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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(1) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(11)	45.00

July 3, 1979.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

Execution and Filing of Patent Applications

This notice is intended as a reminder that United States patent applications which have not been prepared and executed in accordance with the requirements of Title 35 of the United States Code and Title 37 of the Code of Federal Regulations may be denied a filing date as a complete application or may be, in appropriate circumstances, stricken from the files as having been improperly executed and/or filed. Although the statute and the rules have been in existence for many years, the Office continues to receive a number of applications which have been improperly executed and/or filed. Since the improper execution and/or filing of patent applications can ultimately result in a loss of rights it is appropriate to re-emphasize the importance of proper execution and filing.

Attention is invited to the fact that 35 U.S.C. 111 requires that "(t)he application must be signed by the applicant . . ." The same requirement appears in 37 CFR 1.57 which specifies that the signature to the oath or declaration "will be accepted as the signature to the application provided the oath or declaration . . . is attached to and refers to the specification and claims to which it applies. Otherwise the signature must appear at the end of the specification after the claims."

It should be carefully noted that the application "signed by the applicant" must be a *complete* application and cannot be simply an oath or declaration signed without the remainder of the application. As an example, it is improper for an applicant to sign an oath or declaration which is later attached to a specification and/or claims unless the specification is also signed after the claims. See 37 CFR 1.56(c) which provides that "(a)ny application may be stricken from the files if: (1) Signed or sworn to in blank, or without actual inspection by the applicant . . ."

The provisions of 35 U.S.C. 363 for filing an international application under the Patent Cooperation Treaty (PCT) which designates the United States and thereby has the effect of a regularly filed United States national application, except as provided in 35 U.S.C. 102(e), are somewhat different than the provisions of 35 U.S.C. 111. Under 35 U.S.C. 363 and PCT Article 11(1), the signature of the inventor is not required to obtain a filing date but must be submitted later. The oath or declaration requirements for an international application before the Patent and Trademark Office are set forth in 37 CFR 1.70.

The requirement that applicant sign "the application" also precludes alterations to the application after execution. See 37 CFR 1.52(c) which states that "(n)o . . . alterations are permissible after execution of the application papers." It is therefore necessary that the application, including the oath or declaration, be executed in the form in which it is intended to be filed since it is improper for anyone, including counsel, to complete or otherwise alter application papers, including the oath or declaration, after the applicant has executed the same. Section 1.56(c) provides that "(a)ny application may be stricken from the files if: . . . (2) Altered or partly filled in after being signed or sworn to."

In summary it is emphasized that the application filed must be the application executed by the applicant and it is improper for anyone, including counsel, to alter, rewrite, or partly fill in any part of the application, including the oath or declaration, after execution by the applicant. This reminder should particularly be brought to the attention of foreign applicants by their United States counsel since the United States law and practice in this area may differ from that in other countries. Hopefully, this Notice will serve as an adequate reminder so that applicants will not lose rights through the improper execution and/or filing of patent applications.

Oct. 11, 1979.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

Patent Suits

Notices under 35 U.S.C. 290: Patent Act of 1952

2,968,490, Gichner Mobile Systems, Inc., DEMOUNTABLE RUNNING GEAR; **3,339,766,** same, PALLET LIFTING AND TRANSPORTING DEVICE; **3,378,276,** same, HYDRAULICALLY OPERATED DEMOUNTABLE RUNNING GEAR WITH DIAGONAL RAMS; **3,521,898,** same, DEMOUNTABLE RUNNING GEAR WITH AIR BAG AND TORSION ARM SUSPENSION, **filed** June 5, 1979, U.S. Court of Claims (Washington, D.C.), Doc. 246–79, *The Union Corporation* v. *The United States.*

3,032,510, Tornqvist and Langer, Jr., POLYMERIZATION CATALYST; **3,128,252,** Tornqvist, Seelbach and Langer, Jr., PREPARATION OF PARTIALLY REDUCED TRANSITION METAL HALIDE CATALYST COMPOSITIONS; **3,252,960,** Tornqvist, Seelbach and Langer, Jr., POLYMERIZATION PROCESS AND PRODUCTS THEREOF; **3,814,743,** Tornqvist and Langer, Jr., PROCESS FOR POLYMERIZING ALPHA-OLEFINS, **filed** Mar. 23, 1976, D.C. Del. (Wilmington), Doc. 76–116, *Amoco Chemicals Corporation* v. *Exxon Research & Engineering Co.* Consent order of dismissal with prejudice filed Aug. 16, 1979.

3,055,988, Shure Brothers, Inc., MAGNETIC PHONOGRAPH PICKUP; **3,077,521,** same, STEREOPHONIC MOVING MAGNET PHONOGRAPH PICKUP; **3,077,522,** same, STEREOPHONIC PICKUP CARTRIDGE, **filed** May 13, 1976, D.C. Md. (Baltimore), Doc. HM 76–722, *Shure Brothers, Inc.* v. *Peeltone, Incorporated.* Consent judgment filed Dec. 5, 1978.

3,071,118, James K. Wilden, ACTUATOR VALVE MEANS, **filed** July 1, 1976, D.C., N.D. Calif. (San Francisco), Doc. C76–0030–SW, *Wilden Pump & Engineering Co.* v. *Pressed & Welded Products Co.* Supplemental judgment filed Aug. 23, 1979.

3,071,856, Gillette Company, RAZOR BLADE AND METHOD OF MAKING SAME; **3,518,110,** same, **filed** Nov. 4, 1976, D.C. Del. (Wilmington), Doc. 76–375, *Societe Bic, S.A. et al.* v. *Gillette Company.* Stipulation and order dismissing action with prejudice filed Dec. 4, 1978.

3,077,521. (See 3,055,988.)

3,077,522. (See 3,055,988.)

3,128,252. (See 3,032,510.)

3,165,544, Stauffer Chemical Company, CHLOROTHIOLFORMATES AND PREPARATION THEREOF; **3,299,114,** same, PROCESS FOR MAKING CHLOROFORMATES WITH AMINES AS CATALYSTS, **filed** May 30, 1979, D.C., S.D. Tex. (Galveston), Doc. G–79–106, *Stauffer Chemical Company* v. *Hu-Mar Chemicals, Inc.*

3,188,941, Francis B. Fishburne, ELECTRICAL MEANS FOR CONTROLLING HYDRAULIC PRESSES; **3,595,282,** Fishburne and Hinnant, APPARATUS FOR COMPRESSING LOOSE MATERIAL INTO CONTAINERS; **3,817,298,** Francis B. Fishburne, VERTICAL PRESS APPARATUS WITH REMOTELY CONTROLLED DISTRIBUTOR, **filed** Oct. 29, 1976, D.C., W.D.N.C. (Asheville), Doc. A–C–76–179, *Fishburne Equipment Co., Inc. and Francis B. Fishburne* v. *Lee Machine-Hydraulic, Inc. and Charles V. Lee.* Judgment filed Nov. 6, 1978.

3,214,510, Robert W. Harmon, CORONA REDUCTION IN CONDUCTOR CLAMPS FOR HIGH VOLTAGE TRANSMISSION LINES, **filed** May 11, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c1681, *Bunker Ramo Corp.* v. *Western Electric Company, Inc.* Transferred to D.C., S.D.N.Y. on Mar. 23, 1979.

3,252,960. (See 3,032,510.)

3,260,340, International Business Machines Corporation, REVISION SYSTEM FOR DATA RECORDING AND PRINTING APPARATUS; **3,297,124,** same, DATA RECORDING AND PRINTING APPARATUS CAPABLE OF RESPONDING TO CHANGED FORMAT; **3,490,004,** same, DATA PROCESSING AND PRINTING APPARATUS; **3,512,137,** same, CORRELATED RECORDING, REPRODUCING, PRINTING, AND COMPOSING APPARATUS; **3,630,336,** same, PROPORTIONAL SPACING PRINTER INCORPORATING WORD UNDERSCORE CONTROL; **3,764,994,** same, SERIAL PRINTER WITH BI-DIRECTIONAL DRIVE CONTROL; **3,991,405,** same, MARGIN ADJUSTING OF TEXTURAL CODES IN A MEMORY, **filed** Feb. 23, 1978, D.C., N.D. Tex. (Dallas), Doc. CA3–78–0210–C, *International Business Machines Corporation* v. *Xerox Corporation.* Cause dismissed with prejudice on Aug. 1, 1978.

3,261,526, Fastener Corporation, FASTENER DRIVING APPARATUS; **3,563,438,** same, FASTENER DRIVING TOOL, **filed** Nov. 22, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78–748, *Duo-Fast Corporation* v. *Acrosmith, Ltd. et al.*

3,297,124. (See 3,260,340.)

3,299,114. (See 3,165,544.)

3,339,766. (See 2,968,490.)

3,340,821, Erich Wesener, TRANSPORTATION SYSTEM, **filed** July 23, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c3038, *Siemens Aktiengesellschaft* v. *Burno Patent et al.*

3,365,762, The Cavins Co. WELL PIPE GRIPPING STRUCTURE, **filed** Aug. 2, 1979, D.C., W.D. Pa. (Shreveport), Doc. 791086, *Dawson Enterprises, doing business as The Cavins Co.* v. *Oilfield Die Manufacturing, Inc. et al.*

3,378,276. (See 2,968,490.)

3,414,254, Norfin, Inc., SHEET COLLATING DEVICE, **filed** Aug. 21, 1978, D.C. Colo. (Denver), Doc. 78–F–857, *Norfin, Inc.* v. *International Business Machines Corporation.* Stipulation and order of dismissal without prejudice filed July 5, 1979.

3,415,129, General Instrument Corporation, DUAL BAND PUSH-BUTTON TUNER; **3,463,017,** same, **filed** Mar. 18, 1977, D.C., E.D. La. (New Orleans), Doc. 77–852, *General Instrument Corporation* v. *Edward Conrad, doing business as Conrad Enterprises.*

3,420,001, Raymond T. Raymon, ADJUSTABLE CLOSURE LOCK, **filed** Aug. 31, 1979, D.C., E.D. Mich. (Detroit), Doc. 79–73417, *M-P Corporation* v. *Haupert & Parson Supply Co., Inc.*

3,463,017. (See 3,415,129.)

3,490,004. (See 3,260,340.)

3,491,590, Billy K. Watkins, POWER STOPPER WEIGHT TRANSFER APPARATUS, **filed** Aug. 22, 1979, D.C. Ind. (Evansville), Doc. EV 79–141–C, *Billy K. Watkins* v. *Plainville Lions Club and Marvin Jolliff.* **Same, filed** Aug. 23, 1979, D.C., W.D. Tenn. (Jackson), Doc. 79–1113, *Billy K. Watkins* v. *Robin Wood and Robin Wood Sled Rental.* **Same, filed** Aug. 24, 1979, D.C., M.D. Tenn. (Nashville), Doc. 79–1029, *Billy K. Watkins* v. *Unionville Sled Association et al.* **Same, filed** Aug. 24, 1979, D.C., W.D. Mo. (Kansas City), Doc. 79–0653–CV–SJ, *Billy K. Watkins* v. *Dave Hager.* **Same, filed** Aug. 31, 1979, D.C., E.D. Tenn. (Greenville), Doc. C–4–79–35, *Billy K. Watkins* v. *Eddie Fletcher.*

3,512,137. (See 3,260,340.)

3,518,110. (See 3,071,856.)

3,521,898. (See 2,968,490.)

3,552,469, B & J Manufacturing Co., TIRE BEAD SEATER; **3,675,705,** same, TIRE BEAD SEATING AND INFLATION APPARATUS, **filed** Aug. 29, 1979, D.C., E.D. Mich. (Detroit), Doc. 79–73373, *B & J Manufacturing Co.* v. *Brown-Hutchinson, Inc. and Anthony C. Fortunski.*

3,563,438. (See 3,261,526.)

3,577,241, American Beef Packers, Inc., METHOD OF PREPARING EDIBLE ANIMAL FEET, **filed** Dec. 15, 1978, D.C. Nebr. (Omaha), Doc. CV 78–0–547, *American Beef Packers, Inc.* v. *Palamera Beef Corp.* Joint stipulation for dismissal filed Aug. 31, 1979.

3,595,282. (See 3,188,941.)

3,630,336. (See 3,260,340.)

3,675,705. (See 3,552,469.)

3,699,815, Medical Development Corporation, IMPROVEMENTS IN BODY FLUID COLLECTION BOTTLE; **3,811,485,** same, VALVE AND RELATED STRUCTURE FOR VACUUM OPERATED LIQUID-FILL BOTTLES; **Re. 29,321,** same, FLUID COLLECTION BOTTLE AND IMPROVEMENTS THEREIN, **filed** Nov. 13, 1978, D.C., N.D. Tex. (Dallas), Doc. CA3–78–1392–C *Medi-Vac Corporation* v. *Medical Development Corporation.*

3,756,139, John Wolens, POPCORN POPPER, **filed** Aug. 30, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c3576, *John Wolens* v. *K-Mart Corporation et al.*

3,764,994. (See 3,260,340.)

3,774,693, Orthman Manufacturing Company, AGRICULTURAL IMPLEMENT; **3,941,194,** same, FOLDING TOOL BAR HAVING A TRANSPORT BRACE, **filed** Aug. 14, 1979, D.C., C.D. Ill. (Rock Island), Doc. 79–4043, *Orthman Manufacturing Company* v. *Chromalloy American Corporation.*

3,780,991, Whitlock, Inc., PROPORTIONING HOPPER FOR GRANULAR MATERIALS, **filed** Aug. 30, 1979, D.C., N.D. Ga. (Atlanta), Doc. C79–162SA, *Whitlock, Inc.* v. *Process Control Corporation.*

3,785,273, Daniel T. Stickle, TACO SHELL MACHINE; **3,880,065,** same, TORTILLA CENTERING DEVICE; **3,928,638,** same, METHOD OF MAKING TACO SHELLS; **4,154,153,** same, DRIVE MECHANISM FOR A MECHANIZED TACO SHELL FRYER, **filed** May 16, 1979, D.C., W.D. Wis. (Madison), Doc. 79–C–213, *H. M. Stickle et al.* v. *Heublein Inc.*

3,811,485. (See 3,699,815.)

3,814,743. (See 3,032,510.)

3,817,298. (See 3,188,941.)

3,826,068, George C. Ballas, ROTARY CUTTING ASSEMBLY; **3,859,776,** Weed Eaters, Inc., same; **4,035,912,** Weed Eaters, Inc., same, **filed** June 1, 1979, D.C., S.D. Tex. (Houston), Doc. CAH–79–1128, *Black & Decker, Inc.* v. *Weed Eater, Inc.*

3,830,526, Hydrotech International, Inc., APPARATUS AND METHOD FOR MAKING SUB-SEA CONNECTIONS, **filed** Mar. 2, 1979, D.C., S.D. Tex. (Houston), Doc. H–79–401, *Hydrotech International, Inc.* v. *Gripper Inc. and Luther L. Manchester Jr.*

3,852,201, Jack M. Jackson, A CLAY FREE AQUEOUS DRILLING FLUID; **3,953,335,** same, MAGNESIA STABILIZED ADDITIVES FOR NON-CLAY WELLBORE FLUIDS, **filed** Apr. 5, 1979, D.C., S.D. Tex. (Houston), Doc. H–79–684, *Brinadd Company* v. *Texas Brine Corporation.*

3,859,594, Rosemount, Inc., TWO WIRE CURRENT TRANSMITTER RESPONSIVE TO A RESISTANCE SENSOR INPUT SIGNAL; **4,016,763,** same, TWO WIRE CURRENT TRANSMITTER RESPONSIVE TO A RESISTIVE TEMPERATURE SENSOR INPUT SIGNAL, **filed** June 3, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c1998, *Rosemount, Inc.* v. *Honeywell Inc.*

3,859,776. (See 3,826,068.)

3,880,065. (See 3,785,273.)

3,893,890, National Starch and Chemical Corp., PROCESS FOR INHIBITING THE ACTION OF PEPSIN, **filed** Feb. 4, 1977, D.C. Del. (Wilmington), Doc. 77–43, *Rohm and Haas Co. and Peter L. Debenneville* v. *National Starch and Chemical Corp.*

3,923,373, Max Roland, FIBER OPTIC EXTRA ORAL OPERATORY LIGHT, **filed** Aug. 28, 1979, D.C., N.D.N.Y. (Utica), Doc. 79–CV–571, *MDT Instrument Company* v. *Welch Allyn, Inc.*

3,929,051, Chicago Musical Instrument Co., MULTIPLEX HARMONY GENERATOR, **filed** June 23, 1978, D.C., N.D.

Ill. (Chicago), Doc. 78c2534, *Norlin Industries Inc.* v. *Conn Organ Corporation.* **Same, filed** June 30, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c2620, *Norlin Industries, Inc.* v. *The Wurlitzer Company.*

3,935,443, Allen P. Simmons, ILLUMINATED ANIMAL COLLAR AND LEASH, **filed** Aug. 17, 1979, D.C., S.D. Fla. (Fort Lauderdale), Doc. 79–6472–CIV–NCR, *Allen P. Simmons* v. *Hilliard A. Haas, Jr. et al.*

3,940,606, Starlight Associates, HIGH INTENSITY SPOTLIGHT, **filed** Sept. 13, 1977, D.C., S.D.N.Y., Doc. 77–4525 (WK,) *Starlight Associates* v. *Berkey-Colortran Ins.*

3,941,194. (See 3,774,693.)

3,953,025, Martin S. Mazman, MUSCLE BUILDING EXERCISE DEVICE, **filed** Nov. 17, 1976, D.C., E.D. Calif. (Fresno), Doc. F–76–211, *Universal Gym Equipment* v. *Martin Mazman and DeWayne Zinkin.* Action dismissed with prejudice by stipulation of the parties on Feb. 6, 1979.

3,953,335. (See 3,852,201.)

3,965,625, Stevan C. White, CANOPY SUPPORT TOWERS WITH ADJUSTABLE CANOPY, **filed** Aug. 27, 1979, D.C., E.D. Ark. (Little Rock), Doc. LR–C–79–371, *Music Circuit Productions, Inc. and Stevan C. White* v. *Riek Calhoun & Associates, Inc. and Calbro Sound, Inc.*

3,966,396, Bruce Howes, TEXTILE PRINTING PROCESS AND TRANSFER MEDIUM; **filed** June 21, 1978, D.C.N.J. (Newark), Doc. C–78–1364, *Bruce Howes* v. *Elnson-Freeman and Detroy Corporation*

3,967,748, Thermo Seal, Inc., DRINKING RECEPTACLE VALVE MEANS, **filed** Jan. 9, 1979, D.C., S.D. Tex. (Houston), Doc. C.A. H–79–45, *Thermo Seal, Inc.* v. *Dart Industries, Inc. et al.*

3,968,879, George A. Lucas & Sons, SHIPPING CONTAINER AND ASSEMBLY THEREOF, **filed** May 19, 1978, D.C., E.D. Calif. (Fresno), Doc. F–78–107, *George A. Lucas & Sons* v. *Styro Tek Inc.*

3,974,925, Girard J. McKenzie, LOADER AND TREE REMOVER, **filed** Aug. 8, 1979, D.C., M.D. Fla. (Tampa), Doc. 79–840–C T.K., *Griffin Grove Service, Inc.* v. *Girard J. McKenzie.*

3,987,467, David W. Cowles, PHOTOGRAPHIC FILM IDENTIFICATION SYSTEM, **filed** Aug. 15, 1979, D.C., W.D. Wash. (Seattle), Doc. C79–955S, *CX Corporation* v. *Shastar Corporation.*

3,991,405. (See 3,260,340.)

4,009,430, Donald F. Partridge, ANTIPARALLEL COMMUTATED INVERTER, **filed** Sept. 4, 1979, D.C. Oreg. (Portland), Doc. 79–1029, *P.P.S. Manufacturing, Inc.* v. *Beaver Induction Services, Inc. and Victor W. Hatch.*

4,016,763. (See 3,859,594.)

4,029,442, Edward Bleiweiss, HIGH PRESSURE PISTON PUMP AND WIPER, SEALING, VALVING STRUCTURE; **4,035,109,** Drath and Schlosser, PUMP FOR FLUENT, AND ESPECIALLY HEAVY AND ABRASIVE MATERIALS, **filed** June 19, 1979, D.C., S.D. Tex. (Houston), Doc. H–79–1252, *Edward Bleiweiss* v. *Xenex Corporation.*

4,033,167, General Signal Corporation, PROCESS FOR FORMING INTERMEDIATE METAL CONDUIT, **filed** Aug. 17, 1979, D.C. Conn. (Bridgeport), Doc. B–79–340, *Allied Tube & Conduit Corp.* v. *General Signal Corp.*

4,035,109. (See 4,029,442.)

4,035,919 (See 3,859,778.)

4,036,486. C & H Manufacturing Company, STOP MEANS FOR MAT BOARD CUTTER, **filed** May 18, 1979, D.C., S.D. Miss. (Jackson), Doc. J79–0261(N), *C & H Manufacturing Company* v. *Keeton Products International, Inc.* Order of dismissal with prejudice filed Aug. 16, 1979.

4,040,806, Kenneth B. Kennedy, PROCESS FOR PURIFYING HYDROCARBON GAS STREAMS, **filed** Aug. 15, 1979, D.C. N. Mex. (Albuquerque), Doc. 79–652B, *K. B. Kennedy Engineering Co., Inc.* v. *Southwestern Public Service Company and Tuco, Inc.*

4,044,193, Prototech Company, FINELY PARTICULATED COLLOIDAL PLATINUM COMPOUND AND SOL FOR PRODUCING THE SAME, AND METHOD OF PREPARATION OF FUEL CELL ELECTRODES AND THE LIKE EMPLOYING THE SAME, **filed** Aug. 14, 1979, D.C. Mass. (Boston), Doc. CA. 79–1598–K, *United Technologies Corp.* v. *Prototech Company.*

4,073,322, National Instrument Co., Inc. HIGH-SPEED FILLING MACHINE; **4,083,389,** Sidney Rosen and National Instrument Company, Inc., STAR-WHEEL INDEXING SYSTEM FOR AUTOMATIC FILLING MACHINES, **filed** Sept. 11, 1979, D.C., E.D. Pa. (Philadelphia), Doc. 79–3317, *National Instrument Company, Inc. et al.* v. *Adtech Design Co., Inc.*

4,077,400, Roy M. Harrigan, EXTERNAL CARDIAC RESUSCITATION AID, **filed** Sept. 21, 1979, D.C. Vt. (Burlington), Doc. 79–219, *Roy M. Harrigan* v. *Pepin Distributing, Inc.*

4,077,400, Roy M. Harrigan, EXTERNAL CARDIAC RESUSCITATION AID; **4,095,590,** same; **4,166,458,** same, **filed** Sept. 17, 1979, D.C. Del. (Wilmington), Doc. 79–446, *Pepin Distributing Inc.* v. *Harrigan Medical Products, Inc.*

4,079,584, American Hoist & Derrick Company, HEAVY DUTY SHACKLE, **filed** Aug. 27, 1979, D.C. Oreg. (Portland), Doc. 79–983, *American Hoist & Derrick Company* v. *Sowa & Sons, Inc.*

4,083,389. (See 4,073,322.)

4,090,694, Clarence K. Vincent, GO-CART GUARD RAIL, **filed** Sept. 7, 1979, D.C., S.D. Tex. (Houston), Doc. H–79–1854, *Clarence K. Vincent* v. *Robert J. Tupper et al.*

4,095,590. (See 4,077,400.)

4,141,361, Snyder Manufacturing Company, Inc. EVACUATOR, **filed** Sept. 11, 1979, D.C., E.D. Mo. (St. Louis), Doc. 79–1110C(1), *Sherwood Medical Industries, Inc.* v. *Snyder Mfg. Co., Inc. & Snyder Laboratories, Inc.*

4,149,331, Jack Prager, FRAME FOR DISPLAYING PHOTOGRAPHS OR THE LIKE, **filed** Aug. 31, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79–03396–RJK (Px), *Photo Art Frames Inc.* v. *Jack Prager & Prager and Associates, Ltd.*

4,159,251. Wrasidlo & Spiegelman, ULTRAFILTRATION MEMBRAMES BASED ON HETEROAROMATIC POLYMERS, **filed** Apr. 20, 1979, D.C., C.D. Ill. (Danville), Doc. 79–2070, *Pharmaco, Inc.* v. *Dr. Wolfgang Wrasidlo and Dr. Sol Spiegelman.*

4,166,458. (See 4,077,400.)

Re. 27,999, Dr. Ing Max Schloetter Fabric fur Galvanotechnik, ELECTROPLATING BATH FOR DEPOSITING BRIGHT ZINC PLATES, **filed** May 23, 1974, D.C., N.D. Ind. (South Bend), Doc. S74–117, *Dr. Ing. Max Schloetter, Fabrik fur Galvanotechnik and Lea-Ronal, Inc.* v. *Railoc of Indiana,* Inc. Stipulation dismissing action and amended counterclaim without prejudice filed Sept. 4, 1979. **Same, filed** Sept. 14, 1979, D.C., N.D. Ohio (Cleveland), Doc. C79–1778, *Dr. Ing. Max Schloetter Fabrik fur Galvanotechnik* v. *Pavco, Inc.*

Re. 29,321. (See 3,699,815.)

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,077,724, Re. S.N. 075,965, Filed Sep. 17, 1979, Cl. 57/286, APPARATUS FOR PROCESSING YARNS, Nicholas J. Stoddard, et al., Owner of Record: *Lextex Ltd. Inc., Ft. Lauderdale, Fla.,* Attorney or Agent: Henry H. Skillman, Ex. Gp.: 244

3,091,912, Re. S.N. 075,967, Filed Sep. 17, 1979, Cl. 57/247, METHOD OF PROCESSING STRETCH YARN AND YARNS PRODUCED THEREBY, Nicholas J. Stoddard, et al., Owner of Record: *Lextex Ltd. Inc., Ft. Lauderdale, Fla.,* Attorney or Agent: Henry H. Skillman, Ex. Gp.: 244

3,472,011, Re. S.N. 075,966, Filed Sep. 17, 1979, Cl. 57/34 TREATMENT OF ARTIFICIAL YARNS AND THREADS, Ernest P. R. Scragg, Owner of Record: *Lextex Ltd. Inc., Ft. Lauderdale, Fla.,* Attorney or Agent: Henry H. Skillman, Ex. Gp.: 244

4,016,261, Re. S.N. 029,040, Filed Apr. 11, 1979, Cl. 424/180, THERAPEUTIC COMPOSITION AND METHOD OF THERAPEUTICALLY TREATING WARM BLOODED ANIMALS THEREWITH, Paul Gordon, Owner of Record: *Strategic Medical Research Corp., Greenwich, Conn.,* Attorney or Agent: Robert D. Bajefsky, Ex. Gp.: 124

4,017,608, Re. S.N. 029,039, Filed Apr. 11, 1979, Cl. 424/180, THERAPEUTIC COMPOSITION AND METHOD OF THERAPEUTICALLY TREATING WARM BLOODED ANIMALS THEREWITH, Paul Gordon, Owner of Record: *Strategic Medical Research Corp., Greenwich, Conn.,* Attorney or Agent: Robert D. Bajefsky, Ex. Gp.: 124

4,060,294, Re. S.N. 043,908, Filed May 30, 1979, Cl. 339/4, WALL PANEL WITH PREWIRED POWER SYSTEM; Richard G. Haworth, et al., Owner of Record: *Haworth Mfg., Inc., Holland, Mich.,* Attorney or Agent: Raywood H. Blanchard et al., Ex. Gp.: 322

4,088,218, Re. S.N. 059,864, Filed Jul. 23, 1979, Cl. 400/208, RIBBON CASSETTE WITH BI-COLOR CAPABILITY, Noel F. Depew, Owner of Record: *NCR Corporation, Dayton, Ohio,* Attorney or Agent: W. Wawk, et al., Ex. Gp.: 337

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PATENT NOTICES

Certificates of Correction for the Week of Nov. 6, 1979

Re. 30,081	4,129,711	4,145,665	4,155,275
D. 252,379	4,129,723	4,147,356	4,155,641
3,900,693	4,130,983	4,147,627	4,156,076
3,941,109	4,132,595	4,148,827	4,156,449
3,963,783	4,132,612	4,148,839	4,156,821
3,972,676	4,132,613	4,149,244	4,156,850
4,012,689	4,133,168	4,149,363	4,156,939
4,017,845	4,133,976	4,149,612	4,157,061
4,029,449	4,135,111	4,149,916	4,157,258
4,032,366	4,135,243	4,150,148	4,158,050
4,035,243	4,136,047	4,150,292	4,158,429
4,050,893	4,136,093	4,150,677	4,158,706
4,066,780	4,136,243	4,150,822	4,158,739
4,083,803	4,136,369	4,150,845	4,158,750
4,087,630	4,136,627	4,150,902	4,159,914
4,089,726	4,136,969	4,151,109	4,160,120
4,091,448	4,137,009	4,151,185	4,160,270
4,099,405	4,137,105	4,151,341	4,160,750
4,103,593	4,137,516	4,151,457	4,160,902
4,104,465	4,138,214	4,151,851	4,161,076
4,108,530	4,138,503	4,152,159	4,161,250
4,108,532	4,138,545	4,152,347	4,161,256
4,109,942	4,138,581	4,152,414	4,161,514
4,110,459	4,138,705	4,152,547	4,161,675
4,111,491	4,139,497	4,153,356	4,161,872
4,111,782	4,140,169	4,153,522	4,162,145
4,112,105	4,141,352	4,153,642	4,162,212
4,112,214	4,141,356	4,153,702	4,162,336
4,117,011	4,141,907	4,153,896	4,162,697
4,120,877	4,141,989	4,154,287	4,163,127
4,122,547	4,142,028	4,154,494	4,163,754
4,123,467	4,142,061	4,154,726	4,163,856
4,125,771	4,142,855	4,154,841	4,164,140
4,125,917	4,142,858	4,154,856	4,164,156
4,126,787	4,144,549	4,154,877	4,164,639
4,129,378	4,144,727	4,155,238	4,165,863
4,129,448	4,144,961		

Disclaimers

3,092,722.—*Hugh K. Howerton,* Silver Spring, Md. SPECTRO-PHOSPHORESCENCE MEASURING INSTRUMENT. Patent dated June 4, 1963. Disclaimer filed June 22, 1979, by the assignee, *Baxter Travenol Laboratories, Inc.*

Hereby enters this disclaimer to claims 3, 4, 6, 15 and 16 of said patent.

3,598,738.—*Charles B. Biswell,* Woodstown, N.J., *Mark Stanley Fawcett,* Chadds Ford, Pa., and *Andrew Mitchell,* Newark, Del. OIL COMPOSITIONS CONTAINING ETHYLENE COPOLYMERS. Patent dated Aug. 10, 1971. Disclaimer filed Sept. 26, 1979, by the assignee, *E. I. du Pont de Nemours and Company.*

Hereby enters this disclaimer to all claims of said patent.

3,852,847.—*Herbert Etz,* Wuppertal-Langerfeld, Germany. APPARATUS FOR MANUFACTURING TAMPONS. Patent dated Dec. 10, 1974. Disclaimer filed Aug. 27, 1979, by the assignee, *Dr. Carl Hahn KG.*

Hereby enters this disclaimer to claims 1–9 inclusive of said patent.

3,895,398.—*Bernard E. Mustee,* Cleveland, Ohio. FREE-STANDING SHOWER STALLS. Patent dated July 22, 1975. Disclaimer filed Aug. 17, 1979, by the assignee, *E. L. Mustee & Sons, Inc.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,984,336.—*Ronald J. Oier,* East Windsor; *Albert L. Williams,* Princeton; and *Robert F. Bridger,* Hopewell, N.J. LUBRICANT COMPOSITIONS. Patent dated Oct. 5, 1976. Disclaimer filed Sept. 6, 1979, by the assignee, *Mobil Oil Corporation.*

Hereby enters this disclaimer to claims 1, 2, 9, 12 and 13 of said patent.

3,990,595.—*Delwin E. Cobb,* Peoria; *Gerald P. Simmons,* Washington; and *Orrin A. Stemler,* East Peoria, Ill. MOUNTING ARRANGEMENT FOR IMPACT ROCK BREAKER. Patent dated Nov. 9, 1976. Disclaimer filed Aug. 29, 1979, by the assignee, *Caterpillar Tractor Co.*

Hereby enters this disclaimer to claims 1, 2, 3, 8 and 9 of said patent.

4,081,533.—*Dean W. Cheesman,* Kentfield, Calif. METHOD OF REDUCING MAMMALIAN FERTILITY AND DRUGS THEREFOR. Patent dated Mar. 28, 1978. Disclaimer filed Aug. 27, 1979, by the assignee, *The Regents of the University of California.*

Hereby enters this disclaimer to claims 12 and 14 of said patent.

4,117,506.—*David Emil Carlson,* Yardley, Pa. and *Christopher Roman Wronski,* Princeton, N.J. AMORPHOUS SILICON PHOTOVOLTAIC DEVICE HAVING AN INSULATING LAYER. Patent dated Sept. 26, 1978. Disclaimer filed Sept. 27, 1979, by the assignee, *RCA Corporation.*

Hereby enters this disclaimer to claims 1 through 8 of said patent.

4,159,143.—*Bernard Erwin Proeschl,* Decatur, Ill. TRUCK BODY CORNER JOINT. Patent dated June 26, 1979. Disclaimer filed Aug. 31, 1979, by the assignee, *Caterpillar Tractor Co.*

Hereby enters this disclaimer to claim 1 of said patent.

3,710,618.—*Armin B. Pagel,* Janesville, Wis. TORQUE SENSING INSTRUMENTS. Patent dated Jan. 16, 1972. Dedication filed Sept. 4, 1979, by the assignee, *Dana Corporation.*

Hereby dedicates to the Public the remaining term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626–7555 Ext. 274
	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library. Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 28, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-8-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines: Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-18-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	10-13-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	6-21-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-6-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	12-19-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	4-10-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-12-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-7-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-31-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-21-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-1-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines; Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	9-25-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	7-21-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-9-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	2-16-78

Expiration of patents: The patents within the range of numbers indicated below expire during July 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents.....Numbers 3,041,614 to 3,047,872, inclusive

Plant Patents.....Numbers 2,155 to 2,159, inclusive

XEROX LICENSE OFFER

This notice is published pursuant to a CONSENT ORDER TO CEASE AND DESIST dated July 29, 1975 between Xerox Corporation and the Federal Trade Commission.

TERMS *contained in this notice are defined in the Consent Order. All interested parties should refer to that document for the definitions and additional details of Xerox' patent and know-how licensing obligations thereunder.* A copy of the Consent Order and a list of PATENTS licensed to Xerox which are subject to the provisions of paragraphs II and IV (C) (9) of the Order, if any, are available from Xerox upon written request. All such requests and any request relating to the licensing of PATENTS and the licensing and disclosure of KNOW-HOW pursuant to the Consent Order should be made in writing and addressed to:

The Manager of Patent Licensing
Xerox Corporation
Stamford, Connecticut 06904

Xerox shall in accordance with the terms of the Consent Order:

(1) Grant licenses under

(a) its ORDER PATENTS to make, have made, use and vend OFFICE COPIER PRODUCTS under the terms of the Consent Order, and

(b) patents which are required to be licensed pursuant to the terms of paragraph X of the Consent Order, if any, and

(2) Disclose certain written materials as provided in the Consent Order [KNOW-HOW] to any LICENSEE of its United States ORDER PATENTS for use in connection with the manufacture of OFFICE COPIER PRODUCTS in the United States upon payment of the cost of collection and duplication of the requested materials.

The following is a list of patents which is believed to include all of the PATENTS available for licensing in accordance with the terms of the Consent Order. Fuji Xerox, Ltd. patents which also make up part of the list are grouped separately. There also follows a classification index for use in conjunction with the classification data appearing in the patent list to identify the category of the patent and a schedule of foreign countries and their corresponding key letters which are used in identifying corresponding foreign patents in the list. Since the classification system is not restricted solely to OFFICE COPIER PRODUCTS there are several patents included in the list to which the Consent Order is not applicable.

LIST CLASSIFICATION

The Patents are listed in numerical order according to their class assignment. For example, all U.S. patents classified as 1(A) appear at the beginning followed by those classified as 1A1, 1A1A, 1A1B, etc. The left-hand column shows the U.S. patent number. To the right of the U.S. patent number is its title followed by its issue date. Following the U.S. patent issue date is a list of the foreign patents based on the U.S. patents. An example of how the list should be used is as follows:

Under Class 1A which is entitled "Electrostatographic Systems, Imaging Systems—Distinctive Photosensitive Members Imaged", two U.S. patents are listed—2,573,881 which issued November 6, 1951 with corresponding patents in Australia, Canada, Germany, Great Britain, Switzerland and Sweden, and 3,877,936 which issued April 15, 1975 with a corresponding patent in Belgium.

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XEROX PATENT CLASSIFICATION INDEX

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2. Distinctive Photosensitive Members
3. Charging Systems
4. Optical Image Formation and Projection
5. Latent Image Development Systems and Compositions
6. Copy Substrate Handling Systems
7. Developed Image Transfer & Display
8. Image Fixing Systems
9. Cleaning of Imaging Surface
10. Document Handling
12. Photoelectrophoresis
15. Imaging Systems Other Than Electrostatographic
17. Optical Systems
18. Chemical Compositions & Preparation Thereof
20. Mechanical Components
21. Metal Working, Forming and Treating
24. Graphic Arts
25. Electronic Components
26. Design Patents
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30. Manifold
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32. Miscellaneous

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1. ELECTROSTATOGRAPHIC SYSTEMS
   - A. Imaging Systems—Distinctive Photosensitive Members Imaged
     - 1. Inorganic Photosensitive Members
       - a. Selenium
       - b. Alloys of Selenium
       - c. Zinc or Cadmium Chalcogenides
       - d. PbO in Binder
       - e. Group IIIa Phosphides
       - f. Photosensitive Glass, Glass Binders and Ceramics
     - 2. Organic Photosensitive Members
       - a. Organic Photoconductor in Binder
       - b. Charge Transfer Complexes
       - c. Photochromic Compounds
       - d. Photopolymerizable Compounds
     - 3. Photosensitive Members with Subadjacent Barrier Layer
     - 4. Photosensitive Members with Protective Overlayer
     - 5. Fibrous Photosensitive Members
     - 6. Multilayered Members (Support-Intermediate Layer-Photoconductor)
   - B. Imaging Systems—Imaged Non-Photosensitive Members
     - 1. Non-Photosensitive Members
     - 2. Induction Imaging Systems
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     - 4. TESI Printing Systems
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     - 2. Imaging Systems with Enlargement
     - 3. Half-tone Imaging Systems
     - 4. Deformation Imaging Systems
       - a. Frost
       - b. Relief
     - 5. Reversal Printing Systems
   - D. Duplex Imaging Systems
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   - F. Imaging Systems for Preparing Duplicating Masters
   - G. Imaging Systems—Distinctive Development Systems
     - 1. Magnetic Recording Systems
     - 2. Multiple Copying Systems with Partial Transfer
     - 3. Imaging Systems Employing Adhesive Transfer Web
     - 4. Imaging Systems Employing Toner Coated Plates
     - 5. Imaging Systems Capable of Development in Ambient Light
     - 6. Imaging Systems with Liquid Polar Ink Development
   - H. Display Systems with Imaging Capability
     - 1. Projection of a Xerographic Image (PROXI)
     - 2. Pin Matrix
   - I. Imaging Systems with Image Enhancement
   - J. Electrostatographic Apparatus
     - 1. Total Reproduction Systems
     - 2. Cameras
     - 3. Variable Imaging Speed
     - 4. Moving Document Reproduction
     - 5. Flat Plate Electrostatographic Apparatus
     - 6. Flexible Electrostatographic Apparatus
     - 7. Count Control Apparatus
     - 8. Developer Dispensing and Control Apparatus
   - K. Miscellaneous Methods and Apparatus
     - 1. Electrometers
     - 2. Reflex Imaging Systems
     - 3. Resist Formation System
2. DISTINCTIVE PHOTOSENSITIVE MEMBERS
   - A. Photosensitive Members—Novel Compositions
     - 1. Inorganic
       - a. Selenium
       - b. Alloys of Selenium with Arsenic and/or Antimony
       - c. Ar_2S_3 and Combinations Thereof with Selenium
       - d. Group III A Phosphides (Ga, Al or B)
       - e. Chalcogenides (Compounds Containing O, S, Se, or Te)
         - (1) ZnO
         - (2) PbO
       - f. Dye Sensitized Inorganic Photoconductors
       - g. Inorganic Photoconductors in Glass Binders
     - 2. Organic
       - a. Photosensitive Organic Compounds in a Binder
       - b. Lewis Acid Charge Transfer Complexes
   - B. Multi-Layered Photosensitive Members
     - 1. Members Having Subadjacent Barrier Layers
     - 2. Members Having Protective Overlayer
     - 3. Members Having Electroluminescent Layer
     - 4. Members Having Releasable or Soluble Layer
   - C. Deformation Imaging Members
   - D. Fibrous Photosensitive Member
   - E. Photosensitive Members—Novem Fabrication Techniques and Configurations
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   - A. Induction Charging Systems
   - B. Non-Uniform Charging Systems
   - C. Corotron Charging Systems
     - 1. A.C. Charging
     - 2. Negative Charging
     - 3. With Fringe or Needle-like Electrodes
     - 4. Scorotron Charging
     - 5. Bipolar Charging
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     - 7. Toner Dust Control
     - 8. Charge Sensing to Terminate Charging

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F. Charging Including Illumination of Photoconductor

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2. Document Holders
a. Platen Covers
3. Illumination Control Systems
B. Projection of Optical Image onto Photoresponsive Member
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a. Distinctive Optical Scanning Systems
(1) Lens Strip
(2) Fiber Optics
(3) Half Tone Projection Systems
(4) Fresnel Lens
2. Simultaneous Charging and Projection of Optical Image
3. Distortion of Optical Image (e.g., for Coding Purposes)
4. Full Frame Exposure
5. Reflex Exposure
6. Projection with Variable Magnification
a. Magnification with Fixed Optical Path Length
7. Projection of Composite Image
C. Control of Image Contrast

5. LATENT IMAGE DEVELOPMENT SYSTEMS AND COMPOSITIONS
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2. Cloud Charging Methods and Devices
3. Specific Toner and/or Gas Supply Devices and Methods
a. Belt and Porous Material Toner Supply Device
b. Cloud Directing Devices and Methods
4. Induction Development
5. Cleaning Devices
6. Charcoal Development Method
B. Fibrous Brush Development Devices and Methods
C. Magnetic Brush Development (Dry)
1. Magnetic Brush Development Methods and Devices
a. Magnetic Belt Devices
b. Loading Devices
2. Color Producing Development
3. Single Component Magnetic Developer
D. Cascade Development
1. Gravitational Developer Handling Methods and Devices
a. Incremental (e.g., Bucket Devices)
b. Continuous (e.g., Wheel)
c. Magnetic
d. Non-Linear Developer Flow
2. Impact Developing Methods and Devices
3. Developer Contact and Concentration Control Apparatus
4. Background Suppression Apparatus
5. Flat Plate Development
E. Liquid Development
1. Liquid Aerosol Development
2. Emulsion Development
3. Encapsulated Liquid Development
4. Electrophoretic Development
5. Polar Ink Development
F. Donor Development Methods and Apparatus
G. Dense Bed Development Methods and Apparatus
H. Fluidized Bed Development Methods and Apparatus
I. Toner and Developer Dispensing Methods and Apparatus
1. Developer Dispensing
2. Toner Dispensing
a. Powdered Toner Containers
b. Solid Toner Containers
c. Dispensing Apparatus
(1) Without Concentration Control
(2) With Concentration Control
J. Development Electrodes
1. Electrode Types in General
2. Segmented Electrodes
3. Flexible Electrodes
4. Self-Cleaning Electrodes
5. With Variation of Potential
K. Contrast and Large Area Development Enhancement
L. Simultaneous Positive-Negative Formation
M. Reversal Development
N. Developer, Toner and Carrier Compositions
1. Three Component Developer-Carrier, Toner and Additive
a. Inorganic Additive
b. Organic Additive
2. Two Component Developer
a. Distinctive Toner
(1) Polystyrene-Containing
(2) Phenol-Formaldehyde Containing
b. Distinctive Carrier
3. One Component
4. New Carriers
5. New Toners
a. Distinctive Pigment
b. Encapsulated Liquids
6. Developer Manufacture
a. Carrier Preparation
b. Toner Preparation
O. Miscellaneous
P. Simultaneous Development and Cleaning

6. COPY SUBSTRATE HANDLING SYSTEMS
A. Paper Holding Trays
1. With Stack Height Control
B. Seriatim Stack Feeding Devices
1. Mechanical
2. Aeriform
C. Non-Seriatim Stack Feeding Devices
D. Sheet Tracking, Registration, Aligning, Conveying Devices
1. Belt Conveyors
2. Clutch Mechanisms
E. Sheet Holding Devices (During Image Transfer)
F. Mispuff and Multiple Sheet Detecting Devices

G. Counter Devices
H. Sheet Stripping Devices
I. Sheet Cutting Devices
J. Sheet Inverting Devices
K. Copy Distribution, Collection and Sorting Devices

7. DEVELOPED IMAGE TRANSFER AND DISPLAY
A. Image Display Systems
1. Reflective Projection
2. Transmittive Projection
B. Chemical Treatment to Enhance Transfer
C. Electrostatic Transfer of Toner
1. Corona Charging Systems
a. With Conductive Transfer Web
2. A.C. Field Transfer
3. Multiple Transfer
4. Selective Transfer
D. Magnetic Transfer of Toner
E. Pressure Transfer of Toner
1. With Heat
2. With Solvent
3. With Tackified Copy Substrate
a. Gelatin Coated Substrate

8. IMAGE FIXING SYSTEMS
A. Heat Fixation
1. Radiation
a. Flash Heating
b. Control Systems
c. Glass Panel Heating
2. Conduction
a. With Pressure Means
3. Convection
4. Induction
B. Fixation with Vapor Fixative
1. Fixative Removal
C. Fixation with Liquid Fixative
D. Fixation with Solid Fixative
E. Fixation with Pressure
1. Gelatin Coated Copy Substrate

9. CLEANING OF IMAGING SURFACE
A. Frictional
1. Web
2. Brush
a. With Brush Scraper
b. With Electrostatic Assist
(1) Within a Liquid
c. Filter Bag For Use with
B. Non-Frictional
1. Magnetic Brush
2. Cleaning Beads
3. Liquid

10. DOCUMENT HANDLING
A. Document Feed Apparatus
B. Microfiche Handling Systems
C. Stack Feeding Apparatus
D. Facsimile Feeding Apparatus
E. Document Registration Systems
F. Document Inverting Apparatus
G. Stacking and/or Imbricating Apparatus
H. Collating Apparatus
I. Document Jamming Detection Devices

12. PHOTOELECTROPHORESIS
A. Basic Process and Materials
B. Basic Apparatus
C. Machines
D. Air Breakdown
E. Blocking Electrode
F. Camera Apparatus
G. Cleaning
H. Apparatus Components
I. Composite Particle
J. Fixing
K. Inking
L. Masking
M. Pigments (Including PEP Use of Particular Pigment)
N. Process Variation
O. Sensitizors
P. Shear
Q. Transfer
R. Use of Image

15. IMAGING SYSTEMS OTHER THAN ELECTROSTATOGRAPHIC
A. Deformation Imaging
B. Polymerization Imaging
1. Photopolymerization Imaging
2. Charge Injection Polymerization Imaging
C. Ferromagnetic Imaging
D. Photochromic Imaging
E. Vesicular Imaging
F. Exposure Only Imaging

17. OPTICAL SYSTEMS
A. Radiation Sensing
1. X-ray, Ultraviolet
2. Solar Cell
3. Spectral Response Junctions
4. Photocell Circuits
B. Optical Projection and Modulation
1. Image Projection
2. Lenses, Transparencies
3. Kerr Cell
4. Modulators
C. Image Conversion and Intensification
1. Emission
2. Infrared
3. Passive
4. Active (Semiconductor)
D. Character Generation and Display Devices
1. Deflection Generated Display
2. Character Mask
3. Translation and Function Generation
4. Justifier
5. Optical Lens Arrangements
E. Optical Imaging and Scanning
1. Photosensitive Scanners and Spot Scanning Systems
2. Field Effect Scanners
3. Lenticular
4. Scanning Lens Strip and Rotating Mirror Mechanisms
5. Thermotropic, Thermal, Deformation
6. Optical Stabilizing Devices
F. Electron Beam Devices

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1. Tubes
2. Circuits

G. Electroluminescent Devices
1. Storage with Field Effect Device
2. Storage Panels—Construction
3. Display, Actuation
4. Enhancement, Amplifications, Conversion

H. Stimulated Emission Devices
1. Laser Structure and Materials
2. Laser Structures
3. Laser Optical Systems and Applications

I. Optical Devices
1. Pressure Gauge
2. Density Measuring
3. Fiber Optics

J. Miscellaneous

18. CHEMICAL COMPOSITIONS AND PREPARATION THEREOF

A. Photosensitive
1. With a Liquid Vehicle
2. Phthalocyanine
a. X-Form
3. Carboxamides
4. Naphthols

B. Polymers

C. Developer, Toner and Carrier Compositions
1. Three Component Developer-Carrier, Toner and Additive
a. Inorganic Additive
b. Organic Additive
2. Two Component Developer
a. Distinctive Toner
(1) Polystyrene-Containing
(2) Phenol-Formaldehyde Containing
b. Distinctive Carrier
3. One Component Developer
4. New Carriers
5. New Toners
a. Distinctive Pigment
b. Encapsulated Liquids
6. Developer Manufacture
a. Carrier Manufacture
b. Toner Preparation

D. Brazing Compositions

20. MECHANICAL COMPONENTS

A. Mechanical Reaction Devices
1. Belts
2. Drives
3. Pulleys and Rollers
4. Load Movers
5. Clutch
6. Transport Motor and Speed Controls

B. Dispensing and Filtering Devices
1. Powder Cloud
2. Particulate Material Dispensing, Distribution
3. Filtering

C. Sensing Devices
1. Powder Level
2. Temperature
3. Quality (Web)
4. Pressure Gauge
5. Wind
6. Weight
7. Thickness

D. Work Devices (Mechanical)
1. Holding, Forming, Feeding
2. Bonding and Fastening
3. Coupling (Pipe)
4. Testing
5. Molding
6. Valves
7. Sizing

E. Antenna Structure

F. Fluid Amplifiers and Magnetically Controllable Switching Devices

G. Miscellaneous

21. METAL WORKING, FORMING AND TREATING

A. Electroforming and Plating
1. Methods
2. Structure
3. Apparatus

B. Metal Treating

24. GRAPHIC ARTS

A. Liquid Ink Recording
1. Electrically Responsive System
2. Electromechanically Responsive System
3. Magnetically Responsive System
4. Photoresponsive System

B. Photographic Copying
1. Transparency Formation
a. Document Support
b. Projection and Exposure
(1) Simultaneous Exposure and Development of Different Frames
(2) Image Reversal Optics
(3) Automatic Masking
c. Transparency Identification
d. Frame Counting and Locating
e. Miscellaneous
2. Contact Printing From a Transparency
a. Transparency Feed
b. Establishing and Maintaining Contact Between Transparency and Copy Material
c. Exposure Control
d. Transfer Imaging
(1) Image Layer Support Strip
3. Processing
a. Material Purification
b. Transparency Transport
4. Viewing

C. Duplicating
1. Method and Apparatus
a. Thermographic
b. Pressure Applied to Sandwich of Original, Transfer and Receiving Sheet
c. Transfer of Electrostatic Charge Through Stencil
d. Condensation Imaging
e. Spirit and Dry Duplicating Systems (Including ELCAR)
(1) Means for Rotably Mounting a Transfer Sheet
(2) Means for Establishing Pressure Between Transfer Sheet and Copy Substrate
(3) Copy Substrate Handling
(4) Program Control
(5) Formation of a Spirit Duplicating Transfer Sheet
(6) Formation of a Stencil Transfer Sheet
(7) Composition of a Transfer Sheet, Receiving Sheets and Printing Inks

D. Planographic Imaging (Including Lithography)

E. Relief Imaging

F. Gravure Printing

G. Miscellaneous

25. ELECTRONIC COMPONENTS

A. Passive Components
1. Printed Circuit Boards
2. Semiconductor Devices
3. Thin Film Components
4. Connectors

B. Active Components
1. Space Charge Devices
2. Junction Devices
3. Thermionic Conversion Devices
4. Thyratrons

C. Circuits
1. Amplifiers
2. Switching
3. Oscillators and Generators
4. Pulse Circuitry, Including Signal Storage and Delay
5. Power Supply
6. Miscellaneous

26. DESIGN PATENTS

A. Reproduction Apparatus
1. In General
2. Document Feeding Apparatus
3. Transfer and Fusing Apparatus
4. Printer
5. Camera

B. Sorting and/or Storing Apparatus

C. Containers for Xerographic Powder

D. Labeling Apparatus

E. Facsimile Transmission Apparatus
1. In General
2. Transceiver Paper Feed Apparatus
3. Adapter for Facsimile Computer System

F. Microform Apparatus
1. Viewer and/or Copier

G. Educational Devices
1. Scales

H. Miscellaneous
1. Housing For Electronic Apparatus
2. Computer Keyboard
3. Send/Receive Data Printer Terminal
4. Telephone Acoustic Coupler
5. Prism
6. Paper Shredder
7. Other

27. PHOTOGRAPHY

A. Direct Printout Members

B. Direct Printout Processes

C. Imaging Member Fabrication

D. Photographic Processes Generally

30. MANIFOLD

A. Basic Process

B. Apparatus

C. Process Variations

D. Activation

E. Image Transfer and Fixing

F. Duplication Masters

G. Image Reversal

H. Reflex Imaging

I. Color Processes

31. MIGRATION IMAGING (XDM)

A. Basic Process

B. Apparatus

C. Process Variation

D. Imaging Members

E. Imaging Member Fabrication

F. Imaged Members

G. Stripping and Splitting

H. Reversal

I. Fixing

J. Duplicating Masters

K. Color

L. Use of Image

32. MISCELLANEOUS

A. Energy Cells

B. Miscellaneous

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V 9 8 8 / 1 N 0 6 7 9 UMI

FOREIGN COUNTRY KEY LETTER CODE

COUNTRY KEY	COUNTRY NAME
AAA	NO FOREIGN FILING
ALB	ALBANIA
ALG	ALGERIA
ARG	ARGENTINA
ATR	AUSTRIA
AUS	AUSTRALIA
BAH	BAHAMAS
BAR	BAHRAIN
BEL	BELGIUM
BOL	BOLIVIA
BRA	BRAZIL
BRS	BR. SOLOMON ISL.
BRU	BRUNEI
BUL	BULGARIA
BUR	BURUNDI
CAM	CAMBODIA
CAN	CANADA
CEY	CEYLON
CHL	CHILE
CHN	CHINA
CLB	COLOMBIA
COR	CONGO REP. (ZAIRE)
COS	COSTA RICA
CUB	CUBA
CZC	CZECHOSLOVAKIA
DNK	DENMARK
DOR	DOMINICAN REP.
ECD	ECUADOR
EGP	EGYPT
EGR	E. GERMANY
EIR	EIRE
ELS	EL SALVADOR
FIJ	FIJI
FIN	FINLAND
FOM	FORMOSA
FRA	FRANCE
GER	GERMANY
GHA	GHANA
GIB	GIBRALTAR
GIE	GIBERT & ELLICE
GNR	GUINEA REP.
GRB	GR. BRITAIN
GRK	GREECE
GUA	GUATEMELA
GUR	GUERNSEY
HGK	HONG KONG
HOL	HOLLAND
HON	HONDURAS
HUN	HUNGARY
ICE	ICELAND
IDS	INDONESIA
IND	INDIA
IRL	IRELAND
IRN	IRAN
ISR	ISRAEL
ITL	ITALY
JAM	JAMAICA
JAP	JAPAN
JER	JERSEY
KEN	KENYA
KOR	KOREA
KUW	KUWAIT
LAS	LAOS
LEB	LEBANON
LIB	LIBERIA
LXB	LUXEMBOURG
MAU	MAURITIUS
MEX	MEXICO
MLI	MALI
MLS	MALASIA
MLT	MALTA
MLW	MALAWI
MNC	MONACO
MRC	MOROCCO
NIG	NIGERIA
NOR	NORWAY
NZL	NEW ZEALAND
PAK	PAKISTAN
PLD	POLAND
PLP	PHILIPPINES
PNM	PANAMA
PRU	PERU
PTG	PORTUGAL
RHD	RHODESIA
RMN	RUMANIA
RWD	RWANDA
SAB	SAUDI ARABIA
SAF	SOUTH AFRICA
SBH	SABAH
SGP	SINGAPORE
SHL	ST. HELENA
SLN	SIERRA LEONE
SPN	SPAIN
SRK	SARAWAK
STZ	SWITZERLAND
SWA	SO. WEST AFRICA
SWD	SWEDEN
SYA	SYRIA
TGR	TANGIER
THL	THAILAND
TIW	TAIWAN
TNS	TUNIS
TRD	TRINIDAD
TRK	TURKEY
TZN	TANZANIA
UGD	UGANDA
UK	UNITED KINGDOM (Fuji Xerox list only)
URG	URUGUAY
USA	USA
USR	USSR
UAR	UNITED ARAB REP.
VTM	VIETNAM
VZL	VENEZUELA
YGS	YUGOSLAVIA
ZMB	ZAMBIA
ZZZ	

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FUJI XEROX PATENTS

Class 1A1C

3,569,803.—ELECTROPHOTOGRAPHIC PROCESS UTILIZING FRICTION CHARGING. MAR. 9, 1971. BEL. 719365, CAN. 925561, FRA. 1577647, U.K. 1232470.

3,573,905.—METHOD OF PRODUCING ELECTROPHOTOSENSITIVE CADMIUM SULFIDE WITH CRYSTALS OF A HEXAGONALITY OF LESS THAN 80%. APR. 6, 1971. BEL. 682886, CAN. 814845, FRA. 1526846, JAP. 43-16195, MEX. 93082, U.K. 1148487.

3,775,103.—ELECTROPHOTOGRAPHIC MATERIAL AND PROCESS FOR PRODUCING SAME. NOV. 27, 1973. BEL. 693919, FRA. 1511300, GER. 1,522,612, ITL. 798303, NOR. 122730, U.K. 1,183,762.

3,775,106.—ELECTROPHOTOGRAPHIC PROCESS. NOV. 27, 1973. BEL. 771855, CAN. 946465, JAP. 49-17531, U.K. 1328318.

Class 1A1F

3,705,032.—ELECTROPHOTOGRAPHIC MATERIALS. DEC. 5, 1972. AUS. 432027, BEL. 737701, CAN. 918984, FRA. 6928605, GER. 1942383, ITL. 872749, JAP. 48-2966, U.K. 1237036.

Class 1A2

4,105,466.—ORGANIC PHOTOCONDUCTIVE COATING COMPOSITIONS CONTAINING TRICYANOVINYL COMPOUNDS FOR ELECTROPHOTOGRAPHY. AUG. 8, 1978. U.K. 1531921.

Class 1A2C

3,660,086.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS EMPLOYING INORGANIC PHOTOCONDUCTIVE MATERIAL WITH A PHOTOCHROMIC SENSITIZING AGENT. MAY 2, 1972. U.K. 1290441.

3,799,773.—ELECTROPHOTOGRAPHIC PROCESS EMPLOYING A PHOTOCHROMIC COMPOUND AND TRANSPARENT TONER. MAR. 26, 1974.

Class 1A6

3,787,235.—METHOD OF ELECTROPHOTOGRAPHIC SENSITIVE PAPER. JAN. 22, 1974. JAP. 48-1330.

Class 1C4B

3,563,733.—METHODS OF PREPARING RELIEF IMAGES BY ENZYMATIC DIGESTION. FEB. 16, 1971. BEL. 709856, CAN. 830395, FRA. 1564578, JAP. 46-11628, U.K. 1217087.

3,630,728.—ELECTROPHOTOGRAPHIC METHOD OF FORMING RELIEF IMAGES. DEC. 28, 1971. BEL. 728693, CAN. 877883, FRA. 2002.362, JAP. 46-41348, U.K. 1228509.

Class 1E

3,549,359.—COLOR ELECTROPHOTOGRAPHY EMPLOYING DYE TRANSFER FROM A DYE-CONTAINING PHOTOSENSITIVE LAYER TO AN IMAGE RECEIVING SHEET. DEC. 22, 1970. FRA. 1524473, GER. 1,572,341, JAP. 45-40159, U.K. 1,183,532.

3,615,391.—ELECTROPHOTOGRAPHIC COLOR DEVELOPING METHOD. OCT. 26, 1971. AUS. 435735, CAN. 842157, FRA. 1572518, JAP. 46-21996, U.K. 1231846, U.K. 1257609.

3,615,392.—ELECTROPHOTOGRAPHIC REPRODUCTION OF ORIGINALS CONTAINING BOTH MULTICOLOR AND LINE AREAS. OCT. 26, 1971. CAN. 902986, JAP. 46-43951.

3,654,865.—METHOD FOR FORMING DYE IMAGE USING AN ELECTROPHOTOGRAPHIC DEVELOPER CONTAINING A GELATIN TONER. APR. 11, 1972. AUS. 435812, BEL. 745534, CAN. 924.951, FRA. 7004034, ITL. 888.447, JAP. 48-9017, U.K. 1257296.

3,656,947.—CODING OF ORIGINALS AND SENSITIVE PAPER IN A MULTI-COLOR ELECTROPHOTOGRAPHIC PROCESS. APR. 18, 1972. BEL. 748591, CAN. 902987, FRA. 7012518, JAP. 48-26778, U.K. 1309644.

3,672,887.—ELECTROPHOTOGRAPHIC PROCESS FOR MULTICOLOR REPRODUCTION. JUNE 27, 1972. JAP. 47-19395.

3,687,661.—COLOR ELECTROPHOTOGRAPHIC PROCESS. AUG. 29, 1972. CAN. 925929, JAP. 48-28697.

3,689,260.—COLOR ELECTROPHOTOGRAPHIC PROCESS WITH RESIN DEPOSITION FOR STABILIZATION OF TONER IMAGE. SEPT. 5, 1972. AUS. 437666, BEL. 7531555, CAN. 927649, FRA. 7025295, ITL. 910210, JAP. 48-26779, U.K. 1279506.

3,705,767.—ELECTROPHOTOGRAPHIC DEVICE. DEC. 12, 1972. BEL. 753687, CAN. 947357, FRA. 7026800, GER. 2036140, ITL. 902477, JAP. 48-11054, U.K. 1266112.

3,779,639.—COLOR ELECTROPHOTOGRAPHIC APPARATUS. DEC. 18, 1973. U.K. 1331870.

3,785,812.—METHOD OF EXPOSURE IN MULTI-COLOR ELECTROPHOTOGRAPHY. JAN. 15, 1974. ARG. 185812, AUS. 417288, BEL. 759392, CAN. 945619, FRA. 7042329, ITL. 914549, JAP. 49-23905, U.K. 1322847.

3,806,340.—COLOR ELECTROPHOTOGRAPHIC PROCESS EMPLOYING A POLAR ORGANIC SOLVENT VAPOR. APR. 23, 1974. BEL. 774765, CAN. 946671, FRA. 7138742, JAP. 49-23905, U.K. 1322847.

Class 1F

3,473,923.—REPRODUCTION PROCESS INCLUDING TRANSFER AND REDEVELOPMENT OF ELECTROSTATICALLY FORMED IMAGES. OCT. 21, 1969. BEL. 679506, FRA. 1479592, GER. 1,522,597. JAP. 43-07586, U.K. 1152832.

3,745,002.—METHOD OF PREPARING A PRINTING MASTER BY XEROGRAPHY. JULY 10, 1973. ARG. 120543, AUS. 432568, BEL. 756.595, CAN. 903014, FRA. 2068748, JAP. 48-27362, MEX. 119463, U.K. 1314109.

3,788,845.—PROCESS FOR FORMING DYE IMAGES. JAN. 29, 1974.

Class 1G

3,764,309.—COLOR PRINTING METHOD. OCT. 9, 1973. BEL. 724581, CAN. 877884, FRA. 1595848, ITL. 848192, JAP. 46-33541, U.K. 1223020.

Class 1G1

4,151,604.—IMAGE STORAGE AND OPTICAL READ-OUT DEVICE HAVING STRIPED ELECTRODES. APR. 24, 1979.

Class 1I

3,762,811.—METHOD AND APPARATUS FOR ELECTROPHOTOGRAPHY. OCT. 2, 1973.

3,784,301.—ELECTROPHOTOGRAPHIC BORDER APPARATUS. JAN. 8, 1974. JAP. 49-26590.

Class 1J6

3,796,187.—APPARATUS FOR DEVELOPING CONTINUOUS ELECTROPHOTOGRAPHIC PHOTOSENSITIVE WEB MATERIAL. MAR. 12, 1974. BEL. 769412, CAN. 934541, FRA. 7123852, ITL. 934462, U.K. 1332534.

Class 1K

3,408,217.—FINGERPRINT RECORDING. OCT. 29, 1968. JAP. 41-21520, U.K. 1095572.

3,492,140.—METHOD OF RECORDING FINGERPRINTS OF HUMAN BODY. JAN. 7, 1970. FRA. 1386116, JAP. 39-27575, U.K. 1063635.

Class 1K3

3,745,002.—METHOD OF PREPARING A PRINTING MASTER BY XEROGRAPHY. JULY 10, 1973. ARG. 120543, AUS. 432568, BEL. 756.595, CAN. 903014, FRA. 2068748, JAP. 48-27362, MEX. 119463, U.K. 1314109.

Class 2A1E

3,506,595.—PHOTOCONDUCTIVE INSULATING MATERIALS. APR. 14, 1970. FRA. 1498064, GER. 1,522,606, JAP. 43-24394, U.K. 1148537.

3,615,401.—PROCESS FOR THE PREPARATION OF PHOTOCONDUCTIVE LIGHT-SENSITIVE MATERIALS COMPRISING CdS OR CdS.N $CdCo_2$. OCT. 26, 1971. FRA. 2001257, JAP. 47-40819, U.K. 1239129.

3,615,410.—ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING A PROTEASE ENZYME. OCT. 26, 1971. BEL. 730415, CAN. 885386, FRA. 2004.940, U.K. 1224711.

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Class 2A1E1

3,385,699.—PROCESS FOR PROCESSING ELECTROPHOTOSENSITIVE LAYERS. MAY 28, 1968. BEL. 651039, FRA. 1402385, HOL. 130806, SWD. 310458, U.K. 1072476.

3,494,766.—LIGHT SENSITIVE LAYER FOR ELECTROPHOTOGRAPHY. FEB. 10, 1970. CAN. 791648, FRA. 1460449, NOR. 112288, SWD. 226000, U.K. 1085939.

3,494,789.—PHOTOCONDUCTIVE INSULATING MATERIAL. FEB. 10, 1970. CAN. 813830, FRA. 1564467, ITL. 788829, JAP. 44-10631, MEX. 88112, U.K. 1120091.

3,615,410.—ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING A PROTEASE ENZYME. OCT. 26, 1971. BEL. 730415, CAN. 885386, FRA. 2004940, U.K. 1224711.

3,634,333.—PROCESS FOR COATING ZINC OXIDE POWDER WITH CADMIUM SULFIDE. JAN. 11, 1972. BEL. 731056, CAN. 882627, FRA. 2005849, GER. 1916761, JAP. 47-49616, U.K. 1215685.

3,660,086.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS EMPLOYING INORGANIC PHOTOCONDUCTIVE MATERIAL WITH A PHOTOCHROMIC SENSITIZING AGENT. MAY 2, 1972. U.K. 1290441.

3,674,476.—PROCESS FOR PRODUCING PHOTOCONDUCTIVE LAYER FOR ELECTROPHOTOGRAPHY. JULY 4, 1972. BEL. 751.676, CAN. 918481, FRA. 2051030, U.K. 1264719.

3,689,260.—COLOR ELECTROPHOTOGRAPHIC PROCESS WITH RESIN DEPOSITION FOR STABILIZATION OF TONER IMAGE. SEPT. 5, 1972. AUS. 437666, BEL. 753155, CAN. 927649, FRA. 7025295, ITL. 910210, JAP. 48-26779, U.K. 1279506.

3,707,392.—METHOD OF SENSITIZATION OF AN ELECTROPHOTOGRAPHIC MATERIAL. DEC. 26, 1972. AUS. 444836, BEL. 744600, CAN. 888125, FRA. 7001955, GER. 2002607, ITL. 892368, JAP. 48-7814, U.K. 1257154.

3,725,060.—HEMATEIN OR HEMATOXYLIN-CONTAINING ZINC OXIDE PHOTOCONDUCTIVE LAYERS. APR. 3, 1973. JAP. 49-4340.

3,761,261.—PHTHALOCYANINE DYE SENSITIZERS FOR ZINC OXIDE. SEPT. 25, 1973. JAP. 45-990335.

Class 2A1F

3,394,001.—ELECTROPHOTOGRAPHIC SENSITIVE CONTAINING ELECTRON DONOR DYE LAYERS. JULY 23, 1968. JAP. 44-15758, U.K. 1,106,562.

3,476,659.—ELECTROPHOTOGRAPHIC IMAGING AND COPYING PROCESS. NOV. 4, 1969. BEL. 684406, FRA. 1489929, ITL. 773333, JAP. 43-27579, U.K. 1159394.

3,654,865.—METHOD FOR FORMING DYE IMAGE USING AN ELECTROPHOTOGRAPHIC DEVELOPER CONTAINING A GELATIN TONER. APR. 11, 1972. AUS. 435812, BEL. 745534, CAN. 924.951, FRA. 7004034, ITL. 888.447, JAP. 48-9017, U.K. 1257296.

3,704,123.—DYE SENSITIZED PHOTOCONDUCTIVE MATERIAL. NOV. 28, 1972. AUS. 424510, BEL. 720260, CZC. 142206, FRA. 1568416, GER. 1772210, ITL. 831114, JAP. 47-20753, U.K. 1190676, USR. 374866.

3,705,032.—ELECTROPHOTOGRAPHIC MATERIALS. DEC. 5, 1972. AUS. 432027, BEL. 737701, CAN. 918984, FRA. 6928605, GER. 1942383, ITL. 872749, JAP. 48-2966, U.K. 1237036.

3,707,392.—METHOD OF SENSITIZATION OF AN ELECTROPHOTOGRAPHIC MATERIAL. DEC. 26, 1972. AUS. 444836, BEL. 744600, CAN. 888125, FRA. 7001955, GER. 2002607, ITL. 892368, JAP. 48-7814, U.K. 1257154.

Class 2A1G

3,541,028.—PHOTOCONDUCTIVE INSULATING MATERIALS. NOV. 17, 1970. FRA. 1494699, GER. 1,522,605, JAP. 43-14494, U.K. 1128417.

Class 2A2

3,647,428.—PHOTOCONDUCTIVE MATERIAL FOR ELECTROPHOTOGRAPHY. MAR. 7, 1972. AUS. 429949, BEL. 759550, CAN. 924162, FRA. 2072521, ITL. 923181, JAP. 48-4316, U.K. 1269429.

3,704,119.—ELECTROPHOTOGRAPHIC PROCESS USING TONER OF SAME REFRACTIVE INDEX AS ORGANIC PHOTOCONDUCTIVE LAYER. NOV. 28, 1972. AUS. 433360, BEL. 754544, FRA. 7028556, ITL. 902771, JAP. 48-21054, U.K. 1321065.

Class 2A2A

3,707,369.—PHOTOCONDUCTIVE ELEMENTS CONTAINING 2-METHYL-3, 3-DIMETHYL INDOLE DERIVATIVES. DEC. 26, 1972. BEL. 754969, CAN. 898823, FRA. 703049, GER. 2041490, U.K. 1268889.

Class 2B

3,394,001.—ELECTROPHOTOGRAPHIC SENSITIVE MATERIAL CONTAINING ELECTRON-DONOR DYE LAYERS. JULY 23, 1968. JAP. 44-15758, U.K. 1,106,562.

3,656,949.—METHOD OF PRODUCING AN ELECTROPHOTOGRAPHIC AND ELECTROGRAPHIC RECORDING MEMBER. APR. 18, 1972. BEL. 734288, CAN. 890875, FRA. 6919148, GER. 1929162, JAP. 48-787, U.K. 1259158.

3,704,121.—ELECTROPHOTOGRAPHIC REPRODUCTION PROCESS USING A DUAL LAYERED PHOTORECEPTOR. NOV. 28, 1972. BEL. 739153, FRA. 6932116, ITL. 890989, JAP. 49-25218, SPN. 371685, STZ. 519188, U.K. 1272131.

4,023,181.—RECORDING MEDIUM CONDUCTIVE ELECTRODE. MAY 10, 1977. JAP. 49-91720.

4,042,936.—ELECTROSENSITIVE RECORDING METHOD. AUG. 16, 1977. JAP. P49-042206.

Class 2B1

3,574,682.—ELECTROSTATIC RECORDING MATERIALS. APR. 13, 1971. U.K. 1213395.

3,787,235.—METHOD OF ELECTROPHOTOGRAPHIC SENSITIVE PAPER. JAN. 22, 1974. JAP. 48-1330.

Class 2B2

3,552,956.—METHOD FOR TREATING ELECTROPHOTOGRAPHIC RECORDING MATERIALS WITH PROTECTIVE OVERCOATINGS. JAN. 5, 1971. BEL. 693184, FRA. 1508918, SWD. 326372, U.K. 1155665.

3,717,461.—REMOVAL OF PROTECTIVE RESIN LAYER BY LIQUID DEVELOPER IN ELECTROPHOTOGRAPHIC IMAGING. FEB. 20, 1973. ARG. 182091, AUS. 428797, BEL. 762.808, CAN. 929016, FRA. 2078511, ITL. 919801, MEX. 120941, U.K. 1326300.

Class 2B4

3,428,453.—IMAGING FORMING PROCESS UTILIZING XEROGRAPHY. FEB. 18, 1969. FRA. 1,428,775, ITL. 754,825, JAP. 43-02622, U.K. 1,085,151.

Class 2E

3,417,733.—APPARATUS FOR VACUUM COATING. DEC. 24, 1968. FRA. 1,415,251, GER. 1,521,238, JAP. 40-26402, U.K. 1,081,324.

3,573,905.—METHOD OF PRODUCING ELECTROPHOTOSENSITIVE CADMIUM SULFIDE WITH CRYSTALS OF A HEXAGONALITY OF LESS THAN 80% APR. 6, 1971. BEL. 682886, CAN. 814845, FRA. 1526846, JAP. 43-16195, MEX. 93082, U.K. 1148487.

3,656,949.—METHOD OF PRODUCING AN ELECTROPHOTOGRAPHIC AND ELECTOGRAPHIC RECORDING MEMBER. APR. 18, 1972. BEL. 734288, CAN. 890875, FRA. 6919148, GER. 1929162, JAP. 48-787, U.K. 1259158.

3,672,988.—METHOD OF MANUFACTURING BASES FOR ELECTROSTATIC RECORDING MATERIAL OR ELECTROPHOTOGRAPHIC MATERIAL. JUNE 27, 1972. AUS. 437336, BEL. 746420, CAN. 898621, GER. 2008636, ITL. 888758, JAP. 47-45549, U.K. 1301926.

3,674,476.—PROCESS FOR PRODUCING PHOTOCONDUCTIVE LAYER FOR ELECTROPHOTOGRAPHY. JULY 4, 1972. BEL. 751.676, CAN. 918481, FRA. 2051030, U.K. 1264719.

3,772,173.—ELECTROCONDUCTIVE PAPER. NOV. 13, 1973. CAN. 930693, JAP. 48-15037, U.K. 1329569.

3,775,103.—ELECTROPHOTOGRAPHIC MATERIAL AND PROCESS FOR PRODUCING SAME. NOV. 27, 1973. BEL. 693919, FRA. 1511300, GER. 1522612, ITL. 798303, NOR. 122730, U.K. 1183762.

3,927,638.—VACUUM EVAPORATION PLATING APPARATUS. DEC. 23, 1975.

3,984,585.—VACUUM EVAPORATION PLATING METHOD. MAY 5, 1976. FRA. 7422500, GER. P-2430653.4, JAP. 48-72263, U.K. 1,214,698.

Class 2F

3,998,548.—SENSITIVE DRUM RECEIVING DEVICE FOR USE IN ELECTROPHOTOGRAPHIC REPRODUCING MACHINE. DEC. 21, 1976. JAP. 49-94060, U.K. 32984/75.

Class 3

3,764,207.—ELECTROPHOTOGRAPHIC PROCESS UTILIZING SINGLE CHARGING MEANS FOR EFFECTING SIMULTANEOUS FUNCTIONS OF CHARGING AND FACILITATING TONER IMAGE TRANSFER. OCT. 9, 1973.

Class 3C

3,612,864.—IMAGING SYSTEM UTILIZING AN ELECTRODE TREATED WITH A MIXTURE OF A HYGROSCOPIC MATERIAL AND A HYDROPHILIC BINDER. OCT. 12, 1971. BEL. 726690, CAN. 885615, JAP. 47-12440.

3,775,106.—ELECTROPHOTOGRAPHIC PROCESS. NOV. 27, 1973. BEL. 771855, CAN. 946465, JAP. 49-17531, U.K. 1328318.

Class 3C1

3,772,173.—ELECTROCONDUCTIVE PAPER. NOV. 13, 1973. CAN. 930693, JAP. 48-15037, U.K. 1329569.

Class 3C3

3,649,830.—UNIFORM CHARGING METHOD AND APPARATUS USING AN ARRAY OF NEEDLE ELECTRODES. MAR. 14, 1972. CAN. 940590, JAP. 48-28301, U.K. 1279758.

3,655,966.—ELECTRIC CHARGING DEVICE FOR ELECTROPHOTOGRAPHY. APR. 11, 1972. CAN. 922359, JAP. 48-25942, U.K. 1323599.

Class 3C4

3,719,481.—ELECTROSTATOGRAPHIC IMAGING PROCESS. MAR. 6, 1973. CAN. 948693, FRA. 7108391, ITL. 921208, U.K. 1281149.

Class 3C5

3,715,640.—CORONA CHARGING PROCESS AND APPARATUS IN ELECTROPHOTOGRAPHY. FEB. 6, 1973. AUS. 425637, BEL. 765716, CAN. 927473, FRA. 71131128, ITL. 923947, JAP. 49-17379, U.K. 1338691.

3,779,749.—METHOD OF CHARGING IN ELECTROPHOTOGRAPHY. DEC. 18, 1973. BEL. 772412, CAN. 9481495, FRA. 7132246, ITL. 942080, JAP. 49-17532, U.K. 1359182.

3,788,844.—CHARGING METHOD FOR ELECTROPHOTOGRAPHY. JAN. 29, 1974. JAP. 49-13025, U.K. 1344908.

3,789,222.—CORONA CHARGE METHOD. JAN. 29, 1974. BEL. 771311, CAN. 943180, FRA. 7129655, ITL. 933902, JAP. 49-17530.

3,789,224.—PROCESS FOR CHARGING ELECTROPHOTOGRAPHIC MATERIALS. JAN. 29, 1974. AUS. 435928, BEL. 772465, CAN. 945834, FRA. 7132445, ITL. 938023, JAP. 49-23902, U.K. 1359181.

Class 3C9

3,582,731.—CHARGING SYSTEM. JUNE 1, 1971. CAN. 906045, JAP. 46-30636.

Class 3D

3,546,545.—METHOD OF CHARGING A PHOTOCONDUCTIVE INSULATING LAYER. DEC. 8, 1970. BEL. 721040, FRA. 1586221, U.K. 1205297.

3,569,803.—ELECTROPHOTOGRAPHIC PROCESS UTILIZING FRICTION CHARGING. MAR. 9, 1971. BEL. 719365, CAN. 925561, FRA. 1577647, U.K. 1232470.

Class 3E

3,704,121.—ELECTROPHOTOGRAPHIC REPRODUCTION PROCESS USING A DUAL LAYERED PHOTORECEPTOR. NOV. 28, 1972. BEL. 739153, FRA. 6932116, ITL. 890989, JAP. 49-25218, SPAN. 371685, STZ. 519188, U.K. 1272131.

3,715,640.—CORONA CHARGING PROCESS AND APPARATUS IN ELECTROPHOTOGRAPHY. FEB. 6, 1973. AUS. 425637, BEL. 765716, CAN. 927473, FRA. 71131128, ITL. 923947, JAP. 49-17379, U.K. 1338691.

Class 3F

3,749,927.—ELECTROSTATIC CHARGING PROCESS FOR ELECTROPHOTOSENSITIVE MATERIAL. JULY 31, 1973. AUS. 435008, BEL. 469413, FRA. 7123717, ITL. 934461, JAP. 49-16060, U.K. 1316047.

3,778,148.—APPARATUS AND METHOD FOR SELECTIVELY DISCHARGING THE PHOTOCONDUCTIVE SURFACE OF AN ELECTROSTATIC DRUM COPIER TO FACILITATE THE CLEANING THEREOF. DEC. 11, 1973.

3,778,623.—CHARGING METHOD OF ELECTROPHOTOGRAPHIC MATERIALS. DEC. 11, 1973. FRA. 7229549.

3,789,223.—CHARGING METHOD FOR RELATIVELY MOVABLE ELECTROPHOTOGRAPHIC MEANS AND CORONA MEANS. JAN. 29, 1974. AUS. 431512, BEL. 771143, FRA. 7129349, ITL. 935108, JAP. 49-17529, U.K. 1347100.

3,789,224.—PROCESS FOR CHARGING ELECTROPHOTOGRAPHIC MATERIALS. JAN. 29, 1974. AUS. 435928, BEL. 772465, CAN. 945834, FRA. 7132445, ITL. 938023, JAP. 49-23902, U.K. 1359181.

Class 4A

3,741,644.—ORIGINAL POSITION CONFIRMING MEANS FOR DUPLICATING APPARATUS. JUNE 26, 1973.

Class 4A1

3,771,082.—COPYING APPARATUS WITH AUXILIARY LIGHT SOURCE FOR ILLUMINATING AN ORIGINAL TO BE REPRODUCED. NOV. 6, 1973. U.K. 1350616.

3,841,752.—LIGHT SOURCE FOR COPYING MACHINE. OCT. 15, 1974.

Class 4A2

3,737,223.—PLATEN DRIVING DEVICE IN AN ELECTROPHOTOGRAPHIC COPYING MACHINE. JUNE 5, 1973. U.K. 1341619.

Class 4B

3,687,661.—COLOR ELECTROPHOTOGRAPHIC PROCESS. AUG. 29, 1972. ARG. 182081, BEL. 759454, CAN. 932785, FRA. 7043828, ITL. 909538, JAP. 49-18265, U.K. 1327486.

3,784,301.—ELECTROPHOTOGRAPHIC BORDER APPARATUS. JAN. 8, 1974. JAP. 49-26590.

3,785,812.—METHOD OF EXPOSURE IN MULTI-COLOR ELECTROPHOTOGRAPHY. JAN. 15, 1974. ARG. 185812, AUS. 417288, BEL. 759392, CAN. 945619, FRA. 7042329, ITL. 914549, JAP. 49-11573, U.K. 1326580.

Class 4B1

3,927,940.—MANUSCRIPT SCANNING DEVICE FOR COPYING MACHINES AND THE LIKE. DEC. 23, 1975.

3,955,048.—SCANNING METHOD AND APPARATUS. MAY 4, 1976.

Class 4B1A

3,778,153.—OPTICAL IMAGING SYSTEM. DEC. 11, 1973.

4,063,813.—METHOD OF EXPOSING A LIGHT SENSITIVE MEMBER. DEC. 20, 1977. JAP. 51-89646, U.K. 76-19272.

Class 4B7

3,313,883.—SYSTEMS FOR RECORDING CHARACTERS ON LIGHT SENSITIVE RECORDING SURFACES. AUG. 25, 1964. CAN. 693,055, FRA. 1,246,197, GER. 1,449,634, JAP. 318,009.

3,615,391.—ELECTROPHOTOGRAPHIC COLOR DEVELOPING METHOD. OCT. 26, 1971. AUS. 435735, CAN. 842157, FRA. 1572518, JAP. 46-21996, U.K. 1231846, U.K. 1257609.

3,656,947.—CODING OF ORIGINALS AND SENSITIVE PAPER IN A MULTI-COLOR ELECTROPHOTOGRAPHIC PROCESS. APR. 18, 1972. BEL. 748591, CAN. 902987, FRA. 7012518, JAP. 48-26778, U.K. 1309644.

Class 5A1A

3,451,376.—DEVELOPING DEVICE FOR ELECTROPHOTOGRAPHY. JUNE 24, 1969. AUS. 410555, FRA. 1556520, SWD. 319382, U.K. 1173377.

Class 5A2

3,418,972.—POWDER DUSTING DEVICE FOR ELECTROPHOTOGRAPHY. DEC. 31, 1968. FRA. 1544620, JAP. 45-8838, U.K. 1169410.

Class 5A3B

3,418,972.—POWDER DUSTING DEVICE FOR ELECTROPHOTOGRAPHY. DEC. 31, 1968. FRA. 1544620, JAP. 45-8838, U.K. 1169410.

Class 5A4

3,681,065.—DYE TRANSFER COLOR ELECTROPHOTOGRAPHY. AUG. 1, 1972. CAN. 884,227, JAP. 44-32208.

Class 5A5

3,620,800.—CLEANING LIQUID DEVELOPED ELECTROSTATIC IMAGES BY CONTACT WITH VAPORIZED CLEANING FLUID. NOV. 16, 1971. CAN. 915753, CAN. 933997, JAP. 48-13454.

Class 5C

3,927,641.—DEVELOPING MECHANISM USING MAGNETIC BRUSH. DEC. 23, 1975.

3,937,181.—MAGNETIC BRUSH TYPE DEVELOPING MECHANISM IN ELECTROPHOTOGRAPHIC COPYING MACHINE. FEB. 10, 1976.

Class 5C1

3,545,968.—DEVELOPING A LATENT ELECTROSTATIC IMAGE WITH FERROMAGNETIC CARRIER AND TONER BY EMPLOYING A VARYING MAGNETIC FIELD. DEC. 8, 1970. BEL. 710692, FRA. 1561470, U.K. 1205175.

3,908,595.—MAGNETIC BRUSH DEVELOPMENT APPARATUS UTILIZING MAGNETIC MEANS. SEPT. 30, 1975.

3,977,361.—MAGNETIC BRUSH DEVELOPMENT DEVICE. AUG. 31, 1976. GER. P2521275.3, JAP. 49-52302, KOR. 3670, TIW. 6410622, U.K. 19955-75.

3,981,271.—MAGNETIC BRUSH TYPE DEVELOPER FOR USE IN AN ELECTROPHOTOGRAPHIC MACHINE. SEPT. 21, 1976. GER. P25073910, JAP. 49-19615, U.K. 6841-75.

3,985,099.—MAGNETIC BRUSH DEVELOPING DEVICE. OCT. 12, 1976. GER. P2521291.3 JAP. 52303, KOR. 3669, TIW. 6410736, U.K. 19951-75.

4,048,958.—MAGNETIC BRUSH DEVELOPING DEVICE. SEPT. 20, 1977. KOR. 4052-74, TIW. 22,999, U.K. 9472/76, W. GER. P2611755.5.

Class 5C2

3,672,887.—ELECTROPHOTOGRAPHIC PROCESS FOR MULTICOLOR REPRODUCTION. JUNE 27, 1972. JAP. 47-19395.

3,764,309.—COLOR PRINTING METHOD. OCT. 9, 1973. BEL. 724581, CAN. 877884, FRA. 1595848, ITL. 848192, JAP. 46-33541, U.K. 1223020.

Class 5D1

3,783,818.—ELECTROPHOTOGRAPHIC DEVELOPING PROCESS. JAN. 8, 1974. BEL. 781515, FRA. 7211409, ITL. 950927, U.K. 1358450.

Class 5D2

3,336,904.—XEROGRAPHIC DEVELOPING APPARATUS. AUG. 22, 1967. BEL. 651786, GER. 1,472,946, HOL. 132649, JAP. 40-23755, U.K. 1068575.

Class 5D3

3,804,659.—ELECTROPHOTOGRAPHIC REVERSAL DEVELOPMENT PROCESS FOR ENHANCING THE QUALITY OF THE DEVELOPED IMAGE. APR. 16, 1974. FRA. 7144069, JAP. 49-26901.

Class 5E

3,540,885.—REDUCTION OF FOG FORMATION IN AN ELECTROPHOTOGRAPHIC LIGHT SENSITIVE SHEET. NOV. 17, 1970. BEL. 693302, FRA. 1509571, JAP. 44-2551, U.K. 1176001.

3,560,203.—ELECTROPHOTOGRAPHIC DEVELOPING PROCESS. FEB. 2, 1971. FRA. 1604137, U.K. 1165038.

3,566,834.—ELECTROPHOTOGRAPHIC DEVELOPING DEVICE. MAR. 2, 1971. AUS. 417201, BEL. 718329, FRA. 1578391, JAP. 48-31853, U.K. 1194789.

3,622,515.—ELECTROPHOTOGRAPHIC LIQUID DEVELOPER HAVING A PROTEOLYTIC ENZYME. NOV. 23, 1971. AUS. 436813, BEL. 732273, CAN. 896948, FRA. 2007.520, ITL. 867188, JAP. 47-17879, U.K. 1231544.

3,627,557.—LIQUID DEVELOPMENT BY REDUCING THE VISCOSITY OF THE DEVELOPER ON A ROLLER APPLICATION PRIOR TO DEVELOPMENT. DEC. 14, 1971. CAN. 905230, U.K. 1303499.

3,628,981.—LIQUID TONER DEVELOPMENT. DEC. 21, 1971. BEL. 751669, CAN. 902982, FRA. 7021033, ITL. 893939, JAP. 48-18859, U.K. 1284477.

3,642,515.—LIQUID DEVELOPMENT UTILIZING A CURVILINEAR DEVELOPMENT ELECTRODE. FEB. 15, 1972. CAN. 867698.

3,668,126.—METHOD OF PRODUCING ELECTROPHOTOGRAPHIC LIQUID DEVELOPERS HAVING VERY FINE COLORING MATERIAL. JUNE 6, 1972. BEL. 709625, FRA. 1562934, U.K. 1218064.

3,671,290.—IMAGING SYSTEM. JUNE 20, 1972. CAN. 917486, JAP. 48-8134, U.K. 1278858.

3,685,907.—ELECTROPHOTOGRAPHIC PROCESS. AUG. 22, 1972. ARG. 181932, AUS. 442703, BEL. 752387, CAN. 910132, FRA. 2-51297, ITL. 902170, MEX. 116451, U.K. 1292200.

3,692,523.—PROCESS FOR DEVELOPING ELECTROSTATIC LATENT IMAGE AND LIQUID DEVELOPER USED THEREFOR. SEPT. 19, 1972. AUS. 437065, BEL. 745533, CAN. 924.167, FRA. 7040233, GER. 20052680, ITL. 888.449, JAP. 48-7821, U.K. 1255445.

3,703,400.—DEVELOPING METHOD FOR ELECTROPHOTOGRAPHY. NOV. 21, 1972. AUS. 435816, BEL. 748.590, CAN. 898073, FRA. 7012445, GER. 2016586, ITL. 903950, U.K. 1251623.

3,705,032.—ELECTROPHOTOGRAPHIC MATERIALS. DEC. 5, 1972. AUS. 432027, BEL. 737701, CAN. 918984, FRA. 6928605, GER. 1942383, ITL. 872749, JAP. 48-2966, U.K. 1237036.

3,705,767.—ELECTROPHOTOGRAPHIC DEVICE. DEC. 12, 1972. BEL. 753687, CAN. 947357, FRA. 7026800, GER. 2036140, ITL. 902477, JAP. 48-11054, U.K. 1266112.

3,707,139.—LIQUID TYPE ELECTROPHOTOGRAPHY DEVELOPING APPARATUS. DEC. 26, 1972. BEL. 756409, CAN. 918413, FRA. 7034577, GER. 1314865.

3,713,422.—APPARATUS FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE BY LIQUID DEVELOPMENT. JAN. 30, 1973. BEL. 764267, CAN. 932954, FRA. 7109086, GER. 763,992, U.K. 1341631.

3,716,360.—MOLTEN IMAGE TRANSFER IN ELECTROPHOTOGRAPHY. FEB. 13, 1973. BEL. 763191, FRA. 7105717, GER. 2108080, ITL. 919905, U.K. 1313059.

3,717,461.—REMOVAL OF PROTECTIVE RESIN LAYER BY LIQUID DEVELOPER IN ELECTROPHOTOGRAPHIC IMAGING. FEB. 20, 1973. ARG. 182091, AUS. 428797, BEL. 762808, CAN. 929016, FRA. 2078511, ITL. 919801, MEX. 120941, U.K. 1326300.

3,718,593.—PROCESS FOR THE PRODUCTION OF AN ELECTROPHOTOGRAPHIC LIQUID DEVELOPER CONTAINING GELATIN. FEB. 27, 1973. AUS. 438586, BEL. 745535, CAN. 924166, FRA. 7004034, ITL. 888743, JAP. 48-7822, U.K. 1255763.

3,738,832.—COLOR ELECTROPHOTOGRAPHIC PROCESS EMPLOYING LIQUID DEVELOPER CONTAINING GELATIN. JUNE 12, 1973. CAN. 921746, JAP. 47-30858, U.K. 1277723.

3,749,059.—APPARATUS FOR DEVELOPING ELECTROSTATIC LATENT IMAGE. JULY 31, 1973. AUS. 445683, BEL. 755061, CAN. 903579, FRA. 7029636, JAP. 48-25936, U.K. 1267888.

3,750,624.—APPARATUS FOR DEVELOPING ELECTROPHOTOGRAPHIC CONTINUOUS WEB MATERIAL. AUG. 7, 1973. AUS. 433381, BEL. 770250, CAN. 948843, FRA. 7126524, ITL. 948843, U.K. 1328313.

3,753,419.—ELECTROPHOTOGRAPHIC LIQUID DEVELOPING APPARATUS. AUG. 21, 1973. AUS. 430772, BEL. 768788, CAN. 334540, FRA. 7122426, ITL. 928531, U.K. 1337485.

3,766,887.—DEVELOPING DEVICE FOR ELECTROSTATIC LATENT IMAGE. OCT. 28, 1973. AUS. 429869, BEL. 761227, CAN. 102437, FRA. 2075270, ITL. 919235, U.K. 1310092.

3,774,574.—DEVELOPMENT DEVICE FOR ELECTROPHOTOGRAPHY. NOV. 27, 1973. FRA. 7143873.

3,783,827.—LIQUID DEVELOPMENT APPARATUS FOR ELECTROPHOTOGRAPHY. JAN. 8, 1974. BEL. 777528, CAN. 949309, FRA. 7147339, ITL. 945720.

3,784,397.—IMAGING SYSTEM. JAN. 8, 1974. ARG. 185194, JAP. 1348667, MEX. 120938.

3,788,930.—METHOD OF FIXING IMAGES OBTAINED BY LIQUID DEVELOPMENT IN ELECTROPHOTOGRAPHY. JAN. 29, 1974. BEL. 774763.

3,796,187.—APPARATUS FOR DEVELOPING CONTINUOUS ELECTROPHOTOGRAPHIC PHOTOSENSITIVE WEB MATERIAL. MAR. 12, 1974. BEL. 769412, CAN. 934541, FRA. 7123852, ITL. 934462, U.K. 1332534.

3,804,659.—ELECTROPHOTOGRAPHIC REVERSAL DEVELOPMENT PROCESS FOR ENHANCING THE QUALITY OF THE DEVELOPED IMAGE. APR. 16, 1974. FRA. 7144069, JAP. 49-26901.

3,817,212.—ELECTROSTATOGRAPHIC LIQUID DEVELOPMENT APPARATUS. JUNE 18, 1974. U.K. 1310448.

3,836,384.—IMAGING SYSTEMS. SEPT. 17, 1974. JAP. 46-43198.

3,991,711.—ELECTROSTATIC DUPLICATING METHOD AND APPARATUS UTILIZING WET DEVELOPING. NOV. 16, 1976. FRA. 733636, GER. 2350429, JAP. 47-101120, U.K. 1,443,209.

4,029,826.—ELECTROSTATIC PRINTING METHOD. JUNE 14, 1977. FRA. 7434015, GER. P2448211.9, JAP. 48-112875, U.K. 43016-74.

Class 5E4

3,577,259.—LIQUID DEVELOPMENT OF ELECTROSTATIC LATENT IMAGES UTILIZING A TOWER-FREE ZONE. MAY 4, 1971. AUS. 418640, CAN. 871081, FRA. 1592038, JAP. 46-11633, U.K. 1252917.

3,592,678.—LIQUID DONOR DEVELOPMENT WITH ELECTROPHORETIC CLEANING. JULY 13, 1971. CAN. 939733, JAP. 48-34774, U.K. 1261752.

3,597,368.—LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY CONTAINING YELLOW PIGMENT. AUG. 3, 1971. BEL. 719289, CAN. 846.122, FRA. 1578390, JAP. 46-10480, U.K. 1201134.

Class 5I1

3,537,427.—ELECTROSTATIC LATENT IMAGE DEVELOPING DEVICE. NOV. 3, 1930. BEL. 722040, JAP. 46-14440, U.K. 1239635.

3,607,342.—METHOD OF DEVELOPMENT OF ELECTROSTATIC IMAGES. SEPT. 21, 1971. BEL. 707253, FRA. 1555753, JAP. 44-9878, U.K. 1204548.

3,627,557.—LIQUID DEVELOPMENT BY REDUCING THE VISCOSITY OF THE DEVELOPER ON A ROLLER APPLICATION PRIOR TO DEVELOPMENT. DEC. 14, 1971. CAN. 905230, U.K. 1303499.

Class 5J

3,713,422.—APPARATUS FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE BY LIQUID DEVELOPMENT. JAN. 30, 1973. BEL. 764267, CAN. 932954, FRA. 7109086, GER. 763,992, U.K. 1341631.

3,750,624.—APPARATUS FOR DEVELOPING ELECTROPHOTOGRAPHIC CONTINUOUS WEB MATERIAL. AUG. 7, 1973. AUS. 433381, BEL. 770250, CAN. 948843, FRA. 7126524, ITL. 937783, U.K. 1328313.

Class 5J1

3,620,798.—DEVELOPMENT OF LATENT ELECTROSTATIC IMAGE EMPLOYING NOVEM DEVELOPMENT ELECTRODE. NOV. 16, 1971. BEL. 709410, FRA. 1552425, U.K. 1186841.

3,642,515.—LIQUID DEVELOPMENT UTILIZING A CURVILINEAR DEVELOPMENT ELECTRODE. FEB. 15, 1972. CAN. 867698.

3,655,419.—ELECTROPHOTOGRAPHIC REVERSAL DEVELOPING PROCESS. APR. 11, 1972. AUS. 432643, BEL. 741.440, CAN. 914.518, FRA. 6938659, ITL. 880.593, U.K. 1287.903.

3,685,907.—ELECTROPHOTOGRAPHIC PROCESS. AUG. 22, 1972. AUS. 442703, BEL. 752387, CAN. 910132, FRA. 2-51297, ITL. 902170, U.K. 1292200.

3,783,827.—LIQUID DEVELOPMENT APPARATUS FOR ELECTROPHOTOGRAPHY. JAN. 8, 1974. BEL. 777528, CAN. 949309, FRA. 7147339, ITL. 945720.

3,836,384.—IMAGING SYSTEMS. SEPT. 17, 1974. JAP. 46-43198.

Class 5J2

3,774,574.—DEVELOPMENT DEVICE FOR ELECTROPHOTOGRAPHY. NOV. 27, 1973. FRA. 7143873.

3,784,397.—IMAGING SYSTEM. JAN. 8, 1974. ARG. 185194, MEX. 120938, U.K. 1348667.

Class 5J3

3,566,834.—ELECTROPHOTOGRAPHIC DEVELOPING DEVICE. MAR. 2, 1971. AUS. 417201, BEL. 718329, FRA. 1578391, JAP. 48-31853, U.K. 1194789.

3,672,330.—APPARATUS FOR DEVELOPING A LATENT ELECTROSTATIC IMAGE. JUNE 27, 1972. BEL. 708760, FRA. 149128, U.K. 1192600.

Class 5J5

3,560,203.—ELECTROPHOTOGRAPHIC DEVELOPING PROCESS. FEB. 2, 1971. FRA. 1604137, U.K. 1165038.

3,783,818.—ELECTROPHOTOGRAPHIC DEVELOPING PROCESS. JAN. 8, 1974. BEL. 781515, FRA. 7211409, ITL. 950927, U.K. 1358450.

3,784,397.—IMAGING SYSTEM. JAN. 8, 1974. ARG. 185194, MEX. 120938, U.K. 1348667.

3,981,268.—DEVICE FOR CONTROLLING ELECTRIC POTENTIAL APPLIED TO DEVELOPING ELECTRODE IN AN ELECTROPHOTOGRAPHIC DUPLICATOR. SEPT. 21, 1976. GER. P2526802.4, JAP. 49-47554, KOR. 3672, TIW. 6410621, U.K. 24745-75.

Class 5K

3,724,941.—ELECTROPHOTOGRAPHIC APPARATUS. APR. 3, 1973.

3,762,811.—METHOD AND APPARATUS FOR ELECTROPHOTOGRAPHY. OCT. 2, 1973.

Class 5M

3,620,798.—DEVELOPMENT OF LATENT ELECTROSTATIC IMAGE EMPLOYING NOVEM DEVELOPMENT ELECTRODE. NOV. 16, 1971. BEL. 709410, FRA. 1552425, U.K. 1186841.

3,655,419.—ELECTROPHOTOGRAPHIC REVERSAL DEVELOPING PROCESS. APR. 11, 1972. AUS. 432643, BEL. 471.440, CAN. 914.518, FRA. 6938659, ITL. 880.593, U.K. 1287.903.

3,773,507.—ELECTROPHOTOGRAPHIC REVERSAL DEVELOPMENT PROCESS EMPLOYING A PRETONER. NOV. 20, 1973. AUS. 426720, BEL. 769893, CAN. 947812, FRA. 7124853, ITL. 934605, JAP. 49-5465, U.K. 1340947.

Class 5N

3,764,312.—ELECTROPHOTOGRAPHIC PROCESS. OCT. 9, 1973. FRA. 7146405, JAP. 49-26903.

Class 5N2B

4,020,192.—XEROGRAPHIC REPRODUCTION PROCESS AND TONER CARRIER FOR USE THEREIN. APR. 26, 1977. FRA. 7430644, GER. P2443013.1, JAP. 48-101085, U.K. 39509.

Class 5N5

3,941,898.—DEVELOPING METHOD UTILIZING PULVERIZED, COLORED, CROSSLINKED, VINYLIC POLYMER RESIN AS TONER. MAR. 2, 1976.

Class 5O

3,476,659.—ELECTROPHOTOGRAPHIC IMAGING AND COPYING PROCESS. NOV. 4, 1969. BEL. 684406, FRA. 1489929, ITL. 773333, JAP. 43-27579, U.K. 1159394.

3,565,613.—ELECTROLYTIC ELECTROPHOTOGRAPHY. FEB. 23, 1971. GER. 1597849, JAP. 44-13679, U.K. 1202409.

Class 5P

4,127,083.—DEVELOPER SEALING DEVICE FOR XEROGRAPHIC COPYING MACHINE. NOV. 28, 1978.

V 9 8 8 1 N O 6 7 9 UMI

Class 6B1

3,791,643.—CHAIN DELIVERY PAPER FEEDING DEVICE. FEB. 12, 1974. JAP. 48-20232.
3,927,877.—PAPER FEED TRAY FOR USE WITH COPYING MACHINE AND THE LIKE. DEC. 23, 1975.

Class 6C

3,901,427.—COPY PAPER FEEDER. AUG. 26, 1975.

Class 6D

3,924,848.—PAPER FEED APPARATUS FOR GRIPPER-TYPE PAPER TRANSPORT DEVICE. DEC. 9, 1975.
3,924,849.—PAPER GRIPPING DEVICE FOR USE WITH A CHAIN DRIVEN PAPER CARRIAGE. DEC. 9, 1975.

Class 6H

3,704,881.—TRANSFER SHEET PEELING DEVICE FOR XEROGRAPHIC APPARATUS. DEC. 5, 1972. CAN. 940546, U.K. 1275888.

Class 7C

3,764,207.—ELECTROPHOTOGRAPHIC PROCESS UTILIZING SINGLE CHARGING MEANS FOR EFFECTING SIMULTANEOUS FUNCTIONS OF CHARGING AND FACILITATING TONER IMAGE TRANSFER. OCT. 9, 1973.

Class 7E1

3,716,360.—MOLTEN IMAGE TRANSFER IN ELECTROPHOTOGRAPHY. FEB. 13, 1973. BEL. 763191, FRA. 7105717, GER. 2108080, ITL. 919905, U.K. 1313059.

Class 7E3A

3,549,359.—COLOR ELECTROPHOTOGRAPHY EMPLOYING DYE TRANSFER FROM A DYE-CONTAINING PHOTOSENSITIVE LAYER TO AN IMAGE RECEIVING SHEET. DEC. 22, 1970. FRA. 1524473, GER. 1,572,341, JAP. 45-40159, U.K. 1,183,532.
3,654,865.—METHOD FOR FORMING DYE IMAGE USING AN ELECTROPHOTOGRAPHIC DEVELOPER CONTAINING A GELATIN TONER. APR. 11, 1972. AUS. 435812, BEL. 745534, CAN. 924.951, FRA. 7004034, ITL. 888.447, JAP. 48-9017, U.K. 1257296.

Class 8A

3,825,407.—HEATER HOLDING BRACKET FOR A HEAT FIXER IN A COPYING MACHINE OR THE LIKE. JULY 23, 1974.

Class 8AB

3,806,314.—FIXING APPARATUS FOR THERMOPLASTIC RECORDING. APR. 23, 1974.

Class 8A1B

3,818,185.—HEAT FUSION-BONDING APPARATUS FOR ELECTROPHOTOGRAPHY. JUNE 18, 1974.
3,916,256.—PROTECTIVE CIRCUIT IN A TEMPERATURE REGULATOR FOR THE THERMAL FIXING DEVICE OF A DUPLICATOR. NOV. 4, 1975.

Class 8A2

3,904,786.—PROCESS FOR FIXING IMAGES BY CONTACT HEATING IN A DUPLICATOR. SEPT. 9, 1975.
3,981,269.—FIXING DEVICE FOR ELECTROPHOTOGRAPHIC DUPLICATING MACHINES. SEPT. 21, 1976. GER. P2507365.8, JAP. 31159, KOR. 3389, U.K. 5395-75.

Class 8A2A

3,788,930.—METHOD OF FIXING IMAGES OBTAINED BY LIQUID DEVELOPMENT IN ELECTROPHOTOGRAPHY. JAN. 29, 1974. BEL. 774763.

Class 8B

3,647,773.—SUSPENSION POLYMERIZATION IN THE PRESENCE OF A METHYL STYRENE. MAR. 7, 1972. BEL. 727179, FRA. 2000527, JAP. 47-909, U.K. 1251434.

Class 8C

3,385,699.—PROCESS FOR PROCESSING ELECTROPHOTOSENSITIVE LAYERS. MAY 28, 1968. BEL. 651039, FRA. 1402385, HOL. 130806, SWD. 310458, U.K. 1072476.
3,740,249.—SOLVENT FIXING PROCESS. JUNE 19, 1973. JAP. 49-26591.

Class 9A

3,488,896.—PROCESS OF PUMICING A SURFACE. JAN. 13, 1970. FRA. 1,474,687, ITL. 782,665, JAP. 44-12197, U.K. 1,143,923.
3,936,183.—ELECTROPHOTOGRAPHIC COPYING MACHINE WITH IMPROVED CLEANING BLADE. FEB. 3, 1976.

Class 9A1

3,766,592.—DRUM CLEANING DEVICE FOR AN ELECTROPHOTOGRAPHIC DUPLICATOR. OCT. 23, 1973.

Class 9B3

3,671,290.—IMAGING SYSTEM. JUNE 20, 1972. CAN. 917486, JAP. 48-8134, U.K. 1278858.
3,703,400.—DEVELOPING METHOD FOR ELECTROPHOTOGRAPHY. NOV. 21, 1972. AUS. 435816, BEL. 748.590, CAN. 898073, FRA. 7012445, GER. 2016586, ITL. 903950, U.K. 1251623.

Class 10A, 10E

3,922,662.—DETECTOR FOR USE WITH A DUPLICATOR OR THE LIKE FOR DETECTING INCORRECTLY ALIGNED DOCUMENTS. NOV. 25, 1975.

Class 14A5

3,937,883.—BRAKING CIRCUIT FOR USE WITH PHASE SYNCHRONIZING CIRCUITRY. FEB. 10, 1976.

Class 15

3,795,187.—IMPELLERS FOR IMPACT PRINTERS. MAR. 5, 1974.

Class 15C

4,058,800.—IMAGE PICKUP ELEMENT AND SYSTEM UTILIZING MAGNETIC BUBBLES. NOV. 15, 1977. JAP. P49-137738.
4,054,866.—CONVERSION ELEMENT AND SYSTEM UTILIZING MAGNETIC BUBBLES. OCT. 18, 1977. JAP. P50-077558.
4,151,599.1.—MAGNETIC BUBBLE DISPLAY UNITS. APR. 24, 1979.

Class 17B1

3,687,538.—APPARATUS FOR EXPOSING LATENT IMAGE MARGINS IN ELECTROPHOTOGRAPHIC COPYING APPARATUS. AUG. 29, 1972. CAN. 931204, U.K. 1350795.

Class 17D3

3,936,664.—METHOD AND APPARATUS FOR GENERATING CHARACTER PATTERNS. FEB. 3, 1976.

Class 18A

3,417,733.—APPARATUS FOR VACUUM COATING. DEC. 24, 1968. FRA. 1,415,251, GER. 1,521,238. JAP. 40-26402, U.K. 1,081,324.
3,730,711.—PHOTOCONDUCTIVE MATERIAL FOR ELECTROPHOTOGRAPHY. MAY 1, 1973. BEL. 754699, CAN. 925087, FRA. 754699, GER. 2040152, JAP. 48-32381, U.K. 1272720.
3,799,340.—REFINING PHOTOCONDUCTIVE PARTICLE. MAR. 26, 1974. BEL. 776110, CAN. 944204, FRA. 714325.

Class 18A1

3,589,928.—PROCESS FOR THE PRODUCTION OF A LIGHT SENSITIVE MATERIAL FOR ELECTROPHOTOGRAPHY. JUNE 29, 1971. BEL. 685072, FRA. 1500187, GER. 1,522,603, JAP. 44-23775, U.K. 1139532.

3,607,363.—PROCESS FOR PRODUCING PHOTOCONDUCTIVE MATERIAL. SEPT. 21, 1971. U.K. 1210071.
3,625,747.—PHOTOCONDUCTIVE POWDERS AND A METHOD FOR PRODUCING THE SAME. DEC. 7, 1971.
3,634,333.—PROCESS FOR COATING ZINC OXIDE POWDER WITH CADMIUM SULFIDE. JAN. 11, 1972. BEL. 731056, CAN. 882.627, FRA. 2.005.849, GER. 1916761, JAP. 47-49616, U.K. 1215685.
3,682,825.—PROCESS FOR THE PRODUCTION OF ELECTROPHOTOGRAPHIC LIQUID DEVELOPER CONTAINING GELATIN. AUG. 8, 1972. AUS. 424258, BEL. 745390, CAN. 924165, FRA. 7003324, GER. 2004817, ITL. 887410, JAP. 48-7819, U.K. 1255762.
3,729,419.—LIQUID DEVELOPER. APR. 24, 1973. AUS. 451254, FRA. 71.09434, JAP. 48-43157, U.K. 1341627.
3,743,537.—METHOD OF MAKING ELECTROPHOTOGRAPHIC RECORDING MEMBER. JULY 3, 1973. AUS. 430736, ATR. 305766, BEL. 757.393, CAN. 928165, FRA. 7037234, ITL. 917004, JAP. 49-3846, U.K. 1269306.
3,755,177.—PROCESS OF MAKING LIQUID ELECTROSTATIC DEVELOPERS CONTAINING GELATIN. AUG. 28, 1973. AUS. 443292, CAN. 925743, JAP. 48-7820, U.K. 1284646.
3,803,011.—PROCESS FOR PREPARING 2, 3-DIHYDRO-1H,6H-1,5-BENZODIAZOCINE-2-ONE DERIVATIVE. APR. 9, 1974.

Class 18A2

3,761,261.—PHTHALOCYANINE DYE SENSITIZERS FOR ZINC OXIDE. SEPT. 25, 1973.

Class 18A3

3,806,314.—FIXING APPARATUS FOR THERMOPLASTIC RECORDING. APR. 23, 1974.
3,661,572.—MANUFACTURING PROCESS FOR MANUFACTURING ELECTROPHOTOGRAPHIC SENSITIVE MATERIAL. MAY 9, 1972. AUS. 429948, BEL. 754323, CAN. 754323, FRA. 7028557, GER. 2038762, JTL. 902691, U.K. 1305298.

Class 18B

3,548,035.—SUSPENSION POLYMERIZATION PROCESS. DEC. 15, 1970. FRA. 1559138, GER. 1720782, JAP. 45-40052, U.K. 1185775.
3,625,747.—PHOTOCONDUCTIVE POWDERS AND A METHOD FOR PRODUCING THE SAME. DEC. 7, 1971.
3,647,773.—SUSPENSION POLYMERIZATION IN THE PRESENCE OF METHYL STYRENE. MAR. 7, 1972. BEL. 727179, FRA. 2000527, JAP. 47-909, U.K. 1251434.
3,668,126.—METHOD OF PRODUCING ELECTROPHOTOGRAPHIC LIQUID DEVELOPERS HAVING VERY FINE COLORING MATERIAL. JUNE 6, 1972. BEL. 709625, FRA. 1562934, U.K. 1218064.
3,697,266.—ORGANIC PHOTOCONDUCTIVE MATERIALS FOR ELECTROPHOTOGRAPHY. OCT. 10, 1972. BEL. 761043, CAN. 915493, FRA. 2074451, ITL. 913992, JAP. 48-38429, U.K. 1323109.
3,716,505.—PROCESS FOR SUSPENSION POLYMERIZATION. FEB. 13, 1973. FRA. 2048682, GER. 2025104, JAP. 47-23406, U.K. 1316693.

Class 18C

3,622,515.—ELECTROPHOTOGRAPHIC LIQUID DEVELOPER HAVING A PROTEOLYTIC ENZYME. NOV. 23, 1971. AUS. 436813, BEL. 732273, CAN. 896948, FRA. 2007.520, ITL. 867188, JAP. 47-17879, U.K. 1231544.
3,718,593.—PROCESS FOR THE PRODUCTION OF AN ELECTROPHOTOGRAPHIC LIQUID DEVELOPER CONTAINING GELATIN. FEB. 27, 1973. AUS. 438586, BEL. 745535, CAN. 924166, FRA. 7004034, ITL. 888743, JAP. 48-7822, U.K. 1255763.
3,740,249.—SOLVENT FIXING PROCESS. JUNE 19, 1973. JAP. 49-26591.

Class 18C2A1

3,704,119.—ELECTROPHOTOGRAPHIC PROCESS USING TONER OF SAME REFRACTIVE INDEX AS ORGANIC PHOTOCONDUCTIVE LAYER. NOV. 28, 1972. AUS. 433360, BEL. 754544, FRA. 7028556, ITL. 902771, JAP. 48-21054, U.K. 1321065.

Class 18C2A2

3,668,126.—METHOD OF PRODUCING ELECTROPHOTOGRAPHIC LIQUID DEVELOPERS HAVING VERY FINE COLORING MATERIAL. JUNE 6, 1972. BEL. 709625, FRA. 1562934, U.K. 1218064.
3,682,825.—PROCESS FOR THE PRODUCTION OF ELECTROPHOTOGRAPHIC LIQUID DEVELOPER CONTAINING GELATIN. AUG. 8, 1972. AUS. 424258, BEL. 745390, CAN. 924165, FRA. 7003324, GER. 2004817, ITL. 887410, JAP. 48-7819, U.K. 1255762.

Class 18C5A

3,597,368.—LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY CONTAINING YELLOW PIGMENT. AUG. 3, 1971. BEL. 719289, CAN. 846.122, FRA. 1578390, JAP. 46-10480, U.K. 1201134.
3,738,832.—COLOR ELECTROPHOTOGRAPHIC PROCESS EMPLOYING LIQUID DEVELOPER CONTAINING GELATIN. JUNE 12, 1973. CAN. 921746, JAP. 47-30858, U.K. 1277723.

Class 20A3

3,753,419.—ELECTROPHOTOGRAPHIC LIQUID DEVELOPING APPARATUS. AUG. 21, 1973. AUS. 430722, BEL. 768788, CAN. 334540, FRA. 7122426, ITL. 928531, U.K. 1337485.
3,817,212.—ELECTROSTATOGRAPHIC LIQUID DEVELOPMENT APPARATUS. JUNE 18, 1974. U.K. 1310448.

Class 20B3

3,544,458.—METHOD OF FILTERING. DEC. 1, 1970. BEL. 732578, CAN. 888335.

Class 20C

3,707,139.—LIQUID TYPE ELECTROPHOTOGRAPHY DEVELOPING APPARATUS. DEC. 26, 1972. BEL. 756409, CAN. 918413, FRA. 7034577, GER. 1314865.

Class 20C2

3,753,466.—AUTOMATIC FIRE EXTINGUISHER IN ELECTROPHOTOGRAPHIC COPYING MACHINE OR THE LIKE. AUG. 21, 1973. U.K. 1334579.

Class 20C4

3,704,881.—TRANSFER SHEET PEELING DEVICE FOR XEROGRAPHIC APPARATUS. DEC. 5, 1972. CAN. 940546, U.K. 1275888.

Class 20D

3,653,292.—AUTOMATIC CONTOUR TRACING DEVICE. APR. 4, 1972. FRA. 7204547, GER. 2033094, U.K. 1295128.
3,825,407.—HEATER HOLDING BRACKET FOR A HEAT FIXER IN A COPYING MACHINE OR THE LIKE. JULY 23, 1974.

Class 20D1

3,791,643.—CHAIN DELIVERY PAPER FEEDING DEVICE. FEB. 12, 1974. JAP. 48-20232.

Class 20G

3,795,187.—IMPELLERS FOR IMPACT PRINTERS. MAR. 5, 1974.

Class 20I

3,341,664.—METAL DRAWING APPARATUS. APR. 24, 1974.

Class 25A4

3,952,167.—ELECTROMAGNETIC COUPLER FOR USE WITH A TELEPHONE SET. APR. 20, 1976.

Class 25C2

3,341,631.—CIRCUIT INTERRUPTER. APR. 24, 1974. BEL. 764267, CAN. 932954, FRA. 7109086.
3,846,647.—TRIGGER CIRCUIT FOR USE WITH MULTIVIBRATORS. NOV. 5, 1974.

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Class 25C4

3,838,344.—FREQUENCY MULTIPLYING CIRCUIT. SEPT. 24, 1974.

Class 25C5

3,936,675.—REFERENCE POINT POTENTIAL COMPENSATING CIRCUIT FOR USE WITH PHASE CONTROLLER. FEB. 3, 1976.

Class 27D

3,779,206.—APPARATUS FOR SCRAPING LIQUID OFF OF SHEET MATERIAL. DEC. 18, 1973.

Class 32

3,813,262.—RESIN-IMPREGNATED TISSUE OVERLAYS. MAY 28, 1974. BEL. 777312, FRA. 7146406, ITL. 945655.

Class 32B

3,273,450.—DATA PROCESSING APPARATUS. NOV. 15, 1963. FRA. 1384061, GER. 1449563, GRB. 1048048, JAP. 629392.

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Xerox Patents

Class 1

4,043,549.—IMPACT FEEDER. AUG. 23, 1977
4,060,105.—TONER LOADING APPARATUS WITH REPLENISHING SUPPLY CONTAINER. NOV. 29, 1977
4,109,903.—FLUIDIC FEEDING OF DOCUMENTS TO AN EXPOSURE STATION. AUG. 29, 1978

Class 1A

3,877,936.—PHOTOCONDUCTIVE COPOLYMER OF N-VINYLCARBAZOLE AND N-VINYLPHTHALIMIDE. APR. 15, 1975. BEL. 0812436, FRA. 7409307, GRB. 1444048, ITL. 1010697, SPN. 0424411.
3,954,951.—PREPARATION OF RED AMORPHOUS SELENIUM. MAY 4, 1976.
3,961,954.—ACID SENSITIZED CHARGE TRANSFER COMPLEXES AND CYCLIC ELECTRSTATOGRAPHC IMAGNG METH-ACID SENSITIZATN. JUNE 8, 1976. CAN. 1002366.
4,009,249.—PREPARATION OF RED AMORPHOUS SELENIUM. FEB. 22, 1977.
4,072,522.—METHOD OF TREATING PHOTOCONDUCTIVE ZINC OXIDE. FEB. 7, 1978.
4,078,924.—IMAGING SURFACE SMOOTHING WITH ROUGHENED FOIL NICKEL. MAR. 14, 1978.
4,099,969.—COATING METHOD TO IMPROVE ADHESION OF PHOTOCONDUCTORS. JULY 11, 1978.

Class 1A 1

3,607,261.—INORGANIC CRYSTALLINE BINDERS FOR ELECTROPHOTOGRAPHIC PLATES. SEPT. 21, 1971.
3,850,631.—PHOTOCONDUCTIVE ELEMENT WITH A POLYVINVLIDENE FLUORIDE BINDER. NOV. 26, 1974.
3,928,036.—FLEXIBLE XEROGRAPHIC PHOTORECEPTOR ELEMENT. DEC. 23, 1975.
3,981,728.—XEROGRAPHIC IMAGING MEMBER HAVING HEXAGONAL SELENIUM IN INTER-LOCKING CONTINUOUS PATHS. SEPT. 21, 1971.

Class 1A 1A

3,174,855.—METHOD FOR A PRODUCTION OF A XEROGRAPHIC PLATE. MAR. 23, 1965.
3,251,686.—XEROGRAPHIC PROCESS. MAY 17, 1966. FRA. 1292831, GER. 1243979, GRB. 0996972, JAP. 0416023.
3,312,547.—XEROGRAPHIC PLATE AND PROCESSES OF MAKING AND USING SAME. APR. 4, 1967.
3,341,326.—DARK DECAY CONTROLLED XEROGRAPHY. SEPT. 12, 1967. AUS. 0285843, CAN. 0729829, FRA. 1377592, GRB. 1029199, ITL. 0706101.
3,352,669.—PHOTOCONDUCTIVE MEMBER AND PROCESSES OF PREPARING AND USING SAME. NOV. 14, 1967. AUS. 0405164, CAN. 0834670, FRA. 1422625, GER. 1497194, GRB. 1052970, HOL. 0137891, ITL. 0749420, JAP. 0501912.
3,508,918.—XEROGRAPHIC PLATE CONTAINING ALUMINUM SELENIDE BARRIER LAYER. APR. 28, 1970. CAN. 0872175.
3,532,496.—XRGRPHC PLTS AND PROCS EMPLYNG HMGNUS DISPRSNS OF VTREOUS SLNIUM AND SNSTZNG DYES AS PHTCNDCTV LAYER. OCT. 6, 1970.
3,621,248.—METHOD USING XERORADIOGRAPHIC PLATE INSENSITIVE TO VISIBLE LIGHT. NOV. 16, 1971.
3,645,729.—METHOD OF TRANSFERRING ELECTROSTATIC LATENT IMAGES USING MULTIPLE PHOTOCONDUCTIVE LAYERS. FEB. 29, 1972.
3,690,252.—LITHOGRAPHIC INKING APPARATUS. SEPT. 12, 1972. CAN. 0919006.
3,930,853.—ACCELERATING AGING METHOD FOR SELENIUM ARSENIC PHOTOCONDUCTORS. JAN. 6, 1976.
4,013,463.—PHOTORECEPTOR FABRICATION UTILIZING AC ION PLATING. MAR. 22, 1977.
4,150,029.—SELENIUM AND SELENIUM ALLOY EVAPORATION TECHNIQUE. MAR. 29, 1977.
4,016,310.—COATR HRDWR AND METH FOR OBTNG UNFRM PHROCNDTV LAYR ON A XEROGRAPHIC PHOTORECEPTOR. APR. 5, 1977.
4,109,902.—PHOTORECEPTOR FABRICATION. APR. 26, 1977.
4,023,523.—COATING HARDWARE AND METHOD FOR OBTAINING UNIFORM PHOTOCONDUCTIVE LAYERS ON A XEROGRAPHIC PHOTO. MAY 17, 1977.
4,072,518.—METHOD OF MAKING TRIGONAL SELENIUM INTERLAYERS BY GLOW DISCHARGE. FEB. 7, 1978.
4,075,013.—ELECTROPHOTOCHEMICAL PREPARATION OF SELENIUM PHOTOCONDUCTIVE MEMBERS. FEB. 21, 1978.
4,098,655.—METHOD FOR FABRICATING A PHOTORECEPTOR. JULY 4, 1978.

Class 1A 1B

3,312,548.—XEROGRAPHIC PLATES. APR. 4, 1967. BEL. 0691217, CAN. 0819658, FRA. 1505803, GRB. 1165579, JAP. 0650232.
3,355,289.—CYCLICAL XEROGRAPHIC PROCESSD UTILIZING A SELENIUM-TELLURIUM XEROGRAPHIC PLATE. NOV. 28, 1967.
3,427,157.—XEROGRAPHIC PROCESS UTILIZING A PHOTOCONDUCTIVE ALLOY OF THALLIUM IN SELNIUM. FEB. 11, 1969. CAN. 0834085, FRA. 1461161, GRB. 1132993, HOL. 0150924, ITL. 0749553, JAP. 0534762, MEX. 0085232.
3,489,560.—PHOTOCONDUCTIVE LAYR COMPRISN SELENIUM COMPOUND AND SOLID HYDROPHOBIC METL SALT OF A FATTY ACID. JAN. 13, 1970. BEL. 0711297, CAN. 0871632, FRA. 1544448, GRB. 1203237, ITL. 0815227, JAP. 0632160.
3,490,903.—ALLOYS OF ANTIMONY AND SELENIUM USED IN PHOTOCONDUCTIVE ELEMENTS. JAN. 20, 1970. AUS. 0412949, CAN. 0871074, FRA. 1533536, GRB. 1185389, ITL. 0805955, JAP. 0626127, SWD. 0318193.
3,511,649.—PROCESS OF REDUCING FATIGUE IN PHOTOCONDUCTIVE GLASSES. MAY 12, 1970. GRB. 1193472, JAP. 0604152.
3,524,745.—PHOTOCONDUCTIVE ALLOY OF ARSENIC ANTIMONY AND SELENIUM. AUG. 18, 1970. ARG. 0164055, AUS. 0410443, BEL. 0709132, CAN. 0884810, CHL. 0024255, FRA. 1550902, GRB. 1209971, IND. 0113988, ITL. 0833508, JAP. 9124370, LXB. 0055231, MEX. 0108993, NOR. 0127943, NZL. 0151243, PRU. 0009904, PTG. 0048919, SAF. 0680228, SPN. 0349235, STZ. 0495573, SWD. 0328189, URG. 0009683.
3,645,729.—METHOD OF TRANSFERRING ELECTROSTATIC LATENT IMAGES USING MULTIPLE PHOTOCONDUCTIVE LAYERS. FEB. 29, 1972.
3,690,252.—LITHOGRAPHIC INKING APPARATUS. SEPT. 12, 1972. CAN. 0919006.
3,709,683.—INFRARED SENSITIVE IMAGE RETENTION PHOTORECEPTOR. JAN. 9, 1973.
3,874,917.—METHOD OF FORMING VITREOUS SEMICONDUCTORS BY VAPOR DEPOSITING BISMUTH AND SELENIUM. APR. 1, 1975.
4,015,029.—SELENIUM AND SELENIUM ALLOY EVAPORATION TECHNIQUE. MAR. 29, 1977.
4,016,310.—COATR HRDWR AND METH FOR OBTNG UNFRM PHROCNDTV LAYR ON A XEROGRAPHIC PHOTORECEPTOR. APR. 5, 1977.
4,019,902.—PHOTORECEPTOR FABRICATION. APR. 26, 1977.
4,023,523.—COATING HARDWARE AND METHOD FOR OBTAINING UNIFORM PHOTOCONDUCTIVE LAYERS ON A XEROGRAPHIC PHOTO. MAY 17, 1977.
4,099,969.—COATING METHOD TO IMPROVE ADHESION OF PHOTOCONDUCTORS. JULY 11, 1978.
4,121,981.—ELECTROCHEMICAL METHOD FOR FORMING A SELENIUM-TELLURIUM LAYER IN A PHOTORECEPTOR. OCT. 24, 1978
4,126,457.—EVAPORATION TECHNIQUE FOR PRODUCING TEMPERATURE PHOTORECEPTOR ALLOYS. NOV. 21, 1978. CAN 1046864.

Class 1A 1C

3,077,398.—XEROGRAPHIC PLATE MADE BY CAST COATING. FEB. 12, 1963.
3,080,251.—METHOD OF XEROGRAPHIC DEVELOPMENT. MAR. 5, 1963.
3,121,006.—PHOTO-ACTIVE MEMBER FOR XEROGRAPHY. FEB. 11, 1964. ARG. 0147758, BEL. 0656892, CAN. 0674311, CHL. 0020455, CLB. 0014118, ECD. 0000029, GUA. 0001696, PRU. 0009656, TRK. 0012835, URG. 0006526, VZL. 0016353.
3,121,007.—PHOTO-ACTIVE MEMBER FOR XEROGRAPHY. FEB. 11, 1964.

3,140,174.—PROCESS FOR OVERCOATING A XEROGRAPHIC PLATE. JULY 7, 1964. GRB. 0960871.
3,151,982.—XEROGRAPHIC PLATE. OCT. 6, 1964. ARG. 0149584, ATR. 0247148, AUS. 0275834, BEL. 0630478, BRA. 0088013, CAN. 0879017, DNK. 0116787, FRA. 1359402, GER. 1497054, GRB. 1049872, GRK. 0026268, HOL. 0139212, IND. 0086999, ISR. 0018877, ITL. 0701505, JAP. 0489512, LXB. 0043461, MEX. 0081663, NOR. 0108058, NZL. 0134420, PTG. 0040700, SAF. 0001331, SPN. 0286492, STZ. 0450173, SWD. 0313998.
3,251,686.—XEROGRAPHIC PROCESS. MAY 17, 1966. FRA. 1292831, GER. 1243979, GRB. 0996972, JAP. 0416023.
3,379,527.—PHOTOCONDUCTIVE INSULATORS COMPRISING ACTIVATED SULFIDES SELENIDES AND SULFOSELENIDES OF CADMIUM. APR. 23, 1968. CAN. 0907921, GRB. 1079065.
3,519,420.—METHOD OF CHARGING A ZINC OXIDE PHOTOCONDUCTIVE LAYER WITH A POSITIVE CHARGE. JULY 7, 1970.
3,522,040.—PHOTOSENSITIVE INSULATING MATERIAL. JULY 28, 1970. CAN. 0884808, GRB. 1171910, JAP. 0552966.
3,941,594.—ELECTROPHOTOGRAPHIC ELEMENT WITH ZNO AND TIO2. MAR. 2, 1976.
3,969,113.—PHOTOSENSITIVE BINDER LAYER FOR XEROGRAPHY CONTAINING TITANIUM OXIDE AND A CADMIUM PIGMENT. JULY 13, 1976.
3,975,306.—METHOD FOR IMPROVING THE PHOTOINDUCED DISCHARGE CHARACTERISTICS OF CERTAIN CADMIUM CHALOCOGENIDE. AUG. 17, 1976.

Class 1A 1E

3,469,978.—PHOTOSENSITIVE ELEMENT. SEPT. 30, 1969. CAN. 0872173, GRB. 1171909, JAP. 0552967.

Class 1A 1F

3,288,604.—IMAGING METHOD USING AN ELEMENT HAVING A GLASS OVERCOATING. NOV. 29, 1966. CAN. 0815735.
3,397,982.—XIC PLATE W/INORGANIC GLASS BINDER HAVING OVERCOATING CONSISTING ESSENTIALLY OF ALUMINUM OXIDE. AUG. 20, 1968. ARG. 0150690, AUS. 0407349, BEL. 0674140, CAN. 0866142, FRA. 1460232, GER. 1497230, GRB. 1129674, ITL. 0822914, JAP. 0531894, MEX. 0085270, SWD. 0319976.
3,507,646.—ELECTROPHOTOGRAPHIC PROCESS USING A SINGLE PHASE PHOTOCONDUCTIVE GLASS IMAGING LAYER. APR. 21, 1970. ARG. 0164449, AUS. 0416137, BEL. 0691757, CAN. 0818383, FRA. 1511172, GER. 1522713, GRB. 1167520, ITL. 0787661, JAP. 0567233, MEX. 0105237, SPN. 0334896, STZ. 0472707, SWD. 0331793, VZL. 0024006.
3,565,713.—METHOD OF FORMING A CERAMIC IMAGE ON A CERAMIC SUBSTRATE. FEB. 23, 1971.

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3,738,831.—CHALCOGEN ORGANIC COMPOUNDS USED IN ELECTROPHOTOGRAPHIC PLATES AND PROCESS. JUNE 12, 1973.
3,758,301.—ELECTROPHOTOGRAPHIC USE OF SELENIUM CONTAINING POLYMERS. SEPT. 11, 1973.
3,770,428.—ORGANIC PHOTOCONDUCTIVE MATERIAL. NOV. 6, 1973.
3,850,631.—PHOTOCONDUCTIVE ELEMENT WITH A POLYVINVLIDENE FLUORIDE BINDER. NOV. 26, 1974.
3,864,144.—PROCESS FOR PREPARATION OF PHOTOCONDUCTIVE FILMS FROM INTRACTABLE MATERIALS. FEB. 4, 1975. FRA. 740836, GRB. 1414158, ITL. 1010695, TIW. 0008534.
3,879,198.—ELECTROPHOTOGRAPHIC AMBIPOLAR PHOTOCONDUCTIVE COMPOSITION AND IMAGING METHOD. APR. 22, 1975.
3,882,087.—ORGANIC PHOTOCONDUCTIVE MATERIAL. MAY 6, 1975.
3,903,107.—DIRECT ALPHA TO X PHASE CONVERSION OF METAL CONTAINING PHTHALOCYANINE. SEPT. 2, 1975. BEL. 0815632, SAF. 0743536.
3,915,704.—PHOTOINDUCED ACID CATALYZED DEGRADATION OF DEGRADABLE POLYMERS. OCT. 28, 1975.
3,917,483.—PHOTOINDUCED ACID CATALIZED DEPOLYMERIZATION OF DEGRADABLE POLYMERS. NOV. 4, 1975.
3,923,762.—PROCESS FOR PREPARATION OF 2-ANTHRYL AND SUBSTITUTED 2-ANTHRYL FUNCTIONAL MONOMERS AND P. DEC. 2, 1975. BEL. 0822305, STZ. 0032598.
3,932,180.—DIRECT ALPHA TO X PHASE CONVERSION OF METAL-FREE PHTHALOCYANINE. JAN. 13, 1976. BEL. 0815632, SAF. 0743536.
3,943,108.—PHOTOCONDUCTIVE COMPOSITION OF AN ALDEHYDE CONDENSATE. MAR. 9, 1976.
3,951,658.—COLOR MODIFYING IMAGING METHOD AND ARTICLE. APR. 20, 1976.
3,954,906.—AMBIPOLAR PHOTOCONDUCTIVE COMPOSITION AND IMAGING METHOD. MAY 4, 1976. FRA. 7403086, GRB. 1446966.
3,978,029.—PHOTOCONDUCTIVE COMPOSITIONS AND IMAGING MEMBERS AND METHODS EMPLOYING SAME. AUG. 31, 1976. ARG. 0206212, BEL. 0816552, FRA. 7422479, SAF. 0744129.
3,981,848.—PHOTOCONDUCTIVE COMPOSITION AND IMAGING METHODS EMPLOYING SAME. SEPT. 21, 1976. ARG. 0206211, ATR. 0332734, FRA. 7422484.
4,043,812.—A PROCESS FOR PREPARATION OF 2-ANTHRYL & SUBSTITUTED 2-ANTHRYL FUNCTIONAL MONOMERS AND POLY. JUL 23, 1977. BEL. 822305, FRA. 7527053, STZ. 32598.
4,050,934.—ELECTRON ACCEPTOR MONOMERS & POLYMERS. SEPT. 27, 1977.
4,056,391.—METHOD FOR ENHANCING SOLID SOLUTION STABILITY OF ELECTRON ACCEPTOR MOLECULES AND ELECTROPHO. NOV. 1, 1977.
4,117,072.—PROCESS FOR ENHANCEMENT OF MECHANICAL PROPERTIES OF PHOTOCONDUCTIVE POLYMERS. SEPT. 26, 1978. FRA. 7531736. GRB. 1469371.
4,117,239.—PROCESS FOR PREPARATION OF 2-ANTHRYL AND SUBSTITUTED 2-ANTHRYL FUNCTIONAL MONOMERS & POLYMERS. SEPT. 26, 1978. BEL. 822305.
4,153,802.—ELECTRON ACCEPTOR MONOMERS AND POLYMERS. MAY 8, 1979. FRA. 7626102.
4,161,490.—ELECTRON ACCEPTOR MONOMERS. JULY 17, 1979. FRA. 7626102.

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3,081,165.—XEROGRAPHIC CHEMOGRAPHY. MAR. 12, 1963. CAN. 0618594, GRB. 0977904.
3,357,989.—METAL FREE PHTHALOCYANINE IN THE NEW X-FORM-SEE D2167 FOR RE27117. DEC. 12, 1967. CAN. 0860929, FRA. 1508173, GRB. 1169901, ITL. 0787592, JAP. 0560090, MEX. 0101543.
3,432,415.—ELECTROPHORETIC IMG. PROCESS USING PHOTOSENSITIVE XANTHENONIUM SALTS. MAR. 11, 1969. AUS. 0439502, BEL. 0743895, CAN. 0851118, GER. 1522701, GRB. 1155747, JAP. 0650631, MEX. 0104632.
3,442,781.—PHOTOELECTROPHORETIC AND XEROGRAPHIC IMG. PROC. EMPL. TRIPHENODIOXAZINES AS ELECTRIC. PHOTOSENSIT. MAY 6, 1969. AUS. 0445582, BEL. 0743894, CAN. 0855152, GRB. 0175452, JAP. 0611634.
3,445,225.—ELECTROPHOTOGRAPHIC IMAGING PROCESS. MAY 20, 1969. CAN. 0846121.
3,445,227.—ELECTROPHOTOGRAPHIC IMAGING PROCESSES EMPLOYING 2,4 DIAMINOTRIAZINES AS ELCTRCLY PHOTOSNSTV PRT. MAY 20, 1969. BEL. 0743891, CAN. 0852681, GER. 1522687, GRB. 1146019, JAP. 0617789.
3,448,028.—N-SBSTUD-8,13-DIOXODINAPHTHO-2-1-B,2,3-D-FURAN-6-CARBOXAMIDES AS ELCTLY PTOSNSTV MTLS IN ELCPHG. JUNE 3, 1969.
3,448,029.—ELECTROPHORETIC IMAGING PROCESS USING 8,13-DIOXODINAPTHO-2,1-B,2,3-D-FURAN-6-CARBOXAMIDE PIGMEN. JUNE 3, 1969.
3,448,030.—ELECTRICALLY PHOTOSENSITIVE PART. USEFUL IN PHOTOELECTROPHORETIC AND XEROGRAPHIC IMAGING PROCESSE. JUNE 3, 1969. AUS. 0445639, BEL. 0743893, CAN. 0943830, GRB. 1155554, JAP. 0686735.
3,482,970.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS USING NAPHTHYLAZO COMPOUNDS AS THE PRIMARY PHOTOCONDUCTOR. DEC. 9, 1969. ATR. 0279351, AUS. 0453397, BEL. 0742978, CAN. 0869486, GRB. 1296390, ITL. 0878843, JAP. 0725059.
3,607,261.—INORGANIC CRYSTALLINE BINDERS FOR ELECTROPHOTOGRAPHIC PLATES. SEPT. 21, 1971.
3,615,409.—ELCTROPHOTOGRPHC PLATE AND PROCESS EMPLOYING A PHOTODNDCTV PIGMNT OF GENERAL FORMULA R2 N4 S3. OCT. 26, 1971.
3,640,710.—PHTHALOCYANINE PHOTOCONDUCTIVE ELEMENTS CONTAINING MULTIPLE BINDER MATERIALS. FEB. 8, 1972. ARG. 0184666, ATR. 0328861, AUS. 0456430, BEL. 0760751, CAN. 0933012, FRA. 7047636, GRB. 1333605, ITL. 0913999, PNM. 0002243, STZ. 0554550, SWD. 0365878, TIW. 0006738, USR. 0450420, VZL. 0032928.
3,672,979.—METHOD OF PRODUCING A PHTHALOCYANINE PHOTOCONDUCTIVE LAYER. JUNE 27, 1972. ARG. 0184673, AUS. 0457271, BEL. 0761135, CAN. 0951697, FRA. 7047702, GRB. 1334060, ITL. 0914074, JAP. 0753795, MEX. 0119529, PNM. 0002191, SPN. 0386759, STZ. 0571731, TIW. 0007180, VZL. 0032789.
3,708,292.—PI-FORM METAL PHTHALOCYANINE. JAN. 2, 1973. ARG. 0194234, BEL. 0783793, CAN. 0996931, GRB. 1396922, ITL. 0955644, MEX. 0128928.
3,789,216.—PHOTODETECTION DEVICE AND METHOD COMPRISING PHTHALOCYANINE. JAN. 29, 1974.
3,865,798.—PHOTOACTIVE POLYMERS INDUCED EXOCYCLIC QUARTET CONCEPT. FEB. 11, 1975. AUS. 0462805, BEL. 0790689, FRA. 7237458, GRB. 1411998, ITL. 0969902, MEX. 0133728, SPN. 0407984, STZ. 0028515, VZL. 003956.
3,895,945.—PROCESS FOR PREPARATION OF A DYESTUFF SENSITIZED PHOTOCONDUCTIVE COMPOSITION. JULY 22, 1975.
3,923,762.—PROCESS FOR PREPARATION OF 2-ANTHRYL AND SUBSTITUTED 2-ANTHRYL FUNCTIONAL MONOMERS AND P. DEC. 2, 1975. BEL. 0822305, STZ. 0032598.
3,951,654.—MTHD ENHNCMT RATE AND EFFICIENCY OF PHOTODSCHG OF ELCTRPHGRIC IMAGING MEMBERS COMPRSNG PHTHALOCYA. APR. 20, 1976.
3,970,602.—COPOLYMERS OF N-VINYLCARBAZOLE AND N-VINYLPHTHALIMIDE AND DERIVATIVES THEREOF. JULY 20, 1976. BEL. 0812436. FRA. 740,307, GRB. 1444048, ITL. 1010697, SPN. 0424411.
3,989,860.—REPAIR TECHNIQUE FOR PHOTORECEPTOR. NOV. 2, 1976.
4,006,017.—PHOTOCONDUCTIVE COMPOSITION ARTICLE AND PROCESS. FEB. 1, 1977.
4,012,122.—LIQUID CRYSTALLINE PLATEN FOR A ELECTROPHOTOGRAPHIC PRINTING MACHINE. MAR. 15, 1977.
4,046,563.—PHOTOCONDUCTIVE COMPOSITION CONTAINING A TRICYANOPYRENE, ARTICLE AND PROCESS OF USE. SEPT. 6, 1977. FRA. 7509147.
4,055,420.—SINGLE PHASE ORGANIC PHOTOCONDUCTIVE COMPOSITION. OCT. 25, 1977.
4,072,519.—PHOTOCONDUCTIVE COMPOSITION, AND ELEMENT. FEB. 7, 1978. FRA. 7509146.
4,092,161.—INORGANIC PHOTOCONDUCTORS WITH PHENYL SUBSTITUTED IMAGE TRANSPORT MATERIALS. MAY 30, 1978. AUS. 462805, BEL. 790689, CAN. 1007922, FRA. 7411475, GRB. 1462986, ITL. 969902, MEX. 133728, SPN. 407984, STZ. 28515, VZL. 33956.
4,122,114.—1-TRICYANOINYLPYRENE. OCT. 24, 1978.

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3,408,182.—ELECTROPHOTOGRAPHIC MATERIALS AND METHODS EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRANSFER COMP. OCT. 29, 1968. CAN. 0847805, FRA. 1463743, GER. 1522679, GRB. 1137665, ITL. 0755290, JAP. 0572185, MEX. 0107318.
3,408,183.—ELECTROPHOTOGRAPHIC MATERIALS AND METHODS EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRANSFER COMP. OCT. 29, 1968. CAN. 0819066, FRA. 1463745, GER. 1522676, GRB. 1126048, ITL. 0755287, JAP. 0727091, MEX. 0106758.
3,408,184.—ELECTROPHOTOGRAPHIC MATERIALS AND METHODS EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRNSFR COMPLE. OCT. 29, 1968. CAN. 0818382, FRA. 1463727, GRB. 1137664, ITL. 0755289, JAP. 0726382, MEX. 0105835.
3,408,185.—ELECTROPHOTOGRAPHIC MATERIALS AND METHOD EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRANSFER COMP. OCT. 29, 1968. CAN. 0848383, FRA. 1463728, GER. 1645192, GRB. 1137476, ITL. 0755291, MEX. 0106763.
3,408,186.—ELECTROPHOTOGRAPHIC MATERIALS AND METHODS EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRNSFR COMPLE. OCT.29,1968. CAN. 0846736, FRA. 1463746, GRB. 1138629, ITL. 0755288, JAP. 0569483, MEX. 0106589.
3,408,187.—ELECTROPHOTOGRAPHIC MATER AND METH EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRANSFER COMPLEXES. OCT. 29, 1968. CAN. 0867298, GER. 1522721, GRB. 1163097, JAP. 0797719.
3,408,188.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS COMPRISING PHOTOCONDUCTIVE CHARGE TRANSFER COMPLEXES. OCT. 29, 1968. CAN. 0869485, GRB. 1183516, JAP. 0797720.
3,408,189.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS EMPLOYING PHOTOCONDUCTIVE CHARGE TRANSFER COMPLEXES. OCT. 29, 1968.
3,408,190.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS EMPLOYING PHOTOCONDUCTIVE CHARGE TRANSFER COMPLEXES. OCT. 29, 1968. CAN. 0850019, GER. 1302772, GRB. 1182172.
3,536,482.—ELECTROPHOTOGRPHC IMG SYS INCL A HALOGEN TREATMENT STOP FOR MAKING BCKGRND AREAS TRANSPARENT. OCT. 27, 1970.
3,607,258.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS. SEPT. 21, 1971. CAN. 0871634, GRB. 1174171.
3,865,798.—PHOTOACTIVE POLYMERS INDUCED EXOCYCLIC QUARTET CONCEPT. FEB. 11, 1975. AUS. 0462805, BEL. 0790689, FRA. 7237458, GRB. 1411998, ITL. 0969902, MEX. 0133728, SPN. 0407984, STZ. 0028515, VZL. 0033956.
3,879,201.—PERSISTENT PHOTOCONDUCTIVE COMPOSITIONS. APR. 22, 1975.
3,899,328.—ACTIVE MATRIX AND INTRINSIC PHOTOCONDUCTIVE POLYMER OF A LINEAR POLYSILOXANE. AUG. 12, 1975.
3,923,762.—PROCESS FOR PREPARATION OF 2-ANTHRYL AND SUBSTITUTED 2-ANTHRYL FUNCTIONAL MONOMERS AND P. DEC. 2, 1975. BEL. 0822305, STZ. 0032598.
3,957,725.—AN ACTIVE MATRIX AND INTRINSIC PHOTOCONDUCTIVE POLYMER. MAY 18, 1976. ITL. 1010430.
4,007,043.—PHOTOCONDUCTIVE ELEMENTS WITH COPOLYMER CHARGE TRANSPORT LAYERS. FEB. 8, 1977.
4,013,623.—INTRACHAIN CHARGE TRANSFER COMPLEXES. MAR. 22, 1977.
4,025,710.—INTRACHAIN CHARGE TRANSFER COMPLEXES. MAY 24, 1977.
4,033,769.—PERSISTENT PHOTOCONDUCTIVE COMPOSITIONS. JULY 5, 1977.
4,046,564.—ELECTROPHOTOGRAPHIC IMAGING MEMBERS WITH PHOTOCONDUCTIVE LAYER CONTAINING ELECTRON ACCEPTOR. SEPT. 6, 1977.
4,062,886.—FLUORENONE CARBOXYLE ACID ESTERS. DEC. 13, 1977. FRA. 7621895.
4,069,046.—POLYMERIZED VINYL CARBAZOLES SENSITIZED BY NITRO-SUBSTITUTED 9-DICYANOMETHYLENE FLUORENES. JAN. 17, 1978.
4,075,012.—INTRACHAIN CHARGE TRANSFER COMPLEXES USE IN ELECTROPHOTOGRAPHIC IMAGING. FEB. 21, 1978.
4,092,161.—INORGANIC PHOTOCONDUCTORS WITH PHENYL SUBSTITUTED IMAGE TRANSPORT MATERIALS. MAY 30, 1978.
AUS. 462805, BEL. 790689, CAN. 1007922, FRA. 7411475, GRB. 1462986, ITL. 969902, MEX. 133728, SPN. 407984, STZ. 28515, VZL. 33956.
4,098,984.—ELECTRON ACCEPTOR POLYMERS. JULY 4, 1978.
4,116,691.—ELECTROPHOTOGRAPHIC IMAGING MEMBER OF MONOMERS HAVING PENDANT ELECTRON ACCEPTOR GROUPS. SEPT. 26, 1978.
4,122,113.—9-FLUORENYL ACRYLATES. OCT. 24, 1978.
4,129,581.—MONOMERS HAVING PENDANT ELECTRON ACCEPTOR GROUPS-PROCESS FOR PREPARATION AND USE. DEC. 12, 1978.
4,143,225.—HOMOPOLYMERS OF A FLUORENONE DERIVATIVE HAVING PENDANT ELECTRON ACCEPTOR GROUPS. MAR. 6, 1979.

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3,451,811.—ELECTROPHOTOGRAPHIC IMAGING PROCESSES USING ELECTRICALLY PHOTOSENSITIVE PHOTOCHROMIC MATERIALS. JUNE 24, 1969. CAN. 0828692, JAP. 0573734.
3,660,086.—ELCTRPHTGRPC PLATE AND PROCS EMPLYNG INORGNC PHOTCNDCTV MATRL W/PHOTOCHROMIC SENSITIVE AGENT. MAY 2, 1972.
3,961,948.—PHOTOCHROMIC IMAGING METHOD. JUNE 8, 1976.

Class 1A 2D

3,518,081.—IMAGE FORMATION AND DEVELOPMENT - REISSUED D 857R. JUNE 30, 1970. CAN. 0801270, GRB. 1085573.

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RE29,357.—IMAGE FORMATION AND DEVELOPMENT—REISSUE OF 3,518,081—D 857. AUG. 16, 1977. CAN. 801270, GRB. 1085573.

Class 1A 3

3,312,547.—XEROGRAPHIC PLATE AND PROCESSES OF MAKING AND USING SAME. APR. 4, 1967.

3,341,326.—DARK DECAY CONTROLLED XEROGRAPHY. SEPT. 12, 1967. AUS. 0285843, CAN. 0729829, FRA. 1377592, GRB. 1029199, ITL. 0706101.

3,352,669.—PHOTOCONDUCTIVE MEMBER AND PROCESSES OF PREPARING AND USING SAME. NOV. 14, 1967. AUS. 0405164, CAN. 0834670, FRA. 1422625, GER. 1497194, GRB. 1052970, HOL. 0137891, ITL. 0749420, JAP. 0501912.

3,393,070.—XEROGRAPHIC PLATE WITH ELECTRIC FIELD REGULATING LAYER. JULY 16, 1968. CAN. 0871308, GER. 1490987, GRB. 1141452, JAP. 0764435, MEX. 0105660.

3,508,918.—XEROGRAPHIC PLATE CONTAINING ALUMINUM SELENIDE BARRIER LAYER. APR. 28, 1970. CAN. 0872175.

3,573,906.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS. APR. 6, 1971. ARG. 0177890, AUS. 0441534, BEL. 0725173, BRA. 0088092, CAN. 0906801, CZC. 0157053, FRA. 1594981, GRB. 1217726, ITL. 0852743, SPN. 0379204, SWD. 0335063, USR. 0448658, VZL. 0029780.

3,723,110.—ELECTROPHOTOGRAPHIC PROCESS. MAR. 27, 1973.

3,765,757.—TRANSPORT ARRANGEMENT FOR THIN SHEET MATERIAL. OCT. 16, 1973. BEL. 0793551, CAN. 1004289, GRB. 1419978, ITL. 0972846, SPN. 0410107.

3,867,027.—TRANSPORT ARRANGEMENT FOR THIN SHEET MATERIAL. FEB. 18, 1975. BEL. 0793551, CAN. 1004289, GRB. 1419978, ITL. 0972846, SPN. 0410107.

3,907,650.—PHOTOSENSITIVE BINDER LAYER FOR XEROGRAPHY. SEPT. 23, 1975.

3,914,126.—NICKEL OXIDE INTERLAYERS FOR PHOTOCONDUCTIVE ELEMENTS. OCT. 21, 1975.

4,043656.—TRANSPARENCY COPYING MACHINE. AUG. 23, 1977.

Class 1A 4

3,251,686.—XEROGRAPHIC PROCESS. MAY 17, 1966. FRA. 1292831, GER. 1243979, GRB. 0996972, JAP. 0416023.

3,256,089.—MASKED PLATE XEROGRAPHY. JUNE 14, 1966.

3,288,604.—IMAGING METHOD USING AN ELEMENT HAVING A GLASS OVERCOATING. NOV. 29, 1966. CAN. 0815735.

3,397,982.—XIC PLATE W/INORGANIC GLASS BINDER HAVING OVERCOATING CONSISTING ESSENTIALLY OF ALUMINUM OXIDE. AUG. 20, 1968. ARG. 0150690, AUS. 0407349, BEL. 0674140, CAN. 0866142, FRA. 1460232, GER. 1497230, GRB. 1129674, ITL. 0822914, JAP. 0531894, MEX. 0085270, SWD. 0319976.

3,434,832.—XEROGRAPHIC PLATE COMPRISING A PROTECTIVE COATING OF A RESIN MIXED WITH A METALLIC STEARATE. MAR. 25, 1969. CAN. 0835883, FRA. 1454672, GER. 1497223, GRB. 1128156, ITL. 0772535, JAP. 0545757, MEX. 0085603.

3,488,189.—ELECTROPHOTOGRAPHIC RECORDING MEMBER HAVING SOLID CRYSTALLINE PLASTICIZR AVAILBL AT IMGNG SURFA. JAN. 6, 1970. CAN. 0866700, FRA. 1506810, GRB. 1183205, ITL. 0788976, JAP. 0570734, MEX. 0108241.

3,607,258.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS. SEPT. 21, 1971. CAN. 0871634, GRB. 1174171.

3,816,115.—METHOD FOR FORMING A PLURALITY OF ELECTROSTATIC LATENT IMAGES ON AN ELECTROPHOTOGRAPHIC PLATE. JUNE 11, 1974.

3,860,421.—N-ALKYL MORPHOLINE TREATMENT OF A SELENIUM-CONTAINING PHOTOCONDUCTIVE LAYER. JAN. 14, 1975.

3,865,798.—PHOTOACTIVE POLYMERS INDUCED EXOCYCLIC QUARTET CONCEPT. FEB. 11, 1975. AUS. 0462805, BEL. 0790689, FRA. 7237458, GRB. 1411998, ITL. 0969902, MEX. 0133728, SPN. 0407984, STZ. 0028515.

3,884,690.—POLYESTER PHOTOCONDUCTORS AND MATRIX MATERIALS. MAY 20, 1975.

3,896,184.—POLYMERS OF BENZANTHRACENE AS ACTIVE MATRIX MATERIALS. JULY 22, 1975.

3,899,328.—ACTIVE MATRIX AND INTRINSIC PHOTOCONDUCTIVE POLYMER OF A LINEAR POLYSILOXANE. AUG. 12, 1975.

3,957,725.—AN ACTIVE MATRIX AND INTRINSIC PHOTOCONDUCTIVE POLYMER. MAY 18, 1976. ITL. 1,010,430.

4,022,956.—POLYMERS OF BENZANTHRACENE AS ACTIVE MATRIX MATERIALS. MAY 10, 1977.

4,027,964.—IMAGING METHOD AND APPARATUS. JUNE 7, 1977. ARG. 0190535, BEL. 0777714, CAN. 0949825, FRA. 7201000, GRB. 1374501, ITL. 0946355, MEX. 0124981.

4,045,413.—POSSIBLE ACTIVE MATRIX POLYMERS. AUG. 30, 1977. FRA. 7432710.

4,063,943.—ELECTROSTATOGRAPHIC IMAGING METHOD. DEC. 20, 1977.

4,063,945.—ELECTROSTATOGRAPHIC IMAGING METHOD. DEC. 20, 1977.

4,092,161.—INORGANIC PHOTOCONDUCTORS WITH PHENYL SUBSTITUTED IMAGE TRANSPORT MATERIALS. MAY 30, 1978. AUS. 462805, BEL. 790689, CAN. 1007922, FRA. 7411475, GRB. 1462986, ITL. 969902, MEX. 133728, SPN. 407984, STZ. 28515, VZL. 33956.

Class 1A 5

3,411,903.—XEROGRAPHIC METHOD AND PLATE COMPRISING PHOTOCONDUCTIVE INSULATING FIBERS. NOV. 19, 1968. ARG. 0149620, ATR. 0270379, AUS. 0410718, BEL. 0672668, BRA. 0084119, CAN. 0834669, CHL. 0023648, CLB. 0014943, DNK. 0120577, EGR. 0055545, FRA. 1464792, GER. 1497224, GRB. 1084024, GRK. 0031509, IND. 0102560, ISR. 0024632, ITL. 0734376, JAP. 0724233, LXB. 0049849, MEX. 0098487, NOR. 0122817, NZL. 0143432, PLO. 0067959, PLP. 0004547, PNM. 0001533, PRU. 0008384, PTG. 0044879, SAF. 0656280, SPN. 0319795, STZ. 0458076, SWD. 0308250, THL. 1084024, TIW. 0003735, URG. 0006624, VZL. 0023996.

3,947,184.—IMAGING METHOD. MAR. 30, 1976.

3,972,718.—ELECTROSTATOGRAPHIC GRAVURE MEMBER. AUG. 3, 1976.

Class 1A 6

3,288,602.—XEROGRAPHIC PLATE AND METHOD. NOV. 29, 1966. CAN. 0795978, GER. 1237902, GRB. 1029181, ITL. 0690835, JAP. 0578399.

3,621,248.—METHOD USING XERORADIOGRAPHIC PLATE INSENSITIVE TO VISIBLE LIGHT. NOV. 16, 1971.

3,684,500.—METHOD OF FORMING PERMANENT ELECTROSTATIC IMAGE WITH TWO-LAYERED PHOTORECEPTOR. AUG. 15, 1972.

3,843,407.—BLADE CLEANING WITH REVERSE MOVEMENT. OCT. 22, 1974.

3,907,650.—PHOTOSENSITIVE BINDER LAYER FOR XEROGRAPHY. SEPT. 23, 1975.

3,914,126.—NICKEL OXIDE INTERLAYERS FOR PHOTOCONDUCTIVE ELEMENTS. OCT. 21, 1975.

3,994,791.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. NOV. 30, 1976.

4,049,449.—METHOD FOR FORMING AN ELECTROPHOTOGRAPHIC MEMBER. SEPT. 20, 1977.

Class 1B

3,730,453.—EARLY END-OF-TAPE DETECTION. MAY 1, 1973. CAN. 0939052, GRB. 1354581.

3,889,292.—APPARATUS FOR MAKING MULTIPLE ALPHANURMIC COPIES OF A BINARY CODED MESSAGE. JUNE 10, 1975. CAN. 0986572.

4,032,746.—CONTROL SYSTEM FOR A FUSING APPARATUS. JUNE 28, 1977.

4,076,858.—ELECTROSTATIC COPYING PROCESS WITH CHARGING OF THE ORIGINAL. FEB. 28, 1978.

Class 1B 1

3,244,546.—ELECTROSTATIC IMAGE REPRODUCTION. APR. 5, 1966. CAN. 0847532, GRB. 1040371, JAP. 0477223.

3,484,162.—ELECTROVISCOUS RECORDING. DEC. 16, 1969.

3,518,698.—IMAGING SYSTEM. JUNE 30, 1970. CAN. 0905481, FRA. 1542838, GRB. 1200804, JAP. 0604154, MEX. 0099911.

3,561,957.—ELECTROPHOTOGRAPHIC PROCESS USING A HIGH INTENSITY ELECTROMAGNETIC RADIATION SOURCE. FEB. 9, 1971. CAN. 0914266, GRB. 1207361.

3,631,507.—METHOD OF REDISTRIBUTING CHARGE ON A DIELECTRIC MEDIUM. DEC. 28, 1971.

3,677,750.—PHOTOELECTROSOLOGRAPHIC IMAGING. JULY 18, 1972. GRB. 1326934.

3,686,678.—DUAL MODE ELECTROSTATIC PRINTING. AUG. 22, 1972. BEL. 0747125, CAN. 0952574, FRA. 7007650, GRB. 1297996, JAP. 0753534.

3,693,185.—ELECTROSTATIC RECORDING HEAD AND METHOD OF MANUFACTURE. SEPT. 19, 1972.

3,719,481.—ELECTROSTATOGRAPHIC IMAGING PROCESS. MAR. 6, 1973.

3,729,123.—PRINTING MACHINE AND METHOD. APR. 24, 1973. CAN. 0959532, FRA. 7142517, GRB. 1348014.

3,729,334.—IMAGING PROCESS. APR. 24, 1973.

3,793,107.—ELECTROSTATIC RECORDING HEAD AND METHOD OF MANUFACTURE. FEB. 19, 1974.

3,829,185.—HOUSING ASSEMBLY FOR ELECTROSTATIC PRINTING MACHINE. AUG. 13, 1974.

3,854,942.—TRANSPARENCY FOR MULTI-COLOR ELECTROSTATIC COPYING. DEC. 17, 1974.

3,859,960.—PRINTING MACHINE WITH ELECTROSTATIC WEB DEVELOPING APPARATUS. JAN. 14, 1975. CAN. 0959532, FRA. 7142517, GRB. 1348014.

3,937,177.—ELECTROSTATIC PRINTING MACHINE WITH IMPROVED TONER FOUNTAIN AND RECOVERY. FEB. 10, 1976.

3,985,666.—PLASTIC MATERIALS MIXED WITH POLAR GROUP CONTAINING MATERIALS. OCT. 12, 1976. ARG. 0195541, BEL. 0781970, CAN. 0976742, FRA. 7213873, GRB. 1396141, ITL. 0951326, MEX. 0126158, VZL. 0032937.

4,042,939.—PRINTER/PLOTTER STYLE SYSTEM FOR CONFINED INSTALLATION AND METHOD. AUG. 16, 1977.

Class 1B 2

3,057,719.—PROCESS FOR FORMING ELECTROSTATIC IMAGES. OCT. 9, 1962. GRB. 0947039.

3,084,061.—METHOD FOR FORMATION OF ELECTROSTATIC IMAGE. APR. 2, 1963. CAN. 0607290.

3,196,013.—XEROGRAPHIC INDUCTION RECORDING WITH MECHANICALLY DEFORMABLE IMAGEFORMATION IN A DEFORMABLE LAY. JULY 20, 1965. CAN. 0778520, FRA. 1360084, GER. 1253581, ITL. 0711488, JAP. 0649672.

3,321,308.—XEROGRAPHIC INDUCTION RECORDING. MAY 23, 1967. CAN. 0778521, FRA. 1393821, GRB. 1049903, ITL. 0801906, JAP. 0537660.

3,551,146.—INDUCTION IMAGING SYSTEM. DEC. 29, 1970.

3,703,376.—INDUCTION SYSTEM. NOV. 21, 1972. ARG. 0190247, MEX. 0123032.

3,738,855.—INDUCTION IMAGING SYSTEM. JUNE 12, 1973.

3,778,841.—INDUCTION IMAGING SYSTEM. DEC. 11, 1973. ARG. 0190247, MEX. 0123032.

3,953,206.—IMAGING METHOD. APR. 27, 1976.

4,050,804.—LIQUID INK IMAGING SYSTEM. SEPT. 27, 1977.

4,056,314.—LIQUID INK IMAGING SYSTEM. NOV. 1, 1977.

4,076,405.—LIQUID INK IMAGING SYSTEM. FEB. 28, 1978.

Class 1B 3

3,145,655.—EQUIPOTENTIAL XEROPRINTING MEMBER AND PROCESS OF PRINTING THERE WITH. AUG. 25, 1964. CAN. 0784647, GER. 1287095, GRB. 0958964, JAP. 0591209.

3,160,091.—HIGH SPEED XEROPRINTER AND METHOD THEREFOR. DEC. 8, 1964. GRB. 0978349.

3,318,698.—XEROPRINTING REPRODUCTION. MAY 9, 1967. CAN. 0790236, FRA. 1394421, GRB. 1055323, ITL. 0801547, JAP. 0504497.

3,515,584.—XEROPRINTING MASTER. JUNE 2, 1970. CAN. 0882600, GRB. 1204246, JAP. 0659019.

3,547,627.—LITHOGRPHC PRINTG MASTER AND METHOD EMPLOYING A CRYSTALLINE PHOTOCONDUCTIVE IMAGING LAYER. DEC. 15, 1970.

3,574,614.—PROCESS OF PREPARING MULTIPLE COPIES FROM A XEROPRINTING MASTER. APR. 13, 1971. ATR. 0305769, AUS. 0448396, BEL. 0743660, CAN. 0882599, FRA. 6944513, GRB. 1209060, ITL. 0879118, JAP. 0713808.

3,967,818.—DUPLICATING SYSTEM. JULY 6, 1976.

4,047,945.—XEROPRINTING MASTER AND PROCESS. SEPT. 13, 1977.

Class 1B 4A

3,653,891.—FORMS OVERLAY TECHNIQUE USING TESI. APR. 4, 1972. ARG. 0184314, AUS. 0459354, BEL. 0761030, CAN. 0946912, FRA. 7047635, GRB. 1339714, ITL. 0913996, MEX. 0119467.

4,023,895.—ELECTROSTATOGRAPHIC APPARATUS. MAY 17, 1977.

Class 1B 4B

3,060,432.—ELECTROSTATIC RECORDING OF INFORMATION. OCT. 23, 1962.

3,064,259.—ELECTROSTATIC RECORDING OF INFORMATION. NOV. 13, 1962. CAN. 0736628.

3,068,481.—PROCESS AND APPARATUS FOR TESI-PRINTING. DEC. 11, 1962. CAN. 0709093, GRB. 0987234, JAP. 0446814.

3,091,762.—ELECTROSTATIC APPARATUS FOR MEASURING AND RECORDING TIME INTERVALS. MAY 28, 1963. CAN. 0620988, FRA. 1202341, GER. 1252149, GRB. 0880725, ITL. 0585388.

3,182,591.—IMAGE FORMING APPARATUS AND METHOD. MAY 11, 1965.

3,208,076.—ELECTROSTATIC PRINTER. SEPT. 21, 1965. GRB. 0999260.

3,217,330.—ELECTROSTATIC PRINTING UTILIZING PRINT-THROUGH RECORDING. NOV. 9, 1965. CAN. 0773752, GRB. 1001152.

3,234,359.—RECORD CARD SCANNING APPARATUS. FEB. 8, 1966.

3,234,904.—DEVICE FOR TESIPRINTING. FEB. 15, 1966. AUS. 0277492, CAN. 0804878, FRA. 1367728, GRB. 1024635, ITL. 0697883.

3,257,222.—ELECTROSTATIC RECORDING METHOD AND APPARATUS USING SHAPED ELECTRODES. JUNE 21, 1966. CAN. 0736231, GRB. 1027438, JAP. 0451019.

3,289,209.—ELECTROSTATIC MATRIX PRINTER. NOV. 29, 1966. CAN. 0707049, FRA. 1357858, GER. 1447873, GRB. 1018513, ITL. 0694321, JAP. 0440456.

3,342,126.—MULTIPLE ELECTROGRAPHIC PRINTER HAVING PLURAL UNITS CONNECTED TO COMMON DRIVE MEANS. SEPT. 19, 1967. CAN. 0825341, GRB. 1182685, JAP. 0648073.

3,348,232.—ASYNCHRONOUS PAGE-AT-A-TIME PRINTER. OCT. 17, 1967. CAN. 0709971, GRB. 1025487, JAP. 0462803.

3,358,592.—ELECTROGRAPHIC PRINTING. DEC. 19, 1967. CAN. 0896701, FRA. 1514749, GER. 1512401, GRB. 1182686, ITL. 0793834, MEX. 0098070.

3,430,254.—TESI PRINTING WITH FLEXIBLE ELECTRODE ON ENDLESS BELT. FEB. 25, 1969.

3,438,052.—AIR-SUPPORTED HOUSING CONTAINING TESI PRINTING DRUM. APR. 8, 1969. CAN. 0827330, GRB. 1149349.

3,495,269.—ELECTROGRAPHIC RECORDG METH AND APPRTS W/INERT GASEOUS DISCHARGE IONIZATION AND ACCELERATION GAPS. FEB. 10, 1970. ARG. 0174765, ATR. 0309208, AUS. 0413341, BEL. 0707986, CAN. 0865837, CZC. 0164808, FRA. 1551296, GRB. 1205790, ITL. 0819587, JAP. 0587936, MEX. 0103538, SPN. 0348328, SWD. 0346867, USR. 0291520.

3,599,225.—ELECTROSTATIC RECORDING APPARATUS - AIR GAP APERTURE BELT COMMUNICATIONS PRINTER. AUG. 10, 1971. CAN. 0882319, GRB. 1226436, JAP. 0675796.

3,644,930.—MULTI-STYLUS RECORDER. FEB. 22, 1972. ARG. 0181835, AUS. 0457379, BEL. 0751150, CAN. 0944812, CHL. 0025752, FRA. 7019463, GRB. 1297110, ITL. 0893693, MEX. 0119071, SPN. 0380273, SWD. 0368289, TIW. 0005822, VZL. 0027516.

3,673,600.—ELECTROGRAPHIC RECORDING METHOD AND APPARATUS. JUNE 27, 1972. CAN. 0947361, GRB. 1318605.

3,673,603.—RECIPROCATING CARRIAGE FOR ELECTROGRAPHIC PRINTING. JUNE 27, 1972. CAN. 0937629, GRB. 1346647.

3,686,676.—DUAL MODE ELECTROGRAPHIC RECORDER. AUG. 22, 1972. CAN. 0954293.

3,686,679.—MULTI-STYLUS RECORDING ASSEMBLY. AUG. 22, 1972.

3,714,665.—ELECTROSTATIC RECORDING WITH IMPROVED ELECTROSTATIC CHARGE RETENTION. JAN. 30, 1973.

3,717,880.—DUAL MODE ELECTROGRAPHIC RECORDING. FEB. 20, 1973. BEL. 0774564, CAN. 0948271, FRA. 7139638, GRB. 1366129, ITL. 0937674.

3,766,850.—DEVELOPING MEANS FOR ELECTROSTATIC PRINTING APPARATUS. OCT. 23, 1973. CAN. 0972551, FRA. 7246855, GRB. 1415325, ITL. 0973310, SWD. 7216975.

V 988 1 NO 06 79 UMI

3,771,184.—PRINTING APPARATUS. NOV. 13, 1973. CAN. 0973704, FRA. 7246858, GRB. 1415200, ITL. 0973321, SWD. 7216973.
3,795,010.—WRITING APPARATUS AND METHOD OF MANUFACTURE. FEB. 26, 1974.
3,806,238.—FORMS OVERLAY TECHNIQUE USING TEST. APR. 23, 1974.
3,811,766.—DEVELOPING APPARATUS. MAY 21, 1974. ARG. 0183333, AUS. 0446187, BEL. 0747127, CAN. 0879412, EGR. 0084803, FRA. 7008249, GRB. 1296417, ITL. 0898245, JAP. 0770134, MEX. 0112930, SPN. 0377301, STZ. 0521614, SWD. 0361749, TIW. 0006826, USR. 0352484.
3,875,578.—ENVELOPED STYLUS RECORDER. APR. 1, 1975. CAN. 0947360, FRA. 7008242, GRB. 1296416.
3,971,042.—WRITING APPARATUS AND METHOD OF MANUFACTURE. JULY 20, 1976.

Class 1C

4,072,522.—METHOD OF TREATING PHOTOCONDUCTIVE ZINC OXIDE. FEB. 7, 1978.

Class 1C 1

3,236,165.—XEROGRAPHIC REPRODUCING APPARATUS. FEB. 22, 1966. CAN. 0771829, JAP. 0547196.
3,343,142.—XEROGRAPHIC CODING AND INFORMATION STORAGE ON A SPECULAR BUSINESS MACHINE CARD. SEPT. 19, 1967. CAN. 0844786, GRB. 1047261, JAP. 0701182.
3,437,020.—MICROFILM TITLING APPARATUS. APR. 8, 1969. CAN. 0837780, GRB. 1191019, JAP. 0572188.
3,499,374.—XEROGRAPHIC PRINTER. MAR. 10, 1970. AUS. 0415164, BEL. 0677146, CAN. 0846424, FRA. 1470069, GRB. 1135603, ITL. 0762255, MEX. 0091183, SWD. 0327142.
3,521,950.—XEROGRAPHIC REPRODUCING APPARATUS. JULY 28, 1970. ARG. 0184148, ATR. 0317675, AUS. 0441739, BEL. 0713876, CAN. 0877511, CHL. 0024535, DNK. 0129304, FRA. 1558225, GRB. 1231622, GRK. 0037839, IND. 0124668, ISR. 0029824, ITL. 0831700, JAM. 0001853, JAP. 0774498, LXB. 0055912, MEX. 0102085, NOR. 0131313, NZL. 0159801, PRU. 0009366, PTG. 0049474, SAF. 6872518, SPN. 0352885, STZ. 0505015, SWD. 7012263, UAR. 0008668, URG. 0009239, VZL. 0025077.
3,689,143.—REPRODUCING MACHINE. SEPT. 5, 1972.
4,047,810.—DUAL MODE COPYING MACHINE. SEPT. 13, 1977.

Class 1C 2

3,094,036.—IMAGE SELECTOR APPARATUS. JUNE 18, 1963. CAN. 0683832.
3,236,165.—XEROGRAPHIC REPRODUCING APPARATUS. FEB. 22, 1966. CAN. 0771829, JAP. 0547196.
3,379,106.—XEROGRAPHIC REPRODUCTION APPARATUS. APR. 23, 1968. ATR. 0300567, AUS. 0416116, BEL. 0674602, CAN. 0821718, DNK. 0117045, FRA. 1475712, GRB. 1135742, ITL. 0750206, MEX. 0095580, SPN. 0321099, STZ. 0509924, SWD. 6912065.
3,480,360.—XEROGRAPHIC COPYING APPARATUS. NOV. 25, 1969. ARG. 0180571, ATR. 0301344, AUS. 0310556, BEL. 0704978, CAN. 0870794, CHL. 0023569, FRA. 1540839, GRB. 1206964, GRK. 0035147, HUN. 0158496, IND. 0112715, ITL. 0827017, LXB. 0054635, MEX. 0102269, NZL. 0156632, PRU. 0009341, PTG. 0048460, SAF. 0676065, SPN. 0345998, STZ. 0487439, SWD. 0337743, URG. 0008847, VZL. 0023675.
3,592,539.—RECORDING APPARATUS. JULY 13, 1971. CAN. 0917230.
3,689,143.—REPRODUCING MACHINE. SEPT. 5, 1972.

Class 1C 3

3,130,411.—ELECTRONIC RECORDER. APR. 21, 1964. CAN. 0729326.
3,212,888.—METHOD FOR DEVELOPING LATENT ELECTROSTATIC CHARGE HALFTONE IMAGES. OCT. 19, 1965. GER. 1284302, GRB. 1017683, JAP. 0470423.
3,281,857.—XEROGRAPHIC TRANSFER PLATEN. OCT. 25, 1966. CAN. 0733683, GRB. 1025199.
3,535,036.—APPARATUS FOR FORMING HALF-TONE LINE SCREEN WITH A LENS. OCT. 20, 1970. CAN. 0909309, GRB. 1253887.
3,698,893.—METHODS OF ORGANIZED THERMOPLASTIC XEROGRAPHY AND PHOTORECEPTOR STRUCTURE THEREFOR. OCT. 17, 1972.
3,873,310.—METHOD OF CONTROLLING THE BRIGHTNESS ACCEPTANCE RANGE AND TONAL CONTRAST OF XEROGRAPHIC PLATE. MAR. 25, 1975. GRB. 1414951.
3,905,822.—COMPOUND SCREEN FOR OBJECT SCREENING. SEPT. 16, 1975. GRB. 1459558.
3,912,510.—ELECTROPHOTOGRAPHIC PROCESS EMPLOYING A COMPOUND DOCUMENT SCREEN. OCT. 14, 1975. GRB. 1459558.
4,013,355.—NOTCH FILTER FOR COLOR TRANSPARENCY COPYING MACHINES. MAR. 22, 1977.
4,014,607.—REMOVABLE SCREENING SYSTEM FOR A TRANSPARENCY REPRODUCTION MACHINE. MAR. 29, 1977.
4,025,181.—A SCREEN CLEANING DEVICE. MAY 24, 1977.
4,043,656.—TRANSPARENCY COPYING MACHINE. AUG. 23, 1977.
4,051,536.—ELECTRONIC HALFTONE IMAGING SYSTEM. SEPT. 27, 1977.
4,066,353.—HALF TONE IMAGING SYSTEM. JAN. 3, 1978.
4,068,940.—VARIABLE CONTRAST OPTICAL SCREENING SYSTEM. JAN. 17, 1978.
4,072,414.—SCREEN FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. FEB. 7, 1978.
4,080,055.—A HALF-TONE COLOR COPIER. MAR. 21, 1978.
4,083,632.—MULTI FREQUENCY SCREEN. APR. 11, 1978.
4,090,786.—MULTI-COLOR SCREEN FOR ELECTROPHOTOGRAPHIC PRINTING. MAY 23, 1978.
4,095,889.—EXPOSURE SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. JUNE 20, 1978.
4,108,654.—COLOR ELECTROPHOTOGRAPHIC PROCESS EMPLOYING A DOCUMENT SCREEN. AUG. 22, 1978. FRA. 7514227. GRB. 1490898.
4,130,841.—VARIABLE FREQUENCY HALF-TONE IMAGING APPARATUS. DEC. 19, 1978.
4,149,183.—ELECTRONIC HALFTONE GENERATOR. APR. 10, 1979.
4,149,194.—VARIABLE ANGLE ELECTRONC HALFTONE SCREENING. APR. 10, 1979.

Class 1C 4

3,196,009.—ELECTROSTATIC IMAGE LIQUID DEFORMATION DEVELOPMENT. JULY 20, 1965. ATR. 0267320, AUS. 0273895, BEL. 0631984, CAN. 0768329, DNK. 0129676, FRA. 1408156, GER. 1497058, GRB. 1043981, HOL. 0134043, ISR. 0019144, ITL. 0695213, JAP. 0620918, LXB. 0043704, MEX. 0080571, NOR. 0123260, SAF. 0001947, STZ. 0448745, SWD. 0315502.
3,196,010.—ELECTROPHOTOGRAPHIC PROCESS FOR FORMATION OF DEFORMATION IMAGES IN DEFORMABLE INTERFERENCE FILM. JULY 20, 1965. CAN. 0790232, FRA. 1364100, GRB. 1036738, ITL. 0695214, JAP. 0510166.
3,196,012.—HALF-TONE XEROGRAPHY WITH THERMOPLASTIC DEFORMATION OF THE IMAGE. JULY 20, 1965. CAN. 0760623, FRA. 1359565, GER. 1497060, GRB. 1040836, ITL. 0697483, JAP. 0478444.
3,196,013.—XEROGRAPHIC INDUCTION RECORDING WITH MECHANICALLY DEFORMABLE IMAGE FORMATION IN A DEFORMABLE LAY. JULY 20, 1965. CAN. 0778520, FRA. 1360084, GER. 1253581, ITL. 0711488, JAP. 0649672.
3,307,941.—PLASTIC DEFORMATION IMAGING FILM AND PROCESS. MAR. 7, 1967. CAN. 0801262.
3,419,885.—IMAGE DEVELOPMENT OF THERMOPLASTIC LAYERS. DEC. 31, 1968. CAN. 0785985, GRB. 1117644, JAP. 0537663.
3,436,216.—IMAGE STORAGE COMPRISING A THERMOPLASTIC DEFORMATION PATTERN. APR. 1, 1969. CAN. 0807326, FRA. 1488094, GRB. 1160731, ITL. 0774940.
3,445,227.—ELECTROPHOTOGRAPHIC IMAGING PROCESSES EMPLOYING 2,4 DIAMINOTRIAZINES AS ELCTRCLY PHOTOSNSTV PRT. MAY 20, 1969. BEL. 0743891, CAN. 0852681, GER. 1522687, GRB. 1146019, JAP. 0617789.
3,448,028.—N-SBSTUD-8,13-DIOXODINAPHTHO-2-1-B,2,3-D-FURAN-6-CARBOXAMIDES AS ELCTLY PTOSNSTV MTLS IN ELCPHG. JUNE 3, 1969.
3,448,029.—ELECTROPHORETIC IMAGING PROCESS USING 8,13-DIOXODINAPTHO-2,1-B,2,3-D-FURAN-6-CARBOXAMIDE PIGMEN. JUNE 3, 1969.
3,448,030.—ELECTRICALLY PHOTOSENSITIVE PART. USEFUL IN PHOTOELECTROPHORETIC AND XEROGRAPHIC IMAGING PROCESSE. JUNE 3, 1969. BEL. 0743893, CAN. 0943830, GRB. 1155554, JAP. 0686735.

3,698,892.—METHODS OF THERMOPLASTIC XEROGRAPHY AND APPARATUS THEREFOR. OCT. 17, 1972. CAN. 0949117, GRB. 1343191.
3,698,893.—METHODS OF ORGANIZED THERMOPLASTIC XEROGRAPHY AND PHOTORECEPTOR STRUCTURE THEREFOR. OCT. 17, 1972.
3,716,359.—CYCLIC RECORDING SYSTEM BY THE USE OF AN ELASTOMER IN AN ELECTRIC FIELD. FEB. 13, 1973. ARG. 0196734, AUS. 0461213, BEL. 0777320, CAN. 0953990, FRA. 7147891, GRB. 1380057, ITL. 0944392, MEX. 0131400, SPN. 0398306.
3,719,483.—METHODS OF ORGANIZED THERMOPLASTIC XEROGRAPHY AND PHOTORECEPTOR STRUCTURE THEREFOR. MAR. 6, 1973.
3,730,621.—CONTROL OF ELECTROSTATIC DEFORMATION OF THERMOPLASTIC FILM. MAY 1, 1973.
3,795,514.—DEFORMATION IMAGING METHOD. MAR. 5, 1974.
3,842,406.—CYCLIC RECORDING SYSTEM BY THE USE OF AN ELASTOMER IN AN ELECTRIC FIELD. OCT. 15, 1974. ARG. 0196734, AUS. 0461213, BEL. 0777320, CAN. 0953990, FRA. 7147891, GRB. 1380057, ITL. 0944392, MEX. 0131400, SPN. 0398306.
3,858,973.—METHODS OF THERMOPLASTIC XEROGRAPHY AND APPARATUS THEREFOR. JAN. 7, 1975. CAN. 0949117, GRB. 1343191.
3,888,591.—IMAGE SUBTRACTION APPARATUS. JUNE 10, 1975.
3,932,025.—IMAGING SYSTEM. JAN. 13, 1976.
3,944,358.—COLOR IMAGE REPRODUCTION SYSTEMS. MAR. 16, 1976.
3,946,433.—PHASE IMAGE SCANNING METHOD. MAR. 23, 1976. BEL. 0835551.
3,951,533.—COLOR IMAGE REPRODUCTION SYSTEM. APR. 20, 1976.
3,961,950.—IMAGING SYSTEM. JUNE 8, 1976.
3,980,476.—IMAGING SYSTEM. SEPT. 14, 1976.
3,997,243.—COLOR IMAGE REPRODUCTION SYSTEM. DEC. 14, 1976.
3,999,988.—METHOD FOR REAL-TIME COLOR MASKING. DEC. 28, 1976.
4,018,603.—DEFORMATION IMAGING SYSTEM USING THERMOPLASTIC AND ELASTOMERIC LAYERS. APR. 19, 1977.
4,021,236.—IMAGING SYSTEM. MAY 3, 1977.
4,023,969.—DEFORMABLE ELASTOMER IMAGING MEMBER EMPLOYING AN INTERNAL OPAQUE DEFORMABLE METALLIC LAYER. MAY 17, 1977.
4,065,308.—DEFORMATION IMAGING ELEMENT. DEC. 27, 1977.
4,079,421.—IMAGE SCANNING SYSTEM. MAR. 14, 1978.BEL. 835551, SPN. 442965.

Class 1C 4A

3,196,008.—ELECTROPC PRCS FOR FRMTN OF FRST LIKE DEFRMTN IMGS IN MECHANICALLY DEFRMBL PHOTOCONDUCTIVE LAYER. JULY 20, 1965. CAN. 0844221.
3,196,011.—ELECTROSTATIC FROSTING. JULY 20, 1965. ARG. 0150575, ATR. 0256625, AUS. 0275848, BEL. 0631983, BRA. 0082433, CAN. 0918226, CHL. 0019655, EIR. 0027268, FIN. 0044982, FRA. 1364101, GER. 1295371, GRB. 1039881, GRK. 0026981, HOL. 0140635, IND. 0087685, ISR. 0019143, ITL. 0695215, LXR. 0043693, MEX. 0102124, NOR. 0118346, NZL. 0134799, PAK. 0114430, PLP. 0003269, PTG. 0040894, SAF. 0001948, SPN. 0292129, STZ. 0425467, SWD. 0315201, TRK. 0011937, UAR. 0004997, VTM. 0000992, VZL. 0014488.
3,213,429.—HIGH SPEED INFORMATION RECORDER. OCT. 19, 1965.
3,258,336.—STRIPPABLE LAYER FROST PRINTING. JUNE 28, 1966. CAN. 0815184.
3,322,034.—FROST COLOR DISPLAY. MAY 30, 1967.
3,329,500.—ELECTROSTATIC FROSTING. JULY 4, 1967.
3,482,969.—FIXING OF DEFORMATION IMAGES. DEC. 9, 1969. CAN. 0801883, FRA. 1399003, GRB. 1061235, ITL. 0726200, SWD. 0315806.
3,485,623.—CONTINUOUS TONE THERMOPLASTIC PHOTOGRAPHY. DEC. 23, 1969. CAN. 0810834, GRB. 1181093, JAP. 0565795.
3,526,879.—INTERNAL FROST RECORDING APPARATUS USING A DEFORMABLE PHOTOCONDUCTOR. SEPT. 1, 1970.
3,542,545.—FROST OR RELIEF WRNKLNG OF AN IMGNG ARTCL COMPRSNG AN ELCTRCLY PHOTSNSTV LAYER AND DEFORMABLE LAY. NOV. 24, 1970. ARG. 0174588, ATR. 0300563, AUS. 0424162, BEL. 0726280, CAN. 0928764, CHL. 0025764, DNK. 0126400, FRA. 1604336, GER. 1817226, GRB. 1234600, GUA. 0002531, ITL. 0864015, JAP. 0693385, LXB. 0057697, MEX. 0107799, NZL. 0154931, PNM. 0001803, PRU. 0010480, SAF. 0688517, SPN. 0362039, STZ. 0518578, SWD. 0354132, URG. 0009690.
3,560,205.—METHOD OF FORMING A PHASE MODULATING HOLOGRAM ON A DEFORMABLE THERMOPLASTIC. FEB. 2, 1971. CAN. 0949793, GRB. 1162853.
3,560,206.—PRODUCTION OF LATENT PERODIC MEMORY PATTERNS IN FROSTABLE FILMS. FEB. 2, 1971.
3,561,958.—INDUCING FROST DEFORMATION IMAGING BY ELECTROLYTIC DEPOSITION. FEB. 9, 1971.
3,672,883.—CRYSTALLINE POLYMERS FOR FROST. JUNE 27, 1972.
3,672,886.—NOVOLAR RESINS IN DEFORMATION IMAGING. JUNE 27, 1972.
3,764,311.—IMAGING SYSTEM. OCT. 9, 1973.
3,819,369.—SURFACE DEFORMABLE IMAGING MEMBER OF IMPROVED DARK DECAY CHARACTERISTICS. JUNE 25, 1974.
3,923,504.—MIGRATION IMAGING MEMBER AND METHOD. DEC. 2, 1975. GRB. 1461872.
3,926,626.—CIRCULATION IMAGING METHOD. DEC. 16, 1975.
4,047,810.—DUAL MODE COPYING MACHINE. SEPT. 13, 1977.

Class 1C 4B

3,238,041.—RELIEF IMAGING OF PHOTORESPONSIVE MEMBER AND PRODUCT. MAR. 1, 1966. CAN. 0850841, GRB. 1043983, MEX. 0080410.
3,321,308.—XEROGRAPHIC INDUCTION RECORDING. MAY 23, 1967. CAN. 0778521, FRA. 1393821, GRB. 1049903, ITL. 0801906, JAP. 0537660.
3,542,545.—FROST OR RELIEF WRNKLNG OF AN IMGNG ARTCL COMPRSNG AN ELCTRCLY PHOTSNSTV LAYER AND DEFORMABLE LAY. NOV. 24, 1970. ARG. 0174588, ATR. 0300563, AUS. 0424162, BEL. 0726280, CAN. 0928764, CHL. 0025764, DNK. 0126400, FRA. 1604336, GER. 1817226, GRB. 1234600, GUA. 0002531, ITL. 0864015, JAP. 0693385, LXB. 0057697, MEX. 0107799, NZL. 0154931, PNM. 0001803, PRU. 0010480, SAF. 0688517, SPN. 0362039, STZ. 0518578, SWD. 0354132, URG. 0009690.
3,615,388.—DEFORMATION IMAGING PROCESS AND ELEMENT. OCT. 26, 1971. CAN. 0941877, MEX. 0101539.
3,923,504.—MIGRATION IMAGING MEMBER AND METHOD. DEC. 2, 1975. GRB 1461872.
3,926,626.—CIRCULATION IMAGING METHOD. DEC. 16, 1975.

Class 1C 5

3,519,818.—METHOD OF PREPARING A NEGATIVE XEROGRAPHIC REPRODUCTION FROM A POSITIVE LINE COPY IMAGE. JULY 7, 1970. CAN. 0829037, GRB. 1191159, JAP. 0589516.

Class 1D

3,318,212.—DUPLEX XEROGRAPHIC REPRODUCTION. MAY 9, 1967.
3,506,347.—DUPLEX XEROGRAPHIC REPRODUCTION APPARATUS. APR. 14, 1970.
3,536,398.—REPRODUCTION APPARATUS. OCT. 27, 1970. AUS. 0442047, BEL. 0737274, CAN. 0899443, EGR. 0091200, FRA. 6927759, GRB. 1246226, ITL. 0883645, SPN. 0370416, STZ. 0500517, SWD. 0356144, TIW. 0005358, USR. 0359871.
3,580,670.—APPARATUS FOR DUPLEXING. MAY 25, 1971. CAN. 0929581.
3,615,129.—DUPLEXING XEROGRAPHIC REPRODUCING MACHINE WITH COPY SHEET REVERSING STATION. OCT. 26, 1971. ARG. 0172601, AUS. 0432830, BEL. 0737341, CAN. 0909853, CZC. 0158650, EGR. 0083299, FRA. 6927784, GRB. 1256767, ITL. 0883644, JAP. 0774495, MEX. 0108784, SPN. 0370415, STZ. 0500518, SWD. 0356143, TIW. 0006822, USR. 0371736, VZL. 0032923.
3,671,118.—APPARATUS FOR CREATING DUPLEX REPRODUCTIONS. JUNE 20, 1972. ARG. 0186265, AUS. 0445064, BEL. 0760746, CAN. 0922768, EGR. 0088254, FRA. 7047143, GRB. 1282808, ITL. 0913849, JAP. 0773214, MEX. 0116655, SPN. 0386707, STZ. 0526137, SWD. 0366403.
3,674,475.—ENCLOSED MIGRATION IMAGING SYSTEM. JULY 4, 1972.

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3,694,073.—METHOD FOR DUPLEXING. SEPT. 26, 1972.
3,754,822.—SCANNING SYSTEM. AUG. 28, 1973.
3,844,653.—ROOF MIRROR COPYING SYSTEM. OCT. 29, 1974.
3,844,654.—DUPLEX COPYING SYSTEM. OCT. 29, 1974. FRA. 7340246.
3,847,478.—SEGMENTED BIAS ROLL. NOV. 12, 1974.
3,936,171.—ELECTROSTATOGRAPHIC METHODS AND APPARATUS. FEB. 3, 1976.
3,940,210.—PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES. FEB. 24, 1976. BEL. 0832356, IRN. 0013436.
3,944,359.—PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES. MAR. 16, 1976.
4,014,609.—PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINE. MAR. 29, 1977.
4,035,073.—DUPLEX REPRODUCTION MACHINE. JULY 12, 1977. BEL. 0832115, SPN. 0440012.
4,104,726.—PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES. AUG. 1, 1978.
4,107,779.—PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES. AUG. 15, 1978.
4,109,313.—PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES. AUG. 22, 1978.
4,116,558.—DUPLEX SYSTEM AND METHOD FOR PRECOLLATION COPIERS. SEPT. 26, 1978.
4,120,034.—PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES. OCT. 10, 1978.
4,131,360.—DUPLEX REPRODUCTION SYSTEM EMPLOYING COPY SHEET CLEANER. DEC. 26, 1978.

Class 1E

3,057,720.—XEROGRAPHIC COLOR REPRODUCTION. OCT. 9, 1962. GRB. 0956772.
3,227,549.—MULTIPLE IMAGE FORMING XEROGRAPHIC REPRODUCTION PROCESS. JAN. 4, 1966.
3,313,623.—LINE SEQUENTIAL COLOR XEROGRAPHY. APR. 11, 1967. CAN. 0880483, GRB. 1019974.
3,316,805.—COLOR DISPLAY. MAY 2, 1967.
3,357,830.—DYED IMAGE XEROGRAPHY. DEC. 12, 1967. CAN. 0821484, GER. 1277018, GRB. 1016581, ITL. 0679720, JAP. 0477809.
3,373,091.—DATA STORAGE DEVICE AND METHOD. MAR. 12, 1968.
3,386,379.—DUPLICATING WITH COLOR PRODUCING REAGENTS. JUNE 4, 1968. AUS. 0294747, CAN. 0842445, FRA. 1390006, GER. 1249089, GRB. 1043875, ITL. 0801548, JAP. 0611643.
3,468,705.—METHOD OF PREPARING LEAD OXIDE FILMS. SEPT. 23, 1969. CAN. 0806134, FRA. 1501511, GER. 1521942, GRB. 1170428, ITL. 0787638, JAP. 0634868, MEX. 0093335.
3,508,823.—DUPLICATING APPARATUS. APR. 28, 1970.
3,583,806.—DYED IMAGE XEROGRAPHY. JUNE 8, 1971.
3,615,392.—ELECTROPHORETIC REPRODUCTION ORIGINAL CONTAINING BOTH MULTI-COLOR AND LINE AREAS. OCT. 26, 1971.
3,672,887.—ELECTROPHOTOGRAPHIC PROCESS FOR MULTICOLOR REPRODUCTION. JUNE 27, 1972.
3,687,661.—COLOR ELECTROPHOTOGRAPHIC PROCESS. AUG. 29, 1972. CAN. 0932785.
3,690,756.—COLOR XEROGRAPHY. SEPT. 12, 1972. BEL. 0781001, CAN. 0963522, FRA. 7210584, GRB. 1365753, ITL. 0950399.
3,702,483.—COLOR RENDITION METHOD. NOV. 7, 1972. BEL. 0777015, CAN. 0935334, FRA. 7146255, GRB. 1361647, ITL. 0944210.
3,719,482.—IMAGING SYSTEM. MAR. 6, 1973.
3,724,943.—COLOR REPRODUCTION APPARATUS. APR. 3, 1973. CAN. 0946463.
3,734,607.—COLOR REPRODUCTION APPARATUS. MAY 22, 1973. ARG. 0184654, ATR. 0314352, AUS. 0459724, BEL. 0751490, CAN. 0946462, CHL. 0026265, DNK. 0130156, EGR. 0085001, FRA. 7020455, GRB. 1316499, ITL. 0893863, MEX. 0120285, NZL. 0160302, PNM. 0002259, PTG. 0053890, SAF. 0703775, SPN. 0380376, STZ. 0514164, SWD. 0359176.
3,799,668.—COLOR STANDARD AND METHOD OF CALIBRATING A MULTI-COLOR ELECTROPHOTOGRAPHIC PRINTING MACHINE. MAR. 26, 1974. BEL. 0812179, SAF. 0741562.
3,799,774.—MULTI COLOR ELECTROPHOTOGRAPHIC MASKING PROCESS. MAR. 26, 1974.
3,805,283.—CHART CREATION APPARATUS. APR. 16, 1974.
3,869,203.—COLOR ELECTROPHOTOGRAPHIC PRINTING MACHINE. MAR. 4, 1975. BEL. 0820041.
3,884,686.—COLOR CORRECTION METHOD. MAY 20, 1975.
3,909,127.—MULTI-COLOR ORIGINAL FOR AN ELECTROPHOTOGRAPHIC PRINTING SYSTEM. SEPT. 30, 1975.
3,914,043.—COLOR ACCENTING COPYING MACHINE. OCT. 21, 1975.
3,936,182.—CONTROL ARRANGEMENT FOR AN ELECTROSTATOGRAPHIC REPRODUCTION APPARATUS. FEB. 3, 1976.
3,944,711.—TRANSPARENCY. MAR. 16, 1976.
3,958,990.—TRANSFERRING TONER TO AN AMINE COATED SHEET. MAY 25, 1976.
3,960,445.—COLOR HIGHLIGHTING ELECTROPHOTOGRAPHIC PRINTING MACHINE. JUNE 1, 1976.
3,963,341.—A COLOR ELECTROPHOTOGRAPHIC PRINTING MACHINE. JUNE 15, 1976.
3,970,042.—COLOR DEVELOPMENT APPARATUS. JULY 20, 1976.
3,999,987.—COLOR REPRODUCTION METHOD. DEC. 28, 1976.
4,013,355.—NOTCH FILTER FOR COLOR TRANSPARENCY COPYING MACHINES. MAR. 22, 1977.
4,014,696.—MULTICOLORED XEROGRAPHIC TRANSPARENCY UTILIZING AN APIPHATIC ESTER COATING. MAR. 29, 1977.
4,027,962.—COLOR TRANSPARENCY REPRODUCING MACHINE. JUNE 7, 1977. BEL. 0830321, IRN. 0013435, SPN. 0437814.
4,040,828.—MULTICOLOR IMAGING METHOD AND IMAGED MEMBER EMPLOYING COMBINATION OF TRANSPARENT TONER AND. AUG. 9, 1977. FRA. 7540219.
4,045,218.—METHOD FOR ELECTROSTATICALLY PRODUCING A COLOR ACCENTED PHOTOCOPY. AUG. 30, 1977.
4,045,219.—METHOD OF REPRODUCING COLOR HIGHLIGHTED DOCUMENTS. AUG. 30, 1977.
4,053,216.—COLOR TRANSPARENCY REPRODUCING MACHINE. OCT. 11, 1977. BEL. 830321, FRA. 7518443, GRB. 1489142, IRN. 13435, SPN. 437814, STZ. 597632.
4,053,217.—COLOR TRANSPARENCY REPRODUCING MACHINE. OCT. 11, 1977. BEL. 830321, FRA. 7518443, GRB. 1489142, IRN. 13435, SPN. 437814, STZ. 597632.
4,058,850.—PROGRAMMABLE CONTROLLER. NOV. 15, 1977.
4,063,810.—COLOR TRANSPARENCY REPRODUCING MACHINE. DEC. 20, 1977. BEL. 830321, FRA. 7518443, GRB. 1489142, IRN. 13435, SPN. 437814, STZ. 597632.
4,063,946.—ELECTROPHOTOGRAPHIC COLOR REPRODUCTION PROCESS EMPLOYING PHOTOCONDUCTIVE MATERIAL WITH DUAL. DEC. 20, 1977.
4,068,938.—ELECTROSTAIC COLOR PRINTING USING DISCRETE POTENTIALS. JAN. 17, 1978. GRB. 1442234.
4,068,939.—COLOR TRANSPARENCY REPRODUCING MACHINE. JAN. 17, 1978. BEL. 830321, FRA. 7518443, GRB. 1489142, IRN. 13435, SPN. 437814, STZ. 597632.
4,072,522.—METHOD OF TREATING PHOTOCONDUCTIVE ZINC OXIDE. FEB. 7, 1978.
4,078,929.—METHOD FOR TWO-COLOR DEVELOPMENT OF A XERIOGRAPHIC CHARGE PATTERN. MAR. 14, 1978.
4,082,443.—SYSTEM FOR SUPERPOSITION OF COLOR SEPARATION IMAGES. APR. 4, 1978.
4,087,168.—CHARGING SYSTEM FOR ELECTROSTATIC REPRODUCTION MACHINE. MAY 2, 1978.
4,097,139.—REPRODUCING MACHINE HAVING INTERCHANGEABLE DEVELOPER HOUSINGS. JUNE 27, 1978.
4,111,542.—COLLATING SYSTEM FOR OPAQUE DOCUMENTS AND SLIDE REPRODUCTIONS. SEPT. 5, 1978.
4,135,927.—MULTICOLOR XEROGRAPHIC PROCESS. JAN. 23, 1979. ARG. 188730. AUS. 459398. BEL. 767360. CAN. 946910. CHL. 26754. DNK. 133524. FRA. 7118951. GRB. 1345391. ITL. 930586. MEX. 121678. PNM. 2395. SPN. 391274. STZ. 530659. SWD. 358245. TIW. 8520. VZL. 32422.

Class 1F

3,109,366.—METHOD FOR PATTERN REPRODUCTION. NOV. 5, 1963. CAN. 0624372.
3,109,367.—METHOD FOR PATTERN REPRODUCTION. NOV. 5, 1963. CAN. 0624374, FRA. 1146623, GER. 1029837, GRB. 0813637.
3,143,066.—PRODUCTION OF DUPLICATING MASTERS. AUG. 4, 1964. CAN. 0722954.

3,428,453.—IMAGE FORMING PROCESS UTILIZING XEROGRAPHY-ETCHING PROCESS. FEB. 18, 1969. CAN. 0856722, FRA. 1428775, GRB. 1085151, ITL. 0754825.
3,455,240.—IMAGING SYSTEM. JULY 15, 1969. CAN. 0823599, GER. 1571913, GRB. 1165676, JAP. 0594700.
3,460,476.—IMAGING PROCESS. AUG. 12, 1969. ARG. 0164839, AUS. 0418783, BEL. 0691755, CAN. 0882050, FRA. 1511173, GRB. 1168268, ITL. 0787662, JAP. 0562388, MEX. 0108240, SPN. 0346128, STZ. 0480672, SWD. 0331794, VZL. 0024009.
3,490,368.—PRINTING BY PARTICULATE IMAGES. JAN. 20, 1970. ARG. 0152222, ATR. 0281875, AUS. 0403243, BEL. 0674293, BRA. 0086720, CAN. 0824922, DNK. 0117303, FIN. 0047145, FRA. 1464987, GER. 1496169, GRB. 1128173, GRK. 0031516, HOL. 0145056, ITL. 0750153, JAP. 0547199, MEX. 0101075, NOR. 0130551, SAF. 0656968, SPN. 0321274, STZ. 0446906, SWD. 0355681, VZL. 0023998.
3,549,447.—IMAGING SYSTEM. DEC. 22, 1970.
3,559,570.—METHOD OF PREPARING AND USING A GRAVURE PRINTING PLATE. FEB. 2, 1971. CAN. 0844544, GRB. 1198142.
3,589,290.—RELIEF IMAGING PLATES MADE BY REPETITIVE XEROGRAPHIC PROCESSES. JUNE 29, 1971. CAN. 0896949.
3,615,128.—APPARATUS FOR ELECTROSTATIC PRINTING. OCT. 26, 1971. CAN. 0910956.
3,638,567.—METHOD OF PREPARING AND UTILIZING A GRAVURE PRINTING MASTER. FEB. 1, 1972.
3,806,354.—METHOD OF DEVELOPING ELECTROSTATIC LATENT IMAGES. APR. 23, 1974.
3,884,686.—COLOR CORRECTION METHOD. MAY 20, 1975.
3,919,938.—PERMANENT ELECTROSTATIC MASTER. NOV. 18, 1975.
4,006,267.—COLOR HIGHLIGHTING PROCESS. FEB. 1, 1977.
4,068,588.—PRINTING USING AN ELECTROCHROMIC IMAGE. JAN. 17, 1978.

Class 1G 1

3,093,039.—APPARATUS FOR TRANSFERRING POWDER IMAGES AND METHOD THEREFOR. JUNE 11, 1963. CAN. 0744873.
3,124,457.—DIFFERENTIAL IMAGE TRANSFER SYSTEM. MAR. 10, 1964. CAN. 0800184, GRB. 1031986, JAP. 0477375.
3,185,777.—MAGNETIC RECORDING. MAY 25, 1965.
3,485,621.—RECORDING BY PARTICLE ORIENTATION. DEC. 23, 1969. CAN. 0916777, GRB. 1188982, JAP. 0582501.
3,526,191.—DUPLICATING PROCESS EMPLOYING MAGNETIC DEVELOPER MATERIAL. SEPT. 1, 1970. CAN. 0903830, GRB. 1208307.
3,803,638.—RECORDING SYSTEM USING MAGNETIC CORE MATRIX. APR. 9, 1974.
3,875,576.—ELECTROSTATIC IMAGING SYSTEM WITH MAGNETIC TONER. APR. 1, 1975.
4,160,046.—METHOD OF MAKING AN IMAGING SYSTEM. JULY 3, 1979.

Class 1G 2

3,592,642.—DUPL METH PAPR SHT HTS MELTG PT TONR IMG SIMUL CAUSE TRANSF TNR FRPHOTOCNDCR AND FSG TNR IMG ON PAP. JULY 13, 1971. BEL. 0706852, FRA. 1547828, GRB. 1198306, HUN. 0157321, ITL. 0815498.

Class 1G 3

3,275,436.—METHOD OF IMAGE REPRODUCTION UTILIZING A UNIFORM RELEASABLE SURFACE FILM. SEPT. 27, 1966. AUS. 0296158, CAN. 0811877, FRA. 1371894, GRB. 1033523, ITL. 0702168, JAP. 0508402.
3,438,772.—IMG RPDCTN INVLVNG ELCTROSTC TRSF OF RELESBL DONR FILM FRM PTOCNDTV INSLTNG LAYER TO ADHSV TRS. APR. 15, 1969. CAN. 0838044, GRB. 1124954, JAP. 0542587.
3,446,616.—XEROGRAPHIC IMAGING EMPLOYING A SELECTIVELY REMOVABLE LAYER. MAY 27, 1969.

Class 1G 4

3,166,418.—IMAGE DEVELOPMENT. JAN. 19, 1965. CAN. 0747566, FRA. 1259438, GER. 1190334, GRB. 0952609, JAP. 0418117.
3,619,054.—OIL FILM IMAGING APPARATUS. NOV. 9, 1971.

Class 1G 5

3,234,019.—METHOD FOR FORMATION OF AN ELECTROSTATIC IMAGE RESISTANT TO DETERIORATION ON STORAGE. FEB. 8, 1966. ATR. 0248873, AUS. 0266424, BEL. 0618720, FRA. 1325903, GER. 1295374, GRB. 1006231, IND. 0081730, ISR. 0017057, ITL. 0667262, SAF. 0001489, STZ. 0407176, SWD. 0307733.

Class 1G 6

3,084,043.—LIQUID DEVELOPMENT OF ELECTROSTATIC LATENT IMAGES. APR. 2, 1963. CAN. 0678365, GRB. 0880597.
3,869,896.—ROLLING PROCESS. MAR. 11, 1975. GRB. 1434131.
3,924,945.—APPARATUS FOR INDUCTIVE IMAGING WITH SIMULTANEOUS POLAR INK DEVELOPMENT. DEC. 9, 1975.
3,974,554.—QUANDRANGULAR TRIPETICORD GRAVURE ROLL. AUG. 17, 1976.
3,980,404.—XEROGRAPHIC APPARATUS HAVING IMPROVED FLUID DISPENSING MEMBER. SEPT. 14, 1976.
3,994,726.—LAMINATED FLEXIBLE PHOTORECEPTOR. NOV. 30, 1976. GRB. 1429517.
4,002,476.—METHOD OF DEVELOPING RESILIENT PHOTOCONDUCTIVE ELEMENT. JAN. 11, 1977. GRB. 1429517.
4,017,174.—DEVELOPER ASSEMBLY SUPPORT. APR. 12, 1977.
4,020,788.—DOCTORING MEANS. MAY 3, 1977.
4,023,967.—ELECTROPHOTOGRAPHIC LIQUID DEVELOPMENT METHOD IN WHICH A UNIFORM SUBSTANTIAL INTERFACE CONTACT. MAY 17, 1977. BEL. 0819537.
4,024,838.—DEVELOPER LIQUID SUPPLY DEVICE. MAY 24, 1977.

Class 1H 1

3,100,427.—PROJECTION DEVICE. AUG. 13, 1963.
3,166,419.—IMAGE PROJECTION. JAN. 19, 1965. CAN. 0699802, FRA. 1260843, GRB. 0955994.
3,166,420.—SIMULTANEOUS IMAGE FORMATION. JAN. 19, 1965. CAN. 0756267, GRB. 0955142.
3,185,050.—XEROGRAPHIC IMAGE PROCESSOR PROJECTOR. MAY 25, 1965.
3,196,765.—IMAGE DEVELOPMENT AND PROJECTION. JULY 27, 1965.
3,220,012.—SIMULTANEOUS RECORDING AND DISPLAY SYSTEM. NOV. 23, 1965. CAN. 0809339, FRA. 1373673, GER. 1303156, GRB. 1019900, ITL. 0695895, JAP. 0470425.
3,317,317.—XEROGRAPHIC METHOD OF MAKING A PARTICLE TRANSPARENCY PROJECTIBLE IMAGE. MAY 2, 1967.
3,320,061.—MASKING BY TOTAL INTERNAL REFLECTION FOR IMAGE REPRODUCTION AND DISPLAY. MAY 16, 1967. CAN. 0847533, FRA. 1401615, GER. 1497081, GRB. 1065986, ITL. 0729029, JAP. 0471308.
3,343,142.—XEROGRAPHIC CODING AND INFORMATION STORAGE ON A SPECULAR BUSINESS MACHINE CARD. SEPT. 19, 1967. CAN. 0844786, GRB. 1047261, JAP. 0701182.
3,519,344.—IMAGE PROJECTION. JULY 7, 1970.
3,543,031.—DEVICE AND PROCESS FOR IMAGE STORAGE. NOV. 24, 1970. ARG. 0161299, AUS. 0432468, BEL. 0703461, CAN. 0862332, FRA. 1543309, GER. 1549142, GRB. 1201374, ITL. 0811521, JAP. 0742514, MEX. 0100142, SPN. 0344004, STZ. 0497022, SWD. 0354169, VZL. 0023663.
3,593,832.—KEYBOARD INPUT DISPLAY DEVICE. JULY 20, 1971.
3,619,049.—XEROGRAPHIC IMAGERY USING A LONG PERSISTENCE PHOSPHOR INTERMEDIATE. NOV. 9, 1971.
3,955,977.—ELECTROSTATOGRAPHIC PROCESS. MAY 11, 1976.

Class 1H 2

3,437,408.—MULTIPLE COPY ELECTROSTATIC IMAGING APPARATUS. APR. 8, 1969. ARG. 0164840, ATR. 0283115, AUS. 0410817, BEL. 0704323, CAN. 0831674, CZC. 0156411, EGR. 0065587, FRA. 1538197, GRB. 1202583, HUN. 0161168, ITL. 0822157, JAP. 0582502, MEX. 0099950, SPN. 0345482, STZ. 0484459, SWD. 0331795, USR. 0353450, VZL. 0023662.
3,512,038.—PIN SYSTEM. MAY 12, 1970. CAN. 0873507, GRB. 1201497, JAP. 0623001.

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Class 11

3,414,409.—PARTICLE TRANSFER. DEC. 3, 1968. BEL. 0713399, CAN. 0822324, FRA. 1568374, GRB. 1145026, ITL. 0829803.
3,543,022.—METH AND APPARATUS CHARG DISCRETE SMALL AREAS XEROGRAPHIC PLATES TO DIF POTENT CONT TONE PRINTG. NOV. 24, 1970. CAN. 0921971, GRB. 1186599.
3,682,677.—BACKGROUND REMOVAL. AUG. 8, 1972.
3,784,301.—ELECTROPHOTOGRAPHIC METHOD. JAN. 8, 1974.
3,883,349.—ELECTROPHOTOGRAPHIC CHARGING METHOD. MAY 13, 1975.
3,973,846.—ELECTROSTATIC MASTER MAKING APPARATUS. AUG. 10, 1976.
4,021,112.—PHOTORECEPTOR DARK CURRENT LEAKAGE DETECTING APP FOP XEROGRAPHIC MACHINES. May 3, 1977.
4,039,831.—TWO COLOR XERORADIOGRAPHY DEVELOPMENT. AUG. 2, 1977.
4,134,137.—SINGLE WIRE MICROELECTROMETER IMAGING SYSTEM. JAN. 9, 1979.

Class 1J

3,652,156.—LINEAR-TO-DRUM OPTICAL SCAN CONVERTER SYSTEM. MAR. 28, 1972.
3,766,850.—DEVELOPING MEANS FOR ELECTROSTATIC PRINTING APPARATUS. OCT. 23, 1973. CAN. 0972551, FRA. 7246855, GRB. 1415325, ITL. 0973310, SWC. 7216975.
3,954,463.—METHOD FOR ELECTROSTATIC PRINTING. MAY 4, 1976.
4,046,472.—ELECTROSTATIC IMAGING APPARATUS. SEPT. 6, 1977.
4,103,995.—IMAGING APPARATUS. AUG. 1, 1978.

Class 1J 1

3,062,108.—ELECTROPHOTOGRAPHIC COPYING APPARATUS. NOV. 6, 1962.
3,062,109.—XEROGRAPHIC REPRODUCING APPARATUS. NOV. 6, 1962. ARG. 0149705, CAN. 0683779, CHL. 0024545, CLB. 0014851, COS. 0001435, FRA. 1291840, GER. 1290817, GRB. 0995414, GUA. 0001694, HGK. 0022168, ITL. 0646249, JAP. 0444672, KEN. 0167268, PNM. 0002135, PRU. 0008376, URG. 0007955, VZL. 0017266.
3,078,770.—XEROGRAPHIC REPRODUCING APPARATUS. FEB. 26, 1963. CAN. 0701741.
3,099,943.—XEROGRAPHIC REPRODUCING APPARATUS. AUG. 6, 1963. ADN. 0000468, ARG. 0169828, ATR. 0251420, AUS. 0270773, BEL. 0629050, BRA. 0082981, BRS. 00J3736, BRU. 0000369, CAN. 0738132, CHL. 0023724, CLB. 0015207, COS. 0001436, ECD. 0000022, FIJ. 0000340, FRA. 1346575, GHA. 0000997, GIB. 1032951, GIE. 0006569, GRB. 1032951, GRK. 0025939, GUA. 0001740, GUR. 1032951, HGK. 0008969, IND. 0086614, ISR. 0018757, ITL. 0752146, JAP. 0491155, JER. 0000P97, KEN. 0001743, LXB. 0043231, MAU. 1897571, MEX. 0074814, MLS. 0014969, NIG. 0001617, NOR. 0124476, NZL. 0134238, PRU. 0008375, PTG. 0040583, SAF. 0063737, SBH. 0005169, SGP. 0008069, SHL. 0000016, SLN. 1677286, SPN. 0286059, SRK. 0000387, STZ. 0425469, SWD. 0323285, UGD. 0000169, URG. 0007713, VZL. 0017049.
3,131,617.—XEROGRAPHIC REPRODUCING APPARATUS. MAY 5, 1964.
3,135,179.—XEROGRAPHIC APPARATUS. JUNE 2, 1964.
3,135,180.—XEROGRAPHIC APPARATUS. JUNE 2, 1964.
3,139,013.—DOCUMENT REPRODUCING APPARATUS. JUNE 30, 1964. CAN. 0727819, FRA. 1346596, GRB. 1016265, JAP. 0442652.
3,146,688.—XEROGRAPHIC MACHINE. SEPT. 1, 1964. ATR. 0249503, AUS. 0272158, BEL. 0616948, CAN. 0712269, FRA. 1324504, GER. 1295372, GRB. 1009867, JAP. 0464921.
3,182,573.—MASKED PLATE XEROGRAPHY. MAY 11, 1965. CAN. 0859657, FRA. 1353685, GRB. 1021882, ITL. 0694073, JAP. 0470242.
3,205,484.—ELECTROSTATIC MEMORY SYSTEM. SEPT. 7, 1965.
3,355,983.—CARD HANDLING MECHANISM. DEC. 5, 1967. CAN. 0814086, MEX. 0113373.
3,514,201.—RECORDING APPARATUS. MAY 26, 1970. CAN. 0880484.
3,520,602.—GRAPHIC DISPLAY DEVICE. JULY 14, 1970. CAN. 0838312.
3,536,395.—TRANSACTION RECORDING APPARATUS AND SYSTEM. OCT. 27, 1970. CAN. 0870184, GRB. 1213825.
3,580,671.—EXPOSURE APPARATUS. MAY 25, 1971. CAN. 0912104, GRB. 1276010.
3,677,633.—PORTABLE DOCUMENT ABSTRACTOR. JULY 18, 1972.
3,770,430.—PHOTOELECTROSCLOGRAPHIC IMAGING PROCESS. NOV. 6, 1973.
3,865,482.—ELECTROSTATOGRAPHIC COPYING MACHINE. FEB. 11, 1975.
3,917,396.—CONTROL SYSTEM. NOV. 4, 1975.
3,955,977.—ELECTROSTATOGRAPHIC PROCESS. MAY 11, 1976.
3,976,374.—ELIMINATION OF REDUNDANT IMAGE. AUG. 24, 1976. GRB. 1419725.
3,977,780.—ELECTROSTATIC REPRODUCTION METHOD AND APPARATUS. AUG. 31, 1976.
RE29,514.—PROGRAMMING CONTROL SYSTEM FOR PRINTING MACHINE. JAN. 10, 1978.
4,046,472.—ELECTROSTATIC IMAGING APPARATUS. SEPT. 6, 1977.
4,054,380.—CONTROL SYSTEM FOR HIGH SPEED COPIER/DUPLICATORS. OCT. 18, 1977. GRB. 1491911.
4,093,367.—IMAGING APPARATUS. JUNE 6, 1978.
4,103,995.—IMAGING APPARATUS. AUG. 1, 1978.
4,122,996.—COPY REPRODUCTION MACHINE WITH CONTROLLER SELF CHECK SYSTEM. OCT. 31, 1978.
4,124,287.—IMAGING SYSTEM UTILIZING UNCHARGED MARKING PARTICLES. NOV. 7, 1978.
4,125,325.—AUTOMATIC DUPLEX CONTROL SYSTEM FOR A REPRODUCTION MACHINE. NOV. 14, 1978. BEL. 870043.
4,130,354.—REPRODUCTION MACHINE HAVING DUPLEX JOB RECOVERY CAPABILITIES. DEC. 19, 1978. BEL. 870038.
4,149,487.—XEROGRAPHIC MACHINE WITH INFINITELY VARIABLE DEVELOPER BIAS. APR. 17, 1979.
4,153,241.—DOUBLE DOCUMENT FEED DETECTION FOR A DOCUMENT HANDLER IN A REPRODUCTION MACHINE. MAY 8, 1979. BEL. 870041.
4,156,133.—REPRODUCTION MACHINE WITH PAPER PATH DETECTION DIAGNOSTICS. MAY 22, 1979. BEL. 870040.
4,158,886.—OPERATOR CONSOLE FOR A REPRODUCTION MACHINE. JUNE 19, 1979. BEL. 870041.
4,161,277.—IMPROPER COPY RUN PROGRAM ENTRY CHECK FOR ELECTROSTATIC TYPE REPRODUCTION OR COPYING MACHINE. JULY 17, 1979.
4,162,844.—REPRODUCTION MACHINE WITH DUPLEX IMAGE SHIFT. JULY 31, 1979. BEL. 870037.

Class 1J 2

3,057,275.—IMAGE KEEPING. OCT. 9, 1962.
3,185,051.—XEROGRAPHIC METHOD. MAY 25, 1965. CAN. 0740113, FRA. 1385444, GRB. 1026557, ITL. 0712017.
3,237,197.—IMAGE METHOD FOR ELECTROSTATIC RETENTION IN PHOTOCONDUCTIVE LAYERS. FEB. 22, 1966.

Class 1J 3

3,105,426.—XEROGRAPHIC APPARATUS. OCT. 1, 1963. CAN. 0689214, FRA. 1290414, GER. 1297476, GRB. 0989487, JAP. 0626117.
3,132,206.—HIGH SPEED PRINTING APPARATUS. MAY 5, 1964. GRB. 0999043.
3,649,114.—MULTIPLE OUTPUT ELECTROSTATIC RECORDING SYSTEM. MAR. 14, 1972. ARG. 0200567, AUS. 0447901, CAN. 0923542, NZL. 0160104.

Class 1J 4

3,148,601.—XEROGRAPHIC REPRODUCING APPARATUS. SEPT. 15, 1964.
3,187,651.—XEROGRAPHIC REPRODUCING APPARATUS. JUNE 8, 1965. FRA. 1338861, GER. 1797533, GRB. 1015633, HGK. 0013368, JAP. 0441423, KEN. 0167368.
3,196,767.—DOCUMENT COPY MECHANISM. JULY 27, 1965. CAN. 0731929, GRB. 1032953, JAP. 0651995.
3,399,610.—XEROGRAPHIC APPARATUS. SEPT. 3, 1968. CAN. 0819923.
3,788,203.—JUSTIFICATION APPARATUS. JAN. 29, 1974. CAN. 0989929, GRB. 1380831.
3,982,831.—ELECTROSTATOGRAPHIC REPRODUCTION APP & DRIVE THEREFOR. SEPT. 28, 1976.
4,002,409.—CHAIN-FEED CONTROL LOGIC FOR A MULTI-MODE COPIER/DUPLICATOR. JAN. 11, 1977. BEL. 0840300.

4,027,963.—MULTI-MODE REPRODUCING APPARATUS. JUNE 7, 1977. BEL. 0843154, HAT. 0001534.
4,053,221.—MULTI-MODE REPRODUCING APPARATUS. OCT. 11, 1977.

Class 1J 5

3,083,869.—XEROGRAPHIC PLATE MAGAZINE AND FEEDING APPARATUS. APR. 2, 1963.
3,091,160.—XEROGRAPHIC PLATE FEEDING AND SUPPORTING APPARATUS. MAY 28, 1963.
3,160,057.—XEROGRAPHIC PROCESSING APPARATUS. DEC. 8, 1964.
3,272,101.—XEROGRAPHIC APPARATUS. SEPT. 13, 1966.
3,520,605.—DOCUMENT SCAN DRIVE AND RETURN APPARATUS. JULY 14, 1970. CAN. 0858848.
3,697,160.—CONTINUOUS IMAGING APPARATUS. OCT. 10, 1972.

Class 1J 6

RE.27,776.—ROLLER ASSEMBLY FR BELT-TYPE PHOTORECEPTR IN ELECTROSTATC PRNTNG MACHINES—RE OF D1480—3,536. OCT. 9, 1973.
3,190,199.—XEROGRAPHIC COPYING APPARATUS. JUNE 22, 1965. CAN. 0709970, GRB. 1033834, JAP. 0477813.
3,435,693.—BELT TRACKING DEVICE. APR. 1, 1969. ARG. 0168295, ATR. 0283116, AUS. 0421893, BEL. 0705641, CAN. 0853440, CHL. 0023084, CLB. 0017528, DNK. 0117047, FRA. 1543079, GRB. 1180659, ITL. 0827782, MEX. 0100320, NOR. 0124530, PRU. 0009336, SAF. 0676414, SPN. 0346430, STZ. 0471736, URG. 0009729, VZL. 0023676.
3,536,323.—BELT ASSEMBLY—REISSUED D3492—27,776. OCT. 27, 1970. ARG. 0181307, AUS. 0437364, BEL. 0733405, BRA. 6909127, CAN. 0943179, FRA. 6917082, GRB. 1275135, HUN. 0157763, ITL. 0869475, JAP. 0700616, MEX. 0112302, PNM. 0001817, SPN. 0367615, STZ. 0506819, TIW. 0UM5646, USR. 0406385, VZL. 0025831.
3,661,452.—XEROGRAPHIC REPRODUCTION MACHINE MAY 9, 1972. ARG. 0169621, AUS. 0442749, BEL. 0733407, CAN. 0910959, CHL. 0024800, DNK. 0125257, FRA. 6917084, GRB. 1264406, ITL. 0877771, MEX. 0115542, PNM. 0001759, PRU. 0010640, SPN. 0367613, STZ. 0491418, TIW. 0006498, USR. 0358875, VZL. 0026279.
3,664,204.—BELT ASSEMBLY FOR USE IN AN ELECTROSTATIC PRINTING MACHINE. MAY 23, 1972. ARG. 0193980, BEL. 0777322, CAN. 0939735, FRA. 7147893, GRB. 1372389, ITL. 0944437, MEX. 0128274, VZL. 0032791.
3,730,623.—VACUUM HOLDDOWN DEVICE FOR MOVING BELTS. MAY 1, 1973. ARG. 0191239, BEL. 0777323, CAN. 0940591, FRA. 7147894, GRB. 1372390, ITL. 0944436, MEX. 0127634.
3,765,757.—TRANSPORT ARRANGEMENT FOR THIN SHEET MATERIAL. OCT. 16, 1973. BEL. 0793551, GRB. 1419978, ITL. 0972846, SPN. 0410107.
3,790,271.—PROCESSING CONTROL SYSTEM FOR PRINTING MACHINES. FEB. 5, 1974. CAN. 0986173, SPN. 0418256.
3,801,092.—VACUUM HOLD-DOWN DEVICE FOR MOVING BELTS. APR. 2, 1974. ARG. 0191239, BEL. 0777323, CAN. 0940591, FRA. 7147894, GRB. 1372390, ITL. 0944436, MEX. 0127634.
3,860,340.—OPTICAL ALIGNMENT ON VACUUM PLENUM. JAN. 14, 1975. BEL. 0784630, FRA. 7220686, GRB. 1379674, ITL. 0956164.
3,867,027.—TRANSPORT ARRANGEMENT FOR THIN SHEET MATERIAL. FEB. 18, 1975. BEL. 0793551, GRB. 1419978, ITL. 0972846, SPN. 0410107.
3,907,650.—PHOTOSENSITIVE BINDER LAYER. FOR XEROGRAPHY. SEPT. 23, 1975.
3,914,126.—NICKEL OXIDE INTERLAYERS FOR PHOTOCONDUCTIVE ELEMENTS. OCT. 21, 1975.
3,921,179.—FLUID PEN ASSEMBLY. NOV. 18, 1975.
3,961,849.—ELECTROSTATIC PRINTING MACHINE. JUNE 8, 1976. ARG. 0200108, ATR. 0323556, AUS. 0458405, BEL. 0776599, CAN. 0948274, FRA. 7145342, GRB. 1374799, ITL. 0943875, MEX. 0127493, PNM. 0718307, SAF. 0718307, SPN. 0397851, STZ. 0554009, SWD. 7115731, VZL. 0032936.
4,094,606.—XEROGRAPHIC SYSTEM EMPLOYING WAVEGUIDE ADDRESSING AND MODULATING APPARATUS. JUNE 13, 1978.

Class 1J 7

3,099,944.—XEROGRAPHIC CONTROL APPARATUS. AUG. 6, 1963. CAN. 0738131, IND. 0096308, JAP. 0491992.
3,512,885.—ACCOUNTING DEVICE FOR XEROGRAPHIC REPRODUCING APPARATUS. MAY 19, 1970. ARG. 0152214, ATR. 0285324, AUS. 0409894, BEL. 0670170, BRA. 0086686, CAN. 0763624, CHL. 0022095, CLB. 0015661, COS. 0001881, DNK. 0125559, ECD. 0000019, EGR. 0050203, EIR. 0029756, ELS. 0000939, FRA. 1459931, GER. 1522804, GRB. 1122522, GRK. 0030861, GUA. 0001741, HOL. 0146300, IND. 0096570, ISR. 0024363, ITL. 0729658, JAP. 0513607, LXB. 0049537, MEX. 0079047, NOR. 0124392, NZL. 0142991, PAK. 0116058, PLP. 0005074, PNM. 0002079, PRU. 0008106, PTG. 0044651, SAF. 0655276, SPN. 0318011, STZ. 0438031, SWD. 0358037, TRK. 0013473, UAR. 0007497, URG. 0006622, VZL. 0023997.
3,588,472.—LOGIC CONTROL APPARATUS. JUNE 28, 1971. ARG. 0181590. ATR. 0279353, BEL. 0706629, BRA. 6793350, CAN. 0834957, FRA. 1567082, GRB. 1204719, ITL. 0815466, JAP. 0645591, LXB. 0054882, MEX. 0101675, VZL. 0023684.
3,734,610.—MICROFICHE VIEWER-COPIER WITH BILLING DATA STORAGE. MAY 22, 1973.
3,813,157.—CONTROL LOGIC FOR TROUBLE DETECTION AND RECOVERY. MAY 28, 1974.

Class 1J 8

3,094,049.—XEROGRAPHIC DEVELOPER MEASURING APPARATUS. JUNE 18, 1963.
3,301,152.—XEROGRAPHIC COPYING APPARATUS. JAN. 31, 1967.
3,348,521.—AUTOMATIC TONER CONTROL SYSTEM. OCT. 24, 1967. CAN. 0799398.
3,453,045.—XEROGRAPHIC DEVELOPMENT APPARATUS. JULY 1, 1969. CAN. 0852125, FRA. 1559973, GRB. 1213493, HUN. 0156188, ITL. 0832847, JAP. 0602169, USR. 0371739.
3,542,466.—DEVELOPMENT APPARATUS. NOV. 24, 1970. AUS. 0428620, BEL. 0725611, CAN. 0884213, FRA. 1598505, GRB. 1203167, ITL. 0870661, JAP. 0641479, SPN. 0361653, SWD. 0343694.
3,695,224.—CASCADE DEVELOPMENT. OCT. 3, 1972.
3,816,756.—AUTOMATIC BIAS CONTROL. JUNE 11, 1974.
3,851,966.—REPRODUCTION APPARATUS. DEC. 3, 1974. BEL. 808482.
3,869,896.—ROLLING PROCESS. MAR. 11, 1975. GRB. 1434131.
3,931,792.—ABRASIVE LIQUID DEVELOPING APPARATUS. JAN. 13, 1976.
3,994,726.—LAMINATED FLEXIBLE PHOTORECEPTOR. GRB. 1429517.
4,002,476.—METHOD OF DEVELOPING RESILIENT PHOTOCONDUCTIVE ELEMENT. JAN. 11, 1977. GRB. 1429517.
4,023,967.—ELECTROPHOTOGRAPHIC LIQUID DEVELOPMENT METHOD IN WHICH A UNIFORM SUBSTANTIAL INTERFACE CONTACT. BEL. 0819537, GRB. 1429518.

Class 1K

T.940,022.—PRESSURIZED AND FILTERED XEROGRAPHIC SYSTEM. NOV. 4, 1975.
3,638,110.—DEVC FOR MEASRNG CHRG ON MATRIAL BY CONVRTNG INTO ELCTRCL SGNLS FRICTNL FORCS CAUSD BY CHARGE. JAN. 25, 1972. AUS. 0161306, BEL. 0746479, FRA. 7007991, GRB. 1280803, HUN. 0161306, ITL. 0892329, JAP. 0681943, PLD. 0069581, SPN. 0376910, STZ. 0519185, SWD. 0364418, USR. 0412696.
3,661,453.—ELECTROSTATIC LABEL PRINTER. MAY 9, 1972. CAN. 0927471, FRA. 7122950, GRB. 1345800, ITL. 0927543.
3,893,175.—RECORDER FOR MONITORING COPIERS. JULY 1, 1975. GRB. 1427292.
4,007,326.—ELECTRONIC COPY ANALYSIS. FEB. 8, 1977.
4,016,310.—COATR HRDWR & METH FOR OBTNG UNFRM PHROCNDTV LAYR ON A XEROGRAPHIC PHOTORECEPTOR. APR. 5, 1977.
4,023,523.—COATING HARDWARE AND METHOD FOR OBTAINING UNIFORM PHOTOCONDUCTIVE LAYERS ON A XEROGRAPHIC PHOTO. MAY 17, 1977.
4,023,901.—REPRODUCTION MACHINE SERVICE CONTROL. MAY 17, 1977.
4,025,188.—PHOTOACTIVE DEVICE FOR XEROGRAPHY. MAY 24, 1977.
4,026,397.—CONTROL KNOB CLUTCHES WITH LOCK. MAY 31, 1977.
4,134,137.—SINGLE WIRE MICROELECTROMETER IMAGING SYSTEM. JAN. 9, 1979.

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Class 1K 1

3,835,380.—ELECTROMETER SYSTEM. SEPT. 10, 1974.
3,852,668.—ELECTROMETER SYSTEM. DEC. 3, 1974.
3,887,845.—COPIER PHOTORECEPTOR CHARGE CONTROL. JUNE 3, 1975. GRB. 1465969.
3,891,316.—MULTI-PROCESS CONTROL SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. JUNE 24, 1975.
3,898,001.—ELCTROMETR SYSTM FOR NON-CNTCT DETCTN OF ELCTRSTATC CHRGE ON A MVNG ELCTRSTGRPHC IMAGNG SURFACE. AUG. 5, 1975.
3,909,126.—MULTI-PROCESS CONTROL SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. SEPT. 30, 1975.
3,934,141.—APPARATUS FOR AUTOMATICALLY REGULATING THE AMOUNT OF CHARGE APPLIED TO AN INSULATING SURFACE. JAN. 20, 1976.
3,935,531.—ELECTROMETER WITH LOW VOLTAGE INDICATOR. JAN. 27, 1976.
3,935,532.—AUTOMATIC ZEROING ELECTROMETER. JAN. 27, 1976.
3,998,538.—ELECTROMETER APPARATUS FOR REPRODUCTION MACHINES. DEC. 21, 1976.
4,000,944.—PHOTORECEPTOR FOR ELECTROSTATIC REPRODUCTION MACHINES WITH BUILT IN ELECTRODE. JAN. 4, 1977.
4,003,650.—CONTROLLER FOR REPRODUCTION APPARATUS. JAN. 18, 1977.
4,100,484.—D.C. ELECTROMETER. JULY 11, 1978.
4,105,321.—ILLUMINATED CHARGE CONTROL SYSTEM FOR XEROGRAPHIC MACHINES. AUG. 8, 1978.
4,127,806.—SHIELDED ELECTROMETER WHOSE OUTPUT IS USED TO CONTROL WIDTH OF PULSES FED BACK TO THE SHIELD. NOV. 28, 1978.
4,139,813.—ADAPTOR FOR AN ELECTROMETER PROBE TO PERMIT CONTACT POTENTIAL MEASUREMENTS AND METHOD FOR USE. FEB. 13, 1979.
4,149,119.—COMBINED AC-DC ELECTROMETER WITH AC FEEDBACK FOR DRIFT COMPENSATION. APR. 10, 1979.

Class 1K 2

3,335,003.—REFLEX XEROGRAPHIC PROCESS. AUG. 8, 1967. CAN. 0764912, FRA. 1415836, GER. 1261398, GRB. 1059657, ITL. 0741353, JAP. 0511404.
3,337,339.—SCREEN XEROGRAPHY. AUG. 22, 1967. AUS. 0291558, BEL. 0638029, CAN. 0729824, DNK. 0114045, FRA. 1404424, GER. 0114045, GRB. 1027354, HOL. 0130250, ITL. 0706191, JAP. 0489562, LXB. 0044538, NOR. 0109228, SWD. 0321859.
3,676,118.—REFLEX XEROGRAPHY IMAGING SYSTEM. JULY 11, 1972.
4,063,154.—D.C. ELECTROMETER. DEC. 13, 1977.
4,063,155.—D.C. ELECTROMETER PROBE. DEC. 13, 1977.
4,106,869.—DISTANCE COMPENSATED ELECTROSTATIC VOLTMETER. AUG. 15, 1978.

Class 1K 3

3,926,626.—CIRCULATION IMAGING METHOD. DEC. 16, 1975.

Class 2

4,043,549.—IMPACT FEEDER AUG. 23, 1977.
4,059,353.—PHOTORECEPTOR BELT SYSTEM. NOV. 22, 1977.

Class 2A

3,856,461.—REPRODUCTION MACHINE FUSER. DEC. 24, 1974.
3,856,462.—REPRODUCTION MACHINE FUSER. DEC. 24, 1974. BEL. 0821050.
3,877,936.—PHOTOCONDUCTIVE COPOLYMER OF N-VINYLCARBAZOLF AND N-VINYLPHTHALIMIDE. APR. 15, 1975. BEL. 0812436.
3,883,921.—CLEANING ROLL APPARATUS HAVING REJUVENATED CLEANING SURFACE. MAY 20, 1975.
3,944,358.—COLOR IMAGE REPRODUCTION SYSTEMS. MAR. 16, 1976.
3,951,533.—COLOR IMAGE REPRODUCTION SYSTEM. APR. 20, 1976.
3,984,183.—SHEET STRIPPING FROM IMAGING SURFACE. OCT. 5, 1976. BEL. 0836791.
3,997,243.—COLOR IMAGE REPRODUCTION SYSTEM. DEC. 14, 1976.
4,004,549.—ROLL FUSER. JAN. 25, 1977.
4,022,956.—POLYMERS OF BENZANTHRACENE AS ACTIVE MATRIX MATERIALS. MAY 10, 1977.
4,027,138.—A FUSER RELEASE MATERIAL DISPENSER. MAY 31, 1977.
4,035,140.—FIXING DEVICE IN AN ELECTROPHOTOGRAPHIC COPYING MACHINE. JULY 12, 1977.
4,045,163.—HEATED FUSER RELEASE AGENT CONTAINER. AUG. 30, 1977.
4,060,105.—TONER LOADING APPARATUS WITH REPLENISHING SUPPLY CONTAINER. NOV. 29, 1977.
4,063,530.—IMAGE FIXING. DEC. 20, 1977.
4,072,522.—METHOD OF TREATING PHOTOCONDUCTIVE ZINC OXIDE. FEB. 7, 1978.
4,078,924.—IMAGING SURFACE SMOOTHING WITH ROUGHENED FOIL NICKEL. MAR. 14, 1978.

Class 2A 1

3,764,315.—AMBIPOLAR ELECTROPHOTOGRAPHIC PLATE. OCT. 9, 1973. BEL. 0802608, GRB. 1421948.
3,948,656.—IMPROVED METHOD FOR THE PREPARATION OF CDSSE. APR. 6, 1976.

Class 2A 1A

3,077,386.—PROCESS FOR TREATING SELENIUM. FEB. 12, 1963. CAN. 0705359.
3,170,790.—RED SENSITIVE XEROGRAPHIC PLATE AND PROCESS THEREFOR. FEB. 23, 1965.
3,174,855.—METHOD FOR A PRODUCTION OF A XEROGRAPHIC PLATE. MAR. 23, 1965.
3,234,020.—PLATE FOR ELECTROSTATIC ELECTROPHOTOGRAPHY. FEB. 8, 1966.
3,460,296.—METAL WORKING. AUG. 12, 1969. BEL. 0705574, CAN. 0853918, GRB. 1196684.
3,488,896.—PROCESS OF PUMICING A SURFACE. JAN. 13, 1970.
3,489,560.—PHOTOCONDUCTIVE LAYR COMPRISN SELENIUM COMPOUND AND SOLID HYDROPHOBIC METL SALT OF A FATTY ACID. JAN. 13, 1970. BEL. 0711297, CAN. 0871632, FRA. 1544448, GRB. 1203237.
3,517,995.—METHOD & APPARATUS FOR INCREASING THE EFFICIENCY OF CORONA CHARGNG. JUNE 30, 1970. ARG. 0172471, BEL. 0721553, CAN. 0856714, FRA. 1585283, GRB. 1247034, ITL. 0844214, JAP. 0708414, MEX. 0103113, VZL. 0023701.
3,552,848.—XEROGRAPHIC PLATE. JAN. 5, 1971.
3,621,248.—METHOD USING XERORADIOGRAPHIC PLATE INSENSITIVE TO VISIBLE LIGHT. NOV. 16, 1971.
3,954,464.—METHOD OF FABRICATING A COMPOSITE TRIGONAL SELENIUM PHOTORECEPTOR. MAY 4, 1976.
3,961,953.—METHOD OF FABRICATING COMPOSITES TRIGONAL SELENIUM PHOTORECEPTORS. JUNE 8, 1976.
4,007,255.—PREPARATION OF RED AMORPHOUS SELENIUM. FEB. 8, 1977.
4,009,249.—PREPARATION OF RED AMORPHOUS SELENIUM. FEB. 22, 1977.
4,019,014.—METHOD FOR HEAT WELDING SELENIUM. APR. 19, 1977.

Class 2A 1B

3,312,548.—XEROGRAPHIC PLATES. APR. 4, 1967. BEL. 0691217, CAN. 0819658, FRA. 1505803, GRB. 1165579, JAP. 0650232.
3,467,548.—METHOD OF MAKING XEROGRAPHIC PLATE BY VACUUM EVAPORATION OF SELENIUM ALLOY. SEPT. 16, 1969.
3,490,903.—ALLOYS OF ANTIMONY AND SELENIUM USED IN PHOTOCONDUCTIVE ELEMENTS. JAN. 20, 1970. AUS. 0412949, CAN. 0871074, FRA. 1533536, GRB. 1185389, ITL. 0805955, JAP. 0626127, SWD. 0318193.
3,511,649.—PROCESS OF REDUCING FATIGUE IN PHOTOCONDUCTIVE GLASSES. MAY 12, 1970. GRB. 1193472, JAP. 0604152.
3,524,745.—PHOTOCONDUCTIVE ALLOY OF ARSENIC ANTIMONY AND SELENIUM. AUG. 18, 1970. ARG. 0164055, AUS. 0410443, BEL. 0709132, CAN. 0884810, CHL. 0024255, FRA. 1550902, GRB. 1209971, IND. 0113988, ITL. 0833508, JAP. 9124370, LXB. 0055231, MEX. 0108993, NOR. 0127943, NZL. 0151243, PRU. 0009904, PTG. 0048919, SAF. 0680228, SPN. 0349235, STZ. 0495573, SWD. 0328189, URG. 0009683.
3,615,413.—INDIUM DOPING OF A SE-AS PHOTOCONDUCTIVE ALLOYS. OCT. 26, 1971. CAN. 0917981, GRB. 1309312, JAP. 0739528.

3,655,377.—TRI-LAYERED SELENIUM DOPED PHOTORECEPTOR. APR. 11, 1972.
3,660,086.—ELCTRPHTGRPC PLATE AND PROCS EMPLYNG INORGNC PHOTCNDCTV MATRL W/PHOTOCHROMIC SENSITIVE AGENT. MAY 2, 1972.
3,685,989.—AMBIPOLAR PHOTORECEPTOR AND METHOD OF IMAGING. AUG. 22, 1972. CAN. 0971800, GRB. 1360078.
3,697,265.—VTRS SELNUM ALLY MTRX CNTNING ISLTD PRTCLS/PRTCL NETWKS OF RSN. OCT. 10, 1972. ARG. 0183560, ATR. 0299699, AUS. 0449439, BEL. 0752439, CAN. 0933014, EGR. 0090944, FRA. 7023472, GRB. 1319341, ITL. 0894623, MEX. 0116409, PNM. 0002539, SPN. 0409740, STZ. 0000000, SWD. 7216008, TIW. 0006838, USR. 0374867, VZL. 0031909.
3,879,199.—SURFACE TREATMENT OF ARSENIC-SELENIUM PHOTOCONDUCTORS. APR. 22, 1975.
3,884,688.—PHOTOSENSITIVE ELEMENT EMPLOYING A VITREOUS BISMUTH-SELENIUM FILM. MAY 20, 1975.
3,887,368.—COMPOSITION. JUNE 3, 1975.
3,898,083.—HIGH SENSITIVITY VISIBLE INFRARED PHOTOCONDUCTOR. AUG. 5, 1975.
3,909,458.—PHOTOSENSITIVE VITREOUS LAYER COMPRISING BISMUTH AND SELENIUM. SEPT. 30, 1975.
4,015,029.—SELENIUM & SELENIUM ALLOY EVAPORATION TECHNIQUE. MAR. 29, 1977.
4,126,457.—EVAPORATION TECHNIQUE FOR PRODUCING TEMPERATURE PHOTORECEPTOR ALLOYS. NOV. 21, 1978. CAN. 1046864.

Class 2A 1C

3,140,174.—PROCESS FOR OVERCOATING A XEROGRAPHIC PLATE. JULY. 7, 1964. FRA. 1260498, GRB. 0960871.
3,379,527.—PHOTOCONDUCTIVE INSULATORS COMPRISING ACTIVATED SULFIDES SELENIDES AND SULFOSELENIDES OF CADMIUM. APR. 23, 1968. CAN. 0907921, GRB. 1079065.
3,682,631.—METHOD OF FORMING AN ELECTROPHOTOGRAPHIC LAYER CONTAINING A BENZOQUANAMINE RESIN BINDER. AUG. 8, 1972.
3,867,145.—METHANOL AND HEAT TREATED ZINC OXIDE. FEB. 18, 1975.
3,971,742.—ORGANO-CHALCOGEN COMPOSITIONS. JULY 27, 1976.

Class 2A 1D

3,469,978.—PHOTOSENSITIVE ELEMENT. SEPT. 30, 1969. CAN. 0872173, GRB. 1171909, JAP. 0552967.
3,522,040.—PHOTOSENSITIVE INSULATING MATERIAL. JULY 28, 1970. CAN. 0884808, GRB. 1171910, JAP. 0552966.
3,627,573.—COMPOSITION AND METHOD. DEC. 14, 1971. ARG. 0176480, AUS. 0441224, BEL. 0721965. CAN. 0892493, FRA. 0095985, GRB. 1251630, ITL. 0889828, MEX. 0124897, SPN. 0358960, STZ. 0517359, VZL. 0030358.

Class 2A 1E

3,238,150.—PHOTOCONDUCTIVE CADMIUM SULFIDE POWDER AND METHOD FOR THE PREPARATION THEREOF. MAR. 1, 1966. CAN. 0712516, GRB. 1062022, JAP. 0486530.
3,879,200.—NOVEL XEROGRAPHIC PLATE CONTAINING PHOTOINJECTING BIX-BENZIMIDAZOLE PIGMENTS. APR. 22, 1975. ARG. 0188392, AUS. 0465970, BEL. 0763545, BRA. 0088118, CAN. 0928125, CHL. 0027130, EGR. 0093279, FRA. 7107565, GRB. 1337222, ITL. 0919105, MEX. 0122169, PNM. 0002460, SAF. 0711225, SPN. 0388590, TIW. 0008178, USR. 0449515.
3,909,261.—XEROGRAPHIC IMAGING MEMBER HAVING PHOTOCONDUCTIVE MATERIAL IN INTERLOCKING CONTINUOUS PATHS. SEPT. 30, 1975. ARG. 0186443, ATR. 0451252, BEL. 0763544, CAN. 0925741, CHL. 0026794, FRA. 7107567, GRB. 1296291, ITL. 0918909, MEX. 0122096, NZL. 0162891, PLP. 0009378, PNM 0002396, SAF. 0711227, SPN. 0388639, STZ. 0568591, SWD. 0367259, TIW. 0007844, USR. 0398062.

Class 2A 1E 1

3,077,398.—XEROGRAPHIC PLATE MADE BY CAST COATING. FEB. 12, 1963.

Class 2A 1F

3,394,001.—ELECTROPHOTOGRAPHIC SENSITIVE MATERIAL CONTAINING ELECTRON-DONOR DYE LAYERS. JULY 23, 1968. GRB. 1106562.
3,498,835.—METHOD FOR MAKING XEROGRAPHIC PLATES. MAR. 3, 1970. ARG. 0154134, AUS. 0418468, BEL. 0700454, CAN. 0872174, FRA. 1529285, GRB. 1189504, ITL. 0807717, JAP. 0567234, MEX. 0096199, SPN. 0342303, STZ. 0479093, SWD. 0332346, VZL. 0024014.
3,532,496.—XRGRPHC PLTS AND PROCS EMPLYNG HMGNUS DISPRSNS OF VTREOUS SLNIUM AND SNSTZNG DYES AS PHTCNDCTV LAYER. OCT. 6, 1970.

Class 2A 1G

3,288,603.—METHOD OF RESTORING XEROGRAPHIC PROPERTIES TO A GLASS BINDER PLATE. NOV. 29, 1966. CAN. 0800955, FRA. 1432127, GER. 1497201, GRB. 1088473, ITL. 0802168, JAP. 0519677.
3,397,982.—XIC PLATE W/INORGANIC GLASS BINDER HAVING OVERCOATING CONSISTING ESSENTIALLY OF ALUMINUM OXIDE. AUG. 20, 1968. ARG. 0150690, AUS. 0407349, BEL. 0674140, CAN. 0866142, FRA. 1460232, GER. 1497230, GRB. 1129674, ITL. 0822914, JAP. 0531894, MEX. 0085270, SWD. 0319976.
3,451,846.—PROCESS OF MAKING XEROGRAPHIC PLATE. JUNE 24, 1969. CAN. 0818384, GRB. 1183961, JAP. 0598621.
3,510,298.—PROCESS OF ACTIVATING PHOTOCONDUCTIVE MATERIAL IN GLASS BINDER. MAY 5, 1970. CAN. 0834668, GER. 1572366, GRB 1189822, JAP 0552968.
3,537,848.—PROCESS OF TREATING A XEROGRAPHIC GLASS BINDER PLATE AND PRODUCT. NOV. 3, 1970. ARG. 0180580
3,655,376.—ELECTROPHOTOGRAPHIC DENITRIFIED GLASS BINDER PLATE. APR. 11, 1972.
3,885,962.—PHOTOGRAPHIC AND ELECTROPHOTOGRAPHIC MEMBERS WITH GLASS FIBER CONTAINING PAPER SUBSTRATES. MAY 27, 1975.

Class 2A 2

3,657,272.—PROCESS FOR PREPARING X-FORM METAL FREE PHTHALOCYANINE. APR. 18, 1972.
3,738,831.—CHALCOGEN ORGANIC COMPOUNDS USED IN ELECTROPHOTOGRAPHIC PLATES AND PROCESS. JUNE 12, 1973.
3,758,301.—ELECTROPHOTOGRAPHIC USE OF SELENIUM CONTAINING POLYMERS. SEPT. 11, 1973.
3,770,428.—ORGANIC PHOTOCONDUCTIVE MATERIAL. NOV. 6, 1973.
3,864,144.—PROCESS FOR PREPARATION OF PHOTOCONDUCTIVE FILMS FROM INTRACTABLE MATERIALS. FEB. 4, 1975. GRB. 1414158, TIW. 0008534.
3,870,516.—METHOD OF IMAGING PHOTOCONDUCTOR IN CHARGE TRANSPORT BINDER. MAR. 11, 1975. AUS. 0466028, BEL. 0763541, CAN. 0931413, CHL. 0026797, EGR. 0094762, FRA. 7107559, GRB. 1343671, ITL. 0919108, MEX. 0122098, NZL. 0162883, PNM. 0002450, SAF. 0711219, SPN. 0388584, STZ. 0567744.
3,877,936.—PHOTOCONDUCTIVE COPOLYMER OF N-VINYLCARBAZOLE AND N-VINYLPHTHALIMIDE. APR. 15, 1975. BEL. 0812436.
3,879,198.—ELECTROPHOTOGRAPHIC AMBIPOLAR PHOTOCONDUCTIVE COMPOSITION AND IMAGING METHOD. APR. 22, 1975.
3,882,087.—ORGANIC PHOTOCONDUCTIVE MATERIAL. MAY 6, 1975.
3,903,107.—DIRECT ALPHA TO X PHASE CONVERSION OF METAL CONTAINING PHTHALOCYANINE. SEPT. 2, 1975. BEL. 0815632, SAF. 0743536.
3,915,702.—PHTOELCTRC & ELCTRPHTGRPHC PGMNTS COMPRISING DERIVATIVES OF CONDENSED PLYCYLC ARMATC HYDRCABN A. OCT. 28, 1975.
3,915,704.—PHOTOINDUCED ACID CATALYZED DEGRADATION OF DEGRADABLE POLYMERS. OCT. 28, 1975.
3,917,483.—PHOTOINDUCED ACID CATALTZED DEPOLYMERIZATION OF DEGRADABLE POLYMERS. NOV. 4, 1975.
3,923,762.—PROCESS FOR PREPARATION OF 2-ANTHRYL AND SUBSTITUTED 2-ANTHRYL FUNCTIONAL MONOMERS AND P. DEC. 2, 1975. BEL. 0822305, STZ. 0032598.

3,926,629.—ELECTROPHOTOGRAPHIC METHOD AND PLATE EMPLOYING A PHTHALOCYANINE POLYMER. DEC. 16, 1975.
3,932,180.—DIRECT ALPHA TO X PHASE CONVERSION OF METAL-FREE PHTHALOCYANINE. JAN. 13, 1976. BEL. 0815632, SAF. 0743536.
3,943,108.—PHOTOCONDUCTIVE COMPOSITION OF AN ALDEHYDE CONDENSATE. MAR. 9, 1976.
3,954,906.—AMBIPOLAR PHOTOCONDUCTIVE COMPOSITION AND IMAGING METHOD. MAY 4, 1976.
3,970,602.—COPOLYMERS OF N-VINYLCARBAZOLE AND N-VINYLPHTHALIMIDE AND DERIVATIVES THEREOF. JULY 20, 1976. BEL. 0812436.
3,978,029.—PHOTOCONDUCTIVE COMPOSITIONS AND IMAGING MEMBERS AND METHODS EMPLOYING SAME. AUG. 31, 1976. ARG. 0206212, BEL. 0816552, FRA. 7422479, SAF. 0744129.
3,981,848.—PHOTOCONDUCTIVE COMPOSITION AND IMAGING METHODS EMPLOYING SAME. SEPT. 21, 1976. ARG. 0206211, ATR. 0332734, FRA. 7422484.
4,043,812.—A PROCESS FOR PREPARATION OF 2-ANTHRYL & SUBSTITUTED 2-ANTHRYL FUNCTIONAL MONOMERS AND POLY. AUG. 23, 1977. BEL. 822305, FRA. 7527053, STZ. 32598.
4,089,684.—IMAGING METHOD UTILIZING THE CHEMICAL REACTIVITY OF DONOR-ACCEPTOR MIXTURES. MAY 16, 1978.
4,117,239.—PROCESS FOR PREPARATION OF 2-ANTHRYL AND SUBSTITUTED 2-ANTHRYL FUNCTIONAL MONOMERS & POLYMERS. SEPT. 26, 1978. BEL. 822305.

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3,408,181.—HEAT DEFORMABLE RECORDING MATERIALS CONTAINING PHOTOCONDUCTIVE RESINOUS CHARGE TRANSFER COMPLE. OCT. 29, 1968. CAN. 0843620, FRA. 1463744, GER. 1522677, GRB. 1138552, ITL. 0755286, MEX. 0109927.
3,432,415.—ELECTROPHORETIC IMG. PROCESS USING PHOTOSENSITIVE XANTHENONIUM SALTS. MAR. 11, 1969. AUS. 0439502, BEL. 0743895, CAN. 0851118, GER. 1522701, GRB. 1155747, JAP. 0650631, MEX. 0104632.
3,445,227.—ELECTROPHOTOGRAPHIC IMAGING PROCESSES EMPLOYING 2,4 DIAMINOTRIAZINES AS ELCTRCLY PHOTOSNSTV PRT. MAY 20, 1969. BEL. 0743891, CAN. 0852681, GER. 1522687, GRB. 1146019, JAP. 0617789.
3,447,922.—ELECTRICALLY PHOTOSENSITIVE PARTICLES USEFUL IN PHOTOELECTROPHORETIC AND XEROGRAPHIC IMAGING PROC. JUNE 3, 1969.
3,448,029.—ELECTROPHORETIC IMAGING PROCESS USING 8,13-DIOXODINAPTHO-2,1-B,2,3-D-FURAN-6-CARBOXAMIDE PIGMEN. JUNE 3, 1969.
3,448,030.—ELECTRICALLY PHOTOSENSITIVE PART. USEFUL IN PHOTOELECTROPHORETIC AND XEROGRAPHIC IMAGING PROCESSE. JUNE 3, 1969. BEL. 0743893, CAN. 0943830, GRB. 1155554, JAP. 0686735.
3,482,970.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS USING NAPHTHYLAZO COMPOUNDS AS THE PRIMARY PHOTOCONDUCTOR. DEC. 9, 1969. AUS. 0453397, BEL. 0742978, CAN. 0869486, GRB. 1296390, ITL. 0878843, JAP. 0725059.
3,553,009.—PROCESS OF PREPARING AN ELECTROPHOTOGRAPHIC MATERIAL. JAN. 5, 1971.
3,594,163.—METHOD OF CONVERTING ALPHA PHTHALOCYANINE TO THE X FORM. JULY 20, 1971.
3,640,710.—PHTHALOCYANINE PHOTOCONDUCTIVE ELEMENTS CONTAINING MULTIPLE BINDER MATERIALS. FEB. 8, 1972. ARG. 0184666, ATR. 0328861, AUS. 0456430, BEL. 0760751, CAN. 0933012, FRA. 7047636, GRB. 1333605, ITL. 0913999, PNM. 0002243, STZ. 0554550, SWD. 0365878, TIW. 0006738, USR. 0450420, VZL. 0032928.
3,667,943.—QUINACRIDONE PIGMENTS IN ELECTROPHOTOGRAPHIC IMAGING. JUNE 6, 1972. ARG. 0184823, AUS. 0452663, BEL. 0737810, CAN. 0877882, EGR. 0077411, FRA. 6928700, GRB. 1278702, ITL. 0888005, SPN. 0370720, STZ. 0519183, SWD. 0346396, TIW. 0005517, USR. 0351396.
3,667,944.—QUINACRIDONE PIGMENTS IN ELECTROPHOTOGRAPHIC RECORDING. JUNE 6, 1972. ARG. 0177369, AUS. 0452031, BEL. 0741159, CAN. 0884807, FRA. 6937223, GRB. 1286079, ITL. 0879710, JAP. 0693421, MEX. 0115407.
3,667,945.—QUINACRIDONE PIGMENTS IN ELECTROPHOTOGRAPHIC IMAGING. JUNE 6, 1972.
3,708,292.—PI-FORM METAL PHTHALOCYANINE. JAN. 2, 1973. ARG. 0194234, BEL. 0783793, GRB. 1396922, ITL. 0955644, MEX. 0128928.
3,708,293.—PI-FORM METAL-FREE PHTHALOCYANINE. JAN. 2, 1973. ARG. 0195167, BEL. 0783792, GRB. 1395769, ITL. 0955643, MEX. 0131970.
3,761,261.—PHTHALOCYANINE DYE SENSITIZERS FOR ZINC OXIDE. SEPT. 25, 1973.
3,816,118.—ELECTROPHOTOGRAPHIC ELEMENT CONTAINING PHTHALOCYANINE. JUNE 11, 1974. ARG. 0156316, CAN. 0890855, FRA. 0091579, GRB. 1175451, ITL. 0809972, MEX. 0115884, VZL. 0024012.
3,850,630.—XEROGRAPHIC PLATE CONTAINING PHOTOINJECTING INDIGOLD PIGMENTS. NOV. 26, 1974. ARG. 0188393, AUS. 0465971, BEL. 0763391, CAN. 0932198, CHL. 0027129, EGR. 0093923, FRA. 7107566, GRB. 1337221, ITL. 0919106, MEX. 0122099, NZL. 0162890, PNM. 0002480, SAF. 0711226, SPN. 0388591, TIW. 0006740, USR. 0463276.
3,865,798.—PHOTOACTIVE POLYMERS INDUCED EXOCYCLIC QUARTET CONCEPT. FEB. 11, 1975. AUS. 0462805, BEL. 0790689, FRA. 7237458, GRB. 1411998, ITL. 0969902, MEX. 0133728, SPN. 0407984, STZ. 0028515.
3,877,935.—NOVEL XEROGRAPHIC PLATE CONTAINING PHOTOINJECTING POLYNUCLEAR QUINONE PIGMENTS. APR. 15, 1975. ARG. 0002614, AUS. 0452620, BEL. 0763389, CAN. 0932197, CHL. 0027120, FRA. 7107563, GRB. 1337224, GUA. 0002614, ITL. 0919103, MEX. 0122100, NZL. 0162887, PNM. 0002467, SAF. 0711223, SPN. 0388588, TIW. 0006741.
3,884,689.—POLYCYCLIC AROMATIC POLYMER AS A PHOTO-CONDUCTOR OR OVERLAYER. MAY 20, 1975.
3,895,945.—PROCESS FOR PREPARATION OF A DYESTUFF SENSITIZED PHOTOCONDUCTIVE COMPOSITION. JULY 22, 1975.
3,899,328.—ACTIVE MATRIX AND INTRINSIC PHOTOCONDUCTIVE POLYMER OF A LINEAR POLYSILOXANE. AUG. 12, 1975.
3,899,329.—MIXTURE OF PHOTOCONDUCTORS IN AN ACTIVE MATRIX. AUG. 12, 1975. ARG. 0187047, ATR. 327000, AUS. 0450862, BEL. 0775968, CAN. 0971797, CHL. 0027272, FRA. 7143179, GRB. 1348188, GUA. 0002724, ITL. 0941822, MEX. 1328040, PNM. 0002602, SAF. 0718022, SPN. 397403, STZ. 0026771.
3,904,407.—XEROGRAPHIC PLATE CONTAINING PHOTOINJECTING PERYLENE PIGMENTS. SEPT. 9, 1975. ARG. 0189747, AUS. 0465811, BEL. 0763388, CAN. 0933010, CHL. 0026796, EGR. 0093458, FRA. 7107562, GRB. 1337225, GUA. 0002799, ITL. 0919102, MEX. 0126620, PNM. 0002468, SAF. 0711222, SPN. 0388587, SWD. 0362509, TIW. 0007210, USR. 0473381.
3,923,762.—PROCESS FOR PREPARATION OF 2-ANTHRYL AND SUBSTITUTED 2-ANTHRYL FUNCTIONAL MONOMERS AND P. DEC. 2, 1975. BEL. 0822305, STZ. 0032598.
3,927,026.—PROCESS OF MAKING X-FORM METAL PHTHALOCYANINE. DEC. 16, 1975. CAN. 0916703, GRB. 1312946, JAP. 0693981.
3,932,454.—PROCESS OF MAKING HEXAGONAL ALPHA METAL-FREE PHTHALOCYANINE. JAN. 13, 1976. CAN. 0918152, GRB. 1327084, JAP. 0752724.
3,941,085.—RELEASE MATERIAL APPLICATOR. MAR. 2, 1976.
3,941,750.—POLYVINYL PYREMAL-AN INTRINSIC PHOTOCONDUCTOR AND ACTIVE MATRIX POLYMER. MAR. 2, 1976.
3,951,654.—MTHD ENHNCMT RATE AND EFFICIENCY OF PHOTODSCHG OF ELCTRPHGRIC IMAGING MEMBERS COMPRSNG PHTHALOCYA. APR. 20, 1976.
4,006,017.—PHOTOCONDUCTIVE COMPOSITION ARTICLE & PROESS. FEB. 1, 1977.
4,031,109.—METHOD FOR THE PREPARATION OF X-FORM METAL PHTHALOCYANINE AND X-FORM METAL FREE COMPOUNDS. JUNE 21, 1977. ARG. 0188048.
4,046,563.—PHOTOCONDUCTIVE COMPOSITION CONTAINING A TRICYANOPYREME, ARTICLE AND PROCESS OF USE. SEPT. 6, 1977. FRA. 7509147.
4,050,934.—ELECTRON ACCEPTOR MONOMERS & POLYMERS. SEPT. 27, 1977.
4,056,391.—METHOD FOR ENHANCING SOLID SOLUTION STABILITY OF ELECTRON ACCEPTOR MOLECULES AND ELECTROPHO. NOV. 1, 1977.
4,072,519.—PHOTOCONDUCTIVE COMPOSITION, AND ELEMENT. FEB. 7, 1978. FRA. 7509146.
4,076,528.—XEROGRAPHIC BINDER PLATE. FEB. 28, 1978. AUS. 456887, BEL. 775967, CAN. 971796, CHL. 27271, FRA. 7143178, GRB. 1358269, ITL. 941821, MEX. 124712, PNM. 2599, SAF. 718023, SPN. 397402, STZ. 26772.

4,092,161.—INORGANIC PHOTOCONDUCTORS WITH PHENYL SUBSTITUTED IMAGE TRANSPORT MATERIALS. MAY 30, 1978. AUS. 462805, BEL 790689, CAN. 1007922, FRA. 7411475, GRB. 1462986, ITL. 969902, MEX. 133728, SPN. 407984, STZ. 28515, VZL. 33956.
4,098,795.—METHOD FOR THE PREPARATION OF X-FORM METAL FREE PHTHALOCYAMINE. JULY 4, 1978. ARG. 182328, BEL. 737989, CAN. 899870, FRA 6928871, GER. 1943381, GRB. 1280843, ITL. 870314, JAP. 654041, MEX. 116011.
4,122,114.—1-TRICYANOINYLPYRENE. OCT. 24, 1978
4,153,802.—ELECTRON ACCEPTOR MONOMERS AND POLYMERS MAY 8, 1979. FRA. 7626102
4,161,490.—ELECTRON ACCEPTOR MONOMERS. JULY 17, 1979. FRA. 7626102.

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3,408,182.—ELECTROPHOTOGRAPHIC MATERIALS AND METHODS EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRANSFER COMP. OCT. 29, 1968. CAN. 0847805, FRA. 1463743, GRB. 1137665, ITL. 0755290, JAP. 0572185, MEX. 0107318.
3,408,183.—ELECTROPHOTOGRAPHIC MATERIALS AND METHODS EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRANSFER COMP. OCT. 29, 1968. CAN. 0819066, FRA. 1463745, GER. 1522676, GRB. 1126048, ITL. 0755287, JAP. 0727091, MEX. 0106758.
3,408,184.—ELECTROPHOTOGRAPHIC MATERIALS AND METHODS EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRNSFR COMPLE. OCT. 29, 1968 CAN. 0818382, FRA. 1463727, GRB. 1137664, ITL. 0755289, JAP. 0726382, MEX. 0105835
3,408,185.—ELECTROPHOTOGRAPHIC MATERIALS AND METHOD EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRANSFER COMP. OCT. 29, 1968. CAN. 0848383, FRA. 1463728, GER. 1645192, GRB. 1137476, ITL. 0755291, MEX. 0106763.
3,408,186.—ELECTROPHOTOGRAPHIC MATERIALS AND METHODS EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRNSFR COMPLE. OCT. 29, 1968. CAN. 0846736, FRA. 1463746, GRB. 1138629, ITL. 0755288, JAP. 0569483, MEX. 0106589.
3,408,187.—ELECTROPHOTOGRAPHIC MATER AND METH EMPLOYING PHOTOCONDUCTIVE RESINOUS CHARGE TRANSFER COMPLEXES. OCT 29, 1968. CAN. 0867298, GER. 1522721, GRB. 1163097, JAP. 0797719.
3,408,188.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS COMPRISING PHOTOCONDUCTIVE CHARGE TRANSFER COMPLEXES. OCT. 29, 1968. CAN. 0869485, GRB. 1183516, JAP. 0797720.
3,408,189.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS EMPLOYING PHOTOCONDUCTIVE CHARGE TRANSFER COMPLEXES. OCT. 29, 1968.
3,408,190.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS EMPLOYING PHOTOCONDUCTIVE CHARGE TRANSFER COMPLEXES. OCT. 29, 1968. CAN. 0850019, GER. 1302772, GRB. 1182172.
3,879,201.—PERSISTENT PHOTOCONDUCTIVE COMPOSITIONS. APR. 22, 1975.
3,896,184.—POLYMERS OF BENZANTHRACENE AS ACTIVE MATRIX MATERIALS. JULY 22, 1975.
3,923,762.—PROCESS FOR PREPARATION OF 2-ANTHRYL AND SUBSTITUTED 2-ANTHRYL FUNCTIONAL MONOMERS AND P. DEC. 2, 1975. BEL. 0822305, STZ. 0032598.
4,033,769.—PERSISTENT PHOTOCONDUCTIVE COMPOSITIONS. JULY 5, 1977.
4,069,046.—POLYMERIZED VINYL CARBAZOLES SENSITIZED BY NITRO-SUGSTITUTED 9-DICYANOMETHYLENE FLUORENES. JAN. 17, 1978.

Class 2A 2C

4,019,902.—PHOTORECEPTOR FABRICATION. APR. 26, 1977.

Class 2A2E

4,099,969.—COATING METHOD TO IMPROVE ADHESION OF PHOTOCONDUCTORS. JULY 11, 1978.

Class 2B

3,617,265.—METHOD FOR PREPARING A RESIN OVERCOATED ELECTROPHOTOGRAPHIC PLATE. NOV. 2, 1971.
3,635,705.—MULTI-LAYERED HALOGEN-DOPED SELENIUM PHOTOCONDUCTIVE ELEMENT. JAN. 18, 1972. GRB. 1311329, ITL. 0901916, JAP. 0739531.
3,639,120.—2-LAYERED PHOTOCONDUCTIVE ELEMNT CONTNG A HALOGEN DOPED STORG LAYER AND SELENIUM ALLOY CNTRL LAYER. FEB. 1, 1972. CAN. 0870535, GRB. 1193876, JAP. 0558440.
3,655,377.—TRI-LAYERED SELENIUM DOPED PHOTORECEPTOR. APR. 11, 1972.
3,712,810.—AMBIPOLAR PHOTORECEPTOR AND METHOD. JAN. 23, 1973. CAN. 0971025, GRB. 1363266
3,843,407.—BLADE CLEANING WITH REVERSE MOVEMENT. OCT. 22, 1974.
3,848,994.—LINE CHARGE TONER CLEANING. NOV. 19, 1974.
3,928,034.—ELECTRON TRANSPORT LAYER OVER AN INORGANIC PHOTOCONDUCTIVE LAYER. DEC. 23, 1975. AUS. 0453265, BEL. 0763542, CAN. 0932199, CHL. 0026802, EGR. 0093924, FRA. 7107560, GRB. 1337227, GUA. 0002423, ITL. 0919109, MEX. 0121682, NZL. 0162884, PNM. 0002473, SAF. 0711220, SPN 0388585, STZ. 0576659, SWD. 0363176, TIW 00 07181.
3,953,207.—A COMPOSITE LAYERED PHOTORECEPTOR. APR 27, 1976
4,007,043.—PHOTOCONDUCTIVE ELEMENTS WITH COPOLYMER CHARGE TRANSPORT LAYERS. FEB. 8, 1977.
4,007,100.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. FEB. 8, 1977.
4,007,101.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. FEB. 8, 1977.
4,012,251.—MULTI-LAYERED PHOTOCONDUCTIVE MEMBER. MAR. 15, 1977
4,013,528.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATRIALS. MAR. 22, 1977.
4,013,529.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. MAR. 22, 1977.
4,013,530.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. MAR. 22, 1977.
4,013,623.—INTRACHAIN CHARGE TRANSFER COMPLEXES. MAR. 22, 1977
4,014,768.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. MAR. 29, 1977.
4,016,058.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. APR. 5, 1977.
4,018,602.—METHOD FOR IN-SITU FABRICATION OF PHOTOCONDUCTIVE COMPOSITE. APR. 19, 1977.
4,022,956.—POLYMERS OF BENZANTHRACENE AS ACTIVE MATRIX MATERIALS. MAY 10, 1977.
4,023,969.—DEFORMABLE ELASTOMER IMAGING MEMBER EMPLOYING AN INTERNAL OPAQUE DEFORMABLE METALLIC LAYER. MAY 17, 1977
4,025,710.—INTRACHAIN CHARGE TRANSFER COMPLEXES. MAY 24, 1977.
4,028,203.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. JUNE 7, 1977.
4,030,991.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. JUNE 21, 1977.
4,030,992.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. JUNE 21, 1977.
4,030,993.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. JUNE 21, 1977.
4,046,564.—ELECTROPHOTOGRAPHIC IMAGING MEMBERS WITH PHOTOCONDUCTIVE LAYER CONTAINING ELECTRON ACCEPTOR. SEPT. 6, 1977.
4,047,948.—COMPOSITE LAYERED IMAGING MEMBER FOR ELECTROPHOTOGRAPHY. SEPT. 13, 1977.
4,047,949.—COMPOSITE LAYERED IMAGING MEMBER FOR ELECTROPHOTOGRAPHY. SEPT. 13, 1977.
4,049,449.—METHOD FOR FORMING AN ELECTROPHOTOGRAPH IC MEMBER. SEPT. 20, 1977.
4,050,935.—TRIGONAL SE LAYER OVERCOATED BY BIS(4-DIETHYLAMINO-2-METHYLPHENYL) PHENYLMETANE CONTAINING. SEPT. 27, 1977. FRA. 7709994.
4,052,205.—PHOTOCONDUCTIVE IMAGING MEMBER WITH STUBSTITUTED ANTHRACENE PLASTICIZER. OCT. 4, 1977.

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4,053,311.—POLY-L-VINYL CARBAZOLE IMAGE TRANSPORT LAYER PLASTICIZED OF BIS-(4-DIETHYLAMINO-2-METHYLPHE. OCT. 11, 1977.
4,062,886.—FLUORENONE CARBOXYLE ACID ESTERS. DEC. 13, 1977. FRA. 7621895
4,063,947.—PHOTOCONDUCTIVE INSULATING FILMS COMPRISING FLUORENONE-SUBSTITUTED OLIGOMERS. DEC. 20, 1977.
4,075,012.—INTRACHAIN CHARGE TRANSFER COMPLEXES USE IN ELECTROPHOTOGRAPHIC IMAGING. FEB. 21, 1977.
4,078,925.—A COMPOSITE LAYERED PHOTORECEPTOR. MAR. 14, 1978.
4,081,274.—COMPOSITE LAYERED PHOTORECEPTOR. MAR. 28, 1978.
4,098,984.—ELECTRON ACCEPTOR POLYMERS. JULY 4, 1978.
4,115,116.—IMAGING MEMBER HAVING A POLYCARBONATE-BIPHENYL DIAMINE CHARGE TRANSPORT LAYER. SEPT. 19, 1978.
4,116,691.—ELECTROPHOTOGRAPHIC IMAGING MEMBER OF MONOMERS HAVING PENDANT ELECTRON ACCEPTOR GROUPS. SEPT. 26, 1978.
4,117,072.—PROCESS FOR ENHANCEMENT OF MECHANICAL PROPERTIES OF PHOTOCONDUCTIVE POLYMERS. SEPT. 26, 1978. FRA. 7531736. GRB 1469371.
4,122,113.—9-FLUORENYL ACRYLATES. OCT. 24, 1978.
4,129,581.—MONOMERS HAVING PENDANT ELECTRON ACCEPTOR GROUPS-PROCESS FOR PREPARATION AND USE. DEC. 12, 1978.
4,140,529.—CHARGE TRANSPORT OVERLAYER IN PHOTOCONDUCTIVE ELEMENT AND METHOD OF USE. FEB. 20, 1979.
4,143,225.—HOMOPOLYMERS OF A FLUORENONE DERIVATIVE HAVING PENDANT ELECTRON ACCEPTOR GROUPS. MAR. 6, 1979.

Class 2B 1

3,243,293.—PLATE FOR ELECTROSTATIC ELECTROPHOTOGRAPHY. MAR. 29, 1966. CAN. 0830430.
3,288,602.—XEROGRAPHIC PLATE AND METHOD. NOV. 29, 1966. CAN. 0795978, GER. 1237902, GRB. 1029181, ITL. 0690835, JAP. 0578399.
3,312,547.—XEROGRAPHIC PLATE AND PROCESSES OF MAKING AND USING SAME. APR. 4, 1967.
3,341,326.—DARK DECAY CONTROLLED XEROGRAPHY. SEPT. 12, 1967. AUS. 0285843, CAN. 0729829, FRA. 1377592, GRB. 1029199, ITL. 0706101.
3,352,669.—PHOTOCONDUCTIVE MEMBER AND PROCESSES OF PREPARING AND USING SAME. NOV. 14, 1967. AUS. 0405164, CAN. 0834670, FRA. 1422625, GER. 1497194, GRB. 1052970, HOL. 0137891, ITL. 0749420, JAP. 0501912.
3,393,070.—XEROGRAPHIC PLATE WITH ELECTRIC FIELD REGULATING LAYER. JULY 16, 1968. CAN. 0871308, GER. 1490987, GRB. 1141452, JAP. 0764435, MEX. 0105660.
3,508,918.—XEROGRAPHIC PLATE CONTAINING ALUMINUM SELENIDE BARRIER LAYER. APR. 28, 1970. CAN. 0872175.
3,539,255.—XEROGRAPHIC RECORDING APPARATUS - LIGHT-CONTROLLED-CHARGE STORAGE LAYER. NOV. 10, 1970.
3,573,906.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS. APR. 6, 1971. ARG. 0177890, AUS. 0441534, BEL. 0725173, BRA. 0088092, CAN. 0906801, CZC. 0157053, FRA. 1594981, GRB. 1217726, ITL. 0852743, SPN. 0379204, SWD. 0335063, USR. 0448658, VZL. 0029780.
3,619,153.—PHOTOCONDUCTIVE ELMNT AND PROCESS EMPLYNG SBSTUTD SILYLISOBUTYLETHYLENEDIAMINE ADHESIVE INTERLAYE. NOV. 9, 1971. ARG. 0180118, ATR. 0305764, AUS. 0434739, BEL. 0733402, BUL. 0017353, CAN. 0898034, DNK. 0131833, EGR. 0078900, FRA. 6917079, GRB. 1229559, GRK. 0040058, IND. 0121424, ISR. 0032250, ITL. 0864983, JAP. 0702563, LXB. 0058678, MEX. 0109385, NOR. 0125557, NZL. 0156506, PAK. 0121226, PLP. 0008481, PNM. 0001683, PTG. 0051754, RHD. 2236953, RMN. 0054256, SAF. 0693687, SPN. 0367618, STZ. 0511461, SWD. 0341926, TIW. 0006442, TRK. 0015647, USR. 0300036, VTM. 0001865.
3,713,821.—PHOTORECEPTOR INTERFACE. JAN. 30, 1973. ARG. 0194731, ATR. 0322357, AUS. 0464711, BEL. 0784453, CAN. 0964916, EGR. 0099870, FRA. 7220691, GRB. 1393612, ISR. 0039655, ITL. 0959793, SAF. 0723958, SPN. 0403454, STZ. 0554007, SWD. 0367491, VZL. 0032939.
3,720,514.—ELECTROPHOTOGRAPHIC PAPER HAVING AN IMONGANIC COLLOIDAL OXIDE COATING. MAR. 13, 1973.
3,738,831.—CHALCOGEN ORGANIC COMPOUNDS USED IN ELECTROPHOTOGRAPHIC PLATES AND PROCESS. JUNE 12, 1973.
3,758,301.—ELECTROPHOTOGRAPHIC USE OF SELENIUM CONTAINING POLYMERS. SEPT. 11, 1973.
3,795,513.—METHOD OF STORING AN ELECTROSTATIC IMAGE IN A MULTILAYERED PHOTORECEPTOR. MAR. 5, 1974. BEL. 0788303, CAN. 976018, FRA. 7230831, GRB. 1388934, ITL. 0964410, SWD. 7211341.
3,799,775.—XEROGRAPHIC SYSTEM. MAR. 26, 1974. ARG. 0172053, ATR. 0300559, AUS. 0423123, BEL. 0720940, BRA. 6800650, BUR. 0000043, CAM. 00043/3, CAN. 0895805, CHL. 0024257, EIR. 0032903, FRA. 1586238, GNR. 0000039, GRB. 1243384, GRK. 0039223, IND. 0119625, ISR. 0031543, ITL. 0844307, LEB. 0002816, LIB. P102693, LXB. 0056890, MEX. 0105163, MLG. 0003058, MLW. 00MW569, MNC. 8126975, MRC. 0014727, NOR. 0128132, NZL. 0153781, PAK. 0120895, PLP. 0009065, PNM. 0002053, PTG. 0050322, RHD. 5369487, SAF. 0681107, SPN. 0358355, STZ. 0506102, SWD. 0345530, TGR. 0000547, URG. 0009361, VTM. 0001830, VZL. 0023696, ZMB. 0156971.
3,816,288.—GLOW DISCHARGE TECHNIQUE FOR THE PREPARATION OF ELECTROPHOTOGRAPHIC PLATES. JUNE 11, 1974.
3,888,667.—HETROPHASE ADHESIVE COMPOSITIONS CONTAINING POLYSULFONE FOR METAL-SELENIUM COMPOSITIES. JUNE 10, 1975.
3,891,435.—HETEROPHASE ADHESIVE COMPOSITIONS CONTAINING CHLOROSULFONATED POLYETHLENE FOR METAL-SELENIUM CO. JUNE 24, 1975.
3,895,131.—ELECTROLESS COATING METHOD. JULY 15, 1975.
3,907,650.—PHOTOSENSITIVE BINDER LAYER FOR XEROGRAPHY. SEPT. 23, 1975.
3,914,126.—NICKEL OXIDE INTERLAYERS FOR PHOTOCONDUCTIVE ELEMENTS. OCT. 21, 1975.
3,958,207.—INJECTION CURRENT DEVICE AND METHOD. MAY 18, 1976.
4,011,078.—PHOTOSENSITIVE MEMBER AND METHOD OF IMAGING. MAR. 8, 1977.
4,106,935.—XEROGRAPHIC PLATE HAVING AN PHTHALOCYANINE PIGMENT INTERFACE BARRIER LAYER. AUG. 15, 1978.

Class 2B 2

3,092,493.—PROTECTED XEROGRAPHIC PLATE. JUNE 4, 1963.
3,146,145.—PROCESS FOR ADHERING PLASTIC TO VITREOUS SELENIUM. AUG. 25, 1964.
3,256,089.—MASKED PLATE XEROGRAPHY. JUNE 14, 1966.
3,397,982.—XIC PLATE W/INORGANIC GLASS BINDER HAVING OVERCOATING CONSISTING ESSENTIALLY OF ALUMINUM OXIDE. AUG. 20, 1968. ARG. 0150690, AUS. 0407349, BEL. 0674140, CAN. 0866142, FRA. 1460232, GER. 1497230, GRB. 1129674, ITL. 0822914, JAP. 0531894, MEX. 0085270, SWD. 0319976.
3,434,832.—XEROGRAPHIC PLATE COMPRISING A PROTECTIVE COATING OF A RESIN MIXED WITH A METALLIC STEARATE. MAR. 25, 1969. CAN. 0835883, FRA. 1454672, GER. 1497223, GRB. 1128156, ITL. 0772535, JAP. 0545757, MEX. 0085603.
3,488,189.—ELECTROPHOTOGRAPHIC RECORDING MEMBER HAVING SOLID CRYSTALLINE PLASTICIZR AVAILBL AT IMGNG SURFA. JAN. 6, 1970. CAN. 0866700, FRA. 1506810, GRB. 1183205, ITL. 0788976, JAP. 0570734, MEX. 0108241.
3,720,514.—ELECTROPHOTOGRAPHIC PAPER HAVING AN IMONGANIC COLLOIDAL OXIDE COATING. MAR. 13, 1973.
3,738,831.—CHALCOGEN ORGANIC COMPOUNDS USED IN ELECTROPHOTOGRAPHIC PLATES AND PROCESS. JUNE 12, 1973.
3,758,301.—ELECTROPHOTOGRAPHIC USE OF SELENIUM CONTAINING POLYMERS. SEPT. 11, 1973.
3,837,849.—MULTILAYERED VARIABLE SPEED PHOTORECEPTOR AND METHOD OF USING SAME. SEPT. 24, 1974. BEL. 0788302, CAN. 0978007, FRA. 7230830, GRB. 1401040, ITL. 0964409, SWD. 7211342.
3,850,630.—XEROGRAPHIC PLATE CONTAINING PHOTOINJECTING INDIGOLD PIGMENTS. NOV. 26, 1974. ARG. 0188393, AUS. 0465971, BEL. 0763391, CAN. 0932198, CHL. 0027129, EGR. 0093923, FRA. 7107566, GRB. 1337221, ITL. 0919106, MEX. 0122099, NZL. 0162890, PNM. 0002480, SAF. 0711226, SPN. 0388591, TIW. 0006740, USR. 0463276.

3,856,548.—STRIPPABLE OVERCOATING FOR IMPROVED XEROGRAPHIC PLATES. DEC. 24, 1974. GRB. 1426030.
3,860,421.—N-ALKYL MORPHOLINE TREATMENT OF A SELENIUM-CONTAINING PHOTOCONDUCTIVE LAYER. JAN. 14, 1975.
3,868,983.—HAND TOOL. MAR. 4, 1975
3,877,935.—NOVEL XEROGRAPHIC PLATE CONTAINING PHOTOINJECTING POLYNUCLEAR QUINONE PIGMENTS. APR. 15, 1975. ARG. 0002614, AUS. 0452620, BEL. 0763389, CAN. 0932197, CHL. 0027120, FRA. 7107563, GRB. 1337224, GUA. 0002614, ITL. 0919103, MEX. 0122100, NZL. 0162887, PNM. 0002467, SAF. 0711223, SPN. 0388588, TIW. 0006741.
3,884,690.—POLYESTER PHOTOCONDUCTORS AND MATRIX MATERIALS. MAY 20, 1975.
3,884,825.—IMAGING COMPOSITION MAY 20, 1975. AUS 0467835, BEL. 0802879, CAN. 0995963, FRA. 7328589, GRB. 1437041, ITL. 0991465, SPN. 0417382.
3,896,184.—POLYMERS OF BENZANTHRACENE AS ACTIVE MATRIX MATERIALS. JULY 22, 1975.
3,900,589.—AN ELECTROSTATOGRAPHIC IMAGING PROCESS. AUG. 19, 1975. AUS. 0467835, BEL. 0802879, GRB. 1437041.
3,904,407.—XEROGRAPHIC PLATE CONTAINING PHOTOINJECTING PERYLENE PIGMENTS. SEPT. 9, 1975. ARG. 0189747, AUS. 0465811, BEL. 0763388, CAN. 0933010, CHL. 0026796, EGR. 0093458, FRA. 7107562, GRB. 1337225, GUA. 0002799, ITL. 0919102, MEX. 0126620, PNM. 0002468, SAF. 0711222, SPN. 0388587, SWD. 0362509, TIW. 0007210, USR. 0473381.
3,912,511.—MULTICOMPONENT ORGANIC COATING OF POLYESTER POLYURETHAND AND HUMIDITY. OCT. 14, 1975. ARG. 0182692, BEL. 0767325, CAN. 0938143, FRA. 7118948, GRB. 1350476, ITL. 0926822, MEX 0121668.
3,954,464.—METHOD OF FABRICATING A COMPOSITE TRIGONAL SELENIUM PHOTORECEPTOR. MAY 4, 1976.
3,961,953.—METHOD OF FABRICATING COMPOSITES TRIGONAL SELENIUM PHOTORECEPTORS. JUNE 8, 1976.
3,973,843.—ELECTROSTATOGRAPHIC IMAGING APPARATUS. AUG. 10, 1976. AUS. 0467835, BEL. 0802879, GRB. 1437041.
4,006,019.—METHOD FOR PREPARATION OF AN ELECTROSTATOGRAPHIC PHOTORECEPTOR. FEB. 1, 1977.
4,006,020.—OVERCOATED ELECTROSTATOGRAPHIC PHOTORECEPTOR. FEB. 1, 1977.
4,012,255.—OVERCOATED ELECTROSTATOGRAPHIC PHOTORECEPTOR. MAR. 15, 1977.
4,022,956.—POLYMERS OF BENZANTHRACENE AS ACTIVE MATRIX MATERIALS. MAY 10, 1977.
4,064,514.—PORTABLE CAMERA. DEC. 20, 1977.
4,072,521.—AMIDES OF W AND CIS ALKENOIC ACIDS IN IMAGING PROCESS AND ELEMENT. FEB. 7, 1978.
4,073,649.—DI CARBOXYLIC ACID BIS AMIDES AND IMPROVED IMAGING PROCESS. FEB. 14, 1978.
4,076,641.—W- AND CIS ALKENOIC ACID AMIDES IN ELECTROSTATOGRAPHIC DEVELOPERS. FEB. 28, 1978.
4,099,968.—DICARBOXYLIC ACID BIS-AMIDES IN ELECTROSTATIC IMAGING COMPOSITIONS AND PROCESSES. JULY 11, 1978.
4,123,269.—ELECTROSTATOGRAPHIC PHOTOSENSITIVE DEVICE COMPRISING HOLE INJECTING AND HOLE TRANSPORT LAYER. OCT. 31, 1978.
4,126,455.—ELECTROSTATOGRAPHIC IMAGING PROCESS AND RELATED APPARATUS. NOV. 21, 1978. AUS. 467835. BEL. 802879. CAN. 995963. FRA. 7328588. GRB. 1437041. ITL. 991465. SPN. 417382. USR. 637099.
4,147,541.—ELECTROSTATIC IMAGING MEMBER WITH ACID LUBRICANT. APR. 3, 1979. AUS. 467835. BEL. 802879. CAN. 995963. FRA. 7328588. GRB. 1437041. ITL. 991465. SPN. 417382. USR. 637099.

Class 2B 3

3,510,660.—METHOD FOR VISUAL COMPARISON OF INFORMATION. MAY 5, 1970. CAN. 0848611, GRB. 1201376, JAP. 0595641.
3,543,031.—DEVICE AND PROCESS FOR IMAGE STORAGE. NOV. 24, 1970. ARG. 0161299, AUS. 0432468, BEL. 0703461, CAN. 0862332, FRA. 1543309, GER. 1549142, GRB. 1201374, ITL. 0811521, JAP. 0742514, MEX. 0100142, SPN. 0344004, STZ. 0497022, SWD. 0354169, VZL. 0023663.

Class 2B 4

3,428,453.—IMAGE FORMING PROCESS UTILIZING XEROGRAPHY-ETCHING PROCESS. FEB. 18, 1969. CAN. 0856722, FRA. 1428775, GRB. 1085151, ITL. 0754825.
3,446,616.—XEROGRAPHIC IMAGING EMPLOYING A SELECTIVELY REMOVABLE LAYER. MAY 27, 1969.
3,926,626.—CIRCULATION IMAGING METHOD. DEC. 16, 1975.
4,007,372.—IMPROVED METHOD & ARTICLE FOR IMAGE REPRODUCTION. FEB. 8, 1977.
4,011,078.—PHOTOSENSITIVE MEMBER AND METHOD OF IMAGING. MAR. 8, 1977.

Class 2C

3,307,941.—PLASTIC DEFORMATION IMAGING FILM AND PROCESS. MAR. 7, 1967. CAN. 0801262.
3,317,316.—INTERNAL FROST RECORDING. MAY 2, 1967. ATR. 0272830, AUS. 0292886, BEL. 0648043, CAN. 0882890, FRA. 1399017, GER. 1243018, GRB. 1069741, ITL. 0725002, JAP. 0521009, LXB. 0046101, NOR. 0122729, STZ. 0469292, SWD. 0319083.
3,408,181.—HEAT DEFORMABLE RECORDING MATERIALS CONTAINING PHOTOCONDUCTIVE RESINOUS CHARGE TRANSFER COMPLE. OCT. 29, 1968. CAN. 0843620, FRA. 1463744, GER. 1522677, GRB. 1138552, ITL. 0755286, MEX. 0109927.
3,443,937.—IMAGE RESOLUTION. MAY 13, 1969. CAN 0824316, GRB. 1137766, JAP. 0544235.
3,443,938.—FROST IMAGING EMPLOYING A DEFORMABLE ELECTRODE. MAY 13, 1969. CAN. 0801263, FRA. 1441806, GRB. 1073097, JAP. 0573732.
3,526,879.—INTERNAL FROST RECORDING APPARATUS USING A DEFORMABLE PHOTOCONDUCTOR. SEPT. 1, 1970.
3,672,883.—CRYSTALLINE POLYMERS FOR FROST. JUNE 27, 1972.
3,672,886.—NOVOLAR RESINS IN DEFORMATION IMAGING. JUNE 27, 1972.
3,707,391.—IMAGING PROCESS. DEC. 26, 1972.
3,873,197.—APPARATUS FOR REGULATING THE TONER CONCENTRATION IN A ELECTROPHOTOGRAPHIC DEVICE. MAR. 25, 1975.
3,892,567.—ELECTROSTATICALLY DEFORMABLE MATERIALS. JULY 1, 1975. ARG. 0196065, BEL. 0781973, CAN. 9814520, FRA. 7213876, GRB. 1394286, ITL. 0951328, MEX. 0124825.
3,944,358.—COLOR IMAGE REPRODUCTION SYSTEMS. MAR. 16, 1976.
3,951,533.—COLOR IMAGE REPRODUCTION SYSTEM. APR. 20, 1976.
3,980,476.—IMAGING SYSTEM. SEPT. 14, 1976.
3,997,243.—COLOR IMAGE REPRODUCTION SYSTEM. DEC. 14, 1976.
4,023,969.—DEFORMABLE ELASTOMER IMAGING MEMBER EMPLOYING AN INTERNAL OPAQUE DEFORMABLE METALLIC LAYER. MAY 17, 1977.
4,054,381.—TONER FILTER ARRANGEMENT. OCT. 18, 1977.
4,065,031.—PROGRAMMABLE DEVELOPMENT CONTROL SYSTEM. DEC. 27, 1977.
4,093,369.—CLEANING SYSTEM. JUNE 6, 1978.

Class 2D

3,411,903.—XEROGRAPHIC METHOD AND PLATE COMPRISING PHOTOCONDUCTIVE INSULATING FIBERS. NOV. 19, 1968. ARG. 0149620, ATR. 0270379, AUS. 0410718, BEL 0672668, BRA. 0084119, CAN. 0834669, CHL. 0023648, CLB. 0014943, DNK. 0120577, EGR. 0055545, FRA. 1464792, GER. 1497224, GRB. 1084024, GRK. 0031509, IND. 0102560, ISR. 0024632, ITL. 0734376, JAP. 0724233, LXB. 0049849, MEX. 0098487, NOR. 0122817, NZL. 0143432, PLD. 0067959, PLP. 0004547, PNM. 0001533, PRU. 0008384, PTG. 0044879, SAF. 0656280, SPN. 0319795, STZ. 0458076, SWD. 0308250, THL. 1084024, TIW. 0003735, URG. 0006624, VZL. 0023996.
3,787,235.—METHOD OF ELECTROPHOTOGRAPHIC SENSITIVE PAPER. JAN. 22, 1974.
3,951,658.—COLOR MODIFYING IMAGING METHOD AND ARTICLE. APR. 20, 1976.
4,045,413.—POSSIBLE ACTIVE MATRIX POLYMERS. AUG. 30, 1977. FRA. 7432710.
4,130,274.—PNEUMATIC REGISTRATION APPARATUS. DEC. 19, 1978. BEL. 847912. SAF. 6401.

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Class 2E

3,341,681.—XEROGRAPHIC PLATE FABRICATION. SEPT. 12, 1967. CAN. 078 0598, FRA. 1415795, GRB. 1070555, HOL. 0144068, IND. 0094992, ITL. 0738063.

3,350,203.—XEROGRAPHIC PLATE. OCT. 31, 1967. CAN. 0715017, FRA. 1421950, GER. 1270400, GRB. 1085989, ITL. 0750417, JAP. 0511420.

3,447,957.—METHOD OF MAKING A SMOOTH SURFACED ADHESIVE BINDER XEROGRAPHIC PLATE. JUNE 3, 1969. CAN. 0788947.

3,468,705.—METHOD OF PREPARING LEAD OXIDE FILMS. SEPT. 23, 1969. CAN. 0806134, FRA. 1501511, GER. 1521942, GRB. 1170428, ITL. 0787638, JAP. 0634868, MEX. 0093335.

3,472,679.—COATING SURFACES. OCT. 14, 1969. CAN. 0896992.

3,536,397.—XEROGRAPHIC APPARATUS. OCT. 27, 1970. CAN. 0917231.

3,536,481.—ELECTROLYTIC PROCESS OF FORMING A XEROGRAPHIC BELT. OCT. 27, 1970. ARG. 0175659, AUS. 0416583, BEL. 0716410, CAN. 0865080, FRA. 1572605, GRB. 1200670, ITL. 0859021, MEX. 0103043, SWD. 0345698.

3,536,485.—XEROGRAPHIC PLATE SUPPORTED BY A MANDREL. OCT. 27, 1970.

3,578,445.—XEROGRAPHIC PLATE FABRICATION. MAY 11, 1971.

3,634,134.—METHOD OF MAKING A PHOTOCONDUCTIVE COMPOSITION AND DEVICE. JAN. 11, 1972. ARG. 0184074, ATR. 0307226, AUS. 449514, BEL. 0752440, CAN. 0904111, EGR. 0083703, FRA. 7023473, GRB. 1319342, ITL. 0894622, MEX. 0117839, PNM. 0002547, SPN. 0381111, STZ. 0548624, SWD. 0351734, TIW. 0007153.

3,695,757.—XEROGRAPHIC PLATE. OCT. 3, 1972.

3,746,571.—METHOD OF VACUUM EVAPORATION. JULY 17, 1973.

3,752,691.—METHOD OF VACUUM EVAPORATION. AUG. 14, 1973.

3,756,811.—ELECTROPHOTOGRAPHIC PROCESS EMPLOYING PHOTOCONDUCTIVE MATERIALS OF DIFFERENT DYNAMIC RANGES. SEPT. 4, 1973. CAN. 0894715, GRB. 1226578.

3,787,208.—XEROGRAPHIC IMAGE MEMBER HAVING PHOTOCONDUCTIVE MATERIAL IN INTERLOCKING CONTINUOUS PATHS. JAN. 22, 1974. ARG. 0186443, ATR. 0451252, BEL. 0763544, CAN. 0925741, CHL. 0026794, FRA. 7107567, GRB. 1296291, ITL. 0918909, MEX. 0122096, NZL. 0162891, PLP. 0009378, PNM. 0002396, SAF. 0711227, SPN. 0388639, STZ. 0568591, SWD. 0367259, TIW. 0007844, USR. 0398062.

3,788,889.—METHOD OF PREPARING BINDER LAYERS. JAN. 29, 1974.

3,837,906.—METHOD OF MAKING A XEROGRAPHIC BINDER LAYER AND LAYER SO PREPARED. SEPT. 24, 1974. ARG. 0186444, ATR. 0319750, AUS. 0448147, BEL. 0763392, CAN. 0939204, CHL. 0027098, FRA. 7107568, GRB. 1292425, ITL. 0918910, NZL. 0162892, PNM. 0002439, SAF. 0711228, SPN. 0388640, STZ. 0558554, SWD. 0036479, TIW. 0007713.

3,856,548.—STRIPPABLE OVERCOATING FOR IMPROVED XEROGRAPHIC PLATES. DEC. 24, 1974. GRB. 1426030.

3,894,868.—ELECTRON TRANSPORT BINDER STRUCTURE. JULY 15, 1975. AUS. 0461951, BEL. 0763543, CAN. 0932196, CHL. 0026795, EGR. 0096346, FRA. 7107561, GRB. 1337226, GUA. 0002467, ITL. 0919110, MEX. 0120807, NZL. 0162885, PNM. 0002481, SAF. 0711221, SPN. 0388586, TIW. 0007182, USR. 0444380.

3,911,091.—MILLING TRIGONAL SELENIUM PARTICLES TO IMPROVED XEROGRAPHIC PERFORMANCE. OCT. 7, 1975.

3,911,162.—SYSTEM FOR VAPOR DEPOSITION OF THIN FILMS. OCT. 7, 1975. BEL 0798324.

3,926,762.—R F SPUTTERING OF TRIGONAL SELENIUM FILM. DEC. 16, 1975.

3,944,682.—METHOD OF PROVIDING AN ELECTROPHOTOGRAPHIC COATING AND COMPOSITIONS FOR METHOD. MAR. 16, 1976.

3,945,723.—RESILIENT ROLLERS. MAR. 23, 1976. ARG. 0205448.

3,954,466.—ELECTROSTATOGRAPHIC PHOTORECEPTOR. MAY 4, 1976.

3,979,495.—METHOD OF MAKING A PHOTORECPTOR. SEPT. 7, 1976.

3,984,183.—SHEET STRIPPING FROM IMAGING SURFACE. OCT. 5, 1976. BEL. 0836791.

3,992,091.—ROUGHENED IMAGING SURFACE FOR CLEANING. NOV. 16, 1976.

4,014,697.—ELECTROSTATOGRAPHIC IMAGING MEMBER. MAR. 29, 1977.

4,014,728.—METHOD OF MAKING AN IMAGING MEMBER. MAR. 29, 1977.

4,015,985.—COMPOSITE XEROGRAPHIC PHOTORECPTOR WITH INJECTING CONTACT LAYER. APRIL 5, 1977. BEL. 0840221.

4,016,310.—COATR HRDWR AND METH FOR OBTNG UNFRM PHROCNDTV LAYR ON A XEROGRAPHIC PHOTORECEPTOR. APR. 5, 1977.

4,023,523.—COATING HARDWARE AND METHOD FOR OBTAINING UNIFORM PHOTOCONDUCTIVE LAYERS ON A XEROGRAPHIC PHOTO. MAY 17, 1977.

4,025,188.—PHOTOACTIVE DEVICE FOR XEROGRAPHY. MAY 24, 1977.

4,033,768.—METHOD FOR THE PREPARATION OF AN ELECTROSTATOGRAPHIC PHOTOSENSITIVE DEVICE. JULY 5, 1977.

4,047,973.—RECOVERY OF SELENIUM AND SELENIUM ALLOYS BY HUDRAULIC LATHING. SEPT. 13, 1977.

4,071,363.—METHOD OF MAKING COMPOSITE XEROGRAPHIC PHOTORECEPTOR WITH INJECTING CONTACT LAYER FOR A PHO. JAN. 31, 1978. BEL. 840221. FRA. 7610576.

4,072,518.—METHOD OF MAKING TRIGONAL SELENIUM INTERLAYERS BY GLOW DISCHARGE. FEB. 7, 1978.

4,076,183.—PHOTOCONDUCTOR INCREMENTING APPARATUS. FEB. 28, 1978.

4,076,564.—ROUGHENED IMAGING SURFACE FOR CLEANING. FEB. 28, 1978.

4,103,994.—RECORDING PLATE. AUG. 1, 1978.

4,115,115.—CRYSTALLIZATION OF SELENIUM IN POLYMER MATRICES VIA IN SITU GENERATION OF ORGANIC CRYSTALLIZATION. SEPT. 19, 1978.

4,122,030.—FORMATION OF COLLOIDAL DISPERSIONS OF SELENIUM BY THE LOCUS CONTROL METHOD. OCT. 24, 1978.

4,126,457.—EVAPORATION TECHNIQUE FOR PRODUCING TEMPERATURE PHOTORECEPTOR ALLOYS. NOV. 21, 1978. CAN. 1046864.

Class 2F

3,143,044.—XEROGRAPHIC PLATE HOLDER. AUG. 4, 1964.

3,592,071.—BELT TRACKING APPARATUS. JULY 13, 1971. ARG. 0179666, BEL. 0751117, CAN. 0925118, FRA. 7019040, GRB. 1298926, ITL. 0893540, JAP. 0770135, MEX. 118981, SPN. 0380136.

3,765,757.—TRANSPORT ARRANGEMENT FOR THIN SHEET MATERIAL. OCT. 16, 1973. BEL. 0793551, GRB. 1419978, ITL. 0972846, SPN. 0410107.

3,820,888.—MISTRACK INTERLOCK FOR SELENIUM BELT. JUNE 28, 1974.

3,867,027.—TRANSPORT ARRANGEMENT FOR THIN SHEET MATERIAL. FEB. 18, 1975. BEL. 0793551, CAN. 1004289, GRB. 1419978, ITL. 0972846, SPN. 0410107.

3,874,790.—FAIL-SAF MECH STPNG MVMNT PHTCNDCTV BLT ELTRSTC REPRDCTN MACH WHEN TRCKNG BECOMES IREGULAR AND UN. APR. 1, 1975.

3,888,577.—APPARATUS FOR PACKAGING AND SUBSEQUENTLY INSTALLING A BELT ONTO A ROLLER ASSEMBLY. JUNE 10, 1975. BEL. 0810900.

3,994,053.—DRUM SUPPORT APPARATUS. NOV. 30, 1976.

4,005,285.—OPTICAL SYSTEM FOR EXTENDING PHOTOSENSOR ARRAY RESOLUTION. JAN. 25, 1977.

4,009,388.—ARRANGEMENT FOR EXTENDING PHOTOSENSOR ARRAY SOLUTION. FEB. 22, 1977.

4,027,966.—TRACKING ASSEMBLY FOR AN ENDLESS BELT ELECTROSTATIC REPRODUCTION MACHINE. JUNE 7, 1977.

4,040,157.—DRUM SUPPORT APPARATUS. AUG. 9, 1977.

4,068,942.—ADVANCED PHOTORECEPTOR. JAN. 17, 1978. BEL. 847264, FRA. 7630970.

4,088,403.—REPLENISHABLE PHOTOSENSITIVE SYSTEM. MAY 9, 1978.

4,105,345.—EXPANDABLE PHOTORECEPTOR ENDBELLS. AUG. 8, 1978.

4,120,576.—DRUM SUPPORT APPARATUS. OCT. 17, 1978.

Class 3

3,935,517.—CONSTANT CURRENT CHARGING DEVICE. JAN. 27, 1976.

Class 3A

3,172,024.—CHARGE INDUCTION. MAR. 2, 1965. CAN. 0809341, FRA. 1294101, GER. 1414991, GRB. 0958663, JAP. 0455338.

3,254,998.—INDUCTION IMAGE FORMATION. JUNE 7, 1966. CAN. 0740576, FRA. 1357220, GER. 1276445, GRB. 1024985, JAP. 0451689.

3,288,602.—XEROGRAPHIC PLATE AND METHOD. NOV. 29, 1966. CAN. 0795978, GER. 1237902, GRB. 1029181, ITL. 0690835, JAP. 0578399.

3,684,364.—LIFTOFF ELECTRODE. AUG. 15, 1972.

3,842,273.—CORONA GENERATOR CLEANING APPARATUS. OCT. 15, 1974. AUS. 0480142, BEL. 0817485. GRB. 1458088, SPN. 0428358.

3,884,181.—CAPILLARY BAFFLE-CONSTANT OIL HEIGHT INDEPENDENT TO OIL LEVEL. MAY 20, 1975.

3,893,800.—BACKSIDE HEATING AND FIXING APP IN AN ELECTRONIC PHOTOGRAPH DUPLICATOR. JULY 8, 1975.

3,957,423.—STRIPPER FINGER DESIGN. MAY 18, 1976.

4,049,344.—ELECTROSTATIC IMAGING SYSTEM. SEPT. 20, 1977.

4,082,444.—LAMP CARRIAGE DRIVE SYSTEM. APR. 4, 1978.

Class 3B

3,160,746.—CORONA CHARGING APPARATUS FOR NONUNIFORMLY CHARGING A XEROGRAPHIC PLATE IN A PREDETERMINED MAN. DEC. 8, 1964. GER. 1197475, GRB. 1011793, JAP. 0484759.

3,288,602.—XEROGRAPHIC PLATE AND METHOD. NOV. 29, 1966. CAN. 0795978, GER. 1237902, GRB. 1029181, ITL. 0690835, JAP. 0578399.

3,449,568.—CORONA DISCHARGE APPARATUS FOR CREATING AN ELECTROSTATIC CHARGE PATTERN ON A XEROGRAPHIC SURFAC. JUNE 10, 1969. CAN 0858664.

3,532,494.—SOLID AREA DEVELOPMENT IN XEROGRAPHY EMPLOYING AN INSULATING SCREEN IN THE CHARGING STEP. OCT. 6, 1970.

3,543,022.—METH AND APPARATUS CHARG DISCRETE SMALL AREAS XEROGRAPHIC PLATES TO DIF POTENT CONT TONE PRINTG. NOV. 24, 1970. CAN. 0921971, GRB. 1186599.

3,784,299.—DARK DECAY RETARDATION. JAN. 8, 1974.

3,981,498.—NON-UNIFORM CHARGING OF SHEET MATERIAL. SEPT. 21, 1976.

4,043,656.—TRANSPARENCY COPYING MACHINE. AUG. 23,1977.

4,073,587.—COROTRON APPARATUS. FEB. 14, 1978.

4,095,233.—METHOD FOR FORMING A CHARGE PATTERN. JUNE 13, 1978.

Class 3C

3,122,634.—CONTROLLED CHARGING IN XEROGRAPHIC COPYING APPARATUS. FEB. 25, 1964. CAN. 0706543, FRA. 1352624, GER. 1210323, GRB. 1026262, JAP. 0446815.

3,160,746.—CORONA CHARGING APPARATUS FOR NONUNIFORMLY CHARGING A XEROGRAPHIC PLATE IN A PREDETERMINED MAN. DEC. 8, 1964. GER. 1197475, GRB. 1011793, JAP. 0484759.

3,335,274.—XIC CHARGING APPARATUS WITH MEANS TO AUTOMATICALLY CONTROL THE POT ENTAIL APPLIED TO THE CORONA. AUG. 8, 1967. CAN. 0801834, FRA. 1459487, GRB. 1121498, ITL. 0734870, MEX. 0085777.

3,382,360.—XIC CHARGING SYSTEM HAVING MEANS FOR PROVIDING AN AIR CUSHION BETWEEN CHARGING DEVICE AND XIC DR. MAY 7, 1968.

3,457,405.—CORONA WIRE MOUNTING MEANS WHICH COMPENSATES FOR WIRE EXPANSION DUE TO HEAT. JULY 22, 1969. CAN. 0857406, GRB. 1196927.

3,471,695.—CORONA CHGNG APPTS W/MEANS TO URGE A FLOW OF AERIFORM FLUID ACROSS THE CORONA WIRES. OCT. 7, 1969. CAN. 0856355, GRB. 1220745.

3,483,372.—CORONA CHARGING DEVICE WITH CONDUCTIVE SHIELD AND INSULATING MEANS ON SAID SHIELD. DEC. 9, 1969. CAN. 0840508, GRB. 1169632, JAP. 0770817.

3,517,995.—METHOD AND APPARATUS FOR INCREASING THE EFFICIENCY OF CORONA CHARGNG. JUNE 30, 1970. ARG. 0172471, BEL. 0721553, CAN. 0856714, FRA. 1585283, GRB. 1247034, ITL. 0844214, JAP. 0708414, MEX. 0103113, VZL. 0023701.

3,566,108.—CORONA GENERATING ELECTRODE STRUCTURE FOR USE IN A XEROGRAPHIC CHARGING METHOD. FEB. 23, 1971.

3,598,991.—ELCTRSTC CHRGNG DEV HAVNG SPRK GAP VOLTG REGULTR BETWEEN A CORONA SOURCE AND VOLTG SOURCE. AUG. 10, 1971. AUS. 0457211, BEL. 0754426, CAN. 0916233, CZC. 0163219, EGR. 0084558, FRA. 7029148, GRB. 1322378, ITL. 0901159, JAP. 0715800, PLD. 0070053, SPN. 0382404, STZ. 0513436, SWD. 0359663, TIW. 0007173, USR. 0442617.

3,604,925.—APPARATUS FOR CONTROLLING THE AMOUNT OF CHARGE APPLIED TO SURFACE. SEPT. 14, 1971.

3,612,864.—IMAGING SYSTEM UTILIZING AN ELECTRODE TREATED W/MIXTURE OF HYDROSCOPIC MATERIAL AND HYDROPHILIC B. OCT. 21, 1971

3,675,011.—METHODS AND APPARATUS FOR OPERATING RAISED COROTRONS OF OPPOSITE POLARITY. JULY 4, 1972.

3,723,793.—COATED CORONA GENERATING ELECTRODE. MAR. 27, 1973.

3,742,237.—AC CORONA CHARGING APPARATUS. JUNE 26, 1973. CAN. 0955299, GRB 1387209.

3,760,229.—A C COROTRON. SEPT. 18, 1973. GRB. 1410671.

3,769,506.—CORONA GENERATING METHOD AND APPARATUS THEREFOR. OCT. 30, 1973.

3,790,999.—CORONA WIRE APPARATUS. FEB. 12, 1974.

3,800,153.—ELECTROPHOTOGRAPHY CHARGING DEVICE. MAR. 26, 1974.

3,813,547.—CORONA GENERATING APPARATUS. MAY 28, 1974.

3,813,548.—CORONA GENERATING METHODS AND APPARATUS THEREFOR. MAY 28, 1974

3,816,749.—EXPOSURE CONTROLLED CORONA DEVICE. JUNE 11, 1974.

3,851,229.—CURRENT MEASURING DEVICE. NOV. 26, 1974

3,870,883.—ELECTROSTATIC PRINTING MACHINE WITH SELF-CLEANING CORONAL GENERATING DEVICE. MAR. 11, 1975.

3,901,189.—MAGNETIC BRUSH DEVELOPING APPARATUS. AUG. 26, 1975.

3,919,605.—CORONA DISCHARGE APPARATUS. NOV. 11, 1975.

3,922,548.—CORONA CHARGING DEVICE AND SUPPORT ARRANGEMENT. NOV. 25, 1975.

3,937,960.—CHARGING DEVICE FOR ELECTROPHOTOGRAPHY. FEB. 10, 1976.

3,939,386.—TECHNIQUE FOR CHARGING DIELECTRIC SURFACES TO HIGH VOLTAGE. FEB. 17, 1976.

3,950,680.—ELECTROSTATOGRAPHIC DIAGNOSTIC SYSTEM. APR. 13, 1976.

3,976,880.—CORONA STABILIZATION ARRANGEMENT. AUG. 24, 1976.

3,976,881.—ARRANGEMENT FOR STABILIZING CORONA DEVICES. AUG. 24, 1976.

3,978,379.—CORONA GENERATING DEVICE WITH AN IMPROVED CLEANING MECHANISM. AUG. 31, 1976.

3,983,393.—CORONA DEVICE WITH REDUCED OZONE EMISSION. SEPT. 28, 1976.

3,996,466.—TRANSFER CORONA DEVICE WITH ADJUSTABLE SHIELD BIAS. DEC. 7, 1976

4,027,960.—TRANSFER SYSTEM FOR ELECTROSTATIC REPRODUCTION MACHINE. JUNE 7, 1977

4,038,544.—IMPROVED APPARATUS AND METHOD FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE. JULY 26, 1977

4,038,546.—AN IMPROVED APPARATUS FOR A CORONA GENERATING DEVICE. JULY 26, 1977

4,056,723.—ROTATIABLE CORONA DEVICE. NOV. 1, 1977.

4,068,284.—CORONA DISCHARGE DEVICE. JAN. 10, 1978. CAN. 1029794, FRA. 7432708, GRB. 1407718.

4,072,413.—ELECTROSTATOGRAPHIC REPRODUCTION METHODS AND MACHINES. FEB. 7,1978.

4,099,219.—CORONODE TENSIONING AND SUPPORT ARRANGEMENT. JULY 4, 1978.

4,100,411.—BIASING ARRANGEMENT FOR A CORONA DISCHARGE DEVICE. JULY 11, 1978.

4,110,811.—SUPPORT STRUCTURE FOR A CORONA GENERATING DEVICE. AUG. 29, 1978.

4,112,298.—CORONA WIRE MOUNTING MEANS. SEPT. 5, 1978.

4,112,299.—CORONA DEVICE WITH SEGMENTED SHIELD SEPT. 5, 1978. GRB. 1499477.

4,118,751.—CORONODE CONNECTION ARRANGEMENT. OCT. 3, 1978.

4,138,719.—AUTOMATIC WRITING SYSTEMS AND METHODS OF WORD PROCESSING. FEB. 6, 1979. CAN. 1055161. GRB. 1530444.

Class 3C 1

3,076,092.—XEROGRAPHIC CHARGING APPARATUS. JAN. 29, 1963.

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3,275,837.—XEROGRAPHIC CHARGING APPARATUS. SEPT. 27, 1966. ARG. 0158430, ATR. 0242511, AUS. 0276177, BEL. 0642095, CAN. 0753356, FRA. 1385736, GER. 1488286, GRB. 1040264, ITL. 0712888, JAP. 0477814, MEX. 0075819, STZ. 0460930, SWD. 0314133.

3,307,034.—TWO-WIRE CORONA DISCHARGE SYSTEM FOR SINGLE-STEP ELECTROSTATIC IMAGE FORMATION. FEB. 28, 1967. CAN. 0768802, FRA. 1416275, GER. 1275864, GRB. 1055416, ITL. 0744235, JAP. 0491997.

3,492,476.—ELECTROSTATIC CHARGING DEVICE UTILIZING BOTH AC AND DC FIELDS. JAN. 27, 1970. ARG. 0175174, ATR. 0300573, AUS. 0425768, BEL. 0729976, CAN. 0862232, CHL. 0024600, CZC. 0158639, DNK. 0126728, EGR. 0081574, EIR. 0032976, FRA. 6907701, GRB. 1255998, GRK. 0039915, IND. 0120218, ISR. 0031765, ITL. 0860063, LXB. 0058234, MEX. 0108894, NOR. 0129709, NZL. 0155636, PAK. 0120995, PLD. 0017649, PLP. 0007523, PNM. 0001813, PTG. 0051315, RHD. 1096947, RMN. 0055216, SAF. 0691730, SPN. 0364888, STZ. 0493014, SWD. 0341528, UAR. 0009212, USR. 0318248, VTM. 0001845, VZL. 0023731.

3,873,895.—TECHNIQUE FOR CHARGING DIELECTRIC SURFACES TO HIGH VOLTAGE. MAR. 25, 1975.

3,886,416.—METHOD AND APPARATUS FOR ADJUSTING COROTRON CURRENTS. MAY 27, 1975.

3,908,164.—CORONA CURRENT MEASUREMENT AND CONTROL ARRANGEMENT. SEPT. 23, 1975.

3,921,042.—ELECTROSTATIC REPRODUCTION MACHINE WITH IMPROVED CORONA GENERATING DEVICE. NOV. 18, 1975.

3,961,193.—SELF ADJUSTING CORONA DEVICE. JUNE 1, 1976.

3,984,182.—PRETRANSFER CONDITIONING FOR ELECTROSTATIC PRINTING. OCT. 5, 1976.

4,038,593.—REGULATED HIGH VOLTAGE AC POWER SUPPLY WITH REGULATED DC BIAS CURRENT. JULY 26, 1977. BEL. 0846572.

4,039,257.—PRETRANSFER COROTRON SWITCHING. AUG. 2, 1977. GRB. 1498259

4,042,874.—HIGH VOLTAGE AC POWER SUPPLY WITH AUTOMATICALLY VARIABLE DC BIAS CURRENT. AUG. 16, 1977.

4,057,723.—COMPACT CORONA CHARGING DEVICE. NOV. 8, 1977. BEL. 850335, SPN. 455179.

4,086,650.—CORONA CHARGING DEVICE. APR. 25, 1978. BEL. 844116, SAF. 764178, SPN. 449789.

4,110,614.—CORONA DEVICE. AUG. 29, 1978.

Class 3C 2

3,304,476.—TRANSFER SWITCH FOR A XEROGRAPHIC APPARATUS. FEB. 14, 1967.

3,433,948.—NEGATIVE CORONA DISCHARGE SYSTEM USING ALTERNATING ELECTRIC FIELDS ACROSS THE AIR GAP. MAR. 18, 1969. CAN. 0855811, FRA. 1564157, GRB. 1211442, ITL. 0829718, JAP. 0655407.

3,541,329.—NEGATIVE CORONA DEVICE WITH MEANS FOR PRODUCING A REPELLING ELECTROSTATIC FIELD. NOV. 17, 1970. CAN. 0841136, FRA. 1546256, GRB. 1205040, JAP. 0634886.

4,140,874.—AUTOMATIC COMPENSATING CIRCUIT. FEB. 20, 1979. CAN. 1056919. GRB. 1522703.

Class 3C 3

3,146,385.—XEROGRAPHIC PLATE CHARGING METHOD AND APPARATUS. AUG. 25, 1964. GRB. 1013924.

3,649,830.—UNIFORM CHARGING METHOD AND APPARATUS USING AN ARRAY OF NEEDLE ELECTRODES. MAR. 14, 1972.

3,655,966.—ELECTRIC CHARGING DEVICE FOR ELECTROPHOTOGRAPHY. APR. 11, 1972.

3,689,767.—METHOD AND APPARATUS FOR UNIFORMLY CHARGING THE SURFACE OF AN INSULATING MEMBER. SEPT. 5, 1972.

3,709,595.—PRINTER SYSTEM. JAN. 9, 1973.

Class 3C 4

3,068,356.—XEROGRAPHIC CHARGING APPARATUS. DEC. 11, 1962. CAN. 0681400, GER. 1214996, GRB. 0990114.

3,220,324.—PHOTOCONDUCTIVELY CONTROLLED CORONA CHARGING. NOV. 30, 1965. CAN. 0710976, GER. 1243967, GRB. 1034009, JAP. 0651092.

3,307,034.—TWO-WIRE CORONA DISCHARGE SYSTEM FOR SINGLE-STEP ELECTROSTATIC IMAGE FORMATION. FEB. 28, 1967. CAN. 0768802, FRA. 1416275, GER. 1275864, GRB. 1055416, ITL. 0744235, JAP. 0491997.

3,492,476.—ELECTROSTATIC CHARGING DEVICE UTILIZING BOTH AC AND DC FIELDS. JAN. 27, 1970. ARG. 0175174, ATR. 0300573, AUS. 0425768, BEL. 0729976, CAN. 0862232, CHL. 0024600, CZC. 0158639, DNK. 0126728, EGR. 0081574, EIR. 0032976, FRA. 6907701, GRB. 1255998, GRK. 0039915, IND. 0120218, ISR. 0031765, ITL. 0860063, LXB. 0058234, MEX. 0108894, NOR. 0129709, NZL. 0155636, PAK. 0120995, PLD. 0017649, PLP. 0007523, PNM. 0001813, PTG. 0051315, RHD. 1096947, RMN. 0055216, SAF. 0691730, SPN. 0364888, STZ. 0493014, SWD. 0341528, UAR. 0009212, USR. 0318248, VTM. 0001845, VZL. 0023731.

3,496,351.—CORONA CONTROL CIRCUIT FOR STEPPING XEROGRAPHIC RECORDNG APPARATUS. FEB. 17, 1970. CAN. 0834978, FRA. 1512919, GRB. 1170472, ITL. 0793742, JAP. 0923309.

3,688,107.—ELECTROSTATOGRAPHIC CHARGING APPARATUS. AUG. 29, 1972. CAN. 0938660, GRB. 1365130.

3,875,407.—CORONA GENERATOR CLEANING APPARATUS. APR. 1, 1975.

3,908,127.—CORONA GENERATING DEVICES. SEPT. 23, 1975.

3,909,614.—SCOROTRON POWER SUPPLY CIRCUIT. SEPT. 30, 1975.

3,936,635.—CORONA GENERATING DEVICE. FEB. 3, 1976.

Class 3C 5

3,970,381.—METHOD AND APPARATUS FOR XEROGRAPHIC REPRODUCTION. JULY 20, 1976. BEL. 0811188.

Class 3C 6

3,549,962.—UNIFORM ELECTROSTATIC CHARGING. DEC. 22, 1970. CAN. 0897757, GRB. 1189578.

3,648,133.—UNIFORM ELECTROSTATIC CHARGING OF A PHOTOCONDUCTIVE INSULATING SURFACE. MAR. 7, 1972.

3,743,830.—DEVICE FOR UNIFORMLY CHARGING A NON PLANAR ELECTROPHOTOGRAPHIC PLATE. JULY 3, 1973.

3,764,866.—CORONA GENERATOR. OCT. 9, 1973. ARG. 0198185, ATR. 0325420, AUS. 0467386, BEL. 0793227, CZC. 0168018, DNK. 0131699, FRA. 7245484, GRB. 1402739, ITL. 0972692, MEX. 0128581, NZL. 0169420, PTG. 0058386, SAF. 0729029, STZ. 0553435, SWD. 7216596.

3,792,913.—XEROGRAPHIC ERASE MECHANISM. FEB. 19, 1974. GRB. 1422175.

3,811,048.—ELECTROPHOTOGRAPHIC CHARGING APPARATUS. MAY 14, 1974.

3,967,119.—CORONA CHARGING DEVICE. JUNE 29, 1976.

3,967,891.—IMAGING SYSTEM FOR ELECTROSTATIC REPRODUCTION MACHINE. JULY 6, 1976.

4,087,168.—CHARGING SYSTEM FOR ELECTROSTATIC REPRODUCTION MACHINE. APR. 2, 1978.

Class 3C 7

3,323,373.—ESCAPEMENT MECHANISM. JUNE 6, 1967. CAN. 0841310.

3,324,291.—CORONA GENERATING DEVICE W/MEANS TO CAUSE AIR FLOW THERE-THROUGH TO MAINTN PARTS FREE OF DUST. JUNE 6, 1967. CAN. 0794904, GRB. 1070615, JAP. 0512648.

3,339,069.—CORONA CHARGING DEVICE W/MEANS TO PREVENT TONER DUST CONTAMINATION. AUG. 29, 1967. CAN. 0788539, FRA. 1450010, GRB. 1116687, ITL. 0730715, JAP. 0875339, MEX. 0089459.

3,496,352.—SELF-CLEANING CORONA GENERATING APPARATUS. FEB. 17, 1970. CAN. 0856356, GRB. 1227987, JAP. 0641478.

3,743,540.—SURFACE CLEANING BY IONIZED FLOW. JULY 3, 1973.

3,794,839.—CORONA GENERATING APPARATUS. FEB. 26, 1974. GRB. 1434863.

3,942,006.—CORONA GENERATOR CLEANING APPARATUS. MAR. 2, 1976.

3,965,400.—CORONA GENERATING DEVICE WITH IMPROVED BUILT IN CLEANING MECHANISM. JUNE 22, 1976.

4,019,055.—CORONA CLEANING ASSEMBLY. APR. 19, 1977. BEL. 0795870, GRB. 1416480.

Class 3C 8

3,335,273.—XIC CHARGING APPARATUS W/MEANS TO TERMINATE CHARGING CYCLE WHEN A PREDETERMINED CHARGE IS OBTAI. AUG. 8, 1967. CAN. 0794905, FRA. 1462556, GRB. 1128618, ITL. 0743940, JAP. 0632530, MEX. 0087314.

3,335,275.—XIC CHARGNG APPTS W/ADJSTBL MEANS TO TERMINATE CHRGNG CYCLE WHEN PREDETERMINED CHARGE IS OBTAI. AUG. 8, 1967. CAN. 0801833.

3,667,036.—ELECTROMETER AMPLIFIER CIRCUITS. MAY 30, 1972.

3,678,350.—ELECTRIC CHARGING METHOD. JULY 18, 1972.

3,805,069.—REGULATED CORONA GENERATOR. APR 16, 1974.

3,934,141.—APPARATUS FOR AUTOMATICALLY REGULATING THE AMOUNT OF CHARGE APPLIED TO AN INSULATING SURFACE. JAN. 20, 1976.

3,944,356.—A CHARGING APPARATUS. MAR. 16, 1976.

3,980,929.—CORONA CURRENT INTERRUPTER. SEPT. 14, 1976.

Class 3C 9

3,557,367.—METHOD AND APPARATUS FOR INCREASING THE EFFICIENCY OF COR ONA CHARGING OF A PHOTOCONDUCTOR. JAN. 19, 1971. ARG. 0170822, BEL. 0720017, BRA. 6800368, CAN. 0879279, FRA. 1597512, GRB. 1244378, ITL. 0840366, JAP. 0628391, MEX. 0105427, VZL. 0023699.

3,582,731.—CHARGING SYSTEM. JUNE 1, 1971. CAN. 0906045.

3,765,026.—ELECTROGRAPHIC RECORDING SYSTEM. OCT. 9, 1973. CAN. 0948272, GRB. 1365346.

4,049,344.—ELECTROSTATIC IMAGING SYSTEM. SEPT. 20, 1977.

Class 3D

3,394,002.—CHARGE TRANSFER WITH LIQUID LAYERS. JULY 23, 1968. CAN. 0840028, GRB. 1126048, JAP. 0524527.

3,398,336.—ELECTRICAL CHARGING UTILIZING TWO PHASE LIQUID MEDIUM. AUG. 20, 1968. CAN. 0815738, GRB. 1149074, JAP. 0562387.

3,687,106.—DONOR APPARATUS AND METHOD. AUG. 29, 1972. ARG. 0185079, BEL. 0753207, CAN. 0911706, FRA. 7027124, GRB. 1314862, ITL. 0900444, JAP. 0733285, MEX. 0117318, PNM. 0002237, VZL. 0027517.

3,907,559.—IMGNG PRCS EMPLYNG FRCTN CHRGNG IN THE PRESENCE OF AN ELECTRICALLY INSULATING DEVELOPER LIQUID. SEPT. 23, 1975.

3,971,658.—IMAGING PROCESS EMPLOYING FRICTION CHARGING IN THE PRESENCE OF AN ELECTRICALLY INSULATING LIQUID. JULY 27, 1976.

Class 3E

3,172,024.—CHARGE INDUCTION. MAR. 2, 1965. CAN. 0809341, FRA. 1294161, GER. 1414991, GRB. 0958663, JAP. 0455338.

3,254,998.—INDUCTION IMAGE FORMATION. JUNE 7, 1966. CAN. 0740576, FRA. 1357220, GER. 1276445, GRB. 1024985, JAP. 0451689.

Class 3F

3,307,034.—TWO-WIRE CORONA DISCHARGE SYSTEM FOR SINGLE-STEP ELECTROSTATIC IMAGE FORMATION. FEB. 28, 1967. CAN. 0768802, FRA. 1416275, GER. 1275864, GRB. 1055416, ITL. 0744235, JAP. 0491997.

3,453,427.—ELEC LAMP FOR UNIFRMLY CHRGNG THE PHOTOCNDCTIVE INSULATNG LAYER OF A XEROGRAPHIC PLATE. JULY 1, 1969.

3,481,669.—PHOTO-CHARGING OF XEROGRAPHIC PLATES. DEC. 2, 1969. AUS. 0420860, BEL. 0705167, CAN. 0814631, FRA. 1541297, GER. 1522683, GRB. 1088073, JAP. 0517512.

3,687,538.—APPARATUS FOR EXPOSING LATENT IMAGE MARGINS IN ELECTROPHOTOGRAPHIC COPYING APPARATUS. AUG. 29, 1972.

3,751,155.—PRE-DEVELOPMENT EXPOSURE ASSEMBLY. AUG. 7, 1973.

3,809,472.—PRE-DEVELOPMENT EXPOSURE ASSEMBLY. MAY 7, 1974. ARG. 0196103, AUS. 0466757, BEL. 0793559, CHL. 0027991, FRA. 7246234, GRB. 1415170, ITL. 0973319, JAP. 0552841, MEX. 0131207, NZL. 0169421, PRU. 0013334, PTG. 0058769, SAF. 0729132, SPN. 0410172, STZ. 0552841, SWD. 7216970.

3,845,307.—COMBINED CORONA AND LUMINESCENT DISCHARGE. OCT. 29, 1974. BEL. 0811310, GRB. 1433663.

3,860,338.—ADJUSTABLE FADEOUT. JAN. 14, 1975. BEL. 0809655.

3,893,419.—BACKGROUND REDUCTION TECHNIQUE. JULY 8, 1975.

3,984,842.—DEVICE FOR CONTINOUS ELECTROSTATIC REPRODUCTION OF AN OPTICAL IMAGE. OCT. 5, 1976.

3,994,000.—DEVICE FOR ELECTROSTATOGRAPHIC REPRODUCTION OF AN OPTICAL IMAGE USING A CHARGE STORAGE GRID. NOV. 23, 1976.

4,005,438.—DEVICE WITH CONTROL GRID FOR ELECTROSTATOGRAPHIC REPRODUCTION OF AN OPTICAL IMAGE. JAN. 25, 1977

Class 4

4,162,118.—WAVEGUIDE IMAGING SYSTEM. JULY 24, 1979.

Class 4A

3,811,764.—APPARATUS FOR PHOTOELECTROPHORETIC IMAGING USING A PERIODIC ELECTRIC FIELD. MAY 21, 1974.

4,068,950.—VARIABLE PLATEN COVER. JAN. 17, 1978.

4,111,541.—EXPOSURE SYSTEM FOR ELECTROSTATIC REPRODUCTION MACHINES. SEPT. 5, 1978.

4,120,579.—IMAGING SYSTEM FOR A PHOTOCOPYING DEVICE. OCT. 17, 1978.

Class 4A 1

3,330,180.—ILLUMINATION CONTROL SYSTEM. JULY 11, 1967. ARG. 0151653, BRA. 0084295, CAN. 0785137, FRA. 1450157, GER. 1264239, GRB. 1122629, ITL. 0730678, JAP. 0508404, MEX. 0078870

3,432,231.—EXPOSURE CONTROL DEVICE. MAR. 11, 1969.

3,432,232.—ILLUMINATION SYSTEM. MAR. 11, 1969 CAN. 0846423, JAP. 0534763

3,487,252.—CESIUM LIGHT SOURCE. DEC. 30, 1969

3,504,969.—IMAGING APPARATUS. APR. 7, 1970.

3,512,886.—DUAL CARRIAGE SCANNING SYS. MAY 19, 1970. CAN. 0875712, GRB. 1235136.

3,586,849.—ILLUMINATION SYSTEM. JUNE 22, 1971 ARG. 0183139, ATR. 0303522, AUS. 0428629, BEL. 0733400, BRA. 6908480, CAN. 0903730, CHL. 0024870, FRA. 6917011, GRB. 1260688, ITL. 0864185, MEX. 0111515, NOR. 0125954, NZL. 0156507, PNM. 0001430, PRU. 0010320, PTG. 0051752, SAF. 0693689, SPN 0367616, STZ. 0758269, SWD. 0354924, VZL. 0025067.

3,622,217.—LIGHT PRODUCING SYSTEM. NOV. 23, 1971.

3,733,599.—TRIGGERING APPARATUS FOR A FLASH LAMP. MAY 15, 1973. CAN. 0937281, GRB. 1361073

3,746,442.—ELECTROPHOTOGRAPHIC IMAGING APPARATUS. JULY 17, 1973.

3,767,956.—APERTURE FLUORESCENT LAMP FOR COPYING MACHINES. OCT. 23, 1973

3,777,135.—ILLUMINATION SYSTEM. DEC. 4, 1973.

3,779,640.—HEATING APPARATUS FOR SCAN LAMP. DEC. 18, 1973. ITL. 0995677.

3,781,585.—LIGHT PRODUCING SYSTEM. DEC. 25, 1973.

3,824,013.—LIGHT SOURCE ALIGNMENT DEVICE. JULY 16, 1974.

3,851,201.—LAMP ASSEMBLY. NOV. 26, 1974.

3,868,182.—LAMP ASSEMBLY. FEB. 25, 1975.

3,869,205.—ILLUMINATION SOURCE FOR XEROGRAPHIC EXPOSURE. MAR. 4, 1975.

3,881,817.—OPTICAL ALIGNMENT SYSTEM FOR AN ORIGINAL DOCUMENT. MAY 6, 1975. CAN. 3881817.

3,893,754.—COMBINATION PARABOLOID-ELLIPSOID MIRROR SYSTEM. JULY 8, 1975.

3,904,290.—OPTICAL SYSTEM ALIGNMENT APPARATUS. SEPT. 9, 1975.

3,909,254.—LASER RECORDING METHOD. SEPT. 30, 1975.

3,914,649.—PULSED METAL OR METAL HALIDE LAMPS FOR PHOTOCOPYING APPLICATIONS. OCT. 21, 1975.

3,961,222.—SODIUM VAPOR LAMP CONFIGURATION. JUNE 1, 1976.

3,967,893.—AN ILLUMINATING APPARATUS. JULY 6, 1976.

3,983,441.—MULTIPLE PINCH INCANDESCENT LAMP. SEPT. 28, 1976.

3,992,108.—OPTICAL SYSTEM ALIGNMENT APPARATUS. NOV. 16, 1976.

3,998,539.—AN ILLUMINATION SYSTEM. DEC. 21, 1976.

4,005,332.—EFFICIENT DC OPERATED FLUORESCENT LAMPS. JAN. 25, 1977.

4,005,940.—OPTICAL SYSTEM ALIGNMENT APPARATUS. FEB. 1, 1977.

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4,071,798.—SODIUM VAPOR LAMP WITH EMISSION APERTURE. JAN. 31, 1978.
4,071,799.—SODIUM VAPOR LAMP WITH EMISSION APERTURE. JAN. 31, 1978.
4,072,417.—EXPOSURE DEVICE FOR A XEROGRAPHIC COPYING MACHINE. FEB. 7, 1978.
4,080,545.—SODIUM VAPOR LAMP. MAR. 21, 1978.
4,086,010.—ILLUMINATION SYSTEM UTILIZING TWO OPPOSING DC LAMPS WITH AN OPTIMUM BARREL-SHAPED SLIT. APR. 25, 1978.
4,113,379.—ILLUMINATION APPARATUS FOR ELECTRONIC COPYING MACHINES. SEPT. 12, 1978.
4,128,332.—ILLUMINATOR. DEC. 5, 1978. GRB. 1494424.
4,140,385.—LOW PRESSURE METAL OR METAL HALIDE LAMPS FOR PHOTOCOPYING APPLICATIONS. FEB. 20, 1979.

Class 4A 2

3,381,573.—SCANNING ATTACHMENT. MAY 7, 1968. CAN. 0820036, GER. 1945460, GRB. 1134645, JAP. 0524529.
3,524,704.—MULTI-LENGTH DOCUMENT RECORDING APPARATUS. AUG. 18, 1970.
3,888,581.—SEMI-AUTOMATIC DOCUMENT HANDLER. JUNE 10, 1975.
3,888,582.—SEMI-AUTOMATIC DOCUMENT HANDLER. JUNE 10, 1975.
3,888,584.—SEMI-AUTOMATIC DOCUMENT HANDLER. JUNE 10, 1975.
3,888,585.—SEMI-AUTOMATIC DOCUMENT HANDLER. JUNE 10, 1975.
3,901,594.—SEMI-AUTOMATIC DOCUMENT HANDLER. AUG. 26, 1975.
3,930,724.—MASKING APPARATUS FOR A MULTI-COLOR ELECTROPHOTOGRAPHIC PRINTING MACHINE. JAN. 6, 1976.

Class 4A 2A

3,062,110.—EXPOSURE STATION APPARATUS. NOV. 6, 1962. CAN. 0701636, JAP. 0318676.
3,560,089.—PLATEN COVER. FEB. 2, 1971. BEL. 0736415, CAN. 0910104, FRA. 0024759, GRB. 1245543, ITL. 8691460, JAP. 0674392.
3,560,090.—PLATEN COVER. FEB. 2, 1971. CAN. 0910103.
3,615,134.—COUNTERBALANCED AND SELF-CLOSING PLATEN COVER. OCT. 26, 1971. ARG. 0185533, AUS. 0449673, BEL. 0756482, CAN. 0921744, CHL. 0025836, EGR. 0084323, FRA. 7035445, GRB. 1318753, GUA. 0002610, ITL. 0908279, MEX. 0116804, PLD. P143518, PNM. 0002181, SPN. 0384046, STZ. 0515525, TIW. 0006830, USR. 0439097.
3,642,371.—PLATEN COVER FOR COPYING MACHINE. FEB. 15, 1972. ARG. 0189873, BEL. 0768991, CAN. 0938485, FRA. 7124554, ITL. 0932443.
3,642,376.—REMOVABLE PLATEN COVER. FEB. 15, 1972. CAN. 0926919.
3,685,905.—COMBINED DOCUMENT FEED AND BOOK COPYING APPARATUS. AUG. 22, 1972. ARG. 0189167, BEL. 0782370, CAN. 0954579, FRA. 7214327, GRB. 1382646, ITL. 0959701, MEX. 0127002, VZL. 30688.
3,788,737.—LUMINESCENT COVER. JAN. 29, 1974. FRA. 7336535.
3,813,161.—PLATEN COVER. MAY 28, 1974.
3,860,338.—ADJUSTABLE FADEOUT. JAN. 14, 1975. BEL. 0809655.
3,914,043.—COLOR ACCENTING COPYING MACHINE. OCT. 21, 1975.
3,914,049.—OPTICAL SCANNING SYSTEM. OCT. 21, 1975. BEL. 0815416.
3,930,466.—SEGMENTED GATE DEVELOPER FLOW CONTROLLER. JAN. 6, 1976.
3,936,172.—LIQUID CRYSTALLINE PLATEN FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. FEB. 3, 1976.
3,997,265.—PLATEN COVER. DEC. 14, 1976.
4,045,218.—METHOD FOR ELECTROSTATICALLY PRODUCING A COLOR ACCENTED PHOTOCOPY. AUG. 30, 1977.
4,072,418.—DEVICE FOR PREVENTING MOVEMENT OF AN ORIGINAL DOCUMENT ON A RECIPROCATING COPIER PLATEN. FEB. 7, 1978.
4,111,540.—FIELD LENS FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. SEPT. 5, 1978.
4,118,119.—FACETTED EDGE FADEOUT REFLECTOR. OCT. 3, 1978.

Class 4A 3

3,432,232.—ILLUMINATION SYSTEM. MAR. 11, 1969. CAN. 0846423, JAP. 0534763.
3,600,610.—TIME DELAY CIRCUIT FOR A RADIANT ENERGY PROTECTIVE APPARATUS. AUG. 17, 1971.
3,672,759.—ILLUMINATION CONTROL SYSTEM. JUNE 27, 1972.
3,775,008.—OPTICAL SCANNING APPARATUS. NOV. 27, 1973.
3,829,209.—IMAGE REGISTRATION IN A MULTIPLE MAGNIFICATION PHOTOCOPY INH SYSTEM. AUG. 13, 1974. ARG. 0194481, BEL. 0784522, CAN. 0988146, FRA. 7220688, GRB. 1397446, ITL. 0956415, MEX. 0128160, SPN. 403.700, STZ. 0563605, SWD. 7207535.
3,926,518.—OPTICAL SCANNING SYSTEM. DEC. 16, 1975.
3,947,117.—EXPOSURE CONTROL SYSTEM. MAR. 30, 1976.
3,975,289.—CHARGE TRANSFER COMPLEXES OF FERRONCENES HAVING LIGHT FILLING PROPERTIES. AUG. 17, 1976.
3,995,954.—EXPOSURE SYSTEM. DEC. 7, 1976.
4,025,541.—CHARGE TRANSFER OF FERROCENES HAVING LIGHT FILTERING PROPERTIES. MAY 24, 1977.
4,080,071.—EXPOSURE DEVICE OF A COPYING MACHINE. MAR. 21, 1978.
4,098,552.—COPYING MACHINE. JULY 4, 1978.
4,101,807.—METHOD AND APPARATUS FOR CONTROLLING THE TEMPERATURE OF LOW PRESSURE METAL OR METAL HALIDE. JULY 18, 1978.

Class 4B

3,912,387.—ELECTROSTATOGRAPHY. OCT. 14, 1975.
3,967,894.—A SCREENED OPTICAL SYSTEM. JULY 6, 1976.
3,967,895.—ILLUMINATION CONTROL SYSTEM. JULY 6, 1976.
3,981,577.—AN OPTICAL SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. SEPT. 21, 1976.
3,994,723.—ELECTROPHOTOGRAPHIC PROCESS INVOLVING STEP OF SUBSEQUENT DISCHARGE OF AREAS RECEIVING INSUFFICIENT. NOV. 30, 1976.
4,134,671.—INTERSECTING OPTICAL AND COPY SHEET PATH METHOD AND APPARATUS. JAN. 16, 1979.

Class 4B 1

3,062,094.—ELECTROPHOTOGRAPHIC COPYING APPARATUS. NOV. 6, 1962. JAP. 0286655.
3,062,095.—PROJECTOR OPTICAL SCANNING SYSTEM. NOV. 6, 1962. CAN. 0706050.
3,062,108.—ELECTROPHOTOGRAPHIC COPYING APPARATUS. NOV. 6, 1962.
3,076,392.—XEROGRAPHIC REPRODUCING APPARATUS. FEB. 5, 1963. CAN. 0689623, FRA. 1271754, GER. 1209418, GRB. 0962654.
3,137,202.—OPTICAL SCANNING APPARATUS FOR XEROGRAPHIC PRINTERS. JUNE 16, 1964. CAN. 0685880.
3,221,622.—OPTICAL SCANNING SYSTEM. DEC. 7, 1965. ADN. 0000471, ARG. 0150818, ATR. 0267325, AUS. 0402541, BEL. 0657557, BRS. 00J3737, BRU. 0000469, CAN. 0756354, EIR. 0028649, FIJ. 0000342, FIN. 0045258, FRA. 1420763, GER. 1497089, GHA. 0000994, GIB. 1089536, GIE. 0006969, GRB. 1089536, GRK. 0029663, GUR. 1089536, HGK. 0009169, HOL. 0146615, ISR. 0022618, ITL. 0742392, JAP. 0599246, JER. 0000P96, KEN. 0001744, LXB. 0047657, MAU. 1927571, MLS. 0015069, NIG. 0001619, NOR. 0118726, NZL. 0140371, PTG. 0043364, SAF. 0646113, SBH. 0005269, SGP. 0008269, SHL. 0000017, SLN. 2677286, SPN. 0307501, SRK. 0000389, STZ. 0450920, SWD. 0338716, UGD. 0000269.
3,318,186.—OPTICAL SYSTEM FOR REPRODUCTION MACHINES. MAY 9, 1967. CAN. 0798356, FRA. 1467332, GRB. 1139231, ITL. 0758313, JAP. 0512656, MEX. 0085288, SWD. 6912062.
3,381,573.—SCANNING ATTACHMENT. MAY 7, 1968. CAN. 0820036, GER. 1945460, GRB. 1134645, JAP. 0524529.
3,405,564.—PULLEY. OCT. 15, 1968. CAN. 0850353.
3,454,335.—SCANNING SYSTEM. JULY 8, 1969. BEL. 0708647, CAN. 0853453, FRA. 1549127, GRB. 1207850, ITL. 0819656, JAP. 0591210.
3,484,163.—SCANNING SYSTEM. DEC. 16, 1969. CAN. 0840630.
3,504,969.—IMAGING APPARATUS. APR. 7, 1970.
3,512,886.—DUAL CARRIAGE SCANNING SYS. MAY 19, 1970. CAN. 0875712, GRB. 1235136.

3,523,725.—XEROGRAPHIC REPRODUCING APPARATUS. AUG. 11, 1970. CAN. 0917730, GRB. 1271862.
3,532,425.—GRAPHIC DISTORTION APPARATUS. OCT. 6, 1970.
3,552,221.—SPEED CONVERTING MECHANISM. JAN. 5, 1971.
3,591,277.—XEROGRAPHIC REPRODUCING APPARATUS. JULY 6, 1971. AUS. 0428584, BEL. 0723949, CAN. 0869628, CZC. 0157352, FRA. 1591801, GER. 0989774, GRB. 1223429, ITL. 0856815, SWD. 0348060, USR. 0465805.
3,612,679.—SCANNING APPARATUS. OCT. 12, 1971. GRB. 1307918.
3,671,237.—METHOD FOR PRODUCING IMAGES. JUNE 20, 1972. CAN. 0886492, GRB. 1317043.
3,794,418.—IMAGING SYSTEM. FEB. 26, 1974.
3,832,057.—SCANNING APPARATUS. AUG. 27, 1974. GRB. 1417255.
3,858,976.—OPTICAL SCANNING SYSTEM. JAN. 7, 1975.
3,869,204.—SCANNING OPTICAL SYSTEM. MAR. 4, 1975. BEL. 0815215.
3,905,247.—CLUTCHES. SEPT. 16, 1975.
3,918,806.—DASHPOT FOR COPIER OPTICAL SCANNING. NOV. 11, 1975.
3,936,173.—OPTICAL SYSTEM. FEB. 3, 1976.
3,948,374.—CLUTCHES. APR. 6, 1976.
3,950,091.—APPARATUS FOR CONTROLLING MOVEMENT OF A CARRIAGE. APR. 13, 1976.
3,973,825.—FLAT FIELD SCANNING SYSTEM. AUG. 10, 1976. BEL. 0836735.
3,989,369.—SCANNING MECHANISM FOR A COPYING APPARATUS. NOV. 2, 1976.
4,027,961.—COPIER/RASTER SCAN APPARATUS. JUNE 7, 1977.
4,032,231.—MULTIPLE RANGE VARIABLE MAGNIFICATION REPRODUCTION MACHINE USING THREE-DIMENSIONAL CAM. JUNE 28, 1977. BEL. 0843419.
4,054,359.—APPARATUS FOR SYNCHRONOUSLY SCANNING A FLAT PLATEN WITH A ROTATING MIRROR USING PULLEYS. OCT. 18, 1977.
4,066,353.—HALF TONE IMAGING SYSTEM. JAN. 3, 1978.
4,067,640.—APPARATUS FOR SYNCHRONOUSLY SCANNING A FLAT PLATEN WITH A ROTATING MIRROR. JAN. 10, 1978.
4,068,940.—VARIABLE CONTRAST OPTICAL SCREENING SYSTEM. JAN. 17, 1978.
4,068,950.—VARIABLE PLATEN COVER. JAN. 17, 1978.
4,070,089.—TWO DIMENSIONAL LASER SCANNER WITH MOVABLE CYLINDER LENS. JAN. 24, 1978.
4,093,374.—MULTIPLE RANGE VARIABLE MAGNIFICATION REPRODUCTION MACHINE. JUNE 6, 1978. BEL. 843419, GRB. 1500877, SPN. 449267.
4,095,880.—EXTENDED RANGE VARIABLE MAGNIFICATION REPRODUCTION MACHINE. JUNE 20, 1978. BEL. 843419, GRB. 1500877, SPN. 449267.
4,143,311.—HYSTERESIS SYNCHRONOUS MOTOR RATE SERVO SYSTEM. MAR. 6, 1979.
4,161,359.—APPARATUS FOR SYNCHRONIZING MOVEMENT BETWEEN AN OPTICAL SCANNING SYSTEM AND AN IMAGING MEMBER. JULY 17, 1979.

Class 4B 1A

3,139,013.—DOCUMENT REPRODUCING APPARATUS. JUNE 30, 1964. CAN. 0727819, FRA. 1346596, GRB. 1016265, JAP. 0442652.
3,330,190.—PRINTING APPARATUS. JULY 11, 1967. CAN. 0758791, GER. 1280282, GRB. 1102419, JAP. 0529726.
3,438,704.—ILLUMINATION CONTROL SYSTEM. APR. 15, 1969. CAN. 0865838, GRB. 1209473, JAP. 1002842.
3,485,546.—FIELD FLATTENER SCANNING MEANS. DEC. 23, 1969. CAN. 0850916, GRB. 1196373, JAP. 0667705.
3,504,960.—SAGITTAL RAY APERTURE STOP. APR. 7, 1970. AUS. 0413558, BEL. 0704924, CAN. 0849815, FRA. 1540700, GRB. 1209472, ITL. 0814606, JAP. 0972613.
3,524,704.—MULTI-LENGTH DOCUMENT RECORDING APPARATUS. AUG. 18, 1970.
3,542,467.—XEROGRAPHIC REPRODUCING APPARATUS. NOV. 24, 1970. ARG. 0180116, AUS. 0442029, BEL. 0731552, BRA. 6908056, CAN. 0877451, FRA. 6911558, GRB. 1257103, ITL. 0857659, JAP. 0668806, MEX. 0108892, SPN. 0366056, SWD. 0346397, VZL. 0023746.
3,592,531.—SPLIT DAGOR-TYPE OF SYMMETRICAL COPYING LENS SYSTEM. JULY 13, 1971. CAN. 0929389.
3,640,615.—XEROGRAPHIC REPRODUCING APPARATUS. FEB. 8, 1972. ARG. 0174792, AUS. 0428440, BEL. 0723948, CAN. 0884439, FRA. 1596660, GRB. 1223428, ITL. 0847541, JAP. 0992414, MEX. 0108966, PNM. 0001806, SPN. 0360210, SWD. 0352456, VZL. 0023711.
3,652,157.—MICROFILM PROJECTION APPARATUS. MAR. 28, 1972. CAN. 0937797, GRB. 1324097.
3,655,284.—LONGITUDINALLY INSENSITIVE LENS STRIP IMAGING DEVICE. APR. 11, 1972.
3,670,633.—RECORDING APPARATUS. JUNE 20, 1972.
3,778,147.—ELECTROSTATIC REPRODUCTION MACHINE HAVING SLEECTSBLE MAGNIFICATIONRATIOS. DEC. 11, 1973. CAN. 989464.
3,788,740.—IMAGING SYSTEM. JAN. 29, 1974.
3,975,289.—CHARGE TRANSFER COMPLEXEX OF FERRONCENES HAVING LIGHT FILLING PROPERTIES. AUG. 17, 1976.
3,994,580.—OPTICAL SYSTEM FOR SCANNING DURING RECIPROCAL MOTION NOV. 30, 1976.
4,008,958.—OPTICAL SYSTEM FOR EFFECTED IMAGE ROTATION. FEB. 22, 1977.
4,025,541.—CHARGE TRANSFER OF FERROCENES HAVING LIGHT FILTERING PROPERTIES. MAY 24, 1977.
4,029,409.—MULTI-MODE OPTICAL SCANNING SYSTEM. JUNE 14, 1977. BEL. 0843153, HAT 0001524
4,088,401.—OPTICAL SYSTEM FOR ALTERNATIVELY PROJECTING AD JACENT IMAGES OF ADJACENT OBJECTS OR DOUBLE I. MAY 9, 1978.
4,103,991.—OPTICAL SYSTEM FOR SCANNING DURING RECIPROCAL MOTION PROVIDING 180 ROTATION OF IMAGE. AUG. 1, 1978
4,134,670.—HIGH CAPACITY PHOTOCOPY OPTICAL SCANNING SYSTEM. JAN. 16, 1979.

Class 4B 1A 1

3,544,190.—LENS STRIP OPTICAL SCANNING SYSTEM. DEC. 1, 1970. CAN. 0904070, GRB. 1278336.
3,584,950.—LENS STRIP OPTICAL SCANNING SYSTEM. JUNE 15, 1971.
3,584,952.—LENS STRIP OPTICAL SCANNING SYSTEM - REISSUED D 2074R. JUNE 15, 1971.
3,584,953.—SHORT FOCAL OPTICAL LENGTH SCANNING SYSTEM. JUNE 15, 1971.
3,650,621.—OPTICAL IMAGING SYSTEM. MAR. 21, 1972. BEL. 0747978, CAN. 0927470, FRA. 7011548, GRB. 1297907, ITL. 0898936, JAP. 0731225.
3,881,369.—BI-AXIAL POSITIONER. MAY 6, 1975.
3,912,392.—SHORT FOCAL LENGTH OPTICAL SCANNING SYSTEM. OCT. 14, 1975.

Class 4B 1A 2

3,496,846.—SCRIPTWRITER USING FIBER OPTIC BUNDLE. FEB. 24, 1970.
3,560,085.—APPARATUS FOR GRAPHIC DISTORATION. FEB. 2, 1971.
3,681,777.—RECORDING APPARATUS. AUG. 1, 1972.

Class 4B 1A 3

3,120,790.—XEROGRAPHIC EXPOSURE APPARATUS. FEB. 11, 1964. AUS. 0270483, FRA. 1333280, GER. 1204066, GRB. 1019291, ITL. 0674895, JAP. 0468454.
3,497,296.—XEROGRAPHIC EXPOSURE APPARATUS. FEB 24, 1970.
3,535,036.—APPARATUS FOR FORMING HALF-TONE LINE SCREEN WITH A LENS. OCT. 20, 1970. CAN. 0909309, GRB. 1253887.
3,540,806.—HALF TONING METH AND APPARATUS FOR SOLID AREA COVERAG. NOV. 17, 1970. CAN. 0892754, GRB. 1253888.
3,580,671.—EXPOSURE APPARATUS. MAY 25, 1971. CAN. 0912104, GRB. 1276010.
3,905,822.—COMPOUND SCREEN FOR OBJECT SCREENING. SEPT. 16, 1975.
3,912,510.—ELECTROPHOTOGRAPHIC PROCESS EMPLOYING A COMPOUND DOCUMENT SCREEN. OCT. 14, 1975.
3,914,040.—REVERSIBLE SCREEN FOR ELECTROPHOTOGRAPHIC PRINTING. OCT. 21, 1975.
3,958,877.—HALF-TONE SCREEN WITH CLEANING MEANS FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. MAY 25, 1976.
3,961,847.—AN ARCUATE SCREEN FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. JUNE 8, 1976.
3,961,848.—AN ELECTROPHOTOGRAPHIC PRINTING MACHINE WITH HALFTONE SCREEN CLEANING. JUNE 8, 1976.
3,963,342.—CURVED SCREEN. JUNE 15, 1976.
3,973,953.—IMAGING METHOD INCLUDING EXPOSURE OF PHOTOCONDUCTIVE IMAGING MEMBER THROUGH LENTICULAR LENS ELE. AUG. 10, 1976. STZ. 0557051.

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3,973,954.—IMAGING METHOD INCLUDING EXPOSURE OF PHOTOCONDUCTIVE IMAGING MEMBER THROUGH LENTICULAR LENS ELE. AUG. 10, 1976. STZ. 0557051.
3,973,957.—IMAGING METHOD INCLUDING EXPOSURE OF DEFORMATION IMAGING MEMBER THROUGH LENTICULAR LENS ELEMENT. AUG. 10, 1976.
3,973,958.—IMAGING METHOD INCLUDING EXPOSURE OF DEFORMATION IMAGING MEMBER THROUGH LENTICULAR ELEMENT. AUG. 10, 1976.
4,003,649.—ELECTROPHOTOGRAPHIC HALFTONE PRINTING MACHINE EMPLOYING A PHASE SCREEN. JAN. 18, 1977.
4,007,981.—DUAL MODE ELECTROSTATOGRAPHIC PRINTING MACHINE. FEB. 15, 1977.
4,012,137.—AN OPTICAL SYSTEM HAVING A ROTATING SCREEN. MAR. 15, 1977.
4,013,355.—NOTCH FILTER FOR COLOR TRANSPARENCY COPYING MACHINES. MAR. 22, 1977.
4,014,030.—HALF-TONE IMAGING WITH FLYING SPOT SCANNER SYSTEM. MAR. 22, 1977.
4,014,607.—REMOVABLE SCREENING SYSTEM FOR A TRANSPARENCY REPRODUCTION MACHINE. MAR. 29, 1977.
4,025,181.—A SCREEN CLEANING DEVICE. MAY 24, 1977.
4,035,070.—APPARATUS AND METHOD FOR OPTICAL GENERATION OF A STRUCTURED CHARGE-DISCHARGE PATTERN ON A PHOTO. JULY 12, 1977.
4,047,810.—DUAL MODE COPYING MACHINE. SEPT. 13, 1977.
4,072,414.—SCREEN FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. FEB. 7, 1978.
4,080,055.—A HALF-TONE COLOR COPIER. MAR. 21, 1978.
4,083,632.—MULTI FREQUENCY SCREEN. APR. 11, 1978.
4,090,786.—MULTI-COLOR SCREEN FOR ELECTROPHOTOGRAPHIC PRINTING. MAY 23, 1978.
4,095,889.—EXPOSURE SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. JUNE 20, 1978.
4,108,654.—COLOR ELECTROPHOTOGRAPHIC PROCESS EMPLOYING A DOCUMENT SCREEN. AUG. 22, 1978. FRA. 7514227. GRB. 1490898.
4,111,542.—COLLATING SYSTEM FOR OPAQUE DOCUMENTS AND SLIDE REPRODUCTIONS. SEPT. 5, 1978.
4,130,841.—VARIABLE FREQUENCY HALF-TONE IMAGING APPARATUS. DEC. 19, 1978.

Class 4B 1A 4

3,424,525.—MICROFILM COPIER ATTACHMENT. JAN. 28, 1969.
3,542,468.—MICROFILM ENLARGER-COPIER MICROFILM ATTACHMENT. NOV. 24, 1970. CAN. 0858250.
3,547,533.—MICROFILM REPRODUCTION MACHINE. DEC. 15, 1970. BEL. 0689227, CAN. 0891072, FRA. 1498788, GRB. 1160904, ITL. 0794772, MEX. 0095144.
4,046,473.—PHOTORECEPTOR METHOD AND SYSTEM. SEPT. 6, 1977.

Class 4B 2

3,220,324.—PHOTOCONDUCTIVELY CONTROLLED CORONA CHARGING. NOV. 30, 1965. CAN. 0710976, GER. 1243967, GRB. 1034009, JAP. 0651092.
3,254,998.—INDUCTION IMAGE FORMATION. JUNE 7, 1966. CAN. 0740576, FRA. 1357220, GER. 1276445, GRB. 1024985, JAP. 0451689.
3,307,034.—TWO-WIRE CORONA DISCHARGE SYSTEM FOR SINGLE-STEP ELECTROSTATIC IMAGE FORMATION. FEB. 28, 1967. CAN. 0768802, FRA. 1416275, GER. 1275864, GRB. 1055416, ITL. 0744235, JAP. 0491997.
3,394,002.—CHARGE TRANSFER WITH LIQUID LAYERS. JULY 23, 1968. CAN. 0840028, GRB. 1126048, JAP. 0524527.
3,698,807.—DISPLAYING AND PRINTING APPARATUS. OCT. 17, 1972. CAN. 0963521, GRB. 1376814.

Class 4B 3

3,283,651.—INFORMATION ENCODING DEVICE. NOV. 8, 1966. CAN. 0859923, GRB. 1096645, JAP. 0547197.
3,532,425.—GRAPHIC DISTORTION APPARATUS. OCT. 6, 1970.
3,560,085.—APPARATUS FOR GRAPHIC DISTORATION. FEB. 2, 1971.
3,584,950.—LENS STRIP OPTICAL SCANNING SYSTEM. JUNE 15, 1971.
3,584,953.—SHORT FOCAL OPTICAL LENGTH SCANNING SYSTEM. JUNE 15, 1971.
3,725,059.—METHOD OF CLEANING AN ELECTROSTATOGRAPHIC SURFACE. APR. 3, 1973. GRB. 1337282.
3,862,801.—METHOD OF CLEANING AN ELECTROSTATOGRAPHIC IMAGING SURFACE. JAN. 28, 1975. GRB. 1337282.
4,066,353.—HALF TONE IMAGING SYSTEM. JAN. 3, 1978.
4,068,940.—VARIABLE CONTRAST OPTICAL SCREENING SYSTEM. JAN. 17, 1978.

Class 4B 4

3,283,651.—INFORMATION ENCODING DEVICE. NOV. 8, 1966. CAN. 0859923, GRB. 1096645, JAP. 0547197.
3,432,231.—EXPOSURE CONTROL DEVICE. MAR. 11, 1969.
3,473,455.—EXPOSURE REGISTRATION APPARATUS. OCT. 21, 1969.
3,521,950.—XEROGRAPHIC REPRODUCING APPARATUS. JULY 28, 1970. ARG. 0184148, ATR. 0317675, AUS. 0441739, BEL. 0713876, CAN. 0877511, CHL. 0024535, DNK. 0129304, FRA. 1558225, GRB. 1231622, GRK. 0037839, IND. 0124668, ISR. 0029824, ITL. 0831700, JAM. 0001853, JAP. 0774498, LXB. 0055912, MEX. 0102085, NOR. 0131313, NZL. 0159801, PRU. 0009366, PTG. 0049474, SAF. 68/2518, SPN. 0352885, STZ. 0505015, SWD. 7012263, UAR. 0008668, URG. 0009239, VZL. 0025077.
3,586,849.—ILLUMINATION SYSTEM. JUNE 22, 1971. ARG. 0183139, ATR. 0303522, AUS. 0428629, BEL. 0733400, BRA. 6908480, CAN. 0903730, CHL. 0024870, FRA. 6917011, GRB. 1260688, ITL. 0864185, MEX. 0111515, NOR. 0125934, NZL. 0156507, PNM. 0001430, PRU. 0010320, PTG. 0051752, SAF. 0693689, SPN. 0367616, STZ. 0758269, SWD. 0354924, VZL. 0025067.
3,697,160.—CONTINUOUS IMAGING APPARATUS. OCT. 10, 1972.
3,995,950.—EXPOSURE SYSTEM FOR ELECTROSTATIC MACHINES. DEC. 7, 1976.
4,111,541.—EXPOSURE SYSTEM FOR ELECTROSTATIC REPRODUCTION MACHINES. SEPT. 5, 1978.

Class 4B 5

3,094,910.—REFLEX XEROGRAPHIC APPARATUS. JUNE 25, 1963. CAN. 0704293, GRB. 0997415.
3,212,417.—REFLEX EXPOSURE SYSTEM. OCT. 19, 1965. CAN. 0733682, GRB. 1052783, JAP. 0487026.
3,278,302.—PHOSPHORESCENT SCREEN REFLEX. OCT. 11, 1966. CAN. 0748828.

Class 4B 6

3,076,392.—XEROGRAPHIC REPRODUCING APPARATUS. FEB. 5, 1963. CAN. 0689623, FRA. 1271754, GER. 1209418, GRB. 0962658.
3,355,236.—AUTOMATIC OPTICAL CONTROL APPARATUS. NOV. 28, 1967. CAN. 0771917.
3,542,467.—XEROGRAPHIC REPRODUCING APPARATUS. NOV. 24, 1970. ARG. 0180116, AUS. 0442029, BEL. 0731552, BRA. 6908056, CAN. 0877451, FRA. 6911558, GRB. 1257103, ITL. 0857659, JAP. 0668806, MEX. 0108892, SPN. 0366050, SWD. 0346397, VZL. 0023746.
3,765,027.—ION LENS RECORDING SYSTEM. OCT. 9, 1973.
3,848,996.—PHOTOCOMPOSING APPARATUS. NOV. 19, 1974. BEL. 0815043.
3,901,585.—ZOOM LENS ASSEMBLY. AUG. 26, 1975. GRB. 1443481.
3,909,103.—LENS SCAN MECHANISM. SEPT. 30, 1975.
3,947,188.—VARIABLE CONJUGATE OPTICAL SYSTEM. MAR. 30, 1976.
3,967,896.—VARIABLE EDGE FADEOUT APP FOR ELECTROSTATIC REPRODUCTION MACHINE. JULY 6, 1976.
3,998,540.—REPOSITIONING SYSTEM FOR VIEWING AND PROJECTION ELEMENTS OF A REPRODUCING APPARATUS. DEC. 21, 1976.
4,013,361.—OPTICAL APP AND REPRODUCING MACHINE. MAR. 22, 1977. BEL. 0843158.
4,027,963.—MULTI-MODE REPRODUCING APPARATUS. JUNE 7, 1977. BEL. 0843154, HAT. 0001534.
4,029,411.—VARIABLE MAGNIFICATION COPIER. JUNE 14, 1977. BEL. 0839792, SPN. 0445641.
4,033,691.—VARIABLE MAGNIFICATION REPRODUCING APPARATUS. JULY 5, 1977.
4,033,692.—MULTI-MODE REPRODUCING MACHINE. JULY 5, 1977. HAT. 0001504.
4,046,467.—ZOOM LENS COPIER. SEPT. 6, 1977.

4,053,221.—MULTI-MODE REPRODUCING APPARATUS. OCT. 11, 1977.
4,060,324.—LENS SWITCHING MECHANISM FOR USE IN COPYING MACHINE. NOV. 29, 1977.
4,076,388.—ZOOM LENS ASSEMBLY. FEB. 28, 1978. GRB. 1443481.
4,076,416.—ILLUMINATION SLIT FOR AND A PROCESS OF USE THEREOF IN A REPRODUCING MACHINE. FEB. 28, 1978. HAT. 1584.
4,076,417.—INTERLOCKING APPARATUS FOR AN OPTICAL SYSTEM AND REPRODUCING MACHINE. FEB. 28, 1978. HAT. 1604.
4,101,213.—ZOOM LENS COPIER. JULY 18, 1978

Class 4B 6A

3,318,186.—OPTICAL SYSTEM FOR REPRODUCTION MACHINES. MAY 9, 1967. CAN. 0798056, FRA. 1467332, GRB. 1139231, ITL. 0758313, JAP. 0512656, MEX. 0085288, SWD. 6912062.
3,454,335.—SCANNING SYSTEM. JULY 8, 1969. BEL. 0708647, CAN. 0853453, FRA. 1549127, GRB. 1207850, ITL. 0819656, JAP. 0591210.
3,476,478.—APPARATUS FOR CHANGING MAGNIFICATION OF PHOTOCOPIER W/O CHANGING CONJUGATE LENGTH OF OPTICAL SY. NOV. 4, 1969. ARG. 0172460, AUS. 0415808, BEL. 0708650, BRA. 6795668, CAN. 0845405, FRA. 1552364, GER. 1297981, GRB. 1223427, ITL. 0821929, MEX. 0100019, VZL. 0023689.
3,510,219.—OPTICAL ALIGNMENT SYSTEM. MAY 5, 1970 ARG. 0172455, BRA. 6793791, CAN. 0881018, CHL. 0023570, GRB. 1206966, MEX. 0101166, PRU. 0009329, SPN. 0360896, STZ. 0501233, SWD. 0359168, URG 0008831, VZL. 0025783.
3,521,950.—XEROGRAPHIC REPRODUCING APPARATUS. JULY 28, 1970. ARG. 0184148, ATR. 0317675, AUS 0441739, BEL. 0713876, CAN. 0877511, CHL. 0024535, DNK. 0129304, FRA. 1558225, GRB. 1231622, GRK 0037839, IND. 0124668, ISR. 0029824, ITL. 0831700, JAM. 0001853, JAP. 0774498, LXB. 0055912, MEX 0102085, NOR. 0131313, NZL. 0159801, PRU. 0009366, PTG. 0049474, SAP. 68/2518, SPN. 0352885, STZ. 0505015, SWD. 7012263, UAR. 0008668, URG. 0009239, VZL. 0025077.
3,524,704.—MULTI-LENGTH DOCUMENT RECORDING APPARATUS. AUG. 18, 1970.
3,591,256.—VARIABLE MAGNIFICATION LENS SYSTEM. JULY 6, 1971. BEL. 0731553, CAN. 0881019, FRA 6911559, GRB. 1234515, ITL. 0857660.
3,591,277.—XEROGRAPHIC REPRODUCING APPARATUS. JULY 6, 1971. AUS. 0428584, BEL. 0723949, CAN 0869628, CZC. 0157052, FRA. 1591801, GER. 0989774, GRB. 1223429, ITL. 0856815, SWD. 0348060, USR. 0465805.
3,600,066.—OPTICAL ASSEMBLY WITH SUPPLEMENTAL LENS MEANS. AUG. 17, 1971. CAN. 0943792, GRB. 1261159, JAP. 0728824.
3,817,599.—PROJECTION LENS WITH ADD LENS ELEMENTS. JUNE 18, 1974.
3,912,374.—SIX COMPONENT ZOOM LENS. OCT. 14, 1975.
4,047,811.—AVAILABLE LIGHT MARGINAL ILLUMINATION SYSTEM. SEPT. 13, 1977.
4,056,308.—VARIABLE FOCAL LENGTH REFLECTOR LENS SYSTEM. NOV. 1, 1977.
4,057,342.—ILLUMINATION SLIT FOR A REPRODUCING MACHINE. NOV. 8, 1977.
4,061,419.—VARIABLE MAGNIFICATION LENS SYSTEM. DEC. 6, 1977.
4,076,389.—ZOOM LENS MOUNT AND MECHANISM. FEB. 28, 1978.

Class 4B 7

3,470,797.—DISPLAY DEVICE. OCT. 7, 1969.
3,472,136.—CHARACTER GENERATOR. OCT. 14, 1969. CAN. 0884500, GRB. 1191881.
3,473,455.—EXPOSURE REGISTRATION APPARATUS. OCT. 21, 1969.
3,523,725.—XEROGRAPHIC REPRODUCING APPARATUS. AUG. 11, 1970. CAN. 0917730, GRB. 1271862.
3,615,132.—METHOD OF PRINTING MULTIPLE COPIES OF COMPOSITE INFORMATION ON STANDARD SIZE COPY SHEETS. OCT. 26, 1971.
3,620,618.—MULTIPLE INPUT COPYING APPARATUS. NOV. 16, 1971.
3,775,007.—FORMS REPRODUCTION APPARATUS. NOV. 27, 1973.
3,827,062.—OPTICAL ARRANGEMENT FOR HIGH SPEED PRINTOUT SYSTEM. JULY 30, 1974.
4,157,869.—TRANSPARENCY REPRODUCING MACHINE. JUNE 12, 1979.

Class 4C

3,188,208.—SPECTRAL CONTRAST CONTROL IN XEROGRAPHY. JUNE 8, 1965.
3,432,232.—ILLUMINATION SYSTEM. MAR. 11, 1969 CAN. 0846423, JAP. 0534763.
3,438,705.—AUTOMATIC XEROGRAPHIC DEVELOPMENT CONTROL. APR. 15, 1969. GRB. 1207830.
3,852,782.—IMAGING SYSTEM. DEC. 3, 1974
3,901,189.—MAGNETIC BRUSH DEVELOPING APPARATUS. AUG. 26, 1975.
3,917,393.—VARIOSLIT. NOV. 4, 1975. BEL. 0820132.
3,970,382.—A SPATIALLY SELECTIVE OPTICAL SYSTEM. JULY 20, 1976. FRA. 7421348
3,975,289.—CHARGE TRANSFER COMPLEXE OF FERRONCENES HAVING LIGHT FILLING PROPERTIES. AUG. 17, 1976.
3,997,259.—APPARATUS FOR REDUCING IMAGE BACKGROUND IN ELECTROSTATIC REPRODUCTION MACHINES. DEC. 14, 1976.
4,007,326.—ELECTRONIC COPY ANALYSIS. FEB. 8, 1977
4,025,541.—CHARGE TRANSFER OF FERROCENES HAVING LIGHT FILTERING PROPERTIES. MAY 24, 1977
4,066,351.—VARIABLE ILLUMINATION OPTICAL SYSTEM. JAN. 3, 1978.
4,118,122.—METHOD OF RENDERING OBJECTS UNCOPYABLE BY PHOTOCOPY PROCESSES. OCT. 3, 1978
4,162,845.—COPIER FOR GREATER THAN STANDARD LENGTH DOCUMENTS. JULY 31, 1979

Class 5

3,942,266.—METHOD AND APPARATUS FOR FIXING TONER IMAGES. MAR. 9, 1976.
4,043,052.—METHOD AND APPARATUS FOR FIXING TONER IMAGES. AUG. 23, 1977.

Class 5A 1

3,094,248.—XEROGRAPHIC DEVELOPING APPARATUS JUNE 18, 1963. CAN. 0678004, GRB 0985306
3,276,426.—CLOSED AEROSOL DEVELOPMENT. OCT 4, 1966.
3,518,969.—DEVELOPMENT APPARATUS, JULY 7, 1970 CAN. 0852127, GRB. 1259879
3,791,730.—APPARATUS FOR DEVELOPING ELECTROSTATIC LATENT IMAGES. FEB. 12, 1974
3,795,443.—XEROGRAPHIC DEVELOPMENT. MAR. 5, 1974. GRB. 1255568, JAP. 0721852.
4,096,826.—MAGNETIC BRUSH DEVELOPMENT SYSTEM FOR FLEXIBLE PHOTORECEPTORS JUNE 27, 1978.

Class 5A 1A

3,060,131.—POWDER CLOUD GENERATING APPARATUS. OCT. 23, 1962.
3,129,113.—AUTOMATIC POWDER APPLICATOR APPARATUS. APR. 14, 1964.
3,640,246.—DEVELOPMENT APPARATUS FOR LATENT ELECTROSTATIC IMAGE. FEB. 8, 1972. ATR. 0319044, AUS. 0457007, BEL. 0758632, CAN. 0917404, FRA. 7042231, GRB. 1336747, ITL. 0909113, JAP. 0815548, SPN. 0385187, STZ. 0527453, SWD. 0363411, USR. 0505386.
3,646,910.—DEVELOPMENT APPARATUS FOR LATENT ELECTROSTATIC IMAGES. MAR. 7, 1972.
3,924,568.—APPARATUS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES. DEC. 9, 1975. BEL. 0809747, GRB. 1434673.
3,974,796.—DUAL MODE APPARATUS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES. AUG. 17, 1976
4,033,292.—APPARATUS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES. JULY 5, 1977.

Class 5A 2

3,160,524.—APPARATUS FOR CHARGING POWDER PARTICLES AND APPLYING THE CHARGED PARTICLES TO A RECEIVING MEMBER. DEC. 8, 1964. CAN. 0779861, GRB. 1026457.
3,257,223.—ELECTROSTATIC POWDER CLOUD XEROGRAPHIC DEVELOPMENT METHOD AND APPARATUS. JUNE 21, 1966. CAN. 0756559, GRB. 1028900, JAP. 0460474.
3,284,224.—CONTROLLED XEROGRAPHIC DEVELOPMENT. NOV. 8, 1966. CAN. 0751349, GRB. 1038801, JAP. 0640353.
3,357,403.—POWDER CLOUD DEVELOPMENT APPARATUS. DEC. 12, 1967.

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3,470,009.—POWDER CLOUD DEVELOPMENT OF ELECTROSTATIC IMAGES. SEPT. 30, 1969. CAN. 0820240, FRA. 1461941, GRB. 1130452, HOL. 0142253, ITL. 0750148, JAP. 0512653, MEX. 0085176.
3,707,390.—METHOD FOR DEVELOPING ELECTROSTATIC LATENT IMAGES. DEC. 26, 1972.
3,767,446.—DEVELOPMENT METHOD WITH OSCILLATING BRUSH PAD. OCT. 23, 1973

Class 5A 3

RE 28,183.—POWDER CLOUD. OCT. 1, 1974. ARG. 0119221, BEL. 0764300, CAN. 0939137, FRA. 7110037, GRB. 1351471, ITL. 0921294, MEX. 0119823, VZL. 0032790.
RE 28,193.—POWDER CLOUD XEROGRAPHIC DEVELOPMENT APPARATUS. OCT. 8, 1974. ARG. 0119221, BEL. 0764300, CAN. 0939137, FRA. 7110037, GRB. 1351471, ITL. 0921294, MEX. 0119823, VZL. 0032790.
3,129,850.—POWDER CLOUD GENERATING APPARATUS. APR. 21, 1964. CAN. 0693933, GER. 1497044, GRB. 1001237, JAP. 0436042.
3,648,901.—POWDER CLOUD XEROGRAPHIC DVLMNT APP-REISSUED AS 28183 AND 28193 10/74. MAR. 14, 1972. ARG. 0119221, BEL. 0764300, CAN. 0939137, FRA. 7110037, GRB. 1351471, ITL. 0921294, MEX. 0119823, VZL. 0032790.
3,799,113.—HYBRID DEVELOPMENT OF ELECTROSTATIC LATENT IMAGE. MAR. 26, 1974. CAN. 0980634, GRB. 1411708.
4,057,340.—SINGLE COMPONENT COLOR DEVELOPMENT SYSTEM. NOV. 8, 1977.

Class 5A 3A

3,060,131.—POWDER CLOUD GENERATING APPARATUS. OCT. 23, 1962.

Class 5A 3B

3,599,604.—XEROGRAPHIC DEVELOPMENT APPARATUS. AUG. 17, 1971. ARG. 0187552, ATR. 0300574, AUS. 0427548, BEL. 0726572, BUL. 0017289, CAN. 0882577, DNK. 0122194, EGR. 0074431, EIR. 0032989, FRA. 1597322, GRB. 1248671, GRK. 0039920, IND. 0120485, ISR. 0031892, ITL. 0854007, LXB. 0058261, MEX. 0108936, NZL. 0155879, PAK. 0121035, PLP. 0006856, PNM. 0001804, PTG. 0051418, RHD. 1406967, RMN. 0054927, SAF. 0069181, SPN. 0362359, STZ. 0493015, UAR. 0009253, VTM. 0001857, VZL. 0023728.
3,633,544.—TURBO-CLOUD DEVELOPMENT. JAN. 11, 1972. CAN. 0934959, GRB. 1322363, JAP. 0741518.
3,670,701.—TWO STEP ORBITAL PAD DEVELOPMENT. JUNE 20, 1972. CAN. 0092849, GRB. 1313870, JAP. 0743834.
3,882,822.—APPARATUS FOR DEVELOPING ELECTROSTATIC LATENT IMAGE. MAY 13, 1975.

Class 5A 5

3,345,293.—COLORED ELECTROSTATOGRAPHIC TONERS CONTAINING ORGANIC DYE PIGMENTS CAN. 0834674, GRB. 107147, JAP. 0788652.
3,483,679.—FILTER APPARATUS. DEC. 16, 1969. BEL. 0708648, CAN. 0853503, FRA. 1552363, ITL. 0837050.
3,697,263.—METHOD OF CLEANING RESIDUAL LIQUID DEVELOPER FROM ELECTROPHOTOGRAPHIC PLATES. OCT. 10, 1972. ARG. 0181940, AUS. 0455091, BEL. 0758060, CAN. 0906334, EGR. 0087483, FRA. 7041623, GRB. 1328406, ITL. 0916264, JAP. 0749381, MEX. 0116862, SPN. 0385000, STZ. 0519186, SWD. 0365624, TIW. 0006850, USR. 0349206, VZL. 0032211.
3,924,568.—APPARATUS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES. DEC. 9, 1975. BEL. 0809747, FRA. 7401161, GRB. 1434673, ITL. 1003370.
3,937,570.—CLOUD SUPPRESSION IN AN ELECTROSTATIC COPYING APPARATUS. FEB. 10, 1976. CAN. 0974751, GRB. 1396922.

Class 5B

3,103,445.—METHOD OF DEVELOPING AN ELECTROSTATIC LATENT IMAGE ON A XEROGRAPHIC PLATE. SEPT. 10, 1963, GRB. CAN. 0705363, GRB. 0956358.
3,251,706.—XEROGRAPHIC DEVELOPMENT METHOD AND APPARATUS. MAY 17, 1966. CAN. 0629542, FRA. 1120534, GER. 1020234, GRB. 0774433.
3,357,402.—ROTARY BRUSH DEVELOPMENT. DEC. 12, 1967. ARG. 0167329, ATR. 0279354, AUS. 0416581, BEL. 0708497, BRA. 0088306, CAN. 0859029, FRA. 1548189, GER. 1597901, GRB. 1200068, HUN. 0156541, ITL. 0819626, JAP. 0608703, MEX. 0106260, PLD. 0071357, SPN. 0348633, SWD. 0328190, VZL. 0023686.
3,542,466.—DEVELOPMENT APPARATUS. NOV. 24, 1970 AUS. 0428620, BEL. 0725611, CAN. 0884213, FRA. 1598505, GRB. 1203167, ITL. 0870661, JAP. 0641479, SPN. 0361653, SWD. 0343694.
3,558,339.—METHOD OF AND APPARATUS FOR STIPPLING. JAN. 26, 1971. CAN. 0871649, GRB. 1266969.
3,574,301.—DEVELOPING APPARATUS. APR. 13, 1971. AUS. 0449350, BEL. 0748073, CAN. 0873249, FRA. 7011549 GRB. 1303493, ITL. 0899146, JAP. 0715126, STZ. 0518579, SWD. 0356379, USR. 0331581.
3,592,167.—APPARATUS FOR LOADING TONER ON A DEVELOPING BRUSH. JULY 13, 1971.
3,613,638.—MATERIALS FOR FIBROUS DEVELOPMENT. OCT. 19, 1971. CAN. 0910736.
3,632,370.—MULTIPLE BRUSH DEVELOPMENT. JAN. 4, 1972.
3,636,924.—FUR BRUSH DEVELOPING APPARATUS. JAN. 25, 1972. CAN. 0912811, GRB. 1340060, JAP. 0751882.
3,638,613.—TONER DEVELOPER SYSTEM. FEB. 1, 1972. AUS. 0445403, BEL. 0747124, CAN. 0889762, EGR. 0081783, FRA. 7007651, GRB. 1294603, ITL. 0898243, SPN. 0377302, STZ. 0520960, SWD. 0354363, TIW. 0006827.
3,687,106.—DONOR APPARATUS AND METHOD. AUG. 29, 1972. ARG. 0185079, BEL. 0753207, CAN. 0911706, FRA. 7027124, GRB. 1314862, ITL. 0900444, JAP. 0733285, MEX. 0117318, PNM. 0002237, VZL. 0027517.
3,692,402.—MATERIALS FOR FIBROUS DEVELOPMENT AND CLEANING MEMBER. SEPT. 19, 1972.
3,847,306.—DEVELOPING APPARATUS. NOV. 12, 1974. CAN. 0966998, GRB. 1353651.

Class 5C

3,648,657.—ELECTROSTATIC IMAGE DEVELOPMENT APPARATUS. MAR. 14, 1972.
3,805,739.—CONTROLLING MULTIPLE VOLTAGE LEVELS FOR ELECTROSTATIC PRINTING. APR. 23, 1974. CAN. 0972552, GRB. 1382710.
3,854,449.—DEVELOPMENT APPARATUS. DEC. 17, 1974. ARG. 0195893, BEL. 0797447, CAN. 0982886, FRA. 7243003, GRB. 1435761, ITL. 0987768, MEX. 0130638, SAF. 0733407, SPN. 0414805, STZ. 0551030, SWD. 7307101, VZL. 0032067.
3,967,892.—A DEVELOPMENT SYSTEM. JULY 6, 1976.
3,981,272.—MAG BRUSH HOUSING WITH DETACHABLE SUMP SECTION. BEL. 0835755. SEPT. 21, 1976.
3,998,537.—SPLIT DEVELOPER HOUSING WITH INTERLOCKED FLOW GATE & CATCH. DEC. 21, 1976. BEL. 0835370.
4,027,621.—DEVELOPING SYSTEM FOR ELECTROSTATIC REPRODUCTION MACHINES. JUNE 7, 1977.
4,039,102.—DEVELOPER DOOR WITH USE COUNTER ON DOOR. AUG. 2, 1977.
4,095,883.—MAGNETIC MIXING APPARATUS AND PROCESS. JUNE 20, 1978.
4,118,115.—ROLL DEVELOPER DRIVE. OCT. 3, 1978.
4,146,323.—AUGER FOR A DEVELOPMENT SYSTEM. MAR. 27, 1979.

Class 5C 1

3,113,042.—XEROGRAPHIC APPARATUS WITH MAGNETIC CONVEYOR. DEC. 3, 1963. CAN. 0738917, GRB. 0987985.
3,176,652.—XEROGRAPHIC DEVELOPING APPARATUS. APR. 6, 1965. CAN. 0737851, GRB. 1018787, JAP. 0627140.
3,570,453.—DEVELOPMENT APPARATUS. MAR. 16, 1971. ARG. 0181813, AUS. 0429322, BEL. 0737102, CAN. 0885918, CZC. 0161861, EGR. 0081317, FRA. 6927184, GRB. 1256282, ITL. 0869726, JAP. 0716364, SPN. 0370289, STZ. 0496263, SWD. 0353165, TIW. 0005357, USR. 0380031.
3,572,288.—DEVELOPMENT APPARATUS. MAR. 23, 1971. CAN. 0885917.
3,572,289.—MAGNETIC BRUSH DEVELOPMENT APPARATUS. MAR. 3, 1971.
3,575,139.—ELECTROSTATIC MAGNETIC DEVELOPER UNIT GATING APPARATUS. APR. 20, 1971. CAN. 0930538.
3,583,364.—DEVELOPMENT APPARATUS. JUNE 8, 1971. BEL. 0738574, CAN. 0883725, FRA. 6930427, GRB. 1273187, ITL. 0871550, JAP. 0674394.
3,608,522.—XEROGRAPHIC DEVELOPMENT CONTROL APPARATUS. SEPT. 28, 1971. CAN. 0911704.

3,640,248.—ELECTROSTATIC MAGNETIC DEVELOPING APPARATUS—MULTIPLE MAGNETIC BRUSH UNIT FEB. 8, 1972. ARG. 0184080, ATR. 0312419, AUS. 0437486, BEL. 0751486, BRA. 0088030, CAN. 0929337, CHL. 0026193, EGR. 0084331, FRA. 7020260, GRB 1251477, ITL. 0893838, MEX. 0117951, NOR. 0133049, PNM. 0002537, SAF. 0703774, SPN. 0380378, STZ 0509614, SWD. 0359664, TIW. 0007168, USR 0419061, VZL. 0025834.
3,641,980.—DEVELOPMENT APPARATUS. FEB. 15, 1972 ARG. 0185081, AUS. 0445430, BEL. 0757698, CAN. 0913354, EGR. 0085713, FRA. 7038237, GRB. 1273456, ITL. 0909031, JAP. 0720627, MEX. 0118187, SPN 0384576, STZ. 0516183, SWD. 0362510, TIW. 0006205.
3,665,891.—MAGNETIC BRUSH DEVELOPMENT APPARATUS. MAY 30, 1972. CAN. 0914904, GRB 1347138, JAP. 783770.
3,683,406.—MAGNETIC INCREMENTAL CASCADE DEVELOPMENT SYSTEM. AUG. 8, 1972. CAN. 0945200, GRB. 1335995, JAP. 0752521.
3,690,912.—METHOD FOR MAGNETIC DEVELOPMENT OF LATENT ELECTROSTATIC IMAGE. SEPT. 12, 1972
3,697,050.—CROSS MIXING BAFFLE. OCT. 10, 1972. CAN 0951110.
3,709,713.—METHOD FOR MAGNETIC DEVELOPMENT. JAN. 9, 1973.
3,724,422.—MAGNETIC BRUSH DEVELOPING APPARATUS. APR. 3, 1973. ARG. 0190744, AUS. 0457858, BEL. 0776598, CAN. 0951111, EGR. 0097962, FRA 7145341, GRB. 1373010, ITL. 0943877, MEX. 0124647, SPN. 0397854, SWD. 0365880, USR. 0459904.
3,788,275.—MAGNETIC SHIELDING APPARATUS. JAN. 29, 1974. BEL. 0801242, CAN. 0973703, GRB. 1438332, ITL. 0990692.
3,828,728.—XEROGRAPHIC DEVELOPMENT SYSTEM. AUG. 13, 1974. BEL. 0791193, CAN. 0980635, FRA 7240058, GRB. 1413337, ITL. 0970350, SWD. 7214311.
3,866,564.—MAGNETIC BRUSH DEVELOPING APPARATUS FOR COPIERS. FEB. 18, 1975.
3,872,830.—MAGNETIC BRUSH DEVELOPING APPARATUS. MAR. 25, 1975.
3,880,517.—REPRODUCTION MACHINE DEVELOPER APPARATUS. APR. 29, 1975.
3,880,518.—FLOATING DEVELOPER PLATEN FOR REPRODUCTION APPARATUS. APR. 29, 1975.
3,887,367.—METHOD FOR TEMPERATURE STABLIZING PHOTORECEPTORS. JUNE 3, 1975.
3,893,815.—MAGNETIC BRUSH SUPPORT MEMBER. JULY 8, 1975.
3,906,121.—ELECTROSTATIC DEVELOPMENT METHOD USING MAGNETIC BUSH CONFIGURATION TRANSPORT. SEPT. 16, 1975. CAN. 0970631, GRB. 1381049
3,906,898.—MAGNETIC BRUSH DEVELOPING APPARATUS. SEPT. 23, 1975.
3,911,864.—TONER PRELOADED MAGNETIC BRUSH DEVELOPMENT SYSTEM. OCT. 14, 1975. BEL 0809859, STZ. 0568594.
3,915,121.—DEVELOPMENT APPARATUS. OCT. 28, 1975.
3,920,329.—BACKGROUND REMOVAL APPARATUS. NOV. 18, 1975.
3,921,577.—MAGNETIC DEVELOPMENT UNIT. NOV. 25, 1975.
3,926,516.—DEVELOPMENT APPARATUS FOR AN ELECTROSTATOGRAPHIC PRINTING MACHINE. DEC. 16, 1975.
3,927,640.—DEVELOPER SHUT-OFF APPARATUS. DEC 23, 1975.
3,934,549.—TRANSFER APPARATUS. JAN. 27, 1976.
3,945,342.—MAGNETIC BRUSH SUPPORT MEMBER. MAR. 23, 1976.
3,948,217.—MAGNETIC BRUSH DEVELOPMENT SYSTEM WITH FLOATING DEVELOPMENT ROLLS. APR. 6, 1976. BEL. 0835370.
3,949,704.—MAGNETIC BRUSH DEVELOPING APPARATUS. APR. 13, 1976.
3,950,089.—COATED ROLL FOR MAGNETIC BRUSH DEVELOPMENT & CLEANING SYSTEMS. APR. 13, 1976.
3,953,121.—ARTICULATED DEVELOPMENT APPARATUS. APR. 27, 1976. IRN. 0013434.
3,962,003.—METHOD OF FORMING MAGNETIC BRUSH SUPPORT MEMBER. JUNE 8, 1976.
3,968,773. JULY 13, 1976.
3,982,498.—DEVELOPMENT APPARATUS. SEPT. 28, 1976. FRA. 7436713.
3,991,713.—DEVELOPMENT APPARATUS FOR AN ELECTROSTATOGRAPHIC PRINTING MACHINE. NOV. 16, 1976.
3,996,892.—SPATIALLY PROGRAMMABLE ELECTRODE TYPE ROLL FOR ELECTROSTATOGRAPHIC PROCESSORS AND THE LIKE. DEC. 14, 1976.
4,033,293.—A DEVELOPING DEVICE OF AN ELECTROPHOTOGRAPHIC COPYING MACHINE. JULY 5, 1977
4,033,294.—DEVELOPER MIXING AND TRANSPORTING AUGER FOR MAGNETIC BRUSH DEVELOPING APPARATUS. JULY 5, 1977.
4,034,709.—AN IMPROVED DEVELOPER ROLL. JULY 12, 1977
4,044,719.—DEVELOPING APPARATUS IN ELECTROCOPYING MACHINES. AUG 30, 1977
4,050,413.—MAGNETIC BRUSH CROSSMIXING SYSTEM. SEPT. 27, 1977
4,057,666.—MAGNETIC BRUSH DEVELOPER ROLL FOR ELECTROSTATIC REPRODUCTION MACHINES. NOV. 8, 1977.
4,077,358.—DEACTIVATING DEVICE FOR A MAGNETIC BRUSH DEVELOPER USED IN A MULTICOLOR ELECTROPHOTOGRAPHIC MAR. 7, 1978
4,078,520.—VIBRATING SCREEN FILTER FOR TONER DENSITY MEASURING APPARATUS. MAR. 14, 1978
4,084,542.—POSITIONING APPARATUS FOR MAGNETIC BRUSH DEVELOPING DEVICE. APR. 18, 1978
4,086,006.—PURGING SYSTEM FOR A DEVELOPMENT APPARATUS. APR. 25, 1978
4,096,826.—MAGNETIC BRUSH DEVELOPMENT SYSTEM FOR FLEXIBLE PHOTORECEPTORS. JUNE 27, 1978
4,098,228.—HIGH SPEED MAGNETIC BRUSH DEVELOPMENT SYSTEM. JULY 4, 1978
4,116,555.—BACKGROUND REMOVAL APPARATUS. SEPT. 26, 1978
4,117,803.—DEVELOPER FLOW REGULATOR FOR A MAGNETIC BRUSH DEVELOPING DEVICE. OCT. 3, 1978.
4,118,115.—ROLL DEVELOPER DRIVE. OCT. 3, 1978.
4,127,327.—APPARATUSES INCORPORATING A COMPOSITE SUPPORT MEMBER. NOV. 28, 1978.
4,131,357.—SEQUENTIALLY ACTIVATED DEVELOPMENT SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTER. DEC. 26, 1978.
4,155,329.—MAGNETIC BRUSH DEVELOPING DEVICE MAY 22, 1979.

Class 5C 1A

3,584,601.—MAGNETIC BRUSH BELT DEVELOPMENT. JUNE 15, 1971. CAN. 0884799, GRB. 1238277
3,592,166.—APPARATUS FOR DEVELOPING ELECTROSTATIC IMAGES. JULY 13, 1971. CAN. 0887598, GRB. 1275822, JAP. 1162298
3,638,614.—ELECTROSTATIC LATENT IMAGE DEVELOPMENT APPARATUS. FEB. 1, 1972. CAN. 0929338, GRB. 1304236, JAP. 0808219.
3,741,790.—METHOD FOR MAGNETICALLY DEVELOPING ELECTROSTATIC IMAGES. JUNE 26, 1973.
3,823,688.—MAGNETIC BRUSH ASSEMBLY. JULY 16, 1974. BEL. 0794507, CAN. 0989607, FRA. 7302247, GRB. 1394502, SWD. 7301014.
3,965,862.—XEROGRAPHIC DEVELOPMENT SYSTEM JUNE 29, 1976.

Class 5C 1B

3,532,071.—DEVELOPMENT APPARATUS. OCT. 6, 1970. CAN. 0883763, GRB. 1227549, JAP. 0650630.
3,552,355.—DEVELOPMENT APPARATUS. JAN. 5, 1971. ARG. 0175330, ATR. 0300575, AUS. 0441519, BEL. 0730371, CAN. 0914005, CZC. 0161850, DNK. 0129880, EGR. 0077412, EIR. 0032786, FRA. 6909741, GRB. 1263566, GRK. 0039919, IND. 0120212, ISR. 0031757, ITL. 0860255, LXB. 0058295, MEX. 0111374, NOR. 0128037, NZL. 0155695, PAK 0120989, PLD. 0017651, PLP. 0006606, PNM. 0001723, PTG. 0051392, RHD. 1156947, SAF. 0691728, SPN. 0365439, STZ. 0499140, SWD. 0341530, TIW. 0006602, UAR. 0009242, USR. 0383338, VTM. 0001829, VZL. 0023745.
3,645,770.—METHOD FOR DEVELOPING XEROGRAPHIC IMAGES. FEB. 29, 1972.
3,893,414.—METHOD AND APP FOR VARYING DEVELOPER BANDWIDTH. JULY 8, 1975.
3,908,596.—SEGMENTED GATE DEVELOPER FLOW CONTROLLER. SEPT. 30, 1975.
3,930,466.—SEGMENTED GATE DEVELOPER FLOW CONTROLLER. JAN. 6, 1976.
3,990,393.—APPARATUS FOR DEPOSITING MAGNETIC MATERIAL ON AN IMAGE BEARING MEMBER. NOV. 9, 1976.
3,998,184.—A DEVELOPMENT APPARATUS. DEC. 21, 1976.
4,025,179.—PASSIVE CROSS MIXING SYSTEM. MAY 24, 1977.

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Class 5C 2

3,508,823.—DUPLICATING APPARATUS. APR. 28, 1970.
3,836,244.—COLOR XEROGRAPHY. SEPT. 17, 1974.
3,941,280.—APPARATUS FOR CONTROLLING DEVELOPER EFFICIENCY. MAR. 2, 1976.
3,965,862.—XEROGRAPHIC DEVELOPMENT SYSTEM. JUNE 29, 1976.
4,053,218.—DEVELOPMENT SYSTEM. OCT. 11, 1977.
4,082,061.—MULTI-COLOR DEVELOPMENT SYSTEM. APR. 4, 1978.
4,087,168.—CHARGING SYSTEM FOR ELECTROSTATIC REPRODUCTION MACHINE. MAY 2, 1978.
4,131,357.—SEQUENTIALLY ACTIVATED DEVELOPMENT SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTER. DEC. 26, 1978.

Class 5C 3

3,906,897.—DEVELOPMENT APPARATUS. SEPT. 23, 1975. ARG. 0195893, BEL. 0797447, CAN. 0982886, FRA. 7243003, GRB. 1435761, ITL. 0987768, MEX. 0130638, SAF. 0733407, SPN. 0414905, STZ. 0551030, SWD. 7307101, VZL. 0032067.
3,940,272.—METHOD OF DEVELOPING AN ELECTROSTATIC LATENT IMAGE. FEB. 24, 1976. ARG. 0195893, BEL. 0797447, CAN. 0982886, FRA. 7243003, GRB. 1435761, ITL. 0987768, MEX. 0130638, SAF. 0733407, SPN. 0414905, STZ. 0551030, SWD. 7307101, VZL. 0032067.
4,102,305.—DEVELOPMENT SYSTEM WITH ELECTRICAL FIELD GENERATING MEANS. JULY 25, 1978.
4,150,173.—PROCESS OF PREPARING TRANSPARENT COLORED MAGNETIC MATERIALS. MAY 17, 1979.

Class 5D

3,768,904.—PRINTING APPARATUS INCLUDING REGISTRATION CONTROL. OCT. 30, 1973.
3,793,985.—IMAGING SYSTEM. FEB. 26, 1974.
3,924,944.—SPLIT DEVELOPER HOUSING. DEC. 9, 1975.
4,015,561.—ANTI-GRAVITATIONAL CASCADE DEVELOPMENT FOR ELECTROSTATIC PROCESSOR. APR. 5, 1977.
4,095,883.—MAGNETIC MIXING APPARATUS AND PROCESS. JUNE 20, 1978.

Class 5D 1

3,219,014.—MECHANICAL SHIELD TO PROTECT MAGNETIC CORE IN XEROGRAPHIC DEVELOPING APPARATUS. NOV. 23, 1965. CAN. 0757573, FRA. 1393298, GER. 1497076, GRB. 1034099, ITL. 0710188, JAP. 0477812.
3,685,488.—XEROGRAPHIC DEVELOPMENT. AUG. 22, 1972.
3,884,571.—LEAKAGE DEVELOPER RECIRCULATION. MAY 20, 1975 HOL. 3884571.
3,999,512.—ELECTROSTATIC DEVELOPMENT SYSTEM WITH PASSIVE STORAGE CAPACITY. DEC. 28, 1976. BEL. 0823656.
4,033,293.—A DEVELOPING DEVICE OF AN ELECTROPHOTOGRAPHIC COPYING MACHINE. JULY 5, 1977.

Class 5D 1A

3,067,720.—XEROGRAPHIC DEVELOPING APPARATUS. DEC. 11, 1962. ARG. 0175377, BEL. 0750689, PNM. 0002011, VZL. 0025828.
3,095,325.—TONER DISPENSER DRIVE MECHANISMS. JUNE 25, 1963.
3,190,264.—XEROGRAPHIC DEVELOPING APPARATUS. JUNE 22, 1965. CAN. 0733036.
3,303,817.—XEROGRAPHIC DEVELOPING APPARATUS. FEB. 14, 1967.
3,472,657.—XEROGRAPHIC DEVELOPMENT METHOD AND APPARATUS. OCT. 14, 1969. AUS. 0418178, BEL. 0680374, CAN. 0813843, FRA. 1477370, GRB. 1141167, ITL. 0766858, JAP. 0537665, MEX. 0091119, SWD. 0330833.
3,593,838.—CONVEYOR BELT. JULY 20, 1971. CAN. 0883720.
3,635,553.—CASCADE DEVELOPING APPARATUS UTILIZING A ROTARY WHEEL WITH SCOOPS. JAN. 18, 1972.
3,649,262.—SIMULTANEOUS DEVELOPMENT-CLEANING OF SAME AREA OF AN ELECTROSTATOGRAPHIC IMAGE SUPPORT SURFACE. MAR. 14, 1972. AUS 0445365, BEL. 0743661, CAN. 0916232, FRA. 6944511, GRB. 1296997, ITL. 0882670, USR. 0358873.
3,662,711.—DEVELOPMENT APPARATUS. MAY 16, 1972. CAN. 0945757, GRB. 1345253.
3,663,291.—CASCADE DEVELOPMENT. MAY 16, 1972.
3,678,896.—CONVEYOR SYSTEM. JULY 25, 1972. CAN. 0952465, GRB. 1325831.

Class 5D 1B

3,122,454.—XEROGRAPHIC DEVELOPING APPARATUS. FEB. 25, 1964.
3,435,803.—LIFTING APPARATUS. APR. 1, 1969. CAN. 0937394, FRA. 1511169, GER. 1456806, GRB. 1165378, ITL. 0788954, JAP. 0542586, MEX. 0095039.
3,448,724.—DEVELOPING APPARATUS. JUNE 10, 1969. ARG. 0174576, AUS. 0430081, BEL. 0726573, CAN. 0884214, CZC. 0157058, EGR. 0077413, FRA. 1598024, GRB. 1258781, ITL. 0854008, JAP. 0665972, MEX. 0107603, PNM. 0001429, RMN. 0054735, SAF. 0069179, SPN. 0362358, STZ. 0486057, SWD. 0338507, USR. 0410595, VZL. 0023716.
3,472,657.—XEROGRAPHIC DEVELOPMENT METHOD AND APPARATUS. OCT. 14, 1969. AUS. 0418178, BEL. 0680374, CAN. 0813843, FRA. 1477370, GRB. 1141167, ITL. 0766858, JAP. 0537665, MEX. 0091119, SWD. 0330833.
3,606,533.—XEROGRAPHIC DEVELOPMENT. SEPT. 20, 1971.
3,661,118.—ELECTROSTATIC DEVELOPMENT. MAY 9, 1972. CAN. 0951107, GRB. 1359234.
3,695,224.—CASCADE DEVELOPMENT. OCT. 3, 1972.
3,835,811.—DEVELOPMENT APPARATUS FOR ELECTROPHOTOGRAPHIC PRINTING MACHINE. SEPT. 17, 1974.
3,888,578.—DEVELOPMENT APPARATUS FOR ELECTROPHOTOGRAPHIC PRINTING MACHINE. JUNE 10, 1975.
3,900,255.—PADDLE-WHEEL DEVELOPMENT SYSTEM. AUG. 19, 1975.

Class 5D 1C

3,117,891.—XEROGRAPHIC APPARATUS. JAN. 14, 1964. CAN. 0740394, GRB. 1006078.
3,287,150.—CASCADE DEVELOPMENT PROCESS W/TWO-COMPONENT DEVELOPER. NOV. 22, 1966.
3,415,224.—MAGNETIC CASCADE DEV APPARATUS. DEC. 10, 1968. AUS. 0423497, BEL. 0725943, CAN. 0852660, COR. 000948A, EGR. 0074432, FRA. 1603904, GRB. 1217281, ITL. 0849521, LXB. 0057873, MRC. 0014726, PTG. 0051108, SAF. 0688440, SPN. 0361840, STZ. 0493872, SWD. 0345753, SYA. 0002440, ZMB. 0166972.
3,667,427.—CASCADE APPARATUS. JUNE 6, 1972. CAN. 0951112, GRB. 1377152.
3,678,897.—DEVELOPER MIXING APPARATUS. JULY 25, 1972. BEL. 0778426, CAN. 0951113, FRA. 7203212, GRB. 1377151, ITL. 0986909.
3,741,372.—CONVEYOR FOR DEVELOPER APPARATUS. JUNE 26, 1973.

Class 5D 1D

3,550,555.—XEROGRAPHIC DEVELOPER SEPARATION. DEC. 29, 1970. CAN. 0855652, GRB. 1238032.

Class 5D 2

3,105,770.—CASCADE DEVELOPMENT IMPROVEMENT. OCT. 1, 1963. AUS. 0252867, BEL. 0749545, CAN. 0746453, FRA. 1286397, GER. 1278244, GRB. 0986844, ITL. 0648862, JAP. 0517396.
3,375,807.—XEROGRAPHIC DEVELOPER. APR. 2, 1968. CAN. 0819049, MEX. 0092092, VZL. 0024448.
3,542,579.—ELECTROSTATIC IMAGE DEVELOPMENT. NOV. 24, 1970.
3,973,517.—DEVELOPMENT DEVICE AND METHOD. AUG. 10, 1976.

Class 5D 3

3,057,324.—XEROGRAPHIC DEVELOPING APPARATUS. OCT. 9, 1962.
3,336,905.—XEROGRAPHIC DEVELOPER APPARATUS. AUG. 22, 1967. CAN. 0793223, GRB. 1123059, JAP. 0508405.
3,428,025.—XEROGRAPHIC DEVELOPMENT APPARATUS-POWDER CLOUD BY CHARGE BREAKDOWN. DEC. 18, 1969.
3,638,610.—DEVELOPMENT APPARATUS. FEB. 1, 1972. CAN. 0916432, FRA. 7041622.

3,638,611.—ELECTRODED DEVELOPMENT DEVICE. FEB. 1, 1972. ARG. 0184658, ATR. 0308537, AUS. 0446323, BEL. 0752936, CAN. 0913893, CHL. 0025914, DNK 0129305, EGR. 0084129, FRA. 7024067, GRB. 1258738, GUA. 0002615, IND. 0127311, ITL. 0900196, JAP. 0719143, MEX. 0115403, NOR. 0130134, NZL. 0160644, PLD. 0081287, PLP. 0006288, PNM. 0002266, PTG. 0054072, SAF. 0704532, SPN. 0381383, STZ. 0520961, SWD. 0359386, TIW. 0005923, USR. 0414818.
3,682,132.—AUTOMATIC DEVELOPER CONTROLLER. AUG. 8, 1972.

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3,347,691.—XEROGRAPHIC DEVELOPMENT. OCT. 17, 1967. ARG. 0168482, CAN. 0827608, FRA. 1497061, GRB. 1166464, ITL. 0788454, JAP. 0589492, MEX. 0093822, VZL. 0032595.
3,412,710.—CLEAN UP ELECTRODE. NOV. 26, 1968. BEL. 0704923, CAN. 0867283, FRA. 1540699, GRB. 1196637, ITL. 0814605, JAP. 0585018.
3,620,191.—BIASED INPUT CHUTE. NOV. 16, 1971. ARG. 0199542, ATR. 0324837, AUS. 0446250, BEL. 0752943, CAN. 0918411, CHL. 0025871, DNK. 0128800, EGR. 0083704, FRA. 7024665, GRB. 1310444, GUA. 0002727, IND. 0127313, ITL. 0900192, JAP. 0731612, MEX. 0114979, NOR. 0132115, NZL. 0160647, PLP. 0008638, PNM. 0002269, PTG. 0054075, SAF. 70/4534, SPN. 0381382, STZ. 0528761, SWD. 0359387, TIW. 0007164, USR. 0358874.
3,669,072.—DEVELOPER APPARATUS. JUNE 13, 1972. CAN. 0930539, GRB. 1343141.
3,682,538.—XEROGRAPHIC PICK-OFF PLATE. AUG. 8, 1972. ARG. 0186267, BEL. 0764562, CAN. 0935635, FRA. 7110750, GRB. 1349272, ITL. 0922348, MEX. 0119677, USR. 0426387.
3,682,677.—BACKGROUND REMOVAL. AUG. 8, 1972.
3,795,222.—DEVELOPMENT ELECTRODE SYSTEM. MAR. 5, 1974.
3,807,997.—PLURAL ELECTRODE DEVELOPMENT METHODS FOR LATENT ELECTROSTATIC IMAGES. APR. 30, 1974. CAN. 0979299, GRB. 1381910.
3,808,026.—LIQUID DEVELOPMENT OF ELECTROSTATIC LATENT IMAGE. APR. 30, 1974.
3,834,930.—METHOD OF DEVELOPING ELECTROSTATOGRAPHIC IMAGE. SEPT. 10, 1974.
3,907,695.—LIQUID DEVELOPER. SEPT. 23, 1975.

Class 5D 5

3,223,548.—XEROGRAPHIC DEVELOPING MACHINE AND METHOD. DEC. 14, 1965.
3,316,878.—CASCADE DEVELOPING APPARATUS. MAY 2, 1967.

Class 5E

3,357,399.—COMBINED FLUIDIZED BED AND INVERTED CASCADE DEVELOPMENT APPARATUS. DEC. 12, 1967. ARG. 0171121, CAN. 0821473, CHL. 0022944, MEX. 0096075, PRU. 0009332, URG. 0008548, VZL. 0021060.
3,677,633.—PORTABLE DOCUMENT ABSTRACTOR. JULY 18, 1972.
3,738,832.—COLOR ELECTROPHOTOGRAPHIC PROCESS EMPLOYING LIQUID DEVELOPER CONTAINING GELATINAIN. JUNE 12, 1973.
3,748,126.—MULTIPLE COPY SELECTIVE RE-WETTING PRINTING. JULY 24, 1973.
3,748,127.—TREATMENT OF REUSABLE PHOTOCONDUCTIVE SURFACES WITH LEWIS ACIDS OR BASES. JULY 24, 1973.
3,776,631.—LIQUID DEVELOPER CLEANING SYSTEM. DEC. 4, 1973.
3,865,611.—METHOD FOR ELECTROSTATIC IMAGE DEVELOPMENT EMPLOYING TONER AND CARRIER SUPPORTED BY CONDUCTIVE. FEB. 11, 1975.
3,893,854.—PHOTOGRAPHIC ARTICLES WITH GAPS FOR PROCESSING FLUIDS. JULY 8, 1975.
3,918,809.—APPARATUS FOR CLEANING A SURFACE SUPPORT. NOV. 11, 1975, GRB. 1438660.
3,927,934.—ELECTROSTATOGRAPHIC REPRODUCTION MACHINES. DEC. 23, 1975.
3,940,282.—BLADE CLEANING OF SURFACE WITH REVERSE MOVEMENT. FEB. 24, 1976.
3,951,653.—METHOD OF PREVENTING TONER BUILD-UP ON ELECTRODES DURING LIQUID DEVELOPMENT. APR. 20, 1976.
3,973,699.—LIQUID DISPENSING APPARATUS UTILIZING DOUBLE ACTING PISTON. AUG. 10, 1976, GRB. 1455885.
3,974,554.—QUANDRANGULAR TRIHETICORD GRAVURE ROLL. AUG. 17, 1976, BEL. 0841855.
3,978,817.—PATTERNED GRAVURE & DOCTORING MEANS THEREFOR. SEPT. 7, 1976. BEL. 0841855.
3,980,404.—XEROGRAPHIC APPARATUS HAVING IMPROVED FLUID DISPENSING MEMBER. SEPT. 14, 1976.
4,017,174.—DEVELOPER ASSEMBLY SUPPORT. APR. 12, 1977.
4,020,788.—DOCTORING MEANS. MAY 3, 1977.
4,023,900.—VARIABLE SPEED LIQUID DEVELOPMENT ELECTROSTATOGRAPHIC APPARATUS. MAY 17, 1977.
4,024,834.—TEMPERATURE COMPENSATED DOCTOR BLADE. MAY 24, 1977. GRB. 1430518.
4,037,952.—METHOD OF PREVENTING TONER BUILD-UP ON ELECTRODES DURING LIQUID DEVELOPMENT. JULY 26, 1977.
4,068,938.—ELECTROSTATIC COLOR PRINTING USING DISCRETE POTENTIALS. JAN. 17, 1978. GRB. 1442234.
4,126,711.—CHARGE PATTERN DEVELOPMENT METHOD & APPARATUS. NOV. 21, 1978. GRB. 1484712.
4,161,360.—LIQUID DEVELOPMENT APPARATUS. JULY 17, 1979.

Class 5E 2

3,068,115.—ELECTROSTATIC EMULSION DEVELOPMENT. DEC. 11, 1962. GER. 1302344, GRB. 1006230, JAP. 0466442.
3,730,708.—ELECTROPHOTOGRAPHIC MULTI-COLOR PROCESS EMPLOYING LIQUID DEVELOPER. MAY 1, 1973.
3,776,723.—LIQUID TRANSFER ELECTROPHOTOGRAPHIC DEVELOPMENT PROCESS. DEC. 4, 1973.
3,862,618.—LIQUID DEVELOPING APPARATUS DEVELOPING AN ELECTROSTATIC IMAGE. JAN. 28, 1975.
3,960,444.—ELECTROPHOTOGRAPHIC PRINTING MACHINE. JUNE 1, 1976.
4,007,401.—ELECTROPHOTOGRAPHIC PRINTING METHOD. FEB. 8, 1977.

Class 5E 3

3,080,251.—METHOD OF XEROGRAPHIC DEVELOPMENT. MAR. 5, 1963.

Class 5E 4

3,064,622.—IMMERSION DEVELOPMENT. NOV. 20, 1962. CAN. 0729544, FRA. 1296944, GER. 1190787, GRB. 0990968, JAP. 0451638.
3,129,115.—XEROGRAPHIC DEVELOPING APPARATUS. APR. 14, 1964. GRB. 1008004.
3,251,688.—LIQUID TRANSFER DEVELOPMENT. MAY 17, 1966. CAN. 0765523, FRA. 1362253, GRB. 1032013.
3,270,637.—ELECTROVISCOUS RECORDING. SEPT. 6, 1966. AUS. 0403009, CAN. 0740112, FRA. 1414126, GER. 1497109, GRB. 1086197, HOL. 0141644, ITL. 0738077, JAP. 0508403, NOR. 0127882, STZ. 0472710, SWD. 0331032.
3,281,241.—METHOD OF FORMING A VISUAL RECORD OF A LATENT IMAGE RECEIVING WEB. OCT. 25, 1966. AUS. 0275028, CAN. 0766420, FRA. 1362254, GER. 1303008, GRB. 1035236, ITL. 0699412, JAP. 0470426.
3,284,224.—CONTROLLED XEROGRAPHIC DEVELOPMENT. NOV. 8, 1966. CAN. 0751349, GRB. 1038801, JAP. 0640353.
3,334,613.—XEROGRAPHIC DEVELOPMENT APPARATUS. AUG. 8, 1967. CAN. 0787870, GRB. 1125628, JAP. 0546654.
3,369,918.—DEV OF LATENT ELECTROSTATIC IMGS W/ CREATED WAVES OF LIQUID DEVELOPER. FEB. 20, 1968.
3,576,623.—DEVELOPMENT SYSTEM EMPLOYING A CORONODE IMMERSED IN A LIQUID DEVELOPER. APR. 27, 1971. AUS. 0434437, CAN. 0872191, GER. 1908292, GRB. 1259880, JAP. 0675662.
3,577,259.—LIQUID DEVELOPMENT OF ELECTROSTATIC LATENT IMAGES UTILIZING A TONER-FREE ZONE. MAY 4, 1971.
3,592,678.—LIQUID DONOR DEVELOPMENT WITH ELECTROPHORETIC CLEANING. JULY 13, 1971.
3,620,800.—CLEANING LIQUID DEVELOPED ELECTROSTATIC IMAGES BY CONTACT WITH VAPORIZED CLEANING FLUID. NOV. 16, 1971. CAN. 0933997.
3,627,410.—REPRODUCTION APPARATUS WITH LIQUID. DEC. 14, 1971. CAN. 0886508.

3,627,557.—LIQUID DVLPMNT BY REDUCING VISCOSITY OF DVLPR ON ROLLER APPLICATION PRIOR TO DEVELOPMENT. DEC. 14, 1971.
3,628,981.—LIQUID TONER DEVELOPMENT. DEC. 21, 1971. ARG. 0181932, MEX. 0116451.
3,642,471.—LIQUID DEVELOPING PROCESS IN AN ELECTROSTATOGRAPHIC IMAGING SYSTEM. FEB. 15, 1972.
3,642,515.—LIQUID DEVELOPMENT UTILIZING A CURVILINEAR DEVELOPMENT ELECTRODE. FEB. 15, 1972.
3,652,319.—CYCLIC IMAGING SYSTEM. MAR. 28, 1972. AUS. 0441527, BEL. 0761029, CAN. 0944010, FRA. 7047634, GRB. 1336739, ITL. 0913957, JAP. 0771819, SWD. 0363175.
3,656,948.—SELECTED REMOVAL OF LIQUID DVLPR IN CYCLICAL ELECTROPHOTOGRAPHIC PROCESS. APR. 18, 1972. CAN. 0906335, GRB. 1335054, JAP. 0760503.
3,671,290.—IMAGING SYSTEM. JUNE 20, 1972.
3,672,884.—ELECTROSTATIC PRINTING. JUNE 27, 1972.
3,692,520.—DVLPNG ELCTRSTIC IMGS EMPLYNG FATTY ACD ESTRS INHBT DVLPR BUILD-UP. SEPT. 19, 1972. CAN. 0940361, GRB. 1332674.
3,784,397.—IMAGING SYSTEM. JAN. 8, 1974.
3,800,744.—ELECTROSTATIC LATENT IMAGE DEVELOPING APPARATUS. APR. 2, 1974.
3,804,510.—IMAGING DEVELOPING SYSTEM. APR. 16, 1974.
3,808,025.—LIQUID DEVELOPING METHOD FOR ELECTROPHOTOGRAPHY. APR. 30, 1974.
3,816,114.—ELECTRO-PHOTOGRAPHIC METHOD. JUNE 11, 1974.
3,817,212.—ELECTROSTATOGRAPHIC LIQUID DEVELOPMENT APPARATUS. JUNE 18, 1974.
3,832,975.—ELECTROPHOTOGRAPHIC APPARATUS. SEPT. 3, 1974.
3,836,384.—IMAGING SYSTEMS. SEPT. 17, 1974.
3,841,893.—CHARGE CONTROL AGENTS FOR LIQUID DEVELOPERS. OCT. 15, 1974.
3,849,171.—METHOD FOR CLEANING BACKGROUND AREAS FROM DEVELOPED RECORDING SURFACES. NOV. 19, 1974. CAN. 0941882.
3,862,619.—ELECTRO-PHOTOGRAPHIC APPARATUS. JAN. 28, 1975.
3,864,125.—ELECTROPHOTOGRAPHIC METHOD OF MAKING AN IMAGING MASTER. FEB. 4, 1975.
3,870,514.—LIQUID DEVELOPMENT FOR THE ELECTRONIC PHOTOGRAPHY. MAR. 11, 1975.
3,877,934.—INDUCTION IMAGING WITH IN-PLACE DEVELOPMENT. APR. 15, 1975.
3,890,040.—INDUCTION IMAGING APPARATUS. JUNE 17, 1975.
3,913,524.—LIQUID DEVELOPING APPARATUS FOR ELECTROPHOTOGRAPHY. OCT. 21, 1975.
3,926,825.—LIQUID DEVELOPER COMPOSITION AND PROCESS FOR PREPARING SAME. DEC. 16, 1975.
3,931,792.—ABRASIVE LIQUID DEVELOPING APPARATUS. JAN. 13, 1976.
3,942,474.—DEVELOPING SYSTEMS. MAR. 9, 1976. ARG. 0181931, ATR. 0311971, AUS. 0457519, BEL. 0752802, CAN. 0904108, CHL. 0026275, EGR. 0084325, FRA. 7024068, GRB. 1320509, ITL. 0894828, JAP. 0815361, MEX. 0116454, SAF. 0704474, SPN. 0381297, STZ. 0513437, SWD. 0357269, TIW. 0006614, 0033335.
3,943,268.—LIQUID DEVELOPER PROCESS AND APP FOR ELECTROSTATOGRAPHY. MAR. 9, 1976. CAN. 0904683.
3,965,861.—SEPARATED ROLLER LIQUID DEVELOPMENT. JUNE 29, 1976.
3,968,044.—MILLED LIQUID DEVELOPER. JULY 6, 1976.
3,970,043.—ELECTROPHOTOGRAPHIC DEVICE FOR LIQUID DEVELOPMENT. AUG. 20, 1976.
3,971,659.—COLOR ELECTROPHOTOGRAPHIC PROCESS USING PHOTO CONDUCTIVE PARTICLES IN LIQUID DEVELOPER. JULY 27, 1976.
3,972,305.—IMAGING SYSTEM. AUG. 3, 1976. CAN. 0904683.
3,976,808.—IMAGING SYSTEMS. AUG. 24, 1976.
3,986,968.—MILLED AND POLAR SOLVENT EXTRACTED LIQUID DEVELOPER. OCT. 19, 1976.

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3,084,043.—LIQUID DEVELOPMENT OF ELECTROSTATIC LATENT IMAGES. APR. 2, 1963. CAN. 0678365, GRB. 0880597.
3,372,027.—XEROGRAPHIC LIQUID DEVELOPMENT. MAR. 5, 1968. CAN. 0800963, GRB. 1091169, ITL. 0760712, JAP. 0571175.
3,652,319.—CYCLIC IMAGING SYSTEM. MAR. 28, 1972. AUS. 0441527, BEL. 0761029, CAN. 0944010, FRA. 7047634, GRB. 1336739, ITL. 0913957, JAP. 0771819, SWD. 0363175.
3,667,428.—DEVELOPING SYSTEMS. JUNE 6, 1972. ARG. 0195534, ATR. 0312420, AUS. 0456202, BEL. 0752805, CAN. 0904107, CHL. 0026274, CZC 0164275, DNK. 0126528, EGR. 0083514, FRA. 7024066, GRB. 1320232, ITL. 0894827, JAP. 0745765, MEX. 0114978, PNM. 0002541, SAF. 0704475, SPN. 0194607, STZ. 0543753, SWD. 0366126, TIW. 0006616, USR. 0420196.
3,676,215.—IMAGING SYSTEM. JULY 11, 1972. ARG. 0182525, AUS. 0430692, BEL. 0732139, CAN. 0900770, FRA. 6913232, GRB. 1272306, ITL. 0857440, JAP. 0698292, MEX. 0109289, PNM. 0001433, SPN. 0386902, SWD. 0352117, USR. 0309549.
3,692,520.—DVLPNG ELCTRSTIC IMGS EMPLYNG FATTY ACD ESTRS INHBT DVLPR BUILD-UP. SEPT. 19, 1972. CAN. 0940361, GRB. 1332674.
3,712,728.—REVERSAL DEVELOPMENT. JAN. 23, 1973. BEL. 0777718, CAN. 0949826, FRA. 7201004, GRB. 1374831, ITL. 0946351.
3,729,419.—LIQUID DEVELOPER. APR. 24, 1973.
3,772,012.—REVERSAL DEVELOPMENT USING POLAR LIQUID DEVELOPERS. NOV. 13, 1973. BEL. 0777718, CAN. 0949826, FRA. 7201004, GRB. 1374831, ITL. 0946351.
3,776,723.—LIQUID TRANSFER ELECTROPHOTOGRAPHIC DEVELOPMENT PROCESS. DEC. 4, 1973.
3,795,530.—ELECTROSTATIC LATENT IMAGE DEVELOPMENT. MAR. 5, 1974.
3,806,354.—METHOD OF DEVELOPING ELECTROSTATIC LATENT IMAGES. APR. 23, 1974.
3,817,748.—CONTRAST CONTROL IN ELECTROSTATIC COPYING UTILIZING LIQUID DEVELOPMENT. JUNE 18, 1974. GRB. 1406794.
3,834,930.—METHOD OF DEVELOPING ELECTROSTATOGRAPHIC IMAGE. SEPT. 10, 1974.
3,856,519.—TRANSFER OF TONER USING A VOLATILE INSULATING LIQUID. DEC. 24, 1974.
3,900,405.—CASSETTE OPENING MECHANISM. AUG. 19, 1975. CAN. 0926460, GRB. 1362697.
3,907,694.—NON-VOLATILE CONDUCTIVE INKS. SEPT. 23, 1975.
3,907,695.—LIQUID DEVELOPER. SEPT. 23, 1975.
3,918,400.—BLADE MOUNTING ASSEMBLIES. NOV. 11, 1975. BEL. 0816534, FRA. 7421752, GRB. 1419417.
3,918,807.—CLEANING BLADE FOR PHOTOCOPIER. NOV. 11, 1975.
3,942,349.—CROWN DIE FOR THREAD ROLLING OF APPLICATOR ROLLS. MAR. 9, 1976.
3,942,474.—DEVELOPING SYSTEMS. MAR. 9, 1976. ARG. 0181931, ATR. 0311971, AUS. 0457519, BEL. 0752802, CAN. 0904108, CHL. 0026275, EGR. 0084325, FRA. 7024068, GRB. 1320509, ITL. 0894828, JAP. 0815361, MEX. 0116454, SAF. 0704474, SPN. 0381297, STZ. 0513437, SWD. 0357269, TIW. 0006614, VZL. 0033335.
3,954,640.—ELECTROSTATIC PRINTING INKS. MAY 4, 1976. BEL. 0816553, GRB. 1452556.
3,978,817.—PATTERNED GRAVURE AND DOCTORING MEANS THEREFOR. SEPT. 7, 1976. BEL. 0841855.
3,980,404.—XEROGRAPHIC APPARATUS HAVING IMPROVED FLUID DISPENSING MEMBER. SEPT. 14, 1976.
3,985,663.—CONDUCTIVE INKS CONTAINING QUATERNARY AMMONIUM COMPOUNDS. OCT. 12, 1976.
3,993,023.—COATED FILAMENT WOUND INK APPLICATOR ROLL. NOV. 23, 1976.
3,993,024.—FILAMENT WOUND INK APPLICATOR ROLL. NOV. 23, 1976.
3,994,726.—LAMINATED FLEXIBLE PHOTORECEPTOR. NOV. 30, 1976. GRB. 1429517.
4,002,476.—METHOD OF DEVELOPING RESILIENT PHOTOCONDUCTIVE ELEMENT. JAN. 11, 1977. GRB. 1429517.
4,004,931.—CONSTANT VISCOSITY INKS. JAN. 25, 1977.
4,007,983.—IMPROVED LIQUID DEVELOPER CLEANING MEANS. FEB. 15, 1977.
4,017,174.—DEVELOPER ASSEMBLY SUPPORT. APR. 12, 1977.
4,023,967.—ELECTROPHOTOGRAPHIC LIQUID DEVELOPMENT METHOD IN WHICH A UNIFORM SUBSTANTIAL INTERFACE CONTACT. BEL. 0819537, GRB. 1429518.
4,024,292.—PROCESS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES WITH INK. MAY 17, 1977. BEL. 0816553, GRB. 1452556.
4,024,838.—DEVELOPER LIQUID SUPPLY DEVICE. MAY 24, 1977.

4,027,964.—IMAGING METHOD AND APPARATUS. JUNE 7, 1977. ARG. 0190535, BEL. 0777714, CAN. 0949825, FRA. 7201000, GRB. 1374501, ITL. 0946355, MEX. 0124981.
4,040,827.—DEVELOPMENT IMAGING METHODS. AUG. 9, 1977.
4,042,415.—METHOD FOR SCRAPING LIQUIDS FROM A MOVING SURFACE. AUG. 16, 1977.
4,043,657.—BLADE FOR METERING LIQUID DEVELOPER. AUG. 23, 1977. GRB. 1501464.
4,047,943.—METHOD OF DEVELOPING ELECTROSTATIC LATENT IMAGES WITH CONDUCTIVE LIQUID DEVELOPER. SEPT. 13, 1977.
4,049,344.—ELECTROSTATIC IMAGING SYSTEM. SEPT. 20, 1977.
4,059,444.—LIQUID DEVELOPMENT USING CONDUCTIVE INKS. NOV. 22, 1977. GRB. 1495785.
4,089,683.—LIQUID DEVELOPER CLEANING MEANS. MAY 16, 1978.
4,105,445.—RESILIENT ARCUATE SURFACE CONTAINING PHOTOCONDUCTOR. AUG. 8, 1978. GRB. 1476355.

Class 5F

3,124,483.—APPARATUS FOR TRANSFERRING POWDER IMAGES AND METHOD THEREFOR. MAR. 10, 1964 CAN. 0843622.
3,166,432.—IMAGE DEVELOPMENT. JAN. 19, 1965. CAN. 0675704, FRA. 1260844, GER. 1185062, GRB. 0959608, JAP. 0401040.
3,203,394.—XEROGRAPHIC DEVELOPMENT APPARATUS AUG. 31, 1965. CAN. 0757572, GER. 1497070, GRB. 1026704, JAP. 0464922.
3,216,844.—METHOD OF DEVELOPING ELECTROSTATIC IMAGES WITH PHOTOCONDUCTIBLE DONOR MEMBER. NOV. 9, 1965. CAN. 0794035, GRB. 1024983.
3,301,152.—XEROGRAPHIC COPYING APPARATUS. JAN. 31, 1967.
3,332,396.—XEROGRAPHIC DEVELOPING APPARATUS WITH CONTROLLED CORONA MEANS. JULY 25, 1967. AUS. 0287695, BEL. 0656893, CAN. 0775061, FRA. 1419973, GER. 1288915, GRB. 1060679, ITL. 0745583.
3,375,806.—XEROGRAPHIC DONOR DEVELOPMENT APPARATUS. APR. 2, 1968.
3,376,852.—DIELECTRIC BELT DEVELOPING. APR. 9, 1968. CAN. 0859028, GRB. 1214512, JAP. 0919364
3,405,682.—XEROGRAPHIC DEVELOPMENT APPTS WITH WEB LOADING MEANS TO REMOVE RESIDUAL DEVELOPER. OCT. 15, 1968. GRB. 1102282.
3,606,864.—DONOR ASSEMBLY. SEPT. 21, 1971. CAN. 0903461, GRB. 1280951, MEX. 0116025.
3,613,636.—ELECTROGRAPHIC DEVELOPER. OCT. 19, 1971. GRB. 1282991.
3,635,196.—PNEUMATICALLY CONTROLLED SEAL. JAN. 18, 1972.
3,645,618.—VACUUM NOZZLE TO REMOVE AGGLOMERATES ON A TONER APPLICATOR. FEB. 29, 1972. CAN. 0949823.
3,696,783.—AUTOMATED TOUCHDOWN DEVELOPMENT SYSTEM. OCT. 10, 1972. CAN. 0949822, GRB. 1373666.
3,696,785.—DEVELOPMENT APPARATUS. OCT. 10, 1972. CAN. 0949824, GRB. 1373665.
3,697,169.—ELECTROSTATIC RECORDING APPARATUS AND METHOD. OCT. 10, 1972. CAN. 0954292, GRB. 1322681.
3,703,157.—MTHD/APPRTS FOR FRMNG UNFRM LYR OF PWDR DVELPR ON A SURFACE. NOV. 21, 1972.
3,707,389.—LATENT ELECTROSTATIC IMAGE DEVELOPMENT. DEC. 26, 1972. AUS. 0457281, BEL. 0777721, CAN. 0949827, FRA. 7201007, GRB. 1375048, ITL. 0946354.
3,729,334.—IMAGING PROCESS. APR. 24, 1973.
3,739,748.—DONOR FOR TOUCHDOWN DEVELOPMENT. JUNE 19, 1973.
3,759,222.—MICROFIELD DONOR WITH CONTINUOUSLY REVERSING MICROFIELDS. SEPT. 18, 1973. BEL. 0780091, CAN. 0951596, FRA. 7208102, GRB. 1385966, ITL. 0949779.
3,848,566.—DONOR APPARATUS. NOV. 19, 1974.
3,866,574.—XEROGRAPHIC DEVELOPING APPARATUS. FEB. 18, 1975, FRA. 7405248, GRB. 1458766.
3,881,927.—HALF TONE DEVELOPMENT PROCESS FOR TOUCHDOWN SYSTEM IN ELECTROSTATIC IMAGING. MAY 6, 1975. GRB. 1419926.
3,884,185.—COATED WIRE DEVELOPER BRUSH. MAY 20, 1975.
3,890,929.—XEROGRAPHIC DEVELOPING APPARATUS JUNE 24, 1975.
3,893,418.—XEROGRAPHIC DEVELOPING APPARATUS. JULY 8, 1975.
3,900,002.—DONOR APPARATUS. AUG. 19, 1975.
3,914,460.—DEVELOPMENT UTILIZING ELECTRIC FIELDS. OCT. 21, 1975.
3,929,098.—TONER LOADING FOR TOUCHDOWN DONOR. DEC. 30, 1975
3,970,042.—COLOR DEVELOPMENT APPARATUS. JULY 20, 1976.
3,997,688.—DEVELOPING AN ELECTRICAL IMAGE. DEC. 14, 1976.
3,998,185.—MICROFIELD DONORS WITH TONER AGITATION AND THE METHODS OF THEIR MANUFACTURE. DEC. 21, 1976.
3,999,515.—SELF SPACING MICROFIELD DONORS. DEC 28, 1976.
3,999,849.—TOUCHDOWN AMBIPOLAR DEVELOPMENT. DEC. 28, 1976.
4,003,333.—DEVELOPMENT SYSTEM. JAN. 18, 1977.
4,006,981.—HALF TONE DEVELOPMENT FOR TOUCHDOWN SYSTEM FEB. 8, 1977. GRB. 1419926.
4,011,834.—TOUCHDOWN ELECTROSTATIC DEVELOPMENT APPARATUS. MAR. 15, 1977
4,017,648.—TONER AGITATION THROUGH MICROFIELD DONOR. APR. 12, 1977.
4,025,185.—APPLICATOR MEMBER. MAY 24, 1977. GRB. 1436098.
4,040,827.—DEVELOPMENT IMAGING METHODS. AUG. 9, 1977.
4,067,295.—MAGNETIC MICROFIELD DONOR SYSTEM. JAN. 10, 1978.
4,092,165.—METHOD OF MAKING A DONOR MEMBER MOLD. MAY 30, 1978.
4,105,445.—RESILIENT ARCUATE SURFACE CONTAINING PHOTOCONDUCTOR. AUG. 8, 1978. GRB. 1476355.
4,114,261.—METHOD OF MANUFACTURE OF A XEROGRAPHIC MICROFIELD DONOR. SEPT. 19, 1978. GRB. 1515938.
4,136,637.—CONTINUOUS CONTRAST DEVELOPMENT SYSTEM. JAN. 30, 1979.
4,144,061.—TRANSFER DEVELOPMENT USING A FLUID SPACED DONOR MEMBER. MAR. 13, 1979.
4,149,486.—TRANSFER DEVELOPMENT APPARATUS USING SELF-SPACING DONOR MEMBER. APR. 17, 1979.

Class 5G

3,380,437.—TRANSVERSELY RECIPROCATING FLUIDIZED BED DEVELOPMENT APPARATUS. APR. 30, 1968. ARG. 0179553, BRA. 0088502, CAN. 0821491, CHL. 0022941, CLB. 0016330, MEX. 0095936, PRU. 0009315, URG. 0008636, VZL. 0020996.
3,393,663.—FLUIDIZING ELECTRODE DEVELOPMENT APPARATUS. JULY 23, 1968. ARG. 0171118, AUS. 0411962, BEL. 0701467, CAN. 0821472, CHL. 0024009, CLB. 0017645, CZC. 0157025, DNK. 0123998, EGR. 0072982, FRA. 1531274, GRB. 1193443, ISR. 0028298, ITL. 0805956, LXB. 0054062, MEX. 0095697, NOR 0127834, NZL. 0149432, PLD. 0069038, PTG. 0048069, SAF. 0674268, SPN. 0343103, STZ. 0481406, SWD. 0322414, USR 0353449, VZL. 0021059.
3,396,700.—XEROGRAPHIC TONER DISPENSING APPARATUS. AUG. 13, 1968. CAN. 0852126, GRB. 1231868, JAP 0752503
3,574,660.—ORBITAL DEVELOPER STREAM DEVELOPMENT. APR. 13, 1971. CAN. 0845076, GRB. 1193277
3,641,977.—APPARATUS FOR AGITATING DEVELOPER MATERIAL WITHIN A HOUSING FEB. 15, 1972. CAN. 0917405, GRB. 1342684.
3,682,137.—J-SHELL DEVELOPER HOUSING. AUG. 8, 1972. CAN. 0949820, GRB. 1342782.
3,900,001.—DEVELOPING APPARATUS. AUG. 19, 1975 CAN. 0970631, GRB. 1381049.

Class 5H

3,484,265.—TRANSVERSELY RECIPROCATING FLUIDIZED BED DEVELOPMENT METH. DEC. 16, 1969.
3,503,776.—XEROGRAPHIC DEVELOPMENT. MAR. 31, 1970. CAN. 0828694, FRA. 1511809, GRB. 1182291, ITL. 0793692, MEX. 0098765.
3,611,991.—VIBRATING BED DEVELOPING APPARATUS WITH ELECTROMAGNETIC DEVELOPER AGITATOR.

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OCT. 12, 1971. AUS. 0445409, BEL. 0755605, CAN. 0911707, EGR. 0083516, FRA. 7032503, GRB. 1264780, ITL. 0907435, JAP. 0745766, SPN. 0383333, STZ. 0521615, SWD. 0361956, TIW. 0007201, USR. 0371738.

3,613,637.—DEVELOPER FOR ELECTROSTATIC IMAGES. OCT. 19, 1971. AUS. 0448238, BEL. 0752034, CAN. 0911702, FRA. 7021987, GRB. 1301157, ITL. 0894180, SWD. 0358975.

3,621,816.—INTERLACED VIBRATING ELECTRODE. NOV. 23, 1971. CAN. 0914397, GRB. 1316614, JAP. 0835102.

3,623,454.—FLUIDIZED - BED DEVELOPMENT APPARATUS. NOV. 30, 1971. CAN. 0895208, GRB. 1272373, JAP. 0731616.

3,654,900.—FLUIDIZED DEVELOPMENT OF ELECTROSTATIC IMAGES. APR. 11, 1972. CAN. 0949821, GRB. 1357149.

3,685,486.—FLUIDIZED DEVELOPMENT APPARATUS. AUG. 22, 1972. CAN. 0921693, GRB. 1316306, JAP. 0746925.

3,754,531.—FLUIDIZED DEVELOPMENT APPARATUS. AUG. 28, 1973.

3,844,252.—SHEET REMOVAL DEVICE. OCT. 29, 1974. BEL. 0814943, CAN. 1000749, FRA. 7415957, ITL. 1012669, PNM. 0003193, PTG. 0061701, SPN. 0426423, SWD. 7406337.

Class 51

3,838,922.—APPARATUS FOR SENSING THE QUANTITY OF RECLAIMED DEVELOPER MATERIAL. OCT. 1, 1974. CAN. 0992600, GRB. 1414319.

3,841,265.—DEVELOPER ASSEMBLY FOR ELECTROSTATIC COPIER. OCT. 15, 1974.

3,844,252.—SHEET REMOVAL DEVICE. OCT. 29, 1974. BEL. 0814943, CAN. 1000749, FRA. 7415957, ITL. 1012669, PNM. 0003193, PTG. 0061701, SPN. 0426423, SWD. 7406337.

3,873,197.—APPARATUS FOR REGULATING THE TONER CONCENTRATION IN A ELECTROPHOTOGRAPHIC DEVICE. MAR. 25, 1975.

3,926,338.—THERMALLY INSENSITIVE PARTICLE CONCENTRATION CONTROLLER. DEC. 16, 1975.

4,065,031.—PROGRAMMABLE DEVELOPMENT CONTROL SYSTEM. DEC. 27, 1977.

Class 51 1

3,316,875.—XEROGRAPHIC DEVELOPING APPARATUS. MAY 2, 1967.

3,331,355.—XEROGRAPHIC DEVELOPING APPARATUS. JULY 18, 1967. CAN. 0793224, FRA. 1465811, GRB. 1069351, ITL. 0778708.

3,349,750.—XEROGRAPHIC DEVELOPMENT APPARATUS. OCT. 31, 1967. CAN. 0819050, FRA. 1516053, GRB. 1165377, ITL. 0788953, JAP. 0547202, MEX. 0093862.

3,356,248.—CONTAINER WITH A ROTATABLE CLOSURE. DEC. 5, 1967. CAN. 0825091, GRB. 1166618.

3,550,556.—DEVELOPMENT APPARATUS. DEC. 29, 1970. ARG. 0180677, AUS. 0442279, BEL. 0726571, BRA. 6905449, CAN. 0882576, CZC. 157055, EGR. 0076888, FRA. 1604314, GRB. 1252498, ITL. 0854006, JAP. 0731247, MEX. 0109983, PNM. 0001770, RMN. 0054558, SAF. 0069180, SPN. 0362037, STZ. 0498431, SWD. 0351059, USR. 0372851, VZL. 0023724.

3,661,118.—ELECTROSTATIC DEVELOPMENT. MAY 9, 1972. CAN. 0951107, GRB. 1359234.

3,662,711.—DEVELOPMENT APPARATUS. MAY 16, 1972. CAN. 0945757, GRB. 1345253.

3,663,291.—CASCADE DEVELOPMENT. MAY 16, 1972.

3,687,270.—CONVEYOR ASSEMBLY. AUG. 29, 1972. CAN. 0952464, GRB. 1376231.

3,717,122.—MAGNETIC GATE. FEB. 20, 1973. CAN. 0960031, GRB. 1377023.

3,943,887.—HYBRID CROSSMIXER. MAR. 16, 1976.

3,947,107.—PARTIALLY SUBMERGED ACTIVE CROSSMIXER. MAR. 30, 1976. BEL. 0835370.

3,973,518.—CROSS MIXING BLENDING CHAMBER FOR ELECTROSTATIC PROCESSORS AND THE LIKE. AUG. 10, 1976.

3,995,590.—BLENDING CHAMBER FOR ELECTROSTATIC PROCESSORS. DEC. 7, 1976.

3,999,512.—ELECTROSTATIC DEVELOPMENT SYSTEM WITH PASSIVE STORAGE CAPACITY. DEC. 28, 1976. BEL. 0823656.

4,040,386.—RETRACTABLE EDGE SEALS FOR ELECTROSTATOGRAPHIC DEVELOPMENT SYSTEMS. AUG. 9, 1977.

4,056,076.—DEVELOPER MIXING SYSTEM. NOV. 1, 1977.

Class 51 2

3,941,280.—APPARATUS FOR CONTROLLING DEVELOPER EFFICIENCY. MAR. 2, 1976.

3,983,841.—TONER RECLAIM CONVEYOR. OCT. 5, 1976.

4,011,835.—TONER CONVEYOR. MAR. 15, 1977.

4,133,458.—TONER DISPENSER ARRANGEMENT. JAN. 9, 1979.

4,133,459.—DEFORMABLE TONER DISPENSER WITH FLOW RATE CONTROLLER. JAN. 9, 1979.

4,135,642.—WIPER ARRANGEMENT FOR TONER LEVEL SENSOR. JAN. 23, 1979.

4,142,655.—TONER DISPENSING AND SUPPLY ARRANGEMENT. MAR. 6, 1979.

Class 51 2A

3,122,455.—XEROGRAPHIC TONER DISPENSER. FEB. 25, 1964.

3,135,433.—XEROGRAPHIC TONER DISPENSING APPARATUS. JUNE 2, 1964. CAN. 0701240.

3,149,760.—POWDER DISPENSING APPARATUS. SEPT. 22, 1964.

3,250,439.—XEROGRAPHIC TONER DISPENSER. MAY 10, 1966. CAN. 0815453, GRB. 1126197, JAP. 0512654.

3,337,072.—LOADER. AUG. 22, 1967. CAN. 0825092, GRB. 1166619, JAP. 0605648.

3,385,500.—TONER PACKAGE. MAY 28, 1968. CAN. 0864337, GRB. 1189147, JAP. 0931680.

3,619,279.—TONER RECEIVING MEMBER. NOV. 9, 1971.

3,622,054.—TONER DISPENSER IMPROVEMENT. NOV. 23, 1971. CAN. 0911705.

3,722,471.—TONER METER DEVICE. MAR. 27, 1973. CAN. 0951108, GRB. 1370009.

3,740,288.—METHOD OF PREPARING A TONER DISPENSER. JUNE 19, 1973.

3,920,155.—PARTICLE LEVEL INDICATOR. NOV. 18, 1975.

3,924,566.—REPRODUCTION MACHINE WITH MEANS FOR SOLIDIFYING THE RECLAIM TONER. DEC. 9, 1975.

3,941,470.—A TONER PARTICLE DISPENSER. MAR. 2, 1976.

3,951,539.—ELECTROSTATIC REPRODUCTION MACHINE WITH IMPROVED TONER DISPENSING APPARATUS. APR. 20, 1976.

3,954,331.—TONER DISPENSER. MAY 4, 1976.

3,979,022.—MONITORING DEVICE—MAGNETIC POWERED ALARM DEVICE. SEPT. 7, 1976. BEL. 0801607, CAN. 0982861, FRA. 7300103, GRB. 1431574, ITL. 0990693, SWD 7308931.

4,034,701.—PARTICLE DISPENSER0TONER DISPENSER—EPIC. JULY 12, 1977. BEL. 0801243, CAN. 0979209, FRA. 7323735, GRB. 1,438,799, ITL. 0990691, SWD. 7,308,929.

Class 51 2B

3,389,863.—XEROGRAPHIC TONER DISPENSER. JUNE 25, 1968. CAN. 0835862, FRA. 1497062, GRB. 1171303, ITL. 0787552, JAP. 0589523, MEX. 0093821, VZL. 0024004.

3,390,664.—XEROGRAPHIC TONER DISPENSING APPARATUS. JULY 2, 1968. CAN. 0852124, GRB. 1208593, JAP. 0608323.

3,619,279.—TONER RECEIVING MEMBER. NOV. 9, 1971.

Class 51 2C

3,951,539.—ELECTROSTATIC REPRODUCTION MACHINE WITH IMPROVED TONER DISPENSING APPARATUS. APR. 20, 1976.

3,956,108.—ANTI-PLUGGING DEVICE FOR AUTOMATIC DEVELOPABILITY CONTROL SYSTEMS. MAY 11, 1976.

3,958,878.—ELECTROSTATIC PROCESSOR HOUSING INTERCHANGABLE RESERVOIRS FOR SUPPING & RECLAIMING TONER. MAY 25, 1976.

3,974,944.—TONER DISPENSER. AUG. 17, 1976.

4,065,031.—PROGRAMMABLE DEVELOPMENT CONTROL SYSTEM. DEC. 27, 1977.

Class 51 2C 1

RE.27,876.—DISPENSING APPARATUS. JAN. 8, 1974. CAN. 0868818.

3,300,101.—TONER DISPENSER. JAN. 24, 1967. CAN. 0800856, GRB. 1152671, JAP. 0524530.

3,339,807.—TONER CONTAINER AND DISPENSER. SEPT. 5, 1967. CAN. 0842133, GRB. 1165953, JAP. 0547201.

3,396,700.—XEROGRAPHIC TONER DISPENSING APPARATUS. AUG. 19, 1968. CAN. 0852126, GRB. 1231868, JAP. 0752503.

3,453,045.—XEROGRAPHIC DEVELOPMENT APPARATUS. JULY 1, 1969. CAN. 0852125, FRA. 1559973, GRB. 1213493, HUN. 0156188, ITL. 0832847, JAP. 0602169, USR. 0371739.

3,538,887.—ELECTROSCOPIC TONER POWDER DISPENSER. NOV. 10, 1970.

3,542,089.—TONER DISPENSER. NOV. 24, 1970. CAN. 0885916.

3,596,807.—DISPENSING APPARATUS—REISSUED D2184R RE27876. AUG. 3, 1971. CAN 0868818.

3,608,792.—APPARATUS FOR DISPENSING FINELY DIVIDED PARTICULATE MATERIAL. SEPT. 28, 1971. ARG. 0182132, ATR. 0311790, AUS. 0456817, BEL. 0745602, CAN. 0869923, CHL. 0025844, DNK. 0128336, FRA. 7003984, GRB. 1302401, GUA. 0002512, ITL. 0886722, MEX. 0119828, NZL. 0159117, PNM. 0002240, SAF. 0700806, SPN. 0376265, STZ. 0526801, SWD. 7001426, TIW. 0005927, VZL. 0032924.

3,654,900.—FLUIDIZED DEVELOPMENT OF ELECTROSTATIC IMAGES. APR. 11, 1972. CAN. 0949821, GRB. 1357149.

3,655,033.—VIBRATORY BOWL—TONER DISPENSER. APR. 11, 1972.

3,752,576.—TRANSPORT FOR PARTICULATE MATERIAL. AUG. 14, 1973.

3,896,279.—TNE LVL DETCTR ASSEMBLY INC MAGNETICLY RESPONSIVE SWITCH ACTUATD BY DFERENTL LOADED BLADE TYPE. JULY 22, 1975.

3,901,187.—DEVELOPER RETONING APPARATUS. AUG. 26, 1975.

3,920,154.—TONER LEVEL DETECTOR NOV. 18, 1975

3,951,539.—ELECTROSTATIC REPRODUCTION MACHINE WITH IMPROVED TONER DISPENSING APPARATUS. APR. 20, 1976.

Class 51 2C 2

3,094,049.—XEROGRAPHIC DEVELOPER MEASURING APPARATUS. JUNE 18, 1963.

3,348,522.—AUTOMATIC TONER CONTROL SYSTEM. OCT. 24, 1967. CAN. 0799397, GRB. 1135743, JAP. 0942998, MEX. 0089292.

3,348,523.—AUTOMATIC TONER CONTROL SYSTEM. OCT. 24, 1967. CAN. 0799399, GRB. 1139299, JAP. 5371200.

3,376,853.—ELECTROSTATIC TONER CONTROL. APR. 9, 1968. CAN. 0819051, GRB. 1177232, JAP. 0568731.

3,376,854.—AUTOMATIC TONER DISPENSING CONTROL—SEE D2425 FOR RE27480. APR. 9, 1968. ARG. 0164003, ATR. 0279352, AUS. 0416453, BEL. 0699115, CAN. 0866349, CHL. 0022942, CLB. 0016441, CZC. 0160633, DNK. 0116114, EGR. 0067870, EIR. 0031100, FRA. 1524678, GRB. 1186775, GRK. 0033692, IND. 0110760, ISR. 0028022, ITL. 0796438, JAP. 0800113, LXB. 0053713, MEX. 0099990, NOR. 0128039, NZL. 0148850, PAK. 0118694, PLD. 0069794, PLP. 0005554, PRU. 0009348, PTG. 0047758, SAF. 0673111, SPN. 0340983, STZ. 0473409, SWD. 6707266, TRK. 0014624, UAR. 0008620, URG. 0008538, USR. 0494887, VZL. 0023661.

3,430,606.—ELECTROSCOPIC PARTICLE SENSOR. MAR. 4, 1969. BEL. 0726274, BRA. 6805010, CAN. 0891683, FRA. 1597321, ITL. 0866513, MEX. 0107599, PNM. 0001400, USR. 0336895, VZL. 0023727.

3,498,500.—LEVEL SENSOR. MAR. 3, 1970. CAN. 0912851, GRB. 1251128, JAP. 0663856.

3,520,445.—DIELECTRIC LEVEL SENSOR. JULY 14, 1970. CAN. 0895527, GRB. 1239856, JAP. 0663857.

3,526,338.—METHOD AND CONTROLLER FOR DISPENSING ELECTROSCOPIC MATERIAL—AUTOMATIC TONER DISPENSER CONTROL—24. SEPT. 1, 1970. ARG. 0181603, AUS. 0436922, BEL. 0726274, BRA. 6804852, CAN. 0895526, GRB. 1216690, ITL. 0866513, JAP. 0752505, MEX. 0107687, PNM. 0001419, SPN. 0362036, SWD. 0355090, USR. 0336895, VZL. 0023723.

3,527,387.—DEVELOPER REPLENISHING PROGRAMMING SYSTEM. SEPT. 8, 1970. CAN. 0922772, GRB. 1233814, JAP. 0758340.

3,536,042.—XEROGRAPHIC DEVELOPMENT APPARATUS. OCT. 27, 1970.

3,604,939.—TONER SENSING APPARATUS—TONER SENSOR ASSEMBLY-GENIE. SEPT. 14, 1971. CAN. 0915751, GRB. 1260379, JAP. 0752502.

3,635,373.—AUTOMATIC DEVELOPABILITY CONTROL APPARATUS. JAN. 18, 1972. ARG. 0190708, AUS. 0445334, BEL. 0760748, CAN. 0923546, CHL. 0025916, EGR. 0091983, FRA. 7047630, GRB. 1336590, GUA. 0002624, ITL. 0913903, JAP. 0795149, MEX. 0116721, PNM. 0002092, SPN. 0386750, STZ. 0524843, SWD. 0362511, TIW. 0007197.

3,659,556.—PROGRAMMABLE TONER DISPENSER. MAY 2, 1972. BEL. 0771423, CAN. 0936681, FRA. 7130743, GRB. 1358448, ITL. 0934010.

3,692,403.—AUTOMATIC CONTROL OF TONER CONCENTRATIONS. SEPT. 19, 1972. CAN. 0979635, GRB. 1409578.

3,693,581.—TONER DISPENSER CIRCUIT FOR ELECTROSTATOGRAPHIC APPARATUS. SEPT. 26, 1972.

3,727,065.—AUTOMATIC DEVELOPABILITY CONTROL SYSTEM. APR. 10, 1973. ARG. 0185080, AUS. 0440458, BEL. 0757430, CAN. 0934806, CHL. 0025915, CZC. 0169811, EGR. 0086755, FRA. 7038235, GRB. 1318895, ITL. 0908953, JAP. 0795148, MEX. 0116873, PNM. 0002179, SPN. 0384593, STZ. 0514168, SWD. 0369114, TIW. 0007196, VZL. 0032004.

3,754,821.—AUTOMATIC DEVELOPMENT CONTROL. AUG. 28, 1973. ARG. 0195188, AUS. 0467463, BEL. 0793425, CAN. 1004725, FRA. 7246724, GRB. 1411448, ITL. 0972845, JAP. 0552838, MEX. 0128209, NZL. 0169419, SAF. 7219030, SPN. 0410096, STZ. 0552838, SWD. 7216891, VZL. 0032066.

3,757,999.—AUTOMATIC DEVELOPABILITY CONTROL SYSTEM FOR ELECTROSTATIC RECORDING APPARATUS. SEPT. 11, 1973. ARG. 0185080, AUS. 0440458, BEL. 0757430, CAN. 0934806, CHL. 0025915, CZC. 0169811, EGR. 0086755, FRA. 7038235, GRB. 1318895, ITL. 0908953, JAP. 0795148, MEX. 0116873, PNM. 0002179, SPN. 0384593, STZ. 0514168, SWD. 0369114, TIW. 0007196, VZL. 0032004.

3,778,146.—ILLUMINATING APPARATUS. DEC. 11, 1973.

3,801,196.—TONER CONCENTRATION REGULATING APPARATUS. APR. 2, 1974.

3,814,516.—HUMIDITY COMPENSATED CONTROL DEVICE. JUNE 4, 1974. CAN. 1012202, GRB. 1458558.

3,825,337.—COLOR BALANCE DISPLAY. JULY 23, 1974. CAN. 1006766.

3,834,806.—PARTICLE LEVEL INDICATOR. SEPT. 10, 1974.

3,872,825.—PARTICLE CONCENTRATION DETECTOR. MAR. 25, 1975. CAN. 1014598.

3,873,002.—TONER DISPENSER LOGIC CONTROL. MAR. 25, 1975. BEL. 0813798, CAN. 1008915, GRB. 1457565, ITL. 1009837.

3,893,408.—TONER DISPENSER SYSTEM. JULY 8, 1975.

3,894,799.—APPARATUS FOR MONITORING COPY QUALITY. JULY 15, 1975.

3,931,792.—ABRASIVE LIQUID DEVELOPING APPARATUS. JAN. 13, 1976.

3,936,176.—DEVICE FOR MAINTAINING A DEVELOPABILITY REGULATING APPARATUS CONTAMINANT FREE. FEB. 3, 1976.

3,960,444.—ELECTROPHOTOGRAPHIC PRINTING MACHINE. JUNE 1, 1976.

3,969,114.—METHOD FOR MONITORING COPY QUALITY. JULY 13, 1976.

3,999,119.—MEASURING TONER CONCENTRATION DEC 21, 1976.

4,026,643.—APP & MTHD FOR MEASUREMENT OF THE RTO OF TNR PRTLCS ELCTRSTATC CHRGE TO TNR PRTLE MASS IN ELCTSTC. MAY 31, 1977.

4,032,225.—COPYING MACHINES. JUNE 28, 1977.

4,043,293.—DEVELOPABILITY REGULATING APPARATUS. AUG. 23, 1977.

4,076,149.—SLAVE DRIVER FOR TONER DISPENSER WITH STRIKER. FEB. 28, 1978.

4,079,266.—ELECTRONIC CONTROL FOR AUTOMATIC DEVELOPABILITY SYSTEM. MAR. 14, 1978.

4,082,445.—TONER CONTROL SYSTEM FOR AN ELECTROSTATIC REPRODUCTION MACHINE. APR. 4, 1978. BEL. 848542.

4,111,151.—MULTI-PARTICLE DEVELOPABILITY REGULATING SYSTEM. SEPT. 5, 1978.

4,113,371.—A COLOR DEVELOPMENT SYSTEM. SEPT. 12, 1978.

Class 5J

3,804,510.—IMAGING DEVELOPING SYSTEM. APR. 16, 1974.

3,889,637.—SELF-BIASED DEVELOPMENT ELECTRODE AND REPRODUCING MACHINE EMPLOYING SAME. JUNE 17, 1975. FRA. 7422700, GRB. 1464886.

3,893,415.—DEVELOPING APPARATUS. JULY 8, 1975. ARG. 0204387, BEL. 0789238, BRA. 0088405, CAN. 0991394, FRA. 7232380, GRB. 1409815, ITL. 0970948, MEX. 0128578, SPN. 0408654, STZ. 0554551, SWD. 7214863, VZL. 0033578.

3,908,037.—IMAGE DEVELOPING TECHNIQUES. SEPT. 23, 1975. CAN. 0980181, GRB. 1406292.

3,965,861.—SEPARATED ROLLER LIQUID DEVELOPMENT. JUNE 29, 1976.

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Class 5J 1

3,091,219.—XEROGRAPHIC DEVELOPING APPARATUS. MAY 28, 1963.
3,147,147.—XEROGRAPHIC DEVELOPING APPARATUS AND ELECTRODE. SEPT. 1, 1964. CAN. 0738918, GRB. 1007167.
3,241,466.—ELECTROSTATIC PHOTOGRAPHY. MAR. 22, 1966.
3,424,131.—ELECTRODED CASCADE DEVELOPMENT SYSTEM. JAN. 28, 1969. CAN. 0848084, FRA. 1463050, GER. 1497214, GRB. 1123618, ITL. 0729637, JAP. 0499007.
3,606,863.—DEVELOPMENT ELECTRODE. SEPT. 21, 1971. CAN. 0905099, GRB. 1296756, JAP. 0774497.
3,611,992.—CLEANUP ELECTRODE. OCT. 12, 1971. CAN. 0916431.
3,642,515.—LIQUID DEVELOPMENT UTILIZING A CURVILINEAR DEVELOPMENT ELECTRODE. FEB. 15, 1972.
3,648,658.—DEVELOPING APPARATUS. MAR. 14, 1972.
3,651,784.—LOW POTENTIAL DEVELOPMENT ELECTRODE. MAR. 28, 1972. CAN. 0917900.
3,670,700.—DEVELOPMENT ELECTRODE. JUNE 20, 1972. ARG. 0185528, ATR. 0324836, AUS. 0445848, BEL. 0752935, CAN. 0916430, CHL. 0025837, DNK. 0126729, EGR. 0085926, FRA. 7024671, GRB. 1304065, IND. 0127310, ITL. 0900194, JAP. 0731613, MEX. 0115164, NOR. 0131437, NZL. 0160642, PLP. 0006295, PNM. 0001951, PTG. 0054071, SAF. 0704531, SPN. 0381380, STZ. 0513439, SWD. 0358976, TIW. 0007161, USR. 0503555, VZL. 30684.
3,741,156.—XEROGRAPHIC DEVELOPMENT APPARATUS. JUNE 26, 1973.
3,778,144.—XEROGRAPHIC DEVELOPMENT ELECTRODE APPARATUS. DEC. 11, 1973. CAN. 0972550, GRB. 1393144.
3,784,299.—DARK DECAY RETARDATION. JAN. 8, 1974.
3,790,397.—RETONING CARRIER BEADS IN THE DEVELOPMENT ZONE. FEB. 5, 1974.
3,795,222.—DEVELOPMENT ELECTRODE SYSTEM. MAR. 5, 1974.
3,816,114.—ELECTRO-PHOTOGRAPHIC METHOD. JUNE 11, 1974.
3,817,212.—ELECTROSTATOGRAPHIC LIQUID DEVELOPMENT APPARATUS. JUNE 18, 1974.
3,832,975.—ELECTROPHOTOGRAPHIC APPARATUS. SEPT. 3, 1974.
3,955,976.—DEVELOPING METHOD IN ELECTROPHOTOGRAPHY-DEVELOPING METHOD IN ELECTROPHOTOGRAPHY. MAY 11, 1976. GRB. 1329143.

Class 5J 2

3,416,494.—XEROGRAPHIC DEVELOPMENT ELECTRODE. DEC. 17, 1968. CAN. 0882575, GER. 1816690, GRB. 1249664, JAP. 0653014.
3,621,816.—INTERLACED VIBRATING ELECTRODE. NOV. 23, 1971. CAN. 0914397, GRB. 1316614, JAP. 0835102.

Class 5J 3

3,349,676.—XEROGRAPHIC DEVELOPMENT ELECTRODE APPARATUS. OCT. 31, 1967. CAN. 0814087, FRA. 1473662, GER. 1522685, GRB. 1144766, ITL. 0764006, JAP. 0513609, MEX. 0090133.
3,866,572.—FORAMINOUS ELECTROSTATOGRAPHIC TRANSFER SYSTEM. BEL. 0815546, CAN. 1009503, FRA. 7418641, GRB. 1448386, ITL. 1012842, SPN. 0426760.

Class 5J 4

3,062,178.—XEROGRAPHIC DEVELOPING APPARATUS. NOV. 6, 1962.
3,105,777.—XEROGRAPHIC DEVELOPING APPARATUS. OCT. 1, 1963. CAN. 0700762.

Class 5J 5

3,284,224.—CONTROLLED XEROGRAPHIC DEVELOPMENT. NOV. 8, 1966. CAN. 0751349, GRB. 1038801, JAP. 0640353.
3,438,705.—AUTOMATIC XEROGRAPHIC DEVELOPMENT CONTROL. APR. 15, 1969. GRB. 1207830.
3,611,982.—DEVELOPMENT ELECTRODE CONTROL APPARATUS. OCT. 12, 1971. ARG. 0185532, AUS. 0450067, BEL. 0755383, BRA. 0088402, CAN. 0913353, CHL. 0025834, EGR. 0090283, FRA. 7032350, GRB. 1303148, ITL. 0901777, JAP. 0758461, MEX. 0117918, PLD. 80986, PNM. 0002245, SPN. 0383058, STZ. 0523526, SWD. 0361750, TIW. 0007514, USR. 0473382, VZL. 0032598.
3,696,784.—XEROGRAPHIC DEVELOPMENT APPARATUS. OCT. 10, 1972. BEL. 0776601, CAN. 0951109, FRA. 7146241, GRB. 1369648, ITL. 0943905.
3,719,169.—PLURAL ELECTRODE DEVELOPMENT APPARATUS. MAR. 6, 1973. CAN. 0979299, GRB. 1381910.
3,784,397.—IMAGING SYSTEM. JAN. 8, 1974.
3,788,739.—IMAGE COMPENSATION METHOD AND APPARATUS FOR ELECTROPHOTOGRAPHIC DEVICES. JAN. 29, 1974.
3,805,739.—CONTROLLING MULTIPLE VOLTAGE LEVELS FOR ELECTROSTATIC PRINTING. APR. 23, 1974. CAN. 0972552, GRB. 1382710.
3,810,165.—ELECTRONIC DISPLAY DEVICE. MAY 7, 1974.
3,815,988.—IMAGE DENSITY CONTROL APPARATUS. JUNE 11, 1974. ARG. 0205710, BEL. 0815209, FRA. 7416693, GRB. 1458707, ITL. 1012346, SAF. 0743132.
3,818,864.—IMAGE DEVELOPING APPARATUS. JUNE 25, 1974. CAN. 0980181, GRB. 1406292.
3,888,666.—REVERSAL DEVELOPING METHOD USING PHOTOCONDUCTIVE DEVELOPING ELECTRODE. JUNE 10, 1975.
3,889,637.—SELF-BIASED DEVELOPMENT ELECTRODE AND REPRODUCING MACHINE EMPLOYING SAME. JUNE 17, 1975. FRA. 7422700, GRB. 1464886.
4,084,538.—AMBIENT TEMPERATURE COMPENSATING DEVICE FOR POWER SOURCE APPARATUS FOR DEVELOPING ELECTRODE. APR. 18, 1978.

Class 5K

3,212,889.—XEROGRAPHIC CONTRAST CONTROL. OCT. 19, 1965. GRB. 1008897.
3,251,685.—METHOD OF CONTROLLING CONTRAST IN A XEROGRAPHIC REPRODUCTION PROCESS. MAY 17, 1966. CAN. 0707047, GER. 1265583, JAP. 0446813.
3,540,806.—HALF TONING METH AND APPARATUS FOR SOLID AREA COVERAG. NOV. 17, 1970. CAN. 0892754, GRB. 1253888.
3,669,072.—DEVELOPER APPARATUS. JUNE 13, 1972. CAN. 0930539, GRB. 1343141.
3,707,947.—CROSS-CHANNEL MIXER. JAN. 2, 1973. ARG. 0200109, ATR. 0322982, AUS. 0457444, BEL. 0776661, CAN. 0946145, CHL. 0027259, DNK. 0132048, EGR. 0099026, FRA. 7145340, GRB. 1372731, ITL. 0943876, MEX. 0127352, PNM. 0002585, SAF. 7018308, SPN. 0397852, STZ. 0557558, TIW. 0005832, USR. 0402245.
3,808,026.—LIQUID DEVELOPMENT OF ELECTROSTATIC LATENT IMAGE. APR. 30, 1974.
3,817,748.—CONTRAST CONTROL IN ELECTROSTATIC COPYING UTILIZING LIQUID DEVELOPMENT. JUNE 18, 1974. CAN. 0991246, GRB. 1406794.
3,865,080.—TONER PICKOFF APPARATUS. FEB. 11, 1975. GRB. 1430876.
3,865,612.—XEROGRAPHIC DEVELOPMENT METHOD. FEB. 11, 1975.
3,887,367.—METHOD FOR TEMPERATURE STABILIZING PHOTORECEPTORS. JUNE 3, 1975.
3,889,637.—SELF-BIASED DEVELOPMENT ELECTRODE AND REPRODUCING MACHINE EMPLOYING SAME. JUNE 17, 1975. FRA. 7422700, GRB. 1464886.
3,893,413.—XEROGRAPHIC DEVELOPING APPARATUS. JULY 8, 1975.
3,911,865.—TONER PICKOFF APPARATUS. OCT. 14, 1975.
3,946,920.—VACUUM SYSTEM CONTROL. MAR. 30, 1976.
3,960,444.—ELECTROPHOTOGRAPHIC PRINTING MACHINE. JUNE 1, 1976.
3,965,861.—SEPARATED ROLLER LIQUID DEVELOPMENT. JUNE 29, 1976.
3,994,725.—MEANS FOR ENHANCING REMOVAL OF BACKGROUND TONER PARTICLE. NOV. 30, 1976.
3,997,259.—APPARATUS FOR REDUCING IMAGE BACKGROUND IN ELECTROSTATIC REPRODUCTION MACHINES. DEC. 14, 1976.
4,023,900.—VARIABLE SPEED LIQUID DEVELOPMENT ELECTROSTATOGRAPHIC APPARATUS. MAY 17, 1977.

Class 5K 5

4,161,357.—PHOTORECEPTOR HEATING APPARATUS. JULY 17, 1979.

Class 5L

3,245,823.—ELECTROSTATIC IMAGE DEVELOPMENT APPARATUS. APR. 12, 1966.

3,926,824.—ELECTROSTATOGRAPHIC DEVELOPER COMPOSITION. DEC. 16, 1975. ARG. 0192480, AUS. 0466319, BEL. 0793098, CAN. 0985552, FRA. 7245403, GRB. 1417179, ITL. 0973327, SPN. 0410171, STZ. 0028663, SWD. 7216977.

Class 5M

3,712,728.—REVERSAL DEVELOPMENT. JAN. 23, 1973. BEL. 0777718, CAN. 0949826, FRA. 7201004, GRB. 1374831, ITL. 0946351.
3,772,012.—REVERSAL DEVELOPMENT USING POLAR LIQUID DEVELOPERS. NOV. 13, 1973. BEL. 0777718, CAN. 0949826, FRA. 7201004, GRB. 1374831, ITL. 0946351.
3,800,744.—ELECTROSTATIC LATENT IMAGE DEVELOPING APPARATUS. APR. 2, 1974.
3,877,963.—REVERSAL LIQUID DEVELOPING USING A DEVELOPMENT ELECTRODE AND CORONA CHARGING. APR. 15, 1975.
3,888,666.—REVERSAL DEVELOPING METHOD USING PHOTOCONDUCTIVE DEVELOPING ELECTRODE. JUNE 10, 1975.
3,901,698.—METHOD OF REVERSAL DEVELOPMENT USING TWO ELECTROSTATIC DEVELOPERS. AUG. 26, 1975.

Class 5N

3,907,693.—LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY. SEPT. 23, 1975.
3,907,694.—NON-VOLATILE CONDUCTIVE INKS. SEPT. 23, 1975.
3,954,640.—ELECTROSTATIC PRINTING INKS. MAY 4, 1976. BEL. 0816553, GRB. 1452556.
3,963,486.—ELECTROPHOTOGRAPHIC IMAGING PROCESS EMPLOYING EPOXY-ESTER CONTAINING LIQUID DEVELOPER. JUNE 15, 1976.
4,024,292.—PROCESS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES WITH INK. MAY 17, 1977. BEL. 0816553, GRB. 1452556.
4,047,943.—METHOD OF DEVELOPING ELECTROSTATIC LATENT IMAGES WITH CONDUCTIVE LIQUID DEVELOPER. SEPT. 13, 1977.
4,075,391.—PRODUCTION OF FERRITE ELECTROSTATOGRAPHIC CARRIER MATERIAL HAVING IMPROVED PROPERTIES. FEB. 21, 1978. BEL. 847571, FRA. 7632899, SPN. 452858.
4,076,640.—PREPARATION OF SPHEROIDIZED PARTICLES. FEB. 28, 1978. SPN. 445496.
4,077,804.—METHOD OF PRODUCING TONER PARTICLES BY IN-SITU POLYMERIZATION AND IMAGING PROCESS. MAR. 7, 1978.

Class 5N 1A

3,609,082.—ELECTROSTATIC DEV PARTICLS CONTAING RESIN, COLORANT, METAL SALT AND PHTHALATE. SEPT. 28, 1971. ARG. 0165457, BAH. 0000094, BOL. 3389B, CAN. 0902985, CHL. 0023567, CLB. 0017680, DOR. 0001462, ECD. 0000168, ELS. 0001065. JAM. 0001897, MEX. 0100808, PNM. 0002016, PRU. 0009862, TRK. 0015594, URG. 0009288.
3,720,617.—AN ELECTROSTATIC DEVELOPER CONTAINING MODIFIED SILICON DIOXIDE PARTICLES. MAR. 13, 1973. ARG. 0189666, ATR. 0321104, AUS. 0463862, BEL. 0767359, CAN. 0941212, CHL. 0026780, EGR. 0093928, FRA. 7118950, GRB. 1347318, ITL. 0926884, MEX. 2131403, NZL. 0163670, PNM. 0002393, PRU. 0011824, STZ. 0567746, SWD. 0366402, TIW. 0006149, USR. 0460634, VZL. 0032423.
3,819,367.—IMAGING SYSTEM. JUNE 25, 1974. ARG. 0189666, ATR. 0321104, AUS. 0463862, BEL. 0767359, CAN. 0941212, CHL. 0026780, EGR. 0093928, FRA. 7118950, GRB. 1347318, ITL. 0926884, MEX. 0131403, NZL. 0163670, PNM. 0002393, PRU. 0011824, STZ. 0567746, SWD. 0366402, TIW. 0006149, USR. 0460634, VZL. 0032423.
3,820,986.—LIQUID DEVELOPMENT METHOD AND MATERIALS. JUNE 28, 1974.
3,833,364.—METHOD OF DEVELOPING ELECTROSTATIC IMAGE CHARGE. SEPT. 3, 1974.
3,850,830.—LIQUID DEVELOPER CONTAINING EXTENDER BODY PARTICLES. NOV. 26, 1974.
3,900,588.—NON-FILMING DUAL ADDITIVE DEVELOPER. AUG. 19, 1975. BEL. 0825924.
4,051,077.—NON FILMING DUAL ADDITIVE DEVELOPER. SEPT. 27, 1977. AUS. 487989, BEL. 825924, FRA. 7505307, GRB. 1494360, SPN. 435074.

Class 5N 1B

3,577,345.—SOLID XEROGRAPHIC DEVELOPER. MAY 4, 1971. ARG. 0172448, ATR. 0325417, AUS. 0424173, BAH. 0000095, BEL. 0716084, BOL. 003270B, CAN. 0902983, CHL. 0025923, CLB. 0017674, DOR. 0001461, ELS. 0001064, FRA. 1567731, GRB. 1232117, GRK. 0037628, GUA. 0002003, HOL. 0148714, IND. 0116209, ISR. 0030116, ITL. 0851653, JAM. 0001848, JAP. 0623002, LXB. 0056197, MEX. 0119320, NOR. 0131653, NZL. 0164353, PNM. 0002062, PRU. 0009911, PTG. 0049749, SPN. 0354686, STZ. 0516180, SWD. 0338238, TIW. 0005096, TRD. 0000057, TRK. 0015620, URG. 0009286, VZL. 0023666.
3,590,000.—SOLID DEVELOPER FOR LATENT ELECTROSTATIC IMAGES. JUNE 29, 1971. ARG. 0172453, ATR. 0288860, AUS. 0480033, BAH. 0000093, BEL. 0716083, BOL. 3399B, CAN. 0902984, CHL. 0024050, DOR. 0001460, ECD. 0000198, ELS. 0001062, FRA. 1567721, GER. 1772570, GRB. 1232118, GRK. 0037629, GUA. 0002095, HOL. 0151523, IND. 0116210, ISR. 0030117, ITL. 0851651, JAM. 0002094, JAP. 0655407, LXB. 0056196, MEX. 0104566, NZL. 0164356, PLP. 0007690, PNM. 0002083, PRU. 0009495, PTG. 0049748, SPN. 0354685, STZ. 0519737, SWD. 0357071, TIW. 0001940, TRD. 0000058, TRK. 0015606, URG. 0009287, VZL. 0032392.
3,609,082.—ELECTROSTATIC DEV PARTICLS CONTAING RESIN, COLORANT, METAL SALT AND PHTHALATE. SEPT. 28, 1971. ARG. 0165457, BAH. 0000094, BOL. 3389B, CAN. 0902985, CHL. 0023567, CLB. 0017680, DOR. 0001462, ECD. 0000168, ELS. 0001065, JAM. 0001897, MEX. 0100308, PNM. 0002016, PRU. 0009862, TRK. 0015594, URG. 0009288.
3,635,704.—IMAGING SYSTEM. JAN. 18, 1972. ALB. 0004133, ARG. 0176978, ATR. 0303521, AUS. 0440759, BEL. 0727560, BRA. 0088093, BUR. 0000042, CAM. 0000463, CAN. 0867697, CHL. 0026254, COR. 000949A, DNK. 0131403, EGR. 0078899, EIR. 0032632, FRA. 6902174, GNR. 0000042, GRB. 1259514, GRK. 0039240, IND. 0119583, ISR. 0031503, ITL. 0871510, LAS. 0000199, LIB. 00P7269, LXB. 0057849, MEX. 0106332, MLG. 0003056, MLW. 00MW869, MNC. 8156975, MRC. 0014724, NZL. 0155208, PAK. 0120859, PLP. 0008511, PNM. 0001676, PRU. 0010443, PTG. 0051063, RHD. 4169529, RMN. 0055464, SAF. 0069995, SPN. 0363127, STZ. 0513431, SWD. 0342921, SYA. 0002477, TGR. 0000551, TIW. 0005257, UAR. 0009525, USR. 0396887, VTM. 0001805, VZL. 0023744, ZMB. 0186974.
3,652,319.—CYCLIC IMAGING SYSTEM. MAR. 28, 1972. AUS. 0441527, BEL. 0761029, CAN. 0944010, FRA. 7047634, GRB. 1336739, ITL. 0913957, JAP. 0771819, SWD. 0363175.
3,653,893.—IMAGING SYSTEM. APR. 4, 1972.
3,655,374.—IMAGING PROCESS EMPLOYING NOVEL SOLID DEVELOPER MATERIAL. APR. 11, 1972.
3,681,107.—DEVELOPMENT OF ELECTROSTATOGRAPHIC IMAGES. AUG. 1, 1972.
3,748,127.—TREATMENT OF REUSABLE PHOTOCONDUCTIVE SURFACES WITH LEWIS ACIDS OR BASES. JULY 24, 1973.
3,820,778.—VACUUM STRIPPING ROLL WITH ROTARY PICKUP SLOTS. JUNE 28, 1974. CAN. 1010081, GRB. 1430856.
3,856,692.—LIQUID ELECTROSTOGRAPHIC DEVELOPER COMPOSITIONS. DEC. 24, 1974. CAN. 0940361, GRB. 1332674.
3,900,588.—NON-FILMING DUAL ADDITIVE DEVELOPER. AUG. 19, 1975. BEL. 0825924, SPN. 0435074.
3,900,589.—AN ELECTROSTATOGRAPHIC IMAGING PROCESS. AUG. 19, 1975. AUS. 0467835, BEL. 0802879, FRA. 7328589, GRB. 1437041, ITL. 0991465, SPN. 041 7382.
3,948,654.—ELECTROSTATOGRAPHIC PROCESS. APR. 6, 1976.
3,983,045.—THREE COMPONENT DEVELOPER COMPOSITION. SEPT. 28, 1976. ARG. 0194232, ATR. 0334199, AUS. 0462045, BEL. 0789987, CHL. 0027625, FRA. 7236617, GRB. 1402009, ITL. 0968815, MEX. 0125231, NZL. 0168638, PNM. 0002796, SAF. 0727225, SPN. 0407564, STZ. 0028096, SWD. 7213035, TIW. 0007666, VZL. 0012802.
4,002,570.—ELECTROPHOTOGRAPHIC DEVELOPER WITH POLYVINYLLIDENE FLUORIDE ADDITIVE. JAN. 11, 1977.
4,072,521.—AMIDES OF W AND CIS ALKENOIC ACIDS IN IMAGING PROCESS AND ELEMENT. FEB. 7, 1978.
4,073,649.—DI CARBOXYLIC ACID BIS AMIDES AND IMPROVED IMAGING PROCESS. FEB. 14, 1978.

4,076,641.—W- AND CIS ALKENOIC ACID AMIDES IN ELECTROSTATOGRAPHIC DEVELOPERS. FEB. 28, 1978.
4,099,968.—DICARBOXYLIC ACID BIS-AMIDES IN ELECTROSTATIC IMAGING COMPOSITIONS AND PROCESSES.
4,147,541.—ELECTROSTATIC IMAGING MEMBER WITH ACID LUBRICANT. APR. 3, 1979. AUS. 467835. BEL. 802879. CAN. 995963. FRA. 7828588. GRB. 1437041. ITL. 991465. SPN. 417382. USR. 637099.

Class 5N 2

3,844,815.—FORON YELLOW AS A TONER COLORANT. OCT. 29, 1974. BEL. 808754, CAN. 1003264, FRA. 7345058, ITL. 1000870.
4,078,930.—DEVELOPER COMPOSITIONS COMPRISING TONER AND CARRIER. MAR. 14, 1978. FRA. 763634.

Class 5N 2A

3,723,114.—THERMOSETTING ELCTRSTGRPHC DVLPR OF CARRIER/PREPOLYMER OF DIALLYL PHTHALATE ISOPHTHALATE AND MXTR. MAR. 27, 1973. ARG. 0185089, BEL. 0762507, CAN. 0970195, FRA. 7104349, GRB. 1344197, ITL. 0918244, MEX. 0122234.
3,806,339.—LIQUID DEVELOPER COMPOSITION. APR. 23, 1974.
3,900,800.—HIGH VOLTAGE AMPLIFIER. AUG. 19, 1975.
3,903,320.—ELECTROSTATOGRAPHIC DEVELOPMENT METHOD FOR PRESSURE FIXABLE TONERS. SEPT. 2, 1975.
3,909,259.—COLOR ELECTROPHOTOGRAPHIC IMAGING PROCESS UTILIZING SPECIFIC CARRIER-TOWER COMBINATIONS. SEPT. 30, 1975. CAN. 1005678, FRA. 7345057, GRB. 1435218.
3,942,979.—IMAGING SYSTEM. MAR. 9, 1976.
3,965,021.—ELECTROSTATOGRAPHIC DEVELOPMENT-POLYBLEND TONERS. JUNE 22, 1976.
3,967,962.—DEVELOPING WITH TONER POLYMER HAVING CRYSTALLINE AND AMORPHOUS SEGMENTS. JULY 6, 1976.
3,969,251.—DEVELOPER MIXTURE. JULY 13, 1976.
4,013,572.—HYBRID FIX SYSTEM INCORPORATING PHOTOGRADABLE POLYMERS. MAR. 22, 1977.
4,049,447.—IMAGING SYSTEM. SEPT. 20, 1977. ARG. 195092, AUS. 468938, BEL 791376, CAN. 986768, FRA 7239133, GRB. 1411446, ITL. 972536, MEX. 131270, SPN. 409973, STZ. 28528, VZL. 33138.
4,104,066.—COLD PRESSURE FIX TONERS FROM POLYCAPROLACTONE. AUG. 1, 1978.

Class 5N 2A 1

RE.25,136.—ELECTROSTATIC DEVELOPER COMPOSITION AND METHOD THEREFOR-RE OF 2,940,934-D432. MAR. 13, 1962.
3,079,342.—ELECTROSTATIC DEVELOPER COMPOSITION AND METHOD THEREFOR. FEB. 26, 1963. ARG. 0157131, CAN. 0726134, GUA. 0001817.
3,239,465.—XEROGRAPHIC DEVELOPER. MAR. 8, 1966. CAN. 0630295, GRB. 0952166.

Class 5N 2A 2

3,239,465.—XEROGRAPHIC DEVELOPER. MAR. 8, 1966. CAN. 0630295, GRB. 0952166.

Class 5N 2B

3,533,835.—ELECTROSTATOGRAPHIC DEVELOPER MIXTURE. OCT. 13, 1970. ARG. 0181296, AUS. 0417746, BEL. 0704918, CAN. 0900769, CHL. 0024909, CLB. 0017825, FRA. 1540695, GRB. 1211865, IND. 0112449, ITL. 0814857, MEX. 0100137, PRU. 0009323, SWD. 0323583, URG. 0009011, VZL. 0023668.
3,591,503.—ELECTROSTATOGRAPHIC DEVELOPER. JULY 6, 1971. ARG. 0172143, ATR. 0287491, AUS. 0418556, BEL. 0713751, CAN. 0879020, CHL. 0024256, CLB. 0017933, FRA. 1560849, GRB. 1225980, GRK. 0038397, IND. 0115457, ITL. 0833710, LXB. 0055904, MEX. 0111625, NOR. 0128297, NZL. 0152196, PLP. 0008847, PRU. 0009319, PTG. 0049455, SAF. 0682386, SPN. 0352810, STZ. 0508903, SWD. 0333868, URG. 0009139, VZL. 0023688.
3,595,794.—ELECTROSTATOGRAPHIC DEVELOPER. JULY 27, 1971. ARG. 0169109, ATR. 0290986, AUS. 0418156, BEL. 0713752, CAN. 0879021, CHL. 0024482, FRA. 1582855, GRB. 1227471, IND. 0115458, ITL. 0883043, LXB. 0055894, MEX. 0115899, NOR. 0128036, NZL. 0152195, PLP. 0007966, PRU. 0009335, PTG. 0049154, SAF. 0682358, SPN. 0352811, STZ. 0505410, SWD. 0331633, URG. 0009283, VZL. 0023687.
3,627,522.—DEVELOPER COMPOSITION AND METHOD OF USE. DEC. 14, 1971.
3,672,928.—ELECTROSTATOGRAPHIC DEVELOPERS HAVING CARRIERS COMPRISING POLYSTER COATED CORES. JUNE 27, 1972. ARG. 0184669, BEL. 0762415, CAN. 0941209, FRA. 7103845, GRB. 1344365, ITL. 0918191, JAP. 0764506.
3,704,066.—REFLEX ESPOSURE MEDIUM. NOV. 28, 1972.
3,725,283.—ELECTROSTATOGRAPHIC DEVELOPER CONTAINING UNCOATED GLASS CERAMIC CARRIER PARTICLES. APR. 3, 1973. BEL. 0777720, CAN. 0973745, FRA. 7201006, GRB. 1376457, ITL. 0946358.
3,767,578.—CARRIER MATERIAL FOR ELECTROSTATOGRAPHIC. OCT. 23, 1973. ARG. 0198052, ATR. 0322978, AUS. 0461667, BEL. 0784452, CAN. 0986351, CHL. 0027640, FRA. 7220690, GRB. 1397445, ITL. 0959791, MEX. 0127643, SPN. 0403664, STZ. 0546969, SWD. 7207389, TIW. 0006042, VZL. 0032064.
3,847,604.—ELECTROSTATIC IMAGING PROCESS USING MODULAR CARRIERS. NOV. 12, 1974. ARG. 0198052, ATR. 0322978, AUS. 0461667, BEL. 0784452, CAN. 0986351, CHL. 0027640, FRA. 7220690, GRB. 1397445, ITL. 0959791, MEX. 0127643, SPN. 0403664, STZ. 0546969, SWD. 7207389, TIW. 0006042, VZL. 0032064.
3,849,127.—AN ELECTROSTATOGRAPHIC PROCESS IN WHICH COATED CARRIER PARTICLES ARE USED. NOV. 19, 1974.
3,857,792.—ELECTROSTATIC DEVELOPER MIXTURE WITH A COATED CARRIER. DEC. 31, 1974.
3,914,181.—ELECTROSTATOGRAPHIC DEVELOPER MIXTURES COMPRISING FERRITE CARRIER BEADS. OCT. 21, 1975. ARG. 0194244, AUS. 0471676, BEL. 0785913, CAN. 1000477, GRB. 1398871, ITL. 0962400, MEX. 0126285, SPN. 0404423, VZL. 0032940.
3,923,503.—ELECTROSTATIC LATEN IMAGE DEVELOPMENT EMPLOYING STEEL CARRIER PARTICLES. DEC. 2, 1975. ARG. 0181848, ATR. 0316987, AUS. 0456820, BAH. 0000162, BEL. 0752230, CAN. 0940360, CHL. 0025833, EGR. 0095180, FRA. 7021985, GRB. 1312806, ITL. 0894287, JAP. 0728825, MEX. 0121681, NOR. 0131364, NZL. 0160479, PLD. 0081013, PNM. 0002264, PTG. 0053978, SAF. 0704155, SPN. 0380913, STZ. 0548625, SWD. 0351058, TIW. 0006837, USR. 0457235.
3,926,824.—ELECTROSTATOGRAPHIC DEVELOPER COMPOSITION. DEC. 16, 1975. ARG. 0192480, AUS. 0466319, BEL. 0793098, CAN. 0985552, FRA. 7245403, GRB. 1417179, ITL. 0973327, SPN. 0410171, STZ. 0028663, SWD. 7216977.
3,939,086.—HIGHLY CLASSIFIED OXIDIZED DEVELOPER MATERIAL. FEB. 17, 1976. ARG. 0181848, ATR. 0316987, AUS. 0456820, BAH. 0000162, BEL. 0752230, CAN. 0940360, CHL. 0025833, EGR. 0095180, FRA. 7021985, GRB. 1312806, ITL. 0894287, JAP. 0728825, MEX. 0121681, NOR. 0131364, NZL. 0160479, PLD. 0081013, PNM. 0002264, PTG. 0053978, SAF. 0704155, SPN. 0380913, STZ. 0548625, SWD. 0351058, TIW. 0006837, USR. 0457235.
3,942,979.—IMAGING SYSTEM. MAR. 9, 1976.
3,969,251.—DEVELOPER MIXTURE. JULY 13, 1976.
4,018,601.—ELECTROSTATOGRAPHIC MAGNETIC BRUSH IMAGING PROCESS EMPLOYING CARRIER BEADS COMPRISING HIGH NICK. APR. 19, 1977.
4,051,077.—NON FILMING DUAL ADDITIVE DEVELOPER. SEPT. 27, 1977. AUS. 487989, BEL. 825924, FRA. 7505307, GRB. 1494360, SPN. 435074.
4,065,305.—XEROGRAPHIC DEVELOPER. DEC. 27, 1977.

Class 5N 4

3,467,634.—ORGANOSILICON TERPOLYMERS AND PROCESS. SEPT. 16, 1969. ARG. 0165758, AUS. 0417109, BEL. 0702403, BRA. 6790950, CAN. 0887389, FRA. 1534183, GRB. 1200756, HOL. 0826202, ITL. 0826202, JAP. 0671041, MEX. 0100136, NOR. 0125392, SPN. 0343902, STZ. 0484210, SWD. 0339752, VZL. 0025437.
3,526,533 —COATED CARRIER PARTICLES. SEPT. 1, 1970. ARG. 0161341, AUS. 0418867, BEL. 0702404, CAN. 0878413, FRA. 1534184, GRB. 1205051, ITL. 0826203, JAP. 0578401, MEX. 0120334, NOR. 0122818, SPN. 0343903, STZ. 0486056, SWD. 0308987, VZL. 0032393.
3,533,835.—ELECTROSTATOGRAPHIC DEVELOPER MIXTURE. OCT. 13, 1970. ARG. 0181296, AUS. 0417746, BEL. 0704918, CAN. 0900769, CHL. 0024909, CLB. 0017825, FRA. 1540695, GRB. 1211865, IND. 0112449, ITL. 0814857, MEX. 0100137, PRU. 0009323, SWD. 0323583, URG. 0009011, VZL. 0023668.

3,713,819.—XEROGRAPHIC IMAGING AND DEVELOPMENT USING METAL OXIDE CARRIER PART. JAN. 30, 1973.
3,730,707.—METHOD OF DEVELOPING LATENT IMAGES. MAY 1, 1973.
3,752,666.—ELECTROSTATIC IMAGING PROCESS USING CARRIER BEADS CONTAINING CONDUCTIVE PARTICLES. AUG. 14, 1973.
3,833,366.—CARRIER COMPOSITIONS. SEPT. 3, 1974. BEL. 0748633, CAN. 0904641, FRA. 7012584, GRB. 1319787, ITL. 0899337, JAP. 0709043.
3,839,029.—ELECTROSTATOGRAPHIC DEVELOPMENT WITH FERRITE DEVELOPER MATERIALS. OCT. 1, 1974. ARG. 0194244, AUS. 0471676, BEL. 0785913, CAN. 1000477, GRB. 1398871, ITL. 0962400, MEX. 0126285, SPN. 0404423, VZL. 0032940.
3,849,182.—HIGHLY SHAPE-CLASSIFIED OXIDIZED LOW CARBON HYPEREUTECTOID ELECTROSTATOGRAPHIC STEEL CARRIER PA. NOV. 19, 1974. ARG. 0181848, ATR. 0316987, AUS. 0456820, BAH. 0000162, BEL. 0752230, CAN. 0940360, CHL. 0025833, EGR. 0095180, FRA. 7021985, GRB. 1312806, ITL. 0894287, JAP. 0728825, MEX. 0121681, NOR. 0131364, NZL. 0160479, PLD. 0081013, PNM. 0002264, PTG. 0053978, SAF. 0704155, SPN. 0380913, STZ. 0548625, SWD. 0351058, TIW. 0006837, USR. 0457235
3,850,663.—CELLULOSE COATED CARRIERS. NOV. 26, 1974. ARG. 0183677, AUS. 0458322, BEL. 0763987, CAN. 0941210, EGR. 0091603, FRA. 7108585, GRB. 1345027, ITL. 0922292, MEX. 0120027, PNM. 0002440, SAF. 0711547, STZ. 0557050, SWD. 0359940, TIW. 0008177, VZL. 0032931.
3,850,676.—COATED CARRIER PARTICLES FOR ELECTROSTATOGRAPHIC DEVELOPMENT. NOV. 26, 1974.
3,900,587.—IMAGING PROCESS EMPLOYING TREATED CARRIERS PARTICLES. AUG. 19, 1975.
3,903,320.—ELECTROSTATOGRAPHIC DEVELOPMENT METHOD FOR PRESSURE FIXABLE TONERS. SEPT. 2, 1975.
3,916,064.—DEVELOPER MATERIAL. OCT. 28, 1975.
3,916,065.—ELECTROSTATOGRAPHIC CARRIER PARTICLES. OCT. 28, 1975.
3,929,657.—STOICHIOMETRIC FERRITE CARRIERS. DEC 30, 1975. BEL. 0819535
3,945,823.—ELECTROSTATOGRAPHIC REVERSAL DEVELOPMENT WITH DEVELOPER COMPRISING POLY(P-XYLYLENE) COATED CARR. MAR. 23, 1976 BEL. 0807597, CAN. 1003262, GRB. 1453595, MEX. 0133543, SPN. 0420696.
3,947,371.—DEVELOPER MATERIAL WITH POLYPXYLYLENE-COATED CARRIER. MAR. 30, 1976. BEL. 0807597, CAN. 1003262, GRB. 1453595, MEX. 0133543, SPN. 0420696.
3,989,648.—IMAGING SYSTEM. NOV. 2, 1976. CAN 1007923.
3,996,392.—HUMIDITY-INSENSIVE FERRITE DEVELOPER MATERIALS. DEC. 7, 1976. BEL. 0847571.
4,007,293.—MECHANICALLY VIABLE DEVELOPER MATERIALS. FEB. 8, 1977.
4,019,903.—ELECTROSTATIC DEVELOPMENT. APR. 26, 1977. BEL. 0777715, CAN. 0973746, FRA. 7201001, GRB 1376456, ITL. 0946359.
4,035,520.—IMAGING SYSTEMS. JULY 12, 1977.
4,039,331.—CARRIER BEAD COATING COMPOSITIONS. AUG. 2, 1977.
4,040,969.—HIGH SURFACE AREA CARRIER. AUG. 9, 1977. BEL. 829639, GRB. 1497732, SPN. 438084.
4,042,517.—ELECTROSTATOGRAPHIC DEVELOPER MIXTURE CONTAINING A THERMOSET ACRYLIC RESIN COATED CARRIER. AUG. 16, 1977.
4,042,518.—STOICHIOMETRIC FERRITE CARRIERS. AUG. 16, 1977. BEL. 819535, CAN. 1033978, FRA. 7429829, GRB. 1468841, SPN. 429670.
4,043,929.—ELECTROSTATOGRAPHIC CARRIER COMPOSITION. AUG. 23, 1977.
4,053,310.—DURABLE CARRIER COATING COMPOSITIONS COMPRISING POLYSULFONE OCT. 11, 1978
4,057,426.—MAGNETIC TONER WITH A COATED CARRIER. NOV. 8, 1977
4,058,397.—YELLOW DEVELOPER E MPLOYING A COATED CARRIER. NOV. 15, 1978
4,065,585.—RENEWABLE CHOW FUSER COATING. DEC. 27, 1977. GRB. 1490252.
4,066,563.—COPPER-TETRA-4-(OCTADECYLSULFONOMIDO) PHTHALOCYANINE ELECTROPHOTOGRAPHIC CARRIER. JAN. 3, 1978.
4,073,965.—YELLOW DEVELOPER EMPLOYING A COATED CARRIER AND IMAGING PROCESS USING SAME. FEB. 14, 1978.
4,076,893.—TRIBO MODIFIED CARRIER MATERIALS VIA ACYLATION. FEB. 28, 1978.
4,078,926.—IMAGING METHOD UTILIZING FUNCTIONALIZED CARRIER MATERIALS. MAR. 14, 1978.
4,079,166.—AMINOLYZED CARRIER COATINGS. MAR. 14, 1978.
4,092,163.—IMAGING PROCESS UTILIZING SILYLATED COATED CARRIER. MAY 30, 1978
4,094,803.—DEVELOPER COMPOSITION COMPRISING AMINOLYZED COATED CARRIER. JUNE 13, 1978.
4,104,066.—COLD PRESSURE FIX TONERS FROM POLYCAPROLACTONE. AUG. 1, 1978.
4,122,024.—CLASSIFIED TONER MATERIALS. OCT. 24, 1978. BEL. 829719. CAN. 1043149. FRA. 7516758. GRB. 1497731.
4,124,385.—MAGNETIC GLASS CARRIER MATERIALS. NOV. 7, 1978.
4,124,735.—MAGNETIC GLASS CARRIER MATERIALS. NOV. 7, 1978.
4,125,667.—HIGH SURFACE AREA FERROMAGNETIC CARRIER MATERIALS. NOV. 14, 1978. BEL. 829639. CAN. 1041344. FRA. 7516181. GRB. 1497732. SPN. 438084. SWD. 75060434. USR. 623532.
4,126,437.—MAGNETIC GLASS CARRIER MATERIALS. NOV. 21, 1978.
4,126,454.—IMAGING PROCESS UTILIZING HIGH SURFACE AREA CARRIER MATERIALS. NOV. 21, 1978.
4,126,458.—INORGANIC REVERSAL CARRIER COATINGS. NOV. 21, 1978.
4,126,566.—ELECTROSTATIC DEVELOPER MATERIAL. NOV. 21, 1978. CAN. 1055761. GRB. 1494392.
4,147,540.—COLOR ELECTROPHOTOGRAPHIC DEVELOPER SYSTEM EMPLOYING ONE CARRIER HAVING A COATING OF RESIN. APR. 3, 1979. FRA. 7629316. GRB. 1526875.
4,152,279.—TRIBOELECTRIC MODIFIED CARRIER FOR ELECTROSTATOGRAPHIC DEVELOPER. MAY 1, 1979.
4,156,607.—CARRIER COATED WITH ACYL MODIFIED STYRENE COPOLYMER, USED IN ELECTROSTATIC IMAGING PROCESS. MAY 29, 1979.

Class 5N 5

3,788,994.—PRESSURE FIXABLE ELECTROSTATOGRAPHIC TONER. JAN. 29, 1974. ARG. 0200575, BEL. 0793247, CAN. 0985943, FRA. 7244381, GRB. 1406687, ITL. 0973323, SPN. 0410212, STZ. 0028529, VZL. 0032608.
3,804,764.—ELECTROSTATOGRAPHIC PRESSURE SENSITIVE POLYMERIC TONER. APR. 16, 1974. ARG. 0196320, AUS. 0464392, BEL. 0793554, CAN. 1011149, FRA. 7246575, GRB. 1417409, ITL. 0973325, SPN 0410211, STZ. 0028568.
3,853,778.—TONER COMPOSITION EMPLOYING POLYMER WITH SIDE CHAIN CRYSTALLINITY. DEC 10, 1974. AUS. 0465653, BEL. 0793639, CAN. 0998869, FRA. 7246888, GRB. 1423291, ITL. 0973330, SPN. 0410267, SWD. 7300003.
3,893,932.—PRESSURE FIXABLE TONER. JULY 8, 1975.
3,893,934.—SOLID DEVELOPER FOR ELECTROSTATIC LATENT IMAGES. JULY 8, 1975.
4,002,776.—IMAGING PROCESS EMPLOYING TONER PARTICLES CONTAINING ARYLSULPONAMIDE FORMALDEHYDE ADDUCT. JAN. 11, 1977.
4,027,048.—ELECTROSTRATOGRAPHIC DEVELOPMENT. ARG. 0196318, AUS. 0467046, BEL. 0792115, CAN 1001884, FRA. 7239134, ITL. 0973326, MEX 0128788, SPN. 0410205, STZ. 0028567, VZL. 0033139.
4,049,447.—IMAGING SYSTEM. SEPT. 20, 1977. ARG. 195092, AUS. 468938, BEL. 791376, CAN. 986768, FRA. 7239133, GRB. 1411446, ITL. 972536, MEX. 131270, SPN. 409973, STZ. 28528, VZL. 33138
4,070,186.—TRIBO MODIFIED TONER MATERIALS VIA SILYLATION AND ELECTROSTATOGRAPHIC IMAGING PROCESS. JAN. 24, 1978.
4,070,296.—TRIBOELECTRICALLY CONTROLLED COVAL- ENTLY DYED TONER MATERIALS. JAN. 24, 1978.
4,078,931.—AMINOLYZED TONER COMPOSITIONS AND IMAGING PROCESS USING SAME. MAR. 14, 1978.
4,079,166.—AMINOLYZED CARRIER COATINGS. MAR. 14, 1978.
4,104,066.—COLD PRESSURE FIX TONERS FROM POLYCAPROLACTONE. AUG. 1, 1978.
4,113,482.—IMAGING COMPOSITIONS. SEPT. 12, 1978. CAN. 978790. GRB. 1418292.
4,134,760.—TRIBO MODIFIED TONER MATERIALS VIA ACYLATION. JAN. 16, 1979 GRB. 1525703.
4,135,925.—METHODS OF CHANGING COLOR BY IMAGE DISRUPTION. JAN. 23, 1979. CAN. 978790. GRB. 1418292
4,139,483.—ELECTROSTATOGRAPHIC TONER COMPOSITION CONTAINING SURFACTANT. FEB. 13, 1979.

V.988.1.NO.6.79 UMI

Class 5N 5A

3,729,419.—LIQUID DEVELOPER. APR. 24, 1973.
3,804,619.—COLOR ELECTROPHOTOGRAPHIC IMAGING PROCESS. APR. 16, 1974. CAN. 1005678, FRA. 7345057, GRB. 1435218.
3,836,244.—COLOR XEROGRAPHY. SEPT. 17, 1974.
3,841,893.—CHARGE CONTROL AGENTS FOR LIQUID DEVELOPERS. OCT. 15, 1974.
3,897,249.—TONERS FOR PHTHALOCYANINE PHOTORECEPTORS. JULY 29, 1975.
3,900,800.—HIGH VOLTAGE AMPLIFIER. AUG. 19, 1975.
3,909,259.—COLOR ELECTROPHOTOGRAPHIC IMAGING PROCESS UTILIZING SPECIFIC CARRIER-TONER COMBINATIONS. SEPT. 30, 1975. CAN. 1005678, FRA. 7345057, GRB. 1435218.
4,035,310.—YELLOW DEVELOPER. JULY 12, 1977.
4,052,207.—ELECTROSTATOGRAPHIC IMAGING PROCESS. OCT. 4, 1977: SPN. 450203.

Class 5N 5B

3,080,250.—SELF-TACKIFYING XEROGRAPHIC TONER. MAR. 5, 1963.
3,080,318.—THREE-COMPONENT XEROGRAPHIC TONER. MAR. 5, 1963.

Class 5N 6

3,755,177.—PROCESS OF MAKING LIQUID ELECTROSTATIC DEVELOPERS CONTAINING GELATIN. AUG. 28, 1973.
3,908,046.—P-XYLYENE VAPOR PHASE POLYMERIZATION COATING OF ELECTROSTATOGRAPHIC PARTICLES. SEPT. 23, 1975.,
3,986,968.—MILLED AND POLAR SOLVENT EXTRACTED LIQUID DEVELOPER. OCT. 19, 1976.

Class 5N 6A

3,507,686.—METHOD OF COATING CARRIER BEADS. APR. 21, 1970. CAN. 0872190, GRB. 1239621, JAP. 0675782.
3,658,500.—METHOD OF PRODUCING GLASS BEADS FOR ELECTROSTATOGRAPHIC DEVELOPERS. APR. 25, 1972. CAN. 0916536, GRB. 1331485.
3,685,113.—DEVELOPER SYSTEM. AUG. 22, 1972. ARG. 0183679, BEL. 0764635, CAN. 0941211, FRA. 7110751, GRB. 1347568, ITL. 0922132, MEX. 0122432.
3,764,310.—METHOD OF PRODUCING ELECTROSTATOGRAPHIC DEVELOPER. OCT. 9, 1973.
3,789,796.—APPARATUS FOR PRODUCING DEVELOPER MATERIALS. FEB. 5, 1974.
3,989,435.—APPARATUS FOR FABRICATING SPHERICALLY SHAPED PARTICLES OF SMALL DIAMETER. NOV. 2, 1976.
4,019,842.—APPARATUS FOR FORMING MAGNETITE ELECTROSTATOGRAPHIC CARRIERS. APR. 26, 1977.
4,075,391.—PRODUCTION OF FERRITE ELECTROSTATOGRAPHIC CARRIER MATERIAL HAVING IMPROVED PROPERTIES. FEB. 21, 1978. BEL. 847571, FRA. 7632899, SPN. 452858.
4,076,640.—PREPARATION OF SPHEROIDIZED PARTICLES. FEB. 28, 1978. SPN. 445496.
4,129,136.—REJUVENATING ELECTROSTATOGRAPHIC CARRIER PARTICLES. DEC. 12, 1978.

Class 5N 6B

3,326,848.—SPRAY DRIED LATEX TONERS. JUNE 20, 1967. AUS. 0409084, BEL. 0666056, CAN. 0866260, FRA. 1451366, GRB. 1115653, ITL. 0717377, MEX. 0088140, SWD. 0340046.
3,338,991.—METHOD OF FORMING ELECTROSTATIC TONER PARTICLES. AUG. 29, 1967. FRA. 1450642, GRB. 1115634, HOL. 0142251, ITL. 0717378, JAP. 0539572.
3,502,582.—IMAGING SYSTEMS. MAR. 24, 1970. ARG. 0171952, BEL. 0726571, CAN. 0873934, FRA. 1569382, GRB. 1237095, ITL. 0835554, MEX. 0100704, VZL. 0032414.
3,740,334.—PROCESS OF PREPARING SOLID DEVELOPERS FOR ELECTROSTATIC LATENT IMAGES. JUNE 19, 1973.
3,830,750.—ENCPSLING SBSTNLY SLUBL PRTN OF CORE MATL IN SBSTNLY SLBLE SHELL MATL OF DFRNT SOLUBLTY. AUG. 20, 1974. AUS. 0466018, BEL. 0793246, CAN. 0983328, GRB. 1411954, ITL. 0973317, SPN. 0410224, STZ. 0028527.
3,893,933.—PROCESS FOR PRODUCING ENCAPSULATED TONER COMPOSITION. JULY 8, 1975.
3,968,044.—MILLED LIQUID DEVELOPER. JULY 6, 1976.
3,990,797.—DIFFRACTION MONITORING OF RAYLEIGH MODE JETS. NOV. 9, 1976.
4,016,099.—METHOD OF FORMING ENCAPSULATED TONER PARTICLES. APR. 5, 1977.
4,097,404.—PROCESS FOR PROVIDING ENCAPSULATED TONER COMPOSITION-MICROENCAPSULATION. JUNE 27, 1978.

Class 5O

3,641,981.—APPARATUS FOR CONTROLLING DEVELOPER CHARGE LEVEL. FEB. 15, 1972. CAN. 0914006, GRB. 1338417.
3,654,901.—TONER RECLAIMING SYSTEM. APR. 11, 1972. ATR. 0321720, AUS. 0459286, BEL. 0754425, CAN. 0941881, DNK. 0130262, EGR. 0085711, FRA. 7029147, GRB. 1325455, IND. 0127847, ITL. 0901160, JAP. 1143014, NOR. 0130609, PLD. 0080951, PLP. 0008671, PTG. 0054272, SAF. 0705408, SPN. 0382437, STZ. 0513441, SWD. 0361533, TIW. 0006725, USR. 0373974.
3,664,297.—CENTRIFUGAL DEVELOPMENT APPARATUS AND METHOD. MAY 23, 1972. GRB. 1315565, JAP. 0719144.
3,809,012.—DEVELOPER SEAL. MAY 7, 1974. CAN. 0984133.
3,872,826.—DEVELOPMENT SYSTEM SEAL. MAR. 25, 1975.
3,893,415.—DEVELOPING APPARATUS. JULY 8, 1975. ARG. 0204387, BEL. 0789238, BRA. 0088405, CAN. 0991394, FRA. 7232380, GRB. 1409815, ITL. 0970948, MEX. 0128578, SPN. 0408654, STZ. 0554551, SWD. 7214863, VZL. 0033578.
3,906,899.—DEVELOPER SEAL. SEPT. 23, 1975.
3,915,121.—DEVELOPMENT APPARATUS. OCT. 28, 1975.
3,924,566.—REPRODUCTION MACHINE WITH MEANS FOR SOLIDIFYING THE RECLAIM TONER. DEC. 9, 1975.
3,982,498.—DEVELOPMENT APPARATUS. SEPT. 28, 1976. FRA. 7436713.
4,029,047.—IMPROVED TONER HANDLING SYSTEM. JUNE 14, 1977.
4,039,102.—DEVELOPER DOOR WITH USE COUNTER ON DOOR. AUG. 2, 1977.
4,041,902.—FILTER APPARATUS. AUG. 16, 1977.
4,058,086.—EMISSION CONTROLLER FOR DEVELOPMENT APPARATUS. NOV. 15, 1977.
4,088,481.—EXTENDED RANGE COLOR ELECTROPHOTOGRAPHIC METHOD BY SUPERIMPOSING A HALF-TONE IMAGE ON A LOW. MAY 9, 1978.
4,100,611.—APPARATUS FOR CONTROLLING AIRBORNE PARTICLE EMISSION. JULY 11, 1978.
4,139,296.—CROSS MIXER. FEB. 13, 1979.

Class 5P

3,649,262.—SIMULTANEOUS DEVELOPMENT-CLEANING OF SAME AREA OF AN ELECTROSTATOGRAPHIC IMAGE SUPPORT SURFACE. MAR. 14, 1972. AUS. 0445365, BEL. 0743661, CAN. 0916232, FRA. 6944511, GRB. 1296997, ITL. 0882670, USR. 0358873.
4,029,047.—IMPROVED TONER HANDLING SYSTEM. JUNE 14, 1977.

Class 6

3,753,560.—AUXILIARY SHEET FEEDER-MULTI STATION AUXILIARY PAPER FEEDER-2400. AUG. 21, 1973. AUS. 0466179, BEL. 0793641, CAN. 1000750, FRA. 7300150, GRB. 1402971, ITL. 0973328, SPN. 0410322.
3,833,790.—HEATED PRESSURE FUSING SYSTEM. SEPT. 3, 1974, FRA. 7422884.
4,111,565.—APPARATUS FOR SENSING WHEN PAPER UTILIZED IN A PRINTER HAS BEEN DEPLETED. SEPT. 5, 1978.
4,161,362.—DOCUMENT CODING. JULY 17, 1979.

Class 6A

3,104,873.—PAPER SUPPLY TRAY. SEPT. 24, 1963. CAN. 0699129, GRB. 1016553.
3,153,534.—PAPER SUPPLY TRAY. OCT. 20, 1964.
3,154,356.—PAPER CATCH TRAY. OCT. 27, 1964. CAN. 0726574, GRB. 1032952, JAP. 0497185.
3,405,635.—PAPER SUPPORT TRAY FOR REPRODUCTION MACHINES. OCT. 15, 1968.
3,406,964.—ADJUSTABLE PACK HOLDER. OCT. 22, 1968. CAN. 0848822, GER. 1270049, GRB. 1158671, JAP. 0914623.
3,415,510.—AUXILIARY SHEET FEEDER. DEC. 10, 1968. CAN. 0831412, GRB. 1235158.

3,458,187.—SHEET HOLDER. JULY 29, 1969. CAN. 0879560, GRB. 1199947.
3,599,966.—SHEET HANDLING APPARATUS. AUG. 17, 1971. CAN. 0921504, JAP. 783765.
3,601,394.—SHEET RETAINING APPARATUS. AUG. 24, 1971. ARG. 0195162, AUS. 0437722, BEL. 0752940, CAN. 0966521, CHL. 0026165, CZC. 0164276, EGR. 0085710, FRA. 7024668, GRB. 1312304, ITL. 0900198, JAP. 0803409, MEX. 0116509, PLD. 0082760, PNM. 0002170, SPN. 0381385, STZ. 0547747, SWD. 0361648, TIW. 0005745, USR. 0493985.
3,651,933.—COPY SHEET PACKAGE. MAR. 28, 1972.
3,687,448.—SHEET FEEDING APPARATUS. AUG. 29, 1972. CAN. 9782161, GRB. 1373810.
3,847,385.—SHEET CONTAINER. NOV. 12, 1974. CAN. 0991208.
3,847,388.—SHEET STACKING METHOD AND APPARATUS. NOV. 12, 1974. CAN. 0996145, FRA. 7344220, GRB. 1440489, MEX. 0134934.
3,848,988.—MOISTURE CONTROL DEVICE. NOV. 19, 1974.
3,857,558.—PAPER CASSETTE DESIGN WITH IRREGULAR BOTTOM. DEC. 31, 1974, CAN. 1010083.
3,883,133.—MOVABLE PACK ADVANCER. MAY 13, 1975.
3,907,283.—SENSING SHEETS ON A SUPPORT SURFACE. SEPT. 23, 1975.
3,921,972.—SHEET STACK RECEPTACLE. NOV. 25, 1975.
3,926,519.—CONTROL DEVICE FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. DEC. 16, 1975.
3,934,870.—SHEET FEEDING DEVICES. JAN. 27, 1976.
3,936,044.—ADJUSTABLE SHEET GUIDE. FEB. 3, 1976.
3,957,366.—SHEET FEEDING APPARATUS. MAY 18, 1976.
3,995,951.—SHEET FEEDING APPARATUS & REPRODUCING MACHINE. DEC. 7, 1976.
4,008,957.—REPRODUCTION MACHINE CONTROL. FEB. 22, 1977.
4,014,537.—AIR FLOATATION BOTTOM FEEDER. MAR. 29, 1977.
4,060,233.—CASSETTE LOADED SHEET FEEDER FOR REPRODUCTION MACHINE. NOV. 29, 1977.
4,060,234.—CARTRIDGE TRAY FOR USE IN A COPYING MACHINE. NOV. 29, 1977.
4,075,391.—PRODUCTION OF FERRITE ELECTROSTATOGRAPHIC CARRIER MATERIAL HAVING IMPROVED PROPERTIES. FEB. 21, 1978. BEL. 847571, FRA. 7632899, SPN. 452858.
4,086,007.—DUAL PURPOSE DOCUMENT AND COPY SHEET FEED CASSETTE. APR. 25, 1978.

Class 6A 1

3,100,111.—SHEET FEED MECHANISM. AUG. 6, 1963. ARG. 0162642, CAN. 0683564, GRB. 1032956, IND. 0096309, JAP. 0478677.
3,301,551.—SHEET FEED MECHANISM. JAN. 31, 1967. CAN. 0811029, JAP. 0639312.
3,378,254.—PACK ADVANCER. APR. 16, 1968. CAN. 0815409, GER. 1289850, GRB. 1129872, JAP. 0615872.
3,402,928.—SHEET HANDLING APPARATUS. SEPT. 24, 1968. CAN. 0871575, GRB. 1203615, JAP. 0602168.
3,558,127.—SHEET HANDLING APPARATUS. JAN. 26, 1971. ARG. 0180315, AUS. 0443480, BEL. 0741889, CAN. 0928826, FRA. 6939710, GRB. 1282910, ITL. 0878226, JAP. 0791733, MEX. 0112773, SPN. 0373541, SWD. 6915742.
3,630,517.—COUNTER STACKER. DEC. 28, 1971.
3,768,806.—BI-DIRECTIONALLY MOVABLE PLATFORM CONTROL. OCT. 30, 1973. CAN. 0992113, GRB. 1403040.
3,820,777.—ELEVATOR ASSEMBLY POSITIONING CONTROL. JUNE 28, 1974. BEL. 0802196, CAN. 0999334, GRB. 1416470.
3,898,425.—FUSING APPARATUS. AUG. 5, 1975.
4,004,127.—IMPROVED ON LINE FUSING SYSTEM. JAN. 18, 1977.
4,033,578.—STACK ELEVATING APPARATUS. MAY 7, 1977.
4,147,342.—VIBRATING TAMPER. APR. 3, 1979.

Class 6B

3,847,388.—SHEET STACKING METHOD AND APPARATUS. NOV. 12, 1974. CAN. 0996145, FRA. 7344220, GRB. 1440489, MEX. 0134934.
3,958,989.—TRANSPARENCY SUPPORT MATERIAL FOR ELECTROPHOTOGRAPHIC PROCESS. MAY 25, 1976. BEL. 0815634, CAN. 1006012.
4,043,549.—IMPACT FEEDER. AUG. 23, 1977.
4,051,285.—TEARABLE EDGE STRIP FOR PLASTIC SHEET. SEPT. 27, 1977. BEL. 815634, CAN. 1006012, FRA. 7419536, ITL. 1014700.

Class 6B 1

3,062,533.—PAPER FEED APPARATUS. NOV. 6, 1962. CAN. 0712936.
3,062,534.—SHEET FEED MECHANISM. NOV. 6, 1962. GRB. 1016700.
3,083,962.—SHEET STRIPPER. APR. 2, 1963. ARG. 0165468, CAN. 0712935, GRB. 1032958, IND. 0096311, JAP. 0484728.
3,104,872.—EDGE DRAG DEVICE. SEPT. 24, 1963. CAN. 0699594.
3,241,830.—SHEET FEED MECHANISM. MAR. 22, 1966. ATR. 0276087, AUS. 0295720, CAN. 0765301, DNK. 0126493, EIR. 0028650, GER. 1197326, GRB. 1089538, ISR. 0030228, NZL. 0148732, STZ. 0457511.
3,251,594.—SHEET FEED MECHANISM. MAY 17, 1966. AUS. 0416589, CAN. 0785164, DNK. 131.557, EIR. 0029758, GRB. 1122623, ISR. 0034134, JAP. 0499006, NOR. 0125806, SWD. 0358480.
3,276,770.—SHEET FEEDING APPARATUS. OCT. 4, 1966. CAN. 0788346, FRA. 1459041, GER. 1237587, GRB. 1055215, ITL. 0726800, JAP. 0537118.
3,288,460.—PAPER FEED MECHANISM. NOV. 29, 1966. ATR. 0300566, CAN. 0792617, GRB. 1135746, JAP. 0630911, STZ. 0509924.
3,288,461.—SHEET FEEDING APPARATUS. NOV. 29, 1966. CAN. 0856098, GER. 1249887, GRB. 1123260, JAP. 0562385.
3,300,206.—ELECTRICALLY ENERGIZED CLUTCH FOR SHEET FEED CONTROL MECHANISM. JAN. 24, 1967. CAN. 0788344, GRB. 1135745, MEX. 0112221, STZ. 0513063.
3,406,960.—PAPER HANDLING APPARATUS. OCT. 22, 1968. CAN. 0907683, GRB. 1202218.
3,425,685.—PAPER FEED MECHANISM. FEB. 4, 1969. BEL. 0708498, CAN. 0847744, FRA. 1552327, GRB. 1165279, ITL. 0819625, JAP. 0972609, MEX. 0105134.
3,469,834.—SHEET FEEDER AND SEPARATOR APPARATUS. SEPT. 30, 1969. ARG. 0168907, CAN. 0847743, CHL. 0023614, CLB. 0017683, JAM. 0001852, MEX. 0102646, PRU. 0009339, URG. 0008981, VZL. 0023673.
3,524,639.—AUTOMATIC FEEDING DEVICE. AUG. 18, 1970. CAN. 0895184, FRA. 6906418, GRB. 1254784, ITL. 0875431, JAP. 0713806.
3,537,703.—MANIFOLD SHEET SEPARATING DEVICE. NOV. 3, 1970. CAN. 0923351, GRB. 1261077.
3,556,516.—SELF-ALIGNING FEED ROLLER. JAN. 19, 1971. CAN. 0899392, GRB. 1256265.
3,565,421.—FEEDING SYSTEM. FEB. 23, 1971.
3,567,214.—SHEET FEEDING AND SEPARATING APPARATUS. MAR. 2, 1971. BEL. 0734128, CAN. 0902124, FRA. 6919122, GER. 1929105, GRB. 1263193, HOL. 0144551, ITL. 0866188, SPN. 0368173, STZ. 0501501, SWD. 6908176.
3,578,317.—SHEET CONVEYOR APPARATUS FOR AUTOMATIC COPYING MACHINE. MAY 11, 1971. ARG. 0193800, ATR. 0307233, AUS. 0446229, BEL. 0750390, CAN. 0907682, EGR. 0082423, FRA. 7017317, GRB. 1284832, ITL. 0893096, JAP. 783766, MEX. 0117916, NZL. 0160102, SPN. 0379652, STZ. 0516404, SWD. 0361952, TIW. 0006833, VZL. 0025781.
3,580,565.—SHEET FEEDING APPARATUS. MAY 25, 1971.
3,592,462.—GATED PAPER SNUBBER. JULY 13, 1971. CAN. 0923922.
3,601,389.—SHEET FEEDING APPARATUS. AUG. 24, 1971. ARG. 0184657, BEL. 0752939, CAN. 0912055, CHL. 0026164, FRA. 7024666, GRB. 1306595, GUA. 0002508, ITL. 0907152, MEX. 0114977, PNM. 0002212, TIW. 0006720, VZL. 0032784.
3,618,752.—STACK OF IMAGE RECEIVING MEMBERS. NOV. 9, 1971.
3,655,183.—SHEET FEED APPARATUS. APR. 11, 1972.
3,664,663.—PAPER CASSETTE LOADING DEVICE. MAY 23, 1972. CAN. 0951342, GRB. 1351766.
3,713,645.—SHEET SEPARATING APPARATUS. JAN. 30, 1973. CAN. 0957392.
3,727,910.—SHEET SEPARATOR APPARATUS. APR. 17, 1973. CAN. 0956660, GRB. 1391198.
3,731,915.—FEED ROLL ABRASION ROLLER. MAY 8, 1973. ARG. 0194272, BEL. 0791064, CAN. 0966518, FRA. 7239549, GRB. 1389426, ITL. 0970223.
3,768,803.—SHEET FEEDER. OCT. 30, 1973. ARG. 0197314, BEL. 0795206, CAN. 0966138, FRA. 7304740, GRB. 1413541, ITL. 0978938, MEX. 0130347, SPN. 0411475, STZ. 5656860, SWD. 7301809, VZL. 0033780.
3,773,316.—SHEET FEEDER DRIVE MECHANISM. NOV. 20, 1973. CAN. 0994376, GRB. 1424580.
3,861,670.—SHEET FEEDING APPARATUS. JAN. 21, 1975. CAN. 1010080, GRB. 1435762.

3,866,901.—REVERSE BUCKLE FEEDER. FEB. 18, 1975. CAN. 1008893.
3,873,084.—PAPER FEEDER. MAR. 25, 1975.
3,893,663.—REVERSE BUCKLE SHEET FEEDING APPARATUS. JULY 8, 1975. CAN. 1005090, GRB. 1447909, MEX. 0135280.
3,895,791.—BOTTOM SHEET FEEDER USING SEPARATION BELT AND RETARD PAD. JULY 22, 1975. CAN. 1007255, GRB. 1443089.
3,934,869.—SHEET SEPARATING AND FEEDING APPARATUS. JAN. 27, 1976. GER. 7439833.
3,936,046.—FRONT AND SIDE SHEET REGISTERING APPARATUS. FEB. 3, 1976.
3,941,373.—FLOATING GATE SHEET SEPARATOR. MAR. 2, 1976.
3,947,018.—UNIVERSAL FEEDER-STACKER. MAR. 30, 1976. BEL. 0836262.
3,949,979.—SINGLE LONGITUDINAL MODE GAAS/GAALAS DOUBLE HETEROSTRUCTURE LASER. APR. 13, 1976.
3,966,189.—TOGGLING RETARD PAD. JUNE 29, 1976.
3,995,952.—SHEET FEEDING APPARATUS. DEC. 7, 1976.
4,023,792.—SHEET FEEDING APPARATUS. MAY 17, 1977. ARG. 0195877, AUS. 0462397, BEL. 0792370, CAN. 0978556, FRA. 7239132, GRB. 1410799, ITL. 0990513, MEX. 0128127, SPN. 0437744, STZ. 0546689.
4,030,725.—PAPER TRAY FOR COPYING MACHINES. JUNE 21, 1977.
4,043,549.—IMPACT FEEDER. AUG. 23, 1977.
4,053,152.—SHEET FEEDING DEVICE. OCT. 11, 1977.
4,058,305.—PAPER FEEDING DEVICE. NOV. 15, 1977.

Class 6B 2

3,378,255.—PAPER HANDLING APPARATUS. APR. 16, 1968. CAN. 0836939, FRA. 1527333, GRB. 1181271, ITL. 0804517, JAP. 1052342, MEX. 0099951.
3,547,431.—PNEUMATIC CUT SHEET FEEDER. DEC. 15, 1970.
4,043,549.—IMPACT FEEDER. AUG. 23, 1977.

Class 6C

3,120,446.—METHOD OF TRANSFERRING A DEVELOPED SOLID PARTICULATE IMAGE. FEB. 4, 1964.
3,519,124.—ARTICLE TO FACILITATE FEEDING OF IMAGE RECEIVING SHEETS. JULY 7, 1970. CAN. 0941879, FRA. 1568821, GRB. 1216347, ITL. 0870563.
3,589,809.—FEEDING SYSTEM. JUNE 29, 1971.
3,630,514.—SHEET FEEDING APPARATUS. DEC. 28, 1971. ARG. 0186214, AUS. 0452075, BEL. 0751309, CAN. 0921948, EGR. 0090063, FRA. 7019460, GRB. 1253503, ITL. 0893690, JAP. 783764, MEX. 0117507, SPN. 0380270, STZ. 0511759, SWD. 0363621, TIW. 0006836, USR. 0466680.
3,645,615.—COPYING APPARATUS. FEB. 29, 1972. ARG. 0185529, AUS. 0445849, BEL. 0752941, CAN. 0925927, CHL. 0025888, FRA. 7024670, GRB. 1312305, GUA. 0002324, ITL. 0900200, MEX. 0115165, PNM. 0002260, SPN. 0381387, STZ. 0525778, SWD. 7009063, TIW. 0007163, USR. 0535033, VZL. 0032783.
3,902,421.—METHOD FOR FORMING A PICTURE IMAGE. SEPT. 2, 1975.

Class 6D

3,062,538.—SHEET FEEDING APPARATUS. NOV. 6, 1962. CAN. 0701742.
3,071,370.—SHEET FEEDING APPARATUS. JAN. 1, 1963. CAN. 0683900, GRB. 0999435.
3,071,374.—PAPER GRIPPER MECHANISM. JAN. 1, 1963.
3,078,770.—XEROGRAPHIC REPRODUCING APPARATUS. FEB. 26, 1963. CAN. 0701741.
3,095,194.—SHEET GUIDING APPARATUS. JUNE 25, 1963. CAN. 0713451, FRA. 1355072, GER. 1174334, GRB. 1026214, ITL. 0688494, JAP. 0457839.
3,100,109.—PAPER GRIPPER MECHANISM. AUG. 6, 1963. GRB. 1015634, JAP. 0471314.
3,100,112.—DOCUMENT FEED MECHANISM. AUG. 6, 1963. GRB. 1015635, JAP. 0478676.
3,137,495.—SHEET FEED MECHANISM. JUNE 16, 1964. GRB. 1015636, JAP. 0471315.
3,179,407.—SHEET FEED GUIDE. APR. 20, 1965. CAN. 0719606, FRA. 1355071, GER. 1179562, GRB. 1023036, ITL. 0688495, JAP. 0457850.
3,190,643.—SHEET GUIDING APPARATUS. JUNE 22, 1965.
3,199,866.—SHEET FEED MECHANISM. AUG. 10, 1965. CAN. 0742591, GRB. 1043646.
3,206,193.—XEROGRAPHIC REPRODUCING MACHINE CONTROL. SEPT. 14, 1965.
3,239,215.—DOCUMENT FEED MECHANISM. MAR. 8, 1966. CAN. 0741548, GRB. 1052820, JAP. 0497188.
3,239,220.—DOCUMENT CONVEYOR. MAR. 8, 1966. CAN. 0770495, FRA. 1434188, GRB. 1094188, ITL. 0742434.
3,245,311.—DOCUMENT CONVEYOR. APR. 12, 1966.
3,256,009.—SHEET REGISTRATION DEVICE. JUNE 14, 1966. CAN. 0777667.
3,281,144.—SHEET REGISTRATION DEVICE. OCT. 25, 1966. ARG. 0152212, AUS. 0423243, CAN. 0803888, DNK. 0122597, EIR. 0029757, GRB. 1122621, ISR. 0034133, JAP. 0512650, MEX. 0078899, NOR. 0126565, SWD. 0358034.
3,357,347.—PAPER FEEDING AND BREAKING MEANS FOR ELECTROGRAPHIC DEVICE. DEC. 12, 1967. CAN. 0863520, GRB. 1182684, JAP. 0582500.
3,374,732.—SELF-ALIGNING COPY DRUM STRIPOUT MECHANISM FOR REPRODUCTION MACH. MAR. 26, 1968.
3,375,781.—REGISTRATION MECHANISM FOR A REPRODUCTION MACHINE. APR. 2, 1968.
3,389,907.—DOCUMENT HANDLING APPARATUS. JUNE 25, 1968.
3,411,771.—SHEET TRANSPORT. NOV. 19, 1968. ARG. 0177552, ATR. 0284168, AUS. 0455833, CAN. 0869421, CHL. 0023101, CLB. 0016775, DNK. 0126100, EIR. 0031308, FIN. 0047867, GRB. 1193515, IND. 0112002, ISR. 0028520, JAP. 0604153, MEX. 0099909, NOR. 0127531, NZL. 0149790, PAK. 0119259, PLP. 0005199, PRU. 0009331, SAF. 0674988, SPN. 0344351, STZ. 0478048, SWD. 0343829, TRK. 0015345, URG. 0008858, VZL. 0026277.
3,422,756.—PAPER SUPPORT AND REGISTRATION MEANS FOR REPRODUCTION MACHINE. JAN. 21, 1969.
3,434,710.—SHEET HANDLING APPARATUS. MAR. 25, 1969. ARG. 0166613, CAN. 0830328, CHL. 0023568, CLB. 0017530, DNK. 0120163, GRB. 1206965, MEX. 0100814, PRU. 0009338, SPN. 0360895, STZ. 0502942. URG. 0008977, USR. 0433696, VZL. 0023674.
3,502,325.—CARD HANDLING APPARATUS. MAR. 24, 1970. ARG. 0168398, CAN. 0850515, CHL. 0024133, JAM. 0001890, MEX. 0105082, PRU. 0009337, URG. 0009016, VZL. 0027509.
3,509,780.—DOUBLE-ACTION ROTARY SOLENOID DRIVE MECHANISM. MAY 5, 1970.
3,517,923.—SHEET REGISTRATION APPARATUS. JUNE 30, 1970.
3,518,739.—TRACKING ROLLER. JULY 7, 1970. ARG. 0177437, AUS. 0437287, BEL. 0733662, BRA. 6908481, CAN. 0884215, FRA. 6917189, GRB. 1206750, ITL. 0865847, JAP. 0677434, MEX. 0111433, SPN. 0367807, SWD. 0356022, VZL. 0025065.
3,521,060.—METHOD FOR DETECTING MISROUTING OF TRANSPARENCIES DURING PROCESS OF IMAGING THEREON. JULY 21, 1970.
3,531,109.—SHEET MATERIAL TRANSPORT SYSTEM. SEPT. 29, 1970. ARG. 0177190, ATR. 0288161, AUS. 0446394, BEL. 0733197, CAN. 0899923, DNK. 0122717, FRA. 6916409, GER. 1925039, GRB. 1269100, ITL. 0863848, JAP. 0656986, MEX. 0110288, PNM. 0001431, SAF. 0693497, SPN. 0367408, SWD. 0355870.
3,536,320.—SHEET REGISTRATION DEVICE. OCT. 27, 1970.
3,556,511.—DOCUMENT FEED APPARATUS. JAN. 19, 1971. ARG. 0185791, BEL. 0741891, CAN. 0905439, FRA. 6939711, GER. 1957780, GRB. 1279129, HOL. 0144227, ITL. 0878272, JAP. 0854601, MEX. 0112825.
3,556,512.—DOCUMENT FEED APPARATUS. JAN. 19, 1971. CAN. 0905438, SWD. 6915838.
3,556,513.—DOCUMENT FEED APPARATUS. JAN. 19, 1971. CAN. 0905437.
3,601,392.—SHEET REGISTERING APPARATUS. AUG. 24, 1971. ARG. 0190238, AUS. 0446147, BEL. 0752933, CAN. 0923512, CHL. 0025789, EGR. 0084327, FRA. 7024672, GRB. 1262444, ITL. 0900199, JAP. 0803410, MEX. 0115310, PLD. 0002183, PNM. 0002050, SPN. 0381386, STZ. 0525780, SWD. 0356375, TIW. 0007194, USR. 0406343.
3,603,680.—ULTRASONIC PAPER DETACTION. SEPT. 7, 1971. CAN. 0915715, GRB. 1331457.
3,614,221.—IMAGING SYSTEM. OCT. 19, 1971. CAN. 0930540, GRB. 1343603, JAP. 0728865.
3,622,238.—COPIER MACHINE FEEDING MULTIPLE SIZE COPY SHEETS. NOV. 23, 1971. ARG. 0194337, AUS. 0451241, CAN. 0902127, JAP. 0512383, NZL. 0160105.
3,647,207.—SHEET FEEDING MECHANISM CENTERING DEVICE. MAR. 7, 1972. CAN. 0959934, GRB. 1351765.
3,694,712.—SPEED CONTROL APPARATUS. SEPT. 26, 1972. CAN. 0976641, GRB. 1339506.
3,796,486.—PROGRAMMING CONTROL SYSTEM FOR PRINTING MACHINE. MAR. 12, 1974.

3,804,516.—FIRE DETECTING DEVICE FOR A PHOTOGRAPHIC PRINTING MACHINE. APR. 16, 1974.
3,809,475.—COPIER FUSER PROTECTOR. MAY 7, 1974. FRA. 7343567.
3,815,380.—SHAFT COUPLING APPARATUS. JUNE 11, 1974. CAN. 0994121.
3,819,266.—COPIER JAM PROTECTION. JUNE 25, 1974. CAN. 1005510.
3,845,951.—FORAMINOUS SHEET REGISTRATION SYSTEM. NOV. 5, 1974. CAN. 0999316.
3,858,777.—PRINTING APPARATUS INCLUDING REGISTRATION CONTROL. JAN. 7, 1975.
3,861,673.—BI-DIRECTIONAL SHEET TRANSPORT. JAN. 21, 1975. CAN. 1004240.
3,876,317.—LATCH MECHANISM. APR. 8, 1975. CAN. 1005486.
3,888,579.—DIGITAL CONTROLLED DOCUMENT FEEDER. JUNE 10, 1975.
3,893,662.—SHEET FEEDING DEVICE. JULY 8, 1975.
3,902,421.—METHOD FOR FORMING A PICTURE IMAGE. SEPT. 2, 1975.
3,934,182.—SYNCHRONIZING APPARATUS. JAN. 20, 1976. CAN. 0957735, GRB. 1372568.
3,936,042.—SHEET FEEDING DEVICES. FEB. 3, 1976.
3,947,270.—REPRODUCING APPARATUS AND PROCESS FOR DUPLEX IMAGING IN A SINGLE PASS. MAR. 30, 1976.
3,948,511.—SHEET FEEDING DEVICES. APR. 6, 1976.
3,949,979.—SINGLE LONGITUDINAL MODE GAAS/GAALAS DOUBLE HETEROSTRUCTURE LASER. APR. 13, 1976
3,963,339.—SHEET FEEDING APPARATUS. JUNE 15, 1976.
3,984,098.—PNEUMATIC REGISTRATION AND CLAMPING APPARATUS. OCT. 5, 1976. BEL. 0848824.
4,003,568.—FLUID CONVEYER. JAN. 18, 1977.
4,025,187.—BUCKLE CONTROL SYSTEM. MAY 24, 1977.
4,036,421.—WEIGHTED PINCH ROLLS. JULY 19, 1977.
4,055,340.—ASSISTED PNEUMATIC TRANSPORT AND REGISTRATION APPARATUS. OCT. 25, 1977. BEL. 848823.
4,073,001.—APPARATUS FOR NEUTRALIZING AND REGISTERING AN ELECTROSTATICALLY CHARGED SHEET. FEB. 7, 1978.
4,077,519.—CURL DETECTOR AND SEPARATOR. MAR. 7, 1978.
4,090,704.—REGISTRATION STATION. MAY 23, 1978.
4,092,021.—UNFUSED IMAGE TRANSPORT. MAY 30, 1978.
4,128,327.—TRANSFER MATERIAL FEED APPARATUS FOR ELECTROPHOTOGRAPHIC COPYING MACHINES. DEC. 5, 1978.
4,134,671.—INTERSECTING OPTICAL AND COPY SHEET PATH METHOD AND APPARATUS. JAN. 16, 1979.
4,135,804.—REGISTRATION SYSTEM FOR A REPRODUCING MACHINE. JAN. 23, 1979.

Class 6D 1

RE.29,124.—SHEET TRANSPORT SYSTEM. JAN. 25, 1977. CAN. 1001104.
3,148,878.—SHEET FEED MECHANISM. SEPT. 15, 1964. CAN. 0715431, GER. 1222083, GRB. 1020933, JAP. 0481251.
3,240,486.—PAPER TRANSPORT MECHANISM. MAR. 15, 1966. CAN. 0766647.
3,275,318.—SHEET CONVEYING APPARATUS. SEPT. 27, 1966. MEX. 0085657.
3,408,633.—HIGH SPEED PRINTER SYSTEM. OCT. 29, 1968.
3,482,676.—DOCUMENT FEED BELT. DEC. 9, 1969. CAN. 0890297, GRB. 1253415.
3,642,362.—APPARATUS FOR CONVEYING SHEET MATERIAL. FEB. 15, 1972. GRB. 1307117.
3,719,951.—WRAP ADJUST DEVICE FOR CONTROLLING ENGAGEMENT BETWEEN A WEB AND ROLLER IN AN IMAGING SYSTEM. MAR. 6, 1973. CAN. 0995295, GRB. 1406047.
3,743,403.—TRANSPORT ASSEMBLY. JULY 3, 1973. CAN. 0983305, GRB. 1417018.
3,781,004.—CONVEYING SYSTEM FOR ELECTROSTATIC PRINTING MACHINES. DEC. 25, 1973. CAN. 1007287.
3,790,270.—REGISTRATION RESET SYSTEM. FEB. 5, 1974. GRB. 1439772, ITL. 0993064, SPN. 0418253.
3,804,507.—PROCESSING CONTROL DEVICE FOR PRINTING MACHINES. APR. 16, 1974.
3,808,658.—SNAP ROLLER. MAY 7, 1974. CAN. 1000637.
3,826,568.—SHEET TRANSPORT SYSTEM. JULY 30, 1974. CAN. 1001104.
3,832,053.—BELT TRANSFER SYSTEM. AUG. 27, 1974.
3,846,020.—ELECTROSTATIC SHEET TRANSPORT SYSTEM. NOV. 5, 1974.
3,854,566.—PHOTOELECTRIC TABULATING APPARATUS. DEC. 17, 1974. BEL. 0815420, CAN. 0982969, GRB. 1442450, ITL. 1012805, SWD. 7406400.
3,902,715.—SHEET REGISTRATION FOR PAPER HANDLING APPARATUS. SEPT. 2, 1975, CAN. 1003867, ITL. 0993066, SPN. 0418255.
3,918,705.—PROCESSING CONTROL DEVICE FOR PRINTING MACHINES. NOV. 11, 1975.
3,930,725.—MULTIPLE SHEET FEEDING SYSTEM FOR ELECTROSTATOGRAPHIC PRINTING MACHINES. JAN. 6, 1976. GRB. 1436457.
4,085,673.—SHEET FEEDING APPARATUS. APR. 25, 1978.

Class 6D 2

3,112,819.—CLUTCH MECHANISM—914. DEC. 3, 1963. CAN. 0688810.
3,337,015.—LATCH OPERATED AND ONE WAY COIL CLUTCHES. AUG. 22, 1967. CAN. 0810494, JAP. 0914622.
3,840,100.—UNIDIRECTIONAL COUPLING APPARATUS. OCT. 8, 1974. CAN. 1006706.

Class 6E

RE29124.—SHEET TRANSPORT SYSTEM. JAN. 25, 1977. CAN. 1001104
3,348,288.—DRUM CLAMP. OCT. 24, 1967. CAN. 0838542, GRB. 1123459.
3,357,325.—XEROGRAPHIC TRANSFER APPARATUS. DEC. 12, 1967. CAN. 0812525.
3,375,782.—PROGRAMMING MECHANISM FOR A REPRODUCTION MACHINE. APR. 2, 1968.
3,567,213.—CONTROL APPARATUS FOR REGISTER STOPS AND GRIPPER FINGERS. MAR. 2, 1971.
3,685,898.—PAPER FLIP CONTROL APPARATUS. AUG. 22, 1972.
3,717,801.—METHODS AND APPARATUS FOR ELCLRSTCLY PRFMNG A TCKING OPERATION. FEB. 20, 1973.
3,826,568.—SHEET TRANSPORT SYSTEM. JULY 30, 1974. CAN. 1001104.
3,841,751.—ELECTROSTATIC COLOR REPRODUCTION METHOD. OCT. 15, 1974. CAN. 0946463.
3,845,951.—FORAMINOUS SHEET REGISTRATION SYSTEM. NOV. 5, 1974. CAN. 0999316.
3,976,370.—BELT TRANSFER AND FUSING SYSTEM. AUG. 24, 1976.
3,993,124.—METH&APPRTS FOR SUSR ASSMBLY CLING IN ELCTROSTATOGRPC MACHNE-GAMMA METH&APPRTS FOR FUSER END CO. NOV. 23, 1976. BEL. 0793560, FRA. 7246728, ITL. 0973322, SWD. 7216976.
3,995,951.—SHEET FEEDING APPARATUS & REPRODUCING MACHINE. DEC. 7, 1976.
4,063,946.—ELECTROPHOTOGRAPHIC COLOR REPRODUCTION PROCESS EMPLOYING PHOTOCONDUCTIVE MATERIAL WITH DUAL. DEC. 20, 1977.
4,078,862.—APPARATUS FOR PRODUCING A COMPOSITE COPY OF AN ORIGINAL DOCUMENT ON SELECTIVELY POSITIONED. MAR. 14, 1978.
4,082,137.—METHOD AND APPARATUS FOR FUSER ASSEMBLY COOLING AN ELECTROSTATOGRAPHIC MACHINE. APR. 4, 1978. BEL. 793560, CAN. 1025515, FRA. 7246728, GRB. 1418306, ITL. 973322, SWD. 7216976.
4,085,794.—METHOD AND APPARATUS FOR FUSER ASSEMBLY COOLING IN AN ELECTROSTATOGRAPHIC MACHINE. APR. 25, 1978. BEL. 793560, CAN. 1025515, FRA. 7246728, GRB. 1418306, ITL. 973322, SWD. 7216976.
4,138,102.—AUTOMATIC DOCUMENT PROCESSING DEVICE. FEB. 6, 1979.

Class 6F

3,249,354.—MULTIPLE SHEET DETECTING DEVICE. MAY 3, 1966. CAN. 0770494.
3,281,145.—PAPER REJECT MECHANISM. OCT. 25, 1966. CAN. 0770493.
3,288,462.—APPARATUS FOR HANDLING SUPERPOSED SHEETS. NOV. 29, 1966. AUS. 0422882, CAN. 0786210, EIR. 0029759, GRB. 1122625, ISR. 0034135, JAP. 0894757, NOR. 0124531.
3,301,975.—SENSING DEVICE FOR DETECTING A SHEET ON A TRANSPORT OR DRUM. JAN. 31, 1967. CAN. 0800094, FRA. 1487581, GER. 1522699, GRB. 1077117, ITL. 0774188, JAP. 0923304.

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3,360,652.—FAIL SAFE PHOTOELECTRIC SHEET SENSING MACHINE CONTROL CIRCUIT. DEC. 26, 1967. CAN. 0775268, FRA. 1455478, GER. 1522805, GRB. 1121099, ITL. 0732531, JAP. 0503244, MEX. 0078869.
3,396,965.—SENSOR GAUGE. AUG. 13, 1968. CAN. 0822218, GRB. 1152538, JAP. 0587326.
3,504,911.—VACUUM POWERED MULTIPLE DOCUMENT DETECTOR. APR. 7, 1970. CAN. 0861362, FRA. 1589986, GER. 1804476, GRB. 1241968, ITL. 0845395, JAP. 0656984.
3,593,065.—SHEET DETECTION APPARATUS. JULY 13, 1971. CAN. 0923544, CZC. 0151559, EGR. 0100567, GRB. 1322794, JAP. 1162030, USR. 0365085.
3,614,419.—MULTIPLE SHEET DETECTION SYSTEM. OCT. 19, 1971. ARG. 0186441, BEL. 0765366, CAN. 0930052, FRA. 7113404, GRB. 1342656, ITL. 0922694, MEX. 0119754, VZL. 0021933.
3,627,311.—SHEET SENSOR. DEC. 14, 1971. CAN. 0871371, GRB. 1322258.
3,628,785.—GRIP FORCE DETECTION APPARATUS. DEC. 21, 1971. ARG. 0185946, AUS. 0455882, BEL. 0760750, CAN. 0923158, FRA. 7047695, GRB. 1340206, ITL. 0913997, MEX. 0117505, STZ. 0518227, SWD. 7017384, VZL. 0032788.
3,650,616.—MISPUFF DETECTOR. MAR. 21, 1972. BEL. 0778739, CAN. 0954181, FRA. 7203548, GRB. 1374923, ITL. 0947120.
3,650,617.—SWITCHING DETECTOR—A. MAR. 21, 1972.
3,650,618.—SWITCHING DETECTOR—B. MAR. 21, 1972.
3,650,619.—SWITCHING DETECTOR—C. MAR. 21, 1972.
3,684,890.—PHOTOSENSITIVE MISFEED DETECTOR. AUG. 15, 1972. CAN. 0929631, GRB. 1335444.
3,778,051.—SUPERPOSED SHEET DETECTOR. DEC. 11, 1973. CAN. 0975067.
3,791,729.—APPARATUS FOR MONITORING A SHEET TRANSPORT MECHANISM. FEB. 12, 1974. CAN. 0991244, GRB. 1413069.
3,882,308.—DETECTION SYSTEM FOR SUPERPOSED SHEETS. MAY 6, 1975. CAN. 0929632, GRB. 1342838.
3,932,755.—DEVICE FOR DETECTING DOUBLE SHEET FEEDING. JAN. 13, 1976.
3,948,508.—SHEET DETECTING APPARATUS. APR. 6, 1976.
4,025,187.—BUCKLE CONTROL SYSTEM. MAY 24, 1977.
4,077,519.—CURL DETECTOR AND SEPARATOR. MAR. 7, 1978.

Class 6G

3,152,757.—XEROGRAPHIC CONTROL APPARATUS. OCT. 13, 1964. JAP. 0494168.
3,260,455.—STEPPED COUNTING APPARATUS. JULY 12, 1966. ARG. 0157223, BRA. 0083779, CAN. 0760825, FRA. 1459930, GER. 1513422, GRB. 1113420, ITL. 0729650, MEX. 0094217.
3,301,126.—REPRODUCING APPARATUS. JAN. 31, 1967. CAN. 0777413, EIR. 0029760, GRB. 1122626, ISR. 0034136, JAP. 0669365, NOR. 0128732.
3,358,570.—COPY COUNTING SYSTEM. DEC. 19, 1967. CAN. 0842444, FRA. 1508192, GER. 1283855, GRB. 1165943, ITL. 0787991, JAP. 0572187.
3,375,780.—SHEET COUNTING MECHANISM FOR REPRODUCTION MACHINES. APR. 2, 1968.
3,375,783.—COPY INDICATING MECHANISM FOR A REPRODUCTION MACHINE. APR. 2, 1968.
3,588,472.—LOGIC CONTROL APPARATUS. JUNE 28, 1971. ARG. 0181590, ATR. 0279353, BEL. 0706629, BRA. 6793350, CAN. 0834957, FRA. 1567082, GRB. 1204719, ITL. 0815466, JAP. 0645591, LXB. 0054882, MEX. 0101675, VZL. 0023684.
3,655,281.—BILLING APPARATUS. APR. 11, 1972. BEL. 0760911, CAN. 0929013, FRA. 7047633, GRB. 1329579, ITL. 0913956, JAP. 0766713.
3,813,157.—CONTROL LOGIC FOR TROUBLE DETECTION AND RECOVERY. MAY 28, 1974. GRB. 1457781, ITL. 1009725, SPN. 0425049.
3,831,933.—TAMPER DETECTION AND RECOVERY. AUG. 27, 1974. GRB. 1457781, ITL. 1009725, SPN. 0425049.
3,909,128.—CONTROL LOGIC FOR CHARGING A MULTI-MODE COPIER DUPLICATOR FROM ONE MODE TO ANOTHER. SEPT. 30, 1975. BEL. 0819383.
3,916,171.—COUNTING CIRCUIT. OCT. 28, 1975.
3,989,368.—DUAL MODE CONTROL LOGIC FOR A MULTI-MODE COPIER DUPLICATOR. NOV. 2, 1976. BEL. 0819384.
4,019,028.—PRINTING MACHINE WITH VARIABLE COUNTER CONTROL SYSTEM. APR. 19, 1977. BEL. 0812560, GRB. 1451992, ITL. 1010688, SPN. 0424462.
4,057,341.—DUAL MODE CONTROL LOGIC FOR A MULTI-MODE COPIER/DUPLICATOR. NOV. 8, 1977. AUS. 489874, BEL. 819384, CAN. 1029431, GRB. 1470598, MEX. 137406.
4,058,815.—METERING SYSTEM FOR A COPIER/DUPLICATOR MACHINE. NOV. 15, 1977. BEL. 824682, FRA. 7501637, GRB. 1451991.

Class 6H

3,062,536.—SHEET STRIPPING APPARATUS. NOV. 6, 1962. ARG. 0174781, CAN. 0736834, PNM. 0001999, VZL. 0023703.
3,090,616.—SHEET HANDLING CONTROL APPARATUS. MAY 21, 1963. CAN. 0683777.
3,339,069.—CORONA CHARGING DEVICE W/MEANS TO PREVENT TONER DUST CONTAMINATION. AUG. 29, 1967. CAN. 0788539, FRA. 1450010, GRB. 1116687, ITL. 0730715, JAP. 0875339, MEX. 0089459.
3,357,400.—ELECTROSTATIC APPARATUS FOR PAPER DETACKING. DEC. 12, 1967. CAN. 0841229, MEX. 0100315.
3,450,402.—SHEET STRIPPER APPARATUS. JUNE 17, 1969.
3,506,259.—ELECTROSTATIC SHEET DETACKING APPARATUS. APR. 14, 1970. ARG. 0177881, AUS. 0418161, BEL. 0721966, CAN. 0848612, FRA. 1585343, GRB. 1230113, ITL. 0895052, MEX. 0104231.
3,578,859.—MECHANICAL STRIPPING APPARATUS. MAY 18, 1971. ARG. 0185526, AUS. 0445289, BEL. 0752938, CAN. 0922771, CHL. 0025913, EGR. 0085002, FRA. 7024669, GRB. 1296763, GUA. 0002611, ITL. 0900197, MEX. 0117139, PLD. 0081340, PNM. 0002049, SPN. 0381384, STZ. 0523150, SWD. 0366849, TIW. 0007785, USR. 0443525, VZL. 0032781.
3,620,615.—SHEET STRIPPING APPARATUS. NOV. 16, 1971. CAN. 0927472, GRB. 1290518.
3,704,881.—TRANSFER SHEET PEELING DEVICE FOR XEROGRAPHIC APPARATUS. DEC. 5, 1972.
3,774,907.—VACUUM SHEET STRIPPING APPARATUS. NOV. 27, 1973. CAN. 0966519.
3,804,401.—PNEUMATIC STRIPPING APPARATUS. APR. 16, 1974. CAN. 0998705.
3,811,670.—ELECTROSTATOGRAPHIC APPARATUS WITH AIR BAFFLE. MAY 21, 1974.
3,819,175.—VACUUM STRIPPING ROLL WITH STATIONARY PICKUP SLOTS. JUNE 25, 1974.
3,820,778.—VACUUM STRIPPING ROLL WITH ROTARY PICKUP SLOTS. JUNE 28, 1974. CAN. 1010081, GRB. 1430856.
3,826,568.—SHEET TRANSPORT SYSTEM. JULY 30, 1974. CAN. 1001104.
3,837,640.—STRIPPER FINGER WITH AIR CUSHION. SEPT. 24, 1974. CAN. 1002077, FRA. 7338663, GRB. 1427058, ITL. 998964.
3,857,560.—ADHESIVE PAPER PICK-OFF SYSTEM. DEC. 31, 1974.
3,885,785.—VACUUM TRANSPORT. MAY 27, 1975. CAN. 1008892, FRA. 7437717.
3,885,786.—STRIPPER FINGER. MAY 27, 1975. GRB. 1402956.
3,891,206.—SHEET STRIPPING APPARATUS. JUNE 24, 1975. CAN. 1003868, GRB. 1449754.
3,895,793.—VACUUM SHEET STRIPPER. JULY 22, 1975. CAN. 1014179.
3,907,280.—FLEXIBLE SHEET HANDING DEVICE. SEPT. 23, 1975. FRA. 7322885.
3,940,126.—SHEET HANDLING MECHANISM. FEB. 24, 1976. GRB. 1450219.
3,948,507.—COPYING STRIPPER. APR. 6, 1976.
3,970,381.—METHOD AND APPARATUS FOR XEROGRAPHIC REPRODUCTION. JULY 20, 1976. BEL. 0811188, FRA. 7406478, GRB. 1451288, ITL. 1008269, SPN. 0423529, STZ. 5672880.
3,991,999.—REVOLVING STRIPPER FINGER. NOV. 16, 1976.
3,992,000.—SHEET STRIPPER. NOV. 16, 1976.
3,998,536.—METHOD & APPARATUS FOR ELECTROSTATIC PAPER STRIPPING. DEC. 21, 1976.
4,004,802.—SHEET STRIPPING DEVICE. JAN. 25, 1977.
4,017,065.—TRANSFER FUSING SPEED COMPENSATION. APR. 12, 1977.
4,017,067.—TRANSFER-FUSING SPEED COMPENSATION. APR. 12, 1977.
4,026,541.—SHEET STRIPPING DEVICE. MAY 31, 1977.
4,058,306.—DETACK AND STRIPPING SYSTEM. NOV. 15, 1977.
4,060,235.—SELF-LIFTING VACUUM STRIPPER. NOV. 29, 1977.
4,072,307.—CORNER SHEET STRIPPER. FEB. 7, 1978.
4,073,585.—SHEET REMOVING DEVICE FOR USE IN ELECTROPHOTOGRAPHIC COPYING MACHINE. FEB. 14, 1978.

4,092,021.—UNFUSED IMAGE TRANSPORT. MAY 30, 1978.
4,119,307.—SHEET STRIPPING APPARATUS. OCT. 10, 1978.
4,119,308.—SHEET STRIPPING APPARATUS. OCT. 10, 1978.

Class 6I

RE.27,720.—SIGNAL STORAGE DEVICE - RE OF 3,416,861-D1593. AUG. 7, 1973.
3,075,493.—XEROGRAPHIC APPARATUS WITH WEB CUTTING MEANS. JAN. 29, 1963. CAN. 0682231, FRA. 1280975, GER. 1177487, GRB. 0979161, JAP. 0502929.
3,105,425.—WEB MARKING AND CUTTING APPARATUS FOR XEROGRAPHIC REPRODUCING DEVICES. OCT. 1, 1963. CAN. 0701949.
3,135,179.—XEROGRAPHIC APPARATUS. JUNE 2, 1964.
3,135,180.—XEROGRAPHIC APPARATUS. JUNE 2, 1964.
3,244,084.—WEB MARKING DEVICE FOR XEROGRAPHIC REPRODUCING APPARATUS. APR. 5, 1966.
3,401,613.—WEB CUTTER CONTROL DEVICE FOR XEROGRAPHIC REPRODUCING APPARATUS. SEPT. 17, 1968. CAN. 0786141, GRB. 1118217, JAP. 0517506.
3,402,628.—CUTTING APPARATUS. SEPT. 24, 1968. CAN. 0847666, GRB. 1137800.
3,416,061.—SIGNAL STORAGE DEVICE—REISSUED D72104—27,720. DEC. 17, 1968. CAN. 0824770, GER. 1524998, GRB. 1184579, JAP. 0571176.
3,418,046.—SIGNAL STORAGE DEVICE. DEC. 24, 1968. CAN. 0852814, GER. 1524999, GRB. 1190084, JAP. 0589515.
3,466,959.—WEB MATERIAL HANDLING APPARATUS. SEPT. 16, 1969.
3,485,622.—PRINTING OF TIMING MARKS IN XEROGRAPHIC PROCESS. DEC. 23, 1969. FRA. 1488142, GER. 1522700, GRB. 1047451, JAP. 0608701.
3,504,586.—ROLL CONVERTER CONTROL. APR. 7, 1970.
3,506,175.—ROLL STOCK CONVERTING APPARATUS. APR. 14, 1970.
3,585,289.—FACSIMILE RECORDING APPARATUS WITH CAM OPERATED PAPER CUTTER. JUNE 15, 1971.
3,591,279.—CUT AND DEFLECT WEB DRIVE APPARATUS. JULY 6, 1971. CAN. 0924635, FRA. 7019910, GRB. 1307549, ITL. 0893691.
3,639,053.—WEB CUTTING AND FEEDING APPARATUS. FEB. 1, 1972. ARG. 0192554, AUS. 0461657, BEL. 0749786, CAN. 0917974, FRA. 7015812, GRB. 1314727, ITL. 0900026, MEX. 0116866, SAF. 0703019, SPN. 0379248, STZ. 0516181, SWD. 7006081.
3,728,920.—CUT AND DEFLECT WEB DRIVE APPARATUS. APR. 24, 1973.
3,743,409.—CUTTER ASSEMBLY. JULY 3, 1973. BEL. 0784635, CAN. 0974447, FRA. 7220418, GRB. 1400465, ITL. 0956414.
3,855,890.—SLITTER/PERFORATOR APPARATUS. DEC. 24, 1974. BEL. 808873, CAN. 0996462, FRA. 7345296, GRB. 1423770, ITL. 1001152, USR. 0546267.
3,882,744.—ELECTROSTATOGRAPHIC WEB FEEDING APPARATUS. MAY 13, 1975. FRA. 7417339.
3,931,090.—RUBBER COMPOSITIONS FOR FLEXIBLE BELTS. JAN. 6, 1976.
4,043,233.—METHOD OF PREVENTING MULTI-SHEET FEEDING. AUG. 23, 1977.

Class 6J

3,380,733.—SHEET STRIPPING APPARATUS. APR. 30, 1968. ATR. 0268045, AUS. 0413138, BEL. 0689067, CAN. 0819593, DNK. 0112289, FRA. 1499560, GER. 1522704, GRB. 1157342, HOL. 0151191, ITL. 0788572, JAP. 0560087, LXB. 0052213, MEX. 0101989, NOR. 0122220, NZL. 0146848, PTG. 0046633, SAF. 0666572, SPN. 0332819, STZ. 0468661, SWD. 0326103, USR. 0261292.
3,416,791.—DOCUMENT INVERTING APPARATUS. DEC 17, 1968. CAN. 0853562, GRB. 1210564, JAP. 0648074.
3,548,783.—PAPER TRANSPORT - SHEET TURNER PAPER TRANSPORT-90 DEG TURN. DEC. 22, 1970.
3,627,312.—RESTACKING APPARATUS. DEC. 14, 1971. AUS. 0447183, BEL. 0752942, CAN. 0922747, CHL. 0025830, EGR. 0084128, FRA. 7024663, GRB. 1312303, GUA. 0002616, ITL. 0900193, JAP. 791920, MEX. 0114980, PLD. 0081346, PNM. 0001953, SPN. 0381379, STZ. 0525779, SWD. 0359381, TIW. 0022313, VZL 0032782.
3,856,295.—INVERTER-REVERSER FOR A REPRODUCTION MACHINE. DEC. 24, 1974.
3,862,802.—SHEET REVERSING APPARATUS AND A DUPLEX REPRODUCING APPARATUS EMPLOYING SAME. JAN. 28, 1975. BEL. 0818894.
3,942,785.—SELF-ACTUATING SHEET INVERTER-REVERSER. MAR. 9, 1976.
3,944,212.—SHEET REVERSING MECHANISM. MAR. 16, 1976.
3,947,270.—REPRODUCING APPARATUS AND PROCESS FOR DUPLEX IMAGING IN A SINGLE PASS. MAR. 30, 1976.
4,040,616.—SHEET TURN AROUND INVERTER. AUG. 9, 1977. FRA. 7701111.

Class 6K

D.227,933.—SORTER. JULY 24, 1973.
D.230,515.—DOCUMENT REPRODUCING AND SORTING MACHINE. FEB. 26, 1974.
D.233,937.—SORTER. DEC. 17, 1974.
D.236,030.—PAPER TRAY. JULY 22, 1975.
3,395,913.—SHEET MATERIAL DISTRIBUTION SYSTEM. AUG. 6, 1968. AUS. 0409539, BEL. 0704922, CAN. 0832159, FRA. 1543565, GRB. 1193517, ITL. 0823413, JAP. 0645590, MEX. 0101165, USR. 0343419.
3,460,824.—MODULAR SHEET DISTRIBUTOR. AUG. 12, 1969. ARG. 0175858, ATR. 0304588, AUS. 0443802, CAN. 0871013, CHL. 0023362, CLB. 0016672, EIR. 0031307, FIN. 0047868, GRB. 1193514, IND. 0112001, ISR. 0028521, JAP. 0645589, MEX. 0099178, NOR. 0125174, NZL. 0149789, PAK. 0119258, PLP. 0006159, PRU. 0009362, SAF. 0674987, SPN. 0344350, STZ. 0478049, SWD. 0342203, TRK. 0014721, URG. 0008514, VZL. 0016672.
3,484,101.—SORTING APPARATUS FOR DOCUMENTS. DEC. 16, 1969. CAN. 0889441, GRB. 1246033.
3,552,739.—SHEET HANDLING APPARATUS. JAN. 5, 1971. BEL. 0738575, CAN. 0921945, FRA. 6930567, GRB. 1274277, ITL. 0871023.
3,565,420.—DOCUMENT FEEDING APPARATUS. FEB. 23, 1971. ARG. 0184075, AUS. 0453309, BEL. 0750391, CAN. 0922328, EGR. 0082941, FRA. 7017112, GRB. 1305825, ITL. 0893198, MEX. 0117914, PLD. 0082841, SPN. 0379694, STZ. 0513435, SWD. 0368797, USR. 0476767.
3,589,808.—REPRODUCING APPARATUS. JUNE 29, 1971. CAN. 0917482.
3,618,936.—JAM DETECTION SYSTEM FOR SORTING APPARATUS. NOV. 9, 1971. AUS. 0445492, BEL. 0758059, CAN. 0949671, EGR. 0088009, FRA. 7041622, GRB. 1324119, ITL. 0909902, PLD. 0081147, SPN. 0385034, STZ. 0525723, TIW. 0007648.
3,622,061.—STAPLE FEED AND FASTENING APPARATUS. NOV. 23, 1971.
3,630,607.—SET SEPARATION COPIER SYSTEM. DEC. 28, 1971.
3,649,006.—SHEET HANDLING APPARATUS. MAR. 14, 1972. BEL. 0762643, CAN. 0944310, FRA. 7104922, GRB. 1341286, ITL. 0918344, JAP. 0795150.
3,652,875.—CONTROL CIRCUIT FOR DRIVING STAPLING MECHANISM. MAR. 28, 1972.
3,669,447.—SHEET PROPELLING APPARATUS. JUNE 13, 1972. CAN. 0938624.
3,671,094.—COVER APPARATUS. JUNE 20, 1972.
3,682,328.—TRAY APPARATUS. AUG. 8, 1972.
3,685,712.—STAPLING APPARATUS. AUG. 22, 1972. CAN. 0953851.
3,690,537.—STAPLE FORMING AND FASTENING APPARATUS. SEPT. 12, 1972.
3,695,756.—SHEET STRIPPING APPARATUS. OCT. 3, 1972. BEL. 0774563, CAN. 0950931, FRA. 7139637, GRB. 1366909, ITL. 0937673.
3,707,418.—METHOD OF BINDING. DEC. 26, 1972. CAN. 0974723, EGR. 0094346, GRB. 1359338.
3,709,485.—CONTROL CIRCUIT FOR SORTING SYSTEM. JAN. 9, 1973.
3,709,492.—SORTING APPARATUS. JAN. 9, 1973. ARG. 0194366, AUS. 0457968, BEL. 0783854, CAN. 0968300, FRA. 7218317, GRB. 1365399, ITL. 0955692, MEX. 0127721, SPN. 0403108, STZ. 0555198.
3,719,266.—SHEET STACKING APPARATUS. MAR. 6, 1973.
3,735,978.—METHOD AND APPARATUS FOR STACKING COPY SHEETS. MAY 29, 1973. ARG. 0190825, BEL. 0772406, CAN. 0951340, FRA. 7133309, GRB. 1358420, ITL. 0936377, MEX. 0125745.
3,788,640.—MOVING BIN SORTING APPARATUS. JAN. 29, 1974. CAN. 0996495, FRA. 7346312, GRB. 1429726.
3,793,016.—ELECTROPHOTOGRAPHIC SHEET BINDING PROCESS. FEB. 19, 1974.
3,794,550.—SHEET BINDING. FEB. 26, 1974. CAN. 1012583, GRB. 1431286.
3,833,911.—REPRODUCTION SYSTEM AND METHOD WITH SIMPLEX AND DUPLEX MODES OF OPERATION. SEPT. 3, 1974.

3,841,754.—DUPLEX REPRODUCTION SYSTEM. OCT. 15, 1974.
3,841,827.—DUPLEX REPRODUCTION SYSTEM. OCT. 15, 1974. BEL. 0816155, FRA. 7419739, GER. 7409422, GRB. 1441370.
3,845,949.—SORTER CONTROL TO PREVENT OVERSTACKING IN THE SORTER TRAYS. NOV. 5, 1974. BEL. 808173, CAN. 1005511, FRA. 7342816, GRB. 1436599, ITL. 1002130, SPN. 0421148.
3,848,995.—COPIER/DUPLICATOR SYSTEM. NOV. 19, 1974. BEL. 0815548, GRB. 1450847, ITL. 1012907, SPN. 0426782.
3,861,219.—METHOD FOR MEASURING HEAT AND PRESSURE CHARACTERISTICS OF FUSING APP. JAN. 21, 1975. CAN. 1013807.
3,861,861.—FUSER ROLL CLEANING APPARATUS. JAN. 21, 1975.
3,866,904.—MULTIPLE FEED SORTING APPARATUS. FEB. 18, 1975. CAN. 1001109, GRB. 1432790.
3,868,019.—TRAY APPARATUS. FEB. 25, 1975. FRA. 7346312, CAN. 0996495, FRA. 7346912, GRB. 1429726.
3,870,295.—SORTER SUPPLEMENT CONTROL. MAR. 11, 1975. CAN. 1007283.
3,871,643.—SORTER CONTROL. MAR. 18, 1975. BEL. 808172, CAN. 1000647, GRB. 1422029, ITL. 1002129, SPN. 0421116.
3,878,818.—CLEANING APPARATUS FOR DRY FUSER ROLLS. APR. 22, 1975. FRA. 7427783, GRB. 1464759.
3,880,119.—DEVELOPMENT APPARATUS. APR. 29, 1975.
3,902,709.—BINLESS SORTER. SEPT. 2, 1975. FRA. 7436985.
3,907,276.—WOBBLE JOGGER. SEPT. 23, 1975.
3,908,978.—BINLESS SORTING APPARATUS. SEPT. 30, 1975. CAN. 0996586, GRB. 1426020.
3,917,256.—DUAL PURPOSE SHEET HANDLING APPARATUS. NOV. 4, 1975. CAN. 1014098.
3,917,257.—SHEET INVERTER APPARATUS. NOV. 4, 1975. CAN. 1005009, FRA. 7346309, GRB. 1430620.
3,938,802.—SHEET STACKING APPARATUS. FEB. 17, 1976. CAN. 1010462, GRB. 1431605.
3,941,369.—SHEET DISTRIBUTING APPARATUS. MAR. 2, 1976.
3,947,018.—UNIVERSAL FEEDER-STACKER. MAR. 30, 1976. BEL. 0836262.
3,953,023.—BIN INDICATOR DEVICE. APR. 27, 1976.
3,971,554.—SHEET STACKER. JULY 27, 1976.
3,973,769.—COMPACT SORTING APPARATUS. AUG. 10, 1976. BEL. 0836261.
3,977,667.—SORTING APPARATUS. AUG. 31, 1976.
3,988,817.—PRESSURE ROLL FOR FUSER APPARATUS. NOV. 2, 1976.
3,990,695.—SORTING APPARATUS. NOV. 9, 1976.
3,995,748.—SORTER APPARATUS. DEC. 7, 1976. BEL. 0844420.
4,011,952.—MANUAL SORTER. MAR. 15, 1977.
4,012,034.—MULTIPLE MODULAR SORTER ASSEMBLY. MAR. 15, 1977.
4,012,035.—SORTER CONTROL SYSTEM. MAR. 15, 1977.
4,015,841.—SORTER. APR. 5, 1977.
4,022,458.—SHEET DISTRIBUTION APPARATUS. MAY 10, 1977.
4,029,309.—SET TRANSPORT AND STACKER. JUNE 14, 1977. BEL. 0847844.
4,033,579.—AN OFFSET STACKER. JULY 5, 1977.
4,037,832.—IMPROVED SORTER APPARATUS. JULY 26, 1977.
4,038,594.—DISTORTIONLESS LINE WAVE AMPLIFICATION. JULY 26, 1977.
4,049,180.—STITCHING HEAD BYPASS APPARATUS. SEPT. 20, 1977.
4,055,339.—SORTER APPARATUS. OCT. 25, 1977.
4,069,728.—SHEET SLITTING APPARATUS. JAN. 24, 1978.
4,084,809.—SHEET STACKING APPARATUS. APR. 18, 1978.
4,087,087.—SHEET STACKING APPARATUS FOR SORTER. MAY 2, 1978.
4,111,410.—SORTING APPARATUS AND REPRODUCING MACHINE. SEPT. 5, 1978.
4,138,076.—STAPLE CASSETTE. FEB. 6, 1979.
4,151,944.—STAPLERS. MAY 1, 1979.

Class 7

3,784,300.—PRE-TRANSFER STATION. JAN. 8, 1974. AUS. 0465154, BEL. 0789340, CAN. 1000782, EGR. 0106095, FRA. 7234200, GRB. 1379826, ITL. 0972691, MEX. 0128584, SPN. 0409975, STZ. 0557051, SWD. 7215168.
3,809,471.—PHOTOELECTROPHORETIC IMAGING APPARATUS WITH CORRECTION FOR PARALLAX. MAY 7, 1974.
3,819,263.—CLEANING APPARATUS. JUNE 25, 1974. ARG. 0200252, AUS. 0469469, BEL. 0796984, EGR. 0104374, FRA. 2177733, GRB. 1421929, ISR. 0041829, ITL. 0983618, MEX. 131438, SAF. 0732067, SPN. 0439774, STZ. 0556047, SWD. 7304022.

Class 7A

3,850,517.—HIGH SPEED PRINTOUT SYSTEM. NOV. 26, 1974.

Class 7A 1

3,051,041.—IMAGE PROJECTION. AUG. 28, 1962. CAN. 0734194, GRB. 0956359.
3,148,581.—CYLINDRICAL SURFACE PROJECTION APPARATUS. SEPT. 15, 1964.
3,273,999.—IMAGE DEFORMATION UTILIZING A PRISM. SEPT. 20, 1966. AUS. 0274351, CAN. 0840628, FRA. 1367772, GRB. 1034097, ITL. 0699466, SAF. 0002971, SWD. 0306232.
3,320,061.—MASKING BY TOTAL INTERNAL REFLECTION FOR IMAGE REPRODUCTION AND DISPLAY. MAY 16, 1967. CAN. 0847533, FRA. 1401615, GER. 1497081, GRB. 1065986, ITL. 0729029, JAP. 0471308.
3,481,668.—IMAGE PROJECTION APPARATUS. DEC. 2, 1969.
3,510,660.—METHOD FOR VISUAL COMPARISON OF INFORMATION. MAY 5, 1970. CAN. 0848611, GRB. 1201376, JAP. 0595641.
3,519,344.—IMAGE PROJECTION. JULY 7, 1970.
3,622,217.—LIGHT PRODUCING SYSTEM. NOV. 23, 1971.

Class 7A 2

3,196,765.—IMAGE DEVELOPMENT AND PROJECTION. JULY 27, 1965.
3,355,308.—PROJECTION TRANSPARENCY HAVING A TRANSPARENT POWDER IMGE. NOV. 28, 1967.
3,607,256.—FULLY-ENCLOSED ELECTROPHORETIC IMAGING SYSTEM. SEPT. 21, 1971.

Class 7A 2A

3,999,038.—FLARED FUSER ROLLL. DEC. 21, 1976.

Class 7B

3,501,294.—METH OF TREATNG SURFACE OF XIC PLATE W/METAL SALT OF A FATTY ACID TO IMPROVE IMAGE TRANSFER. MAR. 17, 1970. ARG. 0168294, AUS. 0419434, BEL. 0706369, CAN. 0880230, CHL. 0027764, FRA. 1544449, GRB. 1209644, ITL. 0822799, MEX. 0102265, PNM. 0002797, SWD. 0340047, VZL. 0023670.
3,690,754.—CONTROL SYSTEM FOR AN OPTICAL IMAGING SYSTEM. SEPT. 12, 1972. CAN. 0949797, GRB. 1337420.
3,884,825.—IMAGING COMPOSITION. MAY 20, 1975. AUS. 0467835, BEL. 0802879, CAN. 0995963, FRA. 7328589, GRB. 1437041, ITL. 0991465, SPN. 0417382.
3,973,843.—ELECTROSTATOGRAPHIC IMAGING APPARATUS. AUG. 10, 1976. AUS. 0467835, BEL. 0802879, CAN. 0995963, FRA. 7328589, GRB. 1437041, ITL. 0991465, SPN. 0417382.
4,064,285.—ELECTROPHOTOGRAPHIC DECALCOMANIAS. DEC. 20, 1977.
4,066,802.—COLORED XEROGRAPHIC IMAGE TRANSFER PROCESS. JAN. 3, 1978.
4,126,455.—ELECTROSTATOGRAPHIC IMAGING PROCESS AND RELATED APPARATUS. NOV. 21, 1978. AUS. 467835. BEL. 802879. CAN. 995963. FRA. 7328588. GRB. 1437041. ITL. 991465. SPN. 417382. USR. 637099.

Class 7C

3,063,859.—METHOD AND APPARATUS FOR TRANSFERRING IMAGES FROM XEROGRAPHIC TO METALLIC PLATES. NOV. 13, 1962.
3,071,070.—METHOD AND APPARATUS FOR TRANSFERRING IMAGES FROM XEROGRAPHIC TO METALLIC PLATES. JAN. 1, 1963. CAN. 0638821.
3,620,616.—TRANSFER DRUM WITHDRAWAL APPARATUS. NOV. 16, 1971. BEL. 0751487, CAN. 0923543, FRA. 7020458, GRB. 1300267, ITL. 0893835.
3,633,543.—BIASED ELECTRODE TRANSFER APPARATUS. JAN. 11, 1972. CAN. 0914398, GRB. 1337123, JAP. 783769.
3,781,105.—CONSTANT CURRENT BIASING TRANSFER SYSTEM. DEC. 25, 1973. FRA. 7341869, GRB. 1448385.

3,795,441.—TRANSFER ROLLER. MAR. 5, 1974.
3,822,093.—TRANSFER REGULATING APPARATUS. JULY 2, 1974. FRA. 7428422
3,830,589.—CONDUCTIVE BLOCK TRANSFER SYSTEM. AUG. 20, 1974.
3,832,053.—BELT TRANSFER SYSTEM. AUG. 27, 1974.
3,832,055.—FORAMINOUS VACUUM BIAS ROLL TRANSFER SYSTEM. AUG. 27, 1974. CAN. 0999316.
3,837,741.—CONTROL ARRANGEMENT FOR TRANSFER ROLL POWER SUPPLY. SEPT. 24, 1974.
3,837,883.—IMAGE TRANSFER PROCESS. SEPT. 24, 1974. ARG. 0203811, AUS. 0461437, BEL. 0760456, CAN. 0947368, FRA. 7047140, GRB. 1339577, ITL. 0913634, MEX. 0119591, SWD. 7017139.
3,842,800.—TRANSFER ROLLER ASSEMBLY. OCT. 22, 1974. BEL. 0793553, CAN. 9780221, FRA. 7237770, GRB. 1412454, ITL. 0973320, SPN. 0410173, SWD. 7216978.
3,846,020.—ELECTROSTATIC SHEET TRANSPORT SYSTEM. NOV. 5, 1974.
3,847,119.—TRANSFER ROLLER ASSEMBLY. NOV. 12, 1974. ARG. 0196224, ATR. 327002, AUS. 0464751, BEL. 0796983, CAN. 0977206, EGR. 0103979, FRA. 7305277, GER. 0103979, GRB. 1413711, ISR. 0041830, ITL. 0983617, MEX. 131018, SAF. 0722068, SPN. 0413018, STZ. 0558033, SWD. 7304021.
3,847,478.—SEGMENTED BIAS ROLL. NOV. 12, 1974.
3,848,204.—PRESSURE ADJUSTABLE ELECTROPHOTOGRAPHIC PRINTING MACHINE TRANSFER APPARATUS. NOV. 12, 1974.
3,860,436.—CONSTANT CURRENT BIASING TRANSFER SYSTEM. JAN. 14, 1975. FRA. 7341869, GRB. 1448385.
3,866,572.—FORAMINOUS ELECTROSTATOGRAPHIC TRANSFER SYSTEM. FEB. 18, 1975. BEL. 0815546, CAN. 1009503, FRA. 7418641, GRB. 1448386, ITL. 1012842, SPN. 0426760.
3,877,416.—HUMIDITY CORRECTED TRANSFER APPARATUS. APR. 15, 1975. BEL. 0814054, GRB. 1445671, ITL. 1009955, STZ. 0573612.
3,888,208.—IMAGE TRANSFER PROCESS. JUNE 10, 1975.
3,901,186.—TRANSFER ROLLER ASSEMBLY. AUG. 26, 1975. BEL. 0816848, FRA. 7423024.
3,924,943.—SEGEMENTED BIASED TRANSFER MEMBER. DEC. 9, 1975.
3,936,175.—INTERNALLY SHIELDED TRANSFER ROLLER. FEB. 3, 1976.
3,942,888.—STEPPED TRANSFER ROLLER. MAR. 9, 1976.
3,957,367.—A COLOR ELECTROSTATOGRAPHIC PRINTING MACHINE. MAY 18, 1976.
3,959,574.—BIASABLE MEMBER AND METHOD FOR MAKING. MAY 25, 1976.
3,994,579.—TRANSFER SYSTEM FOR ELECTROPHOTOGRAPHIC PRINTING. NOV. 30, 1976.
4,014,605.—TRANSFER SYSTEM WITH TAILORED ILLUMINATION. MAR. 29, 1977.
4,023,894.—TRANSFER APPARATUS. MAY 17, 1977.
4,025,182.—A TRANSFER APPARATUS FOR A COLOR ELECTROPHOGRAPHIC PRINTING MACHINE. MAY 24, 1977.
4,055,380.—TRANSFER CHARGE MAINTAINING SYSTEM. OCT. 25, 1977.
4,058,879.—COMPOSITIONS AND METHOD FOR ENHANCING ELECTRICAL LIFE OF POLYMERS USED IN XEROGRAPHIC DEVICE. NOV. 22, 1977.
4,062,812.—METHOD FOR EXTENDING THE FUNCTIONAL LIFE OF POLYMERS USED IN XEROGRAPHIC DEVICES. DEC. 13, 1977.
4,087,169.—TRANSFER ROLLER SYSTEM. MAY 2, 1978.
4,098,227.—BIASED FLEXIBLE ELECTRODE TRANSFER. JULY 4, 1978.
4,105,320.—TRANSFER OF CONDUCTIVE PARTICLES. AUG. 8, 1978.
4,110,024.—TRANSFER ASSEMBLY FOR ELECTROSTATIC TRANSFER OF A TONER IMAGE FROM A CURVILINEAR RECORDING. AUG. 29, 1978. BEL. 854404.
4,116,894.—COMPOSITIONS AND METHOD FOR ENHANCING ELECTRICAL LIFE OF COPOLYMERS. SEPT. 26, 1978.
4,134,147.—TRANSFER HUMIDITY CONTROL DEVICE. JAN. 9, 1979.
4,141,728.—TRANSFER OF DRY DEVELOPED ELECTROSTATIC IMAGE USING PLURAL OPPOSITELY CHARGED FIELDS. FEB. 27, 1979.

Class 7C 1

3,150,003.—APPARATUS FOR TRANSFERRING XEROGRAPHIC IMAGES. SEPT. 22, 1964.
3,150,004.—XEROGRAPHIC TRANSFER APPARATUS. SEPT. 22, 1964.
3,244,083.—XEROGRAPHIC DEVICE. APR. 5, 1966. AUS. 0284069, CAN. 0710975, FRA. 1379820, GRB. 1030449, JAP. 0654006.
3,339,069.—CORONA CHARGING DEVICE W MEANS TO PREVENT TONER DUST CONTAMINATION. AUG. 29, 1967. CAN. 0788539, FRA. 1450010, GRB. 1116687, ITL. 0730715, JAP. 0875339, MEX. 0089459.
3,357,325.—XEROGRAPHIC TRANSFER APPARATUS. DEC. 12, 1967. CAN. 0812525.
3,444,369.—METHOD AND APPARATUS FOR SELECTIVE CORONA TREATMENT OF TONER PARTICLES. MAY 13, 1969. ARG. 0167581, ATR. 0288863, AUS. 0415969, BEL. 0704919, BRA. 6791610, CAN. 0845871, DNK. 0119094, FRA. 1540696, GER. 1597884, GRB. 1203811, HOL. 0152375, ITL. 0853627, JAP. 0587935, MEX. 0099470, SPN. 0345918, STZ. 0487438, SWD. 0337986, VZL. 0023669.
3,765,330.—XEROPRINTING EMPLOYING LETTER PRESS SURFACE COVERED WITH A LAYER OF RESISTIVE MATERIAL. OCT. 16, 1973. CAN. 0949806, GRB. 1374651.
3,850,519.—XEROGRAPHIC IMAGE TRANSFER APPARATUS. NOV. 26, 1974. ARG. 0202116, BEL. 0809579, GRB. 1446252, ITL. 1006786, MEX. 0135278, SPN. 0422230, STZ. 0567748, SWD. 7400197, VZL. 0033340.
3,870,515.—METHOD FOR ELECTROSTATIC PAPER STRIPPING BY NEUTRALIZATION OF TRANSFER CHARGE. MAR. 11, 1975.
3,877,417.—TRANSFER CORONA GENERATING DEVICE WITH SUPPORT BRUSHES. APR. 15, 1975.
3,918,403.—CORONA TRANSFER MECHANISM. NOV. 11, 1975.
3,920,325.—MOISTURE STABLE BIAS TRANSFER ROLL. NOV. 18, 1975.
3,966,199.—BELT TRANSFER LOADING SYSTEM. JUNE 29, 1976.
4,014,606.—REPRODUCTION MACHINE WITH TEXTURED TRANSFER ROLLER. MAR. 29, 1977.
4,017,065.—TRANSFER FUSING SPEED COMPENSATION. APR. 12, 1977.
4,017,067.—TRANSFER-FUSING SPEED COMPENSATION. APR. 12, 1977.
4,058,306.—DETACK AND STRIPPING SYSTEM. NOV. 15, 1977.
4,076,407.—DUPLEX COPYING TRANSFER SYSTEM. FEB. 28, 1978.
4,077,709.—TRANSFER CHARGE CONTROL SYSTEM. MAR. 7, 1978.
4,080,053.—TRANSFER APPARATUS AND METHOD. MAR. 21, 1978.

Class 7C 1A

3,319,604.—XEROGRAPHIC TRANSFER APPARATUS. MAY 16, 1967.

Class 7C 2

3,132,037.—XEROGRAPHIC TRANSFER METHOD. MAY 5, 1964. CAN. 0727919.
3,132,050.—XEROGRAPHIC TRANSFER APPARATUS. MAY 5, 1964.
3,795,441.—TRANSFER ROLLER. MAR. 5, 1974.
3,817,616.—THERMAL CHAMBER FOR DEVELOPABILITY REGULATING APPARATUS. JUNE 18, 1974. CAN. 0991247, GRB. 1439527.
3,838,918.—TRANSFER APPARATUS. OCT. 1, 1974. BEL. 0811434, GRB. 1445243, ITL. 1008903.
3,892,962.—THERMAL CHAMBER FOR A DEVELOPABILITY REGULATING APPARATUS. JULY 1, 1975. CAN. 0991247, GRB. 1439527.

Class 7C 3

3,244,083.—XEROGRAPHIC DEVICE. APR. 5, 1966. AUS. 0284069, CAN. 0710975, FRA. 1379820, GRB. 1030449, JAP. 0654006.
3,612,677.—ELECTROSTATIC TRANSFER APPARATUS. OCT. 12, 1971. CAN. 0941220, GRB. 1296742.
3,697,170.—AUTOMATIC DUPLEXING APPARATUS. OCT. 10, 1972. CAN. 0948269.
3,697,171.—SIMULTANEOUS IMAGE TRANSFER. OCT. 10, 1972. ARG. 0192330, AUS. 0461728, BEL. 0777016, CAN. 0948267, FRA. 7146256, GRB. 1368456, ITL. 0944212, MEX. 0124562, SWD. 0366123, VZL. 32765.
3,702,482.—BIAS ROLL TRANSFER. NOV. 7, 1972. ARG. 0191238, BEL. 0777017, CAN. 0962890, FRA. 7146257, GRB. 1368500, ITL. 0944209, MEX. 0126775.

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3,734,015.—SINGLE PASS DUPLEXING BY SEQUENTIAL TRANSFER. MAY 22, 1973. ARG. 0192332, BEL. 7777018, CAN. 0948691, FRA. 7146258, GRB. 1368496, ITL. 0944211, MEX. 0124992.
3,902,801.—COLOR CORRECTED PRINTING SYSTEM. SEPT. 2, 1975 GRB. 1465590.
4,093,457.—METHOD OF TRANSFER.

Class 7C 4

3,444,369.—METHOD AND APPARATUS FOR SELECTIVE CORONA TREATMENT OF TONER PARTICLES. MAY 13, 1969. ARG. 0167581, ATR. 0288863, AUS. 0415969, BEL. 0704919, BRA. 6791610, CAN. 0845871, DNK. 0119094, FRA. 1540696, FRA. 1540696, GRB. 1203811, HOL. 0152375, ITL. 0853627, JAP. 0587935, MEX. 0099470, SPN. 0345918, STZ. 0487438, SWD. 0337986, VZL. 0023669.
3,640,249.—TRANSFER APPARATUS. FEB. 8, 1972. BEL. 0758058.
3,647,292.—TRANSFER APPARATUS. MAR. 7, 1972. AUS. 0450919, BEL. 0759452, CAN. 0919004, FGR. 0086978, FRA. 7043065, GRB. 1319148, ITL. 0909441, JAP. 0773213, SPN. 0385845, STZ. 0519187, SWD. 7015876.
3,650,617.—SWITCHING DETECTOR-A. MAR. 21, 1972.
3,650,618.—SWITCHING DETECTOR-B. MAR. 21, 1972.
3,687,545.—SHORT FOCAL LENTH OPTICAL IMAGING SYSTEM. AUG. 29, 1972. BEL. 0747977, CAN. 0913438, FRA. 7011547, GRB. 1300156, ITL. 0898935, JAP. 0731226.
3,729,311.—ELECTROSTATIC TRANSFER METHOD. APR. 24, 1973.
3,854,974.—METHOD FOR TRANSFERRING A TONER IMAGE. DEC. 17, 1974.
3,926,824.—ELECTROSTATOGRAPHIC DEVELOPER COMPOSITION. DEC. 16, 1975. ARG. 0192480, AUS. 0466319, BEL. 0793098, CAN. 0985552, FRA. 7245403, GRB. 1417179, ITL. 0973327, SPN. 0410171, STZ. 0028663, SWD. 7216977.
3,932,035.—APPARATUS FOR TRANSFERRING A TONER IMAGE. JAN. 13, 1976.
3,994,726.—LAMINATED FLEXIBLE PHOTORECEPTOR. NOV. 30, 1976. GRB. 1429517.
4,002,476.—METHOD OF DEVELOPING RESILIENT PHOTOCONDUCTIVE ELEMENT. JAN. 11, 1977. GRB. 1429517.
4,023,967.—ELECTROPHOTOGRAPHIC LIQUID DEVELOPMENT METHOD IN WHICH A UNIFORM SUBSTANTIAL INTERFACE CONTACT. MAY 17, 1977. BEL. 0819537, GRB. 1429518.

Class 7D

3,093,039.—APPARATUS FOR TRANSFERRING POWDER IMAGES AND METHOD THEREFOR. JUNE 11, 1963. CAN. 0744873.

Class 7E

3,063,351.—XEROGRAPHIC POWDER IMAGE TRANSFER APPARATUS. NOV. 13, 1962. CAN. 0706541.
3,132,050.—XEROGRAPHIC TRANSFER APPARATUS. MAY 5, 1964.
3,375,781.—REGISTRATION MECHANISM FOR A REPRODUCTION MACHINE. APR. 2, 1968.
3,375,782.—PROGRAMMING MECHANISM FOR A REPRODUCTION MACHINE. APR. 2, 1968.
3,422,756.—PAPER SUPPORT AND REGISTRATION MEANS FOR REPRODUCTION MACHINE. JAN. 21, 1969.
3,499,374.—XEROGRAPHIC PRINTER. MAR. 10, 1970. AUS. 0415164, BEL. 0677146, CAN. 0846424, FRA. 1470069, GRB. 1135603, ITL. 0762255, MEX. 0091183, SWD. 0327142.
3,687,541.—XEROGRAPHIC DUPLEX TECHNIQUE. AUG. 29, 1972. CAN. 0948268.
3,847,642.—METHOD FOR TRANSFERRING ELECTROSTATOGRAPHICALLY FORMED IMAGES. NOV. 12, 1974.
3,848,204.—PRESSURE ADJUSTABLE ELECTROPHOTOGRAPHIC PRINTING MACHINE TRANSFER APPARATUS. NOV. 12, 1974.
3,854,974.—METHOD FOR TRANSFERRING A TONER IMAGE. DEC. 17, 1974.
3,867,168.—TRANSPARENCY. FEB. 18, 1975.
3,888,208.—IMAGE TRANSFER PROCESS. JUNE 10, 1975.
3,932,035.—APPARATUS FOR TRANSFERRING A TONER IMAGE. JAN. 13, 1976.
3,936,174.—TRANSFER ROLLER WITH STATIONARY INTERNAL ELECTRODE. FEB. 3, 1976.
3,954,332.—REPRODUCTION MACHINE WITH IMPROVED TRANSFER ROLL. MAY 4, 1976.
3,954,333.—TRANSFER ROLL HAVING MEANS FOR MONITORING AND CONTROLLING THE RESITIVITY THEREOF. MAY 4, 1976.
3,977,779.—ELECTROSTATOGRAPHIC TRANSFER WITH AIR. AUG. 31, 1976. GRB. 1459450.

Class 7E 1

3,063,859.—METHOD AND APPARATUS FOR TRANSFERRING IMAGES FROM XEROGRAPHIC TO METALLIC PLATES. NOV. 13, 1962.
3,071,070.—METHOD AND APPARATUS FOR TRANSFERRING IMAGES FROM XEROGRAPHIC TO METALLIC PLATES. JAN. 1, 1963. CAN. 0638821.
3,374,769.—TONER FUSING APPARATUS. MAR. 26, 1968. CAN. 0819836, FRA. 1396610, GER. 1522709, GRB. 1152067, JAP. 0534764.
3,685,896.—DUPLICATING METHOD AND APPARATUS. AUG. 22, 1972.
3,845,742.—FUSER ROLL CONSTRUCTION. NOV. 5, 1974. GRB. 1450882.
3,849,062.—REINFORCED FUSER ROLL CONSTRUCTION. NOV. 19, 1974.
4,064,285.—ELECTROPHOTOGRAPHIC DECALCOMANIAS. DEC. 20, 1977.
4,066,802.—COLORED XEROGRAPHIC IMAGE TRANSFER PROCESS. JAN. 3, 1978.

Class 7E 2

3,083,684.—APPARATUS FOR PATTERN REPRODUCTION. APR. 2, 1963.

Class 7E 3

3,157,546.—IMAGE TRANSFER. NOV. 17, 1964. ATR. 0225034, BEL. 0602721 FRA. 1287124, GER. 1271547, GRB. 0985176, ITL. 0647042, JAP. 0414127, STZ. 0383417.
3,591,276.—METHOD AND APPARATUS FOR OFFSET XEROGRAPHIC REPRODUCTION. JULY 6, 1971. CAN. 0894931, GER. 1811893, GRB. 1245426, JAP. 0648075.
3,682,677.—BACKGROUND REMOVAL. AUG. 8, 1972.
3,690,252.—LITHOGRAPHIC INKING APPARATUS. SEPT. 12, 1972. CAN. 0919006.
4,064,285.—ELECTROPHOTOGRAPHIC DECALCOMANIAS. DEC. 20, 1977.

Class 7E 3A

3,060,052.—TRANSFER OF XEROGRAPHIC DYE IMAGES. OCT. 23, 1962. AUS. 0242307, CAN. 0678380, FRA. 1246634, GRB. 0946761.

Class 8

3,961,236.—CONSTANT POWER REGULATOR FOR XEROGRAPHIC FUSING SYSTEM. JUNE 1, 1976.
4,027,138.—A FUSER RELEASE MATERIAL DISPENSER. MAY 31, 1977.
4,104,692.—DEVICE FOR DETECTING ABNORMAL TEMPERATURE IN FIXER. AUG. 1, 1978.

Class 8A

D.233,414.—TONER BOTTLE OR THE LIKE. OCT. 29, 1974.
3,130,064.—METHOD OF FORMING RESIN PATTERN ON A PAPER RECORD CARD. APR. 21, 1964.
3,778,222.—FIRE PREVENTION APPARATUS. DEC. 11, 1973.
3,830,590.—SORTER APPARATUS OF PRINTER SYSTEM. AUG. 20, 1974. AUS. 0466096, BEL. 0791361, CAN. 0998425, CHL. 0027890, EGR. 0102488, FRA. 7240557, GRB. 1400619, IND. 0137843, ISR. 0040831, ITL. 0970911, MEX. 0128646, NOR. 0135210, NZL. 0168971, PLP. 0008722, PTG. 0058789, SAF. 0728101, SPN. 0408628, STZ. 0560108.
3,834,861.—PRESSURE HEATED FUSER ASSEMBLY. SEPT. 10, 1974. GRB. 1424307.
3,847,391.—STACKING CONTROL APPARATUS. NOV. 12, 1974. ARG. 0194365, AUS. 0454812, BEL. 0783855, CAN. 0969205, FRA. 7218318, GRB. 1365400, ITL. 0955693, MEX. 0128712, SPN. 0403109, STZ. 0557242.
3,848,868.—SHEET SORTING APPARATUS. NOV. 19, 1974. CAN. 1005387, GRB. 1440557.
3,856,461.—REPRODUCTION MACHINE FUSER. DEC. 24, 1974.
3,856,462.—REPRODUCTION MACHINE FUSER. DEC. 24, 1974. BEL. 0821050, FRA. 7435222.

3,868,744.—CLEANING APPARATUS FOR HEATED PRESSURE ROLL FUSER. MAR. 4, 1975. AUS. 0466542, BEL. 0794569, CAN. 1007407, FRA. 7302888, GRB. 1424132, ITL. 0978560, SPN. 0410976, SWD. 7301015.
3,883,921.—CLEANING ROLL APPARATUS HAVING REJUVENATED CLEANING SURFACE. MAY 20, 1975
3,936,658.—FUSER APPARATUS FOR ELECTROSTATIC REPRODUCING MACHINES. FEB. 3, 1976. BEL. 0844831.
3,998,450.—IMPROVED SORTING APPARATUS. DEC. 21, 1976. GRB. 1433088.
4,004,549.—ROLL FUSER. JAN. 25, 1977.
4,006,985.—XEROGRAPHIC APPARATUS HAVING TIME CONTROLLED FUSING. FEB. 8, 1977.
4,032,746.—CONTROL SYSTEM FOR A FUSING APPARATUS. JUNE 28, 1977.
4,035,140.—FIXING DEVICE IN AN ELECTROPHOTOGRAPHIC COPYING MACHINE. JULY 12, 1977.
4,045,163.—HEATED FUSER RELEASE AGENT CONTAINER. AUG. 30, 1977.
4,063,530.—IMAGE FIXING. DEC. 20, 1977.
4,065,586.—FIXING METHOD USING POLYARYLSILOXANES AS RELEASE AGENTS. DEC. 27, 1977.
4,078,286.—HEAT FIXING ROLL FOR ELECTROPHOTOGRAPHIC DUPLICATORS. MAR. 14, 1978.
4,078,948.—FIXING METHOD. MAR. 14, 1978.
4,133,522.—PIVOTING TRAY SORTING APPARATUS. JAN. 9, 1979. CAN. 1011681. GRB. 1455159.
4,144,835.—CONTACT HEAT FIXING APPARATUS. MAR. 20, 1979.
4,146,659.—FUSING TONER ON FUSER MEMBERS MADE OF NOBLE METALS AND ALLOYS THEREOF. MAR. 27, 1979.

Class 8A 1

RE.28,802.—FUSING APPARATUS. MAY 4, 1976. CAN. 0990779, FRA. 7338110, GRB. 1436563.
3,079,483.—XEROGRAPHIC FIXING APPARATUS. FEB. 26, 1963. ARG. 0155449, CAN. 0682500, GRB. 1032955, IND. 0096312.
3,083,623.—TRANSFERRED IMAGE APPARATUS. APR. 2, 1963. CAN. 0701631.
3,219,326.—XEROGRAPHIC FUSING APPARATUS. NOV. 23, 1965. CAN. 0716212.
3,374,769.—TONER FUSING APPARATUS. MAR. 26, 1968. CAN. 0819836, FRA. 1396610, GER. 1522709, GRB. 1152067, JAP. 0534764.
3,396,401.—APPARATUS AND METHOD FOR MARKING OF INTELLIGENCE ON A RECORD MEDIUM. AUG. 6, 1968.
3,409,280.—POROUS DRUM FUSER. NOV. 5, 1968.
3,411,932.—QUALITY XEROGRAPHIC REPRODUCTIONS. NOV. 19, 1968. CAN. 0788948, FRA. 1459094, GER. 1497213, GRB. 1112000, ITL. 0725763, MEX. 0078900.
3,498,592.—HEAT FIXING APPARATUS FOR FUSIBLE MATERIAL. MAR. 3, 1970. ARG. 0180584, AUS. 0432632, BEL. 0733403, CAN. 0878082, CZC. 0164830, FRA. 6917080, GRB. 1269716, ITL. 0864984, MEX. 0111516, PNM. 0001417, SPN. 0367614, STZ. 0506821, SWD. 0345328, TIW. 0006603, USR. 0340215.
3,519,253.—SELECTIVE XEROGRAPHIC FUSER. JULY 7, 1970. ARG. 0168753, ATR. 0293871, AUS. 0416089, BEL. 0704925, CAN. 0843377, CHL. 0023289, CLB. 0017682, DNK. 0123893, FRA. 1540701, GRB. 1193355, GUA. 0002145, HUN. 0157550, ITL. 0830722, JAM. 0001850, MEX. 0107890, PRU. 0009344, SAF. 0676018, SPN. 0345919, STZ. 0470698, SWD. 0322690, TRD. 0000113, URG. 0008846, USR. 0372852, VZL. 0026101.
3,535,492.—FUSING APPARATUS. OCT. 20, 1970. ARG. 0181204, BEL. 0733663, CAN. 0872978, FRA. 6917190, GRB. 1266932, HOL. 149013, ITL. 0865914, MEX. 0110755.
3,623,710.—FIXING ARRANGEMENT. NOV. 30, 1971.
3,648,991.—METHOD AND APPARATUS FOR SELECTIVE FUSING. MAR. 14, 1972.
3,667,742.—FIXING ARRANGEMENT. JUNE 6, 1972. BEL. 0777318, CAN. 0928766, FRA. 7147890, GRB. 1368307, ITL. 0944393.
3,765,828.—FUSING APPARATUS. OCT. 16, 1973. CAN. 0991256, GRB. 1428800.
3,770,346.—METHOD AND APPARATUS FOR FUSER ASSEMBLY COOLING IN AN ELECTROSTATOGRAPHIC MACHINE. NOV. 6, 1973. CAN. 1002582, GRB. 1421863.
3,781,517.—FUSER THERMAL PROTECTOR. DEC. 25, 1973. GRB. 1441702.
3,792,227.—FUSER APPARATUS. FEB. 12, 1974.
3,819,259.—LIGHT ATTENUATOR. JUNE 25, 1974. GRB. 1428799.
3,826,892.—FUSING APPARATUS. JULY 30, 1974. CAN. 0990779, FRA. 7338110, GRB. 1436563.
3,849,905.—FUSING APPARATUS NOV. 26, 1974.
3,849,907.—FUSING APPARATUS. NOV. 26, 1974
3,869,696.—FUSER APPARATUS. MAR. 4, 1975.
3,874,892.—ELECTROSTATOGRAPHIC FUSING PROCESS EMPLOYING REPLACEABLE LINER. APR. 1, 1975. CAN. 0980405, GRB. 1374652.
3,898,424.—RADIANT FUSER XEROGRAPHIC REPRODUCING APPARATUS. AUG. 5, 1975.
3,907,492.—FUSING APPARATUS. SEPT. 23, 1975. CAN 0990779, GRB. 1436563.
3,939,326.—DUAL RIBBON FUSER. FEB. 17, 1976.
3,944,784.—DUAL RIBBON FUSER. MAR. 16, 1976.
3,953,709.—TWO SOURCE RADIANT FUSER FOR XEROGRAPHIC REPRODUCING APPARATUS. APR. 27, 1976.
3,987,757.—PAPER HANDLING IMPROVEMENTS IN RADIANT FUSER VIA CORRUGATION OF PAPER. OCT. 26, 1976.
4,001,622.—DIRECTIONAL SOURCES OF ELECTROMAGNETIC RADIATION. JAN. 4, 1977. GRB. 1443340.
4,015,103.—A FUSER CONVEYOR BELT. MAR. 29, 1977.
4,021,641.—RADIANT FUSER FOR FIXING TONER IMAGES. MAY 3, 1977.
4,056,706.—APPARATUS & METHOD FOR EXTENDING FUSER RELEASE LIFE. NOV. 1, 1977.
4,064,313.—HEAT FIXING MEMBER FOR ELECTROPHOTOGRAPHIC COPIERS. DEC. 20, 1977
4,078,285.—HARD ALLOY FUSER MEMBERS. MAR. 14, 1978.
4,092,099.—COPIER PAPER DELIVERY MEANS IN A HEAT-FIXING DEVICE OF A COPYING MACHINE. MAY 30, 1978.
4,102,681.—TRANSFER AND FUSING METHOD. JULY 25, 1978. CAN. 990779, FRA. 7338110.

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3,445,626.—FUSING APPARATUS WITH FLASH LAMP CIRCUIT. MAY 20, 1969. CAN. 0843525, GRB. 1180604, JAP. 1075585.
3,465,203.—FLASH LAMP FOR ELECTROSCOPIC TONER. SEPT. 2, 1969. CAN. 0843526, GER. 1589315, GRB. 1185687, JAP. 0758339.
3,474,223.—SELECTIVE FLASH FUSING. OCT. 21, 1969. CAN. 0851811, FRA. 1546257, GRB. 1208770, JAP. 0558445.
3,529,129.—REFLECTION TYPE FLASH FUSER. SEPT 15, 1970. ARG. 0180678, BEL. 0728716, CAN. 0855311, FRA. 6004567, GRB. 1252465, ITL. 0866971, JAP 0661180, MEX. 0107835.
3,566,076.—TONER FIXING APPARATUS. FEB. 23, 1971. CAN. 0913164, GRB. 1256471.
3,655,280.—XEROGRAPHIC FUSING METHOD AND APPARATUS. APR 11, 1972.
3,765,828.—FUSING APPARATUS. OCT. 16, 1973. CAN 0991256, GRB. 1428800.
3,792,227.—FUSER APPARATUS. FEB. 12, 1974
3,819,259.—LIGHT ATTENUATOR. JUNE 25, 1974. GRB. 1428799.
3,865,081.—MAGNETIC BRUSH DEVELOPING APPARATUS. FEB. 11, 1975
3,869,696.—FUSER APPARATUS. MAR. 4, 1975.
3,903,394.—READ/WRITE APPARATUS FOR MAGNETIC RECORDERS. SEPT. 2, 1975.
3,920,952.—DUPLEX FUSING APPARATUS AND METHOD. NOV. 18, 1975.
3,935,424.—FLASH FUSING APPARATUS. JAN. 27, 1976.
3,944,783.—HIGH EFFICIENCY NON CAVITY RADIANT METHOD AND APPARATUS. MAR. 16, 1976.
3,980,424.—FUSER CLEANING ROLLER. SEPT. 14, 1976.
4,001,541.—FLASH FUSING SYSTEM WITH ENERGY CONTROL. JAN. 4, 1977.
4,027,199.—FLASH LAMP MODULATOR SYSTEM. MAY 31, 1977.
4,039,770.—INTERFACE SYSTEM TO CONTROL FLASH LAMP. AUG. 2, 1977.
4,050,801.—RELEASE AGENT APPLICATION SYSTEM FOR A HEATED FUSER ROLL. SEPT. 27, 1977.
4,050,803.—QUICK RELEASE MECHANISM FOR A BACKUP ROLL FUSER EMPLOYED IN A COPIER APPARATUS. SEPT. 27, 1977.
4,090,108.—INTERFACE SYSTEM TO CONTROL FLASH LAMP. MAY 16, 1978.

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3,053,962.—XEROGRAPHIC FUSING APPARATUS. SEPT. 11, 1962. CAN. 0657396, GER. 1165413, GRB. 0999763.

3,357,401.—XEROGRAPHIC FUSER MONITORING APPARATUS. DEC. 12, 1967.
3,432,639.—FUSING APPARATUS. MAR. 11, 1969. CAN. 0851810, GRB. 1194234, JAP. 0608702.
3,437,407.—XEROGRAPHIC FUSING SYSTEM. APR. 8, 1969. CAN. 0842370, JAP. 0758338.
3,445,626.—FUSING APPARATUS WITH FLASH LAMP CIRCUIT. MAY 20, 1969. CAN. 0843525, GRB. 1180604, JAP. 1075585.
3,449,546.—INFRA-RED HEATER. JUNE 10, 1969. ARG. 0170237, ATR. 0303518, AUS. 0402657, BEL. 0700101, BRA. 6788714, CAN. 0852819, CHL. 0023085, DNK. 0118703, FRA. 1527629, GRB. 1187481, ITL. 0805313, MEX. 0101251, NOR. 0123480, PLD. 0068551, PRU. 0009320, SAF. 0673601, SPN. 0341906, STZ. 0499143, SWD. 0332936, URG. 0008615, VZL. 0026103.
3,507,333.—FIRE PREVENTION SYSTEM. APR. 21, 1970. BEL. 0722599, CAN. 0910255, FRA. 1589864, GRB. 1229495, ITL. 0845253, JAP. 0752504.
3,558,853.—FUSER SYSTEM FOR COPYING MACHINE. JAN. 26, 1971. ARG. 0186145, ATR. 0309984, AUS. 0446113, BEL. 0750389, BRA. 7019023, CAN. 0874013, CZC. 0168526, EGR. 0083065, FRA. 7017316, GRB. 1309129, ITL. 0893097, JAP. 0836943, MEX. 0117915, NZL. 0160101, SPN. 0379651, STZ. 0506817, SWD. 0357840, TIW. 0006834, VZL. 0032597.
3,588,445.—FUSER CONTROL CIRCUIT. JUNE 28, 1971.
3,735,092.—FUSER CONTROL CIRCUIT FOR COPYING APPARATUS. MAY 22, 1973. CAN. 0991254, GRB. 1406655.
3,781,516.—FUSER CONTROL SYSTEM. DEC. 25, 1973. MEX. 0135422.
3,790,747.—REGULATOR FOR XEROGRAPHIC FUSING APPARATUS. FEB. 5, 1974. ARG. 0200245, AUS. 0467385, BEL. 0789339, CAN. 0991252, FRA. 7234199, GRB. 1397586, ITL. 0972690, MEX. 0129168, SPN. 0409974, STZ. 0554008, SWD. 7215167, VZL. 0032607.
3,833,794.—FIXING UNIT FOR USE IN A DUPLICATING APPARATUS. SEPT. 3, 1974.
3,851,144.—FEEDBACK FUSER FOR 730S. NOV. 26, 1974.
3,989,370.—ADAPTIVE FUSER CONTROLLER. NOV. 2, 1976.
3,989,926.—DEVICE FOR PREVENTING OVERHEATING OF ELECTROPHOTOGRAPHIC FIXING DEVICE. NOV. 2, 1976.
4,032,746.—CONTROL SYSTEM FOR A FUSING APPARATUS. JUNE 28, 1977.

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3,076,083.—XEROGRAPHIC FIXING APPARATUS. JAN. 29, 1963.

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3,349,702.—FUSER HAVING HEATED AND UNHEATED PORTIONS FOR PRINT FIXING PURPOSES. OCT. 31, 1967. CAN. 0833789, MEX. 0096468.
3,356,831.—XEROGRAPHIC FUSING APPARATUS. DEC. 5, 1967. CAN. 0798466, FRA. 1465786, GER. 1497228, GRB. 1117339, ITL. 0749552, JAP. 0512652.
3,584,195.—HEAT FIXING APPARATUS. JUNE 8, 1971. GRB. 1322354.
3,718,390.—MICROFICHE INDEXER. FEB. 27, 1973. ARG. 0190620, BEL. 0768712, CAN. 0946659, GRB. 1350656, ITL. 0927453, MEX. 0121626, SWD. 7107727.
3,788,873.—FIXING METHOD UTILIZING INTERMEDIATE HEAT TRANSFER. JAN. 29, 1974.
3,810,735.—HEAT FIXING APPARATUS FOR FUSIBLE MATERIAL. MAY 14, 1974.
3,849,628.—NON-CONTACT TEMPERATURE SENSOR FOR ROLL FUSER OF A XEROGRAPHIC REPRODUCTION APPARATUS. NOV. 19, 1974. CAN. 1002583, GRB. 1322612.
3,881,859.—STRIPPER FINGER DESIGN TO PREVENT OIL-ON-THE-COPY. MAY 6, 1975.
3,900,590.—XEROGRAPHIC FUSING APPARATUS. AUG. 19, 1975. CAN. 0992614, GRB. 1192444.
3,904,354.—RESILIENT STRIPPER MEMBERS FORMING A PART OF A FUSER ROLL. SEPT. 9, 1975.
3,937,637.—ROLL CONTACT FUSER. FEB. 10, 1976.
3,940,235.—IMMERSIONS FUSING. FEB. 24, 1976.
3,965,855.—IMMERSION FUSING. JUNE 29, 1976.
3,976,814.—FUSING DEVICE & METHOD. AUG. 24, 1976.
3,997,691.—FUSING SURFACE AND METHOD FOR FIXING TONER. DEC. 14, 1976.
4,000,339.—FUSING SURFACE & METHOD FOR FIXING XEROGRAPHIC TONER DEC. 28, 1976.
4,015,103.—A FUSER CONVEYOR BELT. MAR. 29, 1977.
4,029,827.—MERCAPTO FUNCTIONAL POLYORGANOSILOKANE RELEASE AGENTS FOR FUSERS IN ELECTROSTATIC COPIERS. JUNE 14, 1977. SPN. 0439743.
4,054,410.—FUSING DEVICE. OCT. 18, 1977.
4,056,706.—APPARATUS & METHOD FOR EXTENDING FUSER RELEASE LIFE. NOV. 1, 1977. FRA 7611767.
4,075,390.—FUSING SURFACE AND METHOD FOR FIXING TONER. FEB. 21, 1978.
4,101,686.—METHOD OF FUSING TONER IMAGES USING FUNCTIONALIZED POLYMERIC RELEASE AGENTS. JULY 18, 1978. BEL. 831662, FRA. 7523193.
4,150,181.—FIXING METHOD USING POLYSILOXANE-FLUOROCARBON BLENDS AS RELEASE AGENTS. APR. 17, 1979.

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3,256,002.—XEROGRAPHIC FIXING DEVICE. JUNE 14, 1966. ADN. 0000470, AUS. 0295646, BRS. 00J3738, BRU. 0000569, CAN. 0796441, FIJ. 0000343, GHA. 0000995, GIB. 1089537, GIE. 0006669, GRB. 1089537, GUR. 1089537, HGK. 0009269, ISR. 0030229, JAP. 0537119, JER. 0000P98, KEN. 0001745, MAU. 1917571, MLS. 0015169, NIG. 0001618, NZL. 0148733, SBH. 0005369, SGP. 0008369, SHL. 0000018, SLN. 3677286, SRK. 0000386, STZ. 0458077, UGD. 0000369.
3,268,351.—XEROGRAPHIC FIXING METHOD AND APPARATUS. AUG. 23, 1966. JAP. 0489660.
3,291,466.—XEROGRAPHIC FIXING DEVICE. DEC. 13, 1966. CAN. 0800935, FRA. 1458647, GRB. 1122628, ITL. 0729649, JAP. 0524526, MEX. 0090836.
3,324,791.—XEROGRAPHIC ROLLER FUSER DRIVE APPARATUS. JUNE 13, 1967. CAN. 0825903, GRB. 1135744, JAP. 0512655, STZ. 0520889.
3,327,096.—TEMPERATURE CONTROL CIRCUIT. JUNE 20, 1967. CAN. 0797970, FRA. 1448641, GRB. 1113451, ITL. 0729649, JAP. 0572184, MEX. 0085994.
3,331,592.—XEROGRAPHIC FUSING APPARATUS. JULY 18, 1967. CAN. 0823589, JAP. 0512657, MEX. 0108575.
3,357,249.—TEMPERATURE SENSOR. DEC. 12, 1967. CAN. 0810332, GER. 1690654, GRB. 1171381.
3,435,500.—PRESSURE ROLL AND METHOD OF MANUFACTURING. APR. 1, 1969. ARG. 0153406, AUS. 0408490, BEL. 0670480, BRA. 0083780, CAN. 0832922, FRA. 1450156, GER. 1546792, GRB. 1124036, ITL. 0730679, JAP. 0669366, MEX. 0107366, VZL. 0024008.
3,437,032.—HEATED FUSER ROLL. APR. 8, 1969. ARG. 0155221, AUS. 0043081, BEL. 0683308, CAN. 0800936, FRA. 1484969, GRB. 1137227, ITL. 0773369, JAP. 1071499, MEX. 009310S, SPN. 0328427, STZ. 0467476, SWD. 0321410, VZL. 0023990.
3,449,548.—FUSING DEVICE. JUNE 10, 1969.
3,498,596.—HEAT FIXING APPARATUS FOR FUSIBLE MATERIAL. MAR. 3, 1970. ARG. 0181805, AUS. 0428652, BEL. 0733408, BRA. 6909134, CAN. 0860450, CZC. 0150764, FRA. 6917085, GRB. 1258152, ITL. 0865073, MEX. 0111517, PLD. 0079991, PNM. 0002166, SPN. 0367312, STZ. 0505411, SWD. 0345329, TIW. 0006194, USR. 0230669, VZL. 0025073.
3,539,161.—HEAT FIXING APPARATUS FOR FUSIBLE MATERIALS. NOV. 10, 1970. CAN. 0889987.
3,612,820.—HEAT FIXING APPARATUS FOR LENGTHY FUSIBLE MATERIALS. OCT. 12, 1971.
3,649,992.—CLEANING APPARATUS FOR FUSING SYSTEM. MAR. 21, 1972. CAN. 0980517, GRB. 1340684.
3,667,742.—FIXING ARRANGEMENT. JUNE 6, 1972. BEL. 0777318, CAN. 0928766, FRA. 7147890, GRB. 1368307, ITL. 0944393.
3,690,176.—TEMPERATURE SENSING APPARATUS. SEPT. 12, 1972. GRB. 1383087.
3,718,116.—OIL DISPENSING APPARATUS. FEB. 27, 1973. CAN. 0984895.
3,745,972.—WICKING APPARATUS. JULY 17, 1973. CAN. 0991251, GRB. 1397626.
3,751,216.—FUSER ROLL ASSEMBLY. AUG. 7, 1973.
3,754,819.—APPARATUS FOR PLACING ROLLERS IN CONTACT IN A PRESSURE FUSER ASSEMBLY. AUG. 28, 1973.
3,776,760.—METHOD FOR MANUFACTURING A TETRAFLUOPOETHLENE POLYMER-COATED ROLL. DEC. 4, 1973. ARG. 0199302, ATR. 0335842, AUS. 0165141, BEL. 0789728, CAN. 0990149, GRB. 1410025, NZL. 0168554, SAF. 0727133, STZ. 0028514.
3,796,183.—FREE FLOATING PRESSURE BIASING APPARATUS FOR CLEANING ROLL FUSER. MAR. 12, 1974.
3,799,401.—SILICONE OIL CAPACITY CONTROL USING POLYURETHANE BELT. MAR. 26, 1974.

3,820,591.—APPARATUS FOR SENSING DIMENSION OF SHEETS OF MATERL TO BE TRNPRTD THROUGH ELCTRSTIC REPRDCTN M. JUNE 28, 1974. CAN. 1004290.
3,831,553.—WICK FOR OIL DISPENSING APPARATUS. AUG. 27, 1974. CAN. 0984895.
3,852,861.—SURFACES WITH FLUOROCARBON PROCESS FOR MULTIPLE COATING RESINS. DEC. 10, 1974. ARG. 0199302, ATR. 0335842, AUS. 0165141, BEL. 0789728, CAN. 0990149, GRB. 1410025, NZL. 0168554, SAF. 0727133, STZ. 0028514.
3,861,860.—DRY FUSER ROLL CLEANING APPARATUS. JAN. 21, 1975.
3,881,085.—FUSER CONTROL CIRCUIT FOR COPYING APPARATUS. APR. 29, 1975. BEL. 0808310, GRB. 1447679.
3,883,291.—OIL APPLICATOR FOR REPRODUCTION MACHINE FUSER. MAY 13, 1975. BEL. 0822048, FRA. 7438048, SPN. 0432090.
3,883,292.—SLEEVELESS PRESSURE ROLL CLEANER. MAY 13, 1975.
3,883,293.—PRESSURE ROLL CONSTRUCTION. MAY 13, 1975.
3,902,845.—METAL FOAM UNDER CONFORMABLE SURFACE REPLACEABLE. SEPT. 2, 1975.
3,906,800.—REUSABLE NIP MEASURING DEVICE AND METHOD. SEPT. 23, 1975.
3,907,493.—VISCO-ELASTIC DAMPENER MECHANISM FOR FUSER ASSEMBLY. SEPT. 23, 1975.
3,908,589.—STRUCTURE FOR APPLYING RELEASE AGENT TO A HEATED FUSER ROLL STRUCTURE SEPT. 30, 1975.
3,912,901.—PFA TEFLON SLEEVED CHOW PRESSURE ROLL. OCT. 14, 1975.
3,913,521.—COMPOSITE DOCTORING BLADE FOR A HEATED FUSER ROLL UTILIZED FOR FIXING TONER. OCT. 21, 1975.
3,918,397.—CONTACT FUSING APP FOR FIXING TONER IMAGES TO A SUPPORT MEMBER. NOV. 11, 1975.
3,918,804.—APP FOR APPLYING RELEASE MATERIAL TO A CONTACT FUSER ROLL MEMBER UTILIZED IN FIXNG TNR IMGS TO. NOV. 11, 1975.
3,921,573.—CLEANING SYSTEM FOR ELECTROSTATIC REPRODUCING APPARATUS. NOV. 25, 1975.
3,924,564.—FUSER APPARATUS HAVING AN ARTICULATED RELEASE MATERIAL DISPENSER. DEC. 9, 1975.
3,926,058.—CONTACT ARC REPLICATION DEVICE. DEC. 16, 1975.
3,929,094.—ROLL FUSER. DEC. 30, 1975.
3,929,095.—ROLL FUSER. DEC. 30, 1975.
3,929,096.—ROLL FUSER. DEC. 30, 1975.
3,934,113.—ROLL FUSER APPARATUS AND MOUNTING ARRANGEMENT THEREFOR. JAN. 20, 1976.
3,934,547.—RENEWABLE CHOW FUSER COATING. JAN. 27, 1976.
3,935,836.—METERING BLADE FOR A FUSER ROLL. FEB. 3, 1976.
3,938,950.—STRIPPING APPARATUS. FEB. 17, 1976.
3,940,238.—CLEANING STRUCTURE FOR AN ELASTOMERIC FUSER MEMBER. FEB. 24, 1976.
3,940,518.—BAKE TECHNIQUE FOR MANUFACTURING TETRAFLUOROETHYLENE COATED ROLLS. FEB. 24, 1976. GRB. 1452718.
3,941,558.—A CONTACT AND HEATING FIXING DEVICE FOR ELECTROPHOTOGRAPHY. MAR. 2, 1976.
3,942,887.—DRIVE MECHANISM FOR A ROLL FUSER EMPLOYED IN A COPIER APPARATUS. MAR. 9, 1976.
3,948,214.—INSTANT START FUSING APPARATUS. APR. 6, 1976.
3,951,538.—A PERMANENTLY NIPPED CONTACT IMAGE FUSER SYSTEM INCORPORATING A ONE-WAY CLUTCH. APR. 20, 1976.
3,955,916.—FUSER ROLL SHEET STRIPPING APPARATUS. MAY 11, 1976.
3,965,331.—DUAL MODE ROLL FUSER. JUNE 22, 1976.
3,965,332.—SELECTIVE FUSING APPARATUS. JUNE 22, 1976.
3,965,853.—CONTACT FUSER ASSEMBLY. JUNE 29, 1976.
3,965,973.—TEMPERATURE SENSING DEVICE. JUNE 29, 1976.
3,966,394.—PLURAL CLEANING ROLLS ASSEMBLY. JUNE 29, 1976.
3,968,343.—FUSER ROLL TEMPERATURE REGULATOR PROBE. JULY 6, 1976.
3,970,038.—ROLL FUSER. JULY 20, 1976.
3,973,844.—LATCHING MECHANISM FOR THE BACK-UP ROLL OF A ROLL FUSER EMPLOYED IN A COPIER APPARATUS. AUG. 10, 1976.
3,976,370.—BELT TRANSFER AND FUSING SYSTEM. AUG. 24, 1976.
3,980,423.—FUSER CLEANING ROLLER ASSEMBLY. SEPT. 14, 1976.
3,981,085.—AIR STRIPPING DEVICE FOR ELASTOMERIC SURFACE. SEPT. 21, 1976.
3,989,005.—IMPROVED OIL METERING BLADE DEVICE. NOV. 2, 1976.
3,993,124.—METH&APPRTS FOR SUSR ASSMBLY CLING IN ELCTROSTATOGRPC MACHNE-GAMMA METH&APPRTS FOR FUSER END CO. NOV. 23, 1976. BEL. 0793560, FRA. 7246728, ITL. 0973322, SWD. 7216976.
3,996,886.—IMPROVED OIL METERING BLADE HOLDER ASSEMBLY. DEC. 14, 1976.
3,996,887.—IMPROVED OIL METERING BLADE HOLDING DEVICE. DEC. 14, 1976.
3,999,510.—HIGH SURFACE ENERGY CLEANING ROLL. DEC. 28, 1976.
4,000,394.—FUSER THERMAL DETECTOR. DEC. 28, 1976.
4,000,957.—CONTACT FUSER AND RELEASE AGENT APPLICATOR THEREFOR. JAN. 4, 1977.
4,000,963.—CLEANING APPARATUS FOR A HEAT & PRESSURE FUSER. JAN. 4, 1977.
4,004,549.—ROLL FUSER. JAN. 25, 1977.
4,008,955.—FUSER ASSEMBLY FOR AN ELECTROPHOTOGRAPHIC COPYING MACHINE. FEB. 22, 1977.
4,011,831.—IMPROVED OIL METERING BLADE LOADING ASSEMBLY. MAR. 15, 1977.
4,013,400.—CLEANING APPARATUS FOR A HEAT & PRESSURE FUSER. MAR. 22, 1977.
4,018,555.—CLEANING APPARATUS FOR ROLL FUSER. APR. 19, 1977.
4,025,751.—FUSER ROLL SLEEVE. MAY 24, 1977.
4,026,238.—APP FOR APPLYING RELEASE MATERIAL TO A CONTACT FUSER ROLL MEMBER UTILIZED IN FIXING TONER IMAGE. MAY 31, 1977.
4,028,050—STRIPPER FINGER COMBINATION MOUNTING MEANS THEREFOR. JUNE 7, 1977.
4,034,188.—HEAT FIXING DEVICE FOR COPYING MACHINE. JULY 5, 1977.
4,034,706.—DUAL RELEASE AGENT CU-VITON FUSER JULY 12, 1977.
4,042,804.—ROLL FUSER APPARATUS. AUG. 16, 1977.
4,043,747.—PRESSURE HEAT FIXING DEVICE. AUG. 23, 1977.
4,045,163.—HEATED FUSER RELEASE AGENT CONTAINER. AUG. 30, 1977.
4,045,164.—USE OF SILICONE OIL AS A POLYETHYLENE OXIDATION RETARDANT IN A TONER IMAGE FUSING APPARATUS. AUG. 30, 1977. GRB 1498469
4,047,885.—ROTATING WICK OIL DISPENSING SYSTEM SEPT. 13, 1977.
4,050,801.—RELEASE AGENT APPLICATION SYSTEM FOR A HEATED FUSER ROLL. SEPT 27, 1977
4,050,803.—QUICK RELEASE MECHANISM FOR A BACKUP ROLL FUSER EMPLOYED IN A COPIER APPARATUS SEPT. 27, 1977.
4,050,886.—ROLL FUSER SEPT. 27, 1977. BEL. 858880.
4,052,150.—OIL WETTED FUSER ROLL STRIPPING APPARATUS OCT. 4, 1977.
4,062,534.—STRIPPER ARRANGEMENT FOR REMOVING VARIOUS SIZED COPY SHEETS FROM FUSER ROLL. DEC. 13, 1977.
4,064,313.—HEAT FIXING MEMBER FOR ELECTROPHOTOGRAPHIC COPIERS DEC 20, 1977.
4,071,735.—EXTERNALLY HEATED LOW-POWER ROLL FUSER. JAN. 31, 1978.
4,075,707.—PROGRAMMED DEVICE CONTROLLER FEB. 21, 1978.
4,079,227.—CONTACT HEAT FIXING APPARATUS FOR ELECTROPHOTOGRAPHIC REPRODUCTION MACHINES. MAR. 14, 1978
4,079,228.—PRESSURIZED SOLVENT FUSING. MAR. 14, 1978.
4,079,229.—CONTACTING AND FIXING HEATING APPARATUS. MAR. 14, 1978.
4,080,159.—TILTING PAD STRIPPER FINGER. MAR 21, 1978.
4,081,213.—FUSER DRIVE SYSTEM. MAR. 28, 1978
4,082,137.—METHOD AND APPARATUS FOR FUSER ASSEMBLY COOLING AN ELECTROSTATOGRAPHIC MACHINE. APR. 4, 1978. BEL. 793560, CAN. 1025515, FRA. 7246728, GRB. 1418306, ITL. 973322, SWD. 7216976.
4,083,092.—SLEEVED ORGANIC RUBBER PRESSSURE ROLLS. APR. 11, 1978.
4,083,322.—FUSER WICK. APR. 11, 1978.
4,085,794.—METHOD AND APPARATUS FOR FUSER ASSEMBLY COOLING IN AN ELECTROSTATOGRAPHIC MACHINE. APR. 25, 1978. BEL. 793560, CAN. 1025515, FRA. 7246728, GRB. 1418306, ITL. 973322, SWD. 7216976.

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4,087,676.—FIXING APPARATUS WITH HEAT AND PRESSURE FOR ELECTROPHOTOGRAPHIC COPIERS. MAY 2, 1978.
4,101,267.—ROLL FUSER CLEANING SYSTEM. JULY 18, 1978. BEL. 846861, FRA. 7630971.
4,114,021.—HEAT ROLL FIXING DEVICE FOR ELECTROPHOTOGRAPHIC COPYING MACHINE. SEPT. 12, 1978.
4,119,831.—CONTACT PRESSURE ADJUSTING DEVICE IN HEATING PRESSING FIXING APPARATUS FOR ELECTROPHOTOGRAPHIC. OCT. 10, 1978.
4,149,797.—SLEEVED ORGANIC RUBBER PRESSURE ROLLS. APR. 17, 1979.
4,156,524.—ROLL FUSER STRIPPING MECHANISM. MAY 29, 1979.

Class 8A 3

3,180,971.—XEROGRAPHIC FUSING APPARATUS. APR. 27, 1965. CAN. 0734734, GRB. 1027904, JAP. 0524355.
3,219,799.—XEROGRAPHIC FUSING APPARATUS. NOV. 23, 1965.
3,604,892.—FUSING APPARATUS. SEPT. 14, 1971.
3,856,460.—DEVELOPING SYSTEM FOR FILM BY ADIABACTIC HEAT FLOW. DEC. 24, 1974.

Class 8A 4

3,093,039.—APPARATUS FOR TRANSFERRING POWDER IMAGES AND METHOD THEREFOR. JUNE 11, 1963. CAN. 0744873.

Class 8B

3,049,810.—XEROGRAPHIC FUSING APPARATUS. AUG. 21, 1962. CAN. 0740393.
3,117,847.—XEROGRAPHIC POWDER IMAGE FIXING APPARATUS. JAN. 14, 1964.
3,132,047.—XEROGRAPHIC FIXING APPARATUS. MAY 5, 1964. AUS. 0266991, CAN. 0713996, FRA. 1332228, GER. 1571130, GRB. 1012444, JAP. 0835352.
3,148,078.—XEROGRAPHIC FUSING METHOD. SEPT. 8, 1964.
3,149,931.—XEROGRAPHIC VAPOR FUSING APPARATUS. SEPT. 22, 1964. CAN. 0758518.
3,158,509.—XEROGRAPHIC FIXING APPARATUS. NOV. 24, 1964. CAN. 0762382, GRB. 1023052, JAP. 0456309.
3,215,116.—VAPOR FUSING APPARATUS. NOV. 2, 1965.
3,704,524.—APPARATUS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES. DEC. 5, 1972. ARG. 0188616, BEL. 0779806, CAN. 0950655, FRA. 7208101, GRB. 1385328, MEX. 0126261.
3,884,690.—POLYESTER PHOTOCONDUCTORS AND MATRIX MATERIALS. MAY 20, 1975.
3,884,825.—IMAGING COMPOSITION. MAY 20, 1975. AUS. 0467835, BEL. 0802879, CAN. 0995963, FRA. 7328589, GRB. 1437041, ITL. 0991465, SPN. 0417382.
3,934,546.—APPARATUS FOR FIXING WITH SOLVENT VAPORS. JAN. 27, 1976.
3,940,518.—BAKE TECHNIQUE FOR MANUFACTURING TETRAFLUOROETHYLENE COATED ROLLS. FEB. 24, 1976. GRB. 1452718.

Class 8B 1

3,070,900.—XEROGRAPHIC FIXING APPARATUS. JAN. 1, 1963. CAN. 0686166.
3,078,589.—XEROGRAPHIC FUSING APPARATUS. FEB. 26, 1963. CAN. 0609621, GRB. 0859788.
3,140,159.—XEROGRAPHIC FUSING AND DRYING APPARATUS. JULY 7, 1964.
3,140,160.—XEROGRAPHIC FUSING AND DRYING APPARATUS. JULY 7, 1964.
3,199,223.—XEROGRAPHIC FUSING AND DRYING APPARATUS. AUG. 10, 1965.
3,288,624.—VAPOR FUSING METHOD FOR XEROGRAPHIC POWDER IMAGES. NOV. 29, 1966.

Class 8C

3,158,509.—XEROGRAPHIC FIXING APPARATUS. NOV. 24, 1964. CAN. 0762382, GRB. 1023052, JAP. 0456309.
3,386,822.—SOLVENT CAPSULE FIXING OF POWDER IMAGES. JUNE 4, 1968. CAN. 0712993, FRA. 1430471, GER. 1497196, GRB. 1087201, HOL. 0132775, ITL. 0745341, JAP. 0741995.
3,893,760.—TRANSFER APPARATUS. JULY 8, 1975.
3,926,824.—ELECTROSTATOGRAPHIC DEVELOPER COMPOSITION. DEC. 16, 1975. ARG. 0192480, AUS. 0466319, BEL. 0793098, CAN. 0985552, FRA. 7245403, GRB. 1417179, ITL. 0973327, SPN. 0410171, STZ. 0028663, SWD. 7216977.
3,940,235.—IMMERSIONS FUSING. FEB. 24, 1976.
3,965,855.—IMMERSION FUSING. JUNE 29, 1976.
4,063,530.—IMAGE FIXING. DEC. 20, 1977.
4,072,521.—AMIDES OF W AND CIS ALKENOIC ACIDS IN IMAGING PROCESS AND ELEMENT. FEB. 7, 1978.
4,073,649.—DI CARBOXYLIC ACID BIS AMIDES AND IMPROVED IMAGING PROCESS. FEB. 14, 1978.
4,076,641.—W- AND CIS ALKENOIC ACID AMIDES IN ELECTROSTATOGRAPHIC DEVELOPERS. FEB. 28, 1978.
4,099,968.—DICARBOXYLIC ACID BIS-AMIDES IN ELECTROSTATIC IMAGING COMPOSITIONS AND PROCESSES. NOV. 11, 1978.

Class 8D

3,493,412.—TRANSFERRING XEROGRAPHIC TONER IMAGES TO A SOLID CRYSTALLINE PLASTICIZER COATED RECEIVING SURFA. FEB. 3, 1970. CAN. 0880837, MEX. 0096609.
3,640,746.—ADHESIVE CONTACT ELECTRIFICATION IMAGING. FEB. 8, 1972.
3,861,911.—IMAGING FIXING METHOD. JAN. 21, 1975.

Class 8E

3,157,546.—IMAGE TRANSFER. NOV. 17, 1964. ATR. 0225034, BEL. 0602721, FRA. 1287124, GER. 1271547, GRB. 0985176, ITL. 0647042, JAP. 0414127, STZ. 0383417.
3,591,276.—METHOD AND APPARATUS FOR OFFSET XEROGRAPHIC REPRODUCTION. JULY 6, 1971. CAN. 0894931, GER. 1811893, GRB. 1245426, JAP. 0648075.
3,799,827.—PROCESS FOR PROTECTING THE SURFACE OF AN IMAGE. MAR. 26, 1974.
3,816,066.—XEROGRAPHIC FIXING DEVICE. JUNE 11, 1974.
3,861,219.—METHOD FOR MEASURING HEAT AND PRESSURE CHARACTERISTICS OF FUSING APP. JAN. 21, 1975. CAN. 1013807.
3,888,622.—TEMPERATURE SENSING DEVICE. JUNE 10, 1975.
3,928,656.—METHOD OF DEVELOPING ELECTROSTATIC LATENT IMAGES WITH PRESSURE SENSITIVE TONER. DEC. 23, 1975. ARG. 0196320, AUS. 0464392, BEL. 0793554, CAN. 1011149, FRA. 7246575, GRB. 1417409, ITL. 0973325, SPN. 0410211, STZ. 0028568.
3,934,477.—TEMPERATURE SENSING DEVICE. JAN. 27, 1976.
3,936,658.—FUSER APPARATUS FOR ELECTROSTATIC REPRODUCING MACHINES. FEB. 3, 1976. BEL. 0844831.
4,055,143.—RELEASE MATERIAL APPLICATION SEAL. OCT. 25, 1977.

Class 8E 1

3,060,052.—TRANSFER OF XEROGRAPHIC DYE IMAGES. OCT. 23, 1962. AUS. 0242307, CAN. 0678380, FRA. 1246634, GRB. 0946761.

Class 9

3,836,244.—COLOR XEROGRAPHY. SEPT. 17, 1974.
3,958,878.—ELECTROSTATIC PROCESSOR HOUSING INTERCHANGABLE RESERVOIRS FOR SUPPING AND RECLAIMING TONER. MAY 25, 1976.
3,980,494.—METHOD OF REDUCING FRICTION IN BLADE CLEANING OF IMAGING SURFACES. SEPT. 14, 1976.
3,983,841.—TONER RECLAIM CONVEYOR. OCT. 5, 1976.
4,093,369.—CLEANING SYSTEM. JUNE 6, 1978.

Class 9A

RE29818.—TONER-RECLAIMING SYSTEM-REISSUE OF PATENT 3,641,979 ISSUED FEB. 15, 1972. OCT. 31, 1978. CAN. 913351.
T.940,022.—PRESSURIZED AND FILTERED XEROGRAPHIC SYSTEM. NOV. 4, 1975.
3,552,850.—LUBRICATED BLADE CLEANING OF IMAGING PHOTOCONDUCTIVE MEMBERS. JAN. 5, 1971. ALB. 0003931, ARG. 0172544, ATR. 0300568, AUS. 0438884, BEL. 0727561, BRA. 6898275, BUR. 0000041, CAM. 0000453, CAN. 0869669, CHL. 0024409, CLB. 0017926, COR. 000947A, DNK. 0122738, EGR. 0075946, EIR. 0032784, FRA. 6902175, GNR. 0000043, GRB. 1259513, GRK. 0039219, IND. 0119582, ISR. 0031502, ITL. 0854622, LIB. P272693, LXB. 0057856, MEX. 0106799, MLG. 0003059, MLW. 00MW769, MNC. 8146975, MRC. 0014725, NOR. 0128683, NZL. 0155207, PAK. 0120897, PLD. 0017650, PLP. 0006639, PNM. 0001979, PRU. 0009588, PTG. 0051062, RHD. 5569489, SAF. 6970696, SPN. 0363130, STZ. 0493016, SWD. 0346398, TGR. 0000550, URG. 0009736, USR. 0385466, VTM. 0001840, VZL. 0023692, ZMB. 0176973.
3,635,704.—IMAGING SYSTEM. JAN. 18, 1972. ALB. 0004133, ARG. 0176978, ATR. 0303521, AUS. 0440759, BEL. 0727560, BRA. 0088093, BUR. 0000042, CAM. 0000463, CAN. 0867697, CHL. 0026254, COR. 000949A, DNK. 0131403, EGR. 0078899, EIR. 0032632, FRA. 6902174, GNR. 0000042, GRB. 1259514, GRK. 0039240, IND. 0119583, ISR. 0031503, ITL. 0871510, LAS. 0000199, LIB. 00P7269, LXB. 0057849, MEX. 0106332, MLG. 0003056, MLW. 00MW869, MNC. 8156975, MRC. 0014724, NZL. 0155208, PAK. 0120859, PLP. 0008511, PNM. 0001676, PRU. 0010443, PTG. 0051063, RHD. 4169529, RMN. 0055464, SAF. 0069995, SPN. 0363127, STZ. 0513431, SWD. 0342921, SYA. 0002477, TGR. 0000551, TIW. 0005257, UAR. 0009525, USR. 0396887, VTM. 0001805, VZL. 0023744, ZMB. 0186974.
3,717,409.—CLEANING OF ELECTROSTATOGRAPHIC SURFACES. FEB. 20, 1973.
3,724,019.—WIPER BLADE CLEANING APPARATUS FOR XEROGRAPHIC MACHINES. APR. 3, 1973. CAN. 991248.
3,724,020.—WIPER BLADE CLEANER FOR XEROGRAPHIC MACHINES. APR. 3, 1973. ARG. 0194951, BEL. 0783490, CAN. 0991249, FRA. 7216778, GER. 2220821, GRB. 1399156, ITL. 0955404, MEX. 0127875.
3,838,472.—TONER CLEANING APPARATUS. OCT. 1, 1974. BEL. 0789325, CAN. 0991694, FRA. 7233424, GER. 2239441, GRB. 1403439, ITL. 0967797, SWD. 7212456.
3,847,480.—CONTINOUS BLADE CLEANE R. NOV. 12, 1974.
3,848,992.—DEVELOPER BLADE CLEANING. NOV. 19, 1974. FRA. 7415394, GRB. 1443128, ITL. 0010212.
3,848,993.—SUPPORTED DEVELOPER BLADE CLEANING. NOV. 19, 1974.
3,848,994.—LINE CHARGE TONER CLEANING. NOV. 19, 1974.
3,854,814.—TRANSLATING DWELL CLEANING SYSTEM. DEC. 17, 1974.
3,871,762.—BLADE CLEANING SYSTEM. MAR. 18, 1975.
3,918,807.—CLEANING BLADE FOR PHOTOCOPIER. NOV. 11, 1975.
3,918,809.—APPARATUS FOR CLEANING A SURFACE SUPPORT. NOV. 11, 1975.
3,927,937.—CLEANING ASSEMBLY FOR AN ELECTROSTATOGRAPHIC DEVICE. DEC. 23, 1975. SPN. 0420425.
3,940,282.—BLADE CLEANING OF SURFACE WITH REVERSE MOVEMENT. FEB. 24, 1976.
3,947,108.—CLEANING SYSTEM. MAR. 30, 1976.
3,950,092.—CLEANING TRANSPORTING & SORTING APPARATUS & REPRODUCING MACHINE. APR. 13, 1976.
3,957,509.—METHOD AND APPARATUS FOR REMOVING CONTAMINANTS FROM AN ELECTROSTATIC IMAGING SURFACE. MAY 18, 1976.
3,973,845.—METHOD OF REDUCING FRICTION IN BLADE CLEANING OF IMAGING SURFACES. AUG. 10, 1976.
3,977,898.—METHOD FOR CLEANING A SURFACE SUPPORT. AUG. 31, 1976. GRB. 1438660.
3,992,091.—ROUGHENED IMAGING SURFACE FOR CLEANING. NOV. 16, 1976.
4,002,570.—ELECTROPHOTOGRAPHIC DEVELOPER WITH POLYVINYLIDENE FLUORIDE ADDITIVE. JAN. 11, 1977.
4,007,982.—METHOD AND APPARATUS FOR ULTRASONICALLY CLEANING A PHOTOCONDUCTIVE SURFACE. FEB. 15, 1977.
4,030,824.—A REPRODUCING APPARATUS HAVING AN IMPROVED IMAGING SURFACE CLEANING SYSTEM. JUNE 21, 1977.
4,042,415.—METHOD FOR SCRAPING LIQUIDS FROM A MOVING SURFACE. AUG. 16, 1977.
4,043,659.—CLEANING BLADE TONER ARRESTOR. AUG. 23, 1977.
4,051,536.—ELECTRONIC HALFTONE IMAGING SYSTEM. SEPT. 27, 1977.
4,054,381.—TONER FILTER ARRANGEMENT. OCT. 18, 1977.
4,083,633.—BLADE CLEANING HOLDER. APR. 11, 1978.
4,111,545.—VIBRATING BLADE CLEANER. SEPT. 5, 1978.
4,123,154.—COMBINED CORONA GENERATOR AND IMAGING SURFACE CLEANER. OCT. 31, 1978.

4,131,359.—SENSITIVE MEDIUM CLEANER FOR USE IN ELECTROPHOTOGRAPHIC COPYING MACHINE. DEC. 26, 1978.
4,145,137.—ELECTROPHOTOGRAPHIC REPRODUCING MACHINE BLADE CLEANING APPARATUS. MAR. 20, 1979.
4,158,498.—BLADE DEVELOPING SYSTEM FOR A REPRODUCING APPARATUS. JUNE 19, 1979.

Class 9A 1

3,099,856.—WEB CLEANER APPARATUS. AUG. 6, 1963. ARG. 0146853. CAN. 0760369, GRB. 1032957, IND. 0096310, JAP. 0481944.
3,149,356.—XEROGRAPHIC PLATE CLEANING APPARATUS. SEPT. 22, 1964.
3,186,838.—XEROGRAPHIC PLATE CLEANING METHOD UTILIZING THE RELATIVE MOVEMENT OF A CLEANING WEB. JUNE 1, 1965. CAN. 0858757, FRA. 1435510, GER. 1497242, GRB. 1094224, ITL. 0761145.
3,190,198.—XEROGRAPHIC CLEANING APPARATUS. JUNE 22, 1965.
3,337,891.—PLATE CLEANING AND TRANSPORTING APPARATUS. AUG. 29, 1967.
3,380,355.—XEROGRAPHIC CLEANING APPARATUS. APR. 30, 1968. CAN. 0819048.
3,405,682.—XEROGRAPHIC DEVELOPMENT APPTS WITH WEB LOADING MEANS TO REMOVE RESIDUAL DEVELOPER. OCT. 15, 1968. GRB. 1102282.
3,492,732.—WEB QUANTITY INDICATOR. FEB. 3, 1970. CAN. 0887178.
3,526,457.—CLEANING APPARATUS FOR ELECTROSTATIC COPYING MACHINES. SEPT. 1, 1970. CAN. 0880402, GRB. 1225287.
3,615,397.—METHOD OF CLEANING ELECTROSTATIC COPYING MACHINES. OCT. 26, 1971.
3,624,858.—CLEANING APPARATUS. DEC. 7, 1971.
3,664,300.—APPARATUS FOR TREATING THE SURFACE OF AN ELECTROSTATOGRAPHIC IMAGING PLATE. MAY 23, 1972.
3,725,059.—METHOD OF CLEANING AN ELECTROSTATOGRAPHIC SURFACE. APR. 3, 1973. GRB. 1337282.
3,781,107.—CLEANING APPARATUS. DEC. 25, 1973.
3,867,170.—METHOD FOR CLEANING LIQUID DEVELOPERS. FEB. 18, 1975. CAN. 0906336, GRB. 1339904.
3,879,785.—CLEANING APPARATUS. APR. 29, 1975.
4,007,983.—IMPROVED LIQUID DEVELOPER CLEANING MEANS. FEB. 15, 1977.
4,089,683.—LIQUID DEVELOPER CLEANING MEANS. MAY 16, 1978.
4,110,035.—CLEANING SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. AUG. 29, 1978.

Class 9A 2

3,477,450.—BRUSH RECLAIMING. NOV. 11, 1969. GRB. 1206539.
3,489,463.—BRUSH SIZING APPARATUS. JAN. 13, 1970. GRB. 1243233, JAP. 0810578.
3,493,269.—LOADING HEAD. FEB. 3, 1970. CAN. 0864392.
3,610,693.—METHOD OF MAKING A CYLINDRICAL BRUSH. OCT. 5, 1971. CAN. 0944415, GRB. 1332920, JAP. 0758464.
3,617,123.—XEROGRAPHIC CLEANING APPARATUS. NOV. 2, 1971.
3,634,077.—METHOD AND APPARATUS FOR REMOVING A RESIDUAL IMAGE IN AN ELECTROSTATIC COPYING SYSTEM. JAN. 11, 1972. BEL. 0737956, CAN. 0896611, FRA. 6929217, GRB. 1259960, ITL. 0870232, JAP. 0742513.
3,664,300.—APPARATUS FOR TREATING THE SURFACE OF AN ELECTROSTATOGRAPHIC IMAGING PLATE. MAY 23, 1972.
3,766,593.—CLEANING APPARATUS FOR INSULATING SURFACES. OCT. 23, 1973. ARG. 0194956, AUS. 0460978, BEL. 0784898, CAN. 0990017, FRA. 7219012, GRB. 1399900, ITL. 0960138, MEX. 0127720, SPN. 404266, STZ. 0538310, SWD. 7208414, VZL. 0032065.
3,947,108.—CLEANING SYSTEM. MAR. 30, 1976.
3,957,509.—METHOD AND APPARATUS FOR REMOVING CONTAMINANTS FROM AN ELECTROSTATIC IMAGING SURFACE. MAY 18, 1976.
4,025,188.—PHOTOACTIVE DEVICE FOR XEROGRAPHY. MAY 24, 1977.
4,113,376.—CLEANING APPARATUS FOR REPRODUCING MACHINE. SEPT. 12, 1978.
4,134,673.—DUAL BRUSH CLEANING APPARATUS. JAN. 16, 1979.

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Class 9A 2A

3,278,972.—XEROGRAPHIC PLATE CLEANING APPARATUS. OCT. 18, 1966. CAN. 0774795, FRA. 1458646, GER. 1497218, GRB. 1122624, ITL. 0729648, JAP. 0512649.

3,534,427.—CLEANING APPARATUS FOR ELECTROSTATIC PRINTING MACHINES. OCT. 20, 1970. AUS. 0425369, BEL. 0729977, CAN. 0873426, CZC. 0157666, FRA. 6907700, GRB. 1238117, HUN. 0158312, ITL. 0876795, JAP. 0645593, SPN. 0364889, SWD. 0345533, USR 0372853.

3,590,412.—BRUSH CLEANING DEVICE FOR ELECTROSTATIC MACHINES. JULY 6, 1971. CAN. 0930107, GRB. 1248521, JAP 0832526.

3,660,863.—CLEANING APPARATUS. MAY 9, 1972. ARG. 0188292, ATR. 0324838, AUS. 0445312, BEL. 0752937, CAN. 0925659, CHL. 0027132, DNK. 0129483, EGR. 0084130, FRA. 7024664. GRB. 1259446, GUA. 0002676, IND. 0127312, ITL. 0900201, MEX. 0115163, NOR. 0133164, NZL. 0160666, PLD. 0081341, PLP. 0007492, PNM. 0002014, PTG. 0054078, SAF. 0704533, SPN. 0381388, STZ. 0514165, SWD. 0359942, TIW. 0007784, USR. 0384250, VZL. 0032417.

3,692,402.—MATERIALS FOR FIBROUS DEVELOPMENT AND CLEANING MEMBER. SEPT. 19, 1972.

3,740,789.—XEROGRAPHIC ROLLER OSCILLATING CLEANING BLADE WITH DRIVE MECHANISM THEREFOR. JUNE 26, 1973. BEL. 0789327, CAN. 0991250, FRA. 7233724, GER. 2243491, GRB. 1403440, ITL. 0967796, SWD. 7212455.

3,742,551.—TONER CLEANING AND STORAGE APPARATUS. JULY 3, 1973. BEL. 0789325, CAN. 0991694, FRA. 7233424, GER. 2239441, GRB. 1403439, ITL. 0967797, SWD. 7212456.

3,788,454.—CHAIN BEAD DRIVE APPARATUS. JAN. 29, 1974. GRB. 1430379.

3,795,025.—ELECTROPHOTOGRAPHIC PHOTORECEPTOR CLEANING APPARATUS. MAR. 5, 1974.

3,807,853.—ELECTROPHOTOGRAPHIC CLEANING APPARATUS. APR. 30, 1974. GRB. 1439229.

4,032,228.—FOREIGN OBJECT DETECTOR BRUSH CLEANER. JUNE 28, 1977.

Class 9A 2B

3,404,418.—SHEET TRANSPORT APPARATUS. OCT. 8, 1968. CAN. 0859327.

3,572,923.—CLEANING METHOD AND APPARATUS FOR ELECTROSTATIC COPYING MACHINES. MAR. 30, 1971. ARG. 0172603, AUS. 0429490, BEL. 0737957, CAN. 0884822, FRA. 6929174, GRB. 1259890, ITL. 0870233, JAP. 0819708, MEX. 0113040, SPN. 0370878, SWD. 0348851.

3,655,373.—CLEANING METHOD FOR ELECTROSTATIC COPYING MACHINE. APR. 11, 1972.

3,668,008.—IONIZED AIR CLEANING DEVICE. JUNE 6, 1972, CAN. 0956406, GRB. 1310836.

3,722,018.—CLEANING APPARATUS. MAR. 27, 1973.

3,738,745.—FUR BRUSH ERASER. JUNE 12, 1973. CAN. 0970554, GRB. 1418036.

4,123,154.—COMBINED CORONA GENERATOR AND IMAGING SURFACE CLEANER. OCT. 31, 1978.

Class 9A 2B 1

3,128,683.—XEROGRAPHIC APPARATUS. APR. 14, 1964.

Class 9A 2C

3,252,274.—XEROGRAPHIC POWDER FILTER. MAY 24, 1966. CAN. 0712876, GER. 1278245, GRB. 1031634, JAP. 0502993.

3,410,060.—XEROGRAPHIC FILTER APPARATUS. NOV. 12, 1968. CAN. 0810976, FRA. 1458648, GRB. 1114505, ITL. 0729638, JAP. 0724232.

3,570,224.—FILTER FOR ELECTROSTATOGRAPHIC DEVELOPER. MAR. 16, 1971.

3,641,979.—TONER RECLAIMING SYSTEM. FEB. 15, 1972. CAN. 0913351.

3,793,986.—TONER RECLAIMING SYSTEM FOR ELECTROSTATIC PRINTING MACHINES. FEB. 26, 1974. ARG. 0194370, AUS. 0464194, BEL. 0784636, GER. 0978341, GRB. 1373721, ITL. 0956416, MEX. 0128265, SPN. 403.704, STZ. 0546970, VZL. 0033339.

3,816,157.—TONER RECLAIMING METHOD. JUNE 11, 1974.

4,046,682.—TONER RECLAIMING SYSTEM. SEPT. 6, 1977. CAN. 1030209.

Class 9B

3,332,328.—XEROGRAPHIC DEVELOPER SEAL AND PROCESS. JULY 25, 1967. CAN. 0792684, GRB. 1138394, JAP. 0512658, MEX. 0091318.

3,607,160.—LIGRCIN CONTAINING PUMICING COMPOSITION. SEPT. 21, 1971.

3,610,749.—IMAGING SYSTEM. OCT. 5, 1971. CAN. 0923541, GRB. 1339905, JAP. 0745767.

3,646,910.—DEVELOPMENT APPARATUS FOR LATENT ELECTROSTATIC IMAGES. MAR. 7, 1972.

3,668,008.—IONIZED AIR CLEANING DEVICE. JUNE 6, 1972. CAN. 0956406, GRB. 1310836.

3,697,263.—METHOD OF CLEANING RESIDUAL LIQUID DEVELOPER FROM ELECTROPHOTOGRAPHIC PLATES. OCT. 10, 1972. ARG. 0181940, AUS. 0455091, BEL. 0758060, CAN. 0906334, EGR. 0087483, FRA. 7041623, GRB. 1328406, ITL. 0916264, JAP. 0749381, MEX. 0116862, SPN. 0385000, STZ. 0519186, SWD. 0365624, TIW, 0006850, USR. 0349206, VZL. 0032211.

3,834,804.—COPYING MACHINE WITH MEANS FOR MOUNTING CARRIER BEAD PICKOFF ROLLER THEREIN. SEPT. 10, 1974.

4,026,701.—GAS IMPINGMENT & SUCTION CLEANING APPARATUS. MAY 31, 1977.

4,108,536.—CLEANING APPARATUS AND ELECTROSTATOGRAPHIC REPRODUCING MACHINE. AUG. 22, 1978.

4,121,947.—METHOD OF CLEANING A PHOTORECEPTOR. OCT. 24, 1978.

Class 9B 1

3,920,329.—BACKGROUND REMOVAL APPARATUS. NOV. 18, 1975.

4,108,546.—CLEANING APPARATUS AND ELECTROSTATORAPHIC REPRODUCING MACHINE. AUG. 22, 1978.

4,116,555.—BACKGROUND REMOVAL APPARATUS. SEPT. 26, 1978.

4,127,327.—APPARATUSES INCORPORATING A COMPOSITE SUPPORT MEMBER. NOV. 28, 1978.

Class 9B 2

RE.28,566.—CLEANING APPARATUS. OCT. 7, 1975. CAN. 0913310, MEX. 0113698.

3,424,615.—METHOD AND APPARATUS FOR CLEANING XEROGRAPHIC PLATES. JAN. 28, 1969. CAN. 0842022, GRB. 1158521, JAP. 0561239.

3,580,673.—CLEANING APPARATUS-REISSUED AS RE28566-D2266R. MAY 25, 1971. CAN. 0913310, MEX. 0113698.

3,615,398.—METHOD FOR ELECTROSTATIC COPYING INCLUDING AN IMPROVED PROCESS OF CLEANING PHOTOCONDUCTV SRFACE. OCT. 26, 1971.

3,625,683.—PROCESS FOR CLEANING A PHOTO-CONDUCTIVE DRUM OF RESIDUAL TONER PARTICLES AND REUSE OF THE SAME. DEC. 7, 1971. CAN. 0937800, GRB. 1329982.

3,628,950.—METHOD OF REMOVING THE RESIDUAL TONER PARTICLES FROM A PHOTOCONDUCTIVE SURFACE. DEC. 21, 1971.

3,640,707.—IMAGING SYSTEM. FEB. 8, 1972.

3,655,375.—INTERMITTENT GRIT REMOVAL PROCESS. APR. 11, 1972. CAN. 0924493, GRB. 1341404, JAP. 0746926.

3,656,948.—SELECTED REMOVAL OF LIQUID DVLPR IN CYCLICAL ELECTROPHOTOGRAPHIC PROCESS. APR. 18, 1972. CAN. 0906335, GRB. 1335054, JAP. 0760503.

3,776,631.—LIQUID DEVELOPER CLEANING SYSTEM. DEC. 4, 1973.

Class 9B 3

3,128,683.—XEROGRAPHIC APPARATUS. APR. 14, 1964.

3,483,034.—PROCESS OF CLEANING XEROGRAPHIC PLATES. DEC. 9, 1969. CAN. 0800825, FRA. 1463257, GER. 1497235, GRB. 1125594, ITL. 0750154.

3,592,678.—LIQUID DONOR DEVELOPMENT WITH ELECTROPHORETIC CLEANING. JULY 13, 1971.

3,620,800.—CLEANING LIQUID DEVELOPED ELECTROSTATIC IMAGES BY CONTACT WITH VAPORIZED CLEANING FLUID. NOV. 16, 1971. CAN. 0933997.

3,628,981.—LIQUID TONER DEVELOPMENT. DEC. 21, 1971. ARG. 0181932, MEX. 0116451.

3,671,290.—IMAGING SYSTEM. JUNE 20, 1972.

3,702,303.—CLEANING OF PHOTOCONDUCTIVE INSULATING SURFACES. NOV. 7, 1972. CAN. 0944650, GRB. 1369451.

3,762,950.—CLEANING OF PARTICLES FROM A SURFACE. OCT. 2, 1973. ARG. 0195076, AUS. 0464713, BEL. 7916681, CAN. 0974009, FRA. 7241538, GRB. 1400238, ITL. 0931072, MEX. 0128580, SPN. 0408837, STZ. 0553433, SWD. 7215089, VZL. 0032005.

3,849,171.—METHOD FOR CLEANING BACKGROUND AREAS FROM DEVELOPED RECORDING SURFACES. NOV. 19, 1974. CAN. 0941882.

3,862,801.—METHOD OF CLEANING AN ELECTROSTATOGRAPHIC IMAGING SURFACE. JAN. 28, 1975. GRB. 1337282.

3,937,665.—PHOTORECEPTOR SOLVENT CLEANER. FEB. 10, 1976.

3,979,317.—VOLATILE CLEANING SOLUTION FOR PHOTORECEPTOR. SEPT. 7, 1976.

4,054,534.—VOLATILE CLEANING SOLUTION FOR MIRRORS AND LENSES. OCT. 18, 1977.

Class 10

3,945,728.—AN ALARM FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE. MAR. 23, 1976.

4,089,515.—DOCUMENT STORAGE AND TRANSPORT APPARATUS. MAY 16, 1978. BEL. 850379.

4,109,903.—FLUIDIC FEEDING OF DOCUMENTS TO AN EXPOSURE STATION. AUG. 29, 1978.

Class 10A

RE29,406.—DOCUMENT ORIGINAL HANDLING SYSTEM. SEPT. 20, 1977. FRA. 7442405.

D.230,085.—COPY PAPER CASSETTE. JAN. 22, 1974.

3,100,112.—DOCUMENT FEED MECHANISM. AUG. 6, 1963. GRB. 1015635, JAP. 0478676.

3,152,528.—DOCUMENT CARRIER. OCT. 13, 1964. CAN. 0707048, FRA. 1414049, GER. 1197744, GRB. 1032954, ITL. 0737307, JAP. 0471310.

3,220,275.—DOCUMENT DRIVE TRANSMISSION. NOV. 30, 1965.

3,239,215.—DOCUMENT FEED MECHANISM. MAR. 8, 1966. CAN. 0741548, GRB. 1052820, JAP. 0497188.

3,239,220.—DOCUMENT CONVEYOR. MAR. 8, 1966. CAN. 0770495, FRA. 1434188, GRB. 1094188, ITL. 0742434.

3,326,548.—CARD CONVEYING APPARATUS HAVING A ROTARY FRONT GAUGE. JUNE 20, 1967. CAN. 0793702, MEX. 0086197.

3,370,844.—CARD HANDLING-SCANNING DEVICE. FEB. 27, 1968.

3,409,356.—CONVEYOR FOR DOCUMENTS. NOV. 5, 1968. FRA. 1500227, GRB. 1162982, ITL. 0776597.

3,409,357.—APPARATUS FOR AN ELECTROSTATIC MACHINE. NOV. 5, 1968. CAN. 0816416, GRB. 1151104, JAP. 0542588.

3,419,264.—DOCUMENT HANDLING SYSTEM. DEC. 31, 1968. ARG. 0168399, CAN. 0831413, CHL. 0024536, JAM. 0002459, MEX. 0101167, PRU. 0009340, URG. 0009205, VZL. 0023735.

3,424,528.—DOCUMENT CONVEYOR UNIT. JAN. 28, 1969. CAN. 0842644, GRB. 1175596.

3,446,554.—XEROGRAPHIC REPRODUCING APPARATUS. MAY 27, 1969. ARG. 0171943, ATR. 0302040, AUS. 0451715, BEL. 0708649, CAN. 0880187, FRA. 1567148, GRB. 1223426, HUN. 0158170, ITL. 0823019, JAP. 0657008, LXB. 0055166, MEX. 0101029, NOR. 0127833, PLD. 0069795, SPN. 0348801, STZ. 0485581, SWD. 0354529, USR. 0259733, VZL. 0023685.

3,504,908.—DOCUMENT FEEDING APPARATUS CONTROL. APR. 7, 1970.

3,520,605.—DOCUMENT SCAN DRIVE AND RETURN APPARATUS. JULY 14, 1970. CAN. 0858848.

3,578,316.—DRIVING APPARATUS FOR ARTICLE FEEDERS. MAY 11, 1971. CAN. 0907653.

3,614,090.—DOCUMENT CONVEYOR. OCT. 19, 1971. ARG. 0183554, AUS. 0451766, BEL. 0751308, CAN. 0922330, EGR. 0081784, FRA. 7019911, GRB. 1311766, ITL. 0893688, MEX. 0118182, SPN. 0380271, STZ. 0512751, SWD. 0362150, TIW. 0007678, USR. 0349152, VZL. 0032780.

3,628,408.—STAMP DISPENSER. DEC. 21, 1971. CAN. 0931918, GRB. 1324699, JAP. 0755787.

3,628,786.—DOCUMENT HANDLING APPARATUS. DEC. 21, 1971. CAN. 0942552, GRB. 1329989.

3,630,515.—DOCUMENT HANDLING APPARATUS. DEC. 28, 1971.

3,630,519.—DOCUMENT FEED APPARATUS. DEC. 28, 1971. CAN. 0903779, GRB. 1329747.

3,649,447.—APPARATUS FOR DECURLING A PAPER WEB. MAR. 14, 1972. CAN. 0916185, GRB. 1288846.

3,674,363.—SHEET FEEDING APPARATUS. JULY 4, 1972. ARG. 0176106, ATR. 0307230, AUS. 0447387, BEL. 0734129, DNK. 0131336, FRA. 6919121, GRB. 1263192, ITL. 0866189, MEX. 0112842, SPN. 0368216, STZ. 0501500, SWD. 0356136, TIW. 0006604.

3,804,514.—DUAL FUNCTION DOCUMENT STOP FOR A COPYING DEVICE. APR. 16, 1974. FRA. 7334456, GRB. 1424060

3,846,020.—ELECTROSTATIC SHEET TRANSPORT SYSTEM NOV. 5, 1974.

3,860,339.—COPYING MACHINE. JAN. 14, 1975.

3,861,673.—BI-DIRECTIONAL SHEET TRANSPORT. JAN. 21, 1975.

3,874,651.—REGISTRATION EDGE FOR AUTOMATIC DOCUMENT HANDLER. APR. 1, 1975. GRB. 1467791.

3,884,408.—APPARATUS FOR EJECTING A STAPLED SET OF SHEETS SIDEWISE FROM THE COLLATING BINS. MAY 20, 1975.

3,885,782.—SHEET FEEDER. MAY 27, 1975. CAN. 3885782.

3,888,581.—SEMI-AUTOMATIC DOCUMENT HANDLER. JUNE 10, 1975.

3,888,582.—SEMI-AUTOMATIC DOCUMENT HANDLER. JUNE 10, 1975.

3,888,584.—SEMI-AUTOMATIC DOCUMENT HANDLER. JUNE 10, 1975.

3,888,585.—SEMI-AUTOMATIC DOCUMENT HANDLER. JUNE 10, 1975.

3,889,943.—PLATEN TRANSPORT FOR AUTOMATIC DOCUMENT HANDLER. JUNE 17, 1975.

3,900,258.—EXPOSURE APPARATUS. AUG. 19, 1975. AUS. 0474469, CAN. 1004724, GRB. 1424242, ITL. 0993030, SPN. 0418138, SWD. 7311579.

3,901,594.—SEMI-AUTOMATIC DOCUMENT HANDLER. AUG. 26, 1975.

3,909,129.—DOCUMENT FEEDING APPARATUS. SEPT. 30, 1975.

3,915,447.—HORIZONTAL PLATEN BELT TRANSPORT. OCT. 28, 1975.

3,941,376.—AUTOMATIC DOCUMENT HANDLER-ARDRI ADH PLATEN TRANSPORT MOUNTING. MAR. 2, 1976. BEL. 0799234, CAN. 0993906, FRA. 7316540, GRB. 1421427, ITL. 0987317, SPN. 0414541.

3,941,473.—MANUAL ASSIST DOCUMENT FEEDER. MAR. 2, 1976.

3,944,365.—DOCUMENT FEEDING APPARATUS AND LATCHING MECHANISM. MAR. 16, 1976.

3,944,794.—COPYING SYSTEM CONTROL. MAR. 16, 1976. ARG. 0204710, BEL. 0808230, CAN. 1007289, FRA. 7343289, GRB. 1450707, ITL. 1002162, MEX. 0135679, SPN. 0421150, STZ. 0577391, USR. 0543364.

3,947,111.—DOCUMENT FEEDING APPARATUS. MAR. 30, 1976.

3,953,122.—DOCUMENT ORIGINAL HANDLING SYSTEM. APR. 27, 1976.

3,954,259.—DOUBLE BAR SEPARATOR FOR A SHEET RECEIVING TRAY. MAY 4, 1976.

3,959,573.—COMPOSITIONS AND METHODS FOR MAKING BIASABLE MEMBERS. MAY 25, 1976.

3,963,345.—PRE-COLLATION COPYING. JUNE 15, 1976.

3,977,780.—ELECTROSTATIC REPRODUCTION METHOD AND APPARATUS. AUG. 31, 1976.

3,981,498.—NON-UNIFORM CHARGING OF SHEET MATERIAL. SEPT. 21, 1976.

3,982,832.—ELECTROSTATOGRAPHIC COPYING MACHINES. SEPT. 28, 1976.

3,984,099.—AN IMPROVED DOCUMENT FEEDING SYSTEM. OCT. 5, 1976.

3,988,065.—REFLECTIVE DOCUMENT FEEDER. OCT. 26, 1976.

3,997,263.—BI-DIRECTIONAL COPIER OUTPUT. DEC. 14, 1976. BEL. 0839792, SPN. 0445641.

4,000,943.—DUAL PURPOSE DOCUMENT HANDLING SYSTEM. JAN. 4, 1977. BEL. 0837235.

4,004,941.—CLEANING METHOD FOR AUTOMATIC DOCUMENT HANDLER. JAN. 25, 1977.

4,008,956.—DOCUMENT HANDLING SYSTEM FOR PRE-COLLATION COPYING. FEB. 22, 1977. BEL. 0839792, SPN. 0445641.

4,012,140.—COPIER DOCUMENT LOADING SYSTEM. MAR. 15, 1977. BEL. 0839792, SPN. 0445641.

4,017,172.—DOCUMENT FEEDING APPARATUS. APR. 12, 1977.

4,018,523.—REPRODUCING APPARATUS AND PROCESS FOR FORMING MULTIPLE COPIES OF A DOCUMENT. APR. 19, 1977. BEL. 0842928.

4,030,721.—AUTOMATIC MANUSCRIPT DISCHARGING DEVICE FOR COPYING MACHINES. JUNE 21, 1977.

4,033,694.—COPIER DOCUMENT EJECTOR. JULY 5, 1977.

4,034,869.—FLUID MEANS TO LOAD AND UNLOAD A VERTICALLY MOVABLE DOCUMENT STORAGE RACK. JULY 12, 1977.

4,040,615.—ORIGINAL DISCHARGING DEVICE FOR COPIERS. AUG. 9, 1977.

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4,043,550.—IMPROVED REGISTRATION MEANS FOR AUTOMATIC DOCUMENT HANDLING APPARATUS. AUG. 23, 1977. BEL. 847626, FRA. 7631994, SPN. 452660.
4,043,664.—INTERLINEAR FEEDER FOR COPYING MACHINE. AUG. 23, 1977
4,043,665.—COPIER DOCUMENT HANDLER. AUG. 23, 1977.
4,047,812.—DOCUMENT BELT WITH IMPERFORATE BANDS. SEPT. 13, 1977. GER. 7700998.
4,049,255.—APPARATUS FOR FEEDING DOCUMENTS TO AND FROM A COPIER. SEPT. 20, 1977. FRA. 7706823.
4,050,751.—DOCUMENT CAROUSEL. SEPT. 27, 1977.
4,050,816.—DOCUMENT HANDLING SYSTEM. SEPT. 27, 1977. BEL. 839792, SPN. 445641.
4,053,224.—DOCUMENT HANDLING SYSTEM. OCT. 11, 1977.
4,059,260.—DOCUMENT HANDLING APPARATUS. NOV. 22, 1977.
4,062,538.—SPEED REGULATED FLUIDIC SHEET TRANSPORT. DEC. 13, 1977. BEL. 850380.
4,078,786.—AUTOMATIC DOCUMENT RECIRCULATION SYSTEM. MAR. 14, 1978.
4,079,876.—COMPUTER FORMS FEEDER. MAR. 21, 1978.
4,080,063.—COPIER DOCUMENT HANDLING SYSTEM. MAR. 21, 1978.
4,086,007.—DUAL PURPOSE DOCUMENT AND COPY SHEET FEED CASSETTE. APR. 25, 1978.
4,087,172.—DOCUMENT HANDLING APPARATUS. MAY 2, 1978.
4,093,372.—PRE-SEPARATED RECIRCULATING DOCUMENT COPYING SYSTEM. JUNE 6, 1978.
4,097,146.—ORIGINAL HANDLING SYSTEM AND PROCESS. JUNE 27, 1978.
4,099,810.—UPRIGHT DOCUMENT CAROUSEL. JULY 11, 1978.
4,108,547.—DOCUMENT LOADING FOR COPYING. AUG. 22, 1978. BEL. 839792. GRB. 1524101. SPN. 445641.
4,110,028.—DRIVE SYSTEM FOR MULTI-MODE REPRODUCING APPARATUS. AUG. 29, 1978. BEL. 844828.
4,126,817.—SERVO SYSTEM FOR MAINTAINING CONSTANT TENSION ON A WEB. NOV. 21, 1978.
4,132,401.—COPIER DOCUMENT SENSING AND CONTROL SYSTEM. JAN. 2, 1979. GRB. 1523900. USR. 604211.
4,145,041.—AUTOMATIC DOCUMENT HANDLING APPARATUS. MAR. 20, 1979.
4,146,220.—DOCUMENT HANDLING APPARATUS. MAR. 27, 1979.
4,146,326.—DOCUMENT HANDLING APPARATUS AND REPRODUCING MACHINE. MAR. 27, 1979.
4,159,824.—METHOD FOR REVERSING THE DIRECTION OF TRAVEL OF A SHEET. JULY 3, 1979.
4,160,547.—DOCUMENT HANDLING APPARATUS. JULY 10, 1979.

Class 10B

3,094,036.—IMAGE SELECTOR APPARATUS. JUNE 18, 1963. CAN. 0683832.
3,139,279.—RECORD CARD MAGAZINE. JUNE 30, 1964. CAN. 0717868.
3,180,637.—RECORD CARD FEEDING APPARATUS. APR. 27, 1965. CAN. 0806932.
3,357,574.—SEQUENTIAL CONTROL SYSTEM. DEC. 12, 1967. CAN. 0824898.
3,383,105.—CARD PICK-OFF APPARATUS. MAY 14, 1968. CAN. 0820743, GRB. 1193512, JAP. 0610154.
3,482,917.—CARD TRANSPORT APPARATUS. DEC. 9, 1969. CAN. 0842646, GRB. 1193516.
3,784,303.—AUTOMATIC MICROFICHE COPIER. JAN. 8, 1974. CAN. 1000779, GRB. 1412221.
4,095,732.—METHOD AND APPARATUS FOR ACCURATELY CONTROLLING THE POSITION OF A FILM TRANSPORT DEVICE. JUNE 20, 1978.

Class 10C

3,239,213.—DOCUMENT FEEDER. MAR. 8, 1966. CAN. 0766646, FRA. 1447269, GER. 1243698, GRB. 1087786, ITL. 0761046, JAP. 0497197.
3,506,257.—DOCUMENT FEEDING APPARATUS. APR. 14, 1970. CAN. 0885333, GRB. 1253416.
3,567,214.—SHEET FEEDING AND SEPARATING APPARATUS. MAR. 2, 1971. BEL. 0734128, CAN. 0902124, FRA. 6919122, GER. 1929105, GRB. 1263193, HOL. 0144551, ITL. 0866188, SPN. 0368173, STZ. 0501501, SWD. 6908176.
3,861,671.—LIFTABLE BAIL BAR FOR ALLOWING RETURN OF MULTIPLY SEPARATED SHEETS TO STACK. JAN. 21, 1975.
3,895,790.—MOVABLE BAIL BAR. JULY 22, 1975. BEL. 0815050, CAN. 1009267.
3,936,180.—XEROGRAPHIC APPARATUS WITH SAMPLE PRINT CAPABILITIES. FEB. 3, 1976. BEL. 0809398, ITL. 1006708.
3,968,364.—HEIGHT SENSING DEVICE. JULY 6, 1976.
3,993,300.—AUTOMATIC FEEDER FOR COMPOSITE COPYING. NOV. 23, 1976. BEL. 0815215, GRB. 1467996, STZ. 0561917.
4,025,068.—SHEET FEEDER. MAY 24, 1977.
4,054,284.—PAPER-ANTI-SKEW DEVICE. OCT. 18, 1977.

Class 10D

3,239,213.—DOCUMENT FEEDER. MAR. 8, 1966. CAN. 0766646, FRA. 1447269, GER. 1243698, GRB. 1087786, ITL. 0761046, JAP. 0497197.
3,495,904.—RADIANT ENERGY PROTECTIVE APPARATUS. FEB. 17, 1970.
3,581,000.—INCREMENTAL STEPPING PAPER DRIVE. MAY 25, 1971.
3,618,123.—FACSIMILE DRUM CONVEYOR. NOV. 2, 1971. ARG. 0181314, BEL. 0743659, CAN. 0918186, FRA. 6944287, GER. 1963786, GRB. 1280340, ITL. 0880304, JAP. 0852728, MEX. 0122967, SPN. 0374915, SWD. 0363457, VZL. 0025438.
3,790,159.—AUTOMATIC DOCUMENT HANDLING DEVICE. FEB. 5, 1974. CAN. 1013377, GRB. 1417793.
3,815,899.—SHEET DELIVERY DEVICE. JUNE 11, 1974. CAN. 0994377, FRA. 7409303, GRB. 1456422.
3,854,715.—CAM. DEC. 17, 1974. CAN. 1007256, GRB. 1456576.

Class 10E

3,288,459.—DOCUMENT FEEDING APPARATUS. NOV. 29, 1966. CAN. 0788345, JAP. 0632541, MEX. 0086958.
3,300,208.—COPY POSITIONING APPARATUS AND METHOD. JAN. 24, 1967. CAN. 0817270, JAP. 0605646, MEX. 0090842.
3,473,035.—DOCUMENT TRANSPORT AND REGISTRATION SYS USING PHOTOCELLS. OCT. 14, 1969. ARG. 0170131, CAN. 0858983, CHL. 0024005, JAM. 0001926, MEX. 0101674, PRU. 0009301, URG. 0009238, VZL. 0023677.
3,510,125.—DOCUMENT REGISTRATION SYSTEM. MAY 5, 1970. BEL. 0726865, CAN. 0897195, FRA. 2000318, GER. 1902112, GRB. 1253417, ITL. 0854755, JAP. 0783473.
3,558,223.—DOCUMENT CENTERING APPARATUS. JAN. 26, 1971.
3,630,611.—DOCUMENT REGISTRATION APPARATUS. DEC. 28, 1971.
3,630,620.—PLATEN COVER FOR COPYING MACHINES. DEC. 28, 1971. CAN. 0921307, GRB. 1309313.
3,642,370.—DOCUMENT PRESENTATION DEVICE. FEB. 15, 1972. GRB. 1206633.
3,724,941.—ELECTROPHOTOGRAPHIC APPARATUS. APR. 3, 1973.
3,741,644.—ORIGINAL POSITION CONFIRMING MEANS FOR DUPLICATING APPARATUS. JUNE 26, 1973.
3,771,082.—COPYING APPARATUS WITH AUXILIARY LIGHT SOURCE FOR ILLUMINATING AN ORIGINAL TO BE REPRODUCED. NOV. 6, 1973.
3,829,082.—AUTOMATIC DOCUMENT HANDLER. AUG. 13, 1974. CAN. 0986958, GRB. 1421425.
3,854,715.—CAM. DEC. 17, 1974. CAN. 1007256, GRB. 1456576.
3,861,673.—BI-DIRECTIONAL SHEET TRANSPORT. JAN. 21, 1975. CAN. 1004240.
3,877,804.—CORNER REGISTRATION DEVICE FOR DOCUMENT FEEDER. APR. 15, 1975.
3,883,134.—DETECTING AND REMOVING APPARATUS FOR SKEW FED SHEETS. MAY 13, 1975.
3,915,447.—HORIZONTAL PLATEN BELT TRANSPORT. OCT. 28, 1975.
3,984,098.—PNEUMATIC REGISTRATION AND CLAMPING APPARATUS. OCT. 5, 1976. BEL. 0848824.
3,984,099.—AN IMPROVED DOCUMENT FEEDING SYSTEM. OCT. 5, 1976.
3,990,794.—COPYING MACHINE. NOV. 9, 1976. STZ. 05.? 7508.
4,026,542.—DUAL REGISTRATION APPARATUS. MAY 31, 1977.
4,029,411.—VARIABLE MAGNIFICATION COPIER. JUNE 14, 1977. BEL. 0839792, SPN. 0445641.
4,033,574.—DOCUMENT HANDLING APPARATUS. JULY 5, 1977.

4,033,694.—COPIER DOCUMENT EJECTOR. JULY 5, 1977.
4,043,550.—IMPROVED REGISTRATION MEANS FOR AUTOMATIC DOCUMENT HANDLING APPARATUS. AUG. 23, 1977. BEL. 847626, FRA. 7631994, SPN. 452660.
4,043,665.—COPIER DOCUMENT HANDLER. AUG. 23, 1977.
4,047,812.—DOCUMENT BELT WITH IMPERFORATE BANDS. SEPT. 13, 1977. GER. 7700998.
4,050,688.—ORTHOGONAL DOCUMENT HANDLING APPARATUS. SEPT. 27, 1977.
4,054,285.—APPARATUS FOR REGISTERING AND INVERTING SHEETS. OCT. 18, 1977.
4,055,340.—ASSISTED PNEUMATIC TRANSPORT AND REGISTRATION APPARATUS. OCT. 25, 1977. BEL. 848823.
4,062,538.—SPEED REGULATED FLUIDIC SHEET TRANSPORT. DEC. 13, 1977. BEL. 850380.
4,066,254.—THREE-WAY PNEUMATIC REGISTRATION APPARATUS. JAN. 3, 1978.
4,073,001.—APPARATUS FOR NEUTRALIZING AND REGISTERING AN ELECTROSTATICALLY CHARGED SHEET. FEB. 7, 1978.
4,076,233.—DOCUMENT HANDLING APPARATUS. FEB. 28, 1978. BEL. 847625, FRA. 7631999, SPN. 452661.
4,090,704.—REGISTRATION STATION. MAY 23, 1978.
4,097,146.—ORIGINAL HANDLING SYSTEM AND PROCESS. JUNE 27, 1978.
4,116,431.—METHOD FOR TRANSPORTING AND REGISTERING STACKED SHEETS. SEPT. 26, 1978.
4,124,205.—DOCUMENT HANDLING. NOV. 7, 1978.
4,130,274.—PNEUMATIC REGISTRATION APPARATUS. DEC. 19, 1978. BEL. 847912. SAF. 6401.
4,143,960.—RETRACTABLE SUPPORT MEMBER. MAR. 13, 1979.
4,146,219.—DOCUMENT TRANSPORT APPARATUS. MAR. 27, 1979. GRB. 1529698. SPN. 452659.

Class 10F

3,288,464.—CARD INVERTING APPARATUS. NOV. 29, 1966. CAN. 0803316, JAP. 0547200
3,408,140.—DOCUMENT HANDLING APPARATUS. OCT. 29, 1968. CAN. 0842643, GRB. 1143062.
3,416,791.—DOCUMENT INVERTING APPARATUS. DEC. 17, 1968. CAN. 0853562, GRB. 1210564, JAP. 0648074.
3,844,654.—DUPLEX COPYING SYSTEM. OCT. 29, 1974. FRA. 7340246, GRB. 1445854.
3,862,802.—SHEET REVERSING APPARATUS AND A DUPLEX REPRODUCING APPARATUS EMPLOYING SAME. JAN. 28, 1975. BEL. 0818894.
3,926,338.—THERMALLY INSENSITIVE PARTICLE CONCENTRATION CONTROLLER. DEC. 16, 1975.
3,980,406.—DUPLEX IMAGING SYSTEM. SEPT. 14, 1976.
4,040,616.—SHEET TURN AROUND INVERTER. AUG. 9, 1977. FRA. 7701111.
4,054,285.—APPARATUS FOR REGISTERING AND INVERTING SHEETS. OCT. 18, 1977.
4,089,515.—DOCUMENT STORAGE AND TRANSPORT APPARATUS. MAY 16, 1978. BEL. 850379.
4,111,547.—DUPLEX DOCUMENT COPYING. SEPT. 5, 1978.

Class 10G

3,419,265.—DOCUMENT STACKER APPARATUS. DEC. 31, 1968. ARG. 0171423, CAN. 0833415, CHL. 0024006, JAM. 0001859, MEX. 0100967, PRU. 0001930, URG. 0009140, VZL. 0023736.
3,460,825.—FAN FOLD STACKING APPARATUS. AUG. 12, 1969. CAN. 0855586, GRB. 1205418.
3,497,207.—SORTING APPARATUS FOR DOCUMENTS. FEB. 24, 1970. BEL. 0727203, CAN. 0895731, FRA. 6900957, GRB. 1245841, HOL. 0148006, ITL. 0854588.
3,630,517.—COUNTER STACKER. DEC. 28, 1971
3,729,188.—DOCUMENT STACKER APPARATUS. APR. 24, 1973. CAN. 1000311, FRA. 0701711, GRB. 1303165, ITL. 0893040.
3,865,480.—ELECTROSTATIC CONTROL OF FAN FOLD PAPER STACKING. FEB. 11, 1975.
4,017,066.—SET SEPARATOR. APR. 12, 1977.
4,033,579.—AN OFFSET STACKER. JULY 5, 1977.
4,093,372.—PRE-SEPARATED RECIRCULATING DOCUMENT COPYING SYSTEM. JUNE 6, 1978.
4,132,400.—APPARATUS FOR ALIGNING A STACK OF SHEETS. JAN. 2, 1979.

Class 10H

3,467,371.—SHEET DISTRIBUTOR. SEPT. 16, 1969. ARG. 0168293, ATR. 0294140, AUS. 0423257, BEL. 0702898, CAN. 0925803, CHL. 0023102, CLB. 0017542, DNK. 0124250, EIR. 0031306, FIN. 0047869, FRA. 1541084, GRB. 1193513, GRK. 0038675, IND. 0112000, ISR. 0028519, ITL. 0813836, JAP. 0645588, LXB. 0054335, MEX. 0099952, NOR. 0124920, NZL. 0149788, PAK. 0118964, PLP. 0006507, PRU. 0009477, PTG. 0048210, SAF. 0674986, SPN. 0344349, STZ. 0480253, SWD. 0337384, TRK. 0015492, URG. 0008974, VZL. 0026276.
3,815,896.—AUTOMATIC DOCUMENT HANDLER. JUNE 11, 1974. BEL. 0797889, CAN. 0984863, FRA. 7316287, GRB. 1421426, ITL. 0987316, SPN. 0414486.
3,884,408.—APPARATUS FOR EJECTING A STAPLED SET OF SHEETS SIDEWISE FROM THE COLLATING BINS. MAY 20, 1975.
3,907,277.—METHOD AND DEVICE FOR REMOVING DOCUMENTS FROM A PLATEN. SEPT. 23, 1975.
3,913,467.—COLLATING APPARATUS. OCT. 21, 1975.
3,944,207.—LIMITLESS SORTER. MAR. 16, 1976.
3,944,366.—SLIDING PLATEN COVER APPARATUS. MAR. 16, 1976.
3,963,345.—PRE-COLLATION COPYING. JUNE 15, 1976. BEL. 0839792, SPN. 0445641.
3,997,263.—BI-DIRECTIONAL COPIER OUTPUT. DEC. 14, 1976. BEL. 0839792, SPN. 0445641.
4,008,956.—DOCUMENT HANDLING SYSTEM FOR PRE-COLLATION COPYING. FEB. 22, 1977. BEL. 0839792, SPN. 0445641.
4,012,140.—COPIER DOCUMENT LOADING SYSTEM. MAR. 15, 1977. BEL. 0839792, SPN. 0445641.
4,050,816.—DOCUMENT HANDLING SYSTEM. SEPT. 27, 1977. BEL. 839792, SPN. 445641.
4,108,547.—DOCUMENT LOADING FOR COPYING. AUG. 22, 1978. BEL. 839792. GRB. 1524101. SPN. 445641.
4,120,580.—COLLATING SYSTEM FOR SLIDE REPRODUCTION. OCT. 17, 1978.

Class 10I

3,495,904.—RADIANT ENERGY PROTECTIVE APPARATUS. FEB. 17, 1970.
3,600,610.—TIME DELAY CIRCUIT FOR A RADIANT ENERGY PROTECTIVE APPARATUS. AUG. 17, 1971.
3,609,737.—METHOD AND APPARATUS FOR ARTICLE DETECTION UTILIZING CORONA DISCHARG. SEPT. 28, 1971. CAN. 0872468, GER. 1932248, GRB. 1259998, JAP. 0657911.
3,672,760.—XEROGRAPHIC PLATE TRANSPORTING MECHANISM. JUNE 27, 1972. CAN. 0939555, GRB. 1359888.
3,674,363.—SHEET FEEDING APPARATUS. JULY 4, 1972. ARG. 0176106, ATR. 0307230, AUS. 0447387, BEL. 0734129, DNK. 0131336, FRA. 6919121, GRB. 1263192, ITL. 0866189, MEX. 0112842, SPN. 0368216, STZ. 0501500, SWD. 0356136, TIW. 0006604.
3,697,063.—DOCUMENT HANDLING APPARATUS. OCT. 10, 1972. GRB. 1369618.
3,744,047.—SUPERPOSED SHEET DETECTION. JULY 3, 1973. CAN. 0985762, FRA. 7231694, GRB. 1396560, ITL. 0967501.
3,748,088.—FUSER CONTROL APPARATUS. JULY 24, 1973.
3,778,618.—PHOTODETECTION OF NON-OPAQUE OBJECTS TRANSPRTD ALONG A CONVEYOR BY USE OF A LIGHT BLCKING OPAQU. DEC. 11, 1973. GRB. 1406170.
3,790,158.—AUTOMATIC DOCUMENT HANDLER. FEB. 5, 1974. GRB. 1421428.
3,894,513.—COPYING MACHINE WITH BEAD PICKOFF ROLLER. JULY 15, 1975. FRA. 7342586, GRB. 1441288.
3,945,546.—ZIG ZAG FOLDED STRIP BOTTOM FEEDER. MAR. 23, 1976.
4,116,431.—METHOD FOR TRANSPORTING AND REGISTERING STACKED SHEETS. SEPT. 26, 1978.
4,132,401.—COPIER DOCUMENT SENSING AND CONTROL SYSTEM. JAN. 2, 1979. GRB. 1523900. USR. 604211.

Class 12

4,027,138.—A FUSER RELEASE MATERIAL DISPENSER. MAY 31, 1977.

Class 12A

3,384,488.—POLYCHROMATIC PHOTOELECTROPHORETIC IMAGING COMPOSITION. MAY 21, 1968.

V 9 8 8 1 N 0 6 7 9 UMI

3,384,565.—PROCESS OF PHOTOELECTROPHORETIC COLOR IMAGING. MAY 21, 1968. ARG. 0149921, ATR. 0304268, AUS. 0414156, BEL. 0667116, BRA. 0087920, CAN. 0867678, CHL. 0021697, CLB. 0014706, FRA. 1450843, GER. 1497243, GRB. 1124626, GRK. 0030605, IND. 0119647, ISR. 0023973, ITL. 0744030, JAP. 681941, LXB. 0049058, MEX. 0091899, NOR. 0128733, NZL. 0142323, PPU. 0009538, PTG. 0044324, SAF. 653922, SPN. 0321858, STZ. 0481409, SWD. 6509579, URG. 0009540, VZL. 0017273.

3,384,566.—METHOD OF PHOTOELECTROPHORETIC IMAGING. MAY 21, 1968.

3,734,610.—MICROFICHE VIEWER-COPIER WITH BILLING DATA STORAGE. MAY 22, 1973. CAN. 1003025.

3,759,611.—MICROIMAGE RANSOM ACCESS AND RETRIEVAL PRINTER. SEPT. 18, 1973. CAN. 0987156, GRB. 1427017.

Class 12B

3,383,993.—PHOTOELECTROPHORETIC IMAGING APPARATUS. MAY 21, 1968. ARG. 0165160, AUS. 0419734, BEL. 0692048, CAN. 0866143, FRA. 1507051, GRB. 1158301, GRK. 0033285, HOL. 0150926, ITL. 0862555, LXB. 0052738, MEX. 0096357, PTG. 0044324, SAF. 0067022, SPN. 0335121, STZ. 0510901, VZL. 0024450.

3,610,748.—PHOTOELECTROPHORETIC IMAGING SYSTEM. OCT. 5, 1971. BEL. 0752438, CAN. 0922569, FRA. 7023045, GRB. 1319532, ITL. 0894621, JAP. 0739527.

3,656,847.—ELEVATOR MECHANISM. APR. 18, 1972.

3,663,396.—KINESCOPE PHOTOELECTROPHORETIC IMAGING METHODS AND SYSTEMS. MAY 16, 1972. ARG. 0196858, BEL. 0762417, CAN. 0935965, FRA. 7104350, GRB. 1345571, ITL. 0918121, JAP. 0743838, MEX. 0131834.

3,697,409.—BELT ELECTRODE IMAGING SYSTEM. OCT. 10, 1972. ARG. 0183572, BEL. 0760077, BRA. 7023343, CAN. 0937803, FRA. 7045072, GRB. 1339734, ITL. 0913368, JAP. 0752721, MEX. 0119368, VZL. 0032930.

3,844,779.—PHOTOELECTROPHORETIC IMAGING METHOD EMPLOYING A BELT ELECTRODE. OCT. 29, 1974.

4,043,654.—DISPLAY SYSTEM. AUG. 23, 1977.

4,043,655.—PHOTOELECTROPHORETIC IMAGING REPRO- DUCTION DEVICE. AUG. 23, 1977.

Class 12C

3,427,242.—APPARATUS FOR CONTINUOUS PHOTOELECTROPHORETIC IMAGING. FEB. 11, 1969. BEL. 0743902, CAN. 0851701, FRA. 1521727, GER. 1572385, GRB. 1185932, ITL. 0794269, JAP. 0580245, MEX. 0097005.

3,474,019.—PHOTOELECTROPHORETIC IMAGING MTD INC. CONTACTNG IMGNG SUSPNSN W/ ALG SFC OF FLEXIBLE ELECTRODE. OCT. 21, 1969. AUS. 0418224, BEL. 0692912, BRA. 6678842, CAN. 0834679, GRK. 0033301, LXB. 0052730, MEX. 0090286, PTG. 0046984, SAF. 0670024, SPN. 0335454.

3,551,320.—IMAGING APPARATUS. DEC. 29, 1970.

3,600,081.—IMAGING APPARATUS. AUG. 17, 1971. ARG. 0192211, ATR. 0324839, AUS. 0455820, BEL. 0758903, CAN. 0936732, CZC. 0164288, EGR. 0090482. FRA. 7041652, GRB. 1335990, ITL. 0909307, JAP. 0751878, MEX. 0122272, PNM. 0002094, SPN. 0385453, STZ. 0518582, SWD. 0362717, TIW. 0008461, USR. 0412697, VZL. 0032926.

3,609,028.—IMAGING APPARATUS. SEPT. 28, 1971. ARG. 0186570, ATR. 0319749, AUS. 0455572, BEL. 0758806, CAN. 0935012, EGR. 0086977, FRA. 7041648, GRB. 1335988, ITL. 0909306, MEX. 0121331, PLD. 0082852, PNM. 0002167, SPN. 0385452, STZ. 0518580, SWD. 0361753, TIW. 0007385, USR. 0465806, VZL. 30683.

3,622,691.—HIGH SPEED LIGHT RESPONSIVE TRANSFORM COMPUTER FOR A LIGHT-SENSITIVE PRINTING SYSTEM. NOV. 23, 1971. CAN. 0915813, GRB. 1335222, JAP. 0774709.

3,642,365.—AUTOMATED IMAGING MACHINE. FEB. 15, 1972. ARG. 0183571, ATR. 0324123, AUS. 0456428, BEL. 0758902, CAN. 0937440, EGR. 0091986, FRA. 7041647, GRB. 1337145, ITL. 0909311, JAP. 0758463, MEX. 0120289, PLD. 0082861, PNM. 0002255, SPN. 0385457. STZ. 0544327, SWD. 0367493, TIW. 0007386.

3,642,606.—APPARATUS FOR IMAGE FORMATION ON THE INSIDE OF A CYLINDER. FEB. 15, 1972. ARG. 0183573, BEL. 0760749, BRA. 7022094, CAN. 0938490, FRA. 7047632, GRB. 1339578, ITL. 0913902, JAP. 0752722, MEX. 0119589, VZL. 0032929.

3,644,035.—FLAT PLATE TRAVELING ROLLER IMAGING. FEB. 22, 1972. ARG. 0183670, AUS. 0456429, BEL. 0758904, BRA. 7023406, CAN. 0923356, EGR. 0090280, FRA. 7041653, GRB. 1335051, ITL. 0909308, JAP. 0751879, MEX. 0119530, PLD. 0082860, SPN. 0385454, STZ. 0528763, SWD. 0367074, TIW. 0008460, USR. 0404290, VZL. 30682.

3,645 616.—PHOTOELECTROPHORETIC IMAGE TRANSFER APPARATUS. FEB. 29, 1972. CAN. 0949049, GRB. 1337417, JAP. 783768.

3,647,290.—PHOTOELECTROPHORETIC IMAGING SYSTEM. MAR. 7, 1972. ARG. 0184762, AUS. 0454820, BEL. 0058902, CAN. 0939954, EGR. 0090483, FRA. 7061651, GER. 1337416, GRB. 1337416, ITL. 0909312, JAP. 0751880, MEX. 0119752, SPN. 0385458, STZ. 0530662, SWD. 0366850, TIW. 0007384, USR. 0419062, VZL. 30685.

3,667,842.—IMAGING APPARATUS. JUNE 6, 1972. ARG. 0193347, BEL. 0768538, CAN. 0953559, FRA. 7122750, GRB. 1350395, ITL. 0927384, MEX. 0123298.

3,703,335.—MULTIPLE EXPOSURE IMAGING APPARATUS. NOV. 21, 1972. BEL. 0760457, CAN. 0968605, FRA. 7047141, GRB. 1339550, ITL. 0913636, JAP. 0759479.

3,719,484.—PHOTOELECTROPHORETIC IMAGING METHOD. MAR. 6, 1973. CAN. 0957890, GRB. 1369701.

3,728,018.—IMAGING APPARATUS. APR. 17, 1973. CAN. 0924156, GRB. 1335699.

3,800,743.—MATERIALS APPLICATION APPARATUS. APR. 2, 1974.

3,860,336.—PHOTOELECTROPHORETIC IMAGING MACHINE AND APPTS FOR CONTACTING A ROLLER TO A SURFACE TO BE CONTACT. JAN. 14, 1975.

3,860,337.—MULTIPLE EXPOSURE METHOD AND APPARATUS. JAN. 14, 1975. CAN. 0957890, GRB. 1369701.

3,990,043.—CHARACTER CODING AND RECOGNITION SYSTEM. NOV. 2, 1976.

4,006,982.—PHOTOELECTROPHORETIC CONCURRENT PROCESS CYCLING. FEB. 8, 1977. BEL. 0841077.

4,009,466.—CHARACTER CODING AND RECOGNITION SYSTEM. FEB. 22, 1977.

4,066,452.—VELOCITY COMPENSATION FOR BEAD BYPASS. JAN. 3, 1978.

4,084,896.—PHOTOELECTROPHORETIC WEB IMAGING APPARATUS. APR. 18, 1978. BEL. 841077, FRA. 7612178.

Class 12D

3,448,025.—PHOTOELECTROPHORETIC IMAGING SYSTEM UTILIZING A PROGRAMMED POTENTIAL APPLICATION. JUNE 3, 1969. ARG. 0167580, AUS. 0417981. BEL. 0719188, CAN. 0875492, FRA. 0095530, GER. 1797123, GRB. 1149666, ITL. 0890086, MEX. 0100805, VZL. 0025946.

3,485,738.—PHOTOELECTROPHORETIC IMG PROCESS EMPLOYNG LAYER OF INSULATNG LIQUID TO IMPROVE IMAGE QUALITY. DEC. 23, 1969. AUS. 0431891, BEL. 0743640, CAN. 0850591, GER. 1522751, GRB. 1174831, JAP. 0578397.

3,565,614.—IMAGE TRANSFER. FEB. 23, 1971. ARG. 0157773, AUS. 0413930, BEL. 0696853, CAN. 0890362, FRA. 1520919, GER. 1572384, GRB. 1185931, ITL. 0801198, JAP. 0586922, MEX. 0099070, SPN. 0349966, STZ. 0482230, SWD. 0332754, VZL. 0024013.

3,582,205.—IMAGING APPARATUS. JUNE 1, 1971.

3,616,398.—PHOTOELECTROPHORETIC IMAGING COMPOSITION CONTAINING B-CAROTENE. OCT. 26, 1971.

3,657,103.—ELECTRODE IMAGING SYSTEM. APR. 18, 1972. CAN. 0890360, GRB. 1309663, JAP. 0731609.

3,697,407.—PREVENTION OF ARCING IN AN ELECTRODE IMAGING SYSTEM. OCT. 10, 1972. CAN. 0884225, GRB. 1309127, JAP. 0731608.

3,697,408.—IMAGING SYSTEM. OCT. 10, 1972. CAN. 0890361, GRB. 1312733, JAP. 0731610.

3,708,286.—PHOTOELECTROPHORETIC IMAGING WITH ULTRASONIC VIBRATION DURING IMAGING. JAN. 2, 1973. ARG. 0174613, ATR. 0293874, AUS. 0455712, BEL. 0739747, CAN. 0922141, FRA. 6933738, GER. 1949416, GRB. 1279285, HOL. 0146950, ITL. 0877873, JAP. 0709042, MEX. 0108820.

3,853,556.—METHOD FOR ELIMINATING ELECTRICAL ARCING DURING PHOTOELECTROPHORETIC IMAGING. DEC. 10, 1974.

Class 12E

3,535,221.—PHOTOELECTROPHORETIC IMAGING SYSTEM EMPLOYING A PHOTOCONDUCTOR COATING FOR THE BLOCKING ELECTRO. OCT. 20, 1970. ARG. 0176485, AUS. 0448560, BEL. 0722301, CAN 0891971, FRA. 1587938, GER. 1802988, GRB. 1236619, ITL. 0845022, JAP. 0693378, MEX. 0108364, VZL. 0023742.

3,595,771.—METHOD OF REMOVING ACCUMULATED CHARGES IN PHOTOELECTROPHORETIC IMAGING. JULY 27. 1971. ARG. 0198476, ATR. 0302041, AUS. 0448837, BEL. 0737549, CAN. 0922955, FRA. 6927969, GER. 1941463, GRB. 1267255, ITL. 0869935, JAP. 0704156, SWD. 0341726.

3,639,224.—PHOTOELECTROPHORETIC IMAGING SYSTEM. FEB. 1, 1972. CAN. 0922568, GRB. 1313683, JAP. 0739526.

3,657,103.—ELECTRODE IMAGING SYSTEM. APR. 18, 1972. CAN. 0890360, GRB. 1309663, JAP. 0731609.

3,669,872.—IMAGING SYSTEM. JUNE 13, 1972.

3,775,107.—IMAGING SYSTEM. NOV. 27, 1973.

3,859,576.—HIGH PERFORMANCE BLOCKING ELECTRODE FOR ELECTROPHOTOPHORESIS. JAN. 7, 1975. BEL. 0810802, ITL. 1006354.

3,866,572.—FORAMINOUS ELECTROSTATOGRAPHIC TRANSFER SYSTEM. FEB. 18, 1975. BEL. 0815546, CAN. 1009503, FRA. 7418641, GRB. 1448386, ITL. 1012842, SPN. 0426760.

3,956,524.—METHOD FOR THE PREPARATION OF ELECTROSTATOGRAPHIC AND PHOTORECEPTORS. MAY 11, 1976.

3,966,466.—PHOTOELECTROPHORETIC IMAGING PROCESS USING DARK CHARGE INJECTING AGENT ON BLOCKING ELECTRODE. JUNE 29, 1976.

3,967,961.—PHOTOELECTROPHORETIC IMAGING PROCESS EMPLOYING A DARK CHARGE INJECTING AGENT-AKLYD RESIN COATING. JULY 6, 1976.

3,980,477.—PHOTOELECTROPHORESIS WITH DARK CHARGE INJECTING ELEMENT. SEPT. 14, 1976.

Class 12F

3,695,755.—PHOTOELECTROPHORETIC CAMERA. OCT. 3, 1972. CAN. 0958580, GRB. 1359694.

3,702,289.—PHOTOELECTROPHORETIC PROC-ESS AND APPARATUS. NOV. 7, 1972. CAN. 0958579, GRB. 1359695.

3,705,766.—PHOTOELECTROPHORETIC APPARATUS DEC. 12, 1972. CAN. 0955100, GRB. 1359862.

Class 12G

3,655,550.—ELECTROSTATIC PIGMENT FILTER. APR. 11, 1972.

3,656,200.—CLEANING APPARATUS. APR. 18, 1972.

3,658,687.—APPARATUS FOR FORMING IMAGES WITH APPLICATOR SHEARING SMOOTHING AND CLEANING MEANS. APR. 25, 1972. CAN. 0916433, GRB. 1337149, JAP. 0751881.

3,659,302.—CLEANING APPARATUS. MAY 2, 1972.

3,673,632.—CLEANING APPARATUS. JULY 4, 1972.

3,686,035.—CLEANING APPARATUS. AUG. 22, 1972. CAN. 0925660, GRB. 1335989.

3,821,027.—METHOD OF CLEANING ACCUMULATED MATERIAL FROM A SLOT. JUNE 28, 1974.

3,919,737.—CLEANING APPARATUS. NOV. 18, 1975.

3,945,724.—VELOCITY COMPOSITION FOR BEAD BYPASS. MAR. 23, 1976.

3,950,088.—VELOCITY COMPENSATION FOR BEAD BYPASS WITH SPEED REDUCTION. APR. 13, 1976.

3,986,772.—BEAD BYPASS. OCT. 19, 1976.

3,988,060.—BEAD BYPASS SPEED REDUCTION. OCT. 26, 1976.

3,989,365.—MOTION COMPENSATION FOR BEAD BYPASS. NOV. 2, 1976.

4,066,452.—VELOCITY COMPENSATION FOR BEAD BYPASS. JAN. 3, 1978.

Class 12H

3,505,131.—PROCESS FOR THE PREPARATION OF A CUPROUS IODIDE CONDUCTIVE FILM. APR. 7, 1970. CAN. 0876074, GER. 1800653, GRB. 1244012, JAP. 0615874.

3,623,680.—CLUTCH/BRAKE MECHANISM. NOV. 30, 1971.

3,623,805.—DRIVE MECHANISM FOR IMAGING APPARATUS. NOV. 30, 1971.

3,628,859.—IMAGING MACHINE IMPROVEMENT. DEC. 21, 1971. BEL. 0760455, CAN. 0937436, FRA. 7047139, GRB. 1339549, ITL. 0913635, JAP. 0764505.

3,630,615.—METHOD AND APPARATUS FOR TRANSPORTING SUPPORT MATERIAL. DEC. 28, 1971.

3,630,884.—TRANSPARENT ELECTRODE IMAGING IMPROVEMENT. DEC. 28, 1971. CAN. 0890359, GRB. 1313696, JAP. 0739525.

3,639,049.—COPY SYSTEM. FEB. 1, 1972.

3,640,616.—OPAQUE ILLUMINATION AND SCANNING SYSTEM. FEB. 8, 1972. CAN. 0926674, GRB. 1337418, JAP. 0731615.

3,647,294.—MATERIALS APPLICATION AND CLEANING APPARATUS FOR XEROGRAPHIC APPARATUS. MAR. 7, 1972. CAN. 0913355, GRB. 1337146, JAP. 0759478.

3,654,654.—CLEANING APPARATUS. APR. 11, 1972. CAN. 0925257, GRB. 1335850, JAP. 0791054.

3,673,632.—CLEANING APPARATUS. JULY 4, 1972.

3,681,064.—PHOTELCTROPHRTC IMNG PROCS EMPLYNG MULTI-COMPNT ELCTRCLY PHOTOSNTV PARTICLE. AUG. 1, 1972.

3,685,897.—PHOTOELECTROPHORETIC APPARATUS USING PYRAMID GEARS. AUG. 22, 1972. CAN. 0957542.

3,687,109.—MATERIALS APPLICATION APPARATUS. AUG. 29, 1972. CAN. 0915907, GRB. 1337148.

3,697,167.—OPTICAL PROJECTION APPARATUS. OCT. 10, 1972. BEL. 0772913, CAN. 0955090. FRA. 7134731, GRB. 1316023, ITL. 0936735.

3,703,459.—LIQUID APPLICATOR. NOV. 21, 1972.

3,718,393.—IMAGING APPARATUS. FEB. 27, 1973.

3,722,993.—MATERIALS APPLICATION APPARATUS. MAR. 27, 1973.

3,730,620.—FOCUSING ME THOD. MAY 1, 1973.

3,737,221.—ROTATIONAL DRIVE MECHANISM. JUNE 5, 1973.

3,744,897.—TRANSPARENT ELECTRODE FOR ELECTROPHORETIC IMAGING. JULY 10, 1973.

3,769,850.—PHOTOELECTROPHORETIC APPARATUS USING PYRAMID GEARS. NOV. 6, 1973.

3,776,628.—PHOTOELECTROPHORETIC IMAGING SYSTEM. DEC. 4, 1973.

3,784,294.—IMAGE DENSITY CONTROL. JAN. 8, 1974.

3,840,299.—PHOTOELECTROPHORETIC IMAGING APP FOR VARYING ADVANCING RATE OF VELOCITY OF ROLLER ELECTRODES. OCT. 8, 1974.

3,844,651.—PHOTELCTRPHRTC IMG APP FOR CONTRLNG TIME INTRVL OF SUCSSV ROLLR ELCTRDS LEAVNG AND ENTERNG IMG RE. OCT. 29, 1974.

3,920,330.—ELECTROPHORETIC IMAGING APPARATUS. NOV. 18, 1975. BEL. 0777719, CAN. 0961334, FRA. 7201005, GRB. 1376241, ITL. 0946357.

3,944,353.—BACKGROUND REDUCTION MAR. 16, 1976.

3,950,640.—LAMP CONTROL AND LAMP SWITCH CIRCUIT FOR CONTROLLING LIGHT BALANCE. APR. 13, 1976.

3,952,700.—LIQUID APPLICATOR. APR. 27, 1976.

3,954,465.—ELECTROPHORETIC IMAGING METHODS. MAY 4, 1976. BEL. 0777719, CAN. 0961334, FRA. 7201005, GRB. 1376241, ITL. 0946357.

3,957,510.—OVERFLOW PREVENTION FOR LIQUID BETWEEN FLEXIBLE LAYERS ON A SOLID SURFACE. MAY 18, 1976.

3,981,459.—PHOTOELECTROPHORETIC ELECTROSTATIC TACKING CAPSTAN WEB TENSION SYS. SEPT. 21, 1976.

3,982,710.—PHOTOELECTROPHORETIC WEB TENSION SYSTEM. SEPT. 28, 1976.

3,985,434.—PHOTOELECTROPHORETIC PIGMENT DISCHARGING WITH AC COROTRON OR UV ILLUMINATION. OCT. 12, 1976.

3,989,366.—PHOTOELECTROPHORETIC IMAGING APPARATUS HAVING A DEVICE FOR INCREASING THE FRICTION FORCE BETWEE. NOV. 2, 1976. BEL. 0841080.

3,989,367.—APPARATUS FOR CONTACTING A ROLLER TO A SURFACE TO BE CONTACTED. NOV. 2, 1976.

3,991,992.—PHOTOELECTROPHORETIC WEB MACHINE SERVO DRIVE SYSTEM. NOV. 16, 1976. BEL. 0841079.

4,049,343.—COMBINATION IMAGING AND GROUNDING ROLLER. SEPT. 20, 1977. BEL. 841076, FRA. 7612176.

4,059,443.—ELECTRICAL INFORMATION STORAGE SYSTEM. NOV. 22, 1977.

4,073,583.—PHOTOELECTROPHORETIC HEAT & PRESSURE TRANSFER MECHANISMS. FEB. 14, 1978. BEL. 841078, FRA. 7612171.

4,084,896.—PHOTOELECTROPHORETIC WEB IMAGING APPARATUS. APR. 18, 1978. BEL. 841077, FRA. 7612178.

Class 12I

3,681,064.—PHOTELCTROPHRTC IMNG PROCS EMPLYNG MULTI-COMPNT ELCTRCLY PHOTOSNTV PARTICLE. AUG. 1, 1972.

V 9 8 8 1 N O 6 7 9 UMI

3,820,987.—PHOTOELECTROPHORETIC IMAGING WITH FIXING ON A SEPARATE ELECTRODE. JUNE 28, 1974.

Class 12J

3,642,364.—TRANSFER APPARATUS. FEB. 15, 1972. AUS. 0455718, BEL. 0758808, CAN. 0918412, CZC. 0164906, EGR. 0087486, FRA. 7041650, GRB. 1336720, HUN. 0169308, ITL. 0909310, PLD. 0082862, SPN. 0385456, STZ. 0518581, USR. 0406387.

3,791,823.—PHOTOELECTROPHORETIC IMAGING TRANSFER METHOD. FEB. 12, 1974.

3,861,911.—IMAGING FIXING METHOD. JAN. 21, 1975.

3,897,143.—IMAGING SYSTEM. JULY 29, 1975.

4,065,304.—METHOD FOR FIXING INK IMAGES. DEC. 27, 1977. BEL. 848487.

Class 12K

3,510,419.—PHOTOELECTROPHORETIC IMAGING METHOD. MAY 5, 1970. ARG. 0165519, AUS. 0425666, BEL. 0717829. CAN. 0876044, FRA. 0095234, GRB. 1242262, ITL. 0896927, JAP. 0658876, MEX. 0102064, PNM. 0001975, PRU. 0010174, VZL. 0023693.

3,561,864.—ELECTROPHORETIC COATING DEVICE. FEB. 9, 1971. ARG. 0174608, ATR. 0302815, AUS. 0447649, BEL. 0739544, CAN. 0890357, FRA. 6933095, GER. 1949861, GRB. 1277806, ITL. 0873705, JAP. 0686763, MEX. 0113013.

3,609,029.—MATERIALS APPLICATION APPARATUS. SEPT. 28, 1971. BEL. 0772565, CAN. 0953097, FRA. 7133987, GRB. 1366382, ITL. 0936510.

3,619,053.—PHOTOELECTROPHORETIC IMAGING SYSTEM. NOV. 9, 1971. GRB. 1324102, JAP. 0759477.

3,620,948.—PHOTOELECTROPHORETIC IMAGING SYSTEM EMPLOYING PRELIMINARY ELECTROPHRIC DSPSTN OF IMAGNG SUSPENS. NOV. 16, 1971. ATR. 0326480, AUS. 0447819, BEL. 0739754, CAN. 0899137, FRA. 6933734, GRB. 1280027, HOL. 0146951, ITL. 0877872, JAP. 0709041, MEX. 0114889, SPN. 0372065, STZ. 0508232, SWD. 0341929, VZL. 0015070.

3,645,874.—IMAGE DENSITY CONTROL IN PHOTOELECTROPHORETIC IMAGING. FEB. 29, 1972. BEL. 0756899, CAN. 0922957, FRA. 7035803, GRB. 1331621, ITL. 0908434, JAP. 0743836.

3,658,687.—APPARATUS FOR FORMING IMAGES WITH APPLICATOR SHEARING SMOOTHING AND CLEANING MEANS. APR. 25, 1972. CAN. 0916433, GRB. 1337149, JAP. 0751881.

3,695,755.—PHOTOELECTROPHORETIC CAMERA. OCT. 3, 1972. CAN. 0938580, GRB. 1359694.

3,744,896.—IMAGING SYSTEM. JULY 10, 1973.

3,769,009.—INKING SYSTEM FOR LIQUID PARTICLE MIGRATION ON AUTOMATIC MACHINE. OCT. 30, 1973. HOL. 7216013.

3,938,088.—CHARACTER CODING AND RECOGNITION SYSTEM. FEB. 10, 1976.

3,944,353.—BACKGROUND REDUCTION. MAR. 16, 1976.

3,968,271.—COATING APPARATUS AND USE THEREOF. JULY 6, 1976.

3,993,020.—BLADE APPLICATOR ASSEMBLY. NOV. 23, 1976.

4,019,816.—COATING SYSTEM HAVING A COMPOSITE APPLICATOR ASSEMBLY PROVIDED WITH A RECIPROCATING BLADE. APR. 26, 1977.

Class 12L

3,622,691.—HIGH SPEED LIGHT RESPONSIVE TRANSFORM COMPUTER FOR A LIGHT-SENSITIVE PRINTING SYSTEM. NOV. 23, 1971. CAN. 0915813, GRB. 1335222, JAP. 0774709.

3,649,515.—PHOTOGRAPHIC MASKING SYSTEM. MAR. 14, 1972. CAN. 0936733, GRB. 1349610, JAP. 0774711.

3,715,209.—ELECTRICAL COLOR MASKING FOR A PHOTOELECTROPHORETIC IMAGING PROCESS. FEB. 6, 1973. BEL. 0763539, CAN. 0938191, FRA. 7107557, GRB. 1347139, ITL. 0918979, JAP. 0752723, MEX. 0120935.

3,810,758.—PHOTOGRAPHIC MASKING SYSTEM. MAY 14, 1974.

Class 12M

RE.27,117.—METAL FREE PHTHALOCYANINE IN THE NEW X-FORM-RE OF 3,357,989-D1170. APR. 20, 1971.

3,384,632.—ARYLAZO-4-ISOPROPOXY-1-NAPHTHOL COMPOUNDS. MAY 21, 1968. BEL. 0743897, CAN. 0787920, FRA. 1473703, GER. 1644400, GRB. 1145374, ITL. 0764015, JAP. 0578398.

3,402,177.—SUBSTITUTED 1-CYANO-2, 3-PHTHALOYL-7, 8-BENZOPYRROCOLINES. SEPT. 17, 1968. AUS. 0435189, BEL. 0743896, CAN. 0812820, GRB. 1145373.

3,432,415.—ELECTROPHORETIC IMG. PROCESS USING PHOTOSENSITIVE XANTHENONIUM SALTS. MAR. 11, 1969. AUS. 0439502, BEL. 0743895, CAN. 0851118, GER. 1522701, GRB. 1155747, JAP. 0650631, MEX. 0104632.

3,442,781.—PHOTOELECTROPHORETIC AND XEROGRAPHIC IMG. PROC. EMPL. TRIPHENODLOXAZINES AS ELECTRIC. PHOTOSENSIT. MAY 6, 1969. AUS. 0445582, BEL. 0743894, CAN. 0855152, GRB. 0175452, JAP. 0611634.

3,445,227.—ELECTROPHOTOGRAPHIC IMAGING PROCESSES EMPLOYING 2,4 DIAMINOTRIAZINES AS ELCTRCLY PHOTOSNSTV PRT. MAY 20, 1969. BEL. 0743891, CAN. 0852681, GER. 1522687, GRB. 1146019, JAP. 0617789.

3,447,922.—ELECTRICALLY PHOTOSENSITIVE PARTICLES USEFUL IN PHOTOELECTROPHORETIC AND XEROGRAPHIC IMAGING PROC. JUNE 3, 1969.

3,448,028.—N-SBSTUD-8,13-DIOXODINAPHTHO-2-1-B,2,3-D-FURAN-6-CARBOXAMIDES AS ELCTLY PTOSNSTV MTLS IN ELCPHG. JUNE 3, 1969.

3,448,029.—ELECTROPHORETIC IMAGING PROCESS USING 8,13-DIOXODINAPHTO-2,1-B,2,3-D-FURAN-6-CARBOXAMIDE PIGMEN. JUNE 3, 1969.

3,448,030.—ELECTRICALLY PHOTOSENSITIVE PART. USEFUL IN PHOTOELECTROPHORETIC AND XEROGRAPHIC IMAGING PROCESSE. JUNE 3, 1969. AUS. 0445639, BEL. 0743893, CAN. 0943830, GRB. 1155554, JAP. 0686735.

3,474,020.—PHOTOELECTROPHORETIC IMAGING PROCESS USING QUINACRIDONES. OCT. 21, 1969. ARG. 0154377, AUS. 0414491, BEL. 0683405, CAN. 0834673, FRA. 0090514, GRB. 1155403, ITL. 0842587, JAP. 0601872, MEX. 0088935, SPN. 0328503, SWD. 6608734, VZL. 0023989.

3,478,064.—1,5-BIS-SUBSTITUTED ALKYLAMINOANTHRAQUINONES. NOV. 11, 1969. ARG. 0145636, AUS. 0419687, BEL. 0683222, CAN. 0880309, FRA. 1484968, GRB. 0155985, ITL. 0771955, JAP. 0581828, MEX. 0092775, SPN. 0328428, STZ. 0461273, SWD. 0328188, VZL. 0021224.

3,485,633.—ELECTROPHORETIC IMG PROC EMPL METALLIC BAKES OF FLUORESCEIN DERIVATIVES AS ELECTRICLY PHOTOSENS. DEC. 23, 1969. AUS. 0444394, BEL. 0743641, CAN. 0848386, GER. 1572387, GRB. 1190965, JAP. 0586923.

3,492,308.—PROCESS FOR PREPARING METAL FREE PHTHALOCYANINES - SYNTHESIS OF METAL-FREE PHTHALOCYANINE. JAN. 27, 1970. CAN. 0922708, GRB. 1216887, JAP. 0586926.

3,492,309.—SYNTHESIS OF ALPHA METAL-FREE PHTHALOCYANINE. JAN. 27, 1970. CAN. 0894803, GRB. 1206306, JAP. 0604155.

3,531,309.—COMPOSITIONS COMPRISING 1-CYANO-2,3-PHTHALOYL-7,8-BENZOPYRROCOLINES AND A CARRIER. SEPT. 29, 1970.

3,546,085.—PHOTOELECTROPHORETIC IMAGING PROCESS AND SUSPENSION. DEC. 8, 1970. BEL. 0710052, CAN. 0875493, FRA. 1568088, GER. 1622380, GRB. 1208812, ITL. 0823929, JAP. 0594741.

3,560,350.—PHOTOELECTROPHORETIC IMAGING PROCESS AND ANTHRAQUINONES AS THE ELECTRICALLY PHOTOSENSITIVE PARTIC. FEB. 2, 1971. CAN. 0850590, MEX. 0096584.

3,562,248.—BISAZO PGMTS DRVD CPLRS OBTD CONDG 8-AMINO-2-NAPHTHOLS W/ DICARBOXYLIC ACID CHLORIDES. FEB. 9, 1971. ATR. 0302037, AUS. 0435392, BEL. 0743422, CAN. 0889836, FRA. 6944290, GER. 1717183, GRB. 1217905, ITL. 0879047, JAP. 0608727.

3,574,182.—CALCIUM SALT OF 6-BROMO-1-1-SULFO-2-NAPHTHYLAZO-2-NAPHTHOL. APR. 6, 1971. ARG. 0168131, ATR. 0302812, AUS. 0429649, BEL. 0710053, CAN. 0878483, CHL. 0024254, CLB. 0018785, DNK. 0128493, FIN. 0049711, FRA. 1556484, GRB. 1197374, GRK. 0036648, IND. 0114221, ISR. 0029376, ITL. 0823989, JAP. 0605213, LXB. 0055364, MEX. 0099564, NOR. 0129593, NZL. 0151403, PRU. 0009483, PTG. 0049036, SAF. 0068559, SPN. 0349965, STZ. 0524844, SWD. 0351737, URG. 0008893, VZL. 0032776.

3,594,163.—METHOD OF CONVERTING ALPHA PHTHALOCYANINE TO THE X FORM. JULY 20, 1971.

3,615,558.—PHOTOELECTROPHORETIC IMAGING PROCESS EMPLOYING A FINELY-DIVIDED PHTHALOCYANINE PIGMENT. OCT. 26, 1971. CAN. 0850022.

3,616,393.—PHOTOELECTROPHORETIC IMAGING PROCESS EMPLOYING A PIGMENT HAVING THE FORMULA RNS. OCT. 26, 1971.

3,634,221.—PIGMENT RECLAIMING. JAN. 11, 1972. BEL. 0744760, CAN. 0921427, FRA. 7001822, GRB. 1301382, ITL. 0886625.

3,635,981.—PHOTOELECTROPHORETIC IMAGING PIGMENT COMPOSITION AND PROCESS. JAN. 18, 1972. ARG. 0193337, ATR. 0305459, AUS. 0448778, BEL. 0741064, CAN. 0953143, FRA. 6937772, GER. 1955001, GRB. 1285610, ITL. 0879711, JAP. 0685461, MEX. 0114879.

3,645,883.—PHTELCTRPHRTC IMGNG APRTUS EMPLYNG PHTSNSTV PRTCLS EXHBTG 'FATIGUE CHARACTERISTICS. FEB. 29, 1972.

3,652,438.—PHTELCTRPHRTC IMGNG PROCS USNG DIVLNT HVY MTL SLT OR 1-1-SULFO-2-NAPHYLZO-2-NAPHLS AS IMGNG MAT. MAR. 28, 1972.

3,658,675.—PHOTOELECTROPHORETIC IMAGING PROCESS USING BISAZO PIGMENTS. APR. 25, 1972.

3,692,517.—PHOTOELECTROPHORETIC IMAGING PROCESS EMPLOYING AN INSULATING CARRIER LQD CNTNG UNSATURATED COMP. SEPT. 19, 1972. ARG. 0164485, AUS. 0430397, BEL. 0715670, CAN. 0913968, FRA. 1563583, GER. 1772522, GRB. 1225316, ITL. 0834948, JAP. 0641521, MEX. 0100255, VZL. 0032921.

3,705,901.—PHOTOELECTROPHORETIC IMAGING COMPOSTION. DEC. 12, 1972.

3,753,708.—PHOTOELECTROPHORETIC IMAGING PROCESS EMPLOYING QUINACRIDONE PIGMENTS. AUG. 21, 1973.

3,758,305.—PHOTOELECTROPHORETIC IMAGING PROCESS. SEPT. 11, 1973.

3,825,422.—IMAGING PROCESS. JULY 23, 1974. CAN. 0984201, GRB. 1442667.

3,867,141.—PHOTOELCTRC AND ELCTRPHOTGRPHC PGMNTS COMPRISNG DERIVATIVS OF CNDNSD PLYCLC AROMTC HYDROCRBN ALDE. FEB. 18, 1975.

3,922,169.—PHOTOELECTRIC AND ELECTROPHOTOGRAPHIC PIGMENTS COMPRISING DERIVATIVES OF CONDENSED POLYCYCLIC A. NOV. 25, 1975.

3,923,506.—PHOTOELECTRIC AND ELECTROPHOTOGRAPHIC PIGMENTS COMPRISING DERIVATIVES OF CONDENSED POLYCYCLIC A. DEC. 2, 1975.

3,953,462.—IMAGING PROCESS. APR. 27, 1976. ARG. 0202139, BEL. 0821400, GRB. 1467999.

3,957,829.—CERTAIN DINAPHTHO (1,2-B,2',3'-D)-FURAN-7,12 DIONES. MAY 18, 1976.

4,012,252.—IMAGING PROCESS UTILIZING 3-BROMO-N-2''-PYRIDYL-8,13-DIOXODIMAPHTHO-(2,1-; 3',3'-)-EURON-6-CARBO. MAR. 15, 1977. ARG. 0202139, BEL. 0821400, GRB. 1467999.

4,017,311.—PHOTOELECTROPHORETIC IMAGING SUSPENSION. APR. 12, 1977.

4,032,339.—PHOTOSENSITIVE COMPOSITION CONTAINING VANADYL PHTHALOCYANINE FOR PHOTOELECTROPHORECTIC IMAGING. JUNE 28, 1977.

4,062,854.—PROCESS FOR PREPARING N-SUBSTITUTED-8,13-DIOXODINAPHTHO-(2,1-B; 2,3-D)FURAN-6-CARBOXAMIDE. DEC. 13, 1977. CAN. 1023360, FRA. 7423881.

4,076,527.—PHOTOSENSITIVE COMPOSITION USEFUL IN PHOTOELECTROPHORETIC IMAGING. FEB. 28, 1978.

4,104,064.—PHOTOELECTROPHORETIC IMAGING METHOD EMPLOYING DINAPHTHO-FURAN-DIONE PIGMENTS. AUG. 1, 1978.

Class 12N

3,466,722.—ELECTROPHORETIC REFINING OF PHOTOSENSITIVE PARTICLES. MAY 27, 1969. AUS. 0424699, BEL. 0743903, CAN. 0840368. GER. 1622376, GRB. 1189636.

3,473,940.—PREPARATION OF PHOTOELECTROPHORETIC IMAGING SUSPENSION. OCT. 21, 1969. BEL. 0743899, CAN. 0847808, FRA. 1524448, GER. 1572386, GRB. 1161780, ITL. 0794432, JAP. 0594583, MEX. 0097623.

3,477,934.—IMAGING PROCESS. NOV. 11, 1969. ARG. 0158372, AUS. 0416251, BEL. 0700645, CAN. 0850023, FRA. 1550998, GRB. 1196044, ITL. 0804665, JAP. 0725097, MEX. 0098737, SPN. 0342376, STZ. 0481408, SWD. 0336525, VZL. 0021263.

3,551,313.—IMAGE CONTRAST CONTROL IN PHOTOELECTROPHORETIC IMAGING - PHAROS CONTRAST CONTROL. DEC. 29, 1970. ATR. 0302814, AUS. 0448317, BEL. 0738218, CAN. 0899689, FRA. 6929449, GER. 1944510, GRB. 1274525, ITL. 0871538, JAP. 0708365, SWD. 0341130.

3,553,093.—COLOR PHOTOELECTROPHORETIC IMAGING PROCESS. JAN. 5, 1971. ATR. 0286783, AUS. 0416331, BEL. 0692911, CAN. 0818388, FRA. 1471745, GER. 1522743, GRB. 1149665, IND. 0104183, ISR. 0025304, ITL. 0762674, JAP. 0608337, MEX. 0089790, NOR. 0123368, NZL. 0144531, STZ. 0479099, SWD. 0334540.

3,586,615.—PHOTOELECTROPHORETIC IMAGING PROCESS INCLUDING THE USE OF AN ELECTRICALLY CHRGD SUSPNSN COATNG. JUNE 22, 1971. BEL. 0743921, CAN. 0891972, FRA. 6945567, GER. 1965460, GRB. 1284429, HOL. 1284429, ITL. 0880418, JAP. 0729281.

3,595,770.—SEQUENTIAL PHOTOELECTROPHORETIC IMAGING SYSTEM. JULY 27, 1971. ARG. 0176384, ATR. 0299697, AUS. 0429715, BEL. 0722300, BRA. 0087996, CAN. 0891970, CHL. 0024332, DNK. 0126879, FRA. 1589548, GRB. 1239259, ITL. 0845021, LXB. 0057101, MEX. 0103850, NZL. 0154114, PNM. 0001418, PTG. 0050485, SAF. 0686705, SPN. 0359239, STZ. 0496265, SWD. 0339172, URG. 0009317, VZL. 0023705.

3,601,483.—IMAGING APPARATUS. AUG. 24, 1971.

3,607,256.—FULLY-ENCLOSED ELECTROPHORETIC IMAGING SYSTEM. SEPT. 21, 1971.

3,616,390.—ELECTROPHORETIC IMAGING METHOD CHARACTERIZED BY EXPOSURE OF ELECTRCLY PHOTSNSTV PRTCLS AT LIQUI. OCT. 26, 1971. ATR. 0322980, AUS. 0448380. BEL. 0743423, CAN. 0890356, FRA. 6944288, GER. 1947105, GRB. 1249546, ITL. 0879048, JAP. 0688351.

3,616,395.—PHOTOELECTROPHORETIC IMAGING WITH CORONA FIELD APPLICATION. OCT. 26, 1971. CAN. 0922142, GRB. 1318565, JAP. 0756962.

3,620,950.—ELECTROPHORETIC IMAGING EMPLOYING PERIODIC ELECTROMAGNETIC RADIATION. NOV. 16, 1971. ATR. 0302045, AUS. 0449606, BEL. 0739750, CAN. 0887022, FRA. 5934262, GRB. 1283384, ITL. 0877875, JAP. 0718339.

3,634,221.—PIGMENT RECLAIMING. JAN. 11, 1972. BEL. 0744760, CAN. 0921427, FRA. 7001822, GRB. 1301382, ITL. 0886625.

3,642,598.—PHOTOELECTROPHORETIC IMAGING METHOD AND APPARATUS. FEB. 15, 1972. ARG. 0188632, BEL. 0756481, CAN. 0922144, FRA. 7034709, GRB. 1324105, ITL. 0908073, JAP. 0740359, MEX. 0115601, VZL. 0032786.

3,645,874.—IMAGE DENSITY CONTROL IN PHOTOELECTROPHORETIC IMAGING. FEB. 29, 1972. BEL. 0756899, CAN. 0922957, FRA. 7035803, GRB. 1331621, ITL. 0908434, JAP. 0743836.

3,645,883.—PHTELCTRPHRTC IMGNG APRTUS EMPLYNG PHTSNSTV PRTCLS EXHBTG FATIGUE CHARACTERISTICS. FEB. 29, 1972.

3,647,659.—PHTELCTRPHRTC IMGNG PRCS WHEREIN IMGNG ELCTRCL FLD APPLD SUBSEQUENT TO IMAGE WISE EXPOSURE. MAR. 7, 1972. BEL. 0772912, CAN. 0958581, FRA. 7134730, GRB. 1354798, ITL. 0936734.

3,657,091.—ELECTROPHORETIC IMAGING METHOD EMPLOYING A PERIODIC ELECTRIC FIELD. APR. 18, 1972. ARG. 0174612, ATR. 0302816, AUS. 0448527, BEL. 0739752, CAN. 0913970, FRA. 6933735, GRB. 1282469, ITL. 0889439, JAP. 0709039, MEX. 0114739.

3,663,396.—KINESCOPE PHOTOELECTROPHORETIC IMAGING METHODS AND SYSTEMS. MAY 16, 1972. ARG. 0196858, BEL. 0762417, CAN. 0935965, FRA. 7104350, GRB. 1345571, ITL. 0918121, JAP. 0743838, MEX. 0131834.

3,664,943.—PHTELCTRPHRTC REVERSAL IMGNG USNG SUSPENSION CONTAINING VITAMIN PRECURSOR, B-CAROTENE. MAY 23, 1972.

3,666,472.—ELECTROPHORETIC IMAGING COMPOSITION - IMPROVEMENT OF PHAROS POLYCHROME IMAGING SYSTEM. MAY 30, 1972. ATR. 0302042, AUS. 0455711, BEL. 0739753, CAN. 0899138, FRA. 6933736, GRB. 1279284, HOL. 0147548, ITL. 0889440, JAP. 0709040, MEX. 0116450.

3,669,872.—IMAGING SYSTEM. JUNE 13, 1972.

3,676,313.—REMOVING UNDESIRED POTENTIAL FROM BLOCKING ELECTRODE IN A PHOTOELECTROPHORETIC IMAGING SYSTEM. JULY 11, 1972.

3,681,221.—PHOTOELECTROPHORETIC IMAGING BY PHOSPHORESCENCE. AUG. 1, 1972. CAN. 0935013, GRB. 1348121.

3,696,020.—ELECTROPHORETIC IMGNG APRTS INCLUDING MEANS TO COAT AND ELCTRFY IMGNG ELCTRODE. OCT. 3, 1972.

3,723,288.—ELECTROPHORETIC IMAGING APPARATUS INCLUDING MEANS TO PROJECT AN IMAGE AT A LIQUID NIP. MAR. 27, 1973.

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3,737,310.—BACKGROUND REDUCTION. JUNE 5, 1973.
3,741,639.—PHOTOELECTROPHORETIC IMAGING BY PHOSPHORESCENCE. JUNE 26, 1973.
3,741,760.—IMAGING SYSTEM. JUNE 26, 1973.
3,748,035.—METHOD FOR SEQUENTIAL ILLUMINATION IN A POLYCHROME PROCESS. JULY 24, 1973. CAN. 0960288, GRB. 1416328.
3,772,013.—PHOTOELECTROPHORETIC IMAGING PROCESS EMPLOYING ELECTRICALLY PHOTOSENSITIVE PARTICLES AND INERT PA. NOV. 13, 1973. ARG. 0196295, ATR. 0327682, BEL. 0777724, CAN. 0957543, FRA. 7200998, GRB. 1370026, ITL. 0946356, JAP. 0759477, MEX. 0124561, SPN. 0398586, SWD. 0367075, VZL. 30687.
3,782,932.—ELECTROPHORETIC IMAGING PROCESS USING TRANSPARENT PARTICLES. JAN. 1, 1974. ATR. 0302043, AUS. 0446066, BEL. 0743424, CAN. 0913441, FRA. 6944289, GER. 1949149, GRB. 1280900, ITL. 0897053. JAP. 0699518.
3,785,816.—ELIMINATING CORONA ARCING IN PHOTOELECTROPHORETIC IMAGING. JAN. 15, 1974.
3,787,206.—PHOTOELECTROPHORETIC IMAGING METHOD INCLUDING AT LEAST ONE ELECTRODE CARRYING A PATTERN. JAN. 22, 1974.
3,801,195.—ELECTROPHORETIC IMAGING. APR. 2, 1974. ARG. 0174613, ATR. 0293874, AUS. 0455712, BEL. 0739747, CAN. 0922141, FRA. 6933738, GER. 1949416, GRB. 1279285, HOL. 0146950, ITL. 0877873, JAP. 0709042, MEX. 0108820.
3,804,620.—METHOD OF PRODUCING PLANOGRAPHIC PLATES BY PHOTOELECTROPHORETIC IMAGING. APR. 16, 1974.
3,811,764.—APPARATUS FOR PHOTOELECTROPHORETIC IMAGING USING A PERIODIC ELECTRIC FIELD. MAY 21, 1974.
3,850,627.—ELECTROPHORETIC IMAGING METHOD. NOV. 26, 1974. BEL. 0777719, FRA. 7201005, GRB. 1376241, ITL. 0946357.
3,857,549.—PHOTOELECTROPHORETIC IMAGING APPARATUS. DEC. 31, 1974.
3,857,707.—PHOTOELECTROPHORETIC IMAGING PROCESS USING DRY PIGMENT COATED SUBSTRATE. DEC. 31, 1974.
3,881,920.—PHOTOELECTROPHORETIC IMAGING PROCESS. MAY 6, 1975.
3,901,701.—PHOTOELECTROPHORETIC IMAGING PROCESS USING PHOTOCONDUCTIVE ELECTRODE WHICH ALTERS SPECTRAL RESPONSE. AUG. 26, 1975.
3,905,812.—IMAGING PROCESS. SEPT. 16, 1975. FRA. 7413994, GRB. 1443121.
3,920,330.—ELECTROPHORETIC IMAGING APPARATUS. NOV. 18, 1975. BEL. 0777719, CAN. 0961334, FRA. 7201005, GRB. 1376241, ITL. 0946357.
3,933,487.—IMAGING COMPOSITION FOR PHOTOELECTROPHORETIC IMAGING SYSTEM. JAN. 20, 1976. CAN. 0973005, GRB. 1375941.
3,954,465.—ELECTROPHORETIC IMAGING METHODS. MAY 4, 1976. BEL. 0777719, FRA. 7201005, GRB. 1376241, ITL. 0946357.
3,961,949.—PHOTOELECTROPHORETIC IMAGING METHOD PRODUCING A DESIRED IMAGE BORDER. JUNE 8, 1976.
3,967,960.—PHOTOELECTROPHORETIC IMAGING PROCESS EMPLOYING DARK CHARGE INJECTING ELEMENT. JULY 6, 1976.
4,023,968.—PHOTOELECTROPHORETIC COLOOR IMAGING PROCESS IN WHICH BACK MIGRATION IS ELIMINATED. MAY 17, 1977.
4,069,047.—TRANSFER OF PHOTOELECTROPHORETIC IMAGES. JAN. 17, 1978.
4,078,928.—PHOTOELECTROPHORETIC IMAGING SYSTEM. MAR. 14, 1978.

Class 12O

3,647,660.—PHOTOELECTROPHORETIC IMAGING METHOD EMPLOYING A HALOGEN CONTAINING SUSPENSION. MAR. 7, 1972.
3,869,286.—PHOTOELECTROPHORETIC IMAGING WITH COPPER-FREE CHLOROPHYLL IN THE CARRIER LIQUID. MAR. 4, 1975.

Class 12P

RE.28,260.—ELECTROPHORETIC IMAGING PROCESS INCLUDING APPL OF DYNAMIC STRESS ON THE PARTICLE SUSPENSION. DEC. 3, 1974. ARG. 0174614, ATR. 0302044, AUS. 0448318, BEL. 0739748, CAN. 0890358, FRA. 6934260, GER. 1949148, GRB. 1282736, HOL. 0146301, ITL. 0877874, JAP. 0718340, MEX. 0108886.
3,595,772.—METHOD OF BREAKING PARTICLE AGGLOMERATES IN THE PHOTO-ELECTROPHORETIC IMAGING SYSTEM. JULY 27, 1971. ARG. 0176808, ATR. 0293875, AUS. 0445175, BEL. 0739749, CAN. 0912398, FRA. 6934261, GRB. 1290370, ITL. 0887503, JAP. 0712831, MEX. 0127747.
3,616,391.—ELECTROPHRTC IMGNG PRCSS INC APPLCTN OF DYNAMIC STRESS ON PARTCL SUSPSN-REISSUED D 2177R. OCT. 26, 1971. ARG. 0174614, ATR. 0302044, AUS. 0448318, BEL. 0739748, CAN. 0890358, FRA. 6934260, GER. 1949148, GRB. 1282736, HOL. 0146301, ITL. 0877874, JAP. 0718340, MEX. 0108886.
3,666,472.—ELECTROPHORETIC IMAGING COMPOSITION - IMPROVEMENT OF PHAROS POLYCHROME IMAGING SYSTEM. MAY 30, 1972. ATR. 0302042, AUS. 0455711, BEL. 0739753, CAN. 0899138, FRA. 6933736, GRB. 1279284, HOL. 0147548, ITL. 0889440, JAP. 0709040, MEX. 0116450.
3,743,404.—PHTOELECTROPHORETIC IMGNG APPTS INCNG MEANS TO SIMULTNUSLY APPLY COMPRSVE STRESS AND SHEAR TO IMGNG. JULY 3, 1973.
3,784,302.—ELECTROPHORETIC IMAGE APPARATUS INCLUDING APPLICATION OF DYNAMIC STRESS ON THE PARTICLE SUSPENS. JAN. 8, 1974.
3,833,493.—IMAGING PROCESS. SEPT. 3, 1974.
3,943,049.—APPARATUS FOR SEPARATING AGGLOMERATED PARTICLES WITH SUSPENSION. MAR. 9, 1976.

Class 12Q

3,642,364.—TRANSFER APPARATUS. FEB. 15, 1972. AUS. 0455718, BEL. 0758808, CAN. 0918412, CZC. 0164906, EGR. 0087486, FRA. 7041650, GRB. 1336720, HUN. 0169308, ITL. 0909310, PLD. 0082862, SPN. 0385456, STZ. 0518581, USR. 0406387.
3,655,370.—PHOTOELECTROPHORETIC IMAGE TRANSFER. APR. 11, 1972.
3,705,797.—FIXING PROCESS FOR PHOTOELECTROPHORETIC IMAGING. DEC. 12, 1972.
3,711,196.—IMAGE TRANSFER. JAN. 16, 1973.
3,791,823.—PHOTOELECTROPHORETIC IMAGING TRANSFER METHOD. FEB. 12, 1974.
3,804,508.—PHOTOELECTROPHORETIC APPARATUS FOR HEAT FACING AN IMAGE. APR. 16, 1974.
3,897,143.—IMAGING SYSTEM. JULY 29, 1975.
4,065,304—METHOD FOR FIXING INK IMAGES. DEC. 27, 1977. BEL. 848487.

Class 12R

3,574,614.—PROCESS OF PREPARING MULTIPLE COPIES FROM A XEROPRINTING MASTER. APR. 13, 1971. ATR. 0305769, AUS. 0448396, BEL. 0743660, CAN. 0882599, FRA. 6944513, GRB. 1209060, ITL. 0899118, JAP. 0710908.
3,607,256.—FULLY-ENCLOSED ELECTROPHORETIC IMAGING SYSTEM. SEPT. 21, 1971.
3,682,628.—PHOTOELECTROPHORETIC FACSIMILE TRANSMISSION. AUG. 8, 1972. CAN. 0957889, GRB. 1365163.
3,800,302.—RECORDING OSCILLOGRAPH UTILIZING PHOTOELECTROPHORETIC TECHNIQUES. MAR. 26, 1974.
3,849,132.—PHOTOELECTROPHORETIC IMAGING METHOD EMPLOYING A CHROMOGENIC REACTION. NOV. 19, 1974. BEL. 0809399, GRB. 1447104.
3,938,088.—CHARACTER CODING AND RECOGNITION SYSTEM. FEB. 10, 1976.

Class 15

3,693,517.—PRINTING APPARATUS—KALEIDOSCOPE PRINTER WITH CIRCUMFERENTIAL STRIPS. SEPT. 26, 1972. CAN. 0948265, GRB. 1330327.
3,801,319.—IMAGING METHOD UTILIZING CHEMICAL REACTIVITIES OF PHOTOEXCITED STATES OF AROMATIC HYDROXY COMPO. APR. 2, 1974. CAN. 1000549, GRB. 1429501.
3,847,644.—IMAGING BY PHASE AGGREGATION FROM BLOCK COPOLYMERS. NOV. 12, 1974.
3,851,584.—CHEMICAL REPRODUCTION SYSTEMS. DEC. 3, 1974.
3,888,670.—IMAGING METHOD. JUNE 10, 1975.
3,915,706.—IMAGING SYSTEM BASED ON PHOTODEGRADABLE POLYALDEHYDES. OCT. 28, 1975.

3,923,514.—METHOD FOR THE PREPARATION OF RELIEF PRINTING MASTERS. DEC. 2, 1975.
3,929,477.—IMAGE PRODUCING TECHNIQUES OF SUPERCONDUCTING MATERIAL IN A MAGNETIC FIELD. DEC. 30, 1975.
3,930,858.—HEAT DEVELOPMENT PROCESS UTILIZING A PHOTOSENSITIVE COMPOSITION CONTAINING A HALOGENATED POLYME. JAN. 6, 1976.
3,963,491.—IMAGING METHOD. JUNE 15, 1976.
3,986,874.—DRIOGRAPHIC IMAGING METHOD. OCT. 19, 1976.
3,990,043.—CHARACTER CODING AND RECOGNITION SYSTEM. NOV. 2, 1976.
4,009,466.—CHARACTER CODING AND RECOGNITION SYSTEM. FEB. 22, 1977.
4,032,980.—RECORDED MAGNETIC MEMBER VIEWING APPARATUS. JUNE 28, 1977.
4,043,298.—MAGNETIC TONER SCAVENGING SYSTEM. AUG. 23, 1977.
4,064,453.—MAGNETIC FIELD DETECTOR. DEC. 20, 1977.
4,074,276.—MAGNETIC IMAGING SYSTEM USING HEAT. FEB. 14, 1978.
4,076,387.—MAGNETIC DISPLAY. FEB. 28, 1978.
4,089,684.—IMAGING METHOD UTILIZING THE CHEMICAL REACTIVITY OF DONOR-ACCEPTOR MIXTURES. MAY 16, 1978.
4,095,233.—METHOD FOR FORMING A CHARGE PATTERN. JUNE 13, 1978.
4,100,088.—IMAGING COMPOSITION. JULY 11, 1978.
4,101,943.—CONTROLLED-WIDTH-SYNCHRONIZATION OF RECORDED PIXELS. JULY 18, 1978.
4,115,786.—CONSTANT WAVELENGTH MAGNETIC RECORDING. SEPT. 19, 1978.
4,133,683.—AGGLOMERATION IMAGING METHOD. JAN. 9, 1979.
4,135,194.—ROTARY HEAD MAGNETIC RECORDING AT FIXED WAVELENGTH WITH VARYING SPEEDS. JAN. 16, 1979.

Class 15A

3,320,060.—DEFORMATION IMAGE REPRODUCTION PROCESS UTILIZING A VOLTAGE THRESHOLD REDUCING SURFACTANT. MAY 16, 1967. CAN. 0807325, FRA. 1416119, GER. 1261867, GRB. 1097919, ITL. 0739830, JAP. 0519668.
3,338,710.—FROST THERMOGRAPHY. AUG. 29, 1967.
3,404,001.—THERMOPLASTIC DEFORMATION IMAGING WITH COLOR REAGENTS. OCT. 1, 1968. CAN. 0801265, FRA. 1459100, GER. 1497214, GRB. 1124925, ITL. 0725974, JAP. 0529727.
3,615,387.—STRIPPABLE LAYER RELIEF IMAGING PROCESS. OCT. 26, 1971. CAN. 0887033.
3,697,184.—APPARATUS FOR EVALUTING THE RECORDING CHARACTERISTICS OF A THERMOPLASTIC PHOTORECEPTOR. OCT. 10, 1972. CAN. 1083484, GRB. 1389471.
3,715,207.—ELCTRSTCLY DEFORMABLE THERMOPLASTIC LAYER CONTAINING A 1,4-DIALKYLAMINO-9, 10-ANTHRAQUINONE DYE. FEB. 6, 1973.
3,729,310.—SURFACE DEFORMABLE IMAGING PROCESS AND MEMBER. APR. 24, 1973.
3,741,759.—FROST IMAGING PROCESS. JUNE 26, 1973.
3,795,514.—DEFORMATION IMAGING METHOD. MAR. 5, 1974.
3,869,612.—COPY APPARATUS WITH MEANS TO EFFECT VISIBLE RAY IMAGING AND INFRARED RAY TRANSFIXING. MAR. 4, 1975. STZ. 0032775.
3,893,416.—DEVELOPMENT AND CLEANING APP FOR REVERSE PATH MACHINE. JULY 8, 1975.
3,902,062.—REVERSE PATH IMAGING AND TRANSFIXING COPYING METHOD. AUG. 26, 1975. BEL. 0823656.
3,904,875.—SINGLE RADIATION RAY PATH FOR THERMOGRAPHIC IMAGING & TRANSFIXING OR FUSING. SEPT. 9, 1975. ARG. 0207128.
3,906,896.—INK APPLICATOR. SEPT. 23, 1975. CAN. 0974753.
3,908,125.—REVERSE PATH IMAGING AND TRANSFIXING COPYING MACHINE. SEPT. 23, 1975.
3,909,613.—COPYING METHOD AND APP WITH MEANS TO EFFECT VISIBLE RAY IMAGING AND INFRARED RAY TRANSFIXING OR FUS. SEPT. 30, 1975.
3,923,004.—DEVELOPMENT AND CLEANING APPARATUS FOR REVERSE PATH MACHINE. DEC. 2, 1975. BEL. 0823656.
3,932,025.—IMAGING SYSTEM. JAN. 13, 1976.
3,944,358.—COLOR IMAGE REPRODUCTION SYSTEMS. MAR. 16, 1976.
3,946,230.—COPY METHOD UTILIZING SINGLE RADIANT RAY PATH FOR IMAGING AND TRANSFIXING. MAR. 23, 1976.
3,949,160.—ELECTRO-OPTIC READ OUT OF THERMOPLASTIC DEFORMATION PATTERNS. APR. 6, 1976.
3,951,533.—COLOR IMAGE REPRODUCTION SYSTEM. APR. 20, 1976.
3,984,262.—METHOD OF MAKING A SUBSTRATE STRIPED PLANAR LASER. OCT. 5, 1976.
3,997,243.—COLOR IMAGE REPRODUCTION SYSTEM. DEC. 14, 1976.
4,023,969.—DEFORMABLE ELASTOMER IMAGING MEMBER EMPLOYING AN INTERNAL OPAQUE DEFORMABLE METALLIC LAYER. MAY 17, 1977.
4,051,463.—METHOD AND APPARATUS FOR INVERTING THE POLARITY OF AN INPUT IMAGE FORMED ON A SURFACE OF AN. SEPT. 27, 1977. FRA. 7701769.
4,063,222.—SELECTIVE ERASURE OF IMAGE RECORDING DEVICES. DEC. 13, 1977. FRA. 7701592.
4,099,262.—AUTOMATIC MEMORY CONTROL FEEDBACK SYSTEM FOR A CYCLING OPTICAL IMAGING SYSTEM. JULY 4, 1978.
4,109,316.—METHOD AND APPARATUS FOR INVERTING THE POLARITY OF AN INPUT IMAGE FORMED ON A SURFACE OF. AUG. 22, 1978.
4,133,611.—TWO-PAGE INTERWEAVED RANDOM ACCESS MEMORY CONFIGURATION. JAN. 9, 1979.

Class 15B

3,350,205.—METHOD OF IMAGE REPRODUCTION BY PHOTOPOLYMERIZATION AND BLUSHING. OCT. 31, 1967. CAN. 0717934, GRB. 1095174, JAP. 0561238.
3,561,962.—METHOD OF IMAGE REPRODUCTION BY PHOTOPOLYMERIZATION AND BLUSHING. FEB. 9, 1971.
3,834,906.—LIGHT ACTIVATING IMAGING PROCESS. SEPT. 10, 1974.
3,885,963.—LIGHT ACTIVATING IMAGING PROCESS. MAY 27, 1975.
3,890,147.—LIGHT ACTIVATING IMAGING PROCESS. JUNE 17, 1975.
3,892,180.—LIGHT ACTIVATING IMAGING PROCESS. JULY 1, 1975.
3,892,570.—LIGHT ACTIVATING IMAGING PROCESS. JULY 1, 1975.

Class 15B 2

3,862,841.—POLYMERIZATION IMAGING BY CHARGE INJECTION FROM A PHOTOCONDUCTIVE LAYER. JAN. 28, 1975.

Class 15C

3,250,636.—MTD AND APTS IMAGE REPRODCTN W/USE OF REUSABLE HEAT / DEMAGNETIZABLE FERROMAGNETIC IMAGING LAYER. MAY 10, 1966. CAN. 0711404, GRB. 1070986, JAP. 0487336.
3,526,191.—DUPLICATING PROCESS EMPLOYING MAGNETIC DEVELOPER MATERIAL. SEPT. 1, 1970. CAN. 0903830, GER. 1671576, GRB. 1208307.
4,014,065.—MAGNETIC DEVELOPER REMOVAL SYSTEM. MAR. 29, 1977.
4,030,104.—THERMO-MAGNETIC IMAGE TRANSFER APPARATUS. JUNE 14, 1977.
4,032,923.—THERMOMAGNETIC IMAGING APPARATUS. JUNE 28, 1977.
4,035,810.—MAGNETIC INTERPOSITIVE METHOD WITH ELECTROSTATIC IMAGING. JULY 12, 1977.
4,038,665.—DONOR TRANSFER OF MAGNETIC TONER. JULY 26, 1977.
4,060,811.—MAGNETIC LATENT IMAGE CREATION. NOV. 29, 1977.
4,067,018.—EXCESSIVE MAGNETIC DEVELOPER DISPLACEMENT SYSTEM. JAN. 3, 1978.
4,092,954.—HIGH SPEED TANK DEVELOPMENT SYSTEM. JUNE 6, 1978.
4,096,485.—SUCCESSIVE DEVELOPMENT MAGNETIC IMAGING APPARATUS. JUNE 20, 1978.
4,101,320.—MAGNETIC IMAGING METHOD. JULY 18 1978.
4,101,904.—MAGNETOGRAPHIC IMAGING MEMBER AND THE METHOD OF ITS USE. JULY 18, 1978.
4,101,943.—CONTROLLED-WIDTH-SYNCHRONIZATION OF RECORDED PIXELS. JULY 18, 1978.
4,108,111.—DEVELOPER HOUSING. AUG. 22, 1978.
4,108,112.—DEVELOPER HOUSING. AUG. 22, 1978.

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4,112,156.—MAGNETIC TONER RECOVERY METHOD USING ALTERNATING MAGNETIC FIELD POLARITIES. SEPT. 5, 1978. GRB. 1530562.
4,115,786.—CONSTANT WAVELENGTH MAGNETIC RECORDING. SEPT. 19, 1978.
4,121,261.—SYNCHRONOUS HELICAL SCAN-HELICAL RECORD MAGNETIC IMAGING. OCT. 17, 1978.
4,135,194.—ROTARY HEAD MAGNETIC RECORDING AT FIXED WAVELENGTH WITH VARYING SPEEDS. JAN. 16, 1979.
4,138,685.—RECORDING WITH IMAGEWISE ALTERATION OF MAGNETIC ATTRACTION OF DONOR. FEB. 6, 1979.

Class 15D

3,441,410.—DEFORMATION IMAGING PROCESSES USING ELECTRICALLY PHOTOSENSITIVE PHOTOCHROMIC MATERIALS. APR. 29, 1969. CAN. 0801267, FRA. 1485348, GER. 1522696, GRB. 1156151, JAP. 0545759.
3,441,411.—IMAGE FORMATION THROUGH CHEMICAL REACTION OF PHOTOCHROMIC MATER. APR. 29, 1969. CAN. 0834676, GRB. 1165215.
3,442,646.—FRMATION OF LIGHT SCATTERING IMGS IN LAYERS COMPRSNG ORGANIC PHOTOCHROMIC MATERIALS. MAY 6, 1969. GRB. 1164484.
3,450,530.—PHOTOGRAPHIC IMAGING BY MEANS THE SURFACE TENSION CREATED BY PHOTOCHROMIC MATERIALS. JUNE 17, 1969.
3,450,531.—ADHESIVE IMAGING ON PHOTOCHROMIC LAYERS. JUNE 17, 1969.
3,450,533.—FORMATION OF LIGHT SCATTERING IMAGES IN PHOTOCHROMIC LAYERS. JUNE 17, 1969. CAN. 0875500.
3,451,811.—ELECTROPHOTOGRAPHIC IMAGING PROCESSES USING ELECTRICALLY PHOTOSENSITIVE PHOTOCHROMIC MATERIALS. JUNE 24, 1969. CAN. 0828692, JAP. 0573734.
3,471,290.—PHOTOCHROMIC PHOTORESIST IMAGING. OCT. 7, 1969.
3,482,973.—IMAGING SYSTEM. DEC. 9, 1969.
3,967,964.—PHOTOSENSITIVE FILM COPRINSING AN ORGANOSELENIUM AND AN ORGANSMERCURY. JULY 6, 1976.
3,973,966.—PHOTOCHROMIC COMPOSITION CONTAINING A DIPHENYL DIBENZOCHRON-3-ENE. AUG. 10, 1976.
4,007,372.—IMPROVED METHOD & ARTICLE FOR IMAGE REPRODUCTION. FEB. 8, 1977.
4,050,937.—IMAGEWISE EXPOSING AND HEATING A MICROIMAGING FILM CONTAINING AN ORGANO DISELENIDE, A TERTI. SEPT. 27, 1977.
4,050,939.—MICROIMAGING FILM CONTAINING AN ORGANO DISELENDIE, A TERTIARY PHOSPHINE OR PHOSPHITE AND AN. SEPT. 27, 1977.
4,106,936.—MICROIMAGING FILM CONTAINING AN ORGANIC DISELENIDE, A TERTIARY PHOSPHINE OR PHOSPHITE & IN. AUG. 15, 1978.

Class 15D 3

4,133,611.—TWO-PAGE INTERWEAVED RANDOM ACCESS MEMORY CONFIGURATION. JAN. 9, 1979.

Class 15E

3,635,708.—VESICULAR IMAGING PROCESS. JAN. 18, 1972.
3,847,644.—IMAGING BY PHASE AGGREGATION FROM BLOCK COPOLYMERS. NOV. 12, 1974.

Class 15F

3,396,401.—APPARATUS AND METHOD FOR MARKING OF INTELLIGENCE ON A RECORD MEDIUM. AUG. 6, 1968.
3,671,237.—METHOD FOR PRODUCING IMAGES. JUNE 20, 1972. CAN. 0886492, GRB. 1317043.
3,753,705.—AGGLOMERATION IMAGING PROCESS USING HARDENABLE MATERIAL. AUG. 21, 1973. CAN. 0929350, GRB. 1330518.
4,029,502.—IMAGING SYSTEM CONTAINING AGGLOMERABLE MATERIAL. JUNE 14, 1977. ARG. 0172317, BEL. 0737883, CAN. 0884217, FRA. 6928725, GER. 1942380, GRB. 1286501, ITL. 0870234, SWD. 0340954.
4,082,549.—AGGLOMERATION IMAGING PROCESS. APR. 4, 1978.
4,084,966.—IMAGING SYSTEM USING AGGLOMERABLE MIGRATION MARKING MATERIAL. APR. 18, 1978.
4,133,683.—AGGLOMERATION IMAGING METHOD. JAN. 9, 1979.

Class 17A

3,909,609.—LIGHT SOURCE MEASURING APPARATUS. SEPT. 30, 1975.

Class 17A 1

2,774,887.—RADIATION SENSING DEVICE. DEC. 18, 1956.
3,445,660.—METHOD FOR DETECTION OF ULTRAVIOLET RADIATION. MAY 20, 1969.

Class 17A 2

3,330,700.—SOLAR-CELL PANELS. JULY 11, 1967.
3,359,137.—SOLAR CELL CONFIGURATION. DEC. 19, 1967.
3,513,040.—RADIATION RESISTANT SOLAR CELL. MAY 19, 1970.

Class 17A 3

3,351,493.—DIFFUSED RADIATION TRACKING TRANSDUCER HAVING A LATERAL PHOTO VOLTAGE JUNCTION. NOV. 7, 1967.
3,443,102.—SEMICONDUCTOR PHOTOCELL DETECTOR WITH VARIABLE SPECTRAL RESPONSE. MAY 6, 1969.

Class 17A 4

3,901,607.—HIGH APERTURE REFLECTION PHOTODETECTOR APPARATUS. AUG. 26, 1975.
4,085,321.—MULTIPHASE PHOTOACTIVATED SWITCH. APR. 18, 1978.

Class 17B

3,650,604.—INTER-FERAMETRIC SCANNING APPARATUS AND METHOD. MAR. 21, 1972. CAN. 0954354, GRB. 1363263.
3,650,605.—INTERFERAMETRIC APPARATUS WITH CONTROLLED SCANNING MEANS. MAR. 21, 1972. CAN. 0952749.
3,902,061.—DIGITAL OPTICAL COMPUTER TECHNIQUES. AUG. 26, 1975.
3,978,342.—DUAL MODE RADIATION TRANSMITTING APPARATUS. AUG. 31, 1976.
3,987,685.—CURSOR POSITION DEVICE. OCT. 26, 1976.
4,162,118.—WAVEGUIDE IMAGING SYSTEM. JULY 24, 1979.

Class 17B 1

3,476,473.—FONT INDICATOR. NOV. 4, 1969.
3,481,668.—IMAGE PROJECTION APPARATUS. DEC. 2, 1969.
3,501,838.—PANTOGRAPHIC IMPLEMENTED OVERHEAD PROJECTOR. MAR. 24, 1970.
3,670,633.—RECORDING APPARATUS. JUNE 20, 1972.
3,677,148.—OPTICAL RECORDER. JULY 18, 1972.
3,678,820.—OPTICAL SYSTEM FOR PROJECTION RECORDING APPARATUS. JULY 25, 1972.
3,685,406.—OPTICAL RECORDER. AUG. 22, 1972. BEL. 0777014, CAN. 0960743, FRA. 7146254, GRB. 1372379, ITL. 0944111.
3,695,161.—ALPHANUMERIC PROJECTION DISC ASSEMBLY. OCT. 3, 1972.
3,700,325.—OPTICAL SYSTEM FOR PHOTOCOPYING APPARATUS. OCT. 24, 1972. BEL. 0764830, CAN. 0931409, FRA. 7111622, GRB. 1337447, ITL. 0922162.
3,705,543.—OPTICAL RECORDER. DEC. 12, 1972. CAN. 0948266, GRB. 1372378.
3,759,149.—MULTIPLE FLASH LAMP ALPHANUMERIC PROJECTION DISC ASSEMBLY. SEPT. 18, 1973. CAN. 1002363.
3,759,612.—OPTICAL SYSTEM. SEPT. 18, 1973. BEL. 0792669, CAN. 0972193, FRA. 7243897, GRB. 1395580, ITL. 0984616, SWD. 7216146.
3,768,384.—PROJECTION ASSEMBLY. OCT. 30, 1973.
3,873,207.—POLARIZING INTERFEROMETER. MAR. 25, 1975.
3,880,497.—METHOD OF STORING OPTICAL INFORMATION ON A RANDOM CARRIER. APR. 29, 1975. CAN. 1004887, FRA. 7408054.
3,883,244.—APERTURE ADJUSTMENT IN OPTICAL ASSEMBLY. MAY 13, 1975.
3,897,136.—POLARIZATION-GRATING MOIRE. JULY 29, 1975.

3,909,103.—LENS SCAN MECHANISM. SEPT. 30, 1975.
4,035,068.—SPECKLE MINIMIZATION IN PROJECTION DISPLAYS BY REDUCING SPATIAL COHERENCE OF IMAGE LIGHT. JULY 12, 1977.
4,082,450.—COMPACT ILLUMINATION SYSTEM FOR OPTICALLY PROVIDING A STRUCTURED PHOTORECEPTOR CHARGE DIST. APR. 4, 1978.
4,082,451.—COMPACT ILLUMINATION SYSTEM FOR OPTICALLY PROVIDING A STRUCTURED PHOTORECEPTOR CHARGE DISTR. APR. 4, 1978.
4,110,023.—OPTICAL SYSTEM FOR ALTERNATIVELY PROJECTING ADJACENT IMAGES OF ADJACENT OBJECTS OR DOUBLE. AUG. 29, 1978.
4,113,370.—OPTICAL SYSTEM FOR ALTERNATIVELY PROJECTING ADJACENT IMAGES OF ADJACENT OBJECTS OR DOUBLE. SEPT. 12, 1978.
4,143,943.—REAR PROJECTION SCREEN SYSTEM. MAR. 13, 1979.
4,162,118.—WAVEGUIDE IMAGING SYSTEM. JULY 24, 1979.

Class 17B 2

3,355,308.—PROJECTION TRANSPARENCY HAVING A TRANSPARENT POWDER IMGE. NOV. 28, 1967.
3,476,478.—APPARATUS FOR CHANGING MAGNIFICATION OF PHOTOCOPIER W/O CHANGING CONJUGATE LENGTH OF OPTICAL SY. NOV. 4, 1969. ARG. 0172460, AUS. 0415808, BEL. 0708650, BRA. 6795668, CAN. 0845405, FRA. 1552364, GER. 1297981, GRB. 1223427. ITL. 0821929, MEX. 0100019, VZL. 0023689.
3,508,812.—HIGHLY CORRECTED SIX ELEMENT GAUSS TYPE LENS. APR. 28, 1970.
3,510,219.—OPTICAL ALIGNMENT SYSTEM. MAY 5, 1970. ARG. 0172455, BRA. 6793791, CAN. 0881018, CHL. 0023570, GRB. 1206966, MEX. 0101166, PRU. 0009329, SPN. 0360896, STZ. 0501233, SWD. 0359168, URG. 0008831, VZL. 0025783.
3,591,256.—VARIABLE MAGNIFICATION LENS SYSTEM. JULY 6, 1971. BEL. 0731553, CAN. 0881019, FRA. 6911559, GRB. 1234515, ITL. 0857660, JAP. 0857539.
3,592,531.—SPLIT DAGOR-TYPE OF SYMMETRICAL COPYING LENS SYSTEM. JULY 13, 1971. CAN. 0929389.
3,600,066.—OPTICAL ASSEMBLY WITH SUPPLEMENTAL LENS MEANS. AUG. 17, 1971. CAN. 0943792, GRB. 1261159, JAP. 0728824.
3,612,662.—EYEPIECE HAVING A WIDE FIELD OF VIEW AND A LARGE EYE RELIEF. OCT. 12, 1971.
3,620,603.—OFF-CENTER FOCUSING SYSTEM. NOV. 16, 1971.
3,630,599.—MECHANICALLY COMPENSATED ZOOM LENS SYSTEM. DEC. 28, 1971. CAN. 0960891, GRB. 1363113.
3,640,605.—MECHANICALLY COMPENSATED ZOOM LENS SYSTEM. FEB. 8, 1972.
3,659,922.—SYMMETRICAL HALF-LENS OPTICAL SYSTEM. MAY 2, 1972.
3,672,748.—SPLIT DAGOR-TYPE OF SYMMETRICAL COPYING LENS SYSTEM. JUNE 27, 1972. ATR. 0322874, AUS. 0467299, BEL. 0783478, CAN. 0960495, GRB. 1358349, ITL. 0955474, SPN. 0402705, STZ. 0544315, SWD. 7206274.
3,741,621.—ADD LENS PROJECTION SYSTEM WITH BALANCED PERFORMANCE. JUNE 26, 1973. BEL. 0781514, CAN. 0963300, FRA. 7208375, GRB. 1393151, ITL. 0950848.
3,817,599.—PROJECTION LENS WITH ADD LENS ELEMENTS. JUNE 18, 1974. CAN. 1008710.
3,865,470.—VARIABLE MAGNIFICATION LENS SYSTEM. FEB. 11, 1975. BEL. 0819497, FRA. 7429827, SPN. 0429431.
3,865,471.—LENS SYSTEM FOR PHOTOELECTROPHORETIC COPYING MACHINE. FEB. 11, 1975.
3,880,498.—ZOOM LENS ASSEMBLY. APR. 29, 1975.
3,907,401.—HIGH PERFORMANCE OPTICAL OBJECTIVE. SEPT. 23, 1975.
3,975,289.—CHARGE TRANSFER COMPLEXEX OF FERRONCENES HAVING LIGHT FILLING PROPERTIES. AUG. 17, 1976.
4,025,541.—CHARGE TRANSFER OF FERROCENES HAVING LIGHT FILTERING PROPERTIES. MAY 24, 1977.

Class 17B 3

3,393,956.—UNIFORM-FIELD KERR CELL. JULY 23, 1968.
3,408,133.—KERR-CELL CAMERA SHUTTER. OCT. 29, 1968.

Class 17B 4

3,358,081.—FACSIMILE PRINTER WITH FERROELECTRIC MODULATOR. DEC. 12, 1967. CAN. 0898336, GRB. 1128973.
3,360,323.—TRANSVERSE MAGNETO-OPTICAL ROTATOR WITH COMPENSATION OF PHASE BETA RDATION. DEC. 26, 1967.
3,601,468.—OPTICAL LIGHT WAVE MODULATOR FOR REPRESENTING A FIRST COLOR LIGHT WAVE AS SECOND COLOR LIGHT WA. AUG. 24, 1971.
3,938,881.—ACOUSTO-OPTIC MODULATION DEVICE. FEB. 17, 1976.
4,011,009.—REFLECTION DIFFRACTION GRATING HAVING A CONTROLLABLE BLAZE ANGLE. MAR. 8, 1977.
4,050,027.—OPTICAL SIGNAL AMPLIFIER. SEPT. 20, 1977.
4,077,700.—WAVEGUIDE ADDRESSING AND MODULATING METHOD AND APPARATUS. MAR. 7, 1978.
4,106,848.—ELASTOMER WAVE GUIDE OPTICAL MODULATORS. AUG. 15, 1978. GRB. 1531900.
4,128,299.—WAVEGUIDE OPTICAL MODULATOR. DEC. 5, 1978.

Class 17C

3,870,921.—IMAGE INTENSIFIER TUBE WITH IMPROVED PHOTOEMITTER SURFACE. MAR. 11, 1975.
4,074,143.—OPTOELECTRONIC DEVICE WITH OPTICAL FEEDBACK. FEB. 14, 1978. FRA. 7631992.
4,138,190.—GEOMETRICAL TRANSFORMATIONS IN OPTICS. FEB. 6, 1979. GRB. 1502127.

Class 17C 1

3,277,297.—ION IMAGE TO ELECTRON IMAGE CONVERTER. OCT. 4, 1966.
3,322,999.—IMAGE-INTENSIFIER TUBE. MAY 30, 1967.
3,519,870.—SPIRLD STRIP MATRL HAVNG PRLEL GROVS FRMNG PLURALITY OF ELCTRN MULTIPLIER CHANNELS. JULY 7, 1970.
3,983,045.—THREE COMPONENT DEVELOPER COMPOSITION. ARG. 0194232, ATR. 0334199, AUS. 0462045, BEL. 0789987, CHL. 0027625, FRA. 7236617, GRB. 1402009, ITL. 0968815, MEX. 0125231, NZL. 0168638, PNM. 0002796, SAF. 0727225, SPN. 0407564, STZ. 0028096, SWD. 7213035, TIW. 0007666, VZL. 0012802.

Class 17C 2

3,368,077.—INFRA-RED IMAGE INTENSIFIER HAVING A TUNNEL-EMISSION CATHODE HAVING A CONDUCTIVE MOSAIC. FEB. 6, 1968.
3,949,225.—INFRARED IMAGING APPARATUS. APR. 6, 1976.

Class 17C 3

3,446,561.—PASSIVE BRIGHT PATTERN RETICLE. MAY 27, 1969.
3,837,732.—PARTIALLY TRANSPARENT PLATED FOR INCREASED IMAGE CONTRAST. SEPT. 24, 1974. CAN. 0893234, GRB. 1237697, JAP. 0645592.

Class 17C 4

3,441,736.—IMAGE INTENSIFIER INCLUDING SEMI-CONDUCTOR AMPLIFIER LAYER. APR. 29, 1969.

Class 17D

D.235,655.—DISPLAY DEVICE. JULY 1, 1975.
3,987,413—DETECTION SYSTEM. OCT. 19, 1976.
4,035,061.—HONEYCOMB DISPLAY DEVICES. JULY 12, 1977.
4,111,538.—PROJECTION SYSTEM OF HIGH EFFICIENCY. SEPT. 5, 1978.
4,126,528.—ELECTROPHORETIC COMPOSITION AND DISPLAY DEVICE. NOV. 21, 1978.
4,126,854.—TWISTING BALL PANEL DISPLAY. NOV. 21, 1978.
4,143,103.—METHOD OF MAKING A TWISTING BALL PANEL DISPLAY. MAR. 6, 1979.

Class 17D 1

3,422,737.—VARIABLE FONT CHARACTER GENERATOR. JAN. 21, 1969. ARG. 0157019, BRA. 0087922, CAN. 0788611, CHL. 0022222, FRA. 1506176, GRB. 1162840, ITL. 0788951, JAP. 0590133, MEX. 0094427.

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3,519,867.—ELECTRIC DISCHARGE TUBE FOR DISPLAYING ALPHNUMERIC CHARACTER SYMBOLS. JULY 7, 1970.
3,564,319.—CATHOD RAY TUBE W/MATRIX FRMG ELEMNTL ELECTRN BEAMS AND MEANS SELECTVLY FRMG INTO CHAR AT FACE PLA. FEB. 16, 1971.
3,587,083.—CHARACTER GENERATION AND DISPLAY SYSTEM. JUNE 22, 1971. CAN. 0858092, FRA. 1582728, GER. 1774884, GRB. 1234580, ITL. 0846528, JAP. 0678504.
3,641,557.—CIRCUIT ARRANGEMENT FOR AN ELECTRIC DISCHARGE TUBE. FEB. 8, 1972.
3,742,484.—CHARACTER GENERATING APPARATUS EMPLOYING BIT STEAM LENGTH CORRECTION. JUNE 26, 1973.
3,781,848.—DISPLAY SYSTEM - CHARACTER GENERATOR SYSTEM A. DEC. 25, 1973.
3,810,165.—ELECTRONIC DISPLAY DEVICE. MAY 7, 1974.
3,830,646.—IMAGE REGISTRATION CORRECTION FOR NON-IMPACT PRINTERS. AUG. 20, 1974. CAN. 0986764, FRA. 7339099, GRB. 1440507.
3,911,419.—CONTROLLER FOR CURSOR POSITIONING ON A DISPLAY MEDIUM. OCT. 7, 1975.
3,952,296.—VIDEO SIGNAL GENERATING APPARATUS WITH SEPARATES PROCESSING OF ODD AND EVEN VIDEO BITS. APR. 20, 1976.
4,103,331.—DATA PROCESSING DISPLAY SYSTEM. JULY 25, 1978.

Class 17D 2

RE.28,360.—ELECTROPHORETIC COLOR DISPLAY DEVICE. MAR. 4, 1975.
3,524,022.—ELECTRO-OPTICAL DISPLAY SYSTEM. AUG. 11, 1970.
3,588,584.—APPARATUS FOR POSITIONING A LIGHT SPOT ONTO A CHARACTER MASK. JUNE 28, 1971.
3,612,758.—COLOR DISPLAY DEVICE - REISSUED D 2717R. OCT. 12, 1971.

Class 17D 3

3,198,976.—ELECTRIC DISCHARGE TUBES AND APPLICATIONS THEREOF. AUG. 3, 1965.
3,264,638.—ELECTRONIC CODE TRANSLATION. AUG. 2, 1966. CAN. 0740559.
3,349,677.—ALPHA NUMERIC CHARACTER PRINTER. OCT. 31, 1967.
3,403,390.—MESSAGE STORAGE. SEPT. 24, 1968. GRB. 1078401.
3,861,804.—INFEROMETRY READOUT OF PHASE INFORMATION. JAN. 21, 1975. CAN. 0980745, GRB. 1387905.
3,898,377.—VIDEO MIXER. AUG. 5, 1975.

Class 17D 4

3,478,659.—APPARATUS FOR JUSTIFYING A REPRODUCED LINE OF CHARACTERS. NOV. 18, 1969.

Class 17D 5

3,330,190.—PRINTING APPARATUS. JULY 11, 1967. CAN. 0758791, GER. 1280282, GRB. 1102419, JAP. 0529726.

Class 17E

3,852,775.—MOVING BELT SCANNING PRINTER. DEC. 3, 1974.
4,027,961.—COPIER/PASTER SCAN APPARATUS. JUNE 7, 1977.
4,080,633.—TWISTING GEOMETRY SCANNER. MAR. 21, 1978.
4,135,812.—MAGNIFICATION CHANGE MECHANISM. JAN. 23, 1979.
4,155,620.—ROTATING MIRROR OPTICAL SCANNER WITH FLAT SCAN AND LINEAR SCAN RATE. MAY 22, 1979.
4,160,939.—MOTOR SPEED CONTROL SYSTEM. JULY 10, 1979.

Class 17E 1

3,337,718.—LIGHT SCAN RECORDING AND READOUT. AUG. 22, 1967. CAN. 0794443, GRB. 1070030.
3,426,144.—TRANSCEIVER APPARATUS FOR TRANSMITTING AND RECORDING OPTICAL INFORMATION. FEB. 4, 1969. CAN. 0810757, GRB. 1158568, JAP. 0579399.
3,426,354.—ELECTROSTATIC CHARGE IMAGE RECORDER. FEB. 4, 1969. AUS. 0295167, BEL. 0664729, CAN. 0739120, DNK. 0115269, FRA. 1455131, GER. 1280281, GRB. 1084494, HOL. 0136720, ITL. 0761085, JAP. 0492014, STZ. 0444906, SWD. 0338117.
3,548,195.—RADIATION SENSITIVE DOCUMENT SCANNING MEANS. DEC. 15, 1970. CAN. 0901968, FRA. 1592840, GER. 1809854, GRB. 1230836, ITL. 0848026, JAP. 0587941.
3,553,463.—RADIATION SENSITIVE DOCUMENT SCANNING APPARATUS USING HELICAL SCANNER. JAN. 5, 1971.
3,775,559.—APERTURE DESIGNS FOR FACSIMILE SCANNING APPARATUS. NOV. 27, 1973. CAN. 0960770, GRB. 1376189.
3,820,900.—INSTRUMENT FOR SCANNING DOCUMENT FOR QUALITY. JUNE 28, 1974.
3,867,571.—FLYING SPOT SCANNER. FEB. 18, 1975. CAN. 0995351.
3,898,470.—SCANNING ARRANGEMENT FOR MULTIFUNCTION OPERATION. AUG. 5, 1975.
3,922,485.—FLYING SPOT SCANNER WITH SCAN DETECTION. NOV. 25, 1975.
3,944,323.—VARIABLE SPOT SIZE SCANNING. MAR. 16, 1976. BEL. 0835552.
3,946,150.—OPTICAL SCANNER. MAR. 23, 1976.
3,962,538.—FLYING SPOT SCANNING SYSTEM WITH VIRTUAL SCANNERS. JUNE 8, 1976.
3,966,319.—FLAT FIELD SCREENING MIRROR. JUNE 29, 1976.
3,970,359.—FLYING SPOT FLAT FIELD SCANNER. JULY 20, 1976.
3,973,825.—FLAT FIELD SCANNING SYSTEM. AUG. 10, 1976. BEL. 0836735.
3,974,506.—SCANNING SYSTEM FOR IMAGING CHARACTERS COMBINED WITH GRAPHIC CURVES. AUG. 10, 1976.
3,997,721.—FLYING SPOT SCANNING SYSTEM WITH REDUCED SCAN ANGLE. DEC. 14, 1976.
4,006,299.—FLAT FILLED SCANNING SYSTEM. FEB. 1, 1977. BEL. 0836543.
4,012,585.—INPUT AND OUTPUT FLYING SPOT SCANNING SYSTEM. MAR. 15, 1977.
4,015,081.—MULTIFUNCTION SCANNING SYSTEM. MAR. 29, 1977. BEL. 0836790.
4,021,897.—A PROCESS FOR PROVIDING CEMENTED GLASS FLATS TO PROVIDE HIGH SPEED MULTIFACETED POLYGONAL SCAN. APR. 10, 1977.
4,034,408.—FLYING SPOT SCANNER. JULY 5, 1977. GRB. 1452300.
4,047,793.—POLYGON SCANNER WITH ANNULAR LIP. SEPT. 13, 1977.
4,052,715.—DIGITAL HALF-TONE GREY SCALE EXPANSION SYSTEM. OCT. 4, 1977.
4,067,639.—HOLOGRAPHIC SCANNING SPINNER. JAN. 10, 1978.
4,070,089.—TWO DIMENSIONAL LASER SCANNER WITH MOVABLE CYLINDER LENS. JAN. 24, 1978.
4,071,754.—BEAM ALIGNMENT DETECTOR. JAN. 31, 1978.
4,080,633.—TWISTING GEOMETRY SCANNER. MAR. 21, 1978.
4,092,632.—CROSSOVER ARRANGEMENT FOR MULTIPLE SCANNING ARRAYS. MAY 30, 1978.
4,093,350.—A SYSTEM FOR CENTRIFUGALLY CASTING A THIN FILM PLASTIC IN A REPLICA PROCESS FOR PROVIDING M. JUNE 6, 1978.
4,101,365.—PROCESS OF MAKING HIGH SPEED MULTIFACETED POLYGONAL SCANNERS. JULY 18, 1978.
4,122,352.—SCANNING ARRAY CONFIGURATION. OCT. 24, 1978.
4,140,903.—PRECISION SPEED CONTROL FOR OPTICAL SCANNERS. FEB. 20, 1979.
4,143,311.—HYSTERESIS SYNCHRONOUS MOTOR RATE SERVO SYSTEM. MAR. 6, 1979.
4,146,786.—SCANNER WITH MODULAR ARRAY OF PHOTOCELLS. MAR. 27, 1979.
4,149090.—CROSSOVER ARRANGEMENT FOR MULTIPLE SCANNING ARRAYS. APR. 10, 1979.
4,149,091.—SCANNING APPARATUS. APR. 10, 1979.
4,150,402.—METHOD AND APPARATUS FOR REDUCING THE EFFECT OF LASER NOISE IN A SCANNING LASER READ SYSTEM. APR. 17, 1979.
4,162,121.—LINEAR ARRAY MODULATOR. JULY 24, 1979.

Class 17E 2

3,407,329.—SCANNED CONVERSION TUBE. OCT. 22, 1968. CAN. 0836783, GER. 1639461, GRB. 1190967, JAP. 0565840.

3,437,408.—MULTIPLE COPY ELECTROSTATIC IMAGING APPARATUS. APR. 8, 1969. ARG. 0164840, ATR. 0283115, AUS. 0410817, BEL. 0704323, CAN. 0831674, CZC. 0156411, EGR. 0065587, FRA. 1538197, GER. 1597879, GRB 1202583, HUN. 0161168, ITL. 0822157, JAP. 0582502, MEX. 0099950, SPN. 0345482, STZ. 0484459, SWD. 0331795, USR. 0353450, VZL. 0023662.
3,474,417.—FIELD EFFECT SOLID STATE IMAGE PICKUP AND STORAGE DEVICE. OCT. 21, 1969. CAN. 0869188, GER. 1549144, GRB. 1203095, JAP. 0568732.
3,523,188.—SEMICONDUCTOR CURRENT CONTROL DEVICE AND METHOD. AUG. 4, 1970.
4,147,928.—SCANNING ARRAY CONFIGURATION. APR. 3, 1979.

Class 17E 3

3,485,945.—ELECTRONIC LENTICULAR RECORDING SYSTEM. DEC. 23, 1969.
3,510,570.—ELECTRONIC LENTICULAR DISPLAY SYS. MAY 5, 1970.
3,650,621.—OPTICAL IMAGING SYSTEM. MAR. 21, 1972. BEL. 0747978, CAN. 0927470, FRA. 7011548, GRB. 1297907, ITL. 0898936, JAP. 0731225.
3,655,284.—LONGITUDINALLY INSENSITIVE LENS STRIP IMAGING DEVICE. APR. 11, 1972.
3,827,062.—OPTICAL ARRANGEMENT FOR HIGH SPEED PRINTOUT SYSTEM. JULY 30, 1974.
3,853,387.—VARIABLE MAGNIFICATION LENS ASSEMBLY HAVING TWO ADD LENSES. DEC. 10, 1974.
3,865,470.—VARIABLE MAGNIFICATION LENS SYSTEM. FEB. 11, 1975. BEL. 0819497, FRA. 7429827, SPN. 0429431.

Class 17E 4

3,279,342.—COMMUNICATION PRINTER. OCT. 18, 1966. CAN. 0767902, GRB. 1120446, JAP. 0698291.
3,481,668.—IMAGE PROJECTION APPARATUS. DEC. 2, 1969.
3,485,546.—FIELD FLATTENER SCANNING MEANS. DEC. 23, 1969. CAN. 0850916, GRB. 1196373, JAP. 0667705.
3,504,960.—SAGITTAL RAY APERTURE STOP. APR. 7, 1970. AUS. 0413558, BEL. 0704924, CAN. 0849815, FRA. 1540700, GRB. 1209472, ITL. 0814606, JAP. 0972613.
3,532,425.—GRAPHIC DISTORTION APPARATUS. OCT. 6, 1970.
3,544,190.—LENS STRIP OPTICAL SCANNING SYSTEM. DEC. 1, 1970. CAN. 0904070, GRB. 1278336.
3,584,950.—LENS STRIP OPTICAL SCANNING SYSTEM. JUNE 15, 1971.
3,584,952.—LENS STRIP OPTICAL SCANNING SYSTEM - REISSUED D 2074R. JUNE 15, 1971.
3,584,953.—SHORT FOCAL OPTICAL LENGTH SCANNING SYSTEM. JUNE 15, 1971.
3,963,343.—CAMMING SYSTEMS. JUNE 15, 1976. BEL. 0824049.
4,006,648.—CAMMING SYSTEM. FEB. 8, 1977. BEL. 0824049.
4,054,359.—APPARATUS FOR SYNCHRONOUSLY SCANNING A FLAT PLATEN WITH A ROTATING MIRROR USING PULLEYS. OCT. 18, 1977.
4,067,640.—APPARATUS FOR SYNCHRONOUSLY SCANNING A FLAT PLATEN WITH A ROTATING MIRROR. JAN. 10, 1978.
4,130,838.—SPEED CONTROL APPARATUS FOR SCANNING SYSTEM. DEC. 19, 1978.

Class 17E 5

3,155,022.—BUFFER FOR ELECTRONIC DISPLAY READOUT. NOV. 3, 1964. CAN. 0773751, GRB. 1056114, JAP. 0542586.
3,219,993.—IMAGE FORMATION AND DISPLAY UTILIZING A THERMOTROPICALLY COLOR REVERSIBLE MATERIAL. NOV. 23, 1965. CAN. 0762159, GER. 1222795, ITL. 0753655, JAP. 0474129.
3,249,757.—THERMAL IMAGING DEVICE. MAY 3, 1966.
3,995,278.—SUPERCONDUCTIVE MAGNETOSTATIC PRINTER. NOV. 30, 1976.

Class 17E 6

3,456,074.—IMAGE STABILIZATION OF OPTICAL IMAGING SYSTEMS. JULY 15, 1969.
3,461,227.—MECHANICAL JITTER EQUALIZER. AUG. 12, 1969. CAN. 0824819, GRB. 1198303.
3,873,189.—ADJUSTABLE-POSITION OPTICAL SYSTEM. MAR. 25, 1975.

Class 17F 1

3,325,674.—MOVING TARGET DISPLAY INDICATOR. JUNE 13, 1967.
3,340,419.—ELECTRIC DISCHARGE TUBES. SEPT. 5, 1967. CAN. 0773690.
3,447,026.—CRT SCAN STABILIZER. MAY 27, 1969. GER. 1490986.
3,483,414.—STORG TUBE HVG FLD EFF LAYR W/ CONDCTG PINS EXT TO LAYR THAT READOUT NOT ERASE CHG PATTERN. DEC. 9, 1969. CAN. 0850846, GER. 1537566, GRB. 1203432, JAP. 0565841.

Class 17F 2

3,153,785.—TIME COMPRESSED DISPLAY. OCT. 20, 1964. CAN. 0708306, GRB. 1008993.
3,579,024.—SELECTIVE BLANKING CONTROL CIRCUIT. MAY 18, 1971.

Class 17G

3,619,714.—PANEL DISPLAY DEVICE. NOV. 9, 1971.
4,003,742.—VELOCITY COMPENSATION FOR BEAD BYPASS WITH SPEED REDUCTION. JAN. 18, 1977.

Class 17G 1

3,459,946.—SOLID STATE STORAGE DEVICE. AUG. 5, 1969.
3,510,660.—METHOD FOR VISUAL COMPARISON OF INFORMATION. MAY 5, 1970. CAN. 0848611, GRB. 1201376, JAP. 0595641.
3,539,862.—DUAL CONDUCTOR STORAGE PANEL. NOV. 10, 1970. ARG. 0175067, AUS. 0414034, BEL. 0723721, CAN. 0878168, FRA. 1591040, GER. 1808238, GRB. 1235310, HOL. 0150616, ITL. 0847618, JAP. 0742515, MEX. 0111871, SPN. 0360366, STZ. 0493930, SWD. 0345341, VZL. 0023718.
4,002,998.—EXTERNALLY CONTROLLABLE MINIATURE LASERS. JAN. 11, 1977.
4,085,321.—MULTIPHASE PHOTOACTIVATED SWITCH. APR. 18, 1978.

Class 17G 2

3,531,647.—DEVICE AND PROCESS FOR REDUCTION OF BACKGROUND LIGHT IN SOLID STATE STORAGE PANELS. SEPT. 29, 1970. CAN. 0862333, FRA. 1540063, GER. 1549143, GRB. 1201375, ITL. 0818126, MEX. 0101197.
3,531,648.—SOLID STATE STORAGE PANEL FOR COLOR REPRODUCTION. SEPT. 29, 1970. CAN. 0846433, GRB. 1201377.
3,540,008.—SOLID STATE STORAGE DEVICES HAVING NON-CORONA EXTINCTION CAPABILITY. NOV. 10, 1970. ARG. 0166245, AUS. 0424286, BEL. 0725616, CAN. 0897827, FRA. 1599275, GER. 1815243, GRB. 1250023, ITL. 0849327, JAP. 0742516, MEX. 0106020, SPN. 0361652, STZ. 0504755, SWD. 0361123, VZL. 0023729.
3,561,964.—METHOD FOR PRODUCTION OF SOLID STATE STORAGE PANELS. FEB. 9, 1971. ARG. 0184633, AUS. 0427883, BEL. 0736077, CAN. 0866994, FRA. 6924001, GER. 1935763, GRB. 1270845, HOL. 0150271, ITL. 0870080, JAP. 0681942, MEX. 0113574, SPN. 0369656, STZ. 0513430, SWD. 0358991, VZL. 0023743.
3,594,610.—DISPLAY PANEL WITH CORONA DISCHARGE CONTROL. JULY 20, 1971.

Class 17G 3

3,154,636.—THREE DIMENSIONAL DISPLAY DEVICE. OCT. 27, 1964. CAN. 0794989, GRB. 1029611, JAP. 0462394.
3,205,403.—ELECTROLUMINESCENT DISPLAY SYSTEMS. SEPT. 7, 1965.
3,221,335.—ELECTRO-OPTICAL RECORDING AND VISUAL DISPLAY SYSTEMS. NOV. 30, 1965. AUS. 0226551, CAN. 0801882, FRA. 1202340, GER. 1107705, GRB. 0880692, JAP. 0306714.
3,989,355.—ELECTRO-OPTIC DISPLAY SYSTEM. NOV. 2, 1976.

Class 17G 4

3,293,441.—IMAGE INTENSIFIER WITH FERRO-ELECTRIC LAYER AND BALANCED IMPEDANCES. DEC. 20, 1966.

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3,300,645.—FERROELECTRIC IMAGE INTENSIFIER INCLUDING INVERSE FEEDBACK MEANS. JAN. 24, 1967.
3,440,428.—IMAGE CONVERTER USING CHARGED PHOTOEMISSIVE LAYER. APR. 22, 1969. CAN. 0858119, GER. 1639462, GRB. 1202049, JAP. 0565839.
3,441,736.—IMAGE INTENSIFIER INCLUDING SEMI-CONDUCTOR AMPLIFIER LAYER. APR. 29, 1969.
3,531,646.—ENHANCEMENT OF ELECTROSTATIC IMAGES. SEPT. 29, 1970. CAN. 0892186, GRB. 1199462, JAP. 0641476.
3,543,032.—DEVICE AND PROCESS FOR AMPLIFYING AND STORING AN IMAGE. NOV. 24, 1970. ARG. 0177440, CAN. 0880586, MEX. 0111518, PNM. 0001809, VZL. 0027508.

Class 17H

3,742,281.—CONTROLLED SPECTRUM FLASH LAMP. JUNE 26, 1973.
3,949,979.—SINGLE LONGITUDINAL MODE GAAS/GAALAS DOUBLE HETEROSTRUCTURE LASER. APR. 13, 1976.
3,995,110.—FLYING SPOT SCANNER WITH PLURAL LENS CORRECTION. NOV. 30, 1976.
4,021,845.—A LASER FOR GENERATING WHITE LIGHT. MAY 3, 1977. BEL. 0846954.
4,040,096.—FLYING SPOT SCANNER WITH RUNOUT CORRECTION. AUG. 2, 1977.
4,065,731.—TANDEM LASER ASSEMBLY. DEC. 27, 1977.
4,084,197.—FLYING SPOT SCANNER WITH SCAN DETECTION. APR. 11, 1978.
4,132,960.—SINGLE LONGITUDINAL MODE GAAS/GAALAS DOUBLE HETEROSTRUCTURE LASER. JAN. 2, 1979.

Class 17H 1

3,427,564.—HIGH-POWER IONIZED GAS LASER STRUCTURE. FEB. 11, 1969.
3,437,950.—ION LASER HAVING A METAL TUBE SHRINK-FITTED ONTO THE CERAMIC DISCHARGE TUBE. APR. 8, 1969.
3,523,256.—HEAT PUMPED LASER. AUG. 4, 1970.
3,529,261.—LASR HVNG ACTV MEDIUM WHCH IS AN EXCTD HALOGN WHSE LOWR ENRGY ST IS DEPLETD BY REACTNG W/ALKAL. SEPT. 15, 1970. CAN. 0816276, FRA. 1446601, GER. 1299367, GRB. 1124346, ITL. 0726918.
3,562,173.—LASER MATERIALS. FEB. 9, 1971.
3,860,888.—TIME-SHARING TWO FREQUENCY LASER. JAN. 14, 1975.
3,954,534.—LIGHT EMITTING DIODE ARRAY WITH DOME GEOMETRY. MAY 4, 1976.
3,969,686.—BEAM COLUMNATION USING MULTIPLE COUPLED ELEMENTS. JULY 13, 1976.
3,970,958.—ELECTRICALLY PUMPED SOLID-STATE DISTRIBUTED FEEDBACK LASER WITH PATICULAR GRATING SPACING. JULY 20, 1976. BEL. 0834484.
3,978,428.—BURIED-HETEROSTRUCTURE DIODE INJECTION LASER. AUG. 31, 1976.
4,006,432.—INTEGRATED GRATING OUTPUT COUPLER IN DIODE LASERS. FEB. 1, 1977. BEL. 0834480.
4,023,993.—METHOD OF MAKING AN ELECTRICALLY PUMPED SOLID STATE DISTRIBUTED FEEDBACK LASER. MAY 17, 1977. BEL. 0832000, SPN. 0440361.
4,033,796.—METHOD OF MAKING BURIED-HETEROSTRUCTURE DIODE INJECTION LASER. JULY 5, 1977.
4,045,749.—CORRUGATION COUPLED TWIN GUIDE LASER. AUG. 30, 1977.
4,052,680.—METAL VAPOR LASER HAVING CAPTAPHORESIS MEANS. OCT. 4, 1977.
4,063,189.—LEAKY WAVE DIODE LASER. DEC. 13, 1977.
4,099,999.—METHOD OF MAKING ETCHED-STRIPED SUBSTRATE PLANAR LASER. JULY 11, 1978.
4,105,954.—DOUBLE-CONFINED MULTIPLE ANODE HOLLOW CATHODE LASER. AUG. 8, 1978.
4,111,521.—SEMICONDUCTOR LIGHT REFLECTOR/LIGHT TRANSMITTER. SEPT. 5, 1978.
4,112,389.—DIODE LASER WITH RING REFLECTOR. SEPT. 5, 1978.
4,122,409.—METHOD AND APPARATUS FOR CONTROLLING THE INTENSITY OF A LASER OUTPUT BEAM. OCT. 24, 1978. BEL. 852044.
4,149,779.—INTERNAL LASER MIRROR ALIGNMENT FIXTURE. APR. 17, 1979.

Class 17H 2

3,296,541.—BROADBND TRVLNG WAVE MASER W/BOTH MASER AND ISOLATOR CRYSTALS CUT ATDFRNT ANGLES TO OPTICAL AXIS. JAN. 3, 1967.
3,983,509.—DISTRIBUTED FEEDBACK DIODE LASER. SEPT. 28, 1976.

Class 17H 3

3,258,597.—LASER HETERODYNE COMMUNICATION SYSTEM. JUNE 28, 1966.
3,465,166.—FAR INFRA-RED COHERENT LIGHT GENERATOR. SEPT. 2, 1969.
3,499,159.—POLYCHROMATIC LASER AEROSOL SIZING AND RANGING-PLASAR-TECHNIQUE. MAR. 3, 1970.
3,500,236.—LASER STABILIZING SYSTEM. MAR. 10, 1970.
3,534,289.—LASER SYSTEM WITH OPTICAL DISCRIMINATOR. OCT. 13, 1970.
3,753,144.—GAS LASER STRUCTURE. AUG. 14, 1973.
3,909,254.—LASER RECORDING METHOD. SEPT. 30, 1975.
4,012,776.—LUMINESCENT SCREEN LASER SCANNING TECHNIQUE. MAR. 15, 1977.
4,070,089.—TWO DIMENSIONAL LASER SCANNER WITH MOVABLE CYLINDER LENS. JAN. 24, 1978.
4,100,408.—SIGNAL GENERATOR FOR RASTER TYPE SCANNERS. JULY 11, 1978.
4,106,844.—LASER SCANNING SYSTEM USING COMPUTER-GENERATED HOLOGRAMS. AUG. 15, 1978.
4,143,311.—HYSTERESIS SYNCHRONOUS MOTOR RATE SERVO SYSTEM. MAR. 6, 1979.

Class 17I

3,630,598.—OPTICAL DEMODULATION FILTER. DEC. 28, 1971. BEL. 0761134, CAN. 0904628, GRB. 1330709, ITL. 0914073, JAP. 0770139.
3,650,605.—INTERFERAMETRIC APPARATUS WITH CONTROLLED SCANNING MEANS. MAR. 21, 1972. CAN. 0952749.
3,687,535.—OPTICAL DEMODULATION SYSTEM. AUG. 29, 1972. BEL. 0762859, CAN. 0944075, FRA. 7105649, GRB. 1343483, ITL. 0918450.
3,689,267.—SCREEN MAKING PROCESS UTILIZING ROTATION OF OPTICAL PLATE. SEPT. 5, 1972. CAN. 0950736.
3,697,184.—APPARATUS FOR EVALUATING THE RECORDING CHARACTERISTICS OF A THERMOPLASTIC PHOTORECEPTOR. OCT. 10, 1972. CAN. 1003484, GRB. 1389471.
3,776,995.—METHOD OF PRODUCING X-RAY DIFFRACTION GRATING. DEC. 4, 1973. CAN. 0944871, GRB. 1363262.
4,066,335.—VARIABLE DENSITY LENS. JAN. 3, 1978.

Class 17I 1

3,191,440.—PRESSURE GAUGE INSTRUMENT. JUNE 29, 1965.
3,249,760.—PRESSURE GAUGE INSTRUMENT. MAY 3, 1966.

Class 17I 2

3,416,865.—OPTICAL DENSITY MEASURING SYSTEM. DEC. 17, 1968.
3,609,047.—SINGLE BEAM PHOTOMETER SYSTEM WHEREIN THE ABSORBANCE OF A SAMPLE IS DETERMINED RELATIVE TO REFE. SEPT. 28, 1971.
4,054,391.—SPECULAR REFLECTANCE MICRODENSITOMETER. OCT. 18, 1977.

Class 17I 3

3,560,085.—APPARATUS FOR GRAPHIC DISTORATION. FEB. 2, 1971.
3,697,063.—DOCUMENT HANDLING APPARATUS. OCT. 10, 1972. GRB. 1369618.
4,128,332.—ILLUMINATOR. DEC. 5, 1978. GRB. 1494424.

Class 17J

D.236,733.—CURSOR POSITION CONTROLLER. SEPT. 9, 1975.
3,447,030.—COLD SEAL LAMP PRESSURE REGULATION. MAY 27, 1969.
3,642,377.—COLOR PRINTING SYSTEM. FEB. 15, 1972.
3,733,123.—METHOD AND APPARATUS FOR ENCLOSING A LAMP. MAY 15, 1973. ARG. 0198292, AUS. 0466394, BEL. 0789338, FRA. 7234198, GRB. 1410046, ITL.

0967625, MEX. 0128585, SPN. 0409972, STZ. 0549825, SWD. 0360935.
3,775,006.—APPARATUS FOR OPTICAL COLOR SEPARATION. NOV. 27, 1973.
3,795,805.—APPARATUS FOR TESTING A CREDIT CARD. MAR. 5, 1974.
3,873,813.—CREDIT CARD. MAR. 25, 1975.
3,892,963.—TRANSDUCER FOR A DISPLAY-ORIENTED POINTING DEVICE. JULY 1, 1975. FRA. 7440265.
3,915,553.—ELECTROOPTIC COLOR FILTER SYSTEM. OCT. 28, 1975.
3,936,179.—SUPPORT STRUCTURE FOR A DUPLICATOR OPTICAL SYSTEM. FEB. 3, 1976.
3,951,521.—REVERSIBLE RADIANT ENERGY FILTER AND PROCESS OF USING SAME. APR. 20, 1976.
3,977,785.—METHOD & APP FOR INHIBITING THE OPERATION OF A COPYING MACHINE. AUG. 31, 1976.
4,071,323.—DIFFUSION CRUCIBLE AND SLAB MEMBER WITH COMMON METAL COMPONENT IN THE VAPOR PHASE. JAN. 31, 1978.
4,071,396.—CONTROLLED ATMOSPHERE PROCESS FOR ALTERING THE NONSTOICHIOMETRY OF CRYSTALLINE MEMBERS. JAN. 31, 1978.

Class 18

3,736,133.—TRANSPARENT INK - ABSORBENT LAQUERS. MAY 29, 1973. ARG. 0193996, CAN. 0985583. GRB. 1390137, MEX. 0127276. VZL. 0033577.
3,738,832.—COLOR ELECTROPHOTOGRAPHIC PROCESS EMPLOYING LIQUID DEVELOPER CONTAINING GELATINAIN. JUNE 12, 1973.
3,860,484.—ENZYME STABILIZATION. JAN. 14, 1975.
3,985,666.—PLASTIC MATERIALS MIXED WITH POLAR GROUP CONTAINING MATERIALS. OCT. 12, 1976. ARG. 0195541, BEL. 0781970, CAN. 0976742, FRA. 7213873, GRB. 1396141, ITL. 0951326, MEX. 0126158, VZL. 0032937.
4,080,332.—ELECTRICALLY CONDUCTIVE COMPOUNDS. MAR. 21, 1978.

Class 18A

3,238,150.—PHOTOCONDUCTIVE CADMIUM SULFIDE POWDER AND METHOD FOR THE PREPARATION THEREOF. MAR. 1, 1966. CAN. 0712516, GRB. 1062022, JAP. 0486530.
3,402,177.—SUBSTITUTED 1-CYANO-2,3-PHTHALOYL-7,8-BENZOPYRPOCOLINES. SEPT. 17, 1968. AUS. 0435189, BEL. 0743896, CAN. 0812820, GRB. 1145373.
3,471,290.—PHOTOCHROMIC PHOTORESIST IMAGING. OCT. 7, 1969.
3,478,064.—1,5-BIS-SUBSTITUTED ALKYLAMINOANTHRAQUINONES. NOV. 11, 1969. ARG. 0145636, AUS. 0419687, BEL. 0683222, CAN. 0880309, FRA. 1484968, GRB. 1155986, ITL. 0771955, JAP. 0581828, MEX. 0092775, SPN. 0328428, STZ. 0461273, SWD. 0328188, VZL. 0021224.
3,482,973.—IMAGING SYSTEM. DEC. 9, 1969.
3,485,633.—ELECTROPHORETIC IMG PROC EMPL METALLIC LAKES OF FLUCRESCEIN DERIVATIVES AS ELECTRICLY PHOTOSENS. DEC. 23, 1969. AUS. 0444394, BEL. 0743641, CAN. 0848386, GER. 1572387, GRB. 1190965. JAP. 0586923.
3,562,248.—BISAZC FGMTS DRVD CPLRS CBTC CONDG 8-AMINO-2-NAPHTHOLS W/ DICARBOXYLIC ACID CHLORIDES. FEB. 9, 1971. ATR. 0302037, AUS. 0435392, BEL. 0743422, CAN. 0889836, FRA. 6944290, GER. 1717183, GRB. 1217905, ITL. 0879047, JAP. 0608727.
3,667,943.—QUINACRIDONE PIGMENTS IN ELECTROPHOTOGRAPHIC IMAGING. JUNE 6, 1972. ARG. 0184823, AUS. 0452663, BEL. 0737810, CAN. 0877882, EGR. 0077411, FRA. 6928700, GRB. 1278702, ITL. 0888005, JAP. 0683893, SPN. 0370720, STZ. 0519183, SWD. 0346396, TIW. 0005517, USR. 0351396.
3,667,944.—QUINACRIDONE PIGMENTS IN ELECTROPHOTOGRAPHIC RECORDING. JUNE 6, 1972. ARG. 0177369, AUS. 0452031, BEL. 0741159, CAN. 0884807, FRA. 6937223, GRB. 1286079, ITL. 0879710, JAP. 0693421, MEX. 0115407.
3,667,945.—QUINACRIDONE PIGMENTS IN ELECTROPHOTOGRAPHIC IMAGING. JUNE 6, 1972.
3,671,467.—SELENIUM CONTAINING POLYMERS. JUNE 20, 1972. ARG. 0190619, BEL. 0770689, CAN. 0941544, FRA. 7128500, GRB. 1364297, ITL. 9308410, SPN. 0393651. VZL. 0029342.
3,694,201.—METHOD FOR PHOTOCONDUCTIVE POWDER. SEPT. 26, 1972. BEL. 0777717, CAN. 0982808, FRA. 7201003, GRB. 1381162, ITL. 0946352.
3,708,292.—PI-FORM METAL PHTHALOCYANINE. JAN. 2, 1973. ARG. 0194234, BEL. 0783793, CAN. 0996931, GRB. 1396922, ITL. 0955644, MEX. 0128928.
3,708,293.—PI-FORM METAL-FREE PHTHALOCYANINE. JAN. 2, 1973. ARG. 0195167, BEL. 0783792, CAN. 0995211, GRB. 1395769, ITL. 0955643, MEX. 0131970, VZL. 0034272.
3,837,850.—PHOTOCONDUCTIVE BUTILE TITANIUM DIOXIDE. SEPT. 24, 1974.
3,867,145.—METHANOL AND HEAT TREATED ZINC OXIDE. FEB. 18, 1975.
3,905,958.—SELENIUM COMPOUNDS. SEPT. 16, 1975.
3,965,049.—ONE-STEP SYNTHESIS OF AROMATIC ORGANIC DISELENIDES. JUNE 22, 1976.
4,007,043.—PHOTOCONDUCTIVE ELEMENTS WITH COPOLYMER CHARGE TRANSPORT LAYERS. FEB. 8, 1977.
4,007,100.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. FEB. 8, 1977.
4,007,101.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. FEB. 8, 1977.
4,013,528.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. MAR. 22, 1977.
4,013,529.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. MAR. 22, 1977.
4,013,530.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. MAR. 22, 1977.
4,014,768.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. MAR. 29, 1977.
4,016,058.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. APR. 5, 1977.
4,028,203.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. JUNE 7, 1977.
4,030,991.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. JUNE 21, 1977.
4,030,992.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. JUNE 21, 1977.
4,030,993.—PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS. JUNE 21, 1977.
4,046,564.—ELECTROPHOTOGRAPHIC IMAGING MEMBERS WITH PHOTOCONDUCTIVE LAYER CONTAINING ELECTRON ACCEPTOR. SEPT. 6, 1977.
4,047,947.—PROCESS FOR THE PREPARATION OF TRANSPARENCIES BY SELECTIVE DECOMPOSITION OF AN ORGANOSELENI. SEPT. 13, 1977.
4,075,012.—INTRACHAIN CHARGE TRANSFER COMPLEXES USE IN ELECTROPHOTOGRAPHIC IMAGING. FEB. 21, 1978.
4,098,984.—ELECTRON ACCEPTOR POLYMERS. JULY 4, 1978.
4,116,691.—ELECTROPHOTOGRAPHIC IMAGING MEMBER OF MONOMERS HAVING PENDANT ELECTRON ACCEPTOR GROUPS. SEPT. 26, 1978.
4,122,113.—9-FLUORENYL ACRYLATES. OCT. 24, 1978.
4,129,581.—MONOMERS HAVING PENDANT ELECTRON ACCEPTOR GROUPS-PROCESS FOR PREPARATION AND USE. DEC. 12, 1978.
4,143,225.—HOMOPOLYMERS OF A FLUORENONE DERIVATIVE HAVING PENDANT ELECTRON ACCEPTOR GROUPS. MAR. 6, 1979.

Class 18A 1

3,384,488.—POLYCHROMATIC PHOTOELECTROPHORETIC IMAGING COMPOSITION. MAY 21, 1968.
3,447,922.—ELECTRICALLY PHOTOSENSITIVE PARTICLES USEFUL IN PHOTOELECTROPHORETIC AND XEROGRAPHIC IMAGING PROC. JUNE 3, 1969.
3,448,028.—N-SBSTUD-8,13-DIOXODINAPHTHO-2-1-B,2,3-D-FURAN-6-CARBOXAMIDES AS ELCTLY PTOSNSTV MITS IN ELCPHG. JUNE 3, 1969.
3,531,309.—COMPOSITIONS COMPRISING 1-CYANO-2,3-PHTHALOYL-7,8-BENZOPYRROCOLINES AND A CARRIER. SEPT. 29, 1970.
3,546,085.—PHOTOELECTROPHORETIC IMAGING PROCESS AND SUSPENSION. DEC. 8, 1970. BEL. 0710052, CAN. 0875493, FRA. 1568088, GER. 1622380, GRB. 1208812, ITL. 0823929, JAP. 0594741.

Class 18A 2

3,492,308.—PROCESS FOR PREPARING METAL FREE PHTHALOCYANINES - SYNTHESIS OF METAL-FREE PHTHALOCYANINE. JAN. 27, 1970. CAN. 0922708, GRB. 1216887, JAP. 0586926.

3,492,309.—SYNTHESIS OF ALPHA METAL-FREE PHTHALOCYANINE. JAN. 27, 1970. CAN. 0894803, GRB. 1206306, JAP. 0604155.

3,509,146.—PROCESS OF PREPARING PHTHALOCYANINE AND HETEROCYCLIC ANALOGUES. APR. 28, 1970. CAN. 0865117, GRB. 1232241, JAP. 0587395.

3,672,979.—METHOD OF PRODUCING A PHTHALOCYANINE PHOTOCONDUCTIVE LAYER. JUNE 27, 1972. ARG. 0184673, AUS. 0457271, BEL. 0761135, CAN. 0951697, FRA. 7047702, GRB. 1334060, ITL. 0914074, JAP. 0753795, MEX. 0119529, PLD. 0082204, PNM. 0002191, SPN. 0386759, STZ. 0571731, TIW. 0007180, VZL. 0032789.

3,761,261.—PHTHALOCYANINE DYE SENSITIZERS FOR ZINC OXIDE. SEPT. 25, 1973.

4,107,389.—FUSING SURFACE. AUG. 15, 1978. GRB. 1511272.

4,126,722.—FUSING SURFACE. NOV. 21, 1978. GRB. 1511272.

Class 18A 2A

RE.27,117.—METAL FREE PHTHALOCYANINE IN THE NEW X-FORM-RE OF 3,357,989-D1170. APR. 20, 1971.

3,594,163.—METHOD OF CONVERTING ALPHA PHTHALOCYANINE TO THE X FORM. JULY 20, 1971.

3,657,272.—PROCESS FOR PREPARING X-FORM METAL FREE PHTHALOCYANINE. APR. 18, 1972.

3,816,118.—ELECTROPHOTOGRAPHIC ELEMENT CONTAINING PHTHALOCYANINE. JUNE 11, 1974. ARG. 0156316, CAN. 0890855, FRA. 0091579, GRB. 1175451, ITL. 0809972, JAP. 0820183, MEX. 0115884, VZL. 0024012.

3,862,127.—PROCESS. JAN. 21, 1975. AUS. 0453518, BEL. 0754407, FRA. 7028418, GRB. 1268574, ITL. 0929169, JAP. 0727963, SPN. 0382366.

3,903,107.—DIRECT ALPHA TO X PHASE CONVERSION OF METAL CONTAINING PHTHALOCYANINE. SEPT. 2, 1975. BEL. 0815632, SAF. 0743536.

3,927,026.—PROCESS OF MAKING X-FORM METAL PHTHALOCYANINE. DEC. 16, 1975. CAN. 0916703, GRB. 1312946, JAP. 0693981.

3,932,180.—DIRECT ALPHA TO X PHASE CONVERSION OF METAL-FREE PHTHALOCYANINE. JAN. 13, 1976. BEL. 0815632, SAF. 0743536.

3,932,454.—PROCESS OF MAKING HEXAGONAL ALPHA METAL-FREE PHTHALOCYANINE. JAN. 13, 1976. CAN. 0918152, GRB. 1327084, JAP. 0752724.

4,031,109.—METHOD FOR THE PREPARATION OF X-FORM METAL PHTHALOCYANINE AND X-FORM METAL FREE COMPOUNDS. JUNE 21, 1977. ARG. 0188048.

4,098,795.—METHOD FOR THE PREPARATION OF X-FORM METAL FREE PHTHALOCYAMINE. JULY 4, 1978. ARG. 182328, BEL. 737989, CAN. 899870, FRA. 6928871, GER. 1943381, GRB. 1280843, ITL. 870314, JAP. 654041, MEX. 116011.

Class 18A 3

3,447,922.—ELECTRICALLY PHOTOSENSITIVE PARTICLES USEFUL IN PHOTOELECTROPHORETIC AND XEROGRAPHIC IMAGING PROC. JUNE 3, 1969.

3,448,028.—N-SBSTUD-8, 13-DIOXODINAPHTHO-2-1-B, 2, 3-D-FURAN-6-CARBOXAMIDES AS ELCTLY PTOSNSTV MTLS IN ELCPHG. JUNE 3, 1969.

Class 18A 4

3,384,632.—ARYLAZO-4-ISOPROPOXY-1-NAPHTHOL COMPOUNDS. MAY 21, 1968. BEL. 0743897, CAN. 0787920, FRA. 1473703, GER. 1644400, GRB. 1145374, ITL. 0764015, JAP. 0578398.

3,574,182.—CALCIUM SALT OF 6-BROMO-1-1-SULFO-2-NAPHTHYLAZO-2-NAPHTHOL. APR. 6, 1971. ARG. 0168131, ATR. 0302812, AUS. 0429649, BEL. 0710053, CAN. 0878483, CHL. 0024254, CLB. 0018785, DNK. 0128493, FIN. 0049711, FRA. 1556484, GRB. 1197374, GRK. 0036648, IND. 0114221, ISR. 0029376, ITL. 0823989, JAP. 0605213, LXB. 0055364, MEX. 0099564, NOR. 0129593, NZL. 0151403, PRU. 0009483, PTG. 0049036, SAF. 0068559, SPN. 0349965, STZ. 0524844, SWD. 0351737, URG. 0008893, VZL. 0032776.

Class 18B

3,467,634.—ORGANOSILICON TERPOLYMERS AND PROCESS. SEPT. 16, 1969. ARG. 0165758, AUS. 0417109, BEL. 0702403, BRA. 6790950, CAN. 0857389, FRA. 1534183, GRB. 1200756, HOL. 0826202, ITL. 0826202, JAP. 0671041. MEX. 0100136, NOR. 0125392, SPN. 0343902, STZ. 0484210, SWD. 0339752, VZL. 0025437.

3,671,467.—SELENIUM CONTAINING POLYMERS. JUNE 20, 1972. ARG. 0190619, BEL. 0770689, CAN. 0941544, FRA. 7128500, GRB. 1364297, ITL. 9308410, SPN. 0393651, VZL. 0029342.

3,725,505.—PYRENE CONTAINING POLYMERS PREPARED BY ANIONIC POLYMERIZATION. APR. 3, 1973. ARG. 0183776, AUS. 0459733, BEL. 0770501, CAN. 0986650, FRA. 7127963, GRB. 1359045, ITL. 0930707, MEX. 0120152, SPN. 0393582, VZL. 0031959.

3,776,760.—METHOD FOR MANUFACTURING A TETRAFLUOROETHLENE POLYMER-COATED ROLL. DEC. 4, 1973. ARG. 0199302, ATR. 0335842, AUS. 0165141, BEL. 0789728, CAN. 0990149, GRB. 1410025, NZL. 0168554, SAF. 0727133, STZ. 0028514.

3,852,861.—SURFACES WITH FLUOROCARBON PROCESS FOR MULTIPLE COATING RESINS. DEC. 10, 1974. ARG. 0199302, ATR. 0335842, AUS. 0165141, BEL. 0789728, CAN. 0990149, GRB. 1410025, NZL. 0168554, SAF. 0727133, STZ. 0028514.

3,860,484.—ENZYME STABILIZATION. JAN. 14, 1975.

3,864,144.—PROCESS FOR PREPARATION OF PHOTOCONDUCTIVE FILMS FROM INTRACTABLE MATERIALS. FEB. 4, 1975. FRA. 7408936, GRB. 1414158, ITL. 1010695, TIW. 0008534.

3,877,936.—PHOTOCONDUCTIVE COPOLYMER OF N-VINYLCARBAZOLE AND N-VINYLPHTHALIMIDE. APR. 15, 1975. BEL. 0812436, FRA. 7409307, GRB. 1444048, ITL. 1010697, SPN. 0424411.

3,879,198.—ELECTROPHOTOGRAPHIC AMBIPOLAR PHOTOCONDUCTIVE COMPOSITION AND IMAGING METHOD. APR. 22, 1975. FRA. 7403086, GRB. 1446966.

3,882,087.—ORGANIC PHOTOCONDUCTIVE MATERIAL. MAY 6, 1975.

3,883,488.—2-VINYL-9-DICYANOMETHYLENE-FLUORENE AND DERIVATIVES THEREOF. MAY 13, 1975.

3,884,825.—IMAGING COMPOSITION. MAY 20, 1975. AUS. 0467835, BEL. 0802879, CAN. 099593, FRA. 7328589, GRB. 1437041, ITL. 0991465, SPN. 0417382.

3,895,945.—PROCESS FOR PREPARATION OF A DYESTUFF SENSITIZED PHOTOCONDUCTIVE COMPOSITION. JULY 22, 1975.

3,899,328.—ACTIVE MATRIX AND INTRINSIC PHOTOCONDUCTIVE POLYMER OF A LINEAR POLYSILOXANE. AUG. 12, 1975. ITL. 1010430.

3,943,108.—PHOTOCONDUCTIVE COMPOSITION OF AN ALDEHYDE CONDENSATE. MAR. 9, 1976.

3,950,168.—FIXING POWDER IMAGES-FUSING AIDES FOR HYBRID FIX. APR. 13, 1976.

3,951,658.—COLOR MODIFYING IMAGING METHOD AND ARTICLE. APR. 20, 1976.

3,954,906.—AMBIPOLAR PHOTOCONDUCTIVE COMPOSITION AND IMAGING METHOD. MAY 4, 1976. FRA. 7403086, GRB. 1446966.

3,965,049.—ONE-STEP SYNTHESIS OF AROMATIC ORGANIC DISELENIDES. JUNE 22, 1976.

3,967,962.—DEVELOPING WITH TONER POLYMER HAVING CRYSTALLINE AND AMORPHOUS SEGMENTS. JULY 6, 1976.

3,970,602.—COPOLYMERS OF N-VINYLCARBAZOLE AND N-VINYLPHTHALIMIDE AND DERIVATIVES THEREOF. JULY 20, 1976. BEL. 0812436. FRA. 7409307, GRB. 1444048, ITL. 1010697, SPN. 0424411.

3,994,994.—IMPROVED PROCESS FOR PREPARATION OF BLOCK COPOLYMERS FROM VINYLCARBOZOLES & OTHER ADDITION MONO. NOV. 30, 1976.

4,007,043.—PHOTOCONDUCTIVE ELEMENTS WITH COPOLYMER CHARGE TRANSPORT LAYERS. FEB. 8, 1977.

4,009,151.—POLYMERS OF 2-VINLYFLUORENONE AND DERIVATIVES THEREOF. FEB. 22, 1977.

4,011,266.—2-VINYL-FLUORENONE AND DERIVATIVES THEREOF. MAR. 8, 1977.

4,045,413.—POSSIBLE ACTIVE MATRIX POLYMERS. AUG. 30, 1977. FRA. 7432710.

4,046,564.—ELECTROPHOTOGRAPHIC IMAGING MEMBERS WITH PHOTOCONDUCTIVE LAYER CONTAINING ELECTRON ACCEPTOR. SEPT. 6, 1977.

4,071,670.—METHOD OF SIZING MONOMER DROPLETS FOR SUSPENSION POLYMERIZATION TO FORM SMALL PARTICLES. JAN. 31, 1978. BEL. 857223.

4,075,012.—INTRACHAIN CHARGE TRANSFER COMPLEXES USE IN ELECTROPHOTOGRAPHIC IMAGING. FEB. 21, 1978.

4,098,984.—ELECTRON ACCEPTOR POLYMERS. JULY 4, 1978.

4,116,691.—ELECTROPHOTOGRAPHIC IMAGING MEMBER OF MONOMERS HAVING PENDANT ELECTRON ACCEPTOR GROUPS. SEPT. 26, 1978.

4,122,113.—9-FLUORENYL ACRYLATES. OCT. 24, 1978.

4,129,581.—MONOMERS HAVING PENDANT ELECTRON ACCEPTOR GROUPS-PROCESS FOR PREPARATION AND USE. DEC. 12, 1978.

4,143,225.—HOMOPOLYMERS OF A FLUORENONE DERIVATIVE HAVING PENDANT ELECTRON ACCEPTOR GROUPS. MAR. 6, 1979.

Class 18C

4,074,143.—OPTOELECTRONIC DEVICE WITH OPTICAL FEEDBACK. FEB. 14, 1978. FRA. 7631992.

Class 18C 1

RE.27,480.—AUTOMATIC DEVELOPMENT CONTROLLER -RE OF 3,376,854-D986. SEPT. 19, 1972.

3,884,825.—IMAGING COMPOSITION. MAY 20, 1975. AUS. 0467835. BEL. 0802879, FRA. 7328589, GRB. 1437041, ITL. 0991465, SPN. 0417382.

Class 18C 1A

3,720,617.—AN ELECTROSTATIC DEVELOPER CONTAINING MODIFIED SILICON DIOXIDE PARTICLES. MAR 13, 1973. ARG. 0189666, ATR. 0321104, AUS. 0463862, BEL. 0767359, CAN. 0941212, CHL. 0026780, EGR. 0093928, FRA. 7118950, GRB. 1347318, ITL. 0926884, MEX. 0131403, NZL. 0163670, PNM. 0002393, PRU. 0011824, STZ. 0567746, SWD. 0366402, TIW. 0006149, USR. 0460634, VZL. 0032423.

3,819,367.—IMAGING SYSTEM. JUNE 25, 1974. ARG. 0189666, ATR. 0321104, AUS. 0463862, BEL. 0767359, CAN. 0941212, CHL. 0026780, EGR. 0093928, FRA. 7118950, GRB. 1347318, ITL. 0926884, MEX. 0131403, NZL. 0163670, PNM. 0002393, PRU. 0011824, STZ. 0567746, SWD. 0366402, TIW. 0006149. USR. 0460634, VZL. 0032423.

3,820,986.—LIQUID DEVELOPMENT METHOD AND MATERIALS. JUNE 28, 1974.

3,833,364.—METHOD OF DEVELOPING ELECTROSTATIC IMAGE CHARGE. SEPT. 3, 1974.

3,850,830.—LIQUID DEVELOPER CONTAINING EXTENDER BODY PARTICLES. NOV. 26, 1974.

3,900,588.—NON-FILMING DUAL ADDITIVE DEVELOPER. AUG. 19, 1975. BEL. 0825924, SPN. 0435074.

4,051,077.—NON FILMING DUAL ADDITIVE DEVELOPER. SEPT. 27, 1977. AUS. 487989, BEL. 825924, FRA. 7505307, GRB. 1494360, SPN. 435074.

Class 18C 1B

3,577,345.—SOLID XEROGRAPHIC DEVELOPER. MAY 4, 1971. ARG. 0172448, ATR. 0325417, AUS. 0424173, BAH. 0000095, BEL. 0716084, BOL. 0032708, CAN. 0902983, CHL. 0025923, CLB. 0017674, DOR. 0001461, ELS. 0001064, FRA. 1567731, GRB. 1232117, GRK. 0037628, GUA. 0002003, HOL. 0148714, IND. 0116209, ISR. 0030116, ITL. 0851653, JAM. 0001848, JAP. 0623002, LXB. 0056197, MEX. 0119320, NOR. 0131653, NZL. 0164353, PNM. 0002062. PRU. 0009911, PTG. 0049749, SPN. 0354686, STZ. 0516180, SWD. 0338238, TIW. 0005096, TRD. 0000057, TRK. 0015620, URG. 0009286, VZL. 0023666.

3,590,000.—SOLID DEVELOPER FOR LATENT ELECTROSTATIC IMAGES. JUNE 29, 1971. ARG. 0172453, ATR. 0288860, BAH. 0000093, BEL. 0716083, BOL. 33998, CAN. 0902984, CHL. 0024050, DOR. 0001460, ECD. 0000198, ELS. 0001062, FRA. 1567721, GER. 1772570, GRB. 1232118, GRK. 0037629, GUA. 0002095, HOL. 0151523, IND. 0116210, ISR. 0030117, ITL. 0851651, JAM. 0002094, JAP. 0655407, LXB. 0056196, MEX. 0104566, NZL. 0164356, PLP. 0007690, PNM. 0002083, PRU. 0009495, PTG. 0049748, SPN. 0354685, STZ. 0519737, SWD. 0357071, TIW. 0004940, TRD. 0000058, TRK. 0015606, URG. 0009287, VZL. 0032392.

3,653,893.—IMAGING SYSTEM. APR. 4, 1972.

3,655,374.—IMAGING PROCESS EMPLOYING NOVEL SOLID DEVELOPER MATERIAL. APR. 11, 1972.

3,681,107.—DEVELOPMENT OF ELECTROSTATOGRAPHIC IMAGES. AUG. 1, 1972.

3,856,692.—LIQUID ELECTROSTOGRAPHIC DEVELOPER COMPOSITIONS. DEC. 24, 1974. CAN. 0940361, GRB. 1332674.

3,900,588.—NON-FILMING DUAL ADDITIVE DEVELOPER. AUG. 19, 1975. BEL. 0825924, SPN. 0435074.

3,900,589.—AN ELECTROSTATOGRAPHIC IMAGING PROCESS. AUG. 19, 1975. AUS. 0467835, BEL. 0802879, CAN. 0995963, FRA. 7328589, GRB. 1437041, ITL. 0991465, SPN 0417382.

4,002,570.—ELECTROPHOTOGRAPHIC DEVELOPER WITH POLYVINYLIDENE FLUORIDE ADDITIVE. JAN. 11, 1977

4,051,077.—NON FILMING DUAL ADDITIVE DEVELOPER. SEPT. 27, 1977. AUS. 487989, BEL. 825924, FRA. 7505307, GRB. 1494360, SPN. 435074.

4,147,541.—ELECTROSTATIC IMAGING MEMBER WITH ACID LUBRICANT. APR. 3, 1979. AUS. 467835. BEL. 802879. CAN. 995963. FRA. 7328588. GRB. 1437041. ITL. 991465 SPN. 417382. USR. 637099.

Class 18C 2

4,038,076.—ELECTROSTATOGRAPHIC DEVELOPMENT JULY 26, 1977. ARG. 0192480, AUS. 0466319, BEL. 0793098, CAN. 0985552, FRA. 7245403, GRB. 1417179, ITL. 0973327, SPN. 0410171, STZ. 0028663, SWD 7216977.

Class 18C 2A

3,723,114.—THERMOSETTING ELCTRSTGRPHC DVLPR OF CARRIER/PREPOLYMER OF DIALLYL PHTHALATE ISOPHTHALATE AND MXTR. MAR. 27, 1973. ARG. 0185089, BEL. 0762507, CAN. 0970195, FRA. 7104349, GRB. 1344197, ITL. 0918244, MEX. 0122234.

3,806,339.—LIQUID DEVELOPER COMPOSITION. APR. 23, 1974.

3,942,979.—IMAGING SYSTEM. MAR. 9, 1976.

3,965,021.—ELECTROSTATOGRAPHIC DEVELOPMENT-POLYBLEND TONERS. JUNE 22, 1976.

3,967,962.—DEVELOPING WITH TONER POLYMER HAVING CRYSTALLINE AND AMORPHOUS SEGMENTS. JULY 6, 1976.

3,969,251.—DEVELOPER MIXTURE. JULY 13, 1976.

Class 18C 2A 1

RE.25,136.—ELECTROSTATIC DEVELOPER COMPOSITION AND METHOD THEREFOR-RE OF 2,940,934-D432. MAR. 13, 1962.

3,079,342.—ELECTROSTATIC DEVELOPER COMPOSITION AND METHOD THEREFOR. FEB. 26, 1963. ARG. 0157131, CAN. 0726134, GUA. 0001817.

3,239,465.—XEROGRAPHIC DEVELOPER. MAR. 8, 1966. CAN. 0630295, GRB. 0952166.

Class 18C 2A 2

3,239,465.—XEROGRAPHIC DEVELOPER. MAR. 8, 1966. CAN. 0630295, GRB. 0952166.

Class 18C 2B

3,533,835.—ELECTROSTATOGRAPHIC DEVELOPER MIXTURE. OCT. 13, 1970. ARG. 0181296, AUS. 0417746, BEL. 0704918, CAN. 0900769, CHL. 0024909, CLB. 0017825, FRA. 1540695, GRB. 1211865, IND. 0112449, ITL. 0814857, MEX. 0100137, PRU. 0009323, SWD. 0323583, URG. 0009011, VZL. 0023668.

3,591,503.—ELECTROSTATOGRAPHIC DEVELOPER. JULY 6, 1971. ARG. 0172143, ATR. 0287491, AUS. 0418556, BEL. 0713751, CAN. 0879020, CHL. 0024256, CLB. 0017933, FRA. 1560849, GRB. 1225980, GRK. 0038397, IND. 0115457, ITL. 0833710. LXB. 0055904, MEX. 0111625, NOR. 0128297, NZL. 0152196, PLP. 0008847, PRU. 0009319, PTG. 0049455, SAF. 0682386, SPN. 0352810, STZ. 0508903, SWD. 0333868, URG. 0009139, VZL. 0023688.

3,595,794.—ELECTROSTATOGRAPHIC DEVELOPER. JULY 27, 1971. ARG. 0169109, ATR. 0290986, AUS. 0418156, BEL. 0713752, CAN. 0879021, CHL. 0024482, FRA. 1582855, GRB. 1227471, IND. 0115458, ITL. 0883043, LXB. 0055894, MEX. 0115899, NOR. 0128036, NZL. 0152195, PLP. 0007966, PRU. 0009335, PTG. 0049154, SAF. 0682358, SPN. 0352811, STZ. 0505410, SWD. 0331633, URG. 0009283, VZL. 0023687.

3,627,522.—DEVELOPER COMPOSITION AND METHOD OF USE. DEC. 14, 1971.

3,672,928.—ELECTROSTATOGRAPHIC DEVELOPERS HAVING CARRIERS COMPRISING POLYSTER

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COATED CORES. JUNE 27, 1972. ARG. 0184669, BEL. 0762415, CAN. 0941209, FRA. 7103845, GRB. 1344365, ITL. 0918191, JAP. 0764506.
3,704,066.—REFLEX EXPOSURE MEDIUM. NOV. 28, 1972.
3,725,283.—ELECTROSTATOGRAPHIC DEVELOPER CONTAINING UNCOATED GLASS CERAMIC CARRIER PARTICLES. APR. 3, 1973. BEL. 0777720, CAN. 0973745, FRA. 7201006, GRB. 1376457, ITL. 0946358.
3,767,578.—CARRIER MATERIAL FOR ELECTROSTATOGRAPHIC. OCT. 23, 1973. ARG. 0198052, ATR. 0322978, AUS. 0461667, BEL. 0784452, CAN. 0986351, CHL. 0027640, FRA. 7220690, GRB. 1397445, ITL. 0959791, MEX. 0127643, SPN. 0403664, STZ. 0546969, SWD. 7207389, TIW. 0006042, VZL. 0032064.
3,847,604.—ELECTROSTATIC IMAGING PROCESS USING MODULAR CARRIERS. NOV. 12, 1974. ARG. 0198052, ATR. 0322978, AUS. 0461667, BEL. 0784452, CAN. 0986351, CHL. 0027640, FRA. 7220690, GRB. 1397445, ITL. 0959791, MEX. 0127643, SPN. 0403664, STZ. 0546969, SWD. 7207389, TIW. 0006042, VZL. 0032064.
3,849,127.—AN ELECTROSTATOGRAPHIC PROCESS IN WHICH COATED CARRIER PARTICLES ARE USED. NOV. 19, 1974.
3,857,792.—ELECTROSTATIC DEVELOPER MIXTURE WITH A COATED CARRIER. DEC. 31, 1974.
3,914,181.—ELECTROSTATOGRAPHIC DEVELOPER MIXTURES COMPRISING FERRITE CARRIER BEADS. OCT. 21, 1975. ARG. 0194244, AUS. 0471676, BEL. 0785913, CAN. 1000477, GRB. 1398871, ITL. 0962400, MEX. 0126285, SPN. 0404423, VZL. 0032940.
3,923,503.—ELECTROSTATIC LATENT IMAGE DEVELOPMENT EMPLOYING STEEL CARRIER PARTICLES. DEC. 2, 1975. ARG. 0181848, ATR. 0316987, AUS. 0456820, BAH. 0000162, BEL. 0752230, CAN. 0940360, CHL. 0025833, EGR. 0095180, FRA. 7021985, GRB. 1312806, ITL. 0894287, JAP. 0728825, MEX. 0121681, NOR. 0131364, NZL. 0160479, PLD. 0081013, PNM. 0002264, PTG. 0053978, SAF. 0704155, SPN. 0380913, STZ. 0548625, SWD. 0351058, TIW. 0006837, USR. 0457235.
3,939,086.—HIGHLY CLASSIFIED OXIDIZED DEVELOPER MATERIAL. FEB. 17, 1976. ARG. 0181848, ATR. 0316987, AUS. 0456820, BAH. 0000162, BEL. 0752230, CAN. 0940360, CHL. 0025833, EGR. 0095180, FRA. 7021985, GRB. 1312806, ITL. 0894287, JAP. 0728825, MEX. 0121681, NOR. 0131364, NZL. 0160479, PLD. 0081013, PNM. 0002264, PTG. 0053978, SAF. 0704155, SPN. 0380913, STZ. 0548625, SWD. 0351058, TIW. 0006837, USR. 0457235.
3,942,979.—IMAGING SYSTEM. MAR. 9, 1976.
3,969,251.—DEVELOPER MIXTURE. JULY 13, 1976.
4,018,601.—ELECTROSTATOGRAPHIC MAGNETIC BRUSH IMAGING PROCESS EMPLOYING CARRIER BEADS COMPRISING HIGH NICK. APR. 19, 1977.

Class 18C 4

3,467,634.—ORGANOSILICON TERPOLYMERS AND PROCESS. SEPT. 16, 1969. ARG. 0165758, AUS. 0417109, BEL. 0702403, BRA. 6790950, CAN. 0857389, FRA. 1534183, GRB. 1200756, HOL. 0826202, ITL. 0826202, JAP. 0671041, MEX. 0100136, NOR. 0125392, SPN. 0343902, STZ. 0484210, SWD. 0339752, VZL. 0025437.
3,526,533.—COATED CARRIER PARTICLES. SEPT. 1, 1970. ARG. 0161341, AUS. 0418867, BEL. 0702404, CAN. 0878413, FRA. 1534184, GRB. 1205051, ITL. 0826203, JAP. 0578401, MEX. 0120334, NOR. 0122818, SPN. 0343903, STZ. 0486054, SWD. 0308987, VZL. 0032393.
3,533,835.—ELECTROSTATOGRAPHIC DEVELOPER MIXTURE. OCT. 13, 1970. ARG. 0181296, AUS. 0417746, BEL. 0704918, CAN. 0900769, CHL. 0024909, CLB. 0017825, FRA. 1540695, GRB. 1211865, IND. 0112449, ITL. 0814857, MEX. 0100137, PRU. 0009323, SWD. 0323583, URG. 0009011, VZL. 0023668.
3,713,819.—XEROGRAPHIC IMAGING AND DEVELOPMENT USING METAL OXIDE CARRIER PART. JAN. 30, 1973.
3,730,707.—METHOD OF DEVELOPING LATENT IMAGES. MAY 1, 1973.
3,752,666.—ELECTROSTATIC IMAGING PROCESS USING CARRIER BEADS CONTAINING CONDUCTIVE PARTICLES. AUG. 14, 1973.
3,839,029.—ELECTROSTATOGRAPHIC DEVELOPMENT WITH FERRITE DEVELOPER MATERIALS. OCT. 1, 1974. ARG. 0194244, AUS. 0471676, BEL. 0785913, CAN. 1000477, GRB. 1398871, ITL. 0962400, MEX. 0126285, SPN. 0404423, VZL. 0032940.
3,849,182.—HIGHLY SHAPE-CLASSIFIED OXIDIZED LOW CARBON HYPEREUTECTOID ELECTROSTATOGRAPHIC STEEL CARRIER PA. NOV. 19, 1974. ARG. 0181848, ATR. 0316987, AUS. 0456820, BAH. 0000162, BEL. 0752230, CAN. 0940360, CHL. 0025833, EGR. 0095180, FRA. 7021985, GRB. 1312806, ITL. 0894287, JAP. 0728825, MEX. 0121681, NOR. 0131364, NZL. 0160479, PLD. 0081013, PNM. 0002264, PTG. 0053978. SAF. 0704155, SPN. 0380913, STZ. 0548625, SWD. 0351058, TIW. 0006837, USR. 0457235.
3,850,663.—CELLULOSE COATED CARRIERS. NOV. 26, 1974. ARG. 0183677, AUS. 0458322, BEL. 0763987, CAN. 0941210, EGR. 0091603, FRA. 7108585, GRB. 1345027, ITL. 0922292, MEX. 0120027, PNM. 0002440, SAF. 0711547, STZ. 0557050, SWD. 0359940, TIW. 0008177, VZL. 0032931.
3,850,676.—COATED CARRIER PARTICLES FOR ELECTROSTATOGRAPHIC DEVELOPMENT. NOV. 26, 1974.
3,856,519.—TRANSFER OF TONER USING A VOLATILE INSULATING LIQUID. DEC. 24, 1974.
3,900,587.—IMAGING PROCESS EMPLOYING TREATED CARRIER PARTICLES. AUG. 19, 1975. CAN. 1007923.
3,916,064.—DEVELOPER MATERIAL. OCT. 28, 1975.
3,916,065.—ELECTROSTATOGRAPHIC CARRIER PARTICLES. OCT. 28, 1975.
3,989,648.—IMAGING SYSTEM. NOV. 2, 1976. CAN. 1007923.
4,019,903.—ELECTROSTATIC DEVELOPMENT. APR. 26, 1977. BEL. 0777715, CAN. 0973746, FRA. 7201001, GRB. 1376456, ITL. 0946359.
4,035,520.—IMAGING SYSTEMS. JULY 12, 1977
4,040,969.—HIGH SURFACE AREA CARRIER. AUG. 9, 1977. BEL. 829639, GRB. 1497732, SPN. 438084.
4,042,517.—ELECTROSTATOGRAPHIC DEVELOPER MIXTURE CONTAINING A THERMOSET ACRYLIC RESIN COATED CARRIER. AUG. 16, 1977.
4,065,585.—RENEWABLE CHOW FUSER COATING. DEC. 27, 1977. GRB. 1490252.
4,066,563.—COPPER - TETRA - 4 - (OCTADECYLSULFONOM- IDO) PHTHALOCYANINE ELECTROPHOTOGRAPHIC CARRIER. JAN. 3, 1978.
4,122,024.—CLASSIFIED TONER MATERIALS. OCT. 24, 1978. BEL. 829719. CAN. 1043149. FRA. 7516758. GRB. 1497731.
4,126,454.—IMAGING PROCESS UTILIZING HIGH SURFACE AREA CARRIER MATERIALS. NOV. 21, 1978.

Class 18C 5

3,788,994.—PRESSURE FIXABLE ELECTROSTATOGRAPHIC TONER. JAN. 29, 1974. ARG. 0200575, BEL. 0793247, CAN. 0985943, FRA. 7244381, GRB. 1406687, ITL. 0973323, SPN. 0410212, STZ. 0028529, VZL. 0032608.
3,804,764.—ELECTROSTATOGRAPHIC PRESSURE SENSITIVE POLYMERIC TONER. APR. 16, 1974. ARG. 0196320, AUS. 0464392, BEL. 0793554, CAN. 1011149, FRA. 7246575, GRB. 1417409, ITL. 0973325, SPN. 0410211, STZ. 0028568.
3,853,778.—TONER COMPOSITION EMPLOYING POLYMER WITH SIDE CHAIN CRYSTALLINITY. DEC. 10, 1974. AUS. 0465653, BEL. 0793639, CAN. 0998869, FRA. 7246888, GRB. 1423291, ITL. 0973330, SPN. 0410267, SWD. 7300003.
3,893,932.—PRESSURE FIXABLE TONER. JULY 8, 1975.
3,893,934.—SOLID DEVELOPER FOR ELECTROSTATIC LATENT IMAGES. JULY 8, 1975.
3,910,846.—METHOD OF PREPARING ELECTROSCOPIC TONER PARTICLES. OCT. 7, 1975. CAN. 0984074.
3,974,078.—AN ELECTROSTATE GRAPHIC DEVELOPMENT OF ENCAPSULATED MATERIALS. AUG. 10, 1976. ARG. 0196318, AUS. 0467046, BEL. 0792115, CAN. 1001884, FRA. 7239134, ITL. 0973326, MEX. 0128768, SPN. 0410205, STZ. 0028567, VZL. 0033139.
4,002,776.—IMAGING PROCESS EMPLOYING TONER PARTICLES CONTAINING ARYLSULPONAMIDE FORMALDEHYDE ADDUCT. JAN. 11, 1977.
4,161,454.—COATING MAGNETITE WITH POLYACID. JULY 17, 1979.

Class 18C 5A

3,345,293.—COLORED ELECTROSTATOGRAPHIC TONERS CONTAINING ORGANIC DYE PIGMENTS. OCT. 3, 1967. CAN. 0834674, GRB. 1074147, JAP. 0788652.
3,864,125.—ELECTROPHOTOGRAPHIC METHOD OF MAKING AN IMAGING MASTER. FEB. 4, 1975.
3,897,249.—TONERS FOR PHTHALOCYANINE PHOTORECEPTORS. JULY 29, 1975.
4,126,565.—TONERS FOR COLOR FLASH FUSERS CONTAINING A PERMANENT COLORANT AND A HEAT SENSITIVE DYE. NOV. 21, 1978.

Class 18C 5B

3,080,250.—SELF-TACKIFYING XEROGRAPHIC TONER. MAR. 5, 1963.
3,080,318.—THREE-COMPONENT XEROGRAPHIC TONER. MAR. 5, 1963.

Class 18C 6

3,755,177.—PROCESS OF MAKING LIQUID ELECTROSTATIC DEVELOPERS CONTAINING GELATIN. AUG. 28, 1973.
3,790,485.—PROCESS FOR PRODUCING ELECTROPHOTOGRAPHIC LIQUID DEVELOPER. FEB. 5, 1974.
3,812,037.—LIQUID DEVELOPER COMPOSITION. MAY 21, 1974.

Class 18C 6A

3,507,686.—METHOD OF COATING CARRIER BEADS. APR. 21, 1970. CAN. 0872190, GRB. 1239621, JAP. 0675782.
3,658,500.—METHOD OF PRODUCING GLASS BEADS FOR ELECTROSTATOGRAPHIC DEVELOPERS. APR. 25, 1972. CAN. 0916536, GRB. 1331485.
3,685,113.—DEVELOPER SYSTEM. AUG. 22, 1972. ARG. 0183679, BEL. 0764635, CAN. 0941211, FRA. 7110751, GRB. 1347568, ITL. 0922132, MEX. 0122432.
3,764,310.—METHOD OF PRODUCING ELECTROSTATOGRAPHIC DEVELOPER. OCT. 9, 1973.
3,789,796.—APPARATUS FOR PRODUCING DEVELOPER MATERIALS. FEB. 5, 1974.
3,908,046.—P-XYLYENE VAPOR PHASE POLYMERIZATION COATING OF ELECTROSTATOGRAPHIC PARTICLES. SEPT. 23, 1975.
3,940,514.—METHOD OF COATING ELECTROSTATOGRAPHIC CARRIER PARTICLES. FEB. 24, 1976.

Class 18C 6B

3,326,848.—SPRAY DRIED LATEX TONERS. JUNE 20, 1967. AUS. 0409084, BEL. 0666056, CAN. 0866260. FRA. 1451366, GRB. 1115653, ITL. 0717377, MEX. 0088140, SWD. 0340046.
3,338,991.—METHOD OF FORMING ELECTROSTATIC TONER PARTICLES. AUG. 29, 1967. FRA. 1450642, GRB. 1115634, HOL. 0142251, ITL. 0717378, JAP. 0539572.
3,502,582.—IMAGING SYSTEMS. MAR. 24, 1970. ARG. 0171952, BEL. 0726571, CAN. 0873934, FRA. 1569382, GRB. 1237095, ITL. 0835554, MEX. 0100704, VZL. 0032414.
3,740,334.—PROCESS OF PREPARING SOLID DEVELOPERS FOR ELECTROSTATIC LATENT IMAGES. JUNE 19, 1973.
3,830,750.—ENCPSLTNG SBSTNLY SLUBL PRTN OF CORE MATL IN SBSTNLY SLBLE SHELL MATL OF DFRNT SOLUBLTY. AUG. 20, 1974. AUS. 0466018, BEL. 0793246, CAN. 0983328, GRB. 1411954, ITL. 0973317, SPN. 0410224, STZ. 0028527.
3,936,517.—METHOD FOR REDUCING PARTICLE SIZE. FEB. 3, 1976.
4,016,099.—METHOD OF FORMING ENCAPSULATED TONER PARTICLES. APR. 5, 1977.
4,071,670.—METHOD OF SIZING MONOMER DROPLETS FOR SUSPENSION POLYMERIZATION TO FORM SMALL PARTICLES. JAN. 31, 1978. BEL. 857223.
4,077,804.—METHOD OF PRODUCING TONER PARTICLES BY IN-SITU POLYMERIZATION AND IMAGING PROCESS. MAR. 7, 1978.
4,097,620.—MAGNETIC TONER PARTICLE COATING PROCESS. JUNE 27, 1978.
4,142,981.—TONER COMBINATION FOR CARRIERLESS DEVELOPMENT. MAR. 6, 1979.
4,148,741.—POLYMERIZATION AND ATTRITION METHOD FOR PRODUCING TONER WITH REDUCED PROCESSING STEPS. APR. 10, 1979.

Class 18D

3,150,446.—BRAZING METHOD AND COMPOSITION. SEPT. 29, 1964.
3,666,429.—MATALLIZED AND BRAZED CERAMICS. MAY 30, 1972.
3,959,934.—COMPOSITION AND METHOD FOR REPAIRING SELENIUM PHOTORECEPTOR. JUNE 1, 1976.
3,971,169.—A METHOD FOR REPAIRING SELENIUM PHOTOCONDUCTORS. JULY 27, 1976.
4,062,658.—COMPOSITION & METHOD FOR REPAIRING SELENIUM PHOTORECEPTORS. DEC. 13, 1977.

Class 18E

3,950,168.—FIXING POWDER IMAGES-FUSING AIDES FOR HYBRID FIX. APR. 13, 1976.
4,025,541.—CHARGE TRANSFER OF FERROCENES HAVING LIGHT FILTERING PROPERTIES. MAY 24, 1977.

Class 20

3,916,167.—COUNTERS. OCT. 28, 1975.

Class 20A

3,751,693.—MOVING COIL MOTOR WITH NO SPRAY FLUX. AUG. 7, 1973. AUS. 3467604, BEL. 0795400, CAN. 0980395, GRB. 1424622, ITL. 0979062, SPN. 0411470.
3,769,467.—VIBRATION DAMPED TRANSDUCER HEAD ASSEMBLY. OCT. 30, 1973. ARG. 0195905, AUS. 0476996, BEL. 0795401, CAN. 0995355, GRB. 1417764, ITL. 0979063, MEX. 0135598, SPN. 0411538, STZ. 0558582, SWD. 7301915.
4,046,105.—LAMINAR DEEP WAVE GENERATOR. SEPT. 6, 1977.
4,076,417.—INTERLOCKING APPARATUS FOR AN OPTICAL SYSTEM AND REPRODUCING MACHINE. FEB. 28, 1978. HAT. 1604.

Class 20A 1

RE.27,313.—BELT TRACKING SYSTEM - RE OF 3,500,694-D2586. MAR 21, 1972.
3,435,693.—BELT TRACKING DEVICE. APR. 1, 1969. ARG. 0168295, ATR. 0283116, AUS. 0421893, BEL. 0705641, CAN. 0853440, CHL. 0023084, CLB. 0017528, DNK. 0117047, FRA. 1543079, GRB. 1180659, ITL. 0827782, MEX. 0100320, NOR. 0124530, PRU. 0009336, SAF. 0676414, SPN. 0346430, STZ. 0471736, URG. 0009729, USR. 0321984, VZL. 0023676.
3,500,694.—BELT TRACKING SYSTEM — SEE D3286 FOR RE27313. MAR. 17, 1970.
3,592,071.—BELT TRACKING APPARATUS. JULY 13, 1971. ARG. 0179666, BEL. 0751117, CAN. 0925118, FRA. 7019040, GRB. 1298926, ITL. 0893540, JAP. 0770135, MEX. 0118981, SPN. 0380136.
3,593,838.—CONVEYOR BELT. JULY 20, 1971. CAN. 0883720.

Class 20A 2

3,498,148.—CHAIN TRAIN. MAR. 3, 1970.
3,509,780.—DOUBLE-ACTION ROTARY SOLENOID DRIVE MECHANISM. MAY 5, 1970.
3,844,179.—GEAR DRIVE FOR ELECTROPHOTOGRAPHIC PRINTING MACHINE. OCT. 29, 1974. ARG. 203483, BEL. 0816382, CAN. 1007075, GRB. 1467714, STZ. 5786990, VZL. 0033061.
3,982,831.—ELECTROSTATOGRAPHIC REPRODUCTION APP & DRIVE THEREFOR SEPT. 28, 1976
3,985,277.—WEB HANDLING DEVICE. OCT. 12, 1976.
4,110,028.—DRIVE SYSTEM FOR MULTI-MODE REPRODUCING APPARATUS. AUG. 29, 1978. BEL. 844828.

Class 20A 3

3,405,564.—PULLEY. OCT. 15, 1968. CAN. 0850353.
3,505,716.—ROLL APPARATUS. APR. 14, 1970.
3,791,243.—METHOD AND APPARATUS FOR FORMING EDGES OF AN ENDLESS BELT. FEB. 12, 1974.
3,932,177.—COLLAR AND METHOD OF MAKING SAME. JAN. 13, 1976.

Class 20A 4

3,329,029.—OFF-CENTER LOAD MOVING ASSEMBLY. JULY 4, 1967.
3,337,072.—LOADER. AUG. 22, 1967. CAN. 0825092, GRB. 1166619, JAP. 0605648.
3,493,269.—LOADING HEAD. FEB. 3, 1970. CAN. 0864392.
3,777,578.—LINEAR ACTUATOR. DEC. 11, 1973. CAN. 9783901.

Class 20A 5

3,112,819.—CLUTCH MECHANISM - 914. DEC. 3, 1963. CAN. 0688810.
3,213,645.—TORQUE LIMITING MECHANISM. OCT. 26, 1965. CAN. 0729978, GRB. 1035547, JAP. 0548690.
3,623,680.—CLUTCH/BRAKE MECHANISM. NOV. 30, 1971.

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3,686,974.—MECHANICAL DRIVE ARRANGEMENT. AUG. 29, 1972.

Class 20A 6

3,351,831.—MOTOR SPEED CONTROL UTILIZING LIGHT SENSITIVE CONDUCTIVE AND RESISTIVE ELEMENTS. NOV. 7, 1967.
3,388,875.—WEB TRANSPORT CONTROL ASSEMBLY. JUNE 18, 1968.
3,418,046.—SIGNAL STORAGE DEVICE. DEC. 24, 1968. CAN. 0852814, GER. 1524999, GRB. 1190084, JAP. 0589515.
3,552,221.—SPEED CONVERTING MECHANISM. JAN. 5, 1971.
3,858,777.—PRINTING APPARATUS INCLUDING REGISTRATION CONTROL. JAN. 7, 1975.
3,870,934.—WEB TENSION CONTROLLER. MAR. 11, 1975.
3,909,125.—STEPPER MOTOR CONTROL. SEPT. 30, 1975.
3,917,400.—METHOD & APPARATUS FOR MAINTAINING A PREDETERMINED PHASE RELATIONSHIP BETWEEN TWO SIGNALS. NOV. 4, 1975.
3,921,043.—METHOD & APPARATUS FOR MAINTAINING SUBSTANTIALLY CONSTANT TORQUE IN A WEB TRANSPORT APPARATUS. NOV. 18, 1975.
3,944,896.—PHASE SYNCHRONIZATION SYSTEM WITH START-UP SEQUENCING AND AUTOMATIC SHUTDOWN. MAR. 16, 1976.
3,991,355.—STEPPER MOTOR CONTROL NOV. 9, 1976.
4,110,028.—DRIVE SYSTEM FOR MULTI-MODE REPRODUCING APPARATUS. AUG. 29, 1978. BEL. 844828.

Class 20B

3,869,896.—ROLLING PROCESS. MAR. 11, 1975. GRB. 1434131.
3,942,349.—CROWN DIE FOR THREAD ROLLING OF APPLICATOR ROLLS. MAR. 9, 1976.
3,965,861.—SEPARATED ROLLER LIQUID DEVELOPMENT. JUNE 29, 1976.
4,040,827.—DEVELOPMENT IMAGING METHODS. AUG. 9, 1977.

Class 20B 1

3,094,248.—XEROGRAPHIC DEVELOPING APPARATUS. JUNE 18, 1963. CAN. 0678004, GRB. 0985306.
3,129,850.—POWDER CLOUD GENERATING APPARATUS. APR. 21, 1964. CAN. 0693933, GER. 1497044, GRB. 1001237, JAP. 0436042.

Class 20B 2

3,094,248.—XEROGRAPHIC DEVELOPING APPARATUS. JUNE 18, 1963. CAN. 0678004, GRB. 0985306.
3,122,455.—XEROGRAPHIC TONER DISPENSER. FEB. 25, 1964.
3,356,248.—CONTAINER WITH A ROTATABLE CLOSURE. DEC. 5, 1967. CAN. 0825091, GRB. 1166618.
3,477,568.—ELECTROSTATIC SEPARATION OF ROUND AND NONROUND PARTICLES. NOV. 11, 1969.
3,478,600.—PARTICLE SIZE AND DISTRIBUTION ANALYZING APPARATUS. NOV. 18, 1969. CAN. 0871819, GRB. 1196449, JAP. 0667702.
3,694,068.—ROLLER RETRACTION MECHANISM IN A MULTIPLE ROLLER BELT ASSEMBLY. SEPT. 26, 1972. CAN. 0946322, GRB. 1370798.
3,698,540.—WEB SENSING MECHANISM FOR TRACKING SYSTEM. OCT. 17, 1972. CAN. 0946926.
3,702,131.—BELT TRACKING SYSTEM. NOV. 7, 1972. ARG. 1949380, AUS. 0459319, BEL. 0777321, CAN. 0953673, FRA. 7147892, GRB 1381720, ITL. 0944435, MEX. 0126336, PNM. 0002633, SPN. 0398380.
3,740,288.—METHOD OF PREPARING A TONER DISPENSER. JUNE 19, 1973.
3,840,879.—EXCESS TONER SHIELD FOR ELECTROGRAPHIC APPARATUS. OCT. 8, 1974.
3,931,792.—ABRASIVE LIQUID DEVELOPING APPARATUS. JAN. 13, 1976.

Class 20B 3

3,410,060.—XEROGRAPHIC FILTER APPARATUS. NOV. 12, 1968. CAN. 0810976, FRA. 1458648, GRB. 1114505, ITL. 0729638, JAP. 0724232.
3,570,224.—FILTER FOR ELECTROSTATOGRAPHIC DEVELOPER. MAR. 16, 1971.
3,662,884.—METHOD AND APPARATUS FOR ELECTROSTATICALLY CLASSIFYING TONER PARTICLES. MAY 16, 1972. CAN. 0956273, GRB. 1327942.
3,740,735.—AIR CIRCULATION APPARATUS. JUNE 19, 1973. CAN. 1014265, GRB. 1322612, JAP. 0840915.
3,909,383.—CLEANING PROCESS. SEPT. 30, 1975. CAN. 0905883.
3,544,458.—METHOD OF FILTERING. DEC. 1, 1970. BEL. 732578, CAN. 888335.

Class 20 C

3,698,540.—WEB SENSING MECHANISM FOR TRACKING SYSTEM. OCT. 17, 1972. CAN. 0946926.

Class 20C 1

3,498,500.—LEVEL SENSOR. MAR. 3, 1970. CAN. 0912851, GRB. 1251128, JAP. 0663856.
3,520,445.—DIELECTRIC LEVEL SENSOR. JULY 14, 1970. CAN. 0895527, GRB. 1239856, JAP. 0663857.

Class 20C 2

3,357,249.—TEMPERATURE SENSOR. DEC. 12, 1967. CAN. 0810332, GER. 1690654, GRB. 1171381.
3,723,980.—TEMPERATURE COMPENSATION SYSTEM FOR MAGNETIC DISK MEMORY UNIT. MAR. 27, 1973. ARG. 0195985, AUS. 0471633, BEL. 0791363, FRA. 7240560, GRB. 1408778, ITL. 0970913, MEX. 0129694, SPN. 0408629, STZ. 0028456, SWD. 7214693, VZL. 0032424.

Class 20C 3

3,492,732.—WEB QUANTITY INDICATOR. FEB. 3, 1970. CAN. 0887178.

Class 20C 4

3,191,440.—PRESSURE GAUGE INSTRUMENT. JUNE 29, 1965.
3,249,760.—PRESSURE GAUGE INSTRUMENT. MAY 3, 1966.
3,907,421.—TRANSFER APPARATUS FOR ELECTROSTATIC REPRODUCING MACHINES. SEPT. 23, 1975.
4,138,635.—ALTERNATING CURRENT GENERATOR USING LIGHT DEPENDENT RESISTOR. FEB. 6, 1979.

Class 20C 5

3,216,247.—WIND-MEASURING METER DEVICE. NOV. 9, 1965.

Class 20C 6

3,502,163.—EQUAL ARM BALANCE WITH C-SHAPED FULCRUM SLEEVE FORMED ON BEAM. MAR. 24, 1970.
3,583,505.—SPRING SCALE. JUNE 8, 1971. CAN. 0902123, GRB. 1295477.
3,878,358.—DIGITAL POWER CONTROL. APR. 15, 1975.

Class 20C 7

3,396,965.—SENSOR GAUGE. AUG. 13, 1968. CAN. 0822218, GRB. 1152538, JAP. 0587326.

Class 20D

3,746,502.—EVAPORATION CRUCIBLE. JULY 17, 1973. GRB. 1411236.
3,765,638.—SUCTION MOUNT. OCT. 16, 1973.
3,765,757.—TRANSPORT ARRANGEMENT FOR THIN SHEET MATERIAL. OCT. 16, 1973. BEL. 0793551, CAN. 1004289, GRB. 1419978, ITL. 0972846, SPN. 0410107.

Class 20D 1

3,379,855.—FLUID FEED SYSTEM. APR. 23, 1968.
3,407,018.—TWO-AXIS ANGULAR POSITIONING APPARATUS FOR ADJUSTING THE POSITION OF AN OPTICAL ELEMENT. OCT. 22, 1968.
3,436,071.—WORK HOLDER. APR. 1, 1969. CAN. 0856095, GRB. 1174795, JAP. 0642773.
3,440,859.—CORNER FORMING APPARATUS. APR. 29, 1969. CAN. 0866532.
3,475,936.—TRANSPORT SYSTEM. NOV. 4, 1969. GRB. 1179749.
3,867,027.—TRANSPORT ARRANGEMENT FOR THIN SHEET MATERIAL. FEB. 18, 1975. BEL. 0793551, CAN. 1004289, GRB. 1419978, ITL. 0972846, SPN. 0410107.

3,869,896.—ROLLING PROCESS. MAR. 11, 1975. GRB. 1434131.
3,901,647.—LOW RADIATION OPEN-BOAT CRUCIBLES. AUG. 26, 1975.
4,016,470.—TRANSDUCER BORING SYSTEM. APR. 5, 1977.
4,018,414.—HOLDING FIXTURES. APR. 19, 1977.
4,143,960.—RETRACTABLE SUPPORT MEMBER. MAR. 13, 1979.

Class 20D 2

3,056,967.—FASTENER DRIVING TOOL. OCT. 9, 1962.
3,091,578.—MECHANICAL BONDING LOCK. MAY 28, 1963.
3,341,681.—XEROGRAPHIC PLATE FABRICATION. SEPT. 12, 1967. CAN. 0780598, FRA. 1415795, GRB. 1070555, HOL. 0144068, IND. 0094992, ITL. 0738063.
3,876,317.—LATCH MECHANISM. APR. 8, 1975. CAN. 1005486.

Class 20D 3

3,258,281.—HERMETIC SEALED COUPLING FOR CONDUITS. JUNE 28, 1966.
3,317,224.—FLANGED PIPE COUPLING HAVING METALLIC SEAL MEANS. MAY 2, 1967.
3,366,343.—DEVICE FOR FASTENING A SHAFT TO A REEL. JAN. 30, 1968.
3,604,737.—METHOD OF JOINING MATERIALS. SEPT. 14, 1971.

Class 20D 4

3,532,863.—DYNAMIC CAM TESTER. OCT. 6, 1970. CAN. 0835529.
3,843,233.—ALIGNING AGENT FOR LOWRNG THRSHLD VOLTG REQUIRD TO EFFECT OPTCLY NEQTV TO OPTCLY POSITIVE PHASE. OCT. 22, 1974.

Class 20D 5

3,596,316.—BLOW MOLDING APPARATUS. AUG. 3, 1971

Class 20D 6

3,384,107.—BAKEABLE VACUUM VALVE. MAY 21, 1968.

Class 20D 7

3,489,463.—BRUSH SIZING APPARATUS. JAN. 13, 1970. GRB. 1243233, JAP. 0810578.

Class 20E

3,217,328.—ANTENNA WITH WIRE MESH REFLECTOR COLLAPSING IN A PINWHEEL MANNER. NOV. 9, 1965.

Class 20F

3,390,693.—PURE FLUID AMPLIFIER. JULY 2, 1968.
3,413,993.—FLUID DEVICE. DEC. 3, 1968.
3,417,770.—FLUID AMPLIFIER SYSTEM. DEC. 24, 1968.
3,459,205.—MAGNETICALLY CONTROLLED FLUID AMPLIFIER. AUG. 5, 1969.
3,496,955.—ELECTRICALLY ACTUATED BISTABLE FLUID AMPLIFIER. FEB. 24, 1970.
3,726,588.—WEB TRACKING SYSTEM. APR. 10, 1973.

Class 20 G

3,217,328.—ANTENNA WITH WIRE MESH REFLECTOR COLLAPSING IN A PINWHEEL MANNER. NOV. 9, 1965.
3,549,059.—TRIGGERING APPARATUS AND WORK LOCATING MEANS FOR AEROSOL SPRAY CANS. DEC. 22, 1970.
3,555,725.—SELF-TRAVELLING WHEEL. JAN. 19, 1971. CAN. 0900718, GRB. 1289331, JAP. 0713807.
3,688,415.—VIBRATION DEMONSTRATION. SEPT. 5, 1972.
3,747,589.—REACTION TIME TESTING APPARATUS. JULY 24, 1973.
3,818,391.—TRACKING ASSEMBLY FOR AN ENDLESS BELT ELECTROSTATOGRAPHIC MACHINE. JUNE 18, 1974. CAN. 1010107.
3,840,879.—EXCESS TONER SHIELD FOR ELECTROGRAPHIC APPARATUS. OCT. 8, 1974.
3,907,421.—TRANSFER APPARATUS FOR ELECTROSTATIC REPRODUCING MACHINES. SEPT. 23, 1975.
3,941,006.—FREE FLOATING BELT TENSIONER. MAR. 2, 1976.
3,946,920.—VACUUM SYSTEM CONTROL. MAR. 30, 1976.
3,982,753.—COMBINED BACKSTOP & BRAKE-COMBINED BACKSTOP & BRAKE FOR ALBERT. SEPT. 28, 1976. BEL. 0812180, CAN. 1004161, FRA. 7407806, GRB. 1443088.
3,994,053.—DRUM SUPPORT APPARATUS. NOV. 30, 1976.
4,040,157.—DRUM SUPPORT APPARATUS. AUG. 9, 1977.
4,040,678.—BEARING ASSEMBLY. AUG. 9, 1977.
4,105,345.—EXPANDABLE PHOTORECEPTOR ENDBELLS. AUG. 8, 1978.
4,120,576.—DRUM SUPPORT APPARATUS. OCT. 17, 1978.
4,135,805.—COUNTERBALANCING APPARATUS. JAN. 23, 1979.
4,143,960.—RETRACTABLE SUPPORT MEMBER. MAR. 13, 1979.

Class 21

D.240,557.—TRAY RACK. JULY 13, 1976.
3,942,349.—CROWN DIE FOR THREAD ROLLING OF APPLICATOR ROLLS. MAR. 9, 1976.
D245,667.—WIRE CUTTER. SEPT. 6, 1977.

Class 21A

3,905,400.—ELECTROFORMING MANDREL. SEPT. 16, 1975.
4,067,782.—METHOD OF FORMING AN ELECTROFORMING MANDREL. JAN. 10, 1978.

Class 21A 1

3,316,158.—FOAM METAL CONSTRUCTION AND A METHOD FOR MAKING IT. APR. 25, 1967.
3,378,469.—ELECTROFORMING TECHNIQUE AND STRUCTURE FOR REFLECTING MIRRORS. APR. 16, 1968.
3,428,533.—HIGH QUALITY SUB-MASTERS AND METHOD FOR PRODUCING THEM. FEB. 18, 1969.
3,472,679.—COATING SURFACES. OCT. 14, 1969. CAN. 0896992.
3,505,177.—ELECTROFORMING PROCESS. APR. 7, 1970.
3,520,780.—MAGNESIUM ELECTRODEPOSITION. JULY 14, 1970.
3,844,906.—DYNAMIC BATH CONTROL PROCESS. OCT. 29, 1974. BEL. 0799236, FRA. 7316539, GRB. 1421818.
3,853,614.—CYCLIC RECORDING SYSTEM BY THE USE OF AN ELASTOMER IN AN ELECTRIC FIELD. DEC. 10, 1974. ARG. 0196734, AUS. 0461213, BEL. 0777320, CAN. 0953990, FRA. 7147891, GRB. 1380057, ITL. 0944392, MEX. 0131400, SPN. 0398306.
3,876,510.—PROCESS FOR ELECTROFORMING A FLEXIBLE BELT. APR. 8, 1975.
3,905,685.—ZOOM LENS FOR FIXED CONJUGATES. SEPT. 16, 1975. CAN. 0995039, GRB. 1451781.
3,954,568.—ELECTROFORMING AN ENDLESS FLEXIBLE SEAMLESS XEROGRAPHIC BELT. MAY 4, 1976. ARG. 0185811, AUS. 0449005, BEL. 0762249. CAN. 0889781, EGR. 0094306, FRA. 7103844, GRB. 1288717, HUN. 0169866, ITL. 0918048, MEX. 0119465, PLD. 0081712, PNM. 0002384, SPN. 0387636, STZ. 0521612, SWD. 0360753, TIW. 0007843, VZL. 0027666.
3,959,109.—METHOD AND APPARATUS FOR ELECTROFORMING. MAY 25, 1976.
3,963,587.—PROCESS FOR ELECTROFORMING NICKEL FOILS. JUNE 15, 1976.
4,043,876.—METHOD AND APPARATUS FOR ELECTROFORMING. AUG. 23, 1977.

Class 21A 2

3,316,158.—FOAM METAL CONSTRUCTION AND A METHOD FOR MAKING IT. APR. 25, 1967.
3,378,469.—ELECTROFORMING TECHNIQUE AND STRUCTURE FOR REFLECTING MIRRORS. APR. 16, 1968.
3,428,533.—HIGH QUALITY SUB-MASTERS AND METHOD FOR PRODUCING THEM. FEB. 18, 1969.
3,577,323.—HIGH QUALITY SUBMASTERS. MAY 4, 1971.
3,927,463.—METHOD OF MAKING A CYLINDRICALLY SHAPED, HOLLOW ELECTROFORMING MANDREL. DEC. 23, 1975.
3,950,839.—ELECTROFORMING MANDREL. APR. 20, 1976.

Class 21A 3

3,352,482.—ION SPUTTER PUMPING COLLECTOR. NOV. 14, 1967.

3,437,568.—APPARATUS AND METHOD FOR DETERMINING AND CONTROLLING STRESS IN AN ELECTROFORMED PART. APR. 8, 1969.
3,799,859.—ELECTROFORMING SYSTEM. MAR. 26, 1974. GRB. 1427544.
4,043,876.—METHOD AND APPARATUS FOR ELECTROFORMING. AUG. 23, 1977.

Class 21B

3,223,878.—METHOD OF FABRICATING FINE GRIDS. DEC. 14, 1965.
3,276,919.—PROCESS FOR FORMING METAL STRUCTURES HAVING VERY FINE PORES. OCT. 4, 1966.
3,360,347.—PRODUCTION OF POUROUS MATERIALS. DEC. 26, 1967.
3,494,748.—OXIDATION RESISTANT COATING AND ARTICLE. FEB. 10, 1970.
3,666,429.—MATALLIZED AND BRAZED CERAMICS. MAY 30, 1972.
3,703,306.—METHOD OF HERMETICALLY SEALING SILICON TO A LOW EXPANSION ALLOY. NOV. 21, 1972.
3,740,830.—BRAZING CERAMICS. JUNE 26, 1973.
3,825,724.—WRAP ADJUST DEVICE FOR CONTROLLING ENGAGEMENT BETWEEN A WEB AND ROLLER. JULY 23, 1974. CAN. 0995295, GRB. 1406047.
3,851,985.—COLLAR AND METHOD OF MAKING SAME. DEC. 3, 1974.
3,885,923.—GENERATION OF CURVED SURFACES ON A WORKPIECE. MAY 27, 1975.
3,911,163.—SOLDER COATING PROCESS AND APPARATUS. OCT. 7, 1975.
4,083,323.—PNEUMATIC SYSTEM FOR SOLDER LEVELING APPARATUS. APR. 11, 1978.
4,114,431.—METHOD OF FORMING TUBULAR METAL PRODUCTS. SEPT. 19, 1978.

Class 21C

3,653,885.—PROCESS OF STABILIZING A MIGRATION IMAGE COMPRISING SELENIUM PARTICLES. APR. 4, 1972. CAN. 0937437.
4,112,841.—RESILIENT LITHOGRAPHIC MASTERS FOR DIRECT PRINTING. SEPT. 12, 1978.
4,114,535.—RESILIENT LITHOGRAPHIC MASTERS FOR DIRECT PRINTING. SEPT. 19, 1978.
4,123,283.—SETTING ELECTRICAL LATENT IMAGES IN MIGRATION IMAGING ELEMENTS. OCT. 31, 1978. AUS. 482769. BEL. 813501. CAN. 1037546. FRA. 7412476. GRB. 1471385. ITL. 1009714. MEX. 136227.
4,135,926.—MIGRATION IMAGING PROCESS IN WHICH LATENT IMAGE IS SET. JAN. 23, 1979. AUS. 482769. BEL. 813501. CAN. 1037546. FRA. 7412476. GRB. 1471385. ITL. 1009714. MEX. 136227.

Class 22

D244,280.—SORTER WITH BIN INDICATOR. MAY 10, 1977.
D247,243.—SORTER CONTROLLER. FEB. 14, 1978.
D.252,275.—SUBSTRATE CLAMP FOR A SLITTING APPARATUS. JULY 3, 1979.

Class 22A

3,473,388.—ISOKINETIC PARTICLE SAMPLER. OCT. 21, 1969. CAN. 0852475, GRB. 1194569.
3,478,600.—PARTICLE SIZE AND DISTRIBUTION ANALYZING APPARATUS. NOV. 18, 1969. CAN. 0871819, GRB. 1196449, JAP. 0867702.
3,544,458.—METHOD OF FILTERING. DEC. 1, 1970. CAN. 0888335.
3,940,997.—APPARATUS AND METHOD FOR MEASURING ANGLE OF REPOSE. MAR. 2, 1976.

Class 22B

3,938,993.—XEROGRAPHIC METHOD FOR MAKING A RESPONSIVE ANSWER SYSTEM. FEB. 17, 1976. CAN. 0858780, GRB. 1235941, JAP. 0888426.
3,972,715.—PARTICLE ORIENTATION IMAGING SYSTEM. AUG. 3, 1976.

Class 22B 1

3,497,320.—AUTOMATED CHEMICAL ANALYZER FLEXIBLE POD SYSTEM. FEB. 24, 1970. ARG. 0182336, ATR. 0308052, AUS. 0419707, BEL. 0722723, CAN. 0917546, FIN. 0050909, FRA. 1578476, GER. 1673342, GRB. 1218748, IND. 0113632, ITL. 0856573, LXB. 0057970, MEX. 0112299, NOR. 0131258, NZL. 0164681, PNM. 0001771, SAF. 0069935, SPN. 0348326, STZ. 0516798, SWD. 0345909, VZL. 0025948.
3,504,376.—AUTOMATED CHEMICAL ANALYZER. MAR. 31, 1970. ARG. 0177588, ATR. 0300733, AUS. 0441839, BEL. 0722721, CAN. 0921812, FIN. 0050908, FRA. 1584398, GRB. 1218750, IND. 0113631, ITL. 0856574, LXB. 0057969, MEX. 0112300, NOR. 0131259, NZL. 0155344, PNM. 0001667, SAF. 0690934, SPN. 0362595, STZ. 0526109, SWD. 0365310, VZL. 0027510.
3,508,879.—ALIQUOTTING DEVICE. APR. 28, 1970. ATR. 0280666, AUS. 0429344, BEL. 0722722, CAN. 0883952, FRA. 1578475, GER. 1673343, GRB. 1218747, ITL. 0862567, LXB. 0057971, MEX. 0101480, NOR. 0131257, NZL. 0155346, SAF. 0069936, SPN. 0363624, STZ. 0494403, SWD. 0342699.
3,526,480.—AUTOMATED CHEMICAL ANALYZER. SEPT. 1, 1970. ARG. 0174584, AUS. 0452281, BEL. 0728248, CAN. 0950341, FRA. 1584397, GER. 1673340, GRB. 1218749, HOL. 1467250, ITL. 0865002, MEX. 0118203, PNM. 0001668, SPN. 0381340, STZ. 0501922, SWD. 0359925, VZL. 0025782.
3,582,283.—CHEMICAL PACKAGE. JUNE 1, 1971.

Class 22B 1A

3,477,821.—CHEMICAL PACKAGE. NOV. 11, 1969. ARG. 0169582, AUS. 0433117, BEL. 0725955, CAN. 0876261, FRA. 1596338, GER. 1816225, GRB. 1245780, HOL. 0141402, ITL. 0852626, JAP. 0805178, MEX. 0108467. PNM. 0001764, SPN. 0361841, STZ. 0531895, SWD. 0345742, VZL. 0023719.
3,477,822.—CHEMICAL PACKAGE. NOV. 11, 1969. ARG. 0169541, AUS. 0433116, BEL. 0725958, CAN. 0904725, FRA. 1596340, GRB. 1251680, HOL. 0141098, ITL. 0852625, JAP. 0802751, MEX. 0108998, PNM. 0001662, SPN. 0361844, STZ. 0530223, SWD. 0346384, VZL. 0023725.
3,480,398.—CHEMICAL PACKAGE. NOV. 25, 1969. ARG. 0169487, AUS. 0433114, BEL. 0725956, CAN. 0885006, FRA. 1596337, GER. 1816228, GRB. 1257336, HOL. 0141797, ITL. 0856875, JAP. 0805177, MEX. 0108468, PNM. 0001663, SPN. 0361842, STZ. 0530637, SWD. 0345012, VZL. 0023722.
3,480,399.—CHEMICAL PACKAGE. NOV. 25, 1969. ARG. 0169540, AUS. 0433115, BEL. 0725957, CAN. 0906891, FRA. 1596339, GER. 1816227, GRB. 1251679, HOL. 0141099, ITL. 0852624, JAP. 0802750. MEX. 0108997, PNM. 0001669, SPN. 0361843, STZ. 0526106, VZL. 0023720.
3,497,320.—AUTOMATED CHEMICAL ANALYZER FLEXIBLE POD SYSTEM. FEB. 24, 1970. ARG. 0182336, ATR. 0308052, AUS. 0419707, BEL. 0722723, CAN. 0917546, FIN. 0050909, FRA. 1578476, GER. 1673342, GRB. 1218748, IND. 0113632, ITL. 0856573, LXB. 0057970, MEX. 0112299, NOR. 0131258, NZL. 0164681, PNM. 0001771, SAF. 0069935, SPN. 0348326, STZ. 0516798, SWD. 0345909, VZL. 0025948.
3,504,376.—AUTOMATED CHEMICAL ANALYZER. MAR. 31, 1970. ARG. 0177588, ATR. 0300733, AUS. 0441839, BEL. 0722721, CAN. 0921812, FIN. 0050908, FRA. 1584398, GRB. 1218750, IND. 0113631, ITL. 0856574, LXB. 0057969, MEX. 0112300, NOR. 0131259, NZL. 0155344, PNM. 0001667, SAF. 0690934, SPN. 0362595, STZ. 0526109, SWD. 0365310, VZL. 0027510.
3,526,480.—AUTOMATED CHEMICAL ANALYZER. SEPT. 1, 1970. ARG. 0174584, AUS. 0452281, BEL. 0728248, CAN. 0950341, FRA. 1584397, GER. 1673340, GRB. 1218749, HOL. 1467250, ITL. 0865002, MEX. 0118203, PNM. 0001668, SPN. 0381340, STZ. 0501922, SWD. 0359925, VZL. 0025782.
3,582,283.—CHEMICAL PACKAGE. JUNE 1, 1971.

Class 22B 1B

3,497,320.—AUTOMATED CHEMICAL ANALYZER FLEXIBLE POD SYSTEM. FEB. 24, 1970. ARG. 0182336, ATR. 0308052, AUS. 0419707, BEL. 0722723, CAN. 0917546, FIN. 0050909, FRA. 1578476, GER. 1673342, GRB. 1218748, IND. 0113632, ITL. 0856573, LXB. 0057970, MEX. 0112299, NOR. 0131258, NZL. 0164681, PNM. 0001771, SAF. 0069935, SPN. 0348326, STZ. 0516798, SWD. 0345909, VZL. 0025948.
3,508,879.—ALIQUOTTING DEVICE. APR. 28, 1970. ATR. 0280666, AUS. 0429344, BEL. 0722722, CAN. 0883952,

FRA. 1578475, GER. 1673343, GRB. 1218747, ITL. 0862567, LXB. 0057971, MEX. 0101480, NOR. 0131257, NZL. 0155346, SAF. 0069936, SPN. 0363624, STZ. 0494403, SWD. 0342699.
3,526,480.—AUTOMATED CHEMICAL ANALYZER. SEPT. 1, 1970. ARG. 0174584, AUS. 0452281, BEL. 0728248, CAN. 0950341, FRA. 1584397, GER. 1673340, GRB. 1218749, HOL. 1467250, ITL. 0865002, MEX. 0118203, PNM. 0001668, SPN. 0381340, STZ. 0501922, SWD. 0359925, VZL. 0025782.
3,586,446.—FLAME PHOTOMETER. JUNE 22, 1971. ARG. 0183956, BEL. 0720577, CAN. 0876239, FRA. 1581844, GER. 1798234, GRB. 1246633, ITL. 0864506, JAP. 0835088, MEX. 0103300, SWD. 0342326, VZL. 0023659.

Class 22B 2

3,497,320.—AUTOMATED CHEMICAL ANALYZER FLEXIBLE POD SYSTEM. FEB. 24, 1970. ARG. 0182336. ATR. 0308052, AUS. 0419707, BEL. 0722723, CAN. 0917546, FIN. 0050909, FRA. 1578476, GER. 1673342, GRB. 1218748, IND. 0113632, ITL. 0856573, LXB. 0057970, MEX. 0112299, NOR. 0131258, NZL. 0164681, PNM. 0001771, SAF. 0069935, SPN. 0348326, STZ. 0516798, SWD. 0345909, VZL. 0025948.
3,504,376.—AUTOMATED CHEMICAL ANALYZER. MAR 31, 1970. ARG. 0177588, ATR. 0300733, AUS. 0441839, BEL. 0722721, CAN. 0921812, FIN. 0050908, FRA. 1584398, GRB. 1218750, IND. 0113631, ITL. 0856574, LXB. 0057969, MEX. 0112300, NOR. 0131259, NZL. 0155344, PNM. 0001667, SAF. 0690934, SPN. 0362595, STZ. 0526109, SWD. 0365310, VZL. 0027510.
3,520,659.—METHOD AND APPARATUS FOR USE IN DETERMINING PROTHROMBIN TIME OF A BLOOD SAMPLE. JULY 14, 1970. ARG. 0176972, AUS. 0421560, BEL. 0722360, CAN. 0892696, FRA. 1588701, GER. 1804292, GRB. 1244355, HOL. 0142783, ITL. 0862597, MEX. 0105611, SPN. 0359312, SWD. 0345744, VZL. 0023706.
3,705,013.—ANALYTICAL PROCEDURES AND COMPOSITIONS THEREFOR. DEC. 5, 1972.

Class 24

D.249,695.—REMOVABLE UNDERSIZE SHEET EDGE GUIDE SHEET FEED CASSETTE. SEPT. 26, 1978.
3,888,892.—LIQUID CRYSTALLINE COMPOUNDS. JUNE 10, 1975.
4,126,711.—CHARGE PATTERN DEVELOPMENT METHOD & APPARATUS. NOV. 21, 1978. GRB. 1484712.

Class 24A 1

3,289,211.—ELECTRICAL RECORDING PEN. NOV. 29, 1966. ARG. 0144972, AUS. 0283737, BEL. 0663614, CAN. 0755964. FRA. 1444045, GER. 1498264, GRB. 1064344, HOL. 0145955, ITL. 0760432, JAP. 0704598, MEX. 0084384, NOR. 0121120, NZL. 0141445, SPN. 0312594, STZ. 0430241, SWD. 0336857, VZL. 0017268.
3,308,475.—ELECTROVISCOUSLY CONTROLLED RECORDER. MAR. 7, 1967.
3,359,566.—MOTOR ACTION CAPILLARY. DEC. 19, 1967. CAN. 0831673, GER. 1537562, GRB. 1196932, JAP. 0583415.
3,375,528.—RECORDING PEN HAVING A PLURALITY OF CLOSELY SPACED WIRES. MAR. 26, 1968. AUS. 0284067, BEL. 0680693, CAN. 0834975, FRA. 0089948, GER. 1548876, GRB. 1148771, HOL. 0150907, ITL. 0809504, JAP. 0773176, MEX. 0091261, SPN. 0326324, STZ. 0457888, SWD. 0325719.
3,484,162.—ELECTROVISCOUS RECORDING. DEC. 16, 1969.
3,512,173.—ALPHANUMERIC INK DROPLET RECORDER. MAY 12, 1970. ARG. 0180676, BEL. 0725960, CAN. 0879917, FRA. 1603645, GER. 1816194, GRB. 1227600, ITL. 0849703, JAP. 0770832, MEX. 0109982.
3,512,177.—INK RECORDING SYSTEM. MAY 12, 1970.
3,848,258.—MULTI-JET INK PRINTER. NOV. 12, 1974. BEL. 0819105, CAN. 1000778, FRA. 7419592.
3,893,131.—INK PRINTER. JULY 1, 1975. BEL. 0819105, CAN. 1000778, FRA. 7419592.
4,014,693.—ELECTROVISCOUS RECORDING. MAR. 29, 1977.

Class 24A 2

3,329,964.—FACSIMILE RECORDING APPARATUS. JULY 4, 1967. CAN. 0809338, GRB. 1095098.
3,334,354.—DOTTING INK RECORDER. AUG. 1, 1967. CAN. 0792422.
3,627,908.—HIGH-SPEED COLOR CORRECTING SCANNER FOR MAKING COLOR PRINTING PLATES. DEC. 14, 1971. CAN. 0923428, GRB. 1335980, JAP. 0774708.
4,024,544.—MENISCUS DAMPENING DROP GENERATOR MAY 17, 1977.
4,032,929.—HIGH DENSITY LINEAR ARRAY INK JET ASSSEMBLY. JUNE 28, 1977
4,057,807.—SEPARABLE LIQUID DROPLET INSTRUMENT AND MAGNETIC DRIVER THEREFOR. NOV. 8, 1977.
4,104,645.—COINCIDENCE INK JET. AUG. 1, 1978. SAF. 6469
4,112,433.—MENISCUS DAMPENING DROP GENERATOR. SEPT. 5, 1978. STZ. 609915.
4,115,789.—SEPARABLE LIQUID DROPLET INSTRUMENT AND PIEZOELECTRIC DRIVERS THEREFOR. SEPT 19, 1978. BEL. 850334.
4,121,227.—INK JET ARRAY WITH ISOLATED FLUID RECTIFIER LAYERS OCT. 17, 1978

Class 24A 3

3,287,734.—MAGNETIC INK RECORDING. NOV. 22, 1966. CAN. 0808834, FRA. 1490442, GRB. 1102505, HOL. 0150643, ITL. 0784569, JAP. 0571140
3,334,000.—METHOD FOR SIMULTANEOUS PRODUCTION OF A PLURALITY OF MICROCIRCUIT WAFERS. AUG. 1, 1967.

Class 24A 4

3,480,962.—FACSIMILE RECORDING SYS. NOV. 25, 1969.
3,484,162.—ELECTROVISCOUS RECORDING. DEC. 16, 1969
3,484,793.—IMAGE RECORDING APPARATUS INK DROPLET RECORDER WITH OPTICAL INPUT. DEC 16, 1969.
3,553,708.—APPARATUS AND METHOD EMPLOYING PHOTOELECTROVISCOUS INK. JAN. 5, 1971.

Class 24B

3,951,658.—COLOR MODIFYING IMAGING METHOD AND ARTICLE. APR. 20, 1976.
4,080,054.—DEVICE FOR REPLENISHING TONER PARTICLES. MAR. 21, 1978.
4,096,294.—PROCESS FOR PREPARING WATERLESS PRINTING MASTERS COMPRISING COPOLYMER OF SILOXANE AND CRYST. JUNE 20, 1978

Class 24B 1

3,833,293.—METHOD OF CREATING COLOR TRANSPARENCIES. SEPT. 3, 1974.
4,047,947.—PROCESS FOR THE PREPARATION OF TRANSPARENCIES BY SELECTIVE DECOMPOSITION OF AN ORGANOSELENI. SEPT. 13, 1978.
4,055,424.—NOVEL MICROFILM AND PROCESS FOR PREPARATION. OCT. 25, 1977.

Class 24B 1A

2,738,705.—FILE-HOLDING DEVICE FOR CAMERA COPY SUPPORT. MAR. 20, 1956.
2,758,503.—COPY-HOLDING APPARATUS. AUG. 14, 1956.

Class 24B 1B 1

3,528,355.—CAMERA-PROCESSOR. SEPT. 15, 1970. ARG. 0184627, ATR. 0303513, AUS. 0426557, BEL. 0720022, BRA. 6800654, CAN. 0864811, CHL. 0024251, CLB. 0018453, FRA. 1586179, GER. 1797177, GRB. 1244641, IND. 0117458. ITL. 0839895, LXB. 0056774, MEX. 0103737, NOR. 0128296, NZL. 0153587, PLP. 0006313, PNM. 0001980, PRU. 0010212, PTG. 0050229, SPN. 0357651, STZ. 0516171, SWD. 0338503, URG. 0009309, VZL. 0023698.

Class 24B 1B 3

3,459,888.—SELECTIVE PHOTOCOPIER. AUG. 5, 1969.
3,537,788.—AUTOMATIC DISCRIMINATION TECHNIQUE FOR SELECTIVE PHOTOCOPYING. NOV. 3, 1970.

Class 24B 1C

3,393,362.—PROCESS FOR DETECTING IRREGULARITIES IN A METALLIC SURFACE. JULY 16, 1968.
3,480,965.—APPARATUS FOR PYROGENICALLY RECORDING ON TRANSPARENCIES. NOV. 25, 1969.

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Class 24B 1D

3,435,243.—FILM FRAME DETECTION SYSTEM. MAR. 25, 1969.

Class 24B 2A

3,349,980.—VACUUM TRANSPORT DEVICE. OCT. 31, 1967.
3,388,875.—WEB TRANSPORT CONTROL ASSEMBLY. JUNE 18, 1968.

Class 24B 2B

3,409,364.—GATE ASSEMBLY. NOV. 5, 1968.
3,409,365.—CONTACT PRINTER. NOV. 5, 1968. AUS. 0425973, JAP. 0613746.

Class 24B 2C

3,379,110.—EXPOSURE CONTROL SYSTEM. APR. 23, 1968.
3,479,119.—EXPOSURE CONTROL APPARATUS. NOV. 18, 1969.

Class 24B 4

3,510,216.—PROJECTION APPARATUS. MAY 5, 1970.

Class 24C

4,007,682.—REVERSE ANGLE MOUNTED INK-SPLITTING DOCTOR BLADE. FEB. 15, 1977.

Class 24C 1

3,843,407.—BLADE CLEANING WITH REVERSE MOVEMENT. OCT. 22, 1974.

Class 24C 1A

3,170,395.—DUPLICATING. FEB. 23, 1965. AUS. 0410880, CAN. 0768079, FRA. 1414985, GRB. 1059659, ITL. 0740682, JAP. 0511405.
3,332,347.—DUPLICATING. JULY 25, 1967. AUS. 0271226, CAN. 0761868, FRA. 1367474, GER. 1471696, GRB. 1029997, ITL. 0730203.
3,357,353.—VAPOR THERMOGRAPHY RECORDING PROCESS AND RECORDING MEMBER USED THEREIN. DEC. 12, 1967.

Class 24C 1B

3,336,867.—DUPLICATING PROCESS. AUG. 22, 1967. CAN. 0796971, GRB. 1149056.

Class 24C 1C

3,487,775.—IMAGING SYSTEM. JAN. 6, 1970. CAN. 0873983.

Class 24C 1D

3,408,216.—IMAGE REPRODUCTION. OCT. 29, 1968. CAN. 0806942, GRB. 1127218, JAP. 0742511.
3,792,266.—THERMOGRAPHIC RECORDING USING VAPORIZED MATERIAL AND COLORED PARTICLE DEVELOPMENT. FEB. 12, 1974.

Class 24C 1E 1

3,402,660.—DRUM SUPPORT AND DRIVE SYSTEM FOR REPRODUCTION MACHINES. SEPT. 24, 1968.
3,427,965.—SHEET GRIPPER MEANS FOR REPRODUCTION MACHINE OF THE PRESSURE TRANSFER TYPE. FEB. 18, 1969.
3,429,259.—PRESSURE TRANSFER REPRODUCTION MACHINE. FEB. 25, 1969.
3,460,472.—TRANSFER SHEET CLAMPING MECHANISM FOR A REPRODUCTION MACHINE. AUG. 12, 1969.

Class 24C 1E 2

3,433,154.—PRESSURE PRODUCING MEANS FOR REPRODUCTION MACHINE. MAR. 18, 1969.

Class 24C 1E 3

3,374,732.—SELF-ALIGNING COPY DRUM STRIPOUT MECHANISM FOR REPRODUCTION MACH. MAR. 26, 1968.
3,375,780.—SHEET COUNTING MECHANISM FOR REPRODUCTION MACHINES. APR. 2, 1968.
3,380,379.—SHEET GUIDING MECHANISM FOR A REPRODUCTION MACHINE. APR. 30, 1968.
3,405,635.—PAPER SUPPORT TRAY FOR REPRODUCTION MACHINES. OCT. 15, 1968.
3,427,966.—PRESSURE TRANSFER TYPE REPRODUCTION MACHINE. FEB. 18, 1969.
3,430,558.—SHEET COUNTING SYSTEM IN A REPRODUCTION MACHINE. MAR. 4, 1969.

Class 24C 1E 4

3,375,779.—PROGRAMMING CONTROL FOR REPRODUCTION MACHINES. APR. 2, 1968.

Class 24C 1E 5

3,083,684.—APPARATUS FOR PATTERN REPRODUCTION. APR. 2, 1963.
3,093,068.—METHOD AND APPARATUS FOR PATTERN REPRODUCTION. JUNE 11, 1963. CAN. 0624373.
3,548,748.—DUPLICATING METHOD EMPLOYING SIMULTANEOUS APPLICATION OF ELECTRIC FIELD AND EXPOSURE TO RADIATION. DEC. 22, 1970. CAN. 0882051, GRB. 1227394, JAP. 0752522.
3,565,612.—DUPLICATING MASTERS BY THE MANIFOLD PROCESS. FEB. 23, 1971. ARG. 0193797, AUS. 0411612, BEL. 0708974, CAN. 0873277, FRA. 1549964, GER. 1671590, GRB. 1215956, ITL. 0823464, MEX. 0106608, VZL. 0023681.
3,681,065.—DYE TRANSFER COLOR PHOTOGRAPHY. AUG. 1, 1972.

Class 24C 1E 6

3,527,163.—SILK SCREEN MASTER. SEPT. 8, 1970.

Class 24C 1E 7

3,357,354.—REPRODUCTION METHOD. DEC. 12, 1967.
3,406,137.—IMAGING MATERIAL. OCT. 15, 1968. AUS. 0409415, BEL. 0680315, CAN. 0815085, FRA. 1477912, GER. 1571874, GRB. 1149055, ITL. 0766799, JAP. 0594685, MEX. 0090845, SWD. 0336860.
3,415,186.—DUPLICATING SYSTEM. DEC. 10, 1968.
3,436,234.—DUPLICATING INK. APR. 1, 1969. AUS. 0408998, BEL. 0680377, CAN. 0806568, FRA. 1477914, GER. 1571875, GRB. 1151495, ITL. 0765635, JAP. 0594687, MEX. 0090362, SWD. 0336421.
3,446,646.—PRESSURE SENSITIVE RECEIVING AND TRANSFER SHEET. MAY 27, 1969. AUS. 0417562, BEL. 0680376, CAN. 0865673, FRA. 1477913, GER. 1571922, GRB. 0115076, ITL. 0765634, JAP. 0575982, MEX. 0090589, SWD. 0333578.

Class 24D

3,275,436.—METHOD OF IMAGE REPRODUCTION UTILIZING A UNIFORM RELEASABLE SURFACE FILM. SEPT. 27, 1966. AUS. 0296158, CAN. 0811877, FRA. 1371894, GRB. 1033523, ITL. 0702168, JAP. 0508402.
3,422,759.—LITHOGRAPHIC IMAGING SYSTEM USING PHOTOCHROMIC AND THERMOCHROMIC MATERIALS. JAN. 21, 1969. CAN. 0855648, GRB. 1190102.
3,460,476.—IMAGING PROCESS. AUG. 12, 1969. ARG. 0164839, AUS. 0418783, BEL. 0691755, CAN. 0882050, FRA. 1511173, GRB. 1168268, ITL. 0787662, JAP. 0562388, MEX. 0108240, SPN. 0346128, STZ. 0480672, SWD. 0331794. VZL. 0024009.
3,547,627.—LITHOGRPHC PRINTG MASTER AND METHOD EMPLOYING A CRYSTALLINE PHOTOCONDUCTIVE IMAGING LAYER. DEC. 15, 1970.
3,554,125.—METHOD OF MAKING A LITHOGRAPHIC MASTER AND METHOD OF PRINTING THEREWITH. JAN. 12, 1971. CAN. 0882052, GER. 1772302, GRB. 1219849.
3,718,087.—APPARATUS FOR APPLYING INK AND IMMISSIBLE FLUID TO A PRINTING SURFACE. FEB. 27, 1973. ARG. 0185945, AUS. 0449639, BEL. 0759110, CAN. 0919007, FRA. 7042608, GRB. 1330183, ITL. 0912865, MEX. 0120782.
3,878,168.—SILICONE ELASTOMERS. APR. 15, 1975.
3,901,151.—PROCESS FOR PREPARING WATERLESS LITHOGRAPHIC MASTERS. AUG. 26, 1975.
3,907,562.—PROCESS FOR PREPARING WATERLESS LITHOGRAPHIC MASTERS. SEPT. 23, 1975.
3,909,256.—ELECTROSTATOGRAPHIC PROCESS FOR PREPARING SCREEN PRINTING MEMBER. SEPT. 30, 1975.

3,923,504.—MIGRATION IMAGING MEMBER AND METHOD. DEC. 2, 1975. GRB. 1461872.
3,948,655.—ELECTROSTATOGRAPHIC PROCESS FOR PREPARING GRAVURE PRINTING MEMBER. APR. 5, 1976.
3,951,060.—PROCESS FOR PREPARING WATERLESS LITHOGRAPHIC MASTERS. APR. 20, 1976.
3,951,063.—PROCESS FOR PREPARING REVERSIBLE CURE WATERLESS LITHOGRAPHIC MASTERS. APR. 20, 1976.
3,957,349.—IMAGING METHOD. MAY 18, 1976.
3,961,947.—PROCESS FOR PREPARING WATERLESS LITHOGRAPHIC MASTERS. JUNE 8, 1976.
3,968,278.—IMAGING METHOD. JULY 6, 1976.
3,971,316.—PROCESS FOR SMOOTHING WATERLESS LITHOGRAPHIC MASTERS. JULY 27, 1976.
3,995,554.—PROCESS FOR PREPARING RESILIENT IMAGED PRINTINGS MASTERS. DEC. 7, 1976.
3,999,481.—METHOD OF MAKING A MASTER. DEC. 28, 1976.
4,003,312.—PROCESS FOR PREPARING WATERLESS LITHOGRAPHIC PRINTING MASTERS BY INK JET PRINTING MEANS. JAN. 18, 1977.
4,005,654.—PROCESS FOR SHALLOW RELIEF PRINTING. FEB. 1, 1977. BEL. 0792620, FRA. 7244602, GRB. 1416158, ITL. 0971749.
4,007,041.—ELECTROPHOTOGRAPHIC PRINTING METHOD. FEB. 8, 1977.
4,009,032.—PROCESS FOR PREPARING WATERLESS PRINTING MASTERS COMPRISING COPOLYMER OF SILOXANE AND THERMOPLA. FEB. 22, 1977.
4,009,660.—INKING IN LITHO PRINTING THROUGH A NON-IMAGED SCREEN. MAR. 1, 1977
4,010,687.—PLANOGRAPHIC PRINTING MASTER-MULTI PHASE TONERS & MULTI PHASE ADHESIVE LAYERS. MAR. 8, 1977. BEL. 0813293, CAN. 0988364, GRB. 1458725, ITL. 1006438, PTG. 61726.
4,012,254.—NOVEL PHOTOCONDUCTIVE WATERLESS LITHOGRAPHIC PRINTING MASTERS & PROCESS OF PREPARATION. MAR. 15, 1977.
4,016,814.—PLANOGRAPHIC PRINTING MASTER — SPONGY IMAGE PATTERNS. APR. 12, 1977. CAN. 0985952, ITL. 1006441.
4,019,437.—PLANOGRAPHIC PRINTING MASTER TONER INDUCED POROUS SPONGE IMAGES TIPSI. APR. 26, 1977. BEL. 0813159, CAN. 1014416, GRB. 1458723, ITL. 1006440, NZL. 0173942.
4,030,416.—WATERLESS PRINTING MASTER. JUNE 21, 1977.
4,064,312.—NONIMAGED WATERLESS LITHOGRAPHIC MASTER WITH CURABLE SILICONE ELASTOMER AND A CURED INK REL. DEC. 20, 1977.
4,077,324.—METHOD OF FOUNTAINLESS LITHOGRAPHY. MAR. 7, 1978. FRA. 7520962.
4,077,325.—PROCESS FOR PREPARING WATERLESS PRINTING MASTERS. MAR. 7, 1978.
4,078,927.—PHOTOCONDUCTIVE PRINTING MASTER. MAR. 14, 1978.
4,080,897.—SELECTIVE TACK IMAGING AND PRINTING. MAR. 28, 1978.
4,081,572.—PREPARATION OF HYDROPHILIC LITHOGRAPHIC PRINTING MASTERS. MAR. 28, 1978.
4,077,073.—PROCESS FOR PREPARING INK RELEASING STENCIL. MAY 9, 1978.
4,097,138.—PHOTOCONDUCTIVE BELT INCREMENTING APPARATUS. JUNE 27, 1978.
4,100,135.—NOVEL ELASTOMERS AND IMPROVED WATERLESS LITHOGRAPHIC PRINTING MASTERS. JULY 11, 1978.
4,103,616.—ELASTOMERS AND IMPROVED WATERLESS LITHOGRAPHIC PRINTING MASTERS. AUG. 1, 1978.

Class 24E

3,315,602.—FORMING OF PRINTING PLATES. APR. 25, 1967. CAN. 0852683, GER. 1267227, GRB. 1132071, JAP. 0532965.
3,443,517.—ELECTROSTATIC DUPLICATION SYSTEM EMPLOYING RELIEF PRINTING PLATE. MAY 13, 1969. CAN. 0873982, GRB. 1212370, JAP. 0641477.
3,456,586.—PROCESS FOR MAKING AND USING A RELIEF PRINTING MASTER. JULY 22, 1969.
3,589,290.—RELIEF IMAGING PLATES MADE BY REPETITIVE XEROGRAPHIC PROCESSES. JUNE 29, 1971. CAN. 0896949.
3,957,348.—METHOD FOR ALTERING ELLIPTICALLY POLARIZED LIGHT. MAY 18, 1976.
3,964,907.—METHOD FOR THE PREPARATION OF RELIEF PRINTING MASTERS. JUNE 22, 1976.
4,017,581.—PROCESS FOR PREPARING PRINTING MASTERS & MOLDS. APR. 12, 1977.

Class 24F

3,445,226.—FROST GRAVURE PRINT MASTER. MAY 20, 1969. CAN. 0842443, FRA. 1480896, GRB. 1136029, ITL. 0771305, JAP. 0605647, MEX. 0093298.
3,559,570.—METHOD OF PREPARING AND USING A GRAVURE PRINTING PLATE. FEB. 2, 1971. CAN. 0844544, GRB. 1198142.
3,561,358.—GRAVURE IMAGING SYSTEM. FEB 9, 1971. CAN. 0908257, GRB. 1201819, JAP. 0594737.
3,638,567.—METHOD OF PREPARING AND UTILIZING A GRAVURE PRINTING MASTER. FEB. 1, 1972.
3,801,315.—GRAVURE IMAGING SYSTEM. APR. 2, 1974. CAN. 0991245, GRB. 1411237.
3,918,400.—BLADE MOUNTING ASSEMBLIES. NOV. 11, 1975. BEL. 0816534, FRA. 7421752, GRB. 1419417.
3,980,404.—XEROGRAPHIC APPARATUS HAVING IMPROVED FLUID DISPENSING MEMBER. SEPT. 14, 1976.
4,024,838.—DEVELOPER LIQUID SUPPLY DEVICE. MAY 24, 1977.

Class 24G

3,565,978.—REPLICATION OF SURFACE DEFORMATION IMAGES. FEB. 23, 1971. AUS. 0417038, BEL. 0710829, CAN. 0879916, FRA. 1583418, GER. 1621783, GRB. 1221342, ITL. 0863054, MEX. 0096672.
3,592,114.—APPARATUS FOR JUSTIFYING A REPRODUCED LINE OF CHARACTERS. JULY 13, 1971.
3,678,850.—POROUS PRINTING PLATE PREPARED FROM PARTICULATE PHOTOSENSITIVE RESINOUS MATERIAL. JULY 25, 1972. CAN. 0844327, GRB. 1188376, JAP. 0635879.
4,059,554.—STABILIZE EMULSION INKS. NOV. 22, 1977.
4,068,588.—PRINTING USING AN ELECTROCHROMIC IMAGE. JAN. 17, 1978.
4,093,371.—COMPOSING MACHINE. JUNE 6, 1978.

Class 25

3,692,659.—ELECTROLYTIC REVERSIBLE COLOR DISPLAY DEVICE. SEPT. 19, 1972. CAN. 0932427, GRB. 1356187.
4,056,822.—LOW PROFILE SINGLE CHANNEL THERMAL ANALOG RECORDER. NOV. 1, 1977.
4,056,823.—ANALOG CHART RECORDER EMPLOYING THERMAL PRINTING MEANS. NOV. 1, 1977.
4,099,071.—MONOLITHIC ELECTRONIC SCANNING DEVICE. JULY 4, 1978.
4,104, 515.—CONSUMABLE CREDIT CARD. AUG. 1, 1978.
4,118,112.—METHOD FOR REDUCING POWER DISSIPATION IN TAPERED RESISTOR DEVICES. OCT. 3, 1978.
4,121,153.—TAPERED RESISTOR METER. OCT. 17, 1978.
4,126,824.—PROGRESSIVELY SHORTED TAPERED RESISTANCE DEVICE. NOV. 21, 1978.

Class 25A

3,692,404.—STRIPPABLE LAYER RELIEF PRINTING. SEPT. 19, 1972.
3,900,817.—SPHERICAL POTENTIOMETER WITH BALL CONTACT MEANS. AUG. 19, 1975.
3,990,072.—ACOUSTIC RESIDUE ALGEBRA DECORDER. NOV. 2, 1976.

Class 25A 1

3,061,911.—METHOD OF MAKING PRINTED CIRCUITS. NOV. 6, 1962.
3,075,866.—METHOD OF MAKING PRINTED CIRCUITS. JAN. 29, 1963.
3,207,127.—APPARATUS FOR FORMING COATINGS ON PRINTED CIRCUIT BOARDS. SEPT. 21, 1965. CAN. 0733463, FRA. 1374360, GER. 1490985, GRB. 1053284, ITL. 0696974.
3,217,209.—PRINTED CIRCUITS WITH RESISTIVE AND CAPACITIVE ELEMENTS. NOV. 9, 1965. CAN. 0782178, FRA. 1300771, GER. 1202853, GRB. 0978571, ITL. 0647493, JAP. 0430795.
3,219,509.—AN APPARATUS FOR AUTOMATIC FABRICATION OF MICROCIRCUITRY. NOV. 23, 1965. CAN. 0785448, GRB. 1031288, JAP. 0477810.
3,288,639.—METHOD FOR MAKING A PLURAL LAYERED PRINTED CIRCUIT BOARD. NOV. 29, 1966.
3,485,934.—CIRCUIT BOARD. DEC. 23, 1969.
3,893,409.—APPARATUS FOR SOLDER COATING PRINTED CIRCUIT. JULY 8, 1975.
3,990,024.—MICROSTRIP STRIPLINE IMPEDANCE TRANSFORMER. NOV. 2, 1976.

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4,018,414.—HOLDING FIXTURES. APR. 19, 1977.
4,024,631.—PRINTED CIRCUIT BOARD PLATING PROCESS. MAY 24, 1977.
4,029,373.—MEANS FOR WIRING INTO A SEALED ENCLOSURE. JUNE 14, 1977. CAN. 0995367, GRB. 1444032.
3,134,930.—MICROMINIATURE CIRCUITRY. MAY 26, 1964.
4,046,105.—LAMINAR DEEP WAVE GENERATOR. SEPT. 6, 1977.
4,048,718.—PIN CRIMPING APPARATUS AND PRODUCT THEREFROM. SEPT. 20, 1977.
4,083,323.—PNEUMATIC SYSTEM FOR SOLDER LEVELING APPARATUS. APR. 11, 1978.
4,125,136.—CUT AND CLINCH MECHANISM. NOV. 14, 1978.

Class 25A 2

3,134,930.—MICROMINIATURE CIRCUITRY. MAY 26, 1964.
3,164,750.—ELECTRONIC PACKAGING APPARATUS. JAN. 5, 1965.
3,445,926.—PRODUCTION OF SEMICONDUCTOR DEVICES BY USE OF ION BEAM IMPLANTATION. MAY 27, 1969.
3,906,537.—SOLID STE ELMNT CMPRSNG SMI-CNDCTVE GLS CMPSTN EXHBING NGTVE INCRMNTL RSISTNCE AND TRSHLD SWTCHNG. SEPT. 16, 1975. BEL. 0820772, CAN. 1005929.
3,956,042.—SELECTIVE ETCHANTS FOR THIN FILM DEVICES. MAY 11, 1976.

Class 25A 3

3,244,556.—ABRASION FOR THIN FILM RESISTANCE CONTROL. APR. 5, 1966. CAN. 0788954, FRA. 1385420, GER. 1490986, GRB 1054076, ITL. 0705899, JAP. 0453904.
3,274,372.—SOLID VAPORIZATION. SEPT. 20, 1966.
3,287,161.—METHOD FOR FORMING A THIN FILM RESISTOR. NOV. 22, 1966. CAN. 0819895, ITL. 0705900, JAP. 0499787.
3,352,731.—THIN FILM PRINTED CIRCUIT. NOV. 14, 1967. AUS. 0296168, CAN. 0790796, FRA. 1419084, GER. 1490987, GRB. 1077686, ITL. 0739442, JAP. 0537661.
3,413,716.—THIN FILM INDUCTOR ELEMENTS. DEC. 3, 1968. CAN. 0841245, FRA. 1476876, GRB. 1149759.
3,832,766.—APPARATUS FOR ASSEMBLING A PLATED WIRE MEMORY PLANE. SEPT. 3, 1974. CAN. 0942420, GRB. 1376654.

Class 25A 4

3,317,656.—ELECTRICAL CONNECTION FOR SHEATHED CONDUCTORS. MAY 2, 1967.
3,603,357.—BACKWIRING. SEPT. 7, 1971.
3,644,659.—CABLE CONSTRUCTION. FEB. 22, 1972.
3,792,227.—FUSER APPARATUS. FEB. 12, 1974.
3,847,479.—COVER FOR WIRE WRAPPED CARD CHASSIS. NOV. 12, 1974.
3,861,775.—MULTIPLE CIRCUIT BOARD CONNECTOR. JAN. 21, 1975. GRB. 1419580.
3,869,696.—FUSER APPARATUS. MAR. 4, 1975.
3,903,937.—BACK WIRING. SEPT. 9, 1975.
4,045,750.—ELECTRICAL CABLE AND COUPLING ARRANGEMENT. AUG. 30, 1977. FRA. 7631197.

Class 25B

3,688,127.—DIGITAL CIRCUIT LOGIC. AUG. 29, 1972.
3,937,986.—LINEAR WAVEFORM GENERATOR. FEB. 10, 1976.
3,975,755.—STABLE NON-CRYSTALLINE MATERIAL FOR SWITCHING DEVICES. AUG. 17, 1976.
4,095,020.—PROCESS FOR CONTROLLED PHASE TRANSFORMATION OF ALPHA PHASE OF POLY (VINYLIDENE FLUORIDE) TO. JUNE 13, 1978.

Class 25B 1

3,384,792.—6TACKED ELECTRODE FIELD EFFECT TRIODE. MAY 21, 1968.
3,584,268.—INVERTED SPACE CHARGE LIMITED TRIODE. JUNE 8, 1971.
3,599,321.—INVERTED SPACE CHARGE LIMITED TRIODE. AUG. 17, 1971.

Class 25B 2

3,510,735.—HIGH SPEED SEMICONDUCTOR. MAY 5, 1970.
3,673,572.—ELECTROLUMINESCENT DEVICE. JUNE 27, 1972. CAN. 0919286.
3,697,163.—PLUG-IN VACUUM AND CIRCUIT SYSTEM FOR ELECTROSTATIC PRINTING MACHINES. OCT. 10, 1972. CAN. 0941883.

Class 25B 3

3,551,727.—THERMIONIC CONVERTER HAVING A LOW FUNCTION COLLECTOR ELECTRODE. DEC. 29, 1970.
3,928,812.—PROGRAMMABLE BIT CLOCK OSCILLATOR FOR CONTROLLING THE PROCESSING OF BINARY DIGITS. DEC. 23, 1975. CAN. 0997434.

Class 25B 4

3,579,031.—ZERO ARC DROP THYRATRON. MAY 18, 1971.

Class 25C

3,911,420.—DISPLAY SYSTEM INCLUDING A HIGH-RESOLUTION CHARACTER GENERATOR. OCT. 7, 1975.
3,937,937.—PRIMARY POWER FAULT DETECTOR. FEB. 10, 1976. CAN. 1011818.
4,045,750.—ELECTRICAL CABLE AND COUPLING ARRANGEMENT. AUG. 30, 1977. FRA. 7631197.
4,136,277.—EXPOSURE CONTROL SYSTEM FOR A DOCUMENT COPYING MACHINE. JAN. 23, 1979. GRB. 1529220.

Class 25C 1

3,296,483.—WIDEBND AMPLER UTLZNG COMN ELCTRN BEAM FR INTRACTN W/HIFROCY TRVLGWAVE LINE AND W/LOWFROCY ELCTRN M. JAN. 3, 1967.
3,299,367.—FEEDBACK AMPLIFIER. JAN. 17, 1967.
3,404,341.—ELECTROMETER UTILIZING A DUAL PURPOSE FIELD-EFFECT TRANSISTOR. OCT. 1, 1968.
3,457,520.—FIELD EFFECT TRANSISTOR BUFFER AMPLIFIER. JULY 22, 1969. CAN. 0830628, FRA. 1541017, GER. 1562109, GRB. 1189515, ITL. 0806188, JAP. 0573712.
3,525,948.—SEISMIC AMPLIFIERS. AUG. 25, 1970.
3,594,654.—DIRECT COUPLED DIFFERENTIAL AMPLIFIER. JULY 20, 1971.
3,790,288.—PHOTOMETER INCLUDING VARIABLE AMPLIFICATION AND DARK CURRENT COMPENSATION. FEB. 5, 1974.

Class 25C 2

3,316,495.—LOW LEVEL COMMUTATOR. APR. 25, 1967.
3,426,259.—ELECTRIC CONTROL CIRCUITS FOR SEQUENTIAL OPERATION OF MOTIVE MEANS. FEB. 4, 1969.
3,454,884.—DUTY CYCLE CONTROL CIRCUIT. JULY 8, 1969. CAN. 0859886, GRB. 1195983, JAP. 0576017.
3,612,907.—SELF-CHECKING FLIP-FLOP. OCT. 12, 1971.
3,668,414.—TRANSITION INTEGRATION SWITCHING AMPLIFIER. JUNE 6, 1972. ARG. 0183473, AUS. 0460647, BEL. 0765005, CAN. 0930432, FRA. 7111626, GRB. 1334407, ITL. 0921529, MEX. 0119755, USR. 0420197, VZL. 0027511.
3,795,857.—ELECTRICAL CONNECTOR TESTING APPARATUS HAVING A PLURALITY OF AND GATES. MAR. 5, 1974.
3,806,242.—APPARATUS FOR REGULATING OPERATION OF DEV IN ACCORDANCE W SUPPLY OF MATERIAL UPON WHICH DEV OPER. APR. 23, 1974. CAN. 1004288, GRB. 1387190.
3,828,222.—FLASH LAMP CIRCUIT. AUG. 6, 1974.
3,856,997.—INDICATING AND SWITCHING APPARATUS. DEC. 24, 1974. BEL. 0809124, CAN. 1004261, ITL. 1002375, MEX. 0135820, SPN. 0421710.
3,866,051.—DIGITAL INTERFACE MODULE. FEB. 11, 1975. BEL. 0810490, GBR. 1455213.
3,932,770.—CONTROL CIRCUIT FOR SWITCHING TRIACS. JAN. 13, 1976.
4,119,840.—FAST-ACTING GAIN PHOTOCURRENT DEVICE. OCT. 10, 1978.

Class 25C 3

3,311,810.—STATIC FREQUENCY MULTIPLIER UTILIZING A PLURALITY OF SATURABLE MAGNETIC CORES. MAR. 28, 1967.
3,340,416.—RADIATION GENERATOR HVNG A CONDCTV COATNG ON A PIEZO-ELCTRC DIFFRCTN GRATING FOR VARYNG OTPT FR. SEPT. 5, 1967.

3,373,377.—SELF-ADJUSTING VARIABLE FREQUENCY SAWTOOTH GENERATOR. MAR. 12, 1968.
3,543,080.—CRT PINCUSHION DISTORTION CORRECTION APPARATUS. NOV. 24, 1970.
3,659,207.—MULTI-WAVE FORM GENERATION FROM A SINGLE TAPPED DELAY LINE. APR. 25, 1972.
4,048,571.—FREQUENCY DOUBLER. SEPT. 13, 1977.

Class 25C 4

RE.27,720.—SIGNAL STORAGE DEVICE - RE OF 3416,861-D1593. AUG. 7, 1973.
3,280,309.—LOGARITHMIC PULSE COUNTER. OCT. 18, 1966.
3,416,861.—SIGNAL STORAGE DEVICE—REISSUED D72104-27,720. DEC. 17, 1968. CAN. 0824770, GER. 1524998, GRB. 1184579, JAP. 0571176.
3,422,287.—PULSE STRETCHING CIRCUIT FOR GENERATING PULSES OF MINIMUM WIDTH. JAN. 14, 1969. AUS. 0408950, CAN. 0814593, GRB. 1087749, ITL. 0773401, SWD. 0337041.
3,593,043.—PULSE SHAPING CIRCUIT. JULY 13, 1971.
3,600,610.—TIME DELAY CIRCUIT FOR A RADIANT ENERGY PROTECTIVE APPARATUS. AUG. 17, 1971.
3,757,032.—METHOD AND APPARATUS FOR SELECTIVELY ENABLING A REMOTE RECEIVER. SEPT. 4, 1973.
3,781,548.—CONTROL SYSTEM. DEC. 25, 1973.
3,816,727.—ECHO CHECK CIRCUIT. JUNE 11, 1974. CAN. 0999463, FRA. 7341866, GRB. 1422835.
3,839,665.—APP MEASRNG RELTV VELCTY MOVBL MEMBR INCLDNG MEANS TO DETECT VELCTY FROM POSITION ENCODER. OCT. 1, 1974. CAN. 0980409, GRB. 1290090, JAP. 0832378.
3,863,143.—APP FOR RECORDING THE OCCURRENCE OF A PREDETERMINED OPERATION BY SENSING MAGNETIC FIELD OPERATION. JAN. 28, 1975.
3,875,387.—MAGNETIC OPERATIONS MONITOR. APR. 1, 1975.
3,931,580.—DIGITAL LINE RECEIVER CIRCUIT. JAN. 6, 1976.
3,953,708.—THERMAL PRINTER USING AMORPHOUS SEMICONDUCTOR DEVICES. APR. 27, 1976
3,971,919.—PROGRAMMABLE BILLING SYSTEM. JULY 27, 1976. BEL. 0812673, FRA. 7409746, GRB. 1451993, ITL. 1007663, SPN. 0424543.
3,983,315.—ELECTROMAGENTIC COUNTER CIRCUIT. SEPT. 28, 1976.
3,987,311.—SHIFT REGISTER UTILIZING AMORPHOUS SEMICONDUCTOR THRESHOLD SWITCHE. OCT. 19, 1976.
3,989,930.—MULTI-MODE BILLING SYSTEM CONTROLLED BY COPY SIZE AND DOCUMENT ORIGINAL SIZE. NOV. 2, 1976.
4,119,907.—POWER FACTOR CORRECTOR FOR A RESISTIVE LOAD. OCT. 10, 1978.
4,140,962.—HIGH VOLTAGE REGULATOR USING LIGHT DEPENDENT RESISTOR. FEB. 20, 1979. BEL. 867865.

Class 25C 5

3,275,837.—XEROGRAPHIC CHARGING APPARATUS. SEPT. 27, 1966. ARG. 0158430, ATR. 0242511, AUS. 0276177, BEL. 0642095, CAN. 0753356, FRA. 1385736, GER. 1488286, GRB. 1040264, ITL. 0712888, JAP. 0477814, MEX. 0075819, STZ. 0460930, SWD. 0314133.
3,496,385.—HIGH VOLTAGE COMPENSATED TRANSISTORIZED SWITCHING APPARATUS. FEB. 17, 1970. CAN. 0853862, FRA. 1521443, GRB. 1181718, ITL. 0793728, JAP. 0592682.
3,522,509.—FLOATING POWER SUPPLY. AUG. 4, 1970.
3,809,916.—DUAL CORD INTERLOCK. MAY 7, 1974. CAN. 1004283, GRB. 1423758.
3,870,903.—PHASE CONTROLLED POWER SUPPLY. MAR. 11, 1975
3,922,595.—HIGH POWER REGULATED D C SUPPLY. NOV. 25, 1975.
3,961,236.—CONSTANT POWER REGULATOR FOR XEROGRAPHIC FUSING SYSTEM. JUNE 1, 1976.
4,004,209.—WIDE RANGE POWER CONVERSION SYSTEM. JAN. 18, 1977.

Class 25C 6

3,192,519.—DIGITAL TRANSIENT ANALYZER. JUNE 29, 1965.
3,376,490.—SYNTHESIZED WAVE STATIC INVERTERS. APR. 2, 1968.
3,508,080.—BRIDGE GATING NETWORK HAVING POWER GAIN. APR. 21, 1970.
3,555,540.—DIGITAL TO ANALOG CONVERTER WITH SMOOTHED RECOVERY. JAN. 12, 1971.
3,599,037.—GAS LAMP LEAD BALLAST CIRCUIT HAVING FEED CONTROL. AUG. 10, 1971. ARG. 0182960, BEL. 0749784, CAN. 0907126, FRA. 7015813, GRB. 1308525, ITL. 0900023, MEX. 0116550.
3,638,089.—SPEED CONTROL SYSTEM HAVING HIGH AND LOW LEVEL SPEED MEANS. JAN. 25, 1972. GRB. 1322611.
3,670,269.—AUTOMATIC TRANSVERSAL EQUALIZER. JUNE 13, 1972. CAN. 0932412, GRB. 1353018.
3,689,915.—ENCODING SYSTEM. SEPT. 5, 1972. CAN. 0870252, GER. 1562051, GRB. 1207701, JAP. 0675600.
3,691,542.—MAGNETIC MEMORY DISK DRIVE APPARATUS WITH REDUCED R.F. NOISE. SEPT. 12, 1972. GRB. 1328717, JAP. 0840914.
3,699,555.—APPARATUS FOR RAPID ACTION DISPLACEMENT CONTROL. OCT. 17, 1972. CAN. 985413, GRB. 1366124.
3,737,569.—TRANSMISSION DEVICE. JUNE 5, 1973.
3,742,374.—TRANSDUCER DEVICE. JUNE 26, 1973.
3,761,799.—CURRENT STABILIZING CIRCUIT HAVING MINIMAL LEAKAGE CURRENT EFFECTS. SEPT. 25, 1973. BEL. 0792285. FRA. 7243406, GRB. 1395600, ITL. 0971515, MEX. 131737.
3,778,817.—OUTPUT KEYBOARD APPARATUS AND SIGNAL TRANSLATING METHODS THEREFOR. DEC. 11, 1973.
3,795,857.—ELECTRICAL CONNECTOR TESTING APPARATUS HAVING A PLURALITY OF AND GATES. MAR. 5, 1974.
3,818,297.—MOTOR CONTROL APPARATUS. JUNE 18, 1974. CAN 1004296, GRB. 1454269.
3,832,065.—DRUM TRACK DETECTOR. AUG. 27, 1974. GRB. 1458283.
3,880,516.—DIAGNOSTIC CIRCUIT BOARD. APR. 29, 1975. BEL. 0808231, FRA. 7342590, GRB. 1447394, ITL. 1002163, SPN. 421149.
3,904,922.—LAMP CONTROL AND LAMP SWITCH CIRCUIT. SEPT. 9, 1975.
3,906,194.—SIGNAL PROCESSOR. SEPT. 16, 1975.
3,909,125.—STEPPER MOTOR CONTROL. SEPT. 30, 1975.
3,918,046.—DIGITAL TO ANALOG CONVERTER. NOV. 4, 1975. ARG. 0197211, BEL. 0795801, FRA. 7305890, GRB. 1417772, ITL. 0979289, MEX. 131264, SPN. 0411883, STZ. 0564887.
3,922,595.—HIGH POWER REGULATED D C SUPPLY. NOV. 25, 1975.
3,928,772.—TIME DEPENDENT FAULT DETECTOR. DEC. 23, 1975. BEL. 0826690.
3,989,371.—CYCLE-OUT LOGIC FOR A MULTI-MODE COPIER/DUPLICATOR. NOV. 2, 1976.
3,991,355.—STEPPER MOTOR CONTROL. NOV. 9, 1976.
4,002,409.—CHAIN-FEED CONTROL LOGIC FOR A MULTI-MODE COPIER/DUPLICATOR. JAN. 11, 1977. BEL. 0840300.
4,074,147.—SWITCHING AMPLIFIERS. FEB. 14, 1978.
4,101,788.—MOS BUFFER CIRCUIT. JULY 18, 1978.
4,103,252.—CAPACITIVE TOUCH-ACTIVATED TRANSDUCER SYSTEM INCLUDING A PLURALITY OF OSCILLATORS. JULY 25, 1978.
4,129,807.—CURRENT REGULATING CIRCUIT FOR MAGNETIC DEFLECTION SYSTEMS. DEC. 12, 1978.

Class 26

D.225,572.—BOOK STACKING UNIT FOR XEROGRAPHIC REPRODUCTION MACHINE. DEC. 19, 1972.
D.231,127.—COPYING MACHINE-LARGE DOCUMENT COPYING FRAME-DECOY. APR. 2, 1974.
D.231,128.—COPYING MACHINE. APR. 2, 1974.
D.231,129.—COPYING MACHINE. APR. 2, 1974.
D.231,564.—COPYING MACHINE. APR. 30, 1974.
D.236,030.—PAPER TRAY. JULY 22, 1975.
D.236,446.—CART. AUG. 26, 1975.
D.236,491.—COMPUTER CABINET. AUG. 26, 1975.
D.236,897.—COMPUTER CABINET. SEPT. 23, 1975.
D.236,961.—BALANCE SCALE. SEPT. 30, 1975.
D.238,450.—PAPER CASSETTE. JAN. 13, 1976.
D.238,966.—COPIER EVENT RECORDER. FEB. 24, 1976.
D.239,063.—STORAGE UNIT. MAR. 9, 1976.
D.239,064.—STORAGE UNIT. MAR. 9, 1976.
D.239,065.—STORAGE UNIT. MAR. 9, 1976.
D.239,066.—STORAGE UNIT. MAR. 9, 1976.
D 239,067.—STORAGE AND DISPLAY UNIT. MAR. 9, 1976.
D.239,106.—SEMICONDUCTOR EDUCATIONAL BOARD. MAR. 9, 1976.
D.239,107.—PARALLEL RL/RC CIRCUITS EDUCATIONAL BOARD. MAR. 9, 1976.
D.239,108.—RLC CIRCUITS EDUCATIONAL BOARD. MAR. 9, 1976.
D.239,109.—SERIES RL AND RC CIRCUITS EDUCATIONAL BOARD. MAR. 9, 1976.

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D.239,110.—EDUCATIONAL DEVICE FOR LEARNING ABOUT RECTIFIERS AND FILTERS. MAR. 9, 1976.
D.239,351.—STORAGE AND DISPLAY UNIT. MAR. 30, 1976.
D.239,392.—COMPUTER CABINET. MAR. 30, 1976.
D.239,750.—STORAGE UNIT. MAY 4, 1976.
D.239,995.—STORAGE UNIT. MAY 25, 1976.
D.240,192.—DESIGN FOR MICROFILM REEL. JUNE 8, 1976.
D.240,540.—COMPUTER TERMINAL. JULY 13, 1976.
D.240,554.—DUPLICATING MACHINE WITH SORTER. JULY 13, 1976.
D.240,555.—SORTER. JULY 13, 1976.
D.240,557.—TRAY RACK. JULY 13, 1976.
D.240,965.—COIN OPERATED REPRODUCTION MACHINE. AUG. 10, 1976.
D.241,982.—ADAPTER FOR COMPRESSING HUMAN BODY ORGANS FOR X-RAY TREATMENT OR THE LIKE. OCT. 19, 1976.
D.246,226.—TONER CONTAINER OR THE LIKE. NOV. 1, 1977.
D.247,673.—STRIPPER PAD. APR. 4, 1978.
D.247,674.—STRIPPER PAD. APR. 4, 1978.
D.247,675.—STRIPPER PAD. APR. 4, 1978.
D.248,765.—MICROFICHE COPIER. AUG. 1, 1978.
D.250,765.—FANFOLD SHEET STACKING TRAY. JAN. 9, 1979.

Class 26A

D.200,130.—XEROGRAPHIC CAMERA. JAN. 19, 1965.
D.200,448.—DOCUMENT REPRODUCING APPARATUS. FEB. 23, 1965.
D.205,806.—REPRODUCTION MACHINE. SEPT. 20, 1966.
D.227,933.—SORTER. JULY 24, 1973.
D.236,850.—CONTROL PANEL FOR A COPIER. SEPT. 16, 1975.
D.237,905.—CONTROL PANEL OF A COLOR ELECTROPHOTOGRAPHIC PRINTING MACHINE. DEC. 2, 1975.
D.238,779.—DOCUMENT TRAY. FEB. 10, 1976.
D.238,818.—PLATEN COVER FOR COPIER. FEB. 10, 1976.
D.239,138.—XEROGRAPHIC COPIER. MAR. 9, 1976.

Class 26A 1

D.163,640.—XEROGRAPHIC COPYING DEVICE. JUNE 12, 1951.
D.165,993.—PAPER REGISTRATION GUIDE FOR ELECTROPHOTOGRAPHIC COPYING MACHINE. FEB. 19, 1952.
D.172,906.—A XEROGRAPHIC PROCESSOR. AUG. 24, 1954.
D.186,832.—DOCUMENT REPRODUCING APPARATUS. DEC. 8, 1959.
D.188,633.—DOCUMENT REPRODUCING APPARATUS. AUG. 16, 1960.
D.193,450.—DOCUMENT REPRODUCING APPARATUS. AUG. 21, 1962.
D.194,815.—DOCUMENT REPRODUCING APPARATUS. MAR. 12, 1963.
D.200,272.—DOCUMENT REPRODUCING APPARATUS. FEB. 9, 1965. CAN. 2092730.
D.200,448.—DOCUMENT REPRODUCING APPARATUS. FEB. 23, 1965.
D.205,558.—REPRODUCTION MACHINE. AUG. 16, 1966.
D.205,806.—REPRODUCTION MACHINE. SEPT. 20, 1966.
D.208,337.—XEROGRAPHIC DOCUMENT REPRODUCING APPARATUS OR SIMILAR ARTICLE. AUG. 15, 1967.
D.210,558.—DOCUMENT REPRODUCING MACHINE. MAR. 19, 1968.
D.210,630.—DOCUMENT REPRODUCING APPARATUS. MAR. 26, 1968.
D.210,856.—DOCUMENT REPRODUCING APPARATUS. APR. 23, 1968.
D.214,699.—DOCUMENT REPRODUCING MACHINE. JULY 15, 1969. ARG. 0011028, CAN. 2543184, MEX. 0011135.
D.218,199.—DOCUMENT REPRODUCING MACHINE. JULY 28, 1970. CAN. 0033011, GRB. 0946459.
D.218,201.—REPRODUCTION MACHINE. JULY 28, 1970. ARG. 0014313, BEL. 0017005, CAN. 0033518, CHL. 0000996, GRB. 0946818, JAP. 0363075, MEX. 0011194, PNM. 0002073, VZL. 0000744.
D.219,889.—XEROGRAPHIC PROCESSOR HOUSING. FEB. 9, 1971.
D.221,694.—XEROGRAPHIC PROCESS HOUSING. AUG. 31, 1971.
D.227,931.—ELECTROPHOTOGRAPHIC PRINTING MACHINE, JULY 24, 1973.
D.230,513.—REPRODUCTION MACHINE. FEB. 26, 1974.
D.238,737.—COPYING MACHINE STAND. FEB. 10, 1976.
D.243,008.—COIN OPERATED REPRODUCTION MACHINE. JAN. 11, 1977.

Class 26A 2

D.214,959.—AUTOMATIC DOCUMENT FEEDING APPARATUS FOR XEROGRAPHIC REPRODUCING MACHINES OR THE LIKE. AUG. 12, 1969. CAN. 0032540, GER. DES5715, GRB. 0942720.
D.227,034.—DOCUMENT FEEDER FOR A XEROGRAPHIC REPRODUCTION. MAY 29, 1973.
D246,373.—PAPER OVERFEED TRAY. NOV. 15, 1977.

Class 26A 3

D.200,129.—XEROGRAPHIC TRANSFER AND FUSING APPARATUS. JAN. 19, 1965.
D.233,481.—XEROGRAPHIC VAPOR FUSING APPARATUS. OCT. 29, 1974.

Class 26A 4

D.201,405.—XEROGRAPHIC PRINTER. JUNE 15, 1965.
D.220,188.—MOBILE PRINTER. MAR. 16, 1971. CAN. 0033207, GER. 0MR6294, GRB. 0946460, JAP. 0443861.
D.230,517.—COMPUTER OUTPUT PRINTER. FEB. 26, 1974.
D.232,125.—CHARACTER PRINT MEMBER. JULY 16, 1974.
D.237,010.—COMBINED RIBBON AND CARTRIDGE THEREFOR. SEPT. 30, 1975. FRA. 0073134, GRB. 0967791, ITL. 0010845.
D.238,904.—CHARACTER PRINT MEMBER. FEB. 17, 1976.
D.238,968.—CHARACTER PRINT MEMBER. FEB. 24, 1976. FRA. 0073135, GER. 0009989, GRB. 0967792, ITL. 0010846.
D.250,950.—CONTROL CONSOLE MODULE FOR A COMPUTER PRINTER. JAN. 30, 1979.
D.250,952.—MODULAR COMPUTER PRINTER. JAN. 30, 1979.
D.250,953.—MODULAR COMPUTER PRINTER. JAN. 30, 1979.
D.250,954.—MODULAR COMPUTER PRINTER. JAN. 30, 1979.

Class 26A 5

D.200,130.—XEROGRAPHIC CAMERA. JAN. 19, 1965.

Class 26B

D.209,408.—CABINET FOR SORTING AND HOLDING SHEETS OF PRINTED MATERIAL. NOV. 28, 1967.
D.209,409.—MODULAR CABINET FOR SORTING AND HOLDING SHEETS OF PRINTED MATERIAL. NOV. 28, 1967.
D.209,872.—DOCUMENT REPRODUCING AND SORTING MACHINE. JAN. 9, 1968.
D.212,227.—A TAPE CONTRL UNIT FOR AN AUTOMATIC SORTER OR THE LIKE. SEPT. 17, 1968.
D.224,054.—XEROGRAPHIC REPRODUCTION MACHINE OR THE LIKE. JUNE 27, 1972.
D.230,515.—DOCUMENT REPRODUCING AND SORTING MACHINE. FEB. 26, 1974.
D.236,330.—REPRODUCTION MACHINE STACKING CART. AUG. 19, 1975.
D.236,924.—PAPER HANDLING STAND. SEPT. 30, 1975.
D.237,871.—REPRODUCTION MACHINE STACKING CART. DEC. 2, 1975.
D.238,779.—DOCUMENT TRAY. FEB. 10, 1976.

Class 26C

D.205,910.—A CAN. OCT. 4, 1966.
D.208,377.—CONTAINER FOR XEROGRAPHIC TONER POWDER. AUG. 22, 1967.
D.211,928.—BOTTLE. AUG. 13, 1968.
D.218,152.—CONTAINER FOR XEROGRAPHIC POWDER. JULY 28, 1970. CAN. 0032629, GRB. 0944047.
D.236,694.—DEVELOPER MIX STORAGE CONTAINER. SEPT. 9, 1975.
D.240,201.—TONER PARTICLE STORAGE CONTAINER-DESIGN FOR TONER CARTRIDGE. JUNE 8, 1976.
D.244,007.—TONER BOTTLES. APR. 12, 1977.

Class 26D

D.216,647.—SPRING SCALE. FEB. 24, 1970. CAN. 0032577, GRB. 0943939.
D.220,011.—ARTICLE ADDRESSING MACHINE. FEB. 23, 1971.

3,666,948.—LIQUID CRYSTAL INFRARED IMAGING SYSTEM HAVING AN UNDISTURBED IMAGE ON A DISTURBED BACKGROUND. MAY 30, 1972. CAN 0964455, GRB. 1387276.
3,737,896.—APPARATUS FOR RECOVERY OF RECORDED BIT INFORMATION IN A MAGNETIC RECORDING MEDIUM. JUNE 5, 1973. AUS 0471989, BEL. 0790688, CAN. 1008967, STZ. 0563642.
D.246,102.—FILM REEL (DESIGN). OCT. 18, 1977

Class 26E

D.200,128.—FACSIMILE RECEIVER. JAN. 19, 1965.

Class 26E 1

D.200,127.—FACSIMILE TRANSMITTER. JAN. 19, 1965.
D.200,128.—FACSIMILE RECEIVER. JAN. 19, 1965
D.215,218.—FACSIMILE TRANSCEIVER. SEPT. 16, 1969. ARG. 0010244, BEL. 0016600, CAN. 2493134, FRA. 0096592, GER. 0005411, GRB 0939330, ITL. 0134198 MEX 0010900.
D.218,170.—FACSIMILE TRANSCEIVER JULY 28, 1970 GRB. 0944047.
D.225,860.—HOUSING FOR ELECTRONIC APPARATUS. JAN. 9, 1973
D.225,861.—HOUSING FOR ELECTRONIC APPARATUS. JAN. 9, 1973
D.225,867.—UNATTENDED TELEPHONE ANSWERING APPARATUS OR SIMILAR ARTICLE. JAN. 9, 1973
D.227,121.—FACSIMILE TRANSCEIVER APPARATUS. JUNE 5, 1973.
D.227,122.—FACSIMILE TRANSCEIVER APPARATUS JUNE 5, 1973

Class 26E 2

D.215,849.—A ROLL-FEED APPARATUS FOR A FACSIMILE TRANSCEIVER. NOV. 4, 1969. ARG. 0011067, BEL. 0016764, CAN. 0032344, GER. DES5719, GRB. 0942723, ITL. 0138774, MEX. 0010975, PNM. 0001983, VZL. 0000663
D.216,123.—FLEXIBLE SHEET MATERIAL GUIDE FOR A FACSIMILE TRANSCEIVER OR SIMILAR ARTICLE. NOV. 25, 1969. GRB. 0942748.
D.216,564.—GUIDE FOR FLEXIBLE SHEET MATERIAL FOR FACSIMILE TRANSCEIVER OR SIMILAR ARTICLE. FEB. 10, 1970. ARG. 0011068, BEL. 0016763, GER. DES5716, GRB. 0942723, ITL. 0138775, MEX 0011018, PNM. 0001401, VZL. 0000662.
D.249,688.—PAPER TAKE UP REEL OR SIMILAR ARTICLE FOR A WEB FED FACSIMILE TRANSCEIVER OF THE LIKE. SEPT. 26, 1978.

Class 26E 3

D.210,589.—ELECTRONIC ADAPTER FOR FACSIMILE COMPUTER SYSTEM. MAR. 26, 1968.

Class 26F

D.203,012.—DESIGN FOR A MACHINE FOR APPLYING INTELLIGENCE TO A MOVING ARTICLE. NOV. 23, 1965.
D.244,943.—FILM REEL (DESIGN). JULY 5, 1977.
D.246,102.—FILM REEL (DESIGN). OCT. 18, 1977
D.247,667.—FILM REEL (DESIGN). APR. 4, 1978.

Class 26F 1

D.202,746.—MICROFICHE PRINTER. NOV. 2, 1965.
D.217,739.—COMBINED MICROFILM VIEWER AND REPRODUCING MACHINE ACCESSORY. JUNE 2, 1970. CAN. 0032698.
D.218,782.—PROJECTION VIEWER. SEPT. 22, 1970. CAN. 0033031, GER. OMR6147, GRB. 0945494, JAP. 413894.
D.218,783.—COMBINATION FILM VIEWING AND REPRODUCING MACHINE. SEPT. 22, 1970. CAN. 0033032, GER. OMR6146, GRB. 0945495, JAP. 0377263.
D.233,369.—MICROFILM XEROGRAPHIC MACHINE. OCT. 22, 1974.
D.236,544.—MICROFORM VIEWER. AUG. 26, 1975.
D.239,055.—HAND-HELD VIEWER FOR MICROFORMS. MAR. 2, 1976.
D.239,056.—HAND-HELD VIEWER FOR MICROFORMS. MAR. 2, 1976.
D.247,295.—MULTICOLOR TRANSPARENCY REPRODUCTION MACHINE. FEB. 21, 1978.

Class 26G

D.225,643.—REACTION TESTING DEVICE. DEC. 26, 1972.
D.225,681.—SUCTION MOUNTING DEVICE. DEC. 26, 1972.
D.226,662.—EDUCATIONAL DEVICE FOR DEMONSTRATING MOMENTUM. APR. 10, 1973
D.232,030.—EDUCATIONAL AID FOR DEMONSTRATING PRINCIPLES IN PHYSICS. JULY 9, 1974
D.232,031.—COLLISION DEMONSTRATION TEACHING AID. JULY 9, 1974.
D.232,098.—TEACHING AID FOR DEMONSTRATING PRINCIPLES IN PHYSICS. JULY 16, 1974.
D.232,698.—CLAMP. SEPT. 10, 1974.
D.233,432.—TEACHING AID FOR DEMONSTRATING PRINCIPLES OF PHYSICS. OCT. 29, 1974
D.233,654.—CONTAINER FOR BOOKLETS OR THE LIKE. NOV. 19, 1974.
D.233,658.—BALANCE SCALE. NOV. 19, 1974
D.233,935.—EDUCATIONAL DEVICE FOR TEACHING ARITHMETIC. DEC. 17, 1974.
D.234,546.—CARRYING CASE. MAR. 18, 1975.
D.235,440.—EDUCATIONAL PLUG-IN BOARD. JUNE 17, 1975.
D.235,441.—BASIC MEASUREMENT EDUCATIONAL BOARD. JUNE 17, 1975
D.236,028.—MAGNIFIER. JULY 22, 1975
D.236,729.—EDUCATIONAL PLUG-ON BOARD. SEPT. 9, 1975
D.236,730.—EDUCATIONAL PLUG-ON BOARD. SEPT. 9, 1975.
D.236,978.—SWITCHING EDUCATIONAL BOARD. SEPT. 30, 1975
D.236,979.—EDUCATIONAL MEASURING DEVICE BOARD. SEPT. 30, 1975.
D.237,020.—COMBINED SUPPORT AND STORAGE TRAY FOR AN EDUCATIONAL KIT OR SIMILAR ARTICLE. SEPT. 30, 1975.
D.237,877.—MOTOR AND GENERATOR EDUCATIONAL BOARD. DEC. 2, 1975
D.237,878.—MULTI-METER EDUCATIONAL BOARD. DEC. 2, 1975.
D.237,879.—EDUCATIONAL DEVICE FOR LEARNING MAGNETISM & INDUCTION. DEC. 2, 1975.
D.237,880.—EDUCATIONAL DEVICE FOR LEARNING BASIC HAND TOOLS. DEC. 2, 1975.
D.242,787.—AN EDUCATIONAL AIDE FOR MEASURING MASS. DEC. 21, 1976.
D.242,793.—EDUCATIONAL AIDE FOR TEACHING PHYSICAL PROPERTIES OF LIGHT. DEC. 21, 1976.

Class 26G 1

D.216,157.—BALANCE SCALE. NOV. 25, 1969. BEL. 0016761, CAN. 0032611, GER. DES5718, GRB. 0942720, ITL. 0138772, JAP. 0337548
D.236,731.—CURCUIT TESTING EDUCATIONAL BOARD. SEPT. 9, 1975.

Class 26H

D.236,556.—CARRYING CASE FOR COLORISTS MATERIALS OR THE LIKE. AUG. 26, 1975.

Class 26H 1

D.215,294.—HOUSING FOR ELECTRONIC APPARATUS. SEPT. 23, 1969. ARG. 0011066, BEL. 0016760, GER. 0005765, GRB 0942725, ITL. 0138776, MEX. 0010934, PNM. 0001839, VZL. 0000664.
D.215,660.—HOUSING FOR ELECTRONIC APPARATUS. OCT. 21, 1969.
D.234,700.—DISC DRIVE CABINET. APR. 1, 1975.
D.238,494.—CONTROL PANEL FOR DISK FILE. JAN. 20, 1976.
D.238,495.—DISK MEMORY MODULE FRONT PANEL. JAN. 20, 1976.
D.240,632.—CABINET FOR ELECTRONIC EQUIPMENT. JULY 20, 1976.
D.241,446.—SINGLE MAGNETIC CARD CONSOLE UNIT FOR ELECTRONIC TYPING SYSTEM. SEPT. 14, 1976.
D.241,447.—SINGLE MAGNETIC TAPE CONSOLE UNIT FOR ELECTRONIC TYPING SYSTEM. SEPT. 14, 1976.
D.241,448.—DUAL MAGNETIC TAPE CONSOLE UNIT FOR ELECTRONIC TYPING SYSTEM. SEPT. 14, 1976.
D.241,449.—DUAL MAGNETIC CARD CONSOLE UNIT FOR ELECTRONIC TYPING SYSTEM. SEPT. 14, 1976.

Class 26H 2

D.221,228.—KEYBOARD FOR A COMPUTER OR THE LIKE. JULY 20, 1971.

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Class 26H 3

D.221,229.—SEND/RECEIVE DATA PRINTER TERMINAL. JULY 20, 1971.
D.224,019.—XEND/RECEIVE DATA PRINTER TERMINAL. JUNE 27, 1972.
D.236,129.—INPUT/OUTPUT TERMINAL. JULY 29, 1975.

Class 26H 4

D.212,692.—TELEPHONE ACOUSTIC COUPLER. NOV. 12, 1968. ARG. 0010245, BEL. 0016601, CAN. 2503147, FRA. 0096593. GER. 0005410, GRB. 0939331, ITL. 1341991, MEX. 0010845.
D.224,025.—ACOUSTIC COUPLER. JUNE 27, 1972.

Class 26H 5

D.204,319.—HOLLOW CORNER PRISM. APR. 5, 1966.
D.206,956.—HOLLOW CORNER PRISM. FEB. 14, 1967.
D.237,849.—COOLING RACK. DEC. 2, 1975.

Class 26H 6

D.221,108.—PAPER SHREDDER. JULY 6, 1971. CAN. 0033939.

Class 26H 7

D.221,901.—OVERHEAD PROJECTOR. SEPT. 14, 1971. CAN. 0033920.
D.231,800.—RIBBON CARTRIDGE. JUNE 11, 1974.
D.236,787.—BOOKCASE OR SIMILAR ARTICLE. SEPT. 16, 1975.
D.239,419.—TAPE CASSETTE STORAGE UNIT. MAR. 30, 1976.
D.239,472.—MAGNETIC CARD STORAGE TRAY. APR. 6, 1976.
D.239,531.—COPY HOLDER. APR. 13, 1976.
D.239,872.—CAMERA/PROJECTOR. MAY 11, 1976.
D.241,774.—PRINTER/KEYBOARD APPARATUS FOR ELECTRONIC TYPING SYSTEM OR SIMILAR ARTICLE. OCT. 5, 1976.
D.242,101.—FILE UNIT OR SIMILAR ARTICLE. NOV. 2, 1976.
D.242,102.—TABLE OR SIMILAR ARTICLE. NOV. 2, 1976.

Class 27A

3,615,614.—LIGHT DEV DIRCT PRINT SILVER HALIDE EMULSION SENSITIZD W/ COMBINTN OF COPPER, LEAD, BROMIDE AND THIOU. OCT. 26, 1971.
3,660,100.—DIRECT-PRINT LIGHT DEVELOPABLE EMULSION. MAY 2, 1972.
3,725,073.—LIGHT DEVELOPABLE DIRECT WRITING, SILVER HALIDE EMULSIONS CONTAINING GOLD, IODINE, LEAD AND COP. APR. 3, 1973. CAN. 0882613.
3,782,960.—DRCT-PRNT LIGHT-DVLPBL EMULSN CNTAING SILVER HALIDE GRAINS SNSTZD SENSTZD ON THE SURFACES W/SI. JAN. 1, 1974. BEL. 0780680, CAN. 0994590, GRB. 1384081, ITL. 0950280.
3,849,146.—DIRECT-PRINT LIGHT-DEVELOPBL SILVER HALIDE EMULSION CONTAINING CYCLIC DIOXIDE OR SELENONE AS SEN. NOV. 19, 1974.

Class 27B

3,631,232.—APPARATUS FOR SIMULATING THE ELECTRICAL CHARACTERISTICS OF A NETWORK. DEC. 28, 1971. CAN. 0951429, GRB. 1267785.
4,125,318.—TIR MODULATOR, NOV. 14, 1978.

Class 27C

3,736,133.—TRANSPARENT INK—ABSORBENT LACQUERS. MAY 29, 1973. ARG. 0193996, CAN. 0985583, GRB. 1390137, MEX. 0127276, VZL. 0033577.
3,773,513.—DIMENSIONALLY STABLE, PHOTOGRAPHIC PAPER CONTAINING GLASS FIBERS. NOV. 20, 1973.

Class 27D

RE.22,654.—PHOTOGRAPHIC DEVELOPING MACHINE—RE OF 2,347,189-D3946. JULY 3, 1945.
2,347,189.—PHOTOGRAPHIC DEVELOPING MACHINE—REISSUED D348-22,654. APR. 25, 1944.
3,393,362.—PROCESS FOR DETECTING IRREGULARITIES IN A METALLIC SURFACE. JULY 16, 1968.

Class 27H 1

4,077,019.—TRANSVERSE MODE CONTROL IN DOUBLE-HETEROSTRUCTURE LASERS UTILIZING SUBSTRATE LOSS. FEB. 28, 1978.

Class 30

3,861,911.—IMAGING FIXING METHOD. JAN. 21, 1975.

Class 30A

3,573,904.—COMBINATION OF ELECTROGRAPHY AND MANIFOLD IMAGING. APR. 6, 1971. ARG. 0188621, AUS. 0408972, BEL. 0708975, CAN. 0883746, FRA. 1563782, GER. 1671591, GRB. 1215957, ITL. 0822303, JAP. 0620886, MEX. 0100810, VZL. 0023682.
3,707,368.—MANIFOLD IMAGING PROCESS. DEC. 26, 1972.
3,741,762.—MANIFOLD IMAGING MEMBER AND PROCESS. JUNE 26, 1973. CAN. 0961909, GRB. 1376391.
3,955,975.—MANIFOLD IMAGING MEMBER AND PROCESS EMPLOYING A METAL SOAP. MAY 11, 1976.

Class 30B

3,642,363.—MANIFOLD IMAGING SYSTEM. FEB. 15, 1972. CAN. 0960289, GRB. 1328405, JAP. 0770137.
3,661,454.—COMBINATION OF ELECTROGRAPHY AND MANIFOLD IMAGING. MAY 9, 1972.
3,684,362.—TRANSPARENT ELECTRODE. AUG. 15, 1972. CAN. 0932378, GRB. 1340685, JAP. 0758465.
3,741,641.—MANIFOLD IMAGING APPARATUS. JUNE 26, 1973.
3,748,034.—MANIFOLD IMAGING MACHINE. JULY 24, 1973. BEL. 0777713, CAN. 0948694, FRA. 7200999, GRB. 1376661, ITL. 0946353, SPN. 0398585, SWD. 7200573.
3,761,174.—MANIFOLD WEB HANDLING. SEPT. 25, 1973.
3,768,902.—MANIFOLD IMAGING. OCT. 30, 1973.
3,876,937.—LAYER TRANSFER IMAGING SYSTEM. APR 8, 1975. CAN. 0933996, GRB. 1282725, JAP. 0726369.
3,963,340.—IMAGING APPARATUS. JUNE 15, 1976.
4,103,995.—IMAGING APPARATUS. AUG. 1, 1978.

Class 30C

3,615,393.—MANIFOLD IMAGING PROCESS EMPLOYING STATIC CHARGE FIELD APPLICATION. OCT. 26, 1971. BEL. 0746582, CAN. 0965829, FRA. 7007627, GRB. 1295533, ITL. 0886478, JAP. 0727962.
3,653,892.—MANIFOLD IMAGING PROCESS WHEREIN THE IMAGED ELEMENTS MAY BE RECOMBINED AND REUSED. APR. 4, 1972. CAN. 0916967, GRB. 1320407, JAP. 0731611.
3,676,116.—IMAGE REVERSAL IN MANIFOLD IMAGING USING ELECTRICALLY CONDUCTIVE RECEIVER SHEET. JULY 11, 1972.
3,684,362.—TRANSPARENT ELECTRODE. AUG. 15, 1972. CAN. 0932378. GRB. 1340685, JAP. 0758465.
3,692,516.—MANIFOLD IMAGING METHOD - PHAROS MANIFOLD IMAGING REVERSAL. AUG. 19, 1972. CAN. 0929204, GRB. 1320012, JAP. 0759476.
3,692,518.—MANIFOLD IMAGING PROCESS. SEPT. 19, 1972. ARG. 0191965, BEL. 0749174, CAN. 0916496, FRA. 7013872, GRB. 1309649, ITL. 0899700, JAP. 0731228, MEX. 0116175.
3,718,462.—MANIFOLD ELECTRIFICATION PROCESS. FEB. 27, 1973. CAN. 0947366, GRB. 1313712, JAP. 0739530.
3,737,311.—ELECTROSTATIC PARTICLES TRANSFER IMAGING PROCESS. JUNE 5, 1973.
3,756,812.—MANIFOLD IMAGING PROCESS. SEPT. 4, 1973.
3,761,258.—IMAGING PROCESS EMPLOYING CHARGED DONOR AND RECEIVER SHEETS. SEPT. 25, 1973.
3,776,721.—MANIFOLD IMAGING. DEC. 4, 1973.
3,844,780.—IMAGING PROCESS. OCT. 29, 1974.
3,846,127.—IMAGING SYSTEM. NOV. 5, 1974.
3,850,626.—IMAGING MEMBER AND METHOD. NOV. 26, 1974. GRB. 1464653.
3,854,943.—MANIFOLD IMAGING METH AND MEMBR EMPLOYING FUNDAMENTAL PARTICLES OF ALPHA METAL FREE PHTHALOCYANINE. DEC. 17, 1974. CAN. 0988766, GRB. 1424234.
3,861,910.—MANIFOLD IMAGING PROCESS. JAN. 21, 1975. ARG. 0198477, BEL. 0744343, CAN. 0947363, FRA. 7001127, GRB. 1284521, ITL. 0885940, JAP. 0727960, MEX. 0111440.

3,909,257.—MANIFOLD IMAGING PROCESS WITH SPOOL ELECTRODE. SEPT. 30, 1975.

Class 30D

3,598,581.—MANIFOLD IMAGING METHOD. AUG. 10, 1971. ARG. 0198157, AUS. 0413154, BEL. 0713100, BRA. 6795099, CAN. 0889250, CHL. 0024249, CLB. 0017928, FRA. 1560020, GER. 1772114, GRB. 1200712, HOL. 0149611, ITL. 0829693, JAP. 0626106, LXB. 0055806, MEX. 0100797, NOR. 0128040, PRU. 0009737, SPN. 0352316, STZ. 0474097, SWD. 0340404, URG. 0009203, VZL. 0023690.
3,723,112.—MANIFOLD IMAGING METHOD WHEREIN THE ACTIVATOR CARRIES A PLASTIC COATING MATERIAL. MAR. 27, 1973.
3,741,762.—MANIFOLD IMAGING MEMBER AND PROCESS. JUNE 26, 1973. CAN. 0961909, GRB. 1376391.
3,907,558.—MANIFOLD IMAGING UTILIZING SILICA GEL ACTIVATING LAYER. SEPT 23, 1975
3,912,504.—MANIFOLD IMAGING WITH THERMAL ACTIVATOR CONTAINED IN A SILICA GEL LAYER. OCT. 14, 1975.
3,955,975.—MANIFOLD IMAGING MEMBER AND PROCESS EMPLOYING A METAL SOAP. MAY 11, 1976.
3,984,904.—MANIFOLD IMAGING MEMBER AND PROCESS EMPLOYING A DARK CHARGE INJECTING LAYER. JUNE 22, 1976. BEL. 0832405.
4,015,983.—A METHOD OF ERASING MANIFOLD IMAGES. APR. 5, 1977.
4,108,655.—METHOD OF MAKING A THERMO ACTIVE IMAGING MEMBER. AUG 22, 1978.

Class 30E

3,653,889.—METHOD OF FIXING MANIFOLD IMAGES. APR. 4, 1972. BEL. 0754024, CAN. 0921745, FRA. 7028279, GRB. 1322772, ITL. 0900939, JAP. 0739529.
3,658,519.—IMAGE TRANSFER PROCESS FROM CONDUCTIVE SUBSTRATES. APR. 25, 1972. ARG. 0195536, AUS. 0456406, BEL. 0760747, BRA. 7022093, CAN. 0960290, FRA. 7047144, GRB. 1337590, ITL. 0913848, MEX. 0119590, SWD. 7017293.
3,706,553.—TRANSFER OF IMAGES TO A NON-CONDUCTIVE SUBSTRATE. DEC. 19, 1972. ARG. 0203811, AUS. 0461437, BEL. 0760456, CAN. 0947368, FRA. 7047140, GRB. 1339577, ITL 0913634, MEX. 0119591, SWD. 7017139.
3,708,288.—IMAGE TRANSFER PROCESS. JAN. 2, 1973. CAN. 0882053, GRB. 1298922, JAP. 0757867.
3,723,112.—MANIFOLD IMAGING METHOD WHEREIN THE ACTIVATOR CARRIES A PLASTIC COATING MATERIAL. MAR. 27, 1973.
3,746,538.—IMAGE TRANSFER PROCESS. JULY 17, 1973. CAN. 0951781, GRB. 1374841.
3,793,017.—IMAGING FIXING METHOD. FEB. 19, 1974.
3,819,368.—MANIFOLD IMAGING MEMBER EMPLOYING A FIXATIVE LAYER. JUNE 25, 1974.
3,825,423.—IMAGE TRANSFER PROCESS. JULY 23, 1974.
3,888,208.—IMAGE TRANSFER PROCESS. JUNE 10, 1975.

Class 30F

3,548,748.—DUPLICATING METHOD EMPLOYING SIMULTANEOUS APPLICATION OF ELECTRIC FIELD AND EXPOSURE TO RADIATION. DEC. 22, 1970. CAN. 0882051, GRB. 1227394, JAP. 0752522.
3,554,125.—METHOD OF MAKING A LITHOGRAPHIC MASTER AND METHOD OF PRINTING THEREWITH. JAN. 12, 1971. CAN. 0882052, GER. 1772302, GRB. 1219849.
3,565,612.—DUPLICATING MASTERS BY THE MANIFOLD PROCESS. FEB. 23, 1971. ARG. 0193797, AUS. 0411612, BEL. 0708974, CAN. 0873277, FRA. 1549964, GER. 1671590, GRB. 1215956, ITL. 0823464, MEX. 0106608, VZL. 0023681.
3,573,904.—COMBINATION OF ELECTROGRAPHY AND MANIFOLD IMAGING. APR. 6, 1971. ARG. 0188621, AUS. 0408972, BEL. 0708975, CAN. 0883746, FRA. 1563782, GER. 1671591, GRB. 1215957, ITL. 0822303, JAP. 0620886, MEX. 0100810, VZL. 0023682.

Class 30G

3,655,372.—IMAGE REVERSAL IN MANIFOLD IMAGING. APR. 11, 1972.
3,901,697.—MANIFOLD IMAGING PROCESSUSING ELECTRONICS PHOTOSENSITIVE MATERIAL SUBJECT TO LIGHT FATIGUE. AUG. 26, 1975.

Class 30H

3,649,117.—IMAGING PROCESS. MAR. 14, 1972. BEL. 0761133, CAN. 0985732, FRA. 7047700, GRB. 1340679, ITL. 0914070, JAP. 0759480.
3,918,967.—CONTACT REFLEX MANIFOLD IMAGING PROCESS. NOV. 11, 1975. ARG. 0183676, BEL. 0761132, CAN. 0949120, FRA. 7047699, GRB. 1340207, ITL. 0914069, JAP. 0770143, MEX. 0119757, VZL. 0032600.

Class 30I

3,556,783.—COLOR MANIFOLD IMAGING PROCESS. JAN. 19, 1971.
3,853,555.—METHOD OF COLOR IMAGING A LAYER OF ELECTRICALLY PHOTOSENSITIVE AGGLOMERATES. DEC. 10, 1974.
3,854,943.—MANIFOLD IMAGING METH AND MEMBR EMPLOYING FUNDAMENTAL PARTICLES OF ALPHA METAL FREE PHTHALOCYANINE. DEC. 17, 1974. CAN. 0988766, GRB. 1424234.

Class 31

3,719,951.—WRAP ADJUST DEVICE FOR CONTROLLING ENGAGEMENT BETWEEN A WEB AND ROLLER IN AN IMAGING SYSTEM. MAR. 6, 1973. CAN. 0995295, GRB. 1406047
4,078,923.—MIGRATION IMAGING WITH SURFACTANT-MODIFIED SOLVENT DEVELOPMENT. MAR. 14, 1978.
4,123,283.—SETTING ELECTRICAL LATENT IMAGES IN MIGRATION IMAGING ELEMENTS. OCT. 31, 1978. AUS. 482769. BEL. 813501. CAN. 1037546. FRA. 7412476. GRB. 1471385. ITL. 1009714. MEX. 136227.
4,135,926.—MIGRATION IMAGING PROCESS IN WHICH LATENT IMAGE IS SET. JAN. 23, 1979. AUS. 482769. BEL. 813501. CAN. 1037546. FRA. 7412476. GRB. 1471385. ITL. 1009714. MEX. 136227.

Class 31A

3,520,681.—PHOTOELECTROSOLOGRAPHY. JULY 14, 1970. BRA. 0084241, CAN. 0852692, MEX. 0085656.
3,801,314.—IMAGING SYSTEM. APR. 2, 1974.
3,975,195.—MIGRATION IMAGING SYSTEM. AUG. 17, 1976.
4,009,028.—REVERSE MIGRATION IMAGING SYSTEM. FEB. 22, 1977. BEL. 0827065.
4,013,462.—MIGRATION IMAGING SYSTEM. MAR. 22, 1977.
4,040,826.—IMAGING SYSTEM OF MIGRATION MATERIAL IN SOFTENABLE LAYER. AUG. 2, 1977.
4,062,680.—IMAGING PROCESS EMPLOYING ELECTRICAL OR MAGNETIC REVERSE MIGRATION FORCE AND SOFTENABLE MAT. DEC. 13, 1977. BEL. 827065, FRA. 7509299, GRB. 1497825.
4,157,259.—ERASURE IN MIGRATION IMAGING SYSTEM. JUNE 5, 1979. BEL. 827065. GRB. 1497825.

Class 31B

3,528,355.—CAMERA-PROCESSOR. SEPT. 15, 1970. ARG. 0184627, ATR. 0303513, AUS. 0426557, BEL. 0720022, BRA. 6800654, CAN. 0864811, CHL. 0024251, CLB. 0018453, FRA. 1586179, GER. 1797177, GRB. 1244641, IND. 0117458, ITL. 0839895, LXB. 0056774, MEX. 0103737, NOR. 0128296, NZL. 0153587, PLP. 0006313, PNM. 0001980, PRU. 0010212, PTG. 0050229, SPN. 0357651, STZ. 0516171, SWD. 0338503, URG. 0009309, VZL. 0023698.
3,542,465.—CAMERA WITH DEVELOPMENT MEANS. NOV. 24, 1970. CAN. 0918739, GRB. 1241846, JAP. 0650672.
3,719,951.—WRAP ADJUST DEVICE FOR CONTROLLING ENGAGEMENT BETWEEN A WEB AND ROLLER IN AN IMAGING SYSTEM. MAR. 6, 1973. CAN. 0995295, GRB. 1406047.
3,770,554.—APPARATUS FOR SPLITTING A SOFTENABLE FILM COMPRISING BITE ROLLERS. NOV. 6, 1973.
3,878,816.—IMAGING SYSTEM. APR. 22, 1975.
3,910,475.—SYSTEM FOR ELECTRICALLY GROUNDING OR BIASING A MEMBER. OCT. 7, 1975. FRA. 7404995, ITL. 1007663.
3,951,324.—CAMERA/PROCESSOR/PROJECTOR & SUBSYSTEMS. APR. 20, 1976. FRA. 7439865.
4,025,183.—CAMERA/PROCESSOR/PROJECTOR & SUBSYSTEMS. MAY. 24, 1977. FRA. 7439865.

Class 31C

3,556,781.—MIGRATION IMAGING PROCESS. JAN. 19, 1971. ARG. 0175887, AUS. 0425096, BEL. 0722718, CAN. 0874909, CHL. 0024333, FRA. 1587222, GER. 1804475, GRB. 1250526, GUA. 0002124, ITL. 0855511, MEX. 0103409, PNM. 0001949, PRU. 0010349, SPN. 0359501, STZ. 0506818, SWD. 0340750, URG. 0009365, VZL. 0023713.

3,615,400.—MIGRATION IMAGING SYSTEM EMPLOYING CARBON LAYER BETWEEN SOLVENT SOLUBLE LAYR AND CONDUCTIVE LAYER. OCT. 26, 1971. ATR. 0306509, AUS. 0433959, BEL. 0726279, CAN. 0874906, DNK. 0129015, FRA. 1598889, GRB. 1261360, ITL. 0850165, LXB. 0057703, NOR. 0127265, NZL. 0154928, SAF. 0688514, SPN. 0380191, STZ. 0512755, SWD. 7210413.

3,653,885.—PROCESS OF STABILIZING A MIGRATION IMAGE COMPRISING SELENIUM PARTICLES. APR. 4, 1972. CAN. 0937437.

3,656,990.—ELECTROSOLOGRAPHY. APR. 18, 1972. ARG. 0152723, BRA. 0084169, CAN. 0800550, CHL. 0025766. CLB. 0014944, MEX. 0086246, PNM. 0002518, PRU. 0009465, URG. 0008153, VZL. 0023999.

3,664,834.—MIGRATION IMAGING METHOD EMPLOYING ADHESIVE TRANSFER MEMBER. MAY 23, 1972. CAN. 0890353, GER. 1964201, GRB. 1291848, JAP. 0726370.

3,713,818.—MIGRATION IMAGING SYSTEM WITH MOLTEN LIQUID DEVELOPMENT. JAN. 30, 1973. CAN. 0933580, GRB. 1358566, USR. 0463275.

3,719,482.—IMAGING SYSTEM. MAR. 6, 1973.

3,720,513.—MIGRATION IMAGING METHOD INVOLVING SOLVENT WASH-AWAY OF UNMIGRATED PARTICLES. MAR. 13, 1973.

3,723,113.—POLYCHROMATIC ELECTROSOLOGRAPHIC. MAR. 27, 1973.

3,740,216.—PHOTOELECTROCOLOGRAPHIC IMAGING EMPLOYING A RELEASABLE IMAGING LAYER. JUNE 19, 1973.

3,741,757.—MIGRATION IMAGE DEVELOPMENT BY SPLITTING OR ABRADING SOFTENABLE LAYER. JUNE 26, 1973. ATR. 0306510, AUS. 0441768, BEL. 0743209, CAN. 0915960, FRA. 6943268, GER. 1961754, GRB. 1297129, ITL. 0879120, JAP. 0725058, PNM. 0001554, SPN. 0374618, SWD. 0358750, VZL. 0032779.

3,753,706.—PHOTOELECTROSOLOGRAPHIC IMAGING METHOD WHEREIN AN ABSORBENT MATERIAL IS USED. AUG. 21, 1973. CAN. 0945796, GRB. 1334141, JAP. 0766711.

3,791,822.—REMOVAL OF BACKGROUND FROM AN IMAGED MIGRATION LAYER. FEB. 12, 1974. ATR. 0306510, AUS. 0441768, BEL. 0743209, CAN. 0915960, FRA. 6943268, GER. 1961754, GRB. 1297129, ITL. 0879120, JAP. 0725058, PNM. 0001554, SPN. 0374618, SWD. 0358750, VZL. 0032779.

3,795,512.—IMAGING SYSTEM. MAR. 5, 1974. ARG. 0188187, ATR. 0301340, AUS. 0429441, BEL. 0725617, BRA. 0088091, CAN. 0883747, DNK. 0131212, FRA. 1599277, GER. 1815217, GRB. 1257189, ITL. 0849328, JAP. 0686721, LXB. 0057585, MEX. 0101986, NOR. 0128084, NZL. 0154842, PTG. 0050858, SAF. 0688365, SPN. 0361650, STZ. 0523523, SWD. 0341128, VZL. 0023715.

3,798,030.—PHOTOELECTROSOLOGRAPHIC IMAGING METHOD UTILIZING POWDER PARTICLES. MAR. 19, 1974.

3,820,984.—PHOTOELECTROSOLOGRAPHIC IMAGING METHOD USING FUSIBLE PARTICLES. JUNE 28, 1974.

3,836,362.—IMAGING METHOD. SEPT. 17, 1974.

3,839,030.—MIGRATION IMAGING PROCESS WITH UNIFORM EXPOSURE BEFORE OR DURING THE SOFTENING STEP. OCT. 1, 1974. BEL. 0715790. CAN. 0890853, FRA. 1572571, GER. 1772523, GRB. 1234652, ITL. 0834777, JAP. 0620888.

3,839,031.—ELECTRODE DEVELOPMENT MIGRATION IMAGING METHOD. OCT. 1, 1974. ARG. 0184241, AUS. 0456843, BEL. 0755599, CAN. 0947367, FRA. 7032000, GRB. 1326950, ITL. 0907387, JAP. 0766709, MEX. 0120156, SPN. 0383314, SWD. 0369115.

3,840,397.—PARTICLE PLACING SYSTEM. OCT. 8, 1974. ARG. 0175888, ATR. 0300561, AUS. 0427473, BEL. 0724135, CAN. 0868305, DNK. 0126727, FRA. 1593258, GER. 1810079, GRB. 1254448, ITL. 0948025, JAP. 0708364, LXB. 0057367, MEX. 0107468, NOR. 0127216, NZL. 0154542, PNM. 0002048, PTG. 0050687, SAF. 0687633, SPN. 0360458, STZ. 0501251, SWD. 0341724, VZL. 0023710.

3,866,236.—IMAGING PROCESS USING VERTICAL PARTICLE MIGRATION. FEB. 11, 1975. CAN. 0936735, GRB. 1360623.

3,873,309.—IMAGING METHOD USING MIGRATION MATERIAL. MAR. 25, 1975. CAN. 978008, GRB. 1357143.

3,878,816.—IMAGING SYSTEM. APR. 22, 1975.

3,894,869.—A POLYCHROMATIC MIGRATION IMAGING SYSTEM. JULY 15, 1975.

3,901,699.—MIGRATION AND AGGLOMERATION IMAGING METHOD. AUG. 26, 1975.

3,910,475.—SYSTEM FOR ELECTRICALLY GROUNDING OR BIASING A MEMBER. OCT. 7, 1975. FRA. 7404995, ITL. 1007663.

3,912,505.—COLOR IMAGING METHOD EMPLOYING A MONOLAYER OF BEADS. OCT. 14, 1975. ARG. 0179561, AUS. 0426600, BEL. 0723097, CAN. 0890354, CHL. 0024276, FRA. 1587252, GRB. 1248744, GUA. 0002327, HOL. 0151526, ITL. 0845607, JAP. 0731223, MEX. 0107801, PNM. 0001814, PRU. 0010425, SPN. 0377583, STZ. 0526138, SWD. 0351501, URG. 0009366, VZL. 0023708.

3,917,880.—ELECTROPHOTETIC IMAGING SYSTEM. NOV. 4, 1975. GRB. 1459468.

3,918,969.—MIGRATION IMAGING METHOD EMPLOYING A UNIFORM EXPOSURE STEP. NOV. 11, 1975. ARG. 0172557, ATR. 0300565, AUS. 0430615, BEL. 0726282, CAN. 0883748, DNK. 0124046, FRA. 1598888, GER. 1817222, GRB. 1257010, ITL. 0850166, JAP. 0665999, LXB. 0057692, MEX. 0107941, NOR. 0127264, NZL. 0154930. PNM. 0001958, SAF. 0688516, SPN. 0362041, STZ. 0506822, SWD. 0340953, VZL. 0023721.

3,933,491.—IMAGING SYSTEM. JAN. 20, 1976.

3,950,167.—IMAGING SYSTEM. APR. 13, 1976. FRA. 7432507.

3,960,555.—PROCESS-PESO WITH CONDUCTORLESS BASE. JUNE 1, 1976. BEL. 0713103, BRA. 0088021, CAN. 0890858, CHL. 0023981, FRA. 1576403, IND. 0115236, ITL. 0829694, LXB. 0055807, MEX. 0096676, PRU. 0009941, SAF. 68/2105, SPN. 0352317, URG. 0009135, VZL. 0023691.

3,966,465.—MULTIPLE LAYER MIGRATION IMAGING SYSTEM. JUNE 29, 1976. BEL. 0773383, CAN. 0960286, FRA. 7135575, GRB. 1370146, ITL. 0938874.

3,967,959.—MIGRATION IMAGING SYSTEM. JULY 6, 1976.

3,970,453.—IMAGING BY SELECTIVE STRIPPING OUT AREAS OF LAYER. JULY 20, 1976.

3,975,739.—MIGRATION IMAGING SYSTEM USING SHAPED ELECTRODE. AUGUST 17, 1976.

3,976,483.—FRASING PROCESS - XDM LATENT IMAGE ERASING. AUG. 24, 1976. ARG. 0184682, AUS. 0458164, BEL. 0761130, CAN. 0946911, FRA. 7047697, GRB. 1339715, ITL. 0914071, JAP. 0770138, MEX. 0119758, VZL. 0032932.

3,979,210.—MIGRATION IMAGING MEMBER EMPLOYING A SURFACE SKIN. SEPT. 7, 1976.

3,982,936.—DEFORMATION IMAGING SYSTEM. SEPT. 28, 1976.

3,982,939.—MULTIPLE LAYER MIGRATION IMAGING SYSTEM. SEPT. 28, 1976. BEL. 0773383, CAN. 0946672, FRA. 7135575, GRB. 1370146, ITL. 0938874.

3,985,560.—IMAGING SYSTEM. OCT. 12, 1976.

4,007,042.—MIGRATION IMAGING METHOD. FEB. 8, 1977.

4,012,250.—IMAGING SYSTEM-MIGRATION IMAGE CONVERSION BY DYE TRANSFER. MAR. 15, 1977. CAN. 0972208, GRB. 1341405, JAP. 0770142.

4,014,695.—IMAGING SYSTEM. MAR. 29, 1977.

4,021,110.—PHOTOCOPYING CAMERA AND PROCESSING DEVICE. MAY 3, 1977.

4,028,101.—MIGRATION IMAGING MEMBER EMPLOYING A SURFACE SKIN. JUNE 7, 1977.

4,055,418.—MIGRATION IMAGING METHOD USING AN IMAGING MEMBER EMPLOYING A SURFACE SKIN. OCT. 25, 1977.

4,081,273.—MIGRATION IMAGING METHOD. MAR. 28, 1978.

4,084,966.—IMAGING SYSTEM USING AGGLOMERABLE MIGRATION MARKING MATERIAL. APR. 18, 1978.

4,101,321.—IMAGING SYSTEM. JULY 18, 1978.

4,123,283.—SETTING ELECTRICAL LATENT IMAGES IN MIGRATION IMAGING ELEMENTS. OCT. 31, 1978. AUS. 482769. BEL. 813501. CAN. 1037546. FRA. 7412476. GRB. 1471385. ITL. 1009714. MEX. 136227.

4,135,926.—MIGRATION IMAGING PROCESS IN WHICH LATENT IMAGE IS SET. JAN. 23, 1979. AUS. 482769. BEL. 813501. CAN. 1037546. FRA. 7412476. GRB. 1471385. ITL. 1009714. MEX. 136227.

Class 31D

3,573,906.—ELECTROPHOTOGRAPHIC PLATE AND PROCESS. APR. 6, 1971. ARG. 0177890, AUS. 0441534, BEL. 0725173, BRA. 0088092, CAN. 0906801, CZC.

0157053, FRA. 1594981, GRB. 1217726, ITL. 0852743, MEX. 0106441, SPN. 0379204, SWD. 0335063, USR. 0448658. VZL. 0029780.

3,615,400.—MIGRATION IMAGING SYSTEM EMPLOYING CARBON LAYER BETWEEN SOLVENT SOLUBLE LAYER AND CONDUCTIVE LAYER. OCT. 26, 1971. ATR. 0306509, AUS. 0433959, BEL. 0726279, CAN. 0874906, DNK. 0129015, FRA. 1598889, GRB. 1261360, ITL. 0850165, LXB. 0057703, NOR. 0127265, NZL. 0154928, SAF. 0688514, SPN. 0380191, STZ. 0512755, SWD. 7210413.

3,740,216.—PHOTOELECTROCOLOGRAPHIC IMAGING EMPLOYING A RELEASABLE IMAGING LAYER. JUNE 19, 1973.

3,740,223.—MIGRATION IMAGING STRUCTURE. JUNE 19, 1973. BRA. 6897135, CAN. 0855151, MEX. 0100800, PNM. 0002192, PRU. 0009484, VZL. 0032425.

3,753,706.—PHOTOELECTROSOLOGRAPHIC IMAGING METHOD WHEREIN AN ABSORBENT MATERIAL IS USED. AUG. 21, 1973. CAN. 0945796, GRB. 1334141, JAP. 0766711.

3,801,314.—IMAGING SYSTEM. APR. 2, 1974.

3,820,984.—PHOTOELECTROSOLOGRAPHIC IMAGING METHOD USING FUSIBLE PARTICLES. JUNE 28, 1974.

3,836,364.—PHOTOELECTROSOLOGRAPHIC PROCESS FOR MAKING MULTIPLE IMAGES. SEPT. 17, 1974. CAN. 0914519, GRB. 1344482, JAP. 0770140.

3,839,031.—ELECTRODE DEVELOPMENT MIGRATION IMAGING METHOD. OCT. 1, 1974. ARG. 0184241, AUS. 0456843. BEL. 0755599, CAN. 0947367, FRA. 7032000, GRB. 1326950, ITL. 0907387, JAP. 0766709, MEX. 0120156, SPN. 0383314, SWD. 0369115.

3,873,309.—IMAGING METHOD USING MIGRATION MATERIAL. MAR. 25, 1975. CAN. 978008, GRB 1357143.

3,901,702.—MIGRATION IMAGING ELEMENT WITH ABSORBENT BLOTTER OVERLAYER. AUG. 26, 1975. CAN. 0945796, GRB. 1334141, JAP. 0766711.

3,933,491.—IMAGING SYSTEM. JAN. 20, 1976.

3,966,465.—MULTIPLE LAYER MIGRATION IMAGING SYSTEM. JUNE 29, 1976. BEL. 0773383, CAN. 0960286, FRA. 7135575, GRB. 1370146, ITL. 0938874.

3,975,195.—MIGRATION IMAGING SYSTEM. AUG. 17, 1976.

3,982,939.—MULTIPLE LAYER MIGRATION IMAGING SYSTEM. SEPT. 28, 1976. BEL. 0773383, CAN. 0946672, FRA. 7135575, GRB. 1370146, ITL. 0938874.

3,985,560.—IMAGING SYSTEM. OCT. 12, 1976.

3,998,635.—IMAGING SYSTEM. DEC. 21, 1976.

4,007,042.—MIGRATION IMAGING METHOD FEB 8, 1977.

4,009,028.—REVERSE MIGRATION IMAGING SYSTEM. FEB. 22, 1977. BEL. 0827065

4,012,250.—IMAGING SYSTEM-MIGRATION IMAGE CONVERSION BY DYE TRANSFER. MAR. 15, 1977. CAN 0972208, GRB. 1341405, JAP. 0770142.

4,013,462.—MIGRATION IMAGING SYSTEM. MAR. 22, 1977.

4,040,826.—IMAGING SYSTEM OF MIGRATION MATERIAL IN SOFTENABLE LAYER. AUG. 2, 1977

4,062,680.—IMAGING PROCESS EMPLOYING ELECTRICAL OR MAGNETIC REVERSE MIGRATION FORCE AND SOFTENABLE MAT. DEC. 13, 1977. BEL. 827065, FRA. 7509299, GRB. 1497825.

4,072,517.—MIGRATION IMAGING METHOD. FEB. 7, 1978.

4,081,273.—MIGRATION IMAGING METHOD. MAR. 28, 1978.

4,102,682.—IMAGING MEMBER. JULY 25, 1978.

4,157,259.—ERASURE IN MIGRATION IMAGING SYSTEM JUNE 5, 1979. BEL. 827065. GRB. 1497825.

Class 31E

3,598,644.—IMAGING MEMBER FABRICATION. AUG. 10, 1971.

3,671,282.—METHOD OF MAKING AN IMAGING MEMBER. JUNE 20, 1972. BEL. 0755384, FRA 7031999, GRB 1326056, ITL. 0901735

3,971,334.—COATING DEVICE. JULY 27, 1976

4,009,028.—REVERSE MIGRATION IMAGING SYSTEM FEB. 22, 1977. BEL. 0827065.

4,062,680.—IMAGING PROCESS EMPLOYING ELECTRICAL OR MAGNETIC REVERSE MIGRATION FORCE AND SOFTENABLE MAT. DEC. 13, 1977. BEL. 827065, FRA. 7509299, GRB. 1497825.

4,157,259.—ERASURE IN MIGRATION IMAGING SYSTEM. JUNE 5, 1979. BEL. 827065. GRB. 1497825.

Class 31F

3,520,681.—PHOTOELECTROSOLOGRAPHY. JULY 14, 1970. BRA. 0084241, CAN. 0852692, MEX. 0085656

3,780,307.—LIQUID CRYSTALLINE COMPOSITIONS HAVING INDUCED OPTICAL ACTIVITY. DEC. 18, 1973. CAN. 1000484, GRB. 1408059.

3,909,262.—IMAGING MIGRATION MEMBER EMPLOYING A GELATIN OVERCOATING. SEPT. 30, 1975.

3,933,491.—IMAGING SYSTEM. JAN. 20, 1976.

3,966,465.—MULTIPLE LAYER MIGRATION IMAGING SYSTEM. JUNE 29, 1976. BEL. 0773383, CAN. 0960286, FRA. 7135575, GRB. 1370146, ITL. 0938874.

4,065,307.—IMAGED AGGLOMERABLE ELEMENT AND PROCESS OF IMAGING. DEC. 27, 1977. CAN. 929350, GRB. 1330518.

4,101,321.—IMAGING SYSTEM. JULY 18, 1978.

Class 31G

3,664,834.—MIGRATION IMAGING METHOD EMPLOYING ADHESIVE TRANSFER MEMBER. MAY 23, 1972. CAN. 0890353, GER. 1964201, GRB. 1291848, JAP. 0726370.

3,723,113.—POLYCHROMATIC ELECTROSOLOGRAPHIC. MAR. 27, 1973.

3,740,216.—PHOTOELECTROCOLOGRAPHIC IMAGING EMPLOYING A RELEASABLE IMAGING LAYER. JUNE 19, 1973.

3,741,757.—MIGRATION IMAGE DEVELOPMENT BY SPLITTING OR ABRADING SOFTENABLE LAYER. JUNE 26, 1973. ATR. 0306510, AUS. 0441768, BEL. 0743209, CAN 0915960, FRA. 6943268, GER. 1961754, GRB. 1297129, ITL. 0879120, JAP. 0725058, PNM. 0001554, SPN. 0374618, SWD. 0358750, VZL. 0032779.

3,741,758.—MIGRATION IMAGING EMPLOYING PRESSURE NIP DEVELOPMENT. JUNE 26, 1973.

3,753,706.—PHOTOELECTROSOLOGRAPHIC IMAGING METHOD WHEREIN AN ABSORBENT MATERIAL IS USED. AUG. 21, 1973. CAN. 0945796, GRB. 1334141. JAP. 0766711.

3,770,554.—APPARATUS FOR SPLITTING A SOFTENABLE FILM COMPRISING BITE ROLLERS. NOV. 6, 1973.

3,791,822.—REMOVAL OF BACKGROUND FROM AN IMAGED MIGRATION LAYER. FEB. 12, 1974. ATR. 0306510, AUS. 0441768, BEL. 0743209, CAN. 0915960, FRA. 6943268, GER. 1961754, GRB. 1297129, ITL. 0879120, JAP. 0725058, PNM. 0001554, SPN. 0374618, SWD. 0358750, VZL. 0032779.

3,836,364.—PHOTOELECTROSOLOGRAPHIC PROCESS FOR MAKING MULTIPLE IMAGES. SEPT. 17, 1974. CAN. 0914519, GRB 1344482. JAP. 0770140

3,876,445.—MIGRATION IMAGING BY SPLITTING A SOFTENABLE MATERIAL. APR. 8, 1975. ATR. 0306510, AUS. 0441768, BEL. 0743209, CAN. 0915960, FRA. 6943268, GER. 1961754, GRB. 1297129, ITL 0879120, JAP. 0725058, PNM. 0001554, SPN. 0374618, SWD. 0358750, VZL. 0032779.

3,979,210.—MIGRATION IMAGING MEMBER EMPLOYING A SURFACE SKIN. SEPT. 7, 1976.

4,014,695.—IMAGING SYSTEM. MAR. 29, 1977.

4,028,101.—MIGRATION IMAGING MEMBER EMPLOYING A SURFACE SKIN. JUNE 7, 1977.

4,055,418.—MIGRATION IMAGING METHOD USING AN IMAGING MEMBER EMPLOYING A SURFACE SKIN. OCT. 25, 1977

4,101,321.—IMAGING SYSTEM. JULY 18, 1978.

Class 31H

3,795,512.—IMAGING SYSTEM. MAR. 5, 1974. ARG. 0188187, ATR. 0301340, AUS. 0429441, BEL. 0725617, BRA. 0088091, CAN. 0883747, DNK. 0131212, FRA. 1599277, GER. 1815217, GRB 1257189, ITL 0849328, JAP. 0686721, LXB. 0057585, MEX. 0101986, NOR. 0128084, NZL. 0154842, PTG. 0050858, SAF. 0688365, SPN. 0361650, STZ. 0523523, SWD. 0341128, VZL 0023715.

3,839,031.—ELECTRODE DEVELOPMENT MIGRATION IMAGING METHOD OCT. 1, 1974. ARG. 0184241, AUS. 0456843, BEL. 0755599, CAN. 0947367, FRA. 7032000, GRB 1326950, ITL. 0907387, JAP 0766709, MEX. 0120156, SPN. 0383314, SWD. 0369115

Class 31I

3,861,911.—IMAGING FIXING METHOD. JAN. 21, 1975

Class 31J

3,648,607.—IMAGING SYSTEM-MASTER MAKING BY BINDER PESO. MAR. 14, 1972. CAN. 0920410, GRB. 1322946, JAP. 0770136.

3,664,834.—MIGRATION IMAGING METHOD EMPLOYING ADHESIVE TRANSFER MEMBER. MAY 23, 1972. CAN. 0890353, GER. 1964201, GRB. 1291848, JAP. 0726370.

V 9 8 8 / 1 N O 6 7 9 UMI

3,723,113.—POLYCHROMATIC ELECTROSOLOGRAPHIC MAR. 27, 1973.
3,740,216.—PHOTOELECTROCOLOGRAPHIC IMAGING EMPLOYING A RELEASABLE IMAGING LAYER JUNE 19, 1973.
3,820,984.—PHOTOELECTROSOLOGRAPHIC IMAGING METHOD USING FUSIBLE PARTICLES. JUNE 28, 1974.
3,923,504.—MIGRATION IMAGING MEMBER AND METHOD. DEC. 2, 1975.
3,985,560.—IMAGING SYSTEM. OCT. 12, 1976.

Class 31K

3,873,309.—IMAGING METHOD USING MIGRATION MATERIAL. MAR. 25, 1975. CAN. 978008, GRB. 1357143.
3,894,869.—A POLYCHROMATIC MIGRATION IMAGING SYSTEM. JULY 15, 1975.
3,912,505.—COLOR IMAGING METHOD EMPLOYING A MONOLAYER OF BEADS. OCT. 14, 1975. ARG. 0179561, AUS. 0426600, BEL. 0723097, CAN. 0890354, CHL. 0024276, FRA. 1587252, GRB. 1248744, GUA. 0002327, HOL. 0151526, ITL. 0845607, JAP. 0731223, MEX. 0107801, PNM. 0001814, PRU. 0010425, SPN. 0377583, STZ. 0526138, SWD. 0351501, URG. 0009366, VZL. 0023708
3,966,465.—MULTIPLE LAYER MIGRATION IMAGING SYSTEM. JUNE 29, 1976. BEL. 0773383, CAN. 0960286, FRA. 7135575, GRB. 1370146, ITL. 0938874.
4,012,250.—IMAGING SYSTEM-MIGRATION IMAGE CONVERSION BY DYE TRANSFER. MAR. 15, 1977. CAN. 0972208, GRB. 1431405, JAP. 0770142.

Class 31L

3,615,394.—METHOD OF FORMING A PIGMENT IMAGE FROM A PIGMENT-RESIN TONER IMAGE. OCT. 26, 1971.
3,615,400.—MIGRATION IMAGING SYSTEM EMPLOYING CARBON LAYER BETWEEN SOLVENT SOLUBLE LAYER AND CONDUCTIVE LAYER. OCT. 26, 1971. ATR. 0306509, AUS. 0433959, BEL. 0726279, CAN. 0874906, DNK. 0129015, FRA. 1598889, GRB. 1261360, ITL. 0850165, LXB. 0057703, NOR. 0127265, NZL. 0154928, SAF. 0688514, SPN. 0380191, STZ. 0512755, SWD. 7210413.
4,012,250.—IMAGING SYSTEM-MIGRATION IMAGE CONVERSION BY DYE TRANSFER. MAR. 15, 1977. CAN. 0972208, GRB. 1431405, JAP. 0770142.

Class 32

3,719,951.—WRAP ADJUST DEVICE FOR CONTROLLING ENGAGEMENT BETWEEN A WEB AND ROLLER IN AN IMAGING SYSTEM. MAR. 6, 1973. CAN. 0995295, GRB. 1406047.
3,746,622.—COMPOSITION AND PROCESS. JULY 17, 1973. BEL. 0783439, CAN. 0986046, FRA. 7216331, MEX. 0132353, GRB. 1388725, ITL. 0965051, SAF. 7213163, STZ. 0590297
3,774,592.—METHOD FOR PROVIDING AN IMPROVED BODY ELECTRODE ELECTRICAL CONNECTION. NOV. 27, 1973.
3,884,685.—LOW DENSITY PAPER USED IN TRANSFER ELECTROPHOTOGRAPHY. MAY 20, 1975. ARG. 0185573, ATR. 0314353, AUS. 0463544, BEL. 0768990, CAN. 9780051, CHL. 0027015, FRA. 7124553, GRB. 1353372, ITL. 0931092, MEX. 0124810, NOR. 0134805, NZL. 0164088, PNM. 0002462, SPN. 0392720, SWD. 0368995.
3,891,990.—IMAGING PROCESS USING DONOR MATERIAL. JUNE 24, 1975. GRB. 1459468.
3,946,172.—A LATCHING APPARATUS. MAR. 23, 1976. GRB. 1429530.
3,946,401.—ELECTROTHERMOGRAPHIC IMAGE PRODUCING TECHNIQUES. MAR. 23, 1976.
3,952,798.—INTERNALLY HEATED HEAT PIPE ROLLER-INTERNALLY HEATED HEAT PIPE. APR. 27, 1976. CAN. 0968341, GRB. 1368100.
3,971,950.—INDEPENDENT COMPRESSION AND POSITIONING DEVICE FOR USE IN MAMMOGRAPHY. JULY 27, 1976.
3,975,681.—ELECTRODE FOR MEASURING THICKNESS OF DIELECTRIC LAYERS ON CONDUCTIVE SUBSTRATES. AUG. 17, 1976.
3,978,342.—DUAL MODE RADIATION TRANSMITTING APPARATUS. AUG. 31, 1976.
3,997,498.—NON-SMUDGE CORRECTION FLUID. DEC. 14, 1976.
4,010,366.—MEASUREMENT OF THE MASS & CHARGE OF CHARGED CIRCUITS. MAR. 1, 1977.
4,018,953.—COATING METHOD. APR. 19, 1977.
4,020,210.—ENCAPSULATED WATER. APR. 26, 1977.
4,020,268.—AGAROSE CONTAINING AFFINITY MATRIX MATERIALS. APR. 26, 1977. BEL. 0783439, CAN. 0986046, FRA. 7216331, GRB. 1388725, ITL. 0965051, MEX. 0132353, SAF. 7213163, STZ. 0590297.
4,046,404.—CARBONLESS PAPER FOR USE IN ELECTROSTATOGRAPHIC COPIERS. SEPT. 6, 1977.
4,046,473.—PHOTORECEPTOR METHOD AND SYSTEM. SEPT. 6, 1977.
4,047,973.—RECOVERY OF SELENIUM AND SELENIUM ALLOYS BY HYDRAULIC LATHING. SEPT. 13, 1977.
4,059,353.—PHOTORECEPTOR BELT SYSTEM. NOV. 22, 1977.
4,074,000.—PRESSURE SENSITIVE ADHESIVE DRAFTING FILMS FOR USE IN ELECTROSTATOGRAPHIC COPIERS. FEB. 14, 1978.
4,085,245.—TRANSPARENCIES FOR COLOR XEROGRAPHIC COPIES. APR. 18, 1978.
4,097,267.—PURIFICATION AND REALLOYING OF ARSENIC/SELENIUM ALLOYS. JUNE 27, 1978.
4,097,273.—ARSENIC/SELENIUM RECOVERY. JUNE 27, 1978.
4,143,118.—APPARATUS AND METHOD FOR OZONE REDUCTION IN ELECTROSTATOGRAPHIC REPRODUCTION EQUIPMENT. MAR. 6, 1979.
4,161,362.—DOCUMENT CODING. JULY 17, 1979.

Class 32A

3,132,972.—ENERGY CONVERSION CELL. MAY 12, 1964.
3,231,426.—CONTINUOUS CONCENTRATION CELL. JAN. 25, 1966.
3,379,527.—PHOTOCONDUCTIVE INSULATORS COMPRISING ACTIVATED SULFIDES SELENIDES AND SULFOSELENIDES OF CADMIUM. APR. 23, 1968. CAN. 0907921, GRB. 1079065.

Class 32B

3,150,446.—BRAZING METHOD AND COMPOSITION. SEPT. 29, 1964.
3,354,644.—LIQUID PROTECTION OF ELECTRODES. NOV. 28, 1967.
3,372,860.—CORRESPONDENCE PIECE. MAR. 12, 1968.
3,453,752.—ANSWER COMPARISON DEVICE. JULY 8, 1969.
3,483,777.—INFORMATION STORAGE AND RETRIEVAL EMPLOYING THERMAL PERFORATION OF THE RECORD MEMBER. DEC. 16, 1969. CAN. 0811566.
3,507,333.—FIRE PREVENTION SYSTEM. APR. 21, 1970. BEL. 0722599, CAN. 0910255, FRA. 1589864, GRB. 1229495, ITL. 0845253, JAP. 0752504.
3,510,210.—COMPUTER PROCESS CHARACTER ANIMATION. MAY 5, 1970.
3,552,562.—RANDOM ACCESS RETRIEVAL SYSTEM. JAN. 5, 1971.
3,577,203.—CHARACTER RECORDING AND RECOGNITION SYS. MAY 4, 1971.
3,635,789.—DRINKING OF WASTE XEROGRAPHIC COPY PAPER - REMOVAL OF XEROX TONER FROM COPY PAPER. JAN. 18, 1972.
3,645,048.—ERASER FOR VELLUM XEROGRAPHIC COPY PAPER. FEB. 29, 1972. AUS. 0449216, CAN. 0933707, GRB. 1329835.
3,647,713.—NONAGGLOMERATING BLENDING PROCESS. MAR. 7, 1972. FRA. 7004722, GRB. 1302409, JAP. 0661186.
3,648,387.—EDUCATIONAL AID. MAR. 14, 1972.
3,655,379.—PRINTING BY VAPOR PROPULSION. APR. 11, 1972. BEL. 0758057, CAN. 0929351, FRA. 7041621, GRB. 1333783, ITL. 0916693.
3,708,287.—OIL FILM IMAGING. JAN. 2, 1973.
3,713,861.—INHIBITOR DEVICE. JAN. 30, 1973. CAN. 0917701, GRB. 1338893, JAP. 0727989.
3,748,090.—EVAPORATION CRUCIBLE. JULY 24, 1973.
3,771,084.—MAGNETIC RETRIEVAL DEVICE. NOV. 6, 1973.
3,772,173.—ELECTROCONDUCTIVE PAPER. NOV. 13, 1973. CAN. 0930693.
3,793,016.—ELECTROPHOTOGRAPHIC SHEET BINDING PROCESS. FEB. 19, 1974.
3,794,550.—SHEET BINDING. FEB. 26, 1974. CAN. 1012583, GRB. 1431286.
3,812,905.—DYNAMIC BARRIER FOR HEAT PIPE. MAY 28, 1974.
3,842,273.—CORONA GENERATOR CLEANING APPARATUS. OCT. 15, 1974. AUS. 0480142, BEL. 0817485. GRB. 1458088, SPN. 0428358.
3,845,739.—SYSTEM FOR VAPOR DEPOSITION OF THIN FILMS. NOV. 5, 1974. BEL. 0798324, GRB. 1428703.

3,861,202.—METHOD OF DETECTING PRESSURE UNIFORMITY. JAN. 21, 1975
3,861,353.—SYSTEM FOR VAPOR DEPOSITION OF THIN FILMS. JAN. 21, 1975. BEL. 0798324, GRB. 1428703.
3,862,841.—POLYMERIZATION IMAGING BY CHARGE INJECTION FROM A PHOTOCONDUCTIVE LAYER. JAN. 28, 1975.
3,869,910.—DIAGNOSTIC TEST DEVICE FOR DEVELOPER MATERIALS. MAR. 11, 1975. CAN. 1006012, FRA. 7421111.
3,873,813.—CREDIT CARD. MAR. 25, 1975.
3,877,155.—RESPONSIVE ANSWER SYSTEM. APR. 15, 1975. CAN. 0858780, GRB. 1235941, JAP. 0688426.
3,879,275.—POLYMERIZATION. APR. 22, 1975.
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3,918,333.—CUTTING DEVICE FOR ELASTOMERIC SHEET MATERIAL. NOV. 11, 1975.
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3,966,467.—TRANSFERRING TONER TO AN HYDROCARBON COATED SHEET. JUNE 29, 1976.
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3,970,186.—DAMPER FOR A COMPOSITE PRINT WHEEL. JULY 20, 1976. BEL. 0825110, CAN. 1010805, STZ. 579990.
3,974,363.—PROGRAMMABLE BILLING SYSTEM. AUG. 10, 1976. BEL. 0813449, FRA. 7412151, GRB. 1448508, ITL. 1007793.
3,978,737.—CHAIN TENSIONING DEVICE. SEPT. 7, 1976.
3,989,865.—A TRANSPARENCY. NOV. 2, 1976
3,992,511.—RECOVERY OF SELENIUM-SELENIUM RECOVERY PROCESS. NOV. 16, 1976.
4,000,460.—DIGITAL CIRCUIT MODULE TEST SYSTEM. DEC. 28, 1976
4,013,362.—ADJUSTABLE FORMS GUIDE. MAR. 22, 1977
4,037,706.—COMPOSITE PRINT WHEEL. JULY 26, 1977 BEL. 0825108, CAN. 1010806
4,054,534.—VOLATILE CLEANING SOLUTION FOR MIRRORS AND LENSES. OCT. 18, 1977.
4,144,550.—REPRODUCTION MACHINE USING FIBER OPTICS COMMUNICATION SYSTEM. MAR. 13, 1979

V 9 8 8 / 1 N O 6 7 9 UMI

V 9 8 8 / 1 N 0 6 7 9 UMI

DEFENSIVE PUBLICATIONS

PUBLISHED NOVEMBER 6, 1979

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T988,001
DIFFERENTIAL ACTION EXTRACTOR COMB

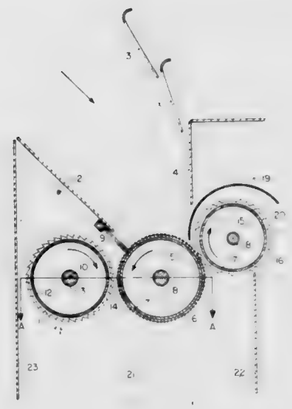
Lowrey A. Smith, Auburn, Ala., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 844,336, Sep. 22, 1978, abandoned. This application Sep. 22, 1978, Ser. No. 944,678

Int. Cl.² D01B *3/00*

U.S. Cl. 19—203

3 Sheets Drawing. 14 Pages Specification



This invention relates to a unique method of combing stripper harvested seed cotton in order to facilitate the removal of trash components such as large sticks and burrs.

Further it relates to a coarse-tooth, reverse pitch, combing saw cylinders, turning with opposite rotation to a fine-toothed combed saw cylinder such that the saw teeth on the adjacent side of the two cylinders move in the same direction without overlap.

Further it relates to the combing action of two adjacent saw cylinders of the same nominal diameter operating at different speeds such that sticks, burrs, and other large trash components are held momentarily by the slower rotating teeth of the combing cylinder as the seed-cotton attached to the combed cylinder passes through the combing area between the cylinders. The large sticks and burrs are loosened or detached from the seed cotton by the combing action to facilitate their separation from the seed cotton by either centrifugal sling off from the combed cylinder or by subsequent processing through a conventional stick machine composed of a single saw cylinder partially surrounded by concentrically spaced grid bars.

T988,002
APPARATUS FOR FORMING A VACUUM EVAPORATING LAYER ON A SUBSTRATE

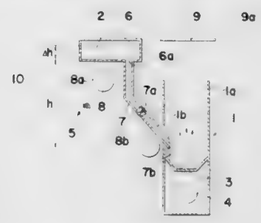
Kazuo Ohta, Nishinomiya, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 821,929, Aug. 3, 1977, abandoned. This application Aug. 7, 1978, Ser. No. 931,441

Int. Cl.² C23C *13/08*

U.S. Cl. 118—719

3 Sheets Drawing. 26 Pages Specification



An evaporator element is positioned within a hermetic enclosure having therein a desired atmosphere. A supply receptacle containing a source material is located at a position higher than the evaporator element. A source material heater is positioned adjacent the supply receptacle for melting the source material. A duct is inclined from the supply receptacle to the evaporator element to substantially continuously supply molten source material from the supply receptacle to the evaporator element. An evaporation heater adjacent the evaporator element substantially momentarily evaporates the molten source material as it is supplied to the evaporator element, without any substantial accumulation of the molten source material in the evaporator element. A substrate is positioned so as to have deposited thereon a layer of source material evaporated from the evaporator element.

T988,003
PROCESS FOR RECOVERING LEAD FROM DISCARDED BATTERIES

Hubert H. Dreissen, St. Jansstraat 16, Geleen, Netherlands

Continuation of Ser. No. 896,022, Apr. 12, 1978, abandoned. This application Dec. 1, 1978, Ser. No. 965,238

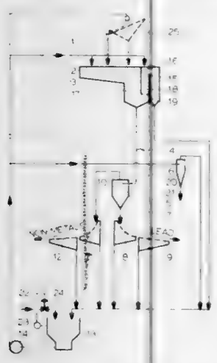
Int. Cl.² B03B *5/34*

U.S. Cl. 209—211

1 Sheets Drawing. 13 Pages Specification

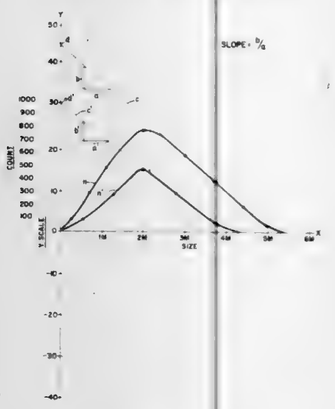
A process is disclosed for recovering lead from discarded storage batteries which have been crushed or ground to obtain a particulate scrap, wherein the lead is separated from non-metallic components, which are mainly plastics and suchlike from the battery casings and separators, in a hyrocyclone having a relatively large top angle of the conical part and using water as the separating medium. A scrap-water mixture is fed to the hydrocyclone and a predominantly lead-containing portion is discharged from the apex area of the hydrocyclone.

while a predominantly non-metal containing portion is discharged from the overflow area of the cyclone. The water is



drained from the separated portions and recycled; part of the recycled water is cleaned in a second hydrocyclone.

T988,004
METHOD OF ANALYZING DATA
Ronald G. Nations, 4539 Preston Dr., Kingsport, Tenn. 37664
Filed Mar. 1, 1979, Ser. No. 16,463
Int. Cl.² G06F *15/36*
U.S. Cl. 364—554
4 Sheets Drawing. 22 Pages Specification

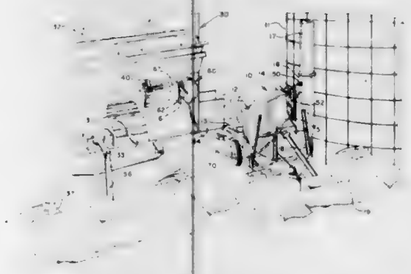


Disclosed is a method for obtaining useful information from a collection of data in which a measured quantity is related to a physical property comprising the steps of

(a) measuring a physical property such as size of a multiplicity of objects,
(b) classifying the measurements into ranges according to relative value,
(c) counting the number of units within each classification range,
(d) plotting the data according to count of each classification,
(e) forming a line representing the plotted data, and
(f) measuring the slope and intersect of a selected segment of the line to obtain useful information concerning the relationship between the measured quantity and physical property.

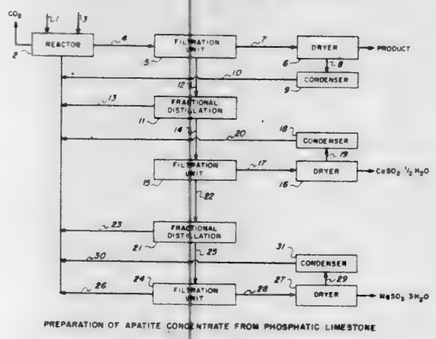
The method is useful for obtaining size and count of gel particles in a cellulose ester spinning solution and is carried out with a schlieren optical system, television camera, and digital computer.

T988,005
AUTOMATIC FEED CONTROL SYSTEM
N. Donald Patterson, Woodford, Va.; Anthony J. Falanga, Lemont; Edward J. Johnston, La Grange Park, and Thomas J. Scarnato, Barrington, all of Ill., assignors to International Harvester Company, Chicago, Ill.
Continuation of Ser. No. 666,729, Mar. 15, 1976, abandoned.
This application Oct. 5, 1978, Ser. No. 948,716
Int. Cl.² B65G *53/66*
U.S. Cl. 406—30
3 Sheets Drawing. 16 Pages Specification



An automatic feed control system for a forage blower of the type adapted to be fed by a forage unloading wagon including a pressure switch connected to the blower discharge pipe, a device for controlling the discharge rate of the wagon to the blower, and electrical circuitry connecting the switch and control device so that when pressure in the discharge pipe exceeds a given level, the pressure switch actuates the control device to reduce the feed rate of the crops to the blower from the wagon.

T988,006
CHEMICAL BENEFICIATION OF PHOSPHATIC LIMESTONE AND PHOSPHATE ROCK WITH α-HYDROXYSULFONIC ACIDS
John F. Phillips, Jr., Florence; Guerry H. McClellan, Killen, and John F. McCullough, Florence, all of Ala., assignors to Tennessee Valley Authority
Filed Sep. 11, 1978, Ser. No. 940,940
Int. Cl.² C01F *5/42, 11/48*
U.S. Cl. 423—167
1 Sheets Drawing. 50 Pages Specification



PREPARATION OF APATITE CONCENTRATE FROM PHOSPHATIC LIMESTONE

A method of selectively extracting calcite and dolomite away from apatite in phosphate rock or phosphatic limestone wherein the phosphate rock or phosphatic limestone is treated with a mixture of sulfur dioxide, water, and a carbonyl compound. Solids are separated from the liquid phase. The solids consist principally of apatite admixed with clay, quartz, and other accessory minerals originally in the rock. The solids are heated to drive off adhering sulfur dioxide, water, and carbonyl. The liquid phase consists of carbonyl, water, sulfur dioxide, and magnesium and calcium ions. Heating this liquid preferentially precipitates $CaSO_3 \cdot \frac{1}{2}H_2O$. This solid is filtered off and the filtrate further heated to precipitate $MgSO_3 \cdot 3H_2O$ largely free of $CaSO_3 \cdot \frac{1}{2}H_2O$. All offgas and filtrate is returned to the process. Examination of extraction results shows that high temperature extraction favors dolomite extraction and low temperature extraction favors apatite extraction. Thus, operating at elevated temperature allows dolomite to be selectively extracted from the apatite in phosphate rock.

T988,007
LASER DEPOSITION OF METAL UPON TRANSPARENT MATERIALS
Roland F. Drew, Poughkeepsie; Frank J. Schmidt, Jr., Highland Falls, and Thomas J. Vanduynhoven, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 862,797, Dec. 21, 1977, abandoned.
This application Feb. 5, 1979, Ser. No. 9,704
Int. Cl.² B05D *3/06*
U.S. Cl. 427—53.1
1 Sheets Drawing. 11 Pages Specification



The present invention contemplates a method and apparatus for selectively depositing metal or other materials upon a transparent substrate utilizing a laser source. More particularly, the invention contemplates depositing material in highly selective areas with a high degree of adhesion and uniformity. The invention attains these results with an arrangement wherein a laser source **12** is located on one side of a transparent or translucent substrate **18** upon which metal is to be deposited, so that the laser beam can be directed through the substrate. A reservoir **20** of metal is located on supports **24** on the opposite side of the substrate adjacent to the surface thereof. Deflection means **14, 16** are provided to selectively scan the laser beam at predetermined intensity levels over a desired pattern.

The scanned laser beam acts to heat and vaporize metal from the metal reservoir, which is then redeposited upon the adjacent surface of the glass substrate. It has been found that with transparent substrates, metal and particularly conductive metal can be redeposited upon one surface thereof using this method with a high degree of adhesion and uniformity.

T988,008
COATING AGENTS COMPRISING FLUOROTERPOLYMERS AND POLYARYLENE SULFIDE RESINS
Franz Mayer, and Gerhard Gebauer, both of Hoechst Aktiengesellschaft, D-6230 Frankfurt am Main 80, Fed. Rep. of Germany
Filed Jan. 2, 1979, Ser. No. 161
Int. Cl.² C08L *57/08, 65/02, 81/04*
U.S. Cl. 525—537
No Drawing. 16 Pages Specification

Coating composition comprising (a) from 98 to 20% by weight of a poly(arylene sulfide) resin, having preferably a melting point between 204° C. and 482° C. and an inherent viscosity from 0.1 to 0.3, determined in chloronaphthalene at 206° C., (b) from 20 to 80% by weight of a terpolymer which contains in copolymerized form 0.5 to 12% by weight of hexafluoropropene, 0.5 to 11% by weight of perfluoro(alkyl vinyl ether), preferably perfluoro(propyl vinyl ether), and tetrafluorethylene, and (c) 40 to 95% by weight, calculated on the total weight of the composition, of a liquid carrier, which is a glycol or glycol ether, an aprotic polar or a non-polar organic solvent or preferably water. Anionic or non-ionic dispersing agents, fillers, pigments and thickeners may optionally be included. Preferred is poly(phenylene sulfide) which is mixed with the liquid carrier and then with the terpolymer in dispersion, suspension or powder form. Compositions are useful for coating metals or non-metallic substrates such as glass or porcelain. Improved adhesion is obtained without pretreating the substrate or without special ingredients. The coating is applied by spraying, dipping or brushing with subsequent heat-treatment.

T988,009
VINYL CHLORIDE POLYMERIZATION PROCESS
William E. Andrew, Hertford, England, assignor to Imperial Chemical Industries Limited, London, England
Continuation of Ser. No. 576,575, May 12, 1975, abandoned.
This application Jan. 19, 1979, Ser. No. 5,024
Claims priority, application United Kingdom, May 30, 1974, 24073/74
Int. Cl.² C08F *2/26, 2/20, 14/06*
U.S. Cl. 526—345
No Drawing. 19 Pages Specification

Vinyl chloride is polymerized by suspension or homogenized dispersion polymerization using a free radical-yielding initiator in which 0.02% by weight, based on the weight of vinyl chloride, of at least one α-olefin having from 6 to 20 carbon atoms is added to the vinyl chloride either (a) prior to the start of polymerization in the case of homogenized dispersion polymerization, or (b) prior to the start of or during the polymerization, but in any event before the onset of autoacceleration in the case of suspension polymerization. The disclosed process avoids or reduces the tendency of the vinyl chloride to undergo autoacceleration during the polymerization.

Preferably the amount of α-olefin employed is 0.03% to 0.075% by weight, particularly 0.03% to 0.06% by weight. The α-olefin preferably contains 8 to 20 carbon atoms; suitable α-olefins include octene-1, nonene-1, decene-1, dodecene-1, tetradecene-1, hexadecene-1, octadecene-1, and eicosene-1.

T988,010
PROCESS FOR PREPARING C_1–C_5 ALKYL 5-(SUBSTITUTED-PHENOXY)-2-NITROBENZOATE
Theresa L. Cunningham, Jackson, and Clifford E. Hunt, Somerset, both of N.J., assignors to Mobil Oil Corporation, N.Y.
Continuation-in-part of Ser. No. 903,275, May 5, 1978, abandoned. This application Mar. 2, 1979, Ser. No. 16,851
Int. Cl.² C07C *79/46*
U.S. Cl. 560—21
No Drawing. 10 Pages Specification

A process of preparing C_1–C_5 alkyl 5-(substituted-phenoxy)-2-

nitrobenzoate such as a process for preparing methyl 5-(2',4'-dichlorophenoxy)-2-nitrobenzoate by the coupling reaction of methyl 2-nitro-5-chlorobenzoate with the potassium salt of 2,4-dichlorophenol in dimethylformamide solvent to produce a reaction product mixture containing desired ester product and byproduct potassium 5-(2',4'-dichlorophenoxy)-2-nitrobenzoate. The yield of desired ester product is increased by a process that comprises reacting said reaction product mixture in situ, with methyl chloride at a pressure of about 440 mm. Hg. to about 50 psig., for between about 0.5 hour and about 4 hours, and at a temperature between about 75° C. and about 105° C. In a specific embodiment the process is carried out on bench scale at a temperature of between about 75° C. and about 100° C. and at a pressure of between about 10 psig. and about 50 psig. In another specific embodiment the process is carried out on plant scale at a temperature of between about 75° C. and about 105° C. and at a pressure of between about 440 mm. Hg. and about 760 mm. Hg.

V 9 8 8 / 1 N 0 0 6 7 9 UM

REISSUES

NOVEMBER 6, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,135

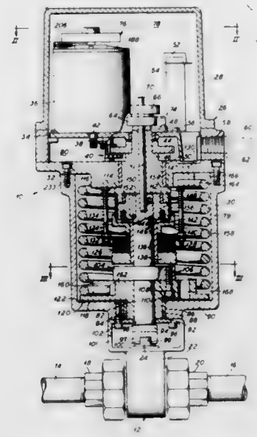
ELECTRIC FAIL-SAFE ACTUATOR

John H. Fitzwater, deceased, late of Warwick, R.I., and by Amelia Fitzwater, executrix, Warwick, R.I., assignor to Amelia Inc., Warwick, R.I.

Original No. 3,808,895, dated May 7, 1974, Ser. No. 331,191, Feb. 9, 1973. Application for reissue Oct. 29, 1975, Ser. No. 626,723

Int. Cl.[2] **F16H** *5/40;* **G01G** *17/00*

U.S. Cl. 74—2 **19 Claims**



32. An electrically operated valve actuator, comprising:

an electric motor for connection to an electrical supply;

means for connecting said motor to a valve for driving the valve in one direction, including electric clutch means for connection to the electrical supply and normally energized to connect said motor in driving engagement with the valve and deenergized in response to loss of power from the electrical supply to disengage the valve from said motor;

energy storage means for connection to the valve responsive to the operation of said motor to store energy and responsive to disengagement of said motor from the valve to drive the valve in the opposite direction;

switch means operated in response to a predetermined number of revolutions of said motor to disconnect said motor from the electrical supply; and

brake means operated in response to the operation of said switch means to hold the valve in the position driven by said motor,

said electric clutch means including a pair of axially aligned shaft means, an electromagnetic coil disposed about one of said shaft means, a clutch armature disposed about said one shaft means and axially movable toward the other shaft means, a torsion spring disposed about said other shaft means and having one end connected to said other shaft means and the other end disposed adjacent said armature, and means on said armature for gripping the other end of said torsion spring to cause a tightening of said torsion spring about said pair of shaft means to couple said shaft means together when said electric motor is energized to drive the valve.

Re. 30,136

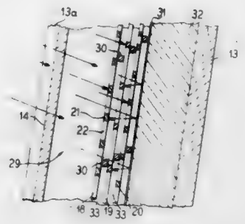
SOLAR PANEL

Arno H. Schriefer, Jr., R.R. #1, Dewey, Ill. 61840

Original No. 4,073,282, dated Feb. 14, 1978, Ser. No. 723,987, Sep. 16, 1976. Application for reissue May 25, 1978, Ser. No. 909,719

Int. Cl.[2] **F24J** *3/02*

U.S. Cl. 126—441 **8 Claims**



1. In a solar collector having a housing, a front transparent panel to allow solar energy to pass into the housing, a back panel, and means for delivering forced fluid into and out of the housing, the improvement comprising:

a matrix of multiple layers of [a black] *an absorbtive* coated sheet, each layer having a plurality of open meshes, defined by a closed loop, each loop having a raised side portion and a lowered side portion, and all said raised portions being regularly repeated along a unidirectional line, said unidirectional line in one sheet positioned at *multiples of* 90° relative to a unidirectional line in an adjoining sheet of the matrix, and

a reflective surface within the housing at said back panel, said reflective surface spaced from said matrix.

Re. 30,137

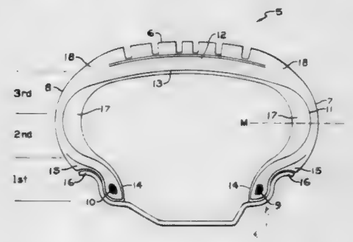
HIGH-MODULUS RUBBER COMPOSITION FOR PNEUMATIC TIRES

James W. Messerly, Stow, Ohio, assignor to The B. F. Goodrich Co., Akron, Ohio

Original No. 3,983,919, dated Oct. 5, 1976, Ser. No. 513,414, Oct. 9, 1974. Application for reissue Jun. 19, 1978, Ser. No. 916,699

Int. Cl.[2] **B60C** *9/02;* **C08K** *3/04;* **C08L** *91/00*

U.S. Cl. 152—357 R **10 Claims**



1. A *tire with a sidewall comparable in thickness to the tread, which sidewall in a major part of its thickness is made of a* high-modulus, low-hysteresis, stable, vulcanized, tire composition consisting essentially of vulcanized cis-polyisoprene rubber containing a high-modulus carbon black, about 4 to 8 parts, per

hundred of rubber, of an active cobalt compound, and an effective quantity of an efficient antioxidant.

Re. 30,138

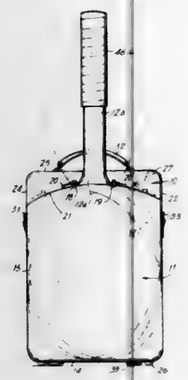
COMBINED CARRYING BAG AND RACKET CARRIER

Arthur T. Cowen, III, 20 W. 75th St., New York, N.Y. 10023

Original No. 3,963,103, dated Jun. 15, 1976, Ser. No. 539,332, Jan. 8, 1975. Application for reissue Aug. 31, 1977, Ser. No. 829,300

Int. Cl.[2] **A45C** *3/00*

U.S. Cl. 190—52 **8 Claims**



7. A combination carrying case for a racket and associated clothing equipment, which comprises

(a) a clothing case,

(b) a carrying handle at the top of said clothing case,

(c) a racket case secured to and extending from one side of said clothing case,

(d) said racket case being substantially in the form of an open top pocket having width dimensions generally corresponding to the width of a racket head to be carried therein, and having a height dimension generally corresponding to the height of the racket head up to its throat area,

(e) said pocket having a top opening extending across the top of said pocket,

(f) a single, continuous zipper track extending across the full width of said top opening,

(g) a double zipper closure for said top opening, comprising a pair of oppositely disposed, independently movable zipper slides on said continuous zipper track,

(h) said top opening being so arranged and spaced from the bottom of said pocket that, when a racket is placed head down in said pocket, said zipper slides may be closed toward said racket to provide support for said racket on both sides, in the general area of the throat and handle thereof, in various angular positions of said racket.

Re. 30,139

SIDEARM HOLSTERS

H. Jack Jones, Orlando, Fla., assignor to Wilma Catherine Jones, Orlando, Fla.

Original No. 3,904,091, dated Sep. 9, 1975, Ser. No. 505,684, Sep. 13, 1974. Application for reissue Aug. 26, 1977, Ser. No. 828,160

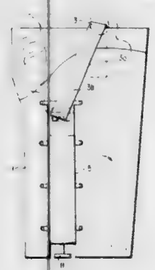
Int. Cl.[2] **F41C** *33/02*

U.S. Cl. 224—243 **8 Claims**

7. In a sidearm holster having a closing member disposed to extend over the top of a sidearm held in the holster and movable into a closed position for keeping the sidearm in the holster, and into an open position for permitting withdrawal of the sidearm, the improvement comprising:

latch means carried by said closing member near the end thereof which, when said closing member is in its closed position, is adjacent one side of said holster;

a manually operable latching mechanism mounted on said holster for holding said latch means when said closing member is in its closed position, said latching mechanism comprising a pushbutton disposed to be manually pushed for moving said mechanism into a position for releasing said latch means; and



said closing member including means for causing said closing member to spring into its open position, and to remain therein, upon release of said latch means.

Re. 30,140

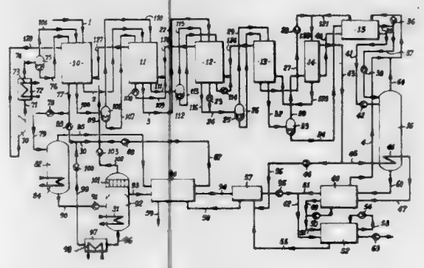
METHOD FOR COOLING A GASEOUS MIXTURE TO A LOW TEMPERATURE

Maurice Grenier, Paris, and Pierre Petit, Chatenay Malabry, both of France, assignors to Compagnie Francaise d'Etudes et de Construction Technip, Paris, France

Original No. 3,274,787, dated Sep. 27, 1966, Ser. No. 484,541, Sep. 2, 1965. Continuation of Ser. No. 273,338, Jul. 19, 1972. Application for reissue Aug. 28, 1974, Ser. No. 501,246

Int. Cl.[2] **F25J** *3/02*

U.S. Cl. 62—28 **2 Claims**



8. A method for cooling a second gaseous mixture to low temperature and producing at least one constituent of said mixture in liquid phase, comprising:

a. cooling and subjecting a first gaseous mixture containing at least one component of said second gaseous mixture, to a fractionate condensation under a first pressure,

b. expanding at least two condensed fractions obtained during the fractionate condensation of said first gaseous mixture, reuniting the expanded condensed fractions with said first gaseous mixture under a second pressure lower than said first pressure, vaporizing and reheating the reunited fractions with said first gaseous mixture under said second pressure, by heat exchange with said second gaseous mixture undergoing cooling, and with said first gaseous mixture undergoing fractionate condensation, and recompressing said first gaseous mixture to said first pressure,

c. reuniting under said first pressure said second gaseous mixture undergoing cooling with said first gaseous mixture undergoing fractionate condensation, when said gaseous mixture is in conditions of temperature and pressure such that a major portion of said constituent to be produced in liquid phase is condensed within said second gaseous mixture, and after the first condensed fraction of said first gaseous mixture has been withdrawn for expansion and vaporization, continuing the fractionate condensation of the mixture so obtained under said first pressure until there is obtained a last condensed fraction containing a major part of said constituent to be produced in liquid phase,

d. expanding to said second pressure the last condensed fraction, and separating the last expanded fraction into a liquid portion expanded to a pressure lower than said second pressure and a residual gaseous portion for recompression with said first gaseous mixture, and withdrawing said last expanded liquid portion as a product stream, and

e. prior to reuniting said first gaseous mixture and said second gaseous mixture, condensing at least partially said second gaseous mixture under a third pressure which is higher than said first pressure, and expanding said second gaseous mixture at least partially condensed to said first pressure.

Re. 30,141

INORGANIC VITREOUS DETECTOR MATERIAL

Hans-Herbert Kaes, Darmstadt, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Original No. 3,947,282, dated Mar. 30, 1976, Ser. No. 424,618, Dec. 13, 1973. Application for reissue Dec. 5, 1978, Ser. No. 966,825

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1972, 2262073

Int. Cl.[2] **C03C** *3/08, 3/16;* **G01T** *5/10*

U.S. Cl. 106—54 **4 Claims**

1. An inorganic vitreous detector material having the properties of excellent energy resolution for impinging heavy ions and fission products, a high dependence of specific hole diameter with respect to impinging particle energy and as being substantially insensitive to background electrons and gamma-rays, said material consisting essentially of:

a. silicon dioxide SiO_2 and boron trioxide B_2O_3 in an amount not exceeding about 10% by weight; and

b. the balance, a three-component basic system consisting essentially of metaphosphoric acid, aluminum metaphosphate and zinc oxide within the following concentration limits:

about 20 to 60% by weight of metaphosphoric acid HPO_3,

about 30 to 80% by weight of aluminum metaphosphate $Al(PO_3)_3$, and

about 2 to 30% by weight of zinc oxide ZnO.

Re. 30,142

PHOSPHORUS, NITROGEN AND SULFO-CONTAINING ADDITIVES

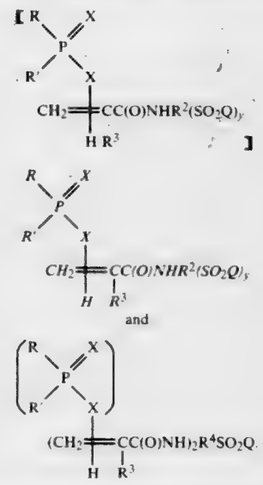
William M. LeSuer, Cleveland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Original No. 3,926,821, dated Dec. 16, 1975, Ser. No. 424,246, Dec. 12, 1973. Application for reissue Dec. 14, 1977, Ser. No. 860,361

Int. Cl.[2] **C10M** *1/48*

U.S. Cl. 252—46.7 **16 Claims**

1. A lubricating oil comprising a major amount of oil and a minor amount of at least one additive sufficient to impart improved load-carrying properties thereto wherein said additive is a sulfo-, nitrogen- and phosphorus-containing additive selected from those corresponding to the formulae:



and

and mixtures of two or more such additives wherein z is one or two, each X is independently oxygen or divalent sulfur, R is hydrogen or a hydrocarbyl, hydrocarbyloxy, or hydrocarbyl mercapto group of about one to about 30 carbon atoms, and R′ is XM or R, M being a hydrogen, an equivalent of a metal or ammonium cation, with the proviso that the total number of carbon atoms in both R and R′ is at least two, y is one or two, each R^3 is independently hydrogen or lower alkyl group of one to seven carbon atoms, R^2 is di- or trivalent hydrocarbyl group having one to 18 carbon atoms, R^4 is a trivalent hydrocarbyl group having one to 18 carbon atoms, and Q is selected from the group consisting of —OH, —OR^3, —OM, —O(Alkylene—O)$_n$—R^3, —$N(R^3)_2$, —NR^3 (Alkylene-NR^3)$_n$$R^3$, [—$OH(R^3)_4$.] —$ON(R^3)_4$ and —ONR_3-(Alkylene-NR^2)$_n$$R^3$, wherein n has an average value of about one to about 10, M is as defined above and the alkylene group has from one to 10 carbon atoms.

V 9 8 8 / 1 NO 0 6 7 9 UMI

PLANT PATENTS

GRANTED NOVEMBER 6, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,475

ACALYPHA WILKESIANA 'DALLAS'

G. Philip Huey, Dallas, Tex., assignor to City of Dallas, Dallas, Tex.

Filed Jul. 20, 1978, Ser. No. 926,944
Int. Cl.[2] A01H *5/12*
U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of *Acalypha wilkesiana,* substantially as shown and described, characterized by its predominantly yellow and green foliage.

4,476

CHRYSANTHEMUM NAMED SUNBURST SPIRIT

Kerry S. Petusky, West Chicago, Ill., assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Nov. 27, 1978, Ser. No. 963,884
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinctive cultivar of chrysanthemum pot plant, substantially as herein shown and described, particularly characterized in uniqueness, when compared with its parent "Spirit", by the bright yellow coloration of its bloooms, the somewhat smaller size of its flowers and its slower flowering response.

4,477

CHRYSANTHEMUM NAMED HARTMANN'S YELLOW DIGNITY

Kerry S. Petusky, West Chicago, Ill., assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Nov. 28, 1978, Ser. No. 964,287
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct cultivar of chrysanthemum, substantially as herein shown and described, characterized by its unique yellow color when compared to the parent variety "Hartmann's Dignity".

4,478

CHRYSANTHEMUM NAMED RUFFLED SPIRIT

Kerry S. Petusky, West Chicago, Ill., assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Nov. 28, 1978, Ser. No. 964,435
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—77 **1 Claim**

1. A new and distinct potted chrysanthemum cultivar, substantially as herein shown and described, particularly characterized by the serrate-tipped ray florets of its generally hemispherically shaped blooms.

4,479

MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Dec. 1, 1978, Ser. No. 965,522
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, spreading, much branched habit, substantially as illustrated and described, characterized by buds and flowers of a soft pink to rose pink color, being of a shade generally near Carmine Rose 621/1, the bud and flower resembling the variety June Time (U.S. Plant Pat. No. 2,563) in form and size; and further characterized by a plant of vigorous and compact growth habit, easy to propagate from cuttings or by budding, with an abundance of small to medium size semi-glossy foliage and an abundance of flowers borne usually in loose clusters of 3 to 5 or more.

V 98 8 / 1 NO 6 79 UMI

PATENTS

GRANTED NOV. 6, 1979

ERRATA

For CLASS	See PATENT NO.
433–120	4,173,072
400–120	4,173,273
294–067 E	4,173,334
356–431	4,173,441
356–346	4,173,442
417–457	4,173,451
430–005	4,173,470
430–060	4,173,472
430–072	4,173,473
430–001	4,173,474
430–290	4,173,475
430–280	4,173,476
430–264	4,173,477
430–353	4,173,478
430–507	4,173,479
430–536	4,173,480
430–621	4,173,481
430–619	4,173,482
430–575	4,173,483
435–094	4,173,514
435–038	4,173,515
435–286	4,173,516
548–216	4,173,567
525–134	4,173,592
525–109	4,173,593
525–498	4,173,594
525–165	4,173,595
428–402	4,173,596
525–098	4,173,597
428–402	4,173,598
525–066	4,173,599
525–076	4,173,600
367–123	4,173,748
367–190	4,173,749

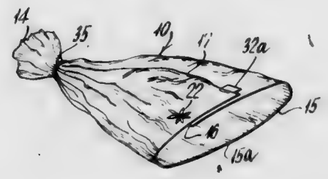
V 988 1 NO 6 79 UM

PATENTS

GRANTED NOVEMBER 6, 1979

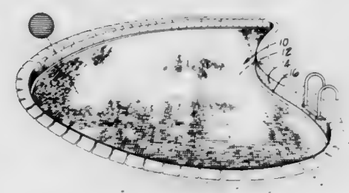
GENERAL AND MECHANICAL

4,173,042
HEAD COVERING GARMENT
Henrietta Krzewinski-Morris, Old Bridge, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.
Filed Oct. 7, 1977, Ser. No. 840,358
Int. Cl.[2] A45D *8/40*; A42B *1/02*
U.S. Cl. 2—197 **13 Claims**



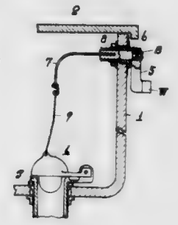
1. A head covering garment comprising a piece of flexible, drapable nonwoven material having a central portion and a pair of adjoining side portions; said piece of material having an upper surface, a lower surface, a top edge, a bottom edge, and a pair of opposed side edges; closure means affixed to said sheet of material in proximity to its bottom edge; one of said side portions being folded to overlie the lower surface of at least part of said central portion and the other of said side portions being folded to overlie part of said central portion and at least part of said one of said side portions; the top edge of said piece of material in its thus folded condition being gathered together and secured in its thus gathered condition by holding means located below the gathered top edge to provide a closed top, whereby there is provided a head covering garment in a generally flat and triangular configuration.

4,173,043
WIND RESISTANT FLOATABLE POOL COVER AND MANUFACTURE THEREOF
William C. Vernon, Walnut Creek, Calif., assignor to Imperial Wax and Chemical Company, Walnut Creek, Calif.
Filed Apr. 26, 1978, Ser. No. 900,176
Int. Cl.[2] E04H *3/19*
U.S. Cl. 4—172.12 **7 Claims**



1. A cover for use with an outdoor pool containing liquid comprising:
means for blanketing a pool to prevent liquid evaporation and heat loss, the blanket means being and of a construction sufficient to be buoyantly floatable upon the liquid surface of the pool;
said blanket means comprising a relatively dark colored, water impervious upper portion and a light colored, buoyant lower portion; said blanket means having an integral peripheral edge folded upon itself and secured thereto to form integral peripheral channel means on the blanket for channeling water about the peripheral edge of said blanket; and
means on the underside of said channel means for rapidly admitting liquid into and for self-filling the channel means when the blanket means is floated upon the pool for increasing resistance to wind lift, the channel means being of a construction sufficient to be buoyantly held substantially horizontally outwardly of the blanket means when the channel means is filled with liquid and the blanket means is floating upon the liquid surface of the pool.

4,173,044
DRAIN VALVE OPERATING DEVICE FOR A CISTERN OF FLUSH TOILET
Etsuji Ota, 20-Banchi, 4-chome, Shinmachi-dori, Nishi-ku, Osaka, Japan
Filed Mar. 6, 1978, Ser. No. 883,998
Claims priority, application Japan, Mar. 7, 1977, 52-27183
Int. Cl.[2] E03D *1/14, 3/12*
U.S. Cl. 4—325 **1 Claim**

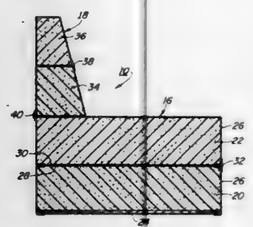


1. A drain valve operating device for a cistern of a flush toilet which has a hollow tank body, a lid on the top of said body, and a drain in the bottom of said body, said device comprising:
a rotatable spindle means mounted through the sidewall of said tank body;
an operating lever means with a weight at its free end connected to said spindle outside of said tank body;
a drain valve over said drain for opening and closing said drain;
a chain connected at one end to said drain valve; and
an L-shaped operating rod means connected at one end which is parallel to the axis of said spindle means, to said spindle inside said tank body and connected at its opposite end to said chain, said operating rod means being positioned near said lid so that rotating said spindle means in one direction causes said operating rod means to abutt said lid, and said lever means being rotatable away from the direction of contacting said lid so that said chain connected between said rod and said drain valve is pulled away from said drain valve at an angle different than the opening direction of said drain valve.

4,173,045
COMBINATION SOFA AND BED
L. Earl Osborn, 25 W. 665 Elmwood Dr., Wheaton, Ill. 60187
Filed Jun. 10, 1977, Ser. No. 805,471
Int. Cl.[2] A47C *17/04*
U.S. Cl. 5—12 R **4 Claims**

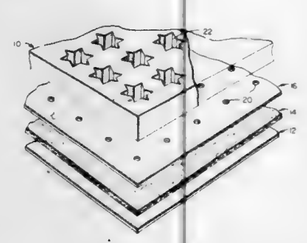
1. A combination sofa and bed, comprising
a first cushion member,
a second cushion member adapted to rest on said first cushion member,
said cushion members having horizontal top and bottom

surfaces and substantially planar and vertical front surfaces,
first hinge means interconnecting the forward upper edge of said first cushion member with the forward bottom edge of said second cushion member,
a first bolster member adapted to rest on said second cushion member,
a second bolster member adapted to rest on said first bolster member with the front surfaces of said bolster members being coplanar,



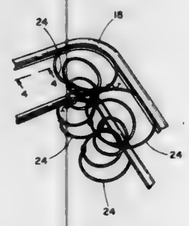
second hinge means interconnecting the forward upper edge of said first bolster member with the forward lower edge of said second bolster member,
said cushion members and said bolster members all having substantially the same height, and
third hinge means interconnecting the upper rear edge of said second cushion member with the rear bottom edge of said first bolster member, and
said third hinge means including first and second mutually disconnectable flexible strips to permit separation of said bolster members from said cushion members.

4,173,046
ABSORPTIVE PATIENT UNDERPAD
John P. Gallagher, 88 Ashley Ave., Charleston, S.C. 29401
Filed Aug. 10, 1977, Ser. No. 823,418
Int. Cl.[2] E03C *11/10*; A61F *13/00*
U.S. Cl. 5—484 **1 Claim**



1. A disposable patient underpad characterized by:
a first liquid impervious bottom layer;
a second coextensive liquid absorbing layer disposed on said bottom layer;
a third coextensive layer disposed on said liquid absorbing second layer, said third layer composed of a liquid impervious sheet having a plurality of spaced openings extending from face to face thereof; said spaced openings in said third layer being of the order of from about 1 to about 3 mm in cross dimensions and spaced not closer than about 1 cm apart to provide liquid drainage into said second layer and to retard generation of odors in fluids contained in said second layer; and a fourth coextensive hydrophobic closed cell expanded foam body cushioning layer secured to said third layer, said fourth layer having a plurality of openings extending from face to face thereof, wherein the openings in said fourth layer are on the order of from about 1 to about 1½ cm in cross dimensions and spaced not closer than about 1 cm and said openings in the fourth layer comprising at least about ¼th the total surface area of said fourth layer and said openings in the fourth layer being vertically aligned with the openings in the third layer, said first, second, third and fourth layers being joined into an integral underpad.

4,173,047
TUBULAR BORDER FRAME FOR INNER SPRING ASSEMBLIES
John W. Schaefer, Des Plaines, Ill., assignor to Nachman Corporation, Des Plaines, Ill.
Filed May 8, 1978, Ser. No. 904,040
Int. Cl.[2] A47C *23/04, 25/00*
U.S. Cl. 5—260 **15 Claims**



1. A border frame for attachment to coil inner spring assemblies comprising:
(a) a hollow elongated tubular member having open ends and of a length and configuration whereby one or more of said members will surround said inner spring assembly, said tubular member including means defining a longitudinally disposed opening into the interior of said member for receiving and securing therein a portion of selected ones of said inner spring assemblies at selected locations along said opening,
(b) means for connecting the open ends of said tubular members to form said border frame,
said receiving and securing means is a pair of opposed lips integral with said tubular member extending inwardly from the surface of said member to a point of engagement near the center of said member, said lips defining said opening therebetween and acting to receive and resiliently engage said spring assemblies.

4,173,048
PILLOW CONFIGURATION
John A. Varaney, 20 Overton Ave., Milford, Conn. 06497
Filed Feb. 1, 1978, Ser. No. 874,369
Int. Cl.[2] A47C *23/06*
U.S. Cl. 5—436 **9 Claims**

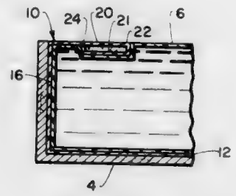
1. A pillow for comfortably encircling substantially the entire body of the user comprising:
A. a central portion for supporting the head of the user, and
B. two extension portions flexibly interconnected with said central portion, substantially perpendicular thereto, and extending substantially the entire length of the bed, providing arm rest zones and blanket retaining means,

whereby the pillow comfortably supports the user's head, allowing him to enter a major portion of the pillow and merge



comfortably therewith with the pillow sides encircling the user's body.

4,173,049
FLOTATION LINER WATERBED STRUCTURE
Ronald G. Underwood, 1415 W. North St., Anaheim, Calif. 92801, and James C. Hauser, 26621 Westvale Rd., Palos Verdes, Calif. 90274
Filed Dec. 27, 1977, Ser. No. 864,466
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—451 **19 Claims**



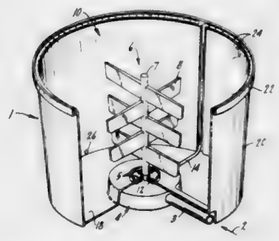
1. A safety liner for retaining liquids in a confined volume comprising the combination: bottom and side wall panels forming an impervious liquid boundary interface, said side wall panels opposite said bottom wall terminating in outwardly, spaced buoyant portions adapted to maintain said side walls in a liquid encompassing and confining position, said buoyant portions being formed by spaced wall portions thereby defining an enclosed laterally extending, with respect to said bottom panel, hollow flotation chamber, the width and thickness of said buoyant portions being sufficient to provide buoyant forces for buoying up said side wall panels, said bottom, side wall panels and spaced wall portions being formed by heat-sealable plastic.

4,173,050
PINCERS ASSEMBLY AND ITS MOUNTING
Walter Vornberger, Tewksbury, Mass., assignor to International Shoe Machine Corporation, Nashua, N.H.
Filed Aug. 10, 1978, Ser. No. 932,596
Int. Cl.[2] A43D *23/00*
U.S. Cl. 12—14.5 **3 Claims**

1. In combination with a pincers assembly comprising: a base at its bottom; and an upwardly extending sleeve having a pincers mounted to its top; a mounting for causing forward-rearward movement of the pincers assembly characterized in comprising: a bearing, through which the sleeve extends, mounted for universal movement; a slide, located below the base, mounted for forward-rearward movement; powered means connected to the slide for effecting said forward-rearward movement; a universal joint mounted to the slide; and connecting means connecting the universal joint to the base.



4,173,051
VEGETABLE WASHER
Joyce P. Reid, 1316 W. 115th St., Chicago, Ill. 60643
Filed Jun. 26, 1978, Ser. No. 919,074
Int. Cl.[2] A23N *13/00*
U.S. Cl. 15—3.12 **4 Claims**



1. An apparatus for washing and cleaning food articles including, in combination
(a) means for housing said food articles,
said housing means including,
a base region,
a wall region formed with said base region, and
a lid,
said lid being removably attachable to the upper portion of said wall region so as to permit the introduction and removal of said food articles to and from the apparatus when said lid is in a first, removed position, and to prevent the discharge of cleaning fluid and said food articles from the apparatus when said lid is in a second, attached position,
(b) means for agitating said food articles and a cleaning fluid within said housing means,
said agitation means including impeller means responsive to turbine means,
(c) means for introducing said cleaning fluid under pressure into said housing means to generate said turbine means,
(d) means for spraying said cleaning fluid discharged from said turbine means at said food articles being agitated and washed,
said spraying means permitting said cleaning fluid to be

directed at said food articles in a plurality of streams so as to further wash said food articles, and

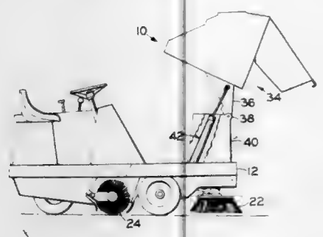
(e) means for discharging said cleaning fluid from said apparatus.

4,173,052

RIDING SWEEPER

Jack L. Burgoon, and Christopher M. Knowlton, both of Toledo, Ohio, assignors to The Scott & Fetzer Company, Lakewood, Ohio

Filed Nov. 17, 1977, Ser. No. 852,199
Int. Cl.² A47L *11/24*
U.S. Cl. 15—83 **6 Claims**



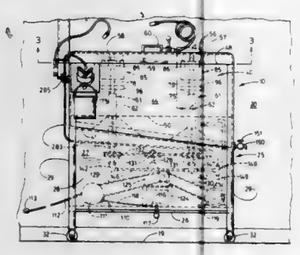
6. A sweeping machine comprising a body, a drum brush rotatably carried by said body in a transverse position, an upwardly-extending rigid support on a forward end portion of said body, a hopper located at a forward position above said drum brush and having forwardly-extending arms at an upper front portion thereof which are pivotally connected to an upper portion of said support, said hopper having an open top, a lid pivotally connected to said hopper at a rear edge of said top, fluid-operated rams having ends pivotally connected to said arms at portions intermediate the pivotal connections thereof and said hopper and having other ends pivotally connected to said body, said rams being enclosed by said rigid support when in retracted positions, said rams being positioned to pivot said hopper forwardly over said support and over the front end of said body when said rams are extended, said lid also swinging open under the influence of gravity when said hopper top is moved beyond a vertical position to a dumping position by said rams.

4,173,053

CLEANING APPARATUS

Robert N. Wills, 5018 E. Townsend, Fresno, Calif. 93727

Continuation-in-part of Ser. No. 757,203, Jan. 6, 1977, Pat. No. 4,115,891. This application Aug. 28, 1978, Ser. No. 937,464
Int. Cl.² A46B *13/04*
U.S. Cl. 15—71 **10 Claims**



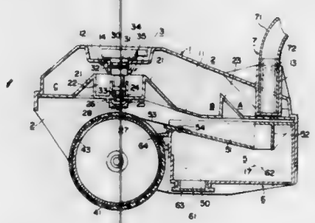
1. An apparatus for cleaning containers bearing paint or the like, the apparatus comprising a housing; a cleaning assembly mounted within the housing; grasping means, having predetermined grasping and releasing modes, borne by the apparatus for holding, in said grasping mode, a container to be cleaned in position for cleaning by said cleaning assembly; a pressure system operably connected to the grasping means; control means for operating the pressure system selectively to dispose the grasping means in said grasping and releasing modes; means for driving the cleaning assembly; and means for pumping a solvent to the cleaning assembly during operation of the apparatus and exhaust means mounted on the housing in communication with the interior thereof for removing gases therefrom.

4,173,054

FLOOR SWEEPER

Masumi Ando, Kashiwa, Japan, assignor to Hukuba Kogyo Kabushiki Kaisha, Chiba, Japan

Filed Jan. 27, 1978, Ser. No. 873,058
Claims priority, application Japan, Aug. 11, 1977, 52/96293; Aug. 11, 1977, 52/107377[U]
Int. Cl.² A47L *11/282*
U.S. Cl. 15—98 **3 Claims**



1. A floor sweeper comprising:

a sweeper body;

a handle connected to said sweeper body for moving said sweeper body;

roller means within said sweeper body for washing and wiping a floor, said roller means comprised of a roller rotatably mounted in said body and a washer belt on the outside of said roller;

a liquid compartment within said sweeper body above said roller means, said liquid compartment being adapted to hold liquid therein and supply said liquid to said washer belt therebeneath;

stopper means within said sweeper body adjacent said roller means for preventing said roller means from rotating when said sweeper body is moved forward and for allowing said roller means to rotate when said said sweeper body is moved rearward;

scraper means contacting said washer belt for squeezing liquid from said washer belt when said roller means is rotated; and

waste fluid container means adjacent said scraper means for collecting fluid squeezed from said washer belt by said scraper means.

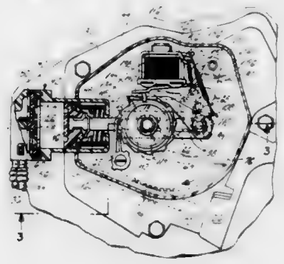
4,173,055

WINDSHIELD WASHER PUMP DRIVE MECHANISM

John Izumi, Glen Ellyn, and Angelo D'Orio, Elmwood Park, both of Ill., assignors to Auto Components, Inc., Franklin Park, Ill.

Filed Nov. 13, 1978, Ser. No. 960,447
Int. Cl.² B60S *1/46*
U.S. Cl. 15—250.02 **36 Claims**

1. A windshield washer pump drive mechanism for use in conjunction with a windshield wiper drive motor of the type having a drive pin adapted to revolve in a circular path when the motor is actuated, and movable to a prescribed point along said circular path and then in a generally radial direction, outwardly thereof, to a park position as said motor is deactuated, said mechanism comprising a pump, a reciprocatable rod for driving said pump, movable cam means, means operably connected to said rod and said cam, to reciprocate said rod between intake and discharge positions, respectively, in accordance with the movement of said cam, and means for automatically causing engagement between said cam and said drive pin after installation of said mechanism adjacent said motor, said engaging means comprising: first means situated on said cam



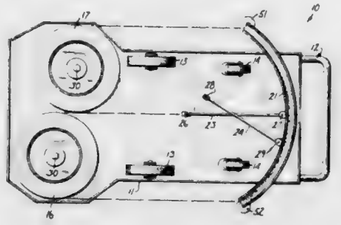
and adapted to engage said pin only during the movement of said pin along said circular path prior to the first movement of said pin to said park position after installation; second means situated on said cam and adapted to engage said pin at all times after said pin is disengaged from said first means by said first movement of said pin to the park position; and, means for positioning said cam to bring said second means into engagement with said pin subsequent to said first movement of said pin to said park position.

4,173,056

SCRUBBING MACHINE WITH TRACKING SQUEEGEE

Robert A. Geyer, Anoka, Minn., assignor to Tennant Company, Minneapolis, Minn.

Filed Jun. 26, 1978, Ser. No. 918,771
Int. Cl.² A47L *11/283, 11/293, 11/30*
U.S. Cl. 15—320 **9 Claims**



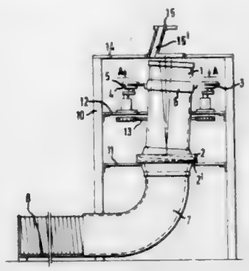
1. A scrubbing machine including a body structure, a plurality of wheels supporting said body, means for depositing scrubbing solution on a surface to be scrubbed thereby providing a wetted path and scrubbing brush means for working said solution on said surface, and vacuum squeegee means for picking up said solution from said surface said squeegee means being disposed rearwardly of said wheels, said squeegee means including draw bar means for pulling said squeegee means along said wetted path and steering bar means for tracking said squeegee means along the wetted path both while traveling along a straight line and when traveling along an arcuate path.

4,173,057

APPARATUS FOR RECEIVING AND GATHERING A FIBRE BAND FROM A CARD OR STRETCHER

Louis Vignon, Geneva, Switzerland, assignor to Heberlein Hispano SA, Vernier-Geneve, Switzerland

Filed Jun. 30, 1978, Ser. No. 920,822
Claims priority, application Switzerland, Jul. 12, 1977, 5869/77
Int. Cl.² B65H *54/80*
U.S. Cl. 19—159 R **5 Claims**



1. Apparatus for receiving and gathering a fibre band comprising means for supporting a lower end of a cylindrical tube, a cylindrical tube mounted on said supporting means and extending upwards therefrom with the longitudinal axis of said cylindrical tube at an inclination to an imaginary fixed vertical line passing through the centre of said lower end of said tube, a ball bearing assembly embracing said tube at a location there around closer to the upper end of said tube than to said lower end, said assembly including an outer race encircling said tube with a centre point on said axis, and crank mechanism operative on said race to displace said centre point with a circular movement thereby causing said longitudinal axis of said tube to trace out the surface of a cone having its apex at said lower end of said tube.

4,173,058

METHODS FOR MANUFACTURING PHOTOGRAPHIC FILM PROCESSING ROLLERS

Frank M. Stieger, Newton Highlands, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 3, 1977, Ser. No. 838,557
Int. Cl.² B21H *1/14*
U.S. Cl. 29—148.4 D **7 Claims**



7. A method for manufacturing photographic film processing rollers each having a given length comprising the steps of:

cutting a cylindrical stainless steel rod having a length greater than a plurality of said given length of said processing rollers into a plurality of segments each having a length at least equal to said given length of said processing rollers;

machining each rod segment to provide its opposite ends with journals having maximum diameters less than the diameter of the rod to facilitate mounting the rod for rotation in a film processing apparatus, the journals each having a predetermined length so that the distance between the journals generally defines the width of a film-contacting surface;

connecting the rod segments together end to end by inserting their journals into couplings to form a continuous chain of rod segments;

applying an adhesive composition to the surface of each rod segment to promote bonding between the stainless steel surface of each rod segment and a polymer;

pushing the continuous chain of rod segments through a cross-head extrusion die to deposit a melted polymer comprising an elastomeric urethane resin on the adhesive composition covering the surface of each rod segment to provide the segment's surface with a thin polymeric coating whose coefficient of friction is greater than that of the stainless steel;

subjecting the coated rod segments to a predetermined temperature to harden the polymeric coating;

separating the coated rod segments from the couplings; and

centerless grinding the coating of each rod segment to reduce its thickness intermediate its journals to provide a film-contacting traction coating of predetermined thickness and smoothness,

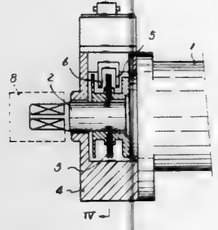
the method steps recited above wherein the adhesive composition comprises a dispersion of carbon black in an adhesive matrix comprising a first polymeric resin containing functional groups reactive with stainless steel and a second polymer resin chemically similar to a polymeric constituent of the urethane resin and having a thickness when substantially dried of 0.15±0.05 mils, wherein the thickness of the extruded polymeric coating is no less than 9.0 mils and no greater than 10.0 mils, and wherein the thickness of the centerless ground film-contacting traction coating is no less than 5.0 mils and no greater than 7.0 mils.

4,173,059

DEVICE FOR TIGHTENING BOLTS

Hiroshi Hashimoto, and Kinya Mori, both of Nishikasugai, Japan, assignors to Sanyo Machine Works, Ltd., Aichi, Japan

Division of Ser. No. 642,706, Dec. 22, 1975, Pat. No. 4,095,325.
This application Apr. 11, 1978, Ser. No. 895,398
Claims priority, application Japan, Dec. 24, 1974, 50/3163; Oct. 13, 1975, 50/123449; Oct. 13, 1975, 50/123450; Oct. 13, 1975, 50/123451; Oct. 14, 1975, 50/124025; Oct. 14, 1975, 50/124026
Int. Cl.[2] B23P *19/04;* **B25B** *23/147*
U.S. Cl. 29—240 **4 Claims**



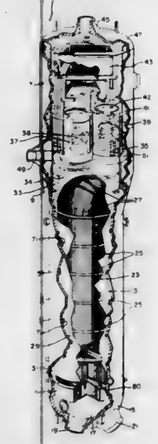
1. Apparatus for tightening a bolt to a member to be clamped by the rotative angle method comprising electric motor means, said motor means so constructed that the current generated thereby is proportional to the torque of said motor means, shaft means connected at one end to said motor means for rotation thereby and the opposite end adapted to receive bolt engaging means, speed change means operatively positioned to said motor for switching the rotative speed of said shaft means from high to low speed at a predetermined point of time during the tightening of a bolt, torque detector means operatively associated with said motor for detecting the current generated by the said motor and thereby determining the torque exerted on the shaft means of said motor means, and rotative angle detector means for rotating the bolt to be tightened through a fixed angle from a predetermined point of time and then stopping the rotation of the shaft means of said motor means whereby, upon detection of the predetermined torque by said torque detector means, the speed change means will be actuated along with said rotative angle detector means to change the speed of rotation of said shaft means from high to low and then to a stop position upon the completion of the tightening of the bolt.

4,173,060

SYSTEM AND METHOD FOR RETUBING A STEAM GENERATOR

Anthony A. Massaro, Jr., Monroeville, and Harry N. Andrews, Franklin Township, Westmoreland County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 24, 1977, Ser. No. 809,588
Int. Cl.[2] B23P *7/00, 17/00, 15/26*
U.S. Cl. 29—157.4 **19 Claims**



11. A method for retubing a steam generator having a shell with enlarged upper portion, a tube sheet with a channel head, a plurality of U-shaped tubes which extend upwardly from the tube sheet to form a tube bundle and a wrapper encircling the tube bundle, the method being applicable to a steam generator vertically oriented in a containment vessel and comprising the steps of:

parting the shell by making a circumferential cut to form an upper and lower portion;

removing the upper portion of the shell;

enclosing the lower portion of the shell with a hood to form a generally air tight enclosure;

forcing air to flow downwardly through the shell by removing the air from the lower portion of the shell and filtering the effluent air to remove particulate materials;

placing a gondola partially made of lead glass in the shell; and

utilizing the gondola as a work station for directly observing and cutting the tubes in segments starting from the top of the tube bundle for removing the tubes from the steam generator;

installing a generally rigid tube support structure in the shell;

sliding tubes through the support structure and into holes in the tube sheet;

welding the tubes to the tube sheet; and

expanding the tubes into engagement with the tube sheet throughout the portion where they are contiguous; and

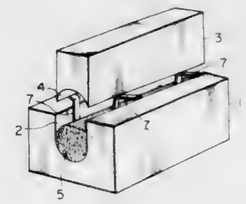
replacing the upper portion of the shell.

4,173,061

PROCESS FOR FORMING A BILLET FOR EXTRUSION

Kazushige Shimizu, Hoya, and Takuma Maeda, Ube, both of Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Continuation of Ser. No. 671,033, Mar. 29, 1976, abandoned.
This application May 1, 1978, Ser. No. 901,465
Claims priority, application Japan, Apr. 3, 1975, 50-39775; Sep. 30, 1975, 50-117225
Int. Cl.[2] B21C *23/04;* **B23P** *7/00*
U.S. Cl. 29—403.2 **4 Claims**



1. A process for forming extruded goods which are substantially free from surface defects, from scrap bars of extruded goods, said scrap bars having an irregular cross-section and being selected from the group consisting of aluminum and its alloys, comprising the steps of:

cutting said scraps into bars having a predetermined length;

piling up a number of said scrap bars in a recess of a female die part which recess is grooved in one direction of said female die part, by first arranging metallic bands or wires along the wall of said recess and in a direction perpendicularly crossing the longitudinal axes of said cut scrap bars to be piled, said metallic bands or wires having a length greater than the peripheral length of said cut scrap bars to be piled, then piling said cut scrap bars by laying same on said bands or wires in a manner such that the longitudinal axes of said cut scrap bars are in agreement with the longitudinal axes of said recess, and said cut scrap bars are parallel to each other, clearances are formed therebetween, and the ends thereof are even, and then fastening and tying said bands or wires around said piled cut scrap bars, thereby forming a scrap aggregate having a predetermined length;

exerting an external force on said scrap aggregate in directions perpendicular to the longitudinal axes of said scrap bars by advancing a male die part into said recess of said female die part thereby forming a billet based upon the density of the metal of said scrap in the range between 70 and 90 percent, said billet containing clearances running through said billet in the longitudinal direction and terminating at the ends of said billet;

preheating said billet;

loading said preheated billet in a container of an extrusion press machine provided with a device for degassing the air in said billet;

degassing the air contained in said clearances through the terminating ends of said clearances, while said billet is contained in said container; and

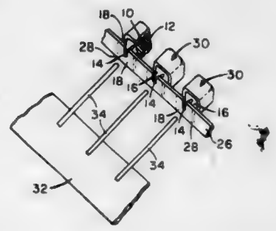
extruding said degassed billet, whereby said extrusion is substantially free from surface defects.

4,173,062

METHOD OF FORMING A QUADRIPLANAR COMPONENT

Gerald M. Locke, Saco, Me., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 714,297, Aug. 16, 1976, Pat. No. 4,097,915.
This application Dec. 7, 1977, Ser. No. 858,111
Int. Cl.[2] H01G *9/24*
U.S. Cl. 29—570 **7 Claims**



1. A method of forming a quadriplanar component comprising the steps of

forming a unitary electrically conductive capacitor enclosure open at one end, the opening defining edge portion of said enclosure forming a quadrilateral, said quadrilateral being in one plane said enclosure forming one electrode of said quadriplanar component,

providing a component element with a lead fixedly attached to said element,

disposing said component element within said enclosure in electrical relationship therewith with said lead extending outwardly from said open end substantially perpendicularly to the plane of said quadrilateral,

providing an elongated metallic strip having a plurality of apertures and a plurality of breakaway notches formed therein, each said aperture being intermediate two of said notches, the portions of said strip between said breakaway notches substantially corresponding to the size and shape of said quadrilateral, said apertures being suitable for accommodating said lead,

disposing the outwardly extending end of said lead in one of said apertures, and

fixedly attaching said strip to said lead for electrical continuity therebetween, the plane of said strip being substantially parallel to the plane of said quadrilateral and substantially perpendicular to the longitudinal axis of said lead, said lead and said portion of said strip between said notches forming the other electrode of said quadriplanar component.

4,173,063

FABRICATION OF A SEMICONDUCTOR COMPONENT ELEMENT HAVING A SCHOTTKY CONTACT AND LITTLE SERIES RESISTANCE UTILIZING SPECIAL MASKING IN COMBINATION WITH ION IMPLANTATION

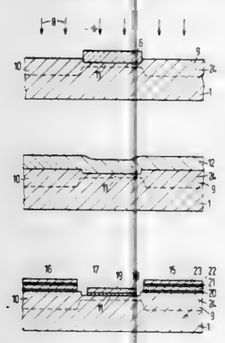
Hermann Kniepkamp, and Walter Kellner, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 30, 1977, Ser. No. 811,875
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1976, 2631873
Int. Cl.[2] H01L *21/265, 29/48, 29/80*
U.S. Cl. 29—571 **11 Claims**

1. Process for the production of a semiconductor component element with a Schottky contact, in which a layer bordering on the surface of a high-ohmic semiconductor body is doped by means of ion implantation, which includes the following steps:

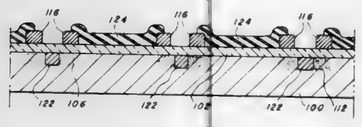
(a) application of a layer of photosensitive lacquer onto a surface of a high ohmic semiconductor body;

(b) exposure and development of said photosensitive lacquer so that an area of said semiconductor body intended for the Schottky contact is freed from said photosensitive lacquer;
(c) etching a depression in said semiconductor body at said points freed from said photosensitive lacquer;
(d) application of a masking layer on said photosensitive lacquer layer and on the areas of said semiconductor body free of said photosensitive lacquer;
(e) development of said photosensitive lacquer and removing parts of said masking layer situated on said photosensitive lacquer;
(f) irradiation of said semiconductor body which has a residual layer of said masking layer with ions having a doping



effect, in which connection the thickness of said residual layer and the kinetic energy of said ions are selected in such a way that the area of said semiconductor body lying under said residual layer is doped 10 to 100 times weaker than the areas bordering thereon;
(g) etching away of said residual layer;
(h) application of a covering layer onto said semiconductor body;
(i) tempering said semiconductor body provided with said covering layer;
(j) etching away said covering layer;
(k) application of source and of drain contacts on said semiconductor body with the aid of a removal technique; and
(l) application of a Schottky contact on said semiconductor body in the area of said depression.

4,173,064
SPLIT GATE ELECTRODE, SELF-ALIGNED ANTIBLOOMING STRUCTURE AND METHOD OF MAKING SAME
Stephen A. Farnow, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Aug. 22, 1977, Ser. No. 826,279
Int. Cl.² B01J *17/00*
U.S. Cl. 29—578 **2 Claims**



1. A method of fabricating an antiblooming drain structure in a charge-coupled device imager comprising:
forming a pair of spaced apart electrodes on an insulating layer disposed on a semiconductor substrate of a first type conductivity;
providing a layer of photoresist material covering said electrodes and the insulating layer on said substrate;
patterning said photoresist layer to provide an aperture therethrough in alignment with the space between said pair of electrodes and exposing the portion of said insulating layer extending between said electrodes, wherein said electrodes serve as a first mask defining the exposed portion of said insulating layer extending therebetween and said patterned photoresist layer serves as a second mask covering the portion of the insulating layer on opposite sides of said electrodes; and
forming a drain region of a second type conductivity opposite to that of said substrate by directing a dopant impurity of the second type conductivity through the aperture in said patterned photoresist layer and penetrating through the exposed portion of said insulating layer extending between said electrodes into said substrate such that the drain region is self-aligned with respect to said electrodes.

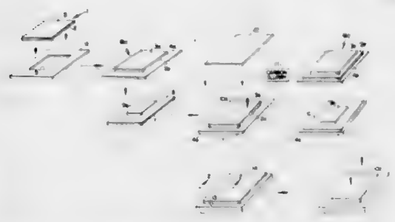
4,173,065
METHOD OF MANUFACTURING A MAGNETIC HEAD
Naotsune Tsuda, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Mar. 14, 1978, Ser. No. 886,336
Int. Cl.² G11B *5/42*
U.S. Cl. 29—603 **4 Claims**



1. A method of manufacturing a magnetic head comprising steps of providing a pair of core blocks arranged facing each other and each having a gap forming surface and gap holding surfaces formed on each core block, providing spacers between the gap holding surfaces of the core blocks, setting the thickness of the spacers and the space between the gap holding surfaces to make an optical gap between the gap forming surfaces, and melting and permeating a gap forming material into the optical gap in such a manner that the melted gap forming material is slightly permeated into the core blocks along the gap forming surfaces, the gap holding surfaces being formed relative to the gap forming surfaces to provide a wider spacing between the gap holding surfaces thereby to enable utilization of spacers thicker than the spacing formed between the gap forming surfaces.

4,173,066
METHODS FOR MAKING LAMINAR CELLS
Gordon F. Kinsman, Billerica, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Division of Ser. No. 811,470, Jun. 30, 1977, Pat. No. 4,125,686.
This application Dec. 8, 1977, Ser. No. 858,684
Int. Cl.² H01M *4/04*
U.S. Cl. 29—623.1 **6 Claims**

1. In the method of making a laminar electrical cell using an electrode layer prelaminated to a separator sheet, the steps of covering said electrode layer with an aqueous slurry dispersion of carbon black, and contacting said carbon dispersion with a sheet of conductive plastic to establish electronic communication between said conductive plastic sheet and said electrode layer through said carbon dispersion.

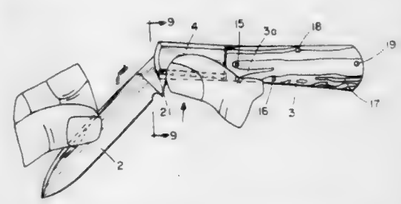


4,173,067
APPLICATOR APPARATUS FOR USE WITH ROTARY CONNECTOR
Charles D. Steiner, and Matthew M. Sucheski, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Nov. 10, 1977, Ser. No. 850,171
Int. Cl.² H01R *43/04*
U.S. Cl. 29—749 **8 Claims**



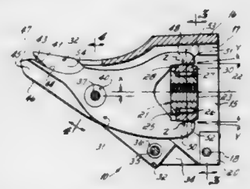
1. Apparatus for splicing a plurality of wires in a two-part rotary actuated electrical connector, said apparatus comprising:
(a) a connector termination station comprising means for sequentially receiving a plurality of connectors in tandem configuration, said connector terminating station being open on first and second opposite ends,
(b) connector feeding means for advancing said connectors sequentially into said connector terminating station from said first end,
(c) connector stop means for abutting the first part of a connector and positioning the connector in the connector terminating station, said connector stop means being adjacent to said second end,
(d) alignment means in the connector terminating station for guiding connectors through the connector station terminating station and for preventing rotation of the second part of a connector in the connector terminating station, said alignment means extending from said first to said second end of the connector terminating station, and
(e) connector terminating means for imparting a force to the first part of a connector in the connector terminating station to cause relative rotation between the first and second parts of a connector, whereby
wires are positioned in a connector located in the connector terminating station and electrically interconnected upon relative rotation between the first and second connector parts.

4,173,068
BOLSTER-ACTUATED LOCKBACK KNIFE
Bobby L. Cargill, 14401 136th Ave., Lockport, Ill. 60441
Filed May 22, 1978, Ser. No. 907,947
Int. Cl.² B26B *1/04*
U.S. Cl. 30—161 **5 Claims**



1. In a lockback knife having a handle formed with a knife blade receiving recess defined in part by a pair of spaced handle sides including a bolster with the knife blade being pivoted between the sides adjacent a first end of the handle at which the bolster is disposed, the improvement comprising an elongated metallic main spring disposed between the sides to form at least a part of a bottom for the blade receiving recess and with the spring being restrained generally on the end of the handle opposite the first end, first locking means being formed on the main spring opposite the restrained end and second locking means being formed on the pivoted end of the knife blade with the two locking means engaging one another to lock the knife open, and the bolster being fixed to the free end of the main spring opposite the restrained end and the bolster when manually operated pivoting the main spring about its handle restraint to disengage the two locking means to enable the knife blade to be returned to a closed position within the recess.

4,173,069
POWER SHEAR HEAD
Harry L. Sidenstick, and Henry R. Hoffman, both of Cincinnati, Ohio, assignors to Kett Tool Co., Cincinnati, Ohio 45227
Filed May 24, 1978, Ser. No. 908,816
Int. Cl.² B26B *15/00*
U.S. Cl. 30—228 **4 Claims**



1. A portable power shears for cutting sheet metal, said shears being powered by a motor unit and comprising:
a housing surrounding the drive shaft of said motor unit;
two stationary shear blades carried by said housing in spaced relationship to one another;
a movable shear blade disposed between said stationary blades;
a pivot pin supporting said movable shear blade upon said housing, said pivot pin being spaced from the axis of said drive shaft on the side of said axis remote from said stationary blades;
an eccentric bushing mounted upon said drive shaft;
a ring rotatably mounted upon said bushing, said ring having an arcuate peripheral surface;
said movable blade having two spaced arms, each of said arms having a shoulder in engagement with said ring, said

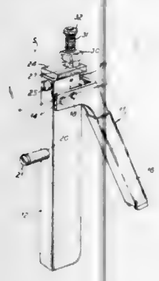
shoulders diverging outwardly from the axis of said drive shaft, said arms engaging said ring on portions of said ring disposed toward said pivot pin from the transverse center line of said ring.

4,173,070

CUTTING TOOL FOR METALS AND PLASTICS

James Vistain, 1320 Bonnie Glenn La., Glenview, Ill. 60025

Filed Mar. 3, 1978, Ser. No. 883,126
Int. Cl.² B26B *15/00*
U.S. Cl. 30—241 **4 Claims**



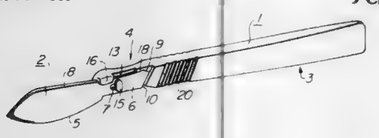
1. A hand tool for shearing individual chips from a relatively stiff sheet material which comprises:
a pair of hollow handle members,
a relatively stationary pivot means interconnecting said handle members to permit relative pivotal movement therebetween,
a cutter support means secured to one of said handle members,
a cutter element reciprocable within said cutter support means,
said cutter element having a cutting edge having a relatively small radius formed thereon,
means interconnecting said cutter element with the handle members to cause downward movement of said cutter element upon movement of said pair of handle members toward each other,
said cutter support means including an aperture over which the sheet material to be sheared is received, the size of the aperture being greater than the chip severed from said sheet by said cutter element by virtue of said radius preventing said sheet from bridging said aperture, and
discharge means communicating with the hollow interior of the handle member to discharge chips sheared by said cutter means and falling through said aperture.

4,173,071

KNIFE HAVING AN EXCHANGEABLE BLADE

Minoru Ishida, Gifu, Japan, assignor to Feather Safety Razor Co., Ltd., Osaka, Japan

Filed Feb. 1, 1978, Ser. No. 874,174
Claims priority, application Japan, Feb. 2, 1977, 52/10574[U]
Int. Cl.² B26B *1/00*
U.S. Cl. 30—339 **9 Claims**



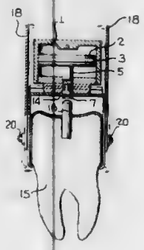
1. A detachable knife assembly comprising:
a blade member including a cutting head portion integrally attached to a base portion, said base portion including an elongated aperture extending completely therethrough; and
a profiled end portion positioned remote from said cutting head portion;
a handle assembly formed of resiliently deformable material and including a forward end portion in contact with said blade member;
recess means formed in said forward end portion of said handle for fixedly positioning the base portion of said blade member relative to said handle assembly;
a stud member projecting from said recess means and including a cross-section permitting said stud member to be received within said elongated aperture;
latch means attached to an end portion of said stud member for maintaining said base portion of said blade member within said recess means;
stop means attached to said forward end portion and positioned on a first side of said stud member for overlapping and securing the base portion of said blade member within said recess means; and guide ridge means positioned on an opposite side of said stud from said stop means and cooperating with said stop means for permitting said resiliently deformable handle to flex a greater amount than the base portion of said blade member during attachment of said blade member to said forward end portion of said handle.

4,173,072

DENTAL CROWN REMOVER

John C. Gager, Alexandria, Va., assignor to Terry W. Gager; Terry W. Gager and Francine Oster, all of Alexandria, Va.

Filed Mar. 15, 1977, Ser. No. 777,713
Int. Cl.² A61C *3/16*
U.S. Cl. 433—120 **3 Claims**



1. A dental crown or bridgework remover comprising crown or bridgework gripping means having attached thereto a power actuated ram including drive means arranged to drive in the direction of the biting surface of the associated crown or bridgework in a direction generally normal thereto so as to separate said crown or bridgework from its underlying tooth system.

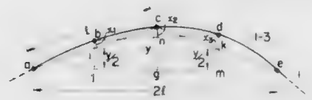
4,173,073

TRACK DISPLACEMENT DETECTING AND MEASURING SYSTEM

Yoshiro Fukazawa; Takahiko Mochinaga, both of Tokyo; Morimasa Shirozume, Chigasaki; Satoru Kishimoto, Higashikurume; Makoto Ito, Hadano, and Fukuo Iwaya, Tokyo, all of Japan, assignors to Hitachi, Ltd.; Japanese National Railways and Hitachi Electronics Engineering Co. Ltd., all of, Japan

Filed Nov. 18, 1977, Ser. No. 852,974
Claims priority, application Japan, May 25, 1977, 52-59780; May 25, 1977, 52-59781; May 25, 1977, 52-59782
Int. Cl.² E01B *27/17, 33/00, 35/02*; E61K *9/08*
U.S. Cl. 33—1 Q **5 Claims**

1. In a track displacement detecting and measuring system including three sensors mounted at the front, middle and rear parts of a track inspection car, respectively, said sensors mounted at the front and rear parts of the track inspection car being spaced apart from each other by a unit chord length, and means for computing the amount of track displacements in the horizontal and vertical directions on the basis of the amounts of rail deviation detected by said three sensors, the improvement comprising:
signal generating means for generating a distance pulse signal consisting of a train of pulses appearing at intervals of a predetermined distance in interlocking relation with the rotation of a wheel of the track inspection car;
analog-digital converter means connected to said computing means and said signal generating means for converting into digital data the amount of track displacement derived from said computing means, which digital data is provided at the output of said converter means in synchronism with the pulses of said distance pulse signal;
a shift register connected to said converter means and consisting of a plurality of stages capable of sequentially storing said digital data provided by said converter means;



an arithmetic circuit connected to said shift register for reading out, from among the data stored in said shift register, data of track displacements obtained for an individual unit chord length at three predetermined spaced points on the track, and for computing a projected amount of a track displacement for a multiple chord length which is an even multiple of said unit chord length from the read-out data of the three track displacements, the positional interrelation among said predetermined three spaced points for said multiple chord length corresponding to the positional interrelation among said three sensors for said unit chord length;
digital-analog converter means for converting the output of said arithmetic circuit into analog data; and
recording means for recording said analog track displacement data applied from said digital-analog converter means together with said analog track displacement data derived from said computing means.

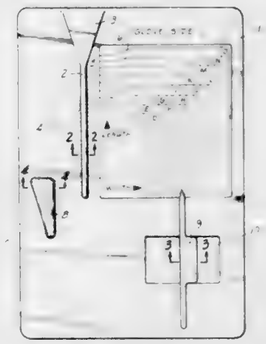
4,173,074

HAND MEASURING DEVICE

Howard F. Newman, Los Angeles, and Benjamin Stansbury, Beverly Hills, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 31, 1977, Ser. No. 846,924
Int. Cl.² A41H *1/02*
U.S. Cl. 33—2 R **4 Claims**

1. A hand measuring device for use in selecting a surgeon's glove comprising: a supporting base; a lateral stop fixed to the base and having an upstanding portion against which is placed one edge of a hand's palm; and upstanding gauge member connected to the base, said gauge member being laterally movable relative to said lateral stop for contacting an opposite edge of such palm to measure its width; a thin upstanding crotch stop laterally spaced from the lateral stop for positioning between two fingers; said crotch stop being fixed against longitudinal movement relative to the base, but having a finger crotch engaging portion that is laterally movable so as to accept different finger thicknesses between the lateral and crotch stops; means for measuring finger length; and indicator



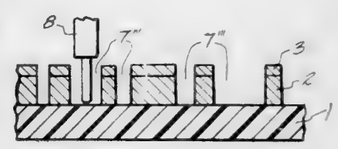
means on the device for correlating the palm width and finger length into a proper glove size reading.

4,173,075

ENGRAVER'S TEMPLATE

John V. Stewart, Watchung, N.J., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 748,428, Dec. 8, 1976, Pat. No. 4,139,386.
This application Jan. 16, 1978, Ser. No. 869,664
Int. Cl.² B43L *13/00*
U.S. Cl. 33—23 K **8 Claims**



1. An engravers template having a desired pattern therein with engraved portions and raised portions comprising a metal sheet having a thickness from about 0.005 to 0.20" and having an oxide layer on one side having a thickness from about 0.0004 to 0.001" and a plastic layer on the opposite side adhered thereto having a thickness from about 0.01 to 1.0", wherein the desired engraved pattern is etched through the oxide layer and through the metal sheet to provide an integral plastic-metal engravers template having said desired pattern etched into the metal sheet and supported by said adhered plastic layer.

4,173,076

SCRIBER-COMPASS WITH SPRING-LOADED CENTER PUNCH

Thomas M. Gossage, 39 Seaview, Daly City, Calif. 94015

Filed Apr. 27, 1977, Ser. No. 791,388
Int. Cl.² B43L *9/22*; B25D *5/02*
U.S. Cl. 33—27 B **6 Claims**

1. A scriber-compass comprising
a pair of first and second arms pivotally connected together at first ends thereof, said arms being at least substantially straight and disposed in the same plane,
adjustment means interconnected between the first and second ends of said first and second arms for selectively pivoting said arms relative to each other to set the linear distance between the second ends of said arms comprising a threaded adjustment rod having a first thumb nut thread-

ably mounted thereon and means for axially adjusting said rod relative to said second arm including a second thumb nut threadably mounted on an end of said rod and rotatably mounted in a collar, restraining axial movement of said second thumb nut and attached to said second arm, whereby rotation of said second thumb nut in said collar will adjust said rod axially,

calibrated scale means on said adjustment means for visually indicating said linear distance,

a scribing point on the second end of said first arm and lying in said plane, and



punch means comprising a housing secured on the second end of said second arm to form an extension thereof and a punch, lying in said plane, reciprocally mounted in said housing for movement between an upward loaded position and a downward released position for automatically releasing said punch from its loaded position for punching a centering hole in a workpiece adapted to have a circle scribed thereon upon depression of said second arm against said workpiece.

4,173,077

PROCESS AND ADDITIONAL DEVICES OF DRYING MACHINES FOR THE UNIFORM DRYING OF TEXTILES

Walter Birke; Hans-Ulrich von der Eltz, and Franz Schön, all of Frankfurt am Main, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

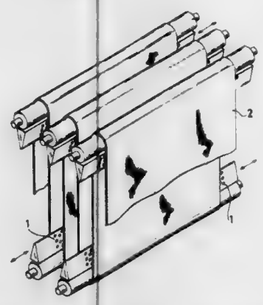
Filed Sep. 10, 1976, Ser. No. 722,156

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1975, 2540852

Int. Cl.² F26B *3/04*

U.S. Cl. 34—23 **3 Claims**

1. In a process for the uniform drying of a travelling moist textile material in the form of a structured fiber web impregnated with a fluid treating agent, containing a solid material that remains permanently in the web after drying, said process being of the type in which either one or both sides of the web are exposed to a heat source selected from a stream of hot air and radiant heat as the web passes over a bank of rotating rolls, the improvement which comprises applying the heat from said heat source to the moving web in a transversely oscillatory



manner to improve the uniformity of drying across the width of the web.

4,173,078

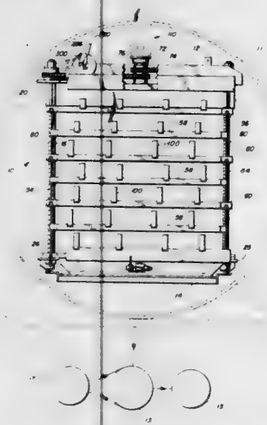
SHELF ARRANGEMENT FOR FREEZE DRYING APPARATUS

Harry L. Bird, Red Hook, and David T. Sutherland, Woodstock, both of N.Y., assignors to The Virtis Company, Inc., Gardiner, N.Y.

Filed May 16, 1978, Ser. No. 906,679

Int. Cl.² F26B *13/30*

U.S. Cl. 34—92 **19 Claims**



1. In a freeze dryer of the type including a sealable vacuum-tight drying chamber, a refrigerated condenser for condensing and freezing moisture removed from items being dried in the drying chamber, a vacuum pump connected to the drying chamber for evacuating the air from the drying chamber, and a cooling system for cooling the condenser; an improved shelf arrangement for use in the drying chamber comprising:

a rigid frame assembly having an upper bracket, a lower bracket, and spacing members holding said upper bracket and said lower bracket in a special apart relationship;

a multiplicity of elongated wire members stretched in a vertical relationship between said upper bracket and said lower bracket;

stop means mounted in predetermined positions along respective ones of said wire members;

a multiplicity of shelf means for supporting items to be dried in the drying chamber;

flange means mounted on said shelf means in suitable positions to slidably engage respective ones of said wire members and rest against respective ones of said stop means so that corresponding ones of said shelf means are supported by respective ones of said stop means in predetermined positions between said upper bracket and said lower bracket;

elevating means mounted on said frame assembly, said elevating means operably connected to the lowest shelf means of said multiplicity of shelf means to cause said lowest shelf means to move vertically;

drive means for driving said elevating means, said drive means mounted externally of the drying chamber and operably extending through a wall of the drying chamber to engage and drive the elevating means so that upon operation of said drive means in a foreward direction, said lowest shelf means is caused to move vertically upward engaging higher shelf means causing all of said shelf means to be slidably moved along said wire members until restrained by said upper bracket, and upon operation of said drive means in a reverse direction, said lowest shelf means is caused to move vertically downward to its original position, and each higher shelf means descends along said wire members until respective ones of said flange means engage corresponding ones of said stop means.

4,173,079

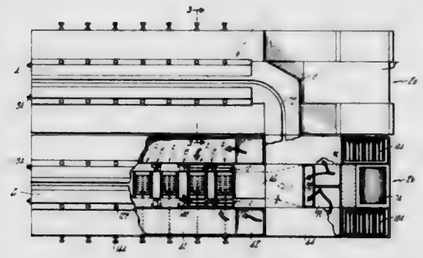
METHOD AND APPARATUS FOR DRYING INVESTMENT CASTING MOLDS

Carlton E. Cruff, Manchester, Conn., and William E. Harrison, Royal Oak, Mich., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 713,025, Aug. 9, 1976, Pat. No. 4,114,285. This application Jun. 26, 1978, Ser. No. 919,184

Int. Cl.² F26B *21/06*

U.S. Cl. 34—217 **14 Claims**



1. In the formation of investment casting molds, an apparatus for drying a layer of ceramic slurry on patterns of the article to be cast, comprising:

(a) an open-ended tunnel having a first and second series of individual drying stations therein for directing drying air of controlled quality, including controlled wet bulb temperature, dry bulb temperature and velocity, across the patterns, the quality of the drying air directed across the patterns at the first series of drying stations being adapted to the rapid moisture removal kinetics of the slurry layer and the quality of the drying air directed across the patterns at the second series of drying stations being adapted to the reduced moisture removal kinetics of the slurry layer so as to prevent harmful increases in pattern temperature during drying, each series of drying stations having associated therewith a series of individual exhaust stations for removing the drying air after it passes over the patterns;

(b) conveyor means extending the length of the tunnel for transporting the patterns into the tunnel, from one drying station to another in the first series and second series and out of the tunnel, including means for removably suspending the patterns from the conveyor means;

(c) air conditioning means for providing drying air to each series of drying stations, including means for maintaining the wet bulb temperature and dry bulb temperature of the air supplied to each series at predetermined values and means for imparting initial controlled velocity thereto;

(d) supply conduit means extending from said air conditioning means to the tunnel for carrying drying air to each series of drying stations, the supply means including at least one supply header associated with each series for distributing drying air to the individual drying stations thereof, and return conduit means extending from the tunnel to said air conditioning means, including at least one return header associated with each series of exhaust stations for collecting moisture-laden drying air from the individual exhaust stations thereof, the return conduit means thereafter recirculating said moisture-laden air from each return header to said air conditioning means;

(e) wherein the individual drying stations of each series comprise at least one conduit having an inlet end opening into the supply header and an outlet end opening into the tunnel, the conduit being disposed inside the tunnel transverse to the direction of advancement of the patterns therein such that the drying air flows through the conduit, out of the outlet end and across the patterns as they progress through the tunnel, means for effecting final velocity control of said air being disposed in the inlet end of the conduit and means for concentrating flow of said air on those portions of the patterns which are most difficult to dry being disposed in the outlet end of the conduit and wherein the individual exhaust stations of each series comprise means in the vicinity of each drying station for connecting the tunnel to the return header to effect withdrawal of moisture-laden drying air before said air interferes with drying air of controlled quality at other drying stations, said connecting means including means for controlling the quantity of air withdrawn therethrough so as to maintain sufficient positive air pressure in the tunnel to preclude infiltration of outside air.

4,173,080

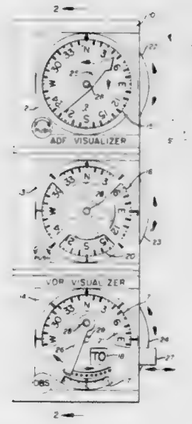
RADIO NAVIGATION TRAINING DEVICE

Paul Minnicks, III, 255 Lee Rd., Brookfield, Ohio 44403

Filed Mar. 17, 1978, Ser. No. 887,816

Int. Cl.² G09B *19/16*

U.S. Cl. 35—10.25 **3 Claims**



1. A navigation training device comprising:

an elongate base sheet folded about itself to define a front section and a back section;

a first arcuate cutout defined in said front section near the top of said front section;

a first arcuate disc centrally rotatably fixed to said back section, said first disc having compass markings thereon and being positioned in said first arcuate cutout so said compass markings are visible through said first cutout, said first disc having an outer diameter larger than said first cutout and having a portion extending beyond an edge of said front section so that said first disc can be hand rotated;

a first marker indicia on said base sheet face section immediately adjacent said first cutout;

a first pointer centrally rotatably mounted on said back section over said first disc to rotate with respect to said first disc;

a plurality of second arcuate cutouts defined in said front section to be circularly oriented and to be spaced from said first cutout;

a second arcuate disc centrally rotatably fixed to said back section at the center of said circularly oriented second cutouts, said second disc having compass markings thereon and being positioned so said compass markings are visible through said second cutouts, said second disc having an outer diameter larger than the outer diameter of said circular orientation of said second cutouts and having a portion extending beyond the edge of said front section so that said second disc can be hand rotated;

a second marker indicia on said base sheet face section immediately adjacent one of said second cutouts;

a circular disc section fixedly located on said base sheet front section having the center thereof coincident with the center of said second cutout circular orientation and having an outer peripheral edge coinciding with inner edges of said second cutouts;

a third marker indicia on said circular disc section;

a plurality of third arcuate cutouts defined in said front section to be circularly oriented and to be spaced from said first and second cutouts;

a third arcuate disc centrally rotatably fixed to said back section at the center of said circularly oriented third cutouts, said third disc having two sets of compass markings thereon and being positioned so that each set of said compass markings is visible through one of said third cutouts, said third disc having an outer diameter larger than the outer diameter of said circular orientation of said third cutouts and having a portion extending beyond the edge of said front section so that said third disc can be hand rotated;

a fourth marker indicia on said base sheet face section immediately adjacent one of said third cutouts;

a fifth marker indicia on said base sheet face section immediately adjacent another one of said third cutouts;

a semi-circular disc section fixedly located on said base sheet front section so that a diameter thereof passes through the center of said circularly oriented third cutouts;

a second pointer rotatably mounted at one end thereof on said base sheet front section at a location spaced from the center of said circularly oriented third cutouts;

a polygonal cutout defined in said base sheet front section; and

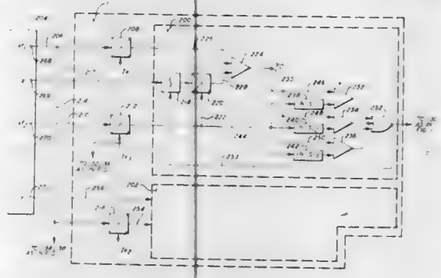
an elongate pull tab having indicia thereon and movably attached to said base sheet front section so said indicia will be visible through said polygonal cutout.

4,173,081

VIDEO GENERATOR FOR USE IN A SYNTHETIC TERRAIN GENERATOR

Maurice Millard, Binghamton; David L. Peters, Whitney Point; John R. Trzeciak, Binghamton, and Brian J. Woycechowsky, Vestal, all of N.Y., assignors to The Singer Company, Binghamton, N.Y.

Filed Mar. 14, 1978, Ser. No. 886,385
Int. Cl.² G09B 9/08
U.S. Cl. 35—12 N **11 Claims**



1. In a synthetic terrain generator which provides on a viewing surface of a display means, a simulated view from an eyepoint in an aircraft or the like, of a synthetic terrain having a plurality of grid lines in a reference plane, an improved video generator of the type which generates signals electronically defining null relationships, which are representative of an intersection of a line of sight from the eyepoint with a grid line, and provides a video pulse to the display means when horizontal and vertical earth direction cosine signals and signals representative of the altitude and horizontal velocity of the aircraft concurrently have values in accordance with the null relationships, wherein the improvement comprises:

(a) means to convert a signal representative of the altitude of the aircraft into a first scaling function signal (sf_1) and a second scaling function signal (sf_2) where each of the said functions are related to the signal representative of the altitude of the aircraft;

(b) first scaling means responsive to the first of said scaling function signals and said horizontal earth direction cosine signal to provide a scaled horizontal earth direction cosine signal proportional to said first scaling function signal;

(c) second scaling means responsive to the second of said scaling function signals and said vertical earth direction cosine signal to provide a scaled vertical earth direction cosine signal proportional to said second scaling function signal; and

(d) means responsive to said scaled earth direction cosine signals and signals representative of the horizontal velocity of the aircraft for electronically defining said null relationships, whereby said scaling provides improved signal strength magnitudes representative of terms of said null relationships so that signal processing over a selected altitude range will result in an accurate depiction of the synthetic terrain as the eyepoint varies from a minimum value of the selected altitude range to a maximum value of the selected altitude range.

4,173,082

PAPER FOR TEACHING WRITING SKILLS

Joan Niquette, 321 Jelliff Mill Rd., New Canaan, Conn. 06840

Filed Sep. 27, 1976, Ser. No. 726,586
Int. Cl.² G09B 11/04
U.S. Cl. 35—37 **7 Claims**

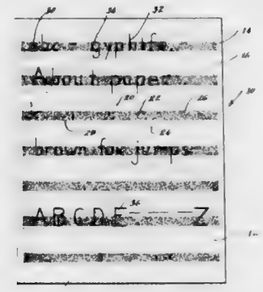
1. A writing surface for use as an aid in developing writing skills comprising:

a substantially planar surface,

a plurality of three module staffs on said surface,

each of said three module staffs including

three contiguous colored bands connected along an interface characterized by the absence of a line to provide an upper, middle and lower writing zone, the middle one of said



bands being colored differently from said upper and lower zones so as to be distinctive, and

a non-colored area separating each of said three staff modules on said writing surface.

4,173,083

ATHLETIC SHOE CONSTRUCTION

Ralph J. Infusino, Bartlett, Ill., assignor to Riddell, Inc., Des Plaines, Ill.

Filed Jan. 16, 1978, Ser. No. 869,919
Int. Cl.² A43C 15/00; A43B 5/02
U.S. Cl. 36—59 R **4 Claims**



1. In a soccer shoe construction including a sole having cleats projecting therefrom, the improvement in the toe area of the sole comprising a plurality of spaced-apart ridges extending outwardly of the sole and transversely across the sole, said ridges being positioned substantially perpendicular to the longitudinal axis of the forward portion of the shoe, the forward surfaces of said ridges slanting downwardly and rearwardly relative to the sole, the more rearwardly located ridges extending outwardly a progressively greater distance than the more forwardly located ridges, and wherein a plurality of spaced-apart cleats are positioned on said sole rearwardly of said ridges.

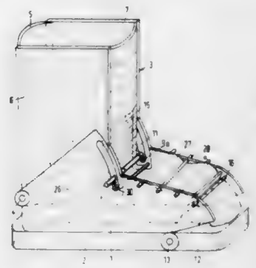
4,173,084

SKI BOOTS

Bernhard Kirsch, Im Litzelholz 23, 5500 Trier-Biewer, Fed. Rep. of Germany

Filed Aug. 23, 1978, Ser. No. 936,084
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1977, 2738523
Int. Cl.² A43B 5/04
U.S. Cl. 36—121 **21 Claims**

1. In a ski-boot of the kind comprising a bottom part to carry the foot and an ankle cuff which is pivotable on said bottom part of the boot about a first pivot shaft extending transversely to the longitudinal direction of the boot, both said bottom part and said ankle cuff being made from a rigid material, the invention which consists in that said ankle cuff has plane side-walls arranged parallel to and at a distance from one another which rest against the insides of plane side-walls sections of said bottom part of the boot which are respectively associated with them, in that said first pivot shaft connecting said ankle cuff and said bottom part of the boot is arranged above the sole of the boot and to the rear of an axis aligned with the ankle joint



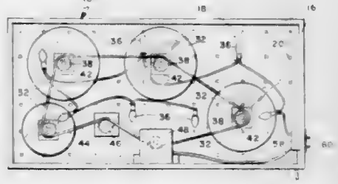
of the intended wearer, (i.e. 5 to 10 cms above said boot sole) and in that at the front end said ankle cuff has a transverse pin orientated parallel to said pivot shaft whose ends are guided in a guide track of curved configuration in said bottom part of the boot.

4,173,085

ANIMATED PAINTING

Pedro J. Cortez, 207 6th St., Calexico, Calif. 92231

Filed Sep. 15, 1977, Ser. No. 833,675
Int. Cl.² G09F 11/23
U.S. Cl. 40—433 **1 Claim**



1. A light-animated picture comprising:

(a) an enclosing housing;

(b) said housing having a front panel having a pictoral display thereon which defines a plurality of different general areas of a single scene;

(c) said front panel having a multiplicity of transparent portions coincident with the locations of pictoral lights in said pictoral display and being partially transparent in other portions to produce a glow when backlighted;

(d) said housing interior being substantially completely silvered;

(e) a plurality of rotating members spaced along the rear surface of said front panel generally coincient with said general area journalled and on axes orthogonally related to said front panel, said rotating members each having coaxial drive sprockets and at least one opaque masking element to periodically cover said transparent portions;

(f) a motor mounted in said housing and a linear drive means engaged by said motor and encircling in driving relation all of said sprockets; and

(g) several light bulbs positioned on the side of said rotating members remote from said front panel and at least some of said light bulbs being directly behind respective ones of said rotating members to selectively and intermittently illuminate the general areas of said display in front thereof to provide a twinkling effect and others of said light bulbs providing constant illumination of portions of said front

panel in spaced areas between said rotating members whereby different areas of said display may be illuminated at different intensities by varying the strength of the individual light bulbs.

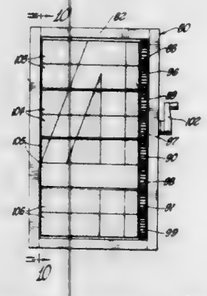
4,173,086
SIGN STRUCTURE
Walter L. Hempfling, 3028 Colerain Ave., Cincinnati, Ohio 45225
Filed Dec. 20, 1976, Ser. No. 752,798
Int. Cl.[2] G09F *15/00*
U.S. Cl. 40—607 **10 Claims**



1. A sign structure which includes a pole member, means for mounting the pole member in upright position, oppositely extending aligned side arms mounted on the pole member adjacent but spaced below an upper end thereof, and a sign panel member mounted on the upper portion of the pole member in gripping relation thereto, the sign panel member including a first panel portion, a bend portion and a second panel portion separated from the first panel portion by the bend portion, there being an opening in the bend portion receiving an upper end portion of the pole member with the inner side of the bend portion supported by the side arms and the first and second panel portions respectively embracingly contacting the pole member therebetween.

4,173,087
CHANGEABLE PRINTED ALPHANUMERIC DISPLAY MODULE
William H. Saylor, 31791 S. Coast Hwy., South Laguna, Calif. 92677, and James O. Narey, 14331 Purdy St., Westminster, Calif. 92683
Continuation of Ser. No. 637,433, Dec. 3, 1975, Pat. No. 4,064,503, which is a continuation-in-part of Ser. No. 546,696, Feb. 3, 1975. This application May 16, 1977, Ser. No. 796,940
Int. Cl.[2] G09F *11/18*
U.S. Cl. 40—518 **2 Claims**

1. A sign module for forming a display of a set of alphanumeric characters one at a time in a viewing window, said module comprising: a set of display tapes, each tape being imprinted on both front and back surfaces at discrete surface segments along its length with a discrete character segment of one character, all character segments on the front surface of a given tape corresponding to the same relative part of the different characters, and all character segments on the back surface of a given tape corresponding to the same relative part of the different characters, the number of display tapes in the set being equal to one-half the number of character segments presented at a time in said viewing window, a driving roller and a slave roller for each tape connected with opposite ends of the respective tape and supporting the respective tape with one surface segment of each surface being displayed in said window at a portion of the window which is in positional correspondence with the character segment represented, the surface segments on both surfaces of each tape being progressively longer from one end of the tape to the other, the character segments being nonuniformly spaced along the length of the tape whereby equal angular displacements of the driving roller causes successive character segments to be aligned with the respective window portions, the set of surface segments being displayed together in said window all bearing different character segments of the same character whereby an entire character is displayed, the diameter of each roller being approximately equal to the length of one surface segment along the length of the tape, the driving and slave rollers for all tapes in the set being disposed with their axes in the same plane, means for displacing the driving rollers simultaneously



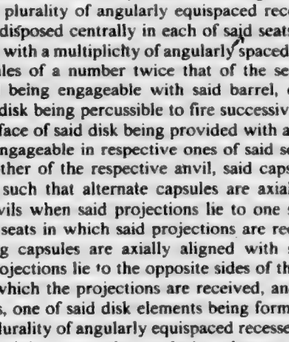
through equal angles for displacing said tapes in unison along their length to successively present the character segments in registry with the respective window portions whereby the characters of said set are successively displayed, each of the driving rollers and each of the slave rollers being mounted upon a shaft, said means for displacing including a driving roller gear connected with the shaft of each driving roller and a slave roller gear connected with the shaft of each slave roller, all gears being of the same size, the driving roller gear associated with any tape being in mesh with the slave roller gear associated with the same tape and only one of the gears associated with each tape being in mesh with one of the gears associated with another tape, each of said slave rollers being provided with a spring drivingly connected between the roller and its respective shaft whereby the tape on each pair of driving and slave rollers is maintained in tension and differential rotation between a slave roller and its shaft is taken up by the respective spring.

4,173,088
TOY GUN OF THE REVOLVER TYPE AND LAMINAR AMMUNITION THEREFOR
Anthony M. Caruso, Sarasota, Fla.
Filed Aug. 18, 1977, Ser. No. 825,588
Int. Cl.[2] F41C *3/06*
U.S. Cl. 42—58 **13 Claims**

1. A toy gun of the repetitive action revolver-type capable of employing various types of laminar ammunition having charges, said toy gun including a rotatable cylinder head provided with a plurality of chambers, and a percussion anvil associated with each of said chambers for cup-like ammunition, the improvement comprising:

indexing means associated with said cylinder head including at least one shoulder having a plurality of perimetral sides, said shoulder extending from said cylinder head axially thereof and having a plurality of concave sides,

said laminar ammunition having a central opening with a plurality of convex sides complementary to said concave sides for engagement therewith and positioning of the charges onto said anvils, and



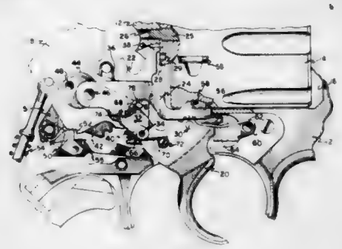
said plurality of perimetral sides being related to the number of said anvils in multiples thereof to assure angular positioning of a correspondingly-shaped laminar ammunition having charges equal to the number of said chambers centered onto said anvils.

4,173,089
AMMUNITION FOR A TOY PISTOL
Eric Gruaz, 4 Avenue Marechal Foch, Lyon, France
Filed Nov. 7, 1977, Ser. No. 849,251
Claims priority, application France, Nov. 8, 1976, 76 34375
Int. Cl.[2] F41C *3/06*; F42B *4/24*
U.S. Cl. 42—58 **5 Claims**



1. A munition disk for a toy revolver having a barrel provided with a plurality of angularly equispaced recessed seats and an anvil disposed centrally in each of said seats, said disk being formed with a multiplicity of angularly spaced explosive-charge capsules of a number twice that of the seats of said revolver and being engageable with said barrel, one of the faces of said disk being percussible to fire successive capsules, the opposite face of said disk being provided with at least two projections engageable in respective ones of said seats to one side or the other of the respective anvil, said capsules being dimensioned such that alternate capsules are axially aligned with said anvils when said projections lie to one side of the anvils in the seats in which said projections are received and the remaining capsules are axially aligned with said anvils when said projections lie to the opposite sides of the anvils of the seats in which the projections are received, and a pair of disk elements, one of said disk elements being formed along a face with a plurality of angularly equispaced recesses of identical depth receiving respective explosive charges adapted to form said capsules, and being provided with said projections on an opposite face of said one of said disk elements, the other of said disk elements closing said capsules along said one of said faces of said one of said disk elements, all of the capsules on the disk being identical, said other of said disk elements being composed of a thin sheet, said one of said disk elements being thicker than said other of said disk elements.

4,173,090
CYLINDER-LOCKING DEVICE FOR REVOLVERS
Richard L. Baker, Granby, Conn., assignor to High Standard, Inc., East Hartford, Conn.
Filed May 11, 1978, Ser. No. 905,043
Int. Cl.[2] F41C *1/00*
U.S. Cl. 42—67 **8 Claims**



1. In a double-action revolver having a cylinder rotatably mounted in a frame for intermittent movement into a plurality of positions and a trigger pivoted on a trigger pin on said frame for movement between a rest position and a firing position, a cylinder-locking device for maintaining said cylinder in each of its positions comprising

a cylinder lock pivoted on said frame for movement into and out of a locking position with respect to said cylinder and resiliently urged into such locking position,

an actuator for pivoting said cylinder lock out of its locking position in order to permit said cylinder to be indexed to another position, said actuator being mounted on said trigger for pivotal movement about a point located intermediate the trigger pin and the pivot point of said cylinder lock, said actuator having a nose portion for operative engagement with said cylinder lock,

means for resiliently pivoting said nose portion of said actuator into engagement with said cylinder lock,

said cylinder lock having a working surface disposed for co-operative engagement by said nose portion for pivoting said cylinder lock out of its locking position,

the pivot point of said actuator being disposed, when said trigger is in its rest position, out of alignment with the pivot points of said trigger and cylinder lock in a direction such that upon movement of said trigger from its rest position, the pivot point of said actuator is moved toward alignment with said other pivot points thereby producing a toggle action,

said nose portion of said actuator being disposed in an operative relationship with said working surface when said trigger is in its rest position for engagement with said working surface when said trigger is pulled, whereby said cylinder lock is pivoted by said actuator out of engagement with said cylinder during the initial travel of said trigger toward its firing position.

4,173,091
DOWN RIGGER LINE RELEASE
John E. Emory, Jr., Traverse City, Mich., assignor to Big Jon, Inc., Traverse City, Mich.
Filed Aug. 26, 1977, Ser. No. 827,891
Int. Cl.[2] A01K *91/00*
U.S. Cl. 43—43.12 **14 Claims**

1. A down rigger line release for releasably holding a fishing line relative to a down rigger line, said release comprising:

a body attachable to the down rigger line and defining an upwardly opening groove having vertically oriented, spaced sidewalls, said groove being angled downwardly at an acute angle from horizontal;

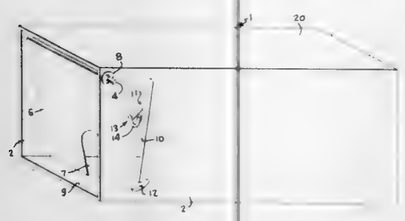
a tapered release pin having a tapered portion and being pivotally mounted at one end within said groove about an axis perpendicular to said sidewalls and around the ta-

pered portion of which the fishing line may be wrapped so as to normally be wedged between said release pin and said body groove sidewalls, said pin being pivoted about an axis perpendicular to the sidewalls of said groove; and



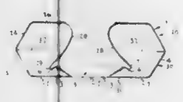
means carried by said body for exerting an adjustable force against the free end of said tapered release pin to maintain the release pin within the groove in a detent fashion.

4,173,092
RAT CAPTURING DEVICE
Tadanobu Nakai, Nara, Japan, assignor to Tokiwa Chemical Industries Limited, Osaka, Japan
Filed Nov. 14, 1977, Ser. No. 851,595
Claims priority, application Japan, Apr. 7, 1977, 52-43681[U]
Int. Cl.[2] A01M *23/18*
U.S. Cl. 43—61 **4 Claims**



1. An animal trap comprising an elongated hollow box-like housing having first and second side walls, a bottom wall and an end wall and an open end portion, a movable closure, a pivot shaft extending between said side walls supporting said movable closure for pivotal movement about an upper portion of said closure so that said closure is movable between a closed position blocking the open end portion of said housing and an open portion to permit the passage of a rat into the interior of said housing, latch means mounted in said housing for movement between an unlatching position permitting opening movement of said closure and a latching position preventing movement of said closure from its closed position, said latch means comprising a latch shaft extending across the interior of said housing between said side walls inwardly of said closure member and latch actuator means supporting said latch means for movement from its unlatching position to its latched position in response to movement of said closure from its closed position to its open position followed by movement of said closure to its closed position and wherein said latch actuator means comprises first and second aligned wall slot means respectively provided in said side walls, the respective ends of said latch shaft being mounted in said respective wall slot means for movement therealong with each of said wall slot means comprising a main vertically extending canted slot portion having a lower end termination and an upper end termination with said upper end termination being spaced inwardly of said housing from said movable closure a greater distance than said lower end termination of said main vertically extending slot portion and wherein each of said wall slot means further includes upper and lower slot portions respectively connected to the upper and lower ends of said main vertically extending slot portion and respectively extending forwardly and rearwardly at a canted angle with respect to said main vertically extending slot portion.

4,173,093
COCKROACH CATCHING DEVICE
Tadanobu Nakai, Nara, Japan, assignor to Tokiwa Chemical Industries Limited, Osaka, Japan
Filed Nov. 14, 1977, Ser. No. 851,594
Claims priority, application Japan, Jun. 27, 1977, 52-84867[U]
Int. Cl.[2] A01M *1/10*
U.S. Cl. 43—121 **2 Claims**



1. A cockroach catching device comprising a hollow housing of generally circular configuration as viewed from above including means defining a floor portion of annular configuration, means supporting said floor portion a predetermined spaced distance above a supporting surface, a downwardly facing entrance opening provided adjacent said floor portion, inclined passageway panel means formed of non-perforated material extending upwardly and outwardly flaring from said entrance opening, said passageway panel means having an edge termination spaced above said floor portion, downwardly extending means positioned above said passageway panel means and having a lower edge portion spaced from the edge termination of said passageway panel means to define an entrance slot therebetween, said entrance slot being of sufficient width to permit a cockroach to pass therebetween to enter said housing, said entrance slot being positioned above said floor portion and dimensioned so as to preclude exit of a cockroach from said housing through said entrance slot wherein said downwardly facing entrance opening is provided axially with respect to said floor portion, said inclined passageway panel comprises an inverted conical section portion extending upwardly from the edge of said downwardly facing entrance opening and a downwardly extending lip portion of conical section shape extending downwardly from the upper edge of said inclined passageway panel and having a lower edge portion comprising said edge termination of said passageway panel means and wherein said housing includes an upper portion and a lower portion joined along a medial juncture, said upper portion including a flat annular upper surface and a downwardly and outwardly inclined conical panel having a lower edge terminating at said medial juncture and said lower portion includes said annular floor portion and an upwardly and outwardly inclined slanting conical surface wall having an upper edge terminating at said medial juncture.

4,173,094
METHOD FOR TREATING GROUND SURFACES WITH A TOXIC AGENT
Wallace H. Nichols, Jr., 4752 Lark Ridge Cir., Sarasota, Fla. 33581
Filed Nov. 17, 1977, Ser. No. 852,315
Int. Cl.[2] A01M *17/00*
U.S. Cl. 43—129 **5 Claims**

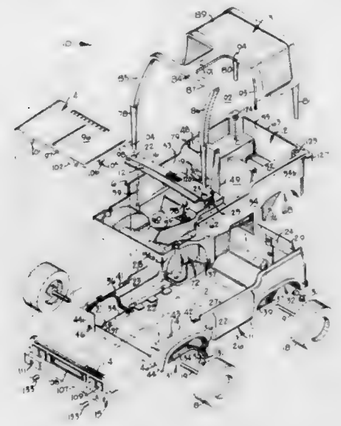
1. A method of dispensing a toxic agent over a ground area comprising:

(a) providing a fuel mixture comprising a mixture of a minor amount of one or more toxic agents effective to control target pests with a major amount of internal combustion engine fuel. the proportion of fuel in said mixture being sufficient to enable operation of an internal combustion engine fueled thereby, said toxic agents being selected from the class consisting of insecticides, fumigants and herbicides which are soluble in said fuel and refractory to fuel combustion conditions of the fueled engine, said toxic agents being present in said mixture in an amount at least sufficient to provide in the exhaust of the fueled engine, an amount of said toxic agent which is effective against such target pests;

(b) supplying said fuel mixture to the combustion chamber of the internal combustion engine operating a ground vehicle while the vehicle is moving over the ground, the fuel in said mixture being substantially completely combusted; and

(c) discharging engine exhaust containing said toxic agent in vapor form from the fueled engine into the atmosphere to deposit said toxic agent over the ground area.

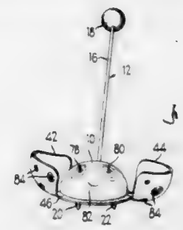
4,173,095
TOY VEHICLE
Ronald R. Pauly, Mound, and Royce D. Rumsey, Hopkins, both of Minn., assignors to Tonka Corporation, Spring Park, Minn.
Filed May 9, 1977, Ser. No. 794,729
Int. Cl.[2] A63H *17/00*
U.S. Cl. 46—201 **15 Claims**



1. A toy vehicle comprising wheels, a chassis, simulated passenger compartment and cab roof, said chassis including a bottom pan, upwardly extending sides, and a plurality of wheel wells, said cab roof including a plurality of substantially vertically oriented, downwardly extending posts, said posts extending to a position adjacent said bottom pan, said posts serving to support said cab roof directly on said bottom pan, said posts securing said passenger compartment to said chassis whereby any external forces applied to the cab roof are transmitted through said posts to said bottom pan.

4,173,096
WHEELED TOY
Burton C. Meyer, Downers Grove, and Eugene Jaworski, Park Ridge, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Nov. 21, 1977, Ser. No. 853,271
Int. Cl.[2] A63H *29/00*
U.S. Cl. 46—205 **14 Claims**

1. A wheeled toy, comprising: a frame including a vertically extending post, wheel means journaled in said frame for rollingly supporting said frame for movement over a support surface, an elongated handle connected to said frame and adapted to be grasped by a user for manually moving the toy over the support surface, a body portion fixedly connected to the upper end of said post, an inner member rotatably mounted on said post beneath said body portion and having an edge portion extending beyond the periphery of said body portion, drive means interconnecting said wheel means and said inner member so that said inner member is rotated as the toy is rolled over a support surface, at least one cover member pivotally connected to said edge portion of said inner member, and means for normally positioning said cover member over said body portion while permitting said cover member to move outwardly by centrifugal force when said inner member is rotated as the toy is moved over a support surface.



4,173,097
CONTAINER WITH RAISED INDENTATIONS FOR AERATION AND DRAINAGE
George L. Staby, 1170 Slade Ave., Columbus, Ohio 43220
Filed Sep. 14, 1977, Ser. No. 833,055
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—66 **2 Claims**



1. A container adapted for holding a growing media suitable for plants comprising:

a bottom wall connected to a circumferentially extending side wall which together define an open topped container having an inside surface and an outside surface;

an outwardly projecting lip at the open top and a shoulder projecting outwardly from said side wall intermediate the bottom and the lip;

said bottom wall including four raised sections projecting symmetrically upwardly into said container about ½ the height thereof around a central bottom portion, each raised section tapering inwardly toward the top of the container, the central bottom portion being free of raised sections;

a plurality of first drainage holes extending through the lowermost portion of said bottom wall;

at least one other drainage hole projecting through each raised section to minimize the distance from a drainage hole to parts of the media;

arched air passageways in the exterior bottom surface of the container in communication with the drainage holes in the raised sections, the number of arched passageways corresponding to the number of raised sections, each arched passageway extending from the side wall to the center of the container bottom and between two of said first drainage holes;

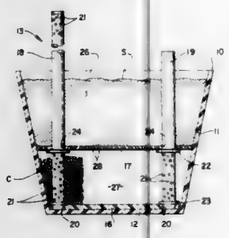
four radially extending passageways, each passageway ex-

V.988/1 N.0 0679 UMI

tending between two raised sections and sloping downward from the central bottom portion to one of said first drainage holes; and

additional drainage holes, each additional hole extending through both the side wall at an arched passageway and the associated raised section.

4,173,098
PLANTER
Elmer L. Smith, 6090 Cedarwood Rd., Mentor-on-the-Lake, Ohio 44060
Filed May 31, 1977, Ser. No. 801,530
Int. Cl.[2] A01G 27/00
U.S. Cl. 47—80 **7 Claims**



1. A planter comprising a receptacle open at the top and having an imperforate bottom wall;

a removable insert structure for said receptacle, said structure comprising a flat bottom support member disposed on said bottom wall, said support member having a plurality of sockets spaced outwardly from the center thereof;

a horizontal wall disposed within said receptacle above said bottom support member and dividing said receptacle into upper and lower compartments, said horizontal wall having a plurality of apertures aligned with said sockets;

a pair of tubular members each having a pair of radially outwardly projecting support rings spaced axially along said tubular member, a lower end portion of each said tubular member being disposed in one of said sockets and one of said support rings abutting the top of said bottom support member, each said tubular member projecting upwardly through one of said apertures and above said horizontal wall, the other of said support rings being disposed below and supporting said horizontal wall;

said horizontal wall being perforated to allow air and water to pass therethrough while retaining soil in said upper compartment;

the lower end portion of each said tubular member which is disposed within said lower compartment being perforated to allow air and water to pass radially therethrough;

said upper compartment adapted to hold soil to a level below the upper ends of said tubular members whereby when excess water from said soil passes through said perforated horizontal wall and collects in said lower compartment, said tubular members provide means for air circulation and evaporation within said lower compartment, and said perforated wall portion provides means for humid air to aerate said soil and keep it moist.

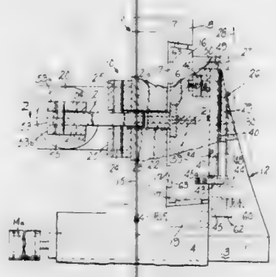
4,173,099
PET DQORS
Donald Robb, Penwortham, England, assignor to Reilor Limited, Lancaster, England
Filed Jul. 24, 1978, Ser. No. 927,722
Int. Cl.[2] E06B 7/28
U.S. Cl. 49—168 **3 Claims**

1. A pet door mounting in an opening in an existing door, of the kind capable of being opened from both sides comprising a rectangular frame of channel shape extruding from a plastics material for attachment to a door opening, the inner member of the channels on the sides and bottom of the frame being provided with inwardly extending flanges, a second rectangular channel frame of substantially U shape extruded from a plastics material to engage the flanges on the rectangular frame, reinforcing moulded channel corner members welded inside the channels of the rectangular frame with holes in the upper reinforcing members to provide sockets for the ends of a rod on which the second frame is pivoted, a door flap pivoted on the rod inwardly of the second frame to open in the opposite



direction from the second frame, a magnet mounted on the outer side of the flange on the bottom of the flap to engage a metal keeper forming one side of a box member welded to the inner side of the bottom channel member of the second frame, a second magnet being mounted on the bottom channel member of the second frame parallel to the metal keeper thereon for engagement by a keeper on the outer bottom flange of the rectangular frame and bolts mounted to slide in the flap to engage the rectangular frame and the second frame to prevent the door from opening.

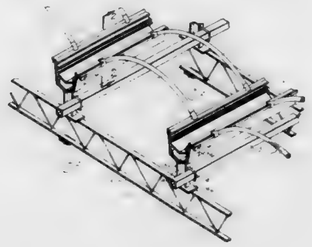
4,173,100
CANNULA GRINDING CARTRIDGE AND FIXTURE
James MacBroom, Jr., Wolcott, Conn., assignor to Toolmatic Corporation of Connecticut, North Branford, Conn.
Filed Feb. 3, 1978, Ser. No. 874,942
Int. Cl.[2] B24B 19/00
U.S. Cl. 51—227 H **10 Claims**



1. A cartridge for holding a multiplicity of cannulas in side-by-side relation for grinding comprising, a base plate and a facing cover plate, a plurality of spaced apart springs interposed between said plates adjacent one end thereof and urging the other ends thereof together, means defining a shoulder for the ends of cannulas between said plates and intermediate said ends, and means connecting said plates between said springs

and said other ends and permitting pivotal movement of said plates with and against the force of said springs and also permitting small relative longitudinal movement of said plates in a direction essentially perpendicular to the directed force of said springs.

4,173,101
GREENHOUSE GUTTER ASSEMBLY
Aart Van Wingerden, R.R. 2, Fletcher, N.C. 28732
Filed Nov. 7, 1977, Ser. No. 849,443
Int. Cl.[2] E04D 13/06
U.S. Cl. 52—13 **5 Claims**



1. A greenhouse gutter assembly comprising:

an extruded channel member having a horizontal drainage bottom and an upper side projecting upwardly adjacent each end of said gutter bottom;

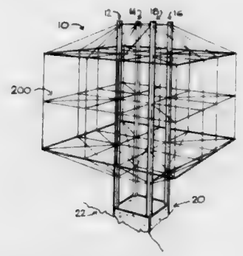
a lower side projecting downwardly adjacent each end of said gutter bottom integral therewith;

a horizontal insulating bottom spaced below said drainage bottom extending between said lower sides; and

means positioning said insulating bottom forming together with said lower sides an insulating air space below and extending across said drainage bottom including a cam member carried adjacent a lower end of each of said lower sides, and a bracket carried adjacent each side of said insulating bottom for encompassing said cam;

whereby said air space serves to insulate the greenhouse and said lower sides enhance the structural characteristics of the gutter.

4,173,102
BUILDING CONSTRUCTION
Bernard Judge, 833 N. Kings Rd., Los Angeles, Calif. 90069
Filed Jun. 28, 1977, Ser. No. 811,131
Int. Cl.[2] E04B 1/34
U.S. Cl. 52—73 **5 Claims**



1. A building construction comprising:

a central support structure including four rigid vertical columns lying at the vertices of a rectangle and fixed at their lower ends to the ground;

a set of trusses including two mutually perpendicular pairs of parallel trusses, each truss including:

a horizontal chord;

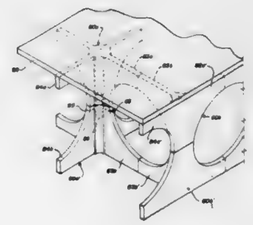
a second chord fixed at its ends to the ends of the horizontal chord and being elsewhere vertically spaced therefrom, said chords being fixed intermediate their ends to two adjacent columns at vertically spaced attachment zones, whereby each column segment between the attachment zones serves as a spreader for mutually perpendicular truses;

a horizontally disposed connector extending between and fixed to adjacent ends of each pair of parallel trusses;

horizontally disposed elongated structural members projecting in opposite prolongation of each connector, each joined at its outer end with the outer end of another such member at a hip point;

and a hip strut extending from each hip point to the adjacent column at an attachment zone spaced from the attachment zone of the horizontal chord.

4,173,103
LIGHT-WEIGHT STRUCTURAL SYSTEM AND MODULAR CONCRETE BUILDING COMPONENTS THEREFOR
Sargis E. Sargis, 6195 Springer Way, San Jose, Calif. 95123
Division of Ser. No. 529,344, Dec. 4, 1974, Pat. No. 4,041,666.
This application May 27, 1977, Ser. No. 801,217
Int. Cl.[2] E04B 2/00
U.S. Cl. 52—79.13 **3 Claims**

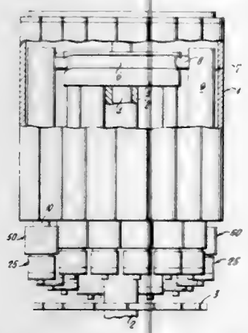


1. In a multiplanar structural system, a capital member of concrete having an axially extending central portion and having, integrally formed therewith a plurality of arcuate quarter-panel wall sections extending radially from said central portion in planes mutually intersecting along the axis of said member, each said arcuate quarter-panel wall section extending over a circular arc of substantially 90°, and having two end faces disposed for cooperation with the end faces of complementary arcuate quarter-panel wall sections of similar, vertically and horizontally adjacent capital members so that when said first-mentioned arcuate quarter-panel wall section is joined in coplanar, generally end-to-end abutting relationship to the arcuate quarter-panel wall sections of said similar members, the quarter-panel wall sections so joined form themselves a substantially rectangular, vertical-and-horizontal-load bearing wall panel with a central, weight reducing circular opening therethrough.

4,173,104
BOTTLE CAPPING APPARATUS AND METHOD
Stanley J. Koll, Keansburg, N.J., assignor to American Flange & Manufacturing Co., Inc., Linden, N.J.
Filed Apr. 17, 1978, Ser. No. 897,197
Int. Cl.[2] B65B 7/28, 59/04; B67B 3/14, 3/12
U.S. Cl. 53—201 **4 Claims**

1. In closure cap applying apparatus, a reciprocally mounted

work imparting shaft, a self-contained compensator spring unit attached as a structurally independent mechanism to the lowermost working end of said shaft so as to depend therebelow said compensator spring unit including a cylindrical housing having one end closed and an open end, a plunger member telescopically fitted within said open end so as to be principally



confined within said housing, compression spring means peripherally disposed within said housing for resiliently urging said plunger member axially away from said closed end, and a closure cap applying head axially connected to said compensator unit whereby variations in travel distance between said work imparting shaft and said closure cap applying head are accommodated by said self-contained compensator spring unit.

4,173,105

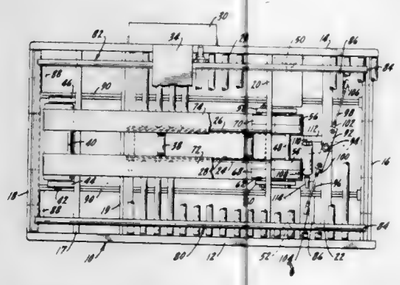
APPARATUS FOR SEALING CONTAINERS

Lawrence W. Ulrich, and Connie W. Walker, both of Bolingbrook, Ill., assignors to Durable Packaging Corporation, Chicago, Ill.

Continuation of Ser. No. 828,272, Aug. 29, 1977, abandoned. This application Jun. 26, 1978, Ser. No. 918,787

Int. Cl.[2] B65B *7/20*

U.S. Cl. 53—374 **1 Claim**



1. Apparatus of the type used for sealing the foldable flaps of cartons of random sizes, said apparatus including a frame structure, a vertically movable sealing head means mounted to said frame structure, a longitudinally extending bottom belt carton conveying means rigidly mounted to said frame structure, and an improved side arm assembly means engagable with opposite sides of said carton for centering and guiding said carton through said sealing head means; said side arm assembly comprising:

(a) first and second longitudinally extending side arm members positioned on opposite sides of the longitudinal center axis of said apparatus, said side arm members being mounted to and extending upward from said frame structure for pivotal movement about a substantially horizontal axis;

(b) a pneumatic cylinder having a first end pivotally secured to said frame structure and a second end pivotally secured to said first side arm member so as to effect pivotal movement of said first side arm member towards and away from the longitudinal center axis of said apparatus;

(c) a flat plate member rotatably mounted about a vertical axis to said frame structure along the longitudinal center axis of said frame structure and outside the longitudinal extent of said carton conveying means; and

(d) first and second straight tie rods having first ends universally secured to opposing ends of said plate member and second ends universally secured to a respective first and second side arm member such that pivot movement of said first side arm member is translated through said first tie rod to rotate said plate member which in turn translates a simultaneous pivotal movement to said second side arm member through said second tie rod.

4,173,106

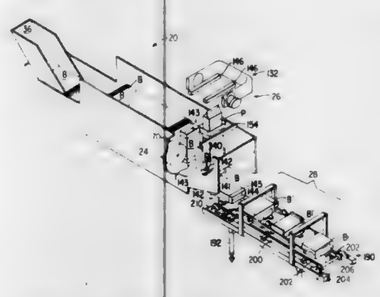
CARTON FORMING METHOD

William Leasure; Luis Garcia; Charles Reifel, and Jack Shelton, all of Houston, Tex., assignors to Mira-Pak Inc., Houston, Tex.

Continuation of Ser. No. 787,062, Apr. 13, 1977, which is a continuation-in-part of Ser. No. 570,504, Apr. 22, 1975, Pat. No. 4,027,579, which is a division of Ser. No. 614,903, Sep. 19, 1975, Pat. No. 4,024,693. This application Aug. 3, 1978, Ser. No. 930,523

Int. Cl.[2] B65B *5/04*

U.S. Cl. 53—449 **4 Claims**



1. A method of forming a bag and box package comprising the steps of forming, filling and sealing a bag, bringing a carton having both ends thereof open into a position beneath the formed, filled and sealed bag, providing a support for the open lower end of the carton, lowering the filled bag into the carton wherein the lower end of the bag is held in a position in alignment with the lower end of the carton by the support, removing the support from the lower end of the carton, and sealing the open ends of the carton with the filled and sealed bag therein.

4,173,107

COLLATING AND PACKAGING MACHINE

Wilfred W. Wilson, Toronto, Canada, assignor to Gemel Ltd., Toronto, Canada

Filed Nov. 4, 1977, Ser. No. 848,479

Int. Cl.[2] B65B *5/10, 35/40*

U.S. Cl. 53—534 **7 Claims**

1. An apparatus for loading sausage-like items into trays comprising:

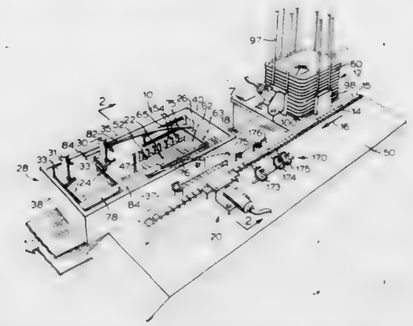
a first endless conveyor for passing the items sequentially along a straight path in a forward direction,

a second endless conveyor laterally adjacent to the first endless conveyor, for carrying trays sequentially in said forward direction,

dispensing means for depositing sequential trays onto said second conveyor,

loader means adjacent the first conveyor on the other side from the second conveyor, the loader means being adapted to displace items laterally off said first conveyor toward the second conveyor,

a table surface suspended over said second conveyor forwardly of said dispensing means and adapted to receive



said items displaced by the loader means, the table surface having a free forward edge above the second conveyor,

means for arresting a tray on said second conveyor such that at least part of the tray projects forwardly beneath said free forward edge,

and reciprocating pusher means above said table surface for pushing off said surface and into the tray items collected on said surface.

4,173,108

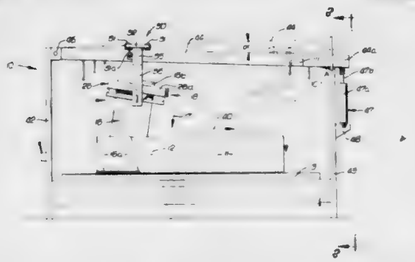
SPIRAL WRAPPING APPARATUS

Robert B. Eglinton, Huntington Beach, and James L. Tuell, Manhattan Beach, both of Calif., assignors to Chromalloy American Corporation, New York, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,540

Int. Cl.[2] B65B *11/04*

U.S. Cl. 53—587 **10 Claims**



1. For use in spiral wrapping a sheet about a longitudinally and horizontally axially elongated generally cylindrical object, the combination comprising

(a) a frame including a beam member extending in the general direction of said object axis, and at a higher elevation than said axis,

(b) means to rotate said object,

(c) support structure carried by the beam to support a sheet roll to rotate about another axis angled from horizontal and to directionally feed the sheet toward and into parallel and close tangency to the object, in a skew feed direction relative to the other axis, in response to rotation of the object,

(d) the beam member tilted at a downhill angle such that tension developed in the sheet during said feed thereof produces a force sufficient in itself to displace the support structure lengthwise along the beam member whereby as the object is rotated about its axis said sheet is fed from said roll and becomes progressively spirally wrapped about the object, and said displacement being at a speed corresponding to the axial rate of spiral wrap advancement along the object,

(e) the support structure supported to pivot in the same angular tilt direction as said beam, and independently of beam tilt.

4,173,109

ANIMAL HALTER

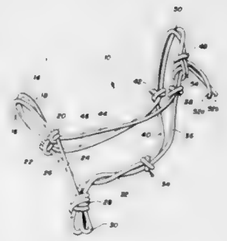
William T. Hibbert, Rte. 2, Box 44, Breckenridge, Tex. 76024

Continuation of Ser. No. 714,140, Aug. 13, 1976, Pat. No. 4,106,266. This application Apr. 13, 1978, Ser. No. 896,091

The portion of the term of this patent subsequent to Aug. 15, 1995, has been disclaimed.

Int. Cl.[2] B68B *1/02*

U.S. Cl. 54—24 **6 Claims**



1. An animal halter, comprising:

a plurality of fixed length segments being formed from a continuous length of line, said segments of the halter being formed and joined together by a plurality of fixed non-slip knots;

an adjustable neck band segment being formed from said length of line and being joined together by an adjustable knot; and

a lead loop being formed from said line for attaching a lead to the halter.

4,173,110

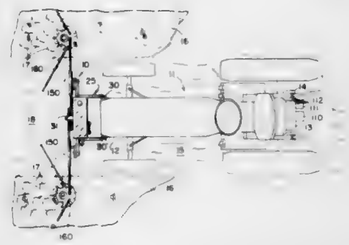
SELF-ACTING IMPLEMENT

Bobbie F. Hansen, Jr., 5393 N. Rolinda, Fresno, Calif. 93705

Filed Jan. 6, 1978, Ser. No. 867,439

Int. Cl.[2] A01D *45/10*

U.S. Cl. 56—10.2 **10 Claims**



6. An implement for cutting canes and the like of a row crop while being borne by a vehicle, having a selectively operable work performing system individual thereto, along a path of travel substantially parallel to said row crop, the implement comprising a cutting head; means for mounting the cutting

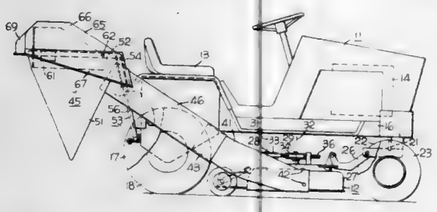
head on the vehicle for movement along a path to and from an extended cutting position; means for moving the cutting head along said path; and control means operatively interconnecting the work performing system of the vehicle and the moving means of the implement for operating said moving means of the implement in response to operation of the work performing system of the vehicle.

4,173,111

VENTED GRASS-CATCHER COVER

James F. Peterson, Cedarburg, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 18, 1977, Ser. No. 825,531
The portion of the term of this patent subsequent to Sep. 13, 1994, has been disclaimed.
Int. Cl.[2] A01D *35/22*
U.S. Cl. 56—202 **5 Claims**



1. A grass catcher comprising:
support means for said grass catcher adapted for connection to the rear of a riding mower whereby said grass catcher is mounted in an elevated position at the rear thereof when installed thereon,
an upwardly opening receptacle secured to said support means, and
a cover structure releasably mounted on the top of said receptacle including
a rigid impervious cover having a main part resting on said receptacle and a rearwardly extending louver at the rear of said main part, said louver extending rearwardly of said receptacle and presenting a downwardly facing discharge opening extending substantially the full transverse width of said receptacle, the inside of said louver constituting a discharge passage connecting the interior of said cover with said discharge opening, said discharge opening being at substantially the same elevation as the top of said receptacle, and
a vertically disposed screen secured to and within said cover across said discharge passage adjacent the junction of said louver with said main part of said cover whereby grass clippings hitting said vertically disposed screen will tend to fall by gravity into said receptacle.

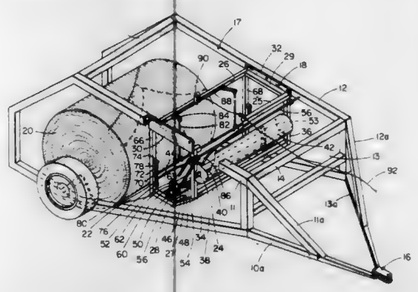
4,173,112

APPARATUS FOR WRAPPING A COVER MATERIAL AROUND ROUND BALES

Elmo R. Meiners, Anchor, Ill., assignor to M & W Gear Company, Gibson City, Ill.

Filed Jul. 27, 1978, Ser. No. 928,507
Int. Cl.[2] A01D *39/00*
U.S. Cl. 56—341 **9 Claims**

1. In a round baler of the type having a bale forming mechanism for transport over a field of cut material to gather and form the material into a round bale, the improvement of apparatus for applying a cover sheet over the round bale during the bale forming operation, said improvement comprising in combination:
(a) a wrapping material roll storage member affixed to the baler forward of the bale forming mechanism, said roll storage member being oriented to position an end of a sheet of wrapping material on the roll member in the path of the cut material for wrapping the bale as the bale is being formed;
(b) drive means for the storage member for removing the sheet of wrapping material from the roll member and directing the end of said sheet along the ground for gathering by the bale forming mechanism about the outside surface of the formed bale;



(c) means forward of the bale forming mechanism for terminating flow of cut material to the bale forming mechanism;
(d) means for cutting the wrapping material intermediate the bale forming mechanism and the roll storage member; and
(e) means for affixing a cut end of sheet material to a bale formed by the bale forming mechanism.

4,173,113

THERMALLY STABLE HELICALLY PLIED CABLE

Donald L. Sneliman, and Willard G. Hudson, both of Seattle, Wash., assignors to Norfin, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 466,174, May 2, 1974, abandoned, which is a division of Ser. No. 311,361, Dec. 1, 1972, Pat. No. 3,821,879. This application Mar. 7, 1975, Ser. No. 556,090
The portion of the term of this patent subsequent to Jul. 2, 1991, has been disclaimed.
Int. Cl.[2] D02G *3/18, 3/40;* **D07B** *1/02, 1/16*
U.S. Cl. 57—249 **40 Claims**



1. A cable, comprising: tensile load bearing elements which can change in length in response to variation in temperature; and thermal radial expansion means operably associated with said load bearing elements in sufficient quantity that overall cable length may be controlled under varying temperature conditions by producing change in the cross sectional area of the cable in opposition to and substantially simultaneously with change in length of said load bearing elements.

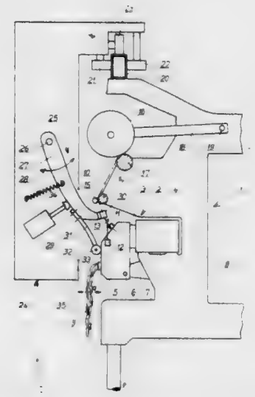
24. A method of making a glass fiber cable, comprising the steps of:
helically winding a plurality of glass fiber rovings to form successive layers of increasing diameter;
surrounding the filaments of each roving with an uncured elastomeric resin having a curing agent or hardener in contact therewith to form an elastomeric cable matrix; and
maintaining the helical angle of the initial and successive layers during lay-up at a substantially constant value selected to provide cured elastomeric resin in sufficient quantity that thermal elongation of the cable produced by thermal elongation of the filaments can be nulled by simultaneous increase in cable cross sectional area produced by thermal radial expansion of the cable matrix, whereby the cable remains essentially constant in length under varying temperatures.

4,173,114

OPEN-END SPINNING MACHINE WITH A PLURALITY OF SPINNING ASSEMBLIES AND AT LEAST ONE MOBILE SERVICING DEVICE

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7341 Bad Überkingen, Fed. Rep. of Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Filed Mar. 8, 1978, Ser. No. 884,572
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1977, 2711163
Int. Cl.[2] D01H *15/00, 13/14*
U.S. Cl. 57—263 **9 Claims**



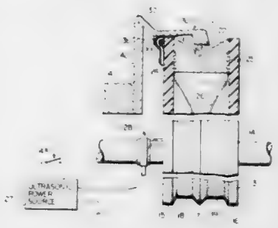
1. Open-end spinning machine apparatus comprising:
a plurality of spinning assemblies disposed adjacent one another,
and a mobile servicing device which is movable to respective servicing positions adjacent respective ones of said spinning assemblies, said mobile servicing device including a servicing instrument engageable with a structural part of a spinning assembly during servicing operations,
wherein said servicing instrument is provided with an aligning element which is positioned in a predetermined position with respect to said servicing instrument,
wherein at least one of said spinning assemblies is provided with a guide element, said guide element being adjustably positioned in a predetermined position with respect to said structural parts,
wherein said aligning element of said servicing instrument is engageable with said guide elements at said spinning assembly to assure precise positioning of said servicing instrument with respect to said structural parts during servicing operations,
and wherein said servicing instrument is movable with respect to said mobile servicing device, and wherein said aligning element is connected to and carried with said servicing instrument.

4,173,115

YARN FORMING APPARATUS WITH NODE WELDING

Phillip W. Chambley, and Alan H. Norris, both of Rome, Ga., assignors to WWG Industries, Inc., Rome, Ga.

Continuation-in-part of Ser. No. 755,671, Dec. 30, 1976, Pat. No. 4,074,511. This application Feb. 6, 1978, Ser. No. 875,423
The portion of the term of this patent subsequent to Feb. 21, 1995, has been disclaimed.
Int. Cl.[2] H01B *13/04;* **D02G** *3/26*
U.S. Cl. 57—293 **8 Claims**



1. An improved apparatus for joining synthetic yarn strands in a machine of the type having means for forming at least two singles yarn strands, means for twisting each of said strands individually to form false-twisted strands, each having longitudinally spaced nodes at which the direction of twist reverses, rotatable guide means having a central axis for guiding and carrying said strands into spaced substantially parallel paths with the nodes of said strands substantially aligned with each other, means at a predetermined location on said guide means for bringing the nodes of said strands into contact with each other, and means for joining said strands to each other at the nodes, the improvement wherein said means for joining comprises
heating means for elevating the temperature of said yarn strand nodes to a temperature substantially at the softening point thereof whereby said nodes are welded to each other.

4,173,116

BULKY YARN SPINDLE FOR SPINNING WHEELS

Nell Schilder, 171 Grandview Rd., Ottawa, Ontario, Canada (K2H 8B9)

Filed Jun. 27, 1974, Ser. No. 483,551
Int. Cl.[2] D01H *3/00, 7/04*
U.S. Cl. 57—316 **2 Claims**



1. A spinning wheel comprising a first spindle for a flyer and a bobbin, said first spindle having a first orifice in its end and a second orifice along its length for guiding yarns to the flyer and the bobbin, a second detachable spindle having an end portion adapted to be fitted into and locked in the first orifice in the first spindle whereby the spinning wheel may alterna-

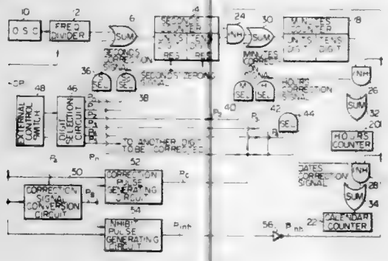
tively be used to spin yarns using the first spindle with the flyer and bobbin or using the second spindle inserted into the end of the first spindle.

4,173,117

ELECTRONIC TIMEPIECE

Kazutoshi Takahashi; Tatsuo Nitta, and Ryoji Iwakura, all of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1977, Ser. No. 844,866
Claims priority, application Japan, Nov. 25, 1976, 51/141417
Int. Cl.[2] G04C *3/00*
U.S. Cl. 58—85.5 **5 Claims**



1. In an electronic timepiece having a frequency standard providing an output frequency signal, a frequency converter responsive to said output frequency signal to provide a low frequency time unit signal and a clock signal, a time counter composed of a plurality of counter circuits responsive to the time unit signal to provide time information signals, display means for providing a display of time information in response to said time information signals, correction gate means coupled to each of said counter circuits for applying correction pulses and a carry signal from a previous stage counter circuit to a succeeding counter circuit to which said correction gate means is coupled, and inhibiting gate means coupled to each of said counter circuits and responsive to a carry inhibiting signal to inhibit carry operation due to said carry signal arising from said correction pulses, the improvement comprising:

a correction switch for producing a correction signal when actuated;

a digit selection switch for producing a digit selection signal when actuated;

digit selection circuit means for selecting a digit to be corrected in response to said digit selection signal;

means for producing an output signal having a first predetermined pulse width in response to said correction signal and said clock signal;

means for generating said correction pulses of a predetermined second pulse width narrower than said first predetermined pulse width in response to said output signal and said clock signal; and

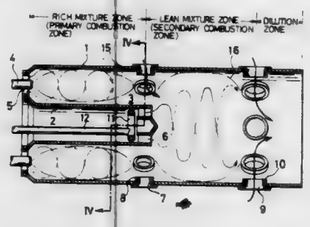
means for producing said carry inhibiting signal of a third predetermined pulse width narrower than said first predetermined pulse width but larger than said second predetermined pulse width, said carry inhibiting signal producing means including a single differentiating circuit having its clock input terminal connected to said frequency converter to receive said clock signal and its data input terminal connected to receive said output signal to produce said carry inhibiting signal composed of a differentiation pulse of said third predetermined frequency.

4,173,118

FUEL COMBUSTION APPARATUS EMPLOYING STAGED COMBUSTION

Katsuyuki Kawaguchi, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 606,794, Aug. 22, 1975, abandoned.
This application Aug. 31, 1977, Ser. No. 829,240
Claims priority, application Japan, Aug. 27, 1974, 49-97517; Aug. 27, 1974, 49-97518; Dec. 3, 1974, 49-137709
Int. Cl.[2] F02C *7/22*
U.S. Cl. 60—39.65 **7 Claims**



1. Fuel combustion apparatus comprising a double concentric combustion cylinder having an outer cylinder and an inner cylinder concentric with, and shorter than the outer one, said inner cylinder being located in the upstream portion of the space within the outer cylinder and extending axially to form an annular space therebetween, a plurality of fuel injection valves installed in a circular arrangement at the head of said annular space, primary combustion air swirlers mounted around each of the fuel injection valves, a secondary combustion air swirler installed at the inner end of the inner cylinder, a first set of air holes annularly disposed in the wall of the outer cylinder in a common plane comprising the outler plane of th inner cylinder and a second set of air holes annularly disposed in the wall of the outer cylinder in a common plane at an axial distance not less than the diameter of the outer cylinder downstream from the said first air holes, both said inner and outer cylinders being imperforate between the head ends thereof and the first set of air holes, and between the first and second sets of air holes thereby defining a primary burning zone in the annular space between said head end and said first set of air holes and a secondary burning zone axially adjacent and downstream thereof between said first and second sets of air holes, said fuel injection valves and primary combustion air swirlers supplying an air-fuel rich mixture to said primary burning zone for combustion therein and said first set of air holes introducing sufficient secondary air to the uncombusted exhaust from said primary zone to provide an air-fuel lean mixture in said secondary burning zone for combustion therein.

4,173,119

CONTROL SYSTEM FOR A GAS TURBINE ENGINE, ESPECIALLY A VEHICULAR GAS TURBINE ENGINE

Christian Greune, Furstenfeldbruck, and Friedrich Hackl, Neu-Esting, both of Fed. Rep. of Germany, assignors to Motoren- und Turbinen-Union Munchen GmbH, Fed. Rep. of Germany

Filed Aug. 23, 1973, Ser. No. 390,844
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1972, 2241363
Int. Cl.[2] F02C *7/02, 9/02, 9/08*
U.S. Cl. 60—39.16 R **70 Claims**

1. Control system for a gas turbine engine, especially for a vehicular gas turbine engine, having a gas generator means including a combustion air compressor and a gas turbine on a common gas generator shaft, a combustion chamber, and a free power turbine, variable guide vanes being arranged at the inlet of said free power turbine, the control system including speed governor means responsive to a controlled variable which is the speed N_1 of the gas generator shaft for providing an output signal for controlling fuel flow to the engine, and temperature governor means responsive to a controlled variable which is a gas temperature T of the gas generator means for providing an output signal for controlling the positioning of the guide vanes, and varying means responsive to engine characteristics for varying the controlled variables and the output signals of said speed governor means and said temperature governor means as a function of engine characteristics, said varying means varying the controlled variable N_1 in accordance with the input temperature T_{t1} of the engine and varying the controlled variable T in accordance with the input temperature T_{t1} and the speed N_1 of the gas generator shaft, said varying means varying the output signal of said speed governor means in accordance with the input temperature T_{t1} of the engine, one of the gas turbine inlet temperature T_{t3} and outlet temperature T_{t4} of the gas generator means, and a multiplier K representing at least one characteristic of the engine, and said varying means varying the output signal of said temperature governor means in accordance with the difference between the specified speed N_{1spec} and the actual speed N_{1act} of the gas generator shaft.

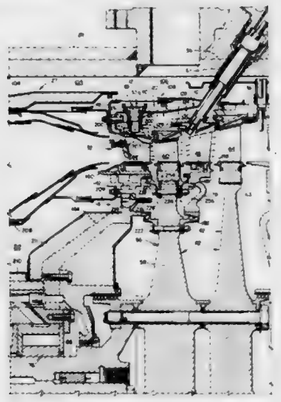


4,173,120

TURBINE NOZZLE AND ROTOR COOLING SYSTEMS

William C. Grosjean, Poway, and John J. Hensley, Delmar, both of Calif., assignors to International Harvester Company, Chicago, Ill.

Filed Sep. 9, 1977, Ser. No. 831,961
Int. Cl.[2] F02C *3/10*; E01D *25/14*
U.S. Cl. 60—39.16 R **13 Claims**



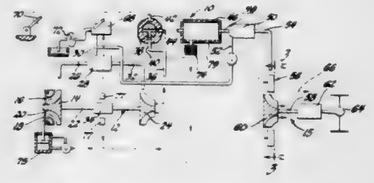
1. A gas turbine comprising: a nozzle case through which heated gases are adapted to flow to drive a turbine rotor rotatably supported in said case; a housing surrounding said case in spaced relation thereto; first and second stage, flow directing nozzles supported in longitudinally spaced relationship from said case; and means for cooling said nozzles and said case comprising means for directing a first stream of air directly from the space between said housing and said case to the interiors of the nozzles in one of said stages, means in the space between said housing and said case and surrounding the latter for directing a second, separate stream of air from said space into impinging relationship with said case in the span between said nozzle stages around the periphery of said case, and means for then directing said second stream of air into the interiors of the nozzles in the other of said stages.

4,173,121

HYBRID DUAL SHAFT GAS TURBINE WITH ACCUMULATOR

Mason K. Yu, Birmingham, Mich., assignor to American Standard, Inc., New York, N.Y.

Filed May 19, 1978, Ser. No. 907,894
Int. Cl.[2] F02C *3/10*
U.S. Cl. 60—39.16 R **3 Claims**



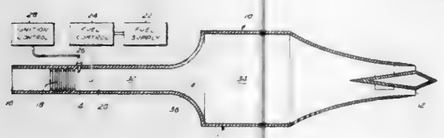
1. An automotive gas turbine engine comprising: a gasifier spool having a compressor on one end thereof and a gasifier turbine on the opposite end thereof, means including a variable area inlet for controlling air flow to said compressor during operation of said gasifier spool, a power turbine, a primary burner receiving air from said compressor and operative to produce motive fluid for driving said gasifier turbine, means including a thermally insulated accumulator and a secondary burner to receive exhaust flow from said gasifier turbine, means including a variable area nozzle to control flow from said accumulator and said secondary burner to said power turbine, control means operative on engine start to open said variable area inlet and to direct fuel to said primary burner until the gasifier turbine increases its speed to produce a predetermined charge pressure in said accumulator, said control means including a pressure sensor operative following attainment of said predetermined charge pressure to close said inlet and cut back fuel flow to a predetermined idle fuel flow level in said primary burner, said idle fuel flow level to said primary combustor being selected to maintain said gasifier spool at eighty-five to ninety-five percent of its full design speed, said control means including a manual operator concurrently controlling said variable area nozzle to direct a controlled amount of motive fluid from said accumulator to said power turbine to meet the vehicle power requirements, said control means further being operative to control fuel flow to said secondary burner to maintain a desired power turbine inlet temperature schedule to meet the driver demanded vehicle output power, and said pressure sensor detecting the pressure level in said accumulator during road operation and operative when the pressure level in said accumulator falls below the maximum predetermined charge pressure to open said variable area inlet and to add fuel to said primary burner whereby the gasifier spool will accelerate to recharge the accumulator to maintain the maximum predetermined pressure level therein whereby optimized gasifier section fuel consumption is attained and increased power turbine pressure ratios are maintained.

4,173,122

INTERMITTENT BURNING JET ENGINE

David B. Wilkinson, Xenia, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 9, 1978, Ser. No. 876,442
Int. Cl.[2] F02K 7/02
U.S. Cl. 60—247 3 Claims



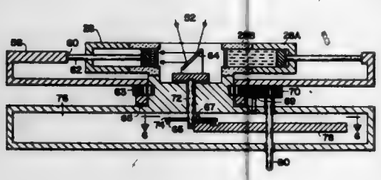
1. An intermittent burning ramjet engine comprising: an elongated tubular member including an inlet diffuser at one end, adapted to receive ram inlet air, and an exit nozzle at the other end; a rough wall combustor within said elongated tubular member; means for supplying fuel to said combustor; means for cyclically igniting said fuel in said combustor, at a predetermined frequency; means, positioned between said combustor and said ram air inlet, for reducing the magnitude of the pressure fluctuations in the inlet diffuser, due to the cyclical ignition of the fuel in the combustion chamber, by a factor of at least 100.

4,173,123

OPTICALLY DRIVEN SOLAR ENGINE

Richard W. Gurtler, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 705,842, Jul. 16, 1976, abandoned. This application Jul. 8, 1977, Ser. No. 814,232
Int. Cl.[2] F03G 7/02
U.S. Cl. 60—641 4 Claims



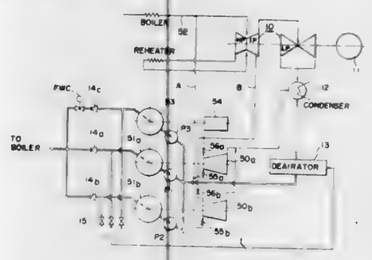
1. An optically driven solar engine, comprising:
(a) a plurality of elements which convert solar energy to mechanical motion, each of said elements comprising a cylinder, a piston operatively disposed in said cylinder, and a thermally expandable fluid in said cylinder, said cylinder having a transparent head which allows solar energy to be transmitted into said cylinder;
(b) means for focusing the sun's rays;
(c) a reflective surface, movable to selectively reflect said focused rays into said cylinders; and
(d) fluid flow passages interconnecting said cylinders, said passages capable of transmitting said thermally expandable fluid from one of said cylinders to another of said cylinders.

4,173,124

BOILER FEED WATER PUMP CONTROL SYSTEMS

Katsumasa Fujii, Tokyo, and Naoshi Takeda, Fuchu, both of Japan, assignors to Tokyo Shibaura Kenki Kabushiki Kaisha, Kanagawa, Japan

Filed Feb. 7, 1978, Ser. No. 875,896
Claims priority, application Japan, Feb. 8, 1977, 52-12843
Int. Cl.[2] F01K 13/02
U.S. Cl. 60—667 5 Claims



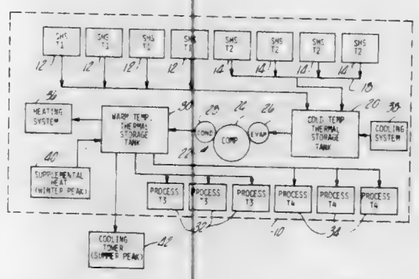
1. A boiler feed water pump control system of a steam electric power generating plant provided with a boiler, a steam turbine driven by the steam generated by said boiler, a generator driven by said steam turbine, and a feed water system of said boiler including a motor driven feed water pump provided with a flow control valve and a steam turbine driven feed water pump, said control system comprising a digital computer including a flow quantity control system responsive to the degree of opening of said flow control valve and discharge quantity of said motor driven feed water pump for controlling the flow quantity thereof, a speed control system responsive to the number of revolutions and discharge flow quantity of said steam turbine driven feed water pump, system head pressure of said feed water system and the operation of a control motor which is used to control steam supplied to a steam turbine for driving said steam turbine driven feed water pump, and means responsive to the load of said power plant for effecting transfer between said flow quantity control system and said speed control system.

4,173,125

ENERGY RECOVERY SYSTEM

Norman F. Bradshaw, Richmond, England, assignor to Schweitzer Industrial Corporation, Madison Heights, Mich.

Filed Mar. 16, 1978, Ser. No. 887,156
Int. Cl.[2] F25B 7/00, 27/02
U.S. Cl. 62—79 20 Claims



1. An energy recovery system for collecting and utilizing heat energy dissipated from a plurality of relatively low, different temperature secondary heat sources in an industrial plant or other installation, the system comprising:
heat pump means including a refrigeration unit consisting of an evaporator, a condenser, and means for condensing said refrigerant in said condenser, and vaporizing said refrigerant in said evaporator, whereby heat energy is transferred from said evaporator into said condenser;
collection heat transfer means associated with each of said secondary waste heat sources causing transfer of heat from said secondary heat sources into said evaporator of said heat pump means, comprising: a plurality of heat exchanger means, one each associated with each of said secondary heat sources and means for transferring heat from said secondary heat sources into said respective associated heat exchanger means and further including a heat transfer medium circulated through each of said plurality of heat exchanger means; a cool temperature thermal storage tank means; means for collecting the heat transfer medium flow circulated through each of said heat exchanger means into said cool temperature thermal storage tank; means for transferring heat from said cool temperature thermal storage tank means into said evaporator associated with said heat pump means, said cool temperature thermal storage tank means further including means for collecting quantities of heat transfer media flow from respective different temperature secondary heat sources in respective different spaces within said cool temperature thermal storage tank means; segregation means for separately maintaining heat transfer media of differing temperatures in said respective different spaces preventing intermixing thereof and maintaining the maximum thermal energy of said heat transfer media received from said plurality of heat exchanger means associated with each of said secondary heat sources;
at least one heat using process device;
process utilization heat transfer means causing heat transfer from said condenser of said heat pump means to at least one heat utilizing process device;
whereby said heat transfer from said relatively low temperature heat sources into said evaporator and said transfer by said heat pump into said condenser enables said utilization of said heat in said at least one heat utilizing process device.

19. A method of recovering heat energy from a plurality of different temperature secondary heat sources located in varying locations within an industrial plant or similar installation, the method comprising the steps of:
transferring heat from each of said secondary heat sources to the evaporator of a heat pump unit including the steps of: circulating a heat transfer medium through a heat exchanger means associated with each of said secondary heat sources; collecting quantities of said heat transfer media in a common thermal storage tank received from respective different flows from each of said heat exchangers at varying locations in said common thermal storage tank; segregating the respective differing temperature quantities of collected heat transfer media from each other;
transferring heat rejected in the condenser of said heat pump unit to heat using process devices, whereby the heat energy may be recovered from said secondary heat source at relatively low different temperatures and utilized at relatively high temperatures by operation of said heat pump unit.

4,173,126

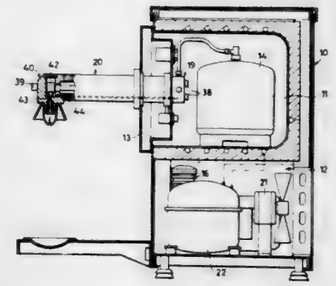
MACHINE FOR THE CONTINUOUS PRODUCTION OF WHIPPED CREAM

Emanuele Romano, Chiasso, Switzerland, assignor to Wetrifin A.G., Mauren, Italy

Filed Oct. 17, 1977, Ser. No. 842,805
Claims priority, application Italy, Oct. 15, 1976, 28401 A/76
Int. Cl.[2] B01F 3/04
U.S. Cl. 62—306 8 Claims

1. A machine for the continuous production of whipped cream during a given time period, comprising:

a cabinet a refrigerating cell disposed in a top portion of said cabinet and including a bottom compartment
a tank containing a food mixture disposed in said cell
a door mounted on said cabinet so as to close said cell
a texturizer mounted on said door



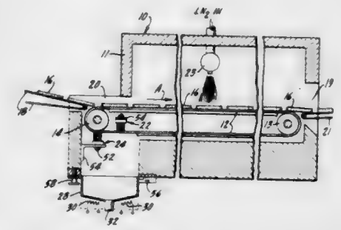
piping members interconnecting said tank and said texturizer means for feeding a gas under pressure disposed in said bottom compartment of said cell, and
a motor and compressor unit disposed in said bottom compartment forming a refrigerating loop of said cell.

4,173,127

FROST REMOVAL APPARATUS FOR CRYOGENIC FREEZING TUNNEL

Glenn A. Sandberg, Lockport, Ill., assignor to Formax, Inc., Mokena, Ill.

Filed Nov. 2, 1977, Ser. No. 847,720
Int. Cl.[2] F25D 3/10, 25/04
U.S. Cl. 62—374 4 Claims



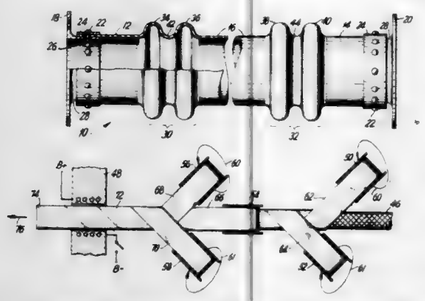
1. Frost removal apparatus for a cryogenic freezing tunnel of the kind in which comestibles, delivered from an outside source, are frozen by contact with a fluid cryogen introduced into the tunnel, a conveyor of open-mesh endless belt form inside the tunnel presenting a reverse turn where the path of the conveyor belt reverses from a lower pass in one direction to an upper pass in the opposite direction, an input opening in one wall of the tunnel through which the comestibles are fed and deposited on the conveyor, the frost removal apparatus comprising a brush engaging the conveyor in its lower pass for brushing accumulated frost from the interstices of the conveyor, a pan to collect the frost brushed from the conveyor, and a heater means to melt the collected frost in the pan.

4,173,128

COMPOSITE DRIVE SHAFT

Nicholas Corvelli, Smithtown, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed May 23, 1978, Ser. No. 908,742
Int. Cl.[2] F16C *1/00*
U.S. Cl. 64—1 S **14 Claims**



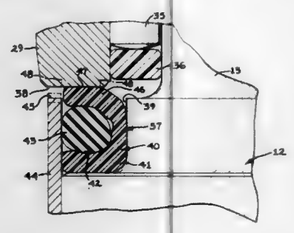
1. A compliant composite drive shaft of a symmetrical lamination comprising:
- a tubular length having bellows adjacent each end inwardly of connection means for the shaft to be used between driving and driven devices said tubular length and bellows having:
- an inner layer of a first continuous filament reinforced tape, said inner layer including several of said tapes layed in alternating acute angles to the axis of the shaft;
- an intermediate layer of a second continuous filament reinforced tape including at least one such tape layed along the longitudinal axis of the shaft about said inner layer; and
- an outer layer of said first continuous filament reinforced tape, said outer layer including several of said tapes layed in alternating acute angles to the axis of the shaft, which acute angles are a repeat of that of said tapes of said inner layer providing integrated inner, intermediate and outer layers throughout the tubular length including the bellows adjacent each end that is symmetrical about the shaft axis such that said bellows provide an integrated universal for said shaft within the extremities and adjacent the ends of the drive shaft.

4,173,129

UNIVERSAL JOINT STRUCTURE WITH IMPROVED SEAL

Donald F. Durham, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 13, 1978, Ser. No. 895,889
Int. Cl.[2] F16D *3/26*
U.S. Cl. 64—17 A **13 Claims**



1. In a universal joint structure having a yoke carrying first and second inwardly opposed coaxial bearing caps defining inner angular end surfaces, and a member having first and second outwardly opposed coaxial trunnions journaled respectively in said first and second bearing caps, said trunnions having a preselected axial play in said bearing caps, the improvement comprising:
- means on said member and said bearing caps cooperatively defining a first annular seal space adjacent said first bearing cap and a second seal space coaxial of said trunnions adjacent said second bearing cap;
- a first annular seal ring in said first seal space having a C-shaped cross section opening away from the axis of said trunnions, one radially extending leg of the seal ring being juxtaposed to the annular end surface of said first bearing cap with a force of approximately 30 to 70 pounds;
- a first annular load ring compressed within said C-shaped seal ring and urging said one leg of the seal ring sealingly against said annular end surface of said first bearing cap;
- a second annular seal ring in said second seal space having a C-shaped cross section opening away from the axis of said trunnions, one radially extending leg of said second seal ring being juxtaposed to the annular end surface of said first bearing cap;
- a second annular load ring compressed within said second C-shaped seal ring and urging said one leg of the second seal ring sealingly against said annular end surface of said second bearing cap with a force of approximately 30 to 70 pounds; and
- retainer means for loading said load rings to cause the radially extending legs to be sealingly engaged with said end surfaces and the seals to be sealingly engaged with said member inwardly of said trunnions over the entire range of axial play movement of said trunnions in said bearing caps, thereby to define an effective oil seal between said member and bearing caps.

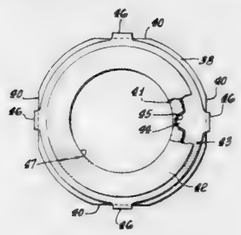
4,173,130

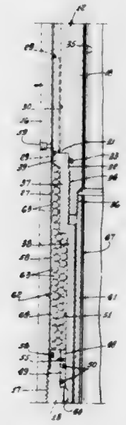
DRILLING SHOCK SUB

Wayne N. Sutliff, and Jim L. Downen, both of 2931 Pierce Rd., Bakersfield, Calif. 93308

Filed Jan. 31, 1978, Ser. No. 874,035
Int. Cl.[2] F16D *3/06;* **F16F** *9/30, 9/06*
U.S. Cl. 64—23 **1 Claim**

1. In a well drill string shock sub, the combination of:
- inner and outer axially telescopically related tubular elements;
- spline means transmitting torque between said elements;
- means for connecting one of said elements to a drill bit;
- means for connecting the other of said elements to a drill string assembly;
- at least one pair of opposed shoulders being provided on said elements to set a limit to expansive telescopic movement between said elements;
- overlapping portions respectively of said elements being comparatively thin walled to provide an annular hydraulic cushion confining chamber closed by annular sliding seals at its opposite ends;
- a semi-hydraulic elastically compressible cushion confined in and filling said chamber to produce normally the telescopic expansion of the tool to its maximum length, the dispersed phase of said cushion comprising a well packed body of polyurethane pellets the continuous phase of said cushion comprising a body of engine lubricating oil of the order of Mobil No. 1;
- the thin walled overlapping portion of said inner element referred to as the outer wash pipe being secured by right hand female threads to right hand male threads of an adjoining thick walled portion of said inner element, said thick walled portion of said inner element being counter bored at one end and at the same end thereof being provided with left hand female threads;
- a left hand threaded inner wash pipe fitting within said counter bore and screwing into the female left hand threads thereof; and





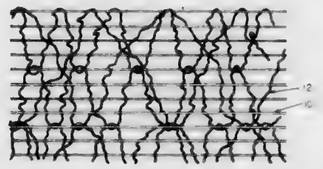
- tang washer means for interlocking outer ends of said outer and inner wash pipes to assure against either becoming accidentally unscrewed.

4,173,131

POROUS ELASTIC BANDAGE

John E. Pendergrass, Seneca, and David T. Melton, Walhalla, both of S.C., assignors to The Kendall Co., Walpole, Mass.

Continuation-in-part of Ser. No. 917,267, Jun. 20, 1978, abandoned, which is a continuation of Ser. No. 829,130, Aug. 30, 1977, abandoned, said Ser. No. 829,130, is a continuation-in-part of Ser. No. 746,360, Dec. 1, 1976, abandoned. This application Nov. 15, 1978, Ser. No. 960,906
Int. Cl.[2] D04B *7/12, 9/12;* **A61L** *15/00*
U.S. Cl. 66—192 **6 Claims**



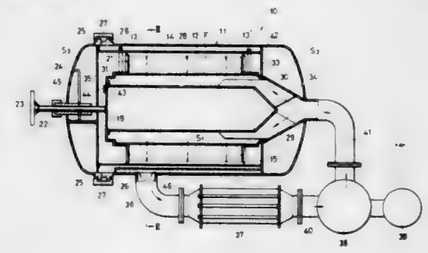
1. A self-supporting, open mesh knitted elastic bandage characterized by the tendency of overlapping layers of the bandage to cling to each other in relatively non-displaceable relationship, which comprises
- a set of composite parallel warp yarns comprising a first false-twist yarn formed into stitch loop chains with a second false-twist yarn inlaid into the loops of said first false-twist yarn,
- said second false-twist yarn being of opposite twist from the twist of said first false-twist yarn,
- and a plurality of individual filling yarns describing varied and cursive patterns across said set of composite warp yarns and being inlaid therewith,
- said varied and cursive patterns of filling yarns overlapping one with another across a substantial portion of the width of said bandage,
- no individual filling yarn pattern extending across more than a minor portion of the width of said bandage,
- and a portion at least of the length of said filling yarns lying in slack looped configuration on the surface of said bandage.

4,173,132

DYEING APPARATUS

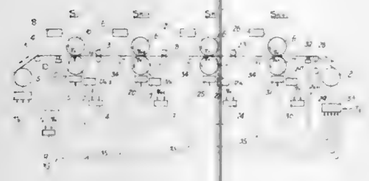
Isao Sugimoto, Aichi, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Chiyoda and Nippon Dyeing Machine Mfg. Co., Ltd., Aichi, both of, Japan

Filed May 24, 1978, Ser. No. 909,123
Int. Cl.[2] D06B *5/18*
U.S. Cl. 68—189 **6 Claims**



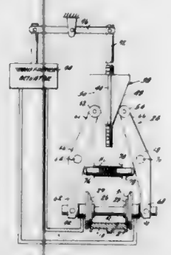
1. A dyeing apparatus which comprises a cylindrical vessel of generally circular cross-section extending longitudinally along a generally horizontal axis, said vessel having an outer wall; means defining a perforated hollow beam supported within said vessel and extending longitudinally along said axis; said beam being capable to support material to be dyed wound upon the exterior of the beam, the perforations of said beam allowing dye liquid to flow into and through such material; an elongated dummy cylinder positioned within the hollow portion of the beam to define therewith an annular flow passage for the dye liquid; a non-perforated elongated cylindrical shell supported within said vessel and interposed in laterally surrounding relation to said beam and material supported thereby, said shell being spaced-apart in relation to said outer wall of the vessel to define with said outer wall a first circumferential chamber, said shell defining a boundary of a second circumferential chamber confining dye liquid passed from said annular flow passage through the perforations of the beam and said material, said shell having at its upper portion an opening that permits overflow of dye liquid from said second circumferential chamber into said first circumferential chamber; means flow connected with said annular flow passage to introduce therein dye liquid; and means flow connected with said first circumferential chamber for the outflow therefrom of overflow dye liquid collected therein.

4,173,133
CONTINUOUS ROLLING MILL
Isao Imai, Yokohama, and Hiroyuki Shiozaki, Yokosuka, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 24, 1978, Ser. No. 880,935
Claims priority, application Japan, Feb. 28, 1977, 52-21344
Int. Cl.[2] B21B *37/06*
U.S. Cl. 72—8 **1 Claim**



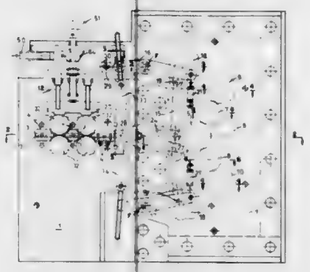
1. A rolling mill wherein a part of upper and lower work rolls are rotated at different peripheral velocities in order to maintain the peripheral velocity ratio of the work rolls substantially equal to an elongation ratio at which a sheet metal is rolled, the rolling mill comprising:
(a) velocity detecting means for detecting the velocities of the sheet metal entering and leaving one or each rolling mill stand;
(b) first work roll velocity control means for controlling the peripheral velocity of one of said pair of upper and lower work rolls which is rotated slower than the other;
(c) second work roll velocity control means for controlling the peripheral velocity of the other work roll;
(d) first velocity comparison means for comparing the peripheral velocity of said one work roll of a first mill stand with the velocity of said sheet metal entering the stand to generate a first correction signal representative of the difference between the entering sheet metal velocity and the one work roll peripheral velocity when there exists a difference therebetween, and first sheet metal tension control means responsive to said first correction signal for correcting the tension of the sheet metal entering the first mill stand, whereby the velocity of said sheet metal entering the first mill stand may be maintained substantially equal to the peripheral velocity of said one work roll of the stand;
(e) second velocity comparison means for comparing the peripheral velocity of said the other work roll with the velocity of said sheet metal leaving the rolling mill stand to generate a second correction signal representative of the difference between the leaving sheet metal velocity and the other work roll peripheral velocity when there exists a difference therebetween, and second sheet metal tension control means responsive to said second tension correction signal for correcting the tension of the sheet metal leaving the rolling stand, whereby the velocity of said sheet metal leaving the rolling mill stand may be maintained substantially equal to the peripheral velocity of said other work roll of the rolling mill stand; and
(f) third sheet metal tension control means for controlling a recoiler so that the tension of the sheet metal leaving a last rolling mill stand may be maintained at a predetermined value.

4,173,134
APPARATUS AND METHOD FOR GUIDING A RING STRUCTURE DURING THE MANUFACTURE THEREOF
Niilo T. Huuskonen, Salem, and Dante P. DiBattista, Lynn, both of Mass., assignors to General Electric Company, Lynn, Mass.
Filed Feb. 24, 1978, Ser. No. 881,096
Int. Cl.[2] B21H *1/06*
U.S. Cl. 72—10 **17 Claims**



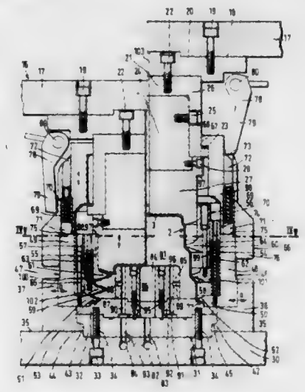
1. For use in a method of manufacturing a metal ring to a desired contour and radial diameter the steps comprising:
providing an initial metal ring having an initial axial width;
rolling the initial ring about a first axis of rotation and between selected pairs of roll forming dies so as to progressively vary the axial width of said ring from said initial axial width to a second axial width;
providing a pair of axially spaced-apart guide members disposed adjacent to said ring and adapted to maintain said ring in a predetermined location with respect to said roll forming dies;
providing sensing means for sensing variations in said axial width of said ring; and
varying the axial spacing between said spaced-apart guide members in response to said sensing means.

4,173,135
MACHINE FOR COILING METAL WIRE
Enrico Lamperti, Via Ercole Ferrario 4, Gallarate (Varise), Italy
Filed Apr. 12, 1977, Ser. No. 786,791
Claims priority, application Italy, Apr. 12, 1976, 83614 A/76
Int. Cl.[2] B21F *3/02, 11/00*
U.S. Cl. 72—21 **3 Claims**



1. An automatic machine for coiling metal wires to form springs, comprising power driven means (**40, 32**) to advance wire to be coiled, means (**36**) to coil the advanced wire, a pair of slides (**33, 34**) disposed on opposite sides of the path of advance of the wire, a retractor (**70**) detachably mounted on one of said slides (**33, 34**) for opening a coiled wire, a cutter (**65**) detachably mounted on the other of said slides (**33, 34**) for severing a length of coiled wire, said cutter (**65**) and retractor (**70**) being adapted to be interchangeably mounted on either of said slides (**33, 34**), a first power-driven shaft (**24**) having means (**22**) for imparting to either of said slides a wire cutting movement, a second power-driven shaft (**23**) having means (**25**) to impart to either of said slides a coil retracting movement, and means (**15, 15', 16, 17**) for selectively interchangeably interconnecting either of said shafts (**23, 24**) with either of said slides (**33, 34**) thereby selectively to adapt said machine to the formation of right-hand coils or left-hand coils.

4,173,136
METHOD AND APPARATUS FOR PRODUCING MULTIPLE GROOVE V-BELT PULLEYS
Wilhelm H. Schroth, Ringstrasse 12, D-6053 Obertshausen, Fed. Rep. of Germany
Filed Nov. 17, 1977, Ser. No. 852,563
Int. Cl.[2] B21D *26/04*
U.S. Cl. 72—58 **19 Claims**



1. A method for producing a multiple groove V-belt pulley from sheet metal during a shaping operation to form the multiple groove V-belt pulley by cold-working a prefabricated cup-shaped blank having at least one cylindrical portion and axially displaceable segmental shaping parts which form shaping rings to embrace said blank comprising moving said shaping parts radially up to the blank at axially spaced precisely predetermined positions to form and shaping rings, moving a sleeve-like retaining member over the shaping parts of a first one of said shaping rings so that the shaping parts cannot move radially outward during the shaping operation, producing controlled fluid pressure within the cup-shaped blank to engage the walls of the cup-shaped blank firmly against the shaping parts along spaced peripheral lines, axially compressing said cup-shaped blank while the other of said shaping rings are independently movable in an axial direction from an initial position at the start of the operation to a final position at the end of the operation without being subject to axial pressure from any other part moving said other shaping rings together to simultaneously form the grooves in the pulley, moving said sleeve-like retaining member from around the shaping parts of said first one of said shaping rings and moving said shaping parts radially outward away from the shaped pulley.

4,173,137
BENDING FIXTURE FOR OFFSET PLATES
Heinz Metje, Mittelstrasse 21, 5630 Leichlingen, Fed. Rep. of Germany
Filed Jun. 23, 1977, Ser. No. 809,429
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1976, 2628249
Int. Cl.[2] B21D *25/04, 5/04*
U.S. Cl. 72—320 **9 Claims**

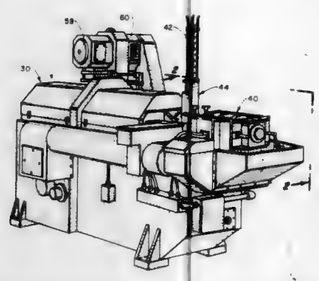


1. A bending fixture for offset plates provided with positioning holes, said bending fixture comprising:
a platform having a flat horizontal upper surface for supporting an offset plate;
a first bending bar being disposed at one end of said platform;
a second bending bar being disposed at an opposite end of said platform;
means for pivotally mounting said first and second bending bars relative to said platform for swinging said first and second bending bars upwardly from their rest positions at the opposite ends of said platform to their bending positions above said platform;
retractable pin means disposed in said first bending bar in a bending area of the plate for positioning the plate on said platform, said retractable pin means including pins disposed in a direction along a length of said first bending bar, said pins being disposed in front of said one end of said platform and extending outwardly in an upward direction from an upper surface of said first bending bar when said first bending bar is in its rest position;
hold-down means for holding down the plate on said platform;
means for raising and lowering said hold-down means relative to said upper surface of said platform;
said hold-down means including positioning rail members, a first of said rail members being disposed at said one end of said platform for cooperating with said first bending bar and a second of said rail members being disposed at said opposite end of said platform for cooperating with said second bending bar; and
said first and second rail members providing back up abutments for bent over edges of the plate.

4,173,138
CAN BODYMAKER HAVING IMPROVED RAM SUPPORT AND DRIVE
Ralph M. Main, San Pedro, and Elpidifor Paramonoff, Los Angeles, both of Calif., assignors to Standun, Inc., Compton, Calif.
Filed Oct. 28, 1977, Ser. No. 846,420
Int. Cl.[2] B21D *22/28*
U.S. Cl. 72—349 **18 Claims**

1. In a can bodymaker and the like of the type having a drive mechanism operably connected to a rearward end of a horizontally reciprocal ram axially moving the ram forwardly through and rearwardly through and from a die assembly, the ram in its forward movement engaging a shallow metal cup blank over a ram forward end and carrying the blank forwardly through the die assembly converting the blank into a relatively deep cup-shaped can body; the improvements comprising: axially spaced and aligned hydrostatic oil bearing sleeves secured stationary on said bodymaker rearwardly of said die assembly and circumferentially surrounding said ram,

said axially spaced bearing sleeves being between said die assembly and said drive mechanism connection to said ram rearward end in all positions of ram movement supporting said ram forward end movable in cantilever fashion projecting forwardly of said bearing sleeves progressively axially into and from said die assembly, said axially spaced bearing sleeves being the last effective alignment maintaining support of said ram forward end prior to entrance of said ram into and during



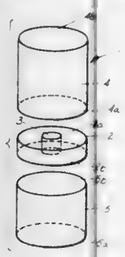
withdrawal from said die assembly, said bearing sleeves having oil bearing pads directing constantly pressurized and flowing oil films against said ram maintaining with said bearing sleeve spacing said ram supported aligned with said die assembly in all positions of ram movement including said ram cantilever projection and a majority of said ram isolated as to said support and alignment from a remainder of said bodymaker in all positions of ram movement.

4,173,139

ULTRASONIC REFERENCE STANDARD AND THE METHODS OF CONSTRUCTION AND USE THEREOF

Don L. Conn, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed Apr. 21, 1978, Ser. No. 898,666
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—1 DV **11 Claims**



1. A reference standard for calibrating ultrasonic flaw detecting test equipment and the like comprising a substantially solid body having at least two spaced surfaces adapted to be engaged and abutted by the test equipment for introducing ultrasonic energy into said body from either surface, and at least one void of known dimensions totally enclosed within said body at a known distance from said surface, said void having two spaced substantially planar surfaces configured to reflect substantially all of the ultrasonic energy impinging on said planar surfaces toward the test equipment, the volume of said void being substantially less than the volume of said body.

10. The method for calibrating ultrasonic flaw detection test equipment and the like by introducing ultrasonic sound waves of known characteristics from the test equipment into a continuously rotating reference standard containing a void and receiving and interpreting waves reflected from said void comprising the steps of:

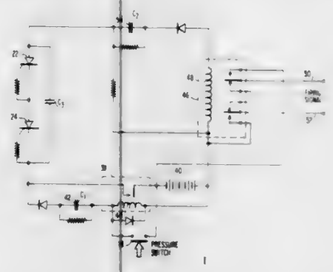
(a) rotatably supporting a substantially cylindrical reference standard having a void of known dimensions totally enclosed within the standard at a known distance from the surface of the standard, said void having two spaced substantially planar surfaces configured to reflect substantially all of the ultrasonic sound waves impinging on said planar surfaces toward the test equipment;
(b) continuously rotating the standard about its longitudinal axis;
(c) introducing ultrasonic sound waves of known characteristics from said test equipment into said standard; and
(d) receiving and interpreting waves reflected from said void to calibrate the test equipment.

4,173,140

TRIGGER DEVICE FOR EXPLOSION BARRIER

Israel Liebman, Library; Frank T. Duda, Oakdale, and Ronald S. Conti, Pittsburgh, all of Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Feb. 3, 1978, Ser. No. 874,953
Int. Cl.[2] G08B *17/00*
U.S. Cl. 73—35 **8 Claims**



1. An apparatus for monitoring the conditions in an area where flammable materials can accumulate and providing a triggering signal when conditions indicative of an explosion are detected, comprising:

a pressure detector for detecting a sudden pressure increase in said area and providing an energizing signal in response thereto; and

first and second radiation detectors for monitoring said area for radiation in response to said energizing signal, said first and second radiation detectors being mounted in a common housing with their axes angularly spaced, said radiation detectors detecting radiation through a common aperture in said housing whereby said first and second radiation detectors monitor nonoverlapping portions of said area, said apparatus providing said triggering signal when both of said radiation detectors simultaneously detect an amount of radiation indicative of the presence of an explosion-related flame.

4,173,141

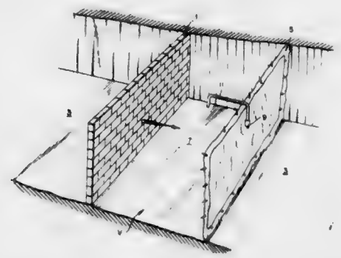
METHOD OF DETERMINING GAS LEAKAGE THROUGH A MINE STOPPING

Fred N. Kissell, Pittsburgh; Slavoljub D. Maksimovic, Library, both of Pa., and Joseph E. Matta, Bel Air, Md., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Nov. 28, 1978, Ser. No. 964,416
Int. Cl.[2] G01M *3/20*
U.S. Cl. 73—40.7 **5 Claims**

1. A method for determining the gas leakage past a mine passageway stopping comprising the steps of:

(1) setting up a test gas barrier in the mine passageway adjacent to the mine stopping to form a substantially closed gas test chamber therebetween;
(2) introducing a tracer gas into the test chamber;
(3) mixing said tracer gas with the ambient gas in the test chamber;



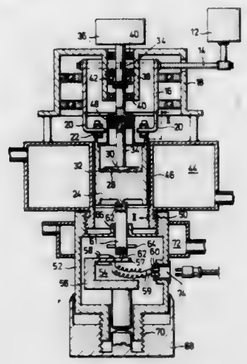
(4) periodically measuring the rate of change in concentration of said tracer gas in the chamber; and
(5) determining the gas leakage past said mine passageway stopping based upon the measured rate of changes in tracer gas concentrations.

4,173,142

ROTARY VISCOMETER

Werner Heinz, Dabringhauser Str. 72, D-5000 Köln-Dellbruck, Fed. Rep. of Germany

Filed Mar. 28, 1978, Ser. No. 891,138
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1977, 2733099
Int. Cl.[2] G01N *11/10*
U.S. Cl. 73—60 **10 Claims**



1. A rotary viscometer operating on the plate to cone or plate to plate principle constructed in the form of a first assembly comprising:

(1) a chamber containing a substance whose viscosity is to be measured,
(2) means for heating same,
(3) upper and lower, counter-rotating measuring surfaces within the chamber, and
(4) a torque measuring device for measuring the tangential force exerted on one of the said measuring surfaces,

and a second assembly, comprising:

(1) a housing,
(2) a releasable connection between the housing and the first assembly,
(3) a force measuring device located within the housing for measuring the force acting normal to one of the said measuring surfaces, and
(4) means for transmitting force from the measuring surface for which the normal force acting thereon is to be measured, to the said force measuring means.

4,173,143

FLUID FLOW MEASURING APPARATUS

Roy Venton-Walters, Steyning, England, assignor to Ricardo & Co., Engineers (1927) Limited, Shorham-by-Sea, England

Filed Aug. 10, 1978, Ser. No. 933,044
Claims priority, application United Kingdom, Aug. 11, 1977, 33782/77
Int. Cl.[2] G01F *1/32*
U.S. Cl. 73—194 VS **14 Claims**



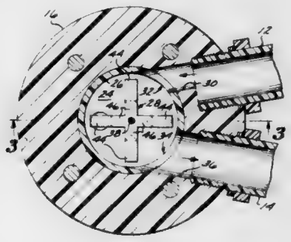
1. A fluid flow meter which comprises a flow duct through whose interior a fluid flow whose velocity to be measured can be passed, and a vortex-shedding bar positioned in the duct to extend across its interior transversely to the direction of fluid flow therein, means for sensing the passage of Karman vortices shed from the bar across a flow section close to the bar in the downstream direction said means producing an alternating output signal, and means for deriving from the output signal a modified output signal of square wave form suitable for operating a digital counter, wherein the improvement comprises at least one additional cross-member positioned in the duct to extend across its interior close to and down-stream of the said flow-section where the vortex-sensing means operates, the additional cross-member extending transversely to the vortex-shedding bar and having sufficient width, in the direction transverse to the flow direction, to cause the divergent parting of the fluid flow.

4,173,144

LOW FLOW RATE TRANSDUCER CONSTRUCTION

Edwin Pounder, La Canada, Calif., assignor to Transdynamics, Burbank, Calif.

Filed Apr. 3, 1978, Ser. No. 892,949
Int. Cl.[2] G01F *1/06*
U.S. Cl. 73—229 **8 Claims**



1. A fluid flow rate sensor construction comprising:

a housing having a cylindrical wall and opposite end walls defining a cylindrical fluid chamber;

inlet and outlet conduits extending tangentially through said cylindrical wall to define inlet and outlet ports, an imagi-

nary longitudinal extension of said inlet conduit into said fluid chamber defining an inlet stream tube;

a paddle wheel assembly rotatably mounted in said fluid chamber and including a hub and a plurality of paddle assemblies extending radially from said hub, each of said paddle assemblies comprising a paddle and strut means connecting said paddle to said hub in spaced relation to define an aperture between said paddle and said hub, each said paddle on rotation of said paddle wheel assembly successively assuming a stream tube position wherein said paddle intersects substantially all of said imaginary longitudinal extension of said inlet conduit, said aperture providing a passageway for fluid flow past said paddle thereby to prevent pulsating fluid flow through said outlet conduit;

a light source mounted in one of said end walls and spaced from the axis of rotation of said paddle wheel assembly; and

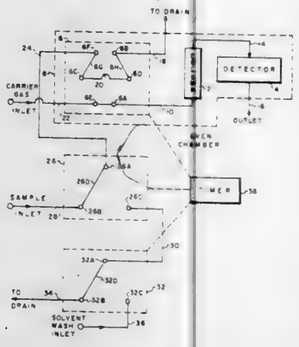
a photosensor mounted in the opposite one of said end walls for receiving light from said light source, the interruption of said light by said paddle assemblies initiating electrical signals indicative of the rate of rotation of said paddle wheel assembly.

4,173,145

SOLVENT WASH SYSTEM FOR A CHROMATOGRAPHIC ANALYZER

Damien E. Durbin, Martin City, Tex., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 8, 1977, Ser. No. 858,786
Int. Cl.[2] G01N *31/08*
U.S. Cl. 73—422 GC **8 Claims**



1. A chromatographic analyzer system comprising

a fluid flow detector having an input and an output,

a chromatographic column having an input and having an output connected to said input of said detector,

a sampling valve having a first input, a second input and a third input and a first output, a second output and a third output, said first output of said sampling valve being connected to said input of said column,

a fluid sample storage loop connected between said first input of said sampling valve and said second output of said sampling valve,

a first fluid switching valve having two inputs and one output,

a second fluid switching valve having two inputs and one output,

a fluid conduit arranged at one end for connection to a source of a sample fluid to be analyzed and connected at the other end to a first input of said first fluid switching valve,

a second fluid conduit connecting said output of said first switching to said second input of said sampling valve,

a third fluid conduit arranged at one end for connection to a continuous flow source of a wash solvent and connected at the other end to a second input of said second switching valve,

a fourth fluid conduit connecting said output of said second switching valve to a second input of said first switching valve,

a fifth fluid conduit arranged at one end for connection to a carrier gas source and connected at the other end to said third input of said sampling valve,

said first and second valves being arranged to selectively connect their output to said first and second inputs in a first and second valve position respectively, and said sampling valve being arranged to selectively connect said second input to said first input and said second output to said third output in one mode of operation and said first input to said third input and said second output to said first output in a second mode of operation, and

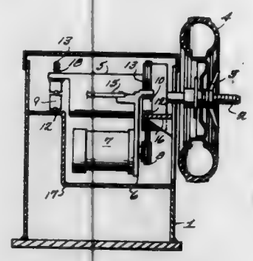
timer means for operating said sampling valve and said first and second switching valves in a desired sequence, said sequence selectively and concurrently operating said first and second switching valves between said first and second positions while said sampling valve is in said one mode of operation.

4,173,146

APPARATUS FOR BALANCING UNBALANCED BODIES

Horst Kögler, Dieburg, and Eickhart Goebel, Pfungstadt, both of Fed. Rep. of Germany, assignors to Gebr. Hofmann G.m.b.H. & Co. KG, Maschinenfabrik, Darmstadt, Fed. Rep. of Germany

Filed May 24, 1978, Ser. No. 909,060
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1977, 2732738
Int. Cl.[2] G01M *1/22*
U.S. Cl. 73—462 **2 Claims**



1. Apparatus for detecting the condition of balance of an unbalanced body in a first and second measuring plane comprising:

a pedestal body;

a mounting shaft having a front portion extending outward from said pedestal body for mounting an unbalanced body and a rear portion rotatably mounted in said pedestal body, along the longitudinal axis of said shaft;

a plurality of force detecting transducer means for horizontally supporting said mounting shaft and producing signals indicating imbalance when said unbalanced body is rotated;

further means for supporting said mounting shaft against movement in all other degrees of freedom;

wherein said plurality of force detecting transducer means, said further supporting means and the longitudinal axis of said mounting shaft are located in a single horizontal plane;

said plurality of force detecting transducer means includes at least three transducers, two of said at least three transducers being laterally arranged in said first plane of measurement adjacent to said mounting shaft; and another of said at least three transducers being disposed in a second plane of measurement behind said rear portion of said mounting shaft centered along the line of the longitudinal axis of said mounting shaft; and

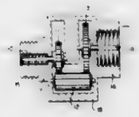
a housing which supports said transducers, and said pedestal body, said further supporting means comprising leaf springs fixedly mounted to said housing and said pedestal and laterally arranged in the horizontal plane of said longitudinal axis.

4,173,147

MILES TO KILOMETERS SPEED AND DISTANCE INDICATORS CONVERTER

Steve Zathy, 1709 Bloor W., Ste. 202, Toronto, Ontario, Canada (M6P 1B2)

Filed Dec. 19, 1977, Ser. No. 861,982
Int. Cl.[2] G01P *1/04*
U.S. Cl. 73—532 **1 Claim**



1. A converter to be connected between a vehicle transmission and a vehicle speedometer having a speedometer cable connected between the speedometer and the transmission by disconnectable couplings, the converter converting calibration of the speedometer between miles per hour and kilometers per hour, comprising:

a housing having an annular wall joining two opposed end walls;

a first spindle entering the housing through a first end wall and supporting a first gear near the end of the spindle inside the housing;

a second spindle entering the housing through the second end wall and supporting a second gear near the end of the spindle inside the housing, the first and second gears having different numbers of teeth in the ratio of miles to kilometers;

first and second coupling means outside the housing and respectively surrounding the spindles and cooperative to receive said disconnectable couplings;

an idler gear journaled in the housing between the end walls and offset from said spindles, the idler gear meshing with said first and second gears; and

a partition in said housing extending between the first and second gears from the annular wall opposite the idler gear toward the idler gear, the partition having bearing holes therein respectively located opposite said spindles and supporting the inner ends of the spindles.

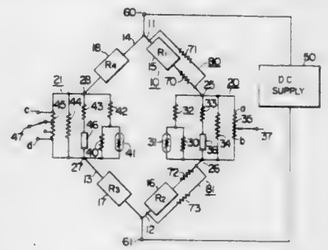
4,173,148

SEMICONDUCTOR STRAIN GAUGE WITH TEMPERATURE COMPENSATOR

Kazuji Yamada; Hideo Sato, both of Hitachi; Tsutomu Okayama; Motohisa Nishihara, both of Katsuta; Yoshitaka Matsuoka, Mito; Katsuya Katohgi, Hitachiota; Yasumasa Matsuda, and Satoshi Shimada, both of Hitachi, all of Japan, assignors to Hitachi, Ltd, Japan

Filed Oct. 5, 1978, Ser. No. 948,778
Claims priority, application Japan, Oct. 7, 1977, 52-119916
Int. Cl.[2] G01B *7/16*
U.S. Cl. 73—766 **7 Claims**

1. In a semiconductor strain gauge with a temperature compensator having a bridge circuit with four arms including semiconductor strain gauge elements to which pressure or strain is applied, said bridge circuit having input terminals for coupling a DC power suply with a pair of diagonally opposite junctions of said bridge circuit per se and output terminals for driving an output of said bridge circuit from a pair of remaining diagonally opposite junctions of said bridge circuit, initial zero-point temperature compensators each connecting in series and in parallel to each of semiconductor strain gauge elements on adjacent two arms of said bridge circuit and each comprising resistors for equalizing the resistance values and the temperature coefficients of all the semiconductor strain gauge elements when no pressure or strain is applied to the semiconductor strain gauge elements on the four arms, and a first temperature compensator for zero-point shift adjustment which is provided between the arms closer to one of the output terminals and is comprised of resistors for making the temperature coefficient of said first temperature compensator equal to that of the sensitivity of the semiconductor strain gauge element, the improvement wherein said first temperature compensator for zero-point shift adjustment is comprised of:



a first circuit including a temperature sensitive element with a positive primary temperature coefficient and a resistor connecting in series to the temperature sensitive element;

a second circuit including a parallel circuit including a thermistor and a resistor connecting in parallel to the thermistor and a resistor connecting in series to the parallel circuit;

a third circuit including a fixed resistor and a variable resistor with a common terminal connecting in parallel to the fixed resistor, the common terminal of the variable resistor connecting to one of the output terminals which is closer to the common terminal per se, said first to third circuit being connected in parallel and wherein B constant of the thermistor falls within a range 2,000° K. to 3,000° K. and the resistance value of the thermistor falls with a range 0.5 KΩ to 5 KΩ, and the resistance value of the temperature sensitive element with a positive primary temperature coefficient falls within a range 0.5 kΩ to 5 KΩ.

4,173,149

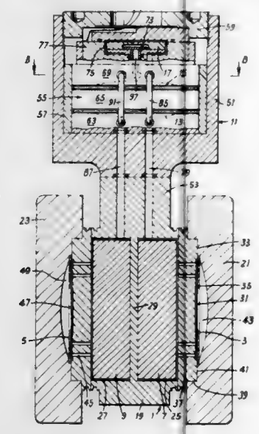
DIFFERENTIAL PRESSURE SENSING DEVICES

Donald L. Critten, and Charles E. Bardwell, both of Luton, England, assignors to George Kent Limited, Luton, England

Filed May 2, 1978, Ser. No. 902,224
Claims priority, application United Kingdom, May 2, 1977, 18295/77
Int. Cl.[2] G01L *13/02*
U.S. Cl. 73—706 **16 Claims**

1. A pressure sensing device wherein a first part of the device contains a first volume of liquid and has a side wall comprising a flexible separator diaphragm through which, in use, pressure is transmitted from a working fluid to said first volume of liquid, sensing means are provided for sensing pressure applied to said first volume of liquid or a difference between the pressure applied to said first volume of liquid and pressure of a fluid outside said first part of the device, a first overload diaphragm has opposed surface thereof subjected to

the pressure of the first volume of liquid and the pressure of the outside fluid, respectively, said first overload diaphragm comprises a dished plate having an inner section which extends inwardly of said first part of the device relative to a peripheral section thereof, said first overload diaphragm is inflexible or substantially inflexible over a working range of differential pressures between said first volume of liquid and the outside fluid but becomes flexible and changes in shape when the pressure of the working fluid increases to a value such that the pressure applied to said first volume of liquid exceeds the pressure of the outside fluid by a predetermined amount, there



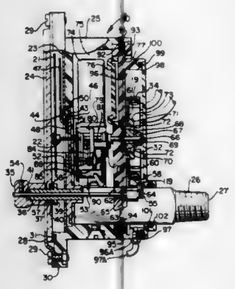
then being a movement of said inner section relative to said peripheral section in a direction outwardly of said first part of the device sufficient to allow a movement of said separator diaphragm inwardly of said first part, and means are associated with said separator diaphragm which serve, when said separator diaphragm has moved inwardly by a predetermined amount, to cause a resistance to further inwards movement and to prevent any further increase in the pressure of the working fluid from being applied via said first volume of liquid to said sensing means, changes in said first volume of liquid, when the said associated means have operated, being accommodated by changes in shape of said first overload diaphragm.

4,173,150

SENSOR WITH ADJUSTABLE PRESSURE RESPONSIVE DETECTION AND CONTROL

Tommy L. Gray, Dallas, Tex., assignor to Span Instruments, Inc., Plano, Tex.

Filed May 18, 1977, Ser. No. 797,914
Int. Cl.[2] G01L 7/04
U.S. Cl. 73—714 **39 Claims**



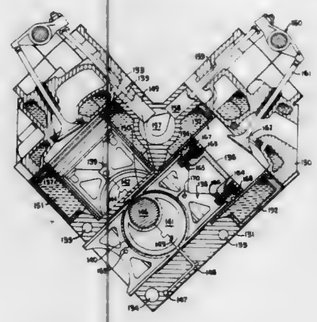
1. A pressure change responsive system for sensing a predetermined pressure limit: a pressure change sensitive device; mounting means for said pressure change sensitive device; said device having an output end remote from connection of said device to said mounting means; pivot means in said mounting means for a pivotally mounted arm connected for movement by the output end of said pressure change sensitive device, said arm including trip means; sensor means mounted in said mounting means for actuating engagement by the trip means of said arm when the arm is pivoted to a predetermined limit as driven by fluid pressure change induced movement of the output end of said pressure change sensitive device wherein said sensor means is fastened to a pivotally mounted plate pivotal about a pivot axis common to said pivot means; and pressure limit setting means for selectively adjusting the predetermined pressure limit position of said sensor means.

4,173,151

MOTION TRANSLATING MECHANISM

Reed H. Grundy, 4081 W. Benden Dr., Murrysville, Pa. 15668

Filed Jun. 30, 1977, Ser. No. 811,529
Int. Cl.[2] F16H 21/18
U.S. Cl. 74—49 **3 Claims**



1. A multi-reciprocating displacement member to rotary motion mechanism including in combination,

(a) a crankshaft having a crank arm with an eccentric pin integrally secured to said crank arm, said crankshaft mounted so that said crank arm and said eccentric pin rotate about a crankshaft axis,

(b) at least two circular linkpieces each having a center axis parallel to said crankshaft axis, each of said circular linkpieces having an opening positioned eccentric to said center axis of each of said circular linkpieces, said circular linkpieces mutually secured to each other such that said eccentrically positioned openings share a common axis,

said crank arm eccentric pin positioned within said circular linkpieces eccentric openings in a manner that allows relative rotary movement between said eccentric pin and said mutually secured circular linkpieces in a path in a fixed zone defined by said circular linkpieces movement,

(c) at least two displacement members mounted for reciprocating motion within separate walled cylinders, each displacement member having opposed parallel flat surfaces positioned in mating engagement with flat surfaced regions of said walls of said cylinders,

said mating engagement providing bearings to support resultant thrust forces arising in said fixed zone,

each of said displacement members having a circular opening in said fixed zone, each of said displacement members circular openings having a central axis at right angles to said fixed zone and parallel respectively to said opposed parallel flat surfaces of said displacement members,

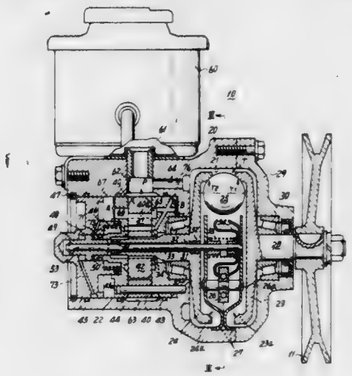
(d) each of said circular linkpieces are positioned such that they are in mating relationship within said displacement members circular openings, reciprocating motion transmitted to said displacement members is thereby converted to rotary motion and said resultant thrust force, said rotary motion of said crankshaft about said crankshaft axis arises through the relative motion of said displacement members, said mutually secured circular linkpieces and said integrally secured eccentric pin of said crankshaft crank arm and said resultant thrust forces are supported by said bearings.

4,173,152

CONTINUOUSLY VARIABLE SPEED CONVERTER FOR COOPERATIVE USE WITH A FLUID PUMP

Yukio Kondo, Toyota; Minoru Kawabata, Aichi, and Mikio Suzuki, Hekinan, all of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha and Toyota Jidosha Kogyo Kabushiki Kaisha, both of Aichi, Japan

Filed Oct. 19, 1977, Ser. No. 843,673
Claims priority, application Japan, Oct. 22, 1976, 51-127650
Int. Cl.[2] F16H 15/00, 15/40, 17/02
U.S. Cl. 74—190 **13 Claims**



1. A continuously variable speed converter comprising:

a main housing;

input and output shafts rotatably carried in said main housing in axial alignment with each other;

a pair of friction discs respectively provided on said input and output shafts and formed with opposing guide ways;

a plurality of balls held in contact with said guide ways of said friction discs;

holding and adjusting means for holding said plurality of balls in contact with said guide ways and for angularly tilting the rotational axis of each of said balls in each plane, including the axis of said input shaft, so as to adjust the output/input speed ratio;

a pump casing received within a pressure chamber, formed in said main housing, for movement in an axial direction of said output shaft and having an internal cam bore;

a pump rotor received within said internal cam bore and mounted on said output shaft for being driven thereby so as to deliver pressurized fluid into said pressure chamber; and

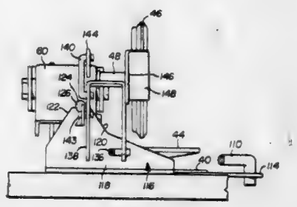
first and second side plates held in contact with both sides of said pump casing and rotor and formed at respective outer sides with first and second areas for receiving pressure of fluid delivered into said pressure chamber, said first and second areas being different from each other in effective area so as to axially pressure said output shaft toward said input shaft.

4,173,153

FRICTION DISC TRANSMISSION

Alan G. Klug, and John H. Marto, both of Oshkosh, Wis., assignors to J. I. Case Company, Racine, Wis.

Filed May 17, 1977, Ser. No. 797,706
Int. Cl.[2] F16H 15/10; A01D 69/8
U.S. Cl. 74—197 **8 Claims**



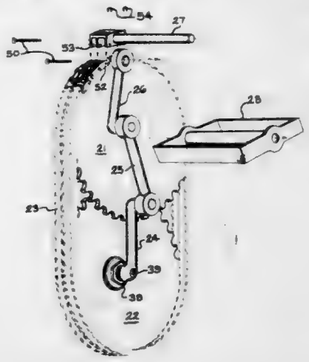
1. A friction disc transmission, comprising: a drive disc rotatably supported on a generally vertical shaft, power means rotating said drive disc, a driven friction disc rotatably supported above said drive disc on a horizontal shaft, said horizontal shaft supported on a frame means yieldably biasing said friction disc against said drive disc, said vertical drive disc shaft mounted on a laterally swingable support, said support swingable about a vertical axis generally parallel to and spaced from said vertical drive disc shaft, a control guide on said support having an upwardly facing vertically inclined camming face extending generally tangent to an arc drawn about said vertical support axis and a guide on the distal end of said frame means engaging said camming face upon lateral swinging movement of said support vertically lifting said frame means and said friction disc out of engagement with said drive disc.

4,173,154

BICYCLE DRIVE SPROCKET SYSTEM

Nile E. Sawmiller, and Craig S. Sawmiller, both of 784 S. Metcalf St., both of Lima, Ohio 45804

Filed Nov. 16, 1977, Ser. No. 851,827
Int. Cl.[2] F16H 9/00, 11/00
U.S. Cl. 74—217 B **7 Claims**



1. A drive mechanism for a foot propelled vehicle comprising, in combination, an upper pair of chain sprockets rotatably journaled on an upper horizontal axis extending transverse of the vehicle frame, said upper pair of sprockets axially spaced from each other and secured together for rotation about said upper axis,

a lower pair of chain sprockets rotatably journaled on a lower horizontal axis extending parallel to said upper axis, said lower pair of sprockets axially spaced from each

other along said lower axis and lying in closely adjacent, parallel planes from the plane of said upper chain sprockets,

a pair of double strand chains extending around and engaging with the peripheries of said upper and lower pairs of chain sprockets with one double chain interconnecting with one upper and one lower sprocket, and the other interconnecting with the other upper and lower sprocket,

a pair of pedals secured to said chains in diametric opposition to each other and extending laterally outwardly therefrom to provide means for propelling said chains and sprockets in rotation about their axes, and

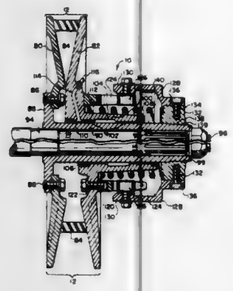
a drive member secured for rotation with one of said upper or lower sprockets to provide a power takeoff from said drive mechanism.

4,173,155

VARIABLE DIAMETER TORQUE SENSING DRIVE

Paul G. Togami, East Moline; T. Gary Drayer, Silvis, both of Ill., and James M. Francis, Bettendorf, Iowa, assignors to International Harvester Company, Chicago, Ill.

Filed Sep. 16, 1977, Ser. No. 833,776
Int. Cl.² F16H *55/52, 55/56*
U.S. Cl. 74—230.17 M **12 Claims**



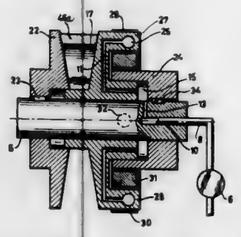
1. A torque sensing unit adapted for use in driving the threshing rotor of a harvesting combine, said unit comprising a variable diameter input sheave designed for cooperation with an engine-driven V-belt, and an output shaft concentric with the input sheave and having means whereby it may be drivingly connected to said rotor, an inner sleeve mounted on said shaft in axially fixed relation for rotation in unison therewith, an outer sleeve rotatably mounted on said inner sleeve and slidable axially therealong, a fixed sheave section extending radially from the front end of said inner sleeve, an axially shiftable sheave section extending radially from the front end of said outer sleeve, opposed V-belt engaging surfaces on said sheave sections, a collar-like hub mounted on the rear end of said inner sleeve for rotation in unison therewith, a generally cylindrical follower-supporting sleeve pivotally mounted about a pivot axis on said hub for limited axial side sway relative to the axis of the hub, a compression spring interposed between said hub and axially shiftable sheave section and yieldingly biasing the latter sheave section toward the fixed sheave section, an open-ended tubular cam member coaxial with and surrounding the sleeves and having its front rim region secured to said axially shiftable sheave section and projecting rearwardly therefrom, a pair of diametrically disposed generally V-shaped in configuration rearwardly opening cam races formed in the rear rim region of said cam member, a pair of roller-type cam followers projecting in diametric fashion into the confines of a respective cam race and carried in diametrically opposed relationship by said generally cylindrical follower-supporting sleeve upon coaxial axes parallel to said pivot axis and cooperating with said cam races whereby differential rotational movement between said sheave sections incident to the frictional drag exerted by the V-belt on said movable sheave section tending to cause the same to overrun the fixed sheave section incident to an increase in the load on the output shaft will exert a camming action by the followers against the cam races and augment the biasing action of said spring against said axially shiftable sheave section.

4,173,156

INFINITELY VARIABLE CONE PULLEY GEAR

Alexandre Horowitz, Eindhoven; Rudolf J. G. A. van der Hoorn, Nuenen, and Jozef W. M. Kummeling, Leende, all of Netherlands, assignors to Volvo Car B.V., Eindhoven, Netherlands

Filed Sep. 29, 1977, Ser. No. 837,922
Claims priority, application Netherlands, Oct. 5, 1976, 7611001
Int. Cl.² F16H *55/52*
U.S. Cl. 74—230.17 F **25 Claims**



1. An infinitely variable cone pulley gear arrangement comprising an endless transmitting element such as a belt or chain running between two pairs of conical discs, one of these on a driving shaft and the other on a driven shaft, at least one disc of each pair being slidable in axial direction on its shaft, hydraulic means producing a control axial pressure on the slidable cones so as to adjust themselves automatically in dependence of the torque transmitted by the driving shaft to the driven shaft, a hydraulic service line receiving a pressure fluid such as oil from a suitable source under pressure and distributing the pressure to the cones to be pressurized, wherein, within a coupling element between a driving motor and a variator section driven thereby a hydraulic cushion is applied so sole means for the transfer of the torque to or from said variator section, free of metallic contact between said variator section and said driven shaft, said service line being connected to a chamber for hydraulic medium in said coupling element, wherein the pressure created in said cushion depends on torque.

4,173,157

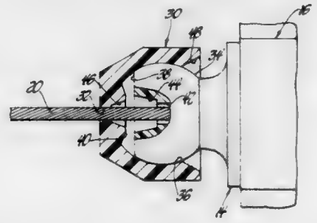
MOTION TRANSMITTING REMOTE CONTROL ASSEMBLY

Donald M. Miller, Pontiac, and Grant A. Webb, West Bloomfield, both of Mich., assignors to Teleflex Incorporated, Linferick, Pa.

Filed Apr. 14, 1978, Ser. No. 896,319
Int. Cl.² F16C *1/10*
U.S. Cl. 74—501 R **10 Claims**

1. A motion transmitting remote control assembly of the type for transmitting forces along a curved path by a motion transmitting core element, said assembly comprising; a guide means, a flexible motion transmitting core element movably supported by said guide means with a first end thereof extending from said guide means to provide a variable extended length of said core element between said guide means and said first end, terminal means disposed on said first end of said core element for operatively attaching said core element to a control member, and wiper means supported by said guide means for swivelling movement relative thereto and in wiping engagement with said core element for preventing foreign matter on said extended length of said core element from entering said

guide means upon movement of said core element and whereby the axis of said extended length may move in a conical area as allowed by said swivelling movement, said guide



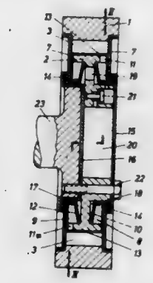
means including a male spherical end portion and said wiper means comprising a female spherical member movably disposed on said end portion.

4,173,158

TUNED ABSORBER FOR TORSIONAL VIBRATIONS WITH HYDROSTATIC DAMPING

Leonhard Geislinger, Höfelgasse 26, Salzburg, Austria

Filed Jan. 18, 1977, Ser. No. 760,430
Claims priority, application Austria, Jan. 23, 1976, 438/76
Int. Cl.² F16F *15/00*; F16D *63/00*
U.S. Cl. 74—574 **7 Claims**



1. A tuned absorber for torsional vibrations with hydrostatic damping, which comprises

(a) an outer member,

(b) an inner member,

(1) the outer and inner members being rotatable relative to each other, and

(2) the outer and inner members defining primary chambers therebetween, the primary chambers comprising at least one first primary chamber arranged to decrease in volume upon relative rotation of the outer and inner members in one sense and at least one second primary chamber arranged to increase in volume in response to said rotation,

(c) a damping liquid in the primary chambers,

(d) means defining secondary chambers, the secondary chambers comprising first and second secondary chambers,

(e) resilient means arranged in each one of the secondary chambers to exert no torque on the outer and inner members, and

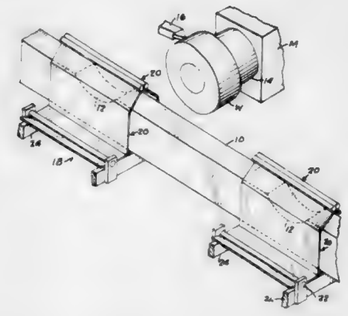
(f) passages connecting each one of the first the primary and secondary chambers, on the one hand, and each one of the second primary and secondary chambers, on the other hand, for permitting the liquid to flow from the primary chambers to the secondary chambers for applying liquid pressure to the resilient means in the secondary chambers.

4,173,159

TRANSFER MECHANISM AND METHOD

Frank C. Skrentner, Bloomfield Hills, Mich., assignor to F. Jos. Lamb Company, Warren, Mich.

Filed May 18, 1978, Ser. No. 907,000
Int. Cl.² B23B *3/00, 13/00*
U.S. Cl. 82—1 C **12 Claims**



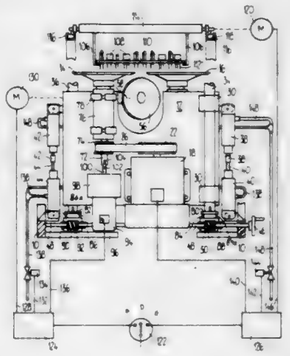
1. In a transfer machine which includes a plurality of regularly spaced machining stations and a transfer bar for indexing workpieces through said successive stations, said transfer bar having work carriers thereon spaced to correspond with the spacing between said stations and being reciprocable through advance and retract strokes corresponding in length to the spacing between successive stations to position the workpieces successively at each of said stations, that improvement which comprises, means for arresting movement of the transfer bar at approximately the mid point of its retract stroke to permit machining the workpieces at the stations while the work carriers are located approximately midway between successive stations.

4,173,160

MACHINE FOR CUTTING THE LEAD ENDS OF COMPONENTS MOUNTED AT PRINTED-WIRING BOARDS

Fritz Hess, Mettmenstetten, Switzerland, assignor to EPM AG, Zurich, Switzerland

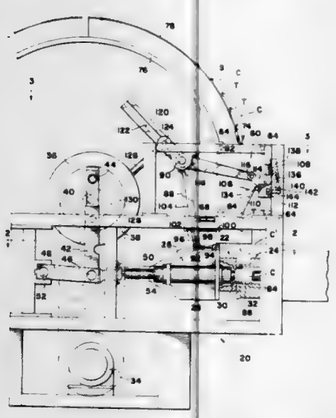
Filed Feb. 27, 1978, Ser. No. 881,798
Claims priority, application Switzerland, Mar. 7, 1977, 2790/77
Int. Cl.² B26D *7/12*
U.S. Cl. 83—174 **16 Claims**



1. A machine for cutting the lead ends of components mounted at a printed-wiring board, comprising:

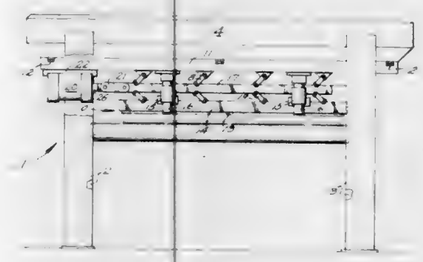
at least one rotatable cutting disk;
means for driving said cutting disk;
a grinding device for grinding said cutting disk;
means for enabling said cutting disk and said grinding device to be advanced in relation to one another;
said grinding device comprising a grinding disk;
said cutting disk having a pair of oppositely situated faces;
one of the faces of said cutting disk being located in confronting neighboring relationship to the printed-wiring board which is being processed;
the other of said faces of said cutting disk being directed away from said printed-wiring board;
said enabling means including means mounting said grinding disk adjacent said cutting disk at the side of the face of said cutting disk which is directed away from the printed-wiring board to be processed;
the plane containing the grinding disk being arranged at least approximately at right angles to the plane containing the cutting disk;
said rotatable cutting disk including a rotational shaft defining an axis of rotation for the cutting disk;
said axis of rotation being disposed at least approximately in the plane containing the grinding disk;
means for stationarily mounting said grinding disk;
said enabling means including structure for advancing said cutting disk downwardly in axial direction towards said stationarily mounted grinding disk.

4,173,161
TRIM PRESS
Albert W. Arends, Gladwin, and George L. Pickard, Beaverton, both of Mich., assignors to Leesona Corporation, Beaverton, Mich.
Filed Sep. 6, 1977, Ser. No. 831,093
Int. Cl.[2] B26F *1/40*
U.S. Cl. 83—278 **13 Claims**



1. In a trim press for severing cup-shaped articles formed in synthetic plastic sheet material from the sheet, said press including a frame, die means on said frame for receiving an article integral with said sheet to locate the article relative to said frame, reciprocable punch means movable on said frame to and from said die means for severing an article located in said die means from said sheet upon the forward stroke of said punch means, drive means for driving said punch means in reciprocation, and feed means for intermittently feeding said sheet with articles formed therein to said die means in synchronism with the stroke of said punch means; the improvement wherein said feed means comprises a treadle mounted on said frame for reciprocating movement along a first path parallel to the path of movement of said reciprocable punch means, first means coupling said treadle to said punch means for coordinating the movement of said treadle with the stroke of said punch means, sheet guiding means fixedly coupled to said treadle for guiding said sheet in movement to said die means, and feed finger means for feeding said sheet to said die means in intermittent movement coordinated with the stroke of said punch means.

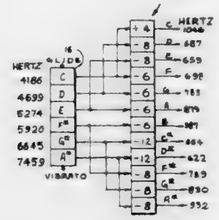
4,173,162
PNEUMATICALLY BRAKED BLADE ASSEMBLY FOR A CLIPPER MACHINE
Ernest P. Shaughnessy, Rte. 1, Box 474, Portland, Oreg. 97231
Continuation-in-part of Ser. No. 717,200, Aug. 24, 1976, abandoned. This application Jan. 16, 1978, Ser. No. 869,650
Int. Cl.[2] B26D *5/12*; B27L *5/08*
U.S. Cl. 83—617 **13 Claims**



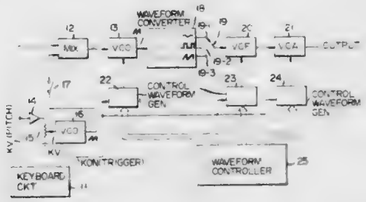
1. In combination with a toggle assembly of a clipping machine, a reciprocally cyclical blade carried by said assembly with a cutting stroke and a return stroke coincident with lengthwise movement of a toggle bar and passage of toggle linkages through an upright position, the improvement comprising,
a pneumatic cylinder of the double acting type imparting lengthwise movement to the toggle bar of the toggle assembly causing one reciprocal cycle of blade operation, a piston within said cylinder having axial extensions of reduced diameter, a piston rod, and end caps closing the cylinder and each defining a central recess to alternatively receive said piston extensions, each end cap recess in communication with a valve controlled pressurized source of air for alternately powering the piston, and cylinder exhaust means within each of said end caps, said exhaust means including pressurized air biased valve members alternately opening to vent a non-constant flow of air from ahead of the moving piston from the cylinder interior at a predetermined cylinder pressure value the build up of which pressure dissipating blade and toggle assembly inertia to prevent blade rebound from a blade rest position.

4,173,163
TONE GENERATOR FOR ELECTRONIC ORGAN
Stephen L. Howell, Jasper, Ind., assignor to Kimball International, Inc., Jasper, Ind.
Filed Jul. 8, 1977, Ser. No. 813,826
Int. Cl.[2] G10H *5/06*
U.S. Cl. 84—1.01 **6 Claims**

1. The method of generating tone frequencies for musical purposes, especially for use in electronic organs, which comprises: generating six input frequencies which are related in frequency substantially as selected diverse tones of the chromatic scale, dividing each frequency by a factor of a whole number multiple of four and by a factor of a whole number multiple of six to produce two respective output frequencies corresponding to the respective input frequency thereby providing a set of twelve said output frequencies related in frequency substantially as the corresponding tones of the chromatic scale of one octave, each of said output frequencies being a substantially symmetrical wave form.



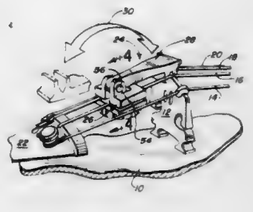
4,173,164
ELECTRONIC MUSICAL INSTRUMENT WITH FREQUENCY MODULATION OF A TONE SIGNAL WITH AN AUDIBLE FREQUENCY SIGNAL
Takeshi Adachi; Masahiko Koike, and Toshiyuki Takahashi, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan
Filed May 25, 1978, Ser. No. 909,370
Claims priority, application Japan, Jun. 1, 1977, 52-64157; Dec. 13, 1977, 52-148846; Dec. 21, 1977, 52-154099
Int. Cl.[2] G10H *1/04, 5/00*
U.S. Cl. 84—1.19 **11 Claims**



1. An electronic musical instrument comprising:
keyboard circuit means for providing a pitch determining voltage signal having a magnitude which is a function of the note of a depressed key;
first voltage-controlled frequency-variable oscillator means coupled to said keyboard circuit means to receive the pitch determining voltage signal therefrom for producing a first audible frequency signal the frequency of which corresponds to the note of the depressed key;
second voltage-controlled frequency-variable oscillator means coupled to said keyboard circuit means to receive the pitch determining voltage signal therefrom for producing a second audible frequency signal; and
means for coupling the second audible frequency signal from said second voltage-controlled oscillator means to said first voltage-controlled oscillator means to thereby produce a frequency-modulated tone signal in which the first audible frequency signal is frequency-modulated with the second audible frequency signal.

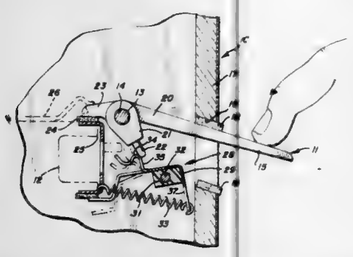
4,173,165
FIXEDLY MOUNTED MUTE FOR STRINGED INSTRUMENTS
Mordy M. Rhodes, 5056 N. Albany Ave., Chicago, Ill. 60625
Filed Jun. 26, 1978, Ser. No. 919,244
Int. Cl.[2] G10D *3/04*
U.S. Cl. 84—311 **9 Claims**

1. In a mute for a stringed instrument that is to be attached to portions of the instrument's strings, that are located between the instrument's bridge and the anchoring member to which the strings attach, by mounting means of a width to overlie and underlie portions of two strings and including upper and lower plate members for respectively engaging upper and lower edges of the strings and adapted to be positively clamped onto said strings to provide an immovable support; the improvement comprising in combination:
an elongated mute member pivotly mounted at one end thereof on one of said members for swinging only about a horizontal axis between an operative position, in which the mute member extends above and across said upper plate member to have its other end engage the instrument's bridge, and an inoperative position, and
selectively operable clamping means operatively associated with said upper and lower plate member for biasing said members toward each other to clamp portions of strings of the instrument therebetween and to selectively locate the mounting means and mute member in position longitudinally of the strings, so that the mute member will be properly positioned to be selectively swung between operative and inoperative positions, said clamping means including a rotatable member positioned below the lower plate member in a plane spaced away from the region in which the mute member is pivoted to swing between operative and inoperative positions, whereby swinging of the mute member and manipulation of the rotatable member of the clamping means may each be separately effected without interference with the other.



5. In a mute for a stringed instrument that is to be attached to portions of the instrument's strings that are located between the instrument's bridge and the anchoring member to which the strings attach, by mounting means of a width to overlie and underlie portions of two strings and including upper and lower plates for respectively engaging upper and lower edges of two strings and adapted to be positively clamped onto said strings to provide an immovable support, the improvement comprising, in combination:
the lower plate being apertured, a threaded attachment stud extending downwardly from the upper plate through the aperture of the lower plate, and below said lower plate;
a mute member pivotly mounted on said mounting means;
a nut member mounted on the threaded attachment stud and being selectively manually adjustable to bias the two plates toward each other to clamp portions of the strings of the instrument therebetween, to provide the positive clamping of the mounting means onto the strings of the instrument; and the threaded attachment stud being non-pivotable relative to the upper plate and having a non-circular cross-section, and the aperture in the lower plate through which the stud extends being non-circular to cooperate with the non-circular cross-section of the stud to prevent pivoting of the lower plate relative to the upper plate.

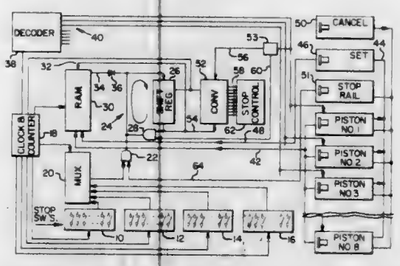
4,173,166
TAB SWITCH MECHANISM FOR MUSICAL INSTRUMENTS
Donald B. Koepke, Franklin Park, Ill., assignor to Thomas International Corporation, Chicago, Ill.
Filed Nov. 7, 1977, Ser. No. 848,891
Int. Cl.[2] G10B *3/10*; H01H *9/26*
U.S. Cl. 84—343 **10 Claims**



1. In a musical instrument having a plurality of electrical switches, and a plurality of tablets having switch actuating means mounted for selectively actuating the respective electrical switches and defining switch actuating and switch releasing positions, an improved switch mechanism comprising:
a plurality of cam followers associated one each with said tablets;
biasing means for urging each said tablet to its switch releasing position;
a plurality of cams;
a pivotally mounted carrier resiliently supporting said cams for joint movement adjacent said tablets to have engagement one each by said cam followers, said tablets being held releasably in said switch actuating position as an incident of engagement of the cam followers thereof with said cams, said cams defining a high portion and first and second low portions at opposite sides of said high portion, said cam followers being disposed at said first low portion in the switch releasing position of the tablet, at said second low portion in the switch actuating position of the tablet, and in engagement with said high portion during movement of the tablet between said positions; and
spring means biasing said carrier for selectively urging said cams into engagement with said cam followers, said cams and cam followers being correlated so that movement of any selected tablet from either of said positions to the other of said positions releases any other tablet in the switch actuating position to be returned by said biasing means to its switch releasing position as an incident of the cam follower of the selected tablet engaging said high portion of its associated cam during said movement.

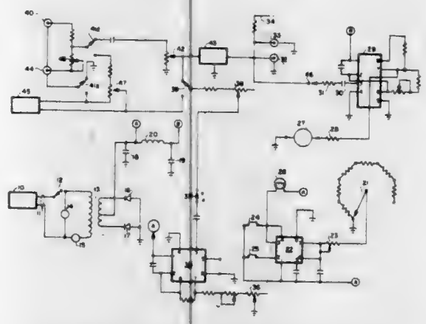
4,173,167
ORGAN STOP SWITCHING SYSTEM
Donald E. Stanley, Hillsboro, Oreg., assignor to CBS, Inc., New York, N.Y.
Filed Feb. 23, 1978, Ser. No. 880,438
Int. Cl.[2] G10B *3/10*
U.S. Cl. 84—345 **13 Claims**

1. An organ stop switching system comprising:
a plurality of manually operable stop elements and means for electrically registering the positions of said stop elements in serial order,
a first memory for storing plural different combinations of stop elements at different memory locations and means for cyclically accessing said locations in said first memory,
a second memory and means for cyclically accessing locations in said second memory wherein the capacity and operating cycle of said second memory are less than said first memory for storing a combination of stop element positions,
means for selectively coupling the positions of said stop elements to said second memory,
a plurality of combination selection pistons and means responsive thereto for coupling said first memory to said second memory during the cycle of said second memory



corresponding to a portion of the cycle of said first memory for entering combinations into said first memory so that different selected combinations from said first memory are transferable into said second memory in additive relation,
and means for receiving the output of said second memory for operating stop responsive means.

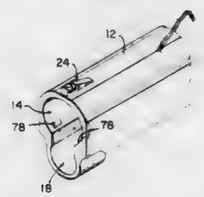
4,173,168
APPARATUS FOR SELF TEACHING A MUSICAL INSTRUMENT
Patrick C. Hicks, 5140 Greenbush, Sherman Oaks, Calif. 91403; Ronald J. Benson, Arleta, Calif., and Howard M. Roberts, North Bend, Oreg., assignors to Patrick C. Hicks, Hollywood, Calif.
Filed Oct. 3, 1977, Ser. No. 838,980
Int. Cl.[2] G09B *15/00*
U.S. Cl. 84—470 R **1 Claim**



1. An integrated portable instructional apparatus for music instruction use comprising:
a portable case including a body portion openable cover and carrying means;
music instructional apparatus within said case comprising in combination;
a metronome for generating controllable frequency timing signals for establishing any of several music tempos;
a tape recorder for recording music produced by the user and for playing music produced by the user or pre-recorded music;
a jack for connecting said apparatus to earphones;
a timer for providing an indication to the user of elapsed time period during use of the apparatus;

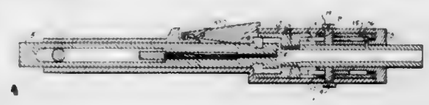
said apparatus including input jacks to receive electrical input signals from at least one musical instrument and from said tape recorder;
switch means for selectively introducing electrical signals from said instrument input jack to the input of said tape recorder or to said earphone jack;
switch means for enabling said metronome and for setting the amplitude thereof;
switch means for enabling and selecting the time interval of said timer;
a signal generator responsive to the completion of a time interval as selected by said last switch means;
means for introducing the output of said signal generator into the jack for said earphone;
switch means for selectively introducing the output of said metronome into said earphone jack or said recorder;
individual volume control means for said instrument, tape recorder, metronome, and signal generator; and
means within said case mounting said tape recorder and its controls and each of said switch means and each volume control means for operation by said user when said cover is open to initiate and control the volume of tempo signals from said metronome, signals from user's instrument, timer signals from said signal generator and the recorder whereby user may control practice duration by the timer switch, tempo by said said metronome and for listening to pre-recorded or user's own instrument input either with or without tempo signal background.

4,173,169
SEMI-AUTOMATIC FIREARM
Patrick Yates, P.O. Box 5779, China Lake, Calif. 93555; Sydney H. Woodcock, Penthouse Seattle Tower, 3rd & University, Seattle, Wash. 98101, and Jeffrey R. Beals, 11216 Phinney Ave. North, Seattle, Wash. 98133
Continuation-in-part of Ser. No. 692,297, Jun. 8, 1976, abandoned. This application May 9, 1977, Ser. No. 794,738
Int. Cl.[2] F41D *11/00*
U.S. Cl. 89—132 **17 Claims**



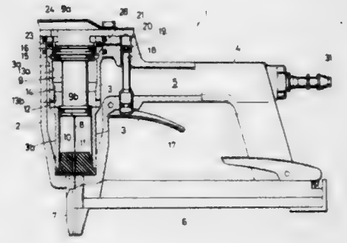
1. In a semi-automatic firearm having a firing chamber, a barrel, a frame, a slide movable with respect to said barrel and said frame between battery and full recoil positions, means for sequentially ejecting a spent cartridge and loading a fresh cartridge during each recoil stroke, and a firing mechanism for selectively initiating said cartridge when said slide is in battery, the improvement comprising a recoil mechanism for allowing the recoil of said cartridge to carry said slide rearwardly toward said full recoil position, and for subsequently returning said slide to its battery position, said recoil mechanism including first and second recoil springs each extending between said frame and said slide, said improvement further including barrel guide means for fixing the radial position of the forward portion of said barrel when said slide is in battery position, said guide means including barrel mounting means at the forward end of said slide for supporting said barrel at the forward end thereof on two discrete, spaced apart, substantially immovable support areas symmetrically positioned about the central axis of said slide beneath said barrel when said slide is in battery position, and linkage means pivotally securing said barrel to said frame at a point rearward of and between said support areas, and diametrically spaced from an area of contact between said slide and barrel such that the force of said barrel exerted by said slide in a forward direction generates a rotational moment about the pivot axis of said linkage means for resiliently biasing the forward end of said barrel against said support areas.

4,173,170
POLICE FIREARM
Ross A. Close, 3831 Glenbrook Rd., Fairfax, Va. 22031
Filed Jan. 16, 1978, Ser. No. 867,931
Int. Cl.[2] F41D *5/10*
U.S. Cl. 89—188 **1 Claim**



1. A firearm comprising in combination a frame having a longitudinally movable floating ring receiver piston combined threadedly with a barrel contained within the two parts of a ring power cylinder turned to release a concentric bolt by cams cut in the piston part of the floating ring receiver piston actuated to turn the floating ring receiver piston by pins through the frame, float-ring receiver piston and ring power piston to release locking lugs between bolt and floating ring receiver piston actuated by gas pressure from a port in the barrel and ring power cylinder, feeding high pressure gas to chamber formed by floating ring receiver piston and ring power cylinder.

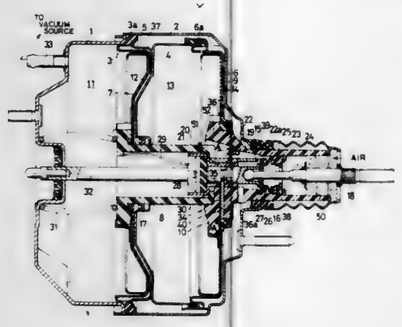
4,173,171
WORKING PROCESS OF A PNEUMATIC OPERATED RAMMING TOOL
Wilfried Lange, Altenhagen, Fed. Rep. of Germany, assignor to Firma Dieter Haubold Industrielle Nagelgerate, Hemmingen-Westerfeld, Fed. Rep. of Germany
Filed Jun. 17, 1977, Ser. No. 807,606
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1976, 2630278
Int. Cl.[2] F15B *15/17, 15/22*
U.S. Cl. 91—25 **7 Claims**



1. In a pneumatically-operated ramming tool, the combination comprising:
a compressed air storage chamber;
a hollow, working cylinder having internal walls which define a generally cylindrical, internal cavity, comprising an upper pressure portion having an upper end and a lower end and a lower guide portion, the upper end of said pressure portion having a closable control port and the lower end of said pressure portion having a plurality of connecting apertures, both of which establish communication with said compressed air storage chamber; and
a piston slidably received within said cavity of said cylinder for reciprocable movement between an upper rest position and a lower work position, said piston having a top end

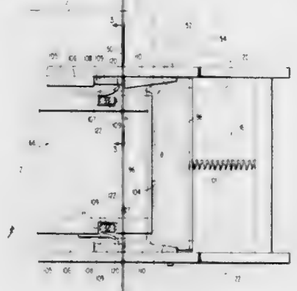
which is reciprocably movable only within the pressure portion of said cylinder and which carries two vertically, spaced-apart, flexible seal rings, with the lower one of said two seal rings having a variable diameter, so as to serve as a return stroke seal, a bottom end which is reciprocably movable only within the guide portion of said cylinder and which carries a flexible seal ring, and an intermediate portion joining said top and bottom ends thereof, and defining an annular gap between said piston and said cylinder walls.

4,173,172
TANDEM BRAKE BOOSTER
Atsushi Ohmi, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan
Filed Mar. 14, 1978, Ser. No. 886,459
Claims priority, application Japan, Mar. 19, 1977, 52/33734[U]
Int. Cl.² F15B 9/10; F01B 19/00
U.S. Cl. 91—369 A **5 Claims**



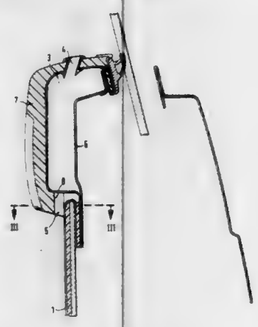
1. A tandem diaphragm brake booster comprising:
a housing;
first and second diaphragms disposed in said housing in spaced relation to each other;
a partition wall disposed between said first and second diaphragms within said housing for defining first, second, third and fourth chambers within said housing;
a first piston means secured to said first diaphragm and axially slidable therewith;
a second piston means secured to said second diaphragm and axially slidable therewith;
first fluid passage means provided in said first piston means for fluid communication between said first and third chambers, said first chamber being in communication with a vacuum source;
second fluid passage means provided in said partition wall for fluid communication between said second and fourth chambers;
third fluid passage means provided in said second piston means for fluid communication between said third and fourth chambers;
valve means disposed in said third fluid passage means for preventing fluid communication between said third and fourth chambers and introducing atmospheric pressure into said fourth chamber, thereby creating pressure differentials between said first and second chambers and said third and fourth chambers, respectively;
an operator-operated means for actuating said valve means in response to manual operation;
said valve means including a plunger operatively engaged with said operator-operated means and axially movable within said piston means;
a case member disposed in said first and second pistons and receiving therein said plunger; and
a key member disposed in said second piston means and extending to said plunger and said case member, thereby to retain said case member to said second piston means, one end of said first piston means being disposed between said case member and said second piston means, thereby connecting said two piston means by said key member.

4,173,173
CARTON ERECTOR
Herman D. Mims, Charlotte, N.C.
Filed Nov. 28, 1977, Ser. No. 855,134
Int. Cl.² B31B 1/50
U.S. Cl. 93—51 R **10 Claims**



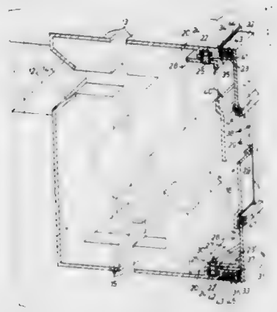
1. A carton erecting apparatus of the type having a cooperating die and plunger, for erecting cartons of the type having an interlocking tab and slot, said apparatus comprising:
means for engaging said tab and preventing the outward movement thereof; and
means for pressing outwardly on said carton adjacent said slot for causing said tab and slot to interlock.

4,173,174
INSTALLATION FOR THE SUPPLY OF FRESH AND/OR HEATED AIR INTO THE INTERIOR SPACE OF A MOTOR VEHICLE
Michael Vinko, Munich, and Dieter Schmid, Neufahrn, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany
Filed Aug. 2, 1977, Ser. No. 821,235
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1976, 2636640
Int. Cl.² B60H 1/24
U.S. Cl. 98—2.04 **8 Claims**



1. An installation for the supply of fresh and/or heated air into the interior space of a motor vehicle, comprising at least one air-guide channel means provided within the area of an inner covering means of a vehicle body part, said air guide channel means being formed by a part of an inner wall of the vehicle body part and by a cover member mounted thereon and being in communication with air discharge openings directed into the vehicle interior space, characterized in that recess means forming said air discharge openings are provided within at least one of an edge area of the cover member, the inner covering means adjoining the cover member and the vehicle body part adjoining the cover member, and further characterized in that the cover member has an essentially U-shaped cross-sectional profile and the discharge openings are provided at both U-legs.

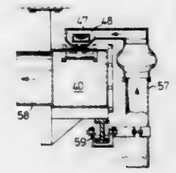
4,173,175
AIR VENT
Eckhard Kucharczyk, Netphen, Fed. Rep. of Germany, assignor to Siegenia-Frank KG, Siegen, Fed. Rep. of Germany
Filed Apr. 17, 1978, Ser. No. 897,151
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1978, 2718167
Int. Cl.² F24F 13/08
U.S. Cl. 98—41 SV **6 Claims**



1. A vent device for rooms comprising a frame, a detachably mounted front plate with a plurality of apertures, a closure plate transversely to its plane and the plane of the front plate between a closed position wherein the closure plate abuts the front plate to close the apertures and an open position for freeing the apertures of the front plate for free air flow, whereby, the operating device has a push rod, movable within guides extending linearly and parallel to the longitudinal edges of the front plate, the closure plate having a flange extending transversely to the plane of the closure plate and extending over its total length adjacent the push rod, said flanges being provided with a plurality of slanted slots and said push rod being provided with a plurality of pins for engagement with said slots, the free edge of the flange having openings connected to the slots for allowing egress of the pins and removal of the closure plate.

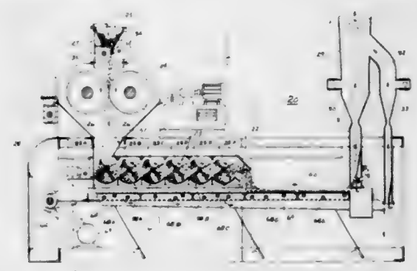
4,173,176
DEVICE FOR TRANSFER OF AIR IN ONE OR THE OTHER DIRECTION BETWEEN TWO PLACES
Eric Svensson, Box 465, 801 06 Gävle, Sweden
Filed Jan. 3, 1978, Ser. No. 866,415
Claims priority, application Sweden, Jan. 10, 1977, 7700177
Int. Cl.² F23J 15/00
U.S. Cl. 98—115 VM **7 Claims**

1. A device for transfer of air mixed with gases, vapours, smaller particles etc. or of fresh air in the one or other direction between a stationary place and a moving intake or exhaust place, comprising: an elongated box with walls and fluid communication tube means connected to its interior; said tube means having its other end adapted to be connectable to a stationary inlet or outlet; one wall of said box, in its longitudinal direction, having a longitudinal slot; an elongate tightening band extending along and over said slot in its longitudinal direction; a connection body, with air passage means therethrough, arranged on said box and through the slot for longitudinal movement along said slot with its passage means in continuous fluid communication between the interior and exterior of said box and with an air passage conduit means projecting from said connection body so that the free opening of said conduit means, during movement of the connection body



being moved to varying places within an area; portions of said wall adjacent said slot have elongate contact surfaces; said connection body having engagement means bearing on said contact surfaces, disposed on one side of said slotted wall, guided slide shoe means on the opposite side of said slotted wall, and stay plates on said connection body on said one side of the slotted wall; a rotatable press roller supported by said stay plates adjacent each slide shoe means; and backing rollers supported by said connection body; means attaching the ends of said tightening band to the ends of said box with said band passing under the press rollers and over the backing rollers.

4,173,177
DECORTICATOR AND SEPARATOR FOR SEED PRODUCTS
Floyd O. Davis, 2326 E. Buckeye Rd., Phoenix, Ariz. 85034
Filed Jul. 20, 1978, Ser. No. 926,453
Int. Cl.² B02B 3/04
U.S. Cl. 99—618 **13 Claims**



1. A decorticator/separator apparatus for seed products comprising:
a frame,
a decorticator mounted on said frame and comprising a pair of juxtapositioned parallelly arranged rollers journaled for rotation about their axes in a direction toward each other,
a hopper mounted on said frame substantially vertically above said decorticator for dispensing seeds between the rollers of said decorticator,
said rollers being spaced apart from each other a small predetermined distance,
each of the outer surfaces of said rollers being provided with cutting ribs extending in a parallel arrangement with a longitudinal lead thereof which cutting ribs cooperate to receive in grooves therebetween the seeds,
the seed being turned by said cutting ribs on each of said

rollers when engaging therewith to extend longitudinally of the cutting ribs on the rollers in the grooves existing between the cutting ribs as said rollers rotate at a differential speed,

the cutting ribs on said rollers shearing the hulls of the seeds as the seeds pass between said rollers, and

a separator mounted below said decorticator for receiving the hull sheared seeds for separating the hulls from the kernels of meat of the seeds,

said separator comprising a plurality of spiked rollers journaled on said frame in a side by side parallel arrangement and rotating in unison in a common direction,

said decorticator dropping the sheared seed products on top of one of said spiked rollers,

said one of said spiked rollers while rotating moving said seed products over an associated screen for separating at least some of the kernels of meat of said seed products from the hulls of the seed product and moving the rest of the seed products into the path of movement of the next juxtapositioned spiked roller.

4,173,178

PROCESS FOR INTRODUCING A GAS, IN PARTICULAR CARBON DIOXIDE, INTO A LIQUID, PARTICULARLY A BEVERAGE, FLOWING THROUGH A LINE, AND A DEVICE FOR PERFORMING THE PROCESS

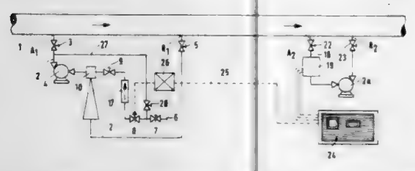
Dieter Wieland, Oststr. 1, D-4000 Düsseldorf, Fed. Rep. of Germany

Filed Sep. 21, 1977, Ser. No. 835,255

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1976, 2644378

Int. Cl.² B01F *3/04*

U.S. Cl. 99—323.1 **8 Claims**



1. A device for introducing carbon dioxide into a liquid which comprises a main line through which a liquid can pass, a bypass line branching from said main line at a first point and returning to said main line at a second point, means for introducing carbon dioxide into said liquid maintained in said bypass line, said means comprising a jet producing system which in turn comprises a driving jet nozzle connected to said bypass line, said bypass line having a low pressure chamber in fluid communication with a source of carbon dioxide, the cross sectional areas in said jet producing system being in the ratios: $f_1:f_2:f_M = 1:(0.2 \text{ to } 0.45):(1.3 \text{ to } 2.6)$, where f_1 is the cross sectional area of the outlet of said driving jet nozzle, f_2 refers to the induction channel inlet in the plane of said driving jet nozzle outlet and f_M is the bore area of a mixing tube which mixing tube is in fluid communication with the outlet of said driving jet nozzle said mixing tube being cylindrical and having a length equal to 24.5 to 30 times the internal diameter d_M of said mixing tube.

4,173,179

COOKING ASSEMBLY

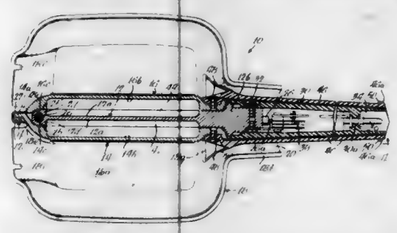
Richard P. Arthur, Darien, Ill., assignor to Sunbeam Corporation, Chicago, Ill.

Filed Oct. 5, 1977, Ser. No. 839,650

Int. Cl.² A47J *27/00*; H05B *1/00*

U.S. Cl. 99—374 **18 Claims**

1. A cooking device for fat-free grilling comprising a, rigid heating plate of heat conductive material defining a first flat heating surface, an outer plate, including a second flat heating surface, means for hingedly relating said outer plate and said heating plate to define a cooking chamber between said heating surfaces, a first handle extending from said heating plate, a second handle extending from said outer plate, means associated with the ends of said handles remote from said plates for holding said plates in position to define said cooking chamber,



an insulating drip tray, said drip tray including means for supporting said plates in a generally vertical plane, and electric heating means for heating said plates, the vertical orientation of said plates permitting grease to flow by gravity from said cooking chamber into said drip tray.

4,173,180

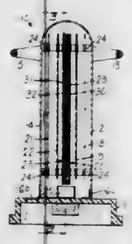
BACON COOKING APPARATUS

Peter M. Reiland, 27 8th Ave., Milford, Conn. 06460

Continuation-in-part of Ser. No. 859,085, Dec. 9, 1977, abandoned. This application Feb. 13, 1978, Ser. No. 877,337

Int. Cl.² A47J *37/06*

U.S. Cl. 99—391 **3 Claims**



1. Cooking apparatus comprising:

a base;

a first support member hingedly attached to said base and a second support member fixedly attached to said base;

each of said support members including heating means and integral means for supporting the food to be cooked, each of said food support means including an outer support means of fine mesh screen adapted to receive the food to be cooked and drain the drippings therefrom and an inner support means adapted to support said outer support means; and

a drip tray positioned to receive drippings from the cooking food.

4,173,181

KNOCK-DOWN PRESS

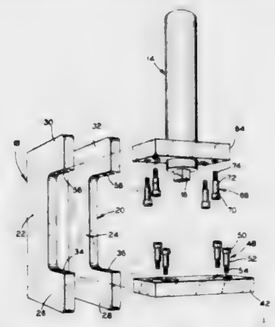
Donald J. Beneteau, 1333 Front Rd. South, Amherstburg, Ontario, Canada

Filed Sep. 1, 1978, Ser. No. 938,858

Int. Cl.² B30B *1/32, 15/04*

U.S. Cl. 100—231 **10 Claims**

1. A fluid-operated press comprising two upright, generally C-shaped frame members, each including a vertically disposed web portion terminating in lower and upper horizontally disposed arms, a lower workpiece-supporting bar, lower fastener means affixing spaced portions of said workpiece-supporting bar to upper edges of said lower arms, a fluid-operated cylinder, a cylinder-supporting bar affixed to a lower portion of said cylinder, upper fastener means affixing spaced portions of said



cylinder-supporting bar to lower edges of said upper arms, said bars thereby positioning said generally C-shaped frame members in parallel, spaced relationship.

4,173,182

STAMPING MECHANISM FOR ROLLED GOODS WITH ARTICLE ALIGNMENT STRUCTURE

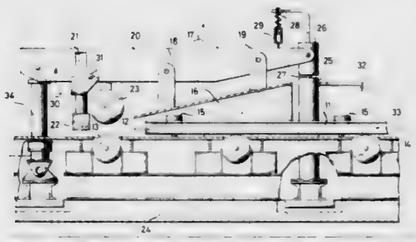
Johannes Balon, Dortmund, and Manfred Oldendorf, Iserlohn, both of Fed. Rep. of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 842,782

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646560

Int. Cl.² B41F *17/00*

U.S. Cl. 101—4 **6 Claims**



1. A stamping device, especially for stamping rolled goods, while the goods are being transported over a roller train, which includes: a feeler device for feeling the goods to be stamped, an aligning device having said feeler device connected thereto, and a stamping head fastened to said aligning device, said aligning device being operable by said feeler device to align the goods to be stamped with said stamping head, said aligning device including: a longitudinal aligning arm having its longitudinal extension in the direction in which the goods to be stamped are to be moved toward said stamping head, and supporting means supporting said aligning arm for pivoting in a vertical plane and in a horizontal plane, thereby permitting conveying movements of said feeler device onto said aligning device for aligning the goods to be stamped with said stamping head.

4,173,183

LINE PRINTER CHARACTER BELT

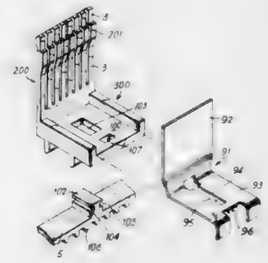
Hiroyuki Akazawa, Shiojiri, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo and Shinshu Seiki Kabushiki Kaisha, Nagano, both of, Japan

Continuation-in-part of Ser. No. 758,885, Jan. 12, 1977, abandoned. This application Mar. 10, 1978, Ser. No. 885,416

Claims priority, application Japan, Jan. 16, 1976, 51-4347

Int. Cl.² B41J *1/20*

U.S. Cl. 101—111 **5 Claims**



1. A line-printer character belt, comprising

(a) an endless belt having teeth on the inner surface thereof for engaging with toothed driving means and a boss on the outer surface thereof;

(b) an injection-molded character member attached to said belt and including a base portion and a finger portion making a dihedral angle of about 90° with each other, said base portion having an opening therein for receiving said boss, said finger portion including a plurality of flexible fingers each having a tip end and a character insert of hard, long-wearing metal in said tip end disposed outwardly from said base portion and a projection disposed inwardly toward said base portion;

(c) a retaining member having first and second segments making a dihedral angle, said retaining member being constructed and arranged for engaging said first segment thereof with said boss for holding said character member removably to said belt and for deflecting with its second segment said fingers uniformly outwardly from said base portion through engagement with said projection on each of said fingers, said engagement of said retainer member with each of said projections assuring uniform alignment of said fingers and the molded-in character insert therein, assuring controlled spacing between said fingers and the substrate on which printing is to be effected and providing for rapid damping of any vibration ensuing on a printing operation.

4,173,184

PRINT HEAD

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

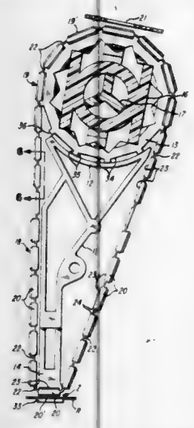
Filed May 14, 1975, Ser. No. 577,372

Int. Cl.² B41J *1/20*

U.S. Cl. 101—111 **10 Claims**

1. A print head, comprising: a frame having a stationary support, a plurality of rotatable wheels mounted by the frame, a plurality of printing bands received under tension about the support and the respective wheels, each printing band having a plurality of different printing elements and hinges connecting the printing elements, and spaced apart, smooth lugs on the undersides of the printing bands and there being a sufficient number of lugs at the underside of each band to enable any selected printing element to be brought to a printing zone by rotation of the respective wheel, there being a lug at the underside of each printing element, the lugs being of substantially equal length and each lug terminating at generally parallel end

faces, the support including a notch and a pair of support members having respective elongated lands, the lands having tapered entries and terminating at opposed shoulders which define the ends of the support notch, the support shoulders being generally parallel, the support lands being spaced apart to support only two adjacent hinges of a printing element while the intervening lug is received in the support notch between the support shoulders, the support notch being deeper than the lug thickness, the end faces of the lug at the printing



zone contacting the support shoulders, each wheel having a plurality of notches to receive the lugs, each wheel notch having a pair of shoulders spaced apart by a distance substantially equal to the length of a lug, each wheel having peripheral lands between the wheel notches for supporting only the hinges, each peripheral land having a peripheral dimension substantially equal to the spacing between adjacent lugs, the wheel shoulders being generally parallel, the wheel notches being deeper than the lug thickness.

4,173,185

SCREEN PRINTING APPARATUS

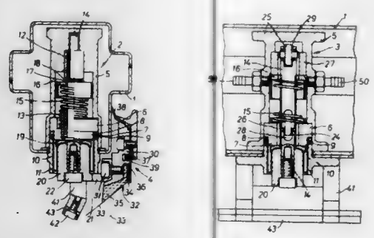
Heinrich Voegelin, Wiler b. Utzenstorf, Switzerland, assignor to Fritz Buser Ag. Maschinenfabrik, Switzerland

Filed Oct. 12, 1977, Ser. No. 841,479

Claims priority, application Switzerland, Oct. 19, 1976, 13240/76

Int. Cl.[2] B41F *15/42, 15/46*

U.S. Cl. 101—120 **9 Claims**



1. A squeegee structure for a screen stencil of a printing machine in which the material to be printed is moved along a feed axis comprising

a relatively stationary, elongated carrier frame having a longitudinal axis;

a first squeegee mounting means;

thrust drive means coupled to said carrier frame and said mounting means for moving said mounting means toward and away from a surface of a screen stencil and along a thrust axis which is perpendicular to the feed axis and said longitudinal axis, said thrust drive means comprising at least one first thrust drive unit and a plurality of second thrust drive units, said first thrust drive unit being located approximately at a longitudinal midpoint of said carrier frame, at least one of said second thrust drive units being located on each side of said first thrust drive unit;

each of said first and second thrust drive units having a relatively stationary portion fixed to said carrier frame, a relatively movable portion movably coupled to said stationary portions, and bearing means between said stationary and movable portions for guiding said movable portions; said bearing means of said first thrust drive unit guiding said movable portion thereof for movement along said thrust axis and for preventing movement of said movable portion in directions perpendicular to said thrust axis; said bearing means of said second thrust drive units guiding said movable portions thereof for movement along said thrust axis, for permitting movement in a direction perpendicular to said thrust axis and parallel to said longitudinal axis, and for preventing movement in a direction perpendicular to said thrust axis and said longitudinal axis; and

a first squeegee coupled to said mounting means;

whereby said first and second thrust drive units are flexibly coupled to compensate for deflection of said carrier member to avoid seizing of said first and second thrust drive units and provide uniform pressure along the entire length of the squeegee.

4,173,186

AMMUNITION

James V. Dunham, Jenkintown, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 7, 1960, Ser. No. 41,459

Int. Cl.[2] F42B *5/02, 9/00*

U.S. Cl. 102—38 R **10 Claims**



1. A cartridge including a substantially rigid extractable case having at one of its ends a head formed to receive a propellant and to provide a primer support adjacent to said propellant, a projectile releasably coupled to the other end of said case, a piston engaging an inner end of said projectile and extending into said casing, said piston having a shoulder near its inner end, a base cup extending into and releasably coupled to said head, said cup enclosing the inner end of said piston with said end spaced from the bottom of said cup, and seal means between the rim of said cup and said shoulder, a second shoulder on said piston in front of the first shoulder, and a shoulder in said case for cooperation with the second mentioned shoulder on said piston in deceleration and deformation of said piston.

4,173,187

MULTIPURPOSE PROTECTION SYSTEM

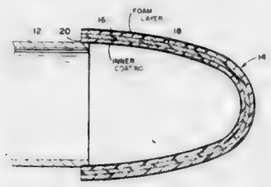
Bernard Steverding, Guntersville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 22, 1967, Ser. No. 670,524

Int. Cl.[2] F42B *11/00*

U.S. Cl. 102—105 **10 Claims**

1. A fused silica matrix shield for a missile structural shell and having incorporated therein at least two layers of radiation absorbing particles, said layers including an inner layer and an outer layer of said particles, said particles comprising materials selected from the group consisting of refractory metals, car-



bides, borides, beryllides and nitrides, the atomic number of the metal component of said material of said inner layer being greater than the atomic number of the metal component of said material of said outer layer.

4,173,188

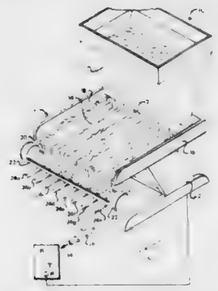
COAL FIRING SYSTEMS FOR KILNS

Philip D. Pearce, P.O. Box 272, Pleasant Garden, N.C. 27313

Filed Oct. 3, 1977, Ser. No. 838,825

Int. Cl.[2] F23K *3/02*

U.S. Cl. 110—106 **9 Claims**



1. A coal feeding system for mixing finely ground coal particles with air to form a combustible mixture of coal and air and deliverying said mixture to a plurality of furnace burners, said system comprising:

(a) a hopper for receiving and storing a supply of said coal particles;

(b) a feeder means including a plate having a front end and rear end with the rear end positioned below the outlet of said hopper, conveying means for evenly distributing the coal particles at a substantially consistent height across said plate and moving said particles toward the front end thereof;

(c) a metering housing including a trough having an open top and positioned below the front end of said plate for receiving coal particles as they drop therefrom;

(d) said trough having a plurality of spaced openings across the bottom thereof corresponding in number to the number of said burners;

(e) a plurality of coal particle intake pipes, each of said pipes extending transversely to said trough and immediately beneath one of said openings in said trough and having an opening in the top surface thereof corresponding in size and shape with and communicating with said opening in said trough with which it is associated;

(f) a mixing chamber having a means for introducing a flow of air thereinto, an exit end, and an opening in the top wall thereof into which one end of at least one of said coal particle intake pipes enters, the other end of said coal particle intake pipe being open to the atmosphere;

(g) a combustible mixture feed conduit leading from the exit end of said mixing chamber to the furnace;

(h) whereby coal dust and inspirated air are drawn through the intake pipe into the mixing chamber and delivered to the furnace.

9. A method of supplying coal to a plurality of furnace burners so as to maintain an even, controlled temperature within said furnace comprising the steps of:

(a) delivering a supply of coal sufficient for a plurality of burners to a metering housing;

(b) dividing said supply of coal particles into a plurality of coal particle batches substantially equal in volume and equal in number to the number of furnace burners;

(c) introducing each batch of said coal particles at a controlled rate into a confined air stream to form a mixture of coal particles and air;

(d) delivering said mixture to one of said fuel burners;

(e) varying the quantity of coal delivered to the metering housing in step (a) responsive to the temperature within the furnace.

4,173,189

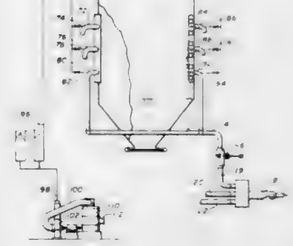
BOILER COLD START USING PULVERIZED COAL IN IGNITOR BURNERS

Thomas H. Cooper, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Continuation of Ser. No. 760,882, Jan. 21, 1977, abandoned. This application Dec. 29, 1977, Ser. No. 865,412

Int. Cl.[2] F23K *3/02*

U.S. Cl. 110—106 **26 Claims**



1. In a furnace system that includes a furnace, a main coal nozzle arranged to direct coal into the furnace, an air preheater having a flue-gas inlet, an air inlet, and an air outlet and being connected to receive flue gases from the furnace at its flue-gas inlet and transfer heat from the flue gas to air entering the air inlet and leaving the air outlet, a main pulverizer, conduit means connected to conduct coal from the pulverizer outlet to the main coal nozzle, means for forcing a first air stream through the preheater from its air inlet to its air outlet and from the air outlet through the pulverizer and into the main coal nozzle, and means for forcing a second air stream from the preheater outlet into the furnace, the improvement comprising:

a. an ignitor nozzle positioned for ignition of coal leaving the coal nozzle;

b. an ignitor pulverizer for pulverizing coal;

c. a separator for separating coal from air;

d. means for conveying coal mixed with air from the ignitor pulverizer to the separator;

e. means for conveying coal from the separator to the ignitor nozzle;

f. means for heating a third air stream to a temperature higher than that of the first and second air streams;
g. means for causing the third air stream to flow to the furnace at the ignitor nozzle; and
h. a lighter, positionable near the outlet of the ignitor nozzle, for igniting coal issuing from the ignitor nozzle.

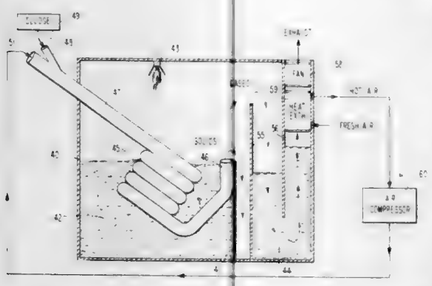
6. In a method of operating a coal-fired furnace that includes heating a first air stream by transferring heat from combustion products of the furnace to the air in the first air stream, using the first air stream to entrain coal ground in a main pulverizer and convey it to the furnace, heating a second air stream by transferring heat from combustion products of the furnace to the air in the second air stream, and conducting it to the furnace, the improvement comprising steps of:
a. separating pulverized coal from a mixture of pulverized coal and air;
b. supplying the separated coal to an ignitor nozzle positioned to ignite the coal entrained in the first air stream as it enters the furnace;
c. heating a third air stream to a temperature higher than the temperature of both the first and second air streams;
d. causing the third air stream to flow to the furnace at the ignitor nozzle; and
e. igniting the coal leaving the ignitor nozzle.

4,173,190

SLUDGE INCINERATOR UTILIZING COILED CHANNEL IMMERSED IN MOLTEN SALT AND METHOD OF OXIDIZING SLUDGE UTILIZING SAME

Jacob Greenberg, Margate, and John E. Robertson, Cardiff, both of N.J., assignors to Anti-Pollution Systems, Inc., Pleasantville, N.J.

Filed Jul. 12, 1978, Ser. No. 923,720
Int. Cl.[2] F23G 5/12
U.S. Cl. 110—243 **12 Claims**



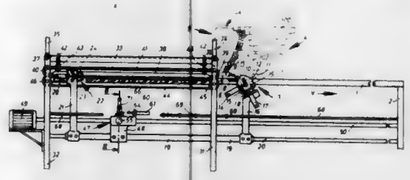
1. An incinerator for treatment of sludge and high water content matter, comprising:
a. a molten salt bath contained in a housing;
b. an enclosed channel made of a high heat transfer material, said channel being immersed in said bath whereby the interior of said channel is maintained at about the temperature of said bath;
c. temperature means for maintaining said bath at a temperature above the ignition temperature of solids contained in said sludge;
d. input means for inputting sludge and air into said channel;
e. output means for outputting effluent from said channel; and
f. pressure means communicating with said input means and said output means for providing a pressure between said input means and said output means, to move said air and sludge into said channel, wherein said sludge is dried and oxidized, and to move the products of the drying and oxidizing to said output means as effluent.

4,173,191

SEWING UNIT WITH SECTIONWISE SHIFTABLE CLAMPING DEVICE

Hermann Taddicken, Schwäbisch-Gmünd, Fed. Rep. of Germany, assignor to Eisele Apparate- und Gerätebau GmbH, Fed. Rep. of Germany

Filed Aug. 30, 1978, Ser. No. 937,976
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1977, 7727206[U]
Int. Cl.[2] D05B 3/00
U.S. Cl. 112—65 **14 Claims**



1. A device for feeding materials in a feed direction for operations on the materials, such as sewing, comprising, a support frame, a carriage mounted on said frame for movement backwardly and forwardly in respect to the feed direction of the material, a lower endless conveyor extending in a feed direction comprising longitudinal guide rollers and an endless belt trained over said rollers supported on said carriage, and upper endless conveyor belt extending in the feed direction and disposed over and cooperable with said lower endless conveyor and comprising longitudinally spaced guide rollers and an endless belt trained over said rollers supported on said carriage, biasing means biasing said upper and lower endless conveyors together for clamping the material therebetween along a considerable length of the material and for feeding the material in the feed direction, and drive means connected to said carriage for driving said carriage to move the material in predetermined timed relationship to the operations to be performed thereon.

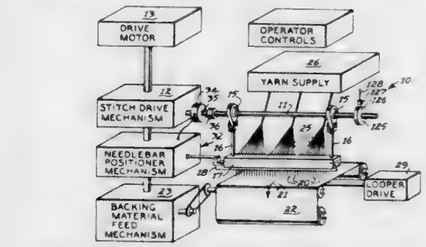
4,173,192

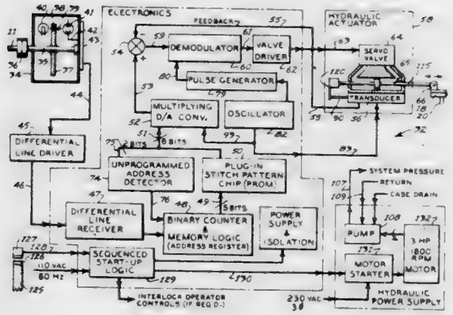
ELECTROHYDRAULIC NEEDLE BAR POSITIONING APPARATUS FOR TUFTING MACHINES

Henry A. Schmidt, Elma, N.Y.; Larry P. Gable, Dalton, Ga., and Wallace W. Hammel, Jr., East Ridge, Tenn., assignors to Tuftco Corp., Chattanooga, Tenn.

Filed Oct. 26, 1977, Ser. No. 845,826
Int. Cl.[2] D05C 15/30
U.S. Cl. 112—79 R **14 Claims**

1. In a tufting machine having a backing material support, means for feeding backing material longitudinally through the machine, a needle bar supporting a plurality of needles transversely of said machine, yarn supply means for feeding yarns to said needles, and means for reciprocating said needle bar to drive said needles into and out of the backing material upon the backing material support, a positioning apparatus for shifting transversely the needle positions relative to the backing material, comprising:
(a) a reciprocably movable, hydraulically driven actuator,
(b) coupling means connected to said actuator for changing the relative transverse positions of said needle bar and said backing material support in response to the relative position of said actuator,
(c) pressurized hydraulic fluid supply means for said actuator,
(d) valve means for controlling the flow of hydraulic fluid to said actuator,
(e) electronic pattern control means having input means and output means,
(f) said pattern control means comprising electronically programmed information corresponding to a stitch pattern predetermining the relative transverse positions of said needle bar and said backing material support for each longitudinal needle stitch position,
(g) stitch sensor means communicating with said input means for producing an input signal for each needle stitch,
(h) said pattern control means also comprising means for producing programmed electrical output signals commensurate with said programmed information at said output means,





(i) said pattern control means further comprising electrical feedback means responsive to the actual position of said actuator producing corresponding feedback signals so that each of said output signals is conditioned by a corresponding feedback signal from said feedback means, and
(j) electrical valve control means responsive to the programmed electrical output signals from said output means for actuating said valve means to cause said actuator to move to a position corresponding to the value of each of said output signals.

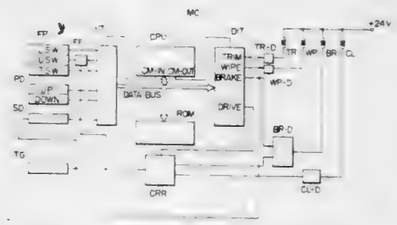
4,173,193

CONTROLLING APPARATUS FOR ELECTRIC SEWING MACHINE

Shigeki Morinaga; Takeo Maeda; Tadashi Takahashi, and Kosho Ishizaki, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 4, 1978, Ser. No. 866,835
Claims priority, application Japan, Jan. 14, 1977, 52-2405
Int. Cl.[2] D05B 69/26, 19/00
U.S. Cl. 112—275 **7 Claims**

1. An apparatus for controlling an electric sewing machine comprising a motor, switch means providing control signals, clutch means for transmitting the driving torque of said motor to said sewing machine to drive the latter, braking means for selectively imparting a braking force to said sewing machine, means for detecting the position of the needle of said sewing machine and for generating a position signal at a desired position in its stroke, controlling means responsive to said control signals and said position signal for controlling said clutch means and said braking means to operate said sewing machine in accordance with a predetermined sequence, and clock means for controlling signal input and signal output to and



from said controlling means so that such signal transfer is effected only in synchronization with a clock signal.

4,173,194

MARINE CLEAT FOR RECEIVING A THROWN LINE

Charles S. McLaughlin, 181 Grove St., Cambridge, Mass. 02138

Filed Dec. 5, 1977, Ser. No. 857,118
Int. Cl.[2] B63B 21/04
U.S. Cl. 114—218 **14 Claims**



1. A cleat for receiving a thrown line, said cleat comprising:
a body,
at least two upwardly diverging fingers extending from said body,
said fingers defining an opening for receiving a thrown line,
said body containing an aperture disposed below said fingers,
means for guiding a line from said opening into said aperture,
said means for guiding being formed in said body and extending from said opening near the bottom of said fingers where said fingers converge, downwardly into said aperture,
said means for guiding and said fingers cooperating to always direct into said aperture a line thrown between said fingers, and
projection means for preventing a line extending through said aperture from being pulled up into said means for guiding,
said projection means being disposed adjacent to the interface of said means for guiding and said aperture and extending downwardly into said aperture.

4,173,195

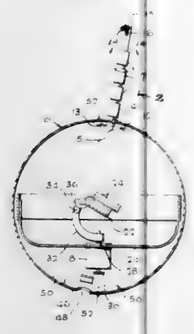
HYDRODYNAMIC CONFIGURATION FOR TOWED SUBMERSIBLE BODY

Calvin A. Gongwer, Glendora, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed Dec. 27, 1977, Ser. No. 864,570
Int. Cl.[2] B63B 21/56
U.S. Cl. 114—244 **9 Claims**

1. A submersible body to be towed in the water from a suspending line comprising a hollow spherical housing having top and bottom ports to facilitate flooding of said housing, means attached to the top of said housing and fastened to said

line for suspending said body, ballast means in said housing near the bottom thereof for locating the wet center of gravity of said body significantly below its geometric center and a narrow projection extending around a great circle of said



housing from approximately top to bottom and generally normal to the direction of tow to interrupt the flow around said body substantially uniformly around its periphery and to provide damping in yaw and pitch.

4,173,196

SAFETY RELEASE FOR WATER SKIING TOW LINE

Edward F. Casad, St. Marys; Thomas R. Casad, Celina, and Richard E. Jones, St. Marys, all of Ohio, assignors to Ajax Machine and Welding Co., St. Marys, Ohio

Filed Oct. 11, 1977, Ser. No. 840,585
Int. Cl.² B63B *21/56*
U.S. Cl. 114—253 **11 Claims**



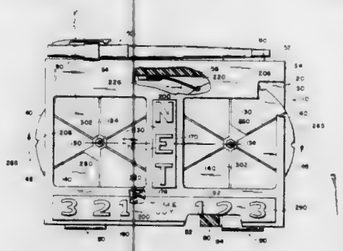
1. A safety release for water skiing tow ropes comprising:
a body having spaced sides, each side having first and second opposite end portions, said first end portions being rigidly secured together, a lever disposed in substantial parallelism with and between said sides, said lever having an arm extending from between said sides and in a direction transversely of a longitudinal axis on said body which extends between said end portions, said second end portions of said sides having laterally registered slots opening therethrough defining a single slot which is substantially coplanar with said longitudinal axis, said lever being pivotally connected to said sides at a location substantially on said longitudinal axis so as to be swingable in substantial parallelism with said sides between first and second positions, bolt means disposed between in substantial parallelism with said sides and movable between a first position spanning and a second position clearing said slots, said bolt means in its first position extending transversely of said longitudinal axis, said lever having a connection with said bolt means to move the latter from its first to its second positions when said lever is moved from its first to its second positions, respectively, a rope-receiving clearance provided between said bolt means and the inner ends of said slots when said bolt means is in its first position.

4,173,197

VOLLEY BALL ROTATION COUNTER

Madylon C. Anker, Omaha, Nebr.

Filed Dec. 9, 1977, Ser. No. 859,082
Int. Cl.² A63B *71/06*
U.S. Cl. 116—223 **10 Claims**



1. A volley ball rotation counter comprising a frame having upper and lower interconnected frame means, two rotatable discs alongside each other and comprising right and left discs capable of receiving visible removeable markings, means rotatably mounting said discs on said lower frame means for rotation about parallel spaced axes between said upper and lower frame means, marking means on said discs indicating six symbolic volleyball playing positions on each disc and spaced around its axis, said upper frame means providing access to each of said discs for the writing of player indicia thereon on each of said playing positions simultaneously, said upper frame means having viewing means thereon extending across the top of each of said discs, said upper frame means permitting all of said volleyball playing positions to be at least partially viewable simultaneously, a portion of the periphery of each of said discs extending beyond said upper frame means, means operably correlated with said discs and with said frame and with said mounting means for retarding rotation of said discs and yet permitting said discs to be rotated manually in a clockwise direction when an operator manually engages an edge of a disc to urge said disc into clockwise rotation.

4,173,198

TREAD END CEMENTER

Ronald E. Allen, Tuscaloosa, Ala., assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 25, 1977, Ser. No. 854,561
Int. Cl.² B05C *5/00, 15/00*
U.S. Cl. 118—706 **14 Claims**



1. A tread end cementer unit comprising a conveying unit operative to convey in a longitudinal direction along a tread pass line a tread having a leading and trailing end, a pair of spray means mounted on said conveying unit in longitudinal spaced direction, each spray means having a plurality of laterally spaced nozzles operative to spray said ends of said tread, one of said spray means mounted above said tread pass line for spraying cement downwardly onto one of said ends of said tread passing along said pass line on said conveying unit, the other of said spray means mounted below said tread pass line for spraying cement upwardly onto the remaining end of said

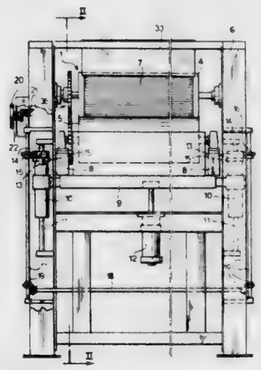
tread passing along said pass line on said conveying unit, and spray collector means mounted opposite each of said spray means on said conveying unit to collect overspray from said spray means.

4,173,199

APPARATUS FOR REINFORCING A FABRIC BY APPLYING A FLUID REINFORCING MATERIAL THERETO

Cassiano Fassina, S. Mauro Torinese, Italy, assignor to Codama Holding S.A., Luxembourg

Division of Ser. No. 841,079, Oct. 11, 1977, which is a continuation of Ser. No. 635,544, Nov. 26, 1975, abandoned. This application Dec. 22, 1977, Ser. No. 863,563
Claims priority, application Italy, Dec. 2, 1974, 70493 A/74; Jul. 23, 1975, 68918 A/75
Int. Cl.² B05C *1/08*
U.S. Cl. 118—212 **6 Claims**



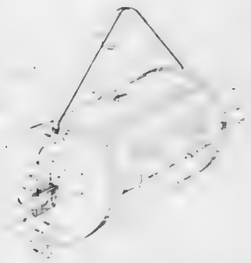
1. Apparatus for reinforcing a fabric by printing a pattern of discrete lines of fluid, settable or curable reinforcing material thereon, which reinforcing material is subsequently set or cured to form lines of an elastomeric or plastics material penetrated into and reinforcing said fabric, said apparatus comprising:
two printing roll means, first drive means for driving one of said printing roll means and second drive means for driving the other printing roll means continuously with said one of said printing roll means, said printing roll means comprising a rotary printing cylinder whose surface defines a printing pattern extending over substantially the entire circumference of the cylinder consisting of mutually parallel, non-interconnected axial grooves of a depth from 0.05 to 1 mm, and a backing roll for defining a printing zone with said printing cylinder;
movable mounting means mounting one of said printing roll means for translatory movement through a substantial distance towards and away from the other said printing roll means, whereby in one end position of said movable mounting means said printing roll means define said printing zone therebetween and in the other end position of said movable mounting means said printing roll means define a large gap through which said fabric can be drawn without printing said fluid reinforcing material thereon, enabling said fluid reinforcing material to be printed on at least one limited, discrete area of said fabric;
adjustable abutment means limiting said movement of said one printing roll means towards said other printing roll means to define a predetermined gap therebetween;
quick-acting means for rapidly moving said movable mounting means, and hence said one printing roll means, towards and away from said other printing roll means and holding said one printing roll means into engagement with said abutment means to maintain said gap constant during printing; and
stand means mounting said other printing roll means, said movable mounting means, said drive means and said quick-acting means.

4,173,200

BIRDHOUSE CONSTRUCTION

Wayne A. Olsen, 250 Ewald SE., Salem, Oreg. 97302, and Calvin L. Tigner, 1035 N. Albany Rd., Albany, Oreg. 97321

Filed Dec. 12, 1977, Ser. No. 859,332
Int. Cl.² A01K *31/00*
U.S. Cl. 119—23 **3 Claims**



1. In a birdhouse of cylindrical shape closed by circular end walls, the improvement comprising,
an end wall of flexible construction,
a perch struck from said end wall and projecting outwardly therefrom along a fold line,
a perch support member subjacent the perch and in abutment with the end wall.
retainer means for said support member also struck from said end wall, and
said retainer means comprising a strip integral at its opposite ends with the end wall and said perch.

4,173,201

ILLUMINATED COLLAR FOR PETS AND THE LIKE

Ethel Chao, and Albert Chao, both of 407 Glendale Rd., Northvale, N.J. 07647

Filed Aug. 30, 1977, Ser. No. 829,181
Int. Cl.² A01K *27/00*
U.S. Cl. 119—106 **1 Claim**



1. An illuminated collar for pets and the like, comprising in combination, a leather strap, a rubber tape glued to one side thereof, forming a central core covered by a plastic facing on its outer side, and a plastic facing on its inner side and stitched together through said core; said collar including a self-contained illumination system that includes a plurality of lamps in

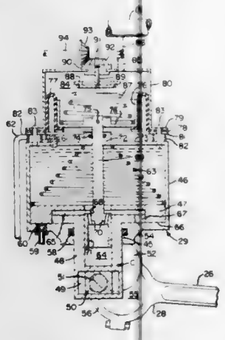
a row along said collar, which are in an electric circuit with a replaceable battery and a manually operative switch; a hard plastic battery case containing said battery, said lamps, switch and battery case protruding outwardly from an outer side of said collar, said battery case having an opening on its rear side for access to replace said battery, a rear edge of said battery case having a peripherally extending flange positioned behind said core, said battery case opening being covered by one end portion of said inner plastic facing which is left unstitched, thus forming a liftable tab for allowing said battery access, and said tab being retained closed over said case by means of VELCRO fasteners.

4,173,202

INTERNAL COMBUSTION ENGINE HAVING AUTOMATIC COMPRESSION CONTROL

George W. Crise, P.O. Drawer A, Danville, Ohio 43014

Division of Ser. No. 766,207, Feb. 7, 1977, Pat. No. 4,131,094.
This application Nov. 20, 1978, Ser. No. 962,236
Int. Cl.[2] F02B 75/04
U.S. Cl. 123—48 B **5 Claims**



1. In combination with a reciprocating piston-type internal combustion engine which includes a combustion cylinder, a fuel intake passage for conducting gaseous fuel to said cylinder, a piston reciprocable in said cylinder, a crankshaft, an articulated connecting rod comprising a plurality of angularly related, pivotally connected sections extending between and connecting said piston with said crankshaft, and a guide rod connected with said connecting rod and movable to vary the angular relationship of the sections of said connecting rod and thereby vary the pattern of reciprocation of said piston in said cylinder; an automatic control for moving said guide rod comprising:

(a) an hydraulically operated servomotor including a movable fluid pressure responsive piston having opposed pressure faces;

(b) crank means connecting the servomotor piston with said guide rod;

(c) a pilot valve having opposite faces connected by a fluid passage and movable in opposite directions independently of the position of the servomotor piston to control the direction of movement of the servomotor piston;

(d) a flexible, fluid pressure operated member continuously connected with said valve and the fuel intake passage of said engine and operable in response to pressure of a predetermined magnitude in said fuel intake passage to move said valve in one direction; and

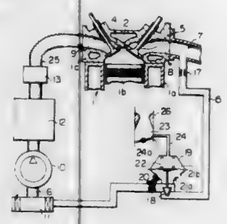
(e) spring means engaging said flexible fluid pressure operated member and urging it to move in an opposite direction.

4,173,203

ENGINE SYSTEM

Yasuo Nakajima, Yokosuka; Michio Onoda, Yokohama; Kunihiko Sugihara, Tokyo, and Shinichi Nagumo, Yokohoma, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama Japan

Filed Dec. 1, 1977, Ser. No. 856,532
Claims priority, application Japan, Dec. 2, 1976, 51-145124
Int. Cl.[2] F02M 25/06
U.S. Cl. 123—119 A **4 Claims**



1. An engine system comprising:

a four stroke reciprocatory internal combustion engine which has a cylinder block formed with at least one cylinder; a piston slidably disposed in said cylinder for reciprocal movement therein; a cylinder head secured to said cylinder block to close said cylinder, said cylinder, piston, and cylinder head cooperating to form a combustion chamber; an intake means, including a carburetor, for admitting air fuel mixture into said cylinder during the intake stroke of said piston; an exhaust means for discharging the exhaust gas resulting from the combustion of the air fuel mixture from said cylinder during the exhaust stroke of said piston; and an additional intake means for admitting air, under pressure above atmospheric pressure, into said cylinder during a period overlapping the exhaust stroke of said piston and during a period overlapping the intake stroke of said piston; and

an exhaust gas recirculation conduit leading from said exhaust means to said additional intake means to permit a portion of exhaust gas passing through said exhaust means to flow from said exhaust means toward said cylinder through said additional intake means.

4,173,204

CONTROL VALVE OF EXHAUST RECIRCULATION APPARATUS

Teruo Takayama; Kinsaku Yamada, and Chiaki Niida, all of Katuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 14, 1977, Ser. No. 851,429
Claims priority, application Japan, Nov. 17, 1976, 51-138777
Int. Cl.[2] F02M 25/06
U.S. Cl. 123—119 A **10 Claims**

1. A control valve for an exhaust recirculation apparatus of an internal combustion engine, which controls an exhaust gas recirculation valve provided in an exhaust recirculation passage which leads exhaust gas from the engine back to the engine for controlling the quantity of exhaust gas recirculated in the exhaust recirculation passage according to the degree of vacuum at a venturi portion of a carburetor and the exhaust pressure in an exhaust inflow chamber defined in the exhaust recirculation passage by an orifice and the exhaust gas recirculation valve, comprising:

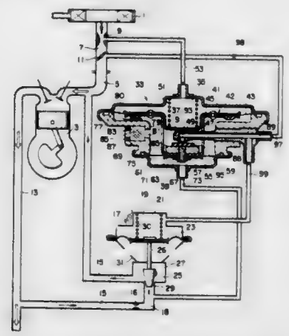
an expansible vacuum chamber having a first diaphragm and communicating with said venturi portion of a carburetor;

an expansible exhaust pressure chamber having a second diaphragm arranged such that the second diaphragm opposes the first diaphragm of the expansible vacuum chamber and is spaced therefrom, the expansible exhaust pressure chamber communicating with said exhaust inflow chamber;

a control chamber defined by the first diaphragm, the second diaphragm, and a frame mounting the first and second diaphragm thereon, the control chamber communicating with atmosphere through a hole in the frame;

connecting means for mechanically connecting the first diaphragm and the second diaphragm;

a seal member provided in said control chamber so as to move with said connecting means;



a control passage disposed in the control chamber and communicating with a throttle portion of the carburetor and with said exhaust gas recirculation valve, and having an opening in said control chamber which faces said seal member and is spaced therefrom so that said opening is throttled by movement of said seal member with respect thereto; and

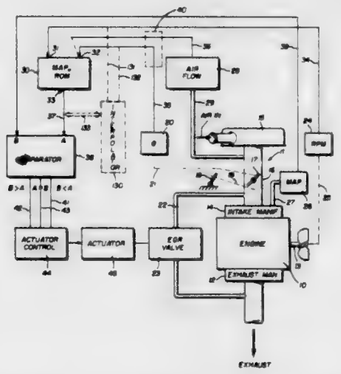
a spring urging said first diaphragm in a direction such that the gap between said seal member and said opening of the control passage will be increased.

4,173,205

CLOSED LOOP EXHAUST GAS RECIRCULATION SYSTEM

Alvin D. Toelle, Fenton, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Nov. 28, 1977, Ser. No. 855,493
Int. Cl.[2] F02M 25/06
U.S. Cl. 123—119 A **11 Claims**



1. In an internal combustion engine having an intake system, an exhaust system, a throttle for controlling the air flow into said intake system, and an output shaft rotatably driven by the combustion of fuel and air in said engine, a closed loop exhaust gas recirculation system comprising:

a memory means for storing a look-up table of optimal values of absolute manifold pressure (MAP_O) as a function of engine speed and throttle position a unique one of said stored optimal values of absolute manifold pressure being defined for each memory location and each memory location being accessible by the entry of a first dimension address and a second dimension address for outputting the optimal value of absolute manifold pressure stored therein;

means associated with said engine and responsive to the rotation of said output shaft for generating a first digital number indicative of actual engine speed for addressing one of said first and second address dimensions of said memory means;

means associated with said throttle and responsive to the relative position thereof for generating a second digital number indicative of the actual throttle position for addressing the other of said first and second address dimensions of said memory means;

said memory means being responsive to the generation of said first and second digital numbers for addressing said first and second memory dimensions to access said unique memory location defined thereby and output a third digital number indicative of said unique optimal value of absolute manifold pressure MAP_O stored therein;

means coupled to said intake system and responsive to the actual absolute manifold pressure existing therein for generating a fourth digital number indicative of the actual absolute manifold pressure (MAP);

means for comparing said third and fourth digital numbers and generating a first control signal if $MAP < MAP_O$ and for generating a second control signal if $MAP > MAP_O$;

a conduit operatively coupling said exhaust supply to said intake supply for supplying said exhaust gases to said intake system for inhibiting the generation and emission of oxides of nitrogen while regulating drivability and the like;

valve means disposed at least partially within said conduit for regulating the flow of exhaust gases back to said intake system; and

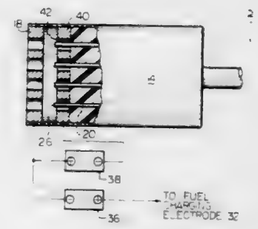
control means for regulating the opening and closing of said valve means and responsive to said first control signal for increasing the amount of recirculated exhaust gases supplied to said intake system and responsive to said second control signal for decreasing the amount of recirculated exhaust gases supplied to said intake system.

4,173,206

ELECTROSTATIC FUEL INJECTOR

Kenji Masaki, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Mar. 18, 1977, Ser. No. 778,944
Claims priority, application Japan, Mar. 24, 1976, 51/31450; May 29, 1976, 51/61785
Int. Cl.[2] F02B 33/00
U.S. Cl. 123—119 E **5 Claims**



1. A fuel ejection unit for combustion systems comprising:

charging and ejecting means for electrically charging a volume of fuel to a given polarity and having ejecting means for ejecting same;

first electrode means electrically charged in use to a polarity opposite to said given polarity to establish an electrostatic field which accelerates the ejected fuel; and

second electrode means spaced from said first electrode means adjacent to a point where said fuel is ejected and electrically charged in use with respect to said first electrode means for modifying said electrostatic field to thereby control the amount of said juel ejected.

4,173,207

CANISTER

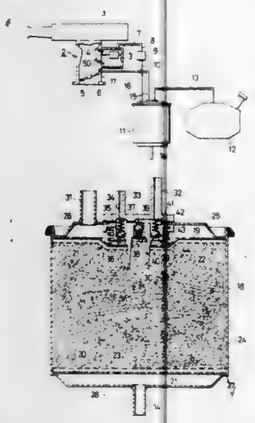
Eiji Hiramatsu, Aichi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 697,848, Jun. 21, 1976, abandoned. This application Mar. 22, 1978, Ser. No. 889,112

Claims priority, application Japan, Jan. 14, 1976, 51-2784

Int. Cl.² F02M *37/02*

U.S. Cl. 123—136 **1 Claim**



1. A canister for an internal combustion engine having a carburetor that includes a float chamber (**3**) and a purge port (**17**) positioned adjacent a throttle valve (**5**) and a fuel tank (**12**), said canister comprising:

a hollow, main body (**18**) having a space therein;

an adsorbent material (**24**) partially filling said space in said main body and defining upper and lower spaces (**26** and **28**, respectively) in combination with said main body;

a first inlet pipe (**31**) attached to said main body (**18**) for permitting passage of fuel evaporation gases from the float chamber (**3**) of the carburetor (**2**) to said upper space (**26**);

an air suction pipe (**14**) attached to said main body (**18**) whereby said lower space (**28**) communicates with the atmosphere through said suction pipe; and

valve means (**37, 41** and **36**) separate from said first inlet pipe (**31**) for providing selected fluid communication between both the fuel tank (**12**) and said upper space as well as the purge port (**17**) and said upper space, said valve means comprising;

a valve casing (**29**) positioned in said housing and having a tubular partition (**30**) extending downwardly therefrom into said adsorbent material (**24**);

a first, positive pressure ball-type check valve (**37**) in said valve casing and in fluid communication with said upper space (**26**);

a second inlet pipe (**32**) fluidly connecting the fuel tank (**12**) to said first check valve (**37**) and to said upper space (**26**);

a second, negative pressure ball-type check valve (**41**) in said valve casing and in fluid communication with said upper space (**26**);

said second inlet pipe (**32**) also providing fluid communication between said second check valve (**41**) and the fuel tank (**12**), said second check valve (**41**) acting only when the pressure in the fuel tank (**12**) is negative;

a third ball-type check valve (**36**) in said valve casing and in fluid communication with said upper space (**26**);

an outlet pipe (**33**) fluidly coupling the purge port (**17**) and said third check valve (**36**) for preventing the fuel evaporation gas from flowing back from the carburetor (**2**) into said upper space (**26**).

4,173,208

FUEL SYSTEMS FOR AN INTERNAL COMBUSTION ENGINE

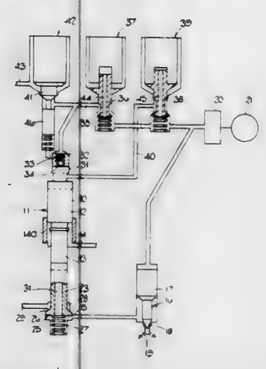
Ivor Fenne, Greenford, and Boaz A. Jarrett, London, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Nov. 7, 1977, Ser. No. 848,999

Claims priority, application United Kingdom, Nov. 9, 1976, 46677/76

Int. Cl.² F02D *5/02*

U.S. Cl. 123—139 AT **10 Claims**



1. A fuel system for connection to a fuel injection nozzle of an internal combustion engine, comprising a first cylinder having a first outlet, first piston means movable within said first cylinder to displace fuel at high pressure from one end of said first cylinder through said outlet to a fuel injection nozzle, a second cylinder having a second outlet, second piston means movable within said second cylinder to displace a limited volume of fluid at pressure from one end of said second cylinder through said second outlet, passage means connecting said second outlet to said first cylinder, and valve means having means operably connecting said first and second cylinders and adapted to supply, in a first condition, fluid under pressure to said second piston means for moving said second piston means towards said one end of the second cylinder so as to displace fluid at pressure therefrom, and also said fluid at pressure displaced from said one end of the second cylinder to said first cylinder to be applied to said first piston means through said passage means, for moving said first piston means towards said one end of the first cylinder so as to displace a limited volume of fuel through said first outlet, said means operably connecting said first and second cylinders being adapted to apply in a second condition, fluid at pressure to said first piston means, whereby said first piston means is moved towards said one end of the first cylinder so as to displace fuel through said first outlet, and said means operably connecting said first and second cylinders enabling, in a third condition, said first piston means to be moved away from said one end of the first cylinder, and also enabling in one of said second and third conditions, said second piston means to be moved away from said one end of the second cylinder.

4,173,209

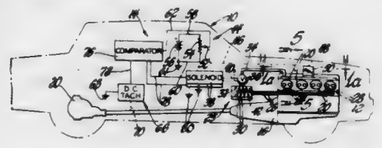
ENGINE CONTROL SYSTEM AND VALVE DEACTIVATOR THEREOF

Edgar R. Jordan, 32260 W. Twelve Mile Rd., Farmington Hills, Mich. 48018

Division of Ser. No. 815,743, Jul. 14, 1977. This application Dec. 16, 1977, Ser. No. 861,377

Int. Cl.² F02D *13/06*

U.S. Cl. 123—198 F **6 Claims**



1. In an internal combustion engine that is throttle operated to control output speed and which includes a plurality of piston cylinders with respective intake and exhaust valves associated therewith for feeding combustible charges to the cylinders and for receiving burnt charges therefrom, an engine control system comprising: valve deactivators associated with the intake and exhaust valves of certain cylinders to control operation thereof; each deactivator having a member movable to a first position where the associated valve operates and to a second position where the associated valve is deactivated; a first sensor for generating a variable signal responsive to engine throttle position; a second sensor for generating a variable second signal responsive to engine output speed; a comparator that compares the signals of the first and second sensors and generates a variable output signal responsive thereto; and actuator means for controlling the valve deactivators in response to the output signal of the comparator such that the movable member of each intake valve deactivator is moved to the first position thereof after the movable member of the associated exhaust valve deactivator is moved to the first position thereof and such that the movable member of each exhaust valve deactivator is moved to the second position thereof after the movable member of the associated intake valve deactivator is moved to the second position thereof.

4,173,210

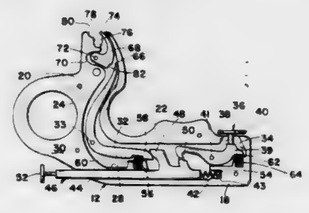
BOW STRING RELEASE DEVICE

Loyd S. Napier, Rte. 1, Box 417A, Sapulpa, Okla. 74066

Continuation-in-part of Ser. No. 684,114, May 7, 1976, Pat. No. 4,066,060. This application Dec. 29, 1977, Ser. No. 865,626

Int. Cl.² F41B *5/00*

U.S. Cl. 124—35 A **3 Claims**



1. A draw and release device for a bow string and comprising a generally L-shaped body means contoured for gripping by a hand and having a substantially co-extensive L-shaped internal passageway means with an open end for receiving a bow string, latch means alternately engageable and releasable with respect to a bow string, a first pivotal bell crank means disposed within said passageway means for movement between latch means engaging and releasing positions, independent trigger means carried by said body means and operably connected with said first bell crank means for selective pivoting of said first bell crank means to pivot said first bell crank means so as to release said latch means from a bow string engaging position, said latch means being pivotally secured within said body means and in communication with said passageway means for selective engagement by said first bell crank means, flexible loop means secured to said body means for selective engagement with a bow string, loop receiving recess means provided on the outer periphery of said body means for removably receiving said loop means therein, said latch means extending transversely across said loop receiving recess means and being selectively engageable therewith for alternate opening and closing thereof to alternately retain and release said loop means with respect to said loop receiving recess means, said trigger means comprising lever means movably secured in said passageway means selectively engageable with said first bell crank means for providing said release of the latch means, and second bell crank means pivotally secured in said passageway means for selective engagement with the movable lever means to control the engagement of the lever means with the said first bell crank means for providing said release of the latch means.

4,173,211

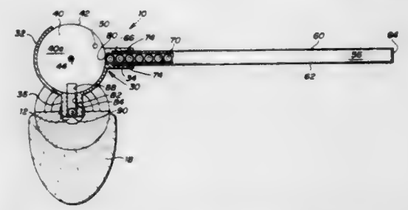
PELLET GUN LOADING DEVICE

Tom H. Crawford, Jr., 408 S. Waverly St., Dallas, Tex. 75208

Filed Dec. 29, 1977, Ser. No. 865,441

Int. Cl.² F41F *9/06*

U.S. Cl. 124—45 **4 Claims**



1. A dispensing device for loading pellets into the receiver of an air gun comprising:

a circular housing having curvilinear wall portions, said wall portions including a pellet receiving aperture and a circumferentially disposed pellet dispensing aperture for mating and communicating with the receiver of the air gun;

an elongated hollow storage tube having top, bottom and side walls for retaining and storing a plurality of pellets in a predetermined orientation, one end thereof being open for removably mating to said housing adjacent said pellet receiving aperture to permit pellets retained and stored in said storage tube to enter said housing;

said bottom wall of said storage tube having an interior surface including a centrally disposed rib for maintaining said plurality of pellets in said predetermined orientation;

a pellet dispensing wheel having a peripheral surface and parallel side wall surfaces rotatably disposed within said housing for circular movement therein, a portion of said peripheral surface of said pellet dispensing wheel being exposed through said housing curvilinear wall portions to permit an operator to rotate said pellet dispensing wheel within said housing;

said peripheral surface of said pellet dispensing wheel including a longitudinal slot perpendicularly disposed to said side wall surfaces of said pellet dispensing wheel, said longitudinal slot opening outwardly of said pellet dispensing wheel and being dimensioned for retaining one of said plurality of pellets retained and stored in said storage tube;

said housing further including a shaft aligned with said pellet dispensing aperture for mating with the receiver of the air gun; and

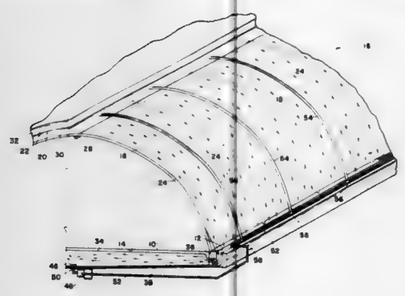
said pellet dispensing wheel being rotatable within said housing between a first position in which said longitudinal slot is aligned with said pellet receiving aperture for receiving one of said plurality of pellets retained and stored in said storage tube and a second position in which said longitudinal slot is aligned with said pellet dispensing aperture for dispensing said received pellet through said housing shaft for insertion in a predetermined orientation into the receiver of the air gun while simultaneously preventing the remaining ones of said plurality of pellets retained and stored in said storage tube from entering said housing until a subsequent loading of the air gun.

4,173,212

SELF-CONTAINED SOLAR GREENHOUSE

Carl E. Whitcomb, Stillwater, Okla., assignor to The Board of Regents for the Oklahoma Agricultural and Mechanical Colleges, Stillwater, Okla.

Filed Oct. 17, 1977, Ser. No. 842,666
Int. Cl.² F24J 3/02
U.S. Cl. 126—430 **9 Claims**



1. A solar heated greenhouse comprising;

a floor having parallel sides;

a quonset type roof structure supported above said floor, the roof extending to the floor sides, the roof being formed of inner and outer spaced apart light penetratable members providing a heat collecting chamber therebetween;

a water filled strata beneath said floor and in heat conductive relationship therewith, the strata having communication with said roof heat collecting chamber at the floor edges, the strata having a base surface, the longitudinal median portion of said base surface being at a lower level than the longitudinal edges of said lower base;

an impervious lining provided between said lower base and the earth;

means for spraying water in said heat collecting chamber between said light penetratable members whereby water heated by solar energy runs down the chamber and into said strata;

pump means for circulating water from said strata into said heat collecting chamber whereby water in said strata is heated during sunlit hours, the heat of the water in the strata penetrating said floor and maintaining a warm temperature within the greenhouse at night and during cloudy days, said pump means comprising a pump having an inlet and outlet, pipe means connected between said pump inlet and the longitudinal median portion of said lower base, a distribution conduit connected to said pump outlet and extending along at least one side of said floor, and a plurality of hoses each having spaced openings therein, the hoses being positioned in spaced apart orientation in said heat roof collecting chamber, each said hose being connected to said distribution conduit; and

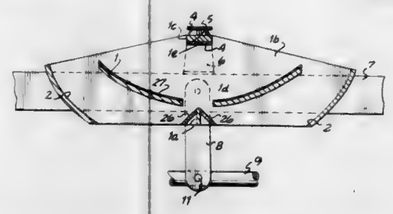
the water filled strata and said heat collecting chamber together with said pump means forming a closed system.

4,173,213

SOLAR POWER SYSTEM, WITH HIGH CONCENTRATION, LINEAR REFLECTIVE SOLAR PANELS

Donald A. Kelly, 58-06 69th Pl., Maspeth, N.Y. 11378

Filed Sep. 15, 1976, Ser. No. 723,501
Int. Cl.² F24J 3/02
U.S. Cl. 126—425 **8 Claims**



1. A solar power system with multiple high concentration reflective solar panels formed of linear parabolic reflectors with mirrored surfaces,

each of said multiple high concentration reflective solar panels is reinforced with a longitudinal support strip and stringer with cross partitions at uniformly spaced intervals,

two lower side concave elongate mirrors secured to said cross partitions at uniformly spaced intervals,

two lower angular mirrors centrally secured to said longitudinal stringer,

centrally disposed longitudinal slots within said high concentration reflective solar panels between said cross partitions,

a continuous line of photovoltaic solar cells affixed to the underside of said longitudinal support strip,

end pivots located at the ends of said multiple high concentration reflective solar panels centered on the focal line of said linear parabolic reflectors,

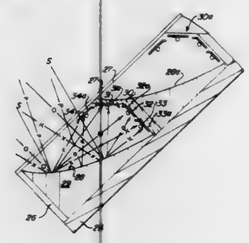
each of said end pivots fitted into trunnion brackets secured to an open rigid framework with suitable hardware.

4,173,214

CONCENTRATING SOLAR HEAT COLLECTOR

Arthur P. Fattor, 5380 S. Holly, Englewood, Colo. 80110

Filed Aug. 15, 1977, Ser. No. 824,569
Int. Cl.² F24J 3/02
U.S. Cl. 126—441 **8 Claims**



1. A non tracking and non tilting concentrating solar radiation collector system of the reflecting type, comprising:

(a) at least one parabolic—trough reflecting surface mounted one generally above the other, and at an angle to collect solar radiation, at sun angles from about 30° to 75° above the horizon which reflect incoming rays generally upright into a line focus, which moves horizontally with a change in the suns angle,

(b) a plurality of separate, spaced apart target means shielded from each other and superposed over each said reflecting surface, and each target positioned to be impinged by said line focus at predetermined times of the year,

(c) each said target means having solar heat collection means over a predetermined distance related to the suns angle to be impinged on by radiation during a predetermined calendar period having attached fluid conveying conduit means in heat transfer contact with said collection means, and each said fluid conduit means being arranged for a flow of fluid therethrough,

(d) control means for individually passing a fluid through one said fluid conduit means while the remainder are closed to fluid flow, and

(e) means for circulating fluid through said fluid conduit means.

4,173,215

APPARATUS FOR STEAMING FOODS

Jean Y. Bureau, Dollard-des-Ormeaux, and Bernard Charlebois, Montreal, both of Canada, assignors to Mscan Metal Canada Limitee, Montreal, Canada

Continuation of Ser. No. 857,683, Dec. 5, 1977, abandoned. This application Jul. 28, 1978, Ser. No. 928,906
Int. Cl.² A21B 1/08; A47J 27/04
U.S. Cl. 126—369 **19 Claims**



1. An apparatus for steaming foods comprising:

(a) a steam chamber;

(b) means for filling the chamber with steam, said filling means comprising means for introducing liquid into the bottom of the steam chamber, and heating means outside the steam chamber for heating the liquid in the steam chamber to produce steam;

(c) means for allowing steam to escape from the chamber to maintain substantially atmospheric conditions in the chamber;

(d) a condensing chamber for the escaping steam;

(e) means in the condensing chamber for spraying liquid on the steam to condense it;

(f) means for draining the liquid and condensed steam from the condensing chamber; and

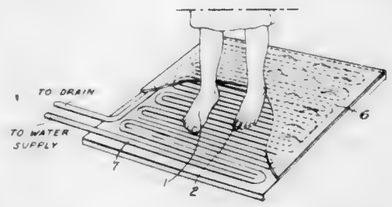
(g) means for controlling the heating means and the filling means, said control means comprising a sensor for sensing the temperature of the water and condensed steam in the condensing chamber.

4,173,216

MASSAGE DEVICE

Roland Nolet, 14 Belle Pl., Ste-Rose, Laval, Quebec, Canada (H7L 3G9)

Filed Jan. 21, 1977, Ser. No. 761,345
Int. Cl.² A61H 29/00
U.S. Cl. 128—24.1 **1 Claim**



1. A massage device for massaging the bottoms of the feet and the palms of the hands of a user on a supporting surface, said massage device comprising

carpet having an upper surface and bumps formed therein and extending from the upper surface thereof, said carpet covering the supporting surface and coming into close contact with the bottoms of the feet or the palm of the hands of a user; and

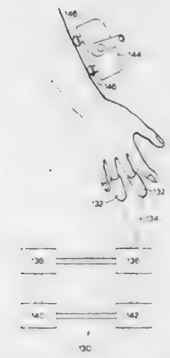
a pipe on the supporting surface under the carpet and having water circulating therethrough.

4,173,217

MASSAGE APPARATUS

Lyman C. Johnston, 12 Boulton Dr., Toronto, Ontario, Canada

Filed Nov. 23, 1976, Ser. No. 744,385
Claims priority, application Canada, Jul. 18, 1976, 256590
Int. Cl.² A61H 29/00
U.S. Cl. 128—734 **1 Claim**



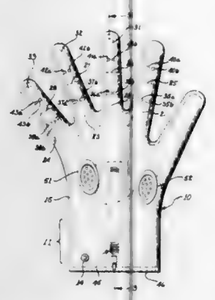
1. A method of massage treatment of deep muscle in body tissue comprising the steps of attaching to the skin of the person being treated a pair of electrodes of a galvanic skin reactor to complete the circuit, applying to said body tissue reciprocating massage elements intended to to cause muscular stretch reflex to affected muscles, which reflex will change the resistance between said pair of electrodes and the underlying skin and measuring the response of said galvanic skin reactor indicating the change in resistance between said electrodes and the enclosed skin caused by said application of said massage elements to said body tissue.

4,173,218

GLOVED SPLINT FOR AN ARTHRITIC HAND

Penny S. Cronin, 7831 W. Zucca Dr., Peoria, Ariz. 85345

Filed Nov. 23, 1977, Ser. No. 854,130
Int. Cl.[2] A61F *5/10*
U.S. Cl. 128—77 **11 Claims**



1. A hand protector for supporting and protecting the fingers of an arthritis stricken hand, said hand protector . . . comprising in combination:

(a) a palm splint positionable in juxtaposed relationship to the palm of the hand, said palm splint being configured to permit unrestricted normal movement of the thumb;

(b) a finger splint extending from said palm splint for supporting each respective finger but not thumb in a non-laterally moveable relationship to the palm;

(c) means for flexing a section of at least one of said finger splints to permit flexing of the fingers along a single axis only to control opening and closing of the fingers of the hand, said flexing means being positionally commensurate with a joint of the respective finger; and

(d) glove means for maintaining said palm splint and said finger splints in juxtaposed relationship with the respective parts of the hand while enclosing at least the fingers and palm of the hand, said glove means including:

i. shock absorbing means for buffering impacts and blows to the hand; and

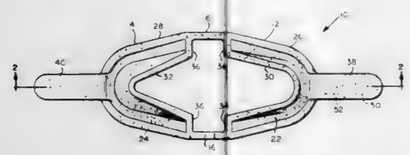
ii. means for opening and closing said glove means to facilitate insertion and withdrawal of the hand therefrom, whereby, said finger splints preclude lateral skewing of the fingers due to involuntary muscle contractions and yet permit mobility of the thumb and mobility of the fingers to flex.

4,173,219

DISPOSABLE DENTAL TRAY

Frank N. Lentine, Taylor, Mich., assignor to Sybron Corporation, Rochester, N.Y.

Filed Jan. 30, 1978, Ser. No. 873,269
Int. Cl.[2] A61M *35/00*
U.S. Cl. 128—260 **5 Claims**



1. A dental tray for applying medicaments and the like to teeth comprising:

(a) an upper tray portion for the upper dentition and a lower tray portion for the lower dentition;

(b) each of said tray portions including an outer shell of closed cell polyethylene foam, said outer shell having a generally U-shaped base approximating the curve of the dental arch and integrally formed buccal, lingual and rear walls upstanding from said base so as to form a closed medicament holding trough;

(c) said base being flat in cross section from the posterior ends of said U-shape to the bicuspid region and concave from the bicuspid region to the anterior end;

(d) said buccal wall being generally normal to said base from the anterior to the posterior ends;

(e) said lingual wall being generally normal to said base at the posterior ends and inclined with respect to said base in a direction away form said buccal wall at the anterior end, the angle of inclination of said upper tray lingual wall being greater than the angle of inclination of said lower tray lingual wall;

(f) said buccal and lingual walls being lower at the posterior than at the anterior ends so as to form a trough which increases in depth from the posterior to anterior ends;

(g) hinge members extending between and connected to the posterior ends of said tray portions connecting said tray portions together;

(h) a layer of open cell polyurethane hydrophillic foam bonded to and lining the entire inner surface of said tray portions;

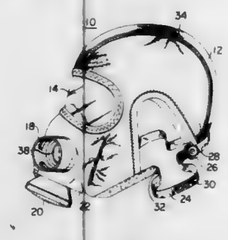
(i) a handle extending outwardly from the upper edge of each buccal wall at the anterior end thereof.

4,173,220

FACEMASK

Thomas J. Ratz, Greenbelt, and Ralph L. Baker, Baltimore, both of Md., assignors to Midori Anzen Company, Ltd., Tokyo, Japan

Filed Jul. 5, 1977, Ser. No. 812,629
Claims priority, application Japan, Jul. 5, 1976, 51-88225
Int. Cl.[2] A62B *7/00*
U.S. Cl. 128—142.7 **2 Claims**



1. A facemask for use in a closed circuit breathing system comprising:

a soft, flexible hood for closely covering the head of a user and having a cut-away portion at opposite side positions corresponding to the user's ears for exposing the user's ears when the facemask is worn;

a transparent flexible eye piece secured to said hood for allowing the user to see therethrough, said eye piece being substantially flush with the hood for forming a continuous, low profile contour with said hood;

a breathing mask secured to said hood and including means adapted to hermetically envelope the mouth and the nostrils of the user when the facemask is worn by the user for forming a closed breathing chamber between said breathing mask and the facial skin of the user, said breathing mask having means for connecting breathing hoses to said breathing mask for directly flow of breathing gas directly into and out of said breathing mask, a voice disc on said breathing mask for allowing voice communications by the user, and check valve means in said means for connecting breathing hoses for regulating the direction of flow of the inhalation and exhalation gases to and from said breathing chamber; and
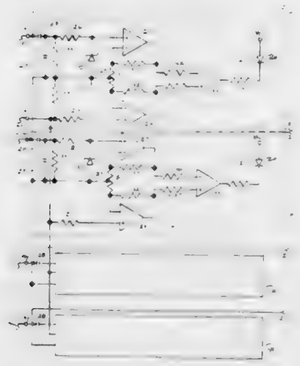
supporting means constituting part of said hood for firmly supporting said breathing mask on the oro-nasal portion of the user's face and constituted by inelastic straps integrally attached to said hood and extending across the top and down the back of said hood, and inelastic adjusting bands connected across said cut-away portion of said hood adjacent the lower edges of said hood and means for adjusting said bands to adjustably secure the hood to the head of a user.

4,173,221

EKG CABLE MONITORING SYSTEM

Richard J. McLaughlin, Hawthorne, Calif., and Wallace J. Rogozinski, 26 Dragonfly, Irvine, Calif. 92714, assignors to Wallace Rogozinski, Irvine, Calif.

Continuation-in-part of Ser. No. 787,976, Apr. 15, 1977, abandoned. This application Jun. 30, 1978, Ser. No. 920,740
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—696 **8 Claims**



1. An EKG cable monitoring system for use with a cable assembly having a plurality of test leads connected to a cable connector for a multiconductor cable to an EKG unit and including at least one reference lead and a plurality of signal leads connected to electrodes electrically coupled to the skin of a patient, said system comprising:

a visual display including a plurality of display devices, each electrically coupled to an associated signal lead and mounted on said cable connector in positional association with the signal lead to which it is coupled; and

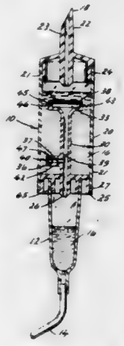
separate display drive means coupled across each signal lead and a reference lead, each drive means comprising a pair of primary differential amplifiers, the combined outputs of which are connected to drive a single one of said display devices, wherein a single one of each of said signal leads is coupled to a single one of said drive means, and therein coupled to a first polarity iput of a first one of said pair of primary differential amplifiers and said reference lead is connected to the first polarity input of the second one of said pair of primary differential amplifiers, and the opposite polarity inputs to said differential amplifiers are connected to a common floating ground.

4,173,222

APPARATUS FOR CONTROLLABLY ADMINISTERING A PARENTERAL FLUID

Andrew J. Muetterties, Gages Lake, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Aug. 19, 1976, Ser. No. 715,810
Int. Cl.[2] A61M *5/16*
U.S. Cl. 128—214 C **31 Claims**



1. An apparatus for administering a parenteral liquid from a parenteral liquid container to the patient comprising:

a reservoir chamber;

connection means for said fluid container in fluid-tight engagement with one end of said chamber, said connection means defining a fluid flow inlet passageway into said chamber;

means defining a closure for another end of said chamber, said closure means providing for a fluid flow outlet passageway;

fluid passage means extending into said chamber and in communication with said fluid flow inlet and outlet passageways;

means disposed in said chamber defining a first and a second orifice in communication with said fluid flow outlet passageway with at least one of said orifices communicating with said fluid passage means, said first and second orifices spaced from each other a predetermined distance and separately communicating with said outlet passageway;

means operatively associated with said first and second orifices and within said reservoir chamber to provide a reservoir of said liquid for flow through said second orifice after flow of said liquid through said first orifice and to substantially eliminate the flow of air into said first orifice; and

means operatively associated with said outlet passageway for administering said liquid.

4,173,223

CHAMBER ASSEMBLY FOR INFUSION AND TRANSFUSION APPARATUS

Kenneth C. Raines, and Robert J. LeFevre, both of Bethlehem, Pa., assignors to National Patent Development Corporation, New York, N.Y.

Filed Oct. 17, 1977, Ser. No. 843,064
Int. Cl.[2] A61M *5/16*
U.S. Cl. 128—214 C **11 Claims**

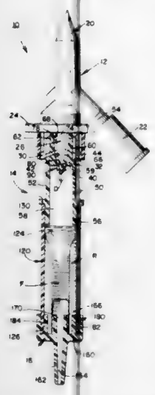
1. A connecting apparatus for use with infusion and transfusion systems comprising:

a piercing device assembly for connection to a source of fluid;

a tubing adaptor for connection to a length of tubing; and

a drip chamber assembly connecting said piercing device assembly to said tubing adaptor, said drip chamber including an observation chamber having port means located at

one end thereof through which fluid passes from said piercing device directly into said drip chamber, said observation chamber being attached to said piercing device assembly at said one end to form a joint and having defined therein an observation chamber passage through which fluid from the source of fluid passes directly from said source, a flexible pump chamber attached to one end thereof directly to another end of said observation chamber and receiving fluid directly therefrom, said pump chamber being filled with fluid at least and only to the level of said joint to form a reservoir from which fluid is removed during an infusion or transfusion procedure, said reservoir being located essentially entirely below said observation chamber, the removed fluid being replaced from the source of fluid as fluid is removed from said



reservoir, said observation chamber being connected to said pump chamber so that a lowering of liquid level of said reservoir caused by removal of one drop of fluid from said reservoir causes a drop in pressure in said observation chamber sufficient to cause a formation of a replacement drop of fluid in said port means, said observation chamber having a cross-sectional area of about 0.4 square centimeters and having a length of about 1.6 centimeters, and said pump chamber having a cross-sectional area of about 1.3 square centimeters so that a liquid level change of said reservoir in said pump chamber effected by the replacement drop will cause pressurization of air in said observation chamber sufficient to prevent falling of a subsequent drop of fluid from said port means until the liquid level in the reservoir is again decreased by a further removal of fluid therefrom.

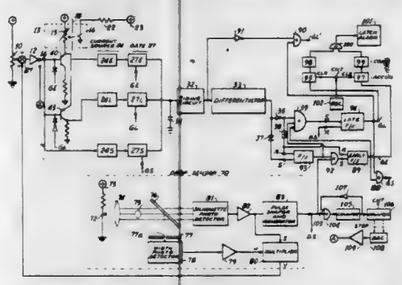
4,173,224

AUTOMATED INTRAVENOUS FLUID REGULATING AND ADMINISTERING APPARATUS

Alvin J. Marx, Rochester, and Abraham Edelman, New York, both of N.Y., assignors to Alvin J. Marx, Rochester, N.Y.

Continuation-in-part of Ser. No. 802,891, Jun. 2, 1977, Pat. No. 4,111,198. This application Jun. 19, 1978, Ser. No. 916,836
Int. Cl.[2] A61M *5/14*
U.S. Cl. 128—214 E **11 Claims**

1. An intravenous fluid regulator apparatus comprising means for establishing a first signal establishing a desired rate of introduction of drops of intravenous fluid to a patient, means for sensing the volume of said drops of fluid and for producing a second signal bearing a relation to the drop volume, and means coupled to said volume sensing means and to said first-



signal establishing means for operatively combining said first and second signals to produce a fluid control signal.

4,173,225

ADJUSTABLE STOP FOR DISPENSING SYRINGE

Howard F. Newman, Los Angeles, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Sep. 27, 1977, Ser. No. 836,995
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—218 C **6 Claims**



1. A dispensing syringe with a generally cylindrical barrel and having a dose control rod or the like with a longitudinally adjustable stop means connected thereto, wherein the improvement comprises: a pair of members with alignable openings through which the rod extends; a cam surface on one member to engage the other member to misalign the openings causing the members to grippingly engage the rod; and one member is a base with a pair of laterally spaced abutment portions for engaging the syringe barrel to limit rotational movement of the base on the rod during a dose adjustment procedure.

4,173,226

DEVICE FOR ADMINISTERING SOLID DRUG PARTICLES TO AN EYE

John W. Shell, Hillsborough, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 850,275, Nov. 10, 1977, Pat. No. 4,111,544, which is a continuation-in-part of Ser. No. 715,519, Aug. 18, 1976, abandoned, which is a division of Ser. No. 592,555, Jul. 2, 1975, Pat. No. 4,001,388, which is a continuation-in-part of Ser. No. 369,916, Jun. 14, 1973, Pat. No. 3,914,402. This application Jul. 7, 1978, Ser. No. 922,742
Int. Cl.[2] A61M *1/00*
U.S. Cl. 128—233 **3 Claims**

1. A container made in the shape of a single dosage dropper adapted for administering drug to an eye, said container consisting essentially of;

a wall defining the container, said wall made of a member selected from the group consisting of a plastic and a glass, and terminated in;

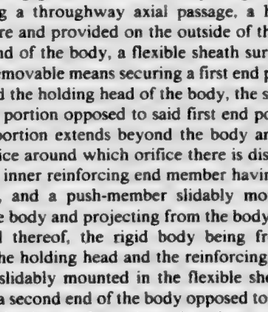
a tip with the wall thereof surrounding and forming a hole;

a cover for the tip;

a space in the container;

a barrier in the space;

a valve carried by the barrier; and



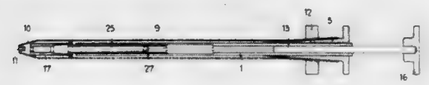
an upper and a lower chamber in the space formed by the barrier, said upper chamber containing solid drug particles administered by the dropper through the hole to the eye, and the lower chamber containing a physiological acceptable carrier for the particles which carrier can move through the valve into the upper chamber and mix with the particles therein.

4,173,227

INJECTING GUN FOR ANIMALS, IN PARTICULAR FOR THE ARTIFICIAL INSEMINATION OF CATTLE

Robert E. J. Cassou, and Bertrand M. E. Cassou, both of Rue Clemenceau, 61300 L'Aigle, France

Filed Jul. 5, 1977, Ser. No. 812,622
Claims priority, application France, Jul. 13, 1976, 7621438; Nov. 3, 1976, 7633107; Jun. 21, 1977, 7718992
Int. Cl.[2] A61M *1/00*
U.S. Cl. 128—235 **27 Claims**



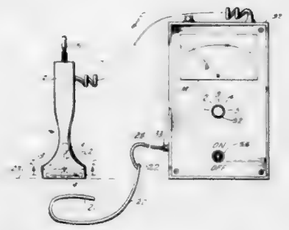
1. An injecting gun for animals, comprising a rigid tubular body defining a throughway axial passage, a holding head defining a bore and provided on the outside of the body adjacent a first end of the body, a flexible sheath surrounding the rigid body, removable means securing a first end portion of the sheath around the holding head of the body, the sheath having a second end portion opposed to said first end portion, which second end portion extends beyond the body and defines an injecting orifice around which orifice there is disposed within the sheath an inner reinforcing end member having a throughway passage, and a push-member slidably mounted in the passage of the body and projecting from the body adjacent the holding head thereof, the rigid body being freely slidably mounted in the holding head and the reinforcing end member being freely slidably mounted in the flexible sheath, the end member and a second end of the body opposed to said first end of the body having such sections that they are capable of bearing axially against each other.

4,173,228

CATHETER LOCATING DEVICE

Donald H. Van Steenwyk, San Marino, and Ira N. Childress, Los Angeles, both of Calif., assignors to Applied Medical Devices, San Marino, Calif.

Filed May 16, 1977, Ser. No. 797,318
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—653 **15 Claims**



1. A locating system for determining the position of a medical catheter inserted in a body, comprising:

an elongated catheter having a first end adapted for insertion in the body, and a second end which remains external to the body during insertion and use of the catheter;

a receiver coupling means mounted on the catheter adjacent the first end, the receiver coupling means having at least two terminals and being adapted to receive energy radiated from a remote source, and to generate a signal between the terminals which is analogous to the received energy;

connection means connected to the terminals of the receiver coupling means and extending along the catheter toward the second end to terminate outside the body;

generating means external to the body for generating a body-penetrating energy field detectable by the receiver coupling means; and

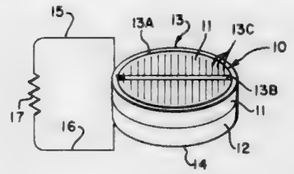
indicating means connected to the connection means for displaying the extent of coupling between the generating means and receiver coupling means, and thereby indicating the position of the catheter first end within the body.

4,173,229

THERAPEUTIC ADORNMENTS UTILIZING SOLAR CELLS

Leon Halfon, 957 N. Palm Ave., Los Angeles, Calif. 90069

Filed Sep. 15, 1977, Ser. No. 833,503
Int. Cl.[2] A61N *1/18*
U.S. Cl. 128—419 R **12 Claims**



1. A therapeutic adornment in the form of a bracelet, comprising:

solar cell means having an energy absorbing active face surface, a back surface and first and second electrical output terminals, said cell means being operable to convert sunlight and equivalent forms of energy received on its active surface into electrical energy which appears as a voltage across said output terminals;

electrically conductive arm band means for securing said cell means on a person's limb, said arm band means being secured to said cell means to extend rearwardly therefrom

around a person's limb and being electrically connected to said first output terminal; and

electrically conductive skin contacting means secured to said cell means to extend across the back surface thereof so as to contact the skin of a person's limb underlying said cell means back surface, said skin contacting means being electrically connected to said second output terminal whereby electrical energy generated by said cell means causes a beneficial current flow through a person's limb positioned between said skin contacting means and said arm band means.

4,173,230

NOISE ELIMINATION AND REFRACTORY PERIOD CONTROL IN DEMAND PACERS

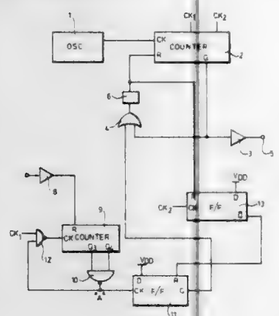
Dennis Digby, Brooklyn Park, Minn., assignor to Biotronik Mess- und Therapiegerate GmbH & Co., Berlin, Fed. Rep. of Germany

Filed Jun. 19, 1978, Ser. No. 917,129

Claims priority, application United Kingdom, Aug. 19, 1977, 34914/77

Int. Cl.² A61N *1/36*

U.S. Cl. 128—419 PG **3 Claims**



1. Demand cardiac stimulating apparatus comprising:

(a) oscillator means;

(b) first counter means, responsive to said oscillator means, for defining respectively larger predetermined first, second and third count intervals, said first counter being reset upon each achievement of said third count interval, and being resettable independently of said counts at any time completely to reinitiate its full counting sequence;

(c) output amplifier means for generating a stimulating pulse upon each achievement by said first counter of said third count interval;

(d) input amplifier means for sensing signals at the heart;

(e) second counter means, controllably incremented upon each repetition by said first counter of said first count interval, said second counter means being reset to recommence counting by each signal sensed at the heart by said input amplifier means;

(f) gating means, responsive to a predetermined terminal count of said second counter, for establishing a logic control state, said control state inhibiting further incrementing of said second counter until the next subsequent resetting of said second counter by said input amplifier;

(g) first control means, responsive to first achievement by said first counter, after resetting thereof, of said second count interval, said first control means establishing a refractory period for said stimulating apparatus after each resetting of said first counter and otherwise independently of the state of said second counter; and

(h) second control means inhibited by said first control means during said refractory period and thereafter being energized by termination of said logic control state, for resetting said first counter and thereby conditionally extending said refractory period as a function of said terminal count, also providing rejection of demand stimulating response to sensed signals having periodicity of less than said terminal count.

4,173,231

HAIR DRYER ATTACHMENT

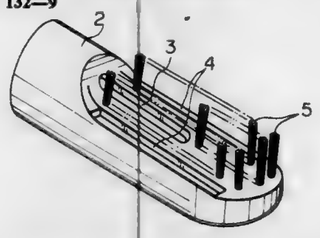
Koichi Isino, and Hisakichi Nose, both of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Oct. 31, 1977, Ser. No. 847,045

Claims priority, application Japan, Oct. 30, 1976, 51-130605

Int. Cl.² A45D *20/00*

U.S. Cl. 132—9 **2 Claims**



1. A hair dryer attachment comprising an elongate cylindrical body closed at an axial end and opened at the other axial end for mounting the body to an air blow-off port of a hair dryer, said body having a longitudinal axis and comprising a plurality of parallel ribs extending transversely relative to said longitudinal axis, a plurality of longitudinally spaced slots located between said ribs, said transverse ribs extending transversely beyond said slots to form lateral projections, and an elongate bristle fixture comprising a plurality of parallel bristle bases extending transversely relative to said longitudinal axis and interconnected by longitudinal ribs, the quantity and shape of said bases corresponding to that of said transverse ribs in said cylindrical body, and a plurality of rows of bristles extending from respective ones of said bristle bases, said bristle fixture being mounted on said body, with said bristle bases being fitted over said transverse ribs and with both ends of said transverse bristle bases engaging said lateral projections of the body, said slots each having a depth extending in a direction substantially perpendicular to said longitudinal axis for allowing an air stream from the hair dryer to be blown through the slot in a direction perpendicular to said axis, and said slots and rows of bristles lying substantially in directions intersecting said longitudinal axis at right angles to deliver said blown air stream to hair caught between the respective bristle rows.

4,173,232

RESIDUAL COIN DETECTING DEVICE IN COIN PROCESSING MACHINE

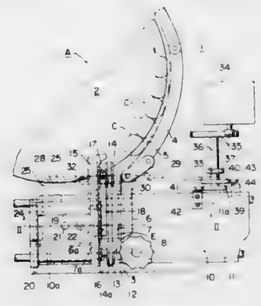
Kazuto Asami, and Takashi Okamoto, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Hyogo, Japan

Filed Feb. 28, 1978, Ser. No. 882,038

Int. Cl.² G07D *3/00*

U.S. Cl. 133—3 R **11 Claims**

1. In a coin processing machine wherein coins to be processed are supplied onto a turntable and thereafter fed in succession through a coin passageway extending from the periphery of the turntable, in which machine the width of the coin passageway is defined by a pair of coin guides which can be adjusted in accordance with the diameter of the coins to be processed by moving at least one of the coin guides which is adjustable, and a control member is provided in engagement with the movable coin guide, the combination therewith of a residual coin detecting device comprising electrical driving means selectively operable for bringing said control member to a predetermined position for moving the adjustable coin guide in response to a signal from a coin denomination setting section of the machine and a residual coin detecting member movable vertically between the coin guides prior to the movement of said movable coin guide by said electrical driving means



thereby detecting any coin or coins which might be remaining in the coin passageway by the vertical movement of the coin detecting member.

4,173,233

PILOT VALVE

David E. Snyder, Longview, Tex., assignor to U.S. Industries, Inc., New York, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,515

Int. Cl.² G05D *7/00*

U.S. Cl. 137—102 **18 Claims**

1. A pilot valve for use in controlling the flow of a control fluid to and from a fluid-operated actuator, comprising a body having a chamber therein, a first port connecting with the chamber to admit control fluid thereto, a first seat about the intersection of the first port with the chamber, a passageway connecting with the chamber, a vent port connecting the passageway with the exterior of the body, a second seat about the connection of the chamber and passageway, a second port for connecting the chamber with the actuator, a ball shiftable in the chamber between a first position seated on the first seat to prevent the admission of control fluid to the chamber while permitting control fluid to exhaust from the chamber out the vent port, and a second position seated on the second seat to prevent the exhaust of control fluid from the chamber out the vent port while admitting control fluid through the first port to the chamber, a spring-pressed stem extending into the chamber to yieldably urge the ball from its second to its first position, whereby said ball is so shifted when the fluid pressure within said chamber drops below a predetermined value, and means for returning the ball to its second position including a part manipulatable from the exterior of the body for moving the stem in a direction away from the second seat to permit the ball to shift from its first to its second position.

4,173,234

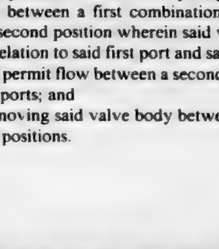
TRANSFER VALVE

David F. Thomas, West St. Paul, and Earl A. Platt, Eden Prairie, both of Minn., assignors to Waterous Company, South St. Paul, Minn.

Filed Nov. 25, 1977, Ser. No. 854,647

Int. Cl.² F16K *11/087*

U.S. Cl. 137—625.47 **20 Claims**



1. A fluid transfer valve including:

(a) a valve casing provided with a part-spherical interior sealing surface defining a valve cavity, said casing being provided with at least three valve ports open from outside said casing and through said sealing surface into said cavity;

(b) a valve body provided with a part-spherical outer surface forming part of the outer wall of said valve body and defining a sphere of diameter only slightly less than a sphere defined by the part-spherical interior sealing surface of the valve casing;

(c) said valve body being provided with a valve passage therethrough;

(d) a valve seal structure movable with the valve body and including a portion of said valve body defined by a fluid impervious circular face, an annular valve seal ring in sealing, surrounding relationship to said valve body face, and means to urge said valve seal ring outwardly from said valve body, said valve seal structure being adapted to seal the interior of one of said valve ports from the remainder of the valve cavity and from said passage in the valve body when the valve seal ring is positioned in sealing relation to the casing interior sealing surface in surrounding relation to such port;

(e) means for mounting said valve body in said cavity of said casing in concentric relation to the casing for movement of said valve body between a first position wherein said valve seal ring is in sealing contact with said interior sealing surface of said casing in surrounding relation to a first of said ports and said valve passage is aligned to permit flow between a first combination of two of said ports and a second position wherein said valve seal ring is in clearing relation to said first port and said valve passage is aligned to permit flow between a second combination of two of said ports; and

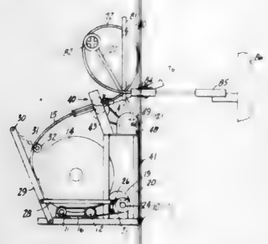
(f) means for moving said valve body between said first and said second positions.

4,173,235

METHOD AND APPARATUS FOR FORMING WIRE TO NONCIRCULAR CROSS SECTIONS

Maynard J. G. Tipper, 25 Melrose Ct., Hillsborough, Calif. 94010

Filed May 19, 1978, Ser. No. 907,738
Int. Cl.[2] B21F *45/22*
U.S. Cl. 140—82 **9 Claims**



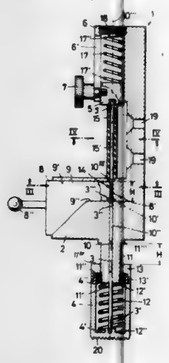
1. In the method of making a clip of noncircular cross section in a wire cutting and forming means the steps of:
providing a source of wire,
feeding said wire from said source,
forming said wire to a noncircular cross section during the feeding thereof,
guiding the formed wire to orient the same in a relatively large loop and thereafter,
feeding the formed wire from said loop to said wire cutting and forming means.

4,173,236

APPARATUS FOR FILLING MAGAZINE OF DENTAL APPLIANCE

Rüdiger Hirdes, Tippelsberger Str. 42, 4630 Bochum, Fed. Rep. of Germany

Continuation of Ser. No. 750,188, Dec. 13, 1976, abandoned. This application Mar. 2, 1978, Ser. No. 882,565
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1975, 2556574
Int. Cl.[2] B65B *3/12*
U.S. Cl. 141—249 **10 Claims**



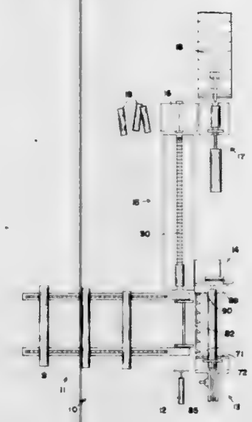
1. An apparatus for charging a moldable plastic dental amalgam mass into the hollow interior of a capsule formed as an elongated magazine tube having a pair of opposite ends and an opening at each end, said hollow interior of said capsule with said openings having a uniform cross-sectional shape, said apparatus comprising a support formed with an elongated passage defining a longitudinal axis and having an outlet end, with a first seat on said outlet end, said seat being snugly fittable with one of the ends of the capsule in a ready position thereof generally aligned with said axis, said support having a guiding passage extending substantially axially of said support in line with said outlet end; holding means including a rigid member in said guiding passage and having a second seat being snugly fittable with the other end of the capsule in a ready position thereof generally aligned with said axis, and resilient means in said guiding passage for normally urging said rigid member towards said first seat, said rigid member being slidable in said guiding passage on said support towards and away from said first seat against the biasing forte of said resilient means; a clamping element for clamping said rigid member in a desired position in said guiding passage to thereby provide a rigid holder for said capsule; means for supplying a moldable plastic mass into said elongated passage in said support; and piston means displaceable axially in said passage between a retracted position in a direction away from said first seat and an advanced position to thereby displace a charge of the moldable plastic mass contained in said passage axially along thereof and out of said outlet end into said capsule through the one opening thereof wherein said outlet end of said elongated passage in said support has a cross-sectional shape similar to that of the capsule, said support being provided with a storage chamber adapted to hold the moldable plastic mass and extending transversely from and opening into said elongated passage, and wherein said moldable-plastic-mass supplying means includes a plug snugly fitting in said chamber and displaceable therein transversely of said axis towards and away from said elongated passage for urging a quantity of the moldable plastic mass in said chamber towards and into said elongated passage.

4,173,237

FIREWOOD SYSTEMS

Leo L. Heikkinen, and Charles L. Lundborg, both of Prentice, Wis., assignors to LaFont Corporation, Prentice, Wis.

Filed Aug. 4, 1977, Ser. No. 821,793
Int. Cl.[2] A47J *42/09*; B27L *7/00*
U.S. Cl. 144—3 K **7 Claims**



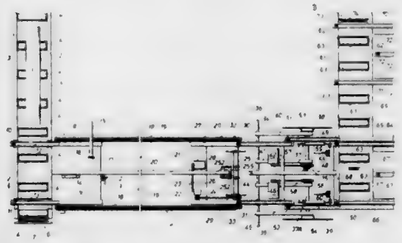
1. An apparatus for converting a log into firewood comprising:
a log deck for receiving and holding a plurality of logs to be cut into firewood;
means for removing a log from the plurality of logs held on the log deck and delivering the log from said log deck to a log feeder;
said log feeder having means for grasping and securely holding a log delivered from said log deck at one end thereof;
said means for grasping and securely holding a log including a first log support member and a second log support member that coact to sandwich a log between said first log support member and said second log support member;
means for cutting the log into fireplace wood when said log is held by said log feeder, means for receiving the log cut into firewood and diverting the cut logs to a splitting mechanism; and
a splitting mechanism for receiving the cut log and for splitting the cut logs.

4,173,238

TRIMMER METHODS AND APPARATUS FOR SAWMILLS

Roy R. Pryor, and Harold A. Pryor, both of P.O. Box 26, Woodville, Tex. 75979

Filed Dec. 6, 1976, Ser. No. 747,436
Int. Cl.[2] B26D *7/06*; B27B *7/00*
U.S. Cl. 144—312 **23 Claims**



1. A method of routing timbers in a sawmill and the like, comprising
conducting a plurality of timbers sequentially and longitudinally along a first path in said sawmill to a first transfer location,
laterally shifting a first one of said timbers from said first transfer location onto a second path extending therefrom to a second transfer location,
laterally shifting a second one of said timbers from said first transfer location onto said second path behind said first timber thereon,
laterally moving said first timber along said second path to said second transfer location,
arcuately and laterally shifting said first timber from said second transfer location to a trimming location while laterally moving said second timber to said second transfer location,
laterally shifting said first timber from said trimming location to a third transfer location along a third path leading to a plurality of receiving location,
arcuately and laterally shifting said second timber from said second transfer location to said trimmer location in response to said shifting of said first timber to said third transfer location, and
shifting said first timber from said third transfer location along said third path to a selected one of said receiving locations.

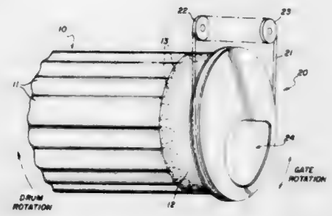
4,173,239

METHOD OF AND APPARATUS FOR CONTROLLING THE FLOW OF MATERIALS FROM A ROTATING DRUM

Robert F. Reiche, Wheaton, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Jul. 12, 1977, Ser. No. 814,975
Int. Cl.[2] B27L *1/00*
U.S. Cl. 144—311 **24 Claims**

1. Apparatus comprising:
a rotatable material processing cylindrical drum having a substantially horizontal axis and a circular discharge open end,
said drum being supported for rotation by means which contacts the outside of the drum,
a material discharge regulating gate adjoining the discharge end of the drum and separate from the drum,
said gate comprising a vertical circular member having a diameter larger than the discharge end of the rotatable drum,



the circular member having a continuous surface with a material discharge opening therein, and
means for rotatably mounting the circular member adjoining the discharge end of the rotatable drum to rotate independent of the drum.

4,173,240

LUMBER CUTTING ATTACHMENTS FOR CHAIN SAWS

Oren D. Boyce, 406 S. Chester St., Gastonia, N.C. 28052

Filed Jul. 12, 1978, Ser. No. 923,774
Int. Cl.[2] B27B *1/00, 17/02*
U.S. Cl. 144—312 **12 Claims**



1. The method of cutting boards of lumber from a log with a portable chain saw having a saw bar and cutting chain, said method comprising the steps of:
(a) providing a visible line on the surface of the log substantially parallel with the longitudinal axis of the log;
(b) cutting a guide channel of a predetermined depth in the log along the visible line;
(c) positioning the saw bar within the guide channel at one end of the log and stabilizing the saw bar within the guide channel while moving the chain saw longitudinally of the log to split the log;
(d) providing a second visible line along one longitudinal edge of the split surface of the log in offset relation to the axis of the log;
(e) defining a second guide channel along said second visible line;
(f) positioning the saw bar in the guide channel at one end of the log and stabilizing the saw bar within the guide channel while drawing the chain saw along the length of the log to simultaneously cut a first slab from the log and define a straight edge on the log;
(g) guiding the chain saw along said straight edge with the saw bar spaced inwardly from said straight edge to cut a board.

4,173,241

GOLF CLUB WOOD HOLDER

Herman E. Stock, P.O. Box 1718, Pompano Beach, Fla. 33061

Filed Feb. 6, 1978, Ser. No. 875,133
Int. Cl.[2] A63B *65/00*
U.S. Cl. 150—1.5 R **1 Claim**



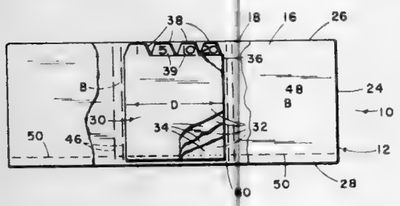
1. An improved golf club holder and divider for protectively housing golf club woods, comprising:
- a resilient pre-molded housing, said housing having an upper open portion and a plurality of integrally formed compartments, each of which is shaped to contour to the upper face of a golf club wood, each compartment having a passage disposed near the base of the compartment, said passages being adjacent each other;
- a plurality of tubes, each of which is connected into a different base passage, said tubes being sized slightly longer than the length of the longest golf club shaft of a particular user; and
- a resilient cushion, said cushion being disposed in each of said compartments of said housing for engaging the upper surface of the golf club wood
- resilient stretchable cover, sized to engage the upper opening of said housing, said cover being diametrically smaller than the diametrical distance across the housing
- at least one ventilation aperture formed with said cover installed between said cover and adjacent compartments.

4,173,242

BILLFOLD BILL FILE WITH MINIMUM PANEL AREA

Donald J. Finn, Sea-Ranch-Club - Apt 712, 5100 North Ocean Blvd., Ft. Lauderdale, Fla. 33308

Filed Dec. 15, 1978, Ser. No. 969,719
Int. Cl.[2] A45C *1/06*
U.S. Cl. 150—38 **6 Claims**



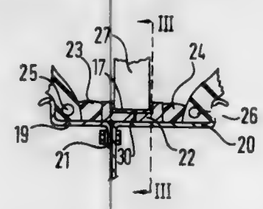
1. A billfold file and billfold assembly comprising a billfold said billfold when in one position having forward and rearward outside parallel vertical walls which are each straight, said billfold when in said one position being longer from left to right than from top to bottom, a panel assembly for receiving currency bills, said panel assembly being inside said billfold for quick, easy and accurate storage and removal of bills, said panel assembly comprising: a plurality of vertical panels of flexible material, said panels being disposed in substantial parallelism, each two adjacent ones of said panels having a vertical bill-receiving area therebetween, said bill-receiving areas each being at least at times open at their upper sides, said panels each being of a dimension from left to right which is less than half of the dimension of said billfold from left to right, said panels each being of a dimension from left to right which is less than five inches so as to be substantially less than the length of a common U.S. currency bill, panel attaching means attaching said panels together at only such portions of each of said panels as are disposed exteriorly of said bill-receiving areas, said panels each having currency indicia at their upper portions.

4,173,243

SAFETY TIRE AND WHEEL RIM ASSEMBLY

Ralph Wilde, Semele, Near Leamington, and Barrie J. Allbert, Sutton Coldfield, both of England, assignors to Dunlop Limited, Great Britain

Continuation of Ser. No. 728,224, Sep. 30, 1976, abandoned. This application Jun. 6, 1978, Ser. No. 913,090
Claims priority, application United Kingdom, Oct. 17, 1975, 42602/75
Int. Cl.[2] B60C *17/04*
U.S. Cl. 152—158 **5 Claims**



1. A safety tire and wheel rim assembly comprising: a pneumatic tire having a tread, sidewalls and beads, a wheel rim having a pair of bead seats and between the bead seats a substantially uniform diameter, a safety support member to act as a load carrying member in the event of tire deflation, the safety support member comprising a plurality of arcuate segments of rigid material coupled together by means of coupling portions at their ends, a bearing ring of rigid material having a smaller diameter at its mid portion, said mid portion being flat and substantially axially extending with substantially radially extending edges so as to define a channel shape in cross section, providing a bearing in which the support member is rotatably mounted, the bearing ring being divided about a radial plane within the smaller diameter bearing surface of the channel section to facilitate assembly thereof about a support member; locating means contacting both tire beads to locate the bearing ring axially of the assembly and retain the tire beads in position, said locating means comprising a pair of spacer rings of resilient material, one on either side of the bearing ring, said spacer rings frictionally engaging the tire beads and the bearing ring.

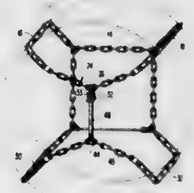
4,173,244

ANTI-SKID VEHICLE TIRE CHAINS

Edwin R. Schultz, 2920 Rhett Dr., Xenia, Ohio 45385

Continuation-in-part of Ser. No. 628,742, Nov. 4, 1975, abandoned. This application Jul. 20, 1977, Ser. No. 817,449
Int. Cl.[2] B60C *27/12*
U.S. Cl. 152—218 **1 Claim**

1. A tire chain device comprising
- (a) a continuous length of chain made up of a series of permanently connected identical links,
- (b) a disconnectable connecting means at each end of the length of chain, each disconnectable connecting means being connectable and disconnectable to any one of the links of the length of chain,
- (c) first color identification means associated with one of the two disconnectable connecting means and with a first link of the length of chain to which the one disconnectable connecting means can be connected so as to form a short loop of the length of chain closed by a short section of the length of chain,
- (d) second color identification means associated with the other of the two disconnectable connecting means and with a second link of the length of chain to which the other disconnectable connecting means can be connected so as to form between the first link and the second link a long loop of the length of chain also closed by the short section of the length of chain,
- (e) a rigid rod having disconnectable connection means at one end for disconnectable connection to any link of the chain,
- (f) means pivotally connecting the other end of the rigid rod to a third link, the third link being located at an intermediate point on one side of the long loop of the length of chain,



- (g) third color identification means associated with the disconnectable connection means of the rigid rod and with a fourth link located at an intermediate point on the other side of the long loop of the length of chain to which fourth link the disconnectable connection means of the rigid rod can be disconnectably connected,
- (h) a tension member of adjustable length having disconnectable connection means at one end portion,
- (i) means for connecting the other end portion of the tension member to a fifth link in the length of chain, the fifth link being located at a midpoint in one of the two loops of chain, and
- (j) fourth color identification means associated with a sixth link of the length of chain to which sixth link the other end portion of the tension member of adjustable length can be connected, the sixth link being located at a midpoint in the other of the two loops of chain.

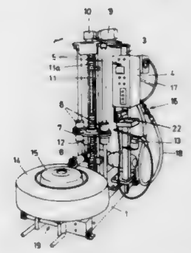
4,173,245

APPARATUS FOR MOUNTING AND DISMOUNTING VEHICLE TIRES

Wilhelm Schäfer, Buchenstrasse 1, D-6349 Herbornseelbach, Fed. Rep. of Germany

Filed Oct. 19, 1977, Ser. No. 843,674
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1976, 2648897
Int. Cl.[2] B60C *25/08*
U.S. Cl. 157—1.24 **8 Claims**

1. Apparatus for the mounting and dismounting of vehicle tires, comprising a machine frame, a horizontal disc carried by said machine frame on which a tire rim can be releasably mounted, means carried by said machine frame for rotating said disc about a vertical axis, a single horizontal roller carried by the machine frame adapted to engage the upper or lower bead of a tire on a tire rim carried by the disc, means carried by the machine frame for moving the roller vertically in either direction to position the roller to act on either the upper or the lower rim of a tire on the disc, and means carried by the machine frame mounting the roller for bodily horizontal movement into and out of positions in which the roller overlies or



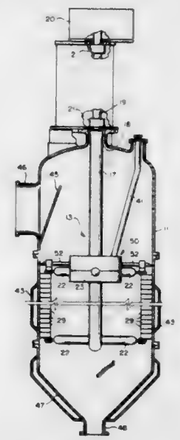
underlies a tire on the disc thereby to permit vertical travel of the roller past a tire on the disc.

4,173,246

FEED DISTRIBUTOR FOR GLASSED STEEL WIPED FILM EVAPORATOR

Erwin J. Nunlist, Penfield, N.Y., and James Mitchell, Leven, Scotland, assignors to Sybron Corporation, Rochester, N.Y.

Filed Jun. 20, 1977, Ser. No. 808,118
Int. Cl.[2] B01D *1/22*
U.S. Cl. 159—6 W **14 Claims**



1. In a glass lined wiped film evaporator having a rotating wiper assembly including a central axial shaft, glass coated steel arms extending outwardly from said axial shaft, and wiper blades supported at the ends of said arms, a corrosion resistant feed distributor comprising:
- a one piece annular fluorocarbon distribution chamber surrounding said axial shaft, overlying said cross arms and rotating with said wiper assembly, said chamber being free to expand radially along said arms;
- support means mounted at the ends of said glass coated steel arms;
- corrosion resistant distributing nozzles extending outwardly from said distribution chamber through said support means and terminating near an interior wall of said evaporator, said nozzles being free to slid in said support means to account for differences in thermal expansion between said nozzles and/or said distribution chamber with respect to said arms; and
- means for supplying liquid to be treated in said evaporator to said annular distribution chamber, whereby said liquid

flows from said distribution chamber out through said distributing nozzles and is deposited on the wall of the evaporator as the wiper assembly rotates.

4,173,247

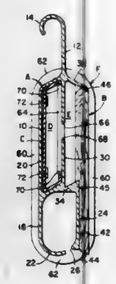
CHAMBERED ELEMENT FOR USE IN FORMING A ROLLER SCREEN

Renato Piana, p.za S. Maria Novella 22, Florence, Italy

Continuation-in-part of Ser. No. 778,228, Mar. 16, 1977. This application Jul. 6, 1978, Ser. No. 922,379

Int. Cl.[2] E06B *3/12*

U.S. Cl. 160—236 **7 Claims**



1. A rod assembly for use in forming a roller screen, said rod assembly comprising a first element having a pair of longitudinally extending, hollow chambers, a common wall separating said chambers, coupling members along the longitudinal edges of the wall means forming one of the hollow chambers, a finish element, said finish element having coupling members formed thereon cooperating with the coupling member along the longitudinal edges of said one of the hollow chambers, said finish element being detachably coupable to said edges of wall means of said one hollow chamber, the effective width of said finish element when coupled to the edges of the said wall means being less than the width of said one hollow chamber such that a pair of side-by-side air spaces are provided in each rod assembly.

4,173,248

MEDIUM DENSITY, HIGH STRENGTH LIGNOCELLULOSE COMPOSITION BOARD INCLUDING EXHAUSTIVELY HYDRATED CELLULOSIC GEL BINDER

James R. Roberts, Palatine, Ill., assignor to Eucatex S.A. Industria e Comercio, Sao Paulo, Brazil

Continuation-in-part of Ser. No. 597,450, Jul. 21, 1975, abandoned. This application Mar. 7, 1978, Ser. No. 884,353

Int. Cl.[2] D21F *11/00*

U.S. Cl. 162—141 **16 Claims**

1. A water laid, pressed and dried medium density lignocellulose composition board having a density of at least 20 pounds per cubic foot and high strength comprising on a dry weight basis:

	% by weight
Lignocellulose fibers	60 to 95
Hydrated cellulosic gel binder	5 to 40

the hydrated cellulosic gel binder being derived from cellulosic chemical pulp and being characterized in its gel condition (1) by a TAPPI drain time of at least 350 seconds and (2) by at least 20% shrinkage, upon being dried to a bone-dry condition, of a TAPPI hand sheet made from the binder.

4,173,249

EXTENDED NIP PRESS FOR A PAPER MACHINE

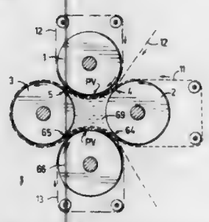
Seppo Holkko; Jukka Lehtinen, and Pekka Majaniemi, all of Tampere, Finland, assignors to Oy Tampella AB, Tampere, Finland

Filed Jul. 6, 1978, Ser. No. 922,393

Claims priority, application Finland, Jul. 8, 1977, 772143

Int. Cl.[2] D21F *3/04, 3/06*

U.S. Cl. 162—360 R **12 Claims**



1. An extended nip press for a paper machine for removing liquid from a fiber web passing through the press, the press comprising a first press roll, two second press rolls which engage the first press roll to define two nips, at least one felt which passes through the two nips and is entrained about the periphery of the first roll between the two nips, for conveying the web to be treated through the nips, a pressure-transmitting band which also passes through the nips and is entrained about the periphery of the first roll between the two nips with the felt being disposed between the band and the first roll, and a sealing means arranged between said second rolls for forming a sealed pressure medium chamber which, in use, contains a pressure medium to which the pressure-transmitting band is impermeable and which is limited in the machine direction by the part of the band which is entrained about the periphery of the first roll between the two nips, and also by the second rolls and the sealing means, whereby the web is subjected to the pressure of the pressure medium as it passes between the two nips.

4,173,250

BALANCING AND HOLDING DEVICE FOR A MOLTEN METAL SUPPLY TUNDISH IN A CONTINUOUS CASTING MACHINE

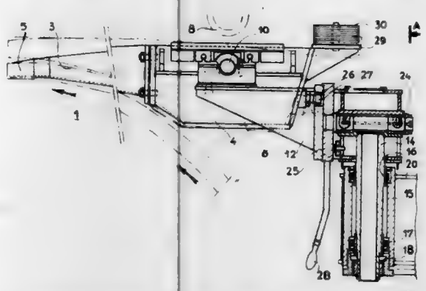
Pierre Houdion, 40 rue Waldeck Rousseau, 77360 Vaires, France

Filed May 4, 1978, Ser. No. 903,031

Claims priority, application France, May 6, 1977, 77 13971

Int. Cl.[2] B22D *11/06, 11/10*

U.S. Cl. 164—434 **3 Claims**



1. A continuous casting machine comprising a vertical wheel rotatable about a horizontal axis and having a peripheral groove partially closed by a strip to form the casting mould, a molten metal tundish having a supply vessel which receives the molten metal and which is borne by two horizontal trunnions

resting on a support allowing the tundish to be pivoted about the axis of the trunnions and about a vertical axis, and a spout which is open at the top, in its casting position is horizontal, forms a continuation of the supply vessel and the end of which remote from the supply vessel has a sealing member and is in contact with the surface of the groove of the casting wheel at the top part thereof, a counterweight being fixed to that region of the supply vessel remote from the region of said vessel connected to the spout, said two regions being situated on either side of the axis of the tundish trunnions, and means being provided for applying an upwardly directed vertical force to the region of the vessel where the counterweight is situated.

4,173,251

MOULD ARRANGEMENT TO BE USED IN A CONTINUOUS CASTING PLANT

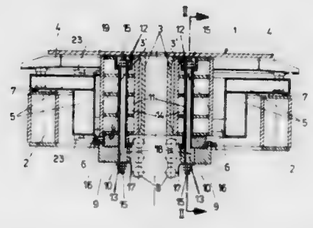
Alois Scheinecker, Linz, Austria, assignor to Vereinigte Österreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Jul. 27, 1977, Ser. No. 819,377

Claims priority, application Austria, Aug. 5, 1976, 5799/76

Int. Cl.[2] B22D *11/04, 11/12*

U.S. Cl. 164—436 **3 Claims**



1. In a mould arrangement to be used in a continuous casting plant, of the type including a mould having inner and outer side walls adjustable together to various strand dimensions, drive means for moving said side walls, strand supporting means arranged below the mould for supporting the strand emerging from the mould, and holding means releasable from above for securing the supporting means to the mould, the improvement which is characterized in that between the inner and outer side walls of the mould there are provided hollow spaces extending to the upper side of the side walls, the holding means being inserted in said hollow spaces so that movement of the mould walls by said drive means provides corresponding movement of the supporting means.

4,173,252

SEAL FOR A ROTARY REGENERATIVE HEAT EXCHANGER

Yoshihiro Sakaki, Yokohama, and Kensuke Eishima, Urawa, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 413,528, Nov. 7, 1973, abandoned. This application Sep. 21, 1977, Ser. No. 835,300

Claims priority, application Japan, Nov. 20, 1972, 47-132634; Nov. 20, 1972, 47-132635

Int. Cl.[2] F28D *19/00*

U.S. Cl. 165—9 **1 Claim**

1. In a rotary regenerative heat exchanger:

a housing having first, second and third annular grooves formed therein;

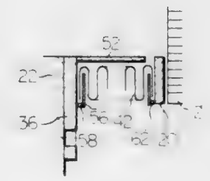
a disc type heat accumulator rotatable within said housing and through which a hot fluid stream flows from a first axial face to a second axial face and cold fluid stream flows from said second axial face to said first axial face, said accumulator being disposed in said housing so that said first and second annular grooves are juxtaposed with said first axial face and said third annular groove juxtaposed with said second axial face;

first, second and third annular sealing shoes, said first and second shoes being disposed in rubbing contact with said first axial face and said third shoe being in rubbing contact with said second axial face, said first, second and third shoes each having an annular groove formed therein;

a first corrugated annular member formed with a plurality of corrugations along the longitudinal length thereof, said first annular member having first and second end portions respectively slidably received in said first annular groove and said annular groove formed in said first shoe in a manner that the thermal expansion of said first annular member can be compensated for and the spaces defined on either side of said end portions in said annular grooves are such that a labyrinth seal effect is produced;

a first annular shield fixedly mounted on said housing at a location juxtaposed with said first annular groove and which extends within said first annular member toward said first axial surface to juxtapose said shoe and define an annular space therebetween so that hot fluid flowing to said first axial face and through said accumulator to said second axial face cannot directly impinge on said first annular member;

a second corrugated annular member formed with a plurality of corrugations along the longitudinal length thereof, said second member having first and second end portions respectively slidably received in said second annular recess and said recess formed in said second shoe so that the thermal expansion of said second annular member can be compensated for and the spaces defined on either side of said end portions in said annular grooves are such that a labyrinth seal effect is produced;



a second annular shield fixedly mounted to said housing at a location juxtaposed with said second annular groove and which extends toward said first axial face to juxtapose said second shoe to define an annular space therebetween so that said cold stream passing from said second axial face through said accumulator to said first axial face and which flows from said first axial face in a heated state having received heat from said accumulator cannot impinge directly on said second annular member; and

a third corrugated annular member formed with a plurality of corrugations along the longitudinal length thereof, said third annular member having first and second end portions respectively slidably received in said third annular groove and said groove formed in said third shoe in a manner such that the thermal expansion of said third annular member can be compensated for and the space defined on either side of said end portions received in said recesses are such that a labyrinth seal effect is produced.

V 9 8 8 1 N 0 0 6 7 9 UMI

4,173,253

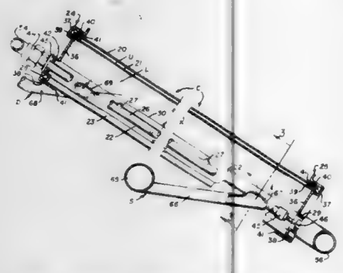
SOLAR RADIATION COLLECTOR AND WATER COOLER

James B. Wiegand, Longmont, Colo., assignor to Solar Energy Research Corp., Longmont, Colo.

Continuation-in-part of Ser. No. 759,762, Jan. 17, 1977, Pat. No. 4,111,187. This application Mar. 20, 1978, Ser. No. 890,640

Int. Cl.[2] F25B *29/00*

U.S. Cl. 165—48 S **12 Claims**



1. A solar radiation collector and water cooling unit, comprising:

(a) an upper, outer radiation transmission surface oriented to receive and transmit radient solar rays;

(b) an intermediate radiation absorption surface spaced below said upper surface to receive and absorb said transmitted solar rays and convert the same to heat;

(c) a lower drainage surface, with an outlet, spaced below said intermediate surface;

(d) side and end connection means interconnecting the sides and ends of said upper, intermediate and lower surfaces to define an upper cavity between the said upper and intermediate surfaces and a lower cavity between the said intermediate and lower surfaces;

(e) a spray means within said lower cavity adapted to spray water against the underside of said intermediate surface, to fall to the lower drainage surface and to flow from said outlet; and

(f) an air-flow means having an air duct means to said lower cavity, to selectively pass or prevent a flow of air through the lower cavity, whereby to cool water from the spray means whenever air flows through the lower cavity or permit solar radiation to heat water from the spray means whenever air is prevented from flowing through the lower cavity.

4,173,254

PARTIAL OXIDATION PROCESS

Peter L. Paull, Weston, Conn., and Rodney McGann, Santa Cruz, Calif., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 698,439, Jun. 21, 1976, Pat. No. 4,099,382. This application Nov. 29, 1977, Ser. No. 855,643

Int. Cl.[2] F28F *19/00*

U.S. Cl. 165—134 R **12 Claims**

1. A heat exchange apparatus for continuously extracting heat from a hot gas stream by heat exchange with a gaseous coolant comprising: a closed shell; conduit with openings in the walls and positioned within said shell; inlet and outlet means in said shell and in said conduit for passing a portion of said gaseous coolant through said heat exchange apparatus in indirect heat exchange with said hot gas stream; and wherein a portion of said gaseous coolant is continuously bled into said



hot gas stream by way of the openings in said conduit walls to protect the surface of said conduit from said hot gas stream.

4,173,255

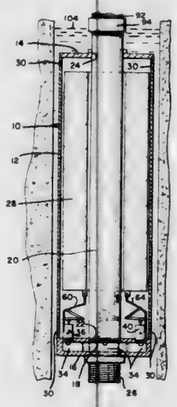
LOW WELL YIELD CONTROL SYSTEM AND METHOD

Richard W. Kramer, R.D. #2, Box 490B, Northumberland, Pa. 17857

Filed Oct. 5, 1978, Ser. No. 948,810

Int. Cl.[2] E21B *43/12*; F01B *25/00*; F04B *49/00*

U.S. Cl. 166—314 **20 Claims**



12. A control system for preventing over pumping of liquid from a reservoir including a riser pipe, a plurality of valves having discharge passages communicating the interior of the riser pipe with the exterior of the control system, a float vertically movable in response to change in the level of liquid in the reservoir, and a connection extending from each valve to the float for opening and closing the valve in response to the vertical position of the float, a first connection operable to commence opening a first valve when the float is in a first position and said second connection operable to commence opening a second valve when the float is in a second position located below said first position so that said valves open sequentially upon lowering of the float.

20. The method of pumping liquid from a reservoir and recirculating liquid back to reservoir from the pumped liquid including the steps of smoothly and progressively opening a plurality of valves located in the path of recirculation flow in response to lowering of the liquid level in the reservoir, all of said valves commencing to open one after the other and commencing to open at least one of said valves during opening of another valve.

4,173,256

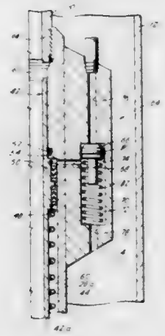
SUBSURFACE SAFETY VALVE

Marion D. Kilgore, London, England, assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Mar. 9, 1978, Ser. No. 884,766

Int. Cl.[2] E21B *43/12*

U.S. Cl. 166—324 **16 Claims**



8. A surface controlled subsurface safety valve comprising:

housing means defining a flow path;

closure means for controlling fluid flow through said flow path and movable between a closed position closing said flow path and an opened position opening said flow path;

pressure responsive actuator means for moving said closure means and being normally disposed in a position wherein said closure means is in its closed position;

a source of control fluid for moving said pressure responsive actuator means;

port means between said pressure responsive actuator means and said source of control fluid;

selective controlling means controlling communication between the port means and the source means so that when the pressure of a control fluid is less than a selected value, the selective controlling means is in a first position and communication between said pressure responsive actuator means and the source of control fluid is prevented and communication between said pressure responsive actuator means and a region surrounding said housing means is permitted and when the pressure of control fluid is at least a selected value, the selective controlling means is in a second position and communication between said pressure responsive actuator means and the source of control fluid is permitted and communication between said pressure responsive actuator means and the region surrounding said housing means is prevented; and

said pressure responsive actuator means having a lower chamber which is in pressure communication with the region surrounding said housing means when said selective controlling means is in its first position.

4,173,257

ROOT CROP HARVESTER

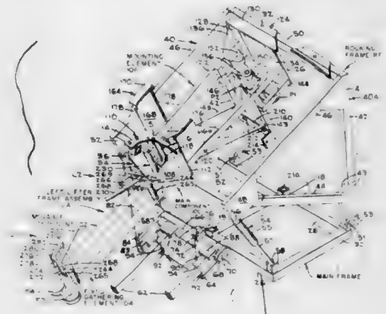
Donald G. Mortensen, San Jose, and James T. Browning, Sunnyvale, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Aug. 11, 1977, Ser. No. 823,781

Int. Cl.[2] A01D *27/00*

U.S. Cl. 171—33 **11 Claims**

1. In a root crop harvester of the type comprising a wheeled chassis having a main frame, a plow on said main frame, a product lifter frame assembly comprising right and left gathering points and lifter belts, topping means comprising cooperating elongate topping units for topping crop received from the lifter belts, each topping unit having a driven end and an idler end, means for driving said lifter belts and the driven end of each topping unit, and means for pivotally mounting said lifter frame assembly on said main frame; the improvement wherein each lifter frame assembly includes a rigid main component that includes a fixed gathering element extending rearwardly from a gathering point and an integral rearward mounting element, a movable gathering component adjustably supported on said main component of the lifter frame assembly, means for



pivotally mounting a rearward portion of said mounting element on said lifter assembly mounting means for accommodating lateral adjustment of said lifter frame assembly, means for rigidly mounting the driven ends of said topping units on a forward portion of said mounting element, and bracket means projecting down from a rearward portion of said mounting element for mounting the idler ends of said topping units.

4,173,258

LASER BEAM LEVEL CONTROL WITH AUTOMATIC OVERRIDE

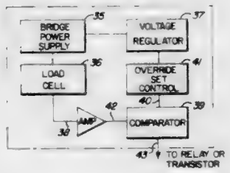
Marcel J. Boulais, 5346 N. 91st Ave., Tolleson, Ariz. 85353, and Richard A. Boulais, 10314 W. Montecito, Phoenix, Ariz. 85039

Filed Dec. 16, 1977, Ser. No. 861,101

Int. Cl.[2] A01B *63/111*, *63/112*

U.S. Cl. 172—4.5 **1 Claim**





1. In a laser beam level control system for an earth-moving machine having a variable height earth-moving blade, ground-contacting drive means and a motive engine, said level control system including

receiver means for sensing a laser beam signal, which signal defines a reference plane, and for generating blade-up and

blade-down command signals in response to the vertical displacement of said receiver means with respect to said reference plane, and

blade operating means responsive to said blade command signals for raising and lowering the earth-moving blade of said machine to maintain the blade at a preselected elevation relative to said reference plane as said machine traverses terrain of variable elevation,

the improvement in said control system which automatically prevents said blade being positioned such that the force required to drive said machine across said terrain exceeds the tractional force capability of said drive means or the available power of said motive engine, said improvement comprising:

(a) means responsive to the force required to move said blade through said terrain, for automatically generating an override signal when said force exceeds a preselected value which does not exceed the tractional force capability of said ground-contacting drive means or the available horsepower of said motive engine;

(b) means responsive to said automatic override signal which temporarily countermands a blade-down signal generated by said receiver means and applies a blade-up signal to said blade operating means; and

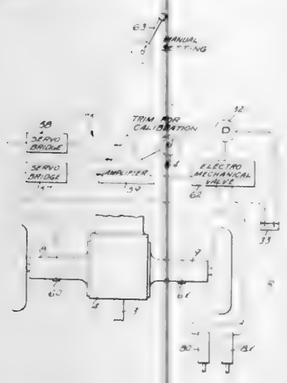
(c) means to maintain said override signal as long as said force exceeds said preselected value and to return said blade to control by said laser beam signal as soon as said force no longer exceeds said preselected value.

4,173,259

REAR DRIVE ASSEMBLY WITH LOAD SENSING

Edward B. Heckenkamp, Brookfield, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 29, 1977, Ser. No. 865,675
Int. Cl.² A01B *63/112, 63/12*
U.S. Cl. 172—10 **9 Claims**



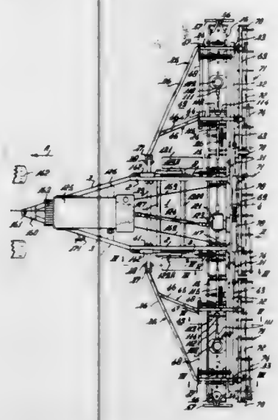
1. A load sensing system on a vehicle comprising, a vehicle, a vehicle chassis, a draft load hitching means connected to said vehicle chassis adapted for connection to an implement, drive wheel axles with drive wheels attached thereto, said axles rotatably mounted in axle drive housings on either side of said vehicle chassis for driving said vehicle, a draft load sensing means mounted on each of said drive axle housings of said vehicle chassis and spaced from said hitching means, said sensing means directly sensing strain and deformation across a portion of said axle housings of said chassis responsive to the opposing forces of the draft load on said hitching means and the driving force from the drive wheels for operating a draft load control system.

4,173,260

SOIL CULTIVATING IMPLEMENTS

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to Cornelis van der Lely N.V., Maasland, Netherlands

Filed Aug. 18, 1977, Ser. No. 825,583
Claims priority, application Netherlands, Aug. 23, 1976, 7609321
Int. Cl.² A01B *33/06*
U.S. Cl. 172—59 **8 Claims**



1. A soil cultivating implement comprising frame means including a main frame and carrier frames pivoted at the lateral sides of the main frame, said main frame and carrier frames each supporting respective groups of soil working members and driving means connected to rotate said members, said groups being positioned adjacent one another side-by-side during operation, means pivoting said carrier frames and respective groups of members to upwardly tilted positions, a central group of working members corresponding to said main frame being interconnected to said carrier frames by connecting means and said central group being raised in horizontal level relative to the main frame by said connecting means when said carrier frames are tilted upwardly, a spring mechanism interconnecting each carrier frame to said main frame, said mechanism and main frame sustaining part of the weight of the carrier frame and the respective group of members during operation, said spring mechanism being connected to said carrier frame and a respective support mounted on said main frame, said support having a latch to retain the carrier frame in its upwardly tilted position, said latch cooperating with a beam of the carrier frame and said latch being automatically engaged upon said beam being tilted upwardly into engagement therewith, said latch having a release mechanism that is operable to disengage from the latch when the tilted carrier frame is lowered into a working position.

4,173,261

AGRICULTURAL FURROWING ASSEMBLY

Willis Wells, Storm Lake, Iowa, assignor to Royal Industries, Inc., a subsidiary of Lear Siegler, Inc., Sac City, Iowa

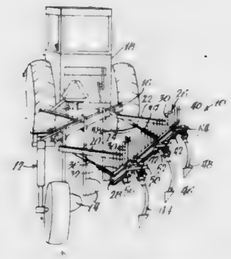
Filed May 23, 1977, Ser. No. 799,553
Int. Cl.² A01B *17/00*
U.S. Cl. 172—136 **7 Claims**

1. In an agricultural furrowing assembly having at least two spaced-apart support arms detachably secured at their forward ends to a beam rigidly attached to a moldboard plow, said plow having a plurality of spaced-apart bottoms thereon and said beam being positioned above the bottoms, an elongated bar assembly pivotably attached to the rear ends of the support arms, the improvement comprising:

a single row of rod-like mulching teeth secured to one side of the elongated bar assembly and extending upwardly therefrom;

a plurality of short tool bars attached to the elongated bar assembly and extending therefrom generally perpindicular to the direction of travel;

a plurality of field cultivators having shanks, the shank of each of said plurality of field cultivators being attached to



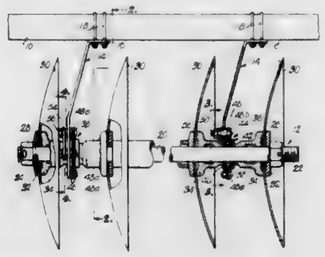
one of said short tool bars with the cultivators extending downwardly from the tool bars trailing said plow, said plurality of cultivators being spaced apart from each other by a distance substantially equal to the distance between said spaced-apart bottoms and in alignment with said bottoms to deepen the bottom created furrow, each of said plurality of cultivators having a field-furrowing shank and share for furrowing the ground to increase moisture retention and to minimize wind erosion.

4,173,262

DISC GANG MOUNTING

Raymond A. Adee, Newton, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed Nov. 25, 1977, Ser. No. 854,887
Int. Cl.² A01B *23/00, 71/04*
U.S. Cl. 172—599 **12 Claims**



8. A disc gang mounting comprising:

a support;

an elongated disc gang assembly including a pair of bearings spaced a certain longitudinal distance apart;

a pair of mounting members for the assembly;

means fastening said members to the support,

said fastening means being selectively adjustable to permit adjustment of the position of said members along said support according to said certain distance between said pair of bearings; and

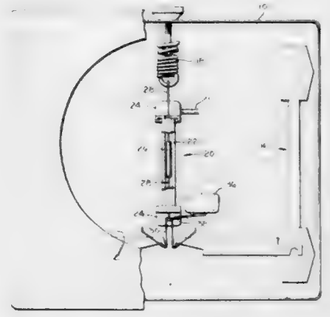
means attaching said assembly to said members for free axial displacement of the assembly relative to said members between a pair of spaced, predetermined limits.

4,173,263

DIGITAL WEIGHING SCALE

Frederick T. Meeks, Asheboro, N.C., assignor to General Electric Company, New York, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,449
Int. Cl.² G01G *3/14, 21/08*
U.S. Cl. 177—210 EM **5 Claims**



1. In a digital platform scale having a base and weight supporting cover movable thereon, a lever system in the base converting vertical cover to horizontal lever movement, spring means connecting said base and lever system counterbalancing lever movement, a differential transformer connected to the lever system and to an electrical digital readout to display the weight of an object on the cover, the improvement comprising,

said spring being disposed horizontally in said base and directly and adjustably connected to said horizontal lever system at its point of maximum movement,

said spring connection including a movable differential transformer core as the sole link between the spring and lever and connected to each,

an alignedly fixed winding adjacent said core and connected to activate said readout,

said winding being floatingly fixed to said base,

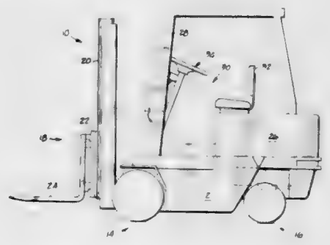
whereby the core is an integral direct and sole link of the balance system at its greatest travel for maximum sensitivity and minimum friction on the system.

4,173,264

EXPANDABLE VEHICLE FRAME

James W. Erker, Mentor-on-the-Lake, and Richard A. Schwehr, Mentor, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed May 25, 1978, Ser. No. 909,414
Int. Cl.² B62D *25/08*
U.S. Cl. 180—68.5 **21 Claims**



1. An adjustable vehicle frame comprising:

a first section;

a channel structure having a channel member secured to the

first section and another channel member removably secured to the first section and in nesting relation with the secured channel member;

a second section;

a portion of the channel structure and a portion of the second section being in lapping relation; and

means for selectively securing together the lapping portions of the channel structure and second section in a variety of relative positions, whereby the length of the vehicle frame may be selectively adjusted.

4,173,265

DEVICE FOR MEASURING THE TORQUE IN A SHAFT

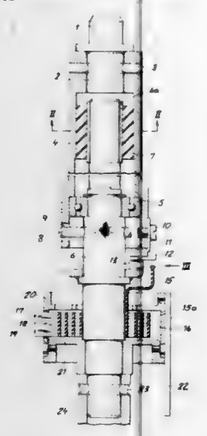
Manfred Kremer, Hamburg, Fed. Rep. of Germany, assignor to Still GmbH, Hamburg, Fed. Rep. of Germany

Filed Dec. 22, 1977, Ser. No. 863,400

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658697

Int. Cl.² B62D 5/04

U.S. Cl. 180—79.1 **12 Claims**



1. A device for measuring the torque in a shaft, comprising a pair of relatively rotatable shaft parts disposed along a common axis, an elastic body resiliently interconnecting said shaft parts and a signal generator connected to said shaft parts for generating an electric signal representing the torque applied to one of said shaft parts as a function of relative angular displacement of said shaft parts against a restoring force supplied by said body, said signal generator comprising a permanent magnet connected to said one of said shaft parts and a differential field plate sensor mounted on the other of said shaft parts, said magnet being disposed opposite the center of said differential field plate sensor in a no-load condition of said shaft corresponding to a nonstressed condition of said body.

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LOUDSPEAKER ENCLOSURE

Robert S. Pizer, 4007 Connecticut Ave., N.W., Washington, D.C. 20008, and Max Tryon, 6008 Namakagan Rd., Bethesda, Md. 20016

Filed Nov. 24, 1978, Ser. No. 963,294

Int. Cl.² H05K 5/00

U.S. Cl. 181—156 **6 Claims**

1. A loudspeaker enclosure, comprising

(a) a horizontal bottom wall;

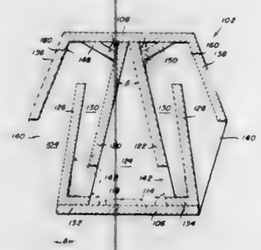
(b) vertical parallel spaced front and rear walls each connected at its lower end with said bottom wall, said front wall containing at least one speaker opening centrally arranged relative to the side edges of said front wall for receiving a loudspeaker;

(c) a horizontal top wall connected with the upper edges of said front and rear walls;

(d) first baffle means defining between said front, rear, bottom and top walls a rearwardly converging compression chamber, said first baffle means including a pair of vertical rearwardly converging first baffle walls, the forward edges of said first baffle walls engaging said front wall at locations equidistant from, and on opposite sides of, said speaker opening, said first baffle walls each being angularly arranged at a first acute angle (α) relative to said front wall and converging toward a first location on said rear wall opposite said speaker opening, thereby to define therebetween an acute angle of convergency (β); and

(e) second baffle means for defining a pair of exponential folded horns between said bottom and top walls on opposite sides of said compression chamber, said second baffle means including

(1) a pair of vertical second baffle walls extending rearwardly from said front wall on opposite sides of said first baffle walls, the forward edges of said second baffle walls being contiguous with the front wall and spaced laterally outwardly from the forward edges of said first



baffle walls, respectively, each of said second baffle walls extending rearwardly at a given angle (γ) from said front wall and terminating in spaced relation from said rear wall, said second baffle walls being arranged at a given acute angle (Δ) relative to said first baffle walls, respectively; and

(2) a pair or vertical forwardly divergent side baffle walls connected at their rear edges with said rear wall at locations on opposite sides of, and equidistant from, said first location, each of said side baffle walls being arranged at an obtuse angle (δ) relative to said rear wall, said side baffle walls extending forwardly beyond the rear edges of said second baffle walls;

(f) each of said first baffle walls containing adjacent its forward edge at least one opening, each of said openings having a trapezoidal vertical cross-section, the vertical dimension of the front portion of each of said openings being greater than the vertical dimension of the rear portion of said openings, whereby the bass-reflux response from the loudspeaker passes from said compression chamber through said openings and through said pair of exponential folded horns.

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SPEAKER CABINET

Ikuo Chatani, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 24, 1977, Ser. No. 827,350

Claims priority, application Japan, Sep. 3, 1976, 51-105976

Int. Cl.² A47B 81/06; H05K 5/00

U.S. Cl. 181—199 **6 Claims**

1. A speaker cabinet having rear, side, bottom and top walls, a baffle plate having front and back surfaces forming at least a portion of said front wall of said cabinet and formed with at least one speaker opening therein, one or more speakers mounted to said baffle plate on the front surface within said

cabinet and each speaker aligned with an associated one of said speaker openings, a first plurality of generally V-shaped parallel grooves having non-parallel side walls formed in the front surface of said baffle plate, wherein the front side of said baffle

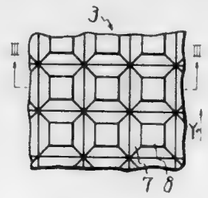


plate is formed with a second plurality of generally V-shaped parallel grooves having non-parallel side walls formed in the front surface of said baffle plate and the orientation of said first and second plurality of parallel grooves being substantially normal to each other.

4,173,268

HOIST MECHANISM

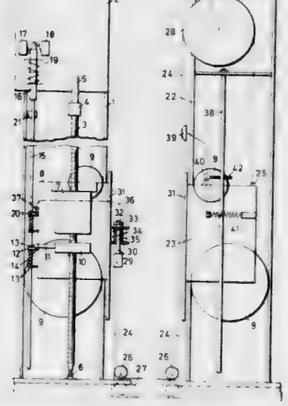
Hans Nussbaum, Korker Strasse 6, 7641 Bodersweier, Fed. Rep. of Germany

Filed Oct. 27, 1977, Ser. No. 846,165

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649769; Sep. 23, 1977, 2742961

Int. Cl.² B66F 7/00

U.S. Cl. 187—8.49 **11 Claims**



1. In a hoist mechanism having at least two lift columns with a movable lifting slide in each column and drive means for moving one lifting slide up and down the associated lift column, the improvement comprising:

a synchronizing chain connected between said one lifting slide and the other lifting slide in the other lift column for moving such other lifting slide in synchronism with the one lifting slide;

a spring loaded chain support on said one lifting slide, engaging said chain and movable with respect to said one slide on slackening of the chain; and

safety means responsive to such movement of said chain support for stopping said drive means.

4,173,269

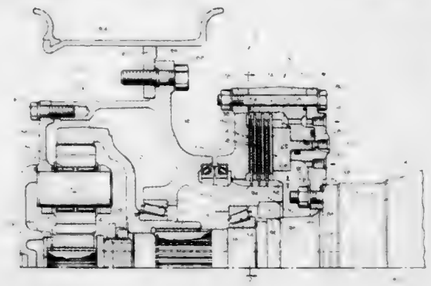
WET BRAKE OR CLUTCH

George A. Craig, Niles, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Feb. 23, 1978, Ser. No. 880,689

Int. Cl.² F16D 55/36

U.S. Cl. 188—71.5 **15 Claims**



1. In a wet disc brake for an axle outer end assembly of the type having an elongate axle housing; a wheel hub rotatably mounted on said housing by bearing means; means for imparting rotation to said wheel hub at one end of said housing; said disc brake being located near the other end of said housing and having a disc pack located within the brake housing, said disc pack including a plurality of axially movable first discs having projections extending radially outward into axially sliding engagement with retaining means on said brake housing and a plurality of axially movable second discs, intermediate adjacent ones of said first discs, and having projections extending radially inward; said wheel hub including a brake hub portion extending into said brake housing for operatively interconnecting said disc pack with said wheel hub via the axially sliding engagement of said radially inward extending second disc projections with retaining means on said brake hub portion; a generally annular cooling fluid clearance between the outer peripheral surface of said plurality of second discs and said brake housing inner peripheral surface; and means for circulating cooling fluid through said disc pack and said clearance, wherein said improvement comprises a plurality of spaced locating tangs extending radially outward from the peripheral outer surface of said second discs for locating said second discs relative to said brake housing inner peripheral surface so as to permit the removal of said wheel hub, and consequently of said brake hub portion, without causing misalignment between said second disc projections and said retaining means on said brake hub portion to the extent that this misalignment with prohibit subsequent reinstallation of said wheel hub and said annular cooling fluid clearance including a relatively smaller running clearance between said tangs and said brake housing inner peripheral surface.

4,173,270

HYDROKINETIC TORQUE CONVERTER WITH A DIRECT DRIVE LOCK-UP CLUTCH ADAPTED FOR ONE-WAY TORQUE DELIVERY

Howard L. Croswhite; James H. Gregg, both of Livonia, and Angelo L. Guido, Dearborn, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

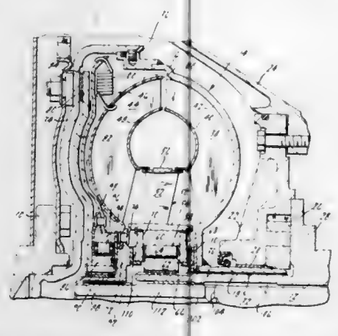
Filed Nov. 14, 1977, Ser. No. 851,005

Int. Cl.² F16D 33/00; F16H 47/00

U.S. Cl. 192—3.29 **6 Claims**

1. A hydrokinetic torque transmitting mechanism for use in an automotive vehicle driveline comprising a hydrokinetic torque converter having a bladed impeller and a bladed turbine situated in toroidal fluid flow relationship, said impeller being adapted to be connected to an internal combustion engine, a turbine shaft connected to said turbine and adapted to be connected to the torque input element of multiple ratio gearing, a

selectively engageable friction clutch means for establishing a direct drive connection between said impeller and said turbine shaft, thus establishing a mechanical torque flow path that is in parallel disposition with respect to the hydrokinetic torque flow path through said hydrokinetic mechanism, and a one-way overrunning clutch situated in and forming part of said mechanical torque delivery path for accommodating torque delivery from said impeller to said turbine shaft but adapted to interrupt torque delivery from the turbine shaft to the impeller, said friction clutch means having a torque input element con-



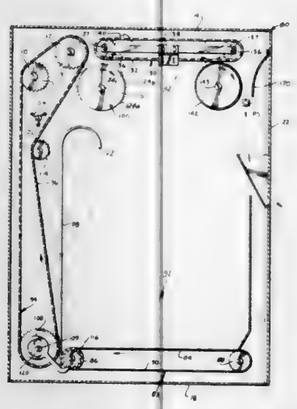
nected continuously to said impeller, said overrunning clutch having a torque input element connected continuously to a torque output element of said friction clutch means, said overrunning clutch having also a torque output element connected to said turbine and an overrunning coupling element between said torque input element and said torque output element of said overrunning clutch adapted to establish a continuous, one-way torque delivery path from said impeller to said turbine upon engagement of said friction clutch means at any turbine speed.

4,173,271

VENDING MACHINE FOR FABRIC-LIKE ARTICLES AND METHOD

Queve E. Copp, 3470 Thornwood Dr., Atlanta, Ga. 30340

Filed Oct. 5, 1977, Ser. No. 839,600
Int. Cl.[2] G07F 7/06
U.S. Cl. 194—4 C **23 Claims**



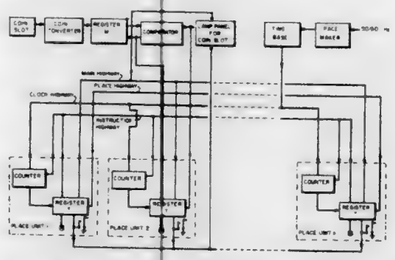
1. In a dispensing machine for receiving and examining an article such as a soiled shop towel prior to dispensing a clean one and wherein there is a normally closed cabinet or housing in which there is a place for storage of soiled towels which have been inserted into the machine and a place for storage and dispensing clean towels and wherein there is a slot or opening in the housing through which a clean towel may be positioned on a continuously driven conveyor means having a plurality of spaced positions thereon on which a towel is inserted, there being a measuring wheel continuously contacted by the movement of said article, the improvement comprising:
   supporting said measuring wheel for movement in response to the travel of said article as said article such as the shop towel is elongated by said conveyor means,
   an elongated measuring member and means connecting said measuring wheel to said measuring member so that said measuring member is displaced in response to the movement,
   means for returning said measuring member to initial position after displacement.

4,173,272

PARKING CONTROL SYSTEM

Knut A. Von Knorring, Sodertalje, Sweden, assignor to AB Transporteknik, Stockholm, Sweden

Continuation-in-part of Ser. No. 567,130, Apr. 11, 1975. This application Sep. 28, 1977, Ser. No. 837,455
Int. Cl.[2] G07F 15/12
U.S. Cl. 194—9 T **8 Claims**



1. A parking control system comprising at least one parking meter having a plurality of coin slots; a plurality of indicating members each arranged for one of a plurality of parking spaces, said indicating members comprising a number of visible signal means arranged to be initially activated in dependence of the magnitude of the parking charge paid for each said parking place and arranged to be successively inactivated as the parking period for which payment has been made expires; and a binary electronic control unit operatively connected with said coin slots and with said indicating members for activating and inactivating same in accordance with the prepaid parking charge as represented by the coins inserted in one or more of said coin slots.

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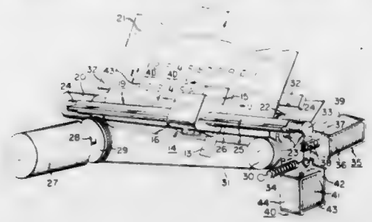
PRINTER DEVICE

Takayoshi Hanakata, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 439,150, Feb. 4, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,585
Claims priority, application Japan, Feb. 12, 1973, 48-17159
Int. Cl.[2] B41J 3/20
U.S. Cl. 400—120 **6 Claims**

1. A printer device comprising:
   a printing medium of thermosensitive paper;
   a rotatable guide rail disposed in parallel with said printing medium;
   holder means slidably mounted on said guide rail and pivotable in accordance with the pivotal movement of said guide rail;
   a thermal head for recording on said printing medium fixed to said holder means;

thermal head moving means for moving said thermal head along said guide rail in one direction and in another direction;
spring means for urging said guide rail to rotate in a first rotational direction to contact said thermal head with said recording medium with a first pressing force, when said thermal head is in non-recording position and is moved along said guide rail by said moving means in said one direction along said guide rail;
first electromagnetic drive means for further urging, in addition to the urging of the guide rail in the first rotational direction by said spring means, said guide rail to



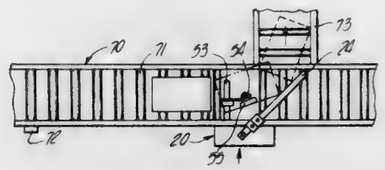
rotate in said first rotational direction to contact said thermal head with said recording medium with a second pressing force larger than said first pressing force, when said thermal head is in recording position and is stopped on said guide rail; and
second electromagnetic drive means for urging, against the urging of the guide rail in the first rotational direction by said spring, said guide rail to rotate in a second rotational direction opposite to said first rotational direction to place said thermal head out of contact with said recording medium, when said thermal head is moved, by said moving means, in said other direction opposite to said one direction of the movement thereof.

4,173,274

CONVEYOR LOAD SHUNTING APPARATUS

Edward T. Kantarian, 4325 Arlington Dr., Royal Oak, Mich. 48072, and Donald F. Staub, 814 Fox Run Dr., Bloomfield Hills, Mich. 48013

Filed Mar. 6, 1978, Ser. No. 883,879
Int. Cl.[2] B65G 47/46
U.S. Cl. 198—367 **5 Claims**



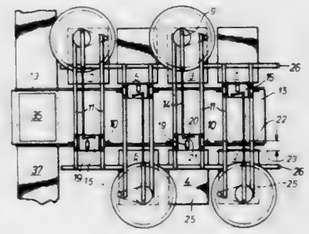
1. Conveyer load shunting apparatus comprising,
   a housing mountable on a conveyer,
   a main shaft pivotably mounted on said housing,
   a radial shunt bar on said main shaft swung by pivotal motion of said main shaft between a neutral position and a shunt position,
   a lever on said main shaft,
   a peg extending radially from said lever,
   an actuator mounted on said housing,
   a moving element in said actuator,
   a push-pull rod linking said moving element and said lever; when said actuator is energized said moving element retracts moving said main shaft angularly via said push-pull rod and said lever to swing said shunt bar from a neutral position to a shunt position over the conveyer,
   a rocker shaft pivotably mounted on said housing having an inner portion within said housing and outer portion for projecting into a conveyer below the load surface of the conveyer,
   a radial leg on said outer portion of said rocker shaft equipped with a load engaging wheel, and
   a blocker arm on said inner portion of said rocker shaft for engaging said peg on said lever when said lever is swung by said actuator being energized;
   upon a conveyer load being proximate to said shunt bar, the load depresses said wheel angularly pivoting said rocker shaft to swing said blocker arm into engagement with said peg preventing return angular motion of said main shaft thereby holding said shunt bar in shunting position so that the force of the shunting is borne by said blocker arm and taken off said actuator.

4,173,275

DEVICE FOR ASSEMBLING A PLURALITY OF LARGE PANEL LAYERS INTO A PRESS PACK

Heinrich Pfeiffer, Eppingen, and Richard Brüssel, Sulzfeld, both of Fed. Rep. of Germany, assignors to Maschinenfabrik J. Dieffenbacher GmbH & Co., Eppingen, Fed. Rep. of Germany

Filed Feb. 10, 1977, Ser. No. 767,320
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1976, 2605172
Int. Cl.[2] B65G 47/26
U.S. Cl. 198—421 **12 Claims**



1. A device for collecting large flexible panel layers, including very thin panel layers, from separate layer stacks and for assembling them into press packs, ready for transfer to a panel press, for the production of layered press panels, for example, the device comprising in combination:
   a plurality of parallel layer collecting lines arranged side-by-side and uniformly spaced from one another; each layer collecting line having at least one layer stack associated therewith;
   a press pack assembly conveyor having an endless conveyor belt running transversely to the layer collecting lines and past all layer stacks at a short distance therefrom; and
   means for driving the press pack assembly conveyor in a stepping motion, the distance of each step being equal to the spacing between the layer collecting lines; and wherein
   the press pack assembly conveyor defines a press pack collecting station for each layer collecting line;
   each layer collecting line includes: a collecting carriage; means for guiding the collecting carriage for shuttle movements between its layer stack and its collecting station on the press pack assembly conveyor; a suction bank on the collecting carriage capable of singulating a panel layer from the layer stack and of transferring it, under the movement of the collecting carriage, to the collecting station; and a horizontal crank drive connected to the collecting carriage for the creation of said shuttle movements;

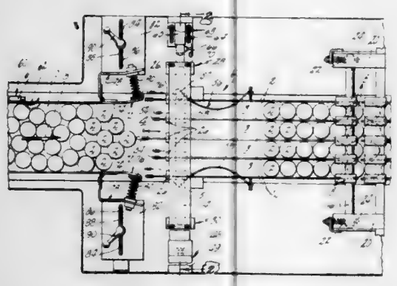
the crank drives of all layer collecting lines operate in unison;
the suction bank of each carriage is guided for vertical movements in relation to the carriage and each carriage includes means for moving the suction bank vertically;
at least one of the collecting lines has two layer stacks arranged on opposite sides of the press pack assembly conveyor, in alignment with and identically spaced from the collecting station on said conveyor;
the collecting carriage of said line executes shuttle movements for the alternating pickup and collection of panel layers from both of said layer stacks;
the collecting carriage guide means of said line includes overhead guide rails extending across said conveyor;
the crank drive for the collecting carriage of said line has a crank radius for a carriage stroke which is equal to the distance to be travelled by a panel layer between its stack and the collecting station;
said crank drive further includes a mechanism for creating a supplemental stroke of the collecting carriage which is equal to the distance between the point of release of one panel layer on the collecting station and the point of pickup of the next panel layer on the opposite layer stack, said supplemental stroke mechanism being so related to the crank drive that its effect on the movement of the suction bank on the collecting carriage is to longitudinally shift its crank-generated stroke by the supplemental stroke; and
the suction banks on the collecting carriages are arranged to engage the panel layers in the area of the edges which are located nearest to the press pack assembly conveyor, lifting only an edge portion of each panel, as the suction banks move vertically, and transferring each panel from its stack to a collecting station on the press pack assembly conveyor by pulling the panel sideways from its stack, as the collecting carriage executes its shuttle movement.

4,173,276

APPARATUS FOR DETECTING AND CLEARING A JAM OF ARTICLES

John L. Raudat, North Madison; Lloyd D. Johnson, Portland, both of Conn., and Adam Z. Rydell, Decatur, Ga., assignors to Standard-Knapp, Inc., Portland, Conn.

Filed Nov. 17, 1976, Ser. No. 742,968
Int. Cl.² B65G *47/26*
U.S. Cl. 198—437 **21 Claims**



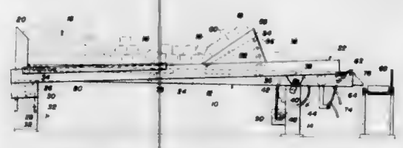
1. An apparatus for detecting and clearing a jam of articles at the entrance to an article lane divider, comprising:
(a) a plurality of parallel guides defining lanes for articles;
(b) conveyor means operative to advance articles toward the entrance to said lanes and to move articles in said lanes;
(c) detecting means for detecting a jam of articles at the entrance to said lanes; and
(d) means for moving at least one of said parallel guides transversely to the direction of travel of the articles in response to said detecting means detecting a jam of articles at the entrance to said lanes.

4,173,277

UNSCRAMBLING APPARATUS FOR BAR MATERIAL, INCLUDING LUMBER

Edwin H. Zimmerman, R.D. #1, New Holland, Pa. 17557

Filed Mar. 8, 1978, Ser. No. 884,496
Int. Cl.² B65G *47/12*
U.S. Cl. 198—443 **4 Claims**



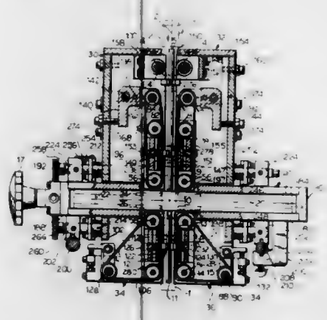
1. An unscrambling apparatus for bar objects, including timber and the like comprising in combination, a stationary base frame comprising elongated longitudinal frame members adapted to receive at one end thereof a plurality of bar-like objects disposed transversely across said frame members and the opposite end comprising the discharge end of said frame, advancing frame means pivotally and slidably supported at one end adjacent said receiving end of said base frame and being at least no higher than said one end of said base frame, power means engaging the opposite end of said advancing frame comprising the discharge end thereof and adapted to successively raise said discharge end of said frame above the level of the discharge end of said stationary base frame and successively lower said discharge end below the level of the discharge end of said base frame while also moving said advancing frame toward the discharge end of said base frame to progressively advance said objects along said base frame toward the discharge end thereof, and means movably supported on said receiving end of said advancing frame means to support said objects and operable to adjustably limit the advancing movement of said objects along said base frame.

4,173,278

TRANSPORT MECHANISM FOR PARTS

Erwin Reitter, Cabot, Ark., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Jan. 26, 1978, Ser. No. 872,498
Int. Cl.² B65G *47/31*
U.S. Cl. 198—461 **13 Claims**



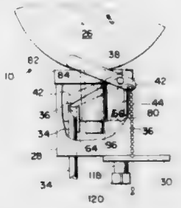
7. A transport mechanism for serially feeding discrete parts of a selected cylindrical or prismatic form and selected length, said transport mechanism comprising, in combination:
transport means defining a feed axis and comprising a succession of at least three feed means constructed and arranged to engage the peripheral surfaces of the parts at at least three locations spaced apart along said feed axis at intervals less than the selected length of the parts, and to locate the longitudinal axes of the parts in substantial coincidence with the feed axis, a work station being defined along said feed axis intermediate a second and third of said feed means;
and drive means connected for actuating said feed means to advance the parts along said feed axis in translatory non-rotating motion through said work station, said drive means being constructed and arranged to drive a second and third of said succession of feed means at equal feed rates to feed the parts uniformly through said work station, and to drive a first in said succession of feed means at a lower rate than said second and third feed means to separate the parts as they pass from said first to said second feed means;
said first feed means comprising a pair of rolls opposed to one another on opposite sides of said feed axis and rotatable on parallel axes lying in a plane normal to said feed axis, said second and third feed means comprising endless belts arranged in pairs having spans extending substantially parallel to said feed axis and opposed to one another an opposite sides thereof.

4,173,279

FLUID METERING AND TRANSFER SYSTEM

Robert D. Lichti, Lakewood, and Joseph O. Herrera, Buena Park, both of Calif., and Paul J. Ashley, Boise, Idaho, assignors to Park Mobile, Inc., New York N.Y., by said Joseph O. Herrera and Paul J. Ashley

Filed Oct. 18, 1977, Ser. No. 843,266
Int. Cl.² F16N *7/18*
U.S. Cl. 198—500 **16 Claims**



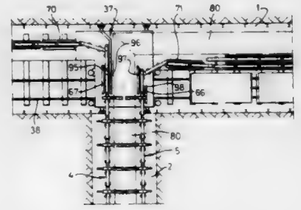
14. A lubrication metering and transfer system for lubricating a conveyor which comprises a drive chain rotatable on a sprocket, a drive shaft for rotating the sprocket, means for rotating said shaft and means for applying lubrication to said drive chain, said system comprising:
a reservoir for containing a lubricant at a predetermined level and located above said lubrication applying means;
a second shaft pivotally mounted;
an elongate member having a distal end portion and mounted at one end thereof to said second shaft, said elongate member having a length such that said distal end portion can be immersed in said lubricant at a first position of said second shaft, said distal end portion retaining a small amount of said lubricant by the adhesion of said lubricant thereto upon pivoting of said shaft from said first position;
a transfer tube spaced from said second shaft a distance approximately equal to the length of said elongate member such that upon pivoting of said shaft to a second position, said distal end portion engages said transfer tube so that the fluid retained on said distal end portion of said elongate member is transferred to said transfer tube which in turn transfers the transferred fluid by gravity flow to said lubrication applying means;
means coupled to the drive shaft for oscillating said second shaft between said first and second positions when said drive shaft is rotating and wherein said elongate member comprises a flexible wire and wherein said wire and said transfer means are spaced apart a distance such that only the distal end of said wire engages said transfer means and such that said wire is flexed upon said engagement so as to permit said removed amount of fluid to be transferred upon said engagement.

4,173,280

APPARATUS FOR DRIVING A MINING MACHINE INTO A DRIVEWAY EXTENDING FROM A MINING ROADWAY

Gordon B. Dawson, Hulland Ward, England, assignor to Atlow Mining Developmeat Consultants Limited, Hulland Ward, England

Filed Oct. 4, 1977, Ser. No. 839,390
Claims priority, application United Kingdom, Jul. 7, 1977, 28522/77
Int. Cl.² B65G *15/60*
U.S. Cl. 198—812 **4 Claims**



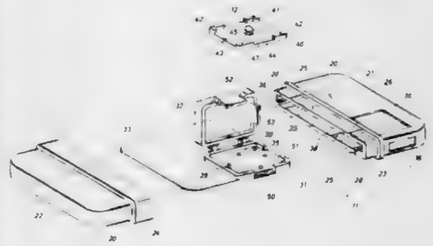
1. Apparatus for feeding one or more chains of connected push rods into a driveway extending laterally from a mine roadway and comprising a first thrust mechanism for applying force to the push rods in a first direction along the driveway, a second thrust mechanism for applying force to the push rods in a second direction laterally of said first direction along the roadway, means for operating the first thrust mechanism together with the second thrust mechanism, said first thrust mechanism including two drives for applying force along the driveway to two separate chains of push rods, a second thrust mechanism including two further drives each for applying force along the roadway to a respective one of the chains and each operable together with a respective one of the drives of the first thrust mechanism, the drives of the first and second thrust mechanisms each including hydraulic cylinder and releasable couplings for connecting the cylinders to the push rods, and the releasable couplings comprise hydraulically operable latches mounted on the hydraulic cylinders.

4,173,281

INTRAOCULAR LENS PACKAGING SYSTEM

John H. Trought, Richwood, Tex., assignor to Intermedics Intraocular, Inc., Freeport, Tex.

Filed Jun. 12, 1978, Ser. No. 914,800
Int. Cl.² B65D *81/18*; A61F *1/16, 1/18*; B65D *25/54*
U.S. Cl. 206—5.1 **13 Claims**



1. An intraocular lens packaging system, which comprises:

an outer case having a top and a bottom, wherein at least a portion of said top and bottom have optically flat transparent surfaces parallel to and substantially overlying each other;

an inner case sealed within said outer case, said inner case having a top and bottom, wherein at least a portion of said top and bottom have optically flat transparent surfaces parallel to and substantially overlying each other and parallel to and substantially between said optically flat transparent surfaces of said outer case;

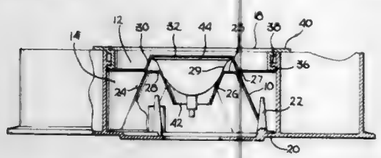
and means for mounting said intraocular lens within said inner case such that said intraocular lens lies in a plane parallel to and substantially between said optically flat transparent surfaces of said inner and outer cases.

4,173,282

SPARE LAMP HOLDER

Benjamin H. Stansbury, Jr., Beverly Hills, and Barry Fluster, Los Angeles, both of Calif., assignors to AVSP, Inc., Los Angeles, Calif.

Filed Sep. 1, 1978, Ser. No. 938,813
Int. Cl.[2] B65D *77/04, 77/26, 85/42;* **F21V** *19/04*
U.S. Cl. 206—216 **10 Claims**



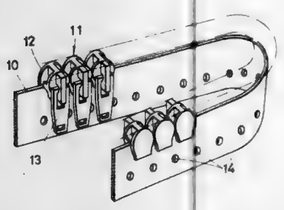
1. In a photographic slide tray for use with an associated slide projector, said tray having a plurality of outwardly extending slide compartments formed about a central cavity, the improvement which comprises a lamp support member disposed in said central cavity, said lamp support member having positioning means for securely holding a spare lamp for said projector.

4,173,283

SUPPORT STRIP FOR READY-FOR USE ARRANGEMENT OF SLIDERS IN THE MANUFACTURE OF SLIDE FASTENERS

Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Chiyoda, Japan

Filed Dec. 16, 1974, Ser. No. 533,243
Claims priority, application Japan, Dec. 24, 1973, 49-1795
Int. Cl.[2] B65D *73/00*
U.S. Cl. 206—338 **6 Claims**



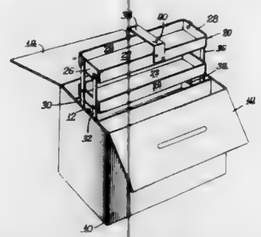
1. An apparatus for conveying sliders for use in the manufacture of slide fasteners, the sliders being of the type including a body having a pair of wings which are interconnected at one end of said body, which apparatus comprises a movable elongated support strip having a continuous longitudinal edge portion disposed for insertion between the wings of each slider body to releaseably support same, in a generally fixed position relative to the support strip and means defining a plurality of apertures spaced apart longitudinally on said support strip and disposed for engagement by a drive means to move said strip and sliders supported thereby.

4,173,284

HINGED TRAY ASSEMBLY

Joseph E. March, Chicago, Ill., assignor to Platt Luggage, Inc., Chicago, Ill.

Filed Mar. 23, 1978, Ser. No. 889,341
Int. Cl.[2] B65D *83/00;* **A47B** *51/00*
U.S. Cl. 206—349 **9 Claims**



1. A carrier comprising a plurality of trays generally identical in shape and dimensions, link means and means pivotally attaching said link means to said trays to permit pivotal relative motion of said trays between a vertically aligned first position in which said trays are vertically aligned, a second supported position in which said trays are progressively offset in a stepwise relationship, and a third supported position in which said trays are horizontally aligned, each of said trays comprising a generally rectangular base and an upstanding flange extending from said base, said flange including a first side wall and a second side wall spaced from and generally parallel to said first side wall, said link means comprising a first pair of link members pivotally attached to the first side wall of each tray and a second pair of link members, generally identical to said first pair of link members, pivotally attached to the second side wall of each tray, each pair of said link members comprising an elongated single first link member of generally constant width and an elongated second single link member of generally constant width, each of said link members being pivotally attached to each of said trays by said pivotal attaching means, the points of pivotal attachment of each link member to each pair of adjacent trays being spaced by a distance greater than the maximum cross-sectional width dimension of each tray, such that all of said link members are generally perpendicular to the planes defined by said bases when said trays are in said first position, such that all of said link members are oblique to the planes defined by said bases when said trays are in said second position, and such that all of said link members are generally parallel to the planes defined by said bases when said trays are in said third position.

4,173,285

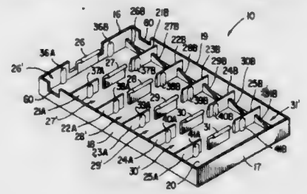
DISPENSER FOR BONDED RAZOR BLADE CARTRIDGES

Ernest F. Kiraly, Fairfield, Conn., and Vincent C. Motta, Bronx, N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 31, 1978, Ser. No. 929,484
Int. Cl.[2] B65D *7/00, 57/00, 85/62*
U.S. Cl. 206—356 **11 Claims**

1. A dispenser for a plurality of razor blade cartridges arrayed in a row, said cartridges being normally housed in said dispenser so as to expose means thereon for connecting engagement with a holder for removal from the dispenser, said dispenser comprising:

base means, a peripheral wall upstanding from said base means, a plurality of spaced partition walls within said peripheral wall and upstanding from said base means, said partition walls being disposed parallel to one another and substantially parallel to portions of said peripheral wall to each define only one respective end of a respective series of generally rectangular open-top compartments disposed in a row, the opposite end of each compartment being



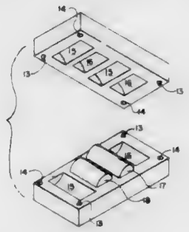
defined by respective substantially free-standing, yieldable retention means upstanding from said base means, and the side walls of said compartments being defined by portions of said peripheral wall, a said cartridge being retained in a respective said open-top compartment by a respective said retention means acting in cooperation with a respective said partition wall in opposed relation therewith.

4,173,286

REUSABLE RESILIENT PACKAGING

John J. Stanko, 327 Coraopolis Rd., Coraopolis, Pa. 15108

Filed Jun. 26, 1978, Ser. No. 919,421
Int. Cl.[2] B65D *85/62, 81/06, 1/36*
U.S. Cl. 206—433 **5 Claims**



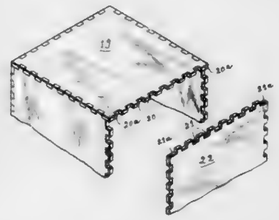
1. A reusable resilient package particularly for the shipment of beverage cans comprising at least first and second half sections, each containing at least one pair of mating recesses, one recess of each pair receiving half of the lengthwise section of a beverage can of one size and the other recess of each pair receiving half of the lengthwise section of a beverage can of different size having a like diameter but a shorter length, cooperating index means on said first and second half sections, said two half sections when superimposed in one position receiving one can of one size and one can of said different size in each pair of mating recesses and in a second position in which one half section is rotated 180° from said first position, receiving two cans of said one different size in each pair of mating recesses, said cans being held against relative movement in said recesses in both positions, fastening means removably connecting said first and second half sections in either said first and second positions and changeable name means on one of said half sections.

4,173,287

METHOD OF MAKING BOARDS AND PACKING CASES MADE THEREFROM

Shozo Kumakawa, 175-1, Nishinonami cho, Hikone City, Shiga Prefecture, Japan

Filed May 25, 1977, Ser. No. 800,223
Claims priority, application Japan, May 25, 1976, 51-60979
Int. Cl.[2] B65D *9/32*
U.S. Cl. 217—65 **4 Claims**



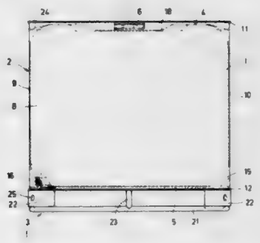
1. A method of making boards (19, 22) for preferably wooden packing cases, comprising the steps of: providing a total odd number of successive connecting elements (20, 20*a*, 21, 21*a*) in the form of tenons (20, 20*a*) and mortises (21, 21*a*) with a bilateral symmetry along edges of the boards, each tenon and mortise of each edge of each board defining engaging means for mating with a corresponding, equally dimensioned mortise and tenon, respectively, of another equally dimensioned edge of another respective board to form a completed container; selecting an overall length (L) for each edge so that said length can be divided mathematically by a desired basic pitch (W) of the elements, leaving a remainder which is other than zero; providing in each edge a plurality of the elements (20, 21), odd in number, that have said basic pitch, as well as a pair of outermost, additional elements (20*a*, 21*a*) that have a different pitch (W'); deriving the number of the plurality of elements by dividing said overall edge length by said basic pitch to obtain, with the remainder that is other than zero, the highest possible quotient that is an integral multiple of said basic pitch; however, reducing the result of the division by one when the latter yields an even number and modifying the remainder of said result when an even number is yielded, by adding the basic pitch thereto; and deriving said different pitch by adding a factor (Z) to said basic pitch, which factor corresponds to half said remainder of the division, all numerical values being integers greater than zero.

4,173,288

PALLET CONTAINER

Udo Schutz, Rückersteg 4, D-5418 Selters, Fed. Rep. of Germany

Filed Jun. 14, 1978, Ser. No. 915,501
Int. Cl.[2] B65D *87/00, 7/42*
U.S. Cl. 220—1.5 **7 Claims**



1. Pallet container for the transport of liquids, comprising an

inner container of synthetic resin, an outer shell of sheet metal with a bottom and a lid, said shell having recesses to provide access to filling and outlet openings of said container, a steel tube pallet welded to the underside of the sheet metal shell, said pallet comprising a lower tubular steel frame and an upper tubular steel frame which are welded into a rigid structure at four corners by profiled metal plates, and a profiled ring of foamed plastic material inside said sheet metal shell and supporting the lower corners of said inner container to impart to said inner corners a smoothly rounded configuration.

4,173,289

STEEL WIRE STACKABLE UPSETTABLE-WALL CONTAINER

Gian P. Nesti, Como, Italy, assignor to Campisusa S.P.A., Milan, Italy

Filed Aug. 4, 1978, Ser. No. 931,165
Claims priority, application Italy, Sep. 14, 1977, 22211 B/77
Int. Cl.² B65D *7/24, 7/20, 7/00;* **B65J** *1/02*
U.S. Cl. 220—7 **5 Claims**



1. A steel wire stackable upsettable-wall container comprising a base plane and four upsettable reticular structures, made of steel wires which are joint-connected onto the sides of said base plane, one of said reticular structures acting as the rear wall, the opposite reticular structure acting as the front wall and the other two reticular structures acting as the side walls, hook elements located on said side walls, wherein the front wall is laterally provided with two vertically movable plates, said plates being raised and engaging said hook elements when the container is assembled and wherein the edges of the three sides of each plate are bent or folded back and engage the steel wires of the front wall reticular structure.

4,173,290

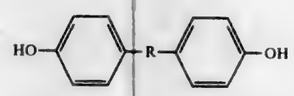
BONDED CAN HAVING HIGH HOT WATER RESISTANCE AND UNDERCOATING COMPOSITION FOR USE IN PRODUCTION THEREOF

Seishichi Kobayashi, Yokohama; Tatsuo Mori, Kawasaki, and Hiroshi Ueno, Yokosuka, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Feb. 7, 1978, Ser. No. 875,889
Int. Cl.² B65D *25/14, 25/34;* **B32B** *15/08, 27/38*
U.S. Cl. 220—75 **10 Claims**

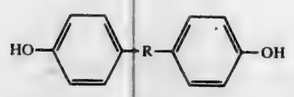


1. A bonded can adapted to be subjected to a retort sterilization treatment, which consists of a metal material having both the confronting side edges bonded together by a linear polyamide adhesive through an epoxy-phenolic resin undercoating composition, wherein said epoxy-phenolic resin undercoating composition comprises 50 to 95% by weight of an epoxy resin having a number average molecular weight of 800 to 5500, which is obtained by condensation of an epihalohydrin with bisphenol A, and 5 to 50% by weight of a resol-type phenol-aldehyde resin having a number average molecular weight of 200 to 1000, which is obtained by reacting a mixed phenol comprising 65 to 98% by weight of a dihydric phenol represented by the following general formula:



wherein R stands for a bridging group or is a direct bond, and 2 to 35% by weight of a monohydric phenol with an aldehyde in the presence of a basic catalyst.

10. An undercoating composition for production of bonded cans to be subject to a retort sterlization treatment, which comprises 50 to 95% by weight of an epoxy resin having a number average molecular weight of 800 to 5500, which is obtained by condensation of an epihalohydrin with bisphenol A, and 5 to 50% by weight of a resol-type phenol-aldehyde resin having a number average molecular weight of 200 to 1000, which is obtained by reacting a mixed phenol comprising 65 to 98% by weight of a dihydric phenol represented by the following general formula:



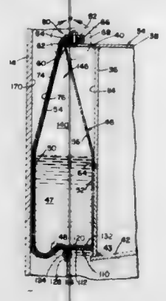
wherein R stands for a bridging group or is a direct bond, and 2 to 35% by weight of a monohydric phenol with an aldehyde in the presence of a basic catalyst.

4,173,291

FLOATING ROOF SEAL

Richard E. Hills, Coraopolis, Pa., assignor to Pittsburgh-Des Moines Steel Company, Pittsburgh, Pa.

Filed Jan. 20, 1978, Ser. No. 871,039
Int. Cl.² B65D *87/18, 87/20*
U.S. Cl. 220—225 **20 Claims**



1. In a floating roof storage tank, a seal on the floating roof for closing a space defined between the floating roof and a tank wall comprising:

a single thickness, unitary length of pliable material, said length of material having on opposite ends of said length of material end edges, and side edges on opposite sides of said length of material; and a longitudinal centerline, said length of pliable material being folded back on itself near said longitudinal centerline, said opposite side edges being superposed with each other;

closing means closing said end edges;

first attaching means attaching said superposed pliable material side edges to a storage tank floating roof so that said folded length of material is capable of containing a fluent material therein, said pliable material being attached to a storage tank only by said first attaching means;

a fluent material contained in said folded length of material; and

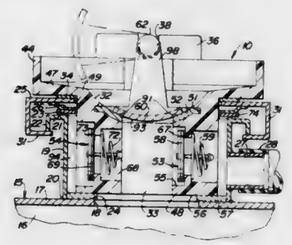
a scuff band positioned on said seal to be interposed between said pliable material and a storage tank side wall, said scuff band having a pair of opposite side edges and being separate from said length of pliable material and being attached to the floating roof at one side edge thereof by said first attaching means and at the other side edge thereof by a second attaching means, said scuff band supporting said length of pliable material and said fluent material contained therein, said pliable material being continuous and unattached to the floating roof adjacent said second attaching means.

4,173,292

VALVED CLOSURE FOR A PRESSURE VESSEL

Joseph J. Malacheski, and Richard J. Zenda, both of 32 Warner St., both of Plains, Pa. 18705

Continuation-in-part of Ser. No. 901,474, May 1, 1978, Pat. No. 4,147,273. This application Sep. 11, 1978, Ser. No. 941,294
Int. Cl.² B65D *51/16*
U.S. Cl. 220—303 **9 Claims**



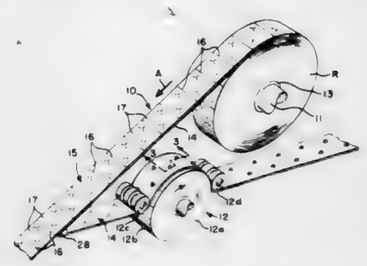
1. In a pressure vessel, the combination comprising a vessel top wall, a filling neck upstanding from and opening through said top wall and having a fluid passageway intermediate its vertical extent, a flange on said neck, an annular adaptor for removable engagement over and sealing the upper end of the neck in interfitting relation with the flange, a pair of aligned upwardly opening pedestal bearings upstanding from opposite locations on said adaptor, an annular insert in sealing engagement within said adaptor and entering in spaced relation with said neck into sealing engagement with said top wall, said insert and neck combining to define therebetween a chamber communicating exteriorly through said intermediate passageway, an annular upwardly facing concave seat on said insert, a valve element having a convex exterior sealing region engagable in sealing relation with said seat, a pair of aligned shafts extending from opposite sides of said valve element and journaled in respective bearings to rotatively guide said valve element out of and into said sealing relation with said seat, resilient means yieldably retaining said shafts downwardly in said bearings against internal pressure within said vessel to urge said valve element toward said seat, and a pair of oppositely directed one-way valves in said insert for passing fluid at predetermined pressures in one direction from said vessel through said chamber and intermediate passageway and in the other direction through said intermediate passageway and chamber into said vessel.

4,173,293

COMPOSITE LABEL WEB AND METHOD OF USING SAME

Paul H. Hamisch, Jr., Franklin, Ohio, and David W. Hubbard, Stamford, Conn., assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 629,191, Nov. 5, 1975, abandoned. This application Sep. 9, 1977, Ser. No. 831,833
Int. Cl.² B32B *3/10;* **B65H** *5/28*
U.S. Cl. 221—1 **3 Claims**



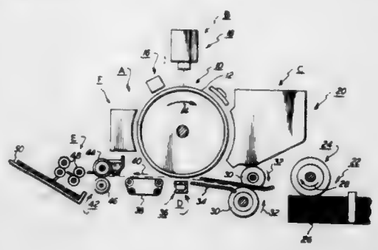
1. In a method of successively dispensing pressure sensitive labels releasably attached to a carrier web of supporting material, the method including the steps of rotatably supporting a supply roll of a composite web of the labels on the carrier web, directing the carrier web about a sharp angle of a delaminator to a rotary feed wheel having peripherally spaced teeth for engaging the carrier web at longitudinally spaced slit means within the carrier web, and pulling the carrier web around the delaminator with the feed wheel to peel the labels successively from the carrier web, the improvement comprising the steps of locating the slit means within the carrier web in longitudinally extending and laterally spaced rows, and staggering the slit means within one row longitudinally relative to the slit means in the other row to provide for passing only one slit means at a time around the delaminator for substantially eliminating tearing of the carrier web at the delaminator.

4,173,294

DISPENSER HAVING RECIPROCATING PADDLES FOR DISCHARGING PARTICLES THEREFROM

Robert C. Savage, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 23, 1977, Ser. No. 809,346
Int. Cl.² G01F *11/10*
U.S. Cl. 222—1 **6 Claims**



3. A system for developing an electrostatic latent image recorded on a photoconductive member, including:

a housing defining a chamber;

means, disposed in the chamber of said housing, for depositing particles on the latent image;

means for storing a supply of particles therein;

an elongated tubular member having a plurality of spaced

apertures extending in a longitudinal direction therein and having an opening in one end portion thereof coupled to said housing enabling particles to enter said tubular member;

a shaft member mounted translatably and rotatably interiorly of said tubular member;

at least a pair of sets of paddles mounted fixedly on said shaft member with one set of said pair of sets of paddles being angularly and linearly displaced from the other set of said pair of sets of paddles;

a motor coupled to said shaft member, said motor indexing said pair of sets of paddles from the operative position with one of said pair of sets of paddles engaging the particles to the inoperative position spacing said pair of sets of paddles from the particles; and

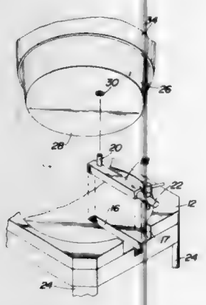
a solenoid coupled to said shaft member for translating said pair of sets of paddles from a first position to a second position with said pair of sets of paddles being in the operative position to advance the particles, and returning said pair of sets of paddles to the first position from the second position after said motor rotates said pair of sets of paddles to the inoperative position.

4,173,295

BARREL DISPENSING SUPPORT

Dieter Steinmann, Glendale, N.Y., assignor to European Design Corporation, Glendale, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,358
Int. Cl.² B05D *17/16, 25/36*
U.S. Cl. 222—81 **11 Claims**



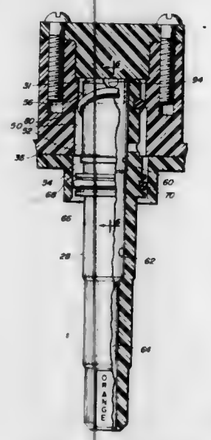
1. A device for use with a beverage barrel from which it is desired to dispense the beverage by gravity flow comprising a support having a circular area on its upper surface for receiving the bottom end of a beverage barrel wherein said support is provided with a channel on an upper surface thereof extending to a periphery of said support, a conduit having one end portion thereof mounted on said support and radially disposed with respect to said circular area, said conduit being located in said channel, an inlet communicating with said one end portion of said conduit and projecting upwardly therefrom, a valved spigot connected to the other end portion of said conduit and being at a location beyond the peripherial portion of said support for dispensing a begerage from a barrel, whereby a beverage barrel may be tapped by placing the barrel on said support and causing said inlet to simultaneous enter through a seal of the bottom wall of the barrel.

4,173,296

APPARATUS FOR MIXING AND DISPENSING A BEVERAGE

William A. Marshall, Elmhurst, Ill., assignor to Alco Foodservice Equipment Company, Miami, Fla.

Filed Oct. 14, 1977, Ser. No. 842,148
Int. Cl.² B67D *5/56*
U.S. Cl. 222—129.1 **3 Claims**



1. A device for mixing a concentrated beverage ingredient and a diluent and dispensing a mixed beverage, said device comprising:

(a) means operative to provide, upon connection to a source of beverage concentrate, a measured flow of said concentrate;

(b) means operative to provide, upon connection to a source of pressurized diluent, a controlled flow of said diluent;

(c) means defining a first flow passage receiving said diluent flow therethrough and defining a second flow passage receiving said concentrate flow therethrough, wherein said first and second passages intersect to form a common flow passage for said diluent and concentrate;

(d) dispensing means receiving said flow from said common passage, said dispensing means including:

(i) housing means defining a bore;

(ii) a tubular member movably received in said bore;

(iii) mixing orifice means including first and second orifices communicating with the interior of said tubular member and operative to restrict said flow to an effective flow area substantially less than the flow area of said common passage and to effect mixing of said concentrate and diluent to form a homogeneously mixed beverage, said orifice means including means selectively movable between a first position providing a first effective orifice flow area and a second position providing a second effective orifice flow area greater than said first effective orifice flow area, said selectively movable means including seal means operative to seal between the outer periphery of said tubular member and the inner periphery of said bore in said first position to prevent flow through said second orifice, and operative in said second position to permit flow through said first and second orifices; and,

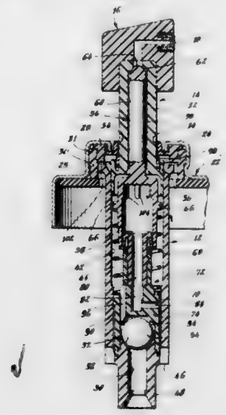
(iv) diffuser means comprising the interior of said tubular member and receiving all flow of said mixed beverage from said mixing orifice means, said diffuser means being operative to diffuse said flow from said orifice means to substantially atmospheric pressure and to a substantially lower velocity than the velocity through said orifice means, said diffuser means including spout means receiving said diffused flow of mixed beverage, said spout means being operative to discharge said mixed beverage by gravity flow.

4,173,297

NON-THROTTLING MANUALLY RECIPROCATED PLUNGER PUMP FOR CONSUMER-TYPE LIQUID DISPENSING CONTAINERS

Edward A. Pettersen, Waterbury, Conn., assignor to The Risdon Manufacturing Company, Naugatuck, Conn.

Continuation-in-part of Ser. No. 873,358, Jan. 30, 1978, abandoned. This application Mar. 1, 1978, Ser. No. 882,321
Int. Cl.² B05L *11/02*
U.S. Cl. 222—321 **10 Claims**



1. In a manually reciprocable pump for dispensing containers;

a housing forming a pump chamber and having provision for fluid intake at one end and discharge at the other, the chamber being open at the discharge end and closed at the intake end;

a fluid inlet formed in the closed end, and an inlet valve seat formed interiorly of said chamber about said inlet;

check valve means coacting with said inlet seat permitting entry of fluid through said inlet into said pump chamber and preventing reverse flow therefrom;

a plunger disposed in said pump chamber for reciprocation therein, said plunger having a skirted hollow head making a sliding piston fit with the wall of the chamber, said plunger including a hollow stem secured to said head and extending axially outwardly of the open end of said chamber to provide a discharge passage therefrom;

a closure member at the open end of said housing, said closure member having a central aperture through which said plunger stem projects axially and which guides said stem during reciprocation, said closure member limiting outward movement of said plunger by abutment of its head against said closure member;

a discharge outlet in said stem passage and a valve seat formed at the upstream side of said discharge outlet;

a differential force actuated control element having a hollow body of lesser diameter than said plunger head and adapted to nest concentrically therewith at its downstream side, said element having a rod secured in it to project axially into said hollow plunger stem in radially spaced relation thereto, said rod having a valve member at its upper end which coacts with the valve seat in said plunger stem to close said discharge outlet;

a compression spring interposed between the closed end of said pump chamber and said control element and biasing its valve member against said plunger valve seat, thereby simultaneously biasing said plunger towards fully extended position in abutment with said housing closure member, said control element moving with said plunger when the plunger stem is manually depressed against said compression spring but capable of independent axial movement relative thereto under influence of pumping pressure in the chamber;

a fitment disposed adjacent said inlet at the closed end of said pump chamber, said fitment and said control element respectively supporting one member of a cylinder/piston combination arranged axially in telescoping relation within said pump chamber and adapted to maintain a piston/cylinder fit throughout full reciprocation of said pump plunger;

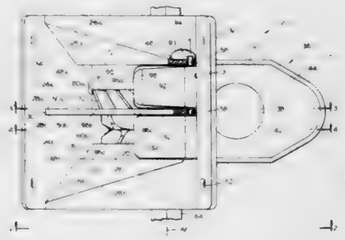
a port in said pump housing wall adjacent said fitment and said fitment having a passage which communicates the interior of said cylinder/piston combination with said port, said fitment having a separate passage which communicates said pump chamber with said fluid inlet.

4,173,298

ROTARY FEED CUP HAVING A SPACER AND A PIVOTED SEAL

Robert D. Lease, Bismarck, N. Dak., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Oct. 6, 1977, Ser. No. 839,951
Int. Cl.² G01F *11/10, 11/24*
U.S. Cl. 222—368 **5 Claims**



1. A feed cup mechanism which comprises a feed cup having first and second spaced-apart side walls that include respective ones of first and second inner surfaces, having a connecting wall that includes a curvilinear surface, having receiving opening means for receiving material to be fed, having discharge spout means for gravity discharging of material from said feed cup, and having drive shaft apertures that orthogonally and substantially coaxially intercept said side walls;

a drive shaft having an elongated longitudinal axis and being inserted through said drive shaft apertures;

a feed wheel having a metering circumferential surface, having a pair of planar side surfaces, being inserted into said feed cup intermediate of said first and second inner surfaces, and being drivingly mounted onto said drive shaft and cooperating with said curvilinear inner surface to form a metering passage between said metering circumferential surface and said curvilinear inner surface from said receiving opening means to said discharge spout means;

spacer means, having a planar spacing surface, having an outer surface portion that is substantially orthogonal to said planar spacing surface, having a drive shaft opening that orthogonally intercepts said planar spacing surface, and being interposed between one of said inner surfaces of said feed cup and one of said planar side surfaces of said feed wheel with said drive shaft extending through said drive shaft opening, for cooperating with said feed wheel to substantially fill the space between said inner surfaces of said feed cup;

pivoted seal means, being inserted intermediate of said first and second inner surfaces, being pivotally attached to said

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feed cup on a pivotal axis that is substantially parallel to said longitudinal axis, and having a swinging end that wings toward and into sealing proximity to both said metering circumferential surface of said feed wheel and said outer surface portion of said spacer means, for preventing said material from passing through said receiving opening means to said discharge spout means except through said metering passage; and

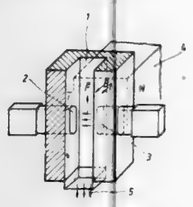
means, comprising said outer surface portion of said spacer means, for preventing said swinging end of said pivoted seal means from contacting said metering circumferential surface of said feed wheel.

4,173,299

ELECTROMAGNETIC VALVE WITH SLAG INDICATOR

Sten Kollberg, Vasteras, and Lars Tiberg, Fagersta, both of Sweden, assignors to ASEA AB, Vasteras, Sweden

Filed Oct. 25, 1977, Ser. No. 845,366
Claims priority, application Sweden, Oct. 25, 1976, 7611806
Int. Cl.² B22D 37/00
U.S. Cl. 222—594 **2 Claims**



1. A valve device to be used in tap holes for tapping molten metal from metallurgical containers, comprising: an electric circuit formed by two electrodes opening out into the molten metal in the tap hole; said electric circuit including means for measuring the resistive voltage drop across the molten metal in the tap hole, the changes in the resistive voltage drop indicating any slag contents in the molten metal;

a electromagnetic circuit arranged perpendicular to the electric current from the electrodes in the molten metal for generating a magnetic field, thus obtaining a resultant force with or against the molten metal;

means for supplying current to said electromagnetic circuit for generating a DC field;

means for superposing an alternating field on the DC field in the electromagnetic circuit to induce an alternating voltage; and

means for filtering the induced alternating voltage across the metal flow.

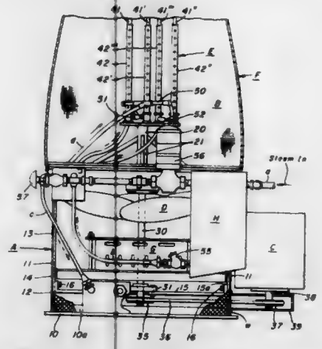
4,173,300

HEAT CONDITIONING APPARATUS FOR SHIRT OR BLOUSE-LIKE GARMENT

John R. Sanko, Altoona, Pa., assignor to Paris Manufacturing Company, Inc., Brockway, Pa.

Filed Feb. 15, 1978, Ser. No. 877,947
Int. Cl.² D06F 73/00
U.S. Cl. 223—70 **6 Claims**

1. In a high speed improved garment processing apparatus for upright finishing a shirt or blouse-like garment, having a base part and an aligned upper part, wherein the base part has an upwardly extending hollow casing defining an ambient air heating chamber therein, wherein the casing has a lower open wall portion through which ambient air is introduced into the heating chamber, and wherein the upper part has an upwardly extending permeable garment-receiving bag that defines a garment finishing chamber; a heat exchanger mounted in the casing above said open wall portion to extend substantially centrally across the air heating chamber, said heat exchanger defining flow passages for upward movement of and heating of air within the heating chamber, the permeable bag having a lower open end portion and the casing having an upper open end portion adapted to receive and mount the lower open end portion of the bag thereon, a rotating blade assembly operatively positioned within the heating chamber of the casing for drawing-in ambient air through said open wall portion and moving it upwardly through interstices of said heat exchanger into the lower open end portion of the permeable bag, a steam supplying tubular upright assembly securely positioned on and above the casing to extend centrally upwardly along and within the permeable bag, said tubular assembly having a group of transversely spaced-apart longitudinally extending dual-wall tubular element pairs, each said pair having a solid wall inner tube defining a heat transfer passageway therealong, each said pair having a perforated wall outer tube in an outwardly spaced relation about and along said inner tube, a manifold connected to said outer tubes for simultaneously



supplying steam thereto, said inner tubes being series-connected for continuously supplying heat therefrom along the spacing between said inner and outer tubes and along the garment processing chamber during the finishing of a garment, a steam separator, means supplying hot pressurized steam from a source to said separator, means connecting an upper portion of said separator to said manifold for introducing dry steam bursts directly into the garment finishing chamber through the perforated walls of said outer tubes, and means for continuously supplying steam from a lower condensate receiving portion of said separator to and along said series connected inner tubes and from said inner tubes to said heat exchanger for supplying heat within the spacing between said inner and outer tubes to the garment finishing chamber, and to the heat exchanger for continuously heating air moving upwardly therethrough into the garment finishing chamber.

4,173,301

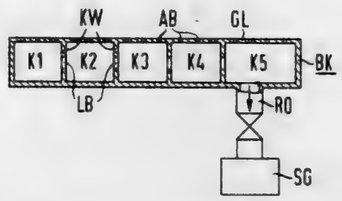
PNEUMATIC BRAKE

Gerhard Turini, Maisach, and Alfred Matthies, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 16, 1977, Ser. No. 851,888
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1977, 2707170
Int. Cl.² B65H 23/08
U.S. Cl. 226—102 **4 Claims**

1. In a pneumatic brake assembly for tensioning a data carrier in an electrostatic printing device where the data carrier passes over a brake surface of the pneumatic brake in contact therewith across substantially the full width of the data carrier, with a suction force being applied at the brake surface to draw the data carrier to the brake surface, the improvement of: the pneumatic brake including an enclosed vacuum chamber having at least one side thereof fromed by the brake surface, a plurality of suction orifices through the brake surface communicating to an interior of the vacuum chamber, the vacuum

chamber being connected to a suction source, suction inhibiting means in the vacuum chamber, the orifices through the brake surface being distributed across the full width of the brake surface, the suction inhibiting means being such that the effective width of the brake element can be adopted to the width of the data carrier passing thereover without adverse reduction of the suction effect through the orifices covered by the data carrier when portions of the brake surface are not covered by the data carrier, the vacuum chamber being subdivided into subchambers by internal partition walls, each of the subchambers open to some of the brake surface orifices, the subchambers being connected to one another through openings in the partition walls between adjacent subchambers, the suction device being connected to a subchamber located at one side end of the vacuum chamber, the side end being adjacent a



transverse edge of the data carrier passing over the pneumatic brake, the openings in the partition walls being of limited cross-section area effective to provide a pressure drop between adjacent chambers when one of the subchambers has a data carrier overlying the portion of the brake surface associated with a first of said adjacent subchambers and another of said adjacent subchambers does not have a data carrier overlying the portion of said brake surface associated with said another of said adjacent subchambers whereby an effective negative pressure is maintained in the first of said subchambers, the partition walls extending along the length of the vacuum chamber in a direction parallel to a path of movement of the data carrier along the brake surface, the vacuum chamber being closed except through the orifices and the connection to the suction device, there being a plurality of partition walls and subchambers transverse the width of the vacuum chamber.

4,173,302

PROCESS AND ALLOY FOR BRAZING ALUMINUM-CONTAINING ARTICLES

Werner Schultze, Bonn, and Heinz Schoer, Alfter, both of Fed. Rep. of Germany, assignors to Vereinigte Aluminium-Werke Aktiengesellschaft, Bonn, Fed. Rep. of Germany

Continuation of Ser. No. 491,072, Jul. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 368,627, Jun. 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 98,173, Dec. 14, 1970, abandoned. This application Sep. 26, 1977, Ser. No. 836,766
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1969, 1962760; Jun. 11, 1970, 2028683; Jul. 14, 1973, 2335940; Mar. 18, 1974, 2412844
The portion of the term of this patent subsequent to May 21, 1991, has been disclaimed.
Int. Cl.² B23K 1/04, 35/28
U.S. Cl. 228—219 **10 Claims**

2. In the process of joining aluminum containing articles which comprises heating in contact with said aluminum articles an aluminum silicon filler metal, the improvement which comprises

interposing between said articles an aluminum-silicon base brazing alloy consisting predominantly of aluminum and containing from about 0.0001 to about 1% by weight of a substance selected from the group consisting of sodium, potassium and lithium, from about 0.00001 to about 1.0% by weight of said brazing alloy of berylium, and from about 0.01 to 10% by weight of at least one material selected from the group consisting of bismuth, strontium, barium, and antimony,

maintaining said aluminum articles and said brazing alloy under an inert gas atmosphere or under a vacuum,

brazing said articles with said alloy, and

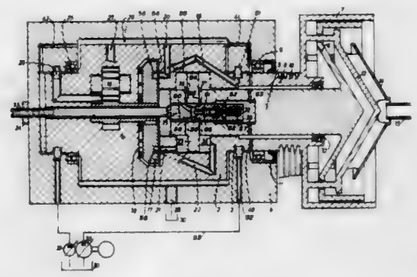
performing said brazing operation in the absence of a flux.

4,173,303

HYDRAULIC PUSH DRIVE FOR PUSHER CENTRIFUGES

Ivan J. Cyphelly, Neuhaus, Hinteregg, Switzerland (8128)

Filed Jun. 9, 1977, Ser. No. 805,222
Claims priority, application Switzerland, Jun. 15, 1976, 7637/76
Int. Cl.² B04B 9/06; F15B 21/02
U.S. Cl. 233—24 **5 Claims**



1. In a hydraulic push drive for a pusher centrifuge having a rotating body with a centrifuge basket attached thereto and a coaxial cylindrical bore therein, a piston disposed in said cylindrical bore defining respective chambers in said cylindrical bore on each side of said piston, said piston being provided with a coaxial piston rod extending beyond said rotating body and having a centrifuge pusher attached thereto, said centrifuge pusher being disposed within said centrifuge basket for simultaneous rotation therewith and a fluid means for supplying a fluid under pressure from a fixed housing to said rotating body, the improvement comprising:

a hydraulic motor, disposed in said rotating body and connected to said fluid means;

a rotary control valve means disposed in said rotating body, for controlling the flow of fluid into and out of said chambers in said cylindrical bore, wherein said hydraulic motor drives said rotary control valve means;

a first fluid control means, disposed outside said rotating body, for controlling the flow of fluid supplied to said hydraulic motor and thereby controlling the stroke frequency of said piston;

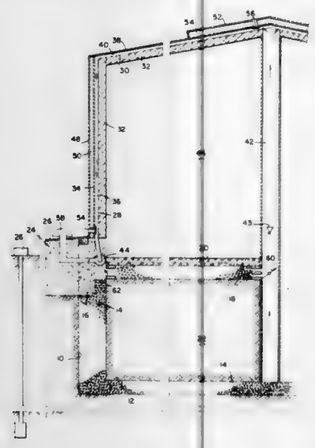
a second fluid control means, disposed outside said rotating body, for controlling the flow of fluid supplied to said rotary control valve means and thereby controlling the stroke length of said piston; and

a sensing valve means, disposed in said rotating body, for sensing the pressure applied to said piston and for producing a leakage current flowing from each chamber of said cylindrical bore for controlling the stroke center of said piston, said sensing valve means, said first fluid control means and said second fluid control means controlling, independently, the stroke center, the stroke frequency, and the stroke length of said piston, respectively.

4,173,304
BUILDING STRUCTURE WITH HEAT STORAGE AND RECOVERY

Arthur F. Johnson, 240 Fox Dr., Boulder, Colo. 80303

Continuation-in-part of Ser. No. 742,798, Nov. 18, 1976, Pat. No. 4,054,246, which is a continuation of Ser. No. 551,075, Feb. 20, 1975, abandoned. This application Oct. 14, 1977, Ser. No. 842,320
The portion of the term of this patent subsequent to Oct. 18, 1994, has been disclaimed.
Int. Cl.² F24J *3/02*
U.S. Cl. 237—1 A **14 Claims**



7. A building structure including solar energy collection and storage means comprising:

wall and roof elements including solar energy collectors having air passages whereby air may be used as a heat transfer medium;

heat storage means beneath said structure comprising:

peripheral trenches beneath the perimeter of said building filled with gravel, said gravel supporting the building foundations;

a plurality of spaced parallel buried trenches extending between opposed peripheral trenches at the bottom thereof and also filled with gravel;

a layer of gravel underlying the floor of said structure;

all of said gravel being sized to have a minimum diameter of about 1.5 inches; and

means for blowing air through said passages for heat collection, blowing heated or ambient air through said gravel for heat storage or retrieval, and blowing heated air through the interior of said building.

4,173,305
SYSTEM FOR DELIVERING MATERIALS TO DEPOSITION SITE ON OPTICAL WAVEGUIDE BLANK

Michael G. Blankenship, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 10, 1978, Ser. No. 885,215
Int. Cl.² B05B *1/24*
U.S. Cl. 239—79 **13 Claims**

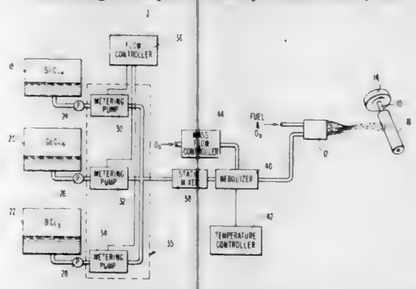
1. In a system including discharge means for depositing a fused siliceous reaction product upon a substrate, the improvement comprising:

first and second reservoirs each for containing a liquid comprising a desired reaction product constituent;

metering pump means coupled to each of said reservoirs for delivering each of the liquids at a controlled flow rate;

mixing means for substantially intermixing liquids received from said metering pump means;

nebulizing means associated with said mixing means for converting the liquids to finely divided form; and

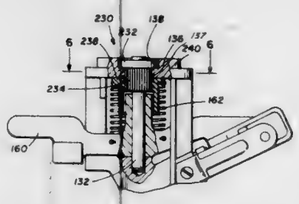


conduit means for conducting the finely divided liquids to the discharge means.

4,173,306
ROTARY SPRINKLER IMPACT ARM SPRING ADJUSTMENT

H. Curtis Ridgway, Dallas, Tex., assignor to Telsco Industries, Inc., Dallas, Tex.

Division of Ser. No. 759,727, Jan. 17, 1977, Pat. No. 4,103,828. This application Mar. 23, 1978, Ser. No. 889,439
Int. Cl.² B05B *3/02*
U.S. Cl. 239—230 **2 Claims**



1. Adjustment means for the biased spring on an impact arm of an impact sprinkler having a laterally directed nozzle cooperating with the impact arm which comprises:

a shaft extending above the nozzle on which the impact arm is journaled;

a cage extending above the nozzle within which the arm is mounted and having a top plate with a splined gear extending downwardly therefrom within said cage;

a helical biased spring surrounding said shaft secured at the lower end to the impact arm; and

a ring member surrounding said shaft and comprising an internally splined member for mating with said splined gear and receiving the upper end of said helical spring, whereby adjustment of said spring is by disengaging said internally splined member from said splined gear, turning said internally splined member and reengaging said splined member on said splined gear.

4,173,307
LOAD BEARING VANE STRUCTURE FOR THRUST REVERSAL

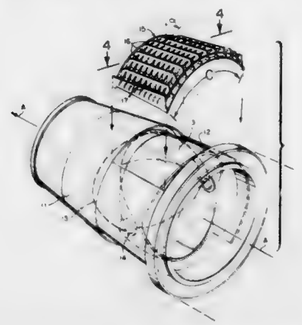
Nelson C. Ittner, Blue Jay, Calif., assignor to Harry Feick Co., Inc. and JRS Mfg. Inc., both of Los Angeles, Calif.

Division of Ser. No. 680,173, Apr. 26, 1976, Pat. No. 4,067,094. This application Oct. 28, 1977, Ser. No. 846,548
Int. Cl.² B64C *15/04*
U.S. Cl. 239—265.29 **3 Claims**

1. A load bearing vane structure for reversing the thrust direction of a jet engine wherein pivoted clam shell means are provided to swing from a position covering a side opening in the engine to a position intercepting the thrust gases normally passing rearwardly of the engine thereby directing the gases laterally out of said side opening, said vane structure comprising:

(a) a plurality of beams extending parallel to each other in side-by-side vertical planes generally in the direction of the thrust axis of said engine when said vane structure is positioned in said side opening; and,

(b) a plurality of vanes in the form of elongated continuous strips extending transversely to the direction of said beams, said beams having closed slots through which said vanes pass to define an egg crate like interlocked grid

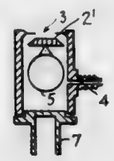


structure, said entire vane structure following a convex surface when viewed from above corresponding to the circumferential extent of said side opening so as to fit therein, each of said vanes being tilted in a forward direction so that when said clam shell means intercepts and directs said gases laterally, said vanes guide said gases upwardly and forwardly, the forward component of movement of the gases providing a reverse thrust, the vertical planes within which the beams lie being progressively spaced closer together in a direction starting from the center of said convex surface towards the outer side such that the chord lengths of each vane between successive beams through which it passes are all equal.

4,173,308
SPRINKLERS

Loucas Savvides, 59 Ifigenias St., Acropolis 112 Nicosia, Cyprus

Filed Apr. 24, 1978, Ser. No. 899,188
Int. Cl.² B05B *1/34*
U.S. Cl. 239—383 **8 Claims**

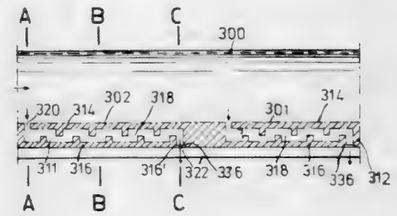


1. A sprinkler head comprising a body defining a generally cylindrical chamber, a liquid inlet to the chamber, and a liquid outlet from the chamber which is located on the central axis of the chamber and in use is located above the inlet, and further comprising a device disposed in the chamber so as to be freely rotatable therein about the central axis thereof, said device comprising a first member having a circular cross-section disposed with the central axis of said circular cross-section substantially parallel to the central axis of the chamber, and a cylindrical member mounted on the top of the first member, so as to be disposed between the first member and said liquid outlet, with its central axis extending substantially perpendicular to the central axis of said circular cross-section, and wherein the liquid inlet is arranged so that liquid entering the chamber by way of said liquid inlet strikes said first member tangentially to rotate it within said chamber.

4,173,309
FLOW CONTROL DEVICES PARTICULARLY USEFUL FOR DRIP IRRIGATION

Mordeki Drori, 89 Zahal St., Kiron, Israel

Filed Dec. 9, 1977, Ser. No. 859,100
Claims priority, application Israel, Dec. 10, 1976, 51080
Int. Cl.² B05B *15/02*
U.S. Cl. 239—542 **21 Claims**

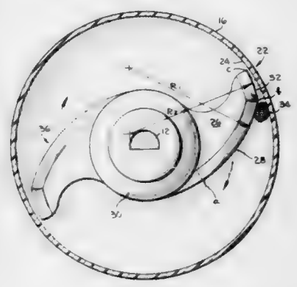


1. A fluid flow control device particularly useful as a drip irrigation emitter comprising a first flexible plastic strip bonded on one surface to a second plastic surface along bond lines defining therewith a pressure-dropping passageway having an inlet at one end for receiving pressurized fluid from a conduit and an outlet at the opposite end for outletting the fluid, characterized in that the device includes a further plastic surface bonded to the opposite surface of said first flexible plastic strip along bond lines defining therewith a static pressure chamber in which said first flexible plastic strip serves as a common wall with said chamber and said passageway for at least a pair of the length of said passageway, said static pressure chamber having an inlet at one end for receiving pressurized fluid from the conduit whereby variations in the velocity of the fluid through said passageway causes said common wall to be flexed to vary the cross-sectional area of the passageway and thereby to regulate the fluid flow therethrough.

4,173,310
ROTARY CUTTER BLADE

Robert L. Schaeffer, LeRoy, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Apr. 24, 1978, Ser. No. 898,908
Int. Cl.² B02C *18/12*
U.S. Cl. 241—282.1 **4 Claims**



1. A rotary cutter blade for use in an unfluted constant diameter bowl of a defined small series motor driven food

processor with a rotatable hub mounted on a vertically oriented drive shaft, said blade comprising,

a cutting surface formed in two distinct curvatures of substantially equal radii comprising, a radially inner first surface and a radially outer second surface,

said first inner surface including a long circular outwardly convex cutting edge with its center of curvature offset a given amount from the hub axis and terminating inwardly of the bowl inner surface, and

said second outer surface including a short circular outwardly convex cutting edge with its center of curvature offset a lesser amount than said first from the hub axis and extending from tangency with the bowl inner surface to terminate in a substantially pointed intersection with said first cutting edge,

said intersection being at a distance not over 0.2" from the bowl inner periphery whereby such blade formation permits use of said defined small series motor to sweep substantially 97% of the unfluted bowl inner diameter without stalling or jamming by wedged pieces between blade and bowl.

4,173,311

DEVICE FOR CUTTING YARN ON BALL WINDING MACHINES

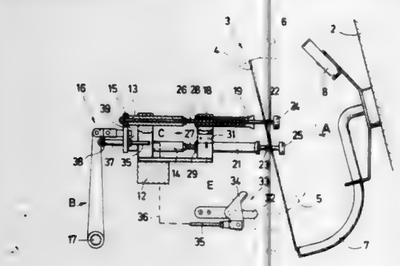
Florian Lucke, Mengen, Fed. Rep. of Germany, assignor to Lucke Apparatebau GmbH, Fed. Rep. of Germany

Filed May 19, 1978, Ser. No. 907,892

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1977, 2724892

Int. Cl.[2] **B65H** *54/66*; **B26D** *5/08*

U.S. Cl. 242—2 **6 Claims**



1. A device for cutting yarn on a ball winding machine with at least one winding station, each winding station comprising a winding flyer, a winding mandrel and a cutting device, the cutting device comprising two thread clamps, one of the thread clamps being located nearer to the winding flyer with the other of the thread clamps located nearer the winding mandrel, the clamp nearer the winding flyer having a higher clamping force for the yarn than the thread clamp nearer the winding mandrel; a cutting element; and first means for successively (a) interposing the thread clamps between the flyer and the mandrel, (b) activating the thread clamps to clamp yarn travelling from the flyer to the mandrel, and (c) feeding the yarn clamped between the clamps to the cutting element so that the yarn is severed between the clamps and the cut ends are held in the clamps.

4,173,312

NUMERICALLY CONTROLLED COIL WINDING MACHINE

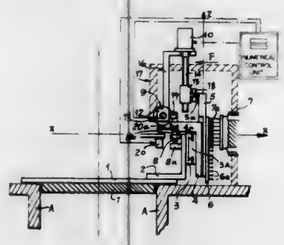
Giuseppe Camardella, Via Miola, 1, 21047 Saronno (Varese), Italy

Filed Nov. 18, 1977, Ser. No. 852,791

Claims priority, application Italy, Nov. 24, 1976, 29698 A/76

Int. Cl.[2] **H01F** *41/02*

U.S. Cl. 242—7.11 **4 Claims**



1. A turret coil winding machine, comprising a turret, means mounting the turret for indexing rotative movement about a vertical axis, a plurality of brackets on the turret distributed about the periphery of the turret, a plurality of fixed work stations surrounding the turret, whereby the brackets on the turret can be brought sequentially into registry with the work stations by indexing movement of the turret, a plurality of coil supports, means mounting each said coil support for sliding movment on and relative to a said bracket in two orthogonal directions in a vertical plane, and a numerical control unit for controlling a work operation in at least one said work station, said unit having an output comprised by means for moving a said coil support in said at least one work station in said two orthogonal directions, and detachable coupling means for releasably fixing the position of said coil supports relative to said brackets.

4,173,313

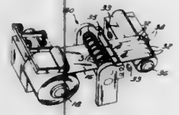
METAL WEB HANDLING METHOD, APPARATUS AND COIL CONSTRUCT

John W. Rogers, c/o 25550 Chagrin Blvd., Cleveland, Ohio 44122

Division of Ser. No. 713,599, Aug. 12, 1976, which is a continuation-in-part of Ser. No. 648,533, Jan. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 612,275, Sep. 11, 1975, abandoned. This application Jul. 25, 1977, Ser. No. 818,795

Int. Cl.[2] **B65H** *35/02*

U.S. Cl. 242—56.2 **26 Claims**



1. A method of producing a plurality of strips from an elongated web of sheet metal comprising the steps of:

(a) slitting said web along spaced, parallel parting lines defining sheet metal strips therebetween, said strips at least over a portion of the length of said parting lines being frangibly interconnected,

(b) winding said interconnected strips into a coiled construct, and

(c) completing severence of said web into separate strips after winding of said construct has commenced.

4,173,314

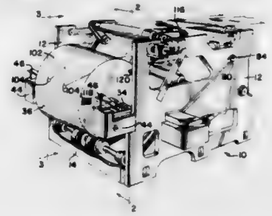
CONTINUOUS WEB SUPPLY APPARATUS

Thomas F. Curran, Wauconda; Leonard I. Tafel, Palatine; Caspar F. Engert, Northlake, and Robert E. LaBarre, Hanover Park, all of Ill., assignors to Cary Metal Products, Inc., Barrington, Ill.

Filed Apr. 17, 1978, Ser. No. 896,697

Int. Cl.[2] **B65H** *19/16*

U.S. Cl. 242—58.4 **23 Claims**



1. In an apparatus for providing a continuous supply of a web wherein the web is fed from a roll supported in a forward position on a roll stand, another roll of web material supported in a rearward position on the roll stand, and means actuatable in response to near depletion of the forward roll for adhesively connecting a leading end portion of the web of the rearward roll with the web of the forward roll and for thereafter severing the engaged portion of the forward roll from the remainder of the forward roll, the improvement comprising one belt means for drivingly engaging both the forward and rearward rolls prior to connecting of the webs of the respective rolls whereby the rolls are driven at substantially the same speed when the connection is made, tension control means for maintaining a predetermined tension in the web, said control means including means for changing the speed of said belt means in response to the detection of variations from said predetermined tension, the change in speed restoring said predetermined tension in said web.

4,173,315

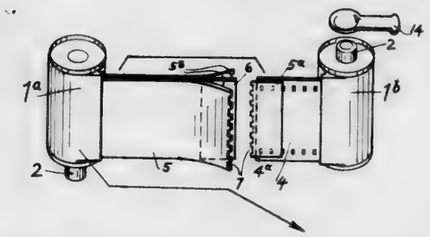
UNIVERSAL 35MM FILM CARTRIDGE FOR REWIND AND NO-REWIND OPERATION

Karl C. Clausser, 695 La Cadena Dr., Riverside, Calif. 92501

Filed May 25, 1978, Ser. No. 909,515

Int. Cl.[2] **B65M** *75/28*

U.S. Cl. 242—74 **2 Claims**



1. A universal 35 mm film cartridge for rewind or no-rewind operation, comprising:

a hollow cylindrical cartridge having a rotatable core at the center thereof;

an elongated trailer of one-sided adhesive tape wrapped at its midpoint around said core with the adhesive side facing toward and adhered to the core, the two ends of said tape having their adhesive sides face-to-face and adhered together for a substantial portion of their length, and extending from said core in a generally radial or tangential direction;

unexposed film having a specified length of its end sandwiched between the extremities of said adhesive tape ends and firmly adhered thereto;

an insert of non-stick sheet material disposed between said tapes and extending from the tip end of said film toward said core for a distance substantially equal to said specified length;

said tape ends having a line of cross-perforations at the juncture between said film end and said non-stick material, whereby the film end and attached portions of adhesive tape can be broken off so as to separate the film from said trailer, the edge of non-stick material being then exposed, whereby the two tape ends can be pulled apart from the non-stick material to expose the adhesive surfaces so that the leader strip of another roll of film can be inserted between them and adhered to the adhesive surfaces.

4,173,316

FISHING REEL

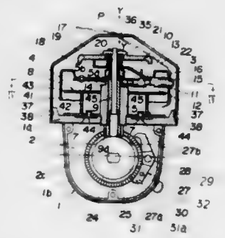
Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Jul. 25, 1977, Ser. No. 818,659

Claims priority, application Japan, Aug. 7, 1976, 51/105573[U]; Aug. 12, 1976, 51/109208[U]

Int. Cl.[2] **A01K** *89/01*

U.S. Cl. 242—84.2 R **1 Claim**



1. A fishing reel mountable to a fishing rod for winding a fishing line on a spool by operating a handle bar, said fishing reel comprising:

(a) a reel body, said reel body having a handle shaft, a rotatable shaft, a transmission and an anti-reverse-rotation mechanism, said handle shaft being provided with said handle bar fixed thereto, said rotatable shaft having an axis directed to intersect with an axis of said handle shaft and being rotatable by said handle shaft to said rotatable shaft, said anti-reverse-rotation mechanism preventing said handle shaft from reversely rotating and comprising a gear and a pair of retaining pawls on a pivotally mounted carrier and meshable with said gear, said gear being fixed to one of said handle shaft and said rotatable shaft, said pawls being pivotally mounted to said reel body, each of said pawls being meshable with said gear individually with respect to the different rotational direction of said handle shaft,

(b) a spool for winding said fishing line thereon said spool comprising a drum having an inner diameter larger than the outer diameter of said rotatable shaft and a pair of flanges formed at the axial ends of said drum, said spool being mounted around said rotatable shaft at the reel body in the relation of being capable of being turned over and of being non-rotatable with respect to said reel body,

(c) a rotatable frame fixed to said rotatable shaft to be rotat-

able in cooperation therewith, said rotatable frame having a guide lever for guiding said fishing line onto said spool,

(d) a cover for said spool and rotatable frame, said cover being detachably mounted to said reel body and having at the center portion a through hole through which said fishing lines passes,

(e) a mounting leg for mounting said reel body to said fishing rod, said mounting leg extending parallel to the axis of said rotatable shaft and having at the end of the extension a mounting seat face extending lengthwise to be substantially at the right angle with respect to the axis of said rotatable shaft, so that said reel body is mounted to said fishing rod through said mounting leg in such a manner that the center line of said through hole is directed substantially at a right angle to the longitudinal direction of said fishing rod, whereby said fishing line is drawn out through said through hole toward the tip of said rod so as to be bent substantially at a right angle with respect to the center line of said through hole, and

(f) a control including a control lever for controlling one of said two retaining pawls of the anti-reverse-rotation mechanism, said control being mounted to said reel body by a pivot spaced from the pivot point of said pawl carrier, said control lever being mounted on an eccentric pivot on said reel body and having pin means protruding therefrom at a position outside the axis of the pivot of the carrier so as to contact the carrier to control the meshing of the pawls with the anti-reverse gear.

4,173,317

SOUND GENERATING MECHANISM FOR A SPINNING REEL

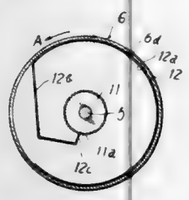
Norio Hamayasu, Sakai, and Kiyohide Kamikawa, Osaka, both of Japan, assignors to Shimano Industrial Company, Limited, Osaka, Japan

Filed Mar. 8, 1978, Ser. No. 884,425

Claims priority, application Japan, Mar. 18, 1977, 52-33772[U]; Mar. 18, 1977, 52-33773[U]

Int. Cl.² A01K *89/01*

U.S. Cl. 242—84.21 R **8 Claims**



1. A sound generating mechanism provided at a spinning fishing reel, the latter comprising a reel body with a crank handle; a rotor supported to said reel body and rotatable by operating said crank handle; a spool spindle supported to said reel body in relation of being non-rotatable but axially movable only; a spool supported rotatably to said spool spindle and comprising a trunk onto the outer periphery of which is wound a fishing line, a front and a rear wall provided at both axial ends of said trunk, and a cylindrical wall extending axially rearward of said rear wall from the outer periphery thereof; and a drag mechanism applying resistance against rotation of the spool; said sound generating mechanism comprising,

sounding teeth mounted to be stationary with respect to said spool spindle, and

a sound generating element in mesh with said teeth for making successive clicking sounds, said sound generating element comprising a long strip of elastic material having a support portion bent in a circular arc and in engagement with an inner periphery portion of said spool, an extension portion extending radially inwardly of said support portion from the tip thereof, and a sound generating portion provided at said tip of the extension portion, said sound generating element being attached to said inner periphery portion in relation of having said sound generating portion positioned ahead of said support portion in the direction of spool rotation when a line is drawn out therefrom, so that when said spool rotates in the direction of drawing out the line said support portion diametrically expands to lock against the inner periphery portion of said spool to thereby cause said sound generating portion to move relative to said teeth and make a clicking sound and, when said spool rotates in the direction of winding up the line, said support portion diametrically contracts so that said support portion slips relative to said spool and said sound generating portion does not move relative to said teeth so that no clicking sound is made.

4,173,318

WEBBING RETRACTOR IN SAFETY SEATBELT SYSTEM

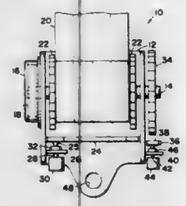
Keiichi Tamura, Nagoya; Masahiro Iwatsuki, Toyoake, and Muneharu Matsunami, Seto, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Jun. 6, 1978, Ser. No. 913,021

Claims priority, application Japan, Jun. 8, 1977, 52/74364[U]

Int. Cl.² A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.4 A **4 Claims**



1. A webbing retractor in a safety seatbelt system, wherein the webbing is wound up on a take-up shaft through a biasing force, said retractor comprising:

a first sensor for sensing the vibrations of the vehicle;

a locking device actuated by said sensor to prevent the biasing force of the take-up shaft from being applied to the webbing, said locking device comprising a first ratchet wheel solidly secured to the take-up shaft and a first pawl actuated by said first sensor to mesh with said first ratchet wheel to thereby prevent wind-up rotations of the first ratchet wheel and the take-up shaft; and

a means for preventing an unwinding rotation of said take-up shaft during an emergency, said means comprising:

a second ratchet wheel which is solidly secured to said take-up shaft and whose ratchet teeth are opposite to that of said first ratchet wheel;

a second pawl to mesh with the second ratchet wheel for stopping the wind-out rotation of the take-up shaft; and

a second sensor for actuating the second pawl in an emergency of the vehicle.

4,173,319

MAGNETIC TAPE CASSETTE

Hiroyuki Umeda, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Division of Ser. No. 750,220, Dec. 13, 1976, Pat. No. 4,091,426. This application Feb. 15, 1978, Ser. No. 877,956

Claims priority, application Japan, Dec. 13, 1975, 50-168236; Jun. 11, 1976, 51-74969

Int. Cl.² G11B *15/32*

U.S. Cl. 242—199 **8 Claims**

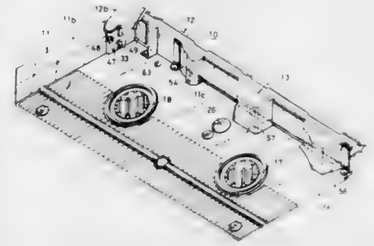
1. A magnetic tape cassette for use in a magnetic recording and/or reproducing apparatus, said cassette comprising:

case means having spaced parallel side walls, a front face, a back wall, and upper and lower panels;

first and second reel means respectively having first and second hubs, said first and second reel means being accommodated in a side-by-side relationship within said case means and between the side walls;

an opaque magnetic tape extending along a tape travel path between the first and second reel means, and having first and second transparent leaders connected from the opposite ends of said opaque tape to the first and second hubs, respectively, to be wound around the first and second reel means;

lid means for covering a part of the magnetic tape on the front face of said case means and for covering the front end portions of the side walls in the vicinity of the front face of said case means;



hinge means mounted respectively on the front end portions of the side walls for enabling said lid means to swing between closed and opened positions to cover or expose the front end portions of the side walls and to cover or expose the part of the magnetic tape on the front face;

means forming a light inlet hole in the lower panel of said case means at a position near the front face and substantially intermediate the first and second reel means; and

first and second window means forming outlets of light paths extending from said light inlet hole across the tape travel path to said first and second outlet window means, said first and second window means being formed in the front portions of the side walls at positions near said hinge means, and said first and second window means being exposed or covered by said lid means when said lid means is in its opened and closed positions respectively.

4,173,320

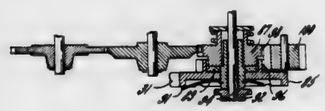
DIRECT DRIVE FOR FAST FORWARD AND REVERSE IN TAPE DECK

Etienne A. M. Schatteman, Wemmel, Belgium, assignor to Staar, S.A., Brussels, Belgium

Filed Oct. 10, 1978, Ser. No. 949,524

Int. Cl.² G03B *1/04*

U.S. Cl. 242—206 **4 Claims**



1. In a tape transport having a capstan drive for transfer of tape from a supply reel to a take-up reel, a reel drive for a take-up spindle for the take-up reel, and a slipping clutch in said reel drive, said clutch including rotating driving and driven clutch plates, and friction means between said clutch plates for transmitting torque from said driving to said driven clutch plates, the improvements in said tape transport comprising:

means providing a direct connection between said clutch plates, said direct connection means including gear teeth carried by said driving and said driven clutch plates forming separate gears, a short circuit gear, and means supporting said short circuit gear for movement into and out of engagement with said gears on both said clutch plates and for rotation about a fixed axis when engaged as said clutch plates rotate, to provide a non-slipping and selectively engageable direct connection between said clutch plates.

4,173,321

VEHICLE FOR TRAVELING IN THE AIR AND ON THE GROUND EQUIPPED WITH HYDRAULICALLY DRIVEN PROPELLERS

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

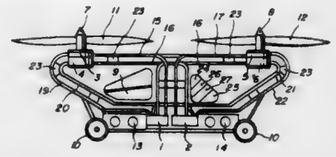
Continuation-in-part of Ser. No. 465,413, Apr. 3, 1974, abandoned. This application May 26, 1977, Ser. No. 801,496

Claims priority, application Austria, May 4, 1973, 3968/73

The portion of the term of this patent subsequent to Aug. 31, 1993, has been disclaimed.

Int. Cl.² B64C *27/08*

U.S. Cl. 244—17.23 **2 Claims**



1. In a vehicle, in combination;

a body structure, a power supply means, a fluid transmission means and at least one propeller;

said body structure including fastening means for holding said power supply means;

said power supply means including at least a pair of independent power supply plants;

said fluid transmission means including at least a pair of pump means comprising a plurality of pumps with separated outlets, at least one fluid motor and at least two fluid flow supply lines from said outlets of said pumps to said at least one fluid motor;

said vehicle including the provision, that said at least one propeller is associated to a rotary portion of said at least one fluid motor as well as the further provision, that each pump of said pump means is associated to one of said power plants separately, said at least one fluid motor includes at least two separated fluid receiving rotors connected to separated inlets, one of said outlets of said pumps connected to one of said inlets and one of said outlets of an other of said pumps connected to the other of said inlets, whereby one of said pumps supplies fluid to one of said rotors to drive said one of said rotors and the other of said pumps supplies fluid to the other of said rotors to drive said other of said rotors;

each of said rotors is hollow and provided with a central rotor hub; said fluid motor includes a shaft; said shaft extends through both of said hubs of said rotors; said shaft is associated to said at least one propeller;

one - way coupling and the opposite way releasing coupling means are provided between said shaft and each of said rotors for the enforcement of releasing one of said rotors from said shaft and for the enforcement of maintaining connection between said shaft and the other of said rotors when one of said fluid flows fails to supply the needed minimum of rate of flow relatively to the rate of flow of the other flow of said flows of fluid in order to assure the continuance of rotary revolution of said at least one propeller when at least one of said power plants and of said flows of fluid fails and also in order to prevent friction

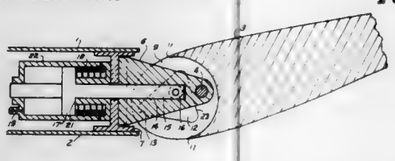
losses which would reduce the efficiency and operation - safety of the vehicles when at least one of said power plants, said pumps and said fluid lines fails to operate with the required accuracy, power and efficiency.

4,173,322

FLUTTER PREVENTION MEANS FOR AIRCRAFT PRIMARY FLIGHT CONTROL SURFACES

Kenneth A. B. Macdonald, Maple Valley, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 27, 1978, Ser. No. 900,621
Int. Cl.[2] B64C *13/00*
U.S. Cl. 244—75 A **2 Claims**



1. A flight control surface rotation and flutter prevention apparatus, comprising:

(a) a flight control surface, rotatably mounted to a wing about a hinge axis substantially perpendicular to the chord of said wing, said surface having a wedge shaped recess medial of said wing and said hinge axis which has rims that converge sharply to a detent in the direction away from said hinge axis;

(b) a spring return hydraulic actuator fixedly mounted in said wing in confronting relationship to said wedge shaped recess, said actuator having a first operating state in which hydraulic pressures forces said actuator to its extreme of travel and compresses a return spring, and a second operating state in which hydraulic pressure is absent and said return spring forces said actuator to its opposite extreme of travel;

(c) a translating arm, capable of translation in a direction substantially parallel to the wing chord, connected at its first end to said actuator and extending at its second end into said control surface in the region of said recess; and

(d) a means for making contact between said second end of said translating arm and the rims of said wedge shaped recess, said means attached to said second end of the translating arm so that said means is drawn into the detent of the recess when hydraulic pressure is absent, and driven into the wide end of the wedge when hydraulic pressure is present, respectively inhibiting and enabling rotation of the flight control surface about its hinge axis.

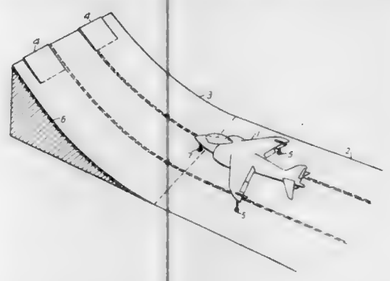
4,173,323

AIRCRAFT LAUNCHING TECHNIQUES

Douglas C. Thorby, Shepperton, and John Johnson, Chertsey, both of England, assignors to Hawker Siddeley Aviation Limited, England

Filed Jan. 4, 1978, Ser. No. 866,920
Claims priority, application United Kingdom, Jan. 13, 1977, 1391/77
Int. Cl.[2] B64F *1/00*
U.S. Cl. 244—114 R **5 Claims**

1. An aircraft take-off runway for an aircraft having first and second sets of undercarriage wheels the second set being spaced both laterally and longitudinally of the aircraft from the first set, said runway having a terminal ramp that curves upward toward its end to launch the aircraft in a semi-ballistic trajectory, and further comprising at least one auxiliary ramp section upon the end portion of the main ramp and forming part of the runway surface which auxiliary ramp section has in the longitudinal direction of the ramp a different slope from the main ramp with the difference in the spacing between the surface of the auxillary ramp and the main ramp increasing as the end of the main ramp is approached; said auxiliary ramp section occupying only a part of the width of the main ramp at a position where only one of said first and second sets of under-



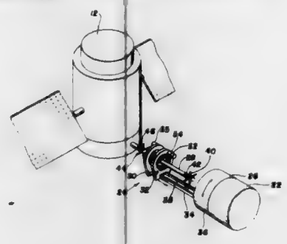
carriage wheels traverses said auxiliary ramp section during aircraft take-off while the other set remains contiguous with the main ramp, said auxillary ramp providing a predetermined pitching moment to the aircraft at the instant of launch from the runway.

4,173,324

COUPLING DEVICE FOR MOVING VEHICLES

Arthur A. Rudmann, Bowie, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 19, 1978, Ser. No. 907,436
Int. Cl.[2] B64D *9/00*; B64G *1/00*
U.S. Cl. 244—161 **14 Claims**



1. A system for capturing and deploying first craft means having motion relative to a second craft means wherein said second craft means includes remotely controlled manipulator apparatus, the combination comprising:

outwardly projecting end receptor means located on said first craft means; and

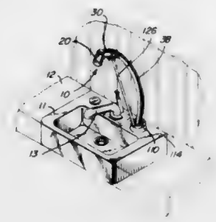
end effector means including a collapsible iris assembly coupled to the manipulator apparatus and operated from said second craft means through said manipulator apparatus, said iris assembly having a pair of axially movable independently operable iris mechanisms, each of said iris mechanisms having a plurality of iris elements adapted to be positioned around said end receptor means and upon command being operable to close and open for respectively engaging and releasing said end receptor means.

4,173,325

SPRAYER

John E. Petrovic, Ft. Collins, Colo., assignor to Teledyne Industries, Inc., Ft. Collins, Colo.

Division of Ser. No. 861,166, Dec. 17, 1997. This application Jan. 16, 1979, Ser. No. 3,919
Int. Cl.[2] B05B *15/06*
U.S. Cl. 248—81 **2 Claims**



1. A sprayer stand for use in supporting a fluid spray device supplied by a flexible hose from a source of said fluid, comprising:

a holder receptive of said device for storage;

a releasable clamp securable upon said device;

a support rod of a length to extend between said holder and said clamp for positioning said clamp, with said device therein included, above said holder;

an opening through said holder in which said rod is slidable to accommodate storage of said device;

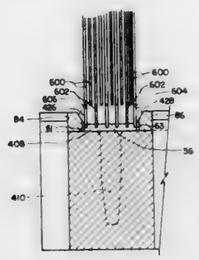
and an upstanding recess in said holder for seating a lower end of said rod and thereby dispose the upper end of said rod above said holder, said clamp being secured upon said upper end of said rod.

4,173,326

CAST ON MOLD INSERTS

Terry R. Oxenreider, Wernersville, Pa., assignor to General Battery Corporation, Reading, Pa.

Filed Jul. 28, 1977, Ser. No. 819,695
Int. Cl.[2] B22D *19/00*
U.S. Cl. 249—83 **11 Claims**



1. A mold for forming battery straps on substantially parallel and spaced apart rows of positive and negative lugs of a stack of battery elements, comprising:

(a) a mold block having at least two mold channels disposed in a surface of said block to receive said rows of positive and negative lugs, each mold channel having end walls, a portion of which extend beyond the surface of said mold block, each said portion including a segment which is beveled away from said mold channel, the width of each portion extending beyond the width of said channel whereby excess molten lead poured into said channel is prevented from overflowing said end walls and forming projections extending beyond said end walls; and

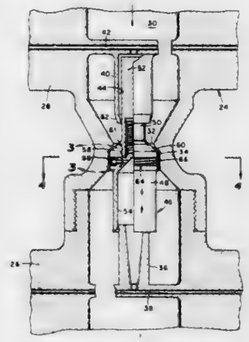
(b) at least one projection extending from at least one of said end walls into said mold channel, said projection having a width which is less then the width of said channel and a beveled top surface which forms a continuation of the beveled segment of said end wall.

4,173,327

SOLID HANDLING VALVE

William R. Williams, Morgantown, W. Va., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 1, 1977, Ser. No. 802,328
Int. Cl.[2] F16K *31/12*
U.S. Cl. 251—31 **5 Claims**



1. A fluid-actuated valve comprising a valve housing having a longitudinally extending throughgoing passageway with a converging segment and a diverging segment therein defining a throat in said passageway with said diverging segment being disposed downstream of said throat with respect to material flow in said passageway, an elongated fluid displaceable piston disposed in said passageway and extending through said throat, means at opposite ends of said piston for movably supporting the piston in said passageway, a conically tapered shoulder carried by said piston with said shoulder having a maximum diameter greater than said throat, seat means defined by a circular lip of a diameter greater than that of said throat with said seat means being disposed adjacent to said throat in said diverging segment and contactable by said shoulder for providing a primary valve closure seal, radially expandable means carried by said piston and contactable with a surface of said valve housing at a location near said seat means in said diverging segment for providing a secondary valve seal, and fluid-actuatable means for expanding said expandable means against said valve housing at said location when said shoulder is contacting said seat means.

3. A fluid-actuated valve as claimed in claim 1, wherein said means at opposite ends of said piston for movably supporting the piston comprise a pair of annular open-ended bosses supported by said housing in said passageway on opposite sides of said throat and extending with the open ends thereof towards one another, fluid passageways are in said housing in registry with the interior of each of said bosses and coupled via valved conduit means to a source of pressurized fluid, one end portion of said piston is disposed within the boss located nearest said converging segment of the housing, the other end of said piston is of an annular configuration defining a receptacle therein of a diameter greater than the other boss located in the passageway on the diverging segment side of said throat for receiving said other boss therein, and wherein the pressurized fluid from said source displaces said piston or maintains the latter at a desired position within said passageway when the pressurized fluid is admitted to a selected one of said bosses.

V.980/1 NO 06 79 UMI

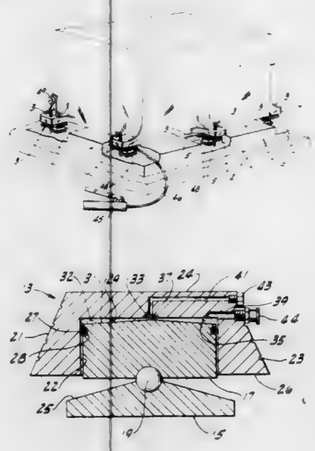
4,173,328
IN-LINE SHUT-OFF VALVE
Richard S. Karbo, Newport Beach, Calif., assignor to The Leisure Group, Carson, Calif.
Continuation-in-part of Ser. No. 718,978, Aug. 30, 1978, abandoned. This application May 5, 1978, Ser. No. 903,179
Int. Cl.² F16K 5/00
U.S. Cl. 251—309 **10 Claims**



1. An in-line shut-off valve comprising:
a valve housing having a straight water flow channel therethrough and a cylindrical bore through the valve housing having its axis of symmetry perpendicular to the axis of symmetry of the water flow channel, said water flow channel terminating as two apertures in the wall of said cylindrical bore;
a valve shaft placed for rotation about its axis of symmetry in said cylindrical bore, said valve shaft having a journal extending along a portion of said shaft and overlapping said apertures in the wall of said bore, said journal having a convex surface of curvature and an elongated concave cavity therein, opposite said convex surface, the cavity being equal in length along said shaft to the length of the journal, water flowing from one aperture to the other around the convex surface in the bore when the valve is open; and
an elongated plug captured by the cavity in said journal, said plug having one side exposed and abutting the wall of said bore, the exposed surface of said plug being of a size to overlap one of the apertures in the wall of the cylindrical bore whereby rotation of said valve shaft causes said plug to slidably engage and seal this aperture.

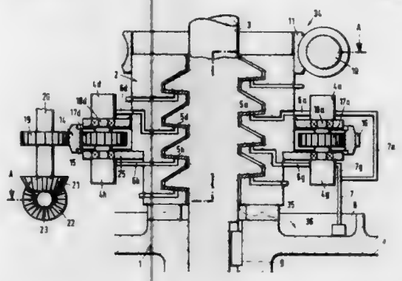
4,173,329
JACK FOR POSITIONING AND SUPPORTING A MACHINE
Morris R. Stith, Jr., R.R. #1, Box 13, Webster, Ky. 40176
Division of Ser. No. 725,374, Sep. 22, 1976, Pat. No. 4,100,714. This application May 1, 1978, Ser. No. 901,287
Int. Cl.² B66F 3/24
U.S. Cl. 254—93 R **4 Claims**

1. A jack for positioning and supporting a large, heavy object, such as a machine, on its foundation, said jack being adapted to be surrounded by and embedded in hardenable grout after the object has been properly positioned with one portion of the jack engaging the object and supporting it on the grout after hardening of the grout, said jack comprising a base adapted to be supported on the foundation, a support member having a blind bore therein constituting a cylinder, a piston slidably received in the cylinder, and a ball mounted on the base, the lower end of the piston bearing on the ball to permit limited swivel movement of the piston and support member relative to the base, the portion of the cylinder between the upper end of the piston and the cylinder end wall constituting an expansible chamber adapted to receive a pressurized hydraulic working fluid for effecting upward movement of the support member away from the base, the support member having a pair of opposed end faces, one face being generally flat and constituting an upper end face for engaging said object from below and the other face constituting a lower end face extending out beyond the base and adapted to be supported by the hardened grout, and the support member being tapered from its lower to its upper end face providing a tapered surface convergent from its lower to its upper end face, said surface



being sufficiently rough to mechanically interlock with the hardened grout thereby to inhibit upward movement of the support member with respect to the foundation.

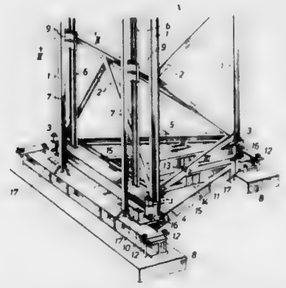
4,173,330
HYDROSTATIC LOAD RELIEF FOR LIFTING SPINDLES
Rolf Goldschmidt, Witten-Annen; Klaus Hänsgen, Witten; Heinz M. Hiersig, Düsseldorf, and Fritz Kirstenpfad, Bad Harzburg, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany
Filed May 22, 1978, Ser. No. 908,578
Claims priority, application Fed. Rep. of Germany, May 25, 1977, 2724232
Int. Cl.² B66F 3/08
U.S. Cl. 254—98 **5 Claims**



1. In a lifting device having a threaded spindle to be moved axially for production of a lifting stroke, further having a threaded female member threadedly engaging the spindle and being mounted for rotation, drive means for rotating the female member to move the spindle axially, a hydrostatic relief device, comprising:
oil pockets in load bearing threads of the threaded member;
oil pump means mounted to the member on the outside thereof, there being ducts in the member leading from the pump means to the oil pockets;
pinion means for driving the pump means;

an annular member having internal and external gearing, and being concentrically arranged around the threaded member, the internal gearing meshing the pinion means for driving same;
a gear journalled for meshing the external gear of the annular member; and
means independent from said drive means for driving the gear to thereby operate the pump means to obtain the hydrostatic load relief.

4,173,331
METHOD AND ARRANGEMENT FOR STAYING CLIMB RODS FOR CO-OPERATION WITH SO-CALLED CLIMBING JACKS
Sören Näslund, Lidkoping, Sweden, assignor to Paul Anderson Industrier AB, Vesteras, Sweden
Filed Jun. 10, 1977, Ser. No. 805,384
Claims priority, application Sweden, Jun. 11, 1976, 7606712
Int. Cl.² B66F 1/00
U.S. Cl. 254—105 **9 Claims**



1. A method of staying climb rods for co-operation with so-called climbing jacks by utilizing masts, each of which climb rods is capable to carry vertical forces transferred via associated climbing jack, while horizontal forces acting on the climb rod are transferred to the staying mast, comprising the steps of supporting the staying mast pivotally at a single pivot point on a footing centrally located beneath the mast permitting the mast to pivot slightly in any direction, and attaching the climb rod slidably to the staying mast so as to render possible relative movements in the vertical direction between the rod and the mast.

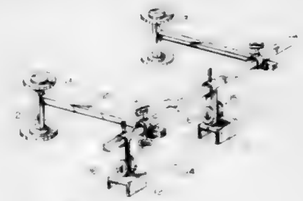
4,173,332
ROTARY SPEED LIMITER DEVICE
Jacques DuLondel, 264, av. Querbes, Outremont, Québec, Canada (H2V 3W2)
Filed Oct. 5, 1977, Ser. No. 839,734
Claims priority, application Canada, Nov. 3, 1976, 264816
Int. Cl.² A62B 1/12
U.S. Cl. 254—160 **1 Claim**

1. A device for lowering a load while limiting its speed of descent, comprising a casing, means for securing said casing to a stationary support, a shaft rotatable in said casing, a pulley secured to one end of said shaft, a cable trained on said pulley and adapted to support a load for lowering the same, the pull exerted by said cable on said pulley casing rotation of said shaft, a rotor mounted on said shaft, means constraining said rotor to rotate with said shaft while allowing reciprocating movement of said rotor axially of said shaft, said casing defining a cylindrical chamber in which said rotor can rotate and reciprocate axially of said shaft, said chamber having a cylindrical surface closely spaced from the periphery of said rotor, said cylindrical surface and the periphery of said rotor having a continuous, sinuous camming groove encircling said shaft, and a radial complementary pin engaging said camming groove, respectively, whereby said pin causes reciprocating axial movement of said rotor on said shaft during rotation of said rotor by said shaft, resulting in a braking force applied to said shaft, and wherein said chamber forms a closed enclosure



filled with air, whereby said rotor forms a piston compressing the air ahead of the axially moving piston, the compressed air retarding axial movement of said piston and consequently increasing the braking force applied to said shaft.

4,173,333
VARIABLE DESIGN TORCH GUIDE
Dennis Wise, Star Route, Mesa, Wash. 99343
Filed Oct. 11, 1978, Ser. No. 950,304
Int. Cl.² B23K 7/00, 7/02
U.S. Cl. 266—66 **5 Claims**



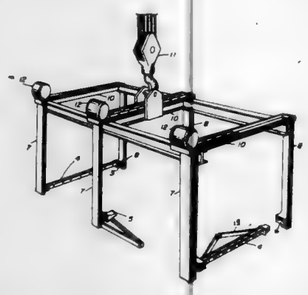
1. A variable degree guide for a gas cutting torch, comprising:
a main bar;
a pair of arms, each slideably secured in a sleeve which is slideably secured on said main bar; and
means for securing said torch to said guide wherein the longitudinal axis of said torch is in registry with said main bar.

4,173,334
UNMANNED CHAIN HOOK-UP FOR LIFTING LOOSE BUNDLES
Daniel L. Lombard, P.O. Box 177, Youngstown, Ohio 44501
Filed Feb. 23, 1976, Ser. No. 660,263
Int. Cl.² B66C 1/12
U.S. Cl. 294—67 E **2 Claims**

1. In combination with a crane hook, a table-like framework having a top portion suspended centrally by said crane hook and having integral vertical legs depending from the sides thereof, one of which is in the form of a channel, a chain guided in said channel, a motor driven means driving said chain selectively into or out of said channel and underneath the load to be lifted, and means mounted at the bottom of the other leg for automatically locking a free end of said chain thereto, each of the links of said chain having a stop element arranged

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to prevent the adjoining interconnected link from pivoting in a downward direction when moved horizontally but allowing it



to be pivoted in an upward direction when retracted into said channel to maintain the unretracted portion of the chain stiff in a horizontal direction.

4,173,335

DRIVE MECHANISM FOR A SHEET FEEDER DEVICE

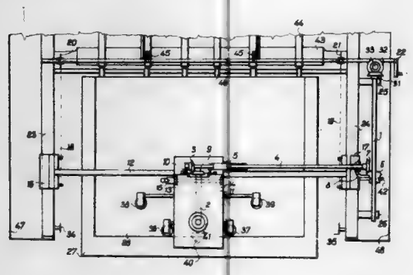
Jaroslav Janecek, Brno, and Jaroslav Jiruse, Blansko, both of Czechoslovakia, assignors to Adamovske strojirny, narodni podnik, Prague, Czechoslovakia

Filed Jun. 24, 1977, Ser. No. 809,803

Claims priority, application Czechoslovakia, Jul. 19, 1976, 4750-76

Int. Cl.[2] B65H *3/08*

U.S. Cl. 271—93 **1 Claim**



1. A sheet feeder drive for transferring paper sheets from a pile thereof to a feeder device by means of pneumatic suckers, comprising:

a pair of spaced apart vertically oriented, side walls straddling said pile of paper sheets;

first and second slides mounted adjacent the top edges of respective ones of said side walls;

a horizontal main drive shaft mounted for rotation in bearings affixed to one of said side walls, said drive shaft being disposed adjacent said first slide;

a drive gear rotatably and slidably mounted on said drive shaft;

elongated support means disposed above said pile of paper sheets, connected between said side walls, and slidably coupled to said slides for horizontal movement in a direction parallel to said side walls;

housing means slidably mounted on said support means;

a driven shaft rotatably mounted to said housing means and parallel to said drive shaft;

a driven gear mounted on one end of said driven shaft;

a transmitting gear engaging said driven gear;

a connecting shaft parallel to said support means and extending between said one of said side walls and said housing, said connecting shaft being rotatably mounted to said first slide at one end thereof;

a coupling having a first end slidably coupled to the other end of said connecting shaft and a second end supported by a swing out bearing disposed in said housing, said coupling being connected to said transmitting gear adjacent said second end thereof;

means comprising a guide screw connected between said support means and said housing for effecting movement of said housing in a vertical direction;

chain means for effecting coordinated movement of said first and second slides;

a control shaft rotationally supported by said side walls;

a pair of rollers mounted to said control shaft adjacent opposite ends thereof for driving said chain means;

said drive gear having a circumferential groove on the hub thereof; and

a carrier fixed at one end thereof to said first slide and being forked at the other end thereof, said forked end engaging said groove.

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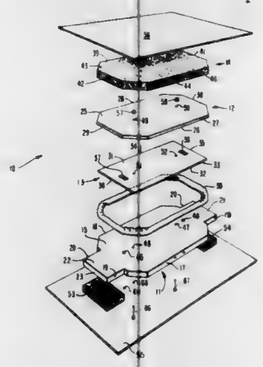
STRIKING EQUIPMENT FOR DEVELOPING MARTIAL ART SKILLS

Robert W. Perry, 21 Patricia Dr., Tyngsboro, Mass. 01879

Filed Nov. 18, 1977, Ser. No. 852,820

Int. Cl.[2] A63B *69/00*

U.S. Cl. 272—76 **17 Claims**



1. A striking board for use in developing one's skill in the martial arts comprising in assembly a relatively inflexible baseboard having planar top and bottom surfaces parallel to one another, a striking surface defined by a first pair of parallel side edges defining a first width of the baseboard, and a second pair of parallel side edges defining a lesser second width of the baseboard, said first pair of parallel said edges being parallel with said second pair of parallel side edges, first and second end portions integral with and extending in opposite directions from said striking surface of said baseboard defined by the said second pair of parallel side edges and defining parallel end edges, a relatively inflexible top board having planar top and bottom surfaces parallel to one another, said top board defined by parallel side edges and having a width coextensive with that of the striking surface of the said baseboard and by parallel end edges defining a lesser length non-coextensive to the length of said baseboard but coextensive with the striking surface, a rectangular shaped spacing member intermediate said top board and baseboard having parallel planar top and bottom surfaces and parallel side edges and end edges defining a lesser width and length than said top board, a relatively flexible cushion member having parallel planar top and bottom surfaces, and being of a width and length so as to be coextensive laterally and longitudinally with said top board and said striking surface, and the bottom planar surface of said cushion member being supported by the top planar surface of said top board, a base cover extending over the bottom surface of the baseboard and being secured by means on the top surface thereof, a top cover extending over the top surface of the said flexible cushion member and being secured by means to the bottom surface of the top board, a seam comprising a material folded in half secured to said bottom surface of the top board around and along its perimeter, and means securing said baseboard, spacing member and top board in assembly together, said seam in the assembly being located around the perimeter of the rectangular spacing member.

4,173,337

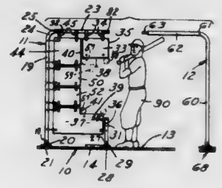
BASEBALL BATTING AND PITCHING APPARATUS

Richard L. Okonowski, 32232 Eastway, Roseville, Mich. 48066

Filed Nov. 21, 1977, Ser. No. 853,324

Int. Cl.[2] A63B *69/40*

U.S. Cl. 273—26 A **8 Claims**



1. In a baseball practice device, the combination comprising:

(a) a baseball home plate,

(b) a first support means mounted adjacent said baseball home plate,

(c) a pad means carried by said first support means and arranged to form a strike zone area opening over said baseball home plate, and which strike zone area opening is enclosed on three sides by the pad means, and open on one side to allow a person to throw balls into said strike zone area opening for baseball pitching practice and a batter to hit balls thrown into said strike zone area opening for batting practice,

(d) a second support means mounted adjacent said baseball home plate; and,

(e) a batter image pad means carried by said second support means and positioned over a batter's box area adjacent the baseball home plate.

4,173,338

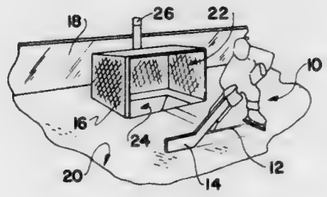
GAME SCORE APPARATUS

Robert L. Barnett, 4918 N. Deception Loop, Oak Harbor, Wash. 98277

Filed Oct. 12, 1977, Ser. No. 841,342

Int. Cl.[2] A63F *7/06*

U.S. Cl. 273—85 B **9 Claims**



1. In the combination of a miniature hockey game apparatus having miniature hockey like playing figures disposed over a playing surface and a goal area, such playing figures being manually moveable, a puck for engagement with a hockey stick carried by said figures, the improvement comprising said board having an opening therein, said opening being disposed adjacent said board, means to detect the dropping of said puck through said opening, means to store said puck over said playing surface, means to detect the presence of said puck in said position over said playing surface, means to dispense said puck onto said playing surface after the expiration of a time interval following the placement of said puck in said position over said surface, a time indicating display, means to enable the operation of said time display when said puck descends downwardly towards said playing surface, means to disable said time display when said puck passes through said opening.

4,173,339

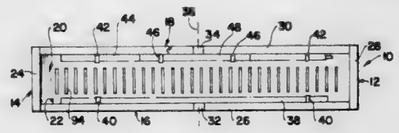
PEG GAME APPARATUS

Violet Crompton, 125 Navenby Crescent, Weston, Canada (M9L 1B3)

Filed Jan. 13, 1978, Ser. No. 869,227

Int. Cl.[2] A63B *71/00*

U.S. Cl. 273—95 R **8 Claims**



1. A peg game apparatus comprising a box, said box having side walls and a base, said side walls defining an open-mouth portion of said box and an interior portion of said box, a pair of notches, each of said pair of notches extending into said open-mouth portion of said box, said pair of notches aligned and disposed opposite each other, a first rod, a second rod, a third rod, means to removably secure said first rod and said second rod and said third rod within said box, said means to removably secure including a plurality of U-shaped clips, each of said U-shaped clips having a pair of free ends, said pair of free ends being biased towards each other, said U-shaped clips being secured to said side walls, one end of said second rod having a first plurality of threads located on an exterior surface thereof, one end of said third rod having a hole, said hole having the longitudinal axis thereof disposed coaxially aligned with the longitudinal axis of said third rod, a second plurality of threads located within said hole and complementary shaped to said first plurality of threads, said first rod having a shorter length than said second and said third rods, said box being configured to entirely contain said first and said second and said third rods within said interior portion of said box when said first and said second and said third rods are secured to said means to removably secure, said notches being a distance apart less than the length of said first rod, whereby said second rod and said third rod are removably secured to one another utilizing said first and said second plurality of threads therefor and whereby said second and said third rods when removably secured together define an elongated rod having a length greater than the largest dimension of said box.

4,173,340

GAME STRUCTURE HAVING A TETHERED BALL

Hideyuki Kanno, Gardena, Calif., assignor to Tomy Corporation, Carson, Calif.

Filed Mar. 28, 1978, Ser. No. 890,907

Int. Cl.[2] A63B *71/04*

U.S. Cl. 273—95 A **4 Claims**

1. A structure useful in playing a game, said structure including a base, a support having an upper end attached to said base so as to extend upwardly from said base, a tether having ends, connecting means connecting said upper end of said support to

one end of said tether and a ball secured to the other end of said tether in which the improvement comprises:

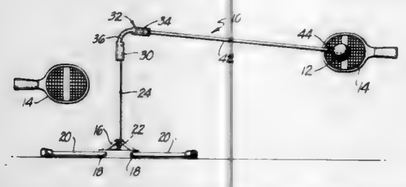
said tether comprising an elongated rod,

said connecting means comprising a hinge member having ends and a flexible portion located intermediate said ends of said hinge member,

one of said ends of said hinge member being secured to said upper end of said support so as to be incapable of movement relative to said support,

the other of said ends of said hinge member being secured to the first mentioned end of said tether,

said flexible portion of the hinge member being shaped so as to permit bending between said ends of said hinge member



and so as to permit said ends being twisted relative to one another no more than about 90 degrees when said ends are located so as to be in alignment with one another, said flexible portion permitting twisting between said ends when said ends are not located in alignment with one another,

said flexible portion is a substantially flat, rectilinearly shaped strip of material having ends, said strip being sufficiently thin so as to be capable of bending between said ends and said strip, the distance between the side edges of said strip being no greater than the distance between the ends of said strip so that the dimensions of said strip serve to limit the amount that said flexible portion may twist.

4,173,341

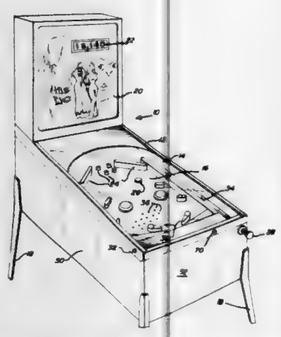
AMUSEMENT DEVICE USING PERFORATED BOARD

William E. Olliges, Barrington Hills, Ill., assignor to George H. Gerstman, Northbrook, Ill.

Continuation of Ser. No. 707,687, Jul. 22, 1976, abandoned. This application May 18, 1978, Ser. No. 906,910

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—126 A **10 Claims**



1. An amusement device of the pinball type comprising:

a game piece;

a housing having a transparent cover member;

a board having an inclined surface visible through said transparent member and carrying score sensing apparatus for actuation by said game piece moving over said inclined surface;

means for supplying an air cushion through said board for supporting said game piece above said board on said air cushion and enabling said game piece to move along said inclined surface under the influence of gravity;

means carried by said housing at a fixed location for enabling said game piece to be moved upwardly along said surface and against the influence of gravity; and

means for recirculating said air.

4,173,342

DEVICE FOR SIMULATING A CARD GAME

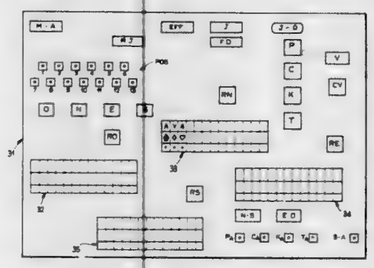
Jeanne De Corlieu-Ferran, 1 rue Scheffer, 75016 Paris, France

Filed Apr. 13, 1978, Ser. No. 896,335

Claims priority, application France, Apr. 29, 1977, 77 12986

Int. Cl.[2] A63B *71/06*

U.S. Cl. 273—148 R **14 Claims**



1. A device for simulating a game of cards which takes place between a number of players in successive tricks and especially a game of bridge, comprising a number of information panels corresponding to the number of players simulated in the game, provision being made on each panel for a number of positions corresponding to the number of cards held by a player at the beginning of a game, and further comprising dealing means for displaying or said information panels any predetermined combination of cards corresponding to any predetermined deal and playing means for individually modifying the information loaded in each position aforesaid in order to indicate that the corresponding card has been played, wherein the playing means for indicating that a predetermined card has been played comprise a first set of control keys each corresponding to one of the information panels, a second set of control keys each corresponding to one of the positions in each information panel and an address coding register connected to both sets of keys aforesaid in order to define the predetermined card by means of its information panel and its position in said panel.

4,173,343

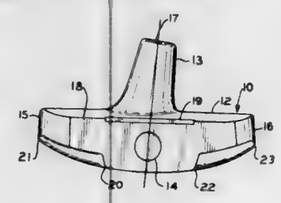
MALLET PUTTER

Vincent J. Richilano, Lakewood, Ohio, assignor to Zephyr Industries, Inc., Lakewood, Ohio

Filed Jun. 7, 1976, Ser. No. 693,175

Int. Cl.[2] A63B *53/04*

U.S. Cl. 273—169 **8 Claims**



1. A mallet type putter comprising:

a shaft having a center line extending between opposite ends;

a head secured to one end of said shaft, having a striking face, and being constructed of a metal with a specific gravity less than 3 and a single heavy core with a specific gravity of at least 7 to provide a sweet spot for the head;

said heavy core being at the sweet spot, extending rearwardly from the striking face and having a front and a rear end;

said center line of said shaft passing through the sweet spot for the head and through said core thereby reducing chances of twisting the putter while in the hands of a golfer;

said core having a substantially greater axial length perpendicular to the striking face than width parallel to the striking face;

the center of gravity of the putter head being rearwardly displaced from the striking face;

the front end of said core being on and constituting a part of the striking face of the putter, and said core being rigidly secured within the head, whereby the sectional density of the core provides improved trajectory for a golf ball with reduced wobble.

4,173,344

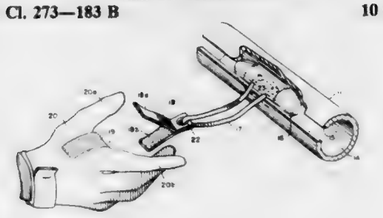
GOLF SWING TRAINING DEVICE AND METHOD

Torsten A. Angshed, 2221 W. 120th Pl., Blue Island, Ill. 60406

Filed May 24, 1978, Ser. No. 908,940

Int. Cl.[2] A63B *69/36*

U.S. Cl. 273—183 B **10 Claims**



1. A golf swing training device comprising an arcuate guide member having the outline of the predetermined path of movement of a golfer's hands in the execution of a prescribed golf swing, means supporting said guide member along an inclined plane parallel with the path of movement of a golfer's hands during such a swing, said arcuate guide member defining a channel therealong, a rider freely movable along said channel but being restrained against lateral release therefrom, means adapted to be worn upon at least one of a golfer's hands, and strap means secured at one end to said rider and being connected at the opposite end thereof to said means adapted to be worn upon at least one of the golfer's hands for guiding movement of the golfer's hands in the execution of said golf swing.

4,173,345

GOLF BALL

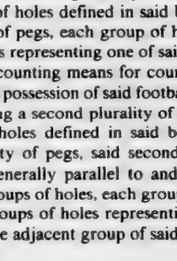
Terence W. Pocklington, Tupelo, Miss., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jun. 26, 1978, Ser. No. 919,381

Int. Cl.[2] A63B *37/02*

U.S. Cl. 273—217 **7 Claims**

1. A compression molded golf ball consisting of an elastic spherical core having a plurality of angularly related shallow surface channels all lying on the paths of great circles passing through opposite poles on the core surface and a relatively thin cover of durable synthetic plastic material the inner surface of



which envelopes said core surface and conformally completely occupies said channels.

4,173,346

BOARD-TYPE GAME SIMULATING FOOTBALL GAME

William D. Godwin, 2812 Roswell La., Columbus, Ga. 31906

Filed Aug. 15, 1977, Ser. No. 824,449

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—247 **2 Claims**



1. A football game apparatus for simulating a game of football and including a board representing a football playing field and having a plurality of locations indicated thereon, first marking means representing a football, a first goal towards which a first player having possession of said football attempts to move said football, a second goal towards which a second player having possession of said football attempts to move said football, a plurality of random selecting means for indicating plays for determining movement of said football through said plurality of locations, and means for determining segments of the game comprises a first counting means for counting the times said first player has possession of said football, said first counting means including a first plurality of pegs, a first plurality of groups of holes defined in said board for receiving said first plurality of pegs, each group of holes of said plurality of groups of holes representing one of said segments of the game, and a second counting means for counting the times said second player has possession of said football, said second counting means including a second plurality of pegs, a second plurality of groups of holes defined in said board for receiving said second plurality of pegs, said second plurality of groups of holes being generally parallel to and aligned with said first plurality of groups of holes, each group of holes of said second plurality of groups of holes representing the same segment of the game as the adjacent group of said first plurality of groups of holes.

4,173,347

GAME BOARD AND PIECES HAVING REMOVABLE INDICIA

Ernest R. Field, II, 407 Tulip Ave., Takoma Park, Md. 20012

Filed Jun. 25, 1976, Ser. No. 697,342

Int. Cl.[2] A63F *3/02*

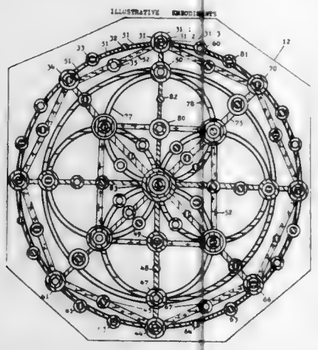
U.S. Cl. 273—261 **3 Claims**

1. A game apparatus for two or more players comprising:

(a) a playing surface, upon which a plurality of spaced-apart

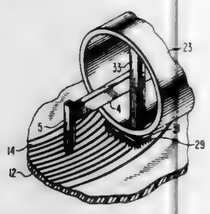
V 9 8 1 N 0 6 7 9 UMI

spots are located, which can be occupied by movable playing pieces and by removable indicia elements;
(b) a plurality of indicia elements containing indicia thereon selected from an indicia group, the indicia group containing a plurality of distinctive indicia;
(c) a plurality of movable playing pieces for each player, each playing piece having an indicium thereon selected from said indicia group, there being playing pieces of various indicia; and



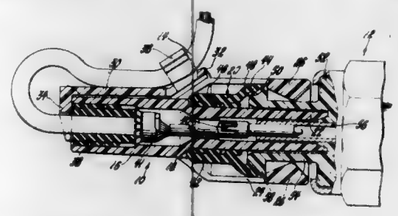
(d) a plurality of indexes removably attached to the playing pieces, said indexes being indicative of player ownership and said indexes not having indicia thereon selected from said indicia group; whereby the spots are capable of selectively receiving one or more of said indicia elements so that certain of the spots contain one indicium element while the remaining spots contain various pluralities of indicia elements and so that there are different indicia elements at said remaining spots in a specified hierarchy of order.

4,173,348
GROOVED RECORD PLAYBACK SYSTEM
Anil R. Dholakia, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Apr. 20, 1978, Ser. No. 898,435
Int. Cl.[2] G11B *3/58*
U.S. Cl. 274—47 **7 Claims**



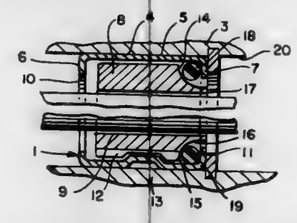
1. A pickup apparatus for use with a disc record having an information bearing spiral groove disposed on the surface thereof; said apparatus comprising:
(A) A first record engaging means comprising a playback stylus having an elongated rigid element tapering to a tip at one end thereof, which tip is dimensioned for reception within said groove during playback; said first record engaging means subject to radial motion toward the center of said record playback;
(B) A pickup arm carrying said first record engaging means at one end thereof;
(C) A second record engaging means separate from said first record engaging means; said second record engaging means subject to radial motion toward said record center independent of said radial motion of said first record engaging means during playback;
(D) A separate support arm carrying said second record engaging means at one end thereof; and
(E) Means for supporting said pickup arm and said support arm in a manner permitting variation in the separation between the radial location of said first record engaging means relative to the radial location of said second record engaging means during playback; said support arm being subject to engagement with said pickup arm when said radial separation between said first record engaging means and said second record engaging means exceeds a predetermined distance; said radial motion of said first record engaging means tracking said radial motion of said second record engaging means during the period of said arm engagement.

4,173,349
CONNECTOR INTERFACE SEALING ARRANGEMENT
Frank T. Neale, III, Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 24, 1978, Ser. No. 936,199
Int. Cl.[2] F16J *15/32*; H01R *3/04*
U.S. Cl. 277—6 **3 Claims**



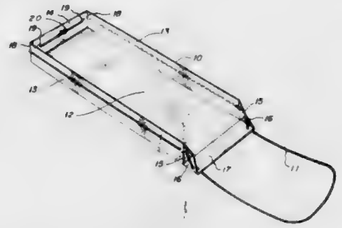
1. An interface sealing arrangement for matable connector bodies comprising:
a first connector body having a tubular end portion,
an interface seal having a sleeve portion at one end and a biconic head portion at an opposite end,
said sleeve portion sealingly engaging a peripheral surface of the tubular end portion and said biconic head portion terminating in a converging end section radially spaced from the tubular end portion, and
a second connector body including a shroud having a conical ramp at one end,
said conical ramp engaging and folding the converging end section back toward a diverging section of the biconic head portion when said connector bodies are mated.

4,173,350
FLOATING SEALS
Leonard J. Sieghartner, Coal Valley, Ill., assignor to Roy E. Roth Company, Rock Island, Ill.
Filed Aug. 7, 1978, Ser. No. 931,499
Int. Cl.[2] F16J *15/16*
U.S. Cl. 277—40 **9 Claims**



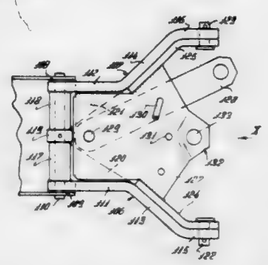
1. A seal for mounting in a portion of a casing in sealing relation with a shaft rotatably supported in said casing for inhibiting flow of pressurized liquid through said portion of said casing, axially of said shaft, from one position in said casing to another position in said casing, said seal comprising:
a. a housing comprising
(1) a tubular outer wall, and
(2) and an annular flange projecting substantially radially inwardly from one end of said outer wall,
b. said housing being adapted to be mounted in said portion of said casing in sealing relation thereto with
(1) the end of said outer wall remote from said flange facing toward said one position, and
(2) the axially outer face of said flange facing toward said other position,
c. an annular bushing mounted in said housing,
d. said annular bushing having
(1) an opening therethrough of a size to receive such a shaft therein with a closely fitting loose fit,
(2) an annular outer surface of a size to fit in said outer wall with a looser fit than said first mentioned fit, and
(3) a recess, of arcuate cross sectional shape, extending annularly around said bushing and formed in one outer annular corner of said bushing,
e. said recess opening outwardly toward the junction of said outer wall with said flange,
f. a resilient O-ring mounted in said recess and extending therearound between said bushing and said flange,
g. said O-ring having a lesser thickness than the length of the chord of said arc,
h. said bushing having an elongated slot formed in the outer periphery thereof and disposed in substantially parallel relation to the longitudinal axis of said bushing,
i. means on said housing and extending into said slot for holding said bushing against rotation in said housing while permitting said bushing to move axially in said housing so that said O-ring is pressed into sealing engagement with said flange and said outer wall by pressure on the side of said bushing remote from said flange in an axial direction relative to said bushing.

4,173,351
LAWN LITTER SLED
Philip R. Hetland, 915 River Dr., Moorhead, Minn. 56560
Filed Sep. 11, 1978, Ser. No. 941,054
Int. Cl.[2] B62D *15/00*
U.S. Cl. 280—19 **7 Claims**



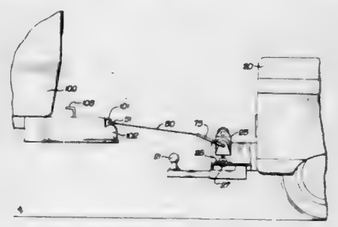
1. A lawn litter sled comprising:
a carrying body including a bottom panel, a substantially vertical end panel and side panels hinged to said bottom panel, a loading panel extending between said side panels and movable between a substantially vertical and a substantially horizontal position, cord guide means for guiding a flexible cord, flexible cord means frictionally held in at least one cord guide means in position to encircle the end and side panels of the carrying body, wherein said cord means provides lateral support to said side and end panels, said cord means also comprising a tow rope to drag said sled along the ground.

4,173,352
COMBINATION ARTICULATED TRACTOR AND TOW CAR
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland
Filed Oct. 18, 1976, Ser. No. 733,373
Claims priority, application Netherlands, Oct. 16, 1975, 7512128
Int. Cl.[2] B60D *1/14*
U.S. Cl. 280—415 A **5 Claims**



1. A tow bar assembly for use on large tractors wherein heavy forces having horizontal components are exerted by implements connected to the tractor's hitch, said tractor having a lifting device which includes a pair of outwardly diverging arms, said assembly comprising an integral supporting plate adapted to be detachably mounted rigidly between said arms in a substantially horizontal disposition, a coupling member for towing loads pivotally connected to said plate, said supporting plate including securing means for said coupling member outward relative to its pivotal connection to said supporting plate whereby said coupling member may be affixed relative to said supporting plate in a plurality of different positions, a further supporting plate being located parallel to said first mentioned supporting plate and secured rigidly thereto, said coupling member being between said supporting plates are pivotally connected to each said supporting plate, said securing means extending from one said supporting plate to the other said supporting plate, said supporting plates including a pair of supporting members rigidly connected to each of said plates on both sides thereof, said supporting members bearing against said arms and being connected thereto, said arms having closing plates attached thereto which extend toward each other and are adapted to be received between said supporting plates.

4,173,353
TOWING HITCH ALIGNMENT DIRECTOR
Richard W. Steele, 6551 Dume Dr., Malibu, Calif. 90265
Filed Mar. 17, 1975, Ser. No. 559,036
Int. Cl.[2] B60D *1/14*
U.S. Cl. 280—477 **3 Claims**



1. In combination with a pair of vehicles having complementary hitches each mounted axially of its vehicle and capable of relative pivotal movement about a vertical axis when engaged; a director for sensing relative alignment of the axis of one of

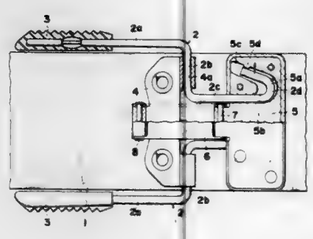
said vehicles with respect to a line intersecting said hitches, comprising a transducer unit mounted on one of said vehicles in a position on its axis forward of said vehicle's hitch; said unit comprising a first potentiometer having a vertically disposed rotatable shaft extending therefrom; reel means carried by said shaft including spring means for rotating said reel means in one direction, an extensible sensor carried by said reel means and having a free end extensible therefrom; said sensor being effective upon extension thereof to rotate said reel in the opposite direction, a second potentiometer having a rotatable shaft and an operating connection between the shaft of said second potentiometer of said reel means whereby said shaft will be rotated by said reel means in response to extension and retraction of said extensible sensor; means for anchoring the free end of said sensor to the other of said vehicles at a position on its hitch substantially coincident with the vertical axis about which said hitches are capable of pivoting when engaged, means controlled by said first potentiometer in response to horizontal angular deflections of the free end of said sensor when so engaged for indicating at an operator's station of one of said vehicles, the direction and magnitude of said angular movement, and means controlled by said second potentiometer in response to extension and retraction of said sensor for indicating at said station the magnitude of such extension.

4,173,354

SKI BRAKING DEVICE

Masahiro Murata, Matsudo, Japan, assignor to Hope Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1978, Ser. No. 893,307
Claims priority, application Japan, Apr. 11, 1977, 52/40464
Int. Cl.² A63C *7/10*
U.S. Cl. 280—605 **8 Claims**



1. A ski braking device comprising a spring wire, the front portion of which extends along a side edge of a ski plate and is extensible below the lower surface of said ski plate, the intermediate portion of which is rotatably supported relative to said ski plate, the rear end portion of which is elastically bent, a mounting plate adapted to be attached on said ski plate and rotatably supporting said intermediate portion of said spring wire, a pedal member having a guide cavity therein in which said rear end portion of said spring wire is slidably provided, and an arm member pivotably connected to said pedal member and to said mounting plate at positions spaced from the rotatable support of the intermediate portion, such that when said pedal member is pushed down by a sole of a ski boot, said pedal member is moved relative to said rear end portions of said spring wire to deform the bent shape thereof and to allow an elastic strain energy to be retained at the deformed rear end portion thereof.

4,173,355

FOLDABLE BABY CARRIAGE WITH FOLDABLE AND ADJUSTABLE FOOT REST

Giuseppe Perego, via de Gasperi, Arcore (Milano), Italy (20043)

Filed Jan. 26, 1978, Ser. No. 872,368
Claims priority, application Italy, Oct. 7, 1977, 28356 A/77
Int. Cl.² B62B *7/06*
U.S. Cl. 280—642 **10 Claims**



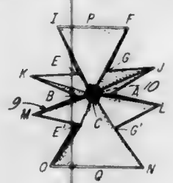
1. In a folding carriage adapted to fold between an operative position and an inoperative folded position wherein said carriage is narrowed in width and shortened in height, said carriage having front and rear legs pivotally connected together, a front wheel on each of said front legs and a rear wheel on each of said rear legs, a pair of elongated handles, an upper sleeve attached to a respective one of said front legs and slidably mounted on each of said handles, a lower sleeve slidably mounted on a respective one of said front legs and attached to a respective one of said handles, an actuating knob, first and second tie rods connecting the upper sleeve to said actuating knob, seat means including a foldable seat and associated foldable seat back, each adapted to fold between operative and inoperative positions, and a pair of generally U-shaped arm rests, each having one end connected to a respective one of said handles and the other end connected to the corresponding one of said lower sleeves, the improvement comprising: foot rest means comprising two side pieces, each connected to a respective one of the arm rests, a central piece, and means pivotally connecting said central piece to said side pieces so that said foot rest means is foldable generally centrally; and support means operatively connecting said side pieces to said lower sleeves for enabling said foot rest means to be automatically folded to be narrower when said carriage is folded toward said inoperative position.

4,173,356

INFLATABLE APPARATUS AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Tsuneyo Ross, 22301 Winshall, St. Clair Shores, Mich. 48081

Filed Mar. 27, 1974, Ser. No. 455,192
Int. Cl.² B60R *21/08*
U.S. Cl. 280—743 **3 Claims**



1. A safety bag adapted to be inflated in a vehicle in order to cushion an occupant of the vehicle, said safety bag having a deflated, folded condition and an inflated, unfolded condition, said bag when in said deflated folded condition comprising:

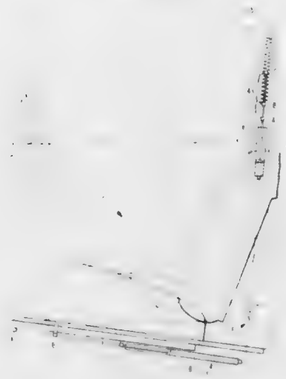
a plurality of adjacent accordion pleats whose fold lines radiate from a central point of the deflated bag, said fold lines converging at the central point and diverging at the opposite end, such that said pleats are circle-sector shaped, said bag being mounted on said vehicle at said central point.

4,173,357

INSTALLATION FOR ADJUSTING THE HEIGHT OF THE UPPER ANCHORING OR DEFLECTION POINT FOR THE SHOULDER BELT OF A BELT SYSTEM

Walter Jahn, Sindelfingen, and Jurgen Gimbel, Gechingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 3, 1977, Ser. No. 803,384
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1976, 2625417
Int. Cl.² B60R *21/00*
U.S. Cl. 280—808 **22 Claims**



1. An installation for the height adjustment of a point consisting of one of upper anchoring and deflection point, for a shoulder belt of a belt system in a vehicle, including individual seat means adjustable in at least one of two directions consisting of horizontal and vertical direction, characterized by transmission means operatively interconnected between a respective seat means and said point coordinated to the seat means, said transmission means being operable to displace said point during an adjustment of the seat means such that a height location of said point is realized which is favorable for a belt user in relation to the respective adjusted seat position.

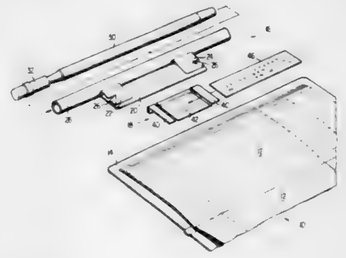
4,173,358

ACCESSORY CLIP AND PAGE SEPARATOR FOR NOTEPADS AND THE LIKE

Richard C. Wilson, P.O. Box 26, Champlin, Minn. 55316

Filed Feb. 23, 1978, Ser. No. 880,396
Int. Cl.² B42F *1/00*
U.S. Cl. 281—45 **13 Claims**

1. An accesory clip assembly for a pocket-carried notepad article or the like comprising a clip having means for detachably securing the same to a portion of a said article, a tubular member affixed to said clip for reception therewithin of a writing instrument, said clip including cooperating base and tab members for gripping a said article portion therebetween to prevent accidental dislodgement thereof from the article, wherein said tab member has a sharpened tang depending therefrom and extending toward said base member whereby



the same fricitionally engages with a said article with the tang biting thereinto.

4,173,359

INTERLOCKED CONTINUOUS WEBS

G. Russell Sornberger, Sanborn, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Continuation of Ser. No. 768,189, Feb. 14, 1977, abandoned.
This application Mar. 30, 1978, Ser. No. 891,842
Int. Cl.² B31F *1/00;* **B42D** *5/00*
U.S. Cl. 282—11.5 A **2 Claims**



1. In an assembly of continuous webs including at least a pair of superimposed continuous webs having spaced feed holes along at least one marginal edge thereof, longitudinally spaced transverse superimposed lines of weakening in said webs for fan folding the assembly into a zig-zag pack and for separating the assembly into individual units when burst therealong, means comprising sets of interlocking tongues spaced longitudinally along at least said one marginal edge for solely interlocking said webs together, said sets each comprising first superimposed interengaging tongues in said webs and second superimposed interengaging tongues in said webs spaced transversely from and adjacent said first tongues, said tongues being formed by cuts having legs parallel to said marginal edge, said tongues extending in a forward direction of feed of the assembly through a web processing machine having free ends and having opposite ends integral with their respective webs, said sets of tongues being longitudinally spaced apart a first predetermined distance from one another, and said first and second tongues in each said set being transversely spaced apart a second predetermined distance less than said first distance, the improvement comprising, said first tongues and second tongues of each said set being longitudinally spaced apart a third predetermined distance less than said first distance, said free ends of one of said tongues in each said set being disposed forwardly of the other of said tongues in each said set in the direction of feed, whereby said one of said tongues in a first of said sets relative to the direction of feed commences disengaging before said other of said tongues in said first set upon separation of said webs in the direction of feed, and said one of said tongues in a second of said set relative to the direction of feed commences disengaging before said other of said tongues

in said second set upon further separation of said webs, and so on for the remaining sets upon still further separation of said webs, whereby simultaneous disengagement of said tongues in said first set, in said second set and in said remaining sets is avoided to thereby decrease resistance offered by said tongues upon web separation.

4,173,360

FLEXIBLE SEALING JOINT

Lawrence A. Bergman, Euclid, Ohio, and John H. Gorndt, Erie, Pa., assignors to Lord Corporation, Erie, Pa.

Continuation of Ser. No. 621,433, Oct. 10, 1975, abandoned. This application Aug. 3, 1977, Ser. No. 821,448

Int. Cl.[2] F16L *11/12, 27/04, 35/00, 59/16*

U.S. Cl. 285—51 **18 Claims**



1. In a pipe joint assembly for fluid conduits that receive fluid under a pressure greater than an external ambient pressure on the conduits, said assembly comprising

a cylindrical housing including an annular housing body and an annular flange at each end extending radially inwardly of said housing body, and

a pair of tubular members of smaller diameter than said housing, each tubular member including a flange at one end extending radially outwardly of said member, said flanges of the tubular members being disposed between the flanges of the housing and the other ends of the tubular members projecting from opposite ends of the housing for attachment to fluid conduits,

the improvement of two annular joints disposed within the housing, each joint comprising:

(a) a pair of spaced rigid rings, and

(b) an annular flexible element disposed between the rings and sealingly engaging opposed surfaces of the rings so as to define a pair of annular exposed side surfaces of said flexible element, the flexible element including a body of elastomer which when measured substantially normal to at least one of the opposed surfaces of the rings has a tapered thickness between the rings that decreases from the radially innermost side surface to the other side surface of the flexible element, the body of elastomer being closely confined in its tapered configuration along surfaces that extend from the radially innermost side surface to the other side surface of the flexible element so as to resist deflection of the elastomer from between the rings in response to pressure exerted on the radially innermost side surface of the flexible element,

one ring of one joint being in load and motion transmitting engagement with the flange of one tubular member and being sealingly engaged with said one tubular member, one ring of the other joint being in load and motion transmitting engagement with the flange of the other tubular member and being sealingly engaged with said other tubular member, the other ring of each joint being sealingly engaged with a fluid-tight portion of the pipe joint assembly such that the two joints together define at least part of a fluid-tight passageway that interconnects the tubular members to permit a flow of fluid between the tubular members, the joints being oriented such that the radially innermost side surface of each flexible element is exposed to fluid in said passageway and to pressure exerted by fluid in the passageway, the radially innermost side surface being the only side surface of each flexible element which is exposed to fluid in said passageway, each flexible element resiliently accommodating relative motion between the rings that engage the element and providing a fluid-tight seal that is particularly resistant to pressure exerted on the radially innermost side surface of the element.

4,173,361

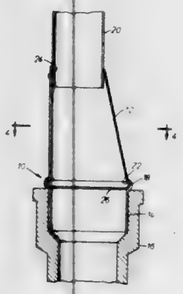
DOWN SPOUT ADAPTOR ASSEMBLY

Stanley J. Gagas, 127 Apline Ter., Shawano, Wis. 54166

Filed Feb. 17, 1978, Ser. No. 878,518

Int. Cl.[2] F16L *55/00*

U.S. Cl. 285—64 **1 Claim**



1. A down spout adaptor assembly for connecting a down spout mounted on the wall of a building to a sewer pipe, said assembly comprising:

a down spout adaptor including a body portion having a first opening adapted to be connected to the lower end of the building down spout and a second opening, said body portion being tapered outwardly from said first opening toward said second opening whereby said down spout adaptor can be placed against the wall of the building, said second opening being larger then said first opening and asymmetric with respect to the flow axis of said down spout, and an entry adaptor including a cylindrical portion having an opening offset from said first opening and corresponding to said second opening and adapted to be inserted into a sewer pipe,

and means connecting said body portion of said down spout adaptor to said cylindrical portion of said entry adaptor to provide a seal between said adaptors, said means including an arcuate bead around the second opening at the lower end of said body portion, and a corresponding bead around the upper edge of the corresponding opening in said cylindrical portion, said arcuate bead being engageable with the inside surface of said corresponding bead on said cylindrical portion.

4,173,362

FEMALE PIPE COUPLING MEMBER WITH ANNULAR SEAL RING

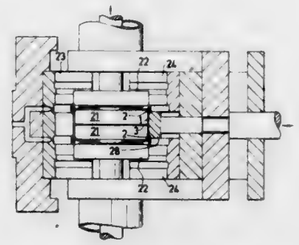
John B. Glover, Huddersfield, and John Upton, Darfield near Barnsley, both of England, assignors to The Hepworth Iron Company Limited, Stocksbridge, England

Filed Apr. 4, 1977, Ser. No. 784,314

Claims priority, application United Kingdom, Apr. 6, 1976, 13936/76

Int. Cl.[2] F16L *17/00, 21/00*

U.S. Cl. 285—110 **6 Claims**



1. A pipe joint member comprising a tubular injection-moulded plastics member having a main portion of a predetermined diameter and at one end thereof a portion of increased diameter defining an inwardly facing annular recess, and a resilient injection-moulded sealing ring in the recess, having a foot portion substantially filling and mould-bonded in the recess and having a sealing head projecting partway across the interior of the joint member and secured to the foot portion by a neck, the sealing head being deformable to an internal diameter at least equal to said predetermined diameter to permit passage of a core used for moulding said joint member.

4,173,363

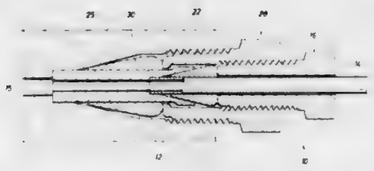
ADAPTOR ASSEMBLY FOR FITTINGS AND CONNECTIVE LINES OF DIFFERING SIZES

Stanley D. Stearns, 1201 Archley Dr., Houston, Tex. 77055

Filed Jul. 3, 1978, Ser. No. 921,167

Int. Cl.[2] F16L *55/00*

U.S. Cl. 285—177 **10 Claims**



1. An adaptor for connecting a tubing to a fitting to accommodate a mismatch in size, comprising:

(a) a hollow nut adapted to be positioned around a tubing;

(b) an elongate hollow tubular sleeve having an internal shoulder facing the end of the tubing;

(c) a first tapered spool adapted to be forced into the end of said sleeve by said nut and surrounding said tubing to wedge against the tubing and thereby grip around it;

(d) an elongate coupling having

(1) an axial passage therethrough;

(2) a first set of threads at one end of said passage for engaging said hollow nut;

(3) a second set of threads concentric with said first set for connection to a fitting;

(4) a shoulder facing away from the end at which said hollow nut is threaded to said coupling; and

(5) a radial thickness in said coupling defined between the radii of said first and second sets of threads which is at least in part related to the difference in diameter between the tubing and fitting; and

(e) a second and larger tapered spool adapted to be abutted against said shoulder and inserted into a tapered seat in the fitting surrounding said hollow sleeve and wedging against it to grip it in axial communication with a passage in the fitting.

4,173,364

CLAMP ASSEMBLY FOR HIGH PRESSURE DIAPHRAGM TEST CELLS

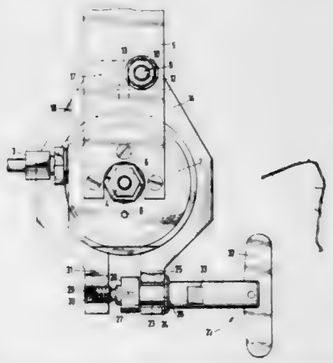
Wolfgang Hein, Dassel, Fed. Rep. of Germany, assignor to Carl Schleicher & Schull, Einbeck, Fed. Rep. of Germany

Filed Aug. 24, 1977, Ser. No. 827,428

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1977, 2717048

Int. Cl.[2] E05C *19/00*

U.S. Cl. 292—256.67 **10 Claims**



1. A clamp assembly for a high pressure diaphragm test cell assembly comprising an upper cell part including a wedge flange and a lower cell part including a wedge flange, said clamp assembly comprising:

a carrier frame including means for fixing said frame relative to a stationary support;

means for securing said upper cell part to said carrier frame with the wedge flange of the upper cell part directed downwardly;

a vertical carrier pin mounted on said carrier frame and extending downwardly therefrom;

first and second clamp ring parts mounted at their rear ends to a lower end of said carrier pin for free swinging movement in a horizontal plane;

said clamp ring parts each including clamp surfaces for engaging the wedge flanges of the cell parts; and,

releasable fastening means engaging front ends of said clamp ring parts and extending tangentially relative thereto for forcing said clamp ring parts toward one another to press said cell parts firmly against one another.

V 9 8 8 1 N 0 6 7 9 UMI

4,173,365

CLAMPING DEVICE FOR TRANSPORTING SPECIMEN PLATES

Claude Lieb, Bad Ragaz, Switzerland, assignor to Balzers Aktiengesellschaft fur Hochvakuumtechnik und Dunne Schichten, Liechtenstein

Filed May 26, 1978, Ser. No. 910,084

Claims priority, application Switzerland, Jun. 1, 1977, 006687/77

Int. Cl.² B25J *1/00*

U.S. Cl. 294—19 R **10 Claims**



1. A clamping device for transporting a specimen plate, particularly for an electron microscope specimen comprising, a support plate, a carrier plate disposed in juxtaposed relationship with said support plate having at least two resilient arm portions, a claw connected to each resilient arm portion of said carrier plate extending away from said support plate for engaging the specimen plate, and a threaded rod having a threaded end threaded into one of said support plate and said carrier plate and being rotatable in a first direction with respect to said support and carrier plates for moving said carrier plate with respect to said support plate to move each claw away from each other and rotatable in a second opposite direction to move each claw toward each other for engaging the specimen plate therebetween.

4,173,366

DEVICE FOR JETTISONING A LOAD IN TWO DIFFERENT WAYS

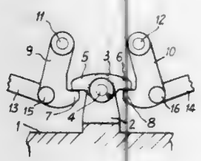
Jean-Pierre Mattei, La Varenne, and Pierre F. Coutin, Paris, both of France, assignors to R. Alkan & Cie., Valenton, France

Filed Dec. 28, 1977, Ser. No. 865,152

Claims priority, application France, Jan. 4, 1977, 77 00061

Int. Cl.² B66C *1/28*

U.S. Cl. 294—83 R **5 Claims**



1. A device, for supporting a load from a carrier so as to be jettisonable by each two separate manners of operation of the device, comprising:

(i) a suspension member for securing to the load

(ii) a two-arm rocker mounted pivotably intermediate its ends on said suspension member

(iii) a first support member for mounting pivotably on said carrier, said first support member having a first position in which it is engaged under one of the arms of said rocker, and a second position in which it is disengaged from said one arm

(iv) a first control means connected to said first support member and serving (a) for movement of said first support member into its first and second positions, and (b) for locking said first support member releasably in its first position

(v) a second support member for mounting pivotably on said carrier, said second support member having a first position in which it is engaged under the other of the arms of said rocker, and a second position in which it is disengaged from said other arm

(vi) a second control means connected to said second support member and serving for (a) movement of said second support member into its first and second positions, and (b) for locking said second support member releasably in its first position,

whereby, when said first and second support members are both in their first position engaged under a respective arm of the rocker, movement of either of said support members by its respective control means to its respective second positon permits said rocker to pivot under the weight of the load and thereby release the load from the carrier.

4,173,367

PICKUP UNIT FOR LIFTING CONCRETE BODY

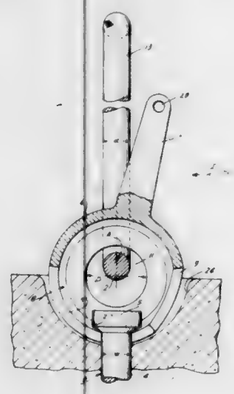
Ernest Haeussler, Grashofstraesse 47, 4300 Essen-Bredeney, Fed. Rep. of Germany

Filed Feb. 28, 1978, Ser. No. 882,249

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1977, 2708787; Mar. 1, 1977, 2708788

Int. Cl.² B66C *1/36, 1/66*

U.S. Cl. 294—83 R **13 Claims**



1. A pickup unit for lifting a body from which projects a bolt having a relatively narrow shaft embedded in and projecting from said body and a relatively wide head on said shaft spaced from said body, said unit comprising:

a shackle; and

a pickup member pivotal on said shackle about a pickup axis and having a generally radially extending actuation arm and an angularly elongated and outwardly open pickup slot lying generally in a plane perpendicular to said axis and having a relatively wide end permitting radial passage of said head into and out of said slot and an angularly opposite relatively narrow end internally sufficiently wide to accommodate said head but externally insufficiently wide to permit radial passage of said head out of said slot, said slot being substantially centered on said axis and internally sufficiently wide between said ends to permit said head to pass angularly along said slot between said ends with said shaft extending out of said slot, whereby said member can pivot about said axis with said bolt engaged in said slot without displacement of said shackle relative to said bolt.

4,173,368

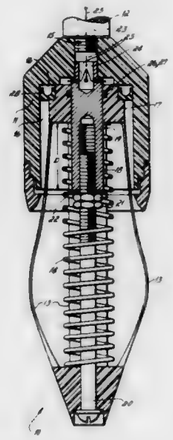
APPARATUS FOR FRICTIONALLY GRIPPING THE INTERIOR SURFACE OF A CONTAINER DURING HANDLING BY AN ARTICLE TRANSFERRING MEANS

Paul J. Haverbusch, Cincinnati, Ohio, assignor to The Lodge & Shipley Company, Cincinnati, Ohio

Filed May 1, 1978, Ser. No. 901,637

Int. Cl.² B66C *1/54*

U.S. Cl. 294—88 **6 Claims**



6. A gripping apparatus comprising:

a downwardly opening cup;

a post fixed to the center of said cup and depending therefrom, said post having a lower end beneath said cup;

a piston in said cup;

flexible means connected between the lower end of said post and said piston; and

means for lowering said piston to expand said flexible means into a container gripping orientation.

4,173,369

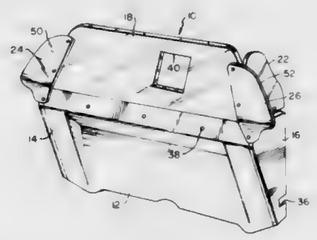
PROTECTIVE VEHICLE PARTITION

Sam Roggin, 23091 Rosewood, Oak Park, Mich. 48237

Filed Oct. 13, 1977, Ser. No. 841,882

Int. Cl.² B60R *27/00*

U.S. Cl. 296—24 R **11 Claims**



2. A protective vehicle partition comprising a lower panel extending transversely across the lower portion of the vehicle centrally constructed of bullet resistant material, an upper transparent panel having a bottom rigidly secured to the top of the lower panel extending transversely completely across the upper portion of the vehicle constructed of bullet resistant material, upper side panels secured to the ends of the upper transverse panel and extending toward the front of the vehicle, and extensions secured to the ends of the upper transverse panel having free edges with substantially the contour of the inside of the vehicle at the location of the protective vehicle partition extending from adjacent the top of the vehicle to a substantial distance below the rear vehicle door locks.

4,173,370

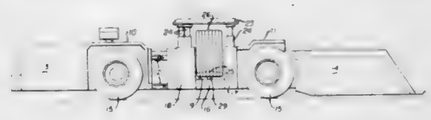
MINE VEHICLE WITH SWIVEL SEAT

Winford Dillard, Bluefield, W. Va., assignor to A-T-O Inc., Willoughby, Ohio

Filed May 4, 1977, Ser. No. 793,511

Int. Cl.² B60R *21/00*

U.S. Cl. 296—65 A **5 Claims**



1. In a mine vehicle having operating controls and an operator's position, a partial enclosure defining said operator's position, an entrance way in said partial enclosure and a swivel seat having a high back positioned in said partial enclosure with said high back normally blocking said entrance way and arranged when moved to unblock said entrance way to engage said controls to stop the operation of the mine vehicle.

4,173,371

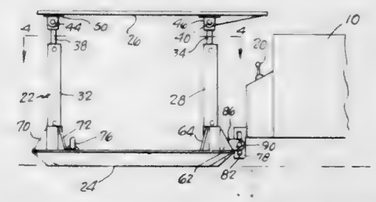
COMBINATION CAB AND CANOPY FOR MINE ROOF BOLTING MACHINE

Peter P. Kopas, Nicktown, Pa., assignor to Kogen Industries, Inc., Carrolltown, Pa.

Filed Jul. 8, 1977, Ser. No. 814,137

Int. Cl.² E21C *11/02*

U.S. Cl. 296—137 R **6 Claims**



1. A combination cab and canopy for a mining machine, which comprises:

cab means having a substantially flat bottom plate with an upstanding rim, for accommodating an operator of said mining machine therein, said plate resting and sliding upon the floor of a mine during use with substantially all of its undersurface area in contact with the mine floor;

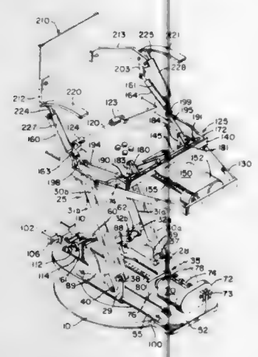
canopy means positioned over said cab means for covering said operator;

means for vertically elevating and lowering the canopy means and solely connected to said cab means so that the canopy means is completely supported by said cab means and is not directly connected to said mining machine; and

means for float coupling said cab means to said mining machine for permitting independent vertical and pivotal movements of said cab and connected canopy means with

respect to said mining machine during travel along a mine floor, said coupling means comprising at least one vertical support member having an elongated vertical slot formed therein, and a horizontally disposed pivot pin extending through said slot so as to be freely vertically movable therein, one of said pin and support member being fixed on said cab means and the other being adapted to be fixedly mounted on said mining machine.

4,173,372
DENTAL CHAIR
Floyd E. Norris, Seattle, Wash., assignor to Gary Reynolds, Seattle and Harold Y. Tai, Everett, both of, Wash.
Filed Oct. 11, 1977, Ser. No. 840,716
Int. Cl.² A61G *15/00*
U.S. Cl. 297—345 **7 Claims**



1. A dental chair, comprising:
a pedestal;
a lifting assembly mounted on the pedestal, said lifting assembly comprising a base, substantially horizontal guide means mounted on the base, elevation link means having first and second ends and being pivotally mounted to the base at its first end, and elevation drive means mounted on the base;
a parallelogram assembly including upper and lower members and a plurality of parallel arms pivotally connected therebetween, the length of said arms being longer than the distance between the pivotal connections of said arms, there said lower member, said lower member being slidably mounted on the guide means and directly connected to the elevation drive means such that said drive means effects movement of said lower member along the guide means, and said elevation link means being pivotally connected at its second end to one of said arms between the midpoint of said arm and its connection to said lower member in such a manner as to act in reaction to the movement of said lower member along said guide means for causing substantially vertical movement of the upper member between raised and lowered positions when the lower member is moved along the guide means;
a seat assembly mounted to the upper member;
a backrest assembly mounted to the seat assembly.

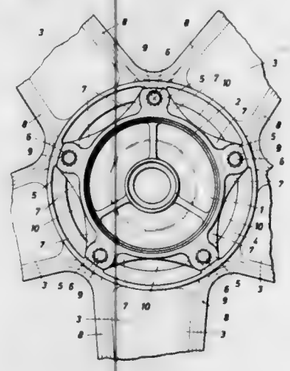
4,173,373
ADVANCE METHOD AND APPARATUS FOR MINING
John A. L. Campbell, Mascoutah, and Daniel J. Moynihan, Belleville, both of Ill., assignors to Peabody Coal Company, Inc., St. Louis, Mo.
Filed Aug. 25, 1977, Ser. No. 827,575
Int. Cl.² E21D *20/00*
U.S. Cl. 299—11 **5 Claims**

1. A method of underground mining, comprising continuously mining an entry through material mined by forwardly moving a mining machine into said material, applying roof control means to the entry behind the mining machine by forwardly moving a roof drilling and bolting machine from position-to-position independently of the forward movement of the mining machine, and continuously transporting the material mined by the mining machine by a conveyor running



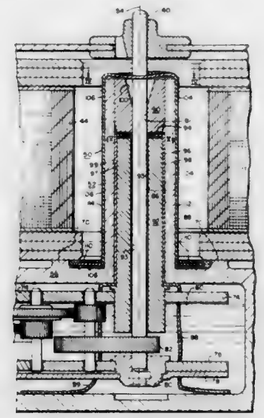
through the roof drilling and bolting machine to a material receiving device behind the roof drilling and bolting machine wherein the conveyor moves extensibly with respect to the mine roof drilling and bolting machine to compensate for difference in advance between the mining machine and the mine roof drilling and bolting machine resulting from the independent movements thereof.

4,173,374
ROAD WHEEL FOR MOTORCYCLES
Peter Resele, and Herwig Leinfellner, both of Graz, Austria, assignors to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria
Filed Apr. 19, 1978, Ser. No. 897,575
Claims priority, application Austria, Jun. 13, 1977, 4134/77
Int. Cl.² B60B *1/00*
U.S. Cl. 301—6 CS **3 Claims**



1. A motorcycle wheel comprising
(a) a hub having a periphery, the hub including
(1) peripherally spaced, radially outwardly extending lugs along the periphery of the hub, the lugs defining bores,
(b) an integral wheel body including
(1) a central ring surrounding the periphery of the hub, the central ring and the hub periphery defining air flow passages disposed radially between the central ring and the periphery of the hub, and
(2) a plurality of spokes radiating from the central ring, respective ones of the lugs being disposed between adjacent ones of the spokes, and each spoke having two stiffened longitudinal edge portions, imaginary longitudinal extensions of adjacent ones of the stiffened edge portions of the adjacent spokes intersecting in the bores of the lugs disposed therebetween, and
(c) fastening elements extending through the bores and affixing the central ring of the wheel body to the hub.

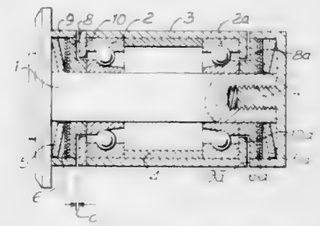
4,173,375
REMOTE LUBRICATION SYSTEM FOR VERTICAL MOTOR SHAFTS
Kenneth G. Halstead, Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Apr. 14, 1978, Ser. No. 896,415
Int. Cl.² F16C *17/00*
U.S. Cl. 308—134.1 **3 Claims**



1. A remotely lubricated support and bearing assembly for extended and vertically rotatable shafts, comprising:
an enclosed housing having an interior reservoir for receiving a lubricant;
an elongated hollow cylindrical wall extending from the top of said housing, said cylindrical wall surrounding a vertical bore extending therethrough and to the interior of said enclosed housing;
a solid bearing member carried by the upper end of said cylindrical wall and including a cylindrical shaft bearing surface aligned with said bore;
a lubricant absorbent washer carried within said cylindrical wall and adjacently below said bearing member;
an internal channel extending through said cylindrical wall between said washer and the interior of said enclosed housing;
a wick extending through said channel for transferring lubricant from said interior reservoir to said absorbent washer so that the lubricant is distributed upward by capillary attraction from said washer to said shaft bearing surface when said shaft is mounted within said bearing member and said bore for rotation about a substantially vertical axis;
a lubricant absorbent retainer mounted outside the bottom of said cylindrical wall; and
a further wick extending over the outer end of said cylindrical wall and around said shaft and further extending to said lubricant absorbent retainer for directing lubricant discharge from the end of the cylindrical wall when the support and bearing assembly is inverted.

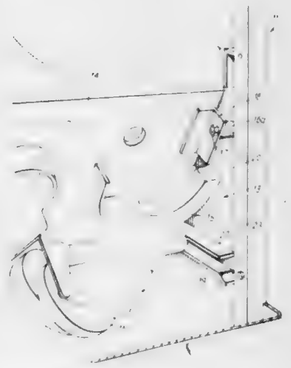
4,173,376
BEARING ASSEMBLIES
John M. Standing, Stevenage, and Joseph S. Sheppard, Harlow, both of England, assignors to Hawker Siddeley Dynamics Limited, England
Filed Feb. 16, 1978, Ser. No. 878,618
Claims priority, application United Kingdom, Feb. 17, 1977, 6585/77
Int. Cl.² F16C *33/00*
U.S. Cl. 308—189 A **7 Claims**

1. A preloaded bearing assembly including relatively high and low rate spring means acting in tandem, the high rate spring means providing the preload and the low rate spring means accommodating vibration and thermal dimensional changes, said assembly comprising a shaft journalled in two angular contact ball bearings mounted in a housing at opposite ends thereof, the outer races of the bearings being maintained



at a fixed separation distance, and wherein the spring means are disposed in two sets, one out beyond each bearing, each set including high and low rate spring members in tandem acting on the inner race of the adjacent bearing through the intermediary of a respective thrust member.

4,173,377
CHASSIS MOUNTING FOR A MACHINE
Philip J. Heslop, Wokingham, and Roger J. Matthews, Slough, both of England, assignors to Mars Limited, London, England
Filed Feb. 8, 1978, Ser. No. 876,097
Claims priority, application United Kingdom, Feb. 9, 1977, 5371/77
Int. Cl.² A47B *81/00*
U.S. Cl. 312—29 **8 Claims**



1. A machine comprising:
a housing;
an opening in a vertical wall of said housing, said opening providing access to the interior of said housing;
panel means covering said opening, said panel means being movable or removable to expose said opening;
a normally-horizontal chassis mounted in said housing;
working components on said chassis, at least some of the working components being difficult of access when the chassis is in the normal horizontal position;
locating and guiding means for said chassis whereby said chassis is movable between its normal horizontal position within said housing and an inclined position adjacent said opening, the said some working components being adjacent said opening and facing outwardly of the machine when the chassis is in inclined position; and

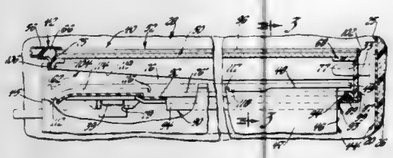
means for holding the chassis in the inclined position.

4,173,378

REFRIGERATOR SEALED FOOD STORAGE DRAWER

Robert S. Hanson, Kettering; Paul E. Kronenberger, and Charles C. Whistler, Jr., both of Dayton, all of Ohio, assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Jul. 31, 1978, Ser. No. 929,347
Int. Cl.[2] A47B *88/04*
U.S. Cl. 312—296 1 Claim



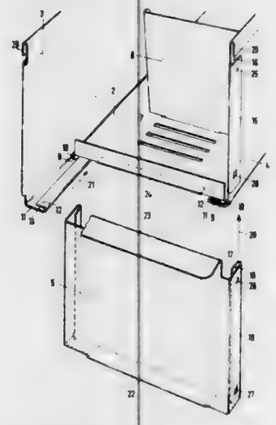
1. A supporting frame and cover panel assembly adapted for slidably and sealingly supporting a flanged, imperforate open top food storage drawer between an open position outside the frame providing access to the food therein and a closed position inside the frame providing a generally airtight sealed environment for the food therein; said assembly including a rectangular one-piece frame, a cover panel of similar rectangular shape and a pair of trim members for affixing the cover panel in said frame, said one-piece frame comprising elongated mirror image side frame members interconnected at their ends by front and rear cross frame members, means defining first inwardly facing channels adjacent the top of said side frame members and extending throughout the length thereof for slidably receiving opposite sides of said cover panel therein, shoulder means on said front cross member abutting said cover panel as it is slidably received in said first channels for positioning said cover panel in said frame, means defining second inwardly facing channels in said side frame members substantially coextensive with said spaced below said first channels, said second channels adapted to provide sliding support for an associated flange of the drawer, means defining a third outwardly facing channel intermediate each said first and second channels and defined thereby, and means defining an inwardly facing groove adjacent the bottom of said side frame members configured for receiving and affixing one portion of a seal for said drawer, each of said pair of trim members having a generally C-shaped section formed by upper and lower legs, each upper leg overlapping an upper face of its associated side frame member and each lower leg overlapping an upper wall portion of its associated third channel in a manner for grippingly retaining the trim member in affixed relationship thereto, the upper leg of at least one trim member including an integral stop tab portion operative to provide interfering relationship with the rearward travel of said cover panel in the first channels to lock said cover panel in said frame in conjunction with said shoulder means, a seal support member on said rear cross frame member defining a forwardly facing groove in substantial alignment with the grooves on said side frame members and configured for receiving and affixing another portion of said seal for said drawer, and a seal affixed in the grooves of said side members and said seal support member and substantially coextensive therewith, said seal extending into the path of said drawer when said drawer is moving from its open position to its closed position, whereby when the drawer is in its closed position said seal portions abut the side and rear walls of said drawer in a manner to partially form a generally airtight seal therewith; said front cross frame member including means for effecting a sealed relationship with the front wall of said drawer when said drawer is in its closed position to complete the generally airtight sealed environment for the food in said drawer.

4,173,379

DRAWER, PARTICULARLY FOR A CARD INDEX

George L. van der Heiden, Bergambachterstraat 3, Schoonhoven, Netherlands, and Karl H. Larsson, Hoornaar, Netherlands, assignors to George Laurens van der Heiden, Schoonhoven, Netherlands

Filed Apr. 21, 1977, Ser. No. 789,618
Claims priority, application Netherlands, Apr. 23, 1976, 7604347
Int. Cl.[2] A47C *88/04, 47/02*
U.S. Cl. 312—330 SM 1 Claim



1. A drawer comprising:

a. an individual bottom panel and first and second pairs of oppositely situated individual wall panels, said second pair of wall panels extending along the length of the drawer, and means for connecting adjacent wall panels together including mutually telescoping portions, in a vertical direction, on adjacent panels, including each telescopic connection comprising a marginal zone on each side of each of said first pair of wall panels bent from the panel through 90° in the direction of the other panel to be connected thereto, and further bent through 180° with a marginal strip being located in a plane substantially parallel to that of said portion bent through 90°, and on each side of each of said second pair of panels a marginal zone bent through 180° outwardly with respect to the panel to be connected thereto, with two bends through 180° being such that the marginal zones are telescoping one into the other with a sliding fit;

b. means for connecting the bottom panel and said second pair of oppositely situated wall panels together including mutually telescoping portions in a longitudinal direction on the marginal adjacent portions of the bottom panel and the second pair of oppositely situated wall panels, each telescopic connection comprising a marginal zone bent from each of said second pair of wall panels through 90° in the direction of the bottom panel, and further bent through 180° with a marginal strip being located in a plane substantially parallel to that of said portion bent through 90°, and on the bottom panel a marginal zone bent through 180° from the bottom panel outwardly with respect to wall panel to be connected thereto, which two bends through 180° being such that the marginal zones are telescoping one into the other with a sliding fit;

c. stops formed on the panels to determine the assembly end position of telescoping of the marginal portions of adjacent panels in the direction of sliding into one another;

d. stop members stopping the telescopic movement of marginal zones of adjacent panels in the sense of sliding out of the assembly end position, said stop members being formed by one or more recessed portions in a marginal zone of a panel mating with one or more projections in a corresponding marginal zone of the adjacent panel; and

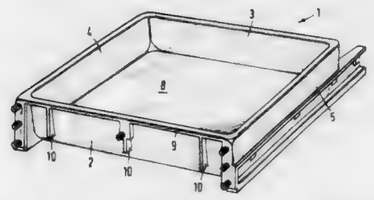
e. one of said first pair of wall panels forming the front of the drawer and being contiguous to the bottom panel with a lip bent through 90° towards the bottom panel, and said bent lip being contiguous to the bottom panel through a self-adhesive strip.

4,173,380

DRAWER ASSEMBLAGE

Hans-Werner Düpree Osnabrücker Landstrasse 154, 4830 Gütersloh 11, Fed. Rep. of Germany

Filed Feb. 27, 1978, Ser. No. 881,858
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1977, 2708167
Int. Cl.[2] A47B *88/00*
U.S. Cl. 312—330 R 23 Claims



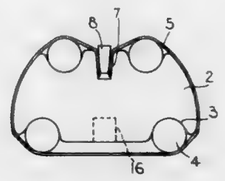
1. A drawer assemblage comprising: a single piece drawer member having a bottom, front and rear walls extending upwardly from said bottom, and first and second sides extending upward from said bottom, each of said sides being formed of an inner wall extending from said bottom and a shorter outerwall parallel to said inner wall and connected to the top thereof; and a ribbed ledge member extending longitudinally in the space between each pair of inner and outer walls, each ledge member comprising a plurality of horizontally spaced vertical ribs, a panel between each pair of ribs, every other panel abutting the inner wall and the remaining panels abutting the outer wall of the pairs, and means for defining a horizontally extending insertion groove positioned below said panels and below the bottom of said outer wall, said groove facing away from said drawer member.

4,173,381

ELECTRICAL CONNECTORS

Reginald H. Allmark, Cheadle, and Norman Bottoms, Wilmslow, both of England, assignors to International Computers Limited, London, England

Filed Feb. 13, 1978, Ser. No. 877,234
Claims priority, application United Kingdom, Feb. 17, 1977, 6638/77
Int. Cl.[2] H01R *7/08*
U.S. Cl. 339—17 LM 4 Claims



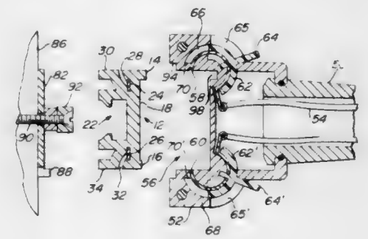
1. An electrical connector including a core comprising at least two resilient elongate members maintained in spaced relationship by a rigid spacing member, a flexible circuit comprising conductive tracks on one surface of a strip of flexible insulating material, the flexible circuit being wrapped around the core so as to cover the resilient elongate members such that the tracks extend substantially circumferentially around the core; a channel having spaced apart walls in the rigid member for receiving the two end regions of the strip; and means separate from the resilient members for simultaneously locking the two end regions of the strip into the channel by pushing the strip end regions against the walls.

4,173,382

PORTABLE TRACK LIGHTING

Donald J. Booty, 513 Durham Dr., Frankfort, Ill. 60423

Continuation-in-part of Ser. No. 763,184, Jan. 27, 1977, Pat. No. 4,099,817. This application Oct. 27, 1977, Ser. No. 845,991
Int. Cl.[2] H01R *13/60*
U.S. Cl. 339—22 B 13 Claims



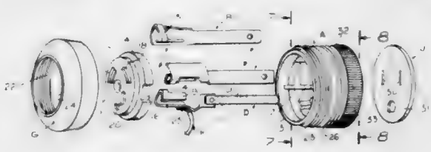
6. Apparatus comprising an elongated track having a recess on a rear face thereof, said track having a pair of elongated spaced electrical conductors with each conductor being accessible from a discrete outside face of the track, bracket means adapted to be rotatably supported by a wall, said bracket means including a locking means which can enter said track recess in one rotative position thereof and releasably lock the track to the bracket means in another rotative position thereof, a housing having a recess, said track being disposed within said recess so that said housing overlies said discrete outside faces of the track, said housing having a pair of contacts, each contact being movable from an inoperative position within said housing to an operative position wherein each contact projects out of the housing and engages one of said conductors, and actuator means on said housing for moving said contacts between their operative and inoperative positions including a discrete actuator being attached to each contact, each actuator extending through a separate opening in said housing.

4,173,383

CONVERTER PLUG

Hop Lee, 2455 24th Ave., San Francisco, Calif. 94116

Filed Aug. 28, 1978, Ser. No. 937,470
Int. Cl.[2] H01R *3/06, 13/54*
U.S. Cl. 339—75 P 2 Claims



1. A converter plug comprising:

(a) a main body with two recesses to receive the hook-shaped ends of two electrodes and a third recess to receive the hook-shaped end of a "ground" terminal;

(b) a pair of electrodes having hook-shaped ends and a

"ground" terminal having a hook-shaped end mounted in the three recesses;

(c) a locking disc rockably mounted in said main body and covering the hook-shaped ends of the two electrodes and said "ground" terminal, said disc having two arcuate slots for receiving two prongs of a standard three prong plug, the disc also having an L-shaped slot for receiving the hook-shaped end of a third prong on the standard plug; and

(d) means for limiting the rotation of said disc with respect to said main body when the three slots in the disc are substantially out of registry with the hook-shaped ends of the two electrodes and "ground" terminal so that the three prongs of the standard plug can enter the three slots in the disc, the three hook-shaped ends of the three prong standard plug interlocking with the hook-shaped ends of the two electrodes and "ground" terminal when the standard plug is rotated with respect to the main body a predetermined distance for electrically connecting the standard plug to the main body of the converter plug.

4,173,384

FLEXIBLE CO-AXIAL CONNECTOR FOR CABLE IN-LINE ELECTRONICS

Raymond J. Phillips, Oakdale, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 23, 1978, Ser. No. 936,541
Int. Cl.[2] H01R *13/56*
U.S. Cl. 339—101 **5 Claims**



1. A flexible electrical connector system for inhibiting rotation comprising:

an insulated electrical connector having a split end and an electrical feedthrough with said split end adapted for connecting an electrical wire and the end opposite said split end suitable for receiving an external electrical conductor.

a spring cap having a split end suitable for abutting said insulated electrical connector split end so as to prevent relative rotation between said spring cap and said insulated electrical connector, said spring cap further having a first aperture adapted for passing through said electrical wire and a second aperture;

a flexible spring having one end inserted in said second aperture of said spring cap and adapted to have said electrical wire fed axially through said spring; and

a spring seat having a first aperture adapted to pass through said electrical wire and a second aperture having the other end of said flexible spring inserted therein.

4,173,385

WATERTIGHT CABLE CONNECTOR

John W. Fenn, Agincourt, and James R. Stokes, Bowmanville, both of Canada, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

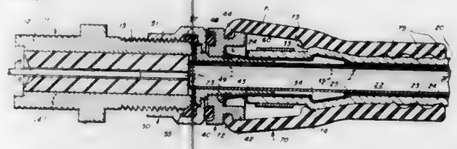
Filed Apr. 20, 1978, Ser. No. 898,276
Int. Cl.[2] H01R *13/34, 13/54*
U.S. Cl. 339—177 E **11 Claims**

1. An electrical connector assembly for terminating a coaxial cable including inner and outer conductors, an insulating member separating said conductors and an outer insulating layer covering the outer conductor, said connector assembly comprising:

a tubular conductive connector stem having a terminal end and a mating end and dimensioned to be mounted coaxially over the insulating member of the associated cable with said terminal end disposed between the insulating member and the outer conductor of the associated cable;

an annular collar diposed coaxially about said stem and having an annular retaining flange extending therefrom;

an outer sleeve having an annular lip at one end, said sleeve being mounted coaxially about the associated cable in sealing engagement therewith, and said lip resiliently engaging said annular retaining flange in sealing relationship;



a coupling nut rotatably carried by the mating end of said stem adjacent to said collar for coupling to a compatible connector component;

first annular seal means disposed between said coupling nut and said collar in sealing engagement with each; and

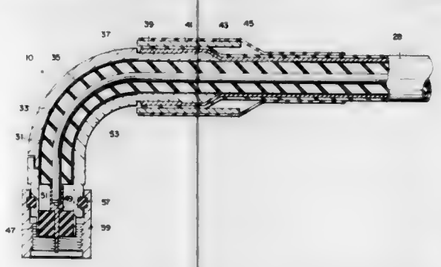
second annular seal means disposable between said coupling nut and the compatible connector component for sealing engagement with each.

4,173,386

COAXIAL ASSEMBLY

Roger S. Kauffman, Newark, and Donald L. Slothour, Wilmington, both of Del., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Mar. 13, 1978, Ser. No. 882,185
Int. Cl.[2] H01R *17/08*
U.S. Cl. 339—177 R **17 Claims**



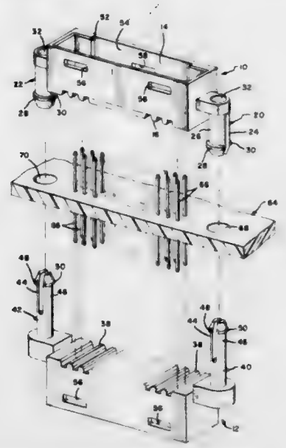
1. A connector for a coaxial cable for transmitting energy therethrough, the cable including a center conductor, an insulating medium, an outer cylindrical conductive shield and an outer jacket, the connector comprising: a tube having between its ends a bent portion said tube having a body and a cap, said body having a tubular cross-section at its mating end and said cap extending along at least a portion of said body, said body and said cap being separable for receiving therebetween a terminal portion of said center conductor, said insulating medium and said conductive shield; said body including electrically conductive means for forming an electrical connection with said conductive shield; and means for joining said cap to said body to form said tube after receipt of said terminal portion of said insulating medium and said conductive shield in said body.

4,173,387

SNAP-ON PIN HEADER

Dale R. Zell, Elizabethtown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 28, 1978, Ser. No. 890,887
Int. Cl.[2] H01R *13/02*
U.S. Cl. 339—196 M **8 Claims**



1. A snap-on header assembly comprising:

first and second header members each having a substantially rectangular profile defining a connector receiving cavity therein,

a base of each said cavity having a plurality of pin apertures therein aligned to receive a like plurality of pins therethrough, and

mounting leg means at each end of said members, the mounting leg means of said first connector member each being defined by a pair of spaced, integral, depending leg portions having an outer arcuate profile and an inner axial bore therebetween, and an outwardly directed arcuate shoulder on the free end of each of said leg portions; and

the mounting leg means of said second member each being defined by a pair of leg portions together having an outer cylindrical profile with a slot between said leg portions and outwardly directed shoulders on the free ends thereof, said leg means of said second member being dimensioned to be received through said bores of said first leg means with the shoulders engaging on the far side thereof.

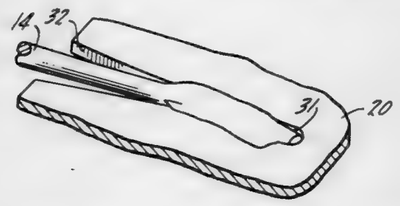
4,173,388

CONNECTOR-CABLE WITH CRIMPED ELECTRICAL TERMINATIONS

Edward P. Brandeau, Willimantic, Conn., assignor to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 771,109, Feb. 23, 1977, abandoned.
This application Jun. 26, 1978, Ser. No. 918,813
Int. Cl.[2] H01R *11/08*
U.S. Cl. 339—276 T **11 Claims**

8. A fine wire termination plate member having a wire receiving slot with at least one open side extending along an axis, said open side defining an open throat substantially wider than the diameter of the wire to be terminated, said slot and said throat merging smoothly one into the other without substantial



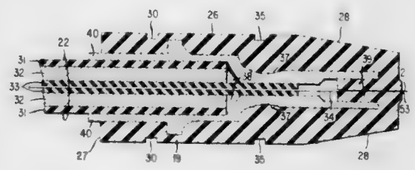
discontinuities, and said open side tapering from said throat to a width somewhat narrower than said wire diameter.

4,173,389

MOLDED OPTICAL FIBER CONNECTOR

Lyn Curtis, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 28, 1977, Ser. No. 837,398
Int. Cl.[2] G02B *5/14;* **B29D** *11/00*
U.S. Cl. 350—96.20 **10 Claims**



1. In a method of molding an optical fiber connector having a precisely formed mating surface, the steps comprising:

providing a molding die having a cavity with a predetermined shaped portion at one end for defining the mating surface and an axis, the other end of said cavity having a base wherein at least one orifice is located precisely in respect to said axis;

guiding an optical fiber through a first end of an elongated sleeve-like member to form a subassembly, said member being hollow throughout its length for passing said fiber;

positioning the first end of said member of said subassembly in said cavity so that said optical fiber is precisely located with respect to said axis while the other end of said member is in the proximity of the predetermined shaped portion of said cavity;

filling said cavity with a filler material so that said member accepts a flow of filler material including any gas pockets formed in the filler material to allow complete filling and conforming to the predetermined portion; and

solidifying said filler material to form a durable molded body around said optical fiber.

4,173,390

FIBER OPTIC T-COUPLER

Alfred Käch, Untersiggenthal, Switzerland, assignor to Patelhold Patentverwertungs- & Electro-Holding AG, Glarus, Switzerland

Filed Jan. 31, 1977, Ser. No. 763,826
Claims priority, application Switzerland, Mar. 16, 1976, 3231/76
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.16 **20 Claims**

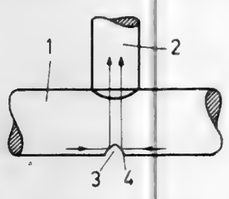
1. A fiber-optics T-coupler comprising:

a solid transparent primary core provided for transmitting a

light therethrough, said primary core having a circular cross-section;

a branch core arranged at right angles to said primary core and forming said T-coupler;

said primary core having at least one recess formed therein, said recess provided with means defining a reflective surface for deflecting light passing through said primary



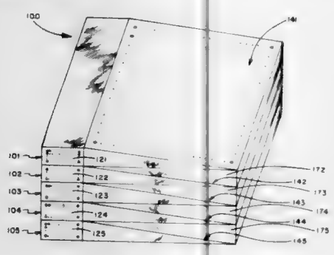
core and incident upon said reflective surface towards said branch core, said reflective surface having a curvature which cooperates with the curvature of said cross-section of said primary core to transmit light travelling in the longitudinal direction of said primary core onto said reflective surface and into said branch core in a manner similar to that of a plano-convex lens.

4,173,391

THREE DIMENSIONAL DISPLAY

Alexander Schure, Old Westbury, N.Y., and William E. Glenn, Ft. Lauderdale, Fla., assignors to New York Institute of Technology, Old Westbury, N.Y.

Filed Apr. 6, 1978, Ser. No. 893,958
Int. Cl.[2] G02B 5/16
U.S. Cl. 350—96.25 **4 Claims**



1. Apparatus for receiving a plurality of two-dimensional images and for generating a three-dimensional display from said images, comprising:

a plurality of fiber optical image magnification units, each unit comprising an input surface defined by the input ends of a multiplicity of fiber optical strands which extend rearwardly and then sidewardly from the input surface and terminate at their output ends which define an output surface that is perpendicular to the input surface, said strands being supported in a transparent support medium;

said image magnification units being disposed one behind another with their output surfaces in substantially parallel relationship;

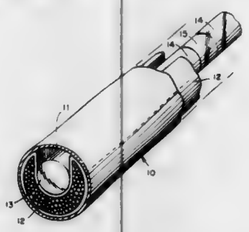
whereby upon application of said two-dimensional images to said input surfaces a three-dimensional image is generated by the output ends of said strands.

4,173,392

GLASS FIBER LIGHT GUIDE AND METHOD OF MAKING THE SAME

Michael H. Ekinaka, Irvine, and Richard B. MacAnally, Altadena, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 20, 1977, Ser. No. 817,152
Int. Cl.[2] G02B 5/17
U.S. Cl. 350—96.26 **22 Claims**



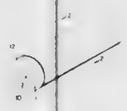
1. A method for making a low-friction abrasion-resistant glass fiber light guide, comprising the steps of lining the cavity of a mold with a thin flexible film; introducing into the lined cavity a multiplicity of generally parallel glass fibers and a liquid potting material capable of passing into a hardened state; covering the exposed fibers and potting material with a second thin flexible film; introducing an insert element into the cavity to reform the assemblage of films, potting material, and fibers into a final predetermined cross-sectional configuration; then allowing said potting material to pass into its hardened state to embed and fix said fibers against relative movement, and withdrawing said insert element.

4,173,393

OPTICAL WAVEGUIDE WITH PROTECTIVE COATING

Robert D. Maurer, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jun. 6, 1977, Ser. No. 803,771
Int. Cl.[2] G02B 5/14; C03C 25/02
U.S. Cl. 350—96.34 **11 Claims**



3. An optical waveguide comprising:

a transparent glass rod having a preselected index of refraction in the core thereof and a different index of refraction at the periphery thereof, and

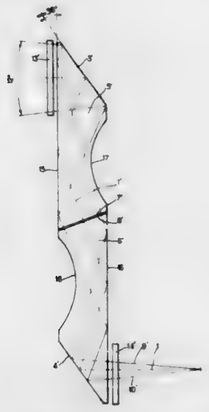
a coating of metallic glass around the periphery of said rod, said metallic glass being selected from the group consisting of at least one noble metal or transition metal and at least one metalloid.

4,173,394

PRISM COMBINATION PERISCOPE

Serge Clave, and Marcel Clave, both of 9 rue Olivier Metra, 7502 Paris, France

Filed Jul. 28, 1977, Ser. No. 819,676
Claims priority, application France, Sep. 20, 1976, 76 28172
Int. Cl.[2] G02B 13/08, 17/00
U.S. Cl. 350—181 **4 Claims**



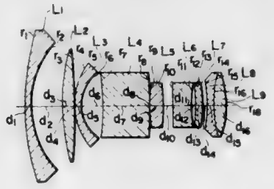
1. In a prismatic combination for periscopic viewing comprising two prismatic masses having two parallel respective light ray inlet and outlet faces and two parallel end faces inclined relative to said light ray inlet and outlet faces, respectively, the light ray entering the prismatic combination substantially normal to the inlet face being reflected from one end face after entering the combination and the light ray leaving the prismatic combination substantially normal to the outlet face being reflected from the other end face before leaving the combination, the inlet and the outlet directions of the light ray being substantially parallel, the improvement wherein the said end face on which the light ray is reflected after entering the combination and the said end face on which the light ray is reflected before leaving the combination are inclined at the same angle substantially less than 45° relative to said inlet and outlet faces, respectively, providing between the said two end faces a broken line optical path causing four reflections of light rays inside the combination, the first on one of said end faces, the second on said inlet face, the third on said outlet face and the fourth on said other end face.

4,173,395

WIDE ANGLE RETROFOCUS LENS SYSTEM

Koichi Kobayashi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1978, Ser. No. 891,360
Claims priority, application Japan, Apr. 2, 1977, 52/37995
Int. Cl.[2] G02B 9/64
U.S. Cl. 350—214 **5 Claims**



1. A wide angle retrofocus lens system, comprising: nine lenses grouped in eight lens components in the following order from the object side to the image side, the first lens component being a negative meniscus lens having a convex surface facing the object, the second lens component being a positive double convex lens, the third lens component being a negative meniscus lens having a convex surface facing the object, the fourth lens component being either a positive or a negative meniscus lens having a concave surface facing the object, the fifth lens component being either a positive meniscus lens having a convex surface facing the object or a positive double convex lens, the sixth lens component being a negative lens, the seventh lens component being a positive meniscus lens having a concave surface facing the object, and the eighth lens component comprising a double concave lens on the object side and a double convex lens on the image side cemented together to form a positive lens, said lens system satisfying the following conditions:

$$0.8f < \sum_{i=1}^{7} d_i < 1.2f. \quad (1)$$

$$0.28 < f/|f_8| < 0.76, \text{ where } f_8 < 0, \quad (2)$$

$$0.34f < d_7 < 0.65f, \quad (3)$$

$$0.35f < \sum_{i=9}^{13} d_i < 0.52f, \text{ and} \quad (4)$$

$$0.13 < f/|r_4| < 0.25, \text{ where } r_4 < 0, \quad (5)$$

wherein:

f is the focal distance of the overall lens system,

f_i is the resultant focal distance of the first through the i-th lens surfaces,

r_i is the radius of curvature of the i-th refracting surface, and

d_i is the spacing between the i-th lens surface and the (i + 1)-th lens surface, and wherein:

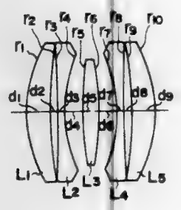
	1 : 3.5, f_b = 134.71, f/f_8 = −0.689		
	r	d	N/ν
L_1	r_1 = 207.46	d_1 = 5.36	n_1 = 1.51633/ν_1 = 64.1
	r_2 = 76.973	d_2 = 25.89	
L_2	r_3 = 168.06	d_3 = 9.82	n_2 = 1.58913/ν_2 = 61.1
	r_4 = 656.53	d_4 = 0.18	
L_3	r_5 = 57.78	d_5 = 5.71	n_3 = 1.51633/ν_3 = 64.1
	r_6 = 34.36	d_6 = 17.86	
L_4	r_7 = −234.66	d_7 = 38.39	n_4 = 1.51112/ν_4 = 60.5
	r_8 = −654.36	d_8 = 0.36	
L_5	r_9 = 119.40	d_9 = 10.71	n_5 = 1.83400/ν_5 = 37.3
	r_{10} = −302.61	d_{10} = 9.93	
L_6	r_{11} = −412.48	d_{11} = 14.71	n_6 = 1.74077/ν_6 = 27.8
	r_{12} = 93.34	d_{12} = 4.11	
L_7	r_{13} = −163.29	d_{13} = 5.07	n_7 = 1.80440/ν_7 = 39.6
	r_{14} = −74.33	d_{14} = 3.21	
L_8	r_{15} = −146.40	d_{15} = 5.36	n_8 = 1.64769/ν_8 = 33.8
L_9	r_{16} = 89.19	d_{16} = 10.71	n_9 = 1.69680/ν_9 = 55.5

-continued

$1:3.5, f_b = 134.71, f/f_b = -0.689$		
r	d	N/ν
$r_{17} = -71.99.$		

wherein:
L_i is the i-th lens from the object side,
f_b is the back focal length,
N is the refractive index, and
ν is the Abbe number.

4,173,396
COPYING LENS
Minoru Yokota, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Filed May 18, 1978, Ser. No. 907,344
Claims priority, application Japan, May 31, 1977, 52/62744
Int. Cl.[2] G02B 9/60
U.S. Cl. 350—216 **9 Claims**



1. In a lens system of five groups of five lens elements in which a front group of two lens elements and a back group of two lens elements are symmetrically arranged with a biconvex lens installed therebetween in the center of the lens system, a copying lens characterised in that each of the lens elements is constituted in sequence from the object by the first lens of a positive meniscus lens with its convex surface directed toward the object, the second lens of a biconcave lens, the third lens of a biconvex lens, the fourth lens of a biconcave lens, and the fifth lens of a positive meniscus lens with its convex surface being directed toward the image and in which the condition

$$0.2\,f < f_3 < 0.7\,f \quad (1)$$

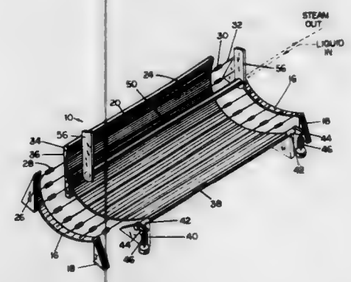
where,
f: overall focal length,
f_3: focal length of the third lens,
and the condition

$$0.01\,f < d_4 \text{ and } d_6 < 0.09\,f \quad (2)$$

where,
$d_1, d_2, d_3, \ldots d_9$: thickness of the lenses and air gaps counted in sequence from the object,
are fulfilled.

4,173,397
SOLAR CONCENTRATOR
John G. Simpson, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Nov. 30, 1977, Ser. No. 856,465
Int. Cl.[2] G02B 5/10
U.S. Cl. 350—295 **4 Claims**

1. In a solar concentrator, the improvement comprising:
A. a plurality of tensioned wires extended between a pair of arcuate base members for forming a frame of an elongated concave configuration, said wires being arranged in parallel with the axes thereof extended into intersecting relation with a common curve defined by said base members; and



B. a thin film of aluminized Mylar drawn taut over the frame with a reflective surface thereof assuming an elongated catenary configuration consistent with the configuration of the frame.

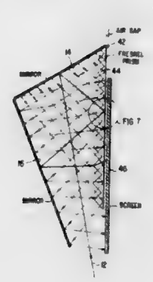
4,173,398
OPTICAL SYSTEM FOR OBJECTIVE EYE-EXAMINATION
Ikuzo Okamoto, Tamagawa, and Osamu Shindo, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 9, 1978, Ser. No. 885,051
Claims priority, application Japan, Mar. 11, 1977, 52-26685
Int. Cl.[2] A61B 3/10
U.S. Cl. 351—9 **5 Claims**



1. An optical apparatus for objective eye examination, comprising:
(a) means for generating two rotating pencil rays of infrared light each slightly displaced by different amounts from an optical axis,
(b) reflector means having a central opening therein angularly disposed on the optical axis,
(c) means for focusing said pencil rays in the vicinity of said reflector means opening,
(d) a dichroic mirror disposed on the optical axis beyond the reflector means for reflecting visible light and passing infrared light,
(e) a collimator lens disposed on the optical axis for paralleling any infrared light passed through the dichroic mirror,
(f) a fixed 90° wedge-shaped outward reflector angularly disposed on the optical axis,
(g) a movable 90° wedge-shaped inward reflector cooperable with the fixed reflector for varying the effective length of the optical axis,
(h) a focusing lens for forming an infrared light image on the pupil of an eye being examined, said image being projected on the eye retina and reflected thereby back along the optical axis,
(i) an image rotator disposed to receive returned infrared light reflected thereon by said reflector means,

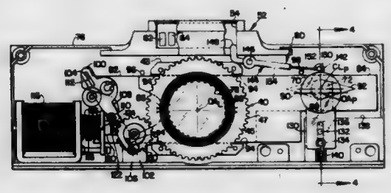
(j) a quadrant photodetector disposed to receive infrared light from said image rotator, and
(k) means for generating differential output signals from said photodetector outputs, whereby said movable reflector may be moved until said differential output signals reach an optimum value, the necessary degree of such movement being indicative of the refractive power of the eye.

4,173,399
COMPACT OPTICAL VIEWER FOR MICROFICHE OR CASSETTE
George J. Yevick, Leonia, N.J., assignor to Izon Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 717,858, Sep. 13, 1976, abandoned. This application Nov. 22, 1977, Ser. No. 854,001
Int. Cl.[2] G03B 21/28
U.S. Cl. 353—78 **19 Claims**



1. An optical projector of the type for projecting a cone of light from an illuminated microimage, including, a plurality of reflecting surfaces for intercepting and folding a cone of light, one of said reflecting surfaces reflecting light incident thereon at angles greater than a critical angle but which transmits light therethrough for any light incident thereon at angles less than the critical angle, characterized by, the one said reflecting surface defined by a prism sheet, and a viewing screen parallel and adjacent to but spaced from the prism sheet.

4,173,400
PHOTOGRAPHIC CAMERA APPARATUS
Faramarz Faramarzpour, Sudbury, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Feb. 2, 1978, Ser. No. 874,387
Int. Cl.[2] G03B 15/02, 7/00
U.S. Cl. 354—27 **11 Claims**

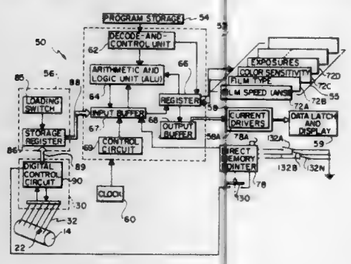


1. Photographic camera apparatus of the type which has a distinct ambient exposure mode of operation and a distinct flash exposure mode of operation in which an artificial light source is utilized to illuminate a scene to be photographed and which includes means for accommodating the positioning of photosensitive film in an exposure plane and an optical path along which scene light from within the apparatus's angular field of view may be transmitted to expose film located in the exposure plane, said apparatus further comprising:
light detecting means, including at least one photodetector having a photosensitive surface of predetermined size, for providing, at least during exposure, an electrical output signal having a characteristic which varies as a function of the intensity of scene light incident on said photodetector's photosensitive surface;
optical means structured to cooperate with said photodetector's photosensitive surface to define a predetermined angular light acceptance zone from which light from a scene is received by said apparatus and directed onto said photodetector's photosensitive surface;
means for moving at least part of said optical means between a first position, corresponding to said apparatus's ambient exposure mode of operation, in which said angular light acceptance zone of said apparatus is aimed in a first predetermined angular direction at a scene and a second position, corresponding to said apparatus's flash exposure mode of operation, in which said angular light acceptance zone of said apparatus is aimed in a second predetermined angular direction at a scene, said moving means operating in response to converting said apparatus from its said ambient exposure mode of operation into its said flash exposure mode of operation to displace said optical means part from its said first position to its said second position, said moving means and said optical means being configured and arranged with respect to one another and said photodetector's photosensitive surface so that said angular light acceptance zone is substantially the same size when aimed in either its first or second predetermined angular direction;
a blade mechanism;
means for mounting said blade mechanism for displacement between at least one blocking arrangement in which said blade mechanism precludes scene light from being transmitted along the optical path of said apparatus and an unblocking arrangement in which said blade mechanism defines at least one aperture value structured to transmit scene light along the optical path of said apparatus to expose photosensitive film located in the film plane;
drive means actuable to displace said blade mechanism between its blocking and unblocking arrangements; and
control means energizable at least in part by a source of electrical energy for monitoring said output signal of said light detecting means, for actuating said drive means to displace said blade mechanism from its said blocking arrangement toward its said unblocking arrangement thereby initiating an exposure interval during which scene light is transmitted along the optical path of said apparatus, and for integrating said output signal of said light detecting means beginning substantially at the commencement of said exposure interval and actuating said drive means when the time integral of said output signal reaches a predetermined value to displace said blade mechanism into its said blocking arrangement thereby terminating said exposure interval.

4,173,401
APPARATUS FOR DISPLAYING ALPHANUMERIC INFORMATION CODED ON A FILM CARTRIDGE
Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed May 15, 1978, Ser. No. 905,689
Int. Cl.[2] G03B 7/00, 13/02, 17/26
U.S. Cl. 354—21 **7 Claims**

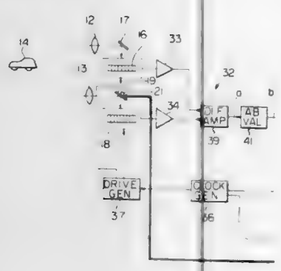
1. In a camera having means for receiving a film cartridge, the cartridge having code indicia representing a plurality of characteristics of film in the cartridge, the improvement comprising:
(a) means for sensing said indicia;
(b) means controlled by said sensing means for producing a first output signal representing said characteristics;
(c) characteristic selector means for providing a second output signal representing a film characteristic selected to be displayed;

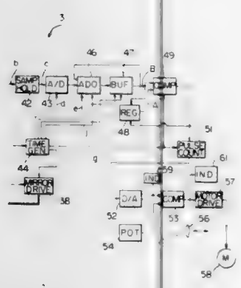
(d) randomly accessible memory means having addressable data storage locations for storing data representing respective characteristics of a variety of photographic films;
(e) electronic computer means, coupled to said signal producing means and said characteristic selector means, for receiving said first output signal and said second output signal, and, in response thereto, for (1) randomly accessing



said addressable data storage locations to retrieve data corresponding to a characteristic of the film in the cartridge that was selected, and (2) generating a third output signal corresponding to said retrieved data; and
(f) display means coupled to said computer means for receiving said third output signal and, in response thereto, for producing an alphanumeric display identifying said selected characteristic.

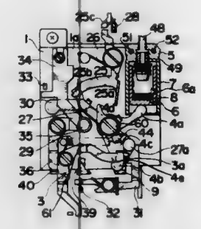
4,173,402
OPTOELECTRONIC SENSING APPARATUS
Masanori Horike; Isamu Shibata, and Ikuo Maeda, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Mar. 6, 1978, Ser. No. 883,838
Claims priority, application Japan, Mar. 10, 1977, 52-26386
Int. Cl.[2] G03B *13/20;* **G01C** *3/08*
U.S. Cl. 354—25 **10 Claims**





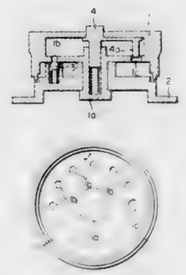
1. An optoelectronic sensing apparatus comprising:
a photosensor array including a plurality of photosensor elements for producing respective electrical signals having magnitudes corresponding to incident light intensity;
optical converging means for focussing a progressively changing light image onto the photosensor array;
reference signal means for producing a plurality of electrical reference signals equal in number to the signals;
strobe means for sequentially strobing the photosensor elements a predetermined number of times, each photosensor element producing the respective electrical signal when strobed;
subtractor means for comparing respective electrical signals and reference signals and producing electrical difference signals corresponding to differences therebetween;
minimum value sensor means for sensing a minimum absolute value of the difference signals; and
counter means for progressively counting a number of times the photosensor elements are sequentially strobed by the strobe means and producing an electrical count signal having a magnitude corresponding to a count of the counter means at which the minimum value of the difference signals is sensed by the sensor means.

4,173,403
SINGLE LENS REFLEX CAMERA WITH AUTOMATIC DIAPHRAGM CONTROL MECHANISM
Hiroshi Ueda, Nara; Shigeru Oyokota, Sakai, and Hideo Kajita, Chihayaakasaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Dec. 8, 1977, Ser. No. 858,790
Claims priority, application Japan, Dec. 9, 1979, 51-147133
Int. Cl.[2] G03B *19/12*
U.S. Cl. 354—152 **7 Claims**



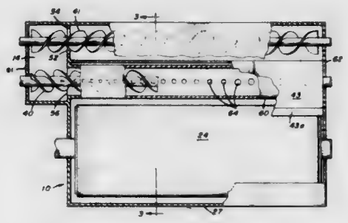
1. In a single lens reflex camera having a reflex mirror and adapted for use with an interchangeable lens detachably mounted on the camera body and having diaphragm and diaphragm control mechanisms including a coupling member adapted to be coupled with a camera mechanism provided in the camera body, said coupling member being interconnected with said diaphragm such that the diaphragm aperture is changed as a function of the position of said coupling member, said camera comprising:
diaphragm driving means movable from a first to a second position for stopping-down the diaphragm through said coupling member;
means for stopping the movement of said diaphragm driving means to determine the diaphragm aperture;
first delay means for delaying said diaphragm driving means;
mirror driving means movable from a cocked to an operating position for driving said reflex mirror;
restraining means for restraining said mirror driving means at said cocked position;
operating means movable from a retaining position for retaining said diaphragm driving means at said first position to an operating position for releasing said restraint on said mirror driving means, said diaphragm driving means being interlocked with said operating means to follow the latter when it moves from said retaining to said operating position; and
means for acting on said operating means to force the latter to release the restraint on said mirror driving means, said means for acting including second delay means for causing release of the restraint later than the determination of the diaphragm aperture.

4,173,404
SHUTTER DIAL DEVICE FOR CAMERA
Shigeo Akasaka, Kodaira, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan
Filed Nov. 15, 1977, Ser. No. 851,678
Claims priority, application Japan, Nov. 30, 1976, 51-159240[U]
Int. Cl.[2] G03B *17/18;* **G01D** *13/00*
U.S. Cl. 354—289 **2 Claims**



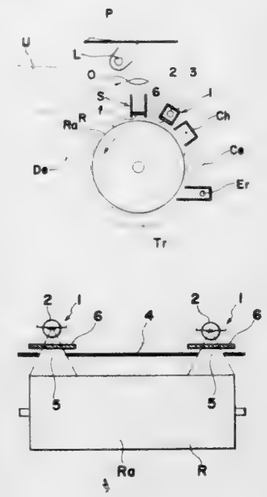
1. A shutter dial device for a camera having a shutter dial having a plurality of apertures for manual setting which are equal in diameter and formed on a circle centered at the rotary shaft of the shutter dial and a steel ball biased so as to be urged into each of said apertures, said apertures and said steel ball together constituting a click stop mechanism for manually setting the shutter speed, the improvement comprising:
an aperture for automatic setting formed on said circle of said shutter dial and having a diameter equal to or larger than the diameter of said steel ball; and
a release member provided on said shutter dial for stopping said steel ball in a position where half or more of said steel ball drops into said aperture for automatic setting and for forcing back said steel ball out of said aperture for automatic setting by manual operation.

4,173,405
DEVELOPER DISTRIBUTION APPARATUS
John P. Swapceinski, Bergen; Thomas K. Hilbert, Spencerport, and James A. McGlen, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 31, 1977, Ser. No. 847,382
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 DD **4 Claims**



3. In electrographic development apparatus including a development station where toner particles are removed during development, from developer having toner and carrier particles and at least one rotating auger for mixing toner and carrier particles and for transporting developer to said development station, the improvement comprising:
(a) a member disposed in said development station adjacent to said auger for supporting the developer as it is transported by said auger and having at least three openings of different sizes arranged so that developer transported by said rotating auger flows through said openings; and
(b) surface defining means disposed in said development station under said openings, said surface extending laterally and sloping downwardly so that developer flowing through said openings engages said surface, spreads laterally on said surface, moves downwardly under the influence of gravity, and is evenly distributed.

4,173,406
ELECTRICAL CHARGE REMOVING ARRANGEMENT FOR REMOVING CHARGE FROM NON-IMAGE BEARING PORTIONS OF PHOTO-SENSITIVE MEDIUM
Kenjiro Oyama, Toyokawa, and Koji Imaizumi, Aichi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Mar. 31, 1978, Ser. No. 892,862
Claims priority, application Japan, Apr. 22, 1977, 52-46965
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 R **12 Claims**



7. In a photocopying machine having a photosensitive medium, corona charging means for charging said photosensitive medium, exposure means including a light source for illumination of an original document to be copied and an optical system for projecting image light from the original document thus illuminated onto said photosensitive medium subsequent to charging thereof by said corona charging means in order to effect production of an electrostatic latent image of said original document on said photosensitive medium, a charge erasing arrangement directed toward said photosensitive medium and actuable to effect erasing of electrical charge from portions of said photosensitive medium which are unnecessary for production of the electrostatic latent image, said charge erasing arrangement comprising;
housing means;
charge erasing lamp means accommodated in said housing means, and filter means for wavelength range correction disposed between said charge erasing lamp means and said photosensitive medium for passing only light from said

charge erasing lamp means in a range of wavelengths approximately equal to the range of wavelengths of said image light from said exposure means.

4,173,407

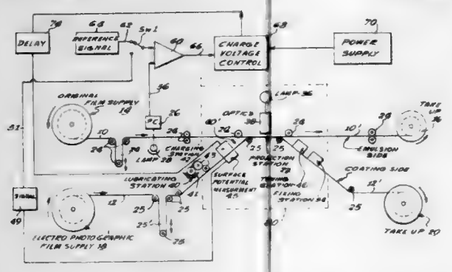
ELECTROPHOTOGRAPHIC CONTACT DUPLICATING APPARATUS AND METHOD

Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Information Systems, Inc., Bedford, Mass.

Continuation of Ser. No. 641,073, Dec. 15, 1975, abandoned, which is a continuation-in-part of Ser. No. 397,310, Sep. 14, 1973, Pat. No. 3,951,541. This application Oct. 14, 1977, Ser. No. 842,361

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—12 **39 Claims**



10. A method of duplicating images carried on a strip of photographic film, comprising,

A. providing an electrophotographic film having a coating of wholly inorganic, highly oriented crystalline photoconductive material on an ohmic layer which is in turn carried on a transparent polyester substrate, said electrophotographic film being transparent,

B. charging said coating of said electrophotographic film in darkness and independently of the photographic film,

C. moving said electrophotographic film strip after charging immediately into intimate face to face contacting engagement with said photographic film strip while maintaining the two strips in darkness,

D. projecting a beam of radiant energy through both strips while so engaged to produce a latent electrostatic image of the photographic image on the coating, and

E. separating the film strips and toning the latent image in darkness independently of the photographic film.

4,173,408

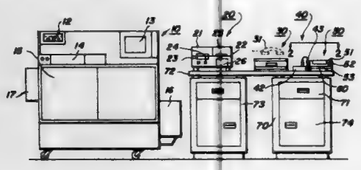
DEMAND PUBLISHING ROYALTY ACCOUNTING SYSTEM FOR AN ELECTROSTATIC COPIER

Donald E. Stewart, Arcadia, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 29, 1977, Ser. No. 828,576

Int. Cl.[2] G03G *15/00*; G06F *7/38*; G06G *7/00*

U.S. Cl. 355—14 R **19 Claims**



1. A transaction accounting system for automated copyright royalty accounting of copies made from copyrighted original documents, each document to be copied having a mark which identifies the copyright owner, said system comprising:

duplicating means on which the original document is positioned,

a machine reader for reading said mark on said original document,

transaction information input means for entering the number of copies to be produced, and

a control system for receiving the output of said machine reader, for receiving the output of said transaction information input means, for controlling said duplicating means to produce the entered number of copies, and for outputting transaction data which specifies the copyright owner and the number of copies produced.

4,173,409

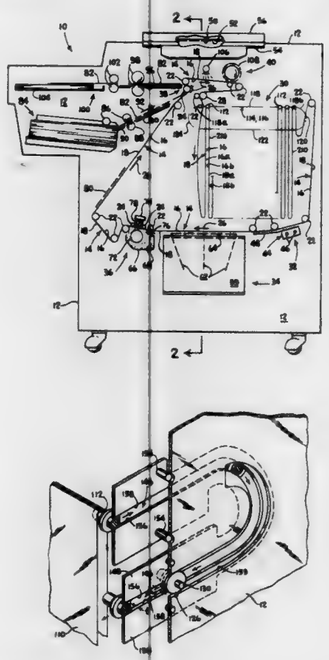
ELECTROSTATIC COPIER INCLUDING PHOTORECEPTOR STORING APPARATUS

James E. Genthe, Newtown, and Douglas I. Morrison, Norwalk, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Nov. 22, 1976, Ser. No. 743,781

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—16 **8 Claims**



1. A copier comprising:

(a) a photoreceptor, said photoreceptor comprising a movable flexible endless web having a light-sensitive outer surface and a non-image inner surface;

(b) means for forming an image on said outer surface of said photoreceptor;

(c) means for transferring the image from the photoreceptor to a copy sheet;

(d) means for storing a major portion of the photoreceptor in the form of a plurality of wavy U-shaped loops, said storing means including means for spacing the respective photoreceptor loops apart from next adjacent loops said spacing means including a plurality of pairs of spaced apart means for edgewise supporting the inner surface of said photoreceptor from the top of said loops in order to form said loops with the bottom of said loops being unsupported;

(e) means for intermittently moving said loops laterally in unison a predetermined distance through said storing means without moving said photoreceptor longitudinally through said storing means; and

(f) said means for spacing said photoreceptor loops including a plurality of movable carriers adapted to support said photoreceptor loops, each of said photoreceptor loops supported by at least one of said carriers, and said means for intermittently moving said loops including means for intermittently actuating said carriers.

4,173,410

METHOD OF DUPLEX COPYING

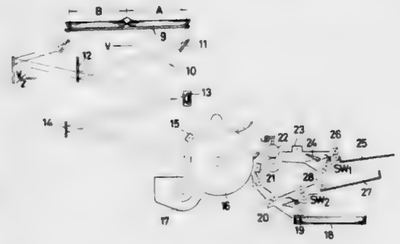
Yasuhiro Tabata, Kawasaki; Toyokazu Satomi, Yokohama; Yutaka Koizumi, Kawasaki; Isao Nakamura, Tokyo, and Tamaki Kaneko, Fujisawa, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jan. 26, 1978, Ser. No. 872,383

Claims priority, application Japan, Jan. 31, 1977, 52/9480

Int. Cl.[2] G03B *27/32, 15/00*; B65H *29/68*

U.S. Cl. 355—24 **8 Claims**



7. A duplex copying apparatus in which a toner image is transferred to a first and second side of a transfer sheet comprising: primary sheet feed means to feed the transfer sheet to a photoconductive drum and transfer a toner image on one side thereof, second sheet feed means to which the transfer sheet is then fed and from which the transfer sheet is fed to said photoconductive drum where another toner image is transferred to a second side of the transfer sheet and the transfer sheet is discharged to a sheet outlet tray, said second sheet feed means comprising, in combination, a base for stacking transfer sheets thereon; a front plate and a side reference plate adjacent said base and fixedly disposed normal to each other; and at least one movable plate disposed parallel to one of said front plate and said side reference plate and operable to bring transfer sheets into contact with both said front plate and said side reference plate so that the transfer sheets, in a stack, are lined up evenly.

4,173,411

EXPOSURE SYSTEM FOR COPYING MACHINES

Hans A. Massengeil; Otto Stemme, both of Munich; Rudolf Eppe, Taufkirchen; Josef Pfeifer, Unterhaching; Georg König, and Anton Schätz, both of Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

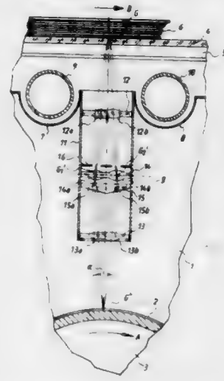
Filed Nov. 25, 1977, Ser. No. 854,750

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1976, 2654319

Int. Cl.[2] G03B *27/48, 27/50*

U.S. Cl. 355—50 **9 Claims**

1. In an exposure arrangement for copying machines, the exposure arrangement being of the type including an optical projection system and means for effecting relative movement between the projection system and an original to be copied in a predetermined direction to project onto a recording medium images of successive transverse strip-shaped sections of the original, the projection system comprising a plurality of lens-row systems, each lens-row system comprising a first row of lens elements operative for receiving light from a strip-shaped section of the original and projecting the received light into an intermediate image plane, each lens-row system comprising a second row of lens elements cooperating with the elements of the respective first row and operative for receiving light from the intermediate plane and projecting the received light onto the recording medium, the lens-row systems being spaced apart in a direction transverse to the direction of elongation of



the individual rows of lenses, the light passing through each lens-row system including a plurality of central rays, each central ray being a ray passing through the optical center of one lens element of the first row of the lens-row system and also passing through the optical center of the corresponding lens element of the second row of the lens-row system,

the improvement comprising the provision of optical deflecting means located in the light path of the projection system and operative for causing the central rays of the lens-row systems to converge both in the vicinity of the original and in the vicinity of the recording medium.

4,173,412

STRAIN MEASUREMENT

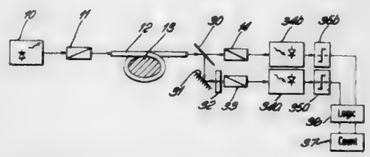
Melvin M. Ramsay, Harlow, and Stephen Wright, London, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,008

Claims priority, application United Kingdom, Jul. 1, 1976, 27438/76

Int. Cl.[2] G01B *11/16*; G01J *4/04*

U.S. Cl. 356—33 **10 Claims**



1. A method of measuring the magnitude of strain in at least one optical fiber of circular symmetry comprising the steps of:

straining the fiber over a portion of its length in a direction perpendicular to the fiber axis;

propagating polarized light through the fiber while under strain;

monitoring the polarized light propagating through the fiber to determine the strain-induced difference in phase veloc-

ity of two orthogonal fundamental modes of the propagated light; wherein the strain is applied to one single fiber and wherein the strain induced phase velocity difference of the two orthogonal fundamental modes is measured by polarized light having components in and perpendicular to the strain direction into one end of the fiber and exiting the light from another end of the fiber; and

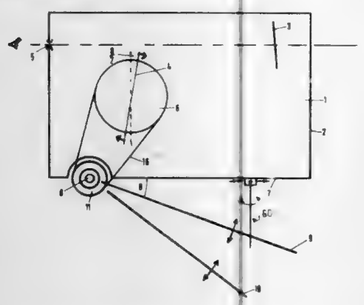
splitting the light emerging from the fiber into two components each of said components passing to an associated photodetector through an associated linear polarization analyzer having a polarization axis aligned at 45° to the strain direction wherein only one of said analyzers is prefaced with a quarter-waveplate with its optic axis aligned at 45° to the polarization axis of the analyzer.

4,173,413

NAVIGATION INSTRUMENT

Gordon K. Clatworthy, Woodlands, Glanconway, Colwyn Bay, Clwyd, Wales, and Edwin Ward, 4 Birch Way, Harpenden, Hertfordshire, England

Filed Aug. 15, 1977, Ser. No. 824,609
Int. Cl.² G01C *1/02*
U.S. Cl. 356—145 **6 Claims**



1. An instrument for taking bearings between objects and plotting them, comprising:

a body member having a straight edge,

a first mirror mounted in the body member,

eyepiece means for viewing a first object through the body member over said first mirror, said first mirror being mounted at an angle to a line along which said first object is viewed,

an arm member, having a straight edge, pivoted to the body member at a pivot axis, wherein said respective straight edges of said body member and arm member intersect at said pivot axis, and wherein said straight edges extend substantially the entire length of said instrument,

a further, passive arm member having a straight edge intersecting the pivot axis pivoted on the pivot axis to the body member, on the same side of the body member as said first-mentioned arm member, means for locking together the two arm members, and means for locking each of the arm members relative to the body member,

a second mirror mounted in the body member,

a reduction drive connecting said arm member to said second mirror, so that as said arm member is turned, said second mirror is constrained to rotate in the same direction and through half the angle that said arm member turns through,

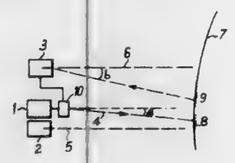
the angle of said first mirror to said line being such that light rays reflected from the second mirror to the first mirror are reflected from the first mirror to the eyepiece means along said line, to achieve a condition of coincident images.

4,173,414

METHOD AND APPARATUS FOR CORRECTING THE AIMING OF AN OPTICAL ILLUMINATOR ON A TARGET

Jean-Marie Vauchy, St-Cloud, and Dominique de Ponteves, Flers, both of France, assignors to Societe de Fabrication d'Instruments de Mesure (S.F.I.M.), Massy, France

Filed Mar. 17, 1977, Ser. No. 778,499
Claims priority, application France, Oct. 18, 1976, 76 31252
Int. Cl.² G01B *11/26;* **F41G** *7/00*
U.S. Cl. 356—152 **15 Claims**



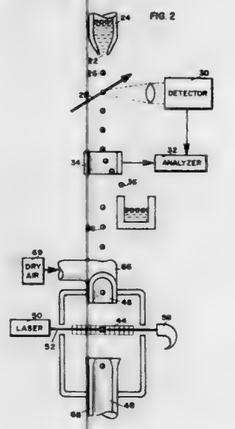
1. A method for correcting the aiming of target aiming apparatus that includes an optical illuminator directed at a target observed by means of a sighting system, wherein the aiming correction is in response to a difference between the direction of the reflected light from the target and the axes of the sighting system and the optical illuminator, said axes being harmonized to be parallel or of a predetermined convergence, the method comprising electro-optically detecting the direction of maximum light of the illuminator reflected by the target, measuring the angle formed by this direction and the sighting direction and utilizing the result of this measurement to control an orientation of the optical axis of the illuminator or of the optical axis of the sighting system with the result that the direction of maximum light of the illuminator reflected by the target coincides with the optical axis of the sighting system.

4,173,415

APPARATUS AND PROCESS FOR RAPIDLY CHARACTERIZING AND DIFFERENTIATING LARGE ORGANIC CELLS

Philip J. Wyatt, Santa Barbara, Calif., assignor to Science Spectrum, Inc., Santa Barbara, Calif.

Filed Aug. 20, 1976, Ser. No. 716,278
Int. Cl.² G01N *15/02*
U.S. Cl. 356—336 **33 Claims**



1. A process for analyzing the cells of a size substantially

larger than a wavelength of visible light, the cells being in a liquid suspension, the process comprising the steps of:

Aerosolizing the suspension of cells to produce a series of droplets, some of which contain a cell;

Separating those droplets containing a cell from the other droplets which do not contain cells;

Illuminating in sequence the separated cells with a beam of monochromatic radiation of a wavelength which, when compared to the size of the cell, is in the resonance region;

Detecting radiation intensities of a given polarization scattered by each illuminated cell to obtain a differential scattering pattern characterizing the size, shape, and dielectric properties of each cell; and

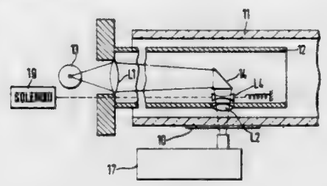
Recording the detected patterns to characterize the illuminated cells.

4,173,416

SCANNING HEADS FOR TRANSPARENCIES

Peter C. Pugsley, Pinner, and Michael J. Perriman, Harpenden, both of England, assignors to Crosfield Electronics Limited, London, England

Filed Jun. 22, 1977, Ser. No. 808,799
Claims priority, application United Kingdom, Jun. 26, 1976, 26698/76
Int. Cl.² G01N *21/06*
U.S. Cl. 356—432 **5 Claims**



1. Apparatus for image scanning and analysis comprising a transparency support and a photoelectric image analyzer mounted for relative movement either for continuous scanning of an image bearing transparency placed on the support or discontinuously under the control of an operator, the image analyzer comprising a light source, means for directing light from the source to a spot on the transparency, and photoelectric means for receiving light from the source which is passed through the transparency and generating a signal corresponding thereto, wherein the improvement comprises means, for use in a parameter-setting operation preliminary to scanning, comprising:

means under the control of an operator for relatively moving the image analyzer and the transparency support to select for analysis a spot on the transparency; and

measuring means including:

means for illuminating the spot on the transparency selected by the operator with a focused light beam for a predetermined period insufficient for the focused light beam to cause bleaching of the transparency; and

sampling means operable to sample and hold the value of the signal derived from the photoelectric means during said predetermined period of illumination of said spot with a focused beam.

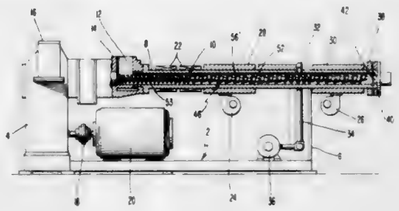
4,173,417

EXTRUSION APPARATUS AND METHOD

George A. Kruder, Marion, Ohio, assignor to HPM Corporation, Mount Gilead, Ohio

Continuation-in-part of Ser. No. 788,028, Apr. 15, 1977, abandoned. This application Jun. 26, 1978, Ser. No. 917,204
Int. Cl.² B29B *1/06*
U.S. Cl. 366—89 **20 Claims**

1. In plasticating apparatus of the type in which a rotating screw is disposed within and cooperates with the inner wall of a barrel provided with inlet and outlet openings and wherein particles of synthetic resinous material are introduced through said inlet opening and into a helical passage formed by conveying flight means of said screw, plasticated by said rotating screw and advanced toward said outlet opening, the improvement comprising a screw having a section for assuring complete melting and mixing of said resinous material, said screw section including outwardly extending barrier flight means disposed intermediate said conveying flight means to divide said passage into channels extending side by side helically along said screw section, each of said channels having a depth which varies cyclically through at least four cycles along the



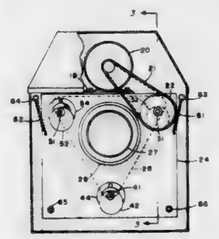
helical length of such channel, the minimum depth portions of the channels on opposite sides of said barrier flight means defining wave crests which are displaced helically from each other, and the barrier flight means adjacent each wave crest being undercut to provide sufficient clearance between its outermost surface and the inner barrel wall to permit the flow thereover of molten resinous material from the channel containing an area of decreasing depth to an adjacent area of the other channel, the outer width of said barrier flight means being shorter than that of said conveying flight means, and being less than eight percent of the screw pitch, so that the shear energy imparted to molten material flowing over said barrier flight means is low.

4,173,418

APPARATUS FOR MIXING LIQUIDS

William D. Vork, Edina, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed Jun. 29, 1978, Ser. No. 920,457
Int. Cl.² B01F *11/00*
U.S. Cl. 366—128 **19 Claims**



1. An apparatus for mixing paint and the like in closed containers, comprising

(a) a box-like frame assembly

(b) a mounting plate vertically suspended from said frame assembly, said mounting plate having an enlarged hole therethrough and three bearing assemblies approximately equally spaced about said enlarged hole;

(c) a crankshaft passing through each of said bearing assemblies and through an aligned opening in said mounting plate;

(d) a drive pulley attached at one end of one of said crankshafts;

(e) rotary drive means attached to said mounting plate and coupled to said drive pulley in driving engagement; and

(f) a shaker plate having respective bearing assemblies coupled to each of said crankshafts said shaker plate having rigidly attached thereto a cylindrical housing, said housing passing through said enlarged hole in said mounting plate.

15. A method of mixing liquids such as paint in a closed cylindrical container, comprising the steps of rotating said container about its own axis and simultaneously moving said container over a closed path in a plane which is normal to said container axis, said closed path being circumscribed about an axis which is parallel but not coincident with said container axis.

4,173,419

ROTARY MIXER

Arie Blok, 1422 Overlea Dr., Dunedin, Fla. 33528

Continuation-in-part of Ser. No. 703,126, Jul. 7, 1976, Pat. No. 4,062,776. This application Dec. 8, 1977, Ser. No. 858,776

Int. Cl.[2] B01F *9/06*

U.S. Cl. 366—228 **3 Claims**



1. A mixer comprising a frusto-conical drum having a large inlet end and a restricted open outlet end, means for supplying a mixture of sludge and a flocculating polymer to said inlet end, support means supporting said drum for rotation about a generally horizontal axis, and drive means for rotating said drum on said support means, said drum including an imperforate wall, a series of baffles mounted on said wall internally of said drum in circumferentially spaced relation to each other and extending longitudinally and generally radially inwardly of said drum for stirring said mixture of sludge and polymer while minimizing carrying of said mixture upwardly to the top of said drum during rotation thereof, said mixer being further characterized in that the number of baffles of each series diminishes from the inlet end to the outlet end for providing adjacent said outlet end a relatively gentle handling of flocs formed from said mixture as compared to the mixing action caused by said baffles adjacent said inlet end.

4,173,420

PAPER FEEDING MECHANISM IN A PRINTER

Katsuhiko Okabe, Tokorozawa, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Mar. 31, 1978, Ser. No. 892,269

Claims priority, application Japan, Apr. 5, 1977, 52-38691; Apr. 18, 1977, 52-48739[U]

Int. Cl.[2] B41J *15/22*

U.S. Cl. 400—618 **3 Claims**

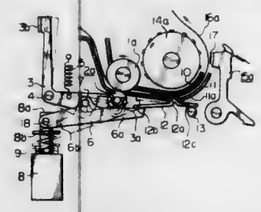
1. A paper feeding mechanism in a printer having a continuously rotating feeding roller which is capable of feeding recording paper, a pressure roller cooperating with said feeding roller for feeding said recording paper sandwiched between said feeding roller and said pressure roller along a paper guide means, and a printing ring cooperating with a printing hammer for printing upon recording paper fed therebetween, said paper feeding mechanism comprising:

a swingable lever supporting at least one of said feeding roller and said pressure roller;

means for resiliently urging said one of said feeding roller and said pressure roller into disengageable engagement with the other but with said recording paper sandwiched therebetween and fed by said continuously rotating paper feeding roller;

an actuating lever pivoted to said swingable lever intermediate their ends;

a paper arresting means contacting said actuating lever at one end so as to cooperate with the operation thereof and



adapted to be actuable so as to releasably contact and arrest said recording paper; and

driving means to which said actuating lever is pivoted at the other end of said actuating lever, said driving means driving said actuating lever when said driving means is actuated;

wherein said swingable lever and said paper arresting means are so arranged with respect to said actuating lever that, when said actuating lever is actuated by said driving means, said swingable lever is urged to move one of said paper feeding roller and said pressure roller apart from the other, so as to inactivate the feeding of said paper by said paper feeding roller while said paper arresting means is actuated by said actuating lever to arrest said paper.

4,173,421

SHIELD APPARATUS FOR USE IN TUNNELLING OR MINING

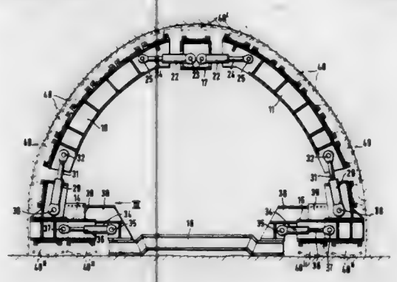
Karl Harhoff, and Heinz Hüsemann, both of Werne, Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Oct. 7, 1977, Ser. No. 840,447

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646552

Int. Cl.[2] E21D *19/00*

U.S. Cl. 405—291 **5 Claims**



1. In a shield apparatus for driving tunnels or the like comprising two axially spaced apart support frames each of generally arch-shaped configuration, drive members supported on the outer sides of the frames, the drive members extending in the axial direction, and means for shifting one frame relative to the next in the axial direction, the improvement comprising support frames each assembled from:

two transversely spaced apart floor components,

a ridge component,

two transversely spaced apart outwardly arcuate side components, each side component having upper and lower ends, the upper end thereof being adjacent a respective side of the ridge component, the lower end thereof being disposed above a respective one of the floor components,

a pair of first telescopic guide means, each comprising a first member rigid with one of the floor components and a second member pivoted to the associated side component about an axis extending axially of the apparatus,

a pair of second telescopic guide means, each comprising a member rigid with a respective side component and a member pivoted to the ridge component about an axis extending axially of the apparatus,

a pair of first hydraulic ram means, each acting between the ridge means and a respective side component, and

said arcuate side components being supported solely at said upper and lower ends.

4,173,422

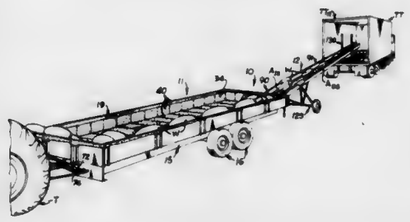
PRODUCE HANDLING SYSTEM

Benjamin R. Baker, Rte. 1, Norman Park, Ga. 31771, and Mickey C. Baker, Rte. 2, Moultrie, Ga. 31768

Filed Feb. 13, 1978, Ser. No. 876,887

Int. Cl.[2] B65G *67/24*

U.S. Cl. 414—390 **7 Claims**



1. In a produce handling system for relative heavy fragile produce such as watermelons, cantaloupes and the like, a trailer comprising:

a trailer frame including ground engaging wheels;

a bed carried by said frame, defining a produce receiving bin therein, and defining a conveyor channel along the length of the bottom of said bin; and,

a trailer unloading conveyor mounted in and extending along said conveyor channel, said conveyor including a support pan extending along the length of said conveyor channel and having a generally V-shaped cross-sectional configuration transversely of said conveyor channel so that said support pan extends across the width of said conveyor channel, a trailer idler unit at one end of said conveyor channel, a trailer drive unit at the opposite end of said conveyor channel, and an endless conveyor belt extending over said support pan, and around said idler unit and said drive unit so that said support pan supports said conveyor belt along opposite edges thereof when said conveyor belt is unloaded with said conveyor belt forming a natural catenary shape not in contact with said support pan between the opposed edges of said conveyor belt to cushion the produce being placed on said conveyor belt as said conveyor belt moves along said conveyor channel so that the support channel supports those portions of said conveyor belt between said opposed edges thereof distorted out of the catenary shape by the weight of the produce thereon to prevent damage to the produce as said conveyor belt supports and moves the produce from said produce receiving bin.

4,173,423

TRASH BIN LOADER AND COMPACTOR FOR TRASH COLLECTING VEHICLES

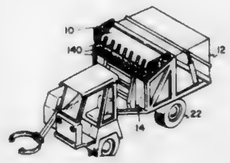
John W. Pickrell, 4206 N. 68th St., Scottsdale, Ariz. 85251

Division of Ser. No. 770,398, Feb. 22, 1977, Pat. No. 4,113,120. This application Jul. 10, 1978, Ser. No. 922,849

The portion of the term of this patent subsequent to Sep. 12, 1995, has been disclaimed.

Int. Cl.[2] B65F *3/02*

U.S. Cl. 414—404 **5 Claims**



1. A system for handling municipal trash comprising: a front loading vehicle; said vehicle having a steerable chassis; a container removeably mounted on said chassis; means on the front of said vehicle for handling household trash containers and moving them upwardly and backwardly into an upsidedown position; said container having means for receiving trash from said household trash container; a trash compactor actuator on said vehicle chassis; and means for power operating said trash compactor actuator; said container having a pivotal portion operable by said compactor actuator; said pivotal portion being a forward wall of said container moveable about a pivotal axis near the forward lower portion of said container and openable at the upper forward portion thereof; and means to secure and release said forward wall from the trash compactor actuator when the container is loaded and unloaded from the vehicle chassis.

4,173,424

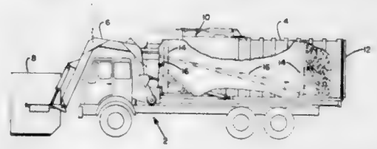
AUTOMATIC PACKING SYSTEM FOR REFUSE VEHICLE

James S. Whitehead, Rockdale, Tex., and Thomas M. Lawson, Knoxville, Tenn., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 21, 1977, Ser. No. 760,897

Int. Cl.[2] B65F *3/14, 3/20*

U.S. Cl. 414—517 **4 Claims**



1. An automatic packing mechanism for refuse compaction bodies including:

a compaction head inside the compaction body and extending across the compaction body,

an hydraulic cylinder connected to said compaction head and to the front of the compaction body,

hydraulic fluid circuit means connected to the hydraulic cylinder so that pressurized hydraulic fluid can flow to and from the hydraulic cylinder to extend and retract the hydraulic cylinder to thereby move the compaction head longitudinally back and forth within the compaction body,

hydraulic cylinder control means including:

(a) a control valve in the fluid circuit means having a first position to direct fluid to the hydraulic cylinder to cause

the cylinder to extend and advance the compaction head rearwardly through the compaction body and a second position to direct fluid to the hydraulic cylinder to cause the cylinder to retract and to return the compaction head back to the front of the compaction body.

(b) an advance solenoid and a return solenoid operatively associated with the control valve to move the valve to the first position and second position respectively upon energization of each solenoid,

electrical circuitry connected to the advance and return solenoids including:

(a) means to energize the advance solenoid

(b) a first pressure sensitive switch positioned in the hydraulic fluid circuit means to sense hydraulic fluid pressure and to close electrical contacts when the fluid directed to the hydraulic cylinder to extend the cylinder reaches a preset pressure,

(c) a first electrical timer positioned electrically in series with the first pressure switch whereby said timer is activated when fluid to the hydraulic cylinder reaches the preset pressure,

(d) electrical contact means associated with the first electric timer to de-energize the advance solenoid and to energize the return solenoid to thereby return the compaction head to the front of the compaction body after the first electric timer has been activated for a preset, relatively short length of time,

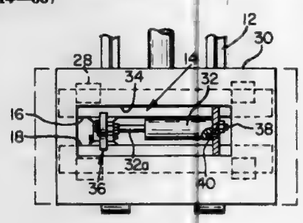
(e) a second pressure sensitive switch positioned in the hydraulic fluid circuit means to sense hydraulic fluid pressure and to de-energize the return solenoid when the pressure of fluid from the hydraulic cylinder as the cylinder retracts drops below a preset low pressure level.

4,173,425

QUICK COUPLING FOR SIDE SHIFT CYLINDER OF LIFT TRUCK ATTACHMENT

Thomas E. Dixon, and Jerry L. Chapman, both of Portland, Oreg., assignors to Brodi Equipment, Inc., Longview, Wash.

Filed Apr. 17, 1978, Ser. No. 896,985
Int. Cl.[2] B66F 9/14
U.S. Cl. 414—667 **8 Claims**



1. A quick coupling for connecting a side shift cylinder of a lift truck side shift attachment to a vertically movable lift carriage of a lift truck in which the lift carriage includes a pair of vertically spaced horizontal carriage frame members having generally vertically extending front faces, said quick coupling comprising:

a pair of mounting block members extending in the space between and affixed to said carriage frame members in positions such that said block members are laterally spaced apart to define with said frame members a mounting space therebetween,

a cylinder mounting plate member having a rearwardly projecting portion sized to fit closely within said mounting space and having a forwardly projecting portion projecting forwardly beyond the front faces of said frame members and overlapping said faces when said rearwardly projecting portion is inserted within said mounting space,

a first pull pin means for removably connecting said rearwardly projecting portion of said plate member to said pair of block members when said rearwardly projecting portion is inserted within said mounting space,

said forwardly projecting portion of said plate member including means defining an opening therethrough for receiving an extensible end portion of said side shift cylinder,

and second pull pin means for removably connecting the extensible end portion of said cylinder to the forwardly projecting portion of said plate member,

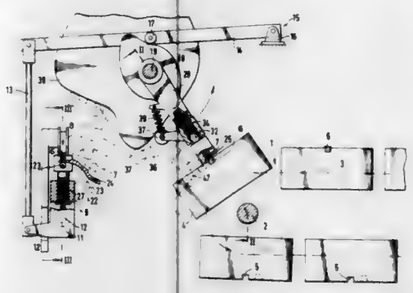
whereby said side shift cylinder can be quickly connected and disconnected from said plate and said plate can be quickly connected and disconnected from said lift carriage.

4,173,426

APPARATUS FOR THE AUTOMATIC LOADING OF A CONTINUOUSLY WORKING MACHINE

Friedrich Schell, Metterstr. 23, 714 Ludwigsburg-Pflugfelden, Fed. Rep. of Germany

Filed Sep. 8, 1977, Ser. No. 831,414
Int. Cl.[2] B65G 25/12
U.S. Cl. 414—737 **21 Claims**



1. An apparatus for automatically loading a continuously operating machine with workpieces, the apparatus comprising:

a rotatably mounted main shaft,

a loading arm means including a means for receiving the workpieces,

a shaft means for pivotally mounting the loading arm means for movement between a workpiece receiving position and a workpiece delivery position,

conveyor means for conveying the workpieces past the continuously operating machine including further means for receiving the workpieces,

gripper means arranged between said loading arm means and said conveyor means for transferring workpieces from said loading arm means, when said loading arm means is in a delivery position, to said further workpiece receiving means on said conveyor means, said gripper means including means for retaining the workpieces therein during a transfer from the loading arm means to said further receiving means, and at least one ram means mounted in the gripper means for causing the workpiece in the gripper means to be inserted into the further workpiece receiving means during a transfer operation,

means for mounting said gripper means at said main shaft so as to be rotatable therewith and also movable relative thereto in a direction of said at least one ram means,

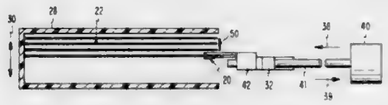
said gripper means and said conveyor means are arranged with respect to one another such that, in a transfer region of the workpiece from the gripper means to the further receiving means, a line extending through a bottom end surface of the gripper means and a line extending through an upper peripheral surface of the further receiving means are brought into a parallel relationship whereby the gripper means executes a relative movement in a direction of a line connecting centers of the main shaft and a supporting shaft of the conveyor means so that the workpiece in the gripper means is radially inserted into the further receiving means on the conveyor means.

4,173,427

GRIPPING DEVICE FOR MAGNETIC DISKETTES

Wallace E. Beuch, Pine Island, and Michael N. Zell, Rochester, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 20, 1978, Ser. No. 888,601
Int. Cl.[2] G11B 17/22
U.S. Cl. 414—751 **8 Claims**



1. Mechanism for gripping an article and moving it from one place to another and including:

a pair of arm portions mounted with respect to a common support and moveable toward and away from each other so as to embrace the article between them,

spring means for moving said arm portions together so that they grip the article and so that the article is moved along with said common support, and

outwardly diverging cam surfaces formed on facing sides of said arm portions and forming a throat into which the article to be moved may be thrust so as to spread the arm portions apart and cause them to grip the article due to said spring means,

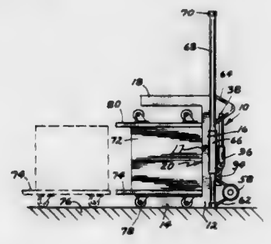
said cam surfaces being of different lengths and said arm portion with the shorter cam surface having an article gripping surface opposite said longer cam surface whereby, as the article travels down the longer cam surface in being withdrawn from between said arm portions, the article frictionally moves on said article gripping surface to be thereby frictionally restrained from being separated from the arm portion having said article gripping surface.

4,173,428

PRINTER'S PAPER PILE INVERTER

John H. Thornberg, Minneapolis, Minn., assignor to Bethany Fellowship, Inc., Minneapolis, Minn.

Filed Oct. 31, 1977, Ser. No. 846,884
Int. Cl.[2] B65G 7/02
U.S. Cl. 414—766 **4 Claims**



1. A pile inverter for inverting a pile of papers initially positioned on a first pallet supported in spaced relation above a horizontal floor to be finally positioned on a second pallet supported in spaced relation above a floor;

said pile inverter including:

A. a pair of parallel, spaced apart C-frames, each C-frame including:

(1) a first outwardly extending C-frame leg;

(2) a base C-frame leg connected to the first leg and extending at right angles thereto, said base leg being provided with a plane interior surface; and

(3) a second outwardly extending C-frame leg connected to the base leg and extending at right angles thereto to lie in spaced, parallel, aligned relation to the first C-frame leg;

B. a base frame including said base C-frame legs and members extending between said base legs to fixedly support these base legs to have fixed, parallel, spaced apart relation to each other;

C. handle means supported on the base frame adapted to be useful to manually move said pile inverter successively from:

(1) an upright position wherein said first C-frame legs are in contact with a horizontal floor, to

(2) a reclining position wherein said base C-frame legs and said base frame are supported in parallel relation to said floor, and to

(3) an inverted position wherein said second C-frame legs are in contact with said floor;

D. a pallet lift platform supported with respect to said base frame;

E. guide means for supporting said lift platform for movement in direction longitudinally of said base C-frame legs from a first position substantially aligned with a plane defined by the interior surfaces of said first outwardly extending C-frame legs toward a second position in parallel alignment with the first plane but adjacent interior surfaces of said second outwardly extending C-frame legs, said guide means being part of said base frame;

F. jack means supported by said base frame adapted to move said platform from said first toward said second position when the pile inverter is in said upright position and when a pile of papers to be inverted is positioned on a first pallet, the first pallet is positioned over the lift platform, and an inverted second pallet is positioned on top of said paper pile in alignment with and below said second C-frame legs;

G. foot means extending outwardly from said base frame to support said base frame in spaced relation to said floor when said pile inverter is in its reclining position;

H. said handle means being constituted as a pair of handlebars, each positionable alternatively to extend outwardly from and in longitudinal alignment with said base C-frame legs in a first position beyond a first end of said base legs adjacent said first C-frame legs and in a second position beyond a second end of said base legs adjacent said second C-frame legs;

I. said foot means including rotatably mounted transport wheels adjacent to said first end of said base C-frame legs;

J. said foot means also including support feet adjacent to said second end of said base legs; and

K. said transport wheels and said support feet being positioned to provide pivot points on the floor when the inverter is moved between said upright position and said reclining position and between said reclining position and said inverted position, respectively.

4,173,429

CENTRIFUGAL FAN, SHAFT, PLATE AND HUB ASSEMBLY

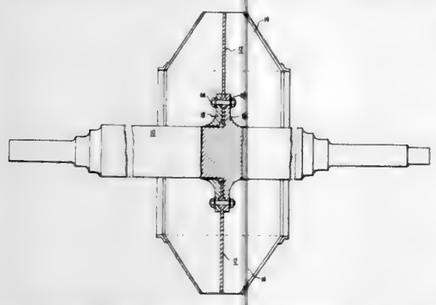
Joseph H. Hoffman, Norwood, Mass., and Daniel G. Thompson, Plum Borough, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 5, 1977, Ser. No. 857,483
Int. Cl.[2] F04D 17/08
U.S. Cl. 416—184 **10 Claims**

1. A shaft, fan plate and hub assembly for a centrifugal fan, comprising:

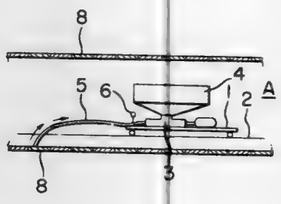
a shaft;

a pair of opposed hubs including a first hub inseparable from said shaft and a second hub ring separable from said shaft;
a disc-shaped fan plate having an inner peripheral margin disposed in sandwiched relation between the opposed faces of said hub and hub ring;
said inner peripheral margin including a thickened ring portion providing oppositely projecting annular shoulders at the outer periphery of the thickened ring portion;
both said hub and said hub ring including annular recesses in their opposing faces to receive said thickened ring portion with the outer peripheries of said recesses in closely abut-



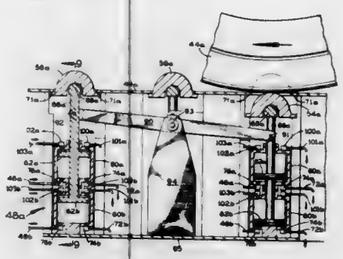
ting relation with said shoulders to provide a shoulder-recess bearing area;
a plurality of fastener means at circumferentially spaced locations around said hub and hub ring and extending in an axial direction through said hub, hub ring and the thickened ring portion;
whereby the assembly arrangement results in said shoulder-recess bearing areas being located radially outwardly from the bearing stress areas in the vicinity of the fastener means so that the stress largely arising from thermal transients in the fan are applied for the most part to the shoulder-recess bearing areas.

4,173,430
METHOD OF INJECTING A BACK FILLING INJECTION MATERIAL IN A SHIELD FORMING PROCESS
Seizo Kubota, Musashi-Murayama, Japan, assignor to Sato Kogyo Kabushiki Kaisha, Toyama, Japan
Filed Nov. 22, 1977, Ser. No. 854,072
Int. Cl.[2] F04B *15/00;* **E02D** *15/02*
U.S. Cl. 417—53 **1 Claim**



1. A method of injecting a back filling injection material in a shield process, characterized by the steps of reversely rotating an injection pump for a back filling injection material having a hopper connected to its intake port to intake the back filling injection material into said hopper through a delivery hose connected to its delivery port; subsequently presetting an upper limit pressure and a lower limit pressure of said injection pump for injecting said back filling injection material; normally rotating said injection pump to inject said back filling injection material in said hopper to a desired location through said delivery hose; and then, after completion of injection filling of said back filling injection material, reversely rotating said injection pump to intake water within a shield through said deliver hose, thereby effecting washing of said delivery hose and said injection pump.

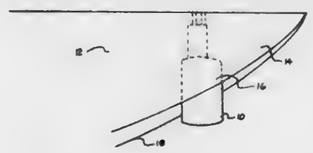
4,173,431
ROAD VEHICLE-ACTUATED AIR COMPRESSOR AND SYSTEM THEREFOR
Roland L. Smith, Homestead, Fla., assignor to Nu-Watt, Inc., Miami, Fla.
Continuation-in-part of Ser. No. 814,685, Jul. 11, 1977, Pat. No. 4,115,034. This application Jan. 16, 1978, Ser. No. 869,780
Int. Cl.[2] F04B *9/02, 35/00*
U.S. Cl. 417—229 **1 Claim**

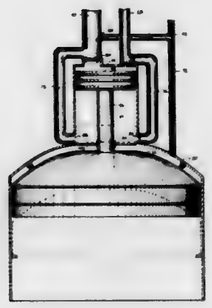


1. A road vehicle-actuated system for compressing air and thereby generating electrical energy comprising:
an electricity generator operated by compressed air to generate electricity;
air storage means operatively connected to said generator to supply compressed air to said generator for operating the same;
first nested floating bar actuator means positioned in a roadway for actuation downward in response to motion of a vehicle along the roadway; said actuator means having a plunger nested in a floating bar projecting into the roadway;
a first pair of cylinders;
a first pair of pistons having down and up strokes in said cylinders respectively and coupled to said plunger of said actuator means for movement thereby;
vent means including an inlet check valve at the top of each of said cylinders above said pistons for introducing air into said cylinders above said pistons;
valve-controlled vent means at the bottom of each of said cylinders for introducing air into said cylinders below said pistons during an up stroke thereof; and valve-controlled outlet means at the bottom and top of said each of said cylinders for supplying air compressed by said pistons during a down stroke and up stroke thereof to said air storage means enroute to said electricity generator;
a second nested floating bar actuator means positioned in said roadway past said first-mentioned actuator means along a pre-determined path of vehicle travel along the roadway for downward actuation by the vehicle; said second actuator means having a plunger nested in a floating bar projecting into the roadway;
a second pair of cylinders;
a second pair of pistons having down and up strokes in said second cylinders and coupled to said plunger of said second actuator means for movement thereby;
vent means including an inlet check valve at the top of each of said second cylinders above said second pistons for introducing air into said second cylinders above said second pistons during a down stroke of said second pistons;
valve-controlled vent means at the bottom of each of said second cylinders for introducing air into said second cylinders below said second pistons during an up stroke thereof;

valve-controlled outlet means at the bottom of each of said second cylinder for supplying air compressed by said second pistons during a down stroke thereof to said air storage means enroute to said electricity generator;
valve-controlled outlet means at the top of each of said second cylinders for supplying air compressed by said second pistons during an up stroke thereof to said air storage means enroute to said electricity generator;
and mechanical linkage means acting between said plungers for causing upward movement of either pair of pistons in response to downward actuation of the other pair of pistons;
said system further including third and fourth nested floating bar actuator means and third and fourth pairs of cylinders and pistons having the same construction as said first and second pairs thereof and each provided with inlet vent means and valve-controlled outlet means and linkage means as recited herein with said third actuator means located between said first and second actuator means and said fourth actuator means located beyond said second actuator means in said path of travel.

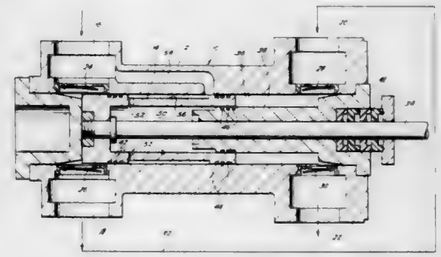
4,173,432
VERTICAL WAVE AIR COMPRESSION DEVICE
Dorwin J. Vines, P.O. Box 71, South Prarie, Wash. 98385
Filed Apr. 19, 1977, Ser. No. 788,920
Int. Cl.[2] F04B *35/00, 25/02*
U.S. Cl. 417—231 **6 Claims**





1. A pump using the vertical energy of waves comprising:
a compression shell;
a float housed within the compression shell and sealingly engaging the walls thereof;
a compression cylinder arising from atop the compression shell with the inner area of the compression cylinder congruent to a hole in the top of the compression shell;
a piston ram attached to the float so that the piston ram will be housed within the compression cylinder on the rise and fall of the float;
inlet and discharge lines extending from the top of the compression cylinder;
a means for opening the discharge line on the rise of the piston ram and closing the discharge line on the falling of the piston ram;
a means for closing the inlet line on the rising of the piston ram and opening the lines upon the fall of the piston ram; a third line extending into the compression shell, a fourth line extending from said third line into said inlet line;
means for opening the third line from a source of fluid to the compression shell upon the fall of the float, means for closing the third line from the source of fluid to the compression shell upon the rise of the float;
means for opening the fourth line upon the rise of the float, means for closing the fourth line upon the fall of the float;
a means of attaching the compression shell to the bow of a boat.

4,173,433
TWO-STAGE GAS COMPRESSOR
John M. Anderson, P.O. Box 5202, Corpus Christi, Tex. 78405
Filed Feb. 6, 1978, Ser. No. 875,257
Int. Cl.[2] F04B *3/00, 5/00, 25/00, 21/08*
U.S. Cl. 417—254 **2 Claims**

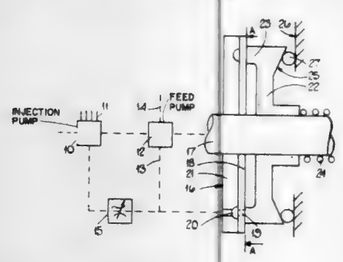


1. In a two-stage gas compressor having a housing with a first-stage inlet and outlet and a second-stage inlet and outlet, a double acting piston having two sets of piston rings reciprocal in a cylinder in the housing and reciprocal about a stationary member having piston rings engaging an interior cavity of the piston and a piston rod sealingly extending through the housing, the improvement comprising,
an opening through the piston between the two sets of piston rings, and
a passageway in the housing extending between the first stage inlet and the cylinder at a position at all times between the two sets of piston rings thereby remaining in communication with the opening whereby gas bypassing any of the piston rings will pass to the first-stage inlet and unnecessary compression of gas in the piston is avoided.

4,173,434
PRESSURE REGULATOR FOR A FLUID PUMP
Robert T. J. Skinner, High Wycombe, England, assignor to Lucas Industries Limited, Birmingham, England
Filed Dec. 9, 1977, Ser. No. 858,943
Claims priority, application United Kingdom, Dec. 17, 1976, 52940/76
Int. Cl.[2] F04B *49/00*
U.S. Cl. 417—294 **3 Claims**

1. A pressure regulator for controlling the pressure at the outlet of a fluid pump in accordance with the speed at which the pump is driven comprising a rotary shaft arranged to be driven at the same speed as the pump, a first member in the form of a disc, a central aperture in said disc and through which said shaft extends, an orifice in said disc at a position spaced from the axis of rotation of the shaft, said orifice breaking out onto the opposite side faces of the disc, a second member in the form of a rotor carried on said shaft so as to rotate therewith but to be axially movable thereon, a side face defined on said rotor for engagement with one of the side faces of said

disc to obturate said orifice, resilient means biasing said rotor into engagement with said disc, an annular surface defined on said rotor, said surface being inclined to a plane normal to the axis of rotation of the shaft, means defining a reaction surface presented to said annular surface, a plurality of balls disposed between said reaction surface and said annular surface and which when the rotor and shaft rotate move outwardly under the action of centrifugal force to impart an axial thrust to said rotor, the magnitude of said thrust depending upon the square



of the speed at which the rotor is driven, a backing plate having a side face located against the other of said side surfaces of said disc and passage means in said backing plate through which said orifice is in communcation with said outlet, the fuel pressure at the outlet of the pump acting to separate said disc and said rotor in opposition to said axial thrust and to the force exerted by the resilient means, whereby the output pressure of the pump will be controlled in accordance with the law N_2+K where N is the speed of rotation of the shaft and K the constant of the resilient means.

4,173,435

PLUNGER PUMP

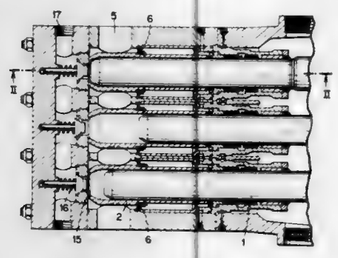
Paul Hammelmann, Oelde, Fed. Rep. of Germany, assignor to Paul Hammelmann Maschinenfabrik, Oelde, Fed. Rep. of Germany

Filed Apr. 7, 1977, Ser. No. 786,041

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1976, 2615531

Int. Cl.² F04B *19/02, 21/00*

U.S. Cl. 417—469 **10 Claims**



1. A pump comprising, in combination, a pump housing defining a pumping chamber and having an end wall; an elongated plunger at least partly accommodated in said pumping chamber and mounted in said pump housing for reciprocation longitudinally thereof toward and away from said end wall of said pump housing between a retracted and an extended position; a sleeve valve surrounding a portion of said plunger and mounted thereon for displacement longitudinally of said plunger and for limited reciprocation therewith between a first position in which said sleeve valve is spaced from said end wall of said pump housing, and a second position in which said sleeve valve sealingly abuts said end wall of said pump housing and subdivides said pumping chamber into a suction space around said sleeve valve and a pressure space within said sleeve valve; an inlet port communicating with said suction space; an outlet port communicating with said pressure space in said second position of said sleeve valve; a one-way valve in said outlet port which opens when said plunger moves toward said extended position thereof and said sleeve valve is in said second position thereof for discharging pressurized medium from said pressure space into said outlet port; and at least one resilient sealing member so extending between and sealingly connected to said sleeve valve and to said pump housing as to simultaneously permanently urge said sleeve valve toward said second position thereof and seal said suction space.

4,173,436

PIVOTABLE PIPE SLIDE FOR USE IN A TWO CYLINDER CONCRETE PUMP

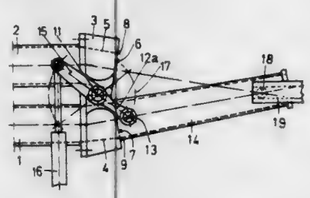
Heinz Bille, Unna, Fed. Rep. of Germany, assignor to Maschinenfabrik Walter Scheele KG, Unna-Massen, Fed. Rep. of Germany

Filed Jun. 1, 1978, Ser. No. 911,727

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725089

Int. Cl.² F04B *15/02*

U.S. Cl. 417—516 **6 Claims**



1. A pivotable slide for use in a two-cylinder concrete pump having two discharge openings, each of which is bordered by a sealing face, comprising:

a swing pipe having an end segment which is reciprocably pivotable in a pivot plane perpendicular to the planes of the sealing faces; and

pivot means for reciprocally pivoting said end segment of said swing pipe between a first end position, in which said end segment is pressed against the sealing face of one of said discharge openings, and a second end position, in which said end segment is pressed against the sealing face of the other of said discharge openings, said pivot means moving said end segment away from contact with said sealing faces during the pivoted movement thereof between said first and second end positions, said pivot means including a movable joint having an axis which is disposed normally relative to the pivot plane of said end segment and which is coupled to said end segment, a fixed joint, spaced from said movable joint and disposed centrally between said discharge openings and having an axis which is parallel to said movable joint and a guide joint which is coupled to said movable joint and is pivotable about said fixed joint.

4,173,437

DUAL-PISTON RECIPROCATING PUMP ASSEMBLY

George T. Leka, Trumbull, and Roland C. Paradis, Bridgeport, both of Conn., assignors to The Perkin-Elmer Corporation, Norwald, Conn.

Filed Aug. 1, 1977, Ser. No. 820,592

Int. Cl.² F04B *23/06;* **F16J** *15/18*

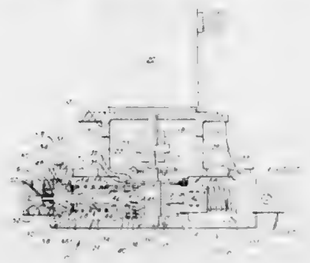
U.S. Cl. 417—521 **9 Claims**

1. A dual-piston reciprocating pump assembly comprising two opposed substantially identical reciprocating pumps, a housing within which said pumps are mounted, motor means, a coupling, a cam shaft, and a cam, said cam being mounted on

the cam shaft which is driven through the coupling by the motor means, and bearing means for mounting said cam shaft in the housing:

each of said reciprocating pumps including a piston assembly comprising a piston body having a piston end, a cam follower mounted on the other end of the piston body for engaging the cam face of said cam;

a cylinder head having a piston cylinder therein for receiving the piston end, said housing having an end opening for receiving said cylinder head, bearing means disposed in said piston cylinder for said piston end, means mounting a guide bushing in said cylinder head adjacent said bearing means for the piston end, means mounting a high-pressure seal adjacent the bearing means, said piston end having



substantial radial end play, and a piston spring, means mounting said piston spring for urging the pistion inwardly to maintain said cam follower in engagement with the cam face of said cam;

said high-pressure seal comprising an annular flexible sealing ring having an annular wiper lip and an annular backup lip, a circumferentially oriented coiled spring disposed between said lips to urge the wiper lip against said piston end, said wiper lip being adapted to engage said piston end along an end edge thereof at the high-pressure side of the high-pressure seal, and said two lips being oriented to face the high-pressure side of the seal so that the fluid pressure in the pump assembly tends to spread the lips and enhance the sealing action.

4,173,438

ROTARY PISTON DEVICE WHICH DISPLACES FLUID IN INNER AND OUTER VARIABLE VOLUME CHAMBERS SIMULTANEOUSLY

A. Frank Putz, 401 N. 89th St., Wauwatosa, Wis. 53226

Continuation-in-part of Ser. No. 632,853, Nov. 17, 1975, Pat. No. 4,030,861. This application May 18, 1977, Ser. No. 798,232

Int. Cl.² F04C *1/02*

U.S. Cl. 418—59 **17 Claims**



1. A rotary piston expansible chamber device comprising, in combination,

a housing having a cylindrical bore and diametrically opposed intake and exhaust ports adjacent at least one axial end of said bore,

a cylindrical piston rotatable within said bore and being lenticular in cross section and having arcuately spaced apices which maintain substantially continuous contact with said bore and divide it into first and second expansible outer chambers defined between the flanks of said lenticular piston and said bore adapted to to alternately communicate with said intake port and with said exhaust port as said piston rotates, said piston having a compartment therein.

a shaft rotatable about an axis parallel to but offset from the bore axis and having a member integral therewith disposed within and movable within said compartment and forming with the compartment walls at least one expansible inner chamber adapted to communicate with said intake port and also with said exhaust port as said piston rotates, and

means including said member disposed within said compartment for operatively connecting said piston to said shaft so that they rotate together in a one-to-one ratio and simultaneously reciprocate said piston within said bore so that the volume of said first and of said second outer chamber varies between maximum and minimum during each revolution of said shaft and also move said member within said compartment so that the volume of said inner chamber varies between minimum and maximum during each revolution of said shaft,

said diametrically opposed intake and exhaust ports being positioned so that each can communicate with only one of said outer chambers at a time and so that both said ports are out of communication with said outer chambers when the outer peripheral flanks of said piston are repectively in closest proximity to said bore.

4,173,439

APPARATUS HAVING EXPANDING AND CONTRACTING CHAMBER

Walter M. Hopkins, 1306 W. Glenoaks Blvd., Glendale, Calif. 91201

Filed Nov. 28, 1977, Ser. No. 855,294

Int. Cl.² F01C *1/02, 11/00;* **F03C** *3/00*

U.S. Cl. 418—58 **14 Claims**



1. An apparatus having at least one alternately expanding and contracting chamber comprising a pair of parallel end plates; a plurality of cylindrical rollers each having their axes parallel to each other, normal to said end plates and in sealing engagement at their ends with the respective adjacent surface of said end plates; each of said rollers having an exterior surface in rolling engagement with two adjacent rollers, said rollers defining with said end plates an enclosed chamber; and wherein at least one of the rollers rotates about an axis eccen-

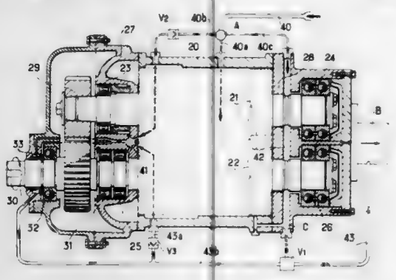
tric with respect to the axis of said roller to move reciprocally into and out of the chamber formed by said rollers and said end plates, and means communicating between said chamber and the exterior thereof.

4,173,440

METHOD AND DEVICE FOR LUBRICATING COMPRESSORS

Fernand Libis, Illkirch Graffenstaden, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jun. 8, 1978, Ser. No. 913,924
Claims priority, application France, Jun. 17, 1977, 77 18646
Int. Cl.[2] F04C *29/02*
U.S. Cl. 418—84 **8 Claims**



1. A method of lubricating a fluid compressor of the type comprising a suction casing, a discharge casing, means including said casings forming a compression chamber, bearings carried by said casings, at least two intermeshed helical screws supported by said bearings for rotation about their axes within said chamber, and at least one drive means for driving said helical screws, said drive means including a drive shaft, a friction seal ring for sealing of said shaft on the suction side thereof, said compressor further comprising an oil separation tank, and said compressor comprising suction and discharge ends, the improvement comprising the steps of:

feeding lubricating oil coming from said separation tank at high pressure which is substantially equal to that which prevails in said separation tank, when the compressor is operating under load, to said bearings, said drive means and said friction seal ring, and when said compressor is operating at no load, feeding said compression chamber and said bearings housed in said discharge casing with oil coming from said separation tank, but at a low pressure, and

independently feeding said bearings and said drive means as well as said friction seal ring housed in said suction casing with oil coming directly from the discharge end of the compressor and at a pressure slightly higher than atmospheric pressure.

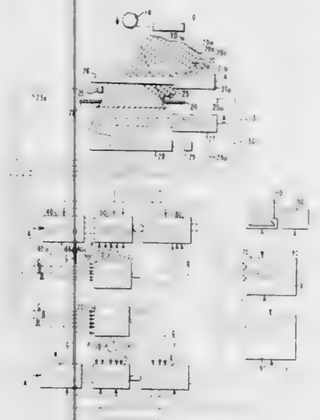
4,173,441

WEB INSPECTION SYSTEM AND METHOD THEREFOR

William E. Wolf, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 28, 1977, Ser. No. 781,879
Int. Cl.[2] G01N *21/02*
U.S. Cl. 356—431 **3 Claims**

1. An inspection system for web materials that includes electronic means responsive to means scanning the web for detecting a plurality of different nonuniform appearance features of the web, said electronic means comprising: means for electrically discriminating said appearance features as to a predefined class to identify the significant electrical signal components thereof; means for electrically dividing the web into frames; means for counting the number of occurrences of said significant signal components over a series of scans within each of said frames; means for comparing each count of the number of occurrences of said significant signal components within each frame with predetermined values to electrically



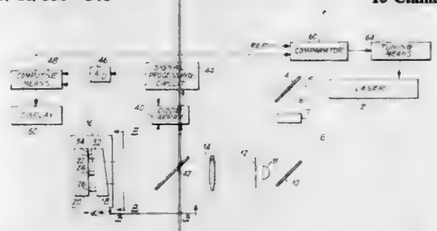
define nonuniform appearance features according to frame; and means for combining said electrically defined nonuniform features to recognize the occurrence of a visual defect class as it occurs within each said scanned frame.

4,173,442

APPARATUS AND METHOD FOR DETERMINATION OF WAVELENGTH

James J. Snyder, Clarksburg, Md., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed May 27, 1977, Ser. No. 801,272
Int. Cl.[2] G01B *9/02*
U.S. Cl. 356—346 **13 Claims**



1. Apparatus for measuring to very high resolution the wavelength of a beam of radiation incident thereon, comprising:

(a) a pair of plain glass flats spaced a substantial distance apart and enclosing a small angle to provide a high-order, multi-fringe Fizeau interferometer, said interferometer stationary during said wavelength measurement;

(b) means for establishing an origin optical path of known length between said flats;

(c) high-resolution photoelectric means for detecting the fringes produced by said interferometer and providing electrical signals corresponding thereto; and

(d) data processing means receiving said electrical signals for:

(i) determining to high resolution the average spacing between said detected fringes and computing therefrom to high resolution the wavelength of said incident radiation;

(ii) determining to high resolution the optical path length between said flats at a fringe near said original path;

(iii) computing from said high-resolution wavelength and said high-resolution optical path length a high-resolution measure of the order number of said high-order interferometer;

(iv) rounding to the nearest integer said computed measure of said order number; and

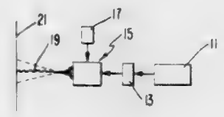
(v) computing from said integer order number said very high-resolution measurement of said incident wavelength.

4,173,443

SPRAY SPINNING NOZZLE HAVING CONVERGENT GASEOUS JETS

Victor J. Lin, Berkeley Heights, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Jun. 1, 1977, Ser. No. 802,342
Int. Cl.[2] B29D *31/00*
U.S. Cl. 425—66 **10 Claims**



1. A spray spinning nozzle for producing a substantially continuous filament from molten synthetic resinous polymeric material comprising:

nozzle means for receiving the material under pressure from a source of molten material, having a distal end with an opening therein and a fluid passage therethrough;

shaping means for forming a filament from the material, removably connected at the opening in fluid communication with the fluid passage and having an axis and an extrusion orifice; and,

attenuation means for supplying gaseous jets angularly spaced about the axis, each jet converging on the axis at the same point, the attenuation means being laterally movable into and out of operative position with respect to the shaping means and including:

at least three conduits, each having an exhaust opening, being aligned to direct a gaseous jet at an angle to the center line, and the exhaust openings being angularly spaced about the axis; and,

manifold means for supplying pressurized gas to the three conduits, having the three conduits connected thereto and extending so that the exhaust openings are downstream of the shaping means.

4,173,444

EQUIPMENT FOR PRODUCING CONTINUOUS TAPES OF RUBBERY VULCANIZABLE MATERIAL, FOR THE MANUFACTURE OF HOSE ARTICLES

Deregibus Alfio, Padua, Italy, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 13, 1977, Ser. No. 841,790
Claims priority, application Italy, Apr. 5, 1977, 23157 A/77
Int. Cl.[2] B29C *15/00*
U.S. Cl. 425—363 **3 Claims**

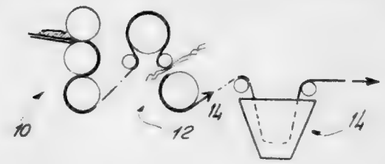
1. In apparatus for the production of continuous tape of vulcanizable elastomeric material, in combination:

(i) at least one pair of counter-rotatable rollers coacting to serve as a calender

(ii) means for feeding vulcanizable elastomeric material to said calender for the production of a tape

(iii) a cooling assembly to receive said tape from the calender, said cooling assembly including:

(a) a plurality of cooling cylinders each having a cylindrical outer wall and first and second axial end walls, said first end wall having an axial opening, an internal wall spaced from and connected to said outer wall and said end walls and defining therewith a chamber to receive coolant fluid, inner and outer radially-spaced concentric hollow shafts coupled for rotation in unison, said inner shaft having said internal wall secured thereon, said outer hollow shaft being connected to said first end wall about said axial opening, said inner hollow shaft extending into said cylinder and through said internal wall and opening adjacent



said second end wall, whereby a continuous flow path for coolant fluid is established between said inner and outer hollow shafts over the whole internal surface of said cylinder, and

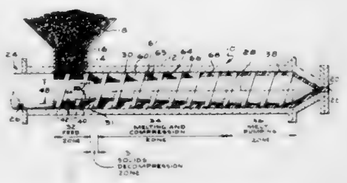
(b) a respective pair of guide rollers disposed adjacent the cylindrical outer wall, said guide rollers being closely spaced angularly with respect to an axis of rotation of the cylinders such that tape material may be passed about said guide rollers and about a major part of each cylindrical outer wall.

4,173,445

PLASTICS EXTRUSION APPARATUS

James M. McKelvey, St. Louis, Mo., and Samuel Steingiser, Bloomfield, Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed Jul. 17, 1978, Ser. No. 925,375
Int. Cl.[2] B29F *3/06*
U.S. Cl. 425—376 A **10 Claims**



1. In plastics extrusion apparatus which includes:

a hollow cylinder having an inlet for containing a bed of solid plastic;

a rotatable screw within said cylinder defining with said cylinder a helical channel for the plastic comprising in series, a feed zone beneath the inlet and a melting zone;

the improvement which comprises:

a solids decompression zone between the feed zone and the melting zone having increased free volume relative to the feed zone;

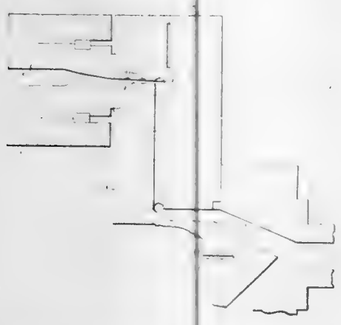
whereby before significant melting occurs the bed of solid plastic is decompressed to the extent that the channel in the solids decompression zone is partially filled.

4,173,446

CHOKE RING FOR PIPE EXTRUSION DIE

Olaf E. Larsen, Dallas, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 21, 1977, Ser. No. 817,766
Int. Cl.² B29D *23/04*
U.S. Cl. 425—380 **5 Claims**



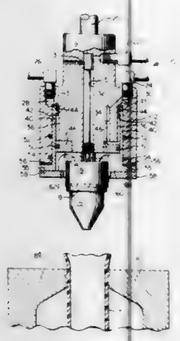
1. In a pipe extrusion device in which polymer flows from an extruder into a spreader cone, through a plurality of individual channels in a distribution plate and through a choke passage for blending the plurality of flow streams from the distribution plate to form the sidewall of an extruded pipe, the improvement of a choke passage comprising in its outer wall a plurality of elongated cavities, each cavity diminishing in depth and width from its upstream end to reach zero depth and width as the passage extends downstream across the line of polymer flow, said cavities being spaced between and overlapping at least an end of the nearest cavity on either side viewed in the direction of polymer flow.

4,173,447

APPARATUS FOR CONTACT COOLING THE NECK MOIL OF BLOWN HOLLOW CONTAINERS

John R. Bradbury, Kansas City, Mo., assignor to Ethyl Development Corporation, Baton Rouge, La.

Filed Sep. 5, 1978, Ser. No. 939,284
Int. Cl.² B29C *17/07, 17/12*
U.S. Cl. 425—526 **8 Claims**



1. An apparatus for cooling the neck moil of a container while it is in a blow mold, said apparatus comprising:

a. a body portion, said body portion having a first connecting means for connecting said body portion to the rod of a blow pin cylinder and a second connecting means for connecting a blow pin stem to said body portion, said blow pin stem carrying a blow pin, a cutting collar and a rotation collar;

b. a blow air channel in said body portion for providing pressurized gas to said blow pin;

c. an annular cylinder in said body portion;

d. an annular piston fittable within said annular cylinder, said piston having attached thereto a cooling plate for pressing said moil onto said blow mold;

e. a first inlet means communicative with said annular cylinder for supplying pressurized gas to said annular cylinder to move said piston towards said moil; and

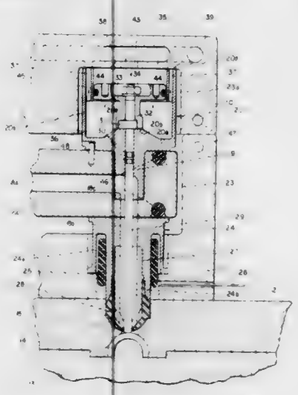
f. a second inlet means communicative with said annular cylinder for supplying pressurized gas to said annular cylinder to move said piston away from said moil.

4,173,448

ACTUATING MECHANISM FOR GATE VALVE OF INJECTION NOZZLE

Herbert Rees, Willowdale, and Robert D. Schad, Schomberg, both of Canada, assignors to Husky Injection Molding Systems, Bolton, Canada

Filed Jan. 6, 1978, Ser. No. 867,506
Int. Cl.² B29F *1/05*
U.S. Cl. 425—549 **7 Claims**



1. In an injection-molding machine including a hot-runner structure with a sprue channel for conveying liquefied plastic material from a pressure chamber to an injection gate,

the combination therewith of valve means for alternately blocking and unblocking said injection gate, said valve means comprising:

a rod having a free end located at said injection gate for selectively obstructing same;

a cylinder remote from said injection gate provided with an end wall and a peripheral wall bounding an internal space, said end wall having an opening slidably receiving said rod;

a cover plate separated by said cylinder from said structure with formation of an air space surrounding said peripheral wall;

a piston head in said internal space connected with the other end of said rod, said peripheral wall being centered on an axis perpendicular to said cover plate and terminating at a face of said cylinder opposite said end wall in contact with said cover plate, said face having an aperture giving access to said internal space, said peripheral wall being divided into a thickened wall portion proximal to said face and a reduced wall portion proximal to said end wall, said wall portions meeting at an internal shoulder between said end wall and said face, said piston head being guided by said thickened wall portion and being provided with stop means limiting its stroke to less than the axial length of

said thickened wall portion, the latter having at least one bore generally parallel to said axis extending from said face to said shoulder and communicating at said shoulder with said internal space;

conduit means including passages in said cover plate communicating with said bore and with said aperture; and

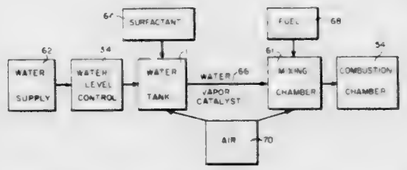
control means connected to said conduit means for alternately admitting a pressure fluid to said aperture and to said bore with resulting reciprocation of said piston head and said rod.

4,173,449

SURFACTANT SYSTEM FOR FUEL CATALYZER

Seymour Israel, 40-06 45 St. (4F), New York, N.Y. 11104

Continuation of Ser. No. 678,532, Apr. 20, 1976, abandoned. This application Mar. 15, 1978, Ser. No. 886,762
Int. Cl.² F23J *7/00*
U.S. Cl. 431—4 **19 Claims**



1. A method of adding finely dispersed liquid water and water vapor to combustion air in a fuel-air combustion system which includes a means for forced intake of a stream of said combustion air, said method comprising:

(a) generating a quantity of aqueous bubbles from a solution of bubble-enhancing surfactant in water, said solution having a lower surface tension than water; and

(b) entraining said aqueous bubbles at a controlled rate into said combustion air stream.

4,173,450

DEVICE FOR INJECTING AIR PROCESSED TO INCREASE ITS HUMIDITY INTO OIL BURNING FURNACES

Jerome Schrank, Jamaica, N.Y., assignor to Allied Energy Corporation, Beverly Hills, Calif.

Continuation-in-part of Ser. No. 712,227, Aug. 27, 1976, abandoned, and Ser. No. 671,621, Mar. 29, 1976, abandoned. This application Dec. 29, 1977, Ser. No. 851,360
Int. Cl.² F23J *7/00*
U.S. Cl. 431—190 **2 Claims**

1. A device for injecting air processed to increase its humidity into oil burning furnaces comprising:

a. a water container dimensioned to receive and contain water received from a water line;

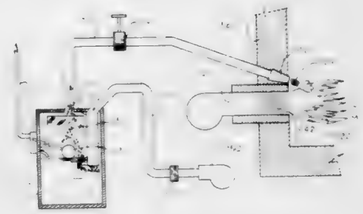
b. an atmospheric line leading from the atmosphere into said water container, at a location below the level of water within said container;

c. first means for drawing and bubbling atmospheric air through the water container, to process the air by increasing its humidity;

d. means for inductively sensing whether a motor in said oil burning furnace is energized;

e. a blower connected to said atmospheric line; and

f. means for stopping and starting said blower connected to said atmospheric line, said means for stopping and starting



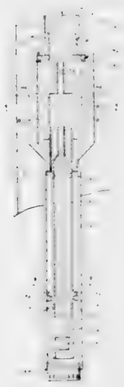
said blower being connected to and being energizable by said inductive means.

4,173,451

DOWNHOLE PUMP

Harold Moore, Jr., Dallas, Tex., assignor to Reserve Oil, Inc., Denver, Colo.

Filed May 8, 1978, Ser. No. 904,022
Int. Cl.² F04B *19/02*
U.S. Cl. 417—457 **13 Claims**



1. A downhole pump, which comprises:

a pump body having upper and lower ends;

means defining fluid passageways interconnecting the ends of the pump body;

check valve means positioned within the fluid passageway means for permitting fluid flow from the lower end to the upper end of the pump body;

a reciprocating piston; and

a slidable barrel with a plurality of ports therein extending from the lower end of the pump body in surrounding relationship with the piston, said barrel being responsive to reciprocation of the piston for movement between an inner position wherein certain of the ports are aligned with the fluid passage means, and an outer position wherein all of the ports are outside the pump body.

4,173,452

PROCESS FOR THE CONTINUOUS DYEING OR PRINTING OF LENGTHS OF MATERIAL

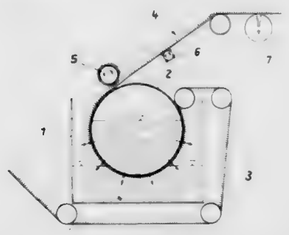
Hans Fleissner, Riehen, Switzerland, assignor to Vepa AG, Switzerland

Filed Apr. 18, 1977, Ser. No. 788,536

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1976, 2617145

Int. Cl.[2] D06B *5/02*

U.S. Cl. 8—1 XB **3 Claims**



1. A process for the continuous dyeing or printing of a length of textile material, particularly a velour-type carpet panel having a base side and a pile side, the materials forming the base and/or pile sides including shrinkable fibers which are set prior to the application of dyes or printing inks, which comprises transporting the length of material with the pile side under pressure to a sieve drum having a perforated circumferential support surface, guiding the length of material onto the circumferential support surface of the sieve drum with the backside of the textile material lying on the support surface, forcing a hot liquid medium from within said sieve drum outwardly through the length of material in the direction of tips of the pile whereby the pile is spread and made upright during the flow of the liquid medium therethrough and the shrinkable fibers are set by said hot liquid medium with the pile in the spread and upright state and thereafter transporting the length of material with the pile surface not under pressure to and through a cooling zone to cool the length of material and the hot liquid contained therein.

4,173,453

TOPICAL HAIR COLORING FORMULATION IN THE FORM OF SUSPENSION, LOTION AND CREAM

Chyn-Duog Shiah, Manhasset, N.Y., assignor to CDC Research Inc., New York, N.Y.

Continuation-in-part of Ser. No. 675,485, Apr. 9, 1976, abandoned. This application Mar. 9, 1978, Ser. No. 884,964

Int. Cl.[2] A61K *7/13*

U.S. Cl. 8—10.1 **19 Claims**

1. A composition for coloring gray hair for topical application which comprises as active coloring agent, a salt selected from the group consisting of copper cystine or zinc cystine in an amount of about 0.1 to 8% by weight of said composition in admixture with sulfur in finely divided form in an amount of about 0.5 to 20% of said composition in an aqueous pharmaceutically acceptable vehicle for topical application.

4,173,454

METHOD FOR REMOVAL OF SULFUR FROM COAL IN STOKER FURNACES

Sidney M. Heins, 6033 N. Sheridan Rd., Chicago, Ill. 60660

Continuation-in-part of Ser. No. 816,310, Jul. 18, 1977, abandoned. This application Nov. 29, 1978, Ser. No. 964,619

Int. Cl.[2] C10L *9/10*

U.S. Cl. 44—1 SR **5 Claims**

1. A method of removal of sulfur from coal having released hygroscopic moisture from the combustion zone in the fuel bed of a stoker furnace wherein the temperature is between the oxidation temperature of the sulfur and the ignition temperature of the coal comprising the steps:

(a) Pulverizing the coal;

(b) Pulverizing a mineral oxide selected from the oxides of the spinel group having the general composition AB_2O_4 wherein A consists of the mineral elements magnesium, iron, zinc, tin, titanium and manganese or any combination thereof, and B consists of the mineral elements aluminum, iron and chromium, both groups of mineral elements with electrode potential above that of hydrogen;

(c) Mixing the pulverulent coal and at least a stoichiometrically correct amount of the pulverulent mineral oxide, one of which contains at least a trace of a pulverized catalytic agent for oxidizing sulfur dioxide;

(d) Introducing the pulverulent mix of coal, mineral oxide and catalytic agent into the combustion zone of said furnace; and

(e) Precipitating the sulfur from the zone of combustion as the sulfates of the mineral elements in the selected mineral oxide.

3. A method of removal of sulfur from coal as set forth in claim 1 wherein the mineral oxide from the spinel group comprises:

(a) A natural-occurring material selected from the group consisting of flue dust from steel-making containing ferrite, red-mud from aluminum-making, retort residue from zinc-making and tailings from the mining of ores of zinc, copper or manganese.

4,173,455

FIRE-SAFE HYDROCARBON FUELS

George E. Fodor; William D. Weatherford, Jr., and Bernard R. Wright, all of San Antonio, Tex., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 11, 1978, Ser. No. 950,501

Int. Cl.[2] C10L *1/18*

U.S. Cl. 44—51 **10 Claims**

1. A stabilized aqueous diesel fuel emulsion comprising: (a) 1–17% by volume of water, (b) 2–6% by volume of an emulsifier consisting of at least 60% oleyl diethanolamide, 8 to 14% by weight diethanolamine soap of oleic acid, 16 to 24% by weight free diethanolamine, to which emulsifier has been added 0 to 7½% by weight oleic acid under conditions causing it to react with an equivalent amount of free diethanolamine, thereby leaving essentially no free oleic acid in the final emulsifier blend, (c) 0–0.5% by weight of an antimist agent with average molecular weight of at least 5 million, and (d) the remainder being a diesel fuel.

4,173,456

POLYOLEFIN/ACYLATED POLY(ALKYLENEAMINE) TWO COMPONENT FUEL ADDITIVE

Harold J. Scheule, Woodstown, N.J., and Roy E. Starn, Jr., West Chester, Pa., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

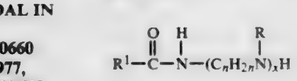
Filed Feb. 6, 1978, Ser. No. 875,621

Int. Cl.[2] C10L *1/18, 1/22*

U.S. Cl. 44—62 **15 Claims**

1. A gasoline additive composition comprising

(i) a hydrocarbon-soluble, acylated, poly(alkyleneamine) of the formula



wherein

R is selected from at least one of H and R′—C(O)—;

R^1 is C_9 to C_{23} hydrocarbyl;

n is 2, 3, or a mixture of 2 and 3; and

x is 2 to 6; and

(ii) from about 1 to 10 parts per part of said poly(alkyleneamine) of a normally liquid, hydrocarbonsoluble polymer of a C_2 to C_6 olefin, said polymer having an average molecular weight of about 400 to 3000.

4,173,457

HARDFACING COMPOSITION OF NICKEL-BONDED SINTERED CHROMIUM CARBIDE PARTICLES AND TOOLS HARDFACED THEREOF

Thomas J. Smith, LaPorte, Tex., assignor to Alloys, Incorporated, Baytown, Tex.

Filed Mar. 23, 1978, Ser. No. 889,277
Int. Cl.[2] C04B *31/16*; B24D *3/08*
U.S. Cl. 51—309 **34 Claims**

1. A tool for use in the penetration of earthen formations wherein the tool has at least one region of steel subject to excessive wear, said tool having an improved hardfacing on such region of sintered chromium carbide particles metallurgically bonded to the tool by a matrix consisting essentially of the underlying steel of said tool alloyed with the particles at the interfaces therebetween, with the interfaces being free from any brittle intermetallic compound such as would interfere with the alloy bond between the particles and matrix, said particles being in the size range of 10 to 60 mesh and being present in an amount for effective abrasion resistance, the particles comprising metal carbide grains of chromium carbide of an average grain size in the range of 0.5 to 25 microns disposed in a binder comprising a major portion of nickel.

4,173,458

AIR CLEANER

Arthur G. Stiles, 4581 Allison St., Wheatridge, Colo. 80033

Continuation-in-part of Ser. No. 771,241, Feb. 28, 1977, abandoned. This application Oct. 5, 1978, Ser. No. 948,671
Int. Cl.[2] B01D *45/14*
U.S. Cl. 55—405 **6 Claims**



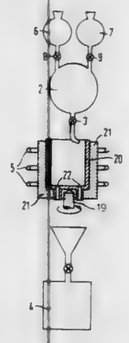
1. An air cleaner for an air line comprising:
(a) housing means having cover means and a bottom housing member which are arranged with respect to each other to define a narrow, peripheral air outlet therebetween;
(b) a freely rotating rotor, rotatively mounted in said housing means in proximity to said cover means;
(c) said rotor having a series of spaced impeller vanes terminating at their distal end adjacent said peripheral air outlet and constructed and arranged with a substantially reduced outlet space between said vanes and terminating at their medial ends short of the rotor axis so as to leave a central opening communicating with the space between the vanes;
(d) a central air outlet in said housing means in communication with said rotor central opening and arranged for a communicating connection with an air line; and
(e) air inlet means in said housing means intermediate said peripheral air outlet and said central air outlet in direct communication with said impeller vanes on said rotor, and constructed and arranged to rotate incoming air whereby incoming air rotates said rotor.

4,173,459

METHOD FOR PRODUCING A LIGHT CONDUCTING FIBER

Hubert Aulich, Munich; Josef Grabmeier, Kempfenhausen, and Hans Pink, Starnberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 26, 1977, Ser. No. 828,150
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1976, 2638991
Int. Cl.[2] C03B *37/02*
U.S. Cl. 65—3 A **5 Claims**



1. A method for producing a light conducting fiber, particularly a gradient glass-like fiber having a radially changing index of refraction, said method comprising providing a rotating, heatable crucible having a cylindrical interior wall; successively depositing glass forming layers from a liquid phase with the first layer being deposited on the interior wall of the rotating crucible and the subsequent layers being deposited on previously deposited layers, by providing a liquid phase consisting of a water-free solution having compounds of glass forming oxides of at least one element selected from a group consisting of Se, Te, P, As, Si, Ge, Sn, Pb, Ti, B, Al, Mg, Ca, Sr, Ba, Li, Na, K and Rb, and said solution having a solution medium selected from a group consisting of lower ketones, lower alcohols, esters of lower alcohols with lower carboxylic acid and combinations thereof; then thermally decomposing each layer into a glass film; to form a workpiece having a plurality of concentric, cylindrical glass films; and subsequently pulling a fiber from said workpiece.

4,173,460

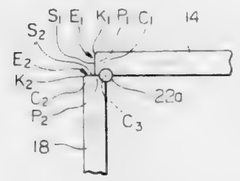
PROCESS FOR WELDING PLATE GLASSES TOGETHER

Yoshihiro Ebata, Kawanishi; Tsutomu Ueno, Ikeda; Nagamasa Kataoka, Kawanishi, and Akimasa Akao, Higashi-murayama, all of Japan, assignors to Agency of Industrial Science and Technology and Central Glass Company, Limited

Filed May 25, 1978, Ser. No. 909,692
Claims priority, application Japan, May 26, 1977, 52/62007
Int. Cl.[2] C03C *27/00*
U.S. Cl. 65—40 **9 Claims**

1. A process for welding first and second plate glasses, comprising:

contacting an edge of the first plate glass with an edge of the second glass, each edge forming part of an edge portion of each plate glass, the step of contacting the edges of the first and second plate glasses including the steps of placing the edge of the first plate glass on the edge of the second plate glass so that the flat surface of the edge of the first plate glass is angularly arranged relative to the flat surface of the edge of the second plate glass, and contacting a corner of the edge of the first plate glass to the flat surface of the edge of the second plate glass at a location such that the corner of the edge of the first plate glass is in a spaced apart relationship between the two corners of the edge of the second plate glass;



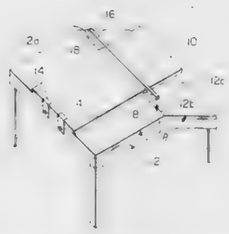
heating the whole of the contacted first and second plate glasses to a first predetermined temperature;
locally heating the contacted edge portions of the first and second plate glasses to a second predetermined temperature which is higher than that in the other portions of the plate glasses and lower than the softening temperature of the plate glasses, said second predetermined temperature being higher than said first predetermined temperature; and
passing electric current to the contacted edge portions through a pair of electrodes which are in contact with both side surfaces of the contacted edge portions, respectively, to generate heat for welding the edges of the first and second plate glasses.

4,173,461

METHOD OF BENDING GLASS PLATE

Yoshihiro Ebata, Kawanishi; Tsutomu Ueno, Ikeda; Nagamasa Kataoka, Kawanishi, and Akimasa Akao, Higashi-murayama, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo and Central Glass Company, Limited, Ube, both of, Japan

Filed May 25, 1978, Ser. No. 909,691
Claims priority, application Japan, May 26, 1977, 52-62009
Int. Cl.[2] C03B *23/02*
U.S. Cl. 65—106 **7 Claims**



1. A method of bending a glass plate along a line traversing the glass plate, comprising the steps of:
(a) providing a pair of electrodes in contact with the glass plate respectively at two terminals of said line;
(b) heating a substantially entire portion of the glass plate by first heater means arranged in spaced-apart relationship with said glass plate so as not to cause softening of the glass plate;
(c) heating the glass plate more intensely only in a zone which traverses the glass plate with a narrow width and contains the entire length of said line while step (b) is continued by the use of a second heater means arranged at a short distance from the glass plate to radiate heat along said line such that only said zone of the glass plate is heated to a temperature at which the glass plate does not yet soften but exhibits an appreciable lowering of its electrical resistivity;
(d) applying a voltage to said electrodes to cause an electric current to flow between said electrodes through said zone of the glass plate while steps (b) and (c) are continued such that only said zone of the glass plate is further heated by the Joule effect of said current and softened; and
(e) bending the glass plate while said zone remains softened so as to give a bend along said line contained in the softened zone.

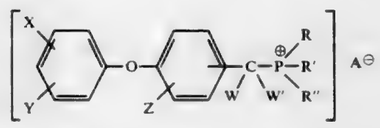
4,173,462

PHENOXYBENZYLPHOSPHONIUM SALT HERBICIDES AND PLANT GROWTH REGULANTS

Michael J. Brown, Randolph Township, Morris County, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Dec. 16, 1977, Ser. No. 861,162
Int. Cl.[2] A01N *9/36*, *5/00*
U.S. Cl. 71—86 **21 Claims**

1. A plant growth inhibiting composition comprising an inert carrier and an inhibitor, said inhibitor consisting essentially of a compound having the formula:



wherein $A^{\ominus}$ is a halogen anion; X, Y and Z are each independently hydrogen, a halogen atom or haloalkyl group of from 1 to 4 carbon atoms; R, R' and R'' are each independently phenyl, halophenyl, haloalkylphenyl of from 7 to 12 carbon atoms or alkyl of from 1 to 6 carbon atoms, optionally substituted with halogen; W is hydrogen, —CHO or $-CHN(R''')_2$ where each R''' is independently hydrogen or alkyl of from 1 to 4 carbon atoms, optionally substituted with halogen; and W' is hydrogen or represents a bond forming a double bond between C and W when W is $-CHN(R''')_2$ an inert carrier therefor.

4,173,463

PHOSPHONIUM SALTS AS HERBICIDES

Larry W. Peterson, Oakdale; Gene A. Bozarth, and Kurt H. G. Pilgram, both of Modesto, all of Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 31, 1978, Ser. No. 956,457
Int. Cl.[2] A01N *9/36*
U.S. Cl. 71—87 **1 Claim**

1. A method for controlling unwanted plant growth which comprises applying to the foliage of the unwanted plant an effective dosage of a compound of the formula

$$(R)_3P^{\oplus}—CH_2—X—R'.hal^{\ominus} \quad (I)$$

wherein R is naphthyl, or is phenyl or phenalkyl optionally substituted by from one to three moieties selected from alkyl of from 1 to 6 carbon atoms, middle halogen, nitro, amino, and trifluoromethyl, and when R is phenalkyl it contains from 1 to 4 carbon atoms in the linking alkyl moiety, with from 1 to 2 carbon atoms linking the phenyl moiety to the phosphorus

atom; or is alkyl of from 1 to 12 carbon atoms, or cycloalkyl of from 5 to 6 carbon atoms; X is —O—, —S—, —SO— or SO_2—; R′ is alkyl of from 1 to 4 carbon atoms, alkenyl of from 3 to 5 carbon atoms, or is phenyl or substituted phenyl as defined for R; hal is chlorine, bromine or iodine.

4,173,464

m-PHENOXYBENZAMIDE DERIVATIVES

Hiroshi Noguchi, Toyonaka; Shunichi Hashimoto, Takarazuka; Shigeyoshi Kitamura, Toyonaka; Takashi Matsuo, Iruma; Akihiko Mine, Kawanishi, and Katsuzo Kamoshita, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

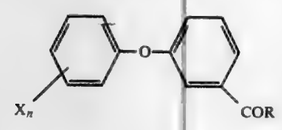
Filed Apr. 29, 1977, Ser. No. 792,221

Claims priority, application Japan, May 7, 1976, 51-52430; May 13, 1976, 51-54989; Oct. 6, 1976, 51-120754; Dec. 28, 1976, 51-160388

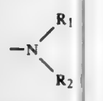
Int. Cl.[2] **C07** *103/22;* **A01N** *9/20, 9/22, 9/02*

U.S. Cl. 71—118 **21 Claims**

1. A herbicidal composition which comprises as an active ingredient a herbicidally effective amount of a m-phenoxybenzamide compound of the formula:



wherein X, which may be the same or different, is a halogen atom, C_1–C_4 alkoxy or at least one halogeh atom in combination with at least one C_1–C_6 alkyl group, n is an integer of 1 to 5 and R is a group of the formula:



in which R_1 is a hydrogen atom or a C_1–C_6 alkyl or C_3–C_4 alkenyl group and R_2 is a C_1–C_6 alkyl, C_3–C_4 alkenyl, C_3–C_5 alkynyl, C_3–C_6 cycloalkyl, C_2–C_3 haloalkyl or C_1–C_3 alkoxy-substituted C_2–C_3 alkyl group, and an inert carrier.

4,173,465

METHOD FOR THE DIRECT REDUCTION OF IRON USING GAS FROM COAL

David C. Meissner, and Charles W. Sanzenbacher, both of Charlotte, N.C., assignors to Midrex Corporation, Charlotte, N.C.

Filed Aug. 15, 1978, Ser. No. 933,691

Int. Cl.[2] **C21B** *13/02*

U.S. Cl. 75—35 **6 Claims**

1. In a method for reducing iron oxide in a direct reduction furnace wherein hot reducing gas is introduced to said furnace to reduce the iron oxide therein to a metallized iron product and to form a CO_2 containing spent reducing gas, the improvement comprising:

a. removing a substantial portion of the CO_2 from said spent reducing gas to form a reductant-rich gas;

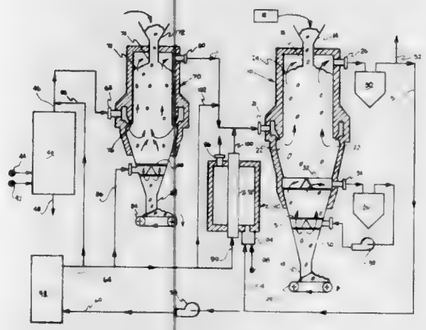
b. gasifying fossil fuel to form a hot gasifier gas;

c. tempering said hot gasifier gas with a first stream of said reductant-rich gas to form a hot gas mixture;

d. reacting said hot gas mixture with a sulfur acceptor to form a hot desulfurized gas;

e. heating a second stream of said reductant-rich gas; and

f. mixing said heated second stream of reductant-rich gas with hot desulfurized gas to form a reducing gas having a



quality of at least about 8 and a temperature of from about 760° to about 900° C. for introduction to said furnace.

4,173,466

MAGNESIUM-CONTAINING TREATMENT AGENTS

John R. McLaughlin; Michael D. Bryant, both of Birmingham, England; Manfred Fessel, and Kenneth C. Taylor, both of Borken, Fed. Rep. of Germany, assignors to Foseco International Limited, Birmingham, England

Filed Dec. 6, 1977, Ser. No. 857,897

Claims priority, application United Kingdom, Dec. 6, 1976, 50847/76; Feb. 11, 1977, 5807/77

Int. Cl.[2] **C21C** *7/02*

U.S. Cl. 75—58 **13 Claims**

1. A treatment agent which is a compacted mixture comprising particulate iron, magnesium and calcium, wherein

(1) the magnesium content is 5 to 15% by weight

(2) the weight ratio of magnesium to calcium is in the range of from 1:1 to 8:1

(3) the iron has a purity of at least 95% by weight and a particle size of all less than 0.5 mm and

(4) the mixture is compacted into a body of density at least 4.3 gm/cm^3.

4,173,467

PROCESS FOR RECOVERING VALUABLE METALS FROM SUPERALLOY SCRAP

Barry H. Rosof, Indianapolis, Ind., assignor to Cabot Corporation, Boston, Mass.

Filed May 26, 1978, Ser. No. 909,729

Int. Cl.[2] **C22B** *23/04*

U.S. Cl. 75—119 **15 Claims**

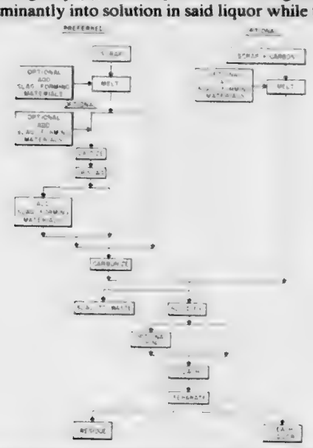
1. A method for treating certain metal scraps which comprises:

providing an initial scrap metal feed containing the combination of (a) at least one metal selected from the group consisting of nickel, cobalt or mixtures thereof, and (b) at least one refractory metal selected from the group consisting of chromium, molybdenum, tungsten and mixtures thereof, said feed comprising at least one acid resistant alloy selected from the group consisting of cobalt and nickel base alloys;

melt carburizing said feed sufficiently to at least predominantly insolubilize the metals of group (b) with respect to the aqueous acid leach step below and to render the group (a) metals of said acid resistant alloy contained in said feed soluble in said acid leach step; and

non-electrolytically leaching the melt carburized feed with aqueous acid leach liquor having dissolving power for the

metals of group (a), whereby said metals of group (a) pass predominantly into solution in said liquor while the metals



of group (b) remain predominantly as undissolved leach residue.

4,173,468

ALLOY FOR SOLDERING ALUMINUM

Frank M. Gault, 148 High Tor Dr., Watchung, N.J. 07060

Filed May 5, 1978, Ser. No. 903,073

Int. Cl.[2] **C22C** *11/00*

U.S. Cl. 75—134 N **1 Claim**

1. A solder alloy composition consisting, by weight, 5.0 to 65.0 percent bismuth, 0.05 to 95.0 percent lead, 0.05 to 55.0 percent cadmium, 0.05 to 10.0 percent silver, 0.05 to 15.0 percent antimony, 0.005 to 5.0 percent cobalt, 0.005 to 5.0 percent copper, 0.005 to 5.0 percent manganese and 0.005 to 5.0 percent nickel.

4,173,469

MAGNESIUM ALLOYS

William Unsworth, Aspull; John F. King, Bury, and Stephen L. Bradshaw, Bolton, all of England, assignors to Magnesium Elektron Limited, Swinton, England

Continuation-in-part of Ser. No. 645,225, Dec. 29, 1977, abandoned. This application Oct. 25, 1977, Ser. No. 844,939

Claims priority, application United Kingdom, Dec. 30, 1974, 56021/74

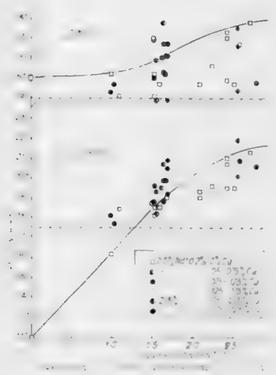
Int. Cl.[2] **C22C** *23/00*

U.S. Cl. 75—168 F **7 Claims**

1. A cast magnesium base alloy which when heat treated has a 0.2% proof stress of at least 175 N/mm^2 and an ultimate tensile strength of at least 240 N/mm^{2}at ambient room temperature, consisting of the following other than iron and other impurities:

Magnesium	at least 88%
Silver	from 1 to 2% by weight
Copper	from 0.05 to 0.15% by weight
Rare Earth Metals of which at least 60% by weight are Neodymium	from 0.5 to 3.0% by weight
Zirconium	nil to 1% by weight
Manganese	nil to 2% by weight
Zinc	nil to 0.5% by weight
Cadmium	nil to 1.0% by weight
Lithium	nil to 6.0% by weight
Calcium	nil to 0.8% by weight
Gallium	nil to 2.0% by weight
Indium	nil to 2.0% by weight
Thallium	nil to 5.0% by weight
Lead	nil to 1.0% by weight
Bismuth	nil to 1.0% by weight

the maximum quantities of zirconium and manganese being



limited by their mutual solubility in the alloy.

4,173,470

NOVOLAK PHOTORESIST COMPOSITION AND PREPARATION THEREOF

Susan Fahrenholtz, Bloomfield, N.J.; David T. Long, Orefield, and Raymond C. Pitetti, Wescosville, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

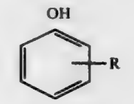
Filed Nov. 9, 1977, Ser. No. 849,754

Int. Cl.[2] **G03C** *1/68, 5/00, 1/52;* **A47G** *27/04*

U.S. Cl. 430—5 **8 Claims**

1. Method for the preparation of a positive photoresist which comprises the steps of

(a) reacting at least one cresol with a condensation agent selected from the group consisting of aldehydes and reactive ketones, said condensation agent having less than 10 carbon atoms and at least one carbonyl group per molecule, and a hydroxylated aromatic of the general formula



wherein R is an alkyl group having from 3–15 carbon atoms, said reaction being effected in the presence of a condensation catalyst,

(b) heating the reaction mixture to reflux over a time period ranging from 12 to 24 hours,

(c) subjecting the resultant mixture to vacuum distillation at a temperature ranging from 200–300 degrees C., and

(d) adding a photosensitizing agent and a solvent to the resultant product.

6. Method for forming a patterned resist on the surface of a substrate which comprises exposing a portion of the composition of claim 1 on said substrate to ultraviolet radiation having a wavelength with the range of 2000 to 5000 Angstroms for a time period sufficient to react the photosensitizer so as to solubilize the resist and selectively removing the exposed pattern from said substrate.

4,173,471

AGE-HARDENABLE TITANIUM CARBIDE TOOL STEEL

M. Kumar Mal, Spring Valley, and Stuart E. Tarkan, Monsey, both of N.Y., assignors to Chromalloy American Corporation, West Nyack, N.Y.

Filed Jan. 27, 1978, Ser. No. 872,907
Int. Cl.[2] B22F 5/00; C22C 33/02, 38/14, 29/00
U.S. Cl. 75—237 **4 Claims**

1. A sintered age-hardenable titanium carbide tool steel composition comprising by volume about 15% to 50% primary grains of titanium carbide dispersed through a high cobalt-containing steel matrix making up the balance and consisting essentially by weight of about 10% to 25% cobalt, about 5% to 20% chromium, about 0.5% to 5% molybdenum, 0 to 2% nickel, 0 to 0.15% carbon and essentially the balance at least about 50% iron.

3. As an article of manufacture, a die element made of an age-hardened titanium carbide tool steel composition comprising by volume about 15% to 50% primary grains of titanium carbide dispersed through a high cobalt containing steel matrix making up the balance and consisting essentially by weight of about 10% to 25% cobalt, about 5% to 20% chromium, about 0.5% to 5% molybdenum, 0 to 2% nickel, 0 to 0.15% carbon and essentially the balance at least about 50% iron.

4,173,472

POLYESTER INTERLAYER AND BINDER COMPONENT IN MULTILAYER PHOTOCONDUCTIVE ELEMENT

Martin A. Berwick, Kendall, and Edgar E. Riecke, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 696,248, Jun. 15, 1976, abandoned. This application Feb. 14, 1977, Ser. No. 768,460
Int. Cl.[2] G03G 5/04, 5/14
U.S. Cl. 430—60 **8 Claims**

1. In a unitary multilayer photoconductive element having a photoconductive insulating composition in electrical contact with a conductive layer, the improvement wherein said element comprises, as an interlayer between said photoconductive insulative composition and said conducting layer, an amorphous, water-insoluble polyester selected from the group consisting of

(a) polyesters having recurring units derived from at least one aromatic dicarboxylic acid component and at least one diol component, at least one of said acid or diol components being a non-linear monomer selected from the group consisting of an isophthalic acid component or a branched-chain alkylenediol having the formula

$$HO—CH_2—R^1—CH_2—OH$$

wherein R^1 is a branched-chain alkylene group, and

(b) polyester copolymers having recurring units derived from at least one aromatic dicarboxylic acid component and at least one diol component, at least one of said acid or said diol components being a mixture of at least two different acids or two different diols, respectively, so that a copolyester is obtained, and at least one of said acid or one of said diol components being selected from the group consisting of a nonlinear monomer as defined above or a cycloaliphatic diol.

4,173,473

RADIATION SENSITIVE COMPOSITIONS CONTAINING PYRYLIUM COMPOUNDS

Constantine C. Petropoulos, Webster; George A. Reynolds, and James A. Van Allan, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 6, 1977, Ser. No. 813,371
Int. Cl.[2] G03G 5/09
U.S. Cl. 430—72 **4 Claims**

1. A photoconductive composition comprising an electrically insulating material containing a sensitizing amount of a pyrylium-type salt having the formula:



wherein:

each of X^1 and X^2, which may be the same or different, represents oxygen, sulfur, or selenium;

each of Y^1 and Y^2, which may be the same or different, represents the atoms necessary to complete a heterocyclic unsaturated ring nucleus having 6 or 10 ring atoms including a selenium, sulfur or oxygen hetero ring atom and 5 or 9 carbon ring atoms;

each of R^1, R^2, and R^3, which may be the same or different, represents hydrogen, halogen, cyano, nitro, alkyl having 1 to about 4 carbon atoms in the alkyl group, or aryl, with the proviso that at least one of R^1, R^2, or R^3 represents aryl; and

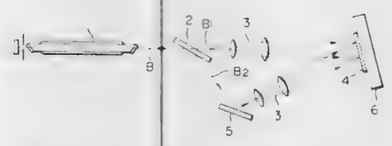
$Z^{\ominus}$ represents an anionic function.

4,173,474

HOLOGRAM AND METHOD OF PRODUCTION USING TWO SOLVENT TREATMENTS

Takashi Tanaka, Tokyo, and Katsuhiko Nishide, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1977, Ser. No. 819,420
Claims priority, application Japan, Jul. 27, 1976, 51-89487
Int. Cl.[2] G03C 5/04, 5/00, 5/24
U.S. Cl. 430—1 **9 Claims**



1. A method of producing a hologram comprising:

(A) a first step wherein a sensitive member is prepared by dispersing a photopolymerizable substance into a polymer by which a carrier is formed,

(B) a second step of exposing said member to an interference pattern of radiation rays,

(C) a third step of contacting the exposed sensitive member with a first solvent capable of providing a difference in swelling in accordance with the interference pattern formed in the sensitive member, and

(D) a fourth step of contacting the exposed sensitive member with a second solvent which is miscible with the first solvent, but relatively weak in swelling action to the sensitive member whereby a hologram having an unexpectedly high diffraction efficiency relative to the thickness of the sensitive member is formed.

4,173,475

LATENT IMAGE THICK REFRACTIVE INDEX RECORDINGS

Edwin A. Chandross, Berkeley Heights, and Walter J. Tomlinson, III, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 31, 1977, Ser. No. 801,783
Int. Cl.[2] G03C 5/04, 1/72
U.S. Cl. 430—290 **8 Claims**

1. A latent-image process for recording refractive index patterns in a thick medium comprising an exposure step wherein a photosensitive body is irradiated with a light pattern followed by a development step wherein a refractive index change corresponding to said light pattern is established in said photosensitive body, characterized in that said photosensitive body is a porous rigid matrix having a pore size of at least 10 A and having photosensitive sites comprising a photosensitive material which has a sufficiently strong adhesion to said rigid matrix to prevent substantial disengagement of said photosensitive compound prior to the completion of said development step wherein said photosensitive sites upon irradiation with said light pattern during said exposure step undergo a photochemical change which destroys the ability of said photosensitive sites to initiate polymerization, said photochemical change occurring without appreciably changing the refractive index in said photosensitive body and said development step comprises filling the pores of said photosensitive body with a reactive composition and producing refractive index changes in said reactive composition by supplying sufficient radiant energy to activate the photosensitive sites remaining after said exposure step thereby initiating polymerization in said reactive composition.

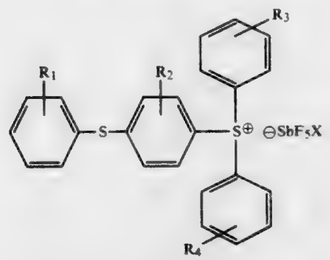
4,173,476

COMPLEX SALT PHOTOINITIATOR

George H. Smith, Maplewood, and Peter M. Olofson, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 8, 1978, Ser. No. 876,114
Int. Cl.[2] G03C 5/04, 1/68; C07F 9/90; C08F 8/18
U.S. Cl. 430—280 **12 Claims**

1. A triarylsulfonium complex salt of the formula:



where X is F or OH; R_1, R_2, R_3 and R_4 are each selected from H, lower alkyl, alkoxy, or halogen.

4,173,477

PHOTOGRAPHIC MATERIAL WITH DEVELOPER IN AZX EMULSION AND SUBLAYER

Keisuke Shiba, Shizuoka; Kikuo Kubotera, and Akira Kashiwabara, both of Asaka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 18, 1977, Ser. No. 816,764
Claims priority, application Japan, Jul. 16, 1976, 51-84861
Int. Cl.[2] G03F 7/02; G03C 1/48
U.S. Cl. 430—264 **27 Claims**

1. A silver halide photographic element comprising an aluminum support having thereon an anodized aluminum oxide layer, a subbing layer on the anodized aluminum oxide layer and a silver halide developing agent-containing light sensitive silver halide emulsion layer on the subbing layer, said subbing layer containing a silver halide and a silver halide developing agent in a molar amount less than the amount thereof contained in the light sensitive layer, wherein the said silver halide developing agent is 4-phenyl catechol and wherein said anodized aluminum oxide layer has been subjected to a graining treatment.

4,173,478

PHOTOGRAPHIC MATERIALS COMPRISING AZO SENSITIZING DYES

Colin Holstead, Abbots Langley; Kenneth N. Kilminster, Linslade Leighton Buzzard, and Michael J. Simons, Eastcote Ruislip, all of England, assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 846,665, Oct. 28, 1977. This application Jul. 31, 1978, Ser. No. 929,879
Int. Cl.[2] G03C 1/02
U.S. Cl. 430—353 **22 Claims**

21. A method of developing an image in an exposed photothermographic element comprising a support having thereon in reactive association;

a. an oxidation-reduction image-forming combination comprising:

i. a silver salt oxidizing agent with

ii. a reducing agent;

b. a photosensitive component consisting essentially of photosensitive silver halide spectrally sensitized with

c. at least one azo spectral sensitizing dye

represented by the formula:

$$A—N{=}N—B$$

wherein A comprises at least one 5 to 12 membered heterocyclic ring having a —NH— moiety as part of the ring which enables the dye to form a substantially water-insoluble silver salt which heterocyclic ring is linked directly or through a second diazo group; and B is either 6 to 14 membered aryl or a 5 to 12 membered heterocyclic ring; said method comprising heating the element to about 100° C. to about 250° C. until an image is developed for about 1 to about 60 seconds.

4,173,479

COLOR PHOTOGRAPHIC RECORDING MATERIAL

Erwin Ranz, Leverkusen; Joachim W. Lohmann, Kuerten, and Heinz-Dieter Schlitz, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Jan. 31, 1978, Ser. No. 873,739
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1977, 2704797
Int. Cl.[2] G03C 1/76
U.S. Cl. 430—507 **3 Claims**

1. A color photographic recording material comprising

(a) a layer support, and applied thereon

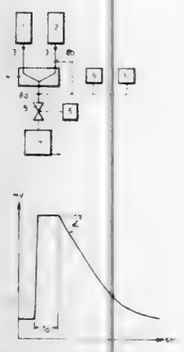
(b) several differently sensitized silver halide emulsion layers containing non-diffusible color couplers of which emulsion layers at least two are sensitive to red light and have different sensitivities and of which at least another two are sensitive to green light and have different sensitivities, the more sensitive of the two red-sensitive and the more sensitive of the two green-sensitive silver halide emulsion layers forming a comparatively more sensitive emulsion layer unit which is arranged further away from the layer support than each of the less sensitive red-sensitive and the less sensitive green-sensitive silver halide emulsion layers, and of which emulsion layers at least one is sensitive to blue light and is arranged further away from the layer support than each of the red-sensitive and the green-sensitive silver halide emulsion layers, and

(c) at least one yellow filter layer which is arranged further

away from the layer support than each of the red-sensitive and the green-sensitive silver halide emulsion layers and, optionally,

(d) other non-photosensitive layers,

wherein the improvement comprises an additional silver halide emulsion layer of comparatively low sensitivity, in which the silver halide contains from 20 to 100 mol % of silver chloride, the balance being silver bromide and the silver halide particles have an average grain diameter of less than 0.5 μm, and which



contains a non-diffusible compound capable of reacting with color developer oxidation products to release a diffusible silver halide development inhibitor, said compound having at 20° C. and at pH 10.2 an effective reaction rate constant in the coupling reaction with 2-methyl-N-ethyl-N-β-hydroxyethyl-p-phenylene diamine of between 200 and 4000 [1. mole^{-1}.sec^{-1}], is arranged within the comparatively more sensitive emulsion layer unit between the red-sensitive and the green-sensitive silver halide emulsion layer.

4,173,480

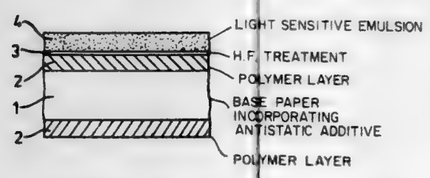
PHOTOGRAPHIC SHEET WITH SYNTHETIC HECTORITE ANTISTATIC ADDITIVE AS SIZING OR BACKCOAT

Antony I. Woodward, Amersham, England, assignor to Wiggins Teape Limited, Beaconsfield, England

Continuation of Ser. No. 601,426, Aug. 4, 1975, abandoned. This application Apr. 11, 1978, Ser. No. 895,480

Int. Cl.[2] **G03C** *1/82, 1/78*

U.S. Cl. 430—536 **10 Claims**



1. A photographic sheet material element, adapted for carrying a radiation-sensitive layer for receiving a photographic image, which comprises a support having incorporated therewith an antistatic additive composition as a sizing or a backcoat, said antistatic additive composition comprising synthetic hectorite clay having a layered structure, the layers of which are electrically charged and said layers being magnesium silicate lattice structure in which magnesium ions are bound in octadhedral relationship with hydroxyl ions.

4,173,481

METHOD OF HARDENING GELATIN AND PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Hidefumi Sera; Tsumoru Ishii; June Yamaguchi, and Hisashi Shiraishi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

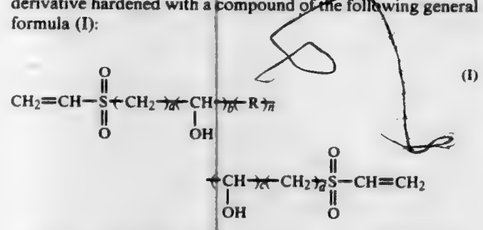
Filed Nov. 1, 1977, Ser. No. 847,520

Claims priority, application Japan, Nov. 4, 1976, 51/132929

Int. Cl.[2] **G03C** *1/30*

U.S. Cl. 430—621 **9 Claims**

1. A photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer with the photographic light-sensitive material having one hydrophilic colloid layer containing gelatin and/or a gelatin derivative hardened with a compound of the following general formula (I):



(I)

wherein a and d each represents 1 or 2; b and c each represents 0, 1 or 2 with the proviso that both b and c are not simultaneously 0; R represents a divalent group selected from the group consisting of a cyclic hydrocarbon group having 6 to 12 carbon atoms, an acyclic hydrocarbon group having 1 to 8 carbon atoms, a $-CH_2OCH_2-$ group, a $-(CH_2CH_2O)_2CH_2CH_2-$ group, a $-CH_2CH_2OCH_2CH_2-$ group and a



group; and is 0 or 1.

4,173,482

DRY IMAGE FORMING MATERIAL CONTAINING AN ORGANIC SILVER SALT OXIDIZING AGENT, A REDUCING AGENT AND A HALOGEN MOLECULE

Kageyasu Akashi; Yoshio Hayashi; Tatsumi Arakawa; Takeo Kimura, and Hidehiko Kobayashi, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 8, 1978, Ser. No. 884,529

Claims priority, application Japan, Mar. 16, 1977, 52-28088; Mar. 16, 1977, 52-28089; Jun. 14, 1977, 52-69424

Int. Cl.[2] **G03C** *1/02*

U.S. Cl. 430—619 **8 Claims**

1. A dry image forming material capable of forming an image by preliminary heating, imagewise exposure to light, and heat development thereof, said material comprising (a) a non-photosensitive organic silver salt oxidizing agent, (b) a reducing agent for a silver ion and (c) at least one halogen molecule selected from the group consisting of a bromine molecule, an iodine molecule, iodine chlorides, iodine bromide and bromine chloride.

4,173,483

SILVER HALIDE PHOTOGRAPHIC EMULSIONS FOR USE IN FLASH EXPOSURE

Teiji Habu; Tomio Nakajima; Elichi Sakamoto; Noboru Fujimori, and Kiyomitsu Mine, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Nihonbashi-Muro, Japan

Filed May 25, 1976, Ser. No. 690,042

Claims priority, application Japan, May 27, 1975, 50-63672

Int. Cl.[2] **G03C** *1/08, 1/14*

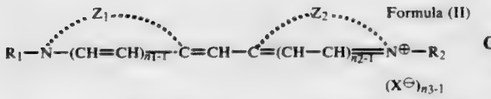
U.S. Cl. 430—575 **5 Claims**

1. A silver halide photographic emulsion for use in flash exposure which comprises at least one compound containing a metal belong to Group VIII of the periodic table in an amount of 10^{-8} to 5×10^{-7} mole per mole of silver halide and at least one of sensitizing dyes represented by the formula (I) or (II) and capable of sensitizing silver halide at less than 550 nm;

Formula (I)



wherein R is selected from the group consisting of alkyl, allyl, aryl, substituted alkyl selected from the group consisting of β-sulfoethyl, γ-sulfopropyl, δ-sulfobutyl, γ-sulfobutyl, β-(γ-sulfopropoxy)ethyl, β-(δ-sulfothiobutoxy)ethyl, β-hydroxyethyl, β-hydroxy-γ-sulfopropyl, carboxymethyl and β-carboxyethyl, and substituted aryl selected from the group consisting of p-chlorophenyl and p-carboxyphenyl; Z represents a non-metallic group necessary to complete a nitrogen-containing heterocyclic ring selected from the group consisting of pyrroline, thiazoline, thiazole, benzothiazole, naphthothiazole, selenazole, benzoselenazole, naphthoselenazole, oxazole, benzoxazole, naphthoxazole, imidazole, benzoimidazole, pyridine, quinoline, and indole; Q represents a non-metallic group necessary to complete a rhodanine, thiohydantoin or thiooxazolidine-dione ring which may be substituted by a group selected from the group consisting of lower alkyl, lower alkoxy, sulfoalkyl, carboxyalkyl, hydroxyalkyl, allyl and aryl; and n represents an integer of 1 or 2;



Formula (II)

wherein R_1 and R_2 individually are selected from the group consisting of alkyl, allyl, aryl, substituted alkyl selected from the group consisting of β-sulfoethyl, γ-sulfopropyl, δ-sulfobutyl, γ-sulfobutyl, β-(γ-sulfopropoxy)ethyl, β-(δ-sulfothiobutoxy)ethyl, β-hydroxyethyl, β-hydroxy-γ-sulfopropyl, carboxymethyl and β-carboxyethyl, and substituted aryl being selected from the group consisting of p-chlorophenyl and p-carboxyphenyl; Z_1 and Z_2 individually represent a non-metallic group necessary to complete a pyridine, pyrroline, oxazole, thiazole or selenazole ring; X^- represents an anion; and n_1, n_2 and n_3 individually represent an integer of 1 or 2; provided that n_3 is 1 when a sensitizing dye of the general formula forms an inner salt.

4,173,484

ARTIFICIAL STONE AND METHOD FOR MAKING

Imre Kubovits; Imre Mészáros, both of Budapest; Ferenc Kaszatnitzky; Mrs. László Szabó, both of Tatabánya, and Péter Ottlik, Budapest, all of Hungary, assignors to Tatabányai Szénbányák, Tatabanya, Hungary

Continuation-in-part of Ser. No. 369,142, Jun. 12, 1973, abandoned. This application Apr. 7, 1977, Ser. No. 785,327

Claims priority, application Hungary, Jun. 12, 1972, TA 1191

Int. Cl.[2] **C03C** *3/22*

U.S. Cl. 106—39.6 **11 Claims**

1. A method for the production of white or throughout colored acid-and base-resistant high-strength artificial stone, comprising preparing a starting material containing from about 30 to about 60% SiO_2, from 0 to about 5% Al_2O_3, from 0 to about 2% $FeO+Fe_2O_3$, from about 5 to about 30% MgO, from about 20 to about 40% CaO, and from about 2 to about 10% Na_2O and/or K_2O, which composition is outside the vitrification range of the system defined by these components, by mixing sand, dolomite and/or limestone, and sodium carbonate and/or cryolite, melting the starting material which contains no nucleating agents at a temperature between about 1,250° and about 1,400° C., casting the melt into a form, and subjecting the melt to spontaneous crystallization without reheating, between about 1,250° and about 1,000° C. for a period from about 0.5 to about 1.5 hours to form a crystallized mass essentially without a glassy phase, and thereafter cooling the crystallized mass.

9. The product of the process of claim 1.

4,173,485

PRODUCTION OF ZINC AND ALKALINE EARTH METAL TITANATES

Peter Woditsch; Gerhard Winter; Günter Linde, all of Krefeld, and Friedhelm Müller, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 31, 1978, Ser. No. 873,995

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1977, 2707229

Int. Cl.[2] **C04B** *35/46, 31/02;* **C01G** *23/00;* **C09C** *1/04*

U.S. Cl. 106—73.3 **11 Claims**

1. A process for the production of a titanate of at least one member selected from the group consisting of zinc and an alkaline earth metal comprising simultaneously adding a solution of a salt of said member and an alkali solution to a suspension of TiO_2 at a substantially constant pH above about 8, thereby to form a precipitate comprising TiO_2 and the hydroxide of said member, filtering said suspension to recover the solids, and calcining the solids at a temperature above about 500° C. thereby to produce the titanate.

4,173,486

COATING OF GLASS FIBRES

Colin J. Cheetham, Ormskirk, and Phillip Maguire, Liverpool, both of England, assignors to Pilkington Brothers Limited, St. Helens, England

Filed Nov. 8, 1977, Ser. No. 849,578

Claims priority, application United Kingdom, Nov. 11, 1976, 47071/76

Int. Cl.[2] **C04B** *7/02;* **C08J** *3/00;* **D02G** *3/00;* **B05D** *3/02*

U.S. Cl. 106—99 **22 Claims**

1. A method of coating glass fibres to protect them from deterioration in an alkaline environment, such as a Portland cement matrix, said method comprising the steps of applying to the glass fibres an aqueous composition containing a water-soluble film-forming material having free aliphatic hydroxyl groups in the molecule, a water-soluble ester formed by reaction of a tri-hydroxy- or di-hydroxy-substituted aromatic carboxylic acid with an alcohol having at least two hydroxyl groups in the molecule, and a cross-linking agent, and drying and curing the composition at elevated temperature so as to

cause cross-linking of the hydroxyl groups of the film-forming material, thereby to form a thermoset film coating on the glass fibres which also retains the ester.

16. Glass fibres coated by a method according to claim 1.

18. A cement composite material formed by incorporating coated glass fibres according to claim 16 in a cement matrix.

4,173,487

PROCESS FOR TREATING CEMENT PLANT DUST CATCH

Sidney M. Cohen, Allentown, Pa., assignor to Fuller Company, Catasauqua, Pa.

Continuation-in-part of Ser. No. 512,576, Oct. 7, 1974, abandoned. This application Dec. 10, 1975, Ser. No. 639,539

Int. Cl.[2] C04B *7/04*

U.S. Cl. 106—103 **8 Claims**

1. The process of treating the dust catch from a cement manufacturing operation having alkali compounds of up to 6% comprising the steps of:

analyzing the dust catch and determining the cement clinker which would be produced if the dust catch is burned and alkali and sulfur volatilization is achieved;

producing feed material by adding to the dust catch sufficient raw materials to chemically adjust the dust catch to produce cement clinker having the desired analysis when the feed material is burned;

pelletizing the feed material;

burning the feed material in a furnace at reducing conditions at a temperature sufficient to volatilize alkalies and sulfur from the feed material;

discharging cement clinker from the furnace; and

discharging volatilized alkalies from the furnace with the exhaust gases.

4,173,488

OIL-IN-WATER EMULSIONS CONTAINING HYDROPHOLEIC STARCH

Anthony E. Vassiliades, Deerfield; Shrenik Shroff, Lake Forest, and Edward F. Nauman, Chicago, all of Ill., assignors to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 87,654, Nov. 6, 1970, Pat. No. 3,707,514, which is a continuation-in-part of Ser. No. 786,337, Dec. 23, 1968, Pat. No. 3,585,149. This application Oct. 10, 1972, Ser. No. 296,163

Int. Cl.[2] C08L *3/08*

U.S. Cl. 106—213 **17 Claims**

1. An oil-in-water emulsion coating composition for imparting brightness and/or opacity to paper, boxboard, and the like, said emulsion having a finely dispersed volatile liquid oil phase and a continuous water phase containing a water binder and an emulsifier, wherein the improvement comprises utilizing a combination binder and emulsifier in said water phase consisting essentially of dispersed particles of a hydrophobic benzyl starch containing ether-linked benzyl groups, said dispersed particles being present in a binder-effective concentration at which said particles exhibit the characteristics of forming and stabilizing said emulsion.

4,173,489

ASPHALT MINERAL AGGREGATE COMPOSITIONS

Wheeler C. Crawford, Houston, and James R. wilson, Missouri City, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 12, 1978, Ser. No. 895,699

Int. Cl.[2] C08L *95/00*

U.S. Cl. 106—281 N **4 Claims**

1. A surfacing composition comprising:

(a) 100 parts by weight of a mineral aggregate,

(b) about 3 to about 15 parts by weight of an asphalt,

(c) about 1 to about 10 parts by weight of a propoxylated asphalt and wherein the said aggregate is coated with a silane adhesion promoter in an amount such that a residual concentration of the said silane on the aggregate is about 0.001 to about 0.01 weight percent.

4. The surfacing composition of claim 1 wherein the said silane is selected from the group consisting of β-aminoethyl-γ-aminopropyl trimethoxysilane and γ-aminopropyl triethoxysilane.

4,173,490

COATING COMPOSITION

Don H. Rotenberg, Westboro; Patricia M. Cuffe, Dudley; Bernard L. Laurin, Ludlow, and Peter R. Ramirez, Southbridge, all of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Apr. 18, 1978, Ser. No. 897,317

Int. Cl.[2] C09K *3/00*

U.S. Cl. 106—287.14 **8 Claims**

1. A coating composition which is curable to provide an optically clear abrasion resistant coating, which comprises a product of the hydrolysis of about 40 to 70 weight percent tetraethyl orthosilicate and 60 to 20 weight percent of a silane selected from the group consisting of methyltrimethoxysilane, methyltrietheoxysilane, ethyltrimethoxysilane, ethyltriethoxysilane, dimethyldimethoxysilane, dimethyldiethoxysilane and mixtures thereof and up to 20 weight percent of a siloxane having a reactive polar site.

4,173,491

PIGMENTED MICROPOROUS SILICA MICROSPHERES BY SPRAY PROCESSES

Lloyd Abrams, Hockessin, and Lionel S. Sandell, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 3, 1978, Ser. No. 882,984

Int. Cl.[2] C09C *1/28*

U.S. Cl. 106—288 B **4 Claims**

1. A process for preparing pigmented microporous silica microspheres by the steps of

(i) forming an aqueous suspension consisting essentially of particulate inorganic pigment uniformly dispersed in an aqueous solution of an alkali metal silicate,

(ii) spraying the aqueous suspension of step (i) into air to form fine droplets,

(iii) contacting the droplets with a medium consisting essentially of from 0% to 80% by volume of water, based on the volume of the medium, and from 20% to 100% by volume of a water miscible organic liquid, based on the volume of the medium, the pH of the medium being maintained at from 2 to 9 throughout the contacting, to form a suspension of pigmented microporous silica microspheres, and

(iv) isolating the pigmented microporous silica microspheres from the suspension of step (iii).

4,173,492

METHOD OF PREPARING COATED PIGMENT PARTICLES AND THE PRODUCT PRODUCED THEREBY

Edward T. Pollard, 78 Jefferson, Huron, Ohio 44839

Continuation of Ser. No. 668,724, Mar. 19, 1976, abandoned. This application Mar. 22, 1978, Ser. No. 888,946

Int. Cl.[2] C09C *3/08*

U.S. Cl. 106—308 F **7 Claims**

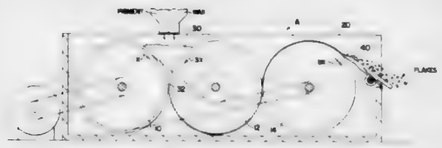
1. A method of preparing colorant flakes comprised of hydrophilic color pigment particles embedded in a wax matrix for dry compounding with a polymeric material, said method comprising the steps of:

(a) providing particles of said color pigment dispersed in a presscake having a given moisture content, said particles having a size ranging from about 0.1 micron to about 100 microns;

(b) before dehydration of said presscake, mixing said particles with particles of a hydroxystearate wax which has a

melting point temperature and is brittle below a selected lower temperature substantially below 212° F. while simultaneously heating the formed admixture to a processing temperature substantially above 212° F., by discharging said pigment particles and wax particles into the nip region of a pair of rotating rolls heated to said processing temperature, to simultaneously boil away any entrapped moisture in said pigment particles and melt the said wax to encapsulate the said pigment particles and form said particle admixture into a molten wax-pigment particle mixture;

(c) passing and compressing said mixture while at said processing temperature between said rolls in the nip thereof



while they are rotated at differing angular velocities to compress and subject said mixture to high shear forces acting to effect further mixing of said pigment particles with and produce substantially uniform dispersion thereof in the said melted wax while simultaneously expelling residual moisture from said pigment particles;

(d) cooling said mixture to a temperature which renders said mixture a brittle, easily breakable solid mass by passing said mixture over and in contact with a surface having a temperature below said selected lower temperature; and,

(e) then, scraping said solid mass off said surface to break it into flakes.

4,173,493

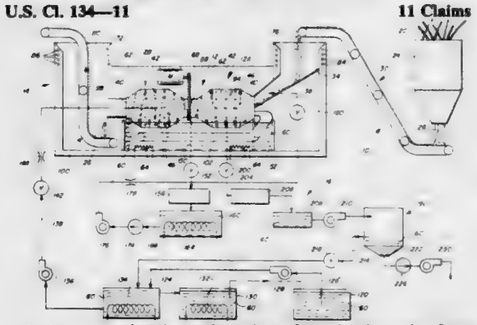
RECLAMATION OF CONDUCTIVE WIRE FROM CABLE

William C. Kallas, Park Ridge, Ill., assignor to Lissner Corporation, Chicago, Ill.

Filed Jul. 21, 1977, Ser. No. 817,722

Int. Cl.[2] B08B *5/00, 7/00, 3/00*

U.S. Cl. 134—11 **11 Claims**



1. A process for the reclamation of conductive wire from cable which includes sheathing material and which contains a filler soluble in a heated organic solvent, and for the recovery of the filler and the sheathing,

said process comprising:

mechanically converting the cable into convenient incremental segments to permit flow through a material handling system and to facilitate solvent extraction of said filler from said cable segments,

transporting said segments to and feeding said segments into an extraction system containing an organic solvent in which said filler is soluble,

conveying said segments into and through said solvent contained in a wash station of said system,

mechanically agitating said segments in said solvent in a revolving drum-like extraction vessel of said system in said wash station, said drum-like extraction vessel being formed with a plurality of spaced apertures in a bounding wall thereof to permit entry and exit of said solvent into and from said vessel in extraction of said filler from said segments,

discharging through said apertures of said drum-like vessel a minor fraction of said segments introduced into said extraction vessel, providing conveyor means for receiving the fraction of discharged segments, and redirecting the discharged segments into said extraction vessel,

circulating said solvent in said vessel to extract said segments and to separate said filler therefrom,

discharging said segments from said wash station of said vessel substantially free of said filler,

providing isolating zone means, including solvent vapor condensing means, between said extraction system and the ambient environment to prevent atmospheric air from intermixing with said organic solvent and solvent vapor container in said extraction system,

transporting said segments from said extraction system through said isolating zone means, and

discharging said segments to the ambient environment.

4,173,494

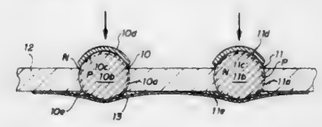
GLASS SUPPORT LIGHT ENERGY CONVERTER

Elwin L. Johnson; Jack S. Kilby, both of Dallas, Tex.; Jay W. Lathrop, Clemson, S.C.; John S. McFerren, Dallas, and David J. Myers, Plano, both of Tex., assignors to Jack S. Kilby, Dallas, Tex.

Filed Feb. 14, 1977, Ser. No. 768,187

Int. Cl.[2] H01L *31/06;* **C25B** *1/02*

U.S. Cl. 136—89 TF **19 Claims**



1. A semiconductor system which comprises in combination:

(a) a multiplicity of semiconducting particles, each having a central body portion inside a surface layer and constituting a photovoltaic generator,

(b) a matrix of glass adhered to each said surface layer to bind said particles in a monolayer sheet form with said particles being exposed at opposite sides of said sheet,

(c) a metal layer on one side of said sheet in contact only with said body portions of said particles and with said sheet, and

(d) transparent metallic electrodes, one covering each surface area of each said particle exposed at the side of said sheet opposite said metallic layer, each said electrode being isolated from every other electrode.

4,173,495

SOLAR COLLECTOR STRUCTURES CONTAINING THIN FILM POLYSILOXANE, AND SOLAR CELLS

Charles F. Rapp, and Norman L. Boling, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

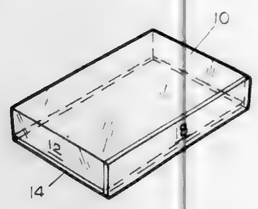
Filed May 3, 1978, Ser. No. 902,520

Int. Cl.[2] H01L *31/04*

U.S. Cl. 136—89 PC **12 Claims**

6. A luminescent solar collector and concentrator comprising a radiation collection medium for receiving incident solar radiation, said medium containing at least one luminescent species capable of emitting luminescent radiation upon excitation with incident solar radiation, said medium being totally internally reflective of a major portion of said emitted luminescent radiation, a relatively small surface area of said medium being optically coupled to a photovoltaic solar cell responsive to said emitted luminescent radiation, wherein said radiation

collection medium is a composite structure comprising a thin layer of a thermoset polysiloxane of a trifunctional silane containing dispersed therein at least one luminescent species, said layer being optically coupled to a thick radiation conducting layer of at least 0.5 mm thickness, which thick layer (1) is



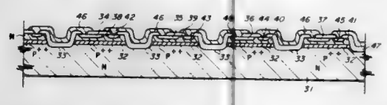
totally internally reflective of a major portion of said emitted luminescent radiation, (2) has an index of refraction close to that of said thin layer, (3) is less absorptive of said emitted luminescent radiation than said thin layer and (4) has a thickness ratio to said thin layer of higher than 4:1.

4,173,496

INTEGRATED SOLAR CELL ARRAY

Shang-Yi Chiang, and Bernard G. Carbajal, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 30, 1978, Ser. No. 910,329
Int. Cl.[2] H01L *31/06*
U.S. Cl. 136—89 MS **4 Claims**



1. An integrated solar cell array comprising a semiconductor body having a plurality of n-type regions extending to a surface thereof and isolated from each other by intervening heavily doped p-type regions; a shallow p-type region in each of said n-type regions to form a unit solar cell of said array; said semiconductor surface also including a pattern of grooves which provide lateral isolation between adjacent unit cells, wherein said heavily doped p-type regions extend between said grooves, parallel to said surface at a depth shallower than said grooves, thereby completing the isolation of said adjacent cells; and a conductive film on said surface, patterned to complete the interconnection of said cells in series, whereby the theoretical output voltage of the array is the sum of the voltages of the cells.

4,173,497

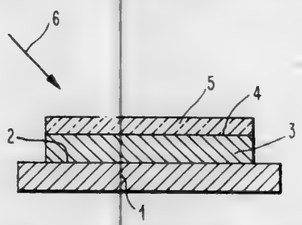
AMORPHOUS LEAD DIOXIDE PHOTOVOLTAIC GENERATOR

Ferenc J. Schmidt, Ardmore, and Jacob F. Betz, Quakertown, both of Pa., assignors to Ametek, Inc., Paoli, Pa.

Continuation-in-part of Ser. No. 827,939, Aug. 26, 1977, abandoned. This application Jul. 31, 1978, Ser. No. 929,352
Int. Cl.[2] H01L *31/06*; C25D *5/00*
U.S. Cl. 136—89 SJ **10 Claims**

1. A photovoltaic generator comprising photovoltaic amorphous lead dioxide, having an oxygen to lead ratio in the range 1.66:1 to 1.99:1 interposed between conductive outer layers, through one of which said lead dioxide is exposed to incident light, said lead dioxide having a rectifying junction at its interface with one layer adjacent thereto and an ohmic junction with the other layer adjacent thereto.

6. A method of making a photovoltaic generator comprising electrodepositing amorphous lead dioxide onto a conductive substrate which forms an ohmic junction therewith, and depos-



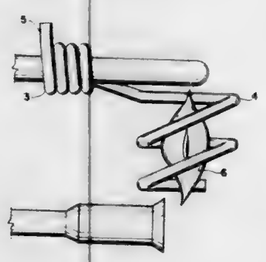
iting a conductive or semi-conductor layer on said electrodeposited lead dioxide which forms a rectifying junction therewith.

4,173,498

HEAT GATHERING AND CONDUCTING DEVICE FOR THERMOCOUPLE SENSORS

Ray N. Gaines, P.O. Box 311, Crystal Lake, Ill. 60014

Filed Mar. 27, 1978, Ser. No. 890,266
Int. Cl.[2] H01L *35/28*
U.S. Cl. 136—217 **1 Claim**



1. A manufacture device to collect and transfer heat by conduction from a pilot flame to a thermocouple comprising in combination a standard thermocouple and wire or the like formed in two coils, the smaller coil close wound with turns touching each other with an internal diameter such as to permit the device to be slid over the end of a standard thermocouple and the larger coil with open turns to surround the pilot flame.

4,173,499

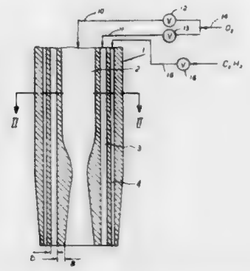
METHOD OF OPERATING A CUTTING BURNER

Paul Hölemann, Dortmund-Berghofen, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jul. 18, 1977, Ser. No. 816,690
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1976, 2633719
Int. Cl.[2] B23K *7/00, 7/08*
U.S. Cl. 148—9 R **6 Claims**

1. In a method of operating a cutting burner for the autogenous cutting of a metal workpiece, said cutting burner having a nozzle directing an oxygen cutting jet against said workpiece and forming an oxygen curtain around said cutting jet, said cutting jet being formed by passing cutting oxygen through a cutting-jet passage and said curtain being formed by passing oxygen through a passage means, the improvement which comprises proportioning the oxygen flow rates through said cutting-jet passage and said passage means such that the oxygen flow rate through said passage means is 5 to 25% of the

oxygen flow rate through said cutting-jet passage, and directing a heating gas against said burner piece from said nozzle by



passing said heating gas through said nozzle outwardly of said passage means.

4,173,500

PROCESS FOR PRODUCING POROUS CAST IRON

Kenryo Kawaguchi, Yamato, Japan, assignor to Oiles Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 21, 1977, Ser. No. 808,564
Claims priority, application Japan, Jun. 25, 1976, 51/74524
Int. Cl.[2] C21D *1/48*
U.S. Cl. 148—16 **9 Claims**

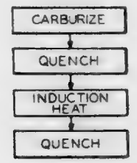
1. A process for producing porous grey cast iron for bearings or the like comprising the step of heating a grey cast iron having mixed structures of perlite and ferrite and a flake graphite structure and consisting of 2.8–4.0 wt% of total carbon, 1.0–3.0 wt% of silicon, less than 1 wt% of elements selected from the group of Mn, P and S and the remainder of iron at a temperature of above A_1 transformation point of the cast iron for 1–5 hours in an atmosphere in which the flake graphite is subjected to oxidation to form pores therein, said atmosphere having the predetermined composition selected among the mixed gases of $CO—CO_2$, $H_2—H_2O$ and $CO—CO_2—H_2—H_2O$.

4,173,501

STEEL TORSIONAL ELEMENT AND METHOD FOR MAKING

Jack A. Hildebrandt, Stevensville; Denver K. Pointer, Buchanan, and Herschel H. Stilley, Edwardsburg, all of Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Jun. 1, 1978, Ser. No. 911,641
Int. Cl.[2] C21D *1/48*
U.S. Cl. 148—16.5 **7 Claims**



1. A method for increasing the torsional strength of a steel torsional element, which method comprises the following steps in the sequence set forth:

(a) carburizing the steel torsional element at austenitizing temperatures to a first depth, whereby a carbon enriched case is produced to the first depth;

(b) quenching the torsional element from said austenitizing temperatures with an oil-like quenching medium, whereby a first hardened case to the first depth is produced, and whereby a heat-treat strengthened core is produced;

(c) successively heating longitudinal portions of the torsional element to austenitizing temperatures to a second and greater depth without appreciably affecting the heat-treat strengthed core below the greater depth; and

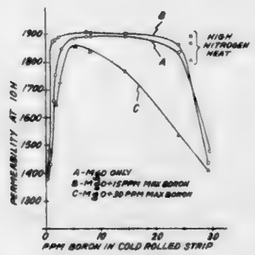
(d) quenching the successively heated longitudinal portions of the torsional element from said austenitizing temperatures with both a water-base quenching medium and the heat-treat strengthened core below the greater depth, whereby the hardness of the first hardened case is a function of both the carbon enriched case and the second recited quenching step, and whereby hardness is produced between the first and second depths of the successively heated longitudinal portions that is both a function of the carbon content of the steel prior to the carburizing step and the second recited quenching step.

4,173,502

METHOD OF PRODUCING SILICON-IRON SHEET MATERIAL WITH BORON ADDITION, AND PRODUCT

Howard C. Fiedler, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 749,117, Dec. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 677,146, Apr. 15, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 881,541
Int. Cl.[2] H01F *1/04*
U.S. Cl. 148—113 **10 Claims**

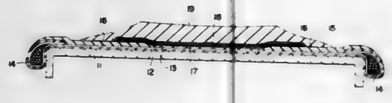


1. The method of producing grain-oriented silicon-iron sheet which comprises the steps of providing a fine-grained, primary-recrystallized, silicon-iron sheet containing 2.2 to 4.5 percent silicon, between about 1.5 and 7.5 parts per million boron, amounts of manganese and sulfur within a ratio of manganese to sulfur less than 2.5, and between about 30 and 90 parts per million nitrogen in the ratio to boron of one to 15 parts per part of boron, covering the sheet with an electrically-insulating adherent coating containing about 15 parts per million boron on the basis of the silicon-iron sheet, the total amount of boron in the sheet and boron in the coating available to the sheet being between about 16.5 and about 22.5 parts per million, and subjecting the coated sheet to a final heat treatment to develop (110) secondary recrystallization texture in the silicon-iron sheet.

4. An electrically-insulating magnetic sheet material comprising a fine-grained, primary-recrystallized, magnetic, silicon-iron sheet containing 2.2 to 4.5 percent silicon, between about 1.5 and 7.5 parts per million boron, amounts of manganese and sulfur within a ratio of manganese to sulfur less than 2.5, and between about 30 and 90 parts per million nitrogen and having thereon a coating of a water-insoluble hydroxide of a metal selected from the group consisting of calcium, magnesium, manganese and aluminum, said coating containing about 15 parts per million boron on the basis of the silicon-iron sheet and so proportioned to the boron content of the said sheet that the total amount of boron in the sheet and boron in the coating available to the sheet is between about 16.5 and 22.5 parts per million.

V 9 8 8 1 N 0 6 7 9 UMI

4,173,503
METHOD OF MAKING A RADIAL TIRE
James J. Shipman, Akron; Robert W. Hallman, Medina; Linwood P. Tenney, and Leman G. Beall, Jr., both of Hudson, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio
Filed May 30, 1978, Ser. No. 910,803
Int. Cl.[2] B29H *17/14*
U.S. Cl. 156—123 R 15 Claims

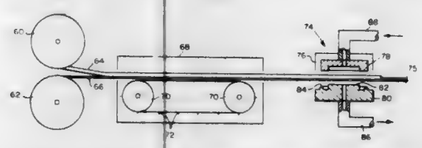


1. The method of making in one stage a radial tire for vehicles wherein all the components of the tire including the carcass, belt, and rubber cover material are assembled sequentially upon a cylindrical building drum, with the rubber material forming the sidewall cover of the completed tire having axially spaced portions thereof, overlaid by marginal portions of the belt of the tire; the improvement which comprises coating the said spaced portions of the sidewall cover prior to placement thereof upon the building drum with a composition comprising a thermoplastic, which has a cured interface with the rubber equivalent of the rubber to itself, a solvent for the thermoplastic, and material which is a lubricant for rubber, with the said coating being dried before the sidewall cover is placed upon the carcass.

4,173,504
METHOD FOR PRODUCING TOBACCO FILTERS
Susumu Tomioka, and Kohichi Kunimune, both of Moriyamashi, Japan, assignors to Chisso Corporation, Osaka, Japan
Filed Dec. 27, 1977, Ser. No. 864,357
Claims priority, application Japan, Jan. 19, 1977, 52-4757
Int. Cl.[2] A24C *5/50*
U.S. Cl. 156—180 9 Claims

1. A method for producing tobacco filters which comprises forming bundles of fibers consisting of
(I) 20–100% by weight of melt spun composite fibers, and
(II) 80–0% by weight of other fibers,
said composite fibers as set forth in (I)
(A) having a side-by-side or sheath and core arrangement of a first component and a second component,
(1) said first component consisting mainly of crystalline polypropylene or propylene copolymer consisting mainly of propylene,
(2) said second component consisting of a member selected from the group consisting of
(a) an ethylenevinyl acetate copolymer having a vinyl acetate content of 0.5–18 mol% of the total monomers of the vinyl acetate component and the ethylene component,
(b) a saponification product of said ethylene vinyl acetate copolymer set forth in (a) and
(c) a mixed polymer of polyethylene and either (a) or (b), said mixed polymer having a total content of vinyl acetate component and vinyl alcohol component of at least 0.5 mol % based upon the total monomer content of the mixed polymer
(3) said second component having a circumferential ratio of 60–100% of the composite fiber cross section,
(4) the composite weight ratio of the first to the second component being in the range of 30:70–70:30,
(B) being subjected to heat treatment at a temperature lower than the melting point of the first component and higher than the melting point of said second component to thereby stabilize said fiber bundles by the self adhesion of the second component portions of the composite fibers.

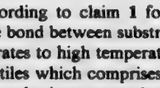
4,173,505
METHOD OF MAKING A DISPOSABLE DENTAL TRAY OR THE LIKE BY COMBINING DISSIMILAR FOAMS
I. Murray Jacobs, Birmingham, Mich., assignor to Sybron Corporation, Rochester, N.Y.
Filed Feb. 3, 1978, Ser. No. 874,850
Int. Cl.[2] B29C *17/03*
U.S. Cl. 156—285 5 Claims



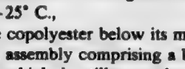
1. A method of making a vacuum formed article having a laminated structure of dissimilar plastic foams comprising the steps of:
(a) superimposing a sheet of closed cell polyethylene foam on a sheet of an open cell hydrophilic polyurethane foam so that said polyethylene foam sheet is supported on and carried by said polyurethane foam sheet;
(b) heating said superimposed sheets by conveying the same through a heating chamber which has been heated to a temperature above the melting point of said polyurethane foam sheet, said sheets being passed through said heating chamber at a rate which allows retention of said sheets in said chamber only for a time sufficient to soften the surfaces of said polyethylene sheet and render the surfaces of said polyurethane sheet tacky, said heating step alone being insufficient to result in the bonding of said sheets so that at the end of said heating step said polyethylene sheet and polyurethane sheet remain unjoined with said polyethylene sheet resting and being carried on said polyurethane sheet;
(c) passing said superimposed sheets from said heating chamber and into a vacuum forming mold; and
(d) establishing a differential pressure across said superimposed sheets in said mold, said polyethylene sheet being oriented between said sheet of hydrophilic polyurethane foam and the higher pressure for moving and compressing said polyethylene sheet towards and against said sheet of hydrophilic polyurethane foam responsive to said differential pressure for simultaneously
bonding said sheets together by embedding the open cell surface of said polyurethane foam sheet in the softened surface of said closed cell polyethylene sheet thereby forming said laminated structure, and
vacuum forming the contours of said article.

4,173,506
BONDING METHOD UTILIZING POLYESTER ADHESIVE EXHIBITING "OPEN TIME"
Wayne A. Pletcher, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Division of Ser. No. 699,976, Jun. 25, 1979, Pat. No. 4,059,715, which is a continuation-in-part of Ser. No. 591,935, Jun. 30, 1975, abandoned. This application Aug. 26, 1977, Ser. No. 827,899
Int. Cl.[2] C09J *5/00*
U.S. Cl. 156—309 4 Claims

1. A method for forming a strong bond between a substrate and a thermoplastic copolyester comprising
(1) melting a thermoplastic segmented copolyester having an open time of at least about ½ minute at 20° C. and consisting essentially of from about 5 to 75 percent by weight of amorphous ester units and 95 to 25 percent by weight of crystallizable ester units joined through ester linkages, the crystallizable ester units being or the formula



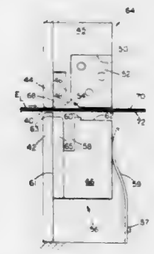
and the amorphous ester units being of the formula



wherein R_1 consists of residues of one or more diacids selected from saturated aliphatic dicarboxylic acids containing from 4 to 10 carbon atoms and aromatic dicarboxylic acids selected from terephthalic acid, isophthalic acid, phthalic acid, 4,4'-benzophenone dicarboxylic acid, 4,4'-diphenylmethane dicarboxylic acid, 4,4'-diphenylether dicarboxylic acid, 4,4'-diphenylthioether dicarboxylic acid and 4,4'-diphenylamine dicarboxylic acid, R_2 consists of residues of one or more saturated aliphatic diols containing from 2 to 12 carbon atoms, R_3 is R_1 or R_5, R_4 is R_2 or R_6, R_5 consists of the divalent radicals containing from about 22 to 50 carbon atoms which remain after removal of the carboxyl groups from saturated aliphatic dimer acids and R_6 consists of the divalent radicals remaining after removal of the hydroxyl groups of long chain aliphatic diols having an average molecular weight of 200 to 4000, provided that at least one of R_3 and R_4 is each amorphous ester unit is R_5 or R_6, and provided that when R_1 is aromatic, R_2 contains from 6 to 12 carbon atoms and the amorphous content is 50–75 percent by weight, the said copolyester having a DTA melting temperature of from about 25° to 150° C., an inherent viscosity of at least 0.5 dl/g at 25° C., as measured in 0.3 g/dl solutions of polymer in chloroform at 25° C., substantially complete solubility in toluene at 25° C. in the ratio of about 10 percent by weight of copolyester and 90% by weight of solvent, a tensile strength of 100–400 kg/cm^2, an elongation at break of 400–1000 percent, a T-peel adhesion to vinyl of at least 0.9 kg/cm of width and a DTA glass transition temperature, T_g, below −25° C.,
(2) cooling the copolyester below its melting temperature,
(3) bringing the copolyester into contact with the substrate which is at a temperature below the copolyester melting temperature and while the copolyester is still open, and
(4) maintaining the copolyester and the substrate in contact until the copolyester has reverted to its solid, non-bondable state.

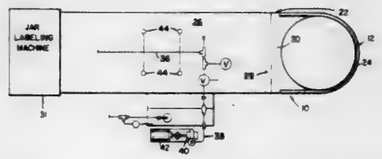
2. A method according to claim 1 for forming a strong, dependable adhesive bond between substrate surfaces without subjecting the substrates to high temperature and without the involvement of volatiles which comprises:
(1) melting a thermoplastic segmented copolyester having an open time of at least about ½ minute at 20° C., a tensile strength of 100–400 kg/cm^2, an elongation at break of 400–1000 percent, a T-peel adhesion to vinyl of at least 0.9 kg/cm of width and a DTA glass transition temperature, T_g, below −25° C.,
(2) cooling the copolyester below its melting temperature,
(3) forming an assembly comprising a bonding layer of the copolyester which is still open between the substrate surfaces which are below the melting temperature of the copolyester, and
(4) maintaining the assembly at a temperature below the melting temperature of the copolyester until it has reverted to its normal, solid, non-bondable state.

4,173,507
SEPARATING LAMINATED LAYERS
Frederic S. Tobey, Brewster, Mass., assignor to W. H. Brady Co., Milwaukee, Wis.
Filed Nov. 15, 1977, Ser. No. 851,685
Int. Cl.[2] B31F *1/00*; B32B *31/00*
U.S. Cl. 156—443 7 Claims



1. Apparatus for separating layers of a laminate at an end thereof, comprising means for bending said layers sharply in one direction at one portion of said end, and bending said layers in the opposite direction at a lengthwise adjacent portion of said end, to cause shearing and lengthwise offset between said layers, and then releasing said end, a differential in the forces that tend to straighten the layers causing said layers to separate upon their release from said means, said means comprising
a first portion providing a narrow cavity and a support surface adjacent thereto, and
a second portion providing a finger-like member, narrower than said cavity, and, adjacent to said finger-like member, a compressible member,
one of said portions being mounted for movement toward the other with an end portion of said laminate therebetween, to cause said finger-like member to force said end portion of said laminate into said cavity while said compressible member holds an adjacent portion of said laminate against said support surface to restrain said laminate longitudinally.

4,173,508
APPARATUS FOR HANDLING GLASS JARS
Robert B. Lind, Oakland, Calif., assignor to Gerber Products Company, Fremont, Mich.
Continuation of Ser. No. 589,159, Jun. 23, 1975, Pat. No. 4,077,826, which is a continuation of Ser. No. 166,885, Jul. 28, 1971, abandoned. This application Jan. 30, 1978, Ser. No. 873,756
The portion of the term of this patent subsequent to Mar. 7, 1995, has been disclaimed.
Int. Cl.[2] B65C *3/06*; B32B *17/06*; B65B *21/04*
U.S. Cl. 156—499 1 Claim



1. In an apparatus for processing externally soiled, cooled, filled glass jars of the type having a closure cap, said jars having been stored during cooling in stacked layers, the apparatus including an unloading station, a jar labeling station, a conveyor belt extending between the unloading station and the labeling station, means for moving said conveyor belt at a

predetermined speed; means located at the unloading station for transferring successive layers of said jars to said conveyor belt so as to provide a continuous supply of said jars thereto; means located at said jar labeling station for applying labels to the surface of said jars, the improvement comprising:

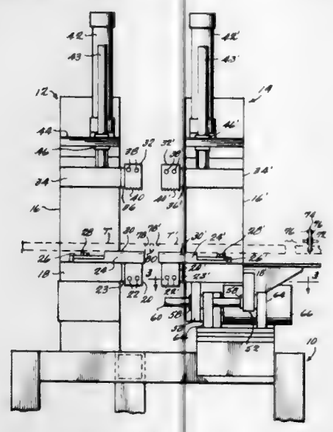
a jar heating and cleaning station positioned along the path of said conveyor belt closely adjacent said jar labeling station, said heating and cleaning station including means to heat a cleaning fluid to substantially 200° F., a quantity of said fluid, an array of downwardly projecting spray nozzles operative to disperse an overlapping continuous spray of said heated cleaning fluid onto said caps and jars during continuous movement thereof along said conveyor belt for simultaneously cleaning the surfaces of said caps and said jars and heating said jars substantially above the room temperature, such that said jar labeling station receives said jars in a heated and cleaned state for securing labels thereto, means for circulating cleaning fluid from said heating means to said spray nozzles, and sufficient of said cleaning fluid to provide said continuous overlapping spray.

4,173,509

APPARATUS FOR SPLICING TREAD STRIPS

Ralph C. Raabe, Letts; Roger G. Cleffman, and Raymond G. Stratton, both of Muscatine, all of Iowa, assignors to Bandag Incorporated, Muscatine, Iowa

Division of Ser. No. 649,518, Jan. 15, 1976, Pat. No. 4,082,592. This application Jan. 18, 1978, Ser. No. 870,584
Int. Cl.[2] B29C *27/06*
U.S. Cl. 156—507 **8 Claims**



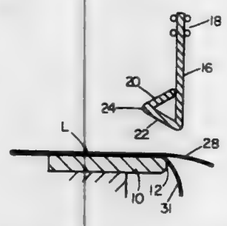
1. Apparatus for splicing the ends of two precured rubber tread strips having tread grooves in one surface thereof, said apparatus comprising: two mold elements each of which has a ribbed surface complementary to the grooved surface of the tread strip whereby the ribs on the mold elements are insertable into grooves in tread strips, said mold elements being spaced apart and arranged with their ribbed surfaces generally in the same plane; a clamping element mounted adjacent each mold element so as to form an assembly for clamping the end portion of a tread strip between the respective mold element and clamping element, each clamping element having a clamping surface facing the respective ribbed surface; power means for effecting relative movement between the mold element and clamping element of each assembly toward and away from each other while maintaining the mold elements coplanar; power means for effecting relative movement between the assemblies toward and away from each other in the plane of the ribbed surfaces of the mold elements to thereby abut the ends of two tread strips clamped between the elements of the assemblies; and means for heating at least one element of each assembly in order to heat the end portions of the clamped tread strips when the latter are abutted with each other.

4,173,510

APPARATUS FOR SEPARATING LAMINATED LAYERS

Frederic S. Tobey, Brewster, Mass., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Nov. 10, 1977, Ser. No. 850,266
Int. Cl.[2] B32B *35/00, 7/12*
U.S. Cl. 156—584 **6 Claims**



1. Apparatus for separating layers of a laminate at an end thereof at which said layers are coterminous, comprising

means for supporting said laminate to permit bending thereof at said end, and

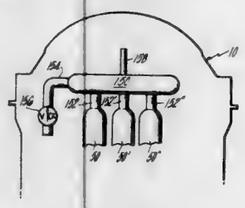
means for applying a force against the outer surface of one said layer and pressing said one layer against the other said layer to simultaneously bend both said layers at said end sufficiently sharply to cause shearing and lengthwise offset therebetween, said outer surface being on the outside of said bend, and for thereafter releasing both said layers to permit them to spring back from said bending said means for supporting comprising a support having a sharply rounded edge, and said means for applying a force comprising a member for wiping around said edge an end of said laminate held on said support.

4,173,511

CONTROL ROD BLOW OUT PROTECTION SYSTEM

Joseph R. Dietrich, West Hartford; William S. Flinn, Bloomfield, and Malcolm D. Groves, Simsbury, all of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jul. 10, 1972, Ser. No. 270,319
Int. Cl.[2] G21C *7/12*
U.S. Cl. 176—36 R **4 Claims**



1. In a nuclear reactor, the reactor including a vessel for containing a circulating coolant under pressure and having a fuel assembly disposed therein, the fuel assembly comprising a plurality of fuel elements containing fissionable material and a plurality of guide tubes for movable neutron absorber elements, an improved control system comprising:

first tubular extension means for each of the guide tubes, said first guide tube extension means extending upwardly from the fuel assembly and having open upper ends terminating within the reactor vessel;

first conduit means coupling the lower ends of said first extension means to the upper ends of associated guide tubes, said first conduit means and extension means cooperating with the guide tubes to define hydraulic cylinders which extend above the fuel assembly;

neutron absorber element means disposed for movement in said hydraulic cylinders, each of said absorber element means in part defining a lift piston which cooperates with its associated hydraulic cylinder;

a source of coolant at a lift pressure exceeding the coolant pressure normally maintained within the reactor vessel, said lift pressure source being located exteriorly of the reactor vessel;

second conduit means for selectively and individually coupling the lower ends of the guide tubes to said lift pressure source whereby selected of said absorber element means may be raised by application of lift pressure to the lower ends of said hydraulic cylinders, said second conduit means penetrating the reactor vessel; and

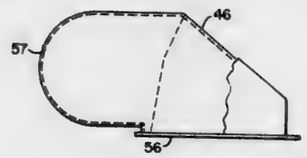
passive means connected to the upper ends of said first tubular extension means, said first tubular extension means being associated together in groups comprising less than the total number of guide tubes, each of said groups being associated with a respective of said passive means, said passive means establishing fluid communication between all of the guide tube extension means of each group and the interior of the reactor vessel, said passive means limiting coolant flow through said hydraulic cylinders to a rate commensurate with raising individual of the absorber element means of each group of guide tubes, said passive means thereby preventing simultaneous raising of a plurality of absorber element means upon establishment of a pressure less than normal coolant pressure within the reactor vessel.

4,173,512

SHOCK ABSORBER SYSTEM FOR NUCLEAR REACTOR ICE CONDENSER COMPARTMENT

Joseph F. Meier, Export; George E. Rudd, Murrysville, both of Pa.; Ashok V. Pradhan, Beechwood, Ohio; John A. George, Greensburg, Pa.; Hugh W. Lippincott, Pittsburgh, Pa., and John D. Sutherland, Monroeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 9, 1974, Ser. No. 459,450
Int. Cl.[2] G21C *13/10*
U.S. Cl. 176—37 **6 Claims**



1. A shock absorber system for use in an ice condenser compartment for a nuclear reactor comprising:

a containment enclosing a reactor compartment containing a nuclear reactor having a closed cooling system including piping connecting the reactor, pumps and a steam generator in a closed loop;

a wall in the reactor compartment spaced from the inner surface of the containment, the space therebetween defining an ice condenser compartment;

multiple aligned ports located in the bottom of said wall, movable doors mounted in each of said ports, said ports providing access from the reactor compartment to the ice condenser compartment so that in the event of rupture of said piping, coolant released inside the reactor compartment generates a steam pressure which forces said doors under high velocity to an open position thereby providing an avenue for escape of steam into the ice condenser compartment;

separate crushable shock absorbing means mounted inside the condenser compartment adjacent said ports for absorbing the energy imparted to each door by the steam pressure;

each of said shock absorber means comprising a member approximately the same size as each of said doors and containing material displaying rigid-brittle type crush behavior which permits fragmentation upon being impacted by said door, and being capable of absorbing the impacting forces of the door without the door rebounding to a closed position; and

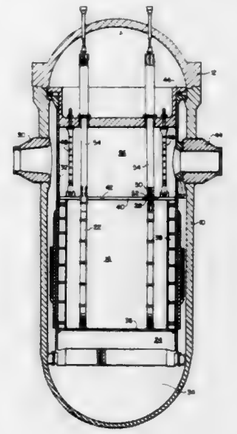
means covering said material for containing the fragmented particles after being impacted by said door, said covering means comprising a fabric containment bag which encompasses said shock absorber material and having an amount of excess fabric of a size sufficiently large to accept at least a major portion of the fragmented material after impacting and to minimize the establishment of an air pressure inside the bag at the time of crushing the fragmented material.

4,173,513

NUCLEAR REACTOR WITH CONTROL RODS

Franklin D. Obermeyer, Pensacola, and Robert T. Berringer, Gulf Breeze, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 7, 1977, Ser. No. 813,564
Int. Cl.[2] G21C *15/00*
U.S. Cl. 176—50 **3 Claims**



1. A nuclear reactor including a pressure vessel, fuel assemblies mounted within said vessel between a perforated lower core plate and a perforated upper core plate, an upper support spaced above said upper core plate, means for circulating a liquid coolant through said vessel and fuel assemblies including a vessel outlet nozzle disposed at an elevation between the elevations of said upper core plate and upper support, a support column mounted to said upper core plate and said upper support in vertical alignment with one of said fuel assemblies, a control rod guide tube mounted between said upper core plate and said upper support plate in vertical alignment with another one of said fuel assemblies for slidingly receiving a rectilinearly movable control rod and being sized to receive a substantial portion of said coolant exiting said another fuel assembly, said guide tube having a plurality of perforated horizontal supports affixed substantially within said guide tube at preselected spaced elevations along said guide tube and a perforated bottom support affixed to the bottom of said guide tube, a plurality of primary flow openings in the wall of said guide tube between said bottom support and the lowermost of said horizontal supports, said guide tube being impervious to

substantial radial discharge of coolant except for discharge through said primary openings, and a continuous control rod guide extending and affixed between said bottom support and said lowermost horizontal support, said lowermost support being positioned at an elevation below the elevation of the flow area of said outlet nozzle.

4,173,514

HIGH MANNITOL PROCESS (ENZYMATIC ISOMERIZATION)

Walter M. Kruse, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Jun. 2, 1977, Ser. No. 802,653
Int. Cl.[2] C12D *13/02*
U.S. Cl. 435—94 **11 Claims**

1. A process for obtaining a mannitol-rich solution of sorbitol and mannitol from glucose which comprises:
(a) catalytically epimerizing glucose in an acidic aqueous solution in the presence of a hexa- valent molybdenum catalyst at a temperature not exceeding about 100° C., thereby obtaining a mixture of glucose and mannose in aqueous solution;
(b) contacting said mixture of glucose and mannose in aqueous solution with a glucose isomerase enzyme under enzymatic isomerization conditions, whereby a portion of the glucose content of said mixture is isomerized and a mixture of glucose, fructose, and mannose in aqueous solution is formed; and
(c) catalytically hydrogenating said mixture of glucose, fructose, and mannose in aqueous solution, thereby forming an aqueous solution containing sorbitol and mannitol.

10. A process for obtaining a mixture of glucose, fructose, and mannose in aqueous solution which comprises:
(a) catalytically epimerizing glucose in an acidic aqueous solution in the presence of a hexavalent molybdenum catalyst at a temperature not exceeding about 100° C., thereby obtaining a mixture of glucose and mannose in aqueous solution; and
(b) contacting said mixture of glucose and mannose in aqueous solution with a glucose isomerase enzyme under enzymatic isomerization conditions, whereby a portion of the glucose content but no substantial portion of the mannose content of said mixture is isomerized and a mixture of glucose, fructose, and mannose in aqueous solution is formed.

4,173,515

GROUP D ENTEROCOCCI BROTH

Clifton Aldridge, Crawford County; Sandra F. Gibson, Chesterfield, both of Mo.; Richard D. Vannest, Richardson, Tex., and Gregory D. Rodgers, Florissant, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 682,661, May 3, 1976, abandoned. This application May 2, 1977, Ser. No. 792,715
Int. Cl.[2] C12K *1/10*
U.S. Cl. 435—38 **9 Claims**

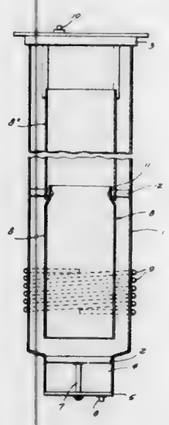
1. A broth medium for the detection of Group D enterococci in polymicrobic specimen comprising:
(a) a nitrogen source,
(b) a carbon source,
(c) an antibiotic inhibitor to inhibit growth of *Staphylococcus aureus,*
(d) an inhibitor to inhibit growth of gram-negative organisms, and
(e) an indicator system which comprises ferric ammonium citrate and esculin hydrolysate whereby metabolic activity of Group D enterococci forms a precipitate in the medium.

4,173,516

DEVICE FOR CULTIVATING CELLS OF ANIMAL AND HUMAN TISSUES

Hermann Katinger, Vienna, and Winfried Scheirer, Wiener-Neudorf, both of Austria, assignors to Chemap AG, Maennedorf, Switzerland

Division of Ser. No. 814,415, Jul. 11, 1977, abandoned. This application Oct. 6, 1977, Ser. No. 840,165
Claims priority, application Austria, Jul. 15, 1976, 5213/76
Int. Cl.[2] C12B *1/14*
U.S. Cl. 435—286 **1 Claim**



1. An arrangement for cultivating cells of animal and human tissues which are highly susceptible to damage resulting from agitation, comprising an upright container for nutrient solution containing the cells which tend to settle in the solution; guide means located in said container and subdividing the interior of the latter into two zones; means for accommodating an oxygen-containing gas and including a gas chamber located below said container; and means for introducing said oxygen-containing gas from said gas chamber of said accommodating means into said container, and including a plate separating said chamber from said container and having at least one outlet opening communicating with said interior and through which said oxygen-containing gas is introduced into said container so as to impart to said nutrient solution a circulatory movement between said zones which is sufficient to prevent the cells from settling and maintain them in suspended state, but is so slight as to avoid agitating said nutrient solution with concomitant damage to the cells, said introducing means constituting the only means for imparting circulatory movement to said nutrient solution, said container having side walls, and said guide means being a tubular member located within said container and inwardly spaced from said side walls thereof, so as to form an inner hollow inside said tubular member defining one of said zones and an outer hollow between said tubular member and the walls of said container defining the other of said zones, for circulating said nutrient solution therethrough, said tubular member being elongated in a substantially vertical direction and having at least two portions which are spaced from each other in the direction of elongation thereof and define therebetween a further outlet opening so that said nutrient solution circulates between said inner and said outer hollow through said further opening.

4,173,517

ELECTROCHEMICAL PROCESS FOR DICYCLOPENTADIENYL IRON

Herbert Lehmkuhl, and Wilhelm Eisenbach, both of Mülheim an der Ruhr, Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle mbH, Mulheim an der Ruhr, Fed. Rep. of Germany

Filed May 1, 1978, Ser. No. 901,918
Claims priority, application Fed. Rep. of Germany, May 5, 1977, 2720165
Int. Cl.[2] C25D *3/12*
U.S. Cl. 204—59 QM **11 Claims**

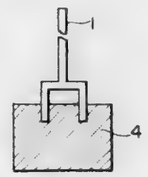
1. A process for the direct production of ferrocenes from iron and cyclopentadiene or derivatives of cyclopentadiene, comprising electrolyzing a conductive salt-containing solution of a monomeric cyclopentadiene compound in an inert solvent, between an iron anode and a cathode which is inert toward the electrolyte.

4,173,518

ELECTRODES FOR ALUMINUM REDUCTION CELLS

Koichi Yamada; Tadanori Hashimoto, and Kazuo Horinouchi, all of Niihama, Japan, assignors to Sumitomo Aluminum Smelting Company, Limited, Osaka, Japan

Continuation of Ser. No. 624,004, Oct. 20, 1975, abandoned. This application Oct. 25, 1977, Ser. No. 845,287
Claims priority, application Japan, Oct. 23, 1974, 49-122916; May 7, 1975, 50-55015
Int. Cl.[2] C25C *3/06, 7/02;* C25B *11/04*
U.S. Cl. 204—67 **26 Claims**



1. A method for producing aluminum by the molten salt electrolysis of aluminum oxide which comprises electrolyzing aluminum oxide dissolved in a molten salt containing aluminum sodium fluoride as the main component at a temperature of about 900° C. to about 1000° C. by passing a direct current therefor through an anode to a cathode disposed in said molten salt, wherein at least a portion of said anode that is brought into contact with said molten salt is made of or covered with a composition which includes at least about 50% by weight of electronic conductive oxide ceramics selected from one or a combination of oxides represented by general formulae XYO_2 wherein X is a monovalent metal, Y is a trivalent metal and O is an oxygen atom; $D_2E_2O_7$ wherein D is a trivalent metal, E is a tetravalent metal and O is an oxygen atom; and GRO_4 wherein G is a trivalent or tetravalent metal, R is a pentavalent or tetravalent metal and O is oxygen atom, with the proviso that when G is a trivalent metal then R is selected from pentavalent metals, and when G is a tetravalent metal then R is selected from tetravalent metals.

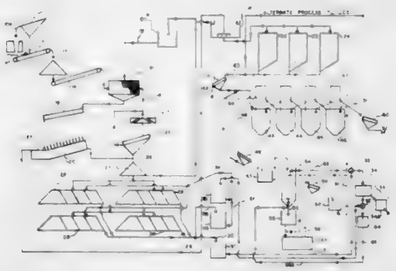
4,173,519

METHOD, PROCESS, SYSTEM, AND APPARATUS FOR RECOVERING METAL VALUES FROM ORES

Trent J. Parker, 1880 Laurel Hurst Dr., Salt Lake City, Utah 84108, and Harmel A. Dawson, 1043 Barbara Pl., Salt Lake City, Utah 84102

Filed Nov. 7, 1978, Ser. No. 958,539
Int. Cl.[2] C25C *1/20, 7/00*
U.S. Cl. 204—110 **13 Claims**

1. A method of recovering metal values from mined ore, comprising the steps of: providing a quantity of said ore; separating from said ore quantity a majority of the slime material therein; processing the so-separated slime material in slime soak-leach tanks to recover metal values therefrom; separately processing a remainder of said ore quantity, from which said



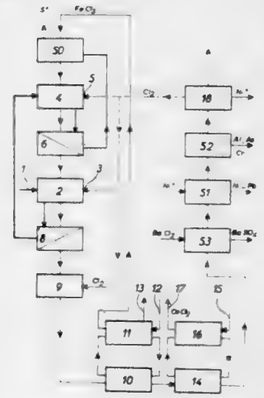
majority has been removed, in heap-leach piles to derive a pregnant liquor; and processing said pregnant liquor to derive metal values therefrom.

4,173,520

HYDROMETALLURGICAL METHOD FOR TREATING NICKEL MATTES

Jean-Michel Demarthe, Viroflay; Louis Gandon, Rambouillet, and Monique Goujet, Versailles, all of France, assignors to Societe Metallurgique le Nickel-S.L.N., Paris, France

Continuation of Ser. No. 649,744, Jan. 16, 1976, abandoned. This application Nov. 8, 1977, Ser. No. 849,603
Claims priority, application France, Jan. 16, 1975, 75 01264; Dec. 12, 1975, 75 38166
Int. Cl.[2] C25C *1/06*
U.S. Cl. 204—113 **14 Claims**



1. A hydrometallurgical process of treating nickel matte containing nickel, cobalt, iron, and sulphur values and trace amounts of lead, chromium, arsenic, and aluminum values to recover essentially pure nickel, comprising:
(a) subjecting an aqueous mixture containing the matte in a grain size of between 100 and 2,000 microns and a concentration of about from 5 to 100 grams per liter of the sum of ferrous and ferric ions to the action of gaseous chlorine to obtain a first solid residue and an aqueous lixiviating solution having a pH value of substantially nil or positive and containing ferric chloride in a concentration of about from 5 to 100 grams per liter, hydrochloric acid, and the chlorides of the metals in the matte;
(b) separating the first solid residue from the aqueous lixiviating solution which has a concentration of nickel of at least 100 g/l and subjecting the aqueous lixiviating solu-

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tion to the action of chlorine so as to oxidize all ferrous ions therein to ferric;
(c) subjecting the separated first solid residue obtained in step (b) to percolation by placing it in a fluidized bed moving counterflow to a solution of ferric chloride to obtain a second solid residue comprising elemental sulphur containing a small amount of metal impurities and a second aqueous solution;
(d) separating the second solid residue from the second aqueous solution and recovering the separated second solid residue as such, or subjecting it to further processing to obtain pure sulphur, while recycling the separated second aqueous solution to step (a);
(e) subjecting the aqueous lixiviating solution containing ferric chloride, hydrochloric acid, and the other metal chlorides obtained in step (b) to organic liquid-aqueous liquid extraction by contacting it with an organic phase containing tributyl phosphate and an aromatic diluent whereupon all the ferric chloride and hydrochloric acid pass into the organic phase while the other metal chlorides remain in the aqueous phase;
(f) separating the organic phase containing all the ferric chloride and hydrochloric acid from the aqueous phase containing all the other metal chlorides;
(g) eluting the separated organic phase containing the ferric chloride and hydrochloric acid from step (f) with a first aqueous regeneration phase whereupon all of the ferric chloride and hydrochloric acid pass into the aqueous phase which is recycled to the percolation procedure of step (c) and thereafter recycled to step (a);
(h) subjecting the separated aqueous phase containing the other metal chlorides obtained in step (f) and now free of ferric chloride to organic liquid-aqueous liquid extraction by contacting it with an organic phase containing triisooctylamine, an aromatic diluent, and tributyl phosphate whereupon all the cobalt chloride passes into the organic phase while the other metal chlorides remain in the aqueous phase;
(i) separating the organic phase containing essentially all of the cobalt chloride from the aqueous phase containing the other metal chlorides;
(j) eluting the separated organic phase containing the cobalt chloride from step (i) with a second aqueous regeneration phase whereupon the cobalt chloride passes into the aqueous phase and is recovered as such or further processed to obtain the cobalt;
(k) treating the aqueous solution containing the remaining metal chlorides and also sulphate ions resulting from the oxidation of the sulphide ions in the matte to elemental sulphur and then to sulphate ions with barium chloride in a quantity slightly less than the stoichiometrical amount required to precipitate all of the sulphate ions, thereby to precipitate the sulphate ions as barium sulphate, and separating the barium sulphate from the aqueous solution containing the remainder of the metal chlorides;
(l) subjecting the aqueous solution containing the remaining metal chlorides from step (k) to partial electrolysis employing a soluble nickel anode to obtain a deposit of lead on nickel and an aqueous phase containing the remaining metal chlorides;
(m) separating the nickel-lead deposit from the aqueous phase containing the remainder of the metal chlorides;
(n) subjecting the separated aqueous phase containing the remaining metal chlorides obtained in step (m) to organic liquid-aqueous liquid extraction by contacting it with an organic phase containing at least one di-ester of orthophosphoric acid and an aromatic diluent whereupon the chlorides of chromium, aluminum, and arsenic pass into the organic phase while the nickel chloride remains in the aqueous phase;
(o) separating the organic phase containing the chromium, aluminum, and arsenic chlorides from the aqueous phase containing nickel chloride only;
(p) treating the separated organic phase from step (o) to recover the chromium, aluminum, and arsenic chlorides; and
(q) electrolyzing the separated aqueous nickel chloride solution from step (o) to obtain pure nickel at the cathode and recycling the chlorine gas produced to step (a).

4,173,521

PHOTOSENSITIVE REDOX SOLUTIONS

Robert C. Wade, Ipswich, Mass., assignor to Thiokol Corporation, Newtown, Pa.

Continuation-in-part of Ser. No. 842,716, Jul. 17, 1969, abandoned. This application Nov. 8, 1971, Ser. No. 196,804
Int. Cl.[2] B01J *1/10, 31/12*
U.S. Cl. 204—157.1 R **6 Claims**

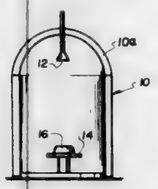
1. The method for reducing a compound normally reducible with Ti (III) which comprises contacting the compound to be reduced in a confined reaction zone free of oxygen with an aqueous solution having a pH between about 2 and about 10 and containing (1) from about 0.1 to 3 weight percent of a titanium (IV) compound and (2) from about 0.5 to 3 weight percent of a complexing agent, the weight percent of said complexing agent being at least equal to that of said titanium (IV) compound, said titanium (IV) compound being selected from the group consisting of (a) the reaction product of substantially anhydrous trimethyl borate with substantially anhydrous titanium tetrachloride, (b) a water soluble titanium compound conforming substantially to the formula $CL_2Ti(OR)_2$ where R is selected from the group consisting of H, CH_3, C_3H_7 and C_4H_9, (c) titanyl sulfate solutions and (d) titanyl chloride solutions, said complexing agent being selected from the group consisting of N-hydroxy - ethylene - diaminetri - acetic acid, diethanol glycine, glucoheptanoic acid, succharic acid, mucid acid, the sodium and ammonium salts of these acids, polyvinyl alcohol and mixtures thereof, and subjecting said solution to actinic radiation between the lower wavelengths of the visible spectrum and ultraviolet light.

4,173,522

METHOD AND APPARATUS FOR PRODUCING CARBON COATINGS BY SPUTTERING

Hans K. Pulker, Triesen, Liechtenstein, and Reinhard Staffler, Feldkirch, Austria, assignors to Balzers Patent- und Beteiligungs-Aktiengesellschaft, Liechtenstein

Filed Sep. 7, 1977, Ser. No. 831,132
Claims priority, application Switzerland, Sep. 9, 1976, 011424/76
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—192 C **1 Claim**



1. A method of forming a carbon coating on a substrate comprising placing a fibrous carbon material having a density of less than 2 grams per cubic centimeter on an electrode forming a cathode which is spaced away from an electrode forming an anode and energizing the electrodes to deposit the carbon material on the substrate by sputtering.

4,173,523

CATHODIC PROTECTION OF A STRUCTURE IN THE SEA BY SACRIFICIAL ANODES

Joël Bastien, Toulouse; Jaime Gratacos, Morlaas, and Flavien Lazarre, Pau, all of France, assignors to Societe Nationale Elf Aquitaine (Production), Paris, France

Filed Sep. 12, 1977, Ser. No. 832,472
Claims priority, application France, Sep. 13, 1976, 76 27443
Int. Cl.[2] C23F *13/00*
U.S. Cl. 204—197 **4 Claims**

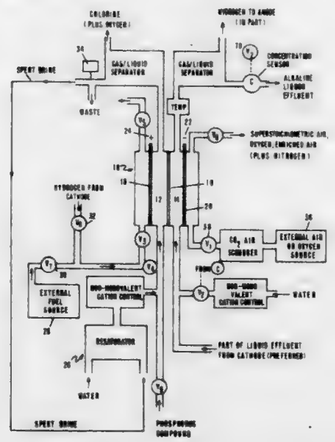
1. A system for cathodic protection of a metal structure in the sea, by means of submerged sacrificial anodes which are joined by electrical conductors to the metal structure, comprising at least one sacrificial anode of a first composition for which the current output is greater than 10 Amperes per square meter with potentials on the order of −900 millivolts in relation to a standard saturated calomel electrode, and at least one sacrificial anode of a second composition different from the first for which the currentoutput is less than 6 Amperes per square meter for potentials on the order of −900 millivolts in relation to an electrode of saturated calomel, and wherein the anodes of the first and of the second composition are aluminum anodes with 0.3 to 6% zinc or cadmium, and 0.02 to 0.2% of mercury, the anodes of the first composition containing less than 0.005% of magnesium and less than 0.005% of copper, the anodes of the second composition containing 0.5 to 10% of magnesium and 0.1 to 1.0% of copper, the absolute values of the decomposition potential under load from the anodes of the first and of the second composition being greater than the absolute value of the potential of the structure to be protected.

4,173,524

CHLOR-ALKALI ELECTROLYSIS CELL

Wayne A. McRae, Zurich, Switzerland, assignor to Ionics Inc., Watertown, Mass.

Filed Sep. 14, 1978, Ser. No. 942,109
Int. Cl.[2] C25B *9/00*
U.S. Cl. 204—265 **9 Claims**



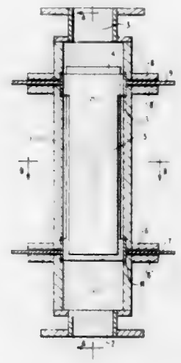
1. In a chlor-alkali cell comprising an anode compartment containing an anode, a cathode compartment containing a cathode catalytic for the reduction of oxygen, a substantially fluid impervious cation permselective membrane separating said anode and cathode compartments, means for passing a direct electric current between said cathode and said anode, the improvement which comprises:
(a) means for flowing a substantially saturated aqueous chloride solution into said anode compartment;
(b) means for resaturating and recirculating to said anode compartment part of the liquid effluent from said compartment;
(c) means for maintaining the concentration of any nonmonovalent metallic cation in the feed to said anode compartment at a concentration of not more than about 5 parts per million;
(d) means for maintaining in the feed to said anode compartment substantially more than 1 part per million of a phosphorous containing compound which can form gelatinous calcium phosphate in the presence of calcium ions under the environmental conditions existing in the anode compartment;
(e) means for maintaining the pH of the liquid effluent from said anode compartment in the range of from about 2 to about 4;
(f) means for passing into contact with said cathode substantially more than the stoichiometric amount of a substantially carbon-dioxide free gas selected from the group consisting of oxygen, air and mixtures thereof;
(g) means for maintaining the liquid effluent from said cathode compartment at a concentration of at least 8 percent by weight;
(h) means for maintaining the liquid immediately effluent from said cathode compartment at a temperature of at least 70° C.

4,173,525

ELECTROLYTIC CELL FOR ELECTROLYSIS OF SEA WATER

Shuji Nakamatsu, Ichihara; Hiroyuki Harada, Yokohama; Yoshitugu Shinomiya, Tamano, and Tuyoshi Omizu, Okayama, all of Japan, assignors to Chlorine Engineers Corp., Ltd., Tokyo, Japan

Filed Jul. 21, 1978, Ser. No. 926,775
Int. Cl.[2] C25B *9/00, 1/26, 11/02*
U.S. Cl. 204—275 **5 Claims**



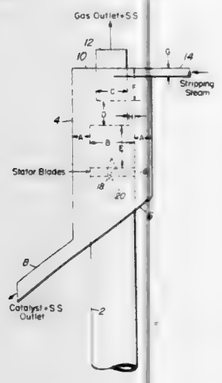
1. An electrolytic cell for electrolysis of sea water comprising
a housing having an opening at the bottom and top of the housing for in-flow of sea water and out-flow of electrolyzed sea water, respectively;
a plurality of flat plate-like anodes vertically disposed in the housing with the major surface area of the anodes being parallel to the flow of sea water through the cell;
a plurality of flat plate-like cathodes vertically disposed in the housing with the major surface area of the cathodes being parallel to the flow of sea water through the cell;
an outwardly projecting portion for passing an electric current provided at the lower side edge of each of the anodes;
an outwardly projecting portion for passing an electric

current provided at the upper side edge of each of the cathodes;
an electric current-passing plate secured to the lower portion of the housing and connected to the portions for passing an electric current to each of the anodes; and
an electric current-passing plate secured to the upper portion of the housing and connected to the portions for passing an electric current to each of the cathodes; and wherein
the anodes and the cathoes are alternatingly disposed with respect to each other,
the side edges of each of the anodes and the side edges of each of the cathodes, except for the portions for passing an electric current of each of the anodes and each of the cathodes, are spaced from the inner wall of the housing,
and each of the flat plate-like cathodes and each of the flat plate-like anodes have an external contour such that the external contour of each of the flat plate-like cathodes, except for the portions for passing an electric current to each of the cathodes, is located inwardly of the external contour of each of the flat plate-like anodes.

4,173,526
CHLOR-ALKALI CELL DIAPHRAGM AND ITS TREATMENT
James C. Fang, Media, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Nov. 21, 1978, Ser. No. 962,716
Int. Cl.[2] C25B *1/16, 1/26, 13/04*
U.S. Cl. 204—296 **8 Claims**

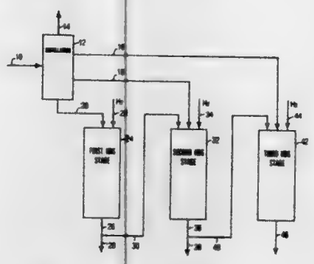
1. A diaphragm for a chlor-alkali cell comprising asbestos and at least one magnesium compound selected from magnesium oxide, hydroxide, carbonate, oxyhalide and hydroxyhalide (wherein the halide is at least one of fluorine and chlorine), the magnesium compound being present in an amount of about 5–50% by weight based on the asbestos plus the magnesium compound.

4,173,527
METHOD AND MEANS FOR SEPARATING SUSPENSIONS OF GASIFORM MATERIAL AND FLUIDIZABLE SOLID PARTICLE MATERIAL
Scott A. Heffley, Bolingbrook, Ill., and Klaus W. Schatz, Wenonah, N.J., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Feb. 1, 1978, Ser. No. 874,263
Int. Cl.[2] C10G *13/18*; B01J *37/12*
U.S. Cl. 208—153 **7 Claims**



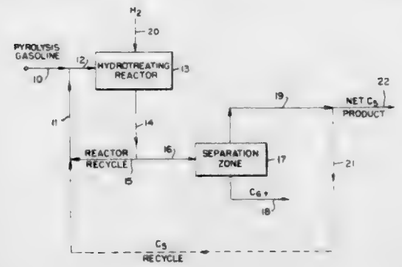
1. An improved method for separating a suspension of catalyst and gasiform material passed through a riser contact zone which comprises,
passing a rising suspension of catalyst and gasiform material upwardly through an elongated riser contact zone, imposing a horizontal centrifugal separating moment on the suspension below but adjacent to the riser open upper end sufficient to accumulate upflowing catalyst on the riser wall before ejecting the catalyst particles thus separated in contact with tangentially introduced stripping gas in an annular zone there-above of larger diameter than said riser and about an open ended vertically extending coaxial passageway of smaller diameter than said riser through which gasiform products separated from catalyst particles are passed,
withdrawing catalyst particles separated from gasiform product downwardly through a first confined annular zone about the upper end of said riser,
stripping catalyst withdrawn by said first confined annular zone in a separate second annular zone,
passing stripping gas and gasiform products through a plurality of cyclone separation zones in an upper portion of said zone comprising said second annular zone above said open ended passageway, and
passing catalyst particles separated by said cyclone separation zones into said second annular stripping zone.

4,173,528
MULTISTAGE RESIDUAL OIL HYDRODESULFURIZATION PROCESS EMPLOYING SEGMENTED FEED ADDITION AND PRODUCT REMOVAL
James A. Frayer, Pittsburgh; Harry C. Stauffer, Cheswick, and Stephen J. Yanik, Valencia, all of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.
Filed Oct. 20, 1977, Ser. No. 843,879
Int. Cl.[2] C10G *23/02*
U.S. Cl. 208—210 **8 Claims**



1. A process for the hydrodesulfurization of an aromatics- and asphaltene-containing feed oil to produce at least three hydrodesulfurized residual oil streams having different respective asphaltene and sulfur contents, said process employing upstream, intermediate and downstream hydrodesulfurization stages containing hydrodesulfurization catalyst comprising Group VI and Group VIII metal on a noncracking support at a temperature between 600° and 900° F. and a hydrogen pressure between 500 and 5,000 psi, said process comprising fractionating said feed oil into an asphaltene-containing residual oil stream, a heavy distillate oil stream and a light distillate oil stream, passing said residual oil stream and hydrogen through said upstream hydrodesulfurization stage and recovering an upstream stage effluent stream containing refractory sulfur asphaltenes, splitting said upstream stage effluent stream into a first upstream stage effluent portion comprising between about 10 and 75 weight percent of the normally liquid material in said upstream stage effluent stream and a second upstream stage effluent portion, removing said first upstream stage effluent portion from said process to selectively remove refractory sulfur asphaltenes from said process and to increase the concentration of more sulfur-reactive material in said intermediate stage, passing said second upstream stage effluent portion and said heavy distillate oil stream and hydrogen through said intermediate stage, said heavy distillate oil stream by-passing said upstream stage, recovering an intermediate stage effluent stream containing refractory sulfur asphaltenes, dividing said intermediate stage effluent stream into a first intermediate stage effluent portion comprising between about 10 and 75 weight percent of the normally liquid material in said intermediate stage effluent stream and a second intermediate stage effluent portion, removing said first intermediate stage effluent portion from said process to selectively remove refractory sulfur asphaltenes from said process and to increase the concentration of more sulfur-reactive material in said downstream stage, passing said second intermediate stage effluent portion and said light distillate oil stream and hydrogen through said downstream stage, said light distillate oil stream by-passing said upstream and intermediate stages, and recovering a downstream stage effluent stream, said downstream stage effluent stream containing aromatics and having a sulfur concentration which is at least 75 percent lower than the sulfur concentration of said feed oil, the removal of said first upstream stage effluent portion and said first intermediate stage effluent portion allowing the sulfur concentration in said downstream stage effluent stream to be achieved with a relatively high aromatics concentration as compared to the aromatics concentration when achieving the same sulfur concentration by hydrodesulfurization without selective removal of refractory sulfur asphaltenes.

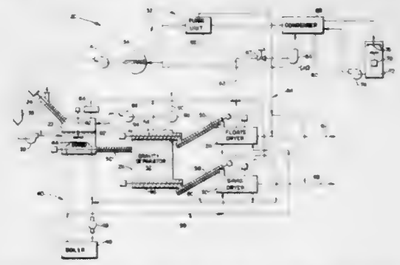
4,173,529
HYDROTREATING OF PYROLYSIS GASOLINE
William V. Bauer, New York, N.Y., assignor to The Lummus Company, Bloomfield, N.J.
Filed May 30, 1978, Ser. No. 910,822
Int. Cl.[2] C10G *23/00*
U.S. Cl. 208—255 **14 Claims**



1. In a process for the catalytic hydrotreating of a pyrolysis gasoline to reduce the diene content thereof wherein a hydrotreated product portion is recycled to the hydrotreating, the improvement comprising:
separating a C_5 fraction from the hydrotreated effluent; and employing a portion of the separated C_5 fraction as a portion of the hydrotreated product portion recycled to the hydrotreating to thereby reduce the Diene Value of a remaining net C_5 product.

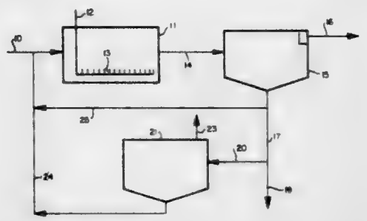
4,173,530
METHODS OF AND APPARATUS FOR CLEANING COAL
Clay D. Smith, and Douglas V. Keller, Jr., both of Lafayette, N.Y., assignors to Otisca Industries, Ltd., Lafayette, N.Y.
Continuation-in-part of Ser. No. 423,577, Jan. 14, 1974, abandoned. This application Mar. 24, 1975, Ser. No. 561,168
Int. Cl.[2] B03B *1/00, 5/44*
U.S. Cl. 209—9 **60 Claims**

1. In that method of beneficiating coal to separate it from foreign material mixed therewith in which the coal is introduced into a body of parting liquid which is or contains a halogenated hydrocarbon and has a specific gravity intermediate those of the coal and foreign material so that the coal will rise toward the top of the body of liquid and the foreign material will sink toward the bottom thereof, the improvement wherein any halogenated hydrocarbon present in the parting liquid is 1,2-difluoroethane or a fluorochloro derivative of



methane or ethane selected from the group consisting of 1-chloro-2,2,2-trifluoroethane, 1-1-dichloro-2,2,2-trifluoroethane, dichlorofluoromethane, 1-chloro-2-fluoroethane, 1,1,2-trichloro-1,2,2-trifluoroethane, 1,1-dichloro-1,2,2,2-tetrafluoroethane, and trichlorofluoromethane.

4,173,531
NITRIFICATION-DENITRIFICATION OF WASTEWATER
Ladislas C. Matsch, Amherst, and Raymond F. Drnevich, Clarence, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.
Filed Nov. 23, 1977, Ser. No. 854,321
Int. Cl.[2] C02C *1/06*
U.S. Cl. 210—5 **11 Claims**



1. In the purification of wastewater by the activated sludge method in which wastewater containing nitrogenous compounds is mixed in an oxic zone in the presence of carbonaceous compounds with oxygen-containing gas and activated sludge containing carbon-consuming and nitrogen-oxidizing bacteria for sufficient duration to nitrify the nitogenous compounds and form nitrified oxygenated mixed liquor which is discharged from the oxic zone and passed to a separate zone to effect concentration of solids from liquor with at least a major part of the concentrated solids being returned to said oxic zone as said activated sludge such that the total mean residence time of solids (SRT) is at least two days, the improvement comprising withdrawing and introducing nitrified oxygenated liquid-solid to an anoxic zone at volume flow rate less than one-half the volume flow rate of nitrified oxygenated mixed liquor entering the solids concentration zone, maintaining said nitrified oxygenated liquid-solid in said anoxic zone under anoxic conditions for a period between 0.4 and 36 hours and sufficient to denitrify the liquid-solid and form nitrogen-containing gas, releasing said nitrogen-containing gas and returning the denitrified liquid-solid to said oxic zone.

V 9 8 8 / 1 NO 06 79 UMI

4,173,532

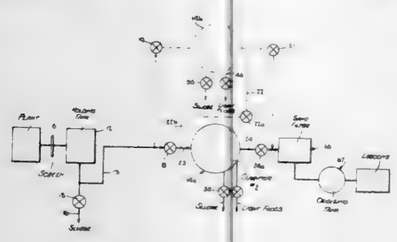
METHOD FOR TREATING PLANT EFFLUENT

Hagop Keoteklian, Islip, N.Y., assignor to Eatenmann's, Inc., Bay Shore, N.Y.

Continuation-in-part of Ser. No. 662,286, Feb. 27, 1976, abandoned, which is a continuation of Ser. No. 449,003, Mar. 7, 1974, abandoned. This application May 27, 1977, Ser. No. 801,375

Int. Cl.[2] C02B *1/20*

U.S. Cl. 210—49 **15 Claims**



1. A process for the continuous removal of wastes from industrial liquid effluent containing a high concentration of starches and sugars, by subjecting the effluent to a plurality of changes in the pH thereof, comprising the sequential steps of:
   (a) receiving liquid industrial effluent;
   (b) adding to the effluent an agent for inhibiting fermentation;
   (c) continuously flowing the effluent into a clarifier and adding to the flow of the effluent, material which includes a primary coagulant and which is acidic, for lowering the pH of the effluent to a value in the range of from about 2.5 to 3.5 and to aid in the hydrolysis of the starches and sugars;
   (d) inducing continuous circulation of the flow of effluent having lower pH in said clarifier, and immediately admixing into the effluent alkaline material to increase the pH of the effluent to a value in the range of from about 11.5 to about 12.5 and to enable the primary coagulant to form flocs therein, the flocs adapted to collect wastes from the effluent;
   (e) adding additional material which includes a secondary coagulant and which is acidic to the continuously circulating effluent in the clarifier having the increased pH for lowering the pH to a value in the range of from about 7.5 to about 8.5 and thereby forming additional flocs;
   (f) maintaining continuous circulation of the effluent in the clarifier for enhancing the development of flocs, the collection of wastes by the flocs, and the separation thereof from the effluent, and
   (g) separating the flocs and the wastes collected therefrom from the effluent,
   (h) discharging the clarifier effluent; and
   (i) discharging the separated flocs.

4,173,533

METHOD FOR REMOVING SUSPENDED OIL DROPLETS FROM WATER

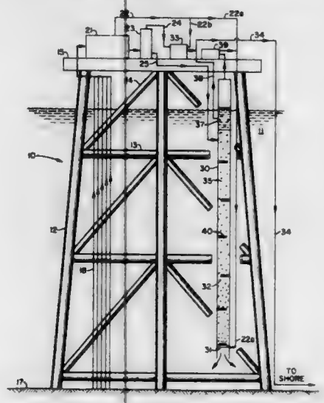
Robert E. Williams, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Nov. 7, 1977, Ser. No. 848,961

Int. Cl.[2] B01D *37/02*

U.S. Cl. 210—73 W **6 Claims**

1. A method of separating oil droplets suspended in a waste water stream produced on an offshore rig comprising:
   introducing said waste water stream into a substantially submerged pipe vertically positioned adjacent said rig;
   introducing a gas from a separator above the water surface into a line which extends from above the water surface adjacent said pipe to the lower portion of said pipe;
   injecting said gas from said line at the lower portion of said pipe directly into a diffuser which disperses said gas by means of said diffuser into bubbles which countercurrently contact said waste water stream as they rise through said pipe so as to reduce the overall density of said suspended oil droplets sufficiently so that the upward velocity of said oil droplets is greater than the downward velocity of said waste water, thereby promoting the gravitational separation of said oil droplets from said waste water, and wherein said bubbles are subjected to a reduced hydrostatic pressure as said bubbles rise causing said bubbles to grow in size such that the increased size enables said bubbles to capture more oil droplets thereby further promoting the gravitational separation of said oil droplets from said water;
   withdrawing oil from the upper portion of said pipe, said oil being formed from the coalescence of said droplets of oil suspended in said waste water; and
   permitting clarified waste water to be discharged from the lower portion of said pipe.



4,173,534

SLUDGE THICKENING APPARATUS AND PROCESS

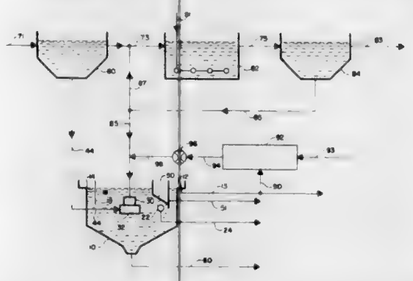
Earl M. Kelly, Hillsborough, Calif., assignor to Envirotech Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 728,480, Sep. 30, 1976, Pat. No. 4,082,671. This application Dec. 12, 1977, Ser. No. 859,768

The portion of the term of this patent subsequent to Apr. 4, 1995, has been disclaimed.

Int. Cl.[2] C02B *3/00*

U.S. Cl. 210—195.3 **10 Claims**



1. In a wastewater treatment system of the activated sludge type including a primary clarifier, a biological treatment unit and a secondary clarifier, the improvement comprising:
   a. a treatment unit for concomitantly treating primary sludge and aerated secondary sludge, said treatment unit including an open tank and a continuous partition wall mounted to define a confined liquid zone in the upper part of said tank;
   b. means connected in communication between the primary clarifier and said tank for introducing primary sludge into the lower part of said tank, said means including first feedwell means;
   c. float collection means mounted within said confined liquid zone in said tank for collecting solids floating on the surface of the liquid within said confined zone;
   d. sediment collection means connected in communication with the bottom of said tank for collecting and discharging sediment therefrom;
   e. discharge means mounted in said tank outside said confined liquid zone for drawing effluent liquid from the surface of the body of liquid held in said tank outside said confined liquid zone;
   f. pressurized aeration means connected in liquid-flow communication with said discharge means to aerate a portion of the effluent liquid at super atmospheric pressure;
   g. means to introduce the aerated effluent liquid into a stream of secondary sludge to produce aerated secondary sludge; and
   h. means coupled in flow communication with the secondary clarifier to convey the aerated secondary sludge into the upper part of said tank above said first feedwell means, said means including a second feedwell means.

4,173,535

FILTER CLOTH WASHING DEVICE FOR FILTER PRESS

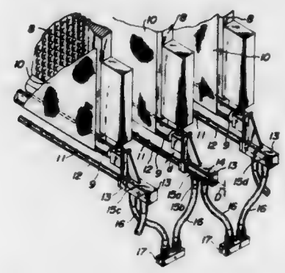
Hiromasa Nakashima, Tajimi, Japan, assignor to NGK Insulators, Ltd., Nagoya, Japan

Filed Mar. 29, 1978, Ser. No. 891,285

Claims priority, application Japan, Apr. 5, 1977, 52-41594[U]

Int. Cl.[2] B01D *25/32*

U.S. Cl. 210—225 **2 Claims**



1. In a filter cloth washing device for a filter press, wherein washing water is sprayed on filter cloths respectively trained about lower rollers positioned below the bottom end of respective filter plates and adapted to travel thereabout, thereby washing respective filter cloths, the improvements comprising
   a plurality of washing water supply pipes respectively having a plurality of spraying nozzles and running in parallel to said respective lower rollers;
   a plurality of coupling means connected to at least one end of each of said water supply pipes, respectively, each of said coupling means having an inner diameter larger than an inner diameter of its respective water supply pipe, and first and second communication ports; and
   a plurality of flexible pressure hoses for connecting the neighboring coupling means to each other, wherein a metallic joint is provided to connect two flexible pressure pipes for interconnecting the neighboring coupling means;
   the connection among the neighboring coupling means being such that the first communication port in one coupling means attached to one filter plate is connected by way of one flexible pressure hose through the metallic joint to a first communication port in another coupling means attached to another filter plate upstream of said one filter plate, and the second communication port in said one coupling means is connected by way of another flexible pressure hose through another metallic joint to a second communication port in another coupling means attached to another filter plate downstream of said one filter plate.

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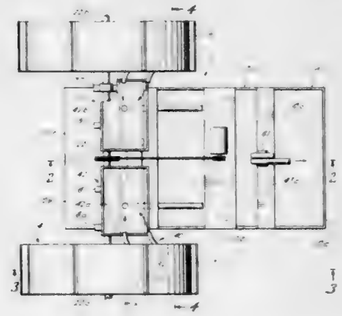
SURFACE FLUID COLLECTOR

Richard H. McCall, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,168

Int. Cl.[2] E02B *15/04*

U.S. Cl. 210—242 S **10 Claims**



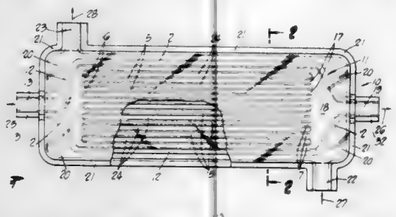
1. Apparatus for skimming a surface fluid from a main fluid, comprising:
   a collection housing means having an annular skimming chamber; and
   said rotating annular skimming chamber having a skim valve means, said skim valve means opening when said chamber is rotated into such surface and main fluids and closing after such chamber is rotated out of such fluids.
2. An apparatus for skimming a surface fluid, comprising;
   a floating collection housing adapted to float in a main fluid having such surface fluid located on the surface of such main fluid;
   rotating skimming means, said rotating skimming means including rotation mount means for mounting an annular skimming chamber on said collection housing for rotation with respect to said collection housing into such surface and main fluids for skimming such surface fluid off of said main fluid into said rotating skimming means and for transferring such skimmed fluid into said collection housing after rotation out of such main fluid,
   said annular skimming chamber comprising a plurality of skim compartments for skimming the surface fluid and collecting same in said compartments, wherein each compartment includes skim valve means;
   said rotation mount means rotating said skim compartments into and out of such surface and main fluids; and
   said skim valve means for each compartment opening when its compartment is rotated into such surface and main fluids and closing after each such compartment is rotated out of such surface and main fluids.

4,173,537

INTEGRAL ARTIFICIAL KIDNEY UNIT

Earle E. Newhart, deceased, late of Newport Beach, Calif., and by Ruth Newhart, executor, 1907 Leeward La., Newport Beach, Calif. 92660

Filed May 23, 1977, Ser. No. 799,501
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—321 B **10 Claims**



1. An integral artificial kidney unit, the unit combination comprising:

a dialysate solution chamber having an opposed first pair of plastic composition sheets bonded together at all the opposed sheet perimeter, excluding the opposed sheet perimeter bonded to an opposed pair of an exterior blood inlet tube and an exterior blood outlet tube projecting outside said sheet perimeter, and having an opposed pair of apertures in said dialysate chamber directly connected to the pair of exterior dialysate inlet and exterior dialysate outlet ports; and,

at least two integral perfusion units enclosed inside of said dialysate chamber, each one of said at least two perfusion units being interconnected in parallel to a common blood inlet tube and a common blood outlet tube disposed inside said dialysate chamber, aforesaid common blood inlet tube and common blood outlet tube being connected to the respective exterior blood inlet tube and aforesaid exterior blood outlet tube projecting outside of said dialysate chamber, each one of said at least one perfusion units having a second pair of opposed thin plastic composition sheets bonded together in a desired pattern including its exterior edges, each one of said perfusion units having an integral interconnecting blood inlet port disposed and interconnected to a blood inlet manifold, said inlet manifold being disposed across and interconnected to multiple parallel blood tubules having small diameters, a blood outlet manifold being disposed across and interconnected to the termini of the blood tubules opposed to the blood inlet manifold, a blood outlet port being interconnected to the blood outlet manifold at the manifold section opposed to the tubule termini, each one of said perfusion units having their respective blood inlet ports interconnected in parallel to said common blood inlet tube and having their respective blood outlet ports interconnected in parallel to said common blood outlet tube, aforesaid second pair of thin plastic composition sheets having a high permeability to waste excreta products in patient blood.

4,173,538

EXTINGUISHING PRODUCT COMPRISING AN UNINFLAMMABLE POWDER AND LIQUID

Celestin L. Herbline, Domaine Bracheux Fouquenies Oise, France

Continuation-in-part of Ser. No. 705,977, Jul. 16, 1976, abandoned. This application Jun. 9, 1978, Ser. No. 913,987
Claims priority, application France, Oct. 8, 1975, 75 30866
Int. Cl.[2] C09K *3/28*
U.S. Cl. 252—8 **11 Claims**

1. A substantially non-toxic extinguishing product capable of forming a refractory coating on a surface consisting essentially of an uninflammable powder selected from the group consisting of silica, alumina, silico-sodium aluminate, silicates of soda and mixtures thereof and an uninflammable liquid in which the powder is insoluble, the powder having an apparent density less than the density of the liquid and being capable of absorbing at least about 75% of its own weight of water and still remain in powdered form.

4,173,539

CATIONIC SURFACTANT COMPOSITIONS

Robert B. Rule, Liverpool; Martin A. Wells, Wirral, and John D. Dance, High Wycombe, all of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Oct. 31, 1978, Ser. No. 956,234
Claims priority, application United Kingdom, Oct. 31, 1977, 45254/77
Int. Cl.[2] D06M *13/34*
U.S. Cl. 252—8.8 **12 Claims**

1. A pourable liquid fabric-softening composition of uniform turbidity comprising a dispersion in an isotropic aqueous medium of positively charged particles of softening agent with a melting point of below 95° C., which particles comprise a quaternary ammonium salt fabric softener having one straight-chain aliphatic hydrocarbon radical with from 12 to 24 carbon atoms, the chloride salt of whose cation A has a Krafft point in water of less than 95° C., complexed with the anion B of an anionic surfactant salt having one straight-chain aliphatic hydrocarbon radical with from 12 to 24 carbon atoms, the normality ratio of A to B being in the range from 1.1:1 to 5:1, the total weight of A and B present being from 2 to 15% by weight of the composition, and the composition having a clear point of above 95° C.

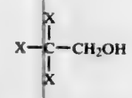
4,173,540

LUBRICATING OIL COMPOSITION CONTAINING A DISPERSING-VARNISH INHIBITING COMBINATION OF POLYOL ESTER COMPOUND AND A BORATED ACYL NITROGEN COMPOUND

Thor F. Lonstrup, Plainfield; Darrell W. Brownawell, Scotch Plains, and Barry J. Howlett, Westfield, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 3, 1977, Ser. No. 838,543
Int. Cl.[2] C10M *1/10*
U.S. Cl. 252—49.6 **6 Claims**

1. A lubricating oil composition comprising a major amount of lubricating oil and a minor but dispersing amount of a dispersing and synergistic varnish inhibiting combination of: (a) one part by weight of an oil-soluble polyol ester dispersant which is the reaction product having a number average molecular weight of from about 1,300 to about 8,000 obtained from the reaction of one molar proportion of a hydrocarbyl substituted C_4–C_{10} monounsaturated dicarboxylic acid material and from about 1 to about 2 molar proportions of a polyol containing a total of 4 to 10 carbons and represented by the formula:



wherein X is hydrogen, an alkyl, or hydroxy alkyl group, with at least one of the X substituents being a hydroxy alkyl group of the structure $-(CH_2)_nOH$, wherein n is 1 to 3; and (b) from 0.25 to 4 parts by weight of an oil-soluble borated acylated nitrogen dispersant compound having a number average molecular weight ranging from about 1,300 to 8,000 characterized by the presence within its structure of a substantially saturated hydrocarbon-substituted polar group selected from the class consisting of acyl, acylimidoyl, and acyloxy radicals wherein the substantially saturated hydrocarbon substituent contains at least about 80 aliphatic carbon atoms and a nitrogen-containing group characterized by a nitrogen atom attached directly to said polar radical.

4,173,541

POLYNUCLEAR HINDERED PHENOLS AND STABILIZED ORGANIC MATERIALS CONTAINING THE PHENOLS

Kenneth R. Molt, Cincinnati, Ohio, assignor to Cincinnati Milacron Chemicals Inc., Reading, Ohio

Filed Jun. 5, 1978, Ser. No. 912,171
Int. Cl.[2] C10M *1/26*; C10L *1/18*; C11C *3/02*; C07C *43/20*
U.S. Cl. 252—52 R **69 Claims**

1. A compound characterized by a six carbon atom aromatic nucleus having attached thereto (1) at the 2, 4 and 6 positions a 3,5-dihydrocarbyl-4-hydroxy benzyl group and (2) through oxygen from one to two organic groups, the remaining groups attached to the nucleus being hydrogen or a hydrocarbyl group, with the proviso that when there is present only one organic group attached to the nucleus through oxygen said organic group must be a 3,5-dihydrocarbyl-4-hydroxyphenyl alkanoic acid radical.

4,173,542

HYDRAULIC FLUID COMPRISING A BORATE ESTER AND CORROSION INHIBITING AMOUNTS OF AN OXYALKYLATED ALICYCLIC AMINE

Teruyuki Sato, Yawata, and Kunio Kawakatsu, Kyoto, both of Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan

Filed May 19, 1978, Ser. No. 907,723
Claims priority, application Japan, May 31, 1977, 52-64420
Int. Cl.[2] C10M *3/26, 3/48*
U.S. Cl. 252—78.1 **18 Claims**

1. A hydraulic fluid composition comprising (A) a hydraulic fluid containing a borate ester and (B) a corrosion inhibiting amount of an oxyalkylated alicyclic amine.

4,173,543

C_{10}-TERPENE ALKYL, ALKENYL, HALOALKYL, AND ALKYNYL ETHERS AND DIETHERS, PROCESSES FOR PREPARING SAME AND ORGANOLEPTIC USES THEREOF

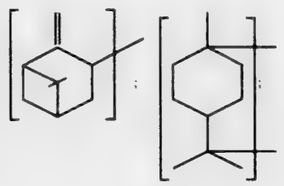
Cynthia J. Mussinan, Bricktown; Braja D. Mookherjee, Holmdel; Manfred H. Vock, Locust; Frederick L. Schmitt, Holmdel, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; James M. Sanders, Eatontown, N.J.; Bette M. Light, Highlands, N.J., and Edward J. Granda, Englishtown, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 872,937, Jan. 27, 1978, Pat. No. 4,131,687.
This application Sep. 5, 1978, Ser. No. 939,896
Int. Cl.[2] C11D *3/50*
U.S. Cl. 252—174.11 **14 Claims**

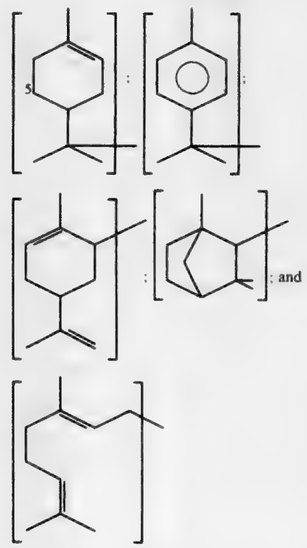
1. A process for augmenting or enhancing the aroma of a solid or liquid detergent comprising the step of adding to a detergent base or a soap base from 0.01% up to 0.5% of a C_{10} terpenyl ether having the structure:

$$(C_{10}\text{ - TERPENYL})—(O—R_1)_n$$

wherein n is 1 or 2, R_1 is C_1–C_4 alkyl, C_3 or C_4 alkenyl, C_3 alkynyl, or C_3 haloalkenyl, and the C_{10}-terpenyl moiety is selected from the group consisting of:



-continued



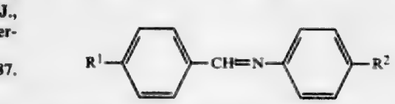
4,173,544

NOVEL ALKYLSUBSTITUTED N-BENZYLIDENEANILINES AND LIQUID CRYSTAL COMPOSITIONS CONTAINING SAME

Maged A. Osman, Zürich, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

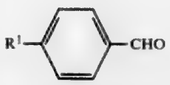
Filed Dec. 15, 1976, Ser. No. 750,646
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1975, 2557267
Int. Cl.[2] C09K *3/34*; G02F *1/13*; C07C *119/00*
U.S. Cl. 252—299 **4 Claims**

1. In a process for producing compounds of formula



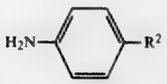
(III)

in which R^1 and R^2 are selected each from the group consisting of hydrogen and alkyl radicals including from 1 to about 10 C-atoms, at least one of said groups R^1 and R^2 being an alkyl group, by condensation of a benzaldehyde compound of formula



(IV)

in which R^1 is as defined above, with an aniline compound of formula

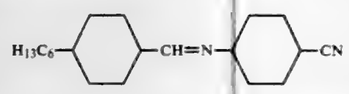


(VI)

in which R^2 is as defined above; the improvement consisting of

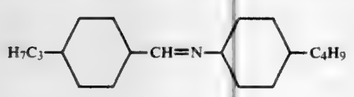
effecting said condensation of said benzaldehyde compound and said aniline compound in substantial absence of a solvent, at temperatures below 100° C. and in the substantial absence of oxygen.

2. A liquid crystal composition comprising 80–90% by weight of a compound of the formula (I)



(I)

and 10–20% by weight of a compound of the formula (II)



(II)

4,173,545

LIQUID CRYSTAL WITH HIGH NEGATIVE DIELECTRIC ANISOTROPY AND MIXTURES OF THE SAME WITH NEMATIC LIQUID CRYSTALS FOR IMPROVING DYNAMIC SCATTERING IN ELECTRO-OPTIC DEVICES

Alain Béguin; Jean-Claude Dubois, and Annie Zann, all of Paris, France, assignors to Thomson-CSF, Paris, France

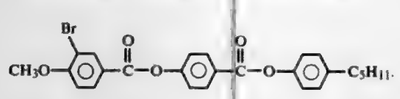
Continuation of Ser. No. 785,113, Apr. 6, 1977, abandoned. This application Jun. 6, 1978, Ser. No. 913,106

Claims priority, application France, Apr. 6, 1976, 76 09884; Jul. 7, 1976, 76 20768

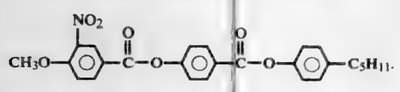
Int. Cl.[2] **C09K** *3/34;* **C02F** *1/13;* **C07C** *69/88, 79/46, 121/64, 121/75*

U.S. Cl. 252—299 **7 Claims**

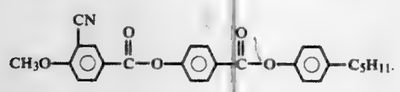
1. A liquid crystal compound having the formula



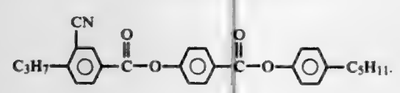
2. A liquid crystal compound having the formula



3. A liquid crystal compound having the formula



4. A liquid crystal compound having the formula



4,173,546

METHOD OF TREATING WASTE MATERIAL CONTAINING RADIOACTIVE CESIUM ISOTOPES

John F. Hayes, 25305 Country Club Blvd., North Olmsted, Ohio 44070

Continuation of Ser. No. 708,473, Jul. 26, 1976, abandoned. This application Apr. 26, 1978, Ser. No. 900,076

Int. Cl.[2] **G21F** *9/16*

U.S. Cl. 252—301.1 W **14 Claims**

1. In the method of treating waste material containing radioactive cesium isotopes by mixing said waste material with a water soluble alkali metal silicate and a sufficient amount of an alkali metal silicate hardening agent to form a solidified mass, the improvement which comprises adding an effective amount of particles of shale to said waste material prior to the formation of said solidified mass to immobolize cesium isotopes present in said waste material upon solidification thereof whereby the leachability of said cesium isotopes is significantly reduced when said solidified mass is subjected to an aqueous environment.

4,173,547

CATALYST FOR PREPARING POLYALKENES

Renier J. L. Graff, Stein, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Mar. 8, 1978, Ser. No. 884,546

Claims priority, application Netherlands, Mar. 4, 1977, 7702323

Int. Cl.[2] **C08F** *4/64*

U.S. Cl. 252—429 B **13 Claims**

1. A process for preparing a catalyst component composition suitable for α-alkene polymerization reactions, which consists essentially in treating a carrier material selected from the group consisting of

a solid porous particulate inorganic carrier having an average particle size of between about 0.1 and 200 microns, and composed of oxidic materials or compounds of metals from Groups I and II of the Periodic Table, and

a particulate polyalkene powder,

by the steps of:

(a) contacting said carrier material with a first liquid phase containing an organometallic compound selected from the group consisting of an organoaluminum halide compound of the general formula R_mAlX_{3-m} wherein

each R independently represents a hydrocarbon radical with 1 to 30 carbon atoms,

each X represents a halogen atom, and

m is a number smaller than 3, and

an ether-free solution containing an organomagnesium compound of the general formula MgR_2' wherein each R' independently represents a hydrocarbon radical having from 1 to 30 carbon atoms, whereafter said carrier material so treated is separated from said first liquid phase;

(b) thereafter contacting said carrier material so treated with a second liquid phase containing the other organometallic compound member of said group whereafter said carrier material so treated is separated from said second liquid phase, so that said carrier material has then been contacted separately with an organoaluminum halide compound and with an organomagnesum compound; and

(c) thereafter contacting said carrier material so treated with a third liquid phase containing a titanium compound selected from the group consisting of halides, alkoxides and mixtures thereof wherein said titanium is in the highest valency, so as to effect reduction of said titanium compound to a lower valency state on said treated carrier material.

4,173,548

ETHYLENE POLYMERIZATION CATALYST AND METHOD

Thomas J. Pullukat, Hoffman Estates; Mitsuzo Shida, Barrington, and Raymond E. Hoff, Palatine, all of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 764,914, Feb. 2, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 915,056

Int. Cl.[2] **C08F** *4/02;* **B01J** *31/14, 21/02, 23/36*

U.S. Cl. 252—430 **26 Claims**

1. A highly active catalyst for polymerizing ethylene to polyethylene or to copolymers of ethylene with alpha-olefins having a narrow molecular weight distribution, prepared by: forming a mixture of (1) a porous support of the class consisting of silica, alumina, zirconia, thoria and mixtures thereof, (2) a chromium compound and (3) an alkyl ester of boron containing 1 to about 7 carbon atoms in the alkyl group or a halide of boron, said (2) being reactive with (3) to form a chromium-boron compound upon heating, said mixture containing about 0.1–10 wt.% of boron and about 0.1–10 wt.% of chromium and (4) activating said mixture at an elevated temperature in a fluidized bed with a substantially dry reducing gas and then fluidizing (4) with (5) an oxidizing gas at an elevated temperature.

4,173,549

CATALYST COMPOSITION FOR DECOMPOSING OZONE

Ronald A. Kent, Ridgewood, and Marvin M. Fein, Westfield, both of N.J., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Sep. 22, 1978, Ser. No. 944,836

Int. Cl.[2] **B01J** *21/06, 23/68, 23/72*

U.S. Cl. 252—463 **24 Claims**

1. A catalyst composition for the decomposition of ozone which comprises:

(a) metallic silver deposited on a relatively high surface area copper substrate, and

(b) a composite of a relatively high surface area zirconia and oxides of manganese.

4,173,550

PERFUMED ARTICLES CONTAINING 3-PHENYL-CYCLOPENT-2-EN-1-ONE

Erling Sundt, Vessy, and Roland Aschiero, Bernex, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Division of Ser. No. 896,440, Apr. 14, 1978, Pat. No. 4,144,200. This application Oct. 23, 1978, Ser. No. 953,916

Claims priority, application Switzerland, May 6, 1977, 005689/77

Int. Cl.[2] **C11B** *9/00;* **C11D** *3/50, 9/44*

U.S. Cl. 252—522 **2 Claims**

1. A method for improving, enhancing or modifying the odoriferous properties of perfumed articles which method comprises adding thereto an effective amount of 3-phenyl-cyclopent-2-en-1-one.

4,173,551

HEAT CURABLE COMPOSITIONS

James V. Crivello, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 781,785, Mar. 28, 1977, abandoned, which is a continuation-in-part of Ser. No. 689,247, May 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 638,982, Dec. 9, 1975, Pat. No. 4,058,401, Ser. No. 638,983, Dec. 9, 1975, and Ser. No. 638,994, Dec. 9, 1975, Pat. No. 4,069,055, said Ser. No. 638,982, is a continuation of Ser. No. 466,374, May 2, 1974, abandoned, said Ser. No. 638,983, is a continuation of Ser. No. 466,375, May 2, 1974, abandoned, said Ser. No. 638,994, is a continuation of Ser. No. 466,378, May 2, 1974, abandoned. This application Dec. 16, 1977, Ser. No. 861,128

Int. Cl.[2] **C08G** *59/68, 8/10;* **C08F** *4/00, 4/06*

U.S. Cl. 260—18 EP **16 Claims**

1. A curable composition comprising by weight

(A) a cationically polymerizable organic material, and

(B) from 1% to 35% of the curable composition of a catalyst selected from the class consisting of

(i) a mixture of

(a) a diaryliodonium salt of the formula,

$$[(R)_a(R^1)_b I]^+[Y]^-, \text{ and}$$

(b) from 0.01 part to 10 parts, per part of (a), of a copper salt,

(ii) a mixture of

(c) the diaryliodonium salt of (a) and

(d) from 0.1 part to 15 parts, per part of (c), of organic acid, organic anhydride, or mixtures thereof and

(iii) a mixture of

(e) the diaryliodonium salt of (a)

(f) from 0.01 part to 10 parts, per part of (e), of the copper salt of (b), and

(g) from 0.1 part to 15 parts, per part of (e), of the organic acid, organic acid anhydride or mixtures thereof of (c),

where R is a monovalent aromatic organic radical, R^1 is a divalent aromatic organic radical, a is a whole number equal to 0 or 2, b is a whole number equal to 0 or 1 and when a is 0, b is 1, and when b is 0, a is 2 and Y is an anion.

4,173,552

RUBBER ADDITIVES

Vincent P. Kuceski, Chicago Heights, Ill., and Lenoir Black, Memphis, Tenn., assignors to The C. P. Hall Company, Chicago, Ill.

Continuation of Ser. No. 496,611, Aug. 12, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,424

Int. Cl.[2] **C08C** *19/20;* **C08K** *5/10*

U.S. Cl. 260—23.7 M **16 Claims**

1. A natural or synthetic olefinic rubber composition comprising the rubber, sulfur and a vulcanization activating effective amount of a vulcanization activator for said rubber comprising an aliphatic polycarboxylic acid having 4 to 54 carbon atoms, wherein said activator is not volatile at 200° F. and has an acid number of at least 50.

4,173,553

NON-COLORING, ABRASION RESISTANT, ADHERENT COATING FOR GOLD AND SILVER SURFACES

Loren A. Haluska, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 23, 1977, Ser. No. 863,969

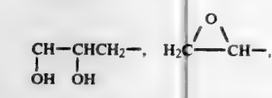
Int. Cl.[2] **C08J** *3/02;* **C08L** *83/04*

U.S. Cl. 260—29.2 M **14 Claims**

1. A pigment free aqueous coating composition comprising a dispersion of colloidal silica in a lower aliphatic alcohol-water solution, or a dispersion of colloidal silica in an ether alcohol-water solution, of a partial condensate of a mixture of silanols of the formula $RSi(OH)_3$ in which R is selected from the group consisting of alkyl radicals of 1–3 inclusive carbon atoms and

R' wherein R' is selected from $R''(S)_nR'''$— and $(HS)_aR'''$— wherein

R'' is a substituted or unsubstituted monovalent hydrocarbon radical of 1 to 6 carbon atoms wherein the hydrocarbon atom is substituted by radicals selected from the group consisting of —COOH, —COH,



HS—, $—NH_2$, $NH(R'''')_x$, Cl, Br and vinyl,

n has a value of 1–4 and a has a value of 1 or 2,

R''' is a divalent hydrocarbon radical containing 1–6 carbon atoms,

R'''' is an alkyl radical of 1–4 carbon atoms,

x is 1 or 2,

at least 50 weight percent of the silanol being $CHSi(OH)_3$ and at least 0.4 weight percent of the silanol being $R'Si(OH)_3$, said composition containing 10 to 50 weight percent solids consisting essentially of 10 to 70 weight percent colloidal silica and 30 to 90 weight percent of the partial condensate, said composition containing sufficient acid to provide a pH in the range of 2.8 to 5.5.

4,173,554

AQUEOUS PRINTING INKS WITH IMPROVED TRANSFER PROPERTIES

Theodore Sulzberg, Highland Park, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Jul. 10, 1978, Ser. No. 923,152

Int. Cl.[2] C09D *11/06, 11/08, 11/10*

U.S. Cl. 260—29.2 EP **2 Claims**

1. In an aqueous printing ink which comprises a pigment, a varnish, and a resin, the improvement which comprises incorporating in said ink about 0.8 to 2.0 parts by weight of a polyethylene oxide having an average molecular weight between about 100,000 and 400,000, about 0.8 to 4.0 parts by weight of a potassium salt, and about 1.6 to 8.0 parts by weight of a urea.

4,173,555

GROUTING COMPOSITION CONTAINING CUPRIC ACRYLATE

Kenneth G. Phillips, River Forest, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Mar. 12, 1979, Ser. No. 19,996

Int. Cl.[2] C08F *220/06*

U.S. Cl. 260—29.7 H **1 Claim**

1. An aqueous solution of

(a) acrylic acid;

(b) cupric acrylate;

(c) methylene bis acrylamide; and

(d) a water-soluble polymerization catalyst which also is a reducing agent;

with the ratio of (a) to (b) being between 10:0.1 to 10:1.5, which solution forms a water resistant gel.

4,173,556

ELASTOPLASTIC COMPOSITIONS OF RUBBER AND POLYAMIDE

Aubert Y. Coran, and Raman P. Patel, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 663,453, Mar. 3, 1976, abandoned. This application Jul. 15, 1977, Ser. No. 816,096

Int. Cl.[2] C08K *5/36; C08L 77/00; C08K 5/49, 5/09*

U.S. Cl. 260—30.8 R **35 Claims**

1. An elastoplastic composition comprising a blend essentially free of low molecular weight phenol plasticizer of (a) thermoplastic crystalline polyamide in an amount sufficient to impart thermoplasticity up to 50 weight percent of the composition, wherein the polyamide in said blend retains at least 50% of its original crystallinity, (b) rubber cross-linked to the extent that the gel content of the rubber is at least about 80 percent, wherein the rubber in said blend is in the form of small dispersed particles essentially of the size of 50 microns or below and is a homopolymer of 1,3-butadiene, copolymer of 1,3-butadiene or isoprene or mixtures thereof, in an amount sufficient to impart rubberlike elasticity up to 80 weight percent of the composition provided that, when the amount of polyamide exceeds the amount of rubber, sufficient inert plasticizer is present to impart rubberlike elasticity to the composition which composition is processable as a thermoplastic and is elastomeric.

4,173,557

INSULATING SEALANT COMPOSITIONS

Lawrence A. Strecker, and Vernon W. Wells, Jr., both of St. Louis, Mo., assignors to Inmont Corporation, New York, N.Y.

Filed Oct. 13, 1978, Ser. No. 951,212

Int. Cl.[2] C08K *5/10*

U.S. Cl. 260—31.8 DR **8 Claims**

1. A pumpable, low viscosity, elastomeric, room temperature curable sealant composition, having good adhesion to glass, aluminum and steel, and providing a moisture barrier seal with good weather properties, said composition comprising (1) a blend of 5 to 95 parts of liquid dibrominated polybutadiene elastomer and 95 to 5 parts of liquid, low molecular weight butyl rubber and (2) a curing agent for each of the elastomers.

4,173,558

NON-AQUEOUS POLYMERIC DISPERSION ALKYL METHACRYLATE COPOLYMERS IN MIXTURES OF ORGANIC SOLVENTS AND GLOSSY COATINGS PRODUCED THEREFROM

Charles K. Beck, Mentor, Ohio, assignor to AM International, Inc., Los Angeles, Calif.

Filed Jun. 30, 1977, Ser. No. 811,523

The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.

Int. Cl.[2] C08F *2/14;* **C08L** *33/08*

U.S. Cl. 260—33.4 R **13 Claims**

1. A chemically stable non-aqueous dispersion which has the property of drying to a clear, glossy finish upon application to a surface which comprises a copolymer consisting of alkyl methacrylates and a mixture of organic liquids, one of which is an alcohol, said copolymer being the disperse phase and said organic liquid constituting the continuous phase of the non-aqueous dispersion, said mixture including substantially no solvent, and no other dispersant, for said copolymer.

4,173,559

NON-AQUEOUS POLYMERIC DISPERSION OF ALKYL METHACRYLATE AND ALKYL ACRYLATE COPOLYMERS IN MIXTURES OF CYCLOHEXANE AND ALCOHOLS AND MATTE COATINGS PRODUCED THEREFROM

Charles K. Beck, Mentor, Ohio, assignor to AM International, Inc., Los Angeles, Calif.

Filed Jun. 30, 1977, Ser. No. 811,524

The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.

Int. Cl.[2] C08F *2/14;* **C08L** *33/08*

U.S. Cl. 260—33.4 R **15 Claims**

1. A chemically stable non-aqueous dispersion which has the property of drying to a uniform matte finish upon application to a surface which comprises a copolymer consisting of an alkyl methacrylate and an alkyl acrylate and a mixture of organic liquids including cyclohexane and an alcohol, said copolymer being the disperse phase and said mixture of organic liquids constituting the continuous phase of the non-aqueous dispersion, said mixture including substantially no solvent for said copolymer.

4,173,560

TREATMENT OF REINFORCING SILICAS WITH AMIDOSILOXANES

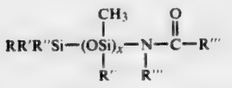
Gary R. Homan, Midland; Myron T. Maxson, Sanford, both of Mich., and Louis H. Toporcer, Twinsburg, Ohio, assignors to Dow Corning Corporation, Midland, Mich.

Filed May 8, 1978, Ser. No. 904,048

Int. Cl.[2] C08L *83/04*

U.S. Cl. 260—37 SB **31 Claims**

1. A treated silica consisting essentially of a finely divided silica with a surface area of at least 50 square meters per gram, said silica having been mixed with treating agent consisting essentially of an amido-siloxane of the formula



where R is a methyl, ethyl, or phenyl radical; R' is a methyl, ethyl, or 2-(perfluoroalkyl)ethyl radical in which the perfluoroalkyl radical contains 1 to 4 inclusive carbon atoms; R'' is a methyl or vinyl radical; R''' is a methyl or ethyl radical; and x is an integer of from 3 to 20 inclusive.

5. A silicone elastomer base comprising a fluid and treated silica of claim 1, in which there is present 100 parts by weight fluid for each 5 to 100 parts by weight of treated silica, the fluid being a triorganosiloxy end-blocked polydiorganosiloxane wherein each organic radical is selected from a group consisting of methyl, ethyl, vinyl, phenyl, and 2-(perfluoroalkyl)ethyl in which the perfluoroalkyl radical contains 1 to 4 inclusive carbon atoms, there being an average of two vinyl radicals per siloxane molecule and one vinyl radical bonded to any one silicon atom, there being from 0 to 50 inclusive percent 2-(perfluoroalkyl)ethyl radicals based on the total number of organic radicals in the siloxane and from 0 to 30 inclusive percent phenyl radicals being based on the total number of organic radicals in the siloxane.

4,173,561

FLAME RETARDANT POLYMER COMPOSITION

Minoru Tabana, Suita; Noriyuki Sekine; Tatsuyuki Mitsuno, both of Toyonaka, and Akira Kinoshita, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 4, 1978, Ser. No. 866,905

Claims priority, application Japan, Jan. 12, 1977, 52/2653; Jan. 13, 1977, 52/3111

Int. Cl.[2] C08K *5/34, 5/13, 5/06*

U.S. Cl. 260—45.75 B **8 Claims**

1. A resin composition comprising

(1) a styrene resin selected from the group consisting of polystyrene, rubber-modified polystyrene, polymethyl styrene, styrene-butadiene copolymers, styrene-acrylonitrile copolymers and styrene-butadiene-acrylonitrile terpolymers,

(2) 3 to 40 parts by weight based on 100 parts by weight of the styrene resin of a halogen-containing flame retarder selected from the group consisting of tetrabromobisphenol A, tetrabromophthalic anhydride, hexabromobenzene, pentabromotoluene, pentabromophenol, tris(2,3-dibromopropyl)phosphate, tris(2-chloro-3-bromopropyl)-phosphate, tribromophenyl allyl ether, tribromophenyl 2,3-dibromopropyl ether, tribromophenyl 1,3-dibromoisobutyl ether, octabromodiphenyl ether, decabromodiphenyl ether, octabromobiphenyl, pentachloropentacyclodecane and hexabromocyclododecane, and

(3) as an inorganic compound 0.1 to 10 parts by weight based on 100 parts by weight of the syrene resin of (a) at least one inorganic hydrate compound selected from alumina hydrate and talc, or (b) at least one magnesium compound selected from magnesium hydroxide, magnesium oxide and basic magnesium carbonate,

provided that the halogen-containing flame retarder is decabromodiphenyl ether in an amount of 11 to 30 parts by weight based on 100 parts by weight of the styrene resin when the inorganic compound is the magnesium compound.

4,173,562

PROCESS FOR THE PREPARATION OF α-L-ASPARTYL-L-PHENYLALANINE METHYL ESTER

Gerald L. Bachman, and Billy D. Vineyard, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 754,297, Dec. 27, 1976, abandoned. This application Mar. 31, 1978, Ser. No. 892,358

Int. Cl.[2] C07C *103/52*

U.S. Cl. 260—112.5 R **9 Claims**

1. A process comprising contacting α-L-aspartyl-L-phenylalanine with a reaction medium comprising from about 0.1 to about 0.8 mole hydrogen halide per 100 grams of reaction medium and from about 0.1 to about 1.1 moles methanol per 100 grams of reaction medium and water to form a solid hydrogen halide salt of α-L-aspartyl-L-phenylalanine methyl ester.

4,173,563

PHOSPHONIUM SALT AND ITS USE

Noboru Yamazaki, and Fukuji Higashi, both of Tokyo, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 815,242, Jul. 13, 1977, Pat. No. 4,120,853, which is a division of Ser. No. 688,289, May 20, 1976, Pat. No. 4,059,603, which is a division of Ser. No. 475,877, Jun. 3, 1974, Pat. No. 3,974,219, which is a continuation-in-part of Ser. No. 305,256, Nov. 10, 1972, abandoned. This application Jun. 12, 1978, Ser. No. 914,773

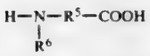
Claims priority, application Japan, Nov. 22, 1971, 56/93872

Int. Cl.[2] C07C *103/52;* **C07G** *7/00*

U.S. Cl. 260—112.5 R **4 Claims**

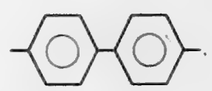
1. A process for producing a peptide which comprises:

reacting the carboxyl group of an amino acid of the formula,

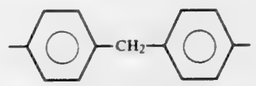


(IV)

having a protected amino group, wherein R^5 is alkylene or alkylidene having 1–30 carbon atoms which may have a substituent selected from the group consisting of phenyl, salicyl, carbamoyl and carboxyl, cycloalkylene or cycloalkylidene having 3–8 carbon atoms, phenylene, a group of the formula



a group of the formula



or a group in which two or more groups selected from the group consisting of the above-mentioned aliphatic and aromatic hydrocarbon groups are bonded through —CONH—; and R^6 is hydrogen or alkyl having 1–4 carbon atoms, with a phosphonium salt obtained by reacting a phosphorous ester selected from the group consisting of monomethyl, monoethyl,

monoisopropyl, monophenyl, dimethyl, diethyl, diisopropyl, di-n-butyl, diphenyl, triethyl, triisopropyl and tributyl esters of phosphorous acid, and an ammonium salt of the phosphorous monoester, with an organic base selected from the group consisting of pyridine, 2-methylpyridine, 3-methylpyridine, 4-methylpyridine, 2,6-dimethylpyridine and triethylamine, and an oxidizing agent selected from the group consisting of bromine, iodine, mercurous chloride, mercuric chloride, mercuric bromide and mercuric acetate, at a temperature of from 30° to 200° C., and then reacting the activated amino acid with an amino acid having a protected carboxyl group or with a free amino acid at a temperature of from 0° to 200° C.

4,173,564

4-N-ACYLFORTIMICIN B DERIVATIVES AND THE CHEMICAL CONVERSION OF FORTIMICIN B TO FORTIMICIN A

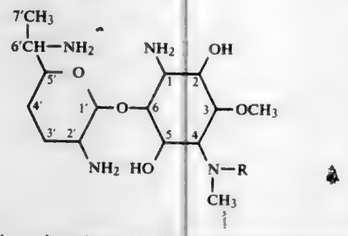
John S. Tadanier; Jerry R. Martin, and Paul Kurath, all of Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 888,085, Mar. 29, 1978, which is a division of Ser. No. 725,829, Sep. 23, 1976, Pat. No. 4,091,032. This application Nov. 1, 1978, Ser. No. 956,751

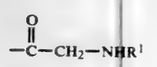
Int. Cl.[2] **C07C** *103/52;* **C07D** *309/22;* **A61K** *37/00*

U.S. Cl. 260—112.5 R **17 Claims**

1. A compound of the formula



wherein R is acyl, aminoacyl, N-monoloweralkylaminoacyl, N,N-diloweralkylaminoacyl, hydroxy-substituted aminoacyl, or substituted aminoacyl of the formula



where R^1 is an acyl radical derived from an amino acid or a short peptide, and the pharmaceutically acceptable salts thereof.

4,173,565

RUBINE DISAZO ACID DYES FOR POLYAMIDES

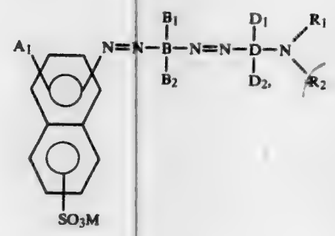
Hans A. Stingl, Toms River, N.J., assignor to Toms River Chemical Corporation, Toms River, N.J.

Filed Dec. 23, 1977, Ser. No. 864,034

Int. Cl.[2] **C09B** *31/04, 31/06, 31/08*

U.S. Cl. 260—191 **6 Claims**

1. A dyestuff of the formula



wherein

M is hydrogen, lithium, sodium, potassium or ammonium;

B and D are each independently 1,4-phenylene or 1,4-naphthylene;

A_1 is hydrogen, C_{1-4} alkoxy, C_{1-4} alkyl, trifluoromethyl, nitro, chloro, bromo, cyano or hydroxy;

B_1 and B_2 are each hydrogen, C_{1-3} alkoxy, C_{1-3} alkyl, chloro or bromo;

D_1 is hydrogen, C_{1-4} alkoxy, C_{1-4} alkyl or chloro;

D_2 is hydrogen, C_{1-4} alkoxy, C_{1-4} alkyl, chloro, bromo, fluoro, C_{1-5} alkanoylamino, C_{1-5} alkylsulfonylamino, benzoylamino, or benzenesulfonylamino, the acylamino groups either unsubstituted or substituted with 1 to 3 C_{1-2} alkyl, C_{1-2} alkoxy, chloro, bromo, cyano, or hydroxy; and

R_1 and R_2 are each C_{1-6} alkyl, C_{1-6} chloro or bromoalkyl, C_{2-6} hydroxy or dihydroxyalkyl, C_{2-6} alkoxyalkyl, C_{1-6} cyanoalkyl or phenyl-C_{1-2} alkyl unsubstituted or substituted on the phenyl with 1 to 3 of C_{1-2} alkyl, C_{1-2} alkoxy, chloro, bromo, cyano, or hydroxy.

4,173,566

1-BENZHYDRYL-2-CYANOAZETIDINE

Elijah H. Gold, West Orange, and Daniel M. Solomon, Edison, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 819,730, Jul. 28, 1977, which is a division of Ser. No. 664,607, Mar. 8, 1976, Pat. No. 4,052,383, which is a continuation-in-part of Ser. No. 519,396, Oct. 30, 1974, abandoned. This application Aug. 23, 1978, Ser. No. 936,293

Claims priority, application Switzerland, Oct. 24, 1975, 13915/75

Int. Cl.[2] **C07D** *205/04;* **A61K** *31/33*

U.S. Cl. 260—239 A **1 Claim**

1. 1-benzhydryl-2-cyanoazetidine.

4,173,567

ISOCYANATE DERIVATIVES OF 1,3[OXAZOLES, OXAZINES, DIAZOLES AND DIAZINES]

Kurt Findeisen; Kuno Wagner, and Walter Uerdingen, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

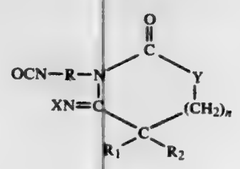
Filed Feb. 10, 1976, Ser. No. 656,909

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1975, 2507682

Int. Cl.[2] **C07D** *233/70, 239/22, 263/38, 265/06*

U.S. Cl. 548—216 **4 Claims**

1. Isocyanates corresponding to the formula



in which

R represents a substituted or unsubstituted aliphatic hydrocarbon group having 2 to 12 carbon atoms, a substituted or unsubstituted cycloaliphatic hydrocarbon group having 4 to 15 carbon atoms, a substituted or unsubstituted aromatic hydrocarbon group having 6 to 15 carbon atoms or a substituted or unsubstituted araliphatic hydrocarbon group having 7 to 15 carbon atoms, said hydrocarbon group having at most three substituents selected from the group consisting of halogen, C_1–C_4-alkyl, methoxy, nitro and C_1–C_4-carbalkoxy groups,

Y represents —O— or —N(R_3)—, where R_3 represents hydrogen, an aliphatic hydrocarbon group having 1 to 4 carbon atoms, a cycloaliphatic hydrocarbon group having 5 to 6 carbon atoms, a phenyl group or —CO—N-H—R—NCO,

n=0 or 1,

R_1 and R_2 are the same or different and represent hydrogen, a substituted or unsubstituted aliphatic hydrocarbon group having 1 to 17 carbon atoms, a substituted or unsubstituted cycloaliphatic hydrocarbon group having 4 to 15 carbon atoms, a substituted or unsubstituted aromatic hydrocarbon group having 6 to 15 carbon atoms or a substituted or unsubstituted araliphatic hydrocarbon group having 7 to 15 carbon atoms, said hydrocarbon group having at most three substituents selected from the group consisting of halogen, C_1–C_4-alkyl, methoxy, nitro and C_1–C_4-carbalkoxy groups or R_1 or R_2 together with the ring carbon atom form a cycloaliphatic ring having 4 to 15 carbon atoms, and

X represents hydrogen or —CO—NH—R—NCO.

4,173,568

PROCESS FOR THE PREPARATION OF COPPER PHTHALOCYANINE

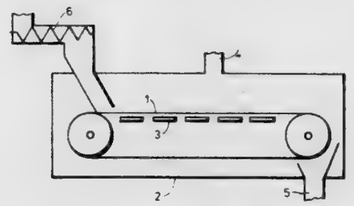
Reinold Schmitz, Odenthal, and Klaus Wunderlich, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 8, 1977, Ser. No. 858,825

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1976, 2657139

Int. Cl.[2] **C09B** *47/04*

U.S. Cl. 260—314.5 **12 Claims**



1. In the process for preparing copper phthalocyanine by reacting phthalic acid, phthalic anhydride, phthalimide, phthalic acid diamide, ammonium salt of phthalic acid or the corresponding isoindolenines; with urea, biuret, guanidine or cyanuric acid; and with copper salts in the solid state; the improvement comprising heating the components from 30° to 270° C. in a thin layer so that an average rise in temperature of 2° C./minute is not exceeded.

4,173,569

PREPARATION OF PYRROLIDINE AND PYRROLIDIN-2-ONE DERIVATIVES

Silvano Banfi, Paderno Dugnano; Renato Pellegata; Giorgio Pifferi, both of Milan, and Mario Pinza, Corsico, all of Italy, assignors to I.S.F. SpA, Milan, Italy

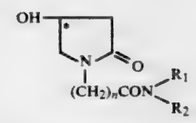
Filed Feb. 8, 1978, Ser. No. 876,169

Claims priority, application Italy, Feb. 11, 1977, 20227 A/77

Int. Cl.[2] **C07D** *207/26*

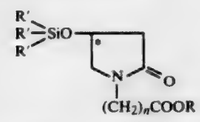
U.S. Cl. 260—326.43 **3 Claims**

1. A process for the preparation of pyrrolidine compounds of the formula:



(I)

in which n is 1, 2 or 3 inclusive, R_1 and R_2, which may be the same or different, are hydrogen or alkyl having 1 to 3 carbon atoms and the asterisk indicates the center of asymmetry of the molecule either as separated enantimoers or as mixture, comprising the steps of (1) reacting γ-amino-β-hydroxybutyric acid in the form of an enantiomer or of a mixture of enantiomers, under anhydrous conditions with a silylating agent, (2) cyclizing the product obtained by heating and (3) then reacting said cyclized product in the presence of an alkaline hydride with an aliphatic acid ester halide of the formula Hal(CH_2)-$_n$COOR, in which Hal is bromine, chlorine or iodine, R is alkyl containing 1 to 4 carbon atoms trichlorophenyl, nitrophenyl or trichloroethyl and n has the same meaning as above, to give a silyl compound of the formula:



(II)

in which R′ is methyl or ethyl and n, R and the asterisk have the same meanings as above, (4) then hydrolizing compound (II) to give the corresponding 4-hydroxy compound and (5) reacting said hydroxy compound with a compound of the formula R_1.NH.R_2, in which R_1 and R_2 have the same meanings as above.

4,173,570

PREPARATION OF HALOGENATED ALDEHYDES

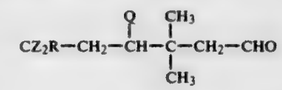
Peter J. V. Cleare, Ascot, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 862,519, Dec. 20, 1977, Pat. No. 4,128,585, which is a division of Ser. No. 737,274, Nov. 1, 1976, Pat. No. 4,085,148. This application Jul. 17, 1978, Ser. No. 925,627

Int. Cl.[2] **C07D** *317/10*

U.S. Cl. 260—340.9 R **3 Claims**

1. An acetal of a compound of formula:



with a lower aliphatic alcohol containing up to 4 carbon atoms or an alkylene diol containing 2 or 3 carbon atoms, where Q, R and Z are independently selected from chlorine or bromine provided that Q is always bromine when either of R and Z are bromine.

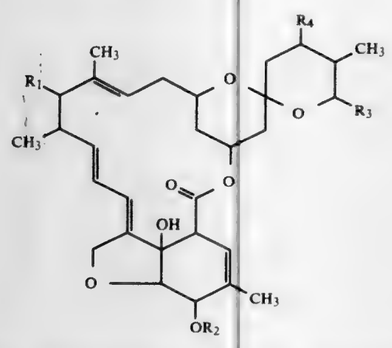
2. 2-(3-Bromo-2,2-dimethyl-5,5,5-trichloropentyl)-1,3-dioxolane.

4,173,571
13-HALO AND 13-DEOXY DERIVATIVES OF C-076 COMPOUNDS

John C. Chabala, Westfield; Michael H. Fisher, Bridgewater, and Helmut H. Mrozik, Matawan, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 19, 1977, Ser. No. 861,919
Int. Cl.[2] C07D *493/22*
U.S. Cl. 260—343.41 **18 Claims**

1. A compound having the formula:



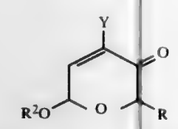
wherein the broken line indicates a single or a double bond;
R_1 is hydrogen or halogen;
R_2 is hydrogen, methyl or loweralkanoyl;
R_3 is n-propyl or sec-butyl; and
R_4 is present only when the broken line indicates a single bond and represents hydrogen, hydroxy, loweralkanoyloxy, loweralkylthio, loweralkylsulfinyl, loweralkylsulfonyl or loweralkoxy;
provided that when R_2 is hydrogen or methyl the broken line can indicate only a single bond and R_4 is other than hydroxy.

4,173,572
PREPARATION OF GAMMA-PYRONES FROM 3-SUBSTITUTED FURANS

Thomas M. Brennan, Old Lyme; Daniel P. Brannegan, Pawcatuck; Paul D. Weeks, and Donald E. Kuhla, both of Gales Ferry, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 741,348, Nov. 12, 1976, Pat. No. 4,126,624. This application Aug. 28, 1978, Ser. No. 937,407
Int. Cl.[2] C07D *309/22*
U.S. Cl. 260—345.9 R **7 Claims**

1. A compound of the formula



wherein R is hydrogen, alkyl of 1 to 4 carbon atoms, phenyl or benzyl; R^2 is hydrogen or alkyl of 1 to 4 carbon atoms; and Y is alkoxyl of 1 to 4 carbon atoms.

4,173,573
PROCESS FOR PREPARING 3,4,3,4-BENZOPHENONE-TETRACARBOXYLIC DIANHYDRIDE

Johann G. D. Schulz, Pittsburgh, and Anatoli Onopchenko, Monroeville, both of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Jul. 3, 1978, Ser. No. 921,571
Int. Cl.[2] C07D *307/89*
U.S. Cl. 260—346.4 **9 Claims**

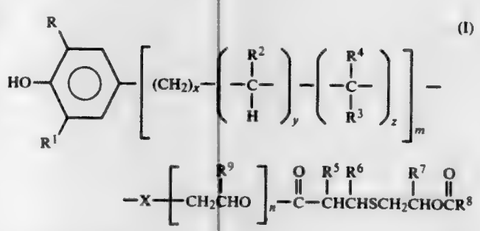
1. A process for preparing 3,4,3',4'-benzophenone-tetracarboxylic dianhydride which comprises condensing an impure ortho-xylene mixture, said impure ortho-xylene mixture containing at least one of meta-xylene, para-xylene, ethylbenzene and cumene, with acetaldehyde in contact with an acid catalyst to obtain an impure 1,1-bis(3,4-dimethylphenyl) ethane mixture, oxidizing the mixture with nitric acid to obtain a mixture of carboxylic acids, from which by crystallization and dehydration, substantially pure 3,4,3',4'-benzophenonetetracarboxylic dianhydride is recovered.

4,173,574
3,5-DITERTIARY ALKYL-4-HYDROXYPHENYL (ALKYL) 6-ACYLOXY-4-THIA HEXANOATES AND HEXENAMIDES AS ANTIOXIDANTS

Richard H. Kline, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 739,687, Nov. 8, 1976, Pat. No. 4,093,591. This application Oct. 11, 1977, Ser. No. 841,239
Int. Cl.[2] C08H *3/00*; C08K *9/00*; C08L *00/00*
U.S. Cl. 260—399 **3 Claims**

1. A process for making compounds having the following structural formula:



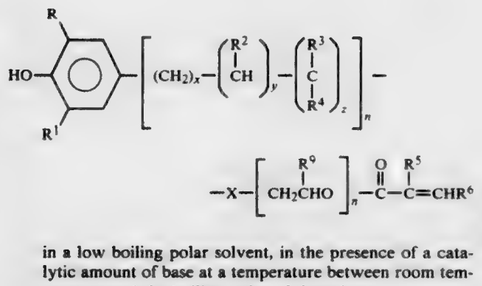
(I)

wherein R and R^1 are radicals selected from the group consisting of tert. alkyl radicals having from 4 to 8 carbons, and cycloalkyl radicals having from 5 to 12 carbons; R^2 and R^3 are selected from the group consisting of H, and alkyl radicals having from 1 to 4 carbons; R^4, R^5, R^6, R^7 and R^9 are selected from the group consisting of H and alkyl radicals having from 1 to 4 carbons; R^8 is selected from the group consisting of alkyl radicals having from 1 to 20 carbons, alkenyl radicals having from 2 to 20 carbons, cycloalkyl radicals having from 5 to 12 carbons, phenyl, substituted phenyl, and aralkyl radicals having from 7 to 12 carbon atoms; x, y or z equals 0 to 12; $x+y+z \leqq 12$; m equals 0 or 1; n equals 0 to 3; an X is 0 or NH; which process comprises:

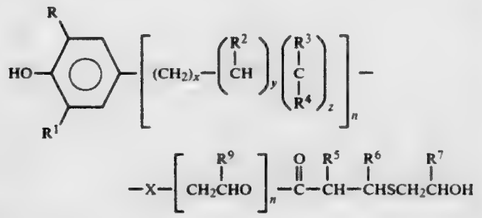
(a) reacting a β-mercaptoethanol of the structure



with an unsaturated ester or amide of the structure



in a low boiling polar solvent, in the presence of a catalytic amount of base at a temperature between room temperature and the boiling point of the solvent;
(b) combining an acid chloride or anhydride derived from a carboxylic acid of the structure R^8COOH with a solution comprising the reaction product of (a) which is of the structure



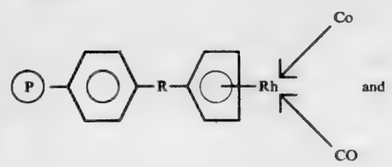
an acid acceptor and an aprotic solvent;
(c) maintaining the resulting reaction in (b) at a temperature between 0° C. and the boiling point of the solvent; and
(d) separating the compound of structure (I) above by standard physical unit operations.

4,173,575
POLYMER BOUND (PENTAHAPTOCYCLOPENTADIENYL) BIS CARBONYL RHODIUM HYDROFORMYLATION CATALYST

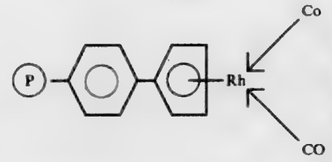
John T. Carlock, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Feb. 13, 1978, Ser. No. 877,440
Int. Cl.[2] C07F *15/00*
U.S. Cl. 260—429 R **9 Claims**

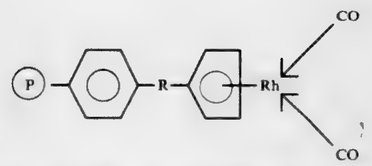
1. A catalyst having a structure selected from the group consisting of



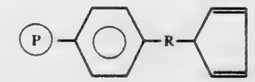
and



wherein R is an alkyl group containing from 1 to 10 carbon atoms, and (P) represents a polystyrene polymer.
4. A method of preparing a catalyst of the formula



wherein R is an alkyl group containing from 1 to 10 carbon atoms and (P) is a polystyrene polymer backbone, under an inert atmosphere, comprising,
(a) dissolving a compound having the structure



in a suitable solvent, wherein (P) and R have the meaning described above, and reacting with
(b) an alkyl or aryl organolithium material containing from 1–10 carbon atoms, continuing agitation for a period of time sufficient to effect reaction;
(c) filtering the polymer from solution, readding to a suitable solvent, and adding $[Rh(CO)_2X]_2$ wherein X is a halogen; and
(d) continuing stirring for a sufficient time to effect reaction, then removing the catalyst from solution extracting with a suitable solvent, and drying prior to use.

4,173,576
PROCESS FOR THE ESTERIFICATION OF CHLOROSILANES

Claus-Dieter Seiler, Rheinfelden; Hans-Joachim Vahlensieck, Wehr, and Hans-Joachim Kötzsch, Rheinfelden, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 707,454, Jul. 21, 1976, abandoned. This application Feb. 28, 1978, Ser. No. 882,000
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1975, 2532887
Int. Cl.[2] C07F *7/18, 7/04, 7/06*
U.S. Cl. 260—448.8 R **12 Claims**

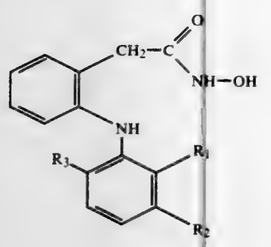
1. In a process for the preparation of an alkoxysilane by the esterification of a chlorosilane with an alcohol of the formula R'OH where R' is an alkyl group of 1 to 11 carbon atoms, the improvement which comprises carrying out the process in the presence of a chlorinated hydrocarbon present in the reaction mixture in an amount of 0.5 to 4 times that of solid halogen silane and in the absence of an acid binding agent.

4,173,577
PHENYLACETOHYDROXAMIC ACIDS

Alfred Sallmann, Bottmingen, and Rudolf Pfister, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 665,986, Mar. 11, 1976, Pat. No. 4,092,430, which is a continuation of Ser. No. 467,366, May 6, 1974, abandoned, which is a continuation-in-part of Ser. No. 177,088, Sep. 1, 1971, abandoned. This application Feb. 13, 1978, Ser. No. 877,066
Claims priority, application Switzerland, Sep. 9, 1970, 13415/70; Jul. 16, 1971, 10580/71
Int. Cl.[2] C07C *83/10*; A61K *31/185*
U.S. Cl. 260—500.5 H **3 Claims**

1. A compound of the formula



(Ib)

wherein R_1 is methyl or chlorine and each of R_2 and R_3 is hydrogen, methyl or chlorine; or an alkali metal or alkaline earth metal salt thereof.

4,173,578

PRODUCTION OF ALKENYL PHOSPHINIC ACIDS

Horst Staendeke, Erftstadt, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

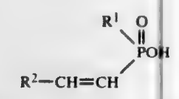
Filed Oct. 11, 1977, Ser. No. 840,908

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646582

Int. Cl.² C07F *9/30*

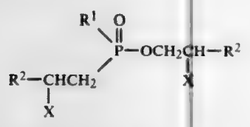
U.S. Cl. 260—502.4 R **6 Claims**

1. A process for making alkenyl phosphinic acids of the general formula



I

in which R^1 stands for an alkyl, aralkyl, cycloalkyl or aryl group having 1 to 20 carbon atoms, and R^2 stands for hydrogen or an alkyl group having 1 to 4 carbon atoms, which comprises subjecting a 2-halogenoalkyl phosphinic acid-2-halogenoalkyl ester of the general formula



II

in which R^1 and R^2 have the meanings given above, and X stands for a halogen atom, to thermal decomposition by heating in a stream of inert gas at temperatures of 150° to 300° C. and simultaneously separating the resulting 1,2-dihalogenoalkane.

4,173,579

CONVERSION OF SULFONATED OLEFINS TO SULFONIC ACID SALTS

Gerhard O. Kuehnhanss, Baton Rouge, La., assignor to Ethyl Corporation, Baton Rouge, La.

Continuation of Ser. No. 445,959, Feb. 26, 1974, abandoned. This application Apr. 1, 1975, Ser. No. 564,095

Int. Cl.² C07C *143/16*

U.S. Cl. 260—513 T **15 Claims**

1. A process for converting into sulfonic acid salts the acid mix produced by the sulfonation of olefins having from about 6 to about 30 carbon atoms per molecule with from about 0.5 to about 2.0 mols of SO_3 per mol of olefin which comprises:

reacting the sulfonated olefins with substantially anhydrous alkali metal oxide, hydroxide or carbonate or ammonium carbonate to convert only a portion of the sulfonated molecules including at least the free sulfonic acids into sulfonic acid salts thereby forming an intermediate product,

adding water or water plus ammonium or alkali metal oxide, hydroxide or carbonate,

and then reacting the intermediate product to convert additional sulfonated molecules into sulfonic acid salts.

4,173,580

PRODUCTION OF β-HALOALKYLAMINOSULFONYL HALIDES

Gerhard Hamprecht, Mannheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

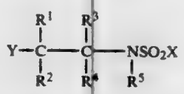
Division of Ser. No. 549,658, Feb. 13, 1975, Pat. No. 4,014,931, which is a continuation-in-part of Ser. No. 431,702, Jan. 8, 1974, Pat. No. 3,919,308. This application Nov. 30, 1976, Ser. No. 746,197

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1974, 2408530

Int. Cl.² C07C *143/70*

U.S. Cl. 260—543 R **6 Claims**

1. A β-haloalkylaminosulfonyl halide of the formula:



(I),

in which the individual radicals R^1, R^2, R^3, and R^4 may be identical or different and each is hydrogen, alkyl of 1 to 20 carbon atoms, aralkyl of 7 to 12 carbon atoms, or phenyl, and R^1 and R^3 and/or R^2 and R^4 together with the 2 adjacent carbon atoms may form a five-membered to eight-membered alicyclic ring, Y and X may be identical or different and each is chloro or fluoro and R^5 is alkyloxyalkyl of 2 to 20 carbon atoms.

4,173,581

PROCESS FOR THE PREPARATION OF ALKYLTHIOSEMICARBAZIDES

Karl-Heinz Steinacker, and Gerhard Adolphen, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

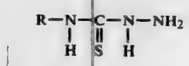
Filed May 9, 1978, Ser. No. 904,346

Claims priority, application Fed. Rep. of Germany, May 23, 1977, 2723121

Int. Cl.² C07C *159/00*

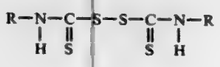
U.S. Cl. 260—552 SC **6 Claims**

1. A process for preparing an alkylthiosemicarbazide of the formula



wherein

R is an alkyl group having up to 4 carbon atoms which comprises contacting a dialkylthiouram disulfide of the formula



wherein

R is an alkyl group having up to 4 carbon atoms with hydrazine in an aqueous medium.

4,173,582

METHOD FOR THE MANUFACTURE OF IMPROVED UREAFORM FERTILIZER

Dahlia S. Greidinger; Liuba Cohen nee Girshowitsh, both of Haifa, and Shimon Epstein, Kiryat Motzkin, all of Israel, assignors to Fertilizers & Chemicals Ltd., Haifa, Israel

Filed Mar. 26, 1976, Ser. No. 670,687

Claims priority, application Israel, Apr. 22, 1975, 47145

Int. Cl.² C07C *127/15*

U.S. Cl. 260—553 R **5 Claims**

1. A method for the production of ureaform of an improved quality and which has an activity index of greater than 75%, which consists in the condensation of urea and formaldehyde, wherein the overall concentration of the reagents is in the range of 20 to 40% by weight, the reaction being carried out in a controlled system having a pH between 3.5–4.2, at a temperature range of 15° C. up to 40° C. for a time range of about 2–6 hours and subsequently neutralized at the termination of the reaction wherein the molar ratio between urea and formaldehyde is in the range of 1.2 up to but not including 1.5.

4,173,583

DIASTEREOISOMERS OF 5-(1-HYDROXY-2-(1-METHYL-3-PHENYL-PROPYLAMINO)ETHYL)SALICYLAMIDE

Elijah H. Gold, West Orange, and Wei Chang, Livingston, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 569,043, Apr. 17, 1975, abandoned. This application Sep. 21, 1978, Ser. No. 944,505

Int. Cl.² C07C *103/26*

U.S. Cl. 260—559 S **11 Claims**

1. A process for separating racemic 5-[1-hydroxy-2-(1-methyl-3-phenylpropylamino)ethyl]salicylamide into its diastereoisomers which comprises:

(a) preparing a solution of racemic 5-[1-hydroxy-2-(1-methyl-3-phenylpropylamino)ethyl]salicylamide, a suitable organic sulfonic acid and an alkanoic acid having 1 to 6 carbon atoms in a neutral solvent;

(b) separating diastereoisomer B therefrom in the form of its salt with the sulfonic acid, leaving a mother liquor containing diastereoisomer A; and

(c) adding a mineral acid to the mother liquor whereby diastereoisomer A separates out as its solid salt with that mineral acid;

said diastereoisomer A being characterized as that diastereoisomer whose hydrochloride salt has the higher melting point.

4,173,584

NOVEL CYCLOPENTANONE DERIVATIVES AS FLAVOR- AND ODOR-MODIFYING INGREDIENTS

Khurshid P. Dastur, Satigny, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

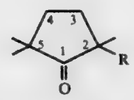
Filed May 3, 1977, Ser. No. 793,287

Claims priority, application Switzerland, May 13, 1976, 5995/76

Int. Cl.² C07C *49/28*

U.S. Cl. 260—586 R **4 Claims**

1.



wherein symbol R represents an alkyl radical comprising from 4 to 6 carbon atoms.

4,173,585

2,2,3-TRIMETHYL-3-CYCLOPENTEN-1-YLALKENYL- AND ALKYLIDENE-CYCLOALKANONES

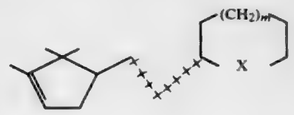
Takao Yoshida, West Long Branch; Braja D. Mookherjee, Holmdel; Venkatesh Kamath, Red Bank; John B. Hall, Rumson; William I. Taylor, Summit, and Frederick L. Schmitt, Holmdel, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Aug. 10, 1978, Ser. No. 932,677

Int. Cl.² C07C *49/46, 49/48*

U.S. Cl. 260—586 R **3 Claims**

1. A compound having the structure:



wherein m is 0 or 1;

wherein one of the lines + + + + is a carbon-carbon single bond and the other of the lines + + + + is a carbon-carbon double bond and wherein X is carbonyl having the structure:



4,173,586

PROCESS FOR CLEAVAGE OF UNSATURATED MULTI-CYCLIC KETONES

Larry W. Payne, Clute; Howard E. Miller, and James R. Ryffel, both of Lake Jackson, all of Tex., assignors to Badische Corporation, Williamsburg, Va.

Filed Sep. 15, 1978, Ser. No. 942,845

Int. Cl.² C07C *27/00, 3/30*

U.S. Cl. 260—586 R **5 Claims**

1. A process for thermal cleavage of unsaturated multicyclic ketones selected from the group consisting of 2-(1-cyclohexenyl)cyclohexanone, 2-cyclohexylidenecyclohexanone, and 2-cyclohexenylidenecyclohexanone which comprises confining the ketone in a substantially dry state, without the addition of water or steam, at a temperature from about 150° to 350° C., and under a pressure high enough to ensure that a liquid phase is present, and recovering the products therefrom.

4,173,587

DECOMPOSITION OF CUMENE HYDROPEROXIDE WITH A HETEROGENEOUS CATALYST

Ching-Yong Wu, O'Hara Township, Allegheny County; Wayne R. Pretzer, Oakmont, and Thaddeus P. Kobylinski, Gibsonia, all of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Nov. 18, 1977, Ser. No. 852,922

Int. Cl.² C07C *49/08, 39/04, 37/08, 45/00*

U.S. Cl. 260—593 A **11 Claims**

1. The method for cleaving cumene hydroperoxide at high selectivity to phenol and acetone using a heterogeneous rhenium catalyst which comprises heating a solution comprising about 0.1 to about 20 weight percent cumene hydroperoxide in a solvent in the presence of a rhenium catalyst consisting essentially of a substantially non-soluble rhenium compound selected from unsupported rhenium sulfides, calcined supported rhenium oxides and sulfided supported rhenium oxides wherein said supports are selected from alumina, zirconia and a silica-alumina or a magnesia-alumina having at least about ten weight percent alumina at a temperature between about 10° C. and about 150° C.

4,173,588

MANUFACTURE OF 2-METHYL-2-HEPTEN-6-ONE

Heinrich Pasedach, Ludwigshafen; Rudolf Mohr, Lampertheim, and Axel Nissen, Leimen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

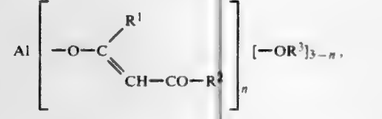
Filed Nov. 3, 1977, Ser. No. 848,211

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1976, 2652863; Jul. 2, 1977, 2729975

Int. Cl.[2] C07C 45/18

U.S. Cl. 260—595 **8 Claims**

1. In a process for the manufacture of 2-methyl-2-hepten-6-one by reacting 2-methyl-3-buten-2-ol with an alkyl acetoacetate at an elevated temperature in the presence of an organic aluminum compound, the improvement wherein the methylbutenol and the alkyl acetoacetate are reacted at from 140° to 180° C., in a molar ratio of from 0.8:1 to 2.0:1, with the proviso that the concentration of said alkyl acetoacetate in the reaction mixture during the entire reaction period is not above 15% by weight for a total time of more than two hours and wherein said organic aluminum compound has the formula



where R^1 and R^2 are alkyl or alkoxy of 1 to 4 carbon atoms, R^3 is alkyl of 1 to 4 carbon atoms and n is 0, 1, 2 or 3 or said aluminum compound is an aluminum triaryloxylate wherein the aryloxy group is phenolate, optionally substituted by lower alkyl or lower alkoxy of 1 to 4 carbon atoms or is naphtholate, optionally substituted by alkyl or alkoxy of 1 to 4 carbon atoms.

4,173,589

PURIFICATION OF OXO ALDEHYDES

Heinrich Elliehausen, Ludwigshafen; Heinz Hohenschutz, Mannheim; Max Strohmeyer, and Juergen Haug, both of Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 25, 1977, Ser. No. 844,648

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1976, 2650829

Int. Cl.[2] C07C 45/24, 45/08

U.S. Cl. 260—604 HF **3 Claims**

1. In a process for the purification of oxo aldehydes containing iron pentacarbonyl from the product stream of the manufacture of oxo aldehydes wherein the oxo aldehydes are distilled at normal pressure from the product stream, the improvement comprising:

distilling the oxo aldehydes containing iron pentacarbonyl in the presence of from 0.01 to 0.10 cubic meter (S.T.P.) of added air per g of iron pentacarbonyl to oxidize the iron pentacarbonyl to non-volatile salts, whereby the oxo aldehydes are freed from iron pentacarbonyl.

4,173,590

PROCESS FOR MAKING TETRAMETHYLDIPHOSPHINOMETHANE

Hubert Schmidbaur, Garching, and Hans-Heinz Karsch, Munich, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 20, 1977, Ser. No. 862,523

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658127

Int. Cl.[2] C07F 9/50

U.S. Cl. 260—606.5 P **4 Claims**

1. A process of making tetramethyldiphosphinomethane of the formula $(CH_3)_2P\text{-}CH_2\text{-}P(CH_3)_2$ which comprises: reacting, with agitation, a suspension of dilithiomethane of the formula Li_2CH_2 or magnesiomethane of the formula $MgCH_2$ in an organic solvent with dimethylchlorophosphine and distilling the resulting reaction mixture.

4,173,591

PROCESS FOR THE PREPARATION OF 1,3,5-TRIFLUORO-2,4,6-TRINITROBENZENE

William M. Koppes, Adelphi; Horst G. Adolph, Silver Spring, and Michael E. Sitzmann, Adelphi, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 28, 1978, Ser. No. 937,281

Int. Cl.[2] C07C 79/12

U.S. Cl. 260—646 **3 Claims**

1. A process for producing 1,3,5-trifluoro-2,4,6-trinitrobenzene comprising the following steps:

(1) forming a mixture of fuming sulfuric acid and potassium nitrate wherein the fuming sulfuric acid is composed of at least 25 percent by weight sulfur trioxide, and wherein the molar ratio of fuming sulfuric acid to potassium nitrate is from about 2:1 to about 3:1;

(2) adding 1,3,5-trifluorobenzene to the mixture until the molar ratio of potassium nitrate to 1,3,5-trifluorobenzene is from 6:1 to 10:1, the temperature of the mixture being maintained in the range of from about 30° C. to about 50° C. during this addition;

(3) then raising the temperature of the mixture into the range of from about 140° C. to about 160° C. where it is maintained until the optimum yield of 1,3,5-trifluoro-2,4,6-trinitrobenzene is obtained; and finally

(4) isolating the product 1,3,5-trifluoro-2,4,6-trinitrobenzene from the reaction mixture.

4,173,592

HEAT-RESISTANT RESIN COMPOSITION

Shuichi Suzuki, Yokohama; Moriyasu Wada, Naka; Sadao Kajiura, Yokohama, and Takeo Ito, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 21, 1978, Ser. No. 898,673

Claims priority, application Japan, Apr. 28, 1977, 52/48447

Int. Cl.[2] C08K 5/15; C08L 63/00, 79/08

U.S. Cl. 525—134 **11 Claims**

1. A heat resistant resin composition comprising

(A) at least one maleimide compound obtained by reacting a condensation product of aniline, an aromatic hydroxy compound having at least one hydroxyl group directly attached to a carbon atom in the aromatic ring, which may contain at least one hydrocarbon substituent group or at least one non-hydrocarbon substituent group, and formaldehyde with an acid anhydride reactant containing at least 40 mole % of maleic anhydride, the molar ratio of aniline to aromatic hydroxy compound being in the range of 5:95 to 95:5, the ratio of total moles of aniline and aromatic hydroxy compound to moles of formaldehyde being in the range of 10:1 to 1:4, the ratio of amine equivalents to acid equivalents being 1:1 or lower, and

(B) at least one allyl compound selected from the group consisting of polyallyl phenyl ether compounds and polyallyl phenolic compounds each having at least two allyl radicals, in the proportion of about 20 to 95% by weight of compound A and from about 5 to 80% by weight of component B based on the total weight of the composition.

4,173,593

METAL ACETYLACETONATE LATENT ACCELERATORS FOR AN EPOXY-STYRENE RESIN SYSTEM

James D. B. Smith, Wilkins Township, Allegheny County, and Robert N. Kauffman, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 5, 1977, Ser. No. 784,752

Int. Cl.[2] C08L 63/00

U.S. Cl. 525—109 **8 Claims**



1. A resinous, solventless, low viscosity liquid impregnating composition having fast cure properties, comprising the admixture of:

(A) an epoxy diester, formed from the reaction of:

(I) 1 part of a mixture of a solid 1,2-epoxy resin having an epoxy equivalent weight of between about 390 to 2,500, and a liquid 1,2-epoxy resin having an epoxy equivalent weight of between about 100 to 385, wherein the weight ratio of solid epoxy resin:liquid epoxy resin is between about 1:1 to 1:10, with

(II) between about 0.01 part to about 0.06 part of maleic anhydride and about 0.0001 part to about 0.005 part of a catalyst selected from the group consisting of piperidine, pyridine, imidazoles, and aliphatic tertiary amines, and mixtures thereof; to form an epoxy diester having an acid number between about 0.5 to 3.0; with

(B) between about 0.05 part to about 3.0 parts of a vinyl monomer co-reactive with the epoxy diester; about 0.0003 part to about 0.004 part of a room temperature stabilizer selected from the group consisting of dinitrophenols, trinitrophenols, aromatic quinones, and mixtures thereof; between about 0.3 part to about 1.2 parts of a polycarboxylic anhydride which is soluble in the epoxy diester-vinyl monomer-stabilizer mixture at temperatures of between about 0° C. to 35° C.; and an amount of a free radical catalyst selected from the group consisting of azo compounds, peroxides, and mixtures thereof, that is effective to provide a catalytic curing effect on the mixture at a temperature of over about 85° C.; and

(C) between 0.0005 part to 0.005 part of a metal acetylacetonate, selected from the group consisting of sodium (I) acetylacetonate, zinc (II) acetylacetonate, chromium (III) acetylacetonate, manganese (III) acetylacetonate, ferric (III) acetylacetonate, aluminum (III) acetylacetonate, uranyl (VI) acetylacetonate, and mixtures thereof, acting as the latent accelerator; to provide an epoxy-styrene solventless, liquid impregnating composition, having a viscosity of between about 5 cps to 500 cps at 25° C., and an atmospheric catalyzed pot life at 25° C. of at least 45 days.

4,173,594

THERMOSETTING LACQUER COMPOSITIONS

Zygmunt D. Dyszlewski, Lake City, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Feb. 24, 1975, Ser. No. 552,505

Int. Cl.[2] C08L 63/00

U.S. Cl. 525—498 **21 Claims**

1. Polyurethane-phenolic resin adducts comprising the organic solvent-soluble reaction product formed by contacting a blocked isocyanate-functional polyurethane and an organic solvent-soluble phenolic resin at a temperature sufficient to dissociate said blocked polyurethane and initiate reaction between said polyurethane and said phenolic resin.

4,173,595

THERMOSETTING COMPOSITION FROM BIS-IMIDE, N-VINYL PYRROLIDONE AND UNSATURATED POLYESTER

Max Gruffaz, La Mulatiere, and Jean-Louis Locatelli, Vienne, both of France, assignors to Rhone-Poulenc Industries, Paris, France

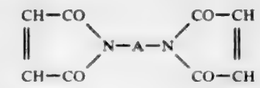
Division of Ser. No. 719,282, Aug. 31, 1976, Pat. No. 4,111,919. This application Jan. 5, 1978, Ser. No. 867,023

Claims priority, application France, Sep. 19, 1975, 75 29460

Int. Cl.[2] C08L 67/06, 79/08

U.S. Cl. 525—165 **1 Claim**

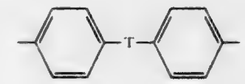
1. A thermosetting composition, characterized in that it consists essentially of, by weight: from 60 to 90% of a bis-maleimide of the formula:



(I)

in which

A represents a divalent radical chosen from the group consisting of phenylene radicals and radicals of the formula:



where

T represents $—CH_2—$, $—C(CH_3)_2—$, —O— or $—SO_2—$; and from 10 to 40% of N-vinylpyrrolid-2-one;

and further modified by the addition of an unsaturated polyester in an amount representing from 5 to 60% of the weight of the mixture of the bis-maleimide and N-vinylpyrrolid-2-one, said unsaturated polyester being derived from at least one polycarboxylic acid derivative and at least one polyol, at least one of which contains olefinic unsaturation, with up to 60% by weight, based on the weight of the polyester composition, of an olefinically unsaturated monomer.

4,173,596

SOFT-SEEDED TOUGHENERS FOR POLYVINYL CHLORIDE

Elmer J. De Witt, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 23, 1977, Ser. No. 863,835

Int. Cl.[2] C08F 279/06

U.S. Cl. 428—402 **9 Claims**

1. A composition comprising polymer particles prepared by (a) providing a seed latex wherein the polymer particles have an average size in the range of from about 200 to 2000 A and a T_g less than about 20° C., said seed consisting essentially of a polymer derived from an alkyl acrylate monomer and from about 0.1 to about 5 weight percent cross-linking monomer or a copolymer derived from a major amount, by weight, of an alkyl acrylate monomer, a minor amount, by weight, of an addition monomer and from about 0.1 to about 5 weight percent cross-linking monomer, the alkyl moiety of the alkyl acrylate monomer comprising an aliphatic or alicyclic hydrocarbon radical having 3 to 12 carbon atoms and the addition monomer being selected from the group consisting of vinyl, acrylic acid ester and nitrile functional monomers derived from acrylic acid esters; (b) contacting said polymer particles within the latex with butadiene monomer or a monomer mixture containing butadiene and an alkyl acrylate ester or butadiene and an addition monomer under conditions designed for the overpolymerization of said monomers on the polymer particles of the latex to the substantial exclusion of the formation of new polymer particles therefrom; and (c) contacting the

overpolymerized polymer particles of said latex formed in step (b) with a monomer mixture containing an α-aryl substituted monoolefin and an α-alkyl alkylacrylate ester monomer under conditions designed for overpolymerization of said monomers on the polymer particles of the latex to the substantial exclusion of the formation of new polymer particles within said latex;

the relative proportion of structural units in the copolymer component of step (b) being adjusted to insure that such component is elastomeric in nature, and the relative proportion of structural units in the copolymer component of step (c) being adjusted to insure that such component is harder than the component of step (b); and

the relative concentration in the composition of the component of step (a) being in the range of from about 5 to about 20 weight percent; the concentration of the component of step (b) being in the range of from about 50 to about 75 weight percent; and, the concentration of components of step (c) being in the range of from about 15 to about 40 weight percent.

4,173,597

IMPACT STYRENE POLYMER BLENDS WITH THERMOPLASTIC ELASTOMERS

Kenneth W. Willcox, and Fay W. Bailey, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 23, 1978, Ser. No. 871,659
Int. Cl.[2] C08L *53/00*
U.S. Cl. 525—98 **10 Claims**

1. A blend having a polymerized diene content within the range of 18 to 24 weight percent based on a total weight of said blend comprising:

a styrene polymer; and

a thermoplastic elastomer having a melt flow within the range of 2–15 at 180° C. in accordance with ASTM D 1238-65T with a 5 kg weight, said thermoplastic elastomer being a block copolymer of at least one conjugated diene and at least one monovinyl-substituted aromatic compound.

4,173,598

POLYMERIC COMPOSITIONS AND METHODS FOR THEIR PRODUCTION

Garbiel G. M. Castelazo; Abraham Quintero; Alejandro Medina, and Gilberto Fabila, all of Presidente Mazaryk No. 61, Col. Polanco, Mexico (5)

Continuation-in-part of Ser. No. 704,633, Jul. 13, 1976, abandoned. This application Dec. 9, 1977, Ser. No. 859,146
Int. Cl.[2] C08F *279/02*
U.S. Cl. 428—402 **7 Claims**

1. A process for making a polymeric composition of matter of the terpolymer type, said process having as its only essential steps the steps of: forming an elastomeric substrate by emulsion copolymerization of from 50–60 percent by weight of a rubber-forming, linear, diene monomer and from 40–50 percent by weight of an aromatic vinyl monomer at a temperature in the range of 65°–85° and in the presence of a free radical catalyst, a C_{10}–C_{18} mercaptan chain transfer agent, and 0.3–1.5% by weight of an aromatic, divinyl, cross-linking agent until a conversion of at least 95 percent is attained; effecting a graft polymerization of at least one of the group consisting of acrylic and methacrylic polymers on said substrate by dosing said substrate simultaneously at a substantially constant rate with a monomeric constituent consisting of at least one C_1–C_3 ester of methacrylic or C_2–C_4 ester of acrylic acid at an ester: substrate ratio of 1:3 to 1:4 and with a chain transfer agent, a catalyst, and a 0.2–0.6% by weight of cross-linking agent, all as aforesaid, the dosing being carried out in emulsion at a temperature in the range of 80° to 95° for a period of 3.5 to 5.5 hours; continuing the reactions for a period of 1 to 2 hours after the dosing is completed; and thereafter recovering the polymer from the emulsion, that being the final step in the making of the composition.

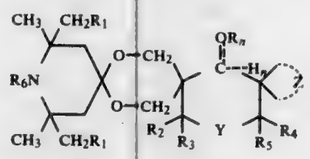
4,173,599

2,2,6,6-TETRAALKYL-4-PIPERIDYL KETONES AND KETALS AS STABILIZERS FOR SYNTHETIC POLYMERS

Motonobu Minagawa, Kosigaya; Naohiro Kubota, and Toshihiro Shibata, both of Urawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Mar. 16, 1978, Ser. No. 886,965
Claims priority, application Japan, Mar. 31, 1977, 52-37051
Int. Cl.[2] C07D *491/10, 491/20;* C08K *5/35*
U.S. Cl. 525—66 **29 Claims**

1. 2,2,6,6-tetraalkyl-4-piperidyl ketones and ketals having the formula:



wherein:

n are each 0 or 1 and are each the same;

R is selected from the group consisting of hydrogen, alkyl having from one to about eighteen carbon atoms, and acyl



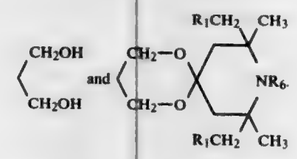
R′ being selected from the group consisting of alkyl and alkenyl having from one to about eighteen carbon atoms, and such radicals containing phenyl, thioalkyl and phenolic groups, pyrrolidonyl and nicotinyl;

R_1, R_2, R_3, R_4 and R_5 are selected from the group consisting of hydrogen and alkyl having from one to about eighteen carbon atoms;

R_6 is selected from the group consisting of hydrogen and O·;

Y is selected from the group consisting of a carbon-to-carbon bond —, oxy —O—; alkylene having from one to about three carbon atoms, and alkyl-substituted alkylene, the alkylene having from one to about three carbon atoms, the alkyl having from one to about six carbon atoms; and

Z is selected from the group consisting of:



23. An olefin polymer composition having improved resistance to deterioration comprising an olefin polymer selected from the group consisting of polymers of alpha-olefins having from two to six carbon atoms and polystyrene, and a compound in accordance with claim **1**.

4,173,600

MULTI-STAGE SEQUENTIALLY PRODUCED POLYMER COMPOSITION

Kazuo Kishida; Akira Hasegawa, both of Otake, and Hiroshi Mohri, Yokohama, all of Japan, assignors to Mitsubishi Rayon Co., Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 807,642, Jun. 17, 1977, abandoned. This application Nov. 27, 1978, Ser. No. 963,733
Claims priority, application Japan, Jun. 25, 1976, 51/75302
Int. Cl.[2] C08F *279/02*
U.S. Cl. 525—76 **12 Claims**

1. A multi-stage sequentially produced polymer structure composition, which comprises:

an innermost layer (A), and successively seed polymerized thereupon an elastic polymer layer (B), an outermost layer (C) and at least one intermediate layer (D);

said layer (A) which has a glass transition temperature (Tg) of at least 10° C. and which constitutes 5–35% by weight of the total polymer composition being the polymerized product of a monomer mixture comprising 51–100 parts by weight of styrene or a styrene derivative, 0–49 parts by weight of a monomer having a copolymerizable double bond, 0–10 parts by weight of a polyfunctional monomer, and 0–5 parts by weight of a graft crosslinking agent;

said layer (B) which has a glass transition temperature of 0° C. or less and which constitutes 5–55% by weight of the total polymer composition being the product, polymerized in the presence of a product containing the previously polymerized stages, of a monomer mixture comprising 60–100 parts by weight of a diene monomer, 0–40 parts by weight of a monomer having a copolymerizable double bond, 0–10 parts by weight of a polyfunctional monomer and 0–5 parts by weight of a graft crosslinking agent;

said layer (C) which has a glass transition temperature of at least 50° C. and which constitutes 10–70% by weight of the total polymer composition being the product, polymerized in the presence of a product containing the previously polymerized stages, of a monomer mixture comprising 51–100 parts by weight of styrene or a styrene derivative and 0–49 parts by weight of a monomer having a copolymerizable double bond; and

said intermediate layer (D) which constitutes 5–45% by weight of the total polymer composition being the product, polymerized in the presence of a product containing the previously polymerized stages, of a monomer mixture comprising 20 to (Y-10) parts by weight of styrene or a styrene derivative, (Y-10) to 20 parts by weight of a diene monomer, 0–10 parts by weight of a polyfunctional monomer and 0–5 parts by weight of a graft crosslinking agent, wherein Y is the amount of diene monomer used in the formation of said layer (B).

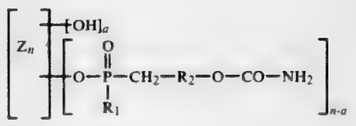
4,173,601

CARBAMOYL-OXYALKYL-PHOSPHINIC ACID DERIVATIVES

Hans-Jerg Kleiner, Kronberg; Fritz Linke, and Walter Dürsch, both of Königstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 8, 1978, Ser. No. 913,548
Claims priority, application Switzerland, Jun. 10, 1977, 7192/77
Int. Cl.[2] C07F *9/32;* C09K *3/28*
U.S. Cl. 260—938 **2 Claims**

1. Compounds of the formula



I

in which

Z_n is an n-valent, saturated hydrocarbon radical having from 1 to 6 carbon atoms,

R_1 is an optionally branched alkyl group having from 1 to 6 carbon atoms, which alkyl group may be substituted by a halogen atom, preferably chlorine, or a phenyl radical,

R_2 is an optionally branched alkylene group having from 2 to 7 carbon atoms,

a is zero to n−1 and

n is in the range of from 1 to 4; and the mixtures thereof.

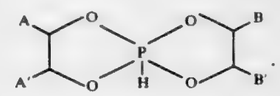
4,173,602

PROCESS FOR PREPARING SPIROCYCLIC PHOSPHORUS COMPOUNDS

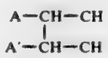
Curtis P. Smith, Cheshire, and Henri Ulrich, Northford, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 786,690, Apr. 11, 1977, Pat. No. 4,113,014, which is a continuation of Ser. No. 634,136, Nov. 21, 1975, abandoned. This application Jun. 28, 1978, Ser. No. 922,335
Int. Cl.[2] C07F *9/08*
U.S. Cl. 260—971 **3 Claims**

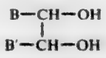
1. A process for the preparation of a spirocyclic phosphorus compound of the formula:



wherein A, A′, B and B′ are each independently selected from the class consisting of hydrogen and lower-alkyl, which comprises admixing substantially equimolar proportions of phosphorus trichloride and a diol



wherein A and A′ are as above defined, at a temperature within the range of 0° C. to 15° C., maintaining the resulting reaction product at a temperature within the same range while adding at least an equimolar proportion of propylene oxide thereto, and, finally, maintaining the product so obtained at a temperature range of about 25° C. to about 40° C. while adding an equimolar proportion of a second diol



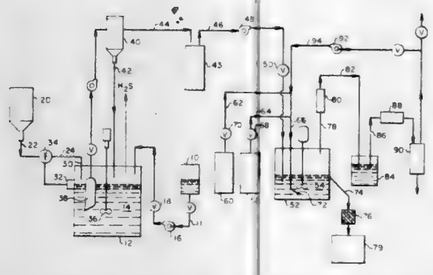
wherein B and B′ are as above defined.

4,173,603

METHOD FOR THE MANUFACTURE OF DIALKYL DITHIOPHOSPHORIC ACID AND DIALKYL PHOSPHOROCHLORIDOTHIONATE

Joseph L. P. Chen, Mission Viejo, Calif., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Dec. 29, 1977, Ser. No. 865,565
Int. Cl.² C07F *9/20, 9/165*
U.S. Cl. 260—986 **15 Claims**



1. A continuous process for manufacturing dialkyl phosphorochloridothionate which comprises:
(a) continuously reacting a liquid lower alkyl alcohol with solid phosphorus pentasulfide slurried in dialkyl dithiophosphoric acid;
(b) partially immersing a settling tube having an inclined inner surface in said slurry to separate dialkyl dithiophosphoric acid product from a major portion of slurried phosphorus pentasulfide;
(c) removing said separated dialkyl dithiophosphoric acid product from a top portion of said settling tube at a fluid velocity at least as slow as the settling velocity of a major portion of said slurried phosphorus pentasulfide;
(d) continuously reacting said removed dialkyl dithiophosphoric acid with chlorine in a single step operation by contacting said removed dialkyl dithiophosphoric acid with chlorine at a temperature of from 0° to about 75° C., said chlorine having been diluted with an inert gas; and
(e) separating the resulting dialkyl phosphorochloridothionate from the reaction mixture.

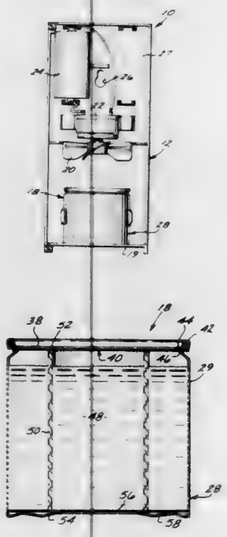
4,173,604

ENVIRONMENTAL CONTROL DISPENSER

Dimitrios A. Dimacopoulos, Redondo Beach, Calif., assignor to Cline-Buckner, Inc., Cerritos, Calif.

Filed Feb. 9, 1978, Ser. No. 876,322
Int. Cl.² F02M *37/00*
U.S. Cl. 261—30 **21 Claims**

1. A vapor generator which comprises:
closed receptacle means having an openable top portion.
capillary action diaphragm means in the upper portion of said receptacle means beneath said openable top portion and adapted to have one side thereof exposed upon opening of said top portion,
vaporizable liquid concentrate in said receptacle means below said diaphragm means, and
liquid transport means in said receptacle means below said diaphragm means, said transport means engaging said diaphragm means and extending downwardly therefrom into said liquid concentrate,
said transport means being adapted to transport said liquid concentrate to said diaphragm means for vaporization thereof from said exposed side of said diaphragm means,
said receptacle means comprising a can having a lid with a peripheral scare defining a removable central portion and a peripheral portion which remains after removal of said central portion,
said diaphragm means extending across the aperture remaining in said lid after removal of said central portion, and



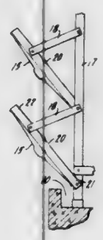
said diaphragm means having a peripheral portion which is supported in said can beneath said peripheral portion of said lid.

4,173,605

LIQUID COOLING TOWER

Robert Long, Santa Rosa, Calif., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed Sep. 5, 1978, Ser. No. 939,759
Int. Cl.² B01F *3/04*
U.S. Cl. 261—109 **29 Claims**



1. A liquid cooling tower having means for delivering liquid and for causing such liquid to fall within said tower, an air inlet, an air outlet, means for causing air to flow from said inlet to said outlet so as to intersect the liquid falling within the tower, and an improved louver assembly at said inlet comprising:
A. a plurality of horizontally spaced, generally vertically extending louver support columns;
B. a plurality of louver support arms spaced vertically along said columns, said arms extending transversely from said columns;
C. a plurality of louver support brackets, each bracket having an upper portion connected to an arm and a lower portion connected to a column;

D. a plurality of louver panels, the outer edges of each panel defining a generally rectangular outline with one pair of parallel edge portions being attached to said louver support brackets, and the other pair of parallel edge portions being oriented generally horizontally, said one pair of edge portions being substantially flat and lying in a single plane and the entire body of said panel extending between said pairs of edge portions lying outside of said single plane.

4,173,606

METHOD OF MANUFACTURING SHAPED ARTICLES FROM CRYSTALLINE ACRYLONITRILE POLYMERS AND COPOLYMERS

Vladimír Stoy; Artur Stoy; Jiří Zíma, and Jaroslav Kálal, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved., Prague, Czechoslovakia

Continuation of Ser. No. 702,573, Jul. 6, 1976, abandoned. This application Apr. 11, 1978, Ser. No. 895,366
Claims priority, application Czechoslovakia, Jul. 14, 1975, 4957/75
Int. Cl.² B29D *11/00;* B29C *25/00*
U.S. Cl. 264—1 **4 Claims**

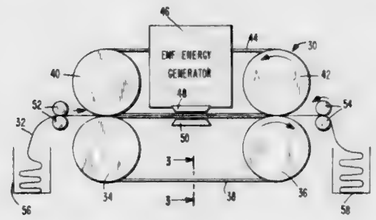
1. Method of manufacturing shaped water-insoluble hydrogel articles of the type comprising plates, filaments, hollow filaments, contact lenses, catheters, intubation tubes and dialysation membranes from crystalline acrylonitrile homopolymers and copolymers, consisting of the steps of:
(1) Shaping a solution of a crystalline acrylonitrile homopolymer or copolymer in a mixture containing 50 to 99.5% by weight of a solvent and 0.5 to 50% by weight of a non-solvent, to the desired final shape;
(2) Cooling the shaped solution to a temperature below the gelation point of the solution until the solution gelates without changing its composition and shape to form a shaped thermoreversible gel; and
(3) Removing the solvent from the shaped thermoreversible gel by means of water at temperatures lower than the gelation point of the solution, whereby a shaped article having the shape established in step (1) is obtained.

4,173,607

METHOD FOR TEXTURING THE SURFACE OF NON-WOVEN FABRIC FILMS

Karl E. Bahr, Meadville, Pa., assignor to Textron Inc., Providence, R.I.

Filed Jun. 9, 1977, Ser. No. 805,175
Int. Cl.² H05B *5/00, 9/00*
U.S. Cl. 264—25 **4 Claims**



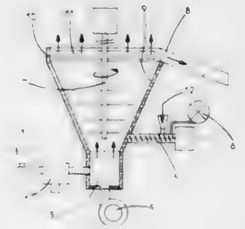
1. A method of manufacturing a textured strip of slide fastener chain comprising the steps of
forming a slide fastener chain including a pair of mounting tapes and a pair of interengaged trains of coupling elements secured on inner edges of the respective tapes, each tape being a smooth film strip of the thermoplastic material which includes a susceptor material,
running the slide fastener chain between parallel sections of a pair of endless nonsusceptible mold bands supported by respective pairs of spaced press wheels rotating the pair of mold bands,
compressively engaging the pair of tapes during the running step by means of facing resilient patterned surfaces of the respective endless mold bands,
passing the strip through an electromagnetic field during an intermediate portion of said compressively engaging step to soften the thermoplastic material of the tapes,
venting air between the resilient patterned surfaces and the strip by means of spaced openings through said endless bands during said passing step,
whereby the tapes of the strip are impressed with a pattern from the patterned surfaces, and
receiving the pair of interengaged trains of coupling elements within longitudinal channels formed in the centers of the respective patterned surfaces so that the pair of interengaged trains of coupling elements remained undeformed.

4,173,608

PROCESS AND APPARATUS FOR THE MANUFACTURE OF EXPANDED PLASTICS MATERIALS

Joël Soulier, Ivry la Bataille, France, assignor to Isobox-Barbier, Bannalex, France

Filed Oct. 5, 1977, Ser. No. 839,453
Claims priority, application France, Oct. 22, 1976, 76 31899
Int. Cl.² B29D *27/00;* H05B *9/06*
U.S. Cl. 264—26 **10 Claims**



1. A process for the pre-expansion of particles of thermoplastic resin material containing an inflating or expanding agent, said process comprising the steps of:
continuously mixing small particles of said thermoplastic resin material with a polar liquid;
continuously introducing said mixture into a resonant chamber communicating with a source of ultra-high frequency electro-magnetic or microwave energy;
introducing said ultra-high frequency electro-magnetic microwave energy into said resonant chamber to vaporize said polar liquid on said plastic particles whereby said particles are caused to expand;
introducing hot air into said chamber to pulse or agitate said vapor whereby condensation of said vapor on said pre-expanded particles is prevented and said particles are dried; and
extracting said dried pre-expanded particles from said resonant chamber.

4,173,609

METHOD OF MANUFACTURING BUILDING ELEMENTS FROM SO-CALLED FOAMED CERAMICS

Carl B. A. Engström, Uttran, Sweden, assignor to Euroc Development AB, Malmo, Sweden

Filed Jun. 10, 1977, Ser. No. 805,484
Claims priority, application Sweden, Jun. 10, 1976, 7606609
Int. Cl.² C04B *21/02, 33/34*
U.S. Cl. 264—43 **7 Claims**

1. In the method of manufacturing a block-like foamed ce-

ramic building element in a mould of refractory material which comprises:

(a) coating at least the bottom surface of the mould with a layer of a glass material or a glass-forming composition having a melting point of 800°–1000° C. and being non-expandable when heated,

(b) charging an expandable ceramic composition into the mould, said expandable ceramic composition being capable of forming a foamed ceramic when heated to a temperature between 800° and 1100° C.,

(c) heating the mould and its contents to temperatures between 800° and 1000° C. for a period of time sufficient for the foamed ceramic and the glass to fuse together at their interface,

the improvement which comprises

(1) said glass material or glass-forming composition being



uncolored and free from substances which will cause coloring when the glass material or glass-forming composition is melted, said glass material or glass-forming composition being in the form of crushed particles, and

(2) prior to charging the expandable mass to the mould placing on the layer of glass material or glass forming compositions a carrier sheet, said carrier sheet

being composed of meltable or destructible material,

carrying a layer of pigmented color glazing material,

(3) said heating of the mould being carried out under oxidizing conditions to foam the ceramic and to fuse together the glass,

whereby, after the expandable mass has expanded and the glass material or the glass-forming composition has been sintered and said carrier sheet has been melted or destroyed, the pigmented glaze layer appears as a colored background through the uncolored sintered glass layer.

4,173,610

PROCESS FOR THE MANUFACTURE OF LUMP CALCIUM SULFATE

Rolf Huller, Iphofen; Alfons Knauf, Siersburg, and Franz Wirsching, Iphofen, all of Fed. Rep. of Germany, assignors to Gebr. Knauf Westdeutsche Gipswerke, Fed. Rep. of Germany

Filed Dec. 20, 1977, Ser. No. 862,605

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658915

Int. Cl.² B01J *2/22*

U.S. Cl. 264—28 **4 Claims**

1. A process for the manufacture of calcium sulfate pellets from finely divided natural or synthetic calcium sulfate, which comprises:

adjusting the free water content of the finely divided calcium sulfate to a value of from about 0.5 to about 4 percent by weight; and

pressing the resultant finely divided calcium sulfate by means of a roll press using a surface pressure of from about 1 to about 5 Mp per cm of roller length,

said pressing step being performed at a temperature between about 0° and about 60° C.

4,173,611

PROCESS FOR FEEDING A MOVING WEB TO A STENTER APPARATUS

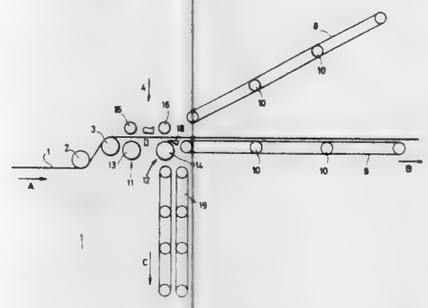
Nigel C. Benson, Ickleford; John M. F. Hughes; Denis Kingslake, both of Stevenage, and David G. Symonds, Hatfield, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jul. 15, 1977, Ser. No. 816,192

Claims priority, application United Kingdom, Apr. 5, 1977, 14315/77

Int. Cl.² B29B *5/04*; B65H *17/18*

U.S. Cl. 264—138 **7 Claims**



1. A process for initially introducing a moving web into a stenter apparatus which includes linearly moving edge grips, utilizing at least one belt conveyor located on one side of the moving web and at least one other belt conveyor located on the other side of the moving web, the process comprising the steps of

gripping and transporting the web between the at least one belt conveyor and the at least one other belt conveyor,

driving the belt conveyors at a linear speed substantially equal to the linear speed of the stenter apparatus edge grips,

transferring the moving web into the moving edge grips of the stenter apparatus,

said gripping and transporting step being accomplished by extending the belt conveyors into the stenter apparatus and located inwardly of the paths of the edge grips of the stenter apparatus, the edge margins of the web extending beyond the edges of the belt conveyors during transferring of the moving web into the moving edge grips of the stenter apparatus; and

disengaging the belt conveyors from gripping and transporting contact with the moving web once continuous web transportation through the stenter apparatus has been established.

4,173,612

EXTRUSION PROCESS FOR THERMOPLASTIC RUBBER FILM

William G. F. Kelly, Cornelia, Ga., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 3, 1977, Ser. No. 848,439

Int. Cl.² B28B *3/20*

U.S. Cl. 264—176 R **5 Claims**

1. In a process for producing thermoplastic rubber film by extruding thermoplastic rubber into a thin film, the improvement which comprises employing as the thermoplastic rubber a mixture of thermoplastic rubber and sufficient amorphous polypropylene to improve the processability of said thermoplastic rubber as evidenced by the ability to achieve a draw ratio while extruding said mixture of at least 1.

4,173,613

PROCESS FOR PRODUCING CELLULOSIC SHAPED ARTICLES

Henry Rodier, Sainte-Foy-Les-Lyon, France, assignor to Rhone-Poulenc-Textile, Paris, France

Filed Jul. 14, 1977, Ser. No. 815,850

Claims priority, application France, Jul. 16, 1976, 76 22032

Int. Cl.² C08L *1/24*

U.S. Cl. 264—187 **11 Claims**

1. Process for producing shaped articles of cellulose, said process comprising contacting a solution in said shaped form with a coagulant bath containing water, DMSO, and ammonia or an ammonium salt to coagulate said solution therein, the DMSO present in an amount of about 25 to 60 weight percent, based on the amount of DMSO and water, and the ammonia or ammonium salt present in an amount, calculated as ammonia, of at least 1 gram per liter of the mixture of DMSO and water, said solution containing cellulose in dimethylsulphoxide (DMSO) and formaldehyde at a formaldehyde/cellulose weight ratio of about 0.2 to 2 and at a cellulose concentration of at least 6% by weight based on the volume of DMSO.

4,173,614

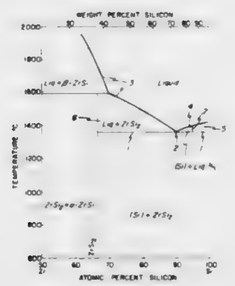
PROCESS FOR PREPARING A POLYCRYSTALLINE DIAMOND BODY/SILICON NITRIDE SUBSTRATE COMPOSITE

Minyoung Lee, Schenectady; Lawrence E. Szala, Scotia, and Robert C. De Vries, Burnt Hills, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 844,449, Oct. 21, 1977. This application Mar. 22, 1978, Ser. No. 889,107

Int. Cl.² B24D *3/08*

U.S. Cl. 264—332 **7 Claims**



1. A process for preparing an integral composite of a polycrystalline diamond body and silicon nitride substrate at pressures substantially below those required by the diamond stable region which includes a hot-pressing step and which comprises:

(a) placing within a protective container or cup a mass of solid eutectiferous silicon-rich alloy, or solid components for providing eutectiferous silicon-rich alloy, a mass of diamond crystals and a polycrystalline silicon nitride substrate, said mass of diamond crystals being intermediate and in contact with said substrate and said mass of solid eutectiferous silicon-rich alloy, or with at least one of said components for providing eutectiferous silicon-rich alloy, said eutectiferous silicon-rich alloy being composed of silicon and a metal which forms a silicide with said silicon and which is selected from the group consisting of cobalt, chromium, iron, hafnium, manganese, molybdenum, nickel, palladium, platinum, rhenium, rhodium, ruthenium, tantalum, thorium, titanium, uranium, vanadium, tungsten, yttrium, zirconium, and alloys thereof;

(b) disposing said container and its contents within a pressure transmitting powder medium that transmits applied pressure substantially undiminished and remains substantially unsintered during said hot-pressing;

(c) applying sufficient substantially isostatic pressure to said container and its contents via said powder medium to substantially stabilize the dimensions of said container and said contents substantially uniformly producing a shaped substantially isostatic system of powder-enveloped container wherein the density of the resulting compressed mass of diamond crystals is higher than 70% by volume of the volume of said compressed diamond crystals;

(d) hot pressing the resulting substantially isostatic system producing fluid infiltrating eutectiferous silicon-rich alloy and infiltrating said fluid eutectiferous silicon-rich alloy through the interstices of said compressed mass of diamond crystals and into contact with the contacting surface of said substrate which forms an interface with said compressed mass of crystals, said hot-pressing being carried out at an hot-pressing temperature below 1600° C. under a hot-pressing pressure sufficient to infiltrate said fluid silicon-rich alloy throughout the interstices of said compressed mass of diamond crystals, said solid eutectiferous silicon-rich alloy, or solid components for eutectiferous silicon-rich alloy being used in an amount sufficient to produce sufficient fluid eutectiferous silicon-rich alloy at said hot-pressing temperature to fill the interstices of said compressed mass of diamond crystals and contact the contacting surface of said substrate filling the pores through the interface so that it is at least substantially pore-free, said hot-pressing being carried out in an atmosphere which has no significant deleterious effect on said diamond crystals or said infiltrating fluid silicon-rich alloy or on said silicon nitride substrate, said hot-pressing converting less than 5% by volume of said diamond crystals to non-diamond elemental carbon, said infiltrating silicon-rich alloy encapsulating the surfaces of the compressed diamond crystals reacting with the diamond surfaces or non-diamond elemental carbon producing a carbide which at least in major amount is silicon carbide;

(e) maintaining sufficient pressure on the resulting hot-pressed substantially isostatic system during cooling thereof to at least substantially maintain the dimensions of said hot-pressed system; and

(f) recovering the resulting composite of polycrystalline diamond body bonded to silicon nitride substrate wherein the diamond crystals are present in an amount from at least 70% by volume up to about but less than 90% by volume of said polycrystalline diamond body, said diamond body being at least substantially pore-free and being free of elemental non-diamond carbon phase in that it does not contain non-diamond elemental carbon phase in an amount detectable by X-ray diffraction analysis.

4,173,615

CHEMICAL APPARATUS FOR CORROSIVE MATERIALS

Eiji Otsuka, Yokohama; Shigeru Inoue; Tetsuo Kimura, both of Kamakura; Toshinori Takae, Tokyo; Morio Tsuji, and Toshiki Kato, both of Osaka, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Division of Ser. No. 591,285, Jun. 30, 1975. This application Jun. 24, 1977, Ser. No. 809,673

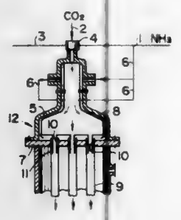
Claims priority, application Japan, Jul. 8, 1974, 49/77374

Int. Cl.² B01J *1/00, 1/20*

U.S. Cl. 422—197 **2 Claims**

1. Reaction apparatus of the vertical type comprising: a vertically disposed heat exchanger having upper and lower ends; a header coupled to the upper end of said heat exchanger; a tube baffle having an upper surface disposed across the interior of said heat exchanger in a substantially horizontal plane to

define an inner space with said header; an inner member made of a corrosion-resistant material positioned in said inner space forming a chamber closely spaced from the inside surface of said header and conforming to the configuration of said inner space; a first inlet in said header for introducing corrosive fluid raw materials into said inner member; a second inlet for introducing a non-corrosive fluid, said second second inlet being connected to said header to supply the non-corrosive fluid between said header and said inner member; an outlet for reaction products; a plurality of openings formed through said tube baffle; a first plurality of vertical tubes attached to said tube baffle and extending through said openings, the upper end of said first plurality of tubes extending above the upper surface of said tube baffle whereby the upper end of said first plurality of tubes are well as the interior surface thereof are



protected from contact with the corrosive fluid that might accumulate on the upper surface of said tube baffle; and a second plurality of vertical tubes attached to and extending downwardly from said inner member and positioned coaxially with respect to said first plurality of vertical tubes, said second plurality of vertical tubes being spaced radially inwardly from said first plurality of vertical tubes and in fluid communication therewith for defining an annular space having a vertical plane located between the interior surface of said first plurality of vertical tubes and the exterior surface of said second plurality of vertical tubes, said annular space being located to receive the flow of non-corrosive fluid from said second inlet whereby the corrosive fluid from said first inlet and the non-corrosive fluid from said second inlet are combined within said first plurality of vertical tubes below the lower end of said second plurality of vertical tubes.

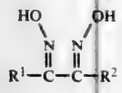
4,173,616

EXTRACTION OF COPPER VALUES FROM AQUEOUS SOLUTION

Peter Koenders; Abraham J. Van der Zeeuw, and Riekert Kok, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 7, 1978, Ser. No. 884,337
Int. Cl.[2] C01G *3/00*; C07C *131/14*
U.S. Cl. 423—24 **12 Claims**

1. A process for the separation, by liquid/liquid extraction, of copper values from an acidic aqueous solution containing copper values, which comprises contacting the acidic aqueous solution with an organic extractant comprising (a) a substantially water-immiscible organic solvent, (b) a hydroxy-oxime or a mixture of hydroxy-oximes capable of extracting copper values, and (c) between 0.1 and 10% by mole, calculated on hydroxy-oxime, of an alpha, beta-dioxime in the anti-stereoisomer configuration or a mixture of alpha, beta-dioximes each in the antistereoisomer configuration, said alpha, beta-dioxime or alpha, beta dioximes having the general formula



wherein R^1 represents an optionally substituted hydrocarbyl group and R^2 and optionally substituted hydrocarbyl group or a hydrogen atom and wherein R^1 and R^2 may be optionally joined to form an optionally substituted ring of carbon atoms.

4,173,617

PREPARATION OF MANGANOUS CHLORIDE SOLUTION

Jay Y. Welsh, Catonsville, and Irving Sochol, Baltimore, both of Md., assignors to Chemetals Corporation, Baltimore, Md.

Filed Feb. 23, 1978, Ser. No. 880,447
Int. Cl.[2] C01G *45/06*
U.S. Cl. 423—34 **15 Claims**

1. A method for the preparation of manganese chloride solution, which comprises:
   (a) contacting a manganese-containing metal with an aqueous solution containing at least 10 grams of copper per liter, at a pH of less than about 2.5;
   (b) introducing elemental chlorine into the solution;
   (c) separating insolubles from the solution;
   (d) introducing sufficient manganese-containing metal into the solution to provide a stoichiometric excess of manganese in relation to the copper content;
   (e) separating insoluble copper and manganese from the solution; and
   (f) recovering a manganous chloride solution.

4,173,618

PROCESS FOR REMOVAL OF ALUMINA FROM AQUEOUS ALKALI METAL CHROMATE SOLUTIONS

John W. Holtz, Solvay, N.Y., assignor to Allied Chemical Corporation, Morristown, N.J.

Filed Oct. 12, 1976, Ser. No. 731,187
Int. Cl.[2] C01G *37/14*
U.S. Cl. 423—58 **4 Claims**

1. A process for removing dissolved alumina from an aqueous alkali metal chromate solution containing dissolved alumina and at least 10 weight percent CTB alkali metal chromate which comprises contacting said solution, for 0.25 to 5 hours at a temperature between 70° C. and the boiling point, with a soluble-silica compound in an amount sufficient to provide an amount of dissolved silica substantially equivalent to that amount which is stoichiometrically required to react with the dissolved alumina in said solution to form crystalline alkali metal alumino silicate and removing said crystalline alkali metal alumino silicate from said solution.

4,173,619

COMBUSTION GAS DESULFURIZATION

Donald C. Erickson, 1704 S. Harbor La., Annapolis, Md. 21401

Filed Mar. 14, 1978, Ser. No. 886,596
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—210.5 **11 Claims**

1. In a regenerative process for removing H_2S, COS, and SO_2 from a sulfur-containing hot combustion gas which comprises:
   a. scrubbing the combustion gas by contacting it with a molten alkali salt mixture;
   b. regenerating the molten salt by contacting it with steam plus CO_2;

the improvement which comprises:
   (i) establishing the quality of the combustion gas in the approximate range of 2% to 20% for the scrubbing contacting action;
   (ii) maintaining the scrubbing salt temperature in the approximate range of 800 K to 950 K;
   (iii) establishing the alkali cation composition of the salt such that is consists essentially of 40±20% potassium cations, 35±25% lithium cations, and balance sodium cations;

   (iv) conducting the scrubbing contact within the approximate pressure range of 0.5 to 4 atmospheres;



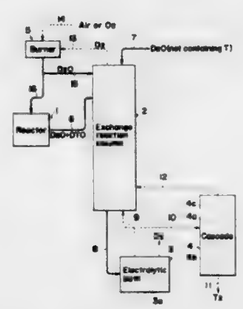
   (v) increasing the salt pressure for regeneration to within the approximate range of 2 times scrub pressure to 60 times scrub pressure.

4,173,620

EXTRACTION METHOD OF TRITIUM

Masami Shimizu, Hayama, Japan, assignor to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Dec. 23, 1977, Ser. No. 863,614
Claims priority, application Japan, Dec. 27, 1976, 51-160202
Int. Cl.[2] C01B *4/00*
U.S. Cl. 423—249 **8 Claims**



1. A method of extracting tritium from tritium-containing heavy water which comprises:
   leading a part of the tritium-containing heavy water from a heavy water source to an exchange reaction column wherein the heavy water is brought into countercurrent contact with a tritium-containing heavy hydrogen to thereby transfer tritium in the heavy hydrogen into the heavy water by way of the exchange reaction;
   withdrawing the heavy water having an enriched tritium content from the bottom of said exchange reaction column and the heavy hydrogen having a reduced tritium content from the top of said exchange reaction column;
   leading the tritium-enriched heavy water to a heavy hydrogen gas generator to generate a tritium-enriched heavy hydrogen;
   recycling a part of the tritium-enriched heavy hydrogen to said exchange reaction column to carry out the countercurrent contact between the heavy water and the heavy hydrogen;
   burning the tritium-depleted heavy hydrogen withdrawn from the top of the exchange reaction column to produce a tritium-depleted heavy water;
   recycling the tritium-depleted heavy water to the heavy water source; p1 leading the remaining part of the tritium-enriched heavy hydrogen generated from the heavy hydrogen gas generator into a hot-wire type thermal diffusion colunm to enrich tritium; and
   withdrawing the tritium gas from the thermal diffusion column.

4,173,621

PROCESS FOR IMPROVING THE REACTIVITY OF PHOSPHORUS PENTASULFIDE

Johannes Krause, Hürth; Günter Reichert, Merten; Franz Mainzer, Hürth, and Hermann Niermann, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 22, 1977, Ser. No. 863,081
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1976, 2659295
Int. Cl.[2] C01B *25/14*
U.S. Cl. 423—303 **2 Claims**

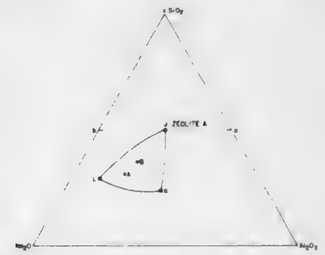
1. In a process for increasing the initial reactivity of phosphorus pentasulfide produced by reacting phosphorus and sulfur at a temperature higher than the melting point of phosphorus pentasulfide and allowing the resulting P_2S_5 melt to cool and solidify by means of a cooling device, the improvement which comprises: regulating the increase of the reactivity by placing the phosphorus pentasulfide melt on, or introducing it into, the cooling device; separating immediately an upper P_2S_5 layer of remaining liquid from a lower P_2S_5 layer being solidified by having direct contact with the cooling surface area of the cooling device; recycling the said upper P_2S_5 layer to the P_2S_5 melt; removing the said lower P_2S_5 layer from the cooling device and collecting it as final product; whereby the reactivity of the collected lower P_2S_5 layer is increased to the same extent as the quantitative ratio of the said upper P_2S_5 layer to the said lower P_2S_5 layer is increased, said ratio being 0.5/1.5 to 3/1 with the resultant increasing of the initial reactivity of the P_2S_5 by a minimum of about 150% to a maximum of about 400% respectively.

4,173,622

ZEOLITE A CRYSTALS OF UNIFORMLY SMALL PARTICLE SIZE AND THE MANUFACTURE THEREOF

James A. Robertson, Levittown, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed Jan. 3, 1978, Ser. No. 866,302
Int. Cl.[2] C01B *33/28*
U.S. Cl. 423—329 **4 Claims**



1. A process for the manufacture of zeolite A crystals that are uniform and less than ten microns in size which comprises the steps of:
   (a) preparing zeolite A seed crystals by comminuting zeolite A crystals until seed crystals having a number average particle size of less than about 0.5 μm have been obtained and any cluster crystals that may be present are broken up;

(b) preparing a sodium aluminum silicate gel containing, on an anhydrous basis, from 26 to 62 mole percent sodium oxide, from 10 to 37 mole percent aluminum oxide, and from 24 to 50 mole percent silicone dioxide, said gel containing from about 88 to 98 mole percent water and being free of particles that would serve as nucleation sites for crystallization;

(c) uniformly distributing throughout said gel a predetermined quantity of the comminuted zeolite A seed crystals, the quantity being such that said gel is depleted and crystal growth is terminated when said seed crystals have grown to the desired size;

(d) maintaining said gel at a temperature above about 70° C. until crystallization of the gel is essentially complete; and

(e) separating the zeolite A crystals so formed from the reaction mixture, the number of zeolite A crystals present in the product separated being substantially the same as the number of seed crystals added.

4,173,623

HALOGENATION OF LEAD SULFIDE

J. Mark Richardson, Tucson, Ariz., and Norbert L. Novinski, II, Houston, Tex., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 811,931, Jun. 30, 1977, abandoned. This application Jun. 1, 1978, Ser. No. 911,613

Int. Cl.[2] C01G *21/16*

U.S. Cl. 423—494 **5 Claims**

1. In a process for the halogenation of a lead sulfide which comprises halogenating said lead sulfide at an elevated temperature with a halogen gas in a dry atmosphere, the improvement which comprises halogenating said lead sulfide in a fluidized bed with said halogen gas, said fluidized bed being effected by the introduction of a gas consisting essentially of a mixture of said halogen gas and air at a rate of from about 4 centimeters per second to about 12 centimeters per second to said lead sulfide within said fluidized bed, wherein the oxygen in said air is substantially inert to said halogenation within said fluidized bed, said halogen gas being present in said mixture in a ratio of from about 0.01:1 to about 0.2:1 parts by volume of halogen gas per part of said air.

4,173,624

RECOVERY OF SODIUM SULPHATE IN PRODUCTION OF IRON OXIDE BLACK PIGMENTS

Jakob Rademachers, and Günter Lisde, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

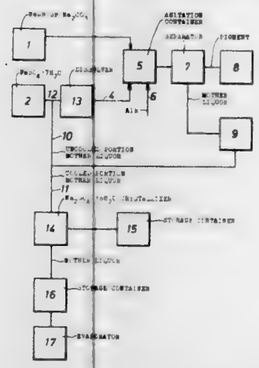
Continuation of Ser. No. 781,280, Mar. 25, 1977, abandoned. This application Mar. 2, 1978, Ser. No. 882,679

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1976, 2712798

Int. Cl.[2] C01D *5/00*; C01G *49/02*

U.S. Cl. 423—551 **1 Claim**

1. In the production of iron oxide black pigments with the simultaneous recovery of sodium sulphate wherein ferrous sulphate is reacted with an alkaline sodium compound at a pH from about 7 to 10 and a temperature above about 50° C., and the pigment formed is separated from the mother liquor containing sodium sulphate, the improvement which comprises conducting the reaction in sodium sulphate at a concentration of at least about 20% by weight, after separation of the pigment cooling at least part of the sodium sulphate-containing mother liquor to a temperature of at most about 30° C., thereby to crystallize sodium sulphate decahydrate, separating the crystals, and recirculating the mother liquor containing sodium



sulphate to dissolve additional ferrous sulphate for further reaction.

4,173,625

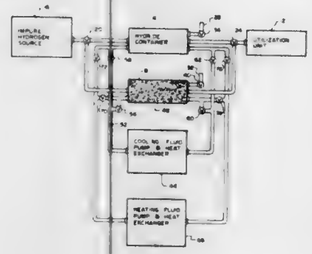
HYDROGEN PURIFICATION AND STORAGE SYSTEM

Roger E. Billings, Provo, Utah, assignor to Billings Energy Corporation, Provo, Utah

Division of Ser. No. 682,836, May 4, 1976, Pat. No. 4,108,605. This application Feb. 21, 1978, Ser. No. 879,044

Int. Cl.[2] C01B *1/32*

U.S. Cl. 423—648 R **2 Claims**



1. A method of separating a hydrogen enriched gas from a gas mixture containing hydrogen and other gaseous components, comprising

(a) supplying said gas mixture to a hydride container having a hydride forming material therein which is adapted to adsorb hydrogen gas from said gas mixture,

(b) venting unadsorbed gaseous components of said gas mixture from said hydride container,

(c) treating the hydrogen-loaded hydride material in said hydride container to desorb and release a hydrogen enriched gas therefrom, by controlling the temperature of said hydride forming material and the pressure in said hydride container so that hydrogen is released from said hydride forming material with substantially none of the other gaseous components which may have been adsorbed by said hydride forming material being released,

(d) delivering the hydrogen enriched gas from said hydride container to a hydrogen utilization unit,

(e) heating said hydride forming material to a second temperature greater than the controlled temperature of step (c) while maintaining the pressure in said hydride container at least no greater than the controlled pressure of step (c) to cause other gaseous components which may have been adsorbed by said hydride forming material to be released therefrom, and

(f) releasing said other gaseous components from said hydride container.

4,173,626

SUSTAINED RELEASE INDOMETHACIN

Robert E. Dempski, Dresher; Gunvant N. Mehta, Lansdale, and Joseph C. Saboe, Norristown, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 11, 1978, Ser. No. 968,608

Int. Cl.[2] A61K *9/22, 9/48*

U.S. Cl. 424—19 **3 Claims**

1. A sustained release pharmaceutical formulation in capsule unit dosage form that provides prolonged plasma levels of indomethacin and is clinically effective, containing 25 to 150 mg of 500 to 1500 micron size pellets of indomethacin, in the form of:

(A) Uncoated pellets comprising pharmaceutical carriers and 5–50 mg of indomethacin for immediate release of about 35% of the total indomethacin, and rapid elevation of plasma levels; and

(B) Coated pellets comprising pharmaceutical carriers and 15–145 mg of indomethacin as a sustaining dose of about 65% of the total indomethacin wherein the coating consists of polyvinyl acetate as a slow dissolving material.

4,173,627

HAIR LACQUER SPRAYS HAVING REDUCED INFLAMMABILITY

Annie Madrange née Dermain, Saint Germain en Laye; Henri M. de Montalembert, Boulogne; Pierre Meurice, L'Isle Adam, and Jean-Louis Refregier, Boussy-Saint-Antoine, all of France, assignors to L'Oreal, Paris, France

Filed Apr. 17, 1978, Ser. No. 897,205

Claims priority, application France, Apr. 26, 1977, 77 12569

Int. Cl.[2] A61K *7/11*

U.S. Cl. 424—47 **10 Claims**

1. In the known type of pressurized container which contains a hair setting composition that is partially in the gaseous phase and partly in a single liquid phase, said composition containing:

(a) at least one resin suitable for use as a hair lacquer,

(b) an inflammable liquid phase for dissolving the resin,

(c) a propellant phase of which a part is in the form of a gas in the body of the pressurized container, said propellant phase providing the pressurization in the container,

the improvement comprising

(1) utilizing a propellant comprising bromotrifluoromethane,

(2) the bromotrifluoromethane being present in an amount ranging from about 5 to 30% by weight based on the total weight of the composition, and

(3) the valve of the pressurized container being a valve provided with an inlet for supplying additional gas.

4,173,628

METHOD OF TREATING BENIGN PROSTATIC HYPERTROPHY WITH CANDIMYCIN

Harry W. Gordon, c/o Schmid Labs., Inc. Rte. 46 West, Little Falls, N.J. 07424

Continuation of Ser. No. 628,790, Nov. 4, 1975, Pat. No. 4,039,661, which is a continuation-in-part of Ser. No. 584,607, Jun. 6, 1975, abandoned, which is a continuation of Ser. No. 414,968, Nov. 23, 1973, Pat. No. 3,920,813, which is a division of Ser. No. 313,568, Dec. 8, 1972, Pat. No. 3,843,785, which is a division of Ser. No. 194,052, Oct. 29, 1971, Pat. No. 3,721,734, which is a division of Ser. No. 70,509, Sep. 8, 1970, Pat. No. 3,714,347, which is a continuation-in-part of Ser. No. 544,712, Apr. 25, 1966, abandoned, and a continuation of Ser. No. 623,847, Mar. 17, 1967, Pat. No. 3,584,118. This application Mar. 9, 1977, Ser. No. 775,797

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—115 **4 Claims**

1. A process for treating prostatic hypertrophy in a mammal afflicted with benign prostatic hypertrophy which comprises orally administering to said mammal an effective amount for treating benign prostatic hypertrophy of candimycin.

4,173,629

ANTIBIOTIC S 31794/F-1

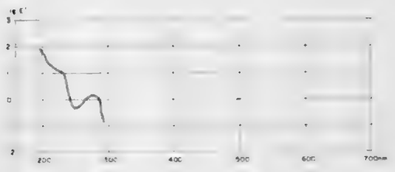
Michael M. Dreyfuss, Basel, and Hans Tscherter, Allschwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 702,210, Jul. 2, 1976, abandoned. This application Jun. 28, 1978, Ser. No. 919,760

Claims priority, application Switzerland, Jul. 8, 1975, 8894/75

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—118 **6 Claims**



1. A compound S 31794/F-1 having the following characteristics:

λ_{MAX} 194 nm $E_{1\ cm}^{1\%} = 807$,

λ_{MAX} 225 nm (shoulder) $E_{1\ cm}^{1\%} = 132$,

λ_{MAX} 276 nm $E_{1\ cm}^{1\%} = 12.8$,

λ_{MAX} 284 nm (shoulder) $E_{1\ cm}^{1\%} = 10.5$, (see FIG. 1);

^1H NMR spectrum in deuterated DMSO (100 megacycles per second second) with tetramethylsilane as internal standard (see FIG. 4);

^{13}C NMR spectrum in deuterated methanol (D_4) with tetramethylsilane as internal standard (see Table 1);

and having the following additional characteristics in amorphous form;

elementary analysis: C 53.9%, H 7.5%, N 10.1%, O 27.3%;

IR spectrum in kBr (see FIG. 2);

and having the following additional characteristics in crystalline form:

elementary analysis: C 55.5–56.5%, H 7.5–7.7%, N 10.5–10.8%, O 26.5–27.0%; IR spectrum in Nujol (see FIG. 3).

4,173,630

N^2ARYLSULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto, 15-18, Asahigaoka 3-chome, Tarumi-ku, Kobe-shi, Hyogo; Akiko Hijikata, Kobe; Ryoji Kikumoto, Machida; Yoshikuni Tamao, Yokohama; Kazuo Ohkubo, Machida; Tohru Tezuka, Yokohama, and Shinji Tonomura, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, Hyogo, both of, Japan

Continuation-in-part of Ser. No. 760,929, Jan. 19, 1977, Pat. No. 4,101,653, which is a continuation-in-part of Ser. No. 703,704, Jul. 8, 1976, Pat. No. 4,069,323, Ser. No. 671,568, Mar. 29, 1976, Pat. No. 4,049,645, and Ser. No. 671,436, Mar. 29, 1976, Pat. No. 4,062,963, said Ser. No. 671,568, and Ser. No. 671,436, each is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned.

This application May 4, 1978, Ser. No. 902,855

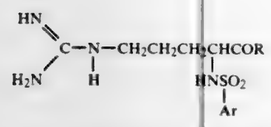
Claims priority, application Japan, Jun. 6, 1977, 52-66508

The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.

Int. Cl.[2] A61K *37/00;* **C07C** *103/52*

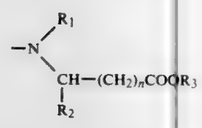
U.S. Cl. 424—177 **15 Claims**

1. An N^2-arylsulfonyl-L-argininamide of the formula (I):



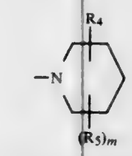
(I)

wherein R is selected from group consisting of



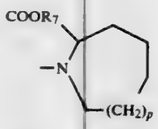
(1)

wherein R_1 is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_3–C_{10} alkenyl, C_3–C_{10} alkynyl, C_2–C_{10} alkoxyalkyl, C_2–C_{10} alkylthioalkyl, C_2–C_{10} alkylsulfinylalkyl, C_1–C_{10} hydroxyalkyl, C_2–C_{10} carboxyalkyl, C_3–C_{10} alkoxycarbonylalkyl, C_3–C_{10} alkylcarbonylalkyl, C_1–C_{10} haloalkyl, C_7–C_{15} aralkyl, C_8–C_{15} α-carboxyaralkyl, C_3–C_{10} cycloalkyl, C_4–C_{10} cycloalkylalkyl, furfuryl, tetrahydrofurfuryl optionally substituted with at least one C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof, 3-furylmethyl, tetrahydro-3-furylmethyl optionally substituted with at least one C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof, tetrahydro-2-pyranylmethyl optionally substituted with at least one C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof, 1,4-dioxa-2-cyclohexylmethyl optionally substituted with at least one C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof, 2-thenyl, 3-thenyl, tetrahydro-2-thenyl optionally substituted with at least one C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof, and tetrahydro-3-thenyl; R_2 is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, carboxy, C_2–C_{10} alkoxycarbonyl, phenyl optionally substituted with at least one C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof, C_7–C_{12} aralkyl and ring substituted benzyl wherein said substitutent is C_1–C_5 alkyl or C_1–C_5 alkoxy; R_3 is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl and 5-indanyl; and n is an integer of 0, 1 or 2



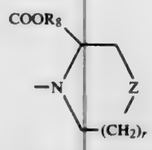
(2)

wherein R_4 is —$COOR_6$ wherein R_6 is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl and 5-indanyl; each R_5 independently is hydrogen, C_1–C_{10} alkyl; phenyl, C_1–C_5 alkoxy or carboxy; m is an integer of 1 to 5; R_4 is substituted at the 2 or 3-position; and R_5 can be substituted at the 2, 3, 4, 5 or 6-position,



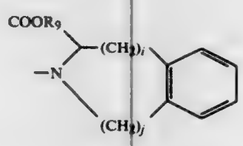
(3)

optionally substituted with at least one C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof, wherein R_7 is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl and 5-indanyl; and p is an integer of 1, 2, 3, or 4,



(4)

wherein R_8 is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7—C_{12} aralkyl and 5-indanyl; Z is selected from the group consisting of oxy, thio and sulfinyl; and r is an integer of 0 or 1, and



(5)

wherein R_9 is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl and 5-indanyl; i is an integer of 0, 1 or 2; j is an integer of 0, 1 or 2; and the sum of i + j is an integer of 1 or 2; and Ar is a phenyl group substituted with at least one substituent selected from the group consisting of alkyl, alkoxy and alkylcarbonyl, said substituent being optionally substituted with halo, alkoxy or alkoxycarbonyl, the number of the carbon atoms of each substituent which is attached to the phenyl group being 3 to 7 and the said phenyl group being optionally substituted further with at least one substituent selected from the group consisting of methyl, ethyl, methoxy, ethoxy, hydroxyl and halo.

4,173,631

7-METHYL-8-METHYLAMINO-10-(1'-D-RIBITYL)ISOALLOXAZINE

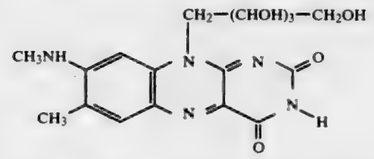
Donald W. Graham, Mountainside, and Edward F. Rogers, Middletown, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 716,498, Aug. 23, 1976, abandoned. This application Jun. 1, 1978, Ser. No. 911,619

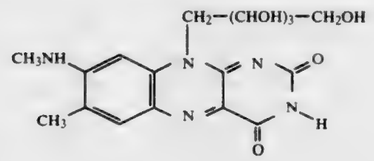
Int. Cl.[2] A61K *31/525;* **C07H** *19/04*

U.S. Cl. 424—180 **7 Claims**

1. The compound of the structural formula:



2. A pharmaceutically acceptable composition for the treatment of coccidiosis comprising an effective amount of the compound of the structural formula:



in poultry feed.

4,173,632

FASCIOLICIDAL COMPOSITIONS

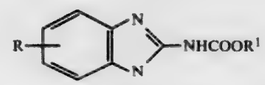
Larry R. Cruthers; Terrence M. James, both of Flemington, N.J.; Sidney Goff, New Hope, Pa., and Antoine R. Alouche, Sao Paulo, Brazil, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 31, 1978, Ser. No. 929,876

Int. Cl.[2] A61K *31/62, 31/415*

U.S. Cl. 424—232 **8 Claims**

1. A fasciolicidal combination comprising a 5(6)-lower alkyl benzimidazol carbamate having the formula



wherein R is in the 5- or 6-position and is lower alkyl, and R^1 is lower alkyl or phenyl lower alkyl, in combination with a bromosalan component commprising 3,5-dibromo-N-(4-bromophenyl)-2-hydroxybenzamide alone or in admixture with 4',5-dibromosalicylanilide, and/or 3,5-dibromosalicylanilide, wherein the bromosalan component is present in a weight ratio to the 5(6)-lower alkyl benzimidazol carbamate of within the range of from about 2:1 to about 10:1.

4,173,633

INDENO AND NAPHTH[1,2-d]AZEPINES

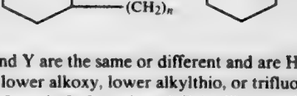
Norbert Gruenfeld, White Plains, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 2, 1977, Ser. No. 856,703

Int. Cl.[2] C07D *403/06;* **A61K** *31/55;* **C07D** *223/14*

U.S. Cl. 424—244 **9 Claims**

1. A compound of the formula



wherein pH is unsubstituted 1,2-phenylene, or 1,2-phenylene substituted by up to 3 members selected from lower alkyl, hydroxy, mercapto, lower alkoxy, lower alkylthio, lower alkenyloxy, halogeno and trifluoromethyl; C_mH_{2m} is lower alkylene separating the adjacent atoms by one or two carbon atoms; C_nH_{2n} is lower alkylene separating the adjacent atoms by two carbon atoms; p is an integer from 1 to 7; Am is amino, simple or mixed, mono- or di-lower (alkyl, alkenyl, alkynyl, hydroxyalkyl, 3 to 7 ring-membered cycloalkyl or H-Ph-alkyl-)amino; 5 to 7 ring-membered cycloalkyl or H-ph-alkyl)amino; 5 to 7 ring-membered lower alkyleneimino, morpholino, thiamorpholino, piperazino or N-(lower alkyl or hydroxyalkyl)-piperazino; X represents oxo and R is hydrogen, lower alkyl or hydroxyalkyl; a lower alkanoyl- or 1,11b-dihydro-derivative, or a therapeutically acceptable acid addition salt thereof.

8. A diuretic pharmaceutical composition comprising a diuretically effective amount of a compound as claimed in claim 1, together with a pharmaceutical excipient.

4,173,634

BASICALLY-SUBSTITUTED TRICYCLIC PYRAZOLES USEFUL AS ANTIINFLAMMATORY AGENTS

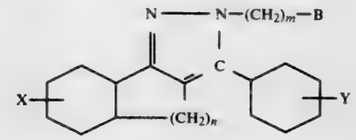
John Krapcho, Somerset, and Chester F. Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 23, 1979, Ser. No. 14,444

Int. Cl.[2] C07D *231/56;* **A61K** *31/415*

U.S. Cl. 424—248.4 **13 Claims**

1. A compound of the formula



wherein X and Y are the same or different and are H, halogen, lower alkyl, lower alkoxy, lower alkylthio, or trifluoromethyl, n is 1, 2 or 3, m is 2, 3 or 4, and B is dilower alkylamino, piperidino, pyrrolidino, morpholino, or N-lower alkyl-piperazino, and pharmaceutically acceptable acid-addition salts thereof.

13. A method for treating an inflammatory condition, which comprises administering to a mammalian host an antiinflammatory amount of a compound as defined in claim 1.

4,173,635

HYPOTENSIVE AJMALICINE DERIVATIVES

Jean A. A. J. Hannart, 98, Avenue De Fre, Brussels, Belgium

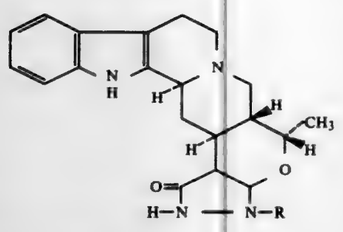
Filed Feb. 24, 1978, Ser. No. 880,731

Claims priority, application France, Feb. 28, 1977, 77 5826

Int. Cl.[2] A61K *31/445;* **C07D** *491/22*

U.S. Cl. 424—256 **6 Claims**

1. Derivative of ajmalicine of the formula:



(I)

wherein R represents either a hydrogen atom or a linear or branched alkyl radical having 1 to 6 carbon atoms and which may be substituted with one hydroxy group.

4. A hypotensive composition comprising as the active ingredient, a compound as defined in claim **1** or a pharmaceutically acceptable acid salt thereof or mixtures thereof in an effective hypotensive amount together with a pharmaceutically acceptable carrier or excipient.

4,173,636

DECAHYDROQUINOLINES, PHARMACEUTICAL COMPOSITIONS AND METHODS OF USE

Maurice Prost, Brussels, Belgium, assignor to Labaz, Paris, France

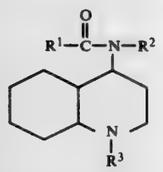
Continuation of Ser. No. 745,542, Nov. 29, 1976, abandoned. This application Mar. 8, 1978, Ser. No. 884,705

Claims priority, application United Kingdom, Dec. 16, 1975, 51507/75

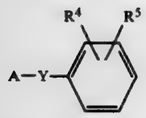
Int. Cl.[2] **A61K** *31/47;* **C07D** *215/44*

U.S. Cl. 424—258 **14 Claims**

1. Compounds of the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein R^1 represents a branched- or straight-chain alkyl group or alkoxy group of from 1 to 4 carbon atoms, a phenyl or pyridyl group; R^2 represents a branched- or straight-chain alkyl group of from 1 to 4 carbon atoms, phenyl, methylphenyl, methoxyphenyl, naphthyl, benzyl, phenethyl, cinnamyl, phenylpropyl or cyclohexyl; and R^3 represents a group of the formula:



wherein A represents a branched- or straight-chain alkylene group of one to four carbon atoms, inclusive; Y represents an oxygen atom, a carbonyl or carbonyl-hydroxyimino group; R^4 and R^5, which are identical or different, each represent hydrogen, fluorine, chlorine or bromine, or methyl, methoxy or acetyl.

8. A pharmaceutical analgesic or antihypertensive composition in dosage unit form containing as essential active principle 25 to 60 mg of a compound or a pharmaceutically acceptable acid addition salt thereof as claimed in claim **1** in association with a pharmaceutical carrier or excipient therefor.

13. A method of treating pain in a mammal in need of such treatment, said method consisting in systemically administering to the said mammal 25 to 60 mg of at least one compound as defind by claim **1** or a pharmaceutically acceptable acid addition salt thereof.

4,173,637

N-BENZOYL-N'-PYRIDYLOXY PHENYL UREA AND INSECTICIDAL COMPOSITIONS THEREOF

Ryuzo Nishiyama, Takatsuki; Kanichi Fujikawa, Kusatsu; Rikuo Nasu, Kusatsu; Tadaaki Toki, Kusatsu, all of Japan; Toshihiko Yamamoto, deceased, late of Kusatsu, Japan, and by Hikotaro Yamamoto, legal representative, Hyogo, Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 844,174, Oct. 21, 1977. This application Apr. 24, 1978, Ser. No. 899,461

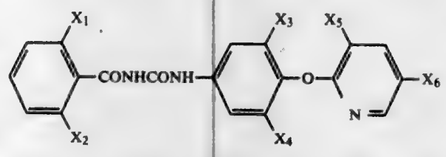
Claims priority, application Japan, Oct. 29, 1976, 51-130903

The portion of the term of this patent subsequent to Nov. 6, 1996, has been disclaimed.

Int. Cl.[2] **A61K** *31/44;* **C07D** *213/64*

U.S. Cl. 424—263 **32 Claims**

1. N-benzoyl N'-pyridyloxy phenyl urea having the formula



(I)

wherein X_1 represents a halogen atom or methyl group; X_2 represents hydrogen or halogen atom; X_3 and X_4 respectively represent hydrogen or halogen atom; X_5 represents hydrogen or halogen atom; X_6 represents a halogen atom or nitro or trifluoromethyl group.

21. An insecticidal composition which comprises an insecticidally effective amount of a N-benzoyl N'-pyridyloxy phenyl urea having the formula (I) according to claim **1** in admixture with a suitable carrier or adjuvant therefor.

4,173,638

N-BENZOYL-N'-PYRIDYLOXY PHENYL UREA AND INSECTICIDAL COMPOSITIONS THEREOF

Ryuzo Nishiyama, Takatsuki; Kanichi Fujikawa, Kyoto; Rikuo Nasu, Kusatsu; Tadaaki Toki, Kusatsu, and Toshihiko Yamamoto, Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

Filed Oct. 21, 1977, Ser. No. 844,174

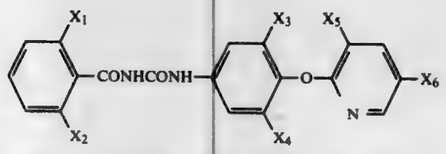
Claims priority, application Japan, Oct. 29, 1976, 51/130903

The portion of the term of this patent subsequent to Nov. 6, 1996, has been disclaimed.

Int. Cl.[2] **A61K** *31/44;* **C07D** *213/64*

U.S. Cl. 424—263 **17 Claims**

1. N-benzoyl N'-pyridyloxy phenyl urea having the formula



(I)

wherein X_1 represents a halogen atom; X_2 represents hydrogen or halogen atom; X_3 and X_4 respectively represent hydrogen or chlorine atom; X_5 represents hydrogen or halogen atom; X_6 represents a halogen atom or nitro or trifluoromethyl group.

10. An insecticidal composition which comprises insecticidally effective amount N-benzoyl N'-pyridyloxy phenyl urea having the formula (I) according to claim **1** in admixture with a suitable carrier or adjuvant therefor.

4,173,639

1-BENZOYL-3-(ALKOXY- OR ALKYLTHIOPYRIDINYL)UREAS

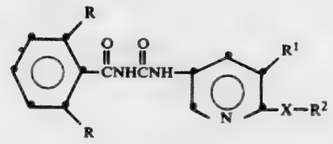
Robert G. Suhr, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 31, 1978, Ser. No. 938,722

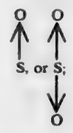
Int. Cl.[2] **C07D** *213/76;* **A01N** *9/22*

U.S. Cl. 424—263 **21 Claims**

1. Compound of the formula



wherein each R is independently chloro, fluoro, methyl, or methoxy; R^1 is H, Cl, CH_3, or C_2H_5; X is O, S,



and R^2 is alkyl of C_1–C_5, alkenyl of C_3–C_5 containing no α,β-unsaturation, mono- or dibromo-C_1–C_5 alkyl, chloroalkyl of C_1–C_5, fluoroalkyl of C_1–C_5, cycloalkyl of C_4–C_6, or alkoxyalkyl of a total of C_2–C_5; and the acid addition salts thereof.

8. Method of suppressing insects of an order selected from the group consisting of Coleoptera, Diptera, Lepidoptera, and Orthoptera, which comprises applying to the locus of the insects an effective amount of an active agent which is a compound of claim **1**.

4,173,640

HYPOTENSIVE PERHYDRO NAPHTHALENE PENTOL DERIVATIVES

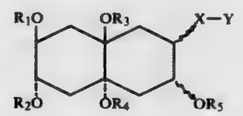
Frederic P. Hauck, Bridgewater; Michael E. Condon, Lawrenceville, and Joyce Reid, Dayton, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 4, 1977, Ser. No. 821,891

Int. Cl.[2] **A61K** *31/445;* **C07D** *211/34*

U.S. Cl. 424—267 **13 Claims**

1. A compound of the structure



wherein R_1, R_2, R_3, R_4 and R_5 are the same or different and are selected from the group consisting of hydrogen or an acyl radical of a hydrocarbon carboxylic acid of less than 12 carbons, an acyl radical of trifluoroacetic acid, angeloyl, veratroyl, vanilloyl, erythro-2-hydroxy-2-methyl-3-acetoxybutyryl, (l)-2-methylbutyryl, (d)-2-hydroxy-2-methylbutyryl, (d)-threo-2,3-dihydroxy-2-methylbutyryl and (l)-erythro-2,3-dihydroxy-2-methylbutyryl, X is a single bond or CH_2 or CH_2CH_2, Y is



which represents a 5- or 6-membered saturated N-containing heterocyclic wherein R^6 is hydrogen or lower alkyl, or a stereoisomer thereof, or a physiologically acceptable acid salt thereof, or a physiologically acceptable quaternary salt thereof or an N-oxide thereof.

4,173,641

DI-O-N-ALKYL GLYCEROL DERIVATIVES AS IMMUNE STIMULANTS

Allen R. Kraska, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

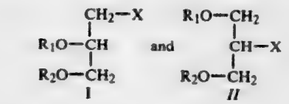
Filed May 15, 1978, Ser. No. 906,260

The portion of the term of this patent subsequent to Aug. 28, 1996, has been disclaimed.

Int. Cl.[2] **A61K** *31/445, 31/135;* **C07D** *211/26;* **C07C** *91/22*

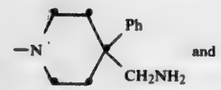
U.S. Cl. 424—267 **18 Claims**

1. A compound selected from the group consisting of

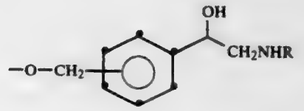


and the pharmaceutically acceptable acid addition salts thereof,

wherein R_1 and R_2 are each n-alkyl of 8 to 11 carbon atoms; and X is selected from

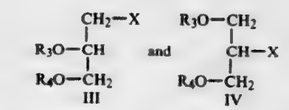


and



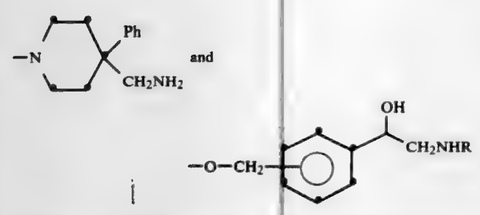
wherein R is hydrogen or alkyl of 1 to 6 carbon atoms and Ph is phenyl.

17. A method of stimulating non-specific cell-mediated immunity in a warm-blooded animal which comprises administering to said animal an immune-stimulant effective amount of a compound selected from the group consisting of



and the pharmaceutically acceptable acid addition salts thereof,

wherein R_3 and R_4 are each n-alkyl of 8 to 20 carbon atoms; and X is selected from



wherein R is hydrogen or alkyl of 1 to 6 carbon atoms and Ph is phenyl.

4,173,642

VASODILATING 1,1-DI-(2-METHOXYCARBONYL-ETHYL)-1,2,3,4,5,6,12,12B-OCTAHYDRO-INDOLO[2,3-a]QUINOLIZINE

Csaba Szantay; Lajos Szabo; György Kalaus; Egon Karpati, all of Budapest, and Laszlo Szporny, Szabolcska M u., all of Hungary, assignors to Richter Gedeon Vegyészeti Gyár Rt, Budapest, Hungary

Filed Dec. 29, 1977, Ser. No. 865,428

Claims priority, application Hungary, Dec. 30, 1976, RI 612

The portion of the term of this patent subsequent to Nov. 8, 1994, has been disclaimed.

Int. Cl.[2] C07D *471/04;* **A61K** *31/445*

U.S. Cl. 424—267 **2 Claims**

1. 1,1-Di-(2-methoxycarbonyl-ethyl)-1,2,3,4,6,7,12,12*b*-octahydro-indolo[2,3-a]quinolizine or the hydrochloride thereof.

2. A vasodilating composition which consists essentially of a vasodilatory effective amount of the compound defined in claim 1 in a pharmaceutically effective carrier.

4,173,643

SYNERGISTIC MICROBIOCIDAL COMPOSITIONS

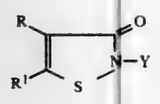
Andrew B. Law, Levittown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 426,881, Dec. 20, 1973, abandoned. This application May 17, 1978, Ser. No. 906,539

Int. Cl.[2] A01N *9/12, 9/20*

U.S. Cl. 424—270 **8 Claims**

1. A synergistic bactericidal composition comprising an isothiazolinone or its acid addition salt having the formula



wherein

Y is (C_1–C_8)alkyl, cyclohexyl, phenyl or benzyl or phenyl or benzyl substituted with up to two halogen atoms;

R is a methyl group, a hydrogen atom or a halogen atom; and

R′ is a hydrogen atom or a halogen atom;

and a bactericidal quaternary ammonium salt wherein the quaternary ammonium salt is selected from the group consisting of:

(a) n-alkyl (C_{14}:50%; C_{12}:40%; C_{16}:10%)dimethylbenzylammonium chloride;

(b) a mixture of 50% by weight alkyl (C_{14}:60%; C_{16}:30%; C_{12}:5%; C_{18}:5%)dimethylbenzylammonium chloride; and 50% alkyl (C_{12}:50%; C_{14}:30%; C_{16}:17%; C_{18}:3%)dimethylethylbenzylammonium chloride;

(c) a mixture of (n-C_8 to n-C_{18})alkyldimethylbenzylammonium chlorides containing not less than 40% by weight n-C_{12} alkyl, not less than 20% n-C_{14} alkyl and not less than 70% by weight total of n-C_{12} and n-C_{14} alkyl;

(d) p-diisobutylphenoxyethoxyethyldimethylbenzylammonium chloride;

(e) a mixture of 80% by weight of methyldodecylbenzyltrimethylammonium chloride and 20% of methyldodecylxylylenebis(trimethyl)ammonium chloride;

(f) di-n-alkyl (C_8–C_{11} n-alkyl, average C_{10}) dimethylammonium chloride; and

the weight ratio of the 4-isothiazolin-3-one to the quaternary ammonium salt is from 5:1 to 1:50.

4,173,644

THIOUREA COMPOUNDS, COMPOSITIONS AND METHODS AND USE

Thomas H. Brown; Graham J. Durant; Charon R. Ganellin, all of Welwyn Garden City, and Robert J. Ife, Stevenage, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

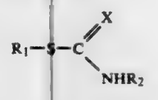
Division of Ser. No. 823,559, Aug. 11, 1977, Pat. No. 4,120,966, which is a division of Ser. No. 652,925, Jan. 27, 1976, Pat. No. 4,056,621. This application Jul. 28, 1978, Ser. No. 928,924

Claims priority, application United Kingdom, Feb. 3, 1975, 4538

Int. Cl.[2] C07D *277/30;* **A61K** *31/425*

U.S. Cl. 424—270 **4 Claims**

1. A compound of the formula:



wherein R_1 represents a grouping of the structure

$Het—CH_2S(CH_2)_2—$

wherein Het is a thiazole, isothiazole, or thiadiazole ring, which ring is optionally monosubstituted or disubstituted by lower alkyl, lower alkoxy or halogen R_2 is hydrogen, lower alkyl or the same as R_1; X is sulphur, =NH or =NCN; or a hydrate or pharmaceutically acceptable acid addition salt or hydrated salt thereof.

4. A method of blocking histamine H_2-receptors which comprises administering to an animal in an effective amount to block said receptors a compound of claim 1.

4,173,645

SUBSTITUTED 4,5-DIHYDROXY-IMIDAZOLIDINE-2-THIONES AND THEIR USE AS ECTOPARASITICIDES

Edgar Enders, Cologne; Volker Ebbighausen, Leverkusen; Wolfgang Gau, Wuppertal; Christian Wünsche, Schwelm, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

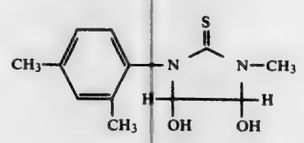
Filed Dec. 8, 1977, Ser. No. 858,917

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658058; Jan. 20, 1977, 2702236; Feb. 15, 1977, 2706265

Int. Cl.[2] C07D *233/02;* **A01N** *9/22*

U.S. Cl. 424—273 R **6 Claims**

1. A compound accord of the formula



(A)

2. An ectoparasiticidal composition containing as active ingredient an effective amount of a compound according to

claim 1 in admixture with a solid or liquefied gaseous diluent or carrier or in admixture with a liquid diluent or carrier containing a surface-active agent.

4,173,646

TRICYCLICDICARBOXIMIDES

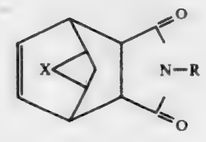
Kenneth L. Shepard, Ambler, and William J. Paleveda, Jr., Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 831,463, Sep. 8, 1977, Pat. No. 4,132,799, which is a division of Ser. No. 713,765, Aug. 12, 1976, Pat. No. 4,061,763, which is a division of Ser. No. 575,918, May 9, 1975, Pat. No. 4,006,233, which is a continuation-in-part of Ser. No. 511,961, Oct. 4, 1974, abandoned. This application Sep. 28, 1978, Ser. No. 946,926

Int. Cl.[2] A61K *31/40;* **C07D** *403/04, 417/04*

U.S. Cl. 424—270 **5 Claims**

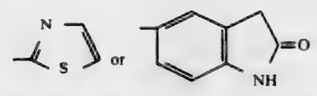
3. A pharmaceutical composition comprising a therapeutically effective amount in unitary dosage form of a compound having the formula:



wherein:

X is $—CH_2—$ or $—CH=CH—$;

R is



or a non-toxic pharmaceutically acceptable salt thereof and a pharmaceutical carrier therefor.

4,173,647

4-SPECTINOMYCYLAMINE AND SALTS THEREOF

Roland Maier; Eberhard Woitun, both of Biberach, an der Riss; Wolfgang Reuter, Laupertshausen; Bernd Wetzel; Hanns Goeth, both of Biberach, an der Riss, and Uwe Lechner, Ummendorf, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

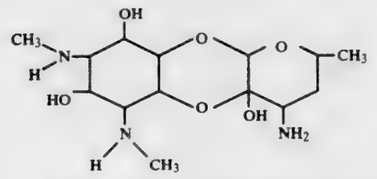
Filed Dec. 4, 1978, Ser. No. 965,869

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1977, 2756914

Int. Cl.[2] A61K *31/35;* **C07D** *311/02, 319/08*

U.S. Cl. 424—283 **4 Claims**

1. The compound of the formula



the R- or S- isomer thereof, or a non-toxic, pharmacologically acceptable acid addition salt of said compound or said isomer.

3. An antibiotic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective antimicrobial amount of a compound of claim 1.

4. The method of destroying harmful microorganisms or suppressing their multiplication or growth in a warm-blooded animal, which comprises perorally, parenterally or rectally administering to said animal an effective antimicrobial amount of a compound of claim 1.

4,173,648

3β-HYDROXY-18β-OLEAN-9-EN-30-OIC ACIDS

Giorgio Pifferi, Milan; Achille Umani-Ronchi, Ancona; Carlo Farina, Valsolda, and Afro Gamba, Milan, all of Italy, assignors to I.S.F. SpA, Milan, Italy

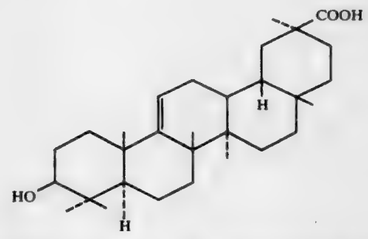
Filed Mar. 13, 1978, Ser. No. 886,145

Claims priority, application Italy, Mar. 16, 1977, 21296 A/77

Int. Cl.[2] C07C *65/14, 69/02, 69/34*

U.S. Cl. 424—294 **11 Claims**

1. The compound of the formula:



and the corresponding esters in the 3-position with mono- and di-alkanoic acids of 2 to 5 carbon atoms, as well as the pharmaceutically acceptable salts thereof with alkali metals, amino acids and copper.

11. Pharmaceutical compositions, containing an ulcer inhibiting effective amount of at least one compound according to claim 1, in admixture with a solid or liquid pharmaceutical diluent or carrier.

4,173,649

5-PHENYL-2,4-PENTADIEN-1-AMINES AND METHOD FOR INHIBITING PROSTAGLANDIN DEHYDROGENASE

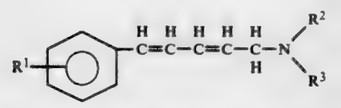
Joseph E. Sundeen, Yardley, Pa.; Tamara Dejneka, Skillman, and Frederic P. Hauck, Bridgewater, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 27, 1978, Ser. No. 881,271

Int. Cl.[2] A61K *31/275, 31/24, 31/195, 31/135*

U.S. Cl. 424—304 **3 Claims**

1. A pharmaceutical composition for use in treatment of gastric ulcers comprising a therapeutically effective amount of a compound of the structure



wherein R^1 is hydrogen, lower alkyl, lower alkoxy, halogen, hydroxy, lower alkanoyloxy, nitro, cyano, amino, carboxy or lower alkoxycarbonyl, and R^2 and R^3 may be the same or different and are hydrogen, lower alkyl, alkenyl-lower alkyl, phenyl-lower alkyl, lower alkylphenyl-lower alkyl, halophenyl-lower alkyl, halo-lower alkyl, hydroxy-lower alkyl, lower alkoxy carbonyl-lower alkyl and cyano-lower alkyl, and physiologically acceptable salts thereof and a pharmaceutically acceptable carrier therefor.

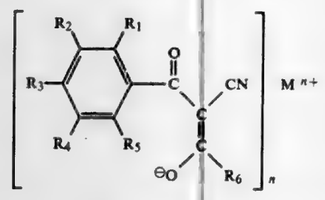
4,173,650

CIS-2-BENZOYL-3-HYDROXY-2-ALKENONITRILES AS ANTI-INFLAMMATORY AGENTS

John W. Hanifin, Jr., Suffern, and David N. Ridge, Grandview, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

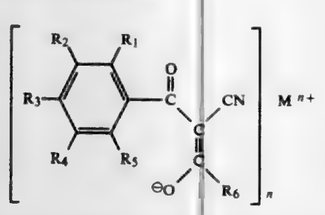
Filed Nov. 3, 1978, Ser. No. 957,595
Int. Cl.[2] A61K *31/275;* **C07C** *121/76*
U.S. Cl. 424—304 **19 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein R_1, R_2, R_3, R_4 and R_5 are each individually selected from the group consisting of hydrogen, halogen, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 4 carbon atoms, trifluoromethyl and trichloromethyl with the proviso that at least two of R_1, R_2, R_3, R_4 and R_5 must be hydrogen but R_1, R_2, R_3, R_4 and R_5 may not all be hydrogen; R_6 is alkyl having from 1 to 4 carbon atoms; n is an integer from 1 to 3 and M is hydrogen or a pharmaceutically acceptable cation; and the tautomers thereof.

16. The method of inhibiting the progression of arthritis in a mammal which comprises administering to said mammal an effective amount of a compound selected from the group consisting of those of the formula:



wherein R_1, R_2, R_3, R_4 and R_5 are each individually selected from the group consisting of hydrogen, halogen, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 4 carbon atoms, trifluoromethyl and trichloromethyl with the proviso that at least two of R_1, R_2, R_3, R_4 and R_5 must be hydrogen but R_1, R_2, R_3, R_4 and R_5 may not all be hydrogen; R_6 is alkyl having from 1 to 4 carbon atoms; n is an integer from 1 to 3 and M is hydrogen or a pharmaceutically acceptable cation; and the tautomers thereof.

4,173,651

METHOD FOR KILLING INSECTS AND/OR FUNGI WITH ELECTRO-MECHANICAL ULTRASONIC NEBULIZER AND COMPOSITION FOR SAID METHOD

Takayoshi Muramoto, Hiroshima, and Kunitaka Orita, Yanai, both of Japan, assignors to Fumakilla Limited, Tokyo, Japan

Filed Jun. 16, 1976, Ser. No. 696,825
Claims priority, application Japan, Jun. 23, 1975, 50-75706; Jan. 27, 1976, 51-7095
Int. Cl.[2] A01N *9/24, 9/36, 9/12, 9/20*
U.S. Cl. 424—306 **14 Claims**

1. A method for killing insects and fungi on plants or in nearby air comprising the steps of:

applying thereto an insecticidal or fungicidal effective amount of a composition selected from the group consisting of the following solutions, and wherein each solution contains an agent and a solvent, said agent being about 2 to 20% by weight of said composition:

a solution of allethrin in n-pentadecane;

a solution of d-cis, trans-allethrin in n-hexadecane;

a solution of resmethrin in n-hexadecane;

a solution of DDVP in n-tetradecane and isopropyl alcohol;

a solution of d-cis, trans-resmethrin in n-hexadecane;

a solution of d-cis, trans-allethrin and d-cis, trans-resmethrin in n-dodecane;

a solution of 0.3% oil suspension of DDVP in kerosene;

and a solution of 0.5% oil suspension of diazinon in kerosene;

wherein said composition is applied by nebulization in an electromechanical ultrasonic transducer operating in a frequency range of between 800,000 and 1,700,000 Hz to effect atomization and vaporization in air of a concentration of said composition, the atomized and vaporized particles of said composition having a particle size in the range of 0.5 to 5 microns.

4,173,652

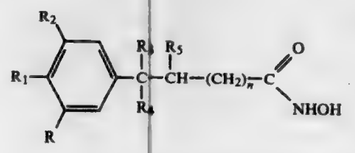
PHARMACEUTICAL HYDROXAMIC ACID COMPOSITIONS AND USES THEREOF

Antonius H. N. M. Bruins, and Gerlof Vollema, both of Ossk, Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 859,142, Dec. 9, 1977. This application Oct. 31, 1978, Ser. No. 956,513
Claims priority, application Netherlands, Dec. 18, 1976, 7614113
Int. Cl.[2] A61K *31/165*
U.S. Cl. 424—324 **3 Claims**

1. A pharmaceutical composition having inhibitive and disaggregative properties towards blood platelet aggregation, comprising:

(A) a therapeutically effective amount to inhibit and disaggregate blood platelet aggregation of a compound of the formula:



or a pharmaceutically acceptable non-toxic salt thereof, wherein:

(a) R is selected from the group consisting of alkoxy of one to six carbon atoms, alkenyloxy of two to six carbons and alkyl of one to six carbon atoms;

(b) R_1 and R_2 are each selected from the group consisting of hydrogen, alkoxy of one to six carbon atoms, alkenyloxy of two to six carbon atoms, alkyl from one to six carbon atoms, and benzyloxy;

(c) R_3 and R_4 are selected from the group consisting of hydrogen and alkyl of one to six carbon atoms;

(d) R_5 is hydrogen or together with R_3 and R_4 methylene, and

(e) n signifies the number 0 or 1; and

(B) a pharmaceutically acceptable carrier.

4,173,653

OXYDIACETALDEHYDE COMPOSITIONS USED AS DISINFECTANTS

David C. F. Law, Arlington, Tex., assignor to Arbrook, Inc., Arlington, Tex.

Filed Dec. 11, 1974, Ser. No. 531,842
Int. Cl.[2] A01N *9/24*
U.S. Cl. 424—333 **9 Claims**

1. A sporicidal composition containing an aqueous solution of 3% oxydiacetaldehyde, 1.4% sodium acetate and 1% phosphate buffer at pH 8.

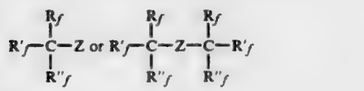
4,173,654

NOVEL FLUOROHYDROCARBONS

Kirby V. Scherer, Santa Monica, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Jan. 3, 1977, Ser. No. 756,011
Int. Cl.[2] A61K *31/02, 31/035;* **C07C** *19/08*
U.S. Cl. 424—350 **11 Claims**

1. A fluorochemical compound containing 9 to 15 carbon atoms selected from compounds of the formulae:



where

$R_f = C_nF_{2n}+1$

$R_f' = C_{n'}F_{2n'}+1$

$R_f'' = C_{n''}F_{2n''}+1$

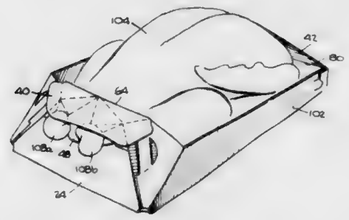
and n, n' and n'' are integers from 1 to 11 and Z is a hydrocarbon moiety containing at least 2 hydrogen atoms and has a methylene group connected to the tertiary carbon atom.

4,173,655

POULTRY TRAY

James L. Capo, Franklin, Ohio, assignor to International Paper Company, New York, N.Y.

Filed Jun. 8, 1978, Ser. No. 913,802
Int. Cl.[2] B65D *85/54*
U.S. Cl. 426—129 **24 Claims**



1. A blank for a poultry tray comprising:

(a) a bottom panel having first and second end edges and first and second side edges;

(b) a rear end wall having an aperture and first and second connecting edges, said first connecting edge being hingedly connected to the first end edge of the bottom panel;

(c) a tail shield hingedly conneted to the second connecting edge of the rear end wall;

(d) a side wall hingedly connected to one of the side edges of the bottom panel; and

(e) means for locking the rear end wall to the side wall at an acute angle to the bottom panel.

4,173,656

MEANS AND METHOD FOR AGING LIQUOR

Richard S. Duggins, 41 Mountainside Dr., Wayne, N.J. 07470

Filed Feb. 23, 1976, Ser. No. 660,720
Int. Cl.[2] C12H *1/12, 1/22*
U.S. Cl. 426—422 **11 Claims**

1. A composition for use in aging liquors, comprising:

particles of charred wood; and

particles of "red layer" wood which may be placed in the liquor to be aged.

4. A device for treating beverges, comprising:

a liquid permeable container;

particles of treating material including particles of red layer wood and charred wood retained in said container; and

means associated with the container facilitating relative movement between a beverage and the container, so that the beverage will flow through the particles for treatment when the device is placed in the beverage.

4,173,657

VEGETABLE PROTEIN INGREDIENT FOR KAMABOKO PRODUCTS CONTAINING A POLYSACCHARIDE

E. Lorna Gaudio, Edwardsville, Ill., and S. Kent Holt, Tokyo, Japan, assignors to Ralston Purina Company, St. Louis, Mo.

Filed Feb. 21, 1978, Ser. No. 879,190
Int. Cl.[2] A23J *3/00;* **A23L** *1/325*
U.S. Cl. 426—574 **5 Claims**

1. A gelled fish product comprising fish and a composition consisting essentially of a soy protein isolate and a polysaccharide in an added amount by weight of the fish product, selected from the group consisting of 0.1 to 0.5% alginates and salts thereof, 0.2 to 0.8% locust bean gum, 0.0125 to 0.5% xanthan gum, 0.125 to 0.5% carrageenans and salts thereof, 0.075 to 0.5% guar gum, 0.0225 to 0.5% methyl cellulose, 0.3 to 6.5% pectin, and 0.1 to 0.5% carboxymethyl cellulose, wherein the level of said composition does not exceed about 90% by weight of the fish flesh.

4,173,658

POWDER COATING COMPOSITIONS

Hanns-Jörg Bax; Jörn Rüter, and Roland Feinauer, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

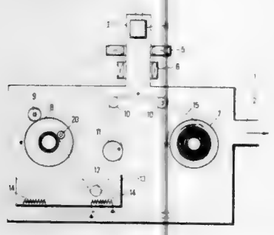
Continuation of Ser. No. 776,817, Mar. 11, 1977, abandoned. This application Jun. 28, 1978, Ser. No. 920,085
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1976, 2611691
Int. Cl.[2] B05D *3/02, 1/24*
U.S. Cl. 427—27 **10 Claims**

1. In a powder polyester coating composition for coating of metallic surfaces at high temperatures whose polyester is a saturated, high-molecular thermoplastic co-polyester obtained by condensation of a functional derivative of a mixture of dicarboxylic acids with one or more diols at least 60 molar percent of which is 1,4-butanediol, the improvement wherein the acid portion of the polyester polymer units consists essentially of a mixture of three acids which are (a) terephthalic acid, (b) 10–60 molar percent of one or more cycloaliphatic dicarboxylic acids of up to 12 carbon atoms and (c) up to 20 molar percent of one or more aliphatic dicarboxylic acids of 2–12 carbon atoms, whereby high values of both Erichsen depression and impact depression are achieved in the finally applied coating.

4,173,659
METHOD FOR MANUFACTURING SENSITIVE ELEMENTS HAVING A PERMANENT ELECTRIC POLARIZATION

Jean-Claude Dubois, Royan, and Alain Delaunay, Lugon, both of France, assignors to Institut Francais du Petrole, France

Filed Jul. 5, 1977, Ser. No. 821,860
Claims priority, application France, Jul. 5, 1976, 76 20698
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—35 5 Claims

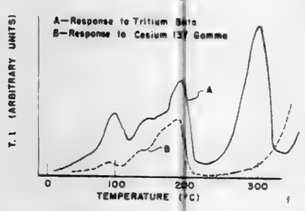


1. A method for manufacturing an electret consisting of placing a substrate of plastic material in an air evacuated enclosure under a high vacuum; subjecting said substrate to electron bombardment to impart thereto a permanent electric polarization; and contacting said substrate in said air-evacuated enclosure after said electron bombardment while maintaining said high vacuum with a liquid of very low saturated vapor pressure whose dielectric strength is higher than that of rarified air.

4,173,660
METHOD OF PREPARING A THERMOLUMINESCENT PHOSPHOR

Jerome B. Lasky, and Paul R. Moran, both of Madison, Wis., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 819,429, Jul. 27, 1977, Pat. No. 4,121,010.
This application Jul. 13, 1978, Ser. No. 924,338
Int. Cl.[2] B05D *5/12, 3/06*
U.S. Cl. 427—38 8 Claims

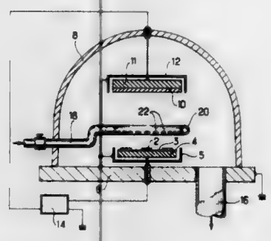


1. A method of preparing a thermoluminescent phosphor for use as a dosimeter comprising:
providing a thermoluminescent phosphor of LiF doped with magnesium;
heating said phosphor to a temperature in excess of 400° C.; and
contacting said phosphor with a boron-containing vapor whereby boron is diffused into the surface portion of said phosphor.

4,173,661
METHOD FOR DEPOSITING THIN LAYERS OF MATERIALS BY DECOMPOSING A GAS TO YIELD A PLASMA

Bernard Bourdon, Orsay, France, assignor to Alsthom-Atlantique, Paris, France

Filed Oct. 27, 1977, Ser. No. 846,073
Claims priority, application France, Nov. 18, 1976, 76 34688
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—39 10 Claims



1. A method for depositing thin layers of material by decomposing a gas to yield a plasma, comprising the steps of:
placing a substrate on which said layer is to be deposited in a chamber;
circulating in said chamber a gaseous medium from which said material can be formed by decomposition, and maintaining the gaseous medium at a pressure between 10^{-2} and 10^{-4} torr in the vicinity of the substrate;
applying a high-frequency alternating voltage between a conductive earth surface and a conductive target surface located on opposite sides of the substrate so as to form a plasma in said chamber in the vicinity of the substrate; and
connecting said substrate to the target surface through a biasing impedance, the improvement and wherein said step of circulating said gaseous medium in said chamber comprises jelling into the chamber from a tube in which the pressure is maintained between 0.2 and 4 torr, said gaseous medium through injection ports which face the substrate.

4,173,662
PROCESS FOR FORMING A FUEL CELL MATRIX

Robert C. Stewart, Jr., Granby, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 23, 1977, Ser. No. 863,815
Int. Cl.[2] H01M *2/14;* B05D *1/30*
U.S. Cl. 427—115 9 Claims

1. A process for making a fuel cell electrode/matrix element comprising the steps of:
creating a continuous falling curtain of material having a viscosity of between 50 and 1000 centipoise and comprising between 15% and 60%, by weight, fuel cell electrolyte matrix material carried in a balance of liquid vehicle by flowing said curtain material through a slot of constant width between 25 and 80 mils, the rate of mass flow of the curtain being maintained substantially constant;
passing a fuel cell electrode through said curtain at a constant speed to coat a surface of said electrode with said curtain material; and
heat treating the coated electrode to remove the liquid vehicle leaving a layer of matrix material on the electrode surface.

4,173,663
DIPLESS METALLIZING PROCESS AND APPARATUS

Theodore Bostroem, Park Rd. Ext., Middlebury, Conn. 06762

Continuation of Ser. No. 482,886, Jun. 25, 1975, abandoned.
This application Jul. 14, 1976, Ser. No. 705,351
Int. Cl.[2] B05D *1/02, 1/28, 1/40*
U.S. Cl. 427—211 11 Claims



1. In a process of providing a metallic article in strip form with a metallic coating, the steps which comprise
(a) passing the metallic strip preheated to coating temperature in a substantially vertical direction through a processing chamber;
(b) passing the metallic strip through a coating zone and applying by distributing means a continuous stream of the molten coating metal uniformly to both sides of the metallic strip for a short period of time so as to minimize the formation of an intermediate alloy layer between the coating metal layer and the surface of the metallic article;
(c) conducting excess molten coating away from the metallic strip by deflecting any excess coating running downwardly from the article strip, whereby the coating can be recovered and does not interfere with the conveying of successive portions of the strip to the coating zone, and
(d) subjecting the coated metallic strip to the action of a hot, non-oxidizing gas blast subsequent to said coating application so as to remove any remaining excess coating metal from the coated metallic article.

4,173,664
PARYLENE STABILIZATION

Gary S. Cieloszyk, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 20, 1978, Ser. No. 871,146
Int. Cl.[2] B05D *3/02*
U.S. Cl. 427—385 R 17 Claims

1. A process for making an article comprising (a) a solid substrate and (b) a coating on said substrate, said coating comprising parylene admixed with a sterically hindered phenol wherein the amount of hindered phenol is about 0.1 to about 15 percent by weight based on the weight of the parylene,
said process comprising diffusing the hindered phenol into the parylene by bringing the hindered phenol into contact with the parylene and providing sufficient heat to cause the diffusion.

4,173,665
METHOD OF RUSTPROOFING MOTOR VEHICLES

Roy J. Nida, 22W054 Stratford Pl., Glen Ellyn, Ill. 60137

Filed Apr. 13, 1978, Ser. No. 895,917
Int. Cl.[2] C09I *11/02;* B32B *25/16, 25/00, 27/04*
U.S. Cl. 427—421 10 Claims

1. An improved method of rustproofing a motor vehicle comprising:
applying a rustproofing composition to the metal panels of the motor vehicle bodies for preventing corrosion of same,
said improved rustproofing composition comprising a substantially uniform dispersion of:
at least approximately twenty (20) percent polychloroprene polymer latex solids dispersed in an aqueous medium;
at least approximately one (1) percent of at least one surface active agent selected from the group of antifoam and wetting agents; and
at least approximately twenty (20) percent of pigment solids.

4,173,666
FLAME RESISTANT CELLULOSE FIBER INSULATION AND PROCESS OF PREPARING IT

Mario J. Quinto, The Seaco Corp., 581 Hope St., Stamford, Conn. 06907

Filed Sep. 11, 1978, Ser. No. 941,652
Int. Cl.[2] D04H *1/58*
U.S. Cl. 427—427 3 Claims

1. A process of producing flame resistant cellulose fiber insulation which comprises producing an aqueous solution of the reaction product of borax and at least one mineral acid and spraying cellulose fiber insulation with said solution without separation of the reaction products to produce a sprayed product, whereby the solution penetrates the cellulose fibers and coats them uniformly, and product which on drying has about 7% to about 20% of solids of the reaction products.

4,173,667
CHRISTMAS ORNAMENT AND KIT FOR MAKING THE SAME

William C. Rusch, Bow Lane R.R. 2, Barrington Hills, Ill. 60010

Filed Apr. 28, 1977, Ser. No. 791,924
Int. Cl.[2] A47G *33/08*
U.S. Cl. 428—11 12 Claims



1. A kit for making an ornament comprising in combination: a pair of housing-forming members each open along a side thereof and interlockable into confronting relation along their open sides to form a housing enclosure therebetween, said housing-forming members having complementary confrontable narrow neck-forming portions which extend upwardly from the respective housing-forming members, at least one of said members having a transparent portion enabling the interior of the resulting housing to be viewed, hang rod-forming means extending or extendable between said confronting narrow neck-forming portions, and an ornamental article mountable in a given predetermined position in said housing so as to be visible through said transparent portion of at least said one housing-forming member, said ornamental article having means adapted to receive and make hanging engagement with said rod-forming means.

5. The kit of claim 1 wherein both of said housing-forming members are transparent, enabling the interior thereof to be viewed from opposite sides thereof, and said ornamental article is a greeting card blank where both sides thereof are visible clearly from said opposite sides of said housing, said greeting card blank having greeting card indicia visible on one side thereof, the opposite side of said greeting card blank having a pressure sensitive adhesive thereon for holding a photograph thereon, and a peelable backing sheet covering said adhesive layer.

4,173,668

FIRE-SCREENING PANEL

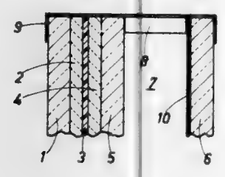
Walther E. Hentzelt, Witten-Annen; Hans-Henning Nolte, and Wolf von Reis, both of Gelsenkirchen, all of Fed. Rep. of Germany, assignors to BFG Glasgroup, Paris, France

Filed Dec. 1, 1975, Ser. No. 636,745

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1974, 2457037

Int. Cl.[2] B32B *17/06, 15/04*

U.S. Cl. 428—34 **23 Claims**



1. A fire-screening glazing panel comprising

a first structural ply formed by a vitreous sheet,

a second structural ply formed by a vitreous or plastic sheet,

a layer of intumescent material between said first and second structural plies, said material being convertible to form a thermally insulating barrier of porous or cellular structure when said panel is subjected to sufficient heat, such as when said panel is subjected to a fire,

an infra-red reflecting coating disposed on a ply of said panel, said coating being isolated from said intumescent material between said first and second plies and said coating reducing the effects of aging upon said panel if exposed to a heat source, and

means for holding said plies together to form a panel.

4,173,669

AQUEOUS DISPERSION FOR COATING AND COATED ARTICLES

Takeshi Ashida; Fumitaka Saito, and Masateru Akamatsu, all of Yokohama, Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Sep. 9, 1977, Ser. No. 832,021

Int. Cl.[2] C03C *17/32, 25/02;* **C08L** *33/02*

U.S. Cl. 428—35 **19 Claims**

1. An aqueous dispersion for coating comprising a partially neutralized copolymer comprising from 99 to 75 mol % of ethylene and from 1 to 25 mol % of α,β-ethylenically unsaturated carboxylic acid of which at least 10% is neutralized with metallic and/or ammonium ions, wherein the improvement comprises using the partially neutralized copolymer of ethylene and α,β-ethylenically unsaturated carboxylic acid having a composition distribution of the acidic units within the range from 0.50 to 0.95 in terms of the ratio of the reciprocal of the minus first-order moment of the distribution of the acidic units to the plus first-order moment of the distribution of the acidic units.

4,173,670

COMPOSITE TUBULAR ELEMENTS

Richard L. VanAuken, Bridgewater, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 27, 1977, Ser. No. 801,028

Int. Cl.[2] B32B *5/12;* **F16C** *1/02*

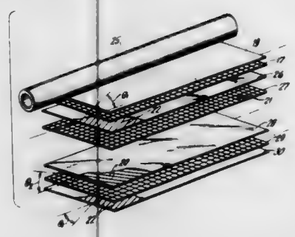
U.S. Cl. 428—36 **9 Claims**

1. A tubular composite rotor shaft structure for transmitting substantial torsion, tension and compression loads comprising:

a cylindrical tubular metal core;

a layer of structural metal adhesive on the exterior surface of the metal core;

a plurality of superimposed layers of resin impregnated unidirectional continuous reinforcing fibers circumferentially wrapped around said tubular metal core, each layer of said resin impregnated reinforcing fibers being generally quadrangular in shape, each layer of said resin impregnated fibers having the fibers oriented at an angle of between about 5° to 12° with respect to the longitudinal axis of the tubular metal core and in opposite orientation with respect to the next preceding layer of said resin impregnated fibers;



a layer of woven fiberglass cloth interposed between each superimposed layer of said resin impregnated reinforcing fibers; and

a layer of woven fiberglass cloth interposed between said layer of structural metal adhesive and said superimposed layers of said resin impregnated reinforcing fibers.

4,173,671

FLAME RETARDANT CARPET AND METHOD FOR PREPARING SAME

Pritam S. Minhas, Mendham, N.J., and Bernard Sukornick, Williamsville, N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 19, 1977, Ser. No. 861,778

Int. Cl.[2] B32B *3/02, 33/00*

U.S. Cl. 428—85 **35 Claims**

1. A flame-retardant carpet having a relatively pliable primary backing and a tufted surface, said surface being comprised of fibers selected from the group consisting of polyester and polyamide fibers, said carpet having from about 1 to about 15 weight percent of a composition added thereto, said composition comprising:

(a) about 10 to about 80 weight percent of a polyvalent metal compound selected from the group consisting of the dispersible and soluble salts, oxides and hydroxides of aluminum, antimony and the alkaline earth metals;

(b) about 5 to about 85 weight percent of boric acid; and

(c) 0 to about 85 weight percent of a hydroxy carboxylic acid selected from the group consisting of maleic acid, citric acid, tartaric acid, gallic acid and 2,4-dihydroxybenzoic acid.

4,173,672

DECORATED SAFETY GLASS

Jose R. Mannheim, Avda. La Pradera 164, Lima, Peru

Filed Sep. 6, 1977, Ser. No. 830,879

Int. Cl.[2] B32B *3/10;* **B44C** *1/18*

U.S. Cl. 428—203 **14 Claims**

1. A method of manufacturing decorated colored glass comprising the following steps:

(a) transferring, with heat and pressure, a color impression from a printed cellulosic support into an adhesive plastic polyvinyl butyral film spread on a lamina of glass for a time period sufficient for the film to become semi-fluid and for the colorants to permeate the entire thickness thereof;

(b) removing the cellulosic support when the color impression has been transferred from the cellulosic layer into the polyvinyl butyral film and when said film has been permanently adhered to said lamina of glass;

(c) placing a second lamina over the decorated polyvinyl butyral film, in direct contact with it; and

(d) laminating these two lamina and said interposed decorated film at a pressure ranging from 25 psi to 850 psi and at a temperature ranging from 70° C. to 350° C.



12. The product of the method of claim 1, wherein said product is transparent.

4,173,673

DOT-ETCHABLE MASKS FROM PHOTOPOLYMERIZABLE ELEMENTS

Martin D. Bratt, Old Bridge, and Abraham B. Cohen, Springfield, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 741,039, Nov. 11, 1976, which is a continuation-in-part of Ser. No. 632,726, Nov. 17, 1975, abandoned. This application Jun. 1, 1977, Ser. No. 802,511

Int. Cl.[2] G03C *5/00, 1/68*

U.S. Cl. 428—217 **14 Claims**



1. A dot-etchable mask prepared by imagewise exposing to actinic radiation a photopolymerizable element which comprises a transparent support bearing an addition photopolymerizable layer which is the outermost layer of the element or is contiguous to a removable cover sheet or an overcoat layer which is at least partially soluble in or permeable to a solvent for the photopolymerizable layer, said photopolymerizable layer being no more than 0.015 mm thick, and removing unexposed areas of the layer, said mask containing a tone correctable image comprised of polymeric dots having a hardened upper skin which rests on a softer undervolume having a lesser degree of polymerization or hardening, said dots having an optical density greater than 3.0 in the 350–400 nm region and being reducible in size by undercutting the polymeric dots with a solvent for the softer undervolume and removing hardened polymer from the edges of the hardened upper skin by mechanical action on the image bearing surface of the mask.

4,173,674

DIELECTRIC INSULATOR SEPARATED SUBSTRATE FOR SEMICONDUCTOR INTEGRATED CIRCUITS

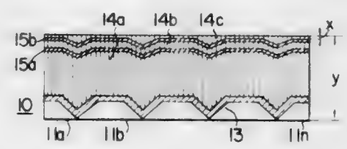
Akio Mimura; Takaya Suzuki, and Seturo Yagiyu, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Continuation-in-part of Ser. No. 680,882, Apr. 27, 1976, abandoned. This application Mar. 22, 1978, Ser. No. 888,981

Claims priority, application Japan, May 12, 1975, 50-54585

Int. Cl.[2] B32B *7/00, 9/04;* **H01L** *21/304, 21/316*

U.S. Cl. 428—220 **3 Claims**



1. A dielectric insulator separated substrate for semiconductor integrated circuits comprising a plurality of monocrystalline semiconductor island regions in which circuit elements are to be formed; and a support region in contact with said island regions through a dielectric film, said support region comprising alternately laminated multiple layer structure of polycrystalline semiconductor layers and at least one oxygen diffusion preventive film, said island regions being electrically isolated from each other by said dielectric film, wherein the extreme outer layer of said support region is composed of a polycrystalline semiconductor layer and has a highly polished flat surface, the thickness of said extreme outer polycrystalline semiconductor layer being represented by the formula,

$$x \leqq y/40,$$

where x represents the ultimate thickness of said extreme outer polycrystalline semiconductor layer, and y represents the entire thickness of said dielectric insulator separated substrate of 200–500 microns.

4,173,675

METHOD FOR COLORING OR DYING FIBROUS SHEETS IMPREGNATED WITH BITUMINOUS MATERIAL

Roger Vallon; André Herdenberger, both of Rouen, and Marc Delhomelle, Elbeuf, all of France, assignors to Societe Anonyme dite: Omnium Francais Industriel et Commercial (O.F.I.C.), Paris, France

Filed May 26, 1977, Ser. No. 800,810

Claims priority, application France, May 28, 1976, 76 16263

Int. Cl.[2] B05D *1/12;* **B32B** *11/02, 11/62;* **D06N** *5/00;* **D06P** *1/673*

U.S. Cl. 428—291 **14 Claims**

1. Coloured or dyed material formed from a substrate impregnated with bitumen, said material being characterized by a colour gradient between surface and the inside of the substrate, the colour intensity decreasing continuously and practically regularly from the surface.

5. Method for producing a coloured roofing, siding or sealing material, based on cellulose fibers, cardboard or other fibrous material inpregnated with bitumen, comprising coating at least one of the surfaces of the material to be treated with a colouring composition, drying the coated material, and impregnating the thus coated material in a conventional hot bitumen bath.

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4,173,676

ADHESIVE TAPE

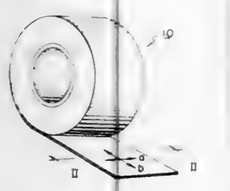
Hiroshi Asakura; Ippei Chimura; Keisuke Kitazume; Yoshiyuki Kaneko; Shirou Fuse, and Akio Ueno, all of Kamakura, Japan, assignors to Toyo Kagaku Kabushiki Kaisha, Kanagawa, Japan

Filed Nov. 10, 1977, Ser. No. 850,218

Claims priority, application Japan, Dec. 28, 1976, 51-157575; Apr. 30, 1977, 52-49077

Int. Cl.[2] B32B *7/10;* **C09J** *7/02*

U.S. Cl. 428—332 **5 Claims**



1. An adhesive tape comprising a film of high density polyethylene having a density of not less than 0.94 g/cc elongated six to sixteen times only transversely to the longitudinal direction of the tape and a layer of pressure sensitive adhesive applied at least on one side of said elongated film of high density polyethylene, said film of high density polyethylene having a thickness of 30 to 60μ.

4,173,677

ELECTRO-THERMOSENSITIVE RECORDING MATERIALS

Shiro Nakano, Suita, and Masahiro Hotta, Osaka, both of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 17, 1977, Ser. No. 807,724

Claims priority, application Japan, Jun. 21, 1976, 51/73488; May 10, 1977, 52/53899

Int. Cl.[2] B41M *5/18, 5/20;* **B32B** *27/30*

U.S. Cl. 428—335 **17 Claims**

1. An electro-thermosensitive recording material comprising:

(1) a support at least the surface of which is electrically conductive, and

(2) a conductive recording layer formed on the conductive surface of the support, said conductive recording layer containing (a) a film-forming polymer selected from the group consisting of polyvinyl chloride and copolymers of not less than 70 mol % of vinyl chloride, and (b) dispersed in the film-forming polymer, an acid-sensitive leuco dye and at least one zinc compound selected from the group consisting of zinc oxide, zinc hydroxide, zinc sulfide, zinc carbonate, zinc acrylate, zinc stearate and zinc oxide doped with a different metal selected from the group consisting of aluminum, titanium, gallium, germanium, indium, tin, antimony and iron.

4,173,678

COLOR BLENDED YARNS WITH ENHANCED LUMINOSITY

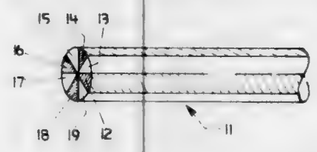
John H. Hennes, Anderson, and Christopher P. Crecente, Mauldin, both of S.C., assignors to Badische Corporation, Williamsburg, Va.

Filed Jul. 24, 1978, Ser. No. 927,697

Int. Cl.[2] D02G *3/00*

U.S. Cl. 428—364 **4 Claims**

1. A non-twisted, non-commingled, draw-textured, multicolored yarn, which yarn has a total denier of from 1000 to 4000 and comprises from 4 to 16 discrete component yarns of a particular coloration or dye receptivity longitudinally disposed in a side-by-side registration, each component yarn having a denier of about 250 and comprising a multiplicity of continuous filaments of about 10 to 20 denier/filament all of which have the same coloration or dye receptivity, there being from 2 to 8 different colorations or dye receptivities present in



the multi-colored yarn, the component yarns being positioned so that there is no discernable predominance of a single coloration or dye recptivity in any longitudinal or transverse segment of the yarn.

4,173,679

LIQUID THERMOSTABLE PHOSPHORIC ACID ESTERS FOR THE FIBER CONDITIONING

Rolf Kleber, Neu-Isenburg, and Winfried Ehrl, Neuotting, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 20, 1977, Ser. No. 862,516

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658862

Int. Cl.[2] C07F *9/02;* **C11C** *3/00;* **A23J** *7/00*

U.S. Cl. 428—375 **3 Claims**

3. A process for the conditioning of fibers and filaments during their synthesis and processing which consists of applying onto the fibers or filaments a reaction product of polyphosphoric acid and an oxalkylate of C_{8-18} alkyl- or alkenylcarboxylic acids with 1 to 22 ethylene oxide units and having a content of free polyethylene glycol of less than 2% by weight, the reaction product being present in acidic form or in the form of its alkali metal salts.

4,173,680

HOT MELT SIZING COMPOSITIONS AND FIBROUS ARTICLES SIZED THEREWITH

Raymond N. Vachon, and Richard L. McConnell, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 794,181, May 5, 1977, Pat. No. 4,136,069, which is a continuation of Ser. No. 597,122, Jul. 18, 1975, abandoned. This application Oct. 27, 1978, Ser. No. 955,291

Int. Cl.[2] D06M *15/14*

U.S. Cl. 428—375 **8 Claims**

1. A textile fiber sized with a composition comprising: a blend of about 35–80 weight percent of at least one member of the group consisting of copolymers of ethylene and α,β-unsaturated carboxylic acids containing 75–90 weight percent ethylene and having a melt viscosity of about 10,000 to 200,000 cp. at 190° C. and about 5 to 50 weight percent of at least one member of the group consisting of copolymers of ethylene and α,β-unsaturated carboxylic acids containing about 80–95 weight percent ethylene and having a melt viscosity of about 1500 cp. to 100 cp. at 140° C.

4,173,681

BRAKE PAD WITH INTEGRAL ORGANIC BACKPLATE

Jean-Pierre Durrieu, Noyon, and Guy Pomes, Margny-les-Compiegne, both of France, assignors to Societe Abex Pagid Equipement S.A., Clichy, France

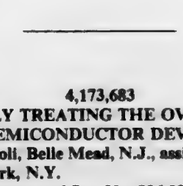
Filed Jul. 19, 1978, Ser. No. 926,050

Claims priority, application France, Jul. 25, 1977, 77 22752

Int. Cl.[2] F16D *69/02;* **B32B** *19/02, 19/06*

U.S. Cl. 428—409 **4 Claims**

1. A disc brake pad comprising an organic friction material layer and an organic backplate material layer integral therewith, characterized in that the backplate layer is an unbaked preform of compacted pulverulent material, the friction layer is an unbaked preform of compacted pulverulent material, each



preform containing the same resin binder, and the brake pad is formed by placing both preforms in a mold and simultaneously applying heat and pressure to join the preforms into an integral disc brake pad.

4,173,682

PROCESS FOR COATING A SUBSTRATE WITH A RADIATION AND MOISTURE CURABLE COATING COMPOSITION

Arie Noomen, Voorhout; Johannes M. P. van der Geest; Cornelis de Jong, both of Sassenheim, and Dick Van Santen, Leimuiden, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Mar. 8, 1978, Ser. No. 884,588

Claims priority, application Netherlands, Mar. 9, 1977, 7702518

Int. Cl.[2] B05D *3/06*

U.S. Cl. 428—423 **12 Claims**

1. A process for coating a substrate by applying to it a radiation curable coating composition based on a urethane compound and subjecting it to radiation have a wavelength of 90 to 600 nm, characterized in that a composition comprising (A) an at least one isocyanate group-containing adduct of (a) an acrylic or methacrylic hydroxy ester with 5 to 20 carbon atoms and (b) a polyisocyanate with 4 to 40 carbon atoms and with 2 to 4 isocyanate groups per molecule, (B) a polyfunctional hydroxy compound having a molecular weight of 178 to 12,000 and a hydroxyl content of 0.5 to 30% by weight in an amount of 0.5 to 1.5 equivalents of hydroxy per equivalent of isocyanate of component A, and (C) a photoinitiator in an amount of 0.1 to 10% by weight of component A, is applied to the substrate, and the coating layer is subjected to radiation and mainly after radiation the adduct is reached with water vapour.

4,173,683

CHEMICALLY TREATING THE OVERCOAT OF A SEMICONDUCTOR DEVICE

Robert B. Comizzoli, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 806,286, Jun. 13, 1977, abandoned. This application Apr. 6, 1978, Ser. No. 894,013

Int. Cl.[2] H01L *21/56, 23/30*

U.S. Cl. 428—447 **4 Claims**

1. In a method of manufacturing a semiconductor device wherein a passivating overcoat of insulating material is disposed over said device prior to encapsulating said device with a packaging material selected from the group consisting of plastic, metal, ceramic and glass, the improvement comprising treating said overcoat with an organosilane as the step immediately prior to said encapsulating step, said organosilane containing an organic functional group remaining after said treatment, said functional group being free of one or more atoms selected from the group consisting of nitrogen, oxygen and fluorine.

4,173,684

PRODUCTION OF NOVEL METAL MODIFIED NOVOLAK RESINS AND THEIR USE IN PRESSURE SENSITIVE PAPERS

John J. Stolfo, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Sep. 6, 1977, Ser. No. 830,993

Int. Cl.[2] B32B *27/10;* **C08G** *8/04*

U.S. Cl. 428—531 **20 Claims**

1. A metal modified novolak resin, said metal modified novolak resin being an electron acceptor suitable for use in a pressure-sensitive copy system and being co-reactive with color precursors of the electron donor type, said metal modified novolak resin being further characterized by compatability with the surface properties of a paper substrate, said metal modified novolak resin comprising a reaction product of a novolak resin and a metal alkanoate salt of an alkanoic acid having 1 to 3 carbon atoms, the metal being selected from the group consisting of copper, zinc, cadmium, aluminum, indium, tin, chromium, cobalt and nickel, said novolak resin being a reaction product in the presence of an acid catalyst of a mixture consisting essentially of:

(a) a para-substituted phenol selected from the group consisting of para-alkylphenols having an alkyl group of from about 1 to about 12 carbon atoms, para-phenylphenol and mixtures thereof;

(b) salicylic acid; and

(c) formaldehyde.

11. A pressure-sensitive paper comprising a paper substrate containing on one surface thereof a coating containing a metal modified novolak resin which is co-reactive with color precursors of the electron donor type comprising a reaction product of a novolak resin and a metal alkanoate salt of an alkanoic acid having 1 to 3 carbon atoms, the metal being selected from the group consisting of copper, zinc, cadmium, aluminum, indium, tin, chromium, cobalt and nickel, said novolak resin being a reaction-product in the presence of an acid catalyst of a mixture consisting essentially of:

(a) a para-substituted phenol selected from the group consisting of para-alkyl phenols having an alkyl group of 1 to about 12 carbon atoms, para-phenylphenol and mixtures thereof,

(b) salicylic acid, and

(c) formaldehyde,

said metal modified novolak resin being compatible with the surface characteristics of said paper substrate.

4,173,685

COATING MATERIAL AND METHOD OF APPLYING SAME FOR PRODUCING WEAR AND CORROSION RESISTANT COATED ARTICLES

Merle H. Weatherly, Indianapolis, Ind., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 23, 1978, Ser. No. 908,623

Int. Cl.[2] B05D *3/06*

U.S. Cl. 428—556 **21 Claims**

1. A powder composition for deposition by a method producing a coating having an as-deposited density greater than 75 percent theoretical on a metal substrate, such coating having high wear and corrosion resistance

comprising two or more components

(a) the first component consisting of 0–25 wt.% of at least one binder taken from the class consisting of cobalt, iron, nickel and alloys thereof and at least one metal carbide taken from the class consisting of tungsten, chromium, vanadium, hafnium, titanium, zirconium, niobium, molybdenum, tantalum carbides, and compounds thereof;

(b) the second component consisting essentially of a single alloy or a mixture of alloys with a total composition of 6.0 to 18.0 wt.% boron; 0–6 wt.% silicon; 0–20 wt.% chromium; 0–5 wt.% iron; balance nickel;

said first component comprising 40–75 wt.% of the entire composition.

10. A method for producing a coating on a metallic substrate, such coating having high wear and corrosion resistance comprising

(a) depositing by a method capable of producing a coating having an as-deposited density greater than 75 percent theoretical, a composition comprising two or more components; the first component consisting of 0–25 wt.% of at least one binder taken from the class consisting of cobalt, iron, nickel and alloys thereof and at least one metal carbide taken from the class consisting of tungsten, chromium, vanadium, hafnium, titanium, zirconium, niobium, molybdenum, tantalum carbides, and compounds thereof; the second component consisting essentially of a single alloy or a mixture of alloys with a total composition of 6.0 to 18.0 wt.% boron; 0–6 wt.% silicon; 0–20 wt.% chromium; 0–5 wt.% iron; balance nickel; said first component comprising 40–75 wt.% of the entire composition;

(b) heating such deposited coating at a temperature greater than 950° C. and for a time sufficient to cause substantial melting of said second component and reaction of said second component with a substantial portion of said first component;

(c) cooling the coating allowing the formation of borides, carbides and intermetallic phases resulting in a coating having a hardness greater than 1000 DPH_{300} and being virtually fully dense with no interconnected porosity.

21. A coating on a metallic substrate, said coating consisting of an interdiffusion zone with said substrate, and intermediate zone consisting of a gradient of borides, carbides and intermetallics in a metal matrix and a hard outer zone which may consist of one or more layers, said outer zone containing large, angular borides, carbides and intermetallic particles, and having a hardness of 1000 to 2200 DPH_{300}.

4,173,686

SODIUM SULPHUR CELLS

Michael P. J. Brennan, Helsby, England, assignor to Chloride Silent Power Limited, London, England

Filed Sep. 14, 1978, Ser. No. 942,253

Claims priority, application United Kingdom, Sep. 19, 1977, 39025/77

Int. Cl.² H01M 6/20

U.S. Cl. 429—104 **20 Claims**

1. A sodium sulphur cell in which a solid electrolyte separates sodium from a cathodic reactant, wherein there is provided a cathode current collector in contact with the cathodic reactant, which current collector comprises a substrate of a first metal which, at least on its surface exposed to the cathodic reactant, has a protective coating of a material chemically and electrically inert to the cathodic reactant, and at least one element of a second metal bonded through the protective coating onto the substrate to be in electrical contact therewith, said element being exposed to the cathodic reactant and being formed of a metal which is either chemically and electrochemically resistant to attack by the cathodic reactant or is coated with a corrosion resistant electronically conductive coating.

4,173,687

CURRENT GENERATING CELL WITH ALLOY ANODE

James P. McKaveney, Claremont, and Martin A. Prieto, Diamond Bar, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Filed Jun. 20, 1978, Ser. No. 917,167

Int. Cl.² H01M 4/36

U.S. Cl. 429—218 **31 Claims**

1. In a current generating cell having an anode, a cathode, and an electrolyte capable of electrochemically reacting with the anode and cathode to generate current, the improvement which comprises providing as the anode, an anode composition comprising from about 20 to about 90 weight percent of a first constituent selected from the group consisting of iron and silicon and at least about 10 weight percent of a second constituent selected from the group consisting of molybdenum, tungsten, vanadium, niobium, titanium, phosphorus, and silicon wherein said composition is in direct contact with the electrolyte for electrochemically reacting with said electrolyte.

4,173,688

PROCESS FOR PREPARING STYRENIC POLYMER FOAMS

Fumio Saito, Ohtsu; Fumito Yamai, Kusatsu; Yositugu Beppu, Shiga, and Shinpei Nakayama, Kusatsu, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka and Sekisui Kasehin Kogyo Kabushiki Kaisha, Nara, both of, Japan

Division of Ser. No. 617,624, Sep. 29, 1975, Pat. No. 4,085,163, which is a continuation of Ser. No. 381,460, Jul. 23, 1973, abandoned. This application Jan. 11, 1978, Ser. No. 868,592

Int. Cl.² C08J 9/02

U.S. Cl. 521—56 **10 Claims**

1. A process for reducing the amount of powdery polymer particles which pass through a 32 mesh sieve to thereby obtain foamable styrenic polymer particles having a uniform particle size of 0.6 to 3 mm by preparing foamable styrenic polymer particles by the suspension polymerization of a system comprising styrenic monomer droplets and styrenic polymer particles using the styrenic monomer and styrenic polymer particles as raw materials, which comprises suspending styrene homopolymer particles or copolymer particles of styrene monomer and up to 50% by weight of a different copolymerizable ester monomer comprising an alkyl alcohol having from 1 to 12 carbon atoms and being selected from the group consisting of acrylic esters, methacrylic esters, maleic esters and fumaric esters, having particle sizes of 0.4 to 1.8 mm in water containing a suspending agent selected from the group consisting of a water-soluble high molecular weight material and a slightly soluble inorganic material and adding to the suspension styrene monomer with up to 50% by weight of a different copolymerizable monomer selected from the group consisting of methylacrylate, ethylacrylate, butylacrylate, methylmethacrylate, ethylmethacrylate, dimethylmaleate, diethylmaleate, acrylonitrile, β-methylstyrene, divinylbenzene and mixtures thereof, a suspension polymerization catalyst, and a polymerization retarder which is soluble in the styrene monomer and which has a molecular weight of at least 200, said retarder being selected from the group consisting of 3,5-di-tertiary butyl-4-hydroxytoluene, 1,1-bis(4-hydroxy-phenyl)cyclohexane, 4,4'-butylidene-bis(3-methyl-6-tertiary butyl phenol), 1,3,5-trimethyl-2,4,6-tris-3,5-di-tertiary-butyl-4-hyroxybenzylbenzene, 2,2'-methylenebis(6-tertiary-butyl-4-methylphenol, dilaurylthiodipropionate, 4,4'-thiobis(3-methyl-6-tertiary-butylphenol), N,N'-di-β-napthyl-p-phenylenediamone, and N-phenyl-N-isopropyl-p-pheylenediamine in an amount of 1/100 to 1/25 mol per mol of said suspension polymerization catalyst to conduct the polymerization of said styrenic monomer while absorbed in said polymer particles, whereby the size of said polymer particles is increased, said polymerization retarder retarding the polymerization of said styrenic monomer droplets until said styrenic monomer is absorbed by said polymer particles, the amount of said polymer and said monomer used as raw material being 5 to 60 weight % and 95 to 40 weight %, respectively, of the polymer particles produced, said polymerization being conducted in the presence of a foaming agent which does not dissolve the styrenic polymer particles or only slightly swells the styrenic polymer particles to thereby obtain styrenic polymer particles having a uniform particle size of 0.6 to 3 mm.

4,173,689

SYNTHETIC POLYMER PROSTHESIS MATERIAL

Donald J. Lyman, and Frank J. Fazzio, both of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Feb. 3, 1976, Ser. No. 654,831

Int. Cl.² C08G 18/14; A61F 1/24

U.S. Cl. 521—64 **22 Claims**

1. A method of fabricating a prosthesis material for use with a living body, said prosthesis having mechanical properties of compliance and elasticity approximating that of soft body tissue and being operable to preserve surface properties of blood and tissue compatibility, said method comprising the steps

(a) preparing a copolyurethane composition having a molecular weight range approximately corresponding to an inherent viscosity of 0.4 to 1.0 as measured in a solution of 0.5% concentration in N,N-dimethylformamide at 30° C.;

(b) dissolving an amount of said copolyurethane composition in solvent to produce a dipping solution having 5–12% by weight polymer concentration, said solution having a relative viscosity between the range of 100 to 1000 at a dipping temperature of 10° C. to 60° C.;

(c) coating forming means with a uniform thickness of said dipping solution; and

(d) precipitating said coating into a stable physical structure having a substantially uniform dispersion of voids throughout the copolyurethane composition by immersing said coated forming means into a precipitating solution comprising a fluid which is miscible in said solvent but operable as a precipitating nonsolvent with respect to the said copolyurethane composition, the precipitation being accomplished by means of a balanced rate of exchange between said solvent and nonsolvent molecules which prevents any substantial shrinkage of said coating during precipitation and fixes said copolyurethane composition in a stable physical structure.

4,173,690

METHOD OF PRODUCING ELECTRICAL INSULATION FOAM

Bernard G. Giessner, Sicklerville, N.J.; David H. Reighter, Roslyn, Pa., and Allen E. Stringfellow, Haddonfield, N.J., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 2, 1977, Ser. No. 856,637

Int. Cl.² C08J 9/22

U.S. Cl. 521—89 **5 Claims**

1. In a method of producing an electrical insulator foam by mixing a hardenable plastic forming material with a molecular sieve having sulfur hexafluoride adsorbed therein and then subjecting the mixture to sufficient heat to cause the hardenable plastic forming material to harden and to cause the sulfur hexafluoride to desorb from the molecular sieve, the improvement which comprises forming said mixture by first mixing said sieve with a part of said plastic forming material sufficient to wet said sieve under low shear mixing conditions, the weight ratio of sieve to said part of said plastic forming material being about 2:1 to about 1:2, and then mixing said wet sieve with additional plastic forming material under low shear conditions, wherein said low shear mixing conditions are such that the mixing apparatus are rotating at a speed low enough so that the stirring edge will not exceed a peripheral speed of 600 feet per minute.

4,173,691

CATALYST COMPOSITION FOR FLEXIBLE POLYURETHANE FOAMS

Kenneth Treadwell, Rahway, N.J., assignor to M&T Chemicals Inc., Stamford, Conn.

Filed Feb. 21, 1978, Ser. No. 879,633

Int. Cl.² C08G 18/24

U.S. Cl. 521—124 **18 Claims**

1. In an improved composition for preparing a flexible polyurethane foam, said composition comprising a polyol having two or three active hydrogen atoms as determined by the Zerewitinoff method, water, a difunctional isocyanate in an amount sufficient to react with substantially all of the polyol and water present in said composition, an effective amount of an organopolysiloxane surfactant, a catalytically effective amount of a gel catalyst of the general formula

$$Sn(OCR^1)_2$$

wherein R^1 is alkyl and contains from 1 to 19 carbon carbon atoms and a catalytically effective amount of a blowing catalyst, the improvement which resides in the presence in said composition, as the blowing catalyst, of an antimony compound of the formula

$$Sb(OCR^2)_3$$

and a potassium salt of the formula

$$KOCR^3,$$

wherein R^2 and R^3 are individually selected from the same group as R^1.

4,173,692

METHOD FOR PREPARING URETHANE-MODIFIED ISOCYANURATE FOAMS

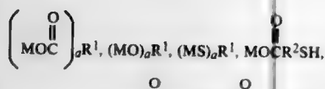
William J. Eldridge, Berkeley Heights, N.J., assignor to M&T Chemicals Inc., Stamford, Conn.

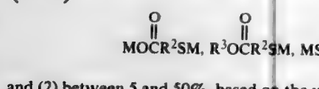
Continuation-in-part of Ser. No. 797,445, May 16, 1977, abandoned, which is a continuation of Ser. No. 613,964, Sep. 16, 1975, abandoned. This application Oct. 25, 1978, Ser. No. 954,447

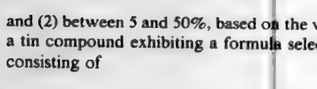
Int. Cl.² C08J 9/00

U.S. Cl. 521—125 **5 Claims**

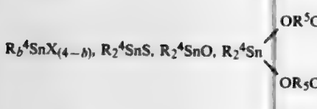
1. In an improved method for preparing urethane-modified isocyanurate foams by reacting a polyfunctional isocyanate with a polyol in the presence of a catalytically effective amount of a catalyst for the reaction, wherein the improvements comprise reacting from 6 to 14 equivalent weights of said polyfunctional isocyanate for each equivalent of polyol and conducting the reaction in the presence of a catalyst composition consisting essentially of (1) an alkali metal salt exhibiting a general formula selected from the group consisting of







and (2) between 5 and 50%, based on the weight of said salt, of a tin compound exhibiting a formula selected from the group consisting of



and SnX_2, wherein M is an alkali metal, a is 1 or 2, R^1 is alkyl containing between 1 and 20 carbon atoms, alkenyl containing between 2 and 20 carbon atoms, cycloalkyl, aryl, alkaryl or aralkyl when a is 1 or R^1 is alkylene, arylene or alkylidene and contains between 2 and 20 carbon atoms when a is 2, R^2 and R^5 each represent identical or different alkylene radicals containing between 2 and 20 carbon atoms, R^3, R^4 and R^6 are individually selected from the group consisting of alkyl radicals containing between 1 and 20 carbon atoms, cycloalkyl, aryl, alkaryl and aralkyl radicals, b is zero or the integer 1, 2 or 3 and X is selected from the group consisting of halogen atoms and radicals of the formula R^7COO—, R^7S— and $R^7OOC(CH_2)_nS$—, wherein R^7 is selected from the same group as R^3 and n is 1 or 2.

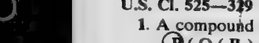
4,173,693

POLYMER-SUPPORTED POLY(ALKYLENEGLYCOL ETHERS)

Andrew T. Au, Newton, and Harold H. Freedman, Newton Center, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 12, 1978, Ser. No. 868,942
Int. Cl.² C08F 8/00, 8/18
U.S. Cl. 525—329 **13 Claims**

1. A compound of the formula



wherein:

Ⓟ is a polymer matrix of sufficient structure and molecular weight so as to be substantially water- and hydrocarbon-insoluble;

R is $-CH_2CH_2O-$, $-CH_2CH_2CH_2O-$,



$-CH_2CH_2CH_2CH_2O-$ or a combination thereof;

R^1 is hydrogen, hydrocarbyl, or an inertly-substituted hydrocarbyl;

n is an integer of 3 to about 40; and

m is a real number such that the weight percent of $-(O-(R-)_nR')$ groups is at least about 1 percent of the total weight of the compound.

4,173,694

POLYCHLOROPRENE RUBBER COMPOSITION

Masaaki Inagami, Kamakura, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Jul. 11, 1978, Ser. No. 923,584
Claims priority, application Japan, Jul. 22, 1977, 52-88006
Int. Cl.² C08K 5/37; C08J 3/24; C08F 8/34, 8/32
U.S. Cl. 525—351 **3 Claims**

1. A polychloroprene rubber composition comprising 100 parts by weight of a polychloroprene rubber, 0.1 to 3 parts by weight of a di- or tri-mercapto-s-triazine compound, and 0.1 to 2 parts by weight of a polyalkylene polyamine.

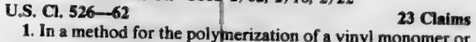
4,173,695

ALKYL AMMONIUM IONOMERS

Douglas Brenner, Livingston, and Alexis A. Oswald, Mountainside, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 788,312, Apr. 18, 1977, Pat. No. 4,102,876. This application Jul. 17, 1978, Ser. No. 924,966
Int. Cl.² C08G 75/00; C08L 19/00
U.S. Cl. 526—332 **32 Claims**

1. Polymers having the general formula:



wherein C is one of a plurality of carbon atoms comprising a portion of the polymer backbone chain of carbon atoms or is in an acyclic, alicyclic or aromatic radical which is pendant to the backbone chain and wherein said C is in a single polymer molecule; A^- is an anionic radical covalently bonded to one or more of said C carbon atoms; and wherein the R groups represent substituents of the nitrogen atom(s) which are each independently selected from the group comprising hydrogen or C_1 to C_{50} straight and branched chain acyclic, alicyclic, aryl, alkylaryl, and arylalkyl radicals and substituted functional derivatives thereof, wherein at least one of the R groups is selected from the group comprising C_{12} to C_{50} straight and branched chain acyclic, alicyclic, aryl, alkylaryl, and arylalkyl radicals and substituted functional derivatives thereof, and wherein each Q is independently selected from the group comprising C_1 to C_{40} divalent straight and branched chain alkylene, cycloalkylene, arylene, dialkylene-arylene radicals and substituted functional derivatives thereof and $-(CHY)_n-Z_m-(CHY)_n$, wherein Z is a hetero atom selected from the group consisting of oxygen and sulfur, m is zero or one, Y is hydrogen or said C_1 to C_{50} radicals or substituted functional derivatives of said radicals and n is an integer of from 1 to 10, wherein p is from zero (for a monoammonium counterion) to about 10, and wherein said ammonium counterion at least partially neutralizes said anionic acid radicals.

4,173,696

METHOD FOR THE POLYMERIZATION OF VINYL MONOMERS

Shunichi Koyanagi, Ibaragi; Niichiro Hasegawa, Joetsu; Toshihide Shimizu, Joetsu; Sensaku Katusima, Joetsu, and Ichiro Kaneko, Joetsu, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Japan

Filed Jan. 23, 1978, Ser. No. 871,249
Claims priority, application Japan, Jan. 25, 1977, 52-7100; Nov. 11, 1977, 52-135356; Nov. 24, 1977, 52-140989
Int. Cl.² C08F 2/02, 2/18, 2/22
U.S. Cl. 526—62 **23 Claims**

1. In a method for the polymerization of a vinyl monomer or a mixture of vinyl monomers, said polymerization being conducted in a polymerization reactor having a surface in contact with said monomer or mixture of monomers, the improvement which comprises the steps of (i) coating said surface, prior to the polymerization, with an aqueous coating liquid obtained by acidifying an alkaline aqueous solution containing a solution for a colloidal dispersion of at least one member selected from the group consisting of alkali metal salts and ammonium salts

of water-soluble anionic dyes of the sulfonic acid form or carboxylic acid form to have a pH value not exceeding 7 by use of a pH adjusting agent, and (ii) drying the thus coated surface.

4,173,697

CONTINUOUS HIGH PRESSURE MASS PROCESSES FOR THE POLYMERIZATION OF ETHYLENE

Ronald E. Gilbert, Katy; Thomas J. Lynch, Houston, and Robert J. Rowatt, Orange, all of Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 838,777, Oct. 3, 1977, abandoned, which is a continuation-in-part of Ser. No. 835,267, Sep. 21, 1977, abandoned. This application May 19, 1978, Ser. No. 907,517
The portion of the term of this patent subsequent to Jun. 19, 1996, has been disclaimed.
Int. Cl.² C08F 4/28, 10/02
U.S. Cl. 526—74 **8 Claims**

1. In a continuous high pressure process for the mass polymerization of ethylene in which ethylene and a free radical generating polymerization initiator are fed continuously to a polymerization zone operating at an elevated temperature and at a pressure of at least about 1,000 atmospheres; the improvement which consists essentially of feeding the polymerization initiator to the polymerization zone on a continuous basis by pumping a Bingham fluid composition into the polymerization zone, said Bingham fluid composition being a solid at ambient temperature and consisting essentially of a free-radical generating polymerization initiator uniformly dispersed in a continuous solid phase which consists essentially of an intimate mixture of a wax and a liquid hydrocarbon.

4,173,698

POLYMERIZATION OF OLEFIN

Natsuki Kanoh, Sagamihara; Toru Tanaka, Komae, and Atsushi Murakami, Machida, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed May 25, 1977, Ser. No. 800,179
Claims priority, application Japan, Jun. 22, 1976, 51/73672
Int. Cl.² C08F 4/68, 10/02
U.S. Cl. 526—142 **5 Claims**

1. In a process for polymerizing ethylene alone or a mixture containing ethylene and a different α-olefin to form copolymers containing less than 10 wt.% of the α-olefin in the presence of a catalyst system comprising an organoaluminum compound and a solid catalytic component, the improvement which comprises preparing said solid catalytic component by the process which comprises:

(a) dissolving a vanadium trichloride-ether complex in a solvent to form a solution;

(b) adding to said solution a quantity of an aluminum halide sufficient to yield a molar ratio of aluminum halide to the ether in the vanadium trichloride-ether complex of 0.1 to 10, whereby said aluminum halide reacts with said vanadium trichloride-ether complex to form a precipitate consisting essentially of said solid catalytic component; and

(c) recovering said solid catalytic component.

4,173,699

PROCESS FOR MANUFACTURING PETROLEUM RESINS FOR ADHESIVE THERMOFUSIBLE COMPOSITIONS

Patrick Borg, Rueil-Malmaison, France, assignor to Ato Chimie, Courbevoie, France

Filed Mar. 10, 1978, Ser. No. 885,283
Claims priority, application France, Mar. 11, 1977, 77 07324
Int. Cl.² C08F 240/00
U.S. Cl. 526—237 **8 Claims**

1. A process for preparing petroleum resins for use in thermofusible adhesive compositions, which comprises the steps of polymerizing a C_5 hydrocarbon cut which contains less than 5% of isoprene and less than 1% of cyclopentadiene, in a hydrocarbon solvent having a boiling point in the range of between 20° and 150° C., in the presence of a Friedel-Crafts catalyst at a temperature in the range of between 20° and 150° C. whereby an organic reaction mixture comprising the polymerized resin is obtained, washing the organic reaction mixture with an alkaline or acid solution, then with water until neutralization at a temperature in the range of between 70° and 100° C. and submitting the washed organic reaction mixture to a distillation carried out by progressively raising the temperature to 250° C. in order to eliminate the hydrocarbon solvent, and to recover a product having a softening point of between 60° and 110° C., and a Gardner color index of less than 9.

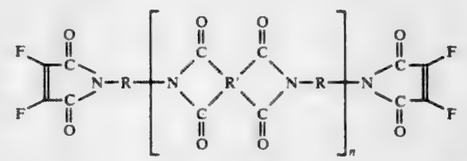
4,173,700

BIS (DIFLUOROMALEIMIDE) CAPPED PROPOLYMERS AND POLYMERS

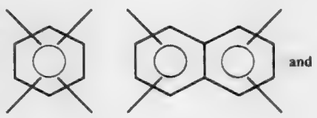
Howard E. Green, Seal Beach; Robert J. Jones, Hermosa Beach, and Michael K. O'Rell, Manhattan Beach, all of Calif., assignors to TRW Inc., Cleveland, Ohio

Filed Jun. 21, 1978, Ser. No. 917,602
Int. Cl.² C08G 73/10
U.S. Cl. 528—125 **8 Claims**

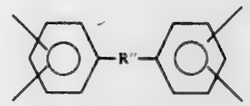
1. Thermally curable prepolymers of the formula:



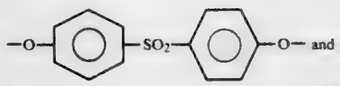
wherein n has a value from 0 to about 3, each R is independently an aromatic radical and R′ is a tetra functional radical selected from the group consisting of:



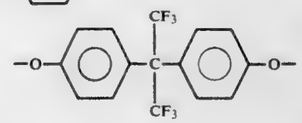
and



wherein R″ is a difunctional radical selected from the group consisting of $-SO_2-$, $-O-$, $-S-$, $-CO-$,



and



4,173,701

SPEAKER DIAPHRAGM MOLDED FROM POLY-BIPHENOL PHTHALATE TYPE RESIN FILM

Kosaku Murata, Kobe; Satoshi Takayama, Moriguchi, and Hirotoshi Niguchi, Kashihara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 26, 1977, Ser. No. 836,734
Claims priority, application Japan, Sep. 30, 1976, 51-118110
Int. Cl.[2] G10K *13/03*
U.S. Cl. 528—194 **3 Claims**

1. A speaker diaphragm having a lowest resonant frequency of about 300 to 400 Hz, molded from a poly-bisphenol phthalate type resin film having ester linkages prepared from an aromatic dicarboxylic acid selected from isophthalic acid, terephthalic acid and a mixture thereof and a bifunctional phenol, wherein said film has a specific gravity of about 1.2, an elastic modulus of 9,000 to 13,000 kg/cm^2, and an inner loss of 0.009 to 0.02.

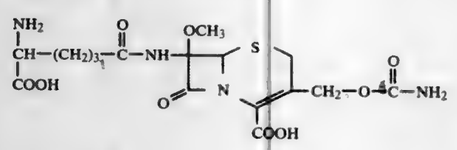
4,173,702

7-(5-AMINO-5-CARBOXYVALER-AMIDO)-3-(CARBAMOYLOXYMETHYL)-7-METHOXY-3-CEPHEM-4-CARBOXYLIC ACID

Marvin Gorman; Calvin E. Higgens, and Ramakrishnan Nagarajan, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 849,395, Aug. 12, 1969, abandoned. This application Aug. 10, 1970, Ser. No. 62,390
Int. Cl.[2] C07D *501/20*
U.S. Cl. 544—21 **3 Claims**

1. The compound of the formula



or a salt thereof.

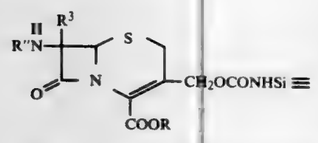
4,173,703

PREPARATION OF CARBAMATES

Floyd E. Roberts, Princeton, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 747,839, Dec. 6, 1976, which is a continuation of Ser. No. 398,495, Nov. 18, 1973, abandoned, which is a continuation of Ser. No. 207,982, Dec. 14, 1971, abandoned. This application Feb. 27, 1978, Ser. No. 881,201
Int. Cl.[2] C07D *501/20*
U.S. Cl. 544—16 **3 Claims**

1. A compound of the formula



wherein R'' represents an acyl group conventionally known in the cephalosporin art, R_3 represents hydrogen or methoxy, R represents hydrogen or a blocking group and Si≡ represents trimethylsilyl.

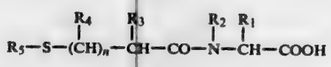
4,173,704

DITHIO AMINOACID DERIVATIVES

Miquel A. Ondetti, Princeton, and David W. Cushman, West Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 773,864, Mar. 3, 1977, which is a division of Ser. No. 684,606, May 10, 1976, Pat. No. 4,053,651. This application May 26, 1978, Ser. No. 918,881
Int. Cl.[2] C07D *233/64*
U.S. Cl. 548—336 **8 Claims**

1. A compound of the formula

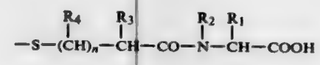


or physiologically acceptable salt thereof, wherein n is 0, 1 or 2;

R_1 is imidazol-4-yl-lower alkylene;

R_2, R_3 and R_4 each is hydrogen, lower alkyl or phenyl-lower alkylene; and

R_5 is



4,173,705

2-(2-FUROYL)-4-METHYLPYRIDINE AND ITS METHYL IODIDE QUATERNARY SALT

Ricardo G. Jarque; Juan B. Cartes; Rosa L. Jimenez, all of Barcelona; Cristobal M. Roldan, and Fernando R. Peinado, both of Madrid, all of Spain, assignors to Laboratorios Made, S.A., Madrid, Spain

Filed Oct. 6, 1978, Ser. No. 949,021
Claims priority, application Spain, Oct. 7, 1977, 462.990
Int. Cl.[2] C07D *405/02*
U.S. Cl. 546—283 **6 Claims**

1. 2-(2-Furoyl)-1,4-dimethylpyridinium iodide.

2. 2-(2-Furoyl)-4-methylpyridine.

3. A process for preparing 2-(2-furoyl)-1,4-dimethylpyridinium iodide comprising the steps of reacting 2-cyano-4-methylpyridine under a nitrogen atmosphere with an ethereal solution of freshly prepared 2-furyl-lithium, hydrolyzing the reaction mixture under acid conditions to form 2-(2-furoyl)-4-methylpyridine, and heating the 2-(2-furoyl)-4-methylpyridine in the presence of methyl iodide to form 2-(2-furoyl)-1,4-dimethylpyridinium iodide.

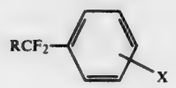
4,173,706

PROCESS FOR PRODUCING FLUORINATED ORGANIC COMPOUNDS CONTAINING A DIFLUOROMETHYLENE GROUP FROM COMPOUNDS COMPRISING AT LEAST ONE CARBONYL FUNCTION

François Mathey, and Jean Bensoam, both of Ballancourt, France, assignors to Institute National de Recherche Chimique Appliquee, Paris, France

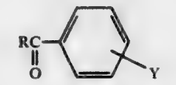
Continuation of Ser. No. 533,272, Dec. 16, 1974, abandoned, which is a continuation-in-part of Ser. No. 185,362, Sep. 30, 1971, Pat. No. 3,878,296. This application Apr. 6, 1978, Ser. No. 894,080
Claims priority, application France, Dec. 14, 1973, 7344885
Int. Cl.[2] C07B *9/00*; C07C *87/28, 103/22, 125/06*
U.S. Cl. 560—30 **9 Claims**

1. Process for preparing an organic compound of the formula



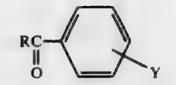
wherein R is H, lower alkyl or phenyl and X is a group capable of reacting with MoF_6 and selected from Lewis bases and groups possessing labile hydrogen atoms,

by fluorinating a starting compound of the formula

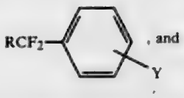


wherein Y is a group incapable of reacting with MoF_6 under the following conditions, but is capable of conversion to X by conventional synthesis, comprising

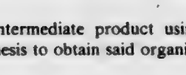
reacting substantially anhydrous MoF_6 with said compound



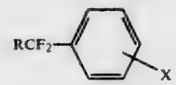
under anhydrous conditions in solution in an organic solvent inert with respect to the reactants at a temperature of about −20° C. to about +40° C. under an inert atmosphere to obtain the intermediate product



, and



reacting said intermediate product using a conventional organic synthesis to obtain said organic compound



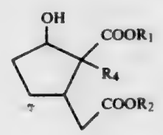
4,173,707

CYCLOPENTANOL DERIVATIVES

Sigeru Torii; Hideo Tanaka, and Yuichi Kobayashi, all of Okayama, Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Osaka, Japan

Filed Jun. 8, 1978, Ser. No. 913,689
Claims priority, application Japan, Aug. 12, 1977, 52-97174; Aug. 12, 1977, 52-97175
Int. Cl.[2] C07C *69/74*
U.S. Cl. 560—122 **3 Claims**

1. A cyclopentanol derivative represented by the formula



wherein R_1 and R_2 are lower straight-chain or branched-chain alkyl, alkenyl or aralkyl, and R_4 is 2-pentenyl or 2-pentynyl.

4,173,708

PURIFICATION OF 4,4'-BENZOPHENONEDICARBOXYLIC ACID

Louis R. Palmer, Morristown, and James T. Karo, Madison both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Oct. 31, 1977, Ser. No. 846,758
Int. Cl.[2] C07C *65/20*
U.S. Cl. 562—460 **5 Claims**

1. A process for purifying 4,4'-benzophenonedicarboxylic acid, containing aromatic monocarboxylic acid genetic impurity, which comprises the steps of

(a) mixing the impure 4,4'-benzophenonedicarboxylic acid with aqueous ammonium hydroxide solution, containing about 28 weight percent or less of ammonia, in weight ratio of solution to acid of about 5:1 to 100:1 thereby forming an aqueous solution of the ammonium salt of the aromatic dicarboxylic acid;

(b) removing insoluble impurities, if present, from the solution of the ammonium salt of the acid;

(c) mixing the resultant solution with an inert water-soluble organic liquid, containing 1 to 10 carbon atoms and selected from the group consisting of aliphatic nitriles, cycloaliphatic ethers and aliphatic ketones, which is a nonsolvent for the ammonium salt, in a weight ratio of organic liquid to solution not greater than about 20:1, thereby precipitating the ammonium salt of the acid;

(d) separating the ammonium salt from the solution; and

(e) recovering the aromatic dicarboxylic acid from the ammonium salt.

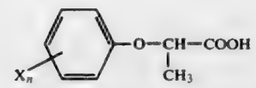
4,173,709

PROCESS FOR THE PREPARATION OF DEXTROROTATORY 2-PHENOXYPROPIONIC ACID DERIVATIVES

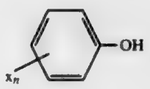
Jean Metivier, and Michel Sauli, both of Paris, France, assignors to Rhone-Poulenc S.A., Paris, France

Continuation-in-part of Ser. No. 746,166, Nov. 30, 1977, abandoned, which is a continuation of Ser. No. 497,461, Aug. 14, 1974, abandoned, which is a continuation of Ser. No. 337,006, Mar. 1, 1973, abandoned, which is a continuation-in-part of Ser. No. 336,832, Feb. 28, 1973, abandoned, which is a continuation of Ser. No. 601,874, Dec. 15, 1966, abandoned. This application Feb. 8, 1977, Ser. No. 766,667
Claims priority, application France, Dec. 17, 1965, 65.42858
Int. Cl.[2] C07C *59/26*
U.S. Cl. 562—471 **10 Claims**

3. A process for the preparation of a 2-phenoxypropionic acid dextrorotatory in acetone, ethanol and chloroform, of the formula:



in which the symbol X_n represents o-methyl, 4-chloro-2-methyl, 2,4,5-trichloro-, or 2,4-dichloro, which comprises heating an alkali metal salt of 2-chloropropionic acid whose sodium salt has an optical rotation $[\alpha]D^{22} = +4°$ (c = 10, water) with an alkali metal derivative of a phenol of the formula:



in which the symbol x_n is as hereinbefore defined, in a refluxing inert organic solvent of boiling point at least as high as that of an aromatic hydrocarbon solvent, and treating with an acid the resultant alkali metal salt of the said 2-phenoxypropionic acid.

4,173,710

HALOGENATED POLYETHER POLYOLS AND POLYURETHANE FOAMS PRODUCED THEREFROM

Jean-Claude Boulet, Tavaux-Cite, France; Rene Walraevens, Brussels, Belgium; Gerard Bonaety, Tavaux-Cite, France; Jacques Lolivier, and Paul Trouillet, both of Brussels, Belgium, assignors to Solvay & Cie, Brussels, Belgium

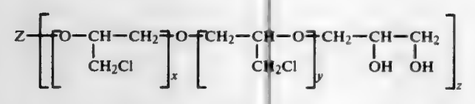
Continuation of Ser. No. 729,423, Oct. 4, 1976, abandoned, which is a division of Ser. No. 607,595, Aug. 25, 1975, abandoned, which is a continuation of Ser. No. 353,536, Apr. 23, 1973, abandoned. This application Nov. 14, 1977, Ser. No. 851,252

Claims priority, application Luxembourg, May 15, 1972, 65359; Feb. 12, 1973, 67005

Int. Cl.[2] **C07C** *43/02, 43/12;* **C08J** *9/00*

U.S. Cl. 568—614 **6 Claims**

1. Polyether polyols of the general formula:



in which z represents a number between 2 and 6, x and y represent numbers between 0 and 12 such that the mean value $\overline{x+y}$ per chain is between 0 and 12, and that z $(\overline{x+y})$ in which $\overline{x+y}$ represents the mean value of x+y in the entire molecule is between 1 and 72 and Z represents the residue of a halogenated polyhydroxyl compound initiator and comprises a C_2 to C_6 halogenated aliphatic radical of valence z, the halogen being selected from the group consisting of chlorine and bromine.

4,173,711

3-(2-CHLOROALLYLOXY)-2(10)-PINENE

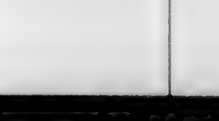
Cynthia J. Mussinan, Bricktown; Braja D. Mookherjee, Holmdel; Manfred H. Vock, Locust; Frederick L. Schmitt, Holmdel, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; James M. Sanders, Eatontown, N.J.; Bette M. Light, Highlands, N.J., and Edward J. Granda, Englishtown, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 872,937, Jan. 27, 1978, Pat. No. 4,131,687. This application Sep. 5, 1978, Ser. No. 939,895

Int. Cl.[2] **C07C** *43/18*

U.S. Cl. 568—665 **1 Claim**

1. The compound having the structure:



4,173,712

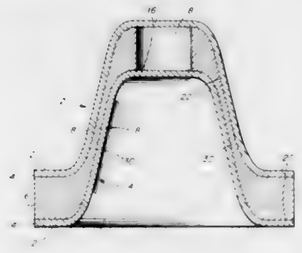
ELECTRICAL CIRCUIT COMPONENT PROTECTING DEVICE

Kenneth H. Purser, Manchester, Mass., assignor to General Ionex Corporation, Ipswich, Mass.

Filed Aug. 30, 1978, Ser. No. 937,954

Int. Cl.[2] **H05K** *9/00*

U.S. Cl. 174—35 R **5 Claims**



1. A device for protecting electrical circuit components from the effects of transient electromagnetic fields in the external environment surrounding the device comprising at least two substantially identical conductive members in spaced, stacked relation; each said conductive member comprising a substantially flat, permissibly apertured, inner portion, a substantially flat flange portion adjacent its periphery, and a wall portion inclined outwardly relative to said central portion, said wall portion connected to said flange portion and to said inner portion by first and second gradually sloping arch portions respectively; and a layer of dielectric material filling the spaces between each conductive member and the conductive members adjacent thereto, each said layer being adapted to allow the location of an electrical circuit component in the region between the inner portions of adjacent conductive members; said device thereby defining in the spaces between adjacent conductive members a component protecting region between adjacent inner portions surrounded in turn by a first transitional region between adjacent second arch portions, a high energy storage region between adjacent wall portions, and a second transitional region between adjacent first arch and flange portions, such that the device will remain electrically stable under surge conditions and the energy of a surge will be stored in the high energy storage region leaving the component protecting region substantially unaffected.

4,173,713

CONTINUOUSLY EXPANDABLE SWITCHING NETWORK

Kenneth F. Giesken, Fairfield, and John M. Cotton, East Norwalk, both of Conn., assignors to International Telephone & Telegraph Corporation, Nutley, N.J.

Continuation of Ser. No. 766,396, Feb. 7, 1977, abandoned. This application May 25, 1978, Ser. No. 909,583

Int. Cl.[2] **H04M** *3/00*

U.S. Cl. 179—18 EA **16 Claims**

1. A plurality of switches arranged in a plurality of stages of said switches to comprise an expandable switching network with each of said switches comprising:

means for providing a plurality of inlets for receiving digital signals and a plurality of outlets;

means for adapting each of said outlets to selectively reflect said digital signals back to any of said inlets;

means for selectively coupling any of said inlets to any of said outlets to provide an output for said digital signals out of said switch from said outlets;

means for coupling said signals from the outlets of the switches of any of said stages of switches to the inlets of switches of higher order switching stages; and



means for reserving said outlets of any of said switches for coupling said digital signals from said outlets to the inlets of switches of said higher order switching stages.

4,173,714

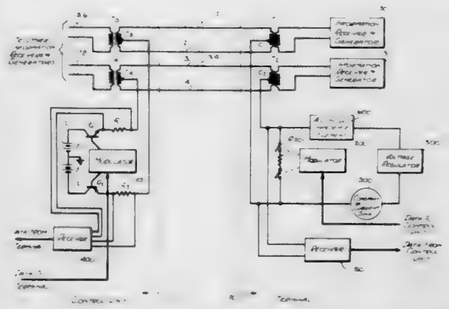
COMMUNICATION CIRCUIT WITH COMBINED POWER FEED AND DATA TRANSMISSION OVER A PHANTOM CHANNEL

Alan Bloch, New York; Frank A. Coviello, Peekskill, both of N.Y.; Ira Guzik, Fairfield, and Candido Puebla, Bridgeport, both of Conn., assignors to TIE/Communications, Inc., Stamford, Conn.

Filed Jun. 3, 1977, Ser. No. 803,243

Int. Cl.[2] **H04Q** *5/18*

U.S. Cl. 179—99 R **12 Claims**



1. A circuit arrangement providing first and second communication channels, power feed and bi-directional signalling between first and second equipment units comprising,

four conductors the ends of which are connected between the first and second equipment units, a first pair of said conductors providing a first information channel between the first and second equipment units, and a second pair of said conductors providing a second information channel between the first and second equipment units,

first and second transformers for inductively coupling associated first communication channels in the first and second equipment units via said first conductor pair, each of the windings of said first and second transformers connected to said first conductor pair having a center tap connection,

third and fourth transformers for inductively coupling associated second communication channels in the first and

second equipment units via said second conductor pair, each of the windings of said third and fourth transformers connected to said second conductor pair having a center tap connection,

means in the first equipment unit connected via said center taps of said first and third transformers to said first and second conductor pairs at the first equipment unit for

(a) applying voltage to said four conductors,

(b) applying voltage-modulated data signals to said four conductors for transmission from the first equipment unit to the second equipment unit, and

(c) receiving current-modulated data signals transmitted from the second equipment unit on said four conductors, and means in the second equipment unit connected via said center taps of said second and fourth transformers to said first and second conductor pairs at the second equipment unit for

(a) receiving and regulating said voltage applied to said four conductors in the first equipment unit and applying said voltage to power the second equipment unit,

(b) receiving voltage-modulated data signals on said four conductors from the first equipment unit, and

(c) applying current-modulated data signals to said four conductors for transmission from the second equipment unit to the first equipment unit.

4,173,715

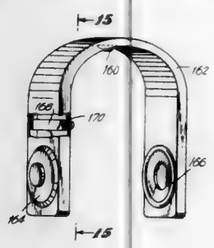
ACOUSTICAL DEVICE

Theodore D. Gosman, 9 Warner Ct., Huntington, N.Y. 11743

Filed Jan. 13, 1978, Ser. No. 869,175

Int. Cl.[2] H04M *1/05*; H04R *5/00*

U.S. Cl. 179—156 R **22 Claims**



1. An acoustical device for the reception of sound by humans which comprises a stereo headset having an acoustic passage, and a terminal earphone at each end of said headset, each of said terminal earphones including a first means to emit sound into said acoustic passage, said headset being mountable on the head of a human so that the terminal earphone at each end of said headset is disposable over an ear of a human, said acoustic passage being a continuous hollow passage and extending from one side of said headset to the other side, so that sound emanating from one terminal earphone is channeled from one ear of a human to the other ear, and so that sound emanating from the other terminal earphone is channeled from the other ear of a human to the one ear, an adjustable mechanical sound inhibitor disposed in said acoustic passage, so that various ratios of direct sound to ambient sound reflected through said acoustic passage may be mixed and received in an ear of a human as a mixed sound, said mechanical sound inhibitor permitting at least partial channeling of sound between the ears, and a second means to emit sound into said acoustic passage, said second means to emit sound being disposed in said acoustic passage.

4,173,716

MICROWAVE HEATING APPARATUS

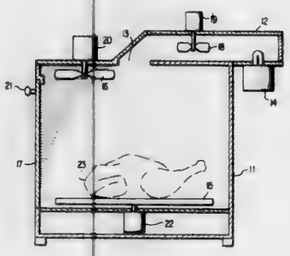
Hirokazu Takahashi, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kanagawa, Japan

Filed Jul. 19, 1977, Ser. No. 817,039

Claims priority, application Japan, Jul. 20, 1976, 51/86353

Int. Cl.[2] H05B *9/06*

U.S. Cl. 219—10.55 F **18 Claims**



1. A microwave heating apparatus for heating an object comprising:

an oven enclosure having a microwave coupling inlet;

a magnetron for generating a microwave at the oscillating frequency of the magnetron;

a waveguide having one end connected to the microwave coupling inlet and the other end connected to the magnetron for transmitting a microwave from the magnetron into the oven enclosure;

drivable means disposed inside the oven enclosure for stirring the pattern of the electromagnetic field of the microwave transmitted into the oven enclosure;

drivable means disposed inside the waveguide for frequency pulling the oscillating frequency of the magnetron; and

means for driving the frequency pulling means independently of the stirring means.

4,173,717

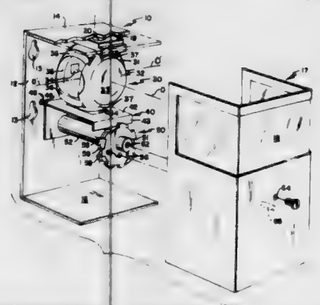
OPTICAL ASSEMBLY

David B. Lederer, Rochester, N.Y., assignor to Detection Systems Inc., Fairport, N.Y.

Filed Jan. 27, 1978, Ser. No. 872,885

Int. Cl.[2] H01J *5/02*

U.S. Cl. 250—239 **9 Claims**



1. An optical assembly for a photoelectric beam system, said assembly comprising

(a) a frame;

(b) an optical module including a spherically shaped shell having a radiation focusing element mounted on the surface thereof for focusing incident radiation into the interior of said shell, said radiation-focusing element having an optical axis;

(c) a pair of spaced support members mounted on said frame for supporting said shell therebetween, at least one of said support members being movable between a first position in which said members cooperate to support said shell in such a manner as to enable said shell to be manually rotatable in at least two mutually perpendicular planes, and a second position in which said members cooperate to prevent rotation of said shell; and

(d) locking means for selectively positioning said movable member in either said first or second position.

4,173,718

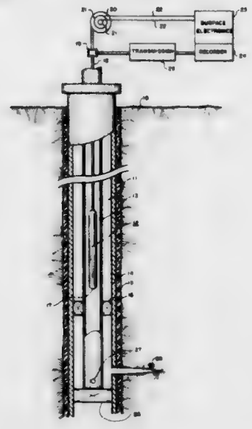
METHOD FOR MONITORING FLUID MOVEMENT BEHIND CASING IN OIL AND GAS WELLS

Walter H. Fertl, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 2, 1977, Ser. No. 830,239

Int. Cl.[2] G01V *5/00*

U.S. Cl. 250—259 **3 Claims**



1. A method for locating fluid movement between the casing and the earth formations in a cased earth borehole, comprising:

traversing a cased earth borehole with a gamma ray detection system, thereby creating a base log;

injecting a fluid containing a salt from the group consisting of potassium, thorium and uranium salts into the formation of interest adjacent the casing; and

thereafter traversing the said cased earth borehole with said gamma ray detection system, thereby creating a second log indicative of the movement of said injected fluid.

4,173,719

APPARATUS FOR IRRADIATING FLOWING MATERIALS

Manfred Tauber, Holm; Dieter Heuer, Uetersen; Max Kröncke, Wedel, all of Fed. Rep. of Germany, and Peter Schimmelpfennig, deceased, late of Holm, Fed. Rep. of Germany (by Ella Anneliese Schimmelpfennig, nee Lehmann, sole heir), assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Fed. Rep. of Germany

Filed Aug. 29, 1978, Ser. No. 937,856

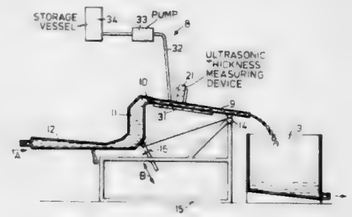
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1977, 2746917

Int. Cl.[2] G01N *23/00*

U.S. Cl. 250—310 **13 Claims**

1. In an apparatus for irradiating a flowing material with an electron beam, including an electron beam accelerating device having an electron beam emitter; an irradiation device having an inclined irradiation tray arranged underneath the electron beam emitter and determining a flowpath for the material to be irradiated; and material feeding means for introducing the material onto the inclined irradiation tray; the improvement in said material feeding means comprising

(a) a riser vessel having an upper portion, a bottom portion



and an overflow edge situated at said upper portion and adjoining said irradiation tray upstream thereof as viewed in the direction of material flow; and

(b) at least one diffuser communicating with said bottom portion of said riser vessel for introducing the material thereinto.

4,173,720

METHOD AND APPARATUS FOR IMAGE CONSTRUCTION

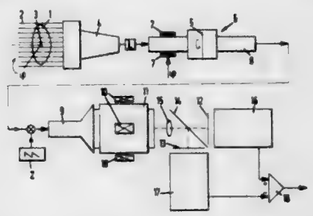
Ronald J. Geluk, Nootdorp, Netherlands, assignor to N.V. Optische Industrie "De Oude Delft", Netherlands

Filed May 9, 1977, Ser. No. 795,238

Claims priority, application Netherlands, May 17, 1976, 7605254

Int. Cl.[2] A61B *6/00, 6/02*

U.S. Cl. 250—445 T **33 Claims**



1. A method of constructing at least one tomogram from a plurality of profiles by means of back projection, characterized in that analog convolution with a suitable function is applied and being further characterized in that line images derived from the profiles are reproduced, summed, by means of back projection on a cathode ray tube having a presisting screen; that the residual image is convolved analogly by means of a luminance amplifier provided with deflection coils with a function F(x,y) established in at least one mask disposed behind said luminance amplifier.

9. A method of constructing at least one tomogram from a plurality of profiles by means of back projection, characterized in that analog convolution with a suitable function is applied and being further characterized in that profiles are written on the persisting screen of a cathode ray tube; that the written profiles are convolved analogly by means of a luminance amplifier provided with deflection coils with a function F(x) established in at least one mask disposed behind the luminance amplifier; and that the required tomogram is formed from the convolved profiles by means of back projection.

4,173,721

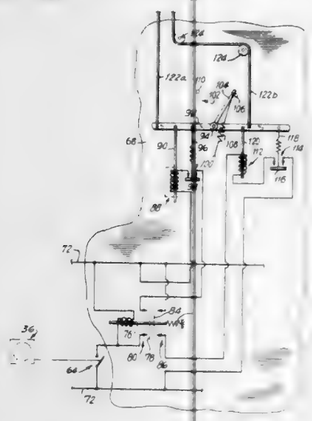
WINDOW SHADE CONTROLS AND METHOD ASSOCIATED THEREWITH

Emma D. Louis, 157-11 N. Conduit Ave., Jamaica, N.Y. 11434

Filed Mar. 17, 1978, Ser. No. 887,639

Int. Cl.[2] H01H *3/06, 5/06*

U.S. Cl. 307—115 **1 Claim**



1. A device for automatically controlling a window shade comprising:

a lever arm pivotally mounted for movement between a first and second position;

first solenoid means coupled to said lever arm for pivotting said lever arm to said first position in response to electrical activation by electrical timing means;

second solenoid means coupled to said lever arm for pivotting said lever arm to said second position in response to electrical activation by electrical timing means;

first switch means for deactivating said first solenoid means upon said lever arm pivotting to said first position;

second switch means for deactivating said second solenoid means upon said lever arm pivotting to said second position;

spring toggle means coupled to said lever arm for maintaining said lever arm in either of said first and second positions after deactivation of said first or second solenoid means respectively by said first or second switch means respectively;

electrical timing means electrically coupled to said first and second solenoid means to sequentially activate and deactivate the latter according to a predetermined timing sequence; and

a pair of elongated flexible members, each having one end connected to a respective end portion of said lever arm and another end adapted to be connected to one of a pair of strings of a Venetian blind, so that when said lever arm assumes said first position, one of the Venetian blind strings is pulled by one of the elongated flexible members and when said lever arm assumes the second position, the other of said Venetian blind strings are pulled by the other of the elongated flexible members.

4,173,722

DIGITAL PULSE GENERATOR WITH END-STOP DETECTION AND CONTROL

Richard L. Detering, Buffalo, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 14, 1978, Ser. No. 886,390

Int. Cl.[2] H03K *17/72, 5/13*

U.S. Cl. 307—252 Q **4 Claims**

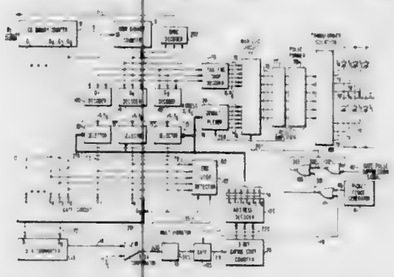
1. In a digital gate pulse generator for sequentially firing thyristors in accordance with a time reference signal derived from a digital counter, the combination of:

comparator means operative in relation to said time reference signal and to a firing angle reference signal to assume one of two states;

means responsive to a transition by said comparator means from a first to a second state for generating a hard pulse;

means responsive to a generated hard pulse for causing firing of the "next" thyristor to be set into conduction;

means responsive to said second state of said comparator means for generating a substitute pulse when said counter



assumes a predetermined first count and responsive to said first state of said comparator means for generating a substitute pulse when said counter assumes a predetermined second output;

means being provided for preventing firing of said next thyristor in response to a generated hard pulse when the count in said counter is below said first count, and when the count in said counter is above said second count;

said hard pulse responsive means being further responsive to a generated substitute pulse, thereby to cause firing of said "next" thyristor.

4,173,723

PHOTO DETECTOR INPUT CIRCUIT

Gabor C. Temes, Los Angeles, and Derek T. Cheung, Thousand Oaks, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 12, 1978, Ser. No. 868,946

Int. Cl.[2] H03K *1/02*

U.S. Cl. 307—304 **4 Claims**



1. A photo detector input circuit comprising:

a first FET with a source for coupling to an output of a photo detector, a gate coupled to a first gate voltage, and a drain for coupling to an output circuit;

a second FET with a grounded source and a gate coupled to said gate of said first FET, said second FET being positioned adjacent said first FET so that the gate voltages and threshold voltages of said first and second FETs are substantially equal;

a third FET with a source coupled to the drain of said second FET, a gate coupled to a third gate voltage, and a drain coupled to a third drain voltage; and

wherein said gates of said first and second FETs are coupled to said drain of said second FET, and said third gate voltage and said third drain voltage are chosen so that the currents of the drains of said second and third FETs are equal and approximately the same as the output current of the photo detector, whereby a low impedance and virtual ground are provided at said source of said first FET, and the voltage variation of said first FET is reduced.

4,173,724

TWO PART LAMINATED STATOR FOR AN ELECTRIC MACHINE WITH AN AIR-GAP WINDING

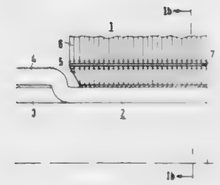
Rudolf von Musil, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 5, 1977, Ser. No. 857,700

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1976, 2656132

Int. Cl.[2] H02K *1/12*

U.S. Cl. 310—258 **2 Claims**



1. In a stator of an electric machine having a stator winding and a laminated core subdivided into radially inner and radially outer concentric component cores defining a cylindrical joint therebetween, axially extending slots formed in said component laminated cores at said cylindrical joint and coupling means fitted in said slots for preventing rotation of said laminated core components, said stator winding being secured at the inner periphery of said inner component core, said stator winding comprising a one-layer air gap winding with every respective second bar thereof being radially outwardly bent in the end turn region thereof, said coupling means comprising elastic isolating members received in oppositely disposed pairs of said axially extending slots.

4,173,725

PIEZOELECTRICALLY DRIVEN ULTRASONIC TRANSDUCER

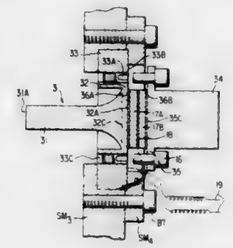
Kiyokazu Asai, and Akihiro Takeuchi, both of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Mar. 7, 1978, Ser. No. 884,148

Claims priority, application Japan, Mar. 7, 1977, 52/24969

Int. Cl.[2] H01L *41/10*

U.S. Cl. 310—325 **43 Claims**



1. An ultrasonic transducer comprising:

a first cylindrical member including a mechanical vibration amplifying part formed in symmetry around the axis thereof and having a gradually increased cross-sectional area toward a base portion thereof, said base portion being formed with an axially thinnest walled annular portion and a flat surface perpendicular to the axis thereof, and an annular rigid part integrally formed with said mechanical vibration amplifying part coaxially therewith, said annular rigid part abutting said thinnest walled portion and being extended from said thinnest walled portion axially and radially outwardly to have sufficient rigidity and weight, and said annular rigid part being provided, in the proximity of said thinnest walled portion, with an annular groove which axially extends from the surface of said annular rigid part to a depth which at least corresponds to the axial thickness of said thinnest walled portion of said mechanical vibration amplifying part;

a second cylindrical member comprising a backing block of a cylindrical body, the base portion of which is formed with a flange and a flat surface perpendicular to the axis thereof;

an ultrasonic transducer portion interposed between said flat surfaces of said first and second cylindrical members and including a pair of piezoelectric elements having flat surfaces perpendicular to the axis of said first and second cylindrical members, and an electrode plate interposed between said pair of piezoelectric elements; and

fastening means for pressingly abutting said flat surfaces of said piezoelectric elements against flat surfaces of said first and second cylindrical members and integrally clamping said annular rigid part and said flange of said second cylindrical member to each other in a manner to circumvent said annular groove and said ultrasonic transducer portion,

whereby cracking of piezoelectric elements is prevented to ensure stabilized operations without transitional variations in electric impedance and resonance frequency and to allow continuous vibrating operations of large amplitude over a long period of time.

4,173,726

TUNING FORK-TYPE PIEZOELECTRIC VIBRATOR

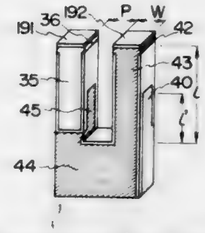
Motoyasu Hanji, Tokyo, Japan, assignor to Kabushiki Kaisha Kinekisha-Kenkyujo, Tokyo, Japan

Continuation of Ser. No. 592,955, Jul. 3, 1975, abandoned. This application Jul. 8, 1976, Ser. No. 703,497

Claims priority, application Japan, Jul. 5, 1974, 49-78680[U]

Int. Cl.[2] H01L *41/10*

U.S. Cl. 310—366 **5 Claims**



1. A tuning fork-type piezoelectric vibrator comprising:

(i) a vibrator body having legs each with a sliding end and a free end, both as defined in the foregoing specification

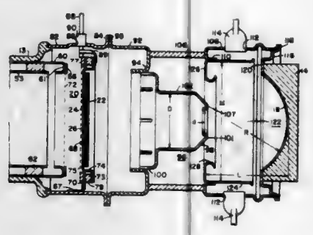
(ii) at least one excitation electrode positioned on a face of each leg, each such excitation electrode commencing at said sliding end and extending from said sliding end for a distance of from 0.3 l to 0.5 l, where l is the length of each of said legs measured from said sliding end to said free end.

4,173,727

ELECTRON IMAGE DEVICE

James Vine, Elmira, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 23, 1966, Ser. No. 560,385
Int. Cl.[2] H01J *39/00*
U.S. Cl. 313—99 5 Claims



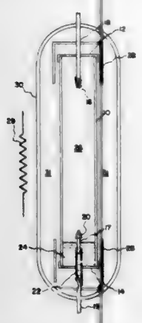
1. An electron-optical system comprising a photocathode element for emitting an electron image in response to a radiation image directed thereon, said photocathode element including an emitting surface of substantially spherical configuration having a radius with a center of curvature on the axis of said electron-optical system, and an anode disposed about the axis of said electron-optical system, said anode having an aperture through which said electron image is directed, said aperture having a diameter of a magnitude not less than 0.3 nor more than 0.5 times the length of said radius, said anode has a conical portion extending away from said aperture at an angle of approximately 45° with respect to the axis of electron-optical system, and a focusing electrode is disposed between said photocathode element and said anode element, said focusing electrode has a cylindrical portion disposed coaxially about the axis of said electron-optical system, said cylindrical portion having a diameter of a magnitude in the approximate range of 2.0 to 2.2 times the length of said radius.

4,173,728

PULSED CESIUM DISCHARGE LIGHT SOURCE

Harald L. Witting, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 730,129, Oct. 6, 1976, abandoned. This application May 19, 1978, Ser. No. 907,792
Int. Cl.[2] H01J *13/00*
U.S. Cl. 313—163 25 Claims



1. A long-lived metal vapor discharge lamp, suitable for operation in a pulsed mode, comprising:

an evacuable arc tube having a first end and a second end;

a solid metal anode disposed in the first end of said arc tube;

a liquid cesium reservoir disposed in the second end of said arc tube;

a cathode comprising a conductive material capable of adsorbing cesium, said cathode pointedly protruding from said reservoir so as to provide a preferred discharge path; and

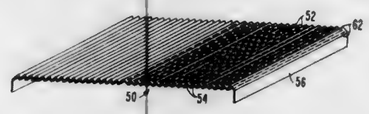
a fill gas, including cesium vapor, disposed within said arc tube between said anode and said cathode at a vapor pressure between approximately 5 torr and approximately 100 torr.

4,173,729

CATHODE-RAY TUBE HAVING A STEPPED SHADOW MASK

Robert P. Stone, and Albert M. Morrell, both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 24, 1977, Ser. No. 809,859
Int. Cl.[2] H01J *29/07*
U.S. Cl. 313—403 16 Claims



1. In a cathode-ray tube including an evacuated envelope, a color phosphor screen on the inner surface of said envelope, a multiapertured color selection shadow mask spaced from said screen, and electron gun means for generating and directing a plurality of electron beams along paths through said mask to said screen, the improvement comprising,

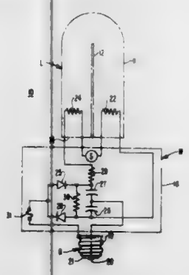
said shadow mask having a plurality of apertured portions through which said electron beams pass and at least one other portion connecting the apertured portions through which said electron beams do not pass, said other portions being step risers aligned substantially parallel to electron beam paths at corresponding points within said tube, and said step risers offsetting adjacent apertured portions relative to said screen.

4,173,730

COMPACT FLUORESCENT LAMP UNIT HAVING INTEGRAL CIRCUIT MEANS FOR DC OPERATION

Robert G. Young, Nutley, and Edward W. Morton, Teaneck, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 11, 1978, Ser. No. 923,598
Int. Cl.[2] H01J *7/44, 17/34*
U.S. Cl. 315—53 15 Claims



1. An electric lamp unit adapted for use in a lighting fixture that includes a lamp socket having terminals which are connected to an alternating-current power source when the fixture is energized, said lamp unit comprising, in combination;

an electric discharge lamp of single-ended construction having an envelope which contains (a) a pair of electrodes that are located at the same end of the envelope and on opposite sides of a partition means which defines a tortuous discharge channel and (b) an ionizable medium comprising a material which is in a vaporous state during lamp operation and exhibits a cataphoretic effect when the lamp is operated on direct current that causes the vaporous material to migrate toward and accumulate at the cathode end of the discharge channel and thus extinguish the electric discharge under such direct-current operating conditions, the electrode-containing end of said envelope having external contact means that are connected to said electrodes by lead-in conductors and said envelope end also having an hermetically-sealed component through which the lamp is evacuated when it is being manufactured,

a module coupled to said discharge lamp and enclosing circuit means that is connected to said electrodes and is adapted to convert an alternating-current input into a direct-current output which is applied to said electrodes when the circuit means is energized,

a base component coupled to said circuit-module and having terminals that are connected to the input portion of said circuit means and are engageable by the lamp socket terminals of the lighting fixture when the lamp unit is placed therein, and

means for allowing the vaporous ionizable material, during operation of the lamp in a direct-current mode, to circumvent the partition means at the electrode-containing end of the envelope and thus migrate from the cathode end to the anode end of the discharge channel without permitting the electric discharge to bypass the partition means comprising a transversely-extending diaphragm assembly that is in engagement with said partition means and the walls of the envelope and includes a porous component which is permeable to the vaporous ionizable material but constitutes an impenetrable barrier to the electric discharge,

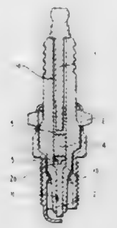
said porous component being so disposed that it also provides a passageway from the hermetically-sealed component of the electrode-containing end of said envelope into the envelope interior which permits water vapor and gaseous impurities to be evacuated from the envelope through said diaphragm assembly during lamp manufacture prior to the closure of said hermetically-sealed component.

4,173,731

RESISTOR COMPOSITION FOR SPARK PLUG HAVING A RESISTOR ENCLOSED THEREIN

Shunichi Takagi, and Masaru Fukuoka, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Mar. 2, 1978, Ser. No. 883,084
Claims priority, application Japan, Mar. 2, 1977, 52-22305
Int. Cl.[2] H01J *7/44, 17/34, 23/16;* H01K *1/62*
U.S. Cl. 315—58 16 Claims



9. In a spark plug having a resistor sealed therein and including a center electrode, a terminal electrode, an electrically conductive glass positioned between the center electrode and the terminal electrode, and a resistor separating the electrically conductive glass between the center electrode and the terminal electrode, wherein the center electrode and the terminal electrode are placed in a face-to-face relationship in an electrode bore of a porcelain insulator of the spark plug and sealed therein, the improvement which comprises said resistor being produced from a resistor composition comprising

(1) 100 parts by weight of

(a) a glass; and

(b) an inorganic filler selected from the group consisting of alumina, zircon, zirconia, silica, mullite, a clay or a mixture thereof;

with the glass (a) being present in a proportion of about 30 to about 70% by weight and the inorganic filler (b) being present in a proportion of about 70% to about 30% by weight; and wherein at least about 0.1% by weight of the inorganic filler (b) is replaced by at least one non-oxide compound having covalent bond characteristics and a specific resistivity of at least about 10^5 Ωcm at about 20° C. to about 300° C.;

(2) about 0.5 to about 7 parts by weight of carbon; and

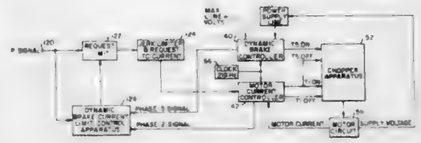
(3) 0 to about 20 parts by weight of at least one of a metal oxide, a transition metal carbide, SiC having a low electrical resistivity and B_4C.

4,173,732

DYNAMIC BRAKE CURRENT LIMITING CONTROL APPARATUS AND METHOD

Larry W. Anderson, West Mifflin, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 9, 1978, Ser. No. 876,310
Int. Cl.[2] H02P *3/12, 3/14*
U.S. Cl. 318—375 10 Claims



1. In control apparatus for a chopper having a current conducting thyristor and being responsive to a brake effort request signal for determining the current of a transit vehicle electric motor operating as a generator and thereby the brake effort provided when that current is supplied to a dynamic braking resistor, the combination of

means for determining a first time interval that current from said motor flows in the dynamic braking resistor,

means for determining a second time interval that current from said motor is not flowing in said thyristor,

means for establishing a predetermined relationship between said first time interval and said second time interval, and

means for controlling the current generated by said motor in response to said predetermined relationship.

4,173,733

BATTERY CHARGER WITH LIQUID CRYSTAL CHARGE CURRENT INDICATOR

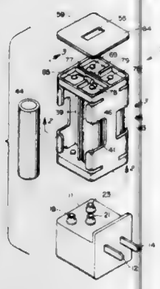
Raymond K. Sugalski, and Charles R. Blake, both of Gainesville, Fla., assignors to General Electric Company, Gainsville, Fla.

Continuation of Ser. No. 793,012, May 2, 1977, abandoned. This application May 30, 1978, Ser. No. 910,517
Int. Cl.[2] H02J *7/00*
U.S. Cl. 320—48 9 Claims

1. A battery charger comprising (a) a charger housing; (b) a circuit means in said housing for connection to a power source and for supplying charge current to a cell connected in said circuit means, said circuit means comprising a heat-generating

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circuit element; and (c) a liquid crystal indicator for indicating the flow of current through said element responsive to the



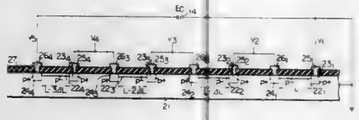
change in temperature of said element, said indicator fixed in said housing in a position adjacent said element.

4,173,734

VOLTAGE DIVIDING INTEGRATED CIRCUIT DEVICE

Masataka Hirasawa, Ayase; Akira Hashimoto, Yokohama; Kenichi Nagao, Yokohama, and Toshiaki Kobayashi, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Jan. 31, 1978, Ser. No. 873,882
Claims priority, application Japan, Jan. 31, 1977, 52-9396
Int. Cl.[2] H01L *27/10*; G05F *3/10*
U.S. Cl. 323—8 **6 Claims**



1. A voltage dividing integrated circuit device for providing equally divided potentials between first and second potential supplying terminals comprising:

a semiconductor substrate of a first conductivity type coupled with a predetermined potential;

a plurality of resistive regions of a second conductivity type formed in said semiconductor substrate which are connected in series between said first and second potential supplying terminals, and at least one equally divided potential taking-out electrode connected between respective resistive regions, wherein the lengths of said resistive regions are made progressively shorter in the increasing order of the potential difference between each respective resistive region and said substrate thereby to ensure substantially equal resistive values of said resistive regions.

4,173,735

CONTACT FAULT DETECTOR

Floyd S. Merchant, Box P25, R.D., Asbury, N.J. 08802

Filed Apr. 19, 1978, Ser. No. 897,785
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—421 **14 Claims**

1. A contact fault detector comprising:

first and second input leads for connecting in series with one or more contacts to be checked,

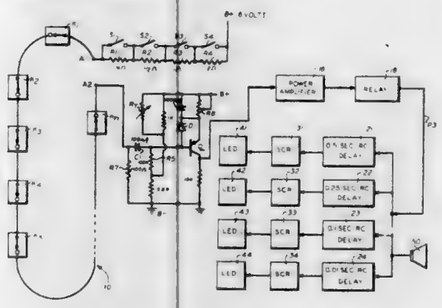
an amplifier having an input and an output,

a capacitor having an input side and an output side, said input side being connected to said first input lead and said output side being connected to said input of said amplifier,

a first resistor connected to said input side of said capacitor to provide a voltage reference,

a second resistor connected to said output side of said capacitor to provide a voltage bleed off function for said capacitor,

said amplifier being responsive to the amplitude of any voltage step applied to said capacitor to provide an output indicative of said amplitude, and



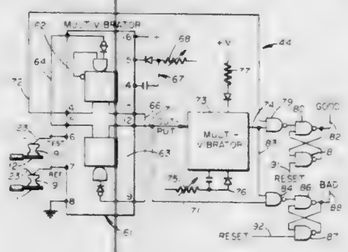
detection and indicating means responsive to said output of said amplifier to provide an indication of said amplitude of the voltage step applied to said capacitor.

4,173,736

CAPACITANCE DETECTING SYSTEM AND METHOD FOR TESTING WIRE CONNECTIONS

Charles K. Adams, St. Louis, Mo., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Mar. 6, 1978, Ser. No. 883,963
Int. Cl.[2] G01R *31/04, 27/26*; H03K *3/284*
U.S. Cl. 324—51 **7 Claims**



1. A system for detecting whether or not an unknown capacitor is above or below a predetermined capacitance level, which comprises:

a free running multivibrator having a pair of cross-coupled networks and a pair of capacitance networks for setting the duration of pulses of trains of output pulses;

means for connecting the unknown capacitance in one of said capacitance networks to produce a first pulse train having pulse durations determined by the value of the unknown capacitance, and a second pulse train having pulses of constant duration which are spaced in accordance with the value of the unknown capacitance;

means responsive to each transition in a first direction in the second pulse train for generating delayed strobing pulses; and

a pair of gating means selectively operated upon occurrences of coincidence of said strobing pulses with either said first or second pulse train for producing output signals indicative of whether or not said unknown capacitance is above or below the predetermined capacitance level.

5. A method of indicating connections between a group of wires of a cable and terminals secured at both ends of each wire, which comprises:

connecting a terminal which is properly secured to a wire in the cable to one side of capacitance network of one stage of a two stage cross-coupled multivibrator;

connecting a terminal of a test wire having one or both terminals not secured to the test wire to a second side of the capacitance network to produce a first pulse train emanating from said one stage of said multivibrator wherein the pulses are timed at a first frequency in accordance with capacitance between both wires having properly secured terminals connected to the capacitance network, and at a second higher frequency when the terminal of the test wire connected to the capacitance network is not secured to the test wire;

generating a series of timing pulses upon each transition in the same direction of each of said pulses in said first train;

generating a second pulse train emanating from the second stage of said multivibrator which is complementary to said first pulse train;

comparing said timing pulses with both said first and second pulse train;

producing a signal indicative of a non-secured terminal when said timing pulses coincide with the pulses of said first pulse train; and

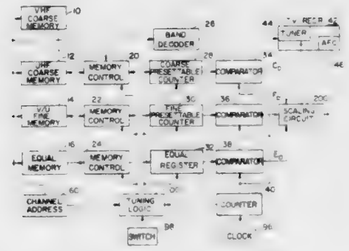
producing a signal indicative of a secured terminal when said timing pulses coincide with the complementary second pulse train.

4,173,737

LIMITED POSITION, NON-VOLATILE MEMORY TUNING SYSTEM

Peter C. Skerlos, Arlington Heights, and Richard A. Smirl, Chicago, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed May 4, 1978, Ser. No. 903,645
Int. Cl.[2] H04B *1/26*
U.S. Cl. 325—418 **10 Claims**



1. A television receiver including:

a voltage controllable tuner;

means producing coarse tuning information for a selected group of channels;

means for producing fine tuning information for said selected group of channels;

means producing equalization information, related to the slope of the tuner voltage-versus-frequency characteristic at said selected channels;

means developing AFC information related to the actual tuning condition of said receiver compared with a reference tuning condition;

means proportioning said fine tuning information and said AFC information with said equalization information;

means combining said proportioned fine tuning information and said proportioned AFC information with said coarse tuning information for the selected channel; and

means generating a tuning voltage therefrom for said tuner.

4,173,738

SOLID STATE LASER AMPLIFIER HAVING TWO OUTPUT WAVELENGTHS

Norman L. Boling, Toledo, Ohio, and George Dube, Temperance, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 469,976, Feb. 18, 1977, abandoned. This application Aug. 16, 1978, Ser. No. 934,242
Int. Cl.[2] H01S *3/16*
U.S. Cl. 330—4.3 **4 Claims**



1. A laser amplifier structure which comprises, in combination:

a first plurality of solid state, plate like lasable elements having a first absorption region of white pump light and an output beam at a first wavelength, said first plurality of elements being aligned in a spaced apart array along a common optical axis;

a second plurality of solid state, plate like lasable elements having a second absorption region of white pump light and an output beam at a second wavelength, said second plurality of elements being aligned in an alternating, adjoining pattern with said first plurality of elements along said common optical axis and said first and second pluralities of elements being such that neither strongly absorbs said first and second output beam wavelengths; and

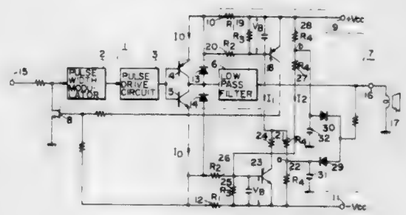
means for furnishing white pump light to said first and second elements.

4,173,739

OVERLOAD DETECTING CIRCUIT FOR A PWM AMPLIFIER

Tadao Yoshida, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 18, 1978, Ser. No. 943,139
Claims priority, application Japan, Sep. 20, 1977, 52-112912
Int. Cl.[2] H03F *3/04*
U.S. Cl. 330—298 **8 Claims**



1. An overload detecting circuit for a PWM amplifier comprising:

(a) a DC voltage source having a pair of terminals;

(b) first and second switching means connected in series between the terminals of said DC voltage source;

(c) signal input means for ON/OFF controlling said first and second switching means, alternatively, in response to an input pulse signal;

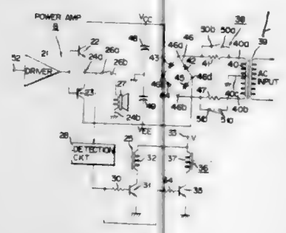
(d) a low pass filter connected between the connection point of said first and second switching means and an output terminal adapted to be connected with a load;
(e) first detecting means for detecting an output current flowing through said first switching means;
(f) second detecting means for detecting an output voltage produced at said output terminal;
(g) first rectifying means connected to said second detecting means and having a discharge time constant circuit determined by the cut-off frequency of said low pass filter; and
(h) first comparing means for comparing the outputs of said first detecting means and of said first rectifying means and for producing an overload indicative signal in response to the comparison result therebetween.

4,173,740

SPEAKER PROTECTION CIRCUIT

Yuuichi Nagata, and Tadataka Matsuoka, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 22, 1978, Ser. No. 944,781
Claims priority, application Japan, Sep. 29, 1977, 52/131116[U]
Int. Cl.² H03F *3/04*
U.S. Cl. 330—298 **5 Claims**



1. An audio amplifier circuit with speaker protection, comprising:
a power amplifier circuit having an output to which a loudspeaker is connected;
a power supply circuit connected with said power amplifier circuit and supplying a DC voltage to said power amplifier circuit;
a detection circuit connected to the output of said power amplifier circuit and detecting an overvoltage exceeding a predetermined level developed at said output;
a relay circuit means connected to said detection circuit and having normally closed contacts connected to the output of said power amplifier circuit to connect said loudspeaker to the output of said power amplifier circuit, said relay circuit means opening said contacts in response to said detection circuit when said overvoltage above the predetermined level is developed at the output of said power amplifier circuit, thereby disconnecting said loudspeaker from the output of said power amplifier circuit; and
a means connected to said detection circuit and power supply circuit and causing said power supply circuit to drop the supply voltage to said power amplifier circuit in response to said detection circuit when said overvoltage is developed at the output of said power amplifier circuit.

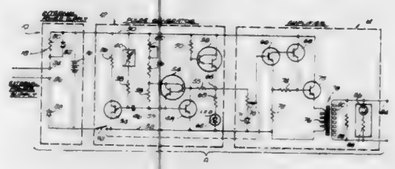
4,173,741

PULSE GENERATOR

Stanley L. Kameny, 14314 Hatteras St., Van Nuys, Calif. 91401

Division of Ser. No. 583,872, Jun. 5, 1975, Pat. No. 4,062,365.
This application Nov. 18, 1977, Ser. No. 852,623
Int. Cl.² H03K *1/18, 3/28*
U.S. Cl. 331—111 **4 Claims**

1. A pulse generator capable of being connected across first and second conductors from a source of power and comprising a unijunction transistor, a pulse generating transistor, a capacitor operatively connected in series with said unijunction transistor and said pulse generating transistor, a first potentiometer means to control the pulse rate and being connected between said unijunction transistor and said capacitor and said first conductor, a second potentiometer means to control pulse width and being connected between said capacitor and said pulse generating transistor and said first conductor, a transistorized switching means, a current limiting resistor operatively connected to said switching means and being connected between said capacitor and pulse generating transistor, said current limiting resistor being operable by said transistorized switching means and being effectively included in circuit with said capacitor and pulse generating transistor means only at selected charge or discharge times of said capacitor, and an impedance changing amplifier connected to said pulse generating transistor and deriving output pulses.

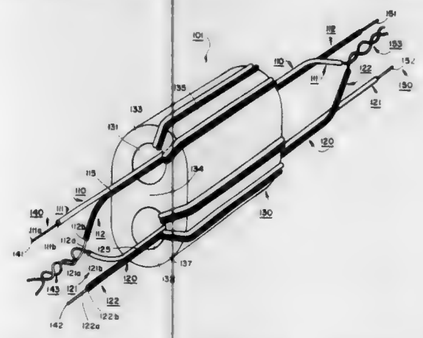


4,173,742

ANTENNA ISOLATION DEVICE

William L. Lehmann, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 15, 1978, Ser. No. 878,131
Int. Cl.² H01P *5/12*
U.S. Cl. 333—100 **9 Claims**



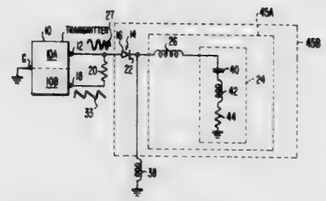
1. In a television receiver, apparatus for processing RF signals in both a VHF range and a UHF range received by an antenna network, comprising:
first and second antenna terminals;
signal splitter means for separating RF signals in the VHF range from RF signals in the UHF range, said signal splitter means including first and second input terminals;
a core having a closed loop configuration; and
first and second transmission lines each having first and second conductors, each of said conductors having first and second ends, each of said transmission lines being wound about said closed loop configuration of said core in the same sense and with a predetermined number of turns, said first end of said first conductor of said first transmission line being coupled to said first antenna terminal, said first end of said second conductor of said second transmission line being coupled to said second antenna terminal, said first end of said second conductor of said first transmission line being coupled to said first end of said first conductor of said second transmission line, said second end of said second conductor of said first transmission line being coupled to said first splitter input terminal, said second end of said first conductor of said second transmission line being coupled to said second splitter input terminal, said second end of said first conductor of said first transmission line being coupled to said second end of said second conductor of said second transmission line;
said predetermined number of turns being selected to substantially determine an upper frequency 3 db point higher than the highest frequency in said UHF range;
said core being formed from a magnetic material having permeability characteristics which are an inverse function of frequency and selected to substantially determine a lower frequency 3 db point below the lowest frequency in said VHF range without substantially affecting said upper frequency 3 db point.

4,173,743

COUPLING A FREQUENCY MODULATED SIGNAL TO A TUNED LOAD

Arnt P. Arntsen, Manchester, Mass., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 2, 1978, Ser. No. 882,876
Int. Cl.² H03N *7/38*
U.S. Cl. 333—32 **7 Claims**



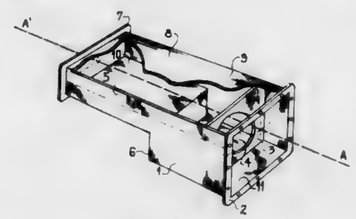
1. A circuit for matching a tuned load to a source that provides a frequency modulated signal, comprising:
means for providing a bias signal having an amplitude that is substantially proportional to the frequency of said modulated signal; and
means responsive to said bias signal for tuning said circuit to the frequency of said modulated signal.

4,173,744

IMPEDANCE MATCHED COUPLING DEVICE FOR MICROWAVE TUBES

Georges Faillon, and Guy Egloff, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 23, 1977, Ser. No. 827,087
Claims priority, application France, Aug. 27, 1976, 76 25955
Int. Cl.² H01P *5/02;* H01J *23/32*
U.S. Cl. 333—33 **6 Claims**



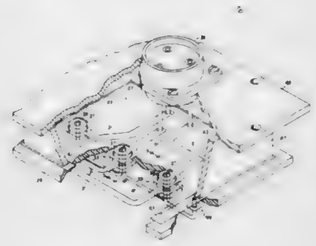
1. A coupling device for a microwave tube made up of two waveguides of rectangular cross-section which are connected together, one of the two waveguides termed the first waveguide and the other termed the second waveguide being coupled in operation at their free ends to a load and to said tube respectively, wherein said first waveguide contains an iris, formed by a metal plate which is pierced by an orifice blocked by a sheet of dielectric material, and said second waveguide has a cross-section whose length is equal and parallel to the length of said first waveguide, the width of the cross-section of the second waveguide being several times smaller than the width of the cross-section of the first waveguide, and the connection between the two waveguides forming a transition, a distance L separating the iris from the transition and the reactance of the iris being such that the impedance at the end of the transition nearer the tube has zero reactance, said iris being placed at said distance L from the transition equal to a multiple of half wavelengths of the microwave transmitted by the first guide.

4,173,745

FILTERING CONFIGURATION USING FEED-THROUGH CAPACITOR

Roger A. Saunders, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 2, 1977, Ser. No. 856,827
Int. Cl.² H03H *7/04;* H01G *4/42, 4/38;* H05K *1/04*
U.S. Cl. 333—182 **7 Claims**



1. The combination comprising:
(a) a printed circuit board comprising a dielectric substrate having a plurality of printed wiring leads on a first side of the substrate and a plurality of printed wiring leads on a second side of the substrate, said substrate also having a plurality of holes completely therethrough from said first side to said second side, each of the said plurality of holes having therein a subcombination comprising (i) a dielectric member being received in said hole, (ii) a first electrically conductive means located between said dielectric substrate and said dielectric member for providing a dc short from a printed wiring lead on said first substrate side to a printed wiring lead on said second substrate side, and (iii) a second electrically conductive means inside said dielectric member so as to be insulated from said first electrically conductive means by said dielectric member and so as to capacitively couple with said first electrically conductive means through said dielectric member, and
(b) dc shorting means for electrically interconnecting all said second electrically conductive means.

4,173,746

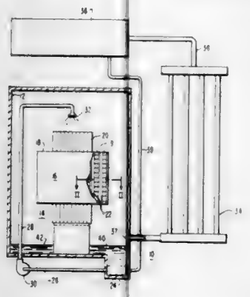
VAPORIZATION COOLED ELECTRICAL APPARATUS

Thomas W. Stubblefield, South Boston, Va., and Frank W. Benke, Hermitage, Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed May 26, 1978, Ser. No. 909,747
Int. Cl.² H01F *27/10*
U.S. Cl. 336—57 **5 Claims**

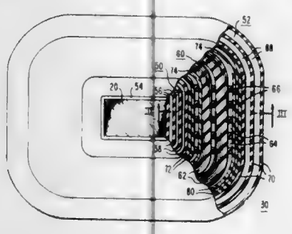
1. Electrical inductive apparatus comprising:
a sealed enclosure;

an electrical winding disposed in said enclosure and producing heat during its operation thereof;
said electrical winding having a plurality of fluid flow passages extending vertically therethrough, with each of said fluid flow passages having a thickness within the range of approximately 0.010 inch to approximately 0.060 inch;
a dielectric fluid, vaporizable within a normal operating temperature range of said electrical winding, disposed in



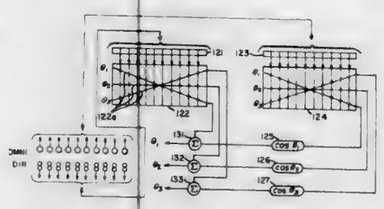
said enclosure, said dielectric fluid filling said enclosure to a level below the top of said electrical winding, and
means for supplying said dielectric fluid from the bottom of said enclosure to the top of said fluid flow passages such that said dielectric fluid removes heat from said electrical winding by vaporizing as it contacts the exposed surfaces of said electrical winding in said fluid flow passages as it flows therethrough.

4,173,747
INSULATION STRUCTURES FOR ELECTRICAL INDUCTIVE APPARATUS
Jerry W. Grimes, Danville; Stephen M. Schroeder, and James M. Waters, both of South Boston, all of Va., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jun. 8, 1978, Ser. No. 913,704
Int. Cl.[2] H01F *27/08*
U.S. Cl. 336—60 **7 Claims**



1. Electrical inductive apparatus comprising:
a tank;
dielectric fluid disposed in said tank to cool and electrically insulate said electrical inductive apparatus;
a magnetic core having a plurality of horizontally-spaced, vertically-extending leg portions connecting first and second yoke portions disposed in said tank;
a plurality of electrical winding assemblies disposed in inductive relation with said leg portions of said magnetic core and having a substantially rectangular cross-sectional configuration;
a support structure disposed in registry with said magnetic core and said electrical winding assemblies to provide a solid structure that resists movement of said electrical winding assemblies;
solid insulation means disposed between at least the adjacent portions of said electrical winding assemblies and between adjacent portions of said electrical winding assemblies and said support structure to provide insulation therebetween;
each electrical winding assembly including concentric first and second electrical windings, each formed of a plurality of layers of conductor turns, said first and second electrical windings being subject to radial movement under forces incident to a short circuit; and
insulation structures disposed between certain of said first and second windings in said electrical winding assemblies and between said electrical winding assemblies and said solid insulating means and in movable relation therewith to permit relative movement between said insulation structures and said windings under forces exerted on said windings during a short circuit;
each of said insulation structures including a plurality of spaced, vertically extending spacer members arranged in a first layer and forming a plurality of passages for the flow of said dielectric fluid therethrough, at least one layer of electrical insulating material disposed on each opposing side of said spacer members with each of said layers of electrical insulating material being unbonded to adjacent portions of said windings and said solid insulating means so as to permit relative movement therebetween, and means for securing said spacer members to said layers of electrical insulating material to form a solid structure that maintains said spacer members in a vertical orientation throughout the operation of said electrical inductive apparatus.

4,173,748
ACOUSTIC TRANSDUCING SYSTEM
Leon M. Lewandowski, Merrimack, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.
Filed Aug. 3, 1978, Ser. No. 930,829
Int. Cl.[2] G01S *3/80*; H04R *1/32*
U.S. Cl. 367—123 **7 Claims**



1. An acoustic transducing system comprising:
an array of spaced apart elements, each of said elements including an omni-directional acoustic transducer and a bi-directional acoustic transducer;
a beam former for the outputs from the omni-directional transducers;
a beam former for the outputs from the bi-directional transducers; and
means for combining selected outputs from said omni-directional beam former and selected outputs from said directional beam former so as to selectively cancel image lobes from the outputs of the bi-directional transducers, whereby the pattern of said array is capable of producing a single main lobe thereby giving the array a uni-directional characteristic over a broad range of steering angles.

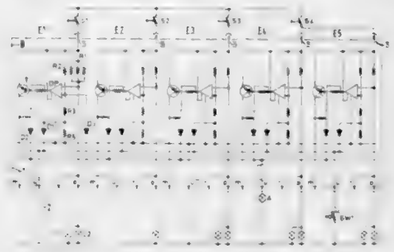
4,173,749
DIGITAL DRIVE AND PHASE-LOCK FOR SEISMIC VIBRATORS
David P. Corkhill, Aberdeen, Scotland, assignor to Standard Oil Company (Indiana), Chicago, Ill.
Filed Mar. 10, 1977, Ser. No. 776,145
Int. Cl.[2] G01V *1/14*
U.S. Cl. 367—190 **11 Claims**



1. A phase control system for controlling a seismic electro-hydraulic vibrator to operate in synchronism with a reference sweep signal comprising a sinusoidal signal of varying frequency, of selected frequency bandwidth and selected time duration, comprising:
(a) a source of a train of pulses, the time interval between the pulses varying the time in a selected manner;
(b) memory means for storing a plurality of digital words, each in known serial address location, said words representative of the digitized values of one cycle of a sine wave;
(c) first counter means responsive to the pulse train of said source for successively addressing said memory locations; whereby a first output of said memory means comprises a digital sinusoidal reference sweep signal of varying frequency;
(d) second counter means responsive to the pulse train of said source modified by a frequency ratio control means, the output of said second counter means addressing said memory locations; whereby a second output of said memory comprises a digitized sinusoidal drive sweep signal of varying frequency and of different phase with respect to said reference sweep signal;
(e) digital-to-analog converter means receiving said drive sweep signal, the output of said converter means connected to said vibrator;
(f) sensor means responsive to the vibration of the baseplate of said vibrator, the output of said sensor means connected to an analog-to-digital converter means to provide a digital sensor signal; and
(g) means to compare the phase of said digital sensor signal and said reference sweep signal, and means responsive to said phase comparison to alter the ratio of said frequency ratio control means.

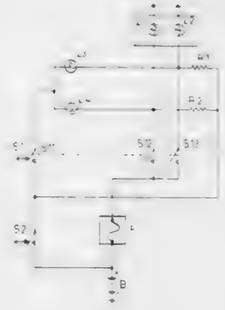
4,173,750
INCANDESCENT LAMP MONITORING DEVICE
Jutta Riba, Rosenbergstr. 26, 5455 Hardert, Fed. Rep. of Germany
Filed Dec. 27, 1977, Ser. No. 864,522
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659658
Int. Cl.[2] B60Q *1/00*; G08B *21/00*
U.S. Cl. 340—80 **18 Claims**

1. In a device for monitoring lamps, in particular lamps of motor vehicles, comprising a measuring resistor connected in series with a lamp to be monitored and means for monitoring the potential drop at the measuring resistor, said monitoring means comprising an operational amplifier and said monitoring device comprising indicator means controlled by said operational amplifier for providing an indication in case of absence of or excessively low potential drop at said resistor, the improvement wherein said operational amplifier comprises a first input and a second input, said first input connected with the junction between said measuring resistor and said lamp to be monitored, and wherein said monitoring means comprises a voltage divider including a first ohmic resistor connected in series with a second ohmic resistor, said series connection of



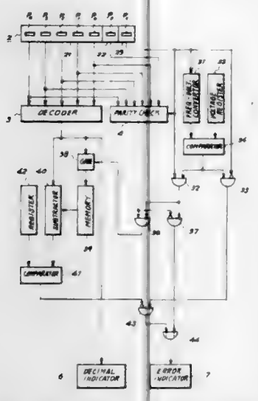
said first ohmic resistor and said second ohmic resistor being connected in parallel with the serial connection of said measuring resistor and said lamp to be monitored, and said second input of said operational amplifier being connected with the junction between said first ohmic resistor and said second ohmic resistor.

4,173,751
STOP LAMP MONITOR CIRCUIT
Stanley Bryant, Taree, Australia, assignor to Bryant Manufacturing Pty. Limited, Taree, Australia
Filed Mar. 14, 1978, Ser. No. 886,398
Int. Cl.[2] B60Q *1/26*
U.S. Cl. 340—80 **11 Claims**



1. A stop signal monitor circuit for use in conjunction with a vehicle stop lamp system wherein a pair of stop lamps is connected across the vehicle's electricity supply through a fuse and a respective pair of switch contacts closable in response to the application of the vehicle's brake, said system including a pair of pilot lamps connected at one side each to a respective one of said pair of stop lamps and connected together at the other side alternatively to the earthed or unearthed side of the vehicle's electricity supply through a series interconnection of first and second switch means, said system further including a pair of resistors connected at one side each to a respective one of said points of connection of said pilot lamps and said stop lamps and connected together at the other side to the point of interconnection of said first and second switch means, said first switch means being operative in response to the application of the vehicle's brake and said second switch means being operative in response to the vehicle's ignition system to provide for an indication by said pair of pilot lamps of an open circuit condition occurring in either of said stop lamps or said fuse.

4,173,752
GRAY CODE READER
Masami Yamanaka, Miki, Japan, assignor to Yamato Scale Company, Limited, Hyogo, Japan
Filed Mar. 24, 1978, Ser. No. 889,910
Claims priority, application Japan, Jun. 7, 1977, 52-67667; Jun. 7, 1977, 52-67668
Int. Cl.² G06F *11/10*; H03K *13/34*
U.S. Cl. 340—146.1 AG 8 Claims



1. A gray code reader, comprising a code plate having gray code bits, parity bits and parity check control bits arranged side by side, said parity check control bits consisting of first bits representing one binary level and lying respectively across the boundaries of the adjoining gray code bits and second bits representing the other binary level and occupying the remaining portions between said first bits, gray code bit reading means arranged in correspondence with the respective bits of said gray code bits for reading said gray code bits, a decoder for decoding the output of said gray code bit reading means, parity bit reading means and parity check control bit reading means arranged respectively in correspondence with said parity bits and parity check control bits for reading said bits respectively, a parity check circuit for receiving the output of said gray code bit reading means and parity bit reading means and executing parity check operation said parity check control bit reading means producing a first warning signal upon sensing of said first bits and said parity check circuit producing a second warning signal when the parity is incorrect, a memory for temporarily storing the output of said decoder, a subtractor for producing a difference between the content of said memory and the output of said decoder, a first comparator for comparing said difference with a predetermined value and producing a third warning signal when the difference is greater than the other, memory control means for interrupting the input of said memory in response to at least one of said first and second warning signals, first error indicating means for producing an error signal in response to said second warning signal only in the absence of said first warning signal, and second error indicating means for producing an error signal in response to at least both of said first and third warning signal.

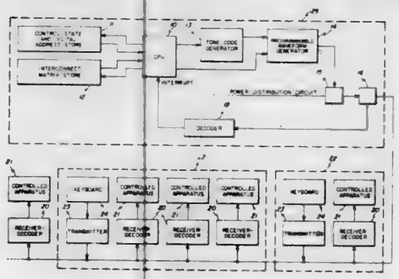
4,173,753
INPUT SYSTEM FOR SINO-COMPUTER
Hsu Ching Chou, No. 24, Chung Hua 2nd Rd., Kaohsiung, Taiwan
Filed Sep. 22, 1977, Ser. No. 835,739
Int. Cl.² G06K *9/00*
U.S. Cl. 340—146.3 R 4 Claims

1. A method of entering Chinese characters into an input system of a Sino-Computer, comprising: dividing each Chinese character into six basic strokes, said strokes including horizontal, vertical, dot, dash strokes and clockwise strokes and counterclockwise strokes, assigning each of said strokes a numerical equivalent, and entering said numerical equivalent into said input system in an order determined by the sequence in which said strokes appear in the respective character, said order being

Characters	Strokes in sequence	Spelling numbers
土	丨 一 一	5 1 1
天	一 一 ノ 丶	1 1 4 4
点	丶 丶 ノ 丶	5 5 4 4
亡	丿 丨 一 一	4 5 1 1
五	一 乙 丶	6 6 5

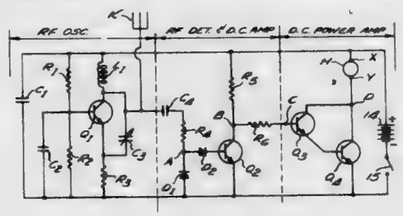
first from up to down and then from left to right, and with clockwise and counter-clockwise strokes having more than two segments, affixing to its respective numerical equivalent a sub-symbol corresponding to the clockwise and counter-clockwise direction of the segment, respectively.

4,173,754
DISTRIBUTED CONTROL SYSTEM
George E. Feiker, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Continuation-in-part of Ser. No. 778,719, Mar. 17, 1977, abandoned. This application Jun. 24, 1977, Ser. No. 809,939
Int. Cl.² H04M *11/00*
U.S. Cl. 340—310 R 9 Claims



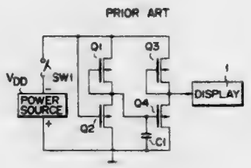
1. A system for performing, from a central location, a selected one of a plurality of electrical functions at a selected one of a plurality of remote locations, comprising:
a central processing unit at said central location;
means at said central location for storing a plurality of digital address and functions codes, and electrical function control state information;
encoding means responsive to the control information from said storing means upon enablement by said central processing unit for generating a programmable combination of frequency and digital address and function codes received from said storing means;
means for directly coupling each of said remote locations to said encoding means;
at least one receiver-decoder means at each of said remote locations, each of the respective receiver-decoder means within each remote location having a common address code unique to said remote location;
means responsive to each of said receiver-decoder means, respectively, for performing said selected one of the plurality of electrical functions at said selected one of the plurality of remote locations; and
transmitting means at at least one predetermined one and less than all of said remote locations for transmitting, independent of transmission from said encoding means to said receiver-decoder means, tone-encoded signals back to said central processing unit for obtaining a pre-programmed combination of electrical function control states from said storing means and causing said encoding means to generate a digital address and function code and a frequency for coupling to said receiver-decoder means by said coupling means for modifying the conditions of those predetermined ones of said means responsive to each of said receiver-decoder means selected from said storing means responsive to the signals transmitted back to said central processing unit from said at least one remote location.

4,173,755
BATTERY-OPERATED BODY CAPACITANCE INTRUSION ALARM APPARATUS
George N. Butler, 4720 NW. 5 La., Boca Raton, Fla. 33431
Continuation of Ser. No. 792,887, May 2, 1977, abandoned. This application Mar. 6, 1978, Ser. No. 883,390
Int. Cl.² G08B *13/26*
U.S. Cl. 340—562 8 Claims



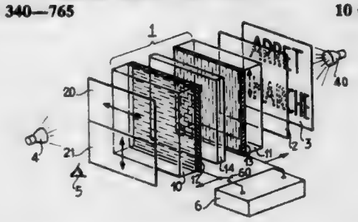
1. In a battery-operated intrusion alarm apparatus having:
a battery;
an oscillator energized by said battery to normally produce oscillations;
a sensor operatively coupled to said oscillator to stop said oscillations in response to the body capacitance of a person touching or in close proximity to the sensor; and
means operatively coupled to said oscillator for signalling an alarm when it stops oscillating;
the improvement which comprises means for causing said oscillator to oscillate at a predetermined frequency within the range from substantially 17 MegaHertz to 65 MegaHertz.

4,173,756
ABNORMAL VOLTAGE DETECTION CIRCUIT
Kenji Kawagai; Shigeki Yoshida, both of Kawasaki; Hisaharu Ogawa, Yokohama, and Toshiro Ohashi, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan
Filed Dec. 7, 1977, Ser. No. 858,209
Claims priority, application Japan, Dec. 11, 1976, 51-148309
Int. Cl.² G08B *21/00*
U.S. Cl. 340—636 15 Claims



1. An abnormal voltage detection circuit comprising first and second power source terminals; a integration circuit coupled between said first and second power source terminals; an inversion circuit having an input terminal connected to the output terminal of said integration circuit; and means for detecting a voltage interrupt at said source terminals comprising flip-flop means, connected to receive at a first input terminal thereof an output signal from said inversion circuit, for being set into a first condition indicating abnormal voltage upon resumption of interrupted voltage to said source terminals in response to a predetermined absolute voltage lower than the absolute threshold voltage of said inversion circuit and for remaining set even after said threshold voltage of said inversion circuit is surpassed.

4,173,757
LIQUID CRYSTAL DISPLAY DEVICE
Michel Hareng; Robert Hehlen, and Serge Le Berre, all of Paris, France, assignors to Thomson-CSF, Paris, France
Filed Sep. 21, 1977, Ser. No. 835,214
Claims priority, application France, Sep. 24, 1976, 76 28768
Int. Cl.² G09F *9/32*; G02F *1/13*
U.S. Cl. 340—765 10 Claims

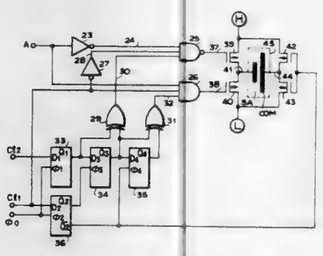


1. A device for alternately displaying one first and at least one second information respectively in the absence and in the presence of a control voltage; said device comprising:
a liquid crystal cell including a layer of a nematic material, one first uniform electrode and at least one second electrode; said first and said second electrode being respectively arranged on one side and the other of said layer for receiving said control voltage and said second electrode facing at least part of said first electrode;
permanent transcription means arranged on at least part of a first outer face of said cell for transcribing at least said first information by a permanent variation in the optical properties of said means; said second electrode covering at least the transcription of said first information in said permanent transcription means;
and commutation means for applying said control voltage between said first and at least one said second electrode;
said first information and said second information being respectively visible and invisible when said control voltage is not applied between said electrodes and the application of said control voltage between said electrodes modifying an optical property of said film for occulting said first information and causing said second information to appear.

4,173,758
DRIVING CIRCUIT FOR ELECTROCHROMIC DISPLAY DEVICES
Mitsuo Sekine, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Aug. 5, 1977, Ser. No. 822,355
Claims priority, application Japan, Aug. 17, 1976, 51-97474
Int. Cl.² G06F *3/14*
U.S. Cl. 340—785 8 Claims

1. A driving circuit for an electrochromic display device provided with a common segment electrode and a display segment electrode, said driving circuit comprising means for applying a common segment signal to said common segment electrode, and means for applying a driving signal to said display segment electrode in accordance with a display decoder output and said common segment signal, said driving signal being at a different level from the level of said common segment signal, thereby effecting display and interruption of the display by using a single source, the improvement compris-

ing means for preventing short-circuiting of the electrodes caused by a delay time between said common segment signal and said driving signal, said means including a delay means for



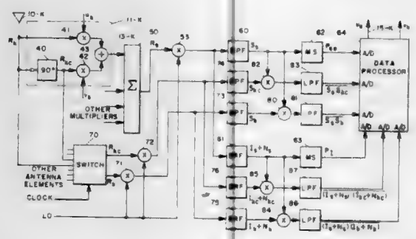
delaying said common segment signal so that said driving signal is enclosed within a time pulse of said common segment signal.

4,173,759

ADAPTIVE ANTENNA ARRAY AND METHOD OF OPERATING SAME

Keshoolal Bakhru, San Diego, Calif., assignor to Cubic Corporation, San Diego, Calif.

Filed Nov. 6, 1978, Ser. No. 957,733
Int. Cl.[2] H04B 7/00
U.S. Cl. 343—100 LE **13 Claims**



1. A method of maximizing the ratio of information signal power to interference plus noise power in an array of N antenna elements including the steps of:

generating at each of said antenna elements composite electrical signals $R_K=S_{KA}+I_{KA}+N_{KA}$ where $1 \leqq K \leqq N$, S_{KA} is a modulated information signal in a first frequency band, I_{KA} is at least one interference signal in said first frequency band, and N_{KA} is noise produced in said antenna elements;

multiplying each of said signals R_K by respective complex weights u_k+jv_k to form product terms;

summing all of said product terms to thereby form a signal R_S;

demodulating said R_S signal;

bandpass filtering said demodulated R_S signal to obtain a signal S_S of a second bandwidth that is substantially less than said first bandwidth and which is representative of the sum of the demodulated S_{KA} signals;

bandreject filtering said demodulated R_S signal to obtain a signal I_S+N_S lying outside of said second bandwidth which is representative of the sum of said interference signals I_{KA} and said noise N_{KA};

determining terms P_{se} and P_I which respectively indicate the power in said signals S_S and I_S+N_S and;

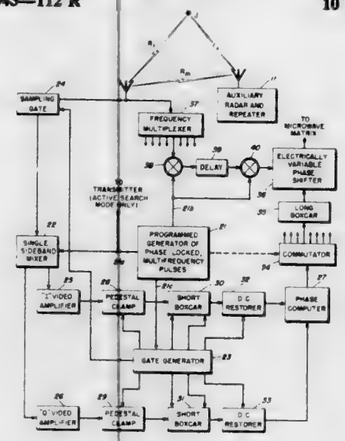
modifying said complex weights u_k+jv_k such that the time rate of change u_k is proportional to the rate of change of T_e with respect to u_k, and such that the time rate of change of v_k is proportional to the rate of change T_e with respect to v_k, where T_e is representative of the ratio of P_{se} to P_I.

4,173,760

PASSIVE ACQUISITION SYSTEM

John B. Garrison, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 24, 1966, Ser. No. 522,789
Int. Cl.[2] G01S 5/04
U.S. Cl. 343—112 R **10 Claims**



1. The method of effecting acquisition of a broadband jammer target comprising the steps of:

generating reference pulses of predetermined different frequencies,

sampling the jammer signal received at a first location directly from said jammer over a direct path of a known direction relative to said first location,

determining the phase relationship existing between each of said generated reference pulses and the component of said direct jammer signal having the same frequency,

relaying the jammer signal received at a second location, spaced a known distance from said first location, to said first location, adjusting each component of said relayed jammer signal having a frequency corresponding to the frequency of each of said generated reference pulses in accordance with the phase relationship found to exist between that frequency component as received in said direct jammer signal and said generated reference pulse of the same frequency such that the only phase difference then present between said relayed jammer signal components is due to the differential distance existing between the direct and relayed path lengths from said jammer target to said first location, and subsequently

combining the adjusted components of said relayed jammer signal to produce an output signal distinctly identifying the location of said jammer target.

4,173,761

MOBILE ANTENNA MOUNTING ASSEMBLY

James P. Liautaud, Cary, Ill., assignor to American Antenna Corporation, Elgin, Ill.

Filed Dec. 13, 1977, Ser. No. 860,237
Int. Cl.[2] H01Q 1/42
U.S. Cl. 343—715 **19 Claims**

1. A mounting assembly for affixing a mobile antenna to an exterior mounting surface comprising, in combination:

a semi-hemispherical mounting shell including retaining means for fixedly attaching the shell to the mounting surface, and having an elongated aperture extending therethrough;

a skirt member movably positioned on the spherical outer surface of said shell, said skirt being fixedly attachable to said antenna;

a mounting pin extending through said aperture and said skirt, said pin having connecting means at the end beyond said aperture for engaging said antenna, and further including projecting means for connecting said skirt to said pin,



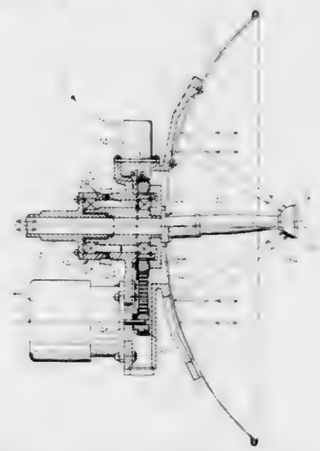
locking means at the other end of said pin for drawing said pin away from the inside surface of said shell whereby said skirt member is drawn against the outside surface of said shell to maintain the antenna in a desired angular position with respect to said mounting surface.

4,173,762

REFERENCE SIGNAL GENERATING APPARATUS

Vernal W. Thompson, Bountiful, and Wilbert C. Anderson, Salt Lake City, both of Utah, assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jun. 12, 1978, Ser. No. 914,466
Int. Cl.[2] H01Q 3/10, 3/12; G01S 5/02
U.S. Cl. 343—759 **10 Claims**



1. In combination with a mechanism, such as a radar tracking antenna, having a frame, a member, such as a nutator device, mounted on said frame for rotation relative to said frame about a longitudinal axis and means for rotating said member, said member including an element thereon, such as a feed horn, which revolves about said axis as said member is rotated about said axis, an apparatus for generating a pair of reference signals being ninety degrees out of phase with one another and in a desired phase relationship to the angular position of said element during rotation of said member, said apparatus comprising:

reference means attached on said member for rotation therewith about said axis, said reference means including first, second and third edge portions being disposed relative to one another for movement in a generally common rotational path upon rotation of said member, said second edge portion extending outwardly from and ninety degrees about the periphery of said member and having a pair of opposite ends, said third edge portion extending outwardly from and ninety degrees about the periphery of said member and having a pair of opposite ends with each end being displaced ninety degrees from a corresponding one of said opposite ends of said second edge portion, said first edge portion extending outwardly from the periphery of said member and being disposed between, but displaced at its opposite ends at known angular distances from, a corresponding one pair of said opposite ends of said second and third edge portions, said first edge portion being located at a reference position on said member having a known angular displacement from said element of said member such that said second and third edge portions are thereby disposed in a known phase relationship to the angular position of said element during rotation of said member;

transducer means mounted on said frame adjacent the rotational path of said edge portions of said reference means for sensing both the presence and absence of any one of said edge portions in predetermined close proximity to said transducer means during movement of said edge portions in said path upon rotation of said member, said transducer means being operable to generate an electrical signal in response to sensing the presence of any one of said edge portions in said predetermined close proximity to said transducer means and in response to sensing the absence of any one of said edge portions in said predetermined close proximity to said transducer means; and

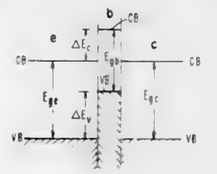
electrical circuitry coupled to said transducer means and receiving said electrical signal generated by said transducer means, said electrical circuitry being operable to generate from said electrical signal a pair of reference signals being ninety degrees out of phase with one another and a sync signal for causing said reference signals to be generated in the desired phase relationship to the angular position of said element during rotation of said member.

4,173,763

HETEROJUNCTION TUNNELING BASE TRANSISTOR

Leroy L. Chang, Mohegan Lake, and Leo Esaki, Chappaqua, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 9, 1977, Ser. No. 805,055
Int. Cl.[2] H01L 29/267, 29/88
U.S. Cl. 357—12 **44 Claims**



1. A semiconductor device, comprising:

first, second, and third semiconductor regions, said second

region being in contact with and between said first and third regions and having a different composition and conductivity type than said first and third regions,

biasing means for biasing semiconductor junctions formed between adjacent opposite conductivity type semiconductor regions in said device,

said first and third regions having energy band gaps which are shifted due to the different composition in the same direction with respect to the energy band gap of said second region and overlap therewith to produce potential wells which substantially prevent majority carriers in said second region from going to said first and third regions, there being a band edge discontinuity between said first and second semiconductor regions which substantially prevents injection of charge carriers from said first region into said second region,

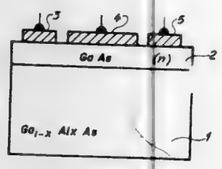
where said second region is sufficiently thin that the dominant mechanism for charge carrier transfer from said first semiconductor region to said third semiconductor region is tunneling through said second region.

4,173,764

FIELD EFFECT TRANSISTOR ON A SUPPORT HAVING A WIDE FORBIDDEN BAND

Baudouin de Cremoux, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Apr. 4, 1978, Ser. No. 893,534
Claims priority, application France, Apr. 8, 1977, 77 10754
Int. Cl.[2] H01L *29/80*
U.S. Cl. 357—22 **9 Claims**



1. A field effect transistor comprising:

a substrate layer;

an active semiconducting layer deposited on said substrate layer, and

three electrodes disposed on the surface of said active layer respectively forming source, gate and drain electrodes, the gate electrode forming a rectifying junction with said active layer, and said active layer forming a heterojunction with said substrate layer, said substrate layer being made of a semiconductor material having a higher forbidden energy band gap than that of said active layer.

4,173,765

V-MOS IMAGING ARRAY

David L. Heald, Hermosa Beach, Calif.; Teh-Hsuang Lee, Webster, and Rajinder P. Khosla, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

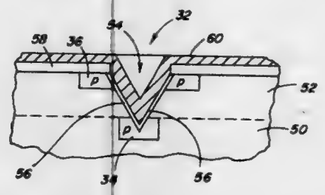
Filed May 26, 1978, Ser. No. 909,907
Int. Cl.[2] H01L *29/78, 27/14*
U.S. Cl. 357—23 **24 Claims**

4. A solid state image sensing element, comprising:

a bulk of semiconductor material of a first dopant type, said bulk having a surface with a depression formed therein, said depression having a generally sloping side;

a first region of a second dopant type disposed within said bulk adjacent said depression, said first region being adapted to be exposed to light, the junction between said first region and said bulk forming a photodiode, whereby when said first region is exposed to light, a charge proportional to the quantity of light may be generated and stored on the junction capacitance of said photodiode;

a second region of said second dopant type disposed within said bulk adjacent said depression and spaced from said first region; and



a gate, including a gate electrode, disposed on said generally sloping side of said depression, said gate extending between said first and second regions,

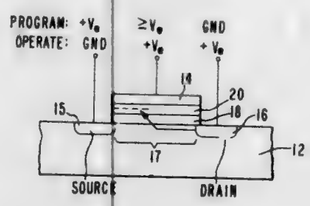
whereby, when said gate electrode is electrically activated, said charge is transferred from said photodiode to said second region.

4,173,766

INSULATED GATE FIELD-EFFECT TRANSISTOR READ-ONLY MEMORY CELL

James A. Hayes, Mountain View, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Sep. 16, 1977, Ser. No. 834,017
Int. Cl.[2] H01L *29/76*
U.S. Cl. 357—23 **7 Claims**



1. A semiconductor memory cell comprising:

an insulated gate field-effect transistor (IGFET) having a substrate of first conductivity type;

spaced-apart source and drain regions formed in the substrate, each of opposite conductivity to the substrate;

a gate insulating region formed on the substrate between the source and the drain, the gate insulating region including means for trapping charge therein;

an electrically conductive gate electrode formed on the gate insulating region between the source and the drain;

means for defining a state in the IGFET by applying a first signal to the gate electrode, a second signal to the source, and a third signal to the drain, wherein the potential of each of the first and second signals is greater than the potential of the third signal, to introduce charge nonuniformly into the gate insulating region predominantly toward the source region, and store charge nonuniformly in the gate insulating region in the means for trapping charge predominantly toward the source region; and

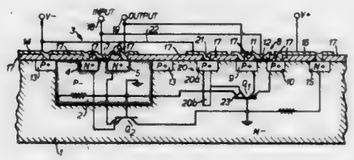
means for detecting the state defined in the IGFET by applying a fourth signal to the gate electrode, a fifth signal to the source, and a sixth signal to the drain, wherein the potential of each of the fourth and sixth signals is greater than the potential of the fifth signal.

4,173,767

CMOS MONOLITHIC INTEGRATED CIRCUIT

Alastair K. Stevenson, Glenrothes, Scotland, assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 5, 1978, Ser. No. 903,360
Claims priority, application United Kingdom, Jun. 1, 1977, 23248/77
Int. Cl.[2] H01L *27/02*
U.S. Cl. 357—44 **13 Claims**



1. A complementary Metal Oxide Semi Conductor (MOS) transistor device formed on a monolithic substrate having a first region of a first conductivity type and an adjacent second region of a second conductivity type, one of said regions comprising a well in said substrate and surrounded by the other of said regions, comprising:

a first MOS transistor in said first region, said first transistor comprising a first source and drain of said second conductivity type;

a second MOS transistor in said second region, said second transistor comprising a second source and drain of said first conductivity type;

a first parasitic bipolar transistor having a base, an emitter and a collector, each respectively comprising said first region, at least one of said first source and drain, and said second region;

a second parasitic bipolar transistor having a base, an emitter and a collector, each respectively comprising said second region, at least one of said second source and drain, and said first region; and

collector means reducing parasitic current gain between said first and second parasitic transistors, said collector means having an additional collector diffusion disposed in one of said first and second regions, said additional collector diffusion separated from the other of said regions by a portion of said one region, said additional collector diffusion having a conductivity type of opposite polarity from the conductivity type of said one region.

4,173,768

CONTACT FOR SEMICONDUCTOR DEVICES

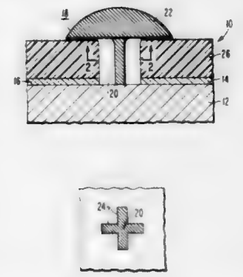
Edgar J. Denlinger, East Windsor, and Harold S. Veloric, Morristown, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 16, 1978, Ser. No. 869,642
Int. Cl.[2] H01L *23/48, 29/44, 29/52*
U.S. Cl. 357—68 **8 Claims**

1. A semiconductor device comprising

a body of semiconductor material having a surface,

a metal contact on said surface, said contact including a post projecting from the surface of the semiconductor body and a head on the post, said post having a transverse cross-sectional shape of at least three arms projecting radially from a common center point and the head having



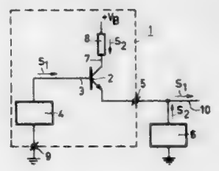
a surface area greater than the transverse cross-sectional area of the post.

4,173,769

CIRCUIT ARRANGEMENT A PORTION OF WHICH IS INCLUDED WITHIN IN A MONOLITHIC INTEGRATED SEMICONDUCTOR BODY

Jan van Straaten, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 12, 1978, Ser. No. 868,977
Claims priority, application Netherlands, Jan. 27, 1977, 7700809
Int. Cl.[2] H04N *9/46*
U.S. Cl. 358—20 **15 Claims**



1. A circuit arrangement comprising a first portion included within a monolithic integrated semiconductor body, a second portion disposed outside said body, and means for deriving from said body a signal present within said first circuit portion through a connecting terminal of said body and for supplying another signal from said second circuit portion to said body through the same connecting terminal, said means comprising an amplifier disposed in one of said portions having first, second, and third terminals, said first terminal comprising an input terminal means for receiving one of the signals, said second terminal comprising an input terminal means for receiving the second signal and also an output terminal means for providing the first signal, said second terminal being connected to said connecting terminal of the semiconductor body, said third terminal comprising an output terminal means for providing the second signal.

4,173,770

MANUAL TINT CONTROL CIRCUIT IN THE COLOR APFC LOOP MIXES TWO SUBCARRIER OSCILLATOR SIGNALS

Yasuaki Watanabe, and Yukio Okabe, both of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Jun. 7, 1978, Ser. No. 913,331
Claims priority, application Japan, Jun. 9, 1977, 52-68191
Int. Cl.[2] H04N *9/535*
U.S. Cl. 358—28 5 Claims



1. A tint control circuit for a color television receiver comprising:

a phase detector including a switching gate responsive to a control signal to pass a received color burst signal to a load circuit and a filter connected to the load circuit for deriving a DC phase detector output signal;

a voltage-controlled oscillator for generating a color subcarrier signal of which the frequency and phase are variable in dependence on said DC phase detector output signal, said oscillator including means for shifting the phase of said subcarrier to provide a pair of subcarrier signals with a phase difference other than an integral multiple of 180° therebetween; and

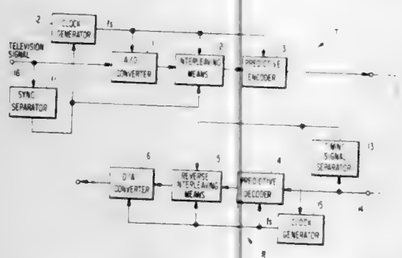
a variable phase shifter for mixing said subcarrier signals in a variable ratio in dependence on a manual setting value of a variable resistor to generate a variable phase-shifted subcarrier signal, the last-mentioned signal being said control signal of said phase detector.

4,173,771

HIGH SPEED PREDICTIVE ENCODING AND DECODING SYSTEM FOR TELEVISION VIDEO SIGNALS

Yukihiko Iijima, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1978, Ser. No. 926,349
Claims priority, application Japan, Jul. 20, 1977, 52/87773
Int. Cl.[2] H04N *7/12*
U.S. Cl. 358—135 3 Claims



1. A predictive encoding/decoding transmission system having a transmitting unit and a receiving unit coupled by a transmission link for transmitting a video signal produced through a repeated horizontal and vertical scanning of an optical image, wherein said transmitting unit comprises:

an A/D converter for digitizing said video signal to provide a series of digitized video codewords at the rate of the sampling of said video signal for digitizing;

means, including a pair of memory means for temporarily storing two successive segments of said codeword series segment by segment, for interleaving said codewords of one segment with those of immediately neighboring segment, and

means for predictive encoding of the output of said interleaving means, to provide a series of codewords representative of the predictive encoding output alternately of the neighboring segments, and wherein said receiving unit comprises;

means for predictive decoding of the output of said predictive encoding means,

means, including a pair of memory means having a capacity equal to that of the memory means at the transmitting unit, for separating the predictive encoding output for one of the segments from that of the other of the segments through a signal processing inverse to that performed at said interleaving means, and

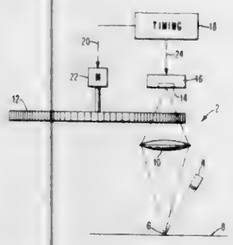
means for converting into an analog signal the output of said separating means.

4,173,772

SOLID STATE IMAGE SCANNING SYSTEM FOR PRODUCING A BINARY OUTPUT

James M. White, Mahopac, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,192
Int. Cl.[2] H04N *3/14, 5/14*
U.S. Cl. 358—213 3 Claims



1. Apparatus for binarizing a scanned image having n, where n is an integer, lines of elements, comprising:

means for imaging a line at a time of elements in said image onto a line of light responsive charge transfer elements, with said charge transfer elements each producing a packet of charge comprised of photogenerated charge and thermally generated charge;

means for alternately changing the effective optical path length of each imaged line of elements between two values for alternately focusing and defocusing each line of elements of said image on said light responsive charge transfer elements;

a first charge transfer gating means for receiving in parallel said charge packets indicative of each alternately focused and defocused line of imaged elements from said light responsive charge transfer elements;

a first charge transfer shift register which has said charge packets indicative of each focused and defocused line of imaged elements alternately gated therein in parallel at a predetermined time from said first charge transfer gating means;

a second charge transfer gating means for receiving said charge packets indicative of each alternately focused and defocused line of imaged elements from said first charge transfer shift register, with said second charge transfer gating means providing said charge packets indicative of each focused line of imaged elements at a first output, and each defocused line of imaged elements at a second output;

a second charge transfer shift register which receives one of said charge packets indicative of each focused and defocused line of imaged elements from either the first or the second output, respectively, of said second charge transfer gating means;

means for converting said charge packets indicative of each focused and defocused line of imaged elements at one of the first and second outputs of said second charge transfer gating means and the output of said second shift register, respectively, to a first and a second voltage, respectively; and

a comparator having a first input to which said first voltage is applied and a second input to which said second voltage is applied and having an output, with said comparator substantially cancelling the components of voltage in said first and second voltages which are produced by said thermally generated charge, and with said comparator providing a binarized signal at the output produced by the difference between the components of voltage in said first and second voltages produced by said photongenerated charge.

4,173,773

TAPE END ALARM FOR TAPE RECORDER

Ken Satoh, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1977, Ser. No. 860,849
Claims priority, application Japan, Dec. 23, 1976, 51-173647[U]; Dec. 24, 1976, 51-173608[U]
Int. Cl.[2] G11B *15/06, 23/30*
U.S. Cl. 360—67 3 Claims



1. A tape end alarm for a tape recorder of the type which includes change-over switch means movable between a record position, wherein said change-over switch means connects the output of a microphone to the input of an amplifier, and a playback position, wherein said change-over switch means connects the output of a magnetic head to said input of said amplifier, said tape end alarm comprising:

a tape end detection switch adapted to be closed upon the detection of a terminal end of a running tape being reached;

alarm oscillator means which is connected to said amplifier by said change-over switch means when said change-over switch means is in said record position and generates an oscillating signal responsive to the closure of said tape end detection switch;

an AGC circuit for controlling the gain of said microphone output when it is connected to said input of said amplifier; and

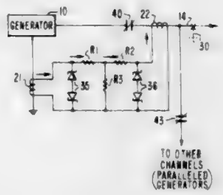
means for decreasing the gain of said AGC circuit responsive to the closure of said tape end detection switch by a sufficient amount to prevent a howling phenomena which may be caused by an audible alarm given off by said loudspeaker and fed through a closed loop including the loudspeaker, the microphone, the amplifier and back to the loudspeaker.

4,173,774

PARALLEL AC ELECTRICAL SYSTEM WITH DIFFERENTIAL PROTECTION IMMUNE TO HIGH CURRENT THROUGH FAULTS

Wayne E. Hyvarinen, American Township, Allen County, and Lloyd J. Rosell, Lima, both of Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 8, 1977, Ser. No. 858,863
Int. Cl.[2] H02H *3/28*
U.S. Cl. 361—87 3 Claims



1. An electrical power system comprising:

a plurality of multi-phase generators having outputs each connected with a plurality of phase conductors that are mutually interconnected in parallel for supplying at least one load, each of said generators also having a neutral conductor that is grounded proximate said generator;

at least one phase conductor and at least one of said generators having a differential protection network between said phase conductor and said neutral conductor of said one generator;

said differential protection network comprising

(a) means for deriving currents from said phase conductor and from said neutral conductor proportional to the respective currents in said conductors,

(b) voltage limiting means connected across each of said means for deriving current to prevent disablement of said differential protection network and to prevent nuisance tripping of said differential protection network upon occurrence of faults on the parallel connected load bus, and

(c) a first resistor in series with the means for deriving current from said phase conductor, a second resistor in series with said means for deriving current from said neutral conductor and a third resistor connected across said means for deriving currents and from between a common point of said first and second resistors, one of said first and second resistors providing an overcurrent voltage signal applied to an overcurrent sensing circuit which is in turn related to a differential protection inhibit circuit, said voltage limiting means having a limiting voltage magnitude of less than that of said overcurrent voltage signal that actuates said overcurrent sensing circuit, said voltage limiting means being directly connected in a circuit with said resistors and said means for deriving currents.

4,173,775

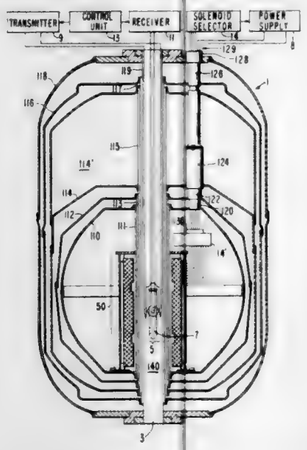
SELECTIVE EXCITATION OF COILS COMPRISING A SUPERCONDUCTING MAGNET

George D. Kneip, Jr., Menlo Park, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Feb. 21, 1978, Ser. No. 879,293
Int. Cl.[2] H01H *47/00*
U.S. Cl. 361—141 10 Claims

1. In a superconducting magnet system, said system housed

in a cryostat and said system comprising means forming a superconductive solenoid to provide a main magnetic field and a plurality of gradient correcting superconducting coils, said solenoid means and each said gradient correcting coils adapted for selective excitation, a plurality of p persistence switch means to effect transitions between the persistent mode and the non-persistent mode, each said solenoid and gradient correcting coil separately controlled by a respective said persistence switch, the improvement comprising



a diode in series relationship with each said persistence switch means whereby a plurality of two-terminal directional persistence switching means is formed,

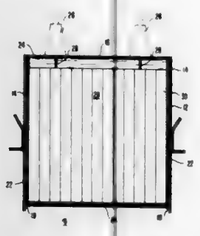
a number, n, of conductors, where $n<p$, for communicating between the exterior and the interior of said cryostat to control said switch means, each said n conductors contacting one terminal of each of $n(n-1)$ of said two-terminal directional switching means whereby the operation of a desired persistence switch is selectable from the exterior of said cryostat.

4,173,776

POWER CAPACITOR WITH AN INTERNAL SUPPORT STRUCTURE

George E. Mercier, Bloomington, Ind., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 8, 1977, Ser. No. 831,622
Int. Cl.[2] H01G *1/02*
U.S. Cl. 361—272 5 Claims



1. A power capacitor apparatus with flammability risk avoidance comprising:

a containment casing having an upper portion including side walls and a cover and a lower portion including a base, said base being joined by a joint at its periphery to said side walls, said base and said joint being the parts of said casing which are susceptible to rupture when stressed by internal casing gas pressure induced by an internal fault;

an electrical assembly including a capacitor winding disposed within said casing;

bushings attached to said cover and connected by electrical leads to said electrical assembly;

a combustible, dielectric liquid filling said casing and impregnating said winding, said liquid occupying substantially the entire volume of said casing that is between said winding and said cover; and

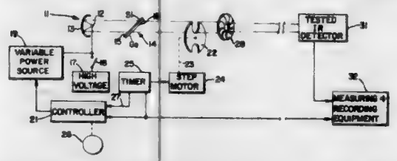
a cradle disposed within said casing for supporting said electrical assembly, said cradle comprising a generally U-shaped structure having a plurality of side members adjacent to and generally parallel with said side walls of said casing and a bottom member connected with said side members and located adjacent to and generally parallel with said base of said casing, said cradle being attached to said upper portion of said casing, said electrical assembly being retainable by said cradle upon rupture of either said casing's base or said joint to prevent substantial oxygen access to said fluid within said retained windings.

4,173,777

JET AIRCRAFT AND/OR MISSILE PLUME SIMULATOR

David E. Schmit, and Jon C. Richmond, both of Cincinnati, Ohio, assignors to Cincinnati Electronics Corporation, Cincinnati, Ohio

Filed Jun. 1, 1977, Ser. No. 802,549
Int. Cl.[2] F21V *33/00*
U.S. Cl. 362—253 15 Claims



1. Apparatus for simulating jet aircraft and/or missile plumes comprising a source of optical energy for deriving a beam having an intensity and spectral content similar to those of the simulated plume over a wavelength band of the simulated plume, said source including an electrically powered lamp, means for modulating the energy of the beam, said means for modulating including variable aperture means in the beam path, and means for controlling the power applied to the lamp so that beams of at least two intensities are derived from the lamp.

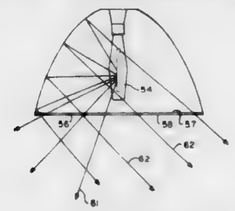
4,173,778

LIGHTING FIXTURES AND GLASS ENCLOSURE HAVING HIGH ANGLE ANTI-REFLECTION COATING

Carol J. Snavely, Santa Rosa, Calif.; Ian Lewin, Scottsdale, Ariz., and Edward A. Small, Jr., Santa Rosa, Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Continuation of Ser. No. 709,413, Jul. 28, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,734
Int. Cl.[2] F21V *7/00*
U.S. Cl. 362—297 22 Claims

1. In a lighting fixture, a housing having an open side, a fixture mounted in said housing and producing light rays passing through the open side, a glass enclosure carried by said housing and enclosing the open side and having at least one surface reflecting light rays at a high angle from the vertical, and an anti-reflection coating disposed on said surface, said anti-reflection coating being comprised of a plurality of layers whose thicknesses have been selected for increasing the transmission of high angle light rays from said lamp, said high angle being 60° and above from the vertical.

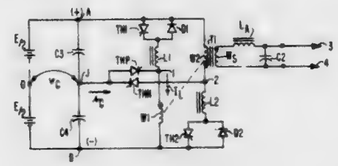


4,173,779

SINGLE-POLE COMMUTATION CIRCUIT

Alberto Abbondanti, Penn Hills, and Andress Kernick, Murrysville Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 8, 1978, Ser. No. 967,829
Int. Cl.[2] H02M *3/315*
U.S. Cl. 363—27 6 Claims



1. In a commutation circuit for alternately commutating a first and a second main thyristor connected in parallel across the poles of a direct current power source, the combination of:

a positive pole network for commutating said first thyristor in relation to the positive pole of said source;

a negative pole network for commutating said second thyristor in relation to the negative pole of said source;

said first thyristor when conductive establishing a first current path across said DC source, said first current path including in series a first inductor and a first primary winding;

said second thyristor when conductive establishing a second current path across said DC source, said second current path including in series a second inductor path and a second primary winding;

said first and second primary windings being driven in opposite directions;

a common secondary winding responsive to said first and second primary windings for outputting AC power converted by said first and second thyristors from said DC source;

said positive pole commutating network including a first capacitor associated with said positive pole, a first auxiliary thyristor, said first inductor and a first diode connected in antiparallel relation to said first thyristor;

said negative pole commutating network including a second capacitor associated with said negative pole, a second auxiliary thyristor, said second inductor and a second diode connected in antiparallel relation to said second thyristor;

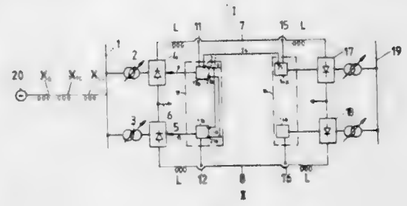
with said first and second capacitors and said first and second auxiliary thyristors having a common junction point.

4,173,780

METHOD AND APPARATUS FOR CONTROLLING THE REAL AND REACTIVE POWER BEHAVIOR OF A HIGH VOLTAGE D.C. TRANSMISSION (HDT) SYSTEM

Michael Häusler, Hirschberg, and Karl-Werner Kanngiesser, Viernheim, both of Fed. Rep. of Germany, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Jan. 26, 1978, Ser. No. 872,628
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1977, 2705242
Int. Cl.[2] H02H *7/00;* H02J *3/36*
U.S. Cl. 363—51 13 Claims



1. In a method for controlling the true and reactive power behavior of a high-voltage D.C. transmission (HDT) system having a rectifier station connected to a first three-phase network and an inverter station connected to a second three-phase network and to said rectifier station over a positive D.C. transmission line and a negative D.C. transmission line, each of said stations divided into two halves, said station-halves of each of said stations connected in common to ground or to a return wire, said station-half of each station connected together over said positive D.C. transmission line forming a positive pole, said station-halves connected over said negative D.C. transmission line forming a negative pole, each station equipped with current and voltage regulators as well as control angle and extinction angle regulators, each of said poles having protective devices to detect transmission disturbances caused by a system fault, whereby in the event of a tripping of one of said protective devices of a disturbed pole and a subsequent load drop in said disturbed pole there occurs an intervention of short duration in the regulation of the other intact pole, said intervention compensating for network transients and overvoltages resulting from said load drop by increasing the current set-point of said current regulator of the other intact station-half according to a preset function and by increasing the control angle set-point for the control angle regulator of the one intact station-half of said intact pole according to a preset function, the improvement comprising the steps of:

forming a new current set-point by storing in memories the pre-fault current set-points of both of said rectifier station halves,

comparing said stored current set point with a predetermined maximum-current value,

attaining a control angle limit (α_{min}) in said rectifier station of said intact station-half,

transferring control of said current regulation of said intact pole from said rectifier station to said inverter station of said intact pole after said control angle limit (α_{min}) is attained, and

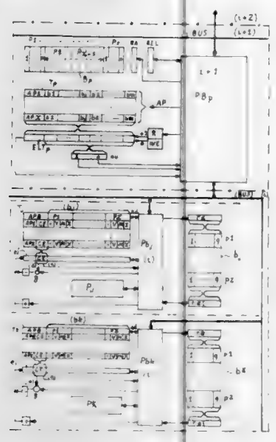
subsequently increasing said control angle of the one intact station-half.

4,173,781

SYSTEM OF COHERENT MANAGEMENT OF EXCHANGES BETWEEN TWO CONTIGUOUS LEVELS OF A HIERARCHY OF MEMORIES

Lucien Cencier, Conflans St Honorine, France, assignor to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull, Paris, France

Filed Mar. 10, 1977, Ser. No. 776,359
Claims priority, application France, Mar. 10, 1976, 76 06879
Int. Cl.[2] G06F *13/00*; G11C *9/06*
U.S. Cl. 364—200 **4 Claims**



1. In a hierarchal memory data processing system having a plurality of memory levels, each level being divided in separate data blocks, a page of each block of a higher speed level equalling a fraction of a page of each block of the next lower speed level, and each block of the lower speed level being arranged for exchanging information with blocks of the higher speed level, a system of coherent management of the exchanges between any two contiguous levels, one of higher speed than the other, comprising

control processor means for managing said blocks at each level, said control processor means having at least one associated table containing status words for each block and means for updating said table responsive to each read-out and write-in request in said block and at each ejection of data from the block,

wherein each control processor of a block of the lower speed level selectively, when receiving a read-out request from a block of the higher speed level, on consultation of its table, purges the blocks of the higher speed level of the fractions of the data addressed in the read-out request by repatriating the copies of such fractions existing in the blocks of the said plurality, accompanied by a decreasing one of the count in said table, of the fractions of a block in said higher level which has not yet been repatriated to the lower level,

wherein each control processor of a block of the lower speed level selectively, when receiving a write-in request from a block of the higher speed level, on consultation of its table, updates the copies of fractions of the data addressed in said write-in request existing in the blocks of the higher speed level,

and wherein:

each table associated to a block of the lower speed level comprises as many entries as are pages in the block and, in each of its entries, comprises means to memorize the read-outs from the page corresponding to this entry and the identifications of the blocks of the higher speed level to which the read-outs send copies of fractions of the page, and,

each table associated to a block of the higher speed level comprises as many entries as are pages in the block of the lower speed level with which it is in data exchange relation and, in each of its entries, comprises means to book an updated count of the copies of the fractions of the page of the block of the lower speed level corresponding to the entry and to concomitantly memorize an updated identification list of pages of the block of the higher speed level which contain such copies, and comprises means for signalling the passage to zero of each of the said counts to the respective blocks of the lower speed level,

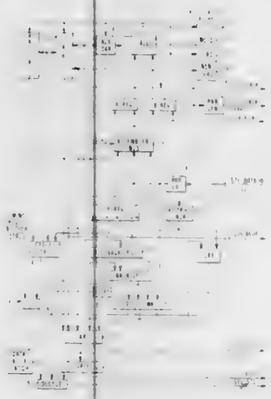
whereby each control processor of a block of the lower speed level is kept posted of the status of the copies of all fractions of data of its block within the blocks of the said plurality of the higher speed level.

4,173,782

RETURN AND LINK MECHANISM

Jerry D. Dixon, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 3, 1978, Ser. No. 866,425
Int. Cl.[2] G06F *9/18*
U.S. Cl. 364—200 **3 Claims**



1. For use in a data processing system, apparatus for linking between separate computer programs comprising:

register means for storing an indication of an address of an instruction; and

return means, responsive to a particular format of instruction within said programs, said return means cooperating with said register means for causing a branch to the instruction which is at the address indicated by said register means and for causing said register means to store an indication of the address of an instruction which follows the instruction having said particular format.

4,173,783

METHOD OF ACCESSING PAGED MEMORY BY AN INPUT-OUTPUT UNIT

John F. Couleur, Scottsdale, and Robert E. Scriver, Phoenix, both of Ariz., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Continuation-in-part of Ser. No. 591,549, Jun. 30, 1975, abandoned. This application May 2, 1977, Ser. No. 792,964
Int. Cl.[2] G06F *3/00, 9/20*
U.S. Cl. 364—200 **2 Claims**

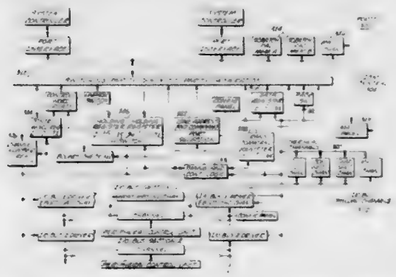
1. A method of operating an electronic data processing system for accessing paged data locations, said system employing a main memory having data locations defined by absolute addresses, a central processing unit, an input-output unit having a plurality of peripheral channels, and a plurality of peripheral devices each communicating with said main memory through one of said peripheral channels of said input-output unit, said method comprising the steps of:

(a) segregating by operation of said central processing unit data locations in a portion of said main memory into memory pages, with each page comprising a plurality of contiguous memory locations and with the address location of each page in said main memory being identified by a page table word;

(b) denoting by operation of said central processing unit the address location of a first memory page containing data locations to be accessed by a selected one of said peripheral channels by a first page table word and loading said first page table word into a page table in another portion of said main memory;

(c) assigning through operation of said central processing unit a unique peripheral control word to said selected peripheral channel and storing said peripheral control word in said main memory, said peripheral control word including as a portion thereof a page table pointer for identifying the address location in said main memory of said page table;

(d) assigning through operation of said central processing unit a data control word to said selected peripheral channel, said data control word including a first portion denoting an offset location of said first page table word in said page table and said data control word further including a second portion denoting an offset location of a specific



data location to be accessed within said first memory page;

(e) loading said data control word into a second memory page in said main memory;

(f) denoting by operaton of said central processing unit the address location of said second memory page containing said data control word by a second page table word and loading said second page table word into said page table;

(g) assigning by operation of said central processing unit and storing in said main memory, a list pointer word, said list pointer word including a first portion denoting an offset location of said second page table word in said page table and a second portion denoting an offset location of said data control word within said second memory page;

(h) combining in said input-output unit said first portion of said list pointer word with said page table pointer to determine the absolute address in said memory of said second page table word;

(i) combining in said input-output unit said second portion of said list pointer word with said second page table word to determine the absolute address of said data control word;

(j) combining in said input-output unit said first portion of said data control word with said page table pointer to determine the absolute address in said main memory of said first page table word; and

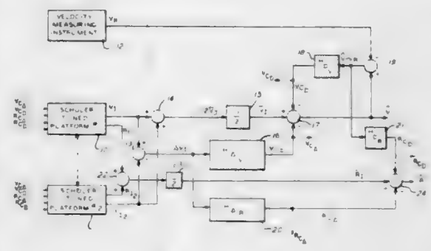
(k) combining in said input-output unit said second portion of said data control word with said first page table word to determine the absolute address in said main memory of said specific data location.

4,173,784

INERTIAL SYSTEM HAVING CORRECTION MEANS FOR EFFECTS OF GRAVITATIONAL ANOMALIES

William H. Heath, Wayne, N.J., and Jack Richman, Forest Hills, N.Y., assignors to The Singer Company, Little Falls, N.J.

Filed Aug. 29, 1977, Ser. No. 828,730
Int. Cl.[2] G06G *7/78*
U.S. Cl. 364—453 **8 Claims**



7. In an inertial navigation system having a first Schuler tuned platform and a second Schuler tuned platform displaced a predetermined distance apart, a plurality of summing, differencing and gain circuits interconnecting the output signals of each Schuler tuned platform, a plurality of identical transfer function circuits comprising summing, differencing and gain circuit and a velocity measuring circuit, the method of correcting for the effects of gravitational anomaly errors comprising:

separating the first and second Schuler tuned platforms a predetermined distance apart,

using the summing, differencing and gain circuits to combine the position and velocity output signals of said first Schuler tuned platform with the position and velocity output signals of said second Schuler tuned platform to obtain signals representative of average inertial platform velocity, average inertial platform position and inertial platform residual velocity,

using summing and differencing circuits of the transfer circuits to combine said average inertial platform position signal with a first and second position correcting signal, and

using said summing and differencing circuits of said transfer function circuit to combine said average inertial platform velocity signal with a first and second velocity correcting signal to obtain estimated system position and velocity signals corrected for gravitational anomalies.

4,173,785

INERTIAL GUIDANCE SYSTEM FOR VERTICALLY LAUNCHED MISSILES WITHOUT ROLL CONTROL

William H. Licata, Stone Mountain, Ga., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 25, 1978, Ser. No. 909,326
Int. Cl.[2] G06F *15/50*
U.S. Cl. 364—453 **16 Claims**

1. An ordnance guidance system for use with an external target localization means wherein said target localization means provides pre-launch target bearing, range, and elevation angle information to said ordnance relative to an inertial coordinate system centered at the intended target including "x", "y", and "z" mutually orthogonal axes, comprising:

a pitch rate sensor;

a yaw rate sensor;

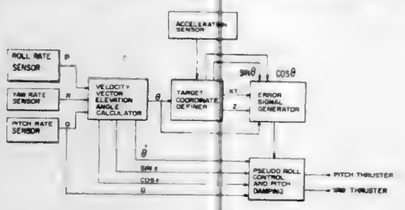
a roll rate sensor;

an acceleration sensor for measuring the component of acceleration in the direction of said ordnance's centerline;

means coupled to said pitch, yaw, and roll rate sensors for determining the elevation angle of said ordnance's veloc-

ity vector, and for producing a signal proportional to the rate of change of the elevation angle of said velocity vector, and for producing signals proportional to the sine and cosine of the bearing angle of said target within said inertial coordinate system;

means coupled to said acceleration sensor and to said velocity vector elevation angle determining means for defining target coordinates in a target plane including said "z" axis and said target, and for producing signals proportional to the sine and cosine of said velocity vector elevation angle;



means coupled to said target coordinate defining means for developing a thruster error signal proportional to the difference between said target elevation angle and said elevation angle of said velocity vector; and

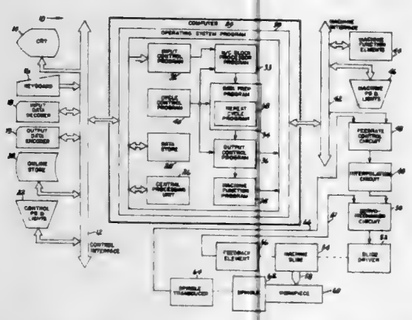
means coupled to said pitch rate sensor, said velocity vector elevation angle determining means, and said thruster error signal developing means for producing pitch and yaw thruster commands, whereby said pitch and yaw thruster commands cause said ordnance's velocity vector to continuously be corrected to point toward said target while said ordnance is constrained to fly in said target plane.

4,173,786

METHOD AND APPARATUS FOR CUTTING A THREAD ON A ROTATING WORKPIECE

Thomas J. Kuhnell, Branch Hill; Randall C. Tanner, Lebanon, and Alois V. Dryak, Glendale, all of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jun. 23, 1977, Ser. No. 809,280
Int. Cl.² G06F *15/46*; G05B *19/24*
U.S. Cl. 364—475 **10 Claims**



1. An apparatus for cutting threads with a numerical control and turning machine system wherein a cutting tool moves from a start point, along an X-axis perpendicular to the center line of a workpiece and along a Z-axis parallel to the center line of the workpiece in synchronization with the rotation of the workpiece, said thread being cut in response to an input program by iteratively moving the cutting tool relative to the workpiece through a number of thread cutting cycles, the apparatus comprising:

(a) means resonsive to the input program for generating input signals including

(1) a DIN_p signal representing an initial depth increment,

(2) a DTH signal representing a signed number defining the total depth of the thread,

(3) a TAA signal representing the tangent of the attack angle between the X-axis and a locus of points defined by thread start points,

(4) position signals defining the final exit position of the cutting tool after a first thread cutting pass, said final exit position being coincident with the start point,

(5) lead and angular spindle velocity signals defining the linear velocity of the cutting tool along the X and Z-axes, and

(6) a rapid signal defining a displacement along the X-axis to a first thread start point for the first thread cutting pass;

(b) means responsive to the rapid, lead, angular spindle velocity, and position signals for generating first command signals to cause the cutting tool to move from the start point, through the first thread cutting pass and back to the start point, said first thread cutting pass having a depth of cut equal to the rapid value;

(c) means responsive to the TAA, DIN_p, rapid, lead, angular spindle velocity, and position signals for providing second command signals to cause the cutting tool to move from the start point, through a second thread cutting pass and back to the start point, said second thread cutting pass having a depth of cut equal to the sum of the rapid and the DIN_p signals;

(d) means responsive to the TAA, DIN_p, DTH, rapid, lead, angular spindle velocity, and position signals for producing sets of subsequent command signals to cause the cutting tool to move from the start point through subsequent thread cutting passes, and back to the start point, said subsequent thread cutting passes having corresponding depths of cut increasing by successively smaller increments, and

(e) means responsive to the DTH signal for terminating the thread cutting cycle when the depth of cut equals or exceeds the magnitude of the DTH signal.

4,173,787

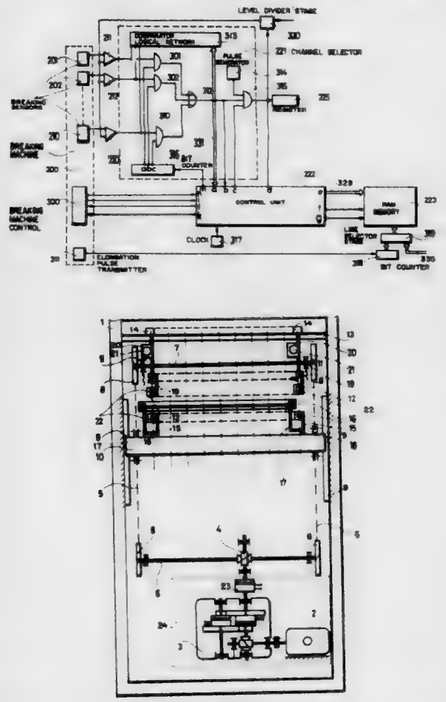
EQUIPMENT FOR THE AUTOMATIC, SUPER-SPEED, AND LARGE-SCALE YARN-STRENGTH TESTING

Tibor Katona; Tamas Kenderessy; Imre Nemes; Agoston Erdelyi, and Jozsef Ragalyi, all of Budapest, Hungary, assignors to Textilipari Kutato Intezet, Budapest, Hungary

Filed Oct. 11, 1977, Ser. No. 842,329
Claims priority, application Hungary, Oct. 12, 1976, TE 860
Int. Cl.² G01N *3/00*; G06F *15/46*
U.S. Cl. 364—550 **8 Claims**

1. In an equipment for the automatic, super-speed, and large-scale yarn-strength testing comprising a control unit for the concerted control of both the breaking process and the processing of the measured data, means for supplying electric signals proportional to the values of the breaking force and the elongation, respectively the said means being connected to at least one data processing unit(s) whereas the latter one(s) is (are) connected to a display and/or printing device, and the data processing unit(s) and the control unit are coupled to a computer the improvement in which n pieces (n being a positive integer) of breaking units each of them comprising at least one sensor (**201** . . . **210**) are mounted upon a common supporting block and coupled to a single, common, program-controlled drive (**24**) the program controlled inputs of which being connected to the outputs of the said control unit (**222**), and a data processing and control network is incorporated into the equipment comprising a RAM-memory (**223**) which is coupled over an address channel (**329**), a read-in control channel, and a readout control channel to the said control unit (**222**), and over its data output to the inputs of a first and a second register (**224** and **225**), the outputs of the said registers (**224**, **225**) are coupled to the inputs of an adder stage (**226**), and the output of the second register (**225**) is also connected to the data input of the

said RAM-memory (**223**), the output of the said adder stage (**226**) is connected to a D/A converter (**227**), and the output of the D/A converter (**227**) is connected to a set of comparators (**211** . . . **220**) over one of their data inputs whereas the other data inputs of the said comparators (**211** . . . **220**) are separately



connected to one of the said sensors (**201** . . . **210**) each, and the outputs of the said comparators (**211** . . . **220**) are connected to the input of a channel selector (**221**) which is coupled with the said control unit (**222**) and the output of which is coupled to one of the inputs of the second register (**225**).

4,173,788

METHOD AND APPARATUS FOR MEASURING DIMENSIONS

Theodore A. Laliotis, Los Altos, Calif., assignor to Atmospheric Sciences, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 727,042, Sep. 27, 1976. This application Sep. 26, 1977, Ser. No. 836,615
Int. Cl.² G01B *11/10*; G06F *15/20*
U.S. Cl. 364—560 **10 Claims**

1. Structure comprising:

means for producing one measure of a field of view without an object present and for producing another measure of the field of view with an object present, said means for producing comprising:

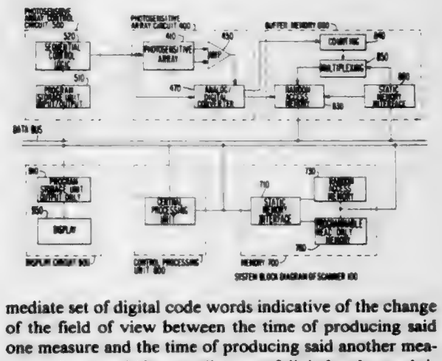
photosensitive array means for receiving light representing the field of view without an object present and for producing from said light one set of intermediate signals representative of said field of view without an object present, said one set of intermediate signals comprising said one measure, and for receiving light representing the field of view with an object present and for producing from said light another set of intermediate signals representing said field of view with said object present, said another set of intermediate signals comprising said another measure;

means for controlling said photosensitive array means to produce in sequence said one set of intermediate signals and said another set of intermediate signals; and

means for converting said one set and said another set of intermediate signals produced by said photosensitive array means to one set and another set of digital code words respectively,

means for storing either said one set of digital code words representing said field of view without said object present, or said another set of digital code words representing said field of view with said object present, whichever set of digital code words is produced first in time;

means for processing said one set of digital code words and said another set of digital code words to produce an intermediate set of digital code words indicative of the change of the field of view between the time of producing said one measure and the time of producing said another measure, wherein said intermediate set of digital code words is also indicative of selected characteristics of said object;



means for storing said intermediate set of digital code words;

means for processing said intermediate set of digital code words to obtain a measure of a selected characteristic of said object in said field of view;

means for deriving from either said one set of digital code words or said another set of digital code words, whichever is produced first in time, and said intermediate set of digital code words, both an indication of the presence or absence of an object at a selected time, and a selected dimension of said object; and

means for displaying said selected dimension of said object.

4,173,789

MULTIPLICATION CONTROL SYSTEM

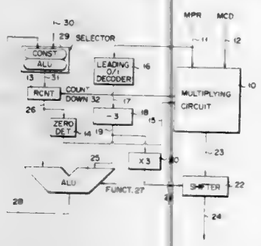
Haruhisa Miura, Hino, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Dec. 28, 1977, Ser. No. 865,211
Claims priority, application Japan, Dec. 23, 1976, 51-154177
Int. Cl.² G06F *7/52*
U.S. Cl. 364—760 **11 Claims**

1. A multiplication control system comprising a recursive multiplying circuit to which a binary-coded multiplier and a binary-coded multiplicand are supplied, a detection portion which detects the number of continuous "0" or "1" bits adjacent the most or least significant digit to detect the number of those significant digits in said multiplier which need to be operated, means to determine the number of recursive opera-

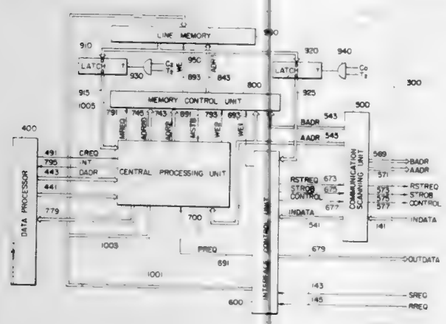
V 9 8 8 1 1
NO 6 79
UMI

tions required of said multiplying circuit in correspondence with the detected number of said digits, and means to execute



said recursive operations in accordance with said determined number of said operations.

4,173,790
COMMUNICATION CONTROL SYSTEM
Masahiro Abe, Sayama; Yoshiaki Elfuku, Hatano, and Toshio Kajiwara, Yokohama, all of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph and Telephone Public Corporation, both of, Japan
Filed Sep. 12, 1977, Ser. No. 832,584
Claims priority, application Japan, Sep. 10, 1976, 51-107754
Int. Cl.[2] G06F 3/04
U.S. Cl. 364—900 **9 Claims**



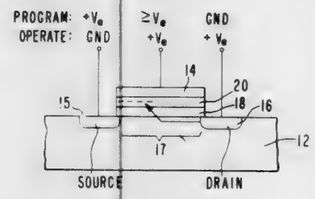
5. In a communication control system including a data processor, a plurality of modems, a line control unit forming a plurality of communication channels each connected to a respective modem, and a communication control unit for controlling transfer of data between said data processor and selected communication channels in said line control unit, the improvement comprising

first and second address signal generator means in said communication control unit each generating the same address signals identifying said communication channels continuously during a predetermined scanning period and cyclically with a predetermined repetition period, the address signals generated by said second address signal generator means being delayed with respect to the address signals generated by said first address signal generator means by a predetermined delay time;

a plurality of line adapters each including first and second switching means in said line control unit for transferring data to and from a selected modem, respectively; and

first and second decoder means in said line control unit responsive to the address signals generated by said first and second address signal generator means, respectively, for generating first and second enabling signals, respectively, which enable said respective first and second switching means in a selected line adapter.

4,173,791
INSULATED GATE FIELD-EFFECT TRANSISTOR READ-ONLY MEMORY ARRAY
Antony G. Bell, Sunnyvale, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.
Filed Sep. 16, 1977, Ser. No. 834,016
Int. Cl.[2] G11C 11/40
U.S. Cl. 365—182 **18 Claims**



6. A method of programming a random-access semiconductor memory array having a common line, a plurality m of x lines, a plurality n of y lines and a plurality of IGFET's wherein each IGFET is connected to one x line and one y line, transistor T_{ab} being connected to line a and line b, wherein $0<a\leqq m$ and $0<b\leqq n$, wherein each IGFET includes:

a substrate of one conductivity type;

spaced-apart source and drain regions formed in the substrate, each of opposite conductivity to the substrate;

a gate insulating region formed on the substrate between the source and the drain;

an electrically conductive gate electrode formed on the gate insulating region between the source and the drain; and

means for defining a state in the IGFET by applying electrical signals to the source, the drain, and the gate electrode to introduce change into and store charge in the gate insulating region predominantly toward one of the source or the drain regions; and

transistor T_{ab} is programmed by the following steps:

applying a first potential to the common line, the x lines and the y lines,

applying a second potential to the common line,

applying a third potential to all y lines except line b,

applying a fourth potential to line a to activate the means for defining a state in the IGFET.

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DESIGNS

NOVEMBER 6, 1979

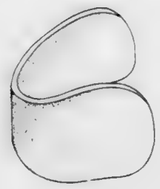
253,316
FABRIC SHOE
L. Perry Hull, 952 12th St., NE., Mason City, Iowa 50401
Filed Aug. 29, 1977, Ser. No. 828,338
Term of patent 14 years
Int. Cl. D2—04
U.S. Cl. D2—273



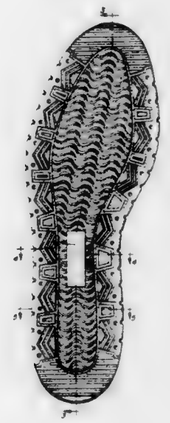
253,317
SHOE
Rino Negrin, Selva del Montello, Italy, assignor to Sports Enterprises, Inc.
Filed Dec. 5, 1977, Ser. No. 857,122
Term of patent 14 years
Int. Cl. D2—04
U.S. Cl. D2—272



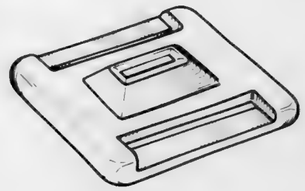
253,318
SHOE HEEL PROTECTOR
Michael Maccario, 336 Huntley Rd., Upper Darby, Pa. 19082
Filed Oct. 20, 1977, Ser. No. 844,119
Term of patent 14 years
Int. Cl. D2—04
U.S. Cl. D2—314



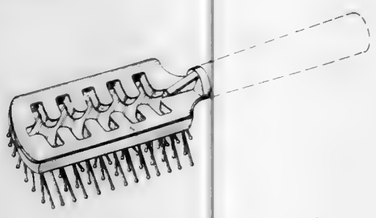
253,319
SOLE FOR FOOTWEAR
Armin A. Dassler, Ringstrasse 121, D-8522 Herzogenaurach, Fed. Rep. of Germany
Filed Feb. 13, 1978, Ser. No. 877,358
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1977, 7363
Term of patent 14 years
Int. Cl. D2—04
U.S. Cl. D2—320



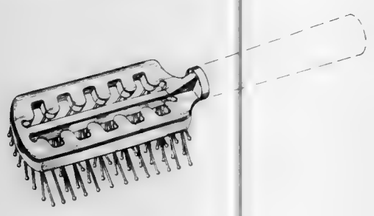
253,320
STRAP RETAINER
Ronald J. Adams, 12311 Kent Ct., Southgate, Mich. 48195
Filed Jun. 27, 1977, Ser. No. 810,024
Term of patent 14 years
Int. Cl. D02—07
U.S. Cl. D2—447



253,321
HEAD FOR A HAIR BRUSH
Robert E. Saute, 10236 Mossy Rock Cir., Los Angeles, Calif. 90024
Filed Jan. 30, 1978, Ser. No. 873,406
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—35



253,322
HEAD FOR A HAIR BRUSH
Robert E. Saute, 10236 Mossy Rock Cir., Los Angeles, Calif. 90024
Filed Jan. 30, 1978, Ser. No. 873,723
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—35



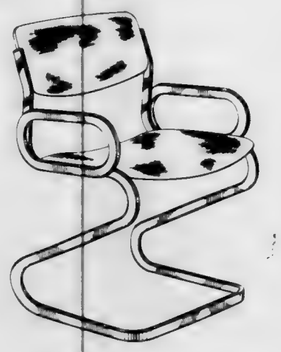
253,323
SUPPORT STAND FOR A LOUDSPEAKER
Thea Blatzer, Lichtenfels; Willfried Ender, and Gerhard Ketnath, both of Neuensee, all of Fed. Rep. of Germany, assignors to Firma Andreas Hofmann Metallwarenfabrik, Fed. Rep. of Germany
Filed Apr. 28, 1977, Ser. No. 792,022
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—25



253,324
SEAT
Camilo Lopez, III, Coral Gables, Fla., assignor to Camilo Muebles, Inc., Coral Gables, Fla.
Filed Nov. 7, 1977, Ser. No. 849,492
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47



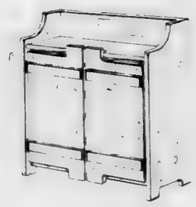
253,325
SIDE ARM CHAIR
George E. Gasser, 6455 Sodom-Hutchings Rd., Girard, Ohio 44420, and Alberto Ranucci, 9 Skye Ct., Downsview, Ontario, Canada (M-3N-1T5)
Filed Jul. 21, 1977, Ser. No. 818,272
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—56



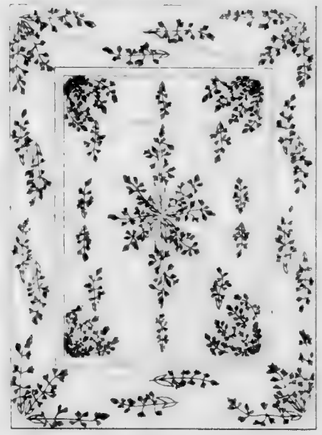
253,326
SOFA
Barry Brukoff, 201 Valley Rd., Sausalito, Calif. 94965
Filed Jun. 17, 1977, Ser. No. 807,363
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—61



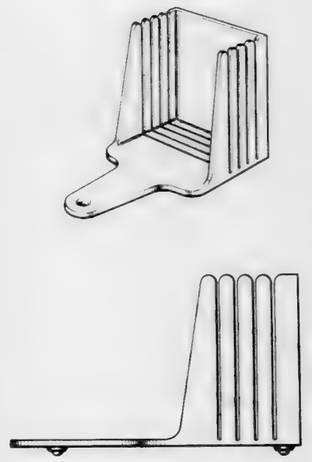
253,327
CABINET
Jerry L. Johnson, Rancho Cuerdo, Box 50, Potrero, Calif. 92063
Filed Dec. 5, 1977, Ser. No. 857,409
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—168



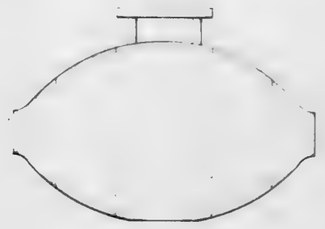
253,328
RUG
James S. Thompson, 10616 Dunkirk Dr., Silver Spring, Md. 02209
Filed Oct. 6, 1977, Ser. No. 840,117
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D6—210



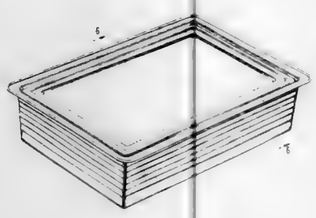
253,329
BREAD SLICING GUIDE
Kenneth H. Latham, 475 Linden Dr., Idaho Falls, Id. 83401
Filed Nov. 21, 1977, Ser. No. 853,643
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—46



253,330
LUNCH PAIL OR SIMILAR ARTICLE
Earl W. Weaver, Rte. 1, Box 72, McIntosh, Ala. 36553
Filed Mar. 25, 1976, Ser. No. 670,101
Term of patent 14 years
Int. Cl. D03—*01*
U.S. Cl. D7—76



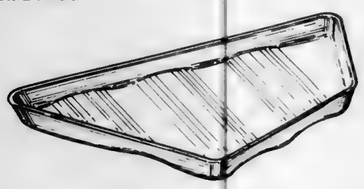
253,331
FOOD CONTAINER
Hans J. Olschewski, Berlin, Fed. Rep. of Germany, assignor to FKF Fleischwaren- und Konserven-Fabrik, Schultz & Berndt GmbH & Co. KG, Berlin, Fed. Rep. of Germany
Filed Jun. 3, 1977, Ser. No. 803,404
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—76



253,332
BAKING PAN
Frances E. Rich, 8802 N. New World Dr., Glendale, Ariz. 85302
Filed Sep. 22, 1977, Ser. No. 835,839
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—96



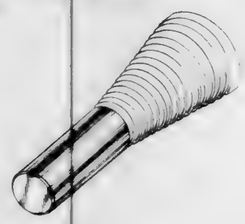
253,333
BAKING PAN
Paul S. Carr, III, and Carolyn M. Carr, both of 1817 La Fromboise St., Enumclaw, Wash. 98022
Filed Oct. 11, 1977, Ser. No. 841,154
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—96



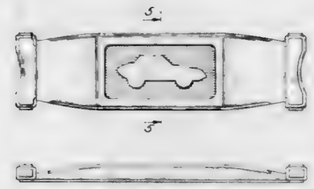
253,334
KNIFE OR SIMILAR ARTICLE OF FLATWARE
Robert J. King, Wallingford, Conn., assignor to International Silver Company, Meriden, Conn.
Filed Oct. 3, 1977, Ser. No. 838,930
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137



253,335
MAGNETIC DOOR STOP
Ralph J. Gauntner, 2404 39th Ave., Sacramento, Calif. 95822, and Alec A. Shilin, Broderick, Calif., assignors to Ralph J. Gauntner and Isabell L. Gauntner, both of Sacramento, Calif.
Filed Apr. 20, 1977, Ser. No. 789,008
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—402



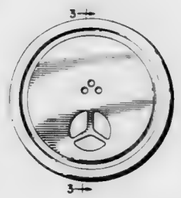
253,336
PUSH BAR FOR DOORS OR THE LIKE
Farrell DeWindt, 13312 Terry Dr., Utica, Mich. 48087
Filed Aug. 10, 1977, Ser. No. 823,210
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—404



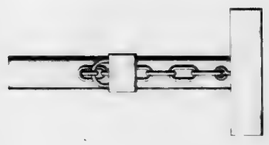
253,337
DISPENSING CONTAINER FOR LIQUIDS OR THE LIKE
Saul Bass, 337 S. Las Palmas Ave., Los Angeles, Calif. 90005, and Arthur J. Goodman, 840 N. Larrabee St., Los Angeles, Calif. 90069
Filed Jul. 7, 1977, Ser. No. 813,748
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—139



253,338
CONTAINER END PANEL
Gary K. Hasegawa, Morton Grove, Ill., assignor to The Continental Group, Inc., New York, N.Y.
Filed Feb. 7, 1977, Ser. No. 766,468
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—253



253,339
STATUETTE
Goldie M. Cloyd, Road 14W, Loami, Ill. 62661
Continuation-in-part of Ser. No. 729,327, Nov. 5, 1976, abandoned. This application Nov. 20, 1978, Ser. No. 962,250
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—157

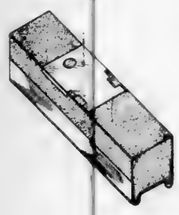


253,340
FIGURINE
Robert E. Friedrich, 218 Smith St., Columbus, Tex. 78934
Filed May 19, 1977, Ser. No. 798,597
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—160

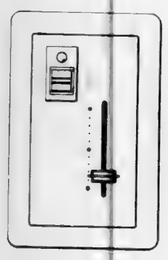




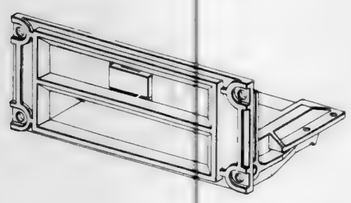
253,341
SOLID STATE PROTECTOR FOR COMMUNICATIONS CIRCUITS OR SIMILAR ARTICLE
John J. Barta, Jr., 1417 Danes Dr., West Covina, Calif. 91791
Filed Oct. 2, 1978, Ser. No. 947,765
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—11



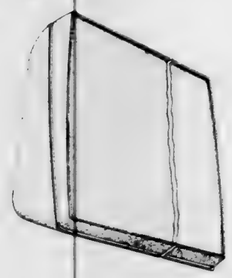
253,342
REMOTE DIMMING CONTROL SYSTEM
Noel Mayo, Philadelphia, Pa., assignor to Lutron Electronics Co., Inc., Coopersburg, Pa.
Division of Ser. No. 726,524, Sep. 27, 1976, Pat. No. D. 249,141.
This application Mar. 8, 1978, Ser. No. 884,613
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32



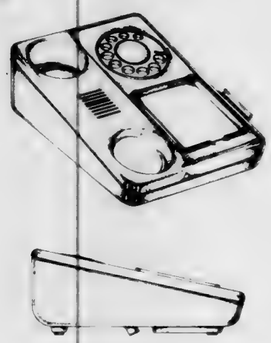
253,343
CARTRIDGE DRIVE
Loren A. Schultz, Dresher, and Alexander Hunter, Chalfont, both of Pa., assignors to Transaction Management, Inc., Montgomeryville, Pa.
Filed Jan. 25, 1978, Ser. No. 872,595
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40



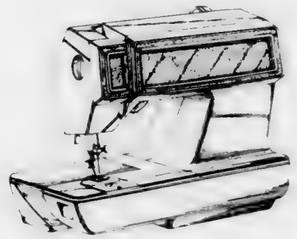
253,344
TELEPHONE STAND
Donald M. Genaro, Haworth, N.J.; John N. McGarvey, Drexel Hill, Pa., and Gordon E. Sylvester, Jamaica, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Division of Ser. No. 604,592, Aug. 14, 1975, which is a continuation-in-part of Ser. No. 469,855, May 14, 1974, Pat. No. D. 237,506, which is a continuation-in-part of Ser. No. 424,413, Dec. 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 364,704, May 29, 1973, abandoned. This application Nov. 23, 1977, Ser. No. 854,503
The portion of the term of this patent subsequent to Nov. 4, 1989, has been disclaimed.
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60



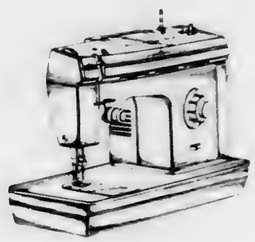
253,345
BASE FOR TELEPHONE SET
Clifford D. Read, Almonte; Robert E. Hillmer, Carleton Place, and John F. Tyson, Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Sep. 19, 1977, Ser. No. 834,833
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60



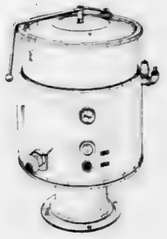
253,346
SEWING MACHINE FRAME OR SIMILAR ARTICLE
Donald M. Genaro, Haworth, N.J.; Cristian J. Felix, Flushing, N.Y.; William L. Herron, Elizabeth, and Kenneth D. Adams, Madison, both of N.J., assignors to The Singer Company
Filed Feb. 28, 1978, Ser. No. 881,997
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—69



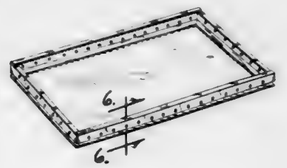
253,347
SEWING MACHINE
Cristian J. Felix, Flushing, N.Y., assignor to The Singer Company
Filed Mar. 28, 1977, Ser. No. 781,899
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—70



253,348
STEAM SELF CONTAINED KETTLE
William M. Bardeau, 158 Norfinch Dr., Downsview, Ontario, Canada (M3N 1Y1)
Filed Jun. 13, 1977, Ser. No. 804,082
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—104

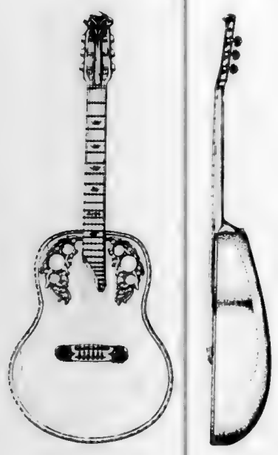


253,349
LINER FOR SPENT NUCLEAR FUEL POOLS
Ralph L. Jennings, Des Moines, Iowa, assignor to Economy Forms Corporation, Des Moines, Iowa
Filed Sep. 6, 1977, Ser. No. 830,903
Term of patent 14 years
Int. Cl. D15—*09*; D25—*01*
U.S. Cl. D15—136

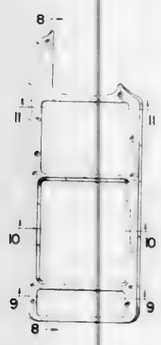


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253,350
GUITAR
Charles H. Kaman, Prattling Pond Rd., Farmington, Conn. 06032
Filed Jan. 27, 1977, Ser. No. 763,230
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—19



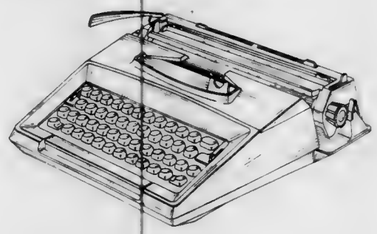
253,351
STRINGED INSTRUMENT BEZEL
James H. Rickard, Harwinton, Conn., assignor to Ovation Instruments, Inc., New Hartford, Conn.
Filed Jan. 19, 1977, Ser. No. 760,743
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—20



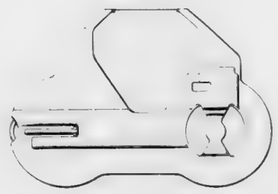
253,352
GUITAR SOUNDBOARD
Charles H. Kaman, Prattling Pond Rd., Farmington, Conn. 06032
Filed Jan. 27, 1977, Ser. No. 763,229
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—20



253,353
TYPEWRITER
John E. Jolliffe, Manlius, N.Y., assignor to SCM Corporation, New York, N.Y.
Filed Feb. 6, 1978, Ser. No. 875,467
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—1



253,354
CARTRIDGE FOR A TYPEWRITER
Edwin J. Lenney, and John O. Schaefer, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation-in-part of Ser. No. 801,289, May 27, 1977, abandoned, and a continuation-in-part of Ser. No. 801,288, May 27, 1977, abandoned. This application Oct. 10, 1978, Ser. No. 950,093
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—12



253,355
MONOGRAM FONT
Lars G. Rosenblad, Huskvarna, Sweden, assignor to Husqvarna AB, Huskvarna, Sweden
Filed Apr. 28, 1977, Ser. No. 792,037
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D18—24



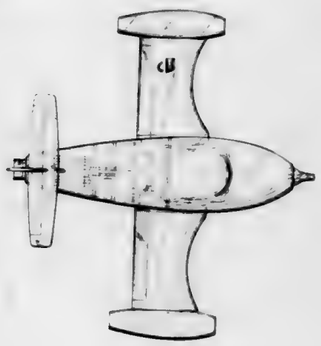
253,356
MONOGRAM
Lars G. Rosenblad, Huskvarna, Sweden, assignor to Husqvarna AB, Huskvarna, Sweden
Filed Apr. 28, 1977, Ser. No. 792,038
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D18—24



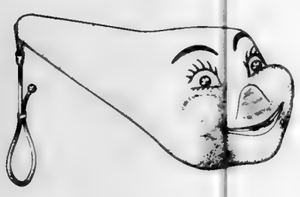
253,357
MONOGRAM
Lars G. Rosenblad, Huskvarna, Sweden, assignor to Husqvarna AB, Huskvarna, Sweden
Filed Apr. 28, 1977, Ser. No. 792,040
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D18—24



253,358
TOY AIRPLANE
Mel Appel, 9 Nottingham Rd., Livingston, N.J. 07039
Filed Jun. 20, 1977, Ser. No. 808,245
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—87



253,359
ACTION DOLL
E. Dean Walker, 823 Patricia Dr., San Antonio, Tex. 78216
Filed Nov. 16, 1977, Ser. No. 851,868
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150



253,360
DOLL
Dietmar Nagel, New York, N.Y., and William J. Baron, Middleton, Mass., assignors to Nagel-Kennedy Associates
Filed Oct. 31, 1977, Ser. No. 847,139
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—166

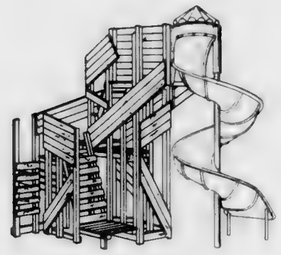


253,361
SKI
Rudolf Ferch, Salzburg, Austria, assignor to Kastle Gesellschaft m.b.H., Austria
Filed Apr. 27, 1977, Ser. No. 791,594
Claims priority, application Austria, Oct. 28, 1976, 25165372/76
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—229

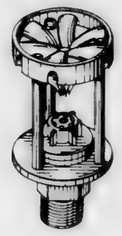
253,362
PLAYGROUND STRUCTURE
Berthold B. Dieter, and Charles L. Gibson, both of Terre Haute, Ind., assignors to Creative Playgrounds Corporation, Terre Haute, Ind.
Filed Dec. 21, 1977, Ser. No. 862,938
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—243



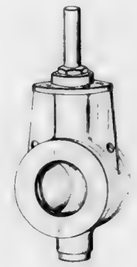
253,363
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Berthold B. Dieter, and Charles L. Gibson, both of Terre Haute, Ind., assignors to Creative Playgrounds Corporation, Terre Haute, Ind.
Filed Nov. 17, 1977, Ser. No. 852,582
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—244



253,364
SPRINKLER HEAD
William J. McFadden, Orange County, Fla., assignor to Senninger Irrigation, Inc., Orlando, Fla.
Filed Aug. 21, 1978, Ser. No. 935,731
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—6



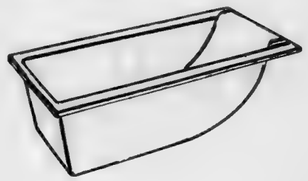
253,365
BALL VALVE
Gustav B. Nyberg, Säffle, Sweden, assignor to AB Källe-Regulatorer, Säffle, Sweden
Filed Apr. 22, 1977, Ser. No. 790,143
Claims priority, application Sweden, Oct. 25, 1976, 76-2062
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



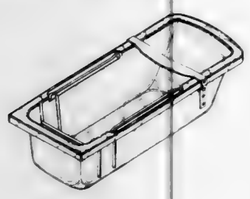
253,366
BATHTUB
Albert R. Weaver, 15001 Calvert, Van Nuys, Calif. 91411
Filed Aug. 30, 1978, Ser. No. 938,054
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



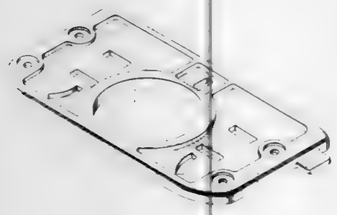
253,367
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Albert R. Weaver, 15001 Calvert, Van Nuys, Calif. 91411
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Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



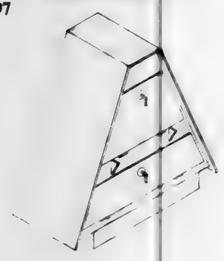
253,368
BATHTUB
Hans A. V. Johansson, Trehäradsvägen 36, Eslöv, Sweden
Filed Oct. 10, 1978, Ser. No. 949,679
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



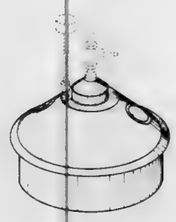
253,369
WATER CLOSET TANK UNIVERSAL ADAPTOR PLATE
Alexander Koelble, and Paul Staehli, both c/o: Geberit AG, CH-8640 Rapperswil, Switzerland
Filed Aug. 26, 1977, Ser. No. 828,130
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69



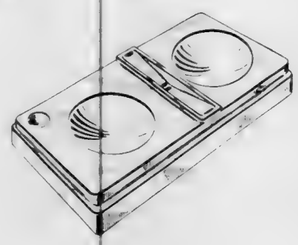
253,370
STOVE
Thomas R. Chalmers, 910-1305 Taylor Ave., Winnipeg, Canada (R3M 2K5)
Filed Oct. 6, 1977, Ser. No. 839,999
Claims priority, application Canada, Apr. 20, 1977, 2004771
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



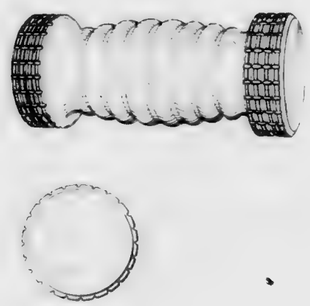
253,371
VAPORIZER FOR A COMBUSTION SYSTEM
Jerome Schrank, Brooklyn, N.Y., assignor to Allied Energy Corp., Beverly Hills, Calif.
Filed Mar. 25, 1977, Ser. No. 781,136
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127



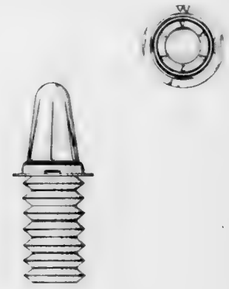
253,372
DENTAL MIXING SLAB
Thomas J. Mayclin, 2629 Louisiana Ave., Minneapolis, Minn. 55426
Filed Jun. 22, 1977, Ser. No. 808,913
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10



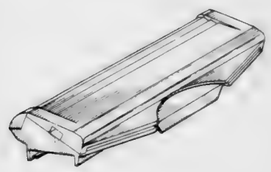
253,373
FOOT MASSAGE ROLLER
Victor Celeste, Toronto, Canada, assignor to 369403 Ontario Limited, Toronto, Canada
Filed Oct. 18, 1977, Ser. No. 843,491
Claims priority, application Canada, Sep. 16, 1977, 1609777
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D24—36



253,374
LUBRICANT DEVICE
Joseph P. Bonk, Des Plaines, Ill., assignor to The Kendall Company, Boston, Mass.
Filed Jul. 27, 1978, Ser. No. 928,758
Term of patent 14 years
Int. Cl. D24—*02, 04*
U.S. Cl. D24—63



253,375
SAFETY RAZOR CARTRIDGE WITH CLEAN-OUT MECHANISM
Evan N. Chen, Fairfield, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Dec. 30, 1977, Ser. No. 866,142
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—43



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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF NOVEMBER, 1979

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-T-O Inc.: *See—*
Dillard, Winford, 4,173,370, Cl. 296-65.00A.

AB Transporteknik: *See—*
Von Knorring, Knut A., 4,173,272, Cl. 194-9.00T.

Abbondanti, Alberto; and Kernick, Andress, to Westinghouse Electric Corp. Single-pole commutation circuit. 4,173,779, Cl. 363-27.000.

Abbott Laboratories: *See—*
Muetterties, Andrew J., 4,173,222, Cl. 128-214.00C.
Tadanier, John S.; Martin, Jerry R.; and Kurath, Paul, 4,173,564, Cl. 260-112.50R.

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Janecek, Jaroslav; and Jirusc, Jaroslav, 4,173,335, Cl. 271-93.000.

Adams, Charles K., to Western Electric Company, Incorporated. Capacitance detecting system and method for testing wire connections. 4,173,736, Cl. 324-51.000.

Adee, Raymond A., to Hesston Corporation. Disc gang mounting. 4,173,262, Cl. 172-599.000.

Adolph, Horst G.: *See—*
Koppes, William M.; Adolph, Horst G.; and Sitzmann, Michael E., 4,173,591, Cl. 260-646.000.

Adolphen, Gerhard: *See—*
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Agency of Industrial Science and Technology: *See—*
Ebata, Yoshihiro; Ueno, Tsutomu; Kataoka, Nagamasa; and Akao, Akimasa, 4,173,460, Cl. 65-40.000.
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Ranz, Erwin; Lohmann, Joachim W.; and Schutz, Heinz-Dieter, 4,173,479, Cl. 430-507.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Ohmi, Atsushi, 4,173,172, Cl. 91-369.00A.

Ajax Machine and Welding Co.: *See—*
Casad, Edward F.; Casad, Thomas R.; and Jones, Richard E., 4,173,196, Cl. 114-253.000.

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Ebata, Yoshihiro; Ueno, Tsutomu; Kataoka, Nagamasa; and Akao, Akimasa, 4,173,461, Cl. 65-106.000.

Akasaka, Shigeo, to Nippon Kogaku K.K. Shutter dial device for camera. 4,173,404, Cl. 354-289.000.

Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Dry image forming material containing an organic silver salt oxidizing agent, a reducing agent and a halogen molecule. 4,173,482, Cl. 430-619.000.

Akazawa, Hiroyuki, to Kabushiki Kaisha Suwa Seikosha; and Shinshu Seiki Kabushiki Kaisha. Line printer character belt. 4,173,183, Cl. 101-111.000.

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Noomen, Arie; van der Geest, Johannes M. P.; de Jong, Cornelis; and Van Santen, Dick, 4,173,682, Cl. 428-423.000.

Akzona Incorporated: *See—*
Brandeau, Edward P., 4,173,388, Cl. 339-276.00T.
Bruins, Antonius H. N. M.; and Vollema, Gerlof, 4,173,652, Cl. 424-324.000.

Alco Foodservice Equipment Company: *See—*
Marshall, William A., 4,173,296, Cl. 222-129.100.

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Allbert, Barrie J.: *See—*
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Allen, Ronald E., to B. F. Goodrich Company, The. Tread end cementer. 4,173,198, Cl. 118-706.000.

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Holtz, John W., 4,173,618, Cl. 423-58.000.
Minhas, Pritam S.; and Sukornick, Bernard, 4,173,671, Cl. 428-85.000.
Palmer, Louis R.; and Karo, James T., 4,173,708, Cl. 562-460.000.

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Allis-Chalmers Corporation: *See—*
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Allmark, Reginald H.; and Bottoms, Norman, to International Computers Limited. Electrical connectors. 4,173,381, Cl. 339-17.0LM.

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Cruthers, Larry R.; James, Terrence M.; Goff, Sidney; and Alouche, Antoine R., 4,173,632, Cl. 424-232.000.

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AM International, Inc.: *See—*
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Beck, Charles K., 4,173,559, Cl. 260-33.40R.

American Antenna Corporation: *See—*
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Ekinaka, Michael H.; and MacAnally, Richard B., 4,173,392, Cl. 350-96.260.
Newman, Howard F.; and Stansbury, Benjamin, 4,173,074, Cl. 33-2.00R.
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Ando, Masumi, to Hukuba Kogyo Kabushiki Kaisha. Floor sweeper. 4,173,054, Cl. 15-98.000.

Andrews, Harry N.: *See—*
Massaro, Anthony A., Jr.; and Andrews, Harry N., 4,173,060, Cl. 29-157.400.

Angshed, Torsten A. Golf swing training device and method. 4,173,344, Cl. 273-183.00B.

Anker, Madylon C. Volley ball rotation counter, 4,173,197, Cl. 116-223.000.

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Law, David C. F., 4,173,653, Cl. 424-333.000.

Arends, Albert W.; and Pickard, George L., to Leesona Corporation. Trim press. 4,173,161, Cl. 83-278.000.

Argus Chemical Corporation: *See—*
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,173,599, Cl. 525-66.000.
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Conn, Don L., 4,173,139, Cl. 73-1.0DV.
Arntsen, Arnt P., to RCA Corporation. Coupling a frequency modulated signal to a tuned load. 4,173,743, Cl. 333-32.000.
Arthur, Richard P., to Sunbeam Corporation. Cooking assembly. 4,173,179, Cl. 99-374.000.
Asahi-Dow Limited: *See—*
Ashida, Takeshi; Saito, Fumitaka; and Akamatsu, Masateru, 4,173,669, Cl. 428-35.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
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Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Kobayashi, Koichi, 4,173,395, Cl. 350-214.000.
Okamoto, Ikuzo; and Shindo, Osamu, 4,173,398, Cl. 351-9.000.
Asai, Kiyokazu; and Takeuchi, Akihiro, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Piezoelectrically driven ultrasonic transducer. 4,173,725, Cl. 310-325.000.
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, to Toyo Kagaku Kabushiki Kaisha. Adhesive tape. 4,173,676, Cl. 428-332.000.
Asami, Kazuto; and Okamoto, Takashi, to Glory Kogyo Kabushiki Kaisha. Residual coin detecting device in coin processing machine. 4,173,232, Cl. 133-3.00R.
Aschiero, Roland: *See—*
Sundt, Erling; and Aschiero, Roland, 4,173,550, Cl. 252-522.000.
ASEA AB: *See—*
Kollberg, Sten; and Tiberg, Lars, 4,173,299, Cl. 222-594.000.
Ashida, Takeshi; Saito, Fumitaka; and Akamatsu, Masateru, to Asahi-Dow Limited. Aqueous dispersion for coating and coated articles. 4,173,669, Cl. 428-35.000.
Atlow Mining Development Consultants Limited: *See—*
Dawson, Gordon B., 4,173,280, Cl. 198-812.000.
Atmospheric Sciences, Inc.: *See—*
Laliotis, Theodore A., 4,173,788, Cl. 364-560.000.
Ato Chimie: *See—*
Borg, Patrick, 4,173,699, Cl. 526-237.000.
Au, Andrew T.; and Freedman, Harold H., to Dow Chemical Company, The. Polymer-supported poly(alkyleneglycol ethers). 4,173,693, Cl. 525-329.000.
Aulich, Hubert; Grabmeier, Josef; and Pink, Hans, to Siemens Aktiengesellschaft. Method for producing a light conducting fiber. 4,173,459, Cl. 65-3.00A.
Auto Components, Inc.: *See—*
Izumi, John; and D'Orio, Angelo, 4,173,055, Cl. 15-250.020.
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Stansbury, Benjamin H., Jr.; and Fluster, Barry, 4,173,282, Cl. 206-216.000.
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De Witt, Elmer J., 4,173,596, Cl. 428-402.000.
Shipman, James J.; Hallman, Robert W.; Tenney, Linwood P.; and Beall, Leman G., Jr., 4,173,503, Cl. 156-123.00R.
Bachman, Gerald L.; and Vineyard, Billy D., to Monsanto Company. Process for the preparation of α-L-aspartyl-L-phenylalanine methyl ester. 4,173,562, Cl. 260-112.50R.
Badische Corporation: *See—*
Hennes, John H.; and Crecente, Christopher P., 4,173,678, Cl. 428-364.000.
Payne, Larry W.; Miller, Howard E.; and Ryffel, James R., 4,173,586, Cl. 260-586.00R.
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Willcox, Kenneth W.; and Bailey, Fay W., 4,173,597, Cl. 525-98.000.
Baker, Benjamin R.; and Baker, Mickey C. Produce handling system. 4,173,422, Cl. 414-390.000.
Baker, Mickey C.: *See—*
Baker, Benjamin R.; and Baker, Mickey C., 4,173,422, Cl. 414-390.000.
Baker, Ralph L.: *See—*
Ratz, Thomas J.; and Baker, Ralph L., 4,173,220, Cl. 128-142.700.
Baker, Richard L., to High Standard, Inc. Cylinder-locking device for revolvers. 4,173,090, Cl. 42-67.000.
Bakhru, Keshoolal, to Cubic Corporation. Adaptive antenna array and method of operating same. 4,173,759, Cl. 343-100.0LE.
Balon, Johannes; and Oldendorf, Manfred, to Hoesch Werke Aktiengesellschaft. Stamping mechanism for rolled goods with article alignment structure. 4,173,182, Cl. 101-4.000.
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Raabe, Ralph C.; Cleffman, Roger G.; and Stratton, Raymond G., 4,173,509, Cl. 156-507.000.
Banfi, Silvano; Pellegata, Renato; Pifferi, Giorgio; and Pinza, Mario, to I.S.F. SpA. Preparation of pyrrolidine and pyrrolidin-2-one derivatives. 4,173,569, Cl. 260-326.430.
Bardwell, Charles E.: *See—*
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Barnett, Robert L. Game score apparatus. 4,173,338, Cl. 273-85.00B.
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Elliehausen, Heinrich; Hohenschutz, Heinz; Strohmeyer, Max; and Haug, Juergen, 4,173,589, Cl. 260-604.0HF.
Hamprecht, Gerhard, 4,173,580, Cl. 260-543.00R.
Pasedach, Heinrich; Mohr, Rudolf; and Nissen, Axel, 4,173,588, Cl. 260-595.000.
Bastien, Joel; Gratacos, Jaime; and Lazarre, Flavien, to Societe Nationale Elf Aquitaine (Production). Cathodic protection of a structure in the sea by sacrificial anodes. 4,173,523, Cl. 204-197.000.
Bauer, William V., to Lummus Company, The. Hydrotreating of pyrolysis gasoline. 4,173,529, Cl. 208-255.000.
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Enders, Edgar; Ebbighausen, Volker; Gau, Wolfgang; Wunsche, Christian; and Stendel, Wilhelm, 4,173,645, Cl. 424-273.00R.
Findeisen, Kurt; Wagner, Kuno; and Uerdingen, Walter, 4,173,567, Cl. 548-216.000.
Rademachers, Jakob; and Linde, Gunter, 4,173,624, Cl. 423-551.000.
Schmitz, Reinold; and Wunderlich, Klaus, 4,173,568, Cl. 260-314.500.
Steinacker, Karl-Heinz; and Adolphen, Gerhard, 4,173,581, Cl. 260-552.0SC.
Woditsch, Peter; Winter, Gerhard; Linde, Gunter; and Muller, Friedhelm, 4,173,485, Cl. 106-73.300.
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BBC Brown Boveri & Company Limited: *See—*
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Beck, Charles K., to AM International, Inc. Non-aqueous polymeric dispersion alkyl methacrylate copolymers in mixtures of organic solvents and glossy coatings produced therefrom. 4,173,558, Cl. 260-33.40R.
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Beguin, Alain; Dubois, Jean-Claude; and Zann, Annie, to Thomson-CSF. Liquid crystal with high negative dielectric anisotropy and mixtures of the same with nematic liquid crystals for improving dynamic scattering in electro-optic devices. 4,173,545, Cl. 252-299.000.
Bell, Antony G., to Fairchild Camera and Instrument Corporation. Insulated gate field-effect transistor read-only memory array. 4,173,791, Cl. 365-182.000.
Bell Telephone Laboratories, Incorporated: *See—*
Chandross, Edwin A.; and Tomlinson, Walter J., III, 4,173,475, Cl. 430-290.000.
Curtis, Lyn, 4,173,389, Cl. 350-96.200.
Fahrenholtz, Susan; Long, David T.; and Pitetti, Raymond C., 4,173,470, Cl. 430-5.000.
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Toelle, Alvin D., 4,173,205, Cl. 123-119.00A.
Beneteau, Donald J. Knock-down press. 4,173,181, Cl. 100-231.000.
Benke, Frank W.: *See—*
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Benson, Nigel C.; Hughes, John M. F.; Kingslake, Denis; and Symonds, David G., to Imperial Chemical Industries Limited. Process for feeding a moving web to a stenter apparatus. 4,173,611, Cl. 264-138.000.
Benson, Ronald J.: *See—*
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Bergman, Lawrence A.; and Gorndt, John H., to Lord Corporation. Flexible sealing joint. 4,173,350, Cl. 285-51.000.
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Berwick, Martin A.; and Riecke, Edgar E., to Eastman Kodak Company. Polyester interlayer and binder component in multilayer photoconductive element. 4,173,472, Cl. 430-60.000.
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Beuch, Wallace E.; and Zell, Michael N., to International Business Machines Corporation. Gripping device for magnetic diskettes. 4,173,427, Cl. 414-751.000.
BFG Glassgroup: *See—*
Hentzelt, Walther E.; Nolte, Hans-Henning; and von Reis, Wolf, 4,173,668, Cl. 428-34.000.
Big Jon, Inc.: *See—*
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Bille, Heinz, to Maschinenfabrik Walter Scheele KG. Pivotable pipe slide for use in a two cylinder concrete pump. 4,173,436, Cl. 417-516.000.
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Billings, Roger E., 4,173,625, Cl. 423-648.00R.
Billings, Roger E., to Billings Energy Corporation. Hydrogen purification and storage system. 4,173,625, Cl. 423-648.00R.
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Bird, Harry L.; and Sutherland, David T., to Virtis Company, Inc., The. Shelf arrangement for freeze drying apparatus. 4,173,078, Cl. 34-92.000.
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, to Hoechst Aktiengesellschaft. Process and additional devices of drying machines for the uniform drying of textiles. 4,173,077, Cl. 34-23.000.
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Blankenship, Michael G., to Corning Glass Works. System for delivering materials to deposition site on optical waveguide blank. 4,173,305, Cl. 239-79.000.
Bloch, Alan; Coviello, Frank A.; Guzik, Ira; and Puebla, Candido, to TIE/Communications, Inc. Communication circuit with combined power feed and data transmission over a phantom channel. 4,173,714, Cl. 179-99.00R.
Blok, Arie. Rotary mixer. 4,173,419, Cl. 366-228.000.
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Boling, Norman L.; and Dube, George, to Owens-Illinois, Inc. Solid state laser amplifier having two output wavelengths. 4,173,738, Cl. 330-4.300.
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Booty, Donald J. Portable track lighting. 4,173,382, Cl. 339-22.00B.
Borg, Patrick, to Ato Chimie. Process for manufacturing petroleum resins for adhesive thermofusible compositions. 4,173,699, Cl. 526-237.000.
Bostroem, Theodore. Dipless metallizing process and apparatus. 4,173,663, Cl. 427-211.000.
Bottoms, Norman: *See—*
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Boulais, Marcel J.; and Boulais, Richard A. Laser beam level control with automatic override. 4,173,258, Cl. 172-4.500.
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Boulet, Jean-Claude; Walraevens, Rene; Bonnety, Gerard; Lolivier, Jacques; and Trouillet, Paul, to Solvay & Cie. Halogenated polyether polyols and polyurethane foams produced therefrom. 4,173,710, Cl. 568-614.000.
Bourdon, Bernard, to Alsthom-Atlantique. Method for depositing thin layers of materials by decomposing a gas to yield a plasma. 4,173,661, Cl. 427-39.000.
Boyce, Oren D. Lumber cutting attachments for chain saws. 4,173,240, Cl. 144-312.000.
Bozarth, Gene A.: *See—*
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Bradshaw, Norman F., to Schweitzer Industrial Corporation. Energy recovery system. 4,173,125, Cl. 62-79.000.
Bradshaw, Stephen L.: *See—*
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Brandeau, Edward P., to Akzona Incorporated. Connector-cable with crimped electrical terminations. 4,173,388, Cl. 339-276.00T.
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Bratt, Martin D.; and Cohen, Abraham B., to Du Pont de Nemours, E. I., and Company. Dot-etchable masks from photopolymerizable elements. 4,173,673, Cl. 428-217.000.
Brennan, Michael P. J., to Chloride Silent Power Limited. Sodium sulphur cells. 4,173,686, Cl. 429-104.000.
Brennan, Thomas M.; Brannegan, Daniel P.; Weeks, Paul D.; and Kuhla, Donald E., to Pfizer Inc. Preparation of gamma-pyrones from 3-substituted furans. 4,173,572, Cl. 260-345.90R.
Brenner, Douglas; and Oswald, Alexis A., to Exxon Research & Engineering Co. Alkyl ammonium ionomers. 4,173,695, Cl. 526-332.000.
Brown, Michael J., to GAF Corporation. Phenoxybenzylphosphonium salt herbicides and plant growth regulants. 4,173,462, Cl. 71-86.000.
Brown, Thomas H.; Durant, Graham J.; Ganellin, Charon R.; and Ife, Robert J., to Smith Kline & French Laboratories Limited. Thiourea compounds, compositions and methods and use. 4,173,644, Cl. 424-270.000.
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Bureau, Jean Y.; and Charlebois, Bernard, to Mscan Metal Canada Limitee. Apparatus for steaming foods. 4,173,215, Cl. 126-369.000.
Burgoon, Jack L.; and Knowlton, Christopher M., to Scott & Fetzer Company, The. Riding sweeper. 4,173,052, Cl. 15-83.000.
Butler, George N. Battery-operated body capacitance intrusion alarm apparatus. 4,173,755, Cl. 340-562.000.
C. P. Hall Company, The: *See—*
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Camardella, Giuseppe. Numerically controlled coil winding machine. 4,173,312, Cl. 242-7.110.
Campbell, John A. L.; and Moynihan, Daniel J., to Peabody Coal Company, Inc. Advance method and apparatus for mining. 4,173,373, Cl. 299-11.000.
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Carlock, John T., to Continental Oil Company. Polymer bound (pentahaptocyclopentadienyl) bis carbonyl rhodium hydroformylation catalyst. 4,173,575, Cl. 260-429.00R.
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Cassou, Robert E. J.; and Cassou, Bertrand M. E. Injecting gun for animals, in particular for the artificial insemination of cattle. 4,173,227, Cl. 128-235.000.
Castelazo, Garbiel G. M.; Quintero, Abraham; Medina, Alejandro; and Fabila, Gilberto. Polymeric compositions and methods for their production. 4,173,598, Cl. 428-402.000.

Caterpillar Tractor Co.: *See—*
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Cencier, Lucien, to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull. System of coherent management of exchanges between two contiguous levels of a hierarchy of memories. 4,173,781, Cl. 364-200.000.
Central Glass Company, Limited: *See—*
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Chabala, John C.; Fisher, Michael H.; and Mrozik, Helmut H., to Merck & Co., Inc. 13-Halo and 13-deoxy derivatives of C-076 compounds. 4,173,571, Cl. 260-343.410.
Chambley, Phillip W.; and Norris, Alan H., to WWG Industries, Inc. Yarn forming apparatus with node welding. 4,173,115, Cl. 57-293.000.
Champion International Corporation: *See—*
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Chandross, Edwin A.; and Tomlinson, Walter J., III, to Bell Telephone Laboratories, Incorporated. Latent image thick refractive index recordings. 4,173,475, Cl. 430-290.000.
Chang, Leroy L.; and Esaki, Leo, to International Business Machines Corporation. Heterojunction tunneling base transistor. 4,173,763, Cl. 357-12.000.
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Chemap AG: *See—*
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Chou, Hsu Ching. Input system for sino-computer. 4,173,753, Cl. 340-146.30R.
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Cincinnati Milacron Chemicals Inc.: *See—*
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Lease, Robert D., 4,173,298, Cl. 222-368.000.
Clatworthy, Gordon K.; and Ward, Edwin. Navigation instrument. 4,173,413, Cl. 356-145.000.
Clausser, Karl C. Universal 35mm film cartridge for rewind and no-rewind operation. 4,173,315, Cl. 242-74.000.
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Clave, Serge; and Clave, Marcel. Prism combination periscope. 4,173,394, Cl. 350-181.000.
Cleare, Peter J. V., to Imperial Chemical Industries Limited. Preparation of halogenated aldehydes. 4,173,570, Cl. 260-340.90R.
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Comizzoli, Robert B., to RCA Corporation. Chemically treating the overcoat of a semiconductor device. 4,173,683, Cl. 428-447.000.
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Conn, Don L., to Armco Steel Corporation. Ultrasonic reference standard and the methods of construction and use thereof. 4,173,139, Cl. 73-1.0DV.
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Cooper, Thomas H., to Combustion Engineering, Inc. Boiler cold start using pulverized coal in ignitor burners. 4,173,189, Cl. 110-106.000.
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Coran, Aubert Y.; and Patel, Raman P., to Monsanto Company. Elastoplastic compositions of rubber and polyamide. 4,173,556, Cl. 260-30.80R.
Corkhill, David P., to Standard Oil Company (Indiana). Digital drive and phase-lock for seismic vibrators. 4,173,749, Cl. 367-190.000.
Cornelis van der Lely N.V.: *See—*
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Maurer, Robert D., 4,173,393, Cl. 350-96.340.
Cortez, Pedro J. Animated painting. 4,173,085, Cl. 40-433.000.
Corvelli, Nicholas, to Grumman Aerospace Corporation. Composite drive shaft. 4,173,128, Cl. 64-1.00S.
Cotton, John M.: *See—*
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Couleur, John F.; and Scriver, Robert E., to Honeywell Information Systems, Inc. Method of accessing paged memory by an input-output unit. 4,173,783, Cl. 364-200.000.
Coulter Information Systems, Inc.: *See—*
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Coutin, Pierre F.: *See—*
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Coviello, Frank A.: *See—*
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Craig, George A., to Clark Equipment Company. Wet brake or clutch. 4,173,269, Cl. 188-71.500.
Crawford, Tom H., Jr. Pellet gun loading device. 4,173,211, Cl. 124-45.000.
Crawford, Wheeler C.; and wilson, James R., to Texaco Inc. Asphalt mineral aggregate compositions. 4,173,489, Cl. 106-281.00N.
Crecente, Christopher P.: *See—*
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Crise, George W. Internal combustion engine having automatic compression control. 4,173,202, Cl. 123-48.00B.
Critten, Donald L.; and Bardwell, Charles E., to George Kent Limited. Differential pressure sensing devices. 4,173,149, Cl. 73-706.000.
Crivello, James V., to General Electric Company. Heat curable compositions. 4,173,551, Cl. 260-18.0EP.
Crompton, Violet. Peg game apparatus. 4,173,339, Cl. 273-95.00R.
Cronin, Penny S. Gloved splint for an arthritic hand. 4,173,218, Cl. 128-77.000.
Crosfield Electronics Limited: *See—*
Pugsley, Peter C.; and Perriman, Michael J., 4,173,416, Cl. 356-432.000.
Croswhite, Howard L.; Gregg, James H.; and Guido, Angelo L., to Ford Motor Company. Hydrokinetic torque converter with a direct drive lock-up clutch adapted for one-way torque delivery. 4,173,270, Cl. 192-3.290.
Cruff, Carlton E.; and Harrison, William E., to United Technologies Corporation. Method and apparatus for drying investment casting molds. 4,173,079, Cl. 34-217.000.
Cruthers, Larry R.; James, Terrence M.; Goff, Sidney; and Alouche, Antoine R., to E. R. Squibb & Sons, Inc. Fasciolicidal compositions. 4,173,632, Cl. 424-232.000.
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Curtis, Lyn, to Bell Telephone Laboratories, Incorporated. Molded optical fiber connector. 4,173,389, Cl. 350-96.200.
Cushman, David W.: *See—*
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Cyphelly, Ivan J. Hydraulic push drive for pusher centrifuges. 4,173,303, Cl. 233-24.000.
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Dastur, Khurshid P., to Firmenich SA. Novel cyclopentanone derivatives as flavor- and odor-modifying ingredients. 4,173,584, Cl. 260-586.00R.
Davis, Floyd O. Decorticator and separator for seed products. 4,173,177, Cl. 99-618.000.
Dawson, Gordon B., to Atlow Mining Development Consultants Limited. Apparatus for driving a mining machine into a driveway extending from a mining roadway. 4,173,280, Cl. 198-812.000.
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De Corlieu-Ferran, Jeanne. Device for simulating a card game. 4,173,342, Cl. 273-148.00R.
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Demarthe, Jean-Michel; Gandon, Louis; and Goujet, Monique, to Societe Metallurgique le Nickel-S.L.N. Hydrometallurgical method for treating nickel mattes. 4,173,520, Cl. 204-113.000.
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Dempski, Robert E.; Mehta, Gunvant N.; and Saboe, Joseph C., to Merck & Co., Inc. Sustained release indomethacin. 4,173,626, Cl. 424-19.000.
Denlinger, Edgar J.; and Veloric, Harold S., to RCA Corporation. Contact for semiconductor devices. 4,173,768, Cl. 357-68.000.
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De Witt, Elmer J., to B. F. Goodrich Company, The. Soft-seeded toughener for polyvinyl chloride. 4,173,596, Cl. 428-402.000.
Dholakia, Anil R., to RCA Corporation. Grooved record playback system. 4,173,348, Cl. 274-47.000.
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Dietrich, Joseph R.; Flinn, William S.; and Groves, Malcolm D., to Combustion Engineering, Inc. Control rod blow out protection system. 4,173,511, Cl. 176-36.00R.
Digby, Dennis, to Biotronik Mess- und Therapiegerate GmbH & Co. Noise elimination and refractory period control in demand pacers. 4,173,230, Cl. 128-419.0PG.
Dillard, Winford, to A-T-O Inc. Mine vehicle with swivel seat. 4,173,370, Cl. 296-65.00A.
Dimacopoulos, Dimitrios A., to Cline-Buckner, Inc. Environmental control dispenser. 4,173,604, Cl. 261-30.000.
Dixon, Jerry D., to International Business Machines Corporation. Return and link mechanism. 4,173,782, Cl. 364-200.000.
Dixon, Thomas E.; and Chapman, Jerry L., to Brudi Equipment, Inc. Quick coupling for side shift cylinder of lift truck attachment. 4,173,425, Cl. 414-667.000.
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Drori, Mordeki. Flow control devices particularly useful for drip irrigation. 4,173,309, Cl. 239-542.000.
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Dubois, Jean-Claude; and Delaunay, Alain, to Institut Francais du Petrole. Method for manufacturing sensitive elements having a permanent electric polarization. 4,173,659, Cl. 427-35.000.
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DuLondel, Jacques. Rotary speed limiter device. 4,173,332, Cl. 254-160.000.
Dunham, James V., to United States of America, Army. Ammunition. 4,173,186, Cl. 102-38.00R.
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Dupree, Hans-Werner. Drawer assemblage. 4,173,380, Cl. 312-330.00R.
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Durrieu, Jean-Pierre; and Pomes, Guy, to Societe Abex Pagid Equipement S.A. Brake pad with integral organic backplate. 4,173,681, Cl. 428-409.000.
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Ebata, Yoshihiro; Ueno, Tsutomu; Kataoka, Nagamasa; and Akao, Akimasa, to Agency of Industrial Science and Technology; and Central Glass Company, Limited. Process for welding plate glasses together. 4,173,460, Cl. 65-40.000.
Ebata, Yoshihiro; Ueno, Tsutomu; Kataoka, Nagamasa; and Akao, Akimasa, to Agency of Industrial Science and Technology; and Central Glass Company, Limited. Method of bending glass plate. 4,173,461, Cl. 65-106.000.
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Ekinaka, Michael H.; and MacAnally, Richard B., to American Hospital Supply Corporation. Glass fiber light guide and method of making the same. 4,173,392, Cl. 350-96.260.
Eldridge, William J., to M&T Chemicals Inc. Method for preparing urethane-modified isocyanurate foams. 4,173,692, Cl. 521-125.000.
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Emory, John E., Jr., to Big Jon, Inc. Down rigger line release. 4,173,091, Cl. 43-43.120.
Enders, Edgar; Ebbighausen, Volker; Gau, Wolfgang; Wunsche, Christian; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Substituted 4,5-dihydroxy-imidazolidine-2-thiones and their use as ectoparasiticides. 4,173,645, Cl. 424-273.00R.
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Erickson, Donald C. Combustion gas desulfurization. 4,173,619, Cl. 423-210.500.
Erker, James W.; and Schwehr, Richard A., to Towmotor Corporation. Expandable vehicle frame. 4,173,264, Cl. 180-68.500.
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Faillon, Georges; and Egloff, Guy, to Thomson-CSF. Impedance matched coupling device for microwave tubes. 4,173,744, Cl. 333-33.000.
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Fang, James C., to Du Pont de Nemours, E. I., and Company. Chloralkali cell diaphragm and its treatment. 4,173,526, Cl. 204-296.000.
Faramarzpour, Faramarz, to Polaroid Corporation. Photographic camera apparatus. 4,173,400, Cl. 354-27.000.
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Farnow, Stephen A., to Texas Instruments Incorporated. Split gate electrode, self-aligned antiblooming structure and method of making same. 4,173,064, Cl. 29-578.000.
Fassina, Cassiano, to Codama Holding S.A. Apparatus for reinforcing a fabric by applying a fluid reinforcing material thereto. 4,173,199, Cl. 118-212.000.
Fattor, Arthur P. Concentrating solar heat collector. 4,173,214, Cl. 126-441.000.
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Fiedler, Howard C., to General Electric Company. Method of producing silicon-iron sheet material with boron addition, and product. 4,173,502, Cl. 148-113.000.
Field, Ernest R., II. Game board and pieces having removable indicia. 4,173,347, Cl. 273-261.000.
Findeisen, Kurt; Wagner, Kuno; and Uerdingen, Walter, to Bayer Aktiengesellschaft. Isocyanate derivatives of 1,3[oxazoles, oxazines, diazoles and diazines]. 4,173,567, Cl. 548-216.000.
Finn, Donald J. Billfold bill file with minimum panel area. 4,173,242, Cl. 150-38.000.
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Mortensen, Donald G.; and Browning, James T., 4,173,257, Cl. 171-33.000.
Robertson, James A., 4,173,622, Cl. 423-329.000.
Fodor, George E.; Weatherford, William D., Jr.; and Wright, Bernard R., to United States of America, Army. Fire-safe hydrocarbon fuels. 4,173,455, Cl. 44-51.000.
Ford Motor Company: *See—*
Croswhite, Howard L.; Gregg, James H.; and Guido, Angelo L., 4,173,270, Cl. 192-3.290.
Formax, Inc.: *See—*
Sandberg, Glenn A., 4,173,127, Cl. 62-374.000
Foseco International Limited: *See—*
McLaughlin, John R.; Bryant, Michael D.; Fessel, Manfred; and Taylor, Kenneth C., 4,173,466, Cl. 75-58.000.
Francis, James M.: *See—*
Togami, Paul G.; Drayer, T. Gary; and Francis, James M., 4,173,155, Cl. 74-230.17M.
Frayer, James A.; Stauffer, Harry C.; and Yanik, Stephen J., to Gulf Research and Development Company. Multistage residual oil hydrodesulfurization process employing segmented feed addition and product removal. 4,173,528, Cl. 208-210.000.
Freedman, Harold H.: *See—*
Au, Andrew T.; and Freedman, Harold H., 4,173,693, Cl. 525-329.000.
Fritz Buser Ag. Maschinenfabrik: *See—*
Voegelin, Heinrich, 4,173,185, Cl. 101-120.000.
Fuji Photo Film Co., Ltd.: *See—*
Sera, Hidefumi; Ishii, Tsumoru; Yamaguchi, June; and Shiraishi, Hisashi, 4,173,481, Cl. 430-621.000.
Shiba, Keisuke; Kubotera, Kikuo; and Kashiwabara, Akira, 4,173,477, Cl. 430-264.000.
Fujii, Katsumasa; and Takeda, Naoshi, to Tokyo Shibaura Kenki Kabushiki Kaisha. Boiler feed water pump control systems. 4,173,124, Cl. 60-667.000.
Fujikawa, Kanichi: *See—*
Nishiyama, Ryuzo; Fujikawa, Kanichi; Nasu, Rikuo; Toki, Tadaaki; Yamamoto, Toshihiko, deceased; and Yamamoto, Hikotaro, legal representative, 4,173,637, Cl. 424-263.000.
Nishiyama, Ryuzo; Fujikawa, Kanichi; Nasu, Rikuo; Toki, Tadaaki; and Yamamoto, Toshihiko, 4,173,638, Cl. 424-263.000.
Fujimori, Noboru: *See—*
Habu, Teiji; Nakajima, Tomio; Sakamoto, Eiichi; Fujimori, Noboru; and Mine, Kiyomitsu, 4,173,483, Cl. 430-575.000.
Fukazawa, Yoshiro; Mochinaga, Takahiko; Shirozume, Morimasa; Kishimoto, Satoru; Ito, Makoto; and Iwaya, Fukuo, to Hitachi, Ltd.; Japanese National Railways; and Hitachi Electronics Engineering Co., Ltd. Track displacement detecting and measuring system. 4,173,073, Cl. 33-1.00Q.
Fukuoka, Masaru: *See—*
Takagi, Shunichi; and Fukuoka, Masaru, 4,173,731, Cl. 315-58.000.
Fuller Company: *See—*
Cohen, Sidney M., 4,173,487, Cl. 106-103.000.
Fumakilla Limited: *See—*
Muramoto, Takayoshi; and Orita, Kunitaka, 4,173,651, Cl. 424-306.000.
Fuse, Shirou: *See—*
Asakura, Hiroshi; Chimura, Ippei; Kitazume, Keisuke; Kaneko, Yoshiyuki; Fuse, Shirou; and Ueno, Akio, 4,173,676, Cl. 428-332.000.
Gable, Larry P.: *See—*
Schmidt, Henry A.; Gable, Larry P.; and Hammel, Wallace W., Jr., 4,173,192, Cl. 112-79.00R.
GAF Corporation: *See—*
Brown, Michael J., 4,173,462, Cl. 71-86.000.
Gagas, Stanley J. Down spout adaptor assembly. 4,173,361, Cl. 285-64.000.
Gager, John C., to Gager, Terry W.; Gager, Terry W.; and Oster, Francine. Dental crown remover. 4,173,072, Cl. 433-120.000.
Gager, Terry W.: *See—*
Gager, John C., 4,173,072, Cl. 433-120.000.
Gager, John C., 4,173,072, Cl. 433-120.000.
Gaines, Ray N. Heat gathering and conducting device for thermocouple sensors. 4,173,498, Cl. 136-217.000.
Gallagher, John P. Absorptive patient underpad. 4,173,046, Cl. 5-484.000.
Gamba, Afro: *See—*
Pifferi, Giorgio; Umani-Ronchi, Achille; Farina, Carlo; and Gamba, Afro, 4,173,648, Cl. 424-294.000.
Gandon, Louis: *See—*
Demarthe, Jean-Michel; Gandon, Louis; and Goujet, Monique, 4,173,520, Cl. 204-113.000.
Ganellin, Charon R.: *See—*
Brown, Thomas H.; Durant, Graham J.; Ganellin, Charon R.; and Ife, Robert J., 4,173,644, Cl. 424-270.000.
Garcia, Luis: *See—*
Leasure, William; Garcia, Luis; Reifel, Charles; and Shelton, Jack, 4,173,106, Cl. 53-449.000.
Garrison, John B., to United States of America, Navy. Passive acquisition system. 4,173,760, Cl. 343-112.00R.
Gau, Wolfgang: *See—*
Enders, Edgar; Ebbighausen, Volker; Gau, Wolfgang; Wunsche, Christian; and Stendel, Wilhelm, 4,173,645, Cl. 424-273.00R.
Gaudio, E. Lorna; and Holt, S. Kent, to Ralston Purina Company. Vegetable protein ingredient for Kamaboko products containing a polysaccharide. 4,173,657, Cl. 426-574.000.
Gault, Frank M. Alloy for soldering aluminum. 4,173,468, Cl. 75-134.00N.
Gebr. Hofmann G.m.b.H. & Co. KG, Maschinenfabrik: *See—*
Kogler, Horst; and Goebel, Eickhart, 4,173,146, Cl. 73-462.000.
Gebr. Knauf Westdeutsche Gipswerke: *See—*
Huller, Rolf; Knauf, Alfons; and Wirsching, Franz, 4,173,610, Cl. 264-28.000.
Geislinger, Leonhard. Tuned absorber for torsional vibrations with hydrostatic damping. 4,173,158, Cl. 74-574.000.
Geluk, Ronald J., to N.V. Optische Industrie "De Oude Delft". Method and apparatus for image construction. 4,173,720, Cl. 250-445.00T.
Gemel Ltd.: *See—*
Wilson, Wilfred W., 4,173,107, Cl. 53-534.000.
General Battery Corporation: *See—*
Oxenreider, Terry R., 4,173,326, Cl. 249-83.000.
General Electric Company: *See—*
Crivello, James V., 4,173,551, Cl. 260-18.0EP.
Feiker, George E., 4,173,754, Cl. 340-310.00R.
Fiedler, Howard C., 4,173,502, Cl. 148-113.000.
Huuskonen, Niilo T.; and DiBattista, Dante P., 4,173,134, Cl. 72-10.000.
Lee, Minyoung; Szala, Lawrence E.; and De Vries, Robert C., 4,173,614, Cl. 264-332.000.
Meeks, Frederick T., 4,173,263, Cl. 177-210.0EM.
Schaeffer, Robert L., 4,173,310, Cl. 241-282.100.
Sugalski, Raymond K.; and Blake, Charles R., 4,173,733, Cl. 320-48.000.
Witting, Harald L., 4,173,728, Cl. 313-163.000.
General Ionex Corporation: *See—*
Purser, Kenneth H., 4,173,712, Cl. 174-35.00R.
General Motors Corporation: *See—*
Neale, Frank T., III, 4,173,349, Cl. 277-6.000.
Genthe, James E.; and Morrison, Douglas I., to Pitney-Bowes, Inc. Electrostatic copier including photoreceptor storing apparatus. 4,173,409, Cl. 355-16.000.
George, John A.: *See—*
Meier, Joseph F.; Rudd, George E.; Pradhan, Ashok V.; George, John A.; Lippincott, Hugh W.; and Sutherland, John D., 4,173,512, Cl. 176-37.000.
George Kent Limited: *See—*
Critten, Donald L.; and Bardwell, Charles E., 4,173,149, Cl. 73-706.000.
Gerber Products Company: *See—*
Lind, Robert B., 4,173,508, Cl. 156-499.000.
Gerstman, George H.: *See—*
Olliges, William E., 4,173,341, Cl. 273-126.00A.
Gewerkschaft Eisenhutte Westfalia: *See—*
Harhoff, Karl; and Husemann, Heinz, 4,173,421, Cl. 405-291.000.
Geyer, Robert A., to Tennant Company. Scrubbing machine with tracking squeegee. 4,173,056, Cl. 15-320.000.
Gibson, Sandra F.: *See—*
Aldridge, Clifton; Gibson, Sandra F.; Vannest, Richard D.; and Rodgers, Gregory D., 4,173,515, Cl. 435-38.000.
Giesken, Kenneth F.; and Cotton, John M., to International Telephone & Telegraph Corporation. Continuously expandable switching network. 4,173,713, Cl. 179-18.0EA.
Giessner, Bernard G.; Reighter, David H.; and Stringfellow, Allen E., to Gould Inc. Method of producing electrical insulation foam. 4,173,690, Cl. 521-89.000.
Gilbert, Ronald E.; Lynch, Thomas J.; and Rowatt, Robert J., to Gulf Oil Corporation. Continuous high pressure mass processes for the polymerization of ethylene. 4,173,697, Cl. 526-74.000.
Gimbel, Jurgen: *See—*
Jahn, Walter; and Gimbel, Jurgen, 4,173,357, Cl. 280-808.000.

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Glenn, William E.: *See—*
Schure, Alexander; and Glenn, William E., 4,173,391, Cl. 350-96.250.

Glory Kogyo Kabushiki Kaisha: *See—*
Asami, Kazuto; and Okamoto, Takashi, 4,173,232, Cl. 133-3.00R.

Glover, John B.; and Upton, John, to Hepworth Iron Company Limited, The. Female pipe coupling member with annular seal ring. 4,173,362, Cl. 285-110.000.

Godwin, William D. Board-type game simulating football game. 4,173,346, Cl. 273-247.000.

Goebel, Eickhart: *See—*
Kogler, Horst; and Goebel, Eickhart, 4,173,146, Cl. 73-462.000.

Goeth, Hanns: *See—*
Maier, Roland; Woitun, Eberhard; Reuter, Wolfgang; Wetzel, Bernd; Goeth, Hanns; and Lechner, Uwe, 4,173,647, Cl. 424-283.000.

Goff, Sidney: *See—*
Cruthers, Larry R.; James, Terrence M.; Goff, Sidney; and Alouche, Antoine R., 4,173,632, Cl. 424-232.000.

Gold, Elijah H.; and Solomon, Daniel M., to Schering Corporation. 1-Benzhydryl-2-cyanoazetidine. 4,173,566, Cl. 260-239.00A.

Gold, Elijah H.; and Chang, Wei, to Schering Corporation. Diastereoisomers of 5-(1-hydroxy-2-(1-methyl-3-phenylpropylamino)ethyl)-salicylamide. 4,173,583, Cl. 260-559.00S.

Goldschmidt, Rolf; Hansgen, Klaus; Hiersig, Heinz M.; and Kirstenpfad, Fritz, to Mannesmann Aktiengesellschaft. Hydrostatic load relief for lifting spindles. 4,173,330, Cl. 254-98.000.

Gongwer, Calvin A., to Bendix Corporation, The. Hydrodynamic configuration for towed submersible body. 4,173,195, Cl. 114-244.000.

Goodyear Tire & Rubber Company, The: *See—*
Alfio, Deregibus, 4,173,444, Cl. 425-363.000.
Kline, Richard H., 4,173,574, Cl. 260-399.000.

Gordon, Harry W. Method of treating benign prostatic hypertrophy with candimycin. 4,173,628, Cl. 424-115.000.

Gorman, Marvin; Higgens, Calvin E.; and Nagarajan, Ramakrishnan, to Eli Lilly and Company. 7-(5-Amino-5-carboxyvaler-amido)-3-(carbamoyloxymethyl)-7-methoxy-3-cephem-4-carboxylic acid. 4,173,702, Cl. 544-21.000.

Gorndt, John H.: *See—*
Bergman, Lawrence A.; and Gorndt, John H., 4,173,360, Cl. 285-51.000.

Gosman, Theodore D. Acoustical device. 4,173,715, Cl. 179-156.00R.

Gossage, Thomas M. Scriber-compass with spring-loaded center punch. 4,173,076, Cl. 33-27.00B.

Goujet, Monique: *See—*
Demarthe, Jean-Michel; Gandon, Louis; and Goujet, Monique, 4,173,520, Cl. 204-113.000.

Gould Inc.: *See—*
Giessner, Bernard G.; Reighter, David H.; and Stringfellow, Allen E., 4,173,690, Cl. 521-89.000.

Grabmeier, Josef: *See—*
Aulich, Hubert; Grabmeier, Josef; and Pink, Hans, 4,173,459, Cl. 65-3.00A.

Graco Inc.: *See—*
Vork, William D., 4,173,418, Cl. 366-128.080.

Graff, Renier J. L., to Stamicarbon, B.V. Catalyst for preparing polyalkenes. 4,173,547, Cl. 252-429.00B.

Graham, Donald W.; and Rogers, Edward F., to Merck & Co., Inc. 7-Methyl-8-methylamino-10-(1'-D-ribityl)isoalloxazine. 4,173,631, Cl. 424-180.000.

Granda, Edward J.: *See—*
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,173,543, Cl. 252-174.110.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,173,711, Cl. 568-665.000.

Gratacos, Jaime: *See—*
Bastien, Joel; Gratacos, Jaime; and Lazarre, Flavien, 4,173,523, Cl. 204-197.000.

Gray, Tommy L., to Span Instruments, Inc. Sensor with adjustable pressure responsive detection and control. 4,173,150, Cl. 73-714.000.

Green, Howard E.; Jones, Robert J.; and O'Rell, Michael K., to TRW Inc. Bis (difluoromaleimide) capped propolymers and polymers. 4,173,700, Cl. 528-125.000.

Greenberg, Jacob; and Robertson, John E., to Anti-Pollution Systems, Inc. Sludge incinerator utilizing coiled channel immersed in molten salt and method of oxidizing sludge utilizing same. 4,173,190, Cl. 110-243.000.

Gregg, James H.: *See—*
Croswhite, Howard L.; Gregg, James H.; and Guido, Angelo L., 4,173,270, Cl. 192-3.290.

Greidinger, Dahlia S.; Cohen nee Girshowitsh, Liuba; and Epstein, Shimon, to Fertilizers & Chemicals Ltd. Method for the manufacture of improved ureaform fertilizer. 4,173,582, Cl. 260-553.00R.

Greune, Christian; and Hackl, Friedrich, to Motoren- und Turbinen-Union Munchen GmbH. Control system for a gas turbine engine, especially a vehicular gas turbine engine. 4,173,119, Cl. 60-39.16R.

Grimes, Jerry W.; Schroeder, Stephen M.; and Waters, James M., to Westinghouse Electric Corp. Insulation structures for electrical inductive apparatus. 4,173,747, Cl. 336-60.000.

Grosjean, William C.; and Hensley, John J., to International Harvester Company. Turbine nozzle and rotor cooling systems. 4,173,120, Cl. 60-39.16R.

Groves, Malcolm D.: *See—*
Dietrich, Joseph R.; Flinn, William S.; and Groves, Malcolm D., 4,173,511, Cl. 176-36.00R.

Gruaz, Eric. Ammunition for a toy pistol. 4,173,089, Cl. 42-58.000.

Gruenfeld, Norbert, to Ciba-Geigy Corporation. Indeno and naphth[1,2-D]azepines. 4,173,633, Cl. 424-244.000.

Gruffaz, Max; and Locatelli, Jean-Louis, to Rhone-Poulenc Industries. Thermosetting composition from bis-imide, N-vinyl pyrrolidone and unsaturated polyester. 4,173,595, Cl. 525-165.000.

Grumman Aerospace Corporation: *See—*
Corvelli, Nicholas, 4,173,128, Cl. 64-1.00S.

Grundy, Reed H. Motion translating mechanism. 4,173,151, Cl. 74-49.000.

Guido, Angelo L.: *See—*
Croswhite, Howard L.; Gregg, James H.; and Guido, Angelo L., 4,173,270, Cl. 192-3.290.

Gulf Oil Corporation: *See—*
Gilbert, Ronald E.; Lynch, Thomas J.; and Rowatt, Robert J., 4,173,697, Cl. 526-74.000.

Gulf Research and Development Company: *See—*
Frayer, James A.; Stauffer, Harry C.; and Yanik, Stephen J., 4,173,528, Cl. 208-210.000.
Schulz, Johann G. D.; and Onopchenko, Anatoli, 4,173,573, Cl. 260-346.400.
Wu, Ching-Yong; Pretzer, Wayne R.; and Kobylinski, Thaddeus P., 4,173,587, Cl. 260-593.00A.

Gurtler, Richard W., to Motorola, Inc. Optically driven solar engine. 4,173,123, Cl. 60-641.000.

Guzik, Ira: *See—*
Bloch, Alan; Coviello, Frank A.; Guzik, Ira; and Puebla, Candido, 4,173,714, Cl. 179-99.00R.

Habu, Teiji; Nakajima, Tomio; Sakamoto, Eiichi; Fujimori, Noboru; and Mine, Kiyomitsu, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic emulsions for use in flash exposure. 4,173,483, Cl. 430-575.000.

Hackl, Friedrich: *See—*
Greune, Christian; and Hackl, Friedrich, 4,173,119, Cl. 60-39.16R.

Haeussler, Ernest. Pickup unit for lifting concrete body. 4,173,367, Cl. 294-83.00R.

Halfon, Leon. Therapeutic adornments utilizing solar cells. 4,173,229, Cl. 128-419.00R.

Hall, John B.: *See—*
Yoshida, Takao; Mookherjee, Braja D.; Kamath, Venkatesh; Hall, John B.; Taylor, William I.; and Schmitt, Frederick L., 4,173,585, Cl. 260-586.00R.

Hallman, Robert W.: *See—*
Shipman, James J.; Hallman, Robert W.; Tenney, Linwood P.; and Beall, Leman G., Jr., 4,173,503, Cl. 156-123.00R.

Halstead, Kenneth G., to Westinghouse Electric Corp. Remote lubrication system for vertical motor shafts. 4,173,375, Cl. 308-134.100.

Haluska, Loren A., to Dow Corning Corporation. Non-coloring, abrasion resistant, adherent coating for gold and silver surfaces. 4,173,553, Cl. 260-29.20M.

Hamayasu, Norio; and Kamikawa, Kiyohide, to Shimano Industrial Company, Limited. Sound generating mechanism for a spinning reel. 4,173,317, Cl. 242-84.21R.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Print head. 4,173,184, Cl. 101-111.000.

Hamisch, Paul H., Jr.; and Hubbard, David W., to Monarch Marking Systems, Inc. Composite label web and method of using same. 4,173,293, Cl. 221-1.000.

Hammel, Wallace W., Jr.: *See—*
Schmidt, Henry A.; Gable, Larry P.; and Hammel, Wallace W., Jr., 4,173,192, Cl. 112-79.00R.

Hammelmann, Paul, to Paul Hammelmann Maschinenfabrik. Plunger pump. 4,173,435, Cl. 417-469.000.

Hamprecht, Gerhard, to BASF Aktiengesellschaft. Production of β-haloalkylaminosulfonyl halides. 4,173,580, Cl. 260-543.00R.

Hanakata, Takayoshi, to Canon Kabushiki Kaisha. Printer device. 4,173,273, Cl. 400-120.000.

Hanifin, John W., Jr.; and Ridge, David N., to American Cyanamid Company. Cis-2-benzoyl-3-hydroxy-2-alkenonitriles as anti-inflammatory agents. 4,173,650, Cl. 424-304.000.

Hanji, Motoyasu, to Kabushiki Kaisha Kinekisha-Kenkyujo. Tuning fork-type piezoelectric vibrator. 4,173,726, Cl. 310-366.000.

Hannart, Jean A. A. J. Hypotensive ajmalicine derivatives. 4,173,635, Cl. 424-256.000.

Hansen, Bobbie F., Jr. Self-acting implement. 4,173,110, Cl. 56-10.200.

Hansgen, Klaus: *See—*
Goldschmidt, Rolf; Hansgen, Klaus; Hiersig, Heinz M.; and Kirstenpfad, Fritz, 4,173,330, Cl. 254-98.000.

Hanson, Robert S.; Kronenberger, Paul E.; and Whistler, Charles C., Jr., to White Consolidated Industries, Inc. Refrigerator sealed food storage drawer. 4,173,378, Cl. 312-296.000.

Harada, Hiroyuki: *See—*
Nakamatsu, Shuji; Harada, Hiroyuki; Shinomiya, Yoshitugu; and Omizu, Tuyoshi, 4,173,525, Cl. 204-275.000.

Hareng, Michel; Hehlen, Robert; and Le Berre, Serge, to Thomson-CSF. Liquid crystal display device. 4,173,757, Cl. 340-765.000.

Harhoff, Karl; and Husemann, Heinz, to Gewerkschaft Eisenhutte Westfalia. Shield apparatus for use in tunnelling or mining. 4,173,421, Cl. 405-291.000.

Harrison, William E.: *See—*
Cruff, Carlton E.; and Harrison, William E., 4,173,079, Cl. 34-217.000.

Harry Feick Co., Inc.: *See—*
Ittner, Nelson C., 4,173,307, Cl. 239-265.290.

Harvey, Donald M., to Eastman Kodak Company. Apparatus for displaying alphanumeric information coded on a film cartridge. 4,173,401, Cl. 354-21.000.

Hasegawa, Akira: *See—*
Kishida, Kazuo; Hasegawa, Akira; and Mohri, Hiroshi, 4,173,600, Cl. 525-76.000.

Hasegawa, Niichiro: *See—*
Koyanagi, Shunichi; Hasegawa, Niichiro; Shimizu, Toshihide; Katusima, Sensaku; and Kaneko, Ichiro, 4,173,696, Cl. 526-62.000.

Hashimoto, Akira: *See—*
Hirasawa, Masataka; Hashimoto, Akira; Nagao, Kenichi; and Kobayashi, Toshiaki, 4,173,734, Cl. 323-8.000.

Hashimoto, Hiroshi; and Mori, Kinya, to Sanyo Machine Works, Ltd. Device for tightening bolts. 4,173,059, Cl. 29-240.000.

Hashimoto, Shunichi: *See—*
Noguchi, Hiroshi; Hashimoto, Shunichi; Kitamura, Shigeyoshi; Matsuo, Takashi; Mine, Akihiko; and Kamoshita, Katsuzo, 4,173,464, Cl. 71-118.000.

Hashimoto, Tadanori: *See—*
Yamada, Koichi; Hashimoto, Tadanori; and Horinouchi, Kazuo, 4,173,518, Cl. 204-67.000.

Hauck, Frederic P.; Condon, Michael E.; and Reid, Joyce, to E. R. Squibb & Sons, Inc. Hypotensive perhydro naphthalene pentol derivatives. 4,173,640, Cl. 424-267.000.

Hauck, Frederic P.: *See—*
Sundeen, Joseph E.; Dejneka, Tamara; and Hauck, Frederic P., 4,173,649, Cl. 424-304.000.

Haug, Juergen: *See—*
Elliehausen, Heinrich; Hohenschutz, Heinz; Strohmeyer, Max; and Haug, Juergen, 4,173,589, Cl. 260-604.0HF.

Hauser, James C.: *See—*
Underwood, Ronald G.; and Hauser, James C., 4,173,049, Cl. 5-451.000.

Hausler, Michael; and Kanngiesser, Karl-Werner, to BBC Brown Boveri & Company Limited. Method and apparatus for controlling the real and reactive power behavior of a high voltage D.C transmission (HDT) system. 4,173,780, Cl. 363-51.000.

Haverbusch, Paul J., to Lodge & Shipley Company, The. Apparatus for frictionally gripping the interior surface of a container during handling by an article transferring means. 4,173,368, Cl. 294-88.000.

Hawker Siddeley Aviation Limited: *See—*
Thorby, Douglas C.; and Johnson, John, 4,173,323, Cl. 244-114.00R.

Hawker Siddeley Dynamics Limited: *See—*
Standing, John M.; and Sheppard, Joseph S., 4,173,376, Cl. 308-189.00A.

Hayashi, Yoshio: *See—*
Akashi, Kageyasu; Hayashi, Yoshio; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,173,482, Cl. 430-619.000.

Hayes, James A., to Fairchild Camera and Instrument Corporation. Insulated gate field-effect transistor read-only memory cell. 4,173,766, Cl. 357-23.000.

Hayes, John F. Method of treating waste material containing radioactive cesium isotopes. 4,173,546, Cl. 252-301.10W.

Heald, David L.; Lee, Teh-Hsuang; and Khosla, Rajinder P., to Eastman Kodak Company. V-MOS imaging array. 4,173,765, Cl. 357-23.000.

Heath, William H.; and Richman, Jack, to Singer Company, The. Inertial system having correction means for effects of gravitational anomalies. 4,173,784, Cl. 364-453.000.

Heberlein Hispano SA: *See—*
Vignon, Louis, 4,173,057, Cl. 19-159.00R.

Heckenkamp, Edward B., to Allis-Chalmers Corporation. Rear drive assembly with load sensing. 4,173,259, Cl. 172-10.000.

Heffley, Scott A.; and Schatz, Klaus W., to Mobil Oil Corporation. Method and means for separating suspensions of gasiform material and fluidizable solid particle material. 4,173,527, Cl. 208-153.000.

Hehlen, Robert: *See—*
Hareng, Michel; Hehlen, Robert; and Le Berre, Serge, 4,173,757, Cl. 340-765.000.

Heikkinen, Leo L.; and Lundborg, Charles L., to LaFont Corporation. Firewood systems. 4,173,237, Cl. 144-3.00K.

Hein, Wolfgang, to Carl Schleicher & Schull. Clamp assembly for high pressure diaphragm test cells. 4,173,364, Cl. 292-256.670.

Heins, Sidney M. Method for removal of sulfur from coal in stoker furnaces. 4,173,454, Cl. 44-1.0SR.

Heinz, Werner. Rotary viscometer. 4,173,142, Cl. 73-60.000.

Hempfling, Walter L. Sign structure. 4,173,086, Cl. 40-607.000.

Hennes, John H.; and Crecente, Christopher P., to Badische Corporation. Color blended yarns with enhanced luminosity. 4,173,678, Cl. 428-364.000.

Hensley, John J.: *See—*
Grosjean, William C.; and Hensley, John J., 4,173,120, Cl. 60-39.16R.

Hentzelt, Walther E.; Nolte, Hans-Henning; and von Reis, Wolf, to BFG Glassgroup. Fire-screening panel. 4,173,668, Cl. 428-34.000.

Hepworth Iron Company Limited, The: *See—*
Glover, John B.; and Upton, John, 4,173,362, Cl. 285-110.000.

Herbline, Celestin L. Extinguishing product comprising an uninflammable powder and liquid. 4,173,538, Cl. 252-8.000.

Herdenberger, Andre: *See—*
Vallon, Roger; Herdenberger, Andre; and Delhomelle, Marc, 4,173,675, Cl. 428-291.000.

Herrera, Joseph O.: *See—*
Lichti, Robert D.; and Herrera, Joseph O., 4,173,279, Cl. 198-500.000.

Heslop, Philip J.; and Matthews, Roger J., to Mars Limited. Chassis mounting for a machine. 4,173,377, Cl. 312-29.000.

Hess, Fritz, to EPM AG. Machine for cutting the lead ends of components mounted at printed-wiring boards. 4,173,160, Cl. 83-174.000.

Hesston Corporation: *See—*
Adee, Raymond A., 4,173,262, Cl. 172-599.000.

Hetland, Philip R. Lawn litter sled. 4,173,351, Cl. 280-19.000.

Heuer, Dieter: *See—*
Tauber, Manfred; Heuer, Dieter; Kroncke, Max; and Schimmelpfennig, Peter, deceased, 4,173,719, Cl. 250-310.000.

Hibbert, William T. Animal halter. 4,173,109, Cl. 54-24.000.

Hicks, Patrick C.; Benson, Ronald J.; and Roberts, Howard M., to Hicks, Patrick C. Apparatus for self teaching a musical instrument. 4,173,168, Cl. 84-470.00R.

Hiersig, Heinz M.: *See—*
Goldschmidt, Rolf; Hansgen, Klaus; Hiersig, Heinz M.; and Kirstenpfad, Fritz, 4,173,330, Cl. 254-98.000.

Higashi, Fukuji: *See—*
Yamazaki, Noboru; and Higashi, Fukuji, 4,173,563, Cl. 260-112.50R.

Higgens, Calvin E.: *See—*
Gorman, Marvin; Higgens, Calvin E.; and Nagarajan, Ramakrishnan, 4,173,702, Cl. 544-21.000.

High Standard, Inc.: *See—*
Baker, Richard L., 4,173,090, Cl. 42-67.000.

Hijikata, Akiko: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,173,630, Cl. 424-177.000.

Hilbert, Thomas K.: *See—*
Swapceinski, John P.; Hilbert, Thomas K.; and McGlen, James A., 4,173,405, Cl. 355-3.0DD.

Hildebrandt, Jack A.; Pointer, Denver K.; and Stilley, Herschel H., to Clark Equipment Company. Steel torsional element and method for making. 4,173,501, Cl. 148-16.500.

Hills, Richard E., to Pittsburgh-Des Moines Steel Company. Floating roof seal. 4,173,291, Cl. 220-225.000.

Hiramatsu, Eiji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Canister. 4,173,207, Cl. 123-136.000.

Hirasawa, Masataka; Hashimoto, Akira; Nagao, Kenichi; and Kobayashi, Toshiaki, to Tokyo Shibaura Electric Co., Ltd. Voltage dividing integrated circuit device. 4,173,734, Cl. 323-8.000.

Hirdes, Rudiger. Apparatus for filling magazine of dental appliance. 4,173,236, Cl. 141-249.000.

Hitachi Electronics Engineering Co., Ltd.: *See—*
Fukazawa, Yoshiro; Mochinaga, Takahiko; Shirozume, Morimasa; Kishimoto, Satoru; Ito, Makoto; and Iwaya, Fukuo, 4,173,073, Cl. 33-1.00Q.

Hitachi, Ltd.: *See—*
Abe, Masahiro; Eifuku, Yoshiaki; and Kajiwara, Toshio, 4,173,790, Cl. 364-900.000.
Fukazawa, Yoshiro; Mochinaga, Takahiko; Shirozume, Morimasa; Kishimoto, Satoru; Ito, Makoto; and Iwaya, Fukuo, 4,173,073, Cl. 33-1.00Q.
Mimura, Akio; Suzuki, Takaya; and Yagiyu, Seturo, 4,173,674, Cl. 428-220.000.
Morinaga, Shigeki; Maeda, Takeo; Takahashi, Tadashi; and Ishizaki, Kosho, 4,173,193, Cl. 112-275.000.
Takayama, Teruo; Yamada, Kinsaku; and Niida, Chiaki, 4,173,204, Cl. 123-119.00A.

Hitachi, Ltd: *See—*
Yamada, Kazuji; Sato, Hideo; Okayama, Tsutomu; Nishihara, Motohisa; Matsuoka, Yoshitaka; Katohgi, Katsuya; Matsuda, Yasumasa; and Shimada, Satoshi, 4,173,148, Cl. 73-766.000.

Hoechst Aktiengesellschaft: *See—*
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 4,173,077, Cl. 34-23.000.
Kleber, Rolf; and Ehrl, Winfried, 4,173,679, Cl. 428-375.000.
Kleiner, Hans-Jerg; Linke, Fritz; and Dursch, Walter, 4,173,601, Cl. 260-938.000.
Krause, Johannes; Reichert, Gunter; Mainzer, Franz; and Niermann, Hermann, 4,173,621, Cl. 423-303.000.
Schmidbaur, Hubert; and Karsch, Hans-Heinz, 4,173,590, Cl. 260-606.50P.
Staendeke, Horst, 4,173,578, Cl. 260-502.40R.

Hoesch Werke Aktiengesellschaft: *See—*
Balon, Johannes; and Oldendorf, Manfred, 4,173,182, Cl. 101-4.000.

Hoff, Raymond E.: *See—*
Pullukat, Thomas J.; Shida, Mitsuzo; and Hoff, Raymond E., 4,173,548, Cl. 252-430.000.

Hoffman, Henry R.: *See—*
Sidenstick, Harry L.; and Hoffman, Henry R., 4,173,069, Cl. 30-228.000.

Hoffman, Joseph H.; and Thompson, Daniel G., to Westinghouse Electric Corp. Centrifugal fan, shaft, plate and hub assembly. 4,173,429, Cl. 416-184.000.

Hohenschutz, Heinz: *See—*
Elliehausen, Heinrich; Hohenschutz, Heinz; Strohmeyer, Max; and Haug, Juergen, 4,173,589, Cl. 260-604.0HF.

Holemann, Paul, to Linde Aktiengesellschaft. Method of operating a cutting burner. 4,173,499, Cl. 148-9.00R.

Holkko, Seppo; Lehtinen, Jukka; and Majaniemi, Pekka, to Oy Tampella AB. Extended nip press for a paper machine. 4,173,249, Cl. 162-360.00R.
Holstead, Colin; Kilminster, Kenneth N.; and Simons, Michael J., to Eastman Kodak Company. Photographic materials comprising azo sensitizing dyes. 4,173,478, Cl. 430-353.000.
Holt, S. Kent: *See—*
Gaudio, E. Lorna; and Holt, S. Kent, 4,173,657, Cl. 426-574.000.
Holtz, John W., to Allied Chemical Corporation. Process for removal of alumina from aqueous alkali metal chromate solutions. 4,173,618, Cl. 423-58.000.
Homan, Gary R.; Maxson, Myron T.; and Toporcer, Louis H., to Dow Corning Corporation. Treatment of reinforcing silicas with amidosiloxanes. 4,173,560, Cl. 260-37.0SB.
Honeywell Inc.: *See—*
Durbin, Damien E., 4,173,145, Cl. 73-422.0GC.
Honeywell Information Systems, Inc.: *See—*
Couleur, John F.; and Scriver, Robert E., 4,173,783, Cl. 364-200.000.
Hooker Chemicals & Plastics Corp.: *See—*
Chen, Joseph L. P., 4,173,603, Cl. 260-986.000.
Hope Co., Ltd.: *See—*
Murata, Masahiro, 4,173,354, Cl. 280-605.000.
Hopkins, Walter M. Apparatus having expanding and contracting chamber. 4,173,439, Cl. 418-58.000.
Horike, Masanori; Shibata, Isamu; and Maeda, Ikuo, to Ricoh Company, Ltd. Optoelectronic sensing apparatus. 4,173,402, Cl. 354-25.000.
Horinouchi, Kazuo: *See—*
Yamada, Koichi; Hashimoto, Tadanori; and Horinouchi, Kazuo, 4,173,518, Cl. 204-67.000.
Horowitz, Alexandre; van der Hoorn, Rudolf J. G. A.; and Kummeling, Jozef W. M., to Volvo Car B.V. Infinitely variable cone pulley gear. 4,173,156, Cl. 74-230.17F.
Hotta, Masahiro: *See—*
Nakano, Shiro; and Hotta, Masahiro, 4,173,677, Cl. 428-335.000.
Houdion, Pierre. Balancing and holding device for a molten metal supply tundish in a continuous casting machine. 4,173,250, Cl. 164-434.000.
Howell, Stephen L., to Kimball International, Inc. Tone generator for electronic organ. 4,173,163, Cl. 84-1.010.
Howlett, Barry J.: *See—*
Lonstrup, Thor F.; Brownawell, Darrell W.; and Howlett, Barry J., 4,173,540, Cl. 252-49.600.
HPM Corporation: *See—*
Kruder, George A., 4,173,417, Cl. 366-89.000.
Hubbard, David W.: *See—*
Hamisch, Paul H., Jr.; and Hubbard, David W., 4,173,293, Cl. 221-1.000.
Hudson, Willard G.: *See—*
Snellman, Donald L.; and Hudson, Willard G., 4,173,113, Cl. 57-249.000.
Hughes Aircraft Company: *See—*
Stevenson, Alastair K., 4,173,767, Cl. 357-44.000.
Hughes, John M. F.: *See—*
Benson, Nigel C.; Hughes, John M. F.; Kingslake, Denis; and Symonds, David G., 4,173,611, Cl. 264-138.000.
Hukuba Kogyo Kabushiki Kaisha: *See—*
Ando, Masumi, 4,173,054, Cl. 15-98.000.
Huller, Rolf; Knauf, Alfons; and Wirsching, Franz, to Gebr. Knauf Westdeutsche Gipswerke. Process for the manufacture of lump calcium sulfate. 4,173,610, Cl. 264-28.000.
Husemann, Heinz: *See—*
Harhoff, Karl; and Husemann, Heinz, 4,173,421, Cl. 405-291.000.
Husky Injection Molding Systems: *See—*
Rees, Herbert; and Schad, Robert D., 4,173,448, Cl. 425-549.000.
Huuskonen, Niilo T.; and DiBattista, Dante P., to General Electric Company. Apparatus and method for guiding a ring structure during the manufacture thereof. 4,173,134, Cl. 72-10.000.
Hyvarinen, Wayne E.; and Rosell, Lloyd J., to Westinghouse Electric Corp. Parallel AC electrical system with differential protection immune to high current through faults. 4,173,774, Cl. 361-87.000.
I.S.F. SpA: *See—*
Banfi, Silvano; Pellegata, Renato; Pifferi, Giorgio; and Pinza, Mario, 4,173,569, Cl. 260-326.430.
Pifferi, Giorgio; Umani-Ronchi, Achille; Farina, Carlo; and Gamba, Afro, 4,173,648, Cl. 424-294.000.
ICI Americas Inc.: *See—*
Kruse, Walter M., 4,173,514, Cl. 435-94.000.
Ife, Robert J.: *See—*
Brown, Thomas H.; Durant, Graham J.; Ganellin, Charon R.; and Ife, Robert J., 4,173,644, Cl. 424-270.000.
Iijima, Yukihiko, to Nippon Electric Co., Ltd. High speed predictive encoding and decoding system for television video signals. 4,173,771, Cl. 358-135.000.
Imai, Isao; and Shiozaki, Hiroyuki, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Continuous rolling mill. 4,173,133, Cl. 72-8.000.
Imaizumi, Koji: *See—*
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Imperial Chemical Industries Limited: *See—*
Benson, Nigel C.; Hughes, John M. F.; Kingslake, Denis; and Symonds, David G., 4,173,611, Cl. 264-138.000.
Cleare, Peter J. V., 4,173,570, Cl. 260-340.90R.
Imperial Wax and Chemical Company: *See—*
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Inagami, Masaaki, to Nippon Zeon Co., Ltd. Polychloroprene rubber composition. 4,173,694, Cl. 525-351.000.
Infusino, Ralph J., to Riddell, Inc. Athletic shoe construction. 4,173,083, Cl. 36-59.00R.
Inmont Corporation: *See—*
Strecker, Lawrence A.; and Wells, Vernon W., Jr., 4,173,557, Cl. 260-31.8DR.
Inoue, Shigeru: *See—*
Otsuka, Eiji; Inoue, Shigeru; Kimura, Tetsuo; Takae, Toshinori; Tsuji, Morio; and Kato, Toshiki, 4,173,615, Cl. 422-197.000.
Institut Francais du Petrole: *See—*
Dubois, Jean-Claude; and Delaunay, Alain, 4,173,659, Cl. 427-35.000.
Institute National de Recherche Chimique Appliquee: *See—*
Mathey, Francois; and Bensoam, Jean, 4,173,706, Cl. 560-30.000.
Intermedics Intraocular, Inc.: *See—*
Trought, John H., 4,173,281, Cl. 206-5.100.
International Business Machines Corporation: *See—*
Beuch, Wallace E.; and Zell, Michael N., 4,173,427, Cl. 414-751.000.
Chang, Leroy L.; and Esaki, Leo, 4,173,763, Cl. 357-12.000.
Dixon, Jerry D., 4,173,782, Cl. 364-200.000.
White, James M., 4,173,772, Cl. 358-213.000.
International Computers Limited: *See—*
Allmark, Reginald H.; and Bottoms, Norman, 4,173,381, Cl. 339-17.0LM.
International Flavors & Fragrances Inc.: *See—*
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,173,543, Cl. 252-174.110.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,173,711, Cl. 568-665.000.
Yoshida, Takao; Mookherjee, Braja D.; Kamath, Venkatesh; Hall, John B.; Taylor, William I.; and Schmitt, Frederick L., 4,173,585, Cl. 260-586.00R.
International Harvester Company: *See—*
Grosjean, William C.; and Hensley, John J., 4,173,120, Cl. 60-39.16R.
Togami, Paul G.; Drayer, T. Gary; and Francis, James M., 4,173,155, Cl. 74-230.17M.
International Paper Company: *See—*
Capo, James L., 4,173,655, Cl. 426-129.000.
International Shoe Machine Corporation: *See—*
Vornberger, Walter, 4,173,050, Cl. 12-14.500.
International Standard Electric Corporation: *See—*
Ramsay, Melvin M.; and Wright, Stephen, 4,173,412, Cl. 356-33.000.
International Telephone & Telegraph Corporation: *See—*
Giesken, Kenneth F.; and Cotton, John M., 4,173,713, Cl. 179-18.0EA.
Ionics Inc.: *See—*
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Ishida, Minoru, to Feather Safety Razor Co., Ltd. Knife having an exchangeable blade. 4,173,071, Cl. 30-339.000.
Ishihara Sangyo Kaisha Ltd.: *See—*
Nishiyama, Ryuzo; Fujikawa, Kanichi; Nasu, Rikuo; Toki, Tadaaki; Yamamoto, Toshihiko, deceased; and Yamamoto, Hikotaro, legal representative, 4,173,637, Cl. 424-263.000.
Nishiyama, Ryuzo; Fujikawa, Kanichi; Nasu, Rikuo; Toki, Tadaaki; and Yamamoto, Toshihiko, 4,173,638, Cl. 424-263.000.
Ishii, Tsumoru: *See—*
Sera, Hidefumi; Ishii, Tsumoru; Yamaguchi, June; and Shiraishi, Hisashi, 4,173,481, Cl. 430-621.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Imai, Isao; and Shiozaki, Hiroyuki, 4,173,133, Cl. 72-8.000.
Ishizaki, Kosho: *See—*
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Isino, Koichi; and Nose, Hisakichi, to Matsushita Electric Works, Ltd. Hair dryer attachment. 4,173,231, Cl. 132-9.000.
Isobox-Barbier: *See—*
Soulier, Joel, 4,173,608, Cl. 264-26.000.
Israel, Seymour. Surfactant system for fuel catalyzer. 4,173,449, Cl. 431-4.000.
Ito, Makoto: *See—*
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Ito, Takeo: *See—*
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Ittner, Nelson C., to Harry Feick Co., Inc.; and JRS Mfg. Inc. Load bearing vane structure for thrust reversal. 4,173,307, Cl. 239-265.290.
Iwakura, Ryoji: *See—*
Takahashi, Kazutoshi; Nitta, Tatsuo; and Iwakura, Ryoji, 4,173,117, Cl. 58-85.500.
Iwatsuki, Masahiro: *See—*
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Iwaya, Fukuo: *See—*
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Izon Corporation: *See—*
Yevick, George J., 4,173,399, Cl. 353-78.000.
Izumi, John; and D'Orio, Angelo, to Auto Components, Inc. Windshield washer pump drive mechanism. 4,173,055, Cl. 15-250.020.
J. I. Case Company: *See—*
Klug, Alan G.; and Marto, John H., 4,173,153, Cl. 74-197.000.
Jacobs, I. Murray, to Sybron Corporation. Method of making a disposable dental tray or the like by combining dissimilar foams. 4,173,505, Cl. 156-285.000.
Jahn, Walter; and Gimbel, Jurgen, to Daimler-Benz Aktiengesellschaft. Installation for adjusting the height of the upper anchoring or deflection point for the shoulder belt of a belt system. 4,173,357, Cl. 280-808.000.
James, Terrence M.: *See—*
Cruthers, Larry R.; James, Terrence M.; Goff, Sidney; and Alouche, Antoine R., 4,173,632, Cl. 424-232.000.
Janecek, Jaroslav; and Jiruse, Jaroslav, to Adamovske strojirny, narodni podnik. Drive mechanism for a sheet feeder device. 4,173,335, Cl. 271-93.000.
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Jarque, Ricardo G.; Cartes, Juan B.; Jimenez, Rosa L.; Roldan, Cristobal M.; and Peinado, Fernando R., to Laboratorios Made, S.A. 2-(2-Furoyl)-4-methylpyridine and its methyl iodide quaternary salt. 4,173,705, Cl. 546-283.000.
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Johnson, Arthur F. Building structure with heat storage and recovery. 4,173,304, Cl. 237-1.00A.
Johnson, Elwin L.; Kilby, Jack S.; Lathrop, Jay W.; McFerren, John S.; and Myers, David J., to Kilby, Jack S. Glass support light energy converter. 4,173,494, Cl. 136-89.0TF.
Johnson, John: *See—*
Thorby, Douglas C.; and Johnson, John, 4,173,323, Cl. 244-114.00R.
Johnson & Johnson: *See—*
Kelly, William G. F., 4,173,612, Cl. 264-176.00R.
Krzewinski-Morris, Henrietta, 4,173,042, Cl. 2-197.000.
Johnson, Lloyd D.: *See—*
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Johnston, Lyman C. Massage apparatus. 4,173,217, Cl. 128-734.000.
Jones, Richard E.: *See—*
Casad, Edward F.; Casad, Thomas R.; and Jones, Richard E., 4,173,196, Cl. 114-253.000.
Jones, Robert J.: *See—*
Green, Howard E.; Jones, Robert J.; and O'Rell, Michael K., 4,173,700, Cl. 528-125.000.
Jordan, Edgar R. Engine control system and valve deactivator thereof. 4,173,209, Cl. 123-198.00F.
JRS Mfg. Inc.: *See—*
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Judge, Bernard. Building construction. 4,173,102, Cl. 52-73.000.
Kabushiki Kaisha Kinekisha-Kenkyujo: *See—*
Hanji, Motoyasu, 4,173,726, Cl. 310-366.000.
Kabushiki Kaisha Suwa Seikosha: *See—*
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Kach, Alfred, to Patelhold Patentverwertungs- & Electro-Holding AG. Fiber optic T-coupler. 4,173,390, Cl. 350-96.160.
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Kalaus, Gyorgy: *See—*
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Kamath, Venkatesh: *See—*
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Kameny, Stanley L. Pulse generator. 4,173,741, Cl. 331-111.000.
Kamikawa, Kiyohide: *See—*
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Kanno, Hideyuki, to Tomy Corporation. Game structure having a tethered ball. 4,173,340, Cl. 273-95.00A.
Kanoh, Natsuki; Tanaka, Toru; and Murakami, Atsushi, to Mitsubishi Chemical Industries Ltd. Polymerization of olefin. 4,173,698, Cl. 526-142.000.
Kantarian, Edward T.; and Staub, Donald F. Conveyor load shunting apparatus. 4,173,274, Cl. 198-367.000.
Karbo, Richard S., to Leisure Group, The. In-line shut-off valve. 4,173,328, Cl. 251-309.000.
Karo, James T.: *See—*
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Kashiwabara, Akira: *See—*
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Kataoka, Nagamasa: *See—*
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Ebata, Yoshihiro; Ueno, Tsutomu; Kataoka, Nagamasa; and Akao, Akimasa, 4,173,461, Cl. 65-106.000.
Katinger, Hermann; and Scheirer, Winfried, to Chemap AG. Device for cultivating cells of animal and human tissues. 4,173,516, Cl. 435-286.000.
Kato, Toshiki: *See—*
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Kauffman, Robert N.: *See—*
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Kauffman, Roger S.; and Slothour, Donald L., to W. L. Gore & Associates, Inc. Coaxial assembly. 4,173,386, Cl. 339-177.00R.
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Kawagai, Kenji; Yoshida, Shigeki; Ogawa, Hisaharu; and Ohashi, Toshiro, to Tokyo Shibaura Electric Co., Ltd. Abnormal voltage detection circuit. 4,173,756, Cl. 340-636.000.
Kawaguchi, Katsuyuki, to Mitsubishi Jukogyo Kabushiki Kaisha. Fuel combustion apparatus employing staged combustion. 4,173,118, Cl. 60-39.650.
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Keller, Douglas V., Jr.: *See—*
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Kellner, Walter: *See—*
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Kelly, Donald A. Solar power system, with high concentration, linear reflective solar panels. 4,173,213, Cl. 126-425.000.
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Kent, Ronald A.; and Fein, Marvin M., to Dart Industries Inc. Catalyst composition for decomposing ozone. 4,173,549, Cl. 252-463.000.

Keoteklian, Hagop, to Entenmann's, Inc. Method for treating plant effluent. 4,173,532, Cl. 210-49.000.

Kernick, Andress: *See—*
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Khosla, Rajinder P.: *See—*
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Kikumoto, Ryoji: *See—*
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Kilby, Jack S.: *See—*
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Kilgore, Marion D., to Otis Engineering Corporation. Subsurface safety valve. 4,173,256, Cl. 166-324.000.

Kilminster, Kenneth N.: *See—*
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Kimball International, Inc.: *See—*
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Kimura, Takeo: *See—*
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King, John F.: *See—*
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Kinoshita, Akira: *See—*
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Kinsman, Gordon F., to Polaroid Corporation. Methods for making laminar cells. 4,173,066, Cl. 29-623.100.

Kiraly, Ernest F.; and Motta, Vincent C., to Warner-Lambert Company. Dispenser for bonded razor blade cartridges. 4,173,285, Cl. 206-356.000.

Kirsch, Bernhard. Ski boots. 4,173,084, Cl. 36-121.000.

Kirstenpfad, Fritz: *See—*
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Kissell, Fred N.; Maksimovic, Slavoljub D.; and Matta, Joseph E., to United States of America, Interior. Method of determining gas leakage through a mine stopping. 4,173,141, Cl. 73-40.700.

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Kleiner, Hans-Jerg; Linke, Fritz; and Dursch, Walter, to Hoechst Aktiengesellschaft. Carbamoyl-oxyalkyl-phosphinic acid derivatives. 4,173,601, Cl. 260-938.000.

Kline, Richard H., to Goodyear Tire & Rubber Company, The. 3,5-Ditertiary alkyl-4-hydroxyphenyl (alkyl) 6-acyloxy-4-thia hexanoates and hexenamides as antioxidants. 4,173,574, Cl. 260-399.000.

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Kneip, George D., Jr., to Varian Associates, Inc. Selective excitation of coils comprising a superconducting magnet. 4,173,775, Cl. 361-141.000.

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Knowlton, Christopher M.: *See—*
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Kobayashi, Hidehiko: *See—*
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Kobayashi, Koichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Wide angle retrofocus lens system. 4,173,395, Cl. 350-214.000.

Kobayashi, Seishichi; Mori, Tatsuo; and Ueno, Hiroshi, to Toyo Seikan Kaisha, Ltd. Bonded can having high hot water resistance and undercoating composition for use in production thereof. 4,173,290, Cl. 220-75.000.

Kobayashi, Toshiaki: *See—*
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Kobayashi, Yuichi: *See—*
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Kobylinski, Thaddeus P.: *See—*
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Koenders, Peter; Van der Zeeuw, Abraham J.; and Kok, Riekert, to Shell Oil Company. Extraction of copper values from aqueous solution. 4,173,616, Cl. 423-24.000.

Koepke, Donald B., to Thomas International Corporation. Tab switch mechanism for musical instruments. 4,173,166, Cl. 84-343.000.

Kogen Industries, Inc.: *See—*
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Kogler, Horst; and Goebel, Eckhart, to Gebr. Hofmann G.m.b.H. & Co. KG, Maschinenfabrik. Apparatus for balancing unbalanced bodies. 4,173,146, Cl. 73-462.000.

Koike, Masahiko: *See—*
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Koizumi, Yutaka: *See—*
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Koll, Stanley J., to American Flange & Manufacturing Co., Inc. Bottle capping apparatus and method. 4,173,104, Cl. 53-201.000.

Kollberg, Sten; and Tiberg, Lars, to ASEA AB. Electromagnetic valve with slag indicator. 4,173,299, Cl. 222-594.000.

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Konigl, Georg: *See—*
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Kopas, Peter P., to Kogen Industries, Inc. Combination cab and canopy for mine roof bolting machine. 4,173,371, Cl. 296-137.00R.

Koppes, William M.; Adolph, Horst G.; and Sitzmann, Michael E., to United States of America, Navy. Process for the preparation of 1,3,5-trifluoro-2,4,6-trinitrobenzene. 4,173,591, Cl. 260-646.000.

Kotzsch, Hans-Joachim: *See—*
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Koyanagi, Shunichi; Hasegawa, Niichiro; Shimizu, Toshihide; Katusima, Sensaku; and Kaneko, Ichiro, to Shin-Etsu Chemical Co., Ltd. Method for the polymerization of vinyl monomers. 4,173,696, Cl. 526-62.000.

Kramer, Richard W. Low well yield control system and method. 4,173,255, Cl. 166-314.000.

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Kraska, Allen R., to Pfizer Inc. Di-O-n-alkyl glycerol derivatives as immune stimulants. 4,173,641, Cl. 424-267.000.

Krause, Johannes; Reichert, Gunter; Mainzer, Franz; and Niermann, Hermann, to Hoechst Aktiengesellschaft. Process for improving the reactivity of phosphorus pentasulfide. 4,173,621, Cl. 423-303.000.

Kremer, Manfred, to Still GmbH. Device for measuring the torque in a shaft. 4,173,265, Cl. 180-79.100.

Kroncke, Max: *See—*
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Kronenberger, Paul E.: *See—*
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Kruder, George A., to HPM Corporation. Extrusion apparatus and method. 4,173,417, Cl. 366-89.000.

Kruse, Walter M., to ICI Americas Inc. High mannitol process (enzymatic isomerization). 4,173,514, Cl. 435-94.000.

Krzewinski-Morris, Henrietta, to Johnson & Johnson. Head covering garment. 4,173,042, Cl. 2-197.000.

Kubota, Naohiro: *See—*
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Kubota, Seizo, to Sato Kogyo Kabushiki Kaisha. Method of injecting a back filling injection material in a shield forming process. 4,173,430, Cl. 417-53.000.

Kubotera, Kikuo: *See—*
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Kubovits, Imre; Meszaros, Imre; Kaszatnitzky, Ferenc; Szabo, Mrs. Laszlo; and Ottlik, Peter, to Tatabanyai Szenbanyak. Artificial stone and method for making. 4,173,484, Cl. 106-39.600.

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Kucharczyk, Eckhard, to Siegenia-Frank KG. Air vent. 4,173,175, Cl. 98-41.0SV.

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Kuehnle, Manfred R., to Coulter Information Systems, Inc. Electrophotographic contact duplicating apparatus and method. 4,173,407, Cl. 355-12.000.

Kuhla, Donald E.: *See—*
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Kuhnell, Thomas J.; Tanner, Randall C.; and Dryak, Alois V., to Cincinnati Milacron Inc. Method and apparatus for cutting a thread on a rotating workpiece. 4,173,786, Cl. 364-475.000.

Kumakawa, Shozo. Method of making boards and packing cases made therefrom. 4,173,287, Cl. 217-65.000.

Kummeling, Jozef W. M.: *See—*
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Kunimune, Kohichi: *See—*
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LaBarre, Robert E.: *See—*
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Laboratorios Made, S.A.: *See—*
Jarque, Ricardo G.; Cartes, Juan B.; Jimenez, Rosa L.; Roldan, Cristobal M.; and Peinado, Fernando R., 4,173,705, Cl. 546-283.000.

LaFont Corporation: *See—*
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Laliotis, Theodore A., to Atmospheric Sciences, Inc. Method and apparatus for measuring dimensions. 4,173,788, Cl. 364-560.000.

Lamperti, Enrico. Machine for coiling metal wire. 4,173,135, Cl. 72-21.000.

Lange, Wilfried, to Dieter Haubold Industrielle Nagelgerate, Firma. Working process of a pneumatic operated ramming tool. 4,173,171, Cl. 91-25.000.

Larsen, Olaf E., to Phillips Petroleum Company. Choke ring for pipe extrusion die. 4,173,446, Cl. 425-380.000.

Larsson, Karl H.: *See—*
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Lasky, Jerome B.; and Moran, Paul R., to United States of America, Energy. Method of preparing a thermoluminescent phosphor. 4,173,660, Cl. 427-38.000.

Lathrop, Jay W.: *See—*
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Laurin, Bernard L.: *See—*
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Law, Andrew B., to Rohm and Haas Company. Synergistic microbiocidal compositions. 4,173,643, Cl. 424-270.000.

Law, David C. F., to Arbrook, Inc. Oxydiacetaldehyde compositions used as disinfectants. 4,173,653, Cl. 424-333.000.

Lawson, Thomas M.: *See—*
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Lazarre, Flavien: *See—*
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Lease, Robert D., to Clark Equipment Company. Rotary feed cup having a spacer and a pivoted seal. 4,173,298, Cl. 222-368.000.

Leasure, William; Garcia, Luis; Reifel, Charles; and Shelton, Jack, to Mira-Pak Inc. Carton forming method. 4,173,106, Cl. 53-449.000.

Le Berre, Serge: *See—*
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Lederer, David B., to Detection Systems Inc. Optical assembly. 4,173,717, Cl. 250-239.000.

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Lee, Minyoung; Szala, Lawrence E.; and De Vries, Robert C., to General Electric Company. Process for preparing a polycrystalline diamond body/silicon nitride substrate composite. 4,173,614, Cl. 264-332.000.

Lee, Teh-Hsuang: *See—*
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Leesona Corporation: *See—*
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LeFevre, Robert J.: *See—*
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Lehmann, William L., to RCA Corporation. Antenna isolation device. 4,173,742, Cl. 333-100.000.

Lehmkuhl, Herbert; and Eisenbach, Wilhelm, to Studiengesellschaft Kohle mbH. Electrochemical process for dicyclopentadienyl iron. 4,173,517, Cl. 204-59.0QM.

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Leka, George T.; and Paradis, Roland C., to Perkin-Elmer Corporation, The. Dual-piston reciprocating pump assembly. 4,173,437, Cl. 417-521.000.

Lentine, Frank N., to Sybron Corporation. Disposable dental tray. 4,173,219, Cl. 128-260.000.

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Lewandowski, Leon M., to Sanders Associates, Inc. Acoustic transducing system. 4,173,748, Cl. 367-123.000.

Lewin, Ian: *See—*
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Liautaud, James P., to American Antenna Corporation. Mobile antenna mounting assembly. 4,173,761, Cl. 343-715.000.

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Licata, William H., to United States of America, Navy. Inertial guidance system for vertically launched missiles without roll control. 4,173,785, Cl. 364-453.000.

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Lichti, Robert D.; and Herrera, Joseph O., to Park Mobile, Inc., by said Joseph O. Herrera and Paul J. Ashley. Fluid metering and transfer system. 4,173,279, Cl. 198-500.000.

Lieb, Claude, to Balzers Aktiengesellschaft fur Hochvakuumtechnik und Dunne Schichten. Clamping device for transporting specimen plates. 4,173,365, Cl. 294-19.00R.

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Light, Bette M.: *See—*
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Lin, Victor J., to Celanese Corporation. Spray spinning nozzle having convergent gaseous jets. 4,173,443, Cl. 425-66.000.

Lind, Robert B., to Gerber Products Company. Apparatus for handling glass jars. 4,173,508, Cl. 156-499.000.

Linde Aktiengesellschaft: *See—*
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Locke, Gerald M., to Corning Glass Works. Method of forming a quadriplanar component. 4,173,062, Cl. 29-570.000.

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Lohmann, Joachim W.: *See—*
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Lombard, Daniel L. Unmanned chain hook-up for lifting loose bundles. 4,173,334, Cl. 294-67.00E.
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Long, Robert, to Ecodyne Corporation. Liquid cooling tower. 4,173,605, Cl. 261-109.000.
Lonstrup, Thor F.; Brownawell, Darrell W.; and Howlett, Barry J., to Exxon Research & Engineering Co. Lubricating oil composition containing a dispersing-varnish inhibiting combination of polyol ester compound and a borated acyl nitrogen compound. 4,173,540, Cl. 252-49.600.
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Bergman, Lawrence A.; and Gorndt, John H., 4,173,360, Cl. 285-51.000.
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Madrange nee Dermain, Annie; de Montalembert, Henri M.; Meurice, Pierre; and Refregier, Jean-Louis, 4,173,627, Cl. 424-47.000.
Louis, Emma D. Window shade controls and method associated therewith. 4,173,721, Cl. 307-115.000.
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Lucke, Florian, to Lucke Apparatebau GmbH. Device for cutting yarn on ball winding machines. 4,173,311, Cl. 242-2.000.
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Lundborg, Charles L.: *See*—
Heikkinen, Leo L.; and Lundborg, Charles L., 4,173,237, Cl. 144-3.00K.
Lyman, Donald J.; and Fazzio, Frank J., to University of Utah. Synthetic polymer prosthesis material. 4,173,689, Cl. 521-64.000.
Lynch, Thomas J.: *See*—
Gilbert, Ronald E.; Lynch, Thomas J.; and Rowatt, Robert J., 4,173,697, Cl. 526-74.000.
M&T Chemicals Inc.: *See*—
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M & W Gear Company: *See*—
Meiners, Elmo R., 4,173,112, Cl. 56-341.000.
MacAnally, Richard B.: *See*—
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MacBroom, James, Jr., to Toolmatic Corporation of Connecticut. Cannula grinding cartridge and fixture. 4,173,100, Cl. 51-227.00H.
Macdonald, Kenneth A. B., to United States of America, Air Force. Flutter prevention means for aircraft primary flight control surfaces. 4,173,322, Cl. 244-75.00A.
Madrange nee Dermain, Annie; de Montalembert, Henri M.; Meurice, Pierre; and Refregier, Jean-Louis, to L'Oreal. Hair lacquer sprays having reduced inflammability. 4,173,627, Cl. 424-47.000.
Maeda, Ikuo: *See*—
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Maier, Roland; Woitun, Eberhard; Reuter, Wolfgang; Wetzel, Bernd; Goeth, Hanns; and Lechner, Uwe, to Boehringer Ingelheim GmbH. 4-Spectinomycylamine and salts thereof. 4,173,647, Cl. 424-283.000.
Main, Ralph M.; and Paramonoff, Elpidifor, to Standun, Inc. Can bodymaker having improved ram support and drive. 4,173,138, Cl. 72-349.000.
Mainzer, Franz: *See*—
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Mal, M. Kumar; and Tarkan, Stuart E., to Chromalloy American Corporation. Age-hardenable titanium carbide tool steel. 4,173,471, Cl. 75-237.000.
Malacheski, Joseph J.; and Zenda, Richard J. Valved closure for a pressure vessel. 4,173,292, Cl. 220-303.000.
Mannesmann Aktiengesellschaft: *See*—
Goldschmidt, Rolf; Hansgen, Klaus; Hiersig, Heinz M.; and Kirstenpfad, Fritz, 4,173,330, Cl. 254-98.000.
Mannheim, Jose R. Decorated safety glass. 4,173,672, Cl. 428-203.000.
March, Joseph E., to Platt Luggage, Inc. Hinged tray assembly. 4,173,284, Cl. 206-349.000.
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Marshall, William A., to Alco Foodservice Equipment Company. Apparatus for mixing and dispensing a beverage. 4,173,296, Cl. 222-129.100.
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Tadanier, John S.; Martin, Jerry R.; and Kurath, Paul, 4,173,564, Cl. 260-112.50R.
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Marvin Glass & Associates: *See*—
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Marx, Alvin J.; and Edelman, Abraham, to Marx, Alvin J. Automated intravenous fluid regulating and administering apparatus. 4,173,224, Cl. 128-214.00E.
Masaki, Kenji, to Nissan Motor Co., Ltd. Electrostatic fuel injector. 4,173,206, Cl. 123-119.00E.
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Maschinenfabrik Walter Scheele KG: *See*—
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Massaro, Anthony A., Jr.; and Andrews, Harry N., to Westinghouse Electric Corp. System and method for retubing a steam generator. 4,173,060, Cl. 29-157.400.
Massengeil, Hans A.; Stemme, Otto; Eppe, Rudolf; Pfeifer, Josef; Konigl, Georg; and Schatz, Anton, to AGFA-Gevaert, A.G. Exposure system for copying machines. 4,173,411, Cl. 355-50.000.
Mathey, Francois; and Bensoam, Jean, to Institute National de Recherche Chimique Appliquee. Process for producing fluorinated organic compounds containing a difluoromethylene group from compounds comprising at least one carbonyl function. 4,173,706, Cl. 560-30.000.
Matsch, Ladislas C.; and Drnevich, Raymond F., to Union Carbide Corporation. Nitrification-denitrification of wastewater. 4,173,531, Cl. 210-5.000.
Matsuda, Yasumasa: *See*—
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Mattei, Jean-Pierre; and Coutin, Pierre F., to R. Alkan & Cie. Device for jettisoning a load in two different ways. 4,173,366, Cl. 294-83.00R.
Matthews, Roger J.: *See*—
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Maurer, Robert D., to Corning Glass Works. Optical waveguide with protective coating. 4,173,393, Cl. 350-96.340.
Maxson, Myron T.: *See*—
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McCall, Richard H., to Texaco Inc. Surface fluid collector. 4,173,536, Cl. 210-242.00S.
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McDonnell Douglas Corporation: *See*—
Aldridge, Clifton; Gibson, Sandra F.; Vannest, Richard D.; and Rodgers, Gregory D., 4,173,515, Cl. 435-38.000.
McFerren, John S.: *See*—
Johnson, Elwin L.; Kilby, Jack S.; Lathrop, Jay W.; McFerren, John S.; and Myers, David J., 4,173,494, Cl. 136-89.0TF.
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McKaveney, James P.; and Prieto, Martin A., to Occidental Research Corporation. Current generating cell with alloy anode. 4,173,687, Cl. 429-218.000.
McKelvey, James M.; and Steingiser, Samuel, to Monsanto Company. Plastics extrusion apparatus. 4,173,445, Cl. 425-376.00A.
McLaughlin, Charles S. Marine cleat for receiving a thrown line. 4,173,194, Cl. 114-218.000.

McLaughlin, John R.; Bryant, Michael D.; Fessel, Manfred; and Taylor, Kenneth C., to Foseco International Limited. Magnesium-containing treatment agents. 4,173,466, Cl. 75-58.000.
McLaughlin, Richard J.; and Rogozinski, Wallace J., to Rogozinski, Wallace. EKG cable monitoring system. 4,173,221, Cl. 128-696.000.
McRae, Wayne A., to Ionics Inc. Chlor-alkali electrolysis cell. 4,173,524, Cl. 204-265.000.
Mead Corporation, The: *See*—
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Castelazo, Garbiel G. M.; Quintero, Abraham; Medina, Alejandro; and Fabila, Gilberto, 4,173,598, Cl. 428-402.000.
Meeks, Frederick T., to General Electric Company. Digital weighing scale. 4,173,263, Cl. 177-210.0EM.
Mehta, Gunvant N.: *See*—
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Meissner, David C.; and Sanzenbacher, Charles W., to Midrex Corporation. Method for the direct reduction of iron using gas from coal. 4,173,465, Cl. 75-35.000.
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Merchant, Floyd S. Contact fault detector. 4,173,735, Cl. 324-421.000.
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Metivier, Jean; and Sauli, Michel, to Rhone-Poulenc S.A. Process for the preparation of dextrorotatory 2-phenoxypropionic acid derivatives. 4,173,709, Cl. 562-471.000.
Metje, Heinz. Bending fixture for offset plates. 4,173,137, Cl. 72-320.000.
Meurice, Pierre: *See*—
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Meyer, Burton C.; and Jaworski, Eugene, to Marvin Glass & Associates. Wheeled toy. 4,173,096, Cl. 46-205.000.
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Millard, Maurice; Peters, David L.; Trzeciak, John R.; and Woycechowsky, Brian J., to Singer Company, The. Video generator for use in a synthetic terrain generator. 4,173,081, Cl. 35-12.00N.
Miller, Donald M.; and Webb, Grant A., to Teleflex Incorporated. Motion transmitting remote control assembly. 4,173,157, Cl. 74-501.00R.
Miller, Howard E.: *See*—
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Mims, Herman D. Carton erector. 4,173,173, Cl. 93-51.00R.
Mimura, Akio; Suzuki, Takaya; and Yagiyu, Seturo, to Hitachi, Ltd. Dielectric insulator separated substrate for semiconductor integrated circuits. 4,173,674, Cl. 428-220.000.
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, to Argus Chemical Corporation. 2,2,6,6-Tetraalkyl-4-piperidyl ketones and ketals as stabilizers for synthetic polymers. 4,173,599, Cl. 525-66.000.
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Minhas, Pritam S.; and Sukornick, Bernard, to Allied Chemical Corporation. Flame retardant carpet and method for preparing same. 4,173,671, Cl. 428-85.000.
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Minnicks, Paul, III. Radio navigation training device. 4,173,080, Cl. 35-10.250.
Minolta Camera Kabushiki Kaisha: *See*—
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Mira-Pak Inc.: *See*—
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Nunlist, Erwin J.; and Mitchell, James, 4,173,246, Cl. 159-6.00W.
Mitsubishi Chemical Industries Ltd.: *See*—
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Mitsubishi Rayon Co., Limited: *See*—
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Mitsui Toatsu Chemicals, Incorporated: *See*—
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Miura, Haruhisa, to Tokyo Shibaura Electric Co., Ltd. Multiplication control system. 4,173,789, Cl. 364-760.000.
Mobil Oil Corporation: *See*—
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Mochinaga, Takahiko: *See*—
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Monarch Marking Systems, Inc.: *See*—
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Hamisch, Paul H., Jr.; and Hubbard, David W., 4,173,293, Cl. 221-1.000.
Monsanto Company: *See*—
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Coran, Aubert Y.; and Patel, Raman P., 4,173,556, Cl. 260-30.80R.
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Moore, Harold, Jr., to Reserve Oil, Inc. Downhole pump. 4,173,451, Cl. 417-457.000.
Moran, Paul R.: *See*—
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Mori, Kinya: *See*—
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Mori, Tatsuo: *See*—
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Morinaga, Shigeki; Maeda, Takeo; Takahashi, Tadashi; and Ishizaki, Kosho, to Hitachi, Ltd. Controlling apparatus for electric sewing machine. 4,173,193, Cl. 112-275.000.
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Mortensen, Donald G.; and Browning, James T., to FMC Corporation. Root crop harvester. 4,173,257, Cl. 171-33.000.
Morton, Edward W.: *See*—
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Motoren- und Turbinen-Union Munchen GmbH: *See*—
Greune, Christian; and Hackl, Friedrich, 4,173,119, Cl. 60-39.16R.
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Moynihan, Daniel J.: *See—*
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Mrozik, Helmut H.: *See—*
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Mscan Metal Canada Limitee: *See—*
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Muetterties, Andrew J., to Abbott Laboratories. Apparatus for controllably administering a parenteral fluid. 4,173,222, Cl. 128-214.00C.

Muller, Friedhelm: *See—*
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Murakami, Atsushi: *See—*
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Muramoto, Takayoshi; and Orita, Kunitaka, to Fumakilla Limited. Method for killing insects and/or fungi with electro-mechanical ultrasonic nebulizer and composition for said method. 4,173,651, Cl. 424-306.000.

Murata, Kosaku; Takayama, Satoshi; and Niguchi, Hirotoshi, to Matsushita Electric Industrial Co., Ltd. Speaker diaphragm molded from poly-biphenol phthalate type resin film. 4,173,701, Cl. 528-194.000.

Murata, Masahiro, to Hope Co., Ltd. Ski braking device. 4,173,354, Cl. 280-605.000.

Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., to International Flavors & Fragrances Inc. C_{10}-terpene alkyl, alkenyl, haloalkyl, and alkynyl ethers and diethers, processes for preparing same and organoleptic uses thereof. 4,173,543, Cl. 252-174.110.

Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., to International Flavors & Fragrances Inc. 3-(2-Chloroallyloxy)-2(10)-pinene. 4,173,711, Cl. 568-665.000.

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Nachman Corporation: *See—*
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Nagao, Kenichi: *See—*
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Nagarajan, Ramakrishnan: *See—*
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Nagata, Yuuichi; and Matsuoka, Tadataka, to Nippon Gakki Seizo Kabushiki Kaisha. Speaker protection circuit. 4,173,740, Cl. 330-298.000.

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Nakajima, Yasuo; Onoda, Michio; Sugihara, Kunihiko; and Nagumo, Shinichi, 4,173,203, Cl. 123-119.00A.

Nakai, Tadanobu, to Tokiwa Chemical Industries Limited. Rat capturing device. 4,173,092, Cl. 43-61.000.

Nakai, Tadanobu, to Tokiwa Chemical Industries Limited. Cockroach catching device. 4,173,093, Cl. 43-121.000.

Nakajima, Tomio: *See—*
Habu, Teiji; Nakajima, Tomio; Sakamoto, Eiichi; Fujimori, Noboru; and Mine, Kiyomitsu, 4,173,483, Cl. 430-575.000.

Nakajima, Yasuo; Onoda, Michio; Sugihara, Kunihiko; and Nagumo, Shinichi, to Nissan Motor Co., Ltd. Engine system. 4,173,203, Cl. 123-119.00A.

Nakamatsu, Shuji; Harada, Hiroyuki; Shinomiya, Yoshitugu; and Omizu, Tuyoshi, to Chlorine Engineers Corp., Ltd. Electrolytic cell for electrolysis of sea water. 4,173,525, Cl. 204-275.000.

Nakamura, Isao: *See—*
Tabata, Yasuhiro; Satomi, Toyokazu; Koizumi, Yutaka; Nakamura, Isao; and Kaneko, Tamaki, 4,173,410, Cl. 355-24.000.

Nakano, Shiro; and Hotta, Masahiro, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Electro-thermosensitive recording materials. 4,173,677, Cl. 428-335.000.

Nakashima, Hiromasa, to NGK Insulators, Ltd. Filter cloth washing device for filter press. 4,173,535, Cl. 210-225.000.

Nakayama, Shinpei: *See—*
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Schure, Alexander; and Glenn, William E., 4,173,391, Cl. 350-96.250.

Newhart, Earle E., deceased; and by Newhart, Ruth, executor. Integral artificial kidney unit. 4,173,537, Cl. 210-321.00B.

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Nichols, Wallace H., Jr. Method for treating ground surfaces with a toxic agent. 4,173,094, Cl. 43-129.000.

Nida, Roy J. Method of rustproofing motor vehicles. 4,173,665, Cl. 427-421.000.

Niermann, Hermann: *See—*
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Niguchi, Hirotoshi: *See—*
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Nippon Telegraph and Telephone Public Corporation: *See—*
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Nippon Zeon Co., Ltd.: *See—*
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Niquette, Joan. Paper for teaching writing skills. 4,173,082, Cl. 35-37.000.

Nishide, Katsuhiko: *See—*
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Nishihara, Motohisa: *See—*
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Nishiyama, Ryuzo; Fujikawa, Kanichi; Nasu, Rikuo; Toki, Tadaaki; Yamamoto, Toshihiko, deceased; and by Yamamoto, Hikotaro, legal representative, to Ishihara Sangyo Kaisha Ltd. N-Benzoyl-N'-pyridyloxy phenyl urea and insecticidal compositions thereof. 4,173,637, Cl. 424-263.000.

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Noda, Hideo, to Shimano Industrial Company, Limited. Fishing reel. 4,173,316, Cl. 242-84.20R.

Noguchi, Hiroshi; Hashimoto, Shunichi; Kitamura, Shigeyoshi; Matsuo, Takashi; Mine, Akihiko; and Kamoshita, Katsuzo, to Sumitomo Chemical Company, Limited. m-Phenoxybenzamide derivatives. 4,173,464, Cl. 71-118.000.

Nolet, Roland. Massage device. 4,173,216, Cl. 128-24.100.

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Noomen, Arie; van der Geest, Johannes M. P.; de Jong, Cornelis; and Van Santen, Dick, to Akzo N.V. Process for coating a substrate with a radiation and moisture curable coating composition. 4,173,682, Cl. 428-423.000.

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Norris, Alan H.: *See—*
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Nu-Watt, Inc.: *See—*
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Nunlist, Erwin J.; and Mitchell, James, to Sybron Corporation. Feed distributor for glassed steel wiped film evaporator. 4,173,246, Cl. 159-6.00W.

Nussbaum, Hans. Hoist mechanism. 4,173,268, Cl. 187-8.490.

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Obermeyer, Franklin D.; and Berringer, Robert T., to Westinghouse Electric Corp. Nuclear reactor with control rods. 4,173,513, Cl. 176-50.000.

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Okabe, Katsuhiko, to Copal Company Limited. Paper feeding mechanism in a printer. 4,173,420, Cl. 400-618.000.

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Okamoto, Ikuzo; and Shindo, Osamu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Optical system for objective eye-examination. 4,173,398, Cl. 351-9.000.

Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Limited; and Okamoto, Shosuke. N^2-Arylsulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof. 4,173,630, Cl. 424-177.000.

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Olsen, Wayne A.; and Tigner, Calvin L. Birdhouse construction. 4,173,200, Cl. 119-23.000.

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Ondetti, Miquel A.; and Cushman, David W., to E. R. Squibb & Sons, Inc. Dithio aminoacid derivatives. 4,173,704, Cl. 548-336.000.

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O'Rell, Michael K.: *See—*
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Osborn, L. Earl. Combination sofa and bed. 4,173,045, Cl. 5-12.00R.

Osman, Maged A., to BBC Brown Boveri & Company Limited. Novel alkylsubstituted N-benzylideneanilines and liquid crystal compositions containing same. 4,173,544, Cl. 252-299.000.

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Ota, Etsuji. Drain valve operating device for a cistern of flush toilet. 4,173,044, Cl. 4-325.000.

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Otsuka, Eiji; Inoue, Shigeru; Kimura, Tetsuo; Takae, Toshinori; Tsuji, Morio; and Kato, Toshiki, to Mitsui Toatsu Chemicals, Incorporated. Chemical apparatus for corrosive materials. 4,173,615, Cl. 422-197.000.

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Oyama, Kenjiro; and Imaizumi, Koji, to Minolta Camera Kabushiki Kaisha. Electrical charge removing arrangement for removing charge from non-image bearing portions of photo-sensitive medium. 4,173,406, Cl. 355-3.00R.

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Paul Hammelmann Maschinenfabrik: *See—*
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Paull, Peter L.; and McGann, Rodney, to Texaco Inc. Partial oxidation process. 4,173,254, Cl. 165-134.00R.

Pauly, Ronald R.; and Rumsey, Royce D., to Tonka Corporation. Toy vehicle. 4,173,095, Cl. 46-201.000.

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Pendergrass, John E.; and Melton, David T., to Kendall Co., The. Porous elastic bandage. 4,173,131, Cl. 66-192.000.
Perego, Giuseppe. Foldable baby carriage with foldable and adjustable foot rest. 4,173,355, Cl. 280-642.000.
Perkin-Elmer Corporation, The: *See—*
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Peterson, James F., to Allis-Chalmers Corporation. Vented grass-catcher cover. 4,173,111, Cl. 56-202.000.
Peterson, Larry W.; Bozarth, Gene A.; and Pilgram, Kurt H. G., to Shell Oil Company. Phosphonium salts as herbicides. 4,173,463, Cl. 71-87.000.
Petropoulos, Constantine C.; Reynolds, George A.; and Van Allan, James A., to Eastman Kodak Company. Radiation sensitive compositions containing pyrylium compounds. 4,173,473, Cl. 430-72.000.
Petrovic, John E., to Teledyne Industries, Inc. Sprayer. 4,173,325, Cl. 248-81.000.
Pettersen, Edward A., to Risdon Manufacturing Company, The. Non-throttling manually reciprocated plunger pump for consumer-type liquid dispensing containers. 4,173,297, Cl. 222-321.000.
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Phillips, Kenneth G., to Nalco Chemical Company. Grouting composition containing cupric acrylate. 4,173,555, Cl. 260-29.70H.
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Phillips, Raymond J., to United States of America, Navy. Flexible co-axial connector for cable in-line electronics. 4,173,384, Cl. 339-101.000.
Piana, Renato. Chambered element for use in forming a roller screen. 4,173,247, Cl. 160-236.000.
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Pulker, Hans K.; and Staffler, Reinhard, to Balzers Patent- und Beteiligungs-Aktiengesellschaft. Method and apparatus for producing carbon coatings by sputtering. 4,173,522, Cl. 204-192.00C.
Pullukat, Thomas J.; Shida, Mitsuzo; and Hoff, Raymond E., to Chemplex Company. Ethylene polymerization catalyst and method. 4,173,548, Cl. 252-430.000.
Purser, Kenneth H., to General Ionex Corporation. Electrical circuit component protecting device. 4,173,712, Cl. 174-35.00R.
Putz, A. Frank. Rotary piston device which displaces fluid in inner and outer variable volume chambers simultaneously. 4,173,438, Cl. 418-59.000.
Quintero, Abraham: *See—*
Castelazo, Garbiel G. M.; Quintero, Abraham; Medina, Alejandro; and Fabila, Gilberto, 4,173,598, Cl. 428-402.000.
Quinto, Mario J. Flame resistant cellulose fiber insulation and process of preparing it. 4,173,666, Cl. 427-427.000.
R. Alkan & Cie.: *See—*
Mattei, Jean-Pierre; and Coutin, Pierre F., 4,173,366, Cl. 294-83.00R.
Raabe, Ralph C.; Cleffman, Roger G.; and Stratton, Raymond G., to Bandag Incorporated. Apparatus for splicing tread strips. 4,173,509, Cl. 156-507.000.
Rademachers, Jakob; and Linde, Gunter, to Bayer Aktiengesellschaft. Recovery of sodium sulphate in production of iron oxide black pigments. 4,173,624, Cl. 423-551.000.
Ragalyi, Jozsef: *See—*
Katona, Tibor; Kenderesy, Tamas; Nemes, Imre; Erdelyi, Agoston; and Ragalyi, Jozsef, 4,173,787, Cl. 364-550.000.
Raines, Kenneth C.; and LeFevre, Robert J., to National Patent Development Corporation. Chamber assembly for infusion and transfusion apparatus. 4,173,223, Cl. 128-214.00C.
Ralston Purina Company: *See—*
Gaudio, E. Lorna; and Holt, S. Kent, 4,173,657, Cl. 426-574.000.
Ramirez, Peter R.: *See—*
Rotenberg, Don H.; Cuffe, Patricia M.; Laurin, Bernard L.; and Ramirez, Peter R., 4,173,490, Cl. 106-287.140.
Ramsay, Melvin M.; and Wright, Stephen, to International Standard Electric Corporation. Strain measurement. 4,173,412, Cl. 356-33.000.
Ranz, Erwin; Lohmann, Joachim W.; and Schutz, Heinz-Dieter, to AGFA-Gevaert, A.G. Color photographic recording material. 4,173,479, Cl. 430-507.000.
Rapp, Charles F.; and Boling, Norman L., to Owens-Illinois, Inc. Solar collector structures containing thin film polysiloxane, and solar cells. 4,173,495, Cl. 136-89.0PC.
Ratz, Thomas J.; and Baker, Ralph L., to Midori Anzen Company, Ltd. Facemask. 4,173,220, Cl. 128-142.700.
Raudat, John L.; Johnson, Lloyd D.; and Rydell, Adam Z., to Standard-Knapp, Inc. Apparatus for detecting and clearing a jam of articles. 4,173,276, Cl. 198-437.000.
RCA Corporation: *See—*
Arntsen, Arnt P., 4,173,743, Cl. 333-32.000.
Comizzoli, Robert B., 4,173,683, Cl. 428-447.000.
Denlinger, Edgar J.; and Veloric, Harold S., 4,173,768, Cl. 357-68.000.
Dholakia, Anil R., 4,173,348, Cl. 274-47.000.
Lehmann, William L., 4,173,742, Cl. 333-100.000.
Stone, Robert P.; and Morrell, Albert M., 4,173,729, Cl. 313-403.000.
Rees, Herbert; and Schad, Robert D., to Husky Injection Molding Systems. Actuating mechanism for gate valve of injection nozzle. 4,173,448, Cl. 425-549.000.
Refregier, Jean-Louis: *See—*
Madrange nee Dermain, Annie; de Montalembert, Henri M.; Meurice, Pierre; and Refregier, Jean-Louis, 4,173,627, Cl. 424-47.000.

Reiche, Robert F., to Chicago Bridge & Iron Company. Method of and apparatus for controlling the flow of materials from a rotating drum. 4,173,239, Cl. 144-311.000.
Reichert, Gunter: *See—*
Krause, Johannes; Reichert, Gunter; Mainzer, Franz; and Niermann, Hermann, 4,173,621, Cl. 423-303.000.
Reid, Joyce: *See—*
Hauck, Frederic P.; Condon, Michael E.; and Reid, Joyce, 4,173,640, Cl. 424-267.000.
Reid, Joyce P. Vegetable washer. 4,173,051, Cl. 15-3.120.
Reifel, Charles: *See—*
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Reighter, David H.: *See—*
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Reiland, Peter M. Bacon cooking apparatus. 4,173,180, Cl. 99-391.000.
Reilor Limited: *See—*
Robb, Donald, 4,173,099, Cl. 49-168.000.
Reitter, Erwin, to Remington Arms Company, Inc. Transport mechanism for parts. 4,173,278, Cl. 198-461.000.
Remington Arms Company, Inc.: *See—*
Reitter, Erwin, 4,173,278, Cl. 198-461.000.
Resele, Peter; and Leinfellner, Herwig, to Steyr-Daimler-Puch Aktiengesellschaft. Road wheel for motorcycles. 4,173,374, Cl. 301-6.0CS.
Reserve Oil, Inc.: *See—*
Moore, Harold, Jr., 4,173,451, Cl. 417-457.000.
Reuter, Wolfgang: *See—*
Maier, Roland; Woitun, Eberhard; Reuter, Wolfgang; Wetzel, Bernd; Goeth, Hanns; and Lechner, Uwe, 4,173,647, Cl. 424-283.000.
Reynolds, Gary: *See—*
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Reynolds, George A.: *See—*
Petropoulos, Constantine C.; Reynolds, George A.; and Van Allan, James A., 4,173,473, Cl. 430-72.000.
Rhodes, Mordy M. Fixedly mounted mute for stringed instruments. 4,173,165, Cl. 84-311.000.
Rhone-Poulenc Industries: *See—*
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Rhone-Poulenc S.A.: *See—*
Metivier, Jean; and Sauli, Michel, 4,173,709, Cl. 562-471.000.
Rhone-Poulenc-Textile: *See—*
Rodier, Henry, 4,173,613, Cl. 264-187.000.
Riba, Jutta. Incandescent lamp monitoring device. 4,173,750, Cl. 340-80.000.
Ricardo & Co., Engineers (1927) Limited: *See—*
Venton-Walters, Roy, 4,173,143, Cl. 73-194.0VS.
Richardson, J. Mark; and Novinski, Norbert L., II, to UOP Inc. Halogenation of lead sulfide. 4,173,623, Cl. 423-494.000.
Richilano, Vincent J., to Zephyr Industries, Inc. Mallet putter. 4,173,343, Cl. 273-169.000.
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Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, 4,173,642, Cl. 424-267.000.
Ricoh Company, Ltd.: *See—*
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Tabata, Yasuhiro; Satomi, Toyokazu; Koizumi, Yutaka, Nakamura, Isao; and Kaneko, Tamaki, 4,173,410, Cl. 355-24.000.
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Ridgway, H. Curtis, to Telsco Industries, Inc. Rotary sprinkler impact arm spring adjustment. 4,173,306, Cl. 239-230.000.
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Robb, Donald, to Reilor Limited. Pet doors. 4,173,099, Cl. 49-168.000.
Roberts, Floyd E., to Merck & Co., Inc. Preparation of carbamates. 4,173,703, Cl. 544-16.000.
Roberts, Howard M.: *See—*
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Roberts, James R., to Eucatex S.A. Industria e Comercio. Medium density, high strength lignocellulose composition board including exhaustively hydrated cellulosic gel binder. 4,173,248, Cl. 162-141.000.
Robertson, James A., to FMC Corporation. Zeolite A crystals of uniformly small particle size and the manufacture thereof. 4,173,622, Cl. 423-329.000
Robertson, John E.: *See—*
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Rockwell International Corporation: *See—*
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Temes, Gabor C.; and Cheung, Derek T., 4,173,723, Cl. 307-304.000.
Rodgers, Gregory D.: *See—*
Aldridge, Clifton; Gibson, Sandra F.; Vannest, Richard D.; and Rodgers, Gregory D., 4,173,515, Cl. 435-38.000.
Rodier, Henry, to Rhone-Poulenc-Textile. Process for producing cellulosic shaped articles. 4,173,613, Cl. 264-187.000.
Rogers, Edward F.: *See—*
Graham, Donald W.; and Rogers, Edward F., 4,173,631, Cl. 424-180.000.
Rogers, John W. Metal web handling method, apparatus and coil construct. 4,173,313, Cl. 242-56.200.
Roggin, Sam. Protective vehicle partition. 4,173,369, Cl. 296-24.00R.
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Rogozinski, Wallace J.: *See—*
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Romano, Emanuele, to Wetrifin A.G. Machine for the continuous production of whipped cream. 4,173,126, Cl. 62-306.000.
Rosell, Lloyd J.: *See—*
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Rosof, Barry H., to Cabot Corporation. Process for recovering valuable metals from superalloy scrap. 4,173,467, Cl. 75-119.000
Ross, Tsuneyo. Inflatable apparatus and methods of constructing and utilizing same. 4,173,356, Cl. 280-743.000.
Rotenberg, Don H.; Cuffe, Patricia M.; Laurin, Bernard L.; and Ramirez, Peter R., to American Optical Corporation. Coating composition. 4,173,490, Cl. 106-287.140.
Rowatt, Robert J.: *See—*
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Royal Industries, Inc., a subsidiary of Lear Siegler, Inc.: *See—*
Wells, Willis, 4,173,261, Cl. 172-136.000.
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Rudmann, Arthur A., to United States of America, National Aeronautics and Space Administration. Coupling device for moving vehicles. 4,173,324, Cl. 244-161.000.
Rule, Robert B.; Wells, Martin A.; and Dance, John D., to Lever Brothers Company. Cationic surfactant compositions. 4,173,539, Cl. 252-88.000.
Rumsey, Royce D.: *See—*
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Rusch, William C. Christmas ornament and kit for making the same. 4,173,667, Cl. 428-11.000.
Ruter, Jorn: *See—*
Bax, Hanns-Jorg; Ruter, Jorn; and Feinauer, Roland, 4,173,658, Cl. 427-27.000.
Rydell, Adam Z.: *See—*
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Ryffel, James R.: *See—*
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Saito, Fumio; Yamai, Fumito; Beppu, Yositugu; and Nakayama, Shinpei, to Sekisui Kagaku Kogyo Kabushiki Kaisha; and Sekisui Kasehin Kogyo Kabushiki Kaisha. Process for preparing styrenic polymer foams. 4,173,688, Cl. 521-56.000.
Saito, Fumitaka: *See—*
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Sakaki, Yoshihiro; and Eishima, Kensuke, to Nissan Motor Co., Ltd. Seal for a rotary regenerative heat exchanger. 4,173,252, Cl. 165-9.000.
Sakamoto, Eiichi: *See—*
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Sallmann, Alfred; and Pfister, Rudolf, to Ciba-Geigy Corporation. Phenylacetohydroxamic acids. 4,173,577, Cl. 260-500.50H.
Sandberg, Glenn A., to Formax, Inc. Frost removal apparatus for cryogenic freezing tunnel. 4,173,127, Cl. 62-374.000.
Sandell, Lionel S.: *See—*
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Sandoz Ltd.: *See—*
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Sanko, John R., to Paris Manufacturing Company, Inc. Heat conditioning apparatus for shirt or blouse-like garment. 4,173,300, Cl. 223-70.000.

Sanyo Chemical Industries, Ltd.: *See—*
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Sanyo Machine Works, Ltd.: *See—*
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Sanzenbacher, Charles W.: *See—*
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Sargis, Sargis E. Light-weight structural system and modular concrete building components therefor. 4,173,103, Cl. 52-79.130.

Sato, Hideo: *See—*
Yamada, Kazuji; Sato, Hideo; Okayama, Tsutomu; Nishihara, Motohisa; Matsuoka, Yoshitaka; Katohgi, Katsuya; Matsuda, Yasumasa; and Shimada, Satoshi, 4,173,148, Cl. 73-766.000.

Sato Kogyo Kabushiki Kaisha: *See—*
Kubota, Seizo, 4,173,430, Cl. 417-53.000.

Sato, Teruyuki; and Kawakatsu, Kunio, to Sanyo Chemical Industries, Ltd. Hydraulic fluid comprising a borate ester and corrosion inhibiting amounts of an oxyalkylated alicyclic amine. 4,173,542, Cl. 252-78.100.

Satoh, Ken, to Olympus Optical Co., Ltd. Tape end alarm for tape recorder. 4,173,773, Cl. 360-67.000.

Satomi, Toyokazu: *See—*
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Sauli, Michel: *See—*
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Saunders, Roger A., to Rockwell International Corporation. Filtering configuration using feed-through capacitor. 4,173,745, Cl. 333-182.000.

Savage, Robert C., to Xerox Corporation. Dispenser having reciprocating paddles for discharging particles therefrom. 4,173,294, Cl. 222-1.000.

Savvides, Loucas. Sprinklers. 4,173,308, Cl. 239-383.000.

Sawmiller, Craig S.: *See—*
Sawmiller, Nile E.; and Sawmiller, Craig S., 4,173,154, Cl. 74-217.00B.

Sawmiller, Nile E.; and Sawmiller, Craig S. Bicycle drive sprocket system. 4,173,154, Cl. 74-217.00B.

Saylor, William H.; and Narey, James O. Changeable printed alphanumeric display module. 4,173,087, Cl. 40-518.000.

Schad, Robert D.: *See—*
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Schaefer, John W., to Nachman Corporation. Tubular border frame for inner spring assemblies. 4,173,047, Cl. 5-260.000.

Schaeffer, Robert L., to General Electric Company. Rotary cutter blade. 4,173,310, Cl. 241-282.100.

Schafer, Wilhelm. Apparatus for mounting and dismounting vehicle tires. 4,173,245, Cl. 157-1.240.

Schatteman, Etienne A. M., to Staar, S.A. Direct drive for fast forward and reverse in tape deck. 4,173,320, Cl. 242-206.000.

Schatz, Anton: *See—*
Massengeil, Hans A.; Stemme, Otto; Eppe, Rudolf; Pfeifer, Josef; Konigl, Georg; and Schatz, Anton, 4,173,411, Cl. 355-50.000.

Schatz, Klaus W.: *See—*
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Scheinecker, Alois, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Mould arrangement to be used in a continuous casting plant. 4,173,251, Cl. 164-436.000.

Scheirer, Winfried: *See—*
Katinger, Hermann; and Scheirer, Winfried, 4,173,516, Cl. 435-286.000.

Schell, Friedrich. Apparatus for the automatic loading of a continuously working machine. 4,173,426, Cl. 414-737.000.

Scherer, Kirby V., to California Institute of Technology. Novel fluorohydrocarbons. 4,173,654, Cl. 424-350.000.

Schering Corporation: *See—*
Gold, Elijah H.; and Solomon, Daniel M., 4,173,566, Cl. 260-239.00A.

Gold, Elijah H.; and Chang, Wei, 4,173,583, Cl. 260-559.00S.

Scheule, Harold J.; and Starn, Roy E., Jr., to Du Pont de Nemours, E. I., and Company. Polyolefin/acylated poly(alkyleneamine) two component fuel additive. 4,173,456, Cl. 44-62.000.

Schilder, Nell. Bulky yarn spindle for spinning wheels. 4,173,116, Cl. 57-316.000.

Schimmelpfennig, Ella Anneliese, nee Lehmann, sole heir: *See—*
Tauber, Manfred; Heuer, Dieter; Kroncke, Max; and Schimmelpfennig, Peter, deceased, 4,173,719, Cl. 250-310.000.

Schimmelpfennig, Peter, deceased: *See—*
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Schmid, Dieter: *See—*
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Schmidbaur, Hubert; and Katsch, Hans-Heinz, to Hoechst Aktiengesellschaft. Process for making tetramethyldiphosphinomethane. 4,173,590, Cl. 260-606.50P.

Schmidt, Ferenc J.; and Betz, Jacob F., to Ametek, Inc. Amorphous lead dioxide photovoltaic generator. 4,173,497, Cl. 136-89.0SJ.

Schmidt, Henry A.; Gable, Larry P.; and Hammel, Wallace W., Jr., to Tufteo Corp. Electrohydraulic needle bar positioning apparatus for tufting machines. 4,173,192, Cl. 112-79.00R.

Schmit, David E.; and Richmond, Jon C., to Cincinnati Electronics Corporation. Jet aircraft and/or missile plume simulator. 4,173,777, Cl. 362-253.000.

Schmitt, Frederick L.: *See—*
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Schmitz, Reinold; and Wunderlich, Klaus, to Bayer Aktiengesellschaft. Process for the preparation of copper phthalocyanine. 4,173,568, Cl. 260-314.500.

Schoer, Heinz: *See—*
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Schon, Franz: *See—*
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 4,173,077, Cl. 34-23.000.

Schrank, Jerome, to Allied Energy Corporation. Device for injecting air processed to increase its humidity into oil burning furnaces. 4,173,450, Cl. 431-190.000.

Schroeder, Stephen M.: *See—*
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Schroth, Wilhelm H. Method and apparatus for producing multiple groove V-belt pulleys. 4,173,136, Cl. 72-58.000.

Schultz, Edwin R. Anti-skid vehicle tire chains. 4,173,244, Cl. 152-218.000.

Schultze, Werner; and Schoer, Heinz, to Vereinigte Aluminium-Werke Aktiengesellschaft. Process and alloy for brazing aluminum-containing articles. 4,173,302, Cl. 228-219.000.

Schulz, Johann G. D.; and Onopchenko, Anatoli, to Gulf Research and Development Company. Process for preparing 3,4,3,4-benzophenone-tetracarboxylic dianhydride. 4,173,573, Cl. 260-346.400.

Schure, Alexander; and Glenn, William E., to New York Institute of Technology. Three dimensional display. 4,173,391, Cl. 350-96.250.

Schutz, Heinz-Dieter: *See—*
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Schutz, Udo. Pallet container. 4,173,288, Cl. 220-1.500.

Schwehr, Richard A.: *See—*
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Schweitzer Industrial Corporation: *See—*
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Science Spectrum, Inc.: *See—*
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Scott & Fetzer Company, The: *See—*
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Scriver, Robert E.: *See—*
Couleur, John F.; and Scriver, Robert E., 4,173,783, Cl. 364-200.000.

Seiler, Claus-Dieter; Vahlensieck, Hans-Joachim; and Kotzsch, Hans-Joachim, to Dynamit Nobel Aktiengesellschaft. Process for the esterification of chlorosilanes. 4,173,576, Cl. 260-448.80R.

Sekine, Mitsuo, to Citizen Watch Co., Ltd. Driving circuit for electrochromic display devices. 4,173,758, Cl. 340-785.000.

Sekine, Noriyuki: *See—*
Tabana, Minoru; Sekine, Noriyuki; Mitsuno, Tatsuyuki; and Kinoshita, Akira, 4,173,561, Cl. 260-45.75B.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
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Saito, Fumio; Yamai, Fumito; Beppu, Yositugu; and Nakayama, Shinpei, 4,173,688, Cl. 521-56.000.

Sekisui Kasehin Kogyo Kabushiki Kaisha: *See—*
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Sera, Hidefumi; Ishii, Tsumoru; Yamaguchi, June; and Shiraishi, Hisashi, to Fuji Photo Film Co., Ltd. Method of hardening gelatin and photographic light-sensitive material. 4,173,481, Cl. 430-621.000.

Shaughnessy, Ernest P. Pneumatically braked blade assembly for a clipper machine. 4,173,162, Cl. 83-617.000.

Shell, John W., to Alza Corporation. Device for administering solid drug particles to an eye. 4,173,226, Cl. 128-233.000.

Shell Oil Company: *See—*
Koenders, Peter; Van der Zeeuw, Abraham J.; and Kok, Riekert, 4,173,616, Cl. 423-24.000.

Peterson, Larry W.; Bozarth, Gene A.; and Pilgram, Kurt H. G., 4,173,463, Cl. 71-87.000.

Shelton, Jack: *See—*
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Shepard, Kenneth L.; and Paleveda, William J., Jr., to Merck & Co., Inc. Tricyclicdicarboximides. 4,173,646, Cl. 424-270.000.

Sheppard, Joseph S.: *See—*
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Shiah, Chyn-Duog, to CDC Research Inc. Topical hair coloring formulation in the form of suspension, lotion and cream. 4,173,453, Cl. 8-10.100.

Shiba, Keisuke; Kubotera, Kikuo; and Kashiwabara, Akira, to Fuji Photo Film Co., Ltd. Photographic material with developer in AzX emulsion and sublayer. 4,173,477, Cl. 430-264.000.

Shibata, Isamu: *See—*
Horike, Masanori; Shibata, Isamu; and Maeda, Ikuo, 4,173,402, Cl. 354-25.000.

Shibata, Toshihiro: *See—*
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Shida, Mitsuzo: *See—*
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Shimizu, Kazushige; and Maeda, Takuma, to Ube Industries, Ltd. Process for forming a billet for extrusion. 4,173,061, Cl. 29-403.200.

Shimizu, Masami, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Extraction method of tritium. 4,173,620, Cl. 423-249.000.

Shimizu, Toshihide: *See—*
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Shipman, James J.; Hallman, Robert W.; Tenney, Linwood P.; and Beall, Leman G., Jr., to B. F. Goodrich Company, The. Method of making a radial tire. 4,173,503, Cl. 156-123.00R.

Shiraishi, Hisashi: *See—*
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Shirozume, Morimasa: *See—*
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Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,173,711, Cl. 568-665.000.

Sidenstick, Harry L.; and Hoffman, Henry R., to Kett Tool Co. Power shear head. 4,173,069, Cl. 30-228.000.

Siegenia-Frank KG: *See—*
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Sieghartner, Leonard J., to Roy E. Roth Company. Floating seals. 4,173,350, Cl. 277-40.000.

Siemens Aktiengesellschaft: *See—*
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Kniepkamp, Hermann; and Kellner, Walter, 4,173,063, Cl. 29-571.000.

Turini, Gerhard; and Matthies, Alfred, 4,173,301, Cl. 226-102.000.

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Simons, Michael J.: *See—*
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Simpson, John G., to United States of America, National Aeronautics and Space Administration. Solar concentrator. 4,173,397, Cl. 350-295.000.

Singer Company, The: *See—*
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Millard, Maurice; Peters, David L.; Trzeciak, John R.; and Woycechowsky, Brian J., 4,173,081, Cl. 35-12.00N.

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Skerlos, Peter C.; and Smirl, Richard A., to Zenith Radio Corporation. Limited position, non-volatile memory tuning system. 4,173,737, Cl. 325-418.000.

Skinner, Robert T. J., to Lucas Industries Limited. Pressure regulator for a fluid pump. 4,173,434, Cl. 417-294.000.

Skrentner, Frank C., to F. Jos. Lamb Company. Transfer mechanism and method. 4,173,159, Cl. 82-1.00C.

Slothour, Donald L.: *See—*
Kauffman, Roger S.; and Slothour, Donald L., 4,173,386, Cl. 339-177.00R.

Small, Edward A., Jr.: *See—*
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Smirl, Richard A.: *See—*
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Smith, Clay D., and Keller, Douglas V., Jr., to Otisca Industries, Ltd. Methods of and apparatus for cleaning coal. 4,173,530, Cl. 209-9.000.

Smith, Curtis P.; and Ulrich, Henri, to Upjohn Company, The. Process for preparing spirocyclic phosphorus compounds. 4,173,602, Cl. 260-971.000.

Smith, Elmer L. Planter. 4,173,098, Cl. 47-80.000.

Smith, George H.; and Olofson, Peter M., to Minnesota Mining and Manufacturing Company. Complex salt photoinitiator. 4,173,476, Cl. 430-280.000.

Smith, James D. B.; and Kauffman, Robert N., to Westinghouse Electric Corp. Metal acetylacetonate latent accelerators for an epoxy-styrene resin system. 4,173,593, Cl. 525-109.000.

Smith Kline & French Laboratories Limited: *See—*
Brown, Thomas H.; Durant, Graham J.; Ganellin, Charon R.; and Ife, Robert J., 4,173,644, Cl. 424-270.000.

Smith, Roland L., to Nu-Watt, Inc. Road vehicle-actuated air compressor and system therefor. 4,173,431, Cl. 417-229.000.

Smith, Thomas J., to Alloys, Incorporated. Hardfacing composition of nickel-bonded sintered chromium carbide particles and tools hardfaced thereof. 4,173,457, Cl. 51-309.000.

Snavely, Carol J.; Lewin, Ian; and Small, Edward A., Jr., to Optical Coating Laboratory, Inc. Lighting fixtures and glass enclosure having high angle anti-reflection coating. 4,173,778, Cl. 362-297.000.

Snellman, Donald L.; and Hudson, Willard G., to Norfin, Inc. Thermally stable helically plied cable. 4,173,113, Cl. 57-249.000.

Snyder, David E., to U.S. Industries, Inc. Pilot valve. 4,173,233, Cl. 137-102.000.

Snyder, James J., to United States of America, Commerce. Apparatus and method for determination of wavelength. 4,173,442, Cl. 356-346.000.

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Societe Abex Pagid Equipement S.A.: *See—*
Durrieu, Jean-Pierre; and Pomes, Guy, 4,173,681, Cl. 428-409.000.

Societe Anonyme dite: Omnium Francais Industriel et Commercial (O.F.I.C.): *See—*
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Societe de Fabrication d'Instruments de Mesure (S.F.I.M.): *See—*
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Societe Metallurgique le Nickel-S.L.N.: *See—*
Demarthe, Jean-Michel; Gandon, Louis; and Goujet, Monique, 4,173,520, Cl. 204-113.000.

Societe Nationale Elf Aquitaine (Production): *See—*
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Solar Energy Research Corp.: *See—*
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Solomon, Daniel M.: *See—*
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Solvay & Cie: *See—*
Boulet, Jean-Claude; Walraevens, Rene; Bonnety, Gerard; Lolivier, Jacques; and Trouillet, Paul, 4,173,710, Cl. 568-614.000.

Sony Corporation: *See—*
Chatani, Ikuo, 4,173,267, Cl. 181-199.000.

Yoshida, Tadao, 4,173,739, Cl. 330-298.000.

Sornberger, G. Russell, to Moore Business Forms, Inc. Interlocked continuous webs. 4,173,359, Cl. 282-11.50A.

Soulier, Joel, to Isobox-Barbier. Process and apparatus for the manufacture of expanded plastics materials. 4,173,608, Cl. 264-26.000.

Span Instruments, Inc.: *See—*
Gray, Tommy L., 4,173,150, Cl. 73-714.000.

Sperry Rand Corporation: *See—*
Thompson, Vernal W.; and Anderson, Wilbert C., 4,173,762, Cl. 343-759.000.

Staar, S.A.: *See—*
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Staby, George L. Container with raised indentations for aeration and drainage. 4,173,097, Cl. 47-66.000

Staendeke, Horst, to Hoechst Aktiengesellschaft. Production of alkenyl phosphinic acids. 4,173,578, Cl. 260-502.40R.

Staffler, Reinhard: *See—*
Pulker, Hans K.; and Staffler, Reinhard, 4,173,522, Cl. 204-192.00C.

Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Open-end spinning machine with a plurality of spinning assemblies and at least one mobile servicing device. 4,173,114, Cl. 57-263.000.

Stahlecker, Hans: *See—*
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Stamicarbon, B.V.: *See—*
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Standard Oil Company (Indiana): *See—*
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Stanko, John J. Reusable resilient packaging. 4,173,286, Cl. 206-433.000.
Stanley, Donald E., to CBS, Inc. Organ stop switching system. 4,173,167, Cl. 84-345.000.
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Stansbury, Benjamin H., Jr.; and Fluster, Barry, to AVSP, Inc. Spare lamp holder. 4,173,282, Cl. 206-216.000.
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Staub, Donald F.: *See—*
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Stauffer, Harry C.: *See—*
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Stearns, Stanley D. Adaptor assembly for fittings and connective lines of differing sizes. 4,173,363, Cl. 285-177.000.
Steele, Richard W. Towing hitch alignment director. 4,173,353, Cl. 280-477.000.
Steinacker, Karl-Heinz; and Adolphen, Gerhard, to Bayer Aktiengesellschaft. Process for the preparation of alkylthiosemicarbazides. 4,173,581, Cl. 260-552.0SC.
Steiner, Charles D.; and Sucheski, Matthew M., to AMP Incorporated. Applicator apparatus for use with rotary connector. 4,173,067, Cl. 29-749.000.
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Steverding, Bernard, to United States of America, Army. Multipurpose protection system. 4,173,187, Cl. 102-105.000.
Stewart, Donald E., to Xerox Corporation. Demand publishing royalty accounting system for an electrostatic copier. 4,173,408, Cl. 355-14.00R.
Stewart, John V., to Swiss Aluminium Ltd. Engraver's template. 4,173,075, Cl. 33-23.00K.
Stewart, Robert C., Jr., to United Technologies Corporation. Process for forming a fuel cell matrix. 4,173,662, Cl. 427-115.000.
Steyr-Daimler-Puch Aktiengesellschaft: *See—*
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Stieger, Frank M., to Polaroid Corporation. Methods for manufacturing photographic film processing rollers. 4,173,058, Cl. 29-148.40D.
Stiles, Arthur G. Air cleaner. 4,173,458, Cl. 55-405.000.
Still GmbH: *See—*
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Stilley, Herschel H.: *See—*
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Stingl, Hans A., to Toms River Chemical Corporation. Rubine disazo acid dyes for polyamides. 4,173,565, Cl. 260-191.000.
Stith, Morris R., Jr. Jack for positioning and supporting a machine. 4,173,329, Cl. 254-93.00R.
Stock, Herman E. Golf club wood holder. 4,173,241, Cl. 150-1.50R.
Stokes, James R.: *See—*
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Stolfo, John J., to Mead Corporation, The. Production of novel metal modified novolak resins and their use in pressure sensitive papers. 4,173,684, Cl. 428-531.000.
Stone, Robert P.; and Morrell, Albert M., to RCA Corporation. Cathode-ray tube having a stepped shadow mask. 4,173,729, Cl. 313-403.000.
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Stoy, Vladimir; Stoy, Artur; Zima, Jiri; and Kalal, Jaroslav, to Ceskoslovenska akademie ved. Method of manufacturing shaped articles from crystalline acrylonitrile polymers and copolymers. 4,173,606, Cl. 264-1.000.
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Strecker, Lawrence A.; and Wells, Vernon W., Jr., to Inmont Corporation. Insulating sealant compositions. 4,173,557, Cl. 260-31.8DR.
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Stubblefield, Thomas W.; and Benke, Frank W., to Electric Power Research Institute, Inc. Vaporization cooled electrical apparatus. 4,173,746, Cl. 336-57.000.
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Sugalski, Raymond K.; and Blake, Charles R., to General Electric Company. Battery charger with liquid crystal charge current indicator. 4,173,733, Cl. 320-48.000.
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Sugimoto, Isao, to Yoshida Kogyo Kabushiki Kaisha; and Nippon Dyeing Machine Mfg. Co., Ltd. Dyeing apparatus. 4,173,132, Cl. 68-189.000.
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Sumitomo Aluminum Smelting Company, Limited: *See—*
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Yamazaki, Noboru; and Higashi, Fukuji, 4,173,563, Cl. 260-112.50R.
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Sundeen, Joseph E.; Dejneka, Tamara; and Hauck, Frederic P., to E. R. Squibb & Sons, Inc. 5-Phenyl-2,4-pentadien-1-amines and method for inhibiting prostaglandin dehydrogenase. 4,173,649, Cl. 424-304.000.
Sundt, Erling; and Aschiero, Roland, to Firmenich SA. Perfumed articles containing 3-phenyl-cyclopent-2-en-1-one. 4,173,550, Cl. 252-522.000.
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Svensson, Eric. Device for transfer of air in one or the other direction between two places. 4,173,176, Cl. 98-115.0VM.
Swapceinski, John P.; Hilbert, Thomas K.; and McGlen, James A., to Eastman Kodak Company. Developer distribution apparatus. 4,173,405, Cl. 355-3.0DD.
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Tadanier, John S.; Martin, Jerry R.; and Kurath, Paul, to Abbott Laboratories. 4-N-acylfortimicin B derivatives and the chemical conversion of fortimicin B to fortimicin A. 4,173,564, Cl. 260-112.50R.
Taddicken, Hermann, to Eisele Apparate- und Geratebau GmbH. Sewing unit with sectionwise shiftable clamping device. 4,173,191, Cl. 112-65.000.
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Takagi, Shunichi; and Fukuoka, Masaru, to NGK Spark Plug Co., Ltd. Resistor composition for spark plug having a resistor enclosed therein. 4,173,731, Cl. 315-58.000.
Takahashi, Hirokazu, to Tokyo Shibaura Electric Co., Ltd. Microwave heating apparatus. 4,173,716, Cl. 219-10.55F.
Takahashi, Kazutoshi; Nitta, Tatsuo; and Iwakura, Ryoji, to Citizen Watch Co., Ltd. Electronic timepiece. 4,173,117, Cl. 58-85.500.
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Takayama, Teruo; Yamada, Kinsaku; and Niida, Chiaki, to Hitachi, Ltd. Control valve of exhaust recirculation apparatus. 4,173,204, Cl. 123-119.00A.
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Tamura, Kenichi; Iwatsuki, Masahiro; and Matsunami, Muneharu, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Webbing retractor in safety seatbelt system. 4,173,318, Cl. 242-107.40A.
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Tanaka, Takashi; and Nishide, Katsuhiko, to Canon Kabushiki Kaisha. Hologram and method of production using two solvent treatments. 4,173,474, Cl. 430-1.000.
Tanaka, Toru: *See—*
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Tanner, Randall C.: *See—*
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Tarkan, Stuart E.: *See—*
Mal, M. Kumar; and Tarkan, Stuart E., 4,173,471, Cl. 75-237.000.
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Kubovits, Imre; Meszaros, Imre; Kaszatnitzky, Ferenc; Szabo, Mrs. Laszlo; and Ottlik, Peter, 4,173,484, Cl. 106-39.600.
Tauber, Manfred; Heuer, Dieter; Kroncke, Max; and Schimmelpfennig, Peter, deceased (by Schimmelpfennig, Ella Anneliese, nee Lehmann, sole heir), to Licentia Patent-Verwaltungs-G.m.b.H. Apparatus for irradiating flowing materials. 4,173,719, Cl. 250-310.000.
Taylor, Kenneth C.: *See—*
McLaughlin, John R.; Bryant, Michael D.; Fessel, Manfred; and Taylor, Kenneth C., 4,173,466, Cl. 75-58.000.
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Teleflex Incorporated: *See—*
Miller, Donald M.; and Webb, Grant A., 4,173,157, Cl. 74-501.00R.
Telsco Industries, Inc.: *See—*
Ridgway, H. Curtis, 4,173,306, Cl. 239-230.000.
Temes, Gabor C.; and Cheung, Derek T., to Rockwell International Corporation. Photo detector input circuit. 4,173,723, Cl. 307-304.000.
Tennant Company: *See—*
Geyer, Robert A., 4,173,056, Cl. 15-320.000.
Tenney, Linwood P.: *See—*
Shipman, James J.; Hallman, Robert W.; Tenney, Linwood P.; and Beall, Leman G., Jr., 4,173,503, Cl. 156-123.00R.
Texaco Inc.: *See—*
Crawford, Wheeler C.; and wilson, James R., 4,173,489, Cl. 106-281.00N
McCall, Richard H., 4,173,536, Cl. 210-242.00S.
Paull, Peter L.; and McGann, Rodney, 4,173,254, Cl. 165-134.00R.
Texas Instruments Incorporated: *See—*
Chiang, Shang-Yi; and Carbajal, Bernard G., 4,173,496, Cl. 136-89.0MS.
Farnow, Stephen A., 4,173,064, Cl. 29-578.000.
Textilipari Kutato Intezet: *See—*
Katona, Tibor; Kenderesy, Tamas; Nemes, Imre; Erdelyi, Agoston; and Ragalyi, Jozsef, 4,173,787, Cl. 364-550.000.
Textron Inc.: *See—*
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Tezuka, Tohru: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,173,630, Cl. 424-177.000.
Thiokol Corporation: *See—*
Wade, Robert C., 4,173,521, Cl. 204-157.10R.
Thomas, David F.; and Platt, Earl A., to Waterous Company. Transfer valve. 4,173,234, Cl. 137-625.470.
Thomas International Corporation: *See—*
Koepke, Donald B., 4,173,166, Cl. 84-343.000.
Thompson, Daniel G.: *See—*
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Thompson, Vernal W.; and Anderson, Wilbert C., to Sperry Rand Corporation. Reference signal generating apparatus. 4,173,762, Cl. 343-759.000.
Thomson-CSF: *See—*
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Hareng, Michel; Hehlen, Robert; and Le Berre, Serge, 4,173,757, Cl. 340-765.000.
Thorby, Douglas C.; and Johnson, John, to Hawker Siddeley Aviation Limited. Aircraft launching techniques. 4,173,323, Cl. 244-114.00R.
Thornberg, John H., to Bethany Fellowship, Inc. Printer's paper pile inverter. 4,173,428, Cl. 414-766.000.
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Tigner, Calvin L.: *See—*
Olsen, Wayne A.; and Tigner, Calvin L., 4,173,200, Cl. 119-23.000.
Tipper, Maynard J. G. Method and apparatus for forming wire to noncircular cross sections. 4,173,235, Cl. 140-82.000.
Tobey, Frederic S., to W. H. Brady Co. Separating laminated layers. 4,173,507, Cl. 156-443.000.
Tobey, Frederic S., to W. H. Brady Co. Apparatus for separating laminated layers. 4,173,510, Cl. 156-584.000.
Toelle, Alvin D., to Bendix Corporation, The. Closed loop exhaust gas recirculation system. 4,173,205, Cl. 123-119.00A.
Togami, Paul G.; Drayer, T. Gary; and Francis, James M., to International Harvester Company. Variable diameter torque sensing drive. 4,173,155, Cl. 74-230.17M.
Toki, Tadaaki: *See—*
Nishiyama, Ryuzo; Fujikawa, Kanichi; Nasu, Rikuo; Toki, Tadaaki; Yamamoto, Toshihiko, deceased; and Yamamoto, Hikotaro, legal representative, 4,173,637, Cl. 424-263.000.
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Tokiwa Chemical Industries Limited: *See—*
Nakai, Tadanobu, 4,173,092, Cl. 43-61.000.
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Tokyo Shibaura Electric Co., Ltd.: *See—*
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Kawagai, Kenji; Yoshida, Shigeki; Ogawa, Hisaharu; and Ohashi, Toshiro, 4,173,756, Cl. 340-636.000.
Miura, Haruhisa, 4,173,789, Cl. 364-760.000.
Suzuki, Shuichi; Wada, Moriyasu; Kajiura, Sadao; and Ito, Takeo, 4,173,592, Cl. 525-134.000.
Takahashi, Hirokazu, 4,173,716, Cl. 219-10.55F.
Tokyo Shibaura Kenki Kabushiki Kaisha: *See—*
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Tomioka, Susumu; and Kunimune, Kohichi, to Chisso Corporation. Method for producing tobacco filters. 4,173,504, Cl. 156-180.000.
Tomlinson, Walter J., III: *See—*
Chandross, Edwin A.; and Tomlinson, Walter J., III, 4,173,475, Cl. 430-290.000.
Toms River Chemical Corporation: *See—*
Stingl, Hans A., 4,173,565, Cl. 260-191.000.
Tomy Corporation: *See—*
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Toporcer, Louis H.: *See—*
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Torii, Sigeru; Tanaka, Hideo; and Kobayashi, Yuichi, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Cyclopentanol derivatives. 4,173,707, Cl. 560-122.000.
Towmotor Corporation: *See—*
Erker, James W.; and Schwehr, Richard A., 4,173,264, Cl. 180-68.500.
Toyo Kagaku Kabushiki Kaisha: *See—*
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Treadwell, Kenneth, to M&T Chemicals Inc. Catalyst composition for flexible polyurethane foams. 4,173,691, Cl. 521-124.000.
Trought, John H., to Intermedics Intraocular, Inc. Intraocular lens packaging system. 4,173,281, Cl. 206-5.100.
Trouillet, Paul: *See—*
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Turini, Gerhard; and Matthies, Alfred, to Siemens Aktiengesellschaft. Pneumatic brake. 4,173,301, Cl. 226-102.000.
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Shimizu, Kazushige; and Maeda, Takuma, 4,173,061, Cl. 29-403.200.
Ueda, Hiroshi; Oyokota, Shigeru; and Kajita, Hideo, to Minolta Camera Kabushiki Kaisha. Single lens reflex camera with automatic diaphragm control mechanism. 4,173,403, Cl. 354-152.000.
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Uerdingen, Walter: *See—*
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Ulrich, Lawrence W.; and Walker, Connie W., to Durable Packaging Corporation. Apparatus for sealing containers. 4,173,105, Cl. 53-374.000.
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Umeda, Hiroyuki, to Victor Company of Japan, Limited. Magnetic tape cassette. 4,173,319, Cl. 242-199.000.
Underwood, Ronald G.; and Hauser, James C. Flotation liner waterbed structure. 4,173,049, Cl. 5-451.000.
Union Carbide Corporation: *See—*
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Matsch, Ladislas C.; and Drnevich, Raymond F., 4,173,531, Cl. 210-5.000.
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Fodor, George E.; Weatherford, William D., Jr.; and Wright, Bernard R., 4,173,455, Cl. 44-51.000.
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National Aeronautics and Space Administration: *See—*
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Simpson, John G., 4,173,397, Cl. 350-295.000.
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Licata, William H., 4,173,785, Cl. 364-453.000.
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Unsworth, William; King, John F.; and Bradshaw, Stephen L., to Magnesium Elektron Limited. Magnesium alloys. 4,173,469, Cl. 75-168.00F.
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Upjohn Company, The: *See—*
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Vachon, Raymond N.; and McConnell, Richard L., to Eastman Kodak Company. Hot melt sizing compositions and fibrous articles sized therewith. 4,173,680, Cl. 428-375.000.
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Vallon, Roger; Herdenberger, Andre; and Delhomelle, Marc, to Societe Anonyme dite: Omnium Francais Industriel et Commercial (O.F.I.C.). Method for coloring or dying fibrous sheets impregnated with bituminous material. 4,173,675, Cl. 428-291.000.
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van der Lely, Ary; and Bom, Cornelis J. G., to Cornelis van der Lely N.V. Soil cultivating implements. 4,173,260, Cl. 172-59.000.
van der Lely, Cornelis. Combination articulated tractor and tow car. 4,173,352, Cl. 280-415.00A.
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van Straaten, Jan, to U.S. Philips Corporation. Circuit arrangement a portion of which is included within in a monolithic integrated semiconductor body 4,173,769, Cl. 358-20.000.
Van Wingerden, Aart. Greenhouse gutter assembly. 4,173,101, Cl. 52-13.000.
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Varian Associates, Inc.: *See—*
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Vassiliades, Anthony E.; Shroff, Shrenik; and Nauman, Edward F., to Champion International Corporation. Oil-in-water emulsions containing hydropholeic starch. 4,173,488, Cl. 106-213.000.
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Vignon, Louis, to Heberlein Hispano SA. Apparatus for receiving and gathering a fibre band from a card or stretcher. 4,173,057, Cl. 19-159.00R.
Vine, James, to Westinghouse Electric Corp. Electron image device. 4,173,727, Cl. 313-99.000.
Vines, Dorwin J. Vertical wave air compression device. 4,173,432, Cl. 417-231.000.
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Voegelin, Heinrich, to Fritz Buser Ag. Maschinenfabrik. Screen printing apparatus. 4,173,185, Cl. 101-120.000.
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Von Knorring, Knut A., to AB Transporteknik. Parking control system. 4,173,272, Cl. 194-9.00T.
von Musil, Rudolf, to Siemens Aktiengesellschaft. Two part laminated stator for an electric machine with an air-gap winding. 4,173,724, Cl. 310-258.000.
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Vork, William D., to Graco Inc. Apparatus for mixing liquids. 4,173,418, Cl. 366-128.000.
Vornberger, Walter, to International Shoe Machine Corporation. Pincers assembly and its mounting. 4,173,050, Cl. 12-14.500.
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Watanabe, Yasuaki; and Okabe, Yukio, to Victor Company of Japan, Limited. Manual tint control circuit in the color APFC loop mixes two subcarrier oscillator signals. 4,173,770, Cl. 358-28.000.
Waterous Company: *See—*
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Weatherly, Merle H., to Union Carbide Corporation. Coating material and method of applying same for producing wear and corrosion resistant coated articles. 4,173,685, Cl. 428-556.000.
Webb, Grant A.: *See—*
Miller, Donald M.; and Webb, Grant A., 4,173,157, Cl. 74-501.00R.
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Wells, Vernon W., Jr.: *See—*
Strecker, Lawrence A.; and Wells, Vernon W., Jr., 4,173,557, Cl. 260-31.8DR.
Wells, Willis, to Royal Industries, Inc., a subsidiary of Lear Siegler, Inc. Agricultural furrowing assembly. 4,173,261, Cl. 172-136.000.
Welsh, Jay Y.; and Sochol, Irving, to Chemetals Corporation. Preparation of manganous chloride solution. 4,173,617, Cl. 423-34.000.
Western Electric Company, Incorporated: *See—*
Adams, Charles K., 4,173,736, Cl. 324-51.000.
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Abbondanti, Alberto; and Kernick, Andress, 4,173,779, Cl. 363-27.000.
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Grimes, Jerry W.; Schroeder, Stephen M.; and Waters, James M., 4,173,747, Cl. 336-60.000.
Halstead, Kenneth G., 4,173,375, Cl. 308-134.100.
Hoffman, Joseph H.; and Thompson, Daniel G., 4,173,429, Cl. 416-184.000.
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Massaro, Anthony A., Jr.; and Andrews, Harry N., 4,173,060, Cl. 29-157.400.
Meier, Joseph F.; Rudd, George E.; Pradhan, Ashok V.; George, John A.; Lippincott, Hugh W.; and Sutherland, John D., 4,173,512, Cl. 176-37.000.
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Smith, James D. B.; and Kauffman, Robert N., 4,173,593, Cl. 525-109.000.
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Young, Robert G.; and Morton, Edward W., 4,173,730, Cl. 315-53.000.
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White, James M., to International Business Machines Corporation. Solid state image scanning system for producing a binary output. 4,173,772, Cl. 358-213.000.
Whitehead, James S.; and Lawson, Thomas M., to Carrier Corporation. Automatic packing system for refuse vehicle. 4,173,424, Cl. 414-517.000.
Wiegand, James B., to Solar Energy Research Corp. Solar radiation collector and water cooler. 4,173,253, Cl. 165-48.00S.
Wieland, Dieter. Process for introducing a gas, in particular carbon dioxide, into a liquid, particularly a beverage, flowing through a line, and a device for performing the process. 4,173,178, Cl. 99-323.100.
Wiggins Teape Limited: *See—*
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Wilde, Ralph; and Allbert, Barrie J., to Dunlop Limited. Safety tire and wheel rim assembly. 4,173,243, Cl. 152-158.000.
Wilkinson, David B., to United States of America, Air Force. Intermittent burning jet engine. 4,173,122, Cl. 60-247.000.
Willcox, Kenneth W.; and Bailey, Fay W., to Phillips Petroleum Company. Impact styrene polymer blends with thermoplastic elastomers. 4,173,597, Cl. 525-98.000.
Williams, Robert E., to Exxon Production Research Company. Method for removing suspended oil droplets from water. 4,173,533, Cl. 210-73.00W.
Williams, William R., to United States of America, Energy. Solid handling valve. 4,173,327, Cl. 251-31.000.
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Wilson, Richard C. Accessory clip and page separator for notepads and the like. 4,173,358, Cl. 281-45.000.
Wilson, Wilfred W., to Gemel Ltd. Collating and packaging machine. 4,173,107, Cl. 53-534.000.
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Wise, Dennis. Variable design torch guide. 4,173,333, Cl. 266-66.000.
Witting, Harald L., to General Electric Company. Pulsed cesium discharge light source. 4,173,728, Cl. 313-163.000.
Woditsch, Peter; Winter, Gerhard; Linde, Gunter; and Muller, Friedhelm, to Bayer Aktiengesellschaft. Production of zinc and alkaline earth metal titanates. 4,173,485, Cl. 106-73.300.
Woitun, Eberhard: *See—*
Maier, Roland; Woitun, Eberhard; Reuter, Wolfgang; Wetzel, Bernd; Goeth, Hanns; and Lechner, Uwe, 4,173,647, Cl. 424-283.000.
Wolf, William E., to Du Pont de Nemours, E. I., and Company. Web inspection system and method therefor. 4,173,441, Cl. 356-431.000.
Woodcock, Sydney H.: *See—*
Yates, Patrick; Woodcock, Sydney H.; and Beals, Jeffrey R., 4,173,169, Cl. 89-132.000.
Woodward, Antony I., to Wiggins Teape Limited. Photographic sheet with synthetic hectorite antistatic additive as sizing or backcoat. 4,173,480, Cl. 430-536.000.
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Wright, Bernard R.: *See—*
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Wright, Stephen: *See—*
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Wu, Ching-Yong; Pretzer, Wayne R.; and Kobylinski, Thaddeus P., to Gulf Research and Development Company. Decomposition of cumene hydroperoxide with a heterogeneous catalyst. 4,173,587, Cl. 260-593.00A.
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Schmitz, Reinold; and Wunderlich, Klaus, 4,173,568, Cl. 260-314.500.
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Enders, Edgar; Ebbighausen, Volker; Gau, Wolfgang; Wunsche, Christian; and Stendel, Wilhelm, 4,173,645, Cl. 424-273.00R.
WWG Industries, Inc.: *See—*
Chambley, Phillip W.; and Norris, Alan H., 4,173,115, Cl. 57-293.000.
Wyatt, Philip J., to Science Spectrum, Inc. Apparatus and process for rapidly characterizing and differentiating large organic cells. 4,173,415, Cl. 356-336.000.
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Savage, Robert C., 4,173,294, Cl. 222-1.000.
Stewart, Donald E., 4,173,408, Cl. 355-14.00R.
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Yamada, Kazuji; Sato, Hideo; Okayama, Tsutomu; Nishihara, Motohisa; Matsuoka, Yoshitaka; Katohgi, Katsuya; Matsuda, Yasumasa; and Shimada, Satoshi, to Hitachi, Ltd. Semiconductor strain gauge with temperature compensator. 4,173,148, Cl. 73-766.000.
Yamada, Kinsaku: *See—*
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Yamada, Koichi; Hashimoto, Tadanori; and Horinouchi, Kazuo, to Sumitomo Aluminum Smelting Company, Limited. Electrodes for aluminum reduction cells. 4,173,518, Cl. 204-67.000.
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Yamamoto, Toshihiko: *See—*
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Yamamoto, Toshihiko, deceased: *See—*
Nishiyama, Ryuzo; Fujikawa, Kanichi; Nasu, Rikuo; Toki, Tadaaki; Yamamoto, Toshihiko, deceased; and Yamamoto, Hikotaro, legal representative, 4,173,637, Cl. 424-263.000.
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Yamazaki, Noboru; and Higashi, Fukuji, to Sumitomo Chemical Company, Limited. Phosphonium salt and its use. 4,173,563, Cl. 260-112.50R.
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Yates, Patrick; Woodcock, Sydney H.; and Beals, Jeffrey R. Semi-automatic firearm. 4,173,169, Cl. 89-132.000.
Yevick, George J., to Izon Corporation. Compact optical viewer for microfiche or cassette. 4,173,399, Cl. 353-78.000.
Yokota, Minoru, to Konishiroku Photo Industry Co., Ltd. Copying lens. 4,173,396, Cl. 350-216.000.
Yoshida Kogyo Kabushiki Kaisha: *See—*
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Kawagai, Kenji; Yoshida, Shigeki; Ogawa, Hisaharu; and Ohashi, Toshiro, 4,173,756, Cl. 340-636.000.
Yoshida, Tadao, to Sony Corporation. Overload detecting circuit for a PWM amplifier. 4,173,739, Cl. 330-298.000.
Yoshida, Takao; Mookherjee, Braja D.; Kamath, Venkatesh; Hall, John B.; Taylor, William J.; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. 2,2,3-Trimethyl-3-cyclopenten-1-ylalkenyl- and alkylidene-cycloalkanones. 4,173,585, Cl. 260-586.00R.
Young, Robert G.; and Morton, Edward W., to Westinghouse Electric Corp. Compact fluorescent lamp unit having integral circuit means for DC operation. 4,173,730, Cl. 315-53.000.
Yu, Mason K., to American Standard, Inc. Hybrid dual shaft gas turbine with accumulator. 4,173,121, Cl. 60-39.16R.
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Zathy, Steve. Miles to kilometers speed and distance indicators converter. 4,173,147, Cl. 73-532.000.
Zell, Dale R., to AMP Incorporated. Snap-on pin header. 4,173,387, Cl. 339-196.00M.
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Zima, Jiri: *See—*
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Zimmerman, Edwin H. Unscrambling apparatus for bar material, including lumber. 4,173,277, Cl. 198-443.000.

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 6TH DAY OF NOVEMBER, 1979

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Andrew, William E., to Imperial Chemical Industries Limited. Vinyl chloride polymerization process. T988,009, 11-6-79, Cl. 526-345.000.
Cunningham, Theresa L.; and Hunt, Clifford E., to Mobil Oil Corporation. Process for preparing C_1–C_5 alkyl 5-(substituted-phenoxy)-2-nitrobenzoate. T988,010, 11-6-79, Cl. 560-21.000.
Dreissen, Hubert H. Process for recovering lead from discarded batteries. T988,003, 11-6-79, Cl. 209-211.000.
Drew, Roland F.; Schmidt, Frank J., Jr.; and Vanduynhoven, Thomas J., to International Business Machines Corporation. Laser deposition of metal upon transparent materials. T988,007, 11-6-79, Cl. 427-53.100.
Falanga, Anthony J.: *See—*
Patterson, N. Donald; Falanga, Anthony J.; Johnston, Edward J.; and Scarnato, Thomas J., T988,005, Cl. 406-30.000.
Gebauer, Gerhard: *See—*
Mayer, Franz; and Gebauer, Gerhard, T988,008, Cl. 525-537.000.
Hunt, Clifford E.: *See—*
Cunningham, Theresa L.; and Hunt, Clifford E., T988,010, Cl. 560-21.000.
Imperial Chemical Industries Limited: *See—*
Andrew, William E., T988,009, Cl. 526-345.000.
International Business Machines Corporation: *See—*
Drew, Roland F.; Schmidt, Frank J., Jr.; and Vanduynhoven, Thomas J., T988,007, Cl. 427-53.100.
International Harvester Company: *See—*
Patterson, N. Donald; Falanga, Anthony J.; Johnston, Edward J.; and Scarnato, Thomas J., T988,005, Cl. 406-30.000.
Johnston, Edward J.: *See—*
Patterson, N. Donald; Falanga, Anthony J.; Johnston, Edward J.; and Scarnato, Thomas J., T988,005, Cl. 406-30.000.
Mayer, Franz; and Gebauer, Gerhard. Coating agents comprising fluoroterpolymers and polyarylene sulfide resins. T988,008, 11-6-79, Cl. 525-537.000.
McClellan, Guerry H.: *See—*
Phillips, John F., Jr.; McClellan, Guerry H.; and McCullough, John F., T988,006, Cl. 423-167.000.
McCullough, John F.: *See—*
Phillips, John F., Jr.; McClellan, Guerry H.; and McCullough, John F., T988,006, Cl. 423-167.000.
Minolta Camera Kabushiki Kaisha: *See—*
Ohta, Kazuo, T988,002, Cl. 118-719.000.
Mobil Oil Corporation: *See—*
Cunningham, Theresa L.; and Hunt, Clifford E., T988,010, Cl. 560-21.000.
Nations, Ronald G. Method of analyzing data. T988,004, 11-6-79, Cl. 364-554.000.
Ohta, Kazuo, to Minolta Camera Kabushiki Kaisha. Apparatus for forming a vacuum evaporating layer on a substrate. T988,002, 11-6-79, Cl. 118-719.000.
Patterson, N. Donald; Falanga, Anthony J.; Johnston, Edward J.; and Scarnato, Thomas J., to International Harvester Company. Automatic feed control system. T988,005, 11-6-79, Cl. 406-30.000.
Phillips, John F., Jr.; McClellan, Guerry H.; and McCullough, John F., to Tennessee Valley Authority. Chemical beneficiation of phosphatic limestone and phosphate rock with α-hydroxysulfonic acids. T988,006, 11-6-79, Cl. 423-167.000.
Scarnato, Thomas J.: *See—*
Patterson, N. Donald; Falanga, Anthony J.; Johnston, Edward J.; and Scarnato, Thomas J., T988,005, Cl. 406-30.000.
Schmidt, Frank J., Jr.: *See—*
Drew, Roland F.; Schmidt, Frank J., Jr.; and Vanduynhoven, Thomas J., T988,007, Cl. 427-53.100.
Smith, Lowrey A., to United States of America, Agriculture. Differential action extractor comb. T988,001, 11-6-79, Cl. 19-203.000.
Tennessee Valley Authority: *See—*
Phillips, John F., Jr.; McClellan, Guerry H.; and McCullough, John F., T988,006, Cl. 423-167.000.
United States of America
Agriculture: *See—*
Smith, Lowrey A., T988,001, Cl. 19-203.000.
Vanduynhoven, Thomas J.: *See—*
Drew, Roland F.; Schmidt, Frank J., Jr.; and Vanduynhoven, Thomas J., T988,007, Cl. 427-53.100.

LIST OF REISSUE PATENTEES

TO WHOM

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NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

B. F. Goodrich Co., The: *See—*
Messerly, James W., Re. 30,137, Cl. 152-357.00R.
Compagnie Francaise d'Etudes et de Construction Technip: *See—*
Grenier, Maurice; and Petit, Pierre, Re. 30,140, Cl. 62-28.000.
Cowen, Arthur T., III. Combined carrying bag and racket carrier. Re. 30,138, Cl. 190-52.000.
Ernst Leitz Wetzlar GmbH: *See—*
Kaes, Hans-Herbert, Re. 30,141, Cl. 106-54.000.
Fitzwater, Amelia, executrix: *See—*
Fitzwater, John H., deceased; and Fitzwater, Amelia, executrix, Re. 30,135, Cl. 74-2.000.
Fitzwater, John H., deceased; and by Fitzwater, Amelia, executrix. Electric fail-safe actuator. Re. 30,135, Cl. 74-2.000.
Grenier, Maurice; and Petit, Pierre, to Compagnie Francaise d'Etudes et de Construction Technip. Method for cooling a gaseous mixture to a low temperature. Re. 30,140, Cl. 62-28.000.
Jones, H. Jack, to Jones, Wilma Catherine. Sidearm holsters. Re. 30,139, Cl. 224-243.000.
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Kaes, Hans-Herbert, to Ernst Leitz Wetzlar GmbH. Inorganic vitreous detector material. Re. 30,141, Cl. 106-54.000.
LeSuer, William M., to Lubrizol Corporation, The. Phosphorus, nitrogen and sulfo-containing additives. Re. 30,142, Cl. 252-46.700.
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LeSuer, William M., Re. 30,142, Cl. 252-46.700.
Messerly, James W., to B. F. Goodrich Co., The. High-modulus rubber composition for pneumatic tires. Re. 30,137, Cl. 152-357.00R.
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Grenier, Maurice; and Petit, Pierre, Re. 30,140, Cl. 62-28.000.
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City of Dallas: *See*—
Huey, G. Philip, 4,475, Cl. 88.000.
Huey, G. Philip, to City of Dallas. *Acalypha wilkesiana* Dallas'. 4,475, 11-6-79, Cl. 88.000.
Moore, Ralph S. Miniature rose plant. 4,479, 11-6-79, Cl. 9.000.
Pan-American Plant Company: *See*—
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Petusky, Kerry S., 4,477, Cl. 78.000.
Petusky, Kerry S., 4,478, Cl. 77.000.
Petusky, Kerry S., to Pan-American Plant Company. Chrysanthemum named Sunburst Spirit. 4,476, 11-6-79, Cl. 78.000.
Petusky, Kerry S., to Pan-American Plant Company. Chrysanthemum named Hartmann's Yellow Dignity. 4,477, 11-6-79, Cl. 78.000.
Petusky, Kerry S., to Pan-American Plant Company. Chrysanthemum named Ruffled Spirit. 4,478, 11-6-79, Cl. 77.000.

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AB Kalle-Regulatorer: *See*—
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Adams, Kenneth D.: *See*—
Genaro, Donald M.; Felix, Cristian J.; Herron, William L.; and Adams, Kenneth D., 253,346, Cl. D15-69.000.
Adams, Ronald J. Strap retainer. 253,320, 11-6-79, Cl. D2-447.000.
Allied Energy Corp.: *See*—
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Andreas Hofmann Metallwarenfabrik, Firma: *See*—
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Appel, Mel. Toy airplane. 253,358, 11-6-79, Cl. D21-87.000.
Bardeau, William M. Steam self contained kettle. 253,348, 11-6-79, Cl. D15-104.000.
Baron, William J.: *See*—
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Barta, John J., Jr. Solid state protector for communications circuits or similar article. 253,341, 11-6-79, Cl. D13-11.000.
Bass, Saul; and Goodman, Arthur J. Dispensing container for liquids or the like. 253,337, 11-6-79, Cl. D9-139.000.
Bell Telephone Laboratories, Incorporated: *See*—
Genaro, Donald M.; McGarvey, John N.; and Sylvester, Gordon E., 253,344, Cl. D14-60.000.
Blatzer, Thea; Ender, Willfried; and Ketnath, Gerhard, to Andreas Hofmann Metallwarenfabrik, Firma. Support stand for a loudspeaker. 253,323, 11-6-79, Cl. D6-25.000.
Bonk, Joseph P., to Kendall Company, The. Lubricant device. 253,374, 11-6-79, Cl. D24-63.000.
Brukoff, Barry. Sofa. 253,326, 11-6-79, Cl. D6-61.000.
Camilo Muebles, Inc.: *See*—
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Carr, Carolyn M.: *See*—
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Celeste, Victor, to 369403 Ontario Limited. Foot massage roller. 253,373, 11-6-79, Cl. D24-36.000.
Chalmers, Thomas R. Stove. 253,370, 11-6-79, Cl. D23-97.000.
Chen, Evan N., to Warner-Lambert Company. Safety razor cartridge with clean-out mechanism. 253,375, 11-6-79, Cl. D28-47.000.
Cloyd, Goldie M. Statuette. 253,339, 11-6-79, Cl. D11-157.000.
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Creative Playgrounds Corporation: *See*—
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Dieter, Berthold B.; and Gibson, Charles L., 253,363, Cl. D21-244.000.
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Jennings, Ralph L., 253,349, Cl. D15-136.000.
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Felix, Cristian J., to Singer Company, The. Sewing machine. 253,347, 11-6-79, Cl. D15-70.000.
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Ferch, Rudolf, to Kastle Gesellschaft m.b.H. Ski. 253,361, 11-6-79, Cl. D21-229.000.
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Gauntner, Ralph J.; and Shilin, Alec A., to Gauntner, Ralph J.; and Gauntner, Isabell L. Magnetic door stop. 253,335, 11-6-79, Cl. D8-402.000.
Genaro, Donald M.; McGarvey, John N.; and Sylvester, Gordon E., to Bell Telephone Laboratories, Incorporated. Telephone stand. 253,344, 11-6-79, Cl. D14-60.000.
Genaro, Donald M.; Felix, Cristian J.; Herron, William L.; and Adams, Kenneth D., to Singer Company, The. Sewing machine frame or similar article. 253,346, 11-6-79, Cl. D15-69.000.
Gibson, Charles L.: *See*—
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Dieter, Berthold B.; and Gibson, Charles L., 253,363, Cl. D21-244.000.
Goodman, Arthur J.: *See*—
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Hasegawa, Gary K., to Continental Group, Inc., The. Container end panel. 253,338, 11-6-79, Cl. D9-253.000.
Herron, William L.: *See*—
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Hillmer, Robert E.: *See*—
Read, Clifford D.; Hillmer, Robert E.; and Tyson, John F., 253,345, Cl. D14-60.000.
Hull, L. Perry. Fabric shoe. 253,316, 11-6-79, Cl. D2-273.000.
Hunter, Alexander: *See*—
Schultz, Loren A.; and Hunter, Alexander, 253,343, Cl. D14-40.000.
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Rosenblad, Lars G., 253,356, Cl. D18-24.000.
Rosenblad, Lars G., 253,357, Cl. D18-24.000.
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International Silver Company: *See*—
King, Robert J., 253,334, Cl. D7-137.000.
Jennings, Ralph L., to Economy Forms Corporation. Liner for spent nuclear fuel pools. 253,349, 11-6-79, Cl. D15-136.000.
Johansson, Hans A. V. Bathtub. 253,368, 11-6-79, Cl. D23-55.000.
Johnson, Jerry L. Cabinet. 253,327, 11-6-79, Cl. D6-168.000.
Jolliffe, John E., to SCM Corporation. Typewriter. 253,353, 11-6-79, Cl. D18-1.000.
Kaman, Charles H. Guitar. 253,350, 11-6-79, Cl. D17-19.000.
Kaman, Charles H. Guitar soundboard. 253,352, 11-6-79, Cl. D17-20.000.
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Latham, Kenneth H. Bread slicing guide. 253,329, 11-6-79, Cl. D7-46.000.
Lenney, Edwin J.; and Schaefer, John O., to International Business Machines Corporation. Cartridge for a typewriter. 253,354, 11-6-79, Cl. D18-12.000.
Lopez, Camilo, III, to Camilo Muebles, Inc. Seat. 253,324, 11-6-79, Cl. D6-47.000.
Lutron Electronics Co., Inc.: *See*—
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Maccario, Michael. Shoe heel protector. 253,318, 11-6-79, Cl. D2-314.000.
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McFadden, William J., to Senninger Irrigation, Inc. Sprinkler head. 253,364, 11-6-79, Cl. D23-6.000.
McGarvey, John N.: *See*—
Genaro, Donald M.; McGarvey, John N.; and Sylvester, Gordon E., 253,344, Cl. D14-60.000.
Nagel, Dietmar; and Baron, William J., to Nagel-Kennedy Associates. Doll. 253,360, 11-6-79, Cl. D21-166.000.
Nagel-Kennedy Associates: *See*—
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Negrin, Rino, to Sports Enterprises, Inc. Shoe. 253,317, 11-6-79, Cl. D2-272.000.
Northern Telecom Limited: *See*—
Read, Clifford D.; Hillmer, Robert E.; and Tyson, John F., 253,345, Cl. D14-60.000.
Nyberg, Gustav B., to AB Kalle-Regulatorer. Ball valve. 253,365, 11-6-79, Cl. D23-19.000.
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Schaefer, John O.: *See*—
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Schrank, Jerome, to Allied Energy Corp. Vaporizer for a combustion system. 253,371, 11-6-79, Cl. D23-127.000.
Schultz, Loren A.; and Hunter, Alexander, to Transaction Management, Inc. Cartridge drive. 253,343, 11-6-79, Cl. D14-40.000.
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Thompson, James S. Rug. 253,328, 11-6-79, Cl. D6-210.000.
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Weaver, Albert R. Bathtub. 253,366, 11-6-79, Cl. D23-55.000.
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CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 6, 1979

NOTE.—First number, class; second number, subclass; third number, patent number

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553 R	4,173,582
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Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

July 3, 1979.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

Re. 29,072, Re. S.N. 055,607, Filed Jul. 9, 1979, Cl. 114/222, METHOD OF PROTECTING THE HULLS OF MARINE VESSELS FROM FOULING, Klaus Zondek, Owner of Record: *Inventor,* Attorney or Agent: Robert E. Burns, et al., Ex. Gp.: 315

3,414,928, Re. S.N. 064,382, Filed Aug. 6, 1979, Cl. 15/118, COMBINATION SPONGE AND SCOURER, Jerome H. Lemelson, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 242

3,835,175, Re. S.N. 062,571, Filed Jul. 31, 1979, Cl. 260/463, 9-FLUORENYLMETHANOL HALOFORMATES, CARBONATES AND THIOCARBONATES, Louis A. Carpino, et al., Owner of Record: *Research Corporation, New York, N.Y.,* Attorney or Agent: Henry T. Burke, Ex. Gp.: 223

3,899,025, Re. S.N. 064,333, Filed Aug. 6, 1979, Cl. 166/117.5, PUMP DOWN SYSTEM FOR PLACING AND RETRIEVING SUBSURFACE WELL EQUIPMENT, Robert W. Dinning, Owner of Record: *Schlumberger Technology Corp., New York, N.Y.,* Attorney or Agent: David L. Moseley, et al., Ex. Gp.: 354

4,026,167, Re. S.N. 044,307, Filed May 31, 1979, Cl. 74/785, PLANETARY TRANSMISSION, James M. Archer, Owner of Record: *Inventor,* Attorney or Agent: John W. Malley, et al., Ex. Gp.: 352

4,029,774, Re. S.N. 064,335, Filed Aug. 6, 1979, Cl. 424/216, O,S-DIALKYL O-PHENYLTHIO-PHENYL PHOSPHOROTHIOLATES/PHOSPHORODITHIOATES AND THEIR DERIVATIVES AND PESTICIDAL USE, William S. Hurt, Owner of Record: *Rohm & Haas Co., Philadelphia, Pa.,* Attorney or Agent: Robert A. Doherty, et al., Ex. Gp.: 125

4,037,621, Re. S.N. 059,040, Filed Jul. 19, 1979, Cl. 137/596.13, LOAD RESPONSIVE VALVE WITH CONSTANT LEAKAGE DEVICE, Tadeusz Budzich, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 341

4,039,098, Re. S.N. 062,883, Filed Aug. 1, 1979, Cl. 220/452, THERMAL INSULATION JACKET FOR WATER HEATERS, Kenneth M. Stilts, Owner of Record: *Inventor,* Attorney or Agent: Leonard W. Sherman, et al., Ex. Gp.: 241

4,040,093, Re. S.N. 062,984, Filed Aug. 2, 1979, Cl. 358/261, SYSTEM FOR CODING INFORMATION CHANGE PICTURE ELEMENTS IN FACSIMILE SIGNAL, Yukio Nakagome, et al., Owner of Record: *Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo-to, Japan,* Attorney or Agent: Robert E. Burns, et al., Ex. Gp.: 233

4,040,796, Re. S.N. 064,432, Filed Aug. 7, 1979, Cl. 44/14, FAST LIGHTING ARTIFICIAL FIRELOG, George C. Vincent, et al., Owner of Record: *The Kingsford Company, Louisville, Ky.,* Attorney or Agent: Leonard Phillips, Ex. Gp.: 116

4,061,921, Re. S.N. 967,171, Filed Mar. 16, 1979, Cl. 205/423 P, INFRARED LASER SYSTEM, Cyrus D. Cantrell, et al., Owner of Record: *The United States of America as represented by The United States Atomic Energy Commission, Washington, D.C.,* Attorney or Agent: James E. Denny, et al., Ex. Gp.: 256

4,072,204, Re. S.N. 059,035, Filed Jul. 19, 1979, Cl. 180/34, CYCLE GEAR SELECTOR, Peter W. Leighton, et al., Owner of Record: *Lucas Industries Limited, Birmingham, England,* Attorney or Agent: John C. Holman, et al., Ex. Gp.: 316

4,085,705, Re. S.N. 062,231, Filed Jul. 30, 1979, Cl. 119/17, ANIMAL CAGE, Thomas M. Gland, et al., Owner of Record: *Eli Lilly and Company, Indianapolis, Ind.,* Attorney or Agent: Thomas P. Jenkins, et al., Ex. Gp.: 333

4,095,589, Re. S.N. 049,060, Filed Jun. 18, 1979, Cl. 128/2 E, COMBINATION URINE METER AND DRAINAGE RECEPTACLE, James G. Manschot, et al., Owner of Record: *Plastronics, Inc., Milwaukee, Wis.,* Attorney or Agent: Paul R. Puerner, Ex. Gp.: 335

4,113,016, Re. S.N. 062,014, Filed Jul. 30, 1979, Cl. 166/297, CASING PERFORATION METHOD AND APPARATUS, Donald E. Trott, Owner of Record: *Inventor,* Attorney or Agent: D. Carl Richards, et al., Ex. Gp.: 354

4,114,838, Re. S.N. 045,280, Filed Jun. 4, 1979, Cl. 224/45 S, CARRIER FOR SKIS AND SKI POLES, James E. Knauf, Owner of Record: *Inventor,* Attorney or Agent: William G. Anderson, et al., Ex. Gp.: 311

4,118,262, Re. S.N. 059,728, Filed Jul. 23, 1979, Cl. 156/175, LONGITUDINAL LOAD CARRYING METHOD FOR FIBER REINFORCED FILAMENT WOUND STRUCTURES, Harry Thomas Abbott, Owner of Record: *Brunswick Corporation, Skokie, Ill.,* Attorney or Agent: John L. Isaac, et al., Ex. Gp.: 161

4,121,856, Re. S.N. 060,615, Filed Jul. 25, 1979, Cl. 282/1 R, IDENTIFICATION ASSEMBLY AND METHOD, Jerome J. Brunette, Owner of Record: *Inventor,* Attorney or Agent: Timothy L. Tilton, et al., Ex. Gp.: 322

4,142,863, Re. S.N. 058,986, Filed Jul. 20, 1979, Cl. 422/63, ARTICLE CONTAINER FOR DISPENSING REAGENT SLIDES, Roger G. Covington, et al., Owner of Record: *Eastman Kodak Company, Rochester, N.Y.,* Attorney or Agent: James A. Smith, et al., Ex. Gp.: 171

4,152,946, Re. S.N. 048,182, Filed Jun. 13, 1979, Cl. 74/193, TRANSMISSION DEVICES, Yves J. Kemper, Owner of Record: *Vacletec Corporation, Troy, Mich.,* Attorney or Agent: Joseph M. Lane, et al., Ex. Gp.: 352

4,156,220, Re. S.N. 059,056, Filed Jul. 19, 1979, Cl. 335/262, STARTER SOLENOID, Alfred B. Mazzorana, Owner of Record: *Societe de Paris et du Rhone, Rhone, France,* Attorney or Agent: Alvin Browdy, Ex. Gp.: 212

V 988 / 2 NO 013 79 UMI

PATENT NOTICES

Certificates of Correction for the Week of Nov. 13, 1979

Plt. 4,197	4,133,194	4,156,946	4,163,194
Plt. 4,201	4,134,068	4,156,963	4,163,367
Re. 30,040	4,134,393	4,157,035	4,163,371
Re. 30,066	4,134,877	4,157,109	4,163,561
3,876,446	4,139,639	4,157,263	4,163,619
3,898,438	4,142,522	4,157,492	4,163,672
3,979,300	4,144,282	4,158,354	4,163,673
4,007,177	4,144,321	4,158,370	4,163,796
4,007,271	4,144,478	4,158,396	4,163,797
4,010,438	4,145,100	4,158,459	4,163,798
4,011,211	4,145,300	4,158,617	4,163,831
4,016,055	4,145,397	4,158,621	4,163,907
4,018,803	4,145,968	4,158,738	4,164,332
4,026,163	4,148,923	4,158,875	4,164,404
4,043,467	4,149,152	4,159,302	4,164,537
4,043,805	4,151,053	4,159,401	4,164,554
4,062,678	4,151,401	4,159,445	4,164,573
4,074,436	4,151,546	4,159,582	4,164,603
4,075,862	4,151,869	4,159,827	4,164,615
4,086,637	4,152,364	4,159,925	4,164,648
4,095,177	4,152,798	4,160,258	4,164,841
4,097,498	4,153,399	4,160,889	4,164,890
4,099,547	4,153,487	4,160,924	4,165,105
4,099,940	4,153,879	4,160,985	4,165,287
4,100,272	4,154,701	4,161,106	4,165,323
4,107,151	4,155,321	4,161,397	4,165,351
4,107,313	4,155,971	4,161,537	4,165,388
4,110,110	4,156,047	4,161,958	4,165,414
4,113,084	4,156,177	4,162,044	4,165,502
4,123,552	4,156,551	4,162,168	4,165,531
4,124,722	4,156,584	4,162,363	4,165,604
4,124,843	4,156,609	4,162,444	4,165,698
4,125,899	4,156,634	4,162,521	4,165,775
4,129,008	4,156,644	4,162,684	4,165,810
4,129,416	4,156,654	4,162,688	4,166,857
4,131,632	4,156,802	4,162,694	4,167,022
4,132,152	4,156,845	4,162,946	4,167,637
4,133,182	4,156,880	4,163,077	4,167,688

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
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California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
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New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

V. 988 / 2 NO 13 79 UMI

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 28, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-8-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-18-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	10-13-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	6-21-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-6-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	12-19-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	4-10-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-12-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-7-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-31-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-21-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-1-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	9-25-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting, Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	7-21-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-9-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	2-16-78

Expiration of patents: The patents within the range of numbers indicated below expire during July 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,041,614 to 3,047,872, inclusive
Plant Patents ..... Numbers 2,155 to 2,159, inclusive

REISSUES

NOVEMBER 13, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in *italics* indicates additions made by reissue.

Re. 30,143

ROTATION SCREEN PRINTING MACHINE AND SQUEEGEE DEVICE

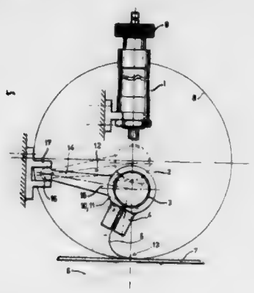
Jacobus G. Vertegaal, Boxmeer, Netherlands, assignor to Stork Amsterdam B.V., Amsterdam, Netherlands

Original No. 3,933,093, dated Jan. 20, 1976, Ser. No. 383,155, Jul. 27, 1973. Continuation-in-part of Ser. No. 811,787, Apr. 1, 1969, abandoned. Application for reissue May 21, 1976, Ser. No. 688,614

Claims priority, application Netherlands, Apr. 25, 1968, 6805845

Int. Cl.[2] **B41L** *13/04*

U.S. Cl. 101—120 **6 Claims**



1. A rotary screen printing machine having a frame, supporting members for the ends of one or more cylindrical stencils and with suspension members mounted on the frame for a squeegee device disposed within the stencil and consisting of a squeegee holder with a fitting for a flexible squeegee blade, and with means for guiding the material to be printed; the improvement consisting in that the squeegee blade consists of a thin flexible metal strip, the thickness of which is less than 1% of the width of the portion of the strip which freely protrudes from the fitting, said squeegee holder being supported at least on one end by suspension members and the squeegee blade with its fitting being supported by the squeegee holder [at two spaced locations], the suspension members of each squeegee holder comprising means for adjusting the height of the squeegee blade within the stencil, and further comprising means connecting the squeegee holder with the frame and permitting displacement of the holder in a generally horizontal direction, parallel to the guiding direction of the material to be printed during the adjustment for height, in such manner that the pressure area of the squeegee blade is situated permanently in a substantially fixed desired zone of the stencil.

Re. 30,144

APPARATUS FOR SPIN FLANGING CONTAINERS

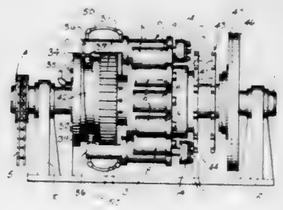
Andrew Gnyp, and Karl Elert, both of Brookfield, Wis., assignors to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Original No. 4,018,176, dated Apr. 19, 1977, Ser. No. 304,093, Nov. 6, 1972. Application for reissue Apr. 6, 1978, Ser. No. 894,237

Int. Cl.[2] **B21D** *51/00*

U.S. Cl. 113—16 **3 Claims**

1. A machine for spin flanging the open ends of containers comprising, a supporting structure, a drive shaft mounted for rotation with respect to the supporting structure, a turret secured to the drive shaft and disposed to rotate with the drive shaft, container holding means carried by the turret for holding the containers during the spin flanging operation, a series of flanging heads carried by the turret, each flanging head being mounted for rotation about its axis and being mounted for reciprocating axial movement with respect to the turret, a fixed drive gear mounted on the supporting structure and disposed concentrically of said drive shaft, each flanging head including a series of circumferentially spaced freely rotatable flanging rollers disposed to engage the open end of the container to flange the same, a pinion connected to each flanging head and operably engaged with said gear to rotate the flanging heads about their axes as the turret rotates, each pinion and the respective gear having substantially different axial lengths to enable the pinion to move axially with respect to the gear and maintain a driving connection therebetween when the head is moved axially with respect to the turret, cam means interconnecting each flanging head and the supporting structure for moving the flanging heads axially with respect to the turret in programmed sequence to thereby move the heads toward and away from the containers being held by said container holding means, gas supply means for introducing a gas under pressure through each flanging head and into the interior of the container to aid in stripping the container from the flanging head as the head is moved away from the container after the flanging operation, each flanging head includes a flanging head shaft journalled with respect to the turret, said gas supply means includes a chamber in said turret and communicating with a source of gas under pressure, and a passage located axially of each flanging head shaft and communicating with said chamber for conducting gas to the interior of each container.



Re. 30,145

ENERGY GENERATING SYSTEM

Ronald I. Papineau, Goshen, Mass., assignor to Unique Energy Systems, Inc., Amherst, Mass.

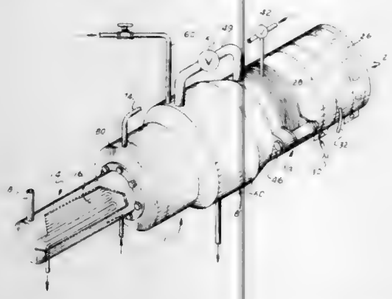
Original No. 3,967,589, dated Jul. 6, 1976, Ser. No. 544,400, Jan. 27, 1975. Application for reissue Jun. 30, 1978, Ser. No. 920,859

Int. Cl.[2] **F22B** *1/00*

U.S. Cl. 122—4 R **11 Claims**

1. Energy generating system comprising a steam generator, a combustion chamber, fuel supply means for introducing a combustible mixture into said chamber, means for supplying water to said generator for conversion to steam by combustion of said mixture, *means connected to said steam generator means for further heating and activating said steam by combustion of said mixture to form gases* feed means for supplying said *gases from such further heated and activated* steam to an asymmetric microporous membrane which produces hydrogen by [chemi-

cal disassociation of said steam,] *diffusion of hydrogen therethrough from said gases* and conduit means for supplying at least



part of the hydrogen gas so produced to said combustion chamber for maintaining combustion therein.

Re. 30,146

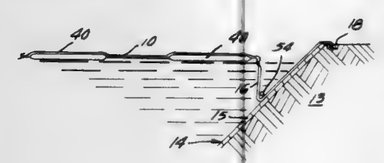
FLOATING COVER FOR A LIQUID STORAGE RESERVOIR

Howard S. Dial; Henry L. Habegger, both of Placentia, and William B. Kays, Whittier, all of Calif., assignors to Howard D. Webb and Arthur M. Lockhart, both of Long Beach, Calif.

Original No. 3,313,443, dated Apr. 11, 1967, Ser. No. 378,469, Jun. 26, 1964. Application for reissue Dec. 26, 1978, Ser. No. 973,371

Int. Cl.[2] B65D *87/18*

U.S. Cl. 220—219 **10 Claims**



5. Apparatus for preventing contamination of the stored liquid in an open reservoir, comprising:

a continuous sheet of flexible, relatively thin material impervious to and completely overlying said liquid in coextensive relationship to the periphery of said reservoir, the size of said sheet being greater than the area encompassed by the upper periphery of said reservoir;

anchor means securing the outer periphery of said sheet to the upper periphery of said reservoir in fluid-tight relationship therewith;

and float means on said sheet spaced inwardly from the upper periphery of said reservoir to raise and lower said sheet on the surface of said liquid as the level thereof varies, with said float means supporting the area of said sheet engaged by said float means at a higher elevation than the *peripheral* portion of said sheet spaced outwardly of said float means and inwardly of said anchor means whereby said *peripheral* portion forms a depending rainwater collection sump, *said float means comprising a plurality of float units arranged across the central portion of said sheet bounded by said peripheral portion, at least some of said float units being spaced apart to define paths for rain water to flow from said central portion toward said peripheral portion, said peripheral portion being unsupported by said float means whereby said peripheral portion is adapted to sink below the level of said central portion of said sheet to form said sump.*

Re. 30,147

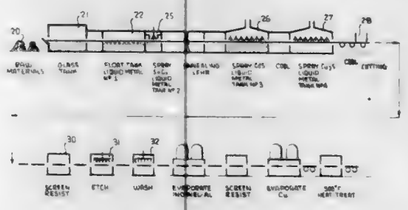
METHOD OF COATING A GLASS RIBBON ON A LIQUID FLOAT BATH

John F. Jordan, and Curtis M. Lampkin, both of El Paso, Tex., assignors to Photon Power, Inc., El Paso, Tex.

Original No. 3,880,633, dated Apr. 29, 1975, Ser. No. 431,705, Jan. 8, 1974. Application for reissue Apr. 28, 1977, Ser. No. 791,737

Int. Cl.[2] C03B *18/00*; C03C *17/10*

U.S. Cl. 65—60 A **13 Claims**



1. A method of fabricating large scale solar cells, comprising moving a continuous strip of glass continuously in a path containing sequential heated liquid float tanks, and forming a SnO_x film on said continuous strip of glass during traverse of said strip of a first of said float tanks, forming a film of CdS microcrystals on said SnO_x film during traverse of said strip through a second of said float tanks, and forming a film of Cu_2S over said CdS film during traverse of said strip through a third of said float tanks, wherein said float tanks contain liquid at temperatures suitable for formation of said films, and wherein said films are spray deposited at rates selected to enable said liquid in said float tanks to maintain the temperatures of the surfaces of said strip of glass constant during the forming of said films.

Re. 30,148

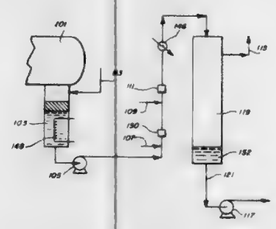
MELT FINISHING PROCESS FOR POLYMERS PRODUCED BY VAPOR STATE POLYMERIZATION PROCESSES

James L. Jezl, Winfield, and Edwin F. Peters, St. Charles, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Original No. 3,970,611, dated Jul. 20, 1976, Ser. No. 533,022, Dec. 16, 1974. Application for reissue Jul. 17, 1978, Ser. No. 925,605

Int. Cl.[2] C08F *2/34, 6/00, 10/00, 14/06*

U.S. Cl. 526—65 **22 Claims**



1. A process for treating polymer made by the polymerization of at least one polymerizable monomer in a vapor state reactor comprising removing without substantial pressure letdown solid polymer from said vapor state reactor together with reactor off-gases into a post polymerization zone into which a controlled amount of said monomer is introduced and wherein a controlled amount of essentially adiabatic polymerization occurs and said polymer is melted by heat from said adiabatic polymerization and externally added heat to form efficiently transferable, molten polymer.

Re. 30,149

PREPARATION OF ANTIFIBRINOLYTICALLY ACTIVE ISOMER OF 4-AMINOMETHYLCYCLOHEXANE CARBOXYLIC ACID

Bengt O. Meiander; Gunnar Hasshoff, both of Stockholm; Bengt R. G. Granstrand, Vallentuna, and Berit M. Olsson, Trangsund, all of Sweden, assignors to AB Kabi, Stockholm, Sweden

Original No. 3,574,721, dated Apr. 13, 1971, Ser. No. 417,235, Dec. 9, 1964. Application for reissue Jan. 30, 1979, Ser. No. 7,717

Claims priority, application Sweden, Dec. 17, 1963, 14085/63

Int. Cl.[2] C07C *101/04*

U.S. Cl. 562—507 **4 Claims**

1. The method of preparing the 4-aminomethyl-cyclohexane carboxylic acid isomer which in substantially pure state assays at least about 90 percent antifibrinolytically active material, which method comprises reacting the 4-aminomethyl-cyclohexane methanol isomer melting at 118° C., in an inert solvent for it and the presence of sufficient alkali metal carbonate to neutralize later formed hydrogen halide, with sufficient benzoyl halide dissolved in an inert solvent for it, and while cooling, to benzoylate its amino group, heating the reaction mixture until substantially complete benzoylation of said group occurs; recovering the resulting 4-benzoylaminomethyl-cyclohexane methanol and admixing it with water and sufficient alkali metal hydroxide to provide oxidizing conditions, adding sufficient of a compatible oxidizing agent to oxidize the methanol group to the carboxylic acid group while controlling the temperature below about 40° C. until substantial completion of the oxidation; removing the resulting 4-benzoylaminomethyl-cyclohexane carboxylic acid from the reaction mixture, heating it with sufficient mineral acid to split off the benzoyl group; and separating the resulting 4-aminomethyl-cyclohexane carboxylic acid antifibrinolytically active isomer.

Re. 30,150

INDUCTOR DRIVE MEANS

John M. Puvogel, West Alexandria, Ohio, assignor to NCR Corporation, Dayton, Ohio

Original No. 3,708,726, dated Jan. 2, 1973, Ser. No. 168,052, Aug. 2, 1971. Application for reissue Nov. 13, 1978, Ser. No. 960,131

Int. Cl.[2] H01H *47/22*

U.S. Cl. 361—152 **10 Claims**

1. In combination with an inductive load having a two-terminal winding, a driving circuit for energizing said winding comprising, in combination,

a direct current voltage supply having two terminals;

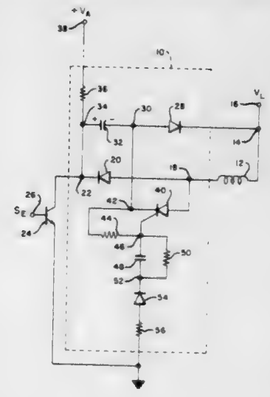
means connecting a first one of the terminals of the winding to a first one of the terminals of the direct current voltage supply;

energy storage means having two terminals;

means including a unidirectional conducting device connecting a first one of the terminals of the energy storage means to said first terminal of said winding;

means including a unidirectional conducting device connecting the second of the terminals of the winding to the second terminal of the energy storage means;

switching means for controlling the state of energization of the winding, said switching means having a first terminal connected to said second terminal of said energy storage means and a second terminal connected to the second terminal of said direct current voltage supply;



signal translating means having a first terminal connected to said second terminal of said winding, a second terminal connected to said first terminal of said energy storage means, and a control gate;

means for connecting said control gate to said second terminal of said voltage supply; and

means for connecting said control gate to said first terminal of said energy storage means; whereby deenergization of said winding under control of said switching means causes energy to be stored in said energy storage means, and whereby during subsequent re-energization of said winding under control of said switching means the energy stored in said energy storage means is applied to said winding through said signal translating means, which is rendered conducting at such time in response to the potential level at the first terminal of the energy storage means.

V 9 8 8 / 2 NOV 13 79 UMI

PLANT PATENTS

GRANTED NOVEMBER 13, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,480

MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Jul. 19, 1978, Ser. No. 925,989
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded much branched habit, substantially as illustrated and described, characterized by buds and flowers which are (A) medium to deep mauve-lavender in color (similar to the pollen parent 'Angel Face' — U.S. Plant Pat. No. 2,792), the bud and flower resembling 'Lavender Lace' miniature, U.S. Plant Pat. No. 2,991, in size and shape; and (B) further characterized by a plant which is vigorous and compact, easy to propagate from cuttings or by budding, with an abundance of small size semi-glossy foliage and an abundance of flowers borne singly or several to the stem in loose clusters.

4,481

STRAWBERRY PLANT

Royce S. Bringhurst, Davis, and Victor Voth, Santa Ana, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 23, 1978, Ser. No. 953,992
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—49 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

4,482

CHRYSANTHEMUM NAMED GOLDEN BOUNTY

Kerry S. Petusky, West Chicago, Ill., assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Nov. 27, 1978, Ser. No. 963,883
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct cultivar of standard chrysanthemum of the greenhouse cut flower type, substantially as herein shown and described, particularly characterized in uniqueness, when compared with its parent variety which has white blooms, by the medium yellow coloration of the blooms.

4,483

CHRYSANTHEMUM NAMED FREE SPIRIT

Kerry S. Petusky, West Chicago, Ill., assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Nov. 28, 1978, Ser. No. 964,436
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—77 **1 Claim**

1. A new and distinct cultivar of chrysanthemum pot plant, substantially as herein shown and described, particularly characterized in uniqueness, when compared with its parent "Spirit", by its quill-shaped ray florets which project in a radial fashion from an upstanding group of the inner or disc florets.

4,484

MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Nov. 29, 1978, Ser. No. 964,497
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded much branched habit, substantially as illustrated and described, characterized by buds and flowers which resemble the miniature rose Kathy (U.S. Plant Pat. No. 3,246) in size and shape and are of a color resembling the variety Fire Princess, miniature (U.S. Plant Pat. No. 3,084); and further characterized by a plant of dwarf compact habit which is easy to propagate from cuttings or by budding, with an abundance of flowers borne singly or several to the stem in loose clusters.

V 9 8 8 / 2 N O 1 3 7 9 UMI

PATENTS

GRANTED NOV. 13, 1979

ERRATA

For CLASS	See PATENT NO.
433–098	4,173,827
433–087	4,173,828
062–324	4,173,865
141–032	4,174,004
141–054	4,174,005
141–087	4,174,006
141–001 R	4,174,007
151–069	4,174,008
165–045	4,174,009
430–068	4,174,215
430–257	4,174,216
430–317	4,174,217
430–306	4,174,218
430–321	4,174,219
430–613	4,174,220
430–225	4,174,221
430–190	4,174,222
208–011 LE	4,174,263
548–219	4,174,321
548–237	4,174,322
548–251	4,174,323
548–264	4,174,324
585–835	4,174,353
585–626	4,174,354
585–843	4,174,355
585–701	4,174,357
525–183	4,174,358
525–332	4,174,360
423–004	4,174,369
428–008	4,174,384
526–114	4,174,429
526–173	4,174,431
525–437	4,174,438
325–320	4,174,489

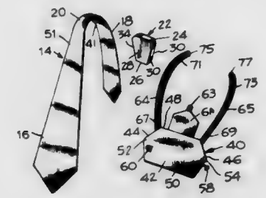
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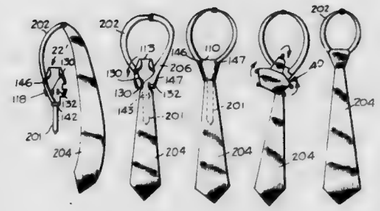
PATENTS

GRANTED NOVEMBER 13, 1979

GENERAL AND MECHANICAL

4,173,792
ADJUSTABLE LENGTH SIMULATED KNOTTED NECKTIE COMBINATION
Franklin S. Intengan, 666 W. 81 St., Apt. W-122, Hialeah, Fla. 33014
Filed Apr. 6, 1978, Ser. No. 894,187
Int. Cl.[2] A41D *25/02*
U.S. Cl. 2—144 **16 Claims**





1. A simulated knotted necktie combination for a wearer comprising:
- **a necktie length having a front display tail portion and a rear tail portion and an intermediate portion between the tail portions, said front display tail portion having a zone adjacent said intermediate portion,**
- **a simulated knot shaped body comprising means to predetermine the size and shape of a simulated knot, said body having a top and side surfaces and a front surface, said body being of generally inverted trapezoidal form as seen in front elevation and said top surface comprising a necktie length support when said necktie length is arranged with the zone of said front display tail overlaying said front surface of said simulated knot shaped body and the front display tail portion and rear tail portions extend in a common direction from the body and away from the top body surface; and**
- **shield means comprising means to slidably connect the necktie length to the simulated knot shaped body and to orient and hold the zone of the length in a simulated knot shape, said shield comprising**
- **a panel having spaced upper and lower edges,**
- **said panel being sized to cover the front face of said body,**
- **said panel having wrap around side flaps between the upper and lower edges to cover the side surfaces of the body,**
- **said panel being positionable over said front face of said body and zone of the necktie length covering said front face and**
- **said flaps including connector means to interengage with one another to slidably captivate the display tail of the necktie length to the body with said zone overlaying the front face of said body and**
- **said shield including a cover flap extending from the upper shield edge sized to cover the top surface of the body and including means to connect the cover flap to the flaps of the shield, and**
- **neckband means included in said combination for connection of the simulated knotted necktie combination about the neck of a wearer.**

4,173,793
KNOT RETAINING IMPLEMENT FOR NECKTIE OR SCARF
Yasui Kazuo, No. 2-3-813, 3-chome, Taishibashi, Asahi-ku, Osaka, Japan
Filed Mar. 28, 1978, Ser. No. 891,113
Claims priority, application Japan, Apr. 11, 1977, 52-45387; Jul. 9, 1977, 52-91332; Jul. 9, 1977, 52-91333; Oct. 31, 1977, 52-146558; Dec. 2, 1977, 52-162313; Dec. 2, 1977, 52-162314
Int. Cl.[2] A41D *25/14*
U.S. Cl. 2—152 A **4 Claims**



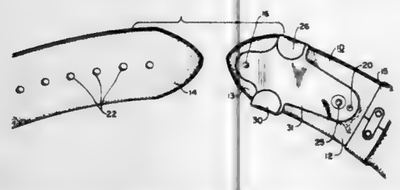
1. A knot retaining implement for a necktie and a scarf comprising:
- **a substantially V-shaped wire retaining portion;**
- **a hook portion integrally formed with and extending backwardly from the ends of said V-shaped portion;**
- **a single looped chain for fitting around said tie connected to said hook portion and extending therefrom;**
- **a slidable ring fitted around the outside of said chain; and**
- **a stop connected to said chain, whereby positioning said tie through said chain with said stop in front of said tie and lowering said slide ring on said chain folds said tie between said stop and said ring.**

4,173,794
BUCKLELESS BELT
Richard D. E. Nichols, Fallbrook, Calif., assignor to Bianchi Leather Products, Inc., Temecula, Calif.
Filed Aug. 4, 1977, Ser. No. 821,912
Int. Cl.[2] A41F *9/00*
U.S. Cl. 2—322 **5 Claims**

1. A buckleless belt comprising of a belt body constituting an elongated strip of leather or leather like material and having an outer face, an inner face and a pair of generally parallel edges;
- **fastener means secured to the inner face of one end region of said belt body;**
- **said fastener means including a fastening device extending outward from the inner face of said belt body;**
- **said belt body in the region of the opposite end from said belt body including a plurality of integral apertures for engagement with said fastening means; and**
- **retaining means engaging said belt body for holding regions**

in fastening engagement wherein said one end region presents substantially no visible fastener means when worn by a person;

wherein said fastener means includes a plate member secured to the inner face of said body and positioning and supporting said pin fastening device in a position extending generally normal to the surface of said plate; and



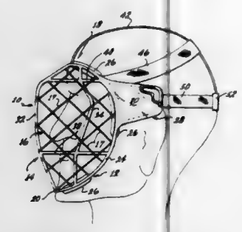
wherein said plate includes integral reentrant arms defining a channel of size to receive the said opposite end of said belt body therein, said reentrant arms including tabs allowing longitudinal movement of said opposite end of said belt while restricting upward or downward movement thereof when worn by a person; said tabs constituting vertually the only portion of said fastener means visible when worn by a person.

4,173,795

RACQUETBALL OR SQUASH SAFETY MASK

Alyce Lundin, 11235 Constellation Dr., and Robert V. Bravin, 1576 Wagner Dr., both of El Cajon, Calif. 92020

Filed Jul. 27, 1978, Ser. No. 928,374
Int. Cl.[2] A42B *1/08*; A63B *71/10*
U.S. Cl. 2—425 **7 Claims**



1. A racquetball or squash safety mask comprising: a primary framework assembly and a secondary framework assembly;

said primary framework assembly having a top framework member, a bottom framework member, and a pair of side framework members that function to form a base for the secondary framework assembly and also to support the safety mask upon the wearer's face:

said secondary framework assembly is attached to said primary framework assembly and it forms a convex frame that extends outwardly from said primary framework assembly and,

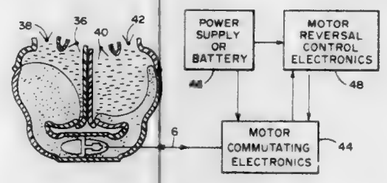
a grid network covering said secondary framework assembly, said grid network comprising a plurality of filaments criss-crossing each other with their ends secured to said primary framework assembly, said filaments of said grid network being laterally spaced apart a distance greater than one inch but less than two inches, said filaments of said grid network being diagonally oriented with respect to the front of said mask such that none of the filaments lie in a vertical plane thereby minimizing the amount of impairment of the wearer's vision.

4,173,796

TOTAL ARTIFICIAL HEARTS AND CARDIAC ASSIST DEVICES POWERED AND CONTROLLED BY REVERSIBLE ELECTROHYDRAULIC ENERGY CONVERTERS

Robert K. Jarvik, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Filed Dec. 9, 1977, Ser. No. 858,921
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.7 **11 Claims**



1. An electric-to-hydraulic energy conversion system to actuate and control a diaphragm, sac or axisymmetric blood pump for use in a total artificial heart or cardiac assist system comprising:

a reversible hydraulic pump having stator, diffusor elements, and an impellor, and said pump having a high ratio of flow to impellor inertia,

a reversible brushless DC motor having a high ratio of power to inertia, said motor having a rotor and stationary elements,

a shaft to which both the impellor of the pump and the rotor of the motor are fixed,

a housing supporting both said stator and diffusor elements of the pump and the stationary elements of the motor,

bearings mounted in the housing supporting the assembly of shaft, motor rotor, and pump impellor for rotation,

means for reversing said motor to alternately cause systolic and diastolic action of the artificial heart, and

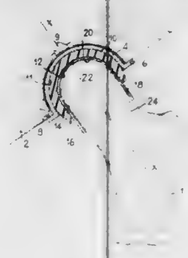
means for controlling said motor reversing means.

4,173,797

PROSTHESIS FOR ARTHROPLASTY OF THE HIP

Frantz Langlais, and Michel Postel, both of Paris, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Aug. 17, 1977, Ser. No. 825,384
Claims priority, application France, Aug. 19, 1976, 76 25215
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.912 **8 Claims**



1. A prosthesis for arthroplasty of the hip, which comprises:

a thin metal cotyloid cup of hemispherical shape to be fitted in the cotyloid cavity and having an outer surface which has dimensions substantially equal to those of the cotyloid cavity and having a peripheral flange for abutting on bone around the cotyloid cavity for preventing the cup from pivoting relative to cotyloid cavity;

a thin femoral cup of metal having a cylindrical skirt portion to be fitted on the head of the femur;

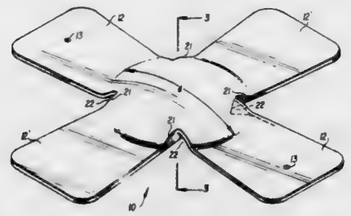
and an intermediate cup of plastics material which is thicker than said cotyloid cup and said femoral cup and has a part-spherical outer surface which is such that when the intermediate cup is mounted in the cotyloid cup it is capable of swivelling in all directions relative to the cotyloid cup, the intermediate cup having an inner surface which comprises a cylindrical portion which fits coaxially on the cylindrical skirt portion of the femoral cup so as to allow the femoral cup only a movement of rotation about the common axis of the skirt portion and cylindrical portion.

4,173,798

INTRA-OCULAR LENS

Robert C. Welsh, 168 SE. First St., Miami, Fla. 33131

Filed May 4, 1978, Ser. No. 902,830
Int. Cl.[2] A61F *1/16, 1/24*
U.S. Cl. 3—13 **5 Claims**



1. An iris plane intra-ocular lens for implantation into an aphakic human eye, comprising:

a central lens area from which four haptics extend generally along two perpendicular lines, two of said haptics being vertical haptics extending upwardly and downwardly, respectively, from said central lens area, and the other two haptics extending horizontally from the sides of said central lens area, said vertical haptics for sitting behind the iris of an aphakic human eye into which the lens is implanted and said horizontal haptics for sitting in front of said iris but behind the cornea of said eye,

each junction region among each two adjacent haptics and the central lens area being a haptic crotch, the posterior side of the lens being substantially flat, with the posterior side of each edge of the horizontal haptics being substantially chamfered in each haptic crotch, for minimizing warping of the iris of said eye at its pupillary margin.

4,173,799

WATER LEVEL CONTROLLER FOR SWIMMING POOL GUTTER

James A. Patterson, 2375 Valleyview Dr., Columbus, Ohio 43204

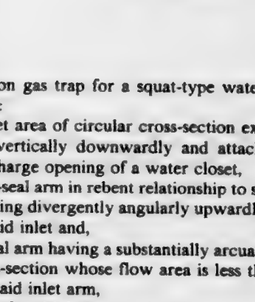
Filed Jul. 3, 1975, Ser. No. 592,950
Int. Cl.[2] E04H *3/20*
U.S. Cl. 4—172.17 **8 Claims**

1. In a swimming pool having generally vertical walls, a gutter located on the top of said walls and extending around the perimeter of said pool, said gutter having a back wall, a bottom wall and an inner wall, a filter, means for supplying fresh water to said pool from said filter, and means connecting said gutter to said filter to return water from said pool to said filter, the improvement comprising,

a plurality of skimmer openings spaced around the perimeter of said pool and located in said inner gutter wall adjacent the top of said inner gutter wall,

means for closing each said opening, said closing means including a float located in said gutter and associated with each said opening, said float being located well below said skimmer opening and effecting the closing of said opening when the level of water in said gutter, lifting said float, rises to a level well below the said opening,

whereby during periods when the water in the pool is quiescent, said skimmer openings will provide a continuous



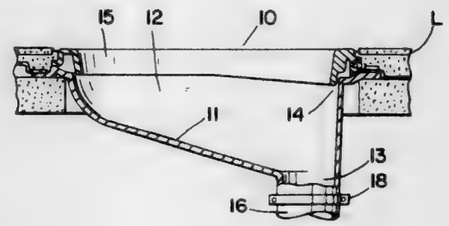
flow of water from said pool into said gutters and during periods of greater activity in said pool the flow of water over the sides of said pool will raise the level of water in said gutters sufficiently to close said skimmer openings, thereby creating greater gutter capacity to accommodate water surging over the inner wall of said gutter.

4,173,800

LOW-PROFILE SYPHON TRAP

George J. Flegel, Michigan City; Roger L. Mielbeck, LaPorte, and Patrick J. Pizarek, Michigan City, all of Ind., assignors to Josam Manufacturing Co., Michigan City, Ind.

Continuation-in-part of Ser. No. 827,065, Aug. 23, 1977, Pat. No. 4,130,907. This application Aug. 24, 1978, Ser. No. 936,354
Int. Cl.[2] E03C *1/00*
U.S. Cl. 4—207 **8 Claims**



1. In a syphon gas trap for a squat-type water closet, the combination of:

a tubular inlet area of circular cross-section extending substantially vertically downwardly and attachable to the waste discharge opening of a water closet,

a tubular gas-seal arm in rebent relationship to said inlet arm and extending divergently angularly upwardly at an acute angle to said inlet and,

said gas-seal arm having a substantially arcuate non-circular cross-section whose flow area is less than the flow area of said inlet arm,

the juncture of said inlet arm and said gas-seal arm defining the lower horizontal plane of a gas seal chamber of said trap when holding water,

a tubular outlet arm extending horizontally from the downstream end of said seal arm,

V 9 8 8 / 2 NOV 13 1979 UMI

said outlet arm being of circular cross-section and having a flow area greater than that of the seal arm,

the juncture of the apex of the bottom portion of said seal arm and said outlet arm defining the upper horizontal plane of said gas-seal chamber,

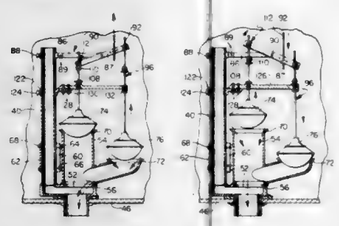
said juncture also defining an angular-downwardly directed flow-fall in said outlet arm downstream of said apex and out of the high velocity flow path of said seal arm into said outlet arm, and the angle of said seal arm being sufficiently large to define a gas-seal chamber having a greater volume than a chamber disposed between said planes would have in a vertically extending seal arm of the same cross-sectional area as said inlet arm.

4,173,801

APPARATUS FOR FLUSHING TOILETS

Nicholas P. Bresnyan, 214 Candlewood Rd., Groton, Conn. 06340

Filed Jun. 23, 1978, Ser. No. 918,679
Int. Cl.[2] E03D *1/14, 3/12*
U.S. Cl. 4—326 **12 Claims**



1. In combination with a toilet including a tank capable of being filled with water having a bottom and sidewalls, a hollow support member mounted on the tank including structure defining an outlet at the bottom of the tank for draining water therefrom, and a hollow standpipe mounted on said support member and extending upwardly therefrom, the interior of said standpipe being in communication through said support member with the outlet, the improvement comprising:

a manifold mounted on said support member having an interior in communication with the outlet and including a first valve seat distant from the bottom of the tank and a second valve seat proximate to the bottom of the tank;

a first valve movable between a closed position engageable with said first valve seat to prevent the flow of water out of the tank through the outlet and an open position spaced from said first valve seat to permit the flow of water out of the tank through the outlet;

a second valve movable between a closed position engageable with said second valve seat to prevent the flow of water out of the tank through the outlet and an open position spaced from said second valve seat to permit the flow of water out of the tank through the outlet;

a handle pivotally mounted on a sidewall of the tank;

a first actuating lever fixed at one end to said handle;

a second actuating lever;

a cantilevered member lying generally in a plane of said first actuating lever and mounted on said standpipe and extending outwardly therefrom;

pivot means rotatably mounting said second actuating lever on said cantilevered member at a location distant from the standpipe;

a link pivotally connecting said first and second actuating levers;

first lift wire means pivotally connecting said first valve and said second actuating lever at one side of said pivot means; and

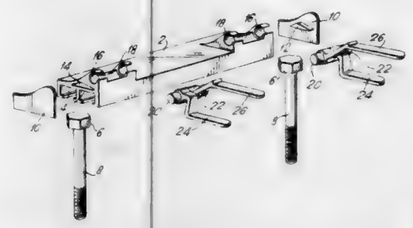
second lift wire means pivotally connecting said second valve and said second actuating lever at an opposite side of said pivot means whereby rotation of said handle in one direction serves to move said first valve to an open position while maintaining said second valve in a closed position, and rotation of said handle in the opposite direction serves to move said second valve to an open position while maintaining said first valve in a closed position.

4,173,802

TOILET SEAT

Karl-Erik Wikstrom, Bergkullavagen 6, S-330 20 Anderstorp, Sweden

Filed Mar. 16, 1978, Ser. No. 887,315
Int. Cl.[2] A47K *13/12*
U.S. Cl. 4—236 **1 Claim**



1. Hinge means for detachably connecting a lavatory seat and cover to a lavatory stool, comprising:

a holder adapted to be attached to said stool; and

a pair of hinge pins each having two brackets mounted thereon, one adapted for attachment to a lavatory seat and the other adapted for attachment to a lavatory cover,

said holder comprising two pairs of resiliently deformable recessed clips, each pair of clips being adapted detachably to receive one of said pins by pressing said one pin into said each pair of clips in a direction transverse to the hinge pin axis, and adapted to permit removal of said one pin from said each pair of clips by urging it outwardly of said each pair of clips in the opposite direction;

each of said clips having C-shaped walls with their openings facing in the same direction and each of said brackets having a bearing portion exceeding said pins in diameter;

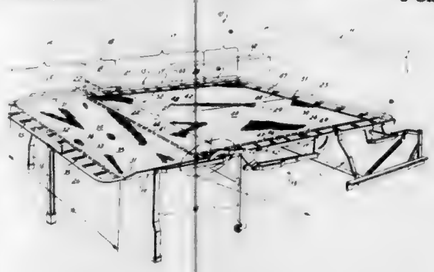
the axial spacing between the clips of each pair being substantially equal to the sum of the axial lengths of said bearing portions of the brackets retained by said pair of clips.

4,173,803

SOFA-SLEEPER

Ronald J. Kennedy, Ennis, Tex., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Mar. 27, 1978, Ser. No. 890,367
Int. Cl.[2] A47C *17/13*
U.S. Cl. 5—13 **3 Claims**



1. An improved sofa-sleeper structure comprising a bed frame having a front bed frame section, and intermediate bed frame section, and a rear bed frame section, said front, intermediate, and rear sections being pivotable relative one to the other between a folded sofa attitude and a flat bed attitude,

a cloth front deck fixed to said front deck section, said cloth front deck being connected with the foot rail of said front deck section by a plurality of springs,

a cloth rear deck fixed to said rear deck section, said cloth rear deck being connected with the side rails of said rear deck section by a plurality of springs,

at least one stitch line fixedly connecting said cloth front deck to said cloth rear deck, said stitch line being disposed generally transverse to the longitudinal axis of said bed frame, and constituting the only direct connection between said front and rear cloth decks, and

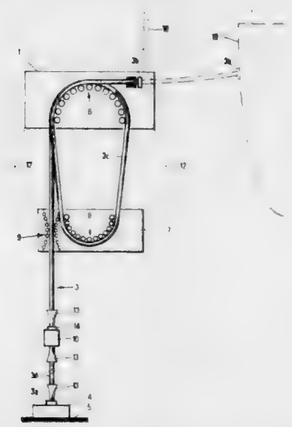
a tensioning device including a cloth flap connecting said intermediate deck frame section with the rear edge of said cloth front deck such that said tensioning device induces tension in said cloth front deck in a longitudinal direction relative to the longitudinal axis of the bed frame when said sofa sleeper structure is in the folded sofa attitude, and said tensioning device induces no tensioning in said cloth front deck when said sofa sleeper structure is in the bed attitude.

4,173,804

FLOATING INSTALLATION CONNECTED TO A STATIONARY UNDERWATER INSTALLATION THROUGH AT LEAST ONE FLEXIBLE PIPE

Xuong N. Duc, Malmaison, France, assignor to Institut Francais du Petrole, Malmaison, France

Filed Feb. 7, 1978, Ser. No. 875,792
Claims priority, application France, Feb. 9, 1977, 77 03833
Int. Cl.[2] B63B *21/52*
U.S. Cl. 9—8 P **15 Claims**



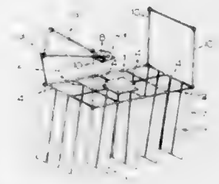
1. A floating installation comprising an element floating on the water surface, at least one flexible pipe having a first end secured to a point which is stationary with respect to the water bottom and having a second end secured to the floating element, the length of the flexible pipe being substantially greater than the distance of said stationary point from the water surface, automatic means maintaining said flexible pipe under substantially constant tension, irrespective of the external forces applied to the floating installation, said automatic tensioning means comprising a first direction reversing means carried by said floating element, an element of determined negative buoyancy corresponding to an apparent weight in water, a second direction reversing means carried by said element of negative buoyancy, said element of negative buoyancy being suspended from said floating element by means of flexible pipe which passes over said first and second direction reversing means forming at least one substantially full passing from one of said first and second direction reversing means to the other and back to said one of the direction reversing means with all curved portions of said flexible pipe having the same direction of curvature, so as to reduce wearing of said flexible pipe, before being secured to said floating element.

4,173,805

BRUSHES

Gordon H. Silcock, P.O. Box 26099, Auckland, New Zealand

Filed Jun. 8, 1976, Ser. No. 693,977
Int. Cl.[2] B60S *3/04*
U.S. Cl. 15—97 B **5 Claims**



1. A brush comprising:

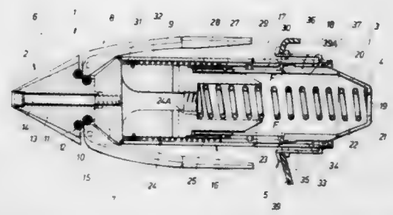
a frame member, a plurality of flexible straps fixed to said frame member and adapted to hang in a substantially vertical direction from said frame member, at least one arm pivoted to said frame member, said arm pivotally connected to a fixed member, said arm further including a pivot joint therein, and a pulse member for imparting a reciprocating motion to said at least one arm about said pivotal connection to said fixed member, said pulse member applying a force to said pivot joint on said arm between said fixed member pivot and said frame member pivot so that said frame member moves in a reciprocal fashion.

4,173,806

APPARATUS FOR CLEANING CONDUITS OR THE LIKE

Paul Hammelmann, Zum Sundern 17, D-4740 Oelde 1, Fed. Rep. of Germany

Filed Oct. 18, 1978, Ser. No. 952,539
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1977, 2746668; Apr. 26, 1978, 2818182
Int. Cl.[2] B08B *9/04*
U.S. Cl. 15—104.06 R **22 Claims**



1. Fluid-propelled apparatus for cleaning conduits of the type having an upstream portion adapted to be filled with a pressurized fluid and an open downstream portion, comprising a housing insertable into the conduit between said portions and including a component slidably engaging the internal surface of the conduit so that pressurized fluid acts upon said component and normally propels said housing forwardly until the housing is arrested or decelerated by an obstruction, if any, in said downstream portion, said housing having an internal space

communicating with said upstream portion and outlet means connecting said space with said downstream portion; valve means movable in said housing to and from an operative position in which said outlet means is sealed; first biasing means for urging said valve means to said operative position; at least one cutting tool mounted on said housing in front of said component and arranged to remove or break up the obstructions in said downstream portion on application of impacts to said housing; impeller means reciprocably mounted in said housing; a plunger reciprocably mounted in said housing behind said impeller means to move rearwardly under the action of pressurized fluid in said space on deceleration or stoppage of said housing and forwardly under the action of fluid pressure in said upstream portion when said space communicates with said downstream portion via said outlet means; second biasing means for urging said impeller means forwardly to impact against said housing; and means for respectively coupling said impeller means with said plunger and with said valve means prior to rearward movement and upon completion of rearward movement of said plunger so that said valve means leaves said operative position against the opposition of said first biasing means while said impeller moves forwardly under the action of said second biasing means upon completion of rearward movement of said plunger to impact against said housing and said first biasing means returns said valve means to said operative position upon completion of forward movement of said plunger.

4,173,807

CLEANING IMPLEMENT

Siegfried Maier, Leinfelden-Echterdingen, Fed. Rep. of Germany, assignor to Dupro AG, Romanshorn, Switzerland

Filed Jun. 28, 1978, Ser. No. 919,940

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1977, 2729266

Int. Cl.² A46B *13/02*

U.S. Cl. 15—179 **16 Claims**



1. A rotatable shaft provided with bristles for a cleaning implement, especially vacuum cleaner, and having its ends designed for journalling in bearings, which comprises an annular depression at each end said shaft comprising at least one longitudinal groove extending parallel to the axis of said shaft, said longitudinal groove extending over the entire length of said shaft, including said depressions.

4,173,808

SOOT BLOWER FOR TUBE BUNDLE IN PRESSURIZED ENCLOSURE

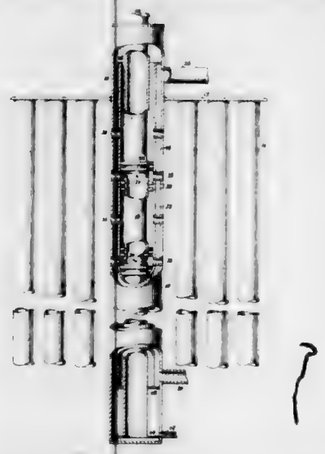
Henry J. Blaskowski, West Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 5, 1979, Ser. No. 1,341

Int. Cl.² F23J *3/02;* **F27D** *23/00*

U.S. Cl. 15—316 R **8 Claims**

1. A soot blower for removal of deposits from the outside surface of a bundle of elongate tubes, said soot blower comprising an elongate outer tube lying parallel to the tubes of said tube bundle and having an apertured end and a closed end, an inlet duct for cooling fluid connected to one end of the outer tube and an outlet duct for cooling fluid connected to the opposite end of the outer tube, and intermediate tube positioned concentrically within the outer tube to define an annular cooling space connected to the inlet and outlet ducts, radial passageways extending between the intermediate and outer tubes to bridge the annular cooling space therebetween, a central soot blower tube axially movable within the intermediate tube having an inlet end thereof traversing the apertured end of the outer tube, a source of cleaning fluid connected to the inlet end of the soot blower tube, and radial openings in the soot blower tube adapted to coincide with the radial passage-



ways that extend between the intermediate and outer tubes to project cleaning fluid radially therethrough when the soot blower tube is moved axially.

4,173,809

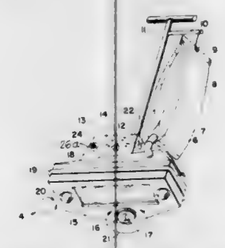
AUTOMATIC VACUUM CLEANER

Paul H. Ku, 47-50 59th St., Woodside, N.Y. 11377

Filed Jun. 30, 1978, Ser. No. 920,807

Int. Cl.² A47L *9/28*

U.S. Cl. 15—319 **2 Claims**



1. An automatic vacuum cleaner comprising in combination: a vacuum cleaner means for vacuuming a carpet, the vacuum cleaner means including support structure; roller means for rollably-supporting the support structure and mounted on the support structure; driven-swivel wheel means for supporting and propelling in diverse directions and mounted on said support structure; said roller means and said driven-swivel wheel means and the support structure in combination being adapted for moving the support structure randomly in alternate directions and intermittently changing direction whenever an obstacle is encountered; electrically-driven motor mounted on said support structure connected to drive said vacuum cleaner means and connected to drive said driven-swivel wheel means; battery means connected to supply power to said electrically-driven motor, said battery means including a rechargeable battery and motor-drive circuitry connected in circuit with the rechargeable battery such that power is providable to said electrically-driven motor, and said battery means additionally including a battery recharging circuitry means for recharging the rechargeable battery when connected to a source of outside electrical power, the battery recharging circuitry means including a rectifier and transformer interconnected with said rechargeable battery such that low voltage rectified direct electrical current is providable to the rechargeable battery in recharging circuitry; switching circuitry for switching to and from connecting said rechargeable battery means to said rectifier and transformer, and for connecting said battery means to said electrically-driven motor; and a timer means for setting activation time, period of running subsequent to an activation, and for deactivation of said switching circuitry for that portion of the switching circuitry for connecting and disconnecting the rechargeable battery to and from said electrically-driven motor.

4,173,810

TWIN-WHEEL CASTOR

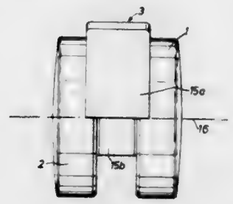
Michael J. James, Cheltenham, England, assignor to Global Castors and Hardware Limited, Cheltenham, England

Filed Jun. 9, 1978, Ser. No. 914,292

Claims priority, application United Kingdom, Mar. 13, 1978, 9785/78

Int. Cl.² B60B *33/00*

U.S. Cl. 16—47 **11 Claims**



1. A twin-wheel castor comprising a body and two coaxial wheels mounted respectively on opposite sides of the body with separate stub axles of the wheels rotatably engaging within the body, said axles having grooves which are engaged by internal projections of said body whereby to retain the axles in the body and provide snap-in assembly of the wheels to the body, said projections comprising for engagement with each axle groove at least one projection with the projections relatively arranged so that, in axial projection, there is no overlap of any one of the projections with another.

4,173,811

SKI-TIE DEVICE

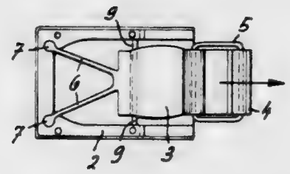
Theodor Kokeisl, Zurlindenstrasse 21, 5000 Aarau, Switzerland

Filed Dec. 28, 1977, Ser. No. 865,301

Claims priority, application Switzerland, Dec. 29, 1976, 16428/76

Int. Cl.² A44B *21/00;* **A63C** *11/02*

U.S. Cl. 24—73 SG **8 Claims**



1. A device for tying a pair of skis together, comprising:
a substantially flat housing adapted to be mounted on an upper surface of a ski and to extend transversely thereof, said housing defining a compartment having a window opening at one side of the housing;
an elongated elastic band having an inner end resiliently connected to said housing within said compartment at a location remote from said window and a free end provided with a grip engageable by a user to draw said band through said window, said free end being provided with means engageable with another such housing on another ski whereby said band holds a pair of skis together;
at least one elastic member anchored to said housing at said location and connected to said inner end of said band for resiliently connecting same to said housing; and
an abutment formed on said housing adjacent said window and engageable with a formation on said inner end of said band upon withdrawal of said band through said opening to anchor said inner end of said band within said housing, said inner end of said band being elastically drawn away from said abutment by said member in a relaxed condition of said band, said elastic member having a lesser force constant than the portion of said band between said ends.

4,173,812

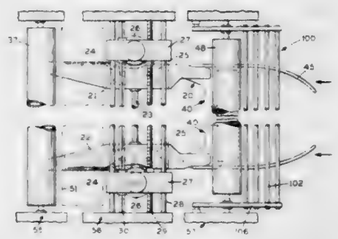
APPARATUS FOR CALENDERING TUBULAR KNITTED FABRICS

Andrew P. Cecere, Valley Stream, N.Y., assignor to Samcoe Holding Corporation, Woodside, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,514

Int. Cl.² D06C *5/00*

U.S. Cl. 26—84 **13 Claims**



1. Apparatus for processing tubular knitted fabric, which comprises
(a) a pair of opposed processing rollers,
(b) means for driving said rollers at equal peripheral speeds,
(c) a generally flat spreader frame arranged to laterally distend tubular knitted fabric to flat, two-layer form and having a discharge end at the nip formed by said processing rollers,
(d) opposed edge drive rolls engaging and supporting said spreader frame by contact with opposed external side edge portions thereof, whereby tubular fabric may be advanced over said spreader frame by said edge drive rolls,
(e) first and second opposed contact rolls disposed respectively above and below the spreader frame on the upstream side of said edge drive rolls,
(f) flat contact plate means extending substantially the full width of said spreader frame and positioned in opposed relation to said contact rolls,
(g) said contact rolls and contact plate means being so related that a single layer of tubular knitted fabric, passing therebetween, is grippingly engaged across the full effective width of the contact plate means by a contact roll,
(h) first controllable drive means for driving said edge drive rolls, and
(i) second and third controllable drive means for driving said contact rolls at speeds variable with respect to each other and with respect to said edge drive rolls,
(j) said spreader, in the immediate region of said contact plate, being of a width to distend said fabric substantially to its full width,
(k) said contact plate having an overall thickness not greater than the overall thickness of said spreader frame whereby, in the region of said contact plate, the distance between

the two layers of fabric is maintained at a practical minimum.

9. Apparatus for processing tubular knitted fabric, which comprises

(a) a generally flat spreader frame arranged to receive tubular knitted fabric and to distend it to flat, two-layer form at a predetermined width,

(b) said spreader frame including spaced, opposed, width-adjustable side frame members,

(c) means for advancing tubular knitted fabric over said frame at a controllable rate,

(d) a thin, flat contact plate extending between said side frame members,

(e) a pair of transversely disposed contact rolls positioned above and below said contact plate and extending for at least the full width of said spreader frame,

(f) said contact rolls being adjustable with respect to said contact plate whereby a layer of fabric passing between the plate and a contact roll is grippingly engaged by said roll over substantially the full width of the plate, and

(g) means for controllably rotating said contact rolls at speeds variable with respect to each other and with respect to the advancing means,

(h) said spreader, in the immediate region of said contact plate, being of a width to distend said fabric substantially to its full width,

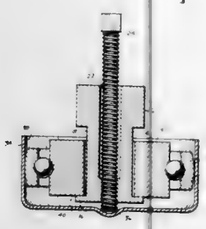
(i) said contact plate having an overall thickness not greater than the overall thickness of said spreader frame whereby, in the region of said contact plate, the distance between the two layers of fabric is maintained at a practical minimum.

4,173,813

BEARING PULLER

John Stockinger, Littlefield, Tex., assignor to John M. Clayton, Jr.; W. H. Berry, Jr. and John M. Clayton, III, all of Littlefield, Tex.

Filed Feb. 24, 1978, Ser. No. 880,784
Int. Cl.² B23P *19/04*
U.S. Cl. 29—266 **6 Claims**



1. In combination, a bearing and a bearing puller for removing the bearing;

a. the bearing within

b. a cup having

(i) a closed bottom, and

(ii) cylindrical sides,

c. said bearing having

(i) an outer race pressed into the cylindrical sides of the cup, and

(ii) an inner race in the outer race with

(iii) a non-circular hole in the inner race, and there being

d. a space between the inner race and the closed bottom; the bearing puller including:

e. an integral spool having a bottom and top end,

f. a flange on the bottom end of the spool,

(i) said flange in the space between the inner race and the closed bottom,

(ii) said flange of correlative cross-section as the hole in the inner race and smaller than the hole, and

(iii) said flange having a thickness less than the space between the inner race and closed bottom,

g. a neck on the spool of lesser cross-section than the flange and extending through the inner race,

h. wrench flats on the top end of the spool above the bearing,

j. a threaded axial bore through the spool, and

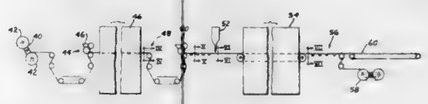
k. a screw threaded through the spool.

4,173,814

PAD MEMBER METHOD OF MANUFACTURE

James H. Enicks, Meadowbrook La., Box 247, Blawenburg, N.J. 08504

Filed Jul. 7, 1977, Ser. No. 813,447
Int. Cl.² B29D *27/04*
U.S. Cl. 29—417 **24 Claims**



1. A method of making a resilient member for use in the forming of pad members for mounting on the body in protective relation thereto comprising; applying a first layer of a plastisol resin material in flowable form onto an elongated moving support member and subjecting the first layer to heat for gelling and at least partially fusing said first layer, applying a second layer of the same plastisol resin material in flowable form but containing a blowing agent to the first layer in substantially laterally coextensive relation thereto, applying a third layer of a plastisol resin material in flowable form in the form of a ribbon over at least one selected lateral region of said second layer and of a lateral extent less than that of the second layer, subjecting the superposed layers to further heat fuse and foam the layers of plastisol resin materials while integrally bonding the layers thereof together, and stripping the bonded, fused and foamed material from said support member.

5. The method according to claim 1 which includes stamping out contoured pad members from said fused and foamed material.

15. The method according to claim 5 which includes connecting elastic strap means to said pad member for mounting of the pad member on the body.

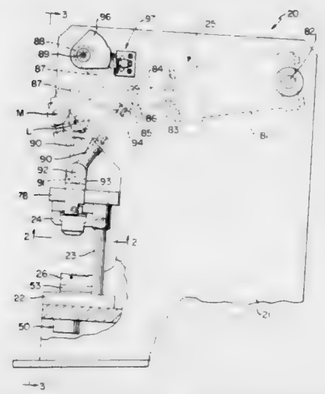
4,173,815

METHOD OF JOINING TWO ABUTTING METAL MEMBERS TOGETHER

Joseph W. Lux, and John M. Varanelli, both of Waterbury, Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 707,780, Jul. 22, 1976, Pat. No. 4,035,901.
This application Apr. 27, 1977, Ser. No. 791,322
The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.
Int. Cl.² B23P *11/00*
U.S. Cl. 29—432.1 **2 Claims**

1. A method of joining two abutting metal members together by a single reciprocating head having a first means for lancing and forming and having a second means for staking, said method comprising the steps of supporting said members in abutting relation with support means, advancing said head toward said supported members to cause said first means to lance and form a part of one of said members through an unblanked part of the other of said members while said members are supported by said support means in opposition to the advancing movement of said head, thereafter withdrawing said head from said members, and then advancing said head a second time toward said supported members to cause said second means to stake the lanced and formed part of said one member to said other member and thereby secure said members together while said members are supported by said support



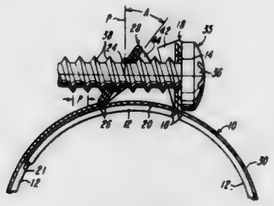
means in opposition to the second advancing movement of said head.

4,173,816

METHOD OF MAKING A HOSE CLAMP WITH TANGENTIAL SCREW

Alan F. Meckstroth, 2357 Shelterwood Dr., Dayton, Ohio 45409, and James F. Pease, 5805 Folkestone Dr., Dayton, Ohio 45459

Division of Ser. No. 703,760, Jul. 9, 1976, Pat. No. 4,078,281, which is a continuation-in-part of Ser. No. 565,545, Apr. 7, 1975, abandoned. This application Mar. 13, 1978, Ser. No. 885,675
The portion of the term of this patent subsequent to Mar. 14, 1995, has been disclaimed.
Int. Cl.² B23P *19/00*
U.S. Cl. 29—526 R **8 Claims**



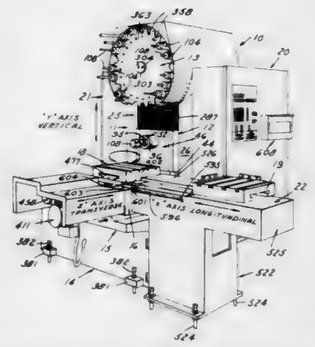
1. A method of making a hose clamp having a part-cylindrical band portion integrally connecting a first ear portion and a second ear portion, comprising the steps of folding one end portion of an elongated metal strip to form a folded metal first ear portion with an integral tongue portion projecting therefrom, folding a second end portion of the strip to form a folded metal second ear portion, forming holes within the first and second ear portions, bending the strip to form the part-cylindrical band portion, extending a screw through the holes within the ear portions with the screw threads engaging the second ear portion, and cocking the second ear portion at a substantial angle relative to a reference plane perpendicular to the axis of the screw and in converging relation with the first ear portion for producing a positive non-stripping engagement of the second ear portion with the screw threads.

4,173,817

MACHINING CENTER WITH AUTOMATIC TOOL CHANGER

Leonhard Voglrieder, Howell, and Raymond O. Hempel, Jr., LaSalle, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Division of Ser. No. 790,224, Apr. 25, 1977, Pat. No. 4,102,035.
This application Mar. 9, 1978, Ser. No. 885,045
Int. Cl.² B23Q *3/157, 1/06*
U.S. Cl. 29—568 **7 Claims**



1. In a machine tool having a column assembly on which is slidably mounted a tool spindle slide assembly on Y-axis ways, and wherein an X-axis ways base is mounted adjacent said column assembly, and a Z-axis ways saddle slide assembly is slidably mounted on the X-axis ways, and a work table assembly is slidably mounted on the Z-axis ways on the saddle slide assembly, the combination of:

(a) a pallet base member rotatably mounted on said work table assembly;

(b) a pallet slidably mounted on said pallet base member;

(c) a clamp plate movably mounted on said pallet base member for clamping the pallet on said base member;

(d) power drive means for rotating said pallet base member;

(e) said pallet being provided with means for sliding the pallet off said pallet base member; and

(f) means for moving said clamp plate between a clamped operative position, and an unclamped inoperative position wherein said means for moving said clamp plate includes:

(1) spring means for moving said clamp plate downwardly to a clamped operative position; and

(2) cam means for moving said clamp plate to said unclamped inoperative position.

4,173,818

METHOD FOR FABRICATING TRANSISTOR STRUCTURES HAVING VERY SHORT EFFECTIVE CHANNELS

Ernest Bassous, Riverdale; Tak H. Ning, Yorktown Heights, and Carlton M. Osburn, Croton-on-Hudson, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

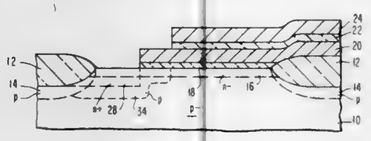
Filed May 30, 1978, Ser. No. 910,254
Int. Cl.² B01J *17/00*
U.S. Cl. 29—571 **10 Claims**

1. A method for fabricating a transistor structure having a short channel length including controlled high voltage threshold and low voltage threshold regions comprising the steps of:

A. forming a first mask having first and second opposed edges over a first area of a body of semiconductor material of one conductivity type,

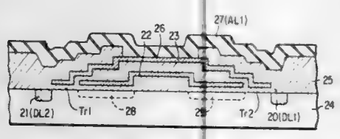
B. ion implanting impurities into said semiconductor material at said edges of said first mask to form field regions,

C. growing thermal oxide in said semiconductor material at said edges of said first mask to form field oxide regions,
D. removing said first mask and ion implanting impurities of opposite conductivity type into said semiconductor material between said field oxide regions to form a channel region,
E. forming a layer of gate oxide over said implanted channel region,
F. forming and doping a layer of polysilicon over said layer of gate oxide to form doped polysilicon gate material of opposite conductivity type,
G. forming a layer of insulating material over said layer of polysilicon gate material,
H. forming a layer of metal over said layer of insulating material,
I. forming a layer of photoresist material over said layer of metal,



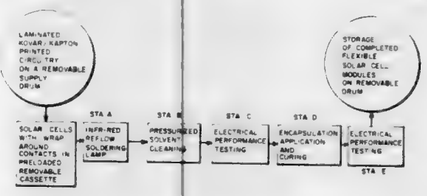
J. using a second mask for defining at least one of a source and drain region and at least one side of a polysilicon gate region, exposing and etching said photoresist, metal, insulating material and polysilicon material to open said at least one of said source and drain regions and to form at least one side of a polysilicon gate,
K. ion implanting impurities through said at least one open source and drain regions to form at least one of said transistor source and drain in said body of semiconductor material, said at least one of said source and drain being aligned with said at least one side of said polysilicon gate,
L. laterally etching away a predetermined amount of at least one side of said remaining metal layer over at least one side of said channel region,
M. and, using said remaining metal layer as a third mask, ion implanting a controlled amount of impurities into one side of said channel region to adjust the threshold voltage of the high threshold voltage channel region for said transistor structure.

4,173,819
METHOD OF MANUFACTURING A DYNAMIC RANDOM ACCESS MEMORY USING MOS FETS
Hiroyuki Kinoshita, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kanagawa, Japan
Division of Ser. No. 764,897, Feb. 2, 1977, Pat. No. 4,131,906. This application Aug. 4, 1978, Ser. No. 931,246
Claims priority, application Japan, Feb. 13, 1976, 51/14568
Int. Cl.² B01J *17/00*
U.S. Cl. 29—571 **3 Claims**



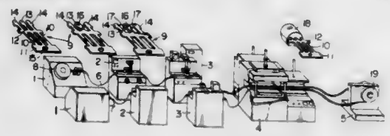
1. A method for manufacturing a dynamic random access memory using a plurality of MOS FETS, wherein the MOS FETS are formed on a semiconductor substrate having a first conductivity type, comprising:
diffusing at least one pair of data line layers having a second conductivity type opposite to said first conductivity type into said substrate;
forming a pair of co-linear adjacent memory cells between the data line layers, wherein said memory cells are formed by,
forming a first insulating film having a pair of thin co-linear end portions separated by a thick portion on said substrate betweeen said data line layers,
forming a first conductor on said first insulating layer and bridging said first insulating layer such that said first conductor has co-linear end portions lying on said thin portions of said first insulating layer, each of said end portions of said first conductor serving as one electrode of a capacitor,
forming a second insulating film on said first conductor and bridging said first conductor, said second insulating film having co-linear thin portions formed on said end portions of said first conductor;
forming a second conductor on said first and said second insulating films bridging said insulated first conductor, said second conductor having co-linear end portions disposed on the thin portions of said first insulating film and serving as the gate electrodes of said pair of adjacent memory cells, said second conductor having a central portion bridging said first conductor and insulated therefrom by said second insulating film,
forming an address line above said memory cells,
locating a single contact hole in said address line to said central portion of said second conductor between the co-linear adjacent memory cells, and
connecting said address line to said central portion of said second electrode through said contact hole.

4,173,820
METHOD FOR FORMING A SOLAR ARRAY STRIP
Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Robert L. Mueller, Azusa, and Robert K. Yasui, Torrance, both of Calif.
Division of Ser. No. 809,890, Jun. 24, 1977, Pat. No. 4,133,697. This application Mar. 29, 1978, Ser. No. 891,358
Int. Cl.² H05K *3/34*
U.S. Cl. 29—572 **7 Claims**



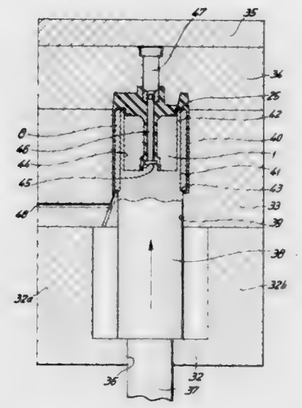
1. In a method for forming a flexible solar array strip, the steps comprising:
A. feeding along a linear path a flexible substrate comprising a pair of laminated layers of polyamide having printed circuitry deposited therebetween, at least one layer of said pair of layers having defined therein apertures within which solder pads are deposited in engagement with the printed circuitry; and
B. individually transporting solar cells into engagement with the solder pads and subjecting the solder pads engaged by each solar cell to infrared radiation for a period sufficient for causing the solder to flow.

4,173,821
METHOD OF PRODUCING SEMICONDUCTOR DEVICES
Masatoshi Yamamoto, Higashimurayama; Keisuke Makino, Funabashi; Kiyomi Suzukawa, Zushi; Souichirou Nakamura, Takasaki, and Kiyomi Sakai, Sawa, all of Japan, assignors to Hitachi, Ltd., Japan
Filed Aug. 23, 1977, Ser. No. 827,091
Claims priority, application Japan, Aug. 25, 1976, 51-100637
Int. Cl.² B01J *17/00*
U.S. Cl. 29—574 **13 Claims**



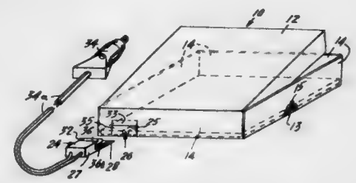
8. A method of fabricating semiconductor devices, said method comprising the steps of:
preparing a lead frame strip formed of a series of the same repeated lead frame unit each having plural lead members;
mounting a semiconductor element to at least one of said lead members of each of said lead frame units;
molding each said semiconductor element with resin;
winding said lead frame strip on a reel after said molding step;
baking the resin-molded wound-up lead frame strip; and
performing succeeding steps for producing the semiconductor devices in an unwound condition of said lead frame strip.

4,173,822
METHOD FOR ASSEMBLING A STATOR FOR AN ELECTRIC MACHINE
Bodo Fütterer, Lucerne; Jürgen Mayer, and Hugo Fritschy, both of Sachseln, all of Switzerland, assignors to Interelectric Aktiengesellschaft, Sachseln, Switzerland
Division of Ser. No. 594,768, Jul. 10, 1975. This application Dec. 30, 1977, Ser. No. 865,979
Int. Cl.² H02K *15/02*
U.S. Cl. 29—596 **4 Claims**



1. A method of assembling a stator for an electric machine of the type having a bell-shaped rotor, a permanent magnet, a face plate holding said permanent magnet, a flux return ring abutting said face plate with one of its end faces and concentrically surrounding said permanent magnet, a casing intimately surrounding the outer surface of said flux return ring, comprising the steps of:
(a) sliding the permanent magnet into the interior of a support die, a plunger fitting into said die having an inner wall defining a cylindrical portion, the diameter of which corresponds to the inner diameter of the air gap space of said machine;
(b) sliding a flux return ring over the outer wall of said plunger;
(c) placing over the assembly, so obtained, a casting mold having a cavity conforming to the configuration of said stator;
(d) closing said mold and injecting plastic material thereinto;
(e) allowing the plastic material to harden;
(f) retracting the plunger from said die; and
(g) disassembling said die mold and removing the stator therefrom.

4,173,823
RESISTANCE HEATER FOR A PIZZA CARTON
Thomas L. Anderson, Neenah; Glenn A. Rasmussen, Larsen, and Gerald J. Van Handel, Neenah, all of Wis., assignors to American Can Company, Greenwich, Conn.
Division of Ser. No. 816,444, Jul. 18, 1977, Pat. No. 4,134,004. This application Jun. 23, 1978, Ser. No. 918,690
Int. Cl.² H01C *7/00*
U.S. Cl. 29—611 **4 Claims**



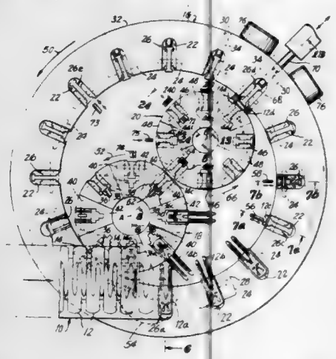
1. In the fabrication of electrical resistance heater means, the method comprising: forming a sheet of electrically resistive material; laying down a strip of electrically conductive material on said sheet of electrically resistive material, in such a pattern that said strip has mutually spaced substantially parallel portions and an interconnecting portion; and converting said parallel strip portions into electrode means for said electrically resistive material and said interconnecting strip portions into terminal means for said electrode means by severing said interconnecting portion and said resistive material underlying same, and severing said resistive material along a region adjacent said interconnecting strip portion and to the side thereof disposed between said parallel strip portions.

4,173,824
APPARATUS FOR AUTOMATICALLY ASSEMBLING ARTICLES, SUCH AS CLIPS
Maurice Wolfthal, Ossining, N.Y., assignor to Stewart Stamping Corporation, Yonkers, N.Y.
Filed Nov. 14, 1977, Ser. No. 851,516
Int. Cl.² B23P *19/04*
U.S. Cl. 29—783 **22 Claims**

1. Apparatus for automatically manufacturing articles including first and second components, such as clips, comprising:
a rotatably mounted first annular or dial member having an upper edge surface, an outer edge surface and an inner edge surface defining an inner area, and a plurality of first component clamping assemblies mounted thereon and spaced therearound, said first annular or dial member sequentially receiving at a receiving station and releasably holding a plurality of first components and sequentially indexing each of said first components to an assembly station;

a second dial member having outer and upper edge surfaces, said second dial member being rotatably mounted within said inner area and having a plurality of second component clamping assemblies mounted thereon and spaced therearound, said second dial member sequentially receiving at said receiving station and releasably holding a plurality of second components and sequentially indexing each of said second components to a transfer station;

a third dial member having outer and upper edge surfaces, said third dial member being rotatably mounted within said inner area and having a plurality of second component clamping assemblies mounted thereon and spaced

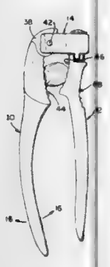


therearound, said third dial member sequentially receiving said plurality of second components at said transfer station and releasably holding and sequentially indexing said second components to said assembly station into confronting relationship with corresponding ones of said first components;

means for sequentially transferring said second components from said second dial member clamping assemblies to said third dial member clamping assemblies; and

means located at said assembly station for sequentially assembling each pair of confronting first and second components to each other to form said article.

4,173,825
NUTCRACKER
William A. Papalardo, P.O. Box 273, Centerport, N.Y. 11721
Division of Ser. No. 844,211, Oct. 21, 1977. This application Dec. 15, 1978, Ser. No. 969,805
Int. Cl.² B26B *17/00*
U.S. Cl. 30—120.3 **10 Claims**



1. A cracking device, comprising in combination:

a first elongate rigid member having a generally concave surface for engaging the object to be cracked, and an elongate handle portion;

a second elongate rigid member having second and third generally concave surfaces for engaging the object to be cracked, and an elongate handle portion; and

a rigid coupling member linking together said first and second elongate members adjacent their respective nut supporting surfaces, said first elongate member being pivotally connected to said coupling member so as to permit relative movement toward and away from said second elongate member, and said second elongate member being rotatably connected to said coupling member so as to permit relative pivotal movement between said second elongate member and said coupling member so that said second elongate member may be rotated relative to said first elongate member between a first position in which said first and second generally concave surfaces face one another, and a second position in which said first and third generally concave surfaces face one another.

4,173,826
APPARATUS FOR CUTTING PILLS
Norbert Leopoldi, 4180 Marine Dr., Chicago, Ill. 60613, and William P. Heinrich, 2709 W. Sterling Dr., McHenry, Ill. 60050
Filed Aug. 17, 1978, Ser. No. 934,336
Int. Cl.² B26B *11/00*
U.S. Cl. 30—124 **2 Claims**



1. A pill cutter comprising an upper member and a lower member which are affixed together at one end thereof, a resilient pad affixed to each of said upper and lower members and disposed so as to compressingly engage one another when said upper and lower members are pressed together, one of said resilient pads being of continuous area covering a continuous area of one of said members, the second pad covering a similar area of the other member but comprising a split construction slightly spaced apart, a cutting element disposed between the split apart portions of said second split resilient pad, a pill to be cut placed upon one of said resilient pads, said upper and lower members pressed together to initially contain said pill compressed between said resilient pads, and said cutting element engaging and splitting said pill upon said upper and lower members being pressed together sufficiently to compress said resilient pads and bring said pill into engagement with said cutting element, at least one of said resilient pads comprising a recessed pocket for receiving therein a pill to be cut.

4,173,827
CONTROL FOR DENTAL HANDPIECES
George K. Austin, Jr., P.O. Box 209, Rte. 2, Box 254, Newberg, Oreg. 97132
Filed Feb. 11, 1976, Ser. No. 657,146
Int. Cl.² A61C *19/02*
U.S. Cl. 433—98 **11 Claims**

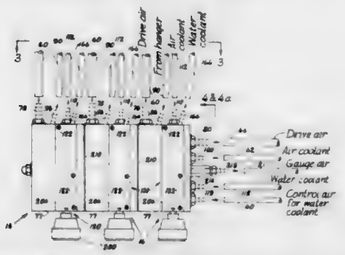
1. In a dental control,

a thin block having transverse main passages extending from one side edge to the other side edge, branch passages leadng from the main passages to one face of the block, and outlet passages leading from said one face to an end edge of the block,

a diaphragm sheet on said one face of the block and adapted to close the ends of the branch passages when pressed against said one face of the block,

and a thin cover on the diaphragm sheet and secured to the block,

the cover having diaphragm chambers therein opposite the ends of the branch and outlet passages and also having control fluid passages to the diaphragm chambers for pressing the corresponding portions of the diaphragm sheet against said one face of the block,



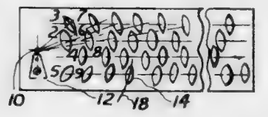
some of the diaphragm chambers being circular and some of the diaphragm chambers including long runners extending from one of the circular chambers to another of the circular chambers and adapted to be closed when the corresponding portions of the diaphragm sheet are pressed against said one face of the block.

4,173,828
INTERCHANGEABLE TOOL OPERATING APPARATUS WITH PLURAL MOTION
Leopold P. Lustig, 304 Greenwood St., Newton Centre, Mass. 02159, and Leonard L. Krasnow, Westboro, Mass., assignors to Leopold Paul Lustig, Newton Centre, Mass.
Filed Dec. 19, 1977, Ser. No. 861,643
Int. Cl.² A61C *3/06, 1/10;* **E02D** *7/02;* **B26B** *1/00*
U.S. Cl. 433—87 **34 Claims**



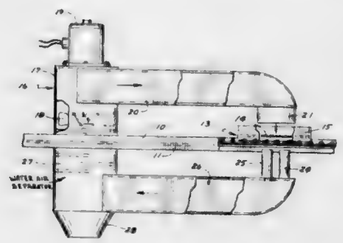
1. A tool operating apparatus for driving alternatively at least a first tool and a second tool from a single tool driving means to which each of said tools can be removably coupled, in which the tool driving means comprises a rotatable shaft and a support in which the shaft is journaled for rotation around its longitudinal axis, and tool engagement means fixed to the shaft, the first tool having a first aperture for receiving the shaft and means in the first aperture to engage the tool engagement means for rotating the first tool with the shaft, the second tool having a second aperture for receiving the shaft and the tool engagement means, and means on the second tool to engage the support so as to hold the second tool non-rotatably fixed to said support, the shaft and the tool engagement means being free to rotate relative to the second tool within the second aperture, and means in the second aperture for coupling with the tool engagement means to drive the second tool in an oscillatory path relative to said axis during rotation of the shaft in the second aperture.

4,173,829
DRAFTING INSTRUMENT
George Khait, 516-28th Ave. #3, San Francisco, Calif. 94121
Filed Apr. 25, 1978, Ser. No. 899,943
Int. Cl.² B43L *9/04*
U.S. Cl. 33—27 C **16 Claims**



14. A circle drafting template comprising a flat sheet of a solid material having pivot means for enabling said template to be rotated about said pivot means in a single plane on a flat surface, a plurality of rows of holes in said template, each of said holes having an exclusive spacing from said pivot means so as to enable a plurality of circles of different radii to be drawn by placing a writing instrument in said holes and rotating said template therewith, adjacent rows of holes being sufficiently closely spaced and the holes in adjacent rows being positioned with staggered spacings such that the holes in adjacent rows overlap when viewed from a location between the ends of said rows, each of said holes being shaped to have confronting edges on opposite sides of a circumference line of a circle, the center of which is at said pivot means, said confronting edges being most widely spaced along one radius from said pivot means and converging therefrom to join and form an acute angle on said circumference line, corresponding points of said confronting edges along any radius through said hole being equidistantly spaced from said circumference line.

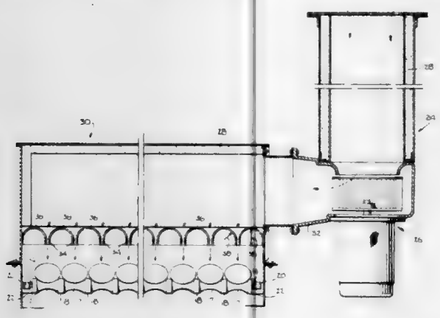
4,173,830
DRYER FOR MESH BASKETS
Douglas R. Hanson, 1720-9th Ave. South, Anoka, Minn. 55303
Filed Dec. 12, 1977, Ser. No. 859,276
Int. Cl.² F26B *5/04*
U.S. Cl. 34—15 **6 Claims**



6. A method of removing water from and drying perforated bottom articles carried on a conveyor using a recirculating fan member having a pressure side and a vacuum side, said fan generating a desired volume of air, comprising the steps of directing air from said pressure side of the fan in a high velocity stream directly through the perforated bottom of the article as it is moved on said conveyor to force the airstream to pass through the perforated bottom of said article and to carry water on the article through said article, collecting the water laden air that has passed through said article and returning said water laden air to the vacuum side of said fan, and separating at least portions of the water carried by the air to the vacuum side of the fan out of the airstream prior to recirculation of the air by said fan.

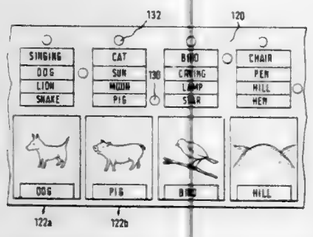
V 9 8 1 2 N 0 1 3 7 9 UMI

4,173,831
EGG DRYING APPARATUS
Robert C. McCord, Romulus, Mich., assignor to Diamond International Corporation, New York, N.Y.
Filed Apr. 26, 1978, Ser. No. 900,138
Int. Cl.[2] F26B *19/00*
U.S. Cl. 34—236 11 Claims



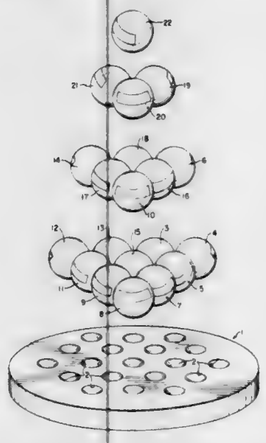
1. An egg drying apparatus comprising conveyor means for advancing eggs through said apparatus, air displacement means for moving air towards said eggs being conveyed through said apparatus, a chamber in communication with said air displacement means, air directing means disposed in said chamber and in communication with said air displacement means for directing air towards eggs being advanced through said apparatus, said air directing means including a plurality of elongated orifices disposed in the bottom of said chamber, said orifices being positioned above said conveyor means to discharge air towards eggs being advanced by the conveyor means, each of the orifices having a coefficient of discharge of at least about 0.8.

4,173,832
EDUCATIONAL TOY
Lim B. Chen, and Lim L. Cher, both of Sunway Garden, F2 17th Floor, 989 King's Rd., Hong Kong, Hong Kong
Filed Mar. 15, 1978, Ser. No. 886,633
Claims priority, application United Kingdom, Mar. 25, 1977, 12593/77
Int. Cl.[2] G09B *7/06*
U.S. Cl. 35—9 B 18 Claims



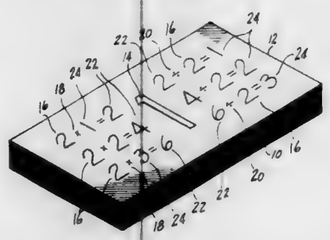
1. An educational toy which comprises a first set of windows and a second set of windows, a first set of keys selectively operable to cause one of a plurality of first images to be displayed in the respective one of the windows in the first set and to cause a simultaneous display of an associated one of a plurality of second images in the second set of windows for a predetermined length of time, a second set of keys, each having as a label a respective one of said second images and selectively operable at the end of the said predetermined length of time, and means for indicating correspondence and non-correspondence between the label of the selected key of the second set and the image displayed in the window of the said first set.

4,173,833
PSYCHOLOGICAL GAME
Martin Rosenblatt, 23909 Berdon St., Woodland Hills, Calif. 91367
Filed Dec. 22, 1977, Ser. No. 863,211
Int. Cl.[2] G09B *1/06*
U.S. Cl. 35—22 R 2 Claims



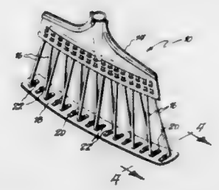
1. A psychological game apparatus for enhancing personal exploration and growth, comprising a flat base having at least ten recesses for receiving respective spheres in a contiguous relationship, and at least four tetrahedrons, each comprising four spheres of a selected color mounted in said recesses, each said tetrahedron comprising a base layer of three spheres and an apex of one sphere contacting its three associated base spheres, the base spheres of three of the tetrahedrons and the apex sphere of one tetrahedron being contained in said recesses, with each sphere containing an erasable legend written by the user in answer to a question on a predetermined topic pertaining to the user, the written legends on the spheres of each tetrahedron referring to one topic.

4,173,834
EDUCATIONAL MATHEMATICAL GAME APPARATUS
Alberto H. Arzola, 308 Palisade Ave., Jersey City, N.J. 07307
Filed Aug. 17, 1977, Ser. No. 825,232
Int. Cl.[2] G09B *19/02*
U.S. Cl. 35—31 R 1 Claim



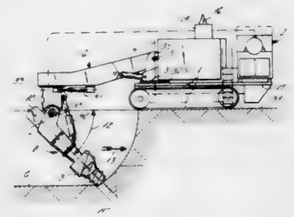
1. A plurality of playing cards, one lateral surface of each of said cards bearing indicia, including three formulas for numeral multiplication, said indicia including three formulas for numeral division, each of said formulas for numeral multiplication and each of said formulas for numeral division utilizing one common number as a multiplicand and as a divisor respectively, said one common number ranging from two to twelve, each of said formulas for multiplication and each of said formulas for division including an equal sign, each of said formulas for multiplication including a numeral representing the product of multiplication, each of said three formulas for division including individually one of said numerals representing said three products of multiplication as a dividend in said formulas for division, said three formulas for division including quotients, each of said three formulas for multiplication including one of three numbers as a multiplicand, each of said three numbers having a different numerical value, and equaling in numerical value said quotients, an enlarged numeral, each of said plurality of playing cards being identified by a different enlarged numeral, said different enlarged numeral being in sequential order, said enlarged numeral being located intermediate said three formulas for multiplication and said three formulas for division, said plurality of playing cards being forty-four in number, means to evaluate a score achieved by the users of said plurality of playing cards, said means including four wheels, said four wheels each being pivotably secured to a plate, said plate having four openings therein, said openings being disposed juxtaposed with the location of each of said four wheels, each of said four wheels suitably identified by an individual color, each of said four wheels carrying numerical indicia thereon, whereby said numerical indicia carried by said each of said four wheels may be viewed through said four openings, four individually colored and individually decorated medallions, each of said medallions having an equivalent color to said identifying color of said four wheels, a time clock, said clock for timing the completion of the use of said cards by said users, said clock including a manual start button and a manual stop button for operating a pointer of said clock.

4,173,835
SNOW REMOVAL TOOL
Dean W. Burrell, 35 Jefferson St., Ellicottville, N.Y. 14731
Filed Oct. 31, 1977, Ser. No. 847,409
Int. Cl.[2] E01H *5/02*
U.S. Cl. 37—53 6 Claims



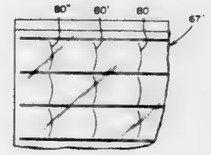
1. A hand tool for manually shifting flake or granular material comprising:
a. a longitudinally extending handle;
b. a laterally extending base member fixed to one end of said handle;
c. a laterally extending plate member oriented to face in the direction of said longitudinally extending handle; and
d. a plurality of resiliently deflectable, laterally spaced, longitudinally extending flat-sided strips oriented to face in a direction generally normal to both said handle and said base member and attached to said base member at their first ends and to said plate member at their extreme second ends so as to extend away from the end of but generally parallel to the length of said handle, a first multiplicity of said strips lying in a first plane and a second multiplicity of said strips lying in a second plane, said first and second planes intersecting said plate in first a second laterally spaced paralleled lines respectively, whereby said flat side of said strips provided partial obstruction to the flow of said flake or granular material from one side of said tool to the other when said tool is moved in a sweeping motion in the direction in which said flat sides face.

4,173,836
CONDITION RESPONSIVE TRENCH EXCAVATOR
Friedrich W. Paurat, Nordstrasse 73, D-4223 Voerde 2, Fed. Rep. of Germany
Filed Jan. 12, 1978, Ser. No. 868,733
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1977, 2700950
Int. Cl.[2] E02F *5/04*
U.S. Cl. 37—81 7 Claims



1. A trench-excavating machine comprising, in combination:
a chassis having tracks for propelling the chassis along the ground and a drive connected to said tracks;
a turntable mounted on said chassis and swingable about a vertical axis;
a boom mounted on said turntable for swinging movement about a horizontal axis thereon;
a cutting head swingable on the free end of said boom about a horizontal axis, said cutting head being formed with a cutting tool rotatable about an axis substantially perpendicular to the swinging axis of said cutting head; and
control means responsive to the inclination of said axis of said tool relative to the ground and controlling said drive for varying the drive force in dependence upon the inclination of said head.

4,173,837
MICROFILM JACKET MICROFILM FEEDING DEVICE AND PROCESS
Paul A. Kiejzik, 2907 Monterey Ct., Springfield, Pa. 19069
Division of Ser. No. 611,004, Sep. 8, 1975, Pat. No. 4,003,187. This application May 13, 1976, Ser. No. 845,483
Int. Cl.[2] G09F *1/10*
U.S. Cl. 40—159 3 Claims



1. A microfilm jacket having upper and lower elongated sheets extending between proximal and distal ends thereof with fused opposing faces positioned one above the other and the fused opposing faces being in contact and fused to one-another at spaced-apart lines, said lines defining a storage through-space conduit along a longitudinal axis of the upper and lower

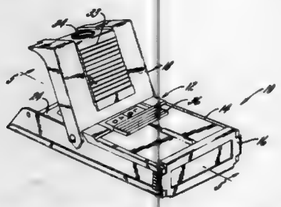
elongated sheets, and the storage through-space conduit having an outlet opening between said upper and lower elongated sheets at said distal end, said upper elongated sheet having a plurality of insert openings in series, and said plurality and said outlet opening being in common communication with through-space of said storage throughspace conduit; and said upper elongated sheet including slit-structures each forming one of said insert openings as a normally-closed arced slit extending up to one of said spaced-apart lines at each of opposite ends of the normally-closed arced slit, each normally-closed arc slit extending transversely to said longitudinal axis; and for each of said plurality, said slit structure consisting of a first section of the upper elongated sheet having a lower concave lip and in opposing relationship thereto on upper convex lip of a second section of the upper elongated sheet, at least one of the normally-closed arced slits being positioned in a direction toward said proximate end, the upper convex lip extending toward the proximal end; each said upper convex lip along with its respective lower concave lip, and storage space of the storage through-space conduit, and said outlet opening jointly forming said storage through-space conduit for each insert opening of said series; said series extending between said proximal and distal ends; each said slit-structure being adapted to form an insertion open space receivable of a microfilm strip lengthwise when the lower concave lip is pressed downwardly sufficiently for said first section of an upper surface of said upper elongated sheet in a direction toward said proximal end to form an angle with said second section of an upper surface of said upper elongated sheet in a direction from the upper convex lip toward said distal end; whereby microfilm strip is optionally insertable through alternate ones of said insert openings.

4,173,838

COMPACT REPEATING SLIDE VIEWER

Joseph Antos, Rte. 1, Box 33, Big Rock, Ill. 60511

Filed Apr. 28, 1978, Ser. No. 901,214
Int. Cl.² G02B *27/02*
U.S. Cl. 40—366 **8 Claims**



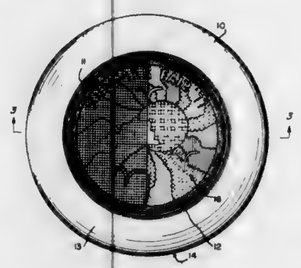
1. In a compact slide viewer, the combination comprising, a body portion having bottom and side walls, a slide carriage member longitudinally shiftable from one end of said body, said end of the body receiving the slide carriage defining a slide storage compartment and the opposite end of the body defining a slide viewing compartment having a translucent window therein, viewer lid means carrying a magnifying lens pivotally mounted to said body above the viewing compartment, a spring actuated tongue means disposed in said storage compartment, said slide carriage having an upper wall member defining a feeding edge, a shiftable member extending forwardly over said edge to retain slides in the storage compartment, a lower wall portion on said slide carriage including forwardly extending spaced fingers having upwardly extending hooks at their ends, at least one of said fingers having an inwardly directed tang, said tang causing the tongue to be retracted when the slide carriage is moved to its outwardly extended position and releasing the tongue upon reaching the substantially fully outwardly extended position of the slide carriage so that the stack is elevated to engage the uppermost slide with said feeding edge of the carriage whereupon inward movement of the carriage feeds the uppermost slide into the viewing compartment and outward movement of the carriage returns the viewed slide from the viewing compartment to the underside of the stack of slides in the storage compartment with said tongue being released from the stack while the viewed slide is being returned to the bottom of the stack.

4,173,839

AERODYNAMIC TOY

M. Jane Kovac, 1679 Elbur Ave., Lakewood, Ohio 44107

Filed Dec. 19, 1977, Ser. No. 861,647
Int. Cl.² A63H *33/18*
U.S. Cl. 46—74 D **9 Claims**



1. A flight-stable, aerodynamic toy, comprising:
a body element having an annular center section;
a flexible fabric material fixed in said center section;
a rim bounding said center section;
a convex wall bounding said rim;
said rim being tangential to said convex wall; and
means joined to said wall and cooperative therewith to define a reentrant-type cavity, having a greater transverse dimension therewithin than at the entry of said cavity, to cause said cavity to retain flight-sustaining air therewithin; wherein
said convex wall defines a convex surface which is smooth and devoid of any air-flow-disturbing protuberances and discontinuities;
said wall has a given thickness; and
said rim has a thickness greater than said given thickness, to rigidize and to lend hoop strength to said center section.

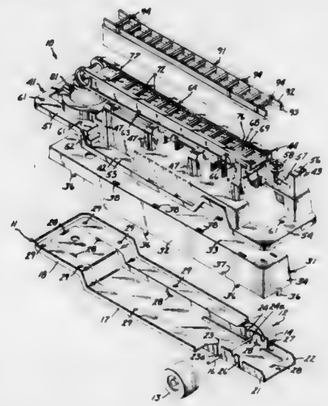
4,173,840

TURRET TOY VEHICLE

Curtis H. Fahrendorf, Anoka, and Delmar D. Berckhan, Wayzata, both of Minn., assignors to Tonka Corporation, Spring Park, Minn.

Filed May 31, 1977, Ser. No. 801,750
Int. Cl.² A63H *17/08*
U.S. Cl. 46—202 **16 Claims**

1. A toy fire engine comprising a body, wheel and axle assembly, aerial ladder and turret means, said turret means comprising:
a first turret member including a frustoconical side wall and a substantially flat upper wall, said side wall being intermediate said body and said upper wall, said side wall being integral with both said body and said upper wall, said side wall and said upper wall defining a cavity;
a second member including a frustoconical portion and an integral upwardly extending ladder support, said frustoconical portion being disposed within the cavity defined by said first member for rotational movement therein, said ladder support extending through said opening in said upper wall;
locking means for securing said second member within said first member and for securing said aerial ladder to said ladder support;



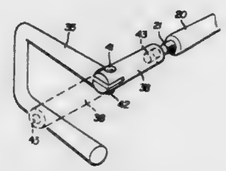
whereby said second member may be rotated within said first member thereby pivoting said aerial ladder about a central axis.

4,173,841

TOY HOOP GUIDE ROD

Richard K. Hensley, P.O. Box 151, Hazel Park, Mich. 48030

Filed Mar. 13, 1978, Ser. No. 885,508
Int. Cl.² A63H *33/02*
U.S. Cl. 46—220 **2 Claims**



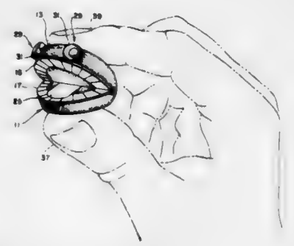
1. A guide rod for rolling and guiding a toy hoop, comprising:
a U-shaped guide member formed of a base with integral legs;
the end of one of said legs being formed with an axially extending tongue portion having a transverse opening formed therethrough;
a short shaft having a slot for receiving said tongue and an opening arranged transversely of the slot;
said shaft being mounted upon said guide member by engaging said tongue within said slot and securing same therein by means of a mechanical fastener extending through said openings;
said shaft being adapted to be arranged to extend perpendicular to the plane of said guide member in either one or an opposite direction for either right hand or left hand use;
the opposite end of said shaft having a coupling means formed thereon and an elongated handle member provided with a corresponding coupling means for interengaging with said shaft to thereby provide the completed guide rod.

4,173,842

FINGER PUPPET

Rodney D. Bahner, 2835 Will Rogers Pl., Anchorage, Ak. 99503

Filed Nov. 11, 1977, Ser. No. 850,751
Int. Cl.² A63H *3/00, 3/14*
U.S. Cl. 46—154 **7 Claims**



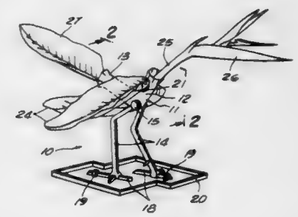
1. A finger puppet, comprising:
a resilient sheet of material having a pair of rigid, planar jaws formed on one surface thereof and a relatively resilient and flexible portion formed adjacent to and underlying said one surface, said jaws delineated on said one surface by a substantially straight preferential fold line for said sheet; and
said substantially straight preferential fold line of said pair of jaws being formed such that, when said sheet is folded about said preferential fold line in a manner to close said jaws, the rigidity of said jaws delineated by said fold line forces said resilient, flexible portion of said sheet to stretch across said fold line, thus self-biasing said puppet to an open position.

4,173,843

DECORATIVE ARTICLE

Orlin G. Marble, 1216 S. Garfield Ave., Alhambra, Calif. 91801

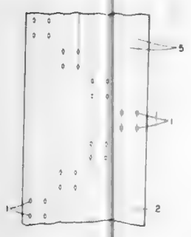
Filed May 15, 1978, Ser. No. 905,801
Int. Cl.² A01G *5/00*
U.S. Cl. 47—41 R **6 Claims**



1. An article of manufacture adapted to receive and support the leaves and flower of a bird of paradise plant in a manner simulating a road runner, said article comprising a generally V-shaped tubular main body supported from the apex thereof by a pair of talon-equipped end portion, one leg of said main body being adapted to receive the stem of a bird of paradise flower simulating the neck and head of a road runner, the other end portion of said main body being adapted to receive the stem of a bird of paradise leaf simulating the tail of a road runner, and said main body including provision for supporting the stems of a pair of paradise leaves extending downwardly and rearwardly along the opposite sides of said main body simulating the wings of a road runner.

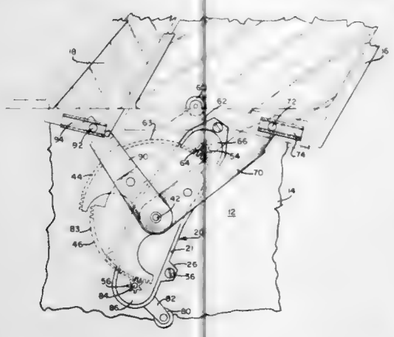
V9881/2 NO 13 79 UMI

4,173,844
LAMINAR SEED CARRIERS AND METHOD OF PREPARING SAME
Jürgen C. Knolle, Eschwege, and Hans Grimm, Meinhard, both of Fed. Rep. of Germany, assignors to Saat- und Erntetechnik GmbH, Eschwege, Fed. Rep. of Germany
Filed Jan. 6, 1978, Ser. No. 867,335
Int. Cl.[2] A01C 7/04
U.S. Cl. 47—56 24 Claims



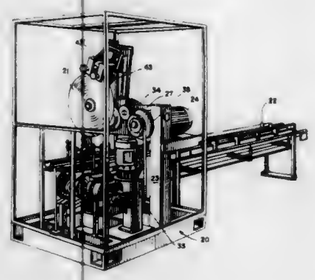
1. A method of preparing a laminar seed carrier in which a support comprising a paper web of tangled short, smooth individual fibres is provided with at least one patch of an adhesive substance, said support paper web having a weight of 15 to 25 g/m^2, a thickness of 0.01 to 0.05 mm, a breaking load of 1000 to 1500 pounds and ash content of 15 to 23 g/m^2, seeds are applied to the patch or patches of adhesive substance, an upper paper web comprising a porous web having a lower weight than the support paper web is placed over the seeds and bonded to the support paper web and is treated simultaneously with one or more powdered water-storing substances to incorporate the powdered water-storing substances within the pores of the upper paper web, said upper paper web comprising cellulose wadding having a weight of 16 to 19 g/m^2, a thickness of 0.005 to 0.02 mm and a pore volume for air of more than 20%, related to the paper surface.

4,173,845
UNITARY REGULATOR MECHANISM FOR MULTIPLE WINDOW PANELS
Max O. Heesch, Brooklyn, Mich., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Jan. 18, 1974, Ser. No. 434,632
Int. Cl.[2] E05F 11/44
U.S. Cl. 49—350 6 Claims



1. A mechanism adapted for controlling the reciprocating movement of a first planarly slidable window panel and a second planarly slidable window panel with each panel independently slidable between fully raised, lowered and intermediate positions independently of one another within a common sliding plane, said mechanism comprising a first rotatable operating arm and means for changing rotational movement of said arm into reciprocal movement of said first panel, a second rotatable arm and means for changing the rotational movement of said second arm into a reciprocal movement of said second second panel, a common pivotal shaft for both said arms, a sector gear secured to each arm, for causing rotation of the respective rotatable arms on rotation of said sector gears, both said sector gears mounted for rotation independently of one another on said common pivotal shaft, and means for driving each sector gear independently of the other sector gear to reciprocate the windows independently of one another, each said driving means including a pinion gear in mesh with a respective one of said sector gears, and a unitary structural plate for mounting said pinion gears and said common pivotal shaft, and wherein said unitary structural plate is configured to secure said entire mechanism to a flat wall, said plate including a central socket area for said pivotal shaft, said wall and opposed sockets spaced from said shaft for said pinion gear mountings.

4,173,846
ORBITAL SAW SHARPENING DEVICE
Gary F. Steiner, and James F. Campbell, both of Green Bay, Wis., assignors to Paper Converting Machine Company, Green Bay, Wis.
Filed Jan. 23, 1978, Ser. No. 871,235
Int. Cl.[2] B24B 3/46
U.S. Cl. 51—248 5 Claims

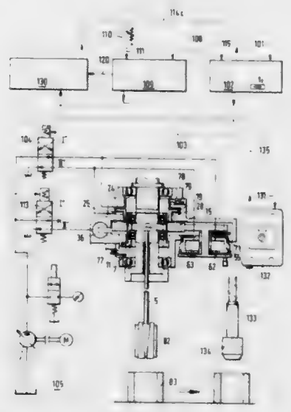


1. In an orbital saw, a frame, a disc supporting member rotatably mounted on said frame, a disc saw eccentrically mounted on said member for movement through a vertical orbit upon rotation of said member, means on said frame for rotating said disc saw independently of the rotation of said member, a conveyor mounted on said frame for advancing logs through said orbit, and a subframe equipped with a sharpening device for the edge of said saw, said subframe being journalled on said member and pivotally, slidably mounted on said frame for contacting said edge throughout the orbit thereof while maintaining a predetermined attitude relative to said saw.

4,173,847
FEEDING DEVICE FOR A CHIP REMOVING TOOL FOR MACHINING BORES IN WORKPIECES, ESPECIALLY A HONING TOOL
Heinz Gehring; Albert Bender, both of Ostfildern; Günter Richter, Nabern, and Reinhard Fröschle, Ostfildern, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Gehring Gesellschaft mit beschränkter Haftung & Co. Kommanditgesellschaft, Ostfildern-Nellingen, Fed. Rep. of Germany
Filed Aug. 4, 1976, Ser. No. 711,483
Claims priority, application Fed. Rep. of Germany, May 5, 1976, 2619741
Int. Cl.[2] B24B 5/10
U.S. Cl. 51—34 J 30 Claims

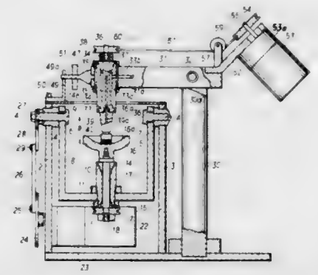
12. A feeding device for a machine tool; a housing, a spindle rotatable in the housing, an axially displaceable feed rod on the

axis of said spindle having one end in said spindle and the other end adapted for connection to tool means, fluid operable piston means in the housing operable for urging said feed rod in at least one direction, feed means for incrementally adjusting the axial position of said feed rod relative to the spindle, and electric actuating means operable for automatically operating at



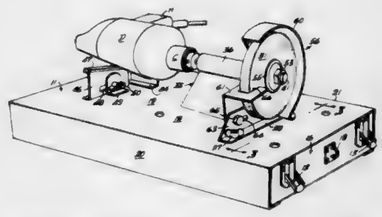
least feed means, load sensitive means responsive to a predetermined axial load imposed on said feed rod by a workpiece engaged by tool means on the feed rod for interrupting the incremental feeding of said feed rod, said load sensitive means comprising a lever actuated by movement of said piston means away from advanced position, and a control switch actuated by movement of said lever.

4,173,848
POLISHING DEVICE
Hitoshi Ikeno, Tokyo, Japan, assignor to Kabushiki Kaisha Seikosha, Japan
Filed Aug. 3, 1977, Ser. No. 821,573
Claims priority, application Japan, Aug. 3, 1976, 51-92483; Aug. 3, 1976, 51-92484; Aug. 3, 1976, 51-92485
Int. Cl.[2] B24B 13/00, 41/04
U.S. Cl. 51—55 6 Claims



1. A device for polishing a convex surface of a quartz oscillator comprising a base, an oscillating member, means mounting said oscillating member on said base for oscillation about a horizontal axis, a lapping dish disposed on said oscillating member and having an upwardly facing concave spherical lapping surface having a center of curvature essentially coinciding with the axis of oscillation of said oscillating member, a support arm pivotally mounted on said base for pivotal movement about a horizontal axis between an upper raised position and a lower operative position, a hollow shaft carried by said arm in position to be essentially vertical when said arm is in operative position, said shaft having an axially extending bore, a chuck for holding a quartz blank on the lower end of said shaft in position to engage said lapping surface of said lapping dish, said chuck being supported on said shaft by a ball and socket joint permitting limited tilting of said chuck relative to said shaft and having a surface for receiving and positioning said blank and suction passages leading to said blank receiving surface, means connecting said passages with said bore of said shaft, means for applying suction to the bore of said shaft and hence to said chuck and to said passages and said blank receiving surface to hold said chuck on the lower end of said shaft by suction and to hold a blank on said blank receiving surface of said chuck by suction, means for oscillating said oscillating member about said oscillation axis and means for concurrently rotating said chuck and said lapping dish relative to one another.

4,173,849
ELECTRIC HAND DRILL POWERED PORTABLE GRINDER
Sergio R. Mar, Mapimi #45, Mexico City, Mexico (2)
Filed Nov. 18, 1977, Ser. No. 852,941
Int. Cl.[2] B24B 9/00
U.S. Cl. 51—98 R 6 Claims



1. An electric hand drill powered tool for use with an electric hand drill having a drill body portion journalling a drive chuck at one end thereof and a hand grip portion extending sidewardly outwardly of the drill body portion, comprising, in combination, a support base structure having a flat upper surface, a drive spindle, means for journalling said drive spindle in spaced parallel relation above said flat upper surface, said drive spindle having a driven end spindle shaft portion extending outwardly of one end of said journalling means, said drive spindle having a driving end spindle shaft portion extending outwardly of other end of said journalling member, means for adjustably supporting said electric hand drill above said flat upper surface so that the chuck thereof is in rotative alignment with said drive spindle for engagement with said driven end of said spindle shaft portion, a rotatively driven tool, means for drivingly interconnecting said rotatively driven tool with said driving shaft spindle portion, said adjustable electrical hand drill supporting means comprising a first upstanding bracket fixed upon said support base structure and having an elongated upper surface portion parallel with and laterally off-set to one side of the axis of rotation of said drive spindle for supporting, from below, the hand grip portion of said electric hand drill, a second support bracket extending upwardly of said upper surface of said support base structure for supporting, from below, the body portion of said electric hand drill, the upper end of said second bracket being elongated and defining an acute angle with respect to said flat upper surface, means for adjustably securing said second bracket in the direction perpendicular to the axis of rotation of said drive spindle for accommodating hand drills having body portions of different sizes, said base support structure being of rectangular box-like structure, a cover member attachable in enclosing relation with respect to said upper surface of said support base structure, and a sliding drawer housed by said support base structure.

4,173,850

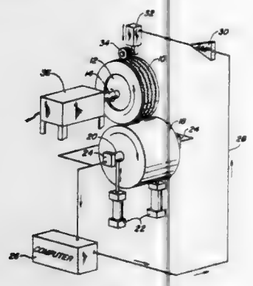
METHOD FOR REDUCING TANGENTIAL FORCE VARIATION IN PNEUMATIC TIRES

Kenneth J. Gormish, Tallmadge, and Clarence Hofelt, Jr., Hudson, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 614,381, Sep. 18, 1975, Pat. No. 4,128,969. This application Apr. 26, 1978, Ser. No. 900,399

Int. Cl.[2] B24B *1/00*

U.S. Cl. 51—281 R **1 Claim**



1. In a method for reducing tangential force variations in a pneumatic tire, which comprises the steps of:
(a) rotating the tire at a speed greater than 300 rpm against a predetermined load;
(b) sensing and measuring the force variations in the tangential direction while the tire is rotating;
(c) determining the magnitude of the tangential force variations and the location of maximum magnitude of tangential force variations;
(d) comparing said magnitude to a predetermined level to determine if the force variations are within acceptable limits; wherein the improvement is characterized by:
(e) grinding rubber only from the inner ribs of the tire at a reduced tire rotational speed at the location of maximum magnitude of the tangential force variations if the tangential force variations exceed acceptable limits.

4,173,851

BARREL POLISHING PROCESS

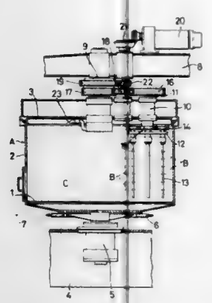
Yasunaga Higashi, 171-1, Kotsuki-cho, Kashihara-shi Nara-ken, Japan

Filed Jan. 18, 1978, Ser. No. 870,928

Claims priority, application Japan, Jan. 29, 1977, 52-8904

Int. Cl.[2] B24B *1/00, 31/02*

U.S. Cl. 51—317 **1 Claim**



1. A process for abrading pieces to be finished, comprising rotating a barrel containing an abrasive at a sufficiently high speed to form a substantially uniform thickness layer of abrasive on the inner peripheral surface of said barrel with the density of the abrasive in the layer varying in the radial direction of the barrel and the density in the layer parallel to the axis of rotation and at any particular radius being substantially uniform, and rotating the pieces within the layer of abrasive around an axis parallel to the axis of rotation of the barrel with the pieces spaced from said parallel axis, while simultaneously rotating said pieces around an axis of the pieces which is also parallel to the axis of rotation of the barrel.

4,173,852

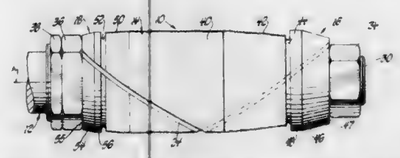
EXPANDABLE TOOL INCLUDING CUTTING SECTION AND PILOT

Paul Fitzpatrick, Southfield, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Jun. 8, 1978, Ser. No. 913,612

Int. Cl.[2] B24B *5/00*

U.S. Cl. 51—355 **6 Claims**



1. A rotatable cutting tool including an expandable cutting section and a leading end having an expandable pilot which expands with the cutting section; the cutting section including a cylindrical cutting portion and a tapered cutting portion of a frustoconical shape whose large end is adjacent the cylindrical cutting portion and whose small end is located adjacent the pilot, said pilot including a tapered surface of a frustoconcial shape that extends away from the cutting section, the pilot also including a cylindrical surface which is located between the tapered pilot surface and the tapered cutting portion of the cutting section, and th cylindrical surface of the pilot having a diameter which is larger than the diameter of the small end of the tapered cutting portion and slightly smaller than the diameter of the cylindrical cutting portion.

4,173,853

MODULAR CHURCH STEEPLE

Gilbert J. Logan, 502 S. 12th St., Leesburg, Fla. 32748

Filed Aug. 28, 1978, Ser. No. 937,042

Int. Cl.[2] E04H *12/00*

U.S. Cl. 52—57 **20 Claims**



1. A modular church steeple comprising in combination:
a plurality of stackable modular spire units, each of a different size from the other spire units, and each shaped to fit at least partially into the next larger spire unit through an opening in the bottom of the next larger spire unit, and each spire unit top having a mast opening therein;
an elongated mast for assembly of each modular spire unit thereonto, said mast extending through said bottom opening and through said top mast opening of each modular spire unit;
coupling means for coupling each spire unit to the adjacent spire unit along said elongated mast;
cap means for attaching to said mast top to lock said modular spire unit onto said mast; and
means to attach said mast and attached modular spire units onto a roof, whereby a modular church steeple has stackable modular spire units which may be easily assembled into a steeple spire.

4,173,854

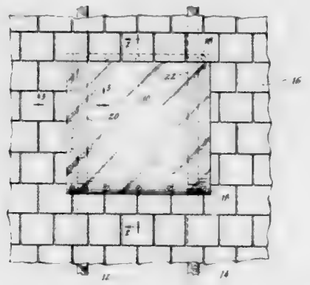
BOWED SKYLIGHT

Martin A. Wallerstein, 29 Oakwood Ave., Norwalk, Conn. 06851

Filed Mar. 13, 1978, Ser. No. 885,887

Int. Cl.[2] E04B *7/18;* **E04D** *13/03*

U.S. Cl. 52—200 **9 Claims**



1. For installation in a roof opening having at least two exposed rafters, a low cost skylight comprising:
a plurality of rafter bow members, each having a convex edge and an opposite straight edge, said straight edge being in contact with one of the exposed rafters;
a sheet of flexible, light-transmitting material overlaying said rafter bow members and extending beyond the ends of said rafter bow members;
means for securing opposite edges of said sheet to the roof;
sealing means for establishing a watertight seal between the lower surface of said sheet of material and the upper surface of each of said rafter bow members.

4,173,855

PREFABRICATED BUILDING FRAME STRUCTURE

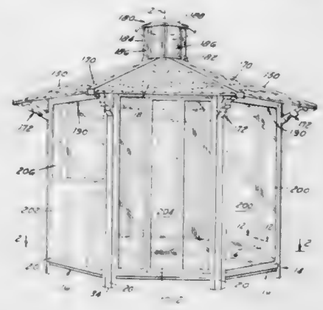
Harry C. Raptoplous, Bloomfield Hills, Mich., assignor to Obezag Design and Development Corporation, Detroit, Mich.

Filed Jun. 16, 1977, Ser. No. 807,097

Int. Cl.[2] E04B *7/00*

U.S. Cl. 52—82 **17 Claims**

1. A prefabricated building frame structure of octagonal configuration and having a centrally located vertical axis, said frame structure comprising a structural support system, said structural support system consisting essentially of eight vertical support columns of equal length and of generally identical configuration, each column being spaced an equal distance from said axis and being spaced equal distances from adjacent columns to form the octagonal configuration, the upper end portion of each of said support columns being notched to form a recess, a floor system carried by said support system above ground level, and a roof system carried solely by said eight vertical support columns of said support system, said floor and roof systems having collars, each with eight sides, said collars being vertically spaced apart and located on said vertical axis, the sides of said floor collar and said support columns having upwardly opening clips secured thereto, said floor system including joists of equal length, one for each collar side and corresponding column, said joists extending horizontally from said floor collar to said support columns, said joists being provided with downwardly extending locking flanges at the ends thereof which are interlocked with and carried by said upwardly opening clips, the sides of said roof collar and the upper end portions of said support columns being provided



with fastening brackets, said roof system including rafters of equal length one for each side of the roof collar and corresponding support column, each of said rafters extending from said roof collar in a downwardly direction towards the corresponding support column and including an end portion seated in the recess and overhanging the support column, and mechanical fastening devices for securing said rafters to the brackets of said roof collar and to the brackets of said support columns.

4,173,856

ANCHOR FOR THE TILT-UP AND TRANSPORT OF PREFABRICATED BUILDING COMPONENTS

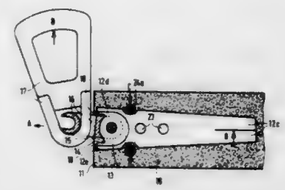
Siegfried Fricker, Wurmberger Strasse 30-34, 7135 Wiernsheim, Fed. Rep. of Germany

Filed Feb. 3, 1978, Ser. No. 874,815

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1977, 2704435; May 5, 1977, 2720148

Int. Cl.[2] E04B *21/12*

U.S. Cl. 52—125 **20 Claims**



1. An anchor element adapted for use with a hoisting shackle of the type having a shackle body and a locking bolt which is engageable across an attachment opening of the shackle body, for the tilt-up and transport of heavy building components, such as prefabricated concrete wall members, supporting columns, and the like, which, in the course of manufacture, transportation, and installation, may have to be reoriented from a horizontal to a vertical orientation, or vice versa, the anchor element being intended to be permanently embedded in the building component, in such a way that an end portion thereof is exposed within a recess, for attachment of the hoisting shackle, the anchor element comprising:

an elongated element body of which said exposed end portion constitutes a first length portion, with a thickness which matches the width of said shackle body attachment opening, the element body having an adjoining second length portion which serves as an anchoring portion and which includes, for that purpose, means for rigidly retaining the element in the building component, when embedded therein;

a transverse hole in said exposed length portion extending through the thickness of the element body, the hole being of a size to allow insertion of said locking bolt therethrough and arranged at such a distance from the extremity of the exposed length portion that a bridge portion is formed between the hole and the exposed extremity; and

said bridge portion includes at least one longitudinal extension of the anchor element body defining at least one force-transmitting surface thereon which is oriented to abut against a cooperating surface portion of the body of the hoisting shackle, when the latter is attached to the anchor element, thereby preventing the hoisting shackle from pivoting about the pivot axis defined by said transverse hole in the exposed anchor portion and the engaged locking bolt, into contact with the wall surrounding said recess, when the shackle is pulled in a direction which creates such a pivoting tendency.

4,173,857

DOUBLE-LAYERED WOODEN ARCH TRUSS

Yoshiharu Kosaka, To-113-2, Aza komagano, Terai machi, Nomi gun, Ishikawa ken, Japan

Filed Nov. 22, 1977, Ser. No. 854,074
Int. Cl.² E04B *1/32*
U.S. Cl. 52—642 **1 Claim**



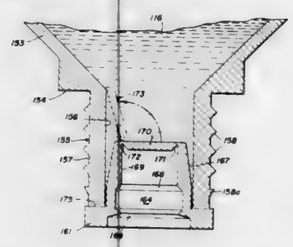
1. A building structure comprising; a plurality of double-membered wooden arch trusses each having an upper arch member formed of laminated wood, a lower arch member formed of laminated wood and extending substantially parallel to said upper arch member and spaced therefrom, a plurality of substantially radially extending connecting pillars connected between said arch member and spaced along said arch member, a plurality of reinforcing web member connected between said upper and lower arch members and extending diagonally across the space between said connecting pillars, and a plurality of metal reinforcing rods, one extending directly through each of said connecting pillars and said upper and lower arch members and having fastening means on the ends thereof for fastening said arch members and pillars into an integral structure; said trusses being positioned at spaced parallel positions along the building structure; a plurality of supporting posts, one at each end of each truss; a plate member extending along the top of the posts at each end of the trusses and having the ends of the trusses supported thereon; and a plurality of turnbuckles, one connected between the lower arch member of each truss and the plate member for adjusting the position of the truss on the plate member and constituting angle ties for said trusses.

4,173,858

SOAP DISPENSING SYSTEM

Antonio M. Cassia, Milan, Italy, assignor to Steiner Corporation, Salt Lake City, Utah

Filed Feb. 24, 1978, Ser. No. 880,766
Claims priority, application Italy, Oct. 6, 1977, 28347 A/77
Int. Cl.² B25B *7/28*; B67B *1/08*; B65B *51/22, 3/04*
U.S. Cl. 53—471 **25 Claims**



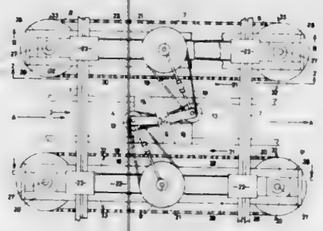
24. A method for forming an injection cartridge for use in refilling liquid soap dispensing containers, said method comprising the steps of providing a plastic squeeze bottle having a cylindrical neck terminating at a discharge end and defining a flow passage communicating with the interior of the bottle, filling the bottle with liquid soap through said neck, then inserting coaxially into said neck a cylindrical plastic sleeve closed at the inner end thereof by a thin closure wall, and then ultrasonically welding said plastic sleeve to said neck around the entire perimeter thereof for forming a fluid-tight closure for said bottle.

4,173,859

HARVESTING APPARATUS

Sydney A. Goldsmith; John A. Taylor, both of Christchurch, and Richard Kleinschafer, North Canterbury, all of New Zealand, assignors to Peco Limited, Christchurch, New Zealand

Filed Dec. 14, 1976, Ser. No. 750,405
Claims priority, application New Zealand, Dec. 15, 1975, 179552
Int. Cl.² A01D *46/00*
U.S. Cl. 56—330 **13 Claims**



1. A harvesting apparatus comprising,

a main frame,

ground-engaging wheels by which frame is supported,

a prime mover to effect relative movement between frame and ground,

at least a pair of spaced apart shaker head assemblies, each pair of shaker head assemblies mounted to one side of a longitudinal horizontal axis of said frame, each shaker head assembly having an input and output member each of which is mounted for rotational movement,

means disposed between said input and output members to convert high speed rotational movement into a torsional high speed vibration superimposed on said output member,

a mounting frame common to each pair of shaker head assemblies,

power transfer means which includes a transfer shaft supported by said mounting frame for transmitting high speed rotational movement to the input member of each head assembly of the pair of head assemblies of the mounting frame,

means coupling together the output members of each pair of head assemblies whereby the rotational and vibrational movement of one output member of the pair is the same as the other,

mounting means coupling said mounting frame to said main frame such as to permit said mounting frame and shaker head assemblies mounted thereon to be moveable transverse to said main frame and pivotable about the axis of said transfer shaft, and

at least one set of radially spaced tines or fingers positioned in operative connection with each output member.

4,173,860

TEXTURED SYNTHETIC FIBER YARN AND PROCESS FOR MAKING SAME

John R. McKlveen, 204 Norwood Dr., Colonial Heights, Va. 23834

Continuation of Ser. No. 554,642, Mar. 3, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 747,964
Int. Cl.² D02G *1/02*
U.S. Cl. 57—247 **6 Claims**

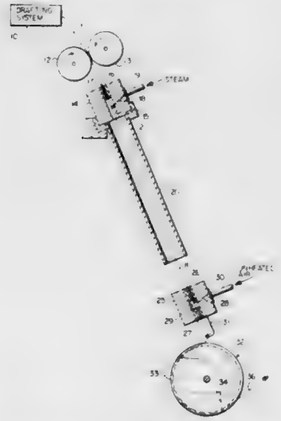
1. A process for making a textured continuous filament synthetic yarn consisting essentially of the steps of twisting two or more drawable fibers, drawing the fibers while in the twisted state thereby permanently fixing the twist in the fibers, and untwisting the fibers.

4,173,861

METHOD AND APPARATUS FOR CONTROLLING TWIST IN YARN

Alan H. Norris, and Phillip W. Chambley, both of Rome, Ga., assignors to WWG Industries, Inc., Rome, Ga.

Filed Nov. 11, 1977, Ser. No. 850,690
Int. Cl.² D02G *3/28, 1/16*
U.S. Cl. 57—293 **9 Claims**



1. A method of preparing a false-twisted singles yarn for incorporation in a plied yarn to obtain an increased ratio of ply twist to singles twist therein comprising the steps of

imparting a first predetermined amount of twist to the singles yarn strand in a first direction;

heating the twisted strand to a temperature at least as great as the glass transition temperature of the material;

subsequently cooling the twisted strand below the glass transition temperature; and

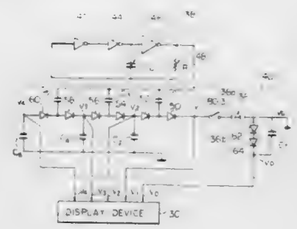
imparting a second predetermined amount of twist in the opposite direction to that portion of the strand which was subjected to said twisting, heating and cooling steps.

4,173,862

BOOSTER CIRCUIT FOR ELECTRONIC TIMEPIECE

Tadahiko Nakagiri, Higashimurayama; Kunihiro Daigo, Higashiyamato; Toshiaki Oguchi, Kodaira; Toshikazu Hatuse; Toshikazu Shimazaki, both of Tanashi; Shigeru Morokawa, Higashiyamato; Minoru Natori, Tokyo, and Hiroshi Ogawa, Tokorozawa, all of Japan

Filed May 25, 1977, Ser. No. 800,251
Claims priority, application Japan, Jun. 1, 1976, 51/63831; Jun. 9, 1976, 51/66449
Int. Cl.² G04C *3/00*
U.S. Cl. 58—23 BA **4 Claims**



1. In an electronic timepiece having a power supply with first and second terminals and providing a battery voltage potential, and a source of clock pulses, a booster circuit for converting said battery voltage potential to a plurality of boosted output voltages, comprising:

boosting circuit means including a plurality of pairs of boosting diodes connected in series with the first terminal of said power supply and having outputs, respectively, a plurality of first capacitors each having one terminal connected to a junction of one of said pairs of said boosting diodes and another terminal connected to said source of clock pulses, a plurality of second capacitors each having one terminal connected to an input of one of said pairs of boosting diodes and another terminal coupled to the second terminal of said power supply, and a plurality of output leads on which said plurality of boosted output voltages appear, respectively, each of said output leads being connected between an input of one of said pairs of boosting diodes and one of said plurality of second capacitors; and

voltage compensating means connected to said second terminal of the power supply and adapted such that the current flow therethrough which is dependent upon said plurality of boosted output voltages produced by said boosting circuit means compensates for an unbalance of said plurality of boosted output voltages applied to said plurality of output leads.

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4,173,863

ANALOG QUARTZ TIMEPIECE

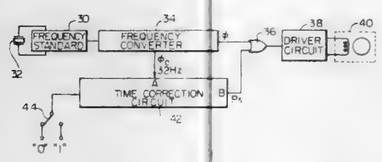
Jinro Motoki, Hoya; Singo Ichikawa, Sayama; Kenzi Miyasaka, Tokyo; Hiroyuki Uematsu, Kunitachi; Mitsuhiro Murata, Tokyo; Hideyuki Kawashima, Higashi-Kurume; Yuri Inoue, Higashimurayama; Masae Ohkubo, Niiza, and Mituo Oooka, Tokorozawa, all of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Dec. 20, 1976, Ser. No. 752,648

Claims priority, application Japan, Dec. 25, 1975, 50-159485; Mar. 19, 1976, 51-30437; Apr. 9, 1976, 51-039297; Apr. 10, 1976, 51-040531; Apr. 10, 1976, 51-40532; Apr. 19, 1976, 51-48000[U]; Apr. 19, 1976, 51-44235; Jun. 22, 1976, 51-73538[U]; Jun. 23, 1976, 51-73537; Jun. 23, 1976, 51-74201; Sep. 14, 1976, 51-110497; Sep. 14, 1976, 51-110498; Sep. 14, 1976, 51-110499

Int. Cl.[2] G04B *27/00*

U.S. Cl. 58—85.5 37 Claims



1. An electronic timepiece having a driver circuit to drive an electro-mechanical transducer connected to time-indicating hands to display time information, comprising, in combination:

a frequency standard to provide a relatively high frequency signal;

means for dividing down said relatively high frequency signal to provide a first low frequency signal as a time unit signal and a second low frequency signal at a predetermined higher frequency than said first low frequency signal;

a manually operated external control member adapted to provide set signals when said control member is actuated; and

correction signal generating means for generating high speed and low speed correction signals in response to said set signals and comprising first circuit means including timer means for generating an output signal when one of said set signals is maintained at a predetermined logic level for a prescribed time interval and gate means responsive to said output signal and said second low frequency signal to provide said high speed correction signal of said predetermined higher frequency, and second circuit means responsive to said set signals to provide said low speed correction signals when said external control member is actuated for a short time interval less than said prescribed time interval;

said driver circuit being normally responsive to said time unit signal to drive said electro-mechanical transducer to advance said time-indicating hands at a normal speed and responsive to said high speed correction signal of said predetermined higher frequency to drive said electro-mechanical transducer so as to advance said time-indicating hands at a higher than normal speed, said driver circuit being also responsive to said low speed correction signals to drive said electro-mechanical transducer so as to advance said time-indicating hands a predetermined number of steps when said external control member is actuated for said short time interval.

4,173,864

SECONDARY AIR FEED CONTROL DEVICE

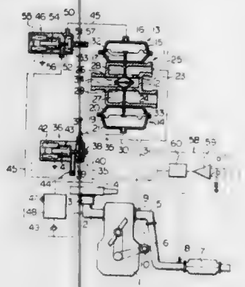
Keiso Takeda, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 8, 1977, Ser. No. 849,621

Claims priority, application Japan, Aug. 24, 1977, 52-100577

Int. Cl.[2] F01N *3/10*

U.S. Cl. 60—276 9 Claims



1. A secondary air feed control device of an internal combustion engine having an intake passage and an exhaust passage equipped with a three way catalytic converter, said device comprising:

means for detecting the total air-fuel ratio to provide a detecting signal indicating that the total air-fuel ratio is smaller than the stoichiometric air-fuel ratio;

an air pump driven by the engine;

a secondary air inlet opening into the exhaust passage located upstream of the three way catalytic converter; and

valve means comprising a valve chamber connected to said air pump, a first valve port communicating said valve chamber with said secondary air inlet, a second valve port communicating said valve chamber with the atmosphere, an air valve co-operating with said first and said second valve ports, means actuating said air valve in response to said detecting signal for reducing the opening speed of said air valve when it opens said first valve port and for increasing the closing speed of said valve when it closes said first valve port in accordance with the reduction in the level of the load of the engine, said actuating means comprises a first actuating device and a second actuating device co-operative with said first actuating device, said first actuating device comprises a first vacuum operated diaphragm apparatus for actuating said air valve to close said first valve port, said second actuating device comprises a second vacuum operated diaphragm apparatus for actuating said air valve to open said first valve port, and said first vacuum operated diaphragm apparatus has a vacuum chamber normally connected to the intake passage via a switching valve which connects said vacuum chamber to the atmosphere via a restricted opening in response to said detecting signal when the total air-fuel ratio becomes smaller than the stoichiometric air-fuel ratio.

4,173,865

AUXILIARY COIL ARRANGEMENT

George N. Sawyer, Flint, Tex., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 25, 1978, Ser. No. 899,777

Int. Cl.[2] F25B *13/00*

U.S. Cl. 62—324 13 Claims

9. In a refrigeration heat pump system of the type including a compressor; a fluid reversal means for switching said system between a cooling and heating mode; an indoor heat exchanger; a first flow conduit connecting said reversal means to one end of said indoor heat exchanger; an outdoor heat exchanger; a second flow conduit connecting said reversal means to one end of said outdoor heat exchanger; a liquid line conduit connecting the other end of said heat exchangers; first expansion means in flow arrangement intermediate said liquid line conduit and said outdoor heat exchanger for permitting refrigeration flow only in the direction toward said outdoor heat exchanger, and second expansion means in flow arrangement intermediate said liquid line conduit and said indoor heat exchanger for permitting refrigerant flow only in the direction toward said indoor heat exchanger; means for conducting refrigerant in a first closed circuit path when said heat pump is operating in said cooling mode from said compressor through said reversal means to said outdoor heat exchanger, said liquid line, and then through said second refrigerant expansion means to said indoor heat exchanger and back to said compressor; said reversal means being adapted to be repositioned to place said system in the heating mode to allow refrigerant from said compressor to flow in a second closed circuit path to said indoor heat exchanger, said liquid line, and then through said first refrigerant expansion means to said outdoor heat exchanger and then back to said compressor, means for increasing the capacity of the heat pump system, comprising:

an auxiliary coil arranged in the path of air passing over said outdoor heat exchanger, flow means having a first portion connecting one end of said auxiliary coil in said system between said first expansion means, and the other end of said outdoor heat exchanger, and a second portion connecting the other end of said auxiliary coil to said liquid line so that said auxiliary coil is in parallel flow arrangement with said first expansion means;

valve means in said first portion of said auxiliary coil flow means responsive to the direction of refrigerant flow for permitting refrigerant flow only in one direction so that in said cooling mode refrigerant flow from said outdoor heat exchanger that is blocked from by-passing said auxiliary coil by said first expansion means flow through said auxiliary coil to said liquid line to provide subcooling of liquid refrigerant, and in said heating mode refrigerant is permitted to flow from said liquid line through said first expansion means and said outdoor heat exchanger with a portion of said refrigerant flowing from said liquid line through the second portion of said auxiliary coil flow means into said auxiliary coil with said portion of refrigerant being blocked from flowing therethrough by said valve means, thereby causing said portion of liquid refrigerant to be stored in said auxiliary coil;

an auxiliary coil arranged in the path of air passing over said indoor heat exchanger, flow means having a first portion connecting one end of said auxiliary coil in said system between said second expansion means and the other end of said indoor heat exchanger and a second portion connecting the other end of said auxiliary coil to said liquid line so that said auxiliary coil is in parallel flow arrangement with said second expansion means;

valve means in said second portion of said auxiliary flow means responsive to the direction of refrigerant flow for permitting refrigerant flow only in one direction so that in said heating mode refrigerant flow from said indoor heat exchanger that is blocked from by-passing said auxiliary coil by said second expansion means flows through said auxiliary coil to said liquid line to provide subcooling of liquid refrigerant, and in said cooling mode refrigerant is permitted to flow from said liquid line through said second expansion means and said indoor heat exchanger with a portion of said refrigerant passing through said second expansion means flowing through said first portion of auxiliary flow means into said auxiliary coil with said portion of refrigerant being blocked from flowing therethrough by said valve means, thereby causing said portion of gaseous refrigerant to be stored in said auxiliary coil.

4,173,866

HYDRAULIC SYSTEMS

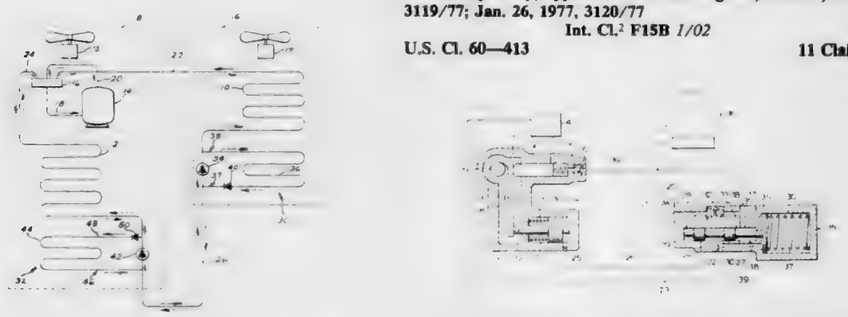
Glyn P. R. Farr, Leek Wooton, England, assignor to Girling Limited, Birmingham, England

Filed Jan. 23, 1978, Ser. No. 871,448

Claims priority, application United Kingdom, Jan. 26, 1977, 3119/77; Jan. 26, 1977, 3120/77

Int. Cl.[2] F15B *1/02*

U.S. Cl. 60—413 11 Claims



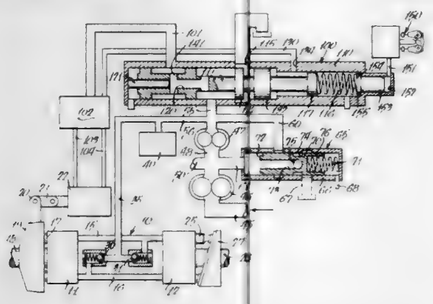
1. An hydraulic system comprising a tank for hydraulic fluid, an hydraulic accumulator, a pump for drawing hydraulic fluid from said tank to charge said accumulator, an unloader valve disposed in a supply line between said pump and said accumulator for preventing said accumulator from being overcharged and to allow said pump to re-charge said accumulator should the pressure of fluid therein fall below a desired minimum value, wherein said unloader valve incorporates a control valve, and a pressure responsive slave which is operated by fluid pressure under the control of said control valve, said control valve comprising a valve member which is movable between a first position in which said accumulator is isolated from said slave so that pump pressure is supplied to said accumulator, and a second position in which fluid pressure from said accumulator can act on said slave to render said slave operative to reduce said pump pressure or disable said pump, and a cut-out spring for biassing said valve member at all times towards said first position, said valve member having different effective areas of which a smaller area is subjected to a control pressure dependent upon the pressure in said accumulator and in response to which said valve member can move at a cut-out point from said first position into said second position, and a greater area is subjected to said pressure in said accumulator, at least when said valve member is in said second position, to determine a cut-in point at an accumulator pressure less than the pressure in said accumulator at the cut-out point and at which the valve member can move from said second position into said first position.

4,173,867

TRANSMISSION

Michael R. Schmidt, Ames, and David W. Reynolds, Huxley, both of Iowa, assignors to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 27, 1978, Ser. No. 881,710
Int. Cl.[2] F15B *21/04*
U.S. Cl. 60—456 19 Claims



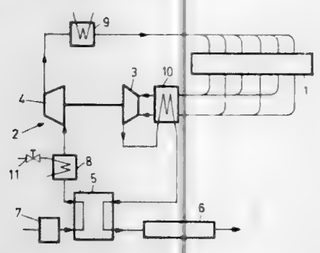
1. A transmission having hydraulic components with a lubrication circuit and a charge circuit, first and second positive displacement pumps in series with said first pump having a larger volume than the second pump, said lubrication circuit and second pump being operatively connected to the outlet of the first pump, said charge circuit being operatively connected to the outlet of said second pump, a fluid line connected between said lubrication circuit and charge circuit, and means in said fluid line for blocking fluid flow therethrough and operable in response to a predetermined drop in pressure in the lubrication circuit for opening said fluid line to permit fluid flow from the charge circuit to the lubrication circuit.

4,173,868

APPARATUS FOR HIGH PRESSURE-CHARGING AN INTERNAL COMBUSTION ENGINE

Alfred Wunsch, Baden, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed May 18, 1977, Ser. No. 798,081
Claims priority, application Switzerland, Jun. 29, 1976, 8280/76
Int. Cl.[2] F02B *33/42*
U.S. Cl. 60—612 8 Claims



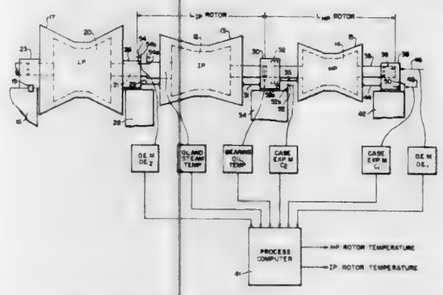
1. Apparatus for power generation, comprising:
an internal combustion engine;
an exhaust gas turbocharger machine; and
a gas-dynamic pressure-wave machine, the exhaust gas turbocharger machine and the gas-dynamic pressure-wave machine being connected in series on the exhaust gas side and on the air side with the internal combustion engine, with each machine providing one stage of a two stage combustion air compression and one stage of a two stage engine exhaust gas pressure drop.

4,173,869

APPARATUS AND METHOD FOR DETERMINING THE ROTOR TEMPERATURE OF A STEAM TURBINE

James A. Martin, Jr., Newtown Township, Delaware County; Harry F. Martin, Middletown, both of Pa., and William R. Berry, Camden, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 9, 1978, Ser. No. 876,396
Int. Cl.[2] F01K *13/02*
U.S. Cl. 60—646 5 Claims



1. In a steam turbine unit including a high temperature steam turbine comprising a casing housing a rotor and wherein said rotor has a critical minimum temperature to which it must be heated prior to fully loading the unit to prevent brittle fracture of said rotor, automatic means for indicating said rotor has been heated to at least said temperature, said means comprising:
a plurality of signal generating means, at least one of said means mounted adjacent said casing and at least another of said means mounted adjacent said rotor, said means generating signals corresponding to the axial dimensional changes of the respective adjacent turbine structure;
means for receiving the signals of said signal generating means and automatically indicating therefrom, based on a known relationship between axial expansion and temperature, the temperature of the rotor relative to the minimum critical temperature.

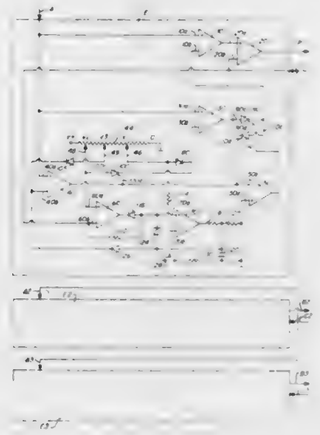
4,173,870

CONTROL SYSTEM AND METHOD

Judson S. Swearingen, and Leendert A. Beeloo, both of 2235 Carmelina Ave., Los Angeles, Calif. 90064

Filed Feb. 6, 1978, Ser. No. 875,183
Int. Cl.[2] F01D *17/00*
U.S. Cl. 60—702 31 Claims

1. A method of controlling fluid-driven systems, wherein the driving fluid is communicated to said systems through nozzles adjustable to determine the speed of operation of said systems, comprising the following steps:
(a) providing a control signal for controlling the speed of operation of such system;
(b) providing a speed signal, generated to correspond to the speed of operation of said system;
(c) generating a flow signal, based on said control signal and said speed signal, for controlling the nozzle of said system to effect the speed of operation of said system corresponding to said control signal;
(d) determining a critical speed interval, identified by a first control signal value and a second control signal value, and determining an intermediate control signal value corresponding to a speed of operation of said system within said critical speed interval;
(e) generating a protecting signal whenever the value of said control signal is within said critical speed interval such that, for values of said control signal between said first control signal value and said intermediate control signal value, said protecting signal value is determined by the difference between said value of said control signal and said first control signal value and, for values of said control signal between said intermediate control signal value and said second control signal value, said protecting signal value is determined by the difference between said value of said control signal and said second control signal value; and
(f) generating said flow signal, when the value of said control signal is within said critical speed interval, based on a first difference between said control signal and said protecting signal, and on a second difference between said first difference and said speed signal.

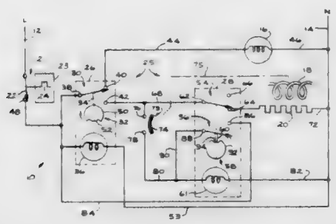


4,173,871

REFRIGERATION APPARATUS DEMAND DEFROST CONTROL SYSTEM AND METHOD

Robert B. Brooks, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 27, 1977, Ser. No. 864,972
Int. Cl.[2] F25D *21/00*
U.S. Cl. 62—80 11 Claims



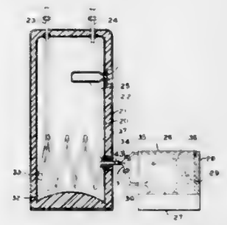
1. An automatically-defrosting refrigeration apparatus including a refrigerant evaporator, a heater for defrosting said evaporator, and a demand defrost control system, said demand defrost control system comprising:
a defrost control including means for establishing either a relatively shorter or a relatively longer interval between successive defrosting operations, said defrost control further including means for establishing the duration of a defrosting operation;
means for de-energizing said evaporator and energizing said heater upon initiation of a defrosting operation and for de-energizing said heater by at least the end of a defrosting operation;
a thermal sensor responsive to a predetermined evaporator temperature being reached during a defrosting operation; and
means responsive to said thermal sensor for selecting the interval before the next defrosting operation, the relatively shorter interval being selected if the predetermined temperature is not reached during a defrosting operation, and the relatively longer interval being selected if the predetermined temperature is reached during a defrosting operation.

4,173,872

WATER HEATER APPARATUS

Franklin R. Amthor, Jr., Murrysville, Pa., assignor to Energy Utilization Systems, Inc., Pittsburgh, Pa.

Filed Feb. 1, 1978, Ser. No. 874,328
Int. Cl.[2] F25B *27/02*
U.S. Cl. 62—238 18 Claims



1. In conversion of the heat source in existing electric water heaters, a hot water tank from which the lower electric resistance heating element has been removed, a heating coil inserted into the said tank through the orifice from which the said lower heating element was removed, said heating coil being helical and having inlet condenser tubing externally communicating with the compressor side of a refrigerating unit to receive hot refrigerant therefrom and being continuously sheathed along its length within said tank by a sheath tube in outwardly spaced relation to said inlet condenser tubing, outlet condenser tubing externally communicating with the evaporator side of said refrigerating unit to deliver relatively cooler refrigerant thereto and being continuously sheathed along its length within said tank by a sheath tube in outwardly spaced relation to said outlet condenser tubing, sheathed return cap engaging the innermost end of the said inlet and outlet condenser tubing and the innermost end of each said sheath tube adapted to preserve inter-space between said condenser tubing and said sheath, thermal conductive material filling the inter-space between the outside of said condenser tubing and the inside of said sheath, each said sheath terminating proximately outside said tank whereat said inter-spaces are open to the atmosphere or fragilely sealed, and a closure means outwardly engaging said sheaths and adapted to close the said orifice therearound.

4,173,873

APPARATUS ON A TEXTILE MACHINE FOR FEEDING YARN, SLIVER OR FIBROUS MATERIALS

Werner Sommer, Esslingen; Antonius Vinnemann, Stuttgart; Manfred Walter, Grötzingen; Willi Gaiser, Gäufelden; Heinrich Elsässer, Stuttgart; Wolfgang Brenner, Schlierbach, and Hermann Kress, Filderstadt, all of Fed. Rep. of Germany, assignors to Sulzer Morat GmbH, Filderstadt, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 869,790

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1977, 2701652; Nov. 10, 1977, 2750192

Int. Cl.[2] D04B *3/06, 15/48, 27/10, 35/00*

U.S. Cl. 66—125 R **32 Claims**



1. Apparatus for textile machines for feeding yarn, sliver or fibrous materials, wound on to fixed supply packages, with at least one endless track, having a working section and a return section, the said track having movable material transporting elements arranged on it to run around in series wherein the track is a single-path, O-shaped, floating-mounted track (**50, 90, 103**) and the materials (**16**) are fed to the movable elements (**19**) during their successive runs through the working section (**51, 115**) alternately from the one and the other side of a surface, laid through the working section (**51, 115**) and the return section (**52, 118**) of the track (**50, 90, 103**).

4,173,874

APPARATUS ON A TEXTILE MACHINE FOR THE FEEDING OF YARNS, SLIVERS OR OTHER FIBRILLAR MATERIALS

Werner Sommer, Esslingen; Antonius Vinnemann, Stuttgart; Manfred E. Walter, Grötzingen; Willi G. Gaiser, Gäufelden; Heinrich K. Elsässer, Stuttgart; Wolfgang A. A. Brenner, Schlierbach, and Hermann Kress, Filderstadt, all of Fed. Rep. of Germany, assignors to Sulzer Morat GmbH, Filderstadt, Fed. Rep. of Germany

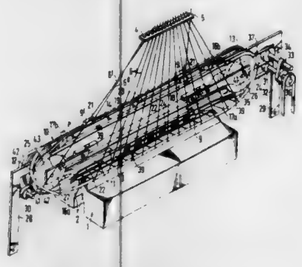
Filed Jan. 16, 1978, Ser. No. 869,757

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1977, 2701652

Int. Cl.[2] D04B *3/06, 15/48, 27/10, 35/00*

U.S. Cl. 66—125 R **27 Claims**

1. Apparatus for feeding yarn, sliver or fibrous materials wound on stationary supply packages to a textile machine, comprising a plurality of movable material transporting elements and a plurality of movable material laying-in elements for feeding the materials from the supply packages to the textile machine, endless tracks defining working and return sections for said transporting elements and working and return regions for said laying-in elements, said transporting elements and said laying-in elements running in series on said endless tracks, and means for avoiding entwining of the materials during successive runs of said elements on said tracks having at least one deflection element by means of which the materials are fed via said transporting elements to said laying-in elements, during successive runs thereof through the working region, alternately from one and another side of a surface laid



through the working region of said laying-in elements and the return section of said transporting elements.

4,173,875

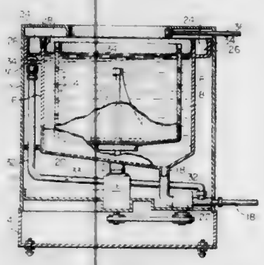
WASHING MACHINE

Otmax Suprapto, 4/245 Cleveland St., Redfern, N.S.W., Australia

Filed Jun. 30, 1978, Ser. No. 920,957

Int. Cl.[2] D06F *39/08*

U.S. Cl. 68—18 D **2 Claims**



1. A washing machine comprising a housing, a generally cylindrically-shaped outer tub disposed in said housing, an inner tub disposed within said outer tub, a vertical drive shaft disposed centrally of said inner tub, an agitator fixed to said vertical drive shaft, said inner tub having upstanding wall portions generally cylindrically-shaped and disposed generally concentrically of said outer tub, said wall portions having perforations therein, a motor disposed in said housing and operative to drive said drive shaft, said outer tub having an inclined bottom surface having a lowest point, a first drain line extending from said bottom surface lowest point of said outer tub, a pump in communication with said first drain line, said motor being operative to drive said pump, said pump being operative to move liquid through said first drain line, said outer tub having an open upper end forming a circular upper edge, a floor fixed to and extending outwardly from said outer tub and generally normal thereto, an upstanding circular wall fixed to an outer circular edge of said floor to define an annular open-top chamber bounded by said outer tub cylindrical wall and said upstanding circular wall, said outer tub cylindrical wall having holes therein placing said chamber in communication with upper regions of said outer tub, said floor of said chamber being inclined in its extent about said outer tub to define a chamber lowest point, a second drain line extending from said annular chamber lowest point and connected to said first drain line, and a one-way valve disposed in said second drain line and permitting flow from said chamber lowest point to said first drain line.

4,173,876

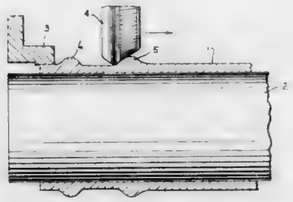
METHOD OF PRODUCING METAL TUBING

Kenneth A. Schaefer, Brookfield, Wis., assignor to Nudyne Corporation, Brookfield, Wis.

Filed Mar. 27, 1978, Ser. No. 890,361

Int. Cl.[2] B21D *22/16*

U.S. Cl. 72—83 **6 Claims**



1. A method of making metal tubes, comprising the step of producing a welded steel tubular blank having a diameter greater than 6 inches and having a longitudinal weld seam, disposing the tubular blank without prior machining on the outer surface of a cylindrical mandrel, applying radial pressure through a plurality of circumferentially spaced rollers to the outer surface of the tubular blank, affecting relative linear feeding movement between the rollers and the tubular blank, effecting relative rotational movement between the rollers and the tubular blank the axis of said blank, the combination of linear and rotational movement acting to reduce the wall thickness of the tubular blank to a final wall thickness in the range of 0.110 to 0.250 inch, and maintaining a ratio between the speed of linear movement in inches per minute and the speed of rotational movement in revolutions per minute per inch of tube diameter in the range of 0.006 to 0.012.

4,173,877

RING ROLLING MACHINE

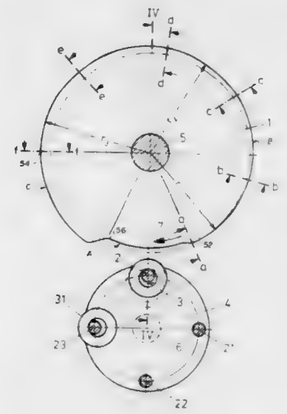
Heinz Kreiskorte, Dortmund, Fed. Rep. of Germany, assignor to Thyssen Industrie AG, Fed. Rep. of Germany

Filed Mar. 17, 1978, Ser. No. 887,559

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715611

Int. Cl.[2] B21H *1/06*

U.S. Cl. 72—105 **7 Claims**



1. A ring rolling machine for rolling a ring blank engaged over a mandrel roll which has an outside diameter smaller than the inside diameter of the ring blank, comprises a rotatable main roll having an annular curved surface, means rotatably supporting said main roll for rotation about an axis at a fixed distance from said mandrel, said surface being divided into a loading zone having a radius less than the spacing from said main roll axis to said ring blank, a rolling zone having a variable radius being curved with a constantly increasing value and including at least a portion of a radius to engage the ring blank during rotation to roll the ring blank to a defined shape, and a rounding zone extending between said rolling zone and said loading zone of a substantially constant radius.

4,173,878

METHOD OF MANUFACTURING TANGENTIAL EXPANDERS FOR OIL CONTROL PISTON RINGS

Rusaam S. Nemets, Sirenevy bulvar, 57, kv. 50; Efim S. Gorbulev, Tovarischesky pereulok, 9/11, kv. 5; Veniamin A. Parygin, ulitsa Malysheva, 18, kv. 200, all of Moscow; Jury M. Kontsov, ulitsa Krasnova, 1, kv. 58, Odessa; Viktor P. Moldavanov, Pionerskaya ulitsa, 10, kv. 6, Odessa; Mark A. Shaforenko, Sredne-Fontanny pereulok, 16/18, kv. 75, Odessa; Alexei K. Ignatiev, Volgogradsky prospekt, 71, kv. 167; Gennady S. Zaikovsky, Matveevskaya ulitsa, 4, korpus 1, kv. 148, both of Moscow, and Mikhail I. Volnyakov, ulitsa Malinovskogo, 31, kv. 95, Odessa, all of U.S.S.R.

Filed Jan. 17, 1978, Ser. No. 870,176

Int. Cl.[2] B23P *15/06*

U.S. Cl. 72—137 **2 Claims**



1. A method of manufacturing tangential expanders for oil control piston rings comprising the following operations: flattening round wire into a rectangular strip with rounded edges; bending the initial serpentine flat spring from said strip; forming thrust shoulders from segment portions of the serpentine spring; calibrating the thrust shoulders for height with simultaneous fixing of the serpentine spring along the pitch of its waves; bending a U-shaped profile in the cross section of the initial spring; coiling said spring into a spiral on a mandrel; heat-hardening the spiral fixed in a compressed state on the mandrel; and cutting said spiral into measured lengths, each constituting a tangential expander in the shape of an all-bent spring ring.

4,173,879

METHOD AND APPARATUS FOR FORMING A METAL STRIP

Francis Vecchiarelli, River Edge, N.J., assignor to Hunter Douglas International N.V., Netherlands

Filed Dec. 29, 1977, Ser. No. 865,395

Int. Cl.[2] B21D *5/08*

U.S. Cl. 72—179 **22 Claims**

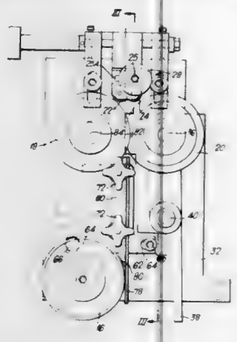
1. A method of forming a thin metal strip into a non-twisted slat with a shape having a transverse concave-convex bow, which metal strip may have stress therein tending to create twist in the finished slat, said method comprising the steps of:

(a) providing a supply of metal strip;

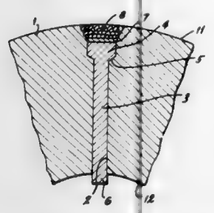
(b) feeding the strip to the nip of a pair of rolls rotatable about parallel axes and having complementary male and female peripheral forming surfaces;

(c) guiding the strip over a substantially straight path upstream of the nip of said forming rolls; and

(d) compensating for any twist inducing stress in said strip by adjusting the relative feed direction of the strip during said guiding with respect to said rolls in a plane passing through the nip and parallel to said axes.



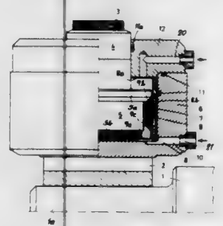
4,173,880
COOLED MANDREL
Helmut Landgraf, Duisburg, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany
Filed Apr. 6, 1978, Ser. No. 894,024
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2716315
Int. Cl.[2] B21B *25/04*
U.S. Cl. 72—201 **8 Claims**



1. A thick-walled hollow mandrel for rolling mills improved as follows:
- a plurality of radial bores in said mandrel wall arranged regularly in an axial as well as in a circumferential direction;
- a plurality of cooling fingers inserted in said bores and being composed of a good thermo-conductive material, said fingers having head portions respectively positioned in said radial bores in recessed relation to an outer surface of the mandrel; and a plurality of plugs of wear resistant metal which fill said recesses, said plugs comprising cladded layers of weld-deposited metal.

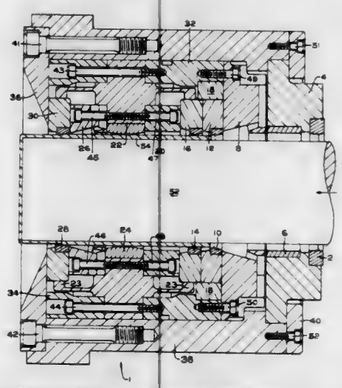
4,173,881
ROLLING STAND WITH HYDRAULIC ADJUSTMENT OF THE MILL ROLLS
Heinrich Rose, Kreuztal, Fed. Rep. of Germany, assignor to Schloemann-Siemag AG, Dusseldorf, Fed. Rep. of Germany
Filed Jun. 9, 1978, Ser. No. 914,144
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726140
Int. Cl.[2] B21B *31/32*
U.S. Cl. 72—245 **9 Claims**

1. The combination in a rolling-mill stand of:
- at least one displaceable roll provided with a bearing block and shiftable to adjust a rolling gap of the stand;
- at least one spindle rotatable for shifting said roll and in force transmitting relationship therewith; and
- a hydraulic device disposed between said spindle and said block, said hydraulic device comprising
- a cylinder pressurizable with a hydraulic medium at an elevated pressure, and a piston slideable in said cylinder,
- a sliding packing surrounding said piston and displaceable therewith relative to said cylinder, and



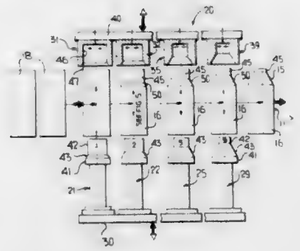
- a cylinder sleeve received within said cylinder and disposed between said packing and the cylinder wall, said sleeve being fixed relative to the cylinder, said device being provided with means for equalizing hydraulic medium pressure between the inner and outer surfaces of said sleeve upon pressurization of said cylinder, said sliding packing engaging said sleeve.

4,173,882
MOUNTING FOR IRONING DIES
Harry W. Lee, Jr., Chesterfield County, Va., assignor to Reynolds Metals Company, Richmond, Va.
Filed Jul. 24, 1978, Ser. No. 927,347
Int. Cl.[2] B21D *22/28*
U.S. Cl. 72—349 **7 Claims**



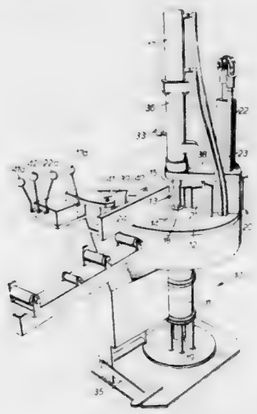
1. In a die set for forming drawn and ironed metal articles comprising a plurality of die nibs, a plurality of die casings holding said die nibs, means for lubricating said die set and means for deflectably mounting said die nibs and die casings the improvement wherein said means for deflectably mounting said die nibs and die casings comprises a metal ring having a plurality of metal fingers extending from said ring along its axis, said fingers having sufficient spring strength to permit said die nibs and die casings to deflect from and return to their original axially centered position.

4,173,883
NECKED-IN AEROSOL CONTAINERS
Arnold R. Boik, Orland Park, Ill., assignor to The Continental Group, Inc., New York, N.Y.
Filed Aug. 18, 1978, Ser. No. 934,924
Int. Cl.[2] B21D *22/00*
U.S. Cl. 72—354 **9 Claims**
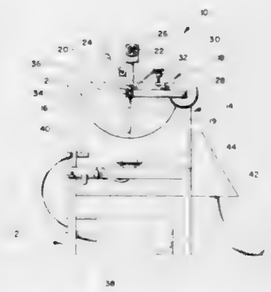


1. An apparatus for progressively necking-in an end portion of a tubular member, said apparatus comprising a plurality of inside tools each having a base portion of a first diameter, a free end portion of a second and lesser diameter, and a frustoconical intermediate portion, the first diameters of said inside tools being identical, the second diameters of said inside tools progressively decreasing, and said frustoconical intermediate portions progressively axially increasing in length, and an outside tool cooperable with each inside tool.

4,173,884
FORMING MACHINE FOR BENDING METAL BARS
Reginald P. Dobinson, 290 Murray St., Rockhampton, Queensland, Australia
Filed Feb. 15, 1978, Ser. No. 878,020
Int. Cl.[2] B21D *7/024*
U.S. Cl. 72—387 **9 Claims**



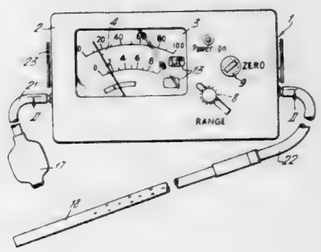
1. A forming machine including a table supported on a main frame and rotatable about a support axis; a mandrel adapted to extend from said table about said support axis; a selectively positionable back-stop member supported on said main frame and adapted for operative engagement with the workpiece to be formed about said mandrel; a jaw assembly on said rotatable table and adapted to be actuated to clamp said workpiece against said mandrel; means for rotating said table to form said workpiece about said mandrel, and means for axially displacing said mandrel to clear same from the formed workpiece.

4,173,885
STANDARD SURFACE ASSEMBLY FOR CALIBRATING A VARIABLE SPEED FRICTION TESTER
Tony L. Matlock, 4026 Greenleaf St., Raleigh, N.C. 27606
Filed Sep. 26, 1978, Ser. No. 945,874
Int. Cl.[2] G01L *25/00*
U.S. Cl. 73—1 R **9 Claims**



1. In a variable speed friction tester for testing pavement surfaces and determining the effective skid resistance thereof of the type including a frame structure with a pendulum type swing arm having a rubber wheel secured to one end and locked in at least one direction in order that the wheel will skid over an underlying surface during a test swing of the pendulum, the improvement comprising a standard surface assembly for calibrating said variable speed friction tester, said standard surface assembly including: base means adapted to be secured about the frame structure of said variable speed frictional tester and disposed such that during the testing operation said pendulum will swing thereover; a standard surface material secured about said base means and exposed such that the rubber wheel of said variable speed friction tester will engage the same as the pendulum is swung across said base means during the testing operation, and wherein said standard surface material is sufficiently porous to allow fluid to move therethrough; and means associated with said base means for directing fluid through said standard surface material for purging the same of foreign material such as rubber particles deposited by the rubber wheel.

4,173,886
GAS DETECTORS
Thomas Archbold, Whitley Bay, and Michael R. G. Sharp, Seaton Sluice, both of England, assignors to British Gas Corporation, London, England
Filed Jun. 27, 1978, Ser. No. 919,564
Int. Cl.[2] G01N *31/00*
U.S. Cl. 73—23 **9 Claims**



1. A portable gas detector having means for aspirating a sample of the atmosphere to be tested through a flow line in the detector into the vicinity of its gas-sensing means, and having

a water-trap associated with said flow line, wherein said water trap comprises valve means arranged, in response to a drop in pressure which occurs in the flow line through the instrument when water is accidentally sucked into the probe with an aspirated sample, to interrupt the flow of said water-containing sample through the flow line of the instrument.

4,173,887

APPARATUS INCLUDING A METER FOR INDICATING THE FUEL CONSUMPTION RATE OF AN INTERNAL COMBUSTION ENGINE

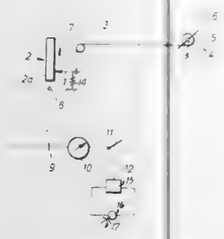
Ernst Fiala, Wolfsburg, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jun. 29, 1978, Ser. No. 920,536

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1977, 2731545

Int. Cl.² G01F *9/00*

U.S. Cl. 73—114 **8 Claims**



1. A device for indicating the fuel consumption rate of an internal combustion engine comprising:
(a) potentiometer means having a sliding contact engaging resistance means for providing variable resistance between said contact and an output lead of said potentiometer;
(b) means connecting said sliding contact with the fuel proportioning means of the engine for adjusting the position of said contact such that the resistance between said contact and said output lead increases as the amount of fuel supplied to the engine increases;
(c) electrical circuit means comprising, in series, a voltage source, a meter responsive to the current in said circuit for indicating fuel consumption rate, said potentiometer means connected at said contact and said output lead, and circuit interrupting means; and
(d) means for actuating said circuit interrupting means to open said electrical circuit only when the fuel proportioning means is in the idling position.

4,173,888

PEAK POINT DETECTOR FOR IONIZED MASS FLOW RATE MEASUREMENT

Suzuo Suzuki, Yokosuka; Hiroyuki Maruoka, Yokohama; Setsuzo Tachibana, Yokosuka; Yuji Matsubara, Yokohama, and Hatsuo Nagaishi, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

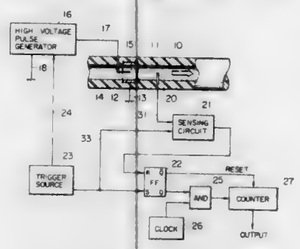
Filed Jan. 13, 1978, Ser. No. 869,245

Claims priority, application Japan, Jan. 14, 1977, 52/3337

Int. Cl.² G01F *1/56*

U.S. Cl. 73—194 F **7 Claims**

7. An ion detecting device for mass flow measuring apparatus including means for ionizing fluids at periodic intervals at a predetermined point of a fluid passage and time measuring means responsive to the ionization and the detection of said ionized fluid, comprising:
a charge collecting electrode in said passage located at a known distance downstream from said predetermined point to produce an electrical signal in response to the proximity thereto of an ionized flow mass;
gating means normally operative to pass said electrical signal and prevent the passage of said signal for a short interval from the time of said ionization; and
voltage sensing means responsive to the signal passing



through said gating means for detecting a predetermined point of the waveform of said electrical signal for signaling said time measuring means as a point of detection of said ionized flow.

4,173,889

ULTRASONIC FLOWMETER

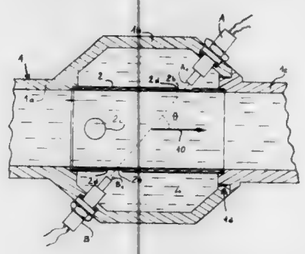
Michel Forster, and Pierre Rampin, both of Valence, France, assignors to Crouzet, Paris, France

Filed Mar. 20, 1978, Ser. No. 888,250

Claims priority, application France, Mar. 25, 1977, 77 09251

Int. Cl.² G01F *1/66*

U.S. Cl. 73—194 A **2 Claims**



1. An ultrasonic flowmeter for measuring the rate of flow of a fluid, comprising:
a conduit in which said fluid flows;
at least two acoustic probes placed outside the flow of fluid on a line inclined with respect to the axis of said conduit, said probes having an active end disposed in a recess in which the fluid, of which the rate of flow is to be measured, may penetrate without circulating therein, said recess being constituted by a discontinuity, in a measuring zone, of the inner wall of the conduit; and
a sleeve disposed in said discontinuity provided with openings through which the fluid may pass, said sleeve having an internal diameter essentially equal to an internal diameter of said conduit for ensuring continuity of the flow of fluid, said conduit comprising a first conduit part and a second conduit part, said first and second conduit parts threadably interconnected, said first part comprising, near said threadable connection, a swell, said swell comprising said discontinuity and in combination with said sleeve, forming an annular chamber.

4,173,890

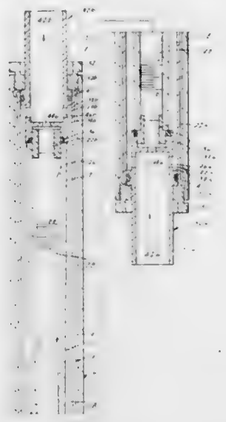
BY-PASS FLOWMETER

Roger Gilmont, Douglaston, N.Y., assignor to Gilmont Instruments, Inc., Great Neck, N.Y.

Filed Oct. 18, 1978, Ser. No. 952,305

Int. Cl.² G01F *5/00*

U.S. Cl. 73—202 **12 Claims**



1. A by-pass flowmeter of coaxial design comprising:
(A) an outer tube having a viewing station;
(B) a rotameter coaxially disposed within said outer tube to define therewith an annular by-pass chamber, said rotameter and said by-pass chamber each including a fluid inlet and a fluid outlet;
(C) inlet means at least partially disposed within said outer tube and in fluid communication with both said rotameter inlet and said by-pass chamber inlet; and
(D) outlet means at least partially disposed within the outer tube and in fluid communication with both said rotameter outlet and said by-pass chamber outlet.

4,173,891

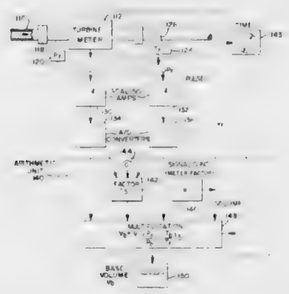
METHOD AND APPARATUS FOR MEASURING GAS FLOW

Nira C. Johnson, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 12, 1978, Ser. No. 869,004

Int. Cl.² G01F *1/90*

U.S. Cl. 73—231 M **21 Claims**



1. A measuring and calculating system for providing with high accuracy a manifestation of base gas volume V_b adjusted to given base conditions of pressure P_b and temperature T_b of a gas flowing through a conduit, said system comprising:
(a) first means for measuring the temperature T_f of the gas flowing through the conduit and for providing a first electrical signal indicative thereof;
(b) second means for measuring the pressure P_f of the gas flowing through the conduit and for providing a second electrical signal indicative thereof;
(c) third means for measuring the volume V_f of the gas flowing through the conduit and providing a third electrical signal indicative thereof; and
(d) calculating means for calculating base gas volume V_b in accordance with the following equation:

$$V_b = (V_f)(\frac{P_F}{P_b})(\frac{T_b}{T_F})(S)$$

where S is the compressibility factor and is calculated as a function of specific gravity G and the mole percentages of the constituents of the gas flowing through said conduit, P_F equals P_f + atmospheric pressure base and T_F equals $459.67 + T_f$), said calculating means further including:
(1) means for entering a value of the specific gravity G and the mole percentages, and
(2) means for performing a series of calculating cycles for obtaining intermediate values of the factor S, whereby an accurate manifestation without approximation of values of S is obtained as a function of the first and second electrical signals, and the entered values of specific gravity G and mole percentages.

4,173,892

APPARATUS FOR MEASUREMENT OF QUANTITY OF LIQUID IN CONTAINER

Boris Khurgin, 14 David Marcus, Haifa, Israel

Filed May 8, 1978, Ser. No. 903,617

Claims priority, application Israel, Nov. 20, 1977, 53430

Int. Cl.² G01F *23/26*

U.S. Cl. 73—304 C **15 Claims**



1. Apparatus for generating a signal proportional to the quantity of the substance in a container composed of electrically non-conducting material, the apparatus comprising a pair of electrically isolated electrodes, mounted on the outside surface of the container, in face-to-face relationship on opposite sections thercof, such that the substance to be measured is situated therebetween, a dielectric coating covering said electrodes, and means, operatively connected to said electrodes, for measuring the capacitance of said electrodes and for generating an output signal proportional to said measured capacitance.

4,173,893

FLUID QUANTITY INDICATOR

Geoffrey S. Hedrick, Laurel Cir., Malvern, Pa. 19355

Continuation-in-part of Ser. No. 731,229, Oct. 12, 1976, Pat. No. 4,090,408. This application Dec. 12, 1977, Ser. No. 859,670

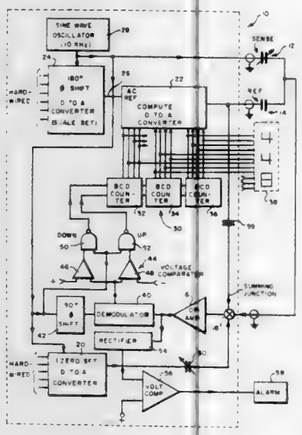
The portion of the term of this patent subsequent to May 23, 1995, has been disclaimed.

Int. Cl.² G01F *23/26*

U.S. Cl. 73—304 C **15 Claims**

1. In an apparatus responsive to the quantity of a fluid within a container therefor of predetermined volume, said apparatus

comprising a capacitive sensing means disposed within said container volume so as to be immersible within said fluid and any air within said container volume, said capacitive sensing means having an associated variable dielectric constant, said dielectric constant being proportional to the proportionate amount of fluid within said container volume, said sensing means capacitance varying in accordance with the variation in said proportionate amount of fluid; a reference capacitive means disposed within said container so as to normally be immersible within said fluid and responsive to variations in the dielectric constant of said fluid due to environmental conditions; the improvement comprising AC reference means operatively connected to said sensing means for providing a signal having a predetermined phase and frequency thereto; first microprocessor control means for providing a control signal output indicative of said fluid quantity; first digital-to-analog conversion means having a magnitude input operatively connected in parallel to said first microprocessor control means control signal output for providing an output in response to said input, said first digital-to-analog conversion means output being operatively connected to said reference capacitive means, said output comprising a signal having a predetermined phase opposite to said AC reference means signal phase and a predetermined frequency identical therewith; said first microprocessor control means being programmable to enable a



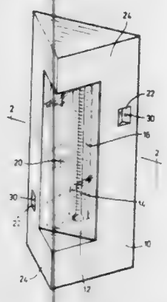
universal apparatus full scale set compensation for containers for said fluid substantially independent of said container configuration for compensating for variations in full scale capacitance of a given container and to directionally count in response to directional counting command signals provided thereto; first differential amplifier summing means having an input operatively connected to said capacitive sensing means and said capacitive reference means outputs for summing the output signals provided therefrom; first means operatively connected to said first summing means output for providing a directional counting command signal in response to said first summing means output, said counting command signal being operatively connected to said first microprocessor control means input, said first microprocessor control means counting in response to said directional counting command input signal for providing a display control signal output dependent thereon, said first microprocessor control means output further being operatively connected in parallel to a digital display means for controllably providing a digital of said fluid quantity on said digital display means in response to said display control signal output; said AC reference means capacitive sensing means, capacitive reference means, first summing means, first directional counting signal providing means, first microprocessor control means and first digital-to-analog conversion means comprising a first independent digital servo control loop which is nulled when said first microprocessor control means output is equivalent to said fluid quantity, whereby a container configuration independent real time digital display of fluid quantity within a given container is provided.

4,173,894

PORTABLE TEMPERATURE SENSING DEVICE

Andy Gerike, 133 Richmond St. West, Toronto, Ontario, Canada (M5H 2L7)

Filed May 30, 1978, Ser. No. 910,498
Int. Cl.[2] G01K *1/16*
U.S. Cl. 73—362.8 **4 Claims**



1. A temperature sensing device adapted to maximize heat transfer from surrounding conditions comprising a frame of thermal material provided with a sealed cavity, a temperature measuring instrument in said sealed cavity operable over a range of temperatures, a thin metal heat transfer plate having a high thermal conductivity extending from said cavity projecting slightly beyond the exterior surface of said frame for presenting a planar heat transfer face for intimate contact which such planar surface and means for reading said temperature measuring instrument and being adapted to provide readout over said range of temperatures, said temperature measuring instrument being in contact with said heat transfer plate, said planar heat transfer face defining the area of thermal contact with such planar surface, said thin metal plate occupying a major portion of the surface area of said exterior surface of said frame for maximizing heat transfer to said temperature measuring instrument and for minimizing response time of said temperature sensing device; said frame being resilient for deformation about said plate to essentially isolate it from thermal effects of surrounding conditions when in use.

4,173,895

APPARATUS FOR AND METHOD OF SAMPLING LIQUID OXYGEN

Lloyd A. Pecor, 502 Sparks Dr., Grand Prairie, Tex. 75051

Filed Jul. 20, 1978, Ser. No. 926,294
Int. Cl.[2] G01N *1/10, 1/22*
U.S. Cl. 73—421.5 R **11 Claims**

1. An apparatus for sampling liquid gas with minimum contamination comprising

a manifold assembly having a vent at one end and a sample container coupling at the other end; said manifold assembly including a first section adjacent said vent, a second section and a third section adjacent said sample container coupling, said second section being located between said first and third sections;

a first valve between said first and second sections;

a second valve between said second and third sections;

a conduit purge connector attached to said first section;

a sample receiving cylinder coupled at one end to said second section, the other end of said cylinder having a conduit fitting; and

a flexible conduit having a quick disconnect fitting at one end and a unit coupling at its other end; said quick disconnect fitting adapted to be selectively connected to said conduit fitting and said conduit purge connector.

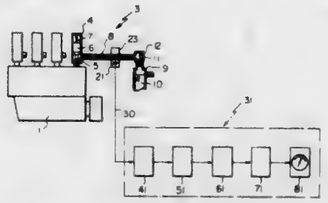


4,173,896

DEVICE FOR MEASURING ROTATIONAL SPEED OF A DIESEL ENGINE

Teruhiro Takama, Hino, Japan, assignor to C. Itoh & Co. Ltd., Osaka and Okuda Koki Co., Ltd., Tokyo, both of, Japan

Filed Aug. 23, 1978, Ser. No. 936,123
Int. Cl.[2] G01P *3/48*
U.S. Cl. 73—518 **12 Claims**



1. A device for detecting the rotational speed of a diesel engine with a fuel injection system comprising:

a sensor element, adapted to be mounted on said fuel injection system and having an intrinsic resonance frequency which is considerably larger than the rotational speed of said diesel engine to be measured, for transmitting a high frequency electric signal in response to a high frequency oscillation generated in the fuel within said fuel injection system when said fuel is injected;

an amplifier, having a tuning frequency which is substantially the same as said intrinsic resonance frequency of said sensor element, for tuning and amplifying said high frequency signal from said sensor element;

a converter for converting said tuned and amplified high frequency electric signal into a low frequency signal corresponding to fuel injection, and;

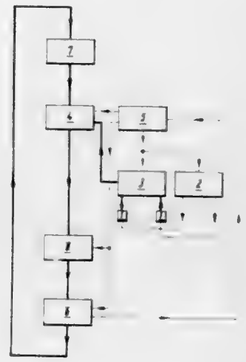
a wave shaping circuit for shaping said low frequency signal from said converter into a pulse signal having a predetermined amplitude and a predetermined pulse width, said wave shaping circuit applies said pulse signal into an indicator in accordance with said rotational speed of said diesel engine.

4,173,897

METHOD OF ADJUSTING ULTRASONIC TEST SYSTEMS

Ulrich Förstermann, Sprockhövel; Hans-Peter Schäfer; Peter Möller, both of Wuppertal; Karl Ries, Mülheim; Dieter Lather, Rheurdt, and Klaus-Uwe Jannsen, Lintorf, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 15, 1977, Ser. No. 816,148
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2632680
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—609 **9 Claims**



1. In a method for ultrasonic inspection of structural material using a plurality of transmitter and receiver channels, and wherein the channels of the plurality are operated in steps, comprising:

sequentially selecting individual ones of the channels of the plurality on the basis of externally provided selection signals including for each selection operating the selected transmitter for launching a test signal and timing the selected receiver channel responsiveness on the basis of externally provided timing signals, to provide a sequence of tests in accordance with the sequential selection;

processing signals as received through the sequentially operated receiver channels by a common circuit to obtain test data for each test and including in each instance of selection the providing for selective gating the common circuit including gates being adjustable as to timing for opening and closing on the basis of second timing signals constituting timing parameters, and the common circuit being further adjustable as to processing said signals as received, for the acquisition of particular amplitudes and transit times on the basis of additional operating parameters;

preparing the common circuit for each test by feeding the second timing signals and the signals representing the operating parameters to the common circuit, separately for each selection of a transmitter and receiver channel; and

updating the signals representing timing and operation parameters to be used in a subsequent test on the basis of the test data information acquired as per the processing step during one or several tests preceeding the subsequent test.

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4,173,898

SYSTEM FOR NONDESTRUCTIVE, ULTRASONIC TESTING OF TEST OBJECTS

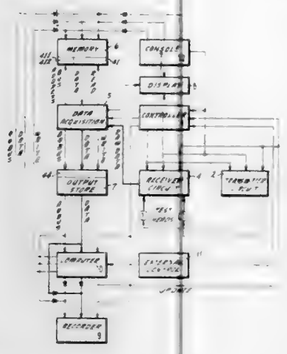
Ulrich Förstermann, Sprockhovel; Hans-Peter Schäfer; Peter Möller, both of Wuppertal; Dieter Lather, Rheurdt; Karl Ries, Mülheim, and Klaus-Uwe Jannsen, Lintorf, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 15, 1977, Ser. No. 816,149

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2632674

Int. Cl.[2] G01N *29/04*

U.S. Cl. 73—611 **28 Claims**



1. In a system for inspecting test objects by means of ultrasonics, having a plurality of individually enablable and triggerable ultrasonic transmitter and receiver channels, further having a control circuit for the control of these channels, the control circuit comprising:

a memory including a plurality of addressable locations, each location of the plurality holding a plurality of different numbers which include time count numbers for the beginning and end of gating signals, and amplitude limit or reference numbers;

a controller for providing a sequence of test identification numbers, each number identifying a particular test involving a particular transmitter and receiver channel;

means connected for accessing the memory locations of the plurality in response to the test identification number to obtain a read-out of content of the accessed memory location, the contents of different memory locations being read out in accordance with said sequence of test identification numbers;

storage means connected for receiving and storing the content of the accessed memory location as read out therefrom, including for each test so identified the time count numbers and at least one amplitude limit or reference number, the storage means receiving a new content for each test;

a time counter means operating to count clock pulses;

gating signal generator means including comparator means, and connected to receive the time count numbers from the means for receiving and storing and further connected to the counter for comparing the count numbers with the running time counts as counted by the time counter to generate gating signals in response thereto, the gating signals establishing looking windows;

means connected to the controller for selecting and operating the particular transmitter channel in response to the test identification numbers to cause the channel to launch an ultrasonic test signal into a test object so that a sequence of tests is conducted in accordance with the sequence of test identification numbers as provided by the controller and wherein different test identification numbers involve different transmitter and receiver channels as selected, each test including the launching of a test signal by the transmitter in the selected channel;

means connected to the receiver channels to receive therefrom a train of measuring signals, including particularly measuring signals following the operation of the selected transmitter channel, the measuring signals representing interaction of the test signal launched by the selected transmitter with the test object, further connected to be responsive to the gating signals to suppress measuring signals in the selected receiver channel outside of the gating signals and looking windows;

comparing means connected to be response to the limit number as held in the means for receiving and storing, and to compare the limit number with the amplitude of a particular signal portion that occurred in one of the windows to determine occurrence of an amplitude in the signal portion, corresponding to the reference number;

means for determining the time of said occurrence and providing a representation thereof as a measuring result; and

processing means for updating said numbers as held in the several locations of the memory on the basis of measuring signals as occurring in particular ones of the said windows.

4,173,899

METHOD AND DEVICE FOR SCANNING BY MEANS OF A FOCUSED ULTRASONIC BEAM

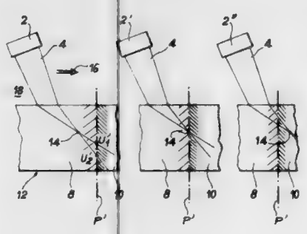
Jean Perdijon, Saint Ismier, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed May 12, 1978, Ser. No. 905,518

Claims priority, application France, May 16, 1977, 77 14886

Int. Cl.[2] G01N *29/04*

U.S. Cl. 73—620 **6 Claims**



1. A method for scanning a segment C' located in a second medium by means of a focused ultrasonic beam formed by a focusing transducer placed in a first medium, said first and second media being separated by an interface, wherein a focal point of the ultrasonic beam is displaced in order to scan the segment C' aforesaid by displacing the focus of the transducer along a segment C which is the optical image of the segment C' in said interface.

4,173,900

SEMICONDUCTOR PRESSURE TRANSDUCER

Masanori Tanabe; Satoshi Shimada, both of Hitachi; Motohisa Nishihara, Katsuta; Kazuji Yamada, Hitachi; Yasumasa Matsuda, Hitachi; Michitaka Shimazoe, Hitachi; Yoshitaka Matsuoka, Mito; Yukio Takahashi, Katsuta; Katsuya Katohgi, Katsuta, and Mitsuo Ai, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 6, 1978, Ser. No. 883,589

Claims priority, application Japan, Mar. 7, 1977, 52/25045; Mar. 7, 1977, 52/25046; Mar. 17, 1977, 52/29678

Int. Cl.[2] G01L *9/06*

U.S. Cl. 73—727 **8 Claims**

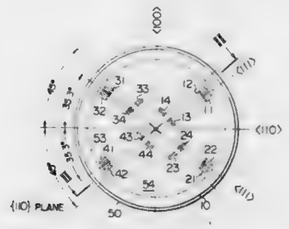
1. A semiconductor pressure transducer comprising:

(a) a disc-shaped diaphragm of single crystal semiconductor material;

(b) at least one radial strain gauge unit having a piezoresistance effect, formed in the radial direction in said disc-shaped diaphragm;

(c) at least one tangential strain gauge unit having a piezoresistance effect, formed in the tangential direction of said disc-shaped diaphragm;

(d) a supporting base for supporting the outer peripheral



portion of said disc-shaped diaphragm, wherein said radial strain gauge unit is disposed near the peripheral portion of said disc-shaped diaphragm, and said tangential strain gauge unit is disposed in the position near the point where a curve representing the relationship between the non-linearity and the distance from the center of said diaphragm to said tangential strain gauge unit, first intersects the straight line on which the non-linearity is substantially.

4,173,901

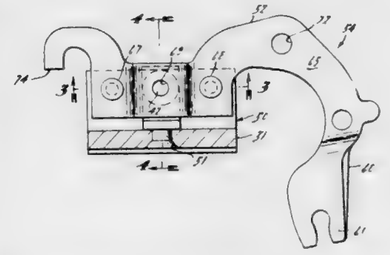
BALL JOINT AND POLE ASSEMBLY FOR STARTER MOTOR

James E. Jaseck, Madison Heights, and Alex M. Pentland, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 24, 1978, Ser. No. 927,207

Int. Cl.[2] F02N *11/02*

U.S. Cl. 74—6 **10 Claims**



1. An automobile starter motor having an armature and a housing in which is disposed at least one electric current carrying coil, said coil serving, in response to an initial flow of current through said coil, as a solenoid to selectively pull into a hole in the housing, a pole means coupled to the housing for responding to a magnetic field, the motor further having a starter drive assembly coupled to the armature for rotation therewith and lever means cooperating with the pole for controlling the position of the starter drive assembly axially of the armature, the improvement comprising:

a coupling means for connecting said pole means to said lever means including a ball joint means for providing an adjustable coupling, a post means extending outwardly from said ball joint means so that said pole means can pivot with respect to said lever means and said pole means can adjust to align in abutment with said housing thereby compensating for manufacturing tolerances and reducing flux path reluctance.

9. A method of operating a starting motor for an automobile wherein the starting motor includes a housing containing an armature and coil, a hole in the housing for receiving a pole piece connected to a lever which is pivotally mounted on the housing for moving a starter drive, said method including the steps of:

energizing the coil with an electric current;

attracting the pole piece to the hole in the housing;

pivoting with three degrees of freedom of movement the pole piece with respect to the lever so that the pole piece has maximum seating on the housing; and

retaining the lever in a pivoted position with the pole piece seated on the housing so that the starter drive is engaged to start the automobile engine.

4,173,902

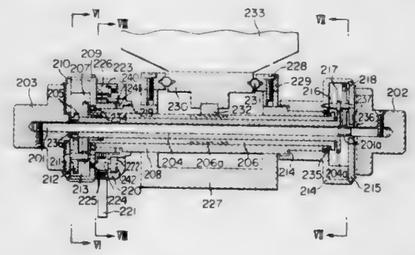
SINGLE-AXIS COARSE AND FINE ADJUSTMENT DEVICE PROVIDED WITH MEDIUM ADJUSTMENT

Megumu Shio, Kamakura, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Division of Ser. No. 718,452, Aug. 30, 1976, Pat. No. 4,083,256. This application Oct. 25, 1977, Ser. No. 845,222

Int. Cl.[2] F16H *35/18*; G02B *21/26*

U.S. Cl. 74—10.52 **5 Claims**



1. A single-axis coarse and fine adjustment device for driving a carriage, comprising:

stationary support means;

a pinion shaft rotatably supported by the support means and having a pinion meshing with a rack provided on the carriage;

a connecting shaft rotatably supported within the pinion shaft and having a first toothed portion and a second toothed portion;

first decelerating gear means meshing with the first toothed portion to decelerate the rotation of the connecting shaft and transmit it to the pinion shaft;

a fine adjustment shaft rotatably supported within the connecting shaft and having a toothed portion;

a fine adjustment operating member for rotating the fine adjustment shaft;

second decelerating gear means meshing with the second toothed portion of the connecting shaft and the toothed portion of the fine adjustment shaft to decelerate the rotation of the fine adjustment shaft and transmit it to the connecting shaft;

a medium adjustment operating member rotatably supporting the second decelerating gear means and rotatably supported by the support means so as to impart rotation of equal ratio to the connecting shaft through the second gear means; and

a coarse adjustment operating member rotatably supported by the support means so as to impart rotation of equal ratio to the pinion shaft through the first decelerating gear means;

said pinion shaft has a toothed portion formed on one end thereof, and said first decelerating gear means comprising a first gear rotatably supported by said coarse adjustment operating member and meshing with the first toothed

portion of said connecting shaft, the number of teeth on said first gear being more than that on said first toothed portion, and a second gear integrally formed with said first gear and meshing with the toothed portion of said pinion shaft, the number of teeth of said second gear being less than on the toothed portion of said pinion shaft.

4,173,903

CRANK DRIVE FOR A PHOTOGRAPHIC CAMERA

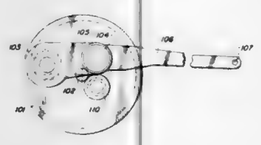
Friedrich Papke, and Erwin Scholz, both of Brunswick, Fed. Rep. of Germany, assignors to Rollei-Werke Franke & Heidecke, Brunswick, Fed. Rep. of Germany

Filed Aug. 22, 1977, Ser. No. 826,404

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1976, 2639953

Int. Cl.² F16H *21/18*

U.S. Cl. 74—47 **9 Claims**



1. A crank drive, particularly for a photographic camera, comprising, in combination:

a housing,

a crank, rotatably mounted on said housing and being movable within a circle, having a crank axis and including a crankpin,

a drawbar including a hinge having a hinge axis substantially parallel to the crank axis, and first and second rods pivotable in first and second planes of motion, respectively, about said hinge, an end of said first rod being pivotable about said crankpin, said second rod being slidable along a substantially straight line defined in said housing, said planes being substantially parallel to one another, and

abutment means disposed within said circle, remaining at a predetermined distance from said crank-pin, and projecting into said first plane of motion, whereby said first rod will operatively abut against said abutment means when the drawbar executes a complete stroke along said straight line during a predetermined portion of said stroke, so that said first rod serves as an operative crank, and said hinge serves as an operative crankpin.

4,173,904

APPARATUS FOR AUTOMATICALLY CENTERING AN ENDLESS BAND TRAINED OVER TWO ROLLS

Silvio Repetto, Modena, Italy, assignor to S.p.A. Luigi Rizzi & C., Modena, Italy

Continuation-in-part of Ser. No. 714,754, Aug. 16, 1976, abandoned. This application Oct. 13, 1977, Ser. No. 841,752

Claims priority, application Italy, Sep. 3, 1975, 26875 A/75; Dec. 2, 1975, 29920 A/75

Int. Cl.² F16H *7/18*; B65H *25/26*

U.S. Cl. 74—241 **4 Claims**

1. An apparatus for automatically centering an endless band trained over a driven guide roll and a stretching roll, each roll having two ends wherebetween the endless band is centered in a starting position, the rolls having axes defining a plane in the starting position, the band having respective side edges adjacent respective ones of the roll ends, and including a nut-and-spindle mechanism at each end of the stretching roll, the nut of each mechanism being mounted on the roll end and the spindle of each mechanism being in threaded rotatable engagement with the nut but axially stationary whereby rotation of the spindle displaces the end in the plane, the centering apparatus comprising

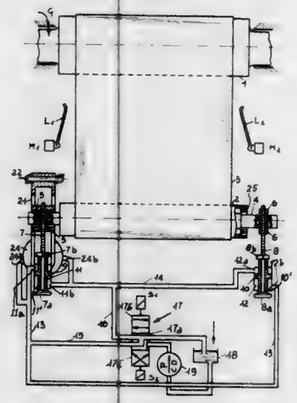
(a) a first hydraulic means for displacing either end of the stretching roll in the plane, the first hydraulic means including

(1) a double-acting cylinder-piston unit at either end of the stretching roll and having a piston connected to a respective one of the spindles,

(b) a second hydraulic means for displacing one of the ends of the stretching roll substantially perpendicularly to the plane, the second hydraulic means including

(1) another double-acting cylinder-piston unit and

(2) a frame pivotally mounted for swinging in a plane substantially perpendicular to the first-named plane, the nut-and-spindle mechanism at the one end being slidably mounted in the frame, and the other cylinder-piston unit being connected to the frame for swinging the frame in the perpendicular plane,



(c) a sensor means disposed adjacent each of the side edges of the endless band and spaced therefrom when the band is centered, a respective one of the sensor means producing a control signal when a respective one of the side edges moves into contact therewith when the endless band deviates from the centered position between the ends of the rolls, and

(d) a hydraulic fluid control circuit including a three-way solenoid valve for delivering hydraulic pressure to the double-acting cylinder-piston units of the first and second hydraulic means, the valve being responsive to the control signal to deliver hydraulic pressure to the cylinder-piston units for simultaneously displacing the one end of the stretching roll in both planes until the endless band has resumed its centered position.

4,173,905

CHANGE-SPEED GEARBOXES

Graham A. B. Byrt, and Douglas E. Riddler, both of Bristol, England, assignors to Masson Scott Thrissell Engineering, Ltd., United Kingdom

Filed Jun. 17, 1977, Ser. No. 807,603

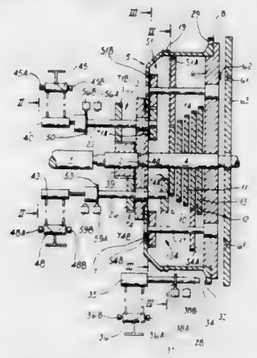
Claims priority, application United Kingdom, Jun. 29, 1976, 27102/76

Int. Cl.² F16H *3/08, 3/22*; B23Q *17/00*; B23B *29/24*

U.S. Cl. 74—356 **11 Claims**

1. A change speed gear box comprising an input shaft, an output shaft, a fixed support, a movable support, a plurality of intermediate shafts rotatably carried by said fixed support, a plurality of secondary shafts rotatably carried by said movable support, two gears carried on each of said intermediate and on each of said secondary shafts and rotatable therewith, a common input gear secured to said input shaft and permanently in mesh with one of the gears of each of the intermediate shafts, a plurality of output gears secured to said output shaft with the number of such output gears being equal to the number of secondary shafts, each of said output gears being permanently

in mesh with one of the gears on a different one of the secondary shafts, means for displacing the movable support to bring one of the secondary shafts adjacent to any selected one of the



intermediate shafts to move the second gear on said one intermediate shaft into meshable alignment with the second gear on the selected secondary shaft, and means for subsequently moving one of said aligned second gears into mesh with the other.

4,173,906

PLANETARY GEAR

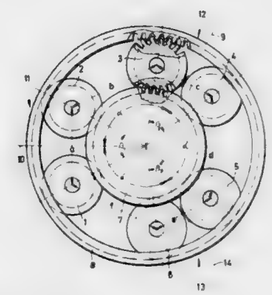
Karlheinz Altenbokum; Klaus Hünsgen, both of Witten, and Heinz M. Hiersig, Düsseldorf, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Nov. 30, 1977, Ser. No. 856,049

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2655363

Int. Cl.² F16H *57/00, 1/;28*

U.S. Cl. 74—410 **8 Claims**



1. Planetary gearset comprising:

a sun gear;

an outer annulus with internal gear;

a planet carrier;

at least one of said gears and said carrier being radially displaceable; and

six planet gears journalled on the carrier and meshing with the sun gear and the outer annulus;

said six planet gears being arranged in groups of two each, wherein the spacings between the gears of and in each of the groups are smaller than the spacings from group-to-group,

the spacings between the respective two gears in each of the groups not being the same for all three groups;

three radial center lines of symmetry respectively for said two planet gears each of said three groups being angularly spaced by 120°.

4,173,907

DEVICE FOR TRANSFORMING A ROTATIONAL MOTION INTO A LINEAR MOTION

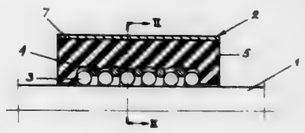
Bengt Lundgren, Ulricehamn, Sweden, assignor to SKF Nova AB, Goteborg, Sweden

Filed Aug. 15, 1977, Ser. No. 824,406

Claims priority, application Sweden, Nov. 19, 1976, 7612934

Int. Cl.² F16H *25/22*

U.S. Cl. 74—459 **4 Claims**



1. A device for transforming a rotational motion into a linear motion, or reversed, and comprising a shaft having a smooth peripheral surface (1), a sleeve (2) circumscribing said shaft and being rotatably and linearly displaceably arranged thereon, and a plurality of rolling elements (3) disposed between the shaft and the sleeve and arranged in a closed track with a load carrying portion in the shape of a helical line and an unloaded recirculation portion, the sleeve comprising an inner portion (4, 8) of resiliently deformable material with a comparatively hard surface having a helically shaped raceway for the rolling bodies, and an outer portion (5) provided with a recirculation channel (6) for the rolling bodies, said rolling bodies being urged against the smooth peripheral surface of said shaft by the inner resilient portion of the sleeve, the outer portion (5) of said sleeve being made of a resiliently deformable polymer material which contacts the inner portion of the sleeve along the entire length of the load carrying portion of the closed track.

4,173,908

SAW CHAIN SHARPENING FIXTURE

Frank J. Aksamit, West Hartford, Conn., assignor to Pro Sharp Corporation, Newington, Conn.

Filed Jan. 3, 1978, Ser. No. 866,366

Int. Cl.² B23D *63/16*

U.S. Cl. 76—25 A **8 Claims**



1. In an assembly for sharpening cutting links of a saw chain having the cutting links mounted on a cutter bar and comprising a sharpening tool and a fixture for the sharpening tool, the improvement wherein the fixture comprises a longitudinally extending frame for straddling the cutter bar and a section of chain mounted on the cutter bar, the frame having an inverted generally U-shaped cross section including a web adapted to freely rest on and be supported by the top of the cutting links

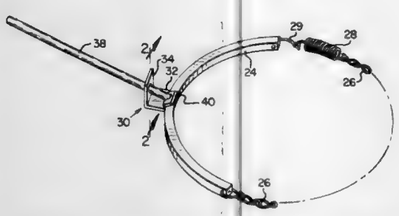
and spaced confronting sidewalls depending from opposite sides of the web and defining an interior channel, said sidewalls being adapted to flex outwardly during mounting of the cutter bar and section of chain in the channel, the frame having intermediate its ends an opening formed in the web and sidewalls for communicating with the interior channel, a pair of adaptor guides respectively mounted on the sidewalls of the frame below its web and diverging outwardly from said opening, the guides being positioned in fixed nonadjusting relationship to said web and sidewalls, each guide having an elongated bearing surface of semi-circular cross section with its lowermost portion below the top of the cutter bar, and an adaptor dimensioned and configured to be seated on and supported by the semi-circular bearing surface of a selected one of the guides, the adaptor being provided with a central aperture for supporting and aligning the sharpening tool for movement along an axis disposed below the web of the frame in spaced apart relation to the bearing surfaces of the guides for sharpening a cutting link positioned within said web opening.

4,173,909

LID LIFTER FOR RECLOSABLE SELF-SEALING BUCKETS

John H. Cleveland, 208 N. Ebbert St., Hillsboro, Oreg. 97123, and Brent A. Bentley, Rte. 4, Box 274, Cornelius, Oreg. 97113

Filed Nov. 30, 1977, Ser. No. 855,945
Int. Cl.[2] B67B *7/00*
U.S. Cl. 81—3.36 **4 Claims**



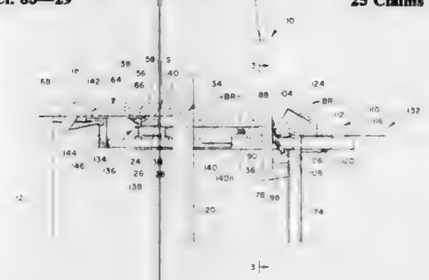
1. A lifter for non-destructively removing the lid from a container of the type having a radially outwardly facing lip at its upper extremity configured for releasably engaging a radially inwardly facing mating catch on the lid when the lid is urged downwardly over the container, and having paired, spaced-apart outwardly extending flanges located near its upper extremity below the lower most extension of the lid when the lid is installed on the container, said lifter comprising:
(a) an arcuate bar having a width which allows it to be received snugly between said outwardly extending flanges of said container;
(b) fastening means for releasably interconnecting the respective ends of said bar for securing said bar to said container;
(c) a fulcrum plate attached to said bar approximately intermediate its ends and extending radially outwardly and upwardly therefrom;
(d) said fulcrum plate defining a central opening which is slightly below said lip when said lifter is installed on said container;
(e) a cylindrically cross-sectioned, elongate lever having a diameter which loosely fits within said opening, said lever having a longitudinal axis which fits through said opening so that said opening defines a pivot axis about which said lever can be pivoted; and
(f) a lifting pad located at the end of said lever, one axis of said lifting pad being acutely angled with respect to the longitudinal axis of said lever so that when said lever is pivoted in said opening, said lifting pad engages said catch and lifts it both outwardly and upwardly to release said catch from engagement with said outwardly facing lip, thereby releasing said lid from said container.

4,173,910

METHOD AND APPARATUS FOR HANDLING BRICK

Cletus E. Lineberry, Rte. 1, Box 106, Staley, N.C. 27355; John G. Buckner, Rte. 2, Box 83, Ramseur, N.C. 27315, and Jimmy W. Harris, 618 Circle Dr., Siler City, N.C. 27344

Continuation-in-part of Ser. No. 854,150, Nov. 23, 1977, abandoned. This application May 30, 1978, Ser. No. 910,646
Int. Cl.[2] B26D *7/06*; B28B *11/14*
U.S. Cl. 83—29 **25 Claims**



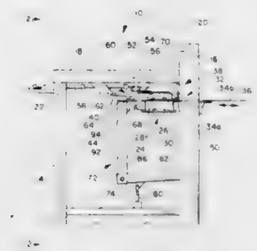
14. A brick handling and stacking apparatus comprising:
(a) conveyor means for conveying individual brick slugs to a cutting area;
(b) cutting means associated with said brick handling and stacking apparatus;
(c) a supply table disposed adjacent said cutting means for receiving and supporting individual rows of cut brick after the brick have been moved through said cutting means;
(d) a first pusher means for engaging each brick slug delivered to said cutting area and for pushing the engaged slug towards said cutting means such that successive strokes by said first pusher means results in a series of slugs being pushed through said cutting means for cutting each slug into a series of brick and onto said supply table to form a series of transversely aligned brick rows with each row of brick including a series of individual bricks disposed in side-by-side relationship;
(e) a stacking elevator assembly movably mounted adjacent said supply table and including a lower and an upper receiving level with each receiving level being adapted to receive at least one row of bricks formed on said supply table;
(f) means for moving said stacking elevator assembly between at least two positions wherein in each position a respective receiving level is aligned with the bricks on said supply table;
(g) said first pusher means including drive means for driving the same in time relationship with the movement of said stacking elevator assembly such that during operation said first pusher means is operative to move at least one row of bricks from said supply table into the particularly aligned receiving level of said elevator assembly;
(h) a receiving table disposed adjacent said stacking elevator assembly opposite said supply table for receiving bricks from said elevator assembly;
(i) second pusher means movable between a retracted position and an extended position wherein in moving from said retracted position to said extended position said second pusher means is operative when aligned with a respective receiving level of said stacking elevator assembly to engage the bricks within said receiving level and to push these bricks therefrom onto said receiving table; and
(j) wherein said second pusher means includes drive means for driving the same in timed relationship with said first pusher means and said stacking elevator assembly such that said first and second pusher means are cooperative to simultaneously act to discharge bricks from both said lower and upper receiving levels of said stacking elevator assembly onto said receiving table as during each cycle of said elevator assembly said second pusher means engages bricks in one receiving level and pushes such bricks onto said receiving table while bricks in the other receiving level of said stacking elevator assembly are displaced therefrom by a row of bricks being pushed into that receiving level by said first pusher means, whereby the bricks being pushed from the lower receiving level to form a two course high brick stack during the continuous operation of the brick handling and stacking apparatus.

4,173,911

METHOD AND APPARATUS FOR HACKING AND STACKING BRICK

Cletus E. Lineberry, Rte. 1, Box 106, Staley, N.C. 27355; John G. Buckner, Rte. 2, Box 83, Ramseur, N.C. 27315, and Jimmy W. Harris, 618 Circle Dr., Siler City, N.C. 27344

Filed May 30, 1978, Ser. No. 910,647
Int. Cl.[2] B26D *7/06*; B28B *11/14*
U.S. Cl. 83—29 **11 Claims**



10. A method of receiving and cutting brick slugs and stacking the cut brick slugs in a two course high stack, comprising the steps of:
a. receiving successive brick slugs on an off bearing belt and conveying the received brick slugs to a discharge area such that one or more brick slugs after another are received at said discharge area;
b. pushing one brick slug from one side of said off bearing belt onto a first receiving area;
c. pushing a succeeding brick slug from the other side of said off bearing belt and transferring the same to an elevator;
d. moving the elevator from a receiving position to a discharge position where the same aligns with a second receiving area;
e. transferring the brick slug on said elevator at said discharge position to said second receiving area;
f. returning said elevator to said receiving position;
g. continuing to transfer brick slugs in alternate fashion from said off bearing belt to said first receiving area and said elevator, and continuing to cycle said elevator between said receiving and discharge positions such that brick slugs may be transferred from said elevator to said second receiving area; and
h. cutting the respective brick slugs being advanced on said first and second receiving areas and directing the cut brick being advanced across the uppermost receiving area onto the cut brick being advanced across the lowermost receiving area to form a stack of brick at least two courses high.

4,173,912

FABRIC TRIMMER

Dennis Holp, Fort Wayne, Ind., assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 18, 1978, Ser. No. 934,928
Int. Cl.[2] B26D *1/02*; B29H *3/06, 9/04*
U.S. Cl. 83—433 **8 Claims**

1. An edge gum trimmer comprising a support frame adapted to be connected to a calender apparatus which processes a sheet of continuously moving fabric material having parallel strands of cords and with such fabric having a longitudinal center line, said support frame having a pair of parallel guide rods mounted thereon said rods lying in a plane that is normal to said longitudinal center line, adjusting means on said support frame operatively engaging said pair of guide rods for adjusting the inclination of said rods relative to a horizontal



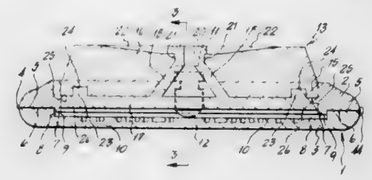
plane, a crosshead slidably mounted on said guide rods, a tool holder, pivot means interconnecting said tool holder and said crosshead, a trimming knife mounted on said tool holder, an adjusting device mounted on said crosshead and operatively connected to said tool holder for pivoting said tool holder and said knife about said pivot means to align said trimming knife relative to said longitudinal center line.

4,173,913

HOLE CUTTER HAVING ROTATABLE BLADE CARRIER

Barrie F. Nicholson, 23 Showell Ln., Lower Penn, Wolverhampton, England

Filed Mar. 8, 1978, Ser. No. 884,386
Claims priority, application United Kingdom, Mar. 8, 1977, 9749/77
Int. Cl.[2] B26D *3/00*
U.S. Cl. 83—555 **10 Claims**



1. A device for cutting a hole in a piece of sheet material comprising a holder for the material, a blade carrier rotatably carried by said holder, a blade carried by said blade carrier, whereby a hole is cut in the material placed in said holder on rotation of said blade carrier, and adjustment means enabling adjustment of the position of said blade relative to the rotational axis of said blade carrier whereby holes of different sizes may be cut, said holder being provided with a hole, and said blade carrier comprising first and second parts overlapping opposite sides of said hole, and releasable securing means connecting said first and second parts, wherein said releasable securing means comprises complementary formations on said parts having a snap engagement with each other to secure said parts together.

4,173,914

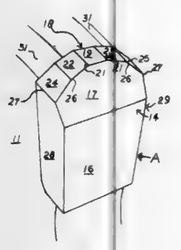
CUTTING TEETH FOR CIRCULAR SAW BLADES

Erwin H. Vollmer, Balmerstrassa, Fed. Rep. of Germany, and George J. Vollmer, Sewickley, Pa., assignors to Vollmer of America Corporation, Pittsburgh, Pa.

Division of Ser. No. 830,673, Sep. 6, 1977, Pat. No. 4,133,240. This application Apr. 24, 1978, Ser. No. 899,534
Int. Cl.[2] B27B *33/08*
U.S. Cl. 83—848 **4 Claims**

1. A raker cutting tooth for use in combination with a low tooth in circular saw blades comprising a leading face and a top, said leading face including a first planar surface and second planar surface extending from said first planar surface to said top and lying in plane inclined at a negative angle from the plane of the first planar surface; and said top consisting of a

first center facet lying in a plane substantially normal to the plane of first planar surface; second and third facets, each positioned adjacent said first facet and lying in a plane angularly offset from the plane of the first facet by a first angle to define first cutting edges; fourth and fifth facets, said fourth facet being positioned adjacent said second facet and said fifth



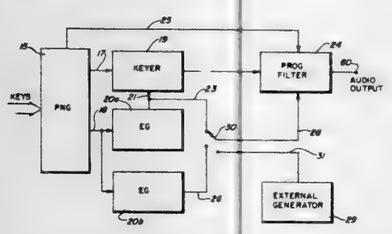
facet being positioned adjacent said third facet, each of said fourth and fifth facets lying in a plane angularly offset from the plane of the first facet by a second angle to define second cutting edges, said fourth and fifth facets defining third cutting edges with the associated side of said tooth; and each of said sides has a radial clearance angle α.

4,173,915

PROGRAMMABLE DYNAMIC FILTER

Glenn M. Gross, Chicago, Ill., assignor to Norlin Industries, Inc., Lincolnwood, Ill.

Filed Jun. 29, 1978, Ser. No. 920,277
Int. Cl.[2] G10H *1/02, 5/00*
U.S. Cl. 84—1.19 **9 Claims**



1. In an electronic musical instrument having means for generating tone signals, means for developing a control signal comprising a stream of pulses having a duty cycle determined according to a generated tone signal or a portion of the musical scale containing a generated tone signal and filtering means having a frequency response controlled by the duty cycle of said control signal, the improvement comprising:

first means coupled between said control signal developing means and said filtering means and operable for adjustably varying the pulse width of said pulses for altering the duty cycle of said control signal independently of said tone signal; and

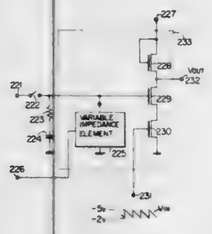
second means for controlling said first means for varying the pulse width of said control signal by a selected amount to achieve a desired filtering means frequency response.

4,173,916

TONE GENERATOR SYSTEM FOR AN ELECTRONIC ORGAN

Michihiro Inoue; Takeji Kimura, both of Hirakata; Masaharu Sato, Moriguchi, and Masahiko Tsunoo, Suita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 622,383, Oct. 14, 1975, Pat. No. 4,056,033. This application Aug. 15, 1977, Ser. No. 824,802
Claims priority, application Japan, Oct. 18, 1974, 49-120763; Oct. 18, 1974, 49-120806; Oct. 23, 1974, 49-122663; Nov. 18, 1974, 49-132981; Nov. 19, 1974, 49-133991; Apr. 18, 1975, 50-47740
Int. Cl.[2] G10H *3/00, 1/02*
U.S. Cl. 84—1.09 **7 Claims**



1. An indirect keying circuit for a tone generator system of an electronic organ comprising

first, second and third field effect transistors each having source, drain and gate regions, the source of said first transistor being connected to the drain of said second transistor and the source of said second transistor being connected to the drain of said third transistor,

means connecting the drain of said first transistor and the source of said third transistor to first and second voltage sources respectively,

means connecting the gate of said first transistor to a voltage signal source, means connecting the gate of said second transistor to a third voltage source and means connecting the gate of said third transistor to a musical tone source, the means connecting said third voltage source to the gate of said second transistor comprising a switch associated with a keyboard, and

means connecting the drain of one of said second or third transistors to an output terminal, said switch alternately connecting and disconnecting a D.C. voltage from said third voltage source to the gate of said second transistor thereby controlling the turning on and off of an output analog signal at said output terminal, the amplitude of said output analog voltage being controlled in accordance with the magnitude of the D.C. voltage from said third voltage source.

4,173,917

MUSICAL DRUMS

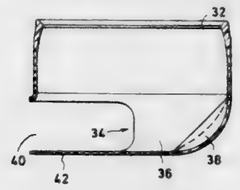
Clifford A. Della-Porta, Leicester, England, assignor to The Premier Drum Company Limited, Leicester, England

Filed Dec. 20, 1977, Ser. No. 863,866
Int. Cl.[2] G10D *13/02, 13/04*
U.S. Cl. 84—419 **4 Claims**

1. A drum shell having a generally cylindrical upper portion and a lower generally bowl-shaped portion, the side wall of said bowl-shaped portion also being generally cylindrical and constituting an integral continuation of said upper portion, the bottom of said bowl-shaped portion being closed,

an aperture in the side wall of said bowl-shaped portion, and

an integral sound reflector situated within said bowl-shaped portion diametrically opposite said aperture, for directing sound toward said aperture, said reflector intersecting



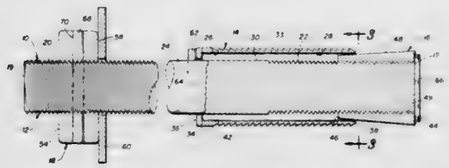
both the side wall and the closed bottom of said bowl-shaped portion.

4,173,918

ROOF BOLT AND THE LIKE

Raymond Piersall, Lake Spa Mobile Home Pk., Star Rte. 1, Box 10, Niland, Calif. 92257

Filed Mar. 27, 1978, Ser. No. 890,260
Int. Cl.[2] F16B *13/06, 31/02*
U.S. Cl. 85—75 **1 Claim**



1. An expansion bolt for use in a predrilled hole of predetermined diameter in rock or like materials, comprising in combination:

(a) an elongated stud of uniform diameter having first and second threaded end portions and an intermediate shank portion, said first end being adapted for insertion into the predrilled hole and the second end remaining outside the hole;

(b) a cylindrical expansion sleeve extending axially around the stud near the first end thereof and covering at least part of the threading on said first end, said sleeve having a uniform inner diameter greater than the outer diameter of the stud for creating an uniform annular radial clearance between the sleeve and stud, and wherein the sleeve has at least four axially extending slots originating at the end of the cylinder nearest the first end of the stud and terminating prior to the opposite end of the cylinder to define an unbroken ring at said opposite end, said slots being symmetrically arranged about the circumference of the sleeve, and the sleeve being formed of spring steel;

(c) a retaining pin carried in a hole formed in the shank portion of the stud and extending radially outwardly therefrom for limiting the movement of said sleeve toward the second end of the stud;

(d) an annular shoulder member carried on the stud between said retaining pin and the expansion sleeve and having an inner diameter closely similar to the outer diameter of the stud;

(e) a frusto conical wedge member threadedly engaged to the first end of said stud and axially aligned therewith, having its narrowest end facing said sleeve and having ribs on the circumferential surface thereof corresponding in number and position to said slots for engaging the slots and holding the sleeve and wedge member in similar rotational position on the stud, the narrow end of the wedge having a radial thickness no greater than said annular radial clearance between the sleeve and stud;

(f) a backing plate attached to the first end of the stud and having a diameter larger than the diameter of the stud and no larger than the maximum diameter of the wedge member;

(g) a threaded nut member engaging the second threaded end portion of the stud, the nut member and stud having an aperture formed diametrically therethrough adapted to be coaxially aligned;

(h) a shear pin carried in the aperture of the nut and passing through the aperture of the stud for maintaining the nut and stud in fixed rotational positions until a predetermined torque is applied to the nut; and

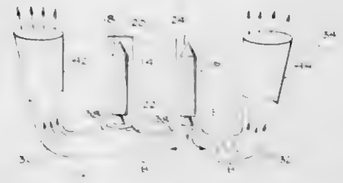
(i) a shoulder plate washer engaging the stud between the nut member and retaining pin and having a larger diameter than the predetermined diameter of the predrilled hole.

4,173,919

TWO-WAY ROCKET PLENUM FOR COMBUSTION SUPPRESSION

Edward T. Piesik, Pomona, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Dec. 12, 1977, Ser. No. 860,038
Int. Cl.[2] F41F *3/04*
U.S. Cl. 89—1.8 **12 Claims**



1. A rocket plenum exhaust system for suppressing unwanted combustion of raw exhaust gases within a manifold comprising:

a plurality of rocket launch tubes positioned in line adjacent one another;

a continuous plenum chamber extending generally horizontally along the line of launch tubes and having means for connecting to each of the launch tubes at the base thereof;

means for releasably sealing each launch tube adjacent the base thereof from communication with the plenum chamber, said sealing means being adapted to open upon the firing of a rocket in the associated launch tube to admit exhaust gases from the rocket into the plenum chamber upon said firing and to close for sealing off the launch tube under all other circumstances; and

a pair of upstanding exhaust ducts coupled respectively to opposite ends of the plenum chamber and being sized to correspond approximately in cross-sectional area to the cross-sectional area of the plenum chamber.

4,173,920

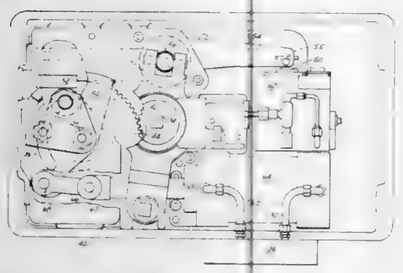
PLUNGE SHAVING MACHINE

John J. Sigman, Jr., Algonac, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Jan. 18, 1978, Ser. No. 870,442
Int. Cl.[2] B23F *19/06;* **B23C** *9/00;* **F15B** *15/22*
U.S. Cl. 409—37 **6 Claims**

1. A plunge-cut gear shaving machine in which a gear shaving cutter in the form of a gear-like tool member and a work gear member, are rotated in mesh and relatively fed radially to a predetermined full depth position at a controlled rate, maintained at full depth without lateral traverse for a predetermined dwell period, and then retracted, which comprises a frame, a rotary support on said frame for supporting a first one of said members, a slide on said frame, a second rotary support on said slide for supporting the other of said members in mesh

with said first member, means for driving one of said supports in rotation, a feed device including threadedly engaged screw and nut elements, one of which is rotatable, connected between said frame and said slide to feed said slide upon rotation of said one rotatable element in a direction to cause a radial depth feed between said members, a feed gear fixed to said rotatable feed element, a driving gear in mesh with said feed gear, a piston and cylinder actuator connected to said driving gear, a lever pivoted intermediate its ends on said frame, a cam fixed to said



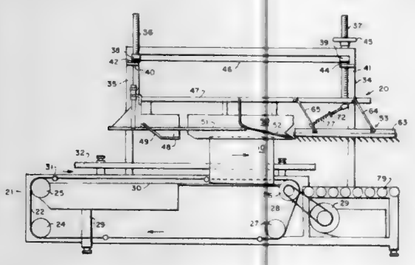
driving gear, a cam follower at one end of said lever engaging said cam, abutment means limiting rotation of said lever and hence of said driving gear, said abutment means comprising a movable abutment engaged by the other end of said lever, and adjustable hydraulic escapement means controlling the rate of movement of said abutment to control the rate of depth feed between said members, said escapement means comprising a manually adjustable metering valve to predetermine the rate of infeed between said members.

4,173,921

CARTON HOLD-DOWN APPARATUS

Halmer B. Mack, Aptos, Calif., assignor to Goodale Manufacturing Company, Inc., Watsonville, Calif.

Filed Dec. 27, 1977, Ser. No. 864,736
Int. Cl.[2] B31B *1/64*
U.S. Cl. 93—36.3 **5 Claims**



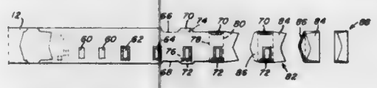
1. An apparatus for exerting pressure on a container comprising in combination:
   a conveyor for moving the container along a predetermined path;
   a frame positioned above said predetermined path; and
   a plurality of flexible planar members supported on said frame and extending downward and across said predetermined path so as to contact a substantial portion of the top surface of the container and exert pressure thereon while flexing as the container is moved along the conveyor.

4,173,922

METHOD FOR MAKING SIDE SEAM ENVELOPES FROM A WEB

Herbert W. Helm, Hollidaysburg, Pa., assignor to F. L. Smithe Machine Company, Inc., Duncansville, Pa.

Continuation of Ser. No. 758,752, Jan. 12, 1977, abandoned, which is a continuation of Ser. No. 569,855, Apr. 21, 1975, abandoned. This application Jan. 5, 1978, Ser. No. 867,328
Int. Cl.[2] B31B *21/00*
U.S. Cl. 93—63 M **4 Claims**



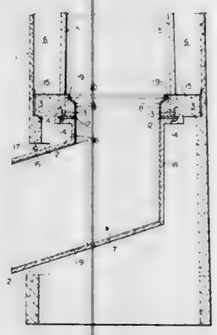
1. In a method for making inside side seam envelopes from a web that includes,
   unwinding a web from a reel,
   introducing said web into an envelope making machine,
   cutting the side edges of said web to form spaced envelope side flaps therein,
   forming longitudinal side flap score lines in said spaced envelope side flaps of said web,
   folding said envelope side flaps on said web,
   cutting envelope blanks from said web with said side flaps folded and forming an envelope blank bottom flap portion,
the improvement comprising:
   after said envelope blank is cut from said web applying glue to the upper surface of said folded side flaps of each of said envelope blanks, and
   thereafter folding said envelope blank bottom portion into overlying relation with the folded side flaps with glue applied to said envelope blank side flaps to thereby form an inside side seam envelope.

4,173,923

METAL AND BRICK CHIMNEY LINER

Randolph W. Snook, Shawnee Mission, Kans., assignor to Pullman Incorporated, Chicago, Ill.

Continuation of Ser. No. 835,900, Sep. 23, 1977, abandoned. This application Nov. 6, 1978, Ser. No. 958,076
Int. Cl.[2] E04F *17/02;* F23L *17/02*
U.S. Cl. 98—58 **22 Claims**



1. In a chimney having an outer column with an exterior and inner surface, in inner lining spaced therefrom and having a lower end, and breeching means joined to said lining, the improvement comprising:
   a breeching member comprising an upright tubular element generally in line with the inner lining, and at least one lateral tubular element, said lateral element extending through the outer chimney column to form a breeching entry;

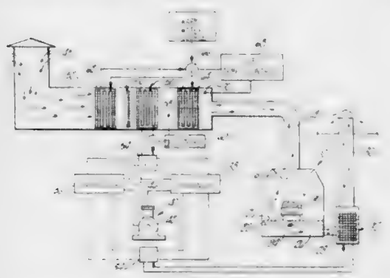
suspension means coacting with the outer chimney column and the upright tubular element for suspending the breeching member within the chimney at the lower end of the lining, and
constant loading hanger means for suspending said lateral tubular element from the outer chimney column adjacent the breeching entry.

4,173,924

PAINT SPRAY BOOTH WITH AIR SUPPLY SYSTEM

Norman F. Bradshaw, Surrey, England, assignor to Schweitzer Industrial Corporation, Madison Heights, Mich.

Filed Mar. 1, 1978, Ser. No. 882,345
Int. Cl.[2] F23J *11/00*
U.S. Cl. 98—115 SB **30 Claims**



1. A paint spray booth including an enclosure for carrying out spray painting operations therein and an air supply system, said air supply system comprising:
   means directing an incoming air supply into said enclosure;
   means exhausting said air after passing through said enclosure;
   filtration means filtering said air after passing through said enclosure removing paint overspray solids therefrom prior to being exhausted;
   conditioning means for heating or cooling said supply air to a predetermined temperature level to supply said air to said enclosure at said temperature level;
   energy recovery means receiving air exhausted from said spray booth enclosure, and including:
   means for transferring heat from said supply air to said filtered exhaust air when said conditioning means air cooling is in operation; and
   further including means for transferring heat from said filtered exhaust air into said supply air when said conditioning means air heating is in operation;
   whereby said system energy efficiency is increased by said heat transfer.

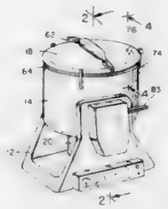
4,173,925

VARIABLE TILT ROTATING POT COOKER AND MIXER

Joseph L. Leon, 154-01 Barclay Ave., Flushing, N.Y. 11355

Continuation of Ser. No. 799,442, May 23, 1977, abandoned. This application May 16, 1978, Ser. No. 906,648
Int. Cl.[2] A47J *27/00;* B01F *9/02*
U.S. Cl. 99—348 **21 Claims**

1. A variable tilt, rotating pot for cooking and mixing a plurality of foods or substances, comprising
   a base,
   a shell pivotably mounted on said base and movable between horizontal and vertical positions,
   a pot rotatably mounted in said shell and adapted for mixing and tumbling said foods or substances,
   means, coupled to said pot and mounted on said shell, for rotating said pot in said shell,
   cover means adapted for disposal over said pot in sealing engagement therewith,
   bracket means, mounted on said shell, for securing said cover means to said pot in a fixed position relative to said pot and said shell,
   bearing means, mounted on said cover means and adapted for disposal between said cover means and said pot in engagement with said pot, for permitting rotation of said pot relative to said cover,
   means for holding said shell and said pot in a tilted position during rotation of said pot, and



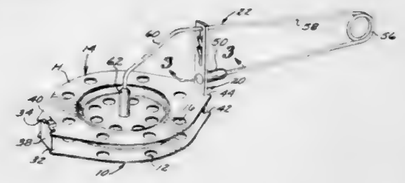
   vent means, disposed in said cover means and adapted to communicate with the interior of said pot, said vent means being located vertically above a horizontal diameter of said pot adjacent a vertically uppermost edge of said cover means for permitting the release of pressure from said pot.

4,173,926

TORTILLA PIE SHELL HOLDER

Clifford N. Brignall, P.O. Box 391, Boulder City, Nev. 89005

Filed Nov. 3, 1978, Ser. No. 957,325
Int. Cl.[2] A47J *36/20*
U.S. Cl. 99—349 **6 Claims**



1. A holder for forming a tortilla or the like into a pie shell and then cooking said tortilla in hot oil, said holder comprising:
   a lower apertured pan;
   an upper apertured pan similar in shape to said lower pan and movable downwardly within the confines of said lower pan, with the space between said lower and upper pans receiving an uncooked tortilla when said pans are vertically separated;
   guide means interposed between said pans to restrain their relative horizontal movement while permitting their relative vertical movement;
   an upstanding bracket secured to said lower pan; a handle attached to said bracket, said handle having its inner end secured to said upper pan; and lock means interposed between said bracket and said handle to selectively control the vertical position of said upper pan relative to said lower pan, whereby said holder and the uncooked tortilla therein may be lowered into said oil to render said tortilla pliable, whereafter said upper pan is lowered toward said lower pan to deform said tortilla into a pie shell shape until said tortilla is cooked.

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4,173,927

PRINTING DEVICE

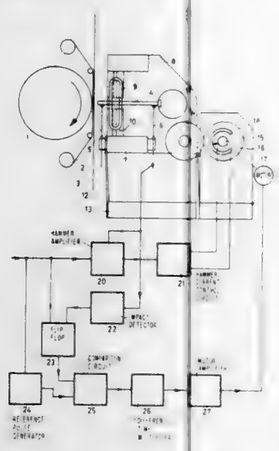
Dick Van Kempen, Eindhoven, and Marius Quirijnen, Zoetermeer, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 780,962, Mar. 24, 1977, abandoned. This application Aug. 22, 1978, Ser. No. 935,895

Claims priority, application Netherlands, Apr. 1, 1976, 7603373

Int. Cl.² B41J *7/92*

U.S. Cl. 101—93.03 **3 Claims**



1. A printing device for printing images on an associated record carrier having at least one layer which comprises: a roll on which a plurality of printing characters are disposed, at least one printing hammer, means mounting said roll for relative motion with respect to said one printing hammer, means for holding the record carrier proximate to said roll, means biasing said hammer away from the record carrier to a first position, a coil cooperating with said one hammer which when excited generates a field which urges said one hammer toward a printing character on said roll and to impact said record carrier in a second position, means for varying the current through said coil, means for mounting said one hammer to be movable so that the distance between (1) said one hammer in the non-actuated condition, and (2) the roll is adjustable, means for providing a fixed reference time signal corresponding to the nominal hammer flying time, said nominal flying time being the time from said first position to said second position with said record carrier having a given number of layers and which produces images in the desired location which are legible, means for measuring actual flying time of said one hammer, means for comparing actual flying time of said one hammer with said fixed reference signal and, means for displacing said one hammer relative to said roll and changing the impact force responsive to a difference between said signal corresponding to nominal hammer flying time and actual flying time for said one hammer.

4,173,928

SCREEN PRINTING MACHINE

Mathias Mitter, Falkenstrasse 57, 4815 Schloss Holte, Fed. Rep. of Germany

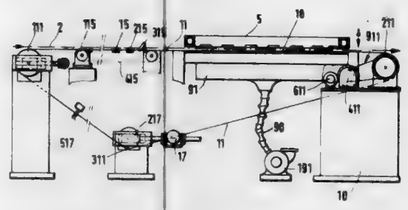
Filed Sep. 22, 1977, Ser. No. 835,793

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1976, 2643226

Int. Cl.² B05C *17/06*

U.S. Cl. 101—126 **16 Claims**

1. A screen printing machine, comprising a printing station including a printing screen; means for supporting and transporting a sheet-material workpiece to be printed, including an endless gas-permeable carrier band having a workpiece supporting run extending beneath said printing screen; suction means below said supporting run for drawing printing ink into the workpiece on said supporting run, including a suction device and means for moving said suction device to and fro below said printing run; and means between said supporting



run and said suction device for reinforcing said carrier band and protecting the same against damage resulting from relative movement of said carrier band and suction device, the last-mentioned means comprising a gas-permeable belt and adjustable tensioning means for maintaining said belt in taut condition.

4,173,929

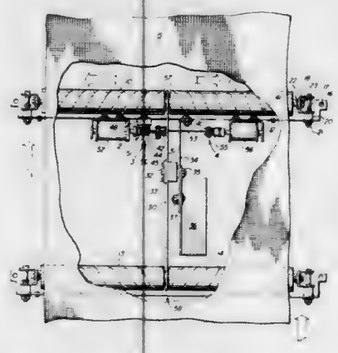
PRINTER RIBBON ANTI-FOLD MECHANISM

Gary P. Fisher, Melbourne, Fla., assignor to Documation Incorporated, Melbourne, Fla.

Filed Nov. 29, 1977, Ser. No. 855,767

Int. Cl.² B41J *35/08*

U.S. Cl. 101—336 **17 Claims**



1. A printer ribbon anti-fold mechanism comprising in combination:

support frame means;

a plurality of elongated ribbon support rollers, each roller having serrations thereon, and each roller mounted with one end abutting one end of at least one other roller of said plurality of rollers, said abutting rollers being mounted at an angle to the elongated center axis of each other roller, whereby a printer ribbon is directed away from the abutting ends of said abutting rollers to prevent creasing of the ribbon;

linkage means connected to said frame means and to one end of each said elongated roller for shifting the angular position of said abutting rollers between a first position, when siad ribbon is moving in one direction, and a second position when said ribbon is moving in a second direction, whereby said printer ribbon is directed away from the abutting ends of said rollers in either direction of travel of said rollers; and

actuation means connected to said linkage means for actuating said linkage means and rollers between said roller's first and second position upon a change in direction of said ribbon mounted thereover.

4,173,930

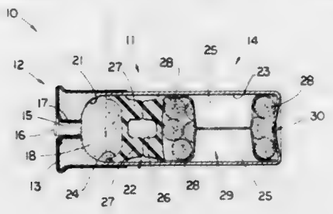
DIMPLED SHOTGUN PELLETS

C. Dickson Faires, Jr., 7621 Somerset Bay, Apt. B, Indianapolis, Ind. 46240

Filed Oct. 25, 1977, Ser. No. 844,880

Int. Cl.² F42B *7/02*

U.S. Cl. 102—42 R **8 Claims**



1. A shotshell load including a casing, a primer, a powder charge, a wad and a plurality of pellets, the improvement comprising said pellets having a plurality of concave dimples arranged on the outer surfaces thereof, the concave dimples being arranged symmetrically around the outer surfaces of said pellets.

4,173,931

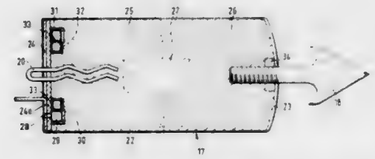
INCENDIARY WARHEAD

Alois Schiessl, Marzoll, Fed. Rep. of Germany; Georg Prachauser, Oberalm, Austria; Wolfgang Badura, Turek-Marzoll, and Wolfgang Trede, Weil am Rhein, both of Fed. Rep. of Germany, assignors to Firma BUCK Chemisch-Technische Werke GmbH. & Co., Bad Ueberkingen, Fed. Rep. of Germany

Filed Feb. 21, 1978, Ser. No. 879,599

Int. Cl.² F42B *13/44*

U.S. Cl. 102—90 **13 Claims**



1. In a warhead of the type comprising a body and incendiary units which are stacked within said body and which are ignited and ejected from the body by a bursting charge, to be spread over a target area, the improvement wherein said incendiary units each comprise:

a cup-shaped housing;

a cover closing a top end of said housing;

a three-part incendiary filling compressed within said housing, said filling comprising

a flame substance which forms a flame during an extended period of combustion,

a thermit substance which forms a red-hot slag during a shorter period of combustion, and

a transfer substance disposed between and completely enveloped by said flame substance and said thermit substance, said transfer substance being readily ignitable by said flame substance and adapted to burn with considerable heat and ignite said thermit substance;

an anchoring point projecting from a bottom end of said housing; and

a tail unit connected at said top end of said housing for regulating the discent of the housing.

4,173,932

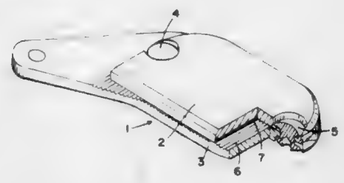
SAFETY SHUTTER FOR A FUZE

Yvanhoe Matte, and G. Russel Walker, both of Quebec, Canada, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 15, 1969, Ser. No. 846,297

Int. Cl.² E42C *15/34*

U.S. Cl. 102—254 **7 Claims**



1. In a munition having a main explosive charge, a detonating charge for exploding said main charge, and a safety shutter between said charges for minimizing the risk of inadvertent explosion of said main charge, said safety shutter being movable from a "safe" to an "armed" position,

the improvement comprising, in combination therewith, a pair of thin metal shutter plates fastened together in contact with each other by fastening means passing through aligned holes in said plates, one of said plates being near said detonating charge and the other plate being near said main charge when said safety shutter is in the "safe" position,

each of said plates having a plurality of parallel grooves in only one of its faces, said grooves of said first plate facing the grooves of said other plate and running in a direction perpendicular to the direction of the grooves in said other plate to provide substantially only point contacts between said plates;

the other surface of each of said plates being substantially smooth;

one of said plates being larger than the other plate, said larger plate being the arm of said movable shutter, and said larger plate being ungrooved in the area not in contact with said other plate;

whereby upon accidental explosion of said detonating charge when said safety shutter is in the "safe" position, the shock wave energy of said detonating charge is absorbed by crushing deformation and shearing of said grooved plates without spalling of the plate near said main charge, and the detonation of said main charge is thereby prevented.

4,173,933

HIGH SPEED BOGIE

Ulrich Kayserling, Nüremberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Nüremberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 575,640, May 8, 1975, abandoned. This application Jun. 24, 1977, Ser. No. 809,940

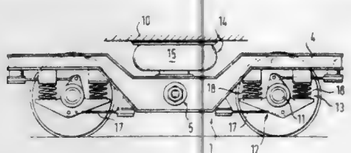
Claims priority, application Fed. Rep. of Germany, May 8, 1974, 2422226

Int. Cl.² B61F *5/10, 5/16, 5/24, 5/52*

U.S. Cl. 105—182 R **15 Claims**

1. A bogie with pivoting frame members for high-speed rail vehicles formed by two rigid bogie longitudinal beams having lateral extensions which are pivotal in vertical direction relative to each other though in the horizontal plane being rigid

and firm relative to each other, in which said longitudinal beams are interconnected by elastic wear-resistant means which are arranged symmetrically to and in the region of the vertical central transverse plane of the bogie, and in which said bogie has at least one pivot point for the pivoting frame members with the upper structure of the rail vehicle and with each axle bearing having axle bearing guiding means, the improvement in combination therewith comprising a wear-resistant means interconnecting the central areas of the bogie longitudi-



nal beams together with one wear-resistant means each interconnecting the longitudinal beam ends by way of the lateral extensions, and that said wear-resistant means which is located within the region of the vertical transverse plane is designed as an intermediate joint permitting movements solely about the vertical axis whereas the wear-resistant means at the ends form components of horizontal spring leaves which form the lateral extensions of the bogie, the ends of said spring leaves being connected to the rigid lateral extensions arranged at the ends of said longitudinal means.

4,173,934

SHELVING STRUCTURE

Dennis deB. Searby, Burlington, Canada, assignor to Speedshelf International, Inc., Skokie, Ill.

Filed Sep. 8, 1977, Ser. No. 831,524
Claims priority, application Canada, Sep. 24, 1976, 262040
Int. Cl.[2] A47B *3/00*
U.S. Cl. 108—111 **25 Claims**

1. In a vertical framework shelving structure extendable in both lateral and longitudinal directions including, in combination:

at least four vertical columns, each column being a tubular member having a rectangular cross-section thereby forming four vertical faces consisting of a front face, a back face and a pair of side faces, each side face being provided with a series of pairs of spaced mounting slots, the mounting slots being both horizontally and vertically aligned;

at least two lateral bracing members extending horizontally between and connected to a pair of front and rear vertical columns and at least two additional lateral bracing members extending horizontally between and connected to a second pair of front and rear vertical columns, each end of said lateral bracing members being formed with at least two mounting lugs projecting at right angles to the plane of the bracing member, arranged in vertical alignment with and spaced apart vertically a distance equal to the vertical spacing of the mounting slots on the vertical columns, at least one mounting lug having a locking means at the lower portion thereof and each of said lateral bracing members having at a side surface thereof at least one upwardly extending shelf support flange, and

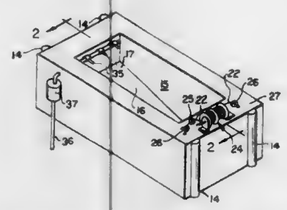
at least one rectangular horizontal shelf member made of sheet metal and extending longitudinally between one lateral bracing member and the next horizontally disposed lateral bracing member thereby defining a shelf structure, said rectangular horizontal shelf member having a downwardly extending lateral and longitudinal periphery, the longitudinally opposite ends of said rectangular horizontal shelf member being adapted to engage with the upwardly extending shelf support flanges of the horizontal lateral bracing members.

4,173,935

DUMP SCOW

Frederick J. Grace, P.O. Box 516, Chambers Bridge Rd., Bricktown, N.J. 08723

Filed Jan. 9, 1978, Ser. No. 867,720
Int. Cl.[2] B63B *35/30*
U.S. Cl. 114—36 **3 Claims**



1. A dump scow comprising a hull having a single cargo carrying cavity, flotation compartments disposed in said hull surrounding said cargo carrying cavity, a single discharge opening in the bottom of said hull at one end of said cargo carrying cavity, said cargo carrying cavity having a bottom surface downwardly sloping from the other end of said cargo carrying cavity to said cargo discharge opening, a gate having a hinge, said gate normally closing said cargo discharge opening, means for controllably closing said gate and for controllably opening said gate for unloading material contained in said cargo carrying cavity through said discharge opening, and water-fed nozzles for introducing wash water into said cargo cavity from the other end of said cargo carrying cavity, for washing down said opening any of said material remaining in said cargo carrying cavity.

4,173,936

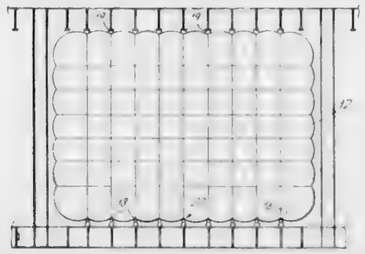
TANKS FOR THE STORAGE AND TRANSPORT OF FLUID MEDIA UNDER PRESSURE

Herbert C. Secord, Markyate, England, and Alfred H. Schwendtner, New York, N.Y., assignors to Martacto Naviera S.A., Washington, D.C.

Filed Sep. 1, 1977, Ser. No. 829,915
Claims priority, application United Kingdom, Sep. 8, 1976, 37247/76
Int. Cl.[2] B63B *25/08*
U.S. Cl. 114—74 A **9 Claims**

1. A support system for a tank of which at least the bottom wall is made up of a series of outwardly convex lobes that are elongated in one horizontal direction so as to form a series of parallel interlobe nodal recesses between the lobes, said support system comprising a plurality of support assemblies under the tank, each support assembly consisting of a pedestal upstanding from external support structure below the tank, and a block of load-bearing heat-insulating material supported on said pedestal and tapering upwardly to an apex at its top which is shaped to fit contiguously into an interlobe nodal recess of the tank bottom, said pedestal having at its bottom a base

secured to said external support structure and further having at its top a tray-like saddle with a horizontal floor in which the bottom of said block rests, with synthetic plastics material filling said saddle tray and in which said bottom of said block is embedded, the width of said bottom of said block, in the



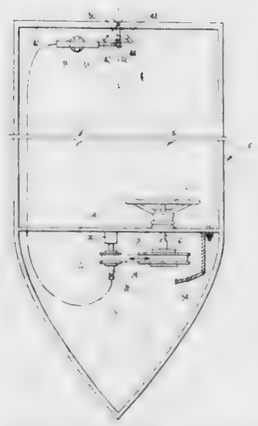
horizontal direction at right angles to the longitudinal direction of said parallel lobes forming the bottom of the tank, being less than the width in the same direction of said tray-like saddle so as to allow for a degree of misalignment between said pedestal and the interlobe recess of the tank bottom.

4,173,937

REMOTELY ACTUATED MARINE STEERING SYSTEM

Walter Kulischenko, East Brunswick, N.J., and Martin J. Capdevielle, Staten Island, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Feb. 23, 1978, Ser. No. 880,410
Int. Cl.[2] B63H *25/00*
U.S. Cl. 114—144 R **3 Claims**



1. In a marine vessel steering system wherein manually-operable steering control means effects rotation of rotatable flexible means for controlling movement of a steering member through screw means which converts rotary motion from said rotatable flexible means to linear motion, said linear motion effecting movement of said steering member which controls direction of travel of said marine vessel, the combination therewith of the improvement characterized by an absence of gear means between said manually-operable steering control means and said rotatable flexible means, said improvement comprising

a driver pulley rotating in response to and accordance with rotation of said manually-operable steering control means,

a driven pulley,

belt means operably engaged about said driver pulley and said driven pulley whereby a single revolution of said manually-operable steering control means and driver pulley causes a plurality of revolutions of said driven pulley,

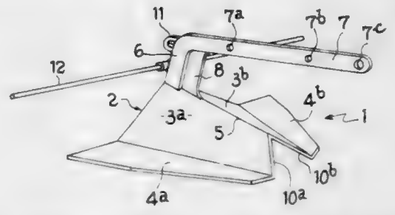
said rotatable flexible means having one end thereof connected to an output of said driven pulley for rotation therewith and other end of said rotatable flexible means connected to said screw means.

4,173,938

ANCHORS AND ANCHORING SYSTEM

Armand T. Colin, Versailles, France, assignor to Constructions Metalliques de Provence, France

Filed Sep. 28, 1977, Ser. No. 837,407
Claims priority, application France, Oct. 6, 1976, 76 30135
Int. Cl.[2] B63B *21/34*
U.S. Cl. 114—301 **21 Claims**



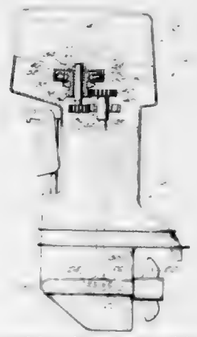
1. An anchor for positioning on water floating machines, such as drilling platforms, drags, landing stages, river crossing structures, said anchor being intended to be lowered to a position flat on the water bed and comprising a plough and a shank which is rigid with the plough, the plough having substantially a dihedral shape and comprising lateral substantially planar side walls defining therebetween an upper corner edge defined by the dihedral angle and having longitudinal edges which are substantially contained in a common plane perpendicular to a bisecting plane of the dihedral angle, the corner edge being downwardly inclined toward said common plane from an end of the corner edge in the vicinity of which end the shank is rigidly fixed to the plough, the anchor having a substantially constant wall thickness in the plough part thereof.

4,173,939

TWO-SPEED TRANSMISSION

Charles D. Strang, Lake Forest, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 729,379, Oct. 4, 1976, abandoned. This application Feb. 22, 1978, Ser. No. 880,038
Int. Cl.[2] B63H *5/13*
U.S. Cl. 115—17 **20 Claims**

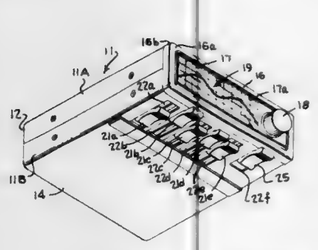


16. A marine propulsion device comprising an input shaft

drivingly connected to a power source, a lower unit having a rotatably mounted drive shaft, a propeller shaft rotatably mounted in said lower unit and carrying a propeller, means drivingly connecting said drive shaft to said propeller shaft, and a two-speed transmission drivingly connecting said input shaft to said drive shaft and including first drive means between said input shaft and said drive shaft for selectively drivingly connecting said input shaft and said drive shaft at all input speeds and including a drive gear, a driven gear in meshing engagement with said drive gear, and a one-way overrunning clutch drivingly connecting said input shaft and said drive shaft through said drive and driven gears when the rotational speed of said input shaft is less than a predetermined value, said first drive means having an input-output speed ratio with a first value, and second drive means for selectively drivingly connecting said input shaft and said drive shaft when the rotational speed of said input shaft is greater than said predetermined value, said second drive means including a selectively actuatable clutch for drivingly connecting said input shaft and said drive shaft, said second drive means having an input-output speed ratio with a second value greater than said first value.

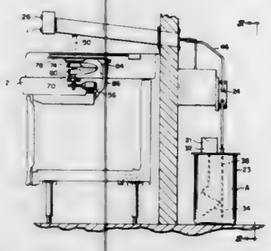
4,173,940
Patent Not Issued For This Number

4,173,941
RESPONSE TRACER AUDIO EQUALIZER AMPLIFIER UNIT HAVING GRAPHIC RESPONSE DISPLAY
John F. Castagna, Brooklyn, N.Y., assignor to Sparkomatic Corporation, Milford, Pa.
Filed Jun. 8, 1978, Ser. No. 914,064
Int. Cl.[2] H03G *1/00*
U.S. Cl. 116—307 **11 Claims**



1. A response tracer amplifier unit having graphic display of frequency response characteristics of output signals from an audio frequency source, comprising an amplifier cabinet housing audio amplifier circuitry for variably amplifying the audio signals at plural predetermined frequency bands in the audio spectrum, a manually adjustable tone control for each of the respective frequency bands for varying the signal amplification at each associated band, a graphic display window panel in a front wall of the cabinet having laterally spaced markings identifying graph-like positions for selected frequencies over most of the audio frequency spectrum, means supporting a continuous flexible curve indicator wire transversely spanning a face of said window panel for vertical movement of portions of the wire corresponding to locations of said frequency bands in a frequency response curve for the amplifier, and flexible motion translating means between each of said adjustable tone controls and said portions of the curve indicator wire for moving said portions of the wire vertically up and down responsive to manual adjustment of the tone controls for the associated frequency bands in a manner to shape the wire to indicate generally a frequency response curve for the audio spectrum including said frequency bands.

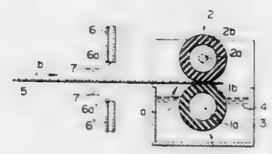
4,173,942
PIZZA MAKING MACHINE
Robert F. Plattner, Spring Lake, Mich., assignor to Bastian Blessing Company, Inc., Phoenix, Ariz.
Filed Feb. 9, 1978, Ser. No. 876,271
Int. Cl.[2] B05C *5/00, 13/02*
U.S. Cl. 118—25 **6 Claims**



1. In a pizza making machine,
a vertical shaft rotatable at a slow speed,
a substantially flat pizza supporting plate disposed substantially coaxially at its base with said vertical shaft,
a fitting between said shaft and plate carried on the upper end of the shaft comprising a radially extending lower arm member secured at one end to the shaft for rotation thereby and carrying a horizontally disposed off center pivot means located within a vertical projection of the supporting plate,
a plate supporting arm pivotally supported for limited vertical movement on said pivot means and carrying a bearing assembly disposed substantially coaxial with said vertical shaft for a variable tilting movement progressing rotatively with respect to the lower member,
resilient means normally holding said bearing with its axis disposed vertically and yielding downwardly under additional weight of sauce deposited centrally on the plate to incline said axis from the vertical,
peristaltic pump means discharging a charge of pizza sauce on the plate at the center thereof, and
means for supporting said plate against rotation to provide a wobble action for spreading said pizza sauce thereon from the center towards the peripheral edge.

4,173,943
DEVICE FOR MOISTENING BLOOD SERUM BEARING FILM IN ELECTROPHORETIC APPARATUS
Toshihide Fujiwara, Fuchu; Nobutaka Kaneko, and Ryo Fujimori, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed May 2, 1978, Ser. No. 902,047
Claims priority, application Japan, May 17, 1977, 52-56840
Int. Cl.[2] G01N *31/08, 33/16*
U.S. Cl. 118—718 **7 Claims**

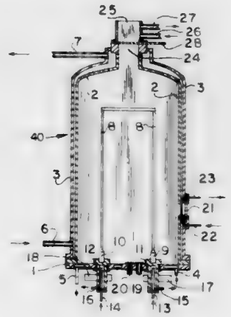
1. A device for wetting a blood serum bearing film in electrophoretic apparatus, comprising a first roller having a surface layer formed of a sponge material and disposed so that the surface layer is partly maintained in immersion in a buffering solution, a second roller disposed above and in abutting relationship with the first roller, wetting means for passing a blood



serum bearing film between the rollers to wet the film with the buffer solution that is contained in the surface layer while the film passes between the rollers, and a vapor ejection tube disposed forwardly of the rollers for moistening the film by the application of a vapor thereto before the film is wetted.

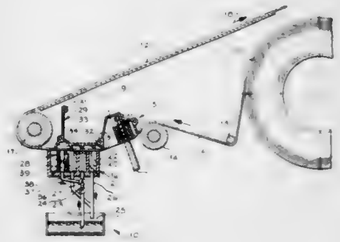
4,173,944
SILVERPLATED VAPOR DEPOSITION CHAMBER
Franz Köppl, Altötting; Helmut Hamster, Burghausen; Rudolf Griesshammer, Burghausen, and Helmut Lorenz, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany
Filed Feb. 14, 1978, Ser. No. 878,127
Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722778
Int. Cl.[2] C23C *13/08*
U.S. Cl. 118—719 **2 Claims**

1. In a device for the deposition of pure semiconductor materials, especially silicon, by thermal decomposition of gaseous compounds of said semiconductor materials on carrier bodies heated to decomposition temperature, wherein the device consists of a metallic base plate; mounting means and electrical connections thereon for heating the carrier bodies;



pipe connections for supply and exhaust of said gaseous compounds; a first bell-shaped cover forming a gas-tight seal with said base plate and defining a reaction chamber therewith; the interior surfaces of said chamber being fabricated of either silver or silver plated steel; a steel bell-shaped cover spaced from said first cover and forming a closed annular chamber therewith; cooling means provided for said annular chamber: an opening formed at the apex of said covers; removable closure means disposed at said apex opening for sealing said reaction chamber; and a finger shaped heater means alternately disposed within said chamber and sealing said opening when said closure is removed.

4,173,945
ELECTROSTATIC PRINTING MACHINE WITH IMPROVED WEB-DEVELOPING SYSTEM
Keith E. McFarland, Woodside, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Feb. 27, 1975, Ser. No. 553,591
The portion of the term of this patent subsequent to Nov. 13, 1994, has been disclaimed.
Int. Cl.[2] G03G *13/10*
U.S. Cl. 118—660 **10 Claims**



1. In an electrostatic printing machine having development apparatus of the type in which fluid toner material is applied to the surface of a web to develop latent electrostatic images thereon, said development apparatus including a toner fountain and a pump for pumping toner into the fountain from a body of toner, and a vacuum channel member for removing excess toner from the surface of said web, said channel member extending transversely of the path of movement of said web and being formed with a cavity open at one side and surrounded by walls which terminate in substantially a common plane for engaging said web passing thereacross to substantially seal the open side of the cavity and having a flow passage formed to conduct fluid toner out of said cavity, the improvement comprising,
aspirator means to provide a degree of suction in proportion to the discharge pumping rate of said pump,
means operatively coupling said aspirator means in fluid communicaton with the discharge side of said pump for generating said degree of suction, and
means operatively coupling said degree of suction in fluid communication with said vacuum channel flow passage for withdrawing toner from within said cavity.

4,173,946

MILKING CUP

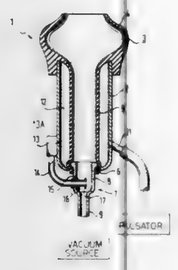
Jakob Maier, Türkheim, Fed. Rep. of Germany, and Tilman Hoefelmayr, Zürich, Switzerland, assignors to Kunzler & Co., Berneck, Switzerland

Continuation of Ser. No. 689,123, May 24, 1976, abandoned. This application Sep. 25, 1978, Ser. No. 945,499

Claims priority, application Fed. Rep. of Germany, May 27, 1975, 2523465

Int. Cl.[2] **A01J** *5/04*

U.S. Cl. 119—14.36 **6 Claims**



1. In a milking cup for use with a vacuum source and a pulsator, comprising a rigid cup sleeve, a resiliently flexible rubber teat holder received in said cup sleeve, said rubber teat holder having a teat receiving end and a suction sleeve means connected in fluid circuit with said teat receiving end and milk discharge pipe means connected in fluid circuit with said suction sleeve means, means defining a chamber between said cup sleeve and said rubber teat holder, an under-pressure relief valve mounted on said milking cup and having a fluid connection to said chamber and a characteristic of responding to an under-pressure reduction in said chamber during a relief cycle in a milking operation to facilitate the flow of air into said suction sleeve means, a conduit connected in fluid circuit with and extending between the interior of said milk discharge pipe means and said relief valve, the improvement comprising wherein said conduit extends on the outside of said cup sleeve between said relief valve means and said milk discharge pipe means and has a terminal end which is spaced inwardly of the inner sidewall of said milk discharge pipe means, said terminal end having a radially enlarged flange thereon defining a drip nose having surface means causing milk from a milking operation to collect on said enlarged flange and be prevented from entering said conduit during operative and inoperative time intervals.

4,173,947

METHOD AND APPARATUS FOR REARING PIGS IN CAGES

John V. Whiteside, Jr., Nesmith, S.C., assignor to John G. Wellman, Johnsonville, S.C.

Filed Jun. 13, 1977, Ser. No. 805,637

Int. Cl.[2] **A01K** *1/00, 1/02*

U.S. Cl. 119—18 **41 Claims**

1. A method of rearing hogs to increase the frequency of litters from each sow while enhancing the condition of the sow and reducing the mortality rate in each litter, said method comprising

placing each pregnant sow prior to delivery of a litter in a confining farrow crate having sufficient room for the sow to move forwardly and backwardly therein and to lie down but insufficient room to turn around,

maintaining the sow in the farrow crate after the birth of a litter for a period of time no longer than about three weeks while suckling the litter and, while during at least the last half of the period of time, providing supplemental food accessible to the litter but inaccessibly located to the sow,

removing the sow and the litter from the farrow crate and separating the sow from the litter,

placing the litter of pigs in an enclosed building within at least one elevated cage of openwork construction also having an openwork floor adapted to allow animal waste to pass therethrough while maintaining the pigs in a dry condition,

maintaining the pigs within the cage while providing readily accessible food and water and while at least periodically introducing outside air into the building to replenish the oxygen supply therein and to remove odors,

collecting the animal waste passing through the openwork floor of the cage in a trough positioned immediately below the cage,

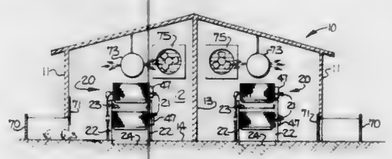
periodically passing a sweeping flow of water along the trough to flush away the animal waste from below the cage, and

directing the animal waste and flush water to a collecting area outside the building.

15. Apparatus for rearing animals in cages, and being especially suited for rearing pigs, said apparatus comprising

an elongate confinement building,

a plurality of elongate cages arranged end-to-end in tiered relation to form respective upper and lower elongate



series of cages extending longitudinally within said confinement building,

each cage comprising a floor of open mesh construction to allow animal waste to pass therethrough while maintaining the animals in a dry condition, and an open-bottomed open mesh enclosure restingly positioned on and supported by said floor with the floor thus serving as the bottom of the cage, said enclosure including a skeletal reinforcing frame and open mesh wire secured to the skeletal frame to define the top and sides of the enclosure, the wire being positioned exteriorly of the frame to locate any rough edges of the wire outside of the cage and shielded from contact by the animals housed therein,

a plurality of upright cage supports at longitudinally spaced locations along the elongate confinement building and engaging and supporting the respective floors of the cages in said upper and lower series of cages,

respective upper and lower elongate troughs underlying said upper and lower elongate series of cages and being positioned for receiving and collecting the animal waste passing through the floors of the cages while facilitating periodic inspection of the animal waste for locating any unhealthy animals and segregating them from the healthy animals,

water supply means operably associated with a corresponding end of said upper and lower elongate troughs for periodically directing a sweeping flow of wash water along the troughs to flush away the animal waste from below the cages,

means associated with corresponding opposite ends of said upper and lower elongate troughs for receiving the wash water and waste flushed from the troughs and for directing the same out of the confinement building, and

ventilation means provided in said confinement building for at least periodically introducing outside air into the building to replenish the oxygen supply therein and control the temperature in the building.

4,173,948

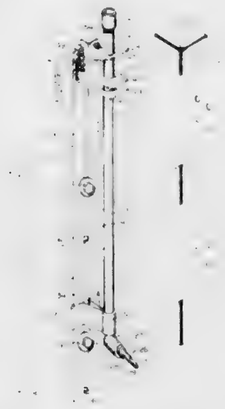
APPARATUS FOR ADJUSTABLY HOLDING A HOG WATERING DEVICE

Charles D. Austin, Box 280, R.R. 2, Nebraska City, Nebr. 68410

Filed Oct. 17, 1977, Ser. No. 842,632

Int. Cl.[2] **A01K** *7/00*

U.S. Cl. 119—72 **2 Claims**



1. An improved apparatus for adjustably holding a hog watering device in which a nipple valve is affixed to the end of an elongated pipe in fluid communication, wherein the improvement comprises:

(a) an elongated base adapted to be secured to a support comprising a first and second angle irons affixed to each other so as to substantially form a T with the common legs of the angle irons spaced apart to form a slot along the length thereof;

(b) a manually slidable pipe bracket secured with said pipe which includes two arms wherein the ends of said arms are angularly disposed so as to engage the longitudinal edges of said first and second angle irons;

(c) a frictional locking means comprising a first and second plates pivotally mounted to one end of said elongated base wherein the first and second plates are biased angularly and disposed so as to extend divergingly away therefrom and a third plate perpendicularly disposed and secured to said elongated base, said three plates each having a hole, in alignment whereby said first and second plates are pressed together to permit passage and selective adjustment of said pipe extending therethrough.

4,173,949

FEEDWATER PREHEAT CORROSION CONTROL SYSTEM

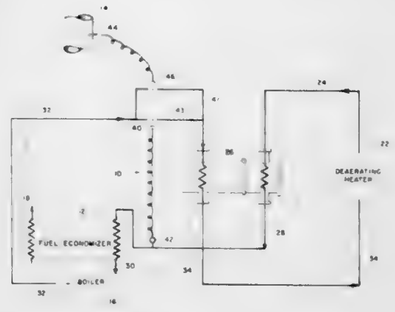
Lester A. Roethe, Tulsa, Okla., assignor to Tranter, Inc., Tulsa, Okla.

Filed Jan. 23, 1978, Ser. No. 871,212

Int. Cl.[2] **F22D** *1/02*

U.S. Cl. 122—1 C **2 Claims**

1. In a boiler system which includes a boiler for boiling feedwater therein to produce steam, an exhaust stack connected to said boiler for removing flue gas therefrom, and a fuel economizer mounted in said stack for preheating feedwater in said economizer prior to introduction of said feedwater into said boiler, and wherein said fuel economizer preheats the feedwater therein by passing the feedwater in heat exchange with flue gas from the boiler; an improved method of preheating said feedwater prior to its introduction into said economizer which comprises passing said feedwater through a preheater heat exchanger prior to its introduction into said economizer, conducting a first portion of steam from said boiler through a first conduit and into said preheater heat exchanger to heat said feedwater therein, conducting a second portion of steam from said boiler through a second conduit and into said



preheater heat exchanger to heat said feedwater therein, controlling the flow of steam through said first conduit in response to the temperature of feedwater entering said economizer whereby the temperature of the feedwater entering said economizer is above the dew point of the corrosive acids in the flue gas passing through said economizer, and controlling the flow of steam through said second conduit in response to the temperature of the exit gas from said exhaust stack to maintain the temperature of the flue gas above a predetermined temperature which will minimize corrosion within the exhaust stack due to the condensation of corrosive acids therein.

4,173,950

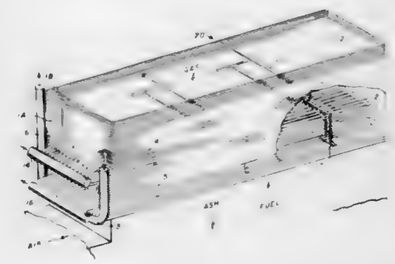
COAL FIRED FLUID BED MODULE FOR A SINGLE ELEVATION STYLE FLUID BED POWER PLANT

Richard E. Waryasz, Chicopee, Mass., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jul. 3, 1978, Ser. No. 921,927

Int. Cl.[2] **F22B** *1/02;* **F23D** *19/02*

U.S. Cl. 122—4 D **12 Claims**



1. A fluidized bed for the combustion of particulate fuel comprised of waterwall tubing having inlet and outlet ends thereof arranged to form a rectangular enclosure that surrounds a combustion chamber and has open areas at the bottom and top thereof for the inlet and outlet of fuel and air, a source of cooling fluid, an outlet header connected to the oulet ends of said waterwall tubing and arranged to receive the cooling fluid

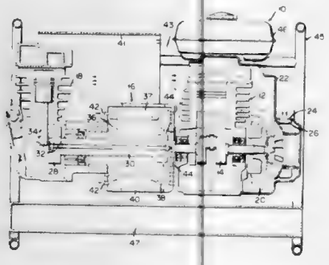
after it has circulated therethrough, and an "L" shaped inlet header adjacent the periphery of said fluidized bed adapted to supply cooling fluid from said source of cooling fluid to the inlet ends of said waterwall tubes for circulation to the outlet header.

4,173,951

POWER PLANT FOR SIMULTANEOUSLY GENERATING ELECTRIC POWER AND PNEUMATIC PRESSURE

Masamitsu Ishihara, 628 Hirai, Kannami-cho, Tagata-gun, Shizuoka-ken, Japan

Filed Oct. 28, 1977, Ser. No. 846,453
Claims priority, application Japan, Jun. 9, 1977, 52-75375
Int. Cl.[2] F02B *63/04, 63/06*
U.S. Cl. 123—2 **1 Claim**



1. A power plant for simultaneously generating electric power and pneumatic pressure, comprising: an engine having a crankshaft and a fan disposed on said crankshaft outside said engine, a dynamo for generating electric power and having a shaft drivingly coupled to the crankshaft of said engine, a compressor for generating pneumatic pressure and having a piston rod having one end thereof eccentrically drivingly connected to said crankshaft of said dynamo for rotation therewith, said engine, dynamo and compressor being arranged parallel to and substantially in alignment with each other, and a cover enclosing said dynamo and compressor and provided with an opening positioned above said dynamo, said dynamo being juxtaposed between said engine and said compressor and having a fan disposed on that side of the dynamo which lies adjacent said engine, and means for cooling said compressor comprising air streams produced by said fan of said engine coverging with air streams produced by said fan of said dynamo and air streams sucked in through said opening of said cover being carried toward said compressor.

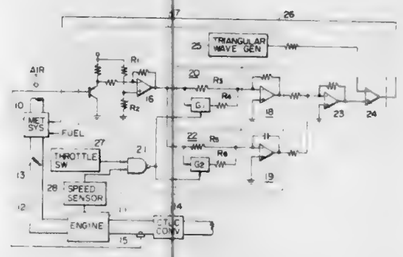
4,173,952

CLOSED-LOOP MIXTURE CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH IMPROVED RESPONSE CHARACTERISTIC TO IDLING CONDITION

Masaharu Asano, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Continuation of Ser. No. 678,667, Apr. 20, 1976, abandoned.
This application Jan. 31, 1978, Ser. No. 873,960
Claims priority, application Japan, Apr. 24, 1975, 50-49174
The portion of the term of this patent subsequent to Jun. 14, 1994, has been disclaimed.
Int. Cl.[2] F02B *3/00, 75/10*
U.S. Cl. 123—32 EE **3 Claims**

1. A mixture control system for internal combustion engines of the type including air-fuel supply means for supplying air and fuel for combustion, and exhaust means for carrying away exhaust gases after combustion, comprising: an exhaust gas sensor for detecting the deviation from a reference value of the concentration of a composition in said exhaust gases determined by said air-fuel supply means; means for generating a control signal varying proportionally to the magnitude of the deviation of said concentration from said reference value in a direction opposite to the direction of said deviation and for controlling said air-fuel supply means so that the ratio of air to fuel is controlled at a predetermined value; means for detecting an operating parameter of the engine indicative of an idling condition; and a switched resistor network providing a variable resistance value which increases in response to the detec-



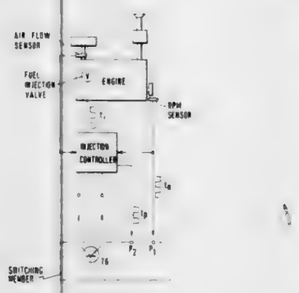
tion of said operating parameter of the engine, said network being connected between the output of said comparator and the input to said control signal generating means to thereby reduce the amplitude of said control signal in response to the detection of an idling condition, whereby the time taken for air and fuel supplied to said engine to approach said predetermined value of air to fuel ratio is reduced.

4,173,953

FUEL INJECTION PULSE SUPPRESSOR APPARATUS

Bernard Pocholle, Paris, France, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 1, 1978, Ser. No. 874,291
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1977, 2704180
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EL **4 Claims**



1. An apparatus for suppressing fuel injection control pulses, said control pulses serving to actuate fuel injection valves of an internal combustion engine, said control pulses being generated at least as a function of engine speed and air flow rate into the engine, and said apparatus including:

a reference circuit for generating reference pulses having a definite length termed reference length;

a first comparison circuit for comparing said control pulses with said reference pulses and for generating a first signal when said control pulses are shorter than said reference pulses;

a second comparison circuit for comparing said control pulses with said reference pulses and for generating a second signal when said control pulses are longer than said reference pulses;

a bistable multivibrator triggered by said first and second signals, respectively, to thereby be placed into one of two states; and

an output circuit, actuated by said bistable multivibrator, for suppressing said fuel injection control pulses during one state of said bistable multivibrator and wherein the improvement comprises:

said reference circuit is a monostable multivibrator having a single transistor, and each of said first and second comparator circuits includes a switching transistor, connected to the transistor in said reference circuit, the base of one of the switching transistors being connected to the collector of said single transistor, while the collector of the other switching transistor is connected to the collector of said single transistor and its base is connected to receive said control pulses;

and wherein the collectors of said switching transistors are connected to the inputs of said bistable multivibrator and determine its status.

4,173,954

LIMITED ROTATION ROLLER TAPPET

Frank H. Speckhart, 534 Dellwood Dr., Knoxville, Tenn. 37919

Filed Dec. 13, 1977, Ser. No. 860,210
Int. Cl.[2] F01L *1/14*
U.S. Cl. 123—90.5 **11 Claims**



1. A non-rotatable valve lifter mechanism for actuating intake and exhaust valves in an internal combustion engine, comprising:

a first tubular member having a bifurcation formed in one end thereof, a first roller bearing mounted in said bifurcation of said first tubular member, said first tubular member having an aperture and a slot formed therein, said slot being substantially parallel to the longitudinal axis of said first tubular member;

a second tubular member having a bifurcation formed in one end thereof, a second roller bearing mounted in said bifurcation in said second tubulor member, said second tubular member having a slot and an aperture formed therein, said slot being substantially parallel to the longitudinal axis of said second tubular member; and

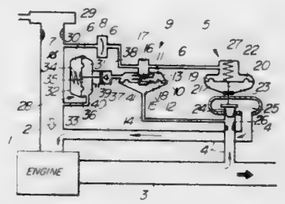
a locking bar supported by and preventing rotation of said tubular members, said locking bar having a first end portion, a first shoulder portion adjacent to said first end portion, a second end portion, a second shoulder portion adjacent to said second end portion, each said end portion being adopted to pass through both said slots and said apertures, each said shoulder portion having at least one dimension too great to allow passage through said apertures, the end portion of said locking bar passing through said apertures.

4,173,955

EXHAUST-GAS RECIRCULATION SYSTEM

Kinsaku Yamada; Chiaki Niida, and Teruo Takayama, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 15, 1977, Ser. No. 768,839
Claims priority, application Japan, Feb. 18, 1976, 51/15935
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **5 Claims**



1. An exhaust-gas recirculation system for an internal-combustion engine comprising an exhaust-gas recirculation passage which provides communication between the intake and exhaust pipes of the engine; an exhaust-gas recirculation valve having a valve inserted in said exhaust-gas recirculation passage to control the amount of exhaust gas flowing in said passage, a diaphragm connected with said valve, and a casing forming a chamber between the casing and said diaphragm; a vacuum conduit for introducing from said intake pipe the vacuum therein into said chamber, an atmospheric release orifice formed in said vacuum conduit, an exhaust-pressure transducer valve for controlling the amount of air introduced into said vacuum conduit through said atmospheric-release orifice in response to the pressure variation of said exhaust pipe; and an acceleration control unit for preventing the entry of air through said atmospheric-release orifice into said vacuum conduit in response to the pressure change in said intake pipe caused by acceleration of the engine, wherein said exhaust pressure transducer valve comprises a transducer valve casing, a second diaphragm dividing the inside space of said transducer valve casing into first and second chambers, a conduit for introducing the exhaust pressure in said exhaust gas pipe into said first chamber of said transducer valve, a passage for communicating said second chamber of said transducer valve with the atmosphere, a valve member fixed to the second chamber side of said second diaphragm for opening and closing said atmospheric-release orifice projecting into said second chamber of said transducer valve; and wherein said acceleration control unit comprises a control unit casing, a third diaphragm dividing the inside of the control unit casing into third and fourth chambers, said third chamber being subject to vacuum pressure from said intake pipe, said fourth chamber constituting an enclosed space, and a valve member fixed to said third diaphragm and arranged to open and close said passage for communicating said second chamber of said transducer valve casing with the atmosphere.

4,173,956

CLOSED LOOP FUEL CONTROL IN ACCORDANCE WITH SENSED ENGINE OPERATIONAL CONDITION

Kenji Ikeura; Masaaki Saito, both of Yokosuka, and Michiyoshi Yamane, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Nov. 17, 1977, Ser. No. 852,352
Claims priority, application Japan, Nov. 30, 1976, 51-144491
Int. Cl.[2] F02M *7/14*
U.S. Cl. 123—119 EC **9 Claims**

1. A closed loop fuel control system for an internal combus-

tion engine including means for supplying an air/fuel mixture to said engine, comprising:

(a) first means for sensing the concentration of a component contained in the exhaust gases emitted from said engine to produce a first signal indicative of the air/fuel ratio of the air/fuel mixture;

(b) second means for producing a second signal indicative of the difference in magnitude between said first signal and a reference signal;

(c) third means for producing a third signal in response to said second signal, said third means including a proportional-integral controller;

(d) fourth means for producing a control signal in accordance with said third signal;

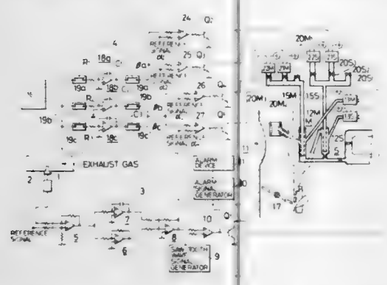
(e) fifth means for controlling the fuel flow rate in accordance with said control signal;

(f) sixth means for detecting the operational conditions of said engine in accordance with engine parameters, said sixth means producing a fourth signal indicative of an engine operational mode by selecting one from a plurality of modes which are predetermined;

(g) a plurality of integrators;

(h) seventh means for selectively supplying said third signal to one of said integrators in accordance with said fourth signal;

(i) eighth means for holding integrated voltages of the remaining integrators which are supplied with no signal from said seventh means until each of said integrators is



supplied with said third signal, each of said integrators integrating said third signal from the level of the holding voltage;

(j) ninth means for producing a second control signal by comparing each output signal of said integrators in magnitude with a plurality of reference signals;

(k) tenth means for selectively supplying each output of said integrators to said ninth means in accordance with said fourth signal; and

(l) eleventh means for controlling the fuel flow rate in accordance with said second control signal, the fuel flow rate being roughly controlled by said eighth means, while the fuel flow rate is precisely controlled by said fifth means.

9. A closed loop fuel control system for an internal combustion engine including means for supplying an air/fuel mixture to said engine, comprising:

(a) first means for sensing the concentration of a component contained in the exhaust gases emitted from said engine to produce a first signal indicative of the air/fuel ratio of the air/fuel mixture;

(b) second means for producing a second signal indicative of the difference in magnitude between said first signal and a reference signal;

(c) third means for producing a third signal in response to said second signal, said third means including a proportional-integral controller;

(d) fourth means for producing a control signal in accordance with said third signal;

(e) fifth means for controlling the fuel flow rate in accordance with each control signal;

(f) sixth means for detecting the operational conditions of said engine in accordance with engine parameters, said sixth means producing a fourth signal indicative of an engine operational mode by selecting one from a plurality of modes which are predetermined;

(g) a plurality of storage means connected to said third means for storing said third signal;

(h) seventh means for selectively enabling one of said plurality of storage means in accordance with said fourth signal;

(i) eighth means for producing a second control signal by comparing each output signal of said storage means in magnitude with a plurality of reference signals;

(j) ninth means for selectively supplying each output of said storage means in accordance with said fourth signal to said eighth means; and

(k) tenth means for controlling the fuel flow rate in accordance with said control signal, the fuel flow rate being roughly controlled by said tenth means, while the fuel flow rate is precisely controlled by said fifth means.

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ADDITIONAL AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Tadashi Hattori, Okazaki; Akira Takata; Tamotsu Fukuda, both of Toyota, and Takamichi Nakase, Gamagori, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Jun. 1, 1977, Ser. No. 802,311

Claims priority, application Japan, Jun. 14, 1976, 51-70006; Jun. 14, 1976, 51-70007; Jun. 22, 1976, 51-73717

Int. Cl.² F02M *7/00*

U.S. Cl. 123—119 EC **13 Claims**



1. In an additional air supply system for an internal combustion engine of the type including a combustion chamber for producing a power therein, an intake system operatively communicating with said combustion chamber for supplying thereto an air-fuel mixture, an exhaust system operatively communicating with said combustion chamber for conveying an exhaust gas from said combustion chamber to the atmosphere, an additional air supply pipe communicating with at least one of said intake and exhaust systems for supplying additional air thereto, to thereby control an air-fuel ratio of said air-fuel mixture at a desired value, air-fuel ratio detecting means disposed in said exhaust system for detecting the air-fuel ratio of the air-fuel mixture supplied with said additional air, control means operatively disposed in said additional air supply pipe for controlling the amount of the additional air to be supplied, drive means operatively connected with said control means for driving the same, and a control circuit electrically connected with said air-fuel ratio detecting means and said drive means for actuating said drive means in response to the detected air-fuel ratio, the improvement wherein said control circuit comprises:

an air-fuel ratio discriminating circuit connected with said air-fuel ratio detecting means for comparing the output from said detecting means with a preset level and for generating a high level or a low level signal based on the comparison; and

actuating means, connected with said discriminating circuit, for actuating said drive means at a first speed for a first period starting from a time when the signal from said discriminating circuit is changed from one level to the other level, said actuating means also actuating said drive means at a second speed for a second period starting from a time when said first period terminates and terminating at a time when the signal from said discriminating circuit is again changed from said other level to said one level.

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CARBURETOR

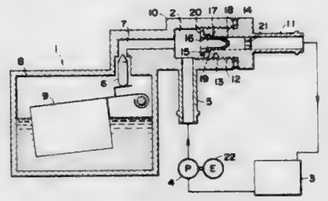
Yuzo Kato; Akira Ii, both of Toyota, and Tetsuya Oniki, Anjo, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aisan Kogyo Kabushiki Kaisha, both of Aichi, Japan

Filed Sep. 12, 1977, Ser. No. 832,560

Claims priority, application Japan, Apr. 22, 1977, 52-46562

Int. Cl.² F02M *5/02*

U.S. Cl. 123—136 **5 Claims**



1. A carburetor in a fuel system in a motor vehicle of the type including a fuel tank, a fuel pump for delivering fuel under pressure to said carburetor and a return fuel line which returns fuel from said carburetor to said fuel tank when an excess amount of fuel is delivered to said carburetor by said fuel pump, said carburetor comprising:

a float chamber;

a fuel inlet communicating with said float chamber and coupled to said fuel pump;

a fuel outlet tube provided in said carburetor and communicating with said fuel inlet, said fuel outlet tube being coupled to said return fuel line; and

a check valve means provided in said fuel outlet tube for preventing fuel from said fuel tank from flowing to said carburetor, said check valve means comprising a cylindrically shaped check valve made from an elastic material and having a tip in the shape of a duckbill.

4,173,959

LIQUID FUEL INJECTION PUMPS

Stanislaw J. A. Sosnowski, and James C. Potter, both of London, England, assignors to Lucas Industries Limited, Birmingham, England

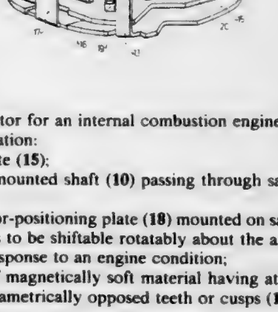
Filed Apr. 24, 1978, Ser. No. 899,403

Claims priority, application United Kingdom, Apr. 30, 1977, 18168/77

Int. Cl.² F02M *39/00;* **F04B** *19/02, 3/00*

U.S. Cl. 123—139 AP **27 Claims**

1. A liquid fuel injection pumping apparatus for supplying fuel to an internal combustion engine and comprising a housing, a rotary distributor member located in the housing, an injection pump including a bore formed in the distributor member, a pump plunger located in said bore, and cam means for imparting inward movement to said plunger as the distributor member rotates, a delivery passage in the distributor member through which the fuel displaced from said bore during the inward movement of the plunger flows, a plurality of outlet ports in the housing said delivery passage communicating with said outlet ports in turn as the distributor member rotates so that the fuel displaced during successive inward movements of the plunger will flow to the outlet ports in turn, a further bore formed in the distributor member or in a port rotatable therewith, a further plunger in said further bore, conduit means connecting said bores, further cam means for imparting inward movement to said further plunger as the distributor member rotates, said further cam means being positioned so that fuel will be displaced from said further bore through said conduit



means to said first mentioned bore whilst the delivery passage is out of register with the outlet ports, valve means in said conduit means operable to allow fuel to flow to said first mentioned bore but to prevent the reverse flow of fuel, said valve means acting to ensure restriction to the flow of fuel to the first mentioned bore, and means operable in conjunction with said further cam means to determine the length of the stroke of said further plunger during which fuel can be delivered to said first mentioned bore.

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INDUCTIVE IGNITION CONTROL PULSE GENERATOR IN AN INTERNAL COMBUSTION ENGINE DISTRIBUTOR

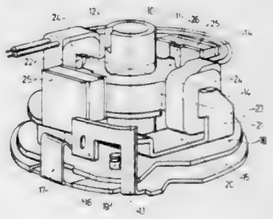
Aldo A. Padovese, Santa Barbara d'Oeste; Giuseppe M. B. Trevisan, and Emilio C. Sitar, both of Campinas, all of Brazil, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 18, 1977, Ser. No. 816,228

Claims priority, application Brazil, Aug. 3, 1976, PI 7605079

Int. Cl.² F02P *3/02, 7/02*

U.S. Cl. 123—146.5 A **7 Claims**



1. A distributor for an internal combustion engine comprising, in combination:

a carrier plate (**15**);

a rotatably mounted shaft (**10**) passing through said carrier plate;

an interruptor-positioning plate (**18**) mounted on said carrier plate so as to be shiftable rotatably about the axis of said shaft in response to an engine condition;

rotor (**11**) of magnetically soft material having at least two pairs of diametrically opposed teeth or cusps (**12**) distrib-

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uted about its periphery and having the same maximum radius dimension;

at least one pair of diametrically opposed coils (**24**) and at least one pair of diametrically poled permanent magnets (**25**) mounted in fixed relation to said interruptor-positioning plate, said coils being centered on an axis that is diametric with respect to said rotor and the facing portions thereof being close to the path of said teeth or cusps of said rotor, said magnets having like poles facing each other with facing portions close to the path of said teeth or cusps of said rotor, the magnets being circumferentially interposed between coils and vice-versa;

said coils of each pair being connected together to produce a common response;

the number of said teeth or cusps being equal to the sum of the number of said magnets and the number of said coils, or a multiple of said sum, and

the angles between successive rotor diameters (**14**) on which coil pairs and magnet pairs are aligned all being equal.

4,173,961

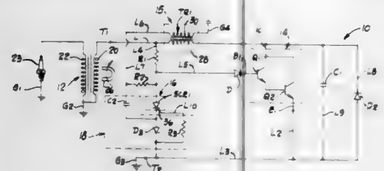
INDUCTIVE SOLID STATE MAGNETO IGNITION SYSTEM

William A. Howard, Troy Township, Ashland County, Ohio, assignor to Delta Systems, Inc., Twinsburg, Ohio

Filed Feb. 22, 1977, Ser. No. 770,647

Int. Cl.[2] **F02P** *1/00;* **F02M** *17/00*

U.S. Cl. 123—148 E **19 Claims**



1. In an inductive solid-state magneto ignition system having a magneto ignition coil with primary and secondary windings:

first circuit means including a first electronic control means for connection across the primary winding of the magneto ignition coil, said control means having power terminals and a control electrode and being changeable between conditions exhibiting low and high electrical impedances to establish and break a low resistance circuit across the primary magneto winding;

second circuit means for energization by the primary magneto winding and operatively connected to said control electrode for applying electrical energy from the primary magneto winding to the control electrode,

and third circuit means inductively coupled for power to said first circuit means, to increase and decrease the level of electrical energy applied to said control electrode, in response to the electrical energy generated in the primary winding of the magneto coil,

the electrical operation of all said circuit means being dependent solely upon magneto-generated energy.

4,173,962

IGNITION SYSTEM WITH ESSENTIALLY CONSTANT IGNITION COIL ENERGY SUPPLY

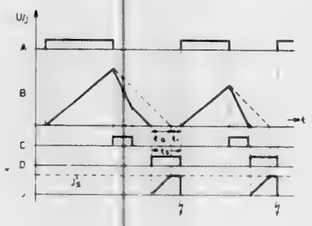
Friedrich Rabus, Schwieberdingen, and Günter Grither, Pinache, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 23, 1978, Ser. No. 871,345

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703431

Int. Cl.[2] **F02P** *1/00, 5/04*

U.S. Cl. 123—148 E **12 Claims**



1. Ignition system for an internal combustion engine (E) having

an ignition coil (**25**);

a controlled main switch (**24**) connected in series with the primary (**24**) of the ignition coil and controlling current flow therethrough;

means (**12**) coupled to the engine providing a first signal occurring at the time in advance of the ignition instant, and a second signal subsequent to the first signal and commanding interruption of current flow through the coil to cause an ignition event;

and means controlling the duration of current flow through the ignition coil in advance of the ignition event to be essentially independent of the speed of the engine, and hence of the repetition rate of said first and second signals, comprising, in accordance with the invention,

a memory (**15, 30**);

controlled memory loading means (**13; 31, 33**) loading the memory in the time interval between said second signal and a subsequent first signal, and accumulating a stored value therein representative of said time duration;

controlled memory clearing means (**17, 30**) unloading the memory in the time interval between the occurrence of the first signal and the occurrence of the next subsequent second signal at variable and controlled rates;

a timing means (**18**) establishing a timing interval connected to said controlled memory clearing means and controlling the unloading rate during the timing interval thereof to differ from the unloading rate subsequent to said timing interval;

and means (**20, 21; 39**) connected to and controlled by said memory (**15, 30**) and responsive to a predetermined storage or loading state of the memory controlling said main switch (**24**) to close the circuit through the primary of the ignition coil (**25**) to store magnetic energy therein in the interval after the memory has reached said predetermined storage state and before the occurrence of the second signal commanding interruption of the current flow through the coil to cause said ignition event.

4,173,963

ELECTRONIC MAGNETO IGNITION FOR INTERNAL COMBUSTION ENGINES

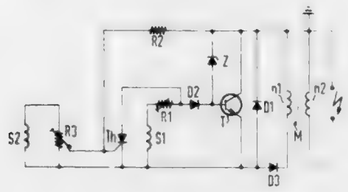
Erwin Heuwieser, Haar; Cosimo Scianna, and Klaus Wetzel, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 26, 1977, Ser. No. 800,742

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1976, 2630372

Int. Cl.[2] **F02P** *1/02;* **H05B** *41/36*

U.S. Cl. 123—149 D **9 Claims**



1. An electronic magneto ignition for an internal combustion engine which has a rotating fly wheel with a permanent magnet mounted thereon, comprising:

a magnetic ignition coil mounted adjacent the fly wheel and including a primary winding and a secondary winding for producing an ignition voltage, in response to rotation of the permanent magnet therepast;

a switching transistor including a base, an emitter and a collector, the emitter-collector circuit connected across said primary winding;

a first diode connected in parallel to said primary winding and poled opposite the emitter-collector circuit of said transistor; and

an electronic control circuit for blocking said switching transistor at a desired ignition time to interrupt the circuit of said primary winding and cause a high ignition voltage in said secondary winding for igniting the fuel mixture of the internal combustion engine, said control circuit comprising

a first control coil mounted adjacent the fly wheel spaced at a first angle from said ignition coil in the direction of rotation of the fly wheel,

a first resistor connected in series with said first control coil, said first resistor and said first control coil series combination connected across the base-emitter circuit of said transistor,

a thyristor including a control electrode, and a controlled conduction path connected in parallel with the first resistor-first control coil combination,

a second resistor connected as a feedback resistor between said collector and said control electrode,

a second control coil mounted adjacent the fly wheel,

a third resistor connected in parallel with said second control coil, said third resistor including a tap connected to said control electrode for applying a portion of the voltage induced in said second control coil to said control electrode,

a Zener second diode connected between said base and said collector of said transistor, and

a third diode connected between said first control coil-first resistor combination and said base of said first resistor.

4,173,964

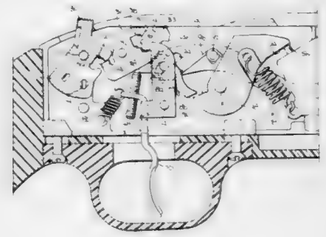
SAFETY FOR THE TRIGGER MECHANISM OF A GUN

Roger Curran, Stratford, Conn., assignor to Bangor Punta Operations, Inc., Greenwich, Conn.

Filed Feb. 4, 1977, Ser. No. 765,553

Int. Cl.[2] **F41C** *17/00;* **F41B** *11/06*

U.S. Cl. 124—40 **27 Claims**



1. A safety for the trigger mechanism of a gun comprising:

a gun frame;

a trigger carried by said frame for movement between first and second positions;

means carried by said frame for firing the gun in response to movement of said trigger into said second position;

a safety element carried by said frame for movement between safe and fire positions;

means coupled to said safety element for preventing movement of said trigger into said second position when said safety element lies in said safe position and enabling movement of said trigger into said second position when said safety element lies in said fire position; and

means coupled to said safety element for returning said safety element to its safe position in response to movement of said trigger between its first position and its second position.

4,173,965

PASSENGER VEHICLE APPLIED TOP CONTAINER

Robert G. Vallee, and Arnold P. Saviano, both of Grosse Pointe Woods, Mich., assignors to George P. Johnson Co., Warren, Mich.

Filed Dec. 21, 1977, Ser. No. 862,866

Int. Cl.[2] **B60R** *9/04*

U.S. Cl. 224—328 **1 Claim**



1. A readily removable car top and security container combination which comprises:

(a) a plurality of anchor blocks secured to a car top in spaced relation.

(b) a relatively rigid, closable container having a base with upper and lower surfaces, end walls, and a top wall with one or more hatch openings above the side edges of the base extending to the top.

(c) a plurality of upper fastening fixtures permanently secured to said base in locations registering respectively

with said anchor blocks, said anchor blocks and fixtures having complemental mating spherical surfaces between the car top and the base of said container adaptable to engage in any one of a plurality of angular dispositions of said anchor blocks relative to said base, and having an overall vertical dimension to space said base upwardly from said car top,

(d) manually movable means accessible only from the interior of said container to connect and disconnect said upper fastening fixtures to said anchor blocks,

(e) one or more closure panels movably secured on said container movable to close said one or more hatch openings to seal the interior of said container from the weather,

(f) a recess formed in the base of said container at each upper fastening fixture, and

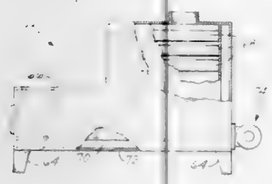
(g) a rotatable disc in said recess depressed below the upper surface of said base and affixed to a lock shaft to facilitate the rotation of said manually movable means to a connect or disconnect position.

4,173,966

SELF-CONTAINED HEATING APPARATUS

Richard O. Scharen, 461 Blackstone, Springfield, Oreg. 97477

Filed May 16, 1977, Ser. No. 796,854
Int. Cl.[2] F24B 7/04
U.S. Cl. 126—121 **2 Claims**



1. A self-contained heating apparatus comprising:

a combustion chamber having spaced-apart and vertically staggered upper and lower front walls, side and rear walls and top and bottom walls,

a flue extending upwardly from an opening in said top wall,

an air chamber including outer side walls and an outer rear wall surrounding and spaced from said side and rear walls respectively,

multiple air ducts disposed between said flue and said bottom wall which extend from openings in said rear wall to corresponding aligned openings in said upper front wall, said air ducts being in communication with said air chamber,

a substantially horizontally arranged heating surface disposed forwardly of and beneath the discharge openings of said air ducts, and

air mover means operable for circulating air through said air chamber for discharging the air through said air ducts outwardly from said upper front wall.

4,173,967

DRAFT AIR CONTROL FOR FIREPLACE GRATE

Rex M. Brown, 435 E., 1st N., Smithfield, Utah 84335

Filed Apr. 25, 1977, Ser. No. 790,449
Int. Cl.[2] F24B 13/02
U.S. Cl. 126—143 **10 Claims**

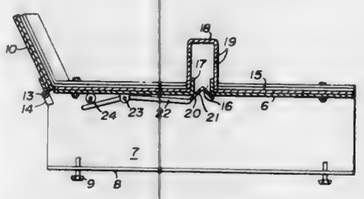
1. A fireplace grate comprising:

a flat, refractory tray, the rear and side edges of which are capable of sealed relationship with the walls of a fireplace;

support means for spacing the tray above the floor of a fireplace to provide an air space beneath the tray that is open at the front for free flow of draft air from a room;

a draft control comprising a hollow enclosure, open at the bottom thereof and having horizontal orifices in its sides; and

means for mounting the draft control over an opening in the central portion of the tray, the open bottom of the draft



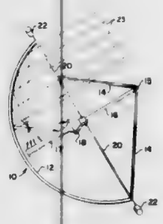
control being coextensive, substantially, with the opening, so that draft air from the space beneath the tray can enter the space above it through the orifices, which are the only openings in the tray, whereby the flow of draft air can be concentrated on fuel surrounding the draft control.

4,173,968

RECEIVER FOR SOLAR ENERGY

Willis G. Steward, Sugar Loaf Rd., Swiss Peaks, Boulder, Colo. 80302

Filed May 17, 1976, Ser. No. 687,137
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—438 **7 Claims**



1. An articulated solar energy receiver adapted for use with a concave, fixed collector having a central axis, comprising:

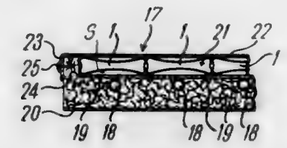
an elongated member located with one end spaced from but adjacent to the concave face of the fixed collector and articulated for movement around a fixed point spaced from, and substantially on the axis of, the concave, fixed collector, the elongated member having means for utilizing solar energy disposed substantially along the entire length of the member, the elongated member further having at least one end portion of enlarged cross section relative to the central portion of the receiver, whereby solar energy reflected and concentrated by the fixed collector will be more completely intercepted by the receiver at the enlarged cross section and, accordingly, more solar energy will be directed to the means for utilizing solar energy.

4,173,969

LIGHT-PERMEABLE THERMAL INSULATION APPARATUS

Günter Schöll, Via Orselina 9, Locarno-Muralto, Switzerland (CH-660)

Filed Oct. 28, 1977, Ser. No. 846,449
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649472
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—417 **17 Claims**



1. In a collector of solar energy, in combination:

a heat-conductive plate forming a flat supporting surface; and

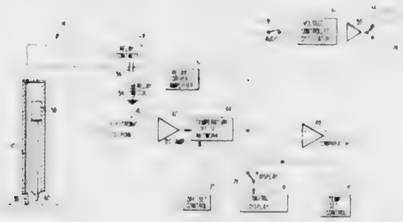
a two-dimensional array of substantially identical contiguous transparent blocks carried on said supporting surface, each of said blocks being a thin-walled hollow glass body of generally prismatic configuration with a broad lower surface, a broad upper surface and four narrower sides formed in part by a pair of opposite sidewalls, said lower surface being concave and free from discontinuities and being mounted on at least three sides by a rounded ridge, at least some of said blocks resting directly on said plate with said ridge making line contact with said supporting surface at locations spaced inwardly from said sidewalls and encompassing a shallow dead-air space separating said lower surface from said supporting surface.

4,173,970

THERMOGRAPHIC DIAGNOSTIC METHOD AND SYSTEM

Abdulmajid U. Momin, Urbana, Ill., assignor to Jaymin Research Corporation, Urbana, Ill.

Filed Aug. 3, 1977, Ser. No. 821,511
Int. Cl.[2] A61B 5/00
U.S. Cl. 128—736 **8 Claims**



1. Apparatus for diagnosing pathological conditions in the human body that are manifested by an area exhibiting skin temperatures above a predetermined value in relation to surrounding areas, the apparatus comprising:

a hand held probe having a temperature responsive sensing element disposed at one end for contact with the skin surface of an area of the human body for providing a signal related to skin temperature at the location of contact;

a marking pen carried by said hand held probe adjacent the temperature responsive sensing element and movable between a retracted non-marking position and an extended marking position wherein said marking pen is biased into contact with the skin surface for selectively placing a visual indication on the skin at the approximate location of contact between the skin surface and the sensing element; and

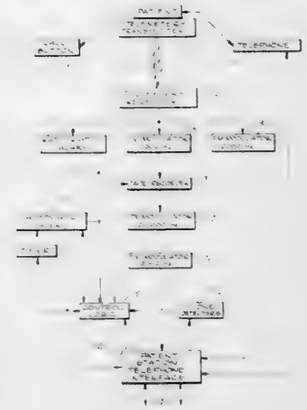
means for biasing and holding said marking pen in contact with the skin surface in response to the temperature related signal exceeding a preselected value.

4,173,971

CONTINUOUS ELECTROCARDIOGRAM MONITORING METHOD AND SYSTEM FOR CARDIAC PATIENTS

Allen E. Karz, 16820 Chatsworth St., Granada Hills, Calif. 91344

Filed Aug. 29. 1977, Ser. No. 828,368
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—702 **38 Claims**



1. System for providing cardiac information from a cardiac patient to a remote station comprising:

means for recording electrocardiogram signals produced by the patient in real time at a first predetermined rate;

means for reproducing said recorded signals at a second predetermined rate, said second predetermined rate being greater than said first predetermined rate thereby compressing the time required to reproduce said signals as compared to the time to record said signals;

means for monitoring said reproduced signals;

a communication interface which includes a telephone system having direct dialing capability coupling said reproducing means to said monitoring means;

an automatic telephone dialing means coupled to said telephone system; and

timer means, said timer means activating said automatic dialing means for controlling the periodicity of transmission of recorded signals from said recording means to said monitoring means.

4,173,972

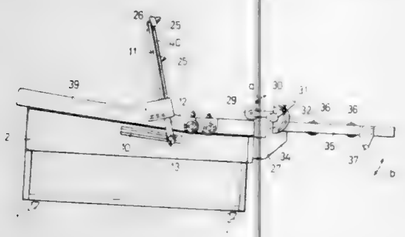
MASSAGING MACHINE

Katsuji Kodera, 35-12, Wada 1-chome, Suginami-ku, Tokyo, Japan

Filed Sep. 9, 1977, Ser. No. 832,027
Int. Cl.[2] A61H 7/00
U.S. Cl. 128—52 **6 Claims**

1. A massaging machine comprising a machine base, a mobile frame reciprocally moveable on a machine base, a backrest frame mounted to the machine base in the manner that its mounting position may be changed and it may be inclined freely, a sliding frame mounted loosely to two guide rods extending parallel to each other in the vertical direction at the

back-rest frame, a screw rod parallel to the guide rods being inserted in the sliding frame and the said frame, in turn, being



transferable according to the rotation of the screw rod, and two projections for massaging located on the sliding frame arranged in the direction perpendicular to the guide rods.

4,173,973

HYPEREXTENSION BACK BRACE

David J. Hendricks, 1718 Wildwood Rd., Bloomington, Ill. 61701

Filed Jun. 30, 1978, Ser. No. 920,937
Int. Cl.[2] A61F *5/02*
U.S. Cl. 128—78 **10 Claims**



1. A hypertension brace including a rigid main cruciform structure adapted to overlie the anterior thoracic area of the human body and having upper and lower vertically alined vertical arms and right and left horizontally alined horizontal arms, sternum and pubic pads disposed respectively at the free ends of the upper and lower arms and right and left side pads disposed respectively at the free ends of the right and left arms, a back pad for contact with the back of the body and right and left means for attaching the back pad to the right and left pads, characterized in that each arm is of two-piece construction comprising a fixed part forming a rigid part of the cruciform structure and a movable part longitudinally adjustable relative to its fixed part, the pads being affixed respectively to the movable parts, and a plurality of means is provided for securing the movable parts in individually selected positions.

4,173,974

RESTRAINING MEANS

Robert J. Belliveau, 34 Ryder Rd. S., Weymouth, Mass. 02190

Filed Sep. 21, 1977, Ser. No. 835,063
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—133 **18 Claims**

1. A restraining device for retaining an individual in a predetermined location, said device comprising,

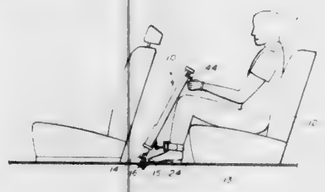
a rigid support member having a length of at least twelve inches,

first means for releasably locking a hand restraint device at one end of said support,

means for releasably locking a second end of said support to a mounting means at a fixed location,

means for releasing said first means with said releasing means being non-accessible to the individual whose hands are restrained,

second means for restraining the feet of an individual with said second means being located between said first means and said second end,



said support member being elongated and defining a cutout notch,

said first means comprising a rod acting to close said notch to retain said hand restraint device or open said notch to allow release of said hand restraint device,

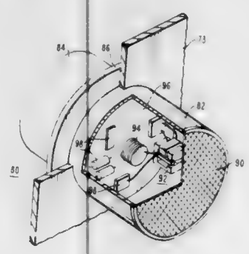
said rod being spring loaded and having a lever for actuating opening of said notch.

4,173,975

MAGNETIC MEANS FOR DETERMINING PARTIAL PRESSURE OF OXYGEN PARTICULARLY IN UNDERWATER BREATHING APPARATUS

Daniel L. DeLong, Stevensville, and Edward L. Rich, III, Arnold, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 6, 1978, Ser. No. 875,654
Int. Cl.[2] A62B *7/00;* **G01R** *33/12*
U.S. Cl. 128—142 R **3 Claims**



1. Apparatus for determining the partial pressure of oxygen in a gas mixture containing oxygen and a background gas comprising:

(A) a magnetic circuit including a magnetic flux source and opposing pole pieces defining a gap;

(B) a piezoelectric bender unit;

(C) a reference chamber having a magnetic susceptibility similar to said background gas;

(D) said reference chamber being arranged for oscillatory movement into and out of said gap by means of said bender unit;

(E) drive means for oscillating said bender unit;

(F) circuit means for measuring the change in magnetic flux in said magnetic circuit due to said reference chamber oscillating into and out of said gap to provide an output signal indicative of said oxygen;

(G) said reference chamber being hollow and containing a gas therein; and

(H) means for equalizing the pressure of said gas within said reference chamber with the pressure of said gas mixture.

4,173,976

POUCH DESIGN BRIEF

Lynn M. H. Bloomquist, Minnetonka, and Robert J. Brazil, Bloomington, both of Minn., assignors to Munsingwear, Inc., Minneapolis, Minn.

Filed Oct. 19, 1977, Ser. No. 843,590
Int. Cl.[2] A41B *9/02;* **A61F** *5/40*
U.S. Cl. 128—159 **4 Claims**



1. A men's undergarment, comprising:

(a) a body member sized to encircle the body and further comprising:

(i) a front panel having top, bottom, and side edges, said bottom edge having a concave arcuate portion;

(ii) a rear panel having top, bottom, and side edges, said edges converging from said bottom to said top edge of said rear panel in a direction generally toward the midline of said rear panel and at an acute angle with respect to said midline, said rear panel joined to said front panel along said side edges of said front and rear panels forming side seams oriented at a slight angle with respect to the vertical so that said body member rides higher on the back than on the front of the body;

(b) a crotch member having a bottom portion and a pair of symmetrical wing members, each wing member having a lateral edge and a convex arcuate end edge, said wing members joined to each other along said lateral edge to form a vertical seam and joined along said convex arcuate edges to said concave arcuate portion of said bottom edge of said front panel to form an arcuate front seam, said bottom portion joined to said bottom edge of said rear panel forming a suspensory pouch, said crotch member formed of material having a stretch bias oriented so that said suspensory pouch will stretch in a direction generally from said arcuate front seam toward said vertical seam.

4,173,977

AEROSOL INTERFACE

Henry L. Burns, Beaverton, Oreg., assignor to Cavitron Corporation, New York, N.Y.

Filed Mar. 25, 1977, Ser. No. 781,259
Int. Cl.[2] A61M *15/00*
U.S. Cl. 128—201 **43 Claims**

1. An aerosol interface comprising:

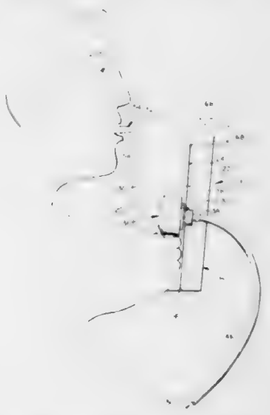
A. a housing defining a fluid receiving chamber having an upper end and a lower end in open communication with the atmosphere,

B. inlet means disposed on said housing between said upper and lower ends for permitting continuous delivery to said chamber of a flow of aerosol fluid so as to obtain an accumulation of the aerosol fluid therein for inhalation by a patient using the aerosol interface,

C. breath transmission means operatively associated with said housing and having a passageway therethrough, said passageway being defined by an inner opening at one end thereof in direct continuously open fluidic communication with said chamber and extending above said inlet means, and an outer opening at the other end thereof, with upper and lower surfaces extending intermediate said ends,

D. said outer opening being adapted for communication with the breath of a patient using the aerosol interface for the inhalation through said passageway of the aerosol fluid in said chamber and the exhalation of expired fluid by the patient into said passageway,

E. outlet means operatively associated with said housing in open communication with said chamber and with the atmosphere, said outlet means comprising a channel in



direct continuously open fluidic communication with said chamber to permit a flow path for the expired fluid from the patient to exhaust to the atmosphere, and

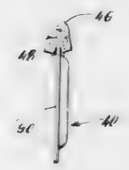
F. flow control means at the upper end of said chamber for fluidically coupling said transmission means and said outlet means so as to cause substantially all of the expired fluid during exhalation from said passageway inner opening to flow in open communication to the atmosphere through said channel of said outlet means without flowing into said chamber.

4,173,978

SELF CONTAINED ANTISEPTIC APPLICATOR SWAB

James B. Brown, R.F.D. #2, Box 313, Mt. Kisco, N.Y. 10549

Filed Jul. 7, 1977, Ser. No. 813,496
Int. Cl.[2] A61M *31/00*
U.S. Cl. 128—269 **5 Claims**



1. A disposable antiseptic applicator swab manufactured on a blister forming and sealing machine comprising: a cylindrical crushable glass ampoule having antiseptic liquid therein, a plastic blister package having identical complimentary parts forming a chamber and a flange section, the latter being provided with a channel extending from said chamber to the edge of said flange, said flange having undercut portions at the side edges of said flange adjacent to said channel, the cross section of said blister chamber being slightly larger than the cross section of said ampoule resulting in a relatively tight fit of said

ampoule in said blister chamber, and an elongated applicator foam tip folded over said flange at the end thereof having said channel and in communication with the latter so that said antiseptic liquid will penetrate said foam tip when said glass ampoule is crushed, the width of said elongated applicator pad being greater than the width of said flange having the channel therein to prevent contact of the edges of said flange with the channel therein from contact with a patient.

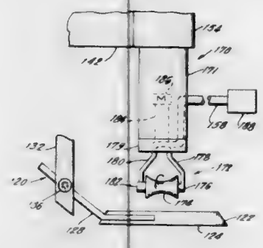
4,173,979
URINE BAG COVER AND HOLDER DEVICE
Johnnie M. Odis, 4941 W. Washington Blvd., Chicago, Ill. 60644
Filed Jun. 10, 1977, Ser. No. 805,291
Int. Cl.[2] A61F 5/44
U.S. Cl. 128—295 **5 Claims**



1. For use in an assembly which includes a reusable urine bag which is made of a flexible material that is irritating to human skin and which has flexible mounting straps extending therefrom, an improved combination cover and holder device which is constructed of a cloth material made from a natural or synthetic fiber which is substantially non-irritating to human skin and which includes a generally rectangularly shaped bag portion with an outer wall and an inner wall, each wall being secured along two opposite side edges thereof and along at least parts of a bottom edge thereof to the adjacent other wall, the adjacent side edges of the walls along the top edge of the bag portion being unattached along a major portion of their length to define an opening therebetween for receiving the reusable urine bag, said inner wall having two pairs of spaced apart slits, each slit being aligned with the connection of one of the mounting straps of the urine bag to the urine bag and said device further including two pairs of straps, each strap having a free outer end and an inner end which is secured to the outer surface of said inner wall adjacent one of said slits and each strap being in a position to extend partially around a human leg and between the leg and one of the urine bag mounting straps.

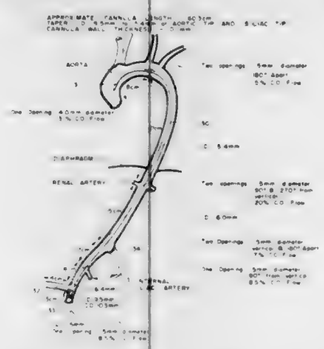
4,173,980
CORNEAL RESURFACING APPARATUS AND METHOD
Brian J. Curtin, 32 E. 64th St., New York, N.Y. 10021
Filed Feb. 25, 1977, Ser. No. 771,942
Int. Cl.[2] A61B 17/00
U.S. Cl. 128—303 R **40 Claims**

1. A corneal resurfacing apparatus comprising:
a circumcorneal suction ring for fixing the eye whose cornea is to be resurfaced so that the eye does not move as it is being resurfaced and for also stiffening the cornea; means connected with said suction ring for transmitting suction thereto, means for moving said suction ring into engagement with the eyeball whose cornea is to be resurfaced;
a grinding element for being moved into contact with the anterior corneal surface of the eye whose cornea is to be resurfaced, and said grinding element being comprised of a material adapted for grinding the corneal surface;
means for positioning said grinding element over the anterior corneal surface;



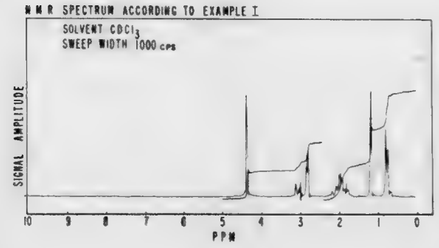
means for moving said grinding element to grind the corneal surface; means for controlling the manner and extent to which said grinding element grinds the corneal surface for grinding the corneal surface to define an optical surface.

4,173,981
CANNULA FOR ARTERIAL AND VENOUS BYPASS CANNULATION
J. D. Mortensen, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah
Filed May 23, 1977, Ser. No. 799,418
Int. Cl.[2] A61M 25/00
U.S. Cl. 128—348 **17 Claims**

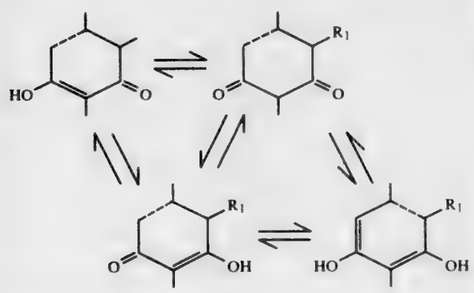


1. A cannula for partial emplacement within a patient's circulatory system to effect extracorporeal fluid transfer therewith, said cannula including a tubular member having inner and outer surfaces of blood and tissue compatible material, and further comprising a nonporous tube section for accomplishing extracorporeal fluid transfer to or from a second tube section which communicates therewith through a junction occurring at a terminal portion of said nonporous tube section with a nonterminal portion of said second tube section, said second tube section having concurrent bidirectional flow capability along bidirectional paths commencing at said junction and continuing toward distal ends of said second tube section, said second tube section having a tapered body along at least one of the bidirectional paths toward said distal ends, said second tube section having a plurality of openings located along the length thereof to effect proper fluid transfer.

4,173,982
USE OF SUBSTITUTED DIMETHYL DIHYDROXY BENZENE AND CYCLOHEXADIENE COMPOUNDS FOR AUGMENTING OR ENHANCING THE TASTE AND/OR AROMA OF SMOKING TOBACCOS
John B. Hall, Rumson; Mark A. Sprecker, Sea Bright, both of N.J.; Edward J. Shuster, Brooklyn, N.Y.; Frederick L. Schmitt, Holmdel, and Joaquin F. Vinals, Red Bank, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.
Division of Ser. No. 800,889, May 26, 1977, Pat. No. 4,115,431.
This application Jun. 8, 1978, Ser. No. 913,717
Int. Cl.[2] A24B 3/12; A24D 1/00
U.S. Cl. 131—9 **3 Claims**



1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco comprising the step of intimately admixing an organoleptic property modifying quantity of a substituted dimethyl dihydroxy benzene or cyclohexadiene represented by the equilibrium mixture of a constituent thereof:



wherein R_1 is selected from the group consisting of acetyl having the structure:

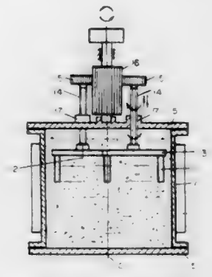


and nitrile having the structure:

$$+C\equiv N]$$

and wherein the dashed line represents a carbon-carbon single bond or a carbon-carbon double bond with the proviso that when the dashed line represents a carbon-carbon single bond R_1 is only nitrile with a smoking tobacco.

4,173,983
METHOD OF IMPROVING THE WORKING PROPERTIES OF LIQUID SYSTEMS
Semyon I. Fishgal, Winnipeg, Canada, assignor to International Design and Development Corporation, Cedar Falls, Iowa
Filed Oct. 3, 1977, Ser. No. 838,580
Int. Cl.[2] G05D 7/00
U.S. Cl. 137—13 **8 Claims**



1. A method of breaking down contaminants containing magnetic materials in liquids of hydraulic systems to a size not interferring with hydraulic units of said systems by means of subjecting a volume of the contaminated liquid to an externally applied oscillating magnetic field changing the volumes of the contaminants and developing the stresses in them enough for their break down, the frequency of the field being not sufficiently high to eliminate the magnetrostrictive effect of the contaminants.

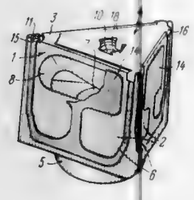
4,173,984
PNEUMATIC AMPLIFIER
Donald F. Solomon, Costa Mesa, Calif., assignor to S/P Product Design, Inc., Newport Beach, Calif.
Filed Jun. 12, 1978, Ser. No. 914,607
Int. Cl.[2] F15B 13/043
U.S. Cl. 137—119 **13 Claims**



1. A fluid amplifier comprising:
a housing having a cavity therein;
a diaphragm in said housing dividing said cavity into first and second chambers on opposite sides of the diaphragm;
supply passage means in said housing for supplying fluid under pressure to said first and second chambers, said supply passage means including first and second supply passages for supplying fluid under pressure to the first and second chambers, respectively, said first supply passage terminating in a supply port in said first chamber and said second supply passage terminating in a second supply port in said second chamber;
said diaphragm being movable in said cavity to selectively substantially seal off said first and second supply ports;
a first control passage in said housing extending between said supply passage means and the first chamber;

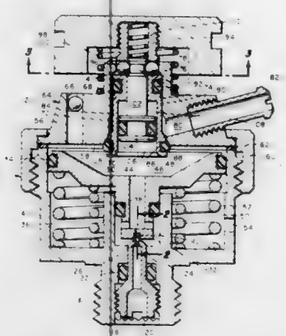
a second control passage in said housing extending between said supply passage means and the second chamber;
first and second signal passages in said housing terminating in said first and second chambers, respectively;
said first control passage being in communication with said first signal passage through said first chamber regardless of which of the supply ports is sealed by the diaphragm;
said second control passage being in communication with said second signal passage through said second chamber regardless of which of the supply ports is sealed by the diaphragm whereby the fluid from the first and second control passages can pass through the first and second chambers and enter the first and second signal passages, respectively, and the presence of a restriction to flow in the first signal passage causes an increase in pressure in the first chamber;
first output passage means in said housing for receiving fluid under pressure from the supply passage means when the first supply port is sealed off by the diaphragm; and
second output passage means in said housing for receiving fluid under pressure when the second supply port is sealed off by the diaphragm.

4,173,985
STRAIGHTWAY VALVE
Alexandr G. Kirpichenkov, ulitsa Komsomola, 45, kv. 29, Leningrad, U.S.S.R.
Filed Jul. 8, 1977, Ser. No. 814,094
Int. Cl.² F16K *15/14*
U.S. Cl. 137—512.1 **3 Claims**



1. A valve for a positive displacement machine such as a compressor for a gaseous fluid comprising, a valve body having a plurality of sides each with a side port and an internal cavity in communication with the side ports, said valve body having an open end with an inlet into said cavity for allowing entry of a flow of a compressible gaseous fluid into said cavity, said valve body having a closed end opposite said open end, a flow-divider internally of said valve body on said closed end extending into said cavity in a direction opposite to the direction of flow of said gas into said cavity for dividing the flow of gaseous fluid into a plurality of flows each directed to flow toward a corresponding one of said side ports, each side having a side port having a substantially planar valve seat peripherally of a corresponding side port, for each side of the body having a side port a valve plate, each valve plate comprising a reed-plate having a U-shape with two flexible mounting arms for mounting the reed-plate on said body and a connecting arm between said two mounting arms having a reed portion extending in a same direction as said mounting arms and seatable on a corresponding seat and overlying a corresponding side port, each mounting arm having an end tab for overlying said closed end of the valve body, a polygonal plate for overlying said closed end of the valve body and securing each reed-plate relative to a corresponding side of the valve body, said polygonal plate having lugs each disposed for overlying an end portion of a respective arm of a reed-plate to fix each reed-plate relative to a respective side and side port of the valve body, and means for fixing the polygonal plate on said closed end of said valve body, whereby each read-plate flexes including the mounting arms and reed portion thereof to open and close the corresponding side port under control of a respective one of said flows of gaseous fluid.

4,173,986
PRESSURIZED GAS FLOW CONTROL VALVE AND ASSEMBLY THEREOF WITH REDUCER REGULATOR
Richard L. Martin, Covina, Calif., assignor to American Safety Equipment Corporation, Racino, Calif.
Filed Apr. 18, 1977, Ser. No. 788,461
Int. Cl.² F16K *17/00, 31/12*
U.S. Cl. 137—613 **8 Claims**

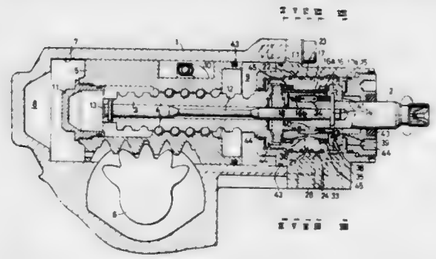


1. A valve for supplying pressurized gas at greater than a preselected minimum pressure for downstream use, said valve comprising:
a housing forming a gas chamber having a gas inlet and a gas outlet;
a poppet valve means for moving between a closed position preventing the flow of gas from the gas chamber through the gas outlet and an open position allowing the flow of gas from the gas chamber through the gas outlet;
a biasing means for urging said poppet valve means to its closed position; and
a gas pressure sensitive means disposed within poppet valve means including locking means between the housing and the poppet valve means for locking the poppet valve means in its open position when it is moved to its open position during gas chamber pressures above said preselected minimum pressure.

4,173,987
POWER STEERING SYSTEM
Masanori Kouda, Atsugi, Japan, assignor to Atsugi Motor Parts Co., Ltd., Atsugi, Japan
Filed Dec. 21, 1977, Ser. No. 862,832
Claims priority, application Japan, Feb. 16, 1977, 52-15692; Feb. 16, 1977, 52-17546[U]
Int. Cl.² F15B *9/10*
U.S. Cl. 137—625.23 **9 Claims**

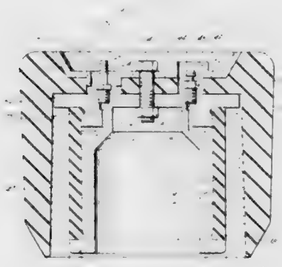
1. In a hydraulic power steering system, having an output shaft, including a rotary control valve contained in the valve chamber, said rotary control valve including an inner valve member rotatable with the input stub shaft and formed on its outer periphery with axially extending equally spaced pressure and return slots, an outer valve member concentrically mounted on said inner valve member in sliding contact therewith for rotation with the output shaft, said inner valve member having a portion defining an annular recess on its inner periphery and an orifice radially extending therethrough for

communication of said annular recess with said pressure slot to permit the supply of pressure fluid into said annular recess so



that no pressure difference occurs between the inner and outer peripheral surfaces of said inner valve member.

4,173,988
PNEUMATICALLY ACTUATED THREAD PROTECTOR FOR PIPES
William P. Fowler, Weatherford, Tex., assignor to Weatherford-/Lamb Inc., Houston, Tex.
Continuation-in-part of Ser. No. 825,329, Aug. 17, 1977, abandoned, which is a continuation-in-part of Ser. No. 792,286, Apr. 29, 1977, abandoned. This application Feb. 10, 1978, Ser. No. 876,608
Int. Cl.² B65D *59/00*
U.S. Cl. 138—96 T **12 Claims**



1. A pneumatically actuated thread protector for externally threaded pipe, comprising:
(a) an inner sleeve including,
(i) a substantially cylindrical rigid member enclosed at a first end by an upper end wall and open at a second end thereof; and
(ii) a substantially cylindrical expansible member having, when unexpanded, an interior cylindrical surface in intimate contact with the exterior cylindrical surface of the rigid member (i), the expansible member having an upper lip and a lower lip, said expansible member being inflatably engagable with an internal surface of the pipe;
(b) a cylindrical thread shield member formed of a resilient material concentrically encircling the cylindrical inner sleeve (a) and spaced outwardly therefrom such that an annulus is provided between the inner sleeve (a) and said thread shield member to receive the end of the pipe;
(c) means for mounting the thread shield member (b) to the inner sleeve (a); and
(d) valve means for inflatably urging the expansible member into engagement with the pipe and for deflatably disengaging said expansible member from the pipe and wherein the upper lip and the lower lip of the expansible member (a) (ii) are each secured to the rigid member (a) (i) for sealing the expansible member thereto.

4,173,989
PREST-O-FIT UNIVERSAL ADAPTER FITTING
J. David Prest, 1313 6th Ave., Yuma, Ariz. 85364
Filed Jun. 12, 1978, Ser. No. 914,967
Int. Cl.² F16L *13/00*
U.S. Cl. 138—109 **10 Claims**



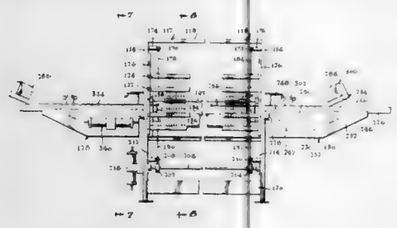
1. A universal one piece adapter fitting for connecting the sewage drain hose of a recreational vehicle to the input pipe of a sewage system, said fitting comprising in combination:
(a) a hollow connector having a first arm and a second arm;
(b) said first arm including:
i. a cylindrical end having a smooth external surface;
ii. a first male threaded section circumscribing said first arm, said first male threaded section being longitudinally displaced from said smooth surfaced cylindrical end; and
iii. a second male threaded section circumscribing said first arm; said second male threaded section being longitudinally and radially outwardly displaced from said first male threaded section;
(c) said second arm including:
i. a further cylindrical end having a smooth external surface;
ii. a female threaded section circumscribing said second arm, said female section being radially outwardly displaced from said smooth surfaced cylindrical end; and
iii. a third male threaded section circumscribing said second arm, said third male section being radially displaced from said female threaded section;
whereby, said connector interconnects the drain hose with any of a smooth surfaced, a male threaded or a female threaded sewage system input pipe.

4,173,990
TEMPORARY FABRIC AND METHOD AND APPARATUS FOR WEAVING SAME
Guy B. Langlois, and Raymond G. Spain, both of Huntington Beach, Calif., assignors to Hitco, Irvine, Calif.
Filed Mar. 13, 1978, Ser. No. 886,266
Int. Cl.² D03D *47/02;* **D03C** *13/00*
U.S. Cl. 139—440 **6 Claims**

1. Apparatus for interweaving at least one elongated fibrous fill member with a plurality of elongated fibrous warp members to form a fabric for processing of the warp members comprising the combination of frame means, at least one generally cylindrical roller rotatably mounted on the frame means and adapted to support a plurality of elongated fibrous warp members, a pair of heddle arrangements slidable mounted on the frame means and each including a plurality of apertured members disposed adjacent the roller and adapted to receive selected ones of the warp members therein, means responsive to rotation of the roller for causing the heddle arrangements to

V.988/2 NO. 013 79 UMI

undergo reciprocating sliding motion relative to the frame means, at least one rapier assembly mounted on the frame means and including a hollow member adapted to receive a fill member therein and mounted to undergo linear motion along an axis between the roller and the pair of heddle arrangements, means responsive to rotation of the roller for causing the hollow member to undergo reciprocating motion along the axis and means for periodically generating a quantity of pressurized air adjacent an open end of the hollow member in a direction



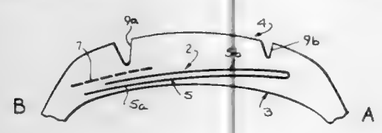
to force a length of a fill member disposed within the hollow member out of the hollow member, the means for periodically generating a quantity of pressurized air including a second hollow member surrounding and including the first-mentioned hollow member therein and terminating in a nozzle surrounding the open end of the first-mentioned hollow member, means providing a source of pressurized air and means for periodically coupling the source of pressurized air to the inside of the second hollow member.

4,173,991

PNEUMATIC TIRE WITH ASYMMETRIC REINFORCING BELT

Henri J. Mirtain, Compiegne, France, assignor to Uniroyal, Inc., New York, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,671
Claims priority, application France, Apr. 6, 1977, 77 10428
Int. Cl.² B60C *9/18*
U.S. Cl. 152—361 FP **23 Claims**



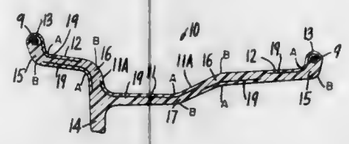
1. A pneumatic tire having a tread and a carcass with a reinforcement belt incorporated between said tread and carcass, said reinforcement belt comprising, in cross-section, a ply of filiform elements coated with an elastomer, said ply being folded into two confronting parts of unequal lateral extent between an axially internal edge of the tread and an axially external edge of the tread, said axially internal edge facing the interior of a vehicle when the tire is mounted to the vehicle and said axially external edge facing away from said vehicle, no part of said reinforcement belt being disposed between the confronting parts of said folded ply, said fold being situated at the axially internal edge, said confronting parts including a main portion having the maximum width of said belt and having a first free lateral edge near the axially external edge of said tire, and an auxiliary portion of lesser width than said main portion, and having a second free lateral edge between said fold and the first free lateral edge of said main portion and wherein the distance between said reinforcing belt and said carcass increases in a lateral direction from the axially external edge of the tire to the axially internal edge and the diameter of said reinforcement belt is smaller at the axially external edge than at the axially internal edge, said tread including sculptures, said sculptures being deeper at the tread portion nearer the axially external edge than at the tread portion nearer the axially internal edge.

4,173,992

RADIALLY REINFORCED WHEEL RIMS OF MOLDABLE MATERIAL

Daniel Lejeune, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Continuation-in-part of Ser. No. 733,908, Oct. 19, 1976, abandoned, which is a continuation of Ser. No. 557,647, Mar. 12, 1975, abandoned. This application Dec. 21, 1977, Ser. No. 862,862
Claims priority, application France, Mar. 25, 1974, 74 10201
Int. Cl.² B60B *5/02*
U.S. Cl. 152—381.1 **19 Claims**



1. In a reinforced single-piece type wheel rim of moldable material for a tire having as elements of the rim a sunken base with two sidewalls and comprising on one side of said sunken base a first rounding between said sunken base and a sidewall, each sidewall terminating in a second rounding, a bead seat adjacent each second rounding and a flange connected to each bead seat by a third rounding, two at least of the first, second and third roundings having different curvatures, each of the roundings having a concave face and a convex face, the improvement which comprises at least the rounding of maximum curvature has a tension-resistant reinforcement embedded in said rounding only in the vicinity of the concave face of said rounding, the reinforcement comprising reinforcing elements arranged solely and approximately in radial planes of the rim.

11. In a reinforced removable flange type wheel rim of moldable material for a tire having as elements of the rim a flat base, a bead seat on each side of the flat base as an extension thereof, a fixed flange connected to one of the bead seats by a first rounding and a removable flange at the other bead seat, said flat base being extended by a bulged portion which is connected to the flat base by a second rounding, said bulged portion having a groove intended to receive a locking ring for the removable flange, each of the roundings having a concave face and a convex face and one of the roundings having a greater curvature than the other, the improvement which comprises at least the rounding of greater curvature has a tension resistant reinforcement embedded in said rounding only in the vicinity of the concave face of said rounding, the reinforcement comprising reinforcing elements arranged solely and approximately in radial planes of the rim.

4,173,993

DOMESTIC APPLIANCE SYSTEM WITH THERMAL EXCHANGE FLUID

Stephen F. Skala, 3839 S. Wenonah Ave., Berwyn, Ill. 60402

Continuation-in-part of Ser. No. 299,274, Oct. 4, 1972, Pat. No. 3,888,303, and a continuation-in-part of Ser. No. 567,647, Apr. 14, 1975, abandoned. This application Oct. 5, 1977, Ser. No. 839,618
Int. Cl.² F25B *29/00*
U.S. Cl. 165—48 R **7 Claims**

1. A system of appliances for exchanging heat between foods and latent heat storing materials by forced circulation of a liquid thermal exchange fluid comprising in combination

a plurality of appliances each in a heat exchange relationship with a food, each of the appliances having a single appliance heat exchanger to receive the liquid thermal exchange fluid,

a hot reservoir having a latent heat storing material of sufficient thermal capacity to release heat over a period of peak use to the thermal exchange fluid and having means to charge the latent heat storing material,

a cold reservoir having a latent heat storing material to absorb heat over a period of peak use from the thermal exchange fluid and having means to charge the latent heat storing material,

a hot liquid thermal exchange fluid circuit connecting the appliances with the hot reservoir, said hot circuit including the appliance heat exchangers, a hot supply main and a hot return main, a pump and a hot reservior heat exchanger joining the hot supply main and the hot return main, said pump developing a pressure differential between the hot supply main and the hot return main,

a cold liquid thermal exchange fluid circuit connecting the appliances with the cold reservoir, said cold circuit including the appliance heat exchangers, a cold supply main and a cold return main, a pump and a cold reservoir heat exchanger joining the cold supply main and the cold return main, said pump developing a differential pressure between the cold supply main and the cold return main,

selector valves connecting the appliance heat exchangers either between the hot supply main and the hot return main or between the cold supply main and the cold return main, and

regulator valves to regulate flow of the thermal exchange fluid through the appliance heat exchangers between the supply main and the return main selected by the selector valves to regulate appliance temperature and thereby using forced circulation of the liquid thermal exchange fluid in the hot circuit and the cold circuit to exchange heat between the foods and the latent heat storing materials through the appliance heat exchangers and the reservoir heat exchangers.

4,173,994

SOLAR ENERGY HEATING AND COOLING APPARATUS AND METHOD

Leland L. Hiser, Rte. 4, Box 361K, New Braunfels, Tex. 78130

Filed Dec. 30, 1977, Ser. No. 866,055
Int. Cl.² F25B *29/00;* **F28D** *13/00;* **F24D** *11/00;* **F24J** *3/02*
U.S. Cl. 165—48 S **13 Claims**

1. A system for heating and cooling an enclosed space from solar radiation comprising:

solar energy collector means for receiving a fluid and heating said fluid from said solar radiation;

control means of said system being connected to said collector means, said control means having at least a heating mode and cooling mode of operation;

conduit means connecting to said collector means;

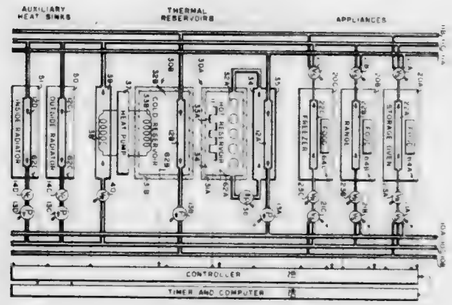
valving means in said conduit means operated by said control means;

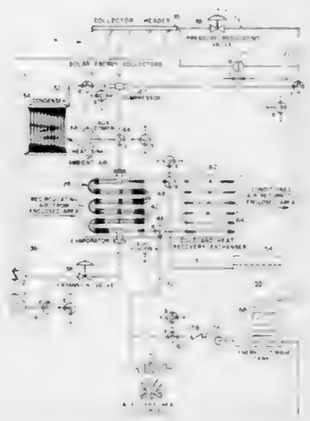
a single energy storage tank being connected by said conduit means and valving means to receive said fluid from said collector means therein, said single energy storage tank storing said fluid in either heated or cooled state as regulated by said control means;

said system for heating including:

at least two heat exchanger means connected by said conduit means and valving means for heating air from said enclosed space circulated therethrough, and for heating an energy storage fluid in said energy storage tank from heated fluid received from said collector means;

said system for cooling including:





jet compressor means connected by said conduit means and valving means to receive pressurized and vaporized fluid from said collector means, said jet compressor means discharging into condenser means;

evaporative means receiving liquified fluid from said condenser means via said conduit means and said valving means, said evaporator means vaporizing said fluid in response to a low pressure drawn therein by said jet compressor means via said conduit means, said evaporator means thereby cooling said air from said enclosed space and said energy storage fluid in said energy storage tank;

control means operable to actuate said jet compressor means to provide cooling as required during sunlight hours and to store said energy storage fluid in said single energy storage tank for recovery during cooler hours when said jet compressor means is not required for cooling purposes,

first circulation means for moving said fluid through said conduit means and valving means to said collector means.

4,173,995

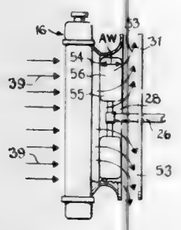
RECIRCULATION BARRIER FOR A HEAT TRANSFER SYSTEM

Harold D. Beck, Downers Grove, Ill., assignor to International Harvester Company, Chicago, Ill.

Continuation-in-part of Ser. No. 603,490, Aug. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 552,090, Feb. 24, 1975, abandoned. This application Sep. 30, 1977, Ser. No. 838,193

Int. Cl.[2] F28F *13/06*

U.S. Cl. 165—51 **19 Claims**



1. A heat exchange apparatus comprising:

a heat exchange means having air intake and air discharge faces;

a rotatable axial flow, suction-type fan having a plurality of circumferentially spaced impeller blades extending radially from a hub and positioned on one side of said heat exchange means adjacent said air discharge face for drawing air through said heat exchange means axially in a direction from said air intake face to said air discharge face, said air flow through said heat exchange means having a major velocity component parallel with respect to the rotational axis of the fan, each of said blades having an effective axial width AW measured axially along the rotational axis of the fan between a first plane and a second plane, said planes being axially spaced and parallel with respect to each other and disposed substantially normal to the rotational axis of the fan, said first and second planes extending radially, respectively, through a point on the leading edge of each of the blades at the tip portion thereof and through a point on the trailing edge of each of the blades at the tip portion thereof;

shroud means having one axial end operatively connected to said heat exchange and encircling said fan, said shroud means being shaped and positioned with respect to said heat exchange means and the blades of said fan whereby the major velocity component of the air stream discharge by the fan is in a direction perpendicular to the direction of the major velocity component of the air stream entering the air intake face and flowing through said heat exchange means, said shroud means including a generally cylindrical, axially extending throat section, one axial end of said throat section substantially defining said one axial end of said shroud means operatively connected to said heat exchange means, said one axial end of said throat section lying substantially in a plane disposed substantially perpendicular to the rotational axis of said fan, one of said first and second planes being axially spaced from and on either axial side of said plane containing said one axial end of said throat section of said shroud means a distance of 12 percent of AW;

and means axially positioned on the side of said fan opposite said heat exchange means for obstructing flow of air axially through the fan at the hub region thereof in an axial direction opposite the direction of said major velocity component of air flow through said heat exchange means, said means lying substantially in a plane spaced and substantially parallel with respect to a radial plane substantially defining a second axial end of said shroud means opposite said one axial end of said throat section substantially defining said one axial end of said shroud means.

4,173,996

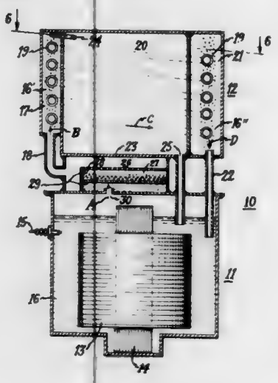
HEAT EXCHANGER ARRANGEMENT FOR VAPORIZATION COOLED TRANSFOMERS

Linden W. Pierce, Rome, Ga., assignor to General Electric Company, N.Y.

Filed Sep. 5, 1978, Ser. No. 939,195

Int. Cl.[2] F28D *15/00*

U.S. Cl. 165—105 **2 Claims**



1. An improved heat exchanger of the type used with condensable coolants and including an intake manifold and a return manifold and a plurality of cooling tubes connecting between both of said manifolds wherein the improvement comprises:

an intake pipe connecting with the intake manifold for promoting the flow of vaporized coolant into the intake manifold;

a return pipe connecting with the return manifold for promoting the flow of condensed coolant out of the return manifold said vaporized coolant and condensed coolant flow being in the same direction within the return manifold;

said cooling tubes inclining from the intake manifold to the exhaust manifold to promote the flow of condensed coolant into the return manifold, said vaporized coolant and condensed coolant flow being in the same direction within the cooling tubes;

an expansion tank forming three divided sections which create the intake and return manifolds and an expansion area intermediate the intake and return manifolds and a connector between the intake manifold and the expansion tank for providing the flow of vaporized coolant into the expansion tank; and

a separate return pipe connecting with the expansion tank for promoting the flow of condensed coolant out of the expansion tank.

4,173,997

MODULAR STEAM GENERATOR

Harry N. Andrews, Export, Pa., and Robert F. Barry, St. Genese, Belgium, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 23, 1977, Ser. No. 771,140

Int. Cl.[2] F28F *3/00*

U.S. Cl. 165—158 **16 Claims**

1. A heat exchanger for transferring heat from a primary fluid to vaporize a secondary fluid, said heat exchanger comprising:

an elongated vertically oriented shell portion;

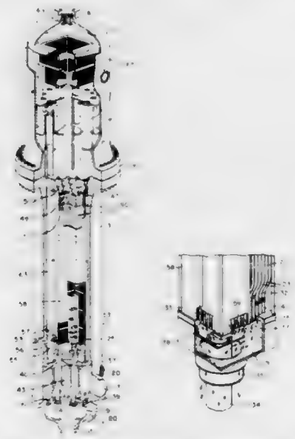
a lower head and an upper head portion forming end closures for said shell;

a first transversely disposed general horizontal plate having a periphery which extends to said shell, and is sealingly affixed thereto and which cooperates with said first plate to form a first compartment having inlet and outlet nozzles for said primary fluid and a second compartment having inlet and outlet nozzles for said secondary fluid;

a second transversely disposed general horizontal plate spaced from said first plate and having a periphery which extends to said shell and having a peripheral seal;

said second plate being so disposed within said first compartment so as to separate said primary fluid inlet nozzle from said primary fluid outlet nozzle;

a plurality of modular tube bundles disposed in said second compartment, each of said tube bundles having a plurality of generally U-shaped tubes forming a hot leg portion and



a cold leg portion, a tube sheet into which the ends of the tubes are secured, a pair of headers, one of said headers serving as an inlet header and the other of said headers serving as an outlet header, and conduits in fluid communication with each of said headers;

said transversely disposed plates having registering openings through which at least one of said conduits in communication with one of said headers passes and forms a seal therewith whereby primary fluid flows in series through said primary fluid inlet nozzle one of said conduits, said tubes, the other of said conduits, and then through the primary fluid outlet nozzle; and

means for transmitting secondary fluid from the secondary fluid inlet nozzle to at least the cold leg portion of said tube bundles adjacent said tube sheets, whereby the secondary fluid flows upwardly over the outside of said tubes and is vaporized and the vapor flows out through said secondary fluid outlet nozzle.

4,173,998

FORMED COIL ASSEMBLY

John Jahoda, McMinnville, Tenn., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 16, 1978, Ser. No. 878,195

Int. Cl.[2] B23P *15/26*

U.S. Cl. 165—182 **9 Claims**

1. A method of manufacturing a formed coil having multiple single row coil cores of varying lengths such that when the coil is bent to the desired shape the coil rows will be in the appropriate location which comprises the steps of:

arranging in registration a plurality of sheets of plate fins, said fins having openings to receive tubular members and said fins being joined by at least one break away tabular portion such that upon an application of force the individual fins of the sheet may be separated;

lacing the sheets of plate fin by inserting tubes through the fin openings such that the fins are spaced along the tubes, said tubes being of varying length depending upon the final coil configuration desired;

expanding the tubes to form a tight fit between the fins and tubes, at least a part of the tabular portions connecting the fin sheets being ruptured during expansion such that said fins are spaced along the tubes of each coil core independently of the spacing of the fins along the adjacent coil core; and

bending the coil cores to the desired configuration.



5. A formed coil having multiple single row coil cores of varying lengths which comprises:

a first coil core having fins spaced along tubes; and

a second coil core of a different length than the first coil core and also having fins spaced along the length thereof, the fins in the first and second coil core having been made from sheets joined by tabular portions such that when the tubes were expanded to enhance heat transfer between the fins and the tubes, at least a part of the tabular portions were ruptured during the expansion so that fins from the sheets that were joined by the tabular portions are spaced dissimilarly along the coil cores.

4,173,999

TECHNIQUE FOR CONTROLLING LOST CIRCULATION EMPLOYING IMPROVED SOFT PLUG

Joseph U. Messenger, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 26, 1977, Ser. No. 836,642

Int. Cl.[2] E21B *33/138, 33/13*

U.S. Cl. 166—293 **4 Claims**

1. In the drilling of a well, the method of alleviating the loss of whole liquid drilling fluid into a lost circulation zone of an incompetent subterranean formation penetrated by said well, comprising:

(a) introducing into a drill string positioned in said well to extend to the vicinity of said lost circulation zone a slurry comprised of a nonaqueous liquid, a hydratable material in an amount sufficient to form a soft plug and within the range of 300 to 800 pounds per barrel of said nonaqueous liquid and a solids suspending agent comprised of oleophilic clay in an amount within the range of about 0.1 to 5.0 pounds per barrel of said nonaqueous liquid to suspend said hydratable material in said nonaqueous liquid;

(b) displacing said slurry down said drill string and into the vicinity of said lost circulation zone;

(c) displacing an aqueous liquid down an annulus formed about said drill string to mix said slurry and said aqueous liquid in said vicinity of said lost circulation zone and form a soft plug; and

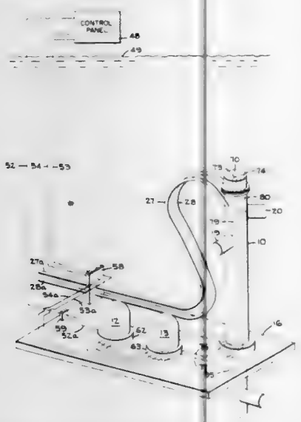
(d) displacing said soft plug into said lost circulation zone to alleviate the loss of whole liquid drilling fluid thereinto.

4,174,000

METHOD AND APPARATUS FOR INTERFACING A PLURALITY OF CONTROL SYSTEMS FOR A SUBSEA WELL

Lionel J. Milberger, Spring, Tex., assignor to FMC Corporation, San Jose, Calif.

Filed Feb. 16, 1978, Ser. No. 878,495
Claims priority, application United Kingdom, Feb. 26, 1977, 8218/77
Int. Cl.² E21B *33/035*
U.S. Cl. 166—362 **16 Claims**



6. Interfacing apparatus for dual control of a subsea wellhead having a plurality of valve operators for controlling a wellhead valve system, said apparatus comprising:
- an electro-hydraulic control module for normally operating said valve operators;
- a hydraulic control module for back-up operation of said valve operators;
- means for selectively connecting one of said electrohydraulic control module and said hydraulic control module to said wellhead valve system;
- a surface control unit for controlling the operation of said electro-hydraulic and said hydraulic control modules and for selecting the control module which operates said valve operators;
- means for coupling control signals from said surface control unit to said valve operators when a tree cap is removed from said wellhead; and
- means for directing the operation of said hydraulic control module while said electro-hydraulic control module is being removed and replaced.

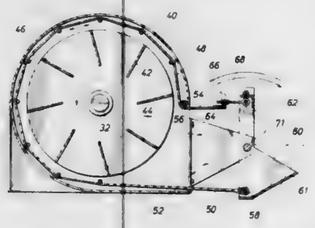
13. A method of interfacing a plurality of control systems between a surface-mounted control panel and a subsea wellhead having a plurality of valve operators in a christmas tree at said wellhead, said method comprising the steps of:
- (1) mounting a primary control module near said christmas tree, said primary control module having a primary control valve for each of said valve operators,
- (2) mounting a back-up control module near said christmas tree, said back-up control module having a back-up control valve for each of said valve operators,
- (3) providing selection means for selectively coupling each of said primary control valves or each of said back-up control valves to a corresponding one of said valve operators in said christmas tree,
- (4) mounting said selection means near said christmas tree for easy replacement thereof without accessing said christmas tree,
- (5) coupling selection signals between said control panel and said selection means to control the operation of said selection means, and
- (6) coupling control signal between said control panel and said primary control module or said back-up control module to operate the control valves which are coupled to said valve operators.

4,174,001

FAN HOUSING CLEAN OUT APPARATUS

Malcolm P. Ellis, Ashland, Me., assignor to Lockwood Corporation, Gering, Nebr.

Filed May 25, 1977, Ser. No. 800,408
Int. Cl.² A01D *33/02*
U.S. Cl. 171—17 **13 Claims**



1. In combination with a vacuum chamber which includes a fan operating within a fan housing through which mire is drawn, the improvement in a fan housing cleanout apparatus for preventing the build up of mire, comprising
- support rods located around the inside periphery of the housing,
- belting under tension positioned between said rods and the inside housing periphery, and
- oscillating means connected for providing relative movement between said belting and rods thereby to flex said belting and to scrape said belting against said rods to loosen mire attempting to build up on said belting.

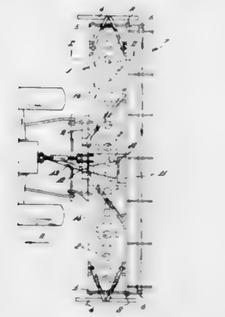
4,174,002

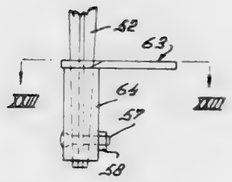
SOIL CULTIVATING MACHINES

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Continuation of Ser. No. 625,083, Oct. 23, 1975, abandoned.
This application Jun. 27, 1977, Ser. No. 810,621
Claims priority, application Netherlands, Oct. 24, 1974, 7413903
Int. Cl.² A01B *33/06, 33/10*
U.S. Cl. 172—49 **3 Claims**

1. A rotary harrow comprising a plurality of soil working members arranged in a transverse row, said members being rotatable about corresponding substantially vertically axes and being mounted on substantially vertical shafts that define said axes, driving means being connected to said shafts to rotate neighboring soil working members in relative opposite directions in order to work overlapping paths of soil, at least one of said soil working members comprising a support and a plurality of downwardly extending tines, at least one of said tines having a substantially straight soil working portion extending downwardly from said support and a chisel releaseably secured by bolt means adjacent the lower end of said portion, said chisel having a knife-like operative portion extending outwardly from said soil working portion in a substantially radial direction, said chisel having a sleeve-like fastening portion that receives the lower end of the tine soil working portion





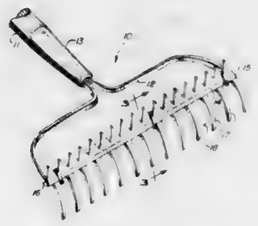
and said fastening portion of the chisel being located below the operative portion of said chisel.

4,174,003

RAKE ATTACHMENT KIT

Lamberto C. Zepeda, 492 Santa Rita, Superior, Ariz. 85723

Filed Apr. 7, 1978, Ser. No. 894,340
Int. Cl.² A01B *1/20*
U.S. Cl. 172—375 **2 Claims**



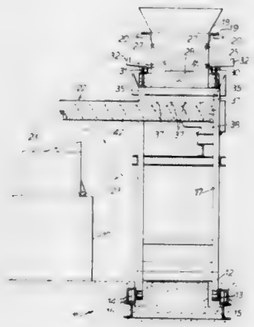
1. A kit for converting a conventional rake including a back bar having a plurality of curved, long, thin, widely spaced tines depending therefrom to a rake including an attachment bar having a plurality of sawteeth substantially opposite to said tines and arranged in general back-to-back relation with respect thereto, said kit comprising:
- (a) an attachment comprising a bar adapted to be arranged in substantially back-to-back relation with respect to the rake bar and having a plurality of sawteeth extending upwardly therefrom, said sawteeth adapted to be shorter, more closely spaced and wider than said tines; and
- (b) means for removably securing said attachment bar to said rake bar, including,
  - (i) a plurality of plate assemblies each of which comprises a pair of complemental plates which are curved so as to be adapted to conform to the contour of said rake and attachment bars which are positioned therebetween, and
  - (ii) a pair of bolts and nuts for each plate assembly with one nut passing through the apices of adjacent sawteeth of the attachment bar and the other bolt adapted to pass between adjacent tines and below said rake bar, for clamping said plates towards each other.

4,174,004

ELECTRIC STORAGE BATTERIES

Edgar Ramsbottom, Bolton; William Whalley, Altrincham, and Edmund Bale, Brooklands, all of England, assignors to Chloride Group Limited, London, England

Filed Feb. 13, 1978, Ser. No. 877,383
Claims priority, application United Kingdom, Feb. 15, 1977, 6260/77
Int. Cl.² H01M *7/00*
U.S. Cl. 141—32 **14 Claims**



1. Plant for pasting battery plates comprising:
- grid feeding means having an outlet path, first flat conveyor means having an inlet end and an outlet end and a drive motor, said grid feeding means being positioned so that said outlet path is juxtaposed to the inlet end of the flat conveyor whereby grids fed from the grid feeding means are deposited on the inlet end of the flat conveyor,
- paste applying means having an inlet for receiving paste and an outlet for forcing paste into a grid conveyed on the conveyor past the said paste applying means, said first flat conveyor and said paste applying means together constituting a pasting machine,
- a transportable hopper and mechanical discharge means for mechanically discharging paste into the inlet to the pasting applying means,
- second conveyor means having an inlet end and an outlet end,
- third conveyor means having an inlet end and an outlet end, the inlet end of the second conveyor being juxtaposed to the outlet end of the first conveyor, and the outlet end of the second conveyor being juxtaposed to the inlet end of the third conveyor,
- a drying oven, the third conveyor passing through the drying oven,
- paste recycling means having an inlet located below the outlet end of the first conveyor,
- a flexible outlet pipe connected to the inlet to the paste applying means, and
- pump means disposed between the inlet and the outlet of the paste recycling means, whereby the paste recycling means is adapted to mechanically collect paste applied to the first conveyor at regions between the grids and to convey it back to the inlet to the paste applying means.

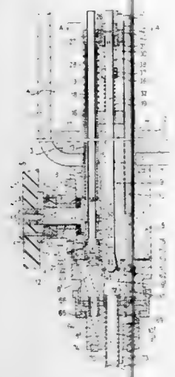
V 9 8 2 N 0 1 3 7 9 UMI

4,174,005

FLUID PRESSURE MEASURING DEVICE

Jean-Claude C. L. Vinois, 129, Rue Papenkasteel, Brussels, Belgium

Filed Nov. 9, 1977, Ser. No. 849,715
Claims priority, application Belgium, Nov. 10, 1976, 848195
Int. Cl.[2] B65C *3/00*
U.S. Cl. 141—54 **18 Claims**



1. In a plant for the isobarometric racking of liquid and filling of bottles under gaseous pressure the said plant comprising a rotating tank containing the liquid to be racked and the gas under pressure and on which are mounted a series of valve devices each for the filling of one separate bottle, each valve device consisting of a valve body which is fixed to the tank, extends downwardly from the base of the tank and has three conduits passing vertically through it and extending upwards through the liquid in the tank to the upper zone in the tank which forms a gas pressure where gas under pressure is contained, said first conduit conducts gas under pressure, said second conduit conducts the flow of liquid and said third conduit returns the gases, the improvement being that a device is situated in the said tank for the control of the opening of the flow of liquid and inside the gas pressure conduit a slidably mounted tube is coaxially and internally mounted said sliding tube having at the lower extremity a distributor consisting of a slide valve which extends the sliding tube downwards and a closing means coaxially connected with the said valve body and resting on said closing means said slide valve is manipulated by a mechanical control means, said valve and said closing means cooperating in such a way that by a succession of actions of said mechanical control means on the said slide valve, said slide valve and said closing means are brought into relative positions of sealing and of passage of gas under pressure and the sliding of said sliding tube is caused and in that a mechanically linked opening means is provided between the said sliding tube and the said control device in the upper zone of the tank for opening of the flow of liquid in such a manner that the movements of the sliding tube are caused to determine the opening of the flow.

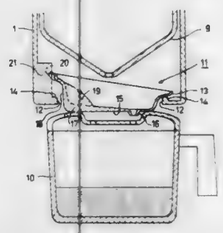
4,174,006

FILTERING DEVICE

Hendrik Panneman, Groningen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 6, 1978, Ser. No. 883,485
Claims priority, application Japan, Mar. 9, 1977, 52/24925
Int. Cl.[2] B65B *3/06*
U.S. Cl. 141—87 **6 Claims**

1. A coffee maker comprising a housing in which a filter holder can be positioned, an opening in said housing beneath the position of the filter holder, said opening having an inwardly extending edge, a leak tray arranged underneath the filter holder position, said leak tray having an outwardly extending rim for resting on the inwardly extending edge of the housing opening, means to permit vertical movement of one portion of the leak tray rim with respect to the opposite portion of said rim, and a discharge outlet in said leak tray adjacent said opposite rim portion for the passage of filtrate into a collecting vessel arrangeable beneath and in contact with said leak tray, said one rim portion of the leak tray being vertically



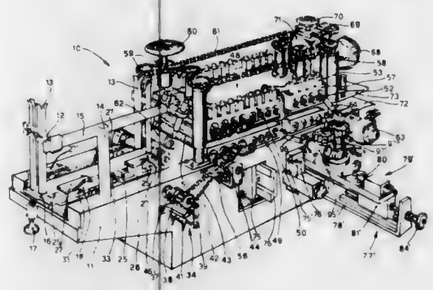
raised when the collecting vessel is in contact with the leak tray, said discharge outlet thereby being located at the lowest point of the bottom of said leak tray, and said one rim portion of the leak tray being vertically lowered when the collecting vessel is removed from contact with said leak tray, the bottom portion of the leak tray adjacent said one rim portion being thereby situated below the level of the discharge outlet.

4,174,007

MACHINE FOR THE PRODUCTION OF SHAPED PARTS

Renzo Novello, Manzano, and Elvio Bottussi, Medeuzza, both of Italy, assignors to Novello Fratelli S.p.A, Udine, Italy

Claims priority, application Italy, Jul. 15, 1975, 83407 A/75
Continuation-in-part of Ser. No. 705,152, Jul. 14, 1976, abandoned. This application Jan. 6, 1978, Ser. No. 867,598
Int. Cl.[2] B27C *9/04, 5/00*
U.S. Cl. 144—1 R **11 Claims**



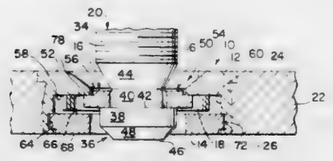
1. A machine for the production of shaped parts by means of material removing tools, said machine comprising in combination a one-directional entraining, guiding and processing bench having drive means thereon for driving said parts longitudinally along the longitudinal axis thereof; indexing means for controlling at least one of said material removing tools for movement at right angles to said longitudinal axis into and out of engagement with said parts; planing and grooving tool means positioned at the entry to said bench; loading means for feeding said parts to said planing and grooving means; and planing means at the exit of said bench for planing said parts prior to exit from the machine.

4,174,008

ACCESS PANEL FASTENER RETAINER

Joseph R. Preziosi, Clark, and Paul A. Trimmer, Berkeley Heights, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed Dec. 28, 1977, Ser. No. 865,027
Int. Cl.[2] F16B *43/00*
U.S. Cl. 151—69 **10 Claims**



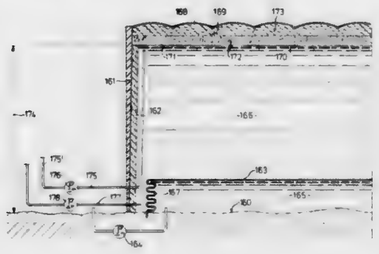
1. A retainer for use as a component of an access panel fastener for securing a panel to a structure, said retainer comprising a grommet having first and second axial ends and an axial aperture in open communication with each said end and adapted to capture a bolt inserted into said first end, said grommet having a radial shoulder surface facing away from said first end and defining a portion of said aperture and an internal surface extending toward said first end from and intersecting said shoulder surface at the radially inward edge thereof and defining a further portion of said aperture, only two discrete retaining jaws in said aperture, each said jaw having a first face confronting and overlapping said radial shoulder surface and a second face facing away from said first face and a boss extending toward said first grommet end from said first face, said boss adapted to pass the radially inward edge of said radial shoulder surface to enter said internal surface of said grommet when force is applied to said jaws tending to move the same toward said first grommet end when said jaws are in the radially innermost positions thereof; and spring means resiliently biasing each said jaw radially inwardly toward the grommet axis, each said jaw being C-shaped and substantially 180° in circumferential extent.

4,174,009

LONG-PERIOD THERMAL STORAGE ACCUMULATORS

Nikolaus Laing; Ingeborg Laing, and Oliver Laing, all of Hofener weg 35-37, 7141 Aldingen bei Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 616,256, Sep. 24, 1975, abandoned. This application Dec. 15, 1977, Ser. No. 860,191
Claims priority, application Austria, Sep. 30, 1974, 7858/74; Nov. 20, 1974, 99290; Apr. 30, 1975, 13312
Int. Cl.[2] F28D *1/00;* **F01K** *3/00*
U.S. Cl. 165—45 **19 Claims**



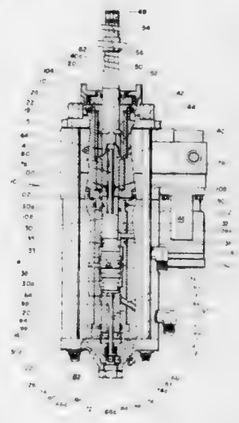
1. A long-period heat storage accumulator comprising a wall structure for containing a large volume of hot water within the accumulator interior and having means for filling and removing hot water therefrom, the improvement comprising in that the wall structure comprises in part a flexible covering including tensioning ropes for holding said covering against vertical movement and in that said accumulator is adapted to be completely submerged in water whereby the pressure of the hot water exerting forces on said wall structure is counteracted in part by the pressure of the water exterior of the accumulator exerting forces on the wall structure.

4,174,010

ROCK DRILL

George A. Hibbard, Claremont, N.H., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Continuation of Ser. No. 625,540, Oct. 24, 1975, abandoned. This application Aug. 15, 1977, Ser. No. 824,597
Int. Cl.[2] E21C *7/10*
U.S. Cl. 173—78 **12 Claims**



1. A fluid motor comprising: a body member; an elongated piston axially reciprocally movable within said body member; said body member including motive fluid conducting means cooperable with a source of motive fluid flow for conducting motive fluid to said piston to reciprocally drive said piston; elongated fluid conveying means extending within said body member and said piston; a sealed containment means defined within said motor and adapted to contain therein a quantity of heat transfer medium in isolation from said motive fluid conducting means; said containment means including a pair of variable volume chambers and passageway means communicating between said pair of variable volume chambers; said passageway means including a passage portion extending within said piston such that the heat transfer medium contained in said passage portion is maintained in heat exchange relation with said fluid conveying means; and said piston including means effective to induce a flow of such heat transfer medium within said passage portion during the reciprocal movement of said piston by increasing the volume of one of said variable volume chambers while decreasing the volume of the other of said variable volume chambers.

4,174,011

SUBSEA DRILLING TEMPLATE WITH CAROUSEL GUIDANCE SYSTEM

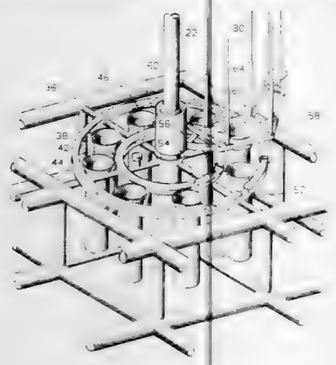
Hubart B. Zaremba, London, England, assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 12, 1977, Ser. No. 832,141
Int. Cl.[2] E21B *15/02*
U.S. Cl. 175—7 **8 Claims**

3. A sea floor template for use with a guidance system for drilling underwater wells from a floating vessel which comprises:

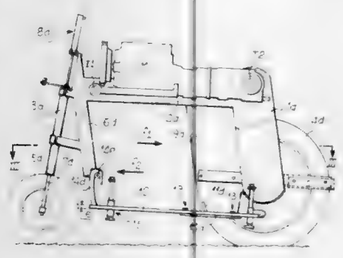
V 9 8 8 1 2 N 0 1 3 7 9 UMI

a template frame,
a group of well slots arranged in a circle and supported by said template frame,
an outer guide rail and an inner guide rail supported by said template frame and extending adjacent said circle of well



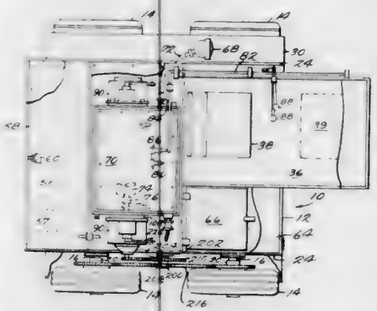
slots, said guide rails being concentric with each other and with said circle, said guide rails are in the form of an I-beam having an upper flat rim extending on either side of a vertical support member, said rim being cut in two places on said outer guide rail and two places on said inner guide rail, defining a quadrant.

4,174,012
SELF-PROPELLED UNIT WITH A HIGH-CLEARANCE CHASSIS VEHICLE
Emile Bobard, Beaune, France, assignor to Emile Bobard and Jeune Bobard (S.A.), Beaune, France
Filed Feb. 8, 1978, Ser. No. 876,088
Claims priority, application France, Feb. 11, 1977, 77 04044
Int. Cl.² B60P *1/02*
U.S. Cl. 180—313 **9 Claims**



1. A self-propelling device comprising
(a) a self-propelling vehicle having a high clearance chassis, drive wheels having pneumatic tires, steering wheels and lateral supports rigidly affixed to the lower portions of said chassis;
(b) a work-facilitating element adapted to fit within the transverse clearance of said vehicle and provided with supports cooperating with said vehicle supports and with means for permitting its positioning in contact with the ground, said element comprising a plate-like structure of sufficient length and rigidity to assure the bracing of said lower portions of said chassis, whereby traction effort can be supported;
(c) means on said device for relative vertical displacement between said vehicle supports and said element, whereby said vehicle supports may be uncoupled for disengagement of said element after it contacts the ground in order to permit longitudinal displacement of said vehicle, said means for relative vertical displacement comprising a system of circuits mounted on said vehicle, and including conventional means for adjustment, at least upon stoppage, of the pressure in the pneumatic tires at least of said drive wheels and of the elevation of suspension of said chassis on said steering wheels, whereby height displacements of said chassis are facilitated due to ground contact of the wheels of said vehicle.

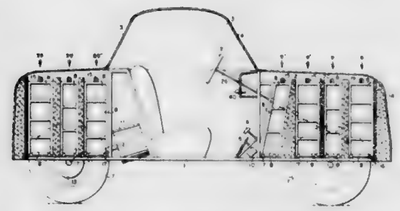
4,174,013
MINE CAR
Jeffry R. Yago, Barboursville, W. Va., assignor to Lester Construction Co., Hurricane, W. Va.
Division of Ser. No. 678,631, Apr. 20, 1976, Pat. No. 4,094,361.
This application May 9, 1978, Ser. No. 904,296
Int. Cl.² B62D *11/12*
U.S. Cl. 180—6.2 **5 Claims**



5. A mine car comprising a vehicle body, an explosion-proof container mounted on said body, said explosion-proof container housing a motor, a plurality of wheels rotatably mounted to said body, drive means connecting said motor to said plurality of wheels, said drive means including a pair of first permissible assemblies, each of said first permissible assemblies being mounted, respectively to an explosion-proof container wall, each of said first permissible assemblies comprising an adapter plate which is secured to the explosion-proof container, said adapter plate having a central through-going stepped bore and shoulders defined at both ends of the central bore by said steps, said shoulders providing a seat for ball bearing races mounted therein and forming a flame baffle, a torque transmitting shaft mounted in and extending through said bore and said bearing races and adapted to rotate freely therein, the proximal end of said torque transmitting shaft being operatively engaged to a coupling means which couples said torque transmitting shaft to said motor, so that said torque transmitting shaft rotates when driven by said motor, transmission means mounted to said mine car outside of said explosion-proof container, said transmission means comprising a transmission assembly mounted to said explosion-proof container wall adjacent to said adapter plate, the distal end of said torque transmitting shaft being operatively engaged to said transmission assembly, a second drive portion of said drive means connecting said wheels to said transmission assembly so that said wheels can be driven by said transmission assembly, and means for controlling the speed and direction of the mine car, said speed and directional control means comprising a plurality of speed and directional control members movably mounted on said mine car body, one of said speed and direction control members being connected by a transmission assembly mounted on said mine car on the right hand side of said explosion-proof container and one of said speed and directional control members being connected to a transmission assembly mounted on a mine car on the left hand side of said explosion-proof container, each of said speed and

directional control members controlling its respective transmission assembly so that those wheels connected to the transmission assembly can be placed in a selective drive mode chosen from a forward, neutral, reverse mode sequence independently of the mode selected for the other transmission assembly, and a power source mounted on said mine car, said power source being connected to said motor and adapted to operate said motor.

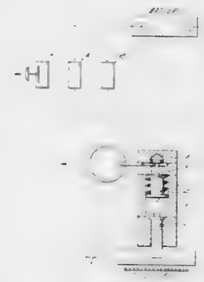
4,174,014
SHOCK ABSORBENT ELECTRIC VEHICLE AND BATTERIES
Johan A. Bjorksten, P.O. Box 9444, Madison, Wis. 53715
Continuation of Ser. No. 645,249, Dec. 29, 1975, abandoned.
This application Oct. 7, 1977, Ser. No. 840,391
Int. Cl.² B60L *11/18*
U.S. Cl. 180—68.5 **1 Claim**



1. A wheeled land vehicle which is powered and driven by electricity comprising:
a passenger compartment,
a plurality of storage batteries,
a plurality of said storage batteries located between said passenger compartment and the front of said vehicle, and
a further plurality of said storage batteries located between said passenger compartment and the rear of said vehicle,
characterized by bodies of foam, said bodies of foam being disposed between at least some of said batteries,
at least some of said bodies of foam being disposed in spaced apart relationship longitudinally of said vehicle,
at least one battery disposed between each of said longitudinally spaced apart bodies,
each of said bodies extending transversely with respect to said vehicle.

4,174,015
RESTRAINT SEVERING DEVICE
Michel Farcinade, Rue des delices, 19, Geneva, Switzerland
Filed Mar. 6, 1978, Ser. No. 883,754
Claims priority, application Switzerland, Mar. 7, 1977, 2977/77
Int. Cl.² B60R *21/10*
U.S. Cl. 180—268 **12 Claims**

1. A restraint severing device which includes: shearing means, retaining means arranged to hold said shearing means in operative proximity to said restraint, energy storing means arranged so that release of the stored energy will effect operation of said shearing means to sever said restraint, and means to provide a triggering signal to said energy storing means including at least one sensing means adapted to sense an abnormal situation, said means to provide a triggering signal further including a striker means within a bore, a cocked spring means to propel said striker along said bore toward said energy storing means and thereby release said stored energy upon contact with said energy storage means, and a fusible wire for holding said spring means in its cocked position but for being severed



in response to said sensing means sensing said abnormal situation to thereby release said spring to propel said striker.

4,174,016
HYDRAULIC CAB TILTING SYSTEMS
Henry J. Levington, and James G. Knowles, both of Lincoln, England, assignors to Clayton Dewandre Company Limited, Lincoln, England
Filed Apr. 11, 1977, Ser. No. 786,541
Claims priority, application United Kingdom, May 3, 1976, 17934/76
Int. Cl.² B62D *33/06*
U.S. Cl. 180—89.15 **8 Claims**



1. In a hydraulic ram system incorporating a cylinder and piston assembly for tilting the cab of a commercial vehicle, which cab is resiliently mounted on the vehicle frame or chassis, wherein the end of the ram cylinder in which the ram piston is located when the cab is in the lowered position is of increased bore diameter to provide enough clearance around the piston to render the ram passive in this position, the length of the increased cylinder bore being sufficient to accommodate the maximum movement of the cab on its suspension, and wherein a lower fluid conducting ram line is connected to the increased bore end of said ram cylinder and an upper fluid conducting ram line is connected to the other end of said ram cylinder; the improvement wherein there is provided in the lower ram line a restriction such that when fluid is pumped through said line to raise the load a pressure drop is created across the restriction, and there is provided in the upper ram

line valve means operatively connected to be responsive to the pressure differential across said restriction and operable thereby to connect the upper ram line to the lower ram line.

4,174,017

VEHICLE POWER ASSISTED STEERING APPARATUS

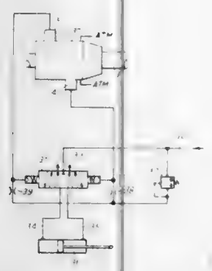
Peter D. Morgan, Clutton, England, and Alistair G. Taig, South Bend, Ind., assignors to Bendix Westinghouse Limited, Bristol, England

Filed Jan. 28, 1978, Ser. No. 872,273

Claims priority, application United Kingdom, Jan. 29, 1977, 3725/77

Int. Cl.[2] **B62D** *5/08*

U.S. Cl. 180—132 **1 Claim**



1. In a steering system having a rotatable input member coupled to a rotatable output member, the input member and output member cooperating to substantially define a sensor, a relay valve communicating pressurized air to atmosphere via the sensor, the relay valve also communicating with an actuator which is engageable with a linkage member in the steering system, the input member being rotatable relative to the output member to vary communication of pressurized air via the sensor, the relay valve being movable in response to the variation of pressurized air communication from a neutral position to an unbalanced position, the relay valve communicating pressurized air to the actuator in the unbalanced position to move the linkage of the steering system, the sensor comprising a first space and a second space on the output member and a first lug and a second lug on the input member extending into the first and second spaces, respectively, a first inlet port communicating via a first set of passages within the output member with the first and second spaces, and a second inlet port communicating via a second set of passages within the output member with the first and second spaces, the first and second spaces opening to atmosphere and the first and second lugs being movable within the first and second spaces, respectively, in order to vary communication through the spaces to atmosphere when the input member is rotatable relative to the output member.

4,174,018

ARRANGEMENT FOR CONTROL OF TWO HYDRAULIC PRESSURE SYSTEMS, INCLUDING BOOSTER STEERING CONTROL

Karl-Heinz Liebert, Schwaebisch Gmuend, and Werner Tischer, Böbingen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

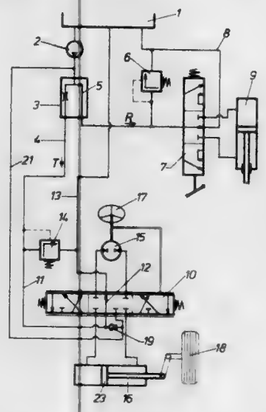
Filed Jun. 28, 1978, Ser. No. 920,059

Int. Cl.[2] **B62D** *5/08*

U.S. Cl. 180—132 **2 Claims**

1. In a dual control hydraulic system having a common pump for pressurizing power cylinders of a booster steering hydraulic circuit and an accessory operating hydraulic circuit via a multiway steering control valve for steering control and accessory control valve for accessory operation, and including a tank and flow connecting means intermediate said tank and said pump and said multiway valves and said power cylinders whereby selective actuation of said multiway valves pressurizes and exhausts respective power cylinders and wherein said booster steering hydraulic circuit also has a constant flow device (3) connected intermediate said pump and the steering control valve (10) effecting a substantially constant flow available for power steering and wherein said system has connection means (4, 11) from said constant flow device (3) to said steering control valve (10) for said constant flow thereto;

the improvement wherein said flow connecting means comprises a first branch connection (21) for pump output, upstream of said constant flow device, to said steering control valve (10); and a second branch connection (5) for pump output, upstream of said constant flow device, to the accessory control valve (7);



wherein said minimal flow is shunted to said tank through said steering control valve (10) in neutral position thereof while flow from said first branch connection (21) is blocked thereat at that time;

and flow combining means (19) effecting combined flow from said first branch connection (21) to said flow connection means (4, 11) when said steering control valve (10) is operated for effecting steering control to provide combined flow therethrough to the power cylinder (16) of said steering hydraulic circuit;

and wherein use of accessory power during steering effects flow from said first branch connection (21) to said second branch connection (5) causing reduction of flow from said first branch connection (21) to said steering control valve, steering power being effected by said constant flow combined with flow from said first branch connection (21) passes to said second branch connection (5).

4,174,019

DUAL SPEAKER

Justin A. Kramer, 10 28 W. 8th Pl., Los Angeles, Calif. 90017

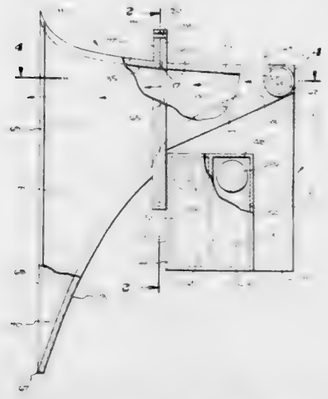
Filed Mar. 20, 1978, Ser. No. 888,200

Int. Cl.[2] **G10K** *13/00;* **H04R** *7/00;* **G10K** *11/00*

U.S. Cl. 181—159 **9 Claims**

1. A dual speaker for emitting sounds originating in an electronic circuit comprising a housing, a side wall structure, a rear wall structure and an output wall structure,

a low frequency driver chamber for reception of a low frequency driver unit, a low frequency outlet opening adjacent the output wall structure for emission of low frequency sounds, and a relatively long circuitous low frequency horn from the low frequency driver chamber to the low frequency outlet opening and forming a clear passage therethrough for sound, a high frequency driver chamber for reception of a high frequency driver unit, a high frequency outlet opening adjacent the output wall structure for emission of high frequency sounds and a relatively short direct high frequency horn from the high



frequency driver chamber to the high frequency outlet opening and forming a clear passage therethrough for sound, there being a common partition between said horns, said outlet openings being in relatively the same plane.

4,174,020

ACOUSTIC TREATMENT FOR FANS

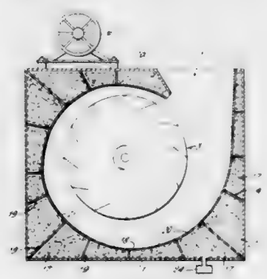
Louis A. Challis, 158 Queen St., Woollahra 2025, New South Wales, Australia

Filed Jun. 14, 1976, Ser. No. 695,622

Claims priority, application Australia, Jul. 1, 1975, PC2191; Aug. 13, 1975, PC2790

Int. Cl.[2] **F01N** *3/06, 1/04;* **G10K** *11/04;* **F01D** *5/10*

U.S. Cl. 181—211 **13 Claims**



1. A centrifugal fan equipped with apparatus for attenuating noise generated thereby, the apparatus comprising:

(a) a rigid backing member having at least one planar surface,

(b) a curved scroll mounted in spaced disposition from said rigid backing member and having a plurality of acoustically permeable zones, each containing a multiplicity of small perforations and being of strip-like shape extending substantially parallel to the axis of the fan over substantially the entire width of the scroll in the direction parallel to said axis, said zones being separated by unperforated zones of the scroll, and

(c) wall means secured to the scroll in the unperforated zones thereof and dividing the space between said scroll and backing member into a plurality of Helmholtz acoustic absorption cavities containing sound absorbing material and dimensioned to have different respective resonant frequencies whereby the noise of the fan is transmitted by said scroll and attenuated in said cavities over a wide range of frequencies, at least two of said Helmholtz cavities being formed between the scroll and said planar surface, and said scroll being so disposed relative to the planar surface that the two cavities are of different depths.

4,174,021

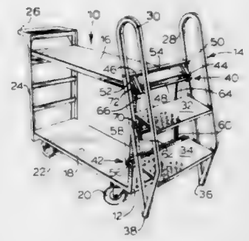
LADDER TRUCK

Norman A. Barlock, Oakville, Canada, assignor to Alnor Material Handling Limited, Canada

Filed May 16, 1978, Ser. No. 906,694

Int. Cl.[2] **E06C** *5/02;* **B62B** *5/04*

U.S. Cl. 182—17 **5 Claims**



1. A ladder truck comprising:

a truck portion having first and second supporting wheel formations near opposed ends thereof, on which the ladder truck may be rolled across a surface;

a step ladder movably secured to the truck portion at the first end thereof and having a single pair of downwardly extending surface engaging extremities;

a pair of pivot arms pivotally connected at one end to the upper part of the first end of the truck portion and pivotally connected at the other end to an upper portion of the step ladder;

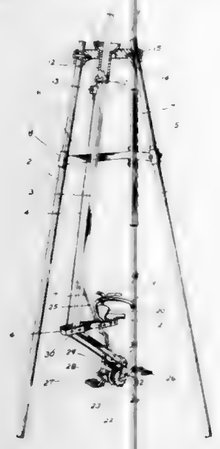
said step ladder being movable relative to the truck portion by pivoting movement of said pivot arms in a vertical plane relative to both the truck portion and the step ladder, between:

a first position in which the step ladder is supported by the truck portion with its downwardly extending extremities clear of the surface on which said wheel formations rest, so as to permit the ladder truck to be rolled across the surface on its wheeled formations, the pivot arms in said first position extending from their connection to the end of the truck portion to their connection to the step ladder in a direction upwardly and rearwardly towards the centre of the truck portion;

an intermediate portion in which the pair of downwardly-extending extremities of the step ladder, and each of the supporting wheel formations, rest on said surface, the pivot arms in said intermediate position extending outwardly in a direction away from the truck portion;

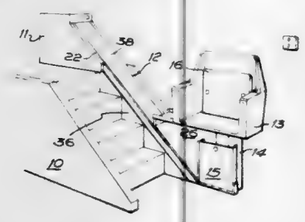
and a second position in which the downwardly-extending extremeties of the step ladder engage the surface and support a portion of the weight of the ladder truck thereon, with the first said supporting wheel formations raised out of engagement with the surface, the pivot arms in said second position extending from their connection to the end of the truck portion to their connection to the step ladder in a direction downwardly and rearwardly towards the centre of the truck.

4,174,022
ORCHARD LIFTS
W. Henry Snyder, c/o Zion's Mtn. View Nursing Home, 2730 E. 33rd St., Salt Lake City, Utah 84109
Filed Feb. 14, 1977, Ser. No. 768,108
Int. Cl.[2] A01D *46/20, 46/24*
U.S. Cl. 182—145 1 Claim



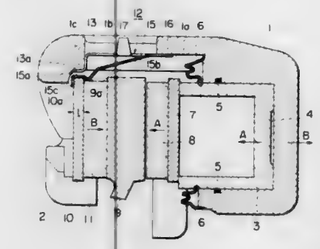
1. An orchard lift apparatus, including a bicycle-type seat upon which an orchard worker may sit, said seat mounted on an elongated pole passing upward through a sleeve and friction hemisphere or partial hemisphere, said hemisphere resting within a socketed bridge through which said sleeve passes downward, a cable attached to said sleeve-hemisphere unit, extending downward, and wound or unwound by the worker on a drum, at the bottom of said elongated pole, by means of foot pedals whereby the worker may move upward or downward, two straight poles or tubes constituting the legs, angling inward in an upward direction, the above mentioned socketed bridge rigidly fastened to, and spanning across the tops of said pole legs, support means, attached to the upper portion of said apparatus, for holding the apparatus upright.

4,174,023
STAIRLIFT
Stephen J. Dooley, 112 Sewerby Rd., Bridlington, North Humberside, Y016 5UP, England
Filed Nov. 8, 1977, Ser. No. 849,583
Int. Cl.[2] B66B *9/08*
U.S. Cl. 187—12 6 Claims



1. A stair lift comprising a load bearing part, a guide rail for extending up one side of a stair way and, for guiding the load bearing part, a lead screw in the guide rail having a plurality of differently inclined sections, at least one spring for connecting adjacent screw sections, the coils of the spring being continuous with the screw thread for maintaining the pitch of the thread, and a corresponding threaded part attached to the load bearing part for co-operation with the lead screw, and means for rotating the lead screw whereby the threaded part and thus the load bearing part can be traversed along the guide rail, and wherein the lead screw is seated on a strip extending longitudinally of the guide rail having a semicircular cross-sectioned recess for the lead screw.

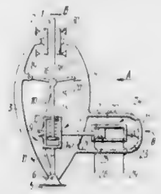
4,174,024
WARNING DEVICE FOR INDICATING WEAR OF FRICTION PADS IN DISC BRAKE
Yutaca Hagiwara, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan
Filed Jan. 26, 1978, Ser. No. 872,652
Claims priority, application Japan, Jan. 26, 1977, 52-7281[U]
Int. Cl.[2] F16D *66/02*
U.S. Cl. 188—1 A 3 Claims



1. A disc brake comprising:
a friction disc capable of rotation with an element to be braked;
a yoke straddling said disc and provided with a piston reciprocative axially with respect to said disc;
first and second opposed backing plates respectively urgeable by said piston and said yoke toward the two opposite faces of said disc;
first and second friction pads respectively carried on the opposing faces of said first and second backing plates; and
a friction pad wear sensor mounted on said yoke and having a resilient tongue portion diverging from said yoke, said tongue portion having an acute bend portion adjacent to a peripheral surface of said second friction pad, said tongue portion coming first into contact with an edge of said disc defined by the junction of the face of said disc facing said second friction pad and the peripheral surface of said disc at a first predetermined level of wear of said second friction pad, whereby a first audible signal is generated by said sensor, and subsequently coming into contact with the peripheral surface of said disc at a point spaced from said edge at a second predetermined level of wear of said second friction pad, whereby a second audible signal is generated by said sensor.

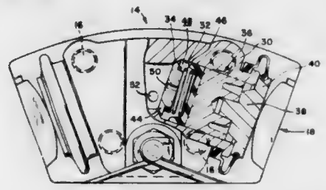
4,174,025
PIVOTED LEVER BRAKE STRUCTURE
Leonid M. Ivachev, ulitsa Sovetskaya, 80, kv. 8, Tolyatti Kuibyshevskoi oblasti, U.S.S.R.
Filed Aug. 11, 1977, Ser. No. 823,860
Int. Cl.[2] F16D *55/26*
U.S. Cl. 188—72.6 4 Claims

1. A braking gear comprising, two symmetrical arcuate brake levers pivoted at one end about a common pivot point and symmetrically disposed about an axis of symmetry passing through said common pivot point, two brake shoes each mounted on a free end of a respective one of said arcuate brke levers, each said free end being spaced from said common pivot point, a toggle system having two levers each pivotally connected to a corresponding arcuate brake lever and pivotally connected at a pivot at one end on said axis of symmetry, and having a third lever disposed along said axis of symmetry connected at the last-mentioned pivot and disposed extending axially between the arcuate brake levers, means to actuate said third lever axially to move said pivot of said two levers along the axis of symmetry to move the free ends of the arcuate levers toward each other or away from each other to thereby



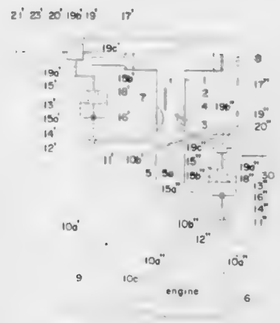
move the brake shoes toward said axis of symmetry for braking a moving element disposed between the brake shoes or away from said axis of symmetry, and fluid-actuated, double-acting means to additionally vary the distance between pivot points at which said two levers are connected to said arcuate levers, thereby to additionally variably control the movement of said brake shoes toward and away from said axis.

4,174,026
DASH POT FOR A HYDRAULIC ACTUATOR FOR A DRUM BRAKE
Donald D. Johannesen, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.
Continuation of Ser. No. 833,531, Sep. 15, 1977, abandoned. This application Oct. 30, 1978, Ser. No. 956,120
Int. Cl.[2] B60T *11/10*
U.S. Cl. 188—361 1 Claim



1. In a hydraulic actuator having a housing communicating pressurized fluid to a stepped bore therein via an inlet and a piston slidably disposed within the stepped bore engaging a brake shoe for urging the brake shoe from a normal position to a braking position when the pressure communicated to the bore is above a predetermined value, the improvement in which a partition is movably disposed within the stepped bore, said partition being connected to the piston by resilient means and being movable within the stepped bore in response to pressurized fluid therein for transmitting the force created by the pressurized fluid within the stepped bore during braking to the piston, said partition being biased by said resilient means into engagement with a shoulder defined by the stepped bore and also cooperating with said piston to substantially define a secondary chamber communicating with the inlet via a restrictive passage substantially defined by said partition, the piston including a portion in abutment with the housing when the brake shoe is in the normal position, the fluid pressure within the secondary chamber increasing as the brake shoe moves from the braking position to the normal position and the partition is in engagement with the shoulder, and said partition regulating reduction of the increased fluid pressure in the secondary chamber as the brake shoe moves from the braking position to the normal position in order to provide for gradual retraction of said piston portion into abutment with the housing, so as to substantially eliminate noise when the piston portion abuts the housing.

4,174,027
EXHAUST GAS RECIRCULATION APPARATUS CONTROLLED BY CLUTCH, THROTTLE AND TIMER
Tadataka Nakazumi, Kure, Japan, assignor to Toyo Kogyo Co., Ltd., Japan
Filed Oct. 27, 1977, Ser. No. 846,494
Claims priority, application Japan, Nov. 5, 1976, 51/133441
Int. Cl.[2] F02M *25/06*; F02B *33/00*
U.S. Cl. 192—0.084 9 Claims



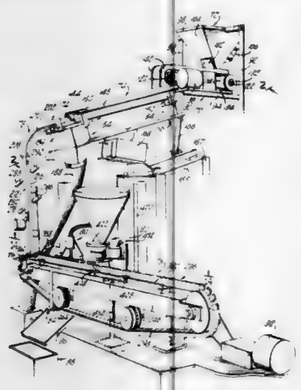
1. An exhaust gas recirculating apparatus for an internal combustion engine provided with a transmission to be operated by a clutch and having a throttle valve controlling flow through a carburetor induction passage and a duct connecting the exhaust gases to the engine intake manifold with a flow control valve normally closing the duct to prevent recirculation and movable to an open position by a signal applied thereto, comprising a device for detecting the actuation of said clutch, a device for detecting the opening of said throttle valve to be reached to the extent above a predetermined degree of opening, and a timer to be actuated for a presetting period, said flow control valve being moved to open by signals from both of said devices and kept opening by signal from said timer.

4,174,028
METHOD AND APPARATUS FOR ORIENTING AND STORING SIMILAR ARTICLES
Gerald Barnes, South Orange, N.J., assignor to Amerace Corporation, New York, N.Y.
Continuation of Ser. No. 479,255, Jun. 13, 1974, abandoned, which is a division of Ser. No. 270,191, Jul. 10, 1972, Pat. No. 3,831,736, which is a division of Ser. No. 30,817, Apr. 22, 1970, abandoned, which is a continuation of Ser. No. 605,769, Dec. 29, 1966, abandoned. This application May 12, 1978, Ser. No. 905,464
Int. Cl.[2] B65G *47/44*
U.S. Cl. 198—389 4 Claims

1. Apparatus for storing similar screws each having a shank and at one end thereof a head of greater transverse dimension than said shank and delivering said screws one at a time to screw receiving, positioning and carrying means moving in a predetermined direction on a predetermined horizontal path, said apparatus comprising an elongated stacking track having a smooth longitudinal aperture of substantially constant cross sectional shape and no abrupt changes in direction, said aperture including a wide portion to receive the heads of said screws in abutting relation and a narrow portion to receive the shanks of said screws in spaced parallel relation, said track and said aperture having a straight lower portion of a length equal to at least several times said transverse head dimension and terminating at a lower screw discharge end located above said path, said aperture in said lower portion thereof being so ori-

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ented that the axes of the screws therein will be horizontal and crosswise of said path, and the longitudinal center line of said aperture in said lower portion making an angle with the vertical, such that a screw in said lower portion will tend to push a screw beneath it in said predetermined direction, said track and said aperture at said discharge end defining a lateral opening facing said predetermined direction for facilitating exiting of



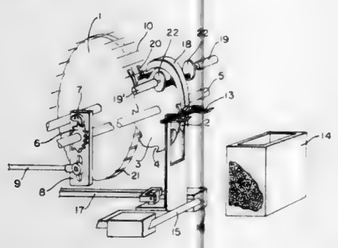
said screws, and wherein a feed control plate is pivotally mounted on said track adjacent said lateral opening and is resiliently deflectable by the shank of each said screw as it exits through said opening, whereby said feed control plate urges each of said discharged screws into article receiving position on said receiving, positioning and carrying means for movement in said predetermined direction along said path.

4,174,029

DEVICE FOR SUPPLYING LINEAR MATERIALS

Hikotarou Kawaguchi, Sakura, and Hisawo Kobayashi, Funabashi, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1978, Ser. No. 923,148
Claims priority, application Japan, Jul. 25, 1977, 52/99114
Int. Cl.[2] B65G *47/26*
U.S. Cl. 198—431 **6 Claims**



1. An apparatus for supplying linear objects, comprising:

a processing drum mounted for rotation about a horizontal axis, said processing drum having a series of circumferentially spaced grooves on its periphery for holding linear objects in horizontal positions during processing thereof;

a transfer drum mounted for rotation about a horizontal axis and means for effecting intermittent stepwise rotation of said transfer drum, said transfer drum having a series of circumferentially spaced slots on its periphery for receiving and holding a group of the linear objects in each slot, said transfer drum having a circumferentially extending recess in its periphery and said drums being arranged so that a portion of said processing drum extends into said recess so that the paths of travel of said grooves and slots intersect whereby the linear objects are transferred from said grooves to said slots; and

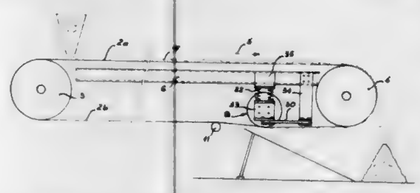
a reciprocable pusher having a sidewardly opening channel-shaped cavity for receiving linear objects therein, said pusher being mounted in association with said transfer drum for pushing the group of linear objects out of each of the slots in succession and beyond the circumference of said transfer drum while said transfer drum is stationary during intermittent stepwise rotation thereof.

4,174,030

VIBRATORY CLEANER FOR ENDLESS BELT CONVEYOR

Daniel Philibert, 152 rue Francois Frandaz, 38290 La Verpilliere, France

Filed Mar. 29, 1978, Ser. No. 891,387
Claims priority, application France, Apr. 26, 1977, 77 13613
Int. Cl.[2] B65G *45/60*
U.S. Cl. 198—494 **7 Claims**



1. An endless belt conveyor comprising frame means, conveyor belt means, first and second guide roller means carried by said frame means and supporting said conveyor belt means to have an upper carrier run and a lower return run thereof, vibrating freely rotating roller means in contact with the inside face of said conveyor belt means on said return run thereof, supporting roller means engaging said return run of said conveyor belt means and located such that said vibrating roller means is disposed between said supporting roller means and said first guide roller means, first and second bearer means supporting said vibrating roller means at respective ends thereof, means resiliently connecting said first and second bearer means to said frame means, vibration generator motor means disposed within said vibrating roller means and having a stator connected to said first and second bearer means, and means sealing said vibrating roller means against access of dirt to said vibration generator motor means, wherein said first and second bearer means each comprise a bearing having an inner race and an outer race, wherein said stator means of said vibration generator motor means includes first and second cylindrical journal pins engaged in the respective bearings of said first and second bearer means, and wherein said first and second bearer means each further include (a) respective end cover means and means for connecting said end cover means to the respective one of said first and second journal pins and (b) respective abutment means carried by said vibrating roller means for preventing axially inward movement of said bearing with respect to said vibrating roller means by engaging the outer race of said bearing.

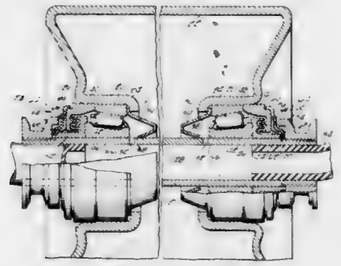
4,174,031

LUBRICATING SYSTEM AND METHOD

Donald R. MacLeod, Ottawa, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Mar. 27, 1978, Ser. No. 890,737
Int. Cl.[2] B65G *45/02*; F16N *7/24*
U.S. Cl. 198—501 **10 Claims**

1. The combination with a belt conveyor idler assembly having at least one shaft with an axial bore supported on bearings, a seal adjacent the bearings providing a passage for the flow of lubricant therethrough, a lubrication fitting at one end of the shaft communicating with the shaft bore for supplying lubricant under pressure to the shaft bore from a pressurized source of lubricant which engages the lubrication fitting, wherein the improvement comprises:



small holes through the walls of the shaft for providing lubricant to flow therethrough from the bore to the bearing so that the lubricant pressure drop through the shaft bore is negligible in comparison to the pressure drop through said holes; said holes having a diameter equal to or less than 0.052 inch; and

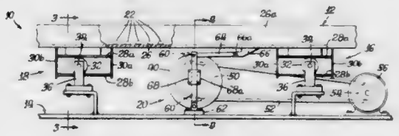
means for sealing the shaft bore against flow of lubricant except through said holes.

4,174,032

SHAKER CONVEYOR DRIVE MECHANISM

Charles L. Watkins, Chicago, Ill., assignor to Goodman Equipment Corporation, Chicago, Ill.

Filed Sep. 6, 1977, Ser. No. 830,881
Int. Cl.[2] B65G *27/00*
U.S. Cl. 198—761 **6 Claims**



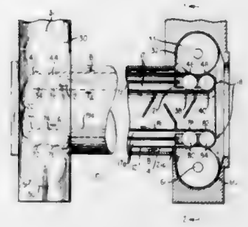
1. A shaker conveyor drive for use in effecting longitudinal reciprocating movement of a conveyor trough supported in fixed guideways so as to be movable only longitudinally, said conveyor drive comprising, in combination, a flywheel, means supporting said flywheel for rotation about a first axis of rotation, a lever arm, means supporting said lever arm at one end thereof for pivotal movement about a pivot axis transverse to said lever arm and spaced from said first axis of rotation, a slide block carried by said lever arm for movement longitudinally along said lever arm, said flywheel having a plurality of openings therein spaced circumferentially about its axis of rotation at different radial distances from said axis of rotation, said slide block having a connecting stub shaft thereon adapted for selective cooperation with said openings in said flywheel eccentric to the axis of rotation thereof, said lever arm being pivotally connected at its opposite end to said conveyor trough at a position spaced from said pivot axis, and means for effecting constant speed rotation of said drive member so as to effect reciprocal pivotal movement of said lever arm about its said pivot axis to reciprocate the conveyor trough with movement thereof in a first direction having greater acceleration than movement thereof in an opposite direction, the movement characteristics of said conveyor trough being variable in relation to connection of said slide block to different ones of said openings.

4,174,033

DOUBLE WALLED ROTARY TUBULAR CONVEYOR

Ronald Parsons, 15 Fieldhedge Dr., Hillsborough, N.J. 08876

Filed Aug. 12, 1977, Ser. No. 823,948
Int. Cl.[2] B65G *17/00*
U.S. Cl. 198—804 **12 Claims**



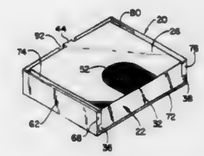
1. In a conveying device the combination comprising: a first flexible member having an inside surface, an outside surface and first and second end portions; said first and second end portions each have a generally annular shape about an orifice to form respectively an inlet and an outlet; first drive and support means disposed intermediate said flexible tube inside and outside surface; said drive and support means disposed relative to said first and second end portions to maintain said inlet and said outlet at a substantially constant separation and orientation with respect to each other; said drive means operative to propel said flexible member in a continuous closed loop such that said inside surface becomes said outside surface and said outside surface becomes said inside surface; and, said flexible member inside surface being a closed substantially continuous surface open at said first and second end portions.

4,174,034

SAFETY CONTAINER HAVING A SLIDEABLE CLOSURE

William K. C. Hoo, 3 Sherwood Dr., Bedford, Mass. 01730

Continuation-in-part of Ser. No. 896,735, Apr. 17, 1978, abandoned. This application Jul. 10, 1978, Ser. No. 923,079
Int. Cl.[2] A45C *13/10, 13/18*
U.S. Cl. 206—1.5 **22 Claims**



1. In a container comprising, in combination:

a cover including a substantially planar rectangular top having coupled to three edges thereof a rear wall and two side walls connected to said rear wall and a fourth edge so as to define with said two side walls an open front end;

a drawer including a substantially planar rectangular bottom of slightly smaller dimensions than said top, said bottom having connected to the four edges thereof a pair of side walls, a front wall connected to said side walls and a back wall connected to said side walls said side, front and back walls of said drawer having respective upper edges lying in a common plane;

said drawer being slidably engagable with said cover so that said drawer is movable between (1) a closed position wherein said drawer fits entirely within said cover and (2) an open position wherein said drawer is displaced from said rear wall of said cover and extends between the side

walls of said cover through said open front end of said cover;

latching means for securing said drawer within said cover in said closed position, said latching means comprising a hooked tongue and a latch, each being mounted on a respective one of the exterior surface of said back wall of said drawer and said rear wall of said cover, said latch being constructed and positioned for engaging said hooked tongue when said drawer is in said closed position;

unlatching means for disengaging said hooked tongue and latch from one another, said unlatching means including a slit formed in said rear wall, wherein said cover is made of a distortable material such that compressive pressure applied simultaneously to the two side walls of said cover will distort said rear wall adjacent said slit so as to disengage said latch from said hooked tongue; and

sealing means formed of said upper edges of the side, front and back walls of said drawer, and cams and cam followers disposed on the side walls of said drawer and said cover respectively so as to slidably engage one another, said cams and cam followers being dimensioned and positioned so as to resiliently urge said sealing means into tight sealing contact with the interior surface of said top as said drawer is moved toward said closed position.

4,174,035

TWO-COMPONENT CONTAINER AND PACKAGE

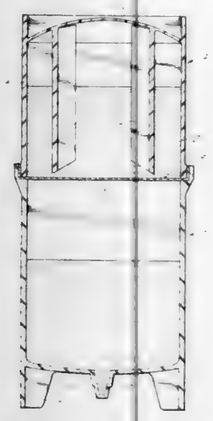
Georg Wiegner, Breslauer Str. 35, Viersen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 720,154, Sep. 30, 1976, Pat. No. 4,103,772. This application Jul. 13, 1978, Ser. No. 924,132

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1975, 2539291

Int. Cl.[2] B65D *25/08*

U.S. Cl. 206—222 **9 Claims**



1. A container comprising:

(a) a first shell and a second shell,

(1) each shell being cup-shaped and having a bottom wall and an annular side wall transverse to said bottom wall,

(2) said walls bounding respective cavities in said shells;

(3) each side wall having an annular rim portion remote from the associated bottom wall and bounding a side of the cavity in the shell open toward the other shell;

(b) fastening means fixedly fastening the rim portions of said shells to each other, said fastening means consisting essentially of a frangible partition of sheet material having two opposite major faces separated by the thickness of said partition, said faces being fixedly fastened to said rim portions respectively and respectively sealing the open sides of said cavities from each other; and

(c) a piercing member mounted on the bottom wall of said first shell for movement transverse to said major faces into piercing engagement with said partition.

4,174,036

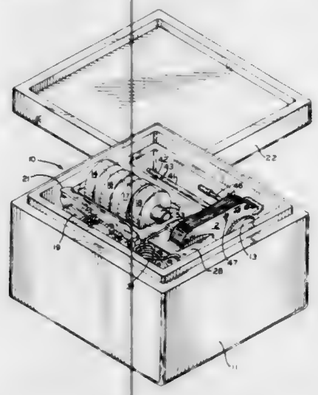
REPLACEMENT MOTOR KIT AND PARTS THEREOF

Daniel L. Beckman, and Earl D. Stauffer, both of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 560,729, Mar. 21, 1975, which is a division of Ser. No. 307,965, Nov. 20, 1972, abandoned. This application Mar. 9, 1978, Ser. No. 884,907

Int. Cl.[2] B65D *85/68*

U.S. Cl. 206—223 **8 Claims**



1. A replacement motor kit comprising an enclosure having a plurality of compartment means defining spaced apart regions therein for receiving electric motor components; a skeleton motor stator assembly and rotor assembly confined in a first one of the spaced apart regions by a first compartment means; a plurality of lubricant reservoir covers confined in a second one of the spaced apart regions by a second compartment means; and adapting instrumentalities confined in a third one of the spaced apart regions by a third compartment means; the rotor assembly including a shaft having at least one weakened section located a predetermined distance from the free end of the shaft, and the stator and rotor assemblies being permanently secured in aligned relationship; said lubricant reservoirs being of the quickly attachable type and each including means for latching such lubricant reservoir in assembled relationship with the stator and rotor assemblies.

4,174,037

SPACE-CONSERVING SKIN-PACKED ASSEMBLY

Kirk K. Chow, Dallas, Tex., assignor to National Hand Tool Corporation, Dallas, Tex.

Filed Jul. 27, 1978, Ser. No. 928,547

Int. Cl.[2] B65D *85/28*

U.S. Cl. 206—378 **7 Claims**

1. In the packaging of hardware items such as hand tools to house and display tools in a container such as a rigid tool box or carrying case, a space-conserving covered package assembly, said package assembly sized to fit within the tool box with peripheral borders of said package in close proximity to upstanding bounding walls of said tool box,

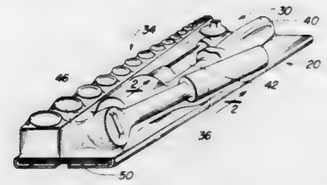
said package assembly comprising:

baseboard means of semi-rigid sheet stock for support of tool elements placed thereon,

the shape and areal configuration of said baseboard means being essentially congruous to a floor area of a case in which said package assembly is to be inserted,

floor sheet means for attachment of a tool retaining film thereto, said floor sheet means extending laterally beyond said baseboard means at a pair of opposed parallel edges thereof to demark a pair of fold lines and to delineate a corresponding pair of flanges extending marginally along said floor means and outwardly of said opposed side edges of said baseboard means along the length thereof,

a plurality of tool elements arranged on said floor sheet means interiorly of said fold lines and in a zone corresponding to said baseboard means, said tool elements being supported on said baseboard means,



a cover film of transparent plastic superimposed on so as snugly to confine said tool elements for securing said tool elements fixed in place in said package assembly,

bonding means bonding said film to said flanges of said floor sheet means over a substantial surface area of said flanges,

said flanges with said film bonded thereto being folded under said baseboard means at said fold lines to lie contiguously against said baseboard means at an undersurface thereof,

whereby substantially the entire floor area of the case is occupied by said tool elements to effect substantial conservation of space and to provide a pilfer-resistant display.

4,174,038

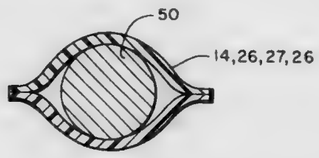
PACKAGE FOR PHOTOGRAPHIC FILM AND MATERIAL AND POWDERS FOR MAKING SAME

Philip C. Whiting, Jr., Holyoke, Mass., assignor to Ludlow Corporation, Needham Heights, Mass.

Filed Mar. 7, 1977, Ser. No. 774,934

Int. Cl.[2] B65D *85/00*

U.S. Cl. 206—389 **14 Claims**



1. A heat-sealable, readily-tearable, opaque flexible packaging sheet material comprising a carbon containing polymeric ply on a paper substrate, the improvement wherein said carbon-containing polymeric ply is a co-extruded ply of polymer consisting of the following three co-extruded layers

(a) an outer layer of about 0.0005 inch thickness comprising 0 to 10 percent carbon black

(b) an interior layer having a thickness of about 0.5 mils comprising from about 15 to 25 percent carbon black

(c) adjacent said paper, another outer layer of about 0.0005 inch thickness comprising 0 to 10 percent carbon black

and wherein said co-extruded ply has a maximum thickness of about 2 mils in thickness.

4,174,039

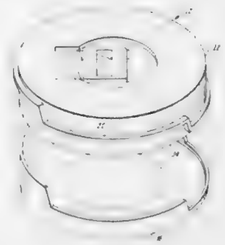
RECORDING DISK CARTRIDGE

Michiel Frankhuizen, Martinez, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 27, 1976, Ser. No. 754,653

Int. Cl.[2] B65D *21/04*; G11B *1/02*

U.S. Cl. 206—444 **11 Claims**



1. A recording disk cartridge comprising:

a housing in which at least one recording disk may be mounted for rotation about its axis, said housing having a peripheral side wall about which a ridge is formed, said ridge being defined by a plurality of sections at least some of which are spaced from one another in a direction parallel to the axis of rotation of a disk mounted in said housing, the dimensions and spacings of said sections being such that the contour of said peripheral side wall at the lower surface of said ridge is the substantial complement of the contour of said peripheral side wall at the upper surface of said ridge; and

a cover including a peripheral side wall having an upper surface that is contoured substantially the same as that of the peripheral side wall of said housing at the lower and upper surfaces of said ridge and having a maximum height only slightly greater than the maximum height of the peripheral side wall of the housing above and below said ridge, whereby said cover may be disposed over the lower end of said housing with the upper surface of the peripheral side wall of said cover seated against the lower surface of said ridge with only a slight increase in the height of the combined housing and cover relative to the housing alone, and whereby said cover may be disposed upside-down over the upper end of said housing with the upper surface of the peripheral side wall of said cover seated against the upper surface of said ridge with only a slight increase in the height of the combined housing and cover relative to the housing above.

4,174,040

MULTI-FUNCTIONAL SUPPOSITORY ENCAPSULATOR

Su-Yen Wang, 881, Section 1, Chung Shan Rd., Tachia Town, Taichung Hsien, Taiwan

Filed Dec. 2, 1977, Ser. No. 857,183

Int. Cl.[2] B65D *1/32*

U.S. Cl. 206—529 **5 Claims**

1. A multi-functional suppository encapsulator comprising:

an upwardly opening trough portion having a plurality of openings in the bottom thereof,

a plurality of bullet-shaped container portions extending down from said openings of said trough portion respectively and having converging nose portions, and

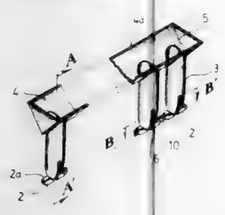
integral strips of material joining said nose portions of said container portions with one another, said strips being spaced from said trough portion,

said trough portion, said container portions and said strips being integrally formed of soft, resilient non-toxic material,

means defining separation lines extending transversely across said trough portion and said strips between said

container portions for separation of said encapsulator into units each comprising a container portion and an appurenant section of said trough portion, and

means defining rupture lines extending across the nose portions of said container portions to open said nose portions of container portions when ruptured for extrusion of a suppository therethrough,



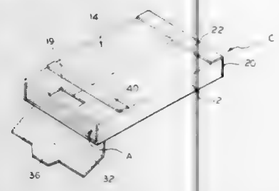
whereby molten suppository material poured into said trough portion flows into said container portions and solidifies therein to form suppositories, which, in use, are extruded through the ruptured nose portion of a container portion by application of digital pressure to said appurtenant section of said trough portion and an adjacent portion of said container portion.

4,174,041

RECLOSABLE DISPENSING CARTON

Gerald W. Turner, Norristown, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Sep. 18, 1978, Ser. No. 943,323
Int. Cl.[2] B65D *5/54, 17/20*
U.S. Cl. 206—611 **2 Claims**



1. An end-opening, reclosable, tubular dispensing container formed of a unitary blank of foldable sheet material, for holding and shipping packaged articles such as sheets of paper or the like, comprising:

(a) a bottom wall, a top wall formed from a pair of panels, and a pair of side walls foldably joined to form a tubular body open at the ends;

(b) an integral, reclosable, dispensing end closure structure at one end of said body including:

(i) an at least partially separable hinge panel cut from material of said bottom wall and detachably joined to a forward edge thereof along a fold line and a pair of diagonally disposed weakened lines of tear diverging from the ends of said fold line toward said end closure structure;

(ii) an end panel foldably joined to said hinge panel;

(iii) a reclosure panel foldably joined at its outer side edge to said end panel and having a locking tab projecting from its inner side edge;

(iv) a securing panel attached to the outer surface of the top wall of said body for retaining said walls together and thereby forming said tubular body;

(v) a removable strip interposed between said reclosure and securing panels and detachably secured to each by parallel tear lines and defining said locking tab;

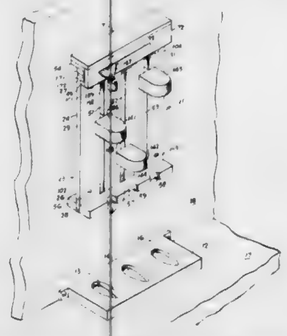
(vi) said top wall presenting an opening adjacent said one end of the body for receiving said locking tab after initial opening and reclosure of said container.

4,174,042

GUN LOCKING DEVICE

Rickey F. Fair, 3190 McMinn Rd., Sharpsville, Pa. 16150

Filed Jun. 19, 1978, Ser. No. 917,090
Int. Cl.[2] E05B *73/00;* **A47F** *7/00;* **A47B** *81/00*
U.S. Cl. 211—8 **7 Claims**



1. A locking mechanism for restraining an object having at least a first end and a second end in a rack having a fixed base of the type in which said first end of said object is seated in a depression in said base, said locking mechanism comprising:

(a) a shaft having a first end and a second end, and having a longitudinal axis extending from said first end to said second end of said shaft, said shaft further having a cross-section such that there exists a locus of points parallel to said longitudinal axis and located at a maximum radial distance from said longitudinal axis relative to all other points within said cross-section, said shaft further having a plurality of notches longitudinally disposed along said shaft, said notches being arranged in a substantially collinear manner along said locus of points and parallel to said longitudinal axis, said shaft further having an extension radially disposed to said first end of said shaft;

(b) containing means slidably mounted on said shaft, said containing means being receptive to said second end of said object, said containing means further being able to engage said notches of said shaft when said shaft is rotated to a given position;

(c) anti-rotation means, said shaft pivotally mounted to said anti-rotation means at said first end of said shaft and at said second end of said shaft about said longitudinal axis and in communication with said containing means for preventing pivoting of said containing means about said shaft thereby constraining said containing means to slide on said shaft without rotation; and

(d) locking means for restraining said extension of said shaft at said given position whereby rotation of said shaft is prevented and further preventing movement of said containing means.

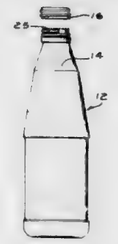
4,174,043

NITRILE PREFORMS AND CONTAINERS AND PROCESS IMPROVEMENTS FOR FORMING SAME

Morris Salame, Windsor, and Samuel Steingiser, Bloomfield, both of Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 10, 1977, Ser. No. 850,364
Int. Cl.[2] B65D *23/00*
U.S. Cl. 215—1 C **48 Claims**

28. A container for environmentally sensitive materials formed of an irradiated thermoplastic material comprising at least 20 weight percent of a polymerized nitrile-group-containing monomer, said container having levels of unpolymerized nitrile monomer and extractable HCN of no greater than about



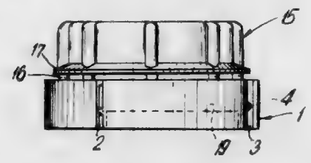
0.8 ppm based on the total weight of the polymer and about 50 ppb based on extracting liquid respectively.

4,174,044

ORIGINAL CLOSURE MEMBER

Otfried Kimm; Theo Hammes, and Peter Loebler, all of Cologne, Fed. Rep. of Germany, assignors to Mauser Kommandit-Gesellschaft, Brühl, Fed. Rep. of Germany

Filed Sep. 29, 1978, Ser. No. 946,969
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1977, 2744787
Int. Cl.[2] B65D *41/34*
U.S. Cl. 215—252 **4 Claims**



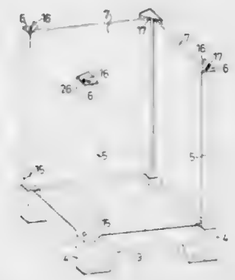
1. An original closure member for a container comprising a screw cap having an axis about which it is screwed onto and unscrewed from the container and a safety ring which is destructible when said screw cap is unscrewed from the container, said safety ring including a break-off section having a predetermined point of separation, said safety ring including said break-off section having an inwardly facing surface, a stop cam formed on said extending inwardly from the inwardly facing surface of said break-off section, said stop cam being yieldable in the screwing-on direction of said cap and being unyieldable in the unscrewing direction of said cap, said cap having a plurality of lugs projecting downwardly from the lower end thereof in the axial direction of the cap, said safety ring being held rigidly in position on the container and one of said lugs being located adjacent to said stop cam for contact therewith when said screw cap is removed from the container, wherein said safety ring comprises a circumferentially extending section having a first end and a second end spaced angularly from said first end, said break-off section extending in the circumferential direction of said safety ring between the first and second ends of said circumferentially extending section thereof and having a first end and a second end spaced angularly apart, a break-off web interconnecting the first end of said circumferentially extending section and the first end of said break-off section, and a separation gap formed between the second end of said break-off section and the second end of said circumferentially extending section, a bridging strap located inwardly of said break-off section within said safety ring and connected at one end thereof to said circumferentially extending section adjacent the first end thereof and at the other end thereof to said circumferentially extending section adjacent the second end thereof so that said strap bridges the circumferentially extending portion of said safety ring formed by said break-off section, said bridging strap having an inwardly facing surface shaped to conform to the configuration of the container where the closure member is attached, said bridging strap having an upper edge spaced below the lower end of said cap when said cap is fully screwed onto the container so that said lugs on the lower end of said cap do not contact the upper edge of said bridging strap when said strap is screwed onto the container, a connecting web secured at one end to the inwardly facing surface of said break-off section intermediate the first and second ends thereof and at the other end to the outwardly facing surface of said bridging strap intermediate the ends thereof, and the inwardly facing surface of said circumferentially extending section of said safety ring located opposite said break-off section is shaped to conform to the configuration of the container where the closure member is attached.

4,174,045

LOADING PLATFORM

Karl H. Heller, Gehrden, and Dieter Schiron, Hanover, both of Fed. Rep. of Germany, assignor to Continental Gummi-Werke Aktiengesellschaft Hanover, Fed. Rep. of Germany

Filed Nov. 29, 1977, Ser. No. 855,929
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1976, 26543806
Int. Cl.[2] B65D *7/00, 87/00, 9/12*
U.S. Cl. 220—4 F **5 Claims**



1. A stackable loading platform, especially metallic platform, having a bottom with a plurality of corners, which includes in combination: a plurality of supports made of profiled rolled steel beams respectively located at said corners and detachably arranged therein, and a plurality of side walls arranged between and detachably engaging the respective adjacent supports, said side walls in the corner regions of their upper edges being positively connected to said supports upon insertion of said side walls from below, said supports being selectively movable in the longitudinal direction thereof away from said bottom for removing said supports from said platform, said side walls being releaseable from said supports which are shiftable at right angles thereto.

4,174,046

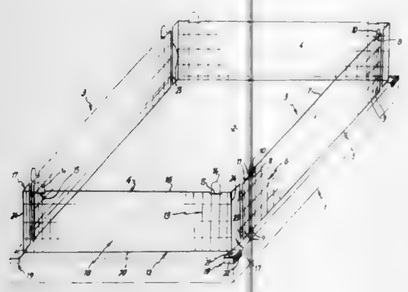
PALLET FRAMES

George T. N. Atkins, Macclesfield, England, assignor to Palletower Limited, Macclesfield, England

Filed Mar. 24, 1978, Ser. No. 889,698
Claims priority, application United Kingdom, May 16, 1977, 20541/77
Int. Cl.[2] B65D *19/10, 7/20*
U.S. Cl. 220—6 **7 Claims**

1. A collar converter of the kind comprising a frame structure adapted to fit around the periphery of a load supporting surface and having interconnected side walls each adapted to extend upwardly at a respective side of said surface, each said side wall being of elongated form in that its height is a minor proportion of the transverse dimension thereof which extends

in use parallel to the respective side of said surface, and each said wall comprising an openwork structure formed from elongated metal members, said side walls all being interconnected by hinge joints such that the frame structure can be folded flat for storage when not in use, a lower part of the converter being arranged to seat in use on said load supporting surface and having downwardly projecting elements which



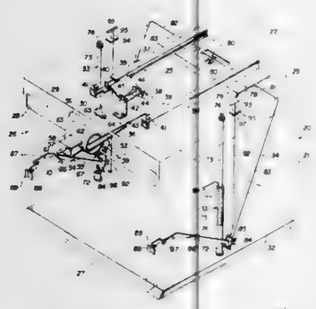
extend alongside the load supporting surface for locating the converter transversely relative to said surface and an upper part of the converter being adapted to define a seat for alternatively receiving another, upper pallet or another upper converter and having upwardly projecting elements arranged to fit alongside said upper converter or upper pallet for locating the converter transversely related to said upper pallet or upper converter.

4,174,047

VENDING MACHINE FOR NEWSPAPERS AND THE LIKE

Walter K. Owens, Crestview, Fla., assignor to 3-in-1, Inc., Crestview, Fla.

Filed Mar. 6, 1978, Ser. No. 883,820
Int. Cl.² G07F *11/16*
U.S. Cl. 221—154 **10 Claims**



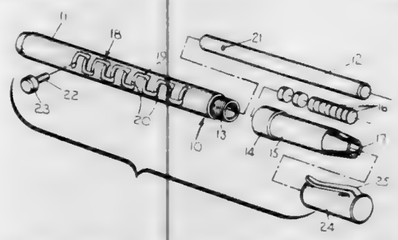
1. In a vending machine for newspapers and the like, a rectangular cabinet adapted to contain a plurality of newspapers in stacked relationship, said cabinet having a single newspaper dispensing slot formed in one wall thereof, a coin mechanism on said cabinet having a normally locked coin released control element spaced from said slot, and a reciprocatory single newspaper gripping, transporting and releasing device mounted on one wall of said cabinet and being connected to said control element of the coin mechanism and being manually movable within and through said slot when said control element is in a released state following the depositing of proper coins in the coin mechanism by a customer, said gripping, transporting and releasing device comprising a reciprocatory slide member, a coacting jaw member, a spring biasing the jaw member toward newspaper gripping relationship with the slide member, a manually operable camming means on said device to shift the jaw member away from the slide member to a newspaper releasing position, a spring-urged panel element in said cabinet engaging a stack of newspapers therein and biasing one endmost newspaper in the stack in one direction, and a coacting opposing newspaper stabilizing member in said cabinet in spaced relationship to said panel element and engaging said endmost newspaper to position and stabilize it for engagement by said device with said slide member and jaw member on opposite sides of said newspaper, whereby said endmost newspaper is gripped by said device, transported by said device through said slot and then delivered directly to the customer.

4,174,048

TABLET RETAINING AND DISPENSING DEVICE

John J. Volpe, Jr., 52 Taft St., Milford, Mass. 01757

Filed Oct. 4, 1977, Ser. No. 839,393
Int. Cl.² B65D *83/04*
U.S. Cl. 221—267 **2 Claims**



1. A tablet retaining and dispensing device comprising:
(a) a cylindrical member;
(b) a tablet containing cartridge removably attached to one end of said cylindrical member;
(c) an ejector rod assembled within said cylindrical member for engaging a tablet within said cartridge; and
(d) means operatively associated with said ejector rod which allows limited rotation of said ejector rod within said cylindrical member between positions which restrict longitudinal movement of said ejector rod within said cylindrical member and positions which allow limited longitudinal movement of said ejector rod within said cylindrical member a distance to cause the ejection of a single tablet from said cartridge, which includes:
(i) opposed side walls forming a channel communicating with the inner and outer surfaces of said cylindrical member having a configuration extending for a portion of the length of the latter defining a uniform square sine path; and
(ii) a selector pin fixedly attached to said ejector rod and extending in a direction normal to the axis of the latter outwardly through and beyond said channel.

4,174,049

DEVICE FOR PURGING PITOT AND STATIC LINE TUBES

Ralph A. Bolen, London, Ohio, assignor to John Sawyer, Cincinnati, Ohio

Filed Nov. 14, 1977, Ser. No. 851,167
Int. Cl.² B67B *7/24*
U.S. Cl. 222—5 **15 Claims**



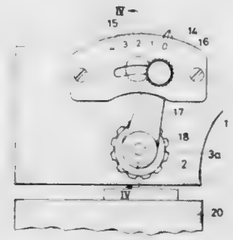
12. A device for purging the pitot and/or pitot-static tubes of an aircraft with pressurized gaseous media which comprises:
a spool valve which includes an elongate valve body having an axial bore therethrough and having a forward and a rear end;
a valving spool reciprocably mounted within the axial bore of the valve body for movement between fully retracted and advanced positions, the forward end of said spool terminating in a hollow piercing-tip, said spool having an elongate hollow tubular forward portion and a cylindrical rearward portion;
a housing for the reception of a disposable gas cylinder removably secured to the forward end of the valve body and in open communication with the forward end of the axial bore thereof;
means secured to and carried by the rear end of the valve body for selectively advancing the valving spool from a fully retracted to a fully advanced position within the axial bore of said valve body;
said valving spool including at least one through-passageway for placing a pitot tube in open communication with a recording instrument when said valve spool is in a fully retracted position and for terminating the open communication between said pitot tube and recording instrument when the spool valve is in a fully advanced position;
and means in said valve spool establishing communication between the interior of the hollow tubular portion of the valving spool and the pitot tube only when the valving spool has been moved to its fully advanced position.

4,174,050

DEVICE FOR SUPPLYING A REPLENISHING TONER TO A DEVELOPING UNIT

Tomio Saito, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1977, Ser. No. 786,546
Claims priority, application Japan, Apr. 16, 1976, 51/43212
Int. Cl.² G01F *11/10*
U.S. Cl. 222—43 **6 Claims**



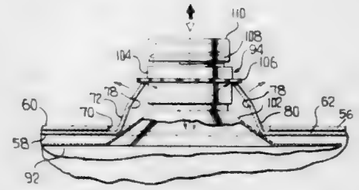
1. A device for supplying a replenishing toner to a developing unit provided in an electrophotographic copying machine, comprising:
a rotatable toner-supplying roller adapted to be rotated only in one direction and to provide a predetermined quantity of replenishing toner;
a one-way clutch connected to said toner-supplying roller and rotatable therewith;
a rockable member mounted on said one-way clutch and adapted to be engaged therewith only in the rotational direction of said toner-supplying roller;
means for rotating said rockable member alternatively clockwise and counterclockwise;
adjustable limiting means for limiting the angular displacement of said rockable member;
a selector associated with an indicator for determining the amount of toner to be supplied, said selector being operatively associated with said limiting means to position said limiting means; and
a shaft extending coaxially with said supplying roller, said selector and said limiting means being rigidly mounted on opposite ends of said shaft, respectively, so that said selector is operatively associated with said limiting means to position said limiting means.

4,174,051

PROTECTIVE LOCKING FLAPS FOR OPENING IN SEALED CORRUGATED CONTAINERS

Edgar B. Edwards, Warren, Pa., and Richard G. Wachter, Middletown, Conn., assignors to The Continental Group, Inc., New York, N.Y.

Filed Jul. 26, 1978, Ser. No. 928,324
Int. Cl.² B65D *5/60, 5/46*
U.S. Cl. 222—105 **11 Claims**



9. In a carton for a container having a spout, a closure flap arrangement, said closure flap arrangement comprising first and second inner flaps and first and second outer flaps, said outer flaps being bonded to said inner flaps, said inner flaps having free edges positionable in opposed adjacent relation, opening defining means formed in said inner flaps and opening through said free edges for alignment with each other when said free edges are in said opposed relation to define a single opening, each of said opening defining means including a deflectable flap formed from the respective inner flap and permanently hingedly connected to said respective inner flap along a hinge line generally parallel to and remote from said respective inner flap free edge.

4,174,052

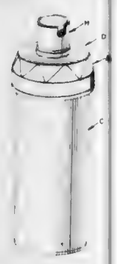
MECHANICALLY OPERATED DISPENSING DEVICE WITH EXPANSIBLE BULB

Nicholas G. Capra, East Hanover, N.J., and Roy Hammett, Miami, Fla., assignors to James D. Pauls, Ltd., Miami, Fla.

Filed Dec. 20, 1977, Ser. No. 862,551
Int. Cl.² B05B *11/02*
U.S. Cl. 222—207 **34 Claims**

1. A mechanically operated dispensing device, comprising: a manifold member having means thereon for attachment to a container; first expansible chamber means carried by the manifold member; manually operable actuating means carried by the manifold member and connected with the first expansible

chamber means to operate the first expansible chamber means; second expansible chamber means carried by the manifold member and comprising an elastomeric bulb having a closed end and an open end and adapted to receive and store a quantity of material under pressure, the pressure being provided by the elasticity of the bulb; and one way means associated with



the manifold member and with the first and second expansible chamber means to control flow from a container with which the dispensing device is associated into the first expansible chamber means, from the first expansible chamber means into the second expansible chamber means for accumulation of a quantity of material to be dispensed, and from the second expansible chamber means to a point of use.

4,174,053

VACUUM BOTTLE HAVING A TILT RESPONSIVE CLOSURE

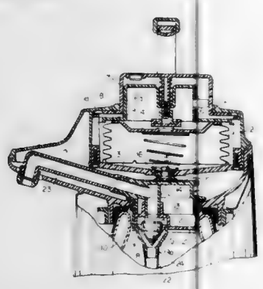
Masahiro Shimizu, Higashi-Osaka, Japan, assignor to Zojirushi Vacuume Bottle Co., Ltd., Osaka, Japan

Filed Oct. 27, 1976, Ser. No. 736,179

Claims priority, application Japan, Mar. 15, 1976, 51-31905[U]

Int. Cl.[2] B67D *3/42*

U.S. Cl. 222—209 **2 Claims**



1. A vacuum bottle manually operated safety pump comprising:

a cover portion, said cover portion including a top portion, said top portion including a centrally positioned horizontally extending aperture;

an outer push element, said outer push element including a radially outwardly extending flange, said radially outwardly extending flange being adapted to abut an inner face of said top portion adjacent the horizontally extending aperture;

an inner push element, said inner push element being positioned partially within said outer push element, said inner push element being operatively connected with said outer push element;

a pressure means, said pressure means comprising a bellows having a horizontal top wall, a horizontal bottom wall and a flexible side wall interconnecting said top and bottom walls, said top wall being operatively connected to said inner push element, said bottom wall including a centrally positioned opening communicating with the interior of said bellows:

a plug element, said plug element comprising a horizontally extending top plug wall having a centrally positioned aperture, a plug bottom wall spaced from said plug top wall, said plug bottom wall including a plurality of ports, said ports providing fluid communication between interior of said bellows and the interior of said vacuum bottle and a chamber formed between said upper and lower plug walls;

valve means, said valve means being positioned between said centrally positioned opening in said bellows bottom wall and said centrally positioned aperture in said top plug wall for providing an air-tight connection between said bellows interior and said plug element chamber;

a vertically extending cylindrical member within said plug element separated from said chamber;

a receiving portion formed in a lower portion of said cylindrical portion;

a liquid draw-up tube positioned within said vacuum bottle, said draw-up tube having an upper end in fluid-tight communication with said receiving portion of said cylindrical member;

a liquid discharge outlet, an interior end of said discharge outlet being in fluid-tight connection with an upper portion of said cylindrical member and an exterior end of said discharge outlet communicating to the exterior of said vacuum bottle;

closure means positioned between said cylindrical member lower portion and said draw-up tube upper end, said closure means comprising a vertically positioned inverted truncated cone element having a cylindrical neck portion formed as a continuous extension of the lower end thereof for mounting said draw-up tube upper end, and a radially inwardly extending horizontal upper wall having a central aperture formed therein, said cylindrical neck and said truncated cone upper wall aperture being axially aligned with said vertically extending cylindrical member, and a cooperating inverted cone-shaped closure element movable relative to said inverted truncated cone element, said closure element having a horizontally extending upper face, wherein when said vacuum bottle is in an upright position fluid is permitted to flow up said draw-up tube and through said closure means and vertically extending cylindrical member and out said liquid discharge outlet upon manual depression of said outer push element and when said vacuum bottle is in an inverted position said closure element horizontally extending upper face seats against said truncated cone upper face thereby fluidly sealing said truncated cone upper face aperture and preventing the flow of fluid to said vertically extending cylindrical member.

4,174,054

VOLUMETRIC FEEDER FOR METERING PARTICULATE MATERIAL

Elbert G. Hubbard, 6 N. 111 Gary Ave., Keeneyville, Ill. 60172

Filed Jul. 31, 1978, Ser. No. 929,220

Int. Cl.[2] G01F *11/20*

U.S. Cl. 222—241 **9 Claims**

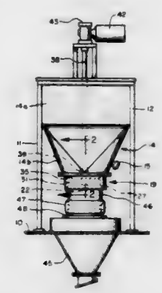
1. A volumetric feeder for metering particulate material, comprising:

a stationary pressure relief member having a horizontally-disposed, circular, flat support plate and a cylindrical guide wall depending therefrom;

means for maintaining particulate material on said support plate;

a rotatably mounted agitator above said support plate for sweeping the particulate material radially outward so that it flows down said guide wall;

a horizontally-disposed stationary circular, flat metering plate, having a centrally located discharge orifice, mounted below said pressure relief member for receiving and supporting the particulate material flowing down said guide wall;



and a metering rotor, rotatably mounted between said pressure relief member and said metering plate, for sweeping the particulate material radially inward over said metering plate and through said discharge orifice.

4,174,055

NON-AEROSOL PRESSURE DISPENSER

Nicholas G. Capra, East Hanover, N.J., and Ronald L. Antenore, Coral Gables, Fla., assignors to James D. Pauls & J. Claybrook Lewis & Associates, Ltd., Miami, Fla.

Filed Apr. 20, 1977, Ser. No. 789,551

Int. Cl.[2] B67D *5/32*

U.S. Cl. 222—319 **20 Claims**

1. A dispensing device for dispensing material under pressure, comprises: a cap having fastening means thereon for attachment of the cap to an open end of a container of the material to be dispensed, said cap having an end wall for closing the open end of the container; an accumulating chamber carried by the cap in a position to extend through the container open end and into the container when the cap is fastened to the container; a piston reciprocable in the accumulating chamber for alternately drawing material into the accumulating chamber and then pressurizing the material to dispense it; a piston actuating rod connected with the piston and extending through the accumulating chamber; manually engageable piston actuating means outside the container and connected with the piston actuating rod to pull the rod and piston in a first direction outwardly relative to the container to enlarge the accumulating chamber volume and draw material from the container into the accumulating chamber; spring means engaged with the piston urging it in a second direction to pressurize material drawn into the accumulating chamber, said piston being movable in the second direction independently of the actuating rod; and discharge nozzle means connected with the accumulating chamber for selectively releasing the pressurized contents of the chamber.

4,174,056

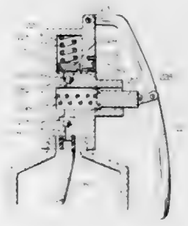
PUMP TYPE DISPENSER WITH CONTINUOUS FLOW FEATURE

Herbert H. Loeffler, Arlington, Mass., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 10, 1977, Ser. No. 795,553

Int. Cl.[2] B05B *11/02*

U.S. Cl. 222—321 **2 Claims**



2. A pump type dispenser for dispensing a spray of liquid, said dispenser being for mounting on a container for containing the liquid to be dispensed, said dispenser comprising a pump body member, a pump plunger member movable into and out of said pump body member, one end of said pump plunger member and said pump body member cooperating to define therebetween a piston-cylinder means, spring means between said members urging them apart, said pump body member having a liquid flow path therethrough having one end communicating with the container and the other end communicating with the piston-cylinder means, a check valve in said liquid flow path for blocking flow of liquid in said liquid flow path in the direction toward said container, a dispensing head integral with said pump body and having a free piston chamber therein, a pressurized liquid flow path from said piston-cylinder means into one end of said free piston chamber, a further check valve in said pressurized liquid flow path for blocking flow of liquid in the direction toward the piston-cylinder means, a free piston slidable in said free piston chamber, a free piston spring in said free piston chamber urging said free piston toward and into engagement with said one end of said free piston chamber, and nozzle means opening out of said free piston chamber through said dispensing head member from a position just above said one end of said free piston chamber, said free piston in the position in engagement with said one end of the free piston chamber obturating the fluid flow between said pressurized liquid flow path nozzle means.

4,174,057

LIQUID MEASURING AND DISPENSING DEVICES

John A. Emery, Chicester, England, assignor to Sinclair International Bar Services Limited, Chichester, England

Filed Mar. 13, 1978, Ser. No. 885,946

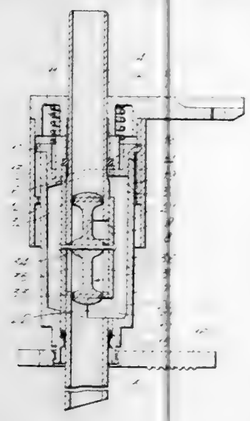
Claims priority, application United Kingdom, Mar. 14, 1977, 10680/77

Int. Cl.[2] G01F *11/16*

U.S. Cl. 222—332 **6 Claims**

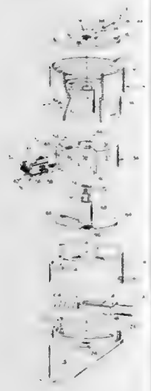
1. A liquid measuring and dispensing device comprising a central flow tube with means intermediate its ends to divdide the tube into inflow and outflow ducts, each duct having a respective inflow and outflow port in the tube side wall, a measuring chamber embracing the flow tube and having a cylindrical inside wall axially slidable along the outer surface of the flow tube and provide with liquid seals adjacent its ends

in contact with the said outer surface, and further ports in the chamber inside wall arranged so that at one end of the sliding movement of the chamber one of said further ports is in register with the inflow port and at the other end of the sliding movement of the chamber the other of said further ports is in register with the outflow port, and wherein the outside diameter of the flow tube is reduced over a portion of its length to cause one of the said seals to lose sealing contact with the tube as the outflow port comes into register with its respective port



in the chamber inner wall and thereby vent the chamber to atmosphere, and wherein the means to divide the flow tube comprises a shuttle within the flow tube fixed to the measuring chamber and having sealing means at each end for isolating a portion of the flow tube between the seals from the inflow and outflow ducts, the sealing means being located between the respective ends of that portion of the chamber inside wall extending between the further ports in the inside wall of the measuring chamber.

4,174,058
MATERIAL MEASURING AND DISPENSING DEVICE
Anthony L. Bassignani, 17 King St., Norfolk, Mass. 02056
Continuation-in-part of Ser. No. 761,894, Jan. 24, 1977, Pat. No. 4,071,171. This application Jan. 3, 1978, Ser. No. 866,219
Int. Cl.[2] G01F *11/40*
U.S. Cl. 222—438 **8 Claims**



1. A closure member for attachment to an outlet from a container of granulated material for providing dispensing of the contents thereof in successive increments of variable volume, said closure member comprising:

variable capacity dispensing means having an inlet end arranged for exposure to said container outlet and an outlet end;

barrier members oppositely pivotable about an axis to alternately close said outlet end and thereafter open said inlet end to said container for filling, and to close said inlet end and thereafter open said outlet end for dispensing;

operating means for oppositely pivoting said barrier members, including an operating member accessible from the exterior of said closure member,

said closure member, at least in the area containing said operating member, having a cross-section of a size and shape suitable for grasping in one hand, and said operating member being accessible for operation by a thumb or finger of a hand grasping the closure member in said area and having a generally rectilinear path of opposite operating movement inwardly and outwardly of said closure member; and

adjustment means accessible from the exterior of said closure member for adjustably varying the capacity of said dispensing means.

4,174,059
BACK PACK
Martha Maunder, 475 W. Woods Rd., Hamden, Conn. 06514
Filed Feb. 14, 1977, Ser. No. 768,048
Int. Cl.[2] A45F *3/04*
U.S. Cl. 224—209 **2 Claims**



1. A back pack having a hollow back storage portion adapted to reside on the back of a wearer and having a pair of flexible straps extending on either side of said back portion adapted to extend over the shoulders and under the arms of the wearer and secure the back pack to the wearer, a closable opening defined in said back storage portion, at least one of said straps of each of said pairs being hollow and having means defining closable openings thereinto for storage therein, and means for coupling together the straps to secure said back pack on a wearer, said back pack being in the form of a creature having a pair of anterior limbs and a pair of posterior limbs, said limbs forming said straps, said back portion defining the body of the creature.

4,174,060
DETACHABLE PAPER BAG CARRIER
David Porat, 17 Englewood Ave., Brookline, Mass. 02146
Filed Jun. 3, 1977, Ser. No. 803,242
Int. Cl.[2] B65D *71/00*
U.S. Cl. 224—45 H **4 Claims**

1. A detachable paper clamp comprising

(a) a front plate having an inner face;

(b) a top member fixedly attached to a portion of the inner face of the front plate;

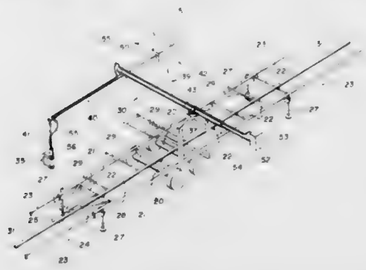
(c) two side plates fixedly attached to the top member whereby a volume of space is bounded on four sides by the inner face of the front plate, the top member and the two side plates, said side plates leaving a channel between the inner face of the front plate and the edges of the side plate sufficiently wide to receive an upper end of a paper bag, each of said side plates further having a recess through its faces oriented on a diagonal upwards towards the top member and away from the inner face of the front plate;

(d) a travelling plate located within the volume of space, and having a protrusion on each of its two sides that slidably engages the recesses in the side plates, said travelling plate



having a face substantially parallel to the inner face of the face plate, whereby the insertion of the upper end of a paper bag between the front plate and the travelling plate causes the travelling plate to move upwards and away from the inner face of the front plate until the upper end of the paper bag is substantially within the space between the inner face of the front plate and the face of the travelling plate and the paper bag will be so retained on the carrier when the travelling plate moves downwardly and towards the front plate to engage the paper bag.

4,174,061
PORTABLE APPARATUS FOR FABRICATING WOODEN TRUSSES
William D. McDonald, Rte. 1, Box 322C, Monroe, Oreg. 97456
Filed Jun. 6, 1978, Ser. No. 913,247
Int. Cl.[2] B25C *7/00*
U.S. Cl. 227—152 **13 Claims**



1. A portable apparatus for fabricating wooden trusses comprising a wheeled bed adapted to be towed and having a truss lumber supporting surface means, an upright support frame rising from one side of the bed near the longitudinal center of the bed, a main horizontally rotatable boom swiveled on the top of the upright supporting frame, a secondary boom carried by the main boom and being vertically swingable and horizontally rotatable relative to and independently of the main boom and being supported by the main boom at an elevation substantially above said bed, and a manually guided power clamping device suspended from the secondary boom and being operable to press nailing plates into opposite sides of lumber joints of a wooden truss being fabricated by the apparatus.

4,174,062
WELDING ROD HOLDER ACCESSORY
Lawrence E. Francis, R.R. #2, Spencerville, Ontario, Canada (K0E 1X0)
Filed Feb. 1, 1978, Ser. No. 874,050
Int. Cl.[2] B23K *37/00, 9/32*
U.S. Cl. 228—19 **1 Claim**

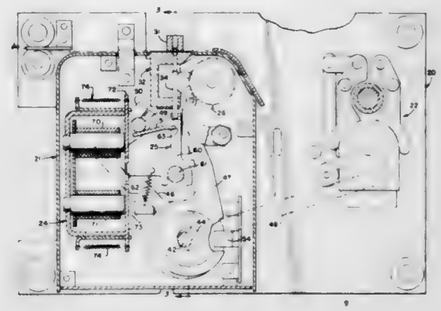


1. A combination welding rod holder and a chipper head, said welding rod holder having a handle with a free end and a holder head at the free end of the handle for supporting a welding rod at a predetermined point thereof, said combination welding rod holder and chipper head comprising

a chipper head removably affixed to the holder head in an area thereof spaced from and opposite the predetermined point thereof at which the welding rod is supported; and

fastening means for removably affixing the chipper head to the holder head whereby said welding rod holder functions as a combinatio: welding rod holder and chipper hammer, said fastening means comprising a pair of spaced slots formed in the holder head and a pair of spaced resilient clamp members affixed to and extending from the chipper head, said clamp members being removably clamped in said slots.

4,174,063
PAPER TAPE PUNCH AND READER
Jacob H. Drillick, Glen Rock, N.J., assignor to Drillick-LaManna Corporation, Hawthorne, N.J.
Division of Ser. No. 774,529, Mar. 4, 1977, Pat. No. 4,126,257. This application Mar. 27, 1978, Ser. No. 890,536
Int. Cl.[2] G06K *1/05*
U.S. Cl. 234—130 **2 Claims**



1. A paper tape punch and reader having selectively operable bi-directional transports for the punch and for the reader comprising:

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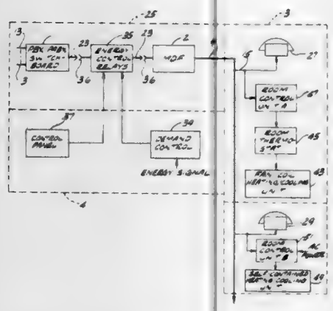
(a) a single continuously rotating drive shaft;
(b) said shaft driving a first reciprocating link for said punch transport;
(c) said shaft driving a second reciprocating link for said reader transport;
(d) a pair of angularly oscillating transport assemblies, one driven by said punch transport link and the other driven by said reader transport link;
(e) signal controlled bi-directional driving means on each of said transport assemblies; and
(f) a pair of sprocket wheels for controlling the movement of tapes, the first controlled by the driving means on the punch transport assembly and the second controlled by the driving means on the reader transport assembly.

4,174,064

ENERGY CONTROL SYSTEM PROVIDING SELECTIVE CONTROL OF REMOTE ZONE HEATING OR COOLING FROM A CENTRAL LOCATION

Fred Pratt, Jr., Humboldt, Tenn., assignor to Teleci, Inc., Jackson, Tenn.

Filed Dec. 27, 1977, Ser. No. 864,494
Int. Cl.² G05D *23/19*; H04M *11/00*
U.S. Cl. 236—1 B **23 Claims**



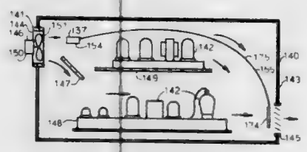
1. An energy control system for selectively controlling permissible temperatures in a plurality of remote zones from a control location, said zones each having heat transfer means normally operational for effecting heat transfer with respect to said zone to control temperature in said zone, said zones each being interconnected with said control location by respective telephone circuits each comprising ring and tip conductors constituting a conductor pair having a DC telephone operating voltage normally imposed thereon of a normal polarity, said system comprising polarity reversing means for effecting a reversal of said normal polarity, said polarity reversing means comprising polarity switching means interconnected with each said conductor pair for selectively reversing the polarity of connection of such conductor pair to said DC telephone operating voltage, voltage responsive means in each zone responsive to reversal of polarity of said DC voltage imposed on a conductor pair interconnecting said zone with said control location, heat transfer control means in each zone, operatively associated with said voltage responsive means in said zone, for altering normal operation of said heat transfer control means for as long as there is maintained a reversal in the polarity of the voltage on said conductor pair, in a sense tending to require less enerby for heat transfer with respect to said zone, said polarity reversing means and said voltage responsive means each operating independently of any telephone voice communication signals carried by said conductor pair without interruption by voice communication signals.

4,174,065

FLUID FLOW REGULATING SYSTEMS

Berthold A. Knauth, Daytona Beach, Fla., assignor to Knauth Design, Inc., Daytona Beach Shores, Fla.

Continuation-in-part of Ser. No. 838,676, Sep. 30, 1977, abandoned, which is a continuation of Ser. No. 692,845, Jun. 4, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,470
Int. Cl.² G01F *1/28*; F04B *49/00*
U.S. Cl. 236—49 **20 Claims**



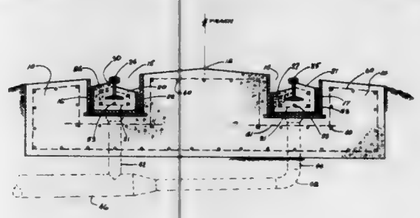
1. A motor speed regulating system for an electrically powered motor that is drivingly connected to a fluid impeller comprising velocity head monitoring means having a force sensor that is mounted in a flow path for fluid delivered by the impeller for sensing the velocity head of the fluid flowing along the path, temperature sensing means for sensing the temperature of fluid delivered by the impeller, and circuit means connected to a power source and to the motor, said monitoring means being responsive to velocity head changes sensed by the force sensor, said temperature sensing means being responsive to temperature changes sensed thereby, and said circuit means operating under the control of said monitoring means and said temperature sensing means to regulate the power delivered to the motor in accord with the sensed fluid velocity head changes and temperature changes.

4,174,066

CORROSION RESISTANT SELF-ALIGNING TRACK CONFIGURATIONS PARTICULARLY ADAPTED FOR RAILROAD CARS

William L. Dugasz, 396 Alpine St., Perth Amboy, N.J. 08861

Filed Jan. 10, 1978, Ser. No. 868,377
Int. Cl.² E01B *1/00*; E01F *5/00*
U.S. Cl. 238—7 **13 Claims**



1. A railroad track construction apparatus comprising a concrete bed of a predetermined length and having a top surface of a relatively triangular configuration forming a central apex relatively equidistant from a right and left side of said bed, said bed having first and second parallel "U" shaped channels located on said top surface, with said first channel nearer said right side and spaced a given distance from said apex, and said second channel nearer said left side and spaced relatively the same distance from said apex, a first and second channel vessel, each of a "U" cross-sectional configuration relatively congruent with said first and second channels for insertion of said first and second vessels in said first and second channels, said vessels including a first track positioned at a predetermined location in said first vessel, and a second track positioned at a predetermined location in said second vessel, each of said tracks extending from the open top of said "U" and positioned

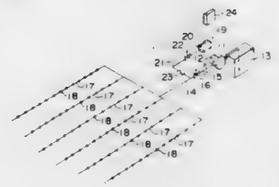
at said locations by means of a plurality of track supporting rods retained between said track and said vessels by means of a concrete binder located within the hollow of said "U" shaped vessel, wherein each of said supporting rods is of a relatively arcuate configuration having one end secured to a portion of said track at one side and a second end secured to a portion of said track at said opposite side with said rod disposed within said hollow of said "U" shaped vessel and having the major portion thereof facing the bottom surface of said vessel.

4,174,067

IRRIGATION SYSTEM

Sohsuke Watanabe, and Masahiro Metsugi, both of Shimodate, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Jul. 14, 1977, Ser. No. 815,779
Claims priority, application Japan, Jul. 23, 1976, 51/88354
Int. Cl.² B05B *15/02*
U.S. Cl. 239—112 **1 Claim**



1. An irrigation system comprising:
a first source means for pressurized liquid, which comprises a pump and supplies irrigating liquid at a predetermined first pressure;
passage means for conducting said irrigating liquid from said source means to individual irrigation locations, comprising a plastic pipe having very small enlargeable slit openings on its outside surface extending through to its interior and lying transverse to its longitudinal direction, for continuously discharging liquid therefrom;
a second source means for compressed air, which comprises a compressor and supplies compressed air at a predetermined second pressure which is substantially higher than said first pressure;
and an operational control means, which comprises a first control valve which controls a connection of said first source means for pressurized liquid and said passage means, and a second control valve which controls a connection of said second source means for compressed air and said passage means; and which opposedly operates said first and second control valves, so that when one is opened the other is closed, and which temporarily stops supply of said pressurized liquid from said first source means to said passage means while supplying compressed air from said second source means to said passage means.

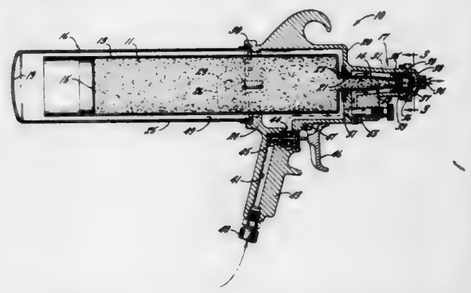
4,174,068

GUN HAVING DISPOSABLE CARTRIDGE

Robert L. Rudolph, c/o Cartri-Spray Corporation, 310 Peoples Ave., Rockford, Ill. 61101

Filed Nov. 7, 1978, Ser. No. 958,428
Int. Cl.² B05B *9/047*
U.S. Cl. 239—322 **5 Claims**

1. A gun for spraying flowable material, said gun comprising an elongated tubular barrel having a rear section with a closed rear end and having a separate forward section with an opening extending through its forward end, a forwardly opening tubular nozzle projecting forwardly from the forward end of said barrel and alined substantially with said opening, a disposable tubular cartridge containing said material and positioned removably in said barrel, means securing said rear and forward sections of said barrel together in end-to-end relation and being selectively releasable for the purpose of enabling said cartridge to be inserted into and removed from said barrel, said cartridge being spaced inwardly from said barrel to define a first passage between the cartridge and the barrel, a forwardly opening spout joined to and communicating with the forward end of said cartridge and telescoped through said opening and into said nozzle, said spout being spaced inwardly from said nozzle to define a second passage between the spout and the nozzle, a piston telescoped slidably into and closing the rear portion of said cartridge and being disposable as a unit with the cartridge, said piston being operable, when advanced forwardly, to force said material out of said spout, selectively operable means for admitting air into said first and second passages with the air



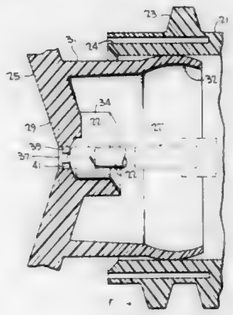
admitted into said first passage being effective to advance said piston, and means disposed adjacent the forward ends of said nozzle and said spout and coacting with the air admitted into said second passage to cause the material which is forced from said spout to spray out of said nozzle, said last-mentioned means comprising a head telescoped into said nozzle and over said spout and having a centrally located hole extending therethrough to allow material to pass out of said spout and through said head, and a series of holes extending through said head and spaced angularly around said centrally located hole, said series of holes communicating with said second passage to allow pressurized air in said second passage to flow through said head.

4,174,069

ADJUSTABLE SPRAY FLUID DISPENSER

Richard P. Grogan, Ontario, Calif., assignor to Diamond International Corporation, New York, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,415
Int. Cl.² B05B *11/01*
U.S. Cl. 239—333 **8 Claims**



1. In a dispensing pump having a pump housing containing inlet and outlet passages defining a discharge path for fluid from a supply container to a circular discharge orifice, a needle

valve adjacent said outlet passage, a nipple surrounding said valve, a nozzle cap in engagement with said nipple for movement toward and away from said valve, said cap containing said orifice and having means defining an open ended swirl chamber thereon extending toward said valve and surrounding said orifice for effecting a discharge through said orifice of a fine fluid spray when movement of said cap toward said valve causes said valve to plug the open end of said swirl chamber means, the improvement comprising, said discharge orifice being defined by a circular wall opening and by a pair of opposed projections on said wall, said projections extending inwardly of said orifice toward one another and having free ends spaced a predetermined distance apart, whereby a fluid discharge of a substantially flat spray pattern is effected through said orifice between said spaced apart ends when the movement of said cap toward said valve causes said valve to plug the open end of said swirl chamber means.

4,174,070

SPRAY GUN ASSEMBLY

George W. Lau, Blue Island, and Edward J. Bujnowski, Chicago, both of Ill., assignors to Binks Manufacturing Company, Franklin Park, Ill.

Division of Ser. No. 740,121, Nov. 8, 1976. This application Apr. 10, 1978, Ser. No. 894,697

Int. Cl.[2] B05B *7/30*

U.S. Cl. 239—340 **6 Claims**



1. A syphon-type spray gun assembly, comprising a container for holding contents to be syphoned through a syphon tube into said gun for discharge therefrom, said container having a vent formed through a portion thereof not normally contacting the contents, and means connected with said vent exteriorly of said container for preventing passage of contents through said vent to exterior of said assembly upon manipulation of said assembly into any position wherein the contents contact the vent and would otherwise flow through the vent and drip from the assembly, said means for preventing passage including a flexible tube connected at one end to said vent exteriorly of said container and at its other end to a connector on the assembly remote from said vent, said tube enclosing said vent and containing therewithin any contents passing through said vent and with said vent connecting the interior of said container to atmosphere.

4,174,071

SPRAY GUN ASSEMBLY

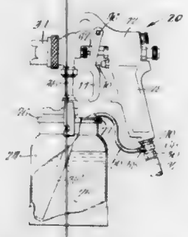
George W. Lau, Blue Island, and Edward J. Bujnowski, Chicago, both of Ill., assignors to Binks Manufacturing Company, Franklin Park, Ill.

Filed Nov. 8, 1976, Ser. No. 740,121

Int. Cl.[2] B05B *7/30*

U.S. Cl. 239—348 **4 Claims**

1. A syphon-type spray gun assembly including a spray gun and an associated container for holding contents to be syphoned therefrom, means for generating within said container a positive pressure with respect to ambient to urge the contents toward said gun, and means for limiting the pressure generated within said container to a predetermined value which is less than sufficient to move the contents into said gun, said container having a vent formed through a portion thereof not normally contacting the contents, said means for generating said pressure including means for connecting air under pressure with said vent, said means for limiting said pressure to said predetermined value including means for venting to atmosphere a portion of said connected air, said gun having an air inlet for receiving air under pressure to draw contents from said container by syphon and to be discharged from said gun



with the contents, said means for connecting air under pressure to said vent including conduit means for connecting said air under pressure at said inlet with said vent, said means for venting comprising a passage through said conduit means for continuously venting to atmosphere a portion of said connected air whenever air is received at said air inlet to maintain said pressure in said container at said predetermined value and less than the pressure of air at said air inlet both when contents are and are not being discharged from said gun.

4,174,072

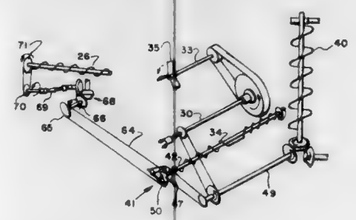
OVERLOAD PROTECTIVE DEVICE

Charles M. Kline, Reinholds, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 23, 1978, Ser. No. 889,310

Int. Cl.[2] B02C *25/00*

U.S. Cl. 241—35 **14 Claims**



1. In a crop feed grinding and mixing apparatus having a mixing means mounted to a mobile frame, a grinding means fixed to the frame, material transfer means extending at least between the grinding means and the mixing means, material infeed means in material flow communication with the grinding means and drive means including a first rotatable shaft and a second rotatable shaft, the first shaft being operably connected to the second shaft and the mixing, grinding, material infeed and material transfer means, the improvement in the drive means comprising:

a positively engaging, functionally nonfriction dependent speed responsive overload protective device mounted to the second rotatable shaft including a power transfer means with a block affixed thereto and a pivotable arm rotatably mounted adjacent the power transfer means having a first weighted end and a second driving end with a tab affixed thereto for mated driving engagement with the block to thereby drive the material infeed means so that when the first rotatable shaft is slowed in operation below a predetermined speed by excessive crop feed accumulation in the grinding means the protective device automatically disengages the material infeed means from the drive means in order to permit the grinding means to continue to operate without any additional crop feed being delivered thereto until the first rotatable shaft returns to the predetermined speed, thereby automatically causing the tab to return to a condition of driving engagement with the block reengaging the material infeed means to permit the flow of crop feed material to recommence.

4,174,073

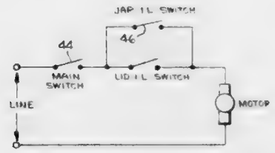
MULTI CONTAINER INTERLOCKED FOOD MACHINE WITH A SAFETY SWITCH FOR EACH CONTAINER

William M. Maher, Churchville, and Duane M. Seaburg, Oakfield, both of N.Y., assignors to General Electric Company, New York, N.Y.

Filed Jul. 17, 1978, Ser. No. 924,938

Int. Cl.[2] B02C *18/12*

U.S. Cl. 241—36 **8 Claims**



1. In a multi container interlocked food machine having a power base with a bowl-supporting portion and driven shaft extending vertically therefrom, and an upstanding motor-containing housing, a processor bowl having means locking it on said portion and containing a cutter on said shaft, a lid on said bowl operatively connected to an interlock of an internal lid switch-controlled motor energizing circuit to deenergize said circuit on lid removal, an improved cooperating second interlock comprising,

a separate smaller diameter blender jar and cutter disposable on said shaft,

base securing means on said jar locking it on said base portion concentric with said bowl means locking portion,

an internal jar switch connected to said switch,

said base securing means operatively connecting with said jar switch,

whereby on mounting said jar on the base, the jar switch is closed to "on" to by-pass the lid switch inactivating the processor bowl interlock for operation of the machine with said jar as a blender.

4,174,074

BALL MILL

Armin Geiger, Wattwil, Switzerland, assignor to Gebrueder Buehler AG, Uzwil, Switzerland

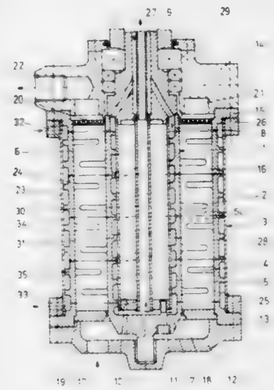
Filed Apr. 26, 1978, Ser. No. 900,192

Claims priority, application Switzerland, Apr. 29, 1977, 5273/77

Int. Cl.[2] B02C *17/16*

U.S. Cl. 241—46.11 **30 Claims**

1. Agitator mill for continuous grinding and dispersion of material suspended in a liquid, said mill comprising: a plurality of rotor ring elements, at least some of said rotor ring elements having rotor agitator members projecting outwardly therefrom, said rotor ring elements being aligned to constitute a rotor; a stator surrounding said rotor and having stator agitator members projecting inwardly therefrom; said rotor being mounted for rotation within said stator; said rotor and said stator forming a grinding chamber therebetween intended to hold a charge of grinding elements; stator cooling means for cooling said stator; rotor cooling means for cooling said rotor, said rotor cooling means comprising cooling ribs which at least in part form boundaries of rotor cooling channels and at least



in part are bounded by a surface of said rotor ring elements; and said rotor ring elements being replaceable and being highly wear resistant on surfaces that are intended to come into contact with said grinding elements.

4,174,075

APPARATUS FOR PROCESSING WASTE MATERIAL CHIEFLY COMPOSED OF PAPER AND PLASTIC FILM

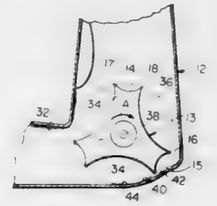
Manlio Cerroni, via Bruxelles 53, Rome, Italy

Continuation-in-part of Ser. No. 674,156, Apr. 6, 1976, abandoned. This application Nov. 11, 1977, Ser. No. 850,807

Claims priority, application Italy, Apr. 16, 1975, 49142 A/75

Int. Cl.[2] B02C *13/06*

U.S. Cl. 241—189 R **2 Claims**



1. Apparatus for treating waste materials composed chiefly of paper and plastic film comprising: a casing including inner wall means defining a conduit through which said waste material is passed; conveyor means for delivering said waste material into said casing; reducer means essentially composed of a stellate rotor rotatably mounted within said casing and having rotary arms with ends engaging portions of said inner wall means of said casing to effect treatment of said waste materials; said rotor being mounted for rotation in a fixed direction about a fixed center of rotation with said arms being of a generally rigid configuration so that the ends thereof will be maintained generally equidistantly from said rotational center and will move through a generally circular path having a fixed radius while said rotor rotates; said casing inner wall means including a curved portion having a first and a second end, with said second end being located forwardly of said first end taken in the direction of rotor rotation, said first end being spaced radially outwardly from said circular path to form a gap between the ends of said rotor arms and said first end of said

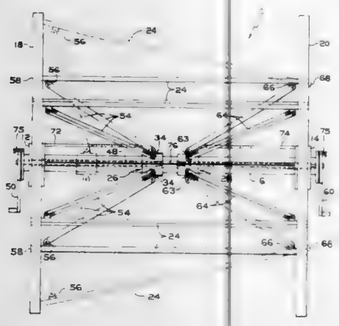
curved portion; and means defining an indented concave pocket located immediately upstream of said first end of said curved portion taken relative to the direction of waste material passage through said casing, said pocket being formed by portions of said inner wall means which are spaced radially outwardly from said circular path of said ends of said rotor arms a greater distance than said first end of said curved portion; said inner wall means being thereby formed to define an edge extending transversely of the direction of movement of the ends of said rotor arms and defining a demarcation between said concave pocket and said first end of said curved portion; with said curved portion being configured so that the spacing between said first end thereof and said ends of said rotor arms narrows toward said second end of said curved portion; said curved portion being formed with said second end generally conforming to the configuration of said circular path of said rotor and with a radius of curvature generally equivalent with the radius of said circular path; said first end of said curved portion being generally formed with a radius of curvature which is larger than the radius of said circular path of said ends of said rotor arms.

4,174,076

CUTTING STRETCHED INTERLAYER SHEETING

Richard J. Tolliver, Greensburg, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 8, 1977, Ser. No. 814,068
Int. Cl.[2] B29C *17/14*; B26D *3/28*
U.S. Cl. 242—56 B **6 Claims**



1. A method of cutting a series of individual sheets of thermoplastic interlayer material having a first side edge of a predetermined trapezoidal sheet and a second opposed side edge of said trapezoidal sheet, one of which side edges is longer than the other, from a continuous ribbon of said material having a dyed border portion along one of said side edges and that has been differentially stretched previously to approximately the differentially stretched condition desired, comprising:

(a) independently adjusting the circumferences at both ends of an adjustable mandrel to provide a conical shape approximately equal to an integral number of a given longitudinal length of said predetermined shape along one side portion of said mandrel and the same number of a different longitudinal length of said predetermined shape along the other side portion of said mandrel,

(b) winding a plurality of plies of said material onto said mandrel so adjusted in circumference at both ends to provide a conical shape having a circumference at one end that corresponds to an integral number of a given length along one side of said thermoplastic interlayer material and a circumference at its other end that corresponds to the same number of a different length along the other side of said thermoplastic interlayer material and rotatable about an axis of rotation,

(c) cutting said plies along an integral number of lines equal to said integral number at equi-angular relation therebetween, said lines extending in planes that intersect said axis, and

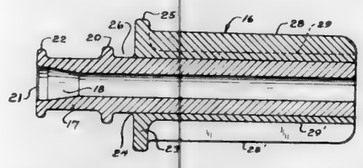
(d) removing the plies from said mandrel to provide a plurality of sheets of said predetermined trapezoidal shape having longitudinal side edges approximately equal to said predetermined different lengths, each of which has a dyed portion along said one side edge of said given length and said opposite side edge of said different length.

4,174,077

CORE HOLDER FOR REELING

Richard J. Charles, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Jul. 3, 1978, Ser. No. 921,579
Int. Cl.[2] B65H *75/02, 19/12, 19/30*
U.S. Cl. 242—68.6 **2 Claims**



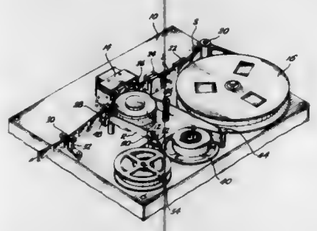
1. A core holder for reeling comprising a relatively elongated plastic tube having a radially extending flange adjacent to but spaced from one end of said tube, a plastic sleeve fixed on said tube adjacent the other end of said tube and terminating a spaced distance from said flange, said sleeve having radially outwardly projecting therefrom a plurality of longitudinally extending ribs.

4,174,078

TAPE TENSIONING APPARATUS PARTICULARLY USEFUL IN PRINTING APPARATUS

Robert J. Brooks, Woodinville, Wash., assignor to Interface Mechanisms, Inc., Lynnwood, Wash.

Filed Oct. 16, 1978, Ser. No. 951,624
Int. Cl.[2] B65H *25/22, 59/38*
U.S. Cl. 242—75.43 **16 Claims**



1. An apparatus for dispensing tape from a spool thereof and for regulating the tension in the tape so dispensed at a substantially constant value, said apparatus comprising:

first means adapted to receive said spool, said first means being supported for rotation about a first axis;

second means supported for rotation about a second axis which is proximate to and substantially parallel to said first axis, said second means including a tape guide which is adapted to engage a portion of the tape exiting from said spool, whereby said second means may be caused to rotate in a predetermined direction about said second axis by forces exerted on the tape which tend to draw the tape from said first means;

third means exerting a rotational force on said second means so as to yieldably bias said second means to a predetermined angular position thereof;

a compressible, resilient member located between said first means and said second means so as to be capable of being compressed therebetween;

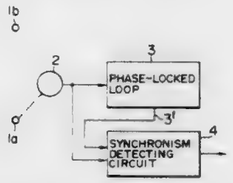
fourth means for varying the displacement between said first means and said second means, in an axial direction substantially parallel to said first and second axes, as the angular position of said second means is varied, said displacement being at a minimum when said second means is at said predetermined angular position so that said compressible, resilient member is fully compressed to substantially inhibit rotation of said first means relative to said second means, said displacement progressively increasing as said second means is caused to rotate away from said predetermined angular position as that said compressible, resilient member is progressively decompressed to permit rotation of said first means relative to said second means.

4,174,079

METHOD OF DETECTING TAPE TRANSPORT CONDITION

Kiyoshi Hayashi, Nagoya, Japan, assignor to Shin-Shirasuna Electric Corp., Aichi, Japan

Filed Feb. 22, 1977, Ser. No. 770,414
Claims priority, application Japan, Feb. 24, 1976, 51/19143
Int. Cl.[2] G11B *15/32*
U.S. Cl. 242—186 **4 Claims**



1. A method of detecting tape transport condition, which comprises deriving a signal from detector means provided in association with at least one of a pair of reel spindles to detect the rate of revolution of said reel spindle, said signal having a frequency proportional to said rate of revolution, applying said signal to a phase-locked loop having a lock range which is previously set so as to cover the rotational speed range of said reel spindle as the tape is being transported at a predetermined steady speed, applying to a synchronism detecting circuit said signal derived from said detector means and a signal derived from a voltage-controlled oscillator contained in said phase-locked loop, and detecting whether or not said two signals agree in frequency with each other.

4,174,080

TAPE CASSETTE

Hiroyuki Yamada, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1978, Ser. No. 961,529
Claims priority, application Japan, Nov. 25, 1977, 52-158099[U]
Int. Cl.[2] G03B *1/04*
U.S. Cl. 242—199 **5 Claims**



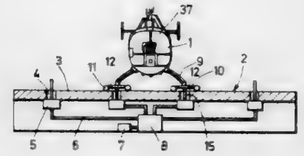
1. A tape cassette having a pair of case members which are oppositely arranged to form a case body and are each provided with pins at the four corners on the major inner surface, a pair of reel hubs rotatably provided within the case body, and sheet members which are each provided at the four corners with holes and each fixedly attached in place to the major inner surface of the case member in such a manner that the holes receive the corresponding pins on the case member, wherein the distance between each pair of adjacent holes arranged on the sheet member along one of the sides of the sheet member is longer than the corresponding distance between each pair of adjacent pins arranged on the case member in order that the sheet member bends inwardly within the case body, with the maximally bent center part thereof resiliently contacting the corresponding sides of a tape loaded on the reel hubs.

4,174,081

APPARATUS FOR SECURING A FLYING CRAFT TO A STARTING AND LANDING AREA

Wladimir Sardanowsky, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Dec. 16, 1977, Ser. No. 861,561
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658483
Int. Cl.[2] B64F *1/12*
U.S. Cl. 244—17.17 **24 Claims**



1. An apparatus for securing a flying craft to a starting and landing area, comprising landing platform means, at least one aperture in said landing platform means, suction means located for cooperation with said aperture, connection means including valve means operatively connecting said aperture in said landing platform means to said suction means, suction cup holding means secured to said flying craft, said suction cup holding means sealing said aperture against the atmosphere, said valve means being operatively arranged relative to said aperture, said valve means comprising actuator means for establishing a vacuum under said suction cup holding means when the latter covers said aperture when said flying craft is landing on said landing platform whereby the suction cup holding means are secured to said landing platform.

4,174,082

SOLAR POWERED HOT AIR BALLOON

Frederick Eshoo, 151 Kakh Ave., Tehran, Iran

Filed Dec. 15, 1977, Ser. No. 860,711
Int. Cl.[2] B64B *1/58*
U.S. Cl. 244—31 **19 Claims**

1. A solar powered hot air balloon, comprising:

an envelope;

a gondola suspended from the envelope;

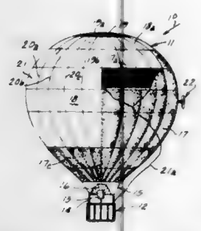
a highly translucent portion of the envelope;

an opaque portion of the envelope, said opaque portion having a substantially black light absorbing inner surface over substantially the entire opaque portion within the envelope positioned so as to receive a substantial portion of sunlight passing through the translucent portion;

substantially an entire outer surface of the opaque portion having a substantially total light reflecting outer surface means opposite the black inner surface for minimizing

radiation of heat from within the balloon through the opaque portion;

a horizontal plane relative to level flight passing through a central portion of the balloon at its largest periphery intersecting the opaque portion at one side of the balloon



and the translucent portion at an opposite side of the balloon; and

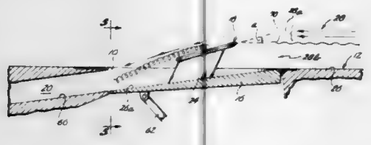
means for rotating the balloon about its vertical axis relative to level flight so as to position the translucent portion towards the sun.

4,174,083

FLOW DEFLECTOR FOR FLUID INLET

Larry W. Mohn, Edmonds, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 29, 1977, Ser. No. 792,332
Int. Cl.[2] B64D *33/02*
U.S. Cl. 244—53 B **9 Claims**



1. In an air or water craft in which the body of the craft has a fluid inlet for ingesting some of the fluid through which the craft passes, said inlet being flush with respect to an exterior surface of the body of the craft, said craft being equipped with a door mounted for movement between a closed position flush and the exterior surface of said body and an open position recessed inwardly from the exterior surface of said body to place said inlet in fluid communication with an inlet duct located interiorly of the craft body and associated with said inlet, the improvement in combination therewith comprising:

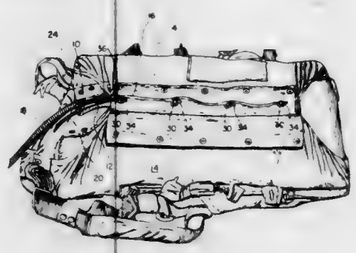
a wing-airfoil deflector supportively mounted on said door and oriented such that when said door is in its open position said deflector is spaced outwardly from said body so as to be positioned at a predetermined angle of attack to a stream of fluid flowing relative to said body along said exterior surface so as to interact with said stream to produce counterrotating flow vortices trailing said deflector which coact to cause a downwash of the fluid from said stream into said inlet.

4,174,084

DUAL PARACHUTE RIPCORD CABLE RELEASABLE CLAMP

Jon T. Matsuo, El Centro, Calif., and Ronald S. Boyum, Minneapolis, Minn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 784,107, Apr. 4, 1977, abandoned. This application Jun. 14, 1978, Ser. No. 915,499
Int. Cl.[2] B64D *17/52*
U.S. Cl. 244—149 **7 Claims**



1. A clamping device for securing adjacent manual ripcord and automatic power cable housings to a base plate on a parachute container comprising:

one clamp member for supporting the automatic power cable housing;

a first means for securing said one clamp member to spaced positions on the base plate;

a second clamp member for supporting the manual ripcord housing to the base plate;

a second quick release means for detachably securing said second clamp member to the base plate;

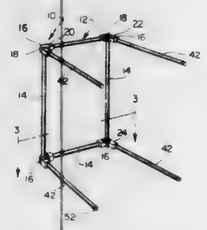
a lanyard connected between said second means and the parachute riser strap for operating said second means to detach said second clamp when a tension is applied to the strap for freeing the manual ripcord housing from the base plate whereby said automatic power cable remains clamped to the base plate when the manual ripcord housing is detached from the base plate.

4,174,085

COLLAPSIBLE TRASH BAG HOLDER

Richard A. Ferreira, and Albert Vincent, both of 82 Taunton Ave., East Providence, R.I. 02914

Filed Dec. 26, 1978, Ser. No. 973,881
Int. Cl.[2] A63B *55/04*
U.S. Cl. 248—97 **12 Claims**



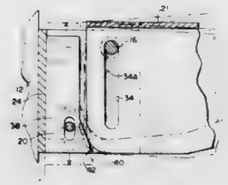
1. A trash bag holder device comprising a substantially rigid generally rectangular frame having a plurality of elongated perimetal frame elements interconnected at the corners of said frame, each of said corners including a connecting member having a body, upper and lower pairs of spaced elongated support elements connected to said connecting members and outwardly projecting in a generally normal attitude from the plane of said frame and each of said support elements terminating in a free end, the lower pair of said support elements and that frame element disposed therebetween adapted to contact a supporting surface so as to support said device in a use position with said frame disposed upright, the upper pair of said support elements and that frame element disposed therebetween adapted to support the folded upper peripheral edge of a flexible wall container such as a plastic trash bag so as to hold such bag in an open receiving position, said body including means for permitting said support elements to be moved to a storage position substantially coplanar with an adjacent frame element.

4,174,086

FOLDING TRAY RAIL BRACKET

John A. Verberkmoes, Grand Haven, Mich., assignor to Bastian Blessing Company, Inc., Phoenix, Ariz.

Filed Feb. 10, 1978, Ser. No. 876,648
Int. Cl.[2] A47G *29/02*
U.S. Cl. 248—242 **3 Claims**



1. A fold down tray rail comprising a tray supporting slide member, and a plurality of spaced brackets secured to the underside of the tray slide member, each bracket having a vertical flange defining a vertical track adjacent its inner end and facing its outer end,

bracket support means mountable on a wall for each bracket and having a horizontally disposed pivot pin engaging said track for relative vertical movement,

adjustable cam means carried by said bracket support means spaced from said pivot pin for engaging said bracket in cooperation with said pivot pin to adjust and determine in supporting relation the angle between the bracket and tray rail with respect to a weightbearing working position,

cam means defining a vertically adjustable cam member to vary the relative horizontal orientation of said relieved lower end of said bracket with respect to said pin, and

said bracket at its lower end engaging said cam means in its working position, and at its lower end being relieved to clear said cam means at the upper limit of bracket movement to free said bracket for downward hinging movement to a vertical depending position supported by said pin engaging said track.

4,174,087

SWIVEL SUSPENSION SET

Stanley Gaines, Roslyn Heights, N.Y., assignor to Allen-Stevens Corp., Woodside, N.Y.

Filed Mar. 3, 1978, Ser. No. 883,198
Int. Cl.[2] F16B *45/00*
U.S. Cl. 248—339 **7 Claims**

1. An overhead swivel suspension set consisting of:

(A) a mount and

(B) a support,

(C) said mount including

(i) a base,

(ii) a ring below the base, the top surface of the ring constituting a step bearing,

(iii) legs connecting the ring to the base,

(iv) the base being securable to an overhead horizontal surface so as to hold the ring in horizontal position,

(v) the base, the legs and the ring being molded as a single piece,

(vi) the ring having a radial gap the width of which is less than the diameter of the opening through the ring,

(D) said support including

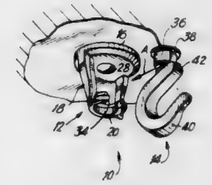
(i) a journal,

(ii) a head at the upper end of the journal, the head projecting laterally beyond the journal to provide a circular flange,

(iii) a grab at the lower end of the journal,

(iv) the diameter of the journal being greater than the width of the gap,

(v) the upper end of the grab below the journal having at least one lateral dimension which is smaller than the width of the gap over a vertical distance at least equal to the height of the ring,



(vi) the journal, the head and the grab being molded as a single piece,

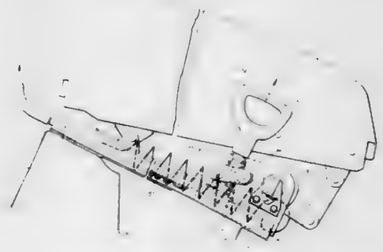
(E) whereby in order to assemble the support to a mount secured to an overhead horizontal surface, the support is held alongside the gap with the journal vertical and at a level higher than the ring and with the said lateral dimension of the upper end of the grab registering with said gap and perpendicular to the sides thereof, after which the support is moved with respect to the mount with said lateral dimension of the grab passing through the gap until the journal is located above the ring, and the support then is lowered until the journal is received within the opening in the ring and the head at the upper end of the journal rests against the top surface of the ring.

4,174,088

VEHICLE SEAT

Peter Schaefer, and Wolfgang Doerre, both of Gummersbach, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Oct. 18, 1977, Ser. No. 843,191
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1976, 2647288
Int. Cl.[2] F16M *13/00*; B60N *1/02*
U.S. Cl. 248—395 **3 Claims**



1. A vehicle seat which is adjustable in the longitudinal direction by a first adjustment device including two spaced

guideways and the inclination of which is adjustable by a second adjustment device comprising:

a train of toothed gears for automatically coupling together said first and second adjustment devices; and

an adjusting lug associated with one of said two spaced guideways supporting two shafts **16** and **19** and an adjusting shaft **9** which effects the inclination adjustment, said two shafts **16** and **19** and said adjusting shaft **9** cooperate with each other by means of a plurality of gears, one of said plurality of gears being in mesh with a rack **14** of said one of said two spaced guideways;

said two shafts including a first shaft **16** having a first gear **15** and a second gear **17** and a second shaft **19** having a third gear **18** and a fourth gear **20**, said second shaft **19** being axially displaceable with respect to said third gear **18** and said fourth gear **20** and said first shaft **16** being displaceable with respect to said first gear **15** which is in mesh with said rack **14**, said second gear **17** being carried along;

said fourth gear **20** being in mesh with a gear **21** of said adjusting shaft **9**, while said third gear **18** in the initial position is in mesh with said second gear **17** which is axially fixed to said first shaft **16**;

a disk carried by said second shaft **19** having a projection thereon to engage on elongated hole is said third gear **18**; and

a locking device to secure said disk from twisting upon axial displacement of said first shaft **16** and said second shaft **19**.

4,174,089

MOLD FOR FIRING BODIES OF SILICA- OR ALUMINA-CONTAINING GRANULES

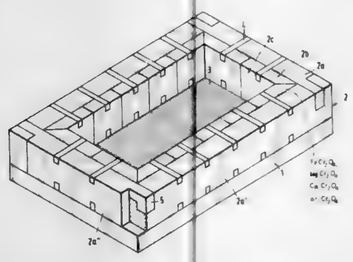
Sigismund Kienow, Wiesbaden, and Karl Briem, Braunschweig, both of Fed. Rep. of Germany, assignors to Zytan Thermochemische Verfahrenstechnik GmbH & Co. Kommanditgesellschaft, Braunschweig, Fed. Rep. of Germany

Filed Feb. 7, 1978, Ser. No. 875,863

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1977, 2705121

Int. Cl.[2] **B28B** *7/34, 7/36*

U.S. Cl. 249—80 **8 Claims**



1. A mold for firing bodies of particles of silica- or alumina-containing material, said mold comprising:

a side wall; and

a floor having an upper surface consisting of ferrochromite, magnesiochromite, calciochromite, or trivalent-chromium oxide.

4,174,090

BALL VALVE WITH SPINDLE, HAVING PARALLELEPIPED-BEARING BLOCK JOINT PORTIONS

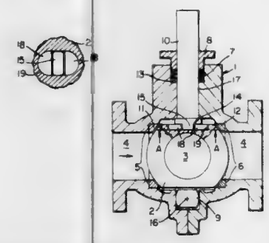
Juha A. E. Nelimarkka, Marjalahdentie 8, 00930 Helsinki 93, Finland

Filed Nov. 28, 1977, Ser. No. 855,333

Claims priority, application Finland, Dec. 28, 1976, 763719

Int. Cl.[2] **F16K** *25/00, 5/06*

U.S. Cl. 251—86 **5 Claims**



1. A ball valve comprising

a body provided with a flow channel;

a generally ball-shaped rigid closing organ;

sealing rings fitted into ring-shaped and transverse grooves in the valve body on both sides of said closing organ;

a pair of spindles associated with said closing organ and provided extending from opposite sides thereof for receipt by said body, and mounting said organ so that the pressure of fluid on said organ tips said organ into sealing engagement against a said sealing ring; and

means for actuating said organ to rotate it with respect to said body to effect opening and closing of said flow channel, said means including one of said spindles extending through said body to the exterior thereof through a sealing mechanism, said one spindle having a joint portion at a first end thereof; a pair of bearing blocks provided on a side of said organ adjacent to said one spindle, said bearing blocks straddling said one spindle joint portion and being spaced from each other and with respect to the dimensions of said joint portion so that a clearance is provided between said joint portion and said bearing blocks sufficient to allow tipping of said organ into sealing engagement with a said sealing ring under the influence of fluid pressure; and means for mounting said one spindle with respect to said bearing blocks so that low-torque turning of said organ is effected by initial rotation of said one spindle so that said joint portion engages said bearing blocks and moves said organ out of tipping engagement with a said sealing ring, and so that continued rotation of said one spindle effects rotation of said organ to a desired position.

4,174,091

DRAIN VALVE

William R. Donahue, Jr., Batavia, and Wesley S. Swanson, Elk Grove Village, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 737,111, Oct. 29, 1976, abandoned. This application Aug. 28, 1978, Ser. No. 937,356

Int. Cl.[2] **F16K** *31/02*

U.S. Cl. 251—138 **4 Claims**

1. A drain valve for use in dishwashing machines, comprising:

(a) a housing defining a substantially continuously extending flow chamber having an inlet passage and an outlet passage and a valve seat disposed in said flow chamber intermediate said inlet and outlet in the flow stream therebetween;

(b) means defining a valve chamber communicating with said flow chamber in a direction transverse with respect to flow therethrough;

(c) valve means including a pivot member disposed within said valve chamber and having portions thereof pivotally mounted therein, said valve means including a poppet mounted on said pivot member, said member being movable between a closed position in which said pivot member extends into said flow chamber and said poppet sealingly engages said valve seat to prevent the flow of fluid therethrough and an open position in which said pivot member and said poppet are substantially within said valve chamber whereby said flow chamber is substantially unrestricted;

(d) means for biasing said pivot member and said poppet to said closed position;

(e) solenoid means mounted on said housing and including a movable armature;

(f) an actuator member having portions thereof connected to said armature;

(g) said pivot member including a crank section extending exteriorly of said flow chamber, said actuator member



having other portions thereof rotatably connected to said crank section near the free end thereof for translating movement of said actuator member to rotational movement of said pivot member; and

(h) spacer means received on said crank section near the free end thereof, said spacer means being an annular member defining a transversely extending abutment surface which registers against portions of said crank section thereby limiting movement of said annular member on said crank section, said spacer means being effective for positioning said actuator member on said crank section such that a predetermined amount of lateral movement of said actuator member is permitted toward and away from said spacer means at said point of connection to said crank portion, said lateral movement of said actuator member being effective for permitting alignment of said armature within said solenoid for minimizing chatter and vibration therein, wherein said solenoid is operable upon activation to overcome the force of said biasing means to move said actuator member and said crank member thereby moving said poppet member to said open position.

4,174,092

ROTARY VALVE WITH STEM SEAL MEANS

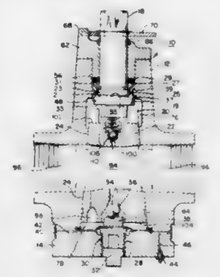
John G. Macleod, Butler, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 29, 1977, Ser. No. 828,509

Int. Cl. F16k *31/44*

U.S. Cl. 251—214 **10 Claims**

1. A valve comprising: a casing having a passageway therethrough for the flow of fluid, said casing having a bore intersecting the passageway; a flow regulating member rotatably mounted in the bore for blocking said passageway in a valve closed position of said flow regulating member, said flow regulating member having a port therethrough for connecting and being in communication with said passageway in a valve open position, said flow regulating member and said casing defining a first chamber at one end of said flow regulating member; a stem rotatably mounted within said casing and mechanically coupled to said flow regulating member within said casing, said stem having an annular rim formed toward and positioned within said first chamber; at least one annular seal surrounding said stem to effect the seal between said stem and said casing; means for introducing a pressure equal to or greater than the line pressure into said first chamber whereby said pressure acts on said annular rim to move said stem in an axial direction to compress said annular seals; said flow regu-



lating member is a tapered plug rotatably mounted in said bore which is tapered to conform to said tapered plug, said plug and said casing defining said first chamber at the smaller end of said plug; the outside diameter of said annular rim formed on said stem is less than the inside diameter of said first chamber; a ring surrounds said stem to rotate therewith, said ring having a radially extending face which sealingly contacts said annuar seal; a pressure tight seal is effected by said annular seal, there being moving contact between the outer surface of said stem and the inward facing surface of said annular seal and between said radially extending face of said ring and said radially extending surface of said annular seal in contact with said radially extending face.

4,174,093

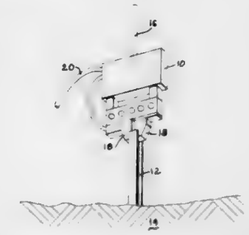
GRIPPER JAW

Thomas R. Shearer, Ligonier, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Apr. 28, 1978, Ser. No. 901,247

Int. Cl.[2] **E21B** *19/00*

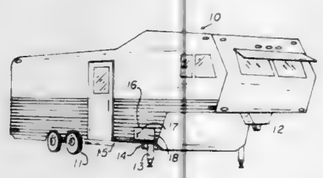
U.S. Cl. 254—29 R **6 Claims**



1. A gripping jaw for a driving/extracting head and comprising: a block-like body having a front face and a back face with said back face adapted for attachment to a powerdriven arm; said front face having holes formed therein and compacts of hard wear resistant material seated in said holes with an end of said compact protruding beyond said front face and bores

smaller than said hole extending from said hole through said back face of said block.

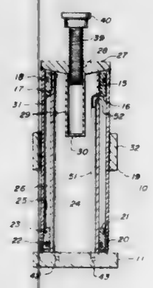
4,174,094
RECREATIONAL VEHICLE LEVELING AND SUPPORT SYSTEM
Joseph M. Valdespino, 5023 Golf Club Pkwy., and Ronald A. Brandl, 3040 N. Pine Hills Rd., both of Orlando, Fla. 32808
Filed Feb. 3, 1978, Ser. No. 874,852
Int. Cl.[2] B60S *9/02*
U.S. Cl. 254—86 H **5 Claims**



1. A recreational vehicle leveling system comprising in combination:
a plurality of fluid cylinders each having at least two telescoping rods, the first rod being mounted in the cylinder casing, and the second rod being mounted in the casing of the first rod to telescope the cylinders from the main casing;
an electrical power source;
electrical motor driven compressor connected to said electrical power source;
valve means operatively connected between said compressor and each said fluid cylinder, said valve means having a manifold connected to said compressor and having a plurality of air lines extending therefrom, each air line having an individual valve therein operated by a valve handle and each air line being connected to one of said plurality of fluid cylinders;
means to reverse the pressure applied to said valve means by said compressor from a positive to a negative pressure, whereby said slidable cylinders can be driven in two directions by the air pressure applied thereto and said means to reverse the pressure applied to said valve means, and said valve means operating handles being located in a panel adjacent each other, whereby each said cylinder can be operated in either direction from a central point; and
means for locking each said air cylinder in position following the leveling of said recreational vehicle said means for locking each said cylinder having a pair of locking clamps located on each cylinder.

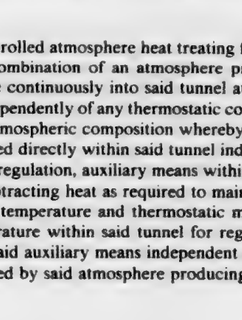
4,174,095
HYDRAULIC JACK
Donald I. Chipman, Estherville, Iowa, assignor to General Electric Company, Schenectady, N.Y.
Filed Feb. 17, 1978, Ser. No. 878,729
Int. Cl.[2] B66F *3/24*
U.S. Cl. 254—93 H **5 Claims**

1. A hydraulic jack comprising:
a base,
an elongate, cylindrical, fixed member mounted on said base and projecting upwardly therefrom
an elongate, cylindrical, moveable member positioned exteriorly around said fixed member and having its inner surface spaced from the exterior surface of said fixed member,
means closing the upper end of said moveable member,
the interior of said fixed and moveable members defining an expandable and contractable first chamber, the space defined between the exterior surface of said fixed member and the interior surface of said moveable member defining a second expandable and contractable chamber,
a pair of passage means in said base and being connected to a source of fluid under pressure, one of said passage means being connected in communicating relation to said first chamber and the other passage means being connected to a conduit projecting upwardly from the base through the interior of said fixed member and being connected to a part in the upper end portion of said fixed member, said part being connected in communicating relation to said second chamber whereby when fluid is directed through said one passage means into said first chamber, said moveable member will be shifted vertically upwardly and fluid will be evacuated from said second chamber, and when fluid is directed through the other passage means into said chamber, the moveable member will be shifted vertically downwardly and fluid will be evacuated from said first chamber through said first passage means,
and a lift element on said moveable member being vertically adjustable relative thereto, said lift element adapted to engage a device to be elevated by said jack, whereby when said moveable member is shifted vertically upwardly relative to said fixed member, the device engaged by the lift member will be elevated.

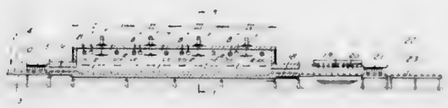


4,174,096
FENCE
David L. Campbell, Anchorage, Ak., assignor to Richard G. Miller; Clifton W. Little, both of Houston; Alex Yovan, Alta Loma, all of, Tex.; Charles M. Gause, Anchorage, Ak.; Don Harvey Campbell, Freeport, Tex.; Sam P. McManus, Houston, Tex.; David L. Weiler, Brookshire, Tex.; Clodis H. Cox, Katy, Tex.; Mable E. Weiler, Rapid City and Richard T. Weiler, Sterling Heights, both of, Mich.
Filed Jun. 6, 1977, Ser. No. 803,880
Int. Cl.[2] E04H *17/16*
U.S. Cl. 256—24 **25 Claims**

1. A rail fence section adapted for interchangeable mounting on an upstanding mast comprising:
a wall portion having a front and a rear surface, a first and a second horizontal edge, and a first and a second vertical edge;
a first and a second mounting member respectively disposed adjacent said first and second vertical edges of said wall portion, each mounting member having a mast-receiving opening extending therethrough, each mounting member having a mating surface thereon, said mating surfaces being disposed in a common plane, each mounting member being connected to said wall portion such that said first mast-receiving opening is disposed adjacent said front surface of said wall portion and said second mast-receiving opening is disposed adjacent said rear surface of said wall portion;
said mating surface on said first mounting member adapted to matingly engage against a mating surface on a second mounting member of a next-adjacent fence section such that said opening in said first mounting member vertically registers with an opening extending through the second mounting member on the next-adjacent fence section and such that the mounting members on each adjacent fence section are obscured when viewed from both the front and rear.

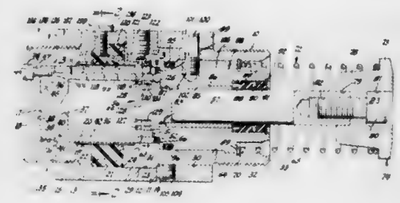


4,174,097
FURNACE FOR BRIGHT ANNEALING OF COPPER
Donald J. Schwalm, Northville, Mich., assignor to Holcroft & Company, Livonia, Mich.
Filed Nov. 3, 1977, Ser. No. 848,155
Int. Cl.[2] F27B *9/04*
U.S. Cl. 266—87 **8 Claims**



1. In a controlled atmosphere heat treating furnace having a tunnel, the combination of an atmosphere producing device pre-set to fire continuously into said tunnel at a constant rate and ratio independently of any thermostatic control to produce the desired atmospheric composition whereby the heat is constantly released directly within said tunnel independent of any thermostatic regulation, auxiliary means within said tunnel for adding or subtracting heat as required to maintain the desired heat treating temperature and thermostatic means responsive to the temperature within said tunnel for regulating the heat supplied by said auxiliary means independent of the heat constantly released by said atmosphere producing device.

4,174,098
SHOCK ABSORBER AND MOUNTING MEANS THEREFOR
Ralph C. Baker, Northville; Larry E. Ellis, Farmington, and Francis M. Simpson, Jr., Livonia, all of Mich., assignors to ACE Controls, Inc., Farmington, Mich.
Filed Jul. 3, 1978, Ser. No. 921,589
Int. Cl.[2] F16F *9/19, 9/34, 9/44*
U.S. Cl. 267—8 R **14 Claims**



1. A shock absorber comprising:
(a) an outer tube which is enclosed at one end and open at the other end;
(b) an inner tube mounted in the outer tube, through the open other end of the outer tube, and having an enclosed inner end disposed against the enclosed end of the outer tube and being open at its outer end;
(c) a piston assembly extended into the outer tube open end and being slidably mounted in the open outer end of the inner tube;
(d) said piston assembly including a piston rod having an impact receiving button on the outer end thereof for receiving loads to be decelerated;
(e) an accumulator chamber formed interior of said outer tube and between said inner tube and outer tube;
(f) a plurality of longitudinally spaced metering orifices forming through said inner tube and communicating said inner tube with said chamber;
(g) a meter tube rotatably mounted in said outer tube and about said inner tube engageable with the inner tube for retaining it against axial movement in the outer tube, and provided with a plurality of metering openings for regulating the flow of fluid through said metering orifices in the inner tube during a load deceleration operation;
(h) an inner tube lock member mounted in said enclosed end of the outer tube and engageable with the inner tube for retaining the inner tube against rotation in the outer tube;
(i) a rotatable retainer member detachably mounted in said open other end of the outer tube and having said piston rod slidably mounted therethrough;
(j) a meter tube adjusting ring rotatably mounted about the outer periphery of said outer tube;
(k) means extended through said outer tube for connecting said adjusting ring to said rotatable retainer member in said outer tube;
(l) means mounted between the rotatable retainer member and said meter tube for axially retaining the meter tube in its operative position;
(m) fluid passageway means interconnecting said accumulator chamber and the open end of said inner tube; and,
(n) means in said outer tube for admitting hydraulic fluid into said accumulator chamber, fluid passageway means and inner tube, whereby when the piston assembly is moved inwardly of said inner tube, when an impact load is received by said piston assembly, the fluid in the inner tube is forced through the metering orifices in the inner tube and through the metering holes in the meter tube and into said accumulator chamber and through said fluid passageway means and into the open end of the inner tube behind the piston assembly, and when the piston assembly is moved outwardly of said inner tube after said impact load is decelerated, the fluid in the open end of the inner tube

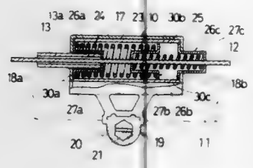
is forced from the open end of the inner tube and back through the fluid passageway means and through the accumulator chamber and through said metering holes and orifices and into the inner tube in front of the piston assembly.

4,174,099

SAFETY DEVICE FOR USE WITH SPEED CHANGE GEAR SYSTEM OF A BICYCLE

Kazuto Yamasaki, Sakai, Japan, assignor to Maeda Industries, Ltd., Osaka, Japan

Filed Feb. 14, 1978, Ser. No. 877,739
Claims priority, application Japan, Feb. 14, 1977, 52-17130[U]
Int. Cl.² F16F *3/04*
U.S. Cl. 267—168 **9 Claims**



1. A safety device for use with a speed change gear system of a bicycle comprising:

a hollow cylindrical shell member having an opening at opposite ends thereof, respectively;

a first coil spring of larger diameter and a second coil spring of smaller diameter, both of which are disposed within said shell member in coaxial alignment and in partially overlapped relation with each other;

three axially spaced slide members, viz., a first slide member, a second slide member, and a third slide member, axially slidably disposed within said shell member, respectfully, so as to cooperate with said first and second coil springs;

each of said three slide members including a hollow cylindrical body which has an opening end at one side formed with an integral annular flange, and an end wall at the other side formed with a through hole for permitting a bicycle gearshift wire to pass therethrough;

said first slide member being disposed adjacent one end of said shell member and connected to one end of a tubular sheath which extends between said shell member and a rear derailleur for bicycle speed change;

said gearshift wire passing through said tubular sheath for operatively connecting said rear derailleur with a speed change lever of a bicycle;

said second slide member being disposed between said first slide member and said third slide member;

said third slide member being disposed adjacent the other end of said shell member;

said first slide member being disposed with its cylindrical body directed axially inward;

said second slide member being disposed with its cylindrical body axially directed toward said first slide member;

said third slide member being disposed in such a manner that its cylindrical body projects out of one end of said shell member;

said first coil spring being interposed in abutment between said annular flange of said first slide member and said annular flange of said second slide member, and

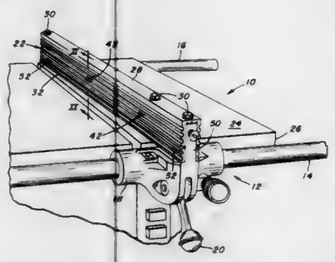
said second coil spring being interposed in abutment between said end wall of said second slide member and said end wall of said third slide member.

4,174,100

ADJUSTABLE FENCE

John H. Estess, Tupelo, Miss., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 27, 1978, Ser. No. 890,145
Int. Cl.² B23Q *3/00*
U.S. Cl. 269—306 **4 Claims**



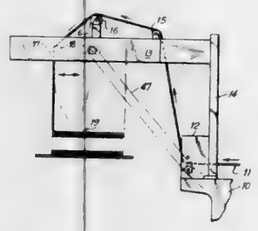
1. A guage adapted for use with a machine tool having a worktable, gauge supporting means separate from the table but secured thereto adjacent both the front and the rear edges thereof, said means providing gauge clamping surfaces therealong, said gauge being movable over said table, said gauge having front and rear clamping brackets, and a two-part rail member connecting said clamping brackets, said two-part rail member comprising, a downwardly open channel-shaped upper member fixed to said clamping brackets and a table-engaging lower member adjustably fixed to said upper member.

4,174,101

HIGH SPEED HORIZONTAL FOLDER

Robert Frezza, Carle Place, N.Y., assignor to Samcoe Holding Corporation, Woodside, N.Y.

Filed Jan. 3, 1978, Ser. No. 866,487
Int. Cl.² B65H *45/20*
U.S. Cl. 270—79 **13 Claims**



1. A high speed horizontal folder for fabric web material and the like, which comprises

(a) a pair of downfeed rollers,

(b) reciprocating means for reciprocating said downfeed rollers back and forth over a folding platform at a predetermined rate of reciprocation.

(c) means to deliver the web material in a generally downward direction to said downfeed rollers at a steady rate corresponding to said rate of reciprocation of said downfeed rollers,

(d) a drive means to rotatingly drive said downfeed rollers comprising an endless drive element mounted on said folder at a position remote from said reciprocating means and means for driving said element so that at least a portion thereof is advanced unidirectionally at a constant rate corresponding to the rate of delivery of the fabric web,

(e) means interconnecting the downfeed rollers to said unidirectionally driven portion of the drive element in any position of the downfeed rollers, whereby said drive element tends to drive the rollers at a faster rotational speed when the rollers are moving in a first direction of a reciprocating stroke and at a slower rotational speed when the rollers are moving in the opposite direction of the reciprocating stroke, and

(f) compensating means associated with said interconnecting means and said downfeed rollers providing differential peripheral speeds for the respective downfeed rollers to compensate for the faster and slower rates of speed caused by the relative motion between said unidirectionally moving portion of the drive element and said reciprocating downfeed rollers, thereby providing a uniform rate of delivery of the fabric web by the downfeed rollers.

7. A high speed horizontal folder for fabric web material and the like, which comprises

(a) a pair of horizontally reciprocating downfeed rollers,

(b) downfeed roller carriage means supporting said rollers at each end,

(c) means to deliver the web material in a generally downward direction to said downfeed rollers at a predetermined rate of delivery,

(d) unidirectionally moving endless carriage drive means for effecting reciprocating movement of said downfeed rollers at a rate substantially equal to said rate of delivery of web material to the folder,

(e) a pair of counterweights, one opposite each end of the downfeed rollers, mounted for reciprocation substantially in the reciprocating plane of said downfeed rollers,

(f) said counterweights being connected to said unidirectionally moving endless carriage drive means for reciprocation approximately 180° out of phase with the reciprocating motion of said downfeed rollers, whereby the moving weight of said counterweight effectively balances out the inertia of said downfeed roller carriage means, and

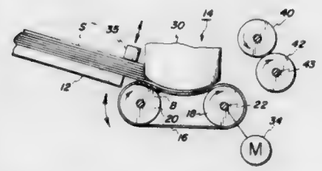
(g) continuously driven downfeed roller drive means engaging said downfeed rollers in any position for effecting continuous, substantially constant speed rotation thereof during reciprocation thereof.

4,174,102

SHEET SEPARATING AND FEEDING APPARATUS

Don P. Clausing, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 1, 1977, Ser. No. 812,217
Int. Cl.² B65H *3/04*
U.S. Cl. 271—35 **8 Claims**



1. An apparatus for feeding and separating individual sheets from a stack of sheets which comprises in combination:

a belt member mounted adjacent the forward edge of the stack of sheets for feeding from the bottom of the stack;

friction retard means positioned along said forward edge of the stack to allow feeding of only one sheet beneath said friction retard;

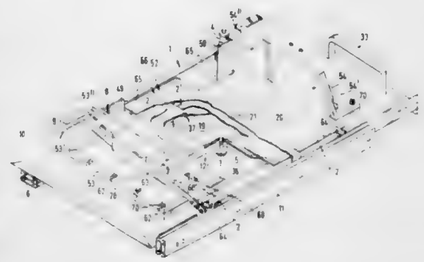
sheet transport means positioned in the path to advance the sheets as they are fed by said belt member, said belt member being pivotable on an axis to move from a first position in contact with the bottom of the stack to a second position in a direction away from said stack whereby the retard forces on the sheet being fed are greatly reduced, wherein said sheet transport means includes a plurality of rolls coaxial with said pivot axis.

4,174,103

MAGAZINE FOR HOLDING A STACK OF SHEET MATERIAL

Günter Back, Hofheim-Diedenbergen, and Reinbold Euler, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 7, 1978, Ser. No. 894,326
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2715948
Int. Cl.² B65H *1/04, 3/56*
U.S. Cl. 271—171 **25 Claims**



1. A magazine for holding a stack of sheet materials and being adjustable to accommodate stacks of different size sheet materials, comprising:

a. a base plate;

b. two sliding plates mounted on said base plate so as to be longitudinally slideably displaceable with respect to each other;

c. a bottom plate positioned in spaced relationship above said sliding plates and being mounted on said base plate so as to be laterally slideably displaceable;

d. a cam follower mounted on the side of said bottom plate facing said sliding plates;

e. means, mounted on one opposing axial end of each of said sliding plates, for longitudinally confining the stack of sheet materials;

f. means, mounted on at least one lateral side of said bottom plate, for laterally confining the stack of sheet materials; and

g. means, including a lever pivoted on said base plate and positioned in the space between said sliding plates and said bottom plate and a cam disk pivoted on said base for rotation with movement of said lever and positioned above said lever in said space so as to engage the camming surface of said cam disk with said cam follower, for longitudinally displacing said sliding plates and laterally displacing said bottom plate in response to movement of said lever.

4,174,104

CONVEYOR FOR CARDS AND SIMILAR ARTICLES

Mark C. Garvey, Antioch, Ill., assignor to Garvey Corporation, Blue Anchor, N.J.

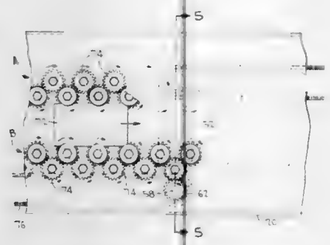
Filed Jul. 27, 1977, Ser. No. 819,465
Int. Cl.² B65H *5/06*
U.S. Cl. 271—272 **8 Claims**

1. A conveyor for moving a plurality of articles including cards successively in flat horizontal position comprising

a plurality of supporting structures each comprising an inverted channel the web of which provides a longitudinally elongated bed,

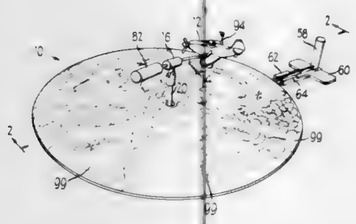
a plurality of rollers mounted in each supporting structure

along said bed for rotation on vertical axes in two longitudinally extending lines laterally spaced apart,
each roller having a peripherally chamfered end portion and an axially spaced drive-receiving portion,
power means including an electric motor carried by each supporting structure connected to the drive-receiving portions of the rollers for rotating the rollers of the two lines in opposite directions,
whereby each supporting structure and its supported elements comprise a complete conveyor module,
means splicing the modules endwise to each other to form a continuous conveyor,



gearing traversing said splicing means connecting the rollers of contiguous modules to each other for insuring uniform rotation of all the rollers of the conveyor,
said splicing means comprising a short upright channel having its upturned flanges bolted to the downturned flanges of adjacent supporting structure channels, and
legs having their tops bearing the webs of the splicing means channels, thereby supporting the entire conveyor,
whereby rotation of the rollers causes cards having their longitudinal edge margins seated in the chamfers of the rollers to be propelled along the bed.

4,174,105
PLAYER ACTUATED FLYING TOY
Burton C. Meyer, Downers Grove, and Alan A. Hicks, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Feb. 10, 1978, Ser. No. 876,405
Int. Cl.² A63H 27/04
U.S. Cl. 272—31 A **3 Claims**



1. An action toy having an airplane rotated at a speed and elevation as controlled by a player of the toy, comprising:
a base including an enlarged platform area defining a playing surface generally below the area of movement of the airplane;
a generally vertical rotatable shaft mounted at the center of the playing surface;
a support arm pivotally connected to the top of said shaft having the airplane connected to a first end of said arm;
a centrifugal elevating means mounted at the opposite end of said arm at an angle relative to the length of the arm;
a rotatable drive gear secured to the bottom of said shaft, generally below said platform;
a first plate slidably mounted on said base for reciprocal sliding movement generally transverse to said shaft;
manually operable means mounted exteriorly of the periphery of said platform to permit reciprocating of said first plate by a player of the game;
a drive plate mounted on said first plate including a pair of sets of teeth for engaging and rotating said gear, a first set of said teeth engaging and rotating said gear upon movement of said drive plate in a first direction and a second set of teeth for engaging said gear upon movement of said drive plate in a second direction; and
lost motion means between said first plate and said drive plate for moving said drive plate, in response to operation of said manually operable means for engaging the respective set of teeth with said gear whereby the speed of rotation of said shaft and altitude of said airplane is controlled by the operation of said manually operable means by a player of the game.

4,174,106
GAME OF SKILL
Willi Moser, Unteres Hardt 6a, 8937 Bad Wörishofen, Fed. Rep. of Germany
Filed Oct. 27, 1977, Ser. No. 846,210
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649381
Int. Cl.² A63F 9/14
U.S. Cl. 273—1 E **8 Claims**



1. A game of skill comprising a remotely controlled toy or model vehicle, for example an automobile, movable along a path of travel having limited boundaries, a central command unit, an arrangement for remotely controlling the operation of said vehicle, and a photographic device disposed for taking a picture of a person operating said remote control arrangement, said path of travel having in the vicinity of its end part a switch contact which is operable by said vehicle to trigger said photographic device, wherein said path of travel is constituted by a transparent plate and photoelectrical cells are disposed beneath said plate in positions defining the boundary of the path of permitted travel and are connected to said command unit, light sources being disposed above the plate and said path of travel, whereby an operating signal will be produced at said command unit in response to trespass of said vehicle from the prescribed path of travel.

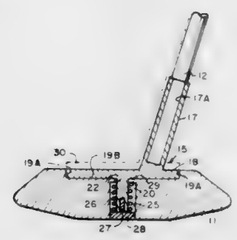
4,174,107
TETHERED BALL TENNIS PRACTICE DEVICE
Robert B. Hickey, Pembroke Pines, Fla., assignor to George L. Mitchell, Miami, Fla.
Filed Aug. 31, 1977, Ser. No. 829,295
Int. Cl.² A63B 61/00
U.S. Cl. 273—29 A **8 Claims**

1. A tennis practice device comprising:
a hollow container adapted for receiving a weighting material;
a lid threadably attached to said container for enclosing said weighting material;
an elongated elastic line;
means for attaching one end of said elastic line to said lid;
a tennis ball; and,



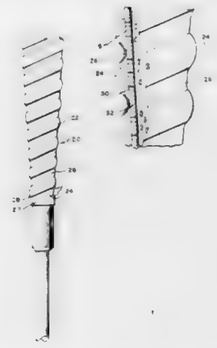
means for attaching the other end of said elongated elastic line to a tennis ball;
the threads of said lid being adapted to permit said elastic line to pass therebetween without damaging said elastic line when said lid is threadably attached to said container.

4,174,108
ADJUSTABLE GOLF PUTTER
Orville A. Reinholz, 4899 Campbell Ave., Apt. #2, San Jose, Calif. 95130
Filed Apr. 27, 1978, Ser. No. 900,604
Int. Cl.² A63B 53/06
U.S. Cl. 273—79 **7 Claims**



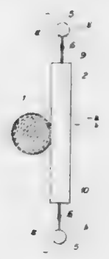
1. An adjustable golf club comprising in combination:
a shaft having a rigidly-connected substantially right angularly disposed planar member attached thereto at one end, said planar member extending in at least two directions from the shaft;
a head having a top surface forming a recess sized to receive said planar member with the top surfaces substantially coinciding with the same plane and align said shaft with the head for hitting a golf ball;
a stub shaft rigidly fixed to the surface of the planar member opposite the shaft such that when the planar member is positioned to fit into the recess, said stub shaft extends substantially normal to said planar member at a position intermediate the planar member ends;
said head including a well opening into said recess and positioned to receive said stub shaft when the planar member is seated in the recess;
means to lock and spring-load said stub shaft in said well to spring-load said planar member in said recess; and
said head having surfaces on two sides configured to strike the ball whereby by moving the head relative to said shaft to unseat the planar member from the recess, the head can be rotated one hundred eighty degrees and the planar member repositioned in the recess to allow hitting the ball with either surface.

4,174,109
ADHESIVELY BONDED HAND GRIP SLEEVE FOR HAND TOOLS AND THE LIKE
Conrad J. Gaiser, 24 S. 66th Pl., Long Beach, Calif. 90802
Filed May 10, 1978, Ser. No. 904,538
Int. Cl.² A63B 53/14
U.S. Cl. 273—81.6 **7 Claims**



1. A manual tool having a handle with a hand grip for grasping by a user and a cover member comprising a porous tape spiral wrap about said handle with a continuous open-edge seam between adjacent tape wraps and being secured to said handle by an adhesive tape spiral wrap overlying said open-edge seam and adjacent edges of said porous tape thereby resulting in a gripping surface of interspaced spiral wraps of said adhesive tape and said porous tape, said porous tape formed of a reticulated plastic foam.

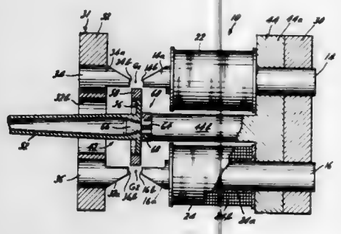
4,174,110
INERTIA BALANCED GOLF CLUB
Zenzo Yamamoto, 2-40-3, Okuzawa, Setagaya-ku, Tokyo, Japan
Filed Feb. 10, 1978, Ser. No. 876,707
Claims priority, application Japan, Apr. 21, 1977, 52/46252
Int. Cl.² A63B 53/04
U.S. Cl. 273—169 **4 Claims**



1. A golf club, comprising:
a head having a striking face;
two weights, respectively disposed with respect to said head adjacent to the toe and heal of the head; and
connecting means comprising at least one resilient element, for swingably connecting said weights to said head in such a manner that said weights are independently swingable, with respect to said head when the club is in use, at a right

angle to the longitudinal axis of said head in a plane perpendicular to the plane of the striking face of the head.

4,174,111
COMPRESSIVE PIVOT SUSPENSION SYSTEM FOR AN ELECTROMAGNETIC CARTRIDGE
Joseph F. Grado, 4614 Seventh Ave., Brooklyn, N.Y. 11220
Continuation of Ser. No. 414,983, Nov. 12, 1973, abandoned. This application Sep. 12, 1975, Ser. No. 612,770
Int. Cl.[2] G11B *3/52*
U.S. Cl. 274—37 **11 Claims**



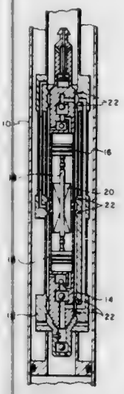
1. An electromagnetic cartridge for the reproduction of sound recordings including a support, a magnetic structure on said support including first, second, third and fourth pole pieces and a front magnetic member defining first and second operating gaps and third and fourth operating gaps, said first and second operating gaps extending symmetrically of a first plane and said third and fourth operating gaps extending symmetrically of a second plane and substantially at right angles to the first plane, a coil mounted on each pole piece, the coils for said first and second operating gaps being connected in series and the coils for the third and fourth operating gaps being connected in series, a rigid stylus lever having an interior wall and disposed symmetrically of said operating gaps having a stylus proximate one end, generator means rigidly and operatively connected to said stylus lever and disposed symmetrically with and proximate to said operating gaps, means for supending said stylus lever from said support including an elastomeric socket member formed on the interior wall of said stylus lever, a pivot member operatively connected to said support and operatively disposed in said elastomeric socket member and means operatively disposed between said stylus lever and said support and arranged to urge said pivot member to bear against said socket member.

4,174,112
SEAL ASSEMBLY
Donald E. Carrens, Tulsa, Okla., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Sep. 13, 1978, Ser. No. 942,092
Int. Cl.[2] F16J *15/32*
U.S. Cl. 277—171 **8 Claims**

1. In a downhole hydraulically operated pump having a generally cylindrically shaped pump body which has an annular seal assembly therearound and which is mounted within a bore in a hollow pump housing, an improved seal assembly comprising:

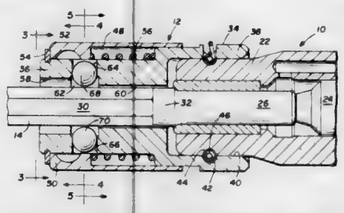
(a) a cross-sectionally generally dovetail shaped groove around said pump body; and

(b) an annular seal element mounted in said groove and having an inner surface resting adjacent to the bottom of said groove, an outer portion including an outer peripheral sealing surface extending from one end thereof over a major portion of the exterior of said seal element, and a lip formed at the opposite end thereof by a recess around the outer perimeter thereof which undercuts a segment of said seal ring at that end portion thereof, said lip being shaped so that fluid pressure acting toward the end of said seal



element having said lip will bias said lip outward into sealing engagement with the pump housing.

4,174,113
BIT RETAINER FOR PNEUMATIC TOOLS
Richard E. Eckman, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed May 8, 1978, Ser. No. 904,136
Int. Cl.[2] B25D *17/08*
U.S. Cl. 279—19.4 **6 Claims**



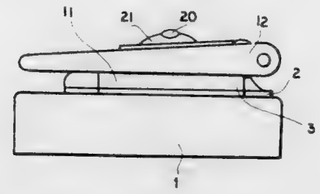
1. An improved retainer for releasably securing bits, such as chisels, chippers, or the like, having a generally elliptical flange on the shanks thereof in pneumatic tools comprising:

a retainer body including a nose end and a rear end arranged for connection to the pneumatic tool, said body having a bore extending axially through said ends for receiving the bit, said bore having a front portion of generally elliptical cross-section to receive the elliptical flanges, an intermediate portion of generally circular cross-section of a diameter at least equal to the major axis of said front portion, and a rear portion of approximately the same cross-section as said front portion, said rear portion having a major axis disposed at an angle relative to the major axis of said front portion and said body also having a pair of radially disposed ports intersecting the intermediate portion of said bore;

a bit latching member movably located in each of said ports; and,

an annular sleeve slidingly positioned on said body for movement between latched and unlatched positions, said sleeve including an inwardly extending flange portion for engaging said latching members when said sleeve is in a latched position to limit the space between said members to a distance approximately equal to the minor diameter of the bore in said front portion, said sleeve having a groove in the interior thereof for receiving said latching members when said sleeve is in an unlatched position to permit radial movement of said latching members to a position wherein the space therebetween is at least equal to the major axis of the front portion of said bore.

4,174,114
CROSSOVER PREVENTER FOR SKIS
Hans Hinterholzer, 5759 Saalbach, Land Salzburg, Austria
Filed Apr. 20, 1978, Ser. No. 898,417
Int. Cl.[2] A63C *11/00*
U.S. Cl. 280—11.37 E **8 Claims**



1. An anticrossing device for a ski comprising:

a base plate adapted to be fixed on an upper surface of said ski;

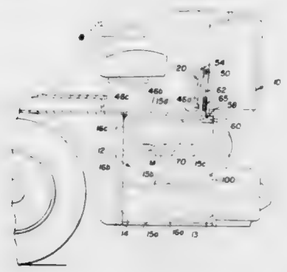
a support body pivotally mounted on said base plate;

a stirrup-shaped barrier member swingably mounted on said support body and defining an axis therewith about which said barrier member is swingable into an upright position limiting crossing of skis;

spring means on said support body for biasing said barrier member into said upright position; and

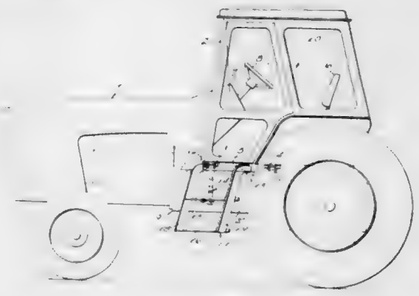
indexing means between said base plate and said support body for indexing said support body selectively in one of three positions, two of the indexable positions having said axis parallel to the longitudinal edges of the ski and the third indexable position having said axis transverse to said longitudinal edges.

4,174,115
MOTORIZED BI-FOLD STEPWELL COVER
John W. Youngblood, 3201 Franklin, Waco, Tex. 76710
Filed Dec. 27, 1977, Ser. No. 864,461
Int. Cl.[2] B60R *3/00*
U.S. Cl. 280—163 **10 Claims**



1. In a vehicle having steps in a stepwell, a stepwell cover comprising: inboard and outboard deck segments; means pivotally securing the inboard deck segment adjacent an upper end of a side of the stepwell, said inboard deck segment being moveable between a substantially vertically disposed first inboard deck segment position and a substantially horizontally disposed second inboard deck segment position; means pivotally securing said outboard deck segment to the inboard deck segment, said outboard deck segment being moveable between a substantially vertically disposed first outboard deck segment position and a substantially horizontally disposed second outboard deck segment position; a first curved surface; means securing said first curved surface relative to the vehicle; a second curved surface; means securing said second curved surface to said outboard deck segment, said first curved surface having a radius of curvature substantially equal to two times the radius of curvature of the second curved surface; and a flexible tension carrying member extending about said first and second curved surfaces such that movement of said inboard deck segment between said first and second inboard deck segment positions moves said outboard deck segment between said first and second outboard deck segment positions.

4,174,116
ISOLATED STEP SUPPORT
Michael L. Slosiarek, Greenfield, and Gregory A. Krieger, Brookfield, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Jul. 31, 1978, Ser. No. 929,290
Int. Cl.[2] B60R *3/02*
U.S. Cl. 280—163 **10 Claims**

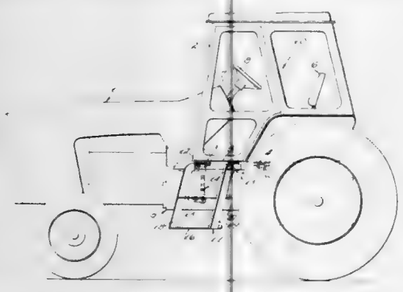


1. A vehicle having an isolated step comprising, a vehicle chassis, a platform, isolators resiliently mounting said platform on said vehicle chassis, a step mounted on said vehicle platform, a stabilizer mounted on said vehicle chassis, isolator means connected between said stabilizer and said step partially supporting said step and dampening vibrations between said stabilizer and said step, said isolator means including fastening means fastened to said stabilizer, securing means secured to said step, and an elastomer consisting of a horizontal elastomeric element extending between said fastening means and said securing means to reduce transmission of vibrations and sound between said stabilizer and said step and provide a cushioned support for said step.

4,174,117
ISOLATED STEP SUPPORT
Michael L. Slosiarek, Greenfield, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Dec. 22, 1977, Ser. No. 863,337
Int. Cl.[2] B60R *3/00*
U.S. Cl. 280—163 **10 Claims**

1. An isolated step for a vehicle comprising, a vehicle chassis, a vehicle cab, isolators resiliently mounting said cab on said vehicle chassis, a step mounted on said vehicle cab, a step

support mounted on said vehicle chassis, isolator means on said step support supporting said step and dampening vibrations of



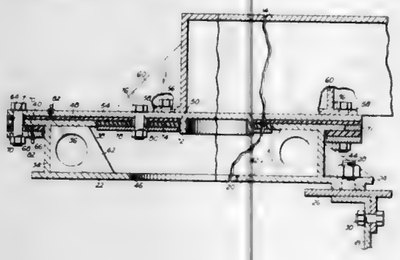
said step in at least two directions to thereby reduce vibrations of said step and cab.

4,174,118

PIVOTAL LOG BUNK SUPPORT FOR VEHICLES

Cecil I. Heyne, and Leelin F. Kirk, both of Estacada, Oreg., assignors to Rowley Trailers, Inc., Estacada, Oreg.

Filed Aug. 1, 1977, Ser. No. 820,790
Int. Cl.[2] B62D *53/08*
U.S. Cl. 280—179 R **5 Claims**



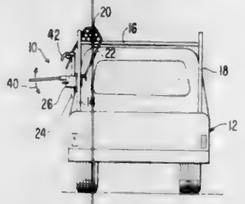
1. A pivotal log bunk for vehicles comprising
(a) a base member arranged to be secured in a fixed position on the vehicle,
(b) said base member having an upright exterior circular peripheral surface and a flat substantially horizontal top surface,
(c) a flat disc member of resinous plastic seated on said top surface and operating with said surface as a load supporting bearing,
(d) a load plate seated on said disc member,
(e) means on said load plate arranged to secure a bunk integrally thereto,
(f) a flange on said base member extending outwardly around an outer portion thereof,
(g) an annular retainer plate engaging under said flange,
(h) an annular resinous plastic disc disposed between said retainer plate and said flange and having edge thrust bearing engagement against said peripheral surface of the base member,
(i) and bolt means releasably securing said load plate and retainer plate together for rotation horizontally on said base member,
(j) said base member and disc member having an extended width so as to provide sole lateral support for a bunk on the load plate.

4,174,119

HOLD-DOWN UNIT FOR PICK-UP TRUCK

James A. Biles, 142 McBain Ct., Campbell, Calif. 95008

Filed Jun. 26, 1978, Ser. No. 918,909
Int. Cl.[2] B60P *7/00*
U.S. Cl. 280—179 A **7 Claims**



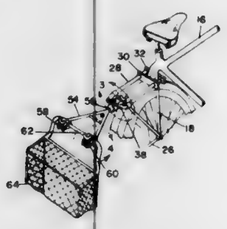
1. A hold down unit for applying tension to a flexible tie-down member comprising: a bar; an actuatable jacking unit having a passage therethrough for receiving the bar and providing with means engageable with the bar for selectively moving the bar in either of a pair of opposed directions, said jacking unit having means for attaching the same to a side of a vehicle or an upright post of same; and cam means on the bar for urging a tie-down member into frictional engagement with the bar so that, when the bar is moved in one direction upon bar of the jacking unit, tension will be applied to the tie-down member when the opposite end of the tie-down member is secured to the vehicle, said jacking unit being actuatable in reverse to shift the bar in the opposite direction to remove the tension on the tie-down member.

4,174,120

BICYCLE CART ATTACHMENT

Anthony L. Freeman, 1143 5th St., Washington, D.C. 20001

Filed Dec. 28, 1977, Ser. No. 865,179
Int. Cl.[2] B62J *7/04*
U.S. Cl. 280—204 **1 Claim**



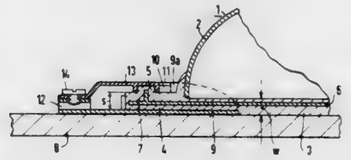
1. A device for towing a cart behind a bicycle comprising a U-shaped attaching member having a bight portion and threaded leg portions removably attached to a frame portion and located above a rear wheel of said bicycle, a universally movable connecting means having a clamp at one end with hinged upper and lower members for rotatable attachment to the bight portion of said U-shaped member, an A-shaped frame member having the tip of said A rigidly connected to said universally movable connecting means wherein said A shaped frame member is movable 180 degrees from an extended position to a stored position overlapping said U-shaped attaching member, the legs of said A-shaped frame member terminating in clamping bearing members for movably engaging the handle portion of a cart, and a pair of parallel plates with aligned apertures therein receiving the threaded ends of said leg portions whereby said plates, when positioned on opposite sides of vertical bicycle frame members and bolted thereagainst, will hold the device on said bicycle.

4,174,121

CROSS-COUNTRY BOOT AND SKI BINDING

Hans Benseler, Hemmingen, Fed. Rep. of Germany, assignor to PUMA-Sportschuhfabriken Rudolf Dassler KG, Fed. Rep. of Germany

Filed Feb. 24, 1978, Ser. No. 880,939
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1977, 2707887
Int. Cl.[2] A63C *9/00*
U.S. Cl. 280—615 **16 Claims**



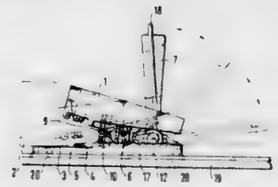
1. In combination with a cross-country ski, a cross-country ski boot having an outer sole which includes an extension portion projecting beyond a forwardly located tip of the cross-country ski boot for attaching the ski boot to the cross-country ski, and a transversely oriented rib-like bulge arranged on a top side of the extension portion, wherein a reinforcing insert is arranged in the outer sole of the cross-country ski boot, said insert extending at least from a ball portion of the outer sole into a zone of the rib-like bulge, and a fastening means is arranged on the cross-country ski and has a clamping portion extending over and embracing the rib-like bulge, the cross-section of the clamping portion corresponding to the cross-section of the rib-like bulge, whereby the cross-country ski boot is secured against displacement longitudinally of the ski.

4,174,122

SKI-BINDING DEVICE FOR CROSS-COUNTRY SKIS

Hans Görlach, Gablonzer Ring 17-19, Kaufbeuren-Neugablonz, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,356
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1977, 7705310[U]
Int. Cl.[2] A63C *9/00*
U.S. Cl. 280—615 **12 Claims**



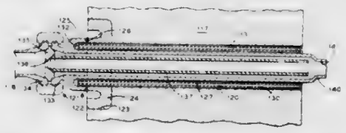
1. A ski-binding device for cross-country skis comprising a base plate having a longitudinal axis, said plate comprising a block portion, a pivot bearing member, and a forward portion; means for fastening said base plate to a ski, said base plate being oriented with said forward portion towards the tip of the skis; a movable holder element having a forward end, a rearward end and a fulcrum portion, said fulcrum portion being between said forward and rearward ends and being pivotally engaged with said pivot-bearing member of said base plate, said rearward end being shaped to engage from above a front portion of a ski boot and hold the same against said block portion of said base plate; a plurality of upwardly projecting pins replaceably mounted in said block portion for engaging from below the front portion of the ski boot; and tensioning lever means rotationally supported on the forward portion of the base plate and operatively engageable with said forward end of said holder element for holding said rearward end in engagement with the front portion of the ski boot, said forward portion of said base plate having supporting hearing means for supporting and removably retaining said tensioning lever means; said holder element, said base plate, and said tensioning means being made of a synthetic material.

4,174,123

VESSEL PENETRATION APPARATUS

Donald C. Schluderberg, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Division of Ser. No. 626,820, Oct. 29, 1975, Pat. No. 4,124,064, which is a division of Ser. No. 327,349, Jan. 29, 1973, Pat. No. 3,941,187, which is a continuation-in-part of Ser. No. 162,359, Jul. 14, 1971, abandoned. This application Aug. 24, 1978, Ser. No. 936,672
Int. Cl.[2] F16L *59/14*
U.S. Cl. 285—47 **1 Claim**



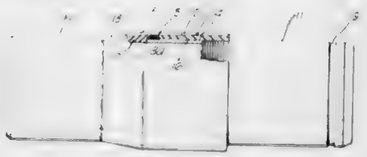
1. A reactor pressure vessel penetration apparatus for feedwater delivery comprising an inlet feedwater line external to the pressure vessel, a flange formed on the end of the feedwater line that is adjacent to the pressure vessel, a nipple protruding from the pressure vessel surface, means for joining the feedwater line and the nipple, said nipple having a flange formed on the end thereof oppositely disposed to and in axial alignment with the feedwater line flange, a plate having an orifice formed in the center thereof interposed between the flanges, a thermal shield secured to the orifice plate and having an axis that is in general alignment with the orifice, said thermal shield protruding through the pressure vessel, a tube formed on the nipple flange and in axial alignment therewith extending through the pressure vessel in axial alignment about the thermal shield, and a sleeve of several laminations of reflective thermal insulation interposed in an annulus that is formed between the pressure vessel and the tube.

4,174,124

PIPE JOINTS AND CONNECTORS THEREFOR

Basil F. Dockree, Potters Bar, England, assignor to Pipeline Seal and Insulation Co. Ltd., London, United Kingdom

Filed Mar. 24, 1977, Ser. No. 780,830
Int. Cl.[2] F16L *21/02*
U.S. Cl. 285—54 **19 Claims**



1. A connector for a pipe joint for the passage of a fluid comprising inner and outer tubular connecting members, end lengths of which are telescopically engaged and overlapped to define a tubular passage therebetween, the external surface portion at the end of the inner member and the opposed internal surface portion of the outer member being polished; a compressable, cross-sectionally rounded O-ring of electrically insulating material located between the members totally within the overlapped end lengths and compressed between said opposed polished surface portions; and sealing means, compris-

ing a jointing compound of electrically insulating material, cast against the compressable, cross-sectionally rounded O-ring and the opposed surfaces of the connecting members defining said tubular passage to hold the members relative to one another and provide electrical insulation therebetween, said compressable, cross-sectionally rounded O-ring thereby providing a substantially hermetic seal between said members when pressed against said jointing compound by said fluid.

4,174,125

TUBE COUPLING

Walter Wyss, Kappel, Switzerland

Filed Oct. 11, 1977, Ser. No. 840,962
Int. Cl.[2] F16L *17/02*
U.S. Cl. 285—110 **10 Claims**



1. A tube coupling for coupling the end portions of two tubes together, comprising a rigid, circumferentially continuous; outer tubular sleeve and an inner tubular seal arranged within said sleeve, said tubular sleeve intended for receiving the respective ones of the two tube end portions, said tubular sleeve having a symmetrical shape relative to its radial median plane and having a bore with a boundary wall defining a plurality of retaining grooves distributed along its length, said seal being a continuous single part which extends substantially over the entire length of said sleeve and is anchored in said retaining grooves, said seal having a seal bore bounding wall being provided adjacent an end of said sleeve with a compression flange, the maximum diameter of said compression flange corresponding at most to the exterior diameter of the tube to be joined, the said diameter of said compression flange decreasing in an axial inward direction to form one face of said compression flange which is adapted to contact the tube, the axially inward end of said compression flange having an undercut steep face, said seal member having a recess portion of greater diameter than said tube to be joined approximately equal in axial length to the length of said steep face and forming a receiving space for the steep face of said compression flange, said compression flange having an axial length greater than the radial height thereof and being adapted to be deflected axially and compressed radially, by insertion of the tube, into the receiving space to project sufficiently to tightly engage and seal with the tube.

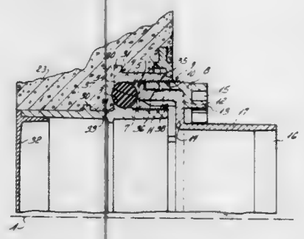
4,174,126

WALL FEEDTHROUGH FITTING

Werner Hauff, In den Stegwiesen 18, Herbrechtingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 737,027, Oct. 19, 1976, Pat. No. 4,078,834. This application Mar. 9, 1978, Ser. No. 884,806
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1975, 2548807; Apr. 22, 1977, 2717951
Int. Cl.[2] F16L *5/00*
U.S. Cl. 285—158 **10 Claims**

1. A feedthrough-fitting assembly comprising:
a wall having a pair of faces;
a feedthrough tube extending along a tube axis and having a pair of opposite axial ends, said tube being imbedded in said wall with its said ends each exposed at a respective one of said faces of said wall;
an annular seal surrounding said tube adjacent one of said ends thereof and radially inwardly engaging said tube, said seal bearing axially against said wall;
a holding ring surrounding said tube at said seal and radially engaging same, said holding ring being fixedly imbedded in said wall and being independent of and spaced radially outwardly from said tube, said holding ring extending axially in one direction beyond said seal toward said one end and having between said seal and said one end an internal screwthread; and



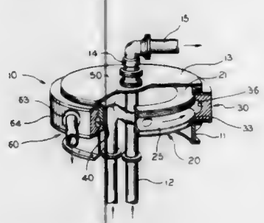
a pressure ring between said holding ring and said tube, threaded into said screwthread of said holding ring, and bearing axially in the opposite direction on said seal, whereby screwing of said pressure ring into said holding ring presses said seal axially in said opposite direction against said wall and deforming said seal radially inwardly and outwardly against said tube and holding ring.

4,174,127

MULTIPORT PIGGABLE FLUID SWIVEL

William R. Carn, Naperville, Ill., and James L. Carothers, Ponca City, Okla., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Apr. 7, 1978, Ser. No. 894,498
Int. Cl.[2] F16L *27/08*
U.S. Cl. 285—190 **17 Claims**



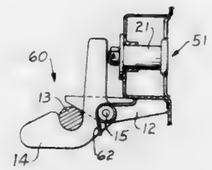
1. A fluid-swivel comprising:
a first member having a first face,
a second member having a second face adjoining and mating with the first face of the first member,
means operatively positioning and holding the first member and the second member to rotate relative to each other about a common axis and with the first face and second face positioned to rotate relative to each other in operative arrangement,
a fluid conduit defined by a first raceway in the first face and a second raceway in the second face opposite the first raceway,
sealing means preventing fluid flow between the first face and the second face and thereby out of the fluid-swivel,
an inlet conduit communicating with the fluid conduit and directed thereto at an angle so as to permit a pipeline pig to travel from the inlet conduit to the fluid conduit,
an outlet conduit communicating with the fluid conduit, and
a pipeline pig guide means extending from the fluid conduit to the outlet conduit to direct a pipeline pig from the fluid conduit to the outlet conduit.

4,174,128

ANTI-RATTLE VEHICLE DOOR LATCH MECHANISM

Wayne G. Styck, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 18, 1977, Ser. No. 816,628
Int. Cl.[2] E05C *3/08*
U.S. Cl. 292—127 **10 Claims**



1. An anti-rattle mechanism for automatically and releasably latching a door to a body for pivotal movement through a given arc from a fully open position to a fully closed position, said mechanism comprising:
(a) first and second rigid support members, one of which is adapted to be mounted on said door and the other of which is adapted to be mounted on said body;
(b) a cylindrical pin rigidly mounted on said first support member and projecting therefrom with the axis of said pin extending normally to said given path of movement of said door;
(c) a cam hook member mounted on said second support member for pivotal movement about a given axis parallel to said axis of said pin;
(d) spring means urging said cam hook member to pivot in a given direction about said given axis; and
(e) actuation means for selectively causing said cam hook member to pivot in the direction opposite said given direction about said given axis;
said second support member having a rigid abutment surface adapted to abut the periphery of said pin when said door is in said fully closed position on that side of the line defined by said axis of said pin and said given axis of pivotal movement of said cam hook member toward which said cam hook member is urged to move in said given direction by said spring means and on the same side of said pin as said given axis of pivotal movement of said cam hook member;
said cam hook member having a camming surface adapted to engage the periphery of said pin as said door approaches said fully closed position thereof causing said cam hook member to pivot in said direction opposite to said given direction about said given axis against said urging of said spring means, said camming surface of said cam hook member terminating in a hooking surface adapted to receive said pin when said door is in said fully closed position thereof and to compressively engage the periphery of said pin under the urging of said spring means at a point which is substantially opposite the abutment of said periphery of said pin by said rigid abutment surface of said second support member.

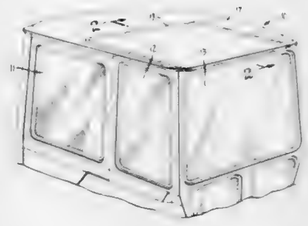
4,174,129

WINDOW LATCH

Marvin W. Schwandt, Brighton, and John F. Hern, Southfield, both of Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.

Filed Jul. 5, 1977, Ser. No. 813,042
Int. Cl.[2] E05C *3/26*
U.S. Cl. 292—216 **10 Claims**

1. Latching apparatus for securing a window movable between a closed vertical position and a horizontal latch position within a cab, a roof on the cab and the latch position of said window being beneath the roof of the cab, comprising: cam means and an eccentric axis pivotally mounting said cam means to said roof to cause said cam means to gravitate to an engaging position whenever released from the latch position, pin means interconnecting said window and said cam means by engagement therewith upon movement of said window therepast, and lever means engageable with said cam means to lock said cam means and said window in the horizontally latched position, said lever means including an arm, said cam means including a shoulder, first and second points on said shoulder,



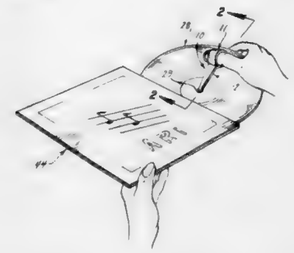
said first point on a closer radius to said cam pivot and the said second point, said arm engaging said shoulder at said first point in the locked position at a distance between said first point and the pivot of said lever greater than the distance between said second point and the pivot of said lever to require raising of said cam means having the weight of the window thereon to permit said lever arm to pass said second point to reach the release position.

4,174,130

RECORD HANDLING DEVICE

Harold Mayfield, 2840 Fortune Dr., Granite City, Ill. 62040

Filed Apr. 21, 1978, Ser. No. 898,693
Int. Cl.[2] B65G *7/12*
U.S. Cl. 294—25 **16 Claims**



1. A handling device for a phonographic record having a spindle hole, the device being for use by a human hand, and comprising:
(a) an extension member;
(b) means at a first end of the extension member for securing the device to the thumb of the hand so that the extension member extends laterally outwardly from the side of the thumb in a direction transverse to the longitudinal axis of the thumb so that pulling force exerted upon the extension member pulls the handling device laterally from the side of the thumb; and
(c) a hook extending downwardly from the second end of the extension member in a direction transverse to the longitudinal axis of the thumb for engaging insertion into the spindle hole.

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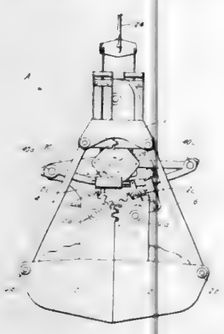
V 9 8 1 2 N 0 1 3 7 9 UMI

4,174,131

CLAMSHELL BUCKET APPARATUS AND METHOD OF USING SAME

Richard E. Gregg, Houston, Tex., assignor to Royce Equipment Company, Division of McGinnes Manufacturing Co., Houston, Tex.

Filed Apr. 21, 1978, Ser. No. 898,922
Int. Cl.[2] B66C *3/10*
U.S. Cl. 294—70 **5 Claims**



1. A clamshell bucket apparatus, comprising:

a pair of relatively movable and connected clamshell bucket sections each having a scoop configuration with an inner edge which is adapted to be in contact with the other inner edge when the bucket sections are in the closed position and which are moved apart when the bucket sections are in the open position, said clamshell bucket sections connected for uniform movement to and from the open and closed positions;

operating and hoisting means operably connected with said clamshell bucket sections for manipulating said clamshell bucket sections to and from the open and closed positions and for raising and lowering said bucket sections, said operating and hoisting means including:

a single line system adapted to extend from the clamshell bucket apparatus to a crane or the like;

releasable latch means movably mounted with said bucket sections for movement to and from a latching position and a release position;

movable latch-engaging means operably connected with said single line system for movement into engagement with said latch means for applying a force to said buckets to move said buckets to the closed position, and for movement from engagement with said latch means for supporting the entire apparatus from said single line system with said bucket sections in the open position; and

latch control means mounted with said bucket section and movable relative thereto between a latched position for holding said latch means in the latched position and a releasable position to enable said latch means to move to the release position, said latch control means to hold said latch means in the latched position when said latch-engaging means moves said latch means to the latched position, said latch control means automatically releasing said latch-engaging means from said latch means by slackening of a single line system when said bucket sections are supported on the ground or the like in the closed position;

means for guiding said latch-engaging means as said means moves longitudinally toward and into latch engagement with said latch means; and

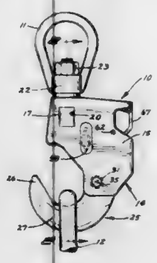
said means for guiding including a pair of parallel and spaced guide arms, each of which is pivotally connected at their lower ends with said clamshell bucket section and pivotally connected at their upper ends with said latch engaging means, each of said guide arms having a central pivot for enabling and guiding the movement of said latch-engaging means relative to said latch means.

4,174,132

MULTIPLE POSITION HOOK ASSEMBLY

Edward J. Crook, Jr., Tulsa, Okla., assignor to American Hoist & Derrick Company, St. Paul, Minn.

Filed Dec. 20, 1977, Ser. No. 862,390
Int. Cl.[2] B64D *17/38*
U.S. Cl. 294—83 R **25 Claims**



1. A hook assembly including:

a frame;

a generally arcuate hook member having a hook tip at one end;

means pivotally assembling the hook member to the frame permitting rotation of the hook member with respect to the frame about a hook pivot axis between a closed position with the hook tip proximate a portion of the frame and forming with a portion of the frame a substantially closed, load retaining eye, and an open position for engagement of a load with said hook tip spaced from the frame portion to provide an unobstructed throat between said tip and said frame;

releasable lock means on the frame to lock said hook member in the closed position;

said releasable lock means including a locking member slideably assembled to the frame and fixed for guided movement relative thereto;

said hook member having a shoulder engageable with said locking member;

said lock means being positioned with respect to said frame for movement of said locking member into and out of locking engagement with the shoulder when the hook member is in the closed position;

said locking member including a transverse lock bar having a plane bearing surface engageable with the shoulder, said lock bar being movable with said locking member to a position for engagement with said shoulder after the hook member has been moved to the closed position with said bearing surface in bearing relationship to said shoulder to prevent movement of the hook member toward the open position;

actuator means to move the locking member out of locking engagement with the shoulder to permit rotation of the hook member toward the open position; and

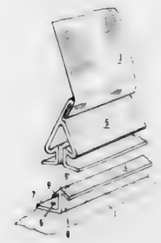
said frame including side plates, said side plates being provided with elongated, parallel and aligned, facing slots, said transverse lock bar of the locking member having transverse ends located in said slots for guided movement of the locking member by said slots and to bear against a part of the frame when the hook member is in the closed position.

4,174,133

FASTENING DEVICE FOR A FIXABLE COVERING

Anton Brockhaus, Rheda-Wiedenbrück, Fed. Rep. of Germany, assignor to Westfalia-Werke Franz Knöbel & Sohne KG, Rheda-Wiedenbrück, Fed. Rep. of Germany

Filed Jan. 9, 1978, Ser. No. 867,718
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1977, 7700804
Int. Cl.[2] B62P *3/32*
U.S. Cl. 296—26 **2 Claims**



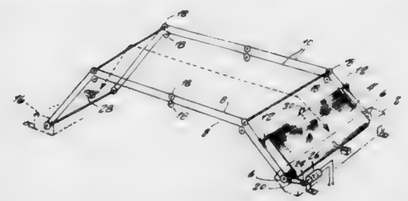
1. A vehicle comprising a fixed roof for the vehicle, the roof having a cutout, a lift roof for covering the cutout, a clamping rail fixed along the edge of the roof cutout, the clamping rail being an elongated member having one arm for attachment to the fixed roof of the vehicle and another arm having symmetrically placed oblique flanges protruding upwardly from the fixed roof, a flexible covering having one edge fixed to the lift roof, and a clamping part fixed to another edge of the flexible covering, the clamping part being an elongated member generally matching the clamping rail in the direction in which the clamping rail is fixed along the edge of the roof cutout, the clamping part having a connecting part folded into a narrow U shape which engages another edge of the flexible covering along the length thereof to fix the edge of the flexible covering to the clamping part, the clamping part also having two symmetrically developed spring clamping arms extending outwardly from the connecting part for forming a hollow space therebetween and then inwardly to form undercuts in the hollow space for engaging the upwardly protruding symmetrical oblique flanges of the clamping rail in order to establish a connection between the flexible covering and the fixed roof of the vehicle.

4,174,134

VEHICLE COVER ASSEMBLY

Joseph S. Mathis, Rt. 3, Box 315, Cantonment, Fla. 32533

Filed Nov. 30, 1977, Ser. No. 855,824
Int. Cl.[2] B60J *7/20*
U.S. Cl. 296—136 **5 Claims**



1. A vehicle cover assembly comprising a housing disposed adjacent a first end of a enclosed passenger compartment of a vehicle having a hard, rigid roof with side rigid windows with rain gutters along its sides at its roofline above the windows, a roller disposed in said housing, a flexible shade disposed on said roller, conveyor wheels attached to said roller at either end thereof, conveyor lines mounted on said wheels, said shade being connected to said conveyor lines, intermediate bracket means mounted on upper, exterior portions of the passenger compartment to the rain gutters of the vehicle and end bracket means mounted adjacent the passenger compartment at a second end thereof, conveyor spools mounted on each said bracket means and having said conveyor lines mounted thereon, said shade being movable out of said housing and along said conveyor lines over and above the roof of the vehicle to the passenger compartment second end to cover the passenger compartment at the top and either end thereof.

4,174,135

UNDERGROUND FORMED WALL SINGLE-ENTRY MINING METHOD

James D. Grenia, Concord, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Filed Apr. 10, 1978, Ser. No. 894,668
Int. Cl.[2] E21C *41/00*
U.S. Cl. 299—11 **18 Claims**



1. In the underground mining of relatively thin mineral seams, a method for forming at least one supporting wall for supporting the overburden above said seam and providing access areas adjacent said supporting wall for mining said seam and providing ventilation, said method comprising:

providing a first access area adjacent a face of said seam;

from said first access area, driving transverse to said seam at least a portion of the width of said seam a first drift of substantially self-supporting dimensions and about the height of said seam;

substantially filling said first drift with a flowable and cureable wall forming material;

curing said wall forming material to form a first walk and

excavating a tunnel adjacent to and completely about said wall to form a loop with said first access area and provide a second access area behind the rear end of said wall.

4,174,136

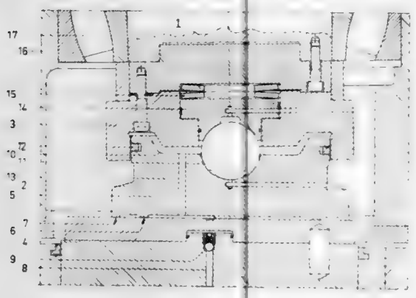
SHOCK ABSORBING DEVICE FOR SLIDING BEARINGS

Göran Hällstedt, Floda, Sweden, assignor to Aktiebolaget SKF, Göteborg, Sweden

Filed Dec. 14, 1977, Ser. No. 860,335
Claims priority, application Sweden, Jan. 18, 1977, 7700451
Int. Cl.[2] F16C *17/00*
U.S. Cl. 308—5 R **2 Claims**

1. A device mounted between a machine member and a base adapted to absorb shock loads which the machine member is subjected to comprising a first element confronting the base, means defining a first chamber between the first element and base of a predetermined cross sectional area, means defining throttling slots between said first element and base, means for

supplying a fluid under pressure to said first chamber, a second element mounted between the machine member and said first element and spaced from the latter to define a second chamber in fluid communication with said first chamber, the cross sectional area of said second chamber being less than said predetermined cross sectional area of said first chamber, a ball mounted in a spherical seat in said first element, a piston in said



second element engaging said ball on the side thereof opposite the seat, biasing means normally urging said piston against said ball and operable to support a predetermined load, shock loads from said machine element in excess of said predetermined load causing flow of pressure fluid from said second chamber to said first chamber and out through said throttling slots to thereby prevent contact between said first element and base.

4,174,137

CONTROL ROD ROLL-OVER LIMITER

Donald L. Ferris, Newtown, Conn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 826,610, Aug. 22, 1977, abandoned. This application Jul. 24, 1978, Ser. No. 927,704

Int. Cl.[2] F16C *9/06*

U.S. Cl. 308—72 **4 Claims**



1. In a control linkage assembly including a control rod with an end provided with an aperture therethrough having an annular perimeter, a spherical bearing within said aperture in the form of a race and a ball with a shaft thru its center rotatably retained within said race, and a clevis secured to the control rod end by a bolt thru said shaft, roll-over stop means comprising a boss member mounted on the control rod end adjacent the aperture for abutment with the clevis to limit movement of the control rod about its longitudinal axis, said boss member being in the form of a segment of a circle disposed in a plane substantially parallel to the longitudinal control rod axis, but perpendicular to the lateral control rod axis with the circle center coincident with the center of the ball of the bearing to permit a full range of control rod movement about its translated and lateral axes.

4,174,138

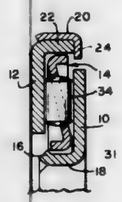
THRUST BEARING AND SEPARATOR

Dean E. Johnston, Thomaston, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Aug. 28, 1978, Ser. No. 937,548

Int. Cl.[2] F16C *33/46*

U.S. Cl. 308—235 **4 Claims**



1. A separator for use with a thrust bearing comprising: a single integral annular member including a radially inner annular flange extending in one longitudinal direction, a radially outer annular flange extending in the opposite longitudinal direction from said radially inner annular flange, an inclined annular wall interconnecting said two flanges, the free end of each flange not extending axially outward from the inclined annular wall further than the radial plane through the axially outermost surface of the radially opposite periphery of the separator; and a plurality of circumferentially spaced rolling member pockets, each extending at least partially along the inclined wall of said single member.

4,174,139

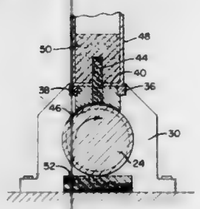
BEARING ASSEMBLY WITH IMPROVED CONTACTOR

Martin L. Abel, Franklin, Mich., assignor to Permawick Company, Inc., Detroit, Mich.

Filed Oct. 1, 1975, Ser. No. 618,337

Int. Cl.[2] F16C *1/24, 33/10*

U.S. Cl. 308—125 **10 Claims**



1. Bearing assembly comprising a bearing, a member mounted in said bearing and adapted for movement relative thereto, the bearing having a window therein, a contactor substantially filling the window, a housing means for defining a chamber about the bearing and contactor, the contactor having a portion projecting through the window to a position adjacent to the member and another portion in the chamber, an oil-impregnated wicking material in the chamber in intimate engagement with the portion of the contactor in the chamber, the oil-impregnated wicking material comprising a mixture of oil and oil retaining particles, the contactor comprising a dimensionally-stable, essentially nonabsorbent, resilient solid mass of a plurality of fibrous particles bonded together with an interconnected network of pores therein, the pores being generally smaller than the interstices between the particles which make up the wicking material so that the lubricant in the wicking material will be drawn into the pores in the contactor by capillary action and transferred to said member.

4,174,140

RESILIENT CENTER PLANE ASSEMBLY

William H. Bogar, Newark, and Howard D. Irwin, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 13, 1977, Ser. No. 832,974

Int. Cl.[2] B61F *5/16;* **F16C** *17/04, 27/08;* **F16F** *1/44*

U.S. Cl. 308—137 **12 Claims**



1. A railway car body center plate assembly which comprises:

(a) a metal base plate having a flat surface on its underside, and a centrally disposed, circular, vertical hole adapted for receiving a king pin;

(b) a circular, metal, partial center plate integral with the base plate and having a flat, bottom, horizontal surface, said partial center plate extending downward from the flat surface on the underside of the base plate adjacent to and encircling the centrally disposed hole, and having a substantial diameter; and

(c) a single, annular, homogeneous, solid, synthetic elastomeric pad having a centrally disposed, circular, vertical opening and horizontal and vertical bearing surfaces, said elastomeric pad being positioned concentrically around and adjacent to the partial center plate in contact with the flat surface on the underside of the base plate, having a substantial diameter adapted to substantially fill the space between the partial center plate and a truck center plate flange with sufficient clearance that, under vertical load, the elastomeric pad contacts the vertical surfaces of less than both of the partial center plate and the truck center plate flange, and having a thickness adapted such that the bottom of the horizontal bearing surface, under load, is lower than the bottom edge of the partial center plate and the elastomeric pad substantially vertically overlaps the truck center plate flange, whereby said elastomeric pad is adapted to transmit all the weight from the body center plate assembly to the truck center plate and to transmit all horizontal forces between the partial center plate and the truck center plate flange.

4,174,141

ROLLER BEARING WITH SYNCHRONIZED CAGE RING AND STABILIZING RING

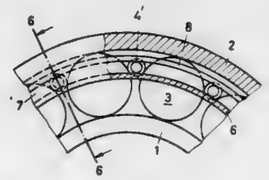
Karl Reiss, c/o Dr. Bernhard H. Geissler, 1321 Hampden Rd., Bartlesville, Okla. 74003

Filed Sep. 23, 1977, Ser. No. 836,038

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1976, 2643773

Int. Cl.[2] F16C *19/40*

U.S. Cl. 308—206 **2 Claims**



1. A roller bearing comprising

(a) an inner ring having an outer roll surface with an outer roll radius RI,

(b) an outer ring having an inner roll surface with an inner roll radius RA,

(c) a plurality of supporting rollers arranged between said inner ring and said outer ring and having a diameter of approximately the difference between the inner roll radius and the outer roll radius,

(d) one separating roller arranged between every two neighboring supporting rollers such as to contact them and keep them separate, said separating roller, having a first roll area with a first radius r4 in which the separating roller engages with the supporting rollers and at least one second roll area with a second roll radius r, with the axis of all the separating rollers arranged outside of a cylinder defined by the path of the axis of the supporting rollers,

(e) a cage ring being concentric to the inner and outer ring and being rigidly connected to the outer ring and having a roll area with an outer cage roll radius RK_a in which the cage ring contacts the second roll area of the separating rollers, the radii being defined by the equation

$$(r/r_4)=(RK_a/RA),$$ and

(f) a stabilizing ring separate from said cage ring and concentric to the inner and outer ring and having an inner roll surface contacting the separating rollers and holding said separating rollers together.

4,174,142

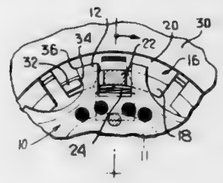
BRUSH MOUNTING FOR ROTARY ELECTRICAL JOINT

Carl A. Pesce, Oak Lawn; Ralph J. Trnka, Dolton, and Robert A. Winkless, Oak Lawn, all of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Sep. 9, 1977, Ser. No. 831,978

Int. Cl.[2] H01R *39/00*

U.S. Cl. 339—5 R **10 Claims**



1. In a rotary electrical joint of the type including a fixed hub carrying at least one brush and a rotary member having an inner cylindrical surface contacting the brush, a brush mounting for eliminating uneven wearing of the brush, said brush mounting comprising resilient means disposed between said hub and said brush urging said brush radially outwardly, said brush having a leading edge and a trailing edge in accordance with the intended direction of rotation of the rotary member and cooperating restraining means on said brush adjacent said leading edge and carried by said hub for restraining rotary movement of said brush leading edge with said rotary member in response to a drag force applied to said brush by said rotary member when rotating.

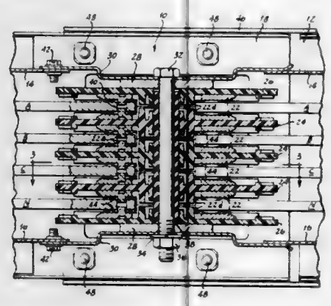
V 9 8 8 2 N 0 1 3 7 9 umi

4,174,143

BUS DUCT JOINT EMPLOYING LIGHTLY-LOADED MULTIPLE-POINT ELECTRICAL CONNECTOR

Loy A. Hicks, Jr., Cedarburg, and James J. Rusenko, Milwaukee, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Mar. 29, 1976, Ser. No. 671,603
Int. Cl.[2] H01R 9/12
U.S. Cl. 339—22 B 15 Claims



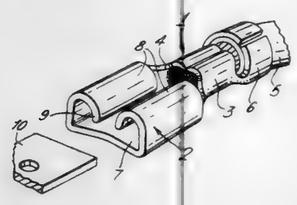
4. In combination, a first and second bus duct each having a plurality of bus bars and a joint assembly electrically interconnecting the individual bus bars of said first bus duct to corresponding ones of said bus bars of said second bus duct, said joint assembly comprising: a plurality of electrically conductive members correspondingly aligned with said bus bars, insulating means disposed between ones of said electrically conductive members associated with adjacent bus bars, and means securing said electrically conductive members and said insulating means rigidly together to form a solid joint assembly independent of connection thereof to the bus bars of either of said first or second bus ducts.

4,174,144

HOUSING FOR AN ELECTRICAL TERMINAL

Roger Le Helloco, Herblay, France, assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 769,986, Feb. 18, 1977, abandoned.
This application Feb. 6, 1978, Ser. No. 875,370
Int. Cl.[2] H01R 11/02
U.S. Cl. 339—59 R 1 Claim



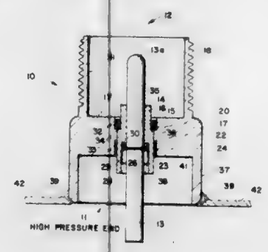
1. A housing of resilient, non-conductive material for receiving varying sizes of electrical terminals comprising, a pair of spaced, parallel side walls joined by resilient top and bottom walls to define a passage through the housing, said top and bottom walls sloping in from either side wall towards the housing's center line in a generally V-shape, so that upon inserting an electrical terminal having a greater dimension than the passage, the passage may expand by the two generally V-shaped, top and bottom walls tending to straighten out.

4,174,145

HIGH PRESSURE ELECTRICAL INSULATED FEED THRU CONNECTOR

Joseph E. Oeschger, Palo Alto, and James E. Berkeland, San Jose, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 29, 1976, Ser. No. 755,510
Int. Cl.[2] H01B 17/26; H01R 7/02
U.S. Cl. 339—94 A 11 Claims



1. In an hermetically sealed electrical connector having a ceramic insulating block supported within a body bore through the metallic body of said connector and at least one conductive pin extending through an axial insulator bore in said ceramic block, said connector being adapted for installation through the wall of a pressurized vessel whereby said pin, said body and said ceramic block each have a high pressure end and an external end, the combination comprising:

first means forming an internal body shoulder facing said high pressure end adjacent and within the external end of said body bore;

second means integral with said ceramic block forming a radially external shoulder which bears against said internal body shoulder in response to thrust force generated by pressure at said high pressure ends;

third means comprising an insulator counterbore extending into said high pressure end of said ceramic block by a predetermined distance, said insulator counterbore being of larger diameter than said conductive pin to generate a first annular cavity surrounding said pin within said insulator counterbore;

fourth means comprising a cup-shaped metal member with a central hole in the base thereof, said conductive pin passing axially therethrough, said cup-shaped member having a relatively thin rim directed outward at said high pressure end and in contact with the inside surface of said counterbore, said base of said member bearing against the internal shoulder generated within said ceramic block by said insulator counterbore;

hermetic seals effected by brazing of said cup-shaped member rim to the inside surface of said insulator counterbore and said base of said member to said conductive pin about said hole;

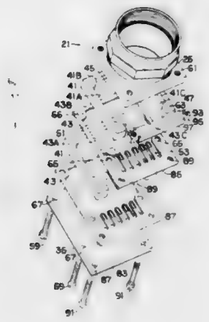
and additional seal and expansion compensating means including a first counterbore into said metallic body a predetermined distance from said high pressure end, said first counterbore providing a second annular cavity between the radially outward surface of said ceramic block and the radially inside surface of said second counterbore, and including a resilient metallic sleeve having a wall thickness less than the radial clearance provided in said second annular space, said sleeve being hermetically brazed to said body within said first counterbore along one axial extremity of said sleeve and to the wall of said ceramic block within said first counterbore along the other axial extremity of said sleeve, thereby to provide for differential expansion of said ceramic block and said metallic body by resilient deformation of said sleeve.

4,174,146

ADAPTER FOR ROUTING ELECTRICAL WIRES

Robert A. Williams, 55 Bounty Rd., East, Fort Worth, Tex. 76116

Filed Jun. 16, 1978, Ser. No. 916,283
Int. Cl.[2] H01R 13/46
U.S. Cl. 339—143 R 3 Claims



1. An adapter for routing electrical wires to a connector, comprising:

an annular socket means having a rectangular shaped base with an opening formed through said base in alignment with the opening of said socket means,

a rectangular shaped end plate,

at least one rectangular shaped spacer having a central opening and a side opening extending from one side to said central opening,

said central opening being generally rectangular in shape and defined by three straight edges, one of which is opposite said side opening and the other two being parallel to each other and perpendicular to said one end,

at least one rectangular shaped shield connecting member having a central opening and a plurality of spaced apart tab members extending from one side toward said central opening,

said central opening of said shield connecting member being generally rectangular in shape and defined by three straight edges and said tabs, one of said straight edges being opposite said tabs and the other two being parallel to each other and perpendicular to said one edge,

said spacer and said shield connecting member being adapted to be located between said base of said socket means and said end plate in an operative position with their central openings in alignment with said openings of said socket means and said base and with said tab members of said shield connecting member in alignment with said side opening of said spacer,

each of said base, spacer, shield connecting member and end plate having four apertures formed therethrough defining the four corners of a square whereby said four apertures of said base, spacer, shield connecting member and end plate respectively are in alignment for receiving connecting means when said spacer and said shield connecting member are located between said base and said end plate in said operative position,

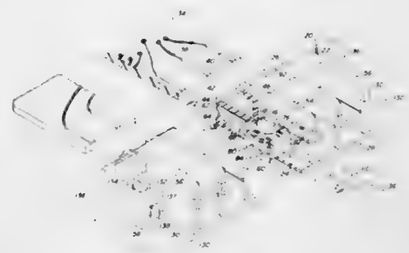
the side opening of said spacer being adapted to receive electrical wires of the type having shields, for routing through said openings of said base and socket means with said shields being connected to said tab members.

4,174,147

CIRCUIT PANEL CONNECTOR

William T. Waddington, Fanwood, and Charles F. Mazzeo, Scotch Plains, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 773,188, Mar. 1, 1977, abandoned. This application Oct. 25, 1977, Ser. No. 844,728
Int. Cl.[2] H01R 13/12
U.S. Cl. 339—176 MP 6 Claims



1. A circuit panel connector for enabling connection of the circuit terminals along the edge of a circuit panel, such as a printed circuit board, with external conductors, said panel connector comprising:

a unitary block of dielectric material having a base, a front, a back opposite to the front, and opposite sides;

an elongate socket in the block extending between the opposite sides thereof and open at the front thereof for receiving the panel edge;

a number of recesses extending from the back toward the front of the block, a pair of barriers associated with each said recess, one said barrier of each adjacent pair of barriers having guide means in its associated recess;

a like number of openings extending from the front toward the back of the block, each opening communicating with the socket and with a corresponding recess, each opening being aligned along a straight line with a recess such that each opening and its corresponding recess establish a cavity passing through the block from front to back thereof, each cavity having upper and lower walls;

a plurality of electrical contact members, each received within a different recess of the block, the contact members each including upper and lower tines juxtaposed, respectively, with the upper and lower walls of the corresponding cavity and extending parallel to the straight line into the socket, a strap portion unitary with the tines, a selective terminal portion having a platform unitary with the strap portion and a clamping screw threaded into the platform for selective movement toward and away from the platform for selectively connecting and disconnecting the external conductor and the terminal portion with the external conductor entering the respective recess from the back toward the front of the block, each said contact member being of either a first configuration wherein the platform thereof lies in a plane parallel to the straight line and said contact member of said first configuration interengages and is located and guided by a portion of said guide means or a second configuration wherein the platform thereof lies in a plane making an acute angle with the straight line, with the platform thereof facing upwardly and toward the back of the block and said contact member of said second configuration interengages and is located and guided by a different portion of said guide means; and

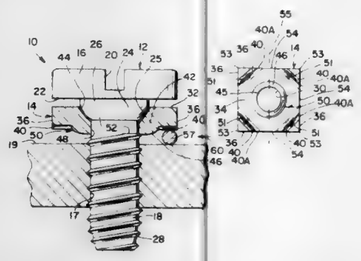
means securing the contact members in the block against movement along the straight line.

4,174,148

ELECTRICAL TERMINAL CLAMP ASSEMBLY

Edward A. Obuch, Linden, and Paul T. Filak, Roselle Park, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed Dec. 16, 1977, Ser. No. 861,417
Int. Cl.[2] H01R 9/10
U.S. Cl. 339—246 **14 Claims**



1. In an electrical terminal clamp assembly of the type for holding an electrically conductive element to an electrical terminal, the improvement comprising:

(a) a screw including a head and a partially threaded shank extending from said head, said head being provided with a convex-shaped bearing portion; and

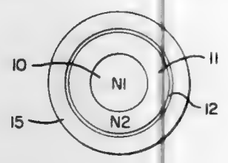
(b) a plate having a first surface and a second surface, said second surface being adaptable for holding said electrically conductive element between said second surface and a surface of said terminal without slipping, said plate also having race means adaptable for receiving therein said shank, said race means having a concave-shaped seating surface on said first surface of the plate for seating said convex-shaped bearing portion of said head, said race means defining a convex-shaped collar means for retaining said plate on an unthreaded portion of said shank without interfering with said threaded portion, and wherein said convex-shaped bearing portion of said head and said race means provide a ball joint means for minimizing frictional resistance between said convex-shaped bearing portion and said concave-shaped seating surface.

4,174,149

SECURE FIBER OPTICS COMMUNICATION SYSTEM

James A. Rupp, Bowie, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 19, 1976, Ser. No. 723,263
Int. Cl.[2] H04B 9/00; G02B 5/14
U.S. Cl. 350—96.33 **10 Claims**



1. A secure fiber optics communication system comprising:

an information transmitter for the generation of an information signal;

an information receiver for receiving said information signal;

an optical fiber having a frangible glass coating therearound, connecting said information transmitter and said information receiver for the transmission of said information signal, said frangible glass coating comprising glass having high internal stresses; and

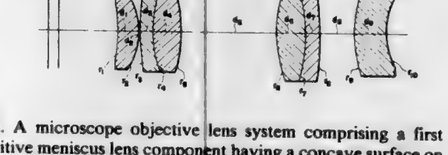
means for disabling said information transmitter upon an attempt to penetrate said optical fiber.

4,174,150

SYSTEM FOR COMBINING LASER BEAMS OF DIVERSE FREQUENCIES

Robert S. Congleton, Richland, Wash., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Continuation of Ser. No. 660,649, Feb. 23, 1976, abandoned. This application Mar. 3, 1978, Ser. No. 883,248
Int. Cl.[2] G02B 27/10
U.S. Cl. 350—174 **14 Claims**



1. A system for combining laser beams of diverse frequencies into a plurality of beams, each comprising laser radiation having components of each of said diverse frequencies, said system comprising:

a plurality, greater than two, of sources of laser radiation including at least first and second source sets;

said plurality of sources of laser radiation providing repsective input beams of laser radiation of different frequencies;

a first plurality of beam splitting elements positioned to receive on one surface of each radiation input beams from said first source set and to receive on the second surface of each the radiation input beams from said second source set;

said first plurality of beam splitting elements providing a plurality of sets of composite beams of radiation comprising:

a first set of composite beams including a fraction of the radiation from said first source set superimposed on a fraction of the radiation from said second source set; and

a second set of composite beams comprising a fraction of the radiation in said first source set superimposed on a fraction of the radiation in said second source set;

a further plurality of beam splitting elements responsive to the plurality of sets of composite beams for providing a set of output beams, each beam thereof having a fraction of the radiation in each of the input beams from said first and second sets of sources.

4,174,151

MICROSCOPE OBJECTIVE LENS SYSTEM

Ken Yonekubo, Tama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1977, Ser. No. 788,962
Claims priority, application Japan, Apr. 20, 1976, 51-45211
Int. Cl.[2] G02B 9/34
U.S. Cl. 350—175 ML **4 Claims**

1. A microscope objective lens system comprising a first positive meniscus lens component having a concave surface on the object side, a second positive cemented lens component, a third positive cemented lens component and a fourth negative meniscus lens component having a concave surface on the image side, and said lens system satisfying the following conditions:

(1) $1.79 < n_1 < 1.81$
(2) $40 < \nu_1 < 43$
(3) $1.60f < f_1 < 1.63f$
(4) $3.5f < |f_4| < 4.5f$
(5) $1.24f < d_5 < 1.27f$

wherein the reference symbol n_1 represents the refractive index of said first lens component, the reference symbol ν_1 designates the Abbe number of said first lens component, the reference symbol d_5 denotes the airspace between the second and third lens components and the reference symbols f_1, f_4 and f represent focal lengths of said first lens component, fourth lens component and the entire lens system as a whole.

4,174,152

ELECTROCHROMIC DEVICES WITH POLYMERIC ELECTROLYTES

Robert D. Giglia, Rye, N.Y.; John A. Sedlak, and David W. Lipp, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 13, 1978, Ser. No. 877,139
Int. Cl.[2] G02F 1/17, 1/23
U.S. Cl. 350—357 **7 Claims**

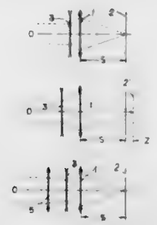
1. An electrochromic device comprising an electrode in contact with a layer of persistent electrochromic material which in turn is in contact with an ion conductive hydrophilic, clear vinyl polymer electrolyte which in turn is in contact with a counterelectrode, and electrical means for selectively applying electrical fields of opposite polarity across said electrodes, wherein the electrolyte comprises a copolymer or partially cross-linked copolymer of 95 to 20% by weight of a vinyl monomer selected from 2-hydroxyethyl methacrylate, 2-hydroxypropyl methacrylate, 2-hydroxyethyl acrylate, and 2-hydroxypropyl acrylate and 5 to 80% by weight of an acid-group-containing monoethylenically unsaturated monomer.

4,174,153

VARIFOCAL OBJECTIVE WITH FOCAL LENGTH ADJUSTMENT

François Laurent, Yverdon, Switzerland, assignor to Bolex International SA, Ste-Croix, Switzerland

Filed Nov. 14, 1977, Ser. No. 851,352
Claims priority, application Austria, Nov. 15, 1976, 8501/76
Int. Cl.[2] G02B 15/10, 15/16
U.S. Cl. 350—184 **28 Claims**



1. In an optical objective including a positively refracting lens assembly centered on an optical axis and adapted to focus incident rays from remote objects upon a receiving surface in line with an image plane located rearwardly of said lens assembly, the combination therewith of focal-length-increasing means for enlarging the image scale of said lens assembly, with consequent rearward displacement of said image plane from a normal position, and a positively refracting supplemental lens member emplaceable on said axis in line with said lens assembly for restoring said image plane to said normal position thereof.

4,174,154

LASER MANIPULATOR APPARATUS WITH DOUBLE PIVOTAL MIRRORS

Harumi Kawasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1977, Ser. No. 791,071
Claims priority, application Japan, Apr. 28, 1976, 51-49190
Int. Cl.[2] G02B 5/08
U.S. Cl. 350—299 **6 Claims**



1. In a manual optical manipulator mechanism including a laser beam source, a freely movable output member having a condenser lens therein for concentrating the laser beam, a plurality of hollow tubular members pivotally coupled between the source and the output member, and a plurality of reflecting mirrors disposed at the pivotal couplings to define a continuous optical beam path within the tubular members, the improvement characterized by:

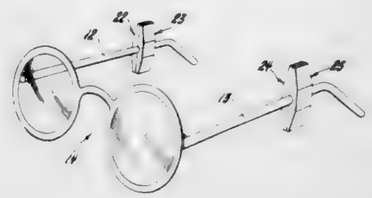
means mounting at least one of said mirrors for rotation about two mutually perpendicular axes, one of said axes being coincident with the incoming laser beam and the other axis being perpendicular to the plane including and defined by the incoming and outgoing laser beams and lying in the plane of the mirror surface, said mounting means controlling the rotation of the mirror such that it rotates about said other axis through an angle equal to one-half of the angular rotation of the outgoing laser beam about said other axis.

4,174,155

SOUND AI ORBING ARTICLE AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Sal Herman, 27096 Aberdeen, Southfield, Mich. 48076

Filed Sep. 19, 1977, Ser. No. 834,323
Int. Cl.[2] G02C 11/00
U.S. Cl. 351—158 **8 Claims**



1. A sound absorbing article for use in conjunction with an eyeglass frame having a pair of temple bar members, comprising:

a main body member fabricated of substantially porous, resilient, flexible, and non-rigid sound absorbing material;

said main body member including a channel formed in a first surface thereof, within which channel a temple bar of said eyeglass frame may be disposed;

adhesive means for securing a second surface of said channel

of said main body member to at least a portion of a temple bar of said eyeglass frame; and

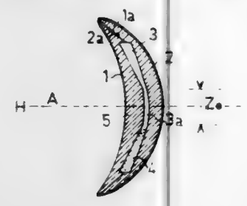
said adhesive means being disposed within said channel provided in said first surface of said main body member.

4,174,156

OPTICAL LENS FOR DIFFERENTIAL CORRECTION

Gilbert Glorieux, 72, rue Achille Viadieu, 31400 Toulouse, France

Filed Oct. 31, 1977, Ser. No. 847,102
Claims priority, application France, Nov. 2, 1976, 76 33208
Int. Cl.² G02B 3/12; G02C 7/06
U.S. Cl. 351—168 **5 Claims**



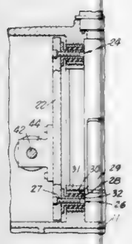
1. A convergent optical correction lens comprising a pair of transparent walls defining a closed internal space therebetween, at least one transparent liquid of predetermined index of refraction in a portion of said internal space, said walls being configured so as to establish in said internal space a zone having a reduced thickness, said zone surrounding the optical axis of said lens and having a capillary volume, said liquid being present in the lower part of said internal space when the optical axis is substantially horizontal, and said liquid filling said capillary volume by capillary action when said lens is tilted in relation to the vertical by at least a predetermined angle.

4,174,157

QUIET MOTION PICTURE CAMERA

Robert E. Gottschalk, Los Angeles, Calif., assignor to Panavision, Incorporated, Tarzana, Calif.

Continuation of Ser. No. 582,698, Jun. 2, 1975, Pat. No. 4,121,886, which is a continuation of Ser. No. 388,630, Aug. 15, 1973, abandoned. This application Feb. 9, 1978, Ser. No. 876,430
Int. Cl.² G03B 31/00
U.S. Cl. 352—35 **2 Claims**



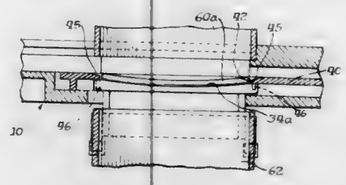
1. In a motion picture camera, the combination of: a housing member having a lens mount, a camera movement assembly enclosed within said housing member, a support member within said housing member, means for mounting the camera movement assembly on said support member, a plurality of sound-absorbing connectors mounting said support member within said housing member, said connectors each having an externally threaded pin free to turn in one of said members, an internally threaded sleeve receiving said threaded pin, an externally threaded bushing, a hollow cylindrical elastomeric liner fixed in an annulus between said bushing and said sleeve, said pin, sleeve, elastomeric liner, and bushing all being coaxial, each externally threaded bushing being received within an internally threaded element on the other said member whereby turning of said bushing within said element, after loosening said pin within said sleeve, provides lateral adjustment of said support member and camera movement with respect to said camera housing and lens mount.

4,174,158

BOWED SLIDE HANDLING APPARATUS

Frank W. Betlejewski, Elgin, and Donald J. Peterson, Chicago, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Sep. 18, 1978, Ser. No. 943,038
Int. Cl.² G03B 23/04
U.S. Cl. 353—113 **5 Claims**



1. An apparatus for controlling the movement of slides in a plane substantially normal to the direction of the movement comprising:

means for receiving a supply of slides having an upper portion for storage and dispensing of photographic slides and a lower portion for accumulating them and a line between said portions of said means lying perpendicular to the photographic surface of the slides;

unidirectional means disposed between said upper and lower portions normal to said line and said unidirectional means including a pair of movable support surfaces in spaced apart relation positioned to engage opposite edges of a photographic slide along their upper distal segments of said surfaces for supporting the parallel extremities of a photographic slide; and

relief means disposed along said distal segments for permitting substantial conjugate disposition in juxtaposed relation of non-planar photographic slides having the central portion thereof curved out of the general plane thereof.

4,174,159

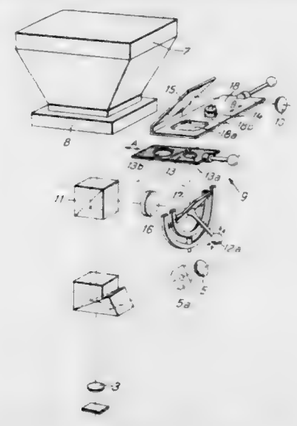
EXPOSURE METER FOR PHOTOMICROGRAPHY

Winfried Kraft, Werdorf; Günter Reinheimer, Biebertal, and Herbert Leiter, Wetzlar, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Apr. 11, 1978, Ser. No. 895,477
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1977, 2717033
Int. Cl.² G02B 21/00; G03B 17/48, 7/08
U.S. Cl. 354—23 R **15 Claims**

1. Photomicrographic exposure meter for a camera attached to a microscope comprising optical means defining a picture-taking beam for microscopic examination of an object positioned on a stage, a beam-splitter located along said picture taking beam and reflecting a part of the picture-taking beam, said part of the picture taking beam projecting an image of said object onto an image plane, a measuring field stop with an aperture for detail or spot measurements located in said image plane, an insertable photo-electric detector positioned downstream of said stop in the direction of and along said part of the picture taking beam, at least one specular means (12,61) reflecting said part of the picture taking beam to said measuring field

stop (13), a gimbal suspension for said specular means, means for displacing said gimbal-suspended specular means (12,61)



and means for viewing said object detail appearing in said stop aperture.

4,174,160

PROGRAMMED AUTOMATIC EXPOSURE CONTROL CIRCUITRY

Yasuhiro Nanba, Osaka, and Seiji Yamada, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japana

Filed Aug. 29, 1977, Ser. No. 828,666
Claims priority, application Japan, Sep. 7, 1976, 51/107609
Int. Cl.² G03B 7/08, 17/18
U.S. Cl. 354—24 **21 Claims**



1. A photographic camera capable of programmed automatic exposure control comprising:

a diaphragm settable to an initial aperture size and capable of being changed to various aperture sizes;

first means for generating a first signal in accordance with the logarithm of light intensity measured through the diaphragm;

second means for generating a second signal in accordance with a given value;

third means responsive to said first and second signals for generating a third signal intermediate said first and second signals with the ratio of the difference between the first and third signals to the difference between the third and second signals being predetermined;

means for setting the diaphragm aperture by determining the difference from the initial aperture size to an aperture size to be set in accordance with one of the differences between the first and third signals and the difference between the first and second signals with the diaphragm at the initial aperture size; and

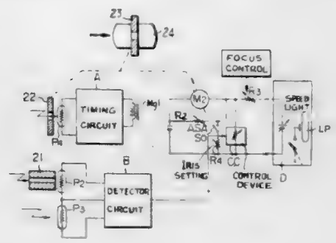
means for controlling the exposure time commensurate with the diaphragm aperture set by the diaphragm aperture setting means.

4,174,161

EXPOSURE CONTROL SYSTEM

Yukio Mashimo, Tokyo; Takashi Uchiyama, and Kanehiro Sorimachi, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 414,455, Nov. 9, 1973, Pat. No. 4,063,257, which is a continuation-in-part of Ser. No. 301,779, Oct. 30, 1972, abandoned, which is a continuation of Ser. No. 85,438, Oct. 30, 1970, abandoned. This application May 17, 1977, Ser. No. 797,640
Claims priority, application Japan, Nov. 6, 1969, 44-88873; Dec. 27, 1969, 44-1328; Dec. 27, 1969, 44-1329; Sep. 21, 1970, 45-83119
Int. Cl.² G03B 7/16
U.S. Cl. 354—33 **19 Claims**



1. An exposure control system for a scene having a main portion and a remaining portion, comprising

(A) flash illumination means for emitting an auxiliary light to illuminate at least a main portion of a scene to be photographed;

(B) exposure control means including

(b1) exposure aperture means adjustable to an aperture for obtaining an appropriate flash exposure in response to the distance to the main portion, said exposure control means including

(b2) shutter means for providing an exposure for a variable time and for actuating said flash illumination means on a synchronous basis;

(C) control circuit having

(c1) a light receiving element for generating an electrical signal in response to an amount of light from substantially the remaining portion of the scene and

(c2) time defining means for determining the time of said shutter means on the basis of the output of said element and the adjusted aperture value so as to produce an appropriate exposure for substantially the remaining portion of the scene; and

(D) limiter means for preventing the shutter from being adjusted beyond a predetermined time.

4,174,162

AERIAL CAMERA MOUNTING MEANS

Joseph M. Giacomini, Columbia, Md., and David E. Lichy, Woodbridge, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 7, 1978, Ser. No. 922,628
Int. Cl.² B64D 47/08; G03B 17/00, 29/00, 39/00
U.S. Cl. 354—70 **9 Claims**

1. Apparatus for adjustably mounting an aerial photography camera externally of an aircraft, comprising:

(a) support means adapted for attachment externally of the aircraft;

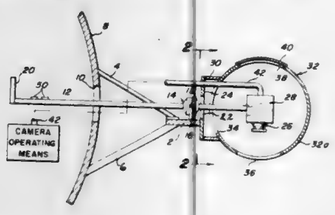
(b) a control rod;

(c) an aerial photography camera connected with one end of said control rod;

(d) a protective housing rigidly attached to said support means and enclosing said camera, said housing including a

first opening for receiving the control rod and a second opening in the bottom thereof;

(e) bearing means connecting said control rod intermediate its ends with said support means, said bearing means supporting said control rod for rotational movement about its longitudinal axis and for pivotal movement about at least one axis normal to its longitudinal axis; and



(f) handle means within the aircraft and connected with the other end of said control rod, whereby said control rod may be rotated and pivoted to a position in which the optical axis of said camera is vertical and passes through said second opening of said protective housing.

4,174,163

FILM UNIT PROCESSING MEANS

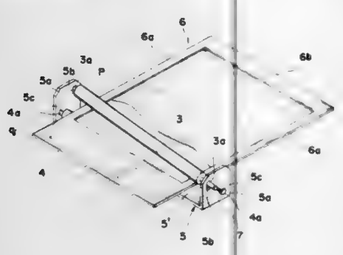
Nakao Oi, 8-32, Naka-machi 1-chome, Odawara-shi, Kanagawa-ken; Tadayoshi Shibata, Fuji Shashin Fuirumu Apato No. 10 A-218, 482-1, Nakanuma, Minami-ashigara-shi, Kanagawa-ken, and Toshio Goto, 1-41, Kishiki-cho, Omiya-shi, Saitama-ken, all of Japan

Continuation-in-part of Ser. No. 666,370, Mar. 12, 1976, abandoned, and a continuation-in-part of Ser. No. 621,332, Oct. 10, 1975, abandoned. This application Mar. 30, 1978, Ser. No. 891,680

Claims priority, application Japan, Oct. 12, 1974, 49/117588

Int. Cl.[2] **G03B** *17/50*

U.S. Cl. 354—86 **11 Claims**



1. In a photographic apparatus including means for spreading a fluid in a film unit between a pair of sheet elements, spacers interposed between said sheet elements at opposite lateral edges, said spreading means comprising:

first and second pressure members with axes of the first and second pressure members being positioned in parallel to the surface of the film unit to be passed therebetween, at least one of said pressure members being inclined, at its center, to form a predetermined angle to the plane perpendicular to a direction of advance of the film unit and crossing over the other of said pressure members; and

means for supporting said first and second pressure members in said predetermined relation to each other,

whereby, as the film unit moves between the pressure members, the processing solution is initially spread in a greater amount at the portions adjacent said spacers at said lateral edges of said sheet elements than at the center portion thereof and after the film unit moves out from between said first and second pressure members, said processing solution flows towards the center portion of the unit as said pair of sheet elements move away from each other at the center to cause said processing solution to spread evenly between the sheets.

4,174,164

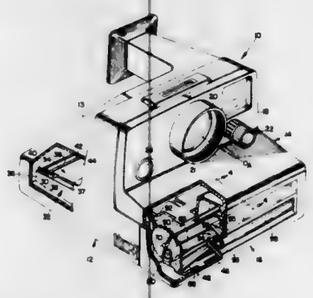
PHOTOGRAPHIC PROCESSING APPARATUS

Harvey S. Friedman, Sudbury, and Irving S. Lippert, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 30, 1978, Ser. No. 910,736

Int. Cl.[2] **G03B** *17/50*

U.S. Cl. 354—86 **8 Claims**



1. Photographic processing apparatus for use with self-processable film units of the type which include a pair of resiliently flexible, substantially flat, rectangular, superposed sheet elements and a rupturable container of processing fluid positioned adjacent a leading edge of the film unit and adapted to have its fluid contents spread between the sheet elements in a substantially uniform thin layer which covers an exposure area of given length and width, said apparatus comprising:

a pair of elongated cylindrical processing rollers rollers of given width;

means for mounting said processing rollers in juxtaposed relationship to define an elongated pressure generating gap through which a film unit may be advanced to apply a pressure to the film unit to first rupture the container of processing fluid causing its fluid contents to be released as a generally elongated mass extending widthwise of the film unit's exposure area and adjacent the leading edge of the film unit and then to cause the released mass of processing fluid to flow between the sheet elements opposite to the direction of advancement of the film unit through said gap so that the widthwise distributed mass of processing fluid is progressively deposited in a layer lengthwise of the film unit's exposure area, said mounting means being structured so that said processing rollers are mounted with their axes of rotation lying in parallel spaced apart planes and intersect one another when either roller axis is projected onto the other roller's mounting plane so that said rollers present to a film unit an effective gap, different from the geometric gap separating said rollers, which varies across the width of said rollers, said effective gap operating, as the fluid mass is spread lengthwise over the exposure area, to reduce the thickness of the fluid widthwise of the film unit's exposure area in such a way that the widthwise thickness of the fluid over centeral regions of the exposure area is reduced relative to the fluid layer's thickness over lateral regions of the exposure area compared to what such central region's fluid thickness would otherwise be if said roller's axes did not intersect said rollers further operating to induce a widthwise twist in a film unit after it emerges from said gap so that one side of the film unit is displaced away from the attitude that it would normally assume if said roller's axes did not intersect and the other side of the film unit is displaced away from the attitude it would normally assume, and opposite to the displacement of that of said one side, if said roller's axes did not intersect; and

interceptor means positioned along the path of travel a film unit takes after it emerges from said gap and structured for engaging said one side of said film unit as the film unit is advanced lengthwise past said intereceptor means to bend said one side in a direction opposite to the direction in which it is twisted by said rollers, said interceptor means operating to reduce the thickness of the fluid layer widthwise over regions of the exposure area of the film unit corresponding to said one side engaged by said interceptor means compared to what the fluid layer thickness in such regions would be absent said interceptor means, said rollers in combination with said interceptor means cooperating in the foregoing manner to provide a layer of fluid whose thickness, both widthwise and lengthwise of the film unit's exposure area, is substantially constant.

4,174,165

POWER SUPPLY CONTROL DEVICE FOR CAMERAS

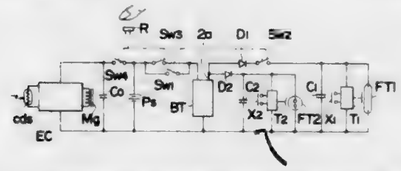
Takeo Hohda; Shinji Tominaga, both of Sakai, and Yoshiharu Ohta, Izumi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 19, 1978, Ser. No. 897,841

Claims priority, application Japan, Apr. 29, 1977, 52-50513

Int. Cl.[2] **G03B** *17/24, 15/05*

U.S. Cl. 354—105 **10 Claims**



1. In a photographic system which includes means for effecting an exposure operation of a camera, means for initiating the exposure operation, a first electronic flash means for illuminating a scene to be photographed and means for recording auxiliary data on a film, the recording means having a second electronic flash means for illuminating the data to be recorded, a power supply control device comprising:

a first capacitor for energizing said first electronic flash means;

a second capacitor for energizing said second electronic flash means;

a voltage converter means for generating a voltage at an output terminal, said first and second capacitors being connected to said output terminal;

a first switch means manually operable independently of the camera exposure initiating means for permitting said first capacitor to be charged with the output voltage of said voltage converter; and

a second switch means operable by said initiating means for permitting said second capacitor to be charged with the output voltage of said voltage converter.

4,174,166

MOTOR DRIVE DEVICE FOR LONG-FOOTAGE FILM

Kouichi Daitoku, Tokyo, Japan, and Kouichi Takahata, deceased, late of Tokyo, Japan (by Kosaku Takahata, legal successor), assignors to Nippon Kogaku K.K., Tokyo, Japan

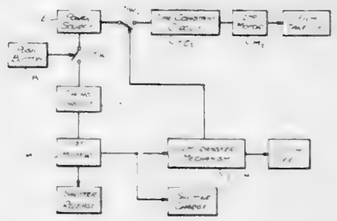
Continuation of Ser. No. 762,452, Jan. 28, 1977, abandoned. This application Jan. 16, 1978, Ser. No. 869,792

Claims priority, application Japan, Jan. 30, 1976, 51-8661[U]

Int. Cl.[2] **G03B** *1/18*

U.S. Cl. 354—173 **3 Claims**

1. In a motor drive device for long-footage film comprising a first motor for effecting shutter release as well as shutter charge and for driving a film supply spool in order to feed a predetermined length of the film, a second motor for rotating a take-up spool in order to take up the film fed by the first motor, and a time constant circuit for controlling the time interval during which the second motor is powered so that the power supply to the second motor may be cut off before the first motor feeds said predetermined length of the film, the improvement comprising control means for controlling the first motor so that shutter release by the first motor may be



effected after the lapse of a predetermined time interval from the stoppage of the power supply to the second motor, which predetermined time interval is the longest time interval of the time intervals from the cut-off of the power supply to the second motor to the actual stoppage thereof when photographs are taken from the first exposure to an exposure in which the tension caused by the take-up spool becomes equal to the resistant force to the tension at the film supply spool side on the film.

4,174,167

INTERCHANGEABLE LENS FOR CAMERAS

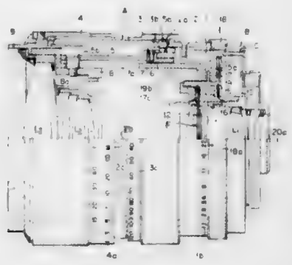
Motoi Nagashima, Tokyo, Japan, assignor to Cima Kogaku Company Limited, Tokyo, Japan

Filed Jul. 8, 1977, Ser. No. 814,125

Claims priority, application Japan, Jul. 9, 1976, 51-81527

Int. Cl.[2] **G03B** *9/07, 17/00*

U.S. Cl. 354—196 **4 Claims**



1. An interchangeable lens for cameras comprising a lens barrel assembly including therein a lens system and a diaphragm blade means arranged in said lens system and a diaphragm operating lever connected to said diaphragm blade means, a separate mount assembly interchangeably secured to said lens barrel assembly to be fitted to all types of cameras and including therein an operating means engageable with said diaphragm operating lever to operate said diaphragm operating lever, wherein said operating means comprises a diaphragm operating ring rotatable concentrically with the optical axis and biasing in one direction, and a sliding plate supported movably concentrically with the optical axis on said diaphragm operating ring and biased in the direction reverse to that of said diaphragm operating ring and engaged with said diaphragm operating lever, and a diaphragm controlling cam

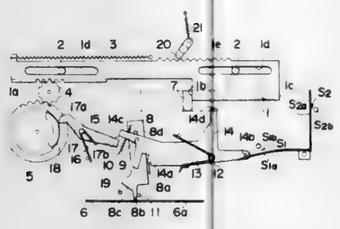
ring rotatably held concentrically with the optical axis between said lens barrel assembly and mount assembly and engageable with said diaphragm operating lever, said interchangeable lens being adapted for a plurality of different types of cameras by selection of different types of mount assemblies having different operating means.

4,174,168

SAFETY MECHANISM FOR CAMERAS

Maki Yamashita, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 30, 1977, Ser. No. 856,143
Claims priority, application Japan, Dec. 3, 1976, 51-145920; Dec. 10, 1976, 51-148900
Int. Cl.² G03B *17/38, 17/42*
U.S. Cl. 354—206 **13 Claims**



1. A camera employing a film cartridge carrying film having longitudinally spaced frame indexing perforations, comprising:
a shutter actuating electromagnet;
means for sensing a film frame indexing perforation of the film from the film cartridge loaded in the camera and assuming a first condition when said perforation is in a predetermined position and assuming a second condition in the presence of the film cartridge in the camera with said indexing perforation spaced from said predetermined position in the direction opposite to the film advancing direction; and
circuit means for energizing said electromagnet, transferable to alternative enabled and disabled states in response to the occurrence of said first and second conditions respectively and including selectively operable means for actuating said circuit means to energize said electromagnet when said circuit means is in said enabled state.

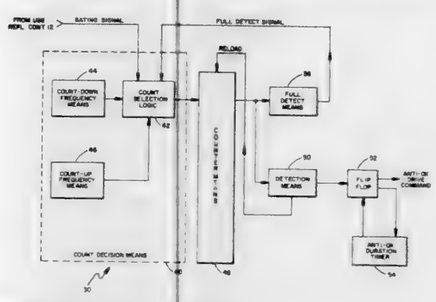
4,174,169

ANTI-OXIDATION FLUID REPLENISHER CONTROL SYSTEM FOR PROCESSOR OF PHOTOSENSITIVE MATERIAL

Theodore A. Melander, and Ralph L. Charnley, both of Minneapolis, Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Mar. 2, 1978, Ser. No. 882,804
Int. Cl.² G03D *3/06*
U.S. Cl. 354—324 **26 Claims**

1. A control system for controlling anti-oxidation replenisher means to provide anti-oxidation fluid to a processor of photosensitive material, the control system comprising:
count decision means responsive to whether use-related chemical replenishment is occurring within the processor for providing a first signal when use-related chemical replenishment is not occurring and a second signal when use-related chemical replenishment is occurring;
counter means operatively coupled to the count decision means for holding a first predetermined value and for counting in one direction in value whenever the count decision means provides the first signal and for counting in the opposite direction in value whenever the count decision means provides the second signal; and
detection means operatively coupled to the counter means for detecting the occurrence of a second predetermined value in the counter means and for causing the anti-oxidation replenisher means to initiate anti-oxidation fluid replenishment.

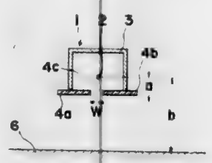


4,174,170

CONDUCTIVE TONER TRANSFER PHOTOCOPYING MACHINE

Toshio Yamamoto, and Shizuo Yuge, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 15, 1977, Ser. No. 861,005
Claims priority, application Japan, Dec. 16, 1976, 51-151677
Int. Cl.² H01T *19/04*; G03G *15/00*
U.S. Cl. 355—3 TR **8 Claims**



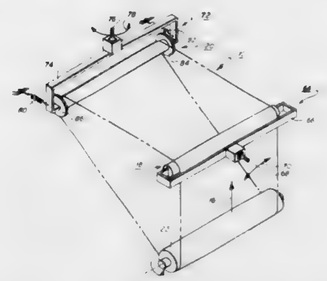
1. In a photocopying apparatus wherein a latent image of an original document to be copied is formed on an electrophotosensitive medium, electrically conductive toner particles are applied to said medium to develop said image, and said developed image is transferred onto copy paper by bringing said copy paper into effective contact with said electrophotosensitive medium and applying an ionic current from a corona discharge unit to the rear surface of said copy paper to cause said toner particles to move onto said copy paper, the improvement comprising shield elements which are provided between said electrophotosensitive medium and said discharge unit, and defining a slit for passing the corona discharge and having a width and said corona discharge unit being spaced from said electrophotosensitive medium and the speed of movement of the copy paper past the corona charger and the voltage applied to the corona charger being such that the amount of said current applied to said copy paper is sufficient to cause transfer of toner particles onto said copy paper but insufficient to permit storage in said copy paper of a charge great enough to cancel the charge of said toner particles transferred onto said copy paper.

4,174,171

BELT TRACKING SYSTEM

Ralph A. Hamaker, Penfield, and Kenneth J. Buck, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 24, 1978, Ser. No. 927,191
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 BE **12 Claims**



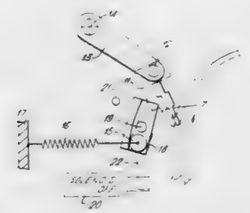
1. An apparatus for controlling the lateral alignment of a belt arranged to move in a pre-determined path, including:
a steering post arranged to provide support for the belt and being mounted for pivotable movement about an axis substantially normal to the longitudinal axis thereof;
means for supporting resiliently the belt, said supporting means opposing the movement of the belt laterally from the pre-determined path and causing the belt to apply a moment on said steering post pivoting said steering post in the direction to restore the belt to the pre-determined path;
means for moving the belt in the pre-determined path; and
means for supplying a pressurized fluid between at least a portion of said steering post and the belt to form a fluid film supporting the belt and reducing friction between the belt and said steering post.

4,174,172

CLEANING METHODS AND APPARATUS FOR A PHOTOCOPYING DEVICE

John N. Lane, Leighton Buzzard, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 26, 1977, Ser. No. 845,696
Claims priority, application United Kingdom, Dec. 17, 1976, 52774/76
Int. Cl.² G03G *21/00*; B08B *7/00*
U.S. Cl. 355—15 **13 Claims**



6. Apparatus for cleaning a surface including a cleaning blade engagable with said surface, drive means for moving the surface past the cleaning blade with rest periods of no relative motion, and blade translation means for moving the blade out of contact with the surface at a first position during a said period of no relative motion and for returning the blade into engagement with the surface at a second position downstream of said first position.

4,174,173

PHOTOGRAPHIC PRINTER WITH INTERACTIVE COLOR BALANCING

John Pone, Jr., Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Nov. 4, 1977, Ser. No. 848,738
Int. Cl.² G03B *27/78*
U.S. Cl. 355—38 **8 Claims**



3. In a photographic printer, the improvement comprising
density measuring means for measuring densities of a reference film;
printing means for printing a test print from the reference film based upon measured densities of the reference film and initial exposures;
data entry means for receiving, from a user of the photographic printer, desired print density values for the test print and measured print density values for the test print; and
exposure control means for deriving modified exposures from the desired print density values, the measured print density values, and the measured densities of the reference film, and controlling subsequent printing of the printing means based upon the modified exposures.

4,174,174

COMPOSING REDUCING CAMERA

Robert K. Hunter, Jr., Northridge; David A. Grafton, Santa Monica; Joseph Lander, Covina; Lauren V. Merritt, Sierra Madre; Donald E. Stewart, Arcadia, and Donald H. Wolpert, Los Angeles, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

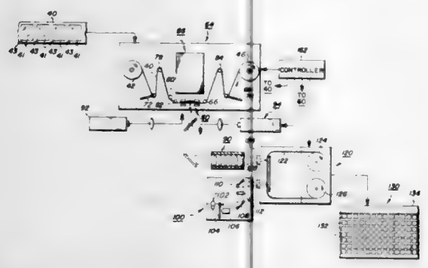
Filed Mar. 15, 1977, Ser. No. 777,866
Int. Cl.² G03B *27/46, 27/32*
U.S. Cl. 355—39 **4 Claims**

1. A system for automatically producing microfilm or microfiche in a variety of formats and reduction ratios from roll microfilm input comprising:
a microfilm transport means for accepting rolls of input microfilm, transporting said microfilm to a filming gate, stopping and registering individual microfilm frames in said filming gate,
a film exposure means for illuminating individual frames in the filming gate as the microfilm is automatically stepped frame by frame through the filming gate,
a reducing lens means for imaging the input microfilm

V.9813:2 NO 13 79 UMI

frames with high optical resolution at various reduction ratios to a focal plane,

a microfilm recording means for accepting the reduced images from said reducing lens means at said focal plane within the recorder; said microfilm recording means being automatically controlled in synchronism with the microfilm transport means to position the output microfilm or microfiche in two dimensions in said focal plane of the recording device resulting in a plurality of reduced microimages being arranged in columns and rows corresponding to a preselected format,



first sequencer means for controlling the microfilm transport means when a search is being executed whereby a selected and coded frame is registered in the film gate,

second sequencer means for providing system operational and level commands, said second sequencer means comprising a microprocessor, and

third sequencer means for controlling said microfilm transport means during the loading and unloading of said microfilm.

4,174,175

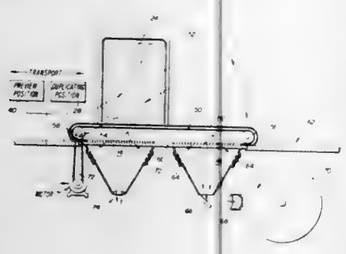
COPY PREVIEW APPARATUS

James D. DiMaria, 11879 St. Trinians Ct., Reston, Va. 22314

Continuation-in-part of Ser. No. 790,024, Apr. 22, 1977, abandoned. This application Feb. 1, 1978, Ser. No. 874,251

Int. Cl.[2] **G03G** *15/00*

U.S. Cl. 355—44 **5 Claims**



1. Apparatus for previewing and copying documents in a positive form comprising:

means for projecting the image of a document on a viewing surface at a previewing station to display an image of the document for viewing prior to copying;

means for transporting the viewed document from said previewing station to a copying station, the transporting means including a transparent endless belt having a surface in contact with a surface of the document, and means for moving the belt with the document in contact therewith between the previewing station and the copying station; and

means for copying the document at said copying station in the same form that the document was viewed at the previewing station.

4,174,176

DEVICE FOR DETACHABLE ATTACHMENT OF A PRINT ORIGINAL TO A CYLINDER

Josef Windele, Puchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 13, 1977, Ser. No. 841,800

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1977, 7712225

Int. Cl.[2] **G03B** *27/10;* **B41F** *1/28, 21/00*

U.S. Cl. 355—110 **6 Claims**



1. A device for removably attaching a negative to a cylinder comprising:

means for attaching spring clips along one longitudinal edge of the negative,

means for attaching locking knobs along the other longitudinal edge of the negative,

said locking knobs being generally aligned with corresponding ones of said spring clips, and

said spring clips being engagable over said locking pins when said negative is rolled in the form of a cylinder, said means for attaching said spring clips being a spring contact strip, said spring contact strip being an elongated strip of material having a plurality of spring clips secured at spaced intervals along the length thereof, said means for attaching said locking knobs being a knob contact strip in the form of an elongated strip of material with a plurality of knobs secured at like spaced intervals along the length thereof, the negative having a first pair of marks located in the vicinity of a first longitudinal end of the negative and adjacent to the longitudinal edges thereof, said negative having a second pair of marks located at the opposite longitudinal end in the vicinity of the longitudinal edges, each of the contact strips having openings which conform in configuration to said respective marks but which are larger in size, said contact strips being caused to overlie the region of said marks such that said holes align with the correspondingly configured marks on the negative, whereby said contact strips are properly positioned on the negative.

4,174,177

FALSE TARGET WARNING SYSTEM

Keith L. Gardner, Tucson, Ariz., and Goro Fujiwara, Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 14, 1978, Ser. No. 933,300

Int. Cl.[2] **G01C** *3/08;* **F41G** *7/00*

U.S. Cl. 356—5 **8 Claims**

1. A false target warning system for a target designator, comprising:

detector means for detecting electromagnetic energy from the target designator that is reflected back thereto and which defines a path of optical transmission;

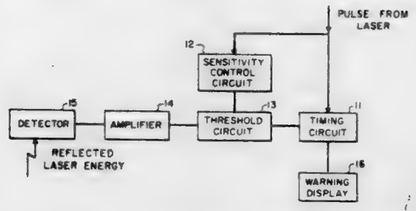
an amplifier connected to the output of said detector means;

a threshold circuit having first and second inputs, said first input connected to the output of said amplifier, said threshold circuit configured to have a signal output whenever the signal applied to said first input exceeds the threshold level;

a sensitivity control circuit for controlling the threshold level of said threshold circuit, comprising: an integrator having the output thereof connected to said second input of said threshold circuit;

a one-shot multivibrator connected to the negative input of said integrator, said one-shot multivibrator configured to be triggered by a pulse of energy from the target detector;

a source of positive voltage connected to the positive input of said integrator, the integrator output being



equal to said positive voltage minus the integrated signal from said one-shot multivibrator, thereby supplying a voltage that decreases with time to said second threshold input to cause the threshold level of said threshold circuit to decrease with time;

a timing circuit triggered by pulses of energy from the target designator, connected to the output of said threshold circuit and configured to be triggered simultaneously with said one-shot multivibrator; and

indicator means, connected to said timing means, for warning the operator of the target designator whenever said timing circuit receives a signal from said threshold circuit in a time less than a predetermined interval.

4,174,178

BLOOD SERUM BEARING FILM WITH POSITION INDICATING MARK

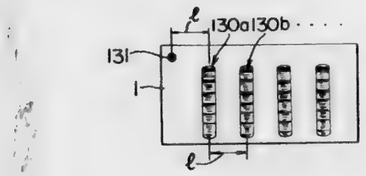
Teruo Ouchi, Hachioji, and Yutaka Kato, Tama, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 572,729, Apr. 29, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,163

Claims priority, application Japan, May 7, 1974, 49/50423; Jun. 8, 1974, 49/66532[U]; Sep. 4, 1974, 49/100954

Int. Cl.[2] **G01N** *33/16, 21/16*

U.S. Cl. 356—39 **18 Claims**



1. A blood serum-bearing film comprising:

a serum-bearing film having a leading and a trailing edge;

a plurality of equally spaced blood serum samples disposed on said film in an array, each said blood serum sample having a leading and a trailing edge; and

a positive indicating mark disposed forward of the leading edge of the sample closest to said leading edge of said film by a distance representative of the spacing between adjacent ones of said samples.

4,174,179

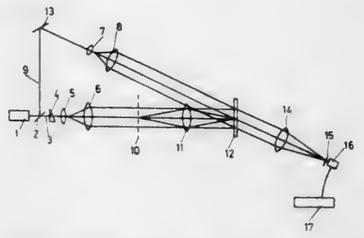
CONTINUOUS FEED HOLOGRAPHIC CORRELATOR FOR RANDOMLY ORIENTED WORKPIECES

Theodor Tschudi, Reinmattstrasse 1, and Guy Indebetouw, Madergutstrasse 31, both of Bern, Switzerland

Filed Aug. 24, 1977, Ser. No. 827,351

Int. Cl.[2] **G06K** *9/08;* **G03H** *1/28;* **G02B** *27/38*

U.S. Cl. 356—71 **13 Claims**



1. A method comparing an object with a reference specimen by means of a coherent optical multichannel correlator employing a coherent input light beam and an output beam passing through a filter, said method comprising the steps of:

(a) producing a holographic filter containing a spatially distinct plurality of images each representing characteristic properties of the referenece specimen in different specimen orientations;

(b) using said holographic filter as the filter in the correlator;

(c) translationally moving the object to be compared through the coherent input light beam of the correlator;

(d) detecting and measuring the intensity of the output beam of the correlator through a slit diaphragm; and

(e) sorting the object in dependence upon the maximum value of the intensity measured during said translational movement of the object to be compared.

4,174,180

ULTRAMICROSCOPIC SPECTROMETER

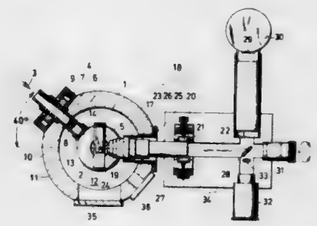
Josef Gebhart, Dietzenbach; Gerhard Heigwer, Offenbach am Main; Joachim Heyder; Friedel Haas, both of Frankfurt am Main, and Christa Roth, Eschborn, all of Fed. Rep. of Germany, assignors to Gesellschaft fur Strahlen- und Umweltforschung mbH, Munchen, Neuherberg, Fed. Rep. of Germany

Filed Aug. 11, 1977, Ser. No. 823,936

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1976, 2637333

Int. Cl.[2] **G01N** *21/00*

U.S. Cl. 356—338 **1 Claim**



1. In an ultramicroscopic spectrometer for examining properties of aerosol particles, including a receptacle having a wall defining a measuring chamber; an aerosol jet generating means for forming an aerosol jet from the particles by aerodynamic focusing; a mount supporting the aerosol generating means in the measuring chamber; a first passage means supported in the receptacle wall for passing an incident illuminating beam

through the receptacle wall into the measuring chamber; an astigmatic image forming system supported in said first passage means for focusing the illuminating beam in the measuring field; a second passage means supported in the receptacle wall for passing an information beam of the aerosol jet through the receptacle wall from the measuring chamber; the axes of the illuminating beam, the information beam and the aerosol jet intersecting in a measuring field in the measuring chamber; the improvement comprising

(a) a base defining the bottom of said receptacle and including means defining an opening in said base;

(b) a mount adjusting device arranged adjacent said base externally of said measuring chamber;

(c) a first flexible sealing sleeve projecting through said opening and being secured to said base;

(d) a post passing through said opening and being surrounded by said first flexible sealing sleeve; said post being in circumferential contact with said first flexible sealing sleeve, whereby said first flexible sealing sleeve provides for a sealed penetration of said post into said measuring chamber; said post being further attached to said mount in said measuring chamber and to said mount adjusting device externally of said measuring chamber, whereby said mount can be adjusted by said mount adjusting device during examination of the aerosol particles in said measuring chamber;

(e) a second flexible sealing sleeve projecting through an aperture in said receptacle wall and being secured thereto;

(f) a tube passing through said aperture in said receptacle wall and projecting into said measuring chamber for directing said information beam thereinto; said tube being surrounded by said second flexible sealing sleeve and being in circumferential contact therewith, whereby said second flexible sealing sleeve provides for a sealed penetration of said tube into said measuring chamber; said tube being included in said second passage means and having a microscope objective extending into said measuring chamber; and

(g) a tube adjusting device arranged externally of said measuring chamber and being operatively connected to said tube for adjusting said tube and said microscope objective by said tube adjusting device during examination of the aerosol particles in said measuring chamber.

4,174,181

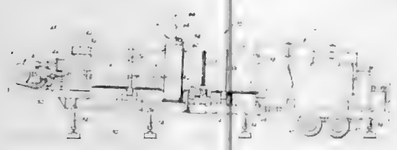
METHOD AND APPARATUS FOR ESTABLISHING AGGREGATE CASCADE ZONES IN AN APPARATUS FOR PRODUCING HOT MIX ASPHALT

David L. Garbelman, Edmond; William H. Minor, Bethany, and Arthur G. Shaw, Mustang, all of Okla., assignors to CMI Corporation, Oklahomo City, Okla.

Filed Apr. 17, 1978, Ser. No. 896,512

Int. Cl.² B28C *5/20*

U.S. Cl. 366—2 **21 Claims**



1. In a method of heating and drying aggregate using a rotating drum having the input end thereof higher than the output end thereof, comprising the steps of:

(a) producing a flame in the drum extending from the input end thereof toward the discharge end thereof;

(b) introducing the aggregate radially into the input end of the drum around the flame;

(c) repeatedly cascading the aggregate through and around a medial portion of the flame as the aggregate gravitates toward the discharge end of the drum; and then

(d) repeatedly cascading the aggregate through and around the remaining, terminal portion of the flame entirely across the drum in a higher density of aggregate across the drum than in step (c) as the aggregate continues to gravitate toward the discharge end of the drum.

2. In a method of making hot mix asphalt using a rotating drum having the input end thereof higher than the output end thereof, comprising the steps of:

(a) producing a flame in the drum extending from the input end thereof to a medial portion of the length of the drum;

(b) introducing aggregate radially into the input end of the drum around the flame;

(c) repeatedly cascading the aggregate through and around a medial portion of the flame as the aggregate gravitates toward the discharge end of the drum;

(d) repeatedly cascading the aggregate through and around the remaining, terminal portion of the flame entirely across the drum in a higher density of aggregate across the drum than in step (c) as the aggregate continues to gravitate toward the discharge end of the drum;

(e) injecting asphaltic oil into the drum between the flame and the discharge end of the drum;

(f) mixing the aggregate and asphaltic oil in the remaining portion of the drum as the aggregate continues to gravitate toward the discharge end of the drum to form the hot mix asphalt; and

(g) discharging the hot mix asphalt from the discharge end of the drum.

4,174,182

NEEDLE PRINTING HEAD

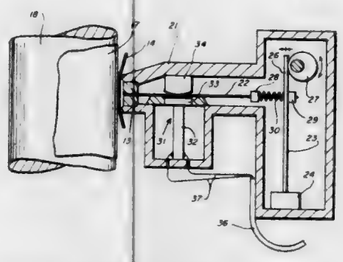
Josef Lendl, Ottensoos, Fed. Rep. of Germany, assignor to Triumph Werke Nurnberg A.G., Nuremberg, Fed. Rep. of Germany

Filed Mar. 30, 1978, Ser. No. 891,607

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1977, 2715617

Int. Cl.² B41J *3/12*; **H02K** *49/00*

U.S. Cl. 400—124 **7 Claims**



5. A mechanism for printing a recording medium, the mechanism comprising:

an array of elongated printing needles,

a needle guide for receiving one end of each of said printing needles,

a reciprocating means for driving each of said printing needles, said printing needles extending in a substantially straight line from the needle guide to the reciprocating means,

an oscillator for driving each of said reciprocating means,

a yieldable coupling for transmitting motion from said reciprocating means to said printing needles, and

a brake for clamping directly upon each of said printing needles, wherein said brake, when energized, prevents the yieldable coupling from transmitting motion from said reciprocating means to said printing needles.

4,174,183

SUPPORT FRAME

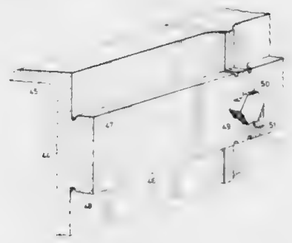
Derek Ferns, Trelleck, Wales, assignor to Self-Level Covers Aktiengesellschaft, Basel, Switzerland

Filed Mar. 1, 1978, Ser. No. 882,386

Claims priority, application United Kingdom, Mar. 1, 1977, 8564/77; Nov. 29, 1977, 49508/77

Int. Cl.² E02D *29/14*

U.S. Cl. 404—26 **7 Claims**



3. A frame for supporting a member at the level of a paved surface, the frame being constituted by a wall portion surrounding an aperture whose cross-section matches that of the member to be supported, an outwardly extending flange projecting from one edge of the wall portion, and internally extending support means adapted to support said member with its top surface substantially level with said one edge of the wall portion when said one edge is uppermost and with the opposite edge of the wall portion to said one edge when said opposite edge is uppermost.

4,174,184

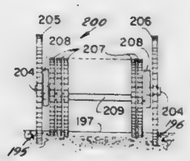
SNOWPLOWABLE PAVEMENT MARKER AND METHOD AND APPARATUS FOR INSTALLING SAME

Sidney A. Heenan, Park Ridge, Ill., assignor to Amerace Corporation, New York, N.Y.

Division of Ser. No. 789,249, Apr. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 681,858, Apr. 30, 1976, abandoned. This application Aug. 18, 1978, Ser. No. 935,069

Int. Cl.² E01F *9/04*

U.S. Cl. 404—72 **15 Claims**



1. A method of installing on a finished roadway surface a pavement marker which includes two longitudinally extending and laterally spaced-apart keel members extending below a plane and a support member interconnecting said keel members and extending below the plane, said method comprising the steps of positioning a cutting apparatus on the pavement in an operating position, cutting in the pavement with said cutting apparatus three arcuate recesses including two laterally spaced-apart keel recesses and a support member recess disposed therebetween all without moving said cutting apparatus from said operating position, said recesses being disposed and dimensioned for respectively receiving said keel members and said support member therein to a depth such that the roadway surface lies substantially in the plane, placing in each of said recesses adhesive material which adheres to both the pavement material and the material of the keel members and support member, and inserting said keel members and said support member respectively in said recesses and said adhesive material so that the roadway surface lies substantially in the plane for fixedly securing the pavement marker to the pavement.

4,174,185

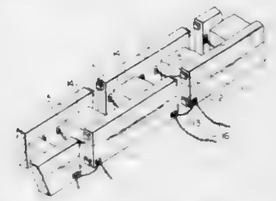
FLOATING-TYPE ANTI-OIL ANTI-IMPACT AND ANTI-WAVE BARRIER

Naoji Toki, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Nov. 14, 1977, Ser. No. 851,585

Int. Cl.² E02B *3/06, 3/22, 15/04*

U.S. Cl. 405—27 **7 Claims**



1. A floating anti-oil, anti-impact and anti-wave barrier comprising:

a plurality of hollow, elongated floating members each having longitudinally extending sides and opposite ends;

said floating members being aligned and connected in at least two separate rows in end-to-end fashion with regular intervals between adjacent ends of adjacent floating members, to thereby form at least two separate elongated floats, each said interval between adjacent floating members being substantially less than the dimension of said sides of each said floating member, taken in the longitudinal direction of each said float;

said floats being arranged and connected in laterally spaced relation to each other with spaces between adjacent said floats, said adjacent floats being longitudinally staggered with respect to each other, such that said longitudinal sides of said floating members of each said float laterally face and longitudinally overlap said intervals of adjacent floats; and

a plurality of flexible floating spacers positioned in said spaces between laterally adjacent said floats, each said spacer being in contact with respective of said longitudinal sides of respective said floating members of said adjacent floats.

4,174,186

FLOATING-TYPE ANTI-OIL ANTI-IMPACT ANTI-WAVE BARRIER

Hironao Kasai; Hitoshi Fujii, and Naoji Toki, all of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1977, Ser. No. 852,523

Claims priority, application Japan, May 27, 1977, 52-67679[U]; May 30, 1977, 52-68600[U]

Int. Cl.² E02B *15/04*

U.S. Cl. 405—71 **6 Claims**

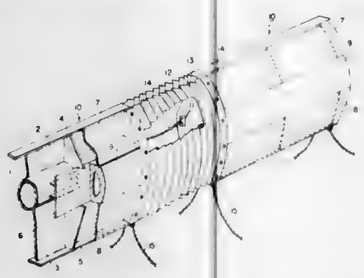
6. A floating-type, anti-oil, anti-impact, anti-wave barrier unit comprising:

a plurality of longitudinally extending float units adapted to float on a body of water, said float units being arranged to extend parallel to each other and laterally spaced from each other with lateral spaces therebetween, each said float unit comprising a hollow, rectangular, elongated box-shaped float;

means for flexibly connecting adjacent laterally spaced said float units; and

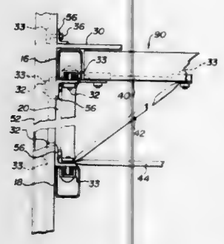
buffer member means loosely positioned in the said lateral

space between adjacent laterally spaced said floats, said buffer member means comprising a rectangular floating



member, a framework surrounding said floating member, and resilient members mounted on said framework and adapted to loosely abut said floats.

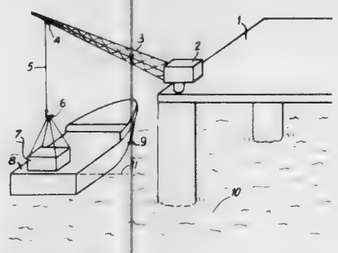
4,174,187
BOAT DOCK
Rudolph E. Parisien, 891 Rainbow St., Ottawa, Ontario, Canada
Filed Apr. 13, 1978, Ser. No. 896,041
Claims priority, application Canada, Apr. 18, 1977, 276369
Int. Cl.[2] E02B *3/20*
U.S. Cl. 405—221 **7 Claims**



1. A boat dock comprising a pair of spaced apart trusses adapted to support decking, each said truss comprising upper and lower channel members spaced apart by braces angularly disposed with respect to said channel members, a cross member at each end of said dock for joining ends of said upper channel members at each end of said dock, at least one diagonal member extending diagonally between said trusses, upright members adjacent each corner for supporting said dock, said upright members being in the form of channel members each having a restricted longitudinal opening in one side and a right angle bracket secured to each said lower channel member adjacent each end of said lower channel member so that a bolt extending through each said bracket extends into the restricted opening in said upright member and is adapted to adjustably secure said upright member to said lower channel member.

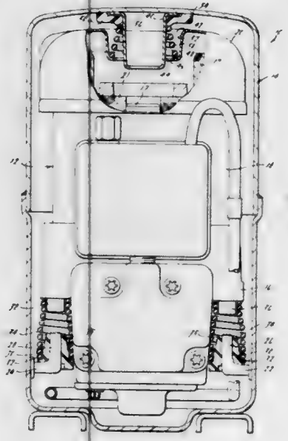
4,174,188
PROCESS AND APPARATUS FOR TRANSFER OF CARGO AT SEA
Andre G. Brun, Paris, France, assignor to Compagnie Francaise des Petroles, Paris, France
Filed Jun. 2, 1977, Ser. No. 802,855
Claims priority, application France, Jun. 2, 1976, 7616591
Int. Cl.[2] B66D *1/50*
U.S. Cl. 414—139 **7 Claims**

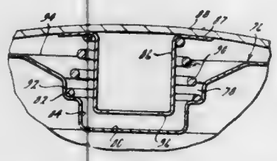
1. A process of transferring cargo from a ship at sea which is rising and falling by hoisting means mounted on a relatively stable platform comprising placing the cargo on a vertically moveable support, located on said ship raising said support relative to said ship, lifting the cargo from said support by means of a cable controlled by said hoist means when said ship



reaches its highest point on the crest of the wave and immediately and rapidly lowering said support relative to said ship to quickly increase the spacing between said cargo and said support.

4,174,189
REFRIGERATION COMPRESSOR SUSPENSION SYSTEM
John P. Elson, Sidney, Ohio, assignor to Copeland Corporation, Sidney, Ohio
Filed Feb. 10, 1977, Ser. No. 767,385
Int. Cl.[2] F04B *17/00, 35/00*
U.S. Cl. 417—363 **15 Claims**

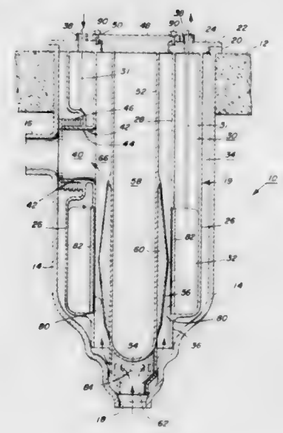




1. A suspension system for a hermetic refrigeration compressor comprising:
a hermetically sealed shell;
compressor means;
motor means rotationally driving said compressor means;

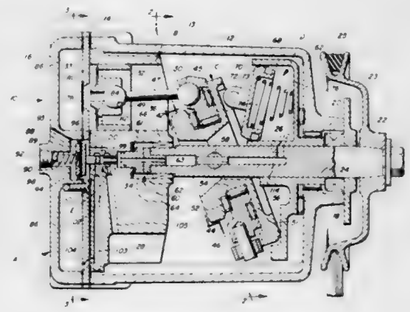
means resiliently mounting said compressor means within said shell including at least one spring;
a shroud having a closed top covering one end of said motor means and having a cylindrical shoulder disposed coaxially with the rotational axis of said motor; and
stop means secured to said shell, said stop means including a rigid projection extending at least partially through said spring and being directly engageable with and cooperating with said cylindrical shoulder to limit relative movement of said compressor means with respect to said shell in a direction transverse to said rotational axis.

4,174,190
ANNULAR LINEAR INDUCTION PUMP WITH AN EXTERNALLY SUPPORTED DUCT
Edwin R. Craig, San Jose, Calif., and Robert S. Semken, Idaho Falls, Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Jun. 30, 1977, Ser. No. 811,627
Int. Cl.[2] H02N *4/20*
U.S. Cl. 417—50 **15 Claims**



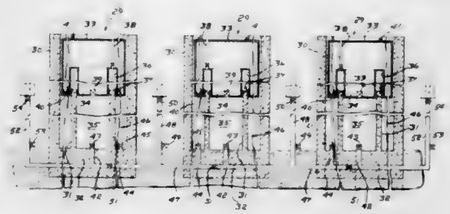
1. An annular linear induction pump for pumping liquid metal, comprising:
(a) a housing having a first opening defining a first open end with the opposite end being open and having toward said first open end a second opening;
(b) a stator assembly comprising a stator held in a fluid tight annular container with a fluid coolant inlet and a fluid coolant outlet enabling contacting said stator with a fluid coolant to cool said stator, said stator assembly having a thin duct wall covering the stator from contact with the liquid metal and being removably held in said housing and filling a portion of said first open end of said housing, and during operation said stator being capable of developing a magnetic flux and a series of electrical poles therein, said container including an outer wall and an inner wall, said inner wall including said thin duct wall, and said stator being held within said container integral therewith for removal with said assembly from said housing; and
(c) means for receiving magnetic flux created during operation of said stator removably positioned in the housing inside said annular container to complete filling said first open end of said housing and leaving a liquid metal flow annulus between said annular container and said means for receiving a magnetic flux, which annulus connects said openings in said housing for one pass flow of fluid through said housing, with said means for receiving a magnetic flux being capable of having induced therein magnetic paths corresponding to said poles of said stator.

4,174,191
VARIABLE CAPACITY COMPRESSOR
Richard W. Roberts, Lombard, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Jan. 18, 1978, Ser. No. 870,395
Int. Cl.[2] F04B *1/12*
U.S. Cl. 417—222 **3 Claims**



1. A compressor comprising: means defining a plurality of gas working spaces each having a piston cooperating with suction and discharge ports to compress a fluid therein; a drive shaft; a cam mechanism driven by said drive shaft; a swash plate driven by said cam mechanism in a nutating path about the drive shaft axis; means operably connected between said swash plate and the individual pistons to impart reciprocating drive to said pistons; means for pivoting said swash plate and said cam mechanism at a fixed point along the drive shaft axis such that the stroke length of the pistons may be varied; means for constraining rotational movement of said swash plate, said means including an arcuately shaped arm pivoted at one end in a fixed support, a pin extending from the opposite end of said arm and engaging said swash plate, the axis of said pin and the pivot axis of said one end of said arm being perpendicular; a fluid operated actuator operatively connected to said swash plate to vary the position thereof, said actuator having a fluid chamber cooperating with a moveable piston, and means for controlling the pressure in said chamber in response to suction pressure.

4,174,192
TIDE OPERATED PUMPS
Francis E. Daddario, 15 Fowler La., Falmouth, Mass. 02450
Filed Dec. 19, 1977, Ser. No. 861,685
Int. Cl.[2] F04B *17/00, 35/00*
U.S. Cl. 417—333 **17 Claims**



1. A tide operated hydroelectric system including a series of pumps, each pump including at least one piston member and a cylinder member defining therewith a vertically expansible

chamber, one member fixed on the ocean bottom and the other including a float, operating means including conduits in communication with said chambers and control valves for said conduits, said conduits and valves arranged to provide a water inlet at low tide for each pump with the chambers filling as the tide lifts the floats, the entrapment of water in each chamber and its subsequent discharge therefrom under a wanted head, said operating means including at least one turbine operable by the discharge from one pump chamber, said operating means also including means operable to enable water discharged from another pump to be under a head adequate to operate said one pump independently of the tide level, and at least some of said floats including valve controlled means operable to admit ballast water therein when in an elevated position in order to increase the head on the chamber water and to be later drained to restore normal float buoyancy.

4,174,193

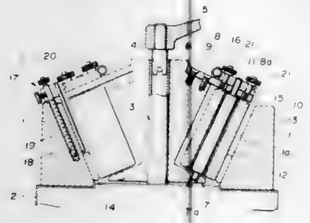
PERISTATIC PUMP WITH HOSE POSITIONING MEANS AND PRESSURE ADJUSTMENT APPARATUS

Kinsaku Sakakibara, Nagoya, Japan, assignor to Senko Medical Instrument Mfg. Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1976, Ser. No. 751,304

Int. Cl.[2] **F04B** *43/08, 43/12, 45/06*

U.S. Cl. 417—477 **5 Claims**



1. A liquid transfer pump in which a soft flexible hose is arranged along an internal peripheral wall of a semi-circular external enclosure, a drive shaft which is driven by drive means is provided at a position with an equal distance from said internal peripheral wall and a plurality of squeeze rollers, which travel around said drive shaft as a center while rolling around their own axis in accordance with rotation of said drive shaft and squeeze said hose while depressing the hose against said internal peripheral wall to transfer a liquid contained in said hose from one position to another position, are rotatably supported by a holder fixed on said drive shaft, wherein said internal peripheral wall of the external enclosure is slanted and external peripheral surfaces of said squeeze rollers are arranged in parallel with said internal peripheral wall, two core bars being fixed at eccentric positions of both ends of a core of said squeeze roller, a worm wheel to which one of said core bars is fixed, a hole in the holder receiving the other of said core bars and a worm engaged with said worm wheel.

4,174,194

RECIPROCATING PUMP

Paul Hammelmann, Zum Sundern 17, Oelde 1, Fed. Rep. of Germany (D-4740)

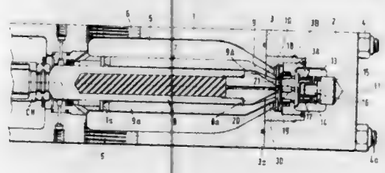
Filed Jul. 1, 1977, Ser. No. 812,368

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1976, 2631217

Int. Cl.[2] **F04B** *21/02*

U.S. Cl. 417—567 **12 Claims**

1. A reciprocating pump, comprising a housing having at least one fluid-admitting inlet; a tubular member mounted in said housing and including a hollow conical end portion; a plunger reciprocable in said tubular member; a lightweight suction valve having a mobile valving element installed in said housing intermediate said inlet and said conical end portion to normally seal said inlet from the interior of said tubular member, said valving element having an opening for the flow of fluid from said tubular member and being movable to an open position in which said valve defines a path for the flow of fluid from said inlet into said tubular member, said housing including a hollow conical portion constituting an extension of said conical end portion and being disposed between said tubular member and said valving element; a delivery valve installed in said housing downstream of said suction valve and arranged to



open in response to flow of fluid from said tubular member via said opening; and means for alternately moving said plunger in a first direction away from said conical end portion to thereby reduce the pressure in the interior of said tubular member with attendant movement of said valving element to open position and the resulting flow of fluid from said inlet into said tubular member by way of said path, and in a second direction toward said conical end portion to thereby pressurize the fluid in said tubular member and to expel the pressurized fluid via said opening and said delivery valve.

4,174,195

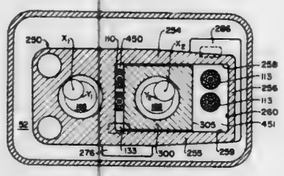
ROTARY COMPRESSOR AND PROCESS OF COMPRESSING COMPRESSIBLE FLUIDS

Marek J. Lassota, 4132 W. Roscoe St., Chicago, Ill. 60641

Continuation-in-part of Ser. No. 692,199, Jun. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 659,430, Feb. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 610,159, Sep. 4, 1975, Pat. No. 4,010,675, which is a continuation of Ser. No. 523,958, Nov. 14, 1974, abandoned. This application Aug. 4, 1977, Ser. No. 821,729

Int. Cl.[2] **F01C** *1/24, 21/12;* **F04C** *17/16;* **F16J** *1/24*

U.S. Cl. 418—1 **31 Claims**



1. A compressible fluid compressing process comprising sequentially the steps of:

opening an intake port or ports leading into a first compression chamber located between a piston, a body and spaced walls of a cylinder-piston, and axially spaced stationary walls by said cylinder-piston and said piston and as a result of planetary rotations of said cylinder-piston and said piston when said first compression chamber is at about its minimum volume;

closing an intake port or ports leading to a second compression chamber located between said piston, said two spaced walls and an interconnecting wall of said cylinder-piston, and said axially spaced stationary walls by one of said spaced walls of said cylinder-piston and as a result of said panetary rotation of said cylinder-piston when said second compression chamber is at about its maximum volume;

passing said compressible fluid to be compressed through said intake port or ports into said first compression chamber while:

said volume of said first compression chamber increases as a result of said coordinated and opposite planetary rotations of said piston and said cylinder-piston with said distance between said piston and said body of said cylinder-piston increasing; and

a discharge valve or valves of said first compression chamber are closed;

compressing said compressible fluid in said second compression chamber by decreasing said volume of said second compression chamber as a result of said coordinated and opposite planetary rotations of said piston and said cylinder-piston while said distance between said piston and said wall interconnecting said two spaced walls of said cylinder-piston decreases;

opening a discharge valve or valves of said second compression chamber when the pressure of said compressible fluid compressed in said second compression chamber reaches desired level, while continuing said intake process in said first compression chamber;

passing said compressed compressible fluid from said second compression chamber through said discharge valve or valves and into a suitable receiver while said compression process in said second compression chamber continues, and while continuing said intake process in said first compression chamber;

closing said intake port or ports of said first compression chamber by a second of said spaced walls of said cylinder-piston and as a result of said planetary rotation of said cylinder-piston when said first compression chamber is at about its maximum volume;

closing said discharge valve or valves of said second compression chamber when said second compression chamber is at about its minimum volume;

opening said intake port or ports leading into said second compression chamber by said cylinder-piston and said piston and as a result of said planetary rotations of said cylinder-piston and said piston when said second compression chamber is at about its minimum volume;

compressing said compressible fluid in said first compression chamber by decreasing said volume of said first compression chamber as a result of said corrdinated and opposite planetary rotations of said piston and said cylinder-piston while said distance between said piston and said body of said cylinder-piston decreases;

passing said compressible fluid to be compressed through said intake port or ports into said second compression chamber while:

said volume of said second compression chamber increases as a result of said coordinated and opposite planetary rotations of said piston and said cylinder-piston with said distance between said piston and said wall interconnecting said two spaced walls of said cylinder-piston increasing; and

said discharge valve or valves of said second compression chamber are closed;

opening said discharge valve or valves of said first compression chamber when the pressure of said compressible fluid compressed in said first compression chamber reaches desired level, and while said intake process in said second compression chamber continues;

passing said compressed compressible fluid from said first compression chamber through said discharge valve or valves and into a suitable receiver while said compression process in said first compression chamber continues, and while said intake process in said second compression chamber continues;

closing said discharge valve or valves of said first compression chamber when said first compression chamber is at about its minimum volume; and

repeating said cylcle in said first and in said second variable volume compression chambers.

4,174,196

SCREW FLUID MACHINE

Hidetomo Mori; Katsumi Matsubara; Haruo Mishina; Akira Arai; Riichi Uchida, all of Ibaraki; Eiji Yokoyama, Kashiwa, and Hajime Arai, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 15, 1977, Ser. No. 816,185

Claims priority, application Japan, Jul. 28, 1976, 51-89117; Oct. 25, 1976, 51-127205

Int. Cl.[2] **F04C** *23/00, 29/02, 29/04, 29/06*

U.S. Cl. 418—9 **14 Claims**



1. A screw fluid machine, comprising:

a main casing including an outer tubular wall, an inner tubular wall, a plurality of rib members interconnecting said outer wall and said inner wall and extending from one end to the other end of said inner and outer walls to define between said inner and outer walls a plurality of spaces linearly extending from one end to the other end of said inner and outer walls, and at least one working space located inside said inner wall and having an inlet port and a discharge port, said working space having two cylindrical bores overlapped with one another;

side casings respectively coupled to the end faces of said main casing, each of said side casings having at least one passage therein communicating at least two of said plurality of spaces in said main casing with each other;

at least one pair of screw rotors housed in said working space; and

at least two accessories for the screw fluid machine housed in said plurality of spaces in said main casing.

4,174,197

ROTARY-PISTON MACHINE HAVING A LIQUID-COOLED PISTON

Wulf Leitermann, Bad Wimpfen, Fed. Rep. of Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

Filed Jul. 11, 1977, Ser. No. 814,702

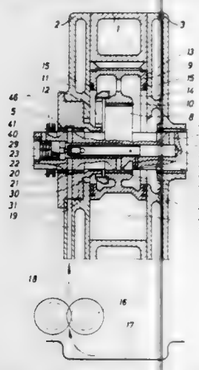
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1976, 2631619

Int. Cl.[2] **F01C** *21/06*

U.S. Cl. 418—84 **4 Claims**

1. A rotary-piston machine, in particular a rotary-piston combustion engine of trochoid type comprising; a housing composed of at least one shell and at least two parallel end pieces and traversed perpendicular to the end pieces by an eccentric shaft mounted on bearings in the end pieces, a liquid-cooled polygonal piston rotatably mounted on the eccentric of the shaft, the piston containing cavities provided with at least one aperture near their radially inner portion, the eccentric shaft having an axial bore traversed by the liquid and communicating by way of transverse holes with the bearings and with at least one nozzle, the orifice of the nozzle being directed at the aperture of the piston cavities, control means arranged in the axial bore of the eccentric shaft for controlling the communication between the axial bore and the nozzle according the temperature of the liquid, the control means including a sleeve arranged in the axial bore and longitudinally displaceable so that the transverse hole leading to the nozzle is shut off by the sleeve below a certain temperature (idling and lower partial-load range) and opened above said temperature, and in order to

displace the sleeve in the axial bore according to the temperature, a liquid-bathed expansion element having two parts relative to each other is provided, the first part of the expansion



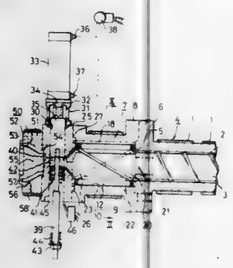
element connected to the sleeve and the second part of the expansion element connected to the eccentric shaft, and the sleeve being traversed by the liquid and a continuation of the sleeve in the shaft leads to a shaft bearing.

4,174,198

FOREIGN MATERIAL REMOVING DEVICE IN SYNTHETIC RESIN RECLAIMING MACHINE

Tomoo Kinoshita, Tokyo, Japan, assignor to Nihon Repro Machine Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1978, Ser. No. 940,602
Claims priority, application Japan, Sep. 14, 1977, 52/109953
Int. Cl.² B29B *1/12*
U.S. Cl. 425—135 **8 Claims**



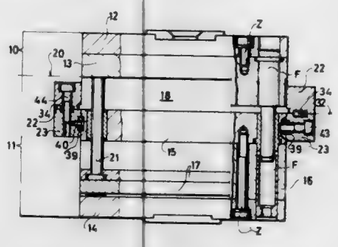
1. A foreign material removing device in a synthetic resin reclaiming machine which comprises:
- an extruder having a screw shaft;
- a filter cylinder connected to the extruder and downstream thereof;
- a resin filtration filter mounted within said filter cylinder so as to form a resin chamber between said filter and said filter cylinder;
- a scraper shaft positioned within the filter cylinder and including projected strips as scrapers which protrude aslant to the axis of the scraper such that the strips contact the inner surface of the filter and interconnect with the screw shaft;
- a body fixed to the filter cylinder downstream thereof, which includes a first guide hole, one end of the body being connected to the inside of the filter cylinder, an ejecting port, and a second guide hole disposed in an orthogonal direction with respect to the axis of the scraper so as to connect said first guide hole to said ejecting port, further including a plurality of resin passages communicating with said resin chamber;
- a plurality of dies fixed to the body which include connecting passages for ejecting resin and a plurality of nozzle holes connecting to said resin ejecting passages;
- a squeezing piston connected to the body which reciprocates within said second guide hole;
- means for reciprocating said squeezing piston connected to said squeezing piston;
- a slide piston operatively associated with said squeezing piston for contacting said squeezing piston, and
- a spring member for biasing said slide piston toward said squeezing piston.

4,174,199

INJECTION-MOLDING TOOL

Hermann Benninghaus, Lüdenscheid, Fed. Rep. of Germany, assignor to HASCO-Normalien Hasenclever & Co., Lüdenscheid, Fed. Rep. of Germany

Filed Feb. 11, 1977, Ser. No. 769,274
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1976, 2605734
Int. Cl.² B29F *1/022*
U.S. Cl. 425—195 **9 Claims**



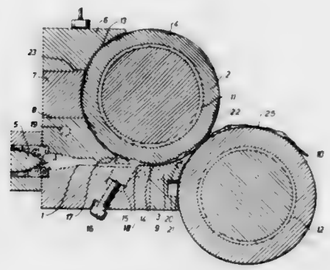
1. An injection mold comprising:
- a first and a second die plate spacedly juxtaposed with one another and parallel to one another;
- a first mold part on said first die plate and a second mold part on said second die plate, said mold parts defining a mold cavity in a closed position of the mold;
- guide sleeves on one of said plates and guide bolts on the other of said plates extending transversely to a mold split between said mold parts and slidingly engaging for guiding the mold parts for relative displacement in a direction parallel to said guide bolts and sleeves, one of said mold parts comprising a pair of jaws relatively displaceable transversely to said direction on the respective die plate; and
- respective guide means disposed along opposite exterior sides of the mold for guiding said jaws, each of said guide means comprising:
  - a retaining bar laterally affixed to said respective die plate with a surface flush with the joint between said jaws and said respective mold plate,
  - a guide bar affixed to said retaining bar and having a surface bearing upon of said retaining bar while forming therewith a groove slidably receiving a lateral rib on said jaws, said guide bar having a further surface bearing laterally upon said jaws, and
  - key means between said bars for form-fittingly connecting said together over their entire lengths.

4,174,200

APPARATUS FOR THE MANUFACTURE OF A CONTINUOUS FILM OR WEB OF THERMOPLASTIC MATERIAL

Peter Hoj, Espergärde, Denmark, assignor to Tetra Pak Developpement SA, Lausanne, Switzerland

Filed Dec. 9, 1977, Ser. No. 859,213
Claims priority, application Switzerland, Dec. 10, 1976, 15584/76
Int. Cl.² B29F *3/04*
U.S. Cl. 425—376 A **10 Claims**



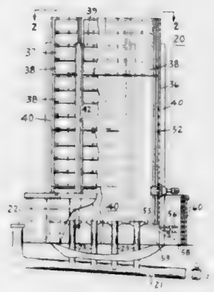
1. An apparatus for manufacturing a continuous web of thermoplastic material, the web including a pattern of thickened portions each having a thickness which exceeds a thickness of adjoining portions of the web, comprising:
- extruder means for supplying molten thermoplastic material;
- a first cylindrical roll having a surface provided with a pattern of recessed portions each recessed portion having a shape, size and relative position corresponding to the thickened portions of the web;
- a member having a first circular-cylindrical seat surface which is positioned immediately adjacent to, but spaced away from the surface of the first roll;
- duct means for supplying the molten thermoplastic material supplied by the extruder to the space between the member and the surface of the first roll, the duct means extending through the member; and
- a second cylindrical roll having a surface that is smooth and unbroken, the second cylindrical roll being positioned adjacent the first cylindrical roll to receive the web from the first roll and being at a lower temperature than the first cylindrical roll, the first and second cylindrical rolls defining a nip with the formed thermoplastic material of the first cylindrical roll passing in the nip between the first and second cylindrical rolls; and wherein
- the member further includes a second circular-cylindrical seat surface which is positioned immediately adjacent to, but spaced away from the surface of the second roll.

4,174,201

BURNER HEADS FOR WASTE COMBUSTIBLE GAS

John F. Straitz, III, Meadowbrook, Pa., assignor to Combustion Unlimited, Jenkintown, Pa.

Continuation of Ser. No. 769,869, Feb. 18, 1977, abandoned, which is a continuation-in-part of Ser. No. 559,492, Mar. 16, 1975, Pat. No. 4,070,146. This application Jul. 26, 1978, Ser. No. 928,298
Int. Cl.² F23C *5/28*
U.S. Cl. 431—202 **5 Claims**



1. Combustion apparatus for use in a flare gas burner for combustible waste gas comprising
- a combustion chamber open at the top and having its lower margin elevated for entry of air for combustion,
- a combustible waste gas supply connection,
- means at the bottom of said combustion chamber in communication with said supply connection comprising a plurality of spaced burner heads spaced above said waste gas supply connection and spaced above the lower margin of said combustion chamber,
- each of said burner heads having a plurality of outwardly extending tilted vanes with elongated slots for gas delivery, and
- said tilted vanes of said spaced burner heads being disposed to provide a plurality of spaced vortex mixing patterns within said combustion chamber and to which air for combustion is freely accessible from the space below said lower margin.

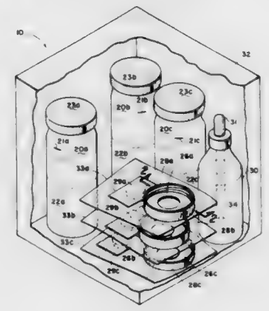
V. 98 / 2 NO 13 79 OMI

4,174,202

KIT AND METHOD FOR TESTING LIQUIDS FOR HYDROGEN SULFIDE CONTENT

Benny E. Simpson, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 28, 1977, Ser. No. 855,540
Int. Cl.[2] G01N *31/22*
U.S. Cl. 23—230 R **17 Claims**



1. A method for qualitatively determining whether or not a liquid contains hydrogen sulfide in a concentration in excess of a preselected concentration, which comprises, in sequence:

(a) admixing a preselected quantity of the liquid to be tested with a quantity of a metal cation capable of reacting with sulfide ion to form a precipitate, which quantity of cation is stoichiometrically sufficient to react with the hydrogen sulfide which would be present in said preselected quantity of liquid if said hydrogen sulfide were initially present at said preselected concentration;

(b) purging the liquid with an inert gas to remove unreacted hydrogen sulfide from the liquid;

(c) contacting a reagent colorimetrically and selectively responsive to the presence of hydrogen sulfide with the gas purged from the liquid;

(d) observing the color of the colorimetrically responsive agent, a color change in response to hydrogen sulfide being indicative that the liquid tested contained hydrogen sulfide at a concentration in excess of said preselected concentration.

4,174,203

PROCESS AND DEVICE FOR THE PRODUCTION OF SUBMICRON-SIZED METALLIC OXIDES

Werner J. Borer, Henggart, and Tomas Zuzak, Feuerthalen, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation-in-part of Ser. No. 755,136, Dec. 29, 1976, abandoned. This application Aug. 3, 1977, Ser. No. 821,559
Claims priority, application Switzerland, May 5, 1976, 6465/76; Fed. Rep. of Germany, Jul. 20, 1976, 2632610
Int. Cl.[2] B01D *7/00*
U.S. Cl. 23—294 R **11 Claims**

1. A process for producing submicron-sized metallic oxide particles from particles having a size within a range of 1 to 100 microns in a vaporizing zone produced by a plasma stream, a zone being disposed downstream of said vaporizing zone and including an agglomerator having an entry region, a cyclone separator being connected in series with said agglomerator, the steps comprising:

sublimating said particles in said vaporizing zone, said particles having an initial size within a range of about 1 to 100 microns;

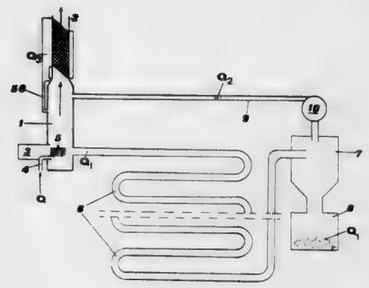
forming said submicron-sized particles having a size within the range of about 0.02 to 0.5 microns;

transporting said submicron-sized particles by means of a carrier gas to said agglomerator;

agglomerating said submicron-sized particles in said agglomerator so as to form loose agglomerates in which said submicron-sized particles are held together by electrostatic forces;

transporting said agglomerated submicron-sized particles by means of said carrier gas to said cyclone separator;

centrifuging said agglomerated submicron-sized particles in



said cyclone separator so as to separate out at least a portion of said agglomerated submicron-sized particles from the fines of said agglomerated submicron-sized particles; and

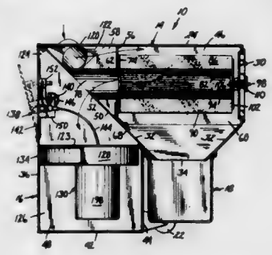
recirculating said fines of said agglomerated submicron-sized particles to said entry region of said agglomerator for further agglomeration.

4,174,204

PULSE JET CLEANED AIR FILTER ASSEMBLY WITH INTEGRAL AIR COMPRESSOR

Frank R. Chase, Excelsior, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Aug. 4, 1978, Ser. No. 931,017
Int. Cl.[2] B01D *46/02*
U.S. Cl. 55—283 **13 Claims**



5. In combination with an air cleaner having a housing with a partition therein dividing the interior of the housing into a clean air chamber and a dust-laden air chamber with the partition having an opening providing fluid communication between the two chambers, a filter means disposed within the dust-laden air chamber for filtering the air passing through the opening in the partition from the dust-laden air chamber to the clean air chamber, a fan mounted within the housing for drawing air through said housing from a dust-laden air inlet which opens into the dust-laden air chamber to a clean air outlet which opens into the clean air chambers, means for cleaning the filter means comprising:

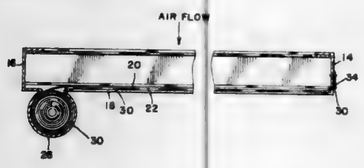
(a) a compressor mounted within said housing;

(b) means for driving said compressor directly from the fan; and

(c) regulated valve means connected to said compressor for automatically and periodically directing a pulse of com-

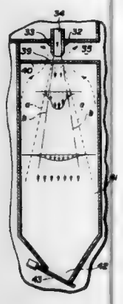
pressed air from said compressor to said filter means to remove the collected dust therefrom.

4,174,205
FURNACE AIR FILTER
Nicholas J. Koushiafes, P.O. Box 1543, Highland, Ind. 46322
Filed May 3, 1978, Ser. No. 902,274
Int. Cl.[2] B01D *46/00*
U.S. Cl. 55—354 **6 Claims**



1. An apparatus for removing solid material from an air stream which is subjected to heat exchange to produce air useful for heating or cooling purposes, said apparatus comprising: filter frame means defining a filter area through which said air flows, supply means located in proximity to said frame means to supply filter medium to said filter area, said medium being constructed to remove solid material from said air stream as said air stream flows through said filter area, said filter frame means and said supply means co-operating so that filter medium which is removed from said filter area is replaced by filter medium from said supply means, and a cutting edge attached to one end of said frame means to cut filter medium being removed from said filter area from filter medium within said filter area.

4,174,206
APPARATUS FOR SEPARATING PARTICULATE MATERIAL FROM AN AIRSTREAM
George T. Dupré, Palatine, and Thomas M. DeMarco, Chicago, both of Ill., assignors to NFE International Ltd., Palatine, Ill.
Continuation of Ser. No. 474,000, May 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 323,130, Jan. 12, 1973, abandoned, which is a continuation of Ser. No. 109,246, Jan. 25, 1971, abandoned. This application Jan. 26, 1978, Ser. No. 872,658
Int. Cl.[2] B01D *45/00*
U.S. Cl. 55—434 **2 Claims**



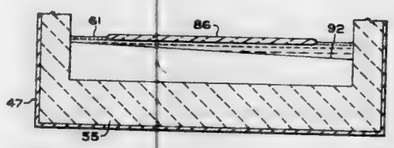
1. In apparatus for the collection of airborne particulate material from a stream of air, which includes an elongated enclosed chamber sealed at its bottom and having a chamber orifice at the top into which a stream of air is directed along the chamber length, defined between the chamber orifice and the chamber bottom, to avoid turbulence at the bottom of the chamber, the particulate matter being collected in the chamber while the airstream exits through the chamber orifice at the top of the chamber, wherein the improvement comprises:

means for gradually separating particulate material from an airstream and thereby improving the efficiency of collection of finely divided particles of particulate materials from an airstream containing a mixture of particle sizes and kinds, and said finely divided particles; and,

wherein said means includes a nozzle mounted above said chamber having an input end for receiving said airstream, an outlet end communicating said airstream to said chamber orifice and a nozzle length axially aligned with said chamber orifice and extending between said input end and said output end for rapidly accelerating said airstream;

the dimensions of: (a) the axial distance between said nozzle outlet end and said chamber orifice to (b) the cross section of said nozzle to (c) the cross section of said chamber orifice to (d) the chamber length being in the ratio of about 1:10:30:90 to enable said accelerated airstream to gradually expand as it traverses from said orifice towards the chamber bottom, and the velocity of said airstream gradually dissipates substantially to zero before reaching the bottom quarter of the chamber.

4,174,207
METHOD AND APPARATUS UTILIZING TRANSVERSELY INCLINED BARRIERS IN FLOAT GLASS FORMATION
Robert Gagne, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Jul. 26, 1978, Ser. No. 928,046
Int. Cl.[2] C03B *18/02*
U.S. Cl. 65—99 A **18 Claims**



1. In a flat glass-forming chamber including an enclosed chamber containing a pool of glass-supporting molten metal, means for delivering molten glass onto the pool of molten metal at an inlet end, means for removing a continuous sheet of glass from the pool of molten metal and from the chamber at an outlet end, means for advancing glass along the surface of the molten metal from the inlet end to the outlet end of the chamber while forming it into a continuous sheet of desired width and thickness and means for removing heat from the glass during its advance and for removing heat from the chamber, wherein there is provided in the pool of molten metal at least one barrier over which the glass can advance, the improvement which comprises:

an asymmetric barrier extending traversely of said chamber beneath said molten metal wherein the upper surface of said barrier is close to the surface on one margin of said molten metal bath and slopes transversely to farther below the surface of said metal at the other margin to create asymmetric flow transverse of the bath.

14. In a method of improving longitudinal distortion in the making of flat glass comprising the steps of delivering molten glass onto the surface of a pool of molten metal in an enclosed forming chamber, advancing the glass in a layer along a path on the surface of the pool of molten metal from an inlet region to an outlet region while cooling the glass and applying forces to it to form it into a dimensionally stable, continuous sheet of glass and removing the continuous sheet of glass from the surface of the pool of molten metal and from the forming chamber wherein the molten metal upon which the glass advances has flows within it along paths which are at least partially aligned with the path of glass advance, including both flows with and flows counter to the advance of the glass, the improvement which comprises providing an asymmetric barrier sloping transversely of said chamber beneath said molten metal creating molten metal flows that are asymmetric transverse of said chamber.

4,174,208
HERBICIDAL COMPOSITIONS
Adolf Fischer, deceased, late of Mutterstadt, Fed. Rep. of Germany (by Caecilia E. Fischer, heiress), assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Division of Ser. No. 627,965, Nov. 3, 1975, Pat. No. 4,057,414. This application Aug. 29, 1977, Ser. No. 828,289
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1974, 2454576
Int. Cl.[2] A01N *9/22*
U.S. Cl. 71—92 **8 Claims**

1. A herbicide composition comprising an inert carrier having dispersed therein a herbicidially effective amount of a mixture consisting essentially of:

(a) O-(methylaminosulfonyl)-glycolic acid-N-isopropylanilide,

(b) 1-phenyl-4-amino-5-chloropyridazone-(6), and

(c) a compound selected from the group consisting of

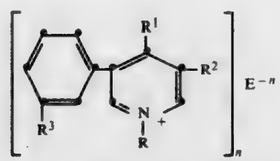
3-methoxycarbonylaminophenyl-N-(3'-methylphenyl)-carbamate,

3-(N-m-trifluoromethylphenylcarbamoyloxy)-(p-methylphenyl)-methylcarbamate, and

3-(N-m-methylphenylcarbamoyloxy)-acetoacetic acid anilide in a weight ratio of a:b:c of 1:0.5 to 2:0.5 to 2.

4,174,209
HERBICIDAL 1-ALKYL-3-PHENYLPYRIDINIUM SALTS
Harold M. Taylor, Indianapolis, and Robert G. Suhr, Greenfield, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
Filed Jun. 19, 1978, Ser. No. 917,038
Int. Cl.[2] C07D *213/26, 213/28*; A01N *9/22*
U.S. Cl. 71—94 **32 Claims**

1. A compound of the formula



wherein R represents methyl or ethyl;

R^1 represents halo, methoxy, or dimethylamino;

R^2 represents hydrogen, phenoxy, C_1–C_4 alkyl, C_1–C_4 alkoxy, phenyl or phenyl monosubstituted with chloro, bromo, fluoro, trifluoromethyl, C_1–C_3 alkyl or C_1–C_3 alkoxy;

R_3 represents C_1–C_3 alkyl, C_1–C_3 alkoxy, trifluoromethyl, chloro, fluoro or bromo;

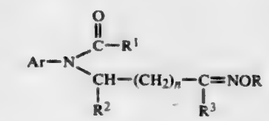
E represents an anion capable of forming a pyridinium salt; and

n represents an integer of 1 to 3.

21. A method of reducing the vigor of unwanted herbaceous plants which comprises contacting the plants with a herbicidally-effective amount of a compound of claim 1.

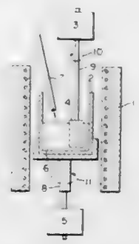
4,174,210
HERBICIDAL AND PLANT-GROWTH REGULATING N-HALOACETYLPHENYLAMINO CARBONYL OXIMES
William L. Schinski, San Rafael; Irene C. Huang, Pinole, and David C. K. Chan, Petaluma, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.
Filed Mar. 31, 1978, Ser. No. 892,365
Int. Cl.[2] A01N *9/20*; C07C *103/34*
U.S. Cl. 71—118 **8 Claims**

1. A compound of the formula



wherein Ar is phenyl or phenyl substituted with 1 to 4 of the same or different substituents selected from fluoro, chloro, bromo, iodo, or alkyl of 1 to 4 carbon atoms, or substituted with 1 to 2 of the same or different substituents selected from alkoxy of 1 to 4 carbon atoms, nitro or haloalkyl of 1 to 2 carbon atoms and 1 to 3 of the same or different halogens selected from fluoro, chloro, bromo or iodo; R^1 is halomethyl of 1 to 3 of the same or different halogens selected from fluoro, chloro, bromo or iodo; n is 0 or 1; and R is hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, alkynyl of 3 to 6 carbon atoms, phenyl, benzyl, or phenyl or benzyl substituted with 1 to 2 of the same or different substituents selected from fluoro, chloro, bromo, iodo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or nitro and R^2 and R^3 are joined together to form a carbocyclic ring of 5 to 6 carbon atoms.

4,174,211
PROCESS FOR MANUFACTURING COMPOSITE POWDER FOR POWDER METALLURGY
Taizo Ohmura, Ohmiya; Noboru Yonezawa, Urawa, and Kazuo Ikuta, Kawagoe, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 7, 1978, Ser. No. 894,336
Claims priority, application Japan, Apr. 23, 1977, 52-46349
Int. Cl.[2] B22F *9/00*
U.S. Cl. 75—0.5 B **16 Claims**



1. A process for manufacturing a fine composite powder for powder metallurgy comprising a core metal powder and many particles of a covering powder adhering to the entire surface of each particle of said core metal powder, characterized by comprising the steps of:

putting a core metal in at least a semi-molten state, which is to be pulverized, in a vessel in coexistence witha covering powder in a solid state, said covering powder consisting of a materialwhich has a higher melting point than said core metal and is difficult to chemically react with said core metal and/or difficult to form a solid solutionwith said core metal, said covering powder being selected in response to the chemical composition of a sintered alloy to

be produced, and the temperature of said at least semi-molten core metal being lower than the melting point of said covering powder;

mixing said at least semi-molten core metal and said solid covering powder by stirring so as to ensure uniform dispersion of said solid covering powder in said at least semi-molten core metal; and then,

slowly cooling said at least semi-molten core metal and said solid covering powder, while continuing said stirring, until the temperature of said at least semi-molten core metal reaches at least its solidus point, to pulverize said core metal into a fine powder and to form a composite powder for powder metallurgy having a structure in which many particles of said covering powder adhere to and cover the entire surface of each particle of said fine powder of said core metal.

4,174,212

METHOD FOR THE REFINING OF STEEL

Hannsgeard G. Bauer; Manfred Walter, and Erick Heimrich, all of Witten, Fed. Rep. of Germany, assignors to A. Finkl & Sons Co., Chicago, Ill.

Filed Mar. 10, 1978, Ser. No. 885,114

Int. Cl.[2] C21C *5/34, 7/10*

U.S. Cl. 75—49 **7 Claims**

1. In a method of making stainless steel having a carbon content of 0.03% or less, the steps of

adding gaseous oxygen to a heat of molten steel containing carbon and chromium until the carbon content of the heat has decreased to about 0.2% to 0.4%,

said gaseous oxygen being added at atmospheric pressure,

terminating the addition of gaseous oxygen after the carbon content of the heat has dropped to about 0.2% to about 0.4%, and

thereafter subjecting the heat containing about 0.2% to 0.4% carbon to the simultaneous effects of,

firstly, inert gas agitation, and,

secondly, sub-atmospheric pressure, until the desired final carbon content is reached.

4,174,213

HIGHLY DUCTILE ALLOYS OF IRON-NICKEL-CHROMIUM-MOLYBDENUM SYSTEM FOR GAS TURBINE COMBUSTOR LINER AND FILLER METALS

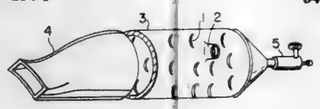
Yutaka Fukui; Fumio Hataya, and Tetsuo Kashimura, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

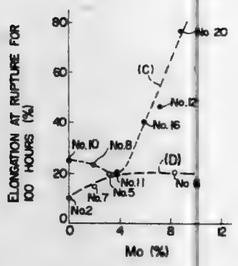
Filed Mar. 1, 1978, Ser. No. 882,455

Claims priority, application Japan, Mar. 4, 1977, 52-22666

Int. Cl.[2] C22C *19/00, 28/00*

U.S. Cl. 75—134 F **34 Claims**





11. An alloy of iron-nickel-chromium-molybdenum system having a high ductility, which consists essentially of 0.05–0.15% by weight of carbon, 0.5–1.5% by weight of silicon, 0.5–2% by weight of manganese, 44–50% by weight of nickel, 22–30% by weight of chromium, 5–10% by weight of molybdenum, 0.2–0.6% by weight of at least one of titanium and niobium as an additive element, 0.3–5% by weight of at least one of tungsten and cobalt as an intensifying element, and 15–25% by weight of iron, the balance being incidental impurities.

4,174,214

WEAR RESISTANT MAGNESIUM COMPOSITE

Foster C. Bennett, and Sidney L. Couling, both of Columbus, Ohio, assignors to Rheocast Corporation, Milwaukee, Wis.

Filed May 19, 1978, Ser. No. 907,747

Int. Cl.[2] C22C *33/00*; B32B *15/14*

U.S. Cl. 75—168 R **11 Claims**

1. A solid composite with a magnesium or magnesium alloy matrix with degenerate dendrites therein and up to about 30 weight percent solid, substantially insoluble oxide particles dispersed in the matrix, the oxide being selected from at least one member of the group consisting of aluminum oxide and magnesium oxide.

4,174,215

ELECTROPHOTOGRAPHIC SCREEN

Yujiro Ando, Yokohama; Katsunobu Ohara, and Keiji Tanaka, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 789,539, Apr. 21, 1977, abandoned, which is a division of Ser. No. 715,821, Aug. 19, 1976, abandoned, which is a continuation of Ser. No. 469,892, May 14, 1974, Pat. No. 3,976,484. This application Sep. 5, 1978, Ser. No. 939,232

Claims priority, application Japan, May 23, 1973, 48-57389; Jun. 19, 1973, 48-69344; Nov. 9, 1973, 48-126038

Int. Cl.[2] G03G *5/04*

U.S. Cl. 430—68 **4 Claims**



1. A photosensitive screen comprising:

a conductive base member having a plurality of fine openings; and

a photoconductive surface layer covering one side of said conductive base member and extending continuously into and through the openings to cover (a) the inner peripheries of the conductive base openings, and to cover (b) the other side of said conductive base while leaving a portion thereof uncovered, said screen being contoured such that when the photoconductive layer is electrically charged and exposed to light at said one side thereof, said portions of the photoconductive layer extending from about half the depth of the openings to the other side of said conductive base do not become conductive but remain electrically insulative, thereby retaining an electrical charge thereon.

4,174,216

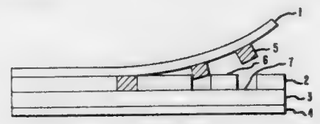
PROCESS FOR IMAGE REPRODUCTION USING MULTILAYER PHOTOSENSITIVE TONABLE ELEMENT

Abraham B. Cohen, Springfield, and Roxy N. Fan, East Brunswick, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 747,027, Dec. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 583,456, Jun. 3, 1975, abandoned. This application Jun. 12, 1978, Ser. No. 915,063

Int. Cl.[2] G03C *5/00, 1/94*

U.S. Cl. 430—257 **20 Claims**



1. An image reproduction process which comprises

(1) exposing imagewise to actinic radiation a peel apart photosensitive element comprising, in order, from top to bottom (a) a strippable cover sheet, (b) a photoadherent layer comprising a material with ethylenically unsaturated or benzophenone type groups, (c) a tonable organic contiguous layer, and optionally (d) a sheet support;

(2) stripping the cover sheet from the element with either the exposed or unexposed areas of the photoadherent layer adhered to the cover sheet while the other areas of said photoadherent layer remain on said contiguous layer; and

(3) toning by embedding colorant or particulate material into the areas of the contiguous layer from which areas of the photoadherent layer were removed.

4,174,217

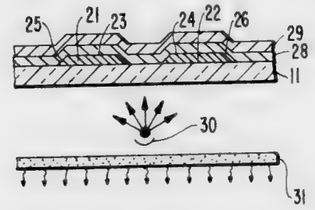
METHOD FOR MAKING SEMICONDUCTOR STRUCTURE

Doris W. Flatley, North Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 2, 1974, Ser. No. 494,179

Int. Cl.[2] H01L *21/84, 21/86*

U.S. Cl. 96—36.2 **14 Claims**



1. A method for making a protective barrier for selected exposed portions of P-N epitaxial semiconductor island consisting of semiconductive material and conductivity modifiers appositioned to a substrate, said island having a top extending along the thickest portion of the island and an edge extending from the top along thinner portions of the island, said method comprising the steps of:

preselecting the thickest portion of the semiconductor island such that said portion absorbs a preselected intensity of ultraviolet radiation of a particular wavelength,

coating surfaces of the semiconductor island with a protective material which material is transmissive to said ultraviolet radiation,

coating the protective material with a material which is responsive to said radiation for providing a masking layer on said semiconductor island which masking layer is selected by exposure to the radiation,

irradiating the radiation responsive material with said radiation of a preselected intensity through the substrate from the side opposite the substrate surface hving a semiconductor island thereon, the thickest portion of the semiconductor island substantially absorbing the radiation of the preselected intensity, all of the thinner portions of the semiconductor island transmitting the radiation of the preselected intensity, thereby exposing all of said radiation responsive material above the thinner portions to the radiation, and

further irradiating said radiation responsive material for an additional preselected time thereby exposing a predetermined area of the masking layer which area extends above the thickest portion of the island from the edge.

4,174,218

RELIEF PLATES FROM POLYMER WITH TERMINAL UNSATURATION

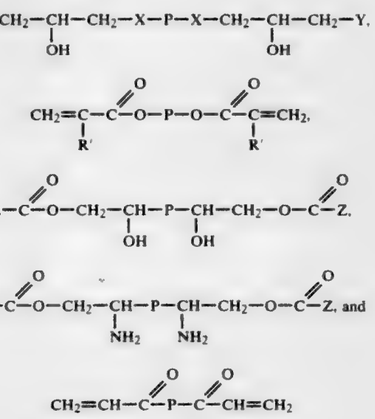
Rudolph L. Pohl, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 810334, Jun. 27, 1977, Pat. No. 4,137,081, which is a continuation-in-part of Ser. No. 628,862, Nov. 5, 1975, abandoned. This application Aug. 16, 1978, Ser. No. 934,281

Int. Cl.[2] G03C *5/00, 1/78, 1/96, 1/68*

U.S. Cl. 430—306 **3 Claims**

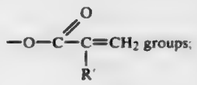
1. The process of making a printing relief which comprises (1) admixing (a) a liquid terminal olefinically unsaturated linear polymer having a molecular weight in the range of from 1,000 to 20,000 selected from polymers having the structure



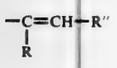
where X is selected from —O—, —S—,



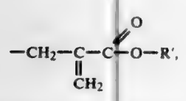
and —NH— groups; Y is selected from —O—CH$_2$—CH=CH$_2$ and



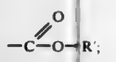
R′ is selected from —H and —CH$_3$ groups; Z is selected from



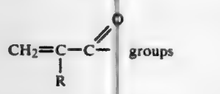
and



where R″ is selected from —H, —CH_3 and



and P is a polymer residue selected from homopolymers of butadiene, isoprene, chloroprene, styrene, isobutylene, ethylene, and copolymers of butadiene with acrylonitrile, butadiene with styrene, butadiene with isoprene, ethylene with neohexene, isobutylene with styrene, isobutylene with acrylonitrile, and the corresponding saturated residues; (b) from about 1 to about 50% by weight based on the weight of the polymer of at least one ethylenically unsaturated monomer selected from acrylonitrile, methacrylonitrile, styrene, methyl substituted styrene and monomers containing one or more



wherein R is hydrogen or a C_1–C_3 alkyl group; (c) from about 0.1 to about 10% by weight based on the weight of the polymer of a photoinitiator, and (d) from about 0.01 to about 2% by weight based on the weight of the polymer of a stabilizer; (2) spreading the photopolymer composition in a layer on a support to form a photopolymer element, (3) exposing to actinic light selected areas of said layer on said support until substantial cross-linking takes place in the exposed areas without significant cross-linking in the unexposed areas, and (4) removing the unexposed areas of photopolymer composition by washing the photopolymer element with an aqueous detergent solution.

4,174,219

METHOD OF MAKING A NEGATIVE EXPOSURE MASK

Heinrich A. Andres, Rheinstetten; Hartmut F. Kolbe, Boeblingen; Horst Schlagdenhaufen, Grafenau, and Frank A. Schwarzbach, Hildrizhausen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1977, Ser. No. 846,741

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658400

Int. Cl.[2] **G03C** *5/00;* **C23F** *1/02;* **G03C** *5/50;* **B32B** *31/28*

U.S. Cl. 430—321 **8 Claims**

1. A method of making an exposure mask comprising:

forming on a transparent substrate a positive pattern of masking material which is opaque to UV light, said material being selected from the group consisting of metals and inorganic metallic compounds,

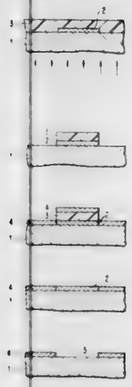
forming on said substrate and pattern a resist layer of positive photoresist,

exposing said resist layer to UV light through the back of said substrate such that the portions of said resist layer in contact with the substrate are exposed,

developing said resist layer so as to remove the exposed portions of said resist layer,

depositing a second layer of masking material, which is opaque to UV light, on the substrate and on the remaining portions of the resist layer,

removing the remaining portions of the resist layer and the overlying masking material, and



removing the positive pattern of masking material to leave a negative pattern of said second layer of masking material on said substrate.

4,174,220

COLOR PHOTOGRAPHIC MATERIALS CONTAINING DYE FADING INHIBITORS

Masahiko Taguchi; Katsuo Mogaki, and Syun Takada, all of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1977, Ser. No. 846,127

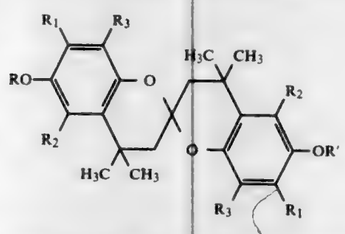
Claims priority, application Japan, Oct. 30, 1976, 51-130742

Int. Cl.[2] **G03C** *1/76, 1/06, 1/40*

U.S. Cl. 430—613 **21 Claims**

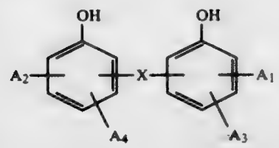
1. A color photosensitive material comprising a support and a silver halide photosensitive layer which material comprises a compound represented by the following formula (I)

Formula (I)



wherein R_1 is an alkyl group, an alkenyl group, an aryl group, an alkoxy group, an alkenoxy group or an aryloxy group; R_2 and R_3 are individually hydrogen, halogen, or an alkyl group, an alkenyl group or an alkoxy group; R is an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group or a member selected from the group consisting of imidazolyl, furyl, pyridyl, and thiazolyl, or R_6CO—, R_7SO_2— or R_8NHCO—; and R′ is hydrogen, or R_6CO—, R_7SO_2— or R_8NHCO— wherein R_6, R_7 and R_8 are individually an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group or a member selected from the group consisting of imidazolyl, furyl, pyridyl, and thiazolyl, in combination with a compound represented by the following formula (II).

Formula (II)



wherein A_1, A_2, A_3 and A_4 are individually an alkyl group having 1–18 carbon atoms, the total number of carbon atoms of A_1, A_2, A_3 and A_4 being not more than 32; and X is a simple bond, oxygen, sulfur, sulfonyl or



in which A_5 is hydrogen or an alkyl group having 1–10 carbon atoms and n is an integer of 1 to 3.

4,174,221

YELLOW 2:1 CHROME COMPLEXED DYE DEVELOPERS

Elbert M. Idelson, Newton Lower Falls, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

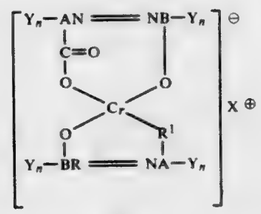
Filed Sep. 23, 1977, Ser. No. 836,076

Int. Cl.[2] **G03C** *7/00, 1/40, 1/10, 5/54*

U.S. Cl. 430—225 **52 Claims**



1. A photographic film unit which comprises a photosensitive system including a silver halide emulsion layer associated with a 2:1 chrome-complexed yellow dye developer of two ortho carboxy, ortho′ hydroxy azo dyes or a 2:1 chrome-complexed yellow dye developer of an ortho carboxy, ortho′ hydroxy azo dye and an ortho, ortho′ dihydroxy azomethine dye, said dye developer having the following structure:



where each A is a phenyl radical; each B is a phenyl or nitrogen containing heterocyclic radical; Y is a silver halide developing substituent; each n is 0 or 1 but at least one n must be 1; R is N or CH; R^1 is



if R is N but R^1 is —O— if R is CH; and X is a cation.

4,174,222

POSITIVE-TYPE O-QUINONE DIAZIDE CONTAINING PHOTORESIST COMPOSITIONS

Takashi Komine, Yokohama; Akira Yokota, Yamato; Hisashi Nakane, Kawasaki; Shingo Asaumi, Fujisawa, and Noboru Okazaki, Chigasaki, all of Japan, assignors to Tokyo Ohka Kogyo Kabushiki Kaisha, Kawasaki, Japan

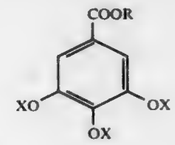
Continuation-in-part of Ser. No. 660,432, Feb. 23, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 881,260

Claims priority, application Japan, May 24, 1975, 50/62412

Int. Cl.[2] **G03C** *1/54;* **C03C** *1/70*

U.S. Cl. 430—190 **8 Claims**

1. A positive-type photoresist composition which comprises as essential ingredients an alkali-soluble phenolic novolac resin in an amount sufficient to give etching resistance to the composition and at least one naphthoquinonediazido derivative of the general formula



in an amount sufficient to make the composition photodecomposable wherein R stands for a substituent selected from the group consisting of alkyl, aryl and nucleus-substituted aryl groups and X stands for a naphthoquinone-(1,2)-diazido-(2)-sulfonyl residue.

4,174,223

FLAME RETARDANT COMPOSITIONS AND METHODS OF PREPARING AND USING SAME

Donald M. Steen, P.O. Box 295, Morrill, Nebr. 69358

Filed Jun. 13, 1978, Ser. No. 915,156

Int. Cl.[2] **C09K** *3/28*

U.S. Cl. 106—18.16 **11 Claims**

1. An aqueous composition useful as a flame retardant and consisting essentially of (a) from about 10 to 60 percent by weight of a blend of an aqueous ammonium nitrate liquor and an aqueous urea liquor compounded so that the blend contains approximately 40–60% of the total nitrogen from each of said ammonium nitrate and urea and a total of about 28 to 32 percent nitrogen, and (b) from about 10 to about 50 percent of an aqueous ammoniated poly phosphate solution containing about 8–12 percent nitrogen and about 30–40 percent phosphoric acid.

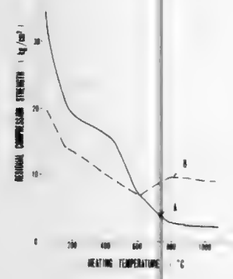
8. A flame retardant insulation material formed by the mixing of constituents comprising (a) a cellulose material selected from the group consisting of ground newsprint, shredded wood fiber, straw, cotton batting or mixtures thereof and (b) a flame retardant composition consisting essentially of (i) from about 10 to 60 percent by weight of a blend of an aqueous ammonium nitrate liquor and an aqueous urea liquor compounded so that the blend contains approximately 40–60 percent of the total nitrogen from each of said ammonium nitrate and urea and a total of about 28 to 32 percent nitrogen, and (ii) from about 10 to about 50 percent of an aqueous ammoniated poly phosphate solution containing about 8–12 percent nitrogen and about 30–40 percent phosphoric acid, said flame retardant comprising about 10 to about 40 percent of the total mixture.

4,174,224

SAND MOLD COMPOSITION

Sigeru Seki, Urawa; Tatsuhiko Noguchi, Iwaki; Minoru Ohta, Iwaki, and Ryuichi Kurita, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1978, Ser. No. 935,546
Claims priority, application Japan, Aug. 26, 1977, 52-101530
Int. Cl.[2] B28B *7/34*
U.S. Cl. 106—38.3 5 Claims



1. A self-hardening composition for making sand molds comprising a molding sand, a water glass as a binder and at least one salt of imidodisulfonic acid as a hardener.

4,174,225

MANUFACTURING MOULDS OR MOULD CORES

Bert K. G. Lundgren, Nynashamn, and Urban Westin, Saltsjobaden, both of Sweden, assignors to AB Nynas-Petroleum and AB Westin and Backlund, both of Stockholm, Sweden

Filed Apr. 11, 1977, Ser. No. 786,305
Claims priority, application Sweden, Apr. 12, 1976, 7604259; Jan. 17, 1977, 7700435
Int. Cl.[2] B28B *7/34*
U.S. Cl. 106—38.6 8 Claims

1. In a method of manufacturing casting moulds or mould cores comprising shaping an aqueous mixture of

(a) a moulding sand,

(b) a binding agent, and a carbonaceous material consisting of

(c) a black coal flour capable of forming lustrous carbon when the mould or mould core is heated by contact with molten metal,

without previous hardening or drying, the mould material or mould core material being recycled to manufacture fresh moulds or mould cores by adding supplementary binding agent and carbonaceous material to replace binding agent and carbonaceous material consumed during a preceding casting operation; the improvement which comprises adding, in place of the black coal flour, a combination of:

(1) a water-free, hydrocarbon-containing substance having a carbon content of 50–95%, a hydrogen-content of more than 6.8% and an ash-content of less than 4.0%, which substance when heated forms minor quantities of coke and no carcinogenic polynuclear aromatic hydrocarbons such as benzo-a-pyrene said hydrocarbon containing substance comprising a resin product obtained by oxidative polymerization, either with or without catalysts, of a mineral oil distillate or solvent extract having a content of aromatically-bound carbon corresponding to a VGC-value of at least 0.85 and a mean molecular weight of 150–600, which resin product has an initial boiling point of at least 300° C. at 750 mm Hg, and

(2) a fine, porous, hydrophilic, heat-resistant inorganic material having open pores and a specific surface area of at least 100 m^2/g, the amount of said inorganic material being sufficient to compensate for the poor ability of the moulding material to retain water as a result of the small amount of coke formed or the poor ability of the coke formed to bind water.

4,174,226

REFRACTORY MIX COMPOSITION AND METHOD OF PREPARATION

Thomas H. Fitzpatrick, Martinez, Ga.; James E. Williamson, Jr., Belvedere, S.C., and Walter H. Alexanderson, Augusta, Ga., assignors to The Babcock & Wilcox Company, New York, N.Y.

Continuation of Ser. No. 833,627, Sep. 15, 1977, abandoned. This application Oct. 13, 1978, Ser. No. 950,958
Int. Cl.[2] C04B *35/02*
U.S. Cl. 106—64 6 Claims

1. A single package, dry refractory mix, which exhibits extended shelf life under conventional storage conditions and does not require an inhibitor, which sets upon the addition of water, and which exhibits high abrasion resistance when set, consisting essentially of:

(a) 40 to 70 weight percent of an inert refractory aggregate,

(b) 15 to 35 weight percent of an aluminous material selected from the group consisting of calcined alumina, calcined bauxite and kaolin calcine,

(c) 2 to 10 weight percent hydrated alumina,

(d) 1 to 10 weight percent calcium aluminate cement, and

(e) 3 to 15 weight percent of 115 percent polyphosphoric acid;

prepared by a process comprising the steps of introducing the dry ingredients into a mixer, mixing the dry ingredients, adding the acid ingredient to the mixture of dry ingredients, and subjecting the dry and acid ingredient mix to a high intensity mixing action for a predetermined period of time, not exceeding four minutes.

4,174,227

HIGH-EARLY-STRENGTH PHOSPHATE GROUTING SYSTEM FOR USE IN ANCHORING A BOLT IN A HOLE

Ernst A. Tomic, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 25, 1978, Ser. No. 926,701
Int. Cl.[2] C04B *19/00*
U.S. Cl. 106—85 15 Claims

1. In a grouting system for use in a hole in combination with a reinforcing member wherein a hardened grout is formed around the reinforcing member in the hole by the reaction of the mixed components of a hardenable inorganic grouting product, thereby anchoring the reinforcing member in the hole, the improvement comprising an inorganic grouting product comprising

(a) an acidic reactive component comprising at least one acidic oxy phosphorus compound selected from the group consisting of phosphoric acids, anhydrides of phosphoric acids, and salts of phosphoric acids with multivalent metal cations;

(b) a basic reactive component comprising at least one particulate basic metal compound of a Group II or Group III metal capable of reacting with said oxy phosphorus compound(s) in the presence of water to form a monolithic solid; and

(c) an aqueous component;

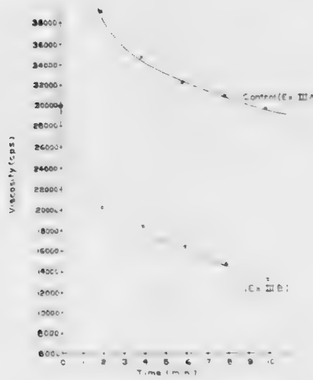
said components being present in or outside a hole in a separated condition such that any substantial hardening reaction between the acidic and basic components is prevented, and when present outside the hole being adapted to be delivered into the hole separately or in a freshly combined condition; said basic metal compound(s) having a particle surface area of up to about 40 square meters per gram and constituting about from 5 to 35 percent of the total weight of said grouting product, with the proviso that when the particles of said basic metal compound(s) have a surface area of less than 1 square meter per gram, more than about 95 percent of said particles pass through a 200 mesh screen; the ratio of the moles of said basic metal compound(s) to the moles of phosphorus pentoxide on which said oxy phosphorus compound(s) are based being in the range of about from 2/1 to 17/1; the amount of water present in said product constituting about from 3 to 20 percent of the total weight of said grouting product; a particulate aggregate being present in said product in an amount such as to constitute about from 30 to 70 percent of the total weight of said product; and the components, when mixed, reacting without the application of heat thereto to form a hardened grout having a pull strength of at least about 175 kilograms per centimeter of anchoring length within an hour.

4,174,228

CEMENTITIOUS MAGNESIA COMPOSITIONS CONTAINING SALTS OF ORGANO-SILANOLS

William G. Boberski; Wen-Hsuan Chang, both of Gibsonia, and Jerome A. Seiner, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 28, 1978, Ser. No. 891,109
Int. Cl.[2] C04B *9/02, 9/04*
U.S. Cl. 106—107 66 Claims



1. A moldable, castable or sprayable cementitious composition, comprising:

(a) magnesium oxide;

(b) a magnesium salt having at least moderate solubility in water;

(c) at least one water-soluble organo-silanol salt, characterized in having attached to the silicon atom (i) at least one group comprising a water-soluble salt having the general formula:

$$O^- A^+$$

where A^+ is a monovalent cation or one equivalent of a polyvalent cation and (ii) at least one group comprising an organo moiety attached to the silicon atom through a substantially non-hydrolyzable silicon-carbon bond with the organo moiety further characterized in having a working parameter of solubility, δ_{wp}, in the range of about 6.2 to about 8.0 (cal./c.c.)$^{\frac{1}{2}}$, with

$$\delta_{wp} = \frac{\Sigma F_i}{\Sigma V_i}$$

wherein:

F_i = the molar attraction constant of an individual functional group of said moiety expressed in (cal. c.c.)$^{\frac{1}{2}}$ per mole, and

V_i = the molar volume constant of an individual group of said moiety expressed in c.c. per mole; and

(d) a liquid phase comprising water;

wherein the mole ratio of the magnesium oxide to the magnesium salt ranges from 3:1 to 10:1, the level or organo-silanol salt ranges from about 0.5 percent to about 10 percent by weight of the magnesium oxide and the level of water is in an amount effective to cause reaction of at least a portion of said magnesium oxide and at least a portion of said magnesium salt to form a matrix curable to a hardened state.

28. A process for forming an article from a curable cementitious composition, comprising:

(a) mixing together in the presence of a liquid phase having water sufficient to produce a moldable, curable slurry composition, the components of:

(1) magnesium oxide;

(2) at least one magnesium salt having moderate solubility in water; and

(3) at least one water-soluble organo-silanol salt, characterized in having attached to the silicon atom (i) at least one group comprising a water-soluble salt having the general formula:

$$O^- A^+$$

where A^+ is a monovalent cation or one equivalent of a polyvalent cation and (ii) at least one group comprising an organo moiety attached to the silicon atom through a substantially non-hydrolyzable silicon-carbon bond with the organo moiety further characterized in having a working parameter of solubility, δ_{wp}, in the range of about 6.2 to about 8.0 (cal.c.c.)$^{\frac{1}{2}}$, with

$$\delta_{wp} = \frac{\Sigma F_i}{\Sigma V_i}$$

wherein:

F_i = the molar attraction constant of an individual group of said moiety expressed in (cal.c.c.)$^{\frac{1}{2}}$ per mole, and

V_i = the molar volume constant of an individual group of said moiety expressed in c.c. per mole; and wherein the mole ratio of the magnesium oxide to the magnesium salt ranges from 3:1 to 10:1, the level of organo-silanol salt ranges from about 0.5 percent to about 10 percent by weight of the magnesium oxide

(b) placing said slurry composition in a mold form; and

(c) allowing said composition to cure sufficiently such that said article may be removed from the mold form without substantially adversely affecting the integrity of the molded article.

4,174,229

MAGNESIUM OXIDE CEMENTITIOUS COMPOSITIONS CONTAINING HYDROLYZABLE ORGANO-SILICON COMPOUNDS

William G. Boberski; Wen-Hsuan Chang, both of Gibsonia; Victor G. Petracca, Apollo, and Jerome A. Seiner, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 28, 1978, Ser. No. 891,110
Int. Cl.[2] C04B *9/02, 9/04*
U.S. Cl. 106—107 52 Claims

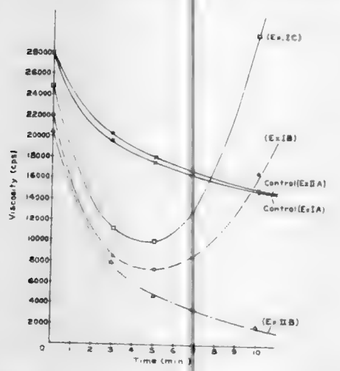
1. A moldable, castable or sprayable cementitious composition, comprising:

(a) magnesium oxide;

(b) a magnesium salt having at least moderate solubility in water;

(c) at least one organo-silicon compound, characterized in having attached to the silicon atom (i) at least one group having a hydrolyzable bond with the silicon atom and selected from the group consisting of halogen, hydroxyl, alkoxyl, aryloxyl, substituted aryloxyl, aralkoxyl, substituted aralkoxyl, alkylamino, substituted alkylamino, silylamino, substituted silylamino, mercapto and substituted mercapto and (ii) at least one moiety attached through a substantially non-hydrolyzable silicon-carbon

bond, wherein the moiety has a working parameter of



solubility, δ_{wp}, in the range of about 6.2 to about 8.0 (cal./c.c.)$^{\frac{1}{2}}$, with

$$\delta_{wp} = \frac{\Sigma F_i}{\Sigma V_i}$$

wherein:

F_i=the molar attraction constant of an individual functional group of said moiety expressed in (cal. c.c.)$^{\frac{1}{2}}$per mole, and

V_i=the molar volume constant of an individual group of said moiety expressed in c.c. per mole; and (d) a liquid phase comprising water;

wherein the mole ratio of the magnesium oxide to the magnesium salt ranges from 3:1 to 10:1, the level of organo-silicon compound ranges from about 0.5 percent to 10 percent by weight of the magnesium oxide and the water is in an amount effective to cause reaction of at least a portion of said magnesium oxide and at least a portion of said magnesium salt to form a matrix curable to a hardened state.

24. A process for forming an article from a curable cementitious composition, comprising:

(a) mixing together in the presence of a liquid phase having water sufficient to produce a moldable, curable slurry composition from the components of:

(1) magnesium oxide;

(2) at least one magnesium salt having moderate solubility in water; and

(3) at least one organo-silicon compound, characterized in having attached to the silicon atom (i) at least one group having a hydrolyzable bond with the silicon atom and selected from the group consisting of halogen, hydroxyl, alkoxyl, aryloxyl, substituted aryloxyl, aralkoxyl, substituted aralkoxyl, alkylamino, substituted alkylamino, silylamino, substituted silylamino, mercapto and substituted mercapto and (ii) at least one moiety attached through a substantially non-hydrolyzable silicon-carbon bond, wherein the moiety has a working parameter of solubility, δ_{wp}, in the range of about 6.2 to about 8.0 (cal./c.c.)$^{\frac{1}{2}}$, with

$$\delta_{wp} = \frac{\Sigma F_i}{\Sigma V_i}$$

wherein:

F_i=the molar attraction constant of an individual functional group of said moiety expressed in (cal. c.c.)$^{\frac{1}{2}}$per mole, and

V_i=the molar volume constant of an individual group of said moiety expressed in c.c. per mole

wherein the mole ratio of the magnesium oxide to the magnesium salt ranges from 3:1 to 10:1 and the level of organo-silicon compound ranges from about 0.5 percent to 10 percent by weight of the magnesium oxide

(b) placing said slurry composition in a mold form; and

(c) allowing said composition to cure sufficiently such that said article may be removed from the mold form without substantially adversely affecting the integrity of the molded article.

4,174,230

GYPSUM COMPOSITIONS

Mitsuo Hashimoto, Ichihara; Toshiyuki Takyu, Sodegaura; Masaru Inoue, Sodegaura; Masami Takasaki, Sodegaura, and Shinho Shiho, Sodegaura, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Feb. 15, 1978, Ser. No. 877,870

Claims priority, application Japan, Apr. 16, 1977, 52/43712

Int. Cl.^{2} **C04B** *11/09*

U.S. Cl. 106—109 **13 Claims**

1. An improved gypsum composition comprising (a) gypsum particles and (b) at least one binder for gypsum particles, the improvement comprising

said gypsum particles being light-weight spherical gypsum formed of intertwined short gypsum fibers and having a bulk density of from 0.05 to 0.5 g/cm^3.

4,174,231

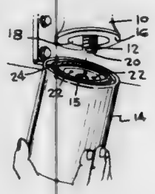
METHOD FOR FLUSHING THE CRANKCASE OF AN INTERNAL COMBUSTION ENGINE

Harold G. Hobgood, 620 Spruce St., Newport News, Va. 23601

Filed Sep. 8, 1977, Ser. No. 831,685

Int. Cl.^{2} **B08B** *3/08*

U.S. Cl. 134—10 **1 Claim**



1. A method of flushing with a liquid the crankcase of an internal combustion engine of the type having a spin-on oil filter cartridge fitting including an outflow opening, an inflow opening and a threaded pipe portion on which a spin-on oil filter cartridge is removably mounted, said method comprising the steps of draining the engine crankcase of any fluids contained therein, removing said spin-on filter cartridge, placing said flushing liquid in the crankcase, operating the engine to effect circulation of the flushing liquid in the engine to cause flow of the flushing liquid from said outflow opening and immediately returning said flushing liquid flowing from the outflow opening to the inflow opening of said engine without passing said flushing liquid through filtration means.

4,174,232

METHOD OF MANUFACTURING SHEETS, STRIPS AND FOILS FROM AGE HARDENABLE ALUMINUM ALLOYS OF THE Al-Si-Mg-TYPE

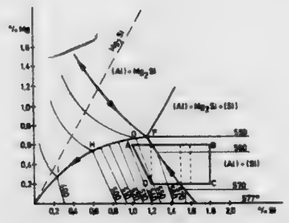
Dieter Lenz, and Erich Trägner, both of Singen, Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Dec. 22, 1977, Ser. No. 863,174

Claims priority, application Switzerland, Dec. 24, 1976, 16299/76

Int. Cl.^{2} **C22F** *1/04*

U.S. Cl. 148—2 **24 Claims**



1. A process for fabricating high strength, improved formability, low earing aluminum strip, sheet and foil from age hardenable aluminum alloys of the Al-Si-Mg type, comprising:

(A) forming an aluminum alloy melt composition consisting essentially of from about 1.0 to 1.8 weight percent silicon, from about 0.2 to 0.6 weight percent magnesium, and the balance essentially aluminum;

(B) casting said alloy in strip form;

(C) hot rolling said cast strip to a first thickness;

(D) cold rolling said hot rolled strip to an intermediate thickness; and

(E) annealing said cold rolled strip of intermediate thickness at a temperature of from about 450° C. to about 550° C. so as to provide an aluminum alloy matrix characterized by undissolved, finely dispersed silicon particles whose size is in the lower zone of the wavelengths of visible light so as to obtain good deformability and strong age hardening characteristics.

4,174,233

EXPANSION PROCESS FOR REDUCING THE STRESSES IN A SEAMLESS METAL TUBE

Alain Vignes, Paris, France, assignor to Societe Franco-Americaine de Constructions Atomiques-Framatome, Courbevoie, France

Filed Sep. 22, 1977, Ser. No. 835,853

Claims priority, application France, Oct. 1, 1976, 76 29655

Int. Cl.^{2} **C23F** *7/00*

U.S. Cl. 148—4 **4 Claims**

1. A process for reducing the longitudinal residue stresses to a negligible amount and the circumferential residual stresses to approximately half their original values in a seamless cold-worked metal tube which has undergone a straightening operation, the process comprising, while maintaining said tube at a temperature close to ambient temperature, subjecting said tube for a period of at least 3 minutes, to an internal pressure of between 0.8 Pc and 1.0 Pc, Pc being the critical pressure beyond which said tube undergoes a plastic deformation over its entire thickness whereby the tube remains substantially undeformed after treatment.

4,174,234

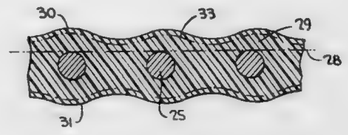
SILICON-IMPREGNATED FORAMINOUS SHEET

Joseph Lindmayer, Bethesda, Md., assignor to Semix, Incorporated, Rockville, Md.

Division of Ser. No. 895,814, Apr. 12, 1978. This application Oct. 10, 1978, Ser. No. 950,044

Int. Cl.^{2} **H01L** *27/14, 21/208, 21/84*

U.S. Cl. 148—33 **7 Claims**



1. A body of cooled, formerly molten silicon suitable for use in making photovoltaic cells, comprising as an inner zone, a foraminous sheet of carrier material capable of maintaining its structural integrity in the presence of molten silicon, the foramina of said sheet being filled with solidified silicon, and a surface zone of silicon overlying said inner zone, said surface zone being substantially free of said carrier material and having a depth of at least about ten microns.

4,174,235

PRODUCT AND METHOD OF PRODUCING SILICON-IRON SHEET MATERIAL EMPLOYING ANTIMONY

Howard C. Fiedler, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 9, 1978, Ser. No. 867,987

Int. Cl.^{2} **H01F** *1/04;* **C22C** *38/02*

U.S. Cl. 148—111 **11 Claims**

1. A cold-rolled silicon-iron sheet product consisting essentially of (i) silicon in an amount from about 2.2 to about 4.5 percent, (ii) boron in an amount from about 3 to about 35 parts per million, (iii) nitrogen in an amount from about 30 to about 100 parts per million and in a ratio to boron of from about one to about 15 parts per part of boron, (iv) manganese in an amount from about 0.02 to about 0.05 percent, (v) sulfur in an amount from about 0.005 to about 0.025 percent, and (vi) antimony in an amount from about 0.01 to about 0.10 percent, said amount of sulfur including an amount thereof which is not combined, the balance iron.

4,174,236

METHODS OF AND APPARATUS FOR CONTROLLING CAPACITANCE UNBALANCE-TO-GROUND IN CABLES

Timothy S. Dougherty, Roswell, and William M. Flegal, Tucker, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Aug. 31, 1977, Ser. No. 829,362

Int. Cl.^{2} **B29D** *27/00;* **B29F** *3/10*

U.S. Cl. 156—51 **8 Claims**

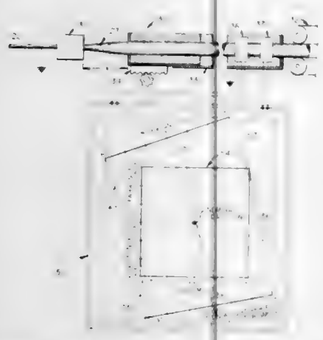
1. A method of controlling capacitance unbalance-to-ground between conductors, which comprises the steps of:

covering individual conductors with a plastic insulating material to form insulated conductors;

measuring coaxial capacitance and outside diameter of each of the conductors;

generating electrical signals corresponding to the measured coaxial capacitance and outside diameter of each insulated conductor and relating these signals to capacitance unbalance-to-ground between each said conductor and a reference insulated conductor having preselected values of coaxial capacitance and outside diameter; and

controlling the process of covering of each conductor to maintain the capacitance unbalance-to-ground between



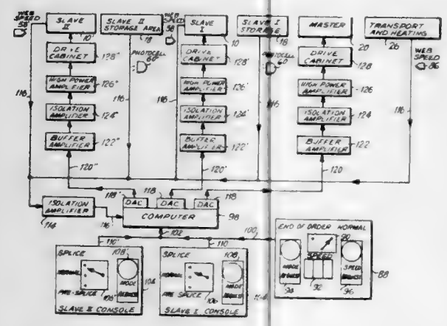
each said conductor and the reference conductor within a predetermined range of values.

4,174,237

PROCESS AND APPARATUS FOR CONTROLLING THE SPEED OF WEB FORMING EQUIPMENT

Frank E. Hemming, Jr., Washingtonville, N.Y., and Stuart A. Johnson, Denville, N.J., assignors to International Paper Company, New York, N.Y.

Filed Jul. 3, 1978, Ser. No. 921,834
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—64 **10 Claims**



1. An apparatus for processing web material comprising a master unit for processing web material having a first drive means, said first drive means capable of driving said master unit at any speed within a predetermined range of speeds, said master unit being selectively operable at any one of a plurality of predetermined modes and at a range of speeds within at least one of said modes, at least one slave unit for processing web material having a second drive means, said second drive means capable of driving said slave unit at any speed within a predetermined range of speeds, each slave unit being selectively operable at any one of a plurality of predetermined modes and at a range of speeds within at least one of said modes, web storage means communicating between each master and slave unit, speed sensing means communicating with said master unit, speed sensing means communicating with each of said slave units, sensing means associated with each of said web storage means, computer means (a) to calculate a signal corresponding to a speed selected for said master unit within said predetermined range of speeds, (b) to compute a speed for each of said slave units corresponding to the speed selected for said master unit and the mode selected for each of said slave units and to provide a signal corresponding to said computed speed, (c) to compute a corrected speed for each of said slave units and to provide a signal corresponding thereto whenever the quantity of web material in the web storage means associated with said slave unit decreases to a predetermined quantity, output interface means between said computer means and each of said first and second drive means including a digital to analog converter, an optical isolation amplifier and a power amplifier, computer input interface means to select the mode and speed for the said master unit and computer input interface means to select the mode of operation of each slave unit.

9. A process for controlling the speed of web processing equipment including a master unit having a first drive means capable of driving said master unit at any speed within a predetermined range of speeds, at least one slave unit having a second drive means and a web storage means communicating between each slave unit and said master unit comprising selecting a speed for said master unit within said predetermined speed range, converting said speed first into a derived number and second into a binary number, further converting said binary number to an analog equivalent direct current voltage referenced to earth ground, converting said equivalent direct current voltage to an equivalent direct current voltage isolated from earth ground by light amplification means and capable of having an alternating current voltage offset from earth ground, amplifying said isolated direct current voltage to a direct current control voltage corresponding to the speed selected for said master unit, applying said direct current control voltage to said master unit first drive means, calculating a speed for each slave unit in binary notation corresponding to the said selected speed for said master unit in binary notation, converting said slave unit speed in binary notation to an analog equivalent direct current voltage referenced to earth ground, converting said equivalent direct current voltage to an equivalent direct current voltage isolated from earth ground by light amplification means and capable of having an alternating current voltage offset from earth ground, amplifying said isolated direct current voltage to a direct current control voltage corresponding to the speed calculated for said slave unit, applying said direct current control voltage to said slave unit second drive means, measuring the speed of the web material passing through said master unit, comparing the measured speed with the speed selected for said master unit, calculating a first error signal corresponding to the difference between said measured speed and said selected speed, converting said first error signal into an isolated amplified direct current control voltage to correct the speed of said master unit, measuring the speed of the web material passing through said slave unit, comparing the measured speed with the speed calculated for said slave unit, calculating a second error signal corresponding to the difference between said measured speed and said calculated speed and converting said second error signal into an isolated amplified direct current control voltage to correct the speed of said slave unit.

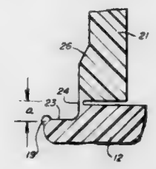
4,174,238

HERMETICALLY SEALED TAMPERPROOF PORT PROTECTOR AND METHOD OF MAKING FRANGIBLE SEAL

Thomas A. Fowles, McHenry, Ill., and David A. Winchell, Twin Lakes, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 777,753, Mar. 14, 1977, Pat. No. 4,127,208. This application Jan. 25, 1978, Ser. No. 872,287
Int. Cl.[2] B29C *27/00*
U.S. Cl. 156—69 **3 Claims**

1. An improved method of forming a fracturable seal of the type wherein a thermoplastic cup-shaped closure is sealed to a thermoplastic planar surface, said cup-shaped closure being formed with a radially outwardly extending sealing portion, said method comprising the steps of assembling the closure on the planar surface with said portion seated on said surface; heating a sealing die above the melting temperature of the thermoplastic material of the closure and surface; bringing said sealing die toward and against said portion; and pressing said sealing die into said portion and said surface to depress said surface at least 0.005 inch from its original height by the sealing action of the die and to displace said portion material into a



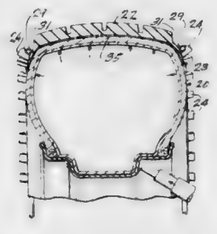
bead outwardly and form a fracturable seal normal to the plane of said surface, whereby said seal will be fractured in a plane substantially parallel to said surface thereafter due to tension stress when the closure is removed from the planar surface.

4,174,239

METHOD AND APPARATUS FOR RETREADING TIRES

Russell Symmes, P.O. Box 621, Muncie, Ind. 47305

Continuation-in-part of Ser. No. 697,859, Jun. 21, 1976, abandoned. This application Mar. 3, 1978, Ser. No. 883,212
Int. Cl.[2] B29H *5/30*
U.S. Cl. 156—96 **2 Claims**



1. Apparatus for the retreading of a worn and prepared tire carcass comprising a precured tread stock strip for application to the circumference of said carcass, said strip including a central wear tread area and wings extending from each side thereof, upstanding means on said wing forming a circumferential groove on each side of said wear tread area, a layer of unvulcanized cushion gum underlying only said wear tread area and stopping laterally short of said wings, and rings having a predetermined substantially fixed circumferential dimension and received in said circumferential grooves, the circumference of said rings being small enough to exert a high pressure on said tread stock during curing of said cushion gum layer, whereby the edge areas of said wear tread are held with high pressure against said tire carcass, said wing areas and lugs being trimmed away after curing of said cushion gum layer leaving said wear tread area fixed to said carcass.

4,174,240

NOVEL TRANSPARENT POLYURETHANE POLYUREAS FOR LAMINATION OF GLAZING MATERIALS

Hanns P. Müller, Leverkusen; Wolfgang Oberkirch, Cologne; Kuno Wagner, and Bernd Quiring, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 833,311, Sep. 14, 1977, Pat. No. 4,139,674. This application Sep. 29, 1978, Ser. No. 947,222
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1976, 2644434
Int. Cl.[2] C03C *27/04;* **B32B** *27/40;* **C08G** *18/32;* **C09J** *5/04*
U.S. Cl. 156—99 **2 Claims**

1. A process for the production of laminates, wherein sheets of silicate glass and/or transparent glass-like plastics are coated and/or bonded together with a transparent film of 0.1 to 5 mm. in thickness formed from a polyurethane polyurea with a predominantly linear molecular structure exclusively containing aliphatically or cycloaliphatically bound urethane and urea segments and having a shear modulus G' (DIN 53 445) which amounts to between 2 and 140 N/mm^2 at 20° C. and does not fall below a value of 1 N/mm^2 at 60° C., characterized by

(a) a content of urea groups —NH—CO—NH— amounting to between 1 and 20% by weight and

(b) a content of lateral carboxyl groups —COOH directly attached to the main chain of the molecule amounting to between 0.001 and 10% by weight.

2. A process for the production of laminates of glass or glass like transparent plastics with polyurethane polyurea comprising subjecting a transparent film of 0.1 to 5 mm in thickness formed from a polyurethane polyurea comprising the reaction product of

(a) dihydroxy compounds having molecular weights between about 300 and 6,000 selected from the group consisting of polyesters and polyethers,

(b) dihydroxy carboxylic acids corresponding to the formula

wherein R represents H, or a C_1 to C_4 alkyl radical,

(c) optionally aliphatic or cycloaliphatic diols having molecular weights of between about 62 and 300,

(d) diisocyanates having exclusively aliphatically and cycloaliphatically bound isocyanate groups, and

(e) organic diamines containing aliphatically and cycloaliphatically bound primary amino groups and having molecular weights between about 60 and 3,000, wherein the equivalent ratio of d:(a+b+c) is between about 1.1:1 and 4:1, the equivalent ratio of e:(a+b+c) is between about 0.1:1 and 3:1, the molar ratio of a:b is between about 1:0.01 and 1:12, and the molar ratio of a:c is between about 1:0 and 1:10, said polyurethane polyurea having

(1) a molecular weight greater than about 10,000,

(2) a urea group content of between about 1 and 20 wt. %, and

(3) a content of lateral carboxyl groups directly attached to the main chain of the molecule of between about 0.001 and 10 wt. %

and at least one immediately adjacent sheet of a glass or glass like plastic to heat and pressure.

4,174,241

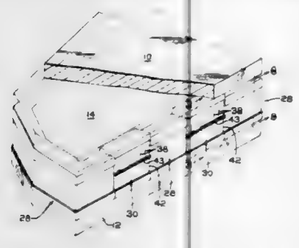
SIMULTANEOUSLY LAMINATING AND PRESS POLISHING PLASTIC LAMINATED TRANSPARENCIES

Paul A. Rockar, Cabot; Melvin K. Law, and Thomas W. Hawk, both of New Kensington, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 21, 1978, Ser. No. 926,685
Int. Cl.[2] B32B *31/20*
U.S. Cl. 156—102 **10 Claims**

1. A method of fabricating a laminated transparency having smooth outer major surfaces and provided with a minimum of entrapped fluid bubbles comprising assembling alternate layers of a relatively hard plastic selected from the group of hard transparent plastic materials consisting of acrylic plastics, polycarbonates, polyesters, and hard polyurethanes and of a relatively soft interlayer material selected from the group consisting of polyurethanes, silicones, ionomers, and plasticized polyvinyl acetals to form an assembly to be laminated and simultaneously press polished, enclosing the outer major surfaces of said assembly between a pair of pressing plates having a greater extent than the outline of said layers in such a

manner that the pressing plates extend beyond the margins of said layers to form a marginal space, applying marginal frame means having a thickness approximating the total thickness of said layers between the extending portions of said pressing plates along at least two adjacent sides of said marginal space and between the extending portions of said pressing plates along at least a portion of the length of at least one of the remaining sides of said marginal space, applying between at least a portion of the remainder of said extending portions of said pressing plates along at least one of said remaining sides of said marginal space, wedge means having a thickness greater than the total thickness of said layers and composed of material softer than said relatively hard plastic to form a wedge-shaped



space between one of said pressing plates and an outer major surface of one of said layers of said assembly that faces said one of said pressing plates, inserting said assembly of said layers so arranged between said pressing plates within a thin, flexible laminating bag with said marginal frame means and said wedge means therearound, evacuating said laminating bag, sealing said evacuated laminating bag, and exposing said sealed, evacuated laminating bag to an elevated pressure and temperature for sufficient time for the pressing plates to press polish the outer major surfaces of said assembly, to distort the wedge means until the thickness thereof approximates the total thickness of said assembly and to laminate the layers of said assembly.

4,174,242

TIME DELAY BEFORE POST CURE INFLATION

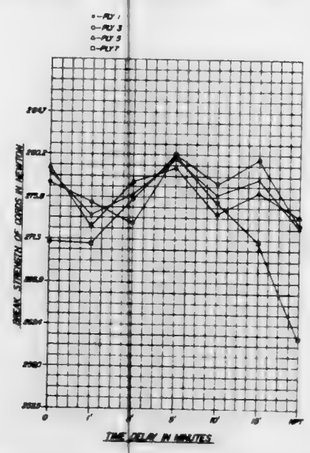
Myron T. Ayers, and William J. Corsaut, both of Akron, Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 770,962, Feb. 22, 1977, abandoned. This application Oct. 11, 1978, Ser. No. 950,505

Int. Cl.[2] B29H *5/00*

U.S. Cl. 156—110 R **2 Claims**

1. In a method of curing a nylon cord tire under heat and pressure in a mold, then post inflating the tire outside of the mold to a pressure of at least 170 kilopascals before the tire cools below the heat shrink temperature of the nylon cord, the improvement which comprises a delay of from 4 to 7 minutes



between the time of removal of the tire from the mold and the time the tire is post inflated.

4,174,243

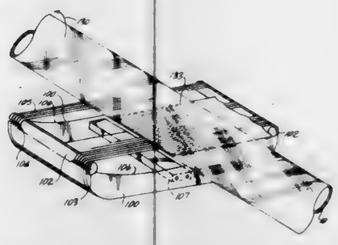
METHOD AND APPARATUS FOR WIPING RESIN FROM FILAMENT WOUND PIPE

Gerald M. Magarian, Long Beach, Calif., assignor to Ameron, Inc., Monterey Park, Calif.

Continuation-in-part of Ser. No. 818,952, Jul. 25, 1977, Ser. No. 824,494, Aug. 15, 1977, and Ser. No. 842,624, Oct. 17, 1977. This application Oct. 17, 1977, Ser. No. 842,548

Int. Cl.[2] B65H *81/00*

U.S. Cl. 156—175 **23 Claims**



1. In a method for manufacturing plastic pipe reinforced with fibrous rovings comprising the steps of coating the rovings with a fluid resin, and winding a rotating mandrel with the resin coated rovings, the improvement which comprises the step of contacting the wound rovings with at least one filament segment curved around a portion of the wound pipe, and moving the filament segment longitudinally along the mandrel during the winding as the mandrel is rotated to wipe resin from the wound rovings to leave a substantially uniform surface layer of resin on the rovings, the layer being sufficiently thin that it stays on the rovings while the mandrel is rotating, whereby resin is prevented from being slung from the pipe as it is formed.

11. In apparatus for making plastic pipe reinforced with helical layers of fibrous roving, and which apparatus includes a rotating mandrel upon which the pipe is formed, means for applying liquid resin to the rovings, and a carriage for carrying the rovings to and from along the length of the mandrel as the resin coated rovings are helically wound on the mandrel, the improvement comprising:

(a) at least two elongated, spaced-apart supporting members, each supporting member having a plurality of circumferential longitudinally spaced grooves;

(b) a plurality of substantially parallel, spaced-apart filament segments positioned in the grooves; and

(c) means for holding the filaments in contact with rovings wound on the pipe to wipe resin from the rovings.

4,174,244

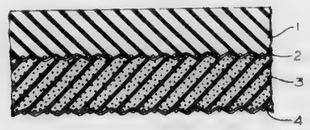
METHOD OF MAKING A PRINTING BLANKET

Eric W. Thomas, and Thomas J. Maistros, both of Stow, Ohio, assignors to Industrial Electronic Rubber Company, Twinsburg, Ohio

Continuation of Ser. No. 690,856, May 28, 1976, abandoned. This application Aug. 1, 1977, Ser. No. 820,845

Int. Cl.[2] B29C *3/00*

U.S. Cl. 156—242 **12 Claims**



1. A process for preparing a printing blanket useful for offset printing which comprises

(a) preparing a composite by

(1) sheeting out a layer of a foamable and cross-linkable elastomeric material over a fibrous or pressure sensitive adhesive backing material,

(2) applying an intermediate layer of fibrous material over a layer of foamable material, and

(3) sheeting out a top layer of a non-foamable cross-linkable elastomeric material over said intermediate layer of fibrous material, and

(b) molding the composite at an elevated temperature under pressure whereby both layers of elastomeric material are cross-linked in situ and the foamable elastomeric material is foamed in situ.

4,174,245

METHOD OF FABRICATING A FLEXIBLE FUEL TANK

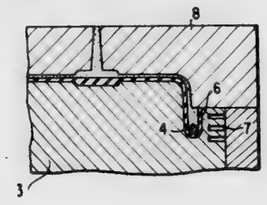
Philippe M. Martineau, Nantes, France, assignor to Regie Nationale des Usines Renault, Billancourt, France

Filed Feb. 24, 1978, Ser. No. 881,125

Claims priority, application France, Feb. 24, 1977, 77 05423

Int. Cl.[2] B32B *1/02*

U.S. Cl. 156—245 **11 Claims**



1. A method of fabricating a flexible fuel tank comprising:

injecting firstly an elastomer into a mold through an elastomer inlet, the mold having a lower element and an upper stand element, said element defining a first half-shell with a peripheral edge;

cooling the peripheral edge of the injected elastomer to a temperature below that which would produce complete vulcanization of the injected elastomer;

vulcanizing in situ the injected elastomer, except for the cooled peripheral edge thereof;

replacing the mold upper stamp element with a second correspondingly shaped stamp element, the second upper stamp element and the lower element defining a second half-shell also having a peripheral edge, the mold formed by said second stamp element having a larger volume than that of the mold produced by said first stamp element;

halting the cooling of the peripheral edge;

injecting secondly an elastomer between the second stamp element and the previously injected elastomer; and,

vulcanizing in situ the secondly injected elastomer and the peripheral edge of the firstly injected elastomer;

whereby first and second vulcanized elastomer half-shells are formed and joined at the commonly vulcanized peripheral edges of each half-shell.

4,174,246

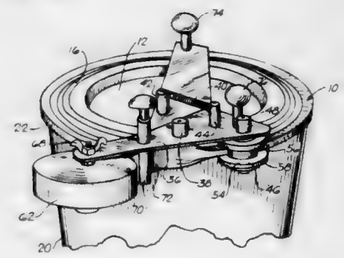
HAND TAPING DEVICE

George D. Ralston, Bridgeview, Ill., assignor to Natico, Inc., Chicago, Ill.

Filed Jul. 25, 1977, Ser. No. 818,540

Int. Cl.[2] B65B *7/28, 51/06*

U.S. Cl. 156—391 **3 Claims**



1. A device for taping a cover onto a drum comprising a base plate and means mounting the base plate on the cover for rotational movement on an axis corresponding to the axis of the cover, an arm pivotally mounted on the base plate for rocking movement relative to the base plate, a pressure roller mounted on the arm for free rotational movement, a tape supply roll support mounted on the arm for free rotational movement of a supply roll, a guide post fixed to the arm intermediate the support and the pressure roller and offset inwardly towards the periphery of the cover from a line between the axes of said support and pressure roller so that the tape comes into engagement with the guide post during passage from the supply roll to the pressure roller, and means constantly urging the arm for rocking movement about its pivot in a direction to displace the pressure roller inwardly towards the periphery of the cover, in which the guide post depends from the arms and in which the lower end portion of the guide post is formed with an outward flare to preform the tape as it is drawn thereover.

2. A device for taping a cover onto a drum comprising a base plate and means mounting the base plate on the cover for rotational movement on an axis corresponding to the axis of the cover, an arm pivotally mounted on the base plate for rocking movement relative to the base plate, a pressure roller mounted on the arm for free rotational movement, a tape supply roll support mounted on the arm for free rotational movement of a supply roll, a guide post fixed to the arm intermediate the support and the pressure roller and offset inwardly towards the periphery of the cover from a line between the axes of said suppport and pressure roller so that the tape comes into engagement with the guide post during passage from the supply roll to the pressure roller, means constantly urging the

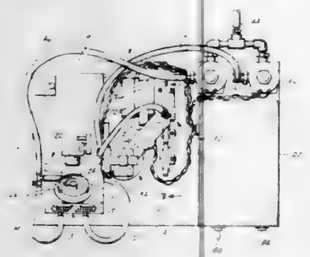
arm for rocking movement about its pivot in a direction to displace the pressure roller inwardly towards the periphery of the cover and means for cutting the tape, in which the cutting means is incorporated in the guide post and comprises a guide post in the form of a hollow sleeve section, a rod mounted for axial movement in the sleeve section between raised and lowered positions of adjustment with a portion of the rod extending above the sleeve section, a knife extending outwardly from the rod through an elongate slot in the sleeve section, means constantly urging the rod towards raised position whereby the knife is out of alignment with the portion of the rod engaged by the tape, and means for actuating the rod from raised to lowered position to sever the portion of the tape in engagement with the post.

4,174,247

APPARATUS FOR SPLICING THE ENDS OF MAGNETIC TAPE WOUND ON SPOOLS OF THE TYPE USED IN ENDLESS TAPE CARTRIDGES

Arthur Dyck, Burnaby, Canada, assignor to International Audio Visual, Inc., Glenview, Ill.

Filed Nov. 25, 1977, Ser. No. 854,767
Int. Cl.[2] B31F *5/00;* **B32B** *31/00*
U.S. Cl. 156—506 **19 Claims**



1. A splicing apparatus for joining the ends of a magnetic tape wound on spools of the type used in endless tape cartridges in which an endless tape is withdrawn from the innermost on the spool and returned to the spool as the outermost winding, comprising:

splicing tape supply means for supplying a continuous length of splicing tape of the type having a contact adhesive on one surface and haing a foil-like thickness dimension selected to insure that a splice formed thereby on the magnetic tape moves smoothly past all points in the tape path of the endless tape cartridge;

cutting means including a cutting blade, a coacting cutting surface, and means for lengthwise advancement of the splicing tape so that the adhesive surface thereof is moved into contact with and adherence to said cutting surface, and means for controllably advancing said cutting surface and the splicing tape adhering thereto passed said blade and for actuating said blade to sever the splicing tape into individual splicing segments which are retained on said cutting surface by the contact adhesive of the splicing tape;

magnetic tape holding means mounted in fixed, spaced relation to said cutting means for holding opposed ends of a spool of tape in end to end abutment; and

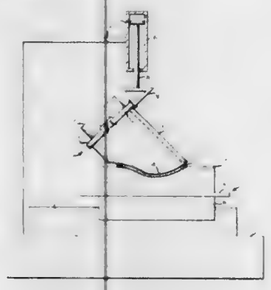
vacuum pickup means mounted for movement between said cutting means and said magnetic tape holding means, and including means for picking up one of said splicing segments off of said cutting surface and transporting said segment to said magnetic tape holding means and placing said segment in splicing position with the adhesive surface in overlapping contact with surfaces of the tape adjacent the abutting end.

4,174,248

PROCESS AND APPARATUS FOR CONNECTING PLASTIC PIPES

James C. Carroll, Hopkinsville, Ky., and Clel H. Shafer, Perryton, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 621,887, Oct. 14, 1975, abandoned. This application Oct. 24, 1978, Ser. No. 954,157
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—538 **6 Claims**



1. Apparatus for connecting a lateral pipe to a main pipe comprising

a. first pipe holding means to hold said main pipe,

b. second pipe holding means to hold said lateral pipe, said second pipe holding means consisting essentially of

aa. a guiding sleeve having an inner configuration essentially equal to the outer configuration of said lateral pipe, one end of said guiding sleeve having essentially the configuration of the outer surface of the main pipe, the internal diameter (d) of said guiding sleeve being related to the external diameter (D) of said main pipe by the following inequality:

$$\frac{9}{10} \leq d/D \leq 1,$$

bb. means contacting the exterior surface of the lateral pipe to hold said lateral pipe in position in said guiding sleeve,

c. motion means connecting said first pipe holding means and said second pipe holding means for applying a relative motion between said second pipe holding means and said first pipe holding means so that said lateral pipe and said main pipe can be brought into contact with each other in the desired relative position, in which said one end of said guiding sleeve approximately fits on said main pipe.

4,174,249

SYSTEM FOR INSTANTANEOUS SEALING OF CRACKED LINES IN PLASTER

John H. Bopst, III, 409 Chalfonte Dr., Baltimore, Md. 21228

Filed Sep. 22, 1977, Ser. No. 835,458
Int. Cl.[2] B30B *15/34;* **B32B** *31/20*
U.S. Cl. 156—577 **2 Claims**

1. In a plaster crack sealing system having a thermal plate with a guide proximate the front end thereof, a handle, and a supply of tape applicable by the thermal plate, the improvement comprising: the tape being metallic foil, one face of the metallic foil having heat sealable adhesive thereon, means holding the tape coiled and spaced from the thermal plate with a free end thereof leading forwardly through the guide and rearwardly past the thermal plate, the handle providing an outwardly angled grip relative to the thermal plate, the means holding the tape including a pair of arms and a spool having means for mounting on the arms, the arms extending forwardly from the handle a distance proportioned for holding the spool rearwardly clear of the forward end of the thermal plate providing for obstruction free maneuvering and visual access in

operation of the system, the guide having a slot proximate the forward end of the thermal plate, and having a portion angled



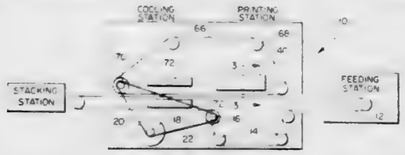
over the forward end of the thermal plate and slightly to the rear leaving space only sufficient for the metallic foil to pass freely between the angled portion and the thermal plate.

4,174,250

APPARATUS FOR SUBLIMATION IMPRINTING TILES

David Durand, Bristol, R.I., assignor to Freeman Transfer Printing Company, Inc., East Providence, R.I.

Filed Apr. 10, 1978, Ser. No. 895,229
Int. Cl.[2] B30B *15/34, 5/02*
U.S. Cl. 156—583.3 **2 Claims**



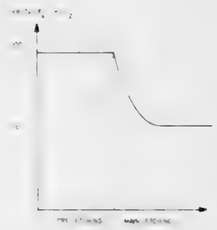
1. Apparatus for transferring a design imprinted on a transfer sheet in dyes which are sublimatible at a predetermined temperature to an article having a plastic resin upper surface capable of receiving said dyes, comprising a platen having a heat conductive press member, means for receiving and moving said article so as to place said upper surface and said press member in opposed position to each other, means for disposing the transfer sheet between said article and said press member, means for moving said press member toward said article so as to force said sheet into direct contact with said article upper suface, and means for heating the platen so as to raise the temperature of said sheet and said article surface to said predetermined temperature so as to sublimate said design into said surface, said press member including a mass of heat conductive liquid metal restrained within a recess in said platen, and a flexible membrane spanning said recess, said membrane adapted to contact said sheet, said platen forming a part of a heat activated printing station, a cooling station positioned adjacent said printing station for cooling said article after being heated in said printing station, said means for receiving and moving said article being a flexible endless belt movable between said printing and cooling station, said belt including an article carrier mounted thereon, said carrier having nest means for supporting a plurality of said articles and means for indexing said carrier into registry with said platen, said belt being wider than said carrier whereby edge portions of said belt are uncovered adjacent said carrier, said transfer sheet being dimensioned so as to cover said carrier and said edge portions, and a pair of second belts engaging the edge portions of said first belt so as to maintain said transfer sheet clamped between said first and second belts and hence in proper registry with said carrier.

4,174,251

METHOD OF SELECTIVE GAS ETCHING ON A SILICON NITRIDE LAYER

Klaus Paschke, Denzlingen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Dec. 1, 1977, Ser. No. 856,446
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658448
Int. Cl.[2] H01L *21/306;* **C03C** *15/00, 25/06*
U.S. Cl. 156—643 **4 Claims**



1. A method of gas etching a silicon nitride layer deposited on a semiconductor body of silicon by immercing said semiconductor body having said silicon nitride layer thereon in a plasma produced by way of high frequency glow discharge of a glass atmosphere containing carbon tetrafluoride and oxygen, the improvement comprising:

etching in a first stage at a first oxygen concentration and at a first high frequency power range; and

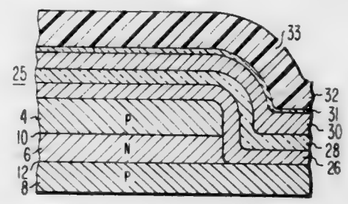
etching in a second stage at a second oxygen concentration and at a second high frequency power range, wherein the first oxygen concentration is lower than the second oxygen concentration.

4,174,252

METHOD OF DEFINING CONTACT OPENINGS IN INSULATING LAYERS ON SEMICONDUCTOR DEVICES WITHOUT THE FORMATION OF UNDESIRABLE PINHOLES

Henry Kressel, Elizabeth, and Mark A. Spak, Edison, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 26, 1978, Ser. No. 928,310
Int. Cl.[2] H01L *21/285, 21/306, 21/314*
U.S. Cl. 156—653 **9 Claims**



1. In a method of defining a contact opening to a semiconductor device having one or more passivating layers thereon whereby an inert layer is applied over said passivating layer, a layer of photoresist is applied over said inert layer, said photoresist exposed to a light pattern, developed to leave openings in the photoresist layer where the desired contact openings are to be formed, and the device contacted with one or more etchant solutions to propagate said openings through the inert and

passivating layers to the substrate, the improvement which comprises

applying as the inert layer a layer of undoped polycrystalline or amorphous silicon and employing an etchant solution for etching said inert layer which etches large diameter openings faster than small diameter openings such that small diameter openings in the photoresist layer are not propagated through said inert layer.

4,174,253

DISSOLUTION OF METALS UTILIZING A H_2O_2-H_2SO_4 SOLUTION CATALYZED WITH HYDROXY SUBSTITUTED CYCLOPARAFFINS

Moenes L. Elias, Canfield, Ohio, and Philip D. Readio, Sparta, N.J., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Nov. 8, 1977, Ser. No. 849,575
Int. Cl.[2] C23F *1/00*
U.S. Cl. 156—666 **23 Claims**

1. In a process for the dissolution of metal in which a metal is contacted with an aqueous solution containing from about 0.2 to about 4.5 gram moles per liter of sulfuric acid, from about 0.25 to about 8 gram moles per liter of hydrogen peroxide, the method of increasing the metal dissolution rate of the solution to a value higher than that obtained by such a solution free of any chloride and bromide ions, which method comprises adding at least about 0.085 and up to 0.5 gram moles per liter of the solution of a promoter selected from:

(a) monohydroxy or dihydroxy-substituted cycloparaffins containing from 5 to 7 carbon atoms in the ring structure, or

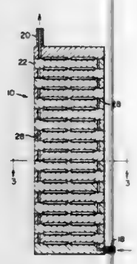
(b) monohydroxy or dihydroxy-substituted alkylcycloparaffins containing from 5 to 7 carbon atoms in the ring structure, where each of the alkyl groups contains from 1 to 4 carbon atoms and is attached to an unsubstituted carbon atom in the ring structure.

4,174,254

COMPRESSION HUB

Albert L. Gaines, West Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 12, 1977, Ser. No. 832,492
Int. Cl.[2] G21B *1/00*
U.S. Cl. 176—2 **6 Claims**



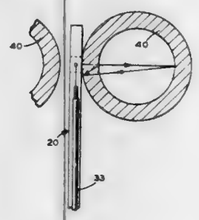
1. A compression hub for bucking forces of magnets in a fusion reactor comprising: a plurality of polygonal metallic pancakes arranged in stacked relationship; said pancakes sealed to one another at the perimeter thereof, and spaced from one another within the seal welded area, thereby forming flow chambers between adjacent pancakes; at least one vertical opening through each of said pancakes in fluid communication with the flow chambers above and below the respective pancake; and the vertical openings through adjacent pancakes being remote from one another, whereby coolant flowing from one opening to another passes through the flow chamber intermediate the adjacent pancakes.

4,174,255

APPARATUS FOR LOCATING DEFECTIVE NUCLEAR FUEL ELEMENTS

William E. Lawrie, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed May 6, 1977, Ser. No. 794,508
Int. Cl.[2] G21C *17/00*
U.S. Cl. 176—19 LD **14 Claims**



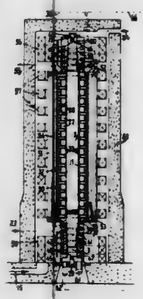
1. An ultrasonic search unit for testing nuclear fuel elements to detect the presence of water in fuel elements spaced within a fuel assembly of the type used in a water cooled nuclear reactor comprising a strip carrier with mutually opposing faces, the strip carrier being dimensioned to freely traverse the spaces between the fuel elements and having an integral aperture, an ultrasonic transducer element, electrodes deposited on at least two sides of the transducer element, the ultrasonic transducer element disposed within the aperture with one of the electrodes being flush with one of the strip carrier faces, means for grounding the ultrasonic transducer element to the strip carrier, means for decoupling said ultrasonic transducer element from the strip carrier, said decoupling means being interposed between the ultrasonic transducer element and the surfaces of the strip carrier defining the aperture, damping means disposed within the aperture adjacent to a recessed portion of the ultrasonic transducer element, and means for energizing the ultrasonic transducer element to transmit an ultrasonic pulse transversely into the wall of the fuel element to be tested.

4,174,256

REACTOR BASED ON A MAGNETOHYDRODYNAMICALLY DRIVEN SUPERSONIC GAS VORTEX

Jacob Kistemaker, Amsterdam, Netherlands, assignor to Ultra Centrifuge Nederland N.V., The Hague, Netherlands

Filed Aug. 17, 1976, Ser. No. 715,201
Claims priority, application Netherlands, Oct. 29, 1975, 7512635
Int. Cl.[2] G21C *1/24*
U.S. Cl. 176—39 **3 Claims**



1. Apparatus for the stable confinement of a fast rotating

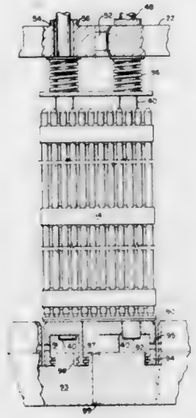
gaseous mixture of a heavy gas component and a light gas component comprising: an elongated reactor vessel constructed for nuclear fission reactions having a wall of circular cross section and end covers; means for cooling the reactor vessel; at least one supply pipe for supplying a gaseous mixture of heavy and light components to the interior of the vessel; means for imparting rapid rotation to the gas in the center of the vessel so that the heavy gas component, by means of a high pressure gradient caused by centrifugal forces, moves to the inside of the vessel wall and so that the light gas component forms a central gas column extending axially in the vessel, said means for imparting rapid rotation including means for ionizing the gas column, means for inducing an axial magnetic field extending the length of the vessel so that the gas in the vessel is subjected to the field, and means including at least one electrode mounted on at least one end cover of the reactor vessel in the center of the cover, from which an ionized column of light gas extends along the central rotation axis of the gas mass, for producing a radial electrical potential between the ionizing means and the vessel wall; means for flowing the heavy gas component in the form of a gas envelope axially along the vessel wall and then axially in an opposite direction; and supply and discharge pipes communicating with the ionized gas column, and a neutron reflector-moderator jacket mounted between the wall of the reactor vessel and the magnetic field-inducing means, said vessel wall being lined with electrode rings which are electrically insulated from each other, openings being provided in the inner surface of the wall of said reactor vessel which give access to annular cavities surrounded by cooling channels, said inner surface and the walls of the cavities being made of carbon or of a carbon compound.

4,174,257

HYDRAULIC HOLD-DOWN FOR NUCLEAR REACTOR FUEL

John N. Calvin, West Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Continuation of Ser. No. 784,189, Apr. 4, 1977. This application Jun. 1, 1978, Ser. No. 911,602
Int. Cl.[2] G21C *15/00*
U.S. Cl. 176—50 **2 Claims**



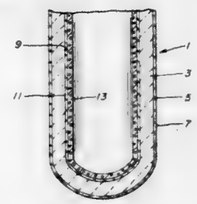
1. In a nuclear reactor having a pressure vessel and a core within the pressure vessel, said core comprised of a plurality of fuel assemblies each comprised of a plurality of vertically oriented fuel elements, the reactor having fluid under pressure passed upwardly over said fuel elements; the improvement comprising: a pressure plate attached to the lower end of a fuel assembly, and having an upper surface and a lower surface, said upper surface exposed to the fluid at the fuel assembly inlet; a sealing plate spaced below said pressure plate, portions of said seal plate peripherally engaged the outer portion of said pressure plate in closely spaced relationship for substantially restricting fluid flow therebetween, thereby forming a pressurizable plenum defined by the lower surface of said pressure plate and the upper surface of said seal plate; and a control rod guide tube extending vertically through said fuel assembly and said pressure plate, said control rod guide tube open to said pressure plenum at the lower end and open to the fluid flowing upwardly at the upper end of said fuel assemblies.

4,174,258

SOLID ELECTROLYTE OXYGEN SENSOR WITH ZERO OXYGEN REFERENCE

James D. Bode, Royal Oak, Mich., assignor to Bendix Autolite Corporation, Fostoria, Ohio

Filed May 3, 1978, Ser. No. 902,472
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 S **16 Claims**



1. An oxygen gas sensor element comprising a solid electrolyte body for transferring oxygen ions, the body having an outer surface having a conductive catalyst electrode thereon for contact with a gas, the oxygen content of which is to be measured, and an inner surface having a conductive electrode thereon, the improvement comprising:

protective means over the conductive electrode and the inner surface of the solid electrolyte body for protecting said inner surface from contact with oxygen-containing gases and providing a substantially zero oxygen reference for said inner surface.

4,174,259

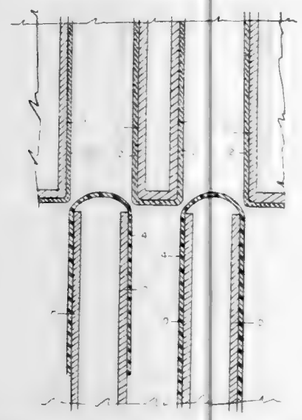
ELECTROLYTIC CELL STRUCTURE AND METHOD OF ASSEMBLY

John T. Rucker, Lewiston, and Donald H. Porter, Kenmore, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Sep. 24, 1976, Ser. No. 726,312
Int. Cl.[2] C25B *13/02, 13/08, 9/00, 11/03*
U.S. Cl. 204—252 **11 Claims**

1. A method for reducing the anode-cathode gap in an electrolytic diaphragm-type cell, said cell having a cell container, anode and cathode elements disposed within said container, said cathodes equipped with deposited polymer reinforced hard asbestos diaphragms, a cell base for mounting said anodes, and a cell top, each of said anode elements comprising a pair of substantially parallel non-adjustable blades in a spaced-apart relationship, which method comprises detachably mounting at least one non-perforated preformed substantially U-shaped guide spacer over the top of each anode, said guide spacer partially enclosing both blades of said anode element during assembly, each leg of said spacer being of a thickness smaller than the desired cathode-anode gap, assembling the cathodes and anodes by inserting one over the other so that each anode

element is positioned between a pair of adjacent cathode elements with the guide spacers separating said elements to pro-



vide a cathode to anode gap of from about 5 millimeters to about 10 millimeters.

4,174,260

COMPOUND CELL FOR HIGH-TEMPERATURE ELECTROCHEMICAL REACTIONS

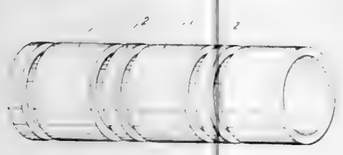
Rainer Schmidberger, Bermatingen, Fed. Rep. of Germany, assignor to Dornier Systems GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Oct. 11, 1978, Ser. No. 950,364

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1977, 2746172

Int. Cl.[2] C25B *9/00;* **H01M** *8/12*

U.S. Cl. 204—260 **5 Claims**



1. A compound cell for performing an electrochemical reaction at a temperature above 600° C. which comprises:

(a) a plurality of hollow, cylindrical bodies of a ceramic electrolyte capable of conducting oxygen ions and substantially impervious to gases;

(b) a plurality of rings of an electronically conductive material substantially impervious to gases, each of said bodies and each of said rings having an axis, two radially extending end faces, and inner and outer axially extending faces;

(c) gas-tight bonding means bonding the two end faces of each of said bodies in axial alignment to respective end faces of two axially adjacent rings, said bonding means, said bodies and said rings jointly constituting a self-supporting, gas-tight tube; and

(d) a pair of electrode layers associated with each of said bodies, one of said electrode layers being superimposed on the inner axial face of the associated body and conductively engaging one of the two adjacent rings in said tube, the other electrode layer being superimposed on the outer axial face of the associated body and conductively engaging the other adjacent ring outside said tube.

4,174,261

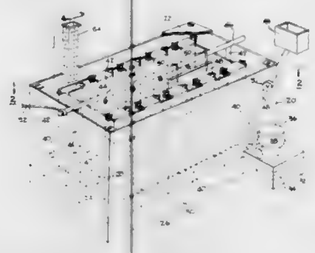
APPARATUS FOR ELECTROPLATING, DEPLATING OR ETCHING

Peter P. Pellegrino, 2642 W. Mendoza, Mesa, Ariz. 85202

Continuation-in-part of Ser. No. 705,827, Jul. 16, 1976, abandoned. This application Apr. 13, 1978, Ser. No. 895,744

Int. Cl.[2] C25D *17/00;* **C25F** *7/00*

U.S. Cl. 204—273 **28 Claims**



1. Electroplating apparatus comprising:

a container for confining an electrolyte, said container having a sump adjacent the bottom thereof for maintaining a quantity of electrolyte,

first electrode means for supporting an article to be plated above the electrolyte level in said container, said first electrode means having means for electrically coupling an article to be plated to one terminal of a power supply,

manifold means adjacent said first electrode means for receiving electrolyte under pressure, said manifold means having spray means for receiving electrolyte from within said manifold means and for spraying electrolyte from a position above the electrolyte level in said container toward an article to be plated supported on said first electrode means above the electrolyte level in said container,

said manifold means including at least one removable cap, said second electrode means comprising at least one electrode member of a metal electrode which is substantially nonreactive in the electrolyte for the metal to be plated,

whereby pieces of the metal to be plated may be placed into said manifold means and into electrical contact with said second electrode means.

4,174,262

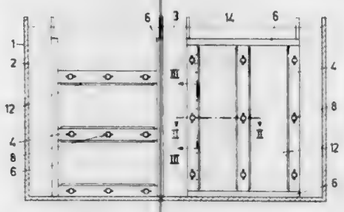
DEVICE FOR FASTENING AT LEAST ONE PLATE INSIDE AN ELECTROLYTE BATH AND FOR FEEDING CURRENT THERETO

Jozef K. E. H. van Mellaert, and Luc J. P. van Mellaert, both of Paalseweg, 51a, Tessenderlo, Belgium

Filed May 24, 1978, Ser. No. 909,004

Int. Cl.[2] C25D *17/08*

U.S. Cl. 204—297 R **15 Claims**



1. A device for fastening at least one plate inside an electrolyte bath and for feeding current thereto, for depositing a coating on the plate, comprising:

at least two parallel electrically insulated battens:

at least one electrical conductor embedded in one of said battens, and having means for connecting it to an electric current source;

electrically conductive contact means for providing electrical connection between said conductor and the plate, comprising a plurality of electrically conductive projections extending from said conductor, through the electrically insulated batten transversely of the batten, and outwardly from said one batten toward the other of said battens for engaging a plate placed between said battens; and

fastener means electrically insulated from said conductor for clamping the plate between said battens and establishing electrical contact between said projections and the plate.

4,174,263

RECOVERY OF BITUMEN FROM TAR SANDS

Franklin Veatch, Cleveland, and Harvey E. Alford, Amherst, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 528,062, Nov. 29, 1974, abandoned. This application Jun. 28, 1978, Ser. No. 919,890

Int. Cl.[2] C10G *1/04*

U.S. Cl. 208—11 LE **3 Claims**



1. In a process for the recovery of bitumen from tar sands wherein bitumen is separated from the remainder of the tar sands by a floatation technique, the improvement comprising the steps of:

(a) contacting the tar sands with from 0.01 to 0.1 weight percent based on the weight of the tar sands of a liquid halogenated hydrocarbon that is able to at least partially penetrate the bitumen to form liquid treated tar sands;

(b) vaporizing at least some of the liquid halogenated hydrocarbon treated tar sands to produce a closed cell foam of the bitumen, whereby the vapor in the bitumen is entrapped, thereby reducing the density of the bitumen; and

(c) separating the bitumen from the remainder of the tar sands by floatation

whereby there is employed the step of mixing the liquid halogenated hydrocarbon treated tar sands with an aqueous alkaline solution to condition the tar sands prior to said floatation step.

4,174,264

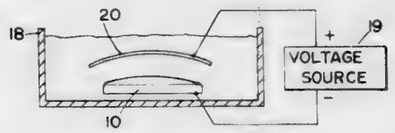
TELEVISION SHADOW MASK AND METHOD OF MAKING SAME

John J. Frantzen, White Bear Lake, Minn., assignor to Neil B. Schulte, North Oaks, Minn., a part interest

Filed Aug. 11, 1978, Ser. No. 933,108

Int. Cl.[2] C25D *1/08;* **H01J** *29/80*

U.S. Cl. 204—11 **2 Claims**



1. A color television shadow mask constructed of electrodeposited metal formed on a base having a suitable resist pattern to produce a hole pattern, said hole pattern created by strips of metal between rows of holes and tie bars connecting said strips, said resist pattern comprising a layer of resist with openings therein to create exposed areas, said exposed areas comprising parallel bars with small elongated islands therebetween, said strips of the mask formed on the parallel bar areas and said tie bars formed on the elongated island areas.

4,174,265

BLACK CHROMIUM ELECTROPLATING PROCESS

Tomoya Minegishi, 4-9, 5-chome, Yachiyodai Kita, Yachiyo-shi, Chiba-ken, and Matsufumi Takaya, 663-88 Usuita, Sakura-shi, Chiba-ken, both of Japan

Continuation of Ser. No. 631,178, Nov. 11, 1975, abandoned. This application Aug. 26, 1977, Ser. No. 827,963

Int. Cl.[2] C25D *3/04*

U.S. Cl. 204—51 **3 Claims**

1. A black chromium electroplating process comprising immersing an anode and a cathode of electrically conductive material to be plated in a plating bath comprising 70 to 1000 g of dissolved chromium trioxide per liter and a radioactive substance selected from the group consisting of a hydroxide, halide, nitrate or acetate of thorium or uranium in an amount of 7×10^{-2} to 7×10^{-1} μCi per 100 parts by weight of chromium trioxide contained in the bath and passing a D.C. current between the anode and the cathode to plate the cathode with a black chromium coating.

4,174,266

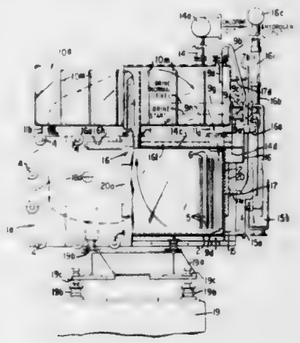
METHOD OF OPERATING AN ELECTROLYTIC CELL HAVING AN ASBESTOS DIAPHRAGM

Thomas C. Jeffery, Lake Charles, La., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 744,309, Mar. 4, 1977, which is a continuation-in-part of Ser. No. 695,626, Jun. 14, 1976, which is a continuation-in-part of Ser. No. 577,270, May 14, 1975, abandoned. This application Aug. 7, 1978, Ser. No. 931,633

Int. Cl.[2] C25B *1/16, 1/26*

U.S. Cl. 204—98 **5 Claims**



1. The method of providing anolyte recirculation in a diaphragmtype electrolysis cell in which gas is evolved at the anode, which comprises operating the cell with a flooded anolyte compartment communicating with an overhead brine feed tank by at least one flooded vertical conduit leading from the top of the anolyte compartment to the top portion of said feed tank causing the anolyte to rise by the gas lift effect of the gas bubbles and to circulate upwardly along the diaphragm, and recirculating the liquid anolyte from the anolyte compartment through another flooded conduit leading from said feed tank to the anolyte compartment, adding diaphragm material to said circulating electrolyte, passing a portion of said electrolyte through the diaphragm and depositing a portion of the added diaphragm material on said diaphragm.

4,174,267

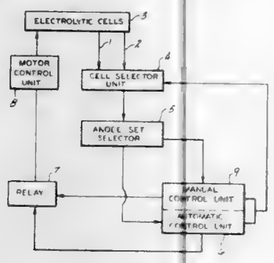
METHOD FOR DETECTING INCIPIENT SHORT CIRCUITS IN ELECTROLYTIC CELLS

Richard W. Ralston, Jr., Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 919,530, Jun. 27, 1978, Pat. No. 4,155,829, which is a continuation-in-part of Ser. No. 605,582, Aug. 18, 1975, Pat. No. 4,098,666, which is a continuation-in-part of Ser. No. 489,647, Jul. 18, 1974, Pat. No. 3,900,373, which is a continuation-in-part of Ser. No. 272,240, Jul. 17, 1972, abandoned. This application Feb. 22, 1979, Ser. No. 14,176

Int. Cl.² C25B *1/36, 15/04, 15/06*

U.S. Cl. 204—99 **9 Claims**



1. In a process for operating an electrolytic cell comprised of adjustable anodes, a group of at least three conductors electrically connected to said anodes, a liquid cathode, secondary conductors electrically connected to said liquid cathode, and an aqueous electrolyte between said liquid cathode and said anodes, wherein voltage is applied across said anodes and said liquid cathode to develop an electric current which passes sequentially through said conductors, said anodes, said electrolyte, said liquid cathode, and said secondary conductors, the improved process for detecting an incipient short circuit between said cathode and a specific said anode connected electrically to a specific said conductor in said group which comprises:

(a) obtaining a first current signal proportional to current in each said conductor in said group,

(b) obtaining a second current signal proportional to current in each of said conductors in said group,

(c) subtracting said first current signal from said second current signal for each of said conductors to obtain a current difference, Δ, for each of said conductors,

(d) selecting said specific anode and said specific conductor in said group, and doubling said Δ to obtain a total selected current difference Δ_t for said selected conductor,

(e) adding said Δ for each said conductor adjacent to said specific conductor, to obtain a total adjacent current difference, Δ_a,

(f) subtracting said Δ_a from said Δ_t to obtain a remainder, R, for said selected conductor,

(g) comparing said R with said Δ_t for said selected conductor, and

(h) raising said specific anode when said R exceeds said Δ_t by more than about 0.5 percent.

4,174,268

ELECTRODE GUIDE

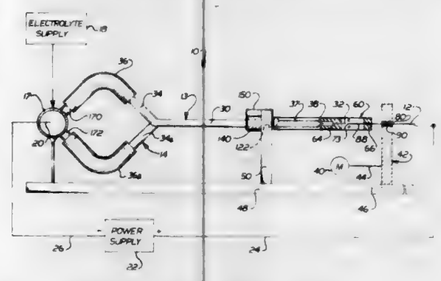
James D. Andrews, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Sep. 1, 1978, Ser. No. 938,948

Int. Cl.² B23P *1/02, 1/12*

U.S. Cl. 204—129.55 **46 Claims**

20. A method of drilling a hole in an axially extending workpiece, said method comprising the steps of providing an electrode, providing a guide to position the workpiece and electrode relative to each other, telescopically inserting the electrode into the guide, telescopically inserting the workpiece into the guide, supplying electrolyte under pressure to a passage through the electrode, providing an electrical potential between the electrolyte and the workpiece, and directing a



flow of electrolyte from the electrode against the portion of the workpiece in the guide to electrochemically drill a hole in the workpiece.

4,174,269

METHOD OF TREATING ELECTRODES

William W. Carlin, Portland, and Lois A. Dahlberg, Corpus Christi, both of Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 21, 1978, Ser. No. 917,621

Int. Cl.² C25F *1/06*

U.S. Cl. 204—129.95 **6 Claims**

1. A method of preparing an iron body for receipt of a catalytic coating comprising:

contacting the iron body with an aqueous cleaning solution comprising an iron oxidation inhibitor, hydrochloric acid, and a source of hydrofluoric acid; and

thereafter maintaining the iron body anodic in an aqueous solution consisting essentially of water and a hydroxy acid until the electrode potential of the clean iron body has decreased by at least 0.01 volt.

4,174,270

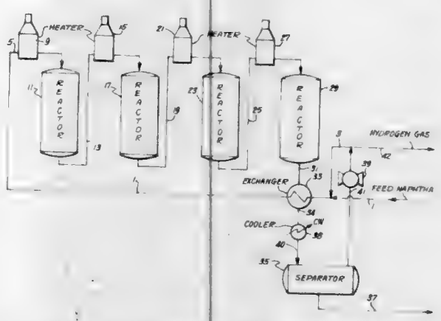
HIGH SEVERITY PROCESS FOR THE PRODUCTION OF AROMATIC HYDROCARBONS

Warden W. Mayes, Big Spring, Tex., assignor to Cosden Technology, Inc., Big Spring, Tex.

Filed Nov. 3, 1977, Ser. No. 848,223

Int. Cl.² C10G *35/08*

U.S. Cl. 208—64 **27 Claims**



1. A process for the production of highly aromatic reformates, suitable for use as blending stocks in the blending of high aromatic content gasoline or the preparation of high purity aromatics, from a naphtha feed fraction by high severity catalytic reforming, using a halogen promoted reforming catalyst, comprising reforming said naphtha feed under reforming conditions of high severity and substantial dryness in a plurality of sequentially arranged reaction zones in which the concentration of the halogen component of the reforming catalyst is adjusted to provide an enhanced hydrocracking activity to the catalyst in the last reaction zones, and a minimal hydrocracking activity to the catalyst in the first reaction zones.

4,174,271

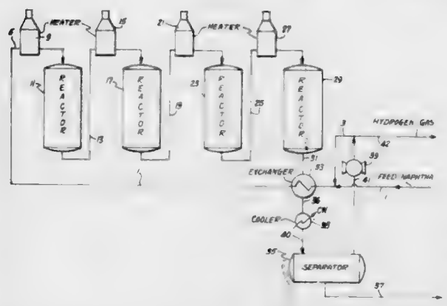
HIGH SEVERITY REFORMING

Warden W. Mayes, Big Spring, Tex., assignor to Cosden Technology, Inc., Big Spring, Tex.

Filed Nov. 3, 1977, Ser. No. 848,229

Int. Cl.² C10G *35/08*

U.S. Cl. 208—64 **30 Claims**



1. A process for the production of highly aromatic reformates, suitable for use as blending stocks in the blending of high aromatic content gasoline or the preparation of high purity aromatics, from a naphtha feed fraction by high severity catalytic reforming, using a reforming catalyst which includes a hydrocracking promotor metal, comprising reforming said naphtha feed under reforming conditions of high severity in a plurality of sequentially arranged reaction zones in which the concentration of the promotor metal of the reforming catalyst is adjusted to provide an enhanced hydrocracking activity to the catalyst in the last reaction zones, and a minimal hydrocracking activity to the catalyst in the first reaction zones.

4,174,272

CATALYTIC CRACKING OF HYDROCARBONS

Albert B. Schwartz, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

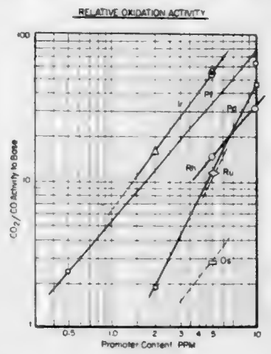
Division of Ser. No. 659,308, Feb. 19, 1976, Pat. No. 4,088,568, and a continuation-in-part of Ser. No. 599,920, Jul. 28, 1975, abandoned, said Ser. No. 659,308, is a continuation-in-part of Ser. No. 649,261, Jan. 15, 1976, Pat. No. 4,072,600, which is a continuation-in-part of Ser. No. 440,890, Feb. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 399,008, Sep. 20, 1973, abandoned. This application Jan. 13, 1978, Ser. No. 869,079

The portion of the term of this patent subsequent to May 9, 1995, has been disclaimed.

Int. Cl.² C10G *11/04;* B01J *8/24;* C01B *29/12*

U.S. Cl. 208—120 **10 Claims**

1. A method for preparing, in situ, an inventory comprising a carbon monoxide oxidation promoting metal and a cracking catalyst for use in a fluid catalytic cracking process for non-hydrogenative cracking of hydrocarbons, which cracking process comprises cofeeding active hot solid cracking catalyst and crackable hydrocarbon feed to a cracking zone; cracking said feed to lighter hydrocarbons while depositing coke on said catalyst; disengaging said coked catalyst from said lighter hydrocarbon products; passing said coked catalyst to a regeneration zone; passing an oxygen containing gas upwardly through said regeneration zone and at sufficient velocity to fluidize said catalyst contained therein, whereby maintaining therein a fluidized bed of catalyst having an ascending temperature profile; retaining said catalyst in said regeneration zone at a temperature and for a time sufficient to burn coke off said catalyst, heat and reactivate such, and produce a flue gas comprising carbon oxides; and returning said reactivated, heated catalyst to said cracking zone; said method comprising adding,



during said process into proximity to said cracking catalyst, an amount of a platinum group metal as a decomposable compound thereof, said amount being effective to increase the temperature of said fluidized bed in said regeneration zone and ineffective to substantially disadvantageously increase the production of coke in said cracking zone, thereby forming said inventory comprising said promoter metal in a proportion of 0.1 to 100 parts per million based on total catalyst.

4,174,273

SEPARATING EXCHANGERS

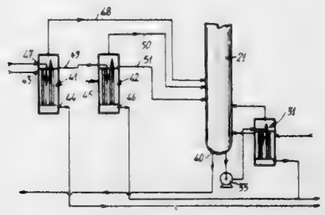
Pierre Cros, Paris; Jean-Pierre Desorbay, Dennemont, and Jean-Jacques Refoubelet, Paris, all of France, assignors to Spie-Batignolles and Societe Generale de Techniques et d'Etudes, both of Puteaux, France

Division of Ser. No. 717,286, Aug. 24, 1976, abandoned. This application Jan. 31, 1978, Ser. No. 873,837

Claims priority, application France, Sep. 9, 1975, 75 27570

Int. Cl.² B01D *3/14;* C10G *7/00*

U.S. Cl. 208—364 **2 Claims**



1. A method of heating crude oil before the introduction thereof into a distillation column at atmospheric pressure, which comprises the steps of:

(a) passing the crude oil through successive heat exchangers disposed in series, each exchanger having a lower exchange chamber and an upper separation chamber

(b) introducing in the exchange chamber of each heat exchanger steam at a pressure which increases from one heat exchanger to the other, said steam pressure reaching approximately 160 bars in the heat exchanger which precedes the crude oil distillation column,

(c) separating the crude oil by heat exchange with said steam in the successive separation chambers into a vapor phase and a liquid phase,

(d) withdrawing the vapor phase from each separation chamber and introducing said successive vapor phases separately and directly into the distillation column at different supply levels, the vapor phase of the first exchanger being introduced at a supply level higher than the supply level of any of the vapor phases separated in the other successive heat exchangers,

(e) withdrawing the liquid phase from the bottom of each separation chamber and introducing said liquid phase in the lower exchange chamber of the following heat exchanger in order to convert said liquid phase into a vapor phase and a higher boiling liquid phase,

(f) introducing into the distillation column, the liquid phase withdrawn from the heat exchanger which precedes the crude oil distillation column at a supply level disposed lower than the supply level of any of the vapor phases separated in the successive heat exchangers.

4,174,274

SEPARATION OF RUTILE FROM ILMENITE

William K. Tolley, and Beckay J. Nelson, both of Arlington Heights, Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jan. 12, 1978, Ser. No. 868,966
Int. Cl.[2] B03D *1/02*
U.S. Cl. 209—166 **6 Claims**

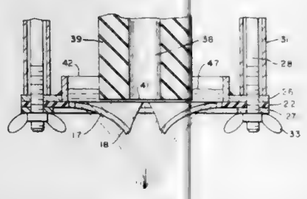
1. A method for effecting the separation of ilmenite from rutile which comprises agitating a mixture of ilmenite and rutile particles in an aqueous hydrogen peroxide solution containing a collection agent selected from the group consisting of a fatty acid and an ether amine, sparging said solution with air, skimming off the resultant froth containing the ilmenite, and recovering the desired rutile.

4,174,275

HYDROCYCLONE APPARATUS AND METHOD FOR UNDERFLOW DENSITY CONTROL

David L. Martin, Woodside, Calif., assignor to Krebs Engineers, Menlo Park, Calif.

Filed Jan. 23, 1978, Ser. No. 871,391
Int. Cl.[2] B04C *5/15*
U.S. Cl. 209—211 **6 Claims**



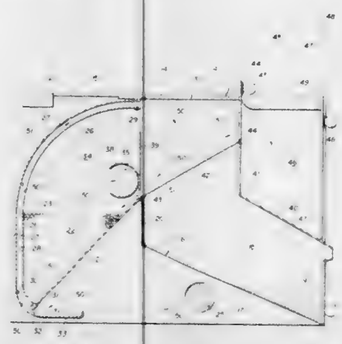
1. A hydrocyclone which when in upright position having a separating chamber that is annular in section with a lower conical shaped portion having an opening at its lower apex end, the chamber having means forming an inlet connected tangentially with the upper portion of the chamber and also having means forming an overflow outlet communicating with a vortex finder disposed axially of the chamber; the improvement comprising a plurality of sectors made of resilient material, mounting means to which the base portions of the sectors are secured, the mounting means serving to so position the sectors whereby when the sectors are relaxed they extend inwardly toward said axis in close proximity with the apex opening of the hydrocyclone, the apex of each sector being substantially aligned with the axis of the chamber and with the side edges of the sectors extending radially from the axis, the side edges of each sector being in juxtaposition with the side edges of the adjacent sectors, said sectors being flexed downwardly by discharging underflow material overlying the same when the hydrocyclone is in operation, said sectors serving to control discharge of underflow material to maintain the density of the underflow material substantially constant, irrespective of changes in the density of the feed material being supplied to the inlet, and shield means forming a wall extending upwardly from an upper face of said mounting means and surrounding the apex end of the hydrocyclone and radially spaced therefrom for retaining underflow material discharging outwardly between the lower end face of the apex opening of the hydrocyclone and the sectors.

4,174,276

HOUSEHOLD GRAIN CLEANER

Leslie Otness, R.R. 2, Box 2, Choteau, Mont. 59422

Filed Jun. 19, 1978, Ser. No. 917,109
Int. Cl.[2] B07B *1/04*
U.S. Cl. 209—250 **2 Claims**



1. A household grain cleaner comprising a pair of spaced, upright side walls, baffle means extending between said side walls and defining therewith a primary vacuum chamber in the upper portion of the grain cleaner near one end thereof and a downwardly tapering grain hopper below the primary vacuum chamber in open communication therewith, one of said side walls having a vacuum port formed therein communicating directly with said primary vacuum chamber and adapted for coupling with a hose of a household vacuum cleaner, said baffle means further defining with said side walls a bottom chamber in said cleaner and below said grain hopper having a vent to ambient atmosphere, a debris storage chamber above said bottom chamber at the end of the cleaner away from said hopper and a clean grain collection chamber above said debris chamber and at the last-named end of said cleaner, separately operable closure panels for said debris and said clean grain collection chambers on the cleaner at the last-named end thereof, and another closure panel at the top of said cleaner between the clean grain collection chamber and said primary vacuum chamber, the primary vacuum chamber extending beyond one side of said hopper at the top of the hopper and toward said clean grain collection chamber and across the mouth of said debris storage chamber, a screen panel extending between said side walls at the mouth of said debris storage chamber and defining the bottom of the portion of said primary vacuum chamber which is extended beyond said hopper, another closure panel at the top of said cleaner and operable to allow the introduction of grain to be cleaned into the primary vacuum chamber and hopper, an upright baffle extending between said side walls in said primary vacuum chamber and at the side of the hopper nearest to said debris collection chamber and screen and defining therewith a restricted passage for grain entering said hopper, said screen panel being inclined to direct grain downwardly toward said restricted passage, the bottom of said hopper having a restricted outlet across the hopper and

between said side walls, and another baffle extending between said side walls and cooperating with said baffle means to define a narrow elongated grain passage at said one end of the cleaner extending from the restricted outlet of the hopper upwardly at said one end to an exit point substantially at the top of the cleaner and at the top of said primary vacuum chamber and substantially above said upright baffle, whereby grain undergoing cleaning can flow in a circuitous path from the restricted outlet of the hopper through said narrow passage, into said primary vacuum chamber and then through the restricted passage near the top of the hopper defined by said upright baffle and screen panel.

4,174,277

RESIN AND METHOD FOR REMOVING ANTIMICROBIALS FROM BODY FLUIDS

Joseph L. Melnick, 8838 Chatsworth Dr., and Craig Wallis, 11002 Hedwig Green, both of Houston, Tex. 77024

Division of Ser. No. 856,851, Dec. 2, 1977, Pat. No. 4,145,304. This application Sep. 25, 1978, Ser. No. 945,538
Int. Cl.[2] B01J *1/04;* **B01D** *15/04;* **G01N** *31/04, 33/16*
U.S. Cl. 210—36 **10 Claims**

1. A method for selectively removing an antibiotic from a bacterially infected body fluid specimen which comprises coating a microporous resin which is capable of adsorbing an antibiotic and is selected from the group consisting of anion exchange resins and non-functional adsorbent resins with a non-ionic detergent by fluidizing the resin with the non-ionic detergent, and thereafter contacting the specimen with the resin.

4,174,278

TREATMENT OF RESIDUAL EARTH DRILLING MUDS

Bernard Tramier, Pau, and Michel Guillerme, Morlaas, both of France, assignors to Societe Nationale Elf Aquitaine (Production), France

Filed Aug. 29, 1977, Ser. No. 828,434
Claims priority, application France, Sep. 3, 1976, 76 26592
Int. Cl.[2] B01D *21/01*
U.S. Cl. 210—51 **4 Claims**

1. Method of dewatering muds from oil well drillings up to a content of more than 20% by weight of dry material, which comprises admixing the mud with a flocculating agent comprising 5 to 30 weight parts of calcium hydroxide per 100 weight parts of dry material present in the mud, wherein said flocculating agent contains an iron salt selected from the group consisting of ferric chloride and ferrous sulfate in a ratio of 0.05 to 0.35 equivalents of iron per equivalent of calcium and said flocculating agent contains 0.2 to 0.4 part weight of partially hydrolyzed polyacrylamide the degree of ionization of which exceeds 25% per 100 parts by weight of the dry material present in the mud, and then mechanically separating the liquid of the mud from the flocculated solids.

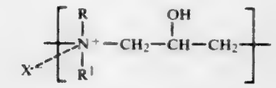
4,174,279

MINERAL FILLERS

Norman O. Clark, and Thomas R. Jones, both of Cornwall, England, assignors to English Clays Lovering Pochin & Co. Ltd., St. Austell, England

Filed Mar. 29, 1978, Ser. No. 891,197
Claims priority, application United Kingdom, Apr. 14, 1977, 15668/77
Int. Cl.[2] B01D *21/01*
U.S. Cl. 210—54 **3 Claims**

1. In a method of dewatering by pressure filtration an aqueous suspension of a kaolin clay having a particle size distribution such that it contains from 1 to 20% by weight of particles having an equivalent spherical diameter smaller than 1 micron, the improvement which comprises treating the aqueous suspension of the clay, prior to dewatering by pressure filtration at a pressure in excess of 150 pounds per square inch, with from 100 to 3000 parts by weight of a water-soluble polyelectrolyte flocculant per million parts by weight of clay, the polyelectrolyte flocculant being a polymer obtainable by copolymerising epichlorohydrin and an aliphatic secondary amine, and essentially consisting of repeating units which can be represented by the formula:



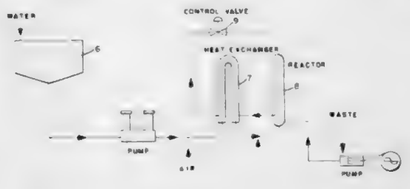
where R and R^1 are each selected from the group consisting of hydrogen, methyl and ethyl, and X is selected from the group consisting of Cl, Br, I, HSO_4, and CH_3SO_4; and said flocculant having a molecular weight (as measured by the Ostwald viscometer method) in the range of from 50,000 to 300,000.

4,174,280

OXIDATION PROCESS

Louis A. Pradt, Wausau, and Wayne B. Gitchel, Rothschild, both of Wis., assignors to Sterling Drug Inc., New York, N.Y.

Continuation of Ser. No. 489,237, Jul. 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 295,230, Oct. 5, 1972, abandoned. This application Oct. 20, 1978, Ser. No. 953,270
Int. Cl.[2] C02C *5/04*
U.S. Cl. 210—60 **4 Claims**



1. A process for oxidizing with an oxygen-containing gas in an aqueous medium in a sealed reactor an oxidizable material which is insoluble, immiscible and difficult to suspend or emulsify in water and selected from the group consisting of motor oils, diesel fuel, explosives and propellants, at a temperature and pressure sufficient to provide a controlled autogenic and self-sustaining oxidation reaction, which comprises passing said aqueous medium through a heat exchanger into said sealed reactor in order to heat the aqueous medium up to the required reaction temperature while supplying the reactor with an oxygen-containing gas, and at the same time injecting said oxidizable material directly into said reactor without heating said oxidizable material, thereby producing an oxidized effluent which is removed from the reactor.

4,174,281

COUNTERCURRENT DECANTATION

Christopher C. Dell, Leeds, England, assignor to National Research Development Corporation, London, England

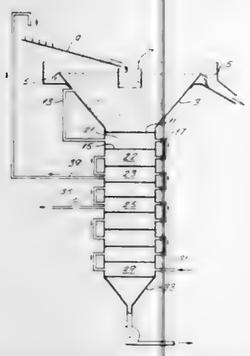
Filed May 1, 1978, Ser. No. 901,616
Claims priority, application United Kingdom, May 3, 1977, 18453/77
Int. Cl.[2] B01D *21/10*
U.S. Cl. 210—83 **14 Claims**

1. Countercurrent decantation apparatus comprising a first cell and a second cell interconnected by a valve responsive to the amount of solid thereon to open, for passing the solid by gravity from the first cell into the second cell, when more than a certain amount of solid is on the valve and to close while there is still enough solid thereon to prevent bulk mixing of liquid in the second cell with liquid from the first cell, the first cell and the second cell also being interconnected by a liquid passage means, said valve comprising a stationary structure and a buoyant barrier member, said buoyant member being of

a form to enable accumulation of solids on the top thereof in cooperation with said stationary structure, so as to provide movement between an upper closed position attained in response to the buoyancy of said barrier member and a lower open position which is attained in response to downward pressure exerted by the weight of solid collected on the buoyant barrier member.

12. A method of countercurrent decantation comprising the steps of:

passing a solid from a first cell containing said solid and a liquid to a valve having a stationary structure and a buoyant barrier member, said buoyant member being of a form to enable accumulation of solids on the top thereof in cooperation with said stationary structure;



permitting said buoyant barrier member to open in response to the amount of solids thereon when more than a certain amount of solid is on said buoyant barrier member;

passing said solid through said open barrier member of said valve and into a second cell containing said liquid;

permitting said buoyant barrier member to close in response to its buoyancy with respect to said liquid while there is a sufficient amount of solid on said buoyant barrier member to prevent mixing of said liquid in said first and second cells; and

passing said liquid from said second cell to said first cell by means independent of said valve.

4,174,282

LIQUID TREATMENT APPARATUS

Donald J. Butterworth, Stirling, N.J., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed Sep. 18, 1978, Ser. No. 943,403
Int. Cl.[2] B01D *29/16*
U.S. Cl. 210—/232 **10 Claims**

1. A liquid filter comprising:

A. a pressurized vessel having an untreated liquid inlet and a treated liquid outlet;

B. a tube sheet spanning a portion of said vessel and defining an untreated liquid chamber communicating with said inlet and a treated liquid chamber communicating with said outlet;

C. a plurality of generally cylindrical pipes connected to said tube sheet and projecting into said untreated liquid chamber, the inside of said pipes communicating with said treated liquid chamber through said tube sheet;

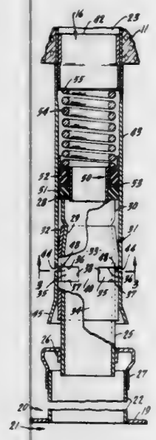
D. a plurality of elongated porous filter elements, each having a closed end and an open end, each of said open ends being axially aligned with one of said pipes and communicating with said treated liquid chamber through its associated pipe;

E. means for releasably connected each filter element to a pipe, comprising:

1. means defining a pair of identical opposed shoulders extending partially around and projecting transversely from said pipe outwardly away from its axis, said shoulders facing toward said tube sheet, and means defining a pair of opposed identical ridges extending axially along said pipe between said shoulders toward said tube sheet, the outside surfaces of said ridges being farther from said axis than said shoulders;

2. an open-ended central support cylinder having one end rigidly attached to the open end of said filter element, the interior of said support cylinder communicating with the interior of said filter element, there being a pair of identical, transversely aligned slits cutting partially through opposite surfaces of said cylinder in a plane perpendicular to the axis of said cylinder, said cylinder telescoping over and being coaxial with said pipe, said cylinder being movable with respect to said pipe, and the terminal end of said pipe facing said open end of said filter element within said cylinder; and

3. a spring clip at least partially surrounding the outside of



said cylinder, opposed portions of said clip being biased towards each other, each of said opposed portions extending into and being retained by one of said aligned slits, said opposed portions normally being separated by a distance less than the distance separating said shoulders on said pipe, and said pipe extending into said cylinder until said slits are located closer to said tube sheet than said shoulders, whereby said opposed portions are biased into a locking position connecting said filter element to said pipe when said opposed portions are in contact with said shoulders, and said opposed portions are spread to a release position for disconnecting said filter element and said pipe when said opposed portions are moved into contact with said ridges; and

F. a spring-biased sliding seal in the central support cylinder of each filter element contacting said terminal edge of said pipe for preventing leakage from said untreated liquid chamber between said filter elements and pipes into said treated liquid chamber.

4,174,283

METHOD OF FRACTURING WITH GELLED ORGANIC LIQUIDS

Thomas J. Griffin, Jr., Sand Springs, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 655,919, Feb. 6, 1976, abandoned. This application Jul. 15, 1977, Ser. No. 816,114
The portion of the term of this patent subsequent to Jun. 21, 1994, has been disclaimed.
Int. Cl.[2] E21B *43/26*; C07F *9/09, 9/11*
U.S. Cl. 252—8.55 R **37 Claims**

1. In the process of fracturing a subterranean formation wherein the viscosity of an organic liquid selected from the group consisting of aliphatic hydrocarbons, aliphatic halogenated hydrocarbons, xylene, and crude oil is first increased an effective amount above its normal viscosity by the addition of a thickening agent and then is introduced into and through a borehole which penetrates said subterranean formation at a sufficient pressure to fracture the formation the improvement which comprises: thickening said organic liquid by mixing therewith an effective quantity of both an aluminum activator compound selected from the group consisting of an alkali metal aluminate, aluminum isopropoxide and hydrated alumina, and an organic phosphate ester composition prepared by the process which comprises the reaction of:

A. a pentavalent phosphorus compound selected from the group consisting of P_2O_5 and a mixture of P_2O_5 with polyphosphoric acid;

B. a hydroxy ether of the formula ROR_1OH wherein R is a C_1 to C_6 alkyl group, R_1 is a C_2 or C_3 alkylene group and the total carbon atoms of R and R_1 range from 3 to about 8; and

C. when the total carbon atoms of R and R_1 is 3 or 4, a long chain substantially unsubstituted monohydric aliphatic alcohol containing at least 5 carbon atoms, but when the total carbon atoms of R and R_1 is 5 to 8, an alcohol selected from the group consisting of a long chain substantially unsubstituted monohydric aliphatic alcohol containing at least 5 carbon atoms, a short chain substantially unsubstituted monohydric aliphatic alcohol containing from 1 to 4 carbon atoms and a mixture of said alcohols,

the individual mole ratios of the hydroxy ether, the long chain alcohol and the short chain alcohol to total P_2O_5 being within the ranges of 0.4:1 to 4.5:1, 0:1 to 4.0:1 and 0:1 to 5.0:1 respectively, said reaction being conducted at temperature ranging from about 70° to about 90° C. for a period of time of from about 1.5 to about 6 hours, and said phosphorus compound, hydroxy ether, and alcohol or alcohols being provided in molar ratios and admixed in a sequence effective to provide a reaction product suitable for use in thickening said organic liquid.

4,174,284

HYDROCARBYLPOLYTHIOBENZOIC ACIDS AS ANTI-OXIDATION ADDITIVES

Albert W. Borel, St. Meinrad, Ind., and Bernard A. Baldwin, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 14, 1978, Ser. No. 933,347
Int. Cl.[2] C10M *1/38*
U.S. Cl. 252—48.6 **12 Claims**

1. An organic composition comprising a major proportion of a hydrocarbon liquid and an oxidation-inhibiting amount of a hydrocarbylpolythiobenzoic acid.

9. A method for rendering a hydrocarbon liquid resistant to oxidation by incorporating into said hydrocarbon liquid an oxidation-inhibiting amount of a hydrocarbylpolythiobenzoic acid.

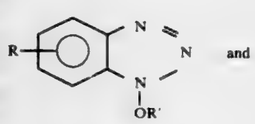
4,174,285

LUBRICANT COMPOSITIONS AND ETHER OR ESTER OF 1-HYDROXYBENZOTRIAZOLE AS ANTIOXIDANT IN THE COMPOSITIONS

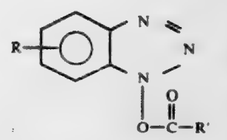
Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 5, 1978, Ser. No. 939,763
Int. Cl.[2] C10M *1/20, 1/32*; C07D *249/18*
U.S. Cl. 252—51.5 A **12 Claims**

1. A lubricant composition which comprises a lubricant, and in an amount effective to impart anti-oxidation properties thereto, an additive selected from the group consisting of ethers and esters of 1-hydroxybenzotriazole having the formula:



and



respectively, where

R is hydrogen or a hydrocarbyl group containing from 1 to about 12 carbon atoms, and

R′ is a hydrocarbyl group containing from 1 to 16 carbon atoms.

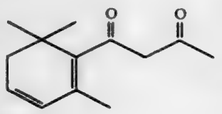
4,174,286

1-(2,6,6-TRIMETHYL-1,3-CYCLOHEXADIEN-1-YL)-1,3-BUTANEDIONE AND ORGANOLEPTIC USES THEREOF

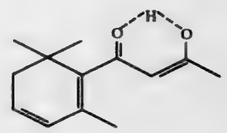
Braja D. Mookherjee, Holmdel; Richard A. Wilson, Westfield; Frederick L. Schmitt, Holmdel; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 887,630, Mar. 17, 1978, Pat. No. 4,157,351.
This application Nov. 17, 1978, Ser. No. 961,687
Int. Cl.[2] C11D *3/50*
U.S. Cl. 252—174.11 **4 Claims**

1. A process for preparing a detergent comprising the step of intimately admixing with a solid or liquid detergent base from 0.005% up to 3% of an equilibrium mixture containing compounds having the structures:



and



4,174,287

2,3-DIMETHYL-5-(2,2,3-TRIMETHYL-3-CYCLOPENTEN-1-yl)-2-PENTANOL, PERFUME COMPOSITIONS, COLOGNES AND PERFUMED ARTICLES CONTAINING SAME AND PROCESS FOR PREPARING SAME

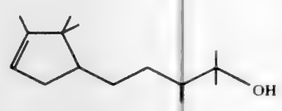
Venkatesh Kamath, Red Bank; Braja D. Mookherjee, and Frederick L. Schmitt, both of Holmdel, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 893,542, Apr. 5, 1978, Pat. No. 4,149,020. This application Dec. 8, 1978, Ser. No. 968,008

Int. Cl.[2] C11D *3/50*

U.S. Cl. 252—174.11 **2 Claims**

1. A process for preparing a solid or liquid detergent comprising the step of intimately admixing with a solid or liquid detergent base from 0.01% up to 0.5% by weight of said solid or liquid detergent of a compound having the structure:



4,174,288

MALTYL-2-METHYL ALKENOATES AND NOVEL PERFUME COMPOSITIONS AND PERFUMED ARTICLES CONTAINING SAME

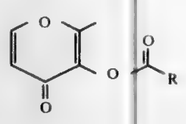
Cynthia J. Mussinan, Bricktown; Braja D. Mookherjee; Frederick L. Schmitt, both of Holmdel, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 884,381, Mar. 8, 1978. This application Sep. 15, 1978, Ser. No. 942,530

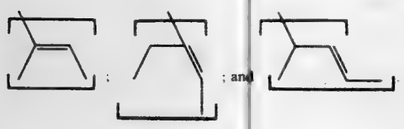
Int. Cl.[2] C11D *3/50*

U.S. Cl. 252—174.11 **6 Claims**

1. A process for preparing a detergent comprising the step of intimately admixing with a solid or liquid detergent base from 0.05% up to 2.0% of a maltyl-2-methyl alkenoate having the structure:



wherein R is a moiety selected from the group consisting of:



4,174,289

LIQUID DETERGENT-BLEACH CONCENTRATES HAVING HIGH ALKALINITY

Malachi E. Sorgenfrei, Grosse Ile, and Donald F. Garvin, Wyandotte, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 819,261, Jul. 27, 1977, abandoned. This application Aug. 28, 1978, Ser. No. 937,691

Int. Cl.[2] C11D *7/54*

U.S. Cl. 252—103 **8 Claims**

1. A cleaning and bleaching liquid composition consisting essentially of an aqueous solution of:

A. about 2% to about 15% by weight, calculated as available chlorine, of an alkali metal hypochlorite,

B. about 15% to about 20% by weight of an alkali metal salt of an alkylated diphenyl oxide sulfonic acid based upon said alkali metal hypochlorite weight,

C. about 5% to about 20% by weight of an alkali metal hydroxide, and

D. about 0.1 mole to about 1.5 mole of an alkali metal chloride per mole of said hypochlorite

wherein said alkali metal is selected from the group consisting of sodium, potassium, and lithium, and wherein said alkylated diphenyl oxide sulfonic acid contains about 8 to about 22 carbon atoms in the alkyl moiety.

4,174,290

METAL OXIDE REMOVER CONTAINING A STRONG MINERAL ACID, CITRIC ACID AND A BASIC AMMONIA DERIVATIVE

Newton G. Leveskis, Auburn, Calif., assignor to Custom Research and Development, Auburn, Calif.

Continuation-in-part of Ser. No. 751,771, Dec. 16, 1976, abandoned. This application Sep. 30, 1977, Ser. No. 838,443

Int. Cl.[2] C11D *7/26, 7/08, 7/32*

U.S. Cl. 252—142 **15 Claims**

1. A composition for removing metal oxides from ferrous metals comprising: an aqueous solution containing a basic ammonia derivative selected from ammonium hydroxide and organic amines, citric acid and a strong mineral acid, all of said components being present in effective concentrations to remove metal oxides from the metal to be cleaned in the absence of acid corrosion and discoloration thereof, the pH of said solution being about 0.5–3.0 and the weight ratio of said ammonia derivative to said citric acid being about 2:7 to 7:2.

4,174,291

CRYSTALLIZATION SEED-CONTAINING COMPOSITION

Lawrence Benjamin; Jay H. Saylor, and Vernon A. Uchtman, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 248,545, Apr. 28, 1972, abandoned. This application Jul. 8, 1974, Ser. No. 486,297

Int. Cl.[2] C11D *7/12*

U.S. Cl. 252—156 **13 Claims**

1. A substantially dry detergent composition consisting essentially of:

(a) from 5% to 50% of a water-soluble organic detergent selected from the group consisting of alkyl ether sulfates of the formula

$$RO(C_2H_4O)_xSO_3M$$

wherein R is alkyl or alkenyl of from about 10 to about 20 carbon atoms, x is 1 to 30, and M is a salt forming cation; the condensation product of an aliphatic alcohol having from 8 to 22 carbon atoms and from 5 to 30 moles of ethylene oxide; and an amine oxide of the formula

$$R^1R^2R^3N{\rightarrow}O$$

wherein R^1 is an alkyl group containing from about 10 to about 28 carbon atoms, from 0 to about 2 hydroxy groups and from 0 to about 5 ether linkages, and R^2 and R^3 are selected from the group consisting of alkyl radicals and hydroxy alkyl radicals containing from about 1 to about 3 carbon atoms;

(b) from 20% to 80% of a material selected from the group consisting of water-soluble salts of carbonates, bicarbonates and sesquicarbonates; and

(c) from 0.1% to 60% of calcium carbonate particles having a maximum particle dimension of less than 20 microns.

4,174,292

SPILL CONTROL COMPOSITION AND USE THEREOF

James W. Seidenberger, Bethlehem, and Francis W. Michelotti, Easton, both of Pa., assignors to J. T. Baker Chemical Company, Phillipsburg, N.J.

Filed Mar. 20, 1978, Ser. No. 888,230

Int. Cl.[2] C09K *3/32;* **B01J** *1/22*

U.S. Cl. 252—189 **6 Claims**

1. A composition useful for the control and cleanup of mineral acid spills comprising: about 55 to 99% by weight of a non-volatile organic amine component selected from the group consisting of a water soluble polyethylineimine polymer or an alkanolamine; from about 0 to 45% by weight water, from about 0.01 to 2% by weight pH indicator changing color in the range pH 4.0 to 10.0, from about 0 to 10% by weight dissolved gas, from about 0.2 to 3% by weight of a surfactant which is foam-forming under acidic or neutral conditions and from about 0 to 1% by weight of a color tinting agent.

4,174,293

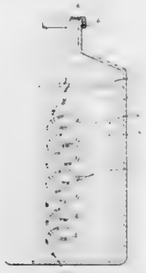
PROCESS FOR DISPOSAL OF AQUEOUS SOLUTIONS CONTAINING RADIOACTIVE ISOTOPES

Peter Colombo, Patchogue; Robert M. Neilson, Jr., Setauket, and Walter W. Becker, Shoreham, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 12, 1977, Ser. No. 841,410

Int. Cl.[2] G21F *9/20*

U.S. Cl. 252—301.1 W **7 Claims**



1. A process for the disposal of aqueous solutions containing radioactive waste material comprising:

(a) densifying dry particulate portland cement in a sealable leak-proof container to a bulk density ranging from about 1.3 to about 1.8 grams per cubic centimeter, said cement having a particle size ranging from about 120 mesh to about 400 mesh;

(b) dispersing without mechanical agitation from about 15 weight percent to about 30 weight percent of the aqueous solution based upon the weight of the densified cement in-situ within the densified cement;

(c) sealing said densified cement containing said aqueous solution off from the atmosphere until the said aqueous solution is hydrated with said cement;

(d) impregnating the hydrated cement with a mixture of monomer and a polymerization catalyst and polymerizing the monomer in-situ within the pregnant hydrated cement;

(e) storing said pregnant hydrated cement in a suitable storage area;

(f) maintaining the temperature of the materials utilized in the process at a temperature below 99° C. throughout steps a thru e of the process.

4,174,294

FLUORESCENT MATERIAL

Katsuo Murakami; Mitsuoki Otani; Hiroshi Ito, all of Kamakura; Kenzo Awazu, Amagasaki; Sumiaki Ibuki, Kamakura, and Toshiyuki Takeda, Tokyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1978, Ser. No. 954,474

Claims priority, application Japan, Dec. 20, 1977, 52-153473

Int. Cl.[2] C09K *11/46*

U.S. Cl. 252—301.4 P **3 Claims**

1. An alkaline earth metal boron phosphate fluorescent material activated by divalent europium having the formula $m(Sr_{1-x-y-p}Ba_xCa_yEu_pO)\cdot(1-n)P_2O_5\cdot nB_2O_3$ wherein parameters x,y,p,m, and n are respectively in the ranges:

$0 \leqq x \leqq 0.5$
$0 \leqq y \leqq 0.2$
$0.001 \leqq p \leqq 0.15$
$1.75 \leqq m \leqq 2.30$ and
$0.05 \leqq n \leqq 0.23$

4,174,295

AEROSOL PROPELLANT COMPOSITIONS

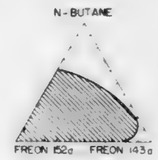
Gianangelo Bargigia; Gerardo Caporiccio, and Giuliano Carniselli, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Aug. 9, 1977, Ser. No. 823,152

Claims priority, application Italy, Aug. 13, 1976, 26269 A/76; Jun. 1, 1977, 24249 A/77; Jun. 10, 1977, 24579 A/77

Int. Cl.[2] C09K *3/30;* **A61L** *9/04;* **A61K** *7/06, 9/12*

U.S. Cl. 252—305 **5 Claims**



1. A propellant composition for use with aerosols, the composition consisting essentially of a mixture of:

(A) from 5 to 60% by weight, based on the total weight of the propellant composition, of a hydrogen-containing fluorocarbon selected from the group consisting of CH_2F_2 and $CF_3—CH_3$, and

(B) from 40 to 95% by weight, based on the total weight of the propellant composition, of a hydrogen-containing chlorofluorocarbon or a hydrogen-containing fluorocarbon, each being selected from the group consisting of $CF_3—CHClF$, $CF_3—CH_2Cl$, $CF_3—CH_2F$, $CClF_2—CH_3$ and $CHF_2—CH_3$.

4. A propellant composition for use with aerosols, the composition consisting essentially of, in admixture:

(A) from 5 to 60% by weight, based on the total weight of the propellant composition, of the hydrogen-containing fluorocarbon CH_2F_2;

(B) from 5 to 95% by weight, based on the total weight of the propellant composition, of a hydrogen-containing chlorofluorocarbon or a hydrogen-containing fluorocarbon, each being selected from the group consisting of $CF_3—CHClF$, $CF_3—CH_2Cl$, $CF_3—CH_2F$, $CClF_2—CH_3$ and $CHF_2—CH_3$; and

(C) up to 50% of a hydrocarbon selected from the group consisting of n-butane and iso-butane.

4,174,296

WATER SOLUBLE LECITHIN COMPOSITION

Gus S. Kass, Skokie, Ill., assignor to American Lecithin Company, Atlanta, Ga.

Filed Dec. 4, 1978, Ser. No. 965,998
Int. Cl.[2] B01J *13/00*; C11D *9/30*; A23J *7/00*
U.S. Cl. 252—312 20 Claims

1. Method of increasing the solubility of lecithin, said method comprising the step of adding to an aqueous dispersion of lecithin an amount of solubilizing agent sufficient to solubilize the lecithin, said solubilizing agent selected from the group consisting of tertiary amine oxides, alkyl alcohol sulfate salts, alkylamidopropyl betaines, sodium alkene sulfonates, alkyl sulfo acetates and disodium salt of monoalkyl amide of sulfosuccinate.

4,174,297

POLYHYDRIC PHENOL COESTER STABILIZERS

William E. Leistner, Atlantic Beach, N.Y.; Motonobu Minagawa, Kosigaya, Japan; Yutaka Nakahara, Iwatsuki, Japan, and Tohru Haruna, Okegawa, Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Nov. 9, 1976, Ser. No. 740,110
Claims priority, application Japan, Nov. 10, 1975, 50-134971
Int. Cl.[2] C08G *63/62*; C08J *3/20*; C08L *69/00*
U.S. Cl. 252—399 13 Claims

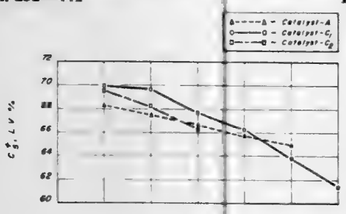
1. A coester stabilizer having a molecular weight measured by a vapor pressure method between 700 and about 10,000, of at least one polyhydric phenol having 2 to 3 phenolic hydroxyl groups and 1 to 3 benzenoid rings, with carbonic acid and an aliphatic dicarboxylic acid having 4 to 10 carbon atoms and not more than one thioether sulfur atom, in which the molar proportions of carbonic acid to aliphatic dicarboxylic acid range from 19:1 to 1:19.

4,174,298

ACTIVATED MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 867,859, Jan. 9, 1978. This application Sep. 21, 1978, Ser. No. 944,504
Int. Cl.[2] B01J *27/10, 27/08, 23/42, 23/46*
U.S. Cl. 252—441 17 Claims



1. A catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhodium carbonyl component with a porous carrier material containing a uniform dispersion of a catalytically effective amount of a platinum group component maintained in the elemental metallic state.

4,174,299

CATALYSTS FOR THE POLYMERIZATION OF OLEFINS

Umberto Giannini, Milan; Enrico Albizzati, Arona; Sandro Parodi, Oleggio, and Franco Pirinoli, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 707,018, Jul. 20, 1976, abandoned. This application Jun. 27, 1978, Ser. No. 919,495
Claims priority, application Italy, Jul. 21, 1975, 25588 A/75
Int. Cl.[2] C08F *4/64, 4/68*
U.S. Cl. 252—429 B 14 Claims

1. Components for catalysts useful in the polymerization of olefins, said components having the general formula

MM'TY.nE

in which
M=Mg, Mn or Ca;
M'=Ti, V or Zr;
T=oxygen, the anion CO_3'', or a pair of monovalent groups selected from the group consisting of

$$\begin{pmatrix}-OH\\-OH,\end{pmatrix}\begin{pmatrix}-OH\\-Cl,\end{pmatrix}\begin{pmatrix}-OR\\-OR,\end{pmatrix}\begin{pmatrix}-OR\\-Cl\end{pmatrix}$$

in which groups R is an alkyl, cycloalkyl, aryl or alkylaryl radical containing from 1 to 20 carbon atoms;
Y=halogen or halogen and alkoxy groups, said halogen or halogen and alkoxy groups being present in a number to satisfy the valence of the metal M';
n=a number from 0.5 to 20, inclusive; and
E=a hydrocarbyl electron donor compound selected from the group consisting of
(a) esters of organic carboxylic acids;
(b) ethers;
(c) amines;
(d) esters of carbonic acid;
(e) nitriles;
(f) esters of phosphoric or phosphorous acid; and
(g) phosphorus oxychloride.

4,174,300

PREPARATION OF HIGHLY ACTIVE COPPER-SILICA CATALYSTS

Sambasivarao Koritala, Peoria, Ill., assignor to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 30, 1978, Ser. No. 873,572
Int. Cl.[2] B01J *29/00*
U.S. Cl. 252—454 6 Claims

1. In a method for preparing highly active and selective linolenate-reducing, copper-silica catalysts including the steps of:
a. reacting sodium silicate from an aqueous solution with a water-soluble copper salt to form a precipitate;
b. recovering said precipitate from said aqueous solution;
c. drying said recovered precipitate from step (b); and
d. heat treating said dried precipitate from step (c) at a temperature in the range of 350°-625° C. to yield said catalyst,
the improvement comprising conducting said drying in step (c) under a vacuum at room temperature or less.

4,174,301

POLYCARBOXYLIC ACIDS AS EXTRUSION AIDS FOR SILICA-ALUMINAS

Monica E. Choca, Chicago, and Gerald R. Feistel, Hinsdale, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation of Ser. No. 829,541, Aug. 31, 1977, abandoned. This application Sep. 22, 1978, Ser. No. 944,838
Int. Cl.[2] B01J *29/06*
U.S. Cl. 252—455 R 7 Claims

1. A process for preparing silica-alumina extrudates having a relatively high crush strength, relatively high shrinkage on calcination and relatively reduced pore volume in pores above 600 A diameter consisting essentially of:
A. Preparing a purified silica-alumina powder comprising on a dry basis 10–60% SiO_2 and 40–90% Al_2O_3;
B. Mixing said purified silica-alumina powder with water and from 0.1–15% by weight of a water-soluble polycarboxylic acid containing from 2–10 carbon atoms based on the dry weight of the powder;
C. Adjusting the moisture content of said silica-alumina powder to an extrudable level so as to allow extrusion; and then,
D. Extruding said silica-alumina powder to prepare a silica-alumina extrudate whereby the extrusion rate is improved over silica-alumina powders not so treated.

3. The process of claim 1 wherein the silica-alumina extrudate is dried and calcined to prepare a catalyst support.

4,174,302

CATALYST FOR PRODUCTION OF CYCLOALKYLAROMATICS

Timothy P. Martha, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 608,597, Aug. 28, 1975, Pat. No. 4,115,463. This application Aug. 14, 1978, Ser. No. 933,343
Int. Cl.[2] B01J *29/06, 29/12*
U.S. Cl. 252—455 R 6 Claims

1. A catalyst for the conversion of monocyclic aromatic and alkyl-substituted monocyclic aromatic hydrocarbons consisting essentially of from about 0.01 to 0.3 weight percent ruthenium, from about 0.03 to 1 weight percent nickel and a support material selected from the group consisting of active clay and synthetic silica-alumina in a weight ratio of ruthenium to nickel in the approximate range of 0.01 to 0.3:1.

2. The catalyst of claim 1 wherein said nickel is present in said catalyst as nickel bromide.

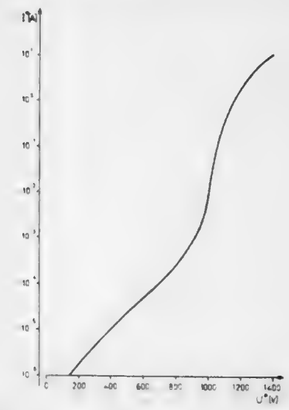
4,174,303

CERAMIC ELECTRICAL MATERIAL WITH HIGH NONLINEAR RESISTANCE

Severino Gaiffi, and Hans-Peter Klein, both of Nussbaumen, Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Jun. 30, 1977, Ser. No. 811,867
Claims priority, application Switzerland, Jul. 1, 1976, 8425/76
The portion of the term of this patent subsequent to Nov. 28, 1995, has been disclaimed.
Int. Cl.[2] H01B *1/08*
U.S. Cl. 252—518 14 Claims

1. A method of producing a ceramic electrical material having a high non-linear resistance, which consists essentially of 50–99.9 mol % of zinc oxide, 0.5 to 3 mol % of at least one oxide of silicon; wherein said ceramic material contains essentially no bismuth oxide; which comprises the steps of: mixing the starting materials in powder form and with grain size of from 0.1 to 1μ; drying; sifting; calcining at about 450° C. for



from 1 to 3 hours; pressing; and subjecting the resulting briquette to a heat treatment.

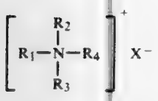
4,174,304

SURFACTANT SYSTEM

John J. Flanagan, Chicago, Ill., assignor to Bullen Chemical Company Midwest, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 832,364, Sep. 12, 1977, abandoned, and a continuation-in-part of Ser. No. 601,054, Aug. 1, 1975, Pat. No. 4,065,409. This application Dec. 20, 1977, Ser. No. 862,595
The portion of the term of this patent subsequent to Dec. 27, 1994, has been disclaimed.
Int. Cl.[2] C11D *1/62, 1/75, 1/825, 1/835*
U.S. Cl. 252—524 9 Claims

4. A high foam degreasing cleaner constituting a mixture including about 0.45 parts by weight of a surfactant system comprising
a. about 25–75% by weight of a non-ionic detergent which is a condensation product of about 4–16 moles of ethylene oxide with one mole of a compound selected from the group consisting of
(1) an alkyl phenol having about 7–10 carbon atoms in the alkyl group;
(2) an alkyl amine having about 12–16 carbon atoms in the alkyl group;
(3) an aliphatic alcohol having about 12–16 carbon atoms; and
(4) a hydrophobic base formed by condensing propylene oxide with propylene glycol;
b. about 5–65% by weight of an amine oxide selected from the group consisting of
(1) alkyl di(lower alkyl) amine oxides in which the alkyl group has about 10–20 carbon atoms and the lower alkyl groups have about 1–7 carbon atoms;
(2) alkyl di(hydroxy lower alkyl) amine oxides in which the alkyl group has about 10–20 carbon atoms and the lower alkyl groups have about 1–7 carbon atoms;
(3) alkylamidopropyl di(lower alkyl) amine oxides in which the alkyl group has about 10–20 carbon atoms and the lower alkyl groups have about 1–7 carbon atoms; and
(4) alkyl morpholine oxides in which the alkyl group has about 10–20 carbon atoms;
said amine oxides being present in a total concentration of about 38.3% to about 43.3% by weight of said system;
c. about 8–50% by weight of a quaternary ammonium halide having the formula



wherein X is a halide and the quaternary ammonium radical is selected from the group consisting of

(1) radicals wherein R_1 and R_2 are lower alkyl, R_3 is a phenyl group or phenyl group substituted with an alkyl group having about 1–18 carbon atoms or an alkyl group having about 8–20 carbon atoms, and R_4 is a phenyl group or a phenyl group substituted with an alkyl group having about 1–18 carbon atoms or an alkyl group having about 8–20, and preferably 12–18 carbon atoms;

(2) radicals wherein R_1, R_2 and R_3 are lower alkyl, and R_4 is an alkyl or phenyl-substituted alkyl group having about 8–20 carbon atoms;

(3) radicals wherein R_1 is an alkyl or phenyl-substituted alkyl group having about 10–20 carbon atoms, R_2 is lower alkyl, R_3 is $[-CH_2CH_2O-]_xH$, and R_4 is $[-CH_2CH_2O-]_yH$, wherein the sum of x and y is between about 2 and 50;

d. about 0.2 parts by weight of sodium metasilicate;

e. about 0.2 parts by weight of sodium hydroxide;

f. about 0.07 parts by weight of tetrasodium ethylene diamine tetraacetate; and

g. the remainder water.

8. A surfactant system comprising:

a. about 25–75% by weight of a non-ionic detergent comprising about 25% by weight of a condensation product of 4–5 moles of ethylene oxide with 1 mole of nonyl phenol, and about 75% by weight of a condensation product of 8–12 moles of ethylene oxide with 1 mole of nonyl phenol;

b. about 5–65% by weight of an amine oxide selected from the group consisting of

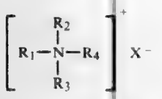
(1) alkyl di(lower alkyl) amine oxides in which the alkyl group has about 10–20 carbon atoms and the lower alkyl groups have about 1–7 carbon atoms;

(2) alkyl di(hydroxy lower alkly) amine oxides in which the alkyl group has about 10–20 carbon atoms and the lower alkyl groups have about 1–7 carbon atoms;

(3) alkylamidopropyl di(lower alkyl) amine oxides in which the alkyl group has about 10–20 carbon atoms and the lower alkyl groups have about 1–7 carbon atoms; and

(4) alkyl morpholine oxides in which the alkyl group has about 10–20 carbon atoms;

c. about 8–50% by weight of a quaternary ammonium halide having the formula



wherein X is a halide and the quaternary ammonium radical is selected from the group consisting of

(1) radicals wherein R_1 and R_2 are lower alkyl, R_3 is a phenyl group or phenyl group substituted with an alkyl group having about 1–18 carbon atoms or an alkyl group having about 8–20 carbon atoms, and R_4 is a phenyl group or a phenyl group substituted with an alkyl group having about 1–18 carbon atoms or an alkyl group having about 8–20, and preferably 12–18 carbon atoms;

(2) radicals wherein R_1, R_2 and R_3 are lower alkyl, and R_4 is an alkyl or phenyl-substituted alkyl group having about 8–20 carbon atoms;

(3) radicals wherein R_1 is an alkyl or phenyl-substituted alkyl group having about 10–20 carbon atoms, R_2 is lower alkyl, R_3 is $[-CH_2CH_2O-]_xH$, and R_4 is $[-CH_2CH_2O-]_yH$, wherein the sum of x and y is between about 2 and 50; and

d. the remainder water.

4,174,305

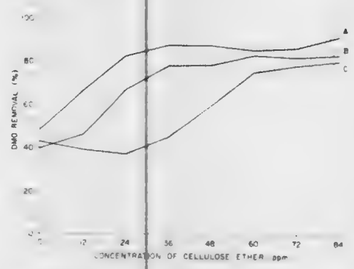
ALKYL BENZENE SULFONATE DETERGENT COMPOSITIONS CONTAINING CELLULOSE ETHER SOIL RELEASE AGENTS

Michael E. Burns, Fairfield, and Charles H. Nicol, Hamilton, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 560,766, Apr. 2, 1975, abandoned. This application Jun. 7, 1977, Ser. No. 804,479

Int. Cl.[2] C11D *1/22, 3/22*

U.S. Cl. 252—545 **27 Claims**



1. A detergent composition, comprising:

(a) from about 5% to about 50% by weight of a surfactant component consisting essentially of a water-soluble alkyl benzene sulfonate wherein the alkyl substituent has a chain length in the range of C_{10}–C_{12}, or mixtures thereof, said surfactant component being substantially free of C_{13} and higher alkyl benzene sulfonates;

(b) from about 0.1% to about 3% by weight of a water-soluble soil release ether component selected from the group consisting of alkyl cellulose ethers, hydroxyalkyl cellulose ethers and hydroxyalkyl alkyl cellulose ethers;

(c) from about 0% to about 70% by weight of a detergency builder component; and

(d) the balance of the composition comprising detergency adjunct materials and carriers selected from a group consisting of water, water/ethanol mixtures, perfumes, optical bleaches, fillers, anti-caking agents, fabric softeners, perborate bleaches, and enzymes and mixtures thereof.

4,174,306

DETERGENT COMPOSITIONS CONTAINING SELF-SEQUESTERING SURFACTANTS

Salvatore Gafa, and Fulvio Burzio, both of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

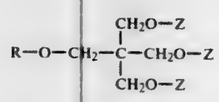
Filed Feb. 27, 1978, Ser. No. 881,390

Claims priority, application Italy, Feb. 28, 1977, 20747 A/77

Int. Cl.[2] C11D *1/04*

U.S. Cl. 252—546 **9 Claims**

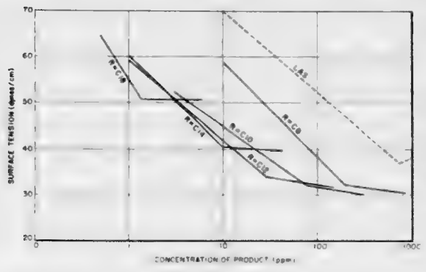
1. Self-sequestering surfactants having the following general formula (I):



in which

R is alkyl, arylalkyl or alkylaryl containing from 6 to 18 carbon atoms; and

at least two Z groups are a $CH_2—COO^-Me^+$ carboxymethylene group in which me^+ is an ion selected from the group consisting of sodium, potassium and ammo-



nium ions or a quarternary onium cation, or combinations of the same and any Z group which is not a $CH_2—COO^-Me^+$ carboxymethylene group as defined is a hydrogen atom.

4,174,307

ROOM-TEMPERATURE-RADIATION-CURABLE POLYURETHANE

William Rowe, Westfield, N.J., assignor to Polychrome Corporation, Yonkers, N.Y.

Continuation of Ser. No. 617,614, Sep. 29, 1975, abandoned, which is a continuation of Ser. No. 315,212, Dec. 14, 1972, abandoned. This application Jul. 31, 1978, Ser. No. 929,155

Int. Cl.[2] C08G *18/67;* **C08L** *75/04, 91/00*

U.S. Cl. 204—159.19 **10 Claims**

1. An ultraviolet radiation room temperature curable monomeric substantially water-insoluble composition which comprises the admixture of,

I. the reaction product of,

A. one equivalent of an isocyanate containing intermediate which is the reaction product of

(i) about one equivalent of an organic, monomeric compound which contains more than one active hydrogen with

(ii) two equivalents of an organic polyisocyanate and,

B. one equivalent of a monomeric olefinically unsaturated compound containing exactly one active hydrogen and,

II. a photoinitiator

said composition being a monomeric, solvent free liquid containing zero percent free isocyanate groups.

4,174,308

FORMING INSULATION FROM SCRAP RUBBER

Rocco J. DiSanto, 103 Read St., Portland, Me. 04103

Filed Apr. 4, 1978, Ser. No. 893,477

Int. Cl.[2] C08J *9/08, 9/14*

U.S. Cl. 260—2.3 **8 Claims**

1. A method of forming foamed thermal insulating material comprising mixing used scrap rubber in particulate form with a heat expansible conventional flour binder material and a mixture which is a levening agent such as yeast or baking powder with a liquid such as water and baking the mixture thereby created to form a foamed product.

4,174,309

POLYISOCYANATE CROSS-LINKED ALKYLENE OXIDE-LINEAR NON-IONIC POLYSACCHARIDE REACTION PRODUCT

Stamoulis Stournas, Flemington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

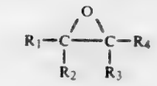
Division of Ser. No. 708,727, Jul. 26, 1976, Pat. No. 4,096,074. This application Mar. 20, 1978, Ser. No. 888,485

Int. Cl.[2] C08L *1/28*

U.S. Cl. 260—13 **7 Claims**

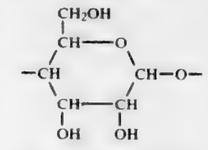
1. A composition comprising the water-soluble reaction product of an organic polyisocyanate having at least two reactive isocyanato groups and the addition product of an alkylene oxide and a linear, non-ionic polysaccharide, said addition product having a molecular weight of at least about 100,000,

said alkylene oxide having the formula



wherein R_1, R_2, R_3 and R_4 are the same or different and are selected from the class consisting of hydrogen and lower alkyl groups containing from one to five carbon atoms,

said linear, non-ionic polysaccharide formed of repeating structural units having the formula



said addition product being cross-linked by said polyisocyanate such that there is a minimum of an average of one cross link for every 2,000 of said repeating structural units up to a maximum of an average of one cross link for every 20 of said repeating structural units.

4,174,310

PROCESS FOR PRODUCING AQUEOUS UREA-FORMALDEHYDE

Donald A. Hubbard, Cambridge, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jun. 20, 1977, Ser. No. 808,429

Claims priority, application United Kingdom, Jun. 23, 1976, 26125/76

Int. Cl.[2] C08G *12/12, 12/32*

U.S. Cl. 260—29.4 R **9 Claims**

1. A process for producing aqueous urea- and/or melamine-formaldehyde resin solutions which comprises the steps of:

(a) forming a first reaction mixture containing substantial amounts of methylol urea and/or methylol melamine products by condensing, under neutral or alkaline conditions, reactants comprising urea and/or melamine and formalin in the form of an aqueous formalin solution (35% to 45% w/w) in a molecular ratio within the range urea and/or melamine:formaldehyde=1:3 to urea and/or melamine:formaldehyde=1:1.5;

(b) vacuum evaporating the reaction mixture to form a concentrated mixture having a solids content of 55% to 80% by weight, and

(c) with no further addition of formaldehyde to the concentrated mixture further condensing the concentrated mixture under acid conditions to produce a resinous material.

4,174,311

HARDENABLE COMPOSITION CONTAINING DIISOPROPYLBENZENE DIHYDROPEROXIDE

Tatsuo Nakano; Shozo Hori, and Ikuji Kishi, all of Machida, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1977, Ser. No. 863,049
Claims priority, application Japan, Feb. 22, 1977, 52-18478
Int. Cl.[2] C08F *4/34, 18/00, 20/00;* C08L *91/00*
U.S. Cl. 260—28.5 R 9 Claims

1. A hardenable composition which consists essentially of (1) an acrylate and/or a methacrylate monomer, wherein the monomer contains more than 50 wt. % of acrylate and/or methacrylate, (2) more than 0.5 wt. part of a hardener consisting essentially of diisopropylbenzene dihydroperoxide and (3) more than 0.01 wt. part of a hardening accelerator to 100 wt. parts of total monomers.

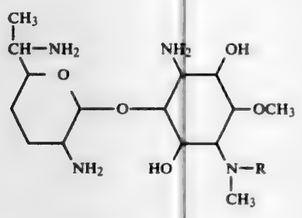
4,174,312

4-N-ACYLFORTIMICIN B DERIVATIVES AND THE CHEMICAL CONVERSION OF FORTIMICIN B TO FORTIMICIN A

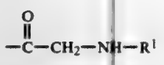
John S. Tadanier; Jerry R. Martin, and Paul Kurath, all of Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 888,085, Mar. 20, 1978, which is a division of Ser. No. 725,829, Sep. 23, 1976, Pat. No. 4,091,032. This application Nov. 1, 1978, Ser. No. 956,752
Int. Cl.[2] C07C *103/52;* C07D *309/22;* A61K *37/00*
U.S. Cl. 260—112.5 R 1 Claim

1. A method of preparing a 4-N-acylfortimicin B derivative of the structure



wherein R is



where R^1 is an acyl radical derived from an amino acid or a short peptide, and the pharmaceutically acceptable salts thereof, which method comprises the steps of:

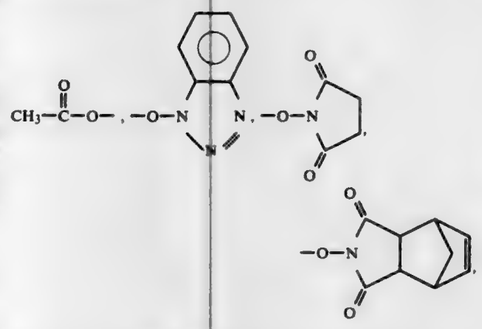
(a) acylating 1,2',6'-tri-N-benzyloxycarbonylfortimicin B with the N-hydroxy-5-norbornene-2,3-dicarboximide active ester of N-tert-butyloxycarbonylglycine in an inert solvent at 0° C. for 1–2 hours and then for 12–48 hours at ambient temperature to provide 4-N-(N-tert-butyloxycarbonylglycyl)-1,2',6'-tri-N-benzyloxycarbonylfortimicin B;

(b) treating said 4-N-(N-tert-butyloxycarbonylglycyl)-1,2',6'-tri-N-benzyloxycarbonylfortimicin B with trifluoroacetic acid in a methylene chloride solution for 10–30 minutes at room temperature to provide 4-N-glycyl-1,2',6'-tri-N-benzyloxycarbonylfortimicin B trifluoroacetate;

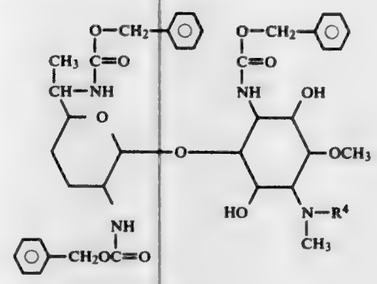
(c) treating said 4-N-glycyl-1,2',6'-tri-N-benzyloxycarbonylfortimicin B trifluoroacetate with triethylamine and acylating the glycylamino terminus thereof with a reagent of the formula

$R^4—Y$

wherein R^4 is an acyl, N,N-dilowеralkylacyl or an acyl group derived from an N-benzyloxycarbonyl protected amino acid or a short peptide, and Y is an activating group selected from the class consisting of



and $—N_3$ is N,N-dimethylformamide or a mixture of tetrahydrofuran and dioxane at a temperature between −10° and 25° C. for 15–48 hours to provide 4-N-acyl-1,2',6'-tri-N-benxyloxycarbonylfortimicin B of the formula



wherein R^4 is as defined above;
and

(d) hydrogenolyzing said benzyloxycarbonyl groups of said 4-N-acyl-1,2',6'-tri-N-benzyloxycarbonylfortimicin B in 0.1 to 0.6 N methanolic hydrochloric acid in the presence of a 2 to 10% palladium on carbon catalyst under 1 to 10 atmospheres of hydrogen gas at a temperature between 10° and 25° C. to form the desired 4-N-acylfortimicin B derivative.

4,174,313

PURIFIED SUNFLOWER SEED PROTEIN ISOLATES

Léon Petit, Sceaux; André Davin, La Chapelle S/Erdre, and Jacques Gueguen, Cachan, all of France, assignors to Institut National de la Recherche Agronomique, Paris, France

Division of Ser. No. 625,036, Oct. 23, 1975. This application Apr. 6, 1978, Ser. No. 894,092
Claims priority, application France, Oct. 23, 1974, 74 35594
The portion of the term of this patent subsequent to Dec. 26, 1995, has been disclaimed.
Int. Cl.[2] A23J *1/14*
U.S. Cl. 260—123.5 2 Claims

1. Purified sunflower seed protein isolates obtained from sunflower seed cake containing substances having a mucilaginous consistency by:

(a) making a suspension of such cake with a solution of a calcium salt and a magnesium salt of volume in l. of 10 to 15 times the weight in Kg of press cake which solution further contains sodium sulfite;

(b) adding thereto a concentrated solution of alkali in an amount sufficient to solubilize the proteins in said press cake;

(c) separating the protein extract from the insoluble residue;

(d) acidifying the protein extract obtained with an acid solution at a pH between 4.5 and 5.5 to precipitate the proteins,

(e) separating the protein precipitate from the mother liquor,

(f) washing the protein precipitate and recovering protein isolate,

said protein isolates being weakly pigmented, substantially free from mucilaginous substances and having a nitrogen content of at least 16.0%, and being readily extrudable through extrusion dies without blocking the dies due to the substantial absence of said mucilaginous substances.

4,174,314

DENSITY FRACTIONATION PROCESS TO RECOVER VEGETABLE SEED PROTEINS

Charles M. Garrison, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 7, 1978, Ser. No. 922,922
Int. Cl.[2] A23J *1/14*
U.S. Cl. 260—123.5 13 Claims

1. A process for recovering vegetable seed protein granules from comminuted vegetable seed material containing protein granules, comprising:

(1) suspending said comminuted vegetable seed material in a solution comprising an aliphatic polyol, a carbohydrate, and water, said solution having a density of from about 1.0 to about 1.4 g/ml and a water activity of less than about 0.90; and

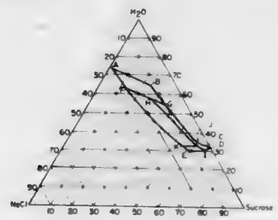
(2) isolating the vegetable seed protein granules from the balance of the seed materials.

4,174,315

ISOLATION OF PROTEIN FROM VEGETABLE SEED MATERIAL

Charles M. Garrison, Fairfield; Rudolph W. Youngquist, and Harry M. Taylor, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 7, 1978, Ser. No. 922,918
Int. Cl.[2] A23J *1/14*
U.S. Cl. 260—123.5 17 Claims



1. A process for recovering vegetable seed protein granules from vegetable seed material, comprising suspending comminuted vegetable seed material having from 0% to about 5% lipid and containing protein granules in an aqueous solution comprising an electrolyte selected from the group consisting of alkali metal halides and alkali metal phosphates and a carbohydrate at a concentration greater than about 1%, said solution having a density of from about 1.2 to about 1.5 g/ml and a water activity of less than about 0.85, and isolating the vegetable seed protein granules from the balance of the vegetable seed material.

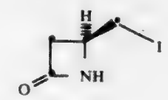
4,174,316

4-IODOMETHYLAZETIDIN-2-ONE

Burton G. Christensen, Metuchen; Ronald W. Ratcliffe, Matawan, and Thomas N. Salzmann, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 14, 1978, Ser. No. 933,323
Int. Cl.[2] C07D *205/08*
U.S. Cl. 260—239 A 1 Claim

1. A compound having the structure:



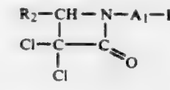
4,174,317

3,3-DICHLORO-2-AZETIDINONE DERIVATIVES

John Krapcho, Somerset, and Chester F. Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 24, 1978, Ser. No. 892,361
Int. Cl.[2] C07D *205/08, 401/06, 403/06, 405/06*
U.S. Cl. 260—239 A 19 Claims

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein R_1 is dialkylamino, 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl, 1-piperazinyl, or 4-alkyl-1-piperazinyl; R_2 is phenyl, phenyl monosubstituted with an alkyl, trifluoromethyl or nitro group, phenyl mono-, di- or trisubstituted with halogen or alkoxy groups, 1-naphthyl, 2-naphthyl, or 1,3-benzodioxol-5-yl; A_1 is an alkylene group having 2 to 4 carbon atoms; and wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 6 carbon atoms.

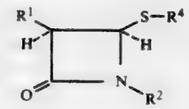
4,174,318

ALKYLATIVE CLEAVAGE OF AZETIDINONE DISULFIDES

Derek H. R. Barton; Peter G. Sammes, both of London; Graham Hewitt, Northolt; Brian E. Looker, Greenford, and William G. E. Underwood, Stoke Poges, all of England, assignors to Glaxo Laboratories Ltd., Great Britain

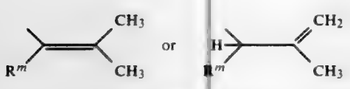
Continuation of Ser. No. 389,663, Aug. 30, 1973, abandoned, which is a division of Ser. No. 167,875, Jul. 30, 1971, abandoned. This application Sep. 22, 1976, Ser. No. 726,425
Claims priority, application United Kingdom, Nov. 3, 1970, 52286/70
Int. Cl.[2] C07D *205/08, 499/00*
U.S. Cl. 260—239 A 9 Claims

1. A process for the preparation of compounds of formula IV:

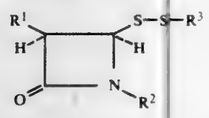


(IV)

wherein R^1 is a phenylacetamido or phenoxyacetamido group; R^2 is a hydrogen atom or a group of formula:

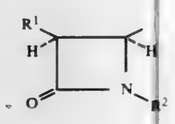


wherein R^m is hydrogen, esterified hydroxyl, etherified hydroxyl, carboxyl or esterified carboxyl; and R^4 is an alkyl group containing 1 to 6 carbon atoms which comprises the step of reacting a compound of formula II:



II

wherein R^1 and R^2 have the above meanings and R^3 is an alkyl group containing 1 to 6 carbon atoms or a group of the formula III wherein R^1 and R^2 are as defined:



III

with a trivalent phosphorus compound of formula $PR^5R^6R^7$ wherein R^5, R^6 and R^7 which may be the same or different are selected from the group consisting of C_{1-6} alkyl and di-C_{1-6} alkylamino groups, in the presence of a reagent R^4X wherein R^4 has the above meaning and X is a halogen atom.

4,174,319

12-ALKYL-1,4,7,10-TETRAAZACYCLOTRIDECANE

Yoshiaki Kobuke, Kyoto, Japan, assignor to Iwao Tabushi, Kyoto, Japan

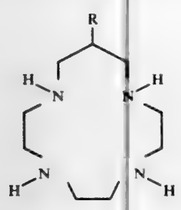
Filed Jan. 23, 1978, Ser. No. 871,349

Claims priority, application Japan, May 19, 1977, 52/57125

Int. Cl.² C07D *257/02*

U.S. Cl. 260—239 BC **3 Claims**

1. 12-alkyl-1,4,7,10-tetraazacyclotridecane represented by the formula:



wherein R is a normal alkyl group having from 8 to 20 carbon atoms.

4,174,320

PROCESS FOR THE PREPARATION OF RIFAMPICIN

Tiberio Bruzzese, Milan, Italy, assignor to Holco Investment Inc., Panama

Filed Sep. 27, 1978, Ser. No. 946,530

Claims priority, application United Kingdom, Nov. 25, 1977, 49148/77

Int. Cl.² C07D *498/18*

U.S. Cl. 260—239.3 P **15 Claims**

1. A process for the preparation of rifampicin, wherein rifamycin S is reacted in an aprotic dipolar solvent with a 1,3,5-trisubstituted hexahydro-1,3,5-triazine at a temperature from 20° to 100° C. followed by reaction with 1-amino-4-methylpiperazine, while keeping the pH in the range of from 5 to 7, whereafter the rifampicin formed is isolated.

15. 3-(1-Ethyl-3-piperidyl)-1,3-oxazino (5,6-c) rifamycin.

4,174,321

POLYCHROMOPHORIC DIBENZOXAZOLE ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

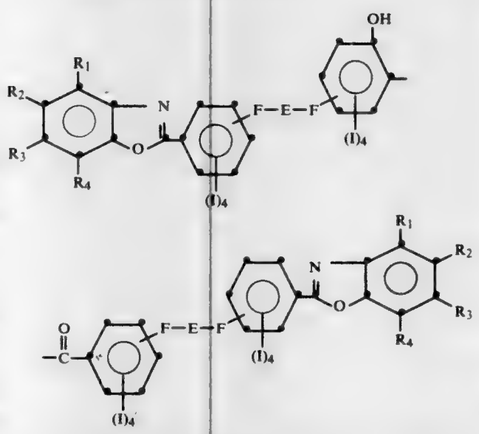
Richard H. S. Wang, and Joseph S. Zannucci, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 502,329, Sep. 3, 1974, abandoned. This application Sep. 1, 1977, Ser. No. 829,752

Int. Cl.² C07D *263/62*

U.S. Cl. 548—219 **18 Claims**

1. A compound having the formula:



wherein E is a member selected from the group consisting of an alkylene group, or cycloalkylene group containing 1 to 8 carbon atoms, carbonyl alkylene, alkylene carbonyl and F is oxygen, nitrogen or sulfur;

R_1, R_2, R_3 and R_4 are hydrogen, hydroxy, chloro, bromo, lower alkyl, cycloalkyl, phenyl, lower alkylphenyl, alkoxy, amino, cyano, carboxy;

I is the same as R_1, R_2, R_3 and R_4 and is present on all positions of the benzenoid ring, except the carbon atom attached to the FEF substituent, said I substituents can be the same or different.

4,174,322

THIOBIS(OXAZOLINES)

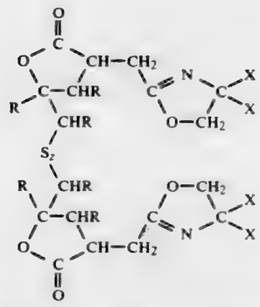
Stanley J. Brois, Westfield, and Antonio Gutierrez, Hamilton Square, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 726,206, Sep. 24, 1976, Pat. No. 4,062,786. This application Jul. 20, 1977, Ser. No. 817,217

Int. Cl.² C07D *263/08*

U.S. Cl. 548—237 **7 Claims**

1. Oil soluble thio-bis-(hydrocarbyl lactone oxazoline) useful as an additive in oleaginous compositions; derived from alkenyl succinic anhydride, acid or ester; and represented by the formula:



wherein R is selected from the group consisting of hydrogen and alkyl of 1 to 400 carbon atoms; X is selected from the group consisting of C_1 to C_3 alkyl and hydroxy-alkyl of the structure $-(CH_2)_nOH$ wherein n is 1 to 3, at least one of said X being hydroxy alkyl; S represents sulfur and z is an integer ranging from 1 to 4.

4,174,323

1-(2-SULFAMIDOETHYL)-1,4-DIHYDRO-5H-TETRAZOLE-5-THIONE

David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 805,197, Jun. 9, 1977, Pat. No. 4,117,123. This application Jul. 3, 1978, Ser. No. 921,681

Int. Cl.² C07D *257/04*

U.S. Cl. 548—251 **3 Claims**

1. 1-(2-Sulfamidoethyl)-1,4-dihydro-5H-tetrazole-5-thione and its alkal metal and ammonium salts.

4,174,324

3-(CARBOXYMETHYL)THIO-1H-1,2,4-TRIAZOL-5-THIONE

David A. Berges, Wayne, Pa., assignor to Smithkline Corporation, Philadelphia, Pa.

Division of Ser. No. 811,642, Jun. 30, 1977, Pat. No. 4,117,124. This application Jul. 3, 1978, Ser. No. 921,922

Int. Cl.² C07D *249/12*

U.S. Cl. 548—264 **3 Claims**

1. [(4,5-Dihydro-5-thioxo-1H-1,2,4-triazol-3-yl)thio]acetic acid and its alkali metal and ammonium salts.

4,174,325

THERMOPLASTIC ABS MOULDING COMPOSITIONS WITH IMPROVED IMPACT STRENGTH

Alfred Pischtschan, Kürten; Siegfried Adelmann, and Dieter Margotte, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 30, 1978, Ser. No. 873,531

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1977, 2704679

Int. Cl.² C08K *5/10*

U.S. Cl. 260—32.1 N **2 Claims**

1. Thermoplastic ABS moulding compositions containing 0.1–10% by weight of at least one ester of a saturated aliphatic monocarboxylic acid with 10–22 C-atoms with a hydroxy compound selected from the group consisting of stearyl alcohol, ethylene glycol, glycerine, trimethylol propane, hexanetriol, erythritol, mannitol, sorbitol, pentaerythritol, bisphenol-A, hydroquinone, and phloroglucinol.

4,174,326

IMIDYL COMPOUNDS

Marcus Baumann, Basel; Vratislav Kvita, Muttenz; Martin Roth, Basel, all of Switzerland, and John S. Waterhouse, Cherry Hinton, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

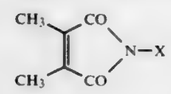
Division of Ser. No. 696,346, Jun. 15, 1976, Pat. No. 4,107,174. This application Apr. 21, 1978, Ser. No. 898,757

Claims priority, application Switzerland, Jun. 18, 1975, 07951/75; Nov. 27, 1975, 15390/75

Int. Cl.² C09D *207/44*; C07D *209/48*

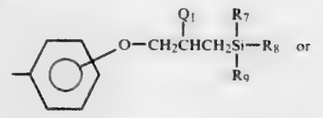
U.S. Cl. 260—326 E **4 Claims**

1. A compound of the formula



wherein

X is the group

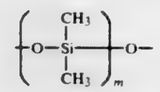


where

Q_1 is hydrogen or methyl,

R_7 and R_8 independently of each other represent hydrogen, OH, chlorine, alkoxy of 1 to 8 carbon atoms, phenoxy, —OCO-alkyl with alkyl of 1 to 8 carbon atoms, —OCO-phenyl, —NH-alkyl with 1 to 8 carbon atoms, or N(alkyl)$_2$ with alkyl of 1 to 8 carbon atoms, and

R_9 represents vinyl, methyl, phenyl, the group —O-Si$(CH_3)_3$, or has the same meaning as R_7 or R_8, or R_7 and R_8 conjointly form the group



where m denotes a number 2, 3 or 4.

4,174,327

SPIRANE DERIVATIVES

Walter Renold, Onex; Werner Skorianetz, Geneva; Karl-Heinrich Schulte-Elte, Onex, and Gunther Ohloff, Bernex, all of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Division of Ser. No. 728,644, Oct. 1, 1976, Pat. No. 4,120,830, which is a continuation-in-part of Ser. No. 625,452, Oct. 23, 1975, Pat. No. 4,014,905, which is a continuation-in-part of Ser. No. 542,072, Jan. 17, 1975, abandoned. This application Jul. 5, 1978, Ser. No. 922,189

Claims priority, application Switzerland, Feb. 4, 1974, 1488/74; Jun. 7, 1974, 7776/74; Jul. 30, 1975, 9920/75

Int. Cl.² C07D *307/94*

U.S. Cl. 260—346.11 **4 Claims**

1. 6,7-Epoxy-2,6,10,10-tetramethyl-1-oxa-spiro [4.5]decane.

4. 2,6,9,10,10-pentamethyl-6,7-epoxy-1-oxa-spiro [4.5]decane.

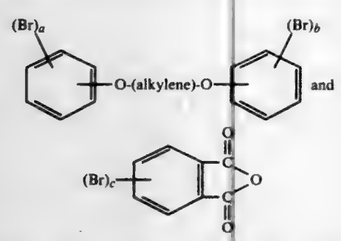
4,174,328

FLAME RETARDED NON-WOVEN TEXTILE MATERIAL COMPRISED OF FLAME RETARDANT AND VINYL CHLORIDE LATEX

Ray E. Smith, and Jayendra G. Shukla, both of Ann Arbor, Mich., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Aug. 16, 1978, Ser. No. 934,123
Int. Cl.[2] C08L *1/02*
U.S. Cl. 260—17.4 CL **8 Claims**

1. A flame-retarded non-woven material comprising a mixture of flame retardant and vinyl chloride latex, wherein said flame retardant is selected from the group consisting of



I

II

wherein a and b are integers independently selected from the group consisting of 1, 2, 3, 4 and 5, a plus b is from about 6 to about 10, c is an integer of from 1 to 4, and alkylene is a straight chain carbon group having from one to six carbon atoms; and wherein more than 50 percent (by weight) of said flame retardant consists of particles with a diameter of from about 2 to about 25 microns.

4,174,329

ALKYD RESINS MODIFIED WITH TETRAFLUOROETHYLENE ADDUCT OF CONJUGATED TRIGLYCERIDES

Edward W. Bell, Peoria, and Lyle E. Gast, Harvard, both of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 26, 1978, Ser. No. 918,892
Int. Cl.[2] C09D *3/34, 3/64*
U.S. Cl. 260—22 XA **7 Claims**

1. A composition comprising the cycloaddition reaction product of a triglyceride oil having sets of conjugated double bonds and a sufficient amount of tetrafluoroethylene with respect to said sets of conjugated double bonds whereby cycloaddition of tetrafluoroethylene in said composition is present at least at substantially each of said sets.

4. An alkyd resin composition comprising the reaction product of (1) glycerol, (2) an anhydride, and (3) the cycloaddition reaction product of tetrafluoroethylene and a conjugated triglyceride oil.

4,174,330

PROCESS FOR DISPERSING ADDITIVES IN THERMOPLASTIC POLYMERS

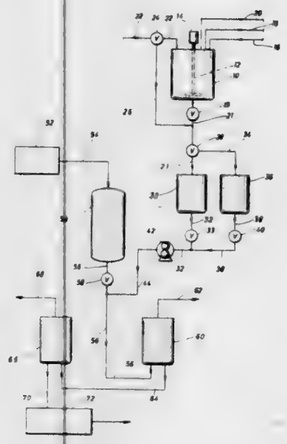
Ronald E. Gilbert, Katy; Thomas J. Lynch, Houston, and Robert J. Rowatt, Orange, all of Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 835,269, Sep. 21, 1977, abandoned. This application May 19, 1978, Ser. No. 907,531
The portion of the term of this patent subsequent to Jun. 19, 1996, has been disclaimed.
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—28.5 A **16 Claims**

1. In a process in which an additive is incorporated into and dispersed in a thermoplastic polymer by comalaxation at a temperature above the softening temperature of the polymer; the improvement which consists essentially of admixing with said thermoplastic polymer a Bingham fluid composition and comalaxating said mixture, said Bingham fluid composition being a solid at ambient temperature and capable of flow under an applied pressure and consisting essentially of:

(a) a continuous solid phase consisting essentially of an intimate mixture of a wax and a liquid hydrocarbon, and

(b) at least one additive capable of modifying a solid polymer uniformly dispersed throughout the continuous solid phase of (a);



the wax employed in the continuous solid phase of the Bingham fluid composition being characterized in that:

(c) at least 30 parts of the wax will dissolve in 100 parts of n-heptane at 80° C.,

(d) a solution prepared per (d), when cooled to 20° C., forms a continuous solid phase, and

(e) the continuous phase prepared per (e) will flow when subjected to a shear stress of 50 sec^{-1}.

4,174,331

REFRACTORY MOLDABLE COMPOSITION CONTAINING CERAMIC FIBER AND COLLOIDAL SILICA

Thomas A. Myles, Tonawanda, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 475,214, May 31, 1974, abandoned, which is a continuation-in-part of Ser. No. 265,945, Jun. 23, 1972, abandoned. This application Feb. 9, 1976, Ser. No. 656,475
Int. Cl.[2] C08L *1/04, 33/24, 1/10, 71/02*
U.S. Cl. 260—29.1 R **15 Claims**

1. A refractory moldable composition consisting essentially of:

(a) from about 45 to about 65% by weight liquid vehicle;

(b) from about 21 to about 26% by weight ceramic fiber;

(c) from about 7 to about 30% by weight colloidal silica; and

(d) sufficient adhesion enhancing agent selected from the group consisting of solid acrylic polymer prepared from acrylamide; polyethylene oxide; hydroxyethylcellulose; carboxymethylcellulose; and mixtures thereof, to impart an adherence value to steel, measured by casting the composition into a cylindrical mold having a three-inch diameter and a one-inch height, and placing a steel plate horizontally in contact with the composition, and measuring the vertical force necessary to obtain separation, of from about 18 to about 50 grams per square centimeter;

the liquid vehicle being a non-solvent for the ceramic fiber and colloidal silica and a solvent for the adhesion enhancing agent.

4,174,332

SELF-CROSSLINKING RESIN EMULSIONS FOR CATHODICALLY DEPOSITABLE COATING COMPOSITIONS

Helmut Honig, and Georgios Pampouchidis, both of Graz, Austria, assignors to Vianova Kunstharz, A.G., Vienna, Austria

Filed Feb. 2, 1978, Ser. No. 874,565
Claims priority, application Austria, Feb. 7, 1977, 758/77; Dec. 15, 1977, 8955/77
Int. Cl.[2] C08L *63/00*
U.S. Cl. 260—29.2 TN **9 Claims**

1. Emulsions of binders which are cathodically depositable in an electrodeposition system comprising (A) 98 to 50 percent by weight of a water-soluble self-crosslinking cationic resin water-dilutable upon partial or total neutralization with an inorganic or organic acid, said resin containing on an average at least 0.5 basic nitrogen atoms in 1000 molecular weight units and a double bond number of at least 0.5; and (B) 2 to 50 percent by weight of a water-insoluble self-crosslinking polymeric resin having a double bond number of at least 0.8.

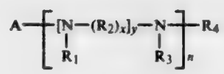
4,174,333

CARBOXYLATED AMIDE POLYMERS AND COATING COMPOSITIONS CONTAINING SAME

Marvis E. Hartman, Pittsburgh, and Thomas R. Hockswender, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 2, 1978, Ser. No. 957,118
Int. Cl.[2] C08G *59/14;* **C08L** *63/00*
U.S. Cl. 260—29.2 EP **37 Claims**

1. A carboxylated amide polymer, said polymer being the reaction product of (1) a compound having the formula



wherein A is the organic residue resulting from a ring opening reaction of a 1,2-epoxy group on a polyepoxide with ammonia or amine, R_1 is hydrogen or a C_{1-4} alkyl group, R_2 is a C_{2-12} alkylene group, x is 0 or 1, y is from 0 to 4, R_3 is hydrogen or a C_{1-6} alkyl group, R_4 is hydrogen or a C_{1-6} alkyl group, provided at least one R_1, R_3 and R_4 group is hydrogen and n is greater than 1.0 with (2) a cyclic anhydride of a dicarboxylic acid.

4,174,334

SURGICAL CEMENT COMPOSITIONS CONTAINING ALUMINO BORATE GLASS AND A POLYMER GLASS AND A POLYMER CONTAINING RECURRING CARBOXYLIC OR CARBOXYLATE GROUPS

Barry W. Bertenshaw; Edward C. Combe; David C. Tidy, all of Manchester, and John N. C. Laycock, Runcorn, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 7, 1977, Ser. No. 849,360
Claims priority, application United Kingdom, Nov. 12, 1976, 47211/76
Int. Cl.[2] C08L *33/00*
U.S. Cl. 260—29.6 M **15 Claims**

1. A cement composition comprising:

(i) an alumino borate glass in powdered form containing fused oxides of aluminum, boron and a third oxide type comprising at least one alkali metal or alkaline earth metal oxide and

(ii) a water soluble organic polymer comprising a polymer chain that contains recurring carboxylic acid or carboxylate ion groups.

4,174,335

AQUEOUS DISPERSIONS OF OLEFINIC RESIN COMPOSITIONS AND PROCESS FOR PREPARATION THEREOF

Akio Ohdaira, Iwakuni; Toru Tomoshige, and Kinich Onodera, both of Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jul. 20, 1976, Ser. No. 707,084
Claims priority, application Japan, Jul. 22, 1975, 50-88857
Int. Cl.[2] C08L *23/08;* **C08J** *3/04*
U.S. Cl. 260—29.6 RW **15 Claims**

1. In a process for producing an aqueous dispersion of an olefinic resin composition the particles of which are composed of a major proportion of carboxyl-free olefinic resin and a minor proportion of carboxyl-containing modified olefinic resin which comprises mixing an olefinic resin composition composed of a carboxyl-free olefin resin selected from the group consisting of homo- and co-polymers of 1-olefinic unsaturated hydrocarbons containing 2 to 6 carbon atoms, copolymers of said hydrocarbons with dienes, copolymers of said hydrocarbons with vinyl acetate, saponified products of copolymers of said hydrocarbons with vinyl acetate, graft copolymers of dienes with said homo- or co-polymers of said hydrocarbons, saponified products of said graft copolymers and blends of these resins having an intrinsic viscosity of not more than 20 and a carboxyl-containing modified olefinic resin selected from the group consisting of copolymers of 1-olefinic unsaturated hydrocarbon containing 2 to 6 carbon atoms with α,β-unsaturated carboxylic acids, saponified products of copolymers of said hydrocarbons with the functional derivatives α,β-unsaturated carboxylic acids, graft copolymers of homo- or co-polymers of said hydrocarbons with α,β-unsaturated carboxylic acids, saponified products of graft copolymers of homo- or co-polymers of said hydrocarbons with the functional derivatives of α,β-unsaturated carboxylic acids and blends of these resins having an acid number of at least 10 and an intrinsic viscosity of at least 0.04 with an aqueous medium in the presence of a base at an elevated temperature; the improvement wherein an olefinic resin composition comprising (a) 50 to 99% by weight of a carboxyl-free olefinic resin having an intrinsic viscosity of 0.01 to 5 and (b) 1 to 50% by weight of a carboxyl-containing modified olefinic resin having an intrinsic viscosity of 0.04 to 1 and an acid number of 30 to 150, the amount of each resin being based on the total amount of said resins (a) and (b), which has been melted by heating to a temperature above the melting point, whichever is higher, of said resins, is mixed with the aqueous medium heated to a temperature of 140 to 300° C in the presence of at least 0.2 chemical equivalent, to the carboxyl groups of said resin (b), of the base.

4,174,336

AQUEOUS HEAT CURABLE PARTICULATE COATING COMPOSITION OF ELASTOMERIC EMULSION COPOLYMER AND THERMOSETTING COPOLYMER

Howard H. Leiner, Southfield, Mich.; Lee E. Koepke, Wayzata, Minn.; Dennis R. Gelarden, Livonia; John L. Gardon, Birmingham, both of Mich., assignors to M & T Chemicals, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 755,647, Dec. 30, 1976, abandoned. This Application Jun. 15, 1978, Ser. No. 915,734

Int. Cl. C08L *31/02*

U.S. Cl. 260—29.7 UP **11 Claims**

1. A heat-curable coating composition consisting essentially of an aqueous medium containing dispersed polymer particles which, in turn, consist essentially of an elastomeric emulsion copolymer A and a thermosetting copolymer B, wherein

(1) copolymer B is prepared in the presence of preformed copolymer A.

(2) the rate of addition of the constituent monomers of copolymer B is substantially equal to the reaction rate of said monomers to form copolymer B.

(3) copolymer B constitutes from 10 to 70% of the combined weight of copolymers A and B, exhibits a glass transition temperature from 40° to 75° C.,

(4) the repeating units of copolymer B are derived from

(a) at least one monoethylenically unsaturated compound containing from 2 to 20 carbon atoms,

(b) from 2 to 20%, based on the weight of copolymer B, of at least one monoester of a diol containing from 2 to 4 carbon atoms and acrylic or methacrylic acid, said monoester being copolymerizable with said monoethylenically unsaturated compound, and

(c) from 5 to 40%, based on the weight of copolymer B, of at least one latent curing agent selected from the group consisting of N-alkoxymethyl acrylamides and N-alkoxymethyl methacrylamides wherein the alkoxy group contains from 1 to 8 carbon atoms,

(5) copolymer A exhibits a glass transition temperature of from −15° to +25° C., .

(6) the repeating units of copolymer A are derived from

(a) at least two monoethylenically unsaturated compounds containing from 2 to 20 carbon atoms, and

(b) from about 0.5 to 5.0%, based on the weight of copolymer A, of a polyfunctional compound selected from the group consisting of diesters and triesters derived from acrylic or methacrylic acid and a diol containing from 2 to 8 carbon atoms or a triol containing from 3 to 8 carbon atoms, divinyl benzene and allyl methacrylate.

4,174,337

HYDROXY-FUNCTIONAL ESTERS OF SUBSTITUTED IMIDAZOLIDINEDIONES AND COMPOSITIONS CONTAINING SAME

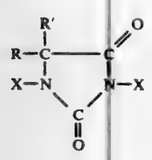
William J. Birkmeyer, Oakmont; J. Alden Erikson, Gibsonia, and Ronald J. Lewarchik, Natrona Heights, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 10, 1978, Ser. No. 950,096

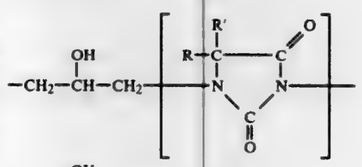
Int. Cl.² C08K *5/06*

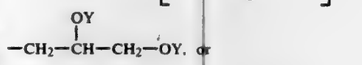
U.S. Cl. 260—31.4 R **34 Claims**

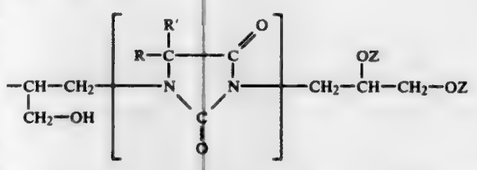
1. A hydroxy-functional ester of a substituted imidazolidinedione having the formula:



where X is hydrogen,







provided both X's are not hydrogen, with R and R′ being independently hydrogen or hydrocarbon groups having 1 to 8 carbon atoms, with one Y being hydrogen, one Z being hydrogen and the other Y and Z being



where the R″ groups are independently hydrocarbon groups having from 1 to 17 carbon atoms.

4,174,338

PASTY COMPOSITIONS FOR CROSSLINKING ORGANOPOLYSILOXANES TO SILICONE RUBBER

Heinz Goller, Bergisch-Gladbach; Hans-Hermann Schulz, Leichlingen, and Bernhard Leusner, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 26, 1977, Ser. No. 836,340

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644193

Int. Cl.² C08L *83/04*

U.S. Cl. 260—37 SB **5 Claims**

1. A pasty composition for the room temperature crosslinking and curing of a vulcanizable organopolysiloxane, comprising a crosslinking agent for an organopolysiloxane, a curing catalyst therefor, and about 3–40% by weight of the total amount of the pasty composition of active hydrophilic silicic acid as a thickener.

4,174,339

ANTI-FOULING PAINT COMPOSITION

Sumio Matsuda, Ibaraki, and Hajime Kudara, Shiga, both of Japan, assignors to Chugoku Marine Paints Ltd., Hiroshima, Japan

Continuation-in-part of Ser. No. 855,231, Nov. 18, 1977, abandoned. This application Oct. 2, 1978, Ser. No. 947,860

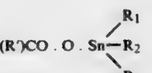
Int. Cl.² C08K *3/00*

U.S. Cl. 260—40 R **7 Claims**

1. An anti-fouling paint composition, which comprises 20% to 60% by weight of at least one pigment and 20% to 60% by weight of a reaction product prepared by the esterification of a copolymer (a), defined below, with a copolymer (b) defined below, said reaction product having an esterification degree of at least 60%;

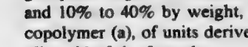
the copolymer (a) being comprised of 60% to 90% by weight, based on the weight of the copolymer (a), of units

derived from at least one trialkyl-tin carboxylate of the formula:



(I)

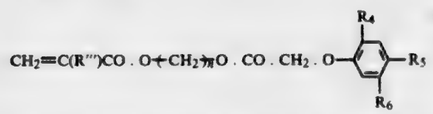
wherein R′ is hydrogen or a methyl group, and R_1, R_2 and R_3 are the same or different and selected from alkyl groups having 1 to 8 carbon atoms and a phenyl group, and 10% to 40% by weight, based on the weight of the copolymer (a), of units derived from at least one carboxylic acid of the formula:



(II)

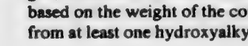
wherein R″ is hydrogen or a methyl group;

the copolymer (b) being comprised of 30% to 80% by weight, based on the weight of the copolymer (b), of units derived from at least one phenoxyaceticalkyl carboxylate of the formula:



(III)

wherein R‴ is hydrogen or a methyl group, n is an integer of 2 to 4, R_4 is chlorine or an alkyl group having 1 to 4 carbon atoms, R_5 is chlorine or bromine and R_6 is hydrogen, chlorine or bromine, and 20% to 70% by weight, based on the weight of the copolymer (b), of units derived from at least one hydroxyalkyl carboxylate of the formula:



(IV)

wherein R⁗ is hydrogen or a methyl group, and n is an integer of 2 to 4; and

the ratio by weight of the copolymer (a) to the copolymer (b) being 40 to 95:5 to 60.

4,174,340

PLASTIC MOLDING COMPOSITION CONTAINING A FILLER

Walter Lüders, Neu-Isenburg; Walter Herwig, Bad Soden am Taunus; Ulrich van Spankeren, Hofheim am Taunus, and Karlheinz Burg, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 2, 1978, Ser. No. 930,397

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1977, 2735160

Int. Cl.² C08K *3/26, 5/53, 9/04*

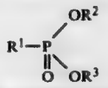
U.S. Cl. 260—42.14 **3 Claims**

1. Plastic molding composition containing a filler, which composition consists of

from 20 to 90 parts by weight of a polyolefin,

from 10 to 80 parts by weight of an alkaline earth metal carbonate,

common additives and from 0.1 to 10% by weight, calculated on the filler, of an adhesion promoter, said adhesion promoter comprising an organo-phosphorus compound of the formula



(I)

in which R^1 is an alkyl radical having from 1 to 18 carbon atoms, an alkenyl radical of from 2 to 18 carbon atoms, an aralkyl radical of from 7 to 13 carbon atoms, whose alkyl chain has from 1 to 3 carbon atoms, or an aralkenyl radical of from 8 to 13 carbon atoms, whose alkenyl chain has 2 or 3 carbon atoms, and R^2 and R^3, which are identical or different, represent hydrogen, an alkyl radical of from 1 to 8 carbon atoms, an aryl radical of from 6 to 10 carbon atoms, an aralkyl radical of from 7 to 13 carbon atoms, whose alkyl chain has from 1 to 3 carbon atoms, or an alkenyl radical of from 3 to 5 carbon atoms.

4,174,341

UNCURED CHLORINATED POLYETHYLENE COMPOSITION WITH HEXAMETHYLPHOSPHORIC TRIAMIDE AND MERCAPTOTRIAZINE

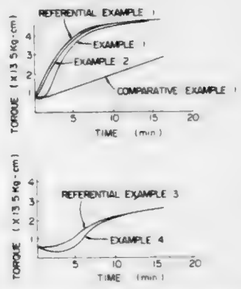
Yasuo Matoba, Suita; Yoshio Kise; Nobuo Yamada, both of Amagasaki; Akira Hashimoto, Itami, and Tetsuya Nakata, Ibaraki, all of Japan, assignors to Osaka Soda Co. Ltd., Osaka, Japan

Filed May 5, 1976, Ser. No. 683,678

Claims priority, application Japan, Dec. 19, 1975, 50-152393

Int. Cl.² C08F *114/04;* **C08C** *19/20, 19/22*

U.S. Cl. 260—45.7 S **4 Claims**

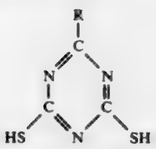


1. A curable chlorinated polyethylene composition comprising:

(A) chlorinated polyethylene,

(B) a complex formed between hexamethylphosphoric triamide and a member selected from the group consisting of carboxylic acids, cyanuric acid, unsubstituted phenols, phenols substituted with alkyl of 1 to 8 carbon atoms, hydroxyl, halogen, lower alkoxy or formyl, alcohols and metal salts, and

(C) a mercaptotriazine of the formula



wherein R is a member selected from the group consisting of a mercapto group, alkylamino groups with the alkyl moiety containing 1 to 8 carbon atoms, dialkylamino groups with the alkyl moiety containing 1 to 8 carbon atoms, cycloalkylamino groups with the cycloalkyl moiety containing 6 to 8 carbon atoms, dicycloalkylamino groups with the alkyl moiety containing 6 to 8 carbon atoms, arylamino groups, N-aryl-N-alkylamino groups with the alkyl moiety containing 1 to 8 carbon atoms and alkoxy groups containing 1 to 8 carbon atoms.

4,174,342

N-(ACENAPHTHENYL)MALEIMIDES

Jorge P. Li, Libertyville, and Frank C. Becker, Gurnee, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

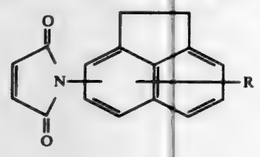
Filed Mar. 27, 1978, Ser. No. 890,736

Int. Cl.² C07D *207/40;* **A61K** *31/40;* **C08L** *33/00*

U.S. Cl. 260—45.8 N **10 Claims**

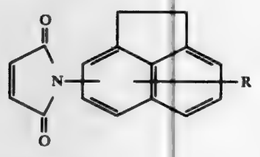
1. A plastic, cellulosic or other film-forming composition

resistant to fungal attack comprising said plastic cellulosic or film-forming composition and between 0.005 and 5.0% by weight of an acenaphthene derivative of the formula



wherein R is H or NO_2.

6. A compound of the formula



wherein R is H or NO_2.

4,174,343

PENTAERYTHRITYL DIPHOSPHONATE-AMMONIUM POLYPHOSPHATE COMBINATIONS AS FLAME RETARDANTS FOR OLEFIN POLYMERS

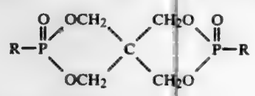
William B. Hardy, Bound Brook; Tae B. Min, Piscataway, and Joseph A. Hoffman, Bridgewater, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 5, 1978, Ser. No. 903,294

Int. Cl.[2] C07C *121/00*; C08K *3/32, 5/53*

U.S. Cl. 260—45.75 B **17 Claims**

1. A self-extinguishing, non-dripping composition comprising a polyolefin and a self-extinguishing, non-dripping amount of a combination of (A) a compound having the formula



wherein R is selected from methyl, phenyl, benzyl and cyano, and (B) ammonium polyphosphate.

17. Dicyanopentaerythrityl diphosphonate.

4,174,344

PROCESS FOR THE PREPARATION OF METHYL 3,4-ANHYDRO-2,6-DIDEOXY-L-RIBO-HEXOPYRANOSIDE

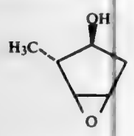
Guenter Grethe, North Caldwell; Milan R. Uskokovic, Upper Montclair, and John Sereno, Pine Brook, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 14, 1977, Ser. No. 850,982

Int. Cl.[2] C07D *301/00*

U.S. Cl. 260—348.55 **2 Claims**

1. A compound of the formula



its enantiomer and racemate thereof.

4,174,345

SYNTHESIS OF STEROIDS

Emil T. Kaiser, 5634 S. Woodlawn Ave., Chicago, Ill. 60637

Filed Aug. 1, 1978, Ser. No. 929,932

Int. Cl.[2] C07J *9/00*

U.S. Cl. 260—397.1 **12 Claims**

1. In a process wherein a methoxyethoxymethoxy ether of a 3β-hydroxy steroid is treated with zinc bromide to cleave methoxyethoxymethoxy groups therefrom, the step of bringing zinc bromide into contact with said sterol and a solution of methylene chloride and an aliphatic alcohol having one to six carbons, said alcohol being in any appreciable amount up to about 5% by volume of said methylene chloride until cleavage of said methoxyethoxymethoxy groups is completed.

11. A process as set forth in claim 1, in which said sterol is 3β-(methoxyethoxymethoxy)-5-cholenic acid methyl ester.

4,174,346

PROCESS FOR PREPARING ORGANOTIN COMPOUNDS

John D. Collins, Albrighton, and Donald A. Wood, Warley, both of England, assignors to Albright & Wilson Limited, Warley, both of, England

Filed Jun. 2, 1977, Ser. No. 802,626

Claims priority, application United Kingdom, Jun. 8, 1976, 23666/76

Int. Cl.[2] C07F *7/22*

U.S. Cl. 260—429.7 **41 Claims**

1. A process for preparing a tricycloalkyltin compound, which comprises reacting at a temperature of between 110° C. and 180° C.

an organotricycloalkyltin of formula $RSnR_3''$, wherein R'' is a cycloalkyl group selected from the group consisting of cyclohexyl and cyclohexyl substituted by at least one inert substituent, and R is a radical selected from the group consisting of alkyl, alkenyl, aralkyl and aryl groups,

with an organotin trichloride of formula $R'SnCl_3$, wherein R' is an organic group,

the molar ratio of said organotricycloalkyltin to said organotin trichloride being between 0.8:1 and 1:1.2,

to form a mixture comprising tricycloalkyltin chloride and a diorganotin dichloride.

4,174,347

PREPARATION OF ESTERS

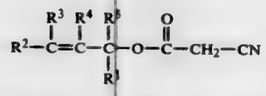
Helena Austermühle-Bertola, Amsterdam, Netherlands, assignor to Shell Internationale Research Maatschappij B.V., Netherlands

Filed Jun. 19, 1978, Ser. No. 916,590

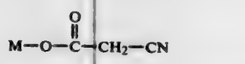
Int. Cl.[2] C07C *120/00, 121/00*

U.S. Cl. 260—465.4 **8 Claims**

1. A process for the preparation of an ester of cyanoacetic acid having the following general formula:

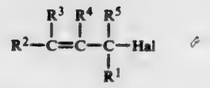


wherein R^1, R^2, R^3, R^4 and R^5 each independently represent a hydrogen atom, an alkyl group of one to four carbon atoms, or a cycloalkyl group, which comprises mixing and reacting an alkali metal carboxylate of general formula:

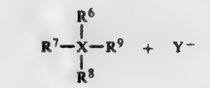


(II)

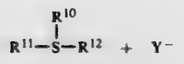
wherein M represents an alkali metal atom, with a hydrocarbyl halide of general formula:



wherein R^1, R^2, R^3, R^4 and R^5 are as defined above and Hal is a halogen atom having an atomic number of at least 17, in the presence of a phase transfer catalyst selected from the group consisting of a quaternary onium salt of the general formula



wherein X represents a nitrogen, phosphorus or arsenic atom, R^6, R^7, R^8 and R^9 represent, independently, an alkyl group containing 1 to 18 carbon atoms or an aralkyl or aryl group containing up to 10 carbon atoms, and Y represents a monovalent ion; a ternary sulphonium salt of the general formula



wherein R^{10}, R^{11} and R^{12} each, independently, represents an alkyl group containing 1 to 18 carbon atoms and Y represents a monovalent ion; a macrocyclic polyether selected from the group consisting of 1,4,7,10,13,16-hexaoxacyclooctadecane, 3,4-benzo-1,6,9,12,15,18,21-heptaoxacyclotricos-3-ene and 3,4-benzo-1,6,9,12-tetraoxycyclotetradec-3,-ene; and in the presence of an organic solvent for the hydrocarbyl halide, at a temperature in the range of from about 20° C. to about 100° C.

4,174,348

PREPARATION OF CYCLOPROPANECARBONITRILES

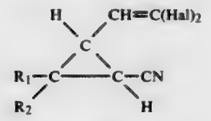
Petrus A. Kramer, and Helena Austermühle-Bertola, both of Amsterdam, Netherlands, assignors to Shell Internationale Research Maatschappij B. V., Netherlands

Filed May 30, 1978, Ser. No. 910,882

Int. Cl.[2] C07C *121/46*

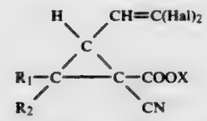
U.S. Cl. 260—464 **7 Claims**

1. A process for the preparation of a cyclopropanecarbonitrile of the general formula:



(I)

wherein R_1 and R_1 each individually represent an alkyl group of from one to six carbon atoms and Hal represents a fluorine, chlorine or bromine atom; which comprises heating, in the presence of a polar aprotic solvent, a cyclopropanecarboxylate of the general formula:



(II)

wherein R_1, R_2 and Hal in general formula II have the same meanings as in general formula I and X represents a quaternary ammonium group.

4,174,349

PREPARATION OF FLUOROORGANIC COMPOUNDS WITH CALCIUM FLUORIDE

Francis E. Evans, Hamburg, N.Y.; Morris B. Berenbaum, Summit, N.J.; Richard E. Elbeck, Orchard Park, and Martin A. Robinson, East Amherst, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Oct. 30, 1978, Ser. No. 955,679

Int. Cl.[2] C07C *17/10, 17/12, 17/14, 51/58*

U.S. Cl. 260—544 F **25 Claims**

1. The method which comprises reacting a haloorganic starting material in which at least one halo atom is replaceable with a fluorine atom by metathetical exchange, with calcium fluoride in the presence of a cage compound and an anhydrous polar, basic organic solvent which contains no —OH groups and which solubilizes the cage compound, starting material and calcium fluoride, at a temperature and for a period of time adequate to effect fluorination.

4,174,350

HERBICIDAL ACTIVE CARBOXANILIDE DERIVATIVES

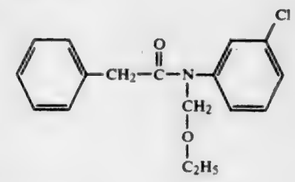
Edmund J. Gaughan, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 655,651, Feb. 6, 1976, Pat. No. 4,088,687, which is a division of Ser. No. 539,200, Jan. 6, 1975, abandoned, which is a division of Ser. No. 449,782, Mar. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 360,242, May 14, 1973, abandoned. This application Feb. 21, 1978, Ser. No. 879,174

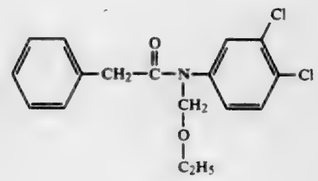
Int. Cl.[2] C07C *103/76*; A01N *9/20*

U.S. Cl. 260—558 P **2 Claims**

1. The compound



2. The compound



4,174,351

SEPARATION OF DISSIMILAR AMINES

James P. Shoffner, Elk Grove Village, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 28, 1978, Ser. No. 937,616

Int. Cl.[2] C07C *85/26, 89/04*

U.S. Cl. 260—582 **10 Claims**

1. A process for the separation of dissimilar amines which comprises treating a mixture containing said dissimilar amines with a reactive carbonyl compound and an acid at reaction conditions, and recovering the separated amines.

4,174,352

PROCESS FOR AQUEOUS CHROMATE ION OXIDATION OF ALLYLIC HALIDES AND HALOMETHYLATED AROMATICS TO ALLYLIC AND AROMATIC ALDEHYDES

Thomas H. Fisher, and William Dowd, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 8, 1978, Ser. No. 903,425
Int. Cl.[2] C07C *45/00*
U.S. Cl. 260—599 **5 Claims**

1. An improved process for preparing an aldehyde of the formula

$$A\text{-}(CHO)_n \quad (I)$$

wherein A is an allylic, aryl or an inertly-substituted allylic or aryl radical and n is an integer of at least 1, the process comprising contacting in a basic, liquid, biphasic mixture and at reactive conditions a compound of the formula

$$A\text{-}(CH_2X)_n \quad (II)$$

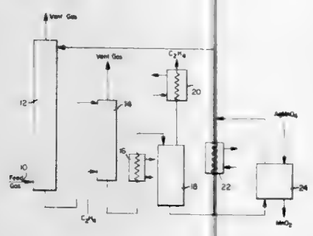
wherein X is chloride, bromide or iodide and A and n are as previously defined, with divalent chromate ion, the improvement comprising contacting II with the chromate ion in the presence of a catalytic amount of a quaternary ammonium and/or phosphonium salt.

4,174,353

OLEFIN SEPARATION PROCESS

Arthur E. Marcinkowsky, Charleston; George E. Keller, II, South Charleston, and Surendra K. Verma, Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 27, 1978, Ser. No. 919,420
Int. Cl.[2] C07C *7/01*
U.S. Cl. 585—835 **9 Claims**



1. The process for the separation of ethylene or propylene from a purified, multi-component gas stream produced from the thermal cracking of hydrocarbons and containing ethylene or propylene and other low molecular weight components comprising the steps of:

(a) introducing, said multi-component gas stream into an aqueous silver salt solution stream to effect the absorption and/or complexing of the contained ethylene or propylene and reaction of trace acetylenes with the silver metal ions of such solution;

(b) venting of the silver salt solution stream at reduced pressure to remove the dissolved other low molecular weight components;

(c) treating the resulting silver salt solution stream to separate the absorbed and/or complexed ethylene or propylene from the silver salt stream;

(d) further treating the resultant silver salt solution stream to release the contained trace acetylenes therefrom and provide an aqueous silver salt stream; and

(e) recycling said aqueous silver salt stream to said introducing step.

4,174,354

OXIDATIVE DEHYDROGENATION USING CHROMIUM-CONTAINING CATALYSTS

Robert K. Grasselli, Chagrin Falls; Arthur F. Miller, and Wilfrid G. Shaw, both of Lyndhurst, all of Ohio, assignors to Standard Oil Company (Ohio), Ohio

Division of Ser. No. 393,732, Sep. 4, 1973, Pat. No. 3,956,181. This application Dec. 18, 1974, Ser. No. 532,097
Int. Cl.[2] C07C *11/12*
U.S. Cl. 585—626 **6 Claims**

1. In the process for the oxidative dehydrogenation of an olefin containing 4 to about 10 carbon atoms to its corresponding diolefin by contacting the olefin with molecular oxygen at a temperature of about 200° C. to about 600° C. in the presence of a catalyst, the improvement comprising

using as the catalyst the catatalyst of the formula

$$A_a\,D_b\,Ni_c\,Co_d\,Cr_e\,Bi_f\,Mo_{12}\,O_x$$

wherein

A is an alkali metal, Tl, In, Ag, Cu, rare earth metal or mixture thereof; and

D is P, As, Sb, Sn, Ge, B, W, Th, V, Ti, Si or mixture thereof;

and wherein

a and b are 0–4;

c and d are 0 to 20 with c+d greater than or equal to 0.1;

e is 0.1 to about 10;

f is about 0.01 to 6; and

x is the number of oxygens required to satisfy the valence requirements of the other elements present.

4,174,355

PROCESS FOR REMOVING α-ACETYLENES FROM DIOLEFINS

Pradeep V. Patel, Parma Heights, and Donald E. Murphy, Gates Mills, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 770,284, Feb. 22, 1977, abandoned. This application Jun. 19, 1978, Ser. No. 916,641
Int. Cl.[2] C07C *7/00*
U.S. Cl. 585—843 **10 Claims**

1. A process for removing alpha-acetylenes from a hydrocarbon vapor mixture comprising said alpha-acetylenes and a conjugated diolefin having four to five carbon atoms, which process comprises, (a) introducing only said hydrocarbon vapor mixture optionally with an inert gaseous diluent, to a fixed bed reactor without supplying hydrogen or oxygen thereto, (b) contacting said mixture at a temperature in the range from about 300° F. to about 360° F. with a solid porous supported catalyst selected from the group consisting essentially of supported cupric oxide and silver oxide in the range from more than 10% but less than 25% by weight of said catalyst, at a gas hourly space volocity (GHSV) in the range from about 100 to about 1500, (c) cracking said alpha-acetylenes to non-oxygenated organic compounds so as to produce at least 90 percent conversion of said alpha-acetylenes in the effluent from said reactor, in which effluent cyclopentadiene, if present in the feed, is essentially unconverted, with loss of diolefin to less than 1 percent by weight of the hydrocarbon feed, and (d) providing heat to said reactor so as to maintain said temperature range during said process.

4,174,356

SYNTHETIC AMORPHOUS SILICA PARAFFIN HYDROGENATION-DEHYDROGENATION

Thomas O. Mitchell, Trenton, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 738,789, Nov. 4, 1976, Pat. No. 4,086,261, which is a continuation-in-part of Ser. No. 638,405, Dec. 8, 1975, Pat. No. 4,003,825, which is a division of Ser. No. 450,967, Mar. 14, 1974, Pat. No. 3,983,055. This application Feb. 10, 1978, Ser. No. 876,813
Int. Cl.[2] C07C *5/36*
U.S. Cl. 585—661 **22 Claims**

1. A hydrogenation-dehydrogenation process wherein a paraffin of from 2 to about 30 carbon atoms is subjected to hydrogenation-dehydrogenation conditions in the presence of a catalytic amount of a solid containing, at least in part, a synthetic amorphous solid prepared by the steps of hydrolyzing and polymerizing in the presence of water a silane having the formula $R(Si)X_3$, wherein R is a nonhydrolyzable organic group, X is a hydrolyzable group and (Si) is selected from the group consisting of

$$-\overset{|}{\underset{|}{Si}}- \text{ and } -Si(R)_2-O-\overset{|}{\underset{|}{Si}}-.$$

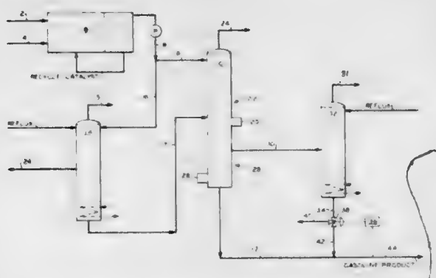
and calcining the polymerized product, said silane being admixed with a second compound, R'_nMY_m, wherein R' is selected from the group consisting of the same groups as R, Y is selected from the group consisting of the same groups as X and oxygen, M is at least one member selected from the group consisting of the elements of Groups IIIA, IVA, VA, IVB, VB, VIB and VIII of the Periodic Table, m is any number greater than 0 and up to 8 and n is from 0 to any number less than 8.

4,174,357

ALKYLATION PROCESS

Charles C. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Ohio

Continuation of Ser. No. 462,877, Apr. 22, 1974, Pat. No. 3,957,901, which is a continuation-in-part of Ser. No. 276,096, Jul. 28, 1972, abandoned. This application Feb. 2, 1976, Ser. No. 654,434
The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.
Int. Cl.[2] C07C *3/52*
U.S. Cl. 585—701 **2 Claims**



1. In a process for producing an alkylate end product stream having a preselected vapor pressure comprising reacting an olefin stream and an isoparaffin stream to form a resultant alkylate product stream, separating said resultant alkylate product stream into an isoparaffin stream, an alkylate stream and a vapor stream comprising normal butane and isopentane, the improvement comprising separating said vapor stream comprising normal butane and isopentane into a normal butane stream and a resultant material stream comprising isopentane,

controllably adding said resultant material stream comprising isopentane to said alkylate stream so as to form an alkylate end product stream,

measuring the vapor pressure of said alkylate end product stream and generating a signal representative of this measurement, and

controlling the addition of said resultant material stream comprising isopentane to said alkylate stream in response to said signal to produce an alkylate end product stream having a constant and preselected vapor pressure.

4,174,358

TOUGH THERMOPLASTIC NYLON COMPOSITIONS

Bennett N. Epstein, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 580,513, May 23, 1975, abandoned. This application Apr. 11, 1977, Ser. No. 786,201
Int. Cl.[2] C08L *77/00*
U.S. Cl. 525—183 **55 Claims**

1. A toughened multiphase thermoplastic composition consisting essentially of one phase containing 60 to 99 percent by weight of a polyamide matrix resin of number average molecular weight of at least 5,000, and 1 to 40 percent by weight of at least one other phase containing particles of at least one polymer taken from the class consisting of branched and straight chain polymers having a particle size in the range of 0.01 to 1.0 microns and having sites which adhere to the polyamide matrix resin, and said at least one polymer having a tensile modulus in the range of about 1.0 to 20,000 psi, the ratio of the tensile modulus of the polyamide matrix resin to tensile modulus of said at least one polymer being greater than 10 to 1 wherein said at least one polymer comprises at least 20 percent by weight of said at least one other phase and is represented by the formula:

$$A_{(a)}\text{-}B_{(b)}\text{-}C_{(c)}\text{-}D_{(d)}\text{-}E_{(e)}\text{-}F_{(f)}\text{-}G_{(g)}\text{-}H_{(h)}$$

derived in any order from monomers A to H wherein

A is ethylene;

B is CO;

C is an unsaturated monomer taken from the class consisting of α,β-ethylenically unsaturated carboxylic acids having from 3 to 8 carbon atoms, and derivatives thereof taken from the class consisting of monoesters of alcohols of 1 to 29 carbon atoms and the dicarboxylic acids and anhydrides of the dicarboxylic acids and the metal salts of the monocarboxylic, dicarboxylic acids and the monoester of the dicarboxylic acid having from 0 to 100 percent of the carboxylic acid groups ionized by neutralization with metal ions and dicarboxylic acids and monoesters of the dicarboxylic acid neutralized by amine-ended caprolactam oligomers having a DP of 6 to 24;

D is an unsaturated epoxide of 4 to 11 carbon atoms;

E is the residue derived by the loss of nitrogen from an aromatic sulfonyl azide substituted by carboxylic acids taken from the class consisting of monocarboxylic and dicarboxylic acids having from 7 to 12 carbon atoms and derivatives thereof taken from the class consisting of monoesters of alcohols of 1 to 29 carbon atoms and the dicarboxylic acids and anhydrides of the dicarboxylic acids and the metal salts of the monocarboxylic, dicarboxylic acids and the monoester of the dicarboxylic acid having from 0 to 100 percent of the carboxylic acid groups ionized by neutralization with metal ions;

F is an unsaturated monomer taken from the class consisting of acrylate esters having from 4 to 22 carbon atoms, vinyl esters of acids having from 1 to 20 carbon atoms, vinyl ethers of 3 to 20 carbon atoms, vinyl and vinylidene halides, and nitriles having from 3 to 6 carbon atoms;

G is an unsaturated monomer having at least one substituent selected from the group consisting of pendant hydrocarbon chains of 1 to 12 carbon atoms and pendant aromatic

groups which may have 1 to 6 substituent groups having a total of 14 carbon atoms; and

H is an unsaturated monomer taken from the class consisting of branched, straight chain and cyclic compounds having from 4 to 14 carbon atoms and at least one additional unsaturated carbon-carbon bond capable of being grafted with a monomer having at least one reactive group of the type defined in C, D and E;

monomers A to H being present in the following mole fraction: (a) 0 to 0.95, (b) 0 to 0.30, (c) 0 to 0.5, (d) 0 to 0.5, (e) 0 to 0.5, (f) 0 to 0.99, (g) 0 to 0.99, and (h) 0 to 0.99; said at least one polymer having present at least one of monomers B, C, D and E with the proviso that when monomer A is present, in addition to at least one of monomers B, C, D and E, at least one of monomers F, G and H is also present, and further provided that when said at least one polymer is present as part of a mixture, that the components of the mixture co-exist in the same discrete particles in the polyamide matrix.

4,174,359

FLAME RETARDANT POLYCARBONATE POLYBLENDS

Parameswar Sivaramakrishnan, and Arthur L. Baron, both of New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 830,518, Sep. 6, 1977, abandoned. This application Mar. 29, 1978, Ser. No. 891,252

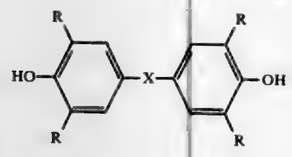
Int. Cl.[2] C08L 67/00

U.S. Cl. 525/1 **31 Claims**

1. A halogen-containing aromatic copolycarbonate blend comprising

(a) an aromatic diphenol-aromatic thiodiphenol copolycarbonate comprising the reaction product of

(i) an aromatic diphenol having the structural formula

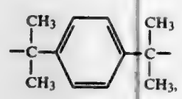


wherein

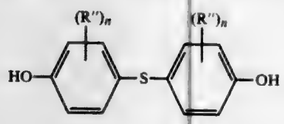
R is identical or different and denotes H or C_1–C_4-alkyl, and

wherein

X is a bond, C_1–C_8-alkylene, C_2–C_8-alkylidene, C_5–C_{15}-cycloalkylene, C_5–C_{15}-cycloalkylidene, —SO_2—, —SO—, —CO— or



(ii) an aromatic thiodiphenol having the structural formula



wherein

R″, which may be identical or different, is H or C_1–C_4-alkyl, and n is 0, 1 or 2, and

(iii) a member selected from the group consisting of carbonyl bromide, phosgene, bischloroformic esters of (i) and (ii) and diaryl carbonates

(b) intimately blended with an effective amount of a halogen-containing compound whereby the critical thickness and flammability properties of the halogen-containing, aromatic copolycarbonate blend is improved.

3. The halogen-containing, aromatic copolycarbonate blend of claim 1 wherein said halogen-containing compound is an aromatic diphenol-halogenated aromatic diphenol copolycarbonate comprising the reaction product of

(i) an aromatic diphenol,

(ii) a halogenated, aromatic diphenol, and

(iii) a member selected from the group consisting of carbonyl bromide, phosgene, bischloroformic esters of (i) or (ii) and diaryl carbonates.

4,174,360

COUPLING OF ALKALI METAL-TERMINATED POLYMERS

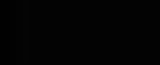
George A. Moczygemba, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 821,256, Aug. 2, 1977, abandoned, which is a division of Ser. No. 678,096, Apr. 19, 1976, Pat. No. 4,049,753. This application May 19, 1978, Ser. No. 907,472

Int. Cl.[2] C08F 8/00, 8/02, 8/06, 8/10

U.S. Cl. 260—880 **12 Claims**

1. A process for the production of a polymer comprising reacting an alkali metal-terminated polymer having the formula M-Z, wherein M represents an alkali metal and Z is a homopolymer or copolymer chain of one or more alkadienes of 4 to 12 carbon atoms per molecule or a copolymer chain of at least one alkadiene of 4 to 12 carbon atoms and at least one monovinylsubstituted arene radical of 8 to 18 carbon atoms per molecule, the vinyl radical being attached to a carbon atom of the arene ring with a coupling agent having the formula



wherein the radicals R, which can be the same or different, are hydrocarbyl radicals with 1 to 7 carbon atoms, and wherein the coupling agent is employed in such a quantity that about 0.1 to about 0.25 mole of coupling agent is present per gram atom of alkali metal M at the beginning of the coupling reaction mixture.

4,174,361

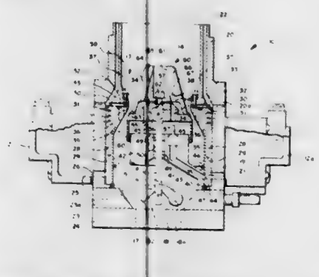
VARIABLE DOWNDRAFT CARBURETOR

Ralph T. Rollins, 1964 Longview Dr., Holladay, Utah 84117

Filed May 22, 1978, Ser. No. 907,986

Int. Cl.[2] F02M 9/14

U.S. Cl. 261—41 B **7 Claims**



1. A variable Venturi, condition responsive carburetor comprising

a carburetor housing having a central passage extending downwardly therethrough;

a fixed Venturi member having a curved shoulder fixed in said central passage and extending into said central passage;

a movable Venturi member having a curved shoulder cooperating with the curved shoulder of the fixed Venturi member to form a Venturi throat;

passage means adapted to connect the Venturi throat with a source of fuel through the fixed Venturi member;

means connecting the movable Venturi member to an accelerator control mechanism for an engine;

means for mounting the carburetor to an intake manifold of the engine;

passage means through the movable Venturi member to the Venturi throat, when said movable Venturi member is in a lowered position; and

means connecting the passage means through the movable Venturi member to the source of fuel only when the movable Venturi member is in its lowered position.

4,174,362

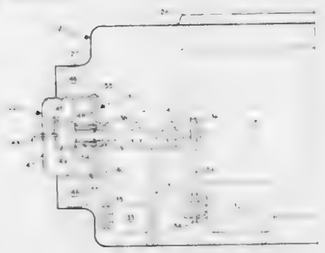
HUMIDIFER

Michael Rahman, Winston-Salem, N.C., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Apr. 20, 1978, Ser. No. 898,242

Int. Cl.[2] F24F 3/14

U.S. Cl. 261—90 **2 Claims**



1. An improved humidifying apparatus comprising:

a. a fan assembly inclusive of

i. a shaft,

ii. a hub member mounted to rotate on said shaft, said hub member having a chamber formed therein to serve as a water plenum; and

iii. fan blades mounted to extend from said hub member;

b. means to deliver water to said chamber;

c. a slinger assembly mounted to rotate coaxial with, independent of and adjacent to said hub member, said slinger assembly inclusive of

i. a first disc-shaped plate having, on its face nearest said hub member, three or more vanes mounted on said nearest face to extend radially inward from the periphery of said first plate to define channels between adjacent vanes; and

ii. a second disc-shaped plate mounted face to face with said first plate such that said vanes are between said faces and the channels formed by said vanes are enclosed, said second plate having a cylindrical passage formed in the center thereof;

d. three or more water-carrying conduits, said conduits extending from said chamber through the end of said hub member to protrude from said hub member and through said cylindrical passage of said second plate to adjacent said nearest face of said first plate such that said conduits extend within said slinger assembly, said conduits being equally spaced radially from said shaft to define a circle on which said conduits are evenly spaced so that said conduits evenly distribute water from said chamber onto said nearest face of said first plate such that water is impelled outwardly from said slinger assembly by centrifugal force; and

e. a tubular member coaxially mounted to said hub member to rotate therewith, said tubular member including a plurality of fins spaced circumferentially from one another to form a cylindrical array which extends outward from said hub member to circumscribe said slinger assembly.

4,174,363

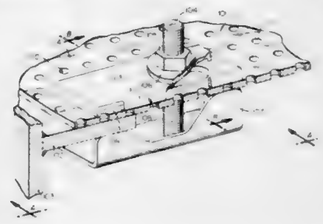
VAPOR-LIQUID CONTACTING TRAY WITH VAPOR THRUST MEANS

Walter Bruckert, Antwerp, Belgium, assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 10, 1978, Ser. No. 885,296

Int. Cl.[2] B01D 3/22

U.S. Cl. 261—114 TC **10 Claims**



1. In a vapor-liquid contacting column including a casing in which a plurality of generally horizontally aligned vapor-liquid contacting trays are disposed, vertically spaced apart from one another and mounted in said casing on substantially imperforate support rings such that the support rings underlie portions of said contacting trays for support thereof, with clamp means for rigidly securing said contacting trays to said support rings, said contacting trays each including a horizontally aligned deck having main flat top and bottom surfaces, with vapor flow perforation openings extending through said deck, and liquid transfer means associated with the tray for transferring liquid previously contacted on said tray deck to a next underlying tray in said contacting column, the improvement comprising: an enclosure member overlying and extending transversely across said deck main flat top surface from a portion thereof above said support ring to an adjacent perforated portion of said tray deck wherein the vapor flow perforation openings are unobstructed by said support ring such that said enclosure member forms an enclosed spatial volume with respect to and above the overlaid tray deck portion, with a vapor flow opening in said enclosure member located over the portion of said tray deck above said support ring, such that closed gas flow communication is provided from the vapor flow perforation openings in said adjacent perforated portion of said tray deck overlaid by said enclosure member to said vapor flow opening in said enclosure member, whereby vapor flowing through said perforation openings and entering said enclosed spatial volume of said enclosure member is directed through said vapor flow opening into the liquid on the tray deck main flat top surface portion overlying said support ring, to effect vapor-liquid contact and prevent liquid flow stagnation thereon.

V 9 8 8 1 2 N 0 1 3 7 9 UMI

4,174,364

PROCESS FOR MANUFACTURE OF POROUS METAL OBJECTS AND USE OF THE PROCESS FOR MANUFACTURE OF A POROUS MOLD

Claudio Balosetti, Via Varallo, 244, I-13011 Borgosesia, Vercelli, Italy

Filed Mar. 23, 1978, Ser. No. 889,530
Claims priority, application Switzerland, Feb. 10, 1978, 1507/78
Int. Cl.[2] B22F *3/16*
U.S. Cl. 264—111 4 Claims

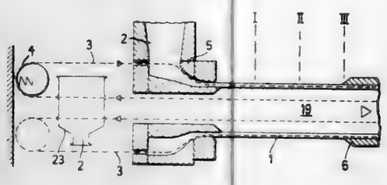
1. A process for the manufacture of porous metal objects comprising (1) mixing aluminum powder having a granulometric fineness of 600 to 25,000 mesh per cm^2 with at least 3% of a particulate mineral having a cellular structure and being selected from the group consisting of vegetable ash, animal ash and diatom fossil meal, (2) compacting the admixture to yield an object of sufficient green strength to be self-supporting, (3) heating the said object to a temperature from about 550° C. to about 600° C., and (4) hot pressing said object to yield a unitary porous metal object.

4,174,365

CONTINUOUS METHOD FOR MAKING HOSES WITH DESTRUCTION OF HORIZONTALLY DISPOSED MANDREL

Karl-Heinz Pahl, Düsseldorf-Lohausen, Fed. Rep. of Germany, assignor to Pahl'sche Gummi—und Asbest-Gesellschaft "PAGUAG", Düsseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 684,347, May 7, 1976, Pat. No. 4,056,596. This application Jul. 25, 1977, Ser. No. 818,892
Claims priority, application Fed. Rep. of Germany, May 10, 1975, 2520853
The portion of the term of this patent subsequent to Nov. 1, 1994, has been disclaimed.
Int. Cl.[2] B29D *23/04;* B29C *2/00;* B29H *7/14*
U.S. Cl. 264—146 22 Claims



1. An apparatus for the continuous production and vulcanization of a hose comprising means for continuously forming a hollow mandrel, means for continuously moving said mandrel axially and horizontally only, forming said hose about said mandrel, means for continuously vulcanizing said hose while on said mandrel, means for continuously reducing said mandrel into remnants after vulcanization of said hose, and means for removing the remnants of said mandrel from within said hose.

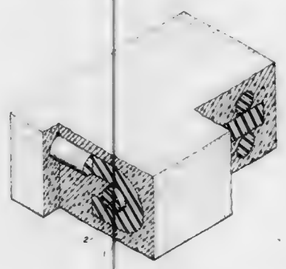
4,174,366

METHOD OF MAKING REINFORCED CONCRETE

Ronald A. Schneider, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 781,591, Mar. 28, 1977, abandoned. This application Jun. 29, 1978, Ser. No. 920,437
Int. Cl.[2] B28B *23/04;* B32B *13/02, 13/14*
U.S. Cl. 264—228 4 Claims

1. A method of pre-stressing a wet-laid concrete which comprises first soaking in water overnight then embedding at least one nontensioned polypyrrolidone reinforcing bar in wet-laid concrete, said embedding being effected by locating said nontensioned polypyrrolidone reinforcing bar within the concrete at least 0.75 times the width of the reinforcing bar from the surface of the wet-laid concrete said nontensioned polypyrrolidone reinforcing bar having a diameter of at least



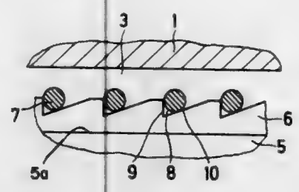
1/16-inch, and thereafter curing the so-treated wet-laid concrete.

4,174,367

FORM TOOL FOR PRODUCTION OF A REINFORCED HOSE PIECE

Rudolf Breher, Porta Westfalica, Fed. Rep. of Germany, assignor to Breco Kunststoffverarbeitungs-GmbH & Co. KG, Porta Westfalica, Fed. Rep. of Germany

Filed Nov. 23, 1977, Ser. No. 854,352
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1976, 2653741
Int. Cl.[2] B29F *00/00;* B23B *31/06*
U.S. Cl. 264—261 7 Claims



1. A form tool for the production of a hose shaped piece from an injectable material with a reinforcing pull-resistant wire means embedded therein and extending in the circumferential direction of the hose piece, the form tool comprising for production by injection moulding

an injection moulding device comprising,

a mould sleeve having a substantially cylindrical inner surface,

end plates mounted at both ends of said mould sleeve, at least one of said end plates being detachable from said mould sleeve,

a mould core having a substantially cylindrical outer surface being disposed inside of said mould sleeve and being withdrawable from said mould sleeve in an axial direction thereof, said mould core being mounted in said end plates and centered within said mould sleeve at both ends thereof by said end plates and defining with said mould sleeve an annular hollow mould space having a radial width greater than the diameter of the wire means, said mould core being sealingly closed at both ends thereof by said end plates, respectively,

an injection channel means disposed in one of said end plates, communicating with one end of said mould space, for injecting with injection pressure an injectable material into said mould space in an axial injection direction of the form tool,

said mould core being formed on said outer surface with a plurality of longitudinal supporting ribs spaced apart in the circumferential direction of and extending in the axial direction of said mould core,

said supporting ribs constituting means for spacing said wire means at a predetermined radial distance from said outer surface of said mould core, while supporting and spacing said wire means simultaneously at a radial distance spaced from said inner surface of said mould sleeve,

said supporting ribs defining recesses adapted for receiving said wire means therein with the latter wound on said supporting ribs, said recesses being respectively arranged in said supporting ribs at predetermined distances in the longitudinal and circumferential directions of said supporting ribs in such a manner that said recesses form a predetermined helical line corresponding to a desired helical course for said wire means within the hose piece to be produced,

said recesses each having a sawtooth-like shape including a steep flank facing said injection channel means adapted to support said wire means in said injection direction and defining a depth of said recesses adapted for the injection moulding for preventing said wire means from rising over said steep flank out of said recesses under the force of the injection pressure during the injecting of the injectable material into said mould space,

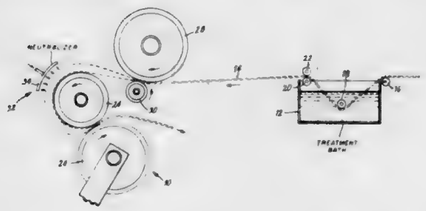
said recesses also each including an inclined flank facing in a direction away from said injection channel means and flatly ascending in a removal direction counter to said injection direction, and adapted for enabling windings of said wire means to climb over said inclined flanks and to shift along said supporting ribs during axial stripping a finished hose piece over said mould core under a stripping pressure against the hose piece in the removal direction.

4,174,368

CURVED SAUSAGE CASINGS

Herman S. Chiu, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jul. 31, 1978, Ser. No. 929,341
Int. Cl.[2] B29D *7/22*
U.S. Cl. 264—561 9 Claims



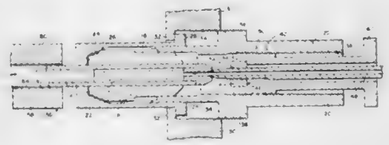
1. A method of producing curved regenerated cellulose casings which comprises the steps of (a) passing a regenerated cellulose tubular casing in contact with a cellulosic swelling solution for a time and at a concentration sufficient to plasticize said casing; (b) inflating the plasticized casing with an inert fluid; (c) passing said inflated plasticized casing around and in contact with a cylindrical surface to conform the shape of said plasticized casing to the shape of said cylindrical surface; (d) contacting said plasticized inflated casing with a neutralizing agent while said plasticized casing is disposed on said cylindrical surface, said neutralizing agent being employed in an amount and for a time sufficient to neutralize said cellulosic swelling solution impregnated in said casing; (e) removing said neutralized casing from said cylindrical surface and thereafter; (f) washing, plasticizing and drying said casing.

4,174,369

FLUID PRESSURE METHOD FOR RECOVERING FUEL PELLETS FROM NUCLEAR FUEL ELEMENTS

Clarence D. John, Jr., Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 749,869, Dec. 13, 1976. This application Nov. 1, 1977, Ser. No. 847,527
Int. Cl.[2] C22B *60/02*
U.S. Cl. 423—4 5 Claims



1. A method of removing fuel pellets from a metallic sheath of a fuel element comprising the steps of:

opening at least one end of said fuel element;

arranging a high pressure tube into contact with said opened end;

conducting water at a high pressure through said opened end and into said metallic sheath thereby internally pressuring said metallic sheath and expanding said metallic sheath away from said fuel pellets; and

inclining said fuel element to the horizontal thereby allowing said fuel pellets to slide out of said metallic sheath.

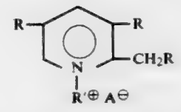
4,174,370

SUBSTITUTED PYRIDINES

Bernardus A. Oude Alink, St. Louis, and Neil E. S. Thompson, Creve Coeur, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 604,609, Aug. 14, 1975. This application Aug. 25, 1978, Ser. No. 937,040
Int. Cl.[2] C23F *9/00*
U.S. Cl. 422—12 4 Claims

1. A process of inhibiting the corrosion of metals which comprises treating a system, wherein metals are affected by corrosion, with a compound of the formula



where R is an alkyl, hydroxyalkyl, cycloalkyl or heterocyclic group and R' is an alkyl, hydroxyalkyl, cycloalkyl, aryl or heterocyclic group, and $A\ominus$ is a carboxylate anion.

4,174,371

INTEGRATED SOLAR HEATED RESOURCE TRANSFORMATION SYSTEM

William M. Bell, 21 Imrie Rd., Allston, Mass. 02134, and David A. Del Porto, 88 Blueberry Hill La., Sudbury, Mass. 01776

Filed Nov. 29, 1977, Ser. No. 855,779
Int. Cl.[2] C05F *3/04, 3/06;* F24J *3/02*
U.S. Cl. 422—109 23 Claims

1. An organic waste treatment system for the production of humus or compost providing for the controlled aerobic composting of organic materials, comprising in combination:

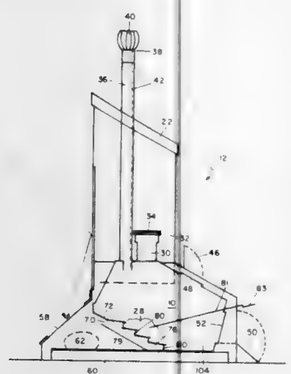
at least one composting chamber;

at least one thermal mass;

means for conveying air from the vicinity of at least one said thermal mass to at least one said composting chamber;

means for providing solar-derived heat to at least one said thermal mass;

at least one air intake port for providing air in the vicinity of at least one said thermal mass; and



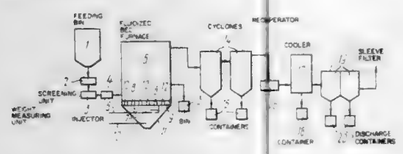
ventilation means communicating with at least one said composting chamber.

4,174,372

PROCESS FOR TREATMENT OF ANTIMONY-CONTAINING MATERIALS

Felix A. Myzenkov, ulitsa Vavilova, 93, kv. 9; Dmitry N. Klushin, Bolshoi Matrossky pereulok, 1, kv. 64; Viktor A. Shupikov, ulitsa Nagornaya, 15, korpus 11a, kv. 118, all of Moscow; Alexandr A. Kaizer, ulitsa Klubnaya, 3, kv. 1; Anatoly M. Shuklin, ulitsa Klubnaya, 3, kv. 2, both of Kirgizskaya SSR, Oshskaya oblast, Frunzensky raion, poselok Frunze; Mikhail D. Deresh, ulitsa Junykh Lenintsev, 89, korpus 2, kv. 52, Moscow; Nikolai A. Kolbin, Tashavtomash, 31, kv. 47, Tashkent; Alla P. Tolmacheva, ulitsa Vavilova, 93, kv. 9; Galina V. Zyryanova, ulitsa Petrozavodskaya, 15, korpus 2, kv. 144, both of Moscow; Vitaly M. Uzlov, ulitsa Kirova, 10, kv. 5, Kirgizskaya SSR, Oshskaya oblast, Frunzensky raion, poselok Frunze, and Elka I. Shmuelzon, ulitsa Metrostroevskaya, 35, kv. 38, Moscow, all of U.S.S.R.

Filed Jul. 26, 1977, Ser. No. 819,001
Int. Cl.[2] C01B *29/00*
U.S. Cl. 423—88 **10 Claims**



1. A process for treatment in a fluidized bed of antimony-containing materials involving combustion of the materials in the fluidized bed formed by the material, a fuel gas and an oxygen-containing gas at a temperature within the range of from 800° to 1,100° C. obtained by combusting a mixture of said fuel gas and oxygen-containing gas,

supplying said fuel gas and said oxygen-containing gas through separated openings to the fluidized bed, and

forming said gas mixture directly in the fluidized bed after supplying thereinto said fuel gas and oxygen-containing gas as separate streams through said separate openings and uniformly distributed over the bottom of the fluidized bed so that the fuel gas stream is surrounded in the fluidized bed over its entire perimeter by the oxygen-containing gas streams.

4,174,373

PROCESS FOR REMOVING SULFUR OXIDES AND NITROGEN OXIDES FROM FLUE GASES

Kazuetsu Yoshida, Hachioji; Michiharu Seki, Fuchu; Keiichi Kanehori, Tokyo; Katsuhiro Kaneko, Sayama, and Yo Sakurai, Kunitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 29, 1975, Ser. No. 609,081
Claims priority, application Japan, Sep. 4, 1974, 49/100904
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—239 **26 Claims**

1. A process for removing at least one of nitrogen oxides and sulfur oxides contained in a flue gas, which comprises contacting a flue gas containing at least one of nitrogen oxides and sulfur oxides with a catalyst comprising a carbonaceous material impregnated with at least one of bromine, iodine, chlorine, ammonium bromide, ammonium iodide, ammonium chloride, hydrogen bromide, hydrogen iodide and hydrogen chloride, and at least one of metal elements of groups 1B, 3B, 4B, 5B, 6B, 2A, 3A and 8 of the periodic table as a promoter in the presence of ammonia.

4,174,374

MAINTAINING THE SEPARATION EFFICIENCY OF IMMOBILIZED LIQUID MEMBRANES IN GAS SEPARATION METHODS AND APPARATUS

Stephen L. Matson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 809,116, Jun. 22, 1977, Pat. No. 4,114,408. This application Aug. 16, 1978, Ser. No. 934,013
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—232 **9 Claims**

1. In a method for removing a gaseous component from a gaseous mixture comprising:

contacting said mixture with an immobilized liquid membrane containing in the liquid thereof at least one carrier species which is reversibly chemically reactive with said component to effect facilitated transport of said component through said membrane to a gas-permeable barrier which is substantially impervious to said liquid;

passing the gases emerging from said membrane through said gas-permeable barrier; and

absorbing in a sweep liquid the gases emerging from said gas-permeable barrier;

the improvement for substantially maintaining the separation efficiency of said membrane; comprising:

said sweep liquid containing a quantity of said carrier species; and

said sweep liquid being contacted with said immobilized liquid membrane through a discrete passage extending transversely through said barrier, to effect diffusive transfer of at least a portion of said reactive species from said sweep liquid into the liquid immobilized in said membrane.

4,174,375

PROCESS FOR REMOVING FLUORINE COMPOUNDS AND SULFUR DIOXIDE FROM EXHAUST GASES

Stephen L. Holehouse, Frankfurt am Main, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 14, 1978, Ser. No. 924,716
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735566
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—240 **8 Claims**

1. A process for removing hydrogen fluoride and sulfur dioxide from exhaust gas comprising the steps of:

(a) scrubbing the exhaust gas in a first scrubbing stage with acid absorbent solution containing ions of sodium, potassium or ammonium and having a pH-value of at most 5 to remove a major part of the fluorine compounds;

(b) recycling part of the absorbent solution used in step (a) to said first scrubbing stage;

(c) scrubbing the exhaust gas scrubbed in the first scrubbing stage in a second scrubbing stage with a basic absorbent solution containing ions of sodium, potassium or ammonium and having a pH-value of at least 8 to remove SO_2 and residual hydrogen fluoride and produce a highly water-soluble sulfite and/or sulfate;



(d) in a regeneration zone regenerating a first part of the absorbent solution used in the second scrubbing stage (c) by the addition of calcium hydroxide thereto, and withdrawing sludge from the regeneration zone;

(e) softening regenerated scrubbing solution from step (d) by mixing it in a softening zone with absorbent solution used in and withdrawn from step (a) which contains fluoride ions to precipitate calcium fluoride, and recovering the calcium fluoride precipitated;

(f) mixing softened absorbent solution which has been regenerated and softened in step (e) with a second part of the absorbent used in the second scrubbing stage (c) and feeding the resulting mixture as the basic absorbent solution to the second scrubbing stage; and

(g) withdrawing a third part of the absorbent solution used in the second scrubbing stage (c) and feeding this third part to the first scrubbing stage (a) as part of the solution to be used therein.

4,174,376

PROCESS FOR MANUFACTURING POTASSIUM POLYPHOSPHATE

James E. Seymour, Virginia Beach, Va., assignor to Royster Company, Norfolk, Va.

Filed Nov. 29, 1977, Ser. No. 855,780
Int. Cl.[2] C01B *15/16, 25/26*
U.S. Cl. 423—315 **2 Claims**

1. A process for making potassium polyphosphate, comprising the steps of:

(a) combining ammonium bisulfate, sulfuric acid, phosphate rock and water to form decomposed phosphate rock,

(b) filtering the decomposed phosphate rock,

(c) adding to the decomposed phosphate rock filtrate a material selected from the group consisting of potassium chloride, potassium sulfate and potassium chloride and potassium sulfate to yield combination;

(d) filtering said first combination to remove potassium fluosilicate,

(e) adding additional potassium chloride to the filtrate to yield a second combination, said additional potassium chloride being added in an amount sufficient to permit polymerization under heat of said second combination,

(f) heating said second combination to at least the polymerization point,

(g) separating solid potassium polyphosphate from the vapor phase of the second combination,

(h) processing said second combination following said removal of potassium polyphosphate to yield bisulfate and sulfuric acid, and

(i) recycling the ammonium bisulfate and sulfuric acid to the process input.

4,174,377

FORMATION OF CYANATE COMPOUNDS

Lee E. Trimble, Clark, and Rudolf J. H. Voorhoeve, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 25, 1978, Ser. No. 909,381
Int. Cl.[2] C01C *3/00, 3/14*
U.S. Cl. 423—365 **14 Claims**



1. A process for producing isocyanic acid comprising the steps of (1) contacting a hydrogenation catalyst with a reaction mixture comprising a nitrogen oxide, CO, and a source of hydrogen under reaction conditions which avoid the substantial formation of collectible ammonia from said reaction mixture and (2) removing said isocyanic acid from the reactant flow.

9. A process for producing ammonium cyanate comprising the steps of (1) contacting a hydrogenation catalyst with a reaction mixture comprising a nitrogen oxide, CO, a source of hydrogen, and ammonia under reaction conditions which avoid the substantial in situ formation of ammonia entities from said reaction mixture and (2) removing said ammonium cyanate from the reactant flow.

4,174,378

IRIDIUM COMPOUND AND PREPARATION THEREOF

Anthony J. Scarpellino, Jr., Tuxedo, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Jul. 14, 1978, Ser. No. 924,618
Int. Cl.[2] C01B *21/00; C01G 55/00*
U.S. Cl. 423—386 **10 Claims**

1. A method of preparing an iridium compound comprising refluxing a diammonium hexahalo salt of iridium, said salt being a member of the group consisting of $(NH_4)_2IrCl_6$ and $(NH_4)_2IrBr_6$, and sulfamic acid in an aqueous medium for a period of time greater than about 30 hours, to permit the formation of a precipitate, said precipitate forming after distillation and cooling of the resultant refluxing product.

4,174,379

MANUFACTURE OF AMMONIUM NITRATE

Robert E. Froehlich, New Providence, and Reginald A. Baldini, South Orange, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Apr. 13, 1978, Ser. No. 895,884
Int. Cl.[2] C01B *1/18*
U.S. Cl. 423—396 **19 Claims**

1. A process for the manufacture of ammonium nitrate using urea process tail gas, said tail gas including ammonia, carbon dioxide and water vapor, said process including the steps of:

(a) reacting water with nitrogen dioxide in an absorption tower to form nitric acid;

(b) reacting said urea process tail gas with said nitric acid to yield an aqueous solution including ammonium nitrate and water, and a tail gas including carbon dioxide, ammonia and water vapor;

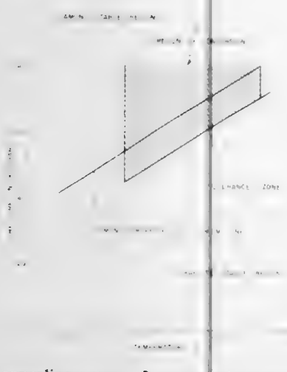
(c) adding a carrier gas to said ammonium nitrate process tail gas to yield a resultant gaseous stream;
(d) cooling said resultant gaseous stream to approximately 60 degrees C., a portion of said water vapor included in said resultant stream being condensed to water, a portion of said ammonia reacting with a portion of said carbon dioxide to form ammonium carbonate and/or ammonium bicarbonate, said carrier gas acting to prevent condensation of some of said water vapor included in said resultant gaseous stream;
(e) separating said condensed water from said cooled resultant stream;
(f) passing said cooled resultant gaseous stream including a water vapor portion to the atmosphere, and
(g) passing said water to said absorption tower for use in said formation of nitric acid.

4,174,380

ANNEALING SYNTHETIC DIAMOND TYPE IB

Herbert M. Strong, Schenectady; Richard M. Chrenko, Scotia, and Roy E. Tuft, Guilderland Center, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 707,298, Jul. 21, 1976, abandoned. This application Dec. 14, 1977, Ser. No. 860,283
The portion of the term of this patent subsequent to Nov. 7, 1995, has been disclaimed.
Int. Cl.[2] C01B *31/06*
U.S. Cl. 423—446 **12 Claims**



1. An annealing process for converting type Ib nitrogen in synthetic diamond crystal to type Ia nitrogen, said crystal having a minimum size of one micron as measured along the longest edge dimension of the crystal which consists essentially of subjecting said synthetic diamond crystal to an annealing temperature ranging from about 1500° C. to about 2200° C. under at least a pressure which prevents significant graphitization of said crystal at said annealing temperature for a period of time ranging from about one minute to about 50 hours and sufficient to convert at least about 20% of the total amount of type Ib nitrogen present in said crystal to type Ia nitrogen, the minimum pressure ranging from 48 kilobars at said annealing temperature of 1500° C. to a minimum pressure of 70 kilobars at said annealing temperature of 2200° C., and recovering the resulting annealed free synthetic diamond crystal wherein the dissolved nitrogen detectable by ultraviolet, visible and infrared absorption spectra and electron paramagnetic resonance consists of types Ib and Ia nitrogen, said type Ib nitrogen always being present in said annealed crystal in at least a detectable amount, said annealing process making no significant change in the morphology and physical dimensions of said synthetic diamond crystal.

4,174,381

CHLORINE AND IRON OXIDE FROM FERRIC CHLORIDE—PROCESS AND APPARATUS

James W. Reeves; Robert W. Sylvester, both of Wilmington, Del., and David F. Wells, Avondale, Pa., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Apr. 24, 1978, Ser. No. 899,696
Int. Cl.[2] C01B *7/03*
U.S. Cl. 423—502 **4 Claims**



1. In a process for producing chlorine and iron oxide in a multistage recirculating-fluidized-bed reactor, wherein ferric chloride is treated in the vapor phase with an excess of oxygen at superatmospheric pressure and at a temperature from 550° to 800° C. in the presence of a catalyst made from sodium chloride and iron oxide, a carbonaceous fuel is fed to the reactor to supply supplemental heat, particles of bed material are recirculated to the reactor, and gaseous and solid effluents are separated and recovered downstream of the reactor,
the improvement comprising carrying out the process in reaction zones comprising
(1) an initial dense zone having a length-to-diameter ratio, $(L/D)_1$, from 2:1 to 4:1, wherein a solids volume fraction, S_1, from 0.3 to 0.6 and a superficial gas velocity, V_1, in the range of 0.15 to 0.6 meters/second are maintained and wherein the fuel is burned, the recirculated-bed material and reactants are heated, the ferric chloride is vaporized and oxidation of the ferric chloride is initiated, and
(2) a downstream dilute zone having a length-to-diameter ratio, $(L/D)_4$, of at least 10:1 wherein a solids volume fraction, S_4, from 0.005 to 0.05 and a superficial gas velocity, V_4, from 1.5 to 6 meters/second are maintained, which velocity is from 4 to 25 times the superficial gas velocity in the dense zone.

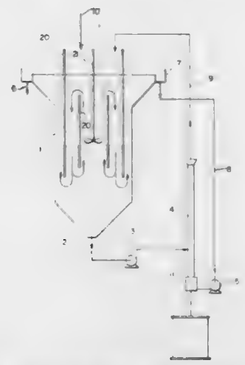
4,174,382

PROCESS FOR THE PRODUCTION OF COARSE K_2SO_4 IN CRYSTALLIZERS AND CLASSIFIERS

Eckhard Menche, Heringen, Fed. Rep. of Germany, assignor to Kali und Salz AG, Kassel, Fed. Rep. of Germany

Filed Jun. 8, 1977, Ser. No. 804,727
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1976, 2627871
Int. Cl.[2] C01D *5/00, 15/06, 17/00*
U.S. Cl. 423—552 **8 Claims**

1. A continuous process for producing K_2SO_4 which comprises:
(a) introducing K_2SO_4 or K_2SO_4 precursor and a solvent therefor into a crystallizer having a slurry outlet means at the bottom portion thereof, an overflow means for supernatant liquid at the top portion thereof and circulating means therein;
(b) supersaturating the resultant solution of K_2SO_4 in said crystallizer, and crystallizing K_2SO_4 out of the resultant supersaturated solution of K_2SO_4 to form a slurry comprising coarse and fine crystalline K_2SO_4 and supernatant, said slurry having a slurry density of over 40% and up to about 80% by weight;
(c) withdrawing slurry from the bottom portion of said crystallizer and introducing said slurry into a separate elutriation classifier comprising an elongated tubular vessel;
(d) withdrawing supernatant collecting at the overflow means of the crystallizer and introducing supernatant into the lower portion of said elongated tubular vessel;



(e) maintaining a slurry density of from about 15% to about 25% by weight, and a flow rate sufficient to effect elutriative separation of particles of a size below 0.16 mm from coarser particles, within said elongated tubular vessel;
(f) withdrawing the supernatant and fine crystalline K_2SO_4 passing upwardly in the elongated tubular vessel, as overhead from the elongated tubular vessel and recycling same to the crystallizer; and,
(g) withdrawing coarse crystalline K_2SO_4 of a particle size above 0.16 mm at the lower portion of said elongated tubular vessel.

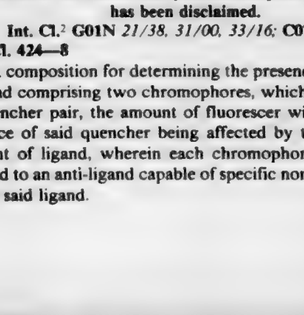
4,174,383

PROCESS FOR PURIFYING A SULFUR DIOXIDE CONTAINING GAS WITH PRODUCTION OF ELEMENTAL SULFUR

Andre Deschamps, Chatou; Claude Dezael, Maisons Laffitte; Henri Gruhier, Chatillon sous Bagneux, and Philippe Renault, Noisy le Roi, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Continuation of Ser. No. 532,606, Dec. 13, 1974, abandoned. This application Aug. 26, 1976, Ser. No. 717,943
Claims priority, application France, Dec. 17, 1973, 73 45151
Int. Cl.[2] C01B *17/00, 7/02*
U.S. Cl. 423—573 R **12 Claims**

1. A process for purifying a sulfur dioxide-containing gas, comprising the steps of:
(a) contacting the impure gas with an aqueous solution containing at least ammonium sulfite, ammonium thiosulfate, and ammonium sulfate and to form a solution having at the end of said contact step a pH from 3.5 to 5, in order to absorb sulfur dioxide, then separating the gas from the solution,
(b) reacting resultant SO_2-containing aqueous solution from step (a) whose pH is from 3.5 to 5 with a hydrogen sulfide containing gas at 20°–90° C., to produce an aqueous phase containing dispersed solid sulfur and dissolved ammonium sulfate and ammonium thiosulfate,
(c) separating resultant aqueous phase containing sulfur into (1) a concentrated dispersion of said sulfur in a fraction of said aqueous phase and (2) a substantially sulfur-free fraction of said aqueous phase,
(d) heating the concentrated dispersion of step (c) to melt sulfur contained therein and separating said molten sulfur therefrom to form a substantially sulfur-free aqueous phase,
(e) recycling to step (a) a portion of said substantially sulfur-free aqueous phases obtained in steps (c) and (d), the total amount of dissolved ammonium sulfate and the total amount of dissolved ammonium thiosulfate in said aqueous phases emanating from steps (c) and (d) being greater with respect to the amounts of ammonium sulfate and ammonium thiosulfate, respectively, in the aqueous absorbing solution of step (a),



(f) introducing residual portion of said substantially sulfur-free aqueous phases into a molten salt formed of ammonium sulfate and/or bisulfate at 250°–400° C. and decomposing ammonium sulfate and ammonium thiosulfate in said residual portion in order to produce a decomposition gas containing sulfur dioxide, ammonia and steam so as to retard a buildup with respect to time of ammonium sulfate and ammonium thiosulfate in the process, and
(g) recycling said decomposition gas to step (a).

4,174,384

FLUORESCENCE QUENCHING WITH IMMUNOLOGICAL PAIRS IN IMMUNOASSAYS

Edwin F. Ullman, Atherton, and Moshe Schwarzberg, Palo Alto, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Continuation of Ser. No. 591,386, Jun. 30, 1975, Pat. No. 3,996,345, which is a continuation-in-part of Ser. No. 497,167, Aug. 12, 1974, abandoned. This application Oct. 12, 1976, Ser. No. 731,255
The portion of the term of this patent subsequent to Dec. 7, 1993, has been disclaimed.
Int. Cl.[2] G01N *21/38, 31/00, 33/16*; C07G *7/00*
U.S. Cl. 424—8 **4 Claims**

1. A composition for determining the presence or amount of a ligand comprising two chromophores, which are a fluorescer-quencher pair, the amount of fluorescer within quenching distance of said quencher being affected by the presence or amount of ligand, wherein each chromophore is covalently bonded to an anti-ligand capable of specific non-covalent binding to said ligand.

V 9 8 N 2 0 1 3 7 9 UMI

4,174,385

METHOD OF IDENTIFICATION OF SURFACE PROTEINS OF CANCER CELLS, CLINICAL TEST AND METHOD OF IMMUNIZATION

Robert H. Reid, 910 Rivenoak, Birmingham, Mich. 48008, assignor to Robert Reid; Robert Alpern; Allan B. Schaffer; Sheldon A. Fealk and Jerry Michael Ellis, all of Southfield, Mich., a part interest to each

Filed Oct. 8, 1976, Ser. No. 730,764
Int. Cl.[2] A61K *43/00*; G01N *33/16*
U.S. Cl. 424—1 7 Claims

1. A method of identification of a specific cancer in a subject, comprising:

(a) synthesizing a peptide having amino acids in sequence including the active site from the n-terminal tridecapeptide of the cancer cell surface antigen protein for specific cell immunity;

(b) developing an antisera in a heterologous animal by injecting the animal with said synthetic peptide, bleeding the animal and recovering the antisera;

(c) conjugating said antisera with a detectable tag; and

(d) contacting the cells to be tested for cancer with said conjugate and determining the presence of said detectable tag.

4,174,386

AEROSOL ANTIPERSPIRANT COMPOSITIONS WITH GOOD ADHERENCE TO THE SKIN

Joseph G. Spitzer, 44 Coconut Row, Palm Beach, Fla. 33480; Lloyd I. Osipow, 2 Fifth Ave., New York, N.Y. 10011; Marvin Small, 1100 Park Ave., New York, N.Y. 10028, and Dorothea C. Marra, 107 Fernwood Rd., Summitt, N.J. 07901

Continuation-in-part of Ser. No. 724,425, Sep. 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 706,857, Jul. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 554,388, Mar. 3, 1975, Pat. No. 3,970,219, Ser. No. 670,913, Mar. 26, 1976, Pat. No. 4,019,657, Ser. No. 566,562, Apr. 9, 1975, abandoned, Ser. No. 620,448, Oct. 7, 1975, abandoned, and Ser. No. 628,283, Nov. 3, 1975, abandoned. This application Dec. 18, 1978, Ser. No. 970,013
Int. Cl.[2] A61K *7/32, 7/34, 7/38*
U.S. Cl. 424—47 30 Claims

1. An aerosol antiperspirant composition that is highly concentrated with respect to the active antiperspirant, and capable of being dispensed from aerosol containers of the foam type at a low delivery rate in a propellant gas:liquid ratio within the range from about 10:1 to about 40:1 comprising, in combination, a liquid phase comprising a nonvolatile miscible organic liquid in an amount within the range from about 0.1 to about 30% by weight of the composition; an antiperspirant salt in an amount within the range from about 8 to about 30% by weight of the composition; a bulking agent in an amount within the range from about 0.1 to about 5% by weight of the composition; a liquefied propellant having a vapor pressure of at least 2.4 atmospheres absolute at 21° C., in an amount of at least 0.15 mole per atmosphere absolute pressure at 21° C. per 100 g of composition to generate an expelled gas:liquid ratio within the range from about 10:1 to about 40:1 and a solid saturated aliphatic carboxylic acid having from about fourteen to about twenty-two carbon atoms in a straight chain and in an amount within the range from about 0.1 to about 5% by weight of the composition to improve adherence of the antiperspirant salt to the skin.

4,174,387

REDUCTION OF ABRASIVENESS IN DENTIFRICES

Martin Cordon, Highland Park, and Robert E. Dickson, Belle Mead, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 544,618, Jan. 28, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 764,131
Int. Cl.[2] A61K *7/18*
U.S. Cl. 424—52 6 Claims

1. A dentifrice having a pH above about 7 obtained by incorporation therein of not more than an effective amount of an alkaline buffering agent, and having cleaning and polishing characteristics containing the abrasive system consisting of at least 10 and up to 70% of an amorphous alkali metal or alkaline earth metal alumino-silicate and at least 7.5% and up to 20% of calcined alumina in the form of alpha-alumina flakes having a particle size of about 1 to 15 microns in diameter and in an amount to provide a radioactive enamel abrasion value to the dentifrice of above about 450, and about 0.005–1.0% of a water soluble fluoride salt to reduce the enamel abrasion of the dentifrice.

4,174,388

METHOD FOR PREPARING HEPATITIS B IMMUNE GLOBULIN

William J. McAleer, Ambler, and Edward H. Wasmuth, Telford, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 830,291, Sep. 2, 1977, Pat. No. 4,118,477, which is a continuation-in-part of Ser. No. 768,236, Feb. 14, 1977, abandoned, which is a division of Ser. No. 587,707, Jun. 16, 1975, Pat. No. 4,024,243. This application Jul. 19, 1978, Ser. No. 925,736
Int. Cl.[2] A61K *39/42*
U.S. Cl. 424—86 1 Claim

1. A method of preparing hepatitis B immune globulin which comprises

selecting a plurality of individuals positive for hepatitis B surface antibody,

administering to the individuals hepatitis B surface antigen in an amount effective to stimulate antibody formation,

monitoring the antibody level of the individuals following administration of the hepatitis B surface antigen,

obtaining plasma from those individuals exhibiting an increase of hepatitis B surface antibody of at least 2,000 PHA units/ml,

and preparing hepatitis B immune globulin from the plasma.

4,174,389

OPHTHALMIC USE OF COLLAGENASE

Louise A. Cope, 3803 University Blvd., Houston, Tex. 77005

Filed May 13, 1977, Ser. No. 796,807
Int. Cl.[2] A61K *37/48*
U.S. Cl. 424—94 6 Claims

1. A method for the selective lysis of collagen fibrils located in the vitreous of the ocular region of a mammal comprising:

injecting intravitreally a small but effective amount of a pharmacologically suitable solution comprising a concentrated amount of collagenase;

contacting said fibrils with said solution;

flushing the intravitreal region by injecting an effective amount of an inactivator of collagenase solution; and

removing said collagenase solution from said intravitreal region before said solution damages other ocular structures not intended to be affected thereby.

4,174,390

ANTIBIOTIC A-7413 AND PROCESS FOR PREPARATION THEREOF

Robert L. Hamill, Greenwood, and W. Max Stark, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 766,306, Feb. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 737,456, Nov. 1, 1976, abandoned, which is a division of Ser. No. 655,670, Feb. 4, 1976, abandoned. This application Aug. 11, 1978, Ser. No. 932,833
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—117 9 Claims

1. A method of increasing feed-utilization efficiency in ruminant animals which comprises orally administering to said animals an effective propionate-increasing amount of a member selected from a group consisting of (1) A-7413 complex produced by cultivating Actinoplanes sp. NRRL 8122 in a culture medium containing assimilable sources of carbohydrate, nitrogen and inorganic salts under submerged aerobic fermentation conditions until a substantial amount of antibiotic activity is produced; (2) A-7413 factor A which is a white to light-yellow crystalline material when crystallized from ethanol; which is soluble in methanol, chloroform, dimethylformamide, dichloroethane and dimethyl sulfoxide; is slightly soluble in ethanol and aqueous ethanol; but is insoluble in acetone, benzene, carbon tetrachloride, dichloromethane, methyl isobutyl ketone, ethyl acetate, diethyl ether and water; which melts with decomposition at about 205°–212° C. and which has:

(A) an apparent molecular weight of approximately 1308, as determined by titration;

(B) an approximate elemental composition of 51.92 percent carbon, 5.25 percent hydrogen, 9.85 percent nitrogen, 22.63 percent oxygen, and 9.66 percent sulfur;

(C) a proposed approximate empirical formula of $C_{72}H_{87}N_{12}O_{23}S_5$;

(D) a specific rotation, $[\alpha]D^{25}$, of +54.5° (c 2.0, $CHCl_3$);

(E) an infrared absorption spectrum in KBr disc with the following observable absorption maxima: 2.93 (shoulder), 2.98 (medium), 3.24 (weak), 3.38 (shoulder), 3.44 (medium), 3.53 (weak), 5.78 (weak), 6.03 (strong), 6.56 (strong), 6.79 (medium), 7.08 (medium), 7.27 (weak), 7.49 (weak), 7.65 (weak), 8.08 (medium), 8.41 (weak), 8.62 (weak), 8.81 (medium), 9.03 (weak), 9.35 (medium), 9.60 (medium), 9.92 (weak), 10.20 (weak), 12.05 (weak), 12.66 (weak), and 13.51 (weak) microns;

(F) an ultraviolet absorption spectrum with the following absorption maxima:

(a) in neutral, 95% aqueous ethanol:
215 nm ($E_{1cm}^{1\%}$=485);
260 nm (shoulder; $E_{1cm}^{1\%}$=240);
300 nm (shoulder; $E_{1cm}^{1\%}$=170);
358 nm (shoulder; $E_{1cm}^{1\%}$=112.5);

(b) in acidic ethanol:
217 nm ($E_{1cm}^{1\%}$=440);
265 nm ($E_{1cm}^{1\%}$=227.5);
293 nm ($E_{1cm}^{1\%}$=210);
358 nm ($E_{1cm}^{1\%}$=95);

(c) in basic methanol:
278 nm (shoulder; $E_{1cm}^{1\%}$=255);
408 nm ($E_{1cm}^{1\%}$=80);

(G) a titratable group with a pK_a value of 7.9 in 80% aqueous dimethylformamide;

(H) an amino-acid analysis, after acidic hydrolysis, which indicates the presence of ammonia, glycine, threonine, aspartic acid, and an as-yet-unidentified amino acid;

(I) a characteristic X-ray powder diffraction pattern (Cu^{++} radiation, 1.54505 λ, nickel filter) having the following interplanar spacings in angstroms (d):

d	Relative Intensity
12.44	100
10.77	70

-continued

d	Relative Intensity
7.96	100
5.71	50
5.09	80
4.53	100
4.25	80
3.88	80
3.61	10
3.44	10
3.03	5

(J) the following R_f values in the paper-chromatographic systems indicated below, using *Bacillus subtilis* ATCC 6633 as a detection organism:

R_f Value	Solvent System
0.57	Butanol sat. with water
0.49	Methyl isobutyl ketone: butanol:water (25:21:4)
0.62	Metanol:water (1:1)
0.30	Water:methanol:acetone (12:3:1); adjusted to pH 10.5 with NH_4OH and then lowered to pH 7.5 with H_3PO_4
0.71	Methanol:0.1 N HCl (3:1)

(K) the following R_f values in the silica-gel thin-layer-chromatographic systems indicated below, using *Bacillus subtilis* as a detection organism:

R_f Value	Solvent System
0.26	Chloroform:methapol (9:1)
0.23	Acetonitrile: water (9:1)

(L) an acid function capable of forming salts and ester derivatives;

(M) at least one hydroxy group capable of esterification; and

(N) the ability to form derivatives with thiol carboxylic acids;

(3) A-7413 factor B which is a white to light-yellow amorphous material which melts above 300° C. and which is soluble in methanol, chloroform, dimethylformamide, dichloroethane and dimethyl sulfoxide; is slightly soluble in ethanol and aqueous ethanol; but is insoluble in acetone, benzene, carbon tetrachloride, dichloromethane, methyl isobutyl ketone, ethyl acetate, diethyl ether and water; and which has:

(A) an approximate elemental composition of 66.34 percent carbon, 8.73 percent hydrogen, 2.98 percent nitrogen, 19.39 percent oxygen, and 2.83 percent sulfur;

(B) a specific rotation, $[\alpha]D^{RT}$, of −26.2° (c 7.5, DMSO);

(C) an infrared absorption spectrum in KBr disc with the following observable absorption maxima: 2.97 (strong), 3.38 (strong), 3.42 (strong), 3.50 (strong), 5.78 (shoulder), 5.99 (medium), 6.50 (medium), 6.80 (medium), 6.90 (shoulder), 7.00 (shoulder), 7.22 (medium), 7.27 (shoulder), 7.42 (weak), 7.58 (weak), 7.78 (shoulder), 7.97 (medium), 8.33 (shoulder), 8.53 (medium), 9.00 (shoulder), 9.26 (strong), 9.71 (strong), 11.11 (weak), 11.79 (weak), 12.35 (weak) and 13.25 (weak) microns;

(D) an ultraviolet absorption spectrum with the following absorption maxima:

(a) in neutral, 95% aqueous ethanol:
268 nm ($E_{1cm}^{1\%}$=104.3);
357 nm (shoulder; $E_{1cm}^{1\%}$=30);

(b) in acidic ethanol:
268 nm ($E_{1cm}^{1\%}$=108.5);
357 nm (shoulder; $E_{1cm}^{1\%}$=35);

(c) in basic ethanol:

268 nm (shoulder; $E_{1cm}^{1\%} = 178.6$);

(E) an amino-acid analysis, after acidic hydrolysis, which indicates the presence of ammonia, glycine, threonine, aspartic acid, and an as-yet-unidentified amino acid;

(F) the following R_f values in the paper-chromatographic systems indicated below, using *Bacillus subtilis* ATCC 6633 as a detection organism:

R_f Value	Solvent System
0.46	Butanol sat. with water
0.33	Methyl isobutyl ketone: butanol:water (25:21:4)
0.58	Methanol:water (1:1)
0.26	Water:methanol:acetone (12:3:1); adjusted to pH 10.5 with NH_4OH and then lowered to pH 7.5 with H_3PO_4
0.71	Methanol:0.1 N HCl (3:1)

(G) the following R_f values in the silica-gel thin-layer-chromatographic systems indicated below, using *Bacillus subtilis* as a detection organism:

R_S Value	Solvent System
0.09	Chloroform: methanol (9:1)
0.03	Acetonitrile:water (9:1)

(H) an acid function capable of forming salts and ester derivatives;

(I) at least one hydroxyl group capable of esterification; and

(J) the ability to form derivatives with thiol carboxylic acids;

(4) A-7413 factor C which is a white to light-yellow amorphous material which melts above 250° C. and which is soluble in methanol, chloroform, dimethylformamide, dichloroethane and dimethyl sulfoxide; is slightly soluble in ethanol and aqueous ethanol; but is insoluble in acetone, benzene, carbon tetrachloride, dichloromethane, methyl isobutyl ketone, ethyl acetate, diethyl ether and water; and which has:

(A) an approximate elemental composition of 69.38 percent carbon, 9.92 percent hydrogen, 2.34 percent nitrogen, 16.58 percent oxygen, and 1.73 percent sulfur;

(B) an infrared absorption spectrum in KBr disc with the following observable absorption maxima: 3.00 (medium), 3.38 (shoulder), 3.42 (strong), 3.51 (strong), 5.73 (medium), 6.02 (medium), 6.14 (shoulder), 6.52 (weak), 6.56 (weak), 6.77 (medium), 6.80 (shoulder), 6.97 (weak), 7.20 (weak), 8.25 (weak), 8.33 (weak), 8.40 (weak), 8.86 (weak), 9.39 (weak), 10.05 (weak), 10.53 (weak), 10.70 (weak), 11.77 (weak) and 13.66 (weak) microns;

(C) an ultraviolet absorption spectrum with the following absorption maxima:

(a) in neutral, 95% aqueous ethanol:
205 nm ($E_{1cm}^{1\%} = 356$);
235 nm (shoulder; $E_{1cm}^{1\%} = 180$);
260 nm (shoulder; $E_{1cm}^{1\%} = 127$);
290 nm (shoulder; $E_{1cm}^{1\%} = 104$);

(b) in acidic ethanol:
205 nm ($E_{1cm}^{1\%} = 356$);
235 nm (shoulder; $E_{1cm}^{1\%} = 180$);
260 nm (shoulder; $E_{1cm}^{1\%} = 127$);
290 nm (shoulder; $E_{1cm}^{1\%} = 103$);
355 nm (shoulder; $E_{1cm}^{1\%} = 40$);

(c) in basic ethanol:
260 nm (shoulder; $E_{1cm}^{1\%} = 268$);
325 nm (shoulder; $E_{1cm}^{1\%} = 189$);

(D) an amino-acid analysis, after acidic hydrolysis, which indicates the presence of ammonia, glycine, threonine, aspartic acid, and phenylalanine;

(E) the following R_f values in the paper-chromatographic systems indicated below, using *Bacillus subtilis* ATCC 6633 as a detection organism:

R_S Value	Solvent System
0.82	Butanol sat. with water
0.90	Methyl isobutyl ketone: butanol:water (25:21:4)
0.31	Methanol:water (1:1)
0.06	Water:methanol:acetone (12:3:1); adjusted to pH 10.5 with NH_3OH and then lowered to pH 7.5 with H_3PO_4
0.42	Methanol:0.1 N HCl (3:1)

(F) the following R_f values in the silica-gel thin-layer-chromatographic systems indicated below, using *Bacillus subtilis* as a detection organism:

R_f Value	Solvent System
0.46	Chloroform:methanol (9:1)
0.42	Acetonitrile:water (9:1)

(G) an acid function capable of forming salts and ester derivatives;

(H) at least one hydroxyl group capable of esterification; and

(I) the ability to form derivatives with thiol carboxylic acids;

(5) the methyl ester derivative of A-7413 factor A, which is soluble in the same solvents as is A-7413 factor A, which has an approximate empirical formula of $C_{73}H_{89}N_{12}O_{23}S_5$, an ultraviolet absorption spectrum and an amino-acid content as given for A-7413 factor A, and which has an infrared absorption spectrum as shown in FIG. 4 of the drawings; (6) the acetyl and triacetyl ester derivatives of A-7413 factor A, each of which is soluble in the same solvents as is A-7413 factor A, each of which has an ultraviolet absorption spectrum, an amino-acid content, and an electrometric titration as given for A-7413 factor A, the acetyl-ester derivative having an approximate empirical formula of $C_{74}H_{89}N_{12}O_{24}S_5$ and an infrared absorption spectrum as shown in FIG. 5 of the drawings and the triacetyl-ester derivative having an approximate empirical formula of $C_{78}H_{93}N_{12}O_{26}S_5$ and an infrared absorption spectrum as shown in FIG. 6 of the drawings; and (7) the physiologically acceptable salts of A-7413 factors A, B, and C; or (8) the physiologically acceptable salts of the acetyl and triacetyl ester derivatives of A-7413 factor A.

4,174,391

SPIRAMYCIN ESTERS

Robert F. Chapman, Benfleet; David D. Jackson, Wickford, and Glyn E. Lee, Thorpe Bay, all of England, assignors to May & Baker Limited, Essex, England

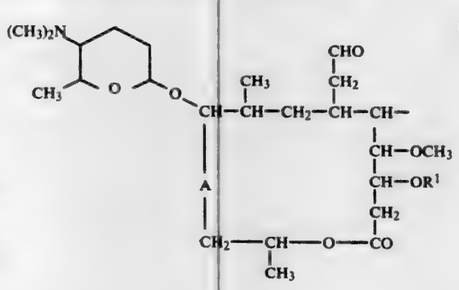
Filed Dec. 6, 1977, Ser. No. 857,999

Claims priority, application United Kingdom, Dec. 8, 1976, 51257/76

Int. Cl.[2] **A61K** *31/70;* **C07G** *11/00*

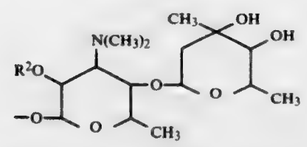
U.S. Cl. 424—180 **29 Claims**

1. A spiramycin derivative of the formula:



(I)

-continued



wherein R^1 represents acetyl, propionyl or hydrogen, A represents butenylene or butadienylene (wherein any double bonds present in A are trans), and R^2 represents a group of the formula:



(II)

wherein Z represents bivalent saturated or unsaturated alkylene of 1 to 6 carbon atoms, Y represents sulphur or oxygen, and R^3 represents alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 8 carbon atoms, phenyl or phenylalkyl in which the alkylene moiety is of 1 to 6 carbon atoms.

27. A pharmaceutical antibiotic composition which comprises a therapeutically effective amount of spiramycin derivative as claimed in claim 1 or a non-toxic pharmaceutically acceptable acid addition salt thereof together with a compatible pharmaceutically acceptable carrier.

4,174,392

COMBATING ARTHROPODS WITH SUBSTITUTED TRIAZINE-2,4-DIONES

Edgar Möhring, and Peter Roessler, both of Berg. Gladbach, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

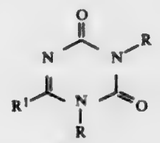
Filed May 9, 1978, Ser. No. 904,347

Claims priority, application Fed. Rep. of Germany, May 24, 1977, 2723248

Int. Cl.[2] **A01N** *9/00, 9/22*

U.S. Cl. 424—249 **9 Claims**

1. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a substituted triazine-2,3-dione of the formula



in which

R is phenyl, naphthyl, or phenyl or naphthyl substituted by halogen, nitro or alkyl with 1–4 carbon atoms, and

R^1 is phenyl, naphthyl, or phenyl or naphthyl substituted by halogen, C_1–C_4 alkyl, nitro, C_1–C_4 halogenalkyl, C_1–C_4 alkoxy C_1–C_4 alkylmercapto, C_1–C_4 halogenoalkoxy or C_1–C_4 halogenoalkylmercapto.

4,174,393

1,3,4-SUBSTITUTED PYRAZOLINE DERIVATIVES

Jan J. Van Daalen, Weesp, and Rudolf Mulder, Lunteren, both of Netherlands, assignors to Duphar International Research B.V., Netherlands

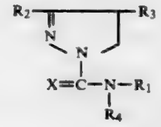
Continuation-in-part of Ser. No. 594,205, Jul. 9, 1975, Pat. No. 4,070,365. This application Jan. 5, 1977, Ser. No. 756,857

Claims priority, application Netherlands, Jan. 9, 1976, 7600178

Int. Cl.[2] **C07D** *231/06;* **A01N** *4/12, 9/22;* **C07D** *401/06*

U.S. Cl. 424—250 **18 Claims**

1. A compound of the formula:



wherein R_1 is a member selected from the group consisting of alkyl of 1 to 4 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenylalkyl wherein the alkyl moiety is of 1–4 carbon atoms, ring halogenated phenylalkyl wherein the alkyl moiety is of 1–4 carbon atoms, ring nitrated phenylalkyl wherein the alkyl moiety is of 1–4 carbon atoms, ring alkylated phenylalkyl wherein the alkyl moiety is of 1–4 carbon atoms, phenyl, phenyl substituted in the 2, 3 or 4 positions with up to two substituents selected from the group consisting of halogen, alkyl of 1 to 4 carbon atoms, halogenated alkyl of 1 to 4 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, dialkylamino wherein each alkyl moiety is of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, acyl of an aliphatic saturated monocarboxylic acid, acylamino wherein the acyl moiety is of an aliphatic saturated monocarboxylic acid, nitro, phenyl, halogenated phenyl and cyano, R_2 is a member selected from the group consisting of alkyl of 1 to 4 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl, phenyl substituted with 1 to 2 substituents selected from the group consisting of halogen, alkyl of 1 to 4 carbon atoms, haloalkyl of 1 to 4 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, monoalkylamino of 1 to 4 carbon atoms, dialkylamino wherein each alkyl is of 1 to 4 carbon atoms, nitro, phenyl, halophenyl and cyano, pyridyl, thienyl, halothienyl, nitrothienyl and alkyl substituted thienyl wherein the alkyl is of 1 to 4 carbon atoms, R_3 is a member selected from the group consisting of alkyl of 5 to 10 carbon atoms, alkyl of 1 to 6 carbon atoms substituted with a moiety selected from the group consisting of cycloalkyl of 3 to 6 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, nitro, piperidino, N-methyl-piperazino, halo, cyano, alkoxycarbonyl of 1 to 4 carbon atoms, nitrophenyl, halophenyl, alkyl substituted phenyl wherein the alkyl is of 1 to 4 carbon atoms, phenoxy, phenylthio, phenylsulfenyl, phenylsulfonyl, alkylphenylamino wherein the alkyl is of 1 to 4 carbon atoms, diphenylamino, dialkylamino wherein each alkyl is of 1 to 4 carbon atoms, N,N-dialkylcarbamoyl wherein each alkyl is of 1 to 4 carbon atoms and N,N-dialkylsulfamoyl wherein each alkyl is of 1 to 4 carbon atoms, R_4 is a member selected from the group consisting of hydrogen, alkyl of 1 to 15 carbon atoms, phenylalkyl wherein the alkyl is of 1 to 4 carbon atoms, cycloalkyl of 3 to 6 carbon atoms and halomethylthio and X is a member selected from the group consisting of oxygen and sulfur and with the proviso that when R_1 is phenyl substituted with a moiety selected from the group consisting of phenylthio, phenoxy and phenylalkyl and/or R_4 is a moiety selected from the group consisting of phenylalkyl, cycloalkyl and halomethylthio R_3 may in addition be a member selected from the group as R_2.

17. An insecticidal composition comprising a compound of claim 1 in an insecticidally effective amount and a finely divided carrier therefore.

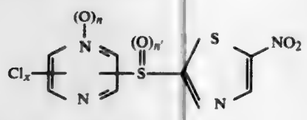
4,174,394

((5-NITRO-2-THIAZOLYL)THIO) AND ((5-NITRO-2-THIAZOLYL)SULFINYL)PYRAZINES

Craig E. Mixan, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 24, 1978, Ser. No. 889,809
Int. Cl.[2] A61K *31/495;* **C07D** *241/18*
U.S. Cl. 424—250 **11 Claims**

1. A compound of the formula



wherein n, n' and x are, individually, 0 or 1.

11. A composition for controlling bacteria or fungi comprising an antimicrobially-effective amount of a compound of claim 1.

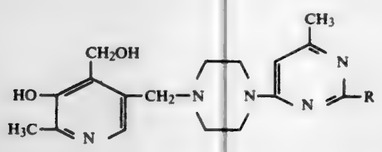
4,174,395

4-[4-(2-METHYL-3-HYDROXY-4-HYDROXYMETHYL-5-PYRIDYL-METHYL)-1-PIPERAZINYL]-6-METHYL-PYRIMIDINES

Alain Beguin, Meudon, France, assignor to Societe Civile de Recherches et d'Applications Scientifiques, Paris, France

Filed Jul. 3, 1978, Ser. No. 921,335
Claims priority, application United Kingdom, Jul. 12, 1977, 29281/77
Int. Cl.[2] A61K *31/505;* **C07D** *401/14*
U.S. Cl. 424—251 **2 Claims**

1. New derivatives of pyrimidine of the general formula:



in which R represents a piperidino radical or a 4-(2-methyl-3-hydroxy-4-hydroxymethyl-5-pyridyl-methyl)-1-piperazinyl radical and therapeutically acceptable salts thereof.

2. A composition of matter for therapeutic use comprising as an active ingredient therein one of the compounds according to claim 1, the active ingredient being present in sufficient amount to be effective as an anti-atheromal agent, and the active ingredient being incorporated in an appropriate carrier.

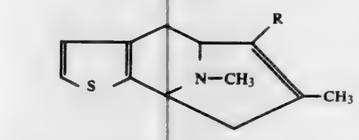
4,174,396

7,10-DIMETHYL-5,9-IMINO-4,5,8,9-TETRAHYDRO-CYCLOOCT[β]THIOPHENES AND A PROCESS FOR OBTAINING IT

Ricardo Granados Jargue, Barcelona; Mercedes Alvarez Domingo, San Juan Despi; Juan Bosch Cartes, Barcelona; Cirstobal Martinez Roidan, and Fernando Rabadan Peinado, both of Madrid, all of Spain, assignors to Laboratories Made, S.A., Madrid, Spain

Filed Apr. 3, 1978, Ser. No. 892,599
Int. Cl.[2] C07D *513/18;* **A61K** *31/44*
U.S. Cl. 424—256 **5 Claims**

4. A compound of the formula:



where R is H or lower alkyl or a pharmaceutically acceptable acid addition salt thereof.

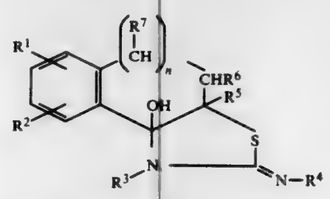
4,174,397

THIAZOLIDINE DERIVATIVES

Bernd Knabe, Kelkheim; Hans-Jochen Lang, Hofheim am Taunus, and Ernold Granzer, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfort am Main, Fed. Rep. of Germany

Filed Sep. 6, 1977, Ser. No. 830,774
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1976, 2640358
Int. Cl.[2] C07D *277/60*
U.S. Cl. 424—270 **11 Claims**

1. Thiazolidine derivatives of the general formula I



I

in which R^1 denotes hydrogen, a methyl group, halogen, trifluoromethyl or an alkoxy group with 1–3 C atoms, R^2 denotes hydrogen, a methyl group, halogen or a nitro group, R^3 and R^4 are the same or different and denote alkyl or alkenyl with 1–4 C atoms, phenylalkyl with 1–2 C atoms in the alkyl part or cycloalkyl with 3–6 C atoms, R^5, R^6 and R^7 denote hydrogen or an alkyl radical with 1–3 C atoms and n is 0–2, or acid addition salts thereof with pharmaceutically acceptable acids.

9. A pharmaceutical preparation for the treatment of obesity or a lipid metabolism disorder of a compound as defined in claim 1 in an effective unit dosage.

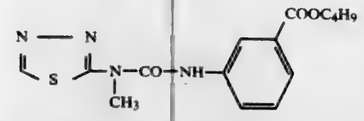
4,174,398

COMBATING FUNGI WITH 1-ALKYL-1-(1,3,4-THIADIAZOL-2-YL)-3-PHENYL-UREAS

Erik Regel, Wuppertal; Paul-Ernst Frohberger, Leverkusen, and Volker Paul, Solingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 2, 1978, Ser. No. 882,833
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2712630
Int. Cl.[2] A01N *9/12;* **C07D** *285/12*
U.S. Cl. 424—270 **3 Claims**

1. 1-Methyl-1-(1,3,4-thiadiazol-2-yl)-3-(3-butoxycarbonyl-phenyl)-urea of the formula



2. A fungicidal composition containing as active ingredient a fungicidally effective amount of a compound according to claim 1 in admixture with a diluent.

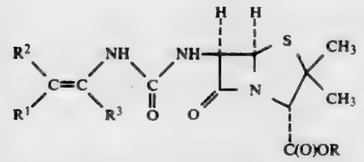
4,174,399

TREATMENT OF LACTIC ACIDOSIS IN RUMINANTS

Arthur F. Kluge, Los Altos, and Ian T. Harrison, Palo Alto, both of Calif., assignors to Syntex (USA) Inc., Palo Alto, Calif.

Filed Jul. 10, 1978, Ser. No. 923,276
Int. Cl.[2] A61K *31/43;* **C07D** *499/78*
U.S. Cl. 424—271 **21 Claims**

1. A compound selected from the group of the formula



(I)

herein R^1, R^2 and R^3 are individually hydrogen; C_1 to C_{12} linear or branched alkyl; C_6 to C_{12} carbocyclic aryl optionally substituted with halo, cyano, C_1 to C_6 linear or branched alkoxycarbonyl, C_1 to C_6 linear or branched alkyl, C_1 to C_6 linear or branched alkoxy; or C_4 to C_{11} heterocyclic aryl optionally substituted with C_1 to C_6 linear or branched alkyl or C_1 to C_6 linear or branched alkoxy, the heteroatom selected from the group nitrogen, oxygen and sulfur; and R is hydrogen or a protecting group selected from t-butyl, diphenylmethyl, benzyl, o-nitrobenzyl, p-nitrobenzyl, 3,5-dinitrobenzyl, p-methoxybenzyl, p-methoxybenzyl, benzhydryl, pivaloxymethyl, phenacyl and C_2 to C_6 linear or branched haloalkyl; and pharmaceutically acceptable salts thereof with the proviso that at least one of R^1, R^2 and R^3 is other than hydrogen.

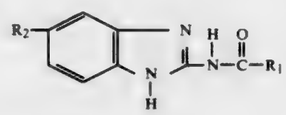
4,174,400

ANTHELMINTIC BENZIMIDAZOLES

Helmut Mrozik, Matawan, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 13, 1978, Ser. No. 941,997
Int. Cl.[2] A61K *31/415;* **C07D** *235/32*
U.S. Cl. 424—273 B **10 Claims**

1. A compound having the formula:



wherein R_1 is loweralkoxy; and
R_2 is halogenated loweralkenyl.

10. A method for the treatment of helmintic infections which comprises administering to an animal infected with parasites with an effective amount of a compound of claim 1.

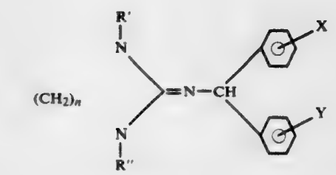
4,174,401

2-BENZHYDRYLIMINO-IMIDAZOLIDINES

Chris R. Rasmussen, Ambler, Pa., assignor to McNeil Laboratories, Incorporated, Ft. Washington, Pa.

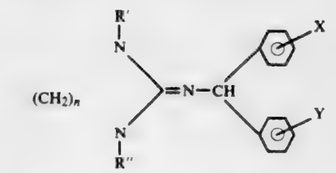
Filed Jul. 13, 1977, Ser. No. 815,393
Int. Cl.[2] A61K *31/415;* **C07D** *233/44*
U.S. Cl. 424—273 R **5 Claims**

1. A compound represented by the formula



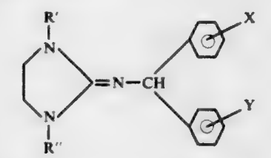
wherein R' and R'' independently are selected from the group consisting of hydrogen and methyl, X and Y independently are selected from the group consisting of hydrogen, lower alkoxy, lower alkyl and halo, and n is 2, and the therapeutically active acid addition salts thereof.

3. A method for inhibiting gastric acid secretion which comprises the step of administering to a subject with gastric hyperacidity an effective antisecretory amount of a compound of the formula



wherein R' and R'' independently are selected from the group consisting of hydrogen and methyl, X and Y independently are selected from the group consisting of hydrogen, lower alkoxy, lower alkyl and halo, and n is 2, and the therapeutically active acid addition salts thereof in admixture with a pharmaceutical carrier.

5. A method for reducing blood sugar which comprises the step of administering an effective hypoglycemic amount of a compound of the formula



wherein R' and R'' independently are selected from the group consisting of hydrogen and methyl, X and Y independently are selected from the group consisting of hydrogen, lower alkoxy, lower alkyl and halo; and the therapeutically active acid addition salts thereof as active ingredient in admixture with a pharmaceutical carrier.

4,174,402

METHOD FOR THE PROPHYLAXIS OF SRS-A-INDUCED SYMPTOMS

Zigurd E. Mielens, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Aug. 17, 1978, Ser. No. 934,616
Int. Cl.[2] A61K *31/40*
U.S. Cl. 424—274 **12 Claims**

1. A method for inhibiting the symptoms induced by SRS-A in a mammal having an allergic condition in which SRS-A is a causative factor which comprises prophylactically administering to said mammal an amount effective for inhibiting said symptoms of a compound selected from the group consisting of 9-benzoyl-1,2,3,4-tetrahydrocarbazole-3-carboxylic acid, 9-benzoyl-6-methoxy-1,2,3,4-tetrahydrocarbazole-3-carboxylic acid, 9-benzoyl-1,2,3,4-tetrahydrocarbazole-4-carboxylic

acid, 9-(4-toluoyl)-1,2,3,4-tetrahydrocarbazole-4carboxylic acid, 9-benzoyl-6-methoxy-1,2,3,4-tetrahydrocarbazole-4-carboxylic acid and 9-benzoyl-6-methyl-1,2,3,4-tetrahydrocarbazole-4-carboxylic acid; or a pharmaceutically acceptable salt of said compound.

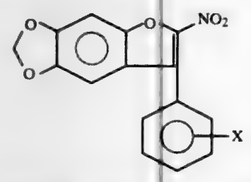
4,174,403

5,6-METHYLENEDIOXY-2-NITRO-3-PHENYLBENZOFURANS

Robert A. Scherrer, White Bear Lake, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Filed Jun. 26, 1978, Ser. No. 919,415
Int. Cl.[2] A61K *31/36*
U.S. Cl. 424—282 **7 Claims**

1. A compound of the formula



wherein X is hydrogen, halogen, methyl or methoxy.

3. A method for arresting or inhibiting the growth of microorganisms comprising contacting microorganisms with a compound according to claim 1 in an amount sufficient to inhibit the growth of said microorganisms.

7. A method for arresting or inhibiting the growth of bacteria comprising contacting bacteria with a compound according to claim 1 in an amount sufficient to inhibit the growth of said bacteria.

4,174,404

DEOXYNARASIN ANTIBIOTICS

Walter M. Nakatsukasa; Gary G. Marconi; Norbert Neuss, all of Indianapolis, and Robert L. Hamill, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 917,036, Jun. 19, 1978, which is a division of Ser. No. 844,087, Oct. 20, 1977. This application Oct. 27, 1978, Ser. No. 955,448
Int. Cl.[2] A61K *31/35*
U.S. Cl. 424—283 **27 Claims**

1. The method of enhancing the contractile force of mammalian heart muscle in a warm-blooded mammal which comprises administering parenterally an effective nontoxic dose of between approximately 30 and 500 mcg/kg of body weight of a compound selected from 20-deoxynarasin and its pharmaceutically acceptable salts.

8. A feed composition adapted to fatten cattle comprising cattle feed and from 1 to 30 g per ton of a member selected from the group consisting of (1) 20-deoxy-narasin and its pharmaceutically acceptable salts, (2) 20-deoxy-epi-17-narasin and its pharmaceutically acceptable salts, and (3) deoxynarasin antibiotic complex.

12. A method of preventing or treating coccidiosis in poultry which comprises administering to poultry an effective anticoccidial amount of a member selected from the group consisting of (1) 20-deoxynarasin and its pharmaceutically acceptable salts, (2) 20-deoxy-epi-17-narasin and its pharmaceutically acceptable salts, and (3) deoxynarasin antibiotic complex.

20. A method for the control of swine dysentery which comprises orally administering to swine an amount which is effective to control swine dysentery of a member selected from the group consisting of (1) 20-deoxynarasin and its pharmaceutically acceptable salts, (2) 20-deoxy-epi-17-narasin and its pharmaceutically acceptable salts, and (3) deoxynarasin antibiotic complex.

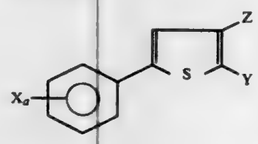
4,174,405

THIOPHENES USEFUL IN CONTROL OF ACARIDS

Douglas I. Relyea, Bethany; Winchester L. Hubbard, Woodbridge, and Robert E. Grahame, Jr., Cheshire, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 691,660, Jun. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 445,378, Feb. 25, 1974, abandoned. This application Oct. 11, 1977, Ser. No. 840,687
Int. Cl.[2] A01N *9/00;* **C07D** *333/16, 333/12*
U.S. Cl. 424—275 **56 Claims**

1. A method of controlling acarid pests comprising contacting the acarid pests with an acaricidal amount of a substituted thiophene of the formula



where X is alkyl having 1 to 3 carbon atoms, halogen, nitro, haloalkyl having 1 to 3 carbon atoms, alkoxy having 1 to 3 carbon atoms, alkylthio having 1 to 3 carbon atoms or phenyl; a is 0, 1 or 2; Y is hydrogen, halogen, phenyl, phenylthio, nitrophenylthio, chlorophenylthio, or phenylsulfono; and Z is hydrogen or phenyl.

4,174,406

TERPENYLAMINOALKANOL FISH TOXICANTS

Carl Bordenca, Rocky River, Ohio, assignor to SCM Corporation, New York, N.Y.

Continuation of Ser. No. 599,244, Jul. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 468,907, May 10, 1974, abandoned. This application May 25, 1977, Ser. No. 800,376
Int. Cl.[2] A01N *9/20, 9/24*
U.S. Cl. 424—325 **16 Claims**

1. A process for controlling fish populations which comprises treating the water wherein said fish reside with a piscicidally effective amount of an aminoalkanol toxicant or water-soluble salt thereof, having the formula:



wherein:

T is a radical selected from the group consisting of geranyl, citronellyl, bupleuryl, neryl, lavandulyl, linalyl, myrcenyl, isobornyl and tetrahydrogeranyl;

R is independently hydrogen or lower alkyl radical containing one to four carbon atoms; and

X is an integer of 1 to 4.

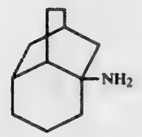
4,174,407

ANTIVIRAL AGENT

Masaru Fukui, Takarazuka; Shigeo Ogino, Nishinomiya, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Kao Soap Co., Ltd., Tokyo, both of, Japan

Filed Jan. 13, 1978, Ser. No. 869,144
Int. Cl.[2] A61K *31/13*
U.S. Cl. 424—325 **1 Claim**

1. A method for the treatment of viral infectious diseases caused by herpes or influenza viruses which comprises administering an amount pharmaceutically effective for the treatment of said infectious diseases of 3-amino-4-homoisotwistane of the formula,



to a patient suffering from said infectious diseases.

4,174,408

DRY POWDER MIX FOR FRYING BATTER

Fred A. Wesselski, and Irving Moore, Jr., both of P.O. Box 28, Wharton, Tex. 77488

Filed Sep. 12, 1977, Ser. No. 832,652
Int. Cl.[2] A21D *10/04*
U.S. Cl. 426—302 **9 Claims**

1. A dry mix consisting essentially of:

Ingredients	Percent By Weight of Listed Ingredients
At least one farinaceous ingredient	From about 87 to about 95
Dried buttermilk	From about 3 to about 7
Dried cream	From about 1 to about 4
Dehydrated eggs	From about 1 to about 3

4,174,409

DEPOSITING LATENT FINGERPRINTS AND DEVELOPMENT THEREOF

Edward J. Goettert, Oakdale, and George Van Dyke Tiers, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Aug. 5, 1977, Ser. No. 822,066
Int. Cl.[2] A61B *5/10*
U.S. Cl. 427—1 **6 Claims**

1. The process for imprinting a latent fingerprint with extended latency on a paper substrate comprising moistening a finger with a composition consisting essentially of non-hardenable, substantially non-volatilizable, non-hygroscopic, nontoxic higher fatty polybasic acid substantive to paper and transferring a pattern from said finger to said substrate.

4,174,410

COATING AND BONDING OF METALS

Frank Smith, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 395,595, Sep. 10, 1973, Pat. No. 3,991,929. This application Sep. 16, 1976, Ser. No. 723,906
Claims priority, application United Kingdom, Sep. 22, 1972, 43897/72
Int. Cl.[2] B05D *3/12*
U.S. Cl. 427—57 **15 Claims**

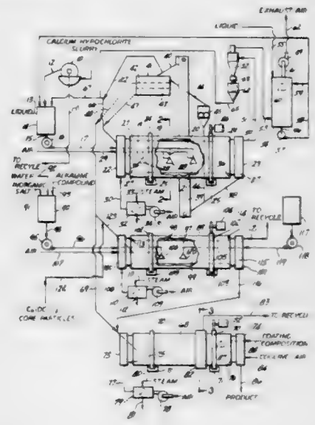
1. A method of coating the inner surface of a sheath of titanium, zirconium, tantalum or an alloy of one of these metals with a tinning metal or alloy comprising heating the sheath while the inner surface thereof is covered with the tinning metal or alloy in a molten state and moving an ultrasonically excited probe over substantially the whole of the outer surface of the sheath, the probe being in contact with said outer surface, and wherein the tinning metal or alloy is placed inside the sheath in a manner such that the outer surface of the sheath is free of tinning metal or alloy whereby the ultrasonically excited probe is out of contact with the tinning metal or alloy.

4,174,411

GRANULAR CALCIUM HYPOCHLORITE COATED WITH AN INORGANIC SALT BY SPRAY GRAINING

Walter C. Saeman, Hamden, Conn.; Noel N. Coe, West Lake, La., and John P. Faust, Hamden, Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 521,417, Nov. 6, 1974, which is a continuation-in-part of Ser. No. 276,615, Jul. 31, 1972, abandoned. This application Feb. 10, 1975, Ser. No. 548,653
The portion of the term of this patent subsequent to Jul. 13, 1993, has been disclaimed.
Int. Cl.[2] C01B *11/06*
U.S. Cl. 427—214 **14 Claims**



1. A method for preparing coated, rounded particulate solid calcium hypochlorite from a pumpable and sprayable aqueous medium containing an alkali metal salt other than calcium hypochlorite in a rotary spray grainer which comprises:

(a) maintaining a moving bed of particulate solid calcium hypochlorite core particles containing from about 50 to about 85 percent available chlorine on a dry basis and from about 5 to about 30 percent by weight of water in the lower part of a distributing zone having an upper part and a lower part,

(b) maintaining a temperature in said distributing zone in the range from about 40° to about 70° C.,

(c) lifting a portion of said moving bed to said upper part and releasing said particles to separately fall through said distributing zone to said bed,

(d) spraying on said falling particles a pumpable and sprayable aqueous medium containing an alkali metal salt which is non-reactive with said calcium hypochlorite core, wherein said alkali metal salt is selected from the group consisting of chloride, chlorate, nitrate, bromide, bromate and sulfate of an alkali metal,

(f) simultaneously evaporating and removing water from said aqueous medium on said falling particles, whereby said particles are coated with a plurality of outer layers of said alkali metal salt in solid form,

(g) removing at least a portion of the resulting coated rounded solid calcium hypochlorite particles from said distributing zone,

(h) wherein said calcium hypochlorite core particles are prepared by rotary spray graining of a calcium hypochlorite slurry in a distribution zone prior to coating with said alkali metal salt, and

(i) wherein the portion of said alkali metal salt coating on said calcium hypochlorite core particles ranges from about 4 to about 45 percent by weight of said particles.

4,174,412

STRUCTURES AND STRUCTURAL MEMBERS MADE WHOLLY OR PARTLY OF WOOD

Richard G. Tyrer, Liverpool, and James Milne, Cumbria, both of England, assignors to Balfour Beatty Limited, Surrey, England

Filed Sep. 28, 1977, Ser. No. 837,438
Claims priority, application United Kingdom, Sep. 29, 1976, 40380/76
The portion of the term of this patent subsequent to Dec. 6, 1994, has been disclaimed.
Int. Cl.[2] B05D *3/00, 7/06*
U.S. Cl. 427—297 14 Claims



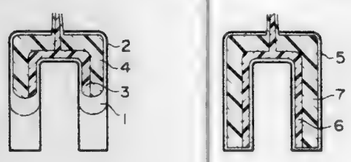
1. A method of impregnating with wood preservative at least a wooden part of a structure that is exposed to the atmosphere, which method comprises surrounding said exposed wooden part of the structure by a closely fitting, fluid-impermeable covering and sealing boundary edges of the covering to form a substantially fluid-tight enclosure; evacuating air and any other fluid from cracks and any other voids in the said wooden part of the structure and from within the fluid-tight enclosure; and allowing wood preservative in a flowable state to enter the enclosure and the cracks and other voids in said wooden part of the structure until said wooden part of the structure is fully impregnated with wood preservative.

4,174,413

MULTI-LAYERED MOLDED ARTICLES

Akio Yasuike, Yokohama; Hiroshi Kataoka, Tokyo, and Norito Takao, Yokohama, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Jul. 18, 1977, Ser. No. 816,469
Claims priority, application Japan, Jul. 27, 1976, 51-89507; Nov. 1, 1976, 51-130546; Dec. 23, 1976, 51-154182; Apr. 27, 1977, 52-48971
Int. Cl.[2] B65D *23/00;* B28B *1/24;* B29F *1/00;* B32B *3/02*
U.S. Cl. 428—35 13 Claims



1. A multi-layered molded article having the shape of a vessel, closed-end parison, disk or the like, said article comprising in its cross-section a triple-layered structure consisting of two surface layers of different thicknesses and a core layer interposed between said surface layers, said triple-layered structure having been injection molded in a mold cavity in a single shot from two different kinds of thermoplastic synthetic resin to form said surface and core layers, respectively, said core layer having a thickness less than one half of the entire thickness of said article, said triple-layered structure having its crosssection represented by

$$a+b<\tfrac{1}{2}(a+b+c)$$

where a is the thickness of the core layer, b is the thickness of the thinner surface layer and c is the thickness of the thicker surface layer.

4,174,414

PRODUCTION OF SYNTHETIC SUEDE LEATHER

Toshimitsu Sasaki; Keikichi Fujita, both of Sennan, and Hajime Ito, Izumisano, all of Japan, assignors to Toyo Cloth Co. Ltd., Sennan, Japan

Filed Jun. 8, 1977, Ser. No. 804,604
Claims priority, application Japan, Apr. 20, 1977, 52/46093
Int. Cl.[2] B32B *5/18, 27/40, 31/18*
U.S. Cl. 428—85 11 Claims

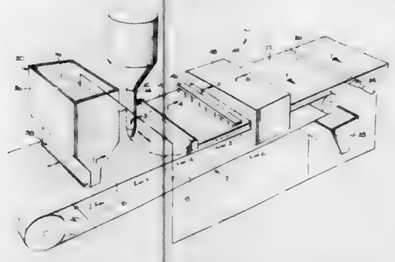
1. A method for producing synthetic suede leather which comprises:
- casting a mixture consisting essentially of a solution of polyurethane elastomer in an organic solvent therefor to form a structure comprising a layer of said solution between two sheets of a substrate fabric,
- immersing said structure in a liquid which is a nonsolvent for said polyurethane elastomer, but miscible with said solvent, until said solvent is only partly removed from said layer and said mixture is only partly gelled,
- splitting said structure into two sheets at or near the middle of said partly gelled layer, said layer being sufficiently tacky to form a fibrous pattern or texture similar to natural suede leather on each sheet, and re-immersing the resultant split sheets in said nonsolvent to complete gellation of said layer, resulting in synthetic suede leather having a long and fibrous texture.

4,174,415

NO-GEL LATEX FOAM MATERIAL AND ITS PREPARATION

Eugene J. Bethe, Mishawaka, Ind., assignor to Uniroyal, Inc., New York, N.Y.

Filed Oct. 29, 1975, Ser. No. 627,153
Int. Cl.[2] B29D *27/04*
U.S. Cl. 428—90 27 Claims



1. A method for making no-gel latex foam comprising
(a) distributing a layer of loosely associated flock onto a water vapor-permeable supporting means,
(b) deposited a froth of uncured no-gel latex foam onto the supporting means over the flock layer to enable the froth to make surface contact with the layer of loosely associated flock, the supporting means being sufficiently layered with flock to enable the flock to prevent the uncured froth from directly contacting the supporting means through the flock layer,
(c) heating the latex foam froth to dehydrate, cure and form the no-gel latex foam, and
(d) separating the foam from the supporting means at the flock layer, the thickness of the flock layer being controlled to permit division of the flock layer into a first portion that is adhered to the separated foam to form an exposed surface coating of flock on the foam due to adhesion between the uncured foam froth and the loosely associated flock in contact with the foam froth, and a second nonadherent portion that remains freely disposed on the supporting means, and wherein the constituents of the foam adhered surface coating of flock are of a size and material that does not prevent the no-gel latex foam from being resiliently stretchable substantially in the same manner as without the flock coating.

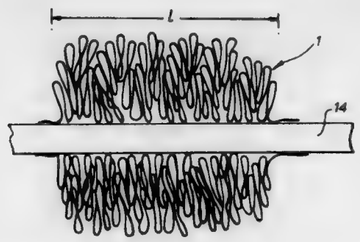
22. A product prepared in accordance with the method of claim 1.

4,174,416

TUBULAR PLASTICS MATERIAL NET HAVING CORRUGATIONS

Frank B. Mercer, Blackburn, England, assignor to Netlon Limited, Lancashire, England

Filed Dec. 14, 1977, Ser. No. 860,324
Claims priority, application United Kingdom, Dec. 14, 1976, 52145/76; Mar. 22, 1977, 11950/77
Int. Cl.[2] B32B *5/12*
U.S. Cl. 428—107 8 Claims



5. An annular sleeve of plastics material net which has been formed by rope-orientating a tubular mesh structure comprising two sets of strands joined together by tenacious intersections, each set extending at an angle to the other set and at an oblique angle to the machine and transverse directions, and subsequently heat setting the rope-oriented net in a transversely opened-out and axially spaced corrugated state with the corrugations running transversely, the net being in a highly concentrated, axially-bunched condition, having a length less than 1/350th of its maximum axially-extended length, and having no substantial tendency to contract radially inwards into a rope form.

4,174,417

METHOD OF FORMING HIGHLY ABSORBENT FIBROUS WEBS AND RESULTING PRODUCTS

Theodore B. Rydell, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 621,840, Oct. 14, 1975, abandoned. This application Dec. 19, 1977, Ser. No. 861,721
Int. Cl.[2] B32B *23/02*
U.S. Cl. 428—221 14 Claims

1. Method of forming a highly absorbent web comprising the steps of;
(a) forming a gel by mixing with a solvent chemically modified cellulose fibers selected from the group consisting of,
(i) cellulose that has been subjected to chemical substitution, etherization or esterification,
(ii) cellulose that has been subjected to chemical substitution, etherization or esterification and crosslinked, and
(iii) cellulose that has been polymeric grafted, without dissolving said fibers to the extent that they are not identifiable,



(b) removing from said gel mixture external solvent to the extent that the total amount remaining is within the range of ±5 grams per gram of fiber of the fiber saturation point,
(c) spraying said gel mixture to separate said fibers,
(d) collecting said fibers as sprayed into a web having a high degree of "z" direction fiber orientation, and
(e) drying said fibers.

4,174,418

ANTIBACTERIAL TEXTILE FINISHES UTILIZING ZIRONYL ACETATE COMPLEXES OF INORGANIC PEROXIDES

Clark M. Welch, Metairie; Gary F. Danna, New Orleans, both of La., and Tyrone L. Vigo, Knoxville, Tenn., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 787,177, Apr. 12, 1977, Pat. No. 4,115,422.
This application May 31, 1978, Ser. No. 911,029
Int. Cl.[2] B32B *23/00;* B05D *3/00, 3/02*
U.S. Cl. 428—264 11 Claims

1. A one-bath process for rendering cellulosic textiles bacteriostatic, which process comprises:
(a) preparing an aqueous treating solution containing about from 1% to 35% zirconyl acetate, 0.3% to 35% acetic acid, and 1% to 25% of an inorganic peroxide selected from the class consisting of hydrogen peroxide, an alkali metal perborate monohydrate and an alkali metal perborate tetrahydrate, the solution being made up by adding the inorganic peroxide to a solution of the zirconyl acetate and acetic acid in water, the ratio by weight of acetic acid to zirconyl acetate being from about 0.3:1 to about 5:1, and the mole ratio of zirconyl acetate to inorganic peroxide being from about 0.1:1 to about 3:1,
(b) immersing a cellulosic textile in the aqueous treating solution for a period of time sufficient to thoroughly wet the cellulosic textile,
(c) removing excess treating solution from the cellulosic textile,

(d) heating the cellulosic textile at a temperature of about from 50° C. to 160° C. for about from 0.5 minutes to 30 minutes to dry the cellulosic textile and cause deposition of peroxide complexes of zirconium on the textile, the higher temperatures being maintained for the shorter times,

(e) washing the cellulosic textile to remove excess reagents, and

(f) drying the treated cellulosic textile at a temperature of 50° C. to 140° C. for from 0.5 minute to 30 minutes, the higher temperatures being used for the shorter times.

4. As a textile material, the cellulosic textile treated by the process of claim 1.

4,174,419

STABILIZED MAGNETIC SHIELDS

Louis F. Nienart, Holland Township, Hunterdon County, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Nov. 8, 1978, Ser. No. 959,026

Int. Cl.[2] B32B *15/00, 5/18*

U.S. Cl. 428—313 **16 Claims**

1. A magnetic composite structure comprising a superposed layer adhesively bonded to a glassy metal alloy sheet.

3. The composite structure as set forth in claim 1 wherein the superposed layer is a polymer foam.

4,174,420

UPHOLSTERED FURNITURE HAVING IMPROVED FLAME RESISTANCE

Colin Anolick; Vivian M. Robinson, both of Wilmington, and Charles W. Stewart, Sr., Newark, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 29, 1975, Ser. No. 572,709

Int. Cl.[2] B32B *3/26*

U.S. Cl. 428—310 **37 Claims**

13. Furniture upholstery fabric having improved flame resistance, said fabric having integrally attached to it a layer of neoprene foam which contains, in parts by weight per 100 parts by weight of the neoprene, about 5–15 parts of a char promoter selected from the group consisting of urea/formaldehyde resins, melamine/formaldehyde resins, melamine phosphate, phthalic anhydride, pyromellitic anhydride, sodium borate, calcium borate, zinc borate, and boric acid and a hydrated inorganic compound containing an amount of hydration water equivalent to 10–180 parts of alumina hydrate, said hydrated inorganic compound retaining most of its hydration water at the foam drying and curing temperatures but losing it below about 500° C.;

the neoprene being a homopolymer of chloroprene or a copolymer of chloroprene with another ethylenically unsaturated organic monomer, the proportion of such other monomer being at most about 20 weight percent of the total polymer;

with the proviso that when the neoprene is a copolymer of chloroprene with acrylonitrile or with an α,β-unsaturated carboxylic acid, the proportion of acrylonitrile or of the α,β-unsaturated carboxylic acid is such that the proportion of the copolymer weight which is contributed by the nitrile or carboxyl groups is about 2–20 percent, and the char promoter may be absent.

4,174,421

PIEZOELECTRIC CRYSTALLINE FILM OF ZINC OXIDE AND METHOD FOR MAKING SAME

Hiroshi Nishiyama, Mukou; Toshio Ogawa, and Tasuku Mashio, both of Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Sep. 7, 1978, Ser. No. 940,336

Claims priority, application Japan, Sep. 13, 1977, 52-110894; Sep. 17, 1977, 52-111763

Int. Cl.[2] C23C *15/00;* **C04B** *35/00*

U.S. Cl. 428—432 **6 Claims**

1. A piezoelectric crystalline film on a substrate, the film being a crystalline zinc oxide film with a hexagonal crystal structure and a c-axis substantially perpendicular to the substrate surface, characterized in that said crystalline zinc oxide film contains, as additive elements, vanadium and manganese; the content of each of said additive elements being 0.01 to 20.0 atomic percent; said film being smooth and having good adhesion to said substrate.

4,174,422

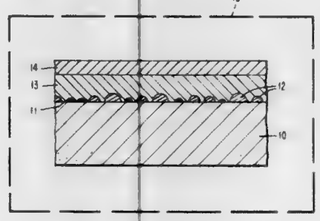
GROWING EPITAXIAL FILMS WHEN THE MISFIT BETWEEN FILM AND SUBSTRATE IS LARGE

John W. Matthews, deceased, late of Ossining, N.Y. (by Valerie A. Matthews, executrix), and William M. Stobbs, Cambridge, England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,088

Int. Cl.[2] B32B *15/04;* **H01L** *21/205, 21/84, 29/26*

U.S. Cl. 428—621 **10 Claims**



1. A structure composed of laminations of several materials including a substrate having a surface of a first single crystal material comprising monocrystalline NaCl,

an intermediate layer of a plurality of Ni crystal islands deposited in epitaxial alignment on said surface of a first single crystal material said islands covering less than about 30% of said substrate, and

an upper layer of monocrystalline epitaxial Ag crystals deposited in the form of a single crystal upon said surface and said intermediate layer with a substantial lattice misfit between said third material and said first single crystal material.

6. A method of producing a thin epitaxial monocrystalline film of a metal including

providing a substrate having a deposition surface composed of a monocrystalline NaCl structure,

forming epitaxial crystal islands of an intermediate material comprising Ni structures on said NaCl structure, said islands covering less than about 30% of said substrate, and

vacuum depositing said epitaxial monocrystalline film of Ag crystals upon said deposition surface covered with said islands of an intermediate material.

4,174,423

Patent Not Issued For This Number

4,174,424

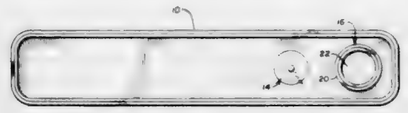
SEAL ARRANGEMENT FOR FACILITATING HERMETICITY LEAKAGE TESTING

Edsel O. Jurva, Anoka, and Howard D. Mosman, Fridley, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Jun. 21, 1978, Ser. No. 917,595

Int. Cl.[2] H01M *2/00*

U.S. Cl. 429—90 **10 Claims**



1. An inner and outer seal arrangement for facilitating the leak testing of hermetically sealed containers, comprising:

an opening in the container for receiving the seal arrangement;

an inner plug member of elastomeric material interference-fitted into the opening; and

an outer hermetic seal closing the opening and spaced from the inner plug member.

4,174,425

PROCESS OF PREPARING STYRENIC POLYMER FOAMS

Fumio Saito, Ohtsu; Fumito Yamai, Kusatsu; Yositugu Beppu, Shiga, and Shinpei Nakayama, Kusatsu, all of Japan, assignors to Sekisui Kasehin Kogyo Kabushiki Kaisha, Nara and Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, both of, Japan

Division of Ser. No. 596,785, Jul. 17, 1975, Pat. No. 4,091,054, which is a continuation-in-part of Ser. No. 381,459, Jul. 23, 1973, abandoned. This application Jan. 11, 1978, Ser. No. 868,591

Int. Cl.[2] C08J *9/02*

U.S. Cl. 521—56 **14 Claims**

1. In a suspension polymerization process for preparing foamable styrenic polymer particles from a styrenic monomer and styrenic polymer particles having particle sizes in a definite particle size range which comprises suspending the styrenic polymer particles in water containing a surface active agent and a suspending agent selected from the group consisting of a water-soluble high molecular weight material and a slightly soluble inorganic material and adding to the aqueous suspension the styrenic monomer and a suspension polymerization catalyst to cause the polymerization, the improvement which comprises reducing the amount of powdery polymer particles which pass through a 32 mesh sieve to thereby obtain said styrenic polymer particles having a uniform particle size by adding:

(1) a polymerization catalyst suspension prepared from a polymerization catalyst solution comprising (a) 100 to 60% by weight of the suspension polymerization catalyst selected from the group consisting of organic peroxides, azo compounds and mixtures thereof and (b) 1 to 10% by weight of styrene monomer with up to 50% by weight of a different monomer copolymerizable therewith selected from the group consisting of methylacrylate, ethylacrylate, butylacrylate, methylmethacrylate, ethylmethacrylate, dimethylmaleate, diethylmaleate, acrylonitrile, α-methylstyrene, divinylbenzene and a mixture thereof having been admixed with an aqueous solution containing an emulsifying agent or a suspending agent to form a finely suspended polymerization catalyst suspension; and

(2) a monomer solution comprising (a') 0 to 40% by weight of the suspension polymerization catalyst and (b') 99 to 90% by weight of styrene monomer with up to 50% by weight of a different monomer copolymerizable therewith, dropwise and simultaneous but separately from each other to the aqueous suspension of the polymer particles selected from the group consisting of styrene homopolymer and a copolymer of styrene monomer and up to 50% by weight of a different monomer copolymerizable therewith selected from the group consisting of an acrylic ester, a methacrylic ester, a maleic ester and a fumaric ester wherein the alcohol moiety is an alkyl group having 1 to 12 carbon atoms, to cause the polymerization, and conducting the polymerization in the presence of a foaming agent which does not dissolve or at most slightly swells the styrenic polymer particles produced; the amount of said styrene monomer and styrene homopolymer or copolymer being 95 to 40% by weight and 5 to 60% by weight, respectively, based on the total amount thereof; and the particle size of said styrene homopolymer or copolymer being about 0.2 to 1.8 mm.

4,174,426

METHOD OF IMPROVING CHARACTERISTIC OF CATION-EXCHANGE MEMBRANE BY SWELLING IN WATER MISCIBLE ORGANIC SOLVENT AND TREATING FURTHER WITH HYDROCHLORIC ACID

Shunichi Asami; Toru Seita, and Akihiko Shimizu, all of Shinnanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Jun. 7, 1978, Ser. No. 913,364

Claims priority, application Japan, Jun. 13, 1977, 52-68883

Int. Cl.[2] B01D *15/04;* **C08F** *14/18;* **C08J** *5/22*

U.S. Cl. 521—27 **10 Claims**

1. A method of improving characteristic of a cation-exchange membrane which comprises swelling a homogeneous cation-exchange membrane made of one or more fluorinated polymer having cation-exchangeable groups with a water miscible organic solvent and then removing said organic solvent from the swollen membrane and then, treating the membrane with hydrochloric acid at from 40° to 95° C.

V. 988 / 2 NO 13 79 UMI

4,174,427

METHOD OF MAKING EXPANDABLE POLYSTYRENE BEADS

Paula Davis, Gibraltar, Mich.; Herbert H. Gahmig, Bad Dürkheim, Fed. Rep. of Germany, and Irving R. Schmolka, Grosse Ile, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jul. 21, 1978, Ser. No. 927,175
Int. Cl.[2] C08J 9/22
U.S. Cl. 521—56 **2 Claims**

1. In making beads of expandable-polystyrene destined for container use from a recipe including styrene, free-radical initiator, and polyvinyl pyrrolidone, the improvement comprising washing the beads for about 3 to 10 hours at a temperature of about 40–55 degrees Centigrade in an aqueous solution of a hydrophilic alkoxylated nonionic surfactant which is solid at room temperature and has a molecular weight, 70–90 percent of which is accounted for by oxyethylene units, said surfactant being present in said aqueous solution in an amount between 0.001 and 1%, said amount being effective to cause said washing to remove contaminating grafted polyvinyl pyrrolidone from the surface of said beads and cause said beads to become expandable into impervious product containers.

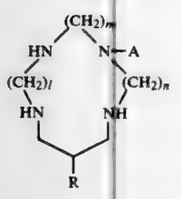
4,174,428

HEAVY METAL ION ADSORBENTS

Iwao Tabushi, No. 15-27, 3-chome, Maidashi, Higashi-ku, Fukuoka-shi, Fukuoka-ken, Japan; Hidefumi Kato, Kurume, Japan; Yoichi Taniguchi, Ogori, Japan, and Yasuhisa Kuroda, Osaka, Japan, assignors to Iwao Tabushi, Kyoto, Japan

Filed Jan. 30, 1978, Ser. No. 873,513
Claims priority, application Japan, Mar. 9, 1977, 52/24884; Mar. 9, 1977, 52/24885; Mar. 9, 1977, 52/24886
Int. Cl.[2] C08F 8/00; C07D 257/02
U.S. Cl. 525—334 **14 Claims**

1. A heavy metal ion absorbent represented by the formula:



wherein l, m and n are 2 or 3, respectively; R is an alkyl group containing 4 to 6 carbon atoms which is substituted by an amino group in the ω-position; and A is hydrogen or polystyrene.

4,174,429

PROCESS FOR POLYMERIZING OLEFINS

Umberto Giannini; Enrico Albizzati, both of Milan; Sandro Parodi, Oleggio, and Franco Pirinoli, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Division of Ser. No. 670,951, Mar. 26, 1976, Pat. No. 4,124,532. This application Aug. 23, 1978, Ser. No. 936,630
Claims priority, application Italy, Mar. 28, 1975, 21815 A/75
Int. Cl.[2] C08F 4/66, 10/00
U.S. Cl. 526—114 **4 Claims**

1. Process for polymerizing or copolymerizing olefins, which comprises effecting the polymerization or copolymerization in the presence of a catalyst prepared by mixing

(1) a catalyst component having the formula

$$M_mM'X_{2m}Y.nE$$

in which

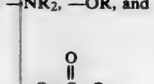
M=at least one metal selected from the group consisting of Mg, Mn and Ca;

m=a number from 0.5 to 2;

M′=at least one metal selected from the group consisting of Ti, V and Zr;

X=Cl, Br or I;

Y=a radical selected from the group consisting of halogen, the groups —NR_2, —OR, and



or mixtures thereof, in which R is a hydrocarbon radical, such radicals or groups being present in an amount corresponding to the valence of M′;

n=a number from 0.5 m to 20 m; and

E=a hydrocarbyl electron-donor compound selected from the group consisting of (a) esters of organic carboxylic acids; (b) amines; (c) esters of carbonic acid; (d) nitriles; (e) phosphoramides; (f) esters of phosphoric and phosphorous acid and (g) phosphorus oxychloride; with

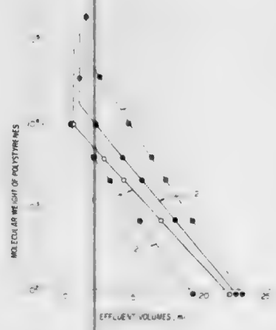
(2) an alkyl Al compound.

4,174,430

PROCESS FOR PRODUCING POROUS POLYSTYRENE GEL

Shiro Kido; Tetsuo Yokota, and Yasuhiro Nakahara, all of Shinnanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Jul. 24, 1978, Ser. No. 927,336
Claims priority, application Japan, Jul. 27, 1977, 52-89303
Int. Cl.[2] C08J 9/00
U.S. Cl. 521—146 **10 Claims**



1. A process for producing a porous polystyrene gel of improved gel permeation chromatographic properties which

comprises polymerizing styrene and divinylbenzene with an inert organic solvent in an aqueous suspension polymerization, in the presence of a radical polymerization catalyst, wherein said catalyst is present in an amount of more than 5 mole % of the total amount of styrene and divinyl benzene.

4,174,431

PROCESS FOR POLYMERIZING CONJUGATED DIENES

Adel F. Halasa, Bath; James E. Hall, Akron, and Donald N. Schulz, Hartville, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 848,958, Nov. 7, 1977, Pat. No. 4,139,490. This application Aug. 25, 1978, Ser. No. 937,007
Int. Cl.[2] C08F 4/50, 4/54, 4/08
U.S. Cl. 526—173 **14 Claims**

1. The process for the hydrocarbon solution polymerization of a monomer composition containing at least 70 percent by weight of a conjugated diene comprising the steps of maintaining said monomer at a temperature of 0°–150° C. and in intimate contact with the catalyst composition comprising

(a) a dihydrocarbyl magnesium compound in which the hydrocarbyl radicals have 1–10 carbon atoms selected from the class consisting of alkyl, carbocyclic aryl and cycloalkyl radicals, and

(b) an alkali metal compound of the formula $R(SM)_n$ or RC=CM, wherein M represents Li, Na, or K; R represents a hydrocarbyl radical of 1–10 carbon atoms; and n represents 1, 2, or 3;

the concentrations of the respective components giving an Mg/alkali metal molar ratio of 0.01/1 to 100/1, said magnesium compound being present in a concentration of 0.1–10 millimoles per 100 grams of monomer.

4,174,432

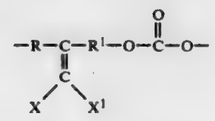
FLAME RETARDANT RIGID THERMOPLASTIC FOAMS

George E. Niznik, Lanesboro, Mass., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 908,553, May 22, 1978, which is a continuation-in-part of Ser. No. 669,027, Mar. 22, 1976, abandoned. This application Feb. 8, 1979, Ser. No. 10,496
Int. Cl.[2] C08J 9/08, 9/10
U.S. Cl. 521—180 **8 Claims**

1. Shaped flame retardant rigid thermoplastic foams having a density of 0.5 g/cc to 1.2 g/cc, and a Gardner Impact Strength of at least 10 ft-lbs, which is the product obtained by injection foam molding the melt of a blend comprising by weight

(A) from 5–100% of a thermoplastic haloethylene polycarbonate having an intrinsic viscosity of at least 35 dl/g and consisting essentially of chemically combined units of the formula,



and correspondingly

(B) from 0–95% of a thermoplastic polycarbonate, where R and R^1 are divalent aromatic radicals having from 6–13 carbon atoms, X is a halogen atom and X^1 is selected from X and hydrogen.

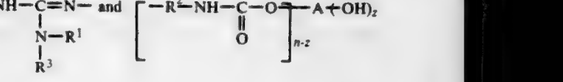
4,174,433

POLYHYDROXYL COMPOUNDS CONTAINING GUANIDINE GROUPS USEFUL IN PREPARATION OF POLYURETHANE FOAMS

Walter Schäfer, Cologne; Kuno Wagner, Leverkusen, and Kurt Findeisen, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 23, 1978, Ser. No. 889,463
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1977, 2714292
Int. Cl.[2] C08G 18/06
U.S. Cl. 528—49 **9 Claims**

1. Compounds containing at least two terminal hydroxyl groups and having a molecular weight of from 400 to 15,000, which compounds comprise segments in their molecular structure corresponding to the following general formulae:



wherein

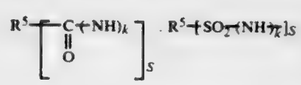
R^1 represents hydrogen or C_1–C_{18} aliphatic, C_4–C_{15} cycloaliphatic or C_6–C_{15} aromatic or araliphatic radical which may optionally contain a double bond and/or be branched and which may optionally contain one or two substituents selected from the group consisting of hydroxyl, mercapto, secondary amino, sulphonic acid ester, phosphonic acid ester, carboxylic ester, siloxane, trifluoromethyl or nitrile groups, fluorine, chlorine, bromine or iodine or R^1 represents one of the radicals:



or R^1 together with R^3 and the nitrogen atom forms a 5- or 6 membered heterocyclic ring optionally containing as additional hetero atoms an oxygen atom or up to two nitrogen atoms;

R^2 represents a divalent aliphatic, cycloaliphatic, aromatic or araliphatic radical containing from 4 to 25 carbon atoms obtained by removing the isocyanate groups from a diisocyanate;

R^3 represents a monovalent or — in the form of a bridge to other guanidine groups — divalent or trivalent C_1–C_{18} aliphatic, C_4–C_{15} cycloaliphatic or C_6–C_{15} aromatic or araliphatic radical which may optionally contain a double bond and/or be branched and which may optionally contain one or two substituents selected from the group of hydroxyl, alkoxyl, mercapto, secondary amino, sulphonic acid ester, phosphonic acid ester, carboxylic ester, siloxane, trifluoromethyl or nitrile groups, fluorine, chlorine, bromine or iodine; or one of the radicals:



or together with R^1, the nitrogen atom and, optionally, the nitrogen atom of another guanidine group forms a 5- or 6-membered heterocyclic ring optionally containing as an additional hetero atom an oxygen or nitrogen atom;

R^4 represents an aliphatic, cycloaliphatic, araliphatic or aromatic radical containing from 1 to 15 carbon atoms;

R^5 represents an s-valent aliphatic, cycloaliphatic, araliphatic or aromatic radical containing from 1 to 15 carbon atoms;

A represents an n-valent radical of the type obtained by removing the hydroxyl groups from a polyhydroxyl com-

pound having a molecular weight of from 62 to 6000; represents an integer of from 2 to 8 represents an integer of from 1 to 3;
represents an integer having a value of from 0 to (n−1); and
k represents 0 to 1.

4,174,434

COMPOUNDS CONTAINING HYDROXYL GROUPS AND URETHANO-ARYL-SULFONIC ACID GROUPS

Dieter Dieterich; Gerhard Balle, both of Leverkusen, and Hans G. Schmelzer, Pulheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 31, 1978, Ser. No. 929,615

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1977, 2735013

Int. Cl.² C08L *81/00*

U.S. Cl. 528—69 **10 Claims**

1. Compounds having an average molecular weight of from 300 to 12,000, containing: at least one hydroxyl group and at least one urethano-aryl-sulfonic acid group.

4,174,435

POLYHYDROXYL COMPOUNDS CONTAINING PHOSPHONOFORMAMIDINE GROUPS PREPARED FROM DIISOCYANATOCARBODIIMIDES, POLYHDROXYL COMPOUNDS AND A PHOSPHITE

Walter Schäfer, Cologne; Kuno Wagner, Leverkusen, and Kurt Findeisen, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

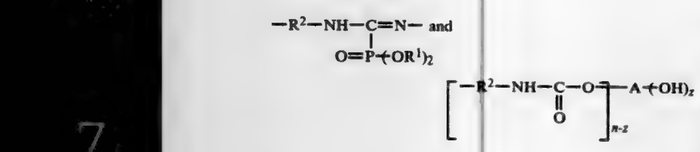
Filed Mar. 23, 1978, Ser. No. 889,329

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1977, 2714289

Int. Cl.² C08G *18/06*

U.S. Cl. 528—70 **9 Claims**

1. Compounds containing at least two terminal hydroxyl groups and having a molecular weight of from 400 to 15,000, which compounds comprise segments in their molecular structure corresponding to the following general formulae:



wherein
R^1 represents a C_1–C_{18} aliphatic, C_4–C_{15} cycloaliphatic or C_6–C_{15} aromatic or araliphatic radical which may optionally contain a double bond and/or be branched and which may optionally be substituted by a group selected from the group of hydroxyl or trifluoromethyl groups, fluorine, chlorine, bromine or iodine;
R^2 represents a divalent aliphatic, cycloaliphatic, aromatic or araliphatic radical having from 4 to 25 carbon atoms obtained by removing the isocyanate groups from a diisocyanate;
A represents an n-valent radical of the type obtained by removing the hydroxyl groups from a polyhydroxyl compound having a molecular weight of from 62 to 6000;
n represents an integer of from 2 to 8; and
z represents an integer having a value of from 0 to (N−1).

4,174,436

POLYURETHANES AND FOOD CASINGS MADE THEREFROM

Rudi Koriatzki, Laudenbach, and Günter Schumacher, Weinheim, both of Fed. Rep. of Germany, assignors to Naturin-Werk Becker & Co., Weinheim, Fed. Rep. of Germany

Division of Ser. No. 753,694, Dec. 23, 1976, Pat. No. 4,123,589. This application Jul. 20, 1978, Ser. No. 926,541

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1975, 2559318

Int. Cl.² C08G *18/42*; B32B *27/40*; A22C *13/00*

U.S. Cl. 528—80 **18 Claims**

1. A polyurethane elastomer exhibiting thermoplastic properties on processing, the polyurethane consisting essentially of base units derived from the reaction of
(a) at least one high molecular weight diol,
(b) at least one di-isocyanate, and
(c) at least one low molecular weight glycol as chain-extender, both the base units derived from both the high molecular weight diol and the di-isocyanate consisting essentially of linear C_6-aliphatic units, the equivalent ratio of high molecular diol to di-isocyanate base units being in the range of approximately 1:3.5 to 1:70, the quantity-weight ratio of said base units being in the range of from approximately 1:0.4 to 1:4.0, respectively, the equivalent ratio of the low molecular glycol to high molecular diol being from approximately 5:1 to 70:1, the chain extender comprising no more than approximately 50 mole-% of linear C_6-aliphatic units.

4,174,437

PROCESS FOR THE PREPARATION OF BRANCHED POLYCARBONATES

Karsten Idel; Dieter Freitag, and Werner Nouvertné, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 7, 1978, Ser. No. 894,229

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1977, 2718466

Int. Cl.² C08G *63/62*

U.S. Cl. 528—199 **15 Claims**

1. Process for the preparation of branched thermoplastic polycarbonates, characterized in that diphenols are completely reacted with about 0.05 to about 2.0 mol %, relative to mols of diphenols, of cyanuric chloride in a primary reaction, while controlling the pH and temperature and in the presence of a water miscible co-solvent, and thereafter the products are subjected to polycondensation, in accordance with known methods of the phase boundary process, to give high-molecular weight, branched polycarbonates.

4,174,438

Patent Not Issued For This Number

4,174,439

PROCESS FOR ISOLATING GLUCOPYRANOSE COMPOUND FROM CULTURE BROTHS

Erich Rauenbusch, and Delf Schmidt, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,263

Claims priority, application Fed. Rep. of Germany, May 4, 1977, 2719912

Int. Cl.² C07H *15/20*

U.S. Cl. 536—18 **17 Claims**

1. A process for isolating an amino sugar derivative which is 0-{4,6-dideoxy-4[[1S-(1,4,6/5)-4,5,6-trihydroxy-3-hydroxymethyl-2-cyclohexen-1-yl]-amino]-α-D-glucopyranosyl}-(1→4)-0-α-D-glucopyranosyl-(1→4)-D-gluco pyranose from a culture broth obtained by fermenting a micro-organism of the family Actinoplanaceae which comprises
(a) adding a mixture of a strongly acid cation exchange resin and an anion exchange resin in the acid or basic form to the said culture broth,
(b) separating the resin mixture from the culture filtrate and from any mycelium that may be present,
(c) treating the separated off resin mixture with at least one cation containing dilute solution so as to elute the amino-sugar derivative,
(d) passing the resulting eluate over a combination of a highly crosslinked strongly acid cation exchanger, which weakly bonds the amino-sugar derivative in the $H^{\oplus}$ form and an anion exchanger in the basic form,
(e) passing the eluate over a strongly acid cation exchanger, which bonds the amino-sugar derivative strongly in the $H^{\oplus}$ form,
(f) treating the cation exchanger with the amino-sugar derivative bonded thereto with from 0.01 to 0.05 N mineral acid so as to fractionally elute material bound to the exchanger in a plurality of fractions, and then
(g) recovering the fraction(s) containing said amino-sugar derivative.

4,174,440

IONIC PULLULAN GELS AND PRODUCTION THEREOF

Fumio Fujita, Osaka; Kousuke Fukami; Masanori Fujimoto, both of Ibaraki, and Tsuneyuki Nagase, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 27, 1978, Ser. No. 890,505

Claims priority, application Japan, Apr. 1, 1977, 52-37787

Int. Cl.² C07H *15/04*

U.S. Cl. 536—120 **8 Claims**

1. A process for producing ionic pullulan gels characterized by the steps of (1) reacting pullulan with a compound of the formula,

$$X_1—R_1—Y$$

wherein X_1 and Y are each a halogen atom or an epoxy group, and R_1 is an aliphatic group having 1 to 30 carbon atoms which may have 1 to 2 hydroxyl groups or an oxygen atom in the carbon chain, in the presence of an alkali metal hydroxide or organic amine, and then (2) reacting the resulting crosslinked water-swellable pullulan gel with a compound selected from the group consisting of 2-dimethylaminoethyl chloride, 2-diethylaminoethyl chloride, 2-dimethylaminoisopropyl chloride, 2-bromo-5-diethylaminopentane, 2-diphenylaminoethyl chloride, 2-(N,N-dimethylphenylamino)ethyl chloride, 3-amino-1,2-epoxypropane, 3-dimethylamino-1,2-epoxypropane, 3-diethylamino-1,2-epoxypropane, 3-dibutylamino-1,2-epoxypropane, 3-diphenylamino-1,2-epoxypropane, 3-(N,N-dimethylphenylamino)-1,2-epoxypropane, N,N-(2,3-epoxypropyl)methylaniline, inorganic acid salts or alkyl halide salts thereof, chloroacetic acid, bromoacetic acid, chloropropionic acid, salts thereof, chloromethanesulfonic acid, bromoethanesulfonic acid, chloroethanesulfonic acid and salts thereof in the presence of an alkali metal hydroxide, alkaline earth metal hydroxide or organic amine.

4,174,441

PYRAN ANALOGS OF 5-HYDROXY-PGI$_1$

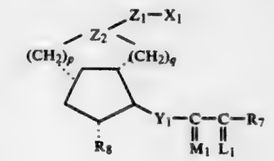
Roy A. Johnson, and John C. Sih, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 815,648, Jul. 14, 1977, Pat. No. 4,110,532. This application Apr. 24, 1978, Ser. No. 899,197

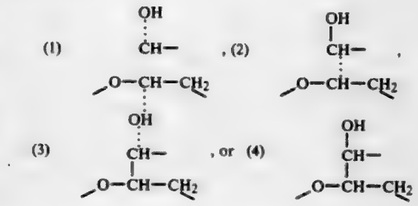
Int. Cl.² C07D *311/94*

U.S. Cl. 542—426 **94 Claims**

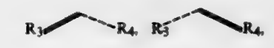
1. A prostacyclin analog of the formula



wherein Z_2 is



wherein one of p or q is the integer one and the other is the integer zero;
wherein Z_1 is
(1) $—(CH_2)_g—CH_2—CH_2—$,
(2) $—(CH_2)_g—CH_2—CF_2—$, or
(3) trans$—(CH_2)_g—CH=CH—$,
wherein g is the integer one, 2, or 3 when q is zero and zero, one, or 2 when q is one;
wherein R_8 is hydrogen, hydroxy, or hydroxymethyl;
wherein Y_1 is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) $—CH_2CH_2—$,
(4) trans—CH=C(Hal)—, or
(5) —C≡C—
wherein Hal is chloro or bromo;
wherein M_1 is



or a mixture of

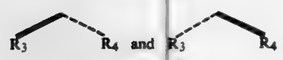


wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive;
wherein L_1 is



or a mixture of

-continued



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein X_1 is

(1) $-COOR_1$; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation,

(2) $-CH_2OH$,

(3) $-CH_2NL_2L_3$, wherein L_2 and L_3 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or $-COOR_1$, wherein R_1 is as defined above;

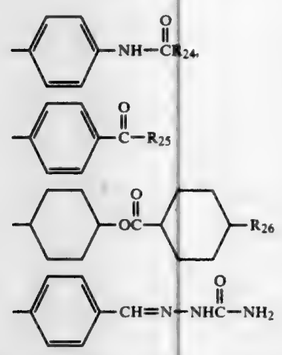
(4) $-COL_4$, wherein L_4 is

(a) amino of the formula $-NR_{21}R_{22}$, wherein R_{21} and R_{22} are hydrogen, alkyl of one to 12 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl or one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive;

(b) carbonylamino of the formula $-NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl of one to 4 carbon atoms and R_{21} is as defined above; or

(c) sulfonylamino of the formula $-NR_{23}SO_2R_{21}$, wherein R_{21} and R_{23} are as defined above; or

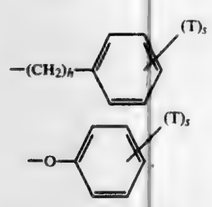
(5) $-COOL_5$, wherein L_5 is p-substituted phenyl selected from the group consisting of



wherein R_{24} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $-NH_2$; R_{25} is methyl, phenyl, $-NH_2$, of methoxy; and R_{26} is hydrogen or acetamido; and

wherein R_7 is

(1) $-(CH_2)_3-CH_3$,



(2)

(3)

wherein h is the integer zero or one; s is the integer zero, one, 2, or 3; and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or with the proviso that not more than two T's are other than alkyl and the 1,5- and 1,15-lactones thereof.

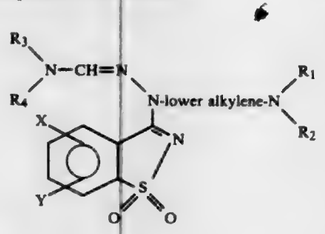
4,174,442

SUBSTITUTED HYDRAZINO DERIVATIVES OF BENZISOTHIAZOLE-1,1-DIOXIDES

Peter C. Wade, Pennington, and Thomas P. Kissick, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 3, 1978, Ser. No. 875,020
Int. Cl.[2] C07D *275/06*; A61K *31/425*
U.S. Cl. 544—62 **4 Claims**

1. A compound of the formula



wherein

R_1, R_2, R_3 and R_4 each is lower alkyl or together with the nitrogen form a pyrrolidino, morpholino, thiamorpholino, piperidino or N-lower alkylpiperazino radical;

X is hydrogen, halogen, lower alkyl, lower alkoxy or nitro, X being the same as Y when

Y is other than hydrogen;

Y is hydrogen, lower alkoxy or halogen;

and non-toxic physiologically acceptable acid addition salts thereof.

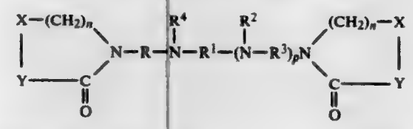
4,174,443

AZA-BIS-LACTAMS

Philip B. Dalton, Brookville, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed Dec. 30, 1977, Ser. No. 865,857
Int. Cl.[2] C07D *241/08, 265/32, 207/26*
U.S. Cl. 544—86 **17 Claims**

1. An aza-bis-lactam having the formula:



wherein n is an integer from 1 to 3; p is 0 or 1; R^2 and R^4 are independently hydrogen, alkyl having from 1 to 4 carbon atoms or phenyl; X is methylene, an oxygen atom or $-N<R^2$; Y is methylene or, when X is methylene, then Y can also be $-N<R^2$; and R, R^1 and R^3 are independently alkylene having from 2 to 6 carbon atoms.

4,174,444

PROCESS FOR PREPARING CYANURIC ACID

Marinus J. A. M. den Otter, Munstergeleen; Lambertus P. G. Hawinkels, Montfort, and Augustinus P. H. Schouteten, Maastricht, all of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Continuation of Ser. No. 703,657, Jul. 8, 1976, abandoned. This application Mar. 27, 1978, Ser. No. 890,843
Int. Cl.[2] C07D *251/32*
U.S. Cl. 544—192 **5 Claims**

1. In a process for the preparation of cyanuric acid by heating a reaction solution of urea, biuret, or mixtures thereof, in a solvent and stripping the solution with a stripping gas to remove ammonia therefrom, the improvement which comprises employing waste gas resulting from heating said reaction solution as the stripping gas by recycling at least 60% by volume of said waste gas to the reaction solution.

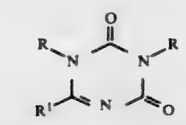
4,174,445

PREPARATION OF ARTHROPODICIDALLY ACTIVE SUBSTITUTED TRIAZINE-2,4-DIONES

Edgar Mohring, and Peter Roessler, both of Bergisch Gladbach, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 5, 1977, Ser. No. 839,694
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648120; May 23, 1977, 2723119
Int. Cl.[2] C07D *251/16*
U.S. Cl. 544—223 **9 Claims**

1. A substituted triazine-2,4-dione of the formula



in which

R in both instances is identical and represents alkyl with up to 20 carbon atoms carrying one or more substituents selected from the group consisting of halogen, CN, aryloxy, alkoxy, halogenalkoxy, alkylmercapto, halogenalkylmercapto or represents furthermore phenyl carrying one or more substituents selected from the group consisting of halogenoalkyl, optionally halogen-substituted phenoxy, alkoxy, halogenoalkoxy, alkylmercapto, alkoxycarbonylalkenyl and halogenoalkylmercapto radicals and which can optionally be further substituted by halogen, or represents phenylsulphonyl which is optionally substituted by halogen, nitro, CN, monoalkylamino, dialkylamino, alkylmercapto or alkoxy, or represents alkylsulphonyl which is optionally substituted by halogen or CN, and

R^1 represents hydrogen or alkyl with 1–10 carbon atoms or cycloalkyl with 5–10 carbon atoms, either of which is optionally substituted by halogen, alkoxy, cyano or nitro, or represents phenyl or naphthyl which are optionally substituted by halogen, nitro, cyano, alkyl with 1–10 carbon atoms, halogenoalkyl, alkoxy or alkylmercapto.

4,174,446

PROCESS FOR THE PREPARATION OF N^1-(2'-FURANIDYL)-5-FLUORO-URACIL

Eva Schönberger, Givatayim; Zabar Sasson, Rehovoth, and Uri Michael, Natanya, all of Israel, assignors to ABIC Ltd., Israel

Filed Oct. 11, 1977, Ser. No. 841,023
Claims priority, application Israel, Oct. 12, 1976, 50671
Int. Cl.[2] C07D *405/04*
U.S. Cl. 544—313 **9 Claims**

1. Method of producing N^1-(2'-furanidyl)-5-fluorouracil which comprises reacting 2,3-dihydrofuran with water in the presence of a catalytic amount of an acidic catalyst at a pH below 2.5, thereby forming a reaction mixture including unreacted starting materials, removing the unreacted starting materials and reacting the remaining reaction mixture with silylated-5-fluorouracil in the presence of a Friedel Crafts catalyst in an inert organic solvent thus forming the N^1-(2'-furanidyl)-5-fluorouracil in high yield.

4,174,447

PROCESS FOR DIMERIZATION, ARYLATION AND TRIFLUOROMETHYLATION OF AROMATIC AND HETEROCYCLIC COMPOUNDS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 26, 1975, Ser. No. 553,093
Int. Cl.[2] C07D *401/04*
U.S. Cl. 546—109 **10 Claims**

1. A process for coupling compounds which comprises the steps of (1) reacting a monosilver salt compound having only one silver salt group per molecule selected from the group consisting of unsaturated, aliphatic carboxylic acids having 1 to 3 carbon-to-carbon double bonds and 3 to 26 carbon atoms, aromatic carboxylic acids, the aromatic groups of said aromatic carboxylic acids selected from the group consisting of phenyl, biphenyl, naphthyl, phenanthryi and anthranyl groups, and heterocyclic acids, the heterocyclic groups of said heterocyclic carboxylic acids being selected from the group consisting of thienyl, pyridyl, benzothienyl, thienobenzenyl, quinolyl, isoquinolyl, dibenzothienyl and phenanthridyl groups and mixtures thereof at a temperature within the range from about 100° to 500° C., (2) extracting the cooled mixture of silver and product with a solvent to recover the product by distillation or, alternatively, collecting the volatile products from the reactor in a cooled receiver and (3) recovering the silver metal.

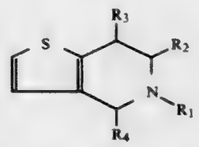
4,174,448

PROCESS FOR THE PREPARATION OF THIENOPYRIDINE DERIVATIVES

André Bousquet, Portet, and Emile Braye, Lagardelle, both of France, assignors to Parcor, Paris, France

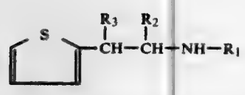
Filed Jun. 6, 1978, Ser. No. 913,073
Claims priority, application France, Jul. 12, 1977, 77 21517
Int. Cl.[2] C07D *495/04*
U.S. Cl. 546—114 **7 Claims**

1. Process for the preparation of compounds having the general formula:



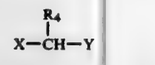
(I)

in which R_1 is a member selected from the group consisting of C_{1-7} alkyl; phenyl lower alkylene, phenyl lower alkylene in which the phenyl is substituted with 1 to 3 substituents selected from the group consisting of lower alkyl, hydroxy, lower acyloxy, lower alkoxy, nitro and halogen; naphthyl lower alkylene; thienyl lower alkylene; diphenyl lower alkylene; phenyl hydroxy-lower-alkylene; phenyl hydroxy-lower-alkylene in which the phenyl is substituted with 1 to 3 substituents selected from the group consisting of lower alkyl, hydroxy, lower acyloxy, lower alkoxy, nitro and halogen; naphthyl hydroxy-lower-alkylene; thienyl hydroxy-lower-alkylene; and diphenyl hydroxy-lower-alkylene; R_2 is selected from the group consisting of hydrogen and lower alkyl; R_3 is hydrogen; and R_4 is hydrogen, comprising reacting a compound having the formula:



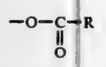
(II)

in which R_1, R_2 and R_3 are as defined above, with a compound having the formula:



(III)

in which R_4 is as defined above; X is a radical selected from the group consisting of halogen, amino and substituted amino; and Y represents a radical selected from the group consisting of lower alkoxy, substituted lower alkoxy, thio(lower)alkyl, substituted thio(lower)alkyl, amino, substituted amino, and a group of the formula:



in which R is a radical selected from lower alkyl, or both the groups X and Y, together with the carbon atom to which they are attached, form a 6-membered nucleus selected from hexahydro-S—triazinic and trioxannic heterocyclic nucleus, in an inert solvent, at a temperature between 0° and 150° C. and in an anhydrous medium.

4,174,449

PROCESS FOR THE REDUCTION OF QUINIDINONE TO QUINIDINE

Jean P. Gignier, 4 Rue de Capucins, and Jacques Bourrelly, 4 Ave. de Chateau, both of 92190, Meudom, France

Filed Jun. 13, 1978, Ser. No. 915,010
Int. Cl.[2] C07D *453/04*
U.S. Cl. 546—134 **18 Claims**

1. A process for reducing quinidinone to quinidine comprising reacting quinidinone with a reducing agent selected from the group consisting of alkyl-substituted aluminum hydrides, and alkali metal alkyl-substituted aluminum hydrides in the presence of an orienting agent selected from the group consisting of pyridine, alkyl-substituted pyridine, pyrrole, and alkyl-substituted pyrrole.

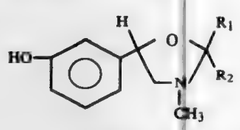
4,174,450

INTERMEDIATES USEFUL IN THE PREPARATION OF OPTICALLY AND THERAPEUTICALLY ACTIVE-m-ACYLOXYα-(METHYL-AMINO) METHYL BENZYL ALCOHOLS

Nicolae S. Bodor, and Sun-Shine Yuan, both of Lawrence, Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Division of Ser. No. 671,067, Mar. 29, 1976, Pat. No. 4,028,368, which is a division of Ser. No. 548,606, Feb. 10, 1975, Pat. No. 3,966,749. This application Nov. 8, 1976, Ser. No. 740,063
Int. Cl.[2] C07D *498/10*
U.S. Cl. 546—16 **6 Claims**

1. The intermediate compound:



(II)

wherein R_1 and R_2 together with the carbon atom to which they are attached form a single hetero atom member selected from the group consisting of a five- to seven-membered heterocycle containing one hetero-N-atom, and an N-substituted five- to seven-membered heterocycle containing one hetero-N-atom whose substituent is C_1-C_2 alkyl.

4,174,451

2-FURYL-(3,4-DIMETHYL-2-PYRIDYL)-CARBINOL

Ricardo Granados Jarque; Juan Bosch Cartes; Rosa Llobera Jimenëz, all of Barcelona; Cristobal Martinez Roldän, and Fernando Rabadan Peinado, both of Madrid, all of Spain, assignors to Laboratorios Made, S.A., Madrid, Spain

Filed Oct. 6, 1978, Ser. No. 949,022
Claims priority, application Spain, Oct. 7, 1977, 462.987
Int. Cl.[2] C07D *405/02*
U.S. Cl. 546—283 **6 Claims**

1. 2-Furyl-(3,4-dimethyl-2-pyridyl)-carbinol.

2. A process for obtaining 2-furyl-(3,4-dimethyl-2-pyridyl)-carbinol comprising the steps of reacting furfural with 2-bromo-3,4-dimethylpyridine in butyl-lithium at about −15° C. and isolating the product.

4,174,452

PRODUCTION OF CARBOXYLIC ACIDS FROM NITRILES

Abraham P. Gelbein, 925 Woodland Ave., Plainfield, N.J. 07060; John E. Paustian, 38 Adams Dr., Whippany, N.J. 07981, and Anthony J. Fanelli, 63 Upper Mountain Ave., Rockaway, N.J. 07866

Continuation of Ser. No. 730,386, Oct. 7, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 877,339
Int. Cl.[2] C07D *213/55*; C07C *63/26*
U.S. Cl. 546—319 **14 Claims**

1. In an acid catalyzed process for producing a carboxylic acid from a nitrile, the improvement comprising:

reacting water and a nitrile selected from the group consisting of (1) nicotinonitrile and intermediate hydrolysis products thereof, and (2) aromatic nitriles having at least one cyano group substituted on an aromatic nucleus selected from the group consisting of benzene and naphthalene and intermediate hydrolysis products thereof, in the vapor phase, in the presence of an acid catalyst in solid form, at a temperature of from 200° F. to 1,000° F., said temperature being above the dew point of the nitrile and corresponding carboxylic acid product to produce a gaseous effluent containing the corresponding carboxylic acid.

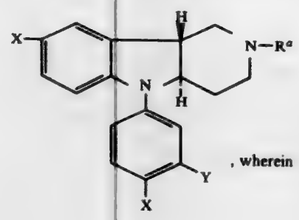
4,174,453

TRANS-HEXAHYDRO-PYRIDO-INDOLES

Joel G. Berger, Summit, N.J., assignor to Endo Laboratories, Inc., Garden City, N.Y.

Continuation-in-part of Ser. No. 698,589, Jun. 22, 1976, which is a continuation-in-part of Ser. No. 522,145, Nov. 8, 1974, Pat. No. 3,991,199, which is a continuation-in-part of Ser. No. 422,613, Dec. 6, 1973, abandoned. This application May 22, 1978, Ser. No. 908,572
Int. Cl.[2] C07D *471/04*
U.S. Cl. 546—85 **1 Claim**

1. A method for making trans-2,3,4,4a,5,9a-hexahydro-1H-pyrido-[4,3-b]indoles corresponding to the formula



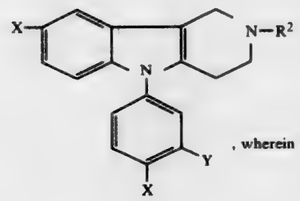
, wherein

wherein

when Y is —H, X is —H, —Cl, —Br, $—CH_3$, -tert-—C_4H_9 or —OCH_3; and when Y is —CF_3, X is —H; and

R^a is benzyl; benzyl ring-substituted with methyl, methoxy or chloro; phenethyl; 3-phenylpropyl; 3-phenylpropyl ring-substituted with chloro, bromo, or methoxy; furfuryl; 2-thienyl; C_1–C_5 alkyl; C_3–C_7 cycloalkyl; C_4–C_8 cycloalkylmethyl; (methylcyclopropyl)methyl; (cis-2,3-dimethylcyclopropyl)methyl; exo-7-norcarylmethyl; (4-methylbicyclo[2.2.2]oct-1-yl)methyl; (bicyclo[2.2.1]hept-2-yl)methyl; 1-adamantylmethyl; or 2-adamantylmethyl,

Comprising stereoselectively reducing a 2,3,4,5-tetrahydro-1H-pyrido-[4,3-b]-indole corresponding to the formula



, wherein

wherein

R^2 is the same as R^a or is



wherein

R^7 is phenyl; chlorophenyl; methylphenyl; methoxyphenyl; benzyl; phenethyl; phenethyl ring-substituted with chloro, bromo, or methoxy; 2-furyl; 2-thienyl; hydrogen; C_1–C_4 alkyl; C_2–C_4 alkenyl; C_3–C_7 cycloalkyl; methylcyclopropyl; C_5–C_7 cycloalkenyl; C_5–C_7 cycloalkadienyl; 2,3-dimethylcycloprop-2-en-1-yl; exo-7-norcaryl; 4-methylbicyclo[2.2.2]oct-1-yl; bicyclo[2.2.1]-hept-2-yl; 4-methylbicyclo[2.2.2]oct-2-en-1-yl; bicyclo[2.2.1]-hept-2-en-5-yl; 1-adamantyl; or 2-adamantyl;

by the sequential steps of

(1) reacting the tetrahydro-indole compound with boronhydride/tetrahydrofuran in the absence of acid; and

(2) acidifying the reaction product of step (1).

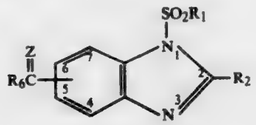
4,174,454

ALKYLIDENYLMETHYL-SUBSTITUTED 1-SULFONYLBENZIMIDAZOLES

Charles J. Paget; James W. Chamberlin, both of Indianapolis, and James H. Wikel, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 750,991, Dec. 15, 1976, Pat. No. 4,118,742, which is a continuation-in-part of Ser. No. 608,415, Aug. 28, 1975, abandoned. This application Mar. 3, 1978, Ser. No. 883,113
Int. Cl.[2] C07D *235/30*
U.S. Cl. 548—306 **7 Claims**

1. A compound of the formula



wherein

R_1 is C_1–C_5 alkyl, C_3–C_7 cycloalkyl, phenyl, furyl, thienyl, or R_4R_5N—, wherein R_4 and R_5 are independently C_1–C_3 alkyl or R_4 and R_5 when taken together with the nitrogen atom to which they are attached are pyrrolidino, piperidino or morpholino;

R_2 is amino, formamido, acetamido, propionamido or butyramido;

R_6 is hydrogen, C_1–C_7 alkyl, C_3–C_7 cycloalkyl, (C_3–C_7 cycloalkyl)methyl, 1-(C_3–C_7 cycloalkyl)ethyl, benzyl, phenyl, or phenyl substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, chloro, bromo, iodo, nitro or trifluoromethyl;

Z is C_1–C_7 alkylidene; and



is at the 5 or 6 position.

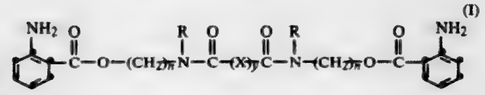
4,174,455

ANTHRANILATES OF OXYALKYLATED CARBOXAMIDES

Jürgen Habermeier, Pfeffingen; Roland Moser, Basel, and Wolfgang Seiz, Pfeffingen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

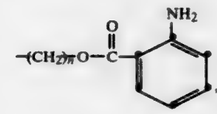
Filed Dec. 4, 1978, Ser. No. 966,417
Claims priority, application Switzerland, Dec. 9, 1977, 15123/77
Int. Cl.[2] C07C *101/54*; C08G *59/54*
U.S. Cl. 560—49 **9 Claims**

1. An anthranilate of the formula I



(I)

wherein each R is hydrogen or



each n is the number 2, 3 or 4, y is nought or 1 and X is an alkylene radical having 1 to 8 C atoms, meta- or para-phenylene or meta- or para-cyclohexylene.

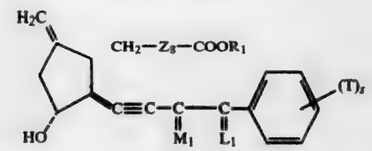
4,174,456

9-DEOXY-9-METHYLENE-INTER-OXA-13,14-DIDEHYDRO-16-PHENYL-17,18,19,20-TETRANOR-PGF$_1$ COMPOUNDS

Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

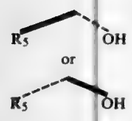
Continuation-in-part of Ser. No. 786,249, Apr. 11, 1977, Pat. No. 4,118,584. This application Jul. 12, 1978, Ser. No. 924,031
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—60 **41 Claims**

1. A prostaglandin analog of the formula

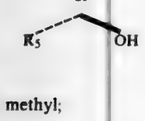


wherein

M_1 is



or

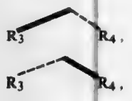


wherein

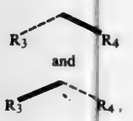
R_5 is hydrogen or methyl;

wherein

L_1 is



or a mixture of



wherein

R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein Z_8 is $—CH_2—O—CH_2—(CH_2)_g—CH_2—$

wherein g is one, 2, or 3; wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alky of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation, and the 1,11- or 1,15-lactones thereof.

4,174,457

CARBAMATE

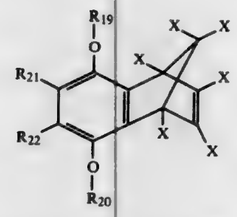
Julian R. Little, Wayne; Walter Nudenberg, West Caldwell, and Yong S. Rim, Paterson, all of N.J., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 789,006, Apr. 20, 1977, Pat. No. 4,080,408, which is a division of Ser. No. 745,065, Nov. 26, 1976, Pat. No. 4,058,568, which is a division of Ser. No. 486,482, Jul. 8, 1974, Pat. No. 4,009,200, which is a division of Ser. No. 329,177, Feb. 2, 1973, Pat. No. 3,875,236, which is a division of Ser. No. 80,747, Oct. 14, 1970, abandoned. This application Nov. 16, 1977, Ser. No. 851,989

Int. Cl.[2] C07C *125/06*

U.S. Cl. 560—134 **3 Claims**

1. A compound of the formula:



(VII)

wherein R_{19} and R_{20} are the same or different and each may be



wherein R_{29} is $—NHR_{30}$ wherein R_{30} is lower alkyl, R_{21} and R_{22} can be the same or different and each may be hydrogen, $—SO_2—R_{24}$ wherein R_{24} is lower alkyl, an aromatic nucleus of the phenyl series or a halogen substituted aromatic mucleus of the phenyl series with the proviso that at least one of R_{21} and R_{22} may also be halogen; and X is halogen.

4,174,458

NOVEL ANALOGUES OF PROSTANOIC ACIDS NOT OCCURRING IN NATURE

Milos Babej, Frankfurt am Main; Wilhelm Bartmann, Neuenhain; Gerhard Beck, Frankfurt am Main, and Ulrich Lerch, Hofheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

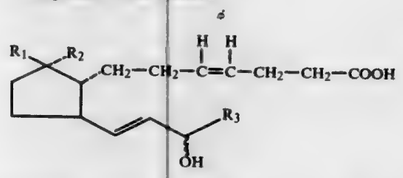
Division of Ser. No. 752,433, Dec. 20, 1976, abandoned, which is a division of Ser. No. 549,651, Feb. 13, 1975. This application May 3, 1978, Ser. No. 902,404

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1974, 2407186; 09241974, Sep. 24, 1974, 2445526

Int. Cl.[2] C07C *177/00*

U.S. Cl. 562—463 **2 Claims**

1. A compound of the formula



physiologically tolerated salts thereof with organic and inorganic bases, and esters thereof with aliphatic, cycloaliphatic, or araliphatic alcohols of 1 to 8 carbon atoms, wherein

R_1 and R_2, taken alone, are different and are each hydrogen or hydroxy;

R_1 and R_2, taken together, are oxygen; and

R_3 is straight chain or branched alkyl having 1 to 10 carbon atoms substituted by 0-aryl or 0-benzyl, which themselves may be substituted by one or several halogen atoms, by trifluoromethyl, by alkyl having 1 to 3 carbon atoms, by phenoxy, or by phenoxy substituted by one or several halogen atoms.

4,174,459

PROCESS FOR PRODUCING METHACRYLIC ACID

Teruhisa Sakamoto; Taketoshi Nagahama; Shigeo Nakamura, and Keiichi Kihara, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Jan. 4, 1977, Ser. No. 756,912

Claims priority, application Japan, Feb. 9, 1976, 51/12245

Int. Cl.[2] C07C *51/32, 57/04*

U.S. Cl. 562—534 **11 Claims**

1. A process for producing methacrylic acid, which comprises:

reacting methacrolein with molecular oxygen or a molecular oxygen-containing gas in the vapor phase in the presence of a complex oxide catalyst having the formula:

$$Mo_aV_bP_cCe_dCu_eX_fO_g$$

wherein X represents at least one element selected from the group consisting of manganese, iron, cobalt, tin and tellurium and wherein a, b, c, d, e and f represent atomic ratios such that when a=12; b=0.01 to 2; c=0.1 to 3; d=0.01 to 2; e=0.01 to 2; f=0 to 2 and g assumes a value depending upon the valences of the other components in the range of 38 to 50.

4,174,460

PROCESS FOR THE HYDROXYLATION OF PHENOLS AND PHENOL ETHERS IN THE NUCLEUS

Hermann Seifert, Cologne; Helmut Waldman; Wulf Schwerdtel, both of Leverkusen, and Wolfgang Swodenk, Odenthal-Globusch, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 553,939, Feb. 28, 1975, Pat. No. 4,045,496. This application Mar. 31, 1977, Ser. No. 783,501

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1974, 2410758

The portion of the term of this patent subsequent to Oct. 11, 1994, has been disclaimed.

Int. Cl.[2] C07C *37/00*

U.S. Cl. 568—629 **15 Claims**

1. A process for the hydroxylation in the nucleus of a phenol or a phenol ether which comprises contacting a phenol or a phenol ether at the start of the reaction with substantially anhydrous hydrogen peroxide dissolved in a non-aqueous solvent which is an ester or an N-alkyl amide of phosphoric acid, phosphonic acid or phosphinic acid, employing 3 to 20 mols of phenol or phenol ether per mol of hydrogen peroxide, the reaction being carried out in the presence of a strong acid which is inert under the reaction conditions at a temperature of 20°–150° C., the acid being present in an amount of 0.01 to 2 mols per mol of hydrogen peroxide, and recovering the resulting hydroxylated phenol or phenol ether.

4,174,461

STABILIZED PERFLUOROPOLYETHER FLUIDS

Dario Sianesi; Giuseppe Nelli, both of Milan; Renzo Fontanelli, Rome, and Valentino Zamboni, Busto Arsizio, all of Italy, assignors to Montecantini Edison S.p.A., Milan, Italy

Continuation of Ser. No. 550,293, Feb. 18, 1975, abandoned, which is a continuation of Ser. No. 294,582, Oct. 3, 1972, abandoned, which is a division of Ser. No. 156,391, Jun. 24, 1971, abandoned. This application Dec. 10, 1976, Ser. No. 749,477

Claims priority, application Italy, Jun. 27, 1970, 26668 A/70

Int. Cl.[2] C07C *43/00*

U.S. Cl. 568—582 **2 Claims**

1. A composition comprising (A) at least one perfluoropolyether fluid of the formula:

$$X—O—(C_3F_6O)_p—(CF_2O)_q—(C_2F_4O)_r—Y$$

wherein the perfluoroalkyleneoxy groups are randomly distributed along the chain; p, q and r are each zero or a number from 1 to 100 inclusive, the sum of p, q and r being 6 to 200; X and Y are the same or different from each other and are perfluoroalkyl groups having 1 to 3 carbon atoms; and (B) from 0.1 to 50 parts by weight per 100 parts of perfluoropolyether fluid of a perfluoropolyether compound having at least one arylamide terminal group and being of the formula:

$$A—O—(C_3F_6O)_P—(CF_2O)_Q—(C_2F_4O)_S—CF(-Z)—CO—N(R)Ar$$

wherein if two or more of the perfluoroalkyleneoxy groups, (C_3F_6O), (CF_2O) and $(C_2Fhd\ 4^o)$ are simultaneously present in the chain, they are randomly distributed therealong; and wherein A is a perfluoroalkyl group having 1 to 3 carbon atoms or a —CF(Z)—CO—N(R)Ar group; P, Q and S are each zero but not simultaneously or a number ranging from 1 to 100 inclusive, the sum of P, Q and S being 3 to 200; Z is a fluorine atom or a CF_3 group; Ar is an unsubstituted aryl group, or an aryl group which is mono-, di- or tri-substituted with a lower alkyl group, an alkylaryl group, phenyl or halogen, and R is a hydrogen atom, a lower alkyl group, an unsubstituted phenyl or phenyl group which may be bound to Ar either directly or through a sulfur atom.

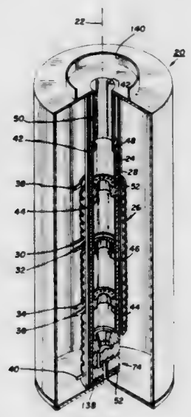
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4,174,462

INDUCTION FURNACES FOR HIGH TEMPERATURE CONTINUOUS MELTING APPLICATIONS

Michael L. Pearce, 741 Windsor-Perrineville Rd., East Windsor, N.J. 08520

Filed Mar. 30, 1978, Ser. No. 891,909
Int. Cl.[2] H05B *5/00*
U.S. Cl. 13—26 **17 Claims**



1. A continuous flow induction furnace for the melting of high temperature non-conducting materials such as glasses, refractories, ceramics, or the like, said furnace having a relatively large axial length comprising:

(a) hollow, cylindrically-shaped shield means disposed along the longitudinal axis of said furnace;

(b) primary inducing means circumscribing the outer surface of said shield means and disposed along a substantial portion thereof, said inducing means being provided with means for selectively introducing varying amounts of power;

(c) hollow, cylindrically-shaped susceptor means serving as a secondary winding means for the absorption of said power and converting to heat, said susceptor being disposed within said primary inducing means and extending along said longitudinal axis for at least the length of said inducing means;

(d) powdered insulating means disposed between the outer surface of said susceptor means and the inner surface of said shield means for retaining the heat generated within the furnace; and

(e) hearth means, said hearth means including an orifice and insuring the continuous flow of the uncontaminated molten material.

4,174,463

CONTRACTION TERMINATION DEVICE AND METHOD

Frank Albert, Jr., Parma, Ohio, assignor to Preformed Line Products Company, Cleveland, Ohio

Filed Sep. 12, 1977, Ser. No. 832,184
Int. Cl.[2] H02G *15/06*
U.S. Cl. 174—79 **29 Claims**



1. A contraction termination device for a length of cable or the like having at least one inner strand surrounded at least by a braided sheath, said device comprising:

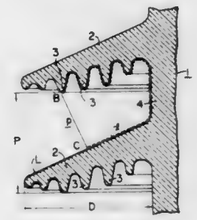
an elongated termination sleeve having opposed lead and terminal ends with an internal passageway communicating between said ends, said sleeve having an outward taper over at least a longitudinal portion thereof from said lead end toward said terminal end whereby said at least one inner strand is adapted to be received through said passageway from said lead end and said braided sheath is adapted to be received over and in surrounding relationship with at least a portion of said sleeve from said lead end; and, means for retaining said sheath over and in said surrounding relationship with said sleeve.

4,174,464

ROD-TYPE INSULATOR HAVING IMPROVED WITHSTAND VOLTAGE CHARACTERISTICS UNDER A CONTAMINATED CONDITION

Toshiyuki Kawaguchi, Inuyama, and Tomio Hayashi, Gifu, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Apr. 17, 1978, Ser. No. 897,103
Claims priority, application Japan, Apr. 28, 1977, 52-49402
Int. Cl.[2] H01B *17/56*
U.S. Cl. 174—212 **8 Claims**



1. A rod-type insulator having a body and a plurality of adjoining sheds in an axial direction thereof and projecting from the body with the following relationships:

$$3.8 \leqq L/P \leqq 5.0;\ 4.5 \leqq l/p \leqq 6.0$$

wherein P is the pitch between the adjoining sheds, L is the leakage distance per shed, p is the distance between a given point on a lower surface of one of the adjoining sheds and another given point on an upper surface of the other opposing shed, and l is the leakage distance between the given points and, wherein the lower surface of each shed has coaxial ribs forming an undulating surface.

4,174,465

SIGNAL TRANSMITTING INTERFACE SYSTEM COMBINING TIME COMPRESSION AND MULTIPLEXING

Lawrence G. Meares, Rancho Palos Verdes, and Robert D. Simpson, Huntington Beach, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jul. 29, 1977, Ser. No. 820,372
Int. Cl.[2] H04J *3/02*
U.S. Cl. 179—15 A **15 Claims**

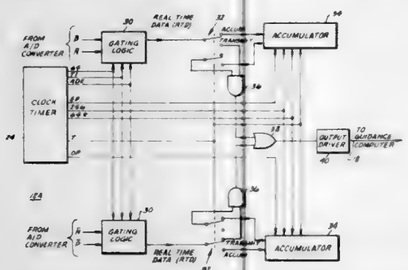
6. An interface system comprising:

gating means for receiving digital signals from a first source and generating a series of real time data pulses in accordance with a selected code;

accumulating means adapted to accumulate a selected plurality of real time data pulses from said first source during a first time interval and transmit pulses corresponding to the accumulated pulses during a second time interval; and

means for selectively interleaving the pulses from the accu-

mulating means with a corresponding plurality of succeeding real time data pulses from said first source for



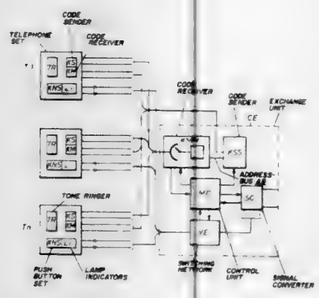
transmission on an output line during the second time interval.

4,174,466

MULTI-PARTY TELEPHONE SYSTEM ALLOWING SPEECH CONNECTION BETWEEN EXTENSIONS AS BETWEEN EXTENSIONS AND AN OUTER LINE

Lars I. Broger, Nynäshamn, and Sten E. Magnusson, Tyresö, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Aug. 17, 1977, Ser. No. 825,182
Claims priority, application Sweden, Sep. 1, 1976, 7609646
Int. Cl.[2] H04Q *1/30*
U.S. Cl. 179—18 AD **3 Claims**



1. In a multiparty telephone system having a plurality of telephone sets line pairs for speech signals, an external line for calls outside the multiparty telephone system and a central unit, apparatus for transmitting control indicia between the telephone sets and the central unit as digital signal words, said apparatus comprising:

(1) a line system for conveying digital signal words between the telephone sets and the central unit, said line system including a set of wires connected from each of the telephone sets to the central unit;

(2) a code sender means in each of the telephone sets for transmitting the same digital signal word at least twice via its associated set of wires to the central unit;

(3) a common code receiver means in the central unit for receiving the digital signal words from the telephone sets, said code receiver comprising a scanner means for continuously sequentially scanning the set of wires from each of the telephone sets for a period of time to receive at least two successive digital signal words, comparison means for comparing two successive received digital signal words to give an indication when said two successive received digital words are the same;

(4) a common code sender comprising in the central unit

(a) an addressed digital signal word memory means in the central unit having a plurality of multibit position storage units each associated with a different one of the telephone sets for storing digital signal words associated with the respective telephone sets;

(b) first addressing means responsive to said comparison means for selecting storage units to accept digital signal words;

(c) second addressing means for sequentially selecting the bit positions of all storage units to emit their contents onto the associated sets of wires connecting the central unit to the respective telephone sets; and

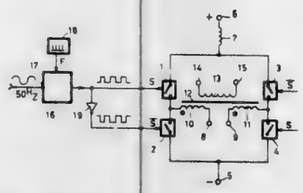
(5) a code receiver in each of the telephone sets for receiving digital signal words on its set of wires connected to the central unit.

4,174,467

RINGING SIGNAL GENERATOR FOR USE IN A SUBSCRIBER'S LINE CIRCUIT

Gilbert M. M. Ferrieu, Bievres, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 17, 1978, Ser. No. 878,667
Claims priority, application France, Mar. 8, 1977, 77 06756
Int. Cl.[2] H04M *3/04*
U.S. Cl. 179—18 HB **4 Claims**



1. A ringing signal generator for use in a subscriber's line comprising pulse code signal generator means for providing a pulse code modulated signal corresponding to a sinusoidal ringing signal of a given frequency and having transitions at time intervals that are a multiple of the inverse of a sampling frequency that is substantially higher than said given frequency, switch means responsive to said pulse code modulated signal for reversing a supply current to said subscriber's line during transitions of said pulse code signal, and filter means comprising an inductance in series with said switch means for substantially attenuating those frequencies of the reversed supply current in the subscriber's line that are higher than said ringing signal frequency.

4,174,468

DIGITAL COIN CIRCUIT

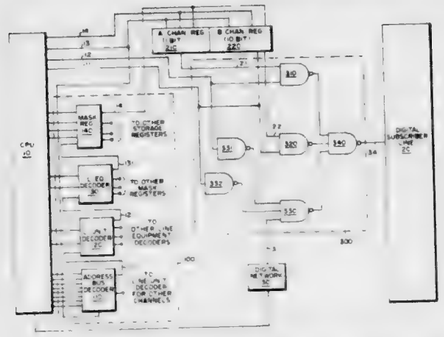
David J. Stelte, Lombard, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Apr. 3, 1978, Ser. No. 892,526
Int. Cl.[2] H04J *3/12*; H04M *17/02*
U.S. Cl. 179—6.3 R **6 Claims**

1. A digital coin circuit for use in a digital telephone switching system including, at least one multi-channel digital subscriber line connected to at least one coin telephone, a digital network connected to a central processing unit operated to generate, digital data representative of control signals for said coin telephone, a loading signal and a periodic timing signal, said digital coin circuit comprising:

storage means connected to said central processing unit for storage of digital coin telephone control signal bits;

control means connected to said central processing unit, to said storage means and to said digital subscriber line, operated in response to said loading signal to transfer said digital coin telephone control signal bits from said central processing unit to said storage means, and further operated in response to said periodic timing signal to transfer said bits from said storage means to said digital subscriber



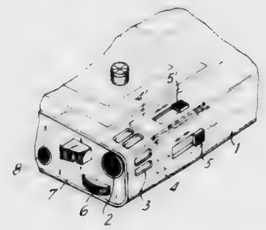
line for asynchronous transmission to said connected coin telephone.

4,174,469

ADJUSTABLE DIRECTIVITY MICROPHONE INCORPORATED IN A TAPE RECORDER CASING

Michio Kusuyama, Hachioji City, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 804,434, Jun. 7, 1977, abandoned. This application Jul. 14, 1978, Ser. No. 924,667
Claims priority, application Japan, Jun. 11, 1976, 51-76135; Jun. 11, 1976, 51-76138
Int. Cl.[2] H04R *1/38*
U.S. Cl. 179—121 D **1 Claim**



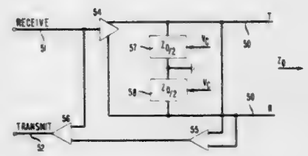
1. A microphone device comprising a microphone body, a tape recorder casing for incorporating the microphone therein, said casing having a front wall and a plurality of side walls extending from said front wall, said microphone body being located adjacent said front wall, acoustic inlet holes provided in said front wall and in at least two said side walls adjacent both said front wall and said microphone body, at least two shielding plates mounted on said casing each associated with a different one of said side walls for opening and closing the acoustic inlet holes in said side wall with which said shielding plate is associated, means mounted on said casing accessible from the exterior thereof for moving said shielding plates to open and close the acoustic inlet holes so that the directionality of the microphone can be selectively obtained by the separate actuation of said shielding plates.

4,174,470

ELECTRONIC HYBRID

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 10, 1978, Ser. No. 949,577
Int. Cl.[2] H04B *1/58*
U.S. Cl. 179—170 NC **11 Claims**



1. An electronic hybrid circuit comprising

a transmit port,

a receive port,

a bidirectional access port,

an unbalanced-to-balanced signal conversion circuit connected between said receive port and said access port,

a balanced-to-unbalanced signal conversion circuit connection between said access port and said transmit port,

a differential amplifier having inputs connected to said receive port and the output of said balanced-to-unbalanced signal conversion circuit and an output connected to said transmit port, and

characterized by

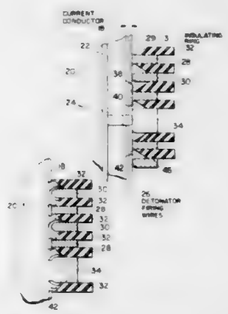
a frequency-sensitive, voltage-controlled matching impedance connected between the output of said unbalanced-to-balanced signal conversion circuit and said access port.

4,174,471

EXPLOSIVELY ACTUATED OPENING SWITCH

Richard D. Ford, Temple Hills, and Ihor M. Vitkovitsky, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 27, 1978, Ser. No. 890,873
Int. Cl.[2] H01H *39/00*
U.S. Cl. 200—61.08 **22 Claims**



1. A current-limiting device comprising, in combination:

current-conducting means having an empty central core inside a wall;

inert pusher material filling said central core;

explosive means located within said pusher material;

means for actuating said explosive means; and

at least one module comprising:

insulating means,

cutting means,

bending means,

said latter three means encompassing the current-conducting means, said cutting means having a cutting edge in girdling contact with the wall of said current-conducting means and extending outward from said wall, said bending means having a rounded end in girdling contact with said wall and extending outward from said wall, said insulating means lying between and in contact with said cutting and bending means and encompassing, and extending outward from, said wall and being formed at its inner end so that a void is formed which is bounded by said wall, said insulating means and at least one of said bending and cutting means, and

an explosion-proof containing ring in girdling contact with the outside of said tube in the region in which said detonator is located,

whereby, when said explosive means is actuated, the explosion forces said wall outward so that it is cut completely by said cutting means and a portion of the wall is forced into contact with said bending means leaving a gap in said wall through which the pusher material is forced, said pusher material filling said void to form an insulating layer between the cut portions of said current-conducting means and between nearby portions of said bending and cutting means so that current flow in said current-conducting means is stopped.

4,174,472

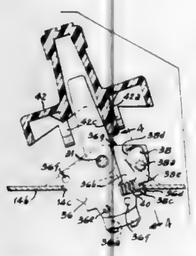
PIVOTED-ACTUATOR SWITCH WITH INTEGRAL OFF-LOCK

Leonardus J. Josemans, Smithfield, N.C., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Oct. 26, 1978, Ser. No. 955,109

Int. Cl.[2] H01H *93/20, 21/80, 9/22*

U.S. Cl. 200—68 **8 Claims**



1. A self-enclosed pivoted-actuator switch with integral off-lock comprising:

a switch housing;

stationary contact means within said housing connected to external terminals;

movable contact means within said housing selectively operable to an "on" position closing a circuit with respect to said stationary contact means or to an "off" position opening said circuit;

a switch operator subassembly;

a hole in said housing;

supporting means on said housing adjacent said hole pivotally mounting said switch operator subassembly for reciprocal movement to actuate said movable contact means;

and said switch operator subassembly comprising:

a contact actuator extending from said pivotal supporting means through said hole into said housing for actuating said movable contact means to said "on" or "off" position;

a slot within said contact actuator;

a spring-biased locking member pivotally mounted within said slot in said contact actuator and having a normal unlocking position wherein said member is retracted into said contact actuator and a locking position wherein a stop lug of said locking member at one side of its pivot projects from said contact actuator to abut the top of the rim of said hole in order to lock said contact actuator in its "off" position;

a removable operating lever having a manually engagable portion;

means for snap-in coupling said operating lever to said contact actuator so that selective actuation thereof by said manually engagable portion effects pivotal movement of both said removable operating member and said contact actuator coupled thereto;

a cam on said locking member at the other side of its pivot;

and a projection on said removable operating lever operable when inserted into said slot to engage said cam and pivot said locking member to retract said stop lug into said unlocking position thereby to allow normal operation of the switch.

4,174,473

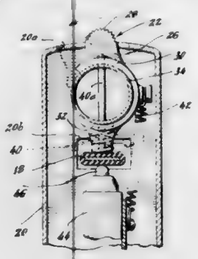
SAFETY SWITCH FOR FLOOR TREATMENT APPARATUS

Allen Brenneman, Elkhart, Ind., assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed May 4, 1978, Ser. No. 902,803

Int. Cl.[2] H01H *9/06, 13/08, 9/20, 3/20*

U.S. Cl. 200—157 **5 Claims**



1. In a motor-driven floor treatment machine having a control box, a cylindrical dual grip handle passing through said control box, a first switch in said control box for controlling said motor, a trigger extending out of opposite sides of said control box and adjacent to said handle for actuating said first switch, the improvement comprising; a second safety switch movably mounted on said handle and interposed between the latter and said trigger, said safety switch having a blocking means that is a generally tubular body slidably fitting over said cylindrical dual grip handle and having at least one lug normally projecting downwardly from said tubular body, spring means normally biasing said lug into engagement with said trigger when said machine is in an inoperative condition, and finger-actuated means on said tubular body and projecting through an opening in said control box for moving said tubular body to disengage said lug from said trigger against the force of said spring means to permit movement of said trigger to actuate said first switch, said blocking means of the safety switch returning to its normal blocking position by said spring means when said finger-actuated means is released.

4,174,474

ENDSWITCH CAM ARRANGEMENT

Hermann Spanier, Windhagen, Fed. Rep. of Germany, assignor to Dr. Boy K.G., Fernthal, Fed. Rep. of Germany

Filed Apr. 28, 1978, Ser. No. 901,146

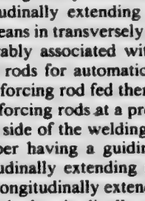
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1977, 2719066

Int. Cl.[2] H01H *3/20*

U.S. Cl. 200—331 **14 Claims**

1. An endswitch cam arrangement having at least one adjustable cam mounted on a switchbar for operation of an endswitch belonging thereto, wherein said switchbar has a profile forming a plurality of paths for the independent adjustment of the cams mounted thereon,

wherein the cross-sectional profile of said switchbar is essentially rectangular, with a lengthwise, V-shaped groove running along one surface,



wherein each said cam comprises a cam body with a flat surface for mating with one wall of said switchbar, an inclined surface for mating with one wall of said V-shaped groove, and an opposing surface at a right angle to said flat cam body surface for engaging the rectangular wall of said switchbar, and wherein the distance between said inclined cam surface and said opposing surface is adjustable.

4,174,475

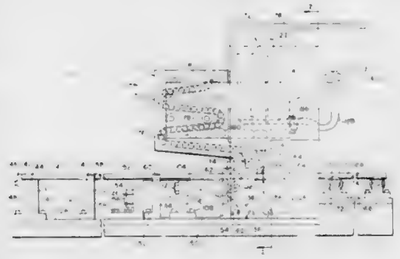
WELDING STRUCTURE

Charles Senn, 12633 Wilfred Ave., Detroit, Mich. 48213

Filed Aug. 30, 1977, Ser. No. 828,983

Int. Cl.[2] B23K *11/10*

U.S. Cl. 219—56 **6 Claims**



1. Structure for welding heavy steel mesh comprising means for supporting longitudinally extending reinforcing rods on one side of welding means in transversely spaced apart parallel positions, means operably associated with the longitudinally extending reinforcing rods for automatically feeding a transversely extending reinforcing rod fed thereto onto the longitudinally extending reinforcing rods at a predetermined welding position from the one side of the welding means comprising a mesh engaging member having a guiding surface extending parallel to the longitudinally extending reinforcing rods and positioned above the longitudinally extending reinforcing rods and positioned above the longitudinally extending reinforcing rods approximately the diameter of the transversely extending reinforcing rods and extending on the one side of the welding means to terminate in an abutment surface adjacent the welding position, a positioning member extending above the guiding surface on the mesh engaging member, and piston and cylinder structure mounting said positioning member for reciprocal movement toward and away from the welding position whereby a transversely extending reinforcing rod positioned on the guiding surface of the mesh engaging member may be moved into the welding position at the welding means adjacent the abutment surface of the mesh engaging member on movement of the positioning member toward the welding position, and a second transversely extending reinforcing rod is allowed to move onto the guiding surface of the mesh engaging member on movement of the positioning member away from the welding position, means for positioning transversely extending reinforcing rods onto the automatic feeding means one at a time, means at the welding position operably associated with the supporting, positioning and feeding means for simultaneously welding a transversely extending reinforcing rod to the longitudinally extending reinforcing rods at the intersections of the longitudinally extending reinforcing rods and the transversely extending reinforcing rod, and means operably associated with the welded transversely extending and longitudinally extending reinforcing rods for automatically indexing the welded reinforcing rods to position the longitudinally extending reinforcing rods for receipt of a subsequent transversely extending reinforcing rod at the welding position in parallel spaced apart relation to the welded transversely extending reinforcing rod, including the mesh engaging member and piston and cylinder means secured thereto for moving the mesh engaging member reciprocally in the direction of extent of the longitudinally extending reinforcing rods a distance equal to the desired spacing between the transversely extending reinforcing rods.

4,174,476

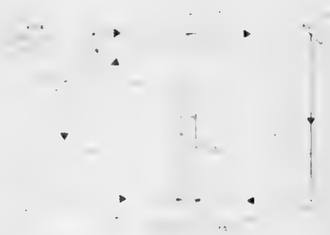
LASER CUTTING OF TUBULAR ARTICLES

Norman L. Boling, and Michael E. Fein, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed May 11, 1978, Ser. No. 904,729

Int. Cl.[2] B23K *9/00*

U.S. Cl. 219—121 L **8 Claims**



1. Apparatus for severing a rotating tubular article with a laser beam comprising:

a laser source having a single output beam;

a beamsplitter for dividing said output beam into two generally equal components, said beamsplitter being positioned so that said output beam strikes said beamsplitter at an angle of incidence θ with respect to a line normal to the beamsplitter that is greater than 0° and less 15°, thereby maintaining the power of said two components substantially equal despite random polarization of said output beams; and

means for directing said two components to strike the peripheral surface of said tubular article, thereby allowing said tubular article to be completely severed during rotation of said tubular article.

4,174,477

METHOD OF AND DEVICE FOR ARC WELDING

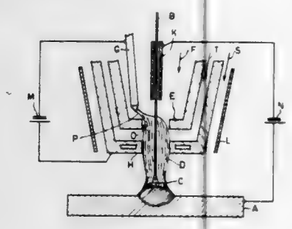
Wilhelmus G. Essers; Gerardus Jelsmorini, and Gerrit W. Tichelaar, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

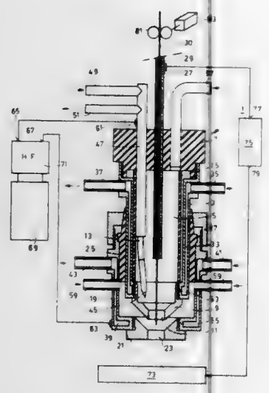
Continuation of Ser. No. 635,988, Nov. 28, 1975, abandoned, which is a continuation of Ser. No. 455,393, Mar. 27, 1974, abandoned. This application May 24, 1977, Ser. No. 799,959

Claims priority, application Netherlands, Apr. 9, 1973, 7304888

Int. Cl.[2] B23K 9/00

U.S. Cl. 219—121 P **3 Claims**





1. A method of arc welding, which comprises flowing a thermally ionizable gas past and within the region of two non-consumable electrodes horizontally spaced from each other and terminating in a horizontal plane establishing a secondary (plasma) arc solely between said two horizontally spaced non-consumable electrodes to initiate and sustain a plasma flow, feeding a consumable electrode between said two horizontally spaced electrodes and through said plasma flow toward a workpiece, and separately and independently establishing a primary (MIG) arc solely between said consumable electrode and the workpiece.

4,174,478

X-RAY INTERFEROMETERS

Albert Franks, London, England, assignor to National Research Development Corporation, London, England

Filed Jul. 5, 1977, Ser. No. 812,736

Int. Cl.[2] G01N 23/20; G21K 1/00

U.S. Cl. 250—276 **6 Claims**

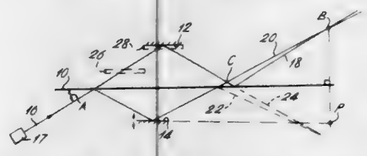
1. An X-ray interferometer comprising:

a plane film of material;

first support-means for supporting a first surface facing one side of the film;

second support-means for supporting a second surface facing the other side of the film and substantially opposite the first surface, so that the first and second surfaces are relatively inclined at a small angle,

arranged so that when a beam of X-rays is incident on the film at a glancing angle in the plane in which said small angle lies, a first part of the incident beam is, in sequence,



transmitted by the film, reflected by the first surface, and reflected by the film as a first partial beam, and a second part of the incident beam is, in sequence, reflected by the film, reflected by the second surface, and transmitted by the film as a second partial beam which intersects the first partial beam.

4,174,479

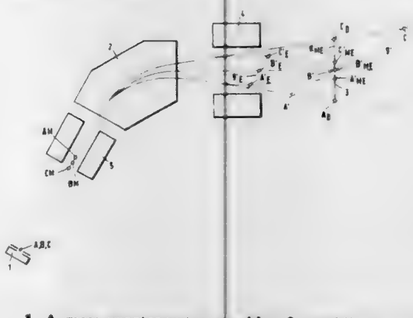
MASS SPECTROMETER

Hans H. Tuithof, Korenbloem 52, Uithoorn, and Anne J. H. Boerboom, Abr. Durerstraat 25, II, Amsterdam, both of Netherlands

Filed Sep. 30, 1977, Ser. No. 838,175

Int. Cl.[2] B01D 59/44; H01J 39/34

U.S. Cl. 250—292 **7 Claims**



1. A mass spectrometer capable of providing mass spectra measurements of short-lived phenomena comprising an ion source for producing a beam of ions of differing masses, a sector magnet, a planar detector, a variable power magnetic lens disposed between said ion source and said sector magnet for determining the dispersion of ions on said beam, and a variable power electrostatic lens disposed between said sector magnet and said detector, said electrostatic lens rotating the image curve of said ion beam to be parallel to and aligned with the plane of the detector wherein the image points corresponding to particles of different masses are simultaneously aligned with said plane of said detector.

4,174,480

METHOD OF DETECTING DEFECTIVE PORTIONS OF METALLIC TANK HAVING THERMALLY PROTECTIVE COATING OF POLYURETHANE FOAM

Takashi Kaihara; Masao Tanepka, and Toshitsugu Kusaka, all of Muroran, Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

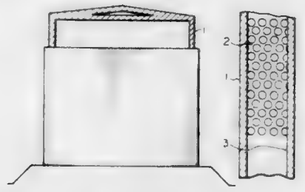
Filed Dec. 8, 1977, Ser. No. 858,902

Claims priority, application Japan, Dec. 9, 1976, 51/147149

Int. Cl.[2] G01J 1/00

U.S. Cl. 250—342 **6 Claims**

1. A method of detecting defective portions of a metallic tank storing hot hydrocarbon oil therein and having a thermally protective coating of polyurethane foam adhered onto the side wall thereof, comprising the steps of determining a distribution of surface temperatures of said coating of polyurethane foam by taking an infrared thermal image of the outer



surface of said coating of polyurethane foam, and analyzing said infrared thermal image to determine portions of said coating having relatively high temperatures, whereby corroded areas in the side wall of the tank and defective portions of said coating of polyurethane foam which cause corrosion of the side wall of the tank are detected.

4,174,481

TOMOGRAPHIC X-RAY APPARATUS FOR THE PRODUCTION OF TRANSVERSE LAYER IMAGES

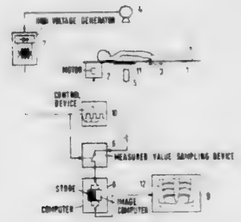
Reiner Liebetruth, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 8, 1977, Ser. No. 775,452

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1976, 2613809

Int. Cl.[2] G03B 41/16

U.S. Cl. 250—445 T **3 Claims**



1. The method of aligning a patient with respect to tomographic X-ray apparatus which includes an X-ray tomographic scanner apparatus for scanning a transverse region from successive angular positions about said region for defining a tomographic image, said method comprising:

(a) restricting the scanner apparatus to a single angular position,

(b) moving a patient longitudinally relative to the scanner apparatus while the scanner apparatus remains in said single angular position such that the patient is scanned at successive longitudinal positions offset from each other longitudinally of the patient but is only scanned from the single angular position,

(c) storing respective sets of readings from the scanner apparatus for the successive longitudinal positions with the scanner apparatus in said single angular position thereby to provide the data for a graphic display wherein the sets of readings are the basis for successive lines of varying visual characteristics on the display, the stored sets of readings thereby defining a general radiographic view representing a longitudinally extensive image useful in the precise positioning of the patient relative to the tomographic X-ray apparatus, and

(d) displaying the stored sets of readings as successive lines of a longitudinally extensive shadow image of the patient.

4,174,482

FOUNDATION FRAME FOR AN INTERNAL COMBUSTION ENGINE AND ELECTRICAL GENERATOR SET

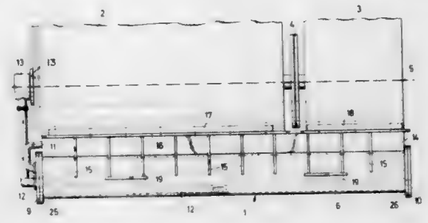
Edwin Bollman, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 4, 1977, Ser. No. 848,643

Claims priority, application Switzerland, Nov. 16, 1976, 14380/76

Int. Cl.[2] F16M 5/00, 9/00

U.S. Cl. 290—1 A **12 Claims**



9. In combination with a set having an internal combustion engine having a base and an electrical generator having a base; a foundation frame for mounting said set, said foundation frame comprising a pair of parallel rigidly interconnected tubes of round cross-section, each said tube defining a reservoir for receiving a liquid lubricant therein, and a pair of plates, each said plate being secured to and extending longitudinally of a respective one of said tubes and receiving said base of said engine and said base of said generator thereon.

4,174,483

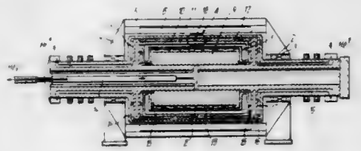
CRYOGENICALLY COOLED ELECTRICAL MACHINE

Alexandr A. Vinokurov, ulitsa Polzunova, 31, kv. 314; Gennady S. Gorbunov, ulitsa Polzunova, 35, kv. 32; Anatoly G. Korolkov, ulitsa Ivanova, 5, kv. 71; Jury S. Popov, ulitsa Barienaya, 16, kv. 14; Lev M. Rozenfeld, ulitsa Pravdy, 7a, kv. 30, all of Novosibirsk; Jury V. Skachkov, Nevsky prospekt, 125, kv. 13, Leningrad; Iosif F. Filippov, ulitsa Pulkovskogo, 17, kv. 39, Leningrad, and Gary M. Khutoretsky, ulitsa Altaiskaya, 20, kv. 5, Leningrad, all of U.S.S.R.

Filed Nov. 29, 1977, Ser. No. 855,778

Int. Cl.[2] H02K 9/00

U.S. Cl. 310—52 **7 Claims**



1. A cryogenically cooled electrical machine comprising:

a hermetically-sealed shell;

a stator winding fixed in place within said shell;

a hollow rotor arranged inside said stator winding;

a superconducting field winding placed within said hollow rotor;

a heat shield surrounding said hollow rotor and having ducts for circulation of a coolant;

a magnetic shield arranged inside said heat shield and

said magnetic shield and said heat shield being arranged

within an evacuated space between said rotor and said shell.

4,174,484

MOTOR WITH A DISK ROTOR

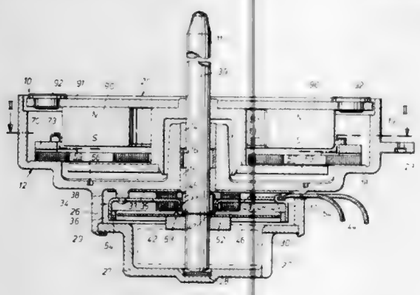
Fritz Schmider, Hornberg, Fed. Rep. of Germany, assignor to Papst-Motoren KG, St. Georgen, Fed. Rep. of Germany

Filed Jul. 23, 1976, Ser. No. 708,092

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1975, 2533187

Int. Cl.[2] H02K *11/00*

U.S. Cl. 310—68 R **39 Claims**



1. Brushless d.c. motor having a substantially disk-shaped permanent magnet rotor mounted on a shaft, a flat air gap and an iron-free stator winding arrangement comprising coils affixed to the motor casing at their radially outer portions so that said coils extend self-supporting into said air gap, said rotor comprising spacing means (**93**) located radially inward of said stator winding arrangement and between rotor portions extending respectively on both sides of said stator winding arrangement for withstanding magnetically produced axial forces between said rotor portions, said motor casing (**12**) being substantially shell-shaped and arranged to surround at least part of said rotor, said spacing means (**93**) surrounding with an interposed clearance a tubular bearing means (**13**) firmly attached to said motor casing (**12**) for journalling the shaft (**11**) of said rotor, said spacing means (**93**) being mounted so as to rotate with said shaft (**11**).

4,174,485

ELECTRIC MOTOR WITH NOVEL STATOR CONSTRUCTION

George B. Soden, Wolcott; Hasit H. Parikh, Southington, and Richard J. Kavanaugh, Bristol, all of Conn., assignors to North American Philips Corporation, New York, N.Y.

Filed Sep. 26, 1977, Ser. No. 836,495

Int. Cl.[2] H02K *5/00*

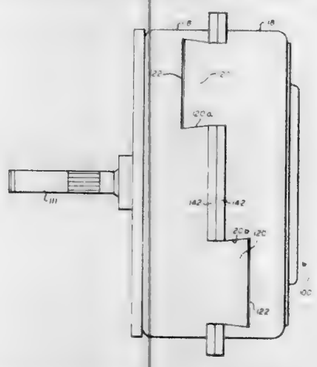
U.S. Cl. 310—89 **7 Claims**

1. An electric motor having:

a rotor having an axis;

a stator having a first cup shaped member having a wall which is disposed generally normal to the axis of said rotor and a circumferential surface disposed generally concentric with said axis, said circumferential surface including a plurality of tabs and a plurality of cooperatively dimensioned and configured recesses, said first cup shaped member further including a plurality of pole pieces disposed in generally aligned relationship to said axis and disposed at angularly spaced intervals about said axis, said tabs of said second cup member and said recesses of said first shaped cup shaped member locking together by means of interference between said tabs and said recesses to form a unitary assembly without additional fastening means between said cup shaped members;

said stator further including a plurality of additional angularly spaced recesses in both said first and second cup shaped members disposed at angularly spaced intervals



about said circumferential surface along the edge which contacts the other cup shaped member;

first and second inner pole plates which are generally planar and have a plurality of upstanding pole pieces disposed in generally parallel relationship to the axis of said rotor, said pole plates further including a plurality of angularly spaced tabs disposed within the plane of said generally planar members and positioned and dimensioned for snug fit in said additional angularly spaced recesses of said first and second cup shaped members to prevent relative angular and axial movement therebetween.

4,174,486

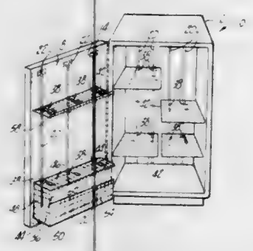
ADJUSTABLE SHELVING SYSTEM

Clifford W. Winkler, P.O. Box 561, Rte. 2, Houghton Lake, Mich. 48629

Filed Dec. 2, 1977, Ser. No. 856,666

Int. Cl.[2] A47F *5/00*; A47G *29/02*

U.S. Cl. 312—138 R **3 Claims**



1. An adjustable shelving support system for appliances and the like comprising:

at least a pair of parallel spaced standards, each having a thin-walled rigid body exhibiting a continuous slot opening in one side thereof;

at least one rigid shelf support arm operatively engaged with each of said pair of standards through said opening, each said support arm including selectively operatable lock means within the associated standard whereby each arm may be fixed in relation to the associated standard when at right angles thereto but released for sliding relationship when rotated away from the right angular relationship;

each shelf support arm having a T-shaped cross section in which the top thereof is adapted to receive and support thereon a flat structural element such as a standard wood shelf;

a shelf constructed of rigid wire elements and of such width as to extend between said standards;

a pair of adaptor brackets substantially permanently fixed to the elements of said shelf in spaced parallel relationship according to the space between said standards, each of said brackets comprising a body having an interior space opening to an end thereof for receiving the T-shaped arm therein through said end opening whereby the shelf may be positively secured to the arms by sliding said arms into said brackets to form a unit consisting of the arms, brackets and shelf, said unit being positionally adjustable relative to the standard as aforesaid and said shelf being removable from said arms by sliding said arms out of said interior spaces;

each bracket being at least substantially wholly within the boundaries of said shelf when secured thereto in operative relationship but with the end opening and the interior space located adjacent but out of the plane of said shelf so as to permit said arm to enter said opening for operative engagement therewith.

4,174,487

MIRROR CONDENSER LAMP

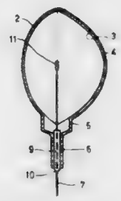
Jozef C. I. Peeters, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 8, 1977, Ser. No. 775,455

Claims priority, application Netherlands, Mar. 10, 1976, 7602483

Int. Cl.[2] H01J *61/40*

U.S. Cl. 313—113 **2 Claims**



1. A mirror condenser lamp comprising:

a glass lamp vessel having a rotationally symmetrically dished mirrored wall portion having a focus and a rotationally symmetrically dished transparent wall portion, said portions being disposed in facing and abutting relationship with the intersection therebetween being a curvilinear line of intersection, a cylindrical wall portion extending from said line of intersection of said two dished portions,

a tungsten filament and current supply wires connected to said filament, said filament being disposed in said lamp vessel surrounding the focus of said mirrored wall portion and within said lamp vessel, said current supply wires extending through said line of intersection, in substantially a transverse direction to light rays being reflected from said dished mirrored wall portion,

a vacuum-tight seal in said cylindrical portion of said lamp vessel through which said current supply conductors are passed to the exterior of said vessel, and

an inert gas-containing atmosphere in said lamp vessel, said gas atmosphere has a pressure of more than 1 atmosphere and containing a halogen, said lamp vessel consisting of a halogen-resistent hard glass having a softening temperature of at least 500° C., said vessel being dimensioned so the inside of the wall of the lamp vessel during operation assumes a temperature at which tungsten-halogen compounds are volatile.

4,174,488

ELECTRIC LAMP

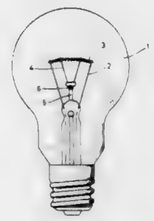
Petrus J. J. Weterings, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 1, 1977, Ser. No. 829,734

Claims priority, application Netherlands, Sep. 22, 1976, 7610507

Int. Cl.[2] H01K *1/00*

U.S. Cl. 313—315 **1 Claim**



1. An electric lamp which comprises: a light-pervious lamp envelope, a mixture of an oxygen getter and a binder disposed in said envelope, said binder being a halide of a metal selected from the group consisting of Mn, Ba, Ca, Sr, Ce and La.

4,174,489

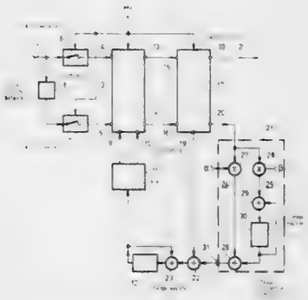
PHASE DISCRIMINATOR IN A RECEIVER FOR A DATA TRANSMISSION SYSTEM

Loïc B. Y. Guidoux, and Jean-Louis Renaudat, both of Le Plessis Robinson, France, assignors to Telecommunications Radioelectriques et Telephoniques TRT, Paris, France

Continuation of Ser. No. 753,270, Dec. 22, 1976, abandoned. This application Jul. 13, 1978, Ser. No. 924,193

Int. Cl.[2] H03K *9/06*

U.S. Cl. 325—320 **11 Claims**



1. A phase discriminator for use in a receiver of a system for data transmission by means of phase modulation of a carrier, the phase discriminator comprising a pair of samplers each having input means for receiving digital passband signals and an output means for providing digital signals having samples which occur at a rate equal to the data modulation rate, said sampled digital signals being respectively representative of the in-phase and quadrature components of said received passband signal at each sampling instant; a calculating unit having a first pair of inputs coupled to said output means respectively, a second pair of input means for receiving respectively the in-

phase and quadrature components of a reference carrier at the preceding sampling instant, and output means for providing the signal samples of digital signals which are representative of the in-phase and quadrature of a reference carrier at the preceding sampling instant, and output means for providing the signal samples of digital signals which are representative of the in-phase and quadrature components of a signal derived from the received passband signal by a phase rotation over an angle which is equal and opposite to the phase of the reference carrier at the preceding samping instant; a decision circuit having input means coupled to said calculating unit output means, a first output means for providing a signal reproducing a phase jump in accordance with each sampling instant the phase variation of the transmitted carrier during one sampling period, and a second output means for providing an error signal which is formed after the reproduction of each phase jump in the decision circuit means for characterizing the difference between the phase of the signal determined by the calculating unit and the phase variation of the transmitted carrier which corresponds to the phase jump reproduced by the decision circuit first output means; and a generator having an input coupled to said decision circuit second output and an output means coupled to said calculating unit second pair of input means for providing respectively said in phase and quadrature components of said reference carrier.

4,174,490

CATHODE-RAY TUBE

Klaus C. Van Erk; Marinus Ploeger, and Peter H. Von Reth, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 19, 1978, Ser. No. 907,553

Claims priority, application Netherlands, May 25, 1977, 7705731

Int. Cl.[2] H01J *31/20;* **C03C** *3/10, 3/30*

U.S. Cl. 313—480 **2 Claims**

1. In a colour television cathode ray tube included an evacuated glass envelope having a glass face plate, a fluorescent layer having a pattern of phosphor regions on the inner surface thereof, and at least one electron gun disposed in said envelope opposite said face plate, the improvement wherein said glass of said face plate consists essentially of, in percent by weight:

SiO_2	60–68		SrO	0–1
Al_2O_3	0–6		PbO	5–10
Na_2O	5–12	combined	ZrO_2	0–3
K_2O	3–11	>13	CeO_2	0–0.6
CaO	0–1		$Sb_2O_3 + As_2O_3$	0.3–0.7
MgO	0–2		F	0–1.5
BaO	3–14		TiO_2	0–0.3

with the complementary conditions that

$Al_2O_3+ZrO_2>2$

$BaO+2SrO+2ZrO_2+3PbO>28$ and

$3CaO+2MgO+SrO+4ZrO_2<12$

4,174,491

MOUNT FOR A LIGHT EMITTING DEVICE

Satoshi Nakamura, Hachioji; Ichiro Ikushima, Kokubunji; Yoshimitsu Sasaki, Tokyo; Katuaki Chiba, Kokubunji, and Ryoichi Ito, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 22, 1978, Ser. No. 918,275

Claims priority, application Japan, Jul. 8, 1977, 52-80961

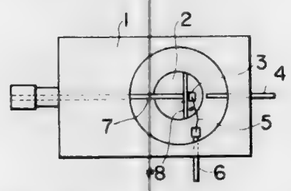
Int. Cl.[2] H01L *33/00;* **H05B** *33/04;* **H01S** *3/00*

U.S. Cl. 313—499 **15 Claims**

1. A mount for a light emitting device including a light emitting element and optical parts, which comprises

mount substrate means provided, with one surface having a positioning groove for locating the light emitting element at a predetermined position and holding grooves of trapezoidal cross section for holding the optical parts in the vicinity of a light emitting plane of the light emitting element;

keeper substrate means provided with one surface having keeping-down grooves of trapezoidal cross section formed in positions corresponding to the respective holding grooves of said mount substrate means, to serve to install the optical parts in cooperation with said holding grooves of said mount substrate means, and with a hole penetratingly extending from the one surface thereof to another surface opposite to the one surface, for snugly



inserting therein the light emitting element to be located by said positioning groove of said mount substrate means; and

a covering member provided on the other surface of said keeper substrate means, for airtightly covering said hole of said keeper substrate means;

so that said optical parts are sandwiched in between said mount substrate means and said keeper substrate means and integrally held in close contact therewith, and that they can be airtightly sealed together with the light emitting element.

4,174,492

DEVICE FOR ATTENUATING CAVITY INTERFERENCE WAVES IN A HIGH-FREQUENCY ELECTRON TUBE

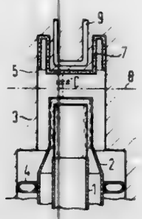
Johannes Holle, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 11, 1977, Ser. No. 814,350

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1976, 2632404

Int. Cl.[2] H01J *7/46, 19/80*

U.S. Cl. 315—39 **7 Claims**



1. In a device for attenuating electromagnetic cavity interference waves, which occur in the vacuum system of a high frequency electron tube having an internal coaxial cavity resonator formed, in part, by the tube anode, the combination of a wave-guide resonator portion, a dielectric window disposed between and coupling the wave-guide portion to the cavity resonator and separating the wave-guide portion from the vacuum system of the tube, said wave-guide portion having a high ohmic resistive coating therein, which thus is external of the vacuum system, said wave-guide portion and resistive material, in effect, presenting a low resistance to interference modes to be attenuated, for the suppression thereof.

4,174,493

VERTICAL DEFLECTION CIRCUIT

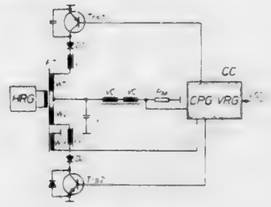
Gerd Dobbert, Deizisau, and Klaus Reh, Albershausen, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 17, 1978, Ser. No. 888,047

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1977, 2712052

Int. Cl.[2] H01J *29/70, 29/76*

U.S. Cl. 315—408 **7 Claims**



1. In a vertical deflection circuit, of the type wherein the deflection current for the vertical deflection coils is obtained by integrating pulses derived from the horizontal deflection voltage, a horizontal output transformer including a pair of output windings each connected to an integrating capacitor and the vertical deflection coils at one end and the other ends being selectively connected to ground through two switches associated with the upper and lower picture halves, the improvement comprising control means for turning on said switches only during the horizontal sweep time in the rhythm of the horizontal frequency with only one of the other ends of the two output windings being grounded at one time.

4,174,494

ELECTRIC MOTORS CONTROL SYSTEM

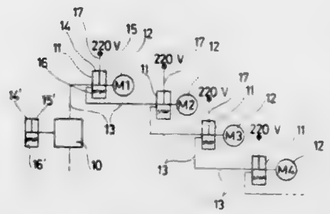
Paul Pfeffer, Gomaringen, Fed. Rep. of Germany, assignor to Etablissements Carpano & Pons, France

Filed Nov. 14, 1977, Ser. No. 851,185

Claims priority, application Switzerland, Nov. 22, 1976, 14640/76

Int. Cl.[2] H02P *1/00*

U.S. Cl. 318—54 **5 Claims**



1. A system for controlling a plurality of reversible electric motors for driving blinds or similar devices, said system comprising:

a plurality of reversible electric motors each connected with and driving a blind or similar device and each having a plurality of terminals comprising a first terminal for rotation of the motor in a first direction, a second terminal for rotation of the motor in a second direction and a common terminal,

central control means comprising a first central inverter actuatable for rotation of all of said motors in a first direction, a second central inverter actuatable for rotation of all of said motors in a second direction, and a central stop switch actuatable for stopping all of said motors,

a common power line for supplying power to all of said motors, and

a plurality of local control means, one for each of said motors, each of said local control means comprising:

a first local inverter actuatable for rotation of the respective motor in a first direction, a second local inverter actuatable for rotation of said motor in a second direction, and a local stop switch for stopping said motor,

a first relay having an operating coil and operable to connect said first terminal and said common terminal of the respective motor with said power line for rotation of said motor in said first direction, and a second relay having an operating coil and operable to connect said second terminal and said common terminal with said power line for rotation of said motor in said second direction,

means connecting the operating coil of said first relay with said first local inverter of the respective local control means and with said first central inverter, and means for connecting the operating coil of said second relay with said second local inverter and with said second central inverter, whereby said first and second relays are actuatable alternatively from said central control means and said local control means, the connections of said operating coils of said first and second relays with said central inverters including unidirectional current means to prevent feed-back from said local control means to said central control means or the local control means of other motors, and

means connecting the respective local stop switch and said central stop switch with both said first and second relays for stopping the respective motor upon actuation of either said local stop switch or said central stop switch, whereby all of said motors can be operated in either direction and stopped from the said central control means and each of the individual motors can be operated in either direction or stopped from the respective local control means without feed-back to the central control means or to other motors.

4,174,495

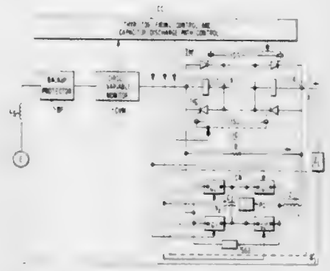
STATIC CURRENT LIMITING SWITCH WITH SOFT FORCED COMMUTATION

John Rosa, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 30, 1978, Ser. No. 921,020

Int. Cl.[2] H02H *7/00*

U.S. Cl. 323—9 **17 Claims**



1. A current limiting switch, comprising:

(a) a pair of terminal means connectable to an electrical circuit in which alternating current flows;

(b) first gated means connected between said pair of terminal means for passing said alternating current therethrough in one circuit direction;

(c) second gated means connected between said pair of terminal means for passing said alternating current therethrough in the other circuit direction;

(d) current limiting means connected between said pair of

terminal means for passing said alternating current therethrough in both said circuit directions for thus performing a current limiting operation on said alternating current during an appropriate period of time;

(e) normally off switchable stored energy means connected between said pair of terminal means; and

(f) control means connected to said stored energy means and to said first gated means for switching said switchable stored energy means on and for rendering said first gated means conductive during a portion of said appropriate period of time for thus providing electrical current to said first gated means from said energy storage means when said second gated means has been rendered non-conductive during said portion of said appropriate period of time, said current from said stored energy means when flowing through said first gated means cooperating with the intrinsic impedance thereof to provide a forward voltage drop across said first gated means which provides soft reverse bias voltage for said second gated means, the presence of said soft reverse bias voltage continuing for the recovery time of said second gated means to prevent reconduction of said circuit alternating current through said second gated means, said current limiting means performing said current limiting operation at this time.

4,174,496

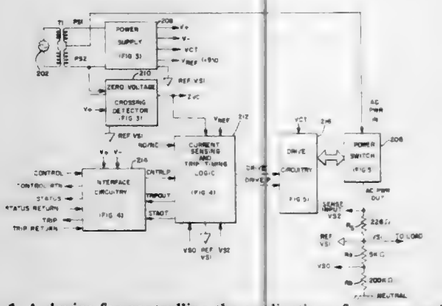
MONOLITHIC SOLID STATE POWER CONTROLLER

William A. McFall, Fullerton; Stanley A. White, Santa Ana; Howard K. Lane, Laguna Niguel; Daryl T. Butcher, La Habra; Donald V. Anderson, Jr., Riverside; Patrick E. McCollum, Santa Ana; James F. Kirk, Anaheim, and Richard Plesset, Santa Ana, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 2, 1978, Ser. No. 930,460

Int. Cl.[2] H02H *3/26*

U.S. Cl. 323—9 **34 Claims**



1. A device for controlling the application of a source voltage to a load, resulting in the development of a load current which passes through a sense resistor to produce a sense voltage,

said device comprising:

detection means connected for detecting a zero voltage crossing in said source voltage and generating a corresponding zero voltage crossing output;

sensing means for receiving said sense voltage and responsive thereto for determining when said load current exceeds a first predetermined value, and generating a fast trip output corresponding thereto, said sensing means further deriving a digital output representing the magnitude of said load current;

computing means for comparing said digital output of said sensing means to a second predetermined value, less than said first predetermined value, for computing a trip time characteristic of said load current in accordance with the value and duration of said comparison, and for determining when said trip time is exceeded so as to generate a timed trip output; and

control means responsive to either of said fast trip output and said timed trip output for interrupting the application of said source voltage to said load, said control means being further responsive to said output of said detection means for preselected control mode synchronization therewith.

4,174,497

CIRCUIT AND METHOD FOR CONTROLLING REACTIVE LOAD CURRENTS OF A THREE-PHASE SYSTEM

Manfred Depenbrock, Bochum, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie Aktiengesellschaft, Mannheim-Kafertal, Fed. Rep. of Germany

Filed Oct. 3, 1977, Ser. No. 839,038

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1976, 2644682

Int. Cl.[2] H02J *3/18*

U.S. Cl. 323—119 **12 Claims**



1. Circuit assembly for compensating and balancing rapidly variable reactive currents of loads connected to a three-phase network, the circuit assembly having compensation control element in the form of three converters with forced commutation connected in parallel with the loads of the three-phase network, at least one energy accumulator connected to the d-c side of the converter, and a closed control loop having measuring transformers for the actual values of the currents (i_R, i_S, i_T) of the compensation control elements, measuring transformers for the actual values of the load currents (i_{RO}, i_{SO}, i_{TO}) and measuring transformers for determining the actual values of the voltages (u_{RS}, u_{ST}, u_{TR}) between the conductors of the three-phase network, and evaluator means for calculating reference values for the active currents (i_{WR}, i_{WS}, i_{WT}) from the actual values of the voltages (u_{RS}, u_{ST}, u_{TR}) and the load currents (i_{RO}, i_{SO}, i_{TO}), said evaluator means including three summers of first current components (i_{VR}, i_{VS}, i_{VT}) determined instantaneously and means for determining the reference values for the control element currents (i_R, i_S, i_T) from the difference of said current components (i_{VR}, i_{VS}, i_{VT}), and for determining reference values for active currents (i_{WR}, i_{WS}, i_{WT}) from the difference of the reference values and the actual values of the control element currents (i_R, i_S, i_T) which control deviations (x_R, x_S, x_T) for controlling firing pulse formers for the compensation control elements to adjust the waveform of the currents on the three-phase side, comprising

(a) said evaluator means being in the form of a conductance measuring converter having an output connected to a fourth summer and an active-current reference value generator connected to said fourth summer for determining, continuously in time, the reference values for the active currents (i_{WR}, i_{WS}, i_{WT}), said conductance measuring transformer being acted upon on the input side thereof by the first current components (i_{VR}, i_{VS}, i_{VT}) and the linked load voltages (u_{RS}, u_{ST}, u_{TR}), the active-current reference value generator being additionally acted upon by the linked load voltages (u_{RS}, u_{ST}, u_{TR}) and by the output signal of the conductance measuring transformer,

(b) capacitors shunted across the loads in all three phases,

(c) said energy accumulator being in the form of an additional capacitor and a resonant circuit, said resonant circuit being tuned to twice the network frequency,

(d) said control loop comprising means for regulating the mean voltage (U_c) on the d-c side of the compensation control element as well as said evaluator means for controlling the wave-shape of the currents on the three-phase side,

(e) said regulating means having an output connected to said fourth summer.

4,174,498
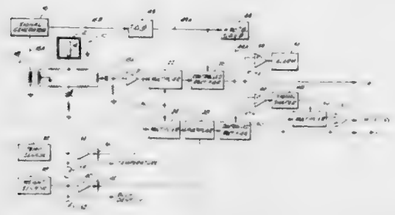
APPARATUS AND METHOD FOR PROVIDING SEPARATE CONDUCTIVITY, DIELECTRIC COEFFICIENT, AND MOISTURE MEASUREMENTS OF PARTICULATE MATERIAL

Fritz K. Preikschat, 16020 Lake Hills Blvd., Bellevue, Wash. 98008

Filed Mar. 30, 1978, Ser. No. 891,535

Int. Cl.[2] G01R *27/00*

U.S. Cl. 324—57 R **22 Claims**



1. An apparatus for providing a moisture content signal whose value is related to the measured moisture content of particulate material, said apparatus comprising:

(a) first means for providing a conductivity signal whose value is related to the measured conductivity of said particulate material;

(b) second means for providing a dielectric coefficient signal whose value is related to the measured dielectric coefficient of said particulate material; and

(c) third means responsive to said conductivity and said dielectric coefficient signals for varying the value of said dielectric coefficient signal in a predetermined relationship with the value of said conductivity signal to obtain said moisture content signal.

4,174,499

METHOD AND APPARATUS FOR THE MEASUREMENT OF ALTERNATING-CURRENT POWER IN TRANSIENT AND SUBTRANSIENT PROCESSES

Bruno G. Waurick, 14, Sylvia Pass, Linksfield, Johannesburg, South Africa

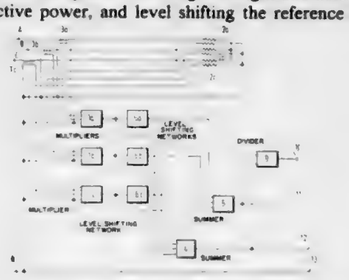
Filed Sep. 26, 1977, Ser. No. 836,795

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1976, 2643457; Oct. 15, 1976, 2646630

Int. Cl.[2] G01R *21/06, 25/00*

U.S. Cl. 324—107 **8 Claims**

1. A method for measurement of a.c. power relative to a source and a load, in particular for transient and subtransient events, comprising the steps of: deriving first input signals which are proportional to instantaneous values of a voltage, deriving second input signals which are proportional to instantaneous values of a current, multiplying said first and second input signals with each other, obtaining product signals of positive and negative polarity which are proportional to the product of the current and voltage instantaneous values and thus to the forward power flowing from said source to said load and return power flowing back to said source, summing said product signals by adding the product signals taking into consideration the positive and negative signs and determining the effective power, and level shifting the reference line on



which the measurement is based to the level of the lower peaks of the envelope curve of the product signals which are proportional to the return power and determining the apparent power by adding the level shifted product signals which are proportional to the forward power and return power.

4,174,500

SCALE PLATE FOR MEASURING INSTRUMENTS

Yasuo Kuga, Mitaka, Japan, assignor to Kabushiki Kaisha Sanwa Denki Seisakusho, Tokyo, Japan

Continuation of Ser. No. 663,681, Mar. 4, 1976, abandoned. This application Oct. 3, 1977, Ser. No. 838,541

Claims priority, application Japan, Mar. 15, 1975, 50-34149

Int. Cl.[2] G01R *15/08,* **G02F** *1/13*

U.S. Cl. 324—115 **10 Claims**



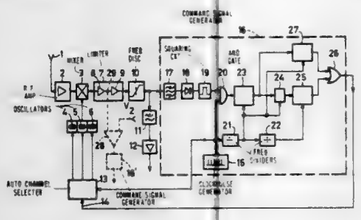
1. A scale plate having a plurality of scale arrangements for use with an electrical measuring instrument, the instrument having a changeover switch for selecting one of the plurality of scale arrangements and a pointer which is pivotably supported to indicate on the selected scale arrangement the electrical measurement in an analog manner, the scale plate comprising plural displaying means for selectively displaying each of the scale arrangements, each of the plural displaying means being separately disposed on a plate member, each of the displaying means having a voltage excitable material contained within a chamber formed from a transparent front electrode means spaced from a rear electrode disposed on the plate member and a continuous insulating side wall joining the transparent front electrode means and the rear electrode, the front electrode means including the scale arrangement, the scale arrangement being an arcuate scale having alphanumerics and/or numerics and/or characters designating values assigned to scale marks, whereby one of the plurality of scale arrangements can be selectively rendered visible to the exclusion of the remaining scale arrangements by applying a voltage between the front electrode means and the rear electrode of one of said plural displaying means selected in accordance with the position of the changeover switch.

4,174,501

COMMAND SIGNAL GENERATOR FOR AN AUTOMATIC CHANNEL SELECTION DEVICE IN A RADIO WHICH IS MOBILE RELATIVE TO TRANSMITTER STATIONS

Jean Chastagnier, and Jean C. Massip, both of Brive la Gaillarde, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,610
Claims priority, application France, Mar. 9, 1977, 77 06964
Int. Cl.[2] H04B *3/60, 1/26*
U.S. Cl. 325—56 **5 Claims**



1. A command signal generator for a channel selection device in a radio receiver for frequency or phase modulation which is mobile relative to fixed transmitter stations transmitting at mutually different frequencies, wherein the generator comprises:

means for forming a logic signal indicating whether the level of the received signal is above or below a first given threshold,

a gate which passes the pulses of a clock pulse generator if said logic signal attains the value which indicates that the level of the received signal is below said threshold,

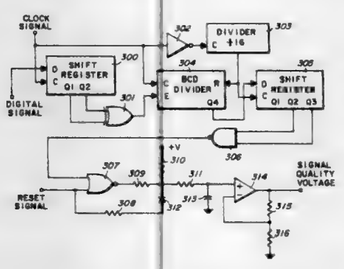
means for counting the clock pulses passed by said gate during given time intervals derived from the clock pulse generator and for supplying a channel change command signal either when during a sequence of n time intervals τ the number of pulses counted during each time interval τ attains a first given threshold, or when the number of pulses counted during a time interval τ attains a second given threshold value which is higher than said first given threshold value.

4,174,502

DELTA MODULATED DIGITAL SIGNAL DETECTOR

Alan L. Wilson, Schaumburg, and Charles A. Backof, Jr., Hoffman Estates, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 16, 1978, Ser. No. 951,895
Int. Cl.[2] H03K *9/00*
U.S. Cl. 329—104 **16 Claims**



1. A detector for delta modulated digital signals transmitted in a serial bit stream at a predetermined bit frequency of a clock signal, comprising:

means for generating a clock signal;

first counting means responsive to the clock signal for providing a reset pulse signal at the end of each successive N bit interval, where N is an integer;

transition detection means responsive to the digital signal and the clock signal for providing a transition pulse signal for each change in logical state between successive bits of the digital signal;

second counting means responsive to the transition pulse signals and reset pulse signals for repetitively providing totallized counts of the transition pulses occurring between successive reset pulse signals;

means for storing at least the last two successive totallized counts; and

means for providing a detect indication signal that the ditital signal is present when both of the stored totallized counts have a magnitude outside of a predetermined range of magnitudes centered about one-half of N.

4,174,503

MODULAR LOW NOISE PREAMPLIFIER

Harold M. Merklinger, and Orest Z. Bluy, both of Dartmouth, Canada, assignors to Her Majesty the Queen in right of Canada, Ottawa, Canada

Filed Jul. 6, 1978, Ser. No. 922,360
Claims priority, application Canada, Nov. 25, 1977, 291786
Int. Cl.[2] H03F *3/16*
U.S. Cl. 330—300 **4 Claims**



1. An amplifier comprising an input stage, a second stage and a third stage, said input stage comprising a field effect transistor (FET) connected in a common source configuration and having a gate electrode to which is connected an input terminal, said input terminal being connected to a pair of oppositely poled reverse-biased input protection diodes, said field effect transistor (FET) acting as a voltage-to-current converter and feeding said second stage, said second stage comprising a PNP junction transistor connected in a common emitter configuration and acting as a current-to-voltage converter, said third stage comprising a further junction transistor connected as an emitter follower, a feedback connection from the third stage to the first stage, for controlling the overall gain of the amplifier, said second and third stages being powered by a bipolar power supply with said second stage junction transistor having an emitter connected to positive supply voltage, said third stage including a second field effect transistor (FET) connected in series with said further junction transistor to enhance output dirve capability, said further junction transistor having a base and a collector with resistors connected in series with them to provide output short circuit protection.

4,174,504

APPARATUS AND METHOD FOR CAVITY DUMPING A Q-SWITCHED LASER

Peter P. Chenausky, Avon; Carl J. Buczek, Manchester, and Robert J. Wayne, Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 25, 1978, Ser. No. 872,282
Int. Cl.[2] H01S *3/11*
U.S. Cl. 331—94.5 Q **27 Claims**



1. A laser having an optical axis and adapted for providing submicrosecond pulses of infrared radiation comprises:

a first cavity including a gaseous gain medium capable of continuous wave operation defined at one end by a first reflector and at the other end by a second reflector;

a second cavity defined at one end by the second reflector and at the other end by a third reflector wherein the first cavity and the second cavity are symmetrically disposed about the optical axis in optical line of sight communication with each other and wherein the second reflector and the third reflector define a Fabry-Perot etalon, which functions as the output mirror of the laser;

a switching cell symmetrically disposed about the optical axis within the second cavity;

means for applying an electric potential across the switching cell with the resulting electric field in a direction transverse to the optical axis;

means for tuning the first cavity to obtain maximum optical flux of a specific wavelength of radiation oscillating within the first cavity; and

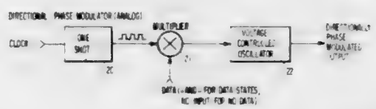
means for varying the separation between the second reflector and the third reflector to tune the second cavity to the wavelength of radiation capable of oscillating within the first cavity.

4,174,505

DIRECTIONAL PSK MODULATION AND DEMODULATION SYSTEM

Lester R. Querry, Laurel, Md., assignor to Digital Communications Corporation, Gaithersburg, Md.

Filed Apr. 26, 1978, Ser. No. 900,535
Int. Cl.[2] H04L *27/20, 27/22*
U.S. Cl. 332—9 R **18 Claims**



12. A method of producing a PSK signal in which said PSK signal carries information encoded as the direction of a phase transition comprising the steps of:

providing a carrier of determined frequency,

altering said carrier frequency for a predetermined period in one sense or another in response to a data signal of one kind or another to produce a gradual phase transition of ϕ in one direction or $-\phi$ in an opposite direction where ϕ is 180° or an integer multiple thereof and then

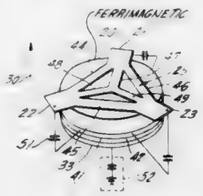
returning said carrier frequency to said determined frequency.

4,174,506

THREE-PORT LUMPED-ELEMENT CIRCULATOR COMPRISING BYPASS CONDUCTORS

Hiroshi Ogawa, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1977, Ser. No. 862,833
Claims priority, application Japan, Dec. 24, 1976, 51-155939
Int. Cl.[2] H01P *1/38*
U.S. Cl. 333—1.1 **4 Claims**



1. A three-port lumped-element circulator comprising:

three ports;

a ferrimagnetic piece having a principal surface and a predetermined point on said principal surface;

means for producing a magnetic field substantially perpendicularly of said principal surface;

three first conductors connected to the respective ports and to one another at three points of connection to enclose an area of said principal surface; and

three second conductors connected to one another and to the respective points of connection and placed in said area and on said predetermined point;

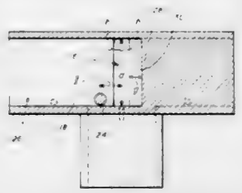
said ports, said first conductors, and said second conductors being arranged on said principal surface substantially in a geometric configuration having a threefold axis of rotational symmetry that passes perpendicularly of said principal surface through said predetermined point.

4,174,507

FOUR-PORT MAGIC TEE HAVING CAVITY STRUCTURE AT FOURTH PORT

Paul T. K. Young, Westwood, Mass., assignor to Microwave Development Labs., Needham Heights, Mass.

Filed Nov. 30, 1977, Ser. No. 855,966
Int. Cl.[2] H01P *5/20*
U.S. Cl. 333—122 **9 Claims**



1. A multi-port electromagnetic coupling device having a plurality of arms meeting at a common junction of the device and including two aligned side arms, each side arm defining a port of the device and have predetermined power divisions therebetween, a third arm extending orthogonally to the side arms defining a third port of the device, and the device having a fourth port at said junction; and an energy coupling and matching structure extending over said fourth port having a coupling section extending from one side of said fourth port and a matching section extending from the opposite side of said fourth port, said matching section having walls including an end wall defining a cavity open to said coupling section and

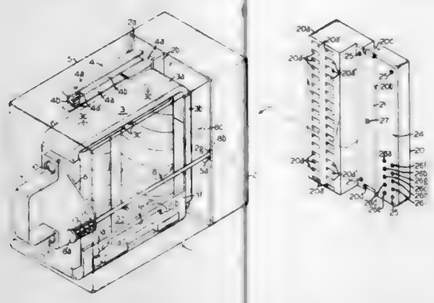
having a predetermined depth extending from the edge of said fourth port on said opposite side to said end wall.

4,174,508

RELAY LATCHING APPARATUS

William J. Lichtenberger, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 10, 1978, Ser. No. 904,641
Int. Cl.[2] H01H *9/02*
U.S. Cl. 335—202 **10 Claims**



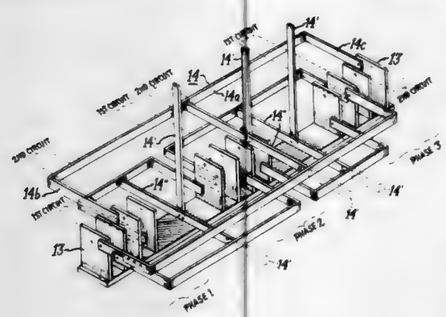
1. A latching arrangement for plug-in relays comprising, a mounting sub-base for receiving a relay base, a cover for enclosing the magnetic and electrical relay structure, a spring biased push rod having one end extending beyond the outer surface of said cover and having an intermediate portion passing along the side of said cover and having the other end communicating with an apertured slot formed in said relay base, an elongated leaf spring carried by said mounting sub-base and having its ends slightly protruding beyond the outer edges of said mounting sub-base, and locking means formed on said relay base for engaging the ends of said elongated leaf spring for latching said relay base to said mounting sub-base when the relay base is plugged into said mounting sub-base.

4,174,509

FURNACE TRANSFORMER HAVING A LOW-VOLTAGE INTERNALLY-CONNECTED DELTA WINDING

Werner Bach, Pittsfield, and George Kardasen, Jr., Dalton, both of Mass., assignors to General Electric Company

Filed Dec. 29, 1977, Ser. No. 865,700
Int. Cl.[2] H01F *33/00*
U.S. Cl. 336—12 **8 Claims**



1. A high-current transformer having an internal delta closure comprising:

a plurality of low-voltage windings concentrically arranged within a transformer casing around corresponding high-voltage windings on each leg of a three-leg electromagnetic core, each leg providing one phase of a three-phase arrangement, each phase consisting of at least one pair of first and second parallel circuits, each of said parallel circuits having a positive and a negative end;

a vertical bus bar array connecting with each of said positive and negative ends;

a first plurality of bus bar connectors within the transformer casing connecting the positive and negative circuit ends in a delta connection by coupling the ends of the first circuit in the first phase to the ends of the second circuit in the second phase and the ends of the first circuit in the third phase on one side of the bus bar array; and

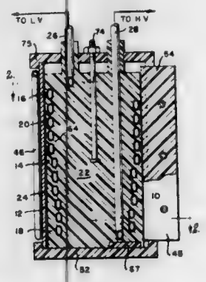
a second plurality of bus bar connectors coupling the ends of the second parallel circuit in the first phase to the ends of the first parallel circuit in the second phase and the ends of the second parallel circuit in the third phase on another side of the bus bar array.

4,174,510

RF TRANSFORMER

James L. Smith, Naperville; Harold W. Helenberg, Calumet City, and Dennis J. Kilodonk, Joliet, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 28, 1977, Ser. No. 865,162
Int. Cl.[2] H01F *27/02, 27/28*
U.S. Cl. 336—62 **7 Claims**



1. An RF transformer, comprising: a can-type secondary, a tapered primary coil encapsulated in epoxy contained within and slip-fitted into said secondary, a constant separation between said encapsulant and said secondary, a gap between said primary and said secondary at one end of said coil is smaller than at the other end and said gap generally tapers between said two ends, and an insulative fluid filling the separation between said encapsulated coil and said can-type secondary.

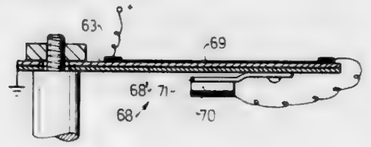
4,174,511

BIMETAL DEVICE WITH AN ELECTRICAL HEATING ELEMENT

Heinrich Knapp, Leonberg; Franz-Ulrich Bosch, Stuttgart, and Gunther Schnepf, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 13, 1978, Ser. No. 886,318
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1977, 2712951
Int. Cl.[2] H01H *71/16*
U.S. Cl. 337—107 **2 Claims**

1. A bimetal device for use in a motor vehicle injection fuel device for controlling the air-fuel mixture during starting and warm-up of the engine comprising, in combination, a bimetallic base, a thin insulating layer on said bimetallic base, at least one electrical resistance heating element on said insulating layer in heat transfer relationship with said bimetallic base, a PTC resistor supported on said bimetallic base out of heat transfer relationship therewith and serially connected with said at least one resistance heating element and means for connecting said



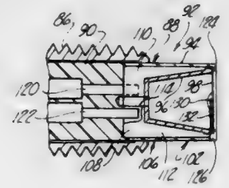
serially connected PTC resistor and said resistance heating element with an associated source of electrical power whereby said bimetal device can be held at a certain temperature.

4,174,512

FAST RESPONSE TEMPERATURE SENSOR

Albert Blatter, Southfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 5, 1977, Ser. No. 857,558
Int. Cl.[2] H01C *7/00*
U.S. Cl. 338—25 **15 Claims**



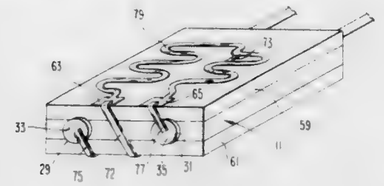
1. A temperature sensor for sensing the temperature of a fluid comprising a base member having at least first and second support arms thereon, fin means formed of a thin disc having a high surface area to mass ratio fixedly mounted on said first and second support arms whereby said fluid to be sensed may flow over the top and bottom surface of said fin means, semiconductor means mounted on said fin means in electrical contact therewith and having the characteristic of changing resistance with changes in temperature, a first output conductor connected to said fin means, a second output conductor electrically insulated from said fin means and connected to the surface of said semiconductor means remote from the surface of said semiconductor means in electrical contact with said fin.

4,174,513

FOIL TYPE RESISTOR WITH FIRMLY FIXED LEAD WIRES

Charles L. Wellard, Oaks, Pa., assignor to American Components Inc., Conshohocken, Pa.

Filed Apr. 5, 1978, Ser. No. 893,286
Int. Cl.[2] H01C *1/012*
U.S. Cl. 338—312 **7 Claims**



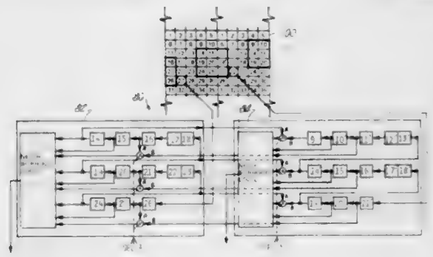
1. A metal foil type resistor assembly comprising in combination: a base means having channels formed therein, said channels opening to a first side of said base means, lead wires disposed in said channels and formed to be accessible for making electrical connections thereto; a first substrate means having an upper side and a lower side and having a metal configuration secured to its upper side, said metal configuration formed to have at least two termination lands and formed to provide electrical resistance, said first substrate means secured at its lower side to said first side of said base means; connecting wire means connecting each of said lead wires with an associated termination land.

4,174,514

PARALLEL PARTITIONED SERIAL NEIGHBORHOOD PROCESSORS

Stanley R. Sternberg, Ann Arbor, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 742,127, Nov. 15, 1976. This application Jun. 26, 1978, Ser. No. 919,171
Int. Cl.[2] G06K *9/12*
U.S. Cl. 340—146.3 MA **14 Claims**



1. Apparatus for generating a transformation of a first data matrix to form a second data matrix wherein the value of each data element is a function of the values of the elements in the neighborhood of the equivalent data element in the first matrix, comprising:

a plurality of serial neighborhood processors;

means for providing said first data matrix to said plurality of serial neighborhood processors with each serial processor receiving a plurality of adjacent columns of the matrix in a row by row raster;

connections between adjacent serial processors; and

means for controlling the serial processors to cause them to each utilize neighborhood information stored in an adjacent processor when generating the transform of a data element having neighboring elements in the columns processed by such adjacent processor, whereby said plurality of serial processors can simultaneously process separate and adjacent columns of the same matrix.

4,174,515

DEVICE FOR TRANSMISSION OF MEASUREMENT VALUES

Rene Marzolf, Eschborn, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 11, 1977, Ser. No. 850,708
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1976, 2652122
Int. Cl.[2] B60C *23/02*
U.S. Cl. 340—58 **20 Claims**

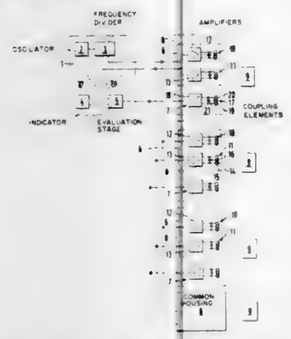
1. A device for transmission at least of one measurement value from a moveable object to a object stationary relative to the latter, particularly from a motor vehicle wheel to the vehicle frame of a motor vehicle, with a transmitting stage and

a receiving stage, which both are secured on the stationary object and a coupling element which is secured on the moveable object and via which the receiver is able to be applied with a measuring value signal, comprising

a transmitting stage means for transmitting two transmission frequency signals of different frequencies,

at least one coupling element means for mixing the two different frequencies and for transmitting at least one signal with a mixing frequency,

a receiving stage means for being responsive to the at least one signal with a mixing frequency transmitted from said coupling element means,



said coupling element means comprises at least one oscillating circuit containing a construction element with a non-linear-current voltage characteristic curve,

said coupling element means contains two parallel oscillating circuits including said at least one oscillating circuit, one of said parallel oscillating circuits lies at a frequency within a frequency range which is predetermined by the transmission frequencies, and the other of said circuits is tuned to the mixing frequency, and

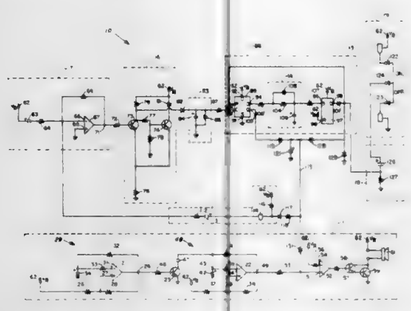
said construction element with a non-linear current-voltage characteristic curve connects both of said two parallel oscillating circuits with each other.

4,174,516

ALARM DEVICE

Mark R. Cleary, Omaha, Nebr., assignor to Jubilee Manufacturing Co., Omaha, Nebr.

Filed Dec. 5, 1977, Ser. No. 856,960
Int. Cl.[2] B60R *25/10*; G08B *13/08*
U.S. Cl. 340—63 **14 Claims**



1. An alarm device for use in conjunction with automobiles having electrical systems, said alarm device comprising:

(a) electric power connection means for connecting the device to the automobile electrical system;

(b) a first trigger means operably connected to the electrical power means, said first trigger means responsive to voltage variations and capable of producing electrical signal in response to such voltage variations;

(c) square wave generating means for converting electrical signal of the first trigger means into a square wave signal, said square wave generating means electrically connected to the first trigger means;

(d) siren means for sounding a siren in response to said activating means and electrically connected to said activating means, said siren means having:

a first operational amplifier circuit including an inverting and non-inverting input, and an output;

a second operational amplifier circuit including an inverting and non-inverting input, and an output;

a first transistor having a base, emitter, and collector, said first transistor electrically connected between said first operational amplifier circuit and said second operational amplifier circuit;

and positive voltage biasing means for positively biasing the non-inverting inputs of said first and second operational circuits, wherein the output of said first operational amplifier circuit is connected to the base of said first transistor, and the collector of said first transistor is connected to the inverting input of said second operational amplifier circuit;

(e) activating means responsive to the square wave signal for activating said siren means, said activating means electrically connected between said square wave means and said siren means;

(f) arming means for arming and dearming said first trigger means, and operably connected to said first trigger means;

(g) a first timing means for deactivating said siren means at some preset period beyond the time when said siren means is activated, said first timing means electrically connected to the siren means;

(h) a second timing means providing a delay time interval between the time when the arming means is activated, said second timing means electrically connected to the first trigger means; and

(i) a third timing means providing a delay interval between the time said activating means produces an activating signal and the time set siren means is activated, said third timing means electrically connected to the activating means.

4,174,517

CENTRAL SYSTEM FOR CONTROLLING REMOTE DEVICES OVER POWER LINES

Jerome Mandel, 15601 Whiteoak La., Huntington Beach, Calif. 92647

Filed Jul. 15, 1977, Ser. No. 816,015
Int. Cl.[2] H04B *3/54*; H04M *11/00*
U.S. Cl. 340—310 A **9 Claims**

1. A system for use in a facility equipped with a common electrical system for controlling, from a central location, the operation of one or more remote devices, comprising:

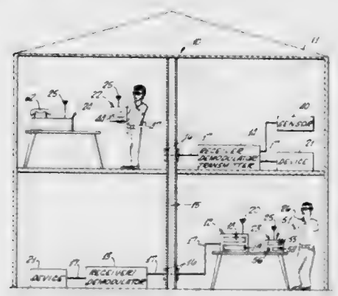
a central control unit located within said facility and including:

means for maintaining current time-of-day information and for generating a signal indicative of the time-of-day;

memory means for storing user-entered command information and time-of-day information associated therewith;

processor means for comprising said time-of-day signal with said time-of-day information stored in said memory means for transferring said command information associated with said time-of-day information from said memory means in the presence of a time match; and

a modulator responsive to said stored command information transferred from said memory means for modulating command signals onto a carrier signal and for coupling said carrier signal directly to said electrical system; and



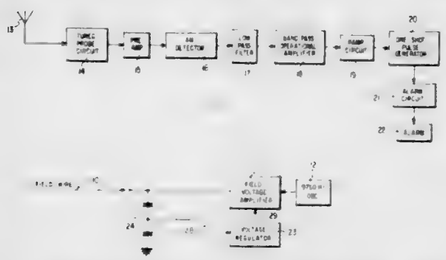
a receiver/demodulator unit coupled to said electrical system and to a remote device for receiving and demodulating command signals from said central control unit and for controlling the operation of said remote device.

4,174,518

INTRUSION WARNING SYSTEM

Ronald W. Mongeon, San Jose, Calif., assignor to Stellar Systems, Inc., Santa Clara, Calif.

Filed Jul. 28, 1977, Ser. No. 820,014
Int. Cl.[2] G08B *13/24*
U.S. Cl. 340—561 **7 Claims**



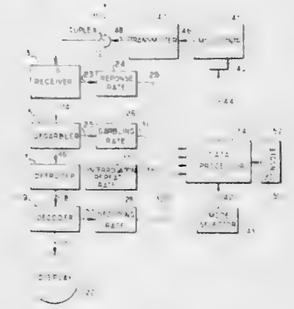
1. In an intrusion warning system for indicating the presence of an intruder into a given area comprising in combination: means for producing a quasi-stationary electric field along at least a portion of the perimeter of said area including a long field wire extending along said portion of the perimeter of said area with said field wire being mounted on and extending between a plurality of fence posts by means of respective insulators so that said field wire is insulated from ground, and first circuit means connected to said field wire for producing an output signal having a wavelength which is very long compared to the length of said field wire and a frequency which is in the range of from 1–40 KHz, said field circuit means including an oscillator circuit for producing an output signal having said frequency in the range of from 1–40 KHz, a first amplifier having an input connected to receive the output signal of said oscillator circuit and an output connected to said field wire, and voltage regulating means, having an output connected to said first amplifier, for regulating the output voltage from said first amplifier; a receiving antenna within said area for receiving said electric field; a second amplifier having an input connected to said antenna; AM detector means, responsive to an output signal from said second amplifier, for detecting changes in the received and amplified electric field signals and for producing an output signal corresponding to same; second circuit means, including voltage amplifying means and filter means, for amplifying said output signal from said detector means and for passing only any low frequency component of said output signal from said detector which is in the range from approximately 0.2 to 2 Hz due to a disturbance of said electric field caused by movement of an intruder; threshold circuit means, responsive to an output signal from said second circuit means, for producing an output signal whenever said output signal from said second circuit means exceeds a predetermined threshold value; and means, responsive to said output signal from said threshold circuit means, for providing an alarm indicating the disturbance of said electric field by an intruder; the improvement wherein: said first amplifier has an output stage including a transistor having an emitter connected to ground, a base connected to receive the output signal from said oscillator circuit and a collector connected to said output of said regulating means via an impedance, and to said field wire; and said regulating means comprises means responsive to said output voltage from said first amplifier for providing a controlled supply voltage to said output stage of said first amplifier including: a capacitive voltage divider connected between the output of said first amplifier and ground; an operational amplifier having an inverting input connected to an output of said capacitive voltage divider, a non-inverting input connected to a source of reference potential, and an output; and means for connecting said output of said operational amplifier to said output of said regulating means.

4,174,519

METHOD FOR THE IMPROVED UTILIZATION OF RESPONSE SIGNALS IN A SECONDARY RADAR SYSTEM AND A SECONDARY RADAR SYSTEM FOR IMPLEMENTING THE METHOD

Pierre R. Poli, Issy les Moulineaux, France, assignor to Electronique Marcel Dassault, Paris, France

Filed Oct. 23, 1978, Ser. No. 953,343
Claims priority, application France, Oct. 26, 1977, 77 32313
Int. Cl.[2] G01S *9/56*
U.S. Cl. 343—6.5 R **13 Claims**

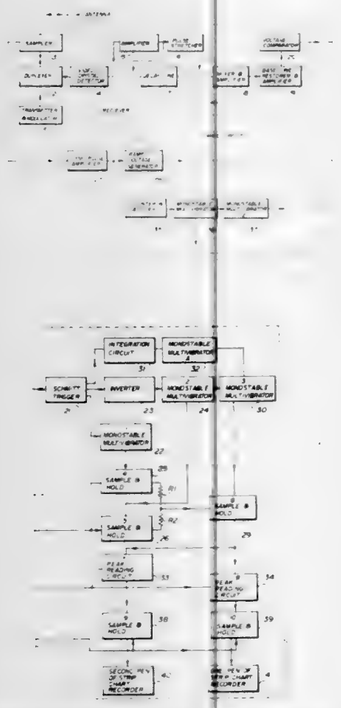


5. In a secondary radar system including a ground-based radar station having interrogator means for transmitting interrogation signals consisting of time-spaced pulse pairs, the time interval T between pulses of a pair being characteristic of the interrogation, a transponder means aboard aircraft, said transponder means being of the type providing response signals to all interrogation signals having a time interval T comprises in a nominal time interval, response signals to a percentage of interrogation signals for ranges of time interval T greater and/or lesser than the nominal time interval, and no responses to interrogation signals having time interval T beyond predetermined limits, said station having a receiver means for receiving said response signals,

the improvement comprising means for varying the time interval T between the pulses of an interrogation signals as a function of the number of response signals and/or the

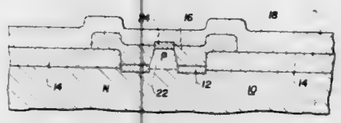
time relationship of the response signals received at the ground-based radar station so as to improve reception decoding of response signals in accordance with air traffic conditions in azimuthal zones.

4,174,520
RADAR ALTIMETER FOR TROPICAL AREAS
Ray L. Westby, Ottawa, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada
Filed Feb. 13, 1978, Ser. No. 877,308
Int. Cl.[2] G01S *9/12*
U.S. Cl. 343—13 R **1 Claim**



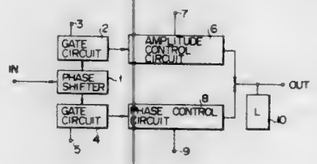
1. A radar altimeter system for measuring from an aircraft flying above tropical forest areas, the height of the ground and the height of the forest canopy above the ground comprising:
(a) a transmitter and antenna system for beaming a series of transmitted pulses towards the ground from an aircraft,
(b) a receiver for detecting return pulses from the ground and the forest canopy,
(c) timing means for measuring, in relation to the transmitted pulse, the time of arrival at the beginning and end of each received pulse and averaging these times,
(d) means for examining the received pulse duration and preventing pulses having a shorter time duration than a predetermined time from passing further in the system, and
(e) means for examining a selected number of pulses and coupling the voltage derived from the received pulse having the longest time of arrival to an output to give an indication of the ground level and the voltage derived from the received pulse having the shortest time of arrival to an output to give an indication of the forest canopy level.

4,174,521
PROM ELECTRICALLY WRITTEN BY SOLID PHASE EPITAXY
Ronald G. Neale, Indian Harbour Beach, Fla., assignor to Harris Corporation, Melbourne, Fla.
Filed Apr. 6, 1978, Ser. No. 893,930
Int. Cl.[2] G11C *11/36*; H01L *21/20*
U.S. Cl. 357—45 **36 Claims**



32. A semiconductor structure comprising:
a layer of single crystal semiconductor material;
a alloy layer of a metal and said semiconductor material;
a doped amorphous layer of said semiconductor material on said alloy layer;
a contact layer of contact material on said amorphous layer;
a doped single crystal column of said semiconductor material on said single crystal layer surrounded laterally by said alloy and amorphous layers; and
a layer of said alloy between said column and said contact layer.

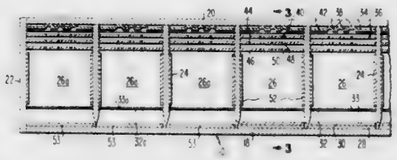
4,174,522
COMPOSITE COLOR SIGNAL-HANDLING CIRCUIT
Shinichiro Taguchi, Fukaya, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan
Filed Oct. 12, 1977, Ser. No. 841,598
Claims priority, application Japan, Oct. 16, 1976, 51-123432
Int. Cl.[2] H04N *9/12*
U.S. Cl. 358—35 **4 Claims**



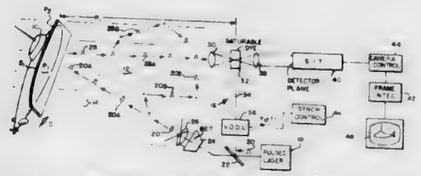
1. A signal-handling circuit comprising: means for separating a composite signal into first and second component signals by time division; means for controlling the amplitude of said first signal component separated by said signal-separating means; means for controlling the phase of said second component signal separated by said signal-separating means; and means for adding together output signals from said means for controlling the phase and from said means for controlling the amplitude, whereby a difference between the phase distortions of said first and second component signals is eliminated.

4,174,523
FLAT DISPLAY DEVICE
Frank J. Marlowe, Kingston, and Charles H. Anderson, Rocky Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.
Filed Jul. 16, 1976, Ser. No. 705,926
Int. Cl.[2] H01J *29/72, 29/08, 31/08*
U.S. Cl. 358—67 **11 Claims**

1. An electron display device comprising
an evacuated envelope having a viewing window,
a phosphor screen along the inner surface of said window,
means in said device for generating a plurality of beams of electrons and directing said beams along paths at least portions of which extend toward said window so that at least some of said beams will impinge on said phosphor screen,
means along the portions of the paths which extend toward said window for simultaneously deflecting said beams so that the beams which impinge on said phosphor screen will each scan a portion of the phosphor screen,
means for substantially continuously detecting the position of at least one of said beams as the beam is deflected, wherein said detecting means comprising means, including a detector electrode upon which the beam impinges as the beam is deflected, for generating a series of current pulses as the beam is deflected with the time between the pulses providing an indication of the position of the beam, and
means whereby the beam intermittently impinges on the detector electrode, said means whereby the beam intermittently impinges on the detector electrode including a mask extending across the detector electrode, said mask having a plurality of spaced openings therethrough through which the beam passes as the beam is deflected.

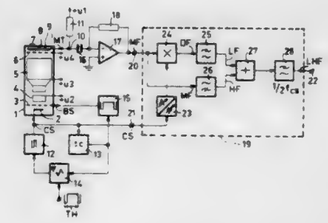


4,174,524
ULTRA HIGH SPEED GATED PULSE OPTICAL IMAGING SYSTEM
Steven E. Moran, Lakeside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sep. 25, 1978, Ser. No. 945,721
Int. Cl.[2] H04N *7/18*
U.S. Cl. 358—95 **14 Claims**



1. Apparatus for providing an image of an object when a diffusive medium is located between said apparatus and said object, said apparatus comprising:
means for projecting successive pulses of coherent light through said medium to said object, each of said coherent light pulses having a time duration in the range 10^{-12}–10^{-10} seconds;
means for selectively receiving light transmitted through said medium, including light of said coherent light pulses which is reflected from various light reflective surfaces of said object;
optical shutter means selectively positioned in relation to said receiving means for allowing light transmitted through said medium to be received by said receiving means during shutter activation time periods, said shutter activation time periods being in the range 10^{-12}–10^{-10} seconds, a shutter activation time period occurring while a coherent light signal is being coupled to said optical shutter means;
synchronous means coupled between said pulse projecting means and said optical shutter means for commencing a shutter activation time period at the conclusion of a pulse travel time period, said pulse travel time period commencing when a given one of said coherent light pulses is projected by said pulse projecting means, the duration of said pulse travel time period being equal to the minimum time required for a wavefront of said given coherent light pulse to travel through said medium from said pulse projecting means to a selected one of said light reflective surfaces of said object, and then from said selected light reflective surface to said receiving means;
means cooperating with said receiving means for providing sets of light responsive signals, each of said sets representing an image of light reflective surfaces of said object which are included in one of one or more discrete viewing spaces;
storage means for storing said sets of light responsive signals; and
display means for combining all of the images represented by said sets of light responsive signals to provide an image of said object.

4,174,525
TELEVISION CAMERA HAVING LOW-FREQUENCY NOISE CORRECTION
Johannes A. B. Dechering, and Martinus F. A. M. Geurts, both of Breda, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 10, 1977, Ser. No. 850,233
Claims priority, application Netherlands, Dec. 1, 1976, 7613357
Int. Cl.[2] H04N *5/34*
U.S. Cl. 358—217 **12 Claims**



1. A television camera comprising a television pick-up tube and a correction circuit for low frequency signal noise, said television pick-up tube including an electron gun comprising a cathode, and control, and an accelerating electrode respectively, a target plate disposed opposite said gun, a mesh electrode disposed near the target plate and causing low frequency noise, and a picture signal output of the pick-up tube coupled to the target plate; an oscillator coupled to said cathode, wherein the peak-to-peak value of the oscillator signal on the cathode exceeds the local maximum potential variation on the target plate occurring at a local maximum illumination present in a scene to be televised and the oscillator frequency is at least equal to twice the highest standardized picture signal, frequency, and an amplitude-demodulation circuit means coupled to said picture signal output for obtaining an unmodulated noise corrected picture signal.

4,174,526

TELEVISION CAMERA COMPRISING A DIAPHRAGM CONTROL AND A CONTROLLABLE PICTURE SIGNAL AMPLIFICATION CIRCUIT

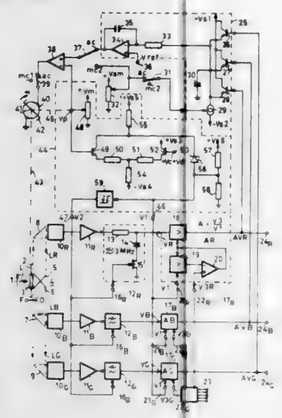
Martinus F. A. M. Geurts, Breda, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 13, 1978, Ser. No. 877,079

Claims priority, application Netherlands, Feb. 21, 1977, 7701811

Int. Cl.² H04N *5/34*

U.S. Cl. 358—219 **9 Claims**



1. A television camera comprising a diaphragm control and a gain controllable picture signal amplification circuit for keeping a picture signal value substantially constant at varying scene light intensities, an adjusting element for adjusting the diaphragm opening, the diaphragm control being mainly operative at a scene having higher light intensities and the control of the picture signal amplification circuit mainly taking place at lower scene light intensities, an electronic control circuit coupled to the adjusting element, said control circuit having a first signal output coupled to a control signal input of the picture signal amplification circuit for providing that at lower scene light intensities and upon a readjustment of the adjusting element and a consequent change of the diaphragm opening simultaneously a change of the gain factor of the picture signal gain circuit occurs.

4,174,527

METHOD FOR LOCALLY PRECISELY SETTING THE START AND END OF REPRODUCTION IN AN ENGRAVING APPARATUS

Klaus Schaefer, Rendsburg, Fed. Rep. of Germany, assignor to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

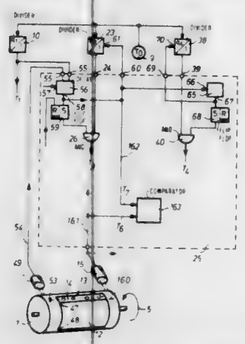
Filed Feb. 3, 1978, Ser. No. 874,790

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1977, 2705993

Int. Cl.² H04N *1/26*

U.S. Cl. 358—267 **7 Claims**

1. The method for the precise setting of a start and end of the reproduction of an image pattern wherein the image pattern mounted on a scanning cylinder is opto-electronically scanned line by line by a scanning member to obtain an image signal and wherein the image pattern is recorded on a recording cylinder by a recording member controlled by said image signal comprising the steps of setting a start mark on the scanning cylinder which determines the desired point at which scanning shall begin in each line of said image pattern, scanning said start mark by said scanning member to obtain a first control signal, producing a revolution mark pulse of the cylinder generating a second scanning start control signal by time delaying said revolution mark pulse and to set the scanning start for subsequent reproduction effecting coincidence for the first and



second control signals with the aid of comparison means by altering said time delay during a test run.

4,174,528

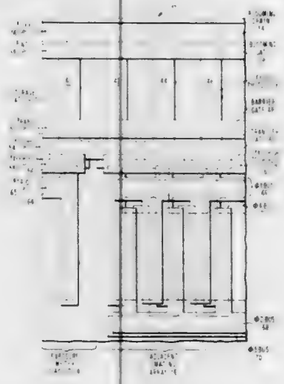
EXPOSURE CONTROL FOR DOCUMENT SCANNER ARRAYS

James M. White, Mahopac, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1978, Ser. No. 920,942

Int. Cl.² H04N *1/40, 1/10, 1/24, 3/14*

U.S. Cl. 358—280 **12 Claims**



1. In a document scanner, the combination comprising:
a scanner array including an exposure control section and a document information receiving section;
means for concurrently imaging a reference indicia onto said exposure control section, and the document onto said document information receiving section; and
means for controlling the amount of time said document information receiving section processes the imaged document as a function of the time said exposure control section senses the imaged reference indicia.

4,174,529

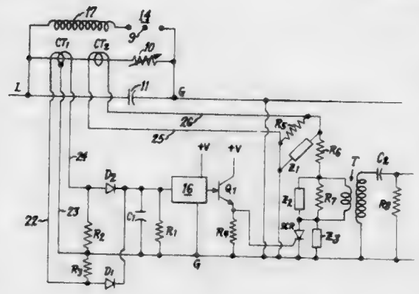
PROTECTIVE CIRCUIT FOR ZINC OXIDE VARISTORS

John R. Hamann, Richmond, Mass., assignor to General Electric Company, N.Y.

Filed Apr. 10, 1978, Ser. No. 894,529

Int. Cl.² H02H *7/16*

U.S. Cl. 361—16 **21 Claims**



1. A protective circuit for zinc oxide varistors comprising in combination:
at least one zinc oxide varistor connected within an electric circuit;
a triggered switching device electrically coupled in shunt relationship with the varistor for bypassing current from the varistor under a condition of varistor overload;
at least one current sensor electrically connected within the circuit for sensing current flow through said varistor and for generating an electric signal in response to the varistor overload condition, said current sensor being directly connected to an input of a rectifier circuit having an output directly connected to a first capacitor and to a first resistor for generating a voltage across the capacitor which is directly proportional to the energy dissipated within the varistor during said overload condition; and
pulse generator circuit means for providing a high voltage pulse to the triggered device for causing the triggered device to become conductive when said overload condition occurs.

4,174,530

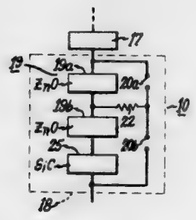
VOLTAGE SURGE ARRESTER DEVICE

James S. Kresge, Pittsfield, and Eugene C. Sakshaug, Lanesborough, both of Mass., assignors to General Electric Company

Filed Jan. 20, 1978, Ser. No. 870,869

Int. Cl.² H02H *3/22*

U.S. Cl. 361—127 **9 Claims**



1. An overvoltage surge arrester comprising:
at least one high-exponent varistor having an exponent greater than 10 for electrical connection between a voltage line and ground;
at least one low-exponent varistor having an exponent less than 10 in series with said high-exponent varistor for providing a more rapid voltage increase than for the high-exponent varistor; and
at least one shunt gap shunting said low-exponent varistor and a portion of said high-exponent varistor for reducing the arrester voltage during a condition of electrical overvoltage.

4,174,531

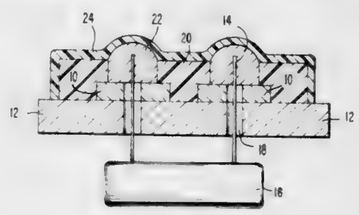
PRINTED CIRCUIT BOARD WITH INCREASED ARC TRACK RESISTANCE

Donald C. McCarthy, Delran, and Martin Rayl, Lawrenceville, both of N.J., assignors to RCA Corporation, New York, N.Y.

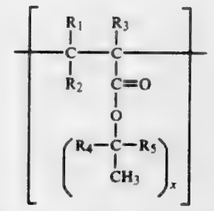
Filed Nov. 14, 1977, Ser. No. 851,401

Int. Cl.² H05K *1/04*

U.S. Cl. 361—411 **11 Claims**



1. A printed circuit board consisting essentially of:
(a) an electrically insulative substrate;
(b) a conductive network layer bonded to the substrate;
(c) a solder resist material adhered to selected areas of the network layer and the substrate;
(d) solder bonded to selected areas of the network layer;
(e) components affixed by means of electrical leads to the conductive layers by the solder; and
(f) an acrylic resin coated over the substrate, network layer, solder and solder resist material wherein the acrylic resin is a polymer having the recurring unit of the formula:



wherein x of each unit is independently selected from integers of 0 to 15 and each R_1, R_2, R_3, R_4 and R_5 is independently selected from the group consisting of H, $-CH_3$ and $-C_2H_5$ and whereby the acrylic resin coating increases the arc track resistance of an electrical potential applied to the circuit board.

4,174,532

PORTABLE LIGHTING FIXTURE

Richard L. Kelley, 7 Elm Pl., Webster Groves, Mo. 63119

Filed May 20, 1977, Ser. No. 798,769

Int. Cl.² F21V *33/00, 21/08*

U.S. Cl. 362—102 **5 Claims**

1. A portable lighting fixture for use with a patio umbrella and the like in which the umbrella is supported by a center pole having struts extending outwardly therefrom to the underside of the umbrella when the umbrella is in a raised position comprising:
a generally planar base of rigid material having a slot therein extending inwardly from an edge of the base toward and

slightly beyond the center thereof, said slot having a relatively constant width approximately equal to but greater than that of the center pole for receiving the pole to removably install the base below the underside of the umbrella about the pole, the latter being at the inward end of the slot and said base being supported by the struts in a generally horizontal plane;

said base having a maximum outside dimension less than the length of one of the umbrella struts for enabling the base to be installed on and removed from the umbrella by



passing it between two adjacent struts when the umbrella is in its raised position;

a plurality of electric light sources mounted on the underside of the base; and

power means adapted for connection to a source of electrical energy for supplying power to the light source thereby to illuminate the area beneath the umbrella, said power means including manually-operable switch means for selectively controlling the flow of electricity to the light sources thereby allowing the latter to be selectively energized and deenergized.

4,174,533

WAVEFLUX CONCENTRATION REFLECTOR

Emile Barthes, Montreuil, and Jean-Luc Richard, Puteaux, both of France, assignors to Compagnie des Lampes, Societe Anonyme, Paris, France

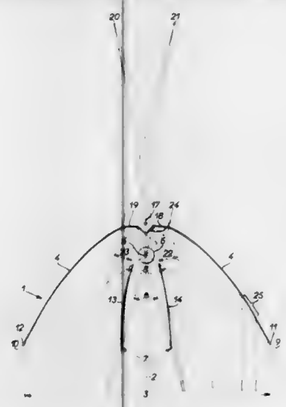
Filed Oct. 3, 1977, Ser. No. 838,475

Claims priority, application France, Oct. 21, 1976, 76 31685

Int. Cl.[2] F21V 7/00

U.S. Cl. 362—346 **4 Claims**

1. An optical reflecting device for concentrating a waveflux produced by a luminous source into a beam of light having a main plane, said device comprising an outer trough-shaped reflector and an inner reflector, said outer reflector comprising, on each side of said main plane, adjacent first and second reflecting surfaces, and said inner reflector comprising, on each side of said main plane, a third reflecting surface, a transverse cross section of said luminous source comprising an emitting area, a transverse cross section of said main plane forming an axis of the beam of light, a transverse cross section of said first reflecting surface being described by an arc of a hyperbola extending between two ends and having a first focus coincident with said emitting area and a second focus, a transverse cross section of said second reflecting surface being described by a first arc of a parabola having an axis coincident with the axis of the beam of light, and a focus coincident with said emitting area, and a transverse cross section of said third reflecting surface being described by a second arc of a parabola having a focus coincident with said emitting area and an axis forming an angle with the axis of the light beam, said second arc of parabola being closer to the axis of said beam of light than to its axis, and the second focus of said arc of hyperbola being positioned at a crossing point of two straight lines passing by the respective ends of said arc of the hyperbola and



between said first arc of parabola and said second arc of parabola.

4,174,534

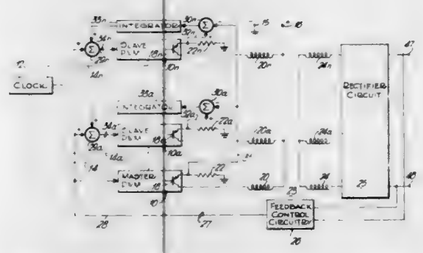
MASTER-SLAVE VOLTAGE REGULATOR EMPLOYING PULSE WIDTH MODULATION

Paul Kotlarewsky, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jan. 20, 1978, Ser. No. 871,105

Int. Cl.[2] H02M 3/335

U.S. Cl. 363—26 **15 Claims**



1. A pulse width modulation converter circuit for transforming a first DC voltage into a second voltage, wherein the magnitude of said second voltage is regulated by said converter circuit, said converter circuit comprising:

a clock means for providing a symmetrical train of pulses on each of n+1 conductors, wherein only one pulse occurs on any one of said conductors at any given instant in time, and wherein n is a positive integer equal to, or greater than, 1;

a master pulse width modulator means responsive both to the train of pulses on one of said n+1 conductors and to a feedback signal indicative of the magnitude of said second voltage, said master pulse width modulator means controlling the flow of current, due to said first DC voltage, through a portion of a transformer primary winding;

n slave pulse width modulator means, each said slave pulse width modulator means being responsive both to the train of pulses on one of said n+1 conductors, in a one-to-one relationship, and to an output control signal based both upon said feedback signal, indicative of the magnitude of said second voltage, and upon the difference in the magnitude of the charge passed by said master pulse width modulator means and the charge passed by said respective slave pulse width modulator means, each said slave pulse width modulator means controlling the flow of current, due to said first DC voltage, through a portion of said transformer primary winding.

4,174,535

INTEGRATED CURRENT SUPPLY CIRCUIT

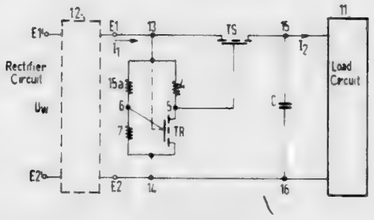
Ruediger Mueller, Munich; Michael Pomper, Schliersee, and Ludwig Leipold, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 10, 1978, Ser. No. 932,498

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1977, 2740763

Int. Cl.[2] H02J 1/04; G05F 1/60

U.S. Cl. 363—147 **12 Claims**



1. An integrated current supply circuit comprising:

(a) two input terminals;

(b) two output terminals having a capacitor connected therebetween;

(c) a lambda circuit means having a current voltage characteristic wherein a current through the circuit is low for a low applied voltage, said current rising to a maximum for a given applied voltage, and said current falling to a low value for higher applied voltages, said given applied voltage being between the low applied voltage and higher applied voltages;

(d) said lambda circuit means comprising

(i) a first field effect transistor (FET) whose one end of a source-drain path connects to one end of a series circuit having a load element connected to a source-drain path of a second field effect transistor (FET), a gate of the first FET connecting between the load element and second FET,

(ii) connection means connecting a gate of the second FET to a drain-side end of said series circuit;

(e) ends of series circuit being connected between said two input terminals;

(f) the other end of the first FET source-drain path connecting to one of said two output terminals; and

(g) the other of said two output terminals connecting to one of said two input terminals.

4,174,536

DIGITAL COMMUNICATIONS CONTROLLER WITH FIRMWARE CONTROL

David P. Misunas, Brighton; Peter G. Jessel, and Robert G. Jacobsen, both of Cambridge, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 21, 1977, Ser. No. 761,126

Int. Cl.[2] G06F 3/04, 13/00

U.S. Cl. 364—200 **34 Claims**

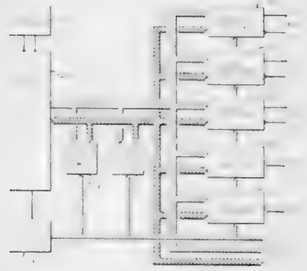
1. A digital data processor comprising

(a) processor means for operational control, said processor means consisting of computational means for performing arithmetic and logical operations on data items and communication means for transferring data items to and from said processor means;

(b) serial interface means operatively connected to said processor means for receiving signals representing first data from said processor means over said communication means and, upon receipt of said signals representing said first data, transmitting signals representing said first data in serial format to a first peripheral device, and for receiving signals representing second data in serial format from a second peripheral device and, upon receipt of said signals representing said second data, transmitting signals representing said second data to said processor means over said communication means;

(c) parallel interface means operatively connected to said processor means for receiving signals representing third data from said processor means over said communication means and, upon receipt of said signals representing said third data, transmitting signals representing said third data in parallel format to a third peripheral device, and for receiving signals representing fourth data in parallel format from a fourth peripheral device and, upon receipt of said signals representing said fourth data, transmitting signals representing said fourth data to said processor means over said communication means;

(d) read-only memory means operatively connected to said processor means for holding an encoding of bits providing a precise specification of the operation of said processor means, causing said processor means to control the transmission of signals representing data received at one of said serial or parallel interface means to another of said serial or parallel interface means;



(e) random-access memory means operatively connected to said processor means, providing temporary storage for use by said processor means and temporarily holding signals representing data received at one of said serial or parallel interface means, under control of said processor means while operating in the manner specified by said encoding of bits contained in said read-only memory means;

(f) control means operatively connected between said processor means and said read-only memory means, said random-access memory means, said serial interface means, and said parallel interface means providing generation of control signals enabling communication over said communication means between said processor means and said read-only memory means, random-access memory means, serial interface means, and parallel interface means;

(g) clock means operatively connected to said processor means and said control means, said clock means providing means for synchronizing the operation of said processor means and said control means; and

(h) said processor means operating in accordance with said encoding of bits contained in said read-only memory means to transfer from one of said serial or parallel interface means to another of said serial or parallel interface means both packets and single data items, wherein each of said packets contains a specification of the serial of parallel interface means to which it is to be transmitted and each of said single data items received at a serial or parallel interface means is transmitted to one or more serial or parallel

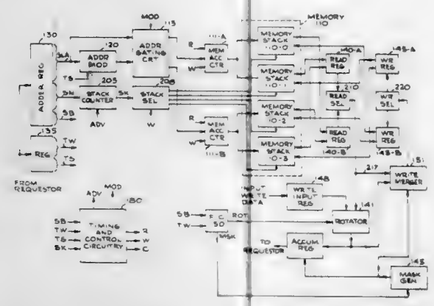
interface means in accordance with a specification contained in said random-access memory means or in said read-only memory means.

4,174,537

TIME-SHARED, MULTI-PHASE MEMORY ACCESSING SYSTEM HAVING AUTOMATICALLY UPDATABLE ERROR LOGGING MEANS

Ke-Chiang Chu, San Jose, and Richard S. Sharp, Santa Barbara, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 784,352, Apr. 4, 1977, Pat. No. 4,138,720. This application May 31, 1977, Ser. No. 801,868
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 **10 Claims**



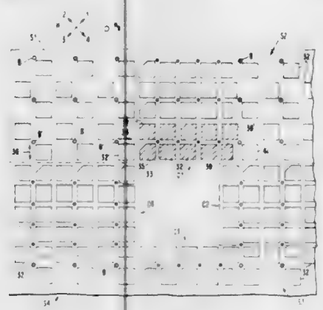
1. In a data processing system, the combination comprising:
a memory partitioned into a plurality of individually addressable memory portions, the accessing time of each memory portion requiring at least a plurality of operating cycles of said data processing system;
addressing means coupled to said memory and responsive to an applied address for initiating accessing of selected locations in a plurality of different memory portions over a plurality of consecutively occurring operating cycles in a manner such that the accessing of only a particular selected one of said memory portions is initiated during an operating cycle;
data accumulation means capable of simultaneously storing data read out from a plurality of said memory portions;
memory output means coupled to said memory and operative during a read operation for receiving data read out from each addressed selected location of a memory portion as it becomes available and operative during each of a plurality of said operating cycles for storing a predetermined portion of the received data from a selected one of said memory portions in a different designated location of said accumulation means until all of the predetermined portions of the received data read out from the addressed selected locations of said memory are simultaneously stored in said accumulation means;
said memory output means including error checking means for detecting the occurrence of a plurality of different types of errors which may occur in data read out from an addressed selected locaton of a memory portion and for producing error patterns corresponding thereto; and
error logging means coupled to said error checking means and responsive thereto for simultaneously storing indications of the occurrence of a plurality of different types of detected errors and for also storing the corresponding error pattern of a first predetermined type of error on a predetermined priority basis over that of a second predetermined type of error.

4,174,538

TWO-DIMENSIONAL BUBBLE DOMAIN MEMORY

Ashok K. Chandra; Hsu Chang, both of Yorktown Heights, and Chak-Kuen Wong, Briarcliff Manor, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,194
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—2 **17 Claims**



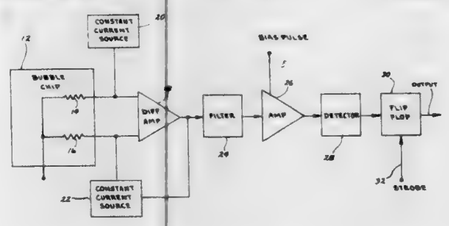
1. A bubble domain storage system for moving magnetic bubble domains in a magnetic film, comprising:
a plurality of storage arrays for storing bubble domains in said magnetic film arranged along x and y directions, each storage array being comprised of bi-directional shift registers for moving bubble domains in x and y directions, said shift registers being comprised of magnetic elements for moving said bubble domains in said x and y directions, wherein the magnetic elements have geometries such that bubble domains will move along them in either the x-direction or the y-direction depending upon the reorientation sequence of a magnetic field substantially in the plane of the magnetic elements,
magnetic translation means located between said storage arrays, said translation means including compressor circuits aligned with said shift registers for translating information in any of said shift registers to an aligned shift register in an adjacent storage array,
detection means for detecting bubble domains in said shift registers, said detection means comprising bubble domain sensing elements located between said storage arrays and disposed along said x and y directions for detection of bubble domains moving in said x and y directions.

4,174,539

MAGNETIC BUBBLE MEMORY DETECTOR-AMPLIFIER

Walter C. Timm, Edina, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Nov. 1, 1978, Ser. No. 956,769
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—8 **4 Claims**



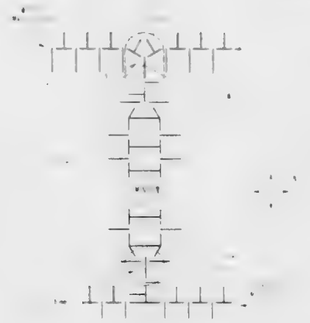
1. A detector-amplifier for bubble memory devices of the type having a dual output, one dummy and one active, comprising:
a differential amplifier, including a constant current source associated with each input and adapted to be connected with respective outputs of a bubble memory device,
a notch filter coupled to the output of said differential amplifier and tuned to eliminate signals at the frequency of the rotating magnetic field of a bubble memory device to be associated therewith,
an amplifier means connected with the output of said notch filter and including means responsive to a bias pulse to increase the gain of said amplifier,
a self biasing detector coupled to the output of said amplifier means, and
flip-flop means coupled to the output of said detector and including means responsive to a strobe pulse for gating an output signal.

4,174,540

BUBBLE DOMAIN TRANSFER SWITCHES

Mitchell S. Cohen, Ossining, and Emerson W. Pugh, Mt. Kisco, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,734
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—15 **23 Claims**



1. A bubble domain device for selectively sending bubble domains along one of two propagation paths, comprising:
at least one magnetic element forming a propagation path for bubble domains as a magnetic drive field continuously rotates through a 360° cycle in a constant sense of rotation,
an electrical conductor for carrying current for determining which of said two paths will be followed by a bubble domain passing through said device,
means for reducing the amplitude of said magnetic drive field for at least a portion of its cycle,
means for applying said current in said conductor while said drive field amplitude is reduced in order to effect path selection through said device, and means for applying a small constant magnetic field in a fixed direction while said rotating field is diminishing in amplitude.

4,174,541

BIPOLAR MONOLITHIC INTEGRATED CIRCUIT MEMORY WITH STANDBY POWER ENABLE

Charles R. Schmitz, Cupertino, Calif., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 746,362, Dec. 1, 1976, abandoned. This application May 25, 1978, Ser. No. 909,334
Int. Cl.[2] G11C *8/00, 7/00*
U.S. Cl. 365—227 **16 Claims**



1. A monolithic integrated circuit comprising:
(a) a memory array;
(b) memory array addressing circuitry for addressing such array in accordance with addressing signals;
(c) a ground bus;
(d) a power enable circuit including a transistor having a Schottky barrier diode formed between the base and collector regions thereof, such Schottky transistor being coupled between the addressing circuitry and the ground bus, the base electrode of such transistor being adapted for coupling to an enable signal, such Schottky transistor electrically coupling or decoupling the addressing circuitry and the ground bus selectively in accordance with the enable signal to enable or inhibit current flow in the addressing circuitry selectively in accordance with such enable signal; and
(e) a semiconductor substrate having formed thereon the memory array, the memory array addressing circuitry, the ground bus and the power enable circuit.

V 9 8 8 / 2 N 0 1 3 7 9 UMI

DESIGN PATENTS

GRANTED NOV. 13, 1979

ERRATA

For CLASS	See PATENT NO.
D21–062	253,430

V 9 8 8 / 2 N 0 1 3 7 9 UMI

253,376

DISPLAY RACK FOR OIL CANS

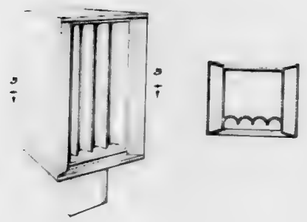
Richard P. Hornblad, Shorewood, Wis., assignor to Display Corporation International, Milwaukee, Wis.

Filed Sep. 5, 1978, Ser. No. 932,044

Term of patent 14 years

Int. Cl. D20—*02*

U.S. Cl. D6—25



253,377

HASSOCK OR SIMILAR ARTICLE

Albert M. Spound, Tarzana, Calif., and Robert C. Day, Princeton, Mass., assignors to Charlton Company, Inc., Leominster, Mass.

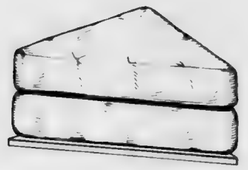
Continuation-in-part of Ser. No. 678,964, Apr. 21, 1976, abandoned. This application Jun. 23, 1978, Ser. No. 918,680

The portion of the term of this patent subsequent to Jun. 12, 1993, has been disclaimed.

Term of patent 14 years

Int. Cl. D6—*01*

U.S. Cl. D6—36



253,378

HASSOCK OR SIMILAR ARTICLE

Albert M. Spound, Tarzana, Calif., and Robert C. Day, Princeton, Mass., assignors to Charlton Company, Inc., Leominster, Mass.

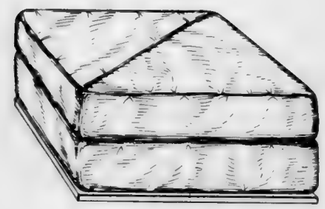
Continuation-in-part of Ser. No. 678,966, Apr. 21, 1976, abandoned. This application Jun. 23, 1978, Ser. No. 918,682

The portion of the term of this patent subsequent to Nov. 13, 1993, has been disclaimed.

Term of patent 14 years

Int. Cl. D6—*01*

U.S. Cl. D6—36



253,379

SOFA

Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.

Filed Nov. 28, 1977, Ser. No. 855,249

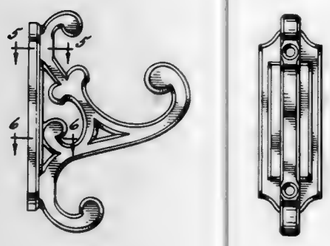
Term of patent 14 years

Int. Cl. D6—*01*

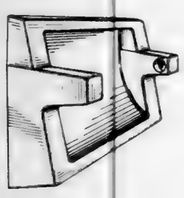
U.S. Cl. D6—62



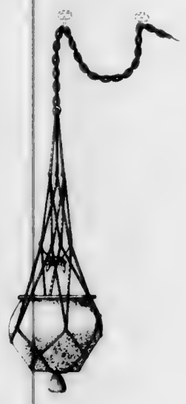
253,380
HARDWARE SUPPORT
Teresa R. B. Pittenger, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Jul. 17, 1978, Ser. No. 925,566
Term of patent 14 years
Int. Cl. D23—*02*; D8—*08*
U.S. Cl. D6—86



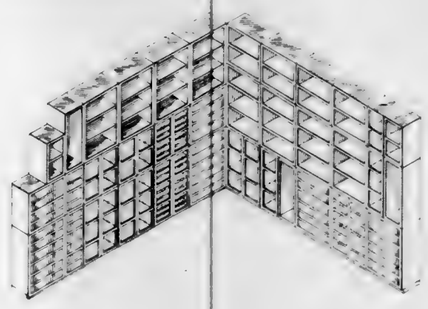
253,381
TISSUE HOLDER
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Filed Oct. 12, 1977, Ser. No. 841,542
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97



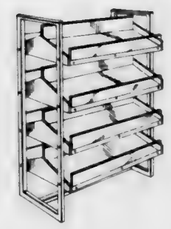
253,382
COMBINED HANGING PLANTER AND LIGHTS THEREFOR
Anthony J. Spruiel, 1210 34th St., Newport News, Va. 23607
Filed Jul. 29, 1977, Ser. No. 820,362
Term of patent 14 years
Int. Cl. D6—*06*; D11—*02*
U.S. Cl. D6—113



253,383
MULTIPLE SHELF AND CABINET UNIT
Giorgio Geli, Palestro St. 8, Senigallia, Italy
Filed May 23, 1977, Ser. No. 799,774
Claims priority, application Italy, Dec. 1, 1976, 526/76[U]
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—169



253,384
RACK
Marvin Glassenberg, 6857 N. Francisco Ave., Chicago, Ill. 60645
Filed May 26, 1978, Ser. No. 910,137
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186



253,385
GLASS TUMBLER
Theodore M. Reyda, Saugatuck, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 14, 1977, Ser. No. 860,425
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—5

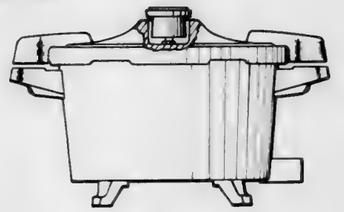


253,386
DECAL FOR CULINARY WARE OR THE LIKE
Patricia A. Luzier, Toledo, Ohio, assignor to Corning Glass Works, Corning, N.Y.
Filed May 16, 1977, Ser. No. 797,471
Term of patent 14 years
Int. Cl. D19—*08*; D07—*01*
U.S. Cl. D7—39



253,387
COFFEEMAKER
Patrick M. Tomaro, Maplewood, N.J., assignor to Conair Corporation, Edison, N.J.
Filed Feb. 27, 1978, Ser. No. 881,160
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—59

253,388
ELECTRIC PRESSURE COOKER
Melvin H. Boldt, Glenview; Thurber H. Morrison, Evanston, and James P. Stevens, Oak Park, all of Ill., assignors to National Presto Industries, Inc., Eau Claire, Wis.
Filed Mar. 7, 1977, Ser. No. 774,581
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—86



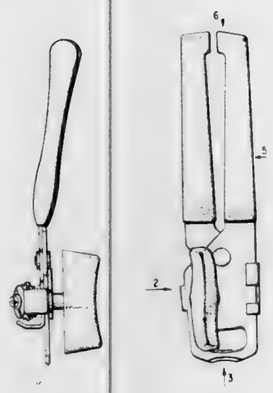
253,389
MARKER FOR HORTICULTURAL ITEMS
Leslie E. South, Jr., Dallas, Tex., assignor to Carscallen Nursery Label Company
Filed Sep. 16, 1977, Ser. No. 834,137
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D8—1



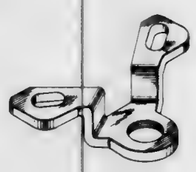
253,390
GRASS TRANSPLANTER
Glen W. Bartholomew, P.O. Box 17565, San Antonio, Tex. 78217
Filed Mar. 27, 1978, Ser. No. 890,226
The portion of the term of this patent subsequent to Oct. 10, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—7



253,391
CAN OPENER
Paul Dreyer, Solingen-Widdert, Fed. Rep. of Germany, assignor to The Prestige Group Limited, London, England
Filed May 18, 1977, Ser. No. 798,268
Claims priority, application United Kingdom, Apr. 6, 1977, 979620
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—39



253,392
MOUNTING BRACKET
Gunnar Baltare, Livonia, Mich., assignor to Eaton Corporation
Filed Oct. 17, 1977, Ser. No. 842,635
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—354



253,393
FASTENER FOR RETICULATE FENCING PANELS
Harold G. Evans, R.R. #2, Wayne, Nebr. 68787
Filed Jul. 5, 1977, Ser. No. 812,458
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—370



253,394
COMBINED DISPENSING CONTAINER AND HOLDER THEREFOR
Walter G. Berghahn, Scotch Plains, and Jack Weinstein, Old Bridge, both of N.J., assignors to Bristol-Myers Company, New York, N.Y.
Filed Oct. 19, 1977, Ser. No. 843,468
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—12



253,395
CAN OR SIMILAR ARTICLE
Gary K. Hasegawa, Chicago, and Carmen T. Mascia, Clarendon Hills, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.
Filed Aug. 15, 1977, Ser. No. 824,680
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—131



253,396
CAN OR SIMILAR ARTICLE
Gary K. Hasegawa, Chicago, and Carmen T. Mascia, Clarendon Hills, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.
Filed Aug. 15, 1977, Ser. No. 824,678
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—131



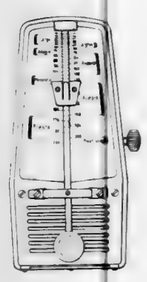
253,397
CAN OR SIMILAR ARTICLE
Gary K. Hasegawa, Chicago, and Carmen T. Mascia, Clarendon Hills, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.
Filed Aug. 15, 1977, Ser. No. 824,892
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—131



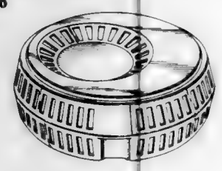
253,398
DISPENSING PUMP
Robert A. Niemeyer, Cincinnati, Ohio, and John Pardo, Yonkers, N.Y., assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Mar. 14, 1977, Ser. No. 777,504
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—276



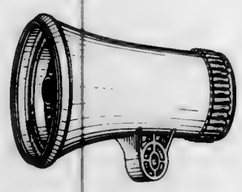
253,399
METRONOME
Fritz Hörle, Sonnenweg 10, 7972 Isny-Neutrauchburg, Fed. Rep. of Germany
Filed Oct. 20, 1977, Ser. No. 843,788
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—43



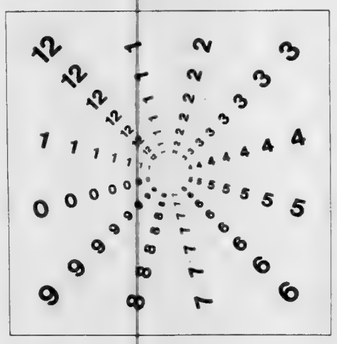
253,400
SMOKE DETECTOR
William W. Vander Wilt, Shawnee Mission, Kans., assignor to Rival Manufacturing Company, Kansas City, Mo.
Filed Dec. 29, 1977, Ser. No. 865,750
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



253,401
SIREN ATTACHMENT FOR CYCLE-TYPE VEHICLES
Mason Benson, Red Bank, and James McIntosh, Sommerset, both of N.J., assignors to Carolina Enterprises, Inc., New York, N.Y.
Filed Jun. 22, 1978, Ser. No. 918,311
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—120



253,402
TIMEPIECE DIAL
Edwin A. Day, 607 Quackenbos St., NW., Washington, D.C. 20011
Filed Nov. 1, 1977, Ser. No. 847,686
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—125



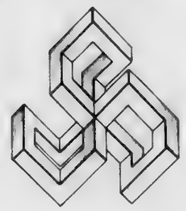
253,403
RING
Gabrielle Glueckselig, New York, N.Y., assignor to Artcarved Class Rings, Inc., New York, N.Y.
Filed Dec. 20, 1977, Ser. No. 862,347
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—35



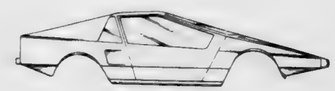
253,404
JEWELRY PENDANT OR SIMILAR ARTICLE
Joseph R. Gatti, 1350 Kelchner Rd., Bethlehem, Pa. 18017
Filed Apr. 26, 1978, Ser. No. 899,898
Term of patent 7 years
Int. Cl. D11—*01*
U.S. Cl. D11—79



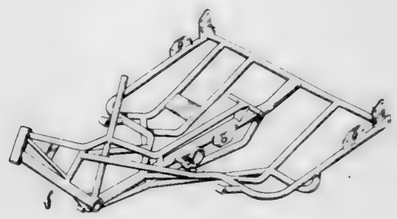
253,405
SCULPTURE
Lawrence F. Caulkett, 12207 Rochester Ave., Apt. 2, Los Angeles, Calif. 90025
Filed Oct. 11, 1977, Ser. No. 840,776
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—131



253,406
AUTOMOBILE BODY
Vito J. Carabetta, 124 W. Avenue 42, Los Angeles, Calif. 90065
Division of Ser. No. 876,854, Feb. 10, 1978. This application Oct. 10, 1978, Ser. No. 949,687
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—90



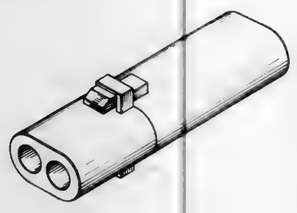
253,407
THREE-WHEELED VEHICLE FRAME
George C. Moore; Jodele Moore, both of 628 Brookway La., Las Vegas, Nev. 89109, and James M. Tipke, 2823 N. Perry St., Spokane, Wash. 99207
Filed Feb. 21, 1978, Ser. No. 879,712
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—112



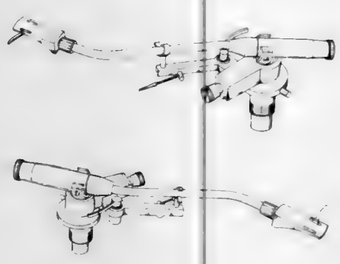
253,408
VEHICLE WHEEL CHOCK
Roy D. Sargent, 722 S. Sixth St., Brighton, Colo. 80601
Filed Oct. 3, 1977, Ser. No. 838,937
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—217



253,409
ELECTRICAL CONNECTOR BLOCK ASSEMBLY
Donald F. Voelkert, Elkhart, Ind., assignor to ElecTroMation, Inc., Elkhart, Ind.
Filed Aug. 18, 1977, Ser. No. 825,773
Term of patent 7 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



253,410
PHONOGRAPH TONE ARM
Isao Sasaki, Tokyo, Japan, assignor to Nippon Columbia Co., Ltd., Tokyo, Japan
Filed Sep. 19, 1977, Ser. No. 834,378
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—27



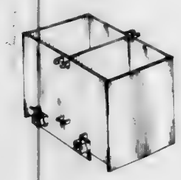
253,411
RADIO RECEIVER
Masanori Hamada, Yao, Japan, assignor to Matsushita Electric Industrial Co., Kadoma, Japan
Filed Jul. 28, 1977, Ser. No. 820,028
Claims priority, application Japan, Feb. 17, 1977, 52-5212
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



253,412
COMBINED RADIO AND TELEVISION SOUND RECEIVER OR THE LIKE
Kazumasa Takenaka, Moriguchi, and Shinzo Murakami, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jun. 15, 1977, Ser. No. 806,634
Claims priority, application Japan, Dec. 17, 1976, 51-49316
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70



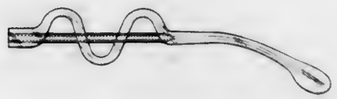
253,413
FORM FOR A CONCRETE TRACTOR WEIGHT
Lloyd L. Vandewater, Rte. 1, Box 98, Dexter, Iowa 50070
Filed May 18, 1977, Ser. No. 798,239
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—136



253,414
PERISCOPIC VIEWING DEVICE
Jorge J. Gomez, 351 E. 84th St., New York, N.Y. 10028
Filed Jun. 20, 1977, Ser. No. 808,253
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—48

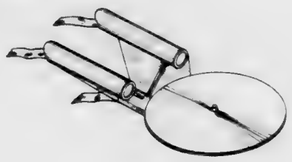


253,415
TEMPLE FOR SPECTACLES
Charles I. Solomon, P.O. Box 12495, San Antonio, Tex. 78215
Filed Aug. 22, 1977, Ser. No. 826,357
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—81



253,416
FINGER BALLPOINT PEN
John J. MacIntosh, 7301 Pomelo Dr., Canoga Park, Calif. 91307
Filed Mar. 28, 1978, Ser. No. 891,160
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—41

253,417
KITE
David Infante, 6002 W. Encanto Blvd., Phoenix, Ariz. 85035
Filed May 9, 1977, Ser. No. 794,964
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—88



253,418
GAME RACKET
Pete Cosmos, Sr., and John T. Kanne, both of Ashtabula, Ohio, assignors to True Temper Corporation, Cleveland, Ohio
Filed Feb. 23, 1973, Ser. No. 334,990
The portion of the term of this patent subsequent to Nov. 13, 1993, has been disclaimed.
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—212



253,419
COMBINED CANE AND CUE STICK
Chin-Tui Kuo, No. 1-10, Ta Ho 1 Hsiang, Hsi Tun District, Taichung, Taiwan
Filed Mar. 29, 1977, Ser. No. 782,550
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—232



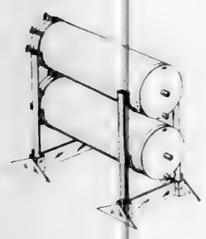
253,420
GOLFER'S TOOL
John G. Heerlien, Cuyahoga County, Ohio, assignor to Unitec Corporation, Cleveland, Ohio
Filed Jul. 8, 1977, Ser. No. 814,149
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234



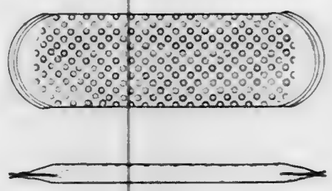
253,421
PUTTING TRAINING DEVICE
Robert E. Gordon, 13222 Admiral Ave., Unit "H", Marina Del Rey, Calif. 90291
Filed Mar. 13, 1978, Ser. No. 886,177
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234



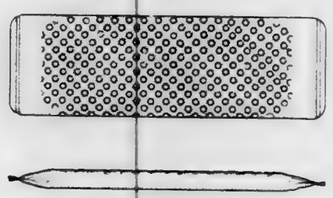
253,422
FILTER FOR CLEANING FLUID OR THE LIKE
Robert G. Smith, St. Louis County, Mo., assignor to Kleen-Rite, Inc., St. Louis, Mo.
Filed Nov. 18, 1977, Ser. No. 852,767
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



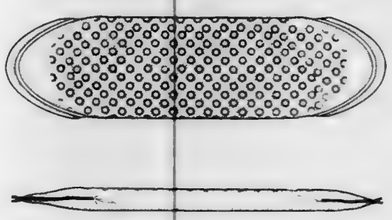
253,423
SANITARY NAPKIN
Robert J. Roeder, Appleton, Wis., assignor to Kimberly-Clark Corporation
Filed Nov. 13, 1978, Ser. No. 960,281
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—51



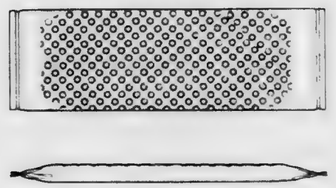
253,424
SANITARY NAPKIN
Robert J. Roeder, Appleton, Wis., assignor to Kimberly-Clark Corporation
Filed Nov. 13, 1978, Ser. No. 960,284
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—51



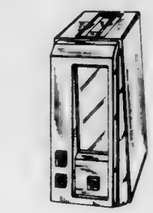
253,425
SANITARY NAPKIN
Robert J. Roeder, Appleton, Wis., assignor to Kimberly-Clark Corporation
Filed Nov. 13, 1978, Ser. No. 960,285
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—51

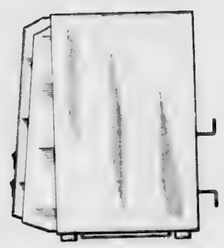


253,426
SANITARY NAPKIN
Robert J. Roeder, Appleton, Wis., assignor to Kimberly-Clark Corporation
Filed Nov. 13, 1978, Ser. No. 960,293
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—51



253,427
ELECTRONIC HEMADYNAMOMETER
Yoshihisa Ohie, and Tsutomu Yamasaki, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Nov. 20, 1978, Ser. No. 962,151
Claims priority, application Japan, May 24, 1978, 53-21472
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17

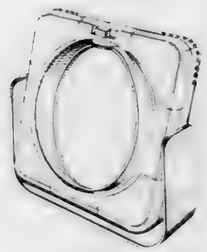




253,428
SAW BUCK BRACKET
William J. Hildebrandt, West Simsbury, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Dec. 12, 1977, Ser. No. 859,285
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D25—68



253,429
DOUBLE-SIDED ILLUMINATED MIRROR
Patrick M. Tomaro, Maplewood, N.J., assignor to Conair Corporation, Edison, N.J.
Filed May 19, 1978, Ser. No. 907,833
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—67



253,430
BILBOQUET STAFF
Matthew E. Morrison, 2455 8th Ave., N., St. Petersburg, Fla. 33713
Filed Jul. 14, 1976, Ser. No. 705,346
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—62



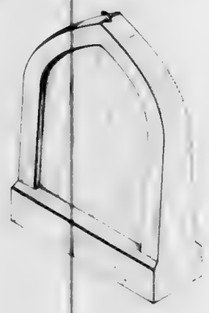
253,431
MULTILAMP FLASHLAMP ARTICLE HAVING COMBUSTIBLE MEMBER THEREIN
Paul M. Marecek, Montoursville, and John W. Shaffer, Williamsport, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.
Filed Sep. 6, 1977, Ser. No. 831,068
Term of patent 14 years
Int. Cl. D26—*04*; D16—*05*
U.S. Cl. D48—33



253,432
COMBINED HURRICANE LAMP AND CENTERPIECE OR THE LIKE
John Van Koert, 190 E. 72nd St., New York, N.Y. 10021
Filed Sep. 23, 1977, Ser. No. 835,988
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2



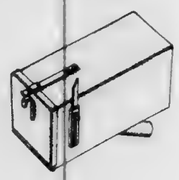
253,433
CANDLE
John H. Schuler, II, R.D. #1, Hanover, Pa. 17331
Filed Feb. 26, 1979, Ser. No. 15,413
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D73—1 R



253,434
EMBOSSED PLASTIC SHEET MATERIAL
Emanuel Mittman, Forest Hills, N.Y., and Mark R. Weitzman, Toledo, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed May 24, 1976, Ser. No. 689,419
Term of patent 14 years
Int. Cl. D05—*06*
U.S. Cl. D92—1.1



253,435
MAILBOX
Stephen D. Hale, Rte. 1, Box 316, Dublin, Va. 24084
Filed Nov. 11, 1977, Ser. No. 850,662
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—29



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF NOVEMBER, 1979

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Finkl & Sons Co.: *See*—
Bauer, Hannsgeard G.; Walter, Manfred; and Heimrich, Erick, 4,174,212, Cl. 75-49.000.

AB Nynas-Petroleum: *See*—
Lundgren, Bert K. G.; and Westin, Urban, 4,174,225, Cl. 106-38.600.

AB Westin and Backlund: *See*—
Lundgren, Bert K. G.; and Westin, Urban, 4,174,225, Cl. 106-38.600.

Abbott Laboratories: *See*—
Li, Jorge P.; and Becker, Frank C., 4,174,342, Cl. 260-45.80N.
Tadanier, John S.; Martin, Jerry R.; and Kurath, Paul, 4,174,312, Cl. 260-112.50R.

Abel, Martin L., to Permawick Company, Inc. Bearing assembly with improved contactor. 4,174,139, Cl. 308-125.000.

ABIC Ltd.: *See*—
Schonberger, Eva; Sasson, Zabar; and Michael, Uri, 4,174,446, Cl. 544-313.000.

ACE Controls, Inc.: *See*—
Baker, Ralph C.; Ellis, Larry E.; and Simpson, Francis M., Jr., 4,174,098, Cl. 267-8.00R.

Adelmann, Siegfried: *See*—
Pischtschan, Alfred; Adelmann, Siegfried; and Margotte, Dieter, 4,174,325, Cl. 260-32.10N.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Langlais, Frantz; and Postel, Michel, 4,173,797, Cl. 3-1.912.

Ai, Mitsuo: *See*—
Tanabe, Masanori; Shimada, Satoshi; Nishihara, Motohisa; Yamada, Kazuji; Matsuda, Yasumasa; Shimazoe, Michitaka; Matsuoka, Yoshitaka; Takahashi, Yukio; Katohgi, Katsuya; and Ai, Mitsuo, 4,173,900, Cl. 73-727.000.

Aisan Kogyo Kabushiki Kaisha: *See*—
Kato, Yuzo; Ii, Akira; and Oniki, Tetsuya, 4,173,958, Cl. 123-136.000.

Aksamit, Frank J., to Pro Sharp Corporation. Saw chain sharpening fixture. 4,173,908, Cl. 76-25.00A.

Aktiebolaget Electrolux: *See*—
Brenneman, Allen, 4,174,473, Cl. 200-157.000.

Aktiebolaget SKF: *See*—
Hallstedt, Goran, 4,174,136, Cl. 308-5.00R.

Albert, Frank, Jr., to Preformed Line Products Company. Contraction termination device and method. 4,174,463, Cl. 174-79.000.

Albizzati, Enrico: *See*—
Giannini, Umberto; Albizzati, Enrico; Parodi, Sandro; and Pirinoli, Franco, 4,174,299, Cl. 252-429.00B.
Giannini, Umberto; Albizzati, Enrico; Parodi, Sandro; and Pirinoli, Franco, 4,174,429, Cl. 526-114.000.

Albright & Wilson Limited: *See*—
Collins, John D.; and Wood, Donald A., 4,174,346, Cl. 260-429.700.

Alexanderson, Walter H.: *See*—
Fitzpatrick, Thomas H.; Williamson, James E., Jr.; and Alexanderson, Walter H., 4,174,226, Cl. 106-64.000.

Alford, Harvey E.: *See*—
Veatch, Franklin; and Alford, Harvey E., 4,174,263, Cl. 208-11.0LE.

Allen-Stevens Corp.: *See*—
Gaines, Stanley, 4,174,087, Cl. 248-339.000.

Allied Chemical Corporation: *See*—
Evans, Francis E.; Berenbaum, Morris B.; Eibeck, Richard E.; and Robinson, Martin A., 4,174,349, Cl. 260-544.00F.
Nienart, Louis F., 4,174,419, Cl. 428-313.000.

Allis-Chalmers Corporation: *See*—
Slosiarek, Michael L.; and Krieger, Gregory A., 4,174,116, Cl. 280-163.000.
Slosiarek, Michael L., 4,174,117, Cl. 280-163.000.

Alnor Material Handling Limited: *See*—
Barlock, Norman A., 4,174,021, Cl. 182-17.000.

Alpern, Robert: *See*—
Reid, Robert H., 4,174,385, Cl. 424-1.000.

Altenbokum, Karlheinz; Hansgen, Klaus; and Hiersig, Heinz M., to Mannesmann Aktiengesellschaft. Planetary gear. 4,173,906, Cl. 74-410.000.

Amerace Corporation: *See*—
Barnes, Gerald, 4,174,028, Cl. 198-389.000.
Heenan, Sidney A., 4,174,184, Cl. 404-72.000.
Obuch, Edward A.; and Filak, Paul T., 4,174,148, Cl. 339-246.000.
Preziosi, Joseph R.; and Trimmer, Paul A., 4,174,008, Cl. 151-69.000.
Waddington, William T.; and Mazzeo, Charles F., 4,174,147, Cl. 339-176.0MP.

American Can Company: *See*—
Anderson, Thomas L.; Rasmussen, Glenn A.; and Van Handel, Gerald J., 4,173,823, Cl. 29-611.000.

American Components Inc.: *See*—
Wellard, Charles L., 4,174,513, Cl. 338-312.000.

American Cyanamid Company: *See*—
Giglia, Robert D.; Sedlak, John A.; and Lipp, David W., 4,174,152, Cl. 350-357.000.
Hardy, William B.; Min, Tae B.; and Hoffman, Joseph A., 4,174,343, Cl. 260-45.75B.

American Hoist & Derrick Company: *See*—
Crook, Edward J., Jr., 4,174,132, Cl. 294-83.00R.

American Lecithin Company: *See*—
Kass, Gus S., 4,174,296, Cl. 252-312.000.

American Safety Equipment Corporation: *See*—
Martin, Richard L., 4,173,986, Cl. 137-613.000.

Ameron, Inc.: *See*—
Magarian, Gerald M., 4,174,243, Cl. 156-175.000.

AMP Incorporated: *See*—
Le Helloco, Roger, 4,174,144, Cl. 339-59.00R.

Amthor, Franklin R., Jr., to Energy Utilization Systems, Inc. Water heater apparatus. 4,173,872, Cl. 62-238.000.

Anderson, Charles H.: *See*—
Marlowe, Frank J.; and Anderson, Charles H., 4,174,523, Cl. 358-67.000.

Anderson, Donald V., Jr.: *See*—
McFall, William A.; White, Stanley A.; Lane, Howard K.; Butcher, Daryl T.; Anderson, Donald V., Jr.; McCollum, Patrick E.; Kirk, James F.; and Plesset, Richard, 4,174,496, Cl. 323-9.000.

Anderson, Thomas L.; Rasmussen, Glenn A.; and Van Handel, Gerald J., to American Can Company. Resistance heater for a pizza carton. 4,173,823, Cl. 29-611.000.

Ando, Yujiro; Ohara, Katsunobu; and Tanaka, Keiji, to Canon Kabushiki Kaisha. Electrophotographic screen. 4,174,215, Cl. 430-68.000.

Andres, Heinrich A.; Kolbe, Hartmut F.; Schlagdenhaufen, Horst; and Schwarzbach, Frank A., to International Business Machines Corporation. Method of making a negative exposure mask. 4,174,219, Cl. 430-321.000.

Andrews, Harry N.; and Barry, Robert F., to Westinghouse Electric Corp. Modular steam generator. 4,173,997, Cl. 165-158.000.

Andrews, James D., to TRW Inc. Electrode guide. 4,174,268, Cl. 204-129.550.

Anolick, Colin; Robinson, Vivian M.; and Stewart, Charles W., Sr., to Du Pont de Nemours, E. I., and Company. Upholstered furniture having improved flame resistance. 4,174,420, Cl. 428-310.000.

Antenore, Ronald L.: *See*—
Capra, Nicholas G.; and Antenore, Ronald L., 4,174,055, Cl. 222-319.000.

Antos, George J., to UOP Inc. Activated multimetallic catalytic composite. 4,174,298, Cl. 252-441.000.

Antos, Joseph. Compact repeating slide viewer. 4,173,838, Cl. 40-366.000.

Arai, Akira: *See*—
Mori, Hidetomo; Matsubara, Katsumi; Mishina, Haruo; Arai, Akira; Uchida, Riichi; Yokoyama, Eiji; and Arai, Hajime, 4,174,196, Cl. 418-9.000.

Arai, Hajime: *See*—
Mori, Hidetomo; Matsubara, Katsumi; Mishina, Haruo; Arai, Akira; Uchida, Riichi; Yokoyama, Eiji; and Arai, Hajime, 4,174,196, Cl. 418-9.000.

Archbold, Thomas; and Sharp, Michael R. G., to British Gas Corporation. Gas detectors. 4,173,886, Cl. 73-23.000.

Argus Chemical Corporation: *See*—
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,174,297, Cl. 252-399.000.

Arzola, Alberto H. Educational mathematical game apparatus. 4,173,834, Cl. 35-31.00R.

Asahi-Dow Limited: *See*—
Yasuike, Akio; Kataoka, Hiroshi; and Takao, Norito, 4,174,413, Cl. 428-35.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Kawasaki, Harumi, 4,174,154, Cl. 350-299.000.

Asami, Shunichi; Seita, Toru; and Shimizu, Akihiko, to Toyo Soda Manufacturing Co., Ltd. Method of improving characteristic of cation-exchange membrane by swelling in water miscible organic solvent and treating further with hydrochloric acid. 4,174,426, Cl. 521-27.000.

Asano, Masaharu, to Nissan Motor Company, Limited. Closed-loop mixture control system for an internal combustion engine with improved response characteristic to idling condition. 4,173,952, Cl. 123-32.0EE.

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Asaumi, Shingo: *See—*
Komine, Takashi; Yokota, Akira; Nakane, Hisashi; Asaumi, Shingo; and Okazaki, Noboru, 4,174,222, Cl. 430-190.000.

Atkins, George T. N., to Palletower Limited. Pallet frames. 4,174,046, Cl. 220-6.000.

Atsugi Motor Parts Co., Ltd.: *See—*
Kouda, Masanori, 4,173,987, Cl. 137-625.230.

Audi NSU Auto Union Aktiengesellschaft: *See—*
Leitermann, Wulf, 4,174,197, Cl. 418-84.000.

Austermuhle-Bertola, Helena, to Shell Internationale Research Maatschappij B.V. Preparation of esters. 4,174,347, Cl. 260-465.400.

Austermuhle-Bertola, Helena: *See—*
Kramer, Petrus A.; and Austermuhle-Bertola, Helena, 4,174,348, Cl. 260-464.000.

Austin, Charles D. Apparatus for adjustably holding a hog watering device. 4,173,948, Cl. 119-72.000.

Austin, George K., Jr. Control for dental handpieces. 4,173,827, Cl. 433-98.000.

Awazu, Kenzo: *See—*
Murakami, Katsuo; Otani, Mitsuoki; Ito, Hiroshi; Awazu, Kenzo; Ibuki, Sumiaki; and Takeda, Toshiyuki, 4,174,294, Cl. 252-301.40P.

Ayers, Myron T.; and Corsaut, William J., to General Tire & Rubber Company, The. Time delay before post cure inflation. 4,174,242, Cl. 156-110.00R.

B. F. Goodrich Company, The: *See—*
Holp, Dennis, 4,173,912, Cl. 83-433.000.
Patel, Pradeep V.; and Murphy, Donald E., 4,174,355, Cl. 585-843.000.

Babcock & Wilcox Company, The: *See—*
Fitzpatrick, Thomas H.; Williamson, James E., Jr.; and Alexanderson, Walter H., 4,174,226, Cl. 106-64.000.
Lawrie, William E., 4,174,255, Cl. 176-19.0LD.
Schluderberg, Donald C., 4,174,123, Cl. 285-47.000.

Babej, Milos; Bartmann, Wilhelm; Beck, Gerhard; and Lerch, Ulrich, to Hoechst Aktiengesellschaft. Novel analogues of prostanoic acids not occurring in nature. 4,174,458, Cl. 562-463.000.

Bach, Werner; and Kardasen, George, Jr., to General Electric Company. Furnace transformer having a low-voltage internally-connected delta winding. 4,174,509, Cl. 336-12.000.

Back, Gunter; and Euler, Reinhold, to Hoechst Aktiengesellschaft. Magazine for holding a stack of sheet material. 4,174,103, Cl. 271-171.000.

Backof, Charles A., Jr.: *See—*
Wilson, Alan L.; and Backof, Charles A., Jr., 4,174,502, Cl. 329-104.000.

Badura, Wolfgang: *See—*
Schiessl, Alois; Praehauser, Georg; Badura, Wolfgang; and Trede, Wolfgang, 4,173,931, Cl. 102-90.000.

Bahner, Rodney D. Finger puppet. 4,173,842, Cl. 46-154.000.

Baker, Ralph C.; Ellis, Larry E.; and Simpson, Francis M., Jr., to ACE Controls, Inc. Shock absorber and mounting means therefor. 4,174,098, Cl. 267-8.00R.

Baldini, Reginald A.: *See—*
Froehlich, Robert E.; and Baldini, Reginald A., 4,174,379, Cl. 423-396.000.

Baldwin, Bernard A.: *See—*
Borel, Albert W.; and Baldwin, Bernard A., 4,174,284, Cl. 252-48.600.

Bale, Edmund: *See—*
Ramsbottom, Edgar; Whalley, William; and Bale, Edmund, 4,174,004, Cl. 141-32.000.

Balfour Beatty Limited: *See—*
Tyrer, Richard G.; and Milne, James, 4,174,412, Cl. 427-297.000.

Balle, Gerhard: *See—*
Dieterich, Dieter; Balle, Gerhard; and Schmelzer, Hans G., 4,174,434, Cl. 528-69.000.

Balosetti, Claudio. Process for manufacture of porous metal objects and use of the process for manufacture of a porous mold. 4,174,364, Cl. 264-111.000.

Bangor Punta Operations, Inc.: *See—*
Curran, Roger, 4,173,964, Cl. 124-40.000.

Bargigia, Gianangelo; Caporiccio, Gerardo; and Carniselli, Giuliano, to Montedison S.p.A. Aerosol propellant compositions. 4,174,295, Cl. 252-305.000.

Barlock, Norman A., to Alnor Material Handling Limited. Ladder truck. 4,174,021, Cl. 182-17.000.

Barnes, Gerald, to Amerace Corporation. Method and apparatus for orienting and storing similar articles. 4,174,028, Cl. 198-389.000.

Baron, Arthur L.: *See—*
Sivaramakrishnan, Parameswar; and Baron, Arthur L., 4,174,359, Cl. 260-860.000.

Barry, Robert F.: *See—*
Andrews, Harry N.; and Barry, Robert F., 4,173,997, Cl. 165-158.000.

Barthes, Emile; and Richard, Jean-Luc, to Compagnie des Lampes, Societe Anonyme. Waveflux concentration reflector. 4,174,533, Cl. 362-346.000.

Bartmann, Wilhelm: *See—*
Babej, Milos; Bartmann, Wilhelm; Beck, Gerhard; and Lerch, Ulrich, 4,174,458, Cl. 562-463.000.

Barton, Derek H. R.; Sammes, Peter G.; Hewitt, Graham; Looker, Brian E.; and Underwood, William G. E., to Glaxo Laboratories Ltd. Alkylative cleavage of azetidinone disulfides. 4,174,318, Cl. 260-239.00A.

BASF Aktiengesellschaft: *See—*
Fischer, Adolf, deceased, 4,174,208, Cl. 71-92.000.

BASF Wyandotte Corporation: *See—*
Davis, Pauls; Gahmig, Herbert H.; and Schmolka, Irving R., 4,174,427, Cl. 521-56.000.
Sorgenfrei, Malachi E.; and Garvin, Donald F., 4,174,289, Cl. 252-103.000.

Bassignani, Anthony L. Material measuring and dispensing device. 4,174,058, Cl. 222-438.000.

Bassous, Ernest; Ning, Tak H.; and Osburn, Carlton M., to International Business Machines Corporation. Method for fabricating transistor structures having very short effective channels. 4,173,818, Cl. 29-571.000.

Bastian Blessing Company, Inc.: *See—*
Plattner, Robert F., 4,173,942, Cl. 118-25.000.
Verberkmoes, John A., 4,174,086, Cl. 248-242.000.

Bauer, Hannsgeorg G.; Walter, Manfred; and Heimrich, Erick, to A. Finkl & Sons Co. Method for the refining of steel. 4,174,212, Cl. 75-49.000.

Baumann, Marcus; Kvita, Vratislav; Roth, Martin; and Waterhouse, John S., to Ciba-Geigy Corporation. Imidyl compounds. 4,174,326, Cl. 260-326.00E.

Baxter Travenol Laboratories, Inc.: *See—*
Fowles, Thomas A.; and Winchell, David A., 4,174,238, Cl. 156-69.000.

Bayer Aktiengesellschaft: *See—*
Dieterich, Dieter; Balle, Gerhard; and Schmelzer, Hans G., 4,174,434, Cl. 528-69.000.
Goller, Heinz; Schulz, Hans-Hermann; and Leusner, Bernhard, 4,174,338, Cl. 260-37.0SB.
Idel, Karsten; Freitag, Dieter; and Nouvertne, Werner, 4,174,437, Cl. 528-199.000.
Mohring, Edgar; and Roessler, Peter, 4,174,392, Cl. 424-249.000.
Mohring, Edgar; and Roessler, Peter, 4,174,445, Cl. 544-223.000.
Muller, Hanns P.; Oberkirch, Wolfgang; Wagner, Kuno; and Quiring, Bernd, 4,174,240, Cl. 156-99.000.
Pischtschan, Alfred; Adelmann, Siegfried; and Margotte, Dieter, 4,174,325, Cl. 260-32.10N.
Rauenbusch, Erich; and Schmidt, Delf, 4,174,439, Cl. 536-18.000.
Regel, Erik; Frohberger, Paul-Ernst; and Paul, Volker, 4,174,398, Cl. 424-270.000.
Schafer, Walter; Wagner, Kuno; and Findeisen, Kurt, 4,174,433, Cl. 528-49.000.
Schafer, Walter; Wagner, Kuno; and Findeisen, Kurt, 4,174,435, Cl. 528-70.000.
Seifert, Hermann; Waldman, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,174,460, Cl. 568-629.000.

BBC Brown Boveri & Company Limited: *See—*
Gaiffi, Severino; and Kleia, Hans-Peter, 4,174,303, Cl. 252-518.000.
Wunsch, Alfred, 4,173,868, Cl. 60-612.000.

Bechtel International Corporation: *See—*
Grenia, James D., 4,174,135, Cl. 299-11.000.

Beck, Gerhard: *See—*
Babej, Milos; Bartmann, Wilhelm; Beck, Gerhard; and Lerch, Ulrich, 4,174,458, Cl. 562-463.000.

Beck, Harold D., to International Harvester Company. Recirculation barrier for a heat transfer system. 4,173,995, Cl. 165-51.000.

Becker, Frank C.: *See—*
Li, Jorge P.; and Becker, Frank C., 4,174,342, Cl. 260-45.80N.

Becker, Walter W.: *See—*
Colombo, Peter; Neilson, Robert M., Jr.; and Becker, Walter W., 4,174,293, Cl. 252-301.10W.

Beckman, Daniel L.; and Stauffer, Earl D., to General Electric Company. Replacement motor kit and parts thereof. 4,174,036, Cl. 206-223.000.

Beeloo, Leendert A.: *See—*
Swearingen, Judson S.; and Beeloo, Leendert A., 4,173,870, Cl. 60-702.000.

Beguin, Alain, to Societe Civile de Recherches et d'Applications Scientifiques. 4-[4-(2-Methyl-3-hydroxy-4-hydroxymethyl-5-pyridylmethyl)-1-piperazinyl]-6-methylpyrimidines. 4,174,395, Cl. 424-251.000.

Bell, Edward W.; and Gast, Lyle E., to United States of America, Agriculture. Alkyd resins modified with tetrafluoroethylene adduct of conjugated triglycerides. 4,174,329, Cl. 260-22.0XA.

Bell & Howell Company: *See—*
Betlejewski, Frank W.; and Peterson, Donald J., 4,174,158, Cl. 353-113.000.

Bell Telephone Laboratories, Incorporated: *See—*
Seidel, Harold, 4,174,470, Cl. 179-170.0NC.
Trimble, Lee E.; and Voorhoeve, Rudolf J. H., 4,174,377, Cl. 423-365.000.

Bell, William M.; and Del Porto, David A. Integrated solar heated resource transformation system. 4,174,371, Cl. 422-109.000.

Belliveau, Robert J. Restraining means. 4,173,974, Cl. 128-133.000.

Bender, Albert: *See—*
Gehring, Heinz; Bender, Albert; Richter, Gunter; and Froschle, Reinhard, 4,173,847, Cl. 51-34.00J.

Bendix Autolite Corporation: *See—*
Bode, James D., 4,174,258, Cl. 204-195.00S.

Bendix Corporation, The: *See—*
Blatter, Albert, 4,174,512, Cl. 338-25.000.
Johannesen, Donald D., 4,174,026, Cl. 188-361.000.

Bendix Westinghouse Limited: *See—*
Morgan, Peter D.; and Taig, Alistair G., 4,174,017, Cl. 180-132.000.

Benjamin, Lawrence; Saylor, Jay H.; and Uchtman, Vernon A., to Procter & Gamble Company, The. Crystallization seed-containing composition. 4,174,291, Cl. 252-156.000.

Bennett, Foster C.; and Couling, Sidney L., to Rheocast Corporation. Wear resistant magnesium composite. 4,174,214, Cl. 75-168.00R.

Benninghaus, Hermann, to HASCO-Normalien Hasenclever & Co. Injection-molding tool. 4,174,199, Cl. 425-195.000.

Benseler, Hans, to PUMA-Sportschuhfabriken Rudolf Dassler KG. Cross-country boot and ski binding. 4,174,121, Cl. 280-615.000.

Bentley, Brent A.: *See—*
Cleveland, John H.; and Bentley, Brent A., 4,173,909, Cl. 81-3.360.

Beppu, Yositugu: *See—*
Saito, Fumio; Yamai, Fumito; Beppu, Yositugu; and Nakayama, Shinpei, 4,174,425, Cl. 521-56.000.

Berckhan, Delmar D.: *See—*
Fahrendorf, Curtis H.; and Berckhan, Delmar D., 4,173,840, Cl. 46-202.000.

Berenbaum, Morris B.: *See—*
Evans, Francis E.; Berenbaum, Morris B.; Eibeck, Richard E.; and Robinson, Martin A., 4,174,349, Cl. 260-544.00F.

Berger, Joel G., to Endo Laboratories, Inc. Trans-hexahydro-pyridoindoles. 4,174,453, Cl. 546-85.000.

Berges, David A., to SmithKline Corporation. 1-(2-Sulfamidoethyl)-1,4-dihydro-5H-tetrazole-5-thione. 4,174,323, Cl. 548-251.000.

Berges, David A., to Smithkline Corporation. 3-(Carboxymethyl)thio-1H-1,2,4-triazol-5-thione. 4,174,324, Cl. 548-264.000.

Berkeland, James E.: *See—*
Oeschger, Joseph E.; and Berkeland, James E., 4,174,145, Cl. 339-94.00A.

Berry, W. H., Jr.: *See—*
Stockinger, John, 4,173,813, Cl. 29-266.000.

Berry, William R.: *See—*
Martin, James A., Jr.; Martin, Harry F.; and Berry, William R., 4,173,869, Cl. 60-646.000.

Bertenshaw, Barry W.; Combe, Edward C.; Tidy, David C.; and Laycock, John N. C., to Imperial Chemical Industries Limited. Surgical cement compositions containing alumino borate glass and a polymer glass and a polymer containing recurring carboxylic or carboxylate groups. 4,174,334, Cl. 260-29.60M.

Bethe, Eugene J., to Uniroyal, Inc. No-gel latex foam material and its preparation. 4,174,415, Cl. 428-90.000.

Betlejewski, Frank W.; and Peterson, Donald J., to Bell & Howell Company. Bowed slide handling apparatus. 4,174,158, Cl. 353-113.000.

Bianchi Leather Products, Inc.: *See—*
Nichols, Richard D. E., 4,173,794, Cl. 2-322.000.

Biles, James A. Hold-down unit for pick-up truck. 4,174,119, Cl. 280-179.00A.

Binks Manufacturing Company: *See—*
Lau, George W.; and Bujnowski, Edward J., 4,174,070, Cl. 239-340.000.
Lau, George W.; and Bujnowski, Edward J., 4,174,071, Cl. 239-348.000.

Birkmeyer, William J.; Erikson, J. Alden; and Lewarchik, Ronald J., to PPG Industries, Inc. Hydroxy-functional esters of substituted imidazolidinediones and compositions containing same. 4,174,337, Cl. 260-31.40R.

Bjorksten, Johan A. Shock absorbent electric vehicle and batteries. 4,174,014, Cl. 180-68.500.

Blaskowski, Henry J., to Combustion Engineering, Inc. Soot blower for tube bundle in pressurized enclosure. 4,173,808, Cl. 15-316.00R.

Blatter, Albert, to Bendix Corporation, The. Fast response temperature sensor. 4,174,512, Cl. 338-25.000.

Bloomquist, Lynn M. H.; and Brazil, Robert J., to Munsingwear, Inc. Pouch design brief. 4,173,976, Cl. 128-159.000.

Bluy, Orest Z.: *See—*
Merklinger, Harold M.; and Bluy, Orest Z., 4,174,503, Cl. 330-300.000.

Bobard, Emile, to Emile Bobard and Jeune Bobard (S.A.). Self-propelled unit with a high-clearance chassis vehicle. 4,174,012, Cl. 180-313.000.

Boberski, William G.; Chang, Wen-Hsuan; and Seiner, Jerome A., to PPG Industries, Inc. Cementitious magnesia compositions containing salts of organo-silanols. 4,174,228, Cl. 106-107.000.

Boberski, William G.; Chang, Wen-Hsuan; Petracca, Victor G.; and Seiner, Jerome A., to PPG Industries, Inc. Magnesium oxide cementitious compositions containing hydrolyzable organo-silicon compounds. 4,174,229, Cl. 106-107.000.

Bode, James D., to Bendix Autolite Corporation. Solid electrolyte oxygen sensor with zero oxygen reference. 4,174,258, Cl. 204-195.00S.

Bodor, Nicolae S.; and Yuan, Sun-Shine, to INTERx Research Corporation. Intermediates useful in the preparation of optically and therapeutically active-m-acyloxy-(methyl-amino) methyl benzyl alcohols. 4,174,450, Cl. 546-16.000.

Boeing Company, The: *See—*
Mohn, Larry W., 4,174,083, Cl. 244-53.00B.

Boerboom, Anne J. H.: *See—*
Tuithof, Hans H.; and Boerboom, Anne J. H., 4,174,479, Cl. 250-292.000.

Bogar, William H.; and Irwin, Howard D., to Du Pont de Nemours, E. I., and Company. Resilient center plane assembly. 4,174,140, Cl. 308-137.000.

Boik, Arnold R., to Continental Group, Inc., The. Necked-in aerosol containers. 4,173,883, Cl. 72-354.000.

Bolen, Ralph A., to Sawyer, John. Device for purging pitot and static line tubes. 4,174,049, Cl. 222-5.000.

Bolex International SA: *See—*
Laurent, Francois, 4,174,153, Cl. 350-184.000.

Boling, Norman L.; and Fein, Michael E., to Owens-Illinois, Inc. Laser cutting of tubular articles. 4,174,476, Cl. 219-121.00L.

Bollman, Edwin, to Sulzer Brothers Limited. Foundation frame for an internal combustion engine and electrical generator set. 4,174,482, Cl. 290-1.00A.

Bopst, John H., III. System for instantaneous sealing of cracked lines in plaster. 4,174,249, Cl. 156-577.000.

Bordenca, Carl, to SCM Corporation. Terpenylaminoalkanol fish toxicants. 4,174,406, Cl. 424-325.000.

Borel, Albert W.; and Baldwin, Bernard A., to Phillips Petroleum Company. Hydrocarbylpolythiobenzoic acids as anti-oxidation additives. 4,174,284, Cl. 252-48.600.

Borer, Werner J.; and Zuzak, Tomas, to Swiss Aluminium Ltd. Process and device for the production of submicron-sized metallic oxides. 4,174,203, Cl. 23-294.00R.

Borg-Warner Corporation: *See—*
Roberts, Richard W., 4,174,191, Cl. 417-222.000.

Bosch, Franz-Ulrich: *See—*
Knapp, Heinrich; Bosch, Franz-Ulrich; and Schnepf, Gunther, 4,174,511, Cl. 337-107.000.

Bottussi, Elvio: *See—*
Novello, Renzo; and Bottussi, Elvio, 4,174,007, Cl. 144-1.00R.

Bourrelly, Jacques: *See—*
Gignier, Jean P.; and Bourrelly, Jacques, 4,174,449, Cl. 546-134.000.

Bousquet, Andre; and Braye, Emile, to Parcor. Process for the preparation of thienopyridine derivatives. 4,174,448, Cl. 546-114.000.

Boyum, Ronald S.: *See—*
Matsuo, Jon T.; and Boyum, Ronald S., 4,174,084, Cl. 244-149.000.

Bradshaw, Norman F., to Schweitzer Industrial Corporation. Paint spray booth with air supply system. 4,173,924, Cl. 98-115.0SB.

Braid, Milton, to Mobil Oil Corporation. Lubricant compositions and ether or ester of 1-hydroxybenzotriazole as antioxidant in the compositions. 4,174,285, Cl. 252-51.50A.

Brandl, Ronald A.: *See—*
Valdespino, Joseph M.; and Brandl, Ronald A., 4,174,094, Cl. 254-86.00H.

Bravin, Robert V.: *See—*
Lundin, Alyce; and Bravin, Robert V., 4,173,795, Cl. 2-425.000.

Braye, Emile: *See—*
Bousquet, Andre; and Braye, Emile, 4,174,448, Cl. 546-114.000.

Brazil, Robert J.: *See—*
Bloomquist, Lynn M. H.; and Brazil, Robert J., 4,173,976, Cl. 128-159.000.

Breco Kunststoffverarbeitungs-GmbH & Co. KG: *See—*
Breher, Rudolf, 4,174,367, Cl. 264-261.000.

Breher, Rudolf, to Breco Kunststoffverarbeitungs-GmbH & Co. KG. Form tool for production of a reinforced hose piece. 4,174,367, Cl. 264-261.000.

Brenneman, Allen, to Aktiebolaget Electrolux. Safety switch for floor treatment apparatus. 4,174,473, Cl. 200-157.000.

Brenner, Wolfgang: *See—*
Sommer, Werner; Vinnemann, Antonius; Walter, Manfred; Gaiser, Willi; Elsasser, Heinrich; Brenner, Wolfgang; and Kress, Hermann, 4,173,873, Cl. 66-125.00R.

Brenner, Wolfgang A. A.: *See—*
Sommer, Werner; Vinnemann, Antonius; Walter, Manfred E.; Gaiser, Willi G.; Elsasser, Heinrich K.; Brenner, Wolfgang A. A.; and Kress, Hermann, 4,173,874, Cl. 66-125.00R.

Bresnyan, Nicholas P. Apparatus for flushing toilets. 4,173,801, Cl. 4-326.000.

Briem, Karl: *See—*
Kienow, Sigismund; and Briem, Karl, 4,174,089, Cl. 249-80.000.

Brignall, Clifford N. Tortilla pie shell holder. 4,173,926, Cl. 99-349.000.

British Gas Corporation: *See—*
Archbold, Thomas; and Sharp, Michael R. G., 4,173,886, Cl. 73-23.000.

Brockhaus, Anton, to Westfalia-Werke Franz Knobel & Sohne KG. Fastening device for a fixable covering. 4,174,133, Cl. 296-26.000.

Broger, Lars I.; and Magnusson, Sten E., to Telefonaktiebolaget L M Ericsson. Multi-party telephone system allowing speech connection between extensions as between extensions and an outer line. 4,174,466, Cl. 179-18.0AD.

Brois, Stanley J.; and Gutierrez, Antonio, to Exxon Research & Engineering Co. Thiobis(oxazolines). 4,174,322, Cl. 548-237.000.

Brooks, Robert B., to General Electric Company. Refrigeration apparatus demand defrost control system and method. 4,173,871, Cl. 62-80.000.

Brooks, Robert J., to Interface Mechanisms, Inc. Tape tensioning apparatus particularly useful in printing apparatus. 4,174,078, Cl. 242-75.430.

Brown, Boveri & Cie Aktiengesellschaft: *See—*
Depenbrock, Manfred, 4,174,497, Cl. 323-119.000.

Brown, James B. Self contained antiseptic applicator swab. 4,173,978, Cl. 128-269.000.

Brown, Rex M. Draft air control for fireplace grate. 4,173,967, Cl. 126-143.000.

Bruckert, Walter, to Union Carbide Corporation. Vapor-liquid contacting tray with vapor thrust means. 4,174,363, Cl. 261-114.0TC.

Brun, Andre G., to Compagnie Francaise des Petroles. Process and apparatus for transfer of cargo at sea. 4,174,188, Cl. 414-139.000.

Bruzzese, Tiberio, to Holco Investment Inc. Process for the preparation of rifampicin. 4,174,320, Cl. 260-239.30P.
BUCK Chemisch-Technische Werke GmbH. & Co., Firma: *See*—
Schiesal, Alois; Praehauser, Georg; Badura, Wolfgang; and Trede, Wolfgang, 4,173,931, Cl. 102-90.000.
Buck, Kenneth J.: *See*—
Hamaker, Ralph A.; and Buck, Kenneth J., 4,174,171, Cl. 355-3.0BE.
Buckner, John G.: *See*—
Lineberry, Cletus E.; Buckner, John G.; and Harris, Jimmy W., 4,173,910, Cl. 83-29.000.
Lineberry, Cletus E.; Buckner, John G.; and Harris, Jimmy W., 4,173,911, Cl. 83-29.000.
Buczek, Carl J.: *See*—
Chenausky, Peter P.; Buczek, Carl J.; and Wayne, Robert J., 4,174,504, Cl. 331-94.50Q.
Bujnowski, Edward J.: *See*—
Lau, George W.; and Bujnowski, Edward J., 4,174,070, Cl. 239-340.000.
Lau, George W.; and Bujnowski, Edward J., 4,174,071, Cl. 239-348.000.
Bullen Chemical Company Midwest, Inc.: *See*—
Flanagan, John J., 4,174,304, Cl. 252-524.000.
Bundy, Gordon L., to Upjohn Company, The. 9-Deoxy-9-methylene-inter-oxa-13,14-didehydro-16-phenyl-17,18,19,20-tetranor-PGF_1 compounds. 4,174,456, Cl. 560-60.000.
Burg, Karlheinz: *See*—
Luders, Walter; Herwig, Walter; van Spankeren, Ulrich; and Burg, Karlheinz, 4,174,340, Cl. 260-42.140.
Burns, Henry L., to Cavitron Corporation. Aerosol interface. 4,173,977, Cl. 128-201.000.
Burns, Michael E.; and Nicol, Charles H., to Procter & Gamble Company, The. Alkyl benzene sulfonate detergent compositions containing cellulose ether soil release agents. 4,174,305, Cl. 252-545.000.
Burrell, Dean W. Snow removal tool. 4,173,835, Cl. 37-53.000.
Burroughs Corporation: *See*—
Chu, Ke-Chiang; and Sharp, Richard S., 4,174,537, Cl. 364-200.000.
Burzio, Fulvio: *See*—
Gafa, Salvatore; and Burzio, Fulvio, 4,174,306, Cl. 252-546.000.
Butcher, Daryl T.: *See*—
McFall, William A.; White, Stanley A.; Lane, Howard K.; Butcher, Daryl T.; Anderson, Donald V., Jr.; McCollum, Patrick E.; Kirk, James F.; and Plesset, Richard, 4,174,496, Cl. 323-9.000.
Butterworth, Donald J., to Ecodyne Corporation. Liquid treatment apparatus. 4,174,282, Cl. 210-/232.000.
Byrt, Graham A. B.; and Riddler, Douglas E., to Masson Scott Thrissell Engineering, Ltd. Change-speed gearboxes. 4,173,905, Cl. 74-356.000.
C. Itoh & Co. Ltd.: *See*—
Takama, Teruhiro, 4,173,896, Cl. 73-518.000.
Calvin, John N., to Combustion Engineering, Inc. Hydraulic hold-down for nuclear reactor fuel. 4,174,257, Cl. 176-50.000.
Campbell, David L., to Miller, Richard G.; Little, Clifton W.; Yovan, Alex; Gause, Charles M.; Campbell, Don Harvey; McManus, Sam P.; Weiler, David L.; Cox, Clodis H.; Weiler, Mable E.; and Weiler, Richard T. Fence. 4,174,096, Cl. 256-24.000.
Campbell, Don Harvey: *See*—
Campbell, David L., 4,174,096, Cl. 256-24.000.
Campbell, James F.: *See*—
Steiner, Gary F.; and Campbell, James F., 4,173,846, Cl. 51-248.000.
Canada, Her Majesty the Queen in right of: *See*—
Merklinger, Harold M.; and Bluy, Orest Z., 4,174,503, Cl. 330-300.000.
Canadian Patents & Development Limited: *See*—
Westby, Ray L., 4,174,520, Cl. 343-13.00R.
Canon Kabushiki Kaisha: *See*—
Ando, Yujiro; Ohara, Katsunobu; and Tanaka, Keiji, 4,174,215, Cl. 430-68.000.
Mashimo, Yukio; Uchiyama, Takashi; and Sorimachi, Kanehiro, 4,174,161, Cl. 354-33.000.
Capdevielle, Martin J.: *See*—
Kulischenko, Walter; and Capdevielle, Martin J., 4,173,937, Cl. 114-144.00R.
Caporiccio, Gerardo: *See*—
Bargigia, Gianangelo; Caporiccio, Gerardo; and Carniselli, Giuliano, 4,174,295, Cl. 252-305.000.
Capra, Nicholas G.; and Hammett, Roy, to James D. Pauls, Ltd. Mechanically operated dispensing device with expansible bulb. 4,174,052, Cl. 222-207.000.
Capra, Nicholas G.; and Antenore, Ronald L., to James D. Pauls & J. Claybrook Lewis & Associates, Ltd. Non-aerosol pressure dispenser. 4,174,055, Cl. 222-319.000.
Carborundum Company, The: *See*—
Myles, Thomas A., 4,174,331, Cl. 260-29.10R.
Carlin, William W.; and Dahlberg, Lois A., to PPG Industries, Inc. Method of treating electrodes. 4,174,269, Cl. 204-129.950.
Carn, William R.; and Carothers, James L., to Chicago Bridge & Iron Company. Multiport piggable fluid swivel. 4,174,127, Cl. 285-190.000.
Carniselli, Giuliano: *See*—
Bargigia, Gianangelo; Caporiccio, Gerardo; and Carniselli, Giuliano, 4,174,295, Cl. 252-305.000.
Carothers, James L.: *See*—
Carn, William R.; and Carothers, James L., 4,174,127, Cl. 285-190.000.
Carrens, Donald E., to Dresser Industries, Inc. Seal assembly. 4,174,112, Cl. 277-171.000.
Carrier Corporation: *See*—
Jahoda, John, 4,173,998, Cl. 165-182.000.
Carroll, James C.; and Shafer, Ciel H., to Phillips Petroleum Company. Process and apparatus for connecting plastic pipes. 4,174,248, Cl. 156-538.000.
Cartes, Juan Bosch: *See*—
Jargue, Ricardo Granados; Domingo, Mercedes Alvarez; Cartes, Juan Bosch; Roldan, Cristobal Martinez; and Peinado, Fernando Rabadan, 4,174,396, Cl. 424-256.000.
Jarque, Ricardo Granados; Cartes, Juan Bosch; Jimenez, Rosa Llobera; Roldan, Cristobal Martinez; and Peinado, Fernando Rabadan, 4,174,451, Cl. 546-283.000.
Cassia, Antonio M., to Steiner Corporation. Soap dispensing system. 4,173,858, Cl. 53-471.000.
Castagna, John F., to Sparkomatic Corporation. Response tracer audio equalizer amplifier unit having graphic response display. 4,173,941, Cl. 116-307.000.
Caterpillar Tractor Co.: *See*—
Styck, Wayne G., 4,174,128, Cl. 292-127.000.
Cavitron Corporation: *See*—
Burns, Henry L., 4,173,977, Cl. 128-201.000.
Cecere, Andrew P., to Samooe Holding Corporation. Apparatus for calendering tubular knitted fabrics. 4,173,812, Cl. 26-84.000.
Cerroni, Manlio. Apparatus for processing waste material chiefly composed of paper and plastic film. 4,174,075, Cl. 241-189.00R.
Challis, Louis A. Acoustic treatment for fans. 4,174,020, Cl. 181-211.000.
Chamberlin, James W.: *See*—
Paget, Charles J.; Chamberlin, James W.; and Wikel, James H., 4,174,454, Cl. 548-306.000.
Chambley, Phillip W.: *See*—
Norris, Alan H.; and Chambley, Phillip W., 4,173,861, Cl. 57-293.000.
Chan, David C. K.: *See*—
Schinski, William L.; Huang, Irene C.; and Chan, David C. K., 4,174,210, Cl. 71-118.000.
Chandra, Ashok K.; Chang, Hsu; and Wong, Chak-Kuen, to International Business Machines Corporation. Two-dimensional bubble domain memory. 4,174,538, Cl. 365-2.000.
Chang, Hsu: *See*—
Chandra, Ashok K.; Chang, Hsu; and Wong, Chak-Kuen, 4,174,538, Cl. 365-2.000.
Chang, Wen-Hsuan: *See*—
Boberski, William G.; Chang, Wen-Hsuan; and Seiner, Jerome A., 4,174,228, Cl. 106-107.000.
Boberski, William G.; Chang, Wen-Hsuan; Petracca, Victor G.; and Seiner, Jerome A., 4,174,229, Cl. 106-107.000.
Chapman, Charles C., to Phillips Petroleum Company. Alkylation process. 4,174,357, Cl. 585-701.000.
Chapman, Robert F.; Jackson, David D.; and Lee, Glyn E., to May & Baker Limited. Spiramycin esters. 4,174,391, Cl. 424-180.000.
Charles, Richard J., to Paper Converting Machine Company. Core holder for reeling. 4,174,077, Cl. 242-68.600.
Charnley, Ralph L.: *See*—
Melander, Theodore A.; and Charnley, Ralph L., 4,174,169, Cl. 354-324.000.
Chase, Frank R., to Donaldson Company, Inc. Pulse jet cleaned air filter assembly with integral air compressor. 4,174,204, Cl. 55-283.000.
Chastagnier, Jean; and Massip, Jean C., to U.S. Philips Corporation. Command signal generator for an automatic channel selection device in a radio which is mobile relative to transmitter stations. 4,174,501, Cl. 325-56.000.
Chen, Lim B.; and Cher, Lim L. Educational toy. 4,173,832, Cl. 35-9.00B.
Chenausky, Peter P.; Buczek, Carl J.; and Wayne, Robert J., to United Technologies Corporation. Apparatus and method for cavity dumping a Q-switched laser. 4,174,504, Cl. 331-94.50Q.
Cher, Lim L.: *See*—
Chen, Lim B.; and Cher, Lim L., 4,173,832, Cl. 35-9.00B.
Chevron Research Company: *See*—
Schinski, William L.; Huang, Irene C.; and Chan, David C. K., 4,174,210, Cl. 71-118.000.
Schneider, Ronald A., 4,174,366, Cl. 264-228.000.
Chiba, Katuaki: *See*—
Nakamura, Satoshi; Ikushima, Ichiro; Sasaki, Yoshimitsu; Chiba, Katuaki; and Ito, Ryoichi, 4,174,491, Cl. 313-499.000.
Chicago Bridge & Iron Company: *See*—
Carn, William R.; and Carothers, James L., 4,174,127, Cl. 285-190.000.
Chipman, Donald I., to General Electric Company. Hydraulic jack. 4,174,095, Cl. 254-93.00H.
Chiu, Herman S., to Union Carbide Corporation. Curved sausage casings. 4,174,368, Cl. 264-561.000.
Chloride Group Limited: *See*—
Ramsbottom, Edgar; Whalley, William; and Bale, Edmund, 4,174,004, Cl. 141-32.000.
Choca, Monica E.; and Feistel, Gerald R., to Nalco Chemical Company. Polycarboxylic acids as extrusion aids for silica-aluminas. 4,174,301, Cl. 252-455.00R.
Chow, Kirk K., to National Hand Tool Corporation. Space-conserving skin-packed assembly. 4,174,037, Cl. 206-378.000.
Chrenko, Richard M.: *See*—
Strong, Herbert M.; Chrenko, Richard M.; and Tuft, Roy E., 4,174,380, Cl. 423-446.000.

Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzmann, Thomas N., to Merck & Co., Inc. 4-Iodomethylazetidin-2-one. 4,174,316, Cl. 260-239.00A.
Chu, Ke-Chiang; and Sharp, Richard S., to Burroughs Corporation. Time-shared, multi-phase memory accessing system having automatically updatable error logging means. 4,174,537, Cl. 364-200.000.
Chugoku Marine Paints Ltd.: *See*—
Matsuda, Sumio; and Kudara, Hajime, 4,174,339, Cl. 260-40.00R.
Ciba-Geigy Corporation: *See*—
Baumann, Marcus; Kvita, Vratislav; Roth, Martin; and Waterhouse, John S., 4,174,326, Cl. 260-326.00E.
Habermeier, Jurgen; Moser, Roland; and Seiz, Wolfgang, 4,174,455, Cl. 560-49.000.
Loeffler, Herbert H., 4,174,056, Cl. 222-321.000.
Cima Kogaku Company Limited: *See*—
Nagashima, Motoi, 4,174,167, Cl. 354-196.000.
Citizen Watch Company Limited: *See*—
Motoki, Jinro; Ichikawa, Singo; Miyasaka, Kenzi; Uematsu, Hiroyuki; Murata, Mitsuhiro; Kawashima, Hideyuki; Inoue, Yuri; Ohkubo, Masae; and Ooka, Mituo, 4,173,863, Cl. 58-85.500.
Clark, Norman O.; and Jones, Thomas R., to English Clays Lovering Pochin & Co. Ltd. Mineral fillers. 4,174,279, Cl. 210-54.000.
Clausing, Don P., to Xerox Corporation. Sheet separating and feeding apparatus. 4,174,102, Cl. 271-35.000.
Clayton Dewandre Company Limited: *See*—
Levington, Henry J.; and Knowles, James G., 4,174,016, Cl. 180-89.150.
Clayton, John M., Jr.: *See*—
Stockinger, John, 4,173,813, Cl. 29-266.000.
Clayton, John M., III: *See*—
Stockinger, John, 4,173,813, Cl. 29-266.000.
Cleary, Mark R., to Jubilee Manufacturing Co. Alarm device. 4,174,516, Cl. 340-63.000.
Cleveland, John H.; and Bentley, Brent A. Lid lifter for reclosable self-sealing buckets. 4,173,909, Cl. 81-3.360.
CMI Corporation: *See*—
Garbelman, David L.; Minor, William H.; and Shaw, Arthur G., 4,174,181, Cl. 366-2.000.
Coe, Noel N.: *See*—
Saeman, Walter C.; Coe, Noel N.; and Faust, John P., 4,174,411, Cl. 427-214.000.
Cohen, Abraham B.; and Fan, Roxy N., to Du Pont de Nemours, E. I., and Company. Process for image reproduction using multilayer photosensitive tonable element. 4,174,216, Cl. 430-257.000.
Cohen, Mitchell S.; and Pugh, Emerson W., to International Business Machines Corporation. Bubble domain transfer switches. 4,174,540, Cl. 365-15.000.
Colgate-Palmolive Company: *See*—
Cordon, Martin; and Dickson, Robert E., 4,174,387, Cl. 424-52.000.
Colin, Armand T., to Constructions Metalliques de Provence. Anchors and anchoring system. 4,173,938, Cl. 114-301.000.
Collins, John D.; and Wood, Donald A., to Albright & Wilson Limited. Process for preparing organotin compounds. 4,174,346, Cl. 260-429.700.
Colombo, Peter; Neilson, Robert M., Jr.; and Becker, Walter W., to United States of America, Energy. Process for disposal of aqueous solutions containing radioactive isotopes. 4,174,293, Cl. 252-301.10W.
Combe, Edward C.: *See*—
Bertenshaw, Barry W.; Combe, Edward C.; Tidy, David C.; and Laycock, John N. C., 4,174,334, Cl. 260-29.60M.
Combustion Engineering, Inc.: *See*—
Blaskowski, Henry J., 4,173,808, Cl. 15-316.00R.
Calvin, John N., 4,174,257, Cl. 176-50.000.
Gaines, Albert L., 4,174,254, Cl. 176-2.000.
Waryasz, Richard E., 4,173,950, Cl. 122-4.00D.
Commissariat a l'Energie Atomique: *See*—
Perdijon, Jean, 4,173,899, Cl. 73-620.000.
Compagnie des Lampes, Societe Anonyme: *See*—
Barthes, Emile; and Richard, Jean-Luc, 4,174,533, Cl. 362-346.000.
Compagnie Francaise des Petroles: *See*—
Brun, Andre G., 4,174,188, Cl. 414-139.000.
Compagnie Generale des Etablissements Michelin: *See*—
Lejeune, Daniel, 4,173,992, Cl. 152-381.100.
Congleton, Robert S., to Jersey Nuclear-Avco Isotopes, Inc. System for combining laser beams of diverse frequencies. 4,174,150, Cl. 350-174.000.
Constructions Metalliques de Provence: *See*—
Colin, Armand T., 4,173,938, Cl. 114-301.000.
Container Corporation of America: *See*—
Turner, Gerald W., 4,174,041, Cl. 206-611.000.
Continental Group, Inc., The: *See*—
Boik, Arnold R., 4,173,883, Cl. 72-354.000.
Edwards, Edgar B.; and Wachter, Richard G., 4,174,051, Cl. 222-105.000.
Pesce, Carl A.; Trnka, Ralph J.; and Winkless, Robert A., 4,174,142, Cl. 339-5.00R.
Control Data Corporation: *See*—
Timm, Walter C., 4,174,539, Cl. 365-8.000.
Cope, Louise A. Ophthalmic use of collagenase. 4,174,389, Cl. 424-94.000.
Copeland Corporation: *See*—
Elson, John P., 4,174,189, Cl. 417-363.000.
Cordon, Martin; and Dickson, Robert E., to Colgate-Palmolive Company. Reduction of abrasiveness in dentifrices. 4,174,387, Cl. 424-52.000.
Corsaut, William J.: *See*—
Ayers, Myron T.; and Corsaut, William J., 4,174,242, Cl. 156-110.00R.
Cosden Technology, Inc.: *See*—
Mayes, Warden W., 4,174,270, Cl. 208-64.000.
Mayes, Warden W., 4,174,271, Cl. 208-64.000.
Couling, Sidney L.: *See*—
Bennett, Foster C.; and Couling, Sidney L., 4,174,214, Cl. 75-168.00R.
Cox, Clodis H.: *See*—
Campbell, David L., 4,174,096, Cl. 256-24.000.
Craig, Edwin R.; and Semken, Robert S., to United States of America, Energy. Annular linear induction pump with an externally supported duct. 4,174,190, Cl. 417-50.000.
Crook, Edward J., Jr., to American Hoist & Derrick Company. Multiple position hook assembly. 4,174,132, Cl. 294-83.00R.
Cros, Pierre; Desorbay, Jean-Pierre; and Refoubelet, Jean-Jacques, to Spie-Batignolles; and Societe Generale de Techniques et d'Etudes. Separating exchangers. 4,174,273, Cl. 208-364.000.
Crouzet: *See*—
Forster, Michel; and Rampin, Pierre, 4,173,889, Cl. 73-194.00A.
Curran, Roger, to Bangor Punta Operations, Inc. Safety for the trigger mechanism of a gun. 4,173,964, Cl. 124-40.000.
Curtin, Brian J. Corneal resurfacing apparatus and method. 4,173,980, Cl. 128-303.00R.
Custom Research and Development: *See*—
Leveskis, Newton G., 4,174,290, Cl. 252-142.000.
Cutler-Hammer, Inc.: *See*—
Hicks, Loy A., Jr.; and Rusenko, James J., 4,174,143, Cl. 339-22.00B.
Josemans, Leonardus J., 4,174,472, Cl. 200-68.000.
Daddario, Francis E. Tide operated pumps. 4,174,192, Cl. 417-333.000.
Dahlberg, Lois A.: *See*—
Carlin, William W.; and Dahlberg, Lois A., 4,174,269, Cl. 204-129.950.
Daigo, Kunihiro: *See*—
Nakagiri, Tadahiko; Daigo, Kunihiro; Oguchi, Toshiaki; Hatuse, Toshikazu; Shimazaki, Toshikazu; Morokawa, Shigeru; Natori, Minoru; and Ogawa, Hiroshi, 4,173,862, Cl. 58-23.0BA.
Daitoku, Kouichi; and Takahata, Kouichi, deceased (by Takahata, Kosaku, legal successor), to Nippon Kogaku K.K. Motor drive device for long-footage film. 4,174,166, Cl. 354-173.000.
Dalton, Philip B., to GAF Corporation. Aza-bis-lactams. 4,174,443, Cl. 544-86.000.
Danna, Gary F.: *See*—
Welch, Clark M.; Danna, Gary F.; and Vigo, Tyrone L., 4,174,418, Cl. 428-264.000.
Dart Industries Inc.: *See*—
Elias, Moenes L.; and Readio, Philip D., 4,174,253, Cl. 156-666.000.
Davin, Andre: *See*—
Petit, Leon; Davin, Andre; and Gueguen, Jacques, 4,174,313, Cl. 260-123.500.
Davis, Pauls; Gahmig, Herbert H.; and Schmolka, Irving R., to BASF Wyandotte Corporation. Method of making expandable polystyrene beads. 4,174,427, Cl. 521-56.000.
Dechering, Johannes A. B.; and Geurts, Martinus F. A. M., to U.S. Philips Corporation. Television camera having low-frequency noise correction. 4,174,525, Cl. 358-217.000.
Dell, Christopher C., to National Research Development Corporation. Countercurrent decantation. 4,174,281, Cl. 210-83.000.
Della-Porta, Clifford A., to Premier Drum Company Limited, The. Musical drums. 4,173,917, Cl. 84-419.000.
DeLong, Daniel L.; and Rich, Edward L., III, to Westinghouse Electric Corp. Magnetic means for determining partial pressure of oxygen particularly in underwater breathing apparatus. 4,173,975, Cl. 128-142.00R.
Del Porto, David A.: *See*—
Bell, William M.; and Del Porto, David A., 4,174,371, Cl. 422-109.000.
Delta Systems, Inc.: *See*—
Howard, William A., 4,173,961, Cl. 123-148.00E.
DeMarco, Thomas M.: *See*—
Dupre, George T.; and DeMarco, Thomas M., 4,174,206, Cl. 55-434.000.
Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Nakano, Tatsuo; Hori, Shozo; and Kishi, Ikuji, 4,174,311, Cl. 260-28.50R.
den Otter, Marinus J. A. M.; Hawinkels, Lambertus P. G.; and Schouteten, Augustinus P. H., to Stamicarbon, B.V. Process for preparing cyanuric acid. 4,174,444, Cl. 544-192.000.
Depenbrock, Manfred, to Brown, Boveri & Cie Aktiengesellschaft. Circuit and method for controlling reactive load currents of a three-phase system. 4,174,497, Cl. 323-119.000.
Deresh, Mikhail D.: *See*—
Myzenkov, Felix A.; Klushin, Dmitry N.; Shupikov, Viktor A.; Kaizer, Alexandr A.; Shuklin, Anatoly M.; Deresh, Mikhail D.; Kolbin, Nikolai A.; Tolmacheva, Alla P.; Zyryanova, Galina V.; Uzlov, Vitaly M.; and Shmuelzon, Elka I., 4,174,372, Cl. 423-88.000.
Deschamps, Andre; Dezael, Claude; Gruhier, Henri; and Renault, Philippe, to Institut Francais du Petrole. Process for purifying a sulfur dioxide containing gas with production of elemental sulfur. 4,174,383, Cl. 423-573.00R.
Desorbay, Jean-Pierre: *See*—
Cros, Pierre; Desorbay, Jean-Pierre; and Refoubelet, Jean-Jacques, 4,174,273, Cl. 208-364.000.

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Diamond International Corporation: *See—*
Grogan, Richard P., 4,174,069, Cl. 239-333.000.
McCord, Robert C., 4,173,831, Cl. 34-236.000.
Dickson, Robert E.: *See—*
Cordon, Martin; and Dickson, Robert E., 4,174,387, Cl. 424-52.000.
Dieterich, Dieter; Balle, Gerhard; and Schmelzer, Hans G., to Bayer Aktiengesellschaft. Compounds containing hydroxyl groups and urethano-aryl-sulfonic acid groups. 4,174,434, Cl. 528-69.000.
Digital Communications Corporation: *See—*
Querry, Lester R., 4,174,505, Cl. 332-9.00R.
DiMaria, James D. Copy preview apparatus. 4,174,175, Cl. 355-44.000.
DiSanto, Rocco J. Forming insulation from scrap rubber. 4,174,308, Cl. 260-2.300.
Dobbert, Gerd; and Reh, Klaus, to International Standard Electric Corporation. Vertical deflection circuit. 4,174,493, Cl. 315-408.000.
Dobinson, Reginald P. Forming machine for bending metal bars. 4,173,884, Cl. 72-387.000.
Dockree, Basil F., to Pipeline Seal and Insulation Co. Ltd. Pipe joints and connectors therefor. 4,174,124, Cl. 285-54.000.
Dr. Boy K.G.: *See—*
Spanier, Hermann, 4,174,474, Cl. 200-331.000.
Dr. Ing. Rudolf Hell GmbH: *See—*
Schaefer, Klaus, 4,174,527, Cl. 358-267.000.
Documation Incorporated: *See—*
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Schaefer, Peter; and Doerre, Wolfgang, 4,174,088, Cl. 248-395.000.
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Donahue, William R., Jr.; and Swanson, Wesley S., to Eaton Corporation. Drain valve. 4,174,091, Cl. 251-138.000.
Donaldson Company, Inc.: *See—*
Chase, Frank R., 4,174,204, Cl. 55-283.000.
Dooley, Stephen J. Stairlift. 4,174,023, Cl. 187-12.000.
Dornier Systems GmbH: *See—*
Schmidberger, Rainer, 4,174,260, Cl. 204-260.000.
Dougherty, Timothy S.; and Flegal, William M., to Western Electric Company, Inc. Methods of and apparatus for controlling capacitance unbalance-to-ground in cables. 4,174,236, Cl. 156-51.000.
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Griffin, Thomas J., Jr., 4,174,283, Cl. 252-8.55R.
Mixan, Craig E., 4,174,394, Cl. 424-250.000.
Simpson, Benny E., 4,174,202, Cl. 23-230.00R.
Dowd, William: *See—*
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Drillick, Jacob H., to Drillick-LaManna Corporation. Paper tape punch and reader. 4,174,063, Cl. 234-130.000.
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Duc, Xuong N., to Institut Francais du Petrole. Floating installation connected to a stationary underwater installation through at least one flexible pipe. 4,173,804, Cl. 9-8.00P.
Dugasz, William L. Corrosion resistant self-aligning track configurations particularly adapted for railroad cars. 4,174,066, Cl. 238-7.000.
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Van Daalen, Jan J.; and Mulder, Rudolf, 4,174,393, Cl. 424-250.000.
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Anolick, Colin; Robinson, Vivian M.; and Stewart, Charles W., Sr., 4,174,420, Cl. 428-310.000.
Bogar, William H.; and Irwin, Howard D., 4,174,140, Cl. 308-137.000.
Cohen, Abraham B.; and Fan, Roxy N., 4,174,216, Cl. 430-257.000.
Epstein, Bennett N., 4,174,358, Cl. 525-183.000.
Reeves, James W.; Sylvester, Robert W.; and Wells, David F., 4,174,381, Cl. 423-502.000.
Tomic, Ernst A., 4,174,227, Cl. 106-85.000.
Dupre, George T.; and DeMarco, Thomas M., to NFE International Ltd. Apparatus for separating particulate material from an airstream. 4,174,206, Cl. 55-434.000.
Dupro AG: *See—*
Maier, Siegfried, 4,173,807, Cl. 15-179.000.
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Dyck, Arthur, to International Audio Visual, Inc. Apparatus for splicing the ends of magnetic tape wound on spools of the type used in endless tape cartridges. 4,174,247, Cl. 156-506.000.
E. R. Squibb & Sons, Inc.: *See—*
Krapcho, John; and Turk, Chester F., 4,174,317, Cl. 260-239.00A.
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Eckman, Richard E., to Dresser Industries, Inc. Bit retainer for pneumatic tools. 4,174,113, Cl. 279-19.400.
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Butterworth, Donald J., 4,174,282, Cl. 210-/232.000.
Edwards, Edgar B.; and Wachter, Richard G., to Continental Group, Inc., The. Protective locking flaps for opening in sealed corrugated containers. 4,174,051, Cl. 222-105.000.
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Eli Lilly and Company: *See—*
Hamill, Robert L.; and Stark, W. Max, 4,174,390, Cl. 424-117.000.
Nakatsukasa, Walter M.; Marconi, Gary G.; Neuss, Norbert; and Hamill, Robert L., 4,174,404, Cl. 424-283.000.
Paget, Charles J.; Chamberlin, James W.; and Wikel, James H., 4,174,454, Cl. 548-306.000.
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Elias, Moenes L.; and Readio, Philip D., to Dart Industries Inc. Dissolution of metals utilizing a H_2O_2-H_2SO_4 solution catalyzed with hydroxy substituted cyclopentenes. 4,174,253, Cl. 156-666.000.
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Ellis, Malcolm P., to Lockwood Corporation. Fan housing clean out apparatus. 4,174,001, Cl. 171-17.000.
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Sommer, Werner; Vinnemann, Antonius; Walter, Manfred; Gaiser, Willi; Elsasser, Heinrich; Brenner, Wolfgang; and Kress, Hermann, 4,173,873, Cl. 66-125.00R.
Elsasser, Heinrich K.: *See—*
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Elson, John P., to Copeland Corporation. Refrigeration compressor suspension system. 4,174,189, Cl. 417-363.000.
Emery, John A., to Sinclair International Bar Services Limited. Liquid measuring and dispensing devices. 4,174,057, Cl. 222-332.000.
Emile Bobard and Jeune Bobard (S.A.): *See—*
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Endo Laboratories, Inc.: *See—*
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Enicks, James H. Pad member method of manufacture. 4,173,814, Cl. 29-417.000.
Environmental Research Institute of Michigan: *See—*
Sternberg, Stanley R., 4,174,514, Cl. 340-146.3MA.
Envirotech Corporation: *See—*
Rahman, Michael, 4,174,362, Cl. 261-90.000.
Epstein, Bennett N., to Du Pont de Nemours, E. I., and Company. Tough thermoplastic nylon compositions. 4,174,358, Cl. 525-183.000.
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Eshoo, Frederick. Solar powered hot air balloon. 4,174,082, Cl. 244-31.000.
Essers, Wilhelmus G.; Jelmorini, Gerardus; and Tichelaar, Gerrit W., to U.S. Philips Corporation. Method of and device for arc welding. 4,174,477, Cl. 219-121.00P.
Estess, John H., to Rockwell International Corporation. Adjustable fence. 4,174,100, Cl. 269-306.000.
Etablissements Carpano & Pons: *See—*
Pfeffer, Paul, 4,174,494, Cl. 318-54.000.
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Evans, Francis E.; Berenbaum, Morris B.; Eibeck, Richard E.; and Robinson, Martin A., to Allied Chemical Corporation. Preparation of fluoroorganic compounds with calcium fluoride. 4,174,349, Cl. 260-544.00F.
Ex-Cell-O Corporation: *See—*
Fitzpatrick, Paul, 4,173,852, Cl. 51-355.000.
Voglrieder, Leonhard; and Hempel, Raymond O., Jr., 4,173,817, Cl. 29-568.000.
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F. L. Smithe Machine Company, Inc.: *See—*
Helm, Herbert W., 4,173,922, Cl. 93-63.00M.
Fahrendorf, Curtis H.; and Berckhan, Delmar D., to Tonka Corporation. Turret toy vehicle. 4,173,840, Cl. 46-202.000.
Fair, Rickey F. Gun locking device. 4,174,042, Cl. 211-8.000.
Faires, C. Dickson, Jr. Dimpled shotgun pellets. 4,173,930, Cl. 102-42.00R.
Fan, Roxy N.: *See—*
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Fanelli, Anthony J.: *See—*
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Farcinade, Michel. Restraint severing device. 4,174,015, Cl. 180-268.000.
Farr, Glyn P. R., to Girling Limited. Hydraulic systems. 4,173,866, Cl. 60-413.000.
Faust, John P.: *See—*
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Feistel, Gerald R.: *See—*
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Ferns, Derek, to Self-Level Covers Aktiengesellschaft. Support frame. 4,174,183, Cl. 404-26.000.
Ferreira, Richard A.; and Vincent, Albert. Collapsible trash bag holder. 4,174,085, Cl. 248-97.000.
Ferrieu, Gilbert M. M., to U.S. Philips Corporation. Ringing signal generator for use in a subscriber's line circuit. 4,174,467, Cl. 179-18.0HB.
Ferris, Donald L., to United States of America, Army. Control rod roll-over limiter. 4,174,137, Cl. 308-72.000.
Fiala, Ernst, to Volkswagenwerk Aktiengesellschaft. Apparatus including a meter for indicating the fuel consumption rate of an internal combustion engine. 4,173,887, Cl. 73-114.000.
Fiedler, Howard C., to General Electric Company. Product and method of producing silicon-iron sheet material employing antimony. 4,174,235, Cl. 148-111.000.
Fields, Ellis K., to Standard Oil Company (Indiana). Process for dimerization, arylation and trifluoromethylation of aromatic and heterocyclic compounds. 4,174,447, Cl. 546-109.000.
Filak, Paul T.: *See—*
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Renold, Walter; Skorianetz, Werner; Schulte-Elte, Karl-Heinrich; and Ohloff, Gunther, 4,174,327, Cl. 260-346.110.
Fischer, Adolf, deceased (by Fischer, Caecilia E., heiress), to BASF Aktiengesellschaft. Herbicidal compositions. 4,174,208, Cl. 71-92.000.
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Fischer, Adolf, deceased, 4,174,208, Cl. 71-92.000.
Fisher, Gary P., to Documation Incorporated. Printer ribbon anti-fold mechanism. 4,173,929, Cl. 101-336.000.
Fisher, Thomas H.; and Dowd, William, to Dow Chemical Company, The. Process for aqueous chromate ion oxidation of allylic halides and halomethylated aromatics to allylic and aromatic aldehydes. 4,174,352, Cl. 260-599.000.
Fishgal, Semyon I., to International Design and Development Corporation. Method of improving the working properties of liquid systems. 4,173,983, Cl. 137-13.000.
Fitzpatrick, Paul, to Ex-Cell-O Corporation. Expandable tool including cutting section and pilot. 4,173,852, Cl. 51-355.000.
Fitzpatrick, Thomas H.; Williamson, James E., Jr.; and Alexanderson, Walter H., to Babcock & Wilcox Company, The. Refractory mix composition and method of preparation. 4,174,226, Cl. 106-64.000.
Flanagan, John J., to Bullen Chemical Company Midwest, inc. Surfactant system. 4,174,304, Cl. 252-524.000.
Flatley, Doris W., to RCA Corporation. Method for making semiconductor structure. 4,174,217, Cl. 96-36.200.
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FMC Corporation: *See—*
Milberger, Lionel J., 4,174,000, Cl. 166-362.000.
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Ford, Richard D.; and Vitkovitsky, Ihor M., to United States of America, Navy. Explosively actuated opening switch. 4,174,471, Cl. 200-61.080.
Forster, Michel; and Rampin, Pierre, to Crouzet. Ultrasonic flowmeter. 4,173,889, Cl. 73-194.00A.
Forstermann, Ulrich; Schafer, Hans-Peter; Moller, Peter; Ries, Karl; Lather, Dieter; and Jannsen, Klaus-Uwe, to Mannesmann Aktiengesellschaft. Method of adjusting ultrasonic test systems. 4,173,897, Cl. 73-609.000.
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Foster Wheeler Energy Corporation: *See—*
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Fowler, William P., to Weatherford/Lamb Inc. Pneumatically actuated thread protector for pipes. 4,173,988, Cl. 138-96.00T.
Fowles, Thomas A.; and Winchell, David A., to Baxter Travenol Laboratories, Inc. Hermetically sealed tamperproof port protector and method of making frangible seal. 4,174,238, Cl. 156-69.000.
Francis, Lawrence E. Welding rod holder accessory. 4,174,062, Cl. 228-19.000.
Frankhuizen, Michiel, to Xerox Corporation. Recording disk cartridge. 4,174,039, Cl. 206-444.000.
Franks, Albert, to National Research Development Corporation. X-ray interferometers. 4,174,478, Cl. 250-276.000.
Frantzen, John J., to Schulte, Neil B., a part interest. Television shadow mask and method of making same. 4,174,264, Cl. 204-11.000.
Freeman, Anthony L. Bicycle cart attachment. 4,174,120, Cl. 280-204.000.
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Frezza, Robert, to Samcoe Holding Corporation. High speed horizontal folder. 4,174,101, Cl. 270-79.000.
Fricker, Siegfried. Anchor for the tilt-up and transport of prefabricated building components. 4,173,856, Cl. 52-125.000.
Friedman, Harvey S.; and Lippert, Irving S., to Polaroid Corporation. Photographic processing apparatus. 4,174,164, Cl. 354-86.000.
Fritschy, Hugo: *See—*
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Fujiwara, Toshihide; Kaneko, Nobutaka; and Fujimori, Ryo, to Olympus Optical Co., Ltd. Device for moistening blood serum bearing film in electrophoretic apparatus. 4,173,943, Cl. 118-718.000.
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Fukui, Masaru; Ogino, Shigeo; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited; and Kao Soap Co., Ltd. Antiviral agent. 4,174,407, Cl. 424-325.000.
Fukui, Yutaka; Hataya, Fumio; and Kashimura, Tetsuo, to Hitachi, Ltd. Highly ductile alloys of iron-nickel-chromium-molybdenum system for gas turbine combustor liner and filler metals. 4,174,213, Cl. 75-134.00F.
Futterer, Bodo; Mayer, Jurgen; and Fritschy, Hugo, to Interelectric Aktiengesellschaft. Method for assembling a stator for an electric machine. 4,173,822, Cl. 29-596.000.
GAF Corporation: *See—*
Dalton, Philip B., 4,174,443, Cl. 544-86.000.
Gafa, Salvatore; and Burzio, Fulvio, to Montedison S.p.A. Detergent compositions containing self-sequestering surfactants. 4,174,306, Cl. 252-546.000.
Gagne, Robert, to PPG Industries, Inc. Method and apparatus utilizing transversely inclined barriers in float glass formation. 4,174,207, Cl. 65-99.00A.
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Gaiffi, Severino; and Klein, Hans-Peter, to BBC Brown Boveri & Company Limited. Ceramic electrical material with high nonlinear resistance. 4,174,303, Cl. 252-518.000.
Gaines, Albert L., to Combustion Engineering, Inc. Compression hub. 4,174,254, Cl. 176-2.000.

Gaines, Stanley, to Allen-Stevens Corp. Swivel suspension set. 4,174,087, Cl. 248-339.000.

Gaiser, Conrad J. Adhesively bonded hand grip sleeve for hand tools and the like. 4,174,109, Cl. 273-81.600.

Gaiser, Willi: *See—*
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Gaiser, Willi G.: *See—*
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Garbelman, David L.; Minor, William H.; and Shaw, Arthur G., to CMI Corporation. Method and apparatus for establishing aggregate cascade zones in an apparatus for producing hot mix asphalt. 4,174,181, Cl. 366-2.000.

Gardner, Keith L.; and Fujiwara, Goro, to United States of America, Navy. False target warning system. 4,174,177, Cl. 356-5.000.

Gardon, John L.: *See—*
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Garrison, Charles M., to Procter & Gamble Company, The. Density fractionation process to recover vegetable seed proteins. 4,174,314, Cl. 260-123.500.

Garrison, Charles M.; Youngquist, Rudolph W.; and Taylor, Harry M., to Procter & Gamble Company, The. Isolation of protein from vegetable seed material. 4,174,315, Cl. 260-123.500.

Garvey Corporation: *See—*
Garvey, Mark C., 4,174,104, Cl. 271-272.000.

Garvey, Mark C., to Garvey Corporation. Conveyor for cards and similar articles. 4,174,104, Cl. 271-272.000.

Garvin, Donald F.: *See—*
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Gast, Lyle E.: *See—*
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Gaughan, Edmund J., to Stauffer Chemical Company. Herbicidal active carboxanilide derivatives. 4,174,350, Cl. 260-558.00P.

Gause, Charles M.: *See—*
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Gebhart, Josef; Heigwer, Gerhard; Heyder, Joachim; Haas, Friedel; and Roth, Christa, to Gesellschaft fur Strahlen- und Umweltforschung mbH, Munchen. Ultramicroscopic spectrometer. 4,174,180, Cl. 356-338.000.

Gebrueder Buehler AG: *See—*
Geiger, Armin, 4,174,074, Cl. 241-46.110.

Gehring, Heinz; Bender, Albert; Richter, Gunter; and Froschle, Reinhard, to Maschinenfabrik Gehring Gesellschaft mit beschrankter Haftung & Co. Kommanditgesellschaft. Feeding device for a chip removing tool for machining bores in workpieces, especially a honing tool. 4,173,847, Cl. 51-34.00J.

Geiger, Armin, to Gebrueder Buehler AG. Ball mill. 4,174,074, Cl. 241-46.110.

Gelarden, Dennis R.: *See—*
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Gelbein, Abraham P.; Paustian, John E.; and Fanelli, Anthony J. Production of carboxylic acids from nitriles. 4,174,452, Cl. 546-319.000.

General Dynamics Corporation: *See—*
Piesik, Edward T., 4,173,919, Cl. 89-1.800.

General Electric Company: *See—*
Bach, Werner; and Kardasen, George, Jr., 4,174,509, Cl. 336-12.000.
Beckman, Daniel L.; and Stauffer, Earl D., 4,174,036, Cl. 206-223.000.
Brooks, Robert B., 4,173,871, Cl. 62-80.000.
Chipman, Donald I., 4,174,095, Cl. 254-93.00H.
Fiedler, Howard C., 4,174,235, Cl. 148-111.000.
Hamann, John R., 4,174,529, Cl. 361-16.000.
Kresge, James S.; and Sakshaug, Eugene C., 4,174,530, Cl. 361-127.000.
Maher, William M.; and Seaburg, Duane M., 4,174,073, Cl. 241-36.000.
Matson, Stephen L., 4,174,374, Cl. 423-232.000.
Niznik, George E., 4,174,432, Cl. 521-180.000.
Pierce, Linden W., 4,173,996, Cl. 165-105.000.
Sawyer, George N., 4,173,865, Cl. 62-324.000.
Strong, Herbert M.; Chrenko, Richard M.; and Tuft, Roy E., 4,174,380, Cl. 423-446.000.

General Tire & Rubber Company, The: *See—*
Ayers, Myron T.; and Corsaut, William J., 4,174,242, Cl. 156-110.00R.
Gormish, Kenneth J.; and Hofelt, Clarence, Jr., 4,173,850, Cl. 51-281.00R.

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Vallee, Robert G.; and Saviano, Arnold P., 4,173,965, Cl. 224-328.000.

Gerike, Andy. Portable temperature sensing device. 4,173,894, Cl. 73-362.800.

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Gebhart, Josef; Heigwer, Gerhard; Heyder, Joachim; Haas, Friedel; and Roth, Christa, 4,174,180, Cl. 356-338.000.

Geurts, Martinus F. A. M., to U.S. Philips Corporation. Television camera comprising a diaphragm control and a controllable picture signal amplification circuit. 4,174,526, Cl. 358-219.000.

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Giacomini, Joseph M.; and Lichy, David E., to United States of America, Army. Aerial camera mounting means. 4,174,162, Cl. 354-70.000.

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Gilmont Instruments, Inc.: *See—*
Gilmont, Roger, 4,173,890, Cl. 73-202.000.

Gilmont, Roger, to Gilmont Instruments, Inc. By-pass flowmeter. 4,173,890, Cl. 73-202.000.

Girling Limited: *See—*
Farr, Glyn P. R., 4,173,866, Cl. 60-413.000.

Gitchel, Wayne B.: *See—*
Pradt, Louis A.; and Gitchel, Wayne B., 4,174,280, Cl. 210-60.000.

Glaxo Laboratories Ltd.: *See—*
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Global Castors and Hardware Limited: *See—*
James, Michael J., 4,173,810, Cl. 16-47.000.

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Goettert, Edward J.; and Van Dyke Tiers, George, to Minnesota Mining and Manufacturing Company. Depositing latent fingerprints and development thereof. 4,174,409, Cl. 427-1.000.

Goldsmith, Sydney A.; Taylor, John A.; and Kleinschafer, Richard, to Peco Limited. Harvesting apparatus. 4,173,859, Cl. 56-330.000.

Goller, Heinz; Schulz, Haas-Hermann; and Leusner, Bernhard, to Bayer Aktiengesellschaft. Pasty compositions for crosslinking organopolysiloxanes to silicone rubber. 4,174,338, Cl. 260-37.0SB.

Goodale Manufacturing Company, Inc.: *See—*
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Goodman Equipment Corporation: *See—*
Watkins, Charles L., 4,174,032, Cl. 198-761.000.

Gorbulev, Efim S.: *See—*
Nemets, Rusaam S.; Gorbulev, Efim S.; Parygin, Veniamin A.; Kontsov, Jury M.; Moldavanov, Viktor P.; Shaforenko, Mark A.; Ignatiev, Alexei K.; Zaikovsky, Gennady S.; and Volnyakov, Mikhail I., 4,173,878, Cl. 72-137.000.

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Gormish, Kenneth J.; and Hofelt, Clarence, Jr., to General Tire & Rubber Company, The. Method for reducing tangential force variation in pneumatic tires. 4,173,850, Cl. 51-281.00R.

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Gottschalk, Robert E., to Panavision, Incorporated. Quiet motion picture camera. 4,174,157, Cl. 352-35.000.

Grace, Frederick J. Dump scow. 4,173,935, Cl. 114-36.000.

Grado, Joseph F. Compressive pivot suspension system for an electromagnetic cartridge. 4,174,111, Cl. 274-37.000.

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Grasselli, Robert K.; Miller, Arthur F.; and Shaw, Wilfrid G., to Standard Oil Company (Ohio). Oxidative dehydrogenation using chromium-containing catalysts. 4,174,354, Cl. 585-626.000.

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Gregg, Richard E., to Royce Equipment Company, Division of McGinnes Manufacturing Co. Clamshell bucket apparatus and method of using same. 4,174,131, Cl. 294-70.000.

Grenia, James D., to Bechtel International Corporation. Underground formed wall single-entry mining method. 4,174,135, Cl. 299-11.000.

Grethe, Guenter; Uskokovic, Milan R.; and Sereno, John, to Hoffmann-La Roche Inc. Process for the preparation of methyl 3,4-anhydro-2,6-dideoxy-L-ribo-hexopyranoside. 4,174,344, Cl. 260-348.550.

Griesshammer, Rudolf: *See—*
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Griffin, Thomas J., Jr., to Dow Chemical Company, The. Method of fracturing with gelled organic liquids. 4,174,283, Cl. 252-8.55R.

Grimm, Hans: *See—*
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Grogan, Richard P., to Diamond International Corporation. Adjustable spray fluid dispenser. 4,174,069, Cl. 239-333.000.

Gross, Glenn M., to Norlin Industries, Inc. Programmable dynamic filter. 4,173,915, Cl. 84-1.190.

Gruhier, Henri: *See—*
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GTE Automatic Electric Laboratories Incorporated: *See—*
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Gueguen, Jacques: *See—*
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Guidoux, Loic B. Y.; and Renaudat, Jean-Louis, to Telecommunications Radioelectriques et Telephoniques TRT. Phase discriminator in a receiver for a data transmission system. 4,174,489, Cl. 325-320.000.

Guillerme, Michel: *See—*
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Gulf Oil Corporation: *See—*
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Habermeier, Jurgen; Moser, Roland; and Seiz, Wolfgang, to Ciba-Geigy Corporation. Anthranilates of oxyalkylated carboxamides. 4,174,455, Cl. 560-49.000.

Hagiwara, Yutaca, to Nissan Motor Company, Limited. Warning device for indicating wear of friction pads in disc brake. 4,174,024, Cl. 188-1.00A.

Halasa, Adel F.; Hall, James E.; and Schulz, Donald N., to Firestone Tire & Rubber Company, The. Process for polymerizing conjugated dienes. 4,174,431, Cl. 526-173.000.

Hall, James E.: *See—*
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Hall, John B.; Sprecker, Mark A.; Shuster, Edward J.; Schmitt, Frederick L.; and Vinals, Joaquin F., to International Flavors & Fragrances Inc. Use of substituted dimethyl dihydroxy benzene and cyclohexadiene compounds for augmenting or enhancing the taste and/or aroma of smoking tobaccos. 4,173,982, Cl. 131-9.000.

Hallstedt, Goran, to Aktiebolaget SKF. Shock absorbing device for sliding bearings. 4,174,136, Cl. 308-5.00R.

Hamaker, Ralph A.; and Buck, Kenneth J., to Xerox Corporation. Belt tracking system. 4,174,171, Cl. 355-3.0BE.

Hamann, John R., to General Electric Company. Protective circuit for zinc oxide varistors. 4,174,529, Cl. 361-16.000.

Hamill, Robert L.; and Stark, W. Max, to Eli Lilly and Company. Antibiotic A-7413 and process for preparation thereof. 4,174,390, Cl. 424-117.000.

Hamill, Robert L.: *See—*
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Hammelmann, Paul. Apparatus for cleaning conduits or the like. 4,173,806, Cl. 15-104.06R.

Hammelmann, Paul. Reciprocating pump. 4,174,194, Cl. 417-567.000.

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Hansgen, Klaus: *See—*
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Hanson, Douglas R. Dryer for mesh baskets. 4,173,830, Cl. 34-15.000.

Hardy, William B.; Min, Tae B.; and Hoffman, Joseph A., to American Cyanamid Company. Pentaerythrityl diphosphonate-ammonium polyphosphate combinations as flame retardants for olefin polymers. 4,174,343, Cl. 260-45.75B.

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Lineberry, Cletus E.; Buckner, John G.; and Harris, Jimmy W., 4,173,911, Cl. 83-29.000.

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Hartman, Marvis E.; and Hockswender, Thomas R., to PPG Industries, Inc. Carboxylated amide polymers and coating compositions containing same. 4,174,333, Cl. 260-29.2EP.

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Hashimoto, Mitsuo; Takyu, Toshiyuki; Inoue, Masaru; Takasaki, Masami; and Shiho, Shinho, to Idemitsu Kosan Company Limited. Gypsum compositions. 4,174,230, Cl. 106-109.000.

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Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Additional air supply system for an internal combustion engine. 4,173,957, Cl. 123-119.0EC.

Hatuse, Toshikazu: *See—*
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Hauff, Werner. Wall feedthrough fitting. 4,174,126, Cl. 285-158.000.

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den Otter, Marinus J. A. M.; Hawinkels, Lambertus P. G.; and Schouteten, Augustinus P. H., 4,174,444, Cl. 544-192.000.

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Hedrick, Geoffrey S. Fluid quantity indicator. 4,173,893, Cl. 73-304.00C.

Heenan, Sidney A., to Amerace Corporation. Snowplowable pavement marker and method and apparatus for installing same. 4,174,184, Cl. 404-72.000.

Heesch, Max O., to International Telephone and Telegraph Corporation. Unitary regulator mechanism for multiple window panels. 4,173,845, Cl. 49-350.000.

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Helenberg, Harold W.: *See—*
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Heller, Karl H.; and Schiron, Dieter. Loading platform. 4,174,045, Cl. 220-4.00F.

Helm, Herbert W., to F. L. Smithe Machine Company, Inc. Method for making side seam envelopes from a web. 4,173,922, Cl. 93-63.00M.

Hemming, Frank E., Jr.; and Johnson, Stuart A., to International Paper Company. Process and apparatus for controlling the speed of web forming equipment. 4,174,237, Cl. 156-64.000.

Hempel, Raymond O., Jr.: *See—*
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Hendricks, David J. Hyperextension back brace. 4,173,973, Cl. 128-78.000.

Hensley, Richard K. Toy hoop guide rod. 4,173,841, Cl. 46-220.000.

Hercules Incorporated: *See—*
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Higashi, Yasunaga. Barrel polishing process. 4,173,851, Cl. 51-317.000.
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Hohda, Takeo; Tominaga, Shinji; and Ohta, Yoshiharu, to Minolta Camera Kabushiki Kaisha. Power supply control device for cameras. 4,174,165, Cl. 354-105.000.
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Holle, Johannes, to Siemens Aktiengesellschaft. Device for attenuating cavity interference waves in a high-frequency electron tube. 4,174,492, Cl. 315-39.000.
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Honig, Helmut; and Pampouchidis, Georgios, to Vianova Kunstharz, A.G. Self-crosslinking resin emulsions for cathodically depositable coating compositions. 4,174,332, Cl. 260-29.2TN.
Hoo, William K. C. Safety container having a slideable closure. 4,174,034, Cl. 206-1.500.
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Ikushima, Ichiro: *See—*
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Hubbard, Donald A., 4,174,310, Cl. 260-29.40R.
Smith, Frank, 4,174,410, Cl. 427-57.000.
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Deschamps, Andre; Dezael, Claude; Gruhier, Henri; and Renault, Philippe, 4,174,383, Cl. 423-573.00R.
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Institut National de la Recherche Agronomique: *See—*
Petit, Leon; Davin, Andre; and Gueguen, Jacques, 4,174,313, Cl. 260-123.500.
Intengan, Franklin S. Adjustable length simulated knotted necktie combination. 4,173,792, Cl. 2-144.000.
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Futterer, Bodo; Mayer, Jurgen; and Fritschy, Hugo, 4,173,822, Cl. 29-596.000.
Interface Mechanisms, Inc.: *See—*
Brooks, Robert J., 4,174,078, Cl. 242-75.430.
International Audio Visual, Inc.: *See—*
Dyck, Arthur, 4,174,247, Cl. 156-506.000.
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Andres, Heinrich A.; Kolbe, Hartmut F.; Schlagdenhaufen, Horst; and Schwarzbach, Frank A., 4,174,219, Cl. 430-321.000.
Bassous, Ernest; Ning, Tak H.; and Osburn, Carlton M., 4,173,818, Cl. 29-571.000.
Chandra, Ashok K.; Chang, Hsu; and Wong, Chak-Kuen, 4,174,538, Cl. 365-2.000.
Cohen, Mitchell S.; and Pugh, Emerson W., 4,174,540, Cl. 365-15.000.
Matthews, John W., deceased; and Stobbs, William M., 4,174,422, Cl. 428-621.000.
White, James M., 4,174,528, Cl. 358-280.000.
International Design and Development Corporation: *See—*
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Kamath, Venkatesh; Mookherjee, Braja D.; and Schmitt, Frederick L., 4,174,287, Cl. 252-174.110.

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International Harvester Company: *See—*
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International Paper Company: *See—*
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INTERx Research Corporation: *See—*
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Bogar, William H.; and Irwin, Howard D., 4,174,140, Cl. 308-137.000.
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Schaefer, Peter; and Doerre, Wolfgang, 4,174,088, Cl. 248-395.000.
Ivachev, Leonid M. Pivoted lever brake structure. 4,174,025, Cl. 188-72.600.
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Kobuke, Yoshiaki, 4,174,319, Cl. 260-239.0BC.
J. T. Baker Chemical Company: *See—*
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Jahoda, John, to Carrier Corporation. Formed coil assembly. 4,173,998, Cl. 165-182.000.
James D. Pauls & J. Claybrook Lewis & Associates, Ltd.: *See—*
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Jargue, Ricardo Granados; Domingo, Mercedes Alvarez; Cartes, Juan Bosch; Roldan, Cirstobal Martinez; and Peinado, Fernando Rabadan, to Laboratories Made, S.A. 7,10-Dimethyl-5,9-imino-4,5,8,9-tetrahydro-cyclooct[b]thiophenes and a process for obtaining it. 4,174,396, Cl. 424-256.000.
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Jaymin Research Corporation: *See—*
Momin, Abdulmajid U., 4,173,970, Cl. 128-736.000.
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Johannesen, Donald D., to Bendix Corporation, The. Dash pot for a hydraulic actuator for a driven brake. 4,174,026, Cl. 188-361.000.
John, Clarence D., Jr., to Westinghouse Electric Corp. Fluid pressure method for recovering fuel pellets from nuclear fuel elements. 4,174,369, Cl. 423-4.000.
Johnson, Nira C., to Rockwell International Corporation. Method and apparatus for measuring gas flow. 4,173,891, Cl. 73-231.00M.
Johnson, Roy A.; and Sih, John C., to Upjohn Company, The. Pyran analogs of 5-hydroxy-PGI$_1$. 4,174,441, Cl. 542-426.000.
Johnson, Stuart A.: *See—*
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Josam Manufacturing Co.: *See—*
Flegel, George J.; Mielbeck, Roger L.; and Pizarek, Patrick J., 4,173,800, Cl. 4-207.000.
Josemans, Leonardus J., to Cutler-Hammer, Inc. Pivoted-actuator switch with integral off-lock. 4,174,472, Cl. 200-68.000.
Joy Manufacturing Company: *See—*
Hibbard, George A., 4,174,010, Cl. 173-78.000.
Jubilee Manufacturing Co.: *See—*
Cleary, Mark R., 4,174,516, Cl. 340-63.000.
Jurva, Edsel O.; and Mosman, Howard D., to Medtronic, Inc. Seal arrangement for facilitating hermeticity leakage testing. 4,174,424, Cl. 429-90.000.
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Kaihara, Takashi; Taneoka, Masao; and Kusaka, Toshitsugu, to Nippon Oil Company, Limited. Method of detecting defective portions of metallic tank having thermally protective coating of polyurethane foam. 4,174,480, Cl. 250-342.000.
Kaiser, Emil T. Synthesis of steroids. 4,174,345, Cl. 260-397.100.
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Kao Soap Co., Ltd.: *See—*
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Karz, Allen E. Continuous electrocardiogram monitoring method and system for cardiac patients. 4,173,971, Cl. 128-702.000.
Kasai, Hironao; Fujii, Hitoshi; and Toki, Naoji, to Mitsubishi Jukogyo Kabushiki Kaisha. Floating-type anti-oil anti-impact anti-wave barrier. 4,174,186, Cl. 405-71.000.
Kashimura, Tetsuo: *See—*
Fukui, Yutaka; Hataya, Fumio; and Kashimura, Tetsuo, 4,174,213, Cl. 75-134.00F.
Kass, Gus S., to American Lecithin Company. Water soluble lecithin composition. 4,174,296, Cl. 252-312.000.
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Kato, Hidefumi: *See—*
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Kavanaugh, Richard J.: *See—*
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Kawasaki, Harumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Laser manipulator apparatus with double pivotal mirrors. 4,174,154, Cl. 350-299.000.

Kawashima, Hideyuki: *See*—
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Keller, George E., II: *See*—
Marcinkowsky, Arthur E.; Keller, George E., II; and Verma, Surendra K., 4,174,353, Cl. 585-835.000.

Kelley, Richard L. Portable lighting fixture. 4,174,532, Cl. 362-102.000.

Kennametal Inc.: *See*—
Shearer, Thomas R., 4,174,093, Cl. 254-29.00R.

Kennedy, Ronald J., to Leggett & Platt, Incorporated. Sofa-sleeper. 4,173,803, Cl. 5-13.000.

Khait, George. Drafting instrument. 4,173,829, Cl. 33-27.00C.

Khurgin, Boris. Apparatus for measurement of quantity of liquid in container. 4,173,892, Cl. 73-304.00C.

Khutoretsky, Gary M.: *See*—
Vinokurov, Alexandr A.; Gorbunov, Gennady S.; Korolkov, Anatoly G.; Popov, Jury S.; Rozenfeld, Lev M.; Skachkov, Jury V.; Filippov, Iosif F.; and Khutoretsky, Gary M., 4,174,483, Cl. 310-52.000.

Kido, Shiro; Yokota, Tetsuo; and Nakahara, Yasuhiro, to Toyo Soda Manufacturing Co., Ltd. Process for producing porous polystyrene gel. 4,174,430, Cl. 521-146.000.

Kiejzik, Paul A. Microfilm jacket microfilm feeding device and process. 4,173,837, Cl. 40-159.000.

Kienow, Sigismund; and Briem, Karl, to Zytan Thermochemische Verfahrenstechnik GmbH & Co. Kommanditgesellschaft. Mold for firing bodies of silica- or alumina-containing granules. 4,174,089, Cl. 249-80.000.

Kihara, Keiichi: *See*—
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Kilsdonk, Dennis J.: *See*—
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Kimberly-Clark Corporation: *See*—
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Kimm, Otfried; Hammes, Theo; and Loebler, Peter, to Mauser Kommandit-Gesellschaft. Original closure member. 4,174,044, Cl. 215-252.000.

Kimura, Takeji: *See*—
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Kinoshita, Tomoo, to Nihon Repro Machine Kogyo Kabushiki Kaisha. Foreign material removing device in synthetic resin reclaiming machine. 4,174,198, Cl. 425-135.000.

Kirk, James F.: *See*—
McFall, William A.; White, Stanley A.; Lane, Howard K.; Butcher, Daryl T.; Anderson, Donald V., Jr.; McCollum, Patrick E.; Kirk, James F.; and Plesset, Richard, 4,174,496, Cl. 323-9.000.

Kirk, Leelin F.: *See*—
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Kirpichenkov, Alexandr G. Straightway valve. 4,173,985, Cl. 137-512.100.

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Kline, Charles M., to Sperry Rand Corporation. Overload protective device. 4,174,072, Cl. 241-35.000.

Kluge, Arthur F.; and Harrison, Ian T., to Syntex (USA) Inc. Treatment of lactic acidosis in ruminants. 4,174,399, Cl. 424-271.000.

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Myzenkov, Felix A.; Klushin, Dmitry N.; Shupikov, Viktor A.; Kaizer, Alexandr A.; Shuklin, Anatoly M.; Deresh, Mikhail D.; Kolbin, Nikolai A.; Tolmacheva, Alla P.; Zyryanova, Galina V.; Uzlov, Vitaly M.; and Shmuelzon, Elka I., 4,174,372, Cl. 423-88.000.

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Knapp, Heinrich; Bosch, Franz-Ulrich; and Schnepf, Gunther, to Robert Bosch GmbH. Bimetal device with an electrical heating element. 4,174,511, Cl. 337-107.000.

Knauth, Berthold A., to Knauth Design, Inc. Fluid flow regulating systems. 4,174,065, Cl. 236-49.000.

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Knolle, Jurgen C.; and Grimm, Hans, to Saat- und Erntetechnik GmbH. Laminar seed carriers and method of preparing same. 4,173,844, Cl. 47-56.000.

Knowles, James G.: *See*—
Levington, Henry J.; and Knowles, James G., 4,174,016, Cl. 180-89.150.

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Koepke, Lee E.: *See*—
Leiner, Howard H.; Koepke, Lee E.; Gelarden, Dennis R.; and Gardon, John L., 4,174,336, Cl. 260-29.7UP.

Kokeisl, Theodor. Ski-tie device. 4,173,811, Cl. 24-73.0SG.

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Kolbin, Nikolai A.: *See*—
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Saito, Tomio, 4,174,050, Cl. 222-43.000.
Taguchi, Masahiko; Mogaki, Katsuo; and Takada, Syun, 4,174,220, Cl. 430-613.000.

Kontsov, Jury M.: *See*—
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Koritala, Sambasivarao, to United States of America, Agriculture. Preparation of highly active copper-silica catalysts. 4,174,300, Cl. 252-454.000.

Korlatzki, Rudi; and Schumacher, Gunter, to Naturin-Werk Becker & Co. Polyurethanes and food casings made therefrom. 4,174,436, Cl. 528-80.000.

Korolkov, Anatoly G.: *See*—
Vinokurov, Alexandr A.; Gorbunov, Gennady S.; Korolkov, Anatoly G.; Popov, Jury S.; Rozenfeld, Lev M.; Skachkov, Jury V.; Filippov, Iosif F.; and Khutoretsky, Gary M., 4,174,483, Cl. 310-52.000.

Kosaka, Yoshiharu. Double-layered wooden arch truss. 4,173,857, Cl. 52-642.000.

Kotlarewsky, Paul, to Northern Telecom Limited. Master-slave voltage regulator employing pulse width modulation. 4,174,534, Cl. 363-26.000.

Kouda, Masanori, to Atsugi Motor Parts Co., Ltd. Power steering system. 4,173,987, Cl. 137-625.230.

Koushiafes, Nicholas J. Furnace air filter. 4,174,205, Cl. 55-354.000.

Kovac, M. Jane. Aerodynamic toy. 4,173,839, Cl. 46-74.00D.

Kraft, Winfried; Reinheimer, Gunter; and Leiter, Herbert, to Ernst Leitz Wetzlar GmbH. Exposure meter for photomicrography. 4,174,159, Cl. 354-23.00R.

Kramer, Justin A. Dual speaker. 4,174,019, Cl. 181-159.000.

Kramer, Petrus A.; and Austermuhle-Bertola, Helena, to Shell Internationale Research Maatschappij B. V. Preparation of cyclopropanecarbonitriles. 4,174,348, Cl. 260-464.000.

Krapcho, John; and Turk, Chester F., to E. R. Squibb & Sons, Inc. 3,3-Dichloro-2-azetidinone derivatives. 4,174,317, Cl. 260-239.00A.

Krasnow, Leonard L.: *See*—
Lustig, Leopold P.; and Krasnow, Leonard L., 4,173,828, Cl. 433-87.000.

Krebs Engineers: *See*—
Martin, David L., 4,174,275, Cl. 209-211.000.

Kreiskorte, Heinz, to Thyssen Industrie AG. Ring rolling machine. 4,173,877, Cl. 72-105.000.

Kresge, James S.; and Sakshaug, Eugene C., to General Electric Company. Voltage surge arrester device. 4,174,530, Cl. 361-127.000.

Kress, Hermann: *See*—
Sommer, Werner; Vinnemann, Antonius; Walter, Manfred; Gaiser, Willi; Elsasser, Heinrich; Brenner, Wolfgang; and Kress, Hermann, 4,173,873, Cl. 66-125.00R.

Sommer, Werner; Vinnemann, Antonius; Walter, Manfred E.; Gaiser, Willi G.; Elsasser, Heinrich K.; Brenner, Wolfgang A. A.; and Kress, Hermann, 4,173,874, Cl. 66-125.00R.

Kressel, Henry; and Spak, Mark A., to RCA Corporation. Method of defining contact openings in insulating layers on semiconductor devices without the formation of undesirable pinholes. 4,174,252, Cl. 156-653.000.

Krieger, Gregory A.: *See*—
Slosiarek, Michael L.; and Krieger, Gregory A., 4,174,116, Cl. 280-163.000.

Ku, Paul H. Automatic vacuum cleaner. 4,173,809, Cl. 15-319.000.

Kudara, Hajime: *See*—
Matsuda, Sumio; and Kudara, Hajime, 4,174,339, Cl. 260-40.00R.

Kuga, Yasuo, to Kabushiki Kaisha Sanwa Denki Seisakusho. Scale plate for measuring instruments. 4,174,500, Cl. 324-115.000.

Kulischenko, Walter; and Capdevielle, Martin J., to Pennwalt Corporation. Remotely actuated marine steering system. 4,173,937, Cl. 114-144.00R.

Kunzler & Co.: *See*—
Maier, Jakob; and Hoefelmayr, Tilman, 4,173,946, Cl. 119-14.360.

Kurath, Paul: *See*—
Tadanier, John S.; Martin, Jerry R.; and Kurath, Paul, 4,174,312, Cl. 260-112.50R.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Seki, Sigeru; Noguchi, Tatsuhiko; Ohta, Minoru; and Kurita, Ryuichi, 4,174,224, Cl. 106-38.300.

Kurita, Ryuichi: *See*—
Seki, Sigeru; Noguchi, Tatsuhiko; Ohta, Minoru; and Kurita, Ryuichi, 4,174,224, Cl. 106-38.300.

Kuroda, Yasuhisa: *See*—
Tabushi, Iwao; Kato, Hidefumi; Taniguchi, Yoichi; and Kuroda, Yasuhisa, 4,174,428, Cl. 525-334.000.

Kusaka, Toshitsugu: *See*—
Kaihara, Takashi; Taneoka, Masao; and Kusaka, Toshitsugu, 4,174,480, Cl. 250-342.000.

Kusuyama, Michio, to Olympus Optical Co., Ltd. Adjustable directivity microphone incorporated in a tape recorder casing. 4,174,469, Cl. 179-121.00D.

Kvita, Vratislav: *See*—
Baumann, Marcus; Kvita, Vratislav; Roth, Martin; and Waterhouse, John S., 4,174,326, Cl. 260-326.00E.

Laboratories Made, S.A.: *See*—
Jargue, Ricardo Granados; Domingo, Mercedes Alvarez; Cartes, Juan Bosch; Roldan, Cirstobal Martinez; and Peinado, Fernando Rabadan, 4,174,396, Cl. 424-256.000.

Laboratorios Made, S.A.: *See*—
Jarque, Ricardo Granados; Cartes, Juan Bosch; Jimenez, Rosa Llobera; Roldan, Cristobal Martinez; and Peinado, Fernando Rabadan, 4,174,451, Cl. 546-283.000.

Laing, Ingeborg: *See*—
Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver, 4,174,009, Cl. 165-45.000.

Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver. Long-period thermal storage accumulators. 4,174,009, Cl. 165-45.000.

Laing, Oliver: *See*—
Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver, 4,174,009, Cl. 165-45.000.

Lander, Joseph: *See*—
Hunter, Robert K., Jr.; Grafton, David A.; Lander, Joseph; Merritt, Lauren V.; Stewart, Donald E.; and Wolpert, Donald H., 4,174,174, Cl. 355-39.000.

Landgraf, Helmut, to Mannesmann Aktiengesellschaft. Cooled mandrel. 4,173,880, Cl. 72-201.000.

Lane, Howard K.: *See*—
McFall, William A.; White, Stanley A.; Lane, Howard K.; Butcher, Daryl T.; Anderson, Donald V., Jr.; McCollum, Patrick E.; Kirk, James F.; and Plesset, Richard, 4,174,496, Cl. 323-9.000.

Lane, John N., to Xerox Corporation. Cleaning methods and apparatus for a photocopying device. 4,174,172, Cl. 355-15.000.

Lang, Hans-Jochen: *See*—
Knabe, Bernd; Lang, Hans-Jochen; and Granzer, Ernold, 4,174,397, Cl. 424-270.000.

Langlais, Frantz; and Postel, Michel, to Agence Nationale de Valorisation de la Recherche (ANVAR). Prosthesis for arthroplasty of the hip. 4,173,797, Cl. 3-1.912.

Langlois, Guy B.; and Spain, Raymond G., to Hitco. Temporary fabric and method and apparatus for weaving same. 4,173,990, Cl. 139-440.000.

Lassota, Marek J. Rotary compressor and process of compressing compressible fluids. 4,174,195, Cl. 418-1.000.

Lather, Dieter: *See*—
Forstermann, Ulrich; Schafer, Hans-Peter; Moller, Peter; Ries, Karl; Lather, Dieter; and Jannsen, Klaus-Uwe, 4,173,897, Cl. 73-609.000.
Forstermann, Ulrich; Schafer, Hans-Peter; Moller, Peter; Lather, Dieter; Ries, Karl; and Jannsen, Klaus-Uwe, 4,173,898, Cl. 73-611.000.

Lau, George W.; and Bujnowski, Edward J., to Binks Manufacturing Company. Spray gun assembly. 4,174,070, Cl. 239-340.000.

Lau, George W.; and Bujnowski, Edward J., to Binks Manufacturing Company. Spray gun assembly. 4,174,071, Cl. 239-348.000.

Laurent, Francois, to Bolex International SA. Varifocal objective with focal length adjustment. 4,174,153, Cl. 350-184.000.

Law, Melvin K.: *See*—
Rockar, Paul A.; Law, Melvin K.; and Hawk, Thomas W., 4,174,241, Cl. 156-102.000.

Lawrie, William E., to Babcock & Wilcox Company, The. Apparatus for locating defective nuclear fuel elements. 4,174,255, Cl. 176-19.0LD.

Laycock, John N. C.: *See*—
Bertenshaw, Barry W.; Combe, Edward C.; Tidy, David C.; and Laycock, John N. C., 4,174,334, Cl. 260-29.60M.

Lear Siegler, Inc.: *See*—
Sigman, John J., Jr., 4,173,920, Cl. 409-37.000.

Lee, Glyn E.: *See*—
Chapman, Robert F.; Jackson, David D.; and Lee, Glyn E., 4,174,391, Cl. 424-180.000.

Lee, Harry W., Jr., to Reynolds Metals Company. Mounting for ironing dies. 4,173,882, Cl. 72-349.000.

Leggett & Platt, Incorporated: *See*—
Kennedy, Ronald J., 4,173,803, Cl. 5-13.000.

Le Helloco, Roger, to AMP Incorporated. Housing for an electrical terminal. 4,174,144, Cl. 339-59.00R.

Leiner, Howard H.; Koepke, Lee E.; Gelarden, Dennis R.; and Gardon, John L., to M & T Chemicals Inc. Aqueous heat curable particulate coating composition of elastomeric emulsion copolymer and thermosetting copolymer. 4,174,336, Cl. 260-29.7UP.

Leipold, Ludwig: *See*—
Mueller, Ruediger; Pomper, Michael; and Leipold, Ludwig, 4,174,535, Cl. 363-147.000.

Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, to Argus Chemical Corporation. Polyhydric phenol coester stabilizers. 4,174,297, Cl. 252-399.000.

Leiter, Herbert: *See*—
Kraft, Winfried; Reinheimer, Gunter; and Leiter, Herbert, 4,174,159, Cl. 354-23.00R.

Leitermann, Wulf, to Audi NSU Auto Union Aktiengesellschaft. Rotary-piston machine having a liquid-cooled piston. 4,174,197, Cl. 418-84.000.

Lejeune, Daniel, to Compagnie Generale des Etablissements Michelin. Radially reinforced wheel rims of moldable material. 4,173,992, Cl. 152-381.100.

Lendl, Josef, to Triumph Werke Nurnberg A.G. Needle printing head. 4,174,182, Cl. 400-124.000.

Lenz, Dieter; and Tragner, Erich, to Swiss Aluminium Ltd. Method of manufacturing sheets, strips and foils from age hardenable aluminum alloys of the Al-Si-Mg-type. 4,174,232, Cl. 148-2.000.

Leon, Joseph L. Variable tilt rotating pot cooker and mixer. 4,173,925, Cl. 99-348.000.

Leopoldi, Norbert; and Heinrich, William P. Apparatus for cutting pills. 4,173,826, Cl. 30-124.000.

Lerch, Ulrich: *See*—
Babej, Milos; Bartmann, Wilhelm; Beck, Gerhard; and Lerch, Ulrich, 4,174,458, Cl. 562-463.000.

Lester Construction Co.: *See*—
Yago, Jeffry R., 4,174,013, Cl. 180-6.200.

Leusner, Bernhard: *See*—
Goller, Heinz; Schulz, Hans-Hermann; and Leusner, Bernhard, 4,174,338, Cl. 260-37.0SB.

Leveskis, Newton G., to Custom Research and Development. Metal oxide remover containing a strong mineral acid, citric acid and a basic ammonia derivative. 4,174,290, Cl. 252-142.000.

Levington, Henry J.; and Knowles, James G., to Clayton Dewandre Company Limited. Hydraulic cab tilting systems. 4,174,016, Cl. 180-89.150.

Lewarchik, Ronald J.: *See*—
Birkmeyer, William J.; Erikson, J. Alden; and Lewarchik, Ronald J., 4,174,337, Cl. 260-31.40R.

Li, Jorge P.; and Becker, Frank C., to Abbott Laboratories. N-(Acenaphthenyl)maleimides. 4,174,342, Cl. 260-45.80N.

Lichtenberger, William J., to Westinghouse Air Brake Company. Relay latching apparatus. 4,174,508, Cl. 335-202.000.

Lichy, David E.: *See*—
Giacomini, Joseph M.; and Lichy, David E., 4,174,162, Cl. 354-70.000.

Liebert, Karl-Heinz; and Tischer, Werner, to Zahnradfabrik Friedrichshafen AG. Arrangement for control of two hydraulic pressure systems, including booster steering control. 4,174,018, Cl. 180-132.000.

Liebetruth, Reiner, to Siemens Aktiengesellschaft. Tomographic X-ray apparatus for the production of transverse layer images. 4,174,481, Cl. 250-445.00T.

Lindmayer, Joseph, to Semix, Incorporated. Silicon-impregnated foraminous sheet. 4,174,234, Cl. 148-33.000.

Lineberry, Cletus E.; Buckner, John G.; and Harris, Jimmy W. Method and apparatus for handling brick. 4,173,910, Cl. 83-29.000.

Lineberry, Cletus E.; Buckner, John G.; and Harris, Jimmy W. Method and apparatus for hacking and stacking brick. 4,173,911, Cl. 83-29.000.

Lipp, David W.: *See*—
Giglia, Robert D.; Sedlak, John A.; and Lipp, David W., 4,174,152, Cl. 350-357.000.

Lippert, Irving S.: *See*—
Friedman, Harvey S.; and Lippert, Irving S., 4,174,164, Cl. 354-86.000.

Little, Clifton W.: *See*—
Campbell, David L., 4,174,096, Cl. 256-24.000.

Little, Julian R.; Nudenberg, Walter; and Rim, Yong S., to Uniroyal, Inc. Carbamate. 4,174,457, Cl. 560-134.000.

Lockwood Corporation: *See*—
Ellis, Malcolm P., 4,174,001, Cl. 171-17.000.

Loebler, Peter: *See—*
Kimm, Otfried; Hammes, Theo; and Loebler, Peter, 4,174,044, Cl. 215-252.000.

Loeffler, Herbert H., to Ciba-Geigy Corporation. Pump type dispenser with continuous flow feature. 4,174,056, Cl. 222-321.000.

Logan, Gilbert J. Modular church steeple. 4,173,853, Cl. 52-57.000.

Looker, Brian E.: *See—*
Barton, Derek H. R.; Sammes, Peter G.; Hewitt, Graham; Looker, Brian E.; and Underwood, William G. E., 4,174,318, Cl. 260-239.00A.

Lorenz, Helmut: *See—*
Koppl, Franz; Hamster, Helmut; Griesshammer, Rudolf; and Lorenz, Helmut, 4,173,944, Cl. 118-719.000.

Lucas Industries Limited: *See—*
Sosnowski, Stanislaw J. A.; and Potter, James C., 4,173,959, Cl. 123-139.0AP.

Luders, Walter; Herwig, Walter; van Spankeren, Ulrich; and Burg, Karlheinz, to Hoechst Aktiengesellschaft. Plastic molding composition containing a filler. 4,174,340, Cl. 260-42.140.

Ludlow Corporation: *See—*
Whiting, Philip C., Jr., 4,174,038, Cl. 206-389.000.

Lundgren, Bengt, to SKF Nova AB. Device for transforming a rotational motion into a linear motion. 4,173,907, Cl. 74-459.000.

Lundgren, Bert K. G.; and Westin, Urban, to AB Nynas-Petroleum; and AB Westin and Backlund. Manufacturing moulds or mould cores. 4,174,225, Cl. 106-38.600.

Lundin, Alyce; and Bravin, Robert V. Racquetball or squash safety mask. 4,173,795, Cl. 2-425.000.

Lustig, Leopold P.; and Krasnow, Leonard L., to Lustig, Leopold Paul. Interchangeable tool operating apparatus with plural motion. 4,173,828, Cl. 433-87.000.

Lustig, Leopold Paul: *See—*
Lustig, Leopold P.; and Krasnow, Leonard L., 4,173,828, Cl. 433-87.000.

Lux, Joseph W.; and Varanelli, John M., to Robertshaw Controls Company. Method of joining two abutting metal members together. 4,173,815, Cl. 29-432.100.

Lynch, Thomas J.: *See—*
Gilbert, Ronald E.; Lynch, Thomas J.; and Rowatt, Robert J., 4,174,330, Cl. 260-28.50A.

M & T Chemicals Inc.: *See—*
Leiner, Howard H.; Koepke, Lee E.; Gelarden, Dennis R.; and Gardon, John L., 4,174,336, Cl. 260-29.7UP.

Mack, Halmer B., to Goodale Manufacturing Company, Inc. Carton hold-down apparatus. 4,173,921, Cl. 93-36.300.

MacLeod, Donald R., to Rexnord Inc. Lubricating system and method. 4,174,031, Cl. 198-501.000.

Macleod, John G., to Rockwell International Corporation. Rotary valve with stem seal means. 4,174,092, Cl. 251-214.000.

Maeda Industries, Ltd.: *See—*
Yamasaki, Kazuto, 4,174,099, Cl. 267-168.000.

Magarian, Gerald M., to Ameron, Inc. Method and apparatus for wiping resin from filament wound pipe. 4,174,243, Cl. 156-175.000.

Magnusson, Sten E.: *See—*
Broger, Lars I.; and Magnusson, Sten E., 4,174,466, Cl. 179-18.0AD.

Maher, William M.; and Seaburg, Duane M., to General Electric Company. Multi container interlocked food machine with a safety switch for each container. 4,174,073, Cl. 241-36.000.

Maier, Jakob; and Hoefelmayr, Tilman, to Kunzler & Co. Milking cup. 4,173,946, Cl. 119-14.360.

Maier, Siegfried, to Dupro AG. Cleaning implement. 4,173,807, Cl. 15-179.000.

Maistros, Thomas J.: *See—*
Thomas, Eric W.; and Maistros, Thomas J., 4,174,244, Cl. 156-242.000.

Makino, Keisuke: *See—*
Yamamoto, Masatoshi; Makino, Keisuke; Suzukawa, Kiyomi; Nakamura, Souichirou; and Sakai, Kiyomi, 4,173,821, Cl. 29-574.000.

Mandel, Jerome. Central system for controlling remote devices over power lines. 4,174,517, Cl. 340-310.00A.

Mannesmann Aktiengesellschaft: *See—*
Altenbokum, Karlheinz; Hansgen, Klaus; and Hiersig, Heinz M., 4,173,906, Cl. 74-410.000.
Forstermann, Ulrich; Schafer, Hans-Peter; Moller, Peter; Ries, Karl; Lather, Dieter; and Jannsen, Klaus-Uwe, 4,173,897, Cl. 73-609.000.
Forstermann, Ulrich; Schafer, Hans-Peter; Moller, Peter; Lather, Dieter; Ries, Karl; and Jannsen, Klaus-Uwe, 4,173,898, Cl. 73-611.000.
Landgraf, Helmut, 4,173,880, Cl. 72-201.000.

Mar, Sergio R. Electric hand drill powered portable grinder. 4,173,849, Cl. 51-98.00R.

Marble, Orlin G. Decorative article. 4,173,843, Cl. 47-41.00R.

Marcinkowsky, Arthur E.; Keller, George E., II; and Verma, Surendra K., to Union Carbide Corporation. Olefin separation process. 4,174,353, Cl. 585-835.000.

Marconi, Gary G.: *See—*
Nakatsukasa, Walter M.; Marconi, Gary G.; Neuss, Norbert; and Hamill, Robert L., 4,174,404, Cl. 424-283.000.

Margotte, Dieter: *See—*
Pischtschan, Alfred; Adelmann, Siegfried; and Margotte, Dieter, 4,174,325, Cl. 260-32.10N.

Marlowe, Frank J.; and Anderson, Charles H., to RCA Corporation. Flat display device. 4,174,523, Cl. 358-67.000.

Marra, Dorothea C.: *See—*
Spitzer, Joseph G.; Osipow, Lloyd I.; Small, Marvin; and Marra, Dorothea C., 4,174,386, Cl. 424-47.000.

Martacto Naviera S.A.: *See—*
Secord, Herbert C.; and Schwendtner, Alfred H., 4,173,936, Cl. 114-74.00A.

Martin, David L., to Krebs Engineers. Hydrocyclone apparatus and method for underflow density control. 4,174,275, Cl. 209-211.000.

Martin, Harry F.: *See—*
Martin, James A., Jr.; Martin, Harry F.; and Berry, William R., 4,173,869, Cl. 60-646.000.

Martin, James A., Jr.; Martin, Harry F.; and Berry, William R., to Westinghouse Electric Corp. Apparatus and method for determining the rotor temperature of a steam turbine. 4,173,869, Cl. 60-646.000.

Martin, Jerry R.: *See—*
Tadanier, John S.; Martin, Jerry R.; and Kurath, Paul, 4,174,312, Cl. 260-112.50R.

Martin, Richard L., to American Safety Equipment Corporation. Pressurized gas flow control valve and assembly thereof with reducer regulator. 4,173,986, Cl. 137-613.000.

Martineau, Philippe M., to Regie Nationale des Usines Renault. Method of fabricating a flexible fuel tank. 4,174,245, Cl. 156-245.000.

Maruoka, Hiroyuki: *See—*
Suzuki, Suzuo; Maruoka, Hiroyuki; Tachibana, Setsuzo; Matsubara, Yuji; and Nagashi, Hatsuo, 4,173,888, Cl. 73-194.00F.

Marvin Glass & Associates: *See—*
Meyer, Burton C.; and Hicks, Alan A., 4,174,105, Cl. 272-31.00A.

Marzolf, Rene, to VDO Adolf Schindling AG. Device for transmission of measurement values. 4,174,515, Cl. 340-58.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Kayserling, Ulrich, 4,173,933, Cl. 105-182.00R.

Maschinenfabrik Gehring Gesellschaft mit beschrankter Haftung & Co. Kommanditgesellschaft: *See—*
Gehring, Heinz; Bender, Albert; Richter, Gunter; and Froschle, Reinhard, 4,173,847, Cl. 51-34.00J.

Mashimo, Yukio; Uchiyama, Takashi; and Sorimachi, Kanehiro, to Canon Kabushiki Kaisha. Exposure control system. 4,174,161, Cl. 354-33.000.

Mashio, Tasuku: *See—*
Nishiyama, Hiroshi; Ogawa, Toshio; and Mashio, Tasuku, 4,174,421, Cl. 428-432.000.

Massachusetts Institute of Technology: *See—*
Misunas, David P.; Jessel, Peter G.; and Jacobsen, Robert G., 4,174,536, Cl. 364-200.000.

Massey-Ferguson Inc.: *See—*
Schwandt, Marvin W.; and Hern, John F., 4,174,129, Cl. 292-216.000.

Massip, Jean C.: *See—*
Chastagnier, Jean; and Massip, Jean C., 4,174,501, Cl. 325-56.000.

Masson Scott Thrissell Engineering, Ltd.: *See—*
Byrt, Graham A. B.; and Riddler, Douglas E., 4,173,905, Cl. 74-356.000.

Mathis, Joseph S. Vehicle cover assembly. 4,174,134, Cl. 296-136.000.

Matlock, Tony L. Standard surface assembly for calibrating a variable speed friction tester. 4,173,885, Cl. 73-1.00R.

Matoba, Yasuo; Kise, Yoshio; Yamada, Nobuo; Hashimoto, Akira; and Nakata, Tetsuya, to Osaka Soda Co. Ltd. Uncured chlorinated polyethylene composition with hexamethylphosphoric triamide and mercaptotriazine. 4,174,341, Cl. 260-45.70S.

Matson, Stephen L., to General Electric Company. Maintaining the separation efficiency of immobilized liquid membranes in gas separation methods and apparatus. 4,174,374, Cl. 423-232.000.

Matsubara, Katsumi: *See—*
Mori, Hidetomo; Matsubara, Katsumi; Mishina, Haruo; Arai, Akira; Uchida, Riichi; Yokoyama, Eiji; and Arai, Hajime, 4,174,196, Cl. 418-9.000.

Matsubara, Yuji: *See—*
Suzuki, Suzuo; Maruoka, Hiroyuki; Tachibana, Setsuzo; Matsubara, Yuji; and Nagashi, Hatsuo, 4,173,888, Cl. 73-194.00F.

Matsuda, Sumio; and Kudara, Hajime, to Chugoku Marine Paints Ltd. Anti-fouling paint composition. 4,174,339, Cl. 260-40.00R.

Matsuda, Yasumasa: *See—*
Tanabe, Masanori; Shimada, Satoshi; Nishihara, Motohisa; Yamada, Kazuji; Matsuda, Yasumasa; Shimazoe, Michitaka; Matsuoka, Yoshitaka; Takahashi, Yukio; Katohgi, Katsuya; and Ai, Mitsuo, 4,173,900, Cl. 73-727.000.

Matsuo, Jon T.; and Boyum, Ronald S., to United States of America, Navy. Dual parachute ripcord cable releasable clamp. 4,174,084, Cl. 244-149.000.

Matsuoka, Yoshitaka: *See—*
Tanabe, Masanori; Shimada, Satoshi; Nishihara, Motohisa; Yamada, Kazuji; Matsuda, Yasumasa; Shimazoe, Michitaka; Matsuoka, Yoshitaka; Takahashi, Yukio; Katohgi, Katsuya; and Ai, Mitsuo, 4,173,900, Cl. 73-727.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Inoue, Michihiro; Kimura, Takeji; Sato, Masaharu; and Tsunoo, Masahiko, 4,173,916, Cl. 84-1.090.

Matte, Yvanhoe; and Walker, G. Russel, to United States of America, Army. Safety shutter for a fuze. 4,173,932, Cl. 102-254.000.

Matthews, John W., decreased; and Stobbs, William M., to International Business Machines Corporation. Growing epitaxial films when the misfit between film and substrate is large. 4,174,422, Cl. 428-621.000.

Maunder, Martha. Back pack. 4,174,059, Cl. 224-209.000.

Mauser Kommandit-Gesellschaft: *See—*
Kimm, Otfried; Hammes, Theo; and Loebler, Peter, 4,174,044, Cl. 215-252.000.

May & Baker Limited: *See—*
Chapman, Robert F.; Jackson, David D.; and Lee, Glyn E., 4,174,391, Cl. 424-180.000.

Mayer, Jurgen: *See—*
Futterer, Bodo; Mayer, Jurgen; and Fritschy, Hugo, 4,173,822, Cl. 29-596.000.

Mayes, Warden W., to Cosden Technology, Inc. High severity process for the production of aromatic hydrocarbons. 4,174,270, Cl. 208-64.000.

Mayes, Warden W., to Cosden Technology, Inc. High severity reforming. 4,174,271, Cl. 208-64.000.

Mayfield, Harold. Record handling device. 4,174,130, Cl. 294-25.000.

Mazzeo, Charles F.: *See—*
Waddington, William T.; and Mazzeo, Charles F., 4,174,147, Cl. 339-176.0MP.

McAleer, William J.; and Wasmuth, Edward H., to Merck & Co., Inc. Method for preparing hepatitis B immune globulin. 4,174,388, Cl. 424-86.000.

McCarthy, Donald C.; and Rayl, Martin, to RCA Corporation. Printed circuit board with increased arc track resistance. 4,174,531, Cl. 361-411.000.

McCollum, Patrick E.: *See—*
McFall, William A.; White, Stanley A.; Lane, Howard K.; Butcher, Daryl T.; Anderson, Donald V., Jr.; McCollum, Patrick E.; Kirk, James F.; and Plesset, Richard, 4,174,496, Cl. 323-9.000.

McCord, Robert C., to Diamond International Corporation. Egg drying apparatus. 4,173,831, Cl. 34-236.000.

McDonald, William D. Portable apparatus for fabricating wooden trusses. 4,174,061, Cl. 227-152.000.

McDonnell Douglas Corporation: *See—*
Meares, Lawrence G.; and Simpson, Robert D., 4,174,465, Cl. 179-15.00A.

McFall, William A.; White, Stanley A.; Lane, Howard K.; Butcher, Daryl T.; Anderson, Donald V., Jr.; McCollum, Patrick E.; Kirk, James F.; and Plesset, Richard, to Rockwell International Corporation. Monolithic solid state power controller. 4,174,496, Cl. 323-9.000.

McFarland, Keith E., to Xerox Corporation. Electrostatic printing machine with improved web-developing system. 4,173,945, Cl. 118-660.000.

McKlveen, John R. Textured synthetic fiber yarn and process for making same. 4,173,860, Cl. 57-247.000.

McManus, Sam P.: *See—*
Campbell, David L., 4,174,096, Cl. 256-24.000.

McNeil Laboratories, Incorporated: *See—*
Rasmussen, Chris R., 4,174,401, Cl. 424-273.00R.

Meares, Lawrence G.; and Simpson, Robert D., to McDonnell Douglas Corporation. Signal transmitting interface system combining time compression and multiplexing. 4,174,465, Cl. 179-15.00A.

Meckstroth, Alan F.; and Pease, James F. Method of making a hose clamp with tangential screw. 4,173,816, Cl. 29-526.00R.

Medtronic, Inc.: *See—*
Jurva, Edsel O.; and Mosman, Howard D., 4,174,424, Cl. 429-90.000.

Melander, Theodore A.; and Charnley, Ralph L., to Pako Corporation. Anti-oxidation fluid replenisher control system for processor of photosensitive material. 4,174,169, Cl. 354-324.000.

Melnick, Joseph L.; and Wallis, Craig. Resin and method for removing antimicrobials from body fluids. 4,174,277, Cl. 210-36.000.

Menche, Eckhard, to Kali und Salz AG. Process for the production of coarse K_2SO_4 in crystallizers and classifiers. 4,174,382, Cl. 423-552.000.

Mercer, Frank B., to Netlon Limited. Tubular plastics material net having corrugations. 4,174,416, Cl. 428-107.000.

Merck & Co., Inc.: *See—*
Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzmann, Thomas N., 4,174,316, Cl. 260-239.00A.
McAleer, William J.; and Wasmuth, Edward H., 4,174,388, Cl. 424-86.000.
Mrozik, Helmut, 4,174,400, Cl. 424-273.00B.

Merklinger, Harold M.; and Bluy, Orest Z., to Canada, Her Majesty the Queen in right of. Modular low noise preamplifier. 4,174,503, Cl. 330-300.000.

Merritt, Lauren V.: *See—*
Hunter, Robert K., Jr.; Grafton, David A.; Lander, Joseph; Merritt, Lauren V.; Stewart, Donald E.; and Wolpert, Donald H., 4,174,174, Cl. 355-39.000.

Messenger, Joseph U., to Mobil Oil Corporation. Technique for controlling lost circulation employing improved soft plug. 4,173,999, Cl. 166-293.000.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See—*
Sardanowsky, Wladimir, 4,174,081, Cl. 244-17.170.

Metallgesellschaft Aktiengesellschaft: *See—*
Holehouse, Stephen L., 4,174,375, Cl. 423-240.000.

Metsugi, Masahiro: *See—*
Watanabe, Sohsuke; and Metsugi, Masahiro, 4,174,067, Cl. 239-112.000.

Meyer, Burton C.; and Hicks, Alan A., to Marvin Glass & Associates. Player actuated flying toy. 4,174,105, Cl. 272-31.00A.

Michael, Uri: *See—*
Schonberger, Eva; Sasson, Zabar; and Michael, Uri, 4,174,446, Cl. 544-313.000.

Michelotti, Francis W.: *See—*
Seidenberger, James W.; and Michelotti, Francis W., 4,174,292, Cl. 252-189.000.

Microwave Development Labs.: *See—*
Young, Paul T. K., 4,174,507, Cl. 333-122.000.

Mielbeck, Roger L.: *See—*
Flegel, George J.; Mielbeck, Roger L.; and Pizarek, Patrick J., 4,173,800, Cl. 4-207.000.

Mielens, Zigurd E., to Sterling Drug Inc. Method for the prophylaxis of SRS-A-induced symptoms. 4,174,402, Cl. 424-274.000.

Milberger, Lionel J., to FMC Corporation. Method and apparatus for interfacing a plurality of control systems for a subsea well. 4,174,000, Cl. 166-362.000.

Miller, Arthur F.: *See—*
Grasselli, Robert K.; Miller, Arthur F.; and Shaw, Wilfrid G., 4,174,354, Cl. 585-626.000.

Miller, Richard G.: *See—*
Campbell, David L., 4,174,096, Cl. 256-24.000.

Milne, James: *See—*
Tyrer, Richard G.; and Milne, James, 4,174,412, Cl. 427-297.000.

Min, Tae B.: *See—*
Hardy, William B.; Min, Tae B.; and Hoffman, Joseph A., 4,174,343, Cl. 260-45.75B.

Minagawa, Motonobu: *See—*
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,174,297, Cl. 252-399.000.

Minegishi, Tomoya; and Takaya, Matsufumi. Black chromium electroplating process. 4,174,265, Cl. 204-51.000.

Minnesota Mining and Manufacturing Company: *See—*
Goettert, Edward J.; and Van Dyke Tiers, George, 4,174,409, Cl. 427-1.000.

Minolta Camera Kabushiki Kaisha: *See—*
Hohda, Takeo; Tominaga, Shinji; and Ohta, Yoshiharu, 4,174,165, Cl. 354-105.000.
Nanba, Yasuhiro; and Yamada, Seiji, 4,174,160, Cl. 354-24.000.
Yamamoto, Toshio; and Yuge, Shizuo, 4,174,170, Cl. 355-3.0TR.
Yamashita, Maki, 4,174,168, Cl. 354-206.000.

Minor, William H.: *See—*
Garbelman, David L.; Minor, William H.; and Shaw, Arthur G., 4,174,181, Cl. 366-2.000.

Mirtain, Henri J., to Uniroyal, Inc. Pneumatic tire with asymmetric reinforcing belt. 4,173,991, Cl. 152-361.0FP.

Mishina, Haruo: *See—*
Mori, Hidetomo; Matsubara, Katsumi; Mishina, Haruo; Arai, Akira; Uchida, Riichi; Yokoyama, Eiji; and Arai, Hajime, 4,174,196, Cl. 418-9.000.

Misunas, David P.; Jessel, Peter G.; and Jacobsen, Robert G., to Massachusetts Institute of Technology. Digital communications controller with firmware control. 4,174,536, Cl. 364-200.000.

Mitchell, George L.: *See—*
Hickey, Robert B., 4,174,107, Cl. 273-29.00A.

Mitchell, Thomas O.; and Whitehurst, Darrell D., to Mobil Oil Corporation. Synthetic amorphous silica paraffin hydrogenation-dehydrogenation. 4,174,356, Cl. 585-661.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Murakami, Katsuo; Otani, Mitsuoki; Ito, Hiroshi; Awazu, Kenzo; Ibuki, Sumiaki; and Takeda, Toshiyuki, 4,174,294, Cl. 252-301.40P.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Kasai, Hironao; Fujii, Hitoshi; and Toki, Naoji, 4,174,186, Cl. 405-71.000.
Toki, Naoji, 4,174,185, Cl. 405-27.000.

Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Ohmura, Taizo; Yonezawa, Noboru; and Ikuta, Kazuo, 4,174,211, Cl. 75-0.50B.

Mitsui Petrochemical Industries, Ltd.: *See—*
Ohdaira, Akio; Tomoshige, Toru; and Onodera, Kinich, 4,174,335, Cl. 260-29.6RW.

Mitter, Mathias. Screen printing machine. 4,173,928, Cl. 101-126.000.

Mixan, Craig E., to Dow Chemical Company, The. ((5-Nitro-2-thiazolyl)thio) and ((5-nitro-2-thiazolyl)sulfinyl)pyrazines. 4,174,394, Cl. 424-250.000.

Miyasaka, Kenzi: *See—*
Motoki, Jinro; Ichikawa, Singo; Miyasaka, Kenzi; Uematsu, Hiroyuki; Murata, Mitsuhiro; Kawashima, Hideyuki; Inoue, Yuri; Ohkubo, Masae; and Ooka, Mituo, 4,173,863, Cl. 58-85.500.

Mobay Chemical Corporation: *See—*
Sivaramakrishnan, Parameswar; and Baron, Arthur L., 4,174,359, Cl. 260-860.000.

Mobil Oil Corporation: *See—*
Braid, Milton, 4,174,285, Cl. 252-51.50A.
Messenger, Joseph U., 4,173,999, Cl. 166-293.000.
Mitchell, Thomas O.; and Whitehurst, Darrell D., 4,174,356, Cl. 585-661.000.
Schwartz, Albert B., 4,174,272, Cl. 208-120.000.
Stournas, Stamoulis, 4,174,309, Cl. 260-13.000.

Moczygemba, George A., to Phillips Petroleum Company. Coupling of alkali metal-terminated polymers. 4,174,360, Cl. 260-880.000.

Mogaki, Katsuo: *See—*
Taguchi, Masahiko; Mogaki, Katsuo; and Takada, Syun, 4,174,220, Cl. 430-613.000.

Mohn, Larry W., to Boeing Company, The. Flow deflector for fluid inlet. 4,174,083, Cl. 244-53.00B.

Mohring, Edgar; and Roessler, Peter, to Bayer Aktiengesellschaft. Combating arthropods with substituted triazine-2,4-diones. 4,174,392, Cl. 424-249.000.

Mohring, Edgar; and Roessler, Peter, to Bayer Aktiengesellschaft. Preparation of arthropodicidally active substituted triazine-2,4-diones. 4,174,445, Cl. 544-223.000.

Moldavanov, Viktor P.: *See—*
Nemets, Rusaam S.; Gorbulev, Efim S.; Parygin, Veniamin A.; Kontsov, Jury M.; Moldavanov, Viktor P.; Shaforenko, Mark A.; Ignatiev, Alexei K.; Zaikovsky, Gennady S.; and Volnyakov, Mikhail I., 4,173,878, Cl. 72-137.000.

Moller, Peter: *See—*
Forstermann, Ulrich; Schafer, Hans-Peter; Moller, Peter; Ries, Karl; Lather, Dieter; and Jannsen, Klaus-Uwe, 4,173,897, Cl. 73-609.000.
Forstermann, Ulrich; Schafer, Hans-Peter; Moller, Peter; Lather, Dieter; Ries, Karl; and Jannsen, Klaus-Uwe, 4,173,898, Cl. 73-611.000.

Momin, Abdulmajid U., to Jaymin Research Corporation. Thermographic diagnostic method and system, 4,173,970, Cl. 128-736.000.

Mongeon, Ronald W., to Stellar Systems, Inc. Intrusion warning system. 4,174,518, Cl. 340-561.000.

Monsanto Company: *See—*
Salame, Morris; and Steingiser, Samuel, 4,174,043, Cl. 215-1.00C.

Montecantini Edison S.p.A.: *See—*
Sianesi, Dario; Nelli, Giuseppe; Fontanelli, Renzo; and Zamboni, Valentino, 4,174,461, Cl. 568-582.000.

Montedison S.p.A.: *See—*
Bargigia, Gianangelo; Caporiccio, Gerardo; and Carniselli, Giuliano, 4,174,295, Cl. 252-305.000.
Gafa, Salvatore; and Burzio, Fulvio, 4,174,306, Cl. 252-546.000.
Giannini, Umberto; Albizzati, Enrico; Parodi, Sandro; and Pirinoli, Franco, 4,174,299, Cl. 252-429.00B.
Giannini, Umberto; Albizzati, Enrico; Parodi, Sandro; and Pirinoli, Franco, 4,174,429, Cl. 526-114.000.

Mookherjee, Braja D.; Wilson, Richard A.; Schmitt, Frederick L.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. 1-(2,6,6-Trimethyl-1,3-cyclohexadien-1-yl)-1,3-butanedione and organoleptic uses thereof. 4,174,286, Cl. 252-174.110.

Mookherjee, Braja D.: *See—*
Kamath, Venkatesh; Mookherjee, Braja D.; and Schmitt, Frederick L., 4,174,287, Cl. 252-174.110.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Schmitt, Frederick L.; and Shuster, Edward J., 4,174,288, Cl. 252-174.110.

Moore, Irving, Jr.: *See—*
Wesselski, Fred A.; and Moore, Irving, Jr., 4,174,408, Cl. 426-302.000.

Moran, Steven E., to United States of America, Navy. Ultra high speed gated pulse optical imaging system. 4,174,524, Cl. 358-95.000.

Morgan, Peter D.; and Taig, Alistair G., to Bendix Westinghouse Limited. Vehicle power assisted steering apparatus. 4,174,017, Cl. 180-132.000.

Mori, Hidetomo; Matsubara, Katsumi; Mishina, Haruo; Arai, Akira; Uchida, Riichi; Yokoyama, Eiji; and Arai, Hajime, to Hitachi, Ltd. Screw fluid machine. 4,174,196, Cl. 418-9.000.

Morokawa, Shigeru: *See—*
Nakagiri, Tadahiko; Daigo, Kunihiro; Oguchi, Toshiaki; Hatuse, Toshikazu; Shimazaki, Toshikazu; Morokawa, Shigeru; Natori, Minoru; and Ogawa, Hiroshi, 4,173,862, Cl. 58-23.0BA.

Mortensen, J D, to University of Utah. Cannula for arterial and venous bypass cannulation. 4,173,981, Cl. 128-348.000.

Moser, Roland: *See—*
Habermeier, Jurgen; Moser, Roland; and Seiz, Wolfgang, 4,174,455, Cl. 560-49.000.

Moser, Willi. Game of skill. 4,174,106, Cl. 273-1.00E.

Mosman, Howard D.: *See—*
Jurva, Edsel O.; and Mosman, Howard D., 4,174,424, Cl. 429-90.000.

Motoki, Jinro; Ichikawa, Singo; Miyasaka, Kenzi; Uematsu, Hiroyuki; Murata, Mitsuhiro; Kawashima, Hideyuki; Inoue, Yuri; Ohkubo, Masae; and Ooka, Mituo, to Citizen Watch Company Limited. Analog quartz timepiece. 4,173,863, Cl. 58-85.500.

Motorola, Inc.: *See—*
Wilson, Alan L.; and Backof, Charles A., Jr., 4,174,502, Cl. 329-104.000.

Mrozik, Helmut, to Merck & Co., Inc. Anthelmintic benzimidazoles. 4,174,400, Cl. 424-273.00B.

Mueller, Robert L.: *See—*
United States of America, National Aeronautics and Space Administration; Mueller, Robert L.; and Yasui, Robert K., 4,173,820, Cl. 29-572.000.

Mueller, Ruediger; Pomper, Michael; and Leipold, Ludwig, to Siemens Aktiengesellschaft. Integrated current supply circuit. 4,174,535, Cl. 363-147.000.

Mulder, Rudolf: *See—*
Van Daalen, Jan J.; and Mulder, Rudolf, 4,174,393, Cl. 424-250.000.

Muller, Hanns P.; Oberkirch, Wolfgang; Wagner, Kuno; and Quiring, Bernd, to Bayer Aktiengesellschaft. Novel transparent polyurethane polyureas for lamination of glazing materials. 4,174,240, Cl. 156-99.000.

Munsingwear, Inc.: *See—*
Bloomquist, Lynn M. H.; and Brazil, Robert J., 4,173,976, Cl. 128-159.000.

Murakami, Katsuo; Otani, Mitsuoki; Ito, Hiroshi; Awazu, Kenzo; Ibuki, Sumiaki; and Takeda, Toshiyuki, to Mitsubishi Denki Kabushiki Kaisha. Fluorescent material. 4,174,294, Cl. 252-301.40P.

Murata Manufacturing Co., Ltd.: *See—*
Nishiyama, Hiroshi; Ogawa, Toshio; and Mashio, Tasuku, 4,174,421, Cl. 428-432.000.

Murata, Mitsuhiro: *See—*
Motoki, Jinro; Ichikawa, Singo; Miyasaka, Kenzi; Uematsu, Hiroyuki; Murata, Mitsuhiro; Kawashima, Hideyuki; Inoue, Yuri; Ohkubo, Masae; and Ooka, Mituo, 4,173,863, Cl. 58-85.500.

Murphy, Donald E.: *See—*
Patel, Pradeep V.; and Murphy, Donald E., 4,174,355, Cl. 585-843.000.

Murtha, Timothy P., to Phillips Petroleum Company. Catalyst for production of cycloalkylaromatics. 4,174,302, Cl. 252-455.00R.

Mussinan, Cynthia J.; Mookherjee, Braja D.; Schmitt, Frederick L.; and Shuster, Edward J., to International Flavors & Fragrances Inc. Maltyl-2-methyl alkenoates and novel perfume compositions and perfumed articles containing same. 4,174,288, Cl. 252-174.110.

Myles, Thomas A., to Carborundum Company, The. Refractory moldable composition containing ceramic fiber and colloidal silica. 4,174,331, Cl. 260-29.10R.

Myzenkov, Felix A.; Klushin, Dmitry N.; Shupikov, Viktor A.; Kaizer, Alexandr A.; Shuklin, Anatoly M.; Deresh, Mikhail D.; Kolbin, Nikolai A.; Tolmacheva, Alla P.; Zyryanova, Galina V.; Uzlov, Vitaly M.; and Shmuelzon, Elka I. Process for treatment of antimony-containing materials. 4,174,372, Cl. 423-88.000.

Nagahama, Taketoshi: *See—*
Sakamoto, Teruhisa; Nagahama, Taketoshi; Nakamura, Shigeo; and Kihara, Keiichi, 4,174,459, Cl. 562-534.000.

Nagaishi, Hatsuo: *See—*
Suzuki, Suzuo; Maruoka, Hiroyuki; Tachibana, Setsuzo; Matsubara, Yuji; and Nagaishi, Hatsuo, 4,173,888, Cl. 73-194.00F.

Nagase, Tsuneyuki: *See—*
Fujita, Fumio; Fukami, Kousuke; Fujimoto, Masanori; and Nagase, Tsuneyuki, 4,174,440, Cl. 536-120.000.

Nagashima, Motoi, to Cima Kogaku Company Limited. Interchangeable lens for cameras. 4,174,167, Cl. 354-196.000.

Nakagiri, Tadahiko; Daigo, Kunihiro; Oguchi, Toshiaki; Hatuse, Toshikazu; Shimazaki, Toshikazu; Morokawa, Shigeru; Natori, Minoru; and Ogawa, Hiroshi. Booster circuit for electronic timepiece. 4,173,862, Cl. 58-23.0BA.

Nakahara, Yasuhiro: *See—*
Kido, Shiro; Yokota, Tetsuo; and Nakahara, Yasuhiro, 4,174,430, Cl. 521-146.000.

Nakahara, Yutaka: *See—*
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,174,297, Cl. 252-399.000.

Nakamura, Satoshi; Ikushima, Ichiro; Sasaki, Yoshimitsu; Chiba, Katuaki; and Ito, Ryoichi, to Hitachi, Ltd. Mount for a light emitting device. 4,174,491, Cl. 313-499.000.

Nakamura, Shigeo: *See—*
Sakamoto, Teruhisa; Nagahama, Taketoshi; Nakamura, Shigeo; and Kihara, Keiichi, 4,174,459, Cl. 562-534.000.

Nakamura, Souichirou: *See—*
Yamamoto, Masatoshi; Makino, Keisuke; Suzukawa, Kiyomi; Nakamura, Souichirou; and Sakai, Kiyomi, 4,173,821, Cl. 29-574.000.

Nakane, Hisashi: *See—*
Komine, Takashi; Yokota, Akira; Nakane, Hisashi; Asaumi, Shingo; and Okazaki, Noboru, 4,174,222, Cl. 430-190.000.

Nakano, Tatsuo; Hori, Shozo; and Kishi, Ikuji, to Denki Kagaku Kogyo Kabushiki Kaisha. Hardenable composition containing diisopropylbenzene dihydroperoxide. 4,174,311, Cl. 260-28.50R.

Nakase, Takamichi: *See—*
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,173,957, Cl. 123-119.0EC.

Nakata, Tetsuya: *See—*
Matoba, Yasuo; Kise, Yoshio; Yamada, Nobuo; Hashimoto, Akira; and Nakata, Tetsuya, 4,174,341, Cl. 260-45.70S.

Nakatsukasa, Walter M.; Marconi, Gary G.; Neuss, Norbert; and Hamill, Robert L., to Eli Lilly and Company. Deoxynarasin antibiotics. 4,174,404, Cl. 424-283.000.

Nakayama, Shinpei: *See—*
Saito, Fumio; Yamai, Fumito; Beppu, Yositugu; and Nakayama, Shinpei, 4,174,425, Cl. 521-56.000.

Nakazumi, Tadataka, to Toyo Kogyo Co., Ltd. Exhaust gas recirculation apparatus controlled by clutch, throttle and timer. 4,174,027, Cl. 192-0.084.

Nalco Chemical Company: *See—*
Choca, Monica E.; and Feistel, Gerald R., 4,174,301, Cl. 252-455.00R.

Nanba, Yasuhiro; and Yamada, Seiji, to Minolta Camera Kabushiki Kaisha. Programmed automatic exposure control circuitry. 4,174,160, Cl. 354-24.000.

Natico, Inc.: *See—*
Ralston, George D., 4,174,246, Cl. 156-391.000.

National Hand Tool Corporation: *See—*
Chow, Kirk K., 4,174,037, Cl. 206-378.000.

National Research Development Corporation: *See—*
Dell, Christopher C., 4,174,281, Cl. 210-83.000.
Franks, Albert, 4,174,478, Cl. 250-276.000.

Natori, Minoru: *See—*
Nakagiri, Tadahiko; Daigo, Kunihiro; Oguchi, Toshiaki; Hatuse, Toshikazu; Shimazaki, Toshikazu; Morokawa, Shigeru; Natori, Minoru; and Ogawa, Hiroshi, 4,173,862, Cl. 58-23.0BA.

Naturin-Werk Becker & Co.: *See—*
Korlatzki, Rudi; and Schumacher, Gunter, 4,174,436, Cl. 528-80.000.

Neale, Ronald G., to Harris Corporation. PROM electrically written by solid phase epitaxy. 4,174,521, Cl. 357-45.000.

Neilson, Robert M., Jr.: *See—*
Colombo, Peter; Neilson, Robert M., Jr.; and Becker, Walter W., 4,174,293, Cl. 252-301.10W.

Nelimarkka, Juha A. E. Ball valve with spindle, having parallelepiped-bearing block joint portions. 4,174,090, Cl. 251-86.000.

Nelli, Giuseppe: *See—*
Sianesi, Dario; Nelli, Giuseppe; Fontanelli, Renzo; and Zamboni, Valentino, 4,174,461, Cl. 568-582.000.

Nelson, Beckay J.: *See—*
Tolley, William K.; and Nelson, Beckay J., 4,174,274, Cl. 209-166.000.

Nemets, Rusaam S.; Gorbulev, Efim S.; Parygin, Veniamin A.; Kontsov, Jury M.; Moldavanov, Viktor P.; Shaforenko, Mark A.; Ignatiev, Alexei K.; Zaikovsky, Gennady S.; and Volnyakov, Mikhail I. Method of manufacturing tangential expanders for oil control piston rings. 4,173,878, Cl. 72-137.000.

Netlon Limited: *See—*
Mercer, Frank B., 4,174,416, Cl. 428-107.000.

Neuss, Norbert: *See—*
Nakatsukasa, Walter M.; Marconi, Gary G.; Neuss, Norbert; and Hamill, Robert L., 4,174,404, Cl. 424-283.000.

NFE International Ltd.: *See—*
Dupre, George T.; and DeMarco, Thomas M., 4,174,206, Cl. 55-434.000.

NGK Insulators, Ltd.: *See—*
Kawaguchi, Toshiyuki; and Hayashi, Tomio, 4,174,464, Cl. 174-212.000.

Nichols, Richard D. E., to Bianchi Leather Products, Inc. Buckleless belt. 4,173,794, Cl. 2-322.000.

Nicholson, Barrie F. Hole cutter having rotatable blade carrier. 4,173,913, Cl. 83-555.000.

Nicol, Charles H.: *See—*
Burns, Michael E.; and Nicol, Charles H., 4,174,305, Cl. 252-545.000.

Nienart, Louis F., to Allied Chemical Corporation. Stabilized magnetic shields. 4,174,419, Cl. 428-313.000.

Nihon Repro Machine Kogyo Kabushiki Kaisha: *See—*
Kinoshita, Tomoo, 4,174,198, Cl. 425-135.000.

Niida, Chiaki: *See—*
Yamada, Kinsaku; Niida, Chiaki; and Takayama, Teruo, 4,173,955, Cl. 123-119.00A.

Ning, Tak H.: *See—*
Bassous, Ernest; Ning, Tak H.; and Osburn, Carlton M., 4,173,818, Cl. 29-571.000.

Nippon Electric Co., Ltd.: *See—*
Ogawa, Hiroshi, 4,174,506, Cl. 333-1.100.

Nippon Kogaku K. K.: *See—*
Shio, Megumu, 4,173,902, Cl. 74-10.520.

Nippon Kogaku K.K.: *See—*
Daitoku, Kouichi; and Takahata, Kouichi, deceased, 4,174,166, Cl. 354-173.000.

Nippon Oil Company, Limited: *See—*
Kaihara, Takashi; Taneoka, Masao; and Kusaka, Toshitsugu, 4,174,480, Cl. 250-342.000.

Nippon Soken, Inc.: *See—*
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,173,957, Cl. 123-119.0EC.

Nishihara, Motohisa: *See—*
Tanabe, Masanori; Shimada, Satoshi; Nishihara, Motohisa; Yamada, Kazuji; Matsuda, Yasumasa; Shimazoe, Michitaka; Matsuoka, Yoshitaka; Takahashi, Yukio; Katohgi, Katsuya; and Ai, Mitsuo, 4,173,900, Cl. 73-727.000.

Nishiyama, Hiroshi; Ogawa, Toshio; and Mashio, Tasuku, to Murata Manufacturing Co., Ltd. Piezoelectric crystalline film of zinc oxide and method for making same. 4,174,421, Cl. 428-432.000.

Nissan Motor Company, Limited: *See—*
Asano, Masaharu, 4,173,952, Cl. 123-32.0EE.
Hagiwara, Yutaca, 4,174,024, Cl. 188-1.00A.
Ikeura, Kenji; Saito, Masaaki; and Yamane, Michiyoshi, 4,173,956, Cl. 123-119.0EC.
Suzuki, Suzuo; Maruoka, Hiroyuki; Tachibana, Setsuzo; Matsubara, Yuji; and Nagaishi, Hatsuo, 4,173,888, Cl. 73-194.00F.

Niznik, George E., to General Electric Company. Flame retardant rigid thermoplastic foams. 4,174,432, Cl. 521-180.000.

Noguchi, Tatsuhiko: *See—*
Seki, Sigeru; Noguchi, Tatsuhiko; Ohta, Minoru; and Kurita, Ryuichi, 4,174,224, Cl. 106-38.300.

Norlin Industries, Inc.: *See—*
Gross, Glenn M., 4,173,915, Cl. 84-1.190.

Norris, Alan H.; and Chambley, Phillip W., to WWG Industries, Inc. Method and apparatus for controlling twist in yarn. 4,173,861, Cl. 57-293.000.

North American Philips Corporation: *See—*
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Northern Telecom Limited: *See—*
Kotlarewsky, Paul, 4,174,534, Cl. 363-26.000.

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Nudenberg, Walter: *See—*
Little, Julian R.; Nudenberg, Walter; and Rim, Yong S., 4,174,457, Cl. 560-134.000.

Nudyne Corporation: *See—*
Schaefer, Kenneth A., 4,173,876, Cl. 72-83.000.

Oberkirch, Wolfgang: *See—*
Muller, Hanns P.; Oberkirch, Wolfgang; Wagner, Kuno; and Quiring, Bernd, 4,174,240, Cl. 156-99.000.

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Oeschger, Joseph E.; and Berkeland, James E., to United States of America, Energy. High pressure electrical insulated feed thru connector. 4,174,145, Cl. 339-94.00A.

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Ogawa, Hiroshi: *See—*
Nakagiri, Tadahiko; Daigo, Kunihiro; Oguchi, Toshiaki; Hatuse, Toshikazu; Shimazaki, Toshikazu; Morokawa, Shigeru; Natori, Minoru; and Ogawa, Hiroshi, 4,173,862, Cl. 58-23.0BA.

Ogawa, Toshio: *See—*
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Ogino, Shigeo: *See—*
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Oguchi, Toshiaki: *See—*
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Ohdaira, Akio; Tomoshige, Toru; and Onodera, Kinich, to Mitsui Petrochemical Industries, Ltd. Aqueous dispersions of olefinic resin compositions and process for preparation thereof. 4,174,335, Cl. 260-29.6RW.

Ohkubo, Masae: *See—*
Motoki, Jinro; Ichikawa, Singo; Miyasaka, Kenzi; Uematsu, Hiroyuki; Murata, Mitsuhiro; Kawashima, Hideyuki; Inoue, Yuri; Ohkubo, Masae; and Ooka, Mituo, 4,173,863, Cl. 58-85.500.

Ohloff, Gunther: *See—*
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Ohmura, Taizo; Yonezawa, Noboru; and Ikuta, Kazuo, to Mitsubishi Kinzoku Kabushiki Kaisha. Process for manufacturing composite powder for powder metallurgy. 4,174,211, Cl. 75-0.50B.

Ohta, Minoru: *See—*
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Hohda, Takeo; Tominaga, Shinji; and Ohta, Yoshiharu, 4,174,165, Cl. 354-105.000.

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Komine, Takashi; Yokota, Akira; Nakane, Hisashi; Asaumi, Shingo; and Okazaki, Noboru, 4,174,222, Cl. 430-190.000.

Okuda Koki Co., Ltd.: *See—*
Takama, Teruhiro, 4,173,896, Cl. 73-518.000.

Olin Corporation: *See—*
Ralston, Richard W., Jr., 4,174,267, Cl. 204-99.000.
Saeman, Walter C.; Coe, Noel N.; and Faust, John P., 4,174,411, Cl. 427-214.000.

Olympus Optical Co., Ltd.: *See—*
Fujiwara, Toshihide; Kaneko, Nobutaka; and Fujimori, Ryo, 4,173,943, Cl. 118-718.000.
Kusuyama, Michio, 4,174,469, Cl. 179-121.00D.
Ouchi, Teruo; and Kato, Yutaka, 4,174,178, Cl. 356-39.000.
Yamada, Hiroyuki, 4,174,080, Cl. 242-199.000.
Yonekubo, Ken, 4,174,151, Cl. 350-175.0ML.

Oniki, Tetsuya: *See—*
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Onodera, Kinich: *See—*
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Osaka Soda Co. Ltd.: *See—*
Matoba, Yasuo; Kise, Yoshio; Yamada, Nobuo; Hashimoto, Akira; and Nakata, Tetsuya, 4,174,341, Cl. 260-45.70S.

Osburn, Carlton M.: *See—*
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Osipow, Lloyd I.: *See—*
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Otness, Leslie. Household grain cleaner. 4,174,276, Cl. 209-250.000.
Ouchi, Teruo; and Kato, Yutaka, to Olympus Optical Co., Ltd. Blood serum bearing film with position indicating mark. 4,174,178, Cl. 356-39.000.
Oude Alink, Bernardus A.; and Thompson, Neil E. S., to Petrolite Corporation. Substituted pyridines. 4,174,370, Cl. 422-12.000.
Outboard Marine Corporation: *See—*
Strang, Charles D., 4,173,939, Cl. 115-17.000.
Owens-Illinois, Inc.: *See—*
Boling, Norman L.; and Fein, Michael E., 4,174,476, Cl. 219-121.00L.
Owens, Walter K., to 3-in-1, Inc. Vending machine for newspapers and the like. 4,174,047, Cl. 221-154.000.
Padovese, Aldo A.; Trevisan, Giuseppe M. B.; and Sitar, Emilio C., to Robert Bosch GmbH. Inductive ignition control pulse generator in an internal combustion engine distributor. 4,173,960, Cl. 123-146.50A.
Paget, Charles J.; Chamberlin, James W.; and Wikel, James H., to Eli Lilly and Company. Alkylidenylmethyl-substituted 1-sulfonylbenzimidazoles. 4,174,454, Cl. 548-306.000.
Pahl, Karl-Heinz, to Pahl'sche Gummi—und Asbest-Gesellschaft "PAGUAG". Continuous method for making hoses with destruction of horizontally disposed mandrel. 4,174,365, Cl. 264-146.000.
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Pahl, Karl-Heinz, 4,174,365, Cl. 264-146.000.
Pako Corporation: *See—*
Melander, Theodore A.; and Charsley, Ralph L., 4,174,169, Cl. 354-324.000.
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Panavision, Incorporated: *See—*
Gottschalk, Robert E., 4,174,157, Cl. 352-35.000.
Panneman, Hendrik, to U.S. Philips Corporation. Filtering device. 4,174,006, Cl. 141-87.000.
Papalardo, William A. Nutcracker. 4,173,825, Cl. 30-120.300.
Paper Converting Machine Company: *See—*
Charles, Richard J., 4,174,077, Cl. 242-68.600.
Steiner, Gary F.; and Campbell, James F., 4,173,846, Cl. 51-248.000.
Papke, Friedrich; and Scholz, Erwin, to Rollei-Werke Franke & Heidecke. Crank drive for a photographic camera. 4,173,903, Cl. 74-47.000.
Papst-Motoren KG: *See—*
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Parcor: *See—*
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Parisien, Rudolph E. Boat dock. 4,174,187, Cl. 405-221.000.
Parodi, Sandro: *See—*
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Giannini, Umberto; Albizzati, Enrico; Parodi, Sandro; and Pirinoli, Franco, 4,174,429, Cl. 526-114.000.
Parsons, Ronald. Double walled rotary tubular conveyor. 4,174,033, Cl. 198-804.000.
Parygin, Veniamin A.: *See—*
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Paschke, Klaus, to ITT Industries, Inc. Method of selective gas etching on a silicon nitride layer. 4,174,251, Cl. 156-643.000.
Patel, Pradeep V.; and Murphy, Donald E., to B. F. Goodrich Company, The. Process for removing α-acetylenes from diolefins. 4,174,355, Cl. 585-843.000.
Patterson, James A. Water level controller for swimming pool gutter. 4,173,799, Cl. 4-172.170.
Paul, Volker: *See—*
Regel, Erik; Frohberger, Paul-Ernst; and Paul, Volker, 4,174,398, Cl. 424-270.000.
Paurat, Friedrich W. Condition responsive trench excavator. 4,173,836, Cl. 37-81.000.
Paustian, John E.: *See—*
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Pearce, Michael L. Induction furnaces for high temperature continuous melting applications. 4,174,462, Cl. 13-26.000.
Pease, James F.: *See—*
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Peco Limited: *See—*
Goldsmith, Sydney A.; Taylor, John A.; and Kleinschafer, Richard, 4,173,859, Cl. 56-330.000.
Pecor, Lloyd A. Apparatus for and method of sampling liquid oxygen. 4,173,895, Cl. 73-421.50R.
Peeters, Jozef C. I., to U.S. Philips Corporation. Mirror condenser lamp. 4,174,487, Cl. 313-113.000.
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Jarque, Ricardo Granados; Cartes, Juan Bosch; Jimenez, Rosa Llobera; Roldan, Cristobal Martinez; and Peinado, Fernando Rabadan, 4,174,451, Cl. 546-283.000.
Pellegrino, Peter P. Apparatus for electroplating, deplating or etching. 4,174,261, Cl. 204-273.000.
Pennwalt Corporation: *See—*
Kulischenko, Walter; and Capdevielle, Martin J., 4,173,937, Cl. 114-144.00R.
Pentland, Alex M.: *See—*
Jaseck, James E.; and Pentland, Alex M., 4,173,901, Cl. 74-6.000.
Perdijon, Jean, to Commissariat a l'Energie Atomique. Method and device for scanning by means of a focused ultrasonic beam. 4,173,899, Cl. 73-620.000.
Permawick Company, Inc.: *See—*
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Pesce, Carl A.; Trnka, Ralph J.; and Winkless, Robert A., to Continental Group, Inc., The. Brush mounting for rotary electrical joint. 4,174,142, Cl. 339-5.00R.
Peterson, Donald J.: *See—*
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Petit, Leon; Davin, Andre; and Gueguen, Jacques, to Institut National de la Recherche Agronomique. Purified sunflower seed protein isolates. 4,174,313, Cl. 260-123.500.
Petracca, Victor G.: *See—*
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Petrolite Corporation: *See—*
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Pfeffer, Paul, to Etablissements Carpano & Pons. Electric motors control system. 4,174,494, Cl. 318-54.000.
Philibert, Daniel. Vibratory cleaner for endless belt conveyor. 4,174,030, Cl. 198-494.000.
Phillips Petroleum Company: *See—*
Borel, Albert W.; and Baldwin, Bernard A., 4,174,284, Cl. 252-48.600.
Carroll, James C.; and Shafer, Clel H., 4,174,248, Cl. 156-538.000.
Chapman, Charles C., 4,174,357, Cl. 585-701.000.
Moczygemba, George A., 4,174,360, Cl. 260-880.000.
Murtha, Timothy P., 4,174,302, Cl. 252-455.00R.
Pierce, Linden W., to General Electric Company. Heat exchanger arrangement for vaporization cooled transformers. 4,173,996, Cl. 165-105.000.
Piersall, Raymond. Roof bolt and the like. 4,173,918, Cl. 85-75.000.
Piesik, Edward T., to General Dynamics Corporation. Two-way rocket plenum for combustion suppression. 4,173,919, Cl. 89-1.800.
Pipeline Seal and Insulation Co. Ltd.: *See—*
Dockree, Basil F., 4,174,124, Cl. 285-54.000.
Pirinoli, Franco: *See—*
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Giannini, Umberto; Albizzati, Enrico; Parodi, Sandro; and Pirinoli, Franco, 4,174,429, Cl. 526-114.000.
Pischtschan, Alfred; Adelmann, Siegfried; and Margotte, Dieter, to Bayer Aktiengesellschaft. Thermoplastic ABS moulding compositions with improved impact strength. 4,174,325, Cl. 260-32.10N.
Pizarek, Patrick J.: *See—*
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Plattner, Robert F., to Bastian Blessing Company, Inc. Pizza making machine. 4,173,942, Cl. 118-25.000.
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Pocholle, Bernard, to Robert Bosch GmbH. Fuel injection pulse suppressor apparatus. 4,173,953, Cl. 123-32.0EL.
Pohl, Rudolph L., to Hercules Incorporated. Relief plates from polymer with terminal unsaturation. 4,174,218, Cl. 430-306.000.
Polaroid Corporation: *See—*
Friedman, Harvey S.; and Lippert, Irving S., 4,174,164, Cl. 354-86.000.
Idelson, Elbert M., 4,174,221, Cl. 430-225.000.
Poli, Pierre R., to Electronique Marcel Dassault. Method for the improved utilization of response signals in a secondary radar system and a secondary radar system for implementing the method. 4,174,519, Cl. 343-6.50R.
Polychrome Corporation: *See—*
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Pone, John, Jr., to Pako Corporation. Photographic printer with interactive color balancing. 4,174,173, Cl. 355-38.000.
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Porat, David. Detachable paper bag carrier. 4,174,060, Cl. 224-45.00H.
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PPG Industries, Inc.: *See—*
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Boberski, William G.; Chang, Wen-Hsuan; Petracca, Victor G.; and Seiner, Jerome A., 4,174,229, Cl. 106-107.000.
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Hartman, Marvis E.; and Hockswender, Thomas R., 4,174,333, Cl. 260-29.2EP.
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Rockar, Paul A.; Law, Melvin K.; and Hawk, Thomas W., 4,174,241, Cl. 156-102.000.
Tolliver, Richard J., 4,174,076, Cl. 242-56.00B.
Pradt, Louis A.; and Gitchel, Wayne B., to Sterling Drug Inc. Oxidation process. 4,174,280, Cl. 210-60.000.
Praehauser, Georg: *See—*
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Pratt, Fred, Jr., to Teleci, Inc. Energy control system providing selective control of remote zone heating or cooling from a central location. 4,174,064, Cl. 236-1.00B.
Preformed Line Products Company: *See—*
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Preikschat, Fritz K. Apparatus and method for providing separate conductivity, dielectric coefficient, and moisture measurements of particulate material. 4,174,498, Cl. 324-57.00R.
Premier Drum Company Limited, The: *See—*
Della-Porta, Clifford A., 4,173,917, Cl. 84-419.000.
Prest, J. David. Prest-O-Fit universal adapter fitting. 4,173,989, Cl. 138-109.000.
Preziosi, Joseph R.; and Trimmer, Paul A., to Amerace Corporation. Access panel fastener retainer. 4,174,008, Cl. 151-69.000.
Pro Sharp Corporation: *See—*
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Burns, Michael E.; and Nicol, Charles H., 4,174,305, Cl. 252-545.000.
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PUMA-Sportschuhfabriken Rudolf Dassler KG: *See—*
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Querry, Lester R., to Digital Communications Corporation. Directional PSK modulation and demodulation system. 4,174,505, Cl. 332-9.00R.
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Rabus, Friedrich; and Grather, Gunter, to Robert Bosch GmbH. Ignition system with essentially constant ignition coil energy supply. 4,173,962, Cl. 123-148.00E.
Rahman, Michael, to Envirotech Corporation. Humidifer. 4,174,362, Cl. 261-90.000.
Ralston, George D., to Natico, Inc. Hand taping device. 4,174,246, Cl. 156-391.000.
Ralston, Richard W., Jr., to Olin Corporation. Method for detecting incipient short circuits in electrolytic cells. 4,174,267, Cl. 204-99.000.
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Ramsbottom, Edgar; Whalley, William; and Bale, Edmund, to Chloride Group Limited. Electric storage batteries. 4,174,004, Cl. 141-32.000.
Raptoplous, Harry C., to Obezag Design and Development Corporation. Prefabricated building frame structure. 4,173,855, Cl. 52-82.000.
Rasmussen, Chris R., to McNeil Laboratories, Incorporated. 2-Benzhydrylimino-imidazolidines. 4,174,401, Cl. 424-273.00R.
Rasmussen, Glenn A.: *See—*
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Ratcliffe, Ronald W.: *See—*
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Rauenbusch, Erich; and Schmidt, Delf, to Bayer Aktiengesellschaft. Process for isolating glucopyranose compound from culture broths. 4,174,439, Cl. 536-18.000.

Rayl, Martin: *See—*
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Kressel, Henry; and Spak, Mark A., 4,174,252, Cl. 156-653.000.
Marlowe, Frank J.; and Anderson, Charles H., 4,174,523, Cl. 358-67.000.
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Reeves, James W.; Sylvester, Robert W.; and Wells, David F., to Du Pont de Nemours, E. I., and Company. Chlorine and iron oxide from ferric chloride—process and apparatus. 4,174,381, Cl. 423-502.000.
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Regel, Erik; Frohberger, Paul-Ernst; and Paul, Volker, to Bayer Aktiengesellschaft. Combating fungi with 1-alkyl-1-(1,3,4-thiadiazol-2-yl)-3-phenyl-ureas. 4,174,398, Cl. 424-270.000.
Regie Nationale des Usines Renault: *See—*
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Reid, Robert H., to Reid, Robert; Alpern, Robert; Schmier, Allan B.; Fealk, Sheldon A.; and Ellis, Jerry Michael, a part interest to each. Method of identification of surface proteins of cancer cells, clinical test and method of immunization. 4,174,385, Cl. 424-1.000.
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Reinholz, Orville A. Adjustable golf putter. 4,174,108, Cl. 273-79.000.
Reiss, Karl. Roller bearing with synchronized cage ring and stabilizing ring. 4,174,141, Cl. 308-206.000.
Relyea, Douglas I.; Hubbard, Winchester L.; and Grahame, Robert E., Jr., to Uniroyal, Inc. Thiophenes useful in control of acarids. 4,174,405, Cl. 424-275.000.
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Renold, Walter; Skorianetz, Werner; Schulte-Elte, Karl-Heinrich; and Ohloff, Gunther, to Firmenich SA. Spirane derivatives. 4,174,327, Cl. 260-346.110.
Repetto, Silvio, to S.p.A. Luigi Rizzi & C. Apparatus for automatically centering an endless band trained over two rolls. 4,173,904, Cl. 74-241.000.
Rexnord Inc.: *See—*
MacLeod, Donald R., 4,174,031, Cl. 198-501.000.
Reynolds, David W.: *See—*
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Rich, Edward L., III: *See—*
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Richter, Gunter: *See—*
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Forstermann, Ulrich; Schafer, Hans-Peter; Moller, Peter; Lather, Dieter; Ries, Karl; and Jannsen, Klaus-Uwe, 4,173,898, Cl. 73-611.000.
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Robert Bosch GmbH: *See—*
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Roberts, Richard W., to Borg-Warner Corporation. Variable capacity compressor. 4,174,191, Cl. 417-222.000.

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Robertshaw Controls Company: *See—*
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Rockar, Paul A.; Law, Melvin K.; and Hawk, Thomas W., to PPG Industries, Inc. Simultaneously laminating and press polishing plastic laminated transparencies. 4,174,241, Cl. 156-102.000.

Rockwell International Corporation: *See—*
Estess, John H., 4,174,100, Cl. 269-306.000.
Johnson, Nira C., 4,173,891, Cl. 73-231.00M.
Macleod, John G., 4,174,092, Cl. 251-214.000.
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Jargue, Ricardo Granados; Domingo, Mercedes Alvarez; Cartes, Juan Bosch; Roldan, Cirstobal Martinez; and Peinado, Fernando Rabadan, 4,174,396, Cl. 424-256.000.

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Rollei-Werke Franke & Heidecke: *See—*
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Rollins, Ralph T. Variable downdraft carburetor. 4,174,361, Cl. 261-41.00B.

Rosa, John, to Westinghouse Electric Corp. Static current limiting switch with soft forced commutation. 4,174,495, Cl. 323-9.000.

Rose, Heinrich, to Schloemann-Siemag AG. Rolling stand with hydraulic adjustment of the mill rolls. 4,173,881, Cl. 72-245.000.

Rosenblatt, Martin. PsychologicaL game. 4,173,833, Cl. 35-22.00R.

Roth, Christa: *See—*
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Rowatt, Robert J.: *See—*
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Rowe, William, to Polychrome Corporation. Room-temperature-radiation-curable polyurethane. 4,174,307, Cl. 204-159.190.

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Rucker, John T.; and Porter, Donald H., to Hooker Chemicals & Plastics Corp. Electrolytic cell structure and method of assembly. 4,174,259, Cl. 204-252.000.

Rudolph, Robert L. Gun having disposable cartridge. 4,174,068, Cl. 239-322.000.

Rupp, James A., to United States of America, Army. Secure fiber optics communication system. 4,174,149, Cl. 350-96.330.

Rusenko, James J.: *See—*
Hicks, Loy A., Jr.; and Rusenko, James J., 4,174,143, Cl. 339-22.00B.

Rydell, Theodore B., to Kimberly-Clark Corporation. Method of forming highly absorbent fibrous webs and resulting products. 4,174,417, Cl. 428-221.000.

S/P Product Design, Inc.: *See—*
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Saat- und Erntetechnik GmbH: *See—*
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Saeman, Walter C.; Coe, Noel N.; and Faust, John P., to Olin Corporation. Granular calcium hypochlorite coated with an inorganic salt by spray graining. 4,174,411, Cl. 427-214.000.

Saito, Fumio; Yamai, Fumito; Beppu, Yositugu; and Nakayama, Shinpei, to Sekisui Kasehin Kogyo Kabushiki Kaisha; and Sekisui Kagaku Kogyo Kabushiki Kaisha. Process of preparing styrenic polymer foams. 4,174,425, Cl. 521-56.000.

Saito, Masaaki: *See—*
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Saito, Tomio, to Konishiroku Photo Industry Co., Ltd. Device for supplying a replenishing toner to a developing unit. 4,174,050, Cl. 222-43.000.

Sakai, Kiyomi: *See—*
Yamamoto, Masatoshi; Makino, Keisuke; Suzukawa, Kiyomi; Nakamura, Souichirou; and Sakai, Kiyomi, 4,173,821, Cl. 29-574.000.

Sakakibara, Kinsaku, to Senko Medical Instrument Mfg. Co., Ltd. Peristatic pump with hose positioning means and pressure adjustment apparatus. 4,174,193, Cl. 417-477.000.

Sakamoto, Teruhisa; Nagahama, Taketoshi; Nakamura, Shigeo; and Kihara, Keiichi, to Toyo Soda Manufacturing Co., Ltd. Process for producing methacrylic acid. 4,174,459, Cl. 562-534.000.

Sakshaug, Eugene C.: *See—*
Kresge, James S.; and Sakshaug, Eugene C., 4,174,530, Cl. 361-127.000.

Sakurai, Yo: *See—*
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Salame, Morris; and Steingiser, Samuel, to Monsanto Company. Nitrile preforms and containers and process improvements for forming same. 4,174,043, Cl. 215-1.00C.

Salzmann, Thomas N.: *See—*
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Samcoe Holding Corporation: *See—*
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Sardanowsky, Wladimir, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Apparatus for securing a flying craft to a starting and landing area. 4,174,081, Cl. 244-17.170.

Sasaki, Toshimitsu; Fujita, Keikichi; and Ito, Hajime, to Toyo Cloth Co. Ltd. Production of synthetic suede leather. 4,174,414, Cl. 428-85.000.

Sasaki, Yoshimitsu: *See—*
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Sato, Masaharu: *See—*
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Saviano, Arnold P.: *See—*
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Sawyer, George N., to General Electric Company. Auxiliary coil arrangement. 4,173,865, Cl. 62-324.000.

Sawyer, John: *See—*
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Saylor, Jay H.: *See—*
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Scarpellino, Anthony J., Jr., to International Nickel Company, Inc., The. Iridium compound and preparation thereof. 4,174,378, Cl. 423-386.000.

Schaefer, Kenneth A., to Nadyne Corporation. Method of producing metal tubing. 4,173,876, Cl. 72-83.000.

Schaefer, Klaus, to Dr. Ing. Rudolf Hell GmbH. Method for locally precisely setting the start and end of reproduction in an engraving apparatus. 4,174,527, Cl. 358-267.000.

Schaefer, Peter; and Doerre, Wolfgang, to ITT Industries, Inc. Vehicle seat. 4,174,088, Cl. 248-395.000.

Schafer, Hans-Peter: *See—*
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Forstermann, Ulrich; Schafer, Hans-Peter; Moller, Peter; Lather, Dieter; Ries, Karl; and Jannsen, Klaus-Uwe, 4,173,898, Cl. 73-611.000.

Schafer, Walter; Wagner, Kuno; and Findeisen, Kurt, to Bayer Aktiengesellschaft. Polyhydroxyl compounds containing guanidine groups useful in preparation of polyurethane foams. 4,174,433, Cl. 528-49.000.

Schafer, Walter; Wagner, Kuno; and Findeisen, Kurt, to Bayer Aktiengesellschaft. Polyhydroxyl compounds containing phosphonoformamidine groups prepared from diisocyanatocarbodiimides, polyhydroxyl compounds and a phosphite. 4,174,435, Cl. 528-70.000.

Scharen, Richard O. Self-contained heating apparatus. 4,173,966, Cl. 126-121.000.

Scherrer, Robert A., to Riker Laboratories, Inc. 5,6-Methylenedioxy-2-nitro-3-phenylbenzofurans. 4,174,403, Cl. 424-282.000.

Schiessl, Alois; Prachauser, Georg; Badura, Wolfgang; and Trede, Wolfgang, to BUCK Chemisch-Technische Werke GmbH. & Co., Firma. Incendiary warhead. 4,173,931, Cl. 102-90.000.

Schinski, William L.; Huang, Irene C.; and Chan, David C. K., to Chevron Research Company. Herbicidal and plant-growth regulating N-haloacetylphenylamino carbonyl oximes. 4,174,210, Cl. 71-118.000.

Schiron, Dieter: *See—*
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Schloemann-Siemag AG: *See—*
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Schmelzer, Hans G.: *See—*
Dieterich, Dieter; Balle, Gerhard; and Schmelzer, Hans G., 4,174,434, Cl. 528-69.000.

Schmidberger, Rainer, to Dornier Systems GmbH. Compound cell for high-temperature electrochemical reactions. 4,174,260, Cl. 204-260.000.

Schmider, Fritz, to Papst-Motoren KG. Motor with a disk rotor. 4,174,484, Cl. 310-68.00R.

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Schmidt, Michael R.; and Reynolds, David W., to Sundstrand Corporation. Transmission. 4,173,867, Cl. 60-456.000.

Schmier, Allan B.: *See—*
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Schmitt, Frederick L.: *See—*
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Mookherjee, Braja D.; Wilson, Richard A.; Schmitt, Frederick L.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,174,286, Cl. 252-174.110.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Schmitt, Frederick L.; and Shuster, Edward J., 4,174,288, Cl. 252-174.110.

Schmitz, Charles R., to Raytheon Company. Bipolar monolithic integrated circuit memory with standby power enable. 4,174,541, Cl. 365-227.000.

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Schneider, Ronald A., to Chevron Research Company. Method of making reinforced concrete. 4,174,366, Cl. 264-228.000.

Schnepf, Gunther: *See—*
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Scholl, Gunter. Light-permeable thermal insulation apparatus. 4,173,969, Cl. 126-417.000.

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Schonberger, Eva; Sasson, Zabar; and Michael, Uri, to ABIC Ltd. Process for the preparation of N^1-(2'-furanidyl)-5-fluoro-uracil. 4,174,446, Cl. 544-313.000.

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den Otter, Marinus J. A. M.; Hawinkels, Lambertus P. G.; and Schouteten, Augustinus P. H., 4,174,444, Cl. 544-192.000.

Schulte-Elte, Karl-Heinrich: *See—*
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Schulz, Donald N.: *See—*
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Schulz, Hans-Hermann: *See—*
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Schumacher, Gunter: *See—*
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Schwalm, Donald J., to Holcroft & Company. Furnace for bright annealing of copper. 4,174,097, Cl. 266-87.000.

Schwandt, Marvin W.; and Hern, John F., to Massey-Ferguson Inc. Window latch. 4,174,129, Cl. 292-216.000.

Schwartz, Albert B., to Mobil Oil Corporation. Catalytic cracking of hydrocarbons. 4,174,272, Cl. 208-120.000.

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Schwendtner, Alfred H.: *See—*
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Seaburg, Duane M.: *See—*
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Searby, Dennis deB., to Speedshelf International, Inc. Shelving structure. 4,173,934, Cl. 108-111.000.

Secord, Herbert C.; and Schwendtner, Alfred H., to Martacto Naviera S.A. Tanks for the storage and transport of fluid media under pressure. 4,173,936, Cl. 114-74.00A.

Sedlak, John A.: *See—*
Giglia, Robert D.; Sedlak, John A.; and Lipp, David W., 4,174,152, Cl. 350-357.000.

Seidel, Harold, to Bell Telephone Laboratories, Incorporated. Electronic hybrid. 4,174,470, Cl. 179-170.0NC.

Seidenberger, James W.; and Michelotti, Francis W., to J. T. Baker Chemical Company. Spill control composition and use thereof. 4,174,292, Cl. 252-189.000.

Seifert, Hermann; Waldman, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, to Bayer Aktiengesellschaft. Process for the hydroxylation of phenols and phenol ethers in the nucleus. 4,174,460, Cl. 568-629.000.

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Boberski, William G.; Chang, Wen-Hsuan; Petracca, Victor G.; and Seiner, Jerome A., 4,174,229, Cl. 106-107.000.

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Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
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Semix, Incorporated: *See—*
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Sharp, Richard S.: *See—*
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Shaw, Arthur G.: *See—*
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Shaw, Wilfrid G.: *See—*
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Shiho, Shinho: *See—*
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Shimazaki, Toshikazu: *See—*
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Shimazoe, Michitaka: *See—*
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Shimizu, Akihiko: *See—*
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Shimizu, Masahiro, to Zojirushi Vacuume Bottle Co., Ltd. Vacuum bottle having a tilt responsive closure. 4,174,053, Cl. 222-209.000.

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Shio, Megumu, to Nippon Kogaku K. K. Single-axis coarse and fine adjustment device provided with medium adjustment. 4,173,902, Cl. 74-10.520.

Shmuelzon, Elka I.: *See—*
Myzenkov, Felix A.; Klushin, Dmitry N.; Shupikov, Viktor A.; Kaizer, Alexandr A.; Shuklin, Anatoly M.; Deresh, Mikhail D.; Kolbin, Nikolai A.; Tolmachevs, Alla P.; Zyryanova, Galina V.; Uzlov, Vitaly M.; and Shmuelzon, Elka I., 4,174,372, Cl. 423-88.000.

Shoffner, James P., to UOP Inc. Separation of dissimilar amines. 4,174,351, Cl. 260-582.000.

Shukla, Jayendra G.: *See—*
Smith, Ray E.; and Shukla, Jayendra G., 4,174,328, Cl. 260-17.4CL.

Shuklin, Anatoly M.: *See—*
Myzenkov, Felix A.; Klushin, Dmitry N.; Shupikov, Viktor A.; Kaizer, Alexandr A.; Shuklin, Anatoly M.; Deresh, Mikhail D.; Kolbin, Nikolai A.; Tolmachevs, Alla P.; Zyryanova, Galina V.; Uzlov, Vitaly M.; and Shmuelzon, Elka I., 4,174,372, Cl. 423-88.000.

Shupikov, Viktor A.: *See—*
Myzenkov, Felix A.; Klushin, Dmitry N.; Shupikov, Viktor A.; Kaizer, Alexandr A.; Shuklin, Anatoly M.; Deresh, Mikhail D.; Kolbin, Nikolai A.; Tolmachevs, Alla P.; Zyryanova, Galina V.; Uzlov, Vitaly M.; and Shmuelzon, Elka I., 4,174,372, Cl. 423-88.000.

Shuster, Edward J.: *See—*
Hall, John B.; Sprecker, Mark A.; Shuster, Edward J.; Schmitt, Frederick L.; and Vinals, Joaquin F., 4,173,982, Cl. 131-9.000.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Schmitt, Frederick L.; and Shuster, Edward J., 4,174,288, Cl. 252-174.110.

Sianesi, Dario; Nelli, Giuseppe; Fontanelli, Renzo; and Zamboni, Valentino, to Montecantini Edison S.p.A. Stabilized perfluoropolyether fluids. 4,174,461, Cl. 568-582.000.

Siemens Aktiengesellschaft: *See—*
Heuwieser, Erwin; Scianna, Cosimo; and Wetzel, Klaus, 4,173,963, Cl. 123-149.00D.
Holle, Johannes, 4,174,492, Cl. 315-39.000.
Liebetruth, Reiner, 4,174,481, Cl. 250-445.00T.
Mueller, Ruediger; Pomper, Michael; and Leipold, Ludwig, 4,174,535, Cl. 363-147.000.
Windele, Josef, 4,174,176, Cl. 355-110.000.

Sigman, John J., Jr., to Lear Siegler, Inc. Plunge shaving machine. 4,173,920, Cl. 409-37.000.

Sih, John C.: *See—*
Johnson, Roy A.; and Sih, John C., 4,174,441, Cl. 542-426.000.

Silcock, Gordon H. Brushes. 4,173,805, Cl. 15-97.00B.

Simpson, Benny E., to Dow Chemical Company, The. Kit and method for testing liquids for hydrogen sulfide content. 4,174,202, Cl. 23-230.00R.

Simpson, Francis M., Jr.: *See—*
Baker, Ralph C.; Ellis, Larry E.; and Simpson, Francis M., Jr., 4,174,098, Cl. 267-8.00R.

Simpson, Robert D.: *See—*
Meares, Lawrence G.; and Simpson, Robert D., 4,174,465, Cl. 179-15.00A.

Sinclair International Bar Services Limited: *See—*
Emery, John A., 4,174,057, Cl. 222-332.000.

Sitar, Emilio C.: *See—*
Padovese, Aldo A.; Trevisan, Giuseppe M. B.; and Sitar, Emilio C., 4,173,960, Cl. 123-146.50A.

Sivaramakrishnan, Parameswar; and Baron, Arthur L., to Mobay Chemical Corporation. Flame retardant polycarbonate polyblends. 4,174,359, Cl. 260-860.000.

Skachkov, Jury V.: *See—*
Vinokurov, Alexandr A.; Gorbunov, Gennady S.; Korolkov, Anatoly G.; Popov, Jury S.; Rozenfeld, Lev M.; Skachkov, Jury V.; Filippov, Iosif F.; and Khutoretsky, Gary M., 4,174,483, Cl. 310-52.000.

Skala, Stephen F. Domestic appliance system with thermal exchange fluid. 4,173,993, Cl. 165-48.00R.

SKF Nova AB: *See—*
Lundgren, Bengt, 4,173,907, Cl. 74-459.000.

Skorianetz, Werner: *See—*
Renold, Walter; Skorianetz, Werner; Schulte-Elte, Karl-Heinrich; and Ohloff, Gunther, 4,174,327, Cl. 260-346.110.

Slosiarek, Michael L.; and Krieger, Gregory A., to Allis-Chalmers Corporation. Isolated step support. 4,174,116, Cl. 280-163.000.

Slosiarek, Michael L., to Allis-Chalmers Corporation. Isolated step support. 4,174,117, Cl. 280-163.000.

Small, Marvin: *See—*
Spitzer, Joseph G.; Osipow, Lloyd I.; Small, Marvin; and Marra, Dorothea C., 4,174,386, Cl. 424-47.000.

Smith, Frank, to Imperial Chemical Industries Limited. Coating and bonding of metals. 4,174,410, Cl. 427-57.000.

Smith, James L.; Helenberg, Harold W.; and Kilsdonk, Dennis J., to United States of America, Energy. RF transformer. 4,174,510, Cl. 336-62.000.

Smith, Ray E.; and Shukla, Jayendra G., to Velsicol Chemical Corporation. Flame retarded non-woven textile material comprised of flame retardant and vinyl chloride latex. 4,174,328, Cl. 260-17.4CL.

SmithKline Corporation: *See—*
Berges, David A., 4,174,323, Cl. 548-251.000.
Berges, David A., 4,174,324, Cl. 548-264.000.

Snook, Randolph W., to Pullman Incorporated. Metal and brick chimney liner. 4,173,923, Cl. 98-58.000.

Snyder, W. Henry. Orchard lifts. 4,174,022, Cl. 182-145.000.

S.p.A. Luigi Rizzi & C.: *See—*
Repetto, Silvio, 4,173,904, Cl. 74-241.000.

Societe Civile de Recherches et d'Applications Scientifiques: *See—*
Beguin, Alain, 4,174,393, Cl. 424-251.000.

Societe Franceo-Americaine de Constructions Atomiques-Framatome: *See—*
Vignes, Alain, 4,174,233, Cl. 148-4.000.

Societe Generale de Techniques et d'Etudes: *See—*
Cros, Pierre; Desorbay, Jean-Pierre; and Refoubelet, Jean-Jacques, 4,174,273, Cl. 208-364.000.

Societe Nationale Elf Aquitaine (Production): *See—*
Tramier, Bernard; and Guillerme, Michel, 4,174,278, Cl. 210-51.000.

Soden, George B.; Parikh, Hasit H.; and Kavanaugh, Richard J., to North American Philips Corporation. Electric motor with novel stator construction. 4,174,485, Cl. 310-89.000.

Solomon, Donald F., to S/P Product Design, Inc. Pneumatic amplifier. 4,173,984, Cl. 137-119.000.

Sommer, Werner; Vinnemann, Antonius; Walter, Manfred; Gaiser, Willi; Elsasser, Heinrich; Brenner, Wolfgang; and Kress, Hermann, to Sulzer Morat GmbH. Apparatus on a textile machine for feeding yarn, sliver or fibrous materials. 4,173,873, Cl. 66-125.00R.

Sommer, Werner; Vinnemann, Antonius; Walter, Manfred E.; Gaiser, Willi G.; Elsasser, Heinrich K.; Brenner, Wolfgang A. A.; and Kress, Hermann, to Sulzer Morat GmbH. Apparatus on a textile machine for the feeding of yarns, slivers or other fibrillar materials. 4,173,874, Cl. 66-125.00R.

Sorgenfrei, Malachi E.; and Garvin, Donald F., to BASF Wyandotte Corporation. Liquid detergent-bleach concentrates having high alkalinity. 4,174,289, Cl. 252-103.000.

Sorimachi, Kanehiro: *See—*
Mashimo, Yukio; Uchiyama, Takashi; and Sorimachi, Kanehiro, 4,174,161, Cl. 354-33.000.

Sosnowski, Stanislaw J. A.; and Potter, James C., to Lucas Industries Limited. Liquid fuel injection pumps. 4,173,959, Cl. 123-139.0AP.

Spain, Raymond G.: *See—*
Langlois, Guy B.; and Spain, Raymond G., 4,173,990, Cl. 139-440.000.

Spak, Mark A.: *See—*
Kressel, Henry; and Spak, Mark A., 4,174,252, Cl. 156-653.000.

Spanier, Hermann, to Dr. Boy K.G. Endswitch cam arrangement. 4,174,474, Cl. 200-331.000.

Sparkomatic Corporation: *See—*
Castagna, John F., 4,173,941, Cl. 116-307.000.

Speckhart, Frank H. Limited rotation roller tappet. 4,173,954, Cl. 123-90.500.

Speedshelf International, Inc.: *See—*
Searby, Dennis deB., 4,173,934, Cl. 108-111.000.

Sperry Rand Corporation: *See—*
Kline, Charles M., 4,174,072, Cl. 241-35.000.

Spie-Batignolles: *See—*
Cros, Pierre; Desorbay, Jean-Pierre; and Refoubelet, Jean-Jacques, 4,174,273, Cl. 208-364.000.

Spitzer, Joseph G.; Osipow, Lloyd I.; Small, Marvin; and Marra, Dorothea C. Aerosol antiperspirant compositions with good adherence to the skin. 4,174,386, Cl. 424-47.000.

Sprecker, Mark A.: *See—*
Hall, John B.; Sprecker, Mark A.; Shuster, Edward J.; Schmitt, Frederick L.; and Vinals, Joaquin F., 4,173,982, Cl. 131-9.000.

Stamicarbon, B.V.: *See—*
den Otter, Marinus J. A. M.; Hawinkels, Lambertus P. G.; and Schouteten, Augustinus P. H., 4,174,444, Cl. 544-192.000.

Standard Oil Company: *See—*
Veatch, Franklin; and Alford, Harvey E., 4,174,263, Cl. 208-11.0LE.

Standard Oil Company (Indiana): *See—*
Fields, Ellis K., 4,174,447, Cl. 546-109.000.
Zaremba, Hubart B., 4,174,011, Cl. 175-7.000.

Standard Oil Company (Ohio): *See—*
Grasselli, Robert K.; Miller, Arthur F.; and Shaw, Wilfrid G., 4,174,354, Cl. 585-626.000.

Stark, W. Max: *See—*
Hamill, Robert L.; and Stark, W. Max, 4,174,390, Cl. 424-117.000.

Stauffer Chemical Company: *See—*
Gaughan, Edmund J., 4,174,350, Cl. 260-558.00P.

Stauffer, Earl D.: *See—*
Beckman, Daniel L.; and Stauffer, Earl D., 4,174,036, Cl. 206-223.000.

Steen, Donald M. Flame retardant compositions and methods of preparing and using same. 4,174,223, Cl. 106-18.160.

Steiner Corporation: *See—*
Cassia, Antonio M., 4,173,858, Cl. 53-471.000.

Steiner, Gary F.; and Campbell, James F., to Paper Converting Machine Company. Orbital saw sharpening device. 4,173,846, Cl. 51-248.000.

Steingiser, Samuel: *See—*
Salame, Morris; and Steingiser, Samuel, 4,174,043, Cl. 215-1.00C.

Stellar Systems, Inc.: *See—*
Mongeon, Ronald W., 4,174,518, Cl. 340-561.000.

Stelte, David J., to GTE Automatic Electric Laboratories Incorporated. Digital coin circuit. 4,174,468, Cl. 179-6.30R.

Sterling Drug Inc.: *See—*
Mielens, Zigurd E., 4,174,402, Cl. 424-274.000.
Pradt, Louis A.; and Gitchel, Wayne B., 4,174,280, Cl. 210-60.000.

Sternberg, Stanley R., to Environmental Research Institute of Michigan. Parallel partitioned serial neighborhood processors. 4,174,514, Cl. 340-146.3MA.

Steward, Willis G. Receiver for solar energy. 4,173,968, Cl. 126-438.000.

Stewart, Charles W., Sr.: *See—*
Anolick, Colin; Robinson, Vivian M.; and Stewart, Charles W., Sr., 4,174,420, Cl. 428-310.000.

Stewart, Donald E.: *See—*
Hunter, Robert K., Jr.; Grafton, David A.; Lander, Joseph; Merritt, Lauren V.; Stewart, Donald E.; and Wolpert, Donald H., 4,174,174, Cl. 355-39.000.

Stewart Stamping Corporation: *See—*
Wolfthal, Maurice, 4,173,824, Cl. 29-783.000.

Stobbs, William M.: *See—*
Matthews, John W., decreased; and Stobbs, William M., 4,174,422, Cl. 428-621.000.

Stockinger, John, to Clayton, John M., Jr.; Berry, W. H., Jr.; and Clayton, John M., III. Bearing puller. 4,173,813, Cl. 29-266.000.

Stournas, Stamoulis, to Mobil Oil Corporation. Polyisocyanate cross-linked alkylene oxide-linear non-ionic polysaccharide reaction product. 4,174,309, Cl. 260-13.000.

Straitz, John F., III. Burner heads for waste combustible gas. 4,174,201, Cl. 431-202.000.

Strang, Charles D., to Outboard Marine Corporation. Two-speed transmission. 4,173,939, Cl. 115-17.000.

Strong, Herbert M.; Chrenko, Richard M.; and Tuft, Roy E., to General Electric Company. Annealing synthetic diamond type Ib. 4,174,380, Cl. 423-446.000.

Styck, Wayne G., to Caterpillar Tractor Co. Anti-rattle vehicle door latch mechanism. 4,174,128, Cl. 292-127.000.

Suhr, Robert G.: *See—*
Taylor, Haroid M.; and Suhr, Robert G., 4,174,209, Cl. 71-94.000.

Sulzer Brothers Limited: *See—*
Bollman, Edwin, 4,174,482, Cl. 290-1.00A.

Sulzer Morat GmbH: *See—*
Sommer, Werner; Vinnemann, Antonius; Walter, Manfred; Gaiser, Willi; Elsasser, Heinrich; Brenner, Wolfgang; and Kress, Hermann, 4,173,873, Cl. 66-125.00R.
Sommer, Werner; Vinnemann, Antonius; Walter, Manfred E.; Gaiser, Willi G.; Elsasser, Heinrich K.; Brenner, Wolfgang A. A.; and Kress, Hermann, 4,173,874, Cl. 66-125.00R.

Sumitomo Chemical Company, Limited: *See—*
Fujita, Fumio; Fukami, Kousuke; Fujimoto, Masanori; and Nagase, Tsuneyuki, 4,174,440, Cl. 536-120.000.
Fukui, Masaru; Ogino, Shigeo; and Yamamoto, Hisao, 4,174,407, Cl. 424-325.000.

Sundstrand Corporation: *See—*
Schmidt, Michael R.; and Reynolds, David W., 4,173,867, Cl. 60-456.000.

Suprapto, Otmax. Washing machine. 4,173,875, Cl. 68-18.00D.

Suzukawa, Kiyomi: *See—*
Yamamoto, Masatoshi; Makino, Keisuke; Suzukawa, Kiyomi; Nakamura, Souichirou; and Sakai, Kiyomi, 4,173,821, Cl. 29-574.000.

Suzuki, Suzuo; Maruoka, Hiroyuki; Tachibana, Setsuzo; Matsubara, Yuji; and Nagaishi, Hatsuo, to Nissan Motor Company, Limited. Peak point detector for ionized mass flow rate measurement. 4,173,888, Cl. 73-194.00F.

Swanson, Wesley S.: *See—*
Donahue, William R., Jr.; and Swanson, Wesley S., 4,174,091, Cl. 251-138.000.

Swearingen, Judson S.; and Beeloo, Leendert A. Control system and method. 4,173,870, Cl. 60-702.000.

Swiss Aluminium Ltd.: *See—*
Borer, Werner J.; and Zuzak, Tomas, 4,174,203, Cl. 23-294.00R.
Lenz, Dieter; and Tragner, Erich, 4,174,232, Cl. 148-2.000.

Swodenk, Wolfgang: *See—*
Seifert, Hermann; Waldman, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,174,460, Cl. 568-629.000.

Sylvester, Robert W.: *See—*
Reeves, James W.; Sylvester, Robert W.; and Wells, David F., 4,174,381, Cl. 423-502.000.

Symmes, Russell. Method and apparatus for retreading tires. 4,174,239, Cl. 156-96.000.

Syntex (USA) Inc.: *See—*
Kluge, Arthur F.; and Harrison, Ian T., 4,174,399, Cl. 424-271.000.

Syva Company: *See—*
Ullman, Edwin F.; and Schwarzberg, Moshe, 4,174,384, Cl. 424-8.000.

Tabushi, Iwao; Kato, Hidefumi; Taniguchi, Yoichi; and Kuroda, Yasuhisa, to Tabushi, Iwao. Heavy metal ion adsorbents. 4,174,428, Cl. 525-334.000.

Tachibana, Setsuzo: *See—*
Suzuki, Suzuo; Maruoka, Hiroyuki; Tachibana, Setsuzo; Matsubara, Yuji; and Nagaishi, Hatsuo, 4,173,888, Cl. 73-194.00F.

Tadanier, John S.; Martin, Jerry R.; and Kurath, Paul, to Abbott Laboratories. 4-N-acylfortimicin B derivatives and the chemical conversion of fortimicin B to fortimicin A. 4,174,312, Cl. 260-112.50R.

Taguchi, Masahiko; Mogaki, Katsuo; and Takada, Syun, to Konishiroku Photo Industry Co., Ltd. Color photographic materials containing dye fading inhibitors. 4,174,220, Cl. 430-613.000.

Taguchi, Shinichiro, to Tokyo Shibaura Electric Co., Ltd. Composite color signal-handling circuit. 4,174,522, Cl. 358-35.000.

Taig, Alistair G.: *See—*
Morgan, Peter D.; and Taig, Alistair G., 4,174,017, Cl. 180-132.000.

Takada, Syun: *See—*
Taguchi, Masahiko; Mogaki, Katsuo; and Takada, Syun, 4,174,220, Cl. 430-613.000.

Takahashi, Yukio: *See—*
Tanabe, Masanori; Shimada, Satoshi; Nishihara, Motohisa; Yamada, Kazuji; Matsuda, Yasumasa; Shimazoe, Michitaka; Matsuoka, Yoshitaka; Takahashi, Yukio; Katohgi, Katsuya; and Ai, Mitsuo, 4,173,900, Cl. 73-727.000.

Takahata, Kosaku, legal successor: *See—*
Daitoku, Kouichi; and Takahata, Kouichi, deceased, 4,174,166, Cl. 354-173.000.

Takahata, Kouichi, deceased: *See—*
Daitoku, Kouichi; and Takahata, Kouichi, deceased, 4,174,166, Cl. 354-173.000.

Takama, Teruhiro, to C. Itoh & Co. Ltd.; and Okuda Koki Co., Ltd. Device for measuring rotational speed of a diesel engine. 4,173,896, Cl. 73-518.000.

Takao, Norito: *See—*
Yasuike, Akio; Kataoka, Hiroshi; and Takao, Norito, 4,174,413, Cl. 428-35.000.

Takasaki, Masami: *See—*
Hashimoto, Mitsuo; Takyu, Toshiyuki; Inoue, Masaru; Takasaki, Masami; and Shiho, Shinho, 4,174,230, Cl. 106-109.000.

Takata, Akira: *See—*
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,173,957, Cl. 123-119.0EC.

Takaya, Matsufumi: *See—*
Minegishi, Tomoya; and Takaya, Matsufumi, 4,174,265, Cl. 204-51.000.

Takayama, Teruo: *See—*
Yamada, Kinsaku; Niida, Chiaki; and Takayama, Teruo, 4,173,955, Cl. 123-119.00A.

Takeda, Keiso, to Toyota Jidosha Kogyo Kabushiki Kaisha. Secondary air feed control device. 4,173,864, Cl. 60-276.000.

Takeda, Toshiyuki: *See—*
Murakami, Katsuo; Otani, Mitsuoki; Ito, Hiroshi; Awazu, Kenzo; Ibuki, Sumiaki; and Takeda, Toshiyuki, 4,174,294, Cl. 252-301.40P.

Takyu, Toshiyuki: *See—*
Hashimoto, Mitsuo; Takyu, Toshiyuki; Inoue, Masaru; Takasaki, Masami; and Shiho, Shinho, 4,174,230, Cl. 106-109.000.

Tanabe, Masanori; Shimada, Satoshi; Nishihara, Motohisa; Yamada, Kazuji; Matsuda, Yasumasa; Shimazoe, Michitaka; Matsuoka, Yoshitaka; Takahashi, Yukio; Katohgi, Katsuya; and Ai, Mitsuo, to Hitachi, Ltd. Semiconductor pressure transducer. 4,173,900, Cl. 73-727.000.

Tanaka, Keiji: *See—*
Ando, Yujiro; Ohara, Katsunobu; and Tanaka, Keiji, 4,174,215, Cl. 430-66.000.

Taneoka, Masao: *See—*
Kaihara, Takashi; Taneoka, Masao; and Kusaka, Toshitsugu, 4,174,480, Cl. 250-342.000.

Taniguchi, Yoichi: *See—*
Tabushi, Iwao; Kato, Hidefumi; Taniguchi, Yoichi; and Kuroda, Yasuhisa, 4,174,428, Cl. 525-334.000.

Taylor, Harold M.; and Suhr, Robert G., to Eli Lilly and Company. Herbicidal 1-alkyl-3-phenylpyridinium salts. 4,174,209, Cl. 71-94.000.

Taylor, Harry M.: *See—*
Garrison, Charles M.; Youngquist, Rudolph W.; and Taylor, Harry M., 4,174,315, Cl. 260-123.500.

Taylor, John A.: *See—*
Goldsmith, Sydney A.; Taylor, John A.; and Kleinschafer, Richard, 4,173,859, Cl. 56-330.000.

Teleci, Inc.: *See—*
Pratt, Fred, Jr., 4,174,064, Cl. 236-1.00B.

Telecommunications Radioelectriques et Telephoniques TRT: *See—*
Guidoux, Loic B. Y.; and Renaudat, Jean-Louis, 4,174,489, Cl. 325-320.000.

Telefonaktiebolaget L M Ericsson: *See—*
Broger, Lars I.; and Magnusson, Sten E., 4,174,466, Cl. 179-18.0AD.

Tetra Pak Developpement SA: *See—*
Hoj, Peter, 4,174,200, Cl. 425-376.00A.

Thomas, Eric W.; and Maistros, Thomas J., to Industrial Electronic Rubber Company. Method of making a printing blanket. 4,174,244, Cl. 156-242.000.

Thompson, Neil E. S.: *See—*
Oude Alink, Bernardus A.; and Thompson, Neil E. S., 4,174,370, Cl. 422-12.000.

3-in-1, Inc.: *See—*
Owens, Walter K., 4,174,047, Cl. 221-154.000.

Thyssen Industrie AG: *See—*
Kreiskorte, Heinz, 4,173,877, Cl. 72-105.000.

Tichelaar, Gerrit W.: *See—*
Essers, Wilhelmus G.; Jelmorini, Gerardus; and Tichelaar, Gerrit W., 4,174,477, Cl. 219-121.00P.

Tidy, David C.: *See—*
Bertenshaw, Barry W.; Combe, Edward C.; Tidy, David C.; and Laycock, John N. C., 4,174,334, Cl. 260-29.60M.

Timm, Walter C., to Control Data Corporation. Magnetic bubble memory detector-amplifier. 4,174,539, Cl. 365-8.000.
Tischer, Werner: *See—*
Liebert, Karl-Heinz; and Tischer, Werner, 4,174,018, Cl. 180-132.000.
Toki, Naoji, to Mitsubishi Jukogyo Kabushiki Kaisha. Floating-type anti-oil anti-impact and anti-wave barrier. 4,174,185, Cl. 405-27.000.
Toki, Naoji: *See—*
Kasai, Hironao; Fujii, Hitoshi; and Toki, Naoji, 4,174,186, Cl. 405-71.000.
Tokyo Ohka Kogyo Kabushiki Kaisha: *See—*
Komine, Takashi; Yokota, Akira; Nakane, Hisashi; Asaumi, Shingo; and Okazaki, Noboru, 4,174,222, Cl. 430-190.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Kinoshita, Hiroyuki, 4,173,819, Cl. 29-571.000.
Taguchi, Shinichiro, 4,174,522, Cl. 358-35.000.
Tolley, William K.; and Nelson, Beckay J., to UOP Inc. Separation of rutile from ilmenite. 4,174,274, Cl. 209-166.000.
Tolliver, Richard J., to PPG Industries, Inc. Cutting stretched interlayer sheeting. 4,174,076, Cl. 242-56.000.
Tolmacheva, Alla P.: *See—*
Myzenkov, Felix A.; Klushin, Dmitry N.; Shupikov, Viktor A.; Kaizer, Alexandr A.; Shuklin, Anatoly M.; Deresh, Mikhail D.; Kolbin, Nikolai A.; Tolmacheva, Alla P.; Zyryanova, Galina V.; Uzlov, Vitaly M.; and Shmuelzon, Elka I., 4,174,372, Cl. 423-88.000.
Tomic, Ernst A., to Du Pont de Nemours, E. I., and Company. High-early-strength phosphate grouting system for use in anchoring a bolt in a hole. 4,174,227, Cl. 106-85.000.
Tominaga, Shinji: *See—*
Hohda, Takeo; Tominaga, Shinji; and Ohta, Yoshiharu, 4,174,165, Cl. 354-105.000.
Tomoshige, Toru: *See—*
Ohdaira, Akio; Tomoshige, Toru; and Onodera, Kinich, 4,174,335, Cl. 260-29.6RW.
Tonka Corporation: *See—*
Fahrendorf, Curtis H.; and Berckhan, Delmar D., 4,173,840, Cl. 46-202.000.
Torrington Company, The: *See—*
Johnston, Dean E., 4,174,138, Cl. 308-235.000.
Toyo Cloth Co. Ltd.: *See—*
Sasaki, Toshimitsu; Fujita, Keikichi; and Ito, Hajime, 4,174,414, Cl. 428-85.000.
Toyo Kogyo Co., Ltd.: *See—*
Nakazumi, Tadataka, 4,174,027, Cl. 192-0.084.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Asami, Shunichi; Seita, Toru; and Shimizu, Akihiko, 4,174,426, Cl. 521-27.000.
Kido, Shiro; Yokota, Tetsuo; and Nakahara, Yasuhiro, 4,174,430, Cl. 521-146.000.
Sakamoto, Teruhisa; Nagahama, Takenoshi; Nakamura, Shigeo; and Kihara, Keiichi, 4,174,459, Cl. 562-534.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,173,957, Cl. 123-119.0EC.
Kato, Yuzo; Ii, Akira; and Oniki, Tetsuya, 4,173,958, Cl. 123-136.000.
Takeda, Keiso, 4,173,864, Cl. 60-276.000.
Tragner, Erich: *See—*
Lenz, Dieter; and Tragner, Erich, 4,174,232, Cl. 148-2.000.
Tramier, Bernard; and Guillerme, Michel, to Societe Nationale Elf Aquitaire (Production). Treatment of residual earth drilling muds. 4,174,278, Cl. 210-51.000.
Tranter, Inc.: *See—*
Roethe, Lester A., 4,173,949, Cl. 122-1.00C.
Trede, Wolfgang: *See—*
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Tyrer, Richard G.; and Milne, James, to Balfour Beatty Limited. Structures and structural members made wholly or partly of wood. 4,174,412, Cl. 427-297.000.
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Matte, Yvanhoe; and Walker, G. Russel, 4,173,932, Cl. 102-254.000.
Rupp, James A., 4,174,149, Cl. 350-96.330.
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Colombo, Peter; Neilson, Robert M., Jr.; and Becker, Walter W., 4,174,293, Cl. 252-301.10W.
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Oeschger, Joseph E.; and Berkeland, James E., 4,174,145, Cl. 339-94.00A.
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Dechering, Johannes A. B.; and Geurts, Martinus F. A. M., 4,174,525, Cl. 358-217.000.
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Van Erk, Klaus C.; Ploeger, Marinus; and Von Reth, Peter H., 4,174,490, Cl. 313-480.000.
Van Kempen, Dick; and Quirijnen, Marius, 4,173,927, Cl. 101-93.030.
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UOP Inc.: *See—*
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Valdespino, Joseph M.; and Brandl, Ronald A. Recreational vehicle leveling and support system. 4,174,094, Cl. 254-86.00H.
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van der Lely, Cornelis. Soil cultivating machines. 4,174,002, Cl. 172-49.000.
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van Mellaert, Jozef K. E. H.; and van Mellaert, Luc J. P. Device for fastening at least one plate inside an electrolyte bath and for feeding current thereto. 4,174,262, Cl. 204-297.00R.
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VDO Adolf Schindling AG: *See—*
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Verberkmoes, John A., to Bastian Blessing Company, Inc. Folding tray rail bracket. 4,174,086, Cl. 248-242.000.
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Vinois, Jean-Claude C. L. Fluid pressure measuring device. 4,174,005, Cl. 141-54.000.
Vinokurov, Alexandr A.; Gorbunov, Gennady S.; Korolkov, Anatoly G.; Popov, Jury S.; Rozenfeld, Lev M.; Skachkov, Jury V.; Filippov, Iosif F.; and Khutoretsky, Gary M. Cryogenically cooled electrical machine. 4,174,483, Cl. 310-52.000.
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Wade, Peter C.; and Kissick, Thomas P., to E. R. Squibb & Sons, Inc. Substituted hydrazino derivatives of benzisothiazole-1,1-dioxides. 4,174,442, Cl. 544-62.000.
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Wang, Su-Yen. Multi-functional suppository encapsulator. 4,174,040, Cl. 206-529.000.
Waryasz, Richard E., to Combustion Engineering, Inc. Coal fired fluid bed module for a single elevation style fluid bed power plant. 4,173,950, Cl. 122-4.00D.
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Weiler, Richard T.: *See—*
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Welch, Clark M.; Danna, Gary F.; and Vigo, Tyrone L., to United States of America, Agriculture. Antibacterial textile finishes utilizing zironyl acetate complexes of inorganic peroxides. 4,174,418, Cl. 428-264.000.
Wellard, Charles L., to American Components Inc. Foil type resistor with firmly fixed lead wires. 4,174,513, Cl. 338-312.000.
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Whiting, Philip C., Jr., to Ludlow Corporation. Package for photographic film and material and powders for making same. 4,174,038, Cl. 206-389.000.
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Winkler, Clifford W. Adjustable shelving system. 4,174,486, Cl. 312-138.00R.
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Fukui, Masaru; Ogino, Shigeo; and Yamamoto, Hisao, 4,174,407, Cl. 424-325.000.
Yamamoto, Masatoshi; Makino, Keisuke; Suzukawa, Kiyomi; Nakamura, Souichirou; and Sakai, Kiyomi, to Hitachi, Ltd. Method of producing semiconductor devices. 4,173,821, Cl. 29-574.000.
Yamamoto, Toshio; and Yuge, Shizuo, to Minolta Camera Kabushiki Kaisha. Conductive toner transfer photocopying machine. 4,174,170, Cl. 355-3.0TR.
Yamamoto, Zenzo. Inertia balanced golf club. 4,174,110, Cl. 273-169.000.
Yamane, Michiyoshi: *See*—
Ikeura, Kenji; Saito, Masaaki; and Yamane, Michiyoshi, 4,173,956, Cl. 123-119.0EC.
Yamasaki, Kazuto, to Maeda Industries, Ltd. Safety device for use with speed change gear system of a bicycle. 4,174,099, Cl. 267-168.000.
Yamashita, Maki, to Minolta Camera Kabushiki Kaisha. Safety mechanism for cameras. 4,174,168, Cl. 354-206.000.
Yasui, Kazuo. Knot retaining implement for necktie or scarf. 4,173,793, Cl. 2-152.00A.
Yasui, Robert K.: *See*—
United States of America, National Aeronautics and Space Administration; Mueller, Robert L.; and Yasui, Robert K., 4,173,820, Cl. 29-572.000.
Yasuike, Akio; Kataoka, Hiroshi; and Takao, Norito, to Asahi-Dow Limited. Multi-layered molded articles. 4,174,413, Cl. 428-35.000.
Yokota, Akira: *See*—
Komine, Takashi; Yokota, Akira; Nakane, Hisashi; Asaumi, Shingo; and Okazaki, Noboru, 4,174,222, Cl. 430-190.000.
Yokota, Tetsuo: *See*—
Kido, Shiro; Yokota, Tetsuo; and Nakahara, Yasuhiro, 4,174,430, Cl. 521-146.000.
Yokoyama, Eiji: *See*—
Mori, Hidetomo; Matsubara, Katsumi; Mishina, Haruo; Arai, Akira; Uchida, Riichi; Yokoyama, Eiji; and Arai, Hajime, 4,174,196, Cl. 418-9.000.
Yonekubo, Ken, to Olympus Optical Co., Ltd. Microscope objective lens system. 4,174,151, Cl. 350-175.0ML.
Yonezawa, Noboru: *See*—
Ohmura, Taizo; Yonezawa, Noboru; and Ikuta, Kazuo, 4,174,211, Cl. 75-0.50B.
Yoshida, Kazuetsu; Seki, Michiharu; Kanehori, Keiichi; Kaneko, Katsuhiro; and Sakurai, Yo, to Hitachi, Ltd. Process for removing sulfur oxides and nitrogen oxides from flue gases. 4,174,373, Cl. 423-239.000.
Young, Paul T. K., to Microwave Development Labs. Four-port magic tee having cavity structure at fourth port. 4,174,507, Cl. 333-122.000.
Youngblood, John W. Motorized bi-fold stepwell cover. 4,174,115, Cl. 280-163.000.
Youngquist, Rudolph W.: *See*—
Garrison, Charles M.; Youngquist, Rudolph W.; and Taylor, Harry M., 4,174,315, Cl. 260-123.500.
Yovan, Alex: *See*—
Campbell, David L., 4,174,096, Cl. 256-24.000.
Yuan, Sun-Shine: *See*—
Bodor, Nicolae S.; and Yuan, Sun-Shine, 4,174,450, Cl. 546-16.000.
Yuge, Shizuo: *See*—
Yamamoto, Toshio; and Yuge, Shizuo, 4,174,170, Cl. 355-3.0TR.

Zahnradfabrik Friedrichshafen AG: *See*—
Liebert, Karl-Heinz; and Tischer, Werner, 4,174,018, Cl. 180-132.000.
Zaikovsky, Gennady S.: *See*—
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Zamboni, Valentino: *See*—
Sianesi, Dario; Nelli, Giuseppe; Fontanelli, Renzo; and Zamboni, Valentino, 4,174,461, Cl. 568-582.000.
Zannucci, Joseph S.: *See*—
Wang, Richard H. S.; and Zannucci, Joseph S., 4,174,321, Cl. 548-219.000.
Zaremba, Hubart B., to Standard Oil Company (Indiana). Subsea drilling template with carousel guidance system. 4,174,011, Cl. 175-7.000.
Zepeda, Lamberto C. Rake attachment kit. 4,174,003, Cl. 172-375.000.
Zojirushi Vacuume Bottle Co., Ltd.: *See*—
Shimizu, Masahiro, 4,174,053, Cl. 222-209.000.
Zuzak, Tomas: *See*—
Borer, Werner J.; and Zuzak, Tomas, 4,174,203, Cl. 23-294.00R.
Zyryanova, Galina V.: *See*—
Myzenkov, Felix A.; Klushin, Dmitry N.; Shupikov, Viktor A.; Kaizer, Alexandr A.; Shuklin, Anatoly M.; Deresh, Mikhail D.; Kolbin, Nikolai A.; Tolmacheva, Alla P.; Zyryanova, Galina V.; Uzlov, Vitaly M.; and Shmuelzon, Elka I., 4,174,372, Cl. 423-88.000.
Zytan Thermochemische Verfahrenstechnik GmbH & Co. Kommanditgesellschaft: *See*—
Kienow, Sigismund; and Briem, Karl, 4,174,089, Cl. 249-80.000.

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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF NOVEMBER, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AB Kabi: *See—*
Melander, Bengt O.; Hanshoff, Gunnar; Granstrand, Bengt R. G.; and Olsson, Berit M., Re. 30,149, Cl. 562-507.000.

Dial, Howard S.; Habegger, Henry L.; and Kays, William B., to Webb, Howard D.; and Lockhart, Arthur M. Floating cover for a liquid storage reservoir. Re. 30,146, Cl. 220-219.000.

Elert, Karl: *See—*
Gnyp, Andrew; and Elert, Karl, Re. 30,144, Cl. 113-16.000.

Gnyp, Andrew; and Elert, Karl, to Jos. Schlitz Brewing Company. Apparatus for spin flanging containers. Re. 30,144, Cl. 113-16.000.

Granstrand, Bengt R. G.: *See—*
Melander, Bengt O.; Hanshoff, Gunnar; Granstrand, Bengt R. G.; and Olsson, Berit M., Re. 30,149, Cl. 562-507.000.

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Hanshoff, Gunnar: *See—*
Melander, Bengt O.; Hanshoff, Gunnar; Granstrand, Bengt R. G.; and Olsson, Berit M., Re. 30,149, Cl. 562-507.000.

Jezl, James L.; and Peters, Edwin F., to Standard Oil Company (Indiana). Melt finishing process for polymers produced by vapor state polymerization processes. Re. 30,148, Cl. 526-65.000.

Jordan, John F.; and Lampkin, Curtis M., to Photon Power, Inc. Method of coating a glass ribbon on a liquid float bath. Re. 30,147, Cl. 65-60.00A.

Jos. Schlitz Brewing Company: *See—*
Gnyp, Andrew; and Elert, Karl, Re. 30,144, Cl. 113-16.000.

Kays, William B.: *See—*
Dial, Howard S.; Habegger, Henry L.; and Kays, William B., Re. 30,146, Cl. 220-219.000.

Lampkin, Curtis M.: *See—*
Jordan, John F.; and Lampkin, Curtis M., Re. 30,147, Cl. 65-60.00A.

Lockhart, Arthur M.: *See—*
Dial, Howard S.; Habegger, Henry L.; and Kays, William B., Re. 30,146, Cl. 220-219.000.

Melander, Bengt O.; Hanshoff, Gunnar; Granstrand, Bengt R. G.; and Olsson, Berit M., to AB Kabi. Preparation of antifibrinolytically active isomer of 4-aminomethylcyclohexane carboxylic acid. Re. 30,149, Cl. 562-507.000.

NCR Corporation: *See—*
Puvogel, John M., Re. 30,150, Cl. 361-152.000.

Olsson, Berit M.: *See—*
Melander, Bengt O.; Hanshoff, Gunnar; Granstrand, Bengt R. G.; and Olsson, Berit M., Re. 30,149, Cl. 562-507.000.

Papineau, Ronald I., to Unique Energy Systems, Inc. Energy generating system. Re. 30,145, Cl. 122-4.00R.

Peters, Edwin F.: *See—*
Jezl, James L.; and Peters, Edwin F., Re. 30,148, Cl. 526-65.000.

Photon Power, Inc.: *See—*
Jordan, John F.; and Lampkin, Curtis M., Re. 30,147, Cl. 65-60.00A.

Puvogel, John M., to NCR Corporation. Inductor drive means. Re. 30,150, Cl. 361-152.000.

Standard Oil Company (Indiana): *See—*
Jezl, James L.; and Peters, Edwin F., Re. 30,148, Cl. 526-65.000.

Stork Amsterdam B.V.: *See—*
Vertegaal, Jacobus G., Re. 30,143, Cl. 101-120.000.

Unique Energy Systems, Inc.: *See—*
Papineau, Ronald I., Re. 30,145, Cl. 122-4.00R.

Vertegaal, Jacobus G., to Stork Amsterdam B.V. Rotation screen printing machine and squeegee device. Re. 30,143, Cl. 101-120.000.

Webb, Howard D.: *See—*
Dial, Howard S.; Habegger, Henry L.; and Kays, William B., Re. 30,146, Cl. 220-219.000.

LIST OF PLANT PATENTEES

Bringhurst, Royce S.; and Voth, Victor, to University of California, The Regents of the. Strawberry plant. 4,481, 11-13-79, Cl. 49.000.

Moore, Ralph S. Miniature rose plant. 4,480, 11-13-79, Cl. 7.000.

Moore, Ralph S. Miniature rose plant. 4,484, 11-13-79, Cl. 7.000.

Pan-American Plant Company: *See—*
Petusky, Kerry S., 4,482, Cl. 78.000.
Petusky, Kerry S., 4,483, Cl. 77.000.

Petusky, Kerry S., to Pan-American Plant Company. Chrysanthemum named Golden Bounty. 4,482, 11-13-79, Cl. 78.000.

Petusky, Kerry S., to Pan-American Plant Company. Chrysanthemum named Free Spirit. 4,483, 11-13-79, Cl. 77.000.

University of California, The Regents of the: *See—*
Bringhurst, Royce S.; and Voth, Victor, 4,481, Cl. 49.000.

Voth, Victor: *See—*
Bringhurst, Royce S.; and Voth, Victor, 4,481, Cl. 49.000.

LIST OF DESIGN PATENTEES

Amerock Corporation: *See—*
Pittenger, Teresa R. B., 253,380, Cl. D6-86.000.
Tegner, Raymond U. H., 253,381, Cl. D6-97.000.

Artcarved Class Rings, Inc.: *See—*
Glueckselig, Gabrielle, 253,403, Cl. D11-35.000.

Baltare, Gunnar, to Eaton Corporation. Mounting bracket. 253,392, 11-13-79, Cl. D8-354.000.

Bartholomew, Glen W. Grass transplanter. 253,390, 11-13-79, Cl. D8-7.000.

Benson, Mason; and McIntosh, James, to Carolina Enterprises, Inc. Siren attachment for cycle-type vehicles. 253,401, 11-13-79, Cl. D10-120.000.

Berghahn, Walter G.; and Weinstein, Jack, to Bristol-Myers Company. Combined dispensing container and holder therefor. 253,394, 11-13-79, Cl. D9-12.000.

Berkline Corporation, The: *See—*
Long, Stapleton, 253,379, Cl. D6-62.000.

Boldt, Melvin H.; Morrison, Thurber H.; and Stevens, James P., to National Presto Industries, Inc. Electric pressure cooker. 253,388, 11-13-79, Cl. D7-86.000.

Bristol-Myers Company: *See—*
Berghahn, Walter G.; and Weinstein, Jack, 253,394, Cl. D9-12.000.

Carabetta, Vito J. Automobile body. 253,406, 11-13-79, Cl. D12-90.000.

Carolina Enterprises, Inc.: *See—*
Benson, Mason; and McIntosh, James, 253,401, Cl. D10-120.000.

Carscallen Nursery Label Company: *See—*
South, Leslie E., Jr., 253,389, Cl. D8-1.000.

Caulkett, Lawrence F. Sculpture. 253,405, 11-13-79, Cl. D11-131.000.

Charlton Company, Inc.: *See—*
Spound, Albert M.; and Day, Robert C., 253,377, Cl. D6-36.000.
Spound, Albert M.; and Day, Robert C., 253,378, Cl. D6-36.000.

Conair Corporation: *See—*
Tomaro, Patrick M., 253,387, Cl. D7-59.000.
Tomaro, Patrick M., 253,429, Cl. D28-67.000.

Continental Group, Inc., The: *See—*
Hasegawa, Gary K.; and Mascia, Carmen T., 253,395, Cl. D9-131.000.
Hasegawa, Gary K.; and Mascia, Carmen T., 253,396, Cl. D9-131.000.
Hasegawa, Gary K.; and Mascia, Carmen T., 253,397, Cl. D9-131.000.

Corning Glass Works: *See—*
Luzier, Patricia A., 253,386, Cl. D7-39.000.

Cosmos, Pete, Sr.; and Kanne, John T., to True Temper Corporation. Game racket. 253,418, 11-13-79, Cl. D21-212.000.

Day, Edwin A. Timepiece dial. 253,402, 11-13-79, Cl. D10-125.000.

Day, Robert C.: *See—*
Spound, Albert M.; and Day, Robert C., 253,377, Cl. D6-36.000.
Spound, Albert M.; and Day, Robert C., 253,378, Cl. D6-36.000.

Display Corporation International: *See—*
Hornblad, Richard P., 253,376, Cl. D6-25.000.

Dreyer, Paul, to Prestige Group Limited, The. Can opener. 253,391, 11-13-79, Cl. D8-39.000.

Eaton Corporation: *See—*
Baltare, Gunnar, 253,392, Cl. D8-354.000.

ElecTroMation, Inc.: *See—*
Voelkert, Donald F., 253,409, Cl. D13-24.000.

Evans, Harold G. Fastener for reticulate fencing panels. 253,393, 11-13-79, Cl. D8-370.000.

Gatti, Joseph R. Jewelry pendant or similar article. 253,404, 11-13-79, Cl. D11-79.000.

Geli, Georgio. Multiple shelf and cabinet unit. 253,383, 11-13-79, Cl. D6-169.000.

Glassenberg, Marvin. Rack. 253,384, 11-13-79, Cl. D6-186.000.

Glueckselig, Gabrielle, to Artcarved Class Rings, Inc. Ring. 253,403, 11-13-79, Cl. D11-35.000.

Gomez, Jorge J. Periscopic viewing device. 253,414, 11-13-79, Cl. D16-48.000.

Gordon, Robert E. Putting training device. 253,421, 11-13-79, Cl. D21-234.000.

GTE Sylvania Incorporated: *See—*
Marecek, Paul M.; and Shaffer, John W., 253,431, Cl. D48-33.000.

Hale, Stephen D. Mailbox. 253,435, 11-13-79, Cl. D99-29.000.

Hamada, Masanori, to Matsushita Electric Industrial Co. Radio receiver. 253,411, 11-13-79, Cl. D14-68.000.

Harle, Fritz. Metronome. 253,399, 11-13-79, Cl. D10-43.000.

Hasegawa, Gary K.; and Mascia, Carmen T., to Continental Group, Inc., The. Can or similar article. 253,395, 11-13-79, Cl. D9-131.000.

Hasegawa, Gary K.; and Mascia, Carmen T., to Continental Group, Inc., The. Can or similar article. 253,396, 11-13-79, Cl. D9-131.000.

Hasegawa, Gary K.; and Mascia, Carmen T., to Continental Group, Inc., The. Can or similar article. 253,397, 11-13-79, Cl. D9-131.000.

Heerlien, John G., to Unitec Corporation. Golfer's tool. 253,420, 11-13-79, Cl. D21-234.000.

Hildebrandt, William J., to Stanley Works, The. Saw buck bracket. 253,428, 11-13-79, Cl. D25-68.000.

Hornblad, Richard P., to Display Corporation International. Display rack for oil cans. 253,376, 11-13-79, Cl. D6-25.000.

Infante, David. Kite. 253,417, 11-13-79, Cl. D21-88.000.

Kanne, John T.: *See—*
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Kimberly-Clark Corporation: *See—*
Roeder, Robert J., 253,423, Cl. D24-51.000.
Roeder, Robert J., 253,424, Cl. D24-51.000.
Roeder, Robert J., 253,425, Cl. D24-51.000.
Roeder, Robert J., 253,426, Cl. D24-51.000.

Kleen-Rite, Inc.: *See—*
Smith, Robert G., 253,422, Cl. D23-4.000.

Kuo, Chin-Tui. Combined cane and cue stick. 253,419, 11-13-79, Cl. D21-232.000.

Long, Stapleton, to Berkline Corporation, The. Sofa. 253,379, 11-13-79, Cl. D6-62.000.

Luzier, Patricia A., to Corning Glass Works. Decal for culinary ware or the like. 253,386, 11-13-79, Cl. D7-39.000.

MacIntosh, John J. Finger ballpoint pen. 253,416, 11-13-79, Cl. D19-41.000.

Marecek, Paul M.; and Shaffer, John W., to GTE Sylvania Incorporated. Multilamp flashlamp article having combustible member therein. 253,431, 11-13-79, Cl. D48-33.000.

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Hasegawa, Gary K.; and Mascia, Carmen T., 253,395, Cl. D9-131.000.
Hasegawa, Gary K.; and Mascia, Carmen T., 253,396, Cl. D9-131.000.
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Moore, George C.; Moore, Jodele; and Tipke, James M. Three-wheeled vehicle frame. 253,407, 11-13-79, Cl. D12-112.000.

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Moore, George C.; Moore, Jodele; and Tipke, James M., 253,407, Cl. D12-112.000.

Morrison, Matthew E. Bilboquet staff. 253,430, 11-13-79, Cl. D21-62.000.

Morrison, Thurber H.: *See—*
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National Presto Industries, Inc.: *See—*
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Niemeyer, Robert A.; and Pardo, John, to Procter & Gamble Company, The. Dispensing pump. 253,398, 11-13-79, Cl. D9-276.000.

Nippon Columbia Co., Ltd.: *See—*
Sasaki, Isao, 253,410, Cl. D14-27.000.

Ohie, Yoshihisa; and Yamasaki, Tsutomu, to Sharp Corporation. Electronic hemadynamometer. 253,427, 11-13-79, Cl. D24-17.000.

Owens-Corning Fiberglas Corporation: *See—*
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Pittenger, Teresa R. B., to Amerock Corporation. Hardware support. 253,380, 11-13-79, Cl. D6-86.000.

Prestige Group Limited, The: *See—*
Dreyer, Paul, 253,391, Cl. D8-39.000.

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Niemeyer, Robert A.; and Pardo, John, 253,398, Cl. D9-276.000.

Reyda, Theodore M., to Owens-Illinois, Inc. Glass tumbler. 253,385, 11-13-79, Cl. D7-5.000.

Rival Manufacturing Company: *See—*
Vander Wilt, William W., 253,400, Cl. D10-106.000.

Roeder, Robert J., to Kimberly-Clark Corporation. Sanitary napkin. 253,423, 11-13-79, Cl. D24-51.000.

Roeder, Robert J., to Kimberly-Clark Corporation. Sanitary napkin. 253,424, 11-13-79, Cl. D24-51.000.

Roeder, Robert J., to Kimberly-Clark Corporation. Sanitary napkin. 253,425, 11-13-79, Cl. D24-51.000.

Roeder, Robert J., to Kimberly-Clark Corporation. Sanitary napkin. 253,426, 11-13-79, Cl. D24-51.000.

Sargent, Roy D. Vehicle wheel chock. 253,408, 11-13-79, Cl. D12-217.000.

Sasaki, Isao, to Nippon Columbia Co., Ltd. Phonograph tone arm. 253,410, 11-13-79, Cl. D14-27.000.

Schuler, John H., II. Candle. 253,433, 11-13-79, Cl. D73-1.00R.

Shaffer, John W.: *See—*
Marecek, Paul M.; and Shaffer, John W., 253,431, Cl. D48-33.000.

Sharp Corporation: *See—*
Ohie, Yoshihisa; and Yamasaki, Tsutomu, 253,427, Cl. D24-17.000.

Smith, Robert G., to Kleen-Rite, Inc. Filter for cleaning fluid or the like. 253,422, 11-13-79, Cl. D23-4.000.

Solomon, Charles I. Temple for spectacles. 253,415, 11-13-79, Cl. D16-81.000.

South, Leslie E., Jr., to Carscallen Nursery Label Company. Marker for horticultural items. 253,389, 11-13-79, Cl. D8-1.000.

Spound, Albert M.; and Day, Robert C., to Charlton Company, Inc. Hassock or similar article. 253,377, 11-13-79, Cl. D6-36.000.

Spound, Albert M.; and Day, Robert C., to Charlton Company, Inc. Hassock or similar article. 253,378, 11-13-79, Cl. D6-36.000.

Spruiel, Anthony J. Combined hanging planter and lights therefor. 253,382, 11-13-79, Cl. D6-113.000.

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Takenaka, Kazumasa; and Murakami, Shinzo, to Matsushita Electric Industrial Co., Ltd. Combined radio and television sound receiver or the like. 253,412, 11-13-79, Cl. D14-70.000.

Tegner, Raymond U. H., to Amerock Corporation. Tissue holder. 253,381, 11-13-79, Cl. D6-97.000.

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Tomaro, Patrick M., to Conair Corporation. Coffeemaker. 253,387, 11-13-79, Cl. D7-59.000.

Tomaro, Patrick M., to Conair Corporation. Double-sided illuminated mirror. 253,429, 11-13-79, Cl. D28-67.000.

True Temper Corporation: *See—*
Cosmos, Pete, Sr.; and Kanne, John T., 253,418, Cl. D21-212.000.

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Vander Wilt, William W., to Rival Manufacturing Company. Smoke detector. 253,400, 11-13-79, Cl. D10-106.000.

Vandewater, Lloyd L. Form for a concrete tractor weight. 253,413, 11-13-79, Cl. D15-136.000.

Van Koert, John. Combined hurricane lamp and centerpiece or the like. 253,432, 11-13-79, Cl. D48-2.000.

Voelkert, Donald F., to ElecTroMation, Inc. Electrical connector block assembly. 253,409, 11-13-79, Cl. D13-24.000.

Weinstein, Jack: *See—*
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CLASSIFICATION OF PATENTS

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	4,173,990	4,174,138	4,174,184	4,173,828	4,174,173	4,174,442
	4,174,069	4,174,254	4,174,191	4,173,950	4,174,204	4,174,452
	4,174,084	4,174,257	4,174,195	4,174,034	4,174,264	4,174,453
	4,174,109	4,174,405	4,174,206	4,174,038	4,174,403	4,174,457
	4,174,145	4,174,411	4,174,238	4,174,048	4,174,409	4,174,462
	4,174,243	4,174,485	4,174,246	4,174,056	4,174,424	4,174,470
	4,174,290	4,174,504	4,174,274	4,174,058	4,174,539	4,174,523
	4,174,366	10 : 4,174,140	4,174,296	4,174,060	28 : 4,174,100	4,174,531
8 :	4,173,968	4,174,218	4,174,298	4,174,164	29 : 4,174,370	36 : 4,173,809
9 :	4,173,808	4,174,227	4,174,300	4,174,192	4,174,532	4,173,812
02 :	4,173,842	4,174,358	4,174,301	4,174,221	30 : 4,173,974	4,173,818
	4,174,096	4,174,381	4,174,304	4,174,371	4,174,276	4,173,824
04 :	4,173,989	4,174,420	4,174,312	4,174,432	31 : 4,173,948	4,173,825
	4,174,003	11 : 4,174,120	4,174,329	4,174,507	4,174,223	4,173,835
06 :	Re.30,146	12 : 4,173,792	4,174,342	4,174,509	4,174,516	4,173,890
	4,173,795	4,173,798	4,174,345	4,174,529	32 : 4,173,926	4,173,925
	4,173,833	4,173,853	4,174,351	4,174,530	33 : 4,174,010	4,173,941
	4,173,870	4,173,929	4,174,368	4,174,536	34 : 4,173,814	4,173,978
	4,173,918	4,174,047	4,174,447	26 : 4,173,817	4,173,834	4,173,980
	4,173,919	4,174,065	4,174,468	4,173,831	4,173,879	4,174,073
	4,173,921	4,174,094	4,174,502	4,173,841	4,173,935	4,174,087
	4,173,971	4,174,107	4,174,510	4,173,845	4,173,937	4,174,101
	4,173,984	4,174,134	18 : 4,173,800	4,173,852	4,173,982	4,174,102
	4,173,986	4,174,386	4,173,912	4,173,855	4,174,008	4,174,111
	4,174,019	4,174,521	4,173,930	4,173,901	4,174,028	4,174,152
	4,174,039	13 : 4,173,861	4,174,026	4,173,920	4,174,033	4,174,171
	4,174,108	4,173,996	4,174,036	4,173,942	4,174,052	4,174,235
	4,174,119	4,174,226	4,174,205	4,173,965	4,174,055	4,174,237
	4,174,135	4,174,236	4,174,209	4,174,086	4,174,063	4,174,259
	4,174,157	17 : Re.30,148	4,174,239	4,174,097	4,174,066	4,174,293
	4,174,174	4,173,826	4,174,284	4,174,098	4,174,147	4,174,297
	4,174,190	4,173,838	4,174,390	4,174,129	4,174,148	4,174,331
	4,174,210	4,173,883	4,174,404	4,174,139	4,174,216	4,174,349
	4,174,261	4,173,915	4,174,415	4,174,155	4,174,217	4,174,374
	4,174,275	4,173,939	4,174,454	4,174,258	4,174,252	4,174,378
	4,174,350	4,173,970	4,174,473	4,174,268	4,174,282	4,174,380
	4,174,384	4,173,973	19 : 4,173,867	4,174,289	4,174,285	4,174,402
	4,174,399	4,173,979	4,174,095	4,174,328	4,174,286	4,174,422
	4,174,465	4,173,993	20 : 4,173,923	4,174,336	4,174,287	4,174,443
	4,174,496	4,173,995	4,174,450	4,174,352	4,174,288	4,174,528
	4,174,517	4,174,032	21 : 4,173,871	4,174,385	4,174,307	4,174,538
	4,174,518	4,174,054	4,174,248	4,174,394	4,174,309	4,174,540
	4,174,524	4,174,068	22 : 4,174,266	4,174,427	4,174,316	37 : 4,173,885
	4,174,537	4,174,070	23 : 4,174,001	4,174,441	4,174,317	4,173,910
	4,174,541	4,174,071	4,174,308	4,174,456	4,174,322	4,173,911
09 :	4,173,801	4,174,091	24 : 4,173,975	4,174,475	4,174,343	4,174,362

39 :	Re.30,150	4,174,476	4,173,922	4,174,401	4,174,113	4,174,376
	4,173,799	40 : 4,173,949	4,173,997	4,174,495	4,174,115	53 : 4,174,078
	4,173,816	4,174,112	4,174,041	4,174,508	4,174,131	4,174,083
	4,173,839	4,174,132	4,174,042	4,174,513	4,174,146	4,174,150
	4,173,850	4,174,141	4,174,051	44 : 4,174,085	4,174,269	4,174,498
	4,173,961	4,174,181	4,174,072	4,174,250	4,174,270	54 : 4,174,013
	4,174,049	4,174,202	4,174,076	45 : 4,173,947	4,174,271	4,174,353
	4,174,189	4,174,283	4,174,092	47 : 4,173,954	4,174,277	4,174,359
	4,174,214	4,174,302	4,174,093	4,173,998	4,174,330	55 : Re.30,144
	4,174,242	4,174,357	4,174,201	4,174,064	4,174,389	4,173,823
	4,174,244	4,174,360	4,174,207	4,174,267	4,174,408	4,173,846
	4,174,253	41 : 4,173,827	4,174,228	4,174,321	49 : 4,173,796	4,173,876
	4,174,263	4,173,909	4,174,229	48 : Re.30,147	4,173,967	4,174,014
	4,174,291	4,173,966	4,174,241	4,173,803	4,173,981	4,174,031
	4,174,305	4,173,977	4,174,272	4,173,813	4,174,022	4,174,077
	4,174,314	4,174,061	4,174,292	4,173,865	4,174,361	4,174,116
	4,174,315	4,174,118	4,174,323	4,173,895	51 : 4,173,860	4,174,117
	4,174,354	42 : 4,173,837	4,174,324	4,173,988	4,173,882	4,174,143
	4,174,355	4,173,869	4,174,333	4,173,994	4,174,123	4,174,280
	4,174,406	4,173,872	4,174,337	4,173,999	4,174,175	4,174,417
	4,174,431	4,173,891	4,174,369	4,174,000	4,174,231	4,174,472
	4,174,463	4,173,893	4,174,388	4,174,037	4,174,255	

DESIGN PATENTS

04 :	253,417	11 : 253,402	19 : 253,413	253,401	253,420	51 : 253,382
06 :	253,377	12 : 253,430	20 : 253,400	253,429	42 : 253,404	52 : 253,435
	253,378	17 : 253,380	26 : 253,385	36 : 253,403	253,431	55 : 253,376
	253,405	253,384	253,392	253,414	253,433	253,381
	253,406	253,388	29 : 253,422	253,432	47 : 253,379	253,423
	253,416	253,395	31 : 253,393	253,434	48 : 253,389	253,424
	253,421	253,396	32 : 253,407	39 : 253,386	253,390	253,425
08 :	253,408	253,397	34 : 253,387	253,398	253,415	253,426
09 :	253,428	18 : 253,409	253,394	253,418		

PLANT PATENTS

6 : 4,480	4,481	4,484	17 : 4,482	4,483	

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UNITED STATES PATENT and TRADEMARK OFFICE

November 20, 1979 Volume 988 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

July 3, 1979.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

Department of the Treasury
United States Customs Service

(TMK-2-R:E:E)

NOTICE OF APPLICATION FOR RECORDATION OF TRADE NAME

OHAUS SCALE CORPORATION

Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name OHAUS SCALE CORPORATION used by Ohaus Scale Corporation organized under the laws of the State of New Jersey, located at 29 Hanover Road, Florham Park, N.J. 07932. The applicant states that the trade name is applied to weighing apparatus, including balances, scales, weights and containers and accessories for same manufactured in the United States.

The applicant states further that no foreign company, parent or subsidiary company is authorized to use the trade name sought to be recorded. Appropriate accompanying papers were submitted with the application.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Any such submission should be addressed to the Commissioner of Customs, Washington, D.C. 20229, in time to be received not later than 30 days from the date of publication of this notice in the FEDERAL REGISTER.

Notice of the action taken on the application for recordation of the trade name will be published in the FEDERAL REGISTER.

Dated: Oct. 22, 1979.

DONALD W. LEWIS,
Director, Office of Regulations and Rulings.

Department of Commerce

Office of the Secretary

PUBLIC ADVISORY COMMITTEE FOR TRADEMARK AFFAIRS; RENEWAL

In accordance with the provisions of the Federal Advisory Committee Act 5 U.S.C. App. (1976) and Office of Management and Budget Circular A-63 of March 1974, and after consultation with GSA it has been determined that the renewal of the Public Advisory Committee for Trademark Affairs is in the public interest in connection with the performance of duties imposed on the Department by law.

The Committee was first established in September, 1970. It was reestablished on April 12, 1979 and its present charter will expire on October 12, 1979. Since its inception the purpose of the Committee has been to advise the Patent and Trademark Office concerning steps which can be taken to increase the efficiency and effectiveness of administration of the Trademark Act and to provide a continuing flow of knowledge from the private sector to the government in the field of trademarks. Approximately seventy-five percent of the over one hundred twenty-five specific recommendations have been implemented at least in part. There is no question that the Committee has contributed greatly to the efficiency and effectiveness of the administration of the statute. In reviewing the Committee, the Secretary has sought continued effort towards this objective. The Committee's function cannot be accomplished by any organizational element or other committee of the Department.

As it was initially established, the Committee will continue to comprise the members of the Advisory Committee for Trademark Affairs of the United States Trademark Association. The membership is balanced and is under the control of the President of the Association. The Committee will continue to operate in compliance with the provisions of the Federal Advisory Committee Act.

Copies of the Committee's revised charter will be filed with appropriate committees of Congress.

Any inquiries or comments may be addressed to Patricia M. Davis, Committee Control Officer, Office of Trademark Program Control, U.S. Patent & Trademark Office, Washington, D.C. 20231; telephone (703) 557-3881.

Dated: Oct. 11, 1979.

ELSA O. PORTER,
Assistant Secretary for Administration.

[FR Doc. 79-32087 Filed 10-17-79; 8:45 am]

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,532,247, Re. S.N. 059,396, Filed Jul. 20, 1979, Cl. 220/23.6, INSULATED TRAYS FOR FOOD OR THE LIKE, John A. Bridges, Owner of Record: *Aladdin Industries, Inc., Chicago, Ill.,* Attorney or Agent: Herman Hersh, et al., Ex. Gp.: 241

3,931,094, Re. S.N. 060,424, Filed Jul. 25, 1979, Cl. 260/37 N, FILLED THERMOPLASTIC CONTAINING FIBROUS DISPERSION AID, Leon Segal, et al., Owner of Record: *Allied Chemical Corporation, New York, N.Y.,* Attorney or Agent: Robert J. North, et al., Ex. Gp.: 141

4,028,912, Re. S.N. 059,459, Filed Jul. 20, 1979, Cl. 66/149 R, FABRIC TAKE-UP MECHANISM, Richard Schneck, Owner of Record: *Sulzer Morat GmbH, Bonlanden, Germany,* Attorney or Agent: Robert Osann, et al., Ex. Gp.: 353

4,028,925, Re. S.N. 048,072, Filed Jun. 13, 1979, Cl. 72/294, APPARATUS AND METHOD FOR FORMING BARBED TAPE, Michael R. Mainiero, Owner of Record: *Man Barrier Corporation, Ansonia, Conn.,* Attorney or Agent: Donald J. Hayes, et al., Ex. Gp.: 321

4,029,234, Re. S.N. 048,429, Filed Jun. 14, 1979, Cl. 220/337, PLASTIC HINGE CONSTRUCTION, Edward M. Johnson, Jr., et al., Owner of Record: *The Triangle Corporation, Grant Park, Ill.,* Attorney or Agent: John J. Toney, et al., Ex. Gp.: 241

4,039,373, Re. S.N. 050,291, Filed Jun. 21, 1979, Cl. 162/52, STATIC DISCHARGE DEVICE AND METHOD FOR FIBER DISCHARGE FROM A PRESSURIZED DIGESTER, Johan L. Michelsen, Owner of Record: *American Defibrator Inc., Minneapolis, Minn.,* Attorney or Agent: Eric Y. Munson, Ex. Gp.: 173

4,070,754, Re. S.N. 048,134, Filed Jun. 13, 1979, Cl. 29/449, HAND TOOL FOR JOINING OBJECTS, Michael Bauerkemper, Owner of Record: *Thomas & Betts Corporation, Elizabeth, N.J.,* Attorney or Agent: James J. Daley, et al., Ex. Gp.: 321

4,075,611, Re. S.N. 060,690, Filed Jul. 25, 1979, Cl. 365/2, CONSECUTIVE BIT ACCESS MAGNETIC BUBBLE DOMAIN MEMORY DEVICE, Isoris S. Gergis, Owner of Record: *Rockwell International Corporation, El Segundo, Calif.,* Attorney or Agent: John F. Lynch, et al., Ex. Gp.: 235

4,075,626, Re. S.N. 047,091, Filed Jun. 11, 1979, Cl. 340/388, ALARM BUZZER, Mitsuo Sakaguchi, et al., Owner of Record: *Kobishi Electric Co. Ltd., Tokyo, Japan,* Attorney or Agent: Keith D. Beecher, Ex. Gp.: 234

4,114,036, Re. S.N. 058,198, Filed Jul. 17, 1979, Cl. 250/214 R, LEAK CURRENT SUPPRESSING PRINTED CIRCUIT BOARD, Tokuichi Tsunekawa, et al., Owner of Record: *Canon Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: David Toren, et al., Ex. Gp.: 252

4,147,425, Re. S.N. 058,842, Filed Jul. 7, 1979, Cl. 354/304, PHOTOGRAPHIC PROCESSING ROLLER HAVING A SURFACE ROUGHENED BY ELECTRIC DISCHARGE MACHINING, Harvey S. Friedman, et al., Owner of Record: *Polaroid Corporation, Cambridge, Mass.,* Attorney or Agent: Francis J. Caufield, Ex. Gp.: 211

PATENT NOTICES

Certificates of Correction for the Week of Nov. 20, 1979

Plt. 4,199	4,143,259	4,156,037	4,164,226
Re. 29,296	4,144,052	4,156,258	4,164,307
D. 252,331	4,144,266	4,156,781	4,164,392
3,749,859	4,144,410	4,157,530	4,164,418
3,883,217	4,145,324	4,157,949	4,164,487
3,923,005	4,145,330	4,157,950	4,164,634
3,957,857	4,145,341	4,158,236	4,164,858
3,993,668	4,145,351	4,158,324	4,165,152
4,032,280	4,145,421	4,158,656	4,165,262
4,041,476	4,145,629	4,158,819	4,165,291
4,073,223	4,147,161	4,158,835	4,165,576
4,074,591	4,147,229	4,159,197	4,165,609
4,083,697	4,147,514	4,159,265	4,165,638
4,090,914	4,147,817	4,159,320	4,165,757
4,091,270	4,147,829	4,160,060	4,165,823
4,099,335	4,148,572	4,160,102	4,165,924
4,108,558	4,148,713	4,160,104	4,166,017
4,111,292	4,148,868	4,160,106	4,166,059
4,111,889	4,149,624	4,160,269	4,166,074
4,121,397	4,150,236	4,160,536	4,166,145
4,122,061	4,150,321	4,160,552	4,166,259
4,122,199	4,151,018	4,161,282	4,166,478
4,124,151	4,151,685	4,161,571	4,166,495
4,125,417	4,152,197	4,162,434	4,166,648
4,126,172	4,153,552	4,162,720	4,166,777
4,127,412	4,153,676	4,162,828	4,166,984
4,128,537	4,153,687	4,162,854	4,167,043
4,131,729	4,153,864	4,162,916	4,167,057
4,131,948	4,154,244	4,162,967	4,167,101
4,134,041	4,154,295	4,162,973	4,167,286
4,136,699	4,154,521	4,163,198	4,167,468
4,137,222	4,154,764	4,163,291	4,167,483
4,138,464	4,154,899	4,163,604	4,167,778
4,138,998	4,155,131	4,163,855	4,167,836
4,141,027	4,155,869	4,163,950	4,167,857
4,141,153	4,155,992	4,164,197	

Disclaimers

3,361,298.—*John G. Trumble,* Big Rapids, Mich. CAMPING UNIT FUEL TANK FILLER SPOUT CAP ASSEMBLY. Patent dated Jan. 2, 1968. Disclaimer filed Aug. 24, 1979, by the inventor.

Hereby enters this disclaimer to claim 3 of said patent.

3,634,874.—*Raymond J. Mason,* Lynwood, Calif. TRIAC MOTOR SPEED CONTROL. Patent dated Jan. 11, 1972. Disclaimer filed Aug. 27, 1979, by the assignee, *Minarik Electric Company.*

Hereby enters this disclaimer to claim 1 of said patent.

3,678,225.—*Harold D. Hulterstrum,* Barbaboo, Wis. REPEAT CYCLE TIMER OF MODULAR CONSTRUCTION WITH IMPROVED ADJUSTABLE CAM. Patent dated July 18, 1972. Disclaimer filed July 6, 1979, by the assignee, *Gulf & Western Industries, Inc.*

Hereby enters this disclaimer to claims 1, 2, 15, 18 and 21 of said patent.

4,152,796.—*Isaac Fogel,* Silver Spring, Md. WATERBED MATTRESS. Patent dated May 8, 1979. Disclaimer filed Sept. 5, 1979, by the assignee, *Classic Products Corporation.*

The term of this patent subsequent to Mar. 27, 1966, has been disclaimed.

4,161,057.—*Daniel Joseph, Jr., II,* Ojo, Caliente, N. Mex. ANTI-VANDALISM NUT ASSEMBLY AND METHOD OF ASSEMBLING SAME. Patent dated July 17, 1979. Disclaimer filed Sept. 19, 1979, by the assignee, *Roland C. Zinn.*

Hereby enters this disclaimer to claims 1, 3, 4 and 6 of said patent.

4,162,680.—*Lester Coch,* Northport, N.Y. NON-POLLUTING SYSTEM FOR METAL SURFACE TREATMENTS. Patent dated July 31, 1979. Disclaimer filed Sept. 25, 1979, by the assignee, *Waldes Kohinoor, Inc.*

The term of this patent subsequent to Dec. 13, 1994, has been disclaimed.

4,165,208.—*Ingemar H. Lundquist,* Oakland, Calif. INTRAVENOUS DELIVERY PUMP. Patent dated Aug. 21, 1979. Disclaimer filed Sept. 19, 1979, by the assignee, *Valleylab.*

The term of this patent subsequent to Apr. 1, 1992, has been disclaimed.

Dedication

4,161,159.—*Basil K. J. Leong,* Portage, Mich. INSTANTANEOUSLY EMPTIABLE EXTERNALLY MOUNTED ANIMAL FOOD TRAY. Patent dated July 17, 1979. Dedication filed June 25, 1979, by the assignee, *International Research & Development Corporation.*

Hereby dedicates to the Public the entire term of said patent.

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,723,474, E. G. Teach, D. R. Arneklev, METATHIOCARBAMYL PHENYLENE AMIDES AND UREAS AND THEIR UTILITY AS HERBICIDES, Interference No. 99,896, decided August 16, 1979, claims 14, 17 and 22.

Patent No. 3,799,915, W. R. Dunnavant, E. M. Harris, P. F. Kurz, R. A. Markle, E. H. Parker, PHOTOPOLYMERS, Interference No. 98,978, decided June 12, 1979, claims 17, 18, 22 and 23.

Patent No. 3,802,115, C. A. Auten, R. A. Fischer, L. H. Fischer, NOISE MAKING FISHING LURE AND METHOD THEREOF, Interference No. 99,470, decided July 3, 1979, claim 4.

Patent No. 3,840,533, J. E. Dolfini, E. Bohme, 7-SUBSTITUTED CEPHALOSPORANIC ACID AND DERIVATIVES, Interference No. 99,162, decided June 1, 1979, claims 1 and 2.

Patent No. 3,852,642, J. C. Engel, R. T. Elms, J. J. Misencik, SENSING AMPLIFIER AND TRIP CIRCUIT PARTICULARLY FOR GROUND FAULT CIRCUIT INTERRUPTER, Interference No. 99,353, decided June 19, 1979, claims 3, 13, 19–21.

Patent No. 3,852,678, G. J. Frye, PUSH-PULL AMPLIFIER WITH CURRENT MIRRORS FOR DETERMINING THE QUIESCENT OPERATING POINT, Interference No. 99,404, decided June 25, 1979, claims 1–3 and 5.

Patent No. 3,855,781, H. Chihara, Y. Ushiyama, STEP MOTOR MECHANISM FOR ELECTRONIC TIMEPIECE, Interference No. 99,370, decided May 23, 1979, claims 1, 2 and 12.

Patent No. 3,860,322, E. L. Sankey, T. J. Holtgrieve, SEALED ELECTRICAL CONNECTOR, Interference No. 99,278, decided June 4, 1979, claims 1 and 2.

Patent No. 3,883,213, F. J. Glaister, CONNECTORS, Interference No. 99, 287, decided May 30, 1979, claims 1, 4–9.

Patent No. 3,895,094, J. L. Carter, M. T. Chapman, B. G. Yoakam, PROCESS FOR SELECTIVE REDUCTION OF OXIDES OF NITROGEN, Interference No. 99,622, decided July 16, 1979, claim 2.

Patent No. 3,899,025, R. W. Dinning, PUMP DOWN SYSTEM FOR PLACING AND RETRIEVING SUBSURFACE WELL EQUIPMENT, Interference No. 99,476, decided April 26, 1979, claims 1–9, 12, 14–21.

Patent No. 3,907,903, Y. G. Chang, P. S. Bailey, ORGANIC PEROXIDES, Interference No. 100,084, decided June 14, 1979, claim 1.

Patent No. 3,925,223, R. L. Coffman, R. W. Shiffler, HYDRAULIC FLUIDS BASED ON BORATE ESTERS, Interference No. 99,418, decided September 10, 1979, claims 1–6.

Patent No. 3,927,017, J. Heeres, L. J. J. Backx, J. H. Mostmans, 1-(BETA-ARYL-BETA-R-ETHYL)IMIDAZOLES, Interference No. 99,966, decided July 31, 1979, claims 1–4.

Patent No. 3,930,829, J. E. Sensi, MOVABLE DAM BARRIERS FOR USE IN THE MANUFACTURE OF A GLASS RIBBON ON A MOLTEN METAL BATH, Interference No. 99,420, decided March 13, 1979, claims 14, 15, 19 and 23.

Patent No. 3,966,042, L. S. Shelton, R. A. M. Golsch, D. G. Boigk, FASTENER STRIP, Interference No. 99,802, decided June 11, 1979, claim 5.

Patent No. 3,973,077, A. Classon, BUSHING FOR ELECTRICAL CONNECTION, Interference No. 99,867, decided June 7, 1979, claims 1–4, 6 and 7.

Patent No. 3,995,635, T. Higuchi, A. A. Hussain, J. W. Shell, OCULAR INSERT, Interference No. 100,051, decided July 11, 1979, claims 1, 5 and 7.

Patent No. 4,014,758, S. Kawai, Y. Yamagiwa, M. Mizusawa, H. Watanabe, Y. Ando, M. Takahashi, CONTINUOUS ELECTROLYTICAL TREATMENT OF ALUMINUM OR ITS ALLOYS, Interference No. 99,847, decided August 16, 1979, claims 1–5 and 9.

Patent No. 4,045,435, G. A. Koppel, PREPARATION OF CEPHALOSPORIN ETHERS, Interference No. 100,153, decided July 16, 1979, claims 1–5.

V 9 8 8 / 3 N 0 2 0 7 9 UMI

V 988 / 3 NO 020 79 UMI

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The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

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Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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	Sunnyvale Patent Library*	(408) 736-0795
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Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF OCTOBER 20, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-1-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-12-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.; Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	11-13-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	4-2-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	5-30-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	4-13-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	5-19-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-5-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-31-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-1-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	12-23-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-17-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	10-13-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	11-30-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-4-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	7-10-78

Expiration of patents: The patents within the range of numbers indicated below expire during October 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,056,137 to 3,061,832, inclusive
Plant Patents..... Numbers 2,178 to 2,188, inclusive

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REISSUES

NOVEMBER 20, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

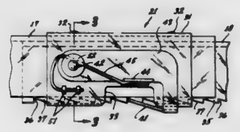
Re. 30,151
ADJUSTABLE BED-FRAME

Richard A. Nowell, Carlsbad, Calif., assignor to Harris-Hub Co., Inc., Harvey, Ill.

Original No. 4,078,270, dated Mar. 14, 1978, Ser. No. 768,331, Feb. 14, 1977. Application for reissue May 16, 1978, Ser. No. 906,769

Int. Cl.[2] **A47C** *19/04*

U.S. Cl. 5—181 **12 Claims**



1. In an adjustable bed frame adapted to support a box spring and mattress,

a pair of spaced parallel [horizontal] *horizontally* disposed side frame members;

at least one horizontally disposed transverse frame member comprising two elongated elements;

one of said elements mounted by one of its ends to one of said side frame member and the other of said elements mounted by one of its ends to the other of said side frame members;

said other element having a series of teeth disposed substantially along its length;

a spring-loaded pawl mounted on said one element [near its free end];

said one element and said other element being disposed in slidable relationship to each other so that said pawl engages said teeth one at a time, *said teeth facing in a direction such that said pawl is free to ride over said teeth when said side frame members are moved inwardly toward one another, engagement between said pawl and one of said teeth preventing said side frame members from moving outwardly relative to one another.*

Re. 30,152
SWINGABLE SHIELD ASSEMBLY FOR TRACTOR POWER TAKE-OFF

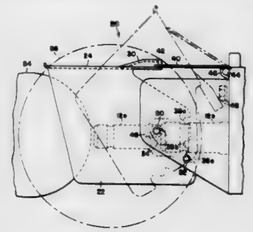
Lewis K. Davis, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Original No. 4,008,583, dated Feb. 22, 1977, Ser. No. 606,361, Aug. 21, 1975. Application for reissue Oct. 23, 1978, Ser. No. 953,487

Int. Cl.[2] **F16D** *3/84*

U.S. Cl. 64—32 R **8 Claims**

1. A PTO shield assembly for a tractor having a PTO shaft protruding therefrom, comprising: an inverted, U-shaped, shield member extending above and to the sides of the PTO shaft and secured to the tractor for pivotation about a horizontal axis perpendicular to the axis of the PTO shaft; said shield member having orientation means provided therein for establishing a plurality of *operative* pivotable positions for the shield member; and holding means on the tractor engageable with the



orientation means for holding the shield member pivoted in *any* one of the plurality of pivotable positions.

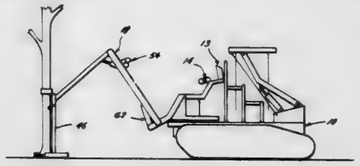
Re. 30,153
TREE HARVESTER

Thomas N. Busch, Daphne, Ala., and Cyrus E. Hoadley, Olla, La., assignors to Youngstown Sheet and Tube Company, Youngstown, Ohio

Original No. 3,556,183, dated Jan. 19, 1971, Ser. No. 739,766, Jun. 25, 1968. Application for reissue May 3, 1971, Ser. No. 139,345

Int. Cl.[2] **A01G** *23/02*

U.S. Cl. 144—3 D **25 Claims**



1. A tree harvester comprising:

a base;

a buck shear mounted on said base for bucking a tree into sections;

upwardly facing means for engaging a tree moving through said buck shear;

an articulating boom having inner and outer arms mounted on said base;

means on said outer arm for grasping a tree;

downwardly facing means mounted on said boom for engaging a tree moving through said buck shear when the boom is retracted;

means for extending said boom and operating said grasping means to engage a tree and for retracting the boom to retracted position in which the tree is engaged by said upwardly and downwardly facing means;

said upwardly and downwardly facing means together with said grasping means aligning the tree for movement through the buck shear; and

means for feeding the tree through said buck shear.

Re. 30,154

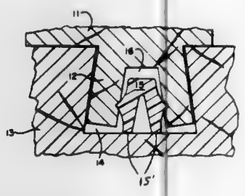
JOINING

Arthur B. Jarvis, Andover, Mass., assignor to Bose Corporation, Framingham, Mass.

Original No. 4,042,307, dated Aug. 16, 1977, Ser. No. 719,942, Sep. 2, 1976. Application for reissue Oct. 25, 1977, Ser. No. 845,256

Int. Cl.[2] **F16B** *2/14*

U.S. Cl. 403—290 **5 Claims**



1. A joint comprising,
a first piece of material having a projection with a groove,
a second piece of material having a slot embraced by angled walls with the width of the slot opening slightly greater than the width of said projection and less than the slot width at its base,
and wedge means located within said slot and said groove, for expanding said groove and urging said projection into engagement with the walls beside said slot,
said wedge means being formed with a slit having an opening adjacent to the base of said slot.

Re. 30,155

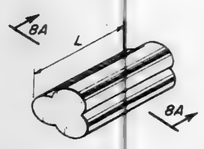
HYDROTREATING OF PETROLEUM DISTILLATES USING SHAPED CATALYST PARTICLES

William R. Gustafson, Lincroft, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Original No. 3,990,964, dated Nov. 9, 1976, Ser. No. 580,865, May 27, 1975. Continuation-in-part of Ser. No. 508,780, Sep. 24, 1974, Pat. No. 3,966,644, which is a continuation-in-part of Ser. No. 385,519, Aug. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 255,491, May 22, 1972, abandoned. Application for reissue Nov. 3, 1978, Ser. No. 957,609

Int. Cl.[2] **C10G** *23/02*

U.S. Cl. 208—216 PP **22 Claims**



12. In a process for hydrotreating petroleum distillate to remove sulfur-containing and nitrogen-containing components by contacting said distillate with hydrogen under pressure, temperature and hydrogen flow rate suitable for such hydrotreating, and with porous hydrotreating catalyst particles comprising a major portion of alumina and hydrotreating promoting amounts of molybdenum oxide and other oxide selected from cobalt oxide, nickel oxide and mixtures thereof, the improvement wherein said catalyst particles having a given length and polylobal cross-sectional shape characterized by a concavity index greater than 1.0, a void fraction in the range of about 0.25 to 0.60, ratio of geometric volume to geometric surface in the range of about **0.001** to **0.042** inch and catalytic pore volume between about **0.35** and **0.85** cubic centimeters per gram, said pore volume resulting from a major portion of pores having a diameter in the range of about **40** to **90** angstrom units when measured with mercury up to **50,000** pounds per square inch absolute pressure and a contact angle of **140°**.

Re. 30,156

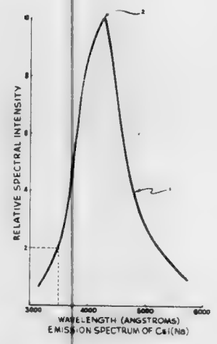
SODIUM ACTIVATED CESIUM IODIDE SCINTILLATOR

Paul C. Brinckmann, Munster, Fed. Rep. of Germany, assignor to The Harshaw Chemical Company, Cleveland, Ohio

Original No. 3,446,745, dated May 27, 1969, Ser. No. 531,455, Mar. 3, 1966. Continuation of Ser. No. 364,833, May 29, 1973, abandoned. Application for reissue Mar. 18, 1976, Ser. No. 668,129

Int. Cl.[2] **C09K** *11/24*

U.S. Cl. 252—301.4 H **2 Claims**



1. A scintillator comprising a transparent optically integral [crystalline] *single crystal* material consisting of a major amount of cesium iodide and a minor amount of a sodium compound *in solid solution therein,* said material being characterized by having an emission peak at about 4200±100 angstrom units *wherein the sodium concentration is from about 0.01 mole percent to about 0.220 mole percent.*

Re. 30,157

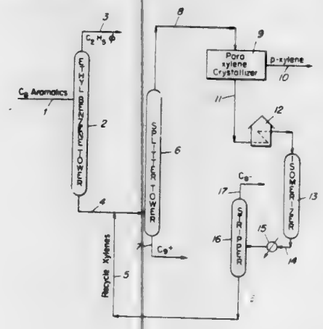
XYLENE ISOMERIZATION

George T. Burress, Somerville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Original No. 3,856,873, dated Dec. 24, 1974, Ser. No. 397,194, Oct. 13, 1973. Application for reissue Dec. 19, 1977, Ser. No. 861,814

Int. Cl.[2] **C07C** *5/24*

U.S. Cl. 585—411 **5 Claims**



1. In a process for conversion of a mixture of aromatic compounds having eight carbon atoms, said mixture containing ethyl benzene and xylenes, to isomerize xylenes contained in said mixture and convert at least part of ethyl benzene so contained to xylene or to compounds readily separable by distillation from eight carbon atom aromatics; the improvement which comprises contacting such mixture of eight carbon atom aromatic compounds with a catalyst which comprises acid zeolite of the ZSM-5 type, acid zeolite ZSM-12 [or acid zeolite ZSM-21], *acid zeolite ZSM-35 or acid zeolite ZSM-38* in vapor phase and in the absence of added hydrogen at a temperature of about 500° F. to about 1,000° F.

Re. 30,158

FUSING RESISTOR

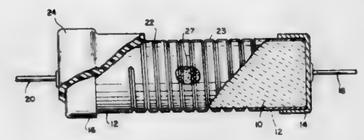
James B. Bucklin, Brazil, and Jay Utken, Frankfort, both of Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Original No. 3,735,318, dated May 22, 1973, Ser. No. 195,689, Nov. 4, 1971. Application for reissue Oct. 9, 1974, Ser. No. 513,454

Int. Cl.[2] **H01H** *85/06*

U.S. Cl. 337—166 **13 Claims**

1. A resistor comprising:
a non-conductive substrate,
a resistive tin oxide based film on said substrate,
a layer of glass frit material disposed on at least a portion of said resistive tin oxide based film having a melting point below the melting point of said resistive film which when melted chemically reacts with said film to render said portion thereof non-conductive,



metallic caps disposed at opposed ends of said substrate and overlying said film,
electrical leads coupled to said end caps, and
an insulative cover substantially surrounding said film and said caps.

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PLANT PATENTS

GRANTED NOVEMBER 20, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,485
RASPBERRY PLANT
J. Miles Reiter, 315 Vista Dr., La Selva Beach, Calif. 95076
Filed May 9, 1978, Ser. No. 904,150
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—46 **1 Claim**

1. The new and distinct variety of raspberry plant herein described and illustrated and identified by the characteristics enumerated above.

4,486
RASPBERRY PLANT
J. Miles Reiter, 315 Vista Dr., La Selva Beach, Calif. 95076
Filed May 9, 1978, Ser. No. 904,151
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—46 **1 Claim**

1. The new and distinct variety of raspberry plant herein described and illustrated and identified by the characteristics enumerated above.

4,487
STRAWBERRY PLANT
Royce S. Bringhurst, Davis, and Victor Voth, Santa Ana, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.
Filed Oct. 23, 1978, Ser. No. 953,815
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—49 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

4,488
STRAWBERRY PLANT
Royce S. Bringhurst, Davis, and Victor Voth, Santa Ana, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.
Filed Oct. 23, 1978, Ser. No. 953,816
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—49 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

4,489
STRAWBERRY PLANT
Royce S. Bringhurst, Davis, and Victor Voth, Santa Ana, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.
Filed Oct. 23, 1978, Ser. No. 953,993
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—49 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

V 9 8 8 / 3 N 0 2 0 7 9 UMI

PATENTS

GRANTED NOV. 20, 1979

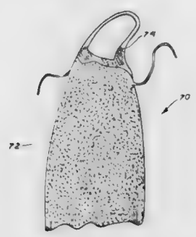
ERRATA

For CLASS	See PATENT NO.
433–053	4,174,570
433–216	4,174,571
340–052 D	4,174,766
435–032	4,174,772
406–076	4,174,868
425–501	4,174,945
430–375	4,174,968
430–445	4,174,969
435–055	4,175,006
435–105	4,175,007
435–295	4,175,008
528–299	4,175,072
548–140	4,175,081
549–065	4,175,085
549–051	4,175,086
549–059	4,175,088
585–831	4,175,099
525–327	4,175,100
525–088	4,175,101
526–309	4,175,176
342–303	4,175,251

V 9 8 8 \ 3 N 0 2 0 7 9 UMI

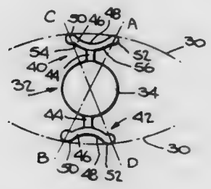


4,174,542
TEXTURED APRON
Maris Vistins, Coshocton, Ohio, assignor to Becton, Dickinson and Company, Rutherford, N.J.
Division of Ser. No. 817,189, Jul. 20, 1977, which is a division of Ser. No. 767,849, Feb. 11, 1977, Pat. No. 4,089,069. This application Nov. 2, 1978, Ser. No. 957,136
Int. Cl.[2] A41B *13/10*
U.S. Cl. 2—48 **4 Claims**



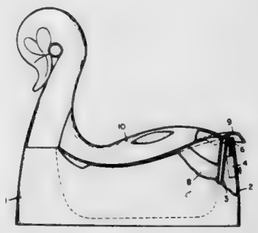
1. An abrasion resistant, wrinkle finish textured apron, which comprises;
- a knitted textile body having the shape and size of an apron, an outer surface of which is napped to provide raised textile fibers, the raised fibrous naps having a height of from ½ inch to 1 inch to create an uneven base on said body; and
- a cured, elastomeric resin coating the base to encapsulate individual nap fibers, whereby the coating is reinforced and strengthened by the included encapsulated fibers and a wrinkle finish is obtained.

4,174,543
INTRAOCULAR LENSES
Charles D. Kelman, 73 Bacon Rd., Old Westbury, N.Y. 11568
Filed Jun. 1, 1978, Ser. No. 911,452
Int. Cl.[2] A61F *1/16, 1/24*
U.S. Cl. 3—13 **16 Claims**



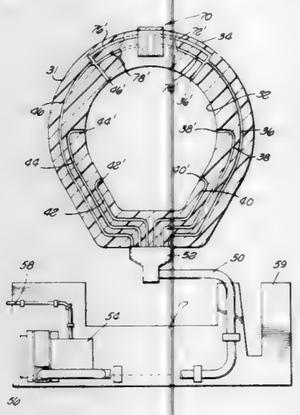
1. An intraocular insert suitable for use as an artificial lens implant in the anterior chamber of a human eye, said anterior chamber having a groove between the scleral spur and the iris of the eye circumferentially and at upper and lower portions of the eye when viewed in cross section, said insert having a medial light focusing lens body having a periphery and generally oppositely disposed first and second position fixation means engageable with said respective upper and lower groove portions to fix the position of the lens body with respect to the pupil of the eye, said upper and lower groove portions having respective interior peripheral surfaces, said first and second position fixation means being integrally joined to predetermined first and second peripheral portions respectively of said lens body and respectively extending generally radially outwardly of said lens body, said first and second position fixation means respectively having first and second outer seating edges, each said outer seating edge respectively having a pair of spaced contact portions for paired contact with a respective one of said interior peripheral surfaces of said groove and a concave portion between said pair of contact portions that is normally free from contact with said respective ones of said interior peripheral surfaces of said groove, at least one of the position fixation means having a first stem portion integrally joined to and extending from one of said peripheral portions of said lens body, and a first limb portion joined to and extending from said first stem portion and including at least one free end having one of said contact portions, said first limb portion having a first radially outermost peripheral edge that defines one of said outer seating edges and a first inner edge free from connection with said lens body from said first stem to said one of said contact portions, at least one of said first stem portion and said first limb portion being of a first predetermined width and thickness to permit movement of said one of said contact portions toward and away from said lens body in response to normal distortions of the eye.

4,174,544
STOOL FOR USE WITH INFANT
Noriko Furusawa, 1439, Torii-Atomachi, Kanuma-shi, Tochigi-ken, Japan
Filed Jun. 12, 1978, Ser. No. 914,543
Int. Cl.[2] A61G *9/00*
U.S. Cl. 4—112 **2 Claims**



1. A stool for use with infants which is portable and used in sit-astride fashion comprising:
- a bed pan having a bottom surface and an extended side edge with an undersurface,
- a straddle seating body having a base portion and a lid with a center opening, said base portion having an inner peripheral wall and an outer peripheral wall, said bed pan being rockably carried in said base portion,
- a music box mounted between said inner and outer perpheral walls having a rotatable governor,
- a stopper rod having two ends longitudinally movably mounted in said base portion, one end being in contact with said undersurface of said side edge and the other end being in rotation-blocking contact with said governor, and
- a spring biasing said stopper rod into contact with said governor whereby when an infant is placed astride said lid, said stopper rod is pushed downwardly against the biasing of said spring unblocking said governor and allowing the same to rotate to sound said music box.

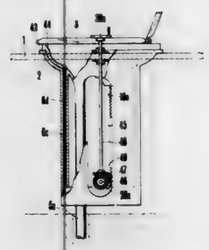
4,174,545
TOILET STOOL VENTILATING DEVICE
Clarence E. Smith, Jr., 1372 E. 107th St., Los Angeles, Calif. 90002
Filed Jul. 31, 1978, Ser. No. 929,721
Int. Cl.[2] A47K *13/00;* **E03D** *9/04*
U.S. Cl. 4—217 **2 Claims**



1. A ventilating device for a toilet stool having a toilet bowl and a seat pivotally connected thereto, said bowl having an enlarged opening, comprising:
an air chamber means adapted to fit the top of said bowl and positioned between said seat and said bowl, said chamber means having an inner wall adjacent said enlarged opening, said inner wall having a plurality of orifices spaced around the exterior thereof to receive air from said bowl, said chamber means having a plurality of conduits therein, said conduits being respectively connected to said orifices such that each conduit defines a separate flow passage from the associated orifice;
discharge connector means connected to said conduits for receiving air discharged from said conduits;
suction means for removing air from said bowl to remove odors therefrom;
conveying means connecting said suction means and said discharge connector means for conveying air from said chamber means to said suction means;
a valve moveably secured in said chamber means, said valve having an inlet to receive air from said bowl, said valve being connected to one of said conduits, said valve being positionable to register said inlet and said one of said conduits to allow flow of air from said bowl into said chamber means and to move said inlet out of registration with said one of said conduits; and
switch means operably connected to said suction means to selectively actuate said suction means.

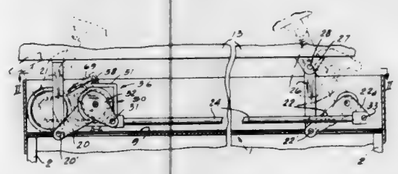
4,174,546
CONSTRUCTION FOR A WATER CLOSET
Toshiro Ohtake, No. 1-5, Tateishi 6-chome, Katsushika-ku, Tokyo, Japan
Filed Nov. 23, 1977, Ser. No. 854,314
Claims priority, application Japan, Nov. 27, 1976, 51-143170; Jan. 18, 1977, 52-004165; Apr. 9, 1977, 52-095400
Int. Cl.[2] E03D *11/02, 11/16, 1/00*
U.S. Cl. 4—420 **6 Claims**

1. A toilet for human waste, adjustably positionable on a support at floor level comprising:
an outer tubular drum member connected to the support and extending downwardly therefrom;
a stool member supported on said outer drum including a seat and bowl portion and a tubular drum portion extending downwardly from said bowl portion, said drum portion comprising an inner drum member concentrically slidable in said outer drum member;
said outer drum member including at least one elongated slot therein having an internal vertical rack formed along one elongated edge thereof;



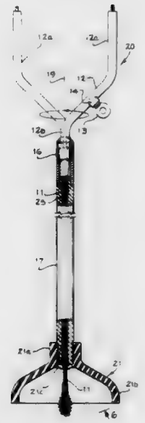
a shaft rotatably mounted on said inner drum member;
a pinion connected to said shaft and engaged with said rack; and
drive means connected to said shaft for rotating said pinion and moving said inner drum member upwardly and downwardly with respect to said outer drum member.

4,174,547
HOSPITAL BED STRUCTURE
Justin J. Wetzler, 703 Sheridan Rd., Evanston, Ill. 60202
Filed Feb. 8, 1978, Ser. No. 876,017
Int. Cl.[2] A47C *3/32, 7/10*
U.S. Cl. 5—68 **21 Claims**



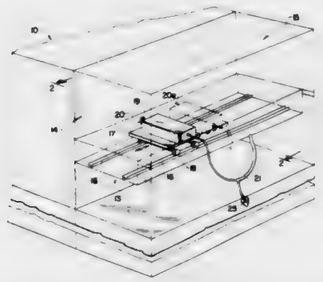
1. In power operated bed structure having a relatively stationary base structure and a mattress-supporting structure, having a head end and a foot end, adapted to support a mattress in a planar position, in which it may be elevated and lowered relative to the base structure by corresponding movement of said mattress-supporting structure, the combination of connecting linkage between the foot end and the base structure and connecting linkage between the head end and the base structure, for supporting the respective ends in elevated or in lowered positions, power means carried by the base structure operatively connected to one of said linkages, for elevating and lowering the associated end of the mattress-supporting structure, means for selectively connecting the other of said linkages to the power source for simultaneous actuation of such other linkage with the first-mentioned linkage, a mattress, while supported in such a planar position, whereby the mattress-supporting structure may be elevated and lowered relative to the base structure, and means for retaining the end of the mattress-supporting structure associated with said other linkage, in position independently of its connection to the power source, whereby such end of the mattress-supporting structure may be disposed in a lowered position relative to the opposite end thereof to tilt the plane of a mattress supported by said mattress structure.

4,174,548
PLUMBER'S APPLIANCE FOR CLEARING DRAINS
Richard P. Dunn, 3437 Davies Ave., Cayucos, Calif. 93430
Filed Jan. 12, 1978, Ser. No. 868,996
Int. Cl.[2] B08B *9/02*
U.S. Cl. 15—104.3 SN **4 Claims**



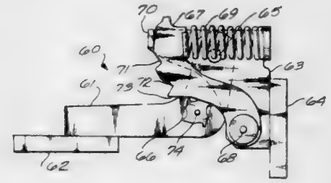
1. A plumber's appliance for clearing drains and the like comprising an elongate flexible clean-out cable, an elongate rigid hollow handle carried on said cable, said handle having first and second portions to be gripped and rotated about the axis of the other said portion for rotating said cable on said axis, an elongate hollow grip member carried about a stretch of said cable for steadying the cable on said axis as said cable is rotated by said handle, a first end of said hollow grip member having aligning means for engaging and guiding said other one of said portions while permitting said one of said portions to be rotated around said axis, a resilient force cup carried from that end of said grip member opposite said first end thereof, said cable being disposed to pass centrally through said force cup, said grip member being movable axially of said stretch of said cable for operating said force cup with said cable disposed axially of said grip member, and means for substantially blocking fluid flow out of said grip member under plunging action of said force cup.

4,174,549
SOOT BLOWING APPARATUS
Herb Michelson, 5 Horizon Rd., Fort Lee, N.J. 07024
Filed Oct. 25, 1977, Ser. No. 844,859
Int. Cl.[2] F23J *3/02*
U.S. Cl. 15—318 **15 Claims**



1. A soot blowing system for cleaning banks of tubes or the like disposed in an apertured housing having a plurality of insertion apertures comprising:
a moveable carriage located exteriorly of said housing,
an apertured lance having an apertured portion containing at least one fixedly positioned emission opening,
means for rotatably and axially displacing said lance relative to said moveable carriage for sequential insertion of said lance into and rotation within said insertion apertures in the housing to pass in proximity to said banks of tubes, and
means for connecting said lance to a fluid supply, said lance being rotatable about its own axis to emit fluid under pressure through its apertured portion for cleaning the tubes in the adjacent spatial area of the emission of the fluid.

4,174,550
DETENT FOR MECHANICAL LINKAGE
George H. Hurst, Jr., 16491 Harbour La., Huntington Beach, Calif. 92649
Continuation of Ser. No. 775,780, Mar. 9, 1977, Pat. No. 4,090,273. This application May 23, 1978, Ser. No. 908,723
The portion of the term of this patent subsequent to May 25, 1995, has been disclaimed.
Int. Cl.[2] E05D *11/06, 11/08*
U.S. Cl. 16—144 **1 Claim**

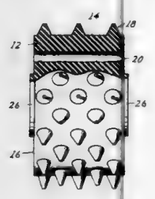


1. A detent for a mechanical linkage comprising:
a movable linkage member;
a rotatable cam follower member;
a generally V-shaped notch with edges and a vertex formed on one of the members;
first and second sides on the other member meeting to form a corner that fits in the notch;
means for urging the cam follower member and the surface of travel of the linkage member against each other; and
an arcuate concave relief on the first side of the other member adjacent to the corner, the relief being shaped to embrace one edge of the notch without such edge bottoming on the other member as the corner of the other member enters the notch from a given direction.

4,174,551
FEATHER PLUCKING DEVICE
Scott W. McKendree, 1893 Del Moro, Klamath Falls, Oreg. 97601
Filed Jan. 3, 1978, Ser. No. 866,568
Int. Cl.[2] A22C *21/02*
U.S. Cl. 17—11.1 R **2 Claims**

1. A feather plucking device comprising a resilient drum having opposed, substantially parallel sides, a central aperture extending from side-to-side through a central region of said drum, a plurality of angularly-spaced apertures extending from side-to-side through a peripheral region of said drum, and a pair of bosses, each formed integrally with the central region of a side of the drum and extending outwardly therefrom about said central aperture, said drum being designed for detachable mounting on a rotatable shaft extending through said central aperture by opposing washers pressed against the bosses on

opposite sides of the drum to frictionally inhibit rotation of the drum relative to the shaft, said bosses allowing said washers to



be pressed tightly against said central region with minimum side-to-side deformation of said peripheral region occurring.

4,174,552
DRAPERY TIEBACK RING HOLDING CLIP
Edna M. Franklin, 1500 NW. 35, Oklahoma City, Okla. 73118
Continuation-in-part of Ser. No. 855,860, Nov. 30, 1977, abandoned. This application Jun. 9, 1978, Ser. No. 914,245
Int. Cl.[2] A44B *13/00*
U.S. Cl. 24—73 CH **3 Claims**



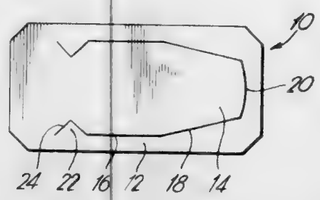
1. A support clip in combination with a drapery panel tieback having an endless ring secured to its respective end portions, the improvement comprising:
an elongated rod having its medial portion arcuately curved in a flat plane to form a part circular screw retaining loop and having intermediate portions disposed in diverging relation in the plane of the screw loop,
the respective end portions of said rod being arcuately curved toward the screw loop to form an open loop lying in a plane normal to the plane of the screw loop for respectively receiving said endless rings.

4,174,553
COUPLING DEVICE FOR ANIMAL COLLARS
Benton Schrougham, 243 S. 25th St., Beech Grove, Ind. 46107, and John W. Lee, 7791 W. 96th St., Zionsville, Ind. 46077
Filed Sep. 15, 1978, Ser. No. 942,459
Int. Cl.[2] A44B *11/00*
U.S. Cl. 24—74 R **6 Claims**



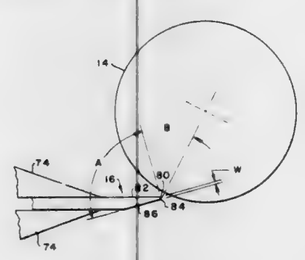
1. In a coupler device for fastening an animal collar provided with an opening near each end of said collar, the combination of a base member having upstanding, longitudinally extending side portions defining the width of a channel and including a post member disposed near each end of said channel and upraised from the lower surface of said base member, each of said post members including a stop means and adapted to receive a respective one of said openings provided near the respective ends of said collar; a locking member comprising a strip of resilient material having a convex curvature along its longitudinal axis and including a pair of spaced openings; a respective one of said openings releasably engaging a respective one of said said stop means provided on said post members with said strip forming a closure over said channel and preventing displacement of the ends of said collars from a respective post member.

4,174,554
BAG CLOSURE
Gysbertus Flantua, Grimsby, Canada, assignor to Bonar & Bemis Ltd., Canada
Filed Jul. 14, 1978, Ser. No. 924,725
Int. Cl.[2] B65D *77/10*
U.S. Cl. 24—30.5 P **2 Claims**



1. A reusable bag closure comprising a base portion and a tongue portion formed from the base portion, said tongue portion having an integral hinge connection with said base portion and being defined by a pair of opposed inwardly directed neck areas adjacent said connection, a pair of opposed parallel edge sections connected to said neck areas, a pair of opposed converging edge sections connected to said parallel edge sections and a curved end section connecting said converging edge sections, said base portion having an opening corresponding to said tongue portion, said opening having a minimum width substantially equal to the minimum distance between said neck areas.

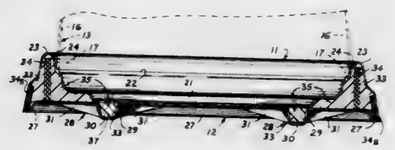
4,174,555
BLADE FOR SCULPTURING PILE FABRIC
Charles E. Willbanks, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.
Filed May 8, 1978, Ser. No. 904,109
Int. Cl.[2] D06G *23/02*
U.S. Cl. 26—16 **8 Claims**



1. An improved apparatus for trimming the pile in regions of a pile fabric to which stiffening agent has been applied, said apparatus being of the type having;

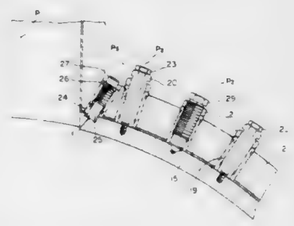
means for supplying a pile fabric having regions of stiffened and regions of unstiffened fibers; and
cutter means for trimming the pile from the stiffened regions including
blade means comprising an endless translating band for contacting both the stiffened fibers and the unstiffened fibers while severing the stiffened fibers and deflecting the unstiffened fibers, said blade means cutting in the same fashion as a knife or razor as opposed to cutting like a pair of scissors;
support means closely adjacent to said blade means for maintaining said pile fabric in contact with said blade means; and
means for effecting relative motion between said blade means and said pile fabric,
wherein the improvement comprises said blade having
a face adjacent to said pile fabric,
a first facet disposed between the leading edge of said blade and said face adjacent to said pile fabric, and
a second facet adjoining said first facet said second facet being substantially wider than said first facet, the intersection of said first facet and said second facet defining the leading edge of said blade, said leading edge being between said second facet and said pile fabric, the angle between said face and said first facet being acute, the angle between said first facet and the normal to said pile fabric adjacent to said blade being between about 30° and about 60°, the included angle defined by said first facet and said second facet being between about 75° and between 105° and the width of said first facet being less than about ½ the depth of the pile on said pile fabric.

4,174,556
CASKET
Richard R. Richings, E. 1707 Bismark, Spokane, Wash. 99207
Filed Nov. 16, 1977, Ser. No. 852,110
Int. Cl.[2] A61G *17/00*
U.S. Cl. 27—7 **12 Claims**



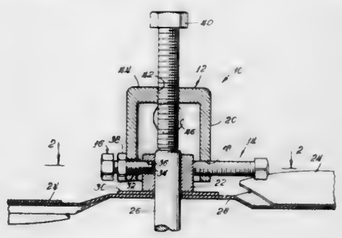
1. A casket comprising:
a base molded of synthetic resin;
said base having integral casket support means formed therein;
a bed molded of synthetic resin mounted on and bonded to the base and having a central portion supported above the base;
said central portion of the bed having recesses formed in the central portion of the bed and extending downward engaging the base for receiving a pillow and having a body supporting pad;
a removable top cover for enclosing a portion of the bed including the integral recesses;
said top cover having a bottom peripheral edge for resting against the bed;
said bed having a continuous peripheral ledge for receiving the peripheral edge of the top cover and for supporting the top cover; and
said bed having a raised rim located outwardly and upward of the ledge for forming an exposed peripheral cleft between the bed and top cover when the top cover is in place on the bed, said cleft being adapted to be filled with a sealing agent to bind the bed and top cover together and to hermetically seal the casket.

4,174,557
METHOD OF MOUNTING VALVE SEATS IN A BUTTERFLY VALVE
Yukio Goto, Osaka; Osamu Nakai, and Ikuo Yoshimori, both of Hirakata, all of Japan, assignors to Kubota, Ltd., Osaka, Japan
Filed Mar. 31, 1978, Ser. No. 892,341
Claims priority, application Japan, Apr. 5, 1977, 52-43387[U]; Apr. 5, 1977, 52-43388[U]
Int. Cl.[2] B23P *15/00*; **F16K** *1/226*
U.S. Cl. 29—157.1 R **4 Claims**



1. A method of mounting a valve seat including a plurality of arcuate seat parts having end surfaces, in a butterfly valve having a disc-shaped valve closure member and stem portions which offstand therefrom and arranged to support seal means disposed in a valve body and arranged to contact said seat parts peripherally when the valve closure member is closed, said method comprising adjusting said seat parts relative to the positions of said end surfaces thereof by screwing a series of first bolts into said valve body, each of said first series of bolts having a tapered extremity substantially of conical shape and formed complemental to recesses in said seat parts, and a second series of bolts screwed into said valve body arranged to adjust said seat parts relative to the positions of said end surfaces, said method further including the steps of
(a) adjusting the first and second series of bolts to properly position said seat parts relative to said valve body,
(b) removing said first series of bolts from said valve body, and
(c) inserting a third series of bolts having a planar end into said valve body in place of said first to equalize pressure on said seat parts against said valve member.

4,174,558
FAN OR WHEEL PULLING DEVICE
Irvin R. Dombrowski, 613 Linden Ave., Bellwood, Ill. 60104
Filed Jul. 31, 1978, Ser. No. 929,546
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—259 **6 Claims**



1. A device for pulling from a drive shaft an affixed hub having one or more radial threaded setscrew holes extending therethrough, the device being of the type having a hollow housing of sufficient internal capacity to accommodate the hub, with one or more locking bolts extending radially through

threaded holes in the wall of the housing and adapted to engage the hub, and a jacking bolt extending axially through a threaded hole in the top of the housing and positioned to engage the end of the shaft, an improvement comprising:

a. at least one circumferential slot in the wall of the housing located to register with a radial threaded setscrew hole in the hub, and

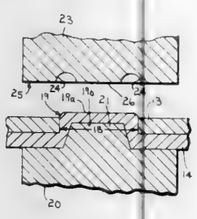
b. a threaded engagement screw having threads compatible with the threaded setscrew hole in the hub, said engagement screw passing through said slot and adapted to be screwed into the threaded setscrew hole to positively secure the housing to the hub for removal of the hub from the shaft during rotation of the jacking bolt against the shaft.

4,174,559

FASTENING METHOD

James E. Persik, and Gerald E. Persik, both of Menomonee Falls, Wis., assignors to J.J. & M., Milwaukee, Wis.

Filed Feb. 9, 1978, Ser. No. 876,295
Int. Cl.[2] B21D *39/00*; B23P *11/02*
U.S. Cl. 29—509 **2 Claims**



1. The method of securely fastening together two sheets of metal each having a thickness of at least about 0.025 inches which comprises:

(a) forming a hollow back, closed end cylindrical projection on one piece of metal;

(b) forming a projection-receiving aperture in the second piece of metal;

(c) positioning the first piece of metal on a support member having a head which extends into and fills the hollow back of the projection;

(d) positioning the second piece of metal upon the first with the projection received in and extending above the projection-receiving aperture; and

(e) then striking the head of the projection with a die having a ring-shaped groove having an outer diameter greater than that of the aperture and a circular flat central portion having a diameter less than the diameter of the aperture so that a portion of the metal of the head of the projection extending above the aperture forms a ring-shaped lip that overlaps the edge of the aperture, grips the surface of the second piece of metal and effectively limits the enlargement of the aperture and a tight friction fit is formed between the projection and the aperture.

4,174,560

TOOL FOR APPLYING CONNECTORS TO FLEXIBLE CABLE

Robert B. Senior, Grand Haven, and Paul A. Yarbrough, Muskegon, both of Mich., assignors to Cooper Industries, Inc., Houston, Tex.

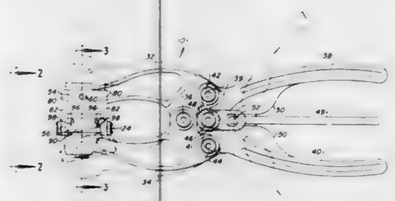
Filed Mar. 17, 1978, Ser. No. 887,906
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—566.1 **16 Claims**

1. A hand-held tool for applying a connector to flexible flat cable wherein said connector comprises a body having one or more terminals for making electrical contact with respective conductors in said cable, and a cover for holding said cable to said body, said tool comprising:

a pair of jaws being relatively movable one with respect to the other between open and closed positions;

a member disposed on one of said jaws for supporting said body;

a member disposed on the other of said jaws for engaging said cover to press said cover and said body together to



establish terminations between said terminals and said conductors in response to moving said jaws to a closed position;

means for moving said jaws between open and closed positions;

a cable cutting blade; and,

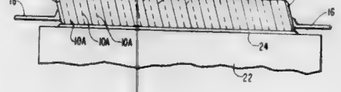
means for mounting said blade on one of said members for movement with respect to said one member between a position for cutting said cable and a non-cutting position.

4,174,561

METHOD OF FABRICATING HIGH INTENSITY SOLAR ENERGY CONVERTER

Robert E. House, Reading; Robert A. Irvin, and Daniel F. Kane, both of Sudbury, all of Mass., assignors to Semicon, Inc., Burlington, Mass.

Division of Ser. No. 656,343, Feb. 9, 1976, Pat. No. 4,082,570.
This application Oct. 27, 1977, Ser. No. 846,173
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—572 **20 Claims**



1. A method of fabricating a photovoltaic energy converter for converting incident radiant energy to electrical energy, said method comprising the steps of:

A. preparing a plurality of wafers of semiconductive material of a first conductivity type, each said wafer having

i. first and second opposed end faces,

ii. a first region below the first end face having a net impurity concentration of a second conductivity type,

iii. a second region below the second end face having a net impurity concentration of the first conductivity type greater than the concentration in

iv. a base region located between said first and second regions, and

v. a photovoltaic junction separating said first and base regions;

B. preparing a plurality of layers of an electrically conductive material;

C. stacking said wafers and conductive layers in a stack with said wafers and conductive layers in alternate layers, said wafers being oriented in the stack so that the first region in each said wafer is directed toward the same end of the stack;

D. fusing the stack to form an integrally bonded unit;

E. cutting from the fused stack a slab defining first and second opposed major surfaces transverse to the junctions of said wafers, the cut forming the second transverse surface of the slab being made along a plane that deviates from a normal to the junction in each said wafer by a predetermined small angle in a direction such that when said slab is viewed through the second transverse surface more of the base region and less of the first region in each said wafer is exposed thereby to provide increased space for junction depletion layer spreading at and below the second transverse surface; and

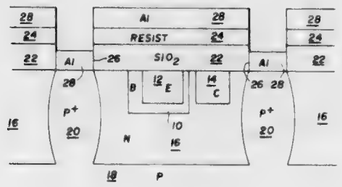
F. mounting the first transverse surface of said slab on a substrate, said slab being positioned on said substrate for exposure to the radiant energy along a direction essentially normal to the second transverse surface of said slab.

4,174,562

PROCESS FOR FORMING METALLIC GROUND GRID FOR INTEGRATED CIRCUITS

Thomas J. Sanders, Indialantic; William R. Morcom, Melbourne Beach, and Jacob A. Davis, Indialantic, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Continuation-in-part of Ser. No. 689,441, May 24, 1976, abandoned, which is a division of Ser. No. 561,677, Mar. 25, 1975, Pat. No. 3,974,517, which is a continuation of Ser. No. 412,118, Nov. 2, 1973, abandoned. This application May 16, 1978, Ser. No. 906,380
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—578 **9 Claims**



1. A process for fabricating an integrated circuit having a plurality of planar regions of a first conductivity type separated by planar isolation barriers of an opposed second conductivity type and having semiconductor components formed in said planar regions comprising:

forming a first insulated layer on said planar regions with said planar isolation barriers exposed;

forming a first continuous conductor on said exposed isolation barriers having a thickness less than the thickness of said first insulated layer;

forming a second insulated layer on said first conductor having a thickness sufficient to produce a substantially planar surface with said first insulated layer;

forming select apertures in said first and second insulated layers to expose planar areas of said semiconductor components and areas of said first conductor respectively; and

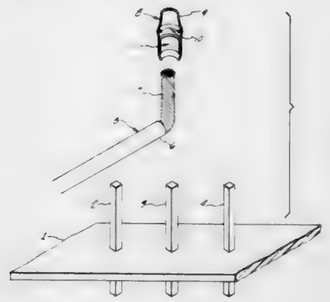
forming a plurality of second conductors interconnecting said exposed planar areas and said exposed first conductor areas.

4,174,563

WIRE WRAP POST TERMINATOR FOR STRANDED WIRE

Damon G. Simpson, Los Altos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 12, 1977, Ser. No. 859,273
Int. Cl.[2] H01R *5/04*
U.S. Cl. 29—628 **19 Claims**



1. A method of forming a wire wrap post termination which comprises:

a. removing the insulation from an end portion of a stranded wire;

b. threading said end portion of the stranded wire into a connector, said connnector comprising a solder insert and a fixturing member positioned in axially displaced relationship within a heat recoverable sleeve such that said fixturing member and said solder insert are held in place by said heat recoverable sleeve;

c. inserting a wire wrap post into said connector sleeve, such that the stranded wire is wedged between the post and the fixturing member of the connector; and

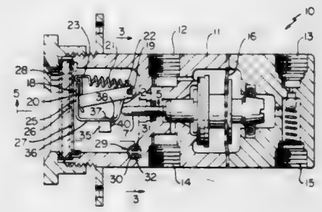
d. heating the assembly at a temperature sufficient to melt the solde. and occasion recovery of the heat recoverable sleeve without melting the fixturing member.

4,174,564

PNEUMATIC INDICATOR DEVICE AND METHOD OF MAKING THE SAME

William T. Moon, Jr.; Arden D. Rogers; Clifford E. Goff, and Harry B. Bannon, all of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 683,623, May 5, 1976, Pat. No. 4,107,492.
This application Jun. 12, 1978, Ser. No. 914,200
Int. Cl.[2] H01H *35/40*
U.S. Cl. 29—622 **5 Claims**



1. In a method of making a pneumatic indicator device having a housing means carrying in a chamber thereof a movable flag that in one position visually indicates through a window means of said housing means one pneumatic condition of said device and in another position visually indicates through

V9813N0279 UMI

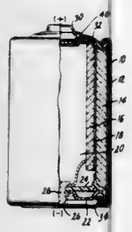
said window means another pneumatic condition of said device, said housing means carrying therein a pneumatically operated plunger that engages and moves said flag between said positions thereof in relation to said pneumatic conditions of said device, the improvement comprising the steps of disposing an electrical switch means in said housing means, forming said movable flag with means thereon that operates said switch means so that said switch means electrically indicates said positions of said flag, forming said housing means with a bore means passing completely therethrough in a manner to partially intersect with said chamber and receive said electrical switch means therein so that part of said switch means is exposed to said chamber, and disposing sealing means in said bore means to seal said bore means from the exterior of said housing means and secure said electrical switch means in said bore means of said housing means so that said part of said switch means is directly exposed to said chamber.

4,174,565

METHOD OF PRECHARGING RECHARGEABLE METAL OXIDE-HYDROGEN CELLS

Karl V. Kordesch, Lakewood, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 810,789, Jun. 28, 1977, abandoned. This application Mar. 28, 1978, Ser. No. 890,986
Int. Cl.² H01M *10/28*
U.S. Cl. 29—623.2 **5 Claims**



1. A method of manufacturing a sealed rechargeable cell with a precharge of hydrogen gas, said cell containing a metal oxide positive electrode, a hydrogen gas negative electrode separated from said positive electrode and an aqueous alkaline electrolyte, comprising the steps of: inserting a metallic member within said cell at a location adapted to contact said alkaline electrolyte, said metallic member being in the form of a solid body composed of a metal selected from the group consisting of aluminum, zinc and magnesium; and hermetically sealing said cell whereby a predetermined quantity of hydrogen gas is generated in-situ, within said cell, over a controlled period of time from a reaction by said member on contact with said electrolyte and with said reaction providing an inactive reaction product.

4,174,566

INSERTION TOOL FOR INTEGRATED CIRCUIT PACKAGES

John G. Smith, Erdenheim, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 30, 1978, Ser. No. 910,657
Int. Cl.² H05K *13/04*
U.S. Cl. 29—758 **9 Claims**

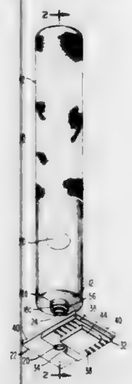
1. A tool for use in inserting within a connector an integrated circuit package having a metallic heat sink member and including a registration hole therein, said connector having a retention post for engaging said registration hole, said tool comprising:

a body member,

said body member having a plurality of contiguous concentric bores, one of said bores terminating in an extremity of said body member,

a pin member,

said pin member having a plurality of contiguous coaxial cylindrical sections, at least a first and second section being accommodated respectively within said bores, a third section contiguous with said second section and defining tip means for said pin member, said tip means for engaging said registration hole and having dimensions



such that the sides of said hole are gripped by the tip surface,

said pin member being slidably disposed within said body member and having said tip means and a portion of said second section adjacent thereto protruding from said extremity of said body member, and

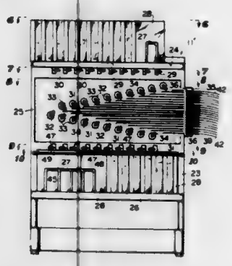
spring means positioned in one of said bores and in contact with said pin member for applying a compressive force thereto which tends to drive said pin member in the direction of said extremity of said body member.

4,174,567

APPARATUS FOR STORING AND SUPPLYING PARALLEL LEAD ELECTRONIC CIRCUIT ELEMENTS

Masakazu Kamoshida, and Keiichi Ihara, both of Tokyo, Japan, assignors to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1977, Ser. No. 811,919
Claims priority, application Japan, Sep. 16, 1976, 51-111013
Int. Cl.² H05K *3/30*
U.S. Cl. 29—741 **10 Claims**



1. An apparatus for storing and supplying parallel lead circuit elements disposed on an elongated web carrier in combination with a mechanism for processing and securing said circuit elements to a printed circuit board comprising in combination,

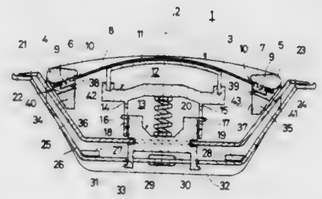
a plurality of cases, each of said cases supporting a reel therein, said reel being adapted to wind an elongated web carrier thereabout, support means for supporting said plurality of cases at predetermined positions, guiding and feeding means supporting by said support means, each of said guiding and feeding means being disposed proximate to one of said cases for incrementally advancing said web carried from said case, independently of the incremental advancement of each other web carrier advanced from each of said other cases, a plurality of guide plates disposed in parallel with respect to each other, each of said guide plates being disposed proximate to each of said guiding and feeding means in order to receive the web carrier incrementally advanced by said guiding and feeding means and guide same toward a mechanism particularly suited to process and secure the circuit elements to said printed circuit board and, a plurality of separator plates supported by said support means, each of said separator plates being disposed adjacent to a guide plate for receiving the web carrier guided thereby, a plurality of slide plates, each of said slide plates being disposed in abutment with said separator plate, and a plurality of second guide plates, each of said second guide plates being secured to said mechanism for processing and securing the circuit elements to a printed circuit board, to permit the second guide plate to be slideably displaced with respect to the slide plate when the ends of said second guide plate are at different elevations.

4,174,568

SHAVING HEAD FOR DRYSHAVING APPARATUS

Ingomar Mixner, Klagenfurt, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,713
Claims priority, application Austria, May 3, 1977, 3131/77
Int. Cl.² B26B *19/04, 19/20*
U.S. Cl. 30—34.1 **2 Claims**



1. A shaving head for a dry shaver, which comprises a longitudinally extending flexible shear foil arcuated in the operating position, a longitudinally reciprocatable cutter cooperating with said flexible shear foil in such position, a longitudinally extending shaving-head frame having two longitudinal side members extending parallel to the longitudinal plane of symmetry of the shaving-head frame, each longitudinal side member having a contact surface for engagement with said flexible shear foil, at least one pin projecting from each contact surface, corresponding openings formed in said flexible shear foil for respectively receiving said pins, and a further member disposed in said shaving-head frame parallel to each longitudinal side member and opposite the free ends of the pins projecting from the contact surface thereof, said two further members each having a first surface extending parallel to the longitudinal plane of symmetry of the shaving-head frame, said two first surfaces facing each other and defining an aperture for insertion of the flexible shear foil into said shaving-head frame, said two further members also each having a second surface adjoining the respective first surface and forming an edge therewith, each second surface facing the contact surface of its associated longitudinal side member and being spaced from the free ends of the pins projecting from said contact surface, the opposite longitudinal sides of said flexible shear foil extending into the spaces between the respective second surfaces and the respective contact surfaces, the second surfaces being respectively disposed in two planes converging in accordance with the curvature of the flexible shear foil, and the plane extending through the edges of the two further members intersecting the projecting pins.

4,174,569

ELECTRIC RAZOR

Hans Schenk, Stadlgasse 6, Graz, Austria (A-8020); Maria Sprung, and Walter Sprung, both of Schiesstattgasse 5/6/23, Graz, Austria (A-8010)

Filed Feb. 24, 1978, Ser. No. 881,081
Claims priority, application Austria, Feb. 25, 1977, 1264/77
Int. Cl.² B26B *19/26*
U.S. Cl. 30—43.3 **12 Claims**



1. An electric razor comprising a housing including a shearing head attached thereto; a shearing comb disposed within the head and having openings permitting hair protruding from a surface to enter into an interior of the comb; a blade beam carrier mounting an elongated blade beam inside of and for cooperation with the comb for severing hair extending through the opening when the blade beam oscillates relative to the comb; drive means disposed within the housing for longitudinally oscillating the blade beam carrier relative to the comb, the drive means including electric motor means and a connecting member driven by the motor means and engaging the blade beam carrier; and shearing comb oscillating means operatively coupled with the connecting member for imparting to the shearing comb a first oscillating motion substantially parallel to the oscillating movement of the blade beam carrier, a second oscillating motion which is transverse to the first oscillating motion of the comb, and a third oscillating motion which lifts the shearing comb off said surface.

4,174,570

MAGNETIC PIN SETTER USEFUL IN DENTISTRY

Donald E. Schwartz, 778 Crestway Dr., San Antonio, Tex. 78239

Filed Jul. 14, 1977, Ser. No. 815,701
Int. Cl.² A61C *13/00*
U.S. Cl. 433—53 **6 Claims**

1. A magnetic pin setter useful in dentistry being magnetically adjustable in three dimensions comprising:

a. a metallic horizontal table supported above a base,

b. an adjustable work table positioned below said horizontal table,

c. a first magnet having its magnetically attaching surface magnetically slidably adjustable in a horizontal plane attached to said horizontal table,

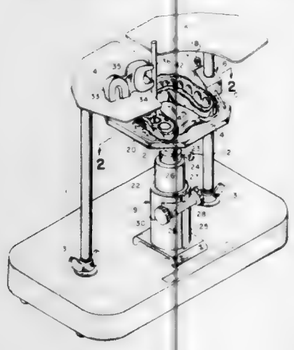
d. a second magnet spaced from said first magnet and having its magnetically attaching surface at right angles to the

said magnetically attaching surface of said first magnet secured in a fixed, stable relationship by,

e. a magnet connecting yoke retaining the said first magnet and said second magnet in predetermined spaced relationship,

f. a dowel support rod magnetically attached to said second magnet, said dowel support rod being slidably adjustable vertically and tiltably adjustable at any desired angle in a plane along said magnetically attaching surface of said second magnet,

g. a dowel pin frictionally attached to said dowel support rod,



h. a substantially flat top attached to,

i. a support stem,

j. a ball and socket means swivelly retaining said support stem,

k. an adjustable base secured to said ball and socket means for elevating and lowering said top further comprising:

(1) an elevator base,

(2) a ratchet shaft movably mounted in said elevator base, and

(3) a rack and pinion drive means for elevating and lowering said ratchet shaft.

4,174,571

METHOD FOR CLEANING TEETH

Ben J. Gallant, Portland, Tex., assignor to Dentron, Inc., Corpus Christi, Tex.

Filed Jul. 28, 1978, Ser. No. 928,907
Int. Cl.² A61C *3/06*
U.S. Cl. 433—216 **6 Claims**



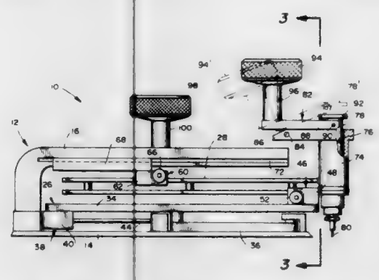
1. A method for cleaning teeth comprising concurrently directing separate streams of water and of an abrasive laden gas against a tooth to be cleaned, the abrasive comprising particles of a water soluble material, and the water and gas streams being directed in predetermined relation to each other and to areas of the tooth immediately adjacent to each other.

4,174,572

DRAFTING INSTRUMENT

Tom T. Mikulin, 601 Airport Blvd., South San Francisco, Calif. 94080

Filed Jun. 26, 1978, Ser. No. 918,801
Int. Cl.² B43L *11/04*
U.S. Cl. 33—31 **2 Claims**



1. A drafting instrument for tracing a curve, including the combination of a movable base, a writing arm having a distal end for carrying a marking element, linkage means connected between the base and writing arm for guiding the marking element along a curvilinear path, said linkage means including a master arm carried at its proximal end by the base and connected at its distal end at a first point on the writing arm which is spaced a first predetermined distance from the marking element for guiding the first point for linear movement along a major axis, joint means carried by the base and connected with a second point on the writing arm which is spaced a second predetermined distance from the marking element for guiding the second point for linear movement along a minor axis orthogonal with the major axis whereby conjoint pivotal movement between the writing arm and master arm guides the writing element along the curvilinear path, a marking element for tracing said curve on the graphics surface, means carried by the distal end of the writing arm for supporting the marking element for vertical movement, hand-operated means carried by the distal end of the writing arm for moving the marking element vertically between a raised stand-by position and a lowered operating position in contact with the graphics surface whereby with the marking element in its operating position the hand-operated means can be manipulated for moving the writing arm along the curvilinear path, the hand-operated means including a yoke mounted on the distal end of the writing arm for pivotal movement about a horizontal axis, said yoke being coupled with the marking element for vertically moving the latter, means forming a handle on the yoke, said yoke being biased by gravity to pivot about the horizontal axis in a direction which moves the marking element toward its stand-by position, said yoke being moved in an opposite direction about the axis for permitting movement of the marking element toward the operating position when a force is applied to the handle for operating the instrument.

4,174,573

BLACK BOARD LINE MARKING DEVICE

George W. Comstock, Jr., P.O. Box 81, North Sioux City, S. Dak. 57049

Filed May 15, 1978, Ser. No. 905,877
Int. Cl.² B43L *13/00*
U.S. Cl. 33—32 C **6 Claims**

1. A board line marking device comprising

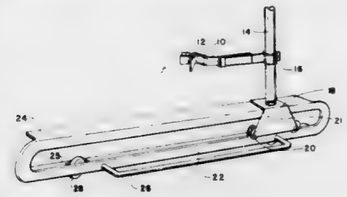
a frame fitted with a plurality of wheels,

a trolley fitted with a plurality of wheels,

an arm mounted on said trolley,

clamp means of fastening a marker fitted to said arm,

said trolley mountable on said frame so that the wheels of the trolley rest on and are in rolling engagement with a straight surface of the frame, with the wheels of said frame located so as to rest in rolling engagement on a horizontal chalk tray that extends from a vertical board, when a



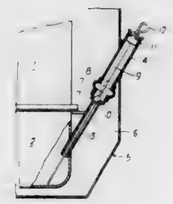
marker is fastened in said clamp means and located so as to extend to the surface of said vertical board for the purpose of marking said board.

4,174,574

ENGINE OIL LEVEL MEASUREMENT DEVICE FOR SOUND PROOF ENCAPSULATED INTERNAL COMBUSTION ENGINES

Karl Kirchweger, and Josef Roschmann, both of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Apr. 19, 1978, Ser. No. 897,842
Claims priority, application Austria, Apr. 28, 1977, 3043/77
Int. Cl.² G01F *23/04*
U.S. Cl. 33—126.7 R **5 Claims**



1. A device for the measurement of the engine oil level in sound proof encapsulated internal combustion engines by means of an oil dipstick, said device comprising an oil dipstick, and a dipstick guide tube comprising two coaxially and successively arranged guide tube parts, the inner of said two guide tube parts adapted to be secured to the engine and the outer guide tube part adapted to penetrate the encapsulation and be fixed thereto, said two guide tube parts being elastically and leakproof connected with each other by sealing means, and the inner guide tube part of the guide tube having a smaller diameter than the outer guide tube part, said inner guide tube part enlarging in diameter in the range of the connection of both guide tube parts to approximately the diameter of the outer guide tube part, said enlarged diameter of the inner guide tube forming a seat for a detent on the oil dipstick.

4,174,575

MEASURING INSTRUMENT

Kiyohiro Nakata, Kure, Japan, assignor to Kabushiki Kaisha Mitutoyo Seisakusho, Tokyo, Japan

Filed May 31, 1978, Ser. No. 911,068
Claims priority, application Japan, May 31, 1977, 52-70413[U]
Int. Cl.² G01B *3/18, 5/00*
U.S. Cl. 33—164 R **8 Claims**

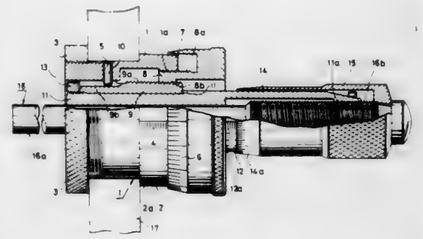
1. A measuring instrument comprising:

a first sleeve provided with a first thread and fixed to a frame;

a second sleeve axially displaceable along the axial direction of the first sleeve without rotation with respect to the first sleeve, said second sleeve having second and third threads;

a spindle with a second thimble, said spindle being screwed to the third thread and displaceable along its axial direction with respect to the second sleeve, and its stem extending through the first sleeve and the second sleeve; and

a first thimble displaceable with respect to the first sleeve and having a fourth thread screwed to the first thread and a fifth thread screwed to the second thread.

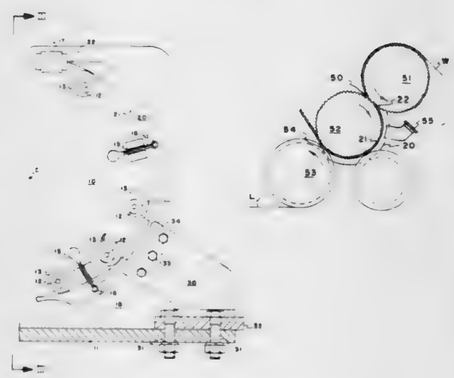


4,174,576

ADJUSTABLE PROFILE FINGER SETTING JIG

Michael L. Shepard, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed Jun. 28, 1978, Ser. No. 919,762
Int. Cl.² G01B *5/14*
U.S. Cl. 33—181 R **3 Claims**



1. An assembly jig for corrugating machine finger-holder units comprising:

A. a side plate and a base plate integrally joined in mutually perpendicular planes;

B. a reference axis disposed perpendicularly to said side plate;

C. holder mounting means on said base plate to locate and secure a finger holder in substantially the same spacial position relative to said reference axis as said holder would occupy when mounted on a subject corrugating machine;

D. first adjustable surface means secured to said side plate at a radial distance from said reference axis approximately the same as a radius of a subject corrugating roll for locating one arcuate end of a stripper finger in substantially the same spacial position relative to said reference axis and

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holder mounting means as said one arcuate end would occupy on said subject corrugating machine;

E. a plurality of second adjustable surface means secured to said side plate in an arcuate distribution relative to said reference axis for locating intermediate arcuate surface points on said stripper finger in substantially the same spacial positions relative to said reference axis and holder means as said intermediate points would occupy on said subject corrugating machine; and

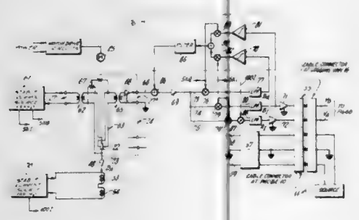
F. clamping means to temporarily secure said stripper finger to said side plate in simultaneous contact position with said adjustable surface means.

4,174,577

BOREHOLE DRIFT-DIRECTION PROBE

John R. Lewis, Stow, Mass., assignor to Harnessed Energies, Inc., Maynard, Mass.

Filed May 9, 1978, Ser. No. 904,273
Int. Cl.² G01C *9/00*
U.S. Cl. 33—302 **36 Claims**



1. A borehole drift-direction probe, comprising an elongate housing of length and diameter selected for reliable assumption of housing-axis orientation parallel to the locally applicable borehole-axis orientation, a rotary spindle with magnetic flux-sensor means mounted theretofor directional response normal to the spindle axis, means suspending said spindle with universal action with respect to said housing, said suspension means including gravitationally sensitive means for maintaining a constant vertical orientation of the spindle axis, motor means connected to said spindle for imparting continuous rotation thereto, whereby said flux-sensor means will develop an electrical output signal which is cyclically responsive to the horizontal component of the local direction of the earth's magnetic-field lines, electric-coil means fixedly mounted within said housing and positioned when excited to establish at said flux-sensor means a magnetic field of substantially uniformly distributed straight lines and parallel to the housing axis, means for exciting said electric-coil means, whereby the electrical output of said magnetic-sensor means is additionally characterized by an output signal which is cyclically responsive to instantaneous housing-axis inclination with respect to the vertical, and means for remotely transmitting said output signals.

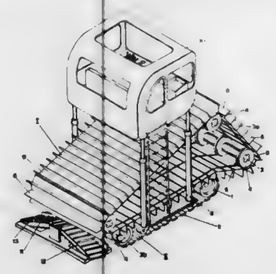
4,174,578

TRACKED SNOWPLOW

Bernardino Grillo, Via Beniamino, 13-, Laigueglia, Italy

Filed Mar. 15, 1978, Ser. No. 886,980
Claims priority, application Italy, May 24, 1977, 51201 B/77
Int. Cl.² E01H *5/00*
U.S. Cl. 37—43 R **10 Claims**

1. A tracked snowplough to work mainly against very high snow barriers, comprising tracked mover means; a frame fixed to the tracked mover means; a main digging and carrying belt assembly including a plurality of multi-link chains stretched in the form of triangles, a plurality of rotatable support rolls positioned at the apexes of the triangles, the rolls being positioned at the front and rear ends and the top of the tracked mover means, a plurality of digging shovels fixed, by brazing, onto the chains in a substantially perpendicular direction with respect to the chains and at predetermined distances therealong, the shovels engaging the tracked mover means; and two



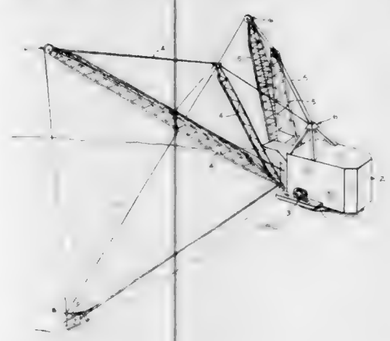
secondary carrying belts at the rear of the tracked mover means to receive snow from the shovels and to throw out the snow towards the right side and the left side of the snowplough.

4,174,579

TWIN BOOM DRAGLINE

Tom Learmont, Wauwatosa, Wis., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.

Filed Mar. 3, 1978, Ser. No. 883,230
Int. Cl.² E02F *3/48*
U.S. Cl. 37—116 **4 Claims**



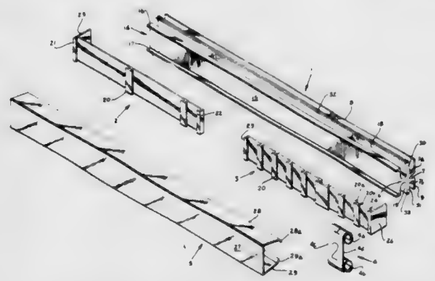
1. In a dragline having a machinery platform, a bucket, and a drag mechanism on the platform including a dragrope leading directly from the platform to the bucket, the combination comprising: two booms footed on the frame and disposed at a horizontal angle to one another, one of the booms being a digging boom and the other a dumping boom; and hoist mechanisms for the booms, each hoist mechanism including a hoist rope leading over the top of the respective boom to the bucket, the drag mechanism being operable to move the bucket from a start position under the digging boom to a filled position under the digging boom and closer to the platform, the hoist mechanisms being operable at relatively different speeds to move the bucket from filled position to a dump position under the dumping boom and back to start position.

4,174,580

ADJUSTABLE INDICATING DEVICE

Carlos L. Sanders, Atlanta, and James L. Gebhardt, Roswell, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Apr. 24, 1978, Ser. No. 899,463
Int. Cl.² G09F *11/21*
U.S. Cl. 40—518 **15 Claims**



1. An adjustable indicating device arranged for mounting on a shelf edge moulding strip having a pair of vertically spaced horizontal holding strips, said device comprising an elongated base element formed of semirigid yieldable material and having an extruded elongated medial strut coextensive with said base element and bifurcated along one edge to form yieldable supports for a pair of integral mounting strips adapted for removable mounting between said holding strips and respectively engageable therewith so as to support said elongated base element, a support channel having a central web section integrally formed along an edge of said medial strut remote from said mounting strips and defining a pair of storage cavities on opposite sides of said medial strut, at least one self coiling tape having its coiled ends disposed respectively in said cavities and having its intermediate section disposed outwardly of said support channel and being movable vertically relative thereto, and visually observable indicia formed along the length of said tape.

4,174,581

GUNSIGHT MOUNT FOR WINCHESTER RIFLE

Joseph C. Castellano, 128 Shrewsbury Ave., Red Bank, N.J. 07701

Filed Dec. 29, 1977, Ser. No. 865,371
Int. Cl.² F41G *1/38*
U.S. Cl. 42—1 ST **2 Claims**



1. A telescopic gun sight mounting device adaptable for attachment of a telescopic sight to a "Winchester" 1894 model rifle, wherein said rifle is formed with a gun barrel, to which a fixed sight is mounted over the said gun barrel and wherein said rifle is formed with a gun receiver in which spaced screw holes are located in a side portion of said gun receiver, and where said rifle is equipped with a cartridge ejection port that opens to the top of said rifle, said device comprising

an elongated mounting bracket formed of a first portion that extends along a vertical plane when a second portion of the bracket extends along a horizontal plane, said second portion extending from a side of the upper front section of the said first portion, with said first portion formed in its lower rear section with a plurality of holes located so as to align with the spaced screw holes in the gun receiver,

said second portion being substantially flat and formed with spaced openings for screws for securing a telescopic sight above said second portion, in which

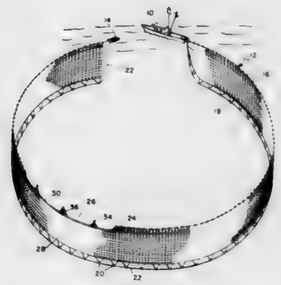
said bracket is of a size and shape so that with said first portion fastened by screws through the said holes in the said first portion to the gun receiver of a said "Winchester" 1894 model rifle, the said second portion extends above the barrel of the rifle forward of the cartridge ejection port and such that a telescopic sight mounted by screws through the spaced openings of the said second portion extends forward of the said ejection port.

4,174,582

COMMERCIAL FISHING NET ASSEMBLY WITH A PORPOISE ESCAPE ZONE

John R. McKnight, 5087 Park West Ave., San Diego, Calif. 92114

Filed Feb. 9, 1978, Ser. No. 876,538
Int. Cl.² A01K *73/12*
U.S. Cl. 43—14 **4 Claims**



1. A fish net assembly comprising:

(a) an elongated reticulated net member balanced to be vertically depoyed in the water;

(b) at least a portion of said net member defining a drop net which defines a porpoise escape zone, and including an inflatable hose secured to the upper edge thereof and remote control means for selectively inflating and deflating said hose to selectively raise and lower said drop net in the water between a position on the water surface and a submerged position at a controlled, pre-selected depth beneath the surface; and

(c) a plurality of floats longitudinally spaced along said hose and connected and spaced vertically from said hose by individual tethers of substantially uniform length, said buoys being discreet and free-standing aside from said tether connections to thus define a plurality of completely free spaces at the water surface bordered along the sides by consecutive buoy pairs and their respective tethers, and along the bottom by said hose.

4,174,583

LINE GUIDE ASSEMBLY FOR FISHING RODS

Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Japan

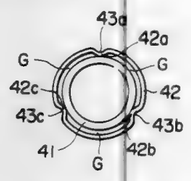
Filed Oct. 5, 1977, Ser. No. 839,415
Int. Cl.² A01K *87/04*
U.S. Cl. 43—24 **6 Claims**

1. An improved line guide assembly for fishing rods comprising:

a fixing ring of elastic material having an outer periphery and an inner periphery;

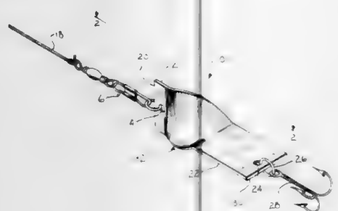
a guide ring within said fixing ring, said guide ring having an

outer periphery of smaller diameter than said inner periphery of said fixing ring; and



circumferentially spaced elements between said outer periphery of said guide rings and said inner periphery of said fixing ring, said elements applying radial pressure between the rings to hold the rings in an assembled condition.

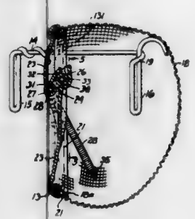
4,174,584
FISHING LURE
Charles R. Howard, 404 Newcomb St., Whitewater, Wis. 53190
Filed Dec. 8, 1977, Ser. No. 858,624
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.5 **3 Claims**



1. A fish lure formed of an elongated rectangular strip of material of uniform width having a central axis of elongation, said lure having planar leading and trailing end portions generally aligned along the axis of elongation of said rectangular strip, the plane in which said leading end portion lies being perpendicular to the plane in which said trailing end portion lies, the central portion of said lure comprising a section twisted to perpendicularly orient said leading and trailing end portion planes, said twisted section exhibiting a high degree of rotation per unit of axial length and occupying the same axial length in the lure as said trailing end portion, said twisted section providing a combined spinning and zig-zag motion to said lure, said leading end portion being one-quarter the length of said trailing end portion, said trailing end portion providing a stabilizing rudder to said lure and having means for connecting a fish hook to the lure, said leading end portion having means for connecting the lure to a fishing line.

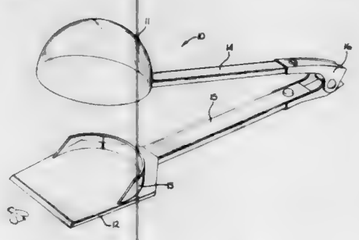
4,174,585
LIVE BAIT CARRIER FOR FISHERMEN AND THE LIKE
Lawrence Beesley, 1095 E. Oakland Ave., Hemet, Calif. 92343
Filed Dec. 27, 1977, Ser. No. 864,524
Int. Cl.[2] A01K *97/04*
U.S. Cl. 43—55 **3 Claims**

1. A live bait carrier comprising
a container having an opening therein,
the part of said container surrounding said opening being substantially rigid,
a cover of resiliently stretchable fabric,
means attaching said cover to said container over said opening,
said cover having an access opening therein,
spring means yieldably causing said fabric to close said access opening whereby to prevent escape of live bait from said container,
said spring means comprising first and second springs attached to respective portions of said fabric on opposite sides of said opening,
first means for tensioning said first spring endwise,



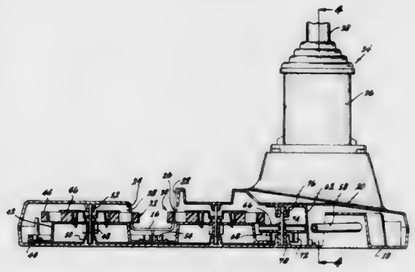
this tensioning means also tensioning the ends of said first spring in a first direction away from said second spring,
second means for tensioning said second spring endwise,
said second means also tensioning the ends of said second spring in a direction opposite to said first direction to cause said portions to overlap each other and to yieldably close said opening.

4,174,586
BUG CATCHER
Louis Burzdak, 2619 Sepulveda Blvd., Apt. No. 8, Los Angeles, Calif. 90064
Filed Jun. 14, 1978, Ser. No. 915,317
Int. Cl.[2] A01M *3/00*
U.S. Cl. 43—134 **3 Claims**



1. An improved bug catcher which captures an insect without killing it in order to that a person may set it free outdoors, said improved bug catcher comprising:
a. a flat platform member which has an angularly cut end surface which enables the person to scoop up the insect;
b. a hollow semispherical member which has an open bottom and which is adapted to be enclosed by said platform member;
c. a first elongated member which is mechanically coupled to said platform member at one end thereof;
d. a second elongated member which is mechanically coupled to said semispherical member at one end thereof;
e. a shielding member comprising an upwardly disposed wall adjacent to the end opposite the angularly cut end of said platform member thereon in order to provide a stop for the insect so that the person's quick scooping action will not cause him to allow the insect to avoid being entrapped between said platform member and said semispherical member; and
f. coupling means for pivotally coupling the ends of said first and second elongated members oppositely disposed from the ends thereof to which said semispherical member and said platform members are mechanically coupled.

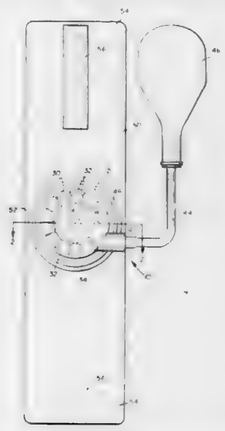
4,174,587
AIR TURBINE OPERATED VEHICLE ACCELERATOR TOY
Marius J. Morin, Rancho Palos Verdes; Otto L. Gabler, Lawndale, and Eugene J. Kilroy, Palos Verdes Estates, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Sep. 12, 1977, Ser. No. 832,418
Int. Cl.[2] A63H *29/16*
U.S. Cl. 46—1 K **8 Claims**



1. A toy for accelerating unpowered toy vehicles along a roadway comprising:
a housing having a roadway portion thereon;
a pair of vehicle engaging rollers rotatably mounted opposite each other on opposite sides of said roadway portion;
an air pump coupled to said housing;
turbine means rotatably mounted within said housing, said turbine means including a turbine housing and a turbine, said turbine housing including air inlet means for directing air into said turbine, said turbine housing having means for providing an audible sound as the toy is operated, said sound providing means including an aperture in said turbine housing adjacent said air inlet means whereby air passing through said inlet means is deflected over an edge of said aperture to cause said sound;
means coupling said turbine to said rollers for rotation of said rollers in opposite directions in response to rotation of said turbine; and
conduit means coupled to said air pump for directing air from said pump into said turbine means to rotate said turbine whereby to accelerate vehicles in said roadway portion in a predetermined direction.

4,174,588
TOY BLOOD PRESSURE MONITORING DEVICE
W. Porter Clanton, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 6, 1978, Ser. No. 875,187
Int. Cl.[2] A63H *29/16*
U.S. Cl. 46—44 **5 Claims**

1. A toy blood pressure monitoring device comprising:
a housing having an open side and a pressure indicating scale on the opposite side;
a flexible diaphragm covering said open side;
a fan mounted for rotation in said housing;
a pointer coupled to said fan and coacting with said scale; and
air impelling means coupled to said housing for substantially simultaneously directing repetitive pulses of air against said fan whereby intermittent rotation is imparted to said fan for repetitively moving said pointer over said pressure indicating scale, and against said diaphragm whereby said



diaphragm is repetitively deflected to simulate a heart pulse beat.

4,174,589
BATHROOM PLANTER BOX
Lonnie J. Daharsh, 6227 Shadybrook La., Dallas, Tex. 75206
Filed Oct. 28, 1977, Ser. No. 846,437
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—66 **3 Claims**



1. A bathroom planter box for receiving soil and housing plants and vegetation within a bathroom upon an open top flush tank of a conventional commode and being in fluid-flow communication therewith for facilitating the watering of said plants and providing for drainage into said flush tank, said planter box comprising:
an elongated housing received within and upstanding from the open top of said flush tank and including four generally upstanding side walls each of said side walls having a lower peripheral portion matingly engaging the top region of said flush tank in secured engagement thereon;
a base portion forming the bottom surface of said housing, said base portion comprised of at least two surfaces slanted one toward the other with a drainage aperture provided therebetween for facilitating the flow of water witin said housing and the drainage therefrom directly into said flush tank;

filter means disposed within said drainage aperture for restricting the transfer of particles of soil therethrough and into said flush tank and comprising a screen affixed across said aperture;

apparatus for providing fluid flow communication between said housing and said flush tank for watering the vegetation cared for within the housing, said apparatus including a tube extending from said housing in depending communication with the water within the flush tank therebelow;

pump means provided in inline communication with said tube for pumping water through said tube and dispersing same upon the vegetation disposed within said planter box and maintaining said fluid flow communication with said flush tank; and

means securing said elongated housing atop said flush tank including at least two lips depending from said side walls of said housing for engaging the inside side walls of said flush tank whereby secured positioning and fluid communication between said flush tank and said elongated housing is affected.

4,174,590

LOWER FRAME FOR PIVOTED WINDOW

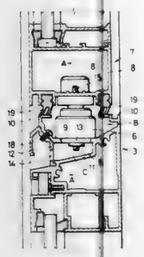
Eiryo Oogami, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Japan

Filed Dec. 20, 1977, Ser. No. 862,647

Claims priority, application Japan, Dec. 21, 1976, 51-171315[U]

Int. Cl.[2] **E06B** *1/04*

U.S. Cl. 49—504 **4 Claims**



1. A lower frame of a window frame structure for rotatably supporting a pivoted window in an opening defined by frames of the window frame structure, said lower frame having a top face confronting the pivoted window and having a first groove portion of a grooved section, and said lower frame comprising a second groove opened to the outside below said first groove portion, first means securing a pivoted window-supporting shaft in the central portion of the bottom side of said first groove portion confronting the pivoted window, said second groove being adapted by its opening to the outside to the dismounting of said pivoted window-supporting shaft at the bottom side of the first grooved portion and ventilation holes formed in said first groove portion so that said ventilation holes are communicated with said second groove opened to the outside.

4,174,591

APPARATUS FOR CLEANING SAND CORES

George T. Dupre, Palatine, and Thomas M. DeMarco, Chicago, both of Ill., assignors to NFE International Ltd., Palatine, Ill.

Filed Apr. 20, 1978, Ser. No. 898,203

Int. Cl.[2] **B24B** *31/00*

U.S. Cl. 51—16 **13 Claims**

1. Apparatus for removing fins from foundry sand cores comprising:

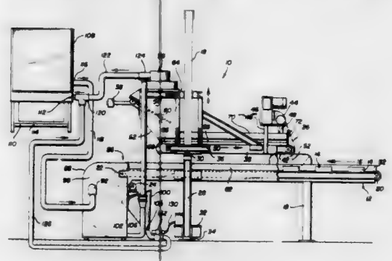
conveyor means, including a moving core conveyor for transporting said sand cores;

cleaning means mounted above said conveyor means, including a core cleaning material reservoir, for delivering a falling curtain of said cores cleaning material onto said sand cores for removing said fins;

separator means for separating said cleaning material from loosened sand resulting from removal of said fins;

loading means for receiving said separated cleaning material from said separator means and loading said cleaning material reservoir for reuse of said core cleaning material;

said loading means including respective cleaning material



and sand receptacles for receiving said respective separated particles from said separator means, a vacuum source coupled to said cleaning material reservoir and a conduit interconnecting said cleaning material reservoir and said cleaning material receptacle to convey cleaning material in said receptacle to said reservoir; and

said cleaning means including a cleaning material conveyor mounted intermediate said cleaning material reservoir and said core conveyor, and means for periodically interrupting the transfer of said cleaning material from said receptacle to said cleaning material reservoir to deposit the periodically accumulated cleaning material in said reservoir onto said cleaning material conveyor.

4,174,592

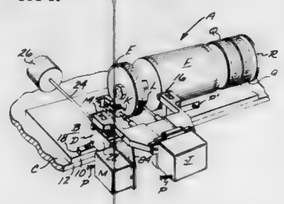
LAPIDARY DEVICE

Paul E. Bernhardt, 1728 E. 3rd St., Long Beach, Calif. 90802

Filed Sep. 1, 1978, Ser. No. 939,071

Int. Cl.[2] **B24B** *5/16*

U.S. Cl. 51—101 R **5 Claims**



1. A lapidary device for use in automatically transforming a generally elliptical shaped piece of rock that serves as a blank into a cabachon of smaller transverse area that conforms to the periphery and convex surface configuration of a rigid pattern, which device includes:

a. a flat base that has a first longitudinal edge and an upper surface;

b. a frame assembly that includes first and second longitudinally spaced members transversely disposed on said base adjacent said first edge above said upper surface thereof and pivotally supported on said base;

c. a grinding wheel disposed above said upper surface intermediate said first and second members, said grinding wheel having a flat peripheral outer abrasive surface;

d. first power operated means for rotating said grinding wheel;

e. first means that tend to pivot said frame assembly towards said grinding wheel with a first force;

f. a yoke pivotally supported from said frame assembly, said yoke including a pair of spaced legs that project away from said grinding wheel and a web that extends between the portions of said pair of legs most remote from said grinding wheel;

g. guide means that extend upwardly from said base, said guide means defining a vertically extending curved surface of substantially the same radius of curvature as the abrasive periphery of said grinding wheel and aligned therewith;

h. first and second longitudinally spaced, transverse shafts rotatably supported from said web between said legs, said first shaft transversely aligned with said guide surface, and said second shaft transversely aligned with said grinding wheel;

i. second power operated means for concurrently rotating said first and second shafts;

j. a rigid cabachon pattern transversely mounted in a centered position on the end of said first shaft most adjacent said guide surface;

k. second means for removably supporting said rock blank in a substantially centered position on the end of said second shaft closest said abrasive periphery of said grinding wheel; and

l. third power operated means that concurrently reciprocate said yoke, first and second shafts, pattern and rock blank upwardly and downwardly relative to said frame assembly concurrently with the rotation of said first and second shaft, and said frame also reciprocating upwardly and downwardly relative to said base during the grinding operation due to the rotation of said rock blank relative to said grinding wheel with which it is in pressure contact, said reciprocation of said frame relative to said base continuing until said rock blank has been formed into said cabachon, and the grinding of the convex surface on said rock blank being controlled by the convex surface of said pattern that is in rotatable sliding contact with said guide surface.

4,174,593

ABRASIVE BLASTING MACHINE

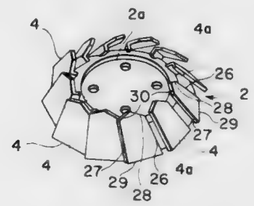
Riichi Maeda, 30-1, Kitakata 2-chome, Ichikawa-shi, Chiba, (272), Japan

Continuation-in-part of Ser. No. 677,785, Apr. 16, 1976, Pat. No. 4,064,661. This application Nov. 28, 1977, Ser. No. 855,466

Claims priority, application Japan, Dec. 10, 1976, 51-147650

Int. Cl.[2] **B24C** *5/06*

U.S. Cl. 51—435 **13 Claims**



1. An abrasive blasting apparatus comprising:

an abrasive particles supply means and a rotatable impeller for blasting onto a workpiece the abrasive particles supplied from said abrasive particles supply means,

said impeller having around its rotation axis a plurality of vanes provided at spaced relationship relative to each other,

each of said vanes having a surface containing a first axis inclined at an angle of 25°–65° relative to the rotation axis and containing a second axis inclined at an angle of 40°–80° relative to an axis crossing the rotation axis at right angle,

said vane having a first end edge and a first side edge which are positioned closer to the rotation axis, and also having a second end edge and a second side edge which face said first end edge and first side edge, respectively, and further having a third edge located between said first end edge and said first side edge and crossing these two edges,

the projection of the intersection of said first end edge and said second side edge onto said rotation axis being positioned between the same projection of the intersection of said first end edge and said third edge and the intersection of said first side edge and said third edge,

whereby said abrasive supply means supplies abrasive particles from said third edge onto said surface.

4,174,594

CLOSABLE SALES KIOSK

Michel A. Panzini, Senneville, Canada, assignor to Multi Restaurants Inc., Montreal, Canada

Filed Apr. 20, 1978, Ser. No. 898,461

Int. Cl.[2] **E04B** *1/346*

U.S. Cl. 52—65 **6 Claims**



1. A sales kiosk comprising (a) a fixed substantially spherical shell member mounted on a cylindrical base, said shell member being truncated by a vertical chordal plane in the region of the center line thereof, said vertical chordal plane extending between the top of the shell and a horizontal serving counter in an intermediate region of the shell, said serving counter being annular and extending between the vertical truncated edges of the shell, and said serving counter including an entryway gap adjacent one of said vertical truncated edges and (b) an outer shell including a spherical segment portion merging into a chordal skirt portion mounted for rotation on and surrounding said fixed shell, with said chordal skirt portion adjacent said cylindrical base, said outer shell being truncated by a vertical chordal plane located forward of the center line thereof and being arranged to rotate relative to the fixed shelf such that in the normal open position the serving counter is exposed and the entry gap is covered by the outer shell, in the normal closed position the serving counter and entry gap are entirely covered by the outer shell and in the entry position the entry gap is uncovered.

4,174,595

ANCHOR EYE PROTECTOR

Gary Q. Watson, Box F, Del Rio, Tex. 78840

Filed Feb. 24, 1978, Ser. No. 880,785

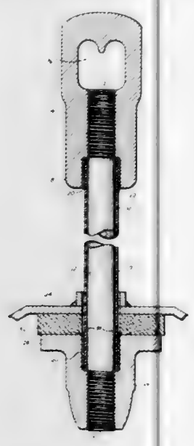
Int. Cl.[2] **E02D** *5/74*

U.S. Cl. 52—166 **6 Claims**

1. In an earth anchor having

a. an anchor member embedded in the earth,

b. a rod extending from the anchor member to above the earth,
c. an eye on the end of the rod for attaching a tension member to the rod, and
d. protective covering on the rod to impede corrosion of the rod;



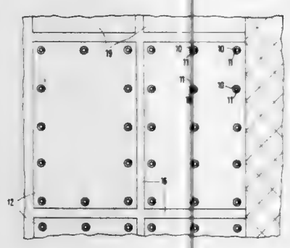
the improved structure attaching the eye to the rod comprising;
e. an eye cap having said eye as a part thereof,
f. an eye flange forming a recess on the bottom of the eye cap telescoped over the rod and also over said protective covering,
g. said eye cap secured to the rod above said eye flange.

4,174,596

DETACHABLE INSULATING COVER ASSEMBLY FOR GREENHOUSES AND THE LIKE

Manfred Deibele, Eislingen, Fed. Rep. of Germany, assignor to Deibele GmbH & Co., Uhingen, Fed. Rep. of Germany

Filed Sep. 22, 1977, Ser. No. 835,540
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1976, 2642543; Mar. 23, 1977, 2712676
Int. Cl.² E06B 9/00
U.S. Cl. 52—202 **15 Claims**



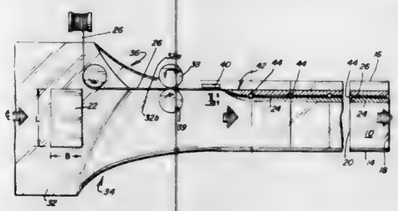
1. An easily attachable and detachable insulating cover assembly, particularly suited for application to the wall elements of the side walls and ceiling of a greenhouse, or of a comparable enclosed building structure, where convective heat transfer across said wall elements is to be minimized, the insulating cover assembly comprising in combination:
a cover sheet of resiliently flexible air-impermeable plastic material;
means for mounting said cover sheet of plastic material in relation to a matching wall element of said greenhouse, in a coextensive, transversely spaced relationship, so as to enclose an air space of substantial width therebetween; and
means for sealing off the borderlines of said air space, so as to entrap within said air space a stationary air layer which serves as a barrier to convective heat transfer; and wherein
said cover sheet mounting means includes a series of fastener assemblies spaced along a clamping line near an edge of the cover sheet, each fastener assembly comprising a pointed stem as part of a fastener base which is permanently attachable to the wall element of the greenhouse, and a fastener cap which is insertable over and securable to said stem, following impalement thereover of the cover sheet, thereby clamping the latter against the fastener base; and
said air space sealing means is defined by the edge portion of the cover sheet which is located outside the clamping line, the edge portion forming a fold toward the wall element of the greenhouse, thereby stiffening the cover sheet along the fold and making elastic contact with the wall element, due to the resiliency of the cover sheet in said fold.

4,174,597

PROCESS FOR WRAPPING ARTICLES AND PROVIDING RECLOSABLE CONTAINER

John C. Mowli, 2032 W. jarvis, Chicago, Ill. 60645, and Harry Bala, 2259 N. Kedzie, Chicago, Ill. 60647

Filed Apr. 7, 1978, Ser. No. 894,497
Int. Cl.² B65B 61/00, 43/10
U.S. Cl. 53—410 **13 Claims**



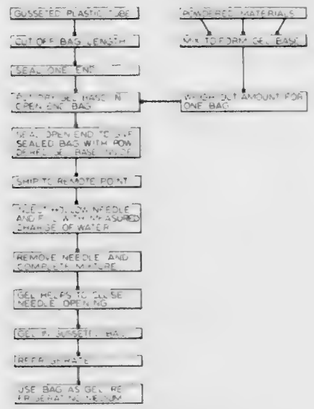
1. A process for wrapping articles and providing a reclosable plastic container which comprises the steps of:
conveying a plastic sheet in a feed direction;
aligning a closure member with the plastic sheet substantially parallel to the feed direction;
feeding the article to be wrapped into the plastic sheet;
folding one side of the plastic sheet over the article and alongside the closure member;
folding the other side of the plastic sheet alongside the closure member in the opposite direction so that the portions of the plastic sheet alongside the closure member face each other;
heat sealing the portions of the plastic sheet facing each other on opposite sides of the closure member so as to enclose the closure member within sealed portions of the plastic sheet; and
heat sealing and cutting the overfolded plastic sheet transversely.

4,174,598

METHOD FOR MAKING A PACKAGED GEL REFRIGERANT

Patrick J. Shepherd, P.O. Box 328, Lodi, Calif. 95240, and David L. Hubble, Sr., Lodi, Calif., assignors to Patrick Joseph Shepherd, Lodi, Calif.

Filed May 24, 1978, Ser. No. 908,977
Int. Cl.² B65B 3/12, 3/02; F25D 3/08
U.S. Cl. 53—431 **7 Claims**



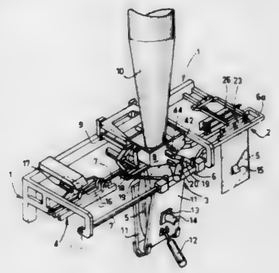
1. A method for making packaged gel refrigerant, including in combination the following sequential steps:
(a) cutting off predetermined lengths of polyethylene gusseted tubing having a gusset fold along each side edge, so that there are two open ends of each cut-off length,
(b) heat-sealing one end of each cut-off length, by melting and congealing together four thicknesses at each of the two gusseted portions at that end and melting and congealing together two thicknesses in between the gusseted portions, thereby forming an open-end bag,
(c) inserting into the open-end bag a metered amount of gel base comprising a dry solid mixture of finely powdered materials, said metered amount being only about one-fifth to one-tenth of the weight of the ultimate gel refrigerant,
(d) heat-sealing the open end of said open-end bag, as in step (b), to provide a closed and sealed bag containing the dry finely-powdered gel base,
(e) shipping the bags from step (d) to a remote location, so that the shipping weight is only about one-fifth to one-tenth that of the ultimate gel refrigerant,
(f) at said remote location, forcing a hollow needle having a sharp inclined cutting end through a said bag adjacent one sealed end, the bag being held so that its contents lie below the needle-entry location, said needle being forced through the gusset fold at a locus next to said one sealed end so that it cuts through the bag but leaves a small plastic flap still attached to the bag, said needle temporarily forcing said flap to one side of the resultant opening,
(g) sending through said needle and said opening and downwardly into said bag, a jet of a metered amount of water under high pressure, said metered amount having a weight approximately four to nine times the weight of said gel base in said bag,
(h) removing the needle from the bag so that the cut flap is caused by the gusset-fold to close most of said opening,
(i) mixing the water and powder together while keeping them away from said opening, so that contact is assured between all of said gel base and said water, and a flexible gel begins to form, and
(j) distributing the freshly formed and still forming flexible gel substantially evenly throughout said bag, said gel holding the water and holding itself together to prevent leakage or seepage out through the flap-blocked opening formed by the needle, so that the bag can be used thereafter in any position and can withstand substantial pressure thereon as in being molded to a shape, without leakage of gel or water from said bag.

4,174,599

BAGGING MACHINE FOR PACKAGING POWDERED MATERIALS

Robert Callet, and Henri Jeantet, both of Chaumont, France, assignors to Societe Anonyme des Imprimerie et Papeterie de l'Est, Chaumont, France

Filed Aug. 15, 1978, Ser. No. 933,965
Claims priority, application France, Aug. 18, 1977, 77 25335
Int. Cl.² B65B 31/04, 1/22, 43/30
U.S. Cl. 53—512 **10 Claims**



1. Bagging machine for packaging powdery materials into bags of the "open mouth" type, said machine comprising a bag-gripping and opening station of the sucker type adapted to be connected to a source of vacuum, a bag-filling station comprising an inlet chute for the substance connected to a measuring and/or weighing means, means for opening and closing the orifice of the chute, means for inserting this orifice into the open mouth of the bag and to apply the lips of the latter into sealed contact against said chute, means for compacting the substance being filled into the bags and means for sucking out the air contained inside the bags being filled, a station for closing the bags by welding and/or sewing, means for holding the bags by suspension and for successively transferring them from one station to the next and means for automatically synchronizing and sequencing the various movements and operations at the various stations.

4,174,600

ROLL OPENING DEVICE WITH HEADER STABILIZER

George B. Cicci, Burr Ridge, and John D. Segredo, Chicago, both of Ill., assignors to International Harvester Company, Chicago, Ill.

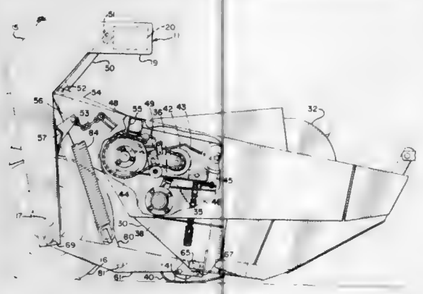
Filed Jun. 12, 1978, Ser. No. 914,319
Int. Cl.² A01D 45/02
U.S. Cl. 56—1 **4 Claims**

1. A hay harvesting machine comprising:
a wheel supported main frame;
a laterally elongated crop harvesting header mounted to said frame by pivotal linkage including an upper link and a pair of lateraly spaced lower swing links permitting movement of the header between a lower operating position and a raised transport position;
hay cutting apparatus mounted on said header and disposed transversely thereacross adjacent the forward edge of said header;
upper and lower transversely extending hay conditioning rolls rotatably mounted to said header rearwardly of said cutting apparatus, said lower conditioning roll being mounted on a fixed axis and said upper roll being mounted at each end to lever arms pivotally mounted to said header

for relative swinging movement of the upper roll toward and away from said lower roll;

spring tensioning means connected to said lever arms and biasing said upper roll to an operating position closely adjacent the lower roll;

toggle links pivotally mounted to said header adjacent each



of said roll lever arms and being operatively connected thereto and having a free ends projecting toward said frame, said frame including means engaging said toggle links for causing a downward force to be exerted on said free ends of said toggle links upon said header being raised to said transport position so that said upper conditioning roll is opened against the force of said tensioning spring.

4,174,601

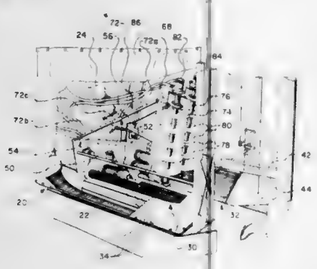
METHOD AND APPARATUS FOR HARVESTING TOBACCO

J. Curtis Griffin, Branford, Fla., assignor to Harrington Manufacturing Co., Lewiston, N.C.

Filed Apr. 20, 1977, Ser. No. 789,209

Int. Cl.[2] A01D *45/16*

U.S. Cl. 56—27.5 **4 Claims**



1. In a tobacco harvester having a mobile main frame and conveying means associated with said harvester for conveying tobacco material along said harvester during the harvesting operation, the improvement comprising a harvesting assembly including:

(a) a support frame assembly;

(b) at least two laterally spaced shafts rotatively journaled within said support frame assembly;

(c) a plurality of circular saw blades secured on each of said shaft and rotatable therewith, said circular saw blades being axially spaced on each respective shaft such that the circular saw blades of one shaft cooperate with the circular saw blades on the other shaft to cut portions of entering tobacco stalks into stalk segments and, wherein the circular saw blades secured on the two respective shafts are disposed in staggered relationship such that each circular saw blade is disposed in a separate and distinct plane relative to any one of the adjacent circular saw blades on the adjacent shaft so as to define a generally vertical stalk cutting area that lies generally midway between the outer extremities of the circular saw blades secured to said shafts, and wherein said staggered circular saw blades are disposed such that an inner portion of a respective circular saw blade overlies an area occupied by an inner portion of an adjacent lower disposed circular saw blade such that in harvesting a resultant cut stalk segment is cut about one end by a circular saw blade of one shaft and about the other end by another circular saw blade on the other shaft;

(d) drive means operatively connected to said shafts for rotatively driving said shafts and the circular saw blades secured thereon, said driving means for driving said shafts including means for driving said shafts in counter directions relative to each other with the respective circular saw blades secured on each shaft being driven such that the leading cutting edge of the blades generally move in an outwardly directed arcuate path relative to the areas occupied by the inner portions of said blades during the harvesting operation in order that the blades will impart an outward directed flinging action to the cut stalk segments; and

(e) wherein said support frame assembly includes mounting means for pivotably mounting said support frame assembly about a transverse axis relative to said harvester such that said support frame assembly may be angularly adjusted about said transverse axis for positioning the respective circular saw blades in an efficient harvesting posture.

4,174,602

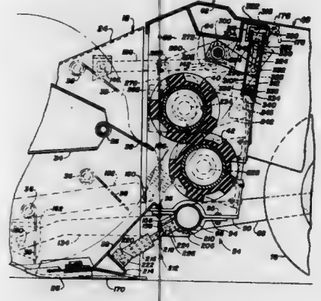
HEADER SUSPENSION AND STABILIZATION MEANS

Bryant F. Webb, Ephrata, and Charles A. Parrish, New Holland, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 31, 1978, Ser. No. 891,989

Int. Cl.[2] A01D *67/00*

U.S. Cl. 56—208 **9 Claims**



1. In a crop harvesting machine having a crop harvesting header, a mobile frame adapted to move across a field in a forward direction, said mobile frame including upper frame structure extending transversely to said forward direction and a lower wheel frame assembly, said assembly including a cylindrical member extending transversely to said forward direction and rotatably mounted to and supporting said upper frame structure, and lift means on said frame and being actuatable for moving said lower wheel frame assembly, and thereby rotating said cylindrical member thereof, relative to said upper frame structure to effectuate raising of said upper transverse frame structure and said cylindrical member relative to the field between a lower field operating position and an upper transport position, an improved means for suspending said header from said mobile frame so as to dispose said header in a harvesting position adjacent the field when said frame is at its lower field operating position and for lifting said header upwardly relative to the field during effectuation of raising of said frame, comprising:

upper means pivotally interconnecting said upper frame structure with an upper portion of said header;

lower elongated means pivotally interconnecting said cylindrical member of said wheel frame assembly with a lower portion of said header, said lower means having a portion which projects rearwardly of the pivotal connection of said lower means with said cylindrical member and underlies said member so as to be engaged by the same to effect lifting of said header upwardly by said lower means upon rotation of said cylindrical member when said lift means is actuated so as to effectuate raising of said upper transverse frame structure and said cylindrical member relative to the field; and

header stabilizing means extending between and pivotally interconnecting a generally central portion of said cylindrical member and a lower generally central portion of said header.

4,174,603

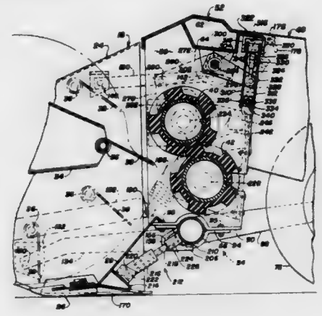
TELESCOPING LATERAL LIMIT LINK

Charles A. Parrish, New Holland, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 31, 1978, Ser. No. 892,044

Int. Cl.[2] A01D *67/00*

U.S. Cl. 56—208 **9 Claims**



1. In a crop harvesting machine having a mobile frame adapted to move across a field, a crop harvesting header affixed to said frame and selectively movable between a lower field operating position and an upper transport position, an improved means for stabilizing said header against lateral movement, comprising:

a pair of telescopible members, not operable for selectively moving said header between said lower field operating position and said upper transport position, extending between and interconnecting a generally central portion of said frame with a generally central portion of said header for stabilizing said header against the effect of any laterally directed forces which may impinge thereon.

4,174,604

HEDGE TRIMMER APPARATUS

David J. Wilson, Sr., 207 N. Jefferson St., Athens, Ala. 35611, and David J. Wilson, Jr., 2707 Churchill Dr., Huntsvlle, Ala. 35801

Continuation-in-part of Ser. No. 789,968, Apr. 22, 1977, abandoned. This application Sep. 19, 1978, Ser. No. 943,699

Int. Cl.[2] A01D *55/02*

U.S. Cl. 56—237 **4 Claims**

1. A carriage for a motorized hedge trimmer comprising:

a rollable first frame adapted to move along the ground, and having a pair of spaced wheels journalled about an axis;

a generally straight, elongated second frame supported by and rising from a point on said axle adjacent to one of said wheels, and including a generally vertically extending guide;

a generally upward extending strut supported adjacent to the other of said wheels on said axle and connecting to an upper point on said second frame;

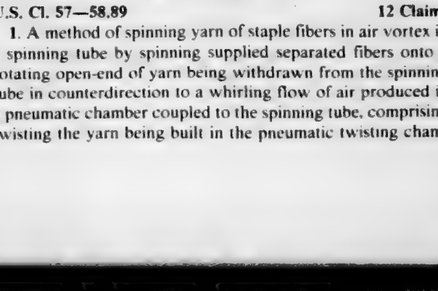
an elevatable base supported by said second guide and adapted to be guided by said guide along said second frame;

support means for supporting a motorized hedge trimmer on said base;

tilt means for adjustably tilting said support means with respect to an axis which is normal to a plane parallel to the axis of said axle;

an operating control assembly comprising:

a triangular-shaped third frame coupled at its base to said



axle and generally lying within a plane which is tilted with respect to said second frame from its base, base of third frame, to its apex.

first control means supported at the apex of said first frame, including a first handle for providing, upon operation, a first bidirectional mechanical output, and

second control means supported at the apex of said third frame, including a second handle for providing, upon operation, a second bidirectional mechanical output;

elevation means responsive to a said first bi-directional output for elevating and lowering said base; and

tilting means responsive to said second bi-directional output for tilting said support means with respect to a line parallel to said axle;

whereby a motorized hedge trimmer attached to said support means may be selectively moved along a hedge and be selectively elevated and tilted.

4,174,605

METHOD OF AND APPARATUS FOR SPINNING YARN IN AN AIR VORTEX IN A SPINNING TUBE

Eduard Pallay, Prague, Czechoslovakia, assignor to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Aug. 16, 1978, Ser. No. 933,991

Claims priority, application Czechoslovakia, Aug. 17, 1977, 5393/77

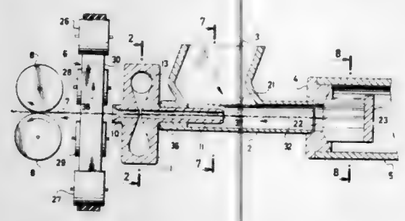
Int. Cl.[2] D01H *1/12*

U.S. Cl. 57—58.89 **12 Claims**

1. A method of spinning yarn of staple fibers in air vortex in a spinning tube by spinning supplied separated fibers onto a rotating open-end of yarn being withdrawn from the spinning tube in counterdirection to a whirling flow of air produced in a pneumatic chamber coupled to the spinning tube, comprising twisting the yarn being built in the pneumatic twisting cham-

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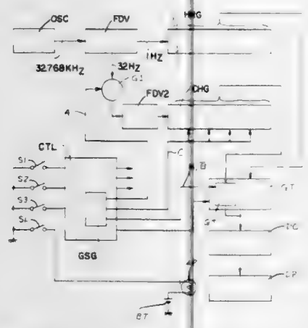
ber by means of concentric air streaming producing an excited potential air vortex about the longitudinal axis of said pneumatic twisting chamber and about the yarn passing therethrough.



4,174,606
ELECTRONIC WATCH HAVING STOPWATCH FUNCTION

Toshiyuki Masuda, Nara, and Takehiko Sasaki, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 19, 1977, Ser. No. 798,390
Claims priority, application Japan, May 20, 1976, 51-58929
Int. Cl.[2] G04F *8/00*; G04B *19/30*; G04F *7/04*
U.S. Cl. 58—39.5 **17 Claims**



1. A digital display type electronic watch having a stopwatch function, comprising:

means for generating a time reference signal;

means responsive to said time reference signal for generating a chronometrical information signal representative of the measured time information, said measured time information comprising a more significant digit portion and a less significant digit portion;

means responsive to said chronometrical information signal generating means for displaying said measured time information;

means for instructing initiation and termination for defining a time period being measured in terms of said measured time information;

means responsive to said initiation/termination instructing means for coupling said chronometrical information signal generating means to said time reference signal generating means;

sequential response means operatively coupled to said chronometrical information signal generating means and said displaying means for making said displaying means sequentially responsive to one and the other of said more and less significant digit portions of said measured time information said sequential response means further comprising,

means for commanding sequential response of said displaying means to said more significant or the less significant digit portion of said measured time information in said chronometrical information signal generating means; and

means responsive to said sequential response commanding means for selectively and sequentially coupling said displaying means to said more significant or the less significant digit portion of said measured time information in said chronometrical information signal generating means, said sequential response commanding means further comprising,

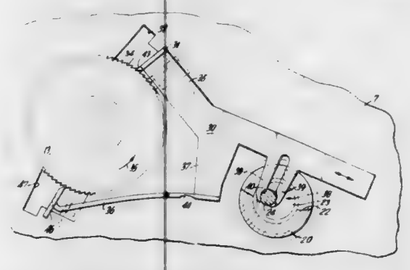
manually operable sequential response commanding means; and

means responsive to said manually operable sequential response commanding means for making a timing operation for providing a timing signal for a predetermined time period, said sequential coupling means being adapted to be responsive to said timing signal of said timing means, whereby said display is switched from one to the other of said more and less significant digit portions of said measured time information in said chronometrical information signal generating means only during said predetermined time period of said timing means.

4,174,607
MECHANISM FOR SELF-WIND WATCHES

Paul Wuthrich, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Dec. 13, 1978, Ser. No. 968,956
Int. Cl.[2] G04B *5/02, 7/02*
U.S. Cl. 58—82 A **7 Claims**



1. In a watch including a mainspring driving a time gear train and having reduction gearing for winding the mainspring by unidirectional rotation of a winding pinion, the improvement comprising:

a supporting frame member inside the watch,

a ratchet wheel rotatably mounted on said frame member and operatively connected to drive said winding pinion,

a rotor bushing projecting from said frame member, said bushing having a cylindrical bore,

a rotor staff journaled in said bushing and having an eccentric crank portion,

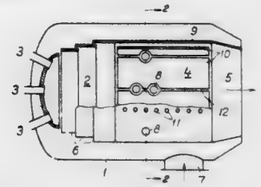
a rotor attached to said rotor staff and having an off-center mass which causes angular oscillation when the rotor is reoriented by movement of the watch, and

a single piece rocking arm having first and second spring loaded click arms having pawl portions cooperating with opposite sides of said ratchet wheel, and having integral spring clip fingers adapted to snap onto said eccentric crank portion from the side thereof, whereby priodic oscillation of the rotor staff crank causes said click arms to rotate the ratchet wheel and wind the mainspring of the watch.

4,174,608
COMBUSTION CHAMBER FOR A GAS TURBINE

Laszlo Hunyadi, Järfälla; Leif Andersson, and Martin Mänsson, both of Finspang, all of Sweden, assignors to Stal-Laval Turbin AB, Finspong, Sweden

Continuation of Ser. No. 613,580, Sep. 15, 1975, abandoned, and a continuation of Ser. No. 386,288, Aug. 6, 1973, abandoned.
This application Feb. 7, 1977, Ser. No. 766,570
Claims priority, application Sweden, Aug. 15, 1972, 10548/72
Int. Cl.[2] F02C *7/22*
U.S. Cl. 60—39.65 **2 Claims**



1. A combustion system for turbines and the like, comprising:

(a) a flame tube having means (3) for admitting a mixture of fuel and primary combustion air;

(b) a shell (1) surrounding said flame tube and defining an annular air space surrounding said flame tube;

(c) said flame tube comprising a combustion chamber (2) and a mixing chamber (4) in which the hot gases passed from the combustion chamber are mixed with diluting air;

(d) said mixing chamber (4) being defined within a double wall construction comprising a relatively thick outer wall (9) supporting said flame tube within said shell and a relatively thin inner wall (10) of heat resistant material, which is supported by the outer wall and which forms a coaxial annular cooling jacket surrounding said mixing chamber;

(e) conduit means (7) for passing pressurized air into said annular air space;

(f) a plurality of cooling apertures (11) spaced about the periphery of said outer wall for admitting a portion of said pressurized air into said cooling jacket;

(g) a plurality of nozzle means (8) spaced alternately with said cooling apertures about the periphery of said cooling jacket for directing a diluting stream of said pressurized air radially into said mixing chamber;

(h) said inner wall having diluting apertures (12) aligned with said nozzle means;

(i) the spacing between said cooling apertures (11) and said diluting apertures (12) being effective to produce high velocity air streams diverging in opposite directions within said jacket from said cooling apertures (11) to said diluting apertures (12) to cool said outer and inner walls (9, 10) preliminary to their injection into said mixing chamber along with said diluting stream.

4,174,609
LOCKING SYSTEM FOR SLIDING COWLINGS OF TURBOJET ENGINE NACELLES

Paul J. Legrand, Vaux le Penil, and Henry Naud, Verrieres le Buisson, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Feb. 7, 1978, Ser. No. 875,916
Claims priority, application France, Feb. 8, 1977, 77 04140
Int. Cl.[2] F02C *7/20*; E05C *5/00, 19/12*
U.S. Cl. 60—262 **10 Claims**

9. Aircraft bypass turbine engine of the type which comprises, in the upstream to downstream direction of the flow of air, a fan turning within a first housing, at least one compressor, a combustion chamber, these latter components being placed within a second housing connected with the first, the said turbine engine being enclosed in a nacelle comprising a forward portion forming an air intake, a middle portion and a sliding, annular rear portion which channels the air exiting from the fan, the first housing having a flange located downstream thereof and fixed with respect thereto, the sliding, annular rear portion of the nacelle being made integral with a flange located downstream of the fan housing by a device comprising:

means for centering and angularly positioning the rear portion with respect to the flange;

means for absorbing stresses acting in the direction of the joining plane of the flange and the rear portion;

means for holding the rear portion tight against the flange and ensuring the transmission of longitudinal stresses between the flange and the rear portion, said holding means comprising a plurality of circumferentially spaced lockbolts, and

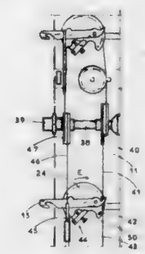
means for synchronously controlling said lockbolts, each lockbolt comprising:

first stationary support on the flange;

a strap mounted on said first support;

a second support attached to the rear portion;

a hook on one end of said tie bar, said hook cooperating with said strap;



a pivot shaft at the other end of said tie bar;

a slide track in said second support, said pivot shaft cooperating with said slide track for translational movement therealong;

means coupled with said tie bar for driving the same;

said driving means including a moving part having an axis defined by a fixed shaft, said fixed shaft being parallel to said pivot shaft, said driving means being actuated by said controlling means;

said moving part including a cam which cooperates with said pivot shaft of said tie bar, said cam having a first section of evolutional radius with respect to the axis of the moving part and a second section which transitions from the end of the largest radius of said first section and has constant radius with respect to the axis of the moving part;

means for disengaging said hook from said strap by pivoting said tie bar from its direction of translation at its fully extended position; and

take-up and holding means between said rear portion and said tie bar for restraining said tie bar to translational movement except when pivoted by said disengaging means.

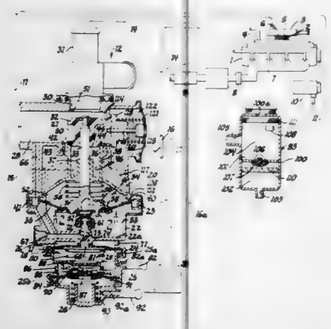
4,174,610
POWER CRUISE DIVERTER VALVE

Thomas J. Hollis, Fairport, N.Y., and William F. Thornburgh, Rochester, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 1, 1978, Ser. No. 901,569
Int. Cl.[2] F01N *3/10*
U.S. Cl. 60—290 **2 Claims**

1. An air control valve for use with an internal combustion engine having an induction system, an exhaust emission control system including an exhaust manifold connected to the engine for receiving exhaust gases discharged from the exhaust ports

of the engine and, a driven air pump for providing secondary air to the exhaust emission control system with flow thereto controlled by said air control valve, said air control valve including a housing means having a valve chamber therein with an inlet connectable to the air pump, a first outlet connectable to the exhaust emission control system and a second outlet adapted for discharging secondary air to the atmosphere, said housing means further including a first valve seat in said valve chamber surrounding said first outlet and a second valve seat, diametrically opposite said first valve seat, surrounding said second outlet, a valve member positioned in said valve chamber or movement between a first position in engagement with said first valve seat and a second position in engagement with second valve seat, actuator means with a timing valve means therewith including a switching diaphragm operatively connected to said valve member for effecting movement of said valve member between said first position and said second position, said actuator means further including first spring means operatively associated with said valve member to normally bias said valve member to said second position, said switching diaphragm being positioned in a first portion of said valve housing means to form therewith a first vacuum chamber on one side of said switching diaphragm and a first pressure chamber on the opposite side of said switching diaphragm, fluid passage means in said housing means in communication at one end with said first pressure chamber and at its other end in communication with said inlet, a first vacuum post



means in said housing means opening into said first vacuum chamber and connectable to the engine induction system, a first valve means operatively positioned in said housing means for movement to control fluid flow through said fluid passage means into said first chamber, said first valve means including a second actuator means having a second diaphragm forming with a second portion of said housing means a second chamber on one side of said diaphragm and located next opposite side next adjacent said first chamber, said second chamber being in communication with the atmosphere, and a second vacuum chamber on the opposite side of said second diaphragm, a second vacuum port means in said housing opening into said second vacuum chamber and connectable at its opposite end to the induction system of the engine, said first valve means further including a second spring means operatively positioned on one side of said second diaphragm to normally bias said first valve means into a position permitting fluid flow through said fluid passage means into said first chamber, an atmospheric air inlet means in said second portion of said housing means in fluid communication at one end with said second vacuum chamber and, a second valve means operatively positioned in said housing means for movement to control fluid flow through said atmospheric air inlet means, said second valve means including a third actuator means having a third diaphragm forming with a third portion of said housing means a third pressure chamber on one side of said third diaphragm in communication with said atmospheric air inlet means and a third vacuum chamber on the opposite side of said third diaphragm, said third actuator means further including a third spring means operatively associated with said third diaphragm to normally effect movement of said second valve means to a position blocking flow through said inlet port means, a third vacuum port means in said third portion of said housing means opening at one end into said third vacuum chamber and at its other end being connectable to the induction system of the engine, and passage means in said housing means opening at one end into said third pressure chamber and in communication at its opposite end with the atmosphere.

4,174,611

HYDRAULIC MACHINE

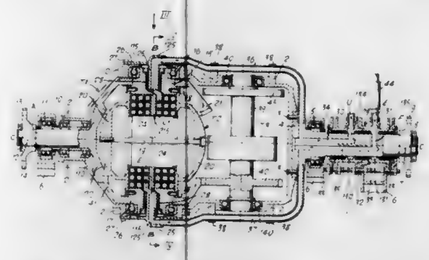
Gino Franch, Via G. Avezzana 10, Milan, Italy

Filed Mar. 14, 1978, Ser. No. 886,924

Claims priority, application Italy, Mar. 17, 1977, 4816 A/77; Mar. 17, 1977, 4817 A/77

Int. Cl.² F16D *33/00*

U.S. Cl. 60—325 **15 Claims**



1. A hydraulic machine, which can be used at will as a pump or as a torque transducer, comprising:

(a) an outer rotor rotatably mounted on a machine frame around a first rotational axis and connectable, through an input shaft, to a driving motor;

(b) an inner rotor mounted at the interior of the outer rotor, said inner rotor being rotatable around a second rotational axis which is perpendicular to said first axis of the outer rotor, and which is connected through a gear drive to an auxiliary shaft coaxial to said input shaft and to said first rotational axis of the outer rotor;

(c) means for securing said auxiliary shaft to the machine frame or to a transmission, utilizer or control device;

(d) a hydraulic circuit arranged at the interior of the inner rotor, presenting at least one active circuit, the projection of which on a plane passing through said second rotational axis of the inner rotor defines a final surface different from zero;

(e) rotary connection means for sealingly connecting the ends of the active circuit with a fixed inflow and a fixed outflow connection;

whereby to the inner rotor there is associated a field of accelerations of Coriolis which depends on the angular speeds of the outer rotor and of the inner rotor, said field generating, between the ends of the active circuit and more precisely between the inflow and the outflow connections, a pressure difference in the field contained in the hydraulic circuit, which pressure difference is substantially sinusoidally varying.

4,174,612

PRESSURE AGENT CONTROL ARRANGEMENTS, ESPECIALLY FOR HYDRAULIC STEERING ARRANGEMENTS FOR MOTOR VEHICLES

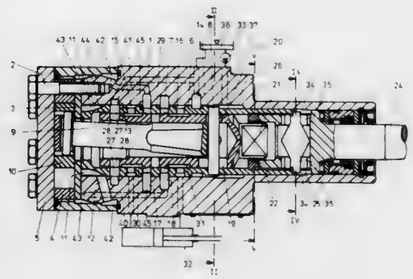
Karl-Heinz Liebert, Schwabisch Gmund, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Mar. 24, 1978, Ser. No. 889,852

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1977, 2712920

Int. Cl.² F16D *31/00*

U.S. Cl. 60—384 **5 Claims**



1. In a booster steering system having a servopump, a metering pump, a servomotor, a tank, and a control valve, including connection means therebetween wherein said control valve has a housing having a pair of concentric valve sleeves therein shiftable relative to each other, there being passage means for said housing and for said valve sleeves for selective coaction responsive to the relative positions of said valve sleeves to selectively control flow between said servopump, said metering pump, said tank and said servomotor; one said valve sleeve **6**) being connected for delayed rotation of said metering pump to manual rotating means, and the other said valve sleeve **7**) being directly connected for rotation by manual rotating means; said passage means comprising passages (**27**) in said one valve sleeve coacting with passages (**28**) in the said other valve sleeve by being shiftable into and out of register for controlling flow through said control valve, effecting circulation of pressureless hydraulic fluid from said servopump to said tank in a neutral position of said valve sleeves for straight ahead steering and blocking said flow in a steering control position for a turn, wherein said one valve sleeve is a metering pump flow control valve and initially held against rotation by said metering pump in neutral position of said one valve sleeve while the other said valve sleeve is initially movable; the improvement which comprises: means intermediate said valve sleeves constructed and arranged to effect initial rotation of said other valve sleeve with simultaneous axial shift relative said valve sleeves when said one valve is stationary to effect reaction support for forces acting on said other valve sleeve; whereby the resultant relative traverse between said valve sleeves is increased beyond that for purely axial or purely rotative shift for the same extent of actuation of said manual rotating means, and wherein said valve sleeve passages (**27,28**) are of a size commensurate with the resultant traverse of combined motions so as to reduce abruptness in change of flow area cross section between said coacting passages when said valve sleeves are shifted.

4,174,613

LOAD RESPONSIVE VALVE ASSEMBLIES

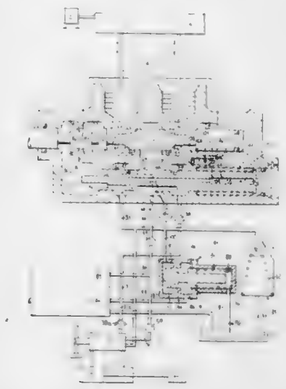
Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation-in-part of Ser. No. 522,324, Nov. 8, 1974, Pat. No. 3,998,134, and a continuation-in-part of Ser. No. 559,818, Mar. 19, 1975, Pat. No. 3,984,979, and a continuation-in-part of Ser. No. 655,561, Feb. 5, 1976, Pat. No. 4,099,379. This application Jul. 27, 1976, Ser. No. 709,204

The portion of the term of this patent subsequent to Jul. 11, 1995, has been disclaimed.

Int. Cl.² F15B *13/08*

U.S. Cl. 60—427 **22 Claims**



1. Multiple load responsive valve assemblies each comprising a housing having a fluid inlet chamber connected to pump means, a fluid supply chamber, at least one load chamber, outlet fluid conducting means and fluid exhaust means connected to reservoir means, first valve means for selectively interconnecting said fluid load chamber with said fluid supply chamber and said fluid exhaust means, said first valve means having first variable metering orifice means operable to throttle fluid flow between said load chamber and said fluid exhaust means and second variable orifice means operable to throttle fluid flow between said fluid supply chamber and said load chamber, pressure sensing port means selectively communicable with said load chamber by said first valve means, second valve means having out flow throttling means between said load chamber and said fluid exhaust means, said second valve means having means responsive to pressure differential at variable pressure level across said first variable orifice means and operable to maintain said pressure differential across said first variable orifice means at a relatively constant preselected level while pressure at said first variable orifice means is permitted to vary, said second valve means having fluid isolating means between said fluid inlet chamber and said fluid supply chamber, fluid replenishing means to interconnect for fluid flow said fluid supply chamber and said fluid exhaust means when said fluid isolating means isolates said fluid supply chamber and said fluid inlet chamber, and control means connected to said inlet chambers of said valve assemblies, control line means interconnecting said control means with said pressure sensing port means of said valve assemblies, control signal direction phasing means in each of said control line means, said control means responsive to highest pressure in any of said load chambers of valve assemblies operating loads and operable to vary fluid flow delivered from said pump means to said load system to maintain a constant pressure differential across said second variable orifice means between pressure in said inlet chambers and said maximum pressure in said load chamber.

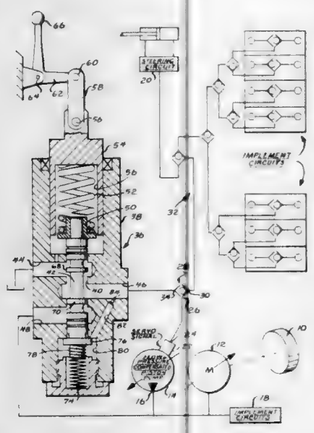
V9803/3 NO 020 79 UMI

4,174,614

TORQUE LIMITING CONTROL FOR FRONT WHEEL DRIVE

Joseph E. Dezelan, Western Springs, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 1, 1978, Ser. No. 874,080
Int. Cl.² F16H 39/46
U.S. Cl. 60—445 **5 Claims**



1. A vehicle drive system comprising:
ground engaging means adapted to at least partially propel a vehicle over underlying terrain;
a hydraulic motor coupled to said ground engaging means to drive the same;
a flow and pressure compensated pump having an output for providing hydraulic fluid under pressure to said motor and including a control system having an input for receiving a hydraulic signal and for controlling pressure and flow output characteristics of the pump; and
a manually settable pressure reducing valve interconnecting said output and said input to provide a substantially constant, but adjustable, pressure signal to said control system,
whereby output pressure from said pump to said motor may be controlled independently of loading on said motor to set maximum torque delivery of said motor at a desired value.

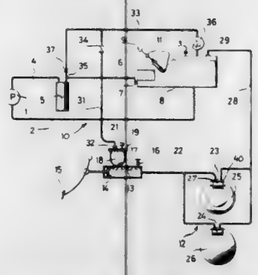
4,174,615

DEVICE FOR THE VENTING OF AN HYDRAULICALLY LOADED SYSTEM

Wolfgang Kuhn, Kaarst, Fed. Rep. of Germany, assignor to International Harvester Company, Chicago, Ill.

Filed Oct. 10, 1978, Ser. No. 950,094
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1977, 7732163[U]
Int. Cl.² F15B 21/04
U.S. Cl. 60—453 **4 Claims**

1. An auxiliary hydraulic fluid circuit for purging air from a hydraulic brake system in a tractor vehicle of the agricultural or industrial type by diverting hydraulic fluid from a hydraulic power system on the tractor into the hydraulic brake system, comprising:
a hydraulic feed line means for supplying fluid to the hydraulic power system;
a first conduit having means for observing fluid flow therethrough and having an intake end connected to the feed line and having a discharge end connected to a one way valve communicating with a fluid reservoir of the hydraulic power system;
a second conduit having means for observing fluid flow therethrough and having an intake end connected to the first conduit upstream of the one way valve and having a discharge end connected to a brake fluid reservoir;
a fluid control valve means in the second conduit for controlling the flow of fluid therethrough;
a third conduit having means for observing fluid flow therethrough and having an intake end connected to a vent



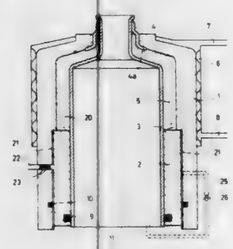
means in a brake servo cylinder unit means and having a discharge end connected to the fluid reservoir of the hydraulic power system;
and a master brake cylinder communicating with the brake fluid reservoir and including a brake line communicating the master brake cylinder to a fluid inlet port in the brake servo cylinder unit.

4,174,616

INSULATED CYLINDER SLEEVE FOR A HOT-GAS ENGINE

Anton M. Nederlof, and George A. A. Asselman, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 1, 1977, Ser. No. 820,460
Claims priority, application Netherlands, Aug. 5, 1976, 7608689
Int. Cl.² F16J 11/04; F02G 1/04
U.S. Cl. 60—517 **6 Claims**



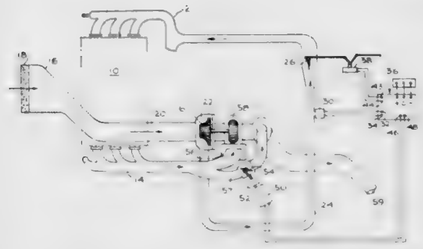
1. A hot-gas engine, comprising at least one metal housing which envelops a chamber in which a pressurized working medium is present during operation, and a layer of a heat insulating material on at least part of the inner side of the housing, characterized in that the engine includes a metal sleeve bounding a portion of the chamber and defining an inner wall of an annular spaced formed at least substantially by the inner wall of the housing and the metal sleeve, the insulating layer consisting of granular material filling the annular space such that the metal sleeve presses against and is supported by the grains of insulating material, whereby the insulating material provides structural support for the sleeve against the effects of internal pressure in the chamber.

4,174,617

TURBOCHARGER CONTROL SYSTEM

Mir Javid Jalali-Karchay, P.O. Box 300, Monrovia, Calif. 91016

Filed Aug. 8, 1977, Ser. No. 822,394
Int. Cl.² F02B 37/00
U.S. Cl. 60—602 **10 Claims**



1. A turbocharger control system for an internal combustion engine having a throttle, an intake manifold and an exhaust manifold, including:
a pressure sensor coupled to said intake manifold and responsive to changes in the air pressure therein to produce a change in a first electrical parameter;
variable electrical means coupled mechanically to said throttle and responsive to the setting of said throttle to set a second electrical parameter of the same type as first electrical parameter;
a comparator circuit including balanced means for comparing the respective total magnitudes of said first and second parameters and trigger means responsive to any imbalance between said total magnitudes of said first and second parameters for producing a correctional output voltage having a polarity indicative of the relative sizes of said total magnitudes of said first and second parameters, respectively;
a gas-driven turbine;
an exhaust gas duct adapted to be coupled at one end to said exhaust manifold and at the other end to said turbine;
an air duct coupled to said intake manifold;
an air compressor;
coupling means for mechanically coupling said air compressor to said turbine, said air compressor being pneumatically coupled to said air duct for the flow of air therebetween;
a by-pass duct coupled to said exhaust-gas duct between said exhaust manifold and said turbine for by-passing exhaust gas around said turbine;
a wastegate adjustably mounted in said by-pass duct for controlling the extent of the by-passing of exhaust gas around said turbine;
a reversible electrical motor having electrical terminals;
driving means coupling said motor to said wastegate; and,
electrical means coupling said terminals of motor to said comparator circuit for operating said motor, in response to said correctional output voltage, in such a direction that said wastegate is positioned to cause the restoration of the balance between the total magnitudes of said first and second parameters, respectively.

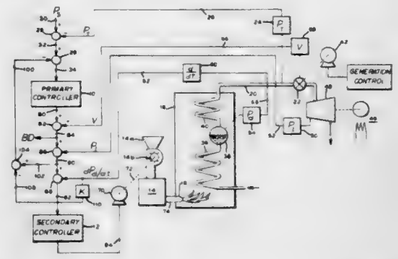
4,174,618

DECOUPLED CASCADE CONTROL SYSTEM

Theron W. Jenkins, Jr., Ambler, and Justus C. Barber, King of Prussia, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Apr. 3, 1978, Ser. No. 892,537
Int. Cl.² F01K 13/02
U.S. Cl. 60—664 **6 Claims**

1. In a cascade control system for controlling the steam boiler of the drum type wherein a primary controller having proportional and reset action responds to the deviation of the throttle pressure from its set point to establish as an output a set point value representing heat release demand with a secondary controller responding to the deviation of the calculated existing heat release from the demand value represented by said set point to control the fuel input to the boiler, the improvement which comprises:



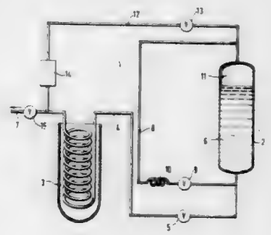
means responsive to the difference between the heat release demand and the existing steam flow to modify the output of said primary controller by an amount sufficient to cancel any changes in said output due to changes in the throttle pressure resulting from disturbances which are detectable as changes in the existing steam flow.

4,174,619

APPARATUS FOR CONTROLLING THE PRESSURE OF A GAS IN A GAS LINE

Klaus Tocha, Langenfeld, Fed. Rep. of Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 13, 1978, Ser. No. 876,891
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1977, 2706484
Int. Cl.² F17C 7/02
U.S. Cl. 62—52 **8 Claims**



1. An apparatus for controlling the pressure of a gas in a gas line, a predetermined pressure prevailing in said gas line, comprising a conduit, said conduit including in combination:
an insulated container,
a source of gas having a relatively low boiling point and being maintained at a prearranged gas pressure within said container, a portion of said gas being in said container in liquefied form, the remaining gas portion being in gaseous form and occupying a gas space within said container,
evaporation-inducing means connected to said portion of gas in liquefied form, and to said gas line, for evaporating said gas in liquefied form, and for generating a gas flow to said gas line, pressure fluctuations occurring in said gas flow,
a feed line disposed in parallel with said evaporation-inducing means and connecting said gas space to said gas line, said gas space being maintained at a prearranged pressure,

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and a predetermined pressure loss occurring in said feed line, and

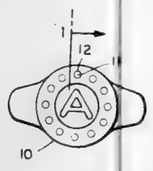
self-actuating valve means disposed in said feed line for releasing a gas stream from said gas space upon the predetermined pressure in said gas line falling below said prearranged pressure less said pressure loss, whereby the pressure in said gas line is substantially maintained at said predetermined pressure, and insulated from pressure fluctuations in said gas flow.

4,174,620

JEWELRY WITH ADHESIVE INSERT FOR LIFTING OBJECTS

David E. Russell, 110 Riverside Ave., Jacksonville, Fla. 32202

Filed Jul. 5, 1977, Ser. No. 812,518
Int. Cl.² A44C 9/00; B65G 7/12
U.S. Cl. 63—1 R **3 Claims**



1. An article of personal jewelry having a size and shape adapting it for attachment to a portion of a wearer's body at an area near a free end of an arm, said article having an outer surface facing generally away from a wearer's body area, contacting means supported by and protruding outwardly away from said surface and facing away from a wearer's body area for contacting and lifting small, light objects, said contacting means comprising a plastic element with a sticky exterior surface positioned to readily contact such objects, and mounting means for firmly and removably securing said element to said article whereby said element may be readily replaced when said element is substantially incapable of lifting small, light objects,

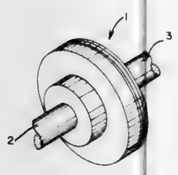
said surface including an ornamental design, said contacting means being adapted and arranged to harmonize with said design thereby rendering same unobtrusive.

4,174,621

TORQUE LIMITING OVERLOAD COUPLING

Duane W. Woltjen, Manchester, Mo., assignor to UMC Industries, Inc., St. Louis, Mo.

Filed Oct. 12, 1977, Ser. No. 841,364
Int. Cl.² F16D 3/56, 7/00
U.S. Cl. 64—29 **16 Claims**



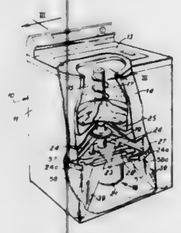
1. A torque limiting coupling assembly for use in connecting rotating and rotatable parts together during normal usage of machinery but effecting disconnecting of said parts when a maximum designed torque is exceeded, comprising, connecting means provided for securement with the said rotating part, a second connecting means provided for securement with the said rotatable part, bearing means, bearing seats operatively associated with each connecting means and for use in seating the bearing means, said bearing means being seated intermediate the two said connecting means and effecting simultaneous turning of said rotatable part by the rotating part during routine operation of the machinery and with the exertion of excessive torque causing a camming action between the bearing means and its bearing seats for effecting an unseating of said bearing means and reduction in the rotation of said rotatable part, a retainer means holding said bearing means between the said connecting means, diaphragm means having one of connecting means formed bearing seats provided thereon cooperating with one of said connecting means for normally seating the said bearing means into position for turning with the revolving of the rotating part, tapered pin means cooperating between the said connecting means and seated within the diaphragm means for assuring the simultaneous rotation of both the said connecting means and bearing means during routine machinery usage, the excessive torque also effecting a camming action between the pin means and its seats tending to cause their movement towards separation, resilient means provided upon the said connecting means and biasing the said diaphragm means against the bearing and pin means, and other bearing seats operatively associated with the said other connecting means and seating the bearing means thereagainst as during designed usage of the said machinery.

4,174,622

AUTOMATIC WASHER SUSPENSION SYSTEM

Douglas E. Bunnell, Marion, Ohio; Joseph A. Gauer, Buchanan, Mich.; R. Bruce Sherer, and William F. Scott, both of St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 27, 1978, Ser. No. 928,714
Int. Cl.² D06F 37/24
U.S. Cl. 68—23.3 **19 Claims**



1. In an automatic clothes washer having a spin type clothes container within which an agitator is oscillatably mounted, a tub enclosing and supporting the container, means supported substantially centrally on and under the tub for driving the container and agitator, and suspension means supporting the tub in a manner to permit limited rocking and transverse displacement movements of the tub during a cycle of operation, the improvement in the suspension means comprising:

a combination skate and rocking support device;

support means supporting said device under said tub for horizontal movement of said device relative to said support means;

generally pyramidally oriented cooperative surfaces on said tub and on said device for supporting said tub on said device and for providing stable support for the tub under normal operating conditions but permitting rocking of the tub relative to the device responsive to tub load imbalances in operation;

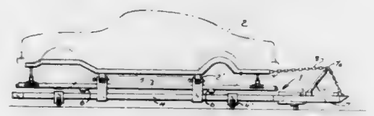
and resiliently yieldable means for normally biasing said tub and thereby said device toward an equilibrium position.

4,174,623

METHOD AND APPARATUS FOR REFORMING AND STRAIGHTENING VEHICLES

Pierre N. LeGrand, Old MBI Bldg., Brunswick Rd., Ashford, Kent, England, and Dirk J. Van Dalen, 701 E. Milwaukee, Janesville, Wis. 53545

Filed Sep. 8, 1977, Ser. No. 831,508
Int. Cl.² B21D 1/14; B21C 51/00
U.S. Cl. 72—34 **16 Claims**



1. An apparatus for applying corrective forces to the body and/or frame of a damaged vehicle comprising:

support means on which a damaged vehicle is positionable;

force applying means coupled to the support means for applying a corrective force to the damaged vehicle through an elongated force transmitting element;

measuring means having interconnected tracks and disposed for movement on the support means and including means for selective and independent movement of the measuring means with respect to the damaged vehicle and with respect to the support means on which the damaged vehicle is positionable, the means for selective and independent movement including resilient biasing and rolling means disposed between the support means and the tracks for biasing the measuring means into operative coupling relationship with the damaged vehicle and permitting rolling movement between the measuring means and the support means, the measuring means including indicating means responsive to the application of a corrective force to the damaged vehicle to provide a continuous indication of the magnitude of correction of the damaged vehicle;

said measuring means further including a plurality of vertically extending and vertically presettably adjustable reference elements having respective first and second ends, the respective first ends thereof biased by said resilient biasing means into operative coupling relationship with datum points on undamaged portions of the vehicle to provide predetermined reference positioning of the measuring means with respect to the vehicle;

said measuring means further including at least one vertically extending extensible measurement element having a first and a second end, the first end thereof biased by said resilient biasing means into operative coupling relationship with a datum point on damaged and unaligned portions of the vehicle;

said measuring means further including independent support means mounted on said tracks to respectively support the second ends of the plurality of reference elements and to support the second end of said at least one measurement element, said independent support means capable of movement on the tracks in at least two directions; and

retention means disposed between the independent support means of the reference elements and the tracks to provide a preselected orientation of the measuring means with respect to the vehicle and to the independent support means during the application of a force to the vehicle.

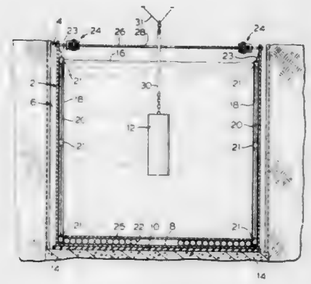
4,174,624

TANK FOR EXPLOSIVE FORMING

Lorne R. Shrum, 820 Manchester Rd., London, Ontario, Canada

Filed Jul. 26, 1978, Ser. No. 928,187
Claims priority, application Canada, Jul. 29, 1977, 283744
Int. Cl.² B21D 26/08
U.S. Cl. 72—56 **5 Claims**

1. A tank for explosive forming comprising an open topped tank cushionedly free-standing within a ground excavation, the tank being cylindrical about a vertical axis, and a substantially horizontal annular plate located within the upper rim of the



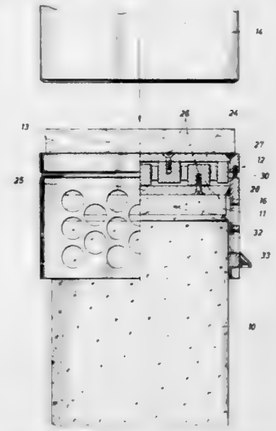
tank, the plate being spaced from and connected to said upper rim by a plurality of rubber-in-shear mountings.

4,174,625

TRANSDUCER FOR DETERMINING STRAIN DATA DURING PILING

Lionel J. Milberger, 19402 Enchanted Oaks Dr., Spring, Tex. 77373, and Byrd M. Sasser, Jr., 8B, Southside, College Station, Tex. 77840

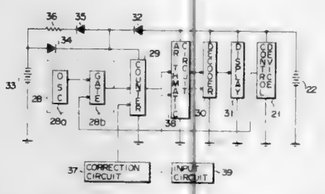
Filed Mar. 2, 1978, Ser. No. 882,572
Int. Cl.² G01N 3/32
U.S. Cl. 73—11 **5 Claims**



5. A strain gauge transducer for use in determining strain data during piling comprising a generally flat-sided metal body for positioning between the top of a pile and a pile driving hammer, said plate having a plurality of symmetrically spaced flexure elements formed therein that extend above the adjacent surface of the body on one side and are recessed relative to the adjacent surface of the body on the other side, a plurality of arms integrally attached to the flexure elements and the body, and extending between the flexure elements and the body with adjacent arms having mutually perpendicular longitudinal axes, and strain gauges positioned on the arms to measure the strain in the arms due to the force imposed on the flexure members by a hammer.

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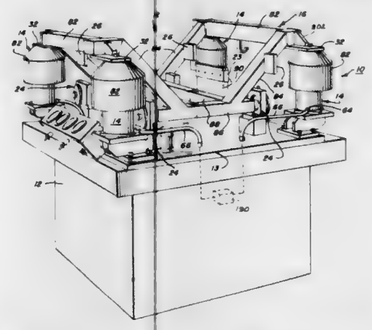
4,174,626
FUEL GAUGE
Yasushi Agawa, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan
Continuation of Ser. No. 767,117, Feb. 9, 1977, abandoned. This application May 25, 1978, Ser. No. 909,485
Claims priority, application Japan, Feb. 10, 1976, 51-13554
Int. Cl.² G01F *9/00*
U.S. Cl. 73—113 **2 Claims**



1. A gauge for measuring fuel consumption in an engine employing an electronic fuel injection control system having means for generating a control signal for controlling the opening and closing of a fuel injection valve, said control signal including a series of control pulses for controlling the opening of said valve wherein the width of each pulse corresponds to the time said valve is open during each injection cycle, said gauge comprising: a clock pulse generator for generating clock pulses; a logic gate circuit for passing, in response to each said control pulse, a number of clock pulses corresponding to the width of said control pulse; an electronic counter connected to said logic gate for counting the clock pulses passed by said logic gate circuit; a principal power supply for energizing said counter through a power supply input thereto; a backup power supply; a first diode connected in a forward direction from said principal power supply to said power supply input of said counter whereby said counter is supplied with power for operation; a second diode connected in a forward direction from said backup power supply to said power supply input of said counter, said diodes operating such that when the voltage output from said principal power supply drops below a predetermined level established by said backup power supply, said power supply input is isolated from said principal power supply and is supplied with power from said backup power supply to be maintained at said predetermined level; and a display device for displaying the contents of said counter.

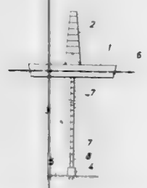
4,174,627
TEST STAND FOR AN INTERNAL COMBUSTION ENGINE TESTING SYSTEM
Philip E. Swis, and Jere L. Hill, both of Armada, Mich., assignors to Sun Electric Corporation, Crystal Lake, Ill.
Filed May 16, 1978, Ser. No. 906,643
Int. Cl.² G01M *15/00*
U.S. Cl. 73—116 **22 Claims**

1. An apparatus for permitting a mechanism mounted thereon to substantially freely vibrate, said apparatus being operable in a first state and a second state and comprising, in combination:
a platform;
cradle means for receiving said mechanism, said cradle means resting upon said platform in said first state; and
support means for supporting said cradle means above said platform in said second state and for permitting said cradle means to substantially freely move in response to said mechanism;
said support means including a housing, having a lower end secured to said platform and an open upper end, and an inflatable bladder member within said housing, said inflatable bladder member being deflated in said first state and



inflated in said second state to engage and lift said cradle means.

4,174,628
MARINE RISER MEASURING JOINT
Hendrik K. J. van den Bussche; Nicolaas J. van Soldt; Adrianus H. van de Krogt, all of Rijswijk, Netherlands, and Willem Drinkwaard, deceased, late of Papendrecht, Netherlands (by Adriana Drinkwaard, née Goossen, personal representative), assignors to Shell Oil Company, Houston, Tex.
Filed Jul. 10, 1978, Ser. No. 923,122
Int. Cl.² G01L *5/00*
U.S. Cl. 73—151 **6 Claims**

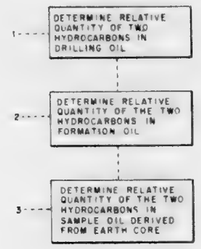


1. Marine riser joint for measuring loads exerted on a marine riser, said joint comprising a first and a second tubular element, means on each of said first and second tubular elements for coupling the joint to sections of the marine riser, a third tubular element extending between the first and second tubular element and in fluid sealing contact therewith near its ends in a manner allowing relative axial displacement between the third element and at least one of the other elements, a load-transmitting element having a shear load area and forming a firm connection between the first and second tubular element, and stress measuring elements operatively carried by said load-transmitting element.

4,174,629
DETECTION OF DRILLING OIL FILTRATE INVASION IN A CORE
John H. Striegler, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Filed Oct. 25, 1978, Ser. No. 954,391
Int. Cl.² E21B *49/02*
U.S. Cl. 73—153 **15 Claims**

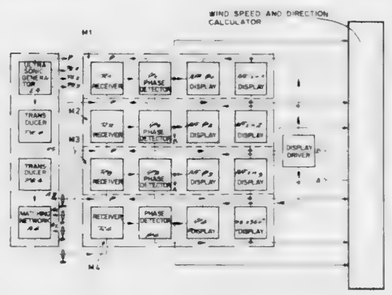
1. In the analysis of sample oil derived from a core taken from a subsurface formation containing formation oil, said core having been subjected to the presence of an oil base drilling fluid using a drilling oil that has a hydrocarbon analysis different from said formation oil, the method comprising:

a. determining the relative quantities of at least two different hydrocabon materials in said drilling oil;
b. determining the relative quantities of said hydrocarbon materials in said formation oil, said relative quantities of said hydrocarbon materials in said formation oil being different from said relative quantities of said hydrocarbon materials in said drilling oil by an amount such that the relative quantities of said hydrocarbons in a mixture of



said drilling oil and said formation oil containing ten percent by weight of said drilling oil are measurably different from the relative quantities of said hydrocarbons in said drilling oil and formation oil; and
c. determining in said sample oil the relative quantities of said hydrocarbon materials to establish whether said core has been noticeably invaded by drilling oil when said core was subjected to the presence of said oil base drilling fluid.

4,174,630
ULTRASONIC ANEMOMETER
Jacques A. G. Nicoli, Paris, France, assignor to Societe d'Exploitation de Produits et de Techniques pour l'Aeronautique et l'Automatique, Paris, France
Filed Nov. 3, 1977, Ser. No. 848,232
Int. Cl.² G01P *5/00*; **G01F** *1/66*
U.S. Cl. 73—194 A **14 Claims**



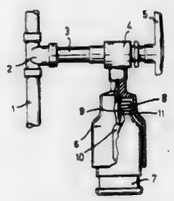
8. An ultrasonic anemometer comprising three transmitter-receiver pairs, the transmitter and receiver of each pair being spaced apart along one of three mutually perpendicular axes, an ultrasonic wave generator electrically coupled to said transmitter and energizing said transmitter to produce acoustic waves, a supporting structure supporting said transmitter-receiver pairs so that said transmitter-receiver pairs define a rectangular tetrahedron, a phasemeter coupled to each receiver, and calculating means responsive to signals from said phasemeter for determining wind velocity.

4,174,631
CLINICAL THERMOMETER WITH THERMO-COUPLE PROBE
Julius G. Hammerslag, Newport Beach, Calif., assignor to Temp-Stik Corporation, Laguna Hills, Calif.
Filed Jan. 9, 1978, Ser. No. 867,975
Int. Cl.² G01K *7/02*
U.S. Cl. 73—359 R **23 Claims**



1. An electrical clinical thermometer comprising display means for indicating a sensed temperature, a temperature sensing probe, and a releasable connector means for connecting said probe to said display means, said probe including an elongated support body, non-self-supporting thin thermo-couple wires extending along and supported by said body from said connector means and terminating in a thermo-couple junction adjacent to the end of said body, said junction being formed between ends of said wires which are bared and which are suspended in spaced relation to the material of said body to be exposed for direct contact with the tissue of a patient, said junction being in a gap free of contact with any solid material.

4,174,632
LIQUID SAMPLER
Adolf E. Jansen, Rotterdam, Netherlands, assignor to Douwes International B.V., Pijnacker, Netherlands
Filed Jun. 29, 1978, Ser. No. 920,521
Claims priority, application Netherlands, Jul. 6, 1977, 7707477
Int. Cl.² G01N *1/10*
U.S. Cl. 73—422 R **5 Claims**



1. A sampler which can be connected to a manufacturing process portion for taking samples therefrom, comprising a tap in a branch line of the process portion, and a cap which is integrally formed with the tap and is adapted to receive a collection container which is inserted into the cap, the configuration of the internal surface of the cap corresponding to the configuration of the external surface of the collection container, and the sampler further comprising an injection needle disposed within the cap for penetrating a septum in the opening of the collection container when the container is inserted into the cap, the needle being in communication with the tap for introducing a sample of fluid from said branch line into the container.

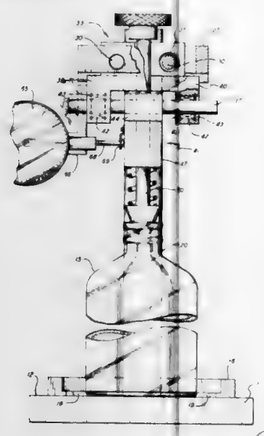
V 9 8 N 3 N 0 2 0 7 9 UMI

4,174,633

BOTTLE TESTING APPARATUS

Donald A. Hoyt, Fulton, and Harold L. Fischer, New Haven, both of N.Y., assignors to Fulton Tool Co., Inc., Fulton, N.Y.

Filed Mar. 24, 1978, Ser. No. 889,882
Int. Cl.[2] G01D *21/00*
U.S. Cl. 73—432 R **8 Claims**



1. Apparatus for inspecting bottles including
a horizontal support platform having a locating fixture thereon for engaging the base of a bottle positioned on the platform and supporting the bottle in an upright position thereupon,
a frame mounted over the platform having a first carriage slidably mounted therein so as to move along a first path of travel parallel to the base,
a second carriage slidably mounted in the first carriage so as to move along a second path of travel that is also parallel to the base and which is angularly offset from the first path of travel,
a probe affixed to the second of said carriages for movement therewith having a plug insertable within a bottle opening in contact with the inner wall thereof, and
means for detecting the displacement between the carriages as a bottle is rotated about its base upon the platform.

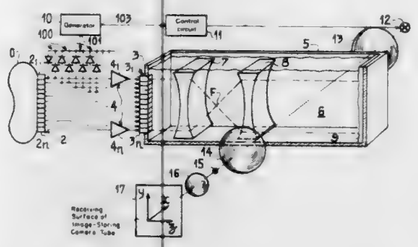
4,174,634

ECHOGRAPHIC DEVICE FOR THE REAL-TIME DISPLAY OF INTERNAL DISCONTINUITIES OF A TEST OBJECT

Jacques Dory, Meaux, France, assignor to C.G.R. Ultrasonic, Meaux, France

Filed Jan. 3, 1978, Ser. No. 866,709
Claims priority, application France, Jan. 4, 1977, 77 00082
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—606 **20 Claims**

1. An echographic device for displaying, in real time, internal discontinuities of a test object to be examined, comprising:
first electroacoustic transducer means juxtaposable with the test object;
a source of recurrent ultrasonic-frequency electrical signals connected to said first transducer means for exciting same to emit original ultrasonic wave trains into said test object and to reconvert reflections of said original wave trains from internal object points into electrical echo signals;
second electroacoustic transducer means electrically connected to said first transducer means for receiving said echo signals therefrom and converting same into regenerated ultrasonic wave trains;
a transluminable interaction medium in contact with said second transducer means for insonification thereby, said medium transmitting the regenerated wave trains in a predetermined general direction of travel;
acoustic focusing means in said medium for concentrating said regenerated wave trains onto image points spatially correlated with respective reflecting object points whereby schlieren differing in density from the surrounding medium are temporarily generated at said image points, said schlieren coming into existence in an image space of said medium with delays measured from the time of excitation of said first transducer means which are a function of the distances of said object points from said first transducer means and which establish an apparent schlieren speed in said direction of travel;



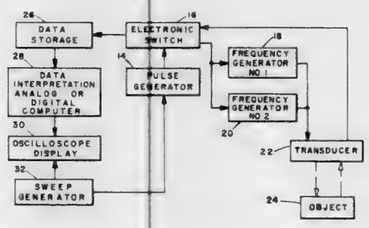
first optical means on one side of said medium generating a laminar light beam transluminating said image space, said beam having a narrow cross-section elongate in a direction substantially perpendicular to said direction of travel;
sweep means coupled with said first optical means and synchronized with said source for displacing said beam parallel to itself in said direction of travel over at least a part of said image space with a velocity substantially corresponding to said apparent schlieren speed and at times coinciding with the formation of schlieren in the region swept by the beam with resulting diffraction of light rays forming part of said beam; and
second optical means on a side of said medium opposite said one side for focusing the diffracted light rays upon a receiving surface to visualize said image points.

4,174,635

METHOD AND APPARATUS FOR ULTRA SOUND IMAGING UTILIZING RAYLEIGH BACKSCATTER

William H. Oldendorf, 2805 Angelo Dr., Los Angeles, Calif. 90024

Filed Jun. 1, 1978, Ser. No. 911,446
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—606 **18 Claims**



1. An ultrasonic imaging system comprising in combination:
ultrasonic generating means for generating at least a pair of pulses of slightly differing ultrasonic frequencies,
means for transmitting said ultrasonic waves to an object;

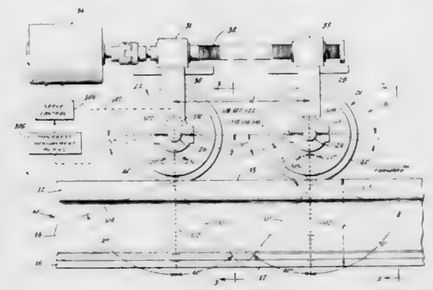
means for individually detecting both frequencies scattered from said object, and
means for differentially amplifying said scattered waves and displaying an image representative of the regional scattering cross-section of the interior of said object.

4,174,636

TWO WHEEL ULTRASONIC RAIL TESTING SYSTEM AND METHOD

Dominick A. Pagano, 10 Sasqua Trail, Georgetown, Conn. 06829

Continuation-in-part of Ser. No. 818,544, Jul. 25, 1977. This application Aug. 1, 1977, Ser. No. 820,588
The portion of the term of this patent subsequent to Aug. 28, 1996, has been disclaimed.
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—636 **6 Claims**



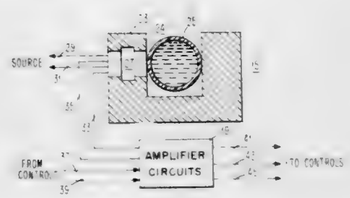
1. In a system of the type for performing ultrasonic inspection of a length of test material, such as a rail, with ultrasonic transducing means emitting a beam of ultrasonic energy from within sealed wheel means containing a coupling liquid therein and having a flexible membrane transparent to the ultrasonic beam and arranged for rolling contact along the test material, rail inspection apparatus comprising:
leading wheel means arranged for rolling contact along the length of rail,
trailing wheel means spaced behind the leading wheel means and arranged for rolling contact along the length of rail,
first ultrasonic transducer means mounted in the leading wheel means aimed at an angle downwardly and rearwardly and second ultrasonic transducer means mounted in the trailing wheel means aimed at an angle downwardly and forwardly for transmitting ultrasonic energy from one of said transducer means to the other longitudinally through the rail at an angle to the top surface thereof,
third ultrasonic transducer means mounted in one of said wheel means aimed at an angle downwardly and laterally for transmitting ultrasonic energy in the rail in a side-looking direction substantially perpendicularly to the side surface of the rail and at a resultant angle of approximately 40° to the perpendicular to the top surface of the rail toward the lower gage corner of the rail head and for obtaining optimum reflection of ultrasonic energy from the lower gage corner, regardless of the various sizes of rail heads encountered, to detect loss of amplitude of the energy caused by impingement with a defect,
fourth ultrasonic transducer means mounted in the other wheel means aimed at an angle downwardly and laterally for transmitting ultrasonic energy in the rail in a side-looking direction substantially perpendicularly to the side surface of the rail and at a resultant angle of approximately 40° to the perpendicular to the top surface of the rail toward the lower field corner of the rail head and for obtaining optimum reflection of ultrasonic energy from the lower field corner, regardless of the various sizes of the rail heads encountered, to detect loss of amplitude of the energy caused by impingement with a defect, and
fifth ultrasonic transducer means in at least one of said wheel means aimed downwardly at a zero angle to the perpendicular to the top surface of the rail,
thereby effectively probing the rail for various kinds and orientations of defects regardless of whether the rail is welded or jointed.

4,174,637

PRESSURE MONITORING SYSTEM

Alfred P. Mulzet, Endicott, and Gary A. Trudgen, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 19, 1978, Ser. No. 952,766
Int. Cl.[2] G01L *7/02*
U.S. Cl. 73—730 **8 Claims**



1. A pressure monitoring system for determining the pressure of fluid in a section of flexible wall tubing comprising, in combination,
a supporting block having a channel therein in which a section of fluid filled tubing is inserted,
a pressure transducer mounted in said block, having a predetermined initial load imposed thereon by the fluid-filled tubing inserted in said block, and providing a first electrical signal having a value dependent upon the value of said initial load,
a reference signal source,
comparing means connected to said transducer and said reference signal source for comparing the signal from said transducer with the reference signal,
reference signal control means connected to said comparing means and said reference signal source for varying said reference signal in accordance with the variation in the output of said comparing means, and
indicating means for indicating variations in said reference signal.

4,174,638

PRESSURE PICKUP FOR MEASURING THE PRESSURE IN THE INTAKE MANIFOLD OF AN INTERNAL COMBUSTION ENGINE

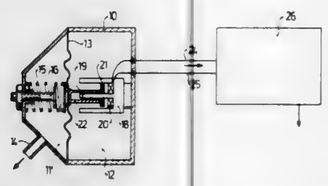
Erich Zabler, Karlsruhe; Walter Jansche, Durmersheim, and Frieder Heintz, Stutensee, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 5, 1978, Ser. No. 912,641
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1977, 2725543
Int. Cl.[2] G01L *9/10*
U.S. Cl. 73—728 **12 Claims**

1. A pressure pickup for measuring the pressure in the intake manifold of an internal combustion engine, comprising:
a housing with a part separating said housing into a first chamber and a second chamber, said first chamber being in communication with said intake manifold and said part being movable in response to said pressure in said first chamber,
an electromagnet in said second chamber including a core

and at least one coil and generating magnetic flux lines in said,

means for short-circuiting the magnetic flux lines covering said central leg of said core and connected to said part for movement therewith slidably in said recess to thereby change the induction of said coil, and



said core comprising an E-shaped member with three legs including a central leg defining an annular recess, said coil being disposed in the bottom of said recess in surrounding relationship with said central leg and in underlying relationship with said short-circuiting means,

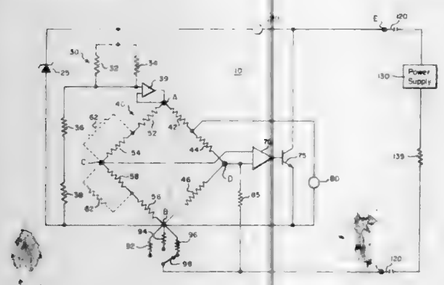
circuit means connected to said electromagnet for evaluating the inductance of said coil thus indirectly measuring the intake manifold pressure.

4,174,639

BRIDGE CIRCUITS

John Raven, Prospect, Conn., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed Apr. 6, 1978, Ser. No. 893,937
Int. Cl.² G01B 7/18
U.S. Cl. 73—766 **20 Claims**



9. An electrical circuit comprising:

a bridge circuit comprising:

first and second electrical elements connected in series in a first arm of the bridge circuit between first and second input nodes, said first and second electrical elements having a resistance which varies as a function of at least two variables;

third and fourth electrical elements connected in series in a second arm of the bridge circuit between said first and second input nodes;

a regulated voltage supply having first and second terminals connected to said first and second input nodes of the bridge circuit;

means for producing an output signal from said bridge circuit, said means having first and second inputs, said first input being connected to a first output node of the bridge circuit between said first and second electrical elements and said said second input being connected to a second output node of said bridge circuit between said third and fourth electrical elements; and

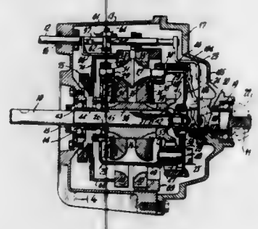
a constant current source connected between said first input node and a point in the second arm of the bridge circuit such that there is a non-zero resistance between said point and the first and second input nodes.

4,174,640

TRACTION-DRIVE TRANSMISSION

Thorn W. Dickinson, Berlin, Conn., assignor to Textron Inc., Providence, R.I.

Filed Sep. 9, 1977, Ser. No. 831,934
Int. Cl.² F16H 37/06
U.S. Cl. 74—690 **18 Claims**



1. In a traction-drive transmission, comprising a housing, a drive shaft journaled for rotation in said housing, two axially spaced sun wheels having keyed longitudinally relatively slidable support on said shaft, means carried by said shaft and axially pre-loading said sun wheels in the direction of relative axial approach to each other, plural like planet wheels axially interposed between and in rolling contact with said sun wheels, a planet-member carrier supported for rotation about the shaft axis and including spaced radial guides positioning said planet wheels on annularly spaced axes offset from the shaft axis and in said planet-member carrier, whereby each of said planet wheels may have at least a degree of generally radial freedom at its guided angular position with respect to said carrier, two axially movable reaction rings having anti-rotational support in said housing and in constant rolling contact with said planet wheels, an output shaft journaled for rotation in said housing, gear means differentially responsive to rotation of said impact shaft with respect to rotation of said planet-member carrier, and control means for varying the relative axial spacing of said reaction rings; the improvement in which the shaft support of said sun wheels includes diametrically aligned pivot means defining an axially fixed pivot axis through and normal to the input-shaft axis at a location intermediate said sun wheels, equalizer means having diametrically opposed radially projecting connection elements and including a central region connected to said input shaft by said pivot means, one radially projecting connecting element of said equalizer means having axially retaining connection to one to the exclusion of the other of said sun wheels, and the other radially projecting connecting element of said equalizer means having axially retaining connection to said other to the exclusion of said one of said sun wheels, whereby said pivot means provides a constant fixed reference for stabilizing like axial offsets of said sun wheels on opposite sides of the radial plane which includes the pivot axis.

4,174,641

POWER DRIVE TRANSMISSION ASSEMBLY

Darrel D. Hillman, Santa Ana, Calif., assignor to Electromatic Drive Corporation, Fort Worth, Tex.

Division of Ser. No. 629,090, Nov. 5, 1975, Pat. No. 4,088,036, which is a continuation-in-part of Ser. No. 525,450, Nov. 20, 1974, abandoned. This application Aug. 8, 1977, Ser. No. 822,516
Int. Cl.² F16H 55/52, 55/56
U.S. Cl. 74—230.17 A **5 Claims**

1. In combination with a prime mover having a driving shaft to which rotational power is transmitted by said prime mover, a power drive assembly operatively associated with said prime mover, said assembly comprising:

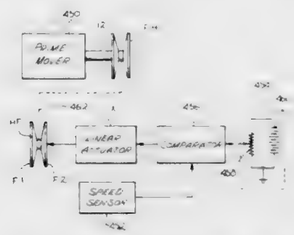
an endless V-belt;

a rotatably supported driven shaft spaced from said driving shaft and parallel thereto;

a driving pulley defined by first and second halves, said first half of said driving pulley rigidly secured to said driving shaft, and said second half of said driving pulley slidably mounted on said driving shaft and substantially nonrotatable relative thereto;

a driven pulley defined by first and second halves, with said first half being rigidly secured to said driven shaft, and said second half being slidably mounted on said driven shaft nonrotatable relative thereto;

force exerting means that tends to maintain said second half of said driving pulley in a position relative to said first half thereof such that the effective pitch diameter of said driving pulley is a maximum, said force exerting means comprising a compressed helical spring that encloses said second shaft, said spring having first and second ends, said first end being in a fixed position relative to said shaft and



said second end being in force exerting contact with said half of said second pulley;

spring means that tends to move said second half of said driven pulley to a predetermined maximum spacing relative to said first half thereof;

a first means operatively associated with said spring means for moving said second half of said driven pulley relative to said first half thereof when said first means is energized to vary the effective pitch diameter of said driven pulley;

a second means for sensing the rotational speed of said driven shaft and generating an output whose magnitude is related to the speed of rotation;

a reference level; and

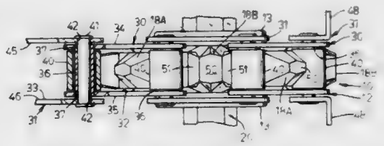
third means for comparing the difference in magnitude between said output of said second means and said reference level, and for generating an output to said first means to move said second half of said driven pulley relative to said first half to vary the effective pitch diameter of said driving and driven pulleys until said output of said second means and said reference level are equal.

4,174,642

CHAIN DRIVE INCLUDING SPROCKET HAVING ALTERNATE WIDE AND NARROW TEETH

Virgil B. Martin, West Bend, and Roger L. Villers, Waubeka, both of Wis., assignors to Gehl Company, West Bend, Wis.

Filed Feb. 9, 1978, Ser. No. 876,251
Int. Cl.² F16H 55/30; F16G 13/02
U.S. Cl. 74—243 R **2 Claims**



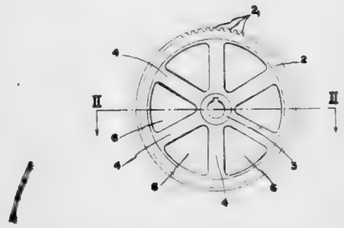
1. In a chain drive, in combination: a sprocket rotatable in a plane about an axis and a flexible chain having a portion engaged with said sprocket and an oncoming flight portion; said chain comprising interconnected links, each link comprising a pair of link plates spaced apart from each other by a predetermined distance in a direction along said axis to define a link opening, with the link plates in adjacent links being spaced apart different predetermined distances and with the plates in every other link being spaced apart the same predetermined distance to provide alternate wide and narrow link openings; said sprocket comprising a body portion having opposite sides of a periphery and having an even number of tapered teeth extending radially outward from said periphery relative to said axis in a plane normal to said axis, each tooth having a length measured in a direction transverse to said axis and having a width measured in a direction along said axis, with adjacent teeth being of different widths relative to each other and with every other tooth being of substantially the same width to provide wide and narrow teeth for engagement with said wide and narrow link openings, respectively, said teeth cooperating with the links in said oncoming flight portion to effect alignment of said chain with said sprocket, each opposite side of said body portion comprising a main surface and a plurality of stepped surfaces spaced apart from each other around the body near the periphery thereof, each side tooth having a side surface near the root thereof defined by a portion of said main surface for load-bearing engagement with the inside surface of a link plate defining a wide link opening, each narrow tooth having a side surface near the root thereof defined by a portion of one of said stepped surfaces for load-bearing engagement with the inside surface of a link plate defining a narrow link opening.

4,174,643

SILENT GEAR WHEEL

Kotaro Tsukamoto, 7-8, Kashima 4-chome, Yodogawa-ku, Osaka, Japan

Filed Sep. 8, 1977, Ser. No. 831,682
Int. Cl.² F16H 55/14; F16F 15/10
U.S. Cl. 74—443 **1 Claim**



1. A gear wheel comprising a rim having a plurality of teeth around the periphery thereof, a hub within said rim, spokes connected between said rim and said hub, sound absorbing material filling the spaces between said spokes for silencing the noise caused by vibration of the gear wheel, and side plates attached to said rim, said hub and said spokes and completely covering the openings from the spaces between said spokes for confining the sound absorbing material in said spaces.

4,174,644

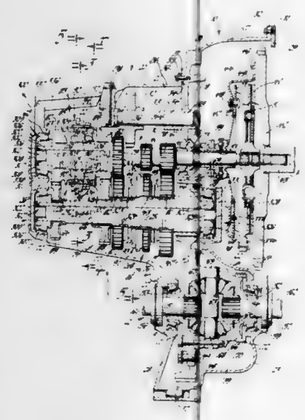
TRANSMISSION AND SHIFT LINKAGE

Laszlo Nagy, St. Clair Shores, and Donald J. Pulk, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 3, 1978, Ser. No. 892,954
Int. Cl.² G05G 5/10, 9/18
U.S. Cl. 74—477 **11 Claims**

1. In a control linkage for a multispeed transmission: a housing; gearing having first and second shift collars each selec-

tively axially movable from a central neutral position in opposite directions to one and another drive positions; a guide member mounted axially in said housing; first and second shift members respectively having first and second connector abutment portions and first and second fork portions directly connected to said first and second shift collars and each shift member being mounted on said guide member for independent axial shifting movement from a central neutral position in one direction to one drive position and in the opposite direction to another drive position; a shift shaft mounted transversely in said housing for selecting movement along its transverse axis between first and second select positions and for rotary shifting movement from a central neutral position in one direction to one drive position and in the opposite direction to another drive position; a shift lever radially mounted on said shift shaft for corresponding movement with said shift shaft to corresponding positions and selectively directly connected respectively to said first and second connector abutment portions of said first and second shift members operative, when in said central neutral position, by selecting movement of said shift shaft and said shift lever to one of said first and second select positions, to respectively selectively directly engage one of



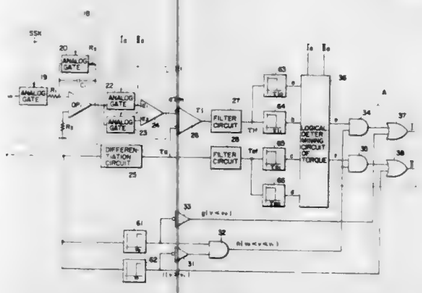
said first and second connector abutment portions and operative on shifting movement to correspondingly shift the selectively engaged one of said first and second connector abutment portions to respectively shift said first and second shift members from said central neutral position to said one and another drive positions; an interlock member mounted on said shift shaft for conjoint transverse axial movement and to permit rotation of said shift shaft relative to said interlock member and having first and second interlock cam portions located transversely on opposite sides of said shift lever operative, when said shift lever is in said first select position to permit free shifting movement of said first shift member and to position said second interlock cam portion to directly engage said second connector abutment portion to hold said second shift member in said central neutral position and when said shift lever is in said second select position to permit free shifting movement of said second shift member and to position said first interlock cam portion to directly engage said first connector abutment portion to hold said first shift member in said central neutral position, and guide means on said housing and interlock member to prevent rotary movement and permit transverse axial movement of said interlock member.

4,174,645

AUTOMATIC CHANGE-GEAR CONTROL DEVICE FOR USE IN ELECTROMOBILE

Tsutomu Ohmae, and Katsuji Marumoto, both of Hitachi, Japan, assignors to The Agency of Industrial Science and Technology, Tokyo, Japan

Filed Nov. 22, 1976, Ser. No. 743,657
Claims priority, application Japan, Nov. 29, 1975, 50-141836
Int. Cl.[2] B60K *41/04*
U.S. Cl. 74—866 **2 Claims**



1. In an vehicle having an inertia characteristic and being driven by an motor, which includes means for detecting an output torque of said motor and producing a correlated motor torque signal, means for detecting a vehicle speed of said electromobile and producing a correlated vehicle speed signal, and a control device for automatically controlling a gear position of a change gear device according to a gear-changing pattern having at least a small gear ratio and a large gear ratio, commensurate with the output torque and the vehicle speed thus detected, and means for detecting the selected gear and producing a correlated gear ratio signal; an automatic change gear control device, comprising:

means for obtaining a vehicle output torque signal from said motor torque signal and said gear ratio signal;

means differentiating said vehicle speed signal with respect to time for obtaining an acceleration torque signal from the variation in vehicle speed signal and the vehicle inertia characteristic;

operational means for obtaining a load torque signal from a difference between said vehicle torque signal and said acceleration torque signal;

means setting a fixed upper acceleration torque limit signal;

means setting a fixed lower acceleration torque signal;

means setting a fixed upper load torque limit signal;

means setting a fixed lower load torque limit signal;

means selecting the small gear ratio when said load torque signal and said acceleration torque signal are both below their lower limit signals;

means selecting the large gear ratio when either one of said load and acceleration torque signals is larger than its upper limit signal; and

means maintaining the selected gear ratio when said load torque signal and said acceleration torque signal are both below their upper limit signals, and when either one of said load and acceleration torque signals is larger than its lower limit signal.

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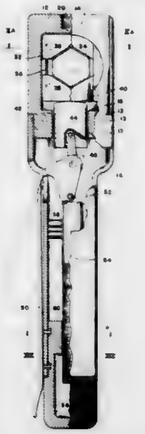
UNIVERSAL TOOL WITH GRIPPING ACTION AND REPLACEABLE JAWS

Simon Kotler, 222 E. 8th St., Brooklyn, N.Y. 11218

Filed May 8, 1978, Ser. No. 903,555
Int. Cl.[2] B25B *13/18*; B25G *1/00*
U.S. Cl. 81—128 **10 Claims**

1. A universal tool including a hollow body portion and a head portion; a cavity in said head; a passageway communicating from said cavity to said body; a cassette-type work element

removably mounted in said cavity; said element including spaced longitudinal guides enclosing fixed and slidable working surfaces connected by expansion springs; a pusher element



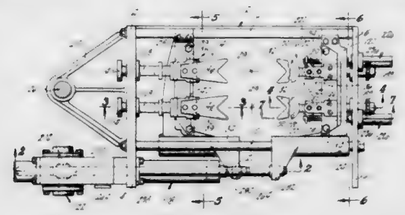
slidably mounted in said passageway in contact with said slidable working surface a clamp including a cam pivoted at one end to said pusher element; a screw unit in said hollow body said cam being eccentrically mounted on said screw unit.

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APPARATUS FOR STRAIGHT LINE SHEARING

Francis A. Dahms, Tariffville, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Feb. 8, 1978, Ser. No. 876,086
Int. Cl.[2] C03B *5/38*
U.S. Cl. 83—58 **12 Claims**



1. An apparatus for use with a feeder for shearing gobs from a column of plastic material comprising:

(a) at least one set of oppositely disposed shear blades movable in a straight line toward and away from each other between open and shearing positions; and

(b) a pneumatic control system for operating said shear blades, said control system including:

(i) a source of fluid pressure;

(ii) pneumatic cylinder assembly means including a piston member and operating rod for driving said shear blades between said open and shearing positions;

(iii) means connecting said pneumatic cylinder assembly means to said source of fluid pressure including a first valve having first and second positions, said first position permitting fluid pressure to flow to one side of said piston to move said piston into the shearing position, said second position permitting fluid pressure flow to the other side of said piston member to move said piston member into the open position;

(iv) means connecting said source of fluid pressure to said first valve to cause the actuation thereof including a second valve having first and second positions, said first position permitting fluid pressure to flow to said first valve to actuate said first valve into its first position, said second position permitting fluid pressure flow to said first valve to actuate said first valve into its second position;

(v) means connecting said source of fluid pressure to said second valve to cause the actuation thereof into its first position and including a third valve having a normal position blocking fluid pressure flow and an actuated position permitting fluid pressure flow; and

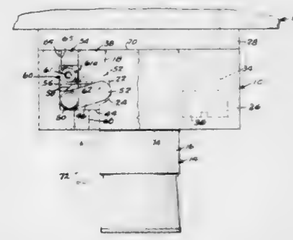
(vi) means driven by said operating rod to actuate said second valve into its second position after said shear blades have moved to their shearing position.

4,174,648

PUNCH RETAINER

Bernard J. Wallis, 25200 Trowbridge Ave., Dearborn, Mich. 48123

Continuation-in-part of Ser. No. 874,230, Feb. 1, 1978, abandoned. This application Oct. 16, 1978, Ser. No. 951,756
Int. Cl.[2] B26D *7/26*; B26F *1/14*
U.S. Cl. 83—698 **16 Claims**



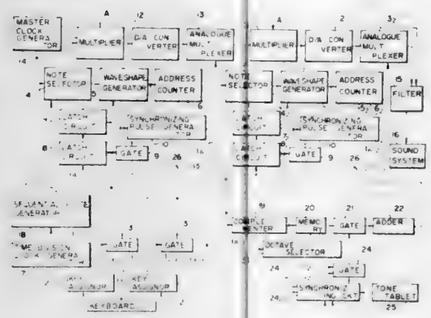
1. In combination, a punch having a shank of circular cross section, said shank having a flat side wall portion extending lengthwise of the punch to the upper end thereof, said shank having a radially inwardly extending recess at the lower end of said flat side wall portion, a retainer having a vertically extending circular bore therein sized to receive said shank and abutment means against which the shank is adapted to bottom when the punch is inserted upwardly therein, said retainer also having a socket therein opening at one side thereof into said bore, a latch supported at one end thereof in said socket for pivotal movement about a horizontal axis spaced radially from said bore, the opposite end of said latch being adapted to engage said recess when the upper end of the punch shank is inserted axially into said bore to retain the punch therein, means biasing said latch to pivot downwardly and means in said socket limiting the pivotal movement of said latch in an upward direction to a position wherein the punch-engaging end of the latch just clears the flat side wall portion on the shank of the punch whereby the punch can be inserted into said bore to interengage the latch with the flat side wall portion of the shank only when the punch is oriented with the flat side wall portion aligned parallel with the pivot axis of said latch, the punch engaging end of said latch comprising a generally cylindrical surface extending parallel to the pivot axis of the latch, said recess including a generally flat latch-engaging surface extending downwardly and radially inwardly from the lower end of said flat side wall portion, said latch being inclined upwardly from its pivot axis with its punch-engaging end engaging said flat latch surface in a wedging relation when the punch bottoms against said abutment means.

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ELECTRONIC MUSICAL INSTRUMENT

Nobuharu Obayashi, Kami; Hikaru Hashizume, Hamamatsu; Noriji Sakashita, Hamamatsu; Seiji Kameyama, Hamamatsu; Sadaaki Ezawa, Hamamatsu; Hironori Watanabe, Hamamatsu; Tatsunori Kondo, Hamamatsu; Toshio Kugisawa, Hamamatsu, and Yutaka Washiyama, Fujieda, all of Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Oct. 17, 1977, Ser. No. 842,523
Int. Cl.[2] G10H *1/00, 5/00*
U.S. Cl. 84—1.01 **2 Claims**



1. An electronic musical instrument having a keyboard with a plurality of keys, comprising:

a key assignor for generating and temporarily storing a key code corresponding to the depression and release of a key, respectively,

a memory circuit for storing inclination and amplitude variations of a required musical waveshape divided into a plurality of periods for reading out the waveshape information corresponding to the key code; and

a tone source device for reading out the information from the memory circuit on a time divided basis to thereby simultaneously obtain waveshapes of different frequencies with the frequencies based on the time division;

wherein the tone source device divides the key code from the key assignor into a plurality of time divided channels and includes waveshape generators of different sound ranges in each of the channels, and wherein there is provided means for reading out the waveshape information from the memory circuit corresponding to the divided information, respectively.

4,174,650

ENVELOPE GENERATOR FOR AN ELECTRONICS MUSICAL INSTRUMENT

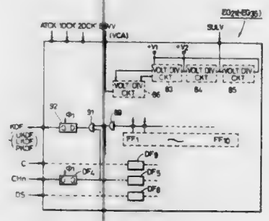
Teruo Hiyoshi; Akira Nakada; Shigeru Yamada, all of Hamamatsu; Kiyoshi Ichikawa, Hamakita, and Shigeki Ishii, Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Division of Ser. No. 678,709, Apr. 20, 1976, Pat. No. 4,082,027. This application Nov. 11, 1977, Ser. No. 850,649
Claims priority, application Japan, Apr. 23, 1975, 50/49525; Apr. 25, 1975, 50/50559; Apr. 26, 1975, 50/51247
Int. Cl.[2] G10H *1/00, 3/00, 1/02*
U.S. Cl. 84—1.01 **12 Claims**

1. For use in an electronic musical instrument, an envelope waveshape generator for generating a control voltage representing an envelope waveshape having a plurality of different waveshape sections each having selectable beginning and end voltage levels, the control voltage variation as a function of time for each such waveshape section being independently selectable, comprising:

a like plurality of voltage dividing circuits each corresponding to a respective one of said waveshape sections and each having a plurality of voltage division points between two input terminals where the selected beginning and end voltage levels for that section are respectively applied,

a sampling circuit for sequentially obtaining divided voltage outputs from consecutive pairs of said voltage division points, first in one of said dividing circuits and thereafter consecutively in others of said dividing circuits, and



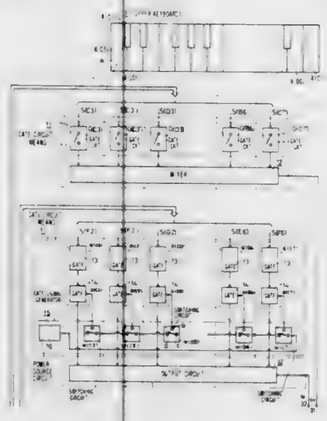
waveshape section timing circuitry, cooperating with said sampling circuit, for separately establishing for each waveshape section the rate at which said voltage outputs are obtained from consecutive pairs of voltage division points, said control voltage being derived from said obtained voltage outputs.

4,174,651

KEYBOARD TYPE ELECTRONIC MUSICAL INSTRUMENT

Ikutaro Kakehashi, Osaka, Japan, assignor to Roland Corporation, Osaka, Japan

Filed Oct. 31, 1977, Ser. No. 847,146
Claims priority, application Japan, Oct. 29, 1976, 51-146515[U]
Int. Cl.[2] G10H *3/00*
U.S. Cl. 84—1.11 **1 Claim**



1. A keyboard type electronic musical instrument comprising:

a keyboard having an arrangement of keys . . . K_{-2}, K_{-1}, K_0, K_{+1}, K_{+2}, . . . corresponding to an arrangement of letter names . . . H_{-2}, H_{-1}, H_0, H_{+1}, H_{+2}, . . . , where H_0 is one of letter names . . . A_{n+1}#, B_{n-1}, C_n, C_n#, D_n, D_n#, E_n, F_n, F_n#, G_n, G_n#, A_n, A_n#, B_n, C_{n+1}, C_{n+1}#, D_{n+1}, . . . based on the scale of the equal temperament of 12 degrees (n being an integer), H_{+1}, H_{+2}, . . . are letter names defined for frequencies higher than that for the letter name H_0 and sequentially arranged in an increasing order of frequency and H_{-1}, H_{-2}, . . . are letter names defined for frequencies lower than that for the letter name H_0 and sequentially arranged in a decreasing order of frequency;

a sound signal generator for generating sound signals . . . S_{-2}, S_{-1}, S_0, S_{+1}, S_{+2}, . . . having frequencies F_{-2}, f_{-1}, f_0, f_{+1}, f_{+2}, . . . defined for the letter names . . . H_{-2}, H_{-1}, H_0, H_{+1}, H_{+2}, . . . , respectively;

first gate circuit means including gate circuits . . . G_{-2}, G_{-1}, G_0, G_{+1}, G_{+2}, . . . respectively corresponding to the keys . . . K_{-2}, K_{-1}, K_0, K_{+1}, K_{+2}, . . . of the keyboard;

a first mixer for mixing the outputs from the gate circuits . . . G_{-2}, G_{-1}, G_0, G_{+1}, G_{+2}, . . . of the first gate circuit means;

second gate circuit means including gate circuits . . . G'_{-2}, G'_{-1}, G'_0, G'_{+1}, G'_{+2}, . . . respectively corresponding to the keys . . . K_{-2}, K_{-1}, K_0, K_{+1}, K_{+2}, . . . of the keyboard;

a frequency multiplier for frequency multiplying the outputs from the gate circuits . . . G'_{-2}, G'_{-1}, G'_0, G'_{+1}, G'_{+2}, . . . of the second gate circuit means;

a second mixer for mixing the outputs from the first mixer and the frequency multiplier;

wherein the gate circuits . . . G_{-2}, G_{-1}, G_0, G_{+1}, G_{+2}, . . . of the first gate circuit means are respectively supplied with the sound signals . . . S_{-2}, S_{-1}, S_0, S_{+1}, S_{+2}, . . . from the sound signal generator and are controlled to pass therethrough the sound signals . . . S_{-2}, S_{-1}, S_0, S_{+1}, S_{+2}, . . . upon depression of the keys . . . K_{-2}, K_{-1}, K_0, K_{+1}, K_{+2}, . . . of the keyboard;

wherein the gate circuits . . . G'_{-2}, G'_{-1}, G'_0, G'_{+1}, G'_{+2}, . . . of the second gate circuit means are respectively supplied with sound signals . . . S_{-2+p}, S_{-1+p}, S_{0+p}, S_{+1+p}, S_{+2+p}, . . . (p being a positive or negative integer larger than unity) and are controlled so that when Q (an integer larger than unity) selected ones of the keys . . . K_{-2}, K_{-1}, K_0, K_{+1}, K_{+2}, . . . of the keyboard are simultaneously depressed (the selected keys being identified generally as K'_1, K'_2, . . . K'_Q, the keys corresponding to the letter means of the highest and lowest frequencies among the keys K'_1, K'_2, . . . K'_Q being identified generally as K_H' and K_L', respectively, the gate circuits corresponding to the keys K_H' and K_L' being identified generally as G_H' and G_L', respectively, and the sound signals supplied to the gate circuits G_H' and G_L' being identified generally as S_{H+P} and S_{L+P}, respectively), the gate circuit G_H' or G_L' passes therethrough the sound signal S_{H+P} or S_{L+P} upon depression of the key K_H' or K_L'; and

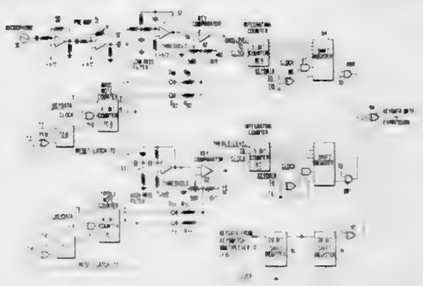
wherein the frequency multiplier has a frequency multiplying ratio of the value of the ratio between a frequency defined for the letter name based on the natural scale corresponding to the letter name based on the scale of the equal temperament of 12 degrees to which a sound signal S_M corresponds, and a frequency defined for the letter name based on the natural scale corresponding to the letter name based on the scale of the equal temperament of 12 degrees to which a sound signal S_M' corresponds, the sound signal S_M being supplied to the gate circuit of the first gate circuit means corresponding to a selected one (identified as K_M) of the keys . . . K_{-2}, K_{-1}, K_0, K_{+1}, K_{+2}, . . . of the keyboard and corresponding to the letter name based on the scale of the equal temperament of 12 degrees corresponding to the letter name based on the natural scale, and the sound signal S_M' being supplied to the gate circuit of the second gate circuit means corresponding to the key K_M.

4,174,652

METHOD AND APPARATUS FOR RECORDING DIGITAL SIGNALS FOR ACTUATING SOLENOID

Joseph M. Campbell, Lewisburg, Tenn., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Aug. 26, 1977, Ser. No. 828,069
Int. Cl.[2] G10H *3/04*
U.S. Cl. 84—1.28 **6 Claims**



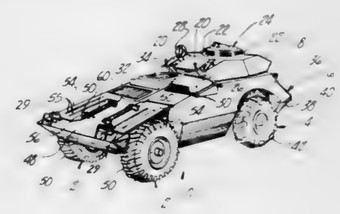
1. In an electronic player piano system having musical key note actuations recorded in a time division multiplex frame format, wherein the improvement for eliminating the choppiness and mechanical sounding in the playing of said musical key note actuations to re-create a musical performance, comprising the steps of storing successive frames of musical key note actuations in at least a pair of serially connected shift registers, and combining the outputs of said shift registers to repeat each preceding time division multiplex frame of data at lease one further time for recording and/or playback to thereby stretch said notes during the re-creation of said musical performance.

4,174,653

ARMORED WHEELED VEHICLE WITH DISPLACEABLE WHEEL WELL FAIRING PANELS

Irving Appelblatt, West Bloomfield, Mich., assignor to Cadillac Cage Company, Warren, Mich.

Filed Oct. 14, 1977, Ser. No. 842,216
Int. Cl.[2] F41H *7/02*
U.S. Cl. 89—36 H **6 Claims**



1. A wheeled armored vehicle including:

an armored hull having an obliquely extending frontal deck structure of ballistic impact resisting material;

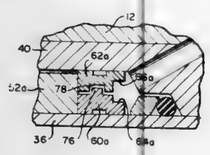
a plurality of wheels supporting said armored hull including two front wheel assemblies disposed on either side of said frontal deck;

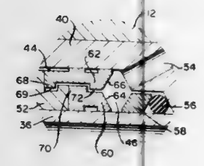
a suspension system allowing relative travel of said wheel assemblies with respect to said armored hull;

an enclosure arrangement for said front wheels comprising recesses extending into said vehicle hull and onto the surface defined by said frontal deck, said suspension normally disposing said front wheels in said recess below the level of said frontal deck;

fairing panels overlaying said open recess and generally conforming to the shape of said frontal deck;
and means mounting said fairing panel to said hull allowing relative displacement therebetween so as to accommodate front wheel travel in said recesses above the level of said frontal deck whereby contours of said frontal deck are uninterrupted with structure enclosing said wheel wells extending above the level of said frontal deck while accommodating said wheel travel above the level of said frontal deck.

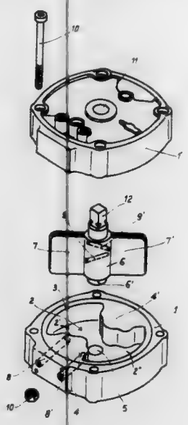
4,174,654
GAS-SEALING MEANS FOR TUBULAR MAGAZINE GAS-OPERATED FIREARM
Carl F. Liedke, North Haven, Conn., assignor to O. F. Mossberg & Sons, Inc., North Haven, Conn.
Filed May 25, 1977, Ser. No. 800,190
Int. Cl.² F41C *5/02*
U.S. Cl. 89—191 A **4 Claims**





1. In a gas-operated autoloading firearm having a receiver, a barrel, a tubular magazine mounted beneath and parallel to said barrel, a gas cylinder fixed to said barrel and surrounding a portion of said magazine, said cylinder and magazine defining an annular gas-chamber closed at the end nearest the muzzle of the barrel, an annular member slidably mounted on said magazine for reciprocal movement axially thereof and normally disposed within said annular chamber, and a gas port connecting said barrel and chamber adjacent the closed end thereof,
a gas-sealing device for preventing leakage of gas from said chamber during the power-stroke of said annular member on pressurization of said annular chamber by gas in said barrel when a cartridge is discharged, said gas-sealing device comprising
a radially flexible inner piston-ring slidably mounted on said magazine forward of said annular member for sealing engagement with said magazine and having a gas-impingement surface facing said chamber,
a radially flexible outer piston-ring disposed radially outward of said inner piston-ring for sealing engagement with the inner walls of said cylinder and having a gas-impingement surface facing said chamber,
said gas-impingement surfaces on said inner and outer piston-rings facing outwardly and inwardly, respectively, relative to each other such that the pressure of the gas in said annular chamber acting directly on said gas-impingement surfaces flexes said inner piston-ring into sealing engagement with said magazine while flexing said outer piston-ring into sealing engagement with said cylinder,
one of said piston-rings being connected to said annular member and to the other of said piston-rings such that said piston-rings move continuously with said annular member throughout its reciprocal movement.

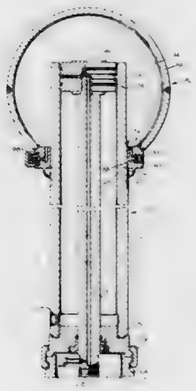
4,174,655
PNEUMATIC APPARATUS FOR THE ROTATION OF VALVE RODS
Domenico Valente, Via Porto Corsini 10, 20126 Milan, Italy
Filed Jul. 27, 1977, Ser. No. 819,423
Claims priority, application Italy, Aug. 27, 1976, 26614 A/76
Int. Cl.² F01C *9/00*; **F16J** *11/04*
U.S. Cl. 92—122 **2 Claims**



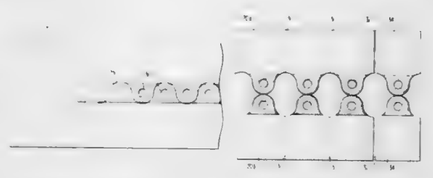
1. A pneumatic rotary actuator for operation of a valve, comprising:
(i) a first casing having a side wall with a cylindrical internal face, and having an end wall with a central hole;
(ii) a resilient annular sealing gasket disposed within and secured to the side wall of the casing, said gasket having two diametrically opposed internal expansions so as to define, within said casing, a cavity having an approximately 8-shaped configuration including two half-chambers, said casing side wall including two inlet and outlet ports each opening into a respective one of said half-chambers;
(iii) a pin having one end journalled in said central hole of the casing end wall and carrying two radial blades lying in the same plane, and the vertical edges of which blades are in contact with said sealing gasket, said blades dividing each half-chamber into two sectors, said pin having two through-holes disposed on different horizontal parallel planes and oriented so as to provide communication between two opposite sectors of the half-chambers, and
(iv) a second casing secured to said first casing and having a central through-hole in which the protruding other end of said pin is journalled.

4,174,656
VALVE ACTUATOR
Donn W. Duffey, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Continuation of Ser. No. 663,787, Mar. 4, 1976, abandoned. This application Jul. 14, 1977, Ser. No. 815,473
Int. Cl.² F01B *31/00*; **F16J** *15/16*
U.S. Cl. 92—134 **6 Claims**

1. A valve actuator comprising:
a hydraulic cylinder having a first and a second end, a central axis and a cylindrical inner surface with a uniform diameter along a length of said axis between said first and said second ends;
piston means slidably mounted within said cylinder for axial movement along said length between said first end and said second end of said cylinder, said piston means having a first side and a second side which extend across said diameter for sealed, sliding contact with said inner surface of said cylinder along said length;
an actuator rod joined at said first side of said piston means, extending through an opening in said first end of said cylinder for sealed, sliding movement therethrough and terminating at an extended end thereof which is outwardly of said cylinder;
said first end of said cylinder being secured to a valve housing and said extended end of said rod being secured to a valve stem;
a high pressure gas accumulator mounted on said cylinder, said accumulator having a generally spherical shaped pressure wall which is intersected by said cylinder to locate said second end of said cylinder within said accumulator, said second end having a passage therethrough to allow communication of an interior of said accumulator with said second side of said piston means;
said generally spherical shaped pressure wall including an upper section thereof which is hemispherical, centrally located on said axis and located relative to said cylinder such that an interior surface of said section lies within a spherically shaped surface which if continued would extend through said cylinder to locate said second end of said cylinder totally within said spherically shaped surface and to also locate said second side of said piston means within said spherically shaped surface when said piston means is axially located along said length toward said second end of said cylinder; and
an access hole through said first end of said cylinder for supplying hydraulic fluid to said cylinder to act on said first side of said piston means to cause movement thereof toward said second end of said cylinder in opposition to a predetermined quantity of high pressure gas on said accumulator and for discharging said fluid to allow said predetermined quantity of high pressure gas to act on said second side of said piston means to cause movement thereof toward said first end of said cylinder.

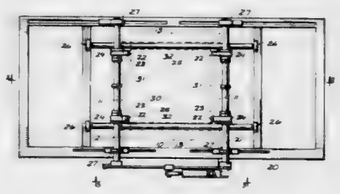


4,174,657
METHOD OF FORMING A PLASTIC SHOPPING BAG HAVING A REINFORCED HANDLE
Heikki S. Suominen, Petsamonk 14, Tampere, Finland
Division of Ser. No. 856,871, Dec. 2, 1977, Pat. No. 4,125,220. This application Jun. 29, 1978, Ser. No. 920,613
Claims priority, application Finland, Dec. 3, 1976, 763481
Int. Cl.² B31B *1/14, 1/86*
U.S. Cl. 93—35 H **5 Claims**



1. The method of forming a plurality of plastic shopping bags comprising the steps of providing an elongated tube of plastic film material having a flattened configuration which defines a pair of elongated tube faces that are disposed closely adjacent to one another and each of which faces includes an elongated strip of plastic material that is of heavier gauge than the remainder of said faces, said strips of heavier gauge material being positioned in coextensive overlapping relation to one another in the direction of elongation of said tube at locations on said tube faces substantially equidistant from the edges of said tube faces, the width of each of said strips between said edges being substantially less than the width of its associated tube face, cutting through said adjacent tube faces along a cutting line which has a cyclically recurring wave configuration extending in the direction of elongation of said tube faces and along said coextensive overlapping strips of heavier gauge material, the wavelength of said wave configuration being substantially equal to the desired width of one of said shopping bags at the mouth of said shopping bag, the amplitude of said cutting line wave configuration being greater than the widths of said heavier gauge strips whereby spaced crests of said wave configuration cut through the film material of said tube faces at positions outside of said heavier gauge strips, seaming the tube faces at a plurality of locations which extend respectively between said spaced crests and the outer edges of said flattened tube of plastic film material to provide a plurality of transverse seam lines, and thereafter cutting said tube faces along said plurality of transverse seam lines.

4,174,658
TRAY FORMER
Robert H. Graham, Spokane, Wash., assignor to R. A. Pearson Company, Spokane, Wash.
Filed Feb. 6, 1978, Ser. No. 875,230
Int. Cl.² B31B *3/26*
U.S. Cl. 93—51 HW **4 Claims**



1. In a carton forming machine for carton blanks having:
a central bottom wall bounded by first and second pairs of scored side walls each adapted to be folded perpendicular to the bottom wall;

said first pair of side walls having first scored tabs formed at each end thereof, said first tabs being adapted to be folded perpendicular to the side walls on which they are formed for engagement by the folded second pair of side walls;

said second pair of side walls having second scored tabs formed at each end thereof, said second tabs being adapted to be folded perpendicular to the side walls on which they are formed for engagement by the folded first pair of side walls;

a folding machanism complementary to a reciprocating mandrel conforming to the interior of a formed carton, comprising:

two opposed pairs of folding irons located respectively along parallel spaced pivot axes, said folding irons including arcuate surfaces generated about their respective pivot axes and adapted to told the first pair of side walls along their score lines common to the bottom wall of each carton blank;

each folding iron further including a radial extension at the outermost edge of its arcuate surface for folding a first scored tab relative to a first side wall;

means supporting the folding irons for pivotal motion about said parallel spaced pivot axes;

the spacing between the spaced pivot axes being greater than the combined lengths of one second side wall and the second scored tabs extending therefrom;

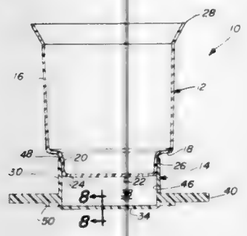
a pair of pressure rollers at an elevation below that of the folding irons, said rollers being journalled about parallel spaced roller axes which are perpendicular to the parallel spaced pivot axes, said rollers spanning the full distance separating the pivot axes and having a minimum separation between them substantially equal to the width dimension of the first carton walls between the second side walls, whereby the second side walls are folded along their score lines common to the bottom wall as each carton blank is forced between the rollers by reciprocation of the mandrel.

4,174,659

COFFEE BREWER

John P. Pugliese, Troy, and Thomas J. Robbins, Warren, both of Mich., assignors to Econo-Brew, Inc., Mt. Clemens, Mich.

Filed Nov. 14, 1977, Ser. No. 851,142
Int. Cl.[2] A47J *31/10*
U.S. Cl. 99—306 **1 Claim**



1. A one-cup coffee brewer consisting of a two-member construction, the first member being a cup-shaped reservoir and the second being a cup-shaped coffee receptacle, said cup-shaped reservoir having an upper circular wall and a lower circular wall of a lesser diameter than said upper circular wall, said circular walls being connected by an integral shoulder, said lower circular wall having a bottom including a plurality of apertures of a predetermined size, said apertures being disposed adjacent the lower circular walls of said reservoir at 90° intervals, and an aperture disposed at the center of said bottom wall, said lower circular wall having an inward taper extending from said shoulder toward said bottom wall to define a socket engaging surface, said reservoir being sized to hold a quantity of water sufficient to fill a cup of maximum desired size; the upper edge of said reservoir having an outwardly flared section which increases the inner diameter of the upper portion of said reservoir and which permits the user to grasp the same to permit removal of said reservoir from said receptacle, said flared end further functioning to limit the splashing of water from the interior of said reservoir during initial pouring of water therein;

said cup-shaped coffee receptacle having a circular wall defining a cavity and a bottom wall with a plurality of fine slits disposed in a transverse fashion on said bottom wall at laterally spaced, parallel locations, said slits defining apertures communicating with said cavity, the coffee receptacle cavity being sized to receive a charge of ground coffee sufficient to make one cup of brewed coffee of maximum desired strength, the inner surface of the circular wall of said receptacle having a taper adapted to snugly interfere with said reservoir tapered lower circular wall when the same is telescopically received within said receptacle cavity so as to securely and releasably attach said reservoir to said receptacle, said receptacle circular wall having an outer diameter less than the outer diameter of said reservoir upper circular wall, said receptacle having an integral, annular support flange projecting radially from the lower end of said receptacle circular wall, said support flange having a diameter greater than the maximum sized cup upon which the coffee brewer is to be supported;

the apertures in said reservoir being sized to permit a metered rate of flow from said reservoir to said cavity within said receptacle, while the apertures in said receptacle bottom are sized to permit a rate of flow from said receptacle cavity, which rate of flow is the same as the rate of flow through said reservoir apertures; and

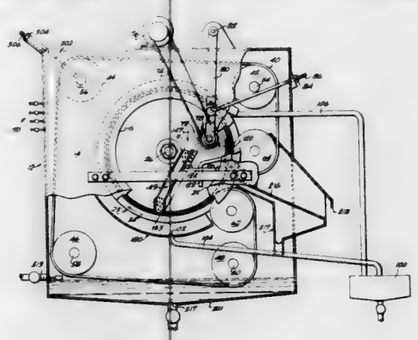
a circular rim projection integral with and extending downwardly from the lower surface of said support flange and radially outwardly from and above said reservoir bottom wall to limit the amount of lateral movement of said coffee brewer with respect to said coffee cup supporting said brewer.

4,174,660

DEVICE TO SEPARATE LIQUIDS AND SOLIDS IN A MIXTURE

Cerso R. Cuza, 2940 NW. 22 St., Miami, Fla. 33142

Filed Jul. 31, 1978, Ser. No. 929,514
Int. Cl.[2] A23N *1/00*
U.S. Cl. 99—495 **12 Claims**



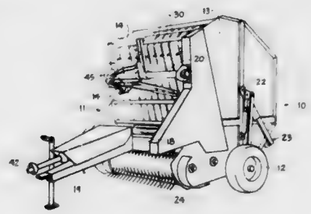
1. A device to separate solids from juice in a mixture of juices and solids and a collector for the juice, said device comprising a frame, an annular centrifugal drum journaled on the frame, said drum having an annular peripheral perforated surface spanned by spaced faces, one of said faces having a charge opening, shield means arranged about the drum in spaced relation therefrom, a drive belt in driving engagement about the drum, said belt having holes by reason of which, when the drum is rotated, juice is extracted from the mixture by centrifugal force and flows radially outwardly through the drive belt holes and drum, said shield means comprising guide means to guide the flow of juice, said machine including drive means for the drum belt, and said device including a first collector means to collect the juice from the shield and a second collector means having a first end zone within the drum and a second end zone outside of said drum and said second collector means extending through said charge opening and adapted for discharging solids from the machine.

4,174,661

AUTOMATIC ROUND BALE TWINE WRAPPING ASSEMBLY

Arnold Mathes, Pella; Norman D. Person, Knoxville, and Stanley J. Vermeer, Pella, all of Iowa, assignors to Vermeer Manufacturing Company, Pella, Iowa

Filed Sep. 18, 1978, Ser. No. 943,530
Int. Cl.[2] B65B *13/02*
U.S. Cl. 100—5 **7 Claims**



1. In a machine for forming a round bale of a windrowed material having a mobile frame, a supply of wrapping twine having a free end portion, bale forming means on said frame operative to continue rotating a completed bale while said wrapping twine is wound thereon, and a pickup mechanism for supplying said material to said bale forming means, the improvement of an automatic bale wrapping assembly comprising:

(a) means for selectively initiating the winding of the wrapping twine about a completed bale,

(b) a linearly extendible and retractable elongated wrapping twine dispensing arm having a pair of sections longitudinally movable relative to each other, with said wrapping twine free end portion extendible from one of said sections,

(c) means on said frame movably supporting said dispensing arm on said frame for pivotal movement between an initial bale wrapping position and a final twine cutting position, and

(d) coacting means interconnected with said frame and dispensing arm for relatively moving said pair of sections during pivotal movement of the dispensing arm so that the dispensing arm is in a retracted condition in said initial bale wrapping position and in an extended condition in said final twine cutting position whereby a greater length of said twine free end portion is exposed in the retracted condition than is exposed in said extended condition.

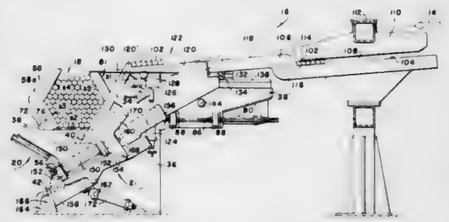
4,174,662

HEXAGONAL BUNDLE FORMING APPARATUS

Kenneth L. Klusmier, Worcester, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed May 22, 1978, Ser. No. 907,482
Int. Cl.[2] B65B *13/00*
U.S. Cl. 100—7 **10 Claims**

1. An apparatus for forming elongated elements into a hexagonal bundle, comprising: an assembly zone defined by a plurality of support surfaces, one of which is stationary and the remainder of which are movable; delivery means for depositing successive tiers of elongated elements one upon the other in said assembly zone; operating means for adjusting said movable support surfaces in order to gradually impart a hexagonal cross section to the elongated elements accumulating in said assembly zone; and means for tieing a completed assemblage of elongated elements in said assembly zone into a bundle which substantially retains said hexagonal cross section following removal of the bundle from said assembly zone.

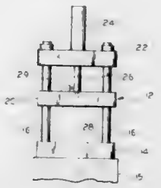


4,174,663

SAFETY SYSTEM FOR HYDRAULIC VERTICAL PRESS

Roy K. Williams, Corinth, Miss., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 23, 1978, Ser. No. 880,371
Int. Cl.[2] F16P *7/00*; B30B *1/08*
U.S. Cl. 100—53 **6 Claims**



1. A hydraulic control system for a vertical hydraulic press adapted for heavy duty use, in which said press includes a fixed platen and a moving platen, said moving platen being engaged by a drive member for upward movement in opening the press and for downward movement for molding processes within said press, said control system including at least one hydraulic cylinder with piston reciprocal therein, said cylinder imposed within a hydraulic network for enabling the downward movement of said piston in said cylinder and consequent downward movement of said moving platen, said cylinder being adapted to be connected to said fixed platen and the piston thereof being adapted to be connected to the moving platen, a switch mechanism for detecting the continued engagement of said moving platen to said drive member, said switch mechanism responsive to the detection of a failure of said engagement for operating said hydraulic network to a condition preventing movement of said piston in said hydraulic cylinder thereby preventing downward movement of said platen.

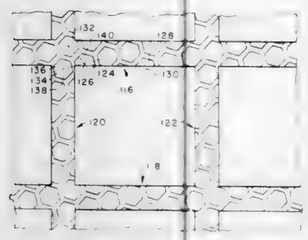
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4,174,664

CYLINDRICAL SCREEN HAVING APERATURES WITH GEOMETRIC CENTERS DEFINED BY ARRAYS OF EQUILATERAL TRIANGLES

Robert C. Arnott, and Charles E. Willbanks, both of Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed May 8, 1978, Ser. No. 904,110
Int. Cl.² B05C *17/08*
U.S. Cl. 101—127 **1 Claim**



1. A screen for printing comprising

a hollow substantially cylindrical body having a plurality of apertures formed therein, the geometric centers of adjacent apertures defining a plurality of equilateral triangles, the angle between one side of each said equilateral triangle and circumferential lines on said cylindrical body being substantially 15°, the angle between another side and longitudinal lines on said cylindrical body being substantially 15° and the angle between the third side and both circumferential and longitudinal lines being substantially 45°.

4,174,665

LAND MINE CONSTRUCTION PARTICULARLY AN ANTIPERSONNEL SPLINTER MINE

Paul Madlener, Karlsruhe, Fed. Rep. of Germany, assignor to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 25, 1977, Ser. No. 818,757
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1976, 2623163
Int. Cl.² F42B *23/16*
U.S. Cl. 102—8 **11 Claims**



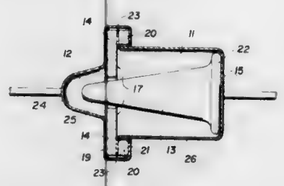
1. A land mine comprising a mine body having at least a ground facing portion with a casing formed of a surface of revolution, said surface of revolution having a multiplicity of projectile splinter forming means arranged in a plurality of enveloping tangent portions, the normals of each tangent portion pointing each splinter forming means to a definite target area to be covered, and an explosive in said casing effective upon explosion to catapult the multiplicity of splinter forming means downwardly in a substantially conical distribution, each at a predetermined angle depending on the mass of said splinter to the mass of said explosive and depending on the angle of impact of the detonation front of the explosion of the individual splinter.

4,174,666

SPRINGLESS IMPACT SWITCH

George K. Lucey, Jr., Greenbelt, Md., and Michael G. Orrell, San Antonio, Tex., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 1, 1978, Ser. No. 901,885
Int. Cl.² F42C *19/06*
U.S. Cl. 102—216 **6 Claims**



1. A springless impact switch comprising:

a housing including a first and a second conductive section co-axial along a first axis and being electrically insulated from each other;

a co-axial movable contact element in conductive engagement with the first housing section and normally spaced from said second housing sections;

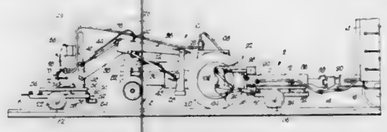
and an insulator disc interior said housing, concentric to said movable contact element and having a reduced inside diameter opening and radial slots defining fingers of the insulator, said fingers being deflectable by forces parallel to said axis to permit the contact element to establish electrical conductivity between said first housing section and said second housing section.

4,174,667

RAIL DRAFT VEHICLE EMPLOYING TRACTOR-LIKE APPARATUS

Charles E. Chenoweth, 3606 N. 30th Ter., Topeka, Kans. 66614

Continuation-in-part of Ser. No. 726,987, Sep. 27, 1976, Pat. No. 4,086,856. This application Nov. 30, 1977, Ser. No. 856,001
The portion of the term of this patent subsequent to May 2, 1995, has been disclaimed.
Int. Cl.² B60F *1/04*
U.S. Cl. 105—26 R **3 Claims**



1. A rail draft vehicle assembly adapted both for travel along conventional railway-type rails to move a number of railroad cars of the kind having a conventional railway-type mechanical coupling mechanism at each end thereof and for travel along the ground between positions of desired operation of said assembly for moving railroad cars upon said rails, said assembly comprising:

a conventional tractor having steerable front wheel means and a pair of rear driving wheels for ordinarily supporting and propelling said tractor for travel along the ground, said tractor being provided with power operated, elevationally swingable, mechanical coupling means on the rear thereof;

a conventional tractor-type, power operated, elevationally swingable, boom apparatus on said tractor and extending forwardly therefrom, said boom apparatus being provided with mechanical coupling means on the forward extremity thereof;

a forward wheeled unit including frame structure and a first pair of rail wheels rotatably mounted on said frame structure and arranged for engaging said rails, said forward wheeled unit being provided with mechanical coupling means on said frame structure, cooperable with said coupling means on said boom apparatus and coupled with the latter for cantilever mounting said forward wheeled unit on said boom apparatus;

an intermediate vehicle unit adapted to be disposed between the rear of said tractor and one of said railroad cars for intercoupling the former with the latter,

said intermediate vehicle unit including frame means and a second pair of rail wheels rotatably mounted on said frame means and arranged for engaging said rails, said intermediate vehicle unit being provided with mechanical coupling means on the front of said frame means, cooperable with said coupling means on the rear of said tractor and coupled with the latter for cantilever mounting said intermediate vehicle unit on said tractor, and with conventional railway-type mechanical coupling means on the rear of said frame means, cooperable with said conventional railway-type mechanical coupling means on the said one railroad car and adapted for coupling with the latter,

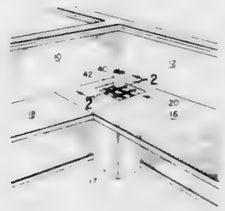
said first and second pairs of rail wheels being movable into engagement with said rails for guiding said draft vehicle assembly along said rails responsive to lowering of said boom apparatus and said coupling means on the rear of said tractor and movable out of engagement with said rails and the ground for permitting off-rail operation of said draft vehicle assembly responsive to raising of said boom apparatus and said coupling means on the rear of said tractor.

4,174,668

GRATING OPENING IN A WORKING TABLE FOR VERTICAL STORAGE

Donald K. Thomas, Jr., 1710 Laurel St., South Pasadena, Calif. 91030

Filed Aug. 7, 1978, Ser. No. 931,761
Int. Cl.² A47B *3/06*
U.S. Cl. 108—25 **7 Claims**



1. A working table having a grating for vertical storage of material in elongated form, comprising:

a working table having a vertically directed opening therethrough,

at least one vertical edge portion forming the surface of said opening,

a plurality of first opposite aligned pairs of horizontal holes in said vertical edge, and

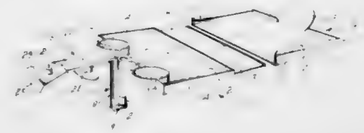
at least one rod extending across said opening and having one end in one of a pair of selected aligned holes and having its other end in the other of said pair of holes.

4,174,669

VEHICLE TRAY AND MOUNTING BRACKET ASSEMBLY

A. Roger Lalonde, Box 577, Chelmesford, Ontario, Canada (P0M 1L0)

Filed Feb. 22, 1978, Ser. No. 880,041
Int. Cl.² A47B *23/00*
U.S. Cl. 108—44 **4 Claims**



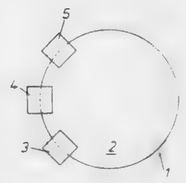
1. A vehicle tray and mounting bracket assembly comprising, in combination, a mounting bracket of L-shape configuration including a horizontally extending arm forming an elongated base securable onto the floor of a vehicle and having in the top face a groove extending longitudinally of said base, and a vertically extending arm pivoted to said base, inoperatively collapsible into said groove, a pin operatively projecting upwardly from said vertically extending arm, and a tray having a hole in a front edge portion thereof forming a socket for removably receiving said pin.

4,174,670

MACHINES FOR SECURING TEXTILE FABRICS ONE TO ANOTHER

Ronald G. Birkhamshaw, Sutton in Ashfield, England, assignor to Mathbirk, Limited

Filed Jun. 6, 1977, Ser. No. 803,518
Int. Cl.² D05B *7/00*
U.S. Cl. 112—25 **7 Claims**



1. A linking machine for securing two or more pieces of textile fabric together comprising:

a plurality of extending points onto which said pieces of fabric to be joined may be threaded;

means for linking of said pieces of fabric together by a single thread chain stitch;

cutter means for removing surplus fabric on the exposed fabric side of said linking thread;

over-sew means, including a needle and thread guide means for wrapping thread around said needle, said over-sew means for forming an over-sew stitch over the edge of said fabric, wherein said needle first pierces said fabric whereupon said thread guide wraps said thread around said needle, said needle then withdrawing from said fabric and then returning over the edge of said fabric whereupon said thread guide again wraps said thread around said needle and said needle is withdrawn over the edge of said fabric; and

means for presenting said link fabric to said cutter and for presenting said fabric to said over-sew means.

V 9883 N0207 9 UMI

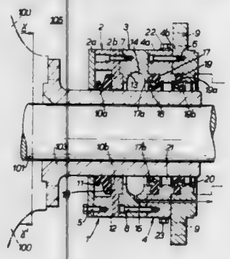
4,174,671
SEMISUBMERGED SHIP
Ludwig H. Seidl, Honolulu, Hi., assignor to Pacific Marine & Supply Co., Ltd., Honolulu, Hi.
Filed May 18, 1978, Ser. No. 907,122
Int. Cl.² B63B *1/10*
U.S. Cl. 114—61 **5 Claims**



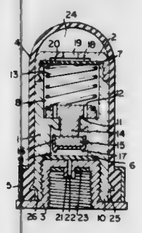
1. A marine vessel comprising:
(a) a platform member;
(b) two parallel hulls disposed below said platform and adapted to be below the water surface when the vessel is in operation;
(c) each of said hulls comprising a pod shaped after section, a forward section having a generally rectangular cross section of substantially smaller cross-sectional area than the after section and a tubular central section, having a cross-sectional area substantially smaller than that of the forward section, joining the forward end of the after section to the after end of the forward section and supported only by the junctions with the forward and after sections;
(d) each after section being joined to said platform by a strut-like member;
(e) each forward section being joined to said platform by a strut-like member;
(f) all of said strut-like members being tapered so that their waterplane areas increase rapidly between the waterline and the junction of the strut-like member with the platform;
(g) the junctions of the strut-like members with the hull sections being so constructed that a portion of each connected hull section extends forward of the junction.

4,174,672
SHIP'S PROPELLER SHAFT SEALING ASSEMBLY
James H. Cox, 31 Hurstleigh Dr., Redhill, Surrey, RH1 2AA, England
Filed Dec. 19, 1977, Ser. No. 861,709
Claims priority, application United Kingdom, Dec. 20, 1976, 53042/76
Int. Cl.² E21B *33/00*; F16J *9/00, 15/00*
U.S. Cl. 115—74 **8 Claims**

1. A ship's propeller shaft sealing assembly comprising a rigid housing structure accommodating two sealing means spaced axially along the shaft, the housing structure being secured to the ship's stern tube bearing so that the forward sealing means is aft of the stern tube bearing, and a chamber between the sealing means and having an outlet, an immovable rigid inner wall of the housing structure defining the radial extent of the chamber, the chamber being empty, unless there is leakage past either of the seals, and the outlet being connected to an inboard collector so as to allow such leakage to be gravity-fed from the chamber to the collector.

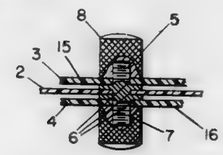


4,174,673
LOW PRESSURE WARNING TIRE AIR VALVE CAP
Wei-Ling Tung, No. 7, Alley 1, Lane 269, Chung-Shino East Rd., Section 6, and Steven Kwan, No. 43, Alley 148, Lane 30, Yung-Chi Rd., both of Taipei, Taiwan
Filed Apr. 6, 1978, Ser. No. 893,852
Int. Cl.² B60C *23/04*
U.S. Cl. 116—34 R **3 Claims**



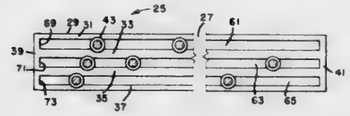
1. A low pressure warning cap for a pneumatic tire air valve comprising:
a generally cylindrical body having first and second ends, a cylinder adjacent the first end, a threaded connector for attachment to a conventional air valve stem of a pneumatic tire at the second end and an acting chamber connecting with and disposed intermediate the cylinder and the threaded connector;
a piston disposed in the cylinder and resiliently biased toward the acting chamber;
the cylinder having an opening at the first end;
a deformable diaphragm disposed across the acting chamber between the threaded connector and the piston;
a perforated diaphragm disposed across the cylinder adjacent the opening;
an elastic sack enveloping in air tight manner the first end including the opening;
a protuberance in the threaded connector to cooperate with the valve to open the valve upon attachment of the cap to valve, whereby, at a desired tire pressure, the deformable diaphragm is deformed by air from at the desired pressure to move the piston against the bias into air-tight engagement with the body to prevent passage of the air into the cylinder; and
the piston having means to rupture the deformable diaphragm when the piston has been moved into air-tight engagement with the body, whereby, upon the occurrence thereafter of an undesirably low tire pressure, the piston is biased against this undesirably low air pressure to allow the air into the cylinder past the piston to pass by way of the perforated diaphragm and opening to inflate and rupture the sack to provide an audible indication of the undesirably low tire pressure.

4,174,674
DEVICE FOR CITIZENS BAND RADIO USERS TO DETERMINE HIGHWAY LOCATION
Richard K. Reid, 7402 NW. 23rd, Apt. 106, Bethany, Okla. 73008
Filed May 23, 1978, Ser. No. 908,677
Int. Cl.² G09B *19/02*; G06C *3/00*
U.S. Cl. 116—307 **5 Claims**



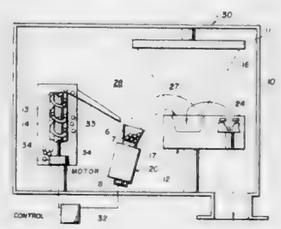
1. In a portable hand held mileage indicator for citizen's band radio users and the like, in vehicles having odometers, a large circular flat disc, a smaller circular flat disc superposed on either side of said large disc, said discs being centrally pivotally mounted on screw means having spaced flanged portions for relative rotation, nut means rotationally mounted on opposing ends of said screw means for locking said discs in fixed set positions, graduated scale markings on each face of said large disc and extending circumferentially therearound representing increasing and decreasing highway mileage markers, respectively, scale markings on the outermost faces of said smaller discs and extending circumferentially therearound representing vehicle odometer readings whereby highway location may be noted and broadcast to other citizen's band radio users in that vicinity by noting the last highway mileage marker passed and rotating the appropriate small disc until the last two digits of the vehicle odometer reading on that small disc scale are aligned with the scale marking on said large disc scale and locking said discs in that fixed set position so that a subsequent mileage marker location may be determined by viewing the odometer reading and determining the users highway location by reading directly from the indicator the mile marker that aligns with the last two digits of the odometer reading.

4,174,675
ANALYTICAL INSTRUMENT
Earl L. Goodwin, deceased, late of Albany, N.Y., and by Bette-Lou T. H. Goodwin, executrix, 11 S. Lake Ave., Albany, N.Y. 12208
Filed Jul. 6, 1978, Ser. No. 922,329
Int. Cl.² G01D *13/22*
U.S. Cl. 116—323 **10 Claims**



1. An analytical instrument for use with profile diagrams of materials exhibited by a detection system to monitor, detect and determine whether such detection system is working properly, and to detect in the monitoring of materials any unknown component profiled by such detection system, said analytical instrument comprising: a body means, slot means for receiving markers for securement therewith and markers; said markers having means cooperating with said slot means to permit adjustable disposition and securement where disposed of said markers relative to said slot means, said markers thusly being adjustably disposable and securable respecting said slot means to pin-point discrete points of known samples of components of materials profiled by such profile diagram to thereby serve as pin-pointing reference markers for such known components for monitoring, detecting and determining whether such detection system is working properly, and to detect in such monitoring of materials any unknown component profiled by such detection system by such unknown component lacking a pin-pointing reference marker.

4,174,676
METERING DEVICE FOR A VACUUM DEPOSITION APPARATUS
Gunther Wulff, Trübbach, Fed. Rep. of Germany, assignor to Balzers Patent- und Beteiligungs Aktiengesellschaft, Liechtenstein
Filed Sep. 28, 1977, Ser. No. 837,152
Claims priority, application Switzerland, Sep. 28, 1976, 012855/76
Int. Cl.² B05C *11/00*; C23C *13/12*
U.S. Cl. 118—688 **6 Claims**

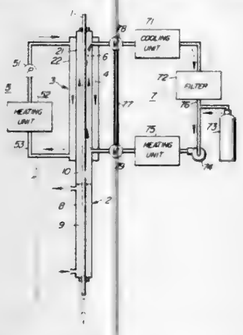


1. A vapor deposition device comprising a housing defining an evacuation chamber, a heater evaporator in said housing chamber, a support for a substrate to be coated located above said heater evaporator, a feeding device for material to be evaporated located alongside said heater evaporator comprising an electromagnet including a coil, an armature associated with said coil and being movable upwardly and downwardly, a receiving trough defined on said armature with an open top for receiving the material to be evaporated therein, and control means connected to said coil for energizing said coil so that upon accumulation of a predetermined weight of material on said trough, said coil is activated to move said armature rapidly to cause ejection of the material accumulated thereon through a trajectory path upwardly and into said evaporator.

4,174,677
DEVICE FOR CROSS-LINKING OF COATING MATERIAL SUCH AS RUBBER OR PLASTIC, FOR ELECTRIC WIRE
Hiroo Nagano; Chuki Ikeda; Kenji Takahashi; Naoyoshi Kato, and Norio Sato, all of Hitachi, Japan, assignors to Hitachi Cable, Ltd., Japan
Division of Ser. No. 496,898, Aug. 12, 1974, abandoned. This application Jan. 27, 1978, Ser. No. 872,768
Claims priority, application Japan, Sep. 18, 1973, 48-109598
Int. Cl.² B05C *11/00*
U.S. Cl. 118—67 **10 Claims**

1. A device for cross-linking of a coating material such as rubber of plastic of an electric wire including a cross-linking tube comprising:
a heating portion through which either one of high temperature inactive gas or high temperature electrically negative gas is passed; and
a cooling portion located below and continuous with said heating portion and filled with cooling liquid;

wherein said heating portion is provided at the side thereof with a gas circulating passage having an inlet port and an outlet port, said inlet port and said outlet port of said gas circulating passage communicating with a gas exhaust port above said heating portion and a gas supply port below said heating portion respectively, said gas circulating passage having a gas cooling device, a gas cleaning



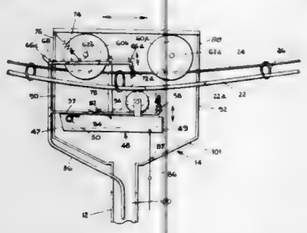
filter, a pressurized gas supply device, a blower for circulating the gas and a gas heating device arranged in the indicated order from the inlet port of said gas circulating passage to the outlet port thereof, the gas being circulated in a direction opposed to the travelling direction of said electric wire passing through said heating portion downwardly from above.

4,174,678

CABLE SPRAYING APPARATUS

William Van Den Bergh, Kentwood, Mich., assignor to Utility Contracting Co., Sparta, Mich.

Filed Sep. 23, 1977, Ser. No. 836,026
Int. Cl.[2] B05C *5/00*; B05B *3/18*
U.S. Cl. 118—307 12 Claims



1. In cable spraying apparatus for spraying a coating material on a cable that is suspended from an overhead supportive wire by intervally spaced connectors, said cable spraying apparatus including a frame; traveling means for suspending the frame from the overhead supportive wire for movement along the supportive wire; at least one spray nozzle mounted to the frame and pointed toward the cable; each spray nozzle being operably connected to a supply means for supplying coating material under pressure through each nozzle; the improvement comprising:

nozzle mounting means connected to the frame for mounting each spray nozzle to the frame for vertical movement with respect to the traveling means, the nozzle mounting means being responsive to the cable position and maintaining each spray nozzle at a predetermined distance from the cable as the apparatus moves along the supportive wire, even though the distance between the cable and supportive wire varies along the length of the cable, the nozzle mounting means including:

sensing means for sensing the distance of the cable below the supportive wire, the sensing means being mounted under the cable and being vertically movable in the frame with respect to the traveling means, the sensing means including biasing means for resiliently biasing the sensing means upwardly so as to ride along the underside of the cable as the apparatus moves along the supportive wire; and

nozzle moving means interconnecting the nozzle with the sensing means for vertical movement therewith such that the nozzle is spaced a predetermined distance from the cable and is maintained at that distance even though the distance between the cable and the supportive wire varies;

movement means for moving the cable spraying apparatus along the cable, said movement means comprising a pole extending downwardly from the frame toward the ground for manual movement of the frame, the supply means being movable along with the frame as the frame is moved along the supportive wire; and

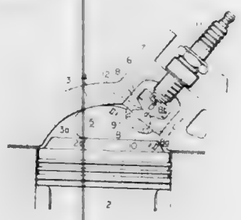
means for remotely moving the sensing means downwardly such that the nozzle and nozzle mounting means are moved away from the supportive wire and cable a sufficient distance to permit lateral movement of the apparatus to mount and dismount the apparatus on the supportive wire and cable.

4,174,679

INTERNAL COMBUSTION ENGINE WITH A SUBSIDIARY COMBUSTION CHAMBER

Masaaki Noguchi, Nagoya; Shougo Sanda, Numazu, and Masaaki Takizawa, Mishima, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 704,505, Jul. 12, 1976, abandoned. This application Jan. 9, 1978, Ser. No. 867,881
Claims priority, application Japan, May 27, 1976, 51-60557
Int. Cl.[2] F02B *19/08*
U.S. Cl. 123—30 D 3 Claims



1. An internal combustion engine comprising:

a cylinder having a cylinder block and a cylinder head fixed onto said cylinder block,

a piston reciprocally movable in said cylinder block,

a main combustion chamber formed between a top surface of said piston and an inner surface of said cylinder head,

means to supply fuel directly only to said main combustion chamber,

said cylinder head having therein a subsidiary combustion chamber symmetrically extending about an axis, said subsidiary combustion chamber having a circumferential inner wall including a raised annular portion defining a restricted opening interconnecting and of smaller diameter than a substantially spherically shaped first portion of said subsidiary combustion chamber located near the main combustion chamber and a second portion of said subsidiary combustion chamber located further from the main combustion chamber than the first portion, wherein said restricted opening is the only opening in said second portion of said subsidiary combustion chamber, the volume of said first portion of said subsidiary chamber is smaller than the volume of said second portion of said subsidiary chamber, the ratio of the diameter of said annular portion to the diameter of said second portion of said subsidiary chamber is less than 0.8, and the diameter of the second portion of the subsidiary chamber is greater than the axial length of said second portion,

passage means connecting the main combustion chamber and the subsidiary combustion chamber through the circumferential wall of said first portion of said subsidiary chamber, the inner end of said passage means being tangent to the circumferential wall of said first portion of said subsidiary chamber and extending downwardly and outwardly to the main combustion chamber to create a swirling motion of a combustible mixture in the first and second portions of said subsidiary combustion chamber, and

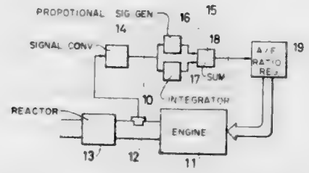
a spark plug having a spark gap located in the vicinity of said symmetrical axis and the second portion of said subsidiary combustion chamber, said restricted opening allowing the flow of a combustion gas from said second portion to said first portion, both of which portions are of greater diameter than the restricted opening, said combustion gas being collected in the vicinity of said symmetrical axis after said combustible mixture is ignited, while said restricted opening prevents outflow of unburned mixture from said second portion to said first portion, said unburned mixture being collected on the peripheral region in said second portion removed from said symmetrical axis due to the centrifugal force caused by said swirling motion of said combustible mixture.

4,174,680

CLOSED LOOP AIR-FUEL RATIO CONTROL SYSTEM

Makoto Anzai, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 23, 1976, Ser. No. 753,795
Claims priority, application Japan, Dec. 27, 1975, 50/176359[U]
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EE 10 Claims



1. In an air-fuel ratio control system for use with an internal combustion engine including means for supplying air and fuel thereto in a ratio variable in response to a P-I control signal and including exhaust means having an exhaust gas treatment means operative when supplied with exhaust gases containing air and fuel in a certain ratio, which system includes an air-fuel ratio detector connected to said exhaust means, for producing an air-fuel ratio signal indicative of an air-fuel ratio of the exhaust gases, and a control circuit for producing said P-I control signal in response to said air-fuel ratio signal, the control circuit comprising:

an integrator connected to said air-fuel ratio detector, for integrating said air-fuel ratio signal to provide integral components of the P-I control signal on an output of the integrator;

an inverter connected to said integrator, for inverting the integrated signal from said integrator;

a switching circuit for passing therethrough the integrated signal when said air-fuel ratio signal is lower than a predetermined level and the inverted integrated signal when said air-fuel ratio signal is higher than said predetermined level to provide proportional components of the P-I control signal on an output thereof, said switching circuit providing means for varying the amplitude of the proportional components of the P-I control signal directly with the integral component; and

a summing circuit with an input connected to the outputs of the integrator and switching circuit for producing a summation of the output signals of said integrator and said switching circuit.

4,174,681

TWO-GROUP/SIMULTANEOUS FULL INJECTION CONVERSION SYSTEM FOR MULTIPLE CYLINDER ENGINES

David G. Luchaco, Macungie, Pa., assignor to The Bendix Corporation, Troy, Mich.

Filed Jul. 18, 1977, Ser. No. 816,250
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EA 11 Claims

1. In an electrical fuel injection system for an internal combustion engine having a number of electromagnetically actuated injectors electrically connected to form a plurality of independent injector groups which are alternately energized during low speed operation and simultaneously energized during certain high speed and power demand regimes of engine operation and including an electrical computer responsive to a plurality of engine operating conditions for providing electrical fuel injection pulses of the exact length required to meet the instantaneous fuel requirements of the engine;

a system for accomplishing the conversion from alternate energization of the injector groups to simultaneous energization and vice versa comprising:

engine driven means providing a plurality of electrical pulse trains each of which includes pulses directly proportional in number to engine revolutions and in which pulses from separate trains do not coincide in time,

first latch means interconnected to receive said trains of pulses having output signals enabling one injector group in response to receipt of pulses from one of said trains and inhibiting another injector group,

means differentiating said pulses to form sharp timing pulses and connected said timing pulses to said computer to time the start of said electrical fuel injection pulses,

AND gate means connected to receive said timing pulses and said electrical fuel injection pulses producing output signals when said pulses coincide in time, and

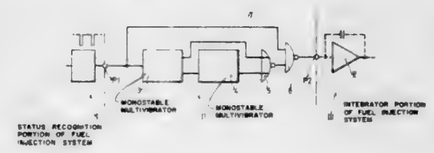
second latch means responsive to said output signals connected to said first latch means for inhibiting timing pulses from one of said trains and for directing timing pulses from another train of pulses to control timing of injection pulses to all of said injectors.

4,174,682

AUXILIARY FUEL INJECTION CONTROL CIRCUIT

Ulrich Drews, Vaihingen-Pulverdingen, and Erich Singer, Besigheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 842,998
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1976, 2651087
Int. Cl.[2] F02D *3/00*; F02M *7/00*
U.S. Cl. 123—32 EE 5 Claims



1. An electronic circuit for use with an electronic fuel injec-

tion system for an internal combustion engine, said engine having an air intake duct and fuel injection valves and said fuel injection system including means for making measurements of the air flow rate through said air intake duct; means for making measurements of the speed (rpm) of said engine; means for making measurements of the exhaust gas composition and for generating an exhaust gas datum; electronic fuel control means for processing said measurements and generating fuel control pulses for controlling the duration of opening of said fuel injection valves; a throttle valve transducer for generating a first signal when said throttle is closed; and means for suppressing said fuel control pulses when said throttle is closed and the engine runs at higher than idling speed; and wherein said electronic circuit comprises:

a signal-delaying subcircuit, for receiving said first signal and said fuel control pulses;

a logical gating subcircuit for receiving said delayed fuel control pulses and said first signal; and

an output circuit controlled by said logical gating subcircuit, for engaging said electronic fuel control means to supply an average (fixed) value of said exhaust gas datum; whereby the width of said fuel control pulses is set to an average value.

4,174,683

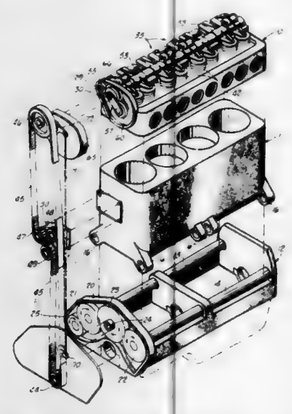
HIGH EFFICIENCY VARIABLE EXPANSION RATIO ENGINE

Howard C. Vivian, 4242 Beulah Dr., La Canada, Calif. 91011

Filed Jan. 20, 1978, Ser. No. 871,017

Int. Cl.[2] F02B *75/04, 75/36;* **F01L** *1/34, 1/18*

U.S. Cl. 123—48 C **13 Claims**



1. In a spark-ignition, variable-expansion ratio, four-cycle engine of the type having a plurality of cylinders equipped with pistons all of which have a power output driving connection with a common crankshaft and including means directly connected to said common crankshaft for varying the cylinder clearance volume under different power demand conditions, that improvement which comprises:

throttleless carburetor means for supplying a combustible charge to said cylinders, including a separate intake valve for each cylinder operatively connected to said crankshaft, and further including means for closing said intake valve selectively not later than bottom dead center of the intake stroke as necessary to provide a charge corresponding to torque output requirements between idling and full power, and means for closing said intake valves and for operating said means for varying the cylinder clearance volume in synchronism with the closure of said intake valves and thereby effective to maintain the engine compression ratio substantially constant over the full range of torque outputs and to increase the engine expansion ratio as the torque output is reduced.

4,174,684

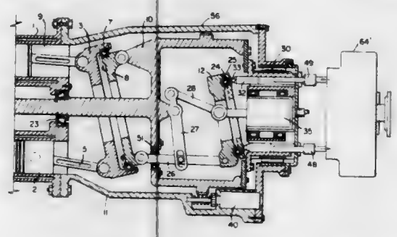
VARIABLE STROKE INTERNAL COMBUSTION ENGINE

Bernard Roseby, 150 W. Edith Ave., #43, and Eckhard P. Hallmann, 2230 Ancora Ct., both of Los Altos, Calif. 94022

Filed May 23, 1977, Ser. No. 799,660

Int. Cl.[2] F02B *75/04, 75/26*

U.S. Cl. 123—48 B **4 Claims**



1. A variable stroke internal combustion engine in which multiple cylinders are located around the axial center line of said engine, parallel to and equidistant from said center line, a cylinder head of annular form in which combustion chambers are formed and on which valves and valve actuating mechanisms and a rotary, circular cam disc are mounted, a wobble plate, on one face of which is formed a mounting plate for a thrust type ball bearing, pistons operating within said cylinders and attached, by means of a connecting link, to a wobble plate, said connecting links being of the conventional gudgeon pin attachment type at the piston end while having, at the opposite end a spherical form, said spherical form being retained in a pivotal manner within a female spherical enclosure formed between a pair of lugs, one of which is formed integrally on the face of said wobble plate, the other said lug being detachable from and fastened to said wobble plate by screws, a swash plate with a means of varying the angle of axial inclination of said swash plate, a thrust bearing interposed between said swash plate and said wobble plate whereby oscillating motion of said wobble plate causes rotary motion of said swash plate in order to accomodate said oscillatory motion of said wobble plate, a carrier plate with a means of supporting said swash plate on a mounting on a fixed projection in such a manner as to allow said swash plate to be rotated in an axial direction about a swivel bearing inserted into a cavity on said carrier plate projection, a sliding link attached to a swivel mounting on said swash plate at the opposite side of said carrier plate to said carrier plate projection and passing through a spherical bearing mounted within a space in said carrier plate face, a linkage comprising a slotted bar and pivots whereby a force applied to said linkage by a hydraulic piston causes said swash plate to be so rotated about said fixed carrier plate projection as to change the angle of axial inclination of said swash plate, said carrier plate being carried in a rotary manner by said swash plate by the transferring of rotary forces through said mounting connections of said swash plate on to said carrier plate, a gear form on the peripheral face of said carrier plate whereby the rotary motion of said carrier plate may be transferred through a meshing gear to an output shaft, whereby the action of said pistons, when driven along said cylinders by means of combustion and expansion of gases, causes said wobble plate to oscillate and thereby generate reciprocating motion in said piston, said reciprocating motion causing a four stroke cycle of an internal combustion nature to occur, the power or combustion stroke of said cycle being the driving force causing said wobble plate to oscillate sequentially in response to said power or combustion strokes, said piston connecting links causing that side of said wobble plate to react against said swash plate through said thrust bearing said swash plate being forced to rotate around the said thrust bearing to allow said oscillations and thereby translate said piston reciprocating motion into swash plate rotary motion, said swash plate axial angle of inclination being controlled by said angle changing linkage similarly controlling and, by means of motion of said angle changing linkage, being changed by an operator causing said angle changing linkage to be moved, thereby causes a change in the distance from one extreme point of wobble plate oscillation to the opposite extreme point of wobble plate oscillation, said extreme points being at opposing sides of said swash plate, thereby similarly causing the distance travelled by said pistons to be changed in such a manner as to cause the stroke of said pistons to be changed whereby the proximity of said pistons to said combustion chambers does not vary with said change of stroke, that point of said stroke being determined by the height of said fixed carrier plate projection point around which said swash plate rotates, a shaft projecting from the center of said carrier plate passing through openings in the centers of said swash plate and said wobble plate and said cylinder block, thereby passing to the cylinder head end of said engine where said shaft causes to be driven a valve actuating mechanism comprising a suitable speed reducing means, a disc, on the face of said disc being formed cam shapes in such a manner that they are caused, during rotary motion of said disc in response to said driving mechanism, to pass over rollers said rollers being mounted on a pivotal mechanism in such a manner as to be forced against stems of valves in response to being moved by said cam shapes and thereby causes said valves to be opened against springs and permit the passage of inlet and exhaust gases to and from said combustion chambers in such a sequence as to generate said four stroke cycle of operation as said gases are ignited by a spark plug energized by electrical means from a distributing rotor mechanism driven by said shaft mechanism by which said cam bearing disc is driven.

4,174,685

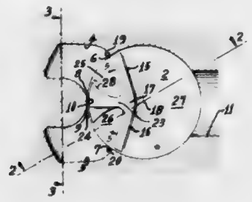
TWO STROKE CYCLE INTERNAL COMBUSTION ENGINE

Hermann R. E. Meier, Palma de Mallorca, Spain, assignor to AB Volvo Penta, Gothenburg, Sweden

Filed Jul. 5, 1978, Ser. No. 922,093

Int. Cl.[2] F02F *3/24*

U.S. Cl. 123—73 A **9 Claims**



1. A two stroke cycle internal combustion engine having a piston reciprocating to and from a bottom dead center position in a closed cylinder, said cylinder having a wall provided with two inlet ports and generally oppositely disposed outlet port means, said inlet ports being circumferentially spaced and having inner edges defining an intermediate section of said wall therebetween, and a generally T-shaped guide outstanding from the face of said piston, the arms of said T-shaped guide comprising a first flange portion outstanding from the face of the piston extending laterally of the path between said inlet ports and said outlet port means and spaced therebetween and delimiting an open inlet chamber between said first flange portion, on the one hand, and said inlet ports and intermediate wall section, on the other hand, the leg of said T-shaped guide comprising a second flange portion outstanding from the face of the piston and extending from an intermediate portion of said first flange portion toward said intermediate wall section and terminating in an end face which confronts said intermediate section when said piston is at bottom dead center position, said flange portions extending outwardly from roots at which they join the piston face to outer flange edges, characterized in that, said end face increases in width from the outer flange edge to the root of said second flange portion and has a width at said root greater than the distance between the upper inner edges of said ports, said piston and the edges of said inlet ports defining inlet openings into said cylinder having generally trapezoidal shapes when said piston is in bottom dead center position, each such opening being defined between an upper port edge substantially parallel to the face of the piston, an outer edge generally perpendicular to the piston face defined by those respective edges of the outer ends of said arms which delimit such inlet chamber, and each such opening being further defined by a lower edge defined by the piston face and by an inclined inner edge extending upwardly and inwardly from the inner end of said lower edge, said inwardly inclined inner edges terminating at spaced apart intersections with said upper edges, said inner edges being defined by the outer edges of said end face.

4,174,686

INTAKE SYSTEM FOR INTERNAL COMBUSTION ENGINES

Hiroshi Shimizu, Higashihiroshima, and Masamichi Shinohara, Hiroshima, both of Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Oct. 7, 1977, Ser. No. 840,365

Claims priority, application Japan, Oct. 9, 1976, 51-121531; Dec. 24, 1976, 51-175089[U]

Int. Cl.[2] F02B *13/00*

U.S. Cl. 123—75 B **3 Claims**



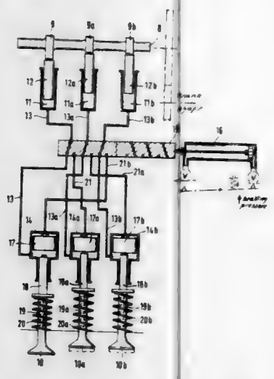
1. Internal combustion engine comprising cylinder means having cylinder bore means, piston means disposed in said cylinder bore means for reciprocating movement so as to define combustion chamber means therein, intake port means having a center and provided in said cylinder means to open to said combustion chamber means, first and second intake passage means which are separated one from the other and communicate with said intake port means, said first intake passage means being smaller in cross-sectional area than the second intake passage means, wall means extending radially of said intake port means and separating said first and second intake passage means at said intake port means, means for closing said second intake passage means at least under light load engine operation, intake valve means having a back contour and provided for closing said intake port means, said first intake passage means having a centroid in a cross-section at the intake port means and being so located that a line passing through the centroid and the center of the intake port means intersects a projection of said cylinder bore means at a point of intersection and makes an angle of 50° to 80° with a tangential line of said projection of the cylinder bore means at said point of intersection, whereby the first intake passage means is located with respect to the axis of said cylinder bore means radially out-

wardly of said second intake passage means at said intake port means.

4,174,687
BRAKING DEVICE FOR FOUR-STROKE CYCLE RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE

Wolfgang Fuhrmann, Nuremberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Dec. 27, 1977, Ser. No. 864,520
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658927
Int. Cl.² F02L *9/02*; F02D *31/00*
U.S. Cl. 123—90.13 **7 Claims**

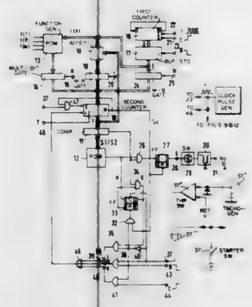


1. In combination with a cam shaft and outlet valve means of a four stroke cycle reciprocating piston internal combustion engine, a braking device which includes: fluid displacing actuating cylinder-piston means operable by said cam shaft, fluid operable two-step control cylinder-piston means for controlling said outlet valve means, each of said control cylinder piston means comprising two different diameter bores with two correspondingly different diameter pistons each reciprocating relative to and independently of the other, the shorter diameter piston of the last mentioned two different diameter pistons having one end face facing an adjacent oppositely located endface of the pertaining larger diameter piston and being located closer to said valve means than the larger diameter piston of said last mentioned two different diameter pistons, control means interposed between said actuating cylinder-piston means and said control cylinder-piston means, first conduit means leading from said actuating cylinder-piston means to said control means, second conduit means leading from said control means to said control cylinder piston means for fluid communication with those piston areas of said larger diameter and shorter diameter pistons which face each other, third conduit means leading from said control means to that surface of said larger diameter piston of said two-step control cylinder piston-means which faces away from the pertaining shorter diameter piston, said control means including a reciprocating member having first passage means therein and being movable into a first control position to make said first passage means effective for establishing fluid communication between said first and second conduit means, said reciprocating member also being movable into a second control position to make said second passage means effective to establish fluid communication between said first and third conduit means, the arrangement being such that in said second control position of said reciprocating member the respective connection of said third conduit means with said second passage means is effected in a different order than the connection of said second conduit means with said first passage means in said first control position of said reciprocating member when in both position looking in the same direction with regard to the longitudinal extension of said reciprocating member thereby in said second control position of said reciprocating member advancing the opening point of said outlet valve means while reducing the maximum opening stroke of said outlet valve means.

4,174,688
DIGITAL-ELECTRONIC ENGINE IGNITION SYSTEM

Guenther Hönig, Markgröningen; Uwe Kiencke, Ludwigsburg, and Martin Zechnall, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 21, 1977, Ser. No. 853,432
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1976, 2655948
Int. Cl.² F02P *5/04*
U.S. Cl. 123—117 D **50 Claims**



1. A digital-electronically controlled ignition system for an internal combustion engine comprising an ignition transformer, a circuit including the primary coil of said transformer and an electronic switch, an electronic control circuit for said electronic switch, and a signal generator operated by said engine providing, in response to at least one reference mark of a rotary portion of said engine, at least signals (A) having steep leading (B) and trailing (C) edges, which signals are representative of a predetermined angular sector of rotation of said engine, said transformer having a secondary winding in circuit with at least one spark gap, said system further comprising in said electronic control circuit:

a generator of waves of a fixed counting frequency (T);

means responsive, for their activation, to said angular sector signals (A) of said engine-operated signal generator, and including a first counter (**16**) arranged to be driven by said counting frequency waves, for providing in successive counting operations digital signals (E) dependent on the duration of said angular sector signals and thereby representative of engine speed;

means for maintaining a substantially constant time interval of closure of said electronic switch (**29**) by predicing the current rise time in said primary coil of said ignition transformer (**30**) up to substantially maximum current therein; said means including a second counter (**10**) connected thereto to count at said counting frequency (T), and a recognition circuit connected thereto, including a digital comparator, for recognizing at least two threshold count value conditions (**S1**, **S0**; **S3**, **S4**) of said second counter (**10**) and for producing signals in response thereto, and

logic circuits responsive to signals produced by said recognition circuits for causing the beginning and for causing the end of the closure interval of said electronic switch (**29**);

means (**24**) for transferring each said digital signal (E) representative of engine speed in the interval between counting operations of said first counter (**16**) to said second counter (**10**), for varying the timing of said time interval of switch closure in a subsequent ignition cycle in dependence on engine speed;

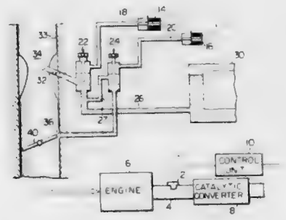
function generator means (**13**) for obtaining an ignition timing count value selected in accordance with the combination of an engine speed parameter and other engine operation parameters, to which means said parameters are provided as digital input signals; and

means for supplying said ignition timing count value as a correction of the momentary count condition of said second counter (**10**) during the counting operation of said second counter at the moment of occurrence of a signal (C) indicative of the transit of one said reference mark of said rotary portion of said engine, in order to shift at least one of the beginning and the end of said time interval of switch closure.

4,174,689
ELECTRONIC CLOSED LOOP AIR-FUEL RATIO CONTROL SYSTEM

Akio Hosaka, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Mar. 23, 1977, Ser. No. 780,688
Claims priority, application Japan, Mar. 24, 1976, 51-31449
Int. Cl.² F02B *3/00*
U.S. Cl. 123—119 EC **3 Claims**



1. An electronic closed loop air-fuel ratio control system for supplying an optimum air-fuel mixture to an internal combustion engine, which system comprises in combination:

an air-fuel mixture supply assembly;

an exhaust pipe;

an exhaust gas sensor provided in the exhaust pipe for sensing the concentration of a component in exhaust gases, generating a first signal representative thereof characterized by upper and lower constant voltage maxima and an analog region as a function of air-fuel mixture therebetween, in the vicinity of stoichiometry;

a difference detecting circuit responsive to said first signal for generating an analog second signal representative of the difference between magnitudes of the first signal from the exhaust gas sensor and a reference signal;

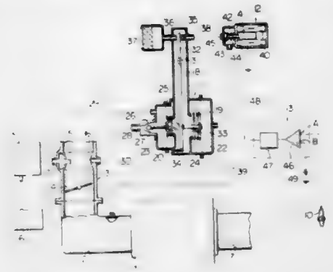
a control signal generator responsive to said second signal, said control signal generator including first means for differentiating the second signal, second means for integrating the second signal, third means for proportionally amplifying the second signal, said first, second and third means being electrically connected in parallel and operating on said second signal simultaneously, and fourth means for summing the output signals of said first means, said second means of said third means to produce a control signal; and

an actuator provided in the air-fuel mixture supply assembly responsive to the control signal for controlling the air-fuel ratio of an air-fuel mixture fed to the engine.

4,174,690
AIR-FUEL RATIO CONTROL DEVICE

Masaharu Sumiyoshi, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 25, 1977, Ser. No. 854,678
Claims priority, application Japan, Sep. 7, 1977, 52-106752
Int. Cl.² F02M *7/00*; F01N *3/10*
U.S. Cl. 123—119 EC **23 Claims**



1. An air-fuel ratio controlling device of an internal combustion engine having a gas flow passage comprising an intake passage and an exhaust passage, said device comprising:

a λ sensor disposed in the exhaust passage for providing a rich signal indicating that the total air-fuel ratio is on the rich side of the stoichiometric air-fuel ratio and a lean signal indicating that the total air-fuel ratio is on the lean side of the stoichiometric air-fuel ratio;

valve means having a valve for controlling the amount of supplementary fluid fed into the gas flow passage; and

valve actuating means for alternately opening and closing said valve and for mechanically changing the opening speed and the closing speed of said valve in response to said rich and said lean signals so that one of said opening and closing speeds in rapidly and gradually changed, while the other of said opening and closing speeds is slowly and gradually changed during the opening and closing operation so as to make the mean value of the total air-fuel ratio precisely equal to a predetermined air-fuel ratio,

said valve actuating means comprises a vacuum chamber, a vacuum control device for controlling the vacuum level in said vacuum chamber in response to said rich and said lean signals, and a valve actuating device for actuating said valve in response to change in the vacuum level in said vacuum chamber; and

said vacuum control device comprises an air port communicating said vacuum chamber with the atmosphere, a vacuum source, a vacuum port communicating said vacuum chamber with said vacuum source, a flapper cooperating with said air and said vacuum ports, a flapper actuating device for gradually opening said air port and gradually closing said vacuum port in accordance with increases in the vacuum level in said vacuum chamber, and a valve device for intermittently establishing the fluid connection between said vacuum port and said vacuum source in response to said rich and said lean signals.

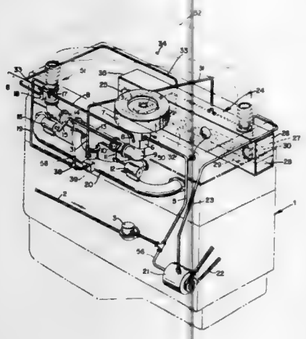
4,174,691
FUEL-AIR SUPPLY SYSTEM FOR INTERNAL COMBUSTION ENGINES

Charles H. Trexler, Sr., 6229 Debora Dr., Richmond, Va. 23225

Filed Jan. 27, 1978, Ser. No. 872,946
Int. Cl.² F02M *31/00*
U.S. Cl. 123—133 **11 Claims**

1. A fuel-air supply system for supplying fuel and combustion air to an internal combustion engine and comprising car-

buretor means providing a unheated supply of fuel and air for said engine, further means for heating unmixed liquid fuel and combustion air to provide a heated supply of liquid fuel and combustion air in which the heated fuel and heated air are unmixed, and means responsive to the temperature of the liquid fuel being heated by said further means for (a) passing the supply of fuel and air from said carburetor means to said engine while blocking the supply of fuel and air from said further



means to said engine when the temperature of the fuel being heated by said further means is less than a predetermined value and (b) for passing the heated liquid fuel and heated air from said further means to said engine without intermixing the heated liquid fuel and heated air while blocking the unheated supply of fuel and air from said carburetor means when the temperature of the fuel being heated by said further means becomes equal to or greater than said predetermined value.

4,174,692

FUEL INJECTION DEVICE

Wolf Wessel, Oberriexingen; Gerhard Stumpp, Stuttgart, and Heinrich Knapp, Leonberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

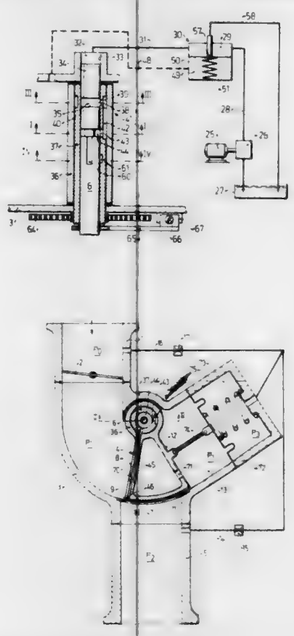
Filed Oct. 17, 1977, Ser. No. 842,996

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1976, 2652347

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 AW **11 Claims**

1. A fuel injection device for mixture compressing, externally ignited internal combustion engines provided with an arbitrarily actuated throttle valve and a pivotally mounted air flow responsive member incorporated with a fuel metering valve rotatably disposed in an air induction tube and means for subjecting said air flow responsive member to a restoring force in the closing direction in opposition to the force of air flow, the improvement wherein said air flow is arranged downstream of said throttle valve and including a return force means, said air flow responsive member including one surface that oscillates into a chamber, said chamber being connected with said air induction tube downstream of the air flow responsive member by means of a first throttle valve element, and with said air induction tube upstream of said throttle valve by means of a second throttle valve element, said restoring force being dependent on the pressure in said chamber so as to decrease the pressure of said return force means as said throttle



valve opens to thereby cause an increase of the pressure in said air induction tube downstream of said throttle valve.

4,174,693

FUEL INJECTION SYSTEM HAVING PRESSURIZER DAMPING MEANS

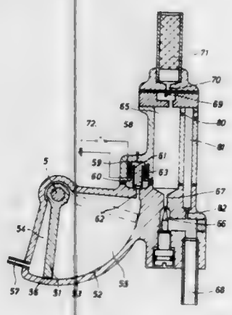
Johannes Steinwart, Obersulm-Willsbach; Gerhard Maurhoff, and Armin Bauder, both of Neckarsulm, all of Fed. Rep. of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 9, 1977, Ser. No. 859,241

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1976, 2656538

Int. Cl.² F02M *39/00*; F02N *9/00*; F02M *37/06*

U.S. Cl. 123—139 AW **9 Claims**



1. A fuel injection system for a mixture compressing spark ignition internal combusion engine having means for injection of fuel into the air intake of the engine, comprising:

a fuel metering valve for dispensing to one or more injection jets a quantity of fuel related to the quantity of air flowing through said intake;

adjustable throttle valve in said air intake;

an air flow measuring element positioned within said intake, said measuring element being movable against a restoring force in accordance with the quantity of air flowing through said intake, said measuring element being arranged to actuate a control element of said fuel metering valve;

A damping device having a damping element connected to said measuring element;

two damping chambers having a throttling passage therebetween, said damping element being movable to displace fuel between said two damping chambers via said throttling passage;

a fuel pump connected to one of said damping chambers to provide fuel under pressure thereto, said fuel pump adapted for delivering fuel to said metering valve; and

a discharge port connected to the second damping chamber via a thermally controlled outlet valve.

4,174,694

FUEL INJECTION CONTROL SYSTEM

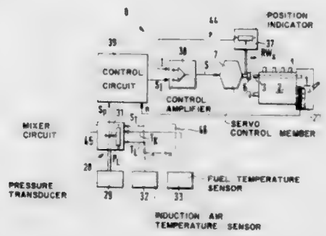
Wolf Wessel, Oberriexingen, and Wilfried Sautter, Ditzingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 31, 1977, Ser. No. 847,364

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1976, 2650246

Int. Cl.² F02M *59/20*

U.S. Cl. 123—140 MC **9 Claims**



1. A control system for use in association with a fuel injection pump of an internal combustion engine, said injection pump having a fuel rack, said control system including control means for positioning the travel of said fuel rack and further including a servo-mechanism for determining the position of said control means, said servo-mechanism including an electronic controller connected to receive engine-related signals to thereby set the position of said control means, and wherein the improvement comprises:

a first transducer, disposed to experience the temperature of the air aspirated by the engine for generating a first signal related to the induction air temperature;

a second transducer, disposed to experience the temperature of the fuel delivered to said pump for generating a second signal related to the fuel temperature;

an electrical circuit for receiving said first and second signals and for providing a composite signal related to the difference of said first and second signals, said composite signal being applied to said electronic controller to thereby correct the control of the position of said servo-mechanism and said control means; whereby the amount of fuel admitted to said engine is limited.

4,174,695
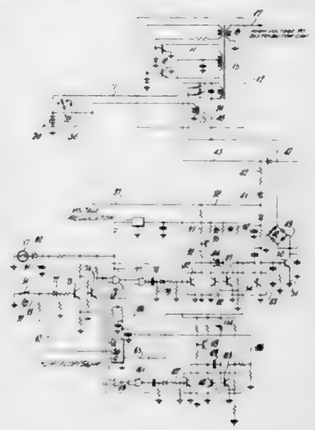
AC TYPE IGNITION SYSTEM WITH TWO TIME DELAY CIRCUITS

Robert E. Canup, Poughkeepsie, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 25, 1977, Ser. No. 844,954

Int. Cl.² F02P *5/02, 1/00*

U.S. Cl. 123—148 E **4 Claims**



1. In combination with a controlled-spark-duration ignition system for an internal combustion engine, said system having a high-frequency continuous-wave oscillator including a transformer having a high voltage output winding adapted for connection to a sparking circuit, an oscillator control winding on said transformer for starting and stopping oscillation, and electronic switch means comprising a transistor connected in series with said oscillator control winding, trigger means for switching said transistor from conducting to non-conducting state and back, and means for producing an engine timed signal for controlling said trigger means,

the improvement comprising a pair of electrical time duration control means each for producing a time delay inversely proportional to the speed of said engine, and

circuit means for alternatively connecting only one or both of said time duration control means in series between said engine timed signal and said trigger means,

said circuit means comprising

a flip-flop,

a switch for determining the state of said flip-flop, and

a pair of NOR gates controlled by the state of said flip-flop.

4,174,696

IGNITION SYSTEM

Werner Jundt, Ludwigsburg; Bernd Bodig, Leinfelden; Heinz Decker, Vaihingen; Günther Schmidt; Bert Wurst, both of Ludwigsburg; Karl Seeger, Ditzingen, and Herman Roozenbeek, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 869,627

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1977, 2701968; Oct. 19, 1977, 2746885

Int. Cl.² F02P *5/04*

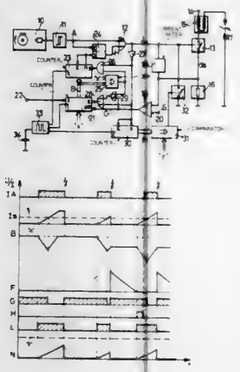
U.S. Cl. 123—148 E **26 Claims**

1. In an ignition system having

spark creating means (14, 17),

and controllable switch means (13) connected to said spark creating means for permitting and blocking current flow through said spark creating means when in a first and second state respectively,

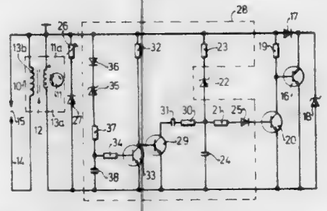
and means (**10**) for furnishing a sequence of first ignition signals, each for timing the furnishing of a spark,
an ignition control system comprising, in accordance with this invention, means (**12**) for switching said controllable switch means to said second state under control of said first ignition signals;
first storage means (**21**) for furnishing a first storage signal representative of a predetermined count;
first storage signal changing means (**28, 29, 18, 33**) for changing said first storage signal in a first direction for a predetermined time period and in a second direction opposite to said first direction for a time period corresponding to the time the current in said spark creating means exceeds a predetermined threshold value, thereby creating a current-depending modified first storage signal;



a second storage means (**23**);
transfer means (**25, 26**) for transferring said current-dependent modified first storage signal to said second storage means under control of said first ignition signal, thereby creating a current-depending second storage signal;
second storage signal changing means connected to said second storage means and continuously changing said second storage signal in a predetermined direction;
and switch control means (**24**) connected to and controlled by said second storage means and further connected for switching said controllable switch means (**13**) back to said first state when said second storage signal reaches a predetermined threshold value.

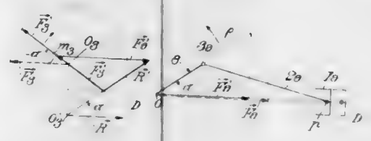
4,174,697
SYSTEM FOR ADVANCING THE IGNITION TIME IN IGNITION SYSTEMS HAVING A MAGNETO GENERATOR
Jiri Podrapsky, Buchschwabach, and Josef Orova, Schwabach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Feb. 6, 1978, Ser. No. 875,684
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1977, 2709745
Int. Cl.[2] **F02P** *1/00, 5/04*
U.S. Cl. 123—148 E **7 Claims**

1. In an ignition system for an internal combustion engine, said ignition system having a rotating magneto system driven by said engine and armature means including a primary winding (**13***a*) and a secondary winding (**13***b*) cooperating with said rotating magneto system, a spark plug connected to said secondary winding, and ignition starting means (**16**) connected to said primary winding for starting the ignition process in response to an ignition timing signal:
timing means (**28, 20**) connected to said primary winding and said ignition starting means, for furnishing said ignition starting signal to said ignition starting means at first predetermined instants in the cycle of said engine when said engine is operating at a speed less than a predetermined speed, and at second time instants preceding said first time instants in each cycle of said engine when said engine is operating at a speed exceeding said predetermined speed, said timing means comprising
threshold means (**22**) for furnishing a first threshold signal when the voltage across said primary winding exceeds a first predetermined voltage;
time constant furnishing means (**31, 30, 24, 23**) connected to said threshold means for furnishing said ignition starting



signal a predetermined time period following receipt of said first threshold signal;
switch means (**29**; **41**) having a first and second stable state, connected to said time constant furnishing means, for shortening said predetermined time period when in said second stable state; and connecting means
for connecting said switch means to said primary in such a manner that said switch means switches from said first to said second stable state prior to the ignition time when the speed of said engine exceeds said predetermined speed.

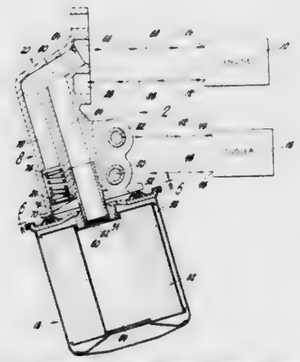
4,174,698
IN-LINE TWO-CYLINDER ENGINE
Jean G. A. Dupin, Versailles, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France
Filed Jul. 29, 1977, Ser. No. 820,242
Claims priority, application France, Aug. 5, 1976, 76 24003
Int. Cl.[2] **F16F** *15/26*
U.S. Cl. 123—192 B **11 Claims**



1. A two-cylinder engine comprising:
first and second cylinders arranged in line;
first and second pistons received in said first and second cylinders respectively for reciprocation therein;
a crankshaft having first and second crankpins set at 360°;
first and second connecting rods connecting said first and second pistons to said first and second crankpins respectively, said crankshaft having an axis perpendicular to a central plane of the engine in which lies the resultant of the reciprocating inertia forces to be balanced, said crankshaft being set so that its centre of gravity is remote from said crankpins when said pistons are at top dead centre; and
balancing means in the form of a first counterweight rotatable about an axis of rotation parallel to said crankshaft in the opposite direction to but at the same speed as said crankshaft, the centre of gravity of said first counterweight lying in said central plane of the engine, said first counterweight being of a size and construction such as to develop a centrifugal force having an amplitude which is

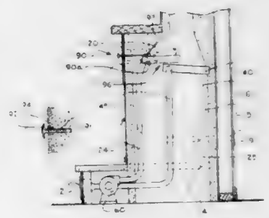
half the maximum amplitude of the reciprocating rectilinear inertia forces of the engine, said axis of rotation of said first counterweight being disposed outside the plane defined by the axes of said first and second cylinders;
the engine being characterized by:
means for compensating for the resultant of the centrifugal force of said first counterweight and of the
reciprocating rectilinear inertia forces of the engine, said compensating means comprising at least one second counterweight rotatable in the same direction and at the same speed as said crankshaft, said compensating means being adapted to produce a compensating force which always passes through a point disposed in said central plane of the engine symmetrically of the axis of rotation of said first counterweight relative to the plane defined by the axes of said first and second cylinders, the compensating force so opposing the resultant as to cancel out the latter.

4,174,699
ENGINE OIL PROCESSING SYSTEM
Lloyd T. Gill, Okemos, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Dec. 27, 1977, Ser. No. 864,528
Int. Cl.[2] **F01M** *1/02*
U.S. Cl. 123—196 S **5 Claims**



1. An engine lubricating oil processing system comprising:
an engine when running normally receiving cool, clean lubricating oil and discharging hot, dirty lubricating oil;
a filter base secured to said engine and having a first inlet receiving the hot, dirty oil discharged from said engine, a first outlet, and a first passage connecting said first inlet and said first outlet and conducting to said first outlet the hot, dirty oil received by said first inlet;
an oil cooler having an inlet connected with said filter base first outlet to receive hot, dirty oil therefrom, and an outlet to discharge cool, dirty oil; said oil cooler removing heat from the oil passing therethrough;
said filter base having a second inlet and a second outlet connected in fluid flow relation by a second passage in said base, said second inlet receiving oil from said cooler outlet;
an oil filter associated with said filter base and having an inlet and an outlet, said filter inlet receiving oil from said filter base second outlet;
said filter base having a third inlet and a third outlet connected in fluid flow relation by a third passage in said base, said filter outlet being connected to said filter base third inlet to deliver cool, clean oil thereto, and said filter base third outlet being connected to deliver oil to said engine;
said filter base having an oil cooler bypass valve therein provided with an inlet and an outlet with the inlet thereof fluid connected to said first passage between said filter base first inlet and first outlet to receive the hot, dirty oil from said engine, and the cooler bypass valve outlet fluid connected to said second passage between said filter base second inlet and second outlet; said cooler bypass valve opening, only upon a predetermined back pressure caused by undue oil flow restriction in said cooler, to bypass a predetermined limited amount of hot, dirty oil from said base first passage to said base second passage without passing through said cooler;
said filter base further having a filter bypass valve therein provided with an inlet and an outlet with the inlet thereof fluid connected to said filter base second passage between said filter base second inlet and second outlet to receive cool, dirty oil from said cooler and any bypassed hot, dirty oil from said cooler bypass valve, said filter bypass valve outlet being fluid connected to said filter base third passage; said filter bypass valve opening, only upon a predetermined back pressure caused by undue oil flow restriction in said filter, to bypass a predetermined limited amount of oil flowing through said filter base second passage to said filter base third passage without passing through said filter; said system operating
When both of said bypass valves are closed to deliver hot, dirty oil to said cooler from said engine; remove heat from that oil; deliver cool, dirty oil to said filter; clean that oil; and return cool, clean oil to said engine;
When said cooler bypass valve is open to deliver a mixture of hot, dirty oil and cool, dirty oil to said filter; and when said filter bypass valve is open to deliver a mixture of dirty and clean oil to said engine which will be cool oil when said cooler bypass valve is closed and will be a mixture of hot and cool oil when said cooler bypass valve is also open.

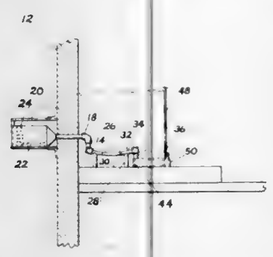
4,174,700
FIREPLACE
Gunther M. Bartsch, P.O. Box 1935, Zephyr Cove, Nev. 89448
Filed Nov. 7, 1977, Ser. No. 848,908
Int. Cl.[2] **F24B** *7/00*; **F23L** *3/00*
U.S. Cl. 126—121 **15 Claims**



1. The combination with a fireplace of: a first hollow chamber fixed to the fireplace structure and covering a portion of the fireplace throat; a second hollow chamber pivotally connected to said fireplace structure in such manner as to be capable of covering essentially all of said fireplace throat in combination with the said first chamber and moveable in such manner as to create an opening between the said two chambers within the throat; a first air inlet means connected to the interior of said first chamber; a second air inlet means connected to the interior of said second chamber; a first hot air outlet means connected to the interior of said first chamber; a second hot air outlet means connected to the interior of said second chamber; and means to cause air to circulate through each of said chambers from its inlet to its outlet means.

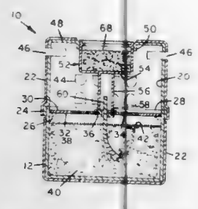
V 9 8 8 3 N 0 2 0 7 9 UMI

4,174,701
FIREPLACE SYSTEM
Thayne R. Gneiting, Rte. 4, Box 256, Blackfoot, Id. 83221
Filed May 3, 1977, Ser. No. 793,377
Int. Cl.² F24B 7/00
U.S. Cl. 126—121 **2 Claims**



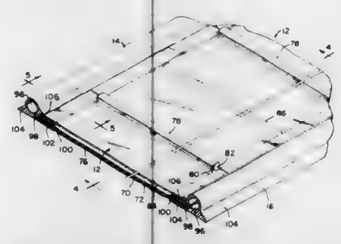
1. A fireplace device comprising a plurality of arcuate hollow tubular members for holding logs, disposed in a fireplace, a rear header connected to said tubular members, an air inlet pipe connected to said rear header, a housing disposed at the rear of the fireplace and outside the back wall of the fireplace, a motor and intake fan in said housing to supply cold outside air to said inlet pipe and rear header and tubular members, a front header connected to the front end of said tubular members and disposed in the fireplace, a substantially horizontal housing connected to said front header and disposed in the fireplace to receive hot air from said hollow members, a plurality of apertures in said hollow members to supply fresh air from combustion, glass panels closing off the front of the fireplace to prevent air from the room in which it is located from entering the fireplace, said horizontal housing having a central inlet adjacent its rear to receive heated air from said front header and oppositely disposed hot air outlets below said glass panels, and a plurality of vertical alternating panels in said horizontal housing to force heated air to pass therethrough in a tortuous path before discharge through its outlets.

4,174,702
DISPOSABLE CATALYTIC HEATER
Alfred A. Rappaport, Apt. 305 2081 S. Ocean Dr., Hallandale, Fla. 33009
Filed Oct. 14, 1977, Ser. No. 842,050
The portion of the term of this patent subsequent to Jan. 17, 1995, has been disclaimed.
Int. Cl.² A61F 7/06
U.S. Cl. 126—208 **20 Claims**



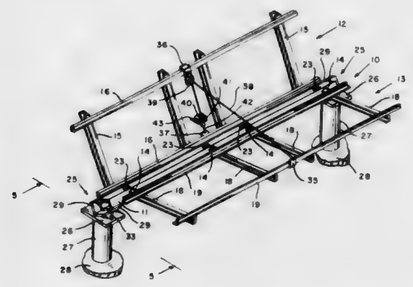
1. A catalytic heater (10, 70) comprising a sealed lower section fuel cartridge (12, 72), an upper chimney section (20, 102), said sealed lower section having a manually removable sealing cover (14, 18, 96), said sections having complementary mating edges (24, 28, 111, 114) in the absence of said sealing cover, said lower cartridge section having an inwardly extending ledge (26, 112) spaced somewhat below its mating edge (28, 114), said cartridge section having fuel material (40, 78) therein, both said sections having a heat insulating coating (22, 107) directly thereon, a catalytic member comprising a single plane frame member (30, 88) fitting on and supported on said ledge, a catalyst impregnated stainless steel member (34, 86)in said plane supported in said catalytic frame member over said fuel material, said stainless steel member having a wick receiving openings (36, 84) centrally located therein, a wick (38, 81) in said fuel material extendable up through said wick opening, a snuffer tube (56, 110) mounted centrally inside said chimney section and contacting said catalytic member about said wick (60,82) extending therethrough, said chimney section having a plurality of inlet openings (44, 104) adjacent its bottom edge and a plurality of combustion product exit openings (46, 106) adjacent its roof (48, 108).

4,174,703
SOLAR HEAT ROOFING SYSTEM
Bruce H. Blakey, Seattle, Wash., and Douglas R. Pohl, Ogden, Utah, assignors to Western Marine Electronics, Inc., Seattle, Wash.
Filed May 31, 1977, Ser. No. 801,544
Int. Cl.² F24J 3/02
U.S. Cl. 126—430 **4 Claims**



1. A solar heat roofing system for waterproofing the roof of a building and for transferring solar heat to a heat utilization device through a heat transfer fluid, comprising:
a plurality of waterproof, heat absorbing panels including upper and lower waterproof sheets connected to each other along spaced apart linear paths thereby forming elongated channels for said transfer fluid extending from the top edges to the bottom edges of said panels with a side edge of each lower sheet projecting laterally beyond the adjoining side edge of said upper sheet by a first distance with the opposite side edge of said upper sheet projecting laterally beyond the adjoining side edge of said lower sheet by said first distance such that the upper sheet of each panel may overlap the lower sheet of an adjacent panel with the thickness of said overlapping portions being substantially identical to the remainder of said panel;
inlet and outlet manifolds extending perpendicularly to said fluid channels at opposite ends of said panel, each of said manifolds including an elongated, fluid impermeable conduit continuously communicating with a slot extending continuously along one side of said manifold, said slot receiving the respective end of said panel such that said fluid channels communicate with said conduit;
means for conveying said heat transfer fluid from said heat utilization device to the conduit of said inlet manifold; and
means for conveying said heat transfer fluid from the conduit of said outlet manifold to said heat utilization device such that said heat transfer fluid recirculates through said panels thereby delivering heat to said heat utilization device and said panels waterproof the roof of said building.

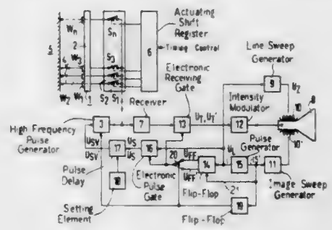
4,174,704
SUPPORT SYSTEM
Terry L. Nelson, 555 Bostwick Ave., P.O. Box 3036 Barnum Sta., Bridgeport, Conn. 06605
Filed Mar. 10, 1978, Ser. No. 885,151
Int. Cl.² F24J 3/02
U.S. Cl. 126—438 **12 Claims**



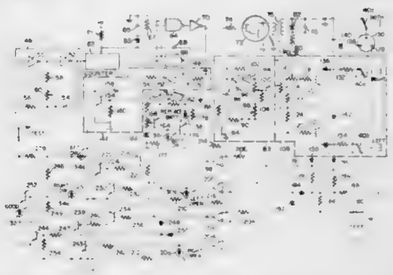
1. A support structure adapted to support opposed elements at an angle relative to horizontal and facing each other in a cooperative relationship, said structure having a generally V-shaped cross-section and comprising opposed wing members which form the arms of said V-shape and which are commonly attached to an elongate tubular member of rectangular cross-section which comprises the apex of said V-shape, said tubular member being supported on edge so that the sides of said rectangular cross-section adjacent said edge extend upwardly at angles relative to horizontal, one of said sides having attached thereto, along the length of said tubular member, a multiplicity of spaced beams which extend upwardly and outwardly of said tubular member to form support ribs for one of said wing members comprising an arm of said V-shape, a second side of said tubular member opposite said one side having attached thereto, along the length of said tubular member, a multiplicity of spaced beams which extend upwardly and outwardly of said tubular member to form support ribs for the other of said wing members comprising the other arm of said V-shape, whereby the weight of said wing members and of elements attached thereto is adapted to be supported solely by said tubular member.

4,174,705
ULTRASONIC IMAGING APPARATUS OPERATING ACCORDING TO THE IMPULSE-ECHO METHOD
Klaus Buchner, Uttenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Filed Jun. 8, 1977, Ser. No. 804,498
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1976, 2628568
Int. Cl.² G01S 9/66; A61R 10/00
U.S. Cl. 128—660 **6 Claims**

1. Ultrasonic imaging apparatus operating according to the impulse-echo method, particularly for medical diagnostics, with an ultrasonic applicator for linear ultrasonic scanning of an examination subject and an image display device with a line sweep generator for reproducing echo impulses as lines, as well as an image generator for displacement of the lines as a function of the displacement of the ultrasonic beam in the subject, and a controllable electronic receiving gate having an output connected to said image display device for controlling the time interval in which echo impulses produced by the ultrasonic beam are displayed during each line sweep operation of the line sweep generator, wherein the improvement comprises means operatively coupled with said electronic receiving gate for operating said receiving gate alternately in the opened and blocking state in synchronism with the sweep pulses of the line sweep generator, control means operatively synchronized with the opened and blocking states of the electronic receiving gate for controlling the repetition rate of the transmitting cycles of the ultrasonic applicator and providing for establishing an independent operating frequency for the line sweep generator equal to a multiple of said repetition rate, and common timing means operatively coupled with said control means and providing for common adjustment of the timing of a series of transmitting pulses and providing for the generation of said transmitting pulses only within respective blocking phases wherein the receiving gate is in the blocking state for echo impulses, said common timing means being adjustable for common adjustment of the moment of emission of each transmitting pulse within a respective blocking phase of the receiving gate thereby to provide a common adjustment of the depth location along the respective scanning paths being displayed on the image display device without alteration of the timing of the line sweep generator.



4,174,706
MANDIBLE STIMULATOR
Bernard Jankelson, 1451 Medical-Dental Bldg., Seattle, Wash. 98101, and John C. Radke, Seattle, Wash., assignors to Bernard Jankelson, Seattle, Wash.
Filed Jun. 27, 1977, Ser. No. 810,507
Int. Cl.² A61B 5/05; A61N 1/36
U.S. Cl. 128—741 **7 Claims**



1. A mandible stimulator for providing controlled electrical stimulation of the multiplicity of muscles innervated by the fifth and seventh cranial nerves, comprising:
a power source;
output means having right, left and common outputs, said output means including a right electrode connected to said right output, a left electrode connected to said left output and a dispersal electrode connected to said common output, said output means being adapted to form a right electrode circuit through the body of a patient between the right side of said patient's face and said dispersal electrode and a left electrode circuit through the body of said patient between the left side of said patient's face and said dispersal electrode;

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amplitude control means for selecting the intensity of said electrical stimulation;

constant current pulsing means connected to said power source for periodically generating a right stimulus pulse between said right and common outputs, and a left stimulus pulse between said left and common outputs, said right and left stimulus pulses producing currents in said right and left electrode circuits, respectively, which are a constant value corresponding to the intensity selected by said amplitude control means such that the electrical stimulation of said muscles is unaffected by variations in electrode circuit resistance; and

electrode circuit testing means for measuring the conductance of said electrode circuits and providing a visual indication of the condition thereof, said testing means comprising right and left circuit conductance sensing means for generating right and left conductance signals indicative of the conductance in said right and left electrode circuits, respectively;

first comparator mens receiving said right and left conductance signals for illuminating a right open circuit indicating lamp and a left open circuit indicating lamp responsive to the conductance in said right and left electrode circuits, respectively, being less than a first predetermined value; and

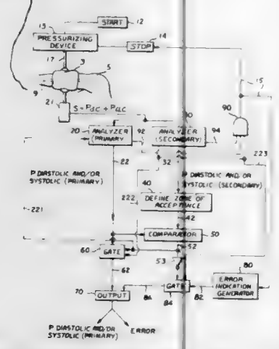
second comparator means receiving said right and left conductance signals for illuminating a right circuit low conductance indicating lamp responsive to the conductance of said right electrode circuit being less than the conductance of said left electrode circuit by a second predetermined value, and for illuminating a left circuit low conductance indicating lamp responsive to the conductance of said left electrode circuit being less than the conductance of said right electrode circuit by said second predetermined value thereby providing a visual indication of circuit unbalance.

4,174,707

APPARATUS AND/PROCESS FOR ANTIFACT REJECTION THROUGH CROSS CORRELATION IN SPHYGMOMETRY

William T. Link, Berkeley; Jerry D. Haney, Sunnyvale, and William D. Jaasen, Palo Alto, all of Calif., assignors to American Optical Corporation, Southbridge, Mass.

Filed Dec. 27, 1976, Ser. No. 754,200
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—681 **22 Claims**



1. An apparatus for producing information indicative of the physical condition of a living test subject comprising:

means for applying a selectively changeable pressure to the test subject adjacent a blood vessel and means for measuring a fluctuating quantity proportional to a sum, said sum comprising a time dependent fluctuating component representative of the pulsatile pressure within the blood vessel, plus the selectively changeable pressure applied externally adjacent the blood vessel;

first means responsive to said quantity in a first analytical manner for providing at least one primary signal tentatively representative of the changeable pressure applied to the living test subject;

second means responsive to said quantity in a second analytical manner different from said first analytical manner for defining at least one respective zone-of-acceptance expressed in terms of a corresponding representation of said changeable applied pressure; and

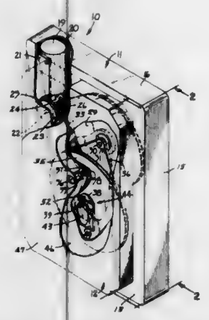
means for comparing a said primary signal with a respective said zone of acceptance and producing an output of said primary signal as being representative of the physical condition of the living test subject only if said primary signal is within said respective zone-of-acceptance.

4,174,708

BACK MASSAGER

Harry A. Coffin, 2811 Stevens Ave. South, Apartment 5C, Minneapolis, Minn. 55407

Filed Oct. 31, 1977, Ser. No. 846,996
Int. Cl.[2] A61H 7/00
U.S. Cl. 128—49 **7 Claims**



1. A massaging unit, comprising, in combination:

a massaging applicator;

a base frame;

means for mounting said applicator for pivotal movement with respect to said base frame;

drive means carried by said base frame for imparting angular oscillatory motion to said massaging applicator in a single plane about said mounting means,

said massage unit including means between said base frame and said massaging applicator for limiting deviation of said massaging applicator from the oscillating plane,

said means for limiting said deviation including rollers carried by one of said massaging applicator and said base frame, engaging rails carried by the other of said massaging applicator and said base frame,

at least one of said rails including a plurality of ridges extending transverse to the path of one of said rollers.

4,174,709

EXTENSIBLE SPLINT

Richard H. Maddux, P.O. Box 231, Whitefish, Mont. 59937

Filed Dec. 20, 1977, Ser. No. 862,574
Int. Cl.[2] A61F 5/04
U.S. Cl. 128—85 **3 Claims**

1. An extensible splint for human limbs, comprising, in combination:

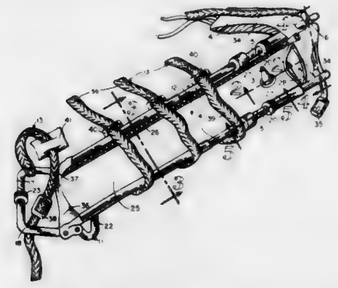
a compound peripheral frame having spaced elongate, articulating side rods with associated mechanical means for adjustable extension, comprising

the interconnecting portions of the side rods formed so that one slidably fits within the other; and

the smaller inter-fitting end portion being threaded and carrying a threadedly engaged adjustment nut to cause extension of the larger side rod portion relative to the other smaller portion responsive to motion of the nut, said articulating side rods interconnected in inner and outer end parts by inner and outer cross members to form a peripheral splint frame, said outer cross member being compound to allow lateral adjustment of the outer portion of the splint frame and having

two interconnecting portions formed so that one slidably fits within the other; and

the smaller inter-fitting portion being threaded and carrying a threadedly engaged adjustment nut to cause motion of the larger inter-fitting portion relative the smaller portion responsive to motion of the nut;



an adjustable fastening strap carried by the inner end portion of the peripheral frame to cooperate with the inner cross member to fasten therebetween a proximal part of a limb to be supported;

an outer support strap extending between the outer end parts of the peripheral frame and an adjustable outer fastening strap extending between those same end parts and over the outer support strap to cooperate therewith to fasten a distal portion of a limb to be supported therebetween; and

fastening means carried by the side rods of the peripheral frame to releasably fasten a human limb between the side rods.

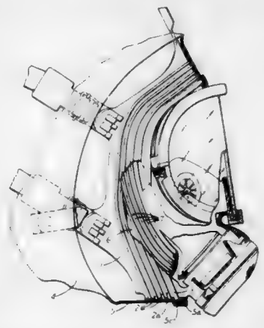
4,174,710

CONNECTION BETWEEN TWO DIFFERENT PARTS OF A PERSON'S PROTECTIVE COVERING

Klaus Pampuch, Berlin, Fed. Rep. of Germany, assignor to Auergesellschaft GmbH, Berlin, Fed. Rep. of Germany

Filed Apr. 26, 1978, Ser. No. 900,252
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1977, 2718864
Int. Cl.[2] A62B 7/00
U.S. Cl. 128—142.7 **7 Claims**

1. A connection between two parts of a flexible protective covering for a person, with one of said parts having an opening therein facing the other part, said connection comprising an elastic band having one edge secured to said one part around said opening, the band extending away from said one part and surrounding a portion of the other part, the free edge of said band being thickened relative to the adjoining portion thereof and provided with a continuous groove in its inner surface extending around said thickened portion, the outer surface of the portion of said other part surrounded by the band being provided with surrounding laterally spaced ribs including one



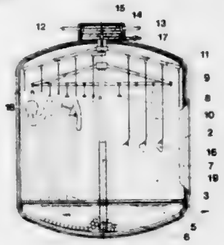
rib projecting into said groove and holding said two parts of said protective covering together.

4,174,711

FIRE RESISTANT ENCLOSURE

Oliver Laing; Nikolaus Laing, and Ingeborg Laing, all of Hofener Weg 35-37, D 7148 Remseck 2, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 843,157
Claims priority, application Austria, Oct. 19, 1976, 147762/76; Fed. Rep. of Germany, Feb. 17, 1977, 2706797; Feb. 17, 1977, 2706798
Int. Cl.[2] A62B 7/00; E04C 2/00
U.S. Cl. 128—145 R **13 Claims**



1. A container defining a shelter for persons having a wall which is heat insulating and protective against fire to prevent the interior of the container from exceeding a predetermined maximum temperature, said predetermined maximum temperature being equal to the physiologically acceptable temperatures of persons within the container, wherein the outer portion of the wall comprises at least one heat insulating layer and at least one other layer adjacent and inwardly of said heat insulating layer, said at least one other layer having hollow bodies of large area which are filled with a meltable crystalline substance whose melting point is below said predetermined maximum temperature and whose temperature of crystallization lies considerably below said melting point.

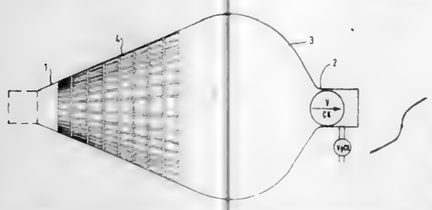
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4,174,712

DEVICE FOR USE WITH MEDICINAL INHALATION DEVICES

Nils F. E. Morén, Staffanstorp, and Kjell I. L. Wetterlin, Sandby, both of Sweden, assignors to Aktiebolaget Draco, Lund, Sweden

Filed Nov. 7, 1977, Ser. No. 849,257
Claims priority, application Sweden, Nov. 9, 1976, 7612448
Int. Cl.[2] A61M *15/00*
U.S. Cl. 128—173 R 4 Claims



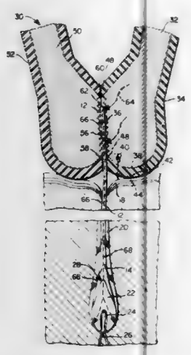
1. A device for use with a medicinal inhalation device for generating and enclosing a delimited aerosol mist, the device comprising a chamber which is rotationally symmetrical about an axis and has opposed ends, an opening at one said end to be connected with a spray nozzle, and a mouthpiece at the other said end, said opening and mouthpiece having axes aligned with said axis, the chamber having a first part adjacent the opening and a second part adjacent the mouthpiece, said first part being conical and divergent away from the opening, said second part converging towards the mouthpiece, orifices being provided in said first part only, said orifices comprising 1–50% of the total surface area of the chamber, the total internal volume of the chamber being between 0.5 and 2.0 liters, the total length of the chamber being between 10 and 40 cm, the maximum diameter of the chamber being between 25 and 80% of its length, and the part of the chamber which has the maximum diameter being closer to the mouthpiece than to the opening.

4,174,713

DEVICE FOR PERMANENT REMOVAL OF HAIR

Thomas L. Mehl, 5821 Cypress Rd., Plantation, Fla. 33317

Continuation-in-part of Ser. No. 670,682, Mar. 26, 1976, abandoned. This application Sep. 28, 1977, Ser. No. 837,172
Int. Cl.[2] A61N *3/04*
U.S. Cl. 128—303.13 41 Claims



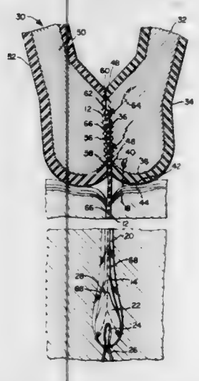
1. A hair removal device, comprising:
(a) two opposed relatively movable support members having lower end sections which are in position to engage each other
(b) each of the end sections having a substantially flat hair engaging surface adjacent and spaced from the periphery thereof
(c) at least one of the hair engaging surfaces being made of conductive material
(d) a high frequency energy wave source which is electrically connected to said one conductive hair engaging surface, and
(e) high frequency electrical wave insulative material bordering each of the hair engaging surfaces and disposed between the periphery thereof and the periphery of the end section which is of sufficient thickness to restrict lateral radiation from the hair engaging surfaces outwardly to the periphery of the end sections.

4,174,714

METHOD FOR PERMANENT REMOVAL OF HAIR

Thomas L. Mehl, 5821 Cypress Rd., Plantation, Fla. 33317

Continuation-in-part of Ser. No. 670,682, Mar. 26, 1976, abandoned. This application Sep. 28, 1977, Ser. No. 837,164
Int. Cl.[2] A61N *3/04*
U.S. Cl. 128—303.13 24 Claims



1. The method of removing hair and inhibiting future regrowth comprising the steps of:
(a) reducing hair length such that the end thereof is relatively close to the skin
(b) grasping the reduced length of hair between small area conductive hair engaging surfaces each one of which are mounted on one of two relatively movable arms which are covered with high frequency electrical insulation at the ends thereof, the hair engaging surfaces being adjacent to but spaced from the periphery of the insulated end portions
(c) moving the insulated end portions of the arms into engagement with the skin
(d) applying high frequency electrical waves to one of the small area conductive hair engaging surfaces, and
(e) holding the hair engaging surfaces in firm engagement in position against the hair while applying the high frequency electrical waves until the hair releases.

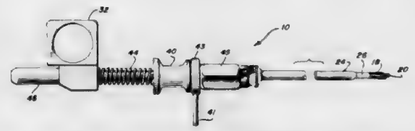
4,174,715

MULTI-PRONGED LAPAROSCOPY FORCEPS

Harrith M. Hasson, 345 Fullerton Pkwy., Chicago, Ill. 60614

Filed Mar. 28, 1977, Ser. No. 781,678
Int. Cl.[2] A61B *17/28*
U.S. Cl. 128—321 11 Claims

1. An improved forceps for use with a laparoscopy instrument of the type that includes elongated tubular guide means having a forward end, finger grip means secured to said guide means distally from said forward end, elongated stem means having a portion thereof slidable in said tubular guide means, and a thumb-operated actuator connected to said stem means for selectively moving said stem means longitudinally along said tubular guide means responsive to movement of the thumb-operated actuator toward and away from the finger grip means;
said improved forceps including a tubular sleeve as the forward portion of said tubular guide means, the elongated stem having a forward prong end arranged to move within the tubular sleeve toward and away from the forward end of said sleeve but with said forward prong end always positioned rearwardly of the forward end of the tubular sleeve, at least three elongated flexible forcep arms of resilient steel each having a base end thereof secured to the forward prong end of the elongated stem so that a portion of each forceps arm is at all times telescoped within the forwardmost portion of the tubular sleeve, each forcep arm being of a different length and having an inturned finger at the distal end thereof constructed and



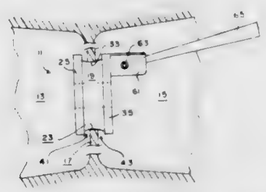
arranged so that when said fingers at the distal ends of the forcep arms are clustered closest together each finger lies adjacent and overlapping adjacent fingers but does not contact any other finger, said fingers when clustered closest together and overlapping being spaced forwardly of the forward end of the tubular sleeve, each forcep arm being biased to normally spring outwardly away from the other forcep arms when the elongated stem is projected forwardly, but being cammed by the extended end of the tubular sleeve to draw the distal ends of the forcep arms toward a clustered relationship when the elongated stem is moved rearwardly, and spring means operative associated with the finger grip means and thumb-operated actuator for normally biasing said elements apart and to tend to move the elongated stem rearwardly, the finger grip means on the rearward side thereof being recessed, and said spring means being an elongated coil spring one end of which enters the recessed rearward side of the finger grip means.

4,174,716

MYRINGOTOMY TUBE

Harry T. Treace, Forest Hill, Tenn., assignor to Richards Manufacturing Co., Inc., Memphis, Tenn.

Filed Dec. 19, 1977, Ser. No. 861,716
Int. Cl.[2] A61M *27/00*
U.S. Cl. 128—350 R 14 Claims



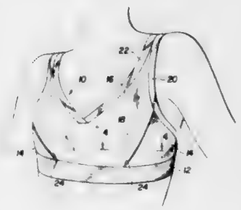
1. A myringotomy tube for providing ventilation and drainage of the middle ear through the external auditory canal, said myringotomy tube comprising a principal member having a passageway provided therein for communicating the middle ear with the external auditory canal subsequent to said principal member having been inserted through a surgical incision applied to the tympanic membrane, an inner flange member integrally combined with said principal member and being disposed at the innermost end thereof for precluding at least in part the inimical natural tendency of the healing incision to cause said myringotomy tube to be spontaneously extruded into the external auditory canal, and the external surface of said inner flange member being substantially elliptical shaped in cross-section as taken on a plane normal to said passageway for facilitating initial engagement thereof with a lip portion of the tympanic membrane defining the incision provided therein to establish optimum ease in the insertion of said myringotomy tube through the incision.

4,174,717

ATHLETIC BRASSIERE

Hinda S. Schreiber; Eugenie Z. Lindahl, both of Burlington, Vt., and Polly P. Smith, New York, N.Y., assignors to SLS, Inc., Burlington, Vt.

Filed Dec. 1, 1978, Ser. No. 965,381
Int. Cl.[2] A41C *3/00*
U.S. Cl. 128—494 9 Claims



1. An athletic brassiere, comprising:
at least one front panel disposed to cover the front of both breasts when worn, without seams in the vicinity of the nipples, said panel being substantially flat and not shaped to uplift the individual breasts when worn;
at least one side panel sewn to each side of said front panel such that the stitches of the seams are on the exterior surface of the panel away from the wearer when worn;
a wide elastic rib band connected to the bottom of said front and side panels and extending continuously around the body when worn, the front portion of said band being on the front of the wearer when worn and the back portion being on the back of the wearer when worn; and
two elastic straps, one of said straps being connected at one end thereof to said front panel on the right side of the wearer when worn and connected at the other end thereof to the back portion of said rib band on the left side of the wearer when worn, and the other of said straps being connected at one end thereof to said left front panel on the left side of the wearer when worn and connected at the other end thereof to the back portion of said rib band on the right side of the wearer when worn such that said straps cross in the back when worn.

4,174,718

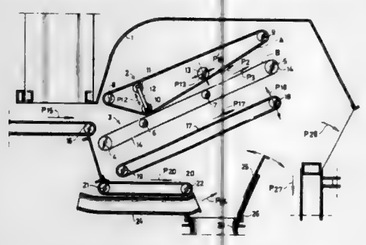
RUB-THRESHING MACHINE

Berend van de Weerd, Bennekom, Netherlands, assignor to Ter Borg & Mensinga's Machinefabriek N.V., Appingedam, Netherlands

Filed Nov. 17, 1977, Ser. No. 852,485
Claims priority, application Netherlands, Nov. 25, 1976, 7613173
Int. Cl.[2] A01F *12/18*
U.S. Cl. 130—30 J 12 Claims

1. Rub-threshing machine for threshing grains and pulse comprising at least two endless belts which have been passed in loop-shape around guiding- and driving rollers, are driven at different speeds and are in mutual contact over a part of their surface length so as to thresh material at that location which is

supplied to the belts, wherein at least the lower threshing belt is constructed of rod shaped elements, transverse with respect to the belt's direction of travel, and interconnected at their



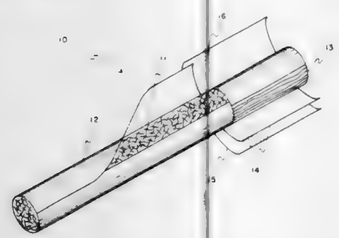
ends in such manner that the rods obtain a mutual spacing which is selected, according to the nature and fruit size of each sort of crop to be processed, such that the fruit can fall through the rods.

4,174,719

MICROPERFORATED FILTER TIP CIGARETTE

Richard H. Martin, and William F. Owens, Jr., both of Pisgah Forest, N.C., assignors to Olin Corporation, Pisgah Forest, N.C.

Filed Jun. 29, 1977, Ser. No. 811,046
Int. Cl.[2] A24B *15/02*; A24D *1/04*
U.S. Cl. 131—10 A **6 Claims**



1. A ventilated filter tip cigarette comprising in combination a filter enclosed by a uniformly porous wrapper having a Filtrona air permeability within the range of from 300 to 4000 units, a tipping envelope enclosing said enclosed filter containing a zone of microperforations, the size of each of said perforations being less than 0.01 mm^2 in open hole area, said wrapper and envelope adhered together over areas of their contiguous surfaces except in the area of the microperforations to permit ambient air to flow through the tipping perforations and porous wrapper, whereby the carbon monoxide yield in the smoke from the cigarette is selectively reduced over other smoke components resulting in a carbon monoxide to nicotine selectivity ratio of at least 3.

4,174,720

GLUE TRANSFER APPARATUS FOR CIGARETTE FILTERS

Floyd V. Hall, Durham, N.C., assignor to Liggett Group Inc., Durham, N.C.

Filed Apr. 26, 1977, Ser. No. 790,949
Int. Cl.[2] A24C *5/50, 5/52, 1/04*
U.S. Cl. 131—90 **8 Claims**

1. A method of forming a multi-sectional particulate-containing filter, said method comprising the steps of

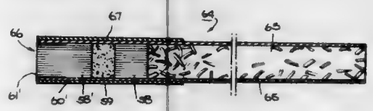
moving a stream of plug wrap paper through a predetermined path;

placing increments of glue on one side of the stream of plug wrap paper at predetermined spacings from each other;

moving a sequence of spaced apart filter sections onto the moving stream of plug wrap paper with alternate filter sections being disposed on the increments of glue;

subsequently depositing charges of particulate filter material onto the moving stream of plug wrap paper between adjacent filter sections;

thereafter wrapping the moving stream of plug wrap paper about the filter sections and charges of particulate filter material to form an endless rod;



severing the endless rod at each of said filter sections into a filter plug, said filter plug having a charge of particulate material flanked by severed filter sections with one of said filter sections being in contact with said glue and with one of said filter sections being free of said glue, and

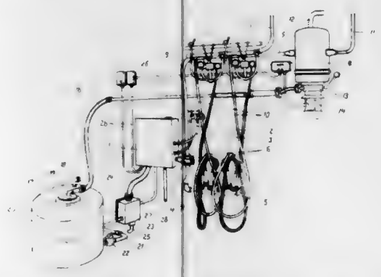
thereafter moving said filter section being free of glue towards said charge of particulate filter material and said filter section being in contact with said glue to compact the charge of particulate material.

4,174,721

APPARATUS FOR CLEANING MILKING SYSTEMS

Gunther R. Wuchse, Vienna, Austria, assignor to Alfa-Laval AB, Tumba, Sweden

Filed May 20, 1977, Ser. No. 798,941
Claims priority, application Sweden, May 21, 1976, 7605772
Int. Cl.[2] B08B *3/02, 9/08*
U.S. Cl. 134—58 R **5 Claims**



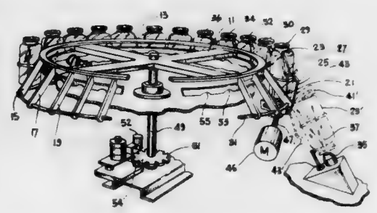
1. In a milking system, the combination of a milking means, a receptacle, a milk transport conduit connecting said milking means to the receptacle, a vacuum source communicating with the receptacle, a pump connected to the receptacle, a storage tank adapted to receive milk from the receptacle by way of said pump, said tank having a drain outlet, a sprayer for cleaning liquid opening into said tank, a control unit having a programmer for controlling a cleaning procedure, the control unit being connectable to said receptacle through said milk transport conduit, first duct means for connecting the pump selectively to either the control unit or said sprayer, discharge means, and second duct means for connecting said drain outlet selectively to either said receptacle or said discharge means.

4,174,722

CLEANING APPARATUS FOR SAMPLE CONTAINERS IN A QUEUE

Richard P. Fleenor, and Henry W. Cassady, Jr., both of Santa Cruz, Calif., assignors to Manning Environmental Corp., Santa Cruz, Calif.

Filed Jun. 23, 1978, Ser. No. 918,470
Int. Cl.[2] B08B *3/02*; B67C *1/00*
U.S. Cl. 134—62 **9 Claims**



6. An improved apparatus for washing containers, such as bottles or the like, comprising,

a hinged container holder having means for securing a container therein with a container opening facing generally upwardly,

a wash station having a nozzle means disposed beneath said holder for directing a washing fluid stream in a predetermined upward trajectory, and

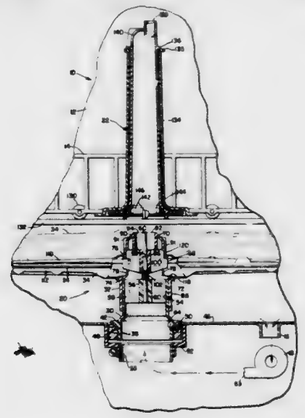
container inverting means for causing holder rotation about said hinge to a generally upside down container position, bringing a holder and the opening of a container secured therein into alignment with the fluid stream trajectory of said nozzle means and later for causing holder rotation about said hinge, restoring said holder to its initial position, said container inverting means comprising a pivotally mounted hook mounted near said wash station for rotatably engaging a holder and causing holder rotation about said hinge.

4,174,723

DISHWASHER WATER DISTRIBUTION APPARATUS

Olan L. Long, Grandview Heights, Ohio, assignor to Westinghouse Corporation, Pittsburgh, Pa.

Filed Oct. 16, 1978, Ser. No. 951,611
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—144 **20 Claims**



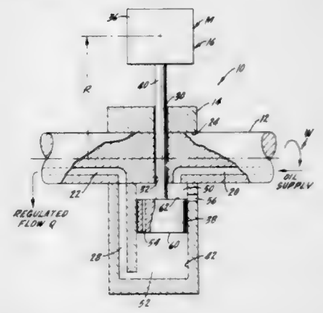
1. For use in a dishwasher, a wash arm installation comprising: a bladed, hollow wash arm with spray and reaction orifices; a distributor non-rotatably mounting said wash arm; a water inlet and distributor support unit adapted to be fixedly secured in the dishwasher; cooperating bearing means on said support unit and said distributor enabling rotation and axial shift and vertical removal of said distributor relative to said support unit; and clip means integral with said distributor structurally cooperating with said wash arm to releasably and non-rotatably secure said wash arm to said distributor.

4,174,724

FLOW VALVE

John J. Tuzson, Evanston, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jul. 11, 1977, Ser. No. 814,353
Int. Cl.[2] G05D *13/08*
U.S. Cl. 137—56 **3 Claims**



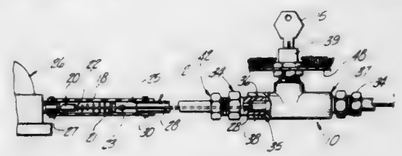
1. A flow valve comprising a rotating shaft, a valve body mounted on said shaft for rotation therewith, a valve member mounted for radial movement with respect to said body and said shaft, said valve member having a weighted head and a pressure differential head, a fluid cavity in which said pressure differential head is mounted, said pressure differential head dividing said cavity into a pair of chambers, an orifice between said chambers, a fluid inlet supplying fluid under pressure to one of said chambers, and a fluid outlet connected to the other of said chambers, in which said other chamber is radially outward of said one chamber, whereby the flow of fluid through said orifice and to said outlet will be proportional to the speed of rotation of said shaft.

4,174,725

ANTITAMPER ARRANGEMENT FOR A LOCKING FUEL SHUTOFF VALVE

Samuel LaPere, Wyandotte, Mich., assignor to Allen LaPere

Filed Jul. 18, 1977, Ser. No. 816,600
Int. Cl.[2] B60R *25/04*; F16K *17/36, 35/06*
U.S. Cl. 137—68 R **11 Claims**



1. An antitamper device for use in conjunction with an automotive vehicle fuel line shutoff valve, the arrangement comprising:

a blocking plug disposed within the fuel line movable between an open and closed position;

a resilient spring element engaged at one end with said blocking plug having the other end positioned within the fuel line;

means releasably restraining said blocking plug in said open position with said spring element compressed in said fuel line;

an element located in said fuel line at said closed position of said blocking plug cooperating with said plug to effect a fuel line blockage upon release of said means restraining said blocking plug and movement of said blocking plug to said closed position under urging of said compressed spring element;

said means releasably restraining said blocking plug element including a flexible element and also including means connecting said flexible element to said blocking plug, said flexible element extending through said fuel line, said means releasably restraining said blocking plug element including means anchoring one end of said flexible element proximate said fuel line shutoff valve in a position in which said blocking plug is positioned in said open position with said spring element compressed;

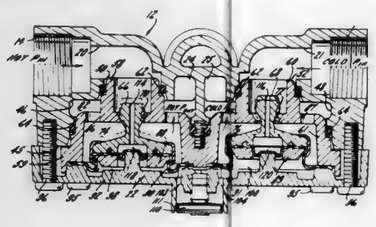
whereby cutting of said flexible element will allow movement of said blocking plug to said closed position to effect said fuel line blockage.

4,174,726

PRESSURE BALANCING VALVE

Don C. Arnold, Palatine; Julio D. Silletti, Rockford; Richard L. Ritzenthaler, Alden, all of Ill., and Thomas J. Wilcox, East Troy, Wis., assignors to Elkay Manufacturing Company, Broadview, Ill.

Filed Nov. 5, 1976, Ser. No. 739,082
Int. Cl.[2] C05D *11/00*
U.S. Cl. 137—100 **5 Claims**



1. A pressure equalizing valve means comprising:

housing means providing hot and cold water inlet members, valve means in each said inlet member,

a water chamber within said housing means associated with each said valve means and inlet member, each said valve means controlling flow of water received at one of said inlet members at supply pressure and regulating the pressure in the associated water chamber,

an outlet member for each water chamber,

said housing means having pressure equalizing means operated by the water pressure in both said water chambers and connected to operate each said valve means responsive to any pressure differential between said water chambers caused by changes in the supply pressure in either said inlet member, said pressure equalizing means including means in said housing means defining two hydraulic fluid chambers associated respectively with said water chambers, a pair of movable walls, one of said movable walls being mounted between each of said associated chambers and connected to said valve means, means including a restricted fluid passage between said hydraulic fluid chambers for transmitting hydraulically the movement of one movable wall, responsive to a change in pressure in the associated water chamber, to the other movable wall and inversely shifting the position of both valve means, to change the water chamber pressure regulated by each said valve means, with the magnitude and sense of the change reducing any such differential to zero and equalizing the pressures in said water chambers thereby to provide equal pressures from said outlet passage means with unequal water supply pressures, said two hydraulic fluid chambers and fluid passage between being sealed from the water supply and having a separate body of hydraulic fluid therein,

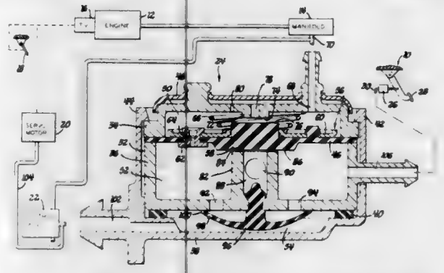
said valve means in each said inlet member comprising a valve seat, a valve member movable relative to each said valve seat, an element connecting each said valve member to one of said movable walls, and means for balancing each said valve member against changes in water supply pressure comprising a balancing chamber formed in said one movable wall, and passage means through said connecting element section between said balancing chamber and the inlet member, the diameter of said balancing chamber being substantially equal to the diameter of the valve seat so that the effective area of the valve member is substantially zero.

4,174,727

VACUUM LATCHING DUMP VALVE

John W. Riddel, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 8, 1978, Ser. No. 940,639
Int. Cl.[2] F02M *37/00*
U.S. Cl. 137—111 **2 Claims**



1. A vacuum dump latch and release valve assembly having a port adapted to be connected to a vacuum actuated member required to be selectively dumped to atmospheric pressure, said assembly also having means adapted to be connected to a source of vacuum and to atmospheric air pressure and to a dump valve openable to connect said assembly to atmospheric pressure and closable to disconnect said assembly from atmospheric pressure, said assembly comprising:

differential pressure responsive means having valve portions movable in response to opening of the dump valve to a condition connecting said port to atmospheric air pressure independently of subsequent closure of the dump valve;

said differential pressure responsive means being maintained in said condition in response to said atmospheric air pressure and at least one of said valve portions being so maintained at least partially in response to vacuum pressure from the vacuum source;

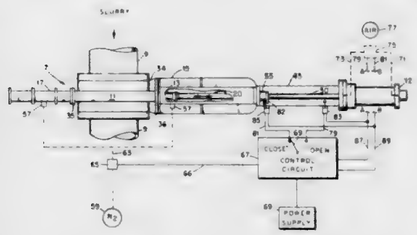
said one of said valve portions of said differential pressure responsive means also being responsive to a sufficient change in vacuum pressure from the vacuum source approaching atmospheric air pressure, with the dump valve closed, to cause said differential pressure responsive means to change to another condition to close said port against connection with atmospheric air pressure through said assembly, said differential pressure responsive means remaining in said another condition until said dump valve is again opened.

4,174,728

SLIDING-GATE VALVE

George B. Usnick, Birmingham; Gene T. Ward; Henry O. Blair, both of Sylacauga, all of Ala.; James W. Roberts, Charlotte, N.C., and Terry N. Warner, Wilsonville, Ala., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 14, 1977, Ser. No. 851,330
Int. Cl.[2] F16K *3/20*
U.S. Cl. 137—240 **6 Claims**



1. A valve assembly comprising:

a valve body defining a circular bore extending about a first axis and also defining opposed passages intersecting said bore and extending along a second axis substantially normal to the first;

an annular seat assembly coaxially fitted in said bore and defining a flow channel, said assembly comprising rings disposed along the first axis, said rings including first and second seat rings cooperatively defining an annular gap communicating with said passages to form a guideway extending along the second axis, the first seat ring being slidably and sealably engaged with said body, the second seat ring being supported by said body in an axially fixed position; and a third ring disposed outwardly of and bearing on the first seat ring, the third ring being fixed to said body against axial movement therein;

a valve casing supporting said body and including chambers extending in opposite directions from said body along the second axis, said chambers communicating respectively with said passages and being sealed from atmosphere;

a plate-type gate mounted for reciprocation in said guideway between positions where a portion of said gate closes said channel and where a generally circular aperture in said gate is in register with said channel, the third ring being cut away to receive slidable inserts for advancement toward said channel to displace the first seat ring toward said gate; and means respectively extending into said chambers for introducing therein purge gas at a pressure exceeding the pressure within said channel.

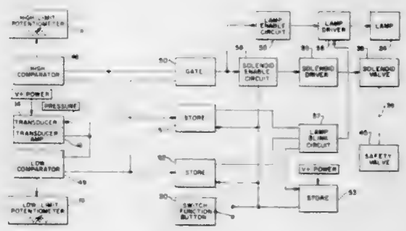
4,174,729

PRESSURE SENSING SAFETY DEVICE

James T. Roark, Carrollton, and Oliver W. McCracken, Richardson, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Feb. 25, 1977, Ser. No. 772,007
Int. Cl.[2] G05D *16/20*
U.S. Cl. 137—487.5 **6 Claims**

1. A safety device for monitoring and controlling the pressure in a pressure vessel comprising, in combination, a pilot device in operative engagement with the pressure vessel, a transducer mounted on the pilot device and communicating with the pressure vessel to sense the magnitude of the pressure within the pressure vessel, a source of power for the transducer, an amplifier electrically connected with the transducer to amplify electrical signals received therefrom, a first potentiometer adjustable to provide a first reference voltage corresponding to an upper limit of pressure desired in the pressure vessel, a second potentiometer adjustable to provide a second reference voltage corresponding to a lower limit of pressure desired in the pressure vessel, a first comparator circuit electrically connected with the first potentiometer and the transducer amplifier to compare the signals received therefrom and to provide a signal representing the magnitude of the pressure in the pressure vessel, a second comparator circuit electrically connected with the second potentiometer and the transducer to compare the signals received therefrom and to provide a signal representing the magnitude of the pressure in the pressure vessel, a gate receiving the output signal from the comparator circuits, a memory circuit for storing the signals received from the comparator circuits through the gate, a visual indicator electrically connected to the gate to receive the output of the comparator circuits for providing a visual display of the



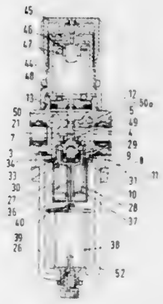
magnitude of the pressure in the pressure vessel; and including a circuit for controlling the operation of the visual display, the circuit being electrically connected to the memory circuit and the gate, a manually operable switch electrically connected to the memory circuit and the control circuit whereby operation of the manual switch in a first mode permits the visual display to indicate the present magnitude of pressure in the pressure vessel and operation of the switch in a second mode permits the visual display to indicate a prior magnitude of pressure in the pressure vessel when the signals stored in the memory circuit correspond to the magnitude of pressure above or below the predetermined desired levels or pressure in the pressure vessel.

4,174,730

HOUSING FOR AIR SERVICE UNITS

Roland Heilmann, Neuenhaus, Fed. Rep. of Germany, assignor to J. Lorch Gesellschaft & Co. KG, Waldenbuch, Fed. Rep. of Germany

Filed Jul. 12, 1977, Ser. No. 814,929
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1977, 7622478
Int. Cl.[2] E03B *7/07*
U.S. Cl. 137—271 **3 Claims**



1. A housing capable of being interchanged for use with air service units such as a water separator, a pressure regulating

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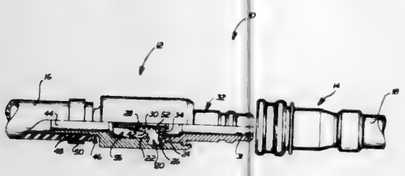
valve or a filter/pressure reducer, comprising, a body member in the form of a cube having first, second and third pairs of opposing sidewalls with each said pair being perpendicularly related to the other pairs, said body member having a flow passage with an inlet and an outlet thereof disposed co-axially and being respectively located in said first opposing sidewalls, a receiving chamber and a valve seat located in the path of said passage, said body member having a bore for guiding a valve body capable of engaging the valve seat for controlling the flow through said passage, a bayonet connection union and a screw connection union respectively located on said second opposing sidewalls, a snap connection member recessed within said cube and lying adjacent said bayonet connection and said receiving chamber, and a guide cylinder located on the other of said second opposing sidewalls adjacent said screw connection union.

4,174,731

EXCESS FLOW LIMITING VALVE

Malcolm B. Sturgis, St. Louis, Mo., and Harry H. Hammond, North Royalton, Ohio, assignors to The Hansen Manufacturing Company, Cleveland, Ohio

Filed Nov. 21, 1977, Ser. No. 853,194
Int. Cl.² F16K *17/26*
U.S. Cl. 137—489 **7 Claims**



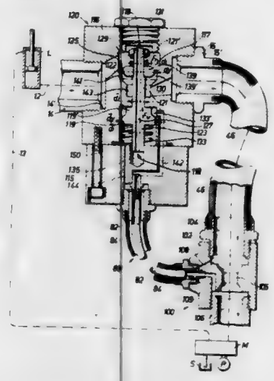
1. A plug assembly for use in association with a socket assembly to connect a pair of conduits in fluid communication with each other, said plug assembly comprising a plug body at least partially defining a valve chamber, said valve chamber having a first valve seat through which fluid normally flows into said valve chamber and a second valve seat through which fluid normally flows out of said valve chamber, said first valve seat being spaced apart from and extending generally parallel to said second valve seat, a longitudinally extending support member disposed in said valve chamber and fixedly connected with said plug body, a valve member slidably mounted on said support member and disposed in said valve chamber, said valve member being movable between a first closed position, an open position, and a second closed position, said valve member in said first closed position engaging said first valve seat and at least partially blocking fluid flow through said first valve seat, said valve member in said second closed position being spaced from said first valve seat and disposed in engagement with said second valve seat and at least partially blocking fluid flow through said second valve seat, and said valve member in said open position being disposed between and spaced apart from said first and said second valve seats to enable fluid to flow from said first valve seat around said valve member and through said second valve seat, spring means for urging said valve member toward said first closed position, said valve member being movable from said first closed position to said open position against the influence of said spring means, said valve member being movable from said open position to said second closed position against the influence of said spring means and under the influence of an excessive flow of fluid through said valve chamber to at least partially block the excessive flow of fluid, said valve member including first surface means for defining a passage extending axially through said valve member, said passage extending axially through said valve member from a first major side of said valve member to a second major side of said valve member at a location which is disposed inwardly of said first valve seat when said valve member is in said first closed position, said valve member further including second surface means defining a central passage extending through said valve member, said second surface means being disposed in sliding, abutting engagement with said support member and movable along said support member as said valve member moves between said first and second closed positions, said support member having an end portion extending through one of said valve seats to enable said valve member to move between said first and second closed positions and having a head connected with said end portion for limiting movement of said valve member relative to said support member during assembly of said plug assembly.

4,174,732

FLOW SENSING VALVE FOR PROTECTING CONDUIT SYSTEMS AGAINST UNINTENTIONAL PRESSURE CHANGES

Lennart W. Freese, Järfälla, Sweden, assignor to SMT-Pullmax AB, Gothenburg, Sweden

Filed Jan. 16, 1978, Ser. No. 870,007
Claims priority, application Sweden, Jan. 17, 1977, 7700415
Int. Cl.² F16K *17/32*
U.S. Cl. 137—498 **6 Claims**



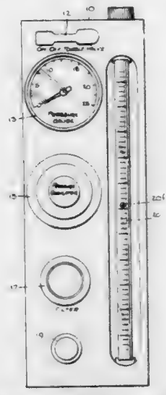
1. A valve arrangement for automatically stopping the flow of a medium through a conduit section on the occurrence of a rupture or leak in the section, the arrangement comprising a closing or blocking valve including a movable closure means mounted at the inlet of the conduit section, said valve normally being open and offering the medium flowing therethrough a resistance resulting in a first pressure drop (Δp_1) across the valve is response to the size of the flow, said first pressure drop being arranged to actuate the closure means for closure thereof; and a flow sensing means mounted at the outlet of the conduit section, including, for example, an orifice plate or venturi constriction known per se, between the inlet and outlet sides of which the medium flowing therethrough generates a second pressure drop (Δp_2) in response to the size of the flow, this second pressure drop being arranged to actuate the said closure means in the opposite direction to that of closure, the improvement wherein the closure means includes two parts, each movable in relation to the other and actuated by the said pressure drops (Δp_1, Δp_2), the first part consisting of a blocking body arranged for moving towards the closure position by the first pressure drop (Δp_1) across the blocking valve for blocking the flow through the valve when in said closure position, while the second part consists of a servo body arranged for actuation by the second pressure drop (Δp_2) across the flow sensing means to thereby in turn act on the blocking body to counteract its movement towards the closure position.

4,174,733

PROCESS GAS FLOW CONTROL MODULE

Paul G. Eidsmore, Saratoga, and Alva A. Eidsmore, Santa Cruz, both of Calif., assignors to Fischer & Porter Company, Warminster, Pa.

Filed Sep. 19, 1977, Ser. No. 834,507
Int. Cl.² F16K *37/00*
U.S. Cl. 137—552 **5 Claims**



1. A module which integrates in a single block a process gas flow control system adapted to precisely meter the flow of gas fed into a utilization device, said module comprising:

A. a block formed by a body which is chemically-inert with respect to the gas being metered, said body having open cavities therein for nesting the components of the system and a network of internal bores therein that communicate with the cavities to intercouple the components; and

B. system components removably nested in said cavities and intercoupled by said network of internal bores, said components including an adjustable pressure-regulator to set the pressure of the gas received from an inlet fitting, an on-off toggle valve to control the passage of gas from said inlet fitting to said regulator, a gas filter interposed between the toggle valve and said regulator, a pressure gauge coupled to the regulator to indicate the set pressure, a metering valve to adjust the flow rate of the regulated gas from the regulator to an output fitting and a flowmeter of the variable area type interposed between the metering valve and the outlet fitting to indicate the flow rate, said flowmeter having a meter tube nested in one of said cavities and held in place by said outlet fitting which is removable to permit removal of said tube, said internal bores having stub extensions terminating in ports on the surface of the block and sealed by removable plugs to permit cleaning of the bores.

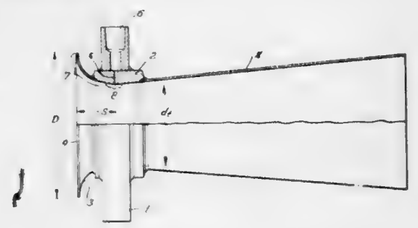
4,174,734

FLUID FLOW METERING TUBE WITH MINIMUM PRESSURE ENERGY LOSS

Allen C. Bradham, III, Milwaukee, Wis., assignor to First Wisconsin National Bank of Wisconsin, Milwaukee, Wis.

Filed Mar. 13, 1978, Ser. No. 886,000
Int. Cl.² F16D *1/02*
U.S. Cl. 138—39 **3 Claims**

1. In a full pipe primary element flow tube comprising an inlet section, a throat section and a recovery section, the improvement wherein the stream-defining internal contour of said inlet section is that which produces a constant rate of acceleration of flow of the fluid in flowing through said inlet section, the profile of said inlet section being defined by the following equation:



$$d_i = \sqrt{\frac{1}{\frac{1}{D^2} + \left[\frac{1}{d_f^2} - \frac{1}{D^2}\right]\sqrt{\frac{S_i}{S}}}}$$

wherein

D=section contour inlet diameter (essentially pipe diameter)

d_f=section contour outlet diameter (essentially throat diameter)

S=section contour length

S_i=increment of contour length (distance from inlet of section contour)

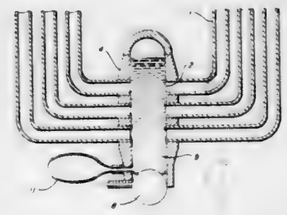
d_i=diameter of contour at increment S_i.

4,174,735

METHOD OF TEMPORARILY SEALING OPEN ENDS OF FLUID CONDUITS TERMINATING IN A HEADER SPACE

Dirk M. Visbach, Rijswijk, Netherlands, assignor to B.V. Neratoom, The Hague, Netherlands

Continuation-in-part of Ser. No. 597,461, Jul. 21, 1975, abandoned. This application Dec. 29, 1976, Ser. No. 755,206
Claims priority, application Netherlands, Dec. 31, 1975, 7515226
Int. Cl.² F28F *11/00*; F16L *55/18*
U.S. Cl. 138—97 **9 Claims**



1. A method of temporarily sealing vacuum-tight a multiplicity of elongated fluid transport conduits to permit detection of leaks in said conduits, said transport conduits having unobstructed open first ends terminating in a common header space, the method comprising:

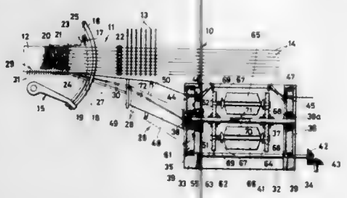
completely filling the header space from a level below the lowest open first end to a level above the highest open first end of the multiplicity of fluid transport conduits with a sealing material in liquid form in sufficient quantity to cover the open first ends;

subsequently causing the sealing material to solidify, thereby sealing the first end of each transport means with said solidified sealing material;

reliquefying said sealing material after completing detection and repair of leaks in said conduits; and

removing said reliquefied sealing material from the header space.

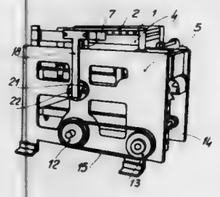
4,174,736
APPARATUS FOR MANUFACTURING A SLIDE FASTENER STRINGER HAVING A WOVEN COILED COUPLING ELEMENT
Kihei Takahashi, and Seiko Terada, both of Uozu, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan
Filed Nov. 3, 1978, Ser. No. 957,556
Claims priority, application Japan, Nov. 9, 1977, 52/134363
Int. Cl.[2] D03D *41/00*
U.S. Cl. 139—35 **9 Claims**

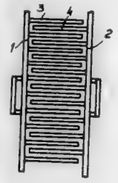


1. An apparatus for manufacturing a slide fastener stringer including a stringer tape, woven of warp and weft threads, and a coiled fastener element woven into the stringer tape along a longitudinal edge thereof, comprising:
(a) means for weaving the stringer tape, said means including means for shedding warp threads and a filling carrier for inserting a weft thread through the warp shed;
(b) a mandrel for extending substantially along the warp threads, said filling carrier being reciprocable across said mandrel; and
(c) a rotor assembly for winding a monofilament in an orbital path to form the fastener element coiled around said mandrel and woven into the tape by the weft thread, said rotor assembly comprising a housing, a wheel rotatably mounted in said housing and having means for guiding the monofilament, a floating axle around which said wheel is rotatable, said mandrel being supported on said axle, a pair of first and second plungers operatively acting between said axle and said housing across said orbital path by which said axle is held at all times stationarily with respect to said housing, one of said plungers being retractable at a time out of said orbital path, and means for rotating said wheel.

4,174,737
MECHANICAL DEVICE FOR MOVING THE LIFTERS OF THE WEAVING MACHINES
Benedetto Bobbio, Via Giotta, 8, Rovellasca (Como), Italy
Filed Mar. 23, 1978, Ser. No. 889,245
Claims priority, application Italy, Mar. 31, 1977, 21927 A/77
Int. Cl.[2] D03C *3/06*
U.S. Cl. 139—65 **5 Claims**

1. In a weaving machine, which comprises lifters, a mechanical device or assembly for moving, upwardly and downwardly, said lifters, which comprises two horizontal bars provided, at the respective adjacent sides, with a series of cantilevered parallel teeth inserted into one another and with vertical guides sliding in respective seats fixed to the side walls of the device; each horizontal bar being articulated to one end of a connecting rod which is at its opposite end eccentrically pivoted to a rotating disc, each horizontal bar being also fixedly connected to one end of a vertically extending bar, the free end of which slides in a guide provided on each side wall of the



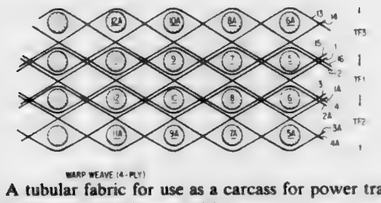


device and having its longitudinal axis slanted with a variable slant.

4,174,738
TUBULAR EDGED BELTING AND METHOD OF MAKING
Johann Berger; Josef Berger, both of Obere Schlosstrase 114, 7071 Alfdorf, Fed. Rep. of Germany, and Konstantin Papageorgion, Urbach, Fed. Rep. of Germany, assignors to Johann Berger and Josef Berger, both of Aldorf, Fed. Rep. of Germany
Filed Apr. 25, 1978, Ser. No. 900,009
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1977, 2719382
Int. Cl.[2] D03D *3/00, 5/00*
U.S. Cl. 139—384 R **4 Claims**

1. A method of making belting on a ribbon band weaving machine having knitting means, said belting having a woven central portion and first and second tubular edge portions each on one edge of said central portion, comprising the steps of:
(a) forming the first tubular edge portion with warp and weft threads,
(b) first weaving the second tubular edge portion as a single layer fabric, having an outside edge,
(c) knitting a course defining a joint along the edge of said central portion and said outside edge with two loops of a tuck thread each having a head held by one pick loop of the weft thread and a neck held by the knitting course, and
(d) closing the second tubular edge portion by pulling the said one pick loop of the weft thread while feeding a length of tuck thread more than sufficient to form said joint and correspondingly less weft thread.

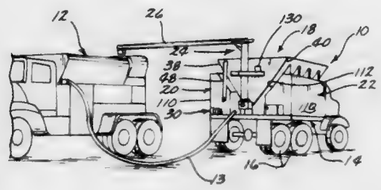
4,174,739
TUBULAR FABRIC
Lawrence J. Rasero; John Pelchuck, Jr., both of Middletown, and Gordon H. Howard, Andover, all of Conn., assignors to Fenner America Ltd., Middletown, Conn.
Filed Feb. 21, 1978, Ser. No. 880,120
Int. Cl.[2] D03D *3/02*
U.S. Cl. 139—388 **4 Claims**



WARP WEAVE (4-PLY)

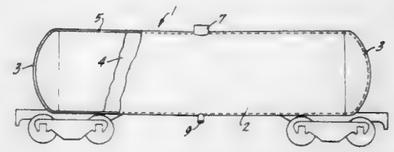
1. A tubular fabric for use as a carcass for power transmission and conveyor belts comprising:
(a) a plurality of longitudinal yarns;
(b) a plurality of transverse yarns interwoven with said longitudinal yarns;
(c) said longitudinal and transverse yarns forming a warp weave wherein said transverse yarns form adjacent pairs having upper yarns and lower yarns and said longitudinal yarns pass above a first upper yarn of a first pair of transverse yarns, between a second upper yarn and a second lower yarn of a second pair of transverse yarns adjacent the first pair, below a third lower yarn of a third pair of transverse yarns adjacent the second pair, and between a fourth upper yarn and a fourth lower yarn of a fourth pair of transverse yarns adjacent the third pair; and
(d) said longitudinal yarns forming first, second, third and fourth substantially parallel planes; said transverse yarn forming fifth, sixth, seventh and eighth substantially parallel planes; said first and second planes binding said fifth plane and said eighth plane; and said third and fourth planes binding said sixth plane to seventh plane.

4,174,740
METHOD AND APPARATUS FOR SUPPLYING INGREDIENTS TO A CONCRETE MIXER
Hugh J. Tobler, 103 N. Kenwood, Indianola, Iowa 50125
Filed Aug. 21, 1978, Ser. No. 935,534
Int. Cl.[2] B65B *1/04*
U.S. Cl. 141—1 **10 Claims**



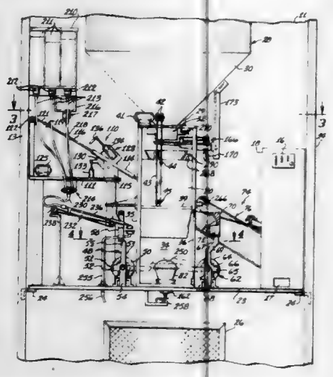
1. A mobile device for supplying ingredients to a concrete mixer, said device comprising:
a vehicle having wheels rotatably mounted to a vehicle frame and supporting said vehicle frame for rolling movement;
a cement container mounted on said vehicle frame, said cement container having a top wall, a pair of opposite side walls, a bottom wall and a pair of opposite end walls, said side walls converging toward one another as they extend downwardly from said top wall to said bottom wall;
one of said end walls having an outlet opening adjacent the lower end thereof adjacent said bottom wall;
a first auger conveyor mounted within said container adjacent said bottom wall and extending along the length of said bottom wall, one end of said first conveyor being adjacent said outlet opening, said conveyor being rotatable to carrying cement out through said outlet opening;
cement fluffing means positioned below said first auger conveyor, said fluffing means being connected to a source of compressed air and being capable of introducing said compressed air into said container from below said first auger conveyor whereby said first compressed air fluffs the cement around said first conveyor and inhibits packing of said cement during movement of said vehicle;
external conveyor means located outside said cement container and connected to said outlet opening of said cement container for carrying cement from said container to a concrete mixer;
said container having an inlet opening therein for permitting the introduction of cement into said container,
said container sidewalls first converging towards one another adjacent their lower ends and then flaring outwardly away from one another at the lowermost portions of their lower ends, wherein said first auger conveyor is positioned adjacent the point where said sidewalls begin flaring outwardly.

4,174,741
METHODS FOR LOADING AND UNLOADING LIQUIDS FROM A RAILROAD TANK CAR
James D. Parsons, Munster, and Jerome A. Sivak, Hammond, both of Ind., assignors to Union Tank Car Company, Lincolnshire, Ill.
Filed Aug. 10, 1978, Ser. No. 932,892
Int. Cl.[2] B65B *3/06*
U.S. Cl. 141—2 **10 Claims**



1. The method of loading an enclosed container which has its interior changeable into different chambers for non-compatible liquids by a flexible diaphragm that alternately lines opposite portions of such container, comprising the steps of:
A. emptying the liquid from said container and flowing air at atmospheric pressure into the chambers on both sides of said diaphragm;
B. sealing one of said chambers so as to trap air at atmospheric pressure on one side of said diaphragm;
C. venting the opposite side of said diaphragm to the atmosphere and flowing liquid into the chamber on said opposite side in such manner that the trapped air on said one side of said diaphragm is displaced by rising liquid, said displaced air moving the upper portion of said diaphragm in one direction while the rising liquid moves the lower portion of said diaphragm in the opposite direction, whereby said diaphragm is stretched out in tension as it is moved upwardly into contact with said container;
D. after said container is partially filled with liquid, releasing said trapped air by venting said one side of said diaphragm to the atmosphere;
E. continuing to load liquid into said container; and
F. sealing both of said chambers when the loading of said container is complete.

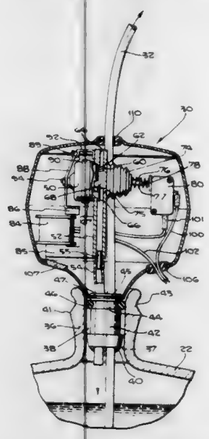
4,174,742
METHOD AND APPARATUS FOR MAKING AND DISPENSING SNOW CONES
James D. Murphey, 2438 W. Butler, Phoenix, Ariz. 85021
Filed Feb. 8, 1978, Ser. No. 875,982
Int. Cl.[2] B65B *1/04, 43/42*
U.S. Cl. 141—11 **18 Claims**



1. A machine for making snow cones comprising:
(a) a cabinet;
(b) a compartment in said cabinet, said compartment having a cup retaining structure upstandingly mounted therein;
(c) cup delivery means in said cabinet adjacent said compartment for delivering a cup to the cup retaining structure in said compartment;
(d) a collar means for collecting and retaining ice mounted in said cabinet adjacent said compartment, said collar means reciprocally movable into said compartment to a position which upstandingly circumscribes the rim of the cup when delivered thereinto;
(e) on ice making machine in said cabinet;
(f) an ice delivery mechanism in said cabinet adjacent said ice making machine and reciprocally movable into said compartment for delivering ice from said ice making machine into the cup when delivered thereto and into said collar means when circumscribingly positioned relative thereto;
(g) a capper means mounted in said cabinet adjacent said compartment and reciprocally movable into said compartment to a position above said cup retaining structure so that when ice is deposited in the cup and in said collar means, said capper means will form the ice into a dome configuration extending above the rim of the cup;
(h) a reservoir for containing flavored syrup in said cabinet; and
(i) syrup delivery means mounted in said cabinet and coupled to said reservoir, said syrup delivery means reciprocally movable into said compartment above the cup retaining structure, said syrup delivery means actuatable to deposit a predetermined amount of flavored syrup onto the dome of ice when formed on the cup.

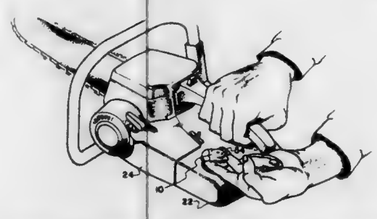
4,174,743
SYSTEM FOR TRANSFERRING WATER
Janos Beny, 23775 Madison St., Torrance, Calif. 90505, and Albert M. Herzig, 700 N. Rexford Dr., Beverly Hills, Calif. 90210
Filed Nov. 21, 1977, Ser. No. 853,498
Int. Cl.[2] B67D *5/54;* **B65B** *3/04*
U.S. Cl. 141—18 **11 Claims**

1. A water supply system adapted for utilization with a water dispensing system having a water reservoir and a dispensing faucet comprising in combination, a housing means which carries a stopper member adapted for insertion into the neck of a water bottle, pump means in the housing for pumping air and tubular means connected to the pump and extending through the said stopper so as to communicate with the interior of the water bottle, further tubular means extending through the stopper, further means to which the end of said further tubular means extends, said last means being constructed to be



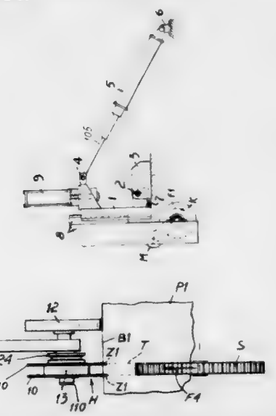
carried by the said water reservoir and including a float valve means for controlling flow from said further tubular means, said pump means being actuatable to pump air into the water bottle for forcing water from the water bottle into the water reservoir under control of the float valve means said further tubular means being a single tube extending from said housing to said further means.

4,174,744
CONTAINER CLOSURE WITH COMPARTMENT
James R. Houghton, 34485 Kirkpatrick Rd., R.R. 3, Mission, British Columbia, Canada (V2V4J1)
Filed Apr. 25, 1978, Ser. No. 899,978
Int. Cl.[2] B65B *3/06*
U.S. Cl. 141—98 **7 Claims**



1. A container enclosure adaptable for direct detachable coupling to the inlet of a liquid fuel tank, which enclosure provides for subsequent discharge into said tank when so desired by user, together with means to serve as funnel for the purpose of pouring liquid fuel directly into said fuel tank, which enclosure is fitted with indicia means for measuring a fixed volume of lubricant that may be subsequently added into said tank, with
said enclosure formed with a bottom outlet opening, said outlet opening of a size and shape to attach about the mouth of the inlet of a liquid fuel tank such as a tank of an internal combustion engine powered saw, and with
said enclosure formed with a top inlet opening of a substantially greater area than the area of the bottom outlet opening with said container formed with a hollow interior chamber that communicates with said outlet opening and said inlet opening so that the container serves as a funnel for pouring of liquid fuel into said inlet opening and out of said outlet opening into the mouth of an attached liquid fuel tank, together with
removable means in said interior chamber to block communication between the interior of the chamber and the bottom inlet opening so that liquid stored in said interior chamber serves as a reserve supply of fuel to the attached tank when the said communication is blocked by said means, together with
a cover detachably mounted to the enclosure which is shaped to close the top inlet opening.

4,174,745
DEVICE FOR MAKING A GROOVE IN THE EDGE OF A PANEL
Gino Benuzzi, 5, Via Angelo Custode, Bologna, Italy (40100)
Filed Sep. 19, 1977, Ser. No. 834,351
Claims priority, application Italy, Sep. 20, 1976, 12796 A/76; May 13, 1977, 12604 A/77
Int. Cl.[2] B27C *9/00*
U.S. Cl. 144—1 R **3 Claims**



1. In a sawing machine for cutting panels and the like, of the type in which said panels are supported on a horizontal supporting table and a main circular saw effects the cutting in a vertical plane and moves across said supporting table along a horizontal cutting line, a device for making at least one groove or incision in the edge of said panels at the line of entry or of exit of said circular saw into or respectively out of said panels, comprising
(a) a grooving saw arranged in a vertical plane in alignment with said cutting plane of said main circular saw;
(b) means for moving said grooving saw in said vertical plane against and along said edge to effect its working stroke, and for withdrawing said grooving saw to a rest position remote from said edge, above or below said panel; and
(c) feeler means for guiding said grooving saw in its working stroke, said feeler means comprising a feeler roller which follows the contour of the edge of said panel and guides said grooving saw along a path corresponding to said contour.

4,174,746
PILE SIZER
Brooks Walker, 1280 Columbus Ave., San Francisco, Calif. 94133, and James Williamson, P.O. Box 93, Tahoe City, Calif. 95730
Filed Oct. 31, 1977, Ser. No. 847,057
Int. Cl.[2] B27C *5/00*
U.S. Cl. 144—134 R **4 Claims**

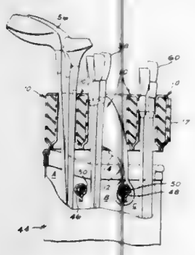


1. Apparatus for reducing the lateral extent or diameter of the top portion of a submerged pile comprising:
a vertically disposed elongated tube adapted to be positioned with its upper end above water level and its lower end below water level.
a pile cutter at the lower end of said tube,
an elongated shaft rotatably supported within said tube and connected to said cutter at its lower end,
motor means mounted on the upper end of said tube for driving said shaft,
an elongated vertically extending anchor member adapted to be secured at its lower end to the upper end of said pile,
means connecting said tube to said anchor member permitting orbital movement of said tube and cutter about said pile, and
means permitting vertical movement of said last mentioned means and said tube, shaft and motor means automatically as a unit relative to said anchor member during said orbital movement.

4,174,747
GOLF CLUBS RESTRAINER MEANS FOR USE WITH GOLF BAG
Richard J. Boles, Louisville, Ky., assignor to Crest Circle, Inc., Louisville, Ky.
Filed Nov. 13, 1978, Ser. No. 960,305
Int. Cl.[2] A63B *55/00*
U.S. Cl. 150—1.5 R **11 Claims**

1. A golf clubs restrainer means for use in the top opening of a golf bag for the padded protection of a set of golf clubs, said restrainer comprising:
(a) a narrow, elongated strap of flexible material having resilient padding means for much of the length thereof;
(b) and a plurality of complementary fastening means provided along the strap;
(c) a first anchoring means formed by certain of the said fastening means adjacent the starter end of the strap and

adapted for attaching the strap to an anchoring means of a golf bag;



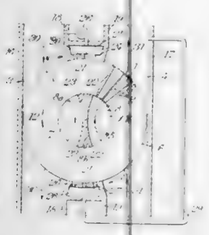
(d) a complementary set of said fastening means being adjacent both the finish end and the midsection of the strap for fastening this finish end to the main body of the strap.

4,174,748

HEAT-EXCHANGER WITH ROTOR HAVING RADIAL PASSAGES

René Denjean, Pavillons-sous-Bois, France, assignor to Air Industrie, France

Filed Dec. 2, 1977, Ser. No. 856,632
Claims priority, application France, Dec. 7, 1976, 76 36797
Int. Cl.[2] F28D *19/00*
U.S. Cl. 165—5 4 Claims



1. A dynamic heat-exchanger for exchanging heat between fumes of combustion and combustive air, said heat-exchanger comprising:

two circulation ducts, respectively for fumes and combustive air,

an annular rotor extending into both said circulation ducts, said rotor having a disengaged central space, said rotor having an outer and an inner cylindrical surface, a dividing wall located in and dividing said central space and extending parallel to the two said circulation ducts, the rotational axis of said rotor being perpendicular to the direction of extension of said two circulation ducts, at least immediately adjacent said rotor,

substantially radial passages provided in said rotor so as to connect said outer cylindrical surface to said inner cylindrical surface so that fumes and combustive air flow radially through said rotor in one sector and in another sector of said rotor, respectively,

two spaced apart outer sealing zones provided on said outer cylindrical surface of said rotor,

a respective inner sealing zone for each said outer sealing zone and being provided on said inner cylindrical surface of said rotor, and

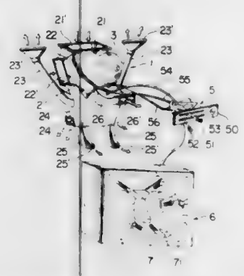
fluid jet cleaning means provided for blowing in the passages of the rotor, this blowing taking place between respective first facing outer and inner sealing zones, said fluid jet cleaning means being connected to take fumes from upstream of the exchanger and to blow these fumes in said passages of said rotor when said passages pass from said fume circulation duct to said combustive air circulation duct.

4,174,749

AIR CONDITIONING DISPLAY SYSTEM FOR VEHICLES

Hideo Oishi, Okazaki, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1978, Ser. No. 881,783
Int. Cl.[2] F28F *27/00*
U.S. Cl. 165—11 34 Claims



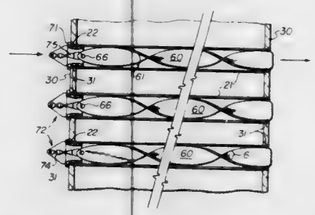
1. An air conditioning display system for a vehicle comprising a vehicle's air conditioner proper including at least a plurality of air intake ducts, a plurality of air discharge ducts, a plurality of dampers disposed in said ducts for closing and opening said ducts, and a fan unit, air conditioner actuating means for actuating at least said dampers and said fan unit in said air conditioner proper thereby introducing and discharging air into and out of said air conditioner proper, and a display device mounted in said vehicle and including a display panel carrying the picture of the vehicle body portions at least around the front seat and displaying the flowing patterns of air out of said air conditioner proper on the portions of said display panel corresponding to the vehicle body portions at which air flows out of said air conditioner proper in response to the manipulation of said air conditioner actuating means.

4,174,750

TUBE CLEANER HAVING ANCHORED ROTATABLE SPIRAL MEMBER

Billy M. Nichols, 21422 Park Rock La., Katy, Tex. 77450

Filed Apr. 18, 1978, Ser. No. 897,382
Int. Cl.[2] F28G *3/00, 15/08*
U.S. Cl. 165—94 2 Claims



1. A tube cleaning device for use in a heat exchanger comprising:

a plurality of tubes adapted to have a fluid pass therethrough; and

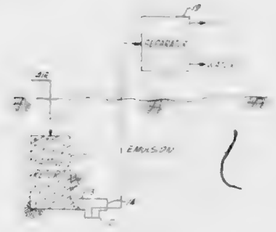
rotatable means for preventing contaminant build-up on the interior wall provided each of said tubes, said rotatable means comprising a spiral having one end rotatably anchored by anchoring means to the upstream end of an associated tube, said anchoring means including a plug fixed to said upstream end and swivel means linking said plug and said rotatable means.

4,174,751

METHOD OF BREAKING SHALE OIL-WATER EMULSION

Leslie E. Compton, Claremont, Calif., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jan. 23, 1978, Ser. No. 871,368
Int. Cl.[2] E21B *43/24;* E21C *41/10;* B01D *17/04*
U.S. Cl. 166—256 23 Claims



18. A method for recovering shale oil from an in situ oil shale retort in a subterranean formation containing oil shale, said in situ oil shale retort containing a fragmented permeable mass of particles containing oil shale, comprising the steps of:

retorting oil shale in the fragmented permeable mass and producing an emulsion of shale oil and water;

withdrawing emulsion of shale oil and water from the retort;

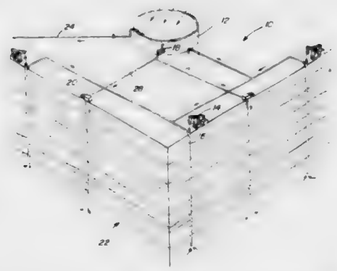
maintaining a volume of such emulsion of shale oil and water at a bulk temperature of at least about 120° F., and subjecting portions of such emulsion to momentary, localized heating to temperatures substantially above the bulk temperature of the volume of emulsion until shale oil and water are substantially separated.

4,174,752

SECONDARY RECOVERY METHOD AND SYSTEM FOR OIL WELLS USING SOLAR ENERGY

Frank W. Slater, P.O. Box 186, and Dale Fuqua, P.O. Box 247, Star Route, both of Durant, Okla. 74701

Filed Jan. 24, 1978, Ser. No. 871,966
Int. Cl.[2] E21B *43/24;* F24J *3/02*
U.S. Cl. 166—303 8 Claims



1. A method for secondary recovery of crude oil from an oil formation, comprising the steps of:

disposing a halogenated hydrocarbon working fluid into heat absorbing relation to a source of heat energy to heat the working fluid;

circulating the heated working fluid into heat exchanging relation with the quantity of crude oil to heat the crude oil; and

injecting at least portions of the heated crude oil into the oil formation to reduce the viscosity of the crude oil in the oil formation in at least localized portions thereof, thereby to allow a greater recovery of crude oil from the formation.

4. Apparatus for the secondary recovery of crude oil from an oil formation, comprising:

a storage tank for temporarily holding crude oil, the storage tank acting as heat exchange system having a working fluid circulating within a closed loop circulatory system for transferring heat to the crude oil from the working fluid;

means for heating the working fluid in the storage tank; and

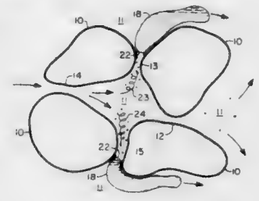
pump means for injecting at least portions of the heated crude oil into the oil formation to reduce the viscosity of the crude oil in the oil formation in at least localized portions thereof, thereby to allow greater recovery of crude oil from the formation.

4,174,753

WELL STIMULATION BY TWO-PHASE FLOW

John W. Graham, 210 County Rd. 147, Rte. 5, Box 58, Alvin, Tex. 77511

Filed Sep. 7, 1977, Ser. No. 831,162
Int. Cl.[2] E21B *43/27, 43/122*
U.S. Cl. 166—307 11 Claims



1. A method for treating a porous subterranean formation which comprises injecting, under matrix rates and pressures, a non-emulsified intimate mixture of an aqueous liquid forming a continuous phase and a fluid forming a discontinuous phase into said formation to cause two-phase flow through at least a portion of the porous formation, said mixture being substantially free of surface-active agents tending to form emulsions, said aqueous liquid comprising at least 60 volume percent of said mixture and being substantially immiscible with said fluid and being capable of wetting formation materials.

4,174,754

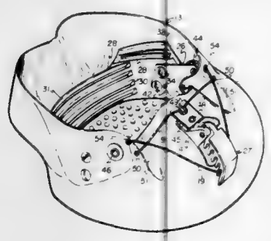
ADJUSTABLE BOOT TYPE COMPOSITION HORSESHOE

Neel W. Glass, Cuyamungue, N. Mex., assignor to Les-Kare, Inc., Santa Fe, N. Mex.

Filed Dec. 16, 1977, Ser. No. 861,286
Int. Cl.[2] A01L *3/00, 5/00*
U.S. Cl. 168—18 3 Claims

1. An improved composition molded shoe for horses comprising a sole and integral walls conforming in shape to a horse's foot, a re-entrant fold on each side of the front shoe wall having the fold creases lying in the plane substantially that of the front of the hoof, a pair of brackets symmetrically located and affixed to the shoe upper portions rearward of and proximate the re-entrant folds, each of said brackets being generally rhombic shaped and adapted to be affixed inside the shoe side walls, a cable engaging grooved means affixed to each of said brackets at a front upper portion, a plurality of inwardly and downwardly inclined teeth on the lower edge of

said brackets, a elongated composition strap having downwardly inclined serrations positioned inside the shoe in approximately a semi-circle around the inside of the rear part of the shoe, means attaching the ends of the strap to the shoe side walls and the brackets, a continuous loop binding cable, a pair of vertically spaced apertures in each front portion of the shoe side wall located to be tangential, substantially to the top and



bottom of cable engaging grooved means, a cable anchoring bracket affixed to the upper midpoint of the shoe front wall, means affixing the cable to said bracket, said cable then dividing to the right and to the left of the front of the shoe, passing into the shoe through the lower apertures, engaging the cable engaging grooved means, passing out of the shoe through the upper apertures for engagement with over-center buckle means.

4,174,755

AGITATOR ASSEMBLY FOR A FRUIT-VINE SEPARATOR

Michael P. Siri, Palo Alto, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Feb. 1, 1978, Ser. No. 874,296
Int. Cl.[2] A01D *33/02*
U.S. Cl. 171—27 **5 Claims**



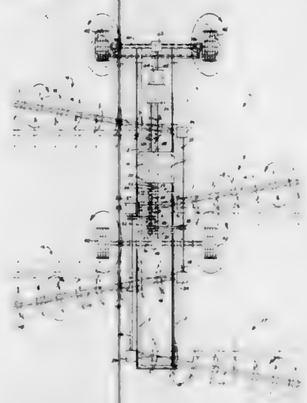
1. An agitator assembly for use in combination with an apparatus for separating fruits such as tomatoes from the vines of the plant, the separating apparatus being of the oscillatory type including a pair of longitudinally extending side frame members, a pair of shafts mounted transversely between the front and rear ends of the side frame members, a plurality of parallel endless conveyors having spaces therebetween through which separated fruits may fall and parallel reaches for conveying the vines, said conveyors being supported on said shafts, means for synchronously oscillating said side frame members in fore-and-aft directions parallel to said conveyors, and means for simultaneously continuously driving said conveyors in a direction of travel, said agitator assembly comprising: a member mounted transversely between said side frame members below said reaches of said conveyors; and a plurality of agitator bars rigidly mounted to said transverse member in parallel relationship and at intervals aligned with the spaces between said conveyors; each agitator bar having an upstream face which is upwardly inclined in said direction of travel of the conveyors at a selected acute angle relative to the conveyor reaches and with the upstream faces of said agitator bars extending above the conveyor reaches, whereby the vines on the conveyors are lifted as the vines are conveyed in said direction of travel and are dropped back onto said conveyors as they move over the agitator bars to hence facilitate the movement of the fruit downwardly through the vines.

4,174,756

SELF-PROPELLED DISK HARROW MACHINE

Kermit M. De Haai, R.R. 1, Monroe, Iowa 50170

Filed Apr. 3, 1978, Ser. No. 892,675
Int. Cl.[2] A01B *9/00*
U.S. Cl. 172—55 **8 Claims**



1. A self-propelled disk harrow comprising:
a frame;
a plurality of wheels rotatably attached to said frame, the forwardmost of said wheels being spaced longitudinally from the rearwardmost of said wheels by at least one-half the operable length of the frame;
means rotatably mounting a plurality of ground engaging disc members to said frame for causing said disc members to carry substantially all of the weight of said disk harrow during normal tilling operations, said disc members extending a substantial distance below said wheels when said disk harrow is in a ground tilling position;
means operatively attached to said frame for rotating said disc members to thereby propel said disk harrow and till the ground;
means operatively attached to said frame for rotating all of said wheels at substantially the same speed as the rotational speed of said disc members whereby if said disc members extend into the ground more than said substantial distance, a substantial amount of the weight of the disk harrow will transfer to said wheels to help propel the disk harrow and prevent it from becoming stuck.

4,174,757

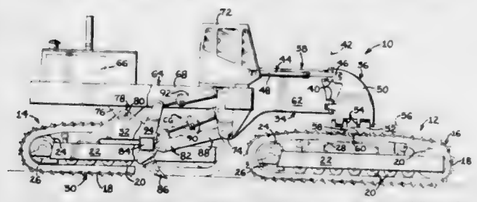
MATERIAL RIPPING VEHICLE

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 3, 1977, Ser. No. 839,049
Int. Cl.[2] A01B *35/14;* **B62D** *55/00*
U.S. Cl. 172—292 **14 Claims**

12. A vehicle (10) comprising:
a frame (34) including a rear portion (38) and a front portion (36);
a first pair of track-type undercarriage assemblies (16) connected to said front portion (36);
a second pair of track-type undercarriage assemblies (30) connected to said rear portion (38) and being spaced laterally apart;
an operator's station (72) connected to said rear portion (38);
a power plant (66) connected to said rear portion (38); and

a work implement (82) connected to said rear portion (38) and being located substantially longitudinally between



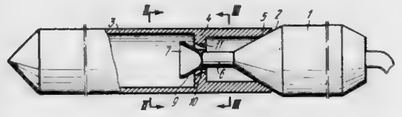
said operator's station (72) and said power plant (66) and substantially laterally between said second pair of track-type undercarriage assemblies (30).

4,174,758

PERCUSSIVE ACTION PNEUMATIC DEVICE FOR DRILLING HOLES IN SOIL

Alexandr D. Kostylev; Nikolai P. Chepurnoi; Vladimir D. Plavskikh, and Evgeny N. Cherednikov, all of Novosibirsk, U.S.S.R., assignors to Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR, U.S.S.R.

Filed Jan. 4, 1978, Ser. No. 866,864
Int. Cl.[2] E21B *11/02*
U.S. Cl. 175—19 **2 Claims**



1. A pneumatic device for making holes in soil by compaction thereof comprising, a driving cylindrical impact housing having a conical head portion, a tubular tip releasably mounted axially forwardly of said housing, said tip having a conical point and an internal transverse partition to which said housing is releasably connected for driving of said tip axially by said impact housing, said conical head portion extending inwardly of said tubular tip, said tip having a tail portion open to receive said conical head portion and on which said housing seats, connection menas on said conical head portion for releasably connecting said housing to said partition, said partition having a central opening for inserting said connection means therethrough and rotating it in one direction for connecting to said partition after insertion of said connection means into said opening.

4,174,759

ROTARY DRILL BIT AND METHOD OF FORMING BORE HOLE

Donald P. Arbuckle, 1203 18th St., Golden, Colo. 80401

Filed Sep. 19, 1977, Ser. No. 834,656
Int. Cl.[2] E21B *7/18*
U.S. Cl. 175—67 **82 Claims**

1. A rotary drill bit for cutting an axially advancing bore hole by rotation at a drill face of the bore hole, comprising:
a drill bit body, said drill bit body comprising a plurality of axle shafts extending radially toward the axis of rotation of said drill bit;
at least one breaking wheel attached for rotation on each axle shaft to traverse a path concentric with the axis of rotation of said drill bit when rotated in contact with the drill face of the bore hole, at least a few of said breaking wheels are positioned to traverse essentially different paths concentric with the axis of rotation, and
fluid jet means, positioned on said drill bit body radially adjacent at least one breaking wheel, for cutting a plurality of different concentric slots concentric with the axis of rotation when said drill bit is rotated, each pair of radially



adjacent concentric slots defining edges of one concentric path traversed by at least one breaking wheel.

4,174,760

SCALE CONSTRUCTION

Donald B. Curchod, San Jose, Calif., assignor to Nortron Corporation, Sunnyvale, Calif.

Filed Nov. 30, 1977, Ser. No. 855,894
Int. Cl.[2] G01G *3/14*
U.S. Cl. 177—211 **9 Claims**



1. A scale construction comprising a pair of substantially rigid plates disposed in spaced relation one above the other, said plates defining spaced load-bearing planes, semi-rigid flexure members connected between the ends of said plates to support one plate spaced from the other, said members being disposed at a common oblique angle to the load bearing planes to define a parallelogram when taken with said planes, strain gauge means carried by one of said flexure members, and means responsive to said strain gauge means serving to indicate the weight of a body disposed in weight transfer relation to the top one of said plates.

4,174,761

RUNNING TRAVEL MANEUVERING APPARATUS FOR AN ENGINEERING WORK VEHICLE

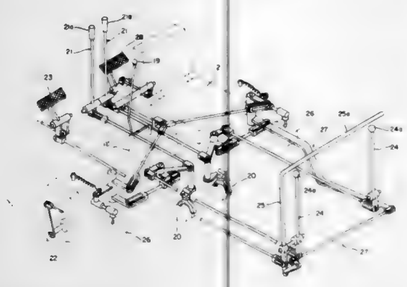
Hideaki Matsuyoshi; Yukio Shimono, both of Sakai; Yuji Tsutsui, Osaka; Shigeru Miyuki, Sakai; Takao Watanabe, Osaka, and Hideaki Mizota, Sakai, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Mar. 23, 1978, Ser. No. 889,589
Claims priority, application Japan, Apr. 18, 1977, 52-49076[U]
Int. Cl.[2] B62D *11/08*
U.S. Cl. 180—6.7 **5 Claims**

1. An earth handling vehicle capable of moving in opposite directions comprising a chassis supported relative to the earth by laterally disposed drivable track mechanisms and steering clutches therefor, said chassis further including an engine transmission, gearshift lever therefor and maneuvering apparatus comprising front and rearwardly disposed interconnected actuators associated with a main clutch means that is drivably connected to said transmission, one each front and rearwardly disposed interconnected steering levers connected to said steering clutches, each of said steering levers provided with

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hand grip portions, further wherein said rearwardly disposed actuator further includes a portion that extends transversely of



said vehicle and in close proximity to said hand grip portions of said steering levers.

4,174,762

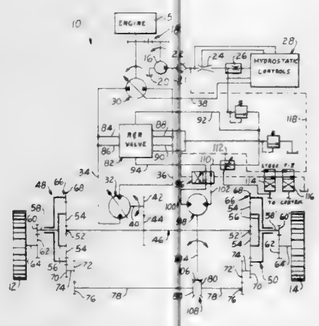
HYDROSTATIC TRANSMISSION WITH DIFFERENTIAL STEERING

Donald L. Hopkins, Joliet, and Gordon W. Johnson, Dunlap, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 764,946, Feb. 2, 1977, abandoned. This application Apr. 3, 1978, Ser. No. 893,202

Int. Cl.[2] B62D *11/06*

U.S. Cl. 180—6.44 **8 Claims**



1. A drive and steering system for a vehicle having a pair of tracks comprising:

a hydrostatic transmission having a hydrostatic fluid motor;

means operatively coupling the hydrostatic motor and tracks, to drive the tracks of the vehicle;

hydrostatic control means for controlling said hydrostatic fluid motor;

another fluid motor;

means for selectively communicating pressurized fluid to the another motor to selectively drive the another motor, wherein said communicating means (i) is provided in fluid communication with said hydrostatic fluid motor such that the fluid driving said hydrostatic fluid motor can also selectively drive said another motor and (ii) is operatively associated with said hydrostatic control means; and

means operatively coupling the another motor and at least one of the tracks for providing a relative differential movement between the tracks different from the relative driving movement thereof provided by the hydrostatic fluid motor.

4,174,763

DRIVE CONTROLLING MECHANISM

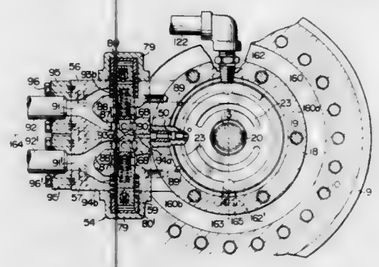
Kiyozumi Fukui, Gifu, Japan, assignor to Teijin Seiki Company Limited, Osaka, Japan

Continuation-in-part of Ser. No. 750,537, Dec. 14, 1976, Pat. No. 4,114,737. This application May 5, 1978, Ser. No. 903,044

Claims priority, application Japan, Dec. 18, 1975, 50-171224[U]

Int. Cl.[2] B62D *11/08*

U.S. Cl. 180—6.48 **20 Claims**



1. A crawler type travelling vehicle comprising in combination:

an endless belt including a number of segments flexibly connected with each other to crawl on the earth;

a sprocket wheel drivably engageable with said endless belt and having an axial wheel bore extending axially thereof;

a motor housing inserted in said axial wheel bore to rotatably support said sprocket wheel through two bearings with the mid-circumferential plane of said sprocket wheel positioned between the mid-circumferential planes of said bearings;

a fixed frame positioned axially inwardly of said sprocket wheel to securely support said motor housing and having an axial frame bore in axial alignment with said axial wheel bore;

a hydraulic motor accommodated in said motor housing and having a rotary shaft;

a reduction gear unit positioned axially outwardly of said sprocket wheel and within the width of said endless belt to operably be connected with one end portion of said rotary shaft in driving engagement with said sprocket wheel;

a control block disposed within the width of said endless belt and securely connected with the axially inner face of said motor housing to rotatably receive the other end portion of said rotary shaft; and

a pair of inlet-outlet passages in fluid communication with said hydraulic motor to allow fluid under pressure to pass therein for imparting rotation of said hydraulic motor.

4,174,764

STEERING COLUMN SWITCH MOUNTING

Erich Mutschler, and Adam Weber, both of Bietigheim-Bissingen, Fed. Rep. of Germany, assignors to SWF-Spezialfabrik für Autozubehör Gustav Rau GmbH, Fed. Rep. of Germany

Filed Aug. 11, 1975, Ser. No. 603,381

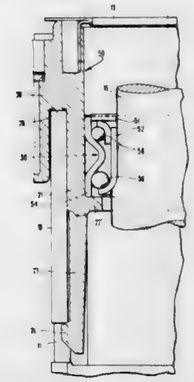
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1974, 2438653

Int. Cl.[2] B60K *26/00*; **H01H** *3/16*

U.S. Cl. 180—78 **10 Claims**

9. A steering column switch mounting for use in association with a steering column having a steering tube arranged around the exterior thereof in spaced relation thereto, comprising a switch base plate member having an inner cylindrical sleeve portion engageable between the steering tube and the steering column and a portion extending outwardly from the top of said cylindrical sleeve portion over the top of the steering tube and a portion extending exteriorly of the steering tube forming a

switch base plate, said cylindrical sleeve portion having at least one elastic strip with a locking stud formation which is biased



into locking engagement with the steering tube at a predetermined location from the top of the steering tube.

4,174,765

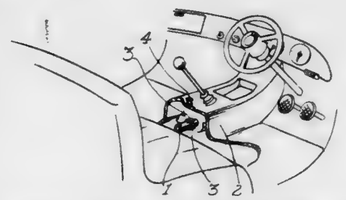
VEHICLE CONTROL SPEED SENSING METHOD

John H. Moshal, 2A Menston Rd., Westville, Natal Province, and Alan B. Murray, 12 Forest Dr., Forest Hills, Kloof, Natal Province, both of South Africa

Filed Jul. 21, 1976, Ser. No. 707,342

Int. Cl.[2] B60K *31/00*

U.S. Cl. 180—313 **9 Claims**



1. A method of generating an electrical signal proportional to the road speed of a vehicle comprising setting up a specific magnetic field in association with a normally unmagnetized component of the vehicle which rotates at a speed proportional to the road speed of the vehicle, the rotation of said component causing variations in said magnetic field, and sensing said variations in the magnetic field by means of a signal generating sensor including a coil, said signal generating sensor located entirely on one side of a ferromagnetic member which is disposed between said component and signal generating sensor, and amplifying the signal generating sensor output signal through a high gain amplifier.

4.174,766

SPEED SHIFT INDICATOR

Thomas A. Kalogerson, Minneapolis, Minn., assignor to Kaltron Company, Inc., Minneapolis, Minn.

Filed Jul. 27, 1978, Ser. No. 928,514

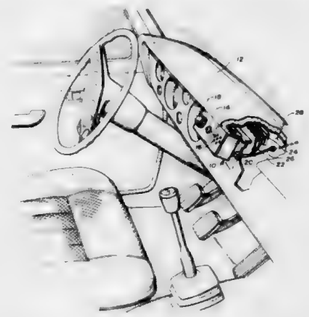
Int. Cl.[2] B60K *23/00*

U.S. Cl. 340—52 D **11 Claims**

1. A speed shift indicating device for a vehicle driven by an internal combustion engine having an ignition system, the vehicle having a manually controlled transmission, the speed shift indicating device comprising:

trigger means for receiving an input electrical signal having a repetition rate indicative of engine RPM and providing trigger pulses in response to the input electrical signal;

timer means having an output which has first and second states, the timer means output switching to the first state in response to a trigger pulse and remaining in the first state only for a first time period unless another trigger pulse is received before the end of the first time period;



adjusting means for adjusting the first time period;

annunciator means to indicate, when energized, the need to shift the transmission; and

annunciator control means for energizing the annunciator means only if the timer means output remains in the first state for at least a second time period greater than the first time period.

4,174,767

AIR-LINE LUBRICATORS AND THE LIKE

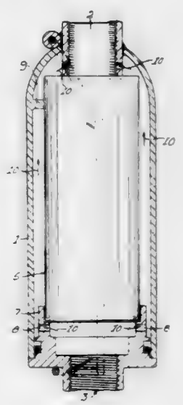
Petrus H. Kramer, Krugersdorp, South Africa, assignor to West Rand Engineering Works (Proprietary) Limited, Transvaal, South Africa

Filed Nov. 10, 1976, Ser. No. 740,359

Claims priority, application South Africa, Nov. 13, 1975, 75/7139

Int. Cl.[2] F16N *7/32*

U.S. Cl. 184—55 A **5 Claims**



1. A removable refillable container holding lubricant for use in an air-line lubricator employing pressurized fluid, said refillable container comprising a relatively rigid sleeve having a closure at one end thereof and an aperture through said end forming a passage through which the lubricant can pass out of

or into said container, said sleeve having an open rear end, a flexible sock having a mouth portion anchored to the side of said sleeve forming an expandable chamber for holding said lubricant, and a toe extending toward said open end of said sleeve, said flexible sock separating said chamber from said pressurized fluid while urging said lubricant out of said chamber through said aperture, said sock having a body length sufficient to permit substantial exhaustion of the lubricant from the sleeve, said aperture and said flexible sock cooperating to receive lubricant to refill said chamber to form a newly charged grease containing chamber to be reused in said lubricator.

4,174,768

CALIPER CARRYING STRUCTURE FOR TILTING TYPE DISC BRAKE

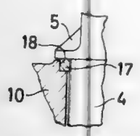
Fumio Takemori, Iwatsuki, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1978, Ser. No. 885,976

Claims priority, application Japan, Mar. 16, 1977, 52-31920[U]

Int. Cl.[2] F16D *55/224*

U.S. Cl. 188—72.3 **7 Claims**



1. A tilting type disc brake comprising: a rotatable disc to which said brake is applied; a support shaft having a longitudinal axis oriented parallel to a plane defined by a side of said disc and a shaft part and a flange part; a pair of friction pads disposed on both sides of said disc; a caliper provided with pushing means which acts to push one of said pair of friction pads against one side of said disc and a reaction part which pushes the other of said friction pads against the other side of said disc by reaction to the action of said pushing means, said caliper also having an opening through which the shaft part of said support shaft is inserted for mounting said caliper on said support shaft for pivoting movement between a resting position and a pivoted position; and a single elastic ring fitted in a circumferential groove formed in the edge of said opening of said caliper with one side face thereof being disposed and arranged in the axial direction of said shaft part of said support shaft to engage the flange part of said support shaft and with the inner circumferential face thereof arranged to engage said shaft part, said elastic ring being arranged to normally hold said caliper resiliently in the axial direction of said shaft part with a clearance between the edge of the opening of said caliper and the flange part of said support shaft and being capable of bringing said caliper back from said pivoted position to said resting position thereof when the brake is released from a braking operation.

4,174,769

DISC BRAKE AND A RESILIENT CLIP FOR SUCH A BRAKE

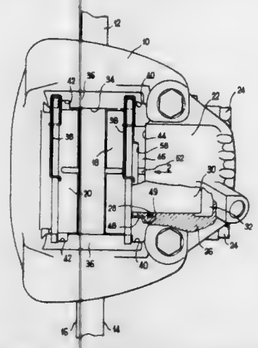
Jean L. Gerard, Paris, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Mar. 3, 1978, Ser. No. 883,100

Int. Cl.[2] F16D *65/02*

U.S. Cl. 188—73.6 **11 Claims**

1. In a disc brake, a rotary disc having a pair of friction faces; a pair of friction pads, each of said friction pads being located adjacent one of said friction faces; a fixed member; a caliper member carried by said fixed member and straddling said disc; brake operating means associated with the caliper member so as to urge at least a first of said pads directly into frictional engagement with the corresponding friction face of the disc; said brake operating means comprising movable piston means capable to occupy an idle position when the brake is released, an operating position closer to the disc than the idle position when the brake is applied, and a retracted position further from the disc than the idle position; said caliper member being provided with at least one aperture permitting extraction of said first pad when said piston means are in their retracted position; at least one detachable member normally located between said first pad and the caliper to prevent said first pad from moving back opposite said aperture whatever the position occupied by the piston means; the caliper defining a surface substantially



parallel to the friction faces of the disc and facing said first pad, the detachable member being inserted between said surface and said first pad; said brake operating means further comprising a housing defining a cylinder portion receiving said piston means, said surface being formed on the housing around an end of the cylinder portion closer to the disc; and said cylinder portion comprising an annular extension running towards the disc from said surface, the detachable member being a resilient clip which at least partly embraces an outer peripheral surface of said annular extension, said resilient clip being adapted to be extracted parallel to the friction faces of the disc.

4,174,770

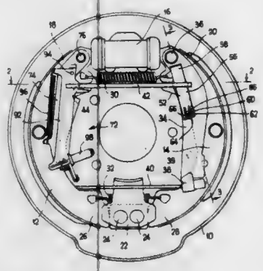
DRUM BRAKE

Pierre Courbot, Villiers le Bel, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Mar. 3, 1978, Ser. No. 883,064

Int. Cl.[2] F16D *65/56*

U.S. Cl. 188—79.5 P **17 Claims**



1. In a drum brake:
a rotary drum;
a pair of brake shoes, each of said shoes carrying wearable friction linings;
a fixed support having a fulcrum block receiving two adjacent ends of said shoes;
brake operating means located between two other ends of said shoes and adapted to urge the latter toward the rotary drum;
a handbrake lever pivoted on one of said shoes in the vicinity of the operating means;
spacer means located between the shoes in the vicinity of the operating means, and capable to be engaged by the handbrake lever to urge said shoes toward the rotary drum;
abutment means between said one shoe and said lever to define an idle position of the lever, said abutment means being disengageable from the one shoe by tilting the lever away from the first shoe around an axis substantially perpendicular to the pivotal axis of the lever;
resilient means provided to normally hold the lever in its idle position;
said spacer means comprising a spacer and self-adjusting means adapted to increase the distance between said other ends of the shoes when idle on wear of the friction linings; and
said resilient means being inserted between the spacer and the handbrake lever so as to urge the latter toward the one shoe in a direction substantially parallel to the drum axis.

4,174,771

FRICTION CLUTCH

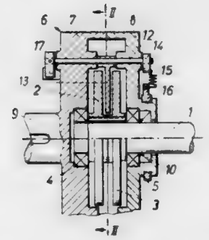
Manfred Hirt, Munich, Fed. Rep. of Germany, assignor to Carl Hurth Maschinen- und Zahnradfabrik, Munich, Fed. Rep. of Germany

Filed Aug. 10, 1977, Ser. No. 823,424

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1976, 2636741

Int. Cl.[2] F16D *35/00, 43/25, 43/14*

U.S. Cl. 192—58 B **16 Claims**



1. In a friction clutch having at least one rotatable first friction member connected to a first clutch half and at least one rotatable second friction member connected to a second clutch half, a liquid, wherein the torque is transmitted by said liquid from said first friction member onto said second friction member, the improvement comprising wherein said first friction member is connected rotationally fixed to said first clutch half and has a first surface thereon, wherein said second friction member includes at least one segment having a second surface thereon parallel to said first surface, said first and second surfaces lying in axially spaced planes perpendicular to the axis of rotation of said first and second friction members, said segment being movably supported in the torque-transmitting vicinity of said first friction member on said first clutch half and includes stop means for limiting movement of said segment in a direction toward a first position wherein said first and second surfaces are opposed, the spacing between said first and second surfaces being such as to effect a shearing of said liquid to effect a drive between said segment and said first friction member.

4,174,772

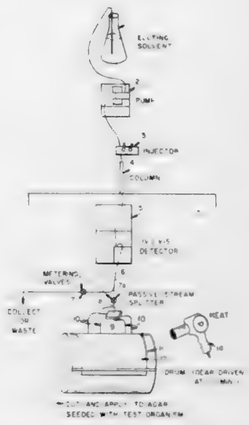
APPARATUS AND METHOD FOR COORDINATING CHROMATOGRAPHIC SEPARATION (HPLC) WITH UV/VIS ABSORBENCY VALUES AND WITH BIOAUTOGRAPH TEST RESULTS

Norbert Neuss, Indianapolis, and Roger D. Miller, Mooresville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 28, 1977, Ser. No. 865,278

Int. Cl.[2] C12K *1/04*

U.S. Cl. 435—32 **7 Claims**



1. An apparatus for coordinating UV/VIS absorbency values of a stream of eluate from a chromatographic column, said eluate having constituents therein with antimicrobial activity, with antimicrobial activity against a plurality of test organisms which comprises:
(a) a UV/VIS spectrophotometer for continuously monitoring the absorbency values of said eluate stream flowing continuously therethrough;
(b) a conduit connected at one end to said spectrophotometer and at the other end to a pair of parallel metering valves;
(c) a conduit connected to the discharge side of the first of the two metering valves and at the other end to a stream splitter, and a conduit connected to the discharge side of the second metering valve and at the other end to a waste disposal;
(d) a stream splitter connected to the conduit from said first metering valve and which divides the eluate stream from said valve into a plurality of independent eluate streams;
(e) a plurality of conduits each of which is connected at one end to said stream splitter at an outlet to receive one of the plurality of eluate streams from said stream splitter and the other end of which is open and disposed immediately above the drum of (f);
(f) a drum having affixed thereto a piece of absorbent material around the circumference of said drum, said drum disposed below the conduits of (e); and
(g) means to rotate said drum.

4. A method for coordinating UV/VIS absorbency valves of a stream of eluate from a chromatographic column, said eluate having constituents therein with antimicrobial activity, with bioautograph test results against a plurality of test organisms comprising:
(a) passing said eluate stream continuously through a UV/VIS spectrophotometer for continuously monitoring the absorbency values of said eluate stream;
(b) conveying the eluate stream exiting the UV/VIS spectrophotometer to a pair of parallel metering valves;
(c) adjusting said parallel metering valves so that the eluate

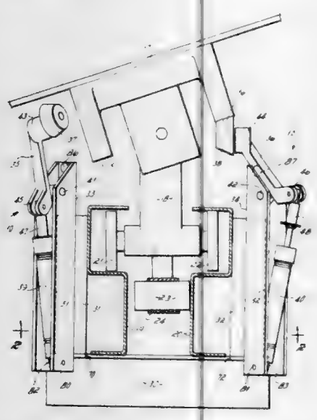
stream passing through the first of said valves is directed to a stream splitter and the eluate stream passing through the second of said valves is directed to a waste disposal;
(d) conveying the stream of eluate from said first metering valve to a stream splitter;
(e) splitting the stream of eluate from (d) into a plurality of streams of essentially equal volume;
(f) conveying each of said eluate streams from (e) to a separate point on a piece of absorbent material affixed to a drum adapted to be rotated;
(g) rotating said drum at a rate that allows each eluate stream to be absorbed in a narrow band on said absorbent material;
(h) evaporating the solvent from the absorbent material;
(i) dividing the absorbent material into strips whereon one of the eluate stream was absorbed;
(j) contacting each of the strips from (i) with a bioautograph media containing one desired test organism;
(k) incubating the bioautograph media; and
(l) relating the UV/VIS absorbency values with the test results shown on the incubated bioautograph media.

4,174,773

SORTATION CONVEYOR TIP-UP AND MOUNTING APPARATUS

Charles E. Venzke, New Berlin, Wis., assignor to A-T-O Inc., Willoughby, Ohio

Filed Jul. 19, 1977, Ser. No. 817,055
Int. Cl.[2] B65G *47/38*
U.S. Cl. 198—365 **20 Claims**



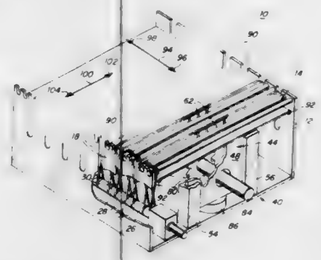
9. Tip-up apparatus for a sortation conveyor including:
an elongated support means adapted for connection to a sortation conveyor;
at least one upstanding angle means having a lower end mounted on said support means, said angle means having an apex directed outwardly of a sortation conveyor when assembled thereto, and legs opening toward said conveyor;
a U-shaped channel mounting bracket having two opposed legs and a web mounted on one of said angle means legs;
a crank arm pivoted to said bracket;
an actuating roller mounted on one end of said crank arm; and
actuating means connected to said crank arm for pivoting said crank arm and said roller into operative position with respect to said sortation conveyor, said crank arm pivoting in a plane at an angle to said sortation conveyor when assembled thereto,
said actuating means having an end mounted to said mounting bracket.

4,174,774

FOUR-WAY DIVERTING CONVEYOR

Ronald D. Bourgeois, 138 Ellison Park, Waltham, Mass. 02154

Filed Jan. 30, 1978, Ser. No. 873,242
Int. Cl.[2] B65G *47/00, 47/34*
U.S. Cl. 198 **5 Claims**



1. A modular positive drive high-speed response diverting conveyor unit comprising:
a support structure;
a static conveyor including a plurality of spaced rollers mounted in said support structure;
a drive apparatus disposed within said support structure for continuously driving said rollers;
a main direction control device for operating said drive apparatus to drive said rollers to convey selectively in the forward and reverse direction;
a support frame and a mounting structure carried on the support structure for slidably supporting said support frame; said mounting structure including spaced slides for slidably receiving a slide member carried by said support frame;
a dynamic roller conveyor having parallel sets of raised laterally spaced flights and a drive chain section carried by said support frame;
a drive system mounted on said support frame for continuously driving said roller conveyor;
a transverse direction control device for operating said drive system to drive said roller conveyor to convey selectively in the left and right directions; and
actuator means mounted on said support structure for moving said support frame selectively up to insert said flights interstitially of said rollers to divert conveyed goods from the main direction and down to withdraw said flights and allow goods to continue in the main direction.

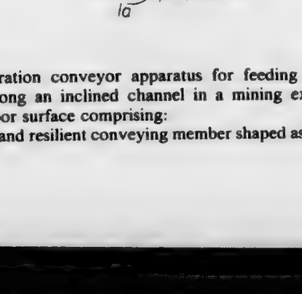
4,174,775

APPARATUS FOR CONTINUOUSLY ORIENTING PLASTIC AND OTHER TYPES OF BOTTLES

Hugh P. McKnight, Indianapolis, and Kenneth B. Welty, Mooresville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 20, 1977, Ser. No. 789,056
Int. Cl.[2] B65G *47/24*
U.S. Cl. 198—397 **2 Claims**

1. An apparatus for the continuous high-speed orientation of randomly oriented plastic and other types of bottles having a transverse axes ratio of from about 1.5:1 to 1 comprising:
(a) a stationary receptacle for holding randomly oriented bottles;
(b) a rotatable round randomly oriented bottle feeding element, said feeding element spatially disposed immediately below said receptacle and cooperating and in communication therewith;
(c) a rotatable round delivery element connectedly disposed immediately below said feeding element, said delivery element comprised of a plurality of vertically disposed tubes cooperating and in communication with said feeding element, and means for regulating the delivery of individual bottles from said feeding element to an orienting element;
(d) a rotatable round orienting-plate disposed immediately below said delivery element and connected thereto, said orienting-plate having vertical holes therein for receiving the bottles being oriented, each of said vertical holes having a vertical portion exposed at the exterior of said orienting plate with a width sufficient for discharge of bottles therethrough and having an inwardly protruding stop at the bottom thereof which stops and holds a bottle either by its base or its shoulder;
(e) means for engaging the neck of a bottle stopped in said vertical hole by the shoulder and moving said bottle by



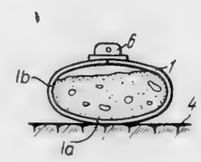
the neck approximately 180° to an upright position while said bottle is disposed in said vertical hole, said means comprising a reorienting rail stationarily spatially disposed with respect to the orienting-plate, said bar beginning at a point immediately below the orienting-plate and inboard of the circumference of the vertical holes in the orienting-plate and directed gradually outwardly until it comes outboard of the orienting-plate and is then directed upwardly until it terminates at a position higher than the orienting-plate immediately before said bottles are discharged from the orienting-plate;
(f) means for discharging the bottle from said vertical hole; and
(g) means for effecting a synchronized rotation of said feeding element, delivery element, and orienting-plate.

4,174,776

VIBRATION CONVEYOR APPARATUS

Vladimir I. Kreimer, ulitsa Dershavina, 46, kv. 52; Anatoly Y. Tishkov, ulitsa Dershavina, 19, kv. 67; Vitaly M. Grigoriev, ulitsa Tankovaya, 49, kv. 7; Ljudmila I. Gendlina, ulitsa Pisareva, 4, kv. 64, and Leonid V. Zimonin, ulitsa Borisa Bogatkova, 247, kv. 10, all of Novosibirsk, U.S.S.R.

Continuation of Ser. No. 531,335, Dec. 10, 1974, abandoned.
This application Oct. 1, 1976, Ser. No. 728,777
Int. Cl.[2] B65G *27/00*
U.S. Cl. 198—771 **2 Claims**



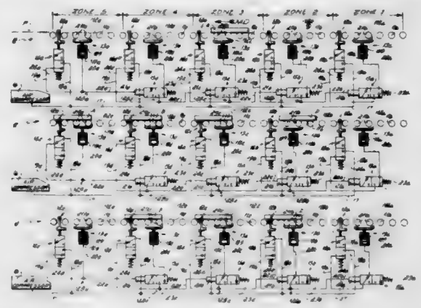
1. A vibration conveyor apparatus for feeding granular materials along an inclined channel in a mining excavation having a floor surface comprising:
a flexible and resilient conveying member shaped as a trough having a bottom portion, and curved side portions arranged axially along the flow path of the material to be fed, said member resting on said floor surface and being anchored in at least one point of said inclined channel, said material being conveyed in said bottom portion; and
means for interconnecting said side portions comprising a vibrator.

4,174,777

ZERO PRESSURE ACCUMULATING CONVEYOR AND METHOD

Frederick W. Riehle, Jeffersonville, Ind., assignor to A-T-O Inc., Willoughby, Ohio

Filed Feb. 24, 1978, Ser. No. 881,123
Int. Cl.[2] B65G *13/071*
U.S. Cl. 198—781 **26 Claims**



1. A zero pressure accumulator conveyor of the type comprising a plurality of accumulation zones for conveying and accumulating articles, said conveyor comprising:
a plurality of driven article conveying rollers in each zone,
a common drive belt engaging and driving the driven rollers in a zone,
brake means in each zone for selectively engaging at least one driven roller in each zone for braking said one roller to stop an article in said zone, said brake means in a downstreammost zone operating in response to an article sensed in said downstream-most zone, and said brake means in other upstream zones operating in response to both an article sensed in an immediate downstream zone and a different article sensed in the zone to be braked,
said drive belt continually directly engaging all driven rollers in a braked zone and, during operation of said brake means, said drive belt continually and directly engaging all such driven rollers throughout the width of the belt and sliding against said braked roller, the frictional forces thereon being insufficient to drive at least said braked roller.

4,174,778

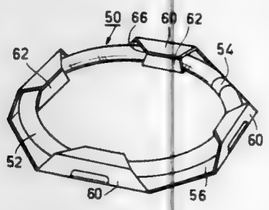
PACKAGE FOR TUBULAR LAMP

Franciscus M. Klomp, and Josephus H. van Kruijsdijk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,068
Claims priority, application Netherlands, Jun. 14, 1977, 7706511
Int. Cl.[2] B65D *85/02*
U.S. Cl. 206—303 **4 Claims**

1. A package for a tubular lamp, comprising a flat support member, at least two substantially parallel first creases in said support member, a substantially U-shaped score mark through said support member and encompassing a portion of at least one of said creases, and a further crease across the open ends of said U-shaped score mark, all portions of the flat support mem-

ber with the exception of the portion encompassed by said score mark being bent along said creases in the same angular direction during packaging, the portion of said support mem-



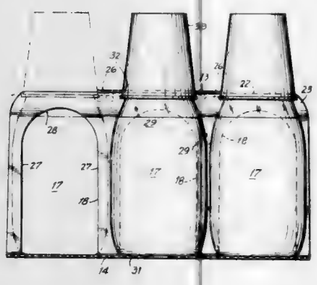
ber between the crease encompassed by the score mark and the closed end of the score mark being bent in the opposite direction.

4,174,779

CARRYING CASE FOR BOTTLES

Adolph Slone, Englewood, N.J., assignor to Schenley Industries, Inc., New York, N.Y.

Filed Jul. 18, 1978, Ser. No. 925,713
Int. Cl.² B65D *65/08*
U.S. Cl. 206—427 **8 Claims**



1. A lightweight case for storing and carrying a plurality of bottles in aligned relationship, each of said bottles having a neck, a shoulder and a body, said case comprising:

a one-piece rack member of a rigid, flexible plastic having an elongated bottom face for supporting said bottles, the width of said bottom face being less than the diameter of said body;

a pair of side faces each joined at the bottom edge thereof to a side edge of said bottom face, each side face having apertures each having side edges and a top rim therein for permitting said bodies to protrude therethrough, each side face having a top edge, the height of said side face corresponding approximately to the height of said shoulders above the bottoms of said bottles to be held in said rack; and

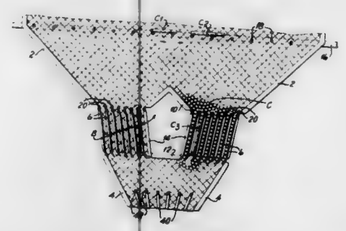
a clip member having first and second spaced-apart clip elements for receiving and holding releasably said top edges of said side faces, the distance between said clip elements being such that said top edges must be displaced toward each other over said shoulders of said bottles for said top edges to be received and held by said clip member, thereby providing for engagement of each by said bottom face and by said side edges and top rim of an aperture in each side face whereby each of said bottles is securely held against accidental dislodgement.

4,174,780

FEEDING CIGARETTES AND SIMILAR ROD-LIKE ARTICLES

David J. Farrar; Robert W. Davies; David C. M. Carter; Reginald C. Bolt, and Robert E. Williams, all of London, England, assignors to Molins Limited, London, England

Filed Jun. 20, 1978, Ser. No. 917,437
Claims priority, application United Kingdom, Jun. 30, 1977, 27509/77
Int. Cl.² B07C *5/00, 5/344*
U.S. Cl. 209—536 **11 Claims**



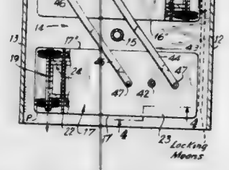
1. Cigarette feeding apparatus comprising a discharge device through which cigarettes are to be discharged at a predetermined rate, and a restraining device upstream of said discharge device through which the cigarettes pass before reaching the discharge device, said restraining device being defined by a plurality of flow channels which are together capable of passing cigarettes at a rate greater than said predetermined rate, each channel having arresting means to arrest any cigarette having at least one class of fault.

4,174,781

DISPENSING APPARATUS

Joseph Hupalowsky, Katonah, N.Y., assignor to Wm. Wrigley Jr. Company, Chicago, Ill.

Filed Jan. 19, 1978, Ser. No. 870,861
Int. Cl.² A47F *7/00*
U.S. Cl. 211—49 D **10 Claims**



1. A dispenser apparatus comprising, in combination, a support frame, first and second dispenser modules mounted on said frame, said modules each including an outwardly directed front face and a rear face, a multiplicity of spaced parallel dispenser guides supported on said modules, said guides having a loading end adjacent said rear face and a dispensing end adjacent said front face of said modules and being downwardly inclined from said loading toward said dispensing end, said guides being adapted slidably to support articles to be dispensed, mounting means interposed between said modules and said frame for supporting said modules for movement between a dispensing position whereat the rear faces of said modules are parallel and juxtaposed and, hence, inaccessible, and a loading position whereat said modules are laterally offset, said mounting means comprising first and second vertical pivot means

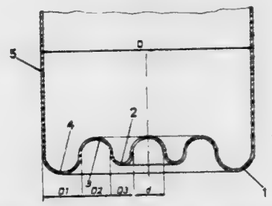
supporting said modules for rotation about laterally displaced vertical axes, and a parallelogram linkage having first and second ends operably connected to said first and second modules, respectively, the points of connection of each end of said linkage being equi-distant from the pivot axis of the respective module, whereby pivotal movement imparted to one said module imparts concomitant pivotal movement to the other said module, thereby to shift said modules between said loading and dispensing positions.

4,174,782

HOLLOW BODY MADE FROM A THERMOPLASTIC

Marc Obsomer, Brussels, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Filed Feb. 6, 1978, Ser. No. 875,502
Claims priority, application Luxembourg, Feb. 4, 1977, 76704; Mar. 29, 1977, 77042
Int. Cl.² B65D *23/00, 7/42*
U.S. Cl. 215—1 C **16 Claims**



1. In a hollow body made of an oriented thermoplastic material, which body is of generally cylindrical shape and includes a base and a side wall, the improvement wherein said base is oriented and is constituted by between three and 15 concentric annular toroidal sections of substantially semicircular cross section and having alternating directions of curvature from the periphery of said body inwards wherein the radially outermost one of said base sections is upwardly concave and joins directly onto said side wall of said hollow body and the diameter of the cross section of each of said annular sections is less than 20% of the maximum diameter of said side wall.

4,174,783

HOLLOW BOTTLE AND PRODUCTION METHOD THEREFOR

Takashi Abe, Koganei; Kazuo Kudo, Tokyo, and Keiji Kazato, Chiba, all of Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

Filed May 24, 1978, Ser. No. 909,007
Claims priority, application Japan, Sep. 30, 1977, 52/117735
Int. Cl.² B65D *23/00*
U.S. Cl. 215—1 C **8 Claims**



1. A unitary multi-layer hollow bottle comprising:

an inner layer of polyamide resin;

an outer layer of polyolefin combined with an incombustible inorganic material; and

an intermediate layer of resin adherent to both said inner and outer layers;

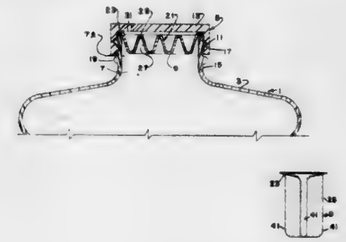
said bottle being formed with a pinch-off portion at the bottom, said inner, outer and intermediate layers being substantially continuous throughout the outwardly projecting length of said pinch-off portion.

4,174,784

ANTI-COLLAPSE CAP

Philip F. Hartung, 655 Main St., East Greenwich, R.I. 02818

Continuation-in-part of Ser. No. 742,492, Nov. 17, 1976, abandoned. This application Nov. 4, 1977, Ser. No. 848,436
Int. Cl.² B65D *53/00*
U.S. Cl. 215—349 **6 Claims**



1. A device for preventing the inward deformation by ambient pressure of a container having a hollow walled dispensing spout and relatively thin flexible walls, after said container is filled and sealed, the device comprising a membrane means for sealing the spout, said membrane means including a circumferentially extending flange and a diaphragm extending downwardly therefrom and more flexible than the walls of the container, means for securing the membrane by said flange into sealing engagement with the spout and means for applying the ambient pressure on the outside surface of the walls of the container to the outside surface of the diaphragm, said diaghragm being formed of a relatively thin and flexible side wall which extends from said spout inwardly of said container when secured therein and which terminates in a bottom wall, said side wall being of substantially uniform thickness and having therein a plurality of longitudinally extending peaks and valleys which extend over a substantial length of said wall thereby to form a cross-section of radial star design, said diaphragm being capable of sufficient lateral expansion by said valleys when pressure is applied to said outside surface of said diaphragm to prevent the deformation by ambient pressure of said container after said container is filled and sealed.

4,174,785

MULTIPLE PERIPHERAL SEAL FOR STORAGE TANK FLOATING DECK

Albert C. Garnett, Allentown, Pa., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

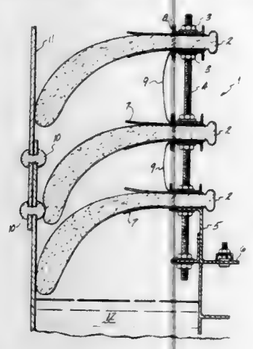
Filed Apr. 29, 1977, Ser. No. 792,448
Int. Cl.² B65D *87/20*
U.S. Cl. 220—224 **8 Claims**

1. A seal for use in a storage tank for volatile liquids, said tank having a tank shell and a floating deck provided with a peripheral edge spaced radially inwardly from said tank shell, comprising:

(a) at least two separate flexible sealing members attached to the peripheral edge of said floating deck, said members being formed from solid resilient material which is impervious to the volatile liquid or vapors within said tank;

(b) securing means secured to the peripheral edge of said

floating tank and secured to said members, said securing means being situated at least in part vertically upwardly from said peripheral edge, said members being individually adjustably attached to said securing means relative to each other in vertical spaced relationship to each other and to said peripheral edge in such a manner as to permit



vertical and horizontal adjustment thereof relative to the surface of said floating deck and to each other, wherein said members are separately secured to said securing means by separate holding means for holding said members in place

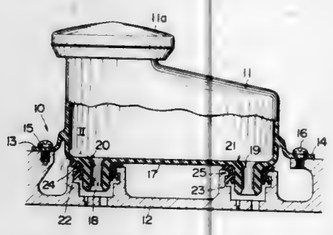
to provide an improved, adjustable sealing arrangement which minimizes evaporative losses from the storage tank.

4,174,786

SEAL MEMBER FOR CONNECTING MASTER CYLINDER AND RESERVOIR

Takashi Fujii, and Jiro Kizaki, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Apr. 25, 1978, Ser. No. 899,821
Claims priority, application Japan, Apr. 25, 1977, 52-47525
Int. Cl.[2] **F16J** *15/32;* **B65D** *53/02*
U.S. Cl. 220—378 **6 Claims**



1. An annular seal member sealingly interposed between and connecting coaxial, telescoped, cylindrical extensions of two members in substantially stationary relative position having different coefficients of thermal expansion, comprising:

one resilient, bifurcated end portion in sealing contact with adjacent surfaces of said extensions of said two members, said one end portion having a plurality of linear projections spaced on the external walls thereof for reducing the contact area with said adjacent surfaces;

a middle portion formed integral with and contiguous to said one end portion, said middle portion being normally separated from either one or both of the adjacent surfaces of said extensions of said two members, and

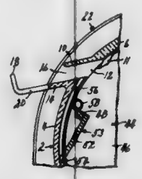
another resilient, bifurcated end portion formed integral with and contiguous to said middle portion and in sealing contact with said adjacent surfaces of said extensions of said two members.

4,174,787

SODA STRAW DISPENSER

Jo[illegible] B. Merila, 6223 E. 127th St., Grandview, Mo. 64030

Filed Jun. 7, 1978, Ser. No. 913,485
Int. Cl.[2] **B65H** *3/56*
U.S. Cl. 221—254 **7 Claims**



1. A soda straw dispenser comprising:

a. a fixed, generally cylindrical hollow drum having its axis disposed horizontally and adapted to contain a large number of straws therein parallel to the axis thereof, each of said straws being of a given length and diameter, and having a downwardly and outwardly inclined chute communicating with the upper forward portion thereof through a longitudinal, horizontal discharge slot thereof,

b. a rotor mounted coaxially in said drum and being axially rotatable therein,

c. a straw carrier consisting of a rod fixed in said rotor and extending parallel to the axis thereof, said rod being spaced apart from the interior surface of said drum by a distance less than the diameter of a single straw, and

d. manually operable drive means operable to turn said rotor from a rest position in which said carrier rod is disposed rearwardly of the vertical midplane of said drum, forwardly around the lower portion of said drum, during which movement a single straw is trapped between said rod and the interior wall surface of said drum, and further in the same direction to a discharge position in which said single straw is elevated to the level of said discharge slot and rolls outwardly by gravity through said chute.

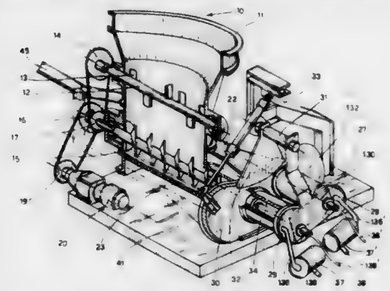
4,174,788

BATCHING PLANT FOR LIME CONCRETE

Bruno Casagrande, Sacile, Italy, assignor to Casagrande & C. S.p.A., Fontanafredda, Italy

Filed Sep. 27, 1977, Ser. No. 837,214
Claims priority, application Italy, Oct. 4, 1976, 83451 A/76; Feb. 7, 1977, 83323 A/77
Int. Cl.[2] **F04B** *7/00, 15/02*
U.S. Cl. 222—630 **6 Claims**

4. A batching pump for lime concrete comprising a base, a longitudinal displacement feeder attached to said base, said longitudinal displacement feeder being axially displaceable, at least one evacuator conduit attached to said base, at least one cylinder for receiving at one end thereof lime concrete and pumping lime concrete from said cylinder from said same end to said conduit, the axis of the cylinder being also parallel to the axis of said evacuator conduit, means to pivotally move



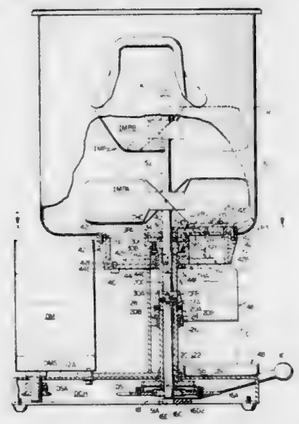
said cylinder between said feeder and said conduit, and means to feed pressurized gaseous fluid to said cylinder.

4,174,789

SOUP DISPENSER

John B. West, Glyndon, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Filed Aug. 25, 1977, Ser. No. 827,678
Int. Cl.[2] **G01F** *11/22*
U.S. Cl. 222—240 **20 Claims**



1. A dispensing assembly for dispensing one or more incremental volumes of liquid or semi-liquid food product from the bottom of a reservoir by gravity filling and emptying, comprising:

a rotary dial shaped plate means having a circular pattern of substantially identically configured measuring chambers formed therin and extending therethrough parallel to a central axis of rotation;

a conformal housing for said dial plate means open at its top and having a supporting web across the bottom thereof coextensive with said dial plate means, said supporting web having a discharge opening formed therein of substantially identical configuration as said measuring chambers for successive registry therewith in response to rotations of said dial plate means on said central axis of rotation within said housing; and

sealing plate means fixed from rotation on said housing over said dial plate means having a fixed hub portion and a sealing portion, the latter overlying an area on said dial plate means coincident with the said discharge opening and surface areas adjacent thereto and greater than the cross-sectional area of a said measuring chamber;

said fixed hub portion being diametrically opposite said sealing portion and of a lesser radial extent;

a first vent port in said sealing plate means adjacent said fixed hub portion;

said dial plate means including a central hub portion coaxial with said fixed hub portion and having a vent chamber and a an annular vent port therein communicating with each measuring chamber and positioned in registration with said first vent port; and

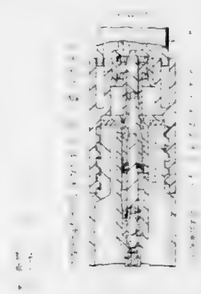
said sealing portion including a second vent port interconnected with said first vent port and said vent chamber and annular vent port in said central hub portion and in registry with said discharge opening through successive ones of said measuring chambers.

4,174,790

SPRAYER USABLE IN BOTH ERECT AND INVERTED STATES

Takamitsu Nozawa; Takayuki Goto; Takao Kishi, and Shigeo Iizuka, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1978, Ser. No. 894,918
Claims priority, application Japan, May 12, 1977, 52-60424[U]; May 18, 1977, 52-57448; Jun. 6, 1977, 52-74188[U]; Aug. 20, 1977, 52-111638[U]
Int. Cl.[2] **B05B** *9/043, 11/02;* **G01F** *11/36*
U.S. Cl. 222—321 **17 Claims**



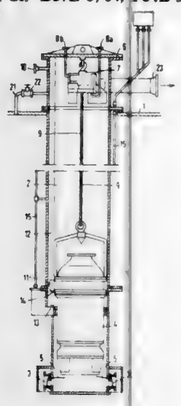
15. A pump mechanism for a sprayer usable in both erect and inverted positions comprising a liquid container and a pressure means including a pressure chamber formed from a cylinder and a piston for sucking up the liquid from the liquid container and pressurizing said liquid for spraying it from the nozzle hole, a piston mounting member extending upwardly from said piston, said pump mechanism comprising a liquid suction hole provided such that it will be positioned slightly below the location of the piston in the cylinder when the pressure chamber becomes largest in its capacity, said suction hole being designed to allow suction of the liquid when the sprayer is in its inverted position, a skirt member provided slightly above that position of the piston mounting member which corresponds to said suction hole when the pressure chamber is maximized in capacity, said skirt member contacting air tightly against the cylinder, a small cylindrical member extending downwardly from the lower end of the cylinder and communicated with the pressure chamber, a valve body fitted on said small cylindrical member, a first check valve provided either in said small cylindrical member or in said valve box for allowing liquid flow into the pressure chamber alone, and a second check valve arranged in countercurrent relation to said first check valve, whereby the valve hole in the valve seat is not closed by the ball valve of the first check valve when the liquid is sucked into the pressure chamber through the first check valve with the sprayer being in its erect position.

V9881/3 NO 020 79 UMI

4,174,791
LIQUID-GAS PUMPING APPARATUS

Bruno Auchter, Mainz; Karl-Heinz Wagner, Rauenthal; Günter Glimm, and Manfred Preiss, both of Erlangen, all of Fed. Rep. of Germany, assignors to Rheinhütte vorm. Ludwig Beck & Co., Wiesbaden-Biebrich and Siemens Aktiengesellschaft, Munich, both of, Fed. Rep. of Germany

Filed Feb. 10, 1978, Ser. No. 876,690
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1977, 2707042
Int. Cl.[2] B67D 5/04; F04B 35/04
U.S. Cl. 222—333 5 Claims



1. In a liquid-gas pumping apparatus for pumping cryogenic liquids from a storage tank, said apparatus including a vertical housing extending into said tank which functions as a pumping line, an immersion pump and motor unit which is slidably insertable into said housing, and valve means disposed at the lower end of said housing which opens when said immersion pump and motor unit is lowered into said housing and closes when said pump and motor unit is raised in said housing, the improvement comprising

means, disposed at the vertically upper end of said housing, for lowering said immersion pump and motor unit into an operating position in said housing and for lifting said immersion pump and motor unit from said operating position;

a plurality of said valve means, disposed adjacent the bottom of said housing and opening laterally through said housing, said valve means being uniformly distributed over the circumference of said housing, at least one of said valve means being disposed in said housing and adapted so as to be engaged first by said immersion pump and motor unit before the other of said valve means when said pump and motor unit is lowered in said housing into said operating position, said one of said valve means thereby being opened first before the other of said valve means upon engagement with said immersion pump and motor unit;

electrical supply line means extending from the exterior of said housing through said housing into the interior thereof;

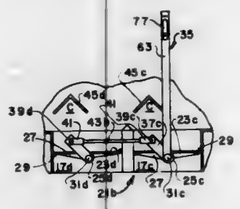
first electrical contact means disposed in said interior of said housing and coupled to said electrical supply line means; and

second electrical contact means mounted on said immersion pump and motor unit and adapted to engage said first electrical contact means and establish an electrical connection between said immersion pump and motor unit and said electrical supply line means when said immersion pump and motor unit is lowered into said operating position in said housing.

4,174,792
DISPENSING APPARATUS FOR A VEHICLE HAVING CLOSURE GATE CLEARING MEMBER

Eldon D. Jones, R.R. 2, Lake Crystal, Minn. 56055

Filed Apr. 24, 1978, Ser. No. 899,121
Int. Cl.[2] A01C 15/06
U.S. Cl. 222—608 9 Claims

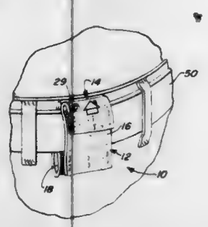


1. In a vehicle for hauling and dispensing a particulate material including body portion for holding said particulate material and a means of elevating said body portion above ground level, said body portion including a floor, walls extending upwardly from said floor, a dispensing orifice in said floor and a dispensing means located in said orifice for selectively opening and closing said orifice thereby to allow or prevent flow of said particulate material from said body portion, said dispensing means comprising a rotatable dispensing gate extending across said orifice, means for rotating said gate about a point intermediate its ends, one of said ends of said gate thereby being rotated upwardly and the other of said ends being rotated downwardly for selectively opening said orifice to allow dispensing of said particulate material from said body, the improvement comprising a concave plate member extending laterally across and above said upwardly rotated end of said gate, said concave plate member being spaced sufficiently above said end to allow said gate to rotate and of a size sufficient to form a cavity proximally above said upwardly rotated end of said gate which is sufficiently devoid of particulate material when said body is filled with said particulate material to allow sufficient upward rotation of said upwardly rotated end to initiate dispensing of said material through said orifice.

4,174,793
STORAGE RECEPTACLE

Sigmund Wisowaty, P.O. Box 601, Medinah, Ill. 60157

Filed Jul. 3, 1978, Ser. No. 921,486
Int. Cl.[2] A45C 1/04
U.S. Cl. 224—240 1 Claim



1. A storage receptacle provided with a plurality of storage compartments, comprising,

a length of material having opposed ends and a substantially centrally positioned fold line,

said fold line permitting said length of material to be folded about said fold line thereby to create substantially equal sections about said fold line,

each of said substantially equal sections including at least one discrete storage compartment, each of said storage compartments provided with a closure flap,

fastening means interposed between each of said closure flaps and each of said corresponding storage compartments such that each of said closure flaps may be disengageably fastened to enclose each of said corresponding storage compartments,

and disengageable fastening means associated with said ends of said length of material thereby to permit said equal sections to be disengageably fastened at said ends thereof,

whereby said storage receptacle may be folded over by folding said length of material along said fold line thereby to permit said equal sections to encircle a support such as a belt, and fastening the storage receptacle in position by said disengageable fastening means whereby such storage receptacle including each of said storage compartments may be securely held in position about the support.

4,174,794
VEHICLE ARTICLE CARRIER

John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Continuation-in-part of Ser. No. 725,500, Sep. 22, 1976. This application May 19, 1977, Ser. No. 798,576
The portion of the term of this patent subsequent to Oct. 25, 1994, has been disclaimed.
Int. Cl.[2] B60R 9/00
U.S. Cl. 224—320 14 Claims



1. In an article carrier for an automotive vehicle:

an article supporting slat mounted on a portion of the vehicle having a lower surface, upwardly extending sidewalls having converging portions, and an article supporting upper surface, said article supporting upper surface containing an elongated opening therein;

a fastening element located within said slat and fixedly secured with respect thereto and securing means associated with article carrying means, said fastening element being adapted to secure said securing means in order to attach said article carrying means to said article supporting slat;

a cover member normally disposed in an operative position partially within said elongated opening, and closing at least a portion of said opening, said cover member being at least partially removable to an inoperative position; and

said fastening element being at least partially concealed from view when said cover member is disposed in said operative position and being accessible at such time as said cover member is moved to said inoperative position.

4,174,795
PANNIER MOUNTING ARRANGEMENT FOR CYCLES

W. Shaun Jackson, 809 Sycamore, Ann Arbor, Mich. 48104, and Leslie E. Bohm, 29560 Rutherland North, Southfield, Mich. 48076

Filed Feb. 14, 1977, Ser. No. 768,467
Int. Cl.[2] B62J 9/00
U.S. Cl. 224—32 A 15 Claims

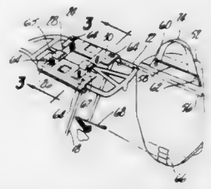
1. A mounting arrangement for mounting a luggage item such as a pannier or the like onto a cycle vehicle having a rear wheel comprising:

an elongated element;

a channel section adapted to slidably receive and support said elongated element therein along the length of said channel section;

means mounting one of said elongated element or said channel section to said luggage item, extending along said luggage item;

means securing the other of said channel section or said elongated element to said cycle vehicle extending adjacent said rear wheel in a longitudinal direction substantially parallel to the length of said cycle, whereby said luggage item may be mounted to or removed from said cycle by fore and aft sliding movement of said elongated element into said channel section to suspend said luggage



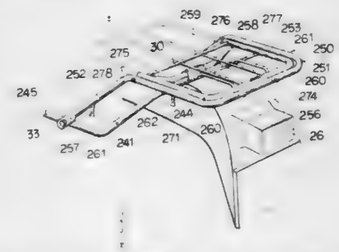
item so as to distribute the weight of said luggage item along the length of said elongated element;

means releasably securing said luggage item to structure carried by said cycle so as to prevent relative fore and aft sliding movement of said channel section and said elongated element.

4,174,796
REAR CARRIER DEVICE ON MOTORCYCLES AND THE LIKE

Nagatoshi Nakamura, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 5, 1978, Ser. No. 867,192
Claims priority, application Japan, Jan. 19, 1977, 52/4981[U]; Jan. 19, 1977, 52/4982[U]
Int. Cl.[2] B62J 7/04
U.S. Cl. 224—39 7 Claims



1. A rear carrier device for a cycle, comprising:

a generally U-shaped rear stay member;

said rear stay member being connected in the right and left front end parts thereof to the sides of the cycle frame, together with the fastening means of the right and left rear cushion or shock absorber units of said cycle;

said device including an intermediate part and a rear part extending substantially over a rear fender of said cycle;

a suspended part provided in said intermediate part of said device, said suspended part being connected to said rear fender of said cycle;

a carrier member connected in the forward side portions thereof respectively to both side parts of said stay;

said carrier member comprising a main frame connected with said rear stay and a sub-frame pivotally fitted to said main frame and formed so as to be selectively rotated between a first position and a second position relative to said main frame;

said sub-frame being provided with a general dimension which is smaller than the dimension of said main frame;

said first position of said sub-frame comprising a position wherein said sub-frame is housed within said main frame and forms a substantially flat carrying surface with said main frame; and

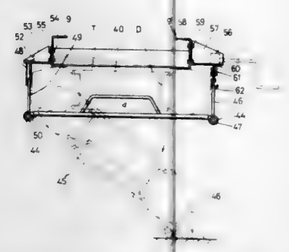
said second position of said sub-frame comprising a position wherein said sub-frame is extended in a direction substantially opposite to said first position, on the seat side of said cycle, to substantially increase the size of said substantially flat carrying surface.

4,174,797

SPARE WHEEL HOLDING APPARATUS

Setsuo Yasue, Gifu, and Tomio Yamamoto, Aichi, both of Japan, assignors to Sankokiki Kabushiki Kaisha, Inazawa, Japan

Division of Ser. No. 811,865, Jun. 30, 1977, abandoned. This application Jun. 8, 1978, Ser. No. 913,870
Claims priority, application Japan, Jul. 1, 1976, 51-78020
Int. Cl.[2] B62D *43/04*
U.S. Cl. 224—42.21 **8 Claims**



1. An apparatus for holding a spare wheel under the chassis of a motor vehicle, said chassis having two longitudinal members, said apparatus comprising:
an elongated wheel supporting frame adapted to be positioned perpendicularly to said longitudinal chassis members to support said spare wheel horizontally thereon;
a pair of vertically disposed hanging members connected at their lower ends to the opposite ends of said wheel supporting frame to form therewith a wheel holder which is rotatable about one end both vertically and horizontally to move its other end vertically and horizontally;
a supporting member secured to the outer surface of one of said longitudinal chassis members;
a vertical pin pivotally depending from said supporting member and secured to one end of one of said hanging members for rotating said wheel holder horizontally;
means provided between said one hanging member and said wheel supporting frame for rotating said wheel holder vertically;
means provided between the other hanging member and said wheel supporting frame for rotating said other hanging member vertically; and
means provided on the outer surface of the other longitudinal chassis member for moving said other end of said wheel holder vertically between an upper position adjacent to said chassis and a lower position on the ground, wherein said wheel holder can be moved to a position below and outside of the motor vehicle.

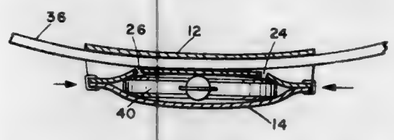
4,174,798

PORTABLE POCKET FOR POCKET WATCHES

Ray E. T. Pollard, 5941 La Jolla Mesa Dr., La Jolla, Calif. 92037

Filed Oct. 27, 1977, Ser. No. 845,888
Int. Cl.[2] A45C *11/10*
U.S. Cl. 224—253 **3 Claims**

1. A portable watch pocket, said pocket comprising: a first elongated sheet of rugged, pliable material having generally parallel sides and rounded ends folded over with the ends secured together for defining a belt receiving loop, and a second sheet of rugged, pliable material having the general size and configuration of one half of the first elongated sheet with a rounded end, a generally straight end and two sides edges, said second sheet secured along its two sides and rounded end to said first sheet thereby defining an upwardly opening pocket, wherein one wall of said pocket is defined by said first sheet and the other wall is defined by said second sheet, and a



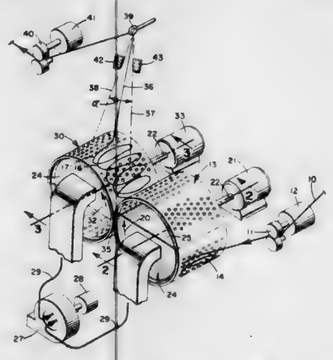
pair of spaced apart independent vertical slits formed in said one wall of said pocket for creating a bowing effect when the watch pocket is strapped to a body so that the sides of the upwardly opening pocket move inwardly toward one another for gripping the edge of a watch therein.

4,174,799

SYSTEM FOR THE TEMPORARY STORAGE OF YARN

Armando d'Agnolo, Porcia, Italy, assignor to Officine Savio S.p.A., Pordenone, Italy

Continuation of Ser. No. 716,558, Aug. 23, 1976. This application Jul. 1, 1977, Ser. No. 812,388
Claims priority, application Italy, Aug. 28, 1975, 83431 A/75
Int. Cl.[2] B65H *23/22*
U.S. Cl. 226—7 **2 Claims**



1. A process for temporarily storing random continuous yarns in a relaxed state in which inversion of the yarn takes place comprising randomly laying up yarn on a first moving partitioned perforated drum, bringing a second partitioned perforated drum into close proximity with said first drum but spaced therefrom, transferring said randomly laid up yarn upwardly from said first drum to said second drum in inverted form where said drums are in close proximity, removing said yarn from said second drum and monitoring the yarn on said second drum thereby to regulate the supply of yarn to said first drum as well as its removal from said second drum.

4,174,800

STORAGE ROLLER THRUSTER DEVICE FOR CONTINUOUS STRIP PAPER FEEDERS

Manuel M. Torres, Avda. Sancho el Fuerte, 21-80C, Pamplona, Spain

Filed Jan. 9, 1978, Ser. No. 867,817
Claims priority, application Spain, Jun. 25, 1977, 229,538
Int. Cl.[2] B65H *17/42*
U.S. Cl. 226—113 **2 Claims**

1. A storage roller thruster device for continuous strip paper feeders, said storage roller being carried by a chain having at least one axle associated therewith, peculiar inasmuch that it is

comprised of an inertia flywheel mounted on an axle, which is mounted in a manner that it is free to revolve with respect to its axle, and where said flywheel is positioned in between two discs equipped with friction linings on their respective faces flanking said flywheel, and which are rotationally attached to the axle, but are able nevertheless to undergo certain axial displacement, and where one of said discs is coupled on its opposite face with means which are provided for exerting a fluid pressure, and where the assembly is equipped with a



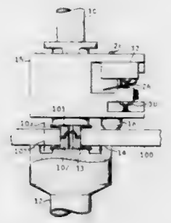
pinion that is rotationally attached to the axle, all this in such a manner that there is gear engagement with an axle belonging to the chain that carries the storage roller to which the device is applied, and where the inertia flywheel is related to a means for transmitting rotation in synchronism with the speed at which the paper strip is being fed, and where, when the thruster means operate, the flywheel becomes engaged and instantaneously thrusts the paper storage roller at the same speed as that of the paper being supplied.

4,174,801

HOLLOW CORE PANEL INSERT INSTALLATION DEVICE

Charles L. Holland, Escondido, and Steven S. Hardy, San Diego, both of Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Filed Aug. 9, 1978, Ser. No. 932,255
Int. Cl.[2] B21D *47/04*
U.S. Cl. 227—4 **4 Claims**



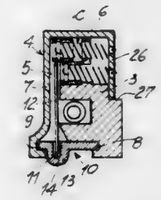
1. A press anvil position control comprising:
a lower anvil adapted to be located on a first side of a panel workpiece;
an upper anvil adapted to be positioned adjacent to the second side of said workpiece opposite said lower anvil;
said anvils adapted to relative movement toward and away from each other;
a compensator body mounted on said upper anvil for movement therewith;
a pin slidably mounted on said body for reciprocating movement substantially parallel to the path of anvil relative movement, said pin adapted to contact a workpiece between said anvils as said anvils undergo relative movement toward each other;
a switch bar mounted on said pin with its major axis substantially normal to said pin; and
a limit switch mounted on said body and disposed for operation by said switch bar after said pin contacts said workpiece during relative movement of said anvils toward each other; whereby said switch may control said anvil movement to stop said movement with said anvils at a selected position relative to said workpiece.

4,174,802

MAGAZINE DEVICE FOR CONTINUOUSLY FEEDING NAILS INTO A NAIL DRIVING MACHINE

Bruno Maestri, Via Foppa, 26, Milano, Italy

Continuation of Ser. No. 779,509, Mar. 21, 1977, abandoned. This application Mar. 23, 1978, Ser. No. 889,294
Claims priority, application Italy, Mar. 24, 1976, 21544 A/76
Int. Cl.[2] B25C *3/00*
U.S. Cl. 227—109 **4 Claims**



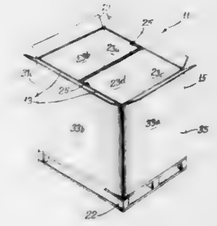
1. An improved magazine device for continuously feeding nails into a nail driving device comprising a first side frame and a second side frame defining therebetween a nail guide passage to guide the nails towards a drive channel, means for connecting and disconnecting said side frames from each other provided at the ends thereof, and a slidable member housed between said side frames to enable insertion of a nail strip into said guide passage, said slidable member being provided on its inner face facing the guide passage with a substantially longitudinal slot suitable for receiving the points of the nails, and said means for connecting and disconnecting said side frames from each other comprising means for adjusting the distance between said side frames and thereby said guide passage to accommodate nails of varying diameters.

4,174,803

MULTICELL CORRUGATED BULK CONTAINER

Michael J. Shrontz, Ingalls, and Robert M. Harvey, New Palestine, both of Ind., assignors to Inland Container Corporation, Indianapolis, Ind.

Filed Jul. 12, 1977, Ser. No. 814,972
Int. Cl.[2] B65D *3/24, 5/56*
U.S. Cl. 229—15 **9 Claims**



1. A reusable bulk container for shipping granular products or the like, which container includes
a pair of rectangular tubular cells each of which is formed from four serially connected panels of corrugated fiberboard having vertical flutes and having flap means at one end, and an outer rectangular sleeve surrounding said cells and disposed in continuous surface-to-surface contact with the outside surfaces of six panels of said pair of cells, said sleeve including four serially connected rectangular panels joined along three vertical score lines which panels carry depending flaps for closing the bottom of the container defined by a transverse score line, said sleeve inside surface being adhesively joined to said outside surfaces of

said six cell panels by an adhesive pattern which covers a major portion of surface area of each of said sleeve panels, wherein the improvement comprises

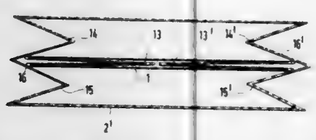
said flap means of each tubular cell being formed as a manufacturer's joint by attachment to the inside surface of the panel at the other end of said serially connected panels, said adhesive pattern crossing said three vertical score lines of said sleeve so as to unite the side edges of said cells tightly to the side edges of said sleeve in three of the four corners, and the lateral ends of said sleeve being joined to each other by a manufacturer's joint that is disposed exterior of the sleeve so as to tightly unite said sleeve to said cell in the fourth corner and thereby provide uninterrupted contact between said sleeve inside surface and said cell outside surfaces about the entire perimeter of the bulk container.

4,174,804

SYMMETRICAL SACK WITH DOUBLE SIDE FOLDS

Frank Bosse, Tecklenburg, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed May 9, 1978, Ser. No. 904,320
Claims priority, application Fed. Rep. of Germany, May 13, 1977, 2721771
Int. Cl.[2] B65D *33/02;* **F15B** *15/22*
U.S. Cl. 229—55 **3 Claims**



1. A symmetrical tubular sack with double side folds comprising a supporting outer sack and a sealing inner sack of thermoplastic film, the outer sack comprising a woven circular fabric tube section of stretched plastic tapes separate from the inner sack and provided with double side folds, and the inner sack comprising a tube section provided with a single side fold and placed in the outwardly directed fold located between the double side folds of the outer sack.

4,174,805

METHOD AND APPARATUS FOR TRANSMITTING DATA TO A PREDEFINED DESTINATION BUS

Robert G. Fulks; Robert E. Enfield, and Edward H. Greenwood, all of Phoenix, Ariz., assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 13, 1978, Ser. No. 895,891
Int. Cl.[2] G06A *11/00;* **G01R** *31/00*
U.S. Cl. 235—302 **32 Claims**

1. A tester for testing printed circuit boards, said tester comprising in combination:

(a) a first processor;

(b) a bus connected to said first processor;

(c) a plurality of sensor/driver circuits each having an input-/output terminal;

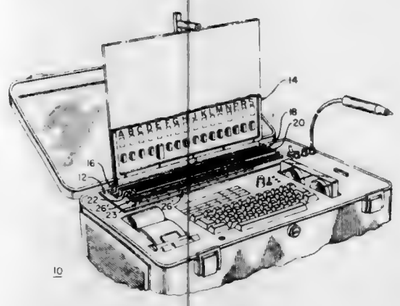
(d) means for storing information defining which outputs of said tester are destinations of the respective bits of a data word in said processor;

(e) a parallel and serially loadable shift register capable of both serial and parallel output coupled to said bus;

(f) means for transferring said data word in parallel format from said processor into said shift register and transferring information in parallel format from said shift register into said processor;

(g) means for serially shifting bits of said data word out of said shift register and for serially shifting information into said shift register;

(h) means for gating said serially shifted bits to data input-/output terminals of ones of said driver/sensor circuits selected in accordance with said stored destination-determining information and for gating information received from said data input/output terminals to said shift register; and



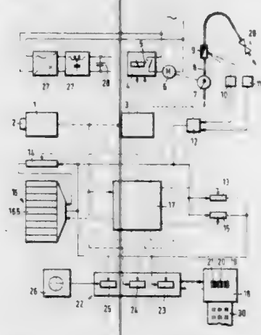
(i) means for transmitting said bits from the input/output terminals of the driver/sensor circuit to predetermined pins of said printed circuit boards.

4,174,806

RECORDING DEVICE FOR THE DISPENSING OF GOODS

Ulrich Zahn, Bollstrasse 32, 3076 Worb, Switzerland

Filed Aug. 2, 1978, Ser. No. 930,342
Int. Cl.[2] G07F *7/08*
U.S. Cl. 235—381 **2 Claims**



1. Recording device for the dispensing of goods, especially liquid automative fuel, comprising

a scanning or reading device (**1**) for information carriers (**2**) serving as credit cards, bearing customer identification numbers individually correlated with the customers;

at least one dispensing unit (**6, 7, 8, 29**) for the goods, which is blocked in the rest condition and is unblocked by the reading device after reading one of these customer ID numbers;

a pulse generator (**9, 10, 11, 12**) which generates counting pulses during the dispensing of the goods, each of these counting pulses corresponding to a predetermined counting unit of the quantity of goods or a corresponding price unit;

a pulse counter (**13**) counting upon each dispensing of goods the thus-produced counting pulses, respectively starting with its zero setting; and

a recording device (**18**) which records the thus-counted pulses, respectively together with the customer ID number scanned or read by the scanning or reading device, continuously on a record carrier (**30**), characterized by

a long-term storage means (**16**) comprising for each customer ID number a storage cell (e.g. **165**) individually associated with this ID number, and

a control circuit (**17, 22**), which

upon each dispensation of goods effect a transfer of the content of the storage cell (e.g. **165**) associated with the customer ID number scanned or read by the scanning or reading device (**1**) into a second counter (**14**),

the addition of the counting pulses produced by the pulse generator (**9, 10, 11, 12**) to the content of this storage cell (e.g. **165**) transferred into the second counter (**14**), and

the transmission of the thus-obtained counter reading (of counter **14**) into this storage cell (e.g. **165**), and

triggers, upon a control command, a blocking of the scanning or reading device (**1**),

thereafter triggers directly successive recordings of the content of the individual storage cells (of the long-term storage means **16**), respectively together with the associated customer ID number, and

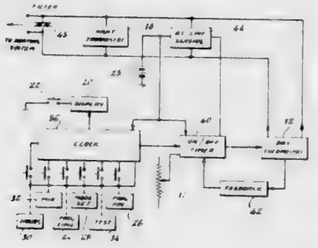
then triggers the unblocking of the scanning or reading device (**1**).

4,174,807

AUTOCYCLING CONTROL CIRCUIT FOR HEATING AND/OR AIR CONDITIONING SYSTEMS

Arthur W. Smith, 4 Dempsey Ct., Ansonia, and George D. Kimble, Curtis Ave., New Fairfield, both of Conn. 06401

Filed Aug. 10, 1978, Ser. No. 932,422
Int. Cl.[2] F23N *5/20*
U.S. Cl. 236—47 **10 Claims**



1. An autocycling control circuit means for automatically controlling the activation of a heating system comprising, in combination,

(a) first and second thermostat means, said second thermostat being set at a higher temperature than said first thermostat,

(b) means for continuously coupling said first thermostat means to said heating system for continually maintaining a minimum temperature in accordance with the setting of said first thermostat, and

(c) programmable timer means for selectively controlling the coupling of said second thermostat to said heating system during settable, predetermined time intervals,

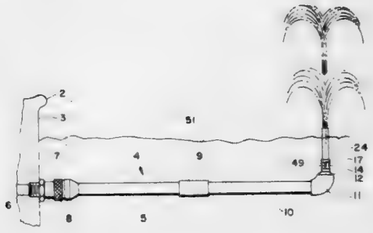
(d) said programmable time means including a control means coupled to said second thermostat for selectively enabling and disabling said second thermostat during said predetermined time intervals in accordance with whether said second thermostat is calling for heat.

4,174,808

POOL FOUNTAIN

Edward Latin, 5357 Ridgevale Way, Fair Oaks, Calif. 95628

Filed Oct. 25, 1977, Ser. No. 844,615
Int. Cl.[2] B05B *17/08*
U.S. Cl. 239—23 **9 Claims**



1. A fountain for a swimming pool comprising:

(a) an extended tubular arm having a quick disconnect flow through valve connectable on one side to an underwater swimming pool water inlet on the first end of said arm,

(b) hollow means for altering the path of fluid flow from generally horizontal to generally vertical connected on one side to the other end of said arm,

(c) an orientable flow through ball valve disposed between and connected to said hollow means on one end,

(d) a jet pump having at least one aperture, and being connected at one of its two ends to said ball valve, said pump including a rotatable collar to adjustably close the apertures of said pump,

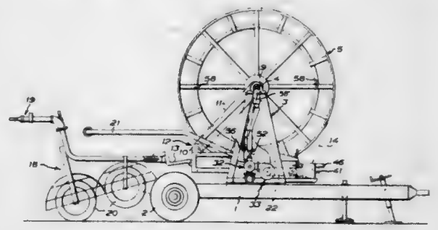
(e) a rigid riser generally vertically disposed and having a first end and a second end; the first end connected to said jet pump's second end, all of said parts communicating to form a conduit for a stream of water.

4,174,809

IRRIGATION MACHINE

Jan M. Arlemark, Skansgatan 18, 272 00 Simrishamn, Sweden

Filed Oct. 21, 1977, Ser. No. 844,306
Claims priority, application Sweden, Oct. 22, 1976, 7611743; Nov. 16, 1976, 7612780; Apr. 26, 1977, 7704768
Int. Cl.[2] B05B *3/18*
U.S. Cl. 239—189 **6 Claims**



1. An irrigation machine with a hose reel rotatably mounted on a wheeled frame for a withdrawable and rewindable hose whose one end fixed to the hose reel is connectable via a coupling to a water supply source, and whose other end is connected to a sprinkler gun on a gun carriage or a sled, the hose reel for the hose, which is compression resistant and consists of rigid hose material, being coupled to a drive motor designed as a water turbine, which drive motor is coupled into a conduit system from the water supply source to the gun, and the hose reel being journalled with its axis of rotation substantially horizontal, wherein said water turbine is coupled into said

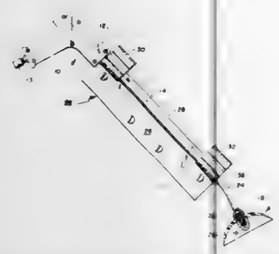
conduit system via a flow-divider in the form of a three-way valve with one inlet and two outlets, said water turbine being coupled in between the two outlets, said flow-divider having a main channel leading from the water supply source to the hose, in which channel there is provided a throttle point, wherein the water turbine is coupled into a branch conduit whose ends are connected to the main channel on either side of the throttle point, said throttle point being adjustable, and a regulator valve disposed in a by-pass conduit whose ends are connected to the main channel on either side of the throttle point.

4,174,810

SAFETY NOZZLE AND RACK

Edward L. Torbett, Rte. 2, P.O. Box 272A, Piney Flats, Tenn. 37686

Filed Oct. 17, 1977, Ser. No. 842,519
Int. Cl.² B05B *15/06*
U.S. Cl. 239—283 **3 Claims**



1. A safety nozzle and storage rack assembly for pressurized fluids comprising an elongated conduit having enlarged shoulder means adjacent its outlet extending radially outwardly from the longitudinal axis of said conduit, said conduit being adapted for connection to a source of pressurized fluid, semi-collar means substantially axially surrounding and supporting said conduit proximate to said shoulder means and having a substantially horizontally disposed leading gap lying substantially above the axis of said conduit when said conduit is resting within said semi-collar means, said semi-collar means having an average diameter less than that of said shoulder means such that axial retraction of said conduit from said semi-collar means by the reverse action from fluid ejected from said outlet is prevented.

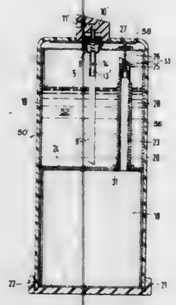
4,174,811

FLUID SUBSTANCE SPRAYER HAVING PROPELLANT GAS AND SUBSTANCE REFILL

Siegfried Binder, Friolzheim, and Karl Herzog, Stuttgart, both of Fed. Rep. of Germany, assignors to Firma Airotechnik Siegfried Binder GmbH, Fed. Rep. of Germany

Filed Feb. 9, 1978, Ser. No. 876,198
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1977, 2706261; Oct. 6, 1977, 2744892
Int. Cl.² B65B *31/00*; B65D *83/14*
U.S. Cl. 239—308 **12 Claims**

1. A sprayer for substances, such as liquids, and pastes, comprising a first container having a top with a spray fitment thereon, said spray fitment including a delivery conduit terminating in a spray nozzle discharge, a discharge valve associated with said fitment mounted on said first container and being actuable by said fitment to open and close the top of said first container, a lifting tube connected to the top of said first container and to said discharge valve and having a lower end extending downwardly into the substance to be sprayed, a pressure gas fill-up valve mounted in said first container having an opening for the inflow of a pressure gas into said first container for pressurizing the substance to flow up said lifting, tube through said discharge valve and through said delivery conduit for spraying out through said nozzle and including means for adding a pressure gas into the substance which flows out through said discharge valve and said nozzle, said first container including an opening in the bottom thereof, a pressure gas container having a top with a delivery tube extending



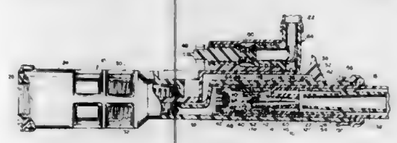
outwardly therefrom into the opening of said container in pressure-sealed engagement therewith, said fill-up valve comprising a delivery valve in said delivery tube and means for actuating said delivery valve.

4,174,812

JET PUMP PROPORTIONERS

Valentine Hechler, IV, 26 Meadow View Rd., Northfield, Ill. 60093

Continuation-in-part of Ser. No. 716,896, Aug. 23, 1976, abandoned. This application Jan. 30, 1978, Ser. No. 873,677
Int. Cl.² B05B *7/30*
U.S. Cl. 239—318 **13 Claims**



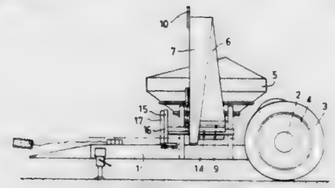
1. A multi-stage solution proportioning, mixing and dispensing device for liquids comprising:
- a housing having a pressurized solvent inlet, a solute inlet and a pressurized solution discharge opening having determined flow characteristics;
- a plurality of mixing means between said inlets and said discharge opening, each mixing means defining a confluence chamber and mixing zone and having a nozzle receiving solvent under pressure from said inlet, each nozzle having converging side walls to convert pressure on the flowing solvent to kinetic flow energy and terminating in a jet flow port opening separately into the respective chambers, one of said port openings having fixed flow characteristics;
- solute conduit means connecting the solute inlet to one of said chambers in free flowing relation;
- conduit means conducting the mixture from said one of said mixing means as a solute to the chamber of the other mixing means including an outlet port from the one mixing means disposed in axial alignment with the solvent jet flow port thereto and having a diverging wall therefrom for converting kinetic flow energy of said mixture to pressure and conducting it to the chamber of the other mixing means;
- further conduit means conducting mixture from said other mixing means to said discharge opening including an outlet port from the chamber of said other mixing means having a flow area not less than that of said discharge opening and being disposed in axial alignment with said one of said openings having fixed flow characteristics, and having a diverging wall for converting kinetic flow energy to pressure upon the solution flowing therethrough; and
- means axially adjustable in one of said converging wall nozzles for varying the flow characteristics of one of said fixed flow openings to provide a ratio correction for the mixture discharged from the discharge opening.

4,174,813

PNEUMATIC SPREADER WITH PIVOTING SPREADER BARS

Xavier R. Grataloup, Montereau, France, assignor to Société Anonyme dite: Nodet-Gougis, Montereau, France

Filed Feb. 27, 1978, Ser. No. 881,364
Claims priority, application France, Mar. 4, 1977, 77 06437
Int. Cl.² A01C *3/06*
U.S. Cl. 239—655 **5 Claims**



1. A high capacity pneumatic spreader particularly adapted for spreading powdered or granular substances comprising a frame mounted on wheels, a hopper carried by said frame, said hopper having an elevational profile defined in part by a pair of opposite lateral sides, at least one spreader bar carried by said frame, said spreader bar being movable between a first generally horizontal position projecting laterally from said frame beyond one of said sides and a second generally vertical position between said lateral sides, said spreader bar having first and second ends respectively adjacent to and remote from said frame in said first position, an arm positioned between said spreader bar first end and said frame, first pivot means for pivotally connecting said arm to said spreader bar first end for relative pivoting movement about a generally horizontal axis, means for raising said spreader bar to a generally vertical position by pivoting movement of said spreader bar about said first pivot means, second pivot means for pivotally connecting said arm to said frame for relative pivoting movement about a generally vertical axis, and said second pivot means being disposed between said hopper sides whereby said spreader arm can be pivoted about said second pivot means from a generally vertical position laterally outboard of one of said hopper sides to a generally vertical position within said profile and between said hopper sides.

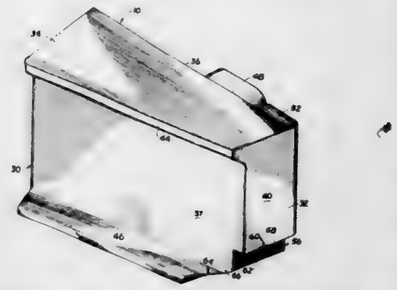
4,174,814

IMPELLER SHOE FOR CENTRIFUGAL IMPACT ROCK CRUSHING MACHINE

Kenneth D. Warren, and Robert G. Tenold, both of Spokane, Wash., assignors to Spokane Crusher Manufacturing Co., Spokane, Wash.

Filed Apr. 3, 1978, Ser. No. 892,886
Int. Cl.² B02C *13/18*
U.S. Cl. 241—275 **6 Claims**

1. An elongated impeller shoe for mounting to a bracket on a horizontal turntable of a vertical axis centrifugal rock crushing machine to accelerate aggregate radially outward from a central distribution cone to impact against stationary anvils to thereby crush the aggregate, in which the central distribution cone has (1) a top surface for initially receiving the aggregate and directing the aggregate radially outward to the elongated impeller shoe, and (2) an annular peripheral surface that extends downward from the top surface toward the turntable, said elongated impeller shoe comprising:
- an elongated body of wear resistant alloy material extending longitudinally from an inner end to an outer end;
- said body being of a generally trapeziform shape having (1) a back bearing surface extending longitudinally between the inner end and the outer end and adapted for bearing against such a turntable bracket; (2) a face surface extending longitudinally between upper and lower longitudinal channel lips from the inner end to the outer end and adapted for receiving and directing aggregate therealong; (3) an outer end surface extending transversely between the face surface and to the back bracket mounting surface; and (4) an inner end surface extending transversely between the face surface and the back bearing surface;



- said face surface being formed at an acute angle of between 10 and 12 degrees with respect to the back bearing surface and being formed at an obtuse angle with respect to the inner end surface;
- said inner and outer end surfaces being formed at acute angles with respect to the back bearing surface;
- said inner end having a transverse notch formed therein intersecting the inner end surface and the face surface including the lower channel lip that is complementary to such a top surface and such an annular peripheral surface of the central distribution cone to enable the inner end of the body to extend over such an annular peripheral surface with the inner end surface overlying a portion of such a top surface of the central distribution cone.

4,174,815

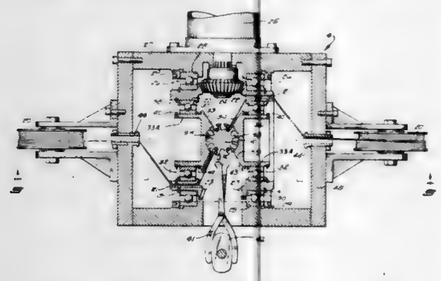
APPARATUS FOR WINDING ARMATURES

Raymon H. Dammar, Minneapolis, Minn., assignor to Possis Corporation, Minneapolis, Minn.

Continuation of Ser. No. 557,363, Mar. 11, 1975, abandoned. This application May 9, 1977, Ser. No. 795,374
Claims priority, application United Kingdom, Mar. 19, 1974, 12132/74
Int. Cl.² H02K *15/04*
U.S. Cl. 242—7.05 B **125 Claims**

1. An apparatus for winding coils of wire on a core of an armature, said core having a longitudinal axis and a plurality of slots for accommodating coils of wire comprising:
- means for holding the armature in a predetermined position, housing means located adjacent opposite sides of the armature when the armature is held by the means for holding the armature, first annular means rotatably mounted on the housing means about an axis generally normal to the longitudinal axis of the core adjacent one side of the core, second annular means rotatably mounted on the housing means about an axis generally normal to the longitudinal axis of the core adjacent the side opposite the one side of the core, said first and second annular means each having means for receiving wire from a supply of wire and locating the wire adjacent the core so that

the wire can be wound on the core, drive means to rotate the first annular means in a first circumferential direction and to rotate the second annular means in the opposite circumferential direction, first means for guiding the wire



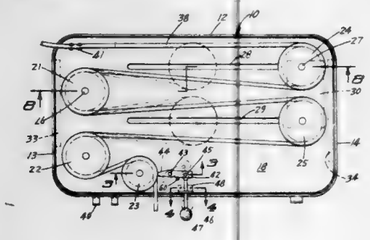
moving from the first annular means into a first pair of slots in the core to form a first coil on the core, and second means to guide the wire moving from the second annular means into a second pair of slots in the core to form a second coil on the core.

4,174,816

STERILE SURGICAL CORD AND TUBE RETRACTOR

Leslie C. Olson, Minneapolis, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Jun. 6, 1973, Ser. No. 367,640
Int. Cl.² B65H *75/36*
U.S. Cl. 242—47.5 **4 Claims**



1. A retractor for elongated flexible linear tube and cord elements used in surgical procedures, said retractor comprising:

(A) a horizontally disposed housing having vertical end walls and side walls and a removable top tray,

(B) a plurality of stacked horizontal parallel vertically spaced apart retractor plates within said housing,

(C) a plurality of laterally spaced apart peripherally grooved wheels fixedly mounted on the top side of each of said retractor plates adjacent one end thereof, said wheels being journaled for rotation about vertical axes,

(D) a plurality of laterally spaced apart peripherally grooved wheels movably mounted on the top side of each of said retractor plates adjacent the opposite end thereof for reciprocable movement relative to said fixedly mounted wheels, said wheels being journaled for rotation about vertical axes,

(E) a plurality of longitudinal slots in each of said retractor plates in number corresponding to said reciprocable wheels, said reciprocable wheels being mounted for movement in said slots,

(F) resilient tension means connected to said reciprocable wheels for normally urging said wheels away from said fixedly mounted wheels,

(G) a further peripherally grooved wheel fixedly mounted on the top side of each of said retractor plates adjacent one side edge of said plate between the first mentioned fixedly mounted wheels and reciprocable wheels,

(H) a first opening in said housing for entry of a linear element to each of said retractor plates,

(I) fastening means on each of said retractor plates adjacent said entry opening for securing a linear element to each plate, whereby, when said linear element is threaded in a serpentine path around said reciprocable and fixedly mounted wheels, said fastening means resists pulling tension on the free end of said element sufficient to cause movement of the reciprocable wheels toward the fixedly mounted wheels resulting in shortening of the serpentine path and extension of the element, and

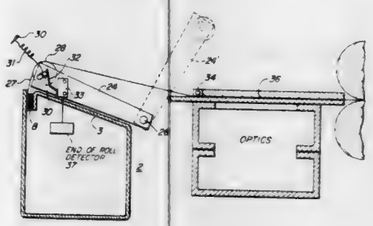
(J) a further exit opening in said housing adjacent each said further fixedly mounted wheel.

4,174,817

END OF ROLL DETECTOR

Daniel H. Robbins, Rochester, N.Y., assignor to Itek Corporation, Lexington, Mass.

Division of Ser. No. 730,758, Oct. 6, 1976, abandoned. This application Jun. 30, 1978, Ser. No. 920,765
Int. Cl.² B65H *25/04*
U.S. Cl. 242—57 **8 Claims**



1. In combination:

a. a film partridge, including exit orifice means;

b. film transport means for conveying photosensitive material from said exit orifice means, said film transport means having support means which enable said film transport means to be translated transverse the film path established by said film transport means; and

c. detector means associated with said film transport means for detecting said translation of said film transport means upon the exhaustion of photosensitive material contained within said cartridge.

4,174,818

GUIDANCE SYSTEMS FOR MOBILE CRAFT

Stephen J. Glenn, East Hanningfield, England, assignor to Elliott Brothers (London) Limited, Chelmsford, England

Filed Jan. 14, 1977, Ser. No. 759,535
Claims priority, application United Kingdom, Jan. 29, 1976, 3581/76
Int. Cl.² F41G *7/14, 9/00, 11/00*; G01S *1/00*
U.S. Cl. 244—3.13 **17 Claims**

1. Apparatus for guiding a craft comprising, means for projecting a beam of electromagnetic energy along a beam path to be followed by a moving craft, means for making different parts of the beam distinctive as to predetermined modulation parameters thereof from other parts so that the craft may establish in what part of the beam it is located, and means for imposing on the beam a code which contains data concerning the movement of the beam path whereby the craft may establish in what direction it should move to remain under the control of the beam.

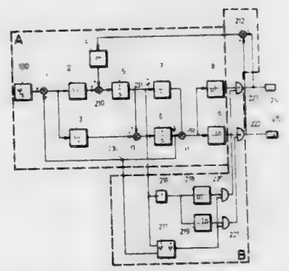


4,174,819

CONTROLLER FOR THE ATTITUDE STABILIZATION OF A SATELLITE

Ernst Brüderle, Ottobrunn; Eveline Gottzein, Oberpframmern, and Helmut Bittner, Munich, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Filed Jul. 11, 1978, Ser. No. 923,531
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1977, 2732201
Int. Cl.² B64G *1/20*
U.S. Cl. 244—169 **5 Claims**



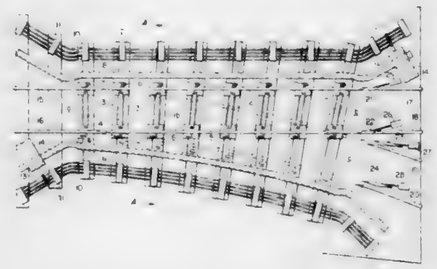
1. In a controller for the attitude stabilization of a satellite, having a first attitude control circuit by means of which said satellite can be returned to a position within predetermined band boundaries, $-\phi_B$, $+\phi_B$, and having output signals for controlling positive and negative thrust nozzles, the improvement comprising: a second control circuit, said second control circuit being supplied from said first attitude control circuit with values for the attitude angle ϕ and the angular velocity of the attitude $\dot{\phi}$, said second control circuit including a comparator means for providing an output signal when ϕ, $\dot{\phi}$ have the same sign, two AND elements responsive to the output signal of the comparator, two Schmitt triggers responsive to the positive direction and the negative direction of the attitude error respectively, each for supplying an output signal to one of said AND elements, OR elements responsive to the outputs of said AND elements and also responsive to said output signals from the first control circuit, the outputs of said OR elements being used for activating positive and negative thrust nozzles.

4,174,820

METHOD FOR MOVING A RAILWAY SWITCH AND EQUIPMENT FOR IMPLEMENTING THE METHOD

Bernd-Joachim Kempa, Berlin, Fed. Rep. of Germany, assignor to Elektro-Thermit GmbH, Fed. Rep. of Germany

Filed Jun. 6, 1978, Ser. No. 912,998
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1977, 2728413
Int. Cl.² E01B *7/04*
U.S. Cl. 246—430 **11 Claims**



1. In an apparatus for moving a railway switch composed of travel rail sections of a main track which are pivoted to rail sections of a branch-off track and locked by closing elements in a particular position with respect to a switch plate extending across the switch,

the improvement comprising two positioning sled means,

a profiled guide rail means supporting each of said sled means, one of said guide rail means being outside of and parallel to said travel rail sections of said main track, and the other of said guide rail means being outside of and parallel to said rail sections of said branch-off track,

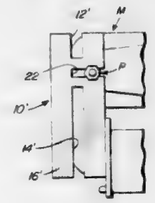
and cross-piece means on each positioning sled means, each of said cross-piece means having compression roller means mounted thereon and adapted to engage the inside of a rail head of an adjacent travel rail.

4,174,821

BRACKETS FOR MOUNTING MOTORS

Fred Levine, P.O. Box 380876, Miami, Fla. 33138

Continuation-in-part of Ser. No. 692,271, Jun. 3, 1976, Pat. No. 4,076,196. This application Jan. 5, 1978, Ser. No. 868,267
Int. Cl.² H02K *9/00*
U.S. Cl. 248—661 **1 Claim**



1. A motor mounting bracket for attachment between preexisting mounting points on a variety of motors and preexisting mounting points on a motor support structure comprising:

a substantially planar, generally rectangular member having first and second spaced ends, with a first slot being formed in said member, said first slot starting at an opening on said first end and extending longitudinally of said member, said first slot having sides which are parallel to said member longitudinal sides, said first slot extending to a position past the longitudinal center of said member;

a second slot extending from an opening in said second end and having sides which are parallel with said member longitudinal sides and longitudinally aligned with the sides of said first slot, said second slot terminating at a position prior to the longitudinal middle of said member and spaced from said first slot; and

a third slot extending from an opening in one of the longitudinal sides of said member and extending transversely of the member between the position of termination of said first slot and a position of termination of said second slot, said third slot terminating at a position aligned with the aligned edges of said first and second slots which are distal from the opening forming the beginning of said third slot.

4,174,822

SHOWER HOLDER

Nils Larsson, Dalävagen 50, Västra Frölunda, Sweden 421 68

Filed Sep. 9, 1977, Ser. No. 831,927
Claims priority, application Sweden, Sep. 17, 1976, 7610371
Int. Cl.² B05B *15/06*
U.S. Cl. 248—75 **4 Claims**



1. A shower holder assembly comprising in combination an elongated bar, means for attaching said bar to a wall, a bracket, a holder member for a shower handle attached to said bracket, said bracket comprising a yoke-like member defining an opening receiving said bar, said bracket being slidable along said bar and rotatable about said bar, said bracket including a pair of generally parallel shanks extending from said opening, said holder member being attached between said shanks and being connected thereto by means of a pivot pin, said holder member including a gripping ring for the shower handle said ring being open on one side and an adjustable tightening means connected between said shanks for releasably clamping the bracket to the bar and simultaneously clamping the holder member in position in the bracket by adjusting the distance between the shanks, wherein the holder member has a width which decreases towards a free end at least over the portion of the holder between said shanks, said shanks being spaced apart a distance substantially equal to the thinnest part of said portion at said free end of said holder, whereby said shanks are force apart by said holder member portion such that the holder member remains fixed against unintentional pivotal movement even if said tightening means is loose for sliding adjustment of said bracket along said bar.

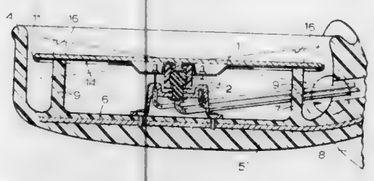
4,174,823

MOTOR VEHICLE REAR-VIEW MIRRORS

Christopher J. Sutton, Leamington Spa, and Leonard Trigg, Stockton, both of England, assignors to Desmo Limited, Warwickshire, England

Filed Jan. 23, 1978, Ser. No. 871,445
Int. Cl.² B60R *1/06*
U.S. Cl. 248—582 **8 Claims**

1. A rear view mirror for a motor vehicle comprising a housing adapted to be secured to the vehicle, a reflective element, an adjustable joint by which the reflective element is mounted in the housing and which enables the reflective element to be adjusted in relation to the housing to alter the rear view, wherein the housing is a moulding of self-skinning foam plastics material and includes resilient projections which are



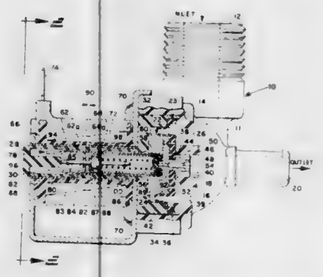
integrally formed in the foam material of the housing and which bear on the back of the reflective element on opposite sides of the adjustable joint and remote from the adjustable joint.

4,174,824

PRESSURE OPERATED PILOT CONTROL SHUT-OFF VALVE

Lawrence A. Kolze, Bensonville, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 13, 1977, Ser. No. 796,779
Int. Cl.² F16K *31/40*
U.S. Cl. 251—30 **17 Claims**



1. A valve assembly of the type energizable upon connection to a source of electrical power to permit fluid flow through the main passage thereof, said assembly comprising:

(a) housing means defining a fluid passage having an inlet and an outlet and including means defining a main valve seating surface intermediate said inlet and outlet, said housing means including guide means defining a guide hollow having the walls thereof formed of non-magnetic material;

(b) a main valve member movable with respect to said housing means between a closed position contacting said seating surface, and an open position spaced from said seating surface permitting fluid flow from said inlet to said outlet;

(c) means biasing said main valve member to the closed position;

(d) means defining a pilot flow passage through said valve member for communicating said inlet and outlet;

(e) a pilot valve member movable with respect to said main valve member between a closed position preventing fluid flow through said pilot passage and an open position permitting flow through said pilot passage;

(f) electromagnetic means operable upon said energization to move said pilot valve from said closed to said open position including means biasing said pilot valve member to the closed position, said electromagnetic means including,

(i) first pole-piece means comprising a pair of tubular members formed of ferromagnetic material received in said housing means with the ends thereof axially spaced to define therebetween a predetermined air gap, said tubular members being disposed about said guide means,

(ii) second pole-piece means formed of ferromagnetic material and movably received in said guide hollow,

(iii) armature means formed of ferromagnetic material movably received in said guide hollow and movable between a first position spaced from said second pole-piece means in which first position said pilot valve is closed and a second position contacting said second pole-piece means in which second position said pilot valve is opened,

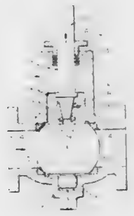
(iv) stop means movable with said second pole-piece means and operable to limit the movement of said armature means relative to said second pole-piece means, wherein, upon energization of said electromagnetic means, said armature means is moved from said first position to said second position such that said pilot valve is opened and flow is permitted through said pilot passage thereby causing a pressure differential across said pressure responsive means and opening of said main valve by said pressure differential acting on said pressure responsive means, wherein as said main valve moves from said closed to said open position, said stop means, second pole piece means and said armature means move as a unit therewith, and wherein, in the deenergized condition, said armature means is disposed such that the space between said armature means and said second pole-piece means is disposed longitudinally at the same station as said air gap.

4,174,825

BALL VALVE WITH RECIPROCAL AND ROTATABLE SPINDLE

Juha A. E. Nelimarkka, Marjalahdentie 8, 00930 Helsinki 93, Finland

Filed Nov. 28, 1977, Ser. No. 855,334
Claims priority, application Finland, Dec. 28, 1976, 763718
Int. Cl.² F16K *25/00, 5/06*
U.S. Cl. 251—86 **6 Claims**



1. A ball valve comprising

a body provided with a flow channel;

a generally ball-shaped rigid closing organ;

sealing rings fitted into ring-shaped and transverse grooves in the valve body on both sides of said closing organ;

a pair of spindles associated with said closing organ and provided extending from opposite sides thereof for receipt by said body; and mounting said organ so that the pressure of fluid on said organ tips said organ into sealing engagement against a said sealing ring; and

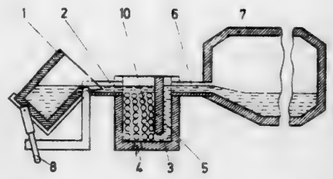
means for actuating said organ to rotate it with respect to said body to effect opening and closing of said flow channel, said means including one of said spindles extending through said body to the exterior of the valve through a sealing mechanism, said one spindle having a wedgelike first end thereof; means defining a generally V-shaped groove in one side of said organ for cooperation with said one spindle first end; and means for mounting said one spindle with respect to said V-shaped groove so that normally said one spindle first end is spaced from operative engagement with said means defining said organ V-shaped groove, and so that low-torque turning of said organ is effected by linear reciprocation of said one spindle into operative association with said means defining said V-shaped groove to move said organ out of tipping engagement with a said sealing ring, and subsequent rotation of said spindle and organ.

4,174,826

APPARATUS FOR LOWERING THE CONCENTRATION OF SODIUM IN ALUMINUM MELTS

Kurt Buxmann; Jean-Daniel Bornand, both of Sierre, and Alfred Steinegger, Venthône, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 780,225, Mar. 22, 1977, Pat. No. 4,138,246.
This application Oct. 13, 1978, Ser. No. 951,214
Claims priority, application Switzerland, Mar. 26, 1976, 3807/76
Int. Cl.² C22B *9/02*
U.S. Cl. 266—227 **9 Claims**



1. An apparatus for lowering the sodium concentration of an aluminum melt comprising:

a filter chamber having a floor, an aluminum melt inlet and an aluminum melt outlet;

filter means provided in said chamber between said inlet and said outlet;

said filter means comprising a loosely packed bed of granular material comprising a carrier material and a chemically active carbon coating provided on the surface of said carrier material.

4,174,827

AIRSPRINGS

Arthur B. Hirtreiter, Akron, and Paul R. Brown, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 4, 1977, Ser. No. 839,488
Int. Cl.² F16F *9/04*
U.S. Cl. 267—65 B **8 Claims**



1. A high ratio L/D rolling lobe airspring mounted between

two members capable of relative motion between them comprising:

a piston mounted to one of the members;

a plug mounted to the other of the members;

a flexible sleeve type membrane mounted at one of its ends to the piston and at the opposite end to the plug by means of ring fittings to form an airtight chamber between them, the mounting being such that the piston moves axially into the tubular membrane and the membrane walls form lobes encasing the piston;

means to pressurize the chamber; and

a collar mounted at the end of the membrane having the plug, exteriorly of and axially aligned with the plug such as to limit any upward excursion of the membrane upon being subjected to load forces.

4,174,828

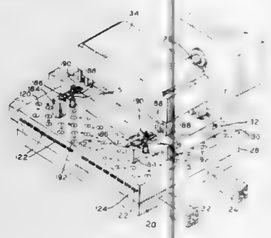
BAYONET CLAMPING APPARATUS FOR MACHINE TOOLS

Raymond A. Bergman, Minster, Ohio

Continuation-in-part of Ser. No. 684,725, May 10, 1976, Pat. No. 4,058,885. This application Aug. 31, 1977, Ser. No. 829,358

Int. Cl.² B23Q 7/00

U.S. Cl. 269—34 **14 Claims**



1. Apparatus for clamping a workpiece or workpiece fixture in a machine tool comprising:

a table having a surface adapted to support a workpiece or workpiece fixture thereon,

a fluid actuator including a piston and cylinder mounted within said table beneath said table surface, one of said piston or cylinder being stationarily secured to said table, and the other of said piston or cylinder being fluid actuated,

a plurality of openings in said table surface through which said fluid actuator is accessible,

a plurality of removable covers for covering selected said openings,

a clamp element removably received in one of said openings for sliding movement in a direction generally normal to said table surface,

means for selectively mechanically interlocking said clamp element with said the other of said piston or cylinder whereby when said fluid actuator is actuated, said clamp element will slide in said opening, and

means on said clamp element for engaging a workpiece or workpiece fixture in a manner to enable clamping of same to said table when said clamp element is drawn toward said table by said fluid actuator.

4,174,829

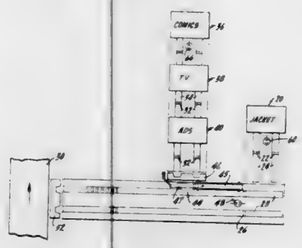
NEWSPAPER STUFFERS

William B. McCain, Hinsdale; James F. Cosgrove, Western Springs, and Elmer Bewersdorf, Downers Grove, all of Ill., assignors to McCain Manufacturing Corporation, Chicago, Ill.

Filed Feb. 1, 1978, Ser. No. 874,265

Int. Cl.² B65H 5/30

U.S. Cl. 270—55 **5 Claims**



1. In a newspaper stuffing machine where a newspaper section is opened at a stuffing station so it may be stuffed with insert material, the newspaper being fed from a jacket supply hopper to a transport conveyor moving past the stuffing station which is located in front of a gathering conveyor on which is gathered the insert material to be stuffed, and in which the insert material may be composed of a number of individuual inserts fed to the gathering conveyor from a corresponding number of insert supply hoppers disposed in feeding relation to the gathering conveyor:

means to feed the newspaper sections one by one from the jacket supply hopper to the transport conveyor;

a detector to detect failure to feed a newspaper section timely to the stuffing station;

a reject deflector positioned at the stuffing station normally to support and guide the gathered insert material for delivery into the opened newspaper section and when actuated serving to guide the gathered insert material into a discard station;

and means to actuate the reject deflector in the event of failure to detect a timely fed newspaper section thereby to prevent delivery of the insert material intended for the missing newspaper section.

4,174,830

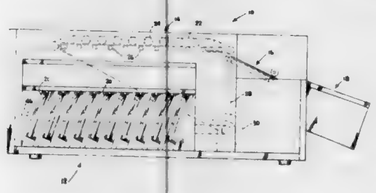
SHEET FEEDER FOR A COLLATOR

Hans C. Mol, Wilton, Conn., assignor to Pitney Bowes, Inc., Stamford, Conn.

Filed Jun. 12, 1978, Ser. No. 914,340

Int. Cl.² B65H 39/055

U.S. Cl. 270—58 **3 Claims**



1. Sheet collating apparatus comprising:

A. a plurality of parallel spaced open ended sheet storage bins for storing stacks of sheets therein;

B. pusher means movably mounted in each of said bins and normally operatively engaged with the topmost sheet of each of said stacks to push said topmost sheets from said bins;

C. drive means for simultaneously reciprocating said pusher means in each of said bins in a sheet pushing stroke and a retracting stroke;

D. conveyor means disposed adjacent the open ends of said bins for receiving sheets from said pusher means and for conveying said sheets to a discharge station of the collating apparatus, and;

E. means for controlling said normal operative engagement of said pusher means with the topmost sheet of each of said stacks, said means including a magnetic latching plate carried on one portion of said pusher means and a magnet affixed to another portion of said pusher means for disengaging said pusher means from said topmost sheet when said pusher means is adjacent the end of its sheet pushing stroke whereat said magnet pulls in and latches said pusher means to said magnetic latching plate and means for re-engaging said pusher means with the next succeeding topmost sheet when said pusher means is adjacent the end of its retracting stroke whereby said pusher means is out of engagement with said succeeding topmost sheet during the retracting stroke of said pusher means.

4,174,831

DEVICE FOR INSERTING A NEW STACK OF SHEETS IN FEEDING POSITION WITHOUT INTERRUPTION OF SHEET-FEEDING MECHANISM OPERATION

Josef Marass, Seehausen, and Rudolf Liepert, Augsburg, both of Fed. Rep. of Germany, assignors to Georg Spiess GmbH, Gersthofen, Fed. Rep. of Germany

Filed Aug. 11, 1977, Ser. No. 823,671

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1976, 2637086

Int. Cl.² B65H 1/26

U.S. Cl. 271—159 **12 Claims**



1. In a continuously operable sheet-feeding mechanism for a printing press or other discrete sheet processing machine, a device for replenishing a stack of sheets in position for sheet-feeding, without interruption of the progress of sheet-feeding, comprising, in combination:

a stacking table;

a frame for supporting sheet-feeding apparatus above the stacking table;

first hoist means for lifting and lowering the stacking table within said frame;

a set of parallel carrier rods oriented parallel to the direction in which sheets are fed off said stack by the sheet-feeding apparatus supported by said frame, which carrier rods are insertable below the bottom of a stack of sheet material into a set of parallel grooves distributed over the area of the stacking table;

a front cross rod and a rear cross rod perpendicular to the carrier rods, arranged so as to support said carrier rods and extending completely across the set of carrier rods, and

second hoist means for lifting and lowering said cross rods, whereby said carrier rods and a depleted stack thereon may be lifted gradually on said carrier rods as required by said sheet-feeding apparatus while the stacking table is lowered to receive a new stack of sheet material,

said rear cross rod being adjustable in the sheet-feeding direction so that it may abut the rear edge of a stack of sheet material on said stacking table and having a configuration and disposition such as to function as a rear stop for the bottom of a stack that is located above the carrier rods, said carrier rods being insertable in support means affixed to said cross rods at the time they are inserted in said grooves of said table and being withdrawable after a new stack is brought up under them by said first hoist means.

4,174,832

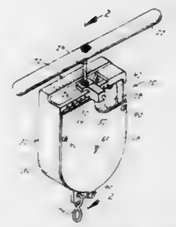
FRICTION TYPE EXERCISE DEVICE

Charles W. Thompson, R.R. 2, Box 24A, Columbia, Ill. 62236

Filed Nov. 8, 1976, Ser. No. 739,627

Int. Cl.² A63B 21/00

U.S. Cl. 272—133 **10 Claims**



2. An exercise device having means mounting a cord within the device for selective movement of the cord into and out of the device, the device having further means to resist movement of the cord as the cord moves out of the device, said last mentioned means including spool means about which the cord may be wound and lever means supported in the device and cooperating with the spool means for pivotal movement thereof so as to force the cord on the spool means against the device.

4,174,833

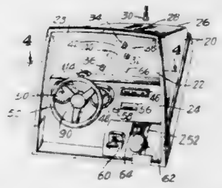
SIMULATED ROAD RACING GAME

Michael Hennig, Fort Lee, N.J., and Lawrence Reiner, Woodbury, N.Y., assignors to Mego Corp., New York, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,517

Int. Cl.² A63F 9/14

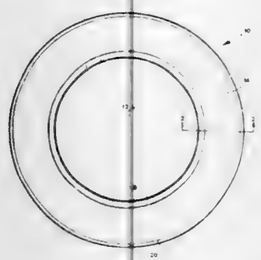
U.S. Cl. 273—1 E **42 Claims**



1. A simulated road racing game comprising an enclosure, means to provide light in said enclosure, a transparent panel, said transparent panel being both light transmissive and light reflective, said transparent panel being an inclined front part of said enclosure, at least one movable belt within said enclosure,

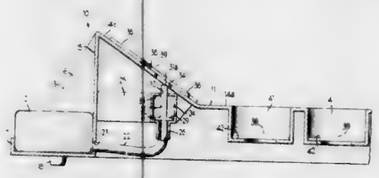
said belt having a substantially horizontal reach, means within said enclosure to move said belt along said reach, at least one toy vehicle mounted on said belt, so that said one toy vehicle is visible through said inclined transparent panael, at least one other toy vehicle within and adjacent the front of said enclosure, said other toy vehicle being disposed in front of said inclined transparent panel so that the image of said other toy vehicle is reflected from said inclined transparent panel in juxtaposition with said one toy vehicle, means to manipulate said other toy vehicle so that the image of said other toy vehicle can be moved relative to said one toy vehicle, sensor means for sensing the instance of visual coincidence of said one toy vehicle with the image of said other toy vehicle, and means for imparting motion to said other toy vehicle such that said other toy vehicle appears to perform a somersault over said one toy vehicle in response to the sensing of said instance.

4,174,834
STICK-PROPELLED DISK GAME
Aldo De Martino, 26 Dodge Ave., Akron, Ohio 44302
Filed Oct. 3, 1977, Ser. No. 838,465
Int. Cl.² A63B *65/10*
U.S. Cl. 273—96 B **3 Claims**



1. A stick-propelled disk game, comprising:
an annular disk having an opening centrally located within said disk, said disk having an inner circumferential edge about said opening having rounded edges for maintaining laminar flow of air over said disk during flight;
an outer circumferential edge about the outside circumference of said disk having rounded edges;
said circumferential edges being of a thickness greater than the thickness of the portion of said disk therebetween, such difference in thicknesses defining an aerodynamic cup between said circumferential edges;
said circumferential edges extending equidistance above and below the portion of said disk therebetween and thereby defining aerodynamic cups on upper and lower surfaces of said disk;
wherein said inner circumferential edge is of a width approximately equal to fifteen percent of the overall width of said disk between said opening and said outer circumferential edge of said disk, and wherein said outer circumferential edge is of a width approximately equal to one-half of the width of said inner circumferential edge; and
at least one stick for engagement with said opening for propelling and retrieving said disk.

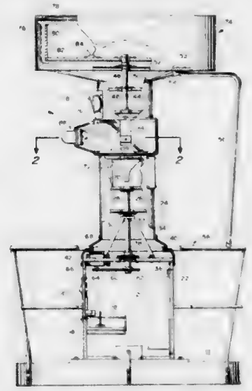
4,174,835
COMPETITIVE GAME
Jeffrey D. Breslow, Highland Park; Michael J. Ferris; Henry Arias, both of Chicago, and Walter J. Wozniak, Addison, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Dec. 29, 1977, Ser. No. 865,735
Int. Cl.² A63B *71/04;* **A63F** *9/02*
U.S. Cl. 273—101 **4 Claims**



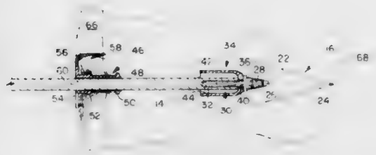
1. A game apparatus, comprising:
a plurality of sets of generally disc-shaped playing pieces, one set for each player of the game, each playing piece having indicia thereon distinguishing one set thereof from another set;
means defining a central, generally flat horizontal playing surface interconnecting the launching stations;
a plurality of opposed playing piece launching stations, each launching station including manually operable pneumatic playing piece propulsion means for launching a playing piece toward an opposing launching station, said playing piece propulsion means including a manually compressible air bulb, a cylinder communicating with said air bulb and mounted in a vertical position relative to the playing surface, and a plunger movably positioned in and guided by said cylinder to propel a playing piece in an end over end trajectory in response to compression of said air bulb;
means defining a launching retainer for receiving and supporting one of said playing pieces in a canted position relative to said playing surface for launching thereacross; and
a plurality of generally tubular shaped recesses formed in said playing surface, each recess being of sufficient depth to receive a plurality of playing pieces stacked on top of one another, said recesses being in a predetermined pattern whereby the object of the game is to launch a plurality of playing pieces into said recesses by a player of the game in an attempt to have the playing pieces of his respective set occupy the uppermost position in a predetermined number of recesses.

4,174,836
GAME FOR SIMULATING SUBMARINE CONNING STATION
Phillip C. Kearney, Aptos, Calif., assignor to Atari, Inc., Sunnyvale, Calif.
Filed Nov. 17, 1977, Ser. No. 852,434
Int. Cl.² A63F *9/02*
U.S. Cl. 273—101.2 **11 Claims**

1. A game for simulating the visual, audio and physical conditions at the conning station of a submarine, including the combination of a pedestal, a simulated periscope column mounted on the pedestal for rotation about a vertical axis, a periscope eyepiece carried on a side of the column for viewing along a line of sight, video means mounted within the column for forming a video display which simulates a scene viewed through the periscope of a submarine, means for directing the video display along the line of sight of the eyepiece, enclosure means having spaced-apart transparent walls extending across said line of sight and disposed between the eyepiece and video means a liquid carried within the enclosure means at a level for creating an image which simulates the water line above a submarine, and speaker means for simulating sounds at the conning station of a submarine.



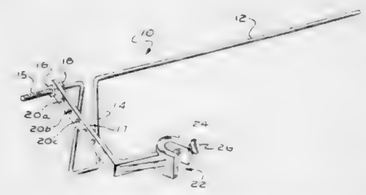
4,174,837
DRUG DISPENSING APPARATUS FOR A HUNTING ARROW
Gus A. Benke, Rte. 9, Box 850, San Antonio, Tex. 78227
Filed Mar. 16, 1978, Ser. No. 887,187
Int. Cl.² F41B *5/02*
U.S. Cl. 273—106.5 R **7 Claims**



1. A drug dispensing apparatus for use in hunting animals with a bow and arrow, said arrow having an arrowhead releasably secured to a forward end of a shank, said drug dispensing apparatus comprising:
center cylinder means having a central opening along a longitudinal axis thereof for slideably receiving said shank therethrough, said center cylinder means having at least one outwardly extending flange along a trailing end thereof;
outer cylinder means with means for securing on a forward end thereof to said arrow at said arrowhead, a rear end of said outer cylinder means slideably receiving and sealing with said center cylinder means to define a space therebetween, said space having a drug therein for immobilizing said animal upon impact.

4,174,838
GOLF PUTTER ALIGNING DEVICE
Paul E. Paschetto, 136 Melwood Ave., East Longmeadow, Mass. 01028
Filed Jun. 30, 1978, Ser. No. 920,814
Int. Cl.² A63B *69/36*
U.S. Cl. 273—163 A **5 Claims**

1. In combination with a golf putter having a shaft with a head at its lower end, a horizontal pointer for aligning the head with respect to a ball, pendulum means mounted for free swinging, pivoted movement with respect to the pointer for aiding in positioning a golfer's head in a vertical direction with respect to the ball and clamping means removably securing the pendulum means and pointer to the shaft over the head.



4,174,839
GOLF CLUB INCLUDING PUTTING GREEN SLOPE CORRECTION AIMING LINES
Duane K. Marrs, 806 2nd Ave., Monett, Mo. 65708
Filed Mar. 21, 1978, Ser. No. 888,766
Int. Cl.² A63B *69/36*
U.S. Cl. 273—183 D **5 Claims**



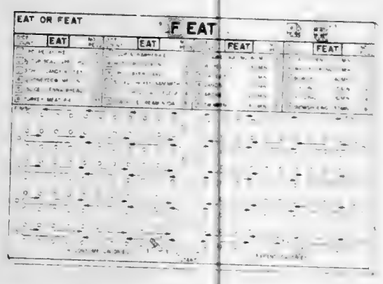
1. A golf club including a shaft, a mallet type club head affixed to said shaft and having a ball striking surface, said head including a top surface intersecting with said striking surface, and having a ball aiming arrangement comprising:
(a) a thin, elongate visible center line on said head top surface and extending substantially perpendicularly to the intersection of said top surface and said striking surface for establishing a ball striking path for squarely hitting the ball;
(b) a focal area on said head top surface, said focal area being aligned with said center line and spaced from said striking surface;
(c) a plurality of visible straight indicating lines on said top surface and emanating from the direction of said focal area, said indicating lines forming a congruent array of multiple pairs of indicating lines on said top surface and extending in opposed angular directions from said center line to said intersection for establishing a series of selective aiming paths directly from the club to a target angularly deviating from the ball striking path; and
(d) coded indicia on said top surface identifying respective indicating lines.

4,174,840
WEIGHT CONTROL GAME APPARATUS
Richard A. Curtiss, 207 Carlton Club Dr., Piscataway, N.J. 08854
Filed Feb. 24, 1978, Ser. No. 880,976
Int. Cl.² A63F *3/00*
U.S. Cl. 273—248 **12 Claims**

1. A weight control game apparatus comprising:
a gameboard having a plurality of consecutive playing positions;
chance selection means for enabling a player to make a chance selection of one of a variety of foods and exercise

activities, each of said foods and exercise activities having a respective number of moves between said playing positions related at least approximately to the caloric value associated with it;

said chance selection means including normally manipulatable means for enabling said player to make a chance selection of one of a plurality of move related symbols, a plurality of eat and feat instruction cards, said feat instruction cards having the letter "F" on one side thereof, said gameboard including a first portion upon which is formed the word "EAT" and a second portion for receiving selected ones of said instruction cards located in relation to said first portion so that the word "FEAT" is spelled out when one of said feat instruction cards is selected by a



player; and a chart for enabling said player to relate a selected one of said move related symbols to a respective one of said foods when one of said eat instruction cards has been selected by said player and to a respective one of said exercise activities when one of said feat instruction cards has been selected by said player;

a first playing position marker for indicating movement between said playing positions corresponding to consumption of selected ones of said foods; and

a second playing position marker for indicating movement between said playing positions corresponding to the performance of selected ones of said exercise activities;

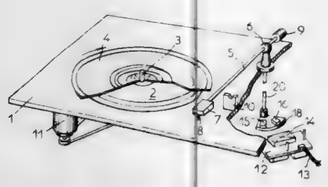
the relative positions of said first and second playing position markers determining one of weight loss and weight gain and the respective amount thereof.

4,174,841

RECORD PLAYER WITH START-STOP CONTROL BY MEANS OF A MAGNETIC FIELD

Alain Cousin, Flers, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 7, 1978, Ser. No. 931,602
Int. Cl.[2] G11B *17/06*
U.S. Cl. 274—1 L **10 Claims**



1. A record player comprising a chassis; a turntable, a pivotable pick-up arm assembly having a cartridge and pick-up sytlus mounted thereon, a fixed arm support, and an electric motor for driving the turntable, mounted on the chassis; means for supplying power to the motor, including control means comprising a motor-stop switch, a first magnetic field generator associated with a Hall-effect detector element movable relative to each other in conjunction with the pivoting movement of the pick-up arm to generate an output stop signal, and a circuit for actuating the stop switch in response to the output stop signal supplied by the Hall element, said circuit including a differentiator for sensing a pivoting speed of the arm which corresponds to the pick-up stylus scanning the zone which follows after the recording area of a record,

wherein said Hall element is combined with said circuit as an integrated assembly fixedly mounted on the chassis, and

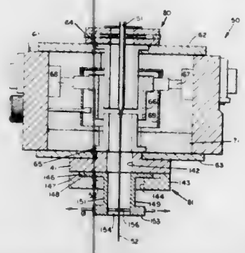
the player comprises a member adjustably secured to a pivoting structure of the pick-up arm assembly, said first magnetic field generator being mounted on the member; and a second magnetic field element mounted on the member for inducing in said Hall element a start signal which is related to the position of the pick-up arm which has been moved from its support, said circuit including means for energizing the motor responsive to said start signal.

4,174,842

NON-CONTACTING SEAL FOR TREATING CHAMBER THROUGH WHICH ELONGATED MATERIAL IS MOVED

Fred P. Partus, Atlanta, Ga., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Mar. 31, 1978, Ser. No. 892,223
Int. Cl.[2] C03B *37/00*; F16J *15/40*
U.S. Cl. 277—3 **11 Claims**



1. Apparatus for sealing a treating chamber into which an elongated material extends, which comprises:

a disc-shaped member adjacent an entrance to the treating chamber and having an opening through which the elongated material extends into the treating chamber without contacting the disc-shaped member when said opening is substantially centered about the elongated material;

means for supporting the disc-shaped member for movement in a plane substantially perpendicular to the elongated material; and

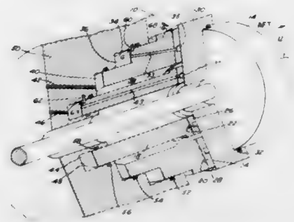
means for flowing a gas through the disc-shaped member into the opening and into engagement with the elongated material at an angle such that the disc-shaped member is moved in the plane relative to the elongated material to center its opening about the elongated material, and such that the gas is divided into streams that move along the elongated material in opposite directions to seal the treating chamber.

4,174,843

SELF-ADJUSTING TANDEM SEAL

John P. Arena, Middletown, R.I.; Charles G. McGuigan, Arlington, Va., and Gene A. Rossi, North Providence, R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 8, 1978, Ser. No. 913,935
Int. Cl.[2] F16J *15/40, 15/34*
U.S. Cl. 277—3 **10 Claims**



1. An adjustable dynamic feedback seal system comprising:

a seal ring having at least one feedthrough aperture for providing feedback pressure to said seal ring;

a mating ring adapted for abutting with said seal ring and having a common axis with said seal ring, said mating ring adapted to be rotated with respect to said seal ring; and

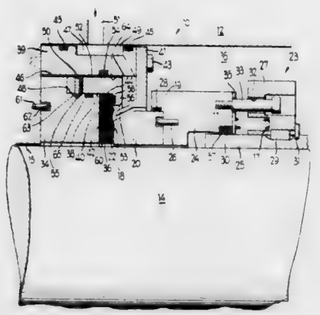
a chamber located at an end of said seal ring away from said mating ring and venting an end of said at least one feedthrough aperture, said chamber being otherwise sealed.

4,174,844

MECHANICAL SEAL

Arthur Zobens, Mount Prospect, Ill., assignor to Crane Packing Company, Morton Grove, Ill.

Filed Dec. 5, 1975, Ser. No. 637,975
Int. Cl.[2] F16J *15/38*
U.S. Cl. 277—85 **8 Claims**



1. In a face type rotary mechanical seal having a pair of sealing members in relatively rotating sealing engagement, a sealing member comprising:

(a) a generally annular sealing ring formed of carbon material defining a sealing face for a relatively rotating sealing engagement with the other sealing member, said carbon sealing ring having an outer peripheral surface and at least one generally radially directed annular support surface spaced from said sealing face;

(b) a generally annular rigid back-up ring having a generally radially directed annular support surface in supporting contact with said support surface of said sealing ring; and

(c) means defining a pressure barrier overlying the outer peripheral surface of said carbon sealing ring to separate said outer peripheral surface from the fluid to be sealed; and

(d) wherein said barrier defining means comprises a rigid generally annular retainer secured to said rigid back-up ring, said retainer including a portion overlying said outer peripheral surface of said sealing ring, and means providing a fluid tight seal between said retainer and said carbon seal ring to prevent entry of sealed fluid therebetween.

4,174,845

FLUID SEAL

Bernard M. Hadaway, Highett, Australia, assignor to Repco Research Proprietary Limited, Victoria, Australia

Continuation of Ser. No. 601,651, Aug. 4, 1975, abandoned, which is a continuation-in-part of Ser. No. 349,174, Apr. 9, 1973, Pat. No. 3,923,315. This application Jun. 30, 1977, Ser. No. 811,857
Claims priority, application Australia, Aug. 15, 1974, PB8545/74
Int. Cl.[2] F16J *15/32*
U.S. Cl. 277—134 **11 Claims**



1. A fluid seal for use between two relatively rotatable members including:

an annular body attachable to one of said members;

a circumferential resilient, flexible lip formed on said body and projecting therefrom so that a sealing edge of said lip is engageable with the other said member;

said sealing edge being defined by the common edge of two angularly disposed annular surfaces;

a pumping configuration formed on one of said surfaces and being operative to urge fluid towards said sealing edge during relative rotation of said members; and

a plurality of discontinuities in the form of ribs on said same surface as said pumping configuration, projecting out from said surface, and extending over said sealing edge to said other angularly disposed annular surface,

said ribs being at regularly spaced intervals around the circumference of said lip edge; and

said ribs and said lip being resiliently deformable whereby as said sealing edge engages said other member, capillary recesses form on either side of said rib to permit fluid to be transferred from one side of said lip to the other under dynamic conditions, but not under static conditions.

4,174,846

SEALING RING

Lynn S. Scott, Salt Lake City, Utah, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Continuation of Ser. No. 777,799, Mar. 15, 1977, abandoned, which is a division of Ser. No. 631,856, Nov. 14, 1975, Pat. No. 4,013,299. This application Mar. 9, 1978, Ser. No. 884,868
Int. Cl.[2] F16J *15/32*
U.S. Cl. 277—205 **4 Claims**

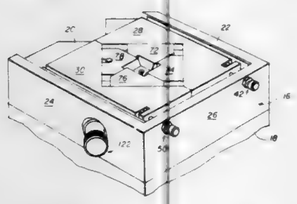
1. A sealing ring for installation between two members spaced apart a predetermined distance, said sealing ring comprising a U cup and an elastomeric expander ring, said U cup having an annular base of generally rectangular cross section

and spaced lips extending from one side of the base to form a cavity between the lips into which cavity the expander ring is mounted, each lip having a free end remote from the base, said expander ring when in the cavity having an initial maximum cross section dimension located substantially at the midpoint of the ring in the direction that said lips extend from the base, said expander ring when in the cavity being substantially symmetrical in cross section about a plane through said midpoint and normal to said direction, said lips each having a pair of frustoconical surfaces that intersect to form well defined circular



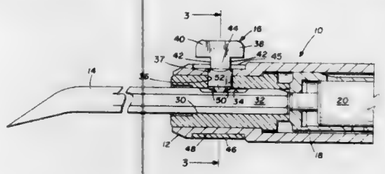
sealing edges that when the sealing ring is uninstalled are transversely spaced from each other a distance greater than said predetermined distance, said U cup when the sealing ring is uninstalled and the expander ring is bottomed in said cavity having a plane through both said edges that is between said midpoint and the bottom of the cavity whereby when the sealing ring is installed said sealing edges move toward each other by contact with said members to cause said lips to deform said expander ring with no portion of the lips other than the sealing edges being in contact with said members.

4,174,847
PRECISION CENTERING DEVICE
Mordechai Wiesler, Lexington, Mass., assignor to Teledyne, Inc., Hawthorne, Calif.
Filed Dec. 12, 1977, Ser. No. 859,734
Int. Cl.² B23B *31/16*
U.S. Cl. 279—1 L **12 Claims**



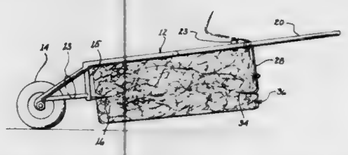
1. A precision positioning device comprising:
(a) a base;
(b) two plates mounted on said base, said plates mounted for relative movement in side-by-side relationship on said base, an opening defining a guideway formed in said plates, said opening formed between said plates, the profile of said opening governed by the relative position on said plates;
(c) a plurality of relatively movable guides constrained by said guideway for mutual coacting movement, a port of predetermined geometrical configuration formed by said guides; and
(d) position means connected to at least one of said guides for moving each of said guides, said geometrical configuration of said port governed by the profile of said opening, the size of said port determined by the relative positions of said guides.

4,174,848
LATCHING MECHANISM FOR RECIPROCATING IMPACT TOOLS
Victor E. Richardson, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Mar. 1, 1978, Ser. No. 882,474
Int. Cl.² B25D *17/08*
U.S. Cl. 279—19.5 **3 Claims**



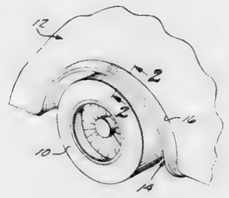
1. An improved latching mechanism for retaining a bit, such as a chisel, scaler, chipper or the like in impact-type, power tools that include a nose portion having a longitudinally extending opening sized to slidably receive the shank of the bit wherein the shank of the bit has a longitudinally extending latch recess along an intermediate part of one side and the nose portion also has a radial port intersecting the opening, the improvement comprising:
a latch member extending through the radial port and rotatable therein between latched and unlatched positions, said latch member having a gripping portion on a first end disposed outside the nose and a bit engaging portion on a second end disposed inside the opening in the nose portion, said bit engaging portion having first surface means engageable with the bit when said latch member is in the latched position for preventing removal of the bit from the nose while permitting limited reciprocating movement of the bit and second surface means frictionally engaging the bit when said latch member is in the unlatched position for inhibiting the inadvertent discharge of the bit from the opening while permitting intentional insertion and removal of the bit; and
resilient means located on the nose portion in engagement with said latch member for preventing inadvertent movement of said latch member from one position to the other and for resiliently urging said latch member into frictional engagement with the bit when said latch member is in the unlatched position.

4,174,849
WHEELBARROW TYPE CARRIER
Alvin L. Wetzel, 1025 S. Stapley, Mesa, Ariz. 85204
Filed Nov. 23, 1977, Ser. No. 854,151
Int. Cl.² B62B *1/22*
U.S. Cl. 280—47.3 **4 Claims**



1. A carrier for transporting a bale of compacted resilient material, which item is penetrably accessible to prong means, said carrier comprising in combination:
(a) a framework having a forward end and a rear end;
(b) intermediate frame member means disposed between the forward end and the rear end for stabilizing the bale against rotation along a fore and aft axis of said framework by juxtapositioning of said bale with said intermediate frame member means upon engagement of said carrier with the bale;
(c) a wheel rotatably attached to the forward end of said framework for supporting the forward end of said framework during transport of said carrier across the ground;
(d) prong means extending rearwardly from the forward end of said framework for penetrably supportingly engaging the material of the bale through the face of one end of the bale;
(e) a pivotable prong means pivotally depending from said framework for penetrably and supportingly engaging the face of another end of the bale, whereby said prong means and said pivotable prong means support in concert the bale in a depending relationship to said framework; and
(f) handle means disposed at the rear end of said framework for pivoting said framework about said wheel and applying a force to transport the framework supported bale across the ground.

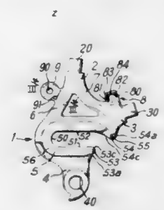
4,174,850
FENDER FLARE CLIP APPARATUS
Richard K. Hart, 11422 Yearling Cir., Cerritos, Calif. 90701
Filed May 30, 1978, Ser. No. 910,473
Int. Cl.² B62D *25/16*
U.S. Cl. 280—153 R **4 Claims**



1. In combination with a flare having a lip that underlies a peripheral flange of a vehicle fender, and a vertically extending web that overlies the exterior surface of said fender adjacent said peripheral flange,
a flexible clip of generally truncated triangle shape having a center leg that abuts the exterior of the lip of said flare, the opposite ends of said center leg integrally merging into inner and outer legs which extend away from the ends of said center leg and taper towards one another,
a tooth formed adjacent the free end of said outer leg, and
a bolt threadedly carried by said inner leg so as to be rotated into tight frictional engagement with the inside of said fender adjacent the lip thereof to thereby releasably lock said clip and flare onto said fender, with said tooth in biting engagement with the web of said flare.

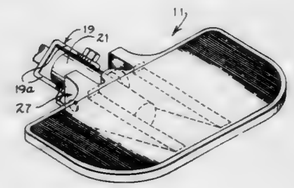
4,174,851
BICYCLE FRAME SUPPORT MEMBER
Roger H. Huret, 60, avenue Felix Faure, Nanterre (Hauts-de-Seine), France
Filed Nov. 17, 1977, Ser. No. 852,358
Claims priority, application France, Nov. 17, 1976, 76 34639
Int. Cl.² B62K *19/30*
U.S. Cl. 280—288 **10 Claims**

1. A one-piece support member for a bicycle, the bicycle including a frame, a derailleur, a wheel having an axle, and a cable for actuating the derailleur, said one-piece support member comprising:
an upper end adapted to be connected to the frame of the bicycle;
a lower end adapted to support the body of the derailleur; first and second sides extending between said upper and lower ends;
an elongated notch defined in said first and second sides, said elongated notch being adapted to receive the axle of the wheel arranged to oppose said first side of said support member; and
a lug having a front part and a rear part integrally disposed on said support member above said elongated notch, said lug projecting outwardly with respect to the plane of said



support member on said second side, and having an orifice through which the cable for actuating the derailleur is adapted to pass, said orifice having a reduced diameter at said front part, slightly larger than the diameter of the cable, and a larger diameter at said rear part to receive a sheath for protecting the derailleur actuating cable.

4,174,852
FOOT REST ASSEMBLY FOR MOTORCYCLE
Nace J. Panzica, 3033 Vistamont, San Jose, Calif. 95118, and Tyrone A. Cruze, 6761 San Anselmo, San Jose, Calif. 95119
Filed Jun. 28, 1978, Ser. No. 919,844
Int. Cl.² B62J *25/00*
U.S. Cl. 280—291 **5 Claims**



1. A foot rest assembly for a motorcycle comprising a bracket adapted to be mounted to a motorcycle, said bracket having a pair of spaced side walls and a back wall extending along and between said side walls, an extension rod disposed between said side walls, means coupling said rod to said bracket, a foot rest member having a relatively broad elongate foot rest surface, and means coupling said member to said rod at a position beyond said bracket in a manner to support said foot rest member upon said rod.

4,174,853

SKI BRAKE WITH BRAKE ELEMENTS ADAPTED TO FORM A TREAD BODY ENGAGEABLE BY A SKI BOOT AND WITH INWARDLY BENT SPRING WIRE

Tilo Riedel, Eching, Fed. Rep. of Germany, assignor to S.A. Establissements Francois Salomon & Fils, Annecy, France

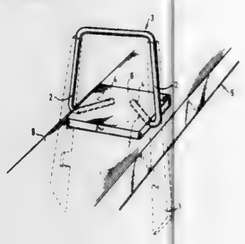
Continuation of Ser. No. 665,789, Mar. 10, 1976, Pat. No. 4,078,825, which is a continuation-in-part of Ser. No. 557,476, Mar. 12, 1975, Pat. No. 3,989,271. This application Mar. 10, 1978, Ser. No. 885,181

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1974, 2412623; Jul. 26, 1974, 2436155; Feb. 20, 1975, 2507371

The portion of the term of this patent subsequent to Jun. 22, 1993, has been disclaimed.

Int. Cl.² A63C *7/10*

U.S. Cl. 280—605 **5 Claims**



1. A ski brake for automatically braking the free flight of a ski upon the release of a ski boot therefrom, said ski brake comprising:

a mounting plate fixed to an upper surface of the ski and forming a pivot;

a spring wire swingable in said pivot on said plate and having a bight lying in one plane and a shank lying generally in said one plane and having an angularly bent portion received in said pivot and projecting out of said plane at least in an upwardly swung position of said bight so that, upon displacement of said bight toward said surface of said ski, said spring wire is resiliently loaded by distortion against said plate through engagement of said bent portion on said plate at said pivot and said wire springs up on release of said brake by said ski boot into said upwardly swung position; and

at least one brake element operatively connected to said spring wire and displaceable thereby into an operative position in which said element extends downwardly from the ski surface beneath said ski to engage the snow in said upwardly swung position of said bight.

4,174,854

BUILDING AND CONSTRUCTIONAL MACHINES OR VEHICLES

Roland Spicka, Serrig; Adolf Krob, Konz; Detlev Seidel, Konz, and Paul Viefhaus, Konz, all of Fed. Rep. of Germany, assignors to Zettelmeyer Maschinenfabrick GmbH & Co. KG Konz, Fed. Rep. of Germany

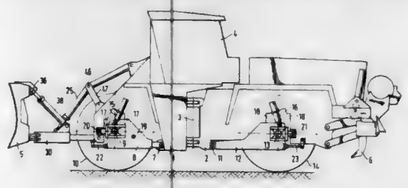
Filed Mar. 6, 1978, Ser. No. 883,680

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1977, 2710239

Int. Cl.² B62D *61/12*

U.S. Cl. 280—702 **9 Claims**

1. A construction vehicle, comprising running gear means, wheel axles mounted on said gear means and wheels mounted on said axles, a resilient suspension system on said running gear means for cushioning the vehicle during transport, means for pressurizing and depressurizing said system for respectively resiliently cushioning said running gear during vehicle transport and for rigidifying said running gear during a working



operation, and means for locking at least one of said axles against cushioning during said working operation.

4,174,855

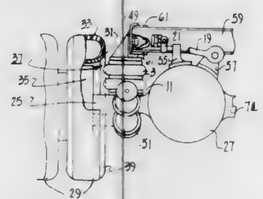
WHEELED VEHICLE AXLE SUSPENSION SYSTEM

Ervin K. Vandenberg, Massillon, Ohio, assignor to Turner Quick-Lift Corporation, Canton, Ohio

Continuation-in-part of Ser. No. 759,217, Jan. 13, 1977, abandoned. This application Jul. 12, 1978, Ser. No. 924,103

Int. Cl.² B60G *9/04*

U.S. Cl. 280—711 **21 Claims**



1. In an axle suspension system for a longitudinally frame membered truck, the system comprising a drive axle having located intermediate its ends a drive axle housing of substantially larger cross-sectional dimension than the ends of said axle and having located at each of its ends a wheel comprising a tire radially extending from a transverse rim and hub of lesser transverse dimension than said tire and rim thereby defining a hub cavity between the axle and the tire and rim, a resilient bellows means, means for locating the bellows in load-bearing relationship to the axle and control arm means for connecting the axle to the frame of the vehicle, the improvement comprising means for connecting one end of the resilient bellows means to a longitudinal frame member of the truck and the other end to and substantially directly above the axle, one side of said bellows being thus located adjacent the enlarged housing of the axle and the opposite side extending into said hub cavity, said resilient bellows means comprising an inflatable and deflatable air bag which expands and contracts dimensionally in the vertical and horizontal direction during operation of the truck axle.

4,174,856

CHROMENOINDOLE COLOR FORMERS

Heinz Balli, Riehen; Sigmund Gunzenhauser, Arlesheim, and Jean C. Petitpierre, Kaiseraugst, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

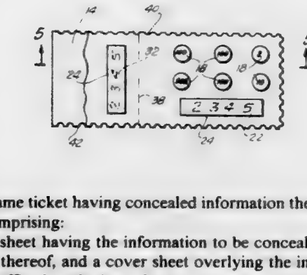
Division of Ser. No. 799,063, May 20, 1977, Pat. No. 4,123,439. This application Aug. 21, 1978, Ser. No. 935,393

Claims priority, application Switzerland, Jun. 4, 1976, 7115/76

Int. Cl.² B41M *5/22*

U.S. Cl. 282—27.5 **14 Claims**

1. A pressure-sensitive or heat-sensitive recording material which contains a colour former system comprising, as the colour-forming agent, at least one chromenoindole compound of the formula



wherein R_1 and R_2 independently of one another represent lower alkyl, phenyl or benzyl, and R_1 also represents hydrogen, or R_1 and R_2, together with the nitrogen atom which links them, represent pyrrolidino, piperidino or morpholino, X represents hydrogen, halogen, methyl or lower alkoxy, Q represents hydrogen, lower alkyl, phenyl, benzyl or the group of the formula



W represents hydrogen, halogen, lower alkyl, lower alkoxy or phenoxy, Y represents hydrogen, lower alkyl, phenyl or benzyl and Z represents hydrogen, halogen, lower alkyl, lower alkoxy, amino or amino substituted by lower alkyl, benzyl or phenyl.

4,174,857

GAME TICKET

John R. Koza, Atlanta, Ga., assignor to Canadian Tag & Label Ltd., Sparta, Mich.

Filed Dec. 28, 1977, Ser. No. 865,202

Int. Cl.² B42D *15/00*

U.S. Cl. 283—6 **28 Claims**

1. A game ticket having concealed information thereon, said ticket comprising:

a base sheet having the information to be concealed on one side thereof, and a cover sheet overlying the information and affixed to the base sheet;

said cover sheet including an optical barrier sheet secured thereto about the entire periphery of the cover sheet and being joined to the base sheet along the entire peripheral area of the sheets;

said base sheet also including a separate optical barrier sheet secured thereto about the entire periphery of the base sheet;

the information to be concealed being positioned within the area defined by the joined peripheral portions of the base and cover sheets whereby it is optically concealed by the optical barrier sheets in both the base and cover sheets;

an opaque removable material on the base sheet overlying and obscuring the information whereby it is concealed upon removal of the cover sheet from the base sheet;

a tear line of perforations in the cover and base sheets extending between at least a portion of the peripheral area of the sheets and the area of the base sheet containing the information whereby the cover and base sheets are adapted to be torn along the tear line to obtain access to the concealed information.

4,174,858

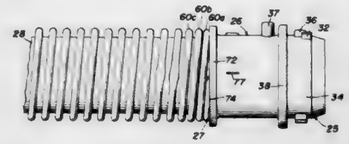
CONNECTION FOR SECURING A HELICALLY CONVOLUTED HOSE TO A HOSE FITTING

Joseph F. Brooks, Bloomington, Ill., assignor to National Union Electric Corporation, Greenwich, Conn.

Filed Dec. 6, 1976, Ser. No. 747,549

Int. Cl.² F16L *33/00*

U.S. Cl. 285—7 **13 Claims**



1. A connection for securing one end of a helically convoluted resilient hose to a hose fitting, each of the convolutions of said hose having inner surfaces defined by a pair of axially spaced, substantially radially extending side walls and a connecting end wall, and said fitting including a tubular portion extending into one end of said hose, said connection comprising at least a portion of one thread on the exterior of said tubular portion and having a pitch substantially the same as the pitch of the unstressed convolutions of said hose, said thread portion having substantially radially extending side walls and a substantially flat top so as to define a sharp edge at the intersection of each side wall with said top, said sharp edges frictionally engaging the inner surfaces of at least a portion of one of the convolutions of said hose, said thread portion also having spaced leading and trailing ends with respect to the relative direction of rotation of said tubular portion and said one end of said hose as these parts are being engaged, and barb means carried at the trailing end of said thread portion, said barb means comprising a sharp edge on the trailing end of said thread portion, said sharp edge extending transversely to said thread portion and being wider than said thread portion, the transverse width of said sharp edge also being greater than the internal width of the convolutions of said hose so that said sharp edge digs into the interior of at least one of the convolutions of said hose, whereby relative rotation between said one end of said hose and said tubular portion in a direction to effect disengagement of these parts is resisted when said thread portion is engaged with said portion of said convolution.

4,174,859

CONDUIT COUPLING ASSEMBLY

Joseph Houghton, 6135 DeGuise, Rochester, Mich. 48063

Filed May 24, 1978, Ser. No. 909,096

Int. Cl.² F16J *15/10;* **F16L** *17/02, 17/06*

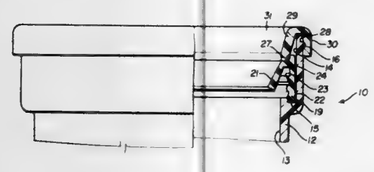
U.S. Cl. 285—111 **4 Claims**

1. In a conduit coupling assembly which couples a conduit that is inserted into said coupling assembly, said coupling assembly comprising:

(a) an annular hub having a first annular interior wall of a diameter slightly greater than the diameter of an inserted conduit and a second annular interior wall concentric with said first interior wall and having a diameter greater

than the diameter of said first interior wall, a portion of said hub connecting said first and second annular walls defining an interior groove portion and a circumferential rib portion extending around the exterior of the hub adjacent a conduit-receiving open end of said hub;

(b) a resilient seal mounted in said interior groove portion of said hub, said resilient seal having a truncated conical sleeve portion and an annular ring portion, said conical sleeve portion joined to said ring portion at one end and said sleeve portion extending progressively, axially away from said one end of said hub and radially inwardly toward the axis of said hub to a second free end, said one end of said conical sleeve portion being thinner than said second free end of said sleeve portion, said second end of said sleeve portion having an internal diameter slightly less than the external diameter of said conduit inserted into the coupling assembly, first raised circumferential rib portions extending around an outer periphery of said ring



portion between said ring portion and said second annular interior wall of said hub, second rib portions extending around an inner circumference of said ring portion between said ring portion and said conical sleeve portion; and

(c) a retainer ring adapted to be mounted on said open end of said hub, said retainer ring having an exterior hub engaging portion and an interior seal engaging portion, a radially inwardly opening circumferential groove in said hub engaging portion mating with said rib portion on said hub to retain said ring in place on said hub, said seal engaging portion engaging and holding said one annular end of said seal ring portion, said conduit being inserted into said coupling assembly and said conical sleeve portion yielding radially outwardly to compress said second rib portions, compression of said second rib portions reacting to cause compression of said sleeve portion against said conduit and compression of said first rib portions against said second annular interior wall of said hub.

4,174,860

OVEN LATCH ASSEMBLY WITH ADJUSTABLE UNLOCKING TEMPERATURE SUB-ASSEMBLY

Christopher J. Shea, New Britain, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Sep. 14, 1977, Ser. No. 833,304
Int. Cl.² E05C *5/02*
U.S. Cl. 292—113 **9 Claims**

1. A latch for ovens and the like comprising:

A. a support;

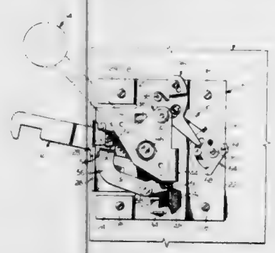
B. a latch subassembly movable on said support between latching and unlatching positions;

C. a high temperature locking pawl having an abutment surface thereon engagable with said latch subassembly to block its movement from latching to unlatching position;

D. means movably mounting said locking pawl on said support;

E. a thermal element operatively connected to said locking pawl and responsive to elevated temperatures to move said pawl from a first position wherein said abutment surface is removed from the path of movement of said latch subassembly from latching position to unlatching position to a second position wherein said abutment surface is disposed in said path of movement of said latch subassembly to block its movement into unlatching position, said thermal element being responsive to subsequent decline in temperature to move said pawl from said second position to said first position;

F. first adjustment means movably mounted on said support and engageable with said locking pawl during its movement from said first position to said second position to locate said abutment surface in a predetermined position in said path of movement of said latch subassembly; and



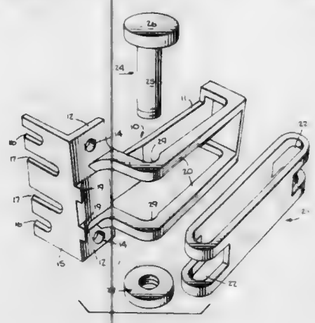
G. second adjustment means movably mounted on said support and engagable with said locking pawl during its movement from said second position to said first position to locate said abutment surface in a predetermined position spaced from said path of movement of said latch subassembly, said first and second adjustment means cooperating to limit the amount of movement of said pawl between said first and second positions and defining the location of said pawl in said first and second positions, whereby the latch may be adjusted for differing thermal conditions in a variety of ovens and the like.

4,174,861

EXTENSIBLE LOCK MECHANISM

Jeffrey P. Drake, Pitney Rd., Mendham, N.J. 07945

Filed Feb. 17, 1978, Ser. No. 878,777
Int. Cl.² E05C *17/10*
U.S. Cl. 292—269 **10 Claims**



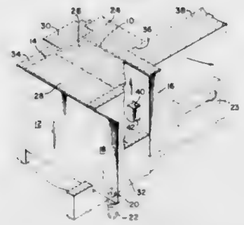
1. In a locking device for use with a dead bolt device, one of which devices is mountable on a door and the other on a jamb, for cooperation to maintain the door in locked condition and to release it from locked condition, the combination comprising: a backing plate formed with a body and spaced apart parallel guides projecting outwardly of said body to define therewith a recess and a pair of vertically aligned slots, a slide adapted to be slidably positioned between said guides and within said recess and to extend beyond an open end thereof, said slide having an elongate aperture therethrough adapted to receive dead bolt means projectable and retractable by the dead bolt device, and pin means extending through said recess and aligned slots and said aperture.

4,174,862

DOOR FRAME PROTECTOR

Charles F. Shane, 3003 Mountain View Ave., Renton, Wash. 98055

Filed Feb. 4, 1977, Ser. No. 765,838
Int. Cl.² E05C *21/00*
U.S. Cl. 292—346 **6 Claims**



1. In a door frame assembly having a hinged door, a door frame member having one side face thereof adjacent a free end face of said door in its closed position and a second side face on the opposite side of said door frame member, a door frame support member extending generally parallel to said second side face of said door frame member and providing structural support therefor, said door having a retractable bolt extending from the free end face thereof and engageable in an opening in said door frame member, said door frame member having a position adjacent said opening which is subject to a splitting force from said bolt during an attempt to force the door open, a door frame protector comprising; a platelike member having two spaced apart portions projecting in opposite directions in substantially parallel relation, and an intervening portion extending between said spaced apart portions in substantially perpendicular relation therewith, said intervening portion being located between said door frame support member and said second side face of said door frame member, one said spaced apart portion being secured to the door frame support member with the other said spaced apart portion in force bearing engagement with said portion of the door frame member which is subjected to a splitting force during an attempt to force the door open.

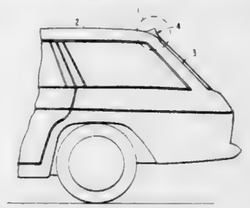
4,174,863

AIR GUIDE INSTALLATION

Hans Götz, Böblingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 27, 1977, Ser. No. 846,256
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1976, 2649953
Int. Cl.² B62D *37/02*
U.S. Cl. 296—1 S **21 Claims**

1. An air-guide installation for motor vehicles, comprising profile bar means arranged at a vehicle outer body panel means within a transition area between a roof of the motor vehicle and rear portion thereof and extends in a vehicle transverse direction, characterized in that the profile bar means is effective as a spoiler for reducing air resistance in a first position wherein a bottom side of the profile bar means contacts the vehicle outer body panel means within the transition area and projects outwardly therefrom, and in that means are provided for selectively displacing the profile bar means from the first position to a second extended position away from the outer body panel means in the transition area so that an air-guide



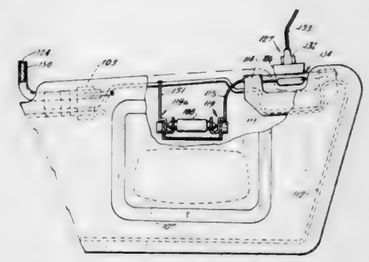
channel results between the outer body panel means and the bottom side of the profile bar means.

4,174,864

LIGHTED SUN VISOR FOR VEHICLES

Lothar Viertel, Wuppertal, and Manfred Nowak, Solingen, both of Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Wuppertal, Fed. Rep. of Germany

Filed Jan. 5, 1978, Ser. No. 866,992
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703447
Int. Cl.² B60J *3/02*
U.S. Cl. 296—97 H **18 Claims**



1. Illuminating means for a sun visor having a visor body and a main swivel bearing on said visor body for swivelingly supporting said visor body and also having a counterbearing shaft supported on said visor body away from said main swivel bearing and a counterbearing housing attachable to a relatively stationary support that is separate from said visor body; said counterbearing shaft being detachably connected to said counterbearing housing upon motion of said visor body around said main swivel bearing toward said counterbearing housing, said illuminating means comprising:

a first contact element carried in said counterbearing housing; said first contact element being connectable to an electric source; a second contact element carried by said counterbearing shaft; said second contact element being engageable with said first contact element on movement of said visor to bring said counterbearing shaft into said counterbearing housing;

a light source carried on said visor body and being electrically connected with said second contact element; said light source being further connected to electric ground.

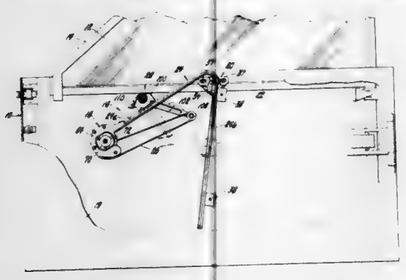
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4,174,865

WINDOW REGULATOR MECHANISM

Juozas Doveinis, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 3, 1978, Ser. No. 921,729
Int. Cl.[2] E05F *5/10*
U.S. Cl. 296—146 **2 Claims**



1. In a window regulator mechanism for use with an automotive door having spaced inner and outer panels, a window frame, and a window pane adapted to being slidably mounted in the window frame; an actuator assembly mounted in the door on the inner panel; a bracket assembly mounted on the window pane at a central location along the bottom edge thereof; a track including a first section operatively connected at one end thereof to the actuator assembly and extending therefrom to a point adjacent the bracket assembly when the window pane is in a closed position in the window frame, and a substantially vertically oriented second section integral with the first section and secured to a bottom portion of the inner panel, and a tape slidably mounted in the track and having one end thereof extending beyond the actuator end of the first track section, through the actuator assembly, and attached to an outer wall of the actuator assembly, the tape having equally-spaced perforations formed along the entire length thereof, the actuator assembly including a rotatable shaft and toothed means operatively connected to the shaft for meshing with the tape perforations for slidably reciprocally moving the tape along the first and second track sections, and the bracket assembly including connector means for connection with the other end of the tape for driving the bracket assembly and, hence, the window pane along a path parallel to the second track section intermediate the door panels in response to rotation of the shaft; the improvement comprising a counterbalance support member secured to the first track section at an intermediate point therealong; a counterbalance arm pivotally mounted at one end thereof in the support member and extending therefrom toward the second track section; a tape guide rotatably mounted on the other end of the arm and about which the tape is circumscribed and a counterbalance spring mounted in the support member for urging the arm away from the actuator assembly to maintain the tape taut and thereby counterbalance the weight of the window pane.

4,174,866

CARRIER READILY ATTACHABLE TO A SUPPORT

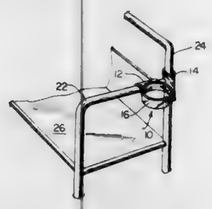
William C. Rhyan, Ft. Lauderdale, Fla., assignor to Clarke Carrier Corporation, Ft. Lauderdale, Fla.

Continuation-in-part of Ser. No. 785,173, Apr. 6, 1977, abandoned. This application Sep. 26, 1977, Ser. No. 836,715
Int. Cl.[2] A47C *7/62*
U.S. Cl. 297—194 **8 Claims**

1. An article supporting member adapted to be used with a wheelchair comprising:

an article retaining frame including a substantially circular ring member with an open top and a bottom on which an article may be positioned, said ring member including an upwardly projecting wall being of a height sufficient to prevent the tipping of an article releasably positioned on said bottom support;

said article retaining frame including a primary attaching arm comprising a substantially horizontally disposed primary plate member upon which is secured said ring member, said primary plate member including a substantially hooked attaching member adapted to releasably attach to a horizontally disposed member of a wheelchair;



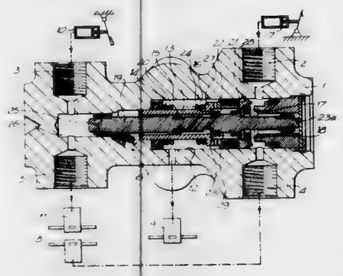
said article retaining frame further including a secondary attaching arm comprising a substantially vertically disposed secondary plate member secured along another edge of said substantially horizontally disposed primary plate member, said secondary plate member including a substantially hooked attaching member adapted to releasably attach to a vertically disposed member of a wheelchair.

4,174,867

BRAKE FORCE REGULATOR FOR A MOTORCYCLE HYDRAULIC BRAKE SYSTEM

Heinrich Oberthür, Offenbac-Rumpenheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jul. 28, 1978, Ser. No. 928,927
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1977, 2743204
Int. Cl.[2] B60T *11/20*
U.S. Cl. 303—6 C **4 Claims**



1. A brake force regulator for a motorcycle hydraulic brake system having a rear-wheel brake and a first front-wheel brake adapted to be actuated by a pedal-operated master cylinder and a second front-wheel brake adapted to be actuated by a hand-operated master cylinder, wherein the pressure applied to said rear-wheel brake is adapted to be reduced by said brake force regulator dependent on the pressure generated by said hand-operated master cylinder, said brake force regulator comprising:

a stepped piston slidable within a stepped bore of a housing against the force of a first spring, said stepped piston having a first effective area exposed to pressure from said pedal-operated master cylinder and a second effective area smaller than said first effective area exposed to pressure in said rear-wheel brake;

a seal carried by said stepped piston adjacent said first effective area;

a control piston disposed within said stepped piston having a collar thereon adjacent said seal such that displacement of said stepped piston in opposition to the force of said first spring causes said collar and said seal to abut each other and interrupt a pressurized-fluid connection between said pedal-operated master cylinder and said rearwheel brake, said control piston further having an effective area exposed to pressure from said handoperated master cylinder, said effective area of said control piston having a force applied thereto in a direction toward said seal; and

a stop secured to said housing within said stepped bore adjacent said seal against which said stepped piston and said control piston are held by spring force in their rest position.

4,174,868

APPARATUS FOR PNEUMATICALLY APPLYING MATERIAL TO AN OBJECT

John M. De Nardo, 1044 Amherest St., Buffalo, N.Y. 14216

Filed Aug. 25, 1977, Ser. No. 827,478
Int. Cl.[2] B65G *53/10*
U.S. Cl. 406—76 **7 Claims**



1. Apparatus for pneumatically applying material to an object, said apparatus being adapted to be connected to a source of compressed air, said apparatus comprising:

a main conduit having an open first end arranged to be supplied with a flow of compressed air from said source, and having an open second end through which material is to be discharged;

a supply conduit having an open first end communicating with said main conduit and having an open second end;

a tubular casing having a first end connected to said supply conduit second end and having a second end;

a tubular wall arranged within said casing and having open first and second ends and adapted to contain a quantity of said material therewithin, said wall first end being in communication with said main conduit through said supply conduit;

a piston operatively arranged within said tubular wall for sliding movement therealong, said piston having a first face arranged to act on material within said tubular wall and having an opposite second face;

a pressurizing conduit connected to said casing second end and communicating said wall second end with said source and selectively operable to apply pneumatic pressure to said piston second face to displace said piston along said tubular wall and to cause extruded material to enter said main conduit; and

a diffuser mounted on said casing between said pressurizing conduit and piston and operable to diffuse a flow of compressed air delivered therethrough;

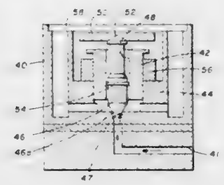
whereby extruded material entering said main conduit may be propelled therealong by said flow of compressed air therethrough, and may be discharged through said main conduit second end.

4,174,869

ELECTRO-HYDRAULIC BRAKE ACTUATING SYSTEM

Larry W. Hipps, 506 Colorado St., Sherman, Tex. 75090

Division of Ser. No. 742,854, Nov. 18, 1976. This application Apr. 24, 1978, Ser. No. 899,262
Int. Cl.[2] B60T *13/10, 7/20*
U.S. Cl. 303—10 **2 Claims**



1. An electromagnetic variable valve means for use in a hydraulic braking system comprising:

(a) a valve housing having an inlet and an outlet;

(b) a valve stem block within said valve housing and having a valve stem aperture therethrough;

(c) a valve stem slidably mounted within the valve stem aperture of said valve stem block and having a first end and a second end, said first end being conical in shape;

(d) a plate of magnetic material adjacent the second end of said valve stem;

(e) a conical valve stem seat adjacent said inlet for receiving said first end of said valve stem;

(f) electromagnet means positioned annularly around said valve stem block; and

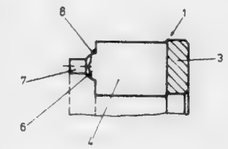
(g) control means for supplying variable electric current to said electromagnet means to thereby selectively move said plate toward said electromagnet means and said first end of said valve stem toward said valve seat.

4,174,870

MULTI-PART ANTIFRICTION BEARING CAGE

Klaus Kispert; Werner Manger, and Paul Weineck, all of Schweinfurt, Fed. Rep. of Germany, assignors to SKF Industrial Trading & Development Company B.V., Nieuwegein, Netherlands

Continuation of Ser. No. 746,943, Dec. 2, 1976, abandoned. This application Jun. 19, 1978, Ser. No. 917,114
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, 7539626[U]
Int. Cl.[2] F16C *33/46*
U.S. Cl. 308—217 **13 Claims**



1. An antifriction bearing cage comprising a plurality of parts centered and secured radially with respect to one another and axially secured together, wherein one of said parts includes a plurality of webs, one end of each web terminating in a common ring, the other ends of each web including one centering projection, each projection having a first defined outer surface converging toward a pin arranged thereon, said centering projection having a greater cross-section than said pin, another of said parts being a cover part, said cover part, on the side thereof pointing towards said first part, having an annular

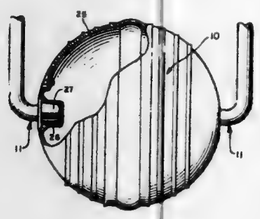
recess for receiving said centering projections, the portion of said recess facing said web having converging lateral walls dimensioned to be engaged by said centering projections, and a plurality of openings in said cover part for receiving said pins.

4,174,871

MATERIAL HANDLING VEHICLE

John E. Brannan, Lake Zurich, Ill., assignor to Ballbarrow Corporation, Itasca, Ill.

Filed Jan. 3, 1978, Ser. No. 866,381
Int. Cl.[2] F16C *33/20*
U.S. Cl. 308—238 2 Claims



1. A stub axle assembly for mounting a vehicle body on a supporting member, comprising:
a. a horizontally disposed stub axle,
b. a closed and flat bottom receptacle formed in a molded plastic side of said supporting member and having polygonal cross-section side walls between the open end of the receptacle and its bottom, and
c. a bushing sub-assembly seated in said receptacle,
d. said bushing sub-assembly including a molded plastic outer bushing having a flat bottom and an outer surface with a polygonal cross-section whereby when the outer bushing is seated in the receptacle it cannot rotate.
e. the bottom of said outer bushing resting against the bottom of said receptacle when the outer bushing is seated.
f. said bushing sub-assembly further including a molded plastic inner bushing having a cylindrical side wall and seated within said outer bushing,
g. said inner bushing having a flat bottom which rests against and rotates on the bottom of said outer bushing,
h. said stub axle being seated in said inner bushing and having means thereon for locking it to said inner bushing so that said outer bushing and said supporting member rotate together relative to said inner bushing and said stub axle,
i. said outer bushing having an annular shield formed around its open end opposite its bottom and seated in a recess in the side of said supporting member, and
j. said inner bushing having an annular shoulder formed around its open end which is seated freely within the confines of and against said annular shield on said outer bushing.

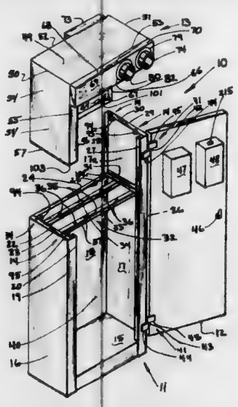
4,174,872

BEVERAGE DISPENSING MACHINE AND CABINET THEREFOR

Herman S. Fessler, Coon Rapids, Minn., assignor to The Cornelius Company, Anoka, Minn.

Filed Apr. 10, 1978, Ser. No. 895,096
Int. Cl.[2] A47B *81/00*
U.S. Cl. 312—290 55 Claims

1. A beverage dispensing machine cabinet, comprising:
a. a cabinet base having
(1) a bottom,
(2) a short side panel attached to the bottom,
(3) a rear panel attached to the bottom and the short side panel,
(4) a tall side panel attached to the bottom and the rear panel, said tall side panel being of greater height than said short side panel, and
(5) a hinge for a cabinet door, said hinge being mounted to one of said side panels;
b. a cabinet door pivotally mounted to said base by said hinge;
c. a removable cabinet top having
(1) a top panel with first and second side edges,
(2) a side panel connected to the top panel first side edge,



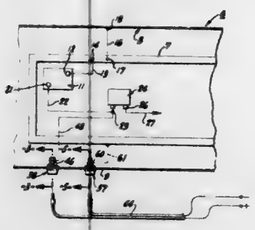
(3) means on said top cap side panel for normal securement of the top cap side panel to the base short side panel, and
(4) means on the top panel second edge for normal securement of the top panel second edge to the base tall side panel; and
d. fastener means securing said top cap to said base, said fastener means being inoperably renderable for releasing the top cap from the base.

4,174,873

ELECTRICAL CONNECTOR FOR A VEHICLE

Jerry D. Hargett, 9460 Tegner Rd., and Alfred C. Nash, 19577 Crane Ave., both of Hilmar, Calif. 95324

Filed Oct. 23, 1978, Ser. No. 953,571
Int. Cl.[2] H01R *33/00*
U.S. Cl. 339—10 5 Claims



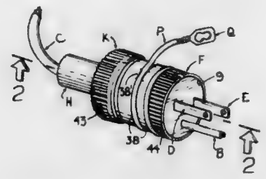
1. An electrical connector for a vehicle having a storage battery and a body panel with first and second openings therein comprising a first conducting stem having an axial recess therein, an insulator head on said first stem having one portion of a size to abut one side of said panel and having another portion of a size to pass into said first opening, first threads on said first stem of a size to pass through said first opening, a first nut rotatable on said first threads and disposed on the other side of said panel, first means for establishing electrical continuity between said first stem and one pole of said storage battery, a second conducting stem having an axial recess therein, a second enlarged insulator head on said second stem of a size to abut said one side of said panel around said second opening, second threads on said second stem of a size to pass through said second opening, a second nut rotatable on said second threads and disposed on said other side of said panel, and second means for establishing electrical continuity between said second stem and the other pole of said storage battery.

4,174,874

ELECTRIC PLUG

Hop Lee, 2425 24th Ave., San Francisco, Calif. 94116

Filed Mar. 15, 1978, Ser. No. 886,669
Int. Cl.[2] H01R *3/06*
U.S. Cl. 339—14 P 2 Claims



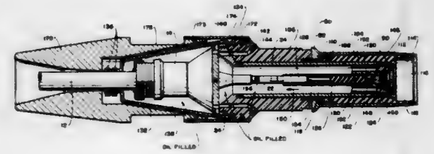
1. In an electric plug:
(a) a terminal carrier for supporting a pivoted "ground" terminal and two electrodes;
(b) a cable receiving sleeve with the "ground" wire and two other wires extending beyond the cable casing and being received in three radially extending grooves in said carrier so that when the sleeve abuts the terminal carrier, the three wires will be gripped in the radial grooves;
(c) said terminal carrier having three projections with a bore extending through each one, each bore communicating with one of the radial grooves and receiving the bare wire strands of the wire in that groove, the wire strands of each wire extending over the outer end of its particular projection with the ends of the strands being received in recesses in the terminal carrier, said "ground" terminal and said two electrodes having portions in electrical contact with their associate bare wire strands that extend over the outer ends of the projections;
(d) an end cap for receiving said terminal carrier and having openings through which the "ground" terminal and two electrodes can extend; and
(e) a coupling connector for receiving said sleeve and being connectible to said end cap for enclosing said terminal carrier and holding said "ground" terminal and two electrodes in electrical connection with their respective bare wire strands.

4,174,875

COAXIAL WET CONNECTOR WITH SPRING OPERATED PISTON

Jeffrey V. Wilson, Camarillo; James H. Schaefer, Del Mar; Anthony A. Glowacz, Northridge, and Jack Bayha, Canoga Park, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 30, 1978, Ser. No. 910,249
Int. Cl.[2] H01R *17/06*
U.S. Cl. 339—91 P 56 Claims



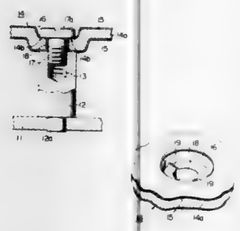
1. An electrical coaxial wet connector, including a male and a female section for mating which produces a nearly perfect impedance match while maintaining a coaxial mode of signal propagation, comprising:
a. a female housing having a central opening therein and a longitudinal axis;
b. a female inner conductor disposed within said female housing along the longitudinal axis thereof;
c. a female outer conductor disposed within said female housing concentric with said inner conductor, said female outer conductor projecting outwards from said female inner conductor such that an interconnection space is formed within said female outer conductor, said female outer conductor having a termination end;
d. female dielectric means disposed between said inner and outer female conductors for providing electrical insulation therebetween;
e. a male housing having a central opening therein and a longitudinal axis, said male housing interfitting with said female housing with said female housing being partially surrounded by said male housing after mating;
f. a male inner conductor disposed within said male housing along the longitudinal axis thereof;
g. a male outer conductor disposed within said male housing concentric with said inner conductor, said male inner conductor projecting outwards from said male outer conductor, said male outer conductor adapted to receive said female outer conductor in electrical connection therewith;
h. male dielectric means disposed between said inner and outer male conductors for providing electrical insulation and a water-tight seal therebetween;
i. male facing means disposed concentric with said male outer conductor between said male outer conductor and said male housing, said male facing means forming a water-tight seal therebetween;
j. female facing lip means disposed concentric with said female outer conductor between said female outer conductor and said female housing, said female facing means forming a water-tight seal therebetween;
k. shuttle piston means disposed within said interconnection space for receiving said male inner conductor and electrically interconnecting said male and female inner conductors, said shuttle piston means being slidable within said interconnection space, said piston means having a front side for receiving said male inner conductor and a back side for engaging said female inner conductor;
l. seal means disposed within said interconnection space adjacent said female outer conductor termination end for providing a water-tight seal between said shuttle piston means and said female outer conductor before mating and between said male inner conductor and said female outer conductor after mating, thereby preventing water from entering said interconnection space rearward of said seal means;
m. spring bias means for maintaining said shuttle piston means in abutting relationship with said seal means before mating and for automatically returning said shuttle piston means to said abutting relationship during unmating.

4,174,876

MOUNTING MECHANISM FOR ENCLOSURE

Yasutaka Tsuchihashi, Tokyo, and Tatsuhiko Omoto, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1978, Ser. No. 912,085
Claims priority, application Japan, Jun. 14, 1977, 52-76760[U]
Int. Cl.² H01R 3/04
U.S. Cl. 339—96 6 Claims



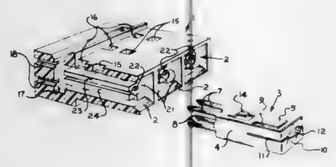
1. A mounting assembly for an enclosure comprising a conductive baseplate on which parts are to be mounted, a conductive enclosure having an insulating coating and adapted to be mounted on the baseplate, a conductive screw for securing the enclosure to the baseplate, said screw having a threaded body integrally joined to a head adapted to facilitate twisting of said threaded body into said baseplate, and a small projection on the surface of the enclosure and located in a region thereof which is adapted to engage the bottom surface of the head of the screw joining said threaded body, the projection cooperating with the screw to remove insulating coating only from said projection as the latter is engaged by the bottom surface of the screw head when the screw is being tightened, thus providing an electrical connection between the enclosure and the baseplate.

4,174,877

CONNECTOR FOR FLAT CABLE

Wilhelmus T. Foederer, Henkelbrits 40, Best, Netherlands

Filed Dec. 19, 1977, Ser. No. 861,974
Int. Cl.² H01R 11/20
U.S. Cl. 339—97 P 1 Claim



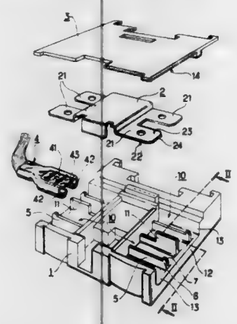
1. A connector comprising a dielectric casing having plural cavities and a conductive terminal in each cavity, said casing having an integral guide block disposed longitudinally in each cavity, said guide block comprised of spaced rails having a pin-receiving passage therebetween, said casing further having a transverse slot for a flat cable, each terminal having an elongated mounting portion in the shape of a channel with side walls and a center strip, tines projecting from said side walls at one end of the mounting portion, said side walls being slidable on said rails, said center strip having a length extending beyond and bent across the mounting portion at its other end, said length having a longitudinal slot and a pin-receiving hole formed as an enlargement of the slot.

4,174,878

SECURITY STRUCTURE FOR POSITIONING A CLIP ON A CONNECTOR TAB

Jean Debaigt, Maisons Laffitte, France, assignor to CGEE Alsthom, Levallois Perret, France

Filed Sep. 21, 1978, Ser. No. 944,661
Claims priority, application France, Oct. 7, 1977, 77 30276
Int. Cl.² H01R 9/18
U.S. Cl. 339—198 R 2 Claims



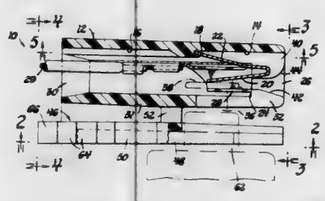
1. In a security structure for positioning a clip on a generally flat tab disposed in a cavity formed in the insulating housing of a connector and defined by opposed, spaced walls, wherein one of said walls of the cavity has a rib which extends against one of the large surfaces of the tab, said rib having, at its clip insertion orifice end, a spur which covers the end of the tab up to a level flush with its other large surface of the tab, the clearance between said other large surface and the other facing wall of the cavity being less than the total thickness of the clip.

4,174,879

ELECTRICAL CONNECTOR

Lyle B. Suverison, Fowler, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 28, 1978, Ser. No. 919,802
Int. Cl.² H01R 9/12, 13/98, 13/54
U.S. Cl. 339—217 S 2 Claims



1. In a hard plastic electrical connector body having a metal terminal secured therein and including an open-ended notch formed in a wall thereof adjacent the terminal for sliding engagement with an external terminal post, the improvement comprising a lock member including a rigid arm integrally formed along one edge of said connector body wall and a movable arm integrally pivotally connected at a midpoint thereof to the connector body wall and the rigid arm and extending along the opposite edge of said wall, an inwardly projecting locking corner formed on the end of the movable arm adjacent the open-ended notch and adapted to being flexed outwardly by the movement therepast of the external terminal post upon the forcing of the connector body onto the terminal post for locking engagement with the terminal, and means formed on the outer edge of the other end of each of the rigid and movable arms adapted to pivot the locking corner outwardly away from the rigid arm in response to manual depression of said means for release of the connector body from the terminal post.

4,174,880

SPADE TERMINAL

Harold G. Hawkins, Bristolville, Ohio, and Andrew F. Rodondi, Sharpsville, Pa., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 26, 1978, Ser. No. 872,474
Int. Cl.² H01R 9/00
U.S. Cl. 339—217 S 3 Claims



1. A spade terminal of unitary sheet metal construction comprising a forward portion and a multi-layered median portion,

said median portion having a flat section which is generally rectangular in plan form and a wing portion which is integrally attached to one longitudinal side of the flat section and folded over onto a surface thereof,

said forward portion comprising a flat section coplanar with the flat section of the median portion and an upstanding flange at its longitudinal side corresponding to the one longitudinal side of the median portion, said flange having a height substantially equal to the thickness of the wing portion, and

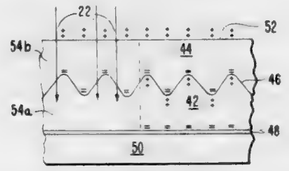
said wing portion terminating short of the opposite longitudinal side of the flat section whereby the longitudinal edges of the forward portion are of the same thickness as the corresponding longitudinal edges of the median portion.

4,174,881

RECORDING A SYNTHETIC FOCUSED-IMAGE HOLOGRAM ON A THERMALLY DEFORMABLE PLASTIC

Thomas L. Credelle, East Windsor, and Fred W. Spong, Lawrenceville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 664,198, Mar. 5, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 822,625
Int. Cl.² G02B 27/00
U.S. Cl. 350—3.63 1 Claim



1. In an image recording medium for improving the contrast ratio of a synthetic focused image hologram produced by a white light image, said medium including a conductor layer carried by a substrate, the improvement comprising:

a photoconductor layer disposed upon said conductor layer; and

a thermoplastic layer having an index of refraction substantially equal to the index of refraction of said photoconductor layer, one face of said thermoplastic layer being disposed upon said photoconductor layer to form a boundary therebetween that has a deformation in the shape of a uniform diffraction grating;

the other face of said thermoplastic layer opposite from said boundary having a deformation corresponding to an image of said white light;

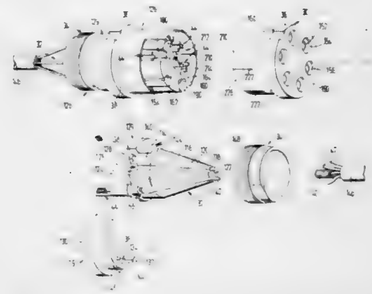
whereby the contrast ratio of said hologram on said other face of said thermoplastic layer is improved by the substantial absence of diffraction of light from said barrier defined by said layers having substantially equal indices of refraction.

4,174,882

SINGLE OPTICAL FIBER CONNECTOR

Ronald L. McCartney, Orange, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 682,274, May 3, 1976, Pat. No. 4,008,390, which is a continuation-in-part of Ser. No. 629,004, Nov. 5, 1975, abandoned. This application Dec. 22, 1977, Ser. No. 863,573
The portion of the term of this patent subsequent to Mar. 30, 1993, has been disclaimed.
Int. Cl.² G02B 5/14
U.S. Cl. 350—96.21 4 Claims



1. A fiber optic connector for coupling optical fibers comprising:

a pair of mating connector members each having a bore therein slidably receiving a termination pin adapted to be connected to an optical fiber, said termination pins being laterally aligned with each other when said connector members are mated and having mating end faces;

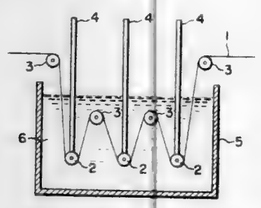
an annular groove in each said termination pin;

an annular recess in the wall of each said bore surrounding the groove in the pin in said bore, said recess providing an annular forwardly facing shoulder;

a resilient ring mounted in each said groove and extending outwardly into its corresponding recess in front of said shoulder; and

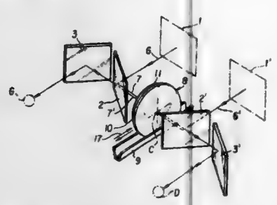
when said connector members are mated, said mating end faces of said pins axially abut each other and said forwardly facing shoulders engage said rings to provide a resilient compression force for contact abutment and relief for axial manufacturing tolerances.

4,174,883
REAR PROJECTION SCREEN
Hiroyuki Imataki, Tokyo; Hitoshi Toma, Kawasaki, and Noboru Narita, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 543,432, Jan. 23, 1975, abandoned. This application Dec. 14, 1977, Ser. No. 860,458
Claims priority, application Japan, Jan. 29, 1974, 49-12410
Int. Cl.[2] G03B *21/60*
U.S. Cl. 350—126 28 Claims



1. A rear projection screen which comprises a light scattering member composed of a melted mixture of at least two high polymers obtained by melting and then mixing said high polymers, wherein the absolute value of the difference between the refractive indexes of the high polymers is from 0.01 to 0.25.

4,174,884
OPTICAL VIEWER WITH ADJUSTABLE ANGULAR CONVERGENCE
Alain Weissler, "Les Muriers", 91800, Boussy, St. Antoine, France
Filed Jun. 16, 1977, Ser. No. 807,038
Claims priority, application France, Jun. 29, 1976, 76 19760
Int. Cl.[2] G02B *27/22*
U.S. Cl. 350—138 6 Claims



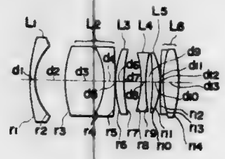
1. In a binocular optical viewing system for the visual observing of a pair of spaced images including optical devices defining a pair of light paths from the eyes to the images having parallel portions, including a pair of mirrors disposed in each said light path, each mirror pair having right-angularly related mirrors, with one said mirror being part transparent and part reflective and disposed at an angle of 45° to a said light path on the eye side thereof thereby to direct parallel light rays therefrom toward the eyes, said other mirror of each pair being on the image side of said path,
the improvement comprising,
refractive optical member means disposed in said light paths and at 45° to said mirrors,
said refractive means being mounted for movement in a direction parallel to its plane and perpendicular to said light path thereat, whereby movement of said refractive means with respect to said mirrors shifts said parallel light path portions on the eye side of said mirrors to increase or decrease the distance therebetween.

4,174,885
FILTER ROTATOR FOR COHERENT OPTICAL CORRELATION SYSTEM
Bernard W. Joseph, Berkley, and Aaron D. Gara, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Jan. 16, 1978, Ser. No. 869,678
Int. Cl.[2] G06G *9/00*; G03H *1/16*
U.S. Cl. 350—162 SF 2 Claims



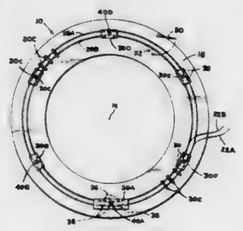
1. In a coherent optical correlation system having means to produce an input image in a plane intersecting an optical axis, means to produce a spatial transform of the image, and a hologram filter to be angularly oriented about said axis in relation to the spatial transform of the image wherein the hologram filter when properly oriented and exposed to the spatial transform of the image emits a correlation beam at a predetermined angle to the hologram filter and at an angle to the optical axis of the system, a filter rotator for angularly moving the filter about said axis comprising
a housing rotatable about the optical axis and carrying the hologram filter for rotation therewith,
a first mirror carried by the housing at an off-axis location for intercepting the correlation beam projected from the filter, the mirror being oriented to direct the correlation beam along a path intersecting the optical axis, and
a second mirror carried by the housing at the location where the correlation beam intersects the axis and positioned to direct the correlation beam substantially along the axis.

4,174,886
INVERTED TELEPHOTO LENS SYSTEM
Akiyoshi Nakamura, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Feb. 27, 1978, Ser. No. 881,637
Claims priority, application Japan, Mar. 8, 1977, 52-25661
Int. Cl.[2] G02B *13/04*
U.S. Cl. 350—215 10 Claims



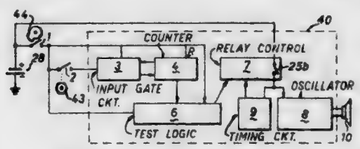
1. A wide angle lens system of an inverted telephoto type comprising six separate lens groups consisting, consecutively from the object to the image side, of:
a first front group consisting of a negative meniscus single lens element convex to the object side;
a second group consisting of a positive doublet element formed by cementing two sub-elements having a cemented intermediate surface concave to the object side;
a third group consisting of a positive meniscus single lens element convex to the object side;
a fourth group consisting of a biconcave single lens element;
a fifth group consisting of one positive lens element; and
a sixth rear group consisting of one positive lens element, one of the positive lens elements of the fifth and sixth groups being a single lens element, while the other being a doublet element formed by cementing two sub-elements.

4,174,887
ROTATABLE STAGE FOR A CAMERA
Douglas T. Mesney, 23 E. 73 St., New York, N.Y. 10021
Filed Jan. 18, 1878, Ser. No. 870,358
Int. Cl.[2] G03B *15/00*
U.S. Cl. 352—87 8 Claims



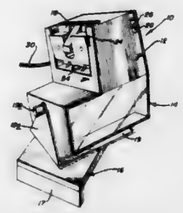
1. A rotatable stage for an object to be photographed comprising a base, a circular track on said base, said circular track having at least two conductive rails, a source of electric current connected across said two conductive rails, a plurality of trucks spaced about said track, at least one of said trucks being electric motorized and energized by electric current in said two conductive rails, each of said trucks having an upstanding support member, and a platform fixed to said support members.

4,174,888
AUTOMATIC FILM TRANSPORT MONITORING SYSTEM
Hans Hunn, Biberstein, and Georg Schwarz, Zurich, both of Switzerland, assignors to Canon, Inc., Tokyo, Japan
Filed Nov. 17, 1977, Ser. No. 852,220
Claims priority, application Switzerland, Nov. 26, 1976, 14598/76
Int. Cl.[2] G03B *1/60*
U.S. Cl. 352—170 12 Claims



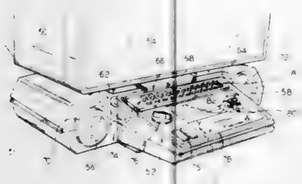
1. Automatic film transport monitoring system for still and motion picture cameras, comprising
film movement sensing means (2, 43; 62) coupled to the film (54, 67) and generating at least one film movement pulse as the film advances in the camera, said film movement sensing means providing a predetermined number of output pulses corresponding to and representative of a predetermined length of film being advanced in the camera;
and a pulse count number evaluation circuit (3, 4, 6) connected to and controlled by said film movement sensing and pulse generating means (2, 43; 62) and providing an alarm output signal if said predetermined number of output pulses has not been attained.

4,174,889
TRAVEL MONITOR
Arnis E. Peters, LaCrosse, Wis., assignor to Northern Engraving Company, Sparta, Wis.
Filed Oct. 31, 1977, Ser. No. 847,257
Int. Cl.[2] G03B *21/11, 23/12*
U.S. Cl. 353—12 6 Claims



1. In a viewing device that provides an illuminated enlarged display of a microimage, that has been selected from an elongated film strip which carries such images and is selectively moveable within a cassette between spaced reels carried within said cassette;
the improvement of such a viewing device for use within an automotive vehicle, comprising in combination:
the viewer including housing means; illuminating means including a light source and light collimating means, enclosed within said housing means and for directing and collimating light from said light source along a first optical axis, means for directing the collimated light through a selected portion of the film and the cassette therefor, and optical projection means, including lens means, mirror means, and a two element viewing screen sandwich that includes a Fresnel lens, in said housing means and for receiving the light that has passed through the film for passage through said lens means, along a second folded optical axis that lies in a projection plane that is transverse to said first axis, against spaced mirrors to effect enlargement of the illuminated image and to project said enlarged image onto said two-element viewing screen sandwich that includes a Fresnel lens;
said housing means being shaped and constructed to provide, on the exterior of said housing means, an open sided recess that is edge-bounded by portions of said housing means and which is adapted to receive thereinto a cassette, said recess being aligned both with said first axis and with said projection plane;
hooded light turning means on said housing means positioned within the confines of said recess for directing light from said illuminating means into said projection plane, said hooded means and the edge boundaries of the recess cooperating to provide a shaped recess for receiving thereinto a film-carrying cassette that is shaped to cooperate with said recess and hooded light turning means so as to be received and held in the recess at a pre-determined attitude, with a selected portion of the film strip positioned between said light turning means and said projection means, said arrangement permitting a person to selectively load a cassette into the viewer without opening the viewer; and
means carried by the housing means and operatively associated with the reel-mounted film strip, when the cassette is operatively positioned within said recess, for selectively moving the film strip transversely of said second optical axis, whereby the enlarged display of microimages from said film strip may be viewed by a person controlling the vehicle for purposes of selecting a course for said vehicle from said enlarged display.

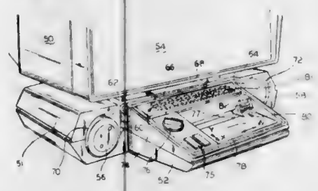
4,174,890
ELECTRONICALLY CONTROLLED MICROFILM PHOTOGRAPHIC IMAGE UTILIZATION DEVICE
Delmar R. Johnson; John R. Flint, both of Barrington; Thomas R. Wells, Des Plaines; Rolf B. Erikson, Lincolnwood, and Bruce A. Rady, Palatine, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.
Division of Ser. No. 711,180, Aug. 3, 1976, Pat. No. 4,110,020. This application Jan. 25, 1978, Ser. No. 872,093
Int. Cl.[2] G03B *23/08, 23/12, 21/14;* **G06K** *7/00*
U.S. Cl. 353—26 A **23 Claims**



1. A microfilm photographic image utilization device for projecting a large library of images onto a viewing area responsive to a three-dimensional selection process, said device comprising a roll of film wound on first and second reels and carrying said large library of images, means for transporting said roll of film in either of two directions from one of said reels to the other of said reels, said film having a plurality of images printed thereon in individually identified discrete photographic areas, each of said photographic areas having an individually associated bar code address printed on the film, each of said bar codes comprising an aligned series of wide and narrow marks separated by spaces, each narrow mark having the same width, each of said wide marks being twice as wide as said narrow marks, the width of each of said spaces being equal to the width of said narrow marks, the individual area identification addresses given by said bar codes constituting an index for a first selective dimension, each photographic area having a plurality of individual images arranged in an orthogonal array, the X and Y axes of said orthogonal array constituting second and third selective dimensions, means responsive to detection of a selected bar code identification of any one of the individual area identifications for automatically driving said transport to reel said film in either of said two directions to position any selected one of said photographic areas during a first dimensional selection in a reading location in said large libray, and manually movable means comprising a movable lens which is thereafter moved in X and Y dimensions in a manual search mode for projecting a selected image from the photographic area which is then positioned within said viewing area, said lens having an angle which is wide enough to project an image from a most remote part of the photographic area onto said viewing area.

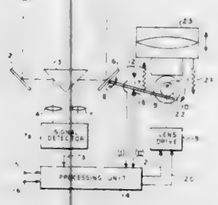
4,174,891
MICROFILM READER/PRINTER
John R. Flint, Barrington, and Bruce A. Rady, Glencoe, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.
Continuation-in-part of Ser. No. 741,929, Nov. 15, 1976, abandoned. This application Sep. 6, 1978, Ser. No. 939,945
Int. Cl.[2] G03B *23/12, 23/08;* **G06K** *7/00, 19/00*
U.S. Cl. 353—26 A **62 Claims**

1. A microfilm reader/printer having a viewing area for use with a web having thereon photographic areas which are individually identified by elongated codes including a series of marks with the elongated dimension of said series of marks being aligned and positioned along the edge of said web, and extending over a portion of the length of said web, each of said codes being positioned adjacent individually associated ones of said areas, means for transporting said web over a path through said reader/printer in either of two opposing directions which presents said marks in series to any point along the path of web travel, at least a pair of sensor means located adjacent said path for individually reading each of said codes in series as said web is being transported adjacent said sensor means, said sensor means reading said code responsive to transport of said web in either of said two directions with one of said sensors strobing the other of said sensors, means responsive to code reading by one sensor means under the control of the other sensor means for storing a code identifying a photographic area on said web, means for indicating a selected code, comparator means jointly



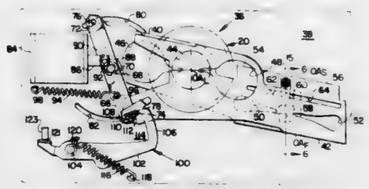
responsive to the codes read by said sensor means and said code-indicating means for comparing the sensed and indicated codes, and means for reversing the direction of web transport responsive to said comparing means detecting a change in the relationship between said compared codes which indicates that the desired photographic area has passed the viewing area, the strobing function performed by at least one of said sensor means reversing each time that the direction of web travel reverses.

4,174,892
AUTOMATIC FOCUSING SYSTEM
Noriaki Osawa, Tachikawa, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 6, 1978, Ser. No. 922,411
Claims priority, application Japan, Jul. 6, 1977, 52/80008
Int. Cl.[2] G03B *13/20*
U.S. Cl. 354—25 **11 Claims**



1. In a camera having a lens adapted to be automatically focused in response to focusing signals generated by coincidental signal outputs from a first photosensitive device receiving light from a subject via a stationary optical path and from a second photosensitive device receiving light from the subject via a scanning optical path, a method of automatically focusing the lens, comprising:
- developing a first focusing signal by causing the scanning optical path to scan, from a first limit focusing position to a second limit focusing position, and developing a second focusing signal by causing the scanning optical path to re-scan from the second limit focusing position to the first limit focusing position;
- computing the interval between the first and second focusing signals; and
- automatically positioning the lens in accordance with the computed interval.

4,174,893
EXPOSURE CONTROL SYSTEM FOR USE IN PHOTOGRAPHIC CAMERA APPARATUS
John P. Burgarella, Sudbury, and Peter P. Carcia, Reading, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Dec. 14, 1977, Ser. No. 860,639
Int. Cl.[2] G03B *7/14*
U.S. Cl. 354—29 **22 Claims**



1. Photographic camera apparatus of the type having means for defining a film plane and an optical path for transmitting light from a scene along the optical path to expose photosensitive film located in the film plane, said apparatus comprising:
- light detecting means, including a photodetector having a predetermined photosensitive surface, for receiving light from the scene and providing an output signal having an electrical characteristic which varies as a function of the intensity of the scene light incident on said photodetector's surface;
- means for providing a first and a second light path for transmitting light from the scene to said photodetector's surface; each of said first and second light paths having light entrances which face the scene and are offset with respect to one another;
- blade apparatus;
- means for mounting said blade apparatus for displacement between a first arrangement in which said blade apparatus is simultaneously in light blocking relation to both the optical path and said first light path thereby precluding scene light from being transmitted along both the optical path and said first light path and in light unblocking relation to said second light path thereby allowing light from the scene to be transmitted along said second light path and onto said photodetector's surface, and a second arrangement in which said blade apparatus is simultaneously in light unblocking relation to both the optical path and said first light path and in light blocking relation to said second light path, said blade apparatus comprising first portions structured to define a primary varying aperture, aligned with the optical path, which changes from an initial value to a final value during displacement of said blade apparatus from its said first to its said second arrangement and to define a secondary varying aperture, aligned with said first light path, which also changes from an initial value to a final value during displacement of said blade apparatus from its said first to its said second arrangement, and at least one other portion adapted to block said second light path prior to said first portions defining said initial aperture value of said secondary varying aperture, said initial values of both said primary and secondary varying apertures occurring generally at the same time;
- drive means actuable for displacing said blade apparatus between its said first and second terminal positions; and
- means energizable at least in part by a source of electrical energy for monitoring said output signal of said light detecting means and measuring scene brightness while said blade apparatus is in its said first arrangement and providing a discernible signal that has one characteristic which indicates that the scene brightness is below a predetermined level, for actuating said drive means when said scene brightness is above said predetermined level to displace said blade apparatus from its said first arrangement to provide said primary and secondary varying apertures aligned, respectively, with the optical path and said first light path thereby initiating an exposure interval during which scene light is transmitted substantially simultaneously along the optical path through said primary varying aperture and along said first light path onto said photodetector's surface through said secondary varying aperture, for integrating said output signal of said light detecting means beginning substantially at the commencement of said exposure interval, and actuating said drive means when the time integral of said output signal reaches a predetermined value to displace said blade apparatus to again block the optical path and said first light path thereby terminating said exposure interval, said blade apparatus serving to block said second light path during said exposure interval.

4,174,894
TTL METERING DEVICE IN A SINGLE LENS REFLEX CAMERA
Toru Fukuhara, Fujisawa, and Jun Shimomura, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan
Continuation of Ser. No. 716,936, Aug. 23, 1976. This application Mar. 28, 1978, Ser. No. 890,967
Claims priority, application Japan, Sep. 1, 1975, 50-119221[U]; Sep. 5, 1975, 50-107099
Int. Cl.[2] G03B *7/00*
U.S. Cl. 354—59 **11 Claims**

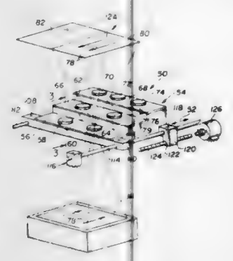


1. A TTL metering device in a single lens reflex camera for measuring light passed through the picture-taking objective lens of the camera, comprising:
- a light-sensing element for receiving the light passed through said picture-taking objective lens and producing an output corresponding to the intensity of the light;
- a jump-up mirror partly having a light-transmitting area through which part of the light passed through said picture-taking objective lens may be transmitted;
- light diffusion means being positioned behind said jump-up mirror and diffusively reflecting the light transmitted through said light-transmitting area of said jump-up mirror to permit said light to reach said light-sensing element; and
- optical means disposed between said light diffusion means and said light-sensing element;
- said light diffusion means including:
- light scattering means including a layer of electro-optical substance; and
- control means for applying a voltage to said light scattering means to vary the scattering characteristic thereof.

4,174,895
APPARATUS FOR PRODUCING MULTIPLE IMAGE FORMATS
Saul Fermaglich, 130 Overlook Ave., Hackensack, N.J. 07601, and Ivan Volent, 1600 Center Ave., Fort Lee, N.J. 07024
Filed Feb. 21, 1978, Ser. No. 879,152
Int. Cl.[2] G03B *5/02, 29/00*
U.S. Cl. 354—76 **5 Claims**

1. Apparatus for producing photographic records of multi-

ple images in selected formats comprising an image display screen, an image-display station in a clearance position from said display screen, a multi-tier carriage having image-projecting lenses thereon disposed in an interposed position between said image display screen and said image-display station and operatively arranged to partake of movement having a transverse relation to said display station to provide selected positions correspondingly oriented transversely of said display station for images projected thereto by said carriage image-projecting lenses, said tiers of said carriage being at selected fixed distances from said display station effective to obtain a magnification in said projected images at said display station for the size desired for a selected format, and said image-projecting lenses of said carriage being in a cooperative ar-



rangement of at least two in number on one said tier and on another said tier in a cooperating arrangement of at least three in number so as to be effective in producing formats of two rows of images using said two lenses and of three rows of images using said three lenses, and means operatively effective to urge said carriage through a successively displaced select number of positions in transverse relation to said image-display station to thereby contribute to providing in said formats additional rows of images transversely oriented to said other rows and in a number corresponding to said positions, whereby with optimum minimum movement of said multi-tier carriage there is nevertheless obtained multiple images appropriately sized and position-located on said photographic record suitable for the format selected for the display of said multiple images.

4,174,896

ADAPTER FOR ELECTRONIC FLASH UNIT

Kazunori Mizokami, Hachioji, and Osamu Kawarada, Fuchu, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1978, Ser. No. 896,565

Claims priority, application Japan, Apr. 20, 1977, 52-50076[U]

Int. Cl.² G03B *15/05*

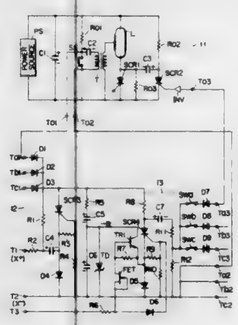
U.S. Cl. 354—132 **6 Claims**

1. An adapter connected between at least one electronic flash unit having a light adjustment circuit and a selected one of a plurality of still cameras of various types with means for generating respective light adjustment signals of different characteristics and each having an electronically-connected shutter mechanism including a synchro contact and a light adjustment signal output contact through which a light adjustment signal is transferred, said adapter comprising:

(a) a trigger circuit means for generating at least one trigger signal in response to the actuation of the synchro contact of the camera to start light emission of the electronic flash unit in response to the trigger signal;

(b) a signal converter circuit for converting the respective light adjustment signal transferred from the selected camera into a signal having characteristics suitable for the operation of the light adjustment circuit of the electronic flash unit; and

(c) a converted signal supplying means for supplying the signal converted by said signal converter circuit to the



light adjustment circuit of the flash unit in order to stop the light emission of the flash unit.

4,174,897

X-CLASS SYNCHRONIZATION CONTACT MEANS FOR ELECTRIC SHUTTERS

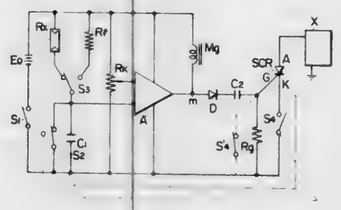
Kunio Matsumoto, Ageo, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Sep. 21, 1977, Ser. No. 835,211

Claims priority, application Japan, Sep. 24, 1976, 128402[U]

Int. Cl.² G03B *15/05*

U.S. Cl. 354—133 **6 Claims**



1. An X-class synchronization contact means for electric shutters comprising an electromagnet capable of being converted from an energized state into a de-energized state to start a shutter closing motion, a flash synchronization contact capable of being operated by an electrical signal associated with said electromagnet when said electromagnet is de-energized, and a first switch which is connected to said synchronization contact and which functions to prevent said synchronization contact from passing an electric current for erroneous flash synchronization during at least any preliminary operation step for the shutter release and which permits said synchronization contact to pass an electric current for flash synchronization by said electrical signal at the time said electromagnet is de-energized only after said first switch is operated.

4,174,898

CAMERA

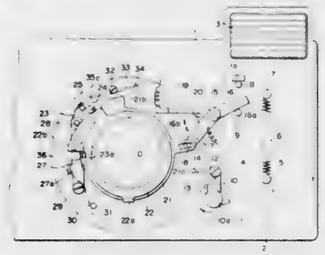
Yaichi Iijima, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 602,916, Aug. 7, 1975, Pat. No. 4,100,554. This application May 5, 1978, Ser. No. 903,218

Claims priority, application Japan, Aug. 13, 1974, 49/97026[U]

Int. Cl.² G03B *15/05*

U.S. Cl. 354—145 **4 Claims**



1. In a camera operable for both daylight and flashlight photography, provided with a diaphragm adjusting member and having a focusing ring, a changeover ring, and a guide number ring all coaxially and rotatably mounted about the optical axis of the camera, the improvement comprising a first cam on and rotatable with said focusing ring, a second cam on and rotatable with said guide number ring, means moving said changeover ring between two control positions, means engageably controlling said diaphragm adjusting member through said cams when said changeover ring is in one control position, and means effecting disengagement of said cams with said diaphragm adjusting member when said changeover ring is in the second control position.

4,174,899

FILM ADVANCE DEVICE FOR CAMERAS

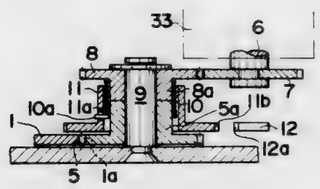
Harumi Tanaka, Kobe, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 9, 1978, Ser. No. 959,131

Claims priority, application Japan, Nov. 10, 1977, 52/135547

Int. Cl.² G03B *1/14*

U.S. Cl. 354—213 **18 Claims**



1. In a camera, a mechanism for advancing predetermined lengths of film comprising:

a rotatable drive member including a first hub;

a rotatable driven member including a second hub coaxial with said first hub;

means for rotating said drive member including said first hub;

means actuated by said driven member for advancing said film;

a helical resilient coupling coil engaging the outer peripheral faces of said hub whereby to transmit the rotation of said first hub to said second hub when said first hub is rotated in a first forward direction and to drive uncouple said hubs when said first hub is rotated in a second reverse direction; and

release means responsive to the advance of a predetermined length of said film for preventing the rotation of an end of said coupling coil whereby to effect the drive uncoupling between said hubs independently of the direction of rotation of said first hub.

4,174,900

CAMERA TRIPOD

Tatsuo Ina, Tokyo, Japan, assignor to Mitsuwa Shashin Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1978, Ser. No. 892,138

Claims priority, application Japan, Jun. 29, 1977, 52/85732[U]; Jun. 29, 1977, 52/85733[U]

Int. Cl.² G03B *17/00*; F16B *7/10, 7/14*; F16M *11/26*

U.S. Cl. 354—293 **5 Claims**



1. A support apparatus comprising a plurality of legs, each leg comprising at least a first and a second leg element with said second leg element telescopically inserted in and movable relative to said first leg element, each leg element being substantially U-shaped in cross section and having a base wall and generally perpendicularly extending side walls, carrier frame means disposed on the interior of said second leg element, said carrier frame means having a hollow interior, a base and side walls extending from said base, said base having an opening therein, a press member carried by said carrier frame means and extending into said opening in said base and being movable at least partially through said opening in said base of said carrier frame means, said base wall of said second leg element having an opening therein, said carrier frame means being disposed over said opening in said base wall of said second leg element, lever means pivotally mounted on the interior of said carrier frame means and engaging said press member to move said press member through said opening in said base wall of said second leg element and press against said base wall of said first leg element when said lever means is pivoted from a deactuated to an actuated position.

4,174,901

FILM SQUEEGEE MECHANISM OF AUTOMATIC FILM DEVELOPING APPARATUS

Nobuhiro Takita, and Tadashi Shintani, both of Kyoto, Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Japan

Filed Jun. 3, 1977, Ser. No. 803,219

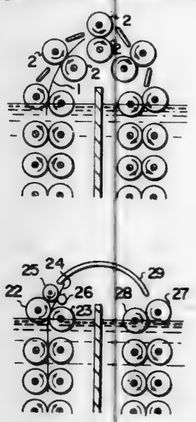
Int. Cl.² G03D *3/08*

U.S. Cl. 354—322 **4 Claims**

1. A film squeegee mechanism for an automatic film developing apparatus including a plurality of processing tanks and a plurality of suitably disposed transport rollers adapted to transport a film medium through each tank and between the tanks in a proper order, wherein said squeegee mechanism is disposed between two of the processing tanks and comprises a squeegee

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roller in contact with and rotated opposite to the direction of movement of the film medium, said squeegee mechanism being held by its own weight in frictional contact with and driven by



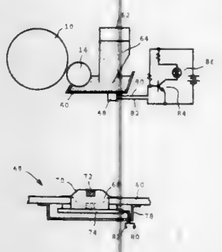
a transport roller whose contact point with the film is located above the liquid level of the tank from which the film is being transported.

4,174,902

DETECTION OF DEVELOPER POWDER AMOUNT CONTAINED IN A DEVELOPER RESERVOIR

Hiroshi Hamaguchi, Sakai, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 21, 1977, Ser. No. 844,204
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 DD **15 Claims**



1. In an electrophotographic copying machine wherein an image from a subject sheet is developed at a developing section through the use of developer powder contained in a developer reservoir, and the quantity of the developer powder contained in the developer reservoir is monitored and detected by a developer powder detection system, said developer powder detection system comprising:

a wall portion forming part of said developer reservoir, said wall portion having an opening formed therein;

a flexible film fixed to said wall so as to cover said opening formed in said wall, said flexible film being adapted to change its configuration based upon the quantity of the developer powder contained in said developer reservoir and

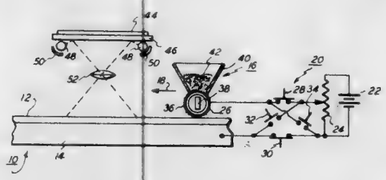
a detection means for detecting the changes in the configuration of said flexible film.

4,174,903

COMBINED PROCESSING STATION FOR USE IN AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

Christopher Snelling, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 3, 1978, Ser. No. 892,610
Int. Cl.² G03G *15/22*
U.S. Cl. 355—3 CH **22 Claims**



1. An electrophotographic printing machine for reproducing at least one copy of an original document, including:

a photoconductive member; and

a combined charging-developing unit having conductive particles adhering to a surface thereof and being positioned so that the conductive particles contact said photoconductive member, said charging-developing unit being electrically biased to a first polarity and magnitude for charging at least a portion of said photoconductive member in a first mode with the conductive particles remaining substantially adhering to the surface of said combined charging-developing unit, said charging-developing unit being electrically biased to a second polarity and magnitude for developing an image recorded on said photoconductive member with the conductive particles in a second mode.

4,174,904

ELECTROPHOTOGRAPHIC COPYING APPARATUS FOR COPYING THICK AND THIN ORIGINALS

Hiroshi Murasaki, Sakai; Yuji Enoguchi, Osaka; Kenichi Wada, and Takao Fujiwara, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 20, 1977, Ser. No. 844,068
Claims priority, application Japan, Oct. 26, 1976, 51-129242
Int. Cl.² G03G *15/28*
U.S. Cl. 355—8 **3 Claims**

1. An electrophotographic copying apparatus which comprises:

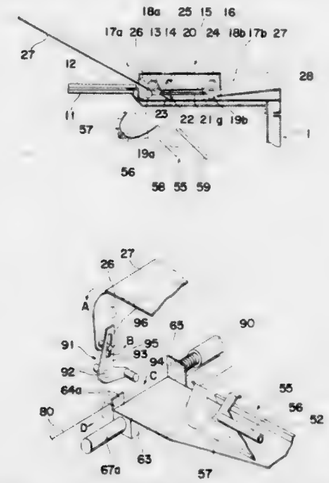
a transparent platform disposed at an upper portion of the apparatus for supporting thereon thick originals to be copied;

means for transporting sheet originals positioned adjacent said transparent platform and having sheet original transportation rollers;

an optical system for image formation having at least an illuminating light source for illuminating the original, first and second reflecting mirror means for projecting the image of the original onto a moving photosensitive member, moving means connected to said light source and said mirror means for (1) moving said light source and said first mirror means and said second mirror means beneath said transparent platform at a first speed or a second speed, said speeds being in a speed ratio of 2 to 1 to scan said transparent platform for copying a thick original and (2) for moving said light source and said first and second mirror means to a scanning starting position with said mirror means closest to each other beneath said sheet original transporting means and discontinuing movement thereof when said apparatus is to copy a sheet original;

changeover means associated with said apparatus for changing over the operation thereof from copying thick originals to copying sheet originals; and

shifting means connected to said changeover means and to said moving means (1) for moving said light source and said mirrors from said scanning starting position under said means for transporting sheet originals and (2) for



shifting said first mirror means away from said second mirror means so as to make the distance between said first and second mirror means in the stationary position greater than the distance therebetween in the scanning starting position upon the operation of said changeover means.

4,174,905

METHOD AND APPARATUS FOR PRODUCING DUPLEX COPIES

Alphonse B. DiFrancesco, Penfield, and Charles T. Hage, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 768,665, Feb. 14, 1977, Pat. No. 4,095,979.
This application Mar. 10, 1978, Ser. No. 885,146
Int. Cl.² G03G *15/00*; G03B *27/32*
U.S. Cl. 355—14 R **18 Claims**



1. Apparatus for producing first and second images on first and second sides respectively of a copy sheet before producing images on a successive copy sheet, comprising:

a movable image transfer member;

means for forming first and second sequential adjacent transferable unfixed images on said image transfer member; and

means located in transfer relation with said transfer member for transferring said first and second sequential adjacent transferable unfixed images directly from said image transfer member to first and second sides respectively of a copy sheet brought into transfer relation with said transfer member before fixing of either of said unfixed images to said copy sheet and before transferring images to a successive copy sheet.

4,174,906

PROCESS AND APPARATUS FOR THE CONTINUOUS PREPARATION OF A MIXTURE FOR FOUNDRY MOLDS OR THE LIKE, WITH FORMATION OF A PREMIX

Gerard Y. Richard, Precy-sur-Oise, France, assignor to Societe d'Applications de Procedes Industriels et Chimiques S.A.P.-.I.C., Asnieres, France

Division of Ser. No. 662,806, Mar. 1, 1976, Pat. No. 4,056,259.
This application Aug. 1, 1977, Ser. No. 820,568
Int. Cl.² B28C *5/14*
U.S. Cl. 366—6 **11 Claims**



1. A method of continuously preparing a mixture of materials comprising a granular and/or pulverulent charge which is agglomerated by a binder-hardener system, comprising; forming an intimate and homogeneous pre-mix by malaxating the charge and only one of the two constituents of the binder-hardener system; then introducing into a thin film malaxating apparatus the second constituent of the binder-hardener system so as to bring this second constituent into contact with the premix, malaxating the entire final mixture of the pre-mix and the second constituent in the form of a thin film formed on the malaxating surface of said apparatus by centrifugal forces imparted to said mixture in said apparatus, for a few seconds, and finally discharging the final mixture immediately to its point of use.

4,174,907

FLUID MIXING APPARATUS

Nam P. Suh, Sudbury; Christopher A. Rotz, Watertown; Lewis Erwin, II, Belmont; James R. Melcher, Lexington, all of Mass., and James F. Hoburg, Allison Park, Pa., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 760,170, Jan. 17, 1977, abandoned, which is a continuation of Ser. No. 584,984, Jun. 9, 1975, abandoned. This application Sep. 1, 1978, Ser. No. 938,817
Int. Cl.² B01F *7/24, 7/28*
U.S. Cl. 366—279 **25 Claims**

1. An apparatus for mixing at least two liquids having different electrical conductivities comprising

means forming a mixing region;

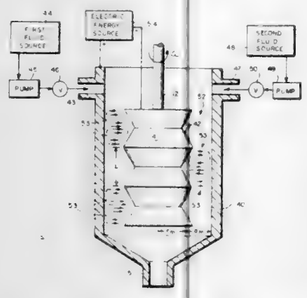
means for introducing said at least two liquids into said mixing region so as to form an interface region therebetween;

means for providing relative motions of said liquids in said mixing region;

means for producing an electrical signal;

means responsive to said electrical signal producing means for applying said electrical signal across said mixing region to interact with said different electrical conductivities so as to prevent said interface region from becoming aligned with the velocity streamlines of said liquids, said

liquids thereby being thoroughly mixed in a substantially laminar fashion in said mixing regions; and

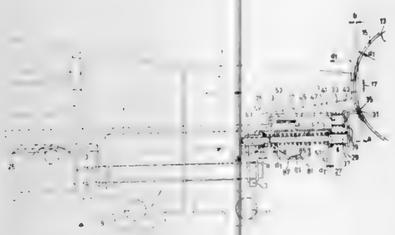


means for removing the mixture of said liquids from said apparatus.

4,174,908
PRINTER COMPRISING A PRINTING HEAD CONTROLLED BY A SENSOR

Herbert Wehler, Neunkirchen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 16, 1977, Ser. No. 851,891
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1976, 2651884
Int. Cl.² B41J *3/12, 11/20*
U.S. Cl. 400—56 **7 Claims**

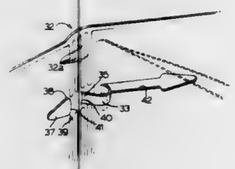


1. A printer which comprises:
a carriage which is displaceable in the printing direction along an associated record carrier,
a printing head carried on said carriage for sliding movement in a direction transverse to the printing direction independently of any carriage movement,
a sensor which is displaced in sychronism with said carriage and which is biased against the associated record carrier, said sensor serving to determine the thickness of the associated record carrier and being coupled to said printing head in order to maintain a constant, predetermined distance between said printing head and the associated record carrier, said sensor comprising a mechanical/electrical converter having an output signal which is proportional to the thickness of the associated record carrier, said sensor comprising a first follower which is biased against the associated record carrier and which is relatively displaceable with respect to said carriage, and a second follower which is biased against the associated record carrier and which is relatively displaceable with respect to said first follower, a mechanical part of said mechanical-/electrical converter being coupled to said first follower and an electrical part of said converter being coupled to said second follower, and
an electric motor connected to said converter to receive said output signal and a mechanical drive for said printing head cooperating with said printing head to displace said printing head relative to said carriage a distance which is equal to the sensed thickness of said record carrier.

4,174,909
LOOSE LEAF BINDER

Gerhard Jahn, 655 Broadview Ave., Apt. 1907, Toronto, Ontario, Canada

Continuation of Ser. No. 677,297, Apr. 15, 1976, abandoned, and Ser. No. 490,093, Jul. 19, 1973, abandoned. This application Nov. 9, 1977, Ser. No. 850,051
Int. Cl.² A47L *13/26*
U.S. Cl. 402—13 **3 Claims**



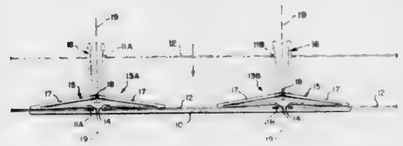
1. A binder formed from a single sheet of material comprising front and back covers and a spine disposed therebetween and about the center line of which said covers swing in opening and closing the binder, a plurality of fastening means formed integrally from one of said covers and each comprising a thin narrow bendable strap of substantially uniform width throughout its length and having its root located adjacent to said spine and extending transversely away from said spine center line and terminating in an enlarged tab, a plurality of openings disposed in said spine adjacent to the center line thereof and having at least a portion thereof clear of that portion of the spine which lies between said center line and the other of said covers, whereby swinging movement of said other cover about said spine center line does not alter the distance between the roots of said straps and said opening portions, said openings being in aligned relation with said fastening means and being adapted to accept the passage of the tabs of said fastening means therethrough with a substantial portion of said fastening means constituted by said straps forming loops extending between said strap roots and said opening portions to accommodate a plurality of sheets of loose leaf material for free sliding movement therealong while permitting said covers to be opened about the center line of said spine into co-planar relation, said binder presenting further openings for receiving and holding said strap tabs against accidental removal to prevent accidental withdrawal of said fastening means from said first mentioned openings.

4,174,910
PAPER CLIP AND BINDER DEVICE

Thomas W. McSherry, Floral Park, and Nathaniel H. Garfield, Harrison, both of N.Y., assignors to Mechanical Plastics Corp., Pleasantville, N.Y.

Filed Feb. 28, 1978, Ser. No. 882,052
Int. Cl.² B42F *13/02*
U.S. Cl. 402—19 **17 Claims**

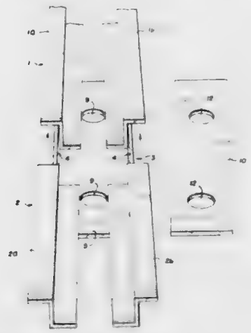
1. A sheet binding device for fastening to one or more sheets having spaced-apart openings comprising:
an elongated backing member extending between such spaced-apart openings; and
attached to said backing member at spaced-apart positions corresponding to the spacing between such openings, a plurality of fastening elements, each comprising a connecting portion for insertion into such openings, and at the end of said connecting portion remote from said backing member, locking means movable between a collapsed position in which the fastening element is insertable into such opening and an expanded over-center locking position in which said locking means is effective to preclude removal of said fastening element.



4,174,911
STRUCTURAL STEEL CLAMPED JOINT

Floriano A. Maccario, 12233 - 135 St., Edmonton, Alberta, Canada (T5L 1W9), and Tommaso Affinita, Corso Liberta 3, 46100 Mantova, Italy

Filed Oct. 10, 1978, Ser. No. 949,789
Claims priority, application Canada, Jun. 30, 1978, 306589
Int. Cl.² B25G *3/00;* F16B *7/04;* F16D *1/00;* F16G *11/00*
U.S. Cl. 403—303 **1 Claim**



1. A joint for structural steel comprising:
a first pair of parallel beams having a cross-sectional form with an L-shaped component;
a second pair of parallel beams having a cross-sectional form with an L-shaped component;
a U-shaped channel having two upstanding side walls and a bottom wall connecting the side walls, the bottom wall having one or more centrally located holes therethrough;
said first and second pairs of parallel beams nesting within the U-shaped channel in end-to- end relationship without obstructing the holes of the bottom wall of the U-shaped channel;
a clamping plate fitting into the U-shaped channel over the beams and having one or more holes aligning with the holes in the bottom wall of the U-shaped channel; and
means for binding the clamping plate and the U-shaped channel together, said clamping plate forcing the beams outwardly against the side walls of the U-shaped channel and downwardly against the bottom wall of the U-shaped channel.

4,174,912
SYSTEM FOR HEAVE REDUCTION IN HIGHWAYS DUE TO FROST OR MOISTURE IN EXPANSIVE CLAY OR SHALE MATERIALS

Earl C. Peterson, Minneapolis, Minn., assignor to Electroosmosis Inc., Minneapolis, Minn.

Filed Jul. 31, 1978, Ser. No. 929,428
Int. Cl.² E01C *3/06*
U.S. Cl. 404—27 **4 Claims**



1. In combination with a roadbed having a centrally disposed paved zone flanked by lateral shoulder zones, electrolytic means for the control of moisture migration through the soil and comprising:
(a) a plurality of spaced anode means disposed laterally along a side of said paved zone and generally equally spaced from the central axis of said roadbed, and a plurality of spaced cathode means disposed laterally along a side of said paved zone and electrolytically coupled to said anodes, and being generally equally spaced from the axis of said roadbed;
(b) said anode means comprising a plurality of columns of particles of a stone having a relatively high calcium and magnesium oxide content, and being disposed in trenches formed along said roadbed; and
(c) said cathode means comprising a quantity of coke particles disposed in trenches formed along said roadbed.

4,174,913
ANIMAL GUARD FOR FIELD PIPE

Carroll G. Schliesser, Hicksville, Ohio, assignor to Myrtle M. Schliesser, Hicksville, Ohio

Filed Nov. 17, 1977, Ser. No. 852,518
Int. Cl.² E02B *7/20*
U.S. Cl. 405—94 **2 Claims**



1. In an animal guard for an elongated field pipe having a generally U-shaped member with elongated inner and outer legs each having a longitudinal axis connected by a bight portion and proportioned to be positioned over an open end of said pipe with said inner and outer legs extending axially of the pipe and respectively engaging the inner and outer surfaces thereof respectively; a generally circular baffle member formed of relatively thin sheet material pivotally suspended adjacent an upper perimetral portion thereof on said inner leg at a pivotal point thereon spaced a predetermined axial distance from said bight portion; said baffle member being vertically suspended from said point for pivotal movement in a first arcuate direction toward said inner leg and bight portion; an indented portion in said inner leg at said pivotal point; said baffle member having an oblong slot for receiving said in-

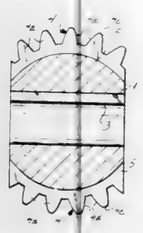
dented portion to provide free pivotal movement between said inner leg and said member; the diameter of said baffle member being less than said predetermined distance; said baffle member being folded along a substantially vertical diameter to form a member half on either side of said diameter and having an obtuse fold angle between the member halves, said halves being inclined from said diameter in a direction away from said bight portion, the improvement comprising a stop member for preventing pivotal movement of said baffle member in the direction opposite said first direction; said stop member comprising an elongated bar with four corners and secured at a first end to said inner leg at a position thereon spaced from said bight portion a distance greater than said predetermined distance and extending lengthwise inwardly and downwardly from the axis of said inner leg; the other end of said bar having the inner corner portions thereof of folded construction and arranged to abut the surfaces of and to conform to said halves, said portions providing stabilizing surface contact with respective halves of said member when said member is pivoted in said opposite direction; said bar having a length to provide a stop for the pivotal movement of said baffle member in an arcuate direction opposite to said first arcuate direction thus preventing animal entry into said pipe past said member from said open pipe end, whereby said member is freely pivotable in said first direction to provide substantially free-flow of debris carrying effluents when mounted in said pipe towards said open pipe end; the length of said bar being less than one-half of the diameter of said baffle member.

4,174,914

SPHERICAL HOB FOR GENERATING GEARS

Masato Ainoura, 1253 Eguchi, Kita-Shigeyasu-cho, Miyaki-gun, Saga-ken, Japan

Filed Jun. 19, 1978, Ser. No. 916,689
Claims priority, application Japan, Jun. 22, 1977, 52-74142
Int. Cl.[2] B26D *1/12*
U.S. Cl. 407—26 **2 Claims**



1. A spherical hob for generation of a gear, which comprises a frustospherical body in the form of a sphere truncated at two opposed extremities thereof, the body having an axis of symmetry perpendicular to said extremities, a hole passing through said body coaxially with said axis, formed spirally about said axis on the peripheral surface of the body projections having a section in a plane including said axis in the form of an involute tooth profile, formed on the peripheral surface of the body, across said projections a plurality of equidistantly arranged spaces dividing said projections into a plurality of spirally continuous hob blades, each having an involute tooth profile, and reliefs formed on the side faces and peripheral face of the hob blades so that as the blade faces of the hob blades are cut and sharpened, the tooth profile of an imaginary gear generated by rotation of the hob about said axis is gradually displaced to attain an addendum to the tooth profile, whereby after cutting and sharpening of the hob blade faces after said faces have become dull from use in cutting gears in gear glanks, shifting of the hob toward a new gear blank by a distance corresponding to the magnitude of undercut of the peripheral relief results in cutting in the new gear blank of a gear generated in gear blanks before cutting and sharpening of the blade faces.

4,174,915

MILLING CUTTER, ESPECIALLY CONTOUR MILLING CUTTER

Wolfgang Peetz, Blitzenreute; Anton Scheuch, Ravensburg, and Walter Müller, Weingarten, all of Fed. Rep. of Germany, assignors to Hawera Probst GmbH & Co., Ravensburg, Fed. Rep. of Germany

Filed Feb. 27, 1978, Ser. No. 881,506
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1977, 7705745[U]
Int. Cl.[2] B26D *1/12*
U.S. Cl. 407—59 **10 Claims**



1. A milling cutter, especially contour milling cutter, which comprises a cutter body, individual cutting elements helically arranged around the axis of said cutting body and connected thereto, and webs connected to and projecting from the cutter body and extending in the same sense, helically about the axis of said cutter body while being separated from each other by chip grooves, all of said chip grooves extending helically about the axis of said cutter body in the same sense, and said webs having web edges located on a common cylinder mantle and provided with depressions along said web edges while web sections between said depressions from said individual cutting elements, each web having a peripheral land and each of said cutting elements having a face forming a relatively small angle with a radial plane of said cutter body, and adjoining one of said peripheral lands, said peripheral lands being located on said common cylinder mantle, said face and the pertaining circular land enclosing an acute angle with each other, the height of said depressions at a maximum amounting to half the depth of said chip grooves, the spacing between said depressions along said web amounting at a maximum to about 1 mm, the width of the cutting elements measured along the pertaining cutter element amounting to about $\frac{1}{3}$ of the distance between said depressions.

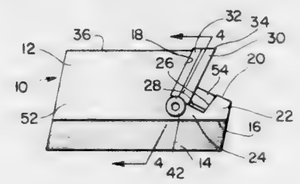
4,174,916

FORMING TOOL CONSTRUCTION

Mitchell Kezran, Cranston, R.I., assignor to Precision Industries, Inc., Providence, R.I.

Filed Apr. 24, 1978, Ser. No. 899,888
Int. Cl.[2] B26D *1/12*
U.S. Cl. 407—108 **13 Claims**

1. A dove-tailed forming tool adapted for receipt in a dove-tailed holder of a machine for plunge forming of a workpiece comprising, a block including front, top and bottom faces, said block having an integral dove-tail extending along the bottom face thereof for releasable engagement in a dove-tailed slot of a holder, said block including a generally vertically oriented front face and an integral front support overlying said dove-tail and extending forwardly of said front face, a laterally extending open top slot having a base wall formed in the upper surface of said support and disposed rearwardly of the forward extent of said support so as to dispose said base wall adjacent said front face and an upstanding slot wall adjacent said base wall and disposed in opposed relation to said front face, a



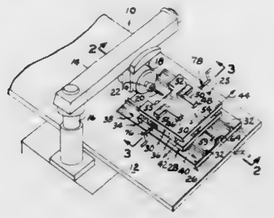
forming insert having a top working surface, a bottom surface, and rear and front surfaces, said insert disposed in said slot with said insert bottom surface supported by said slot base wall and said insert rear surface disposed against said block front face, at least one insert wedge disposed in said slot and adapted to mutually contact said upstanding slot wall and the face surface of said insert so as to securely clamp said insert to said block and positioning means for fixing the position of said insert within said slot with respect to said block.

4,174,917

DOWELING GUIDE

Conrad J. Brower, 4313 NW. 14, Oklahoma City, Okla. 73107

Filed Jul. 13, 1978, Ser. No. 924,123
Int. Cl.[2] B23Q *5/22*
U.S. Cl. 408—62 **3 Claims**



1. A doweling guide in combination with a radial arm saw having an arm portion projecting horizontally in vertically spaced transverse relation across a work platform intermediate its ends and having a drill bit operatively attached to the radial arm saw motor and projecting horizontally in parallel spaced relation toward one end of the platform, the improvement comprising:

an elongated base plate flatly overlying said platform and having a forward end portion underlying the position of said drill bit;

an intermediate plate overlying said base plate in longitudinally aligned vertically spaced parallel relation;

a top plate overlying said intermediate plate in vertically spaced parallel relation;

top plate support and control means interposed between and secured to said top plate and said intermediate plate for movement of said top plate transversely of said intermediate plate;

intermediate plate support and control means interposed between and secured to said intermediate plate and said base plate for movement of said intermediate plate and said top plate as a unit longitudinally of said base plate toward and away from said drill bit; and,

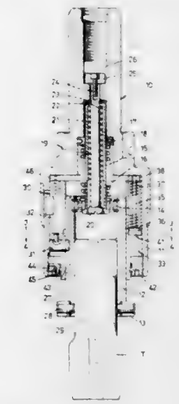
guideways overlying and secured to said top plate for alignably positioning a workpiece with the axis of said drill bit.

4,174,918

TAP HOLDER

Yukio Tanaka, Takarazuka, Japan, assignor to Showa Machine Industries Co., Ltd., Japan

Filed Apr. 18, 1978, Ser. No. 897,644
Int. Cl.[2] B23B *31/38*; B23G *3/00*
U.S. Cl. 408—139 **7 Claims**



1. A tap holder comprising:

an elongated holder body having a first end and a second end, said first end having therein an axial bore for connection to a spindle for rotation of said holder body, and said second end having extending therefrom an axially extending cylindrical housing;

a tap-supporting collet mounted for axial sliding movement within said housing;

clutch means positioned within said housing for transferring rotation of said holder body to said collet and for interrupting transfer of said rotation when the rotation torque exceeds a predetermined maximum, said clutch means comprising a first cylindrical member positioned within said housing between said housing and said collet, said first cylindrical member being rotatively fixed with respect to said housing and freely rotatable with respect to said collet, a second cylindrical member positioned within said housing, axially of said first cylindrical member, between said housing and said collet, said second cylindrical member being freely rotatable with respect to said housing and rotatively fixed with respect to said collet, said second cylindrical member having an end adjacent said first cylindrical member, said end having therein a plurality of radially extending grooves, a plurality of rollers retained within said first cylindrical member and partially fitting into said grooves, and pressing means within said first cylindrical member for urging said rollers into said grooves; and

means for axially resiliently connecting said collet to said holder body, said connecting means including first spring means for urging said collet axially away from said first end of said holder body, second spring means for urging said collet axially toward said first end of said holder body, and means for adjusting the urging force of said first spring means.

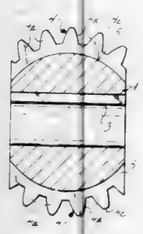
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U.S. Cl. 407—26 **2 Claims**



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Int. Cl.[2] B26D *1/12*
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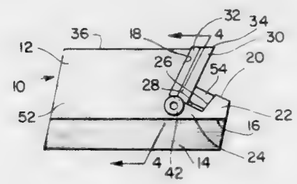
4,174,916

FORMING TOOL CONSTRUCTION

Mitchell Kezran, Cranston, R.I., assignor to Precision Industries, Inc., Providence, R.I.

Filed Apr. 24, 1978, Ser. No. 899,888
Int. Cl.[2] B26D *1/12*
U.S. Cl. 407—108 **13 Claims**

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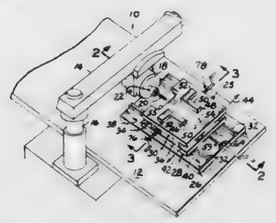
forming insert having a top working surface, a bottom surface, and rear and front surfaces, said insert disposed in said slot with said insert bottom surface supported by said slot base wall and said insert rear surface disposed against said block front face, at least one insert wedge disposed in said slot and adapted to mutually contact said upstanding slot wall and the face surface of said insert so as to securely clamp said insert to said block and positioning means for fixing the position of said insert within said slot with respect to said block.

4,174,917

DOWELING GUIDE

Conrad J. Brower, 4313 NW. 14, Oklahoma City, Okla. 73107

Filed Jul. 13, 1978, Ser. No. 924,123
Int. Cl.[2] B23Q *5/22*
U.S. Cl. 408—62 **3 Claims**



1. A doweling guide in combination with a radial arm saw having an arm portion projecting horizontally in vertically spaced transverse relation across a work platform intermediate its ends and having a drill bit operatively attached to the radial arm saw motor and projecting horizontally in parallel spaced relation toward one end of the platform, the improvement comprising:

an elongated base plate flatly overlying said platform and having a forward end portion underlying the position of said drill bit;

an intermediate plate overlying said base plate in longitudinally aligned vertically spaced parallel relation;

a top plate overlying said intermediate plate in vertically spaced parallel relation;

top plate support and control means interposed between and secured to said top plate and said intermediate plate for movement of said top plate transversely of said intermediate plate;

intermediate plate support and control means interposed between and secured to said intermediate plate and said base plate for movement of said intermediate plate and said top plate as a unit longitudinally of said base plate toward and away from said drill bit; and,

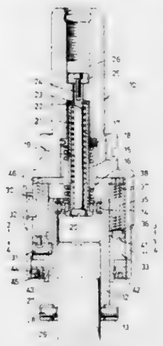
guideways overlying and secured to said top plate for alignably positioning a workpiece with the axis of said drill bit.

4,174,918

TAP HOLDER

Yukio Tanaka, Takarazuka, Japan, assignor to Showa Machine Industries Co., Ltd., Japan

Filed Apr. 18, 1978, Ser. No. 897,644
Int. Cl.[2] B23B *31/38*; B23G *3/00*
U.S. Cl. 408—139 **7 Claims**



1. A tap holder comprising:

an elongated holder body having a first end and a second end, said first end having therein an axial bore for connection to a spindle for rotation of said holder body, and said second end having extending therefrom an axially extending cylindrical housing;

a tap-supporting collet mounted for axial sliding movement within said housing;

clutch means positioned within said housing for transferring rotation of said holder body to said collet and for interrupting transfer of said rotation when the rotation torque exceeds a predetermined maximum, said clutch means comprising a first cylindrical member positioned within said housing between said housing and said collet, said first cylindrical member being rotatively fixed with respect to said housing and freely rotatable with respect to said collet, a second cylindrical member positioned within said housing, axially of said first cylindrical member, between said housing and said collet, said second cylindrical member being freely rotatable with respect to said housing and rotatively fixed with respect to said collet, said second cylindrical member having an end adjacent said first cylindrical member, said end having therein a plurality of radially extending grooves, a plurality of rollers retained within said first cylindrical member and partially fitting into said grooves, and pressing means within said first cylindrical member for urging said rollers into said grooves; and

means for axially resiliently connecting said collet to said holder body, said connecting means including first spring means for urging said collet axially away from said first end of said holder body, second spring means for urging said collet axially toward said first end of said holder body, and means for adjusting the urging force of said first spring means.

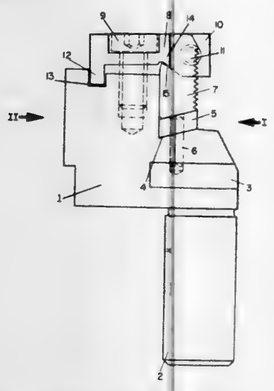
V 9 8 8 / 3 NO 0 2 0 0 7 9 9 UMI

4,174,919

HOLDER FOR A TANGENTIAL CHASING TOOL

Ingolf Knopp, Tuebingen, Fed. Rep. of Germany, assignor to Gustav Wagner Maschinenfabrik, Reutlingen, Fed. Rep. of Germany

Filed May 30, 1978, Ser. No. 910,665
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727498
Int. Cl.[2] B23B 51/00
U.S. Cl. 408—151 5 Claims



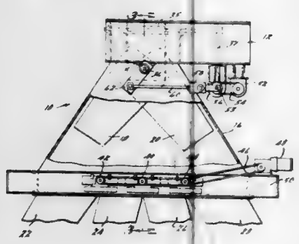
1. A holder for securing a tangential chasing tool including a dovetail portion in a thread cutter head, comprising chaser seat means in said thread cutter head, clamping plate means including guide claw means for securing said chasing tool in said thread cutter head, said clamping plate means comprising clamping jaw means and clamping screw means for securing said dovetail portion of said chasing tool, exchangeable, wedge shaped intermediate disk means having different wedging angles and insertable into said chaser seat, said guide claw means of said clamping plate means having a bottom edge forming a convex arc.

4,174,920

SOLID FUEL DISTRIBUTOR

Harold L. Knox, Grosse Ile, Mich., assignor to Detroit Stoker Company, Monroe, Mich.

Filed Apr. 19, 1978, Ser. No. 897,578
Int. Cl.[2] F23K 3/18; B65G 11/12
U.S. Cl. 414—160 8 Claims



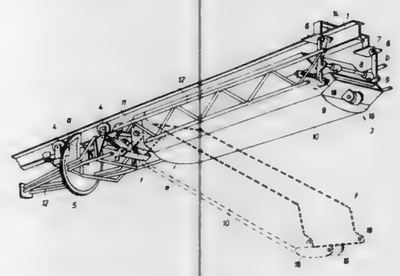
1. In a fuel distribution system for supplying fuel to a furnace through a multiplicity of supply chutes: a reciprocating spout assembly for distribution fuel into each of said supply chutes comprising a first reciprocating spout pivotally mounted on a horizontal axis and adapted to swing back and forth through an arcuate path to distribute fuel is succession into each of said supply chutes, a second reciprocating spout pivotally mounted on a horizontal axis and adapted to swing back and forth through an arcuate path to distribute fuel in succession into each of said supply chutes, and motive means connected to said first and second spouts for causing said spouts to reciprocate in opposed relation to one another.

4,174,921

PROCESS AND PLANT FOR THE CONTINUOUS UNLOADING OF THE HEAVY-DUTY CONTAINERS IN A PNEUMATIC TRANSPORT SYSTEM

Constantin Teodorescu, and Stefan Ardeleanu, both of Bucharest, Romania, assignors to Institutul National Pentru Creatie Stiintifica Si Tehnica - Increst, Bucharest, Romania

Filed Dec. 5, 1977, Ser. No. 857,669
Claims priority, application Romania, Dec. 25, 1976, 88839
Int. Cl.[2] B61D 7/04
U.S. Cl. 414—387 6 Claims



1. A pneumatic transport system comprising:
a transport path defined by spaced tube sections traversed by a continuous overhead rail;
a surface provided below said rail at an unloading zone between tube sections of said path and approaching the rail in the direction of transport;
cam means on said rail in said zone and upstream of said surface; and
at least one transport vehicle pneumatically displaceable along said rail through said tube sections, said transport vehicle comprising:
an elongated frame,
a plurality of support rollers at each end of said frame and engaging said rail,
a packing seal at each end of said frame effective in said sections for the pneumatic displacement of the vehicle,
an elongated container pivotally mounted at one of its ends on said frame,
latch means on said frame and engaging the other end of said container for holding said container in a load-carrying position generally parallel to said rail, said latch means being engageable by said cam means when said vehicle is displaced along said rail for releasing said container to enable the pivoting thereof by gravity into a downwardly sloping unloading position, and
a wheel provided at said other end of said container riding along said surface when said container is in the unloading position for pivoting said container upwardly toward the load-carrying position.

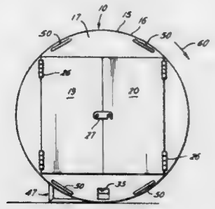
4,174,922

UNLOADING DEVICE

Alvin B. Kennedy, Jr., 410 World Loop, Angleton, Tex. 77515

Division of Ser. No. 743,763, Nov. 22, 1976, abandoned. This application Feb. 17, 1978, Ser. No. 878,693
Int. Cl.[2] B65G 65/24
U.S. Cl. 414—786 3 Claims

1. A method of simultaneously unloading a plurality of barrels containing dry particulate matter, including the steps of:
(a) placing the plurality of barrels on a pallet;
(b) placing the pallet in a rack frame mounted in a cylindrical enclosure;
(c) closing the cylindrical enclosure;



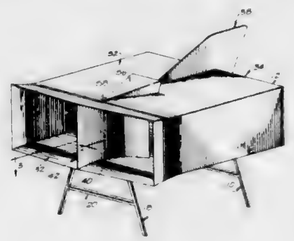
(d) rotating the cylindrical enclosure about its longitudinal axis to thereby dump the dry particulate matter in the enclosure;
(e) tilting one end of the enclosure by lifting it upwardly;
(f) removing the dry particulate matter from the enclosure.

4,174,923

WIND DRIVEN ENGINE

Glen A. Williamson, Wagner, County of Phillips, Mont. 59543

Filed May 19, 1977, Ser. No. 798,294
Int. Cl.[2] F03D 3/02
U.S. Cl. 415—2 2 Claims



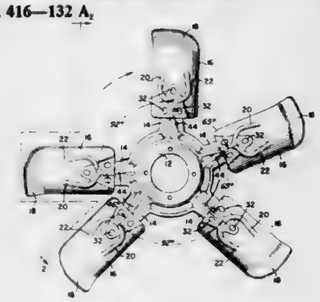
1. In a wind driven engine having:
(a) a base;
(b) a housing rotatably mounted on said base, said housing including a front inlet opening, a rear outlet opening, and at least two sides;
(c) a first and second vertical rotor rotatably mounted in said housing and having a plurality of overlapping blades;
(d) a wedge-shaped air diverter approximately centrally mounted inside said housing and forward of said first and second vertical rotors so that the flow of air which enters said housing is diverted onto the blades of said rotors which are adjacent the sides of said housing thereby rotating one of said rotors clockwise and the remaining rotor counterclockwise;
(e) a vent in said housing which is centrally located over said air diverter; and
(f) means for mechanically joining said clockwise rotating rotor and said counterclockwise rotating rotor to an energy receiving system; said joining means comprising:
(g) a first hollow shaft rotatably mounted on said base, said hollow shaft being mechanically joined to said first vertical rotor;
(h) a first gear means attached to an end of said hollow shaft;
(i) a second shaft rotatably mounted above and extending through said hollow shaft and first gear means, said second shaft being mechanically joined to said second vertical rotor;
(j) a second gear means attached to the end of said second shaft which extends through and is adjacent to said first gear means; and
(k) means for mechanically joining said first and second gear means;
the improvement comprising:
a wedge-shaped air shield which covers said air vent, the apex of said air shield is closed and projects forward toward said inlet opening, and the rear of said shield is open at a point upstream of said rotors.

4,174,924

SHEET METAL FAN ASSEMBLY

Charles L. Smithson, Jr., Indianapolis, Ind., assignor to Wallace Murray Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 624,386, Oct. 21, 1975, abandoned. This application Aug. 16, 1977, Ser. No. 825,034
Int. Cl.[2] F04D 29/38
U.S. Cl. 416—132 A, 2 Claims



1. A sheet metal fan assembly including a sheet metal hub having a plurality of radially extending spider arms each provided with a sheet metal fan blade, the improvement comprising, a radially extending rib on each arm thereof and extending outwardly from the surface of the arm, each blade provided at its radially inner portion with a rib extending radially along the blade and projecting outwardly from the surface of the blade, each blade being rigidly attached to an associated spider arm with the said rib on the blade and the said rib on the spider arm being in registered relationship, each blade being provided with a reinforcing channel intersecting with and branching laterally from either side of the radial outer end of said rib, the channel projecting outwardly from the surface of the blade in the same direction as said rib, said channel presenting a radially inner portion extending generally transverse to the longitudinal axis of the blade and arms at the ends of said inner portion which extend in a direction generally parallel with the longitudinal axis of the blade.

4,174,925

APPARATUS FOR EXCHANGING ENERGY BETWEEN HIGH AND LOW PRESSURE SYSTEMS

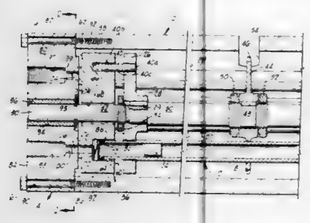
Dwight B. Pfenning, Oklahoma City; Lonnie C. Higginbottom, Midwest City, both of Okla., and Cedomir M. Sliepcevich, 2500 Butler Dr., Norman, Okla. 73069, assignors to Cedomir M. Sliepcevich, Norman, Okla.

Filed Jun. 24, 1977, Ser. No. 809,567
Int. Cl.[2] F04B 1/22
U.S. Cl. 417—225 24 Claims

23. In an apparatus for elevating the pressure of a first liquid by means of a second liquid at a higher pressure, which apparatus includes (a) a plurality of elongated, mutually rotatable fluid pressure transfer passageways rotatable about a common,

centrally disposed axis, and (b) stationary, non-rotating means from and into which said passageways each alternately respectively receive and transfer liquid at alternately high and low pressures at at least two different locations at each of the opposite ends of each of the passageways, the improvement which comprises:

seal plates floatingly disposed at opposite ends of the several passageways and disposed between the passageway ends and said stationary non-rotating means, said seal plates each being sealingly engaged with, and surrounding, the end portions of each of the passageways and each being shiftable longitudinally of the passageways and to ran-



domly varying distances along the several passageways while continuing to surround the end portion of each of said passageways; and

means resiliently urging the seal plates into sealing engagement with said stationary non-rotating means,

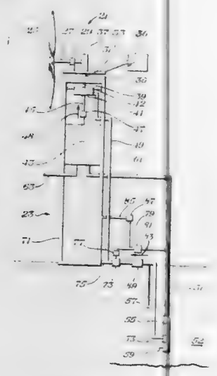
said seal plates each further including openings through the respective seal plate to permit liquid movement between said passageways and said stationary, non-rotating means when each of said passageways rotates into a predetermined position relative to said stationary, non-rotating means, each of said seal plate openings slidably receiving an end portion of one of said passageways.

4,174,926

WINDMILL PUMP DRIVE SYSTEM

Joseph T. Hamrick, Roanoke, and Leslie C. Rose, Rocky Mount, both of Va., assignors to World Energy Systems, Fort Worth, Tex.

Continuation-in-part of Ser. No. 803,525, Jun. 6, 1977. This application Oct. 5, 1977, Ser. No. 839,419
Int. Cl.² F04B *17/02, 9/08*
U.S. Cl. 417—334 **6 Claims**



1. A sysfem for pumping water from subsurface formations to the surface through a borehole, comprising:

pump means located in the borehole for pumping water in the borehole to the surface,

fluid driven power means located in the borehole for driving said pump means,

fluid storage means located at the surface,

second pump means located at the surface and coupled to said fluid storage means,

fluid accumulator means,

conduit means coupled from the outlet of said second pump means to said fluid accumulator means and to said fluid driven power means located in the borehole,

wind operated means located at the surface for operating said second pump means for pumping fluid from said fluid storage means through said conduit means to said fluid driven power means for operation thereof,

valve means coupled to said conduit means and adapted to be opened and closed for allowing fluid to flow through said conduit means to said fluid driven power means and for stopping the flow of fluid through said conduit means to said fluid driven power means respectively, and

control means responsive to the pressure of the water pumped by said pump means located in the borehole for closing said valve means when said pressure is below a certain level and for opening said valve means when said pressure is above said certain level,

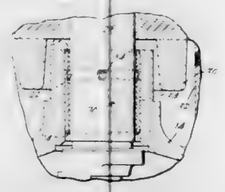
said control means being responsive to the pressure in said fluid accumulator means for opening said valve means when the pressure in said fluid accumulator means rises above a predetermined level.

4,174,927

REFRIGERATION COMPRESSOR LUBRICATION

Ivan T. Lindstrom, Sidney, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Continuation of Ser. No. 787,379, Apr. 14, 1977, abandoned. This application Oct. 5, 1978, Ser. No. 948,911
Int. Cl.² F04B *17/00, 35/00*
U.S. Cl. 417—372 **3 Claims**



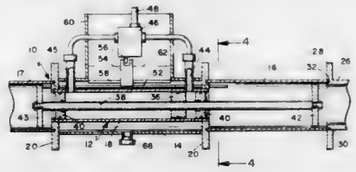
1. A refrigeration compressor comprising a housing, compressor means disposed within said housing, an oil sump containing lubricant, a vertical crankshaft drivingly connected to said compressor means, motor means for rotatably driving said crankshaft, bearing means including an upper bearing provided in said housing, said crankshaft being rotatably journaled in said bearing means, lubrication means in said crankshaft for supplying lubricant from said sump to said bearing means, and return means on said upper bearing for returning lubricant from said upper bearing to said sump via a path disposed between said uppeer bearing and said crankshaft, said return means including a continuous annular groove on the crankshaft engaging surface of said upper bearing, said annular groove being located closer to the upper end of said upper bearing than to the lower end thereof, said return means further including a pair of generally axially extending grooves provided on said crankshaft engaging surface of said upper bearing, said generally axial grooves being circumferentially spaced, spiralled, of opposite hand and extending only from said annular groove to the lower edge of said upper bearing whereby said return means is operative to prevent lubricant from entering said compressor means.

4,174,928

DOUBLE ACTING CONCRETE PUMP

Richard D. Austin, 3337 Hopi Pl., San Diego, Calif. 92117

Filed Mar. 13, 1978, Ser. No. 885,588
Int. Cl.² F04B *17/00, 15/02;* **F01L** *23/00*
U.S. Cl. 417—397 **5 Claims**



1. A double acting concrete pump, comprising:

an actuator having a reciprocating piston therein with a piston rod extending from opposite ends of the actuator;

a pair of mud cylinders mounted axially on opposite ends of said actuator, each having a mud piston therein secured to said piston rod;

said mud cylinders having outer ends with connector means thereon for connection to a source of fluid material to be pumped, and to a delivery outlet;

a lubricant containing reservoir including a jacket surrounding said actuator, with openings communicating with the inner ends of said mud cylinders by action of the mud pistons;

a source of power connected to said actuator;

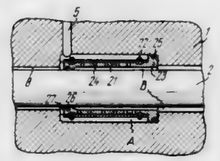
and reversing means coupled to said source of power for reversing said reciprocating piston.

4,174,929

HIGH PRESSURE PUMP

Anatoly N. Grakov, ulitsa Zolotodolinskaya, 29, kv. 424; Oleg I. Grebennik, ulitsa Tereshkovoi, 6, kv. 172., both of Novosibirsk; Jury A. Dudin, ulitsa Parkhomenko, 106, kv. 10, Ufa; Vladimir L. Lutsker, ulitsa Lomonosova, 7/2, kv. 7, Murmansk; Valery N. Makarov, Morskoi prospekt, 5, kv. 43; Viktor M. Ogolikhin, ulitsa Akademicheskaya, 2ª, kv. 213, both of Novosibirsk, and Tatyana P. Khrustaleva, ulitsa Lyashenko, 6ª, kv. 1, Obninsk Kaluzhskoi Oblasti, all of U.S.S.R.

Filed Mar. 15, 1977, Ser. No. 777,845
Int. Cl.² F01M *1/00;* **F04B** *39/02;* **F16J** *18/56*
U.S. Cl. 417—437 **2 Claims**



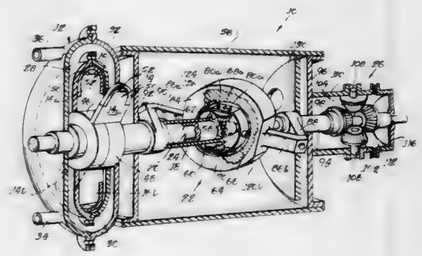
1. A high-pressure pump comprising: a housing; a movable piston mounted within said housing and defining a chamber; a movable partition member arranged within said housing, said partition member dividing said chamber into first and second spaces substantially insulated from each other and mounted coaxially with the piston; a working medium source; a low-pressure sealing medium source; a first non-return valve connecting the first space with said working medium source; a second non-return valve connecting said first space with a consumer; a third non-return valve connecting one side of the second space with said low-pressure sealing medium source; a slit seal comprising an annular space formed between the inner surface of said housing and the outer surface of said piston, said annular space connecting the other side of said second space with said low-pressure sealing medium source; a stop for limiting the displacement of said partition member during the intake stroke, said stop being arranged within said housing, rigidly connected thereto and mounted within said first space, said partition member comprising an elastic membrane, said stop comprising a bushing embracing said piston, said flexible membrane having edges fastened to said bushing, the outer surface of the bushing limiting the displacement of said membrane during the intake stroke, said bushing having open radial bores, the number of bores being selected to provide for minimum resistance offered to the working liquid.

4,174,930

ROTARY ENGINE

Chester A. Posson, 4651 Teonia Woods Rd., Rolling Meadows, Ill. 60008

Filed Nov. 21, 1977, Ser. No. 853,100
Int. Cl.² F02B *53/00*
U.S. Cl. 418—36 **8 Claims**



1. A rotary engine comprising:

housing means defining a substantially closed chamber,

fuel inlet, fuel ignition and exhaust means communicating with said chamber in predetermined registration therewith,

a pair of pistons supported within said chamber for rotation about a common axis, each of said pistons defining substantially diametrically opposed blade pistons extending outwardly from said common axis of rotation,

first support shaft means supporting one of said pistons within said chamber for rotation about said common axis of rotation,

second support shaft means rotatably supporting the other of said pistons within said chamber for rotation about said common axis of rotation and with its said opposed blade pistons being interposed between the blade pistons of said one of said pistons,

said pistons being rotatable relative to each other and relative to said chamber so as to establish variable volume chambers between successive blade pistons,

a power output shaft,

and motion translation mechanism means interconnecting said first and second support shaft means to said power output shaft and operative to effect unidirectional rotation of said output shaft during cyclical rotation of said pistons, said motion translation mechanism means including carrier ring means connected to said output shaft and to said pistons so that rotation of said pistons effects a corresponding rotation of said output shaft, and control means being connected to said output shaft and said carrier ring means and adapted to effect predetermined movement of said carrier ring means in response to rotation of said pistons so that, in continuous predetermined sequence, a first one of said pistons rotates about its rotational axis in a power stroke upon selective ignition of fuel within said chamber while the other of said pistons remains substantially stationary relative to said chamber, and thereafter

said first one of said pistons is maintained in substantially stationary relation to said chamber while the other of said pistons undergoes rotation during a power stroke upon further selective ignition of fuel within said chamber, whereafter said pairs of pistons are caused to undergo continued alternating rotational movement during power strokes so as to effect unidirectional rotation of said power output shaft,

each of said first and second shaft means carrying a gear segment in fixed relation thereon, said carrier ring means including a pair of gear segments each of which is adapted for driven relation with one of said gear segments on said first and second shaft means, said carrier ring means being connected to said power output shaft so that rotation of either one of said gear segments on said first and second shaft means effects a corresponding rotation of said power output shaft, said control means being connected with said carrier ring means and adapted to effect predetermined movement thereof so that one of said pistons is maintained in substantially stationary relation to said chamber when the other of said pistons undergoes a power stroke,

said control means including a control ring member lying in a plane subtending an angle of approximately 49° with the axis of said power output shaft and being coupled to said power output shaft in a manner to be rotated about an axis coincident with the axis of said output shaft in response to and in a rotational direction opposite to said power output shaft, said control ring member connected with said carrier ring means so as to effect said predetermined movement thereof.

4,174,931

VANE FOR ROTARY COMPRESSOR

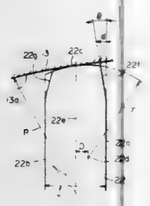
Yutaka Ishizuka, Konan, Japan, assignor to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed Dec. 13, 1977, Ser. No. 860,400

Claims priority, application Japan, Dec. 17, 1976, 51-169994[U]

Int. Cl.² F04C *29/00*

U.S. Cl. 418—259 **10 Claims**



1. In a rotary vane compressor, a generally rectangular vane having a leading surface and trailing surface, a radially outer portion of the leading surface being cut away by a predetermined amount;

the radially outer portion of the leading surface being flat and making an angle θ with the leading surface;

the angle θ being between 3° and 15°.

4,174,932

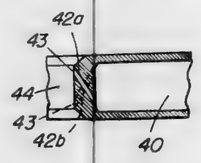
APPARATUS FOR EXTRUDING TUBULAR THERMOPLASTIC FILM

F. John Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 767,097, Feb. 9, 1977, abandoned. This application Jul. 20, 1978, Ser. No. 926,476

Int. Cl.² B29F *3/08*; B29D *23/04*

U.S. Cl. 425—72 R **5 Claims**



1. In an apparatus for forming tubular thermoplastic film comprising extruder means; annular extrusion die means, adopted in combination to extrude a single tube of thermoplastic film; pinch rollers spaced downstream from said annular extrusion die adopted to flatten said tube; and means for introducing a fluid under pressure into said tube whereby to biaxially expand said tube and reduce the wall thickness thereof; the improvement which comprises a housing member assembly disposed concentric to said extruded tube downstream of, and adjacent to, said annular die, said tubular thermoplastic film passing through said housing member assembly upon exiting from said die, said assembly being further characterized by having multiple rows of channels therethrough, each of said channels terminating in an aperture on the inner surface of said housing, said apertures being arranged in a series of streamwisedly spaced pairs of diverging aperture row adjacent to and directed towards said extruded tubing in an overall diverging shape, said streamwisedly spaced pairs of aperture rows having individual apertures in one row of the pair which diverge from the adjacent apertures in the second row of the pair, means for forcing a fluid through said apertures towards said extruded tubing and then away from such tubing, whereby creating a suction and thus drawing said extruded tubing toward said assembly; an uppermost cooling housing superimposed above said assembly, said cooling housing comprising a continuous circular housing which surrounds said tube and which circular housing supplies cooling air under pressure to said tube, said air being outwardly and upwardly directed.

4,174,933

FORMING AN EXTRUDED BAR OUT OF METAL CHIPS

Robert D. Mitchell, Harwood Heights, Ill., and Albert C. Schulz, Hudson, Ohio, assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 27, 1977, Ser. No. 864,413

Int. Cl.² B29F *3/06*

U.S. Cl. 425—79 **2 Claims**

1. Extruding apparatus for extruding metal particles into bar stock; including:

a bin for holding the metal particles;

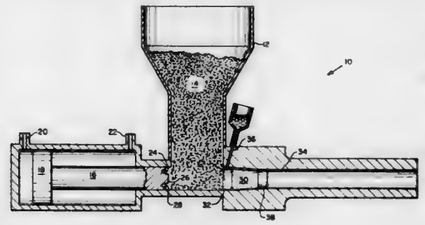
an extruding die having an inlet end opening into a lower portion of the bin, an outlet end through which the finished bar stock is discharged, and a passageway of reducing diameter connecting the inlet end with the outlet end, the inlet end being of a larger diameter than the outlet end;

a ram;

means operatively associated with the ram for reciprocating the ram back and forth through the lower portion of the bin, in alignment with the extruding die, an end surface of the ram which contacts the metal particles containing undulations therein;

means for distributing a lubricant into the extruding die around the periphery of the inlet end; and

a compressible material plug positioned at the inlet end of the extruding die at the start of the extruding operation,



said plug having a diameter smaller than the inlet end of the extruding die, but larger than the outlet end.

4,174,934

APPARATUS FOR THE PREPARATION OF HOLLOW PLASTIC ARTICLES

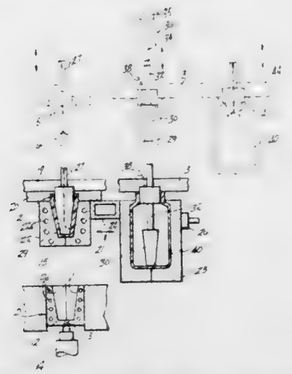
Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Division of Ser. No. 786,461, Apr. 11, 1971, which is a continuation-in-part of Ser. No. 618,782, Oct. 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 473,580, May 24, 1974, Pat. No. 3,966,378. This application May 1, 1978, Ser. No. 901,849

The portion of the term of this patent subsequent to Jun. 29, 1995, has been disclaimed.

Int. Cl.² B29C *17/07*; B29D *3/00*

U.S. Cl. 425—112 **13 Claims**



1. An apparatus for forming multi-axially oriented objects of moldable organic plastic material which comprises: a first core and a temperature controlled first mold; means for providing a parison on said first core, means including said first core to place said parison in said first mold; means for separating said parison from said first core while retaining said parison in said first mold to adjust the temperature thereof for orientation conditions; a second core and a second mold; means for transferring said parison to said second core and said second mold; means for axially extending said parison in said second mold and means to expand said parison on said second core in said second mold to provide a finished article which is multi-axially oriented; means for separating said finished article from said second core while retaining said finished article in said second mold; and means to eject said finished article, wherein said molds are in spaced relationship to each other and move in a lateral direction relative to the parison axis and wherein said cores are in spaced relationship to each other and move in a direction parallel to the parison axis.

4,174,935

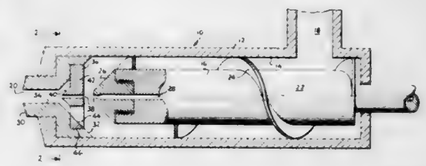
EXTRUSION APPARATUS FOR PRODUCING ELONGATED CORE MEMBERS COVERED WITH CONCENTRIC COATINGS

Roger D. Driskill, Seymour, Conn., assignor to General Electric Company, New York, N.Y.

Filed Dec. 14, 1977, Ser. No. 860,760

Int. Cl.² B29C *27/30*

U.S. Cl. 425—113 **10 Claims**



1. An extruder for the continuous forming of a concentric coating of heat curable plastic material around an elongated core member, comprising an extruder housing having an inlet located in an upstream portion and an outlet located in a downstream end thereof, a rotatable extrusion screw extending from upstream of the inlet substantially through the length of the extruder housing towards the downstream outlet having a free downstream end and conically converging end portion, said rotatable screw being provided with a longitudinal coaxial bore extending the length thereof, the outlet in the downstream end of the housing comprising a forming die orifice provided with a converging entry surface leading into the forming die orifice, and an annular guide means spaced from said free end of the extrusion screw concentrically aligned with the forming die orifice mounted in fixed mechanical relationship with the converging entry to the die orifice in close proximity to the die orifice and contoured to compliment the surface of the converging entry to the die orifice.

4,174,936

APPARATUS FOR MANUFACTURING CELLULAR LIGHTWEIGHT CONCRETE PRODUCTS

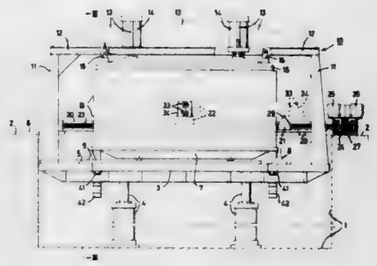
Rolf E. Göransson, Åkarp, Sweden, assignor to Internationella Siporex AB, Malmo, Sweden

Division of Ser. No. 624,079, Oct. 20, 1975, Pat. No. 4,083,909. This application Jan. 17, 1978, Ser. No. 870,141

Claims priority, application Sweden, Oct. 31, 1974, 7413712

Int. Cl.² B28B *3/12*

U.S. Cl. 425—297 **7 Claims**



4. An apparatus for dividing a plastic, cellular and at least generally parallelepipedic body of concrete mass resting in a fully exposed position on a movable support comprising in combination: a substantially rectangular bearing surface, on

which the movable support with the body thereon is receivable; two holders located on opposite sides of said bearing surface and at a distance from each other exceeding the corresponding dimension of the body to be divided; a cutting wire stretched between said two holders and extending in a plane that is at least approximately horizontal; means for effecting a guided horizontal reciprocating motion between the body resting on its support on said bearing surface and said holders with the cutting wire between them in a direction that is lateral to the wire itself so as to cause said wire to cut through the body at each stroke; means for changing the relative vertical position between said bearing surface and said holders with the cutting wire between them after each completed body-cutting stroke of said wire so as to cause said wire to cut through the body at different levels and, hence, to divide the body into a plurality of slab-like slices lying one on top of the other; a vertically movable suction head mounted above said bearing surface and adapted for engaging with and adhering by suction to the top face of the body to be divided, while leaving all the vertical faces thereof substantially free, means for elevating and lowering said suction head in order to effect, after each completed body-cutting stroke of said cutting wire, first a lifting of the uppermost part of the cut body and subsequently a redeposition thereof, before the next body-cutting stroke is started; and a horizontally reciprocatable unit for working at least one of the two cut surfaces obtained at each body-cutting stroke of said wire, said unit being movable independently of said holders and cutting wire.

4,174,937

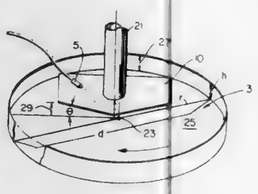
POWDER AGGLOMERATOR AND ITS METHOD OF USE

Danton L. Paulson, and Robert B. Worthington, both of Albany, Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Division of Ser. No. 559,936, Mar. 19, 1975. This application Sep. 15, 1978, Ser. No. 942,834

Int. Cl.[2] **B22F** *3/00*

U.S. Cl. 425—222 **4 Claims**



1. A fine particle powder agglomerator comprising:

a smooth surface generally horizontal disc having a center and a raised outer peripheral edge extending totally around thereof;

power means for rotating said disc at a substantially constant edge speed;

means capable of continuously supplying particles with a diameter of no more than 0.01 of an inch near the center of said rotating disc;

a discharge hopper located generally under said disc;

means for spraying a binder on said particles as they are supplied to said rotating disc to aid in agglomerating them; and

means located near said supply for causing the deposited particles to assume an outwardly increasing sloping configuration from the disc's center to its raised edge.

4,174,938

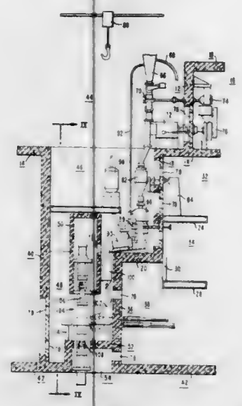
REMOTE NUCLEAR GREEN PELLET PROCESSING APPARATUS

Francis Cellier, Export, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 765,485, Feb. 4, 1977, abandoned. This application Aug. 26, 1977, Ser. No. 828,059

Int. Cl.[2] **B29C** *1/00*

U.S. Cl. 425—317 **3 Claims**



1. Apparatus for manufacturing nuclear fuel pellets comprising:

a restricted access area defined by a plurality of radiation protective vertical walls and horizontal floors offset from each other which contain components for manufacturing nuclear fuel pellets;

a limited access area defined by said protective walls and floors and separated from said restricted access area by said protective walls and floors for containing working personnel for operating and maintaining said components, said components comprising;

a compactor feed hopper disposed in said restricted access area and attached to one of said walls for collecting the nuclear fuel material to be made into nuclear fuel pellets, a star feeder valve disposed in said restricted access area below and laterally to said compactor feed hopper and connected to said compactor feed hopper for controlling the flow from said compactor feed hopper, a roll compactor connected to said star feeder valve and disposed in said restricted access area for rolling said fuel material into ribbon-like strips of various lengths, a granulator connected to said roll compactor and disposed in said restricted access area below and laterally to said roll compactor for granulating said ribbon-like strips into granules, a classifier connected to said granulator and disposed in said restricted access area below and laterally to said granulator for separating said granules according to size and allowing properly sized granules to remain in the process stream, a bulk density check station connected to said classifier and disposed in said restricted access area below and laterally to said classifier for checking the density of said granules, a stearate feed hopper disposed in said restricted access area for collecting stearate material, a rolling drum connected to said stearate feed hopper and said bulk density check station and disposed in said restricted access area below and laterally to said bulk density check station and said stearate feed hopper for mixing said granules with said stearate, a pellet press feed hopper connected to said rolling drum and disposed in said restricted access area below and laterally to said rolling drum for collecting said mixture of said granules and said stearate, and a pellet press connected to said pellet press feed hopper and disposed below and laterally to said rolling drum for forming said mixture into nuclear fuel pellets, said components being disposed below and laterally relative to the preceding component thereby allowing said nuclear material to flow between said components under the influence of gravity and allowing said components to be vertically manipulated without interfering with the other components.

4,174,939

LATCH FOR THREE-PART MOLD

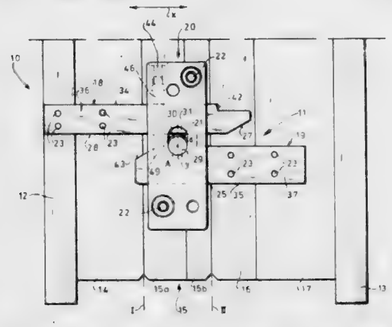
Klaus-Bernd Fenner, Lüdenscheid, Fed. Rep. of Germany, assignor to Hasco-Normalien Hasenclever & Co., Lüdenscheid, Fed. Rep. of Germany

Filed Sep. 19, 1978, Ser. No. 943,616

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1977, 2742166

Int. Cl.[2] **B29C** *1/00*

U.S. Cl. 425—451.9 **10 Claims**



1. A latch for a mold having an inner mold part sandwiched between a pair of the outer mold parts, said parts being relatively displaceable in a longitudinal direction, said arrangement comprising:

a control bar rigid with one of said outer parts and extending longitudinally toward the other outer part;

a locking bar rigid with said other outer part and extending longitudinally toward said one outer part adjacent said control bar;

a locking pin transversely movable but longitudinally fixed on said inner part and engageable with both of said bars; and

means including formations on said bars engageable with said pin for preventing relative longitudinal displacement of said other and inner parts during opening of said mold prior to separation beyond a predetermined spacing of said one and inner parts.

4,174,940

APPARATUS FOR AUTOMATICALLY HANDLING A MOLD FOR TIRES WITH A RIGID SEGMENTED CORE

Augusto Pizzorno, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

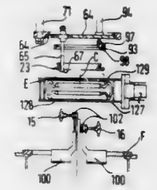
Division of Ser. No. 830,870, Sep. 6, 1977. This application Oct. 2, 1978, Ser. No. 947,714

Claims priority, application Italy, Sep. 13, 1976, 27139 A/76

Int. Cl.[2] **B29H** *5/02;* **B29F** *1/00*

U.S. Cl. 425—577 **24 Claims**

1. An apparatus for driving a mold for making a tire, said mold consisting essentially of an outer envelope and an inner body joined to define the required shape of the tire, said inner body consisting of a core having sectors which can be radially taken to pieces, and at least two annular elements, an upper one and a lower one, separable from each other and from the core in the direction of the core axis, said elements having at least two surfaces which form axially inner surfaces for the beads of the tire to be made, said apparatus consisting essentially of an upper frame, a lower frame having a face for the mold horizontally arranged thereon, said frames having their vertical central axes lined up with each other to form the vertical central axis of the apparatus, said apparatus being further characterized by the fact of consisting essentially of one device for spreading out the sidewalls of the tire in different phases and one operating mechanism for the spreading-out device respectively on the



upper frame and locking means for the lower annular element in the final and locking means for the lower annular element in the final position corresponding to the lower sidewall when spread out, means for effecting contemporary radial movements of a first and second part of the sectors, means for the vertical displacement of said first part of the sectors that have already been moved radially and at the same time towards the center of the apparatus.

4,174,941

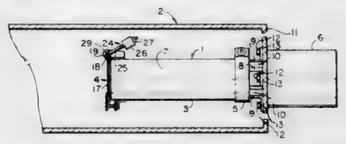
SLEEVE AND DAMPER FOR OIL BURNER

Ralph C. Parkes, Rydal, Pa., assignor to The National Drying Machinery Corp. of America, Philadelphia, Pa.

Filed Dec. 6, 1977, Ser. No. 857,903

Int. Cl.[2] **F23N** *5/00;* **F23D** *15/02*

U.S. Cl. 431—3 **19 Claims**



14. A process for the clean combustion of fuel oil in an installation of the type wherein an oil burner is provided with a sleeve, one connected end of which is supported in proximity to the oil burner and the other remote end of which is equipped with a damper comprising

burning fuel oil in the oil burner to produce a flame and a small percentage of unburned fuel oil particles;

directing the flame from the oil burner into the sleeve;

retaining some of the heat from the flame within the sleeve by utilizing the damper;

maintaining the temperature within the sleeve above that required for the automatic ignition of the fuel oil;

igniting automatically the unburned particles of fuel oil within the sleeve;

building up pressure within the sleeve during the burning of the fuel oil and mantaining constant the pressure by operation of the damper;

whereby fuel oil not fully ignited by the oil burner is automatically ignited within the sleeve to provide complete combustion of the fuel oil.

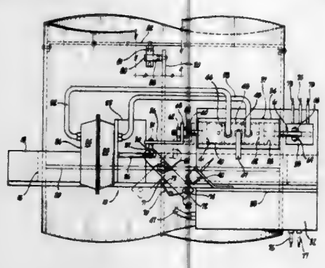
V 9 8 3 N 0 2 0 7 9 UMI

4,174,942

FLUE CONTROL ASSEMBLY

Donald A. McArthur, 4301 Arco, St. Louis, Mo. 63110

Filed Jul. 25, 1977, Ser. No. 818,449
Int. Cl.² F23N *3/00*
U.S. Cl. 431—20 **11 Claims**



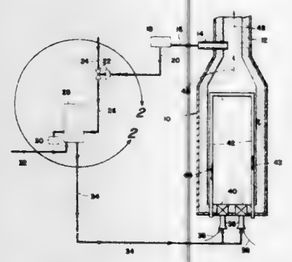
1. A flue control assembly for a combusiton chamber having an electrically actuated, thermostatic switch controlled burner valve circuit, the assembly comprising:
(a) flue means,
(b) damper means pivotally mounted in the flue means, for movement between an open position and a closed position,
(c) fluid operated actuating means including movable means operatively connected to the damper means for rotating said damper means between said open position and said closed position,
(d) fluid pump means,
(e) conduit means connecting the pump means to the actuating means,
(f) valve means between the pump means and the actuating means said valve means selectively supplying fluid from the pump means through the conduit means to the actuating means to move the damper means from an open position to a closed position and from a closed position to an open position, and
(g) switching means connected to the burner valve circuit and conditioning the pump means to supply fluid to the actuating means when the burner valve is closed by the thermostatic switch and the damper means is in a predetermined position.

4,174,943

FUEL GAS PREHEAT FOR EXCESS OXYGEN MAINTENANCE

Robert D. Reed, Tulsa, Okla., assignor to John Zink Company, Tulsa, Okla.

Filed Oct. 31, 1977, Ser. No. 847,227
Int. Cl.² F23N *5/18*
U.S. Cl. 431—41 **2 Claims**



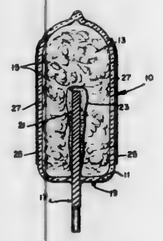
1. In a furnace for combustion of gaseous fuels, said furnace having an outlet stack for the products of such combustion, said fuels having a wide range of molecular weights and calorific values, and including burner means in which a selected percentage of all of the combustion air is provided by inspiration, due to the flow energy of the fuel; the improvement in apparatus for providing full combustion air requirements, comprising;
means to preheat said fuel so as to vary the temperature of said fuel in relation to the molecular weight and calorific value of said fuel; and
means to monitor the percentage of excess oxygen in the products of combustion of said fuel on the way to the stack; and means responsive to said means to monitor, to control the heating of said fuel;
whereby, as the percentage of oxygen increases, the temperature of heating of said gaseous fuel decreases, and vice versa.

4,174,944

SINGLE LEAD ELECTRICALLY-ACTIVATED FLASHLAMP

P. Bruce Newell, Carlisle; James C. Morris, Wakefield, and John F. Waymouth, Marblehead, all of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 30, 1978, Ser. No. 873,250
Int. Cl.² F21K *5/02*
U.S. Cl. 431—359 **18 Claims**



1. An electrically-activated flash lamp comprising:
a hermetically-sealed, light-transmitting envelope defining a chamber therein;
a combustion-supporting atmosphere within said chamber;
a quantity of filamentary combustible material within said chamber;
a single electrically conductive lead member secured to and extending from one end of said envelope, said conductive lead member having an end portion protruding within said chamber;
a quantity of primer material covering said protruding end portion of said lead member; and
an electrically conductive coating positioned on the external surface of said envelope in capacitively coupled relationship to said filamentary combustible material within said chamber, said capacitive coupling occurring through the wall of said envelope.

4,174,945

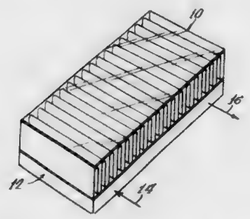
CORRUGATED PANEL AND APPARATUS FOR MANUFACTURING THE SAME

David C. Gertz, 6 N. 139 Weber Dr., St. Charles, Ill. 60174

Division of Ser. No. 776,519, Mar. 11, 1977, abandoned. This application May 30, 1978, Ser. No. 910,272
Int. Cl.² B29C *27/12*
U.S. Cl. 425—501 **6 Claims**

1. Vacuum forming apparatus for producing a corrugated sheet, comprising:
a continuous conveyor belt;

a pair of spaced rotary elements, at least one of which is adapted to be driven, and rotatable about parallel axes, said belt being trained about said rotary elements with one side in contact therewith for movement in a closed path about said elements, said closed path having arcuate segments at said rotary elements;
a plurality of flutes extending across said belt and carried thereby in substantially equally spaced relation and projecting away from said belt on the side thereof opposite said one side to define a plurality of pockets each having a bottom defined by said belt;



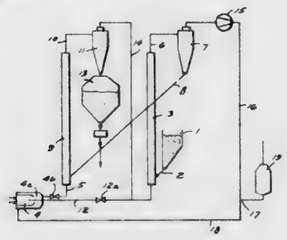
at least one vacuum passage opening to the bottom of each said pocket and to said belt one side;
a vacuum manifold associated with one of said rotary elements;
said one rotary element further including a vacuum distributor establishing fluid communication between said vacuum manifold and said belt one side for at least part of the arcuate segment of said path at said one rotary element; and
means for directing a sheet of plastic material in a plastic state to said flutes at said one rotary element at or prior to the associated arcuate segment of said path.

4,174,946

PROCESS FOR DRYING COAL IN TWO-STAGE FLOW-THROUGH CIRCULATION HEATERS

Wolfgang Rohde, Essen, Fed. Rep. of Germany, assignor to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Aug. 30, 1977, Ser. No. 829,254
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1976, 2640508
Int. Cl.² F27B *15/00*
U.S. Cl. 432—14 **7 Claims**



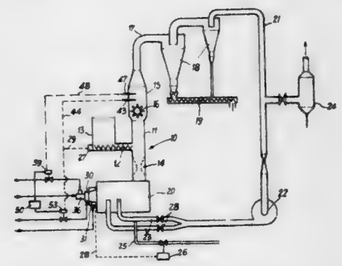
1. In a process of drying coal in a two-stage thermal operation of the type wherein coal is passed in finely divided form together with a fresh heat carrier gas into the lower end of a first elongated flow-through heating element, the coal and vapors withdrawn at the upper end of the first heating element are passed to a first separator where the partly dried coal is separated from the vapors, the separated coal and a fresh heat carrier gas are then passed into the lower end of a second elongated flow-through heating element, the coal and spent heat carrier gas withdrawn at the upper end of the second heating element are passed to a second separator, and the substantially dry separated coal is recovered from the second separator, the improvement comprising generating hot combustion gas having a temperature of about 1500° C.; mixing a portion of the hot combustion gas with the spent carrier gas withdrawn from said second heating element to obtain fresh carrier gas having a temperature lower than the combustion gas; admitting the thus obtained lower temperature carrier gas directly into said first heating element; mixing at least part of the vapors withdrawn from said first heating element with another portion of the hot combustion gas to obtain fresh carrier gas having a temperature higher than said vapors; and admitting the thus obtained higher temperature carrier gas directly into said second heating element.

4,174,947

INSTALLATION AND PROCESS FOR REGULATING THE PREHEATING OF COKING COAL

Serge L. Delessard, Forbach, and Roger M. Puff, Hombourg-Haut, both of France, assignors to Charbonnages de France, Paris, France

Filed Jan. 18, 1978, Ser. No. 870,594
Claims priority, application France, Jan. 24, 1977, 77 01871
Int. Cl.² F27B *15/00*
U.S. Cl. 432—15 **10 Claims**



6. For maintaining at desired temperature values, in any circumstances, a coal preheating installation having at least one drying chamber fed with a fluidisation agent, a combustion chamber having a main neutral combustion burner producing a hot neutral gas serving as entrainment agent and as drying and fluidisation agent, and means for regulating the feeding of the main burner with liquid or gaseous fuel which are controlled by means for measuring the temperature in the fluidisation chamber, a process comprising:
providing an auxiliary burner having a thermal power range lower than the lowest power of the range of power of said main burner and;
regulating said auxiliary burner in dependence on the temperature measured in the fluidisation chamber at least during periods of extinction of the main burner, thereby extending in the downward direction the range of regulation of thermal power in the combustion chamber.

4,174,948

MANIFOLD INPUTS AND OUTPUTS FOR FURNACE REGENERATORS

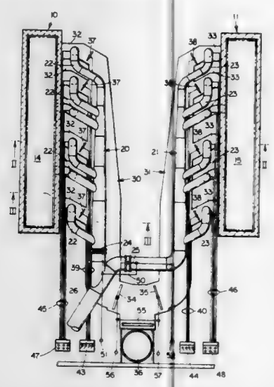
Robert O. Bradley, Toledo, Ohio; Heywood J. Knighton, Grosse Pointe Park, Mich., and Robert J. Naveaux, Toledo, Ohio, assignors to Toledo Engineering Company, Toledo, Ohio

Filed Mar. 6, 1978, Ser. No. 883,696
Int. Cl.² C21B *9/12*; F27D *17/00*
U.S. Cl. 432—54 **11 Claims**

1. A regenerator system for a furnace having a pair of elongated regenerators through which intake air and exhaust gases alternately pass, and each said generator having a longitudinal

duct along its top connected to a plurality of side ports said system comprising:

(A) an input manifold for said intake air to each regenerator, said manifold having branch ducts spaced along and connected to its said regenerators,



(B) an output manifold for exhaust gases from each regenerator, said manifold having branch ducts spaced along and connected to its said regenerator,

(C) separately operative gates in each of said branch ducts, and

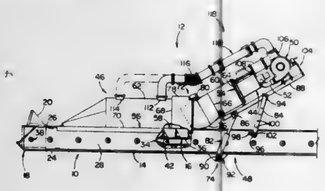
(D) separate reversing valve means between said input manifolds and between said output manifolds.

4,174,949

BURNER AND EXHAUST CONTROL ASSEMBLIES FOR USE WITH AN APPARATUS FOR CONVEYING PARTICULATE MATERIAL

George W. Swisher, Jr., Oklahoma City, Okla., assignor to CMI Corporation, Oklahoma City, Okla.

Filed Aug. 29, 1977, Ser. No. 828,750
Int. Cl.[2] F27B *15/00*
U.S. Cl. 432—58 **8 Claims**



1. In a conveyor apparatus in which a conveyor is supported by a plurality of pulleys and enclosed by a conveyor housing having an input end and an output end, the conveyor powered to convey particulate material from the input end for discharge from the output end which is disposed vertically higher than the input end, the improvement comprising:

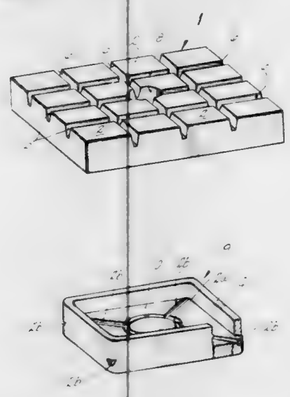
burner means, supported by the conveyor housing between the input end and the output end and including a flame burner, for directly heating the particulate material conveyed by the conveyor via the flame burner in one position thereof, and for indirectly heating the particulate material conveyed by the conveyor via the products of combustion only of the flame burner in one other position thereof.

4,174,950

CERAMIC BASE AND CAP USEFUL IN FIRING CERAMIC SHELL MOLDS

Henry A. Jalbert, Willimantic, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1977, Ser. No. 861,777
Int. Cl.[2] F27D *5/00*
U.S. Cl. 432—6 **11 Claims**



1. A preformed ceramic base useful for firing a ceramic shell mold having an open bottom end and a mold cavity in communication therewith, comprising:

a ceramic member having a preformed working surface which includes a majority of flat surface portions on which the mold base is suported and maintained with desired flatness during firing and one or more groove-like surface portions which define one or more gas circulation passages from the outside atmosphere into the open bottom end of the mold adjacent the ceramic base when the open bottom end of the mold is placed in supported relation on the flat surface portions, said passages permitting gas circulation through the mold interior during firing to minimize hot spots therein.

10. A method for firing a plurality of ceramic shell molds having open bottom ends which are the mold bases and open top ends, comprising:

(a) providing a plurality of preformed ceramic firing bases, each base including a preformed working surface which comprises a majority of flat surface portions on which the mold base is supported and maintained with desired flatness throughout firing and one or more groove-like surface portions extending across the working surface and terminating at the edge periphery at spaced apart locations to define one or more gas circulation passages when the mold base is placed in supported relation on the flat surface portions thereof, said passages being in communication with the outside atmosphere at their terminating locations along the edge periphery of the ceramic firing base and with an opening in the open bottom end adjacent the firing base;

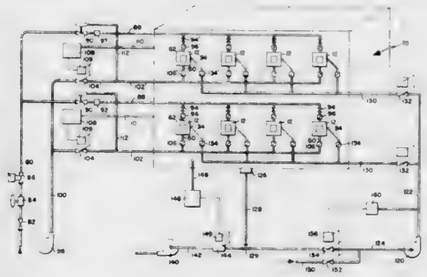
(b) placing each ceramic shell mold on a ceramic firing base so that the mold base is in supported relation on the flat surface portions of the working surface and the gas circulation passages are defined therebetween, and arranging the ceramic firing bases in working relation to one another such that the terminating locations of the gas circulation passages of one firing base are in opposed gas flow relation with those of an adjacent firing base, thereby providing a more or less continuous network of interconnected passages to permit gas circulation through each shell mold during firing to minimize hot spots therein.

4,174,951

FURNACE HEATING SYSTEM

Quentin M. Bloom, Newtown, Pa., assignor to Bickley Furnaces, Inc., Philadelphia, Pa.

Filed Sep. 6, 1977, Ser. No. 830,799
Int. Cl.[2] F27B *9/36*
U.S. Cl. 432—133 **12 Claims**



1. A system for heating a furnace having a heating chamber defined by a furnace wall comprising:

a plurality of individual burner assemblies mounted on the furnace wall to direct heating gas streams into the heating chamber,

each of said burner assemblies having

means defining a diffusion chamber,

a burner means arranged to direct its products of combustion through said diffusion chamber into the furnace heating chamber,

and means for directing the flow of diffusion gas into said diffusion chamber to admix with said burner products of combustion so that the gas stream entering the furnace heating chamber has a greater mass velocity than the burner products of combustion,

means for supplying diffusion gas to said diffusion gas directing means of each of said burner assemblies,

said diffusion gas supply means being connected to the heating chamber of said furnace at a location to withdraw hot products of combustion gases from said furnace heating chamber and being connected to each of said burner assemblies for delivering said hot products of combustion gases thereto, said burner means of each of said burner assemblies being adapted to burn a mixture of fuel gas and air,

means for supplying fuel gas through a supply line to each of said burner assemblies,

and means for supplying combustion air through a supply line to each of said burner assemblies, each of said burner assemblies having means for balancing the flow of fuel gas and the flow of combustion air to said burner means thereof.

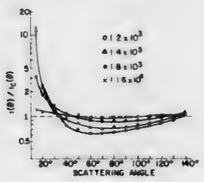
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4,174,952

IMMUNOASSAY BY LIGHT SCATTERING INTENSITY ANISOTROPY MEASUREMENTS

David S. Cannell, Santa Barbara, Calif.; Marzio Giglio, Milan, Italy; George B. Benedek, Belmont, Mass.; Gustav K. von Schulthess, and Richard J. Cohen, both of Brookline, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 23, 1978, Ser. No. 871,294
Int. Cl.² G01N *21/24, 33/16*
U.S. Cl. 23—230 B 5 Claims



1. The process for determining the concentration of a substance which promotes or inhibits an agglutination reaction including an agglutinant coated on carrier particles which comprises:

(a) preparing a plurality of samples by mixing a known concentration of an agglutinant coated on a carrier with either known varying concentrations of the agglutinant or with a mixture of a fixed concentration of the agglutinant with varying concentrations of an agglutination inhibitor, said carrier having a particle size between about 0.07 and 2 microns and a poly-dispersity in diameter of less than about 20%, exposing an agglutinated reaction product of said agglutinant and an agglutinator to a beam of essentially monochromatic light, measuring the intensity of scattered light due to each of said reaction products at two different angles, said angles being the same for each reaction product and determining the quantitative relationship between the ratio of the intensity of scattered light by said agglutinated reaction products at said two angles thereby to establish a standard agglutination curve that relates agglutinator concentration or agglutinant concentration with the ratio of the intensity of scattered light at said two angles,

(b) mixing either a fixed concentration of the agglutinant coated on the carrier or a mixture of a fixed concentration of the agglutinant coated on the carrier and a fixed concentration of the agglutinant in solution with one or more dilutions of the substance being tested, said substance acting either as an agglutinant or as an inhibitor to form at least one agglutinated reaction product of the dilutions,

(c) determining the ratio of the intensity of the scattered light at said two angles by the agglutinated reaction product of the dilutions of the substance being tested,

(d) comparing the ratio of the scattered light intensity of the agglutinated reaction product obtained in step (c) with the quantitative relationship determined by step (a) thereby to determine the concentration of the substance being tested from said standard agglutination curve.

4,174,953

PROCESS FOR REMOVING SULFUR FROM COAL

Jui-Yuan Sun; Jin S. Yoo, both of South Holland; Emmett H. Burk, Jr., Glenwood, all of Ill., and George P. Masologites, Columbus, N.C., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Jan. 3, 1978, Ser. No. 866,589
Int. Cl.² C10L *9/10;* C10B *57/00*
U.S. Cl. 44—1 R 19 Claims

1. A process for reducing the sulfur content of coal comprising the steps of:

(1) contacting coal particles with

(i) a silicate selected from the group consisting of alkali metal silicates, alkaline earth metal silicates and mixtures thereof, and

(ii) a promoter material capable of oxidizing or reducing equilibrium sulfur reaction products formed by the contacting to non-equilibrium reaction products

in an aqueous medium to reduce the sulfur content of coal; and

(2) recovering coal particles of reduced sulfur content.

16. The process of claim 1 wherein the promoter material is selected from the group consisting of air, oxygen, hydrogen peroxide, and alkali metal sulfite.

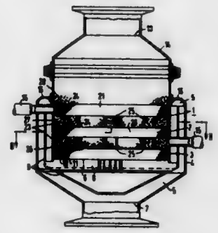
18. The process of claim 1 wherein the promoter material is selected from the group consisting of H_2, CO, $K_2S_2O_4$, NaS_2O_4 and alkali metal polythionites.

4,174,954

METHOD FOR CONVERTING A REACTION MIXTURE CONSISTING OF HYDROCARBON-CONTAINING FUEL AND AN OXYGEN-CONTAINING GAS INTO A FUEL GAS

Walter Kusebauch, Erlangen; Hana Kostka, Nürnberg-Grossgründlach; Hans-Joachim Henkel, Erlangen; Christian Koch, Erlangen; Eugen S. de Bucs, Erlangen, and Theo Weber, Adlitz b. Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 747,935, Dec. 6, 1976, abandoned. This application Feb. 17, 1978, Ser. No. 878,767
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1975, 2558922
Int. Cl.² C10G *11/28;* C01B *2/16*
U.S. Cl. 48—212 18 Claims

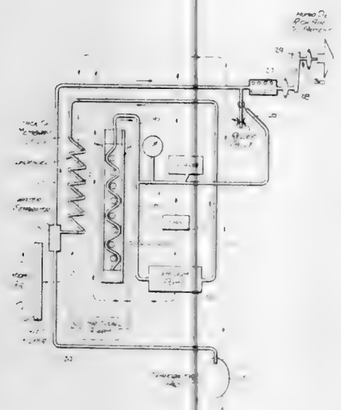


1. A method of converting a reaction mixture consisting of atomized, vaporized or evaporated liquid, hydrocarbon fuel and a gas containing oxygen into a fuel gas at an elevated temperature in a gas generator including a reaction chamber comprising

(a) imbedding a plurality of plates comprising porous ceramic sintered slabs containing a multiplicity of passage openings and having a surface which is catalytically active with respect to hydrocarbon fuels in a bed of packing material made up of a plurality of packing material grains such that said plates are diposed spaced one behind the other perpendicular to the flow direction of the reactants through the reaction chamber, said plates having a higher thermal conductivity than the packing material bed; and

(b) passing the reaction mixture through said reaction chamber to convert it into a fuel gas.

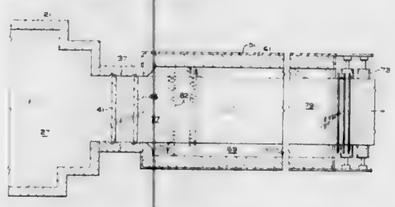
4,174,955
MEMBRANE OXYGEN ENRICHER APPARATUS
Richard H. Blackmer, Scotia, and Jonathan W. Hedman, Burnt Hills, both of N.Y., assignors to Oxygen Enrichment Co., Ltd., Schenectady, N.Y.
Filed Feb. 27, 1978, Ser. No. 881,425
Int. Cl.² B01D 13/00
U.S. Cl. 55—158 12 Claims



1. In an apparatus for providing air enriched with oxygen, said apparatus having an array of selectively permeable membrane cells, said cells being adapted to permit oxygen to permeate to an interior cavity thereof at a greater rate than nitrogen to form a flow of oxygen-enriched air in said interior cavity; means for developing a flow of atmospheric air across said array; conduit means through which air enriched with oxygen is drawn off from said interior cavity of said cells; a partial vacuum maintaining means interconnected with said conduit means to draw the oxygen-enriched air through said conduit means; the improvement comprising:
- a membrane stack box enclosing said array and having an inlet port for flow of atmospheric air and an outlet port in a non-planar orthogonal displaced relationship to said inlet port for a flow of nitrogen enriched air whereby virtually the entire flow of air is directed through said membrane stack box in a manner to achieve noise suppression;
- a cabinet core comprising a housing structure for said partial vacuum maintaining means, said housing structure having an inlet slot communicating with said outlet port of said membrane stack box to receive the flow of nitrogen-enriched air and an outlet slot in non-planar orthogonal displaced relationship to said inlet slot to exhaust the flow of nitrogen enriched air; and
- a cabinet forming together with said membrane stack box and said cabinet core an atmospheric air inlet duct in communication with said membrane stack box inlet port and an air exhaust duct in communication with said housing structure outlet slot.

4,174,956
METHOD AND APPARATUS FOR MOLTEN METAL FLOW DIFFUSION IN A FLOAT GLASS TANK
Robert Gagne, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Jul. 26, 1978, Ser. No. 928,047
Int. Cl.² C03B 18/02
U.S. Cl. 65—99 A 19 Claims

1. A method of reducing optical distortion, caused by molten metal of nonuniform temperature closely adjacent to a glass ribbon as it passes through a float chamber comprising positioning a barrier in the molten metal across the zone of molten metal movement, said barrier having grooves on its upper surface, closely adjacent and angularly transverse the direction of movement of closely adjacent molten metal in the molten metal bath, said grooves being of sufficient depth such that the molten metal movement closely adjacent said glass is angularly diverted from said direction of movement by said grooves as said glass passes over said barrier.



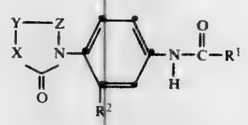
7. A float glass forming chamber barrier comprising an elongated member adapted to be fastened transverse of a float glass bath and having a grooved upper surface wherein the grooves of said upper surface are cross-cut and of a depth sufficient to angularly divert movement of molten metal closely adjacent to float glass passing over said barrier when said barrier is transverse of a float forming chamber.

4,174,957
SYNTHETIC GROWING MEDIUM AND METHOD OF PREPARING IT
Jack Webb, Madison, Ohio, and Stanley L. Schwartz, Sands Point, N.Y., assignors to Hydrosoil Corporation, New York, N.Y.
Filed Mar. 6, 1978, Ser. No. 883,613
Int. Cl.² C05C 9/02; C05G 3/04
U.S. Cl. 71—24 8 Claims

1. A synthetic growing medium for plants comprising water-insoluble urea formaldehyde foam granules, powdered peat-like humus, and a wetting agent, the wetting agent being carried by the powdered humus particles, the powdered humus completely coating each foam granule, and the foam granules being unbonded to each other so that the entire mass of coated foam granules is loose and free flowing and can be intimately mixed with or used in placed of natural soil.

4,174,958
ANILIDE DERIVATIVE HERBICIDES
Kurt H. G. Pilgram, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.
Continuation-in-part of Ser. No. 867,748, Jan. 9, 1978, abandoned. This application Sep. 15, 1978, Ser. No. 942,522
Int. Cl.² A01N 9/22; C07D 271/10
U.S. Cl. 71—88 11 Claims

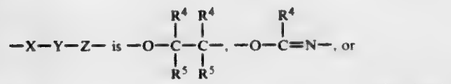
1. A compound of the formula



wherein R^1 is a hydrogen atom, an alkyl group containing 1 to 4 carbon atoms or an alkenyl group containing 2 to 3 carbon atoms or a cyclopropyl group of the formula



wherein R^7 is a hydrogen atom or methyl; R^2 is CF_3 bromo, chloro or methyl;

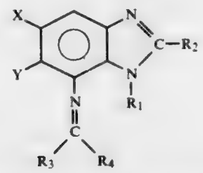


in which R^3 is independently a hydrogen atom or an alkyl group containing from 1 to 6 carbon atoms; each R^4 is independently a hydrogen atom, an alkyl group containing from 1 to 6 carbon atoms or a cycloalkyl group containing from 3 to 5 ring carbon atoms and a total of 3 to 6 carbon atoms, and each R^5 is independently a hydrogen atom or an alkyl group containing from 1 to 2 carbon atoms.

8. An herbicidal composition comprising an herbicidally effective amount of a compound according to claim 1 and at least one surface-active agent or carrier therefore.

4,174,959
BENZIMIDAZOLE COMPOUNDS
Philip L. Strong, Anaheim, Calif., and Wayne S. Belles, Moscow, Id., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.
Filed Apr. 24, 1978, Ser. No. 899,129
Int. Cl.² A01N 9/22; C07D 235/14
U.S. Cl. 71—92 18 Claims

1. A compound of the formula

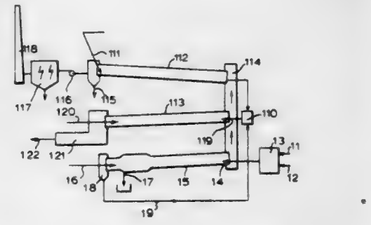


wherein R_1 and R_2 are each selected from the group consisting of hydrogen, lower alkyl, halo-lower alkyl, lower cycloalkyl, lower alkoxy-lower alkyl, hydroxy-lower alkyl and dilower alkylamino, R_3 is selected from hydrogen, lower alkyl and monocyclic aryl, R_4 is selected from lower alkyl, lower alkenyl and monocyclic aryl, or R_3–R_4 taken together represent alkylene of about 3 to 7 carbon atoms, X is selected from halo, lower alkyl, halo-lower alkyl, lower alkylsulfonyl, and halo-lower alkylsulfonyl, and Y is hydrogen, halo or lower alkoxy, in which not more than one of said R_1 and R_2 represents hydrogen and wherein said monocyclic aryl is selected from phenyl, nitrophenyl, halophenyl, lower alkylphenyl and lower alkoxyphenyl groups.

4,174,960
PESTICIDAL FORMULATION
Barry A. Hendriksen, Bracknell, England, assignor to Lilly Industries Limited, Henrietta Place, United Kingdom
Filed Feb. 2, 1978, Ser. No. 874,599
Int. Cl.² A01N 17/00
U.S. Cl. 71—121 18 Claims

1. A herbicidal formulation in concentrate form being an aqueous emulsion comprising
- 10% to 75% by weight of a herbicide being one or more herbicidal 2,6-dinitroaniline derivative having a solubility in water at 25° C. less than 100 parts per million by weight and a melting point in the range of from −10° C. to 150° C.,
- 0% to 60% by weight of a substantially water-immiscible solvent, the herbicide and the solvent forming a homogeneous disperse phase,
- 0.5% to 10% by weight of an emulsifying agent, and
- 15% to 70% by weight of an aqueous solution of an inorganic salt, the concentration of the inorganic salt in the aqueous solution and the pH of said aqueous solution being not greater than 9 being at least 5% by weight.

4,174,961
METHOD FOR WORKING-UP WASTE SLAG FROM THE OXYGEN STEEL PRODUCTION
Andreas G. J. Wolfs, Lanaken, Belgium, and Lambertus H. Goessens, Maastricht, Netherlands, assignors to Eerste Nederlandse Cement Industrie (ENCI) N.V., Maastricht, Netherlands and C.B.R. Cementbedrijven N.V., Brussels, Belgium, a part interest to each
Filed Nov. 1, 1977, Ser. No. 847,509
Int. Cl.² C21B 3/04
U.S. Cl. 75—30 7 Claims



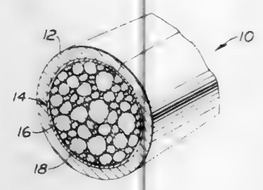
1. A method of treating waste slag from oxygen steel production (L.D.-slag), involving reduction of iron and maganese oxide being present in the slag to their metals after addition of an Al_2O_3-containing additive and heating the total composition, the iron and the manganese being subsequently separated therefrom, which comprises the steps of:
- (1) mixing said L.D.-slag and said Al_2O_3-containing additive being present in the form of a silicate selected from the group consisting of at least one of the waste products of coal mine products including stone-sludge, fly ash, schists, clays, clay-containing waste materials and blast furance slag;
- (2) mixing said L.D.-slag in a ratio of 55–97½ parts to 45–2½ parts of said Al_2O_3-containing additive:
- (3) mixing said L.D.-slag with carbon, or with carbon combined with carbon-containing coal mine waste materials;
- (4) heating the composition so obtained to a temperature of between about 1250° C. to 1500° C., and allowing reduction of said iron and manganese oxides during heating; and
- (5) recovering iron and maganese in molten state from the slag.

4,174,962

FILLED TUBULAR ARTICLE FOR CONTROLLED INSERTION INTO MOLTEN METAL

John G. Frantzreb, Sr., and C. David Weiss, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 27, 1978, Ser. No. 900,634
Int. Cl.[2] C22B 9/10
U.S. Cl. 75—53 **26 Claims**



1. A filled tubular article (10) for controlled insertion into a molten metal having a preselected temperature for altering same, comprising:

an elongated metal conduit (12) having an internal surface (20) and a melting temperature above said preselected temperature; and

a core (14) having treating agent means (16) of a first material for controllably treating the molten metal and liquifying agent means (18) of a second material different than said first material for liquifying at said preselected temperature and accelerating the dissolving of said internal surface (20) of said conduit (12), said treating agent means (16) and said liquifying agent means (18) being discrete members in intimate contact within said conduit (12) and arranged in preselected proportions by weight.

4,174,963

RECOVERY OF TITANIUM METAL VALUES

William K. Tolley, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 31, 1978, Ser. No. 929,605
Int. Cl.[2] C21B 15/00; C01G 23/04
U.S. Cl. 75—101 R **5 Claims**

1. In a process for the recovery of titanium metal values from a titanium and iron bearing source which comprises the steps of:

(a) crushing said source;

(b) subjecting said crushed source to an oxidation treatment with an oxidizing agent at an elevated temperature;

(c) subjecting said crushed source to a reductive roast in the presence of a reductant at an elevated temperature;

(d) leaching the resultant reduced source with a leach solution comprising hydrogen chloride;

(e) separating insoluble gangue from the soluble metal chlorides;

(f) precipitating titanium dioxide from the soluble metal chlorides by treatment with iron oxides; and

(g) separating and recovering said titanium dioxide, the improvement which comprises using as said reductant in said reductive roast step (c) a mixture of about 50% carbon monoxide and 50% hydrogen in an amount of from about two to three times the amount which is stoichiometrically required to reduce the iron oxide present in said source to metallic iron and the following recovery of titanium dioxide in step (g) reducing the temperature of the solution remaining to crystallize ferrous chloride, recovering the solid ferrous chloride, reducing a major portion of said ferrous chloride to form metallic iron and hydrogen chloride, recovering the iron and recycling the hydrogen chloride to leach step (d) as a portion of the leach solution, oxidizing the other portion of said ferrous chloride to form iron oxides and recycling said oxides to step (f).

4,174,964

NICKEL-BASE ALLOYS OF IMPROVED HIGH TEMPERATURE TENSILE DUCTILITY

Stuart W. K. Shaw, Sutton Coldfield, and Paul I. Fontaine, Solihull, both of England, assignors to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 191,544, Oct. 21, 1971, abandoned, which is a continuation-in-part of Ser. No. 84,528, Oct. 27, 1970, abandoned. This application Jan. 25, 1974, Ser. No. 436,539

Claims priority, application United Kingdom, Oct. 28, 1969, 52821/69

Int. Cl.[2] C22C 19/03
U.S. Cl. 75—122 **4 Claims**

1. As a new article of manufacture, a cast metal component having improved tensile ductility within the temperature range of about 700° C. to about 800° C., particularly about 760° C., said component being formed of an alloy consisting essentially of up to 10.5% chromium, from 4% to 12% in total of titanium plus aluminum, up to 20% cobalt, up to 25% tungsten, up to 10% molybdenum, up to 12% tantalum, up to 6% niobium, up to 5% iron, up to 3% vanadium, up to 1.5% zirconium, up to 0.5% carbon, up to 0.5% manganese, up to 0.3% silicon, up to 0.3% boron, and from 0.005% to 0.15% yttrium, the balance being essentially nickel.

4,174,965

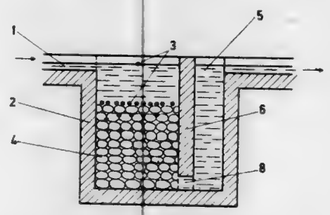
PROCESS FOR THE PRODUCTION OF METAL ALLOYS

Kurt Buxmann, Sierre, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed May 1, 1978, Ser. No. 901,708

Claims priority, application Switzerland, Jun. 2, 1977, 6766/77

Int. Cl. C22c 1/02
U.S. Cl. 75—135 **19 Claims**



1. A process for the production of metal alloys which comprises providing a chamber exposed to atmospheric pressure having an inlet and an outlet for the through-flow of molten metal therethrough, said chamber containing therein a bed of heat resistant, exchangeable, inert granular particles filling at least a portion of said chamber to provide a tortuous path through said chamber, passing molten metal through said chamber whereby said molten metal passes through said tortuous path, adding proportioned amounts of alloying additions to the inflowing molten metal, whereby the alloying additions are dissolved in the melt, provided that the components to be mixed are repeatedly divided and united again by the granular particles of the bed which serves as deflection and mixing elements as the melt flows through the bed before leaving the said chamber, wherein the degree of mixing can be changed by altering the size of the particle employed for the granular bed, whereby the melt leaves said chamber intimately mixed.

4,174,966

HIGH COERCIVE FORCE RARE EARTH METAL-COBALT MAGNETS CONTAINING COPPER AND MAGNESIUM

John W. Walkiewicz, Reno, Nev., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Dec. 15, 1978, Ser. No. 969,767
Int. Cl.[2] C22C 19/00
U.S. Cl. 75—170 **8 Claims**

1. A magnetic alloy composition, which comprises: an alloy of the formula:

34 to 37 wt.% RE 55.6 to 63.9 wt.% Co 2 to 7 wt.% Cu 0.05 to 0.40 wt.% Mg

wherein RE is mischmetal or a rare earth metal excluding samarium.

4,174,967

TITANIUM CARBIDE TOOL STEEL COMPOSITION FOR HOT-WORK APPLICATION

M. Kumar Mal, Spring Valley, and Stuart E. Tarkan, Monsey, both of N.Y., assignors to Chromalloy American Corporation, West Nyack, N.Y.

Filed Jan. 27, 1978, Ser. No. 872,910
Int. Cl.[2] B22F 5/00; C22C 33/02, 38/14, 29/00
U.S. Cl. 75—237 **2 Claims**

1. A sintered titanium carbide tool steel composition suitable as die material for hot working applications characterized by an improved combination of resistance to thermal shock, impact and wear and by resistance to softening at elevated temperatures, said sintered composition comprising by weight about 20% to 30% primary grains of titanium carbide dispersed through a steel matrix making up the balance, the composition of said matrix consisting essentially by weight of about 4% to 6% chromium, about 3% to 5% molybdenum, about 3% to 7% nickel, about 0.3% to 0.5% carbon and the balance essentially iron, said matrix surrounding the primary grains of titanium carbide being characterized by a microstructure of an austenitic decomposition product.

2. As an article of manufacture, a hardened wear resistant die element suitable for hot working applications, said element being made of a sintered titanium carbide tool steel composition characterized by an improved combination of resistance to thermal shock, impact and wear and by resistance to softening at elevated temperature, said sintered composition comprising by weight about 20% to 30% primary grains of titanium carbide dispersed through a steel matrix making up the balance, the composition of said matrix consisting essentially by weight of about 4% to 6% chromium, about 3% to 5% molybdenum, about 3% to 7% nickel, about 0.3% to 0.5% carbon and the balance essentially iron, said steel matrix being characterized by a microstructure comprising martensite.

4,174,968

PHOTOGRAPHIC REVERSAL PROCESS WITHOUT SECOND EXPOSURE

Karl Frank, Leverkusen, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 29, 1977, Ser. No. 865,527

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1977, 2700290

Int. Cl.[2] G03C 7/00, 5/50
U.S. Cl. 430—375 **9 Claims**

1. In a photographic reversal process for the production of positive photographic images comprising the steps of first imagewise exposure of a light sensitive material comprising at least one silver halide emulsion layer

and then black and white development of said exposed material in a first development,

subsequent to said black and white development treatment of the exposed and developed material

in a preliminary bath with an agent selected from the group consisting of metal ions of metals of the transition elements, hydrazine salts or salts of hydrazine derivatives, hydroxylamine salts or salts of hydroxylamine derivatives, iminoaminomethane sulphinic acid compounds and thiourea dioxide,

and then further treating the material in an alkaline bath,

and subsequently color development of the exposed and developed and treated material by reaction of the color couplers with oxidized color developer, so as to provide the exposed and developed and treated material with chemical fogging after black and white development and before color development.

4,174,969

LIGHT SENSITIVE PHOTOGRAPHIC MATERIAL

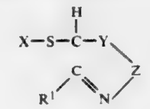
Heinrich Odenwälder, Cologne, and Erwin Ranz, Leverkusen, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Apr. 15, 1977, Ser. No. 787,970

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1976, 2617310

Int. Cl.[2] G03C 7/00, 1/40
U.S. Cl. 430—445 **5 Claims**

1. The color photographic development process for the production of multicolored images by exposing a color photographic multilayered material comprising at least one light-sensitive silver halide emulsion layer and in association with it a non-diffusing color coupler and developing the exposed material with a color developer compound in the presence of a thioether DIR compound which when it reacts with the oxidation product of the color developer compound releases a diffusible substance capable of inhibiting the development of silver halide, wherein the improvement comprises the color development is carried out in the presence of a thioether DIR compound of the following formula I



in which

X represents a 5-membered or 6-membered heteroaromatic group having at least one nitrogen atom;

Y represents —O—,



or —S—;

Z represents a —C—C— or —C—N— bond required for completing a 6-membered heterocyclic ring, which may have fused to it a triazole, triazine or benzene ring

R^1 represents an aliphatic, araliphatic or aromatic hydrocarbon group, or acyl and

R^2 represents hydrogen, an aliphatic, araliphatic or aromatic hydrocarbon group, or acyl.

4,174,970

REFRACTORY COMPOSITION

Günter Gelsdorf, Nordenstadt, and Friedhelm Wirth, Siershahn, both of Fed. Rep. of Germany, assignors to Didier-Werke A.G., Fed. Rep. of Germany

Filed May 1, 1978, Ser. No. 901,837

Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722903

Int. Cl.[2] C04B 35/56
U.S. Cl. 106—44 **11 Claims**

1. In a refractory composition for blast furnace pouring

ducts which comprises: silicon carbide in an amount of 5 to 30% by weight, a predominantly carbon-containing material, refractory components, a binder and water, with or without a plasticizer, the improvement wherein said composition additionally comprises 0.1 to 3% by weight of fine Cr_2O_3 based on the total weight of the dry components.

4,174,971

SILICON CARBIDE BODY CONTAINING A MOLYBDENUM DISILICIDE ALLOY

Nils G. Schrewelius, Hallstahammar, Sweden, assignor to Bulten-Kanthal Aktiebolag, Sweden

Continuation of Ser. No. 749,777, Dec. 13, 1976, abandoned. This application Jun. 22, 1978, Ser. No. 918,045

Claims priority, application Sweden, Dec. 11, 1975, 7513997

Int. Cl.[2] C04B *35/56, 35/58*

U.S. Cl. 106—44 **3 Claims**

1. A silicon carbide body comprising a skeleton consisting of silicon carbide particles, said skeleton having additional amounts of silicon carbide formed in situ and bonded therein, and resulting from the reaction of a pyrolyzed carbonaceous source and silicon in stoichiometric amounts, thereby providing a body with intercommunicating cavities in which the silicon carbide occupies at least 70% by volume of the body, said cavities being filled entirely by a molybdenum-silicon alloy.

4,174,972

NONFIBROUS CASTABLE REFRACTORY CONCRETE HAVING HIGH DEFLECTION TEMPERATURE AND HIGH COMPRESSIVE STRENGTH AND PROCESS

Michel L. Drouzy, 49 Blvd. Saint-Germain, 75005, Paris; Michel M. Richard, 4 rue Faraday, 75017, Paris; François P. Huet, 10 rue de Marignan, 75008, Paris, and Henri M. Lacau, 29 rue de l'Universite, 75007, Paris, all of France

Continuation-in-part of Ser. No. 689,374, May 24, 1976, abandoned. This application Apr. 20, 1978, Ser. No. 898,194

Claims priority, application France, May 29, 1975, 75 16810

Int. Cl.[2] C04B *35/02*

U.S. Cl. 106—64 **1 Claim**

1. A nonfibrous castable refractory concrete nonwettable by molten aluminum, having a deflection temperature under load above 1000° C. and a compressive strength higher than 1450 Newton/cm^2 comprising grains bound by a hydraulic binder and having a content by weight of aluminum expressed as Al_2O_3 of from 40 to 60%, a content by weight of calcium expressed as CaO of from 4 to 14%, a content by weight of silicon expressed as SiO_2 of from 20 to 60%, a content by weight of sodium, expressed as Na_2O less than 2%, and a fluorine-containing material, consisting of F_2Ca in an amount between 1 and 2% by weight or consisting of a mixture 0.8–1.2% by weight of alkali or alkaline-earth metal fluosilicate and 0.2–0.8% by weight of F_2Ca, said fluorine-containing material being distributed uniformly throughout the mass of said concrete in a solid form.

4,174,973

TRANSPARENT YTTRIA CERAMICS CONTAINING MAGNESIA OR MAGNESIUM ALUMINATE

William H. Rhodes, Lexington, and F. Joseph Reid, Acton, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 29, 1979, Ser. No. 7,097

Int. Cl.[2] C04B *35/50*

U.S. Cl. 106—73.2 **5 Claims**

1. A substantially transparent, high density polycrystalline yttria-based body consisting essentially of yttria and about 0.1% to 5% by weight of a material selected from the group consisting of MgO and $MgAl_2O_4$.

4,174,974

PROCESS FOR CONVERTING COAL ASH SLAG INTO PORTLAND CEMENT

F. Frederick Fondriest, Lake Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 18, 1978, Ser. No. 896,354

Int. Cl.[2] C04B *7/14, 7/02*

U.S. Cl. 106—103 **8 Claims**

1. A manufacturing process for converting coal ash slag from a slagging coal gasifier into a marketable cement product having the characteristics and qualities of portland cement, which process comprises the steps of: transferring molten bituminous, semi-bituminous or lignitic noncoking coal slag having a temperature range between approximately 2800° F. and 3600° F. from a slagging coal gasifier to a melt chamber, reacting a preheated mineral containing lime with said slag in the ratio of 1 part slag to 1.2 to 4 parts of said mineral containing lime to form a homogeneous cement product having a temperature range between approximately 2200° F. and 2800° F., transferring said cement product to a quench chamber where said product cools and solidifies in the form of clinkers, and reducing said clinkers to powder form.

4,174,975

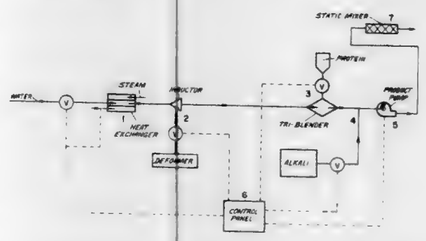
METHOD FOR THE MANUFACTURE OF WATER SOLUBLE ADHESIVES

Thomas W. Daly, Imperial; Ralph A. Hoer, Ballwin; James E. Walsh, and Henry T. James, both of St. Louis, all of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed Sep. 1, 1977, Ser. No. 829,686

Int. Cl.[2] C08L *89/00*

U.S. Cl. 106—161 **4 Claims**



1. An improved method for manufacturing water soluble adhesives, comprising the steps of:

a. heating a continuous flow of water at a rate of from about 90 to 110 BTU/#;

b. subjecting said flow to a venturi flow pattern;

c. injecting through the venturi into the heated flowing water an antifoaming agent at a rate of from 0.01% to 5% of the rate of adhesive solids addition;

d. then subjecting the flowing water to vortex flow mixing conditions.

e. admixing adhesive solids at the point of the vortex flow mixing at a rate of from about 0.25 to 0.33 lbs adhesive solids/# H_2O;

f. then injecting from about 0.026 to 0.044 lbs of an aqueous alkali solution/# H_2O, said alkali solution serving to adjust the pH of the solution to greater than 8.5;

g. and finally subjecting the flow to a static mixing action.

4,174,976

ACID HYDROLYSIS OF CELLULOSE TO YIELD GLUCOSE

George T. Tsao; Michael R. Ladisch, and Arindam Bose, all of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Mar. 8, 1978, Ser. No. 884,478

Int. Cl.[2] C13K *1/02*

U.S. Cl. 127—37 **8 Claims**

1. A process for hydrolyzing the cellulose in a cellulosic material to obtain glucose therefrom comprising:

contacting the cellulosic material either with a solvent comprising ethylenediamine, cadmium hydroxide and water or with a solvent comprising a chelating metal caustic swelling agent whereby the solvent dissolves the cellulose to form a solution,

precipitating the cellulose from the solution; and hydrolyzing the precipitated cellulose with acid to obtain glucose.

4,174,977

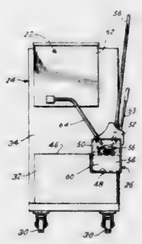
APPARATUS AND METHOD FOR MOPPING FLOORS

Robert L. Shallenberg, Wheaton; Austen B. Hufton, West Chicago; Roland A. Blomgren, Glen Ellyn, and William M. Copeland, Hoffman Estates, all of Ill., assignors to ServiceMaster Industries, Inc., Downers Grove, Ill.

Filed Mar. 13, 1978, Ser. No. 885,859

Int. Cl.[2] A47L *13/22;* **B08B** *7/04*

U.S. Cl. 134—6 **11 Claims**



1. An improved apparatus for rinsing and sanitizing a mop by dispensing a pre-selected volume of "fresh" cleaning solution onto the mop and adapted to be utilized with a conventional mop bucket having a capacity of multiple pre-selected volumes of cleaning solution and having a conventional mop wringer mounted on the upper, open end of the bucket so as to maintain a mop therein out of contact with any cleaning solution in the bucket as a result of normal usage of the apparatus, bucket and mop, said apparatus comprising, in combination:

a reservoir tank defining a reservoir to hold multiple pre-selected volumes of "fresh" cleaning solution;

a metering tank defining a metering chamber to hold a single pre-selected volume of "fresh" cleaning solution;

a dispensing spout for dispensing "fresh" cleaning solution onto the mop when the mop is disposed in the mop wringer; and

valve means for selectively connecting the reservoir in the reservoir tank with the metering chamber in the metering tank so that the metering chamber is filled with "fresh" cleaning solution from the reservoir and for selectively connecting the metering chamber in the metering tank with the dispensing spout so that the pre-selective volume of "fresh" cleaning solution in the metering chamber empties through the dispensing spout onto the mop in the mop wringer.

9. An improved method for rinsing and sanitizing a mop with a pre-selected volume of "fresh" cleaning solution, the mop being used to clean surfaces in cooperation with a conventional mop bucket having a capacity of multiple pre-selected volumes of cleaning solution and having a conventional mop wringer mounted on the upper, open end of the bucket so as to maintain a mop therein out of contact with any cleaning solution in the bucket as a result of normal usage, said method comprising the steps of:

(1) placing the mop in the mop wringer;

(2) wringing any "dirty" cleaning solution from the mop into the mop bucket by actuation of the mop wringer;

(3) dispensing a pre-selected volume of "fresh" cleaning solution onto the mop; and

(4) wringing a portion of said "fresh" cleaning solution into the mop bucket by again actuating the mop wringer so that the mop is partially dry for use in cleaning a surface.

4,174,978

SEMICONDUCTOR PHOTOVOLTAIC GENERATOR AND METHOD OF FABRICATING THEREOF

Nikolai S. Lidorenko, 3 Mytischinskaya ulitsa, 14a, kv. 127; Vladimir M. Evdokimov, Anadyrsky prospekt, 67, kv. 77; Vitaly V. Zadde, poselok Severny, 9 linia, 3, kv. 120; Alexandr I. Kozlov, ulitsa Mikhailova, 5, kv. 66; Stanislav V. Ryabikov, pereulok Vasnetsova, 12, kv. 64; Valery N. Potapov, ulitsa Timiryazevskaya, 13, kv. 213; Dmitry S. Strebkov, ulitsa Luganskaya, 21; Tatiana I. Surianinova, Dmitrovskoe shosse, 25, kv. 113; Boris A. Chubrikov, ulitsa Fedora Poletaeva, 25, kv. 160, all of Moscow; Valentina V. Zatravina, Mytischinsky raion, derevnya Belyaninova, 6, Moskovskaya oblast; Boris V. Korolev, Shenkursky proezd, 8, kv. 208, Moscow; Viktor F. Kulikov, ulitsa Komarova, 11-b, kv. 56, Moscow; Larisa L. Zhuravleva, ulitsa Bochkova, 8, kv. 64, Moscow; Vadim A. Unishkov, ulitsa Bazhova, 15, korpus 1, kv. 162, Moscow; Anatoly A. Dormidontov, ulitsa Marii Ulianovoi, 11, kv. 93, Moscow; Viktor I. Moiseev, 3 Mytischinskaya ulitsa, 14-a, kv. 74, Moscow, and Ljubov P. Kudeshova, Studeny proezd, 38, korpus 2, kv. 391, Moscow, all of U.S.S.R.

Filed May 11, 1978, Ser. No. 904,860

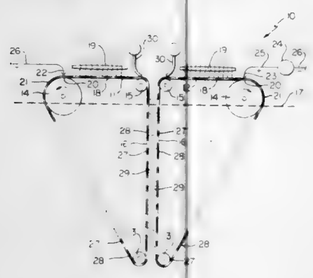
Int. Cl.[2] H01L *31/06*

U.S. Cl. 136—89 PC **8 Claims**



1. A semiconductor photovoltaic generator comprising: a plurality of semiconductor photovoltaic converters, a p-n junction in each of said photovoltaic converters located between a base region and an inverse region of each said photovoltaic converter; a plurality of current-collecting contact pairs, the number of which is equal to the number of said photovoltaic converters, said contacts being located individually on opposite sides of said photovoltaic converters and interconnecting said photovoltaic converters in series to form a monolithic structure; a photoactive face of said generator made as a staircase-type structure and having a plurality of steps, each step having a width that is about equal to, but does not exceed, the diffusion distance of minority carriers in the base region, said steps each having an area which is inversely proportional to the power of incident radiation received by it, transverse parallel grooves being made in the surfaces of said steps, the distance between the crests of said adjacent grooves not exceeding the diffusion distance of minority carriers in said base region, said p-n junction following the contour of the surface of said steps.

4,174,979
METHOD OF STORING SOLAR ENERGY
James T. Candor, 5440 Cynthia Ln., Dayton, Ohio 45429
Filed Apr. 10, 1978, Ser. No. 894,827
Int. Cl.[2] H01L *35/00;* **B03C** *5/00*
U.S. Cl. 136—206 **10 Claims**

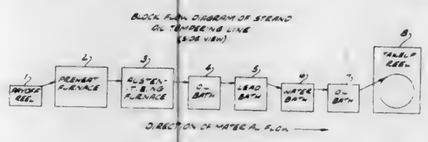


1. A method of storing solar energy in the immediate vicinity of available solar energy comprising the steps of providing a strip of electret producing material, and changing said strip of material into a strip of electret means directly with said available solar energy so that said available solar energy need not be transmitted other than by said electret means, said changing step comprising the step of forming at least one side of said strip of electret means with a repeating serial pattern of a narrow band of electret means transversely across said strip of material and then a wide band of electret means transversely across said strip of material that is spaced from said narrow band of electret means whereby said strip of electret means has each pair of adjacent narrow bands of electret means thereof separated by a wide band of electret means thereof disposed therebetween and spaced therefrom, said forming step comprising the step of causing said bands of said electret means to all have a negative charge or all have a positive charge at said one side of said strip of material.

4,174,980
MELAMINE-FORMALDEHYDE AND TANNIN TREATMENT OF METAL SURFACES
John K. Howell, Jr., North Branch, and Leonard Kulick, Ferndale, both of Mich., assignors to Oxy Metal Industries Corporation, Warren, Mich.
Continuation-in-part of Ser. No. 736,278, Oct. 27, 1976, abandoned, which is a continuation of Ser. No. 518,017, Oct. 25, 1974, abandoned. This application Jul. 24, 1978, Ser. No. 927,421
Int. Cl.[2] C23F *7/00*
U.S. Cl. 148—6.14 R **6 Claims**

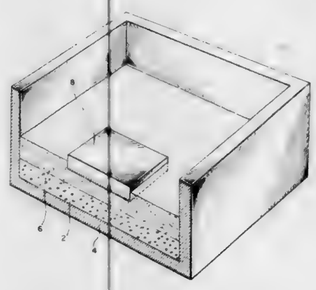
1. A process for treating a bare aluminum surface to impart improved corrosion resistance and adhesion of subsequently-applied paint comprising contacting the surface with a chromium-free aqueous composition exhibiting a pH value of from 8 to 11 and containing at least 0.01 g/l of a melamine-formaldehyde resin and at least 0.01 g/l of a vegetable tannin in a weight ratio of resin:tannin of 1:30 to 30:1 and thereafter drying the composition on the surface to yield a coating weight, of from 1 to 400 mg/ft^2.

4,174,981
METHOD OF MANUFACTURING SPRINGS, INCLUDING THE PRODUCTION OF ROD THEREFOR
Ralph M. Cassell, Florissant, Mo., assignor to Laclede Steel Company, St. Louis, Miss.
Filed Feb. 6, 1978, Ser. No. 875,151
Int. Cl.[2] C21D *1/80, 9/52, 9/56*
U.S. Cl. 148—12 B **6 Claims**



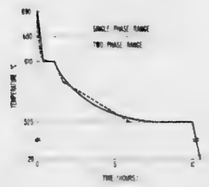
1. The method of producing rod particularly suitable for the manufacture of cold wound coiled springs comprising forming round steel rod by hot rolling with the gauge of the rod within a tolerance of ±0.010 inch and the rod not out of round more than 0.015 inch, oil tempering the rod as produced in the hot rolling operation, without drawing the rod, by passing it through an austenitizing step, an oil quenching step, and a tempering step, and coiling the resultant oil tempered rod.

4,174,982
CAPLESS ANNEALING COMPOUND SEMICONDUCTORS
Anthony A. Immorlica, Jr., Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Jun. 6, 1977, Ser. No. 803,501
Int. Cl.[2] C22F *1/02*
U.S. Cl. 148—13.1 **10 Claims**



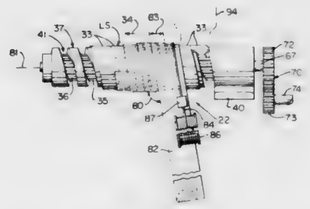
1. A method of annealing a compound semiconductor comprising:
placing an inert solid material in loose physical contact with a surface of the semiconductor to be protected;
placing said inert material and semiconductor in a controlled atmosphere;
heating said semiconductor to an annealing temperature;
maintaining said semiconductor at said annealing temperature to anneal said semiconductor;
cooling said semiconductor; and
removing said semiconductor from said controlled atmosphere and from said inert material.

4,174,983
FE-CR-CO MAGNETIC ALLOY PROCESSING
Gilbert Y. Chin, Berkeley Heights; Sungho Jin, Meyersville; John T. Plewes, Berkeley Heights, and Bud C. Wonsiewicz, Summit, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Jul. 13, 1978, Ser. No. 924,137
Int. Cl.[2] H01F *1/02*
U.S. Cl. 148—102 **18 Claims**



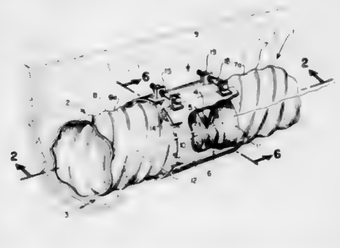
1. Method for producing a magnetic metallic body by an aging treatment of an alloy of which an aggregate amount of at least 95 weight percent consists of Fe, Cr, and Co, said aggregate amount having a Cr content in the range of 20–35 weight percent and a Co content in the range of 5–25 weight percent CHARACTERIZED IN THAT said aging treatment comprises the steps of (1) maintaining said alloy at a first temperature corresponding to an essentially single phase alpha state so as to produce in said alloy an essentially single phase alpha structure, (2) lowering the temperature of said alloy from said first temperature to a second temperature in the range of 585°–625° C. at a rate which over essentially the entire range of temperatures between said first temperature and said second temperature is in the range of 60°–650° C./h, and (3) lowering the temperature of said alloy from said second temperature to a third temperature in the range of 500°–550° C. at a rate which over essentially the entire range of temperatures between said second temperature and said third temperature is in the range of 2°–30° C./h. **20**

4,174,984
MACHINE FOR AND METHOD OF MAKING TUBULAR CONDUIT OF INDEFINITE LENGTH
Roger D. Meadows, Waynesville, N.C., assignor to Dayco Corporation, Dayton, Ohio
Filed Oct. 2, 1978, Ser. No. 948,067
Int. Cl.[2] B65H *81/00*
U.S. Cl. 156—143 **20 Claims**



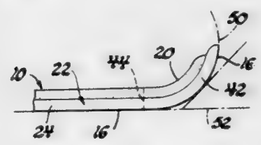
1. In a machine for making a substantially smooth inside surface tubular conduit of indefinite length comprising; an elongate mandrel supported at one end and unsupported at its opposite end; apparatus carried by said mandrel and being rotatably and axially movable therealong between said opposite ends, said apparatus being adapted to support material wound thereon to define a length of said tubular conduit and moving out of supporting relation once said length of tubular conduit moves axially beyond said opposite end; the improvement wherein said mandrel comprises a rotatable central part, a helical structure supported in a cantilevered manner at said one end and at a fixed position concentrically around said central part with said central part being rotatable therewithin, said helical structure defining a helical groove along said mandrel, and a plurality of members defining said apparatus, each of said members having a portion extending within said helical groove and being operatively connected to said central part and movable by said central part along said helical groove in the helical path defined thereby with rotation of said central part, said members being adapted to support said material thereon and moving out of said supporting relation by falling by gravity within said length of tubular conduit at said opposite end.

4,174,985
PROCESS FOR MANUFACTURING COUPLING GASKETS FOR HELICALLY CORRUGATED SPIRAL PIPE
Kirby J. Buidry, P.O. Box 14386, Baton Rouge, La. 70808
Division of Ser. No. 760,702, Jan. 19, 1977, Pat. No. 4,124,236. This application Aug. 22, 1978, Ser. No. 935,869
Int. Cl.[2] B29F *1/00, 3/00*
U.S. Cl. 156—244.18 **4 Claims**



1. A process for manufacturing flexible helically corrugated gaskets for use in a coupling for providing a substantially soil tight joint between abutting ends of helically corrugated pipe which comprises:
(a) forming a sheet constructed of flexible material and having parallel annular-type corrugations having a similar pitch and depth similar to the corrugation of said pipe,
(b) angularly cutting said sheet across said corrugations to form a strip, said angular cut being approximately identical to the complement of the helical angle of said pipe, and
(c) permanently attaching the opposite ends of said strip to one another.

4,174,986
METHOD OF FORMING A FLEXIBLE TAPERED END FOR AN EXTRUDED PLASTIC MOLDING STRIP
Robert E. Jennings, Bayville, N.J., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 13, 1978, Ser. No. 885,753
Int. Cl.[2] B32B *31/18*
U.S. Cl. 156—160 **3 Claims**



1. A method of forming a taper on an end portion of a molded plastic strip comprising the steps of

removing a V-shaped piece from said end portion of said strip to form generally triangular shaped legs, as viewed at the top, said legs being adjacent to the apex of the V,

bending said legs in an upward direction as said strip is viewed from the top such that their bottom surfaces are stretched and, while said legs are bent, drawing them together in line contact as viewed at said top and bottom surfaces to form said taper, said line extending from said apex to the tip of the newly formed taper, and bonding said legs together along a portion of said line at the tip of the taper remote from the apex, and thereafter

forming a series of spaced cuts in the tapered end of said strip through its bottom surface in a direction substantially perpendicular to the said contact line.

4,174,987

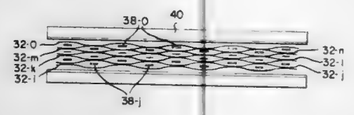
METHOD OF MAKING HEAT EXCHANGE STRUCTURE

David S. Belvin, Seattle; Clifford R. Perry, Renton, and Dale F. Watkins, Sumner, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 7, 1978, Ser. No. 894,251

Int. Cl.[2] B31D *3/02*; B32B *31/00*

U.S. Cl. 156—197 **8 Claims**



1. A method of forming a structure particularly adapted for use as a heat exchange structure providing a plurality of heat exchange passageways, said structure being a longitudinal axis, a lateral axis and a vertical axis, said structure comprising:

a. a plurality of thin film heat sealable plastic sheets aligned longitudinally and laterally with one another and spaced vertically from one another,

b. alternate pairs of said sheets being bonded one to another along a plurality of first longitudinally extending bond lines, positioned at predetermined laterally spaced first locations across said sheets,

c. intermediate pairs of said sheets being bonded one to another along a plurality of second longitudinally extending bond lines positioned at laterally spaced second locations across said sheets, said second bond lines being positioned transversely intermediate of said first locations, each of said intermediate pairs of sheets being made up of adjacent sheets of alternate pairs of said sheets,

said method comprising:

a. placing a plurality of thin film heat sealable plastic sheets, which are to form the heat exchange structure, adjacent one another in both longitudinal and transverse alignment, and in vertically stacked relationship,

b. placing a first set of bonding bars between alternate pairs of said sheets at first locations where the first longitudinally extending bond lines of said alternate sheets are to be located,

c. placing a second set of longitudinally extending bonding bars between intermediate pairs of said sheets being made up of adjacent sheets of adjacent alternate pair of sheets,

d. causing said bars to be in pressure contact with said sheets and heating said bars to a temperature sufficiently high to cause bonding of said sheets to one another at the locations of the first and second longitudinally extending bond lines, and

e. removing the bars from the sheets.

4,174,988

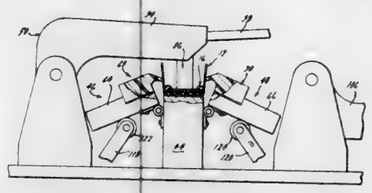
METHOD AND APPARATUS FOR MAKING PADDED STRAPS

Ronald D. Moore, Grosse Pointe, and Everett L. Bethel, Sterling Heights, both of Mich., assignors to Chivas Products Ltd., Warren, Mich.

Continuation of Ser. No. 653,669, Jan. 30, 1976, abandoned. This application Aug. 31, 1977, Ser. No. 829,227

Int. Cl.[2] B29C *17/04*

U.S. Cl. 156—213 **49 Claims**



1. A method for making a padded strap having a strap member, a cushion member, a cover having opposite edge portions, and a flexible shoulder member having shoulders at opposite edge portions comprising

positioning said cushion member on said cover, said strap member on said cushion member, and said shoulder member with respect to the other of said members so that said cushion member and said cover are disposed on one side of said strap member, said opposite edge portions of said cover extend laterally outwardly of said cushion member and said strap member, and said shoulders of said shoulder member are disposed so as to extend above the side of said strap member opposite said one side;

applying a force to the side of said strap member opposite said one side to compress said cushion member;

wrapping said cover about said cushion member, said strap member, and said shoulders while said cushion member is compressed so that said opposite edge portions are disposed on said opposite side of said strap member;

engaging said cover on said opposite side of said strap member at said shoulders in a manner to independently restrain each of said shoulders from movement in either direction laterally of said strap to substantially prevent positional change of said shoulders through flexing of said flexible shoulder member but leaving said opposite edge portions of said cover exposed while maintaining said cushion member at least partially compressed; and

joining said edge portions while said cushion member is at least partially compressed.

4,174,989

METHOD OF FABRICATING DOUBLE-CURVATURE SHELLS

Mikhail G. Skakunov, ulitsa Zelenaya, 6, kv. 60, Levoberezhnaya Moskovskoi oblasti; Konstantin K. Lipodat, 2nd Samotechny pereulok, 4, korpus 1, kv. 37; Leonid V. Karasev, 1st Radiatorskaya 3, kv. 62, both of Moscow, and Vilgelm V. Modzelevsky, ulitsa Molodogvardeiskaya, 225, kv. 106, Kuibyshev, all of U.S.S.R.

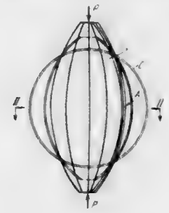
Filed Jun. 21, 1978, Ser. No. 917,517

Claims priority, application U.S.S.R., Sep. 27, 1977, 2522319[1]

Int. Cl.[2] B65C *3/26*

U.S. Cl. 156—156 **5 Claims**

1. A method of fabricating double-curvature shells from meridional petaloid sections wherein said meridional petaloid sections prefabricated from a flexible material are consecutively joined with one another in a number required for making said shell; said meridional petaloid sections are consecutively coiled into a spindle-shaped roll in the process of joining said sections so that said sections are pre-curved in the lateral and longitudinal directions, said spindle-shaped roll being adapted for storage and transportation; said roll is subsequently uncoiled and curved in the longitudinal and lateral directions by



applying an axial force to at least one of the ends of said spindle-shaped roll, thus forming a double-curvature shell; and the first and the last of said sections are thereafter joined with each other.

4,174,990

HEAT AND SOLVENT RESISTANT FLEXIBLE GASKET MEANS AND PROCESS FOR PRODUCTION THEREOF

Herbert Meister, Langnau, Switzerland, assignor to Herbert Meister and Co., Zurich, Switzerland

Division of Ser. No. 798,167, May 18, 1977, Pat. No. 4,119,323. This application May 15, 1978, Ser. No. 906,024

Claims priority, application Switzerland, May 18, 1976, 6222/76

Int. Cl.[2] B65H *69/02*

U.S. Cl. 156—158 **7 Claims**

1. A process of forming a substantially heat and solvent resistant gasket sealing means comprising the steps of

(a) compacting fibrous material around a metallic core;

(b) impregnating said core with a binding material whereby said fibrous material adheres substantially and inseparably to said metallic core to form a composite core;

(c) surrounding said composite core with a flexible substantially helical metallic winding;

(d) winding fibrous material in woven form around said metallic winding to provide a fibrous sheath therefor;

(e) impregnating the said fibrous sheath with a substantially heat and solvent resistant polymeric material in an amount sufficient to provide an envelope having a smooth surface.

4,174,991

PROCESS OF LAMINATING CARPET TO ELASTOMERIC BACKING

Harold Reuben, Akron, Ohio, assignor to The Akro Corporation, Canton, Ohio

Filed Nov. 13, 1978, Ser. No. 959,727

Int. Cl.[2] B29C *19/00*

U.S. Cl. 156—242 **16 Claims**

1. A method of laminating a curable elastomeric backing section having a first surface and a second surface to a heat deformable pile carpet section having a first surface, a second surface, and a carpet pile adjacent to the second surface of the carpet section, comprising:

contacting the second surface of the curable elastomeric backing section to the first surface of the pile carpet section,

placing the curable elastomeric backing section and pile carpet section under a compressive molding pressure of at least 50 psi applied to the first surface of the curable elastomeric backing section and the second surface of the pile carpet section,

crushing the carpet pile while the curable elastomeric backing section and pile carpet section are under the compressive molding pressure,



embedding a portion of the first surface of the pile carpet section in the second surface of the curable elastomeric backing section,

heating the curable elastomeric backing section to set the elastomeric backing simultaneously while the pile carpet section and the curable elastomeric backing section are under the compressive molding pressure,

cooling the pile carpet section to maintain the carpet pile below a temperature at which the carpet pile becomes substantially permanently deformed under the applied molding pressure so as to maintain the resiliency of the carpet pile upon release of the compressive molding pressure, the cooling being conducted simultaneously while the carpet and backing are under pressure, and

maintaining the heating of the curable elastomeric backing section until the elastomeric backing is set.

4,174,992

WATER PROOFING COMPOSITIONS FOR CEMENT MORTAR OR CONCRETE AND METHODS OF APPLICATION THEREFOR

Toshihiro Fujii, Fukuyama, and Sekiji Yokota, Fukayasu, both of Japan, assignors to Hayakawa Rubber Company Limited, Fukuyama, Japan

Division of Ser. No. 846,051, Oct. 27, 1977, which is a continuation of Ser. No. 668,114, Mar. 18, 1976, abandoned, which is a continuation of Ser. No. 537,014, Dec. 27, 1974, abandoned. This application Jul. 27, 1978, Ser. No. 928,656

Claims priority, application Japan, Jun. 15, 1974, 49-68453

Int. Cl.[2] B29F *1/00*

U.S. Cl. 156—244.11 **4 Claims**

1. A method of water-proofing cement mortar and concrete comprising the steps of making a homogeneous mixture consisting essentially of 5–14% by weight of reclaimed butyl rubber, 50–60% by weight filler, 15–20% by weight of at least one of a thermoplastic synthetic resin and a low molecular weight polymer of isobutylene, and 10–20% by weight of a solvent and a softener; and injecting said mixture into engagement with said cement mortar or concrete.

4. A water-proofing composition to be used in contact with wet cement mortar or wet concrete and having adhesion to the wet cement mortar or wet concrete without employing additional bonding materials and a consistency (JIS K2530 penetrometer) at 25° C. of 200–400, which consists essentially of

5–14% by weight of reclaimed butyl rubber, 50–60% by weight of a filler, 15–20% by weight of at least one of a thermoplastic synthetic resin and a low molecular weight polymer of isobutylene, 10–20% by weight of a solvent and a softener.

4,174,993

WATER PROOFING COMPOSITIONS FOR CEMENT MORTAR OR CONCRETE AND METHODS OF APPLICATION THEREFOR

Toshihiro Fujii, Fukuyama, and Sekiji Yokota, Fukayasu, both of Japan, assignors to Hayakawa Rubber Company Limited, Fukuyama, Japan

Division of Ser. No. 846,051, Oct. 27, 1977, which is a continuation of Ser. No. 668,114, Mar. 18, 1976, abandoned, which is a continuation of Ser. No. 537,014, Dec. 27, 1974, abandoned. This application Jul. 27, 1978, Ser. No. 928,657
Claims priority, application Japan, Jun. 15, 1974, 49-68453
Int. Cl.² B29F *3/01*
U.S. Cl. 156—244.11 **4 Claims**

1. A method of water-proofing cement mortar and concrete comprising the steps of making a homogeneous mixture consisting essentially of 35–15% by weight of reclaimed butyl rubber, 40–50% by weight filler, 20–35% by weight of at least one of a thermoplastic synthetic resin and a low molecular weight isobutylene polymer and a softener; molding said mixture by extrusion into a desired shape; and placing said shape into engagement with said cement mortar or concrete.

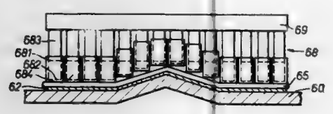
4. A water-proofing composition to be used in contact with wet cement mortar or wet concrete and having adhesion to the wet cement mortar or wet concrete without employing additional bonding materials and a consistency (JIS K2530 penetrometer) at 25° C. of 50–100, which consists essentially of 35–15% by weight of reclaimed butyl rubber, 40–50% by weight of a filler, 20–35% by weight of at least one of a thermoplastic synthetic resin and a low molecular weight of isobutylene polymer and a softener.

4,174,994

APPARATUS FOR METAL COATINGS

Leonardus J. Savelkouls, Bergweg Zuid 159, Bergschenhoek, Netherlands

Division of Ser. No. 844,525, Oct. 25, 1977, Pat. No. 4,101,356. This application Mar. 30, 1978, Ser. No. 891,901
Claims priority, application Netherlands, Nov. 5, 1976, 7612325
Int. Cl.² B32B *31/00*; H05B *5/00*
U.S. Cl. 156—380 **3 Claims**



1. An apparatus for use in a process of continuously coating a metal substrate with an organic polymer composition by providing a polymer stratum including a melt bonding composition in a contacting relation with said metal substrate, heating said substrate by means of electromagnetic radiation capable of heating said substrate, and subsequently cooling said metal substrate so as to form a strong interbonding connection between said melt bonding composition and said metal substrate; said apparatus comprising a first means for generating electromagnetic radiation having a frequency in the radio frequency range and a second means for emitting said radiation and in operative connection with said first means;

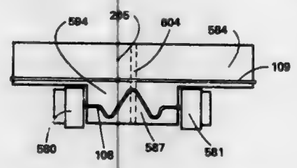
said second means comprising a flexibly-deformable inductor loop for directing said radiation through said polymer stratum onto said metal substrate; and means for deformably pressing said inductor loop onto said polymer stratum to substantially conform said inductor loop and said polymer stratum with a non-planar portion of said metal substrate.

4,174,995

SEVERING AND SEALING TOOL

Sammy J. Ferguson, Dallas, and William R. Yohe, Garland, both of Tex., assignors to Recognition Equipment Incorporated, Dallas, Tex.

Filed Feb. 22, 1978, Ser. No. 879,971
Int. Cl.² B32B *31/00*; B30B *15/34*
U.S. Cl. 156—494 **8 Claims**



1. Tool for severing and sealing a plastic strap of a certain width, said strap having one end in contact with an object, and extending about said object and over said one end to form an overlapping portion of said strap adjacent said one end, said overlapping portion including an inner layer in contact with said object and an outer layer in contact with said inner layer, said strap extending from said overlapping portion to another opposite end to said one end thereof adjacent a supply of said strap, comprising:

a body including a flat head to contact said outer layer of said overlapping portion within a predetermined area of said head;

a first resistive wire heating element extending across said predetermined area and having a length at least said certain width;

a second resistive wire heating element extending meanderously within said predetermined area disposed between said first heating element and said one end, when said head contacts said outer layer;

a power source for selectively supplying electricity to said first and second heating elements when said head is in contact with said outer layer to soften portions of said outer layer adjacent said first and second heating elements;

a tension means coupled to said strap intermediate said overlapping portion and said another end providing tension on said strap about said object for pulling the portion of said strap adjacent said first heating element toward said another end away from said overlapping portion to sever said strap after said first heating element softens the portion of said outer layer adjacent said first heating element; and

a switch connected to deactuate said power source after said tension means severs said strap.

4,174,996

PIPE JOINTING

John Hunter, 63 Osborne Rd., Kiveton Park, Near Sheffield, England

Continuation-in-part of Ser. No. 620,289, Oct. 7, 1975, abandoned. This application Dec. 21, 1977, Ser. No. 862,984
Int. Cl.² B32B *31/00*
U.S. Cl. 156—499 **13 Claims**

1. An apparatus for jointing together by socket fusion two plastics pipe lengths, or one plastics pipe length and a plastics fitting, comprising:

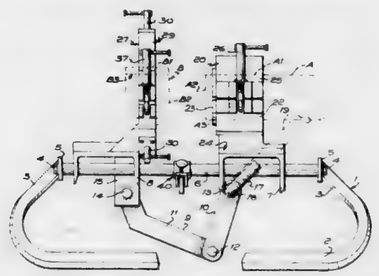
a frame;

first and second ring clamps each slidably mounted on said frame so as to be movable towards or away from one another;

means to effect movement of said clamps relatively toward and away from one another;

said first clamp being dimensioned to clamp one end of a first pipe length and squeeze said end into a predetermined shape;

said second clamp being dimensioned to clamp a fitting, or a socket end of a second spigot and socket pipe length, and said second clamp including a plurality of arcuate bearing shoes circumferentially separated from each other with each being operable on independently of the others by one



of a plurality of screw adjusters carried by said second clamp, said bearing shoes together being adapted to make circumferential contact over substantially the whole of the periphery of said fitting or said socket end, said screw adjusters being adjustable to cause axial alignment of said fitting with respect to said end of said first pipe length, or of said socket end with respect to said end of said first pipe length; and

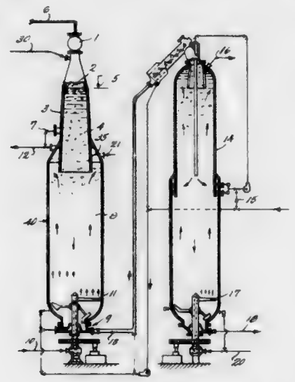
a heating means for bringing surfaces to be fused together to fusion temperature.

4,174,997

METHOD AND APPARATUS FOR CONTINUOUS HYDROLYSIS OF CELLULOSIC FIBER MATERIAL

Johan C. F. C. Richter, St. Jean Cap Ferrat, France, assignor to Kamyr Aktiebolag, Karlstad, Sweden

Filed Aug. 26, 1974, Ser. No. 500,900
Claims priority, application Sweden, Sep. 3, 1973, 11940
Int. Cl.² D21C *1/02, 1/04, 3/02, 3/24*
U.S. Cl. 162—19 **8 Claims**



1. A method for continuously treating cellulosic fiber material containing a dry substance utilizing a first vertical vessel having an upper steam phase and lower liquid phase, and utilizing a second vertical vessel operatively connected to the first vessel said method comprising the steps of

(a) feeding cellulosic fiber material into the upper steam phase of the first vessel so that the material is heated to hydrolysis temperature,

(b) concurrently impregnating and hydrolizing the material as it moves downwardly in the first vessel in a concurrent liquid phase,

(c) subjecting the downwardly moving material to a countercurrent wash liquid heated to hydrolysis temperature, to purge the dry substance therefrom, in a countercurrent liquid phase,

(d) extracting and recovering from the first vessel hydrolysate containing the dry substance at a portion of the first vessel generally corresponding to the area between the concurrent and countercurrent liquid phases,

(e) discharging the fiber material substantially free of hydrolysate from the first vessel and feeding it to a top portion of the second vessel,

(f) digesting the fiber material by subjecting the downflowing fiber material in the second vessel to counter-current digesting liquor flow,

(g) extracting and recovering black liquor from the second vessel and maintaining it separate and distinct from the hydrolysate extracted from the first vessel, and

(h) removing digested fiber material from the bottom of the second vessel.

7. Apparatus for the hydrolysis of fiber material containing a dry substance, comprising

a first vertical vessel having an upper steam phase and lower liquid phases,

a second vertical vessel,

a transfer line connecting the bottom of said first vessel to the top of said second vessel,

means for feeding cellulosic fiber material into the upper steam phase of said first vessel so that the material is heated to hydrolysis temperature,

means located adjacent the bottom of said first vessel for introducing wash liquid heated to hydrolysis temperature into said first vessel with an upwardly directed velocity component to counter wash and hydrolize the downwardly moving fiber material and purge the dry substance therefrom,

means for recovering from said first vessel the hydrolysate, containing the dry substance, at an intermediate portion of said vertical first vessel,

means for discharging the fiber material, substantially free of hydrolysate, from the bottom of said first vessel into said transfer line,

means for feeding the fiber material from said transfer line into said second vessel,

means for subjecting the downflowing fiber material in said second vessel to a countercurrent digesting liquor flow,

means for extracting and recovering black liquor from said second vessel and maintainint it separate and distinct from the hydrolysate extracted from said first vessel, and

means for removing digested fiber material from the bottom of said second vessel.

4,174,998

PREFLOCCULATED FILLER COMPOSITIONS FOR USE IN THE MANUFACTURE OF PAPER

Leslie E. Shiel, Gravesend, England, assignor to The Associated Portland Cement Manufacturers Limited, London, England

Continuation of Ser. No. 628,791, Nov. 4, 1975, abandoned. This application Feb. 15, 1977, Ser. No. 768,779
Claims priority, application United Kingdom, Nov. 15, 1974, 49657/74
Int. Cl.² D21D *3/00*
U.S. Cl. 162—168 N **15 Claims**

1. A flocculated, aqueous filler composition for use in paper furnish, which comprises water, a pigment, a water soluble starch phosphate selected from the group consisting of starch

monoesters of a phosphoric acid, starch diesters of a phosphoric acid and salts thereof, said starch phosphate having a DS of at least 0.002 in terms of bound phosphorous, and an organic polymeric papermaking retention material having the effect of rendering the filler composition flocculent in the aqueous composition, said organic polymeric material being selected from the group consisting of polyacrylamide and polyamide retention aids, said starch phosphate plus said organic polymeric material being present in amount of 0.1–20% by weight of said pigment and said organic polymeric material being present in amount of 0.1–25% of based upon the combined weights of said starch phosphate plus said organic polymeric material, said starch phosphate and said organic polymeric material interacting to increase their substantiveness to papermaking fibers thereby to increase the retention of said pigment.

14. The method of incorporating chalk whiting as filler in the manufacture of paper, which comprises the steps of:

(a) forming a preflocculated filler in an aqueous medium by dispersing chalk whiting in water in the presence of about 4% by weight based on the chalk whiting of a water soluble starch phosphate having a DS of from 0.002–1.0% of bound phosphorous and about 0.4% by weight based on the chalk whiting of an anionic polyacrylamide retention aid; and then

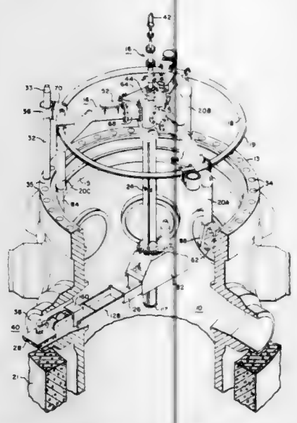
(b) adding said preflocculated filler to a paper furnish having a 2 percent consistency and containing 50% bleached softwood and 50% bleached hardwood beaten to a Schopper-Riegler degree of 25 and sized with rosin and alum.

4,174,999

POSITIONING MEANS FOR CIRCUMFERENTIALLY LOCATING INSPECTION APPARATUS IN A NUCLEAR REACTOR VESSEL

David C. Burns, Trafford, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 25, 1977, Ser. No. 781,403
Int. Cl.² G21C *17/00*
U.S. Cl. 176—19 R **19 Claims**



1. Apparatus for locating an inspection device within a nuclear reactor vessel for volumetric examination thereof, the vessel having an external flange having located thereon a plurality of guide studs extending upwardly therefrom defining a generally circular path, an internal locating element the exact position of which is known and an internal circumferential flange, said apparatus comprising:

(a) a support ring generally sized to relate to the path defined by the position of the guide studs;

(b) a plurality of guide stud bushings, equal in quantity to the number of guide studs, said bushings being larger in internal diameter than the outer diameter of the guide studs;

(c) first clamping means for movably mounting said bushings on said support ring to enable, when loosened, alignment of each of said bushings with one of said guide studs;

(d) at least three support legs, all but one of said support legs including means for adapting said legs to contact and rest upon the internal circumferential vessel flange, the remaining support leg including means for adapting said leg to engage the internal locating element; and

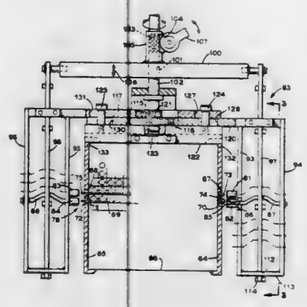
(e) second clamping means for mounting said support legs to said support ring at a point thereon which insures that the internal circumferential vessel flange and the internal locating element are simultaneously and respectively contacted and engaged.

4,175,000

METHOD FOR INSPECTING NUCLEAR REACTOR FUEL ELEMENTS

Felix S. Jabsen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Division of Ser. No. 563,030, Mar. 28, 1975, Pat. No. 4,058,224, which is a division of Ser. No. 408,767, Oct. 23, 1973, Pat. No. 3,894,327. This application Aug. 29, 1977, Ser. No. 830,730
Int. Cl.² G21C *17/00*
U.S. Cl. 176—19 R **2 Claims**



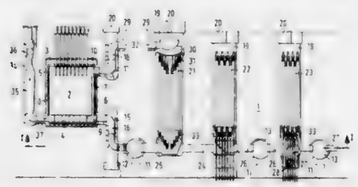
1. In a method of non-destructively inspecting a nuclear reactor fuel element having fuel rods and transversely disposed grids, of the type wherein the fuel element is submerged in a pool, the improvement comprising: moving to a position adjacent to the fuel element a strongback suspended from a bridge that spans the pool and is movable therealong; pivotally moving the strongback to a position in which it is substantially perpendicular to the bridge; positioning the fuel element on the strongback; pivotally moving the strongback into a position in which it is parallel to the bridge; inspecting at least one exposed surface of the fuel element on the strongback; removing the fuel element from the strongback; turning the fuel element to expose at least one different surface; replacing the turned fuel element on the strongback; inspecting said at least one different surface; inserting deflector bars into the grids of the fuel element; rotating the bars to bear against portions of the grids thereby to release the holding engagement between the fuel rods and the grids; withdrawing the fuel rods from the grids; and inspecting at least one of the withdrawn rods.

4,175,001

GAS TURBINE POWER PLANT WITH CLOSED GAS CIRCUIT

Dirk Haferkamp; Alija Hodzic, and Karl-Uwe Schneider, all of Mannheim, Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Mannheim, Fed. Rep. of Germany

Filed Aug. 30, 1977, Ser. No. 829,204
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1976, 2639877
Int. Cl.² G21C *19/28*
U.S. Cl. 176—60 **22 Claims**



1. A gas turbine power plant comprising:

a pressure vessel;

a nuclear reactor as a heat source housed within a cavity in said pressure vessel;

a gas turbine assembly housed within said pressure vessel having a gas turbine, means for compressing circuit gas and means for recuperative heat exchange;

a thermal barrier within said cavity in said pressure vessel and defining an area surrounding said nuclear reactor;

a sealing liner within said pressure vessel sealing said cavity, surrounding said thermal barrier and defining a free space between said thermal barrier and the sealing liner; and

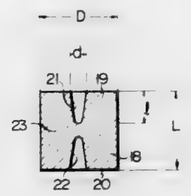
means for circulating cooking gas through said free space comprising a cooling gas inlet conduit joining said high pressure compressor and said free space, and a cooling gas outlet conduit joining said free space and said recuperative heat exchange means, said high pressure compressor releasing the total volume of cooling gas to said free space and said recuperative heat exchange means receiving the total volume of cooling gas after circulation through said free space.

4,175,002

NUCLEAR FUEL PELLET WITH OPPOSITELY BOTTOMED HOLES

Toyoji Wada, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Sep. 2, 1977, Ser. No. 830,143
Claims priority, application Japan, Sep. 6, 1976, 51-106368
Int. Cl.² G21C *3/04*
U.S. Cl. 176—66 **4 Claims**



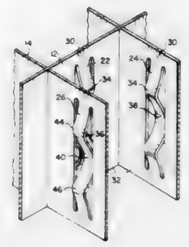
1. A nuclear fuel pellet made of a sintered ceramic nuclear fuel mass and having a cylindrical configuration with a pair of opposite bottomed holes centrally provided one at each end, said bottomed holes being convergent toward their bottoms and each having a U-shaped cross-section, in which a ratio of the diameter of the opening to the depth of the bottomed holes is smaller than unity.

4,175,003

GRID FOR NUCLEAR REACTOR FUEL ASSEMBLIES

Peter H. Beuchel, and Eric G. Cooper, both of Columbia, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 23, 1976, Ser. No. 754,050
Int. Cl.² G21C *3/30*
U.S. Cl. 176—76 **4 Claims**



1. A grid for a nuclear reactor fuel assembly comprising:

a multiplicity of straps interleaved with each other to form a structure of egg-crate configuration which includes individual cells adapted to contain fuel rods and control rod guide tubes;

a spring projecting inwardly into each cell designated to hold a fuel rod from that portion of each strap which cooperates with the other three strap portion to define the four walls of each cell;

each of said springs being pressed from said strap portion and having its top and bottom ends merging directly into the material of said strap;

each of the four springs projecting inwardly into each cell further being of generally sinusoidal shape and having at least one surface thereon arranged to contact the surface of a fuel rod adapted to extend through a cell;

thereby providing at least a four point resilient support for a fuel adapted to extend through said cell to thereby permit fuel rod axial and radial expansion and contraction without distortion.

4,175,004

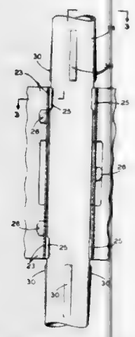
FUEL ASSEMBLY GUIDE TUBE

Felix S. Jabsen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,383
Int. Cl.² G21C *3/30*
U.S. Cl. 176—76 **11 Claims**

1. In combination with a nuclear fuel assembly of the type having a plurality of vertically extending fuel elements and guide tubes maintained in a laterally spaced array by at least one cellular spacer grid assembly that is composed of a multiplicity of intersecting slotted grid plates disposed to form a plurality of cells through which the fuel elements and guide tubes extend; and, lower and upper end fitting assemblies, each being rigidly attached to the respective ends of the guide tubes, the improvement comprising a plurality of protuberancies integrally formed in the guide tubes in spaced relation, each guide tube having a cross-section at each protuberancy greater than a distance between the plates forming the cell through which the guide tubes extend, the protuberancies being longitudinally aligned with and spaced relative to at least part of of the plates such that the protuberancies engage the plates to restrain longitudinal movements of the spacer grid assembly

relative to the guide tubes beyond the longitudinal spacing, and the spaced relation of the protuberancies being such that the



guide tubes, including the protuberancies, may be inserted through a cell.

4,175,005

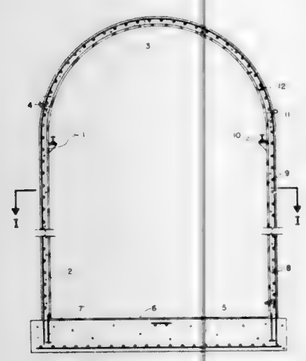
COMPONENT NUCLEAR CONTAINMENT STRUCTURE

Gunnar A. Harstead, 240 Ellin Dr., Park Ridge, N.J. 07656

Continuation of Ser. No. 638,318, Dec. 6, 1975, abandoned. This application Dec. 2, 1977, Ser. No. 856,906

Int. Cl.[2] G21C *13/08*

U.S. Cl. 176—87 **9 Claims**



1. A nuclear reactor containment comprising:

a self-supporting, inner, structural steel, shell-like vessel with curved side walls and top walls having a wall thickness sufficient to enable said steel vessel alone to carry a major portion of the total load imposed on the containment, and, furthermore, sufficient to withstand construction loads imposed upon said vessel during placement of reinforcing and concrete surrounding said vessel,

an outer reinforced concrete vessel surrounding and in direct contact with the steel vessel and carrying the remaining portion of the imposed load,

and a foundation mat, said steel vessel and concrete vessel being supported on said foundation mat,

said steel vessel and said concrete vessel acting together as a composite structure in resisting all applied loads.

4,175,006

COMPOSITION OF MATTER AND PROCESS

Merle G. Wovcha; Frederick J. Antosz, both of Kalamazoo; John M. Beaton, Portage; Alfred B. Garcia, Kalamazoo, and Leo A. Kominek, Portage, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 21, 1977, Ser. No. 844,366

Int. Cl.[2] C07B *29/02*

U.S. Cl. 435—55 **11 Claims**

1. A process for preparing 9α-OH testosterone in its essentially pure form which comprises cultivating *Mycobacterium fortuitum* NRRL B-8119 in an aqueous nutrient culture medium under aerobic conditions in the presence of a steroid containing from 8 to 10 carbon atoms, inclusive, in the 17-alkyl side chain and isolating said compound in its essentially pure form from the culture medium.

4,175,007

PROCESS FOR PRODUCING ANTIBIOTIC A21A

Sheldon B. Zimmerman, Springfield, N.J., and John H. Chalmers, Jr., Houston, Tex., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 736,794, Oct. 29, 1976, Pat. No. 4,071,631. This application Nov. 21, 1977, Ser. No. 853,078

Int. Cl.[2] C12D *9/14*

U.S. Cl. 435—105 **6 Claims**

1. A method of producing antibiotic A21A which comprises cultivating a A21A-producing strain of *Streptomyces filipinensis* in a fermentation broth containing assimilable sources of carbohydrates, nitrogen and inorganic salts under aerobic conditions until a substantial amount of A21A is produced in the fermentation broth and recovering said antibiotic.

4,175,008

CULTURE SPECIMEN COLLECTION AND TRANSPORT PACKAGE

Douglas J. White, Nutley, N.J., assignor to Bio-Pharmaceutical Packaging Corp., Clifton, N.J.

Filed Jun. 26, 1978, Ser. No. 919,212

Int. Cl.[2] C12B *1/00*

U.S. Cl. 435—295 **10 Claims**



1. A culture specimen and transport package comprising:

an elongated stem having a first end and a second end;

a specimen collecting member at said first end of said elongated stem;

a first tubular member for sterilizingly housing said specimen collecting member prior to the collection of specimen;

a second tubular member having a culture medium therein for insertion of said specimen collecting member thereinto after collection of a specimen for transport to a test facility;

a first cap member slidably mounted on said elongated stem between said first and second ends for sealingly closing said first tubular member when said specimen collecting member is disposed in said first tubular member and for sealingly closing said second tubular member when said specimen collecting member is disposed in said second tubular member, said first cap member being movable between a first position and a second position, said first position providing a relatively long effective distance between said specimen collecting member and said first cap member for specimen collection purposes, and said scond position providing a relatively short effective distance between said specimen collecting member and said first cap member when said specimen collecting member is inserted into said second tubular member after collection of said specimen; and

a second cap member mounted at said second end of said elongated stem for affixing said second tubular member to said elongated stem prior to the collection of a specimen.

4,175,009

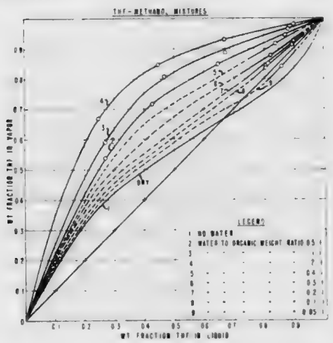
SEPARATION OF ALCOHOL FROM TETRAHYDROFURAN

Harry B. Copelin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 15, 1977, Ser. No. 860,788

Int. Cl.[2] C07D *307/00*; B01D *3/40*

U.S. Cl. 203—96 **4 Claims**



1. A process for separating from a tetrahydrofuran stream comprising one or more aliphatic alcohols selected from the group consisting of methanol, ethanol, isopropanol and tertiary butanol, tetrahydrofuran, optionally water and in the absence of acetone wherein tetrahydrofuran is the major constituent, one or more of said alcohols, said process comprising feeding said tetrahydrofuran stream into a distillation column, extractively distilling said tetrahydrofuran stream in said distillation column by adding water into the distillation column above the feed of said tetrahydrofuran stream at a weight ratio of water to alcohol-tetrahydrofuran of from 0.4:1 to 4:1 and recovering tetrahydrofuran from the top of the column with substantially no alcohol.

4,175,010

METHOD OF REINFORCING A CONDUCTIVE BASE PATTERN BY ELECTROPLATING AND DEVICE OBTAINED BY MEANS OF THE METHOD

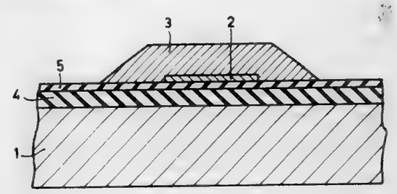
Gerrit J. Koel, and Jan Gerkema, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1978, Ser. No. 895,932

Claims priority, application Netherlands, Apr. 18, 1977, 7704186

Int. Cl.[2] C25D *5/02, 7/12*

U.S. Cl. 204—15 **5 Claims**



1. In a method of manufacturing a device in which an electrically conductive base pattern is formed on a substrate, the surface of which substrate consists of an electrically insulating material, and which conductive base pattern is electroplated so as to form a electrically conductive pattern thereon, the improvement wherein an auxiliary layer having a sheet resistance of between 10^{12} and 10^{17} ohms per square is provided on the electrically insulating surface of said substrate and the electrically conductive base pattern is then formed on said auxiliary layer.

4,175,011

SULFATE-FREE METHOD OF ETCHING COPPER PATTERN ON PRINTED CIRCUIT BOARDS

Nicholas J. Spiliotis, Parsippany, N.J., assignor to Allied Chemical Corporation, Morristown, N.J.

Filed Jul. 17, 1978, Ser. No. 925,085

Int. Cl.[2] C25D *5/02*; C23F *1/02*; C09K *13/08*

U.S. Cl. 204—15 **5 Claims**

1. In a method of forming printed circuit boards of a type wherein a copper pattern on a board is etched and then a tin/lead layer is plated onto the etched copper pattern, the improvement wherein the etching step consists essentially of contacting the surface with an aqueous etchant solution comprising between about 0.5 and about 70 weight % hydrogen peroxide, between about 2.5 and about 90 weight % fluoboric acid and between about 5 and about 85 weight % water.

4,175,012

β-DIKETONES AND THE USE THEREOF AS METAL EXTRACTANTS

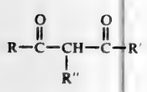
Kenneth D. MacKay, Circle Pines, and Edgar R. Rogier, Minnetonka, both of Minn., assignors to Henkel Corporation, Minneapolis, Minn.

Division of Ser. No. 391,432, Aug. 24, 1973, abandoned. This application Dec. 15, 1975, Ser. No. 641,195

Int. Cl.[2] C25C *1/12*; C01B *3/00, 53/00*

U.S. Cl. 204—108 **22 Claims**

1. The process of extracting divalent metal values selected from copper and nickel from aqueous solutions thereof which comprises contacting the said aqueous solutions with a β-diketone or a solution thereof in an organic hydrocarbon solvent having a boiling point of at least about 150° C. to extract at least a portion of the copper or nickel values in the organic phase, said β-diketone having the structure:



where R is phenyl or alkyl substituted phenyl, R′ is alkyl, alkyl substituted phenyl or chloro substituted phenyl and R″ is H with the provisos that: (1) when R is phenyl, R′ is a branched chain alkyl group of at least seven carbon atoms and (2) when R is alkyl substituted phenyl, the number of carbon atoms in the alkyl substituent or substituents is at least 7 and at least one such alkyl substituent is branched chain.

11. The process of claim **1** wherein the metal is copper, the aqueous solution is ammoniacal, the β-diketone is present in an amount of about 2 to 40% by weight in the organic solvent, the organic solvent is kerosene, the organic solvent solution:aqueous phase ratio is in the range of 5:1 to 1:1, the phases are separated, the loaded organic phase is stripped by contacting the same with an aqueous sulfuric acid stripping solution, the stripped organic phase is separated from the stripping solution and copper metal is recovered from the stripping solution by electrolysis.

4,175,013

METHOD OF GENERATING HYDROGEN AND OXYGEN FROM WATER

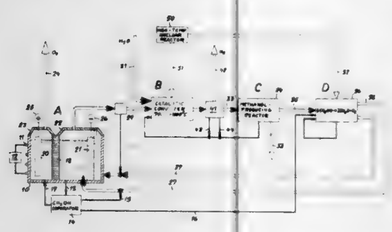
Heiko Barnert; Jiri Divisek, and Wolfgang Faul, all of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Dec. 21, 1978, Ser. No. 971,742

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2758119

Int. Cl.² C25B *1/04*

U.S. Cl. 204—129 **9 Claims**



1. A method of generating hydrogen and oxygen from water by decomposing water, said method comprising the steps, in combination, of:

(a) electrolyzing an aqueous electrolyte containing 1 to 30% by weight of formaldehyde and having a pH of about 0 to 5 at a temperature of about 50° to 200° C. to produce hydrocarbon gases at a cathode and oxygen at an anode;

(b) converting said hydrocarbon gases and water, while supplying thermal energy, at a temperature of about 700° to 1000° C. to produce a gas stream rich in hydrogen and carbon monoxide;

(c) in an endothermic reaction with abstraction of thermal energy and at a temperature of 250° to 350° C., transforming the gas rich in hydrogen and carbon monoxide to methanol;

(d) transforming the methanol produced in step (c) to formaldehyde and hydrogen and separating the formaldehyde from the hydrogen, the transformation of the methanol to the formaldehyde and hydrogen being effected at a temperature of about 500° to 700° C. with the supply of thermal energy; and

(e) feeding the formaldehyde recovered in step (d) to step (a) for electrolysis in said electrolyte.

4,175,014

CATHODIC DISSOLUTION OF COBALTIC HYDROXIDE

Ranko Crnojevich, Gretna; Edward I. Wiewiorowski, New Orleans, and Peter H. Yu, Harvey, all of La., assignors to AMAX Inc., Greenwich, Conn.

Filed Mar. 6, 1978, Ser. No. 883,378

Int. Cl.² C25C *1/08*

U.S. Cl. 204—130 **7 Claims**

1. In the recovery of cobalt from cobalt-containing nickel solutions, wherein cobalt is separated from said solution as a precipitate containing cobaltic hydroxide, the improved method of dissolving said precipitate for the subsequent recovery of cobalt therefrom by reduction of trivalent metal in said precipitate to the divalent state which comprises,

forming an aqueous slurry of said precipitate acidified with sulfuric acid to a pH ranging from about 0.1 to 2,

subjecting the precipitate of said aqueous slurry to electrolytic reduction at the cathode of an electrolytic cell having an insoluble anode,

said precipitate being isolated from said anode during said electrolytic reduction,

and continuing the electrolytic reduction of said precipitate at said cathode until reduction of trivalent metal in said precipitate to the divalent state obtains and hence the dissolution thereof.

4,175,015

PROCESS FOR THE REMOVAL OF LEAD IONS FROM FORMOSE

Edgar Möhring, Bergisch-Gladbach, and Hanns P. Müller, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 17, 1978, Ser. No. 934,579

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1977, 2738274

Int. Cl.² C25C *1/18*

U.S. Cl. 204—131 **6 Claims**

1. The process comprising removing lead ions from aqueous formose solutions by cathodic electro-chemical deposition.

4,175,016

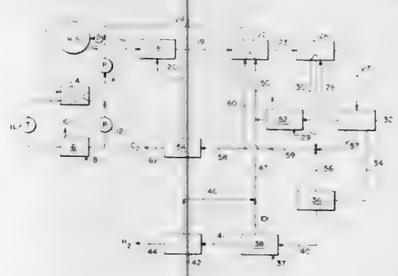
RADIOLYTIC-CHEMICAL METHOD FOR PRODUCTION OF GASES

John G. Lewis; Alfred J. Martin; William W. Meinke, all of Ann Arbor; Charles W. Ricker, Albion, and Robert J. Teitel, Ann Arbor, all of Mich., assignors to Texas Gas Transmission Corporation, Owensboro, Ky.

Continuation-in-part of Ser. No. 609,832, Sep. 2, 1975, abandoned. This application Mar. 30, 1976, Ser. No. 672,016

Int. Cl.² B01J *1/10*

U.S. Cl. 204—157.1 H **1 Claim**



1. A method of separating oxygen from a gaseous mixture including CO_2, oxygen and CO as a combustible gas reacting therewith, comprising the steps of,

introducing NO into said gaseous mixture to react with oxygen and form NO_2, and

removing the oxygen by separation of NO_2 from the gaseous mixture, converting CO_2 to CO and O_2 in said mixture before introduction of the NO by introducing radiation derived from a thermonuclear fusion reaction in the presence of the CO_2,

and confining the CO_2 to be irradiated in a separate container to receive neutron radiation from the reaction by penetration into the separate container.

4,175,017

SULFUR VULCANIZABLE INTERPOLYMERS

Irving Kuntz, Linden, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

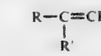
Continuation of Ser. No. 727,802, Sep. 29, 1976, abandoned, which is a division of Ser. No. 629,567, Nov. 6, 1975, Pat. No. 4,051,312, which is a continuation-in-part of Ser. No. 452,969, Mar. 20, 1974, abandoned. This application Feb. 15, 1978, Ser. No. 878,014

Int. Cl.² C08F *4/68*

U.S. Cl. 204—159.24 **4 Claims**

1. Process for the production of an alternating elastomeric sulfur vulcanizable interpolymer of:

(A) one or more C_2–C_{20} acyclic or alicyclic olefins having the general formula



wherein R and R′ are independently selected from the group consisting of halogen, hydrogen, straight and branched chain alkyl radicals, aryl, alkylaryl, arylalkyl and cycloalkyl radicals, plus:

(B) about 50 mole percent of one or more C_1–C_{20} acyclic or alicyclic esters of acrylic acid wherein said acyclic or alicyclic ester radical moiety is free of olefinic unsaturation; and

(C) a minor molar proportion, about 0.10 to 10 mole percent of the total monomers present in said interpolymers, of one or more C_4–C_{10} acyclic conjugated diolefins; said (A) and (B) components forming polymer segments interconnected by said (C) components and said (A) and (C) components comprising a total of about 50 mole percent which comprises:

reacting said olefins, acrylic acid esters and conjugated diolefin monomers in a solvent with a catalyst system comprised of an organoaluminum Lewis acid, a vanadium compound and a free-radical generator at a temperature in the range of −100° C. to 100° C. for a period of time in the range of 2 minutes to 200 hours, and recovering the interpolymer, wherein the molar ratio of organoaluminum compound to vanadium compound is 3 to 30 mols of organoaluminum compound per mol of vanadium compound.

4,175,018

METHOD OF ELECTROCOATING

Gerald R. Gacesa, Baden, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 760,781, Jan. 19, 1977, abandoned. This application May 9, 1977, Ser. No. 795,452

Int. Cl.² C25D *13/16*

U.S. Cl. 204—181 T **9 Claims**

1. A method for electrocoating a continuous length of flat metal sheet comprising:

(A) withdrawing the flat metal sheet from a source of supply and continuously

(B) passing said sheet into an aqueous electrodeposition bath which contains as an electrocoating vehicle

(1) a water-soluble resinous coating material,

(2) a water-insoluble emulsified resinous material having a molecular weight of at least 250,000.

(C) electrodepositing said vehicle on said sheet to form a primer coating as the sheet passes through the bath,



(D) continuously removing the primer coated sheet from the bath and passing it to a coating station,

(E) applying a top coat to the primer coated sheet at the coating station without having previously cured said primer,

(F) curing the top and primer coatings simultaneously, and

(G) leading the coated metal sheet to a point of accumulation.

4,175,019

HEATED SOLID ELECTROLYTE OXYGEN SENSOR

Michael P. Murphy, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 3, 1978, Ser. No. 892,644

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 S **6 Claims**



1. In a galvanic exhaust gas sensor having a solid electrolyte member, an outwardly flanged concentric tubular terminal for a reference electrode on one face of said electrolyte member, an inwardly flanged tubular metal shell surrounding said electrolyte member and said terminal, and means coacting with said terminal and shell flanges for biasing said member, terminal and shell together in a fixed predetermined relationship, the improvement wherein said tubular electrode terminal supports an electrical resistance element for heating said electrolyte member and at least one discrete resistance element terminal in a subassembly unitly assemblable with said electrolyte member and metal shell, said resistance element having a fixed predetermined axial alignment and displacement with respect to said electrode terminal, whereby said means for biasing the electrolyte member, electrode terminal and shell also aligns said resistance element with said electrolyte member and spaces said element and said electrolyte member a predetermined distance apart.

4,175,020

METHOD OF STERILIZING REFERENCE ELECTRODES AND THE LIKE

Jiri Janata, and Paul T. McBride, both of Salt Lake City, Utah, assignors to University of Utah, Utah

Filed Oct. 10, 1978, Ser. No. 949,573
Int. Cl.[2] A61L 1/00; G01N 27/30
U.S. Cl. 204—195 B 7 Claims

1. A method of sterilizing and charging a reference electrode comprising

providing a reference electrode which includes a tubular member open at least at one end, and an electrode element disposed in said tubular member, said one end being formed to function as a capillary,

delivering into the tubular member to surround said electrode element a first solution of a certain salt and hydroxyethylmethacrylate dissolved in an organic solvent,

evaporating the solvent from the first solution,

exposing the surfaces of the reference electrode to a sterilizing gas,

aerating the reference electrode, and

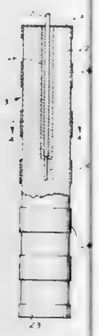
applying a sterile second solution of said certain salt to the reference electrode until the osmolality of the solution within the tubular member and the second solution is substantially the same.

4,175,021

APPARATUS FOR PREVENTING END EFFECT IN ANODES

Joe F. Tatum, and Thomas H. Lewis, both of Hattiesburg, Miss., assignors to C. E. Equipment Co., Inc., Hattiesburg, Miss.

Filed Mar. 6, 1978, Ser. No. 884,057
Int. Cl.[2] C23F 13/00
U.S. Cl. 204—196 4 Claims



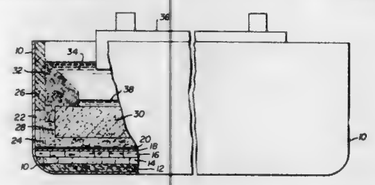
1. Apparatus for preventing end effect in anodes used in an impressed current deep well cathodic protection system for metallic structure in which the apparatus intimately engages a carbonaceous backfill, comprising an anode having an elongated body of current conducting material located along a longitudinal axis, a plurality of current conducting and non-conducting segment alternately disposed along the length of the surface of said body and generally normal to the longitudinal axis thereof, each end of said body terminating in a non-conducting segment, said conducting segments being equally spaced along said body and being separated by said non-conducting segments, said conducting segments being substantially the same length as said non-conducting segments other than the non-conducting segments at the ends of said body, the length of each conducting segment being no more than three times the diameter thereof, means for connecting said body to a source of impressed electrical current so that a uniform electronic current is discharged from each of said conducting segments, and said connecting means supporting said anode within the carbonaceous backfill.

4,175,022

ELECTROLYTIC CELL BOTTOM BARRIER FORMED FROM EXPANDED GRAPHITE

Jostein J. Vadla, Lewiston, N.Y., and Harold J. Wilder, Bay Village, Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,652
Int. Cl.[2] B32B 9/04, 15/04; C25C 9/00
U.S. Cl. 204—243 R 27 Claims



1. In an electrolytic cell, for the electrolytic reduction of metal ores, said cell having a steel shell and a lining of insulation on the bottom and sides thereof, the improvement consisting of a lining on the bottom of said shell comprising thermal insulation and a protective layer of at least one graphite sheet formed from expanded graphite on top of said insulation.

2. In an electrolytic cell, for the electrolytic reduction of metal ores, said cell having a steel shell and a lining of insulation of the bottom and sides thereof, the improvement consisting of a lining on the bottom of said shell comprising thermal insulation, a steel sheet on top of said insulation and directly resting on top of said steel sheet, a protective layer comprising at least one graphite sheet formed from expanded graphite.

4,175,023

COMBINED CATHODE AND DIAPHRAGM UNIT FOR ELECTROLYTIC CELLS

Shyam D. Argade, Woodhaven, Mich., and Thomas G. Coker, Natick, Mass., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 694,976, Jun. 11, 1976, abandoned, Division of Ser. No. 611,030, Sep. 8, 1975, Pat. No. 4,049,841. This application Jul. 17, 1978, Ser. No. 924,896
Int. Cl.[2] C25B 11/03, 11/04, 13/08
U.S. Cl. 204—252 16 Claims

1. In a method for manufacturing a chlor-alkali electrolytic cell having a cathode and a fibrous diaphragm juxtaposed thereto, the improvement comprising

spray coating by plasma spraying or flame spraying a ferrous metal substrate with a powder metal selected from the group consisting of nickel, cobalt, tungsten carbide and mixtures thereof in a manner that forms the cathode with the cathode surface having a larger true surface area than the geometric surface area of the substrate, and

vacuum depositing fibers onto a spray coated surface of the cathode to form the fibrous diaphragm securely adhered thereto,

said fibrous diaphragm being formed from a fibrous slurry in which a major portion of the fibers are an organic thermoplastic polymer.

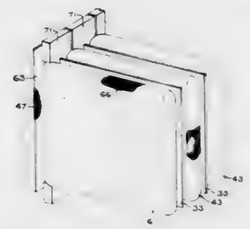
4,175,024

ELECTROLYTIC CELL MEMBRANE SEALING MEANS

William B. Darlington, Portland, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 22, 1978, Ser. No. 963,248
Int. Cl.[2] C25B 9/00, 11/03, 13/04
U.S. Cl. 204—252 9 Claims

1. In an electrolytic cell having two electrode units of opposite polarity, each of said electrode units having fingered electrodes extending outwardly toward the electrode unit of opposite polarity whereby the electrodes are interleaved between electrodes of opposite polarity, at least one of said electrode units comprising a base plate, foraminous fingered electrodes mechanically and electrically connected to the base plate, said fingered electrodes bearing an enveloping synthetic separator



and a back screen parallel to and spaced from the base plate, the improvement comprising:

(a) said synthetic separator having a lap bearing upon said back screen; and

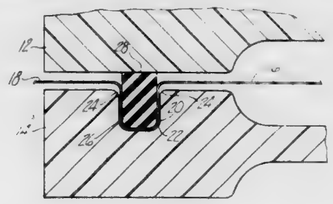
(b) the fingered, interleaved electrodes of the electrode unit of opposite polarity compressively bearing upon said lap whereby to provide an electrolyte tight seal.

4,175,025

SEALED MEMBRANE FILTER PRESS ELECTROLYTIC CELLS

Edward D. Creamer, Ypsilanti, Mich., and Michael Krumpelt, Naperville, Ill., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jul. 7, 1978, Ser. No. 922,592
Int. Cl.[2] C25B 9/00, 13/00
U.S. Cl. 204—253 8 Claims



1. In an electrolysis cell assembly of the filter-press type having frames, wherein the assembly comprises

a membrane formed to fit between adjacent frames, and having a surface area substantially larger than the frames,

a recess in at least one of said adjacent frames extending around the periphery of the frame, and

a gasket formed to fit into said recess and bear against the other of said adjacent frames,

whereby the gasket holds the membrane in position and provides a complete seal between the frames when they are forced relatively together by clamping forces,

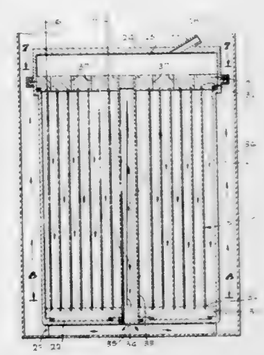
said membrane being sized to extend beyond the periphery of the frames when in assembled position.

4,175,026

ELECTROLYTIC APPARATUS FOR RECOVERING METAL FROM SOLUTIONS

Kenneth R. Houseman, St. Charles, Ill., assignor to Litton Industrial Products, Inc., Beverly Hills, Calif.

Filed Jul. 16, 1976, Ser. No. 705,770
Int. Cl.[2] C25C 7/02; C25B 11/02, 11/04
U.S. Cl. 204—272 31 Claims



1. An electrolytic apparatus for recovering a metal from a solution containing ions of the metal, said apparatus comprising:

a cell including a sheet of insulating material having a first coating of conductive material located on one side thereof to form a cathodic surface and a second coating on the other side thereof to form an anodic surface;

means for impressing a voltage between said anodic and cathodic surfaces: and

means for passing the metal ion-containing fluid through said cell and across said surfaces.

4,175,027

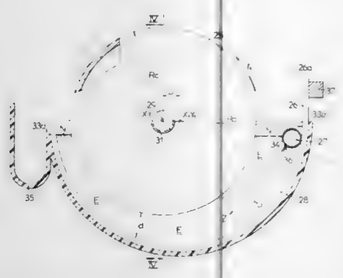
APPARATUS FOR RECOVERING ZINC FROM RESIDUES

Jean-Claude Catonné, La Celle Saint-Cloud; Jean Royon, La Varenne; Maurice Bonnemay, Boulogne; Marie-Thérése Descarsin, Paris; Marcel Bernard-Maugiron, Meulan; Henri Fencki, Le Cateau, and Jean-Francois Fayolle, Bertry, all of France, assignors to Societe d'Etudes pour la Recuperation Electrolytique du Zinc, Paris, France

Filed Sep. 9, 1977, Ser. No. 831,918
Claims priority, application France, Sep. 10, 1976, 76 27302; Dec. 4, 1977, 77 01942; Aug. 9, 1977, 77 25416
Int. Cl.[2] C25C 7/00
U.S. Cl. 204—275 5 Claims

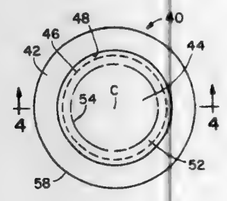
1. An improved electrolysis installation for the continuous extraction of zinc from electrolyte solution by cathodic deposition comprising, a cathode in the form of a cylinder of revolution capable of being rotated about its horizontal axis and located above a cylindrical anode having its concavity directed towards the cathode and having a generatix parallel to the axis of the cathode which it encloses at least partially and, means for introducing the electrolyte solution to be treated into the interelectrode space between the cathode and the anode, wherein the improvement comprises means for introducing the electrolyte solution, said means located close to the surface of the anode and the surface of the electrolyte, so that the injection of said electrolyte takes place uniformly along the cathode in a direction opposite the rotational direction of the cathode into the interelectrode space which is laterally defined by walls substantially perpendicular to the axis of the cathode, the walls located at a small distance from the ends of the cath-

ode, so that the amount of electrolyte leaving the inter-electrode space is equivalent to the amount entering therein, the



interelectrode distance decreasing with distance from the location of the means for introducing the electrolyte solution.

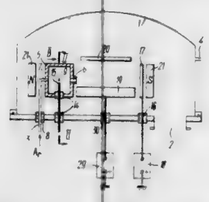
4,175,028
ELECTRODE MEMBRANE
Alan J. Payton, Harvard, Mass., assignor to Corning Glass Works, Corning, N.Y.
Filed Jan. 8, 1979, Ser. No. 1,413
Int. Cl.[2] G01N *27/46*; C25B *13/02*
U.S. Cl. 204—296 **5 Claims**



1. An electrode membrane structure comprising: an annular membrane support having a central membrane portion integrally molded with said annular support, said membrane structure being formed of a material which is gas diffusible when formed sufficiently thin to provide the central membrane portion, an array of perforations formed about the periphery of said central membrane portion to facilitate removal or separation of the annular support from the membrane portion, and an intermediate annular transition zone between said support and membrane portions wherein the thin membrane portion increases in thickness to that of the support, such that the gas diffusible material may be molded to the sufficient thinness required for diffusibility and yet maintain stability and dimension.

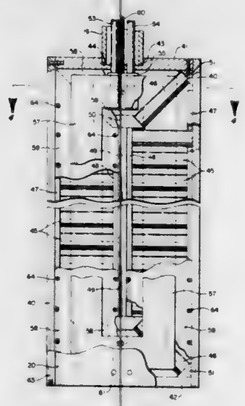
4,175,029
APPARATUS FOR ION PLASMA COATING OF ARTICLES
Georgy A. Kovalsky, ulitsa Stroitelei 4, korpus 7, kv. 6; Jury P. Maishev, Sumskoi proezd 21, korpus 1, kv. 43; Boris A. Egorov, ulitsa Kharkovskaya 3, korpus 1, kv. 38, and Jury A. Dmitriev, ulitsa Kakhovka 21, korpus 1, kv. 10, all of Moscow, U.S.S.R.
Filed Mar. 16, 1978, Ser. No. 887,229
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—298 **17 Claims**

1. An apparatus for ion plasma coating of articles, wherein a plasma flow is produced by an electric field between an anode and a hot cathode in a vacuum chamber, comprising: a discharge chamber accommodated in said vacuum chamber and having at least a single slit provided in one of the walls of said discharge chamber, said anode and hot cathode being so arranged in said discharge chamber that the hot cathode is opposite said slit; a target to be subjected to sputtering and a holder of said articles to be coated arranged in said vacuum chamber on opposite sides of the plasma flow; a magnetic system to



produce a magnetic field extending through said hot cathode and said slit of the discharge chamber perpendicular to said electric field between said hot cathode and anode; and an electron repeller arranged opposite the slit of the discharge chamber, the article holder and target being interposed between the discharge chamber and the electron repeller.

4,175,030
TWO-SIDED PLANAR MAGNETRON SPUTTERING APPARATUS
Robert B. Love, and Alan W. Bowen, both of Franklin, Tenn., assignors to Battelle Development Corporation, Columbus, Ohio
Continuation-in-part of Ser. No. 858,656, Dec. 8, 1977, Pat. No. 4,116,806. This application Sep. 22, 1978, Ser. No. 944,704
The portion of the term of this patent subsequent to Sep. 26, 1995, has been disclaimed.
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—298 **17 Claims**



1. A two-sided planar magnetron cathode comprising
a substantially planar frame formed about a substantially parallel interior plane,
a plurality of magnets supported within the frame and positioned with a neutral axis of each magnet substantially in the interior plane, and
at least one target plate supported on the frame on opposite sides of the interior plane.

4,175,031
HYDROCARBON CONVERSION WITH AN ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE
George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.
Continuation-in-part of Ser. No. 833,332, Sep. 14, 1977. This application Jun. 30, 1978, Ser. No. 921,160
Int. Cl.[2] C10G *35/08*
U.S. Cl. 208—138 **21 Claims**

1. A process for the conversion of a hydrocarbon which comprises contacting said hydrocarbon at reforming conditions with a catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier containing a uniform dispersion of a catalytically effective amount of a platinum group component, which is maintained in the elemental metallic state, and of an indium component.

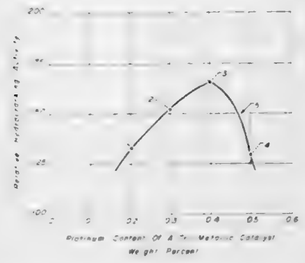
4,175,032
DEHYDROCYCLIZATION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE
George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.
Continuation-in-part of Ser. No. 786,744, Apr. 11, 1977, Pat. No. 4,110,201, which is a division of Ser. No. 621,718, Oct. 14, 1975, abandoned. This application Aug. 28, 1978, Ser. No. 937,623
The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.
Int. Cl.[2] C10G *35/08*
U.S. Cl. 208—139 **27 Claims**

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hydrocarbon at dehydrocyclization conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % cadmium and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt and cadmium components are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group component is present in the elemental metallic state; wherein substantially all of the cadmium component is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalytically available cobalt component is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon dehydrocyclization conditions or in a mixture of these states.

19. A method as defined in claim **1** wherein the dehydrocyclizable hydrocarbon is contained in a naphtha fraction boiling in the range of about 140° F. to about 400° F.

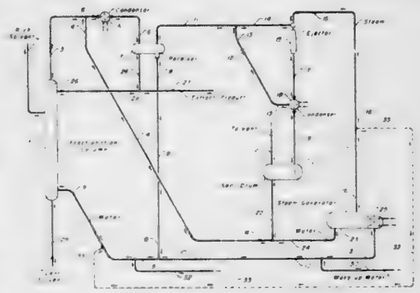
4,175,033
HYDROPROCESSING OF HYDROCARBONS OVER NICKEL, MOLY, PLATINUM CATALYST
Lee Hilfman, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.
Continuation-in-part of Ser. No. 810,323, Jun. 27, 1977, Pat. No. 4,148,759, which is a continuation-in-part of Ser. No. 684,055, May 6, 1976, abandoned. This application Dec. 18, 1978, Ser. No. 970,781
Int. Cl.[2] C10G *23/06*; B01J *23/56. 27/04. 29/12*
U.S. Cl. 208—143 **10 Claims**

1. A hydrocarbon hydroprocess which comprises reacting a hydrocarbon with hydrogen at conditions selected to effect chemical consumption of hydrogen, and in contact with a catalytic composite comprising a combination of a nickel component, a molybdenum component and a platinum component with a zeolitic carrier material wherein said platinum component is present in an amount sufficient to result in the composite



containing, on an elemental basis, about 0.2 to about 0.5 percent by weight platinum.

4,175,034
CLOSED-LOOP VACUUM FRACTIONATION PROCESS
H. Lytle Thompson, Park Ridge, Ill., assignor to UOP Inc., Des Plaines, Ill.
Filed Oct. 10, 1978, Ser. No. 949,606
Int. Cl.[2] B01D *3/10*; C10G *7/00, 21/28*
U.S. Cl. 208—321 **7 Claims**



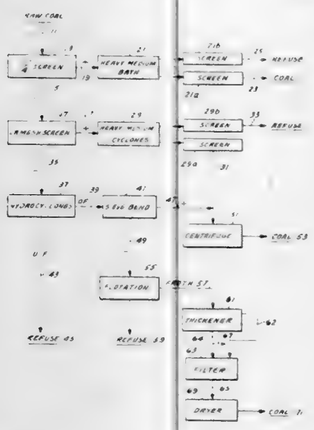
1. A method of fractionating distillable mixtures which comprises the steps of:
(a) passing a feed stream comprising water and a mixture of a first and a second distillable hydrocarbonaceous compounds into a fractionation column at a first point, and removing a first product stream comprising the first distillable hydrocarbonaceous compound from the fractionation column at a second lower point;
(b) effecting a partial condensation of an overhead vapor stream comprising water vapor and the second distillable hydrocarbonaceous compound and which is removed from the fractionation column by admixing the overhead vapor stream with a hereinafter specified liquid recycle stream and by passing the overhead vapor stream through a first condensing zone, and passing the resultant mixed-phase stream into an overhead receiver maintained at a subatmospheric pressure;
(c) withdrawing an overhead liquid comprising the second distillable hydrocarbonaceous compound and containing less than 10 mole percent water from the overhead receiver, passing a first portion of the overhead liquid into the fractionation column as reflux and removing a second portion of the overhead liquid as a second product stream;
(d) passing a first vapor stream comprising water and the second distillable hydrocarbonaceous compound from the overhead receiver to the suction inlet of a steam-jet ejector operated at conditions effective to maintain the subat-

mospheric pressure in the overhead receiver and thereby forming an ejector effluent stream comprising the second distillable hydrocarbonaceous compound and steam;
(e) condensing at least a portion of the ejector effluent stream by passage through a second condensing zone;
(f) passing the ejector effluent stream into a vapor-liquid separation zone maintained at conditions effective to separate the ejector effluent stream into a second vapor stream comprising water and a condensate liquid stream comprising water and the second distillable hydrocarbonaceous compound;
(g) admixing the condensate liquid stream into the overhead vapor stream as the liquid recycle stream of step (b);
(h) removing an aqueous liquid stream comprising at least 60 mole percent water from the overhead receiver and passing at least a first portion of the aqueous liquid stream into a steam generation zone wherein by indirect heat exchange against a high temperature fluid the first portion of the aqueous liquid stream is at least partially vaporized to form moderate pressure steam; and,
(i) passing at least a portion of the moderate pressure steam into the steam-jet ejector of step (d) as the motive stream utilized in the ejector.

4,175,035
METHOD FOR INCREASING FINE COAL FILTRATION EFFICIENCY

William H. Moyer, Jr., Coopersburg, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Feb. 27, 1978, Ser. No. 881,977
Int. Cl.[2] B03D *1/02*
U.S. Cl. 209—5 **4 Claims**

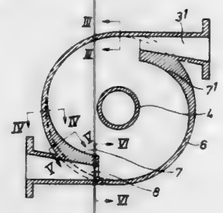


1. In a coal treatment process wherein coal fines are treated in a flotation process followed by filtration of the resultant flotation froth product containing water, coal particles and froth bubbles to isolate coal fines, the improvement comprising:
(a) collecting the flotation froth product prior to filtration,
(b) treating the collected flotation froth product in a thickening apparatus containing a sufficient body of aqueous liquid to physically decompose a portion of the froth and yield (1) a thickened froth which floats upon the surface of the body of aqueous liquid, (2) a coal containing aqueous liquid stream removed from a point between the surface of the aqueous liquid and the bottom of the thickening apparatus and (3) an underflow of a slurry of coal particles which sink to and are removed from the bottom of the thickening apparatus,
(c) removing the thickened flotation froth from the thickening apparatus, and
(d) filtering the thickened flotation froth to yield said coal fines.

4,175,036
HYDROCYCLONE SEPARATOR

Rune H. Frykhult, Huddinge, Sweden, assignor to AB Celleco, Stockholm, Sweden

Filed Jul. 10, 1978, Ser. No. 923,207
Claims priority, application Sweden, Jul. 18, 1977, 7708270
Int. Cl.[2] B04C *5/04*
U.S. Cl. 209—211 **4 Claims**

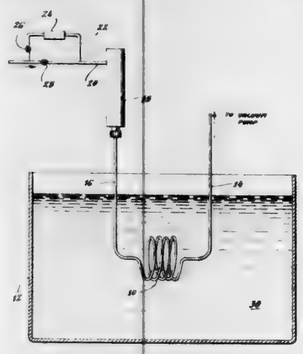


1. In a hydrocyclone separator for separating a mixture into two fractions, the combination of means forming a separation chamber having an axis and a surrounding wall, said chamber including a circular cylindrical part provided with at least one tangential inlet for the incoming mixture and with a central first outlet for one of the fractions, said inlet having an orifice in the chamber, said chamber also including a conical part and a second outlet for the other fraction and to which said conical part leads, and a guide bar located in said cylindrical part of the separation chamber, said bar extending from said wall circumferentially along said wall at least to said orifice and being bent and inclined to give the flow of mixture fed through said inlet a component of movement directed radially inward and a component of movement directed axially toward said conical part of the chamber.

4,175,037
PROCESS FOR PACKING CHROMATOGRAPHIC COLUMNS

Charles H. Benney, Stamford, Conn., and Thomas J. Filipi, Landenberg, Pa., assignors to Whatman Inc., Clifton, N.J.

Filed Apr. 10, 1978, Ser. No. 894,716
Int. Cl.[2] B01D *15/08*
U.S. Cl. 210—31 C **33 Claims**



1. A method of packing a chromatographic column which

comprises introducing a packing material into a chromatographic column in a predetermined direction under the influence of a first pressure differential and in the substantial absence of substantially regular periodic vibration until said chromatographic column is filled to a desired extent with said packing material, and subsequently establishing a substantially regular periodic vibration along the length of said column and subjecting said packing material to a second pressure differential therein, said first and second pressure differentials being applied in said predetermined direction so as to aid in filling and packing said column with said packing material.

4,175,038
PURIFICATION OF WASTE STREAMS CONTAINING AVAILABLE CHLORINE

Walter J. Sakowski, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Jul. 21, 1978, Ser. No. 926,771
Int. Cl.[2] C02B *1/36*
U.S. Cl. 210—62 **8 Claims**

1. A process for reducing the available chlorine content of an impure aqueous solution of the type produced in a plant selected from the group consisting of an alkali metal hypochlorite plant and an alkaline earth metal hypochlorite plant which comprises chlorinating said impure aqueous solution at a temperature in the range between about 80° to about 100° C. and at a pH in the range from about 5.5 to about 8.5, whereby a major portion of said available chlorine is formed into the corresponding chlorate.

4,175,039
WASHER/SEPARATOR SYSTEM FOR DRILLING CUTTINGS IN WATER ENVIRONMENT OIL WELLS

Johnny D. Fisher, 118 Clause La., Lafayette, La. 70507

Filed Jan. 30, 1978, Ser. No. 873,377
Int. Cl.[2] B01D *21/02*
U.S. Cl. 210—74 **4 Claims**

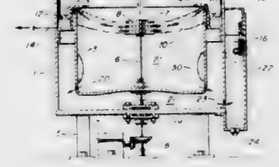


1. The method of disposing of cuttings intermingled with fluids, such as oil, which are considered pollutants in water, from a well being drilled in a water environment comprising the following steps:
(a) providing a washer/separator system at the drilling site which includes
a washer/separator receiving tank having an initial portion into which the cuttings with mud and/or other fluid coatings thereon and water are dumped;
a cuttings outlet feed secion located at the bottom of said tank;
guiding means for directing and guiding the cuttings into said outlet feed section;
a cutting outlet opening in said tank adjacent said outlet feed section;
extended mechanical screw driving means for moving the cuttings from said feed section to and through said outlet openings for dumping out the cuttings;
fluid outlet means located substantially above said cuttings outlet feed section and away from said initial portion of said tank for removing the fluids from said tank;
agitation means located in said initial portion of said tank where the coated cuttings and fluids are initially introduced into the tank for enhancing the washing of the cuttings; and
control means for turning said screw driving means "on" and "off";
(b) providing an initial supply of treating fluid into said tank;
(c) dumping the cuttings intermingled with fluids into said initial portion and agitating them with the treating fluids;
(d) allowing the cuttings to be washed by the agitation and treating fluids to fall down into said feed section at the bottom of the tank;
(e) allowing the polluting fluids to rise and collect in the fluid containing interior area;
(f) intermittently and cyclically turning on said screw driving means when said feed section is filled with washed cuttings to drive the washed cuttings out of the tank;
(g) disposing of the washed cutting by dumping the washed cuttings into the water environment; and
(h) intermittently and cyclically turning off said screw driving means upon the fluid level in said tank reaching a pre-selected minimum level; whereby the cuttings are regularly disposed of into the water environment without pollution problems.

4,175,040
CENTRIFUGAL WATER OIL SEPARATOR

John K. Sammons, Marrero, and Charles H. Fox, Jr., Slidell, both of La., assignors to Continental Oil Company, Ponca City, Okla.

Filed Aug. 28, 1978, Ser. No. 937,391
Int. Cl.[2] B04B *1/12*
U.S. Cl. 210—78 **9 Claims**



1. An apparatus for recovering oil from oil water mixtures comprising two nested bowls; an outer stationary and an inner rotating bowl having an annulus therebetween, the inner bowl having a flange affixed to the upper periphery thereof and covering a portion of the bowl interior, each bowl being penetrated by a shaft, said shaft being rigidly affixed to the inner bowl and rotatably attached to the outer bowl by means sealing the shaft aperature from liquid passage, said shaft connected at the lower end to motive means capable of rapidly rotating said shaft and at the upper end to a perforated basket rigidly fixed to said shaft, said inner bowl having multiple aperatures in the lower portion thereof and multiple aperatures at the upper periphery thereof substantially adjacent said flange and a groove or channel in the annulus rigidly affixed to said stationary outer bowl at a level below the level of the upper aperatures in the rotatable inner bowl, the lower portion of said channel in fluid communication with the exterior of the stationary outer bowl and at least one aperature in the lower portion of the outer bowl in fluid communication with a fluid leveling means capable of balancing inflow and outflow.

7. A method for continuously recovering oil from oil-water mixtures comprising placing a stream of oil-water mixture into an oil-water separator having an outer stationary bowl and an inner rotatable bowl having an annulus therebetween, the inner

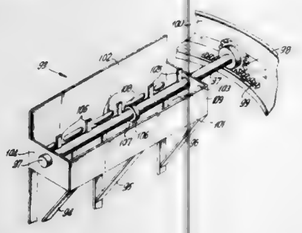
bowl having a flange affixed to the upper periphery thereof and covering a portion of the bowl interior, each bowl penetrated by a shaft said shaft being rigidly fixed to the inner bowl and rotatably attached to the outer bowl by means sealing the shaft aperature from liquid passage, said shaft having at the upper end a dispersant means rigidly affixed to said shaft, said inner bowl having multiple aperatures in the lower portion thereof and multiple aperatures at the upper periphery thereof substantially adjacent said flange, and a groove or channel in the annulus between the bowls, rigidly fixed to said stationary outer bowl at a level below the level of the upper aperatures in the periphery of the rotatable inner bowl, said channel being in fluid communication with the exterior of the outer bowl; at least one aperature in the lower portion of the outer bowl in fluid communication with a fluid leveling means capable of balancing inflow and outflow, wherein oil-water mixture entering the rapidly rotating dispersing means passes into the rapidly rotating inner bowl, separates into heavier water in the lower portion thereof and lighter oil at the upper portion thereof, the centrifugal force passing the oil to the upper portion thereof and through said aperatures into a channel from which oil is recovered, and water is passed through the lower aperatures thereof into the annulus from whence said water flows to a fluid leveling means whereby the inflow and outflow are balanced.

4,175,041

APPARATUS FOR DEGASSING FLOATING SLUDGE

Raymond F. Drnevich, Clarence; Kallidaikurichi N. Venkataraman, Tonawanda, and Thomas E. Walder, Newfane, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 5, 1977, Ser. No. 839,559
Int. Cl.² B01D *19/02*
U.S. Cl. 210—188 **11 Claims**



1. Apparatus for degassing floating solids containing entrapped gas in an open-topped liquid-solid settling chamber wherein said floating solids tend to accumulate at the surface of liquid being separated from solids, said solid-liquid settling chamber including means for introducing liquid-solid to be separated to said chamber, means for withdrawing solids-depleted liquid from an upper section of said chamber and means for withdrawing settled solids from a lower section of said chamber, said apparatus comprising: an open-topped trough enclosure positioned such that said trough enclosure is partially submerged in the liquid in said liquid-solid settling chamber, having a first wall member terminating at an upper end below the surface of liquid in said liquid-solid settling chamber and a second wall member substantially parallelly aligned with respect to the first wall member and spaced therefrom, terminating at an upper end above the surface of liquid in said liquid-solid settling chamber, whereby liquid containing floating solids is flowed into said trough enclosure over said first wall member thereof; a rotatable shaft mounted in said trough enclosure with its longitudinal axis generally horizontally oriented and parallel to said first and second wall members of said trough enclosure; a plurality of radially extending, nonhelical blades joined to said shaft along the length thereof; means for rotating said shaft whereby said blades gently agitate said liquid containing floating solids in said trough enclosure for degassing of same, to form liquid containing degassed solids; and means for discharging said liquid containing degassed solids from said trough enclosure into said liquid-solid settling chamber.

4,175,042

WELL COMPLETION AND WORK OVER FLUID AND METHOD OF USE

Thomas C. Mondshine, Houston, Tex., assignor to Texas Brine Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 735,169, Oct. 26, 1976, abandoned. This application Nov. 11, 1977, Ser. No. 850,639
Int. Cl.² E21B *43/00*
U.S. Cl. 252—8.55 R **16 Claims**

1. A well completion and work over fluid consisting essentially of:

a. a saturated brine solution consisting of any of the group of potassium chloride, sodium chloride, calcium chloride, sodium sulfate, sodium carbonate, sodium bicarbonate, calcium bromide and potassium carbonate;

b. a bridging agent consisting of at least one water soluble sized salt which is insoluble in the saturated brine solution, said sized water soluble salt having a particle size in the range of approximately 5 microns to approximately 800 microns and wherein greater than about 5% of the particles are coarser than 44 microns;

c. the sized soluble salt that is insoluble in the saturated brine solution consisting of any of the group of potassium chloride, sodium chloride, calicum chloride, sodium sulfate, sodium carbonate, sodium bicarbonate, calcium bromide and potassium carbonate in the amount of approximately 4 pounds per barrel to about 50 pounds per barrel of saturated brine solution; and

d. a viscosifier and suspension additive in the amount of about 0.2 pound per barrel of saturated brine solution to about 5 pounds per barrel of saturated brine solution.

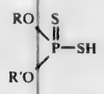
4,175,043

METAL SALTS OF SULFURIZED OLEFIN ADDUCTS OF PHOSPHORODITHIOIC ACIDS AND ORGANIC COMPOSITIONS CONTAINING SAME

Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 21, 1978, Ser. No. 944,448
Int. Cl.² C10M *1/48, 3/42;* **C07G** *17/00*
U.S. Cl. 252—32.7 E **24 Claims**

1. An organothiophosphorus compound comprising a metal salt of the reaction product of (1) a phosphorodithioic acid having the general formula:



wherein R and R' are hydrocarbyl and are the same or different with each having up to about 30 carbon atoms and (2) a sulfurized olefin having from about 2 to about 8 carbon atoms and sufficient reactive olefinic sites to react with said acid, thereby incorporating into the resultant organothiophosphorus compound from about 0.1 to about 10 wt. % of phosphorus.

4,175,044

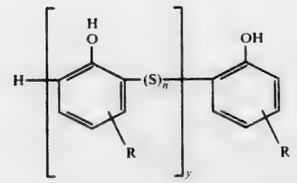
MANNICH BASE COMPOSITION AND LUBRICATING OIL COMPOSITIONS CONTAINING SAME

Donovan R. Wilgus, Richmond, and John M. King, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 756,568, Jan. 3, 1977, abandoned. This application Sep. 30, 1977, Ser. No. 838,196
Int. Cl.² C10M *1/54*
U.S. Cl. 252—42.7 **10 Claims**

1. A Mannich base condensation product selected from the group consisting of

(A) The Mannich base p epared by condensing formaldehyde and a polyamine with a sulfur-containing phenolic mixture consisting of (1) from 5 to 40% of a sulfurized alkylphenol of the formula

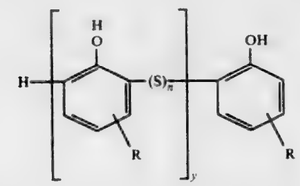


wherein R is C_8–C_{36} alkyl, n is an integer from 1 to 8, and y is an integer from 1 to 9, and (2) from 95 to 60% of a phenolic mixture consisting of (a) from 95 to 30% phenol alkylated with a propylene tetramer, and (b) from 5 to 70% phenol alkylated with a straight-chain alpha-olefin of from 16 to about 28 carbon atoms or alpha-olefin mixtures wherein the olefins are of from 16 to about 28 carbon atoms and

(B) the alkaline earth metal salts thereof.

4. A lubricating oil composition comprising an oil of lubricating viscosity and from 0.1 to 40% by weight of the condensation product or an alkaline earth metal salt thereof of claim **1**.

8. A process for preparing a Mannich base condensation product or an alkaline earth metal salt thereof which comprises condensing 0.5 to 0.85 mol of formaldehyde, at least 0.3 mol of a polyamine, and 1.0 mol of a sulfur-containing phenolic mixture consisting of (1) from 5 to 40% of a sulfurized alkylphenol of the formula



wherein R is C_8–C_{36} alkyl, n is an integer from 1 to 8, y is an integer from 1 to 9, and (2) from 95 to 30% phenol alkylated with propylene tetramer, and (b) from 5 to 70% phenol alkylated with a straight-chain alpha-olefin of from 16 to about 28 carbon atoms or alpha-olefin mixtures wherein the olefins are of from 16 to 28 carbon atoms, and, optionally, forming the alkaline earth metal salt thereof by treating the Mannich base with an alkaline earth metal hydroxide in the presence of a promoter.

4,175,045

COMPRESSOR LUBRICATION

Peter E. Timony, Valley Cottage, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 27, 1978, Ser. No. 881,483
Int. Cl.² C10M *3/20*
U.S. Cl. 252—56 S **9 Claims**

1. A method of lubricating a compressor which comprises bringing the components of said compressor which are to be lubricated into contact with an effective amount of a synthetic lubricant composition comprising a polyol ester of a carboxylic acid having from about 4 to about 13 carbon atoms in its structure.

4,175,046

SYNTHETIC LUBRICANT

Pierre M. Coant, Woodbury, and George W. Munns, Jr., West Deptford, Township, County of Gloucester, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 20, 1978, Ser. No. 944,519
Int. Cl.² C10M *1/26, 3/20*
U.S. Cl. 252—56 S **11 Claims**

1. In an improved lubricating oil composition comprising a major proportion of a lubricating oil and a combination of additives in an amount sufficient to achieve each additives function, the improvement whereby the lubricating oil composition comprises (1) a blend of oils comprising (a) from about 40 to about 60% by weight of said blend of a hydrogenated oligomer of an alpha olefin having from 6 to 12 carbon atoms and (b) from about 60 to about 40% by weight of said blend of a mixture of at least two synthetic ester oils in the proportion of 20 to 30% by weight of either, said ester oils being prepared by reacting a monocarboxylic acid having from 6 to 18 carbon atoms with a polyhydroxy aliphatic hydrocarbon containing 4 to 8 carbon atoms and from 2 to 4 hydroxyls and (2) said combination of additives, which combination does not contain a viscosity index improver.

4,175,047

SYNTHETIC ESTER AND HYDROGENATED OLEFIN OLIGOMER LUBRICANT AND METHOD OF REDUCING FUEL CONSUMPTION THEREWITH

John W. Schick, Cherry Hill, and Joan M. Kaminski, Clementon, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 25, 1978, Ser. No. 945,282
Int. Cl.² C10M *1/26, 3/20*
U.S. Cl. 252—56 S **24 Claims**

1. An organic fluid composition comprising a lubricating oil having from about 20% by weight to about 40% by weight of a hydroxyl-containing synthetic ester oil, or mixtures thereof, and from about 60% by weight to about 80% by weight of a synthetic hydrocarbon lubricating oil consisting essentially of a hydrogenated oligomer of an alpha olefin having from 6 to 12 carbon atoms.

4,175,048

GASEOUS INSULATORS FOR HIGH VOLTAGE ELECTRICAL EQUIPMENT

Loucas G. Christophorou, Oak Ridge; David R. James; Marshall O. Pace, both of Knoxville, and Robert Y. Pai, Concord, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

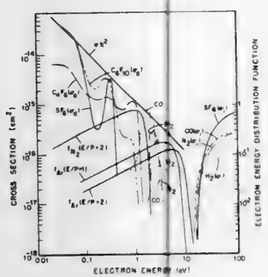
Filed Sep. 6, 1977, Ser. No. 830,973
Int. Cl.² H01B *3/56*
U.S. Cl. 252—63.5 **11 Claims**

1. Apparatus comprising a gas-tight casing, spaced electrical elements therein adapted to be subjected to differences of electrical potential, and a gaseous insulator between said elements, said gaseous insulator comprising a compound selected

from the group of perfluorocyclohexene and hexafluoroazomethane.

7. Apparatus comprising a gas-tight casing, spaced electrical elements therein adapted to be subjected to differences of electrical potential and a gaseous insulator between said elements, said gaseous insulator comprising a synergistic mixture comprising by volume at least 50% N_2, 10–30% hexafluoro-2-butyne, and 10–20% SF_6.

11. An apparatus comprising a gas-tight casing, spaced electrical elements therein adapted to be subjected to differences of electrical potential, and a gaseous insulator between said elements, said gaseous insulator comprising a synergistic mixture comprising a first component selected from the group of perfluorodimethylcyclobutane, perfluorocyclohexene, hexafluoroazomethane, perfluoromethylcyclohexane, hexafluorobutadiene, perfluoroheptene-1, perfluorobutene-2 and mixtures thereof and a second component selected from the group of SF_6, N_2, CO, CO_2, H_2, C_3F_8, C_6F_6 and mixtures thereof.



4,175,049

FUNCTIONAL FLUID METHODS USING ALKOXYSILANE ESTER CLUSTER COMPOUNDS

Karl O. Knollmueller, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 791,359, Apr. 27, 1977, Pat. No. 4,086,260. This application Jan. 12, 1978, Ser. No. 868,963

Int. Cl.² C10M *3/46*

U.S. Cl. 252—78.3 **12 Claims**

1. In a method wherein a fluid is used as a medium for the transmission of a functional impulse selected from pressure or heat from a first location to a second location, the improvement characterized by using as the functional fluid a composition containing an effective amount of a compound having the formula:



wherein R is hydrogen, an alkyl, alkenyl, aryl or aralkyl group, and R″ and the R′ groups are independently selected from alkyl, alkenyl, aryl and aralkyl with the proviso that at least a majority of the R′ radicals are sterically hindered alkyl groups having at least 3 carbon atoms.

4,175,050

SHAPED WASHING AGENTS HAVING A MOSAIC-LIKE STRUCTURE AND PROCESS

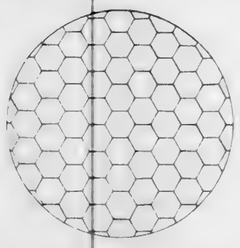
Franz-Josef Carduck, Haan am Rhld; Dietrich Klötzer, Düsseldorf; Werner Schneider, Krefeld, and Willi Wust, Ratingen-Hosel, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KgaA), Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 842,802

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1976, 2647447

Int. Cl.² C11D *13/18, 13/14*

U.S. Cl. 252—91 **14 Claims**



1. A process for the production of a soap bar shaped washing agent based on colored soaps and/or synthetic detergents comprising a plurality of individual colored particles of wash active substances selected from the group consisting of soap and synthetic detergent having a size range of 1 to 20 millimeters, so distributed that they adjoin one another with sharply defined boundaries, said boundaries being substantially free of occluded gas, to give a mosaic-like appearance to at least part of the surface of said shaped washing agent which comprises the steps of compressing a plurality of individual colored particles of wash active substances selected from the group consisting of soap and synthetic detergent having a size range of 1 to 20 millimeters at a temperature of from 15° C. to 45° C., at a press rate of from 0.1 to 5 meters per minute under a pressure of from 60 to 450 bar in the substantial absence of gas between said particles at a vacuum of less than 100 torr, to form a soap bar shaped article and recovering said soap bar shaped washing agent.

4,175,051

SCOURING PAD CONTAINING PHOSPHORIC ACID ESTER-FATTY ACID SOAP MIXTURES

Tetsuya Imamura; Takashi Hiraide, both of Tokyo; Haruhiko Arai, Narashino, and Megumu Hirakura, Matsudo, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jan. 26, 1978, Ser. No. 872,659

Claims priority, application Japan, Feb. 25, 1977, 52-20112

Int. Cl.² C11D *9/34, 9/46, 17/00*

U.S. Cl. 252—91 **10 Claims**

1. A scouring pad comprising a spongy, fine metal thread pad and a detergent composition impregnated therein, said detergent composition consisting essentially of from 5 to 40 percent by weight of one or a mixture of phosphoric acid ester salts having the formula (I):

$$[R(OCH_2CH_2)_m]_xPO_4H_{3-x-y}M_y \quad (I)$$

wherein R is alkyl or alkenyl having 10 to 22 carbon atoms or alkylphenyl having 6 to 18 carbon atoms in the alkyl group, wherein said alkyls or alkenyl can be linear or branched, m is from 0 to 10, x is from 1.0 to 2.0, y is from 0.5 to 2.0 with the proviso that the sum of x and y does not exceed 3, and M is an alkali metal, ammonium, alkanolamine, alkaline earth metal, zinc or aluminum cation,

and from 50 to 95 percent by weight of fatty acid soap having

10 to 22 carbon atoms, the weight ratio of said detergent composition to said fine metal thread pad being from 0.2/1 to 2.0/1.

4,175,052

ALKALINE-MnO_2 CELL HAVING A ZINC POWDER-GEL ANODE CONTAINING P-N-V-P OR PMA

William E. Norteman, Jr., Elyria, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 31, 1978, Ser. No. 892,311

Int. Cl.² H01M *4/62, 4/24, 4/38*

U.S. Cl. 252—182.1 **21 Claims**

1. A powder-gel anode comprising a major portion of a consumable anodic material, a minor amount of poly-N-vinyl pyrrolidone and an aqueous alkaline electrolyte solution.

10. A powder-gel anode comprising a major portion of a consumable anodic material, a minor amount of polymethacrylic acid and an aqueous alkaline electrolyte solution.

4,175,053

BASE REACTANT

Donald J. Peterson, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 12, 1976, Ser. No. 731,176

Int. Cl.² C09K *3/00;* **C11D** *13/00;* **C07C** *29/14, 17/26*

U.S. Cl. 252—192 **5 Claims**

1. A substantially water free-super base reaction medium consisting essentially of a mixture of an alkali metal hydroxide and an alkyl nitrile selected from the group consisting of acetonitrile and propionitrile wherein the ratio of alkyl nitrile to alkali metal hydroxide is from about 1:1 to about 1000:1.

4,175,054

USE OF HYDROCARBON POLYMERS IN DEMULSIFICATION

William S. Tait, Saint Louis, and Roy W. Greenlee, Ballwin, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Nov. 11, 1976, Ser. No. 741,150

Int. Cl.² B01D *17/04*

U.S. Cl. 252—331 **11 Claims**

1. A demulsifier composition comprising 1 to 20,000 parts of an oxyalkylated alkyl phenol-aldehyde resin and 5 to 100,000 parts of a hydrocarbon polymer or copolymer having a molecular weight of from 10,000 to 50,000.

5. A process of demulsification which comprises treating an emulsion with a demulsification composition comprising 1 to 20,000 parts of an oxyalkylated alkyl phenol-aldehyde resin and 5 to 100,000 parts of a hydrocarbon polymer or copolymer having a molecular weight of from 10,000 to 50,000.

4,175,055

DRY MIX METHOD FOR MAKING AN ELECTROCHEMICAL CELL ELECTRODE

Glen J. Goller, West Springfield, Mass.; Vincent J. Petraglia, Vernon, and Joseph R. Salonia, Middletown, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 28, 1978, Ser. No. 920,037

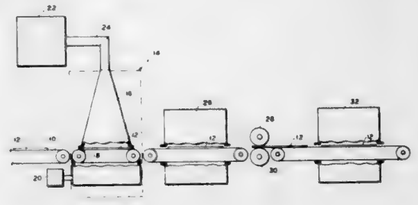
Int. Cl.² H01M *4/04, 4/96*

U.S. Cl. 252—425.3 **9 Claims**

1. A method for making an electrochemical cell electrode comprising the steps of:

blending together, in dry form, dry carbon particles and dry hydrophobic polymer particles to form a dry mixture;

applying a uniform layer of the dry mixture on the surface of a porous electrode substrate with virtually none of the mixture within the pores of the substrate by dispersing the mixture as a cloud of particles in a chamber over said surface of the substrate and pulling the carbon and polymer particles onto said surface by drawing a vacuum under the substrate;



compacting the applied layer; and

sintering the compacted layer.

4,175,056

ACTIVATED MULTIMETALLIC CATALYTIC COMPOSITE COMPRISING PYROLIZED RUTHENIUM CARBONYL

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 848,699, Nov. 4, 1977. This application Oct. 27, 1978, Ser. No. 955,555

Int. Cl.² B01J *27/10, 27/08, 23/46, 23/42*

U.S. Cl. 252—441 **12 Claims**

1. A catalytic composite comprising the pyrolyzed reaction product of a ruthenium carbonyl component with a porous carrier material containing a uniform dispersion of a catalytically effective amount of a platinum group element other than ruthenium maintained in the elemental metallic state, wherein said carbonyl component is pyrolyzed under anhydrous conditions in the substantial absence of free oxygen selected to decompose said carbonyl component until the evolution of carbon monoxide is halted.

4,175,057

ZEOLITE COMPOSITION

Evan E. Davies, Woking, and Alexander J. Kolombos, Thames Ditton, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Dec. 2, 1977, Ser. No. 856,668

Claims priority, application United Kingdom, Dec. 20, 1976, 53012/76

Int. Cl.² B01J *29/06*

U.S. Cl. 252—455 Z **5 Claims**

1. A zeolite composition comprising an aluminosilicate having a molar ratio of silica to alumina between about 20:1 and 70:1 in which cations have been exchanged with gallium ions or on which a gallium compound has been deposited.

4,175,058

CATALYTIC COMPOSITE FOR OXYDEHYDROGENATION OF ALKYLAROMATIC HYDROCARBONS

Tamotsu Imai, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 862,071, Dec. 19, 1977. This application Aug. 4, 1978, Ser. No. 930,941

Int. Cl.² B01J *29/06*

U.S. Cl. 252—455 R **4 Claims**

1. A catalytic composite comprising a combination of cobalt oxide, chromium oxide, alumina and magnesium oxide with a silica carrier material in amounts sufficient to result in a mole ratio of chromium oxide to cobalt oxide of about 0.2:1 to about 2:1, of alumina to cobalt oxide of about 0.05:1 to about 0.5:1 and of magnesium oxide to cobalt oxide of about 0.05:1 to about 0.5:1.

4,175,059

METHOD OF PREPARING A NOVEL PLATELET-TYPE CRYSTALLINE FORM OF SYNTHETIC FAUJASITE

Grant C. Edwards, Silver Spring; David E. W. Vaughan, Ellicott City, and Edwin W. Albers, Annapolis, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 764,246, Jan. 31, 1977, abandoned, which is a continuation-in-part of Ser. No. 592,439, Jul. 2, 1975, abandoned. This application Aug. 7, 1978, Ser. No. 931,512

Int. Cl.² B01J 29/08; C01B 33/28

U.S. Cl. 252—455 Z 15 Claims



1. In a process for preparing synthetic faujasite type zeolites wherein amorphous aluminosilicate zeolite nucelation centers having a particle size of below 0.1 microns are combined with a zeolite producing reaction mixture which contains alumina, silica, alkali metal hydroxide and water, and the mixture is heated to obtain faujasite type zeolite crystals, the improvement comprising:

(a) preparing a reaction mixture containing the following mol ratios of ingredients:
Na_2O/SiO_2—0.3 to 9
SiO_2/Al_2O_3—3 to 25
H_2O/Na_2O—12 to 90
K_2O/Al_2O_3—0.05 to 1.2

(b) adding to said mixture amorphous aluminosilicate zeolite nucleation centers having a particle size of below 0.1 microns, consisting essentially of the following range of composition:
Na_2O—12 to 20
SiO_2—14 to 19
Al_2O_3—0.75–5
H_2O—100 to 600

(c) heating the reaction mixture at a temperature of 40° to 150° C. for a period of about 10 minutes to 30 hours to obtain a faujasite type zeolite product wherein greater than about 5 percent by weight of the crystals comprising said product are characterized by a platelet flattened octahedron shape.

4,175,060

COMPOSITION AND PROCESSING PROCEDURE FOR MAKING THERMISTORS

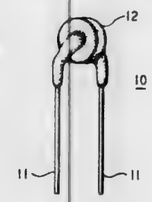
James W. Fleming, Jr., Fanwood; Henry M. O'Bryan, Jr., Plainfield, and John Thomson, Jr., Spring Lake, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 25, 1977, Ser. No. 854,813

Int. Cl.² H01B 1/08

U.S. Cl. 252—518 6 Claims

1. A process for making an electrical device comprising ceramic material with a positive temperature coefficient of resistance, said ceramic material comprising a first material and a second material, said first material comprising a substance with nominal formula $Ba_{1-x}M_xTi_yO_3$ with $x=0.004\pm0.0004$, $y=1.0075\pm0.0025$ and M represents lanthanum doping ion which renders barium titanate semiconducting where said first material is made by mixing together barium, titanium and lanthanum compounds which yield semiconducting barium titanate on heating in which the lanthanum compound is added by precipitation from an aqueous solution of a soluble lanthanum salt and heating said mixture to a temperature of 1150 degrees C. ±25 degrees C. for approximately six hours in an air atmosphere and said second material comprising 0.2 ± 0.05 weight percent Al_2O_3 said process comprising heating a mixture of the first material and the second material to a temperature of from 1300 to 1400 degrees C. for a time between one to four hours in air and cooling in air at a rate between 50 and 200 degrees C. per hour.



4,175,061

METHOD OF MANUFACTURING RESISTOR PASTE

Kenji Fujimura, Hachiohji, Japan, assignor to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed Feb. 21, 1978, Ser. No. 879,251

Claims priority, application Japan, Jul. 9, 1977, 52-82154

Int. Cl.² H01B 1/08

U.S. Cl. 252—518 10 Claims

1. A method of manufacturing a resistor paste comprising the steps of

(a) mixing together 1 to 40 weight percent ruthenium dioxide, 40 to 85 weight percent lead oxide, 10 to 30 weight percent silica, and 1 to 15 weight percent alumina to form a mixture,

(b) fusing the mixture of step (a) at 800° to 1200° C.,

(c) cooling and grinding the fused mixture of step (b), and

(d) adding a TCR modifier and an organic vehicle to the cooled and ground mixture of step (c), said TCR modifier being selected from the group consisting of 2 to 10 weight percent of ZrO_2; 0.5 to 20 weight percent of tin oxide; and 0.5 to 20 weight percent of tin oxide and up to 15 weight percent of Al_2O_3, the sum of which does not exceed 25 weight percent with respect to the total weight of the ground material and organic vehicle.

4,175,062

AQUEOUS CLEANSER COMPOSITIONS

Karlheinz Disch, Haan, and Eva Kiewert, Düsseldorf, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KgaA), Dusseldorf, Fed. Rep. of Germany

Filed Mar. 6, 1978, Ser. No. 883,685

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1977, 2709690

Int. Cl.² C11D 3/065, 1/83

U.S. Cl. 252—540 11 Claims

1. Liquid cleanser compositions for cleaning hard surfaces consisting essentially of an aqueous solution containing

(1) from 2% to 30% by weight of a tenside mixture consisting of:

(a) adducts of 3 to 30 mols of ethylene oxide onto alcohols selected from the group consisting of aliphatic-vicinal alkanediols having 10 to 20 carbon atoms and monoalkyl ethers of said alkanediols having 1 to 4 carbon atoms in the alkyl, and

(b) anionic sulfonic compounds selected from the group consisting of linear alkylbenzene sulfonic acids having 8 to 20 carbon atoms in the alkyl, linear alkane sulfonic acids having 8 to 20 carbon atoms, mixtures of said acids, and water-soluble salts of said acids selected from the group consisting of alkali metal salts, alkaline earth metal salts and ammonium salts, where the ratio of a:b is from 1:1 to 1:20,

(2) from 0 to 3% by weight of a water-soluble salt of a fatty acid having from 12 to 18 carbon atoms, and having a pH in the range of 7.0 to 10.5 as a 2% solution.

4,175,063

RESINOUS PRODUCT

Robert R. Harris, Burnham, and Warren J. Pollack, Carpentersville, both of Ill., assignors to International Minerals & Chemical Corporation, Terre Haute, Ind.

Filed Jun. 1, 1978, Ser. No. 911,654

Int. Cl.² C09D 3/52, 3/64, 3/66

U.S. Cl. 260—22 R 2 Claims

1. A high-solids resinous product obtained by the process comprising reacting an unsaturated aliphatic monocarboxylic acid 32–34%, one or more aromatic dicarboxylic acids or anhydrides thereof 36–38%, a mixture of bis- and tris(hydroxy-)alkanes 28–30% and a monohydric alcohol 1.2–1.4%, in the presence of catalytic amounts of dibutyl tin oxide and a solvent at a temperature of up to 430° F. until the acid value is less than about 3.0, said resinous product having a non-volatile content of about 96%, a Gardner viscosity about Z_1 and a viscosity at 125° C. of about 0.4 poise.

4,175,064

ACCELERATOR SYSTEMS FOR THE PEROXIDE-CATALYZED CURING OF UNSATURATED POLYESTER RESIN COMPOSITIONS

Marvin Landau, North Bergen, N.J.; Samuel J. Bellettiere, New Hope, Pa., and Samuel Hoch, Brooklyn, N.Y., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Sep. 28, 1978, Ser. No. 946,688

Int. Cl.² B01J 31/12; C09D 3/68; C09F 9/00

U.S. Cl. 260—22 CA 26 Claims

1. In the process for the curing of an unsaturated polyester resin composition that comprises contacting a composition comprising an unsaturated polyester resin and an unsaturated monomer capable of reacting with said unsaturated polyester resin to form cross-linkages with an organic peroxide catalyst and an accelerator system, the improvements wherein the accelerator system comprises at least one cobalt salt and at least one potassium salt of monocarboxylic acids selected from the group consisting of aliphatic, aromatic, and alicyclic monocarboxylic acids having 6 to 24 carbon atoms and the accelerator system is present in an amount that will provide from 0.001% to 0.1% of cobalt (as metal) and 0.001% to 0.1% of potassium (as metal), based on the weight of the unsaturated polyester resin composition.

4,175,065

METHOD FOR GLUEING WITH CURABLE, FORMALDEHYDE-BASED ADHESIVES AND A CURING COMPOSITION FOR USE IN THE METHOD

Sven-Erik Andersson, Nacka, Sweden, assignor to AB Casco, Stockholm, Sweden

Filed May 12, 1978, Ser. No. 905,393

Claims priority, application Sweden, May 13, 1977, 7705636

Int. Cl.² C08L 61/10

U.S. Cl. 260—29.3 11 Claims

1. In the known method of glueing with resins formed from resorcinol-formaldehyde or resorcinol-phenol-formaldehyde precondensates and hardener compositions containing paraformaldehyde suspended in a suspending agent, the improvement which comprises using as a suspending agent for the paraformaldehyde a precondensate between a ketone and formaldehyde.

4,175,066

DISPERSANT FOR CALCIUM CARBONATE

Hiroji Shibazaki, Takarazuka; Setsuji Edagawa; Hisashi Hasegawa, both of Nishinomiya; Takashi Takeuchi; Noboru Moriyama, both of Wakayama, and Yukihiro Fukuyama, Naga, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1978, Ser. No. 893,696

Claims priority, application Japan, Apr. 18, 1977, 52/44259

Int. Cl.² C08K 3/26

U.S. Cl. 260—29.6 M 10 Claims

1. An aqueous dispersion consisting essentially of water, calcium carbonate particles having a particle size of from 0.02 to 10 microns and, as a dispersing agent, from about 1 to about 5 wt. %, based on the weight of said calcium carbonate particles, of a salt of an acrylic acid/maleic acid copolymer or mixture thereof, the molar ratio of acrylic acid/maleic acid monomer units in said copolymer being in the range of from 100/5 to 100/200 and said copolymer having a molecular weight of from 1,000 to 20,000.

4,175,067

CURABLE BINDER FOR LARGE FOUNDRY SAND SHAPES

Roger H. Kottke, Crystal Lake, and Scott S. Menard, Mt. Prospect, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Aug. 17, 1977, Ser. No. 825,447

Int. Cl.² C08K 5/05, 3/36, 5/10

U.S. Cl. 260—30.4 R 11 Claims

1. A foundry binder comprising monomeric furfuryl alcohol in an amount between 45–85 percent, inclusive, an aromatic resin mixture of carbomethoxy polyphenyl and polycarbomethoxy diphenyls, said aromatic mixture being present in an amount between 5–50 percent, inclusive, another alcohol in an amount between 2–15 percent, inclusive, all percentages being percent by weight based on the weight of the binder.

4,175,068

WATER-SOLUBLE COATING COMPOSITION

Atsushi Kaiya, Kawasaki; Yutaka Otsuki, and Hideo Horii, both of Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Division of Ser. No. 518,824, Oct. 29, 1974, abandoned. This application Oct. 25, 1977, Ser. No. 844,546

Claims priority, application Japan, Nov. 1, 1973, 48/123042

Int. Cl.² C08K 5/09

U.S. Cl. 260—31.2 MR 16 Claims

1. A water-soluble coating composition comprising an adduct (1) of a butadiene lower polymer or lower copolymer (A) which has a number average molecular weight in a range of 200–10,000 and is a liquid or semi-liquid at room temperature and 60 ,β-ethylenically unsaturated dicarboxylic acid compound (B) resulting from the reaction of said (A) and (B) at a temperature in the range of 120° to 250° C. in the presence of one or more of compounds (C) in an amount of 0.005 to 5 percent by weight of said (A), said compound (C) being selected from catechol derivatives, pyrogallol derivatives, and naphthol derivatives; a hydrophilic solvent (2) in an amount of less than 100 parts by weight to 100 parts by weight of said (A); and a neutralizer (3) in a range of 0.2 to 2.0 equivalents to said (A).

V 9 8 8 N 0 2 0 7 9 UMI

4,175,069

PLASTICIZATION OF NEUTRALIZED SULFONATED ELASTOMERIC POLYMER

Douglas Brenner, Livingston, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 855,547, Nov. 29, 1977, Pat. No. 4,131,587. This application Oct. 2, 1978, Ser. No. 947,430

Int. Cl.[2] C08K *5/18*

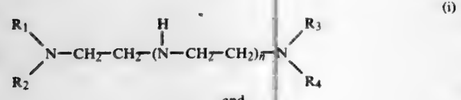
U.S. Cl. 260—32.6 A **12 Claims**

1. An elastomeric composition including:

(a) a neutralized sulfonated elastomeric polymer having about 10 to 80 meq. of neutralized sulfonate groups/100 grams of said neutralized sulfonated polymer, and

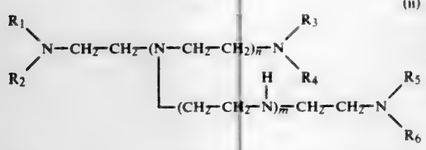
(b) about 0.1 to about 40 parts by weight of a polydentate amine per 100 parts of neutralized sulfonated polymer, said polydentate amine having a structure selected from the group consisting of:

(i)



and

(ii)



wherein R_1, R_2, R_3, R_4, R_5 and R_6 are independently selected from the group consisting of hydrogen, and C_1 to C_{22} straight and branched chain alkyl groups, n being 1,2,3 or 4 and m being 0,1,2, or 3.

4,175,070

HIGH CARBON FRICTION MATERIAL

Bruce W. Klein, West Bloomfield, and Michael G. Jacko, Southfield, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jun. 2, 1978, Ser. No. 911,848

Int. Cl.[2] C08K *3/04, 3/08, 3/22*

U.S. Cl. 260—38 **12 Claims**

1. A friction material consisting of a mixture of:

20–33% by weight of fibers selected from a group consisting of glass fiber, asbestos and other mineral fibers;

4–22% by weight of metal or metal oxide particles;

0–7% by weight of organic modifiers;

7–24% by weight of inorganic modifiers;

18–34% by weight of carbon or graphite particles; and

8–14% by weight of a thermosetting phenolic resin,

said thermosetting phenolic resin being cured to form a matrix for holding the selected fibers, metal or metal oxide particles, the organic and inorganic modifiers and carbon or graphite particles in a fixed relationship, said carbon or graphite particles modifying the abrasive effect of said fibers on a mating surface to prevent degradation thereof.

4,175,071

TITANIUM DIOXIDE AS A U.V. SCREEN IN FIRE RETARDANT VINYL POLYMERS

Stephen Y. Chen, Elburn, and Thomas M. Quinn, St. Charles, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Continuation of Ser. No. 772,109, Feb. 25, 1977, abandoned, which is a continuation of Ser. No. 635,032, Nov. 25, 1975, abandoned. This application Jul. 7, 1978, Ser. No. 922,543

Int. Cl.[2] C08K *3/22, 5/02*

U.S. Cl. 260—42.44 **6 Claims**

1. A method for producing a flame retardant, discoloration resisting styrene polymer composition comprising incorporating into said composition (1) a flame retarding amount of a halogenated organic compound which contains up to about 20 carbon atoms and forms a discolored product when incorporated into styrene polymers and exposed to ultraviolet radiation, and (2) a discoloration retarding amount of titanium dioxide.

4,175,072

LIGHT-COLORED UNSATURATED POLYESTER RESINS CONTAINING AT LEAST 2% BROMINE BY WEIGHT

Alan J. Parr, Bromborough, and Bryan O. Brown, Upton-by-Chester, both of England, assignors to Freeman Chemical Corporation, Port Washington, Wis.

Filed May 24, 1978, Ser. No. 909,009

Claims priority, application United Kingdom, Jul. 9, 1977, 28882/77

Int. Cl.[2] C08G *63/52, 63/68*

U.S. Cl. 528—299 **1 Claim**

1. A method for producing a light-colored unsaturated polyester resin containing at least 2% by weight bromine from polyols or alkylene oxides and polycarboxylic acids or anhydrides wherein at least 5 mol percent of the polyol ingredient is dibromo neopentyl glycol and wherein from 5 to 85 mol percent of the polycarboxylic acid or anhydride is tetrahydrophthalic acid or anhydride or endomethylene tetrahydrophthalic acid or anhydride

and wherein the polycarboxylic acid or anhydride also contains at least 10 mol percent of alpha-beta ethylenically unsaturated dicarboxylic acid or anhydride to yield an unsaturated polyester resin having a color which is lighter than the color of a corresponding unsaturated polyester resin which does not contain the tetrahydrophthalic acid or anhydride or endomethylene tetrahydrophthalic acid or anhydride.

4,175,073

REACTIVE DERIVATIVES OF HS-GROUP-CONTAINING POLYMERS

Jan P. E. Carlason, Uppsala; Rolf E. A. V. Axén, Balinge; Hakan N. Y. Drevin, Brunna, and Goran E. S. Lindgren, Almunge, all of Sweden, assignors to Pharmacia Fine Chemicals AB, Uppsala, Sweden

Filed Mar. 2, 1978, Ser. No. 882,547

Claims priority, application Sweden, Mar. 4, 1977, 7702463

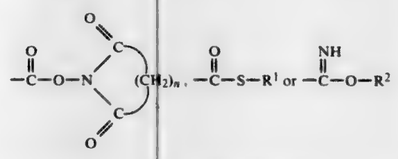
Int. Cl.[2] C07G *7/00*

U.S. Cl. 260—112 R **8 Claims**

1. A reactive derivative of an HS-group-containing polymer, wherein a number of HS-groups are converted to a disulphide group of the formula

—S—S—A—Z

where A is a hydrocarbon residue having 1–10 carbon atoms and Z is a group



or acid addition salts of the last mentioned group, where n is 2 or 3, R^1 is 2-pyridyl, 5-nitro-2-pyridyl or 4-pyridyl and R^2 is methyl or ethyl.

4,175,074

SERUM-SOLUBLE CHOLESTEROL COMPOUNDS AND METHOD FOR THEIR PREPARATION

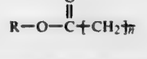
Arvind D. Deshmukh, 1011 Pearl St., Santa Monica, Calif. 90405

Division of Ser. No. 716,615, Aug. 23, 1976, Pat. No. 4,040,784. This application Apr. 15, 1977, Ser. No. 787,737

Int. Cl.[2] C07G *7/00;* **G01N** *33/16*

U.S. Cl. 260—121 **6 Claims**

1. As a new composition of matter, a cholesterol ester conjugatively coupled to the amino residue of a peptide or protein, having as a functional component said ester



in which R is a cholesteryl radical and n is 0–3, said ester being soluble in serum in an amount equivalent to form at least 400 milligrams of cholesterol per 100 milliliters of cholesterol-free serum.

4,175,075

ISOLATION OF PROTEIN FROM VEGETABLE SEEDS

Charles M. Garrison, Fairfield; Rudolph W. Youngquist, and Harry M. Taylor, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 7, 1978, Ser. No. 922,919

Int. Cl.[2] A23J *1/14*

U.S. Cl. 260—123.5 **19 Claims**

1. A process for recovering vegetable seed protein granules from vegetable seed material, comprising suspending comminuted vegetable seed material having from about 10% to about 70% lipid and containing protein granules in an aqueous solution comprising an electrolyte selected from the group consisting of alkali metal halides and alkali metal phosphates, at a concentration greater than about 1%, and a carbohydrate, at a concentration greater than about 1%, said aqueous solution having a density of from about 1.1 to about 1.5 and a water activity of less than about 0.9, and, isolating the vegetable seed protein granules from the balance of the vegetable seed material.

4,175,076

AZETIDINONE MERCURY SULFIDES AND PROCESS THEREFOR

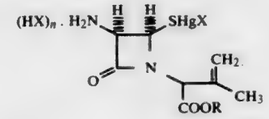
Lowell D. Hatfield, Bargersville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 21, 1977, Ser. No. 853,064

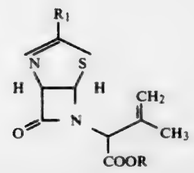
Int. Cl.[2] C07D *205/08*

U.S. Cl. 260—239 A **10 Claims**

1. A process for preparing a compound of the formula



by reacting a compound of the formula



with about 1.0 to about 1.2 equivalents of a mercuric halide of the formula HgX_2 in an inert organic solvent in the presence of at least about an equivalent amount of a C_1 to C_8 primary or secondary alcohol or C_1–C_8 diol

wherein in the above formulas n is 1 or 0, X is chloro or bromo, R is hydrogen or a carboxylic acid ester protecting group and R_1 is

(a) C_1–C_4 alkyl or halo-C_1–C_4 alkyl;

(b) benzyloxy, 4-nitrobenzyloxy, 2,2,2-trichloroethoxy, tert-butoxy, benzhydryloxy, 4-methoxybenzyloxy;

(c) the group R_2 wherein R_2 is 1,4-cyclohexadienyl, phenyl or phenyl substituted with 1 or 2 substituents selected from the group consisting of chloro, bromo, iodo, hydroxy, nitro, cyano, trifluoromethyl, C_1–C_4 alkyl or C_1–C_4 alkoxy;

(d) an arylalkyl group of the formula

R_2—$(O)_m$—CH_2—

wherein R_2 is as defined above and m is 0 or 1; or

(e) a heteroarylmethyl group of the formula

R_3CH_2—

wherein R_3 is 2-thienyl, 3-thienyl, 2-furyl, 2-thiazolyl, 5-tetrazolyl, 1-tetrazolyl, or 4-isoxazolyl.

4,175,077

RIFAMYCIN COMPOUNDS

Vittorio Rossetti; Leonardo Marsili, and Carmine Pasqualucci, all of Milan, Italy, assignors to ARCHIFAR Industrie Chimiche del Trentino S.p.A., Rovereto, Italy

Filed Aug. 12, 1977, Ser. No. 825,163

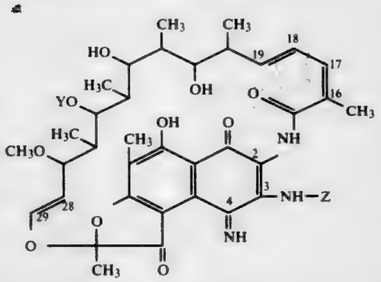
Claims priority, application Italy, Sep. 30, 1976, 5209 A/76

The portion of the term of this patent subsequent to Apr. 12, 1994, has been disclaimed.

Int. Cl.[2] C07D *498/08*

U.S. Cl. 260—239.3 P **1 Claim**

1.

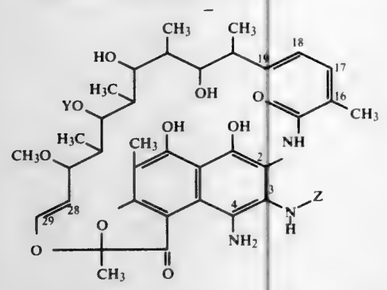


(II)

and 16, 17, 18, 19 tetrahydroderivatives and 16, 17, 18, 19, 28, 29 hexahydroderivatives thereof, wherein:

Y is —H or —$COCH_3$ and Z is an alkyl having 1 to 4 C atoms; cycloalkyl having 3 to 6 C atoms; phenyl; phenyl substituted with one radical selected from the group con-

sisting of halogen, methyl and hydroxy; and corresponding reduced compounds of formula:



(III)

and 16, 17, 18, 19 tetrahydroderivatives and 16, 17, 18 , 19, 28, 29 hexahydroderivatives thereof, wherein Y and Z are as above defined.

4,175,078

CARDENOLIDE AND BUFADIENOLIDE DERIVATIVES OF AJMALINE AND PROCESS FOR PRODUCING SAME

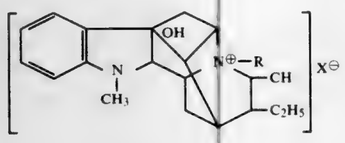
Ivan F. Makarevich; Yaroslav I. Khadzhai; Valeria V. Pavlova, and Anastasia V. Nikolaeva, all of Kharkov, U.S.S.R., assignors to Kharkovsky Naucho-Issledovatelsky Khimfo-Farmatsevtiches-Ky Institut, Kharkov, U.S.S.R.

Continuation-in-part of Ser. No. 880,694, Feb. 22, 1978, abandoned, which is a continuation of Ser. No. 735,211, Oct. 22, 1976, abandoned. This application Jul. 14, 1978, Ser. No. 924,922

Int. Cl.[2] **C07J** *19/00*

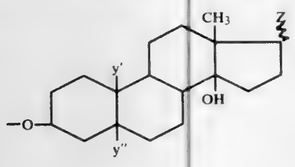
U.S. Cl. 260—239.57 **7 Claims**

1. The cardenolide and bufadienolide derivatives of ajmaline of the formula



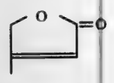
wherein

R is a steroid radical selected from the group consisting of cardenolide and bufadienolide of the formula

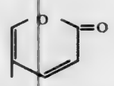


wherein

Z is an unsaturated lactone ring selected from the group consisting of a five-member unsaturated lactone ring of the formula



a six-member unsaturated lactone ring of the formula



y' is a radical selected from the group consisting of —CH_3, —CHO; y'' is a substituent selected from the group consisting of hydrogen and a hydroxy group;

X is a halogen radical.

4,175,079

BENZODIAZEPINE DERIVATIVES

Yutaka Kuwada, Ashiya; Hideaki Natsugari, Itami, and Kanji Meguro, Takarazuka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 6, 1972, Ser. No. 295,575

Claims priority, application Japan, Oct. 21, 1971, 46-83476

Int. Cl.[2] **A61K** *31/55;* **C07D** *487/04*

U.S. Cl. 260—243.3 **3 Claims**

1. The compound 9-chloro-7-(2-chlorophenyl)-3,5-dihydro-1-methylpyrimido[1,2-a][1,4]benzodiazepin-3-one.

4,175,080

PROCESS OF PRODUCING 5'-HYDROXYLEUROSINE AND RELATED COMPOUNDS

Gerald L. Thompson; Gloria C. Paschal, and Robert A. Conrad, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 822,466, Aug. 8, 1977, Pat. No. 4,122,081. This application Aug. 2, 1978, Ser. No. 930,477

Int. Cl.[2] **C07D** *519/04*

U.S. Cl. 260—244.4 **2 Claims**

1. The process which comprises the steps of oxidizing 5'-hydroxyleurosine at −60° C. with CrO_3 in acetone and acetic acid to prepare 5'-hydroxy leuroformine, isolating the 5'-hydroxyleuroformine thus formed and then reducing said 5'-hydroxyleuroformine with sodium cyanoborohydride at ambient temperature to prepare leuroformine.

4,175,081

5-SUBSTITUTED THIADIAZOLE UREAS

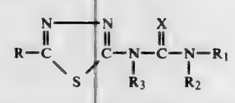
Patrick R. Driscoll, Spotswood, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 316,794, Dec. 20, 1972, which is a division of Ser. No. 296,389, Oct. 10, 1972, which is a continuation-in-part of Ser. No. 71,248, Sep. 10, 1970, abandoned, which is a division of Ser. No. 818,078, Apr. 21, 1969, abandoned, which is a continuation-in-part of Ser. No. 782,756, Dec. 10, 1968, abandoned, which is a continuation-in-part of Ser. No. 702,189, Feb. 1, 1968, abandoned. This application Dec. 22, 1977, Ser. No. 863,369

Int. Cl.[2] **A01N** *9/12;* **C07D** *285/12, 419/12*

U.S. Cl. 548—140 **3 Claims**

1. A compound of the formula



wherein R is alkoxyalkyl; R_1 is selected from the group consisting of H, alkyl (C_1–C_6), and cycloalkyl (C_3–C_6); R_2 is from the group consisting of H, alkyl (C_1C_4), haloalkyl (C_1–C_4), alkoxy (C_1–C_4), alkenyl (C_2–C_4), alkynyl (C_2–C_4), aryl, and haloaryl, and wherein R_1 and R_2 are alkylene which, together with N, form a ring of at least 3, but not more than 6 members; R_3 is H or alkyl ($C_{1\text{-}6}$); and X is selected from the group consisting of oxygen and sulfur.

4,175,082

PROCESS FOR PREPARING N-CHLOROIMIDES

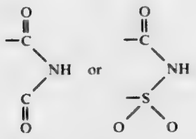
Ta-Sen Chou, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 19, 1977, Ser. No. 861,582

Int. Cl.[2] **C07D** *211/92, 217/24, 487/04, 209/48*

U.S. Cl. 260—326 C **15 Claims**

1. A process for preparing an N-chloroimide which comprises the step of contacting the corresponding imide containing one or more of either or both of the moieties



and devoid of additional functional groups which would react under the conditions herein specified with molecular chlorine at a temperature of from about −10° C. to about +50° C. under substantially non-aqueous conditions and in the presence of

(1) an epoxy compound in an amount representing at least about one epoxy moiety per each imide moiety and (2) at least a catalytic amount of a catalytic transfer agent tertiary amine.

4,175,083

INDOLOPYRONES HAVING ANTIALLERGIC ACTIVITY

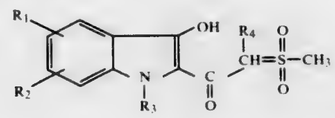
Richard E. Brown, Hanover, and Paul C. Unangst, Hackettstown, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 890,544, Mar. 20, 1978, which is a continuation-in-part of Ser. No. 764,150, Jan. 31, 1977, abandoned, which is a continuation-in-part of Ser. No. 611,453, Sep. 8, 1975, Pat. No. 4,028,383. This application Sep. 8, 1978, Ser. No. 940,541

Int. Cl.[2] **A61K** *31/40;* **C07D** *209/04*

U.S. Cl. 260—326.12 R **3 Claims**

1. A compound of the formula:



wherein R_1 and R_2 are hydrogen, hydroxy, halogen, trifluoromethyl, lower alkoxy or lower alkyl of 1 to 6 carbon atoms, or may be taken together to form a methylenedioxy group; wherein R_3 is hydrogen, lower alkyl of 1 to 6 carbons, phenyl, or phenylmethyl; and wherein R_4 is hydrogen.

4,175,084

COUPLING PRODUCTS OF BIOLOGICALLY ACTIVE AMINES

Jan B. Bøler, and Karl-Ludvig Reichelt, both of Oslo, Norway, assignors to Sentralinstitutt for Industriell Forskning, Oslo, Norway

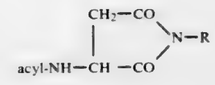
Filed Jun. 27, 1977, Ser. No. 810,471

Claims priority, application Norway, Jun. 25, 1976, 762199

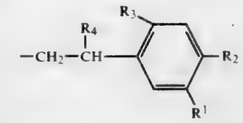
Int. Cl.[2] **C07D** *207/40*

U.S. Cl. 260—326.44 **4 Claims**

1. Physiologically active compounds characterized in that they are coupling products of the formula



wherein "acyl" has the formula $C_xH_{2x+1}CO$ in which x is an integer from 0 to 17, and R is selected from the group consisting of the following formulas (a) and (b):



(a)

wherein R_1 is selected from the group consisting of H, OH and OCH_3, and R_2, R_3 and R_4 are each selected from the group consisting of H and OH, and

$$-CH_2-CH_2-R_7 \quad \text{(b)}$$

wherein R_7 is selected from the group consisting of H, OH, CH_2—$COOCH_3$, CH_2—$COOC_2H_5$ and a sulphonic ester group.

4,175,085

THIENOTHIAZINE DERIVATIVES

Dieter Binder; Otto Hromatka, both of Vienna, Austria; Rudolf Pfister, Basel, and Paul Zeller, Allschwil, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

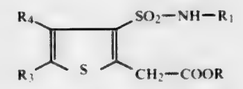
Division of Ser. No. 767,016, Feb. 9, 1977, Pat. No. 4,090,070. This application Mar. 2, 1978, Ser. No. 882,723

Claims priority, application Austria, Feb. 23, 1976, 1268/76; Switzerland, Jan. 5, 1977, 83/77

Int. Cl.[2] **C07D** *333/24;* **A01N** *9/00*

U.S. Cl. 549—65 **6 Claims**

1. A compound of the formula



XIV

wherein R is lower alkyl, R_1 is lower alkyl, and R_3 and R_4, independently, are hydrogen or lower alkyl.

4,175,086

CYCLOHEPTATHIOPHENE DERIVATIVES

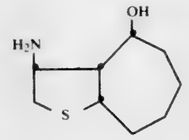
Pasquale N. Confalone; Elizabeth D. Lollar, both of Bloomfield; Giacomo Pizzolato, Belleville, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 836,878, Sep. 26, 1977, Pat. No. 4,124,595, which is a division of Ser. No. 771,218, Feb. 23, 1977, Pat. No. 4,062,868. This application Jul. 31, 1978, Ser. No. 929,870

Int. Cl.[2] **C07D** *333/80*

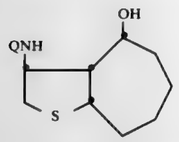
U.S. Cl. 549—51 **5 Claims**

1. A compound of the formula:



the racemates and optical antipodes thereof.

2. A compound of the formula:



wherein Q is selected from the group consisting of $-CO_2R_4$, $-COR_4$, $-COCX_3$, and tosyl, where R_4 is lower alkyl and X is halogen, the racemates and optical antipodes thereof.

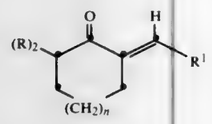
4,175,087

α,β-UNSATURATED KETONES AND ALDEHYDES AND METHOD OF PREPARATION

Riaz F. Abdulla, and Kenneth H. Fuhr, both of Greenfield, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

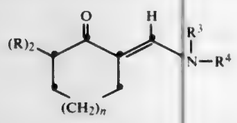
Filed Jan. 12, 1978, Ser. No. 868,774
Int. Cl.² C07C 47/45
U.S. Cl. 260—586 R **4 Claims**

1. A process for preparing 2-alkylidene ketones of the formula



(I)

wherein
R is hydrogen or C_1–C_2 alkyl;
R^1 is C_1–C_7 alkyl; and
n is 0 or 1,
which comprises allowing an enaminoketone of the formula



(V)

wherein R and n represent the same values as above, and R^3 and R^4 are C_1–C_2 alkyl, to react with a C_1–C_7 alkyllithium in the presence of a solvent at a temperature of from about −50° to about 25° C. for a period of from about 2 to about 12 hours.

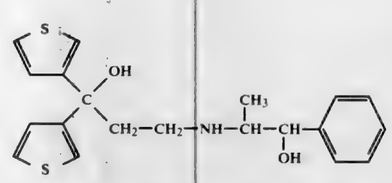
4,175,088

PROCESS FOR THE PRODUCTION OF [1,1-DITHIENYL-(3)-1-HYDROXYPROPYL-(3)]-[1-PHENYL-1-HYDROXYPROPYL-(2)]-AMINE AND [1,1-DITHIENYL-(3)-PROPEN-(1)-YL-(3)]-[1-PHENYL-PROPYL-(2)]-AMINE

Axel Kleemann; Reinhold Kiel, both of Hanau, and Ingomar Nubert, Offenbach, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

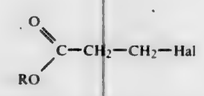
Filed Jan. 5, 1978, Ser. No. 867,294
Claims priority, application United Kingdom, Jan. 12, 1977, 1120/77
Int. Cl.² C07D 333/16
U.S. Cl. 549—59 **8 Claims**

1. A process for the production of



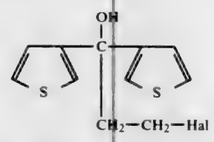
(I)

which comprises condensing thien-(3)-yl lithium with a β-halogen propionic acid alkyl ester corresponding to the formula



(II)

in which R is a lower alkyl group and Hal is chlorine, bromine or iodine, in an inert medium at a temperature below −50° C., and then reacting the resulting compound corresponding to the formula



(III)

with 2-amino-1-hydroxy-1-phenylpropane in an inert medium in the presence of a base or hydrogen halide acceptor.

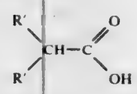
4,175,089

PREPARATION OF GAMMA-BUTYROLACTONES

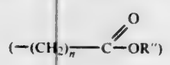
El Ahmadi I. Heiba, Princeton, and Ralph M. Dessau, Highland Park, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 30,582, Apr. 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 714,447, Mar. 20, 1968, abandoned. This application Feb. 28, 1973, Ser. No. 336,857
Int. Cl.² C07D 307/32, 307/83, 307/93
U.S. Cl. 260—343.6 **14 Claims**

1. A method for the production of a gamma-butyrolactone comprising the step of reacting, at a temperature between 20° C. and 250° C.:
an olefin selected from the group consisting of acyclic monoolefins having 2 to 92 carbon atoms, acyclic diolefins having 3 to 8 carbon atoms, cyclic monoolefins having 5 to 8 carbon atoms and cyclic diolefins having 5 to 8 carbon atoms;
an acid having the formula



wherein one or both of the R's are selected from the group consisting of hydrogen, straight or branched chain alkyl or alkenyl group having one to ten carbon atoms, cyano and alkyl carboxy having the formula



wherein R'' is hydrogen or CH_3 and n has a value of one to six; and
at least two equivalents per mole of said olefin of an ion of manganese or cerium, the ion being in a valency state higher than its lowest valency state.

4,175,090

CHEMICAL COMPOSITION

David Berry, North Humberside, England, assignor to BP Chemicals Limited, London, England

Filed Feb. 23, 1978, Ser. No. 880,476
Int. Cl.² C07F 1/08
U.S. Cl. 260—438.1 **2 Claims**

1. A process for preparing a homogeneous liquid composition comprising a cuprammonium complex of one or more C_1–C_4 monocarboxylic acids containing between 4 and 10% by weight of dissolved copper and up to 40% by weight of water, said process comprising reacting an acid ammonium salt of the monocarboxylic acid with a copper compound selected from cupric oxide and cuprous oxide in the presence of aqueous ammonia.

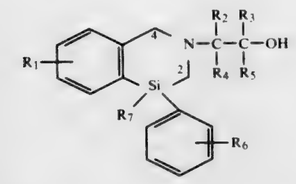
4,175,091

SUBSTITUTED 3,1-BENZAZASILINES

Sandor Barcza, West Orange, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Feb. 27, 1978, Ser. No. 881,687
Int. Cl.² C07F 7/10
U.S. Cl. 260—448.2 N **3 Claims**

1. A compound of the formula



(I)

where
R_1 represents H or alkyl of 1–5 carbon atoms,
R_2, R_3, R_4 and R_5 each, independently, represent H or alkyl of 1–2 carbon atoms,
R_6 represents H, alkyl of 1–5 carbon atoms, halo having an atomic weight of about 19–36, alkoxy having 1–5 carbon atoms, or



where
R_8 and R_9 each, independently, represent alkyl having 1–2 carbon atoms, and
R_7 represents alkyl having 1–5 carbon atoms.

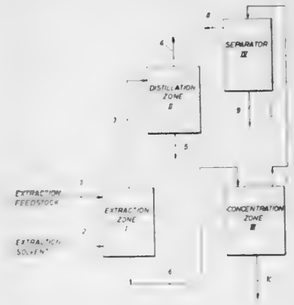
4,175,092

EXTRACTION PROCESS

Pieter M. Bakker, and Cornelis E. Kind, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 856,811, Nov. 30, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 959,958
Claims priority, application United Kingdom, Nov. 30, 1976, 49831/76
Int. Cl.² C07C 141/04, 143/02
U.S. Cl. 260—456 R **10 Claims**

1. A process for recovering non-surface active material from an aqueous based mixture containing water, surface active organic salts comprising sulphated or sulphonated organic matter, and non-surface active organic material, said mixture being obtained by the sulphation or sulphonation of C_8 to C_{22} olefins, paraffins or alcohols to yield the corresponding monoalkyl sulphuric or sulphonic acids followed by neutralization of said acids with a base to afford the corresponding surface active organic salts, which comprises extracting the aqueous-based mixture with, as sole solvent, a C_6 ketone, at a temperature of below 60° C., or an alkyl acetate in which the alkyl



grouping contains one to six carbon atoms to form a ketone or alkyl acetate based extract phase containing essentially all of the non-surface active organic matter and a raffinate phase containing water, some of the ketone or acetate solvent and essentially all of the sulphated or sulphonated organic matter, and subsequently separating the extract phase into a ketone or acetate fraction and a non-surface active organic material fraction which is recycled to the sulphation or sulphonation reaction.

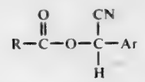
4,175,093

PREPARATION OF α-CYANO ESTERS

Arend Reinink, and Roger A. Sheldon, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

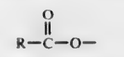
Filed Sep. 25, 1978, Ser. No. 945,716
Claims priority, application United Kingdom, Sep. 28, 1977, 40335/77
Int. Cl.² C07C 120/00, 121/66
U.S. Cl. 260—465 D **30 Claims**

1. In a process for the preparation of an ester of formula I

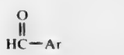


(I)

wherein Ar represents a phenyl group substituted at the 3-position by a phenoxy, a phenylthio or a benzyl group, and

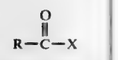


represents the residue of a pyrethroid acid, in which process an aromatic aldehyde of formula II



(II)

wherein Ar has the same meaning as in formula I, is treated with an acid halide of formula III



(III)

wherein R has the same meaning as in formula I, and X is a halogen atom having an atomic number of from 9 to 53, inclusive, in the presence of water and a water-soluble cyanide and optionally in the presence of a phase-transfer catalyst the improvement comprising restarting a stalled reaction by addition of an alkaline compound selected from alkali metal carbonates and hydroxides in an amount sufficient to increase the pH of the aqueous phase and generate cyanide ions.

4,175,094

PREPARATION OF ESTERS

Arend Reinink, and Roger A. Sheldon, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

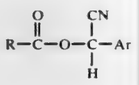
Filed Sep. 25, 1978, Ser. No. 945,717

Claims priority, application United Kingdom, Sep. 28, 1977, 40335/77

Int. Cl.[2] **C07C** *120/00*

U.S. Cl. 260—465 D **29 Claims**

1. A process for the preparation of an ester of formula I

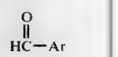


(I)

wherein Ar represents a phenyl group substituted at the 3-position by a phenoxy, a phenythio or a benzyl group and

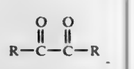


represents the residue of a pyrethroid acid anhydride, which process comprises treating an aromatic aldehyde of formula II



(II)

wherein Ar has the same meaning as in formula I, with an acid anhydride of formula III



(III)

wherein R has the same meaning as in formula I, in the presence of water and a water-soluble cyanide and a phase transfer catalyst.

4,175,095

PROCESS FOR THE MANUFACTURE OF PENTACHLOROVINYLACETYL CHLORIDE

Günther Maahs, and Konrad Rombusch, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huls, A.G., Marl, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 966,299

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1977, 2754670

Int. Cl.[2] **C07C** *57/02, 51/58*

U.S. Cl. 260—544 Y **10 Claims**

1. A method of preparing pentachlorovinylacetyl chloride which comprises chlorinating tetrachlorocyclobutenone with a chlorinating agent.

4,175,096

ALKOXYLATED PERFLUOROALKANESULPHONAMIDES

Gunther Reitz, Cologne, and Günther Boehmke, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

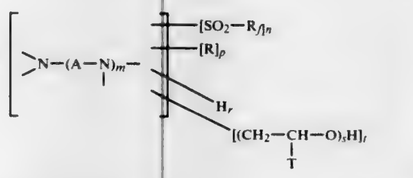
Filed Aug. 30, 1977, Ser. No. 829,145

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1976, 2639473

Int. Cl.[2] **C07C** *143/70, 143/74*

U.S. Cl. 260—556 F **4 Claims**

1. Alkoxylated perfluoroalkanesulphonamide of the formula



and its quaternization product wherein

R_f is C_1–C_{18} perfluoralkyl;

A is C_2–C_8-alkylene;

R is C_1–C_8-alkyl;

T is hydrogen or methyl;

m is a number from 2 to 10;

n is a number from 1 to m;

p is a number from 0 to m+2;

r is a number from 0 to m+1;

s is a number from 2 to 50;

t is a number from 1 to m+2; and

the sum of n+p+r+t is m+3 when the compound is not quaternized and is 2 m+3 when the compound is quaternized.

4,175,097

BIS(DIMETHYLAMINOPROPYL)-AMINE DERIVATIVES AS POLYURETHANE CATALYSTS

Edward E. McEntire, Austin, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Division of Ser. No. 746,577, Dec. 1, 1976, Pat. No. 4,101,466. This application Oct. 21, 1977, Ser. No. 844,240

Int. Cl.[2] **C07C** *87/28, 93/02*

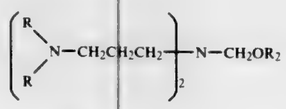
U.S. Cl. 260—570.5 P **5 Claims**

1. A compound of the formula:



where R is lower alkyl and R_1 is hydrogen, alkyl or aryl.

2. A compound of the formula:



where R is lower alkyl and R_2 is alkyl.

4,175,098

METHOD FOR THE PREPARATION OF α-TETRALONE

Fujio Mizukami, Urawa, and Juichi Imamura, Chofu, both of Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

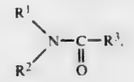
Filed Jul. 6, 1978, Ser. No. 922,462

Claims priority, application Japan, Jul. 7, 1977, 52/81153

Int. Cl.[2] **C07C** *45/02*

U.S. Cl. 260—590 FA **6 Claims**

1. A method for the preparation of α-tetralone which comprises oxidizing tetralin with oxygen in a homogeneous liquid phase at a temperature in the range from 30° to 150° C. in the presenc of a binary catalyst dissolved therein composed of a metal component selected from the class consisting of chromium compounds and cobalt compounds soluble in the reaction mixture in a concentration in the reaction mixture of at least 0.0005 mole/liter and an N,N-dialkyl substituted carboxylic acid amide represented by the general formula



where R^1 and R^2 each are alkyl groups having 1 to 4 carbon atoms and R^3 is a hydrogen atom or an alkyl group having 1 to 4 carbon atoms.

4,175,099

SEPARATION AND RECOVERY OF ETHYLBENZENE FROM C_8 AROMATIC MIXTURES USING RUBIDIUM-X SIEVES

Paul R. Geissler, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 7, 1975, Ser. No. 556,434

Int. Cl.[2] **C07C** *7/13*

U.S. Cl. 585—831 **10 Claims**

1. In a process for separating ethylbenzene from a mixture of C_8 aromatic isomers wherein said mixture is contacted with an adsorbent which selectively adsorbs ethylbenzene under adsorbtion conditions, the improvement which comprises employing as said adsorbent an X-structured zeolite containing exchangeable cationic sites, said cations consisting essentially of rubidium and sodium and wherein said rubidium has been exchanged for at least about 10 percent of the exchangeable sodium cations.

4,175,100

PREPARATION OF ANIONIC POLYMERS FOR USE AS SCALE INHIBITORS AND ANTI-PRECIPITANTS

Arthur M. Schiller, Stamford; Richard M. Goodman, Norwalk, and Roger E. Neff, Stamford, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 735,310, Oct. 26, 1976, Pat. No. 4,072,607. This application Dec. 22, 1977, Ser. No. 863,565

Int. Cl.[2] **C08F** *220/06;* **C08L** *33/02*

U.S. Cl. 525—327 **5 Claims**

1. A composition of matter consisting essentially of a blend of copolymers of from about 95 to 50 mol percent acrylic acid and, correspondingly, about 5 to 50 mol percent acrylamide, said copolymers consisting of a skewed molecular weight distribution such that on a gel permeation chromatograph at least about 60% of said copolymers have a molecular weight of about 500 to 2,000, at least about 10% of said copolymers have a molecular weight of about 4,000 to 12,000 and any balance of said copolymers have a molecular weight of about 500 to 12,000.

4,175,101

ACRYLONITRILE BLOCK TERPOLYMER BARRIER RESINS

Kenneth C. Benton, Bedford Heights, and Timothy J. Williamson, Cuyahoga Falls, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

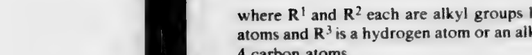
Filed Nov. 14, 1977, Ser. No. 850,988

Int. Cl.[2] **C08F** *293/00*

U.S. Cl. 525—88 **9 Claims**

1. The block polymeric composition resulting from the stepwise

(A) polymerization of an acrylate ester or a mixture of at least 50% by weight of a diene monomer selected from the group consisting of butadiene, isoprene, chloroprene and 2,3-dimethyl-1,3-butadiene, and up to 50% by weight of a member selected from the group consisting of styrene, acrylonitrile, methacrylonitrile, an acrylic ester or a methacrylic ester, with a multi-functional sequential free-radical initiator selected from the group consisting of di[1,3-dimethyl-3-(t-butyl peroxy) butyl] peroxy dicarbonate, 2,5-dimethyl-2-t-butyl peroxy-5-hydro peroxy hexane, 1,3-dimethyl-3-(t-butyl peroxy) butyl-4-t-butyl)-azo-4-cyanovalerate, di-t-butyl-4,4'-azobis(4-cyano peroxy valerate),



wherein n is 5 to 9 and R is alkyl, aryl or hydrogen and then

(B) using some of (A) as the sole polymerization initiator copolymerizing

(1) from 25 to 90% by weight of acrylonitrile and correspondingly

(2) from 10 to 75% by weight of a comonomer selected from the group consisting of methyl acrylate, ethyl acrylate, the propyl acrylates, the butyl acrylates, methyl methacrylate, ethyl methacrylate, the propyl methacrylates, the butyl methacrylates, styrene, alpha-methyl styrene, indene, isobutylene, vinyl acetate, vinyl methyl ether, and vinyl ethyl ether,

wherein there are employed from 5 to 30 parts by weight of (A) per 100 parts by weight of (B).

4,175,102

FUEL SUPPLY DEVICE

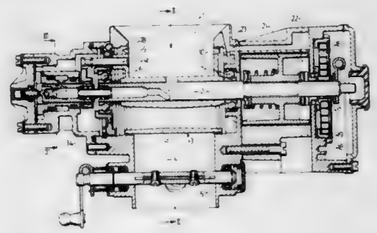
Max Greiner, Gerlingen; Klaus J. Peters, Affalterbach; Peter Schelhas, Stuttgart; Peter Stiefel, Ditzingen, and Hermann Nusser, Asperg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 897,985

Claims priority, application Fed. Rep. of Germany, May 6, 1977, 2720336

Int. Cl.[2] **F02M** *7/22*

U.S. Cl. 261—50 A **6 Claims**



1. A fuel supply device for mixture-compressing, externally ignited internal combustion engines provided with an arbitrar-

ily activatable throttle member arranged in the air intake manifold, a fuel metering device, a rotatable air metering member associated with said throttle member adapted to actuate said fuel metering device, means for applying a return force to the air metering member that corresponds to the air flow rate, said air metering member being deflectable against said return force for actuation of said fuel metering device, said fuel metering device including a guide sleeve having a control slit, a rotatable sleeve having a control groove positioned within said guide sleeve, and arbitrarily slidable relative to said guide sleeve, said control groove being arranged to open said control slit to a greater or lesser degree and to thereby meter the fuel to a nozzle so as to be injected into the air intake manifold, coupling means for transferring the movement of said rotatable air metering member to said rotatable sleeve, secondary sleeve means for interconnecting said air metering member and said rotatable sleeve, said secondary sleeve means being arranged to receive the fuel to be fed to said nozzle, said control groove having at least one control edge portion which overlaps said control slit and is formed at an angle to the axis of rotation of said rotatable sleeve whereby said control groove is both rotatable and slidable relative to said control slit.

4,175,103

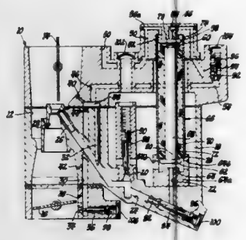
CARBURETOR

Donald D. Stoltman, Henrietta, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 896,684, Apr. 17, 1978, abandoned. This application Nov. 9, 1978, Ser. No. 959,104

Int. Cl.[2] **F02M** *7/18*

U.S. Cl. 261—50 R **12 Claims**



1. A carburetor comprising main and idle fuel passages, a metering orifice in said main fuel passage, an air bleed opening into said idle fuel passge, and a metering apparatus reciprocable between a rich position and a lean position, said metering apparatus including a metering valve engaged with said metering orifice in said lean position to restrict fuel flow through said main fuel passage and displaced from said metering orifice in said rich position to permit increased fuel flow through said main fuel passage, said metering apparatus further including a bleed valve engaged with said air bleed in said rich position to restrict air flow through said air bleed and thereby permit increased fuel flow through said idle fuel passage and displaced from said air bleed in said lean position to permit increased air flow through said air bleed and thereby restrict fuel flow through said idle fuel passage, wherein said valves are magnetically responsive and at least one of said valves is permanently magnetic, and wherein said carburetor further comprises an electromagnet pole member associated with said valves, an electromagnet coil surrounding said pole member for causing said pole member to repel said one valve and attract the other valve to one of said rich and lean positions when said coil is energized and for causing said pole member to attract said one valve to the other of said rich and lean positions when said coil is deenergized, and means for biasing said other valve to said other positions when said coil is deenergized.

4,175,104

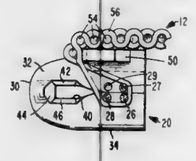
MOLDED ELEMENT TAPE SUPPORT FOR INVISIBLE SLIDE FASTENER AND METHOD OF MANUFACTURE

George B. Moertel, Conneautville, Pa., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 724,222, Sep. 17, 1976, Pat. No. 4,080,691. This application Feb. 13, 1978, Ser. No. 877,531

Int. Cl.[2] **B29D** *5/00*

U.S. Cl. 264—103 **8 Claims**



1. A method of forming a slide fastener stringer comprising the steps of joining a plurality of spaced coupling elements having a body to at least one connecting thread, forming wing portions on an upper surface of each body, bending the wing portions of each body toward the wing portions of the next body thereby forming a substantailly continuous linear tape support, weaving a woven tape to each body with threads thereof overlying and covering the wing portions with selected ones of said threads being secured to said connecting thread for uniting the body, the tape and said connecting thread together thereby concealing the linear support and coupling elements.

4,175,105

POST-PRESS MOLDING OF MAN-MADE BOARDS TO PRODUCE CONTOURED FURNITURE PARTS

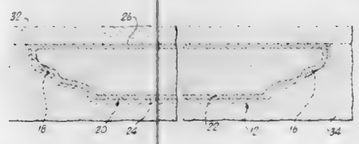
Allan J. Luck, Marengo; John T. Clarke, and Michael R. Hoffman, both of St. Charles, all of Ill., assignors to Masonite Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 739,184, Nov. 5, 1976. This application Jul. 28, 1977, Ser. No. 819,876

The portion of the term of this patent subsequent to Nov. 20, 1996, has been disclaimed.

Int. Cl.[2] **B29J** *5/04*

U.S. Cl. 264—112 **15 Claims**



1. A method of molding a cellulosic fiber contoured board having a skin on at least one surface, comprising:

(a) compressing a cellulosic fibrous mat to form a consolidated, handleable blank having a density of less than 35 pounds/cubic foot;

(b) cutting the consolidated blank to a shape slightly larger in at least two dimensions than corresponding interior dimensions of a closed, contoured mold cavity;

(c) applying to at least one surface of said blank a solution of urea in an amount of at least 5% by weight urea based on the dry weight of the surface fibers penetrated by said solution;

(d) inserting said cut blank in the open cavity of said mold;

(e) closing said mold;

(f) pressing said blank at a temperature of 525°–650° F. to reshape said blank in at least two dimensions to the dimensions of the contoured mold cavity to form a contoured board and form a skin having a density and hardness exceeding the density and hardness of the material thereunder on said surface contacted with said urea solution;

(g) opening said mold; and

(h) removing said contoured board.

4,175,106

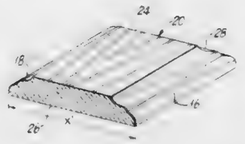
POST PRESS MOLDING OF MAN-MADE BOARDS TO PRODUCE CONTOURED FURNITURE PARTS

John T. Clarke, St. Charles; Allan J. Luck, Marengo, and Roger F. Sutton, St. Charles, all of Ill., assignors to Masonite Corporation, Chicago, Ill.

Filed Sep. 14, 1977, Ser. No. 833,037

Int. Cl.[2] **B29J** *5/00*

U.S. Cl. 264—118 **10 Claims**



1. A method of molding a cellulosic fiber containing board to form a three dimensional contoured part comprising:

(a) compressing and heating a fibrous mass of cellulosic fibers to bond the fibers into a consolidated blank;

(b) cutting the consolidated blank to a shape having a plurality of generally tapered edges and corresponding generally to the interior shape of a closed, contoured mold cavity wherein said cut blank is slightly larger than the interior dimensions of said mold cavity in each of its three dimensions;

(c) inserting said cut blank in the open cavity of said contoured mold;

(d) closing said mold;

(e) hot-pressing said consolidated, cut blank in said mold at a temperature of 500° F. to 650° F. to reshape the blank in all three of its dimensions to form a contoured, molded product; and

(f) opening said mold and removing said molded, contoured part.

4,175,107

CATALYTIC EXHAUST GAS PURIFYING DEVICE

Kazuo Iwaoka; Tagao Toh, both of Toyonaka, and Minoru Fukada, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 605,395, Aug. 18, 1975, abandoned. This application May 5, 1977, Ser. No. 794,115

Claims priority, application Japan, Sep. 3, 1974, 49-101516; Sep. 3, 1974, 49-106251[U]; Dec. 20, 1974, 49-147448; Jun. 2, 1975, 50-74986[U]

Int. Cl.[2] **B01J** *8/02. 35/04;* **F01N** *3/15*

U.S. Cl. 422—114 **7 Claims**

1. A catalytic converter for purifying the exhaust gases from an internal combustion engine, comprising:

a tubular metallic casing having an exhaust gas inlet port at one end and an exhaust gas outlet port at the other end;

a first catalyst stage disposed within said casing, said stage comprising:

a perforated metallic inner tube generally coaxial with said casing and forming an interior conduit communicating with said inlet and outlet ports;

a ring shaped metallic end disk adjacent said inlet port and extending between and connected to a front end of said tube and the interior wall of said casing for supporting said tube in said generally coaxial relationship to said casing, so that said inlet port may communicate exhaust gases through the opening in the disk to the inlet end of the perforated tube;

a metallic shielding disk adjacent said outlet port and connected between a rear end of said tube and said casing for supporting said tube in said generally coaxial relationship to said casing, said shielding disk partially extending radially into said interior conduit to restrict the passage of exhaust gas through said conduit and having an opening communicating with said conduit through which one portion of said exhaust gas may flow;

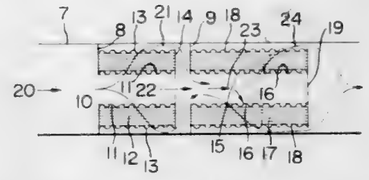
at least one layer comprising catalytic material supported by said inner tube between said disks and disposed between said tube and said casing;

said shielding disk having an apertured part adjacent said casing for permitting another portion of said exhaust gas to flow therethrough, said one portion of said exhaust gas bypassing said catalyst layer and at least a part of said other exhaust gas portion passing through said layer;

at least one intermediate catalyst stage disposed within said casing downstream of said first stage, said intermediate stage comprising:

a perforated metallic inner tube generally coaxial with said casing and forming an interior conduit communicating with said inlet and outlet ports;

a ring shaped metallic end disk adjacent said inlet port and extending between and connected to a front end of said tube of said intermediate stage and the interior wall of said casing for supporting said tube of said intermediate stage in said generally coaxial relationship to said casing, so that said inlet port may communicate exhaust gases through



the opening in the disk of said intermediate stage to the inlet end of the perforated tube of said intermediate stage;

a metallic shielding disk adjacent said outlet port and connected between a rear end of said tube of said intermediate stage and said casing for supporting said tube of said intermediate stage in said generally coaxial relationship to said casing, said shielding disk of said intermediate stage extending radially into said interior conduit of said intermediate stage to restrict the passage of exhaust gas through said conduit of said intermediate stage and having an opening communicating with said conduit of said intermediate stage through which one portion of said exhaust gas may flow;

at least one layer comprising catalytic material supported by said inner tube of said intermediate stage between said disks of said intermediate stage and disposed between said tube of said intermediate stage and said casing of said intermediate stage;

said shielding disk of said intermediate stage having an apertured part adjacent said casing for permitting another portion of said exhaust gas to flow therethrough, said one portion of said exhaust gas bypassing said catalyst layer of said intermediate stage and at least a part of said other exhaust gas portion passing through said layer of said intermediate stage;

a final catalyst stage disposed within said casing and downstream of said at least one intermediate catalyst stage, said final stage comprising:

a final perforated metallic inner tube generally coaxial

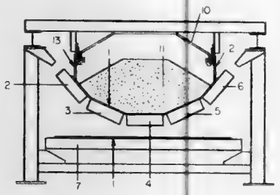
with said casing and having a final interior conduit communicating with said inlet and outlet ports;
a final ring shaped metallic end disk adjacent said inlet port of said final tube and extending between a front end of said final tube and said casing for supporting said final tube in said generally coaxial relationship to said casing;
a final metallic shielding disk adjacent said outlet port of said final tube and extending between a rear end of said final tube and said casing for supporting said final tube in said generally coaxial relationship to said casing,
said final tube cooperating with said casing to form a first interior cylindrical gas flow path and a second exterior annular exhaust gas flow path,
said shielding disk of said final stage having a substantially imperforate part covering said interior gas flow path for blocking only one of said exhaust gas flow paths;
at least one second layer comprising catalytic material supported by said final inner tube between said disks of said final stage and disposed between said final tube and said casing;
said end disk of said final stage being spaced apart from said shielding disk of said intermediate stage adjacent thereto to define a combining region for said exhaust gas portions, said end disk of said final stage having a substantially imperforate part for blocking one end of said second exterior annular exhaust gas flow path, so that substantially all of said exhaust gas is caused to flow through said final catalytic layer.

4,175,108

PROCESS FOR EXTRACTING URANIUM FROM ORES

Jacques Poitte, Rambouillet, France, assignor to Societe Technique des Entreprises Chimiques, Sevres, France

Filed May 4, 1977, Ser. No. 793,553
Claims priority, application France, May 31, 1976, 76 17171
Int. Cl.² C01G *43/00*
U.S. Cl. 423—20 **9 Claims**



1. In a process for extracting uranium from uranium ore wherein the ore is first crushed so that a substantial portion of the grains are of a dimension not less than 0.1 mm, the improvement comprising the steps of sequentially
(a) mixing the crushed ore with an attacking reagent, the volume of which is less than that required to produce a continuous liquid phase,
(b) placing the mixture of crushed ore and attacking reagent on at least one conveyor belt at a predetermined temperature and humidity and allowing it to reside thereon for at least 1 hour, and
(c) extracting the solubilized uranium from the mixture by washing.

4,175,109

PROCESS FOR EXTRACTING TUNGSTEN FROM ALKALI METAL TUNGSTATE SOLUTIONS

Tai K. Kim, Towanda, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Aug. 3, 1978, Ser. No. 930,784
Int. Cl.² C01G *41/00*
U.S. Cl. 423—54 **2 Claims**

1. In a process wherein tungsten values are extracted from an aqueous alkali metal tungstate solution containing impurities by an organic extractant solution containing an amine extractant and thereafter the tungste values are removed from the organic extractant solution by stripping with aqueous ammonia, wherein the improvement comprises providing, as an extractant, an organic extraction solution consisting essentially of from about 6 to about 10 percent by volume of a mixture of tri-alkyl amines having alkyl chains of about 6 to 10 carbon atoms with trisooctyl amine being the major component in said mixture and from about 90 to 94 percent by volume of an aromatic solvent consisting essentially of a mixture of alkyl benzenes wherein the alkyl benzenes constituting the mixture of alkyl benzenes have molecular weights of 120, 134 or 148 and the total number of carbon atoms in the alkyl chains attached to the benzene ring are either 3, 4 or 5.

4,175,110

RECOVERY OF TITANIUM METAL VALUES

William K. Tolley, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 22, 1978, Ser. No. 935,812
Int. Cl.² C01G *23/04*
U.S. Cl. 423—83 **5 Claims**

1. In a process for producing titanium metal values from a titanium bearing source which comprises the steps of:
(a) crushing said titanium bearing source;
(b) subjecting said crushed source to a reductive roast at a temperature in the range of from about 600° up to about 1000° C. in the presence of a reducing medium selected from the group consisting of hydrogen gas, carbon monoxide gas, and combinations thereof;
(c) leaching said reduced source of step (b) with a hydrogen halide leach solution at a temperature in the range of from about ambient up to about 110° C. to solubilize titanium and iron halides;
(d) separating the solid gangue produced in step (c) from said soluble metal chlorides;
(e) cooling said soluble metal halides to a temperature in the range of from about 0° C. to as high as 90° C. to precipitate ferrous chloride;
(f) treating the leach liquor of step (e) after said ferrous chloride precipitation with ferric oxide at a temperature in the range of from about 70° to about 100° C. to nucleate said titanium halide to a titanium dioxide precipitate; and
(g) recovering said precipitated titanium dioxide, the improvement which comprises the treatment of said leach liquor in step (f) with a stoichiometric excess of said ferric oxide in the range of from about 2.5 to about 50 times the stoichiometric amount of ferric oxide required to react with the titanium halide of said leach liquor while concomitantly maintaining said leach liquor in an agitated state, recovering solids, mixing said solids with a second leach solution containing sufficient titanium halide to consume the remaining ferric oxide and recovering the resultant titanium dioxide.

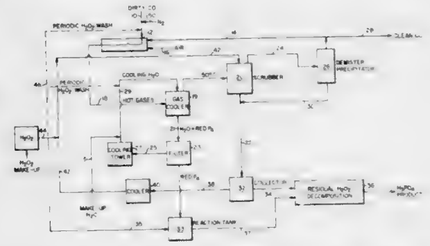
4,175,111

REMOVAL OF PHOSPHINE FROM PHOSPHINE-CONTAMINATED CARBON MONOXIDE GAS STREAMS

Theodore F. Munday, Kendall Park, and John Walden, Hightstown, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Dec. 14, 1977, Ser. No. 860,377
Int. Cl.² B01D *53/34*
U.S. Cl. 423—210 **3 Claims**

1. The process of removing phosphine from the off gas stream obtained after condensing phosphorus from the overhead stream from phosphorus producing furnaces, which gas stream is a mixture of gases containing over 90% of CO and less than 1% PH_3, which comprises heating said gas stream to a temperature of 700° C. to 800° C. for a time sufficient to substantially completely decompose the phosphine to red phosphorus and hydrogen, and then separating the red phosphorus from the gas stream, now substantially free of phosphine.



4,175,112

PROCESS FOR PURIFICATION OF GASES CONTAINING ELEMENTAL SULFUR

Edwin B. Lusk, Plaquemine; Douglas C. Riley, Jr., and Joseph P. Creadh, III, both of Baton Rouge, all of La., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 17, 1978, Ser. No. 925,125
Int. Cl.² C01B *17/00, 17/48*
U.S. Cl. 423—242 **9 Claims**

1. A process for the purification of a sulfur dioxide containing gas containing as an impurity elemental sulfur comprising:
(a) contacting the gas with sulfur trioxide and
(b) introducing the gas now containing sulfur trioxide into a pool of oleum having an acidity of about 101% to about 108% maintained at a temperature of from about 180° F. to about 250° F. whereby elemental sulfur contained in the gas is converted into additional sulfur dioxide.

4,175,113

PURIFICATION OF CRUDE CHLOROPHOSPHAZENE COMPOUNDS BY TREATMENT WITH WATER

John W. Fieldhouse, Mogadore, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 20, 1978, Ser. No. 897,993
Int. Cl.² C01B *25/10*
U.S. Cl. 423—300 **5 Claims**

1. A process for the purification of crude chlorophosphazene which comprises the steps in sequence of:
(a) subjecting the crude chlorophosphazene to at least two water-washings performed at room temperature and under agitation, wherein following each water-washing the water is removed from the chlorophosphazene;
(b) drying the chlorophosphazene under vacuum at room temperature; and
(c) subjecting the chlorophosphazene to a final purification by distillation, recrystallization, sublimation or melting and filtering.

4,175,114

METHOD FOR PRODUCING ZEOLITES

Charles J. Plank, Woodbury; Edward J. Rosinski, Pedricktown, both of N.J., and Mae K. Rubin, Bala Cynwyd, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 650,481, Jan. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 424,481, Dec. 13, 1973, abandoned. This application Oct. 13, 1977, Ser. No. 841,622
Int. Cl.² C01B *33/28*
U.S. Cl. 423—329 **12 Claims**

1. In a method of synthesizing a crystalline aluminosilicate ZSM-5 zeolite from a reaction mixture comprising water, sources of silicate, alumina and alkali metal, the improvement whereby the zeolite is synthesized in a reaction mixture consisting essentially of said sources and a member selected from the group consisting of (1) ZSM-5 seeds, (2) mixtures of ZSM-5 seeds with alcohol, (3) mixtures of ZSM-5 seeds with alcohol and ammonium hydroxide, and (4) mixtures of ZSM-5 seeds with ammonium hydroxide to yield a zeolite ZSM-5 product containing no more than about 0.2% by weight of organic nitrogen.

4,175,115

PROCESS FOR THE PRODUCTION OF SYNTHESIS GAS BY THE CATALYZED DECOMPOSITION OF METHANOL

William J. Ball, Capel, and David G. Stewart, Epsom, both of England, assignors to The British Petroleum Company Limited, London, England

Filed May 26, 1978, Ser. No. 909,979
Claims priority, application United Kingdom, Jul. 27, 1977, 31538/77
Int. Cl.² C01B *31/18, 1/13*
U.S. Cl. 423—415 A **19 Claims**

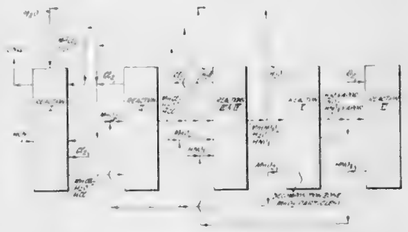
1. A process for the production of hydrogen and carbon monoxide comprising contacting essentially anhydrous methanol in the vapor phase with a supported catalyst at a temperature in the range of about 200° to 600° C., a pressure in the range of from about 0 to 50 atmospheres and a contact time up to 30 seconds, said supported catalyst containing a metal of Group VIII of the Periodic Table and another metal of Group IB, Group II, Group VIB or Group VIII of the Periodic Table, excluding binary combinations of copper and nickel, and said metals constituting from 0.1 to 20% by weight of said catalyst.

4,175,116

NON-ELECTROLYTIC PRODUCTION OF CHLORINE UTILIZING HC_l DERIVED FROM A CYANOGEN CHLORIDE PROCESS

Ralph Miller, Pleasantville, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 748,596, Dec. 8, 1976, Pat. No. 4,100,263. This application Apr. 20, 1978, Ser. No. 898,064
Int. Cl.² C01B *7/03*
U.S. Cl. 423—500 **1 Claim**



1. A process for preparing chlorine and manganese dioxide from manganous chloride and oxygen utilizing nitric acid and manganese dioxide as cyclic reagents, said process comprising the steps of
(1) reacting said manganous chloride with manganese dioxide and nitric acid to form an acidic solution containing manganous nitrate and gaseous chlorine, the molar ratio of manganese dioxide to manganous chloride being in excess of 1:1 and the molar ratio of nitric acid to manganous chloride being in excess of 4:1;
(2) separating and removing said gaseous chlorine;
(3) coating solid manganese dioxide particles with said manganous nitrate-containing solution and heating the coated

particles above about 180° C. to form manganese dioxide and a nitrogen dioxide-containing gaseous mixture, said heating being conducted in the absence of non-condensible gases;

(4) separating said solid manganese dioxide from said gaseous product;

(5) reacting the nitrogen dioxide-containing gas from step (4) with oxygen and water to form nitric acid;

(6) recycling said nitric acid to step (1); and

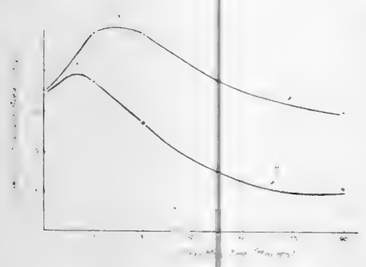
(7) withdrawing a quantity of manganese dioxide separated in step (4) equivalent to the amount of manganous chloride reacted in step (1) and recycling the remainder of said withdrawn manganese dioxide to steps (1) and (3) respectively, the amount recycled to step (3) being equal to the amount originally coated with said manganous nitrate-containing solution with the remaining portion being recycled to step (1).

4,175,117

PRODUCTION OF CERAMIC POWDERS FOR FERRITE, SPINEL, TITANATE AND GARNET PRODUCTION

Brian Hill, Ramsey, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 501,632, Aug. 26, 1975, abandoned, which is a continuation-in-part of Ser. No. 261,798, Jun. 12, 1972, abandoned. This application Jan. 17, 1977, Ser. No. 801,727
The portion of the term of this patent subsequent to Aug. 20, 1991, has been disclaimed.
Int. Cl.² B02C *19/12*
U.S. Cl. 423—594 **11 Claims**



1. A process for producing dense, composite ceramic product powder particles, the product particles being characterized by (i) an intimate interdispersion of initial constituent particles, (ii) a large internal interfacial surface within individual product powder particles with the individual constituent particles being distributed substantially uniformly at close interparticle spacings within the product powder particles, which comprises forming a charge composed of milling impacting elements and the ceramic powder particles to be milled, the ceramic powder charge particles being formulated to provide composite product powder particles which upon heating react to form a member from the group consisting of spinels, ferrites, titanates and garnets, with the weight ratio of impacting elements to powder being greater than 3:1, subjecting the charge under dry conditions to high transmissive energy milling such that the individual constituent powder particles are continuously brought into contact with the compressive energies of the milling impacting elements, and continuing the milling for a period beyond the threshold point of the powder constituents such that the constituent powder particles undergo substantial mechanical cold bonding in the solid state and such that the surface area of the composite product powder particles is less than the constituent powders with the particle size being markedly increased, whereby dense, composite, mechanically cold bonded ceramic product powder particles are produced, the composite product particles being further characterized by a high degree of homogeneity.

4,175,118

METHOD FOR MANUFACTURING A HIGH POROUS ALUMINA HAVING A LARGE SURFACE AREA AND A LOW BULK DENSITY

Martin Wassermann, Hamburg; Klaus Noweck, Brünsbuttel, and Arnold Meyer, Michaelisdonn, all of Fed. Rep. of Germany, assignors to Condea Chemie GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 746,747, Dec. 2, 1976, abandoned. This application May 23, 1978, Ser. No. 908,626
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1975, 2556804
Int. Cl.² C01F *7/02*
U.S. Cl. 423—628 **10 Claims**

1. A process of preparing a highly porous alumina having a surface area of about 300 to 420 m^2/g, a bulk density of 0.13 to 0.3 g/ml and a pore volume of 1.1 to 2.1 ml/g and wherein at least 50% of the pore diameters are less than 1000 Å comprising hydrolyzing an aluminum alcoholate which is an aliminum alkanolate of an alkanol having 1 to 30 carbon atoms at a temperature of 40° to 90° C. in an aqueous solution containing 8 to 30% by weight of a compound which upon drying or activating the alumina formed decomposes to form NH_3 or a mixture of NH_3 and CO_2, said decomposing compound being ammonium carbonate, ammonium bicarbonate, urea, or ammonium acetate, there being used 0.5 to 3 parts by weight of said compounds per 10 parts of aluminum alcoholate, separating the aluminum oxyhydrate paste formed by the hydrolysis from the alcohol phase, and subsequently drying the alumina.

4,175,119

COMPOSITION AND METHOD TO PREVENT ACCIDENTAL AND INTENTIONAL OVERDOSAGE WITH PSYCHOACTIVE DRUGS

Garry L. Porter, 507 N. Volutsia, Wichita, Kans. 67214

Filed Jan. 11, 1978, Ser. No. 868,607
Int. Cl.² A61K *9/30, 31/00*
U.S. Cl. 424—10 **53 Claims**

1. A method of inducing emesis to preclude death from accidental or intentional overdosage of a therapeutic composition, which is normally of the type which if ingested by prescription is safe, but if excessively ingested is lethal, comprising the steps of:

a. coating the surface of the therapeutic composition with between about 0.25 and 2.0 mg. of an emetic chemical comprising a major proportion of methyl cephaeline and cephaeline and a minor proportion of psychotrine, O-methylpsychotrine, and emetamine;

b. controlling the quantity of said emetic chemical coated on the surface of the therapeutic composition such that no emesis ensues if normal prescription directions are followed or if no overdosage occurs;

c. ingesting excessive quantities by a being of said therapeutic composition of step (b), said excessive quantities comprising an accumulation of a total dosage of at least 21 mg. of the emetic chemical; and,

d. emesis by said being of the ingested excessive quantities of coated therapeutic composition of step (c) in order to render the therapeutic compositions harmless and preclude death or serious illness to said being.

4,175,120

DENTIFRICE

Murray L. Schole, 487 Munroe Ave., North Tarrytown, N.Y. 10591

Filed Oct. 30, 1978, Ser. No. 956,200
Int. Cl.² A61K *7/22, 7/24*
U.S. Cl. 424—54 **3 Claims**

1. A water-containing dentifrice consisting essentially of strontium edatate in an amount sufficient to provide from about 2.5 wt.% to about 25 wt.% of strontium ion and from about 0.1 wt.% to about 10 wt.% of a ricinoleate compound

said dentifrice being free from strontium edatate-sequestering Ca, Mg, Al, Sn metal.

4,175,121

METHIONINE HYDROXY ANALOG-CONTAINING FEED FOR LACTATING COWS

Nagaraja S. Mantha, Greenfield Park, Canada, assignor to Agrimel Ltd., Laprairie, Canada

Filed Mar. 20, 1978, Ser. No. 888,191
Int. Cl.² A23K *1/00*
U.S. Cl. 424—94 **9 Claims**

1. A method of improving the milk production of dairy cows, which comprises feeding to said cows as part of their feed diet a composition or complex of 2-hydroxy-4-(methylthio) butyric acid methionine hydroxy analog and a fungal enzyme derived from a microorganism of the genus *Aspergillus*, the methionine hydroxy analog being present in an amount of 5–20% by weight of the composition and being in particulate form, with the particles thereof being coated with a powder of synthetic flavoring agent which masks the taste of the methionine and fungal enzyme being present in an amount of 0.5–5% by weight of the composition and a buffer in the amount of 2–6% by weight, the composition or complex being fed in an amount to provide 20–40 g./day of the methionine hydroxy analog to each cow.

4,175,122

BIOLOGICALLY ACTIVE AMIDES

Norman R. Lazarus, Gravesend, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 676,645, Apr. 14, 1976, abandoned. This application Nov. 15, 1977, Ser. No. 851,706
Claims priority, application United Kingdom, Apr. 15, 1975, 15414/75; Mar. 31, 1976, 12945/76
Int. Cl.² A61K *37/02, 37/24*
U.S. Cl. 424—177 **9 Claims**

1. A method of treating a mammal for hyperinsulinaemia comprising the parenteral administration to the mammal suffering from hyperinsulinaemia of a non-toxic hyperinsulinaemia treatment effective amount of a polypeptide designated Pancreatic Hormone III or a pharmaceutically acceptable salt or metal complex of said polypeptide.

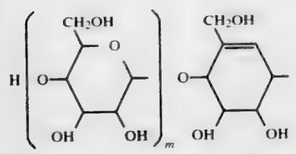
4,175,123

AMINO-SUGAR DERIVATIVES, PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITION THEREOF

Bodo Junge; Hans-Peter Krause; Lutz Müller; Walter Puls, all of Wuppertal, and Jürgen Stoltefuss, Haan, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

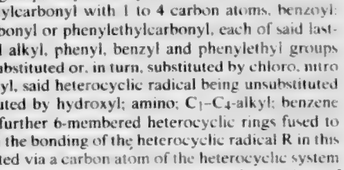
Filed Dec. 15, 1977, Ser. No. 861,043
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658562; Jun. 10, 1977, 2726207
Int. Cl.² A61K *31/73*; C07H *5/06*
U.S. Cl. 424—180 **10 Claims**

1. An amino-sugar derivative of the formula



(II)

-continued



in which

n and m independently of each other represent an integer from 0 to 8 and the value of the sum n + m is an integer from 0 to 8 and

X represents a group —OR, —SH, —SR, $—NH_2$, —NHR or NRR_1, in which

R represents alkyl with 1 to 30 carbon atoms, alkenyl with 2 to 6 carbon atoms, cycloalkyl with 3 to 7 ring carbon atoms, aralkyl with 6 to 10 carbon atoms in the aryl part, monocyclic or bicyclic aryl with 6 to 10 carbon atoms, or heterocyclic with 5 to 6 ring members and 1 to 3 heteroatoms, said alkyl being unsubstituted or substituted by up to 5 substituents, which substituents are hydroxyl; alkoxy with 1 to 4 carbon atoms; amino or monoalkylamino or dialkylamino with 1 to 4 carbon atoms per alkyl radical; mercapto or alkylthio with 1 to 4 carbon atoms; halogen; alkylcarbonyl with 1 to 4 carbon atoms in the alkyl radical; carboxyl; nitro; cyano; the aldehyde group and the sulphonic acid group, said alkenyl being unsubstituted or substituted by hydroxyl; alkoxy with 1 to 4 carbon atoms, mercapto, alkylthio with 1 to 4 carbon atoms, halogen or nitro, said cycloalkyl being unsubstituted or substituted with the substituents defined above where R is alkyl, said aryl and aralkyl being unsubstituted or substituted by up to 3 substituents, said substituents being alkyl having 1 to 10 carbon atoms which is, in turn, unsubstituted or substituted by chlorine, nitro or cyano; alkenyl with 1 to 10 carbon atoms, which is unsubstituted or substituted by cyano; cyclohexyl; hydroxyl or alkoxy with 1 to 4 carbon atoms; amino or monoalkylamino or dialkylamino with 1 to 4 carbon atoms per alkyl radical; mercapto or alkylthio with 1 to 4 carbon atoms; carboxyl or carboalkoxy with 1 to 4 carbon atoms; the sulphonic acid group; alkylsulphonyl with 1 to 4 carbon atoms; phenylsulphonyl; aminosulphonyl or alkylaminosulphonyl or dialkylaminosulphonyl with 1 to 4 carbon atoms per alkyl group; nitro, cyano; the aldehyde group; alkylcarbonylamino with 1 to 4 carbon atoms; alkylcarbonyl with 1 to 4 carbon atoms, benzoyl; benzylcarbonyl or phenylethylcarbonyl, each of said last-mentioned alkyl, phenyl, benzyl and phenylethyl groups being unsubstituted or, in turn, substituted by chloro, nitro or hydroxyl, said heterocyclic radical being unsubstituted or substituted by hydroxyl; amino; C_1–C_4-alkyl; benzene nuclei or further 6-membered heterocyclic rings fused to them with the bonding of the heterocyclic radical R in this case effected via a carbon atom of the heterocyclic system or of the fused benzene nucleus or where the bonding of the heterocyclic radical R is effected via a $-CH_2$-bridge outside the ring.

R_1 represents alkyl with 1 to 6 carbon atoms or cycloalkyl with 3 to 7 ring carbon atoms, aralkyl with 6 to 10 carbon atoms in the aryl part and 1 to 4 carbon atoms in the alkyl part, or monocyclic or bicyclic aryl with 6 to 10 carbon atoms, said radicals being unsubstituted or substituted by alkoxy with 1 to 4 carbon atoms; amino; C_1–C_4-monoalkylamino and C_1–C_4-dialkylamino; nitro; halogen; cyano; hydroxyl; mercapto; C_1–C_4-thioalkyl or the carboxyl or sulphonic acid group and, where R_1 denotes phenyl, also by C_1–C_4-alkyl, R and R_1, taken together with the nitrogen atom to which they are bonded, forms a 5 to 7 ring membered heterocyclic ring which is saturated or unsaturated and contains 0 to 3 additional oxygen atoms, sulphur atoms or nitrogen atoms, a SO_2 group or an N-alkyl

group, in which the alkyl group contains 1 to 4 carbon atoms.

6. A pharmaceutical composition containing as an active ingredient an effective amount of a compound according to claim 1 in admixture with a solid or liquefied gaseous diluent.

4,175,124

METHOD OF TREATING HYPERCHOLESTEROLEMIA

Roy G. Hyldon, and John S. O'Mahony, both of Crystal Lake, Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Dec. 30, 1977, Ser. No. 866,100
Int. Cl.[2] A61K *31/70, 31/715*
U.S. Cl. 424—180 **8 Claims**

1. The method of lowering blood cholesterol which comprises orally administering to an animal an effective amount of oat gum.

2. The method of claim 1 wherein the amount of oat gum administered is from 0.01 percent to 0.1 percent of body weight per day.

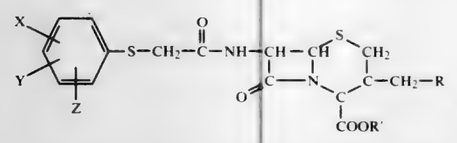
4,175,125

METHOD FOR TREATING METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS

George W. Huffman, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 807,090, Jun. 16, 1977, which is a division of Ser. No. 584,998, Jun. 9, 1975, Pat. No. 4,056,676, which is a division of Ser. No. 341,210, Mar. 14, 1973, Pat. No. 3,907,784, which is a continuation-in-part of Ser. No. 288,227, Sep. 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 212,739, Dec. 27, 1971, abandoned. This application Aug. 28, 1978, Ser. No. 937,389
Int. Cl.[2] A61K *31/545*
U.S. Cl. 424—246 **2 Claims**

1. A method for treating an infection caused by methicillin resistant strains of *Staphylococcus aureus* which comprises administering to a patient having said infection a compound in an amount to combat said infection, said compound having the formula



wherein Z is hydrogen or fluorine; and, where Z is hydrogen, each of X and Y is hydrogen or chlorine selected so that the phenyl ring is substituted with 1 or 2 chlorine atoms and so that when one chlorine atom is present said chlorine atom is in the 3-position, and when two chlorine atoms are present said chlorine atoms are in the 3,4-, the 3,5- or the 2,5-positions; and,

when Z is fluorine said fluorine is in the 3- or 4-position of the phenyl ring, and each of X and Y is hydrogen or chlorine selected so that when the phenyl ring is substituted with 1 or 2 chlorine atoms, one of the chlorine atoms is in the 3- or 4-position of the phenyl ring;

R is selected from the group consisting of carbamoyloxy, methylcarbamoyloxy, and dithiocarbamoyl; and

R' is hydrogen, dicyclohexylamine, or a pharmaceutically acceptable cation.

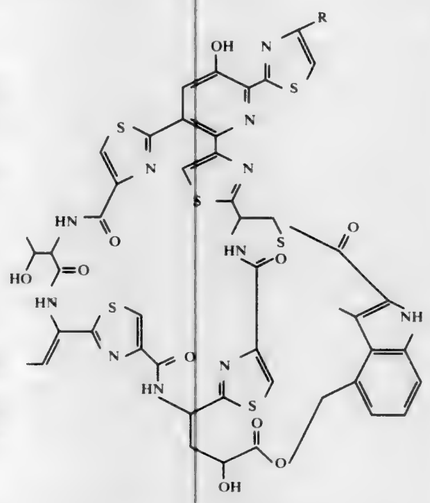
4,175,126

POLYHETEROCYCLIC-ANTIBIOTIC

Bernard Lombardi, Soisy sur Seine, and Jean Lunel, Paris, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Aug. 2, 1978, Ser. No. 930,148
Claims priority, application France, Aug. 4, 1977, 77 24011
Int. Cl.[2] A61K *31/44;* **C07D** *515/22*
U.S. Cl. 424—263 **10 Claims**

1. A new antibiotic, herein designated 35665 RP, of the formula:



(I)

wherein R represents the group —$CONH_2$.

7. An animal feed comprising 1 to 50 g of 35665 RP per tonne of feed.

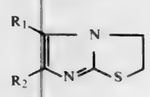
4,175,127

PYRIDYL SUBSTITUTED 2,3-DIHYDROIMIDAZO[2,1-b]THIAZOLES

Paul E. Bender, Cherry Hill, and Ivan Lantos, Blackwood, both of N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Sep. 27, 1978, Ser. No. 946,260
Int. Cl.[2] C07D *513/04;* **A61K** *31/44*
U.S. Cl. 424—263 **13 Claims**

1. A compound of the structure:



in which:

R_1 and R_2, being the same or different but at least one being pyridyl, are pyridyl or phenyl optionally monosubstituted by a lower alkoxy, lower alkyl, lower alkylthio, chloro, fluoro, bromo, or trifluoromethyl, or a pharmaceutically acceptable acid addition salt or oxide derivative thereof.

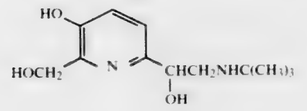
4,175,128

METHOD FOR TREATING CONGESTIVE HEART FAILURE

Colin R. Taylor, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jan. 3, 1979, Ser. No. 986
Int. Cl.[2] A61J *3/06, 3/07, 3/10;* **A61K** *31/44*
U.S. Cl. 424—263 **7 Claims**

1. A method of treating congestive heart failure in a human subject having such condition which comprises administering orally, parenterally or by inhalation to said human subject a congestive heart failure treating amount of a compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof.

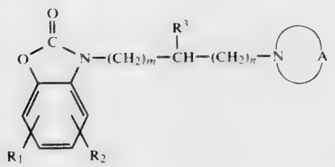
4,175,129

ANTIEMETIC 1-(BENZOXAZOLYLALKYL)-PIPERIDINE DERIVATIVES

Jan Vandenberk, Beerse; Ludo E. J. Kennis, Vosselaar; Marcel J. M. C. Van der Aa, Vosselaar, and Albert H. M. Th. Van Heertum, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 687,139, May 17, 1976, Pat. No. 4,066,772, which is a continuation-in-part of Ser. No. 597,793, Jul. 21, 1975, abandoned. This application Jul. 20, 1977, Ser. No. 817,398
Int. Cl.[2] A61K *31/445;* **C07D** *413/06, 413/14*
U.S. Cl. 424—267 **10 Claims**

1. A chemical compound selected from the group consisting of a 1-(benzoxazolylalkyl)piperidine derivative having the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein:

R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

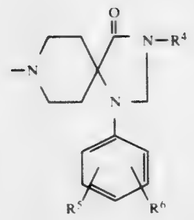
R^3 is a member selected from the group consisting of hydrogen and methyl;

m and n are each an integer of from 1 to 2 inclusive; and the radical



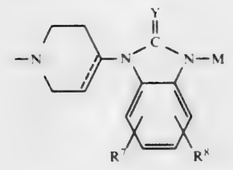
is a member selected from the group consisting of:

(a) a radical having the formula:



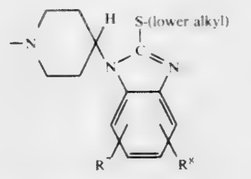
wherein R^4 is a member selected from the group consisting of hydrogen and lower alkyl; and R^5 and R^6 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

(b) a radical having the formula:



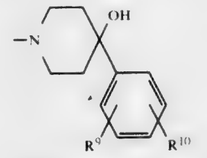
wherein R^7 and R^8 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl; Y is a member selected from the group consisting of O and S; M is a member selected from the group consisting of hydrogen, lower alkyl and lower alkylcarbonyl; and the dotted line indicates that the double bond between the 3 and 4 carbon atoms of the piperidine nucleus is optional, provided that when said Y is S, then there is a single bond between said 3 and 4 carbon atoms of the piperidine nucleus, and then said M is hydrogen;

(c) a radical having the formula:



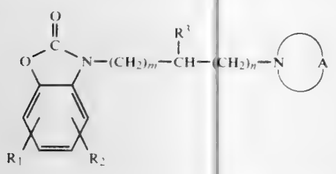
wherein R^7 and R^8 are each independently selected from the group consisting of hydrogen, halo, lower alkyl, and trifluoromethyl; and

(d) a radical having the formula:



wherein R^9 is selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl, and R^{10} is selected from the group consisting of hydrogen and halo.

9. A method of inhibiting emesis which comprises the systemic administration in warm-blooded animals of an effective antiemetic amount of a compound selected from the group consisting of a 1-benzoxazolylalkyl)piperidine derivative having the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein:

R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

R^3 is a member selected from the group consisting of hydrogen and methyl;

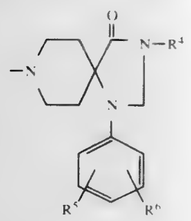
m and n are each an integer of from 1 to 2 inclusive; and

the radical



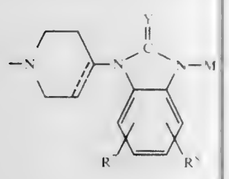
is a member selected from the group consisting of:

(a) a radical having the formula:



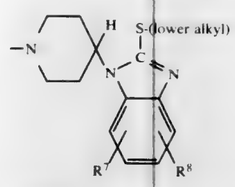
wherein R^4 is a member selected from the group consisting of hydrogen and lower alkyl; and R^5 and R^6 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

(b) a radical having the formula:



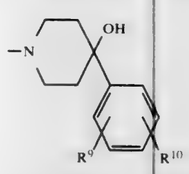
wherein R^7 and R^8 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl; Y is a member selected from the group consisting of O and S; M is a member selected from the group consisting of hydrogen, lower alkyl and lower alkylcarbonyl; and the dotted line indicates that the double bond between the 3 and 4 carbon atoms of the piperidine nucleus is optional, provided that when said Y is S, then there is a single bond between said 3 and 4 carbon atoms of the piperidine nucleus, and then said M is hydrogen;

(c) a radical having the formula:



wherein R^7 and R^8 are each independently selected from the group consisting of hydrogen, halo, lower alkyl, and trifluoromethyl; and

(d) a radical having the formula:



wherein R^9 is selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl, and R^{10} is selected from the group consisting of hydrogen and halo;

in admixture with a pharmaceutical carrier.

4,175,130

OXAZOLE- AND THIAZOLE-ALKANOIC ACID COMPOUNDS

Tsutomu Yamanaka; Hiroshi Yasuda, both of Oita, and Kunio Osuga, Yoshitomi, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

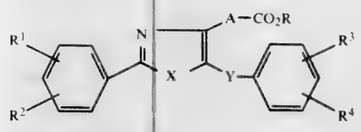
Filed Mar. 22, 1978, Ser. No. 889,073

Claims priority, application Japan, Mar. 25, 1977, 52-33469

Int. Cl.² C07D *277/20*

U.S. Cl. 424—270 **9 Claims**

1. A compound of the formula:



and pharmaceutically acceptable salts thereof, wherein:

R is a hydrogen atom or an ethyl group;

R^1 is a chlorine atom at 4-position on the phenyl nucleus;

R^2 is a hydrogen atom;

R^3 is a hydrogen atom or a methyl group;

R^4 is a hydrogen atom, a chlorine atom or a methyl group where R^3 is a hydrogen atom, or

R^4 is a methyl group where R^3 is a methyl group;

both X and Y are an oxygen atom or a sulfur atom; and

A is a methylene group.

9. A pharmaceutical composition comprising the compound of claim 1 in combination with a pharmaceutically acceptable inert carrier, said compound being present in a therapeutically effective amount.

4,175,131

OXAZOLE UREAS FORMULATIONS AND ASTHMA TREATMENT

William J. Ross, Lightwater; Alex Todd, Wokingham, and John P. Verge, Henley-on-Thames, all of England, assignors to Lilly Industries Limited, London, England

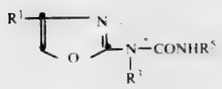
Continuation of Ser. No. 678,015, Apr. 19, 1976, abandoned. This application Dec. 27, 1977, Ser. No. 864,900

Claims priority, application United Kingdom, May 2, 1975, 18320/75

Int. Cl.² C07D *263/48*; A61K *31/42*

U.S. Cl. 424—272 **7 Claims**

1. An oxazole of the formula:



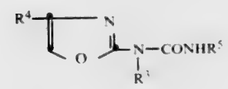
wherein:

R^1 is hydrogen, C_{1-6} alkyl, C_{1-4} hydroxyalkyl, C_{3-8} cycloalkyl, C_{3-6} alkanoyloxyalkyl, phenyl, halophenyl, trifluoromethylphenyl, methylphenyl, methoxyphenyl, or nitrophenyl;

R^3 is C_{1-6} alkyl, C_{2-6} alkenyl, C_{3-6} alkoxyalkyl, C_{3-8} cycloalkyl, C_{3-8} cycloalkyl-C_{1-4} alkyl, phenyl-C_{1-4} alkyl, halophenyl-C_{1-4} alkyl, trifluoromethylphenyl-C_{1-4} alkyl, methylphenyl-C_{1-4} alkyl, methoxyphenyl-C_{1-4} alkyl, nitrophenyl-C_{1-4} alkyl, phenyl-C_{2-4} alkenyl, halophenyl-C_{2-4} alkenyl, trifluoromethylphenyl-C_{2-4} alkenyl, methylphenyl-C_{2-4} alkenyl, methoxyphenyl-C_{2-4} alkenyl, or nitrophenyl-C_{2-4} alkenyl; and

R^5 is C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{2-4} alkenyl, phenyl, halophenyl, trifluoromethylphenyl, methylphenyl, methoxyphenyl, nitrophenyl, or C_{1-6} haloalkyl.

4. A pharmaceutical formulation useful in the treatment of asthma comprising a therapeutically effective amount for treating asthma of an oxazole of the formula:



wherein:

R^1 is hydrogen, C_{1-6} alkyl, C_{1-4} hydroxyalkyl, C_{3-8} cycloalkyl, C_{3-6} alkanoyloxyalkyl, phenyl, halophenyl, trifluoromethylphenyl, methylphenyl, methoxyphenyl, or nitrophenyl;

R^3 is C_{1-6} alkyl, C_{2-6} alkenyl, C_{3-6} alkoxyalkyl, C_{3-8} cycloalkyl, C_{3-8} cycloalkyl-C_{1-4} alkyl, phenyl-C_{1-4} alkyl, halophenyl-C_{1-4} alkyl, trifluoromethylphenyl-C_{1-4} alkyl, methylphenyl-C_{1-4} alkyl, methoxyphenyl-C_{1-4} alkyl, nitrophenyl-C_{1-4} alkyl, phenyl-C_{2-4} alkenyl, halophenyl-C_{2-4} alkenyl, trifluoromethylphenyl-C_{2-4} alkenyl, methylphenyl-C_{2-4} alkenyl, methoxyphenyl-C_{2-4} alkenyl, or nitrophenyl-C_{2-4} alkenyl; and

R^5 is C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{2-4} alkenyl, phenyl, halophenyl, trifluoromethylphenyl, methylphenyl, methoxyphenyl, nitrophenyl, or C_{1-6} haloalkyl in association with a pharmaceutically acceptable carrier therefor.

4,175,132

Patent Not Issued For This Number

4,175,133

1,2-DIAMINOCYCLOHEXANE PLATINUM (II) COMPLEXES HAVING ANTINEOPLASTIC ACTIVITY AGAINST L1210 LEUKEMIA

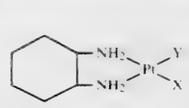
Glen R. Gale, and Sandra J. Meischen, both of Charleston, S.C., assignors to United States of America, Washington, D.C.

Continuation of Ser. No. 769,888, Feb. 18, 1977, abandoned, which is a division of Ser. No. 719,689, Sep. 2, 1976, Pat. No. 4,115,418. This application Nov. 29, 1977, Ser. No. 855,910

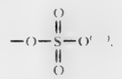
Int. Cl.² A61K *31/28*

U.S. Cl. 424—287 **5 Claims**

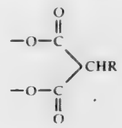
1. A method for the treatment of L1210 leukemia in mice which comprises administering to a mouse inflicted with L1210 leukemia an effective anti-L1210 leukemic amount of an organoplatinum complex having the formula



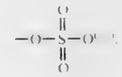
wherein X is a monodentate anionic ligand selected from the group consisting of $-ONO_2$ and



or together with Y a bidentate anionic ligand of the formula



wherein R is OH; when X is $-ONO_2$, Y is $-ONO_2$ or $-OH$; and when X is



Y is $-OH_2$.

4,175,134

PHENOXYBENZYL ESTER PESTICIDES

Royston H. Davis, and Robert J. G. Searle, both of Sittingbourne, England, assignors to Shell Oil Company, Houston, Tex.

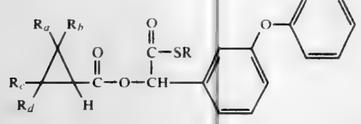
Division of Ser. No. 791,813, Apr. 28, 1977. This application Apr. 17, 1978, Ser. No. 898,367

Claims priority, application United Kingdom, Jun. 17, 1976, 25144/76

Int. Cl.[2] **A01N** *9/12*; **C07C** *153/11*

U.S. Cl. 424—301 **8 Claims**

1. An alpha-carboxylated-phenoxybenzyl ester having the formula



wherein R_a and R_b each represent an alkyl group containing from 1 to 6 carbon atoms, or a halogen atom having an atomic number from 9 to 35, inclusive; R_c and R_d each represent an alkyl group containing from 1 to 6 carbon atoms, or R_c is a hydrogen atom and R_d is an alkenyl group containing from 2 to 6 carbon atoms or a haloalkenyl group containing from 2 to 6 carbon atoms and from 1 to 3 chlorine or bromine atoms; and R represents an alkyl, alkenyl or alkynyl group each containing up to 6 carbon atoms, an aralkyl, alkaryl or aryl group each containing up to 10 carbon atoms, a hydrogen atom or a salt-forming cation selected from an alkali metal, an alkaline earth metal, ammonia or a tetraalkyl-ammonium compound in which each alkyl group contains from 1 to 10 carbon atoms.

4,175,135

METHOD OF CONTROLLING ACARINA ECTOPARASITES ON WARMBLOODED ANIMALS BY ORALLY ADMINISTERING TO THE ANIMAL AN ECTOPARASITICALLY EFFECTIVE AMOUNT OF A 2-ARYL-1,3-CYCLOHEXANEDIONE COMPOUND, AND ALKALI METAL SALTS, AMMONIUM SALTS AND ENOL ESTERS THEREOF

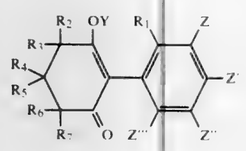
Robert G. Haines, Orange Park, Fla., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jul. 18, 1978, Ser. No. 925,814

Int. Cl.[2] **A61K** *31/22, 31/12, 31/275*

U.S. Cl. 424—311 **11 Claims**

1. A method of controlling ectoparasitic species of the order Acarina in warm-blooded animals which comprises orally administering to said animal an ectoparasitically effective amount of a compound of the formula:



wherein:

Z, Z', Z'' and Z''' are individually hydrogen, haloalkyl, halogen, alkyl, polyhaloalkyl, alkoxy, cyano, nitro, alkylthio, alkanoyl, amido, amino, alkylsulfonyl or alkylsulfinyl substituents;

Y is hydrogen or

wherein:

R is hydrogen, halogen, alkyl, alkenyl, alkynyl, bicycloalkyl, bicyloalkenyl, cycloalkyl, cycloalkenyl, phenyl, phenylalkyl, naphthyl or naphthylalkyl all of which except hydrogen and halogen may be substituted with one or more alkyl, cyano, nitro, alkoxy, halogen, haloalkyl, alkoxyalkyl, alkylthio, alkylsulfinyl, alkylsulfonyl, alkylsulfinylalkyl, alkylsulfonylalkyl, alkylthioalkyl or dialkylamino substituent; phenyl wherein the permissible substituents are one or more alkyl, cyano, halogen, nitro, alkoxy, alkylthio, alkylsulfinyl, -alkylsulfonyl or dialkylamino substituents; or any two, R_2, R_3, R_4, R_5, R_6, or R_7 substituents together may form an alkylene or alkenylene chain having from 2 to 20 carbon atoms completing a 3, 4, 5, 6 or 7 membered ring structure;

with the proviso that R_1, R_2, R_3, R_4, R_5, R_6, R_7, Z, Z', Z''' substituents individually may not include more than ten aliphatic carbon atoms and R may not include more than thirty aliphatic carbon atoms.

8. A method according to claim **1** wherein the compound is 3-(2-ethylhexanoyloxy)-5,5-dimethyl-2-(2',4'-dimethylphenyl)-2-cyclohexenone.

4,175,136

N-PHENETHYL-N-PROPYL-3,4-DIHYDROXYPHENETHYLAMINES AND SALTS THEREOF

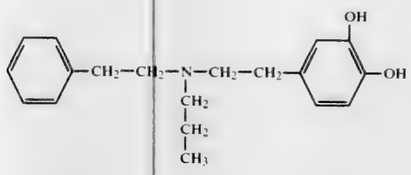
Lucien Nédélec, Le Raincy; Daniel Fréchet, Paris, and Claude Dumont, Nogent-sur-Marne, all of France, assignors to Roussel UCLAF, Paris, France

Continuation of Ser. No. 744,514, Nov. 24, 1976, abandoned. This application May 12, 1978, Ser. No. 905,535

Int. Cl.[2] **A01N** *9/20, 9/24*; **C07C** *91/32*

U.S. Cl. 424—330 **7 Claims**

1. A compound selected from the group consisting of N-phenethyl-N-propyl-3,4-dihydroxyphenethylamine of the formula



and its non-toxic, pharmaceutically acceptable acid addition salts.

5. A method of inducing dopaminergic activity in warm-blooded animals comprising administering to warm-blooded animals a dopaminergically effective amount of at least one compound of claim **1**.

4,175,137

ETHERIFIED CYCLOALKANOLS

Saleem Farooq, Ettingen; Friedrich Karrer, Zofingen, and Georges Haas, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

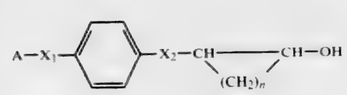
Filed Jul. 13, 1978, Ser. No. 924,315

Claims priority, application Switzerland, Jul. 20, 1977, 9002/77

Int. Cl.[2] **A01N** *9/12*

U.S. Cl. 424—337 **9 Claims**

1. A hypolipidemic pharmaceutical preparation containing an effective, the lipid content of the blood serum lowering amount of a compound of the formula I



(I)

wherein A is phenyl unsubstituted or substituted by at least one member selected from the group consisting of halogen with an atomic number up to 35 inclusive, lower alkyl, lower alkoxy and trifluoromethyl, X_1 is oxygen, sulphur or methylene, X_2 is oxygen or sulphur and n is an integer from 1 to 10 inclusive, together with a pharmaceutical carrier.

4,175,138

α-ALKYL-P-PHENOXY BENZYL ALCOHOLS, COMPOSITIONS AND TREATING LIPIDEMIA

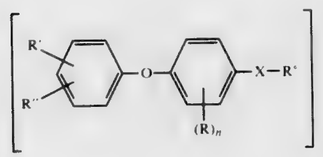
Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz, Inc., East Hanover, N.J.

Division of Ser. No. 662,125, Feb. 27, 1976, Pat. No. 4,085,149, which is a division of Ser. No. 510,477, Sep. 30, 1974, Pat. No. 3,962,459, which is a continuation-in-part of Ser. No. 394,181, Sep. 4, 1973, abandoned. This application Jan. 30, 1978, Ser. No. 873,167

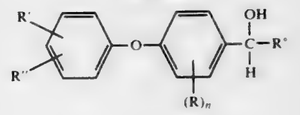
Int. Cl.[2] **A61K** *31/09*

U.S. Cl. 424—341 **7 Claims**

1. A method for treating lipidemia in mammals comprising administering to a mammal in need of such treatment an effective amount therefor of a compound of the formula:



-continued



wherein

R° is branched alkyl of 3 to 5 carbon atoms,

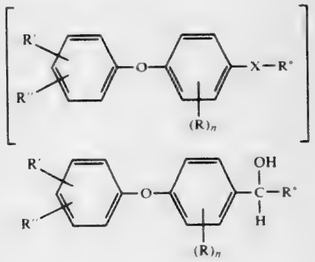
R is hydrogen, alkyl of 1 to 4 carbon atoms or halo of atomic weight of from 18 to 36,

n is 1 or 2,

R' is hydrogen, alkyl of 1 to 4 carbon atoms, halo of atomic weight of from 18 to 36 or alkoxy of 1 to 4 carbon atoms, and

R'' is hydrogen, alkyl of 1 to 4 carbon atoms, halo of atomic weight of from 18 to 36 or alkoxy of 1 to 4 carbon atoms.

5. A pharmaceutical composition in unit dosage form for treating lipidemia in mammals comprising an inert pharmaceutically acceptable carrier and from 50 to 1500 milligrams of a compound of the formula





wherein

R° is branched alkyl of 3 to 5 carbon atoms,

R is hydrogen, alkyl of 1 to 4 carbon atoms or halo of atomic weight of from 18 to 36,

n is 1 or 2,

R' is hydrogen, alkyl of 1 to 4 carbon atoms, halo of atomic weight of from 18 to 36 or alkoxy of 1 to 4 carbon atoms, and

R'' is hydrogen, alkyl of 1 to 4 carbon atoms, halo of atomic weight of from 18 to 36 or alkoxy of 1 to 4 carbon atoms.

4,175,139

HYPERTENSION TREATING AGENT CONTAINING POLYPRENYL ALCOHOL

Shizumasa Kijima, Tokyo; Isao Yamatsu, Kawaguchi; Yuichi Inai, Tokyo; Toshiji Igarashi, Tokorozawa; Yoshikage Nakajima, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

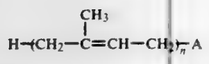
Filed Aug. 7, 1978, Ser. No. 931,687

Claims priority, application Japan, Aug. 10, 1977, 52-94965; Nov. 8, 1977, 52-133008

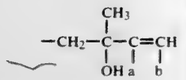
Int. Cl.[2] **A61K** *31/45*

U.S. Cl. 424—343 **15 Claims**

1. A method of treating hypertension which comprises orally or parenterally administering to a hypertensive subject requiring such treatment, a therapeutically effective amount of a hypertension treating composition comprising a pharmaceutical carrier and an effective anti-hypertensive amount of polyprenyl alcohol compound having the formula:

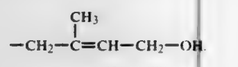


wherein n is an integer of 7–10, and A is a group of the formula:



(a)

in which a and b each is hydrogen or a and b together form a valence bond between the carbon atoms to which they are attached, or



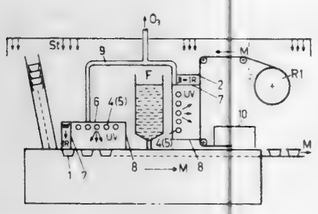
(b)

4,175,140

METHOD FOR AUTOMATIC LOW-BACTERIA TO ASEPTIC FILLING AND PACKING OF FOODSTUFFS EMPLOYING ULTRAVIOLET RADIATION

Robert Bachmann, Döttingen, and Winfried Sturm, Goldach, both of Switzerland, assignors to Aluminiumwerke AG. Rorschach, Rorschach and BBC Brown Boveri & Company Limited, Baden, both of, Switzerland

Continuation of Ser. No. 557,259, Mar. 11, 1975, abandoned.
This application Jul. 26, 1977, Ser. No. 819,120
Claims priority, application Switzerland, Apr. 10, 1974, 5050/74
Int. Cl.[2] B65B *55/08*
U.S. Cl. 426—399 **12 Claims**



1. In a method for automatically packaging previously disinfected or sterilized foodstuffs under antiseptic to low-bacterial count conditions, the improvement comprising the steps of:
providing a packaging material,
producing a predetermined ultraviolet radiation of sufficient intensity to disinfect said packaging material, said step of producing including the steps of;
forming a mercury discharge with a current density of more than one ampere per square centimeter at a pressure between 0.005 and 0.5 Torr;
generating with said discharge ultraviolet radiation in which the spectral radiation intensity of the 253.7 nm line reaching said packaging material is set to at least 0.05 Watts per square centimeter; and,
destroying harmful bacteria on said packaging material exclusively by exposure of said packing material to said predetermined ultraviolet radiation for an interval of from one to sixty seconds.

4,175,141

INACTIVATION OF HEAT RESISTANT BACTERIAL PROTEASES IN ULTRA-HIGH TEMPERATURE TREATED MILK

Daniel M. Adams, Jr.; Jeff T. Barach, and Marvin L. Speck, all of Raleigh, N.C., assignors to Research Triangle Institute, Research Triangle Park, N.C.

Filed Feb. 25, 1977, Ser. No. 772,226
Int. Cl.[2] A23C *3/02*
U.S. Cl. 426—522 **9 Claims**

1. In the process for the ultra-high temperature treatment of milk comprising treating milk at a temperature of at least 120° C. to sterilize said milk, the improvement which comprises holding said milk at a temperature greater than 50° C. and up to 60° C. for a period of from about five to about sixty minutes immediately prior or subsequent to treating at a temperature of at least 120° C. to destroy a substantial amount of heat resistant proteases present in said milk.

4,175,142

PROCESS FOR THE PRODUCTION OF STERILIZED MAYONNAISE OR MAYONNAISE-CONTAINING PRODUCTS

Carl-Georg Hahn, Lübeck, and Kurt Rippel, Bad Schwartau, both of Fed. Rep. of Germany, assignors to Schroeder & Co., Fed. Rep. of Germany

Filed Jul. 8, 1977, Ser. No. 814,026
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1976, 2630872
Int. Cl.[2] A23D *5/02, 5/03*
U.S. Cl. 426—605 **11 Claims**

1. A process for the production of a pasteurized or sterilized mayonnaise or mayonnaise containing product comprising
(a) mixing coagulated egg yolk, milk protein, starch, a stabilizer, a minor amount of oil and water to form a basic mixture;
(b) heating the basic mixture in a first heater in a temperature range of about 80° C. to 100° C. for a time sufficient to pasteurize said basic mixture;
(c) cooling the pasteurized mixture in a first cooler to at least room temperature;
(d) emulsifying the cooled mixture with additional oil to form an emulsion, said combined oil added in steps (a) and (d) being sufficient for preparing said product;
(e) adding with stirring ingredients comprising vinegar and spices to the emulsion to form mayonnaise or mayonnaise containing product;
(f) heating said formed product in a second heater at a temperature in the range of about 80° C. to 100° C. for a time sufficient to pasteurize said product or at a temperature in the range of about 110° C. to 130° C. for a time sufficient to sterilize said product, and
(g) cooling the pasteurized or sterilized product in a second cooler to a temperature of from about 5° to 20° C.

4,175,143

COLOR CATHODE RAY TUBE PHOSPHORS COATED BY A WETTING AGENT

Kenneth Speigel, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 2, 1979, Ser. No. 49
Int. Cl.[2] B05D *5/12*
U.S. Cl. 427—71 **7 Claims**

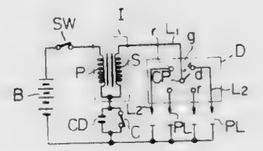
1. In a process for increasing the wetting capabilities of phosphors employed in color displaying cathode ray tubes, said tubes having screens formed of a multiplicity of discrete phosphor triads capable of emitting light in the primary colors, said screens having been formed by applying dry phosphor powders to a tacky photoresist, said process comprising the steps of: applying to said dry phosphor powders, before formation of said screens, a coating of a wetting agent selected from the group consisting essentially of alkyl aryl sulfonates, polyalkylene glycol ether, polyethylene oxide and polyethylene glycols so that said wetting agent is non reactive with dichromatic sensitized polyvinyl alcohol within the temperature range of about 20° C. to 480° C. and vaporizable at a temperature about about 60° C. and below 480° C.; by dispensing said dry phosphor powders into a solution containing said wetting agent; mixing said phosphor and solution thoroughly; filtering said phosphor from said solution to leave a wet phosphor cake; drying said wet phosphor cake; and breaking up said dried cake.

4,175,144

METHOD FOR SURFACE TREATMENT OF ELECTRODE IN DISTRIBUTOR OF INTERNAL COMBUSTION ENGINE FOR SUPPRESSING NOISE

Osamu Hori, and Katsumi Kondo, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 19, 1977, Ser. No. 862,091
Claims priority, application Japan, Sep. 30, 1977, 52-116617
Int. Cl.[2] B05D *5/12;* **H01H** *1/02, 19/00*
U.S. Cl. 427—126 **5 Claims**



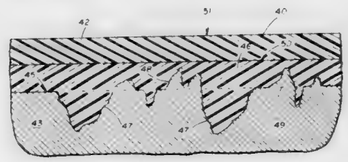
1. A method for the surface treatment of at least one electrode of both the distributor rotor and each stationary terminal in a distributor rotor of an internal combustion engine for suppressing noise, wherein finely powdered metal oxide comprising CuO and having a high electric resistance is applied onto said surface of said electrode by a coating process, wherein the improvement comprises:
adding a finely powdered refractory and electrical insulating material to said finely powdered metal oxide comprising CuO at a predetermined mixing ratio, uniformly mixing said finely powdered metal oxide comprising CuO and said finely powdered refractory and electrical insulating material together, and then applying the mixture onto said surface of said electrode by using a spray coating process.

4,175,145

MAKING MEMORY STRUCTURE FOR LASER RECORDING SYSTEM

Henry G. Fechter, Skokie, Ill., assignor to Teletype Corporation, Skokie, Ill.

Division of Ser. No. 770,244, Feb. 18, 1977, abandoned, which is a continuation of Ser. No. 572,482, Apr. 28, 1975, abandoned.
This application Jun. 19, 1978, Ser. No. 917,128
Int. Cl.[2] B05D *1/38, 5/00*
U.S. Cl. 427—240 **1 Claim**



1. A method of producing a thermoplastic memory structure comprising:
cleaning a substrate;
spinning the substrate;
depositing a liquid thermosetting polyurethane polymer at the center of the spinning substrate and spinning the substrate at an increased rate whereby to spread and to effect a smooth surfaced nonconformal layer of said polymer;
spinning the coated substrate at a reduced rate during which said layer is dried;
curing said nonconformal layer;
spinning said cured-layered substrate;
depositing a liquid thermoplastic polyurethane polymer at the center of the spinning cured-layered substrate and increasing the rate of spin whereby to spread the thermoplastic polymer and effect a microscopically smooth conformal layer;
spinning the now plural coated substrate at a reduced rate during which said conformal layer is dried; and
curing said conformal layer.

4,175,146

METHOD FOR IMPROVING THE PROPERTIES OF NATURAL PRODUCTS COMPOSED MAINLY OF CALCIUM CARBONATE

Tateo Ito, Kamakura, and Tomijiro Kaneko, Tokyo, both of Japan, assignors to Obata Industry & Commerce Co., Ltd., Tokyo, Japan

Filed Sep. 12, 1978, Ser. No. 941,665
Claims priority, application Japan, Oct. 6, 1977, 52-119509
Int. Cl.[2] B05D *3/00, 3/10*
U.S. Cl. 427—304 **7 Claims**

1. A method for reinforcing a natural product which is characterized in that calcium carbonate constitutes the main component of said natural product, which comprises the steps of: (1) soaking said natural product in a pretreatment solution containing a major amount of tin chloride and also containing hydrochloric acid and hydrofluoric acid whereby to make the surface of said natural product hydrophilic, to activate the surface of said natural product by making the surface of said natural product electrically conductive and to make stannous ions present thereon; (2) then soaking said natural product obtained in step (1) in a solution containing a major amount of palladium chloride and also containing hydrochloric acid whereby to replace said stannous ions on the surface of said natural product by palladium ions; (3) then soaking said natural product obtained in step (2) in a fluoride solution having a pH of from 4.3 to 9.0 to harden its surface; and (4) then soaking said natural product obtained in step (3) in a solution of a silane compound and a nonionic surface active agent to confer on said natural product improved resistance against acids, alkalis and salts.

4,175,147

METHOD TO REDUCE DEPOSITS OF TEREPHTHALIC ACID ON COOLING ROLLS DURING SHEET EXTRUSION OF AMORPHOUS POLYETHYLENE TEREPHTHALATE

Philip S. Bollen, Auburn, and Alfieri Degrassi, Pottsville, both of Pa., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Oct. 5, 1976, Ser. No. 729,739
Int. Cl.[2] C09D *5/16;* **C08G** *39/10*
U.S. Cl. 428—35 **16 Claims**

1. A sheet suitable to be formed and filled with heated foods and being formed from a uniform blend of from about 97.5 to 99.9% by weight of polyethylene terephthalate having an intrinsic viscosity of above about 0.9 and a melt viscosity at 525° F. of above about 10,000 poises and correspondingly from about 2.5 to 0.1% by weight of a polycarbonate resin having an intrinsic viscosity of about 0.4 to 0.6 and a melt viscosity at 500° F. of less than 50,000 poises; said sheet having a haze value as determined by ASTM D-1003 of less than about 2% and being essentially amorphous and non-oriented, so that when said sheet is extruded and rapidly cooled by contact with

a cooling surface, deposits onto said cooling surface are reduced.

4,175,148

PRODUCT CONTAINING HIGH DENSITY SKINS ON A LOW DENSITY CORE AND METHOD OF MANUFACTURING SAME

Allan J. Luck, Harvard; John T. Clarke, St. Charles, and Michael R. Hoffman, Elgin, all of Ill., assignors to Masonite Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 739,184, Nov. 5, 1976. This application Feb. 27, 1978, Ser. No. 881,184

The portion of the term of this patent subsequent to Nov. 20, 1996, has been disclaimed.

Int. Cl.[2] **B32B** *5/14;* **B29J** *5/04*

U.S. Cl. 428—171 **21 Claims**

1. A fiberboard product comprising a base layer comprising cellulosic fibers, said base layer having a density in the range of 10–35 pounds/ft^3; and an integral skin disposed on at least one face of said base layer, said skin having a higher density than that of the base layer and formed by contacting the surface fibers of said fiberboard with a skin forming chemical in an amount of 5–20% based on the dry weight of fibers contacted therewith, and heating said contacted surface fibers, under pressure, at a temperature of at least 525° F., said skin formed during said hot-pressing on the surface of said fiberboard contacted with said skin forming chemical.

2. A method of manufacturing a cellulosic fiber containing board having a skin on at least one surface thereof comprising:

compressing a fibrous composition, including cellulosic fibers, under heat and pressure to form a consolidated mat having a density of less than 35 pounds per cubic foot;

including a skin forming chemical in at least a surface layer of fibers of said mat in an amount in the range of 5–20% based on the dry weight of said surface layers wherein said skin forming chemical is selected from the group consisting of ammonium thiocyanate, thiourea, acetamide, dicyandiamide, ethanolamine, hexamethylenetetramine, hydrazine+formaldehyde, ammonium xylene sulfonate, mono-ammonium phosphate, di-ammonium phosphate, ammonium sulfate, sucrose, boric acid+borax, linseed oil+iron tallate, a sugar containing hemicellulose extract derived from steam digestion of wood chips, and mixtures thereof; and

hot-pressing said consolidated mat containing said skin forming chemical in at least its surface fibers, at a temperature of at least 525° F. to form a board having a skin on at least one surface thereof, said skin defined by a layer of material on said surface of said board having a density greater than the material on which the skin is formed, said skin formed during said hot-pressing on the surface of said mat containing said skin forming chemical.

4,175,149

MINERAL WOOL PRODUCT CONTAINING HIGH DENSITY SKINS AND METHOD OF MANUFACTURING SAME

Allan J. Luck, Harvard; John T. Clarke, St. Charles, and Michael R. Hoffman, Elgin, all of Ill., assignors to Masonite Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 739,184, Nov. 5, 1976. This application Feb. 27, 1978, Ser. No. 881,551

The portion of the term of this patent subsequent to Nov. 20, 1979, has been disclaimed.

Int. Cl.[2] **B32B** *5/14;* **B29J** *5/04*

U.S. Cl. 428—171 **39 Claims**

1. A mineral wool-containing fiberboard product comprising a base layer including mineral wool fibers and a binder selected from the group consisting of cellulosic fiber, starch, and mixtures thereof, and an integral skin disposed on at least one surface of said base layer, said skin having a density in the range of 40–55 pounds/ft^3 and formed by including said binder in a surface layer in an amount effective to form said skin and contacting said cellulosic fibers or starch in said surface layer with urea in an amount of 5–20% based on the dry weight of said surface layer contacted therewith, and, after consolidation of said base layer, heating said contacted surface layer, under pressure above ambient, at a temperature of at least 525° F., said skin formed during said hot-pressing on the surface layer contacted with urea.

2. A method of manufacturing a mineral wool board having a skin on at least one surface thereof comprising:

consolidating a fibrous mat containing mineral wool fibers and a binder selected from the group consisting of cellulosic fiber, starch, and mixtures thereof to form a consolidated mineral wool board said cellulosic fiber or starch included in the surface of said consolidated board in an amount effective to form a skin on said surface;

including urea in at least a surface layer of said board in an amount of at least 5% based on the dry weight of said surface layer; and

hot-pressing said consolidated board containing urea in at least its surface fibers, at a temperature of at least 525° F. to form a mineral wool containing board having a skin on at least one surface thereof, said skin defined by a layer of material on said surface of said board having a density greater than the material on which the skin is formed, said skin formed during said hot-pressing on the surface of said board including urea.

4,175,150

UREA CONTAINING HIGH DENSITY SKIN FIBERBOARD WITH A LOW DENSITY CORE

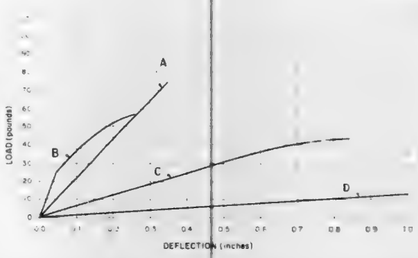
Allan J. Luck, Marengo; John T. Clarke, and Michael R. Hoffman, both of St. Charles, all of Ill., assignors to Masonite Corporation, Chicago, Ill.

Filed Nov. 5, 1976, Ser. No. 739,184

The portion of the term of this patent subsequent to Nov. 20, 1996, has been disclaimed.

Int. Cl.[2] **B32B** *5/14, 7/02;* **B29J** *5/04*

U.S. Cl. 428—171 **35 Claims**



1. A fiberboard product comprising a base layer comprising cellulosic fibers and a binder, said base layer having a density in the range of 10–35 pounds/ft^3; and an integral skin disposed on at least one face of said base layer, said skin having a density in the range of 40–55 pounds/ft^3 and formed by including urea within the surface fibers of said fiberboard, in an amount of 5–20% based on the dry weight of fibers containing urea, consolidating said fiberboard to provide a base layer having a density in the range of 10–35 pounds/ft^3, and thereafter heating said contacted surface fibers, under pressure, at a temperature of at least 525° F., to form said skin during hot-pressing on the surface of said mat containing urea.

2. A method of manufacturing cellulosic fiber containing board having a skin on at least one surface thereof comprising:

compressing a fibrous composition, containing cellulosic fibers, under heat and pressure to form a consolidated mat having a density of less than 35 pounds per cubic foot;

including urea in at least a surface layer of fibers of said mat in an amount in the range of 5–20% based on the dry weight of said surface layer; and

hot-pressing said consolidated mat containing urea in at least its surface fibers, at a temperature of at least 525° F. to form a board having a skin on at least one surface thereof, said skin defined by a layer of material on said surface of said board having a density greater than the material on which the skin is formed, said skin formed during said hot-pressing of said mat including urea.

4,175,151

PROCESS FOR THE PRODUCTION OF DECAL TRANSFERS AND DECAL TRANSFERS PRODUCED ACCORDING TO THE PROCESS

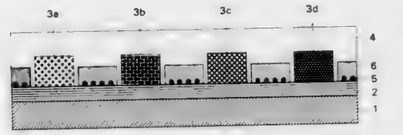
Alfred Eppich, Zirndorf, and Rudolf H. Hochleitner, Weiherhof, both of Fed. Rep. of Germany, assignors to Firma F. Xaver Leipold, Nuremberg, Fed. Rep. of Germany

Filed Jun. 2, 1978, Ser. No. 911,918

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1977, 2729288

Int. Cl.[2] **B32B** *7/06;* **B41M** *3/12*

U.S. Cl. 428—202 **7 Claims**



2. A decal transfer consisting of

a solvent-permeable backing,

a solvent-soluble separation layer on said backing,

a printed color picture on said separation layer,

a solvent-soluble cover on said separation layer in at least the picture-free areas, and

an insoluble protective-transfer foil covering said picture and the majority of said cover.

4,175,152

POLYMERIC MATERIALS CONTAINING SEMICONDUCTING REFRACTORY OXIDES

Robert D. Carnahan, Barrington, Ill.; William C. Holt, Jr., Alexandria, Va., and Karl J. Youtsey, Decatur, Ala., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 670,014, Mar. 24, 1976, Pat. No. 4,107,092, which is a continuation-in-part of Ser. No. 335,972, Feb. 26, 1973, abandoned. This application Mar. 17, 1978, Ser. No. 887,688

Int. Cl.[2] **H01B** *1/06*

U.S. Cl. 428—242 **7 Claims**

1. An electrically conductive sheet which comprises at least one layer of a reinforcing material provided with a polymeric matrix material containing from about 10% to about 95% by weight of a finely divided semiconductive filler comprising a refractory inorganic oxide having a carbonaceous pyropolymer composited on the surface thereof, said semiconductive filler having a particle size of from about 0.1 to about 100 microns and a resistivity in the range of from about 0.001 ohm-centimeter to about 10^{10} ohm-centimeter.

4,175,153

INORGANIC ANISOTROPIC HOLLOW FIBERS

Emerick J. Dobo, Cary, and Tommy E. Graham, Raleigh, both of N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed May 16, 1978, Ser. No. 906,502

Int. Cl.[2] **D02G** *3/00*

U.S. Cl. 428—398 **42 Claims**



1. An essentially inorganic, sintered monolithic hollow fiber having a radially anisotropic internal void volume wall structure.

4,175,154

SHEET BACKING FOR DECORATIVE COVERING MATERIAL

Kenneth J. Faust, Cressona, and Douglas C. Woerner, Northampton, both of Pa., assignors to GAF Corporation, New York, N.Y.

Filed Dec. 22, 1977, Ser. No. 863,431

Int. Cl.[2] **B32B** *3/26, 5/20;* **B05D** *5/00, 3/02*

U.S. Cl. 428—313 **5 Claims**

1. Decorative, flexible, sheet type covering material having a substrate comprising a porous non-woven mat of glass fibers saturated and completely coated on both sides with foamed, heat cured, polyvinyl chloride plastisol or organosol, said mat being characterized by:

a. the glass fibers having an average diameter between about 7 and about 15 microns and an average length between about 0.2 and about 1.5 inch;

b. openings in such mat averaging between about 1 and about 20 mils in the smallest linear dimension with at least about 50 percent of such openings having smallest linear dimensions between about 2 and about 10 mils; and

c. the mat being between about 10 and about 40 mils thick and having a density between about 1 and about 4 pounds per 100 square feet.

4,175,155

DECORATIVE COVERING MATERIAL

Jerome Biranowski, Bronx, N.Y., and Kenneth J. Faust, Cressona, Pa., assignors to GAF Corporation, New York, N.Y.

Filed Dec. 22, 1977, Ser. No. 863,432

Int. Cl.[2] **B32B** *3/26, 5/20;* **B05D** *5/00, 3/02*

U.S. Cl. 428—313 **4 Claims**

1. Decorative, flexible, sheet type covering material having a substrate comprising a porous, non-woven mat of glass fibers saturated and completely coated on both sides with foamed, heat cured, flexible urethane, said mat being characterized by:

a. the glass fibers having an average diameter between about 7 and about 15 microns and an average length between about 0.2 and about 1.5 inch;

b. openings in such mat averaging between about 1 and about 20 mils in the smallest linear dimension with at least about 50 percent of such openings having smallest linear dimensions between about 2 and about 10 mils; and

c. the mat being between about 10 and about 40 mils thick and having a density between about 1 and about 4 lbs per 100 square feet.

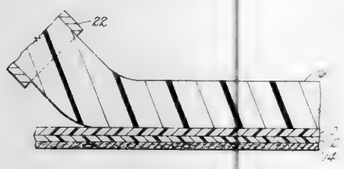
V 9 8 8 3 N 0 2 0 7 9 UMI

4,175,156

COMPOSITE FILM ADHESIVE

Thomas G. Ikins, Battle Creek, Mich., assignor to USM Corporation, Farmington, Conn.

Filed May 19, 1978, Ser. No. 907,663
Int. Cl.[2] B32B *27/40, 27/36, 27/30*
U.S. Cl. 428—336 **14 Claims**



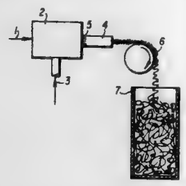
1. Composite film adhesive comprising a layer of heat activatable adhesive for adhesion to a plasticized resin which adhesive is resistant to plasticizer migrating from said resin and a layer of tough flexible resin for adhesion to a urethane adhesive layer and in strongly adhesive intimate relation to said heat activatable adhesive layer, said tough flexible resin containing at least 10^{-4} mol of active hydrogen per gram of tough flexible resin for reaction with free NCO groups of a urethan adhesive.

4,175,157

PROCESS FOR TEXTURIZING POLYESTER YARN AND YARN

Rene Guillermin, Bron; Jean Joly, Craponne, and Silvio Sangalli, Caluire, all of France, assignors to Rhone-Poulenc Textile, Paris, France

Continuation of Ser. No. 724,848, Sep. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 557,088, Mar. 10, 1975, abandoned. This application Aug. 15, 1977, Ser. No. 824,615
Claims priority, application France, Mar. 22, 1974, 74 10429
Int. Cl.[2] D02G *1/12, 1/16, 1/20*
U.S. Cl. 428—369 **13 Claims**



1. A process for the preparation of texturized multifilament polyester yarn possessing a stable crimp, by crimping and compressing the said yarn, in which the yarn passes first through an injector where it is subjected to a stream of hot fluid which separates the filaments, and thereafter through a stacking nozzle to cause crimping, wherein the fluid is fed into the injector at a temperature below the second order transition temperature of said polyester yarn, the stack, after it issues from the nozzle is kept in the compressed state, subjected in this state to a high pressure of the order of 20 to 200 kg/cm^2, and kept at a temperature below the second order transition temperature of said polyester yarn for a period of time ranging from one minute to 150 minutes.

4,175,158

AGGLOMERATING PARTICULATE PERLITE

Elerington Saunders, 2835 E. Van Buren St., Phoenix, Ariz. 85009

Filed Oct. 17, 1977, Ser. No. 842,888
Int. Cl.[2] B32B *9/00;* **C04B** *31/22*
U.S. Cl. 428—402 **14 Claims**

1. A method of forming a particulate product consisting essentially of agglomerated particulate perlite fines, said method comprising the steps of:

(a) commingling said perlite fines with a boron compound to form a particulate mixture with said boron compound, said boron compound capable of being substantially converted to B_2O_3 at elevated temperatures;

(b) initially heating said particulate mixture sufficiently to coat said perlite fines at least partially with said boron compound while continuously mixing said particulate mixture;

(c) converting said boron compound to B_2O_3; and

(d) diffusing said B_2O_3 into said perlite by additional heating of said particulate mixture; said steps resulting in the formation of a plurality of particles, said particles being larger than said perlite fines.

9. A method of forming a particulate filter aid by agglomerating particulate perlite fines having an initial mean particle size of less than 30 microns comprising the steps of:

(a) commingling said perlite fines with particulate solid H_3BO_3 to form a particulate mixture of approximately 5 weight percent H_3BO_3, said H_3BO_3 having a particle size of less than −325 U.S. Standard mesh;

(b) initially heating said particulate mixture above 365° F. for at least one minute while mixing said particulate mixture; and

(c) heating said particulate mixture to a temperature of at least 1200° F. for at least one hour, said steps resulting in the formation of a plurality of particles, said particles being larger than said perlite fines.

13. A particulate agglomerate consisting essentially of perlite particles, said agglomerate being formed from fine particulate perlite and produced by initially coating said fine particulate perlite with molten H_3BO_3 while mixing said perlite and said H_3BO_3 to form a particulate mixture, subsequently converting said H_3BO_3 to B_2O_3 by heat treatment; and finally, diffusing said B_2O_3 into said perlite by heating said particulate mixture to a temperature of at least 1200° F.

4,175,159

SILICONE EMULSIONS FOR TREATING SILICATE PARTICULATE MATTER

William J. Raleigh, Rensselaer, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jul. 31, 1978, Ser. No. 929,461
Int. Cl.[2] B32B *17/00;* **C08A** *31/09*
U.S. Cl. 428—405 **21 Claims**

1. A silicone emulsion for treating silicate particulate matter selected from perlite and vermiculite to make the particulate matter water-resistant comprising (a) from 40 to 60 parts by weight of a silicone fluid having R_2SiO units. R $SiO_{1.5}$ units and R $SiO_{0.5}$ units where the ratio of organosiloxy units to diorganosiloxy units varies from 0.11 to 1.4 inclusive and the ratio of triorganosiloxy units to diorganosiloxy units varies from 0.02 to about 1 inclusive and the fluid has a silanol content varying from 0.1 to 8 percent by weight and a viscosity varying from 10 to 10,000 centipoise at 25° C. and where R is selected from the class consisting of alkyl radicals of 1 to 8 carbon atoms vinyl radicals and mononuclear aryl radicals; (b) from 0.5 to 5 parts by weight of an aliphatic carboxylic acid having from 6 to 20 carbon atoms; (c) from 0.1 to 0.8 parts by weight of ammonia and (d) from 20 to 150 parts of water.

16. A method for coating silicate matter selected from perlite and vermiculite so as to render it water-resistant comprising (1) applying to the surface of the silicate particulate matter a silicone emulsion having (a) from 40 to 60 parts by weight of a

silicone fluid having R_2SiO units, R $SiO_{1.5}$ units and $R_3SiO_{0.5}$ units where the ratio of organosiloxy units to diorganosiloxy units varies from 0.11 to 1.4, inclusive, and the ratio of triorganosiloxy units to diorganosiloxy units varies from 0.02 to about 1, inclusive, and the fluid has a silanol content varying from 0.1 to 8 percent by weight and a viscosity varying from 10 to 10,000 centipoise at 25° C. and where R is selected from the class consisting of alkyl radicals of 1 to 8 carbon atoms, vinyl radicals, and mononuclear aryl radicals; (b) from 0.5 to 5 parts by weight of an aliphatic carboxylic acid having from 6 to 20 carbon atoms; (c) from 0.1 to 0.8 parts by weight of ammonia; and (d) from 20 to 150 parts of water; and (2) curing the silicone emulsion and evaporating the water.

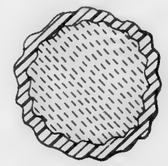
21. A method for coating silicate particulate matter selected from perlite and vermiculite so as to render it water-resistant comprising (1) applying to the surface of the silicate particulate matter a silicone emulsion having (a) from 40 to 60 parts by weight of a linear silanol terminated diorganopolysiloxane polymer having a viscosity varying from 10 to 10,000 centipoise at 25° C. where the organo group is selected from the class consisting of alkyl radicals of 1 to 8 carbon atoms and mononuclear aryl radicals; (b) from 0.5 to 5 parts by weight of an aliphatic carboxylic acid having from 6 to 20 carbon atoms; (c) from 0.1 to 0.8 parts by weight of ammonia; and (d) from 20 to 150 parts of water; and (2) curing the silicone emulsion and evaporating the water.

4,175,160

COATED PHOSPHORS AND ARTICLES EMPLOYING SAME

Clarence D. Vanderpool, Towanda, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jun. 22, 1978, Ser. No. 917,825
Int. Cl.[2] B32B *5/16, 9/00*
U.S. Cl. 428—407 **10 Claims**



1. A composite article of manufacture comprising a phosphor particle and a coating on the surface of the particle, the coating comprising polyvinyl alcohol modified with at least one amino acid in the amount of about 30 to 80 weight percent of the coating.

4,175,161

METHOD OF IMPROVING THE ADHESION OF A HEAT ACTIVATABLE POLYURETHANE ADHESIVE TO A VINYL SUBSTRATE

Ozzie Fogle, and James Cooley, both of Orangeburg, S.C., assignors to Champion International Corporation, Stamford, Conn.

Filed Apr. 27, 1978, Ser. No. 901,014
Int. Cl.[2] B32B *27/40, 27/30, 27/18*
U.S. Cl. 428—425 **10 Claims**

1. A method of improving the adhesion of a heat activatable polyurethane adhesive to a vinyl substrate comprising admixing said heat activatable polyurethane adhesive with at least one agent selected from the groups consisting of N-substituted-2-pyrrolidone and ethoxylated alkyl phenol, wherein said N-substituted-2-pyrrolidone substituent is lower alkyl or lower alkenyl, applying said admixture to a vinyl substrate, and thereafter reacting an organic isocyanate with the additive in said heat activatable polyurethane adhesive.

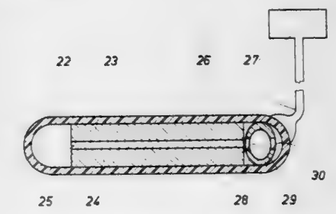
10. A laminate produced by the method of claim **1**.

4,175,162

METHOD OF MANUFACTURING A LAMINATED, LIGHT TRANSMITTING, FIRE SCREENING PANEL

Marcel De Boel, Chatelineau; Pol Baudin, Fontaine l'Eveque; Michel Wasterlain, Trazegnies, and Pierre Collignon, Marcinelle, all of Belgium, assignors to BFG Glassgroup, Paris, France

Filed Nov. 28, 1977, Ser. No. 855,453
Claims priority, application United Kingdom, Nov. 30, 1976, 49850/76
Int. Cl.[2] B32B *17/06*
U.S. Cl. 428—428 **19 Claims**



1. A method of manufacturing a laminated, light-transmitting fire-screening panel comprising at least one solid layer of intumescent material sandwiched between two structural plies without the use of a sheet of plastic material to effect the bonding, comprising the steps of forming a stratum from an intumescent sodium silicate material, assembling said stratum and a first structural ply to an inorganic face of a pane comprising a second structural ply so that said stratum is in contact with said inorganic face and sandwiched between said structural plies, enveloping at least the edges of the sandwich assembly in such manner as to define a space around the edges in which sub-atmospheric pressure can be created for subjecting the inter-ply space to suction at the edges, and subjecting the sandwich assembly to a treatment in which at least one of the main external faces of the sandwich assembly is exposed to sub-atmospheric environmental pressure while the sandwich assembly is exposed to heat in a treatment chamber and the inter-ply space is subjected to the aforesaid suction to effect bonding of the various plies without causing the intumescent material to become tumid, the environmental temperature during said treatment being at least 50° C. and not more than 95° C., the sandwich assembly being subjected to a supplementary bonding stage following said treatment in which final bonding takes place at above atmospheric pressure in excess of 10 kg/cm^2.

4,175,163

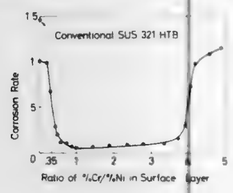
STAINLESS STEEL PRODUCTS, SUCH AS SHEETS AND PIPES, HAVING A SURFACE LAYER WITH AN EXCELLENT CORROSION RESISTANCE AND PRODUCTION METHODS THEREFOR

Teruo Ikeno, Mitaka; Satoshi Kado, Fujisawa; Yasuo Otoguro, Machida; Yasuhiko Miyoshi, Tokyo; Chuichi Kato, and Tadao Azami, both of Sagamihara, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 24, 1977, Ser. No. 780,781
Claims priority, application Japan, Mar. 29, 1976, 51-33498; Apr. 7, 1976, 51-38929; May 12, 1976, 51-53939
Int. Cl.[2] C09D *5/08*
U.S. Cl. 428—553 **2 Claims**

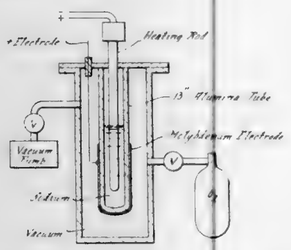
1. A stainless steel product with an excellent high temperature corrosion resistance against vanadium pentoxide and sodium sulfate, having a surface layer of 10μ to 2 mm in thickness, composed mainly of Cr and Ni within a range of $0.35 \leqq \%Cr/\%Ni \leqq 4.0$ containing one or more elements selected from the group consisting of Al, Zn, Sn, Cu, Pb, Si and B in a total amount of not more than 1.0%, and having a poros-

ity of not more than 4.0%, and a diffusion layer of at least 1μ in thickness formed by diffusion of at least one element selected



from the group consisting of Cr and Ni into the base metal at the interface between the surface layer and the base metal.

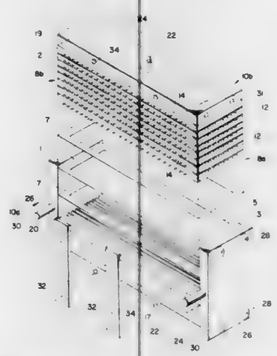
4,175,164
THERMOELECTRIC GENERATOR ELECTRODE
Terry Cole, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Apr. 10, 1978, Ser. No. 894,969
Int. Cl.[2] H01M *10/36*
U.S. Cl. 429—11 **19 Claims**



1. An alkali metal thermoelectric generator device that has an electrically continuous, porous electrode on solid electrolyte that comprises metal peaks averaging below about 50 micrometers and valleys below about 10 micrometers and having an average pore diameter above about 0.15 microns.

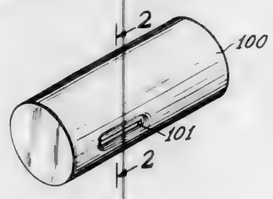
4,175,165
FUEL CELL SYSTEM UTILIZING ION EXCHANGE MEMBRANES AND BIPOLAR PLATES
Otto J. Adlhart, Newark, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.
Filed Jul. 20, 1977, Ser. No. 817,455
Int. Cl.[2] H01M *8/04*
U.S. Cl. 429—30 **32 Claims**

1. A fuel cell assembly comprising a plurality of fuel cell laminates stacked together in substantially parallel relationship to each other, each fuel cell laminate comprising a catalytic fuel electrode to which a fuel is fed;
a catalytic oxygen electrode to which an oxygen-containing gas is fed;
an ion exchange membrane as an electrolyte member between and in contact with the fuel and oxygen electrodes;
a plurality of electrically conductive bipolar plates separating adjacent fuel cell laminates in the stack, each of said bipolar plates having opposite surfaces contacting electrodes of the cells in the stack, one surface contacting a fuel electrode and the opposite surface contacting an oxygen electrode;
means for supplying fuel to said electrodes comprising a plurality of separate fuel gas flow channels on a surface of each bipolar plate contacting a fuel electrode, said means for supplying fuel extending from one edge of a bipolar plate to the opposite edge of the plate; and
means for supplying an oxygen-containing gas to each oxygen electrode, comprising a plurality of separate oxygen-containing gas flow channels on the surface of each bipolar plate in contact with the oxygen containing electrode, said oxygen-containing gas supply means extending from



one edge of each bipolar plate to said opposite edge, the oxygen gas flow channel generally having a larger cross sectional area compared with fuel gas flow channels while arranged along parallel planes in perpendicular pathways.

4,175,166
SEALED CONTAINER CONSTRUCTION CAPABLE OF SAFELY VENTING INTERNAL PRESSURE
Martin G. Rosansky, Mt. Vernon, N.Y., assignor to Power Conversion, Inc., Mount Vernon, N.Y.
Filed May 2, 1978, Ser. No. 902,031
Int. Cl.[2] H01M *2/12*
U.S. Cl. 429—56 **5 Claims**

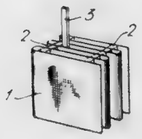


1. A sealed electrical energy storage container being cylindrical in shape and having an internal cylindrical radius, r, said container being arranged to safely vent its contents at a predetermined internal pressure, P, and said container comprised of a material having an ultimate tensile strength, S, characterized by, said container sidewalls being of generally uniform thickness and having at least one area of reduced thickness, t, wherein $t = Pr/S$, whereby said area of reduced thickness ruptures at pressure P to safely vent the storage container contents.

4,175,167
ELECTRODE HAVING POLYTETRAFLUOROETHYLENE POWDER DISPERSED ON ITS OUTER SURFACE
Johannes A. van Lier, Cleveland, Ohio, assignor to Union Carbide Corporation, New York, N.Y.
Filed Mar. 31, 1978, Ser. No. 892,312
Int. Cl.[2] H01M *10/52*
U.S. Cl. 429—59 **6 Claims**

1. A coherent powder electrode having disposed upon and confined only to its outer surface polytetrafluoroethylene particles in an amount of less than 0.5 percent by weight of the active material in the electrode and wherein the polytetrafluoroethylene particles on the outer surface of the electrode cover no more than about 65 percent of the visible surface area of the electrode.

4,175,168
ZINC ELECTRODE FOR LOW TEMPERATURE
William A. Armstrong, and Peter J. Powell, both of Ottawa, Canada, assignors to Her Majesty the Queen in right of Canada as represented by the Minister of National Defence, Canada
Filed Oct. 4, 1978, Ser. No. 948,524
Claims priority, application Canada, Oct. 12, 1977, 288578
Int. Cl.[2] H01M *4/42*
U.S. Cl. 429—229 **17 Claims**



1. An electrode for use in an electrochemical cell comprising a strip of a perforated electrochemically active metal material, said strip being folded upon itself to form sections, and a plurality of spacers attached between and separating adjacent sections, said spacer being made of a perforated electrochemically active material and being of sufficient thickness to permit adequate electrolyte flow between adjacent sections.

4,175,169
PRODUCTION OF POLYETHYLENE
Charles D. Beals; George I. Fitzpatrick, and Kim L. O'Hara, all of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.
Continuation of Ser. No. 625,415, Oct. 24, 1975, abandoned, which is a continuation of Ser. No. 386,915, Aug. 9, 1973, abandoned, which is a continuation of Ser. No. 126,300, Mar. 19, 1971, abandoned, which is a division of Ser. No. 37,610, May 15, 1970, Pat. No. 3,628,918. This application Jan. 16, 1978, Ser. No. 869,727
Int. Cl.[2] C08F *2/02, 4/28, 10/02*
U.S. Cl. 526—64 **21 Claims**



1. In a process for producing polyethylene in a tubular reactor having an inlet and an outlet and at least one reaction zone having an internal diameter between 0.5 and 3 inches, at a temperature within the range between about 300° F. and about 650° F. and at a pressure between about 1,000 and 3,500 atmospheres and in the presence of a free radical yielding initiator, the improvement which comprises:
passing the reaction mass through each reaction zone in said tubular reactor at a bulk fluid velocity sufficient so that the Flow Number is greater than 3.3 $ft.^2/sec.$ and wherein the total pressure drop within said tubular reactor is controlled to be less than 6,000 psi.

4,175,170
MANUFACTURE OF OLEFIN POLYMERS
Guenther Schweier, Ludwigshafen; Robert Bachl, Worms; Heinz Mueller-Tamm, Ludwigshafen; Hans Frielingsdorf, Bad Durkheim; Wolfgang Gruber, Frankenthal, and Erich Kolk, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany
Filed Sep. 7, 1976, Ser. No. 720,777
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1975, 2543181
Int. Cl.[2] C08F *4/02, 10/02*
U.S. Cl. 526—125 **8 Claims**

1. A process for the manufacture of a homopolymer or copolymer of an α-monoolefin of 2 to 10 carbon atoms by polymerizing the monomer or monomers at a temperature of from 30° to 200° C. and a pressure of from 0.1 to 200 bars, by means of a Ziegler catalyst system comprising (1) a catalyst component containing titanium and/or vanadium and (2) a metal compound of the general formula

$$MeA_{m-n}X_n$$

where Me is aluminum, magnesium or zinc, A is a hydrocarbon radical of 1 to 12 carbon atoms, X is chlorine, bromine, iodine or hydrogen m is the valency of the metal Me and n is a number from 0 to m−1, the atomic ratio of transition metal in catalyst component (1) to metal (Me) in catalyst component (2) being from 1:0.1 to 1:500, wherein the catalyst component (1), containing titanium and/or vanadium, is the solid-phase product (VII) which has been obtained by first
(1.1) bringing a finely divided porous inorganic oxidic material (I), which has a particle diameter of from 1 to 1,000μ, a pore volume of from 0.3 to 3 cm^3/g, and a surface area of from 100 to 1,000 m^2/g, and which has the formula SiO_2, into contact with an aluminum compound (II) dissolved in an organic solvent and having the general formula

$$AlB_{3-p}Y_p$$

where B is hydrocarbon radical of 1 to 12 carbon atoms, Y is chlorine, bromine, iodine, hydrogen or OR, R is a hydrocarbon radical of 1 to 12 carbon atoms and p is a number from 0 to 3, to form a solid-phase product (III), the weight ratio of the inorganic oxidic material (I) employed to the aluminum compound (II) employed being from 1:0.05 to 1:10, and then
(1.2) bringing the solid-phase product (III) obtained from stage (1.1) into contact with a magnesium compound (IV), dissolved in an organic solvent, to form a solid-phase product (V), the weight ratio of solid-phase product (III) employed to magnesium compound (IV) employed being from 1:0.01 to 1:0.25, the magnesium compound (IV) being a manasseite of the formula $Mg_6Al_2(OH)_{16}CO_3 \cdot 4H_2O$ and further being brought to a chlorine content of from 50 to 75 percent by weight by halogenation with phosgene, and finally
(1.3) bringing the solid-phase product (V) obtained from stage (1.2) into contact with a solid or liquid transition metal compound (VI) dissolved in an organic solvent, or a liquid transition metal compound (VI) without solvent, the transition metal being titanium and/or vanadium, to form a solid-phase product (VII), the weight raio of solid-phase product (V) employed to transition metal in the

transition metal compound (VI) employed being from 1:0.01 to 1:20.

4,175,171

CATALYST FOR POLYMERIZING α-OLEFINS

Akira Ito, Yokohama; Heizo Sasaki, Tokyo; Masanori Osawa, Yokohama; Tetsuya Iwao, Zushi, and Kenji Iwata, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Jul. 11, 1977, Ser. No. 814,690

Claims priority, application Japan, Aug. 2, 1976, 51-91330; Aug. 4, 1976, 51-91331; Apr. 4, 1977, 52-37651

Int. Cl.[2] C08F *4/02, 10/06*

U.S. Cl. 526—125 **17 Claims**

1. A catalyst for polymerizing α-olefins comprising:

(A) A titanium composition obtained by heat-treatment of:

(1) a comminuted mixture of 10–95% by weight of a magnesium dihalide and 90–5% by weight of a complex consisting of AlX_3, wherein X is a halogen, and a carboxylic acid ester of the formula

R^1COOR^2

wherein R^1 and R^2 are the same or different and selected from the group consisting of aromatic, aliphatic and alicyclic radicals having 1–12 carbon atoms, the molar ratio of said carboxylic acid ester to said aluminum halide being approximately 1:1; and

(2) liquid titanium tetrachloride in an amount whereby Ti constitutes 0.1–10% by weight of (A); and

(B) an organic aluminum compound of the formula

$AlR^3{}_mH_{3-m}$

wherein R^3 is an alkyl radical having 1–12 carbon atoms and m is $1.5 \leqq m \leqq 3$;

wherein (B) is present in an amount whereby the atom ratio of titanium in (A) to aluminum in (B) is in the range of 1:1–300.

4,175,172

BISPIPERAZIDO PHOSPHORUS POLYAMIDES

Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

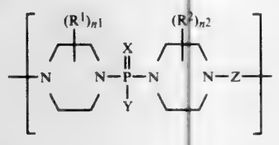
Division of Ser. No. 628,262, Nov. 3, 1975, Pat. No. 4,098,768. This application Jun. 22, 1978, Ser. No. 918,137

Claims priority, application United Kingdom, May 21, 1975, 21974/75

Int. Cl.[2] C08G *77/22*

U.S. Cl. 528—27 **16 Claims**

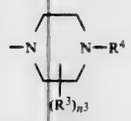
1. A solid polymer consisting essentially of repeating units of the formula:



wherein

(i) X is absent or represents oxygen or sulphur or =N—R;

(ii) Y represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an n-containing heterocyclic group; or —OR or $-NR_2$; or $-NR_2$ in which the two R groups, together with the nitrogen atom to which they are attached, represent an N-containing heterocyclic ring; or a group of the formula:

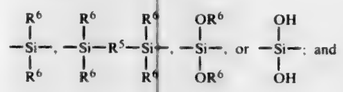


wherein R, R^1, R^2, and R^3 represent hydrogen, or an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group;

(iii) R^4 represents hydrogen or an aliphatic group, a cycloaliphatic group, an N-containing heterocyclic group, an acyl group, a sulfonyl group, or an unsubstituted carbamoyl group;

(iv) n^1, n^2, and n^3 each represent zero or an integer;

(v) Z represents



(vi) R^5 or R^6 represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon radical, or an N-containing heterocyclic radical.

4,175,173

POWDER COATING COMPOSITIONS CONTAINING AN EPOXIDE RESIN AND AN ACID HARDENER

Madan M. Bagga, Cambridge, and Noel S. Moss, Duxford, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

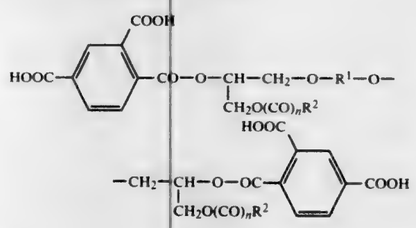
Filed Sep. 8, 1978, Ser. No. 940,678

Claims priority, application United Kingdom, Sep. 9, 1977, 37685/77

Int. Cl.[2] C08G *59/42*

U.S. Cl. 528—97 **10 Claims**

1. Solid, curable compositions in powder form, comprising 100 parts by weight of an epoxide resin and 10 to 30 parts by weight of a carboxylic acid of formula



where

R^1 represents a phenylene or naphthylene group, or a group comprising two or three phenylene radicals linked by one or two carbon-carbon bonds, one or two ether oxygen atoms, one or two sulfur atoms, or by one or two sulfonyl, sulfoxide, carbonyl, or alkylene groups of 1 to 6 carbon atoms, and

either both n represent zero, in which case R^2 represents a saturated alkyl group of 1 to 16 carbon atoms, a benzenoid group of 6 to 12 carbon atoms, or an aralkyl group of 7 to 16 carbon atoms, or

both n represent 1, in which case R^2 represents a saturated alkyl group of 1 to 3 carbon atoms, a benzenoid group of 6 to 12 carbon atoms, or an aralkyl group of 7 to 16 carbon atoms.

4,175,174

BISPIPERAZIDO PHOSPHORUS POLYAMIDES

Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

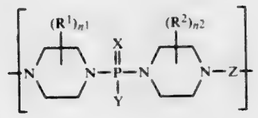
Division of Ser. No. 628,262, Nov. 3, 1975, Pat. No. 4,098,768. This application Jun. 19, 1978, Ser. No. 916,617

Claims priority, application United Kingdom, May 21, 1975, 21974/75

Int. Cl.[2] C08G *69/26*

U.S. Cl. 528—168 **13 Claims**

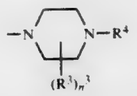
1. A solid polymer consisting essentially of repeating units of the formula



wherein

(i) X is absent or represents oxygen or sulphur or =N—R;

(ii) Y represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group; or —OR or $-NR_2$; or $-NR_2$ in which the two R groups, together with the nitrogen atom to which they are attached, represent an N-containing heterocyclic ring; or a group of the formula

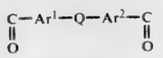


wherein R, R^1, R^2, and R^3 represent hydrogen, or an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group;

(iii) R^4 represents hydrogen or an aliphatic group, a cycloaliphatic group, an N-containing heterocyclic group, an acyl group, a sulfonyl group, or an unsubstituted carbamoyl group;

(iv) n^1, n^2, and n^3 each represent zero or an integer;

(v) Z represents



(vi) Ar^1 and Ar^2 represent arylene; and

(vii) Q represents —O—, or —S—, or —SO—.

4,175,175

POLYARYLENE POLYETHERS

Robert N. Johnson, New Market, and Alford G. Farnham, Mendham, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 230,091, Feb. 28, 1972, Pat. No. 4,108,837, which is a continuation-in-part of Ser. No. 688,302, Dec. 6, 1967, abandoned, which is a continuation-in-part of Ser. No. 446,715, Apr. 8, 1965, abandoned, which is a continuation-in-part of Ser. No. 295,519, Jul. 16, 1963, abandoned. This application May 8, 1978, Ser. No. 903,569

The portion of the term of this patent subsequent to Aug. 22, 1995, has been disclaimed.

Int. Cl.[2] C08G *65/40*

U.S. Cl. 528—125 **10 Claims**

1. A substantially linear thermoplastic polyarylene polyether composed of recurring units of the general formula:

$+O-E-O-E'+$

where E is the residuum of a dihydric phenol and E' is the residuum of a benzenoid compound having an electron withdrawing group in at least one of the positions ortho and para to the valence bonds, having a sigma* value sufficient to activate halogens in the said valence positions to a level adequate to react with an alkali metal phenolate; wherein both of said residua are valently bonded to ether oxygens through aromatic carbon atoms, with the proviso that E may not be the residuum of a bis(hydroxyphenyl) sulfone where E' is the residuum of bis(halophenyl) sulfone and with the further proviso that E may not be the residuum of hydroxybenzohydroxyphenone when E' is the residuum of halobenzohalophenone.

4,175,176

SOLVENT RESISTANT ACRYLIC RESIN COMPOSITION

Kohe Ozawa, Yokohama; Kazuhiro Hosoya, Tokyo; Jiro Kurita, Yokohama, and Makoto Honda, Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabusihiki Kaisha, Osaka, Japan

Filed Jun. 3, 1977, Ser. No. 803,283

Int. Cl.[2] C08F *220/14*

U.S. Cl. 526—309 **8 Claims**

1. A solvent resistant acrylic polymer having a viscosity-average molecular weight of 100,000 to 4,000,000 determined according to the formula $[\eta]=KM_w{}^{\alpha}$ where:

M_w = viscosity-average molecular weight

$K=4.85\times10^{-6}$

$\alpha=0.80$

$[\eta]$ = intrinsic viscosity of chloroform solutions of the acrylic [resin composition] polymer at 25° C.,

and consisting essentially of (A) at least 1% by weight, based on the total weight of the components (A), (B) and (C), of monomer units of at least one of (C_3–C_8) alkyl esters of acrylic acid; (B) methyl acrylate monomer units; and (C) 80 to less than 90% by weight, based on the total weight of the components (A), (B) and (C), of methyl methacrylate monomer units; the amount of the component (B) being the same as or more than that of the component (A).

4,175,177

CROSSLINKABLE COPOLYMER OF A LACTONE AND A POLYFUNCTIONAL ACRYLATE

James E. Potts, Somerset, N.J., assignor to Union Carbide Corporation, New York, N.Y.

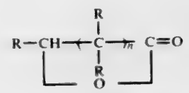
Filed Feb. 24, 1978, Ser. No. 880,955

Int. Cl.[2] B01F *11/00*

U.S. Cl. 528—354 **13 Claims**

1. Process of producing a thermoplastic crosslinkable copolymer which comprises reacting, at a temperature of from 25 to 300° C., an active-hydrogen containing initiator with a molar excess of a monomer mixture comprising:

(A) from 90 to 99.5 weight percent of a lactone monomer of the formula



wherein n is an integer having a value from about 3 to 6, at least n+2 of the R's are hydrogen, and the remaining R's are each alkyl of 1 to 10 carbon atoms; and

(B) from 0.5 to 10 weight percent of a polyfunctional acrylate monomer containing a plurality of acrylate or methacrylate groups.

4,175,178

BISPIPERAZIDO PHOSPHORUS POLYAMIDES

Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

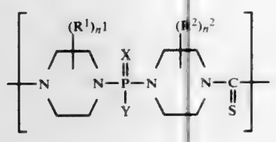
Division of Ser. No. 628,262, Nov. 3, 1975, Pat. No. 4,098,768. This application Jun. 16, 1978, Ser. No. 916,400

Claims priority, application United Kingdom, May 21, 1975, 21974/75

Int. Cl.[2] **C08G** *75/00*

U.S. Cl. 528—373 **13 Claims**

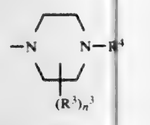
1. A solid polymer consisting essentially of repeating units of the formula



wherein

(i) X is absent or represents oxygen or sulphur or =N—R;

(ii) Y represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group, or —OR or —NR_2; or —NR_2 in which the two R groups, together with the nitrogen atom to which they are attached, represent an N-containing heterocyclic ring; or a group of the formula



wherein R, R^1, R^2, and R^3 represent hydrogen, or an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group;

(iii) R^4 represents hydrogen or an aliphatic group, a cycloaliphatic group, an N-containing heterocyclic group, an acyl group, a sulfonyl group, or an unsubstituted carbamoyl group; and

(iv) n^1, n^2, and n^3 each represent zero or an integer.

4,175,179

BISPIPERAZIDO PHOSPHORUS POLYAMIDES

Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

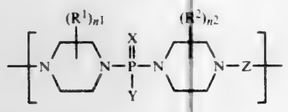
Division of Ser. No. 628,262, Nov. 3, 1975, Pat. No. 4,098,768. This application Jun. 22, 1978, Ser. No. 918,136

Claims priority, application United Kingdom, May 21, 1975, 21974/75

Int. Cl.[2] **C08G** *75/18*

U.S. Cl. 528—381 **14 Claims**

1. A solid polymer consisting essentially of repeating units of the formula:



wherein

(i) X is absent or represents oxygen or sulphur or =N—R;

(ii) Y represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group; or —OR or NR_2; or —NR_2 in which the two R groups, together with the nitrogen atom to which they are attached, represent an N-containing heterocyclic ring; or a group of the formula

wherein R, R^1, R^2, and R^3 represent hydrogen, or an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group;

(iii) R^4 represents hydrogen or an aliphatic group, a cycloaliphatic group, an N-containing heterocyclic group, an acyl group, a sulfonyl group, or an unsubstituted carbamoyl group; and

(iv) n^1, n^2, and n^3 each represent zero or an integer.

4,175,180

BISPIPERAZIDO PHOSPHORUS POLYAMIDES

Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

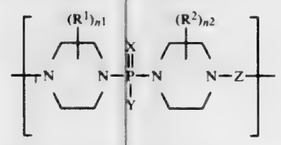
Division of Ser. No. 628,262, Nov. 3, 1975, Pat. No. 4,098,768. This application Jun. 19, 1978, Ser. No. 916,625

Claims priority, application United Kingdom, May 21, 1975, 21974/75

Int. Cl.[2] **C08G** *79/02*

U.S. Cl. 528—399 **15 Claims**

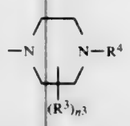
1. A solid polymer consisting essentially of repeating units of the formula



wherein

(i) X is absent or represents oxygen or sulphur or =N—R;

(ii) Y represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group; or —OR or NR_2; or —NR_2 in which the two R groups, together with the nitrogen atom to which they are attached, represent an N-containing heterocyclic ring; or a group of the formula

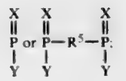


wherein R, R^1, R^2, and R^3 represent hydrogen, or an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group;

(iii) R^4 represents hydrogen or an aliphatic group, a cycloaliphatic group, an N-containing heterocyclic group, an acyl group, a sulfonyl group, or an unsubstituted carbamoyl group;

(iv) n^1, n^2, and n^3 each represent zero or an integer;

(v) Z represents



and

(vi) R^5 represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon radical, or an N-containing heterocyclic radical.

4,175,181

POLYPHOSPHAZENE POLYMERS CONTAINING CYANAMIDO OR DICYANAMIDO SUBSTITUENTS

William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 8, 1978, Ser. No. 941,107

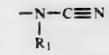
Int. Cl.[2] **C08G** *83/00*

U.S. Cl. 528—168 **18 Claims**

1. A polyphosphazene polymer containing unit represented by the formulas:



wherein X is



in which R_1 is independently selected for each unit from the group consisting of hydrogen and CN and wherein X′ is the same as X or is selected from the group consisting of substituted and unsubstituted alkoxy, aryloxy, amino, and mercapto radicals and mixtures of the radicals.

4,175,182

SEPARATION OF HIGH-ACTIVITY HEPARIN BY AFFINITY CHROMATOGRAPHY ON SUPPORTED PROTAMINE

Gottfried Schmer, Seattle, Wash., assignor to Research Corporation, New York, N.Y.

Filed Jul. 3, 1978, Ser. No. 921,795

Int. Cl.[2] **C07H** *1/06*

U.S. Cl. 536—21 **7 Claims**

1. An affinity chromatography method for the separation of heparin having a specific activity of at least about 270 IU/mg from a mixture thereof with heparin of lower specific activity, comprising the steps of:

(a) preparing a solution of said heparin mixture in a solvent of about 0.6 molar sodium chloride buffered with about 0.01–0.03 molar imidazole to pH 6.5–7.5;

(b) applying said heparin solution onto an affinity column composed of protamine coupled to a water-insoluble solid support material; and

(c) successively eluting a plurality of heparin fractions from said affinity column with a series of elution buffers of successively increasing molarity of sodium chloride buffered with about 0.01–0.03 molar imidazole to pH 6.5–7.5, said elution buffers having a sodium chloride molarity ranging from about 1.3 to about 2.0, so as to effect a stepwise removal from said affinity column of first the heparin of lower specific activity and finally the heparin having a specific activity of at least about 270 IU/mg.

4,175,183

HYDROXYALKYLATED CROSS-LINKED REGENERATED CELLULOSE AND METHOD OF PREPARATION THEREOF

John S. Ayers, Heslington, England, assignor to Development Finance Corporation of New Zealand, Wellington, New Zealand

Continuation-in-part of Ser. No. 773,269, Mar. 1, 1977. This application May 24, 1978, Ser. No. 909,165

Int. Cl.[2] **C08B** *11/08, 11/193, 15/10*

U.S. Cl. 536—57 **11 Claims**

1. A water insoluble, hydrophilic, water swellable hydroxy C_2–C_4 alkylated cross-linked regenerated cellulose prepared from the reaction of up to 20% (V/W based on cellulose) cross-linking agent comprising a bifunctional compound of formula XRY wherein X and Y which may be the same or different is each halo or epoxy and R is an aliphatic residue, up to 100% (V/W based on cellulose) hydroxy C_2–C_4 alkylating agent and regenerated cellulose.

4,175,184

MANUFACTURE OF 2,1,3-THIADIAZIN-4-ONE-2,2-DIOXIDE DERIVATIVES

Hans Merkle; Albrecht Mueller, and Karl Zoller, all of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

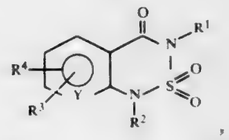
Filed Feb. 21, 1978, Ser. No. 879,722

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1977, 2710382

Int. Cl.[2] **C07D** *285/22*

U.S. Cl. 544—10 **7 Claims**

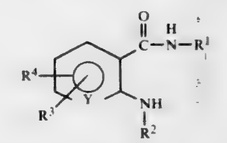
1. A process for the production of a compound of the formula



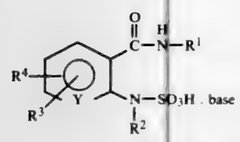
where R^1, R^2 and R^3 are identical or different and each is hydrogen, unsubstituted aliphatic, cycloaliphatic or aromatic hydrocarbon radicals, or aliphatic, cycloaliphatic or aromatic hydrocarbon radicals substituted by halogen, alkyl, alkoxy, haloalkoxy, alkylsulfonyl or dialkylamidosulfonyl, R^1 additionally may be dialkylamino, R^3 additionally may be halogen or trifluoromethyl, R^4 is hydrogen or alkyl, and Y is a



group optionally substituted by R^3 or R^4 or Y is a —N— group, which process comprises reacting a carboxamide compound of the formula

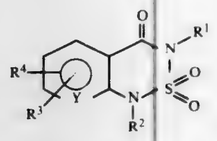


where R^1, R^2, R^3, R^4 and Y have the above meanings, with sulfur trioxide or chlorosulfonic acid in the presence of an organic base, or with adducts of sulfur trioxide and organic bases, to give the corresponding sulfamic acid salt of the formula



where R^1, R^2, R^3, R^4 and Y have the above meanings, and then cyclizing said sulfamic acid salt with the aid of a compound selected from the group consisting of acid halides and acid anhydrides.

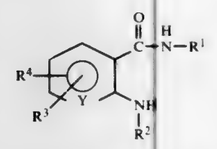
7. A process for the production of a compound of the formula



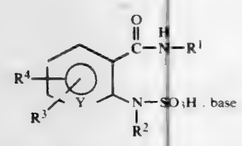
where R^1, R^2 and R^3 are identical or different and each is hydrogen, unsubstituted aliphatic, cycloaliphatic or aromatic hydrocarbon radicals, or aliphatic, cycloaliphatic or aromatic hydrocarbon radicals substituted by halogen, alkyl, alkoxy, haloalkoxy, alkylsulfonyl or dialkylamidosulfonyl, R^1 additionally may be dialkylamino, R^3 additionally may be halogen or trifluoromethyl, R^4 is hydrogen or alkyl, and Y is a



group optionally substituted by R^3 or R^4 or Y is a —N— group, which process comprises reacting a carboxamide compound of the formula



where R^1, R^2, R^3, R^4 and Y have the above meanings, with sulfur trioxide or chlorosulfonic acid in the presence of an organic base, or with adducts of sulfur trioxide and organic bases, to give the corresponding sulfamic acid salt of the formula



where R^1, R^2, R^3, R^4 and Y have the above meanings, converting said acid salt to the corresponding sulfamic acid, and then cyclizing said acid.

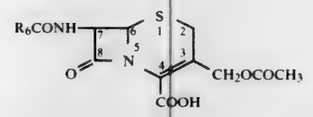
4,175,185

PROCESS FOR PREPARING CEPHALOSPORANIC ACID DERIVATIVES

Shigeo Seki, Tokyo; Satoru Nakabayashi; Toshinori Saito, both of Yokohama; Shunzo Fukatsu, Tokyo; Shokichi Nakajima, Yokohama, and Toshiyasu Ishimaru, Suita, all of Japan, assignors to Meiji Seika Kaisha Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 792,799, May 2, 1977, abandoned. This application Mar. 31, 1978, Ser. No. 892,179
Claims priority, application Japan, May 19, 1976, 51/56645
Int. Cl.[3] **C07D** *501/20*
U.S. Cl. 544—28 **16 Claims**

1. A process for preparing a cephalosporanic acid having the formula (V):



(V)

wherein R_6CO represents a 2-thienylacetyl group; an α-substituted-α-(2-thienyl)acetyl group wherein the substituent is a substituted or unsubstituted benzoyloxy group, a substituted or unsubstituted benzyloxy group, or a substituted or unsubstituted alkoxycarbonyloxy group having 2–3 carbon atoms; an α-substituted-α-phenylacetyl group wherein the substituent is halo, azido, hydroxy, alkanoyloxy having 2 to 5 carbon atoms, alkoxycarbonyloxy having 2 to 6 carbon atoms, halogenoalkanoyl having 2 to 3 carbon atoms, benzyloxycarbonyloxy, alkyltio having 1 to 2 carbon atoms, or alkoxycarbonyl having 2 to 5 carbon atoms; a substituted or unsubstituted benzyloxycarbonylamino group; a substituted or unsubstituted alkoxycarbonylamino group having 2 to 6 carbon atoms; a (carbamylalken-2-yl)amino group wherein the alken moiety has 2 to 3 carbon atoms; α-(t-butyloxy)-α-(p-methoxyphenyl)acetyl; α-valeryloxy-α-(p-nitrophenyl)acetyl; pyridylmercaptoacetyl; tetrazolylacetyl; aminocyclohexanecarbonyl; aminocyclohexadienylacetyl; aminocyclohexenylacetyl and cyanoacetyl;

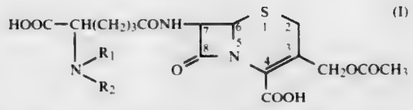
which comprises

contacting an esterifying agent having the formula (II):



wherein R_3, R_4 and R_5 may be the same or different, each represents a hydrogen atom, alkyl having from 1 to 4 carbon atoms, phenyl, nitrophenyl, methoxyphenyl, benzoyl, benzyloxy, benzylthio, (C_1–C_4)alkanoyloxy, benzoxy or benzoyloxy, and X represents a chlorine atom, a bromine atom, an iodine atom, methanesulfonyloxy, benzenesulfonyloxy or p-toluenesulfonoxy,

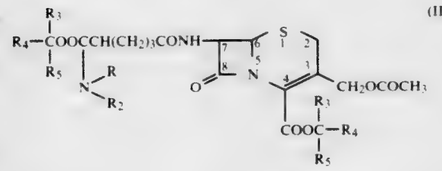
in liquid sulfur dioxide in the presence of a secondary or tertiary amine selected from the group consisting of diethylamine, monomethylaniline, piperidine, pyrrolidine, N,N′-tetramethylguanidine, triethylamine, tripropylamine, tributylamine, pyridine, picoline, lutidine, collidine, quinoline, isoquinoline, N-methylmorpholine, N-ethylmorpholine, N-methylpiperidine, N-ethylpiperidine, N-methylpyrrolidine, N-ethylpyrrolidine, N,N-dimethylaniline and N,N-diethylaniline, at a temperature of from about −10° to about −5° C., with an N-protected-cephalosporin C having the formula (I):



(I)

wherein R_1 represents a group selected from the group consisting of C_1–C_4 alkanoyl; benzoyl; nitrobenzoyl, halobenzoyl; C_1–C_5 alkoxycarbonyl; C_1–C_4 haloalkoxycarbonyl; (C_1–C_4)alkoxy-(C_1–C_4)alkoxycarbonyl; benzyloxycarbonyl; C_1–C_2 alkoxybenzyloxycarbonyl; halobenzyloxycarbonyl; phenyl substituted with nitro, methoxy, cyano or carbomethoxy; benzene sulfonyl; tosyl and nitrophenylsulfenyl; R_2 is hydrogen, or together with R_1 forms a ring selected from the group consisting of phthaloyl and halophthaloyl,

to form a diester having the formula (III):



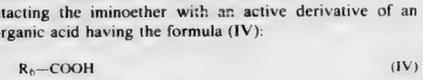
(III)

wherein R_1, R_2, R_3, R_4 and R_5 are as defined above,

contacting the diester (III) in an inert solvent with an iminohalide forming agent at a temperature of from about −10° to about 0° C. to form an iminohalide,

contacting the iminohalide with a lower alcohol having from 1 to 4 carbon atoms to form an iminoether,

contacting the iminoether with an active derivative of an organic acid having the formula (IV):



(IV)

wherein R_6CO is as defined above;

said active derivative being selected from the group consisting of an alkali metal salt of a mixed anhydride of said organic acid and sulfur trioxide; and a halide, an anhydride, an active ester, an azide, a cyanide, and an amide of said organic acid, to form a reaction product,

hydrolyzing said reaction product, and

converting the ester group at the 4-position of the ring to a carboxylic acid group.

4,175,186

BIOCIDALLY-ACTIVE, 1,3-BENZODITHIOLE-2-ONE AND 1,3-BENZODITHIOLE-2-THIONE COMPOUNDS

Khalid Rasheed, Weslaco, and James D. Warkentin, McAllen, both of Tex., assignors to The Ansul Company, Marinette, Wis.

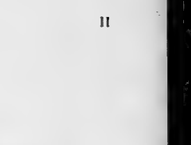
Division of Ser. No. 618,255, Sep. 30, 1975, Pat. No. 4,084,954. This application Nov. 4, 1977, Ser. No. 848,721
Int. Cl.[2] **C07D** *413/02, 409/02, 339/06*
U.S. Cl. 544—145 **43 Claims**

1. A process for preparing compounds of the formula:



I

wherein Y is selected from hydrogen, cyano, alkylsulfonyl, nitro and trifluoromethyl; X is selected from alkyl and alkenyl of up to 6 carbon atoms, nitro, trichloromethyl, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, trifluoromethylsulfoxyl, trifluoromethylsulfonyl, methoxymethyl, cyano, carboxy, carbamyl, halogen, hydroxy, acetylamino, amino, N-phenylamino, N,N-diallylamino, alkoxy, N-morpholino, N-piperidino, N-piperazino, N-pyrrolidino, dimethylaminodithiocarbamyl, carboalkoxy, alkylthio, mono- and dialkylamino, N-alkylcarbamyl, N,N-dialkylcarbamyl, alkylsulfoxy, alkylsulfonyl, said alkyl groups containing from 1 to 4 carbon atoms and n is an integer from 0 to 3 which comprises reacting a nitrobenzene of the formula:



II

wherein Z is halogen, Y, X and n are as defined above;

with an N,N-dialkyldithiocarbamic acid or acid salt thereof, said alkyl group containing from 1 to 4 carbon atoms, straight- or branched-chained, and recovering product.

4,175,187

PROCESS FOR THE PREPARATION OF TERTIARY ALLYLIC AMINES FROM VINYLIC HALIDES AND OLEFINS

Richard F. Heck, Wilmington, Del., assignor to University of Delaware, Newark, Del.

Filed Oct. 24, 1978, Ser. No. 954,184
Int. Cl.[2] **C07D** *295/02*
U.S. Cl. 544—170 **8 Claims**

1. The catalytic process of producing tertiary allylic amines from vinylic halides, with up to about 30 carbon atoms, which comprises reacting said halide with a mono-, di-, or tri-substituted ethylene, or ethylene itself with an unhindered basic secondary amine, in the presence of a palladium catalyst.

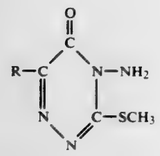
4,175,188

PROCESS FOR THE PRODUCTION OF 1,2,4-TRIAZIN-5-ONE DERIVATIVES

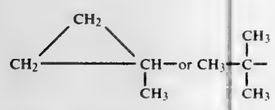
Herbert Klenk, Hanau; Werner Schwarze, Frankfurt, and Wolfgang Leuchtenberger, Bruchkobel, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Jul. 12, 1978, Ser. No. 924,062
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1977, 2733180
Int. Cl.[2] **C07D** *253/06*
U.S. Cl. 544—182 **34 Claims**

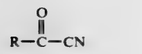
1. A process for the production of a 1,2,4-triazin-5-one compound of the formula



where R is



are prepared by reacting under acid conditions an acyl cyanide of the formula



(II)

with either

(a) a tertiary alcohol of the formula

(III)

in which R' is a t-alkyl group having 4 to 18 carbon atoms

or

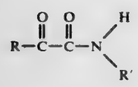
(b) an alkene of the formula



(IV)

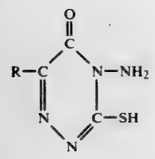
where R_1 and R_2 are hydrogen or alkyl and R_3 and R_4 are alkyl of 1 to 15 carbon atoms

to form an α-ketocarboxylic acid amide of the formula



(V)

and then either (1) reacting compound (V) with thiocarbohydrazide or (2) saponifying (V) to the free carboxylic acid and condensing the free carboxylic acid with thiocarbohydrazide to form a 1,2,4-triazin-5-one of the formula



(VI)

and then methylating the mercapto group.

4,175,189

6-CHLORO-2,4-PYRIMIDINE-DICARBAMATE-3-OXIDES

Jean-Claude Muller, Rixheim, France, and Henri Ramuz, Birsfelden, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

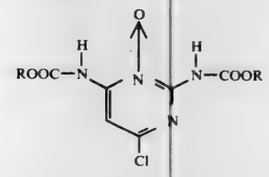
Division of Ser. No. 873,182, Jan. 27, 1978, Pat. No. 4,150,132. This application Dec. 22, 1978, Ser. No. 972,610

Claims priority, application Austria, Feb. 4, 1977, 738/77; Luxembourg, Dec. 5, 1977, 78639

Int. Cl.² C07D *239/48*

U.S. Cl. 544—323 **2 Claims**

1. A compound of the formula



VII

wherein R is alkyl or alkoxyalkyl.

4,175,190

6-CHLORO-2,4-PYRIMIDINE-DICARBAMATE-3-OXIDES

Jean-Claude Muller, Rixheim, France, and Henri Ramuz, Birsfelden, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

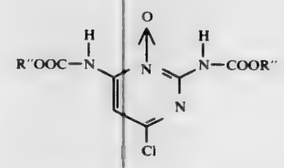
Division of Ser. No. 873,183, Jan. 27, 1978, Pat. No. 4,150,131. This application Dec. 26, 1978, Ser. No. 972,768

Claims priority, application Austria, Feb. 4, 1977, 745/77; Luxembourg, Dec. 5, 1977, 78640

Int. Cl.² C07D *239/48*

U.S. Cl. 544—323 **1 Claim**

1. A compound of the formula



wherein R'' is haloalkyl, aralkyl or aryl.

4,175,191

4-PHENYL ISOQUINOLINES

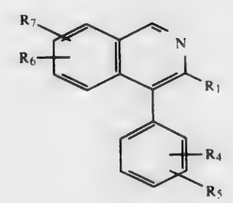
William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Continuation of Ser. No. 705,703, Jul. 15, 1976, abandoned, which is a division of Ser. No. 542,843, Jan. 21, 1975, Pat. No. 3,989,704, which is a division of Ser. No. 411,074, Oct. 30, 1973, Pat. No. 3,872,125, which is a continuation-in-part of Ser. No. 339,616, Mar. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 259,860, Jun. 5, 1972, abandoned. This application Nov. 17, 1977, Ser. No. 852,503

Int. Cl.² C07D *217/02, 217/12*

U.S. Cl. 546—144 **4 Claims**

1. A compound of the formula



where

R_1 represents



where

R_2 and R_3 are each, independently, methyl or ethyl, or R_2 and R_3 together represent $(CH_2)_n$

where

n represents 4, 5, or 6, and

R_4, R_5, R_6 and R_7 each, independently, represent hydrogen, halo of atomic weight 19–36, trifluoromethyl, lower alkyl, or lower alkoxy, provided that R_6 and R_7 may not represent alkyl at the 8-position, and provided further that two trifluoromethyl groups or two tertiary butyl groups or a trifluoromethyl group and a tertiary butyl group are not on adjacent carbon atoms.

4,175,192

PROCESS FOR PREPARING QUININONE

Jean P. Gignier, 4 Rue de Capucins, and Jacques Bourrelly, 4 Ave. de Chateau, both of 92190, Meudom, France

Filed Jun. 13, 1978, Ser. No. 915,009

Int. Cl.² C07D *453/04*

U.S. Cl. 546—134 **18 Claims**

1. A process for oxidizing cinchona alkaloid to its corresponding ketone comprising reacting said cinchona alkaloid with a metal ketyl in an inert hydrocarbon solvent.

4,175,193

2-AMINO-3-CYANO-4-HYDROXYQUINOLINES

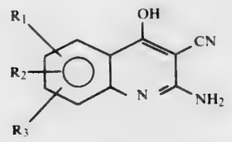
Saul B. Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 759,295, Jan. 14, 1977, abandoned. This application Mar. 27, 1978, Ser. No. 890,738

Int. Cl.² C07D *215/56, 221/04*

U.S. Cl. 546—153 **6 Claims**

1. A compound having the formula:



(IV)

wherein each of R_1, R_2 and R_3 is selected from the group consisting of hydrogen, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 4 carbon atoms, chloro, bromo, fluoro, hydroxy, methylthio and methylsulfinyl, and R_2 and R_3 when taken together are selected from the group consisting of 1,3-butadienyl and alkylenedioxy having from 1 to 2 carbon atoms.

4,175,194

PIPERIDINYLDITHIOCARBONIC ACID DERIVATIVES

Lawrence H. Nash, Fort Lauderdale, Fla.

Continuation-in-part of Ser. No. 888,744, Mar. 21, 1978. This application Jun. 2, 1978, Ser. No. 911,879

Int. Cl.² C07D *295/18*

U.S. Cl. 546—189 **4 Claims**

1. The compound, Bis piperidinyldithiocarbonylsulfoxide.

4,175,195

PROCESS FOR THE PRODUCTION OF SUBSTITUTED PYRIDINE (A)

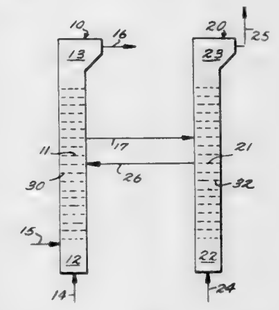
Helmut Beschke; Heinz Friedrich, and Heribert Offermanns, all of Hanau, Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Sep. 6, 1977, Ser. No. 830,984

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1976, 2639701

Int. Cl.² C07D *213/12*

U.S. Cl. 546—250 **20 Claims**



1. A process for the production of a pyridine having an aromatic or heteroaromatic substituent in the 2-position comprising catalytically reacting a aliphatic-aromatic or aliphatic-heteroaromatic ketone with an aliphatic oxo compound having a carbon to carbon ethylenic double bond on the carbon adjacent to the oxo group and ammonia in the gas phase at a temperature from about 250° to 550° C. in the presence of a dehydrating and dehydrogenating catalyst which is (1) a catalyst consisting essentially of oxygen containing compounds of Al, F, at least one of the elements B and Si and at least one element from the second and fourth groups of the periodic system selected from the group consisting of Mg, Ba, Zn, Sn, and Zr, said catalyst having been prepared by heating in the presence of oxygen at a temperature of 600° to 800° C.;

1. aluminum, aluminum oxide or an aluminum compound convertible to the oxide at a said temperature,
2. a compound of fluorine, said fluorine having been added as ammonium fluoride, ammonium hydrogen fluoride, hydrogen fluoride, fluoboric acid, fluosilicic acid, boron trifluoride, magnesium fluoborate, magnesium fluosilicate, zinc fluosilicate or barium fluosilicate,
3. boron, silicon, boric oxide, silica or a compound of boron or silica convertible to the oxide at said temperature and
4. magnesium, zinc, tin, zirconium, magnesium oxide, zinc oxide, tin oxide or a compound of zirconium or barium convertible to the oxide at said temperature, the atomic ratio of Al to F being from 1000:25 to 1000:800 and the atomic ratio of Al to the total of (3) and (4) being from 1000:5 to 1000:200, the atomic ratio of the total of boron and silicon to the other element from the second and fourth groups being between 1 to 10 and 10 to 1 or (2) a catalyst having been prepared by heating at 600° to 800° C. in the presence of gaseous oxygen (1) aluminum metal,

aluminum oxide, or a compound of aluminum convertible to the oxide upon heating with gaseous oxygen at 600° to 800° C., (2) ammonium fluoride, hydrogen fluoride or a fluoride of an element of the second main group of the periodic system and (3) at least one element of the second main group of the periodic system, the oxide of said element or a compound of said element convertible to the oxide in the presence of gaseous oxygen at a temperature of 600° to 800° C., said catalyst consisting essentially of the elements Al, F, O and the element of the second main group of the periodic system or (3) a catalyst consisting essentially of the product obtained by treating with oxygen at a temperature of 550° to 1200° C. compounds of the elements Al, F and O and at least two other elements selected from the second, fourth, fifth and sixth groups of the periodic system, said two other elements being selected from the group consisting of Mg, Ba, Zr, Sn, Ti, P, Ta, Sb and S, the ratios of the elements being Al to F of between 1,000 to 10 and 1,000 to 800 and of Al to the elements of the second, fourth, fifth and sixth groups being between 1,000 to 5 and 1,000 to 200.

4,175,196

CERTAIN PYRIDINIUM SURFACTANTS

Robert F. Harris, Midland, Mich., and Earl H. Wagener, Concord, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 416,308, Nov. 15, 1973, Pat. No. 4,093,663. This application Apr. 12, 1978, Ser. No. 895,558

Int. Cl.[2] **C07D** *213/30*

U.S. Cl. 546—339 **12 Claims**

1. An onium surfactant corresponding to the formula $X[(CH_2CH_2O)_mCH_2—R—CHR'—Q^{\oplus}A^{\ominus}]_n$, wherein X is a hydrophobic n-valent radical derived by the removal of n-atoms of active hydrogen from an organic compound and corresponds to the hydrophobic portion of a nonionic surfactant having a hydrophilic-lipophilic-balance of from 1 to about 30 and having the structural formula $X[(CH_2CH_2O—_mH]_n$; m is an integer of at least 1 and is the same in each of the above formulae; R is a divalent aromatic hydrocarbon radical of from 6 to about 14 carbon atoms, the chain length of which can be interrupted by oxygen or sulfur atoms; R' is hydrogen or methyl and is methyl only when R is m- or p-phenylene; $Q^{\oplus}$ is a pyridinium radical; $A^{\ominus}$ is a compatible anion; and n is an integer of from 1 to 5 and is the same in each of the formulae.

4,175,197

1,3,4-TRISUBSTITUTED-4-ARYL-1,4,5,6-TETRAHYDROPYRIDINES

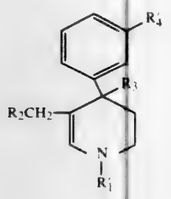
Dennis M. Zimmerman, Mooresville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 852,252, Nov. 17, 1977, Pat. No. 4,115,400, which is a division of Ser. No. 690,767, May 27, 1976, Pat. No. 4,081,450, which is a continuation of Ser. No. 503,581, Sep. 6, 1974, abandoned. This application May 12, 1978, Ser. No. 905,494

Int. Cl.[2] **C07D** *213/04, 213/30*

U.S. Cl. 546—339 **9 Claims**

1. A compound of the formula



wherein:
R_1' is C_1–C_8 alkyl, C_3–C_6 cycloalkyl-C_1–C_3 alkyl, or benzyl;
R_2 is hydrogen, C_1–C_4 alkyl, or C_2–C_6 alkenyl;
R_3 is C_1–C_4 alkyl, or C_2–C_6 alkenyl;
and R_4' is hydrogen, hydroxy, or C_1–C_3 alkoxy.

4,175,198

5-SECONDARY ALKYLIDENE HYDANTOINS

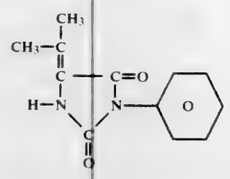
Roger R. Gaudette, Nashua, N.H., assignor to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 730,425, Oct. 7, 1976, abandoned. This application Nov. 17, 1977, Ser. No. 852,279

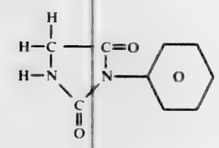
Int. Cl.[2] **C07D** *233/74*

U.S. Cl. 548—308 **32 Claims**

1. A process for preparing a first hydantoin having the formula

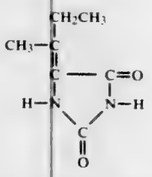


the process comprising condensing acetone and a second hydantoin having the formula

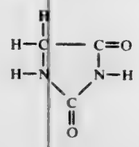


in the presence of (a) a catalyst selected from the group consisting of ammonia or a primary amine having a pK_b between about 3 and about 5, and (b) a polar diluent selected from the group consisting of water or an admixture of water with a lower alkanol having 7 or fewer carbon atoms per molecule; in said reaction mixture the amount of diluent being from about 150–1,000 ml of diluent per mole of the hydantoin and wherein the molar hydantoin:catalyst:ketone ratio is 1:0.1–10:0.5–4.

17. A process for preparing a product hydantoin having the formula



the process comprising condensing methyl ethyl ketone and a second hydantoin having the formula



in the presence of (a) a catalyst selected from the group consist-

ing of ammonia or a primary amine having a pK_b between about 3 and about 5, and (b) a polar diluent selected from the group consisting of water or an admixture of water with a lower alkanol having 7 or fewer carbon atoms per molecule; in said reaction mixture the amount of said diluent being from about 150–1,000 ml of diluent per mole of the hydantoin and wherein the molar hydantoin:catalyst:ketone ratio is 1:0.1–10:0.5–4.

4,175,199

SUBSTITUTED ACYL DERIVATIVES OF AMINO ACIDS

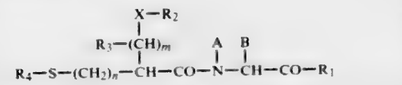
Miguel A. Ondetti, Princeton, and Frank L. Weisenborn, Titusville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 889,768, Mar. 24, 1978, Pat. No. 4,140,864, which is a division of Ser. No. 747,280, Dec. 3, 1976, Pat. No. 4,116,962. This application Dec. 4, 1978, Ser. No. 966,283

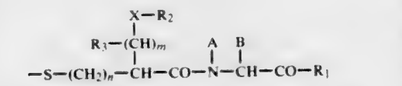
Int. Cl.[2] **C07D** *233/64*

U.S. Cl. 548—336 **8 Claims**

1. A compound of the formula



and non-toxic, physiologically acceptable salts thereof, wherein
R_1 is hydroxy or lower alkoxy;
R_2 is hydrogen, lower alkyl or lower alkanoyl;
R_3 is hydrogen or lower alkyl;
R_4 is hydrogen, lower alkanoyl, benzoyl or



A is hydrogen, lower alkyl or hydroxylower alkylene;
B is imidazolyl-4-lower alkylene
X is oxygen or sulfur;
m is 0, 1, 2, 3 or 4; and
n is 0 or 1.

4,175,200

N,N-DISUBSTITUTED SULFONYL HYDRAZINES

Byron A. Hunter, Woodbridge, and Franklin H. Barrows, Beacon Falls, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 638,474, Dec. 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 567,169, Apr. 11, 1975, abandoned. This application Apr. 21, 1977, Ser. No. 789,484

Int. Cl.[2] **C07C** *143/825, 143/83, 143/833*

U.S. Cl. 560—1 **6 Claims**

1. An N,N'-disubstituted sulfonyl hydrazine having the formula

$$R(SO_2NR^1NHR^2)_n$$

wherein R is a C_1–C_{12} alkyl radical, a C_6–C_{12} aryl radical, a C_7–C_{12} aralkyl or alkaryl radical, a C_5–C_9 cycloalkyl radical or a group of the structure $—R^5—A—R^6$-wherein A is (1) a single bond connecting R^5 and R^6, (2) —O—, (3) —S—, (4) —SO—, (5) $—SO_2—$, (6) a C_1–C_6 alkylene or (7) a C_2–C_3 alkylidene and R^5 and R^6 are each independently selected from the group consisting of C_1–C_4 alkylene and phenylene; R^1 and R^2 are each $—COOR^3$; R^3 is a C_1—C_{12} alkyl, a C_5–C_9 cycloalkyl, a C_6–C_{12} aryl, or a C_7–C_{12} alkaryl or aralkyl radical; and n is 1 or 2.

4,175,201

CHEMICAL SYNTHESIS

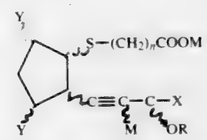
Josef Fried, Chicago, Ill., assignor to University of Chicago, Chicago, Ill.

Continuation-in-part of Ser. No. 274,365, Jul. 24, 1972, abandoned, and Ser. No. 400,297, Sep. 24, 1973, abandoned, which is a continuation of Ser. No. 361,664, May 18, 1973, abandoned, which is a continuation of Ser. No. 53,663, Jul. 9, 1979, abandoned. This application Apr. 18, 1977, Ser. No. 788,503

Int. Cl.[2] **C07C** *177/00*

U.S. Cl. 560—17 **3 Claims**

1. A compound of the formula,



wherein
M is H, or lower alkyl;
Y is H, OH, acyloxy or lower alkoxy;
X is alkyl of from 4 to 8 carbon atoms;
R is H, acyl or lower alkoxy;
n is an integer from 2 to 5; and
wherein the acyl moiety is derived from hydrocarbon carboxylic acids of twelve carbon atoms or less.

4,175,202

4,5,6-TRINOR-3,7-INTER-M-PHENYLENE PROSTAGLANDIN A_1 ANALOGS

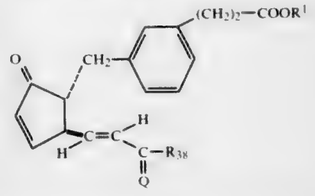
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 764,359, Jan. 31, 1977, Pat. No. 4,118,577, which is a continuation-in-part of Ser. No. 677,874, Apr. 19, 1976, abandoned, which is a division of Ser. No. 604,158, Aug. 13, 1975, abandoned. This application Jun. 29, 1978, Ser. No. 920,571

Int. Cl.[2] **C07C** *177/00*

U.S. Cl. 560—53 **62 Claims**

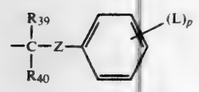
1. An optically active compound of the formula



or a mixture comprising that compound and the enantiomer thereof, wherein Q is



wherein R_3 is hydrogen or alkyl of one to 4 carbon atoms, inclusive;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; including the pharmacologically acceptable salts thereof when R_1 is hydrogen; wherein R_{38} is



wherein R_{39} and R_{40} are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_{39} and R_{40} is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_{39} nor R_{40} is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between $CR_{39}R_{40}$— and the phenyl ring; and wherein L is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR_{41}— wherein R_{41} is alkyl of one to 4 carbon atoms, inclusive, and p is zero, one, 2 or 3, with the proviso that not more than two L's are other than alkyl and when p is 2 or 3 the L's are either the same or different.

4,175,203

INTERPHENYLENE 11,12-SECOPROSTAGLANDINS

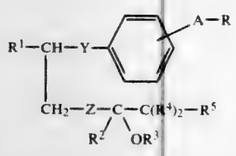
Edward J. Cragoe, Jr., and John B. Bicking, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 751,831, Dec. 17, 1976. This application Dec. 13, 1978, Ser. No. 968,890

Int. Cl.[2] **C07C** *177/00*

U.S. Cl. 560—55 **7 Claims**

1. The compound having the following formula:



wherein R is carboxy, a carboxy salt, or derivatized carboxy having the formula: —$COO^{\ominus}M^{+}$ wherein M^{+} is a pharmaceutically acceptable cation derived from a metal or an amine, or derivatized carboxy having the formula: —COOE, —$CONH_2$, —$CONR^6R^7$, or —$CONHNH_2$; wherein E is alkyl having 1-10 carbon atoms; R^6 and R^7 are each independently hydrogen, lower alkyl having 1-4 carbon atoms, or diloweralkylaminoalkyl having 4-7 carbon atoms;

A is $(CH_2)_n$ where n is 0, 1, or 2, and oxymethylene (—O—CH_2);

Y is $(CH_2)_n$ where n is 1, 2, or 3, and —CH_2—CH=CH—; and A and Y are in the ortho, meta, or para orientation;

R^1 is acetyl, propionyl, butyryl, 1-hydroxyethyl, 1-hydroxypropyl, or 1-hydroxybutyl;

Z is ethylene, vinylene, or ethynylene;

R^2 is independently hydrogen or methyl;

R^3 is hydrogen or lower alkanoyl;

R^4 is selected independently from the group consisting of hydrogen or methyl; and

R^5 is selected from the group consisting of lower alkyl of 3-6 carbon atoms, either straight or branched (propyl, butyl, amyl, isoamyl, hexyl, 3,3-dimethylbutyl), 3-butenyl, 4,4,4-trifluorobutyl, and lower alkoxy, OR^6, where R^6 is selected from the group consisting of lower alkyl of 2-5 carbon atoms, straight or branched (ethyl, propyl, butyl, hexyl, isobutyl, and 3,3,3-trifluoropropyl);

in addition, when R^5 is lower alkyl and R^2 is methyl, they can be joined together (with abstraction of hydrogen) to form a carbocyclic ring with from 6 to 9 members;

also, when R^5 is lower alkyl and R^2 is hydrogen, R^5 can be joined to the carbon atom bearing R^2 and OR^3 to form a carbocyclic ring with from 5 to 8 members;

provided that when R^3 is hydrogen, R is defined as derivatized carboxy having the formula: —$CONH_2$, —$CONR^6R^7$, or —$CONHNH_2$; R^6 and R^7 are each independently hydrogen, lower alkyl having 1-4 carbon atoms, or diloweralkylaminoalkyl having 4-7 carbon atoms.

4,175,204

METHOD OF PREPARING E-4-ACETOXY-2-METHYL-2-BUTENAL

James H. Babler, 125 Callan, Evanston, Ill. 60202

Continuation-in-part of Ser. No. 871,075, Jan. 20, 1978, abandoned. This application Jan. 8, 1979, Ser. No. 1,075

Int. Cl.[2] **C07C** *67/28*

U.S. Cl. 560—262 **10 Claims**

1. A process for synthesis of E-4-acetoxy-2-methyl-2-butenal comprising the following steps in sequence:

(a) forming a reaction mixture of 4-halo-3-methyl-2-buten-1-ol acetate, dimethyl sulfoxide, and a non-nucleophilic base;

(b) isolating E-4-acetoxy-2-methyl-2-butenal as a reaction product from said reaction mixture.

4,175,205

PROCESS FOR THE PREPARATION OF VITAMIN A FROM SULPHONES

Jean-Pierre Decor, Thurins, France, assignor to Rhone-Poulenc Industries, Paris, France

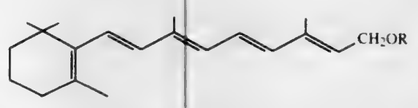
Filed Jul. 25, 1977, Ser. No. 818,871

Claims priority, application France, Jul. 28, 1976, 76 22992

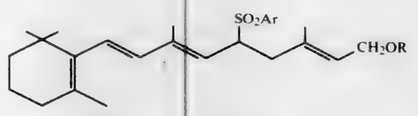
Int. Cl.[2] **C07C** *69/14, 69/24*

U.S. Cl. 560—260 **6 Claims**

1. In a process for the preparation of a vitamin A derivative of the formula:



in which R represents hydrogen or COR_1, where R_1 is alkyl of 1 to 6 carbon atoms, by desulphonation of a sulphone of the formula:



in which R is defined as above and Ar represents unsubstituted or substituted aryl, the improvement which consists in carrying out the desulphonation at a temperature of 10° to 50° C. using at least 3 molecular proportions per molecule of the said sulphone of a potassium alcoholate of a primary or secondary, saturated, straight chain or branched chain aliphatic alcohol of 1 to 6 carbon atoms, in an anhydrous liquid hydrocarbon in which the said alcoholate is insoluble and is suspended in solid form.

4,175,206

PROCESS FOR PREPARING A HYDROXYPHENYLGLYCINE COMPOUND

Masaru Senuma, Takatsuki; Nobuhiko Ishihara, Neyagawa; Shigeru Nishimoto, Minoo; Eisaku Yamato, Kobe, and Noboru Shigematsu, Nishinomiya, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed May 8, 1978, Ser. No. 903,492

Int. Cl.[2] **C07C** *51/00*

U.S. Cl. 562—444 **2 Claims**

1. A process for preparing DL-hydroxyphenylglycine which comprises reacting phenol with a first compound selected from glyoxylic acid, ammonium glyoxidate, sodium glyoxidate, and potassium glyoxidate, and a second compound selected from ammonium alkanoate having one to three carbon atoms.

4,175,207

VISUAL-TYPE HYGROMETER

Stanley B. Elliott, 7125 Conelly Blvd., Bedford, Ohio 44146

Continuation of Ser. No. 547,811, Feb. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 505,526, Sep. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 245,494, Apr. 19, 1972, abandoned, which is a division of Ser. No. 18,921, Mar. 12, 1970, abandoned. This application May 9, 1977, Ser. No. 795,163

Int. Cl.[2] **C07C** *65/20*

U.S. Cl. 562—460 **7 Claims**

1. The solid, crystalline, hydrated, birefringent tetraalkali salts of 3,3',4,4' benzophenone tetracarboxylic acid consisting of the group of Li, K, Rb, and Cs.

2. A mixed crystal of the tetraalkali metal salts of 3,3',4,4' benzophenone tetracarboxylic acid in which at least two different alkali metals are present and function as equivalents to form solid, hydrated, crystals of the non-cubic system.

6. The solid, crystalline, hydrated, birefringent alkali metal salts of 3,3',4,4' benzophenone tetracarboxylic acid in which one hydrogen is left unneutralized.

7. A mixed crystal of the solid, crystalline, hydrated, birefringent alkali metal salts of 3,3',4,4' benzophenone tetracarboxylic acid in which one hydrogen is left unneutralized and at least two different alkali metals are present and function as equivalents.

4,175,208

PROCESS FOR THE PREPARATION OF 1-CHLORO-2-HYDROXY-3-NAPHTHOIC ACID

Frank Miller, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 5, 1979, Ser. No. 1,568

Int. Cl.[2] **C07C** *69/76*

U.S. Cl. 562—467 **3 Claims**

1. A process for the preparation of 1-chloro-2-hydroxy-3-naphthoic acid which comprises reacting, at a temperature below about 70° C., and aqueous alkaline solution of the dialkali metal salt of 2-hydroxy-3-naphthoic acid, containing at least 2 moles of an alkali metal hydroxide per mole of said 2-hydroxy-3-naphthoic acid, with an aqueous solution containing about 0.7 to 2.5 moles of an alkali or alkaline earth metal hypochlorite per mole of said dialkali metal salt.

4,175,209

PREPARATION OF 6,11-DIHYDRO-11-OXODIBENZ[B,E]-OXEPIN-2-ACETIC ACID AND PRECURSORS THEREFOR

Arthur R. McFadden, East Brunswick; Richard C. Allen, Flemington, and Thomas B. K. Lee, Whitehouse Station, all of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 843,482, Oct. 19, 1977, Pat. No. 4,118,401. This application Sep. 5, 1978, Ser. No. 939,111

Int. Cl.[2] **C07C** *63/59*

U.S. Cl. 562—473 **1 Claim**

1. 4-benzyloxy-3-carboxyphenylacetic acid.

4,175,210

ETHERIFICATION PROCESS

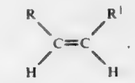
Charles M. Selwitz, Monroeville, and John G. McNulty, Glenshaw, both of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Jun. 19, 1978, Ser. No. 916,969

Int. Cl.[2] **C07C** *41/06*

U.S. Cl. 568—689 **15 Claims**

1. A process for converting an unbranched olefin having from about 3 to about 14 carbon atoms or a mixture of unbranched olefins, having an unsaturated hydrocarbon structure:



wherein R and R^1 and a hydrogen, a straight chain alkyl group or a straight chain alkenyl group containing from about 1 to about 12 carbon atoms but no more than one of said R and R^1 can be hydrogen, to an ether, or a mixture of ethers, which comprises passing a hydrocarbon alcohol and said olefin, or mixture of olefins, in a molar ratio of about 1:1 to about 15:1 in the vapor phase through a catalyst bed of silicatungstic acid at a liquid hourly space velocity of about 0.02 to about 2 volume of feed per volume of catalyst per hour at a temperature of about 50° to about 200° C. and a pressure of about 0.1 to about 10 atmospheres.

4,175,211

METHOD FOR TREATMENT OF RUBBER AND PLASTIC WASTES

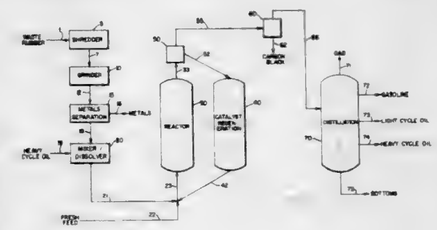
Nai Y. Chen, Titusville, N.J., and Tsoung-Yuan Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 777,509, Mar. 14, 1977, Pat. No. 4,108,730. This application Mar. 1, 1978, Ser. No. 882,308

The portion of the term of this patent subsequent to Aug. 22, 1978, has been disclaimed.

Int. Cl.[2] **C07C** *3/26*

U.S. Cl. 585—241 **5 Claims**



1. A process for the conversion of solid plastic wastes selected from the group consisting of poly(halogenated hydrocarbons), poly(straight-chain olefins), and poly(vinyl aromatics) to distillates including a gasoline fraction which comprises:

(a) grinding the wastes,

(b) adding a selected petroleum-derived stream to the ground wastes,

(c) maintaining the resulting mixture at a temperature of about 150° to 700° F. for a sufficient time for dissolution to occur,

(d) feeding the resulting solution to a catalytic cracking zone operated at a temperature of 850° F. or more and a pressure from subatmospheric to 3 atmospheres,

(e) withdrawing a cracked product from the catalytic cracking zone, and

(f) distilling the cracked product to recover distillates including a gasoline fraction.

4,175,212

ELECTRICAL CONDUCTOR ASSEMBLY

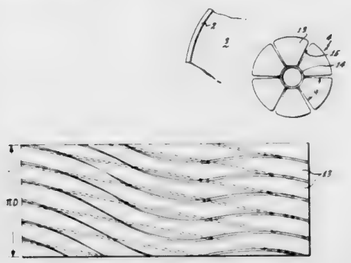
Jan Artbauer, Hanover, Fed. Rep. of Germany, assignor to Kabel- und Metallwerke Guthehoffnungshutte Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Oct. 31, 1977, Ser. No. 847,091

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649398; Mar. 3, 1977, 2712222

Int. Cl.[2] H01B 9/00

U.S. Cl. 174—128 R 7 Claims



1. A conductor assembly for use in an electrical cable for purposes of transmission of large quantities of electrical energy and being comprised of plural, segment shaped elements, arranged in one or several layers on a carrier element, the segments each having a small end in engagement with the carrier, further having a large end, the large ends delineating a periphery of the cable, each segment having two sides, the elements of a layer being placed with a gap between the sides of respective two adjacent ones of the elements and for the length of the conductor assembly to permit lateral displacement in a wave-like pattern upon being heated by a large electric current.

4,175,213

REGENERATOR HAVING AUTOMATIC GAIN CONTROL REFERENCED TO A DATA-PATTERN-DEPENDENT PULSE STREAM

William I. Chen, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 6, 1978, Ser. No. 957,831

Int. Cl.[2] H04L 25/20; H04B 3/04

U.S. Cl. 178—70 R 6 Claims



1. A regenerator comprising

an adjustable gain circuit responsive to a sequence of data pulse signals for producing a data-pattern-dependent input signal,

means responsive to the input signal for producing a data-pattern-dependent detected signal,

means responsive to the input signal for regenerating a data-pattern-dependent output signal,

means responsive to the output signal for producing a data-pattern-dependent reference signal,

means for algebraically combining the detected signal with the reference signal to form a continuously-variable data-pattern-independent gain control signal, and

means for applying the continuously-variable data-pattern-independent gain control signal to the adjustable gain circuit for controlling the gain thereof.

4,175,214

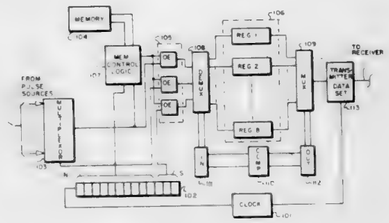
APPARATUS AND METHOD FOR A PULSE REGENERATION SYSTEM

William R. Wedmore, Glen Ellyn, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Aug. 7, 1978, Ser. No. 931,716

Int. Cl.[2] H04L 5/24

U.S. Cl. 179—15 BW 11 Claims



9. A pulse regeneration method for the transmission of information composed of a plurality of binary state changes of non-uniform time duration from a plurality of asynchronous pulse sources over a communication channel to processing equipment located remote to said pulse sources, comprising the steps of:

scanning said event sources for a determination of state change;

comparing said scanned present state value with the last-look value of said event source;

formulating a message describing the state change of the pulse source, its location and time of occurrence;

queuing said messages on a first-in, first-out basis for transmission at regular time intervals;

transmitting serially said queued messages via said communicaton channel;

receiving said transmitted messages sent over said communication channel;

converting said received messages to parallel form;

queuing said received messages for subsequent transfer to said processing equipment;

timing an appropriate predetermined interval in order to reconstruct said transmitted message; and

gating said queued messages one-at-a-time to said processing equipment.

4,175,215

MULTIPORT CONFERENCE CIRCUIT

Donald W. McLaughlin, Naperville, and Gerald F. Fetterer, Mount Prospect, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 5, 1977, Ser. No. 857,168

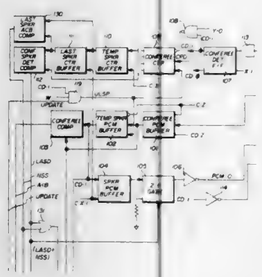
Int. Cl.[2] H04M 3/56

U.S. Cl. 179—18 BC 7 Claims

1. In a pulse code modulated communication system, a plurality of communication channels arranged on a multiplexed basis, a switching system including a memory access by said communication channels and a conference circuit including, a first register connected to said memory operated to store the coded value of information from each of said channels conducted sequentially through said memory; a second register connected to said first register and including an output circuit; a first comparator circuit connected to said first and to said second registers operated to compare the coded value of information stored in said first and said second registers and in response to determination that the value of information stored in said first register is less than the value of information stored in said second register to provide an output signal; counting means connected to said memory periodically incremented in response to signals from said memory, a fourth register con-

V 9 8 8 3 N 0 2 0 7 9 UMI

nected to said counting means operated to store the count of said counting means, a fifth register connected to said fourth register, said count stored in said fourth register transferred to said fifth register in response to signals from said switching system, a second comparator circuit connected to said fourth and fifth registers operated in response to a determination that the count stored in said fourth and fifth registers are equal to provide an output signal; a third comparator circuit connected to said fourth and fifth registers operated in response to determination that the count stored in said fourth and fifth registers are equal to provide an output signal, a sixth register connected to the output of said second register and having an output to said switching system operated in response to a signal from said switching system for transfer of said coded value of information in said second register to said channels under control of said switching system; a first threshold comparator, the contents of said first register being connected to said first threshold comparator and the latter providing an output when said first register achieves an established threshold; a second threshold comparator, the contents of said second register being connected to said second threshold comparator and the latter providing an output when said second register achieves said established threshold; and gating means connected to said first, second and third comparator circuits and to said first and second threshold comparators selectively operated in response thereto to provide an output signal to update, said update signal being coupled to said first and second registers to operate them to transfer the coded value of information stored in said first register into storage in said second register, said update signal further being coupled to said first counting means to operate the latter to transfer the count in said first counting means into storage in said second counting means.



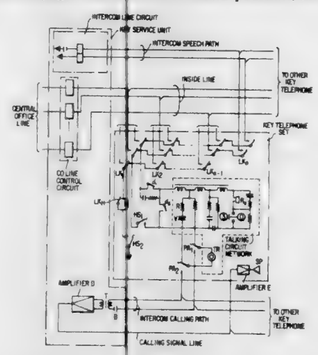
4,175,216
INTERCOM CALLING APPARATUS IN A KEY TELEPHONE SYSTEM
Gunzo Kita, and Koichi Sekiguchi, both of Tokyo, Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 726,230, Sep. 24, 1976, abandoned. This application Apr. 17, 1978, Ser. No. 897,286
Claims priority, application Japan, Oct. 13, 1975, 50/123062
Int. Cl.² H04M *1/72*
U.S. Cl. 179—99 A **3 Claims**

1. In a key telephone system wherein a plurality of key telephone sets are connected to a central office via a central office line, each of said key telephone sets having a transmitter, a talking circuit network, and a loudspeaker circuit for signalling an intercom call, and wherein each of said loudspeaker circuits signals said intercom call, an intercom calling apparatus comprising:

a two-position page switch;

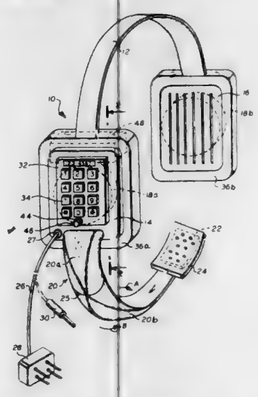
means for electrically connecting the transmitter to the talking circuit network when the page switch is in a first position;

means for electrically connecting the transmitter to the loudspeaker circuit in each of said key telephone sets when the page switch is in a second position; and



means for holding the connection of the talking circuit network with a central office line by a series combination of a resistor and a varistor forming a parallel circuit with the transmitter in the talking circuit network at the same time the page switch is changed to the second positon.

4,175,217
TELEPHONE HEADSET
Lewis M. Williams, 1205 College Ave., Bronx, N.Y. 10456
Filed Mar. 30, 1978, Ser. No. 891,700
Int. Cl.² H04M *1/05*
U.S. Cl. 179—156 R **2 Claims**



1. A telephone headset for connection to a telephone line, said headset having a pair of earphones and a microphone contained therein, said headset comprising:

a headstrap formed to span the head of a user;

first and second housings connected to said headstrap for placement adjacent the two ears of said user, said earphones being mounted in said housings for directing sound towards the user's ears;

a telephone dialing mechanism disposed one one of said housings on the surface thereof disposably remote from the user's ear;

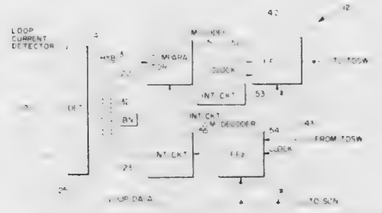
an arm comprising two pivotally connected portions, one end of said arm being connected to the lower portion of either one of said housings and the other end of said arm being connected to said microphone for positioning said microphone in the vicinity of the user's mouth;

signaling means disposed in said headset for alerting the user to an incoming call when said headset is operatively connected to said telephone line;

circuit network means disposed in said headset for coupling said earphone, said microphone, said dialing mechanism, and said signaling means to said telephone line; and

switch means connected to said circuit network means for selecting either a first operating state for said headset wherein said signaling means is connected to said telephone line for alerting the user to an incoming call, or a second operating state wherein said microphone, said earphones and said dialing mechanism are connected to said telephone line for enabling said user to place an outgoing call and converse using said headset.

4,175,218
TELEPHONE SWITCHING SYSTEM
Mitsutoshi Ayano, Tokyo, and Eiji Minamitani, Yokohama, both of Japan, assignors to Fujitsu Limited, Japan
Filed May 18, 1978, Ser. No. 907,197
Claims priority, application Japan, May 18, 1977, 52/57421
Int. Cl.² H04B *3/20*
U.S. Cl. 179—170.2 **10 Claims**



1. A switching system comprising at least two subscriber stations connected by a transmission line, each of said at least two subscriber stations comprising a two-wire circuit having a high impedance state and a low impedance state corresponding to an on-hook condition and an off-hook condition, respectively, at said each subscriber station, and hybrid means for converting said two-wire circuit to a four-wire circuit comprising said transmission line; said switching system further comprising:

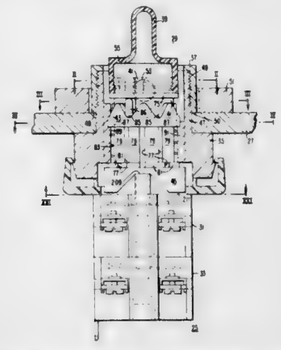
detecting means, one for each subscriber station, for detecting a change in the impedance state, to said high impedance state, of said two-wire circuit of said each subscriber station, so as to generate a high impedance detecting signal, and

switching means inserted in said four-wire circuit responsive to said high impedance detecting signal from the detecting means for electrically opening said four-wire circuit, whereby to prevent singing in said system.

4,175,219
Patent Not Issued for This Number

4,175,220
CONVERTIBLE SELECTOR SWITCH
Robert J. Johnston, Patterson Heights; Stephen G. Layciak, Brighton Township, Beaver County, and Stephen S. Dobrosielski, Beaver, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Dec. 7, 1977, Ser. No. 858,323
Int. Cl.² H01H *3/00, 9/00*
U.S. Cl. 200—4 **9 Claims**

1. A rotary selector switch comprising a rotatable actuating unit, a tubular housing, said unit comprising an actuator within the housing and a switch handle on one end of the actuator, at least two switch structures mounted on the housing and operatively connected to the other end of the actuator, the handle being at one end of the housing and rotatable through one limited sector thereof, the handle being removable from the actuator for repositioning thereon in another limited sector of rotation, mutually interfitting means on the handle and actuator to enable said removal and repositioning, stop means for limiting rotation of said unit and comprising interengageable means between the handle and the housing, the interengageable means on the handle comprising a first pair of peripherally spaced ribs that are rotatable through one limited sector for one position of the handle, the interengageable means on the handle also comprising a second pair of peripherally spaced ribs that are rotatable through another limited sector for another position of the handle, the interengageable means also

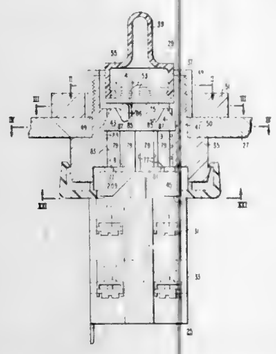


comprising a pair of peripherally spaced guides on the housing, each rib having a stop surface on each side thereof and the peripheral spacing between the stop surfaces of each pair of ribs on one side being longer than the peripheral spacing between the stop surfaces of the ribs on the other side thereof, the interengaging means on the handle being located in the longer peripheral spacing when the handle is rotated through said one limited sector and located in the shorter peripheral spacing when the handle is rotated through said other limited sector, an operating cam on the other end of the actuator, each switch structure having a reciprocable contact operating member to effect opening and closing of a circuit through the switch structure, and the cam having cam operating surface means for actuating the contact operating members.

4,175,221
CONVERTIBLE SELECTOR SWITCH
Walter J. Kellogg, Beaver, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Dec. 7, 1977, Ser. No. 858,326
Int. Cl.² H01H *3/00, 9/00*
U.S. Cl. 200—4 **11 Claims**

1. A rotary selector switch comprising a rotatable actuating unit, a tubular housing, said unit comprising an actuator within the housing and a switch handle on one end of the actuator, at least two switch structures mounted on the housing and operatively connected to the other end of the actuator, the handle being at one end of the housing and rotatable through one limited sector thereof, the handle being removable from the actuator for repositioning thereon in another limited sector of rotation, mutually interfitting means on the handle and actuator to enable said removal and repositioning, stop means for limiting rotation of said unit and comprising interengageable means between the housing and the handle, the interengageable means on the handle comprising a first pair of peripherally spaced ribs that are rotatable through one limited sector for one position of the handle, the interengageable means on the handle also comprising a second pair of peripherally spaced ribs that are rotatable through another limited sector for another position of the handle, the interengageable means also comprising a pair of peripherally spaced guides on the housing, each rib having a stop surface on each side thereof and the peripheral spacing between the stop surfaces of each pair of ribs on one side being longer than the peripheral spacing between the stop surfaces of the ribs on the other side thereof, the interengaging means on the handle being located in the longer peripheral spacing when the handle is rotated through said one limited sector and located in the shorter peripheral spacing when the handle is rotated through said other limited sector, an operating cam on the other end of the actuator, each switch

structure having a reciprocable contact operating member to effect opening and closing of a circuit through the switch



structure, and the cam having cam operating surface means for actuating the contact operating members.

4,175,222

PUSHBUTTON SWITCH

Horace J. Buttner, 1501 Palos Verdes Dr., North, Harbor City, Calif. 90710

Continuation of Ser. No. 720,319, Sep. 3, 1976, abandoned. This application Jan. 27, 1978, Ser. No. 873,030

Int. Cl.² H01H *3/12*

U.S. Cl. 200—159 R **10 Claims**



1. A pushbutton switch for electrically connecting a pair of conductors, each having coined ends retained in said switch, said switch comprising:

a housing including a barrel with an axis and head portion generally transverse to said axis,

a cover secured to said head with said coined conductor ends secured, in electrically non-contacting relation, between said head and cover,

said head and cover including insulating means to prevent an electrical connection between said conductors through either said head or said cover,

a contact moveable along said axis for bridging said coined ends for electrically connecting said conductors,

means mounting said contact for said axial movement to establish an electrical connection,

a plunger axially slidable in said barrel and engaging said mounting for projecting said mounting means in an axial direction,

biasing means yieldably biasing said contact, mounting means and plunger for return to a retracted position in which said contact bridges said conductors,

a ratchet mechanism on said housing and mounting means for retaining said mounting means in a projected position against the bias of said biasing means,

said plunger transmitting axial motion to said mounting means on a first stroke for operating said ratchet mechanism to retain said mounting means in a projected position at the conclusion of said stroke in which position said contact is out of engagement with said coined ends,

said plunger transmitting axial motion to said mounting means on a second stroke for operating said ratchet mechanism to allow said biasing means to return said contact and mounting means to a retracted position, in which position said contact is in engagement with said coined ends.

4,175,223

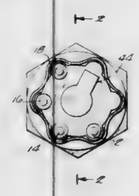
POSITION RESPONSIVE SWITCH

Richard L. Lauritsen, Hoffman Estates, and Richard S. Philbrick, Chicago, both of Ill., assignors to The Singer Company, New York, N.Y.

Filed Oct. 10, 1978, Ser. No. 950,137

Int. Cl.² H01H *1/36, 15/06*

U.S. Cl. 200—159 R **6 Claims**



1. In a switching device having a hollow molded plastic body, a carrier mounted for axial movement in the body, spaced conductors fixed in the body parallel to each other and to the movement axis of the carrier, the improvement comprising a rib molded integrally with the body between the conductors, a shorting bar carried by said carrier for axial movement therewith and for movement transverse the axis into engagement with said conductors or with said rib, said rib having such height that it projects above a plane through the inner surface of both conductors and therefore prevents engagement of the shorting bar with the conductors, a cored hole through the body and the rib at a predetermined axial location so movement of the shorting bar into engagement with the conductors is unrestrained at said location.

4,175,224

APPARATUS FOR TRANSPORTING HEAVY EQUIPMENT ON A PIPELINE

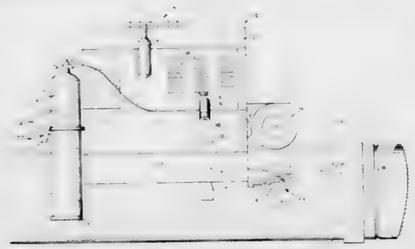
Eugene F. Sims, and Trueman Dierlam, both of Houston, Tex., assignors to CRC-Crose International, Inc., Houston, Tex.

Filed Apr. 18, 1977, Ser. No. 788,550

Int. Cl.² B23K *37/02*

U.S. Cl. 219—60 R **10 Claims**

1. A carriage apparatus adapted to ride substantially in an upright position on and along a pipeline, for transporting and supporting heavy equipment such as welding power generating means and related equipment along said line which comprises, in combination, a carriage structure elongated along the line, power driven traction means at one end of said structure for supporting said structure on and propelling it along said line, a pair of swivel mounted laterally spaced wheels at the other end of said structure normally engaging sides of the pipeline and substantially below its top for imparting lateral stability thereto, a secondary pair of steering wheels adapted to engage the sides of the pipeline, sensing means for detecting incipient tilting of the structure away from its normal substantially upright position, and means connected to and responsive



to operation of the sensing means for controlling the secondary steering wheels to restore the carriage to stable upright position in case of movement to incipient instability.

4,175,225

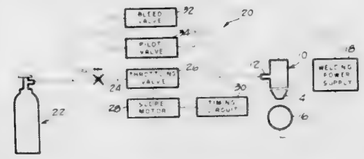
GAS FLOW CONTROL CIRCUIT FOR PLASMA ARC WELDING

Kenneth H. Holko, and John R. Odell, both of San Diego, Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Sep. 19, 1977, Ser. No. 834,415

Int. Cl.² B23K *9/00*

U.S. Cl. 219—121 P **12 Claims**



1. In plasma arc welding apparatus of a type having a plasma arc torch movable relative to a welding stock, the plasma arc torch including means for receiving orifice gas and means for transforming the orifice gas into a plasma jet stream and directing it toward the welding stock, a gas flow circuit for closely regulating the flow of orifice gas from a source to the receiving means of the plasma arc torch which comprises.

conduit means for interconnecting the source with the receiving means of the plasma arc torch,

a throttling valve arranged along said conduit means for controlling flow of the orifice gas from the source to the receiving means of the plasma arc torch,

a motor for operating said throttling valve, and

adjustable timing means coupled with said motor for selectively increasing, decreasing and maintaining at a steady state the flow of orifice gas through the throttling valve, said adjustable timing means including means for automatically upsloping the flow of orifice gas to initiate the weld and for automatically downsloping the flow of orifice gas for terminating the weld.

4,175,226

SEALING DEVICE FOR CHARGED PARTICLE BEAM WELDING

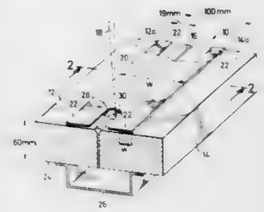
Erwin Kappelsberger; Peter Anderl, both of Munich, and Karl H. Steigerwald, Starnberg, all of Fed. Rep. of Germany, assignors to Steigerwald Strahltechnik GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 28, 1978, Ser. No. 901,003

Claims priority, application United Kingdom, May 11, 1977, 19830/77

Int. Cl.² B23K *9/00*

U.S. Cl. 219—121 EM **13 Claims**



1. A method of electron beam welding a gap or joint (16) between workpiece parts, each of which having an edge defining said joint and a surface extending from the edge;

said method comprising:

placing a longitudinal strip of metal foil over said joint and providing a vacuum-tight seal between said strip and said workpiece surfaces;

sealing the side of the joint opposed to said surfaces;

placing a movable vacuum chamber on, and sealing it with respect to said surfaces, said vacuum chamber comprising an electron gun for producing an electron beam for welding said joint;

evacuating said chamber and directing said beam onto and moving said chamber along said joint to form a weld seam;

the improvement consisting in the additional step of severing a portion of said metal foil strip between the edges thereof within said vacuum chamber and lifting said portion from said workpiece surfaces.

4,175,227

PROCESS FOR AUTOMATICALLY VERTICALLY BUTT WELDING STEEL SHEET MATERIAL FOR CONTAINERS

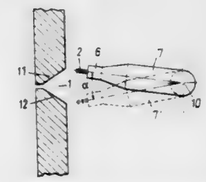
Erich Kasper, Weisskirchen, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Dec. 20, 1977, Ser. No. 862,520

Claims priority, application Austria, Dec. 21, 1976, 9498/76

Int. Cl.² B23K *9/12*

U.S. Cl. 219—125.12 **14 Claims**



1. An automatic process for butt welding a vertical seam along a vertical butt joint between sheets of rust-proof and chemically resistant steels containing more than 2 percent by

weight Ni, in which method the feed motion of a welding wire toward the weld seam, an oscillating movement of the welding wire transverse to the weld seam and the movement of the welding wire along the weld seam are automatically controlled and in which method the edges of the sheets are bevelled on one side only so as to form an open side of the butt joint, said method comprising performing the welding operation along the open side of the butt joint by providing an electrode having a maximum wire thickness of 1 mm, by oscillating the electrode over the whole width of the weld seam with a frequency of 70 to 140 double strokes per minute, by moving the electrode downwardly along the vertical weld seam and by keeping the welding area under a reactive gas atmosphere which contains carbon dioxide, oxygen and a major proportion of argon.

4,175,228

METHOD OF HOT BENDING A GENERALLY STRAIGHT WIRE BLANK

Venanzio Bizzari, and Enar Högfors, both of Hallstahammar, Sweden, assignors to Bulten-Kanthal AB, Hallstahammar, Sweden

Filed Aug. 26, 1977, Ser. No. 828,072
Claims priority, application Sweden, Sep. 3, 1976, 7609774
Int. Cl.[2] B21F *3/027*
U.S. Cl. 219—153 **10 Claims**



1. A method of hot bending a generally straight rod blank of ceramic material, having a diameter in the range of 0.4 to 0.1 mm, into a rod element having straight end portions and coils between said end portions, comprising the steps of

(a) clamping said end portions of said rod blank by means of two clamping jaws movable relative to one another while leaving a central portion, 40 to 100 mm in length, of said rod blank unclamped;

(b) conducting through said rod blank an electric current of such intensity that said rod blank is heated to a softening temperature of 1300° to 1600° C. in said central portion, while said end portions are kept at a temperature below 1300° C.; and

(c) moving at least one of said clamping jaws, during continued electric heating, along a path of movement adapted to a desired coil formation, whereby only said central rod portion is bent, while said end portions are kept substantially straight due to their lower temperature.

4,175,229

ENGINE BLOCK HEATER

Joseph B. Brinkhof, Brampton, and Raymond R. Datt, Mississauga, both of Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Filed Aug. 2, 1977, Ser. No. 821,240
Claims priority, application Canada, Nov. 12, 1976, 265449
Int. Cl.[2] H05B *3/02, 3/82;* **F02N** *17/06*
U.S. Cl. 219—208 **9 Claims**

1. A heater for insertion into an aperture in an engine block comprising

a body member having obverse and reverse faces,

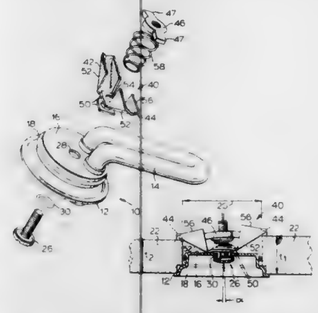
a metal sheathed heating element projecting from said reverse face,

a yoke assembly comprising

(i) a first member located rearwardly of said reverse face and connected to said body member by a single screw means operable from said obverse face to vary the spacing between said body member and said first member, and

(ii) at least two separate and independently movable wing members each having a first end and a second end subtending an obtuse angle to said first end, said wing members being assembled such that each said first end is positioned between said body member and said first member with said second ends diverging away from the reverse face of said body member in generally opposed directions,

said wing members being pivotally connected to said single screw means through a journal opening in each said first end, at least one of said wing members having said open-



ing dimensioned so as to permit pivotal movement of that wing member in the axial plane of said screw,

said first member having portions thereof repectively slidable on the second end of each said wing member,

cheek members associated with said first member and each said wing member to retain said wing members in unitary assembled relationship with said first member,

said yoke assembly having an effective planform boundary, when said first member is spaced from said body member a certain distance, not appreciably greater than that defining the aperture of said block, so that said yoke assembly can be inserted into the engine block through said aperture to position said heating element within the block, and

actuation of said screw means so as to move said first member towards said body member causing the second end of each said wing member to describe an outward and forward path so as to increase said effective planform area whereby distal portions of each said wing member respectively engage internal peripheral portions of said engine block bounding said aperture.

4,175,230

METHOD AND APPARATUS FOR TRANSFERRING CONTROL INFORMATION BETWEEN TWO MEMBERS

Gordon S. Richards, Paignton; Peter E. Douglas, Brixham, and Alan G. Abraham, Torquay, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 26, 1978, Ser. No. 899,927
Claims priority, application United Kingdom, May 5, 1977, 18868/77
Int. Cl.[2] H04B *9/00*
U.S. Cl. 250—199 **16 Claims**

1. Apparatus for transmitting information between two members one of which rotates relative to the other comprising:

first means fastened to one of said members for launching a beam of radiation modulated by said information;

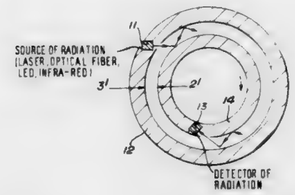
second means fastened to the other of said members for detecting said beam; and

third means for constraining said beam to travel along a path extending between said members;

said two members including

a first element having an internal circular circumference,

a second element having an external circular circumference smaller than said internal circular circumference, said second element being disposed within said first



element with a gap therebetween, said information being transferred across said gap for any relative rotational position of said first and second elements, and

a reflector for said beam provided on each of said circular circumference;

said first means directs said beam through an aperture in said reflector on said first element into said gap, said beam passing around said gap by multiple reflections from said reflectors on said first and second elements until said beam reaches an aperture in said reflector on said second element through which said beam passes to said second means.

4,175,231

DEVICE FOR DETECTING A MOVING BODY

Shinji Murata, Tokyo, and Toshio Iwaya, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1977, Ser. No. 833,707
Claims priority, application Japan, Sep. 28, 1976, 51-116258; Aug. 22, 1977, 52-100300
Int. Cl.[2] G02B *5/14*
U.S. Cl. 250—227 **12 Claims**



1. A device for detecting a moving body, comprising:

means for illuminating a moving body at a predetermined position along the path of movement of the body;

a photoguide member for receiving light reflected by the body, said photoguide member comprising a substantially transparent solid disc segment provided with a light receiving surface which defines a portion of a cylinder having its axis disposed along the axis of the disc segment and in parallel with the direction movement of the body, said transparent disc segment having parallel end surfaces, and having a concave surface disposed radially inward from said light receiving surface, wherein light directed from said light receiving surface is emitted from said concave surface, and wherein said light receiving surface is disposed adjacent said predetermined position along the path of movement of said body; and

a light receiving element located in opposition to said concave surface for receiving the light emitted from said photoguide member, said light receiving element including a photoelectric converter.

4,175,232

INOGRAPHY IMAGING METHOD AND CHAMBER

Jurgen Muller; Manfred Schmidt, and Rolf Eickel, all of Munich, Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Sep. 1, 1977, Ser. No. 829,960
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1976, 2639444; Jan. 13, 1977, 2701202
Int. Cl.[2] B41M *5/00*
U.S. Cl. 250—315.2 **32 Claims**



1. In a method of exposing elastic dielectric receptor sheets in the gap between concentric first and second spherical electrodes of an ionography imaging chamber to object-modulated X-rays which issue from a source located nearer to one of the electrodes, the steps of maintaining said electrodes at a fixed distance from each other so that the width of said gap is constant at all times; introducing into the gap at least one receptor sheet; biasing at least a part of the margin of the introduced sheet against the adjacent portion of the imaging chamber; and thereupon admitting into the gap compressed high Z gas at one side of the introduced sheet at a pressure which suffices to deform the sheet in the gap and to maintain the deformed sheet in face-to-face contact with the first electrode while said part of the margin of the sheet is biased against said portion of the imaging chamber.

4,175,233

FLOW CELL AND METHOD FOR CONTINUOUSLY MONITORING DEPOSITS ON FLOW SURFACES

Vito A. DePalma, Tonawanda, and Robert E. Baier, Buffalo, both of N.Y., assignors to Calspan Corporation, Buffalo, N.Y.

Filed May 26, 1978, Ser. No. 910,165
Int. Cl.[2] G01N *21/26*
U.S. Cl. 250—343 **8 Claims**

1. A demountable flow cell having an inlet and an outlet with a flow path therebetween and including:

a pair of mating housing members having corresponding recesses located therein;

first and second plates receivable in respective ones of said corresponding recesses;

shim means for separating said first and second plates when the flow cell is assembled and to define with said plates a portion of said flow path;

means for holding said housing members in an assembled, flight tight relationship while permitting disassembly of



said flow cell to permit direct examination of said plates defining said flow path.

4,175,234

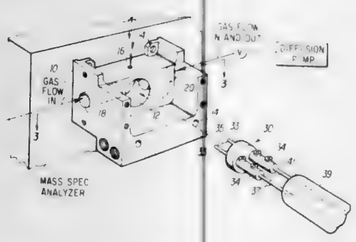
APPARATUS FOR PRODUCING IONS OF THERMALLY LABILE OR NONVOLATILE SOLIDS

Donald F. Hunt, and Jeffrey Shabanowitz, both of Charlottesville, Va., assignors to University of Virginia, Charlottesville, Va.

Continuation of Ser. No. 822,216, Aug. 5, 1977, which is a continuation-in-part of Ser. No. 809,770, Jun. 24, 1977, abandoned. This application Jun. 16, 1978, Ser. No. 916,151

Int. Cl.² H01J *27/00*

U.S. Cl. 250—427 **16 Claims**



1. A method for ionizing and vaporizing a nonvolatile solid sample for introduction into a mass spectrometer, which comprises: introducing a sample of said solid deposited on the highly irregular surface of a conductive emitter into the ionization chamber of said mass spectrometer in close proximity to the ion exit port of the ionization chamber of said spectrometer; flowing a gaseous reactant capable of undergoing ionization to gaseous ions when subjected to high energy radiation through said ionization chamber; subjecting said flowing gaseous reactant to a high energy beam which ionizes the molecules of said gaseous reactant; and, simultaneously passing a heat generating current through said conductive emitter, thereby generating vaporized ions of said solid sample by exposure to the simultaneous influence of said gaseous ions and heat generating current for introduction into the analyzer section of said mass spectrometer.

4,175,235

APPARATUS FOR THE PLASMA TREATMENT OF SEMICONDUCTORS

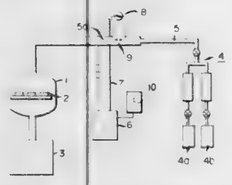
Kazuo Niwa, Yokohama; Masahiro Shibagaki, Hiratsuka, and Yasuhiro Horiike, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Aug. 29, 1977, Ser. No. 828,919

Claims priority, application Japan, Aug. 31, 1976, 51-103238

Int. Cl.² B28D *5/06;* **H05H** *1/24*

U.S. Cl. 250—542 **9 Claims**



1. Apparatus for the plasma etching of semiconductors comprising a plasma-generating section, means for introducing a gas suitable for plasma etching into said plasma-generating section, microwave discharging means for activating the gas contained in said plasma-generating section, an etching section in fluid communication with, and apart from, said plasma-generating section for etching semiconductor substrates with the activated gas, evacuation means for exhausting the gas from said etching section, and electric spark generating means positioned upstream of said plasma-generating section.

4,175,236

METHOD AND APPARATUS OF CAVITY IDENTIFICATION OF MOLD OF ORIGIN

Jonn W. Juvinall, Ottawa Lake, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 23, 1977, Ser. No. 864,080

Int. Cl.² G06K *7/10*

U.S. Cl. 250—566 **20 Claims**



1. A system for identifying machine molded containers, wherein each container has

a specularly reflective bottom surface which includes a concentric ring code integrally molded into the bottom surface of said containers, comprising:

illuminating means for projecting light onto the bottom of said containers at an angle with the intensity of said light being a function of the angle at which the light makes with the general plane of the container bottom;

light sensing means for detecting light reflected from the container bottoms and the ring code;

means for moving the containers relative to said illuminating means; and

code reading means connected to said sensing means for converting reflections from the bottom of the container into a code readout corresponding to the molded ring code of each container as it is moved past said illuminating means.

4,175,237

ELECTRIC STARTER FOR AN ENGINE

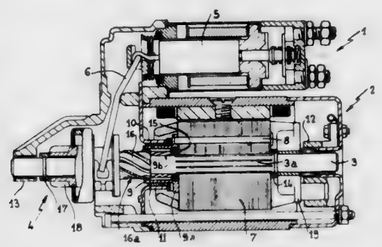
Alfred B. Mazzorana, 12, rue Fernand Léger, 69200 Venissieux, France

Filed Jun. 13, 1977, Ser. No. 806,249

Claims priority, application France, Jun. 22, 1976, 76 19543

Int. Cl.² F02N *11/00*

U.S. Cl. 290—38 R **6 Claims**



1. In an electric starter for an internal combustion engine having an electric motor with a rotating laminated armature on an armature shaft, and having a drive pinion mounted on the shaft with gear teeth on the pinion for engagement with a gear ring of the engine for rotation of the engine when driven by the motor, the improvement comprising a portion of said drive pinion extending toward said armature, the drive pinion and said portion being freely slidable and rotatable relative to the shaft and said portion having an annular splined surface, a drive sleeve fixed to one end of the laminated armature and having an annular splined surface surrounding the shaft in spaced relation thereto and arranged for interengagement with said splined drive pinion portion for direct rotational driving of the pinion from the laminated armature.

4,175,238

SWITCHING ARRANGEMENT FOR REMOTE-CONTROLLED ELECTRICAL LOADS

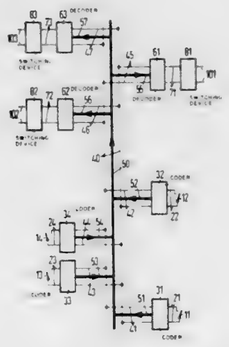
Fritz Breimesser, Erlangen; Christian Kuznia, and Karl-Ulrich Stein, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 27, 1976, Ser. No. 727,240

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1975, 2543028

Int. Cl.² H02J *4/00*

U.S. Cl. 307—40 **52 Claims**



1. In a switching device for remote-controlled electrical load devices, which either individually or in groups can be selectively controlled by at least one command transmitter which produces an electric switching signal, from one or more than one position over at least one switching device which is connected by a low voltage, low current circuit composed of at least a supply and a return line to the command transmitter, and is connected by electric lines to at least one electrical load device, the combination of one coder disposed in the low voltage, low current circuit between each command transmitter and each switching device, which coder converts a switching signal produced by said command transmitter and transmitted to said coder over a first part of said low voltage, low current circuit in a coded signal, one decoder disposed in the low voltage, low current circuit between the coder and the switching device, and a separate transmission channel between said coder and said decoder over which the coded signal can be supplied to the decoder, with the latter converting the coded signal into a switching signal for actuating the switching device over a second part of said low voltage, low current circuit.

4,175,239

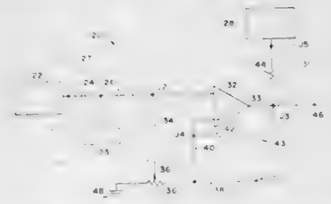
DETECTION MEANS FOR TOUCH CONTROL SWITCHES

Louis M. Sandler, North Reading, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Apr. 12, 1978, Ser. No. 895,755

Int. Cl.² H01H *35/00*

U.S. Cl. 307—116 **14 Claims**



1. In a touch control system of the type including at least one touch sensitive device which capacitively transmits a relatively large electrical signal when not touched and transmits a relatively small electrical signal when touched and means responsive to said electrical signal for detecting said touch and no-touch conditions of said touch sensitive device, the improvement wherein said detection means comprises: means for comparing voltages of said electrical signals to a predetermined reference voltage, said comparing means assuming at least two states indicative to touch and no-touch conditions of said touch sensitive device, and means responsive to said comparing means for controllably defining a time period for at least one of said states of said comparing means.

4,175,240

INTEGRATED LOGIC CIRCUIT WITH A CURRENT SOURCE MADE AS A FIELD-EFFECT TRANSISTOR

Vyacheslav Y. Kremlev, korpus 423, kv. 81; Artashes R. Nazarian, ploschad Junosti, 3, kv. 16; Alexei V. Lubashevsky, ploschad Junosti, 4, kv. 10, and Vilyam N. Kokin, korpus 441, kv. 115, all of Moscow, U.S.S.R.

Filed Jan. 3, 1978, Ser. No. 866,626

Claims priority, application U.S.S.R., Jan. 10, 1977, 2441813[1]; Jan. 10, 1977, 2441910

Int. Cl.² H03K *19/08, 19/34, 19/36, 19/40*

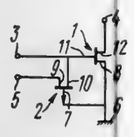
U.S. Cl. 307—205 **7 Claims**

1. An integrated logic circuit comprising:

a first field-effect transistor operating in a switching mode and having a gate, a drain and a source;

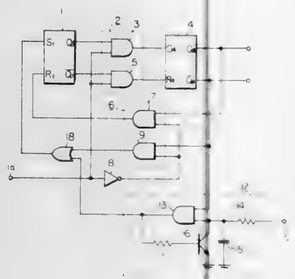
a second field-effect transistor having its conductivity complementary to that of said first field-effect transistor, oper-

ating as a current source and having a gate, a drain and a source;
an input electrode coupled to the gate of said first transistor and to the drain of said second transistor;
an output electrode coupled to the drain of said first transistor;



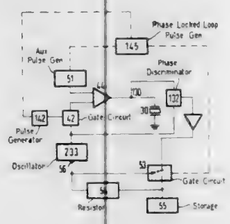
a first power supply circuit electrode coupled to the source of said second field-effect transistor; and
a second power supply circuit electrode, which is grounded and coupled to the gate of said second transistor and to the source of said first transistor.

4,175,241
MASTER-SLAVE FLIP-FLOP CIRCUIT
Takao Tsuchiya, Fujisawa; Susumu Akazawa, Tokyo, and Kyoichi Murakami, Chigasaki, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Continuation of Ser. No. 764,045, Jan. 31, 1977, abandoned. This application May 24, 1978, Ser. No. 909,111
Int. Cl.[2] H03K *1/12*
U.S. Cl. 307—262 **9 Claims**



1. A master-slave, flip-flop circuit comprising:
a first input terminal to which a timing signal is applied;
a master flip-flop circuit having input terminals and output terminals;
a slave flip-flop circuit having input terminals and output terminals;
gating means for connecting said output terminals of said master flip-flop circuit to said input terminals of said slave-flip-flop circuit and for connecting said output terminals of said slave flip-flop circuit to said input terminals of said master flip-flop circuit;
said first input terminal being connected to said gating means to control the operation thereof with the assistance of output signals from said output terminals of said master flip-flop circuit and from said output terminals of said slave flop-flop circuit;
a gating circuit separate from said gating means and having a connection to one of said output terminals of said slave flip-flop circuit and connected to one of said input terminals of said master flip-flop circuit to assist in controlling the operation of said master flip-flop circuit; and
a second input terminal to receive signals to produce phase inversion of the output signals of said master-slave flip-flop circuit, said second input terminal being connected to said gating circuit to cooperate with said connection to said one output terminal of said slave flip-flop circuit in controlling the operation of said gating circuit to achieve controlled phase inversion of the signals at said output terminals of said slave flip-flop circuit.

4,175,242
CIRCUIT ARRANGEMENT FOR THE AUTOMATIC FREQUENCY CONTROL OF AN ULTRASONIC TRANSDUCER
Peter Kleinschmidt, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Filed Apr. 19, 1978, Ser. No. 897,901
Claims priority, application Fed. Rep. of Germany, May 11, 1977, 2721225
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—316 **3 Claims**

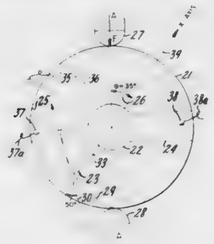


1. Circuit arrangement for inducing resonance oscillations in an ultrasonic transducer which also has the property of generating an alternating current by mechanical excitation of oscillations in the transducer, which circuit comprises an oscillator for generation of an oscillator excitation AC-voltage, a first gate circuit for the pulse wise application of said oscillator AC-voltage to said transducer, said oscillator being frequency controllable, an auxiliary pulse generator being connected to said transducer and parallel to said oscillator and said first gate circuit, a phase discriminator connected to the input connection of said transducer, and to the output connections of said oscillator, an additional gate circuit between the output of said phase discriminator and a control input of said oscillator, a load circuit connected to the control input of said oscillator, a memory storage stage connected to said load circuit and to a second input of said additional gate circuit and a phase locked loop pulse generator which connects the pulse control with said auxiliary pulse generator, said first gate circuit and said additional gate circuit, and the pulse sequence of said phase locked loop pulse generator being such that in one cycle first a pulse is sent to said auxiliary pulse generator after a pause for the impulse generated oscillation and the automatic die-out of the oscillations of said transducer being followed by a pulse being sent to said additional gate circuit by which the phase compared signal of said phase discriminator by way of said additional gate circuit is fed to said control input of said oscillator, the cycle being ended by a pulse being sent to said first gate circuit to initiate transfer of a working pulse to said transducer, whereby, in the case of a no pulse condition of said phase locked loop pulse generator for said additional gate circuit, said storage stage is connected by means of said additional gate circuit with said control input of said oscillator.

4,175,243
TEMPERATURE COMPENSATED OSCILLATING CRYSTAL FORCE TRANSDUCER SYSTEMS
James P. Corbett, 923 Palermo Dr., Santa Barbara, Calif. 93105
Filed Nov. 17, 1977, Ser. No. 852,477
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—338 **9 Claims**

1. A force transducer comprising:

a plate-shaped piezo electric crystal having a peripheral edge,
at least two seating members engaging the peripheral edge of the crystal and arranged to apply force directed along a line extending through the plate-like crystal from one seating member to the opposing portion of the peripheral edge,
a first pair of electrodes disposed on corresponding regions on opposite sides of a first portion of the crystal,
a second pair of electrodes disposed on corresponding regions on opposite sides of a second portion of the crystal spaced from the first portion, and



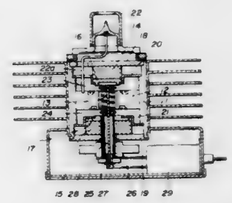
means for energizing the electrode pairs to maintain oscillation of the first and second crystal portions at different frequencies,
the seating members and the first and second crystal portions being arranged with respect to the crystal axis so that the first crystal portion is relatively insensitive to changes in ambient temperature and highly sensitive to changes in force applied by the seating members and the second crystal portion is relatively insensitive to changes in force applied by the seating members and highly sensitive to changes in ambient temperature.

4,175,244
LAMP FILAMENT CONFIGURATION FOR USE IN A DRUM LENS
William R. Klein, and William V. Burns, both of Houston, Tex., assignors to Tideland Signal Corporation, Houston, Tex.
Filed Sep. 11, 1978, Ser. No. 940,939
Int. Cl.[2] K01K *1/14*
U.S. Cl. 313—315 **6 Claims**



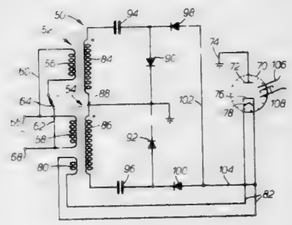
1. In a lamp for use in a drum lens of a navigational light, the improvement in a filament system in the lamp comprising,
at least four vertically positioned similar filaments spaced about but away from a vertical axis adapted to be placed at the focal point of the lens,
said filaments positioned in a horizontal plane relative to each other whereby no more than two filaments are aligned in any horizontal direction.

4,175,245
MAGNETRON MAGNET ASSEMBLY
Yoshio Ishida; Masao Sakai; Mamoru Tsuzurahara; Ichiro Inamura, and Tomokatsu Oguro, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 23, 1978, Ser. No. 880,585
Claims priority, application Japan, Jun. 24, 1977, 52/82501[U]
Int. Cl.[2] H01J *25/50*
U.S. Cl. 315—39.71 **7 Claims**



1. In a magnetron of the type comprising an anode cylinder, a pair of yokes mounted on the opposite ends of said anode cylinder, said anode cylinder and said yokes forming an evacuated envelope, a plurality of radial anode vanes secured to the inner wall of said anode cylinder to define an interaction space, a cathode electrode structure mounted in said interaction space, a holder located within said evacuated envelope and secured to the inner wall of said anode cylinder, a pole piece having a projection and a permanent magnet which are interposed between one of said yokes and said holder, the improvement wherein said holder is provided with an opening at the center thereof having a diameter smaller than the outer diameter of said projection and said projection is force-fitted in said opening to project into said interaction space.

4,175,246
ENERGIZING CIRCUIT FOR MAGNETRON USING DUAL TRANSFORMER SECONDARIES
Albert E. Feinberg, and Kenneth Woo, both of Chicago, Ill., assignors to Advance Transformer Company, Chicago, Ill.
Filed Feb. 27, 1978, Ser. No. 881,626
Int. Cl.[2] H05B *39/00, 41/14*
U.S. Cl. 315—101 **16 Claims**



1. An operating circuit for energizing a magnetron from an a.c. line of relatively low voltage and frequency which comprises:
a. a magnetron having an anode and a cathode;
b. a generally constant current transformer and condenser means combination which includes
i. transformer means having primary winding means adapted to be connected to said a.c. line;
ii. said transformer means including two secondary windings each isolated from said primary winding means but coupled in high leakage reactance operating relation to

said primary winding means, the secondary windings each having a first terminal at opposite instantaneous polarity with respect to one another connected to a first common juncture which is and remains at ground potential during operation of the circuit; and

iii. each secondary winding having its second terminal connected through a respective charging condenser and blocking rectifier means to a common second juncture;

c. the anode and cathode of the magnetron being connected to the combination and to be subjected to the output voltage thereof;

d. each charging condenser having a first rectifier connected from the condenser to the first common juncture whereby to provide a return path for current on alternate half cycles of the applied voltage with respect to each condenser, there being formed thereby two loops each containing a secondary winding, a charging condenser and a first rectifier;

e. the magnetron anode being connected to the second juncture;

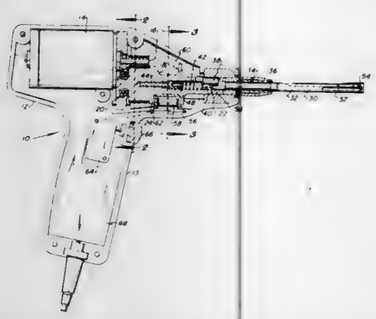
f. the circuit acting as a full wave voltage doubler to energize the magnetron, the transformer means and the charging condensers being chosen with such parameters that the current in each loop during operation is leading to provide good regulation of the magnetron current notwithstanding normal variations in the line voltage applied to said primary winding means.

4,175,247

ELECTRIC MOTOR CONTROL FOR CONDUCTOR WRAPPING TOOL

Robert W. Klemm, Hersey, Mich., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Jun. 26, 1978, Ser. No. 918,991
Int. Cl.[2] H02P *3/00*
U.S. Cl. 318—466 **9 Claims**



1. In a power tool including a housing, a rotary work performing member rotatably mounted in said housing, an electric motor drivably connected to said work performing member, and conductor means for connecting said motor to a source of electrical energy, the improvement which includes:

a motor control circuit connected to said conductor means and including first means for causing said motor to be operated at a first speed and a second speed less than said first speed;

a magnet mounted in said housing and operable to generate a magnetic field;

second means in said control circuit responsive to a change in the intensity of said magnetic field when said motor is operating at said second speed to cause said motor to be deenergized; and,

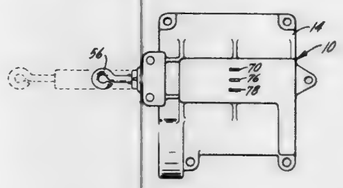
a member made of a magnetic material disposed to be rotated together with said work performing member and operable in a predetermined rotative position in proximity to said magnet to change the intensity of the magnetic field thereby causing said second means to deenergize said motor, said member further being responsive to a magnetic force acting thereon to bias said work performing member in said predetermined rotative position.

4,175,248

ELECTRIC POWER ACTUATOR

Dwight B. Whitfield, Bloomfield, Mich., and Kenneth K. Ferryman, Jr., Onalaska, Wis., assignors to Lake Center Industries, Winona, Minn.

Filed Jul. 18, 1977, Ser. No. 816,372
Int. Cl.[2] H02P *3/00*
U.S. Cl. 318—467 **1 Claim**



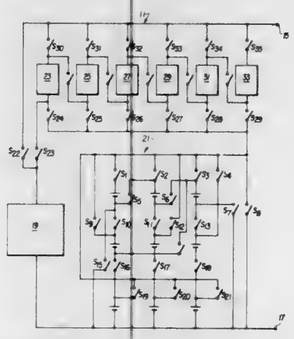
1. A linear actuator including a housing made up of two opposed housing halves, an electric motor mounted in one of the housing halves, a gear train positioned between the two housing halves and driven by the motor, a movable actuator member extending from the housing and driven by the gear train, electric bus bars mounted in the housing opposite the actuator member, a contact member driven by the actuator member and in electrical and mechanical contact with the bus bars, and an electrical connection between the bus bars and the electric motor so that the position of the contact member on the bus bars controls the flow of current to the motor.

4,175,249

SELF-RECONFIGURING SOLAR CELL SYSTEM

Robert P. Gruber, North Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 19, 1978, Ser. No. 916,655
Int. Cl.[2] H02J *7/34;* **G05F** *1/62*
U.S. Cl. 323—15 **7 Claims**



1. A self-reconfiguring solar cell system comprising:

an array of solar cells, the maximum power loading voltage V_L of each cell being a relatively constant fraction of the open circuit voltage V_{oc} of the cell for all ambient temperature and illumination levels within practical usage bounds;

controllable switch means for interconnecting the solar cells in a plurality of series-parallel arrangements;

sensor means for determining the magnitude of V_{oc} for the ambient temperature and illumination level in use; and

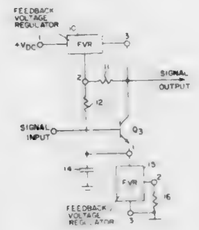
means responsive to the determination of the magnitude of V_{oc} for controlling the switch means to interconnect the solar cells in a series-parallel arrangement to cause each cell in the array to operate at substantially the maximum power loading voltage V_L.

4,175,250

TRANSISTOR BIAS CIRCUIT

Denny E. Morgan, Thousand Oaks, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Mar. 31, 1978, Ser. No. 892,100
Int. Cl.[2] G05F *1/56*
U.S. Cl. 323—22 T **5 Claims**



1. A circuit for providing a constant bias voltage and current for a transistor having a common electrode, an output electrode, and a control electrode adapted to receive a signal input, said circuit comprising

a source of direct current voltage,

two resistors in series between said common electrode and output electrode of said transistor, a first series resistor connected to said output electrode and a second series resistor connected to said common electrode of said transistor,

voltage regulating means connected to said source of direct current voltage for maintaining a predetermined voltage across said first resistor of said two resistors connected in series to the output electrode, thereby to produce a first constant current through said first resistor, and

means for providing a second constant current connected to said common electrode of said transistor, thereby to maintain a desired bias current through said transistor that is equal to the difference between said first and second constant currents while maintaining a constant bias voltage across the transistor from the output electrode to the common electrode.

4,175,251

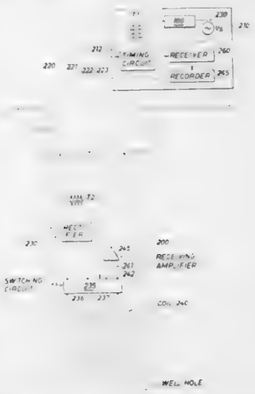
NUCLEAR MAGNETISM LOGGING METHOD AND SYSTEM

Richard N. Chandler, Danbury, Conn., assignor to Schlumberger Technology Corporation

Filed Apr. 20, 1978, Ser. No. 898,275
Int. Cl.[2] G01R *33/08*
U.S. Cl. 324—303 **12 Claims**

1. In a nuclear magnetism logging system, a method for applying a sequence of alternating current waveforms from a surface source of alternating current power to a load, each waveform in the sequence starting and stopping with substantially zero amplitude, the method comprising the steps of:

memorizing the starting and stopping polarity of the immediately preceding waveform in the sequence, and starting and stopping the present waveform in the sequence of waveforms with polarities opposite to the recorded



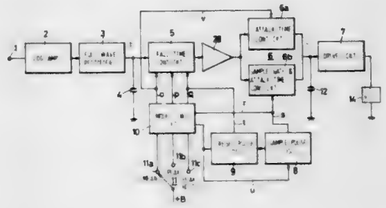
starting and stopping polarities of said immediately preceding waveform in the sequence.

4,175,252

METER DRIVE CIRCUIT

Hatsuhiko Shinoda, Komae, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 9, 1978, Ser. No. 884,814
Claims priority, application Japan, Mar. 12, 1977, 52-30274
Int. Cl.[2] G01R *19/16;* **H03K** *5/00*
U.S. Cl. 324—103 P **9 Claims**



1. A meter drive circuit comprising:

signal input means for supplying an input signal;

peak hold means for providing an output signal which represents the level of the peak value of the input signal occurring during a predetermined period, and for holding said output signal for the duration of such predetermined period;

sample and hold means for sampling the level of said output signal from the peak hold means and for holding the sampled level of said output signal, said sample and hold means including a sampling gate circuit operative to pass said output signal from said peak hold means, a hold circuit connected to said sampling gate circuit for holding the output signal passed by said sample gate circuit, a sampling pulse oscillator to apply a sampling pulse to said sampling gate circuit for making the latter operative, and a reset pulse oscillator connected to said peak hold means for providing a reset pulse to reset said output signal after said sampling gate circuit is made operative; and

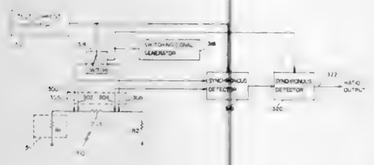
a signal level indicator connected to said sample and hold means for providing an indication of said sampled level which is being held in said sample and hold means.

4,175,253

ANALYZING ELECTRICAL CIRCUIT BOARDS

Alexander D. Pitegoff, Brookline, Mass., assignor to Teradyne, Inc., Boston, Mass.

Filed Feb. 22, 1978, Ser. No. 880,056
Int. Cl.² G01R 27/04
U.S. Cl. 324—62 7 Claims



1. In apparatus for analyzing electrical circuit boards by measuring the voltage drop due test currents flowing along a conductor to an IC mounted on a circuit board, comprising a probe having at least two contact tips mounted to simultaneously contact at least two points on said conductor, said tips being spaced apart sufficiently to permit measurement of electrical activity in a segment of said conductor between said tips, and means for injecting a test signal directly into said conductor via said probe, that improvement comprising

means for measuring a first voltage drop across a said segment produced by the flow of test current through said segment away from said IC and a second voltage drop across a said segment produced by the flow of test current through said segment into said IC, and

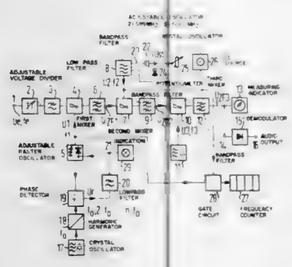
means for determining the ratio R_1/R_2, where R_1 is the internal resistance of said IC and R_2 is the parallel resistance of all other ICs on the same node.

4,175,254

SELECTIVELY TUNABLE HETERODYNE RECEIVER

Alfred Manfreda, Germering, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 666,182, Mar. 12, 1976, abandoned. This application May 5, 1978, Ser. No. 903,255
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1975, 2511027
Int. Cl.² H04B 1/26
U.S. Cl. 325—433 6 Claims



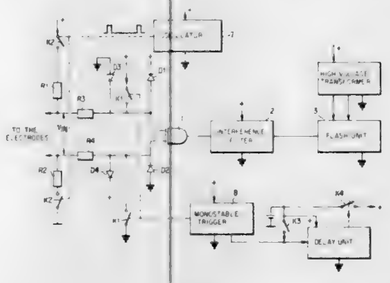
1. A tunable heterodyne receiver receiving an input signal and having at least two conversion stages which utilizes separate coarse and fine tuning and which can be set to a desired received frequency by first and second adjustable variable frequency signals including first and second mixers, a first adjustable injection oscillator developing said first signal which can be adjusted and locked to the harmonics of a fundamental frequency derived from a first crystal, said first mixer receiving said input signal and an input from said first injection oscillator to produce an output signal in a first intermediate frequency band, a second injection oscillator having a frequency determining circuit and developing said second signal which is continuously adjustable within a frequency range corresponding to the frequency spacing between adjacent harmonics of said first crystal, a second crystal in said frequency determining circuit for stabilizing its frequency to a stable frequency, an adjustment means connected to said second crystal oscillator for shifting its stable frequency over a continuously adjustable range which is very small in comparison to its nominal frequency, the frequency spacing between adjacent harmonics of the output of said first crystal oscillator fundamental frequency which control said first injection oscillator selected to be small enough that such spacing does not exceed the width of the adjustment range of said stable frequency of said second crystal oscillator, said second mixer receiving said first mixer output signal and said second variable frequency signal and a frequency counting means deriving the selected received frequency from the frequencies of said first and second injection oscillators, and wherein said adjustment means consists of a voltage controlled capacitive diode connected in the frequency-determining circuit of said second injection oscillator, and an adjustable voltage source connected to said diode, wherein the output of said second mixer comprises a second intermediate frequency band, the output of one of said first and second injection oscillators is supplied to said frequency counting means, said frequency counting means including a gate circuit which is opened by a signal from the other of said first and second injection oscillators whereby a counted output is obtained which corresponds to the frequency of the input signal and wherein said frequency counting means includes a preadjusted counter enabling indication of said selected received frequency.

4,175,255

DEVICE TO PROTECT AGAINST FLOW OF CURRENT

Sven N. J. Linnman, Gottsundav. 13, S18400 Åkersberga; Peter Isoz, Åda Gård, 15014 Vagnhärad; Nils P. Branderud, Båtholmsb. 21nb, S 12742 Skärholmen, and Per E. C. Udden, Box 90, S86100 Timrå, all of Sweden

Filed Sep. 6, 1977, Ser. No. 831,007
Int. Cl.² A61N 1/36; G08B 21/00; H05F 1/00
U.S. Cl. 328—7 5 Claims



1. A protective device to interrupt the flow of current at a work place when current of a magnitude to endanger life flows through the body of a user comprising:

at least two electrodes with skin contact for application to the body of a user;

a voltage sensor connected to the electrodes for determining the voltage difference between the electrodes when a current flows through the body of the user and generating a signal when the voltage difference exceeds a given limit value;

a circuit breaking device spaced from the voltage sensor and responsive to the signal for interrupting the flow of current; and

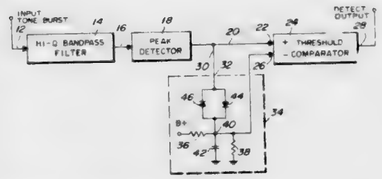
a test oscillator for emitting intermittent voltage impulses through the electrodes to the body of the user.

4,175,256

DYNAMIC THRESHOLD TONE DETECTOR

Arman V. Dolikian, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 30, 1976, Ser. No. 710,766
Int. Cl.² H03K 5/20
U.S. Cl. 328—149 7 Claims



1. Apparatus for detecting the presence of a tone having a frequency f in a received signal comprising:

filter means including tuning circuitry tuned to the frequency f for processing the received signal and passing only those signals having a frequency at or near the frequency f;

detector means, responsive to the filter means, for producing a detecting signal representative of the magnitude of the filter means passed signals, the detect signal being at or near a reference level in response to the absence of a significant filter means passed signal;

comparator means having first and second inputs and an output, the output assuming a first logic state responsive to the signal received at its first input being less than the signal received at its second input, the comparator means output otherwise assuming a second logic state;

means for coupling the detect signal to the comparator means first input;

means for producing a dynamic threshold signal and applying the same to the comparator means second input, the dynamic threshold signal of predetermined magnitude such that when the detect signal is at or near the reference level the comparator output assumes the first state and that for a predetermined incremental increase in the detect signal the comparator means output assumes the second state, the threshold detect signal tracking further increases in the detect signal and lagging by an incremental amount such that for a predetermined incremental decrease in the detect signal the comparator means output assumes its first state,

whereby the comparator output assuming the first state is representative of the undetect condition and the comparator output assuming the second state is representative of the detect condition; said means for producing a dynamic threshold signal comprises:

a bias supply having an output potential terminal and a reference potential terminal;

a resistive voltage divider connected between the output and reference potential terminals of the bias supply, the divider having an output tap for supplying a predeterminedly divided portion of the bias supply;

capacitor means coupled between the voltage divider tap and reference potential for tending to maintain the voltage thereacross;

means for coupling the resistive divider tap to the second input of the comparator means; and

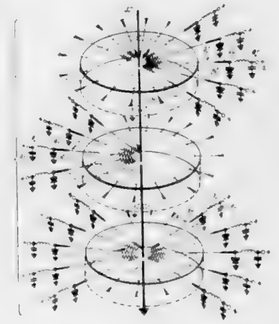
clamping means coupling between the detector means and the resistive divider for clamping the voltage at the tap of the divider to an incremental value above the reference terminal responsive to the detect signal being less than the predetermined lower level, the clamping means clamping the voltage at the tape of the divider to an incremental value below the output terminal responsive to the detect signal being above the predetermined upper level.

4,175,257

MODULAR MICROWAVE POWER COMBINER

Peter W. Smith, Westport, and Rudolph G. Mastrioanni, Stratford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 5, 1977, Ser. No. 839,727
Int. Cl.² H03F 3/60
U.S. Cl. 330—287 22 Claims



1. A power combiner for microwave energy, comprising:

a housing having at least one internal cavity disposed therein defined by a pair of facing end surfaces, said internal cavity being sized to resonate at a single frequency;

diode means situated within said housing for providing a source of microwave energy;

diode waveguide means positioned to extend radially within said housing, and having a coupling point situated axially adjacent one end surface defining said internal cavity, for electrically coupling said diode means to said internal cavity;

aperture means disposed through one of said end surfaces defining said internal cavity, near the periphery thereof, and situated in axial alignment with said coupling point of said radial waveguide means for forming an opening to said internal cavity through which microwave energy can propagate;

output means including an axially extending waveguide through one of said end surfaces defining said internal cavity for propagating microwave energy out of said power combiner; and

means including an axially extending waveguide through the other one of said end surfaces for reflecting microwave energy back into said cavity.

4,175,258

HIGH LEVEL WHITE NOISE GENERATOR

Casimer J. Borkowski, Oak Ridge, and Theron V. Blalock, Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 28, 1978, Ser. No. 929,145
Int. Cl.² H03B 29/00
U.S. Cl. 331—78 7 Claims

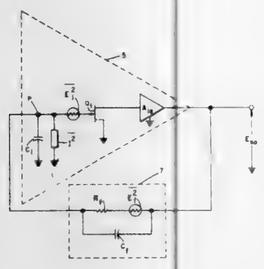
1. A high-level, white noise generator, comprising:

an inverting amplifier having an output from which said white noise signal is available; and

a thermal noise voltage signal generating feedback network connected between the output and the input of said ampli-

fier including a series resistor means (R_f) for generating said thermal noise voltage signal in accordance with the following equation:

$$E_n^2 = 4KT_fR_f\Delta f.$$



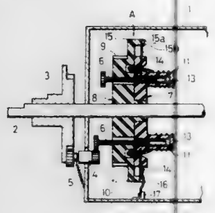
wherein E_n^2 is the open circuit RMS thermal noise voltage, K is the Boltzmann constant, T_f is the absolute temperature of the resistance (R_f) in Kelvins, R_f is the feedback resistance in ohms, and Δf is the noise bandwidth in hertz, said amplifier having an internal generated noise signal level substantially less than said thermal noise voltage signal generated by said feedback network.

4,175,259

CONSTRUCTION OF PRESET PLATE FOR VHF TUNER

Tasuku Noji, Soma, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1977, Ser. No. 861,161
Claims priority, application Japan, Dec. 17, 1976, 51/169081[U]
Int. Cl.² H03J *5/02, 1/00;* **H01H** *19/58*
U.S. Cl. 334—49 **4 Claims**



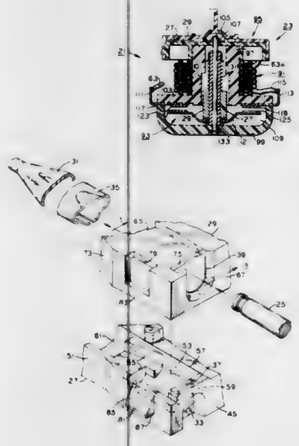
1. In a preset plate for a VHF tuner, including a first rotary body and a second rotary body each adapted to be mounted on a shaft for rotation therewith, said first rotary body carrying a plurality of inductance coils each corresponding to a respective channel of the tuner and said second rotary body carrying a plurality of screws each aligned with a respective inductance coil and adapted to be positioned within its respective coil to vary the inductance thereof for providing a fine tuning of the selected channel, and means for switching between inductance coils, said switching means including contact pieces connected electrically to respective coils and carried by said first rotary body for rotation into engagement with contact portions of at least one fixed contact member; the improvement comprising said contact pieces each being embedded within said first rotary body and extending radially outwards therefrom to a free end portion, said second rotary body having an outer portion spaced radially outwards from said first rotary body, said outer portion having recessed seat portions and projecting portions between adjacent seat portions, said free end portions each lying against a respective seat portion whereby during rotation of said first and second rotary body members, said projecting portions will lift each said contact member by a camming action to disengage the contact portion thereof from said contact pieces and said first rotary body, and return each said contact portions to said contact pieces with little bounce therebetween.

4,175,260

RELAY DEVICE, METHODS OF ASSEMBLING AND MOUNTING, AND SYSTEM

Lee O. Woods, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Jun. 22, 1977, Ser. No. 809,054
Int. Cl.² H01H *9/02;* **H02B** *1/08*
U.S. Cl. 335—202 **25 Claims**



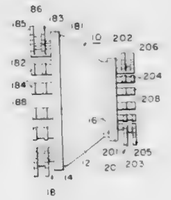
1. A relay device adapted to be removably mounted in plug-on circuit relation with a pair of male terminals of an electrically energized apparatus, the relay device comprising:
- a housing having receptacle means adjacent an end thereof for the releasable mounting in the plug-on circuit relation with the male terminals;
- coil means associated with said housing and adapted for electrical energization;
- switch means in said housing including a first pair of contact means, a second pair of contact means movable between making and breaking positions with respect to said first contact means pair, and armature means disposed in magnetic coupling relation with said coil means and associated with said second contact means pair for moving them from one of the making and breaking positions to the other thereof upon the energization of said coil means;
- a pair of female terminals for respectively receiving in electrical contacting engagement the male terminals;
- a first lead associated with said coil means and electrically connected with one of said female terminals;
- a second lead electrically connected between the other of said female terminals and one of said contact means of said first contact means pair;
- said receptacle means including a flange portion and a cover portion separable therefrom and arranged so as to be releasably engaged with said flange portion in a predetermined assembled position;
- said flange portion including a pair of opposite surfaces interconnected between a plurality of side surfaces, a pair of cavities in one of said opposite surfaces and in which said female terminal pair is respectively seated, a pair of passage means in said one opposite surface and associated with said cavity pair for receiving said first and second leads, respectively, a first pair of openings respectively intersecting with one of said side surfaces of said side surface plurality and connected with said cavity pair for accommodating the passage of the male terminal pair into the electrical contacting engagement with said female terminal pair when said receptacle means is removably mounted in the plug-on circuit relation with the male terminal pair, a pair of bridging means disposed at least closely adjacent said one side surface so as to extend generally across one of said first opening pair and said cavity pair and adapted for engagement with at least one of said female terminal pair and the male terminal pair so as to generally prevent the displacement of said flange from said female terminal pair in the event of at least a partial separation of said flange portion and said cover portion when said female terminal pair is disposed in the electrical contacting engagement with the male terminal pair; and
- said cover portion including a cover wall interconnected between a plurality of sidewalls depending therefrom, said cover wall being disposed generally in overlaying relation with said one opposite surface of said flange portion and at least some of said sidewalls of said sidewall plurality being disposed at least in part in opposed confronting relation with at least some of said side surfaces of said side surface plurality on said flange portion so as to generally capture said female terminal pair in said cavity pair with at least part of said first and second leads enclosed within said passage means pair when said cover portion is releasably engaged in the predetermined assembled position with said flange portion, and a second pair of openings in one of said sidewalls of said sidewall plurality disposed in the overlaying relation with said one side surface of said flange portion when said cover portion and said flange portion are releasably engaged with each other in the predetermined assembled position and arranged generally in alignment with said first opening pair for accommodating the passage of the male terminal pair into the electrical contacting engagement with said female terminal pair when said receptacle means is removably mounted in the plug-on circuit relation with the male terminal pair.

4,175,261

DEFLECTION YOKE

Eiji Sawada, Tokyo, Japan, assignor to Denki Onkyo Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1977, Ser. No. 865,233
Claims priority, application Japan, Dec. 28, 1976, 51-160557
Int. Cl.² H01F *7/00*
U.S. Cl. 335—210 **3 Claims**



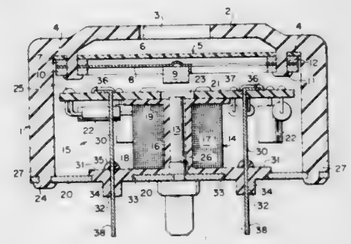
1. A deflection yoke comprising:
a coil frame including a flared body and first and second guide members provided at the front and rear ends of the flared body, each guide member including a ring-shaped attachment portion and a plurality of pairs of circumferentially arrayed finger members displaced from said attachment portion and extending radially with respect to said attachment portion and circumferentially spaced from one another wherein slots are formed between adjacent pairs of said finger members and grooves are formed by the finger members of each pair, all of said grooves being aligned to form a circumferential annular groove;
a toroidal-type deflection coil wound on said coil frame in a toroidal configuration between corresponding ones of said slots formed between the finger members of said guide members; and
a saddle-type deflection coil wound on said coil frame in a saddle-type configuration in the annular circumferential grooves formed by said finger members.

4,175,262

BUZZER WITH RIGID ELECTRICAL LEADS

Mototaka Harakawa, and Yoshio Mitumori, both of Shizuoka, Japan, assignors to Star Seimitsu Kabushiki Kaisha, Japan

Filed May 17, 1978, Ser. No. 906,912
Claims priority, application Japan, May 17, 1977, 52-56627
Int. Cl.² G10K *9/12, 1/00*
U.S. Cl. 340—388 **16 Claims**



1. A buzzer with rigid electrical leads comprising a housing, a vibrator unit including a diaphragm which is supported by the housing, and a drive unit including a coil assembly which electromagnetically excites the vibrator unit, the coil assembly including a bobbin of a non-magnetic and non-conductive material and having a pair of flanges at its opposite axial ends, and a winding on the bobbin, the drive unit including a plurality of rigid electrical leads which project externally of the housing, and electrical circuit means for connecting the leads with the winding, at least one of the flanges having guide means which support the leads, said electrical leads serving to connect the winding electrically with an external electrical circuit and to mount the buzzer on an external mounting structure.

4,175,263

TECHNIQUE FOR MONITORING WHETHER AN INDIVIDUAL IS MOVING FROM A PARTICULAR AREA

William C. Triplett, Ingleside, and Richard B. A. Morrow, Corpus Christi, both of Tex., assignors to Triad & Associates, Inc., Robstown, Tex.

Filed Apr. 25, 1977, Ser. No. 790,814
Int. Cl.² G08B *21/00*
U.S. Cl. 340—573 **19 Claims**

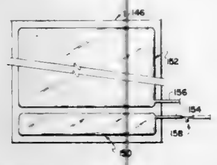
1. A monitoring system for determining and indicating when an individual is moving from a given location, comprising
- a pressure sensing pad for receiving part of the individual's weight, the pad including a layer of compressible permeable material for receiving a fluid therein, an envelope impermeable to the fluid and enclosing the material and a

conduit extending through the envelope in communication with fluid in the material; and

means for indicating when the individual is moving from the given location including

an alarm, and

means in circuit with the alarm for energizing the same including a pressure differential switch having a first



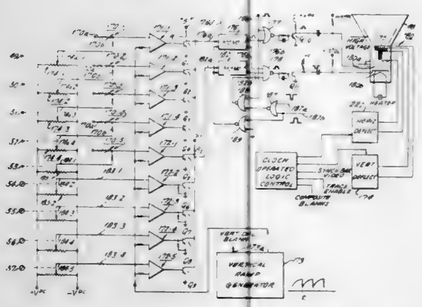
pressure compartment, an inlet to the first compartment connected to the conduit, a second compartment, a first switch contact in one of the compartments, a second switch contact, and means separating the first and second compartments and movable in response to pressure differentials between the first and second compartments in switch contact opening and closing directions.

4,175,264

ELECTRONIC SYNCHRONIZER-MONITOR SYSTEM FOR CONTROLLING THE TIMING OF MECHANICAL ASSISTANCE AND PACING OF THE HEART

Peter Schiff, Box 117, Schwenksville, Pa. 19473

Division of Ser. No. 556,153, Mar. 6, 1975, Pat. No. 4,016,871.
This application Jan. 17, 1977, Ser. No. 759,874
Int. Cl.[2] G06K *15/20*
U.S. Cl. 340—747 **17 Claims**



1. Display means for displaying at least two signals as traces on a display which contrast with one another to enhance the viewing thereof comprising:

a cathode ray tube (CRT) having a display face, an electron beam generating means, a control grid and a cathode and first and second deflection means for deflecting an electron beam generated by said electron beam generating means;

first and second ramp generating means for generating ramp signals and being respectively coupled to said first and second deflection means;

clock means for resetting said first ramp generating means at a first predetermined rate;

divider means coupled to said clock means for resetting said second ramp generating means at a second predetermined rate which is 1/nth said first rate;

a plurality of comparator means at least equal in number to the number of signal traces adapted to be simultaneously displayed on said tube face, said comparator means having first and second inputs and an output for generating a signal when the signals at said first and second inputs are substantially equal;

third ramp generating means operated by said clock means in synchronism with said first ramp generating means and being coupled to one input of each of said comparators;

summing circuit means having first and second inputs and an output coupled to the remaining input of its associated comparator means;

each signal to be displayed being coupled to one input of an associated one of said summing circuit means;

adjustable signal level means for coupling an adjustable d.c. level to the second input of each of said summing circuit means whereby the signal at said first input controls the size and shape of said trace and wherein the d.c. level at said second input controls the position of the trace on the display face;

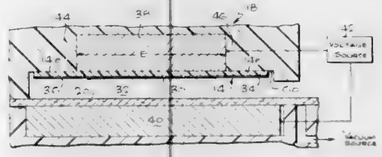
means coupled between each of said comparator means and said cathode and control grid of said CRT and responsive to said signal at the output of said comparator means to render said control grid sufficiently positive relative to said cathode to unblank the CRT electron beam.

4,175,265

TONER TRANSFER SYSTEM

Alfred M. Nelson, Redondo Beach, and David L. Davis, Venice, both of Calif., assignors to AM International, Inc., Los Angeles, Calif.

Filed Oct. 28, 1976, Ser. No. 736,310
Int. Cl.[2] G03G *19/00*
U.S. Cl. 346—74.1 **9 Claims**



1. In a printing system which includes a tape transport for moving a tape which has a layer of dielectric material and which has front and rear faces, with the front face carrying toner that forms images thereon, along a predetermined tape path, a print medium transport for moving paper or other print medium along a predetermined print medium path that passes adjacent to said tape path, so that the front of the tape faces the front of the print medium, and a transfer station located at the region where said print medium path moves the adjacent to said tape path, the improvement of a toner transfer apparatus comprising:

a transfer electrode located behind said tape path, at said transfer station,

a reference electrode located behind said print medium path at said transfer station;

a voltage source coupled to said electrodes, for applying a voltage between said electrodes that causes the toner on said tape to transfer from said tape to said print medium;

said transfer electrode being narrower than said tape; and

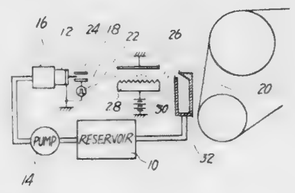
a pair of insulator portions located on either side of said transfer electrode and behind opposite side portions of said tape, whereby to prevent arcing when a high voltage is applied.

4,175,266

GROOVED DEFLECTION ELECTRODES IN AN INK JET SYSTEM PRINTER

Ichizo Nakano, Tokyo; Rikuo Takano, Musashino; Tamaki Saito, Koganei; Yuji Sumitomo, Nara; Toshio Kobayashi, Osaka, and Yoichi Yamamoto, Nara, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo and Sharp Kabushiki Kaisha, Osaka, both of, Japan

Filed May 7, 1976, Ser. No. 684,363
Claims priority, application Japan, May 13, 1975, 50-57860
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **12 Claims**



1. In combination with an ink jet system printer which emits charged ink droplets from a nozzle toward a recording paper in a path of travel and selectively deflects said ink droplets by deflection means and records desired symbols on said recording paper with said selectively deflected ink droplets, said droplets on impact with said recording paper emitting ink mist which rebounds toward said deflection means and tends to accumulate thereon, said deflection means comprising:

a pair of deflection electrodes having opposed surfaces;

a high-voltage source to establish a high-voltage electric field between the pair of deflection electrodes; and

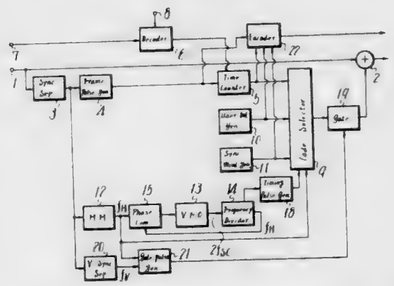
groove means defined in the surface of at least one of said electrodes transversely of said path of travel for constraining ink mist impinged thereon to collect in said groove means away from said surface to preclude disturbance of said electric field by accumulations of ink.

4,175,267

METHOD AND APPARATUS OF INSERTING AN ADDRESS SIGNAL IN A VIDEO SIGNAL

Katsuichi Tachi, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 819,172, Jul. 26, 1977, Pat. No. 4,134,130.
This application Jun. 28, 1978, Ser. No. 919,937
Claims priority, application Japan, Jul. 30, 1976, 51-91551; Jul. 30, 1976, 51-91878; Jul. 30, 1976, 51-91879
Int. Cl.[2] H04N *5/76*
U.S. Cl. 358—4 **6 Claims**



3. An apparatus for producing a video signal having a chrominance subcarrier having a frequency equal to 455/2 of the horizontal line frequency with an address signal therein, comprising:

(a) means for providing the address code corresponding to one field or frame of the video signal, said address code consisting of a plurality of time code bits,

(b) means for converting said address code into an address signal having a shorter duration than one horizontal line of said video signal,

a bit frequency of said address signal being selected at (1/N) of said subcarrier frequency, wherein N is an integer more than one,

(c) means for selecting at least one predetermined horizontal line within a vertical blanking period of each field or frame of said video signal, and

(d) means for inserting said address signal in said selected one horizontal line.

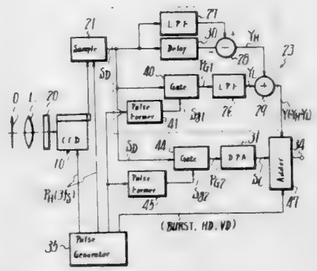
6. Apparatus according to claim **3** including means for recording on a magnetic tape in slant tracks, said video signal including said address code, means for detecting the video signal and address code, a plurality of memories to which successive address code signals are applied and stored, comparing means connected to said plurality of memories and determining when all or a predetermined number of stored address signals correlate, and output means receiving the output of said comparing means.

4,175,268

SOLID STATE COLOR CAMERA

Shigeyuki Ochi, Machida; Hiroshi Yamazaki, Ebina, and Seisuke Yamanaka, Mitaka, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 22, 1977, Ser. No. 853,902
Claims priority, application Japan, Nov. 26, 1976, 51-142493
Int. Cl.[2] H04N *9/04*
U.S. Cl. 358—44 **10 Claims**



1. A solid state color camera comprising:

(a) an image sensor having a plurality of image sensing elements aligned both in the horizontal and vertical directions;

(b) a vertical shift register having a storage register for storing image informations sensed by said image sensing elements and a transfer register for transferring said image information from said image sensing elements to said storage register;

(c) an output register connected to said vertical shift register for reading out said image informations stored in said vertical shift register;

(d) an output terminal to which the color image signal from said output register is supplied;

(e) filter means covering said image sensing elements, said filter means having a predetermined light separation characteristic through which said image sensing elements sense the predetermined limited color image informations;

(f) electrode means for picking up said color informations from said image sensing elements and for transferring said

color informations to said output register, said electrode means having a first group electrodes which correspond to said image sensing elements and a second group of electrodes which corresponds to said vertical shift register;

(g) a clock pulse source connected to said electrode means, said source providing sensor clock pulse and vertical shift clock pulse for driving said image sensing elements and said vertical shift register by the correlated timing phase thereof in which the timing phase of said clock pulses are so arranged that an interlace scanning order and a predetermined color sub-carrier phase order of the output signal informations at the output of said vertical shift register are satisfied as like the order of a standard color television signal; and

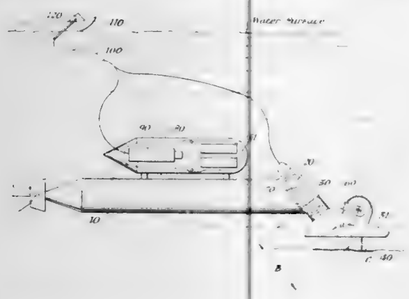
(h) means for supplying a clock carrier signal to said output register by which the transferred color image informations from said vertical shift register are read out due to the carrier signal frequency, said carrier signal being selected that the output signal at said output terminal has a predetermined color sub-carrier frequency equal to that of said standard color television signal.

4,175,269

UNDERWATER TV SURVEILLANCE OF PIPELINES

Dimetri Rebikoff, 102 R.D. E. Gazagnaire 06400, Cannes, France

Filed May 15, 1974, Ser. No. 470,226
Int. Cl.² H04N 7/18
U.S. Cl. 358—99 **5 Claims**



5. An underwater device used for viewing complete images in turbid water and making photographs of the complete images, comprising:

a body positionable near an underwater surface of the subject matter to be viewed,

an underwater electromagnetic wave source directing the wave energy from said source toward the surface of the subject matter being viewed,

a camera connected to said body, said camera positioned such that said wave energy from said wave source which strikes the surface of the subject being viewed is reflected at a reflected angle from the surface of the subject into said camera,

said camera having a center line viewing axis,

said wave source having a general center line wave axis, said wave source and said camera positioned relative to one another with said reflected angle between said viewing axis and said wave axis being greater than 30 degrees and less than 90 degrees to reduce the viewable area on particles positioned between said wave source and said camera,

said camera includes a camera lense connected to said camera and at least one underwater corrected lense having one side connected adjacent to said camera lense and a second surface facing the surface of the subject matter, and

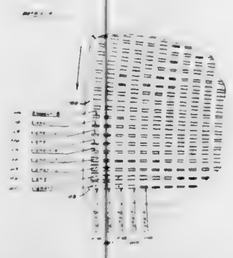
said body includes a block of material having a forward viewing surface, sides, and another surface connected adjacent to said second surface of said corrected lense, said block of material having said camera and said wave source mounted thereupon such that the wave energy from said wave source passes through said block of material to strike the surface of the subject being viewed and is reflected from the surface of the subject through said block of material into said camera.

4,175,270

METHOD AND APPARATUS FOR RECORDING AND REPRODUCING VIDEO

George E. Zenzefilis, 27 Los Vientos, Camarillo, Calif. 93010

Division of Ser. No. 511,932, Oct. 3, 1974, which is a continuation-in-part of Ser. No. 289,989, Sep. 18, 1972, abandoned, which is a division of Ser. No. 23,289, Mar. 27, 1970, Pat. No. 3,701,846. This application Dec. 12, 1977, Ser. No. 859,742
Int. Cl.² H04N 5/76, 5/84, 9/02; G11B 5/09, 5/012, 5/82
U.S. Cl. 358—128 **18 Claims**



1. A device having video information stored thereon for reproduction by means of an associated transducer during relative movement between the transducer and the device comprising:

a plurality of discrete information storage segments located over the surface of said device, each segment representing the condition of a corresponding element of a video display device associated with said transducer for reproducing the stored information in a succession of video frames, each frame being formed of scan lines;

said discrete segments being arrayed for traversal during movement of the transducer relative to the device along a succession of generally circumferential paths while the transducer progresses in a direction of relative movement substantially orthogonal to the circumferential path direction, each circumferential path of discrete segments representing a video frame; and

said discrete segments being arrayed in a plurality of rows generally aligned orthogonally to the direction of the circumferential paths wherein the discrete segments from path to path corresponding to a particularly display device element are located at generally the same angular position from the center of rotation with respect to a reference position.

4,175,271

HELICAL VIDEO TAPE INSERT RECORDING EDITING METHOD WITH FLYING ERASE HEAD AND SERVO CONTROL

Harry Kaemmerer, Franklin Township, Somerset Couty, N.J., assignor to American Telephone and Telegraph, New York, N.Y.

Division of Ser. No. 646,063, Jan. 2, 1976. This application Sep. 6, 1977, Ser. No. 830,596
Int. Cl.² H04N 5/795; G11B 27/08, 15/52
U.S. Cl. 360—14 **5 Claims**

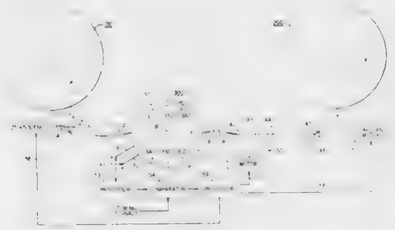
1. A method for controlling tape tension and relative speed during recording editing of a prerecorded video tape on a helical video tape recorder employing a flying erase head and having means for tape tension and relative speed control and including a standard timing signal source, comprising the steps of:

placing said helical video tape recorder into an insert recording editing mode:

detecting horizontal synchronization signals embedded in the diagonal tracks on said prerecorded video tape prior to flying erasure of video information to be replaced;

comparing said embedded synchronization signals with timing signals from said standard source to develop an error signal proportional to the timing difference therebetween; and

controlling responsive to said error signal the tape tension and relative speed of said helical video tape recorder so as to diminish said error signal.

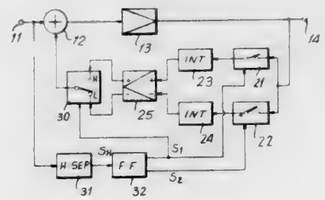


4,175,272

VIDEO SIGNAL PROCESSING CIRCUITRY FOR COMPENSATING DIFFERENT AVERAGE LEVELS

Toshihiko Numakura, Kamakura, and Jun Hirai, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 28, 1978, Ser. No. 937,095
Claims priority, application Japan, Aug. 30, 1977, 52-103999
Int. Cl.² H04N 5/84, 5/14
U.S. Cl. 360—34 **9 Claims**



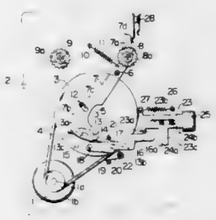
1. Video signal processing circuitry for compensating a video signal having different average levels in alternate horizontal line intervals thereof, comprising first average detecting means operable during alternate ones of said line intervals for detecting the average level of the video signal in said alternate line intervals; second average detecting means operable during the remaining ones of said line intervals for detecting the average level of the video signal in said remaining line intervals; compensating means responsive to the difference between said detected average levels of the video signal in said alternate and remaining line intervals, respectively, for producing compensating signals; and combining means for combining said compensating signals with said video signal so as to minimize the difference between the average level of the video signal in successive line intervals.

4,175,273

APPARATUS FOR AUTOMATICALLY STOPPING A CASSETTE TAPE RECORDER

Toshiaki Nakamura, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1978, Ser. No. 916,796
Claims priority, application Japan, Jul. 5, 1977, 52/88822[U]
Int. Cl.² G11B 15/22; B65H 59/38, 63/02
U.S. Cl. 360—74.3 **11 Claims**



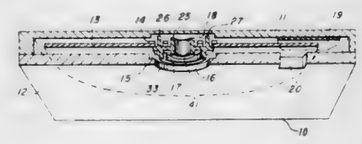
1. Apparatus for automatically stopping a tape recorder, comprising feed means for feeding recording tape in response to the rotation of said feed means, motive means for rotating said feed means at a speed which is dependent upon the speed of said motive means, stop means employing the inertial energy of said feed means when said feed means is rotating for automatically deenergizing said motive means and thus stopping the rotation of said feed means when the end of a fed tape is reached, accelerator means for increasing the speed of said motive means so as to increase the speed and therefore the inertial energy of said feed means, whereby the operation of said stop means is enhanced, and actuator means for automatically actuating said accelerator means as the end of a fed tape is reached.

4,175,274

RECORDING SYSTEM WITH FLEXIBLE MAGNETIC RECORDING DISC

Don C. Mann, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 3, 1977, Ser. No. 848,182
Int. Cl.² G11B 17/04, 23/02
U.S. Cl. 360—99 **12 Claims**



1. A system for recording and/or reading information on a recording surface of a sheet of flexible information storage media, said system comprising:

(a) a sheet of flexible information storage media having first and second opposite major surfaces, said first major surface for recording information thereon;

(b) a cartridge containing said information storage media, said cartridge having:

(i) a first relatively flat surface with an opening for receiving a recording and/or playback head therethrough, said flat surface being in facing relationship to the first major surface of said information storage media, and

(ii) a second relatively flat surface opposite said first relatively flat surface, said second relatively flat surface being in facing relationship to said second major surface;

(c) means for rotating said information storage media so that

the rotational motion of said information storage media causes said information storage media to rise above said first relatively flat surface, creating an air cushion between said first major surface and said first relatively flat surface, said recording and/or playback head writing and reading information on said first major surface while said media is in rotation; and

(d) a flexible spring member affixed to said second relatively flat surface opposite the recording and/or playback head receiving opening in said first relatively flat surface for providing a bias by air back pressure against the second major surface of said information storage media when said media is in rotation, said flexible spring member being sufficiently light in weight to allow an air film to form between the spring member and the information storage media when said media is in rotation, thereby preventing wear and drag.

4,175,275

R/W ARM THAT PREVENTS CATASTROPHIC FAILURE

Donald W. Schaefer, Lakewood, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 22, 1978, Ser. No. 908,490
Int. Cl.² G11B 5/54
U.S. Cl. 360—104 **4 Claims**



1. In a disk storage file including a plurality of flexible disks mounted for rotation about a central axis and a positioning mechanism which positions a transducer into a pack opening along a radial line transverse to circumferential data tracks to read and/or write data formed in the data tracks on a surface of the flexible disks, an improved head support arm for the transducer comprising, in combination, a relatively thin and planar member elongated along said radial line having a closed, continuous and uniformly tapered relatively sharp edge contour formed about a majority portion of its periphery including a front edge, a leading edge and a trailing edge which are symmetrically disposed and inclined at an angle with respect to said radial line with an apex formed by said leading and trailing edges preceding the front edge, said angle and edges cooperating to eject the head support arm automatically from within the magnetic disk pack in the event the pack opening in the flexible rotating disks dissipates.

4,175,276

TRANSFORMER INRUSH CURRENT DETECTOR

Russell M. Smith, North East, Pa., assignor to General Electric Company, Erie, Pa.

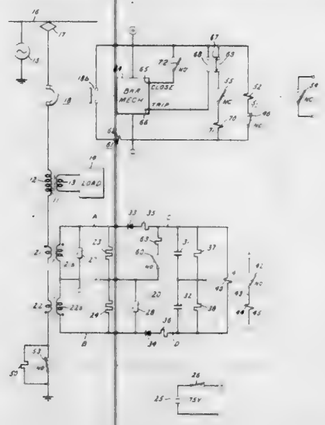
Filed Oct. 25, 1977, Ser. No. 844,773
Int. Cl.² H02H 7/04
U.S. Cl. 361—36 **6 Claims**

1. A system for detecting a d-c component of current in a power transformer winding energized by an a-c source, comprising:

a. first and second current transducers each having a saturable core adapted to be magnetized by alternating current flowing between the power transformer winding and the a-c source and having a secondary winding on said core;

b. bias means associated with said current transducers for presaturating their respective cores in opposite directions by equal predetermined amounts of magnetomotive force; and

c. means connected to the secondary windings of said first and second current transducers for deriving an output signal in response to voltage induced in one of said secondary windings as a result of alternating current containing a d-c component in the power transformer winding,



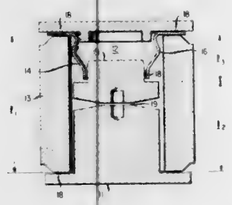
which current has sufficient peak magnitude to unsaturate the core of one of said current transducers, said output signal deriving means being arranged to prevent the output signal from being derived whenever voltages of substantially equal magnitudes are induced in both of said secondary windings as a result of symmetrical alternating current of relatively high amplitude in the power transformer winding.

4,175,277

VOLTAGE SURGE PROTECTOR

Paul Zuk, Allentown, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 8, 1976, Ser. No. 739,470
Int. Cl.² H02H 3/22
U.S. Cl. 361—120 **5 Claims**



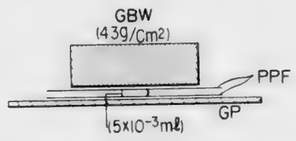
1. A surge protector comprising a tubular insulating housing and two electrodes defining a spark gap within the housing, the electrodes each being provided with a flange, the flanges each engaging one end of the housing and being affixed thereto characterized in that at least one of the electrodes consists essentially of a metal flanged support member and a metal electrode cap telescopically engaging the support member opposite the flange and soldered thereto by means of a fusible metal alloy, whereby the width of the spark gap between the electrode cap and the opposite electrode is determined by differential contraction of the electrodes relative to the housing during cooling from the brazing temperature to ambient temperature.

4,175,278

ELECTRIC INSULATING OIL COMPOSITIONS

Atsushi Sato; Isoo Shimizu, both of Yokohama, and Eiichi Matsuzaka, Tokyo, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

Filed Apr. 6, 1978, Ser. No. 894,117
Claims priority, application Japan, Apr. 13, 1977, 52-41557
Int. Cl.² C10G 37/08; H01B 3/22, 7/00
U.S. Cl. 361—315 **8 Claims**



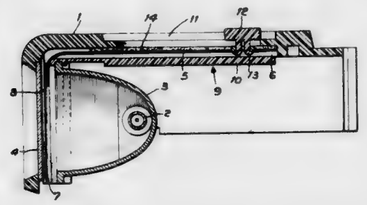
1. Electric insulating oil compositions comprising distillates within a boiling range in terms of normal pressure between 265° C. and 360° C. obtained by processing a hydrocarbon mixture from cracking of petroleum hydrocarbons at a temperature of 700° C. or higher principally composed of components with a boiling range between 75° C. and 198° C., said components consisting essentially of monocyclic aromatics and comprising aromatic olefins of said boiling range in liquid phase in the presence of an acid catalyst uder such conditions that the reaction temperature is from 0° C. to 200° C., the liquid residence time is from 0.1 hour to 5 hours and the concentration of aromatic olefins initially in the reaction system is 10% by weight or below.

4,175,279

FLASH UNIT FOR A CAMERA

James T. Asaki, Middletown, N.J., assignor to International Telephone & Telegraph Corporation, Nutley, N.J.

Filed Oct. 31, 1977, Ser. No. 847,286
Int. Cl.² G03B 15/02
U.S. Cl. 362—18 **20 Claims**



1. A filter for a light source comprising in combination:

a translucent flexible filter material; and

means for actuating said filter material into an operative position in front of said light source and to retract said filter material into an inoperative position removed from in front of said light source;

said means for actuating including

a pair of tracks, each of said pair of tracks being associated with a different one of the longitudinal edges of said filter material to contain and guide said filter material when it is actuated.

4,175,280

HEADLIGHT GLARE REDUCTION DEVICES FOR VEHICLES

Anna Plewka, Nahestr. 7, 4300 Essen-Kettwig, Fed. Rep. of Germany

Filed Oct. 28, 1977, Ser. No. 846,540
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1976, 2649947
Int. Cl.² F21V 3/00
U.S. Cl. 362—61 **8 Claims**



1. Apparatus for reducing the glare of headlights of vehicles, comprising:

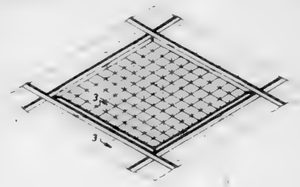
at least one additional light for lighting up the surroundings of the vehicle headlight and being mounted such that it does not emit direct light in the direction of travel and is structurally combined with the headlight, said additional light being mounted in a hollow body, reflectors mounted behind light sources and directed towards all sides and aiming in all directions with the exception of the direction of travel as well as the opposite direction and that said at least one additional light being attached to the front edge of a vehicle headlight by means of a mounting support, whereby at least one reflector is directed substantially parallel to the light emission surface of the vehicle headlights to floodlight the front part of the vehicle, its lateral surroundings as well as the area ahead.

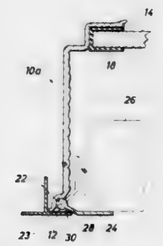
4,175,281

CEILING MOUNTED SUPPORT STRUCTURE

Wayne F. Lonseth, Austin, Tex., assignor to Esquire, Inc., New York, N.Y.

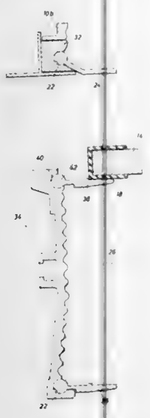
Filed Aug. 22, 1978, Ser. No. 908,069
Int. Cl.² F21S 1/02, 3/02; F21V 17/00, 19/00, 21/02; E04B 5/52; E05C 3/04
U.S. Cl. 362—148 **9 Claims**





1. Support apparatus for ceiling mounting at least a portion of a light fixture located within a ceiling opening at least par-

tially surrounded by a building structure presenting a lip toward the opening, comprising



a frame piece for resting on the lip of the building structure and having an elongate slot therein open on the side thereof toward the ceiling opening, and

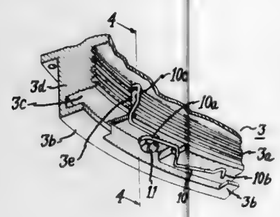
an elongate flipper bar having one edge operating within said slot, the edge of the slot limiting movement of said flipper bar to a support position for providing support for at least a portion of the fixture.

4,175,282

LUMINAIRE ATTACHMENT DEVICE

James L. Grindle, and Walter R. Blake, both of Hendersonville, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 19, 1978, Ser. No. 916,647
Int. Cl.² F21S *1/10*
U.S. Cl. 362—363 **8 Claims**



1. A luminaire comprising, in combination, support means comprising a socket having a screw-threaded wall defining a socket bore open at one end, said wall having an opening therein, an elongated spring member having an intermediate mounting portion and opposite end portions, said spring member secured to said socket wall with one end portion received in said wall opening and normally protruding therefrom into said socket bore, the opposite end portion of said spring member extending along said wall and formed with a catch portion, optical means having an open top threadably engaging said screw- threaded socket wall and yieldably engaged by said protruding spring end portion for firmly holding said optical means in removable assembly in said socket, and a cage-like guard having an open end secured to said support means and extending around said optical means, said support means having inwardly directed flange means at the open end of said socket, said guard formed at its open end with a shoulder portion, said guard being rotatable in one direction relative to said support means with said shoulder portion engaging said flange means for moving said guard into attached position, said shoulder portion formed with recess means engaged by said spring catch portion for yieldably holding said guard in attached position on said support means, said guard being rotatable in the opposite direction for releasing said recess means thereof from said spring catch portion for detaching said guard from said attached position.

4,175,283

BATCH OPTION MODULE

Warren G. Buchwald, and David W. Norris, both of Marshalltown, Iowa, assignors to Fisher Controls Company, Inc., Marshalltown, Iowa

Filed Apr. 24, 1978, Ser. No. 899,131
Int. Cl.² G06G *7/66, 7/58;* **G05B** *11/36*
U.S. Cl. 364—117 **3 Claims**



1. A Batch Option Module for a process control instrument, comprising:

first amplifier means for comparing the measured process variable and the setpoint of said process control instrument;

means for biasing the output of said first amplifier means;

second amplifier means for adding the setpoint to the output of said first amplifier means;

third amplifier means for preventing the output of said process control instrument in direct action from exceeding the absolute magnitude of the output of said second amplifier means and for preventing the output of said process control instrument in reverse action from being less than the absolute magnitude of the output of said second amplifier means;

means controlled by the output of said third amplifier means, for controlling the current flow to the integrator of said process control instrument whereby the output of said instrument is limited according to the formulas:

$$VHL = SP + K\,(SP - PV + B) \text{ or}$$

$$VLL = SP + K\,(PV - SP + B)$$

in which

VHL = high limit

VLL = low limit

SP = setpoint

PV = process variable

B = bias

K = gain; and

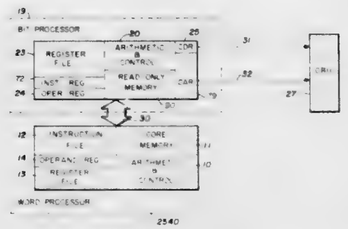
first and second comparator means for activating said Batch Option Module when said process control instrument approaches the limits of its control range and for deactivating said Batch Option Module when said process control instrument is within its normal control range.

4,175,284

MULTI-MODE PROCESS CONTROL COMPUTER WITH BIT PROCESSING

George P. Shuraym, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 178,804, Sep. 8, 1971, abandoned, which is a continuation of Ser. No. 843,614, Jul. 22, 1969, abandoned. This application Nov. 21, 1973, Ser. No. 418,011
Int. Cl.² G06F *7/00*
U.S. Cl. 364—200 **8 Claims**



1. A data processing system comprising:

(a) a memory for storing instructions,

(b) an instruction processing unit adapted to decode said instructions,

(c) a communication register having a plurality of binary bit positions, each bit position having a bistable state,

(d) an external controlling device connected directly to a first bit position in said communication register for setting said first bit position to either one of said bistable states,

(e) an externally controlled device connected directly to a second bit position of said communication register, said controlled device being responsive to and controlled by the state of said second bit position,

(f) logic means responsive to an instruction decoded by said instruction processing unit for directly addressing said first and second bit positions, said logic means including:

(i) testing means for testing the condition of said first bit position as set by said controlling device, and

(ii) means for setting said second bit position in said communication register to either one of said bistable states, and

(g) wherein said controlling device provides a bit of data to said data processing system via said first bit position in said communication register and wherein said controlled device in controlled by the state of said second bit position in said communication register.

4,175,285

NAVIGATIONAL SYSTEM OF HIGH-SPEED AIRCRAFT

Jean Dansac, Paris, and Georges Couderc, Meudon, both of France, assignors to Thomson-CSF, Paris, France

Filed Aug. 25, 1967, Ser. No. 665,195
Int. Cl.² G06F *15/50*
U.S. Cl. 364—456 **17 Claims**

1. A navigational system for the guidance of an aircraft on a high-speed overland flight, comprising aboard the aircraft, in combination with autopilot means for substantially holding the aircraft on a predetermined course and measuring means for taking instantaneous readings of a reference parameter of the overflown terrain;

recording means bearing a plurality of two-dimensional arrays of optically explorable prerecorded markings representing the values of said reference parameter in different elemental areas of respective measuring zones, each array encompassing a series of regions of uncertainty centered on respective measuring points along a simulated trajectory representing said predetermined course within a respective measuring zone, the extent of said regions of uncertainty being determined by the maximum possible deviation of the flight path of the aircraft under the control of said autopilot means from said predetermined course during travel from a preceding point of coincidence between said predetermined course and said flight path;

evaluation means forming a receiving surface;

comparison means including an orientable bench mark displaceable in response to said measuring means for indicating the reference parameter of the terrain actually overflown at successive instants during passage through a measuring zone, said comparison means further including optical correlator means for concurrently directing light rays upon said bench mark and upon the prerecorded markings of a given zone of uncertainty to correlate said bench mark with any of said markings representing the same reference parameter and to focus the light rays from the last-mentioned markings onto said receiving surface, thereby producing on said surface a contour line defined by all locations within the region of uncertainty having the same reference parameter;



programming means for relatively displacing said correlator means and any of said arrays during a respective measuring interval at an average rate proportional to the presumed speed of the aircraft and in a direction keeping said correlator means trained upon said simulated trajectory of the array and for repetitively operating both said measuring means and said comparison means throughout said measuring interval to sample the markings of an array and to project upon said receiving surface a plurality of intersecting contour lines during passage of the aircraft through any given measuring zone; and

storage means in said evaluation means for retaining information from the projected contour lines throughout said measuring interval and developing a cumulative output at a location corresponding to the point of intersection of the contour lines on said receiving surface, thereby indicating the true location of said flight path with reference to said predetermined course.

4,175,286

BURN-IN TEST SYSTEM FOR ELECTRONIC APPARATUS

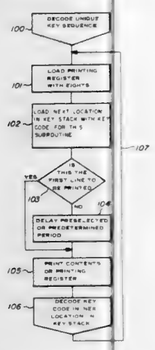
Arthur C. Hunter, Lubbock County, and Lloyd E. Norman, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 19, 1978, Ser. No. 870,697
Int. Cl.² G06F *3/12, 11/06*
U.S. Cl. 364—737 **18 Claims**

1. A method of performing a burn-in test of an electronic apparatus having a keyboard and an output device comprising the steps of:

(a) decoding an unusual sequence of key depressions at said keyboard, said unusual sequence being a sequence which would not be encountered during the normal operation of said apparatus;

(b) loading an output register with data in response to the decoding of the unusual key sequence; and



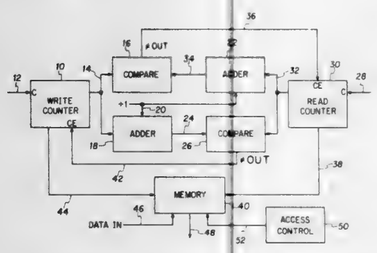
(c) repetitively transferring the data in said output register to said output device, whereby said burn-in test of said apparatus is accomplished.

4,175,287

ELASTIC STORE SLIP CONTROL CIRCUIT APPARATUS AND METHOD FOR PREVENTING OVERLAPPING SEQUENTIAL READ AND WRITE OPERATIONS

James L. Fuhrman, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 23, 1978, Ser. No. 871,575
Int. Cl.² G06F *11/00, 13/00*
U.S. Cl. 364—900 **4 Claims**



1. The electrical circuit method of preventing overlapping sequential read and write operations in the same section of a multisection memory having a minimum of four sections due to nonsynchronized read and write clock pulses, comprising the steps of:

alternately and sequentially reading and writing data into count addressable areas of a multisection memory;

binary digitally counting clock pulses used in actuating read and write operations as they progress from section to section with the portion of the counts, which designate a section, forming the most significant bits of the read and write operation addresses;

logically monitoring the read and write section counts; and

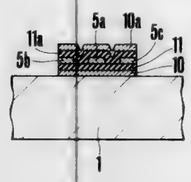
advancing the section count portion of the operation address of one of said read and write operations only when the advancement of that operation will not result in both read and write operations occurring in the same section of said multisection memory.

4,175,288

MAGNETIC BUBBLE MEMORY DEVICES

Hirofumi Ohta; Toshio Futami, and Kazuo Umeyama, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 23, 1978, Ser. No. 880,586
Claims priority, application Japan, Apr. 27, 1977, 52-47907
Int. Cl.² G11C *19/08*
U.S. Cl. 365—2 **4 Claims**



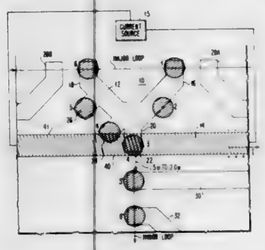
1. In a magnetic bubble memory device of the type comprising an insulating substrate, a magnetic bubble memory chip disposed at substantially the center of said insulating substrate, a plurality of lead pins secured to said insulating substrate at the end thereof, a plurality of planar electrically conducting lines comprising signal lines and ground lines formed on said insulating substrate between said magnetic bubble memory chip and said lead pins for passing small output signals, means for applying a perpendicular bias magnetic field to said magnetic bubble memory chip, and coils for producing a rotating magnetic field in a direction parallel with said memory chip, the improvement which comprises a plurality of grounded conductors including said ground lines disposed to surround signal lines of said plurality of lines for electrostatically shielding the same from said coils so as to decrease noise induced in said signal lines by a voltage developing across said coils.

4,175,289

SERRATED Y-BAR MAGNETIC BUBBLE SWITCH

Thomas W. Collins, Saratoga, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,805
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—15 **14 Claims**



1. A switch for bubble domains adapted to operate in a drive-to-transfer mode comprising:

a first magnetic element for propagating bubble domains and having a shape generally defining the letter Y with first and second arms and a stem, said element having a first propagation path along said first arm of said Y into said stem and then along said second arm of said Y, said element having a second propagation path along said first arm of said Y and then outward along said stem;

at least one serration connected to said second arm and in the vicinity of said stem;

a conductor positioned over the end of said stem and

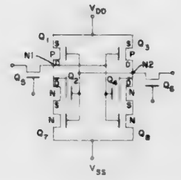
a second magnetic element for propagating bubble domains being located a distance of about 1.5w to 2.0w from said stem where w is one-half the diameter of the bubble domain wherein in the absence of current in said conductor, a bubble positioned near the end of said stem is propagated to said serration as the magnetic field rotates and then along the second arm of said Y, and in the presence of current in said conductor a bubble positioned near the end of said stem is propagated outward away from said stem as the magnetic field rotates to said second magnetic element.

4,175,290

INTEGRATED SEMICONDUCTOR MEMORY ARRAY HAVING IMPROVED LOGIC LATCH CIRCUITRY

Eliyahou Harari, Irvine, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 819,794, Jul. 28, 1977, Pat. No. 4,132,904. This application Oct. 16, 1978, Ser. No. 952,507
Int. Cl.² G11C *11/40*
U.S. Cl. 365—156 **5 Claims**



1. An integrated semiconductor memory array comprising in combination:

(a) a plurality of latch circuits arranged in columns and rows, each latch circuit having a pair of branches, each branch comprising an IGFET driver and an IGFET load connected in series drain-to-drain at a common node, the control gate of the IGFET driver of each branch of a latch being connected to the node of the other branch of that latch, at least one IGFET of each latch having a variable threshold voltage;

(b) means for normally maintaining a first voltage across the two branches of all of said latches which is below that required to change the thresholds of the variable threshold IGFETs of those branches;

(c) means for applying an input signal to at least one node of each latch in a selected column so as to store information in said latch in volatile form;

(d) means for selectively enabling all latches in a given row to receive said input signals so that, by means of the last two named means any one or more of said latches may be selected to receive information in volatile form, thereby achieving volatile storage of information in all of said selected latches;

(e) means for temporarily raising the voltage across all of said branches a second, higher, level which is sufficient to cause a long term change in the thresholds of all of said variable threshold transistors, thereby achieving non-volatile storage of the volatile information in all of said latches; and

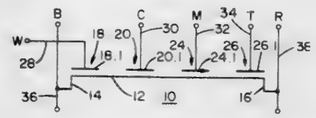
(f) means for applying substantially identical voltages to both nodes of at least one selected latch, while maintaining said first voltage across all of said latches, for selectively obliterating the volatile information content of only said selected latch, resulting in said selected latch assuming the state dictated by the threshold state of its at least one variable threshold IGFET without disturbing the volatile information contents of non-selected latches.

4,175,291

NON-VOLATILE RANDOM ACCESS MEMORY CELL

Wendell Spence, San Jose, Calif., assignor to NCR Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 714,457, Aug. 16, 1976, abandoned. This application Oct. 31, 1977, Ser. No. 847,207
Int. Cl.² G11C *11/40*
U.S. Cl. 365—184 **11 Claims**



1. A random access memory cell formed in a substrate of a given conductivity having a surface and at least one opposite conductivity region formed in the substrate for having signal information applied thereto, the cell comprising:

a capacitor having one electrode thereof formed by the substrate for volatilely storing signal information;

a first transistor, the first transistor having a channel formed in the substrate adjacent the capacitor electrode for transferring signal information from the opposite conductivity region via the channel to the capacitor;

a second transistor, the second transistor having a channel formed in the substrate communicating with the said one electrode of the capacitor for transferring signal information therebetween and having an alterable conduction threshold and being selectively activated by the volatile signal information in the capacitor to a predetermined threshold state; and

a third transistor, the third transistor having a channel formed in the substrate communicating with the second transistor channel for transferring signal information therebetween and cooperating with the opposite conductivity region and the second transistor for restoring signal information to the capacitor;

the predetermined threshold state of the alterable threshold second transistor controlling the restoring of signal information to the capacitor.

V 9 8 8 / 3 N 0 2 0 0 7 9 UMI

DESIGN PATENTS

GRANTED NOV. 20, 1979

ERRATA

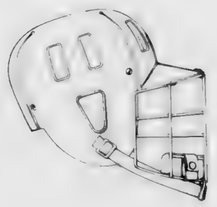
For CLASS	See PATENT NO.
D06–157	253,450
D08–395	253,457
D24–099	253,492

V 9 8 8 / 3 N 0 2 0 7 9 UMI

DESIGNS

NOVEMBER 20, 1979

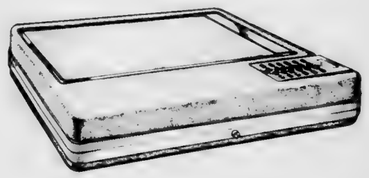
253,436
PROTECTIVE SPORTS HELMET
George Lynn, Ottawa, Canada, assignor to W. H. Brine Company, Needham, Mass.
Filed Feb. 17, 1978, Ser. No. 878,934
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232



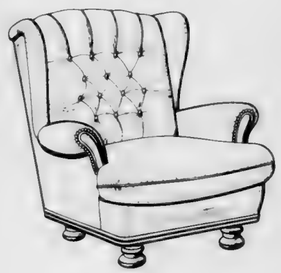
253,437
FOOT DECORATION
Margaret A. Jensen, 3437 Trumbull, San Diego, Calif. 92106
Filed Dec. 27, 1977, Ser. No. 864,531
Term of patent 3½ years
Int. Cl. D11—*01*
U.S. Cl. D2—270



253,438
COMBINED WORK CASE, PAD HOLDER AND CALCULATOR
Harold T. Markley, 23455 Wedgewood Ct. North, Elkhart, Ind. 46514
Filed Sep. 6, 1977, Ser. No. 830,488
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—76



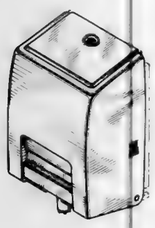
253,439
EASY CHAIR
Jean Prevost, 18 Bis rue Danielle Casanova, 94170 Le Perreux, France
Filed Jun. 17, 1977, Ser. No. 807,749
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—67



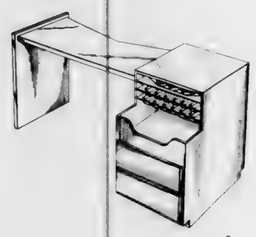
253,440
CHAIR
Huey T. Keller, High Point, N.C., assignor to Vaughan Furniture Company, Inc.
Filed Aug. 8, 1977, Ser. No. 822,604
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—70



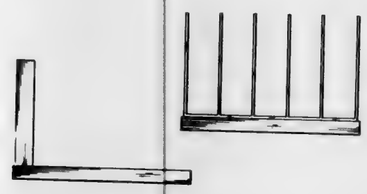
253,441
COMBINED SOAP DISPENSER CASING, DISPENSING LEVER AND DISPENSING NOZZLE
Council A. Tucker, Los Angeles, Calif., assignor to Towlsaver, Inc.
Filed Mar. 6, 1978, Ser. No. 884,034
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—95



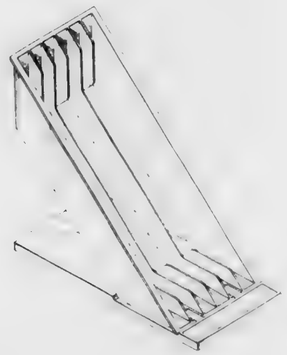
253,442
FITTING TABLE
Stephen U. Winig, Narberth, Pa., assignor to American Optical Corporation, Southbridge, Mass.
Filed Aug. 5, 1977, Ser. No. 822,029
The portion of the term of this patent subsequent to Mar. 13, 1993, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—162



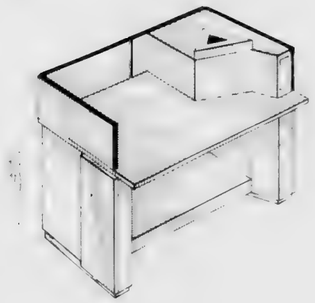
253,443
RECORD RACK
Samuel L. Beder, South Salem, N.Y., assignor to Le-Bo Products Company, Inc., Maspeth, N.Y.
Filed Jan. 3, 1978, Ser. No. 866,602
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—185



253,444
PHONOGRAPH RECORD RACK
Gregory Mathus, Sudbur, and Edward Yonkers, Newton, both of Mass., assignors to Data Packaging Corporation, Cambridge, Mass.
Filed Sep. 2, 1977, Ser. No. 830,361
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—185



253,445
DATA PROCESSING WORK STATION OR THE LIKE
George R. Daniels, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.
Filed Aug. 19, 1977, Ser. No. 825,876
Term of patent 7 years
Int. Cl. D6—*03*
U.S. Cl. D6—186



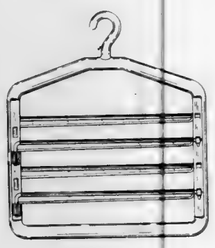
253,446
FITTING MIRROR
Stephen U. Winig, Narberth, Pa., assignor to American Optical Corporation, Southbridge, Mass.
Filed Dec. 29, 1977, Ser. No. 865,459
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—235



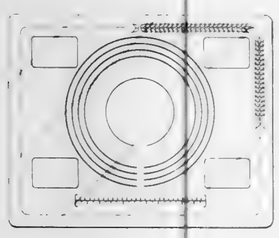
253,447
CLOTHES HANGER
Gene Tully, P.O. Box 64, McIntosh, Fla. 32664
Filed May 31, 1977, Ser. No. 801,565
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—248



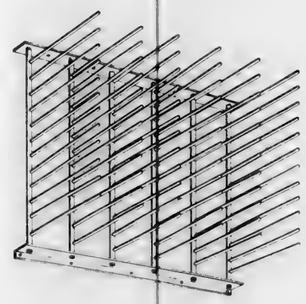
253,448
PANTS HANGER
Mack Salladay, Pittsburgh, Pa., assignor to Action Industries, Inc., Cheswick, Pa.
Filed Sep. 26, 1977, Ser. No. 836,504
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—256



253,449
PASTRY SHEET OR THE LIKE
Ann K. Fritz, Woonsocket, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Oct. 25, 1977, Ser. No. 844,774
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—41



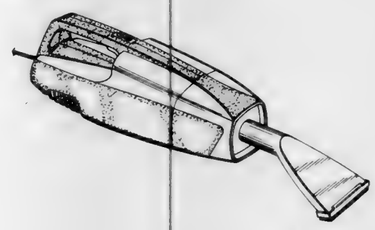
253,450
FABRIC DISPLAY RACK
Donald A. Butcher, Burlington, and Marvin L. Barbee, Glen Raven, both of N.C., assignors to Marquette Electronics, Inc.
Filed Mar. 20, 1978, Ser. No. 890,701
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—157



253,451
BUTTER WARMER
Win Ng, 282 Franconia St., San Francisco, Calif. 94110
Filed Sep. 21, 1977, Ser. No. 835,463
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—125



253,452
HAND-HELD VACUUM CLEANER
Suen S. Tack, Hong Kong, Hong Kong, assignor to Bon-Aire Industries, Inc.
Filed Sep. 23, 1977, Ser. No. 836,045
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—164



253,453
BOTTLE
Edward J. Kretz, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Aug. 22, 1977, Ser. No. 826,449
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—111



253,454
BOTTLE
W. Horton Earle, Brewster, N.Y., assignor to Richardson-Merrell Inc., Wilton, Conn.
Filed Oct. 11, 1977, Ser. No. 841,040
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—128



253,455
BOTTLE
Geoffrey Beene, New York, N.Y., assignor to Geoffrey Beene, Inc., New York, N.Y.
Filed Mar. 31, 1977, Ser. No. 783,402
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—145



253,456
PACKAGING CONTAINER FOR FOOD OR THE LIKE
Joe R. Payne, La Habra, Calif., assignor to Keyes Fibre Company
Filed Mar. 15, 1977, Ser. No. 777,723
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—182



253,457
DRAPE CLAMP HOLDER
Dan Sandel, 17000 Cotter Pl., Encino, Calif. 91436
Filed Dec. 5, 1977, Ser. No. 857,800
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—395



V 9 8 8 \ 3 NOV 20 79 UMI

253,458
CAN OR SIMILAR ARTICLE
Gary K. Hasegawa, Chicago, and Carmen T. Mascia, Clarendon Hills, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.
Filed Aug. 15, 1977, Ser. No. 824,677
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—131



253,459
CAN OR SIMILAR ARTICLE
Gary K. Hasegawa, Chicago, and Carmen T. Mascia, Clarendon Hills, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.
Filed Aug. 15, 1977, Ser. No. 824,679
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—131



253,460
COSMETIC CONTAINER
John C. White, Easton, Conn., assignor to The Bridgeport Metal Goods Manufacturing Company, Bridgeport, Conn.
Filed Aug. 15, 1977, Ser. No. 824,866
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—168



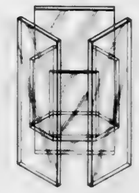
253,461
CARTON BLANK
Thomas B. Dempster, Sioux City, Iowa, assignor to Champion International Corporation, Stamford, Conn.
Filed May 18, 1977, Ser. No. 798,035
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—245



253,462
BUILDING LAYOUT INSTRUMENT
A. Frank Packard, SW. 165 2-9 Dr., Nineveh, Ind. 46164
Filed Nov. 17, 1977, Ser. No. 852,310
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D10—64



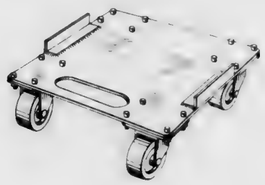
253,463
PLANTER OR SIMILAR ARTICLE
William B. Ailes, II, 17572 Lakeshore Blvd., Cleveland, Ohio 44119
Filed Mar. 16, 1978, Ser. No. 887,176
Term of patent 14 years
Int. Cl. D11—*02*; D6—*06*; D26—*01*
U.S. Cl. D11—143



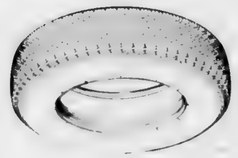
253,464
DESK ORNAMENT OR SIMILAR ARTICLE
Roy D. Elder, Box 314, Oakhurst, Okla. 74050
Filed Sep. 8, 1977, Ser. No. 831,545
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—157



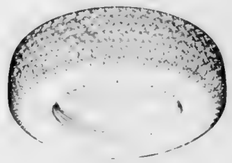
253,465
AUTO WHEEL SUPPORT DOLLY OR SIMILAR ARTICLE
Thomas Lobdell, 1411 Summit Ct., Mukwonago, Wis. 53149
Filed Apr. 17, 1978, Ser. No. 896,921
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—31



253,466
VEHICLE TIRE
Hiroshi Kojima, Hino; Masahiro Takayama, Musashino, and Hideaki Nishio, Kunitachi, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Jul. 24, 1978, Ser. No. 928,041
Claims priority, application Japan, Feb. 28, 1978, 53-7132
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—141



253,467
VEHICLE TIRE
Sakae Ezura, Matsudo, and Hiroshi Kojima, Hino, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Jul. 24, 1978, Ser. No. 927,433
Claims priority, application Japan, Feb. 13, 1978, 53-4581
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147

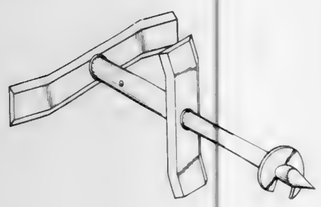


V 9 8 8 1 3 N 0 2 0 7 9 UMI

253,468
MICROPHONE
Donald W. Peterson, Conneaut, Ohio, assignor to The Astatic Corporation, Conneaut, Ohio
Filed Jun. 15, 1978, Ser. No. 915,948
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—12



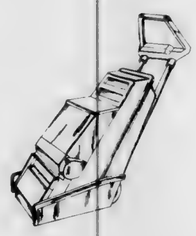
253,469
COMBINED AUGER AND TINE UNIT FOR A GARDEN TILLER
Gary L. Sheldon, Phillipsburg, Mo., assignor to Garden Maid, Inc., Lebanon, Mo.
Filed Jan. 30, 1978, Ser. No. 873,159
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—12



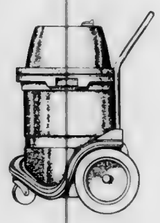
253,470
COMBINED AUGER AND TINE UNIT FOR A GARDEN TILLER
Gary L. Sheldon, Phillipsburg, Mo., assignor to Garden Maid, Inc., Lebanon, Mo.
Filed Jan. 30, 1978, Ser. No. 873,289
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—12



253,471
CARPET CLEANER
Eugene L. Bothun, Berthoud, and Thomas G. Cannon, Fort Collins, both of Colo., assignors to Clarke-Gravely Corporation, Muskegon, Mich.
Filed Oct. 11, 1977, Ser. No. 841,160
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—53



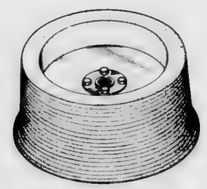
253,472
VACUUM CLEANER
Thomas G. Cannon, Bellvue, and Eugene L. Bothun, Berthoud, both of Colo., assignors to Clarke-Gravely Corporation, Muskegon, Mich.
Filed Nov. 18, 1977, Ser. No. 852,864
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—54



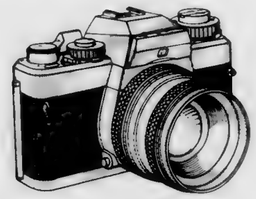
253,473
GATED HOOK FOR TUFTING MACHINES
Paul E. Jolley, Chattanooga, Tenn., assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.
Filed Jan. 31, 1978, Ser. No. 873,964
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—78



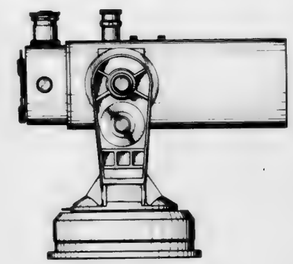
253,474
GRINDING WHEEL
Robert L. Chaykin, 7615 Gladstone, Reno, Nev. 89506
Filed Mar. 28, 1977, Ser. No. 782,180
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—126

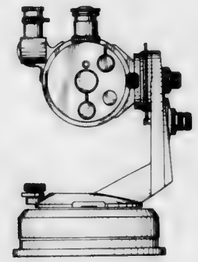


253,475
PHOTOGRAPHIC CAMERA
Jochen Kramer, Wolfsburg; Hans Schönfeld, Wolfsburg-Hattorf; Friedrich Papke, Brunswick; Dieter Mankau, Brunswick; Heinz Hamm, Brunswick, and Lothar Westerweck, Braunschweig-Leiferde, all of Fed. Rep. of Germany, assignors to Rollei-Werke Franke & Heidecke, Brunswick, Fed. Rep. of Germany
Filed Oct. 26, 1977, Ser. No. 845,571
Claims priority, application Fed. Rep. of Germany, May 2, 1977, 1124
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—06



253,476
TELESCOPE
John J. Schneck, Phillips Mill Rd., Solebury, Pa. 18963, and Robert R. Richardson, 11 Concord Pl., Hatboro, Pa. 19040
Filed Jan. 16, 1978, Ser. No. 869,490
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—60

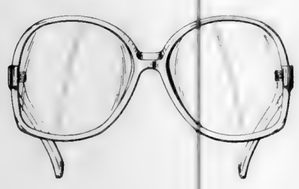




253,477
PAIR OF SPECTACLES
Richard W. Canavan, III, South Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.
Filed Jan. 3, 1978, Ser. No. 866,327
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



253,478
PAIR OF SPECTACLES
Richard W. Canavan, III, South Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.
Filed Jan. 3, 1978, Ser. No. 866,329
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



253,479
SPECTACLES FRAME FRONT
David W. Johnsen, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.
Filed Jan. 19, 1978, Ser. No. 870,775
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

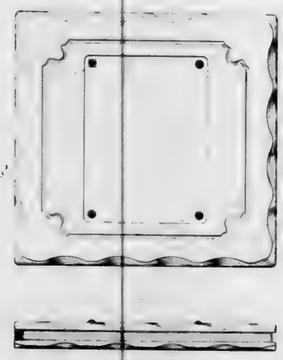
253,480
PAIR OF SPECTACLES
David W. Johnsen, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.
Filed Mar. 3, 1978, Ser. No. 883,024
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



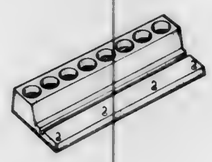
253,481
PAIR OF SPECTACLES
Richard W. Canavan, III, South Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.
Filed Apr. 27, 1978, Ser. No. 900,450
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



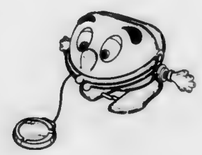
253,482
PHOTOGRAPH ALBUM
Joseph Abruzzo, Jr., Bridgeport, Conn., assignor to The Holson Company, Wilton, Conn.
Filed Oct. 3, 1977, Ser. No. 838,935
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—26



253,483
CRAFT BOARD FOR RUG MAKING
Frieda P. Thuringer, 2755 Hillcrest Dr., Wellsville, N.Y. 14895
Filed Mar. 23, 1978, Ser. No. 889,620
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—35



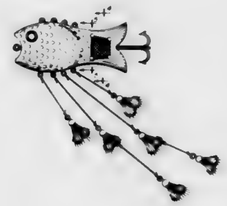
253,484
FIGURE TOY
Shigeru Saitoh, Tokyo, Japan, assignor to Masudaya Toy Company Limited, Tokyo, Japan
Filed Jun. 22, 1977, Ser. No. 809,104
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150



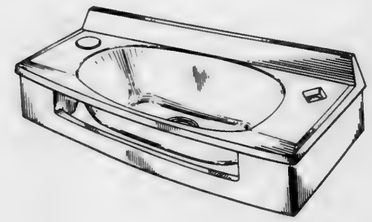
253,485
RIFLE
Marion M. Robinson, Woodlands, Tex., assignor to Golden Eagle Firearms, Inc., Houston, Tex.
Filed Jul. 5, 1977, Ser. No. 813,221
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—6



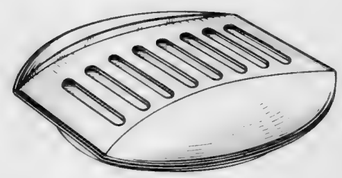
253,486
FISHING LURE
Paul Wigutow, 155 Harbor Dr., Apartment 2712, Chicago, Ill. 60611
Filed May 6, 1977, Ser. No. 794,390
Term of patent 3½ years
Int. Cl. D22—*05*
U.S. Cl. D22—27



253,487
HAND BASIN
Bruce R. Thompson, Tranmere, Australia, assignor to United Packages Limited, Queensland, Australia
Filed Dec. 5, 1977, Ser. No. 857,276
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58



253,488
DISPENSER FOR AIR TREATING MATERIAL
Earl Hoyt, Franklin Lakes, N.J., assignor to Airwick Industries, Inc., Carlstadt, N.J.
Filed Mar. 20, 1978, Ser. No. 888,108
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

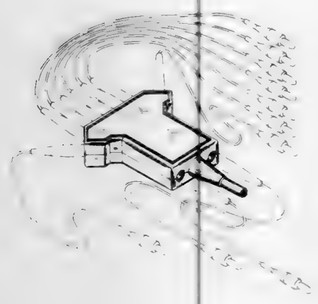


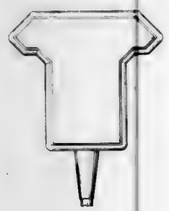
253,489
DISPENSER FOR AIR TREATING MATERIAL
Earl Hoyt, Franklin Lakes, N.J., assignor to Airwick Industries, Inc., Carlstadt, N.J.
Filed Mar. 20, 1978, Ser. No. 888,108
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



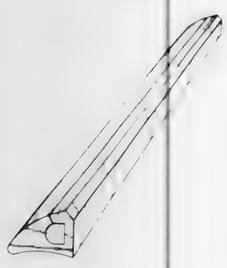
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253,490
JUNCTION BOX FOR ELECTROCARDIOGRAPHIC LEADS
Gerald J. Reiser, Milwaukee, Wis., assignor to Marquette Electronics, Inc.
Filed Mar. 24, 1978, Ser. No. 889,828
Term of patent 14 years
Int. Cl. D24—*01*; D13—*03*
U.S. Cl. D24—29

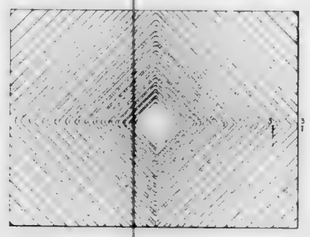




253,491
SEALING STRIPE FOR A LEVEL CROSSING BETWEEN A ROAD AND A RAILROAD
Sten Limmergård, Alvesta, and Stig H. G. Thim, Växjö, both of Sweden, assignors to A - Betong AB, Vaxjo, Sweden
Filed Apr. 6, 1978, Ser. No. 894,199
Claims priority, application Sweden, Oct. 7, 1977, 772011
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

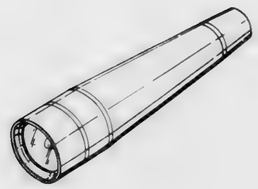


253,492
STERILIZATION INDICATOR
Thomas A. Augurt, Stamford, Conn., assignor to Propper Manufacturing Co., Inc., Long Island City, N.Y.
Filed Apr. 28, 1978, Ser. No. 901,267
Term of patent 14 years
Int. Cl. D24—*99*; D10—*04*
U.S. Cl. D24—99



253,493
BEAM SLING UNIT FOR SUSPENDING POULTRY CAGES
George E. France, 901 W. James St., Geneva, Ill. 60134
Continuation-in-part of Ser. No. 499,321, Aug. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 249,758, May 2, 1972, abandoned. This application Jul. 6, 1976, Ser. No. 702,519
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—2

253,494
FLASHLIGHT
Yeung Sit-Lae, Kowloon, Hong Kong, assignor to Herbert J. Ashe, South Norwalk, Conn.
Filed Apr. 27, 1978, Ser. No. 901,279
Claims priority, application United Kingdom, Nov. 1, 1977, 982099
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A



253,495
ELECTRIC LAMP HOUSING FOR VEHICLES
Dale P. Bodine, Lisbon, N. Dak., assignor to Clark Equipment Company, Buchanan, Mich.
Filed Sep. 12, 1977, Ser. No. 832,265
Term of patent 14 years
Int. Cl. D26—*06*, *05*
U.S. Cl. D48—32 R



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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF NOVEMBER, 1979

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Venzke, Charles E., 4,174,773, Cl. 198-365.000.

AB Casco: *See—*
Andersson, Sven-Erik, 4,175,065, Cl. 260-29.300.

AB Celleco: *See—*
Frykhult, Rune H., 4,175,036, Cl. 209-211.000.

AB Volvo Penta: *See—*
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Abdulla, Riaz F.; and Fuhr, Kenneth H., to Eli Lilly and Company. α,β-Unsaturated ketones and aldehydes and method of preparation. 4,175,087, Cl. 260-586.00R.

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Richards, Gordon S.; Douglas, Peter E.; and Abraham, Alan G., 4,175,230, Cl. 250-199.000.

Adams, Daniel M., Jr.; Barach, Jeff T.; and Speck, Marvin L., to Research Triangle Institute. Inactivation of heat resistant bacterial proteases in ultra-high temperature treated milk. 4,175,141, Cl. 426-522.000.

Adlhart, Otto J., to Engelhard Minerals & Chemicals Corporation. Fuel cell system utilizing ion exchange membranes and bipolar plates. 4,175,165, Cl. 429-30.000.

Advance Transformer Company: *See—*
Feinberg, Albert E.; and Woo, Kenneth, 4,175,246, Cl. 315-101.000.

Affinita, Tommaso: *See—*
Maccario, Floriano A.; and Affinita, Tommaso, 4,174,911, Cl. 403-303.000.

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Ohmae, Tsutomu; and Marumoto, Katsuji, 4,174,645, Cl. 74-866.000.

Agfa-Gevaert Aktiengesellschaft: *See—*
Frank, Karl, 4,174,968, Cl. 430-375.000.
Muller, Jurgen; Schmidt, Manfred; and Eickel, Rolf, 4,175,232, Cl. 250-315.200.
Odenwalder, Heinrich; and Ranz, Erwin, 4,174,969, Cl. 430-445.000.

Agrimel Ltd.: *See—*
Mantha, Nagaraja S., 4,175,121, Cl. 424-94.000.

Ainoura, Masato. Spherical hob for generating gears. 4,174,914, Cl. 407-26.000.

Air Industrie: *See—*
Denjean, Rene, 4,174,748, Cl. 165-5.000.

Airotechnik Siegfried Binder GmbH, Firma: *See—*
Binder, Siegfried; and Herzog, Karl, 4,174,811, Cl. 239-308.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Fujii, Takashi; and Kizaki, Jiro, 4,174,786, Cl. 220-378.000.

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Akebono Brake Industry Co., Ltd.: *See—*
Takemori, Fumio, 4,174,768, Cl. 188-72.300.

Akro Corporation, The: *See—*
Reuben, Harold, 4,174,991, Cl. 156-242.000.

Aktiebolaget Draco: *See—*
Moren, Nils F. E.; and Wetterlin, Kjell I. L., 4,174,712, Cl. 128-173.00R.

Albers, Edwin W.: *See—*
Edwards, Grant C.; Vaughan, David E. W.; and Albers, Edwin W., 4,175,059, Cl. 252-455.00Z.

Alfa-Laval AB: *See—*
Wuchse, Gunther R., 4,174,721, Cl. 134-58.00R.

Allen, Richard C.: *See—*
McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., 4,175,209, Cl. 562-473.000.

Allied Chemical Corporation: *See—*
Bollen, Philip S.; and Degrassi, Alfieri, 4,175,147, Cl. 428-35.000.
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Alps Electric Co., Ltd.: *See—*
Noji, Tasuku, 4,175,259, Cl. 334-49.000.

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Bachmann, Robert; and Sturm, Winfried, 4,175,140, Cl. 426-399.000.

AM International, Inc.: *See—*
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American Chain & Cable Company, Inc.: *See—*
Raven, John, 4,174,639, Cl. 73-766.000.

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Anderl, Peter: *See—*
Kappelsberger, Erwin; Anderl, Peter; and Steigerwald, Karl H., 4,175,226, Cl. 219-121.0EM.

Andersson, Leif: *See—*
Hunyadi, Laszlo; Andersson, Leif; and Mansson, Martin, 4,174,608, Cl. 60-39.650.

Andersson, Sven-Erik, to AB Casco. Method for glueing with curable, formaldehyde-based adhesives and a curing composition for use in the method. 4,175,065, Cl. 260-29.300.

Ansul Company, The: *See—*
Rasheed, Khalid; and Warkentin, James D., 4,175,186, Cl. 544-145.000.

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Anzai, Makoto, to Nissan Motor Company, Limited. Closed loop air-fuel ratio control system. 4,174,680, Cl. 123-32.0EE.

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Arai, Haruhiko: *See—*
Imamura, Tetsuya; Hiraide, Takashi; Arai, Haruhiko; and Hirakura, Megumu, 4,175,051, Cl. 252-91.000.

Arbuckle, Donald P. Rotary drill bit and method of forming bore hole. 4,174,759, Cl. 175-67.000.

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Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,175,077, Cl. 260-239.30P.

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Arena, John P.; McGuigan, Charles G.; and Rossi, Gene A., to United States of America, Navy. Self-adjusting tandem seal. 4,174,843, Cl. 277-3.000.

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Arlemark, Jan M. Irrigation machine. 4,174,809, Cl. 239-189.000.

Armstrong, William A.; and Powell, Peter J., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Zinc electrode for low temperature. 4,175,168, Cl. 429-229.000.

Arnold, Don C.; Silletti, Julio D.; Ritzenthaler, Richard L.; and Wilcox, Thomas J., to Elkay Manufacturing Company. Pressure balancing valve. 4,174,726, Cl. 137-100.000.

Arnott, Robert C.; and Willbanks, Charles E., to Milliken Research Corporation. Cylindrical screen having aperatures with geometric centers defined by arrays of equilateral triangles. 4,174,664, Cl. 101-127.000.

Artbauer, Jan, to Kabel- und Metallwerke Guthehoffnungshutte Aktiengesellschaft. Elecrtrical conductor assembly. 4,175,212, Cl. 174-128.00R.

Asahi Kasei Kogyo Kabusihiki Kaisha: *See—*
Ozawa, Kohe; Hosoya, Kazuhiro; Kurita, Jiro; and Honda, Makoto, 4,175,176, Cl. 526-309.000.

Asaki, James T., to International Telephone & Telegraph Corporation. Flash unit for a camera. 4,175,279, Cl. 362-18.000.

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Sun, Jui-Yuan; Yoo, Jin S.; Burk, Emmett H., Jr.; and Masologites, George P., 4,174,953, Cl. 44-1.00R.
Auchter, Bruno; Wagner, Karl-Heinz; Glimm, Gunter; and Preiss, Manfred, to Rheinhutte vorm. Ludwig Beck & Co.; and Siemens Aktiengesellschaft. Liquid-gas pumping apparatus. 4,174,791, Cl. 222-333.000.
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Auergesellschaft GmbH: *See—*
Pampuch, Klaus, 4,174,710, Cl. 128-142.700.
Austin, Richard D. Double acting concrete pump. 4,174,928, Cl. 417-397.000.
Axen, Rolf E. A. V.: *See—*
Carlsson, Jan P. E.; Axen, Rolf E. A. V.; Drevin, Hakan N. Y.; and Lindgren, Goran E. S., 4,175,073, Cl. 260-112.00R.
Ayano, Mitsutoshi; and Minamitani, Eiji, to Fujitsu Limited. Telephone switching system. 4,175,218, Cl. 179-170.200.
Ayers, John S., to Development Finance Corporation of New Zealand. Hydroxyalkylated cross-linked regenerated cellulose and method of preparation thereof. 4,175,183, Cl. 536-57.000.
Azami, Tadao: *See—*
Ikeno, Teruo; Kado, Satoshi; Otoguro, Yasuo; Miyoshi, Yasuhiko; Kato, Chuichi; and Azami, Tadao, 4,175,163, Cl. 428-553.000.
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Jabsen, Felix S., 4,175,004, Cl. 176-76.000.
Babler, James H. Method of preparing E-4-acetoxy-2-methyl-2-butenal. 4,175,204, Cl. 560-262.000.
Bachl, Robert: *See—*
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Bachmann, Robert; and Sturm, Winfried, to Aluminiumwerke AG. Rorschach; and BBC Brown Boveri & Company Limited. Method for automatic low-bacteria to aseptic filling and packing of foodstuffs employing ultraviolet radiation. 4,175,140, Cl. 426-399.000.
Bagga, Madan M.; and Moss, Noel S., to Ciba-Geigy Corporation. Powder coating compositions containing an epoxide resin and an acid hardener. 4,175,173, Cl. 528-97.000.
Baier, Robert E.: *See—*
DePalma, Vito A.; and Baier, Robert E., 4,175,233, Cl. 250-343.000.
Bakker, Pieter M.; and Kind, Cornelis E., to Shell Oil Company. Extraction process. 4,175,092, Cl. 260-456.00R.
Bala, Harry: *See—*
Mowli, John C.; and Bala, Harry, 4,174,597, Cl. 53-410.000.
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Ballbarrow Corporation: *See—*
Brannan, John E., 4,174,871, Cl. 308-238.000.
Balli, Heinz; Gunzenhauser, Sigmund; and Petitpierre, Jean C., to Ciba-Geigy Corporation. Chromenoindole color formers. 4,174,856, Cl. 282-27.500.
Balzers Patent- und Beteiligungs Aktiengesellschaft: *See—*
Wulff, Gunther, 4,174,676, Cl. 118-688.000.
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Barcza, Sandor, to Sandoz, Inc. Substituted 3,1-benzazasilines. 4,175,091, Cl. 260-448.20N.
Barnert, Heiko; Divisek, Jiri; and Faul, Wolfgang, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method of generating hydrogen and oxygen from water. 4,175,013, Cl. 204-129.000.
Barrows, Franklin H.: *See—*
Hunter, Byron A.; and Barrows, Franklin H., 4,175,200, Cl. 560-1.000.
Bartsch, Gunther M. Fireplace. 4,174,700, Cl. 126-121.000.
BASF Aktiengesellschaft: *See—*
Merkle, Hans; Mueller, Albrecht; and Zoller, Karl, 4,175,184, Cl. 544-10.000.
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Steinwart, Johannes; Maurhoff, Gerhard; and Bauder, Armin, 4,174,693, Cl. 123-139.0AW.
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Beals, Charles D.; Fitzpatrick, George I.; and O'Hara, Kim L., to Exxon Research & Engineering Co. Production of polyethylene. 4,175,169, Cl. 526-64.000.
Beaton, John M.: *See—*
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Vistins, Maris, 4,174,542, Cl. 2-48.000.
Beesley, Lawrence. Live bait carrier for fishermen and the like. 4,174,585, Cl. 43-55.000.
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Chen, William I., 4,175,213, Cl. 178-70.00R.
Chin, Gilbert Y.; Jin, Sungho; Plewes, John T.; and Wonsiewicz, Bud C., 4,174,983, Cl. 148-102.000.
Fleming, James W., Jr.; O'Bryan, Henry M., Jr.; and Thomson, John, Jr., 4,175,060, Cl. 252-518.000.
Zuk, Paul, 4,175,277, Cl. 361-120.000.
Belles, Wayne S.: *See—*
Strong, Philip L.; and Belles, Wayne S., 4,174,959, Cl. 71-92.000.
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Landau, Marvin; Bellettiere, Samuel J.; and Hoch, Samuel, 4,175,064, Cl. 260-22.0CA.
Belvin, David S.; Perry, Clifford R.; and Watkins, Dale F., to Boeing Company, The. Method of making heat exchange structure. 4,174,987, Cl. 156-197.000.
Bender, Paul E.; and Lantos, Ivan, to SmithKline Corporation. Pyridyl substituted 2,3-dihydroimidazo[2,1-b]thiazoles. 4,175,127, Cl. 424-263.000.
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Klein, Bruce W.; and Jacko, Michael G., 4,175,070, Cl. 260-38.000.
Luchaco, David G., 4,174,681, Cl. 123-32.0EA.
Benedek, George B.: *See—*
Cannell, David S.; Giglio, Marzio; Benedek, George B.; von Schulthess, Gustav K.; and Cohen, Richard J., 4,174,952, Cl. 23-230.00B.
Benke, Gus A. Drug dispensing apparatus for a hunting arrow. 4,174,837, Cl. 273-106.50R.
Benney, Charles H., and Filipi, Thomas J., to Whatman Inc. Process for packing chromatographic columns. 4,175,037, Cl. 210-31.00C.
Benton, Kenneth C.; and Williamson, Timothy J., to Standard Oil Company. Acrylonitrile block terpolymer barrier resins. 4,175,101, Cl. 525-88.000.
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Beny, Janos; and Herzig, Albert M. System for transferring water. 4,174,743, Cl. 141-18.000.
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Bergman, Raymond A. Bayonet clamping apparatus for machine tools. 4,174,828, Cl. 269-34.000.
Bergwerksverband GmbH: *See—*
Rohde, Wolfgang, 4,174,946, Cl. 432-14.000.
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Catonne, Jean-Claude; Royon, Jean; Bonnemay, Maurice; Descarsin, Marie-Therese; Bernard-Maugiron, Marcel; Fencki, Henri; and Fayolle, Jean-Francois, 4,175,027, Cl. 204-275.000.
Bernhardt, Paul E. Lapidary device. 4,174,592, Cl. 51-101.00R.
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Beschke, Helmut; Friedrich, Heinz; and Offermanns, Heribert, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of substituted pyridine (A). 4,175,195, Cl. 546-250.000.
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Moore, Ronald D.; and Bethel, Everett L., 4,174,988, Cl. 156-213.000.
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Moyer, William H., Jr., 4,175,035, Cl. 209-5.000.

Beuchel, Peter H.; and Cooper, Eric G., to Westinghouse Electric Corp. Grid for nuclear reactor fuel assemblies. 4,175,003, Cl. 176-76.000.
Bewersdorf, Elmer: *See—*
McCain, William B.; Cosgrove, James F.; and Bewersdorf, Elmer, 4,174,829, Cl. 270-55.000.
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De Boel, Marcel; Baudin, Pol; Wasterlain, Michel; and Collignon, Pierre, 4,175,162, Cl. 428-428.000.
Bicking, John B.: *See—*
Cragoe, Edward J., Jr.; and Bicking, John B., 4,175,203, Cl. 560-55.000.
Bickley Furnaces, Inc.: *See—*
Bloom, Quentin M., 4,174,951, Cl. 432-133.000.
Binder, Dieter; Hromatka, Otto; Pfister, Rudolf; and Zeller, Paul, to Hoffmann-La Roche Inc. Thienothiazine derivatives. 4,175,085, Cl. 549-65.000.
Binder, Siegfried; and Herzog, Karl, to Airotechnik Siegfried Binder GmbH, Firma. Fluid substance sprayer having propellant gas and substance refill. 4,174,811, Cl. 239-308.000.
Bio-Pharmaceutical Packaging Corp.: *See—*
White, Douglas J., 4,175,008, Cl. 435-295.000.
Biranowski, Jerome; and Faust, Kenneth J., to GAF Corporation. Decorative covering material. 4,175,155, Cl. 428-313.000.
Birkhamshaw, Ronald G., to Mathbirk, Limited. Machines for securing textile fabrics one to another. 4,174,670, Cl. 112-25.000.
Bittner, Helmut: *See—*
Bruderle, Ernst; Gottzein, Eveline; and Bittner, Helmut, 4,174,819, Cl. 244-169.000.
Bizzari, Venanzio; and Hogfors, Enar, to Bulten-Kanthal AB. Method of hot bending a generally straight wire blank. 4,175,228, Cl. 219-153.000.
Blackmer, Richard H.; and Hedman, Jonathan W., to Oxygen Enrichment Co., Ltd. Membrane oxygen enricher apparatus. 4,174,955, Cl. 55-158.000.
Blair, Henry O.: *See—*
Usnick, George B.; Ward, Gene T.; Blair, Henry O.; Roberts, James W.; and Warner, Terry N., 4,174,728, Cl. 137-240.000.
Blake, Walter R.: *See—*
Grindle, James L.; and Blake, Walter R., 4,175,282, Cl. 362-363.000.
Blakey, Bruce H.; and Pohl, Douglas R., to Western Marine Electronics, Inc. Solar heat roofing system. 4,174,703, Cl. 126-430.000.
Blalock, Theron V.: *See—*
Borkowski, Casimer J.; and Blalock, Theron V., 4,175,258, Cl. 331-78.000.
Blomgren, Roland A.: *See—*
Shallenberg, Robert L.; Hufton, Austen B.; Blomgren, Roland A.; and Copeland, William M., 4,174,977, Cl. 134-6.000.
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Bobbio, Benedetto. Mechanical device for moving the lifters of the weaving machines. 4,174,737, Cl. 139-65.000.
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Jundt, Werner; Bodig, Bernd; Decker, Heinz; Schmidt, Gunther; Wurst, Bert; Seeger, Karl; and Roozenbeek, Herman, 4,174,696, Cl. 123-148.00E.
Boehmke, Gunther: *See—*
Reitz, Gunther; and Boehmke, Gunther, 4,175,096, Cl. 260-556.00F.
Boeing Company, The: *See—*
Belvin, David S.; Perry, Clifford R.; and Watkins, Dale F., 4,174,987, Cl. 156-197.000.
Bohm, Leslie E.: *See—*
Jackson, W. Shaun; and Bohm, Leslie E., 4,174,795, Cl. 224-32.00A.
Boler, Jan B.; and Reichelt, Karl-Ludvig, to Sentralinstitutt for Industriell Forskning. Coupling products of biologically active amines. 4,175,084, Cl. 260-326.440.
Boles, Richard J., to Crest Circle, Inc. Golf clubs restrainer means for use with golf bag. 4,174,747, Cl. 150-1.50R.
Bollen, Philip S.; and Degrassi, Alfieri, to Allied Chemical Corporation. Method to reduce deposits of terephthalic acid on cooling rolls during sheet extrusion of amorphous polyethylene terephthalate. 4,175,147, Cl. 428-35.000.
Bolt, Reginald C.: *See—*
Farrar, David J.; Davies, Robert W.; Carter, David C. M.; Bolt, Reginald C.; and Williams, Robert E., 4,174,780, Cl. 209-536.000.
Bonar & Bemis Ltd.: *See—*
Flantua, Gysbertus, 4,174,554, Cl. 24-30.50P.
Bonnemay, Maurice: *See—*
Catonne, Jean-Claude; Royon, Jean; Bonnemay, Maurice; Descarsin, Marie-Therese; Bernard-Maugiron, Marcel; Fencki, Henri; and Fayolle, Jean-Francois, 4,175,027, Cl. 204-275.000.
Borg-Warner Corporation: *See—*
Tuzson, John J., 4,174,724, Cl. 137-56.000.
Borkowski, Casimer J.; and Blalock, Theron V., to United States of America, Energy. High level white noise generator. 4,175,258, Cl. 331-78.000.
Bornand, Jean-Daniel: *See—*
Buxmann, Kurt; Bornand, Jean-Daniel; and Steinegger, Alfred, 4,174,826, Cl. 266-227.000.
Bose, Arindam: *See—*
Tsao, George T.; Ladisch, Michael R.; and Bose, Arindam, 4,174,976, Cl. 127-37.000.
Bosse, Frank, to Windmoller & Holscher. Symmetrical sack with double side folds. 4,174,804, Cl. 229-55.000.
Bott, John A. Vehicle article carrier. 4,174,794, Cl. 224-320.000.
Bourgeois, Ronald D. Four-way diverting conveyor. 4,174,774, Cl. 198-.
Bourrelly, Jacques: *See—*
Gignier, Jean P.; and Bourrelly, Jacques, 4,175,192, Cl. 546-134.000.
Bowen, Alan W.: *See—*
Love, Robert B.; and Bowen, Alan W., 4,175,030, Cl. 204-298.000.
BP Chemicals Limited: *See—*
Berry, David, 4,175,090, Cl. 260-438.100.
Bradham, Allen C., III, to First Wisconsin National Bank of Wisconsin. Fluid flow metering tube with minimum pressure energy loss. 4,174,734, Cl. 138-39.000.
Bradley, Robert O.; Knighton, Heywood J.; and Naveaux, Robert J., to Toledo Engineering Company. Manifold inputs and outputs for furnace regenerators. 4,174,948, Cl. 432-54.000.
Branderud, Nils P.: *See—*
Linnman, Sven N. J.; Isoz, Peter; Branderud, Nils P.; and Udden, Per E. C., 4,175,255, Cl. 328-7.000.
Brannan, John E., to Ballbarrow Corporation. Material handling vehicle. 4,174,871, Cl. 308-238.000.
Breimesser, Fritz; Kuznia, Christian; and Stein, Karl-Ulrich, to Siemens Aktiengesellschaft. Switching arrangement for remote-controlled electrical loads. 4,175,238, Cl. 307-40.000.
Brenner, Douglas. Plasticization of neutralized sulfonated elastomeric polymer. 4,175,069, Cl. 260-32.60A.
Breslow, Jeffrey D.; Ferris, Michael J.; Arias, Henry; and Wozniak, Walter J., to Marvin Glass & Associates. Competitive game. 4,174,835, Cl. 273-101.000.
Brinkhof, Joseph B.; and Datt, Raymond R., to Canadian General Electric Company Limited. Engine block heater. 4,175,229, Cl. 219-208.000.
British Petroleum Company Limited, The: *See—*
Ball, William J.; and Stewart, David G., 4,175,115, Cl. 423-415.00A.
Davies, Evan E.; and Kolombos, Alexander J., 4,175,057, Cl. 252-455.00Z.
Brooks, Joseph F., to National Union Electric Corporation. Connection for securing a helically convoluted hose to a hose fitting. 4,174,858, Cl. 285-7.000.
Brower, Conrad J. Doweling guide. 4,174,917, Cl. 408-62.000.
Brown, Bryan O.: *See—*
Parr, Alan J.; and Brown, Bryan O., 4,175,072, Cl. 528-299.000.
Brown, Paul R.: *See—*
Hirtreiter, Arthur B.; and Brown, Paul R., 4,174,827, Cl. 267-65.00B.
Brown, Richard E.; and Unangst, Paul C., to Warner-Lambert Company. Indolopyrones having antiallergic activity. 4,175,083, Cl. 260-326.12R.
Bruderle, Ernst; Gottzein, Eveline; and Bittner, Helmut, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Controller for the attitude stabilization of a satellite. 4,174,819, Cl. 244-169.000.
Buchner, Klaus, to Siemens Aktiengesellschaft. Ultrasonic imaging apparatus operating according to the impulse-echo method. 4,174,705, Cl. 128-660.000.
Buchwald, Warren G.; and Norris, David W., to Fisher Controls Company, Inc. Batch option module. 4,175,283, Cl. 364-117.000.
Bucyrus-Erie Company: *See—*
Learmont, Tom, 4,174,579, Cl. 37-116.000.
Budzich, Tadeusz. Load responsive valve assemblies. 4,174,613, Cl. 60-427.000.
Buidry, Kirby J. Process for manufacturing coupling gaskets for helically corrugated spiral pipe. 4,174,985, Cl. 156-244.180.
Bulten-Kanthal AB: *See—*
Bizzari, Venanzio; and Hogfors, Enar, 4,175,228, Cl. 219-153.000.
Bulten-Kanthal Aktiebolag: *See—*
Schrewelius, Nils G., 4,174,971, Cl. 106-44.000.
Bunker Ramo Corporation: *See—*
Morgan, Denny E., 4,175,250, Cl. 323-22.00T.
Bunnell, Douglas E.; Gauer, Joseph A.; Sherer, R. Bruce; and Scott, William F., to Whirlpool Corporation. Automatic washer suspension system. 4,174,622, Cl. 68-23.300.
Burgarella, John P.; and Carcia, Peter P., to Polaroid Corporation. Exposure control system for use in photographic camera apparatus. 4,174,893, Cl. 354-29.000.
Burk, Emmett H., Jr.: *See—*
Sun, Jui-Yuan; Yoo, Jin S.; Burk, Emmett H., Jr.; and Masologites, George P., 4,174,953, Cl. 44-1.00R.
Burns, David C., to Westinghouse Electric Corp. Positioning means for circumferentially locating inspection apparatus in a nuclear reactor vessel. 4,174,999, Cl. 176-19.00R.
Burns, William V.: *See—*
Klein, William R.; and Burns, William V., 4,175,244, Cl. 313-315.000.
Burroughs Corporation: *See—*
Smith, John G., 4,174,566, Cl. 29-758.000.
Burroughs Wellcome Co.: *See—*
Lazarus, Norman R., 4,175,122, Cl. 424-177.000.
Burzdak, Louis. Bug catcher. 4,174,586, Cl. 43-134.000.
Buttner, Horace J. Pushbutton switch. 4,175,222, Cl. 200-159.00R.
Buxmann, Kurt; Bornand, Jean-Daniel; and Steinegger, Alfred, to Swiss Aluminium Ltd. Apparatus for lowering the concentration of sodium in aluminum melts. 4,174,826, Cl. 266-227.000
Buxmann, Kurt, to Swiss Aluminium Ltd. Process for the production of metal alloys. 4,174,965, Cl. 75-135.000.
B.V. Neratoom: *See—*
Visbach, Dirk M., 4,174,735, Cl. 138-97.000.

C.B.R. Cementbedrijven N.V.: *See—*
Wolfs, Andreas G. J.; and Goessens, Lambertus H., 4,174,961, Cl. 75-30.000.

C. E. Equipment Co., Inc.: *See—*
Tatum, Joe F.; and Lewis, Thomas H., 4,175,021, Cl. 204-196.000.

C.G.R. Ultrasonic: *See—*
Dory, Jacques, 4,174,634, Cl. 73-606.000.

Cadillac Cage Company: *See—*
Appelblatt, Irving, 4,174,653, Cl. 89-36.00H.

Callet, Robert; and Jeantet, Henri, to Societe Anonyme des Imprimerie et Papeterie de l'Est. Bagging machine for packaging powdered materials. 4,174,599, Cl. 53-512.000.

Calspan Corporation: *See—*
DePalma, Vito A.; and Baier, Robert E., 4,175,233, Cl. 250-343.000.

Campbell, Joseph M., to Teledyne Industries, Inc. Method and apparatus for recording digital signals for actuating solenoid. 4,174,652, Cl. 84-1.280.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Armstrong, William A.; and Powell, Peter J., 4,175,168, Cl. 429-229.000.

Canadian General Electric Company Limited: *See—*
Brinkhof, Joseph B.; and Datt, Raymond R., 4,175,229, Cl. 219-208.000.

Canadian Tag & Label Ltd.: *See—*
Koza, John R., 4,174,857, Cl. 283-6.000.

Candor, James T. Method of storing solar energy. 4,174,979, Cl. 136-206.000.

Cannell, David S.; Giglio, Marzio; Benedek, George B.; von Schulthess, Gustav K.; and Cohen, Richard J., to Massachusetts Institute of Technology. Immunoassay by light scattering intensity anisotropy measurements. 4,174,952, Cl. 23-230.00B.

Canon, Inc.: *See—*
Hunn, Hans; and Schwarz, Georg, 4,174,888, Cl. 352-170.000.

Canon Kabushiki Kaisha: *See—*
Imataki, Hiroyuki; Toma, Hitoshi; and Narita, Noboru, 4,174,883, Cl. 350-126.000.
Murata, Shinji; and Iwaya, Toshio, 4,175,231, Cl. 250-227.000.

Canup, Robert E., to Texaco Inc. AC type ignition system with two time delay circuits. 4,174,695, Cl. 123-148.00E.

Carcia, Peter P.: *See—*
Burgarella, John P.; and Carcia, Peter P., 4,174,893, Cl. 354-29.000.

Carduck, Franz-Josef; Klotzer, Dietrich; Schneider, Werner; and Wust, Willi, to Henkel Kommanditgesellschaft auf Aktien (Henkel KgaA). Shaped washing agents having a mosaic-like structure and process. 4,175,050, Cl. 252-91.000.

Carl Hurth Maschinen- und Zahnradfabrik: *See—*
Hirt, Manfred, 4,174,771, Cl. 192-58.00B.

Carlsson, Jan P. E.; Axen, Rolf E. A. V.; Drevin, Hakan N. Y.; and Lindgren, Goran E. S., to Pharmacia Fine Chemicals AB. Reactive derivatives of HS-group-containing polymers. 4,175,073, Cl. 260-112.00R.

Carnahan, Robert D.; Holt, William C., Jr.; and Youtsey, Karl J., to UOP Inc. Polymeric materials containing semiconducting refractory oxides. 4,175,152, Cl. 428-242.000.

Carter, David C. M.: *See—*
Farrar, David J.; Davies, Robert W.; Carter, David C. M.; Bolt, Reginald C.; and Williams, Robert E., 4,174,780, Cl. 209-536.000.

Casagrande, Bruno, to Casagrande & C. S.p.A. Batching plant for lime concrete. 4,174,788, Cl. 222-630.000.

Casagrande & C. S.p.A.: *See—*
Casagrande, Bruno, 4,174,788, Cl. 222-630.000.

Cassady, Henry W., Jr.: *See—*
Fleenor, Richard P.; and Cassady, Henry W., Jr., 4,174,722, Cl. 134-62.000.

Cassell, Ralph M., to Laclede Steel Company. Method of manufacturing springs, including the production of rod therefor. 4,174,981, Cl. 148-12.00B.

Castellano, Joseph C. Gunsight mount for Winchester rifle. 4,174,581, Cl. 42-1.0ST.

Caterpillar Tractor Co.: *See—*
Dezelan, Joseph E., 4,174,614, Cl. 60-445.000.
Frantzreb, John G., Sr.; and Weiss, C. David, 4,174,962, Cl. 75-53.000.
Hopkins, Donald L.; and Johnson, Gordon, 4,174,762, Cl. 180-6.440.
Stedman, Robert N., 4,174,757, Cl. 172-292.000.

Catonne, Jean-Claude; Royon, Jean; Bonnemay, Maurice; Descarsin, Marie-Therese; Bernard-Maugiron, Marcel; Fencki, Henri; and Fayolle, Jean-Francois, to Societe d'Etudes pour la Recuperation Electrolytique du Zinc. Apparatus for recovering zinc from residues. 4,175,027, Cl. 204-275.000.

Cellier, Francis, to Westinghouse Electric Corp. Remote nuclear green pellet processing apparatus. 4,174,938, Cl. 425-317.000.

CGEE Alsthom: *See—*
Debaigt, Jean, 4,174,878, Cl. 339-198.00R.

Chalmers, John H., Jr.: *See—*
Zimmerman, Sheldon B.; and Chalmers, John H., Jr., 4,175,007, Cl. 435-105.000.

Champion International Corporation: *See—*
Fogle, Ozzie; and Cooley, James, 4,175,161, Cl. 428-425.000.

Chandler, Richard N., to Schlumberger Technology Corporation. Nuclear magnetism logging method and system. 4,175,251, Cl. 324-303.000.

Charbonnages de France: *See—*
Delessard, Serge L.; and Puff, Roger M., 4,174,947, Cl. 432-15.000.

Chemische Werke Huls, A.G.: *See—*
Maahs, Gunther; and Rombusch, Konrad, 4,175,095, Cl. 260-544.00Y.

Chen, Nai Y.; and Yan, Tsoung-Yuan, to Mobil Oil Corporation. Method for treatment of rubber and plastic wastes. 4,175,211, Cl. 585-241.000.

Chen, Stephen Y.; and Quinn, Thomas M., to Standard Oil Company. Titanium dioxide as a U.V. screen in fire retardant vinyl polymers. 4,175,071, Cl. 260-42.440.

Chen, William I., to Bell Telephone Laboratories, Incorporated. Regenerator having automatic gain control referenced to a data-pattern-dependent pulse stream. 4,175,213, Cl. 178-70.00R.

Chenoweth, Charles E. Rail draft vehicle employing tractor-like apparatus. 4,174,667, Cl. 105-26.00R.

Chepurnoi, Nikolai P.: *See—*
Kostylev, Alexandr D.; Chepurnoi, Nikolai P.; Plavskikh, Vladimir D.; and Cherednikov, Evgeny N., 4,174,758, Cl. 175-19.000.

Cherednikov, Evgeny N.: *See—*
Kostylev, Alexandr D.; Chepurnoi, Nikolai P.; Plavskikh, Vladimir D.; and Cherednikov, Evgeny N., 4,174,758, Cl. 175-19.000.

Chevron Research Company: *See—*
Wilgus, Donovan R.; and King, John M., 4,175,044, Cl. 252-42.700.

Chin, Gilbert Y.; Jin, Sungho; Plewes, John T.; and Wonsiewicz, Bud C., to Bell Telephone Laboratories, Incorporated. Fe-Cr-Co magnetic alloy processing. 4,174,983, Cl. 148-102.000.

Chivas Products Ltd.: *See—*
Moore, Ronald D.; and Bethel, Everett L., 4,174,988, Cl. 156-213.000.

Chou, Ta-Sen, to Eli Lilly and Company. Process for preparing n-chloroimides. 4,175,082, Cl. 260-326.00C.

Christophorou, Loucas G.; James, David R.; Pace, Marshall O.; and Pai, Robert Y., to United States of America, Energy. Gaseous insulators for high voltage electrical equipment. 4,175,048, Cl. 252-63.500.

Chromalloy American Corporation: *See—*
Mal, M. Kumar; and Tarkan, Stuart E., 4,174,967, Cl. 75-237.000.

Chubrikov, Boris A.: *See—*
Lidorenko, Nikolai S.; Evdokimov, Vladimir M.; Zadde, Vitaly V.; Kozlov, Alexandr I.; Ryabikov, Stanislav V.; Potapov, Valery N.; Strebkov, Dmitry S.; Surianinova, Tatiana I.; Chubrikov, Boris A.; Zatravina, Valentina V.; Korolev, Boris V.; Kulikov, Viktor F.; Zhuravleva, Larisa L.; Unishkov, Vadim A.; Dormidontov, Anatoly A.; Moiseev, Viktor I.; and Kudeshova, Ljubov P., 4,174,978, Cl. 136-89.0PC.

Ciba-Geigy Corporation: *See—*
Bagga, Madan M.; and Moss, Noel S., 4,175,173, Cl. 528-97.000.
Balli, Heinz; Gunzenhauser, Sigmund; and Petitpierre, Jean C., 4,174,856, Cl. 282-27.500.
Farooq, Saleem; Karrer, Friedrich; and Haas, Georges, 4,175,137, Cl. 424-337.000.
Miller, Ralph, 4,175,116, Cl. 423-500.000.

Cicci, George B.; and Segredo, John D., to International Harvester Company. Roll opening device with header stabilizer. 4,174,600, Cl. 56-1.000.

Clanton, W. Porter, to Quaker Oats Company, The. Toy blood pressure monitoring device. 4,174,588, Cl. 46-44.000.

Clarke Carrier Corporation: *See—*
Rhyan, William C., 4,174,866, Cl. 297-194.000.

Clarke, John T.; Luck, Allan J.; and Sutton, Roger F., to Masonite Corporation. Post press molding of man-made boards to produce contoured furniture parts. 4,175,106, Cl. 264-118.000.

Clarke, John T.: *See—*
Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., 4,175,105, Cl. 264-112.000.
Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., 4,175,148, Cl. 428-171.000.
Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., 4,175,149, Cl. 428-171.000.
Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., 4,175,150, Cl. 428-171.000.

CMI Corporation: *See—*
Swisher, George W., Jr., 4,174,949, Cl. 432-58.000.

Coant, Pierre M.; and Munns, George W., Jr., to Mobil Oil Corporation. Synthetic lubricant. 4,175,046, Cl. 252-56.00S.

Coffin, Harry A. Back massager. 4,174,708, Cl. 128-49.000.

Cohen, Richard J.: *See—*
Cannell, David S.; Giglio, Marzio; Benedek, George B.; von Schulthess, Gustav K.; and Cohen, Richard J., 4,174,952, Cl. 23-230.00B.

Coker, Thomas G.: *See—*
Argade, Shyam D.; and Coker, Thomas G., 4,175,023, Cl. 204-252.000.

Cole, Terry, to Ford Motor Company. Thermoelectric generator electrode. 4,175,164, Cl. 429-11.000.

Collignon, Pierre: *See—*
De Boel, Marcel; Baudin, Pol; Wasterlain, Michel; and Collignon, Pierre, 4,175,162, Cl. 428-428.000.

Collins, Thomas W., to International Business Machines Corporation. Serrated Y-bar magnetic bubble switch. 4,175,289, Cl. 365-15.000.

Combustion Engineering, Inc.: *See—*
Mitchell, Robert D.; and Schulz, Albert C., 4,174,933, Cl. 425-79.000.

Compton, Leslie E., to Occidental Oil Shale, Inc. Method of breaking shale oil-water emulsion. 4,174,751, Cl. 166-256.000.

Comstock, George W., Jr. Black board line marking device. 4,174,573, Cl. 33-32.00C.

Condea Chemie GmbH: *See—*
Wassermann, Martin; Noweck, Klaus; and Meyer, Arnold, 4,175,118, Cl. 423-628.000.

Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. Cycloheptathiophene derivatives. 4,175,086, Cl. 549-51.000.

Conrad, Robert A.: *See—*
Thompson, Gerald L.; Paschal, Gloria C.; and Conrad, Robert A., 4,175,080, Cl. 260-244.400.

Continental Oil Company: *See—*
Sammons, John K.; and Fox, Charles H., Jr., 4,175,040, Cl. 210-78.000.

Cooley, James: *See—*
Fogle, Ozzie; and Cooley, James, 4,175,161, Cl. 428-425.000.

Cooper, Eric G.: *See—*
Beuchel, Peter H.; and Cooper, Eric G., 4,175,003, Cl. 176-76.000.

Cooper Industries, Inc.: *See—*
Klemm, Robert W., 4,175,247, Cl. 318-466.000.
Senior, Robert B.; and Yarbrough, Paul A., 4,174,560, Cl. 29-566.100.

Copal Company Limited: *See—*
Matsumoto, Kunio, 4,174,897, Cl. 354-133.000.

Copeland Corporation: *See—*
Lindstrom, Ivan T., 4,174,927, Cl. 417-372.000.

Copeland, William M.: *See—*
Shallenberg, Robert L.; Hufton, Austen B.; Blomgren, Roland A.; and Copeland, William M., 4,174,977, Cl. 134-6.000.

Copelin, Harry B., to Du Pont de Nemours, E. I., and Company. Separation of alcohol from tetrahydrofuran. 4,175,009, Cl. 203-96.000.

Corbett, James P. Temperature compensated oscillating crystal force transducer systems. 4,175,243, Cl. 310-338.000.

Cornelius Company, The: *See—*
Fessler, Herman S., 4,174,872, Cl. 312-290.000.

Corning Glass Works: *See—*
Payton, Alan J., 4,175,028, Cl. 204-296.000.

Cosgrove, James F.: *See—*
McCain, William B.; Cosgrove, James F.; and Bewersdorf, Elmer, 4,174,829, Cl. 270-55.000.

Couderc, Georges: *See—*
Dansac, Jean; and Couderc, Georges, 4,175,285, Cl. 364-456.000.

Courbot, Pierre, to Societe Anonyme D.B.A. Drum brake. 4,174,770, Cl. 188-79.50P.

Cousin, Alain, to U.S. Philips Corporation. Record player with start-stop control by means of a magnetic field. 4,174,841, Cl. 274-1.00L.

Cox, James H. Ship's propeller shaft sealing assembly. 4,174,672, Cl. 115-74.000.

Cragoe, Edward J., Jr.; and Bicking, John B., to Merck & Co., Inc. Interphenylene 11,12-secoprostaglandins. 4,175,203, Cl. 560-55.000.

Crane Packing Company: *See—*
Zobens, Arthur, 4,174,844, Cl. 277-85.000.

CRC-Crose International, Inc.: *See—*
Sims, Eugene F.; and Dierlam, Trueman, 4,175,224, Cl. 219-60.00R.

Creadh, Joseph P., III: *See—*
Lusk, Edwin B.; Riley, Douglas C., Jr.; and Creadh, Joseph P., III, 4,175,112, Cl. 423-242.000.

Creamer, Edward D.; and Krumpelt, Michael, to BASF Wyandotte Corporation. Sealed membrane filter press electrolytic cells. 4,175,025, Cl. 204-253.000.

Credelle, Thomas L.; and Spong, Fred W., to RCA Corporation. Recording a synthetic focused-image hologram on a thermally deformable plastic. 4,174,881, Cl. 350-3.630.

Crest Circle, Inc.: *See—*
Boles, Richard J., 4,174,747, Cl. 150-1.50R.

Crnojevich, Ranko; Wiewiorowski, Edward L.; and Yu, Peter H., to AMAX Inc. Cathodic dissolution of cobaltic hydroxide. 4,175,014, Cl. 204-130.000.

Cruze, Tyrone A.: *See—*
Panzica, Nace J.; and Cruze, Tyrone A., 4,174,852, Cl. 280-291.000.

Curchod, Donald B., to Nortron Corporation. Scale construction. 4,174,760, Cl. 177-211.000.

Curtiss, Richard A. Weight control game apparatus. 4,174,840, Cl. 273-248.000.

Cuza, Cerso R. Device to separate liquids and solids in a mixture. 4,174,660, Cl. 99-495.000.

d'Agnolo, Armando, to Officine Savio S.p.A. System for the temporary storage of yarn. 4,174,799, Cl. 226-7.000.

Daharsh, Lonnie J. Bathroom planter box. 4,174,589, Cl. 47-66.000.

Dahms, Francis A., to Emhart Industries, Inc. Apparatus for straight line shearing. 4,174,647, Cl. 83-58.000.

Daimler-Benz Aktiengesellschaft: *See—*
Gotz, Hans, 4,174,863, Cl. 296-1.00S.

Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Takita, Nobuhiro; and Shintani, Tadashi, 4,174,901, Cl. 354-322.000.

Daly, Thomas W.; Hoer, Ralph A.; Walsh, James E.; and James, Henry T., to Ralston Purina Company. Method for the manufacture of water soluble adhesives. 4,174,975, Cl. 106-161.000.

Dammar, Raymon H., to Possis Corporation. Apparatus for winding armatures. 4,174,815, Cl. 242-7.05B.

Dansac, Jean; and Couderc, Georges, to Thomson-CSF. Navigational system of high-speed aircraft. 4,175,285, Cl. 364-456.000.

Darlington, William B., to PPG Industries, Inc. Electrolytic cell membrane sealing means. 4,175,024, Cl. 204-252.000.

Datt, Raymond R.: *See—*
Brinkhof, Joseph B.; and Datt, Raymond R., 4,175,229, Cl. 219-208.000.

Davies, Evan E.; and Kolombos, Alexander J., to British Petroleum Company Limited, The. Zeolite composition. 4,175,057, Cl. 252-455.00Z.

Davies, Robert W.: *See—*
Farrar, David J.; Davies, Robert W.; Carter, David C. M.; Bolt, Reginald C.; and Williams, Robert E., 4,174,780, Cl. 209-536.000.

Davis, David L.: *See—*
Nelson, Alfred M.; and Davis, David L., 4,175,265, Cl. 346-74.100.

Davis, Jacob A.: *See—*
Sanders, Thomas J.; Morcom, William R.; and Davis, Jacob A., 4,174,562, Cl. 29-578.000.

Davis, Royston H.; and Searle, Robert J. G., to Shell Oil Company. Phenoxybenzyl ester pesticides. 4,175,134, Cl. 424-301.000.

Dayco Corporation: *See—*
Meadows, Roger D., 4,174,984, Cl. 156-143.000.

Debaigt, Jean, to CGEE Alsthom. Security structure for positioning a clip on a connector tab. 4,174,878, Cl. 339-198.00R.

De Boel, Marcel; Baudin, Pol; Wasterlain, Michel; and Collignon, Pierre, to BFG Glassgroup. Method of manufacturing a laminated, light transmitting, fire screening panel. 4,175,162, Cl. 428-428.000.

de Bucs, Eugen S.: *See—*
Kusebauch, Walter; Kostka, Hana; Henkel, Hans-Joachim; Koch, Christian; de Bucs, Eugen S.; and Weber, Theo, 4,174,954, Cl. 48-212.000.

Decker, Heinz: *See—*
Jundt, Werner; Bodig, Bernd; Decker, Heinz; Schmidt, Gunther; Wurst, Bert; Seeger, Karl; and Roozenbeek, Herman, 4,174,696, Cl. 123-148.00E.

Decor, Jean-Pierre, to Rhone-Poulenc Industries. Process for the preparation of vitamin A from sulphones. 4,175,205, Cl. 560-260.000.

Degrassi, Alfieri: *See—*
Bollen, Philip S.; and Degrassi, Alfieri, 4,175,147, Cl. 428-35.000.

De Haai, Kermit M. Self-propelled disk harrow machine. 4,174,756, Cl. 172-55.000.

Deibele GmbH & Co.: *See—*
Deibele, Manfred, 4,174,596, Cl. 52-202.000.

Deibele, Manfred, to Deibele GmbH & Co. Detachable insulating cover assembly for greenhouses and the like. 4,174,596, Cl. 52-202.000.

Delessard, Serge L.; and Puff, Roger M., to Charbonnages de France. Installation and process for regulating the preheating of coking coal. 4,174,947, Cl. 432-15.000.

DeMarco, Thomas M.: *See—*
Dupre, George T.; and DeMarco, Thomas M., 4,174,591, Cl. 51-16.000.

De Martino, Aldo. Stick-propelled disk game. 4,174,834, Cl. 273-96.00B.

De Nardo, John M. Apparatus for pneumatically applying material to an object. 4,174,868, Cl. 406-76.000.

Denjean, Rene, to Air Industrie. Heat-exchanger with rotor having radial passages. 4,174,748, Cl. 165-5.000.

Denki Onkyo Co., Ltd.: *See—*
Sawada, Eiji, 4,175,261, Cl. 335-210.000.

Dentron, Inc.: *See—*
Gallant, Ben J., 4,174,571, Cl. 433-216.000.

DePalma, Vito A.; and Baier, Robert E., to Calspan Corporation. Flow cell and method for continuously monitoring deposits on flow surfaces. 4,175,233, Cl. 250-343.000.

Descarsin, Marie-Therese: *See—*
Catonne, Jean-Claude; Royon, Jean; Bonnemay, Maurice; Descarsin, Marie-Therese; Bernard-Maugiron, Marcel; Fencki, Henri; and Fayolle, Jean-Francois, 4,175,027, Cl. 204-275.000.

Deshmukh, Arvind D. Serum-soluble cholesterol compounds and method for their preparation. 4,175,074, Cl. 260-121.000.

Desmo Limited: *See—*
Sutton, Christopher J.; and Trigg, Leonard, 4,174,823, Cl. 248-582.000.

Dessau, Ralph M.: *See—*
Heiba, El Ahmadi I.; and Dessau, Ralph M., 4,175,089, Cl. 260-343.600.

Detroit Stoker Company: *See—*
Knox, Harold L., 4,174,920, Cl. 414-160.000.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Beschke, Helmut; Friedrich, Heinz; and Offermanns, Heribert, 4,175,195, Cl. 546-250.000.
Kleemann, Axel; Kiel, Reinhold; and Nubert, Ingomar, 4,175,088, Cl. 549-59.000.
Klenk, Herbert; Schwarze, Werner; and Leuchtenberger, Wolfgang, 4,175,188, Cl. 544-182.000.

Development Finance Corporation of New Zealand: *See—*
Ayers, John S., 4,175,183, Cl. 536-57.000.

Dezelan, Joseph E., to Caterpillar Tractor Co. Torque limiting control for front wheel drive. 4,174,614, Cl. 60-445.000.

Dickinson, Thorn W., to Textron Inc. Traction-drive transmission. 4,174,640, Cl. 74-690.000.

Didier-Werke A.G.: *See—*
Gelsdorf, Gunter; and Wirth, Friedhelm, 4,174,970, Cl. 106-44.000.

Dierlam, Trueman: *See—*
Sims, Eugene F.; and Dierlam, Trueman, 4,175,224, Cl. 219-60.00R.

Diesel Kiki Company, Ltd.: *See—*
Ishizuka, Yutaka, 4,174,931, Cl. 418-259.000.

DiFrancesco, Alphonse B.; and Hage, Charles T., to Eastman Kodak Company. Method and apparatus for producing duplex copies. 4,174,905, Cl. 355-14.00R.

Director-General of the Agency of Industrial Science and Technology: *See—*
Mizukami, Fujio; and Imamura, Juichi, 4,175,098, Cl. 260-590.0FA.

Disch, Karlheinz; and Kiewert, Eva, to Henkel Kommanditgesellschaft auf Aktien (Henkel KgaA). Aqueous cleanser compositions. 4,175,062, Cl. 252-540.000.

Divisek, Jiri: *See—*
Barnert, Heiko; Divisek, Jiri; and Faul, Wolfgang, 4,175,013, Cl. 204-129.000.

Dmitriev, Jury A.: *See—*
Kovalsky, Georgy A.; Maishev, Jury P.; Egorov, Boris A.; and Dmitriev, Jury A., 4,175,029, Cl. 204-298.000.

Dobo, Emerick J.; and Graham, Tommy E., to Monsanto Company. Inorganic anisotropic hollow fibers. 4,175,153, Cl. 428-398.000.

Dobrosielski, Stephen S.: *See—*
Johnston, Robert J.; Layciak, Stephen G.; and Dobrosielski, Stephen S., 4,175,220, Cl. 200-4.000.

Dolikian, Arman V., to Motorola, Inc. Dynamic threshold tone detector. 4,175,256, Cl. 328-149.000.

Dombrowski, Irvin R. Fan or wheel pulling device. 4,174,558, Cl. 29-259.000.

Dormidontov, Anatoly A.: *See—*
Lidorenko, Nikolai S.; Evdokimov, Vladimir M.; Zadde, Vitaly V.; Kozlov, Alexandr I.; Ryabikov, Stanislav V.; Potapov, Valery N.; Strebkov, Dmitry S.; Surianinova, Tatiana I.; Chubrikov, Boris A.; Zatravina, Valentina V.; Korolev, Boris V.; Kulikov, Viktor F.; Zhuravleva, Larisa L.; Unishkov, Vadim A.; Dormidontov, Anatoly A.; Moiseev, Viktor I.; and Kudeshova, Ljubov P., 4,174,978, Cl. 136-89.0PC.

Dory, Jacques, to C.G.R. Ultrasonic. Echographic device for the real-time display of internal discontinuities of a test object. 4,174,634, Cl. 73-606.000.

Douglas, Peter E.: *See—*
Richards, Gordon S.; Douglas, Peter E.; and Abraham, Alan G., 4,175,230, Cl. 250-199.000.

Douwes International B.V.: *See—*
Jansen, Adolf E., 4,174,632, Cl. 73-422.00R.

Doveinis, Juozas, to General Motors Corporation. Window regulator mechanism. 4,174,865, Cl. 296-146.000.

Dow Chemical Company, The: *See—*
Harris, Robert F.; and Wagener, Earl H., 4,175,196, Cl. 546-339.000.

Drake, Jeffrey P. Extensible lock mechanism. 4,174,861, Cl. 292-269.000.

Dresser Industries, Inc.: *See—*
Richardson, Victor E., 4,174,848, Cl. 279-19.500.

Drevin, Hakan N. Y.: *See—*
Carlsson, Jan P. E.; Axen, Rolf E. A. V.; Drevin, Hakan N. Y.; and Lindgren, Goran E. S., 4,175,073, Cl. 260-112.00R.

Drews, Ulrich; and Singer, Erich, to Robert Bosch GmbH. Auxiliary fuel injection control circuit. 4,174,682, Cl. 123-32.0EE.

Drinkwaard, Adriana, nee Goossen, personal representative: *See—*
van den Bussche, Hendrik K. J.; van Soldt, Nicolaas J.; van de Krogt, Adrianus H.; and Drinkwaard, Willem, deceased, 4,174,628, Cl. 73-151.000.

Drinkwaard, Willem, deceased: *See—*
van den Bussche, Hendrik K. J.; van Soldt, Nicolaas J.; van de Krogt, Adrianus H.; and Drinkwaard, Willem, deceased, 4,174,628, Cl. 73-151.000.

Driscoll, Patrick R., to Mobil Oil Corporation. 5-Substituted thiadiazole ureas. 4,175,081, Cl. 548-140.000.

Driskill, Roger D., to General Electric Company. Extrusion apparatus for producing elongated core members covered with concentric coatings. 4,174,935, Cl. 425-113.000.

Drnevich, Raymond F.; Venkataraman, Kallidaikurichi N.; and Walder, Thomas E., to Union Carbide Corporation. Apparatus for degassing floating sludge. 4,175,041, Cl. 210-188.000.

Drouzy, Michel L.; Richard, Michel M.; Huet, Francois P.; and Lacau, Henri M. Nonfibrous castable refractory concrete having high deflection temperature and high compressive strength and process. 4,174,972, Cl. 106-64.000.

Dudin, Jury A.: *See—*
Grakov, Anatoly N.; Grebennik, Oleg I.; Dudin, Jury A.; Lutsker, Vladimir L.; Makarov, Valery N.; Ogolikhin, Viktor M.; and Khrustaleva, Tatyana P., 4,174,929, Cl. 417-437.000.

Duffey, Donn W., to Rockwell International Corporation. Valve actuator. 4,174,656, Cl. 92-134.000.

Dumont, Claude: *See—*
Nedelec, Lucien; Frechet, Daniel; and Dumont, Claude, 4,175,136, Cl. 424-330.000.

Dunn, Richard P. Plumber's appliance for clearing drains. 4,174,548, Cl. 15-104.3SN.

Dupin, Jean G. A., to Societe Anonyme Automobiles Citroen. In-line two-cylinder engine. 4,174,698, Cl. 123-192.00B.

Du Pont de Nemours, E. I., and Company: *See—*
Copelin, Harry B., 4,175,009, Cl. 203-96.000.

Dupre, George T.; and DeMarco, Thomas M., to NFE International Ltd. Apparatus for cleaning sand cores. 4,174,591, Cl. 51-16.000.

E. R. Squibb & Sons, Inc.: *See—*
Ondetti, Miguel A.; and Weisenborn, Frank L., 4,175,199, Cl. 548-336.000.

Eastman Kodak Company: *See—*
DiFrancesco, Alphonse B.; and Hage, Charles T., 4,174,905, Cl. 355-14.00R.

Eaton Corporation: *See—*
Kolze, Lawrence A., 4,174,824, Cl. 251-30.000.

Econo-Brew, Inc.: *See—*
Pugliese, John P.; and Robbins, Thomas J., 4,174,659, Cl. 99-306.000.

Edagawa, Setsuji: *See—*
Shibazaki, Hiroji; Edagawa, Setsuji; Hasegawa, Hisashi; Takeuchi, Takashi; Moriyama, Noboru; and Fukuyama, Yukihiro, 4,175,066, Cl. 260-29.60M.

Edwards, Grant C.; Vaughan, David E. W.; and Albers, Edwin W., to W. R. Grace & Co. Method of preparing a novel platelet-type crystalline form of synthetic faujasite. 4,175,059, Cl. 252-455.00Z.

Eerste Nederlandse Cement Industrie (ENCI) N.V.: *See—*
Wolfs, Andreas G. J.; and Goessens, Lambertus H., 4,174,961, Cl. 75-30.000.

Egorov, Boris A.: *See—*
Kovalsky, Georgy A.; Maishev, Jury P.; Egorov, Boris A.; and Dmitriev, Jury A., 4,175,029, Cl. 204-298.000.

Eickel, Rolf: *See—*
Muller, Jurgen; Schmidt, Manfred; and Eickel, Rolf, 4,175,232, Cl. 250-315.200.

Eidsmore, Alva A.: *See—*
Eidsmore, Paul G.; and Eidsmore, Alva A., 4,174,733, Cl. 137-552.000.

Eidsmore, Paul G.; and Eidsmore, Alva A., to Fischer & Porter Company. Process gas flow control module. 4,174,733, Cl. 137-552.000.

Eisai Co., Ltd.: *See—*
Kijima, Shizumasa; Yamatsu, Isao; Inai, Yuichi; Igarashi, Toshiji; Nakajima, Yoshikage; and Eisai Co., Ltd., 4,175,139, Cl. 424-343.000.

Electromatic Drive Corporation: *See—*
Hillman, Darrel D., 4,174,641, Cl. 74-230.17A.

Electroosmosis Inc.: *See—*
Peterson, Earl C., 4,174,912, Cl. 404-27.000.

Elektro-Thermit GmbH: *See—*
Kempa, Bernd-Joachim, 4,174,820, Cl. 246-430.000.

Eli Lilly and Company: *See—*
Abdulla, Riaz F.; and Fuhr, Kenneth H., 4,175,087, Cl. 260-586.00R.
Chou, Ta-Sen, 4,175,082, Cl. 260-326.00C.
Hatfield, Lowell D., 4,175,076, Cl. 260-239.00A.
Huffman, George W., 4,175,125, Cl. 424-246.000.
McKnight, Hugh P.; and Welty, Kenneth B., 4,174,775, Cl. 198-397.000.
Neuss, Norbert; and Miller, Roger D., 4,174,772, Cl. 435-32.000.
Thompson, Gerald L.; Paschal, Gloria C.; and Conrad, Robert A., 4,175,080, Cl. 260-244.400.
Zimmerman, Dennis M., 4,175,197, Cl. 546-339.000.

Elkay Manufacturing Company: *See—*
Arnold, Don C.; Silletti, Julio D.; Ritzenthaler, Richard L.; and Wilcox, Thomas J., 4,174,726, Cl. 137-100.000.

Elliott Brothers (London) Limited: *See—*
Glenn, Stephen J., 4,174,814, Cl. 244-3.130.

Elliott, Stanley B. Visual-type hygrometer. 4,175,207, Cl. 562-460.000.

Emhart Industries, Inc.: *See—*
Dahms, Francis A., 4,174,647, Cl. 83-58.000.

Enfield, Robert E.: *See—*
Fulks, Robert G.; Enfield, Robert E.; and Greenwood, Edward H., 4,174,805, Cl. 235-302.000.

Engelhard Minerals & Chemicals Corporation: *See—*
Adlhart, Otto J., 4,175,165, Cl. 429-30.000.

Enoguchi, Yuji: *See—*
Murasaki, Hiroshi; Enoguchi, Yuji; Wada, Kenichi; and Fujiwara, Takao, 4,174,904, Cl. 355-8.000.

Eppich, Alfred; and Hochleitner, Rudolf H., to F. Xaver Leipold, Firma. Process for the production of decal transfers and decal transfers produced according to the process. 4,175,151, Cl. 428-202.000.

Erikson, Rolf B.: *See—*
Johnson, Delmar R.; Flint, John R.; Wells, Thomas R.; Erikson, Rolf B.; and Rady, Bruce A., 4,174,890, Cl. 353-26.00A.

Erwin, Lewis, II: *See—*
Suh, Nam P.; Rotz, Christopher A.; Erwin, Lewis, II; Melcher, James R.; and Hoburg, James F., 4,174,907, Cl. 366-279.000.

Esquire, Inc.: *See—*
Lonseth, Wayne F., 4,175,281, Cl. 362-148.000.

Evdokimov, Vladimir M.: *See—*
Lidorenko, Nikolai S.; Evdokimov, Vladimir M.; Zadde, Vitaly V.; Kozlov, Alexandr I.; Ryabikov, Stanislav V.; Potapov, Valery N.; Strebkov, Dmitry S.; Surianinova, Tatiana I.; Chubrikov, Boris A.; Zatravina, Valentina V.; Korolev, Boris V.; Kulikov, Viktor F.; Zhuravleva, Larisa L.; Unishkov, Vadim A.; Dormidontov, Anatoly A.; Moiseev, Viktor I.; and Kudeshova, Ljubov P., 4,174,978, Cl. 136-89.0PC.

Exxon Research & Engineering Co.: *See—*
Beals, Charles D.; Fitzpatrick, George I.; and O'Hara, Kim L., 4,175,169, Cl. 526-64.000.
Geissler, Paul R., 4,175,099, Cl. 585-831.000.
Kuntz, Irving, 4,175,017, Cl. 204-159.240.

Ezawa, Sadaaki: *See—*
Obayashi, Nobuharu; Hashizume, Hikaru; Sakashita, Noriji; Kameyama, Seiji; Ezawa, Sadaaki; Watanabe, Hironori; Kondo, Tatsunori; Kugisawa, Toshio; and Washiyama, Yutaka, 4,174,649, Cl. 84-1.010.

F. Xaver Leipold, Firma: *See—*
Eppich, Alfred; and Hochleitner, Rudolf H., 4,175,151, Cl. 428-202.000.

Farnham, Alford G.: *See—*
Johnson, Robert N.; and Farnham, Alford G., 4,175,175, Cl. 528-125.000.

Farooq, Saleem; Karrer, Friedrich; and Haas, Georges, to Ciba-Geigy Corporation. Etherified cycloalkanols. 4,175,137, Cl. 424-337.000.

Farrar, David J.; Davies, Robert W.; Carter, David C. M.; Bolt, Reginald C.; and Williams, Robert E., to Molins Limited. Feeding cigarettes and similar rod-like articles. 4,174,780, Cl. 209-536.000.

Faul, Wolfgang: *See—*
Barnert, Heiko; Divisek, Jiri; and Faul, Wolfgang, 4,175,013, Cl. 204-129.000.

Faust, Kenneth J.; and Woerner, Douglas C., to GAF Corporation Sheet backing for decorative covering material. 4,175,154, Cl. 428-313.000.

Faust, Kenneth J.: *See—*
Biranowski, Jerome; and Faust, Kenneth J., 4,175,155, Cl. 428-313.000.

Fayolle, Jean-Francois: *See—*
Catonne, Jean-Claude; Royon, Jean; Bonnemay, Maurice; Descarsin, Marie-Therese; Bernard-Maugiron, Marcel; Fencki, Henri; and Fayolle, Jean-Francois, 4,175,027, Cl. 204-275.000

Fechter, Henry G., to Teletype Corporation. Making memory structure for laser recording system. 4,175,145, Cl. 427-240.000.

Feinberg, Albert E.; and Woo, Kenneth, to Advance Transformer Company. Energizing circuit for magnetron using dual transformer secondaries. 4,175,246, Cl. 315-101.000.

Fencki, Henri: *See—*
Catonne, Jean-Claude; Royon, Jean; Bonnemay, Maurice; Descarsin, Marie-Therese; Bernard-Maugiron, Marcel; Fencki, Henri; and Fayolle, Jean-Francois, 4,175,027, Cl. 204-275.000

Fenner America Ltd.: *See—*
Rasero, Lawrence J.; Pelchuck, John, Jr.; and Howard, Gordon H., 4,174,739, Cl. 139-388.000.

Fenner, Klaus-Bernd, to Hasco-Normalien Hasenclever & Co. Latch for three-part mold. 4,174,939, Cl. 425-451.900.

Ferguson, Sammy J.; and Yohe, Wilham R., to Recognition Equipment Incorporated. Severing and sealing tool. 4,174,995, Cl. 156-494.000

Fermaglich, Saul; and Volent, Ivan. Apparatus for producing multiple image formats. 4,174,895, Cl. 354-76.000.

Ferris, Michael J.: *See—*
Breslow, Jeffrey D.; Ferris, Michael J.; Arias, Henry; and Wozniak, Walter J., 4,174,835, Cl. 273-101.000.

Ferryman, Kenneth K., Jr.: *See—*
Whitfield, Dwight B.; and Ferryman, Kenneth K., Jr., 4,175,248, Cl. 318-467.000.

Fessler, Herman S., to Cornelius Company, The. Beverage dispensing machine and cabinet therefor. 4,174,872, Cl. 312-290.000.

Fetterer, Gerald F.: *See—*
McLaughlin, Donald W.; and Fetterer, Gerald F., 4,175,215, Cl. 179-18.0BC.

Fieldhouse, John W., to Firestone Tire & Rubber Company, The. Purification of crude chlorophosphazene compounds by treatment with water. 4,175,113, Cl. 423-300.000.

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Benney, Charles H.; and Filipi, Thomas J., 4,175,037, Cl. 210-31.00C.

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Hergenrother, William L.; and Halasa, Adel F., 4,175,181, Cl. 528-168.000.

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Fischer, Harold L.: *See—*
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Fischer & Porter Company: *See—*
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Buchwald, Warren G.; and Norris, David W., 4,175,283, Cl. 364-117.000.

Fisher, Johnny D. Washer/separator system for drilling cuttings in water environment oil wells. 4,175,039, Cl. 210-74.000.

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Fleenor, Richard P.; and Cassady, Henry W., Jr., to Manning Environmental Corp. Cleaning apparatus for sample containers in a queue. 4,174,722, Cl. 134-62.000.

Fleming, James W., Jr.; O'Bryan, Henry M., Jr.; and Thomson, John, Jr., to Bell Telephone Laboratories, Incorporated. Composition and processing procedure for making thermistors. 4,175,060, Cl. 252-518.000.

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Johnson, Delmar R.; Flint, John R.; Wells, Thomas R.; Erikson, Rolf B.; and Rady, Bruce A., 4,174,890, Cl. 353-26.00A.

FMC Corporation: *See—*
Munday, Theodore F.; and Walden, John, 4,175,111, Cl. 423-210.000.

Siri, Michael P., 4,174,755, Cl. 171-27.000

Foederer, Wilhelmus T. Connector for flat cable. 4,174,877, Cl. 339-97.00P.

Fogle, Ozzie; and Cooley, James, to Champion International Corporation. Method of improving the adhesion of a heat activatable polyurethane adhesive to a vinyl substrate. 4,175,161, Cl. 428-425.000.

Fondriest, F. Frederick, to Standard Oil Company (Indiana). Process for converting coal ash slag into portland cement. 4,174,974, Cl. 106-103.000.

Fontaine, Paul L.: *See—*
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Frank, Karl, to Agfa-Gevaert Aktiengesellschaft. Photographic reversal process without second exposure. 4,174,968, Cl. 430-375.000.

Franklin, Edna M. Drapery tieback ring holding clip. 4,174,552, Cl. 24-73.0CH.

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Frechet, Daniel: *See—*
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Freeman Chemical Corporation: *See—*
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Freese, Lennart W., to SMT-Pullmax AB. Flow sensing valve for protecting conduit systems against unintentional pressure changes. 4,174,732, Cl. 137-498.000

Fried, Josef, to University of Chicago. Chemical synthesis. 4,175,201, Cl. 560-17.000

Friedrich, Heinz: *See—*
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Frielingsdorf, Hans: *See—*
Schweter, Guenther; Bachl, Robert; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Gruber, Wolfgang; and Kolk, Erich, 4,175,170, Cl. 526-125.000

Frykhult, Rune H., to AB Celleco. Hydrocyclone separator. 4,175,036, Cl. 209-211.000

Fuhr, Kenneth H.: *See—*
Abdulla, Riaz F.; and Fuhr, Kenneth H., 4,175,087, Cl. 260-586.00R.

Fuhrman, James L., to Rockwell International Corporation. Elastic store slip control circuit apparatus and method for preventing overlapping sequential read and write operations. 4,175,287, Cl. 364-900.000

Fuhrmann, Wolfgang, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Braking device for four-stroke cycle reciprocating piston internal combustion engine. 4,174,687, Cl. 123-90.130.

Fuji Kogyo Co., Ltd.: *See—*
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Fujii, Takashi; and Kizaki, Jiro, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Seal member for connecting master cylinder and reservoir. 4,174,786, Cl. 220-378.000.

Fujii, Toshihiro; and Yokota, Sekiji, to Hayakawa Rubber Company Limited. Water proofing compositions for cement mortar or concrete and methods of application therefor. 4,174,992, Cl. 156-244.110

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Fujimura, Kenji, to Sumitomo Metal Mining Company Limited. Method of manufacturing resistor paste. 4,175,061, Cl. 252-518.000

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Fujiwara, Takao: *See—*
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Fukuhara, Toru; and Shimomura, Jun, to Nippon Kogaku K.K. TTL metering device in a single lens reflex camera. 4,174,894, Cl. 354-59.000.

Fukui, Kiyozumi, to Teijin Seiki Company Limited. Drive controlling mechanism. 4,174,763, Cl. 180-6.480.

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Fulks, Robert G.; Enfield, Robert E.; and Greenwood, Edward H., to NCR Corporation. Method and apparatus for transmitting data to a predefined destination bus. 4,174,805, Cl. 235-302.000.

Fulton Tool Co., Inc.: *See—*
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Fuqua, Dale: *See—*
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Furusawa, Noriko. Stool for use with infant. 4,174,544, Cl. 4-112.000.
Futami, Toshio: *See—*
Ohta, Hirofumi; Futami, Toshio; and Umeyama, Kazuo, 4,175,288, Cl. 365-2.000.
Gabler, Otto L.: *See—*
Morin, Marius J.; Gabler, Otto L.; and Kilroy, Eugene J., 4,174,587, Cl. 46-1.00K.
Gacesa, Gerald R., to PPG Industries, Inc. Method of electrocoating. 4,175,018, Cl. 204-181.00T.
GAF Corporation: *See—*
Biranowski, Jerome; and Faust, Kenneth J., 4,175,155, Cl. 428-313.000.
Faust, Kenneth J.; and Woerner, Douglas C., 4,175,154, Cl. 428-313.000.
Gagne, Robert, to PPG Industries, Inc. Method and apparatus for molten metal flow diffusion in a float glass tank. 4,174,956, Cl. 65-99.00A.
Gale, Glen R.; and Meischen, Sandra J., to United States of America, America. 1,2-Diaminocyclohexane platinum (II) complexes having antineoplastic activity against L1210 leukemia. 4,175,133, Cl. 424-287.000.
Gallant, Ben J., to Dentron, Inc. Method for cleaning teeth. 4,174,571, Cl. 433-216.000.
Gara, Aaron D.: *See—*
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Garcia, Alfred B.: *See—*
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Garrison, Charles M.; Youngquist, Rudolph W.; and Taylor, Harry M., to Procter & Gamble Company, The. Isolation of protein from vegetable seeds. 4,175,075, Cl. 260-123.500.
Gaudette, Roger R., to W. R. Grace & Co. 5-Secondary alkylidene hydantoins. 4,175,198, Cl. 548-308.000.
Gauer, Joseph A.: *See—*
Bunnell, Douglas E.; Gauer, Joseph A.; Sherer, R. Bruce; and Scott, William F., 4,174,622, Cl. 68-23.300.
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Gebr. Happich GmbH: *See—*
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Martin, Virgil B.; and Villers, Roger L., 4,174,642, Cl. 74-243.00R.
Geissler, Paul R., to Exxon Research & Engineering Co. Separation and recovery of ethylbenzene from C_8 aromatic mixtures using rubidium-X sieves. 4,175,099, Cl. 585-831.000.
Gelsdorf, Gunter; and Wirth, Friedhelm, to Didier-Werke A.G. Refractory composition. 4,174,970, Cl. 106-44.000.
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Driskill, Roger D., 4,174,935, Cl. 425-113.000.
Grindle, James L.; and Blake, Walter R., 4,175,282, Cl. 362-363.000.
Raleigh, William J., 4,175,159, Cl. 428-405.000.
Smith, Russell M., 4,175,276, Cl. 361-36.000.
Woods, Lee O., 4,175,260, Cl. 335-202.000.
General Motors Corporation: *See—*
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Gill, Lloyd T., 4,174,699, Cl. 123-196.00S.
Hawkins, Harold G.; and Rodondi, Andrew F., 4,174,880, Cl. 339-217.00S.
Hollis, Thomas J.; and Thornburgh, William F., 4,174,610, Cl. 60-290.000.
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Joseph, Bernard W.; and Gara, Aaron D., 4,174,885, Cl. 350-162.0SF.
Murphy, Michael P., 4,175,019, Cl. 204-195.00S.
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Riddel, John W., 4,174,727, Cl. 137-111.000.
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Georg Spiess GmbH: *See—*
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Gerard, Jean L., to Societe Anonyme D.B.A. Disc brake and a resilient clip for such a brake. 4,174,769, Cl. 188-73.600.
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Gertz, David C. Corrugated panel and apparatus for manufacturing the same. 4,174,945, Cl. 425-501.000.
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Gill, Lloyd T., to General Motors Corporation. Engine oil processing system. 4,174,699, Cl. 123-196.00S.
Glass, Neel W., to Les-Kare, Inc. Adjustable boot type composition horseshoe. 4,174,754, Cl. 168-18.000.
Glenn, Stephen J., to Elliott Brothers (London) Limited. Guidance systems for mobile craft. 4,174,818, Cl. 244-3.130.
Glimm, Gunter: *See—*
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Glowacz, Anthony A.: *See—*
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Goodwin, Bette-Lou T. H., executrix: *See—*
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Goodwin, Earl L., deceased; and by Goodwin, Bette-Lou T. H., executrix. Analytical instrument. 4,174,675, Cl. 116-323.000.
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Goto, Takayuki: *See—*
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Goto, Yukio; Nakai, Osamu; and Yoshimori, Ikuo, to Kubota, Ltd. Method of mounting valve seats in a butterfly valve. 4,174,557, Cl. 29-157.10R.
Gottzein, Eveline: *See—*
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Gotz, Hans, to Daimler-Benz Aktiengesellschaft. Air guide installation. 4,174,863, Cl. 296-1.00S.
Graham, John W. Well stimulation by two-phase flow. 4,174,753, Cl. 166-307.000.
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Grakov, Anatoly N.; Grebennik, Oleg I.; Dudin, Jury A.; Lutsker, Vladimir L.; Makarov, Valery N.; Ogolikhin, Viktor M.; and Khrustaleva, Tatyana P. High pressure pump. 4,174,929, Cl. 417-437.000.
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Greiner, Max; Peters, Klaus J.; Schelhas, Peter; Stiefel, Peter; and Nusser, Hermann, to Robert Bosch GmbH. Fuel supply device. 4,175,102, Cl. 261-50.00A.
Griffin, J. Curtis, to Harrington Manufacturing Co. Method and apparatus for harvesting tobacco. 4,174,601, Cl. 56-27.500.
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Grindle, James L.; and Blake, Walter R., to General Electric Company. Luminaire attachment device. 4,175,282, Cl. 362-363.000.
Gruber, Robert P., to United States of America, National Aeronautics and Space Administration. Self-reconfiguring solar cell system. 4,175,249, Cl. 323-15.000.
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GTE Laboratories Incorporated: *See—*
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GTE Sylvania Incorporated: *See—*
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Newell, P. Bruce; Morris, James C.; and Waymouth, John F., 4,174,944, Cl. 431-359.000.
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Vanderpool, Clarence D., 4,175,160, Cl. 428-407.000.
Guillermin, Rene; Joly, Jean; and Sangalli, Silvio, to Rhone-Poulenc Textile. Process for texturizing polyester yarn and yarn. 4,175,157, Cl. 428-369.000.
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Haferkamp, Dirk; Hodzic, Alija; and Schneider, Karl-Uwe, to Hochtemperatur-Reaktorbau GmbH. Gas turbine power plant with closed gas circuit. 4,175,001, Cl. 176-60.000.
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Hahn, Carl-Georg; and Rippel, Kurt, to Schroeder & Co. Process for the production of sterilized mayonnaise or mayonnaise-containing products. 4,175,142, Cl. 426-605.000.
Haines, Robert G., to Union Carbide Corporation. Method of controlling acarina ectoparasites on warmblooded animals by orally administering to the animal an ectoparasitically effective amount of a 2-aryl-1,3-cyclohexanedione compound, and alkali metal salts, ammonium salts and enol esters thereof. 4,175,135, Cl. 424-311.000.
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Harakawa, Mototaka; and Mitumori, Yoshio, to Star Seimitsu Kabushiki Kaisha. Buzzer with rigid electrical leads. 4,175,262, Cl. 340-388.000.
Harari, Eliyahou, to Hughes Aircraft Company. Integrated semiconductor memory array having improved logic latch circuitry. 4,175,290, Cl. 365-156.000.
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Harris, Robert F.; and Wagener, Earl H., to Dow Chemical Company, The. Certain pyridinium surfactants. 4,175,196, Cl. 546-339.000.
Harris, Robert R.; and Pollack, Warren J., to International Minerals & Chemical Corporation. Resinous product. 4,175,063, Cl. 260-22.00R.
Harstead, Gunnar A. Component nuclear containment structure. 4,175,005, Cl. 176-87.000.
Hart, Richard K. Fender flare clip apparatus. 4,174,850, Cl. 280-153.00R.
Hartung, Philip F. Anti-collapse cap. 4,174,784, Cl. 215-349.000.
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Hasson, Harrith M. Multi-pronged laparoscopy forceps. 4,174,715, Cl. 128-321.000.
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Heilmann, Roland, to J. Lorch Gesselschaft & Co. KG. Housing for air service units. 4,174,730, Cl. 137-271.000.
Heintz, Frieder: *See—*
Zabler, Erich; Jansche, Walter; and Heintz, Frieder, 4,174,638, Cl. 73-728.000.
Hendriksen, Barry A., to Lilly Industries Limited. Pesticidal formulation. 4,174,960, Cl. 71-121.000.
Henkel Corporation: *See—*
MacKay, Kenneth D.; and Rogier, Edgar R., 4,175,012, Cl. 204-108.000.
Henkel, Hans-Joachim: *See—*
Kusebauch, Walter; Kostka, Hana; Henkel, Hans-Joachim; Koch, Christian; de Bucs, Eugen S.; and Weber, Theo, 4,174,954, Cl. 48-212.000.
Henkel Kommanditgesellschaft auf Aktien (Henkel KgaA): *See—*
Carduck, Franz-Josef; Klotzer, Dietrich; Schneider, Werner; and Wust, Willi, 4,175,050, Cl. 252-91.000.
Disch, Karlheinz; and Kiewert, Eva, 4,175,062, Cl. 252-540.000.
Hennig, Michael; and Reiner, Lawrence, to Mego Corp. Simulated road racing game. 4,174,833, Cl. 273-1.00E.
Herbert Meister and Co.: *See—*
Meister, Herbert, 4,174,990, Cl. 156-158.000.
Hergenrother, William L.; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Polyphosphazene polymers containing cyanamido or dicyanamido substituents. 4,175,181, Cl. 528-168.000.
Hermans, Johny C., to s.a. Texaco Belgium n.v. Bispiperazido phosphorus polyamides. 4,175,172, Cl. 528-27.000.
Hermans, Johny C., to s.a. Texaco Belgium n.v. Bispiperazido phosphorus polyamides. 4,175,174, Cl. 528-168.000.
Hermans, Johny C., to s.a. Texaco Belgium n.v. Bispiperazido phosphorus polyamides. 4,175,178, Cl. 528-373.000.
Hermans, Johny C., to s.a. Texaco Belgium n.v. Bispiperazido phosphorus polyamides. 4,175,179, Cl. 528-381.000.
Hermans, Johny C., to s.a. Texaco Belgium n.v. Bispiperazido phosphorus polyamides. 4,175,180, Cl. 528-399.000.
Herrington, F. John, to Mobil Oil Corporation. Apparatus for extruding tubular thermoplastic film. 4,174,932, Cl. 425-72.00R.
Herzig, Albert M.: *See—*
Beny, Janos; and Herzig, Albert M., 4,174,743, Cl. 141-18.000.
Herzog, Karl: *See—*
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Higginbottom, Lonnie C.: *See—*
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Hilfman, Lee, to UOP Inc. Hydroprocessing of hydrocarbons over nickel, moly, platinum catalyst. 4,175,033, Cl. 208-143.000.
Hill, Brian, to International Nickel Company, Inc., The. Production of ceramic powders for ferrite, spinel, titanate and garnet production. 4,175,117, Cl. 423-594.000.
Hill, Jere L.: *See—*
Swis, Philip E.; and Hill, Jere L., 4,174,627, Cl. 73-116.000.
Hillman, Darrel D., to Electromatic Drive Corporation. Power drive transmission assembly. 4,174,641, Cl. 74-230.17A.
Hipps, Larry W. Electro-hydraulic brake actuating system. 4,174,869, Cl. 303-10.000.
Hirai, Jun: *See—*
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Hiraide, Takashi: *See—*
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Hirakura, Megumu: *See—*
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Hirt, Manfred, to Carl Hurth Maschinen- und Zahnradfabrik. Friction clutch. 4,174,771, Cl. 192-58.00B.
Hirtreiter, Arthur B.; and Brown, Paul R., to Goodyear Tire & Rubber Company, The. Airsprings. 4,174,827, Cl. 267-65.00B.
Hitachi Cable, Ltd.: *See*—
Nagano, Hiroo; Ikeda, Chuki; Takahashi, Kenji; Kato, Naoyoshi; and Sato, Norio, 4,174,677, Cl. 118-67.000.
Hitachi, Ltd.: *See*—
Ishida, Yoshio; Sakai, Masao; Tsuzurahara, Mamoru; Inamura, Ichiro; and Oguro, Tomokatsu, 4,175,245, Cl. 315-39.710.
Ohta, Hirofumi; Futami, Toshio; and Umeyama, Kazuo, 4,175,288, Cl. 365-2.000.
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, to Nippon Gakki Seizo Kabushiki Kaisha. Envelope generator for an electronics musical instrument. 4,174,650, Cl. 84-1.010.
Hoburg, James F.: *See*—
Suh, Nam P.; Rotz, Christopher A.; Erwin, Lewis, II; Melcher, James R.; and Hoburg, James F., 4,174,907, Cl. 366-279.000.
Hoch, Samuel: *See*—
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Haferkamp, Dirk; Hodzic, Alija; and Schneider, Karl-Uwe, 4,175,001, Cl. 176-60.000.
Hodzic, Alija: *See*—
Haferkamp, Dirk; Hodzic, Alija; and Schneider, Karl-Uwe, 4,175,001, Cl. 176-60.000.
Hoer, Ralph A.: *See*—
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Hoffman, Michael R.: *See*—
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Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., 4,175,148, Cl. 428-171.000.
Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., 4,175,149, Cl. 428-171.000.
Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., 4,175,150, Cl. 428-171.000.
Hoffmann-La Roche Inc.: *See*—
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Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,175,086, Cl. 549-51.000.
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Muller, Jean-Claude; and Ramuz, Henri, 4,175,190, Cl. 544-323.000.
Hogfors, Enar: *See*—
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Holko, Kenneth H.; and Odell, John R., to General Atomic Company. Gas flow control circuit for plasma arc welding. 4,175,225, Cl. 219-121.00P.
Holland, Charles L.; and Hardy, Steven S., to General Dynamics Corporation. Hollow core panel insert installation device. 4,174,801, Cl. 227-4.000.
Hollis, Thomas J.; and Thornburgh, William F., to General Motors Corporation. Power cruise diverter valve. 4,174,610, Cl. 60-290.000.
Holt, William C., Jr.: *See*—
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Honda Giken Kogyo Kabushiki Kaisha: *See*—
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Honig, Guenther; Kiencke, Uwe; and Zechnall, Martin, to Robert Bosch GmbH. Digital-electronic engine ignition system. 4,174,688, Cl. 123-117.00D.
Hopkins, Donald L.; and Johnson, Gordon, to Caterpillar Tractor Co. Hydrostatic transmission with differential steering. 4,174,762, Cl. 180-6.440.
Hori, Osamu; and Kondo, Katsumi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method for surface treatment of electrode in distributor of internal combustion engine for suppressing noise. 4,175,144, Cl. 427-126.000.
Horii, Hideo: *See*—
Kaiya, Atsushi; Otsuki, Yutaka; and Horii, Hideo, 4,175,068, Cl. 260-31.2MR.
Horiike, Yasuhiro: *See*—
Niwa, Kazuo; Shibagaki, Masahiro; and Horiike, Yasuhiro, 4,175,235, Cl. 250-542.000.
Horodysky, Andrew G., to Mobil Oil Corporation. Metal salts of sulfurized olefin adducts of phosphorodithioic acids and organic compositions containing same. 4,175,043, Cl. 252-32.70E.
Hosaka, Akio, to Nissan Motor Company, Limited. Electronic closed loop air-fuel ratio control system. 4,174,689, Cl. 123-119.0EC.
Hosoya, Kazuhiro: *See*—
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Houghton, James R. Container closure with compartment. 4,174,744, Cl. 141-98.000.
Houghton, Joseph. Conduit coupling assembly. 4,174,859, Cl. 285-111.000.
Houlihan, William J.; and Nadelson, Jeffrey, to Sandoz, Inc. 4-Phenyl isoquinolines. 4,175,191, Cl. 546-144.000.
House, Robert E.; Irvin, Robert A.; and Kane, Daniel F., to Semicon, Inc. Method of fabricating high intensity solar energy converter. 4,174,561, Cl. 29-572.000.
Houseman, Kenneth R., to Litton Industrial Products, Inc. Electrolytic apparatus for recovering metal from solutions. 4,175,026, Cl. 204-272.000.
Howard, Charles R. Fishing lure. 4,174,584, Cl. 43-42.500.
Howard, Gordon H.: *See*—
Rasero, Lawrence J.; Pelchuck, John, Jr.; and Howard, Gordon H., 4,174,739, Cl. 139-388.000.
Howell, John K., Jr.; and Kulick, Leonard, to Oxy Metal Industries Corporation. Melamine-formaldehyde and tannin treatment of metal surfaces. 4,174,980, Cl. 148-6.14R.
Hoyt, Donald A.; and Fischer, Harold L., to Fulton Tool Co., Inc. Bottle testing apparatus. 4,174,633, Cl. 73-432.00R.
Hromatka, Otto: *See*—
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Hubble, David L., Sr.: *See*—
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Huet, Francois P.: *See*—
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Huffman, George W., to Eli Lilly and Company. Method for treating methicillin resistant staphylococcus aureus. 4,175,125, Cl. 424-246.000.
Hufton, Austen B.: *See*—
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Hunn, Hans; and Schwarz, Georg, to Canon, Inc. Automatic film transport monitoring system. 4,174,888, Cl. 352-170.000.
Hunt, Donald F.; and Shabanowitz, Jeffrey, to University of Virginia. Apparatus for producing ions of thermally labile or nonvolatile solids. 4,175,234, Cl. 250-427.000.
Hunter, Arthur C.; and Norman, Lloyd E., to Texas Instruments Incorporated. Burn-in test system for electronic apparatus. 4,175,286, Cl. 364-737.000.
Hunter, Byron A.; and Barrows, Franklin H., to Uniroyal, Inc. N,N-Disubstituted sulfonyl hydrazines. 4,175,200, Cl. 560-1.000.
Hunter, John. Pipe jointing. 4,174,996, Cl. 156-499.000.
Hunyadi, Laszlo; Andersson, Leif; and Mansson, Martin, to Stal-Laval Turbin AB. Combustion chamber for a gas turbine. 4,174,608, Cl. 60-39.650.
Hupalowsky, Joseph, to Wm. Wrigley Jr. Company. Dispensing apparatus. 4,174,781, Cl. 211-49.00D.
Huret, Roger H. Bicycle frame support member. 4,174,851, Cl. 280-288.000.
Hurst, George H., Jr. Detent for mechanical linkage. 4,174,550, Cl. 16-144.000.
Hydrosoil Corporation: *See*—
Webb, Jack; and Schwartz, Stanley L., 4,174,957, Cl. 71-24.000.
Hyldon, Roy G.; and O'Mahony, John S., to Quaker Oats Company, The. Method of treating hypercholesterolemia. 4,175,124, Cl. 424-180.000.
Ichikawa, Kiyoshi: *See*—
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Igarashi, Toshiji: *See*—
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Ihara, Keiichi: *See*—
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Iijima, Yaichi, to Konishiroku Photo Industry Co., Ltd. Camera. 4,174,898, Cl. 354-145.000.
Iizuka, Shigeo: *See*—
Nozawa, Takamitsu; Goto, Takayuki; Kishi, Takao; and Iizuka, Shigeo, 4,174,790, Cl. 222-321.000.
Ikeda, Chuki: *See*—
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Ikeno, Teruo; Kado, Satoshi; Otoguro, Yasuo; Miyoshi, Yasuhiko; Kato, Chuichi; and Azami, Tadao, to Nippon Steel Corporation. Stainless steel products, such as sheets and pipes, having a surface layer with an excellent corrosion resistance and production methods therefor. 4,175,163, Cl. 428-553.000.
Ikins, Thomas G., to USM Corporation. Composite film adhesive. 4,175,156, Cl. 428-336.000.
Imai, Tamotsu, to UOP Inc. Catalytic composite for oxydehydrogenation of alkylaromatic hydrocarbons. 4,175,058, Cl. 252-455.00R.
Imamura, Juichi: *See*—
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Imamura, Tetsuya; Hiraide, Takashi; Arai, Haruhiko; and Hirakura, Megumu, to Kao Soap Co., Ltd. Scouring pad containing phosphoric acid ester-fatty acid soap mixtures. 4,175,051, Cl. 252-91.000.
Imataki, Hiroyuki; Toma, Hitoshi; and Narita, Noboru, to Canon Kabushiki Kaisha. Rear projection screen. 4,174,883, Cl. 350-126.000.
Immorlica, Anthony A., Jr., to Rockwell International Corporation. Capless annealing compound semiconductors. 4,174,982, Cl. 148-13.100.

Ina, Tatsuo, to Mitsuwa Shashin Kogyo Kabushiki Kaisha. Camera tripod. 4,174,900, Cl. 354-293.000.
Inai, Yuichi: *See*—
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Inland Container Corporation: *See*—
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Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR: *See*—
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Institutul National Pentru Creatie Stiintifica Si Tehnica - Increst: *See*—
Teodorescu, Constantin; and Ardeleanu, Stefan, 4,174,921, Cl. 414-387.000.
International Business Machines Corporation: *See*—
Collins, Thomas W., 4,175,289, Cl. 365-15.000.
Mulzet, Alfred P.; and Trudgen, Gary A., 4,174,637, Cl. 73-730.000
Schaefer, Donald W., 4,175,275, Cl. 360-104.000.
International Harvester Company: *See*—
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Kuhn, Wolfgang, 4,174,615, Cl. 60-453.000.
International Minerals & Chemical Corporation: *See*—
Harris, Robert R.; and Pollack, Warren J., 4,175,063, Cl. 260-22.00R.
International Nickel Company, Inc., The: *See*—
Hill, Brian, 4,175,117, Cl. 423-594.000.
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International Standard Electric Corporation: *See*—
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International Telephone & Telegraph Corporation: *See*—
Asaki, James T., 4,175,279, Cl. 362-18.000.
McCartney, Ronald L., 4,174,882, Cl. 350-96.210.
Williams, Roy K., 4,174,663, Cl. 100-53.000.
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Irvin, Robert A.: *See*—
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Ishida, Yoshio; Sakai, Masao; Tsuzurahara, Mamoru; Inamura, Ichiro, and Oguro, Tomokatsu, to Hitachi, Ltd. Magnetron magnet assembly. 4,175,245, Cl. 315-39.710.
Ishihara, Nobuhiko *See*—
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Ishizuka, Yutaka, to Diesel Kiki Company, Ltd. Vane for rotary compressor. 4,174,931, Cl. 418-259.000.
Isoz, Peter: *See*—
Linnman, Sven N. J.; Isoz, Peter; Branderud, Nils P.; and Udden, Per E. C., 4,175,255, Cl. 328-7.000.
Itek Corporation: *See*—
Robbins, Daniel H., 4,174,817, Cl. 242-57.000
Ito, Akira; Sasaki, Heizo; Osawa, Masanori; Iwao, Tetsuya; and Iwata, Kenji, to Mitsui Toatsu Chemicals, Inc. Catalyst for polymerizing α-olefins. 4,175,171, Cl. 526-125.000.
Ito, Tateo, and Kaneko, Tomijiro, to Obata Industry & Commerce Co., Ltd. Method for improving the properties of natural products composed mainly of calcium carbonate. 4,175,146, Cl. 427-304.000.
ITT Industries, Inc.: *See*—
Oberthur, Heinrich, 4,174,867, Cl. 303-6.00C.
Iwao, Tetsuya: *See*—
Ito, Akira; Sasaki, Heizo; Osawa, Masanori; Iwao, Tetsuya, and Iwata, Kenji, 4,175,171, Cl. 526-125.000.
Iwaoka, Kazuo; Toh, Tagao; and Fukada, Minoru, to Matsushita Electric Industrial Co., Ltd. Catalytic exhaust gas purifying device. 4,175,107, Cl. 422-114.000.
Iwata, Kenji: *See*—
Ito, Akira; Sasaki, Heizo; Osawa, Masanori; Iwao, Tetsuya; and Iwata, Kenji, 4,175,171, Cl. 526-125.000.
Iwatsu Electric Co., Ltd.: *See*—
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Iwaya, Toshio: *See*—
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J.J. & M.: *See*—
Persik, James E.; and Persik, Gerald E., 4,174,559, Cl. 29-509.000.
J. Lorch Gesselschaft & Co. KG: *See*—
Heilmann, Roland, 4,174,730, Cl. 137-271.000.
Jabsen, Felix S., to Babcock & Wilcox Company, The. Method for inspecting nuclear reactor fuel elements. 4,175,000, Cl. 176-19.00R.
Jabsen, Felix S., to Babcock & Wilcox Company, The. Fuel assembly guide tube. 4,175,004, Cl. 176-76.000.
Jacko, Michael G.: *See*—
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Jackson, W. Shaun; and Bohm, Leslie E. Pannier mounting arrangement for cycles. 4,174,795, Cl. 224-32.00A.
Jahn, Gerhard. Loose leaf binder. 4,174,909, Cl. 402-13.000.
Jalali-Karchay, Mir Javid. Turbocharger control system. 4,174,617, Cl. 60-602.000.
Jalbert, Henry A., to United Technologies Corporation. Ceramic base and cap useful in firing ceramic shell molds. 4,174,950, Cl. 432-6.000.
James, David R.: *See*—
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James, Henry T.: *See*—
Daly, Thomas W.; Hoer, Ralph A.; Walsh, James E.; and James, Henry T., 4,174,975, Cl. 106-161.000.
Janata, Jiri; and McBride, Paul T., to University of Utah. Method of sterilizing reference electrodes and the like. 4,175,020, Cl. 204-195.00B.
Jankelson, Bernard; and Radke, John C., to Jankelson, Bernard. 4,5,6-Trinor-3,7-inter-m-phenylene prostaglandin A_1 analogs. 4,174,706, Cl. 128-741.000.
Jansche, Walter: *See*—
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Jansen, Adolf E., to Douwes International B.V. Liquid sampler. 4,174,632, Cl. 73-422.00R.
Jansen, William D.: *See*—
Link, William T.; Haney, Jerry D.; and Jansen, William D., 4,174,707, Cl. 128-681.000.
Janssen Pharmaceutica N.V.: *See*—
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,175,129, Cl. 424-267.000.
Jeantet, Henri: *See*—
Callet, Robert; and Jeantet, Henri, 4,174,599, Cl. 53-512.000.
Jenkins, Theron W., Jr.; and Barber, Justus C., to Leeds & Northrup Company. Decoupled cascade control system. 4,174,618, Cl. 60-664.000.
Jennings, Robert E., to General Motors Corporation. Method of forming a flexible tapered end for an extruded plastic molding strip. 4,174,986, Cl. 156-160.000.
Jin, Sungho: *See*—
Chin, Gilbert Y.; Jin, Sungho; Plewes, John T.; and Wonsiewicz, Bud C., 4,174,983, Cl. 148-102.000.
John Zink Company: *See*—
Reed, Robert D., 4,174,943, Cl. 431-41.000.
Johnson, Delmar R.; Flint, John R.; Wells, Thomas R.; Erikson, Rolf B.; and Rady, Bruce A., to Bell & Howell Company. Electronically controlled microfilm photographic image utilization device. 4,174,890, Cl. 353-26.00A.
Johnson, Gordon: *See*—
Hopkins, Donald L.; and Johnson, Gordon, 4,174,762, Cl. 180-6.440.
Johnson, Robert N.; and Farnham, Alford G., to Union Carbide Corporation. Polyarylene polyethers. 4,175,175, Cl. 528-125.000.
Johnston, Robert J.; Laycak, Stephen G.; and Dobrosielski, Stephen S., to Westinghouse Electric Corp. Convertible selector switch. 4,175,220, Cl. 200-4.000.
Joly, Jean: *See*—
Guillermin, Rene; Joly, Jean; and Sangalli, Silvio, 4,175,157, Cl. 428-369.000.
Jones, Eldon D. Dispensing apparatus for a vehicle having closure gate clearing member. 4,174,792, Cl. 222-608.000.
Joseph, Bernard W.; and Gara, Aaron D., to General Motors Corporation. Filter rotator for coherent optical correlation system. 4,174,885, Cl. 350-162.0SF.
Jundt, Werner; Bodig, Bernd; Decker, Heinz; Schmidt, Gunther; Wurst, Bert; Seeger, Karl; and Roozenbeek, Herman, to Robert Bosch GmbH. Ignition system. 4,174,696, Cl. 123-148.00E.
Junge, Bodo; Krause, Hans-Peter; Muller, Lutz; Puls, Walter; and Stoltefuss, Jurgen, to Bayer Aktiengesellschaft. Amino-sugar derivatives, process for their preparation and pharmaceutical composition thereof. 4,175,123, Cl. 424-180.000.
Juvinall, Jonn W., to Owens-Illinois, Inc. Method and apparatus of cavity identification of mold of origin. 4,175,236, Cl. 250-566.000.
Kabel- und Metallwerke Guthehoffnungshutte Aktiengesellschaft: *See*—
Artbauer, Jan, 4,175,212, Cl. 174-128.00R.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
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Imamura, Tetsuya; Hiraide, Takashi; Arai, Haruhiko; and Hirakura, Megumu, 4,175,051, Cl. 252-91.000.
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Kasper, Erich, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Process for automatically vertically butt welding steel sheet material for containers. 4,175,227, Cl. 219-125.120.

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Honig, Guenther; Kiencke, Uwe; and Zechnall, Martin, 4,174,688, Cl. 123-117.00D.

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Disch, Karlheinz; and Kiewert, Eva, 4,175,062, Cl. 252-540.000.

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Kim, Tai K., to GTE Sylvania Incorporated. Process for extracting tungsten from alkali metal tungstate solutions. 4,175,109, Cl. 423-54.000.

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Smith, Arthur W.; and Kimble, George D., 4,174,807, Cl. 236-47.000.

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Bakker, Pieter M.; and Kind, Cornelis E., 4,175,092, Cl. 260-456.00R.

King, John M.: *See—*
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Kispert, Klaus; Manger, Werner; and Weineck, Paul, to SKF Industrial Trading & Development Company B.V. Multi-part antifriction bearing cage. 4,174,870, Cl. 308-217.000.

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Fujii, Takashi; and Kizaki, Jiro, 4,174,786, Cl. 220-378.000.

Kleemann, Axel; Kiel, Reinhold; and Nubert, Ingomar, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of [1,1-dithienyl-(3)-1-hydroxypropyl-(3)]-[1-phenyl-1-hydroxypropyl-(2)]-amine and [1,1-dithienyl-(3)-propen-(1)-yl-(3)]-[1-phenylpropyl-(2)]-amine. 4,175,088, Cl. 549-59.000.

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Klusmier, Kenneth L., to Morgan Construction Company. Hexagonal bundle forming apparatus. 4,174,662, Cl. 100-7.000.

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Wessel, Wolf; Stumpp, Gerhard; and Knapp, Heinrich, 4,174,692, Cl. 123-139.0AW.

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Kobayashi, Toshio: *See—*
Nakano, Ichizo; Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; and Yamamoto, Yoichi, 4,175,266, Cl. 346-75.000.

Koch, Christian: *See—*
Kusebauch, Walter; Kostka, Hana; Henkel, Hans-Joachim; Koch, Christian; de Bucs, Eugen S.; and Weber, Theo, 4,174,954, Cl. 48-212.000.

Koel, Gerrit J.; and Gerkema, Jan, to U.S. Philips Corporation. Method of reinforcing a conductive base pattern by electroplating and device obtained by means of the method. 4,175,010, Cl. 204-15.000.

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Schweier, Guenther; Bachl, Robert; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Gruber, Wolfgang; and Kolk, Erich, 4,175,170, Cl. 526-125.000.

Kolombos, Alexander J.: *See—*
Davies, Evan E.; and Kolombos, Alexander J., 4,175,057, Cl. 252-455.00Z.

Kolze, Lawrence A., to Eaton Corporation. Pressure operated pilot control shut-off valve. 4,174,824, Cl. 251-30.000.

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Lidorenko, Nikolai S.; Evdokimov, Vladimir M.; Zadde, Vitaly V.; Kozlov, Alexandr I.; Ryabikov, Stanislav V.; Potapov, Valery N.; Strebkov, Dmitry S.; Surianinova, Tatiana I.; Chubrikov, Boris A.; Zatravina, Valentina V.; Korolev, Boris V.; Kulikov, Viktor F.; Zhuravleva, Larisa L.; Unishkov, Vadim A.; Dormidontov, Anatoly A.; Moiseev, Viktor I.; and Kudeshova, Ljubov P., 4,174,978, Cl. 136-89.0PC.

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Krause, Hans-Peter: *See—*
Junge, Bodo; Krause, Hans-Peter; Muller, Lutz; Puls, Walter; and Stoltefuss, Jurgen, 4,175,123, Cl. 424-180.000.

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Creamer, Edward D.; and Krumpelt, Michael, 4,175,025, Cl. 204-253.000.

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Goto, Yukio; Nakai, Osamu; and Yoshimori, Ikuo, 4,174,557, Cl. 29-157.10R.
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Lidorenko, Nikolai S.; Evdokimov, Vladimir M.; Zadde, Vitaly V.; Kozlov, Alexandr I.; Ryabikov, Stanislav V.; Potapov, Valery N.; Strebkov, Dmitry S.; Surianinova, Tatiana I.; Chubrikov, Boris A.; Zatravina, Valentina V.; Korolev, Boris V.; Kulikov, Viktor F.; Zhuravleva, Larisa L.; Unishkov, Vadim A.; Dormidontov, Anatoly A.; Moiseev, Viktor I.; and Kudeshova, Ljubov P., 4,174,978, Cl. 136-89.0PC.

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Howell, John K., Jr.; and Kulick, Leonard, 4,174,980, Cl. 148-6.14R.

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Ozawa, Kohe; Hosoya, Kazuhiro; Kurita, Jiro; and Honda, Makoto, 4,175,176, Cl. 526-309.000.

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Tung, Wei-Ling; and Kwan, Steven, 4,174,673, Cl. 116-34.00R.

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Drouzy, Michel L.; Richard, Michel M.; Huet, Francois P.; and Lacau, Henri M., 4,174,972, Cl. 106-64.000.

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Cassell, Ralph M., 4,174,981, Cl. 148-12.00B.

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Tsao, George T.; Ladisch, Michael R.; and Bose, Arindam, 4,174,976, Cl. 127-37.000.

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McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., 4,175,209, Cl. 562-473.000.

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Jenkins, Theron W., Jr.; and Barber, Justus C., 4,174,618, Cl. 60-664.000.

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Marass, Josef; and Liepert, Rudolf. 4,174,831, Cl. 271-159.000.

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Hall, Floyd V., 4,174,720, Cl. 131-90.000.

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Hendriksen, Barry A., 4,174,960, Cl. 71-121.000.
Ross, William J.; Todd, Alex; and Verge, John P., 4,175,131, Cl. 424-272.000.

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Carlsson, Jan P. E.; Axen, Rolf E. A. V.; Drevin, Hakan N. Y.; and Lindgren, Goran E. S., 4,175,073, Cl. 260-112.00R.

Lindstrom, Ivan T., to Copeland Corporation. Refrigeration compressor lubrication. 4,174,927, Cl. 417-372.000.

Link, William T.; Haney, Jerry D.; and Jansen, William D., to American Optical Corporation. Apparatus and process for antifact rejection through cross correlation in sphygmometry. 4,174,707, Cl. 128-681.000.

Linnman, Sven N. J.; Isoz, Peter; Branderud, Nils P.; and Udden, Per E. C. Device to protect against flow of current. 4,175,255, Cl. 328-7.000.

Lipodat, Konstantin K.: *See*—
Skakunov, Mikhail G.; Lipodat, Konstantin K.; Karasev, Leonid V.; and Modzelevsky, Vilgelm V., 4,174,989, Cl. 156-156.000.

List, Hans: *See*—
Kirchweger, Karl; and Roschmann, Josef, 4,174,574, Cl. 33-126.70R.

Litton Industrial Products, Inc.: *See*—
Houseman, Kenneth R., 4,175,026, Cl. 204-272.000.

Lollar, Elizabeth D.: *See*—
Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,175,086, Cl. 549-51.000.

Lombardi, Bernard; and Lunel, Jean, to Rhone-Poulenc Industries. Polyheterocyclic-antibiotic. 4,175,126, Cl. 424-263.000.

Long, Olan L., to White-Westinghouse Corporation. Dishwasher water distribution apparatus. 4,174,723, Cl. 134-144.000.

Lonseth, Wayne F., to Esquire, Inc. Ceiling mounted support structure. 4,175,281, Cl. 362-148.000.

Love, Robert B.; and Bowen, Alan W., to Battelle Development Corporation. Two-sided planar magnetron sputtering apparatus. 4,175,030, Cl. 204-298.000.

Lubashevsky, Alexei V.: *See*—
Kremlev, Vyacheslav Y.; Nazarian, Artashes R.; Lubashevsky, Alexei V.; and Kokin, Vilyam N., 4,175,240, Cl. 307-205.000.

Lucey, George K., Jr.; and Orrell, Michael G., to United States of America, Army. Springless impact switch. 4,174,666, Cl. 102-216.000.

Luchaco, David G., to Bendix Corporation, The. Two-group/simultaneous full injection conversion system for multiple cylinder engines. 4,174,681, Cl. 123-32.0EA.

Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., to Masonite Corporation. Post-press molding of man-made boards to produce contoured furniture parts. 4,175,105, Cl. 264-112.000.

Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., to Masonite Corporation. Product containing high density skins on a low density core and method of manufacturing same. 4,175,148, Cl. 428-171.000.

Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., to Masonite Corporation. Mineral wool product containing high density skins and method of manufacturing same. 4,175,149, Cl. 428-171.000.

Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., to Masonite Corporation. Urea containing high density skin fiberboard with a low density core. 4,175,150, Cl. 428-171.000.

Luck, Allan J.: *See*—
Clarke, John T.; Luck, Allan J.; and Sutton, Roger F., 4,175,106, Cl. 264-118.000.

Lunel, Jean: *See*—
Lombardi, Bernard; and Lunel, Jean, 4,175,126, Cl. 424-263.000.

Lusk, Edwin B.; Riley, Douglas C., Jr.; and Creadh, Joseph P., III, to Stauffer Chemical Company. Process for purification of gases containing elemental sulfur. 4,175,112, Cl. 423-242.000.

Lutsker, Vladimir L.: *See*—
Grakov, Anatoly N.; Grebennik, Oleg I.; Dudin, Jury A.; Lutsker, Vladimir L.; Makarov, Valery N.; Ogolikhin, Viktor M.; and Khrustaleva, Tatyana P., 4,174,929, Cl. 417-437.000.

Maahs, Gunther; and Rombusch, Konrad, to Chemische Werke Huls, A.G. Process for the manufacture of pentachlorovinylacetyl chloride. 4,175,095, Cl. 260-544.00Y.

Maccario, Floriano A.; and Affinita, Tommaso. Structural steel clamped joint. 4,174,911, Cl. 403-303.000.

MacKay, Kenneth D.; and Rogier, Edgar R., to Henkel Corporation. β-Diketones and the use thereof as metal extractants. 4,175,012, Cl. 204-108.000.

Maddux, Richard H. Extensible splint. 4,174,709, Cl. 128-85.000.

Madlener, Paul, to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Land mine construction particularly an antipersonnel splinter mine. 4,174,665, Cl. 102-8.000.

Maeda, Riichi. Abrasive blasting machine. 4,174,593, Cl. 51-435.000.

Maestri, Bruno. Magazine device for continuously feeding nails into a nail driving machine. 4,174,802, Cl. 227-109.000.

Maishev, Jury P.: *See*—
Kovalsky, Georgy A.; Maishev, Jury P.; Egorov, Boris A.; and Dmitriev, Jury A., 4,175,029, Cl. 204-298.000.

Makarevich, Ivan F.; Khadzhai, Yaroslav I.; Pavlova, Valeria V.; and Nikolaeva, Anastasia V., to Kharkovsky Naucho-Issledovatelsky Khimfo-Farmatsevtiches-Ky Institut. Cardenolide and bufadienolide derivatives of ajmaline and process for producing same. 4,175,078, Cl. 260-239.570.

Makarov, Valery N.: *See*—
Grakov, Anatoly N.; Grebennik, Oleg I.; Dudin, Jury A.; Lutsker, Vladimir L.; Makarov, Valery N.; Ogolikhin, Viktor M.; and Khrustaleva, Tatyana P., 4,174,929, Cl. 417-437.000.

Mal, M. Kumar; and Tarkan, Stuart E., to Chromalloy American Corporation. Titanium carbide tool steel composition for hot-work application. 4,174,967, Cl. 75-237.000.

Manfreda, Alfred, to Siemens Aktiengesellschaft. Selectively tunable heterodyne receiver. 4,175,244, Cl. 325-433.000.

Manger, Werner: *See*—
Kispert, Klaus; Manger, Werner; and Weineck, Paul, 4,174,870, Cl. 308-217.000.

Mann, Don C., to Texas Instruments Incorporated. Recording system with flexible magnetic recording disc. 4,175,274, Cl. 360-99.000.

Manning Environmental Corp.: *See*—
Fleenor, Richard P.; and Cassady, Henry W., Jr., 4,174,722, Cl. 134-62.000.

Mansson, Martin: *See*—
Hunyadi, Laszlo; Andersson, Leif; and Mansson, Martin, 4,174,608, Cl. 60-39.650.

Mantha, Nagaraja S., to Agrimel Ltd. Methionine hydroxy analog-containing feed for lactating cows. 4,175,121, Cl. 424-94.000.

Marass, Josef; and Liepert, Rudolf, to Georg Spiess GmbH. Device for inscrting a new stack of sheets in feeding position without interruption of sheet-feeding mechanism operation. 4,174,831, Cl. 271-159.000.

Marrs, Duane K. Golf club including putting green slope correction aiming lines. 4,174,839, Cl. 273-183.00D.

Marsili, Leonardo: *See*—
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,175,077, Cl. 260-239.30P.

Martin, Alfred J.: *See*—
Lewis, John G.; Martin, Alfred J.; Meinke, William W.; Ricker, Charles W.; and Teitel, Robert J., 4,175,016, Cl. 204-157.10H

Martin, Richard H.; and Owens, William F., Jr., to Olin Corporation. Microperforated filter tip cigarette. 4,174,719, Cl. 131-10.00A.

Martin, Virgil B.; and Villers, Roger L., to Gehl Company. Chain drive including sprocket having alternate wide and narrow teeth. 4,174,642, Cl. 74-243.00R.

Marumoto, Katsuji: *See*—
Ohmae, Tsutomu; and Marumoto, Katsuji, 4,174,645, Cl. 74-866.000.

Marvin Glass & Associates: *See*—
Breslow, Jeffrey D.; Ferris, Michael J.; Arias, Henry; and Wozniak, Walter J., 4,174,835, Cl. 273-101.000.

Maryland Cup Corporation: *See*—
West, John B., 4,174,789, Cl. 222-240.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Fuhrmann, Wolfgang, 4,174,687, Cl. 123-90.130.

Masologites, George P.: *See*—
Sun, Jui-Yuan; Yoo, Jin S.; Burk, Emmett H., Jr.; and Masologites, George P., 4,174,953, Cl. 44-1.00R.

Masonite Corporation: *See*—
Clarke, John T.; Luck, Allan J.; and Sutton, Roger F., 4,175,106, Cl. 264-118.000.
Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., 4,175,105, Cl. 264-112.000.
Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., 4,175,148, Cl. 428-171.000.
Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., 4,175,149, Cl. 428-171.000.
Luck, Allan J.; Clarke, John T.; and Hoffman, Michael R., 4,175,150, Cl. 428-171.000.

Massachusetts Institute of Technology: *See*—
Cannell, David S.; Giglio, Marzio; Benedek, George B.; von Schulthess, Gustav K.; and Cohen, Richard J., 4,174,952, Cl. 23-230.00B.
Suh, Nam P.; Rotz, Christopher A.; Erwin, Lewis, II; Melcher, James R.; and Hoburg, James F., 4,174,907, Cl. 366-279.000.

Mastrioanni, Rudolph G.: *See*—
Smith, Peter W.; and Mastrioanni, Rudolph G., 4,175,257, Cl. 330-287.000.

Masuda, Toshiyuki; and Sasaki, Takehiko, to Sharp Kabushiki Kaisha. Electronic watch having stopwatch function. 4,174,606, Cl. 58-39.500.

Mathbirk, Limited: *See*—
Birkhamshaw, Ronald G., 4,174,670, Cl. 112-25.000.

Mathes, Arnold; Person, Norman D.; and Vermeer, Stanley J., to Vermeer Manufacturing Company. Automatic round bale twine wrapping assembly. 4,174,661, Cl. 100-5.000.

Matsumoto, Kunio, to Copal Company Limited. X-Class synchronization contact means for electric shutters. 4,174,897, Cl. 354-133.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Iwaoka, Kazuo; Toh, Tagao; and Fukada, Minoru, 4,175,107, Cl. 422-114.000.

Matsuyoshi, Hideaki; Shimono, Yukio; Tsutsui, Yuji; Miyuki, Shigeru; Watanabe, Takao; and Mizota, Hideaki, to Kubota, Ltd. Running travel maneuvering apparatus for an engineering work vehicle. 4,174,761, Cl. 180-6.700

Matsuzaka, Eiichi: *See*—
Sato, Atsushi; Shimizu, Isoo; and Matsuzaka, Eiichi, 4,175,278, Cl. 361-315.000.

Mattel, Inc.: *See*—
Morin, Marius J.; Gabler, Otto L.; and Kilroy, Eugene J., 4,174,587, Cl. 46-1.00K.

Maurhoff, Gerhard: *See*—
Steinwart, Johannes; Maurhoff, Gerhard; and Bauder, Armin, 4,174,693, Cl. 123-139.0AW.

Mazzorana, Alfred B. Electric starter for an engine. 4,175,237, Cl. 290-38.00R.

McArthur, Donald A. Flue control assembly. 4,174,942, Cl. 431-20.000.

McBride, Paul T.: *See*—
Janata, Jiri; and McBride, Paul T., 4,175,020, Cl. 204-195.00B.

McCain Manufacturing Corporation: *See*—
McCain, William B.; Cosgrove, James F.; and Bewersdorf, Elmer, 4,174,829, Cl. 270-55.000.

McCain, William B.; Cosgrove, James F.; and Bewersdorf, Elmer, to McCain Manufacturing Corporation. Newspaper stuffers. 4,174,829, Cl. 270-55.000.

McCartney, Ronald L., to International Telephone and Telegraph Corporation. Single optical fiber connector. 4,174,882, Cl. 350-96.210.

McCracken, Oliver W.: *See*—
Roark, James T.; and McCracken, Oliver W., 4,174,729, Cl. 137-487.500.

McEntire, Edward E., to Texaco Development Corp. Bis(dimethylaminopropyl)-amine derivatives as polyurethane catalysts. 4,175,097, Cl. 260-570.50P.

McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., to American Hoechst Corporation. Preparation of 6,11-dihydro-11-oxodibenz[b,e]-oxepin-2-acetic acid and precursors therefor. 4,175,209, Cl. 562-473.000.

McGuigan, Charles G.: *See*—
Arena, John P.; McGuigan, Charles G.; and Rossi, Gene A., 4,174,843, Cl. 277-3.000.

McKendree, Scott W. Feather plucking device. 4,174,551, Cl. 17-11.10R.

McKnight, Hugh P.; and Welty, Kenneth B., to Eli Lilly and Company. Apparatus for continuously orienting plastic and other types of bottles. 4,174,775, Cl. 198-397.000.

McKnight, John R. Commercial fishing net assembly with a porpoise escape zone. 4,174,582, Cl. 43-14.000.

McLaughlin, Donald W.; and Fetterer, Gerald F., to GTE Automatic Electric Laboratories Incorporated. Multiport conference circuit. 4,175,215, Cl. 179-18.0BC.

McNulty, John G.: *See*—
Selwitz, Charles M.; and McNulty, John G., 4,175,210, Cl. 568-689.000.

McSherry, Thomas W.; and Garfield, Nathaniel H., to Mechanical Plastics Corp. Paper clip and binder device. 4,174,910, Cl. 402-19.000.

Mead Corporation, The: *See*—
Sanders, Carlos L.; and Gebhardt, James L., 4,174,580, Cl. 40-518.000.

Meadows, Roger D., to Dayco Corporation. Machine for and method of making tubular conduit of indefinite length. 4,174,984, Cl. 156-143.000.

Mechanical Plastics Corp.: *See*—
McSherry, Thomas W.; and Garfield, Nathaniel H., 4,174,910, Cl. 402-19.000.

Mego Corp.: *See*—
Hennig, Michael; and Reiner, Lawrence, 4,174,833, Cl. 273-1.00E.

Meguro, Kanji: *See*—
Kuwada, Yutaka; Natsugari, Hideaki; and Meguro, Kanji, 4,175,079, Cl. 260-243.300.

Mehl, Thomas L. Device for permanent removal of hair. 4,174,713, Cl. 128-303.130.

Mehl, Thomas L. Method for permanent removal of hair. 4,174,714, Cl. 128-303.130.

Meier, Hermann R. E., to AB Volvo Penta. Two stroke cycle internal combustion engine. 4,174,685, Cl. 123-73.00A.

Meiji Seika Kaisha Ltd.: *See*—
Seki, Shigeo; Nakabayashi, Satoru; Saito, Toshinori; Fukatsu, Shunzo; Nakajima, Shokichi; and Ishimaru, Toshiyasu, 4,175,185, Cl. 544-28.000.

Meinke, William W.: *See*—
Lewis, John G.; Martin, Alfred J.; Meinke, William W.; Ricker, Charles W.; and Teitel, Robert J., 4,175,016, Cl. 204-157.10H.

Meischen, Sandra J.: *See*—
Gale, Glen R.; and Meischen, Sandra J., 4,175,133, Cl. 424-287.000.

Meister, Herbert, to Herbert Meister and Co. Heat and solvent resistant flexible gasket means and process for production thereof. 4,174,990, Cl. 156-158.000.

Melcher, James R.: *See*—
Suh, Nam P.; Rotz, Christopher A.; Erwin, Lewis, II; Melcher, James R.; and Hoburg, James F., 4,174,907, Cl. 366-279.000.

Menard, Scott S.: *See*—
Kottke, Roger H.; and Menard, Scott S., 4,175,067, Cl. 260-30.40R.

Merck & Co., Inc.: *See*—
Cragoe, Edward J., Jr.; and Bicking, John B., 4,175,203, Cl. 560-55.000.

Zimmerman, Sheldon B.; and Chalmers, John H., Jr., 4,175,007, Cl. 435-105.000.

Merila, John B. Soda straw dispenser. 4,174,787, Cl. 221-254.000.

Merkle, Hans; Mueller, Albrecht; and Zoller, Karl, to BASF Aktiengesellschaft. Manufacture of 2,1,3-thiadiazin-4-one-2,2-dioxide derivatives. 4,175,184, Cl. 544-10.000.

Mesney, Douglas T. Rotatable stage for a camera. 4,174,887, Cl. 352-87.000.

Messer Griesheim GmbH: *See*—
Tocha, Klaus, 4,174,619, Cl. 62-52.000.

Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See*—
Bruderle, Ernst; Gottzein, Eveline; and Bittner, Helmut, 4,174,819, Cl. 244-169.000.

Meyer, Arnold: *See*—
Wassermann, Martin; Noweck, Klaus; and Meyer, Arnold, 4,175,118, Cl. 423-628.000.

Michelson, Herb. Soot blowing apparatus. 4,174,549, Cl. 15-318.000.

Mikulin, Tom T. Drafting instrument. 4,174,572, Cl. 33-31.000.

Milberger, Lionel J.; and Sasser, Byrd M., Jr. Transducer for determining strain data during piling. 4,174,625, Cl. 73-11.000.

Miller, Frank, to American Cyanamid Company. Process for the preparation of 1-chloro-2-hydroxy-3-naphthoic acid. 4,175,208, Cl. 562-467.000.

Miller, Ralph, to Ciba-Geigy Corporation. Non-electrolytic production of chlorine utilizing HCl derived from a cyanogen chloride process. 4,175,116, Cl. 423-500.000.

Miller, Roger D.: *See*—
Neuss, Norbert; and Miller, Roger D., 4,174,772, Cl. 435-32.000.

Milliken Research Corporation: *See*—
Arnott, Robert C.; and Willbanks, Charles E., 4,174,664, Cl. 101-127.000.
Willbanks, Charles E., 4,174,555, Cl. 26-16.000.

Minamitani, Eiji: *See*—
Ayano, Mitsutoshi; and Minamitani, Eiji, 4,175,218, Cl. 179-170.200.

Minolta Camera Kabushiki Kaisha: *See*—
Murasaki, Hiroshi; Enoguchi, Yuji; Wada, Kenichi; and Fujiwara, Takao, 4,174,904, Cl. 355-8.000.
Nakamura, Akiyoshi, 4,174,886, Cl. 350-215.000.
Tanaka, Harumi, 4,174,899, Cl. 354-213.000.

Mitchell, Robert D.; and Schulz, Albert C., to Combustion Engineering, Inc. Forming an extruded bar out of metal chips. 4,174,933, Cl. 425-79.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Oishi, Hideo, 4,174,749, Cl. 165-11.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
Ito, Akira; Sasaki, Heizo; Osawa, Masanori; Iwao, Tetsuya; and Iwata, Kenji, 4,175,171, Cl. 526-125.000.

Mitsuwa Shashin Kogyo Kabushiki Kaisha: *See*—
Ina, Tatsuo, 4,174,900, Cl. 354-293.000.

Mitumori, Yoshio: *See*—
Harakawa, Mototaka; and Mitumori, Yoshio, 4,175,262, Cl. 340-388.000.

Mixner, Ingomar, to U.S. Philips Corporation. Shaving head for dry-shaving apparatus. 4,174,568, Cl. 30-34.100.

Miyoshi, Yasuhiko: *See*—
Ikeno, Teruo; Kado, Satoshi; Otoguro, Yasuo; Miyoshi, Yasuhiko; Kato, Chuichi; and Azami, Tadao, 4,175,163, Cl. 428-553.000.

Miyuki, Shigeru: *See*—
Matsuyoshi, Hideaki; Shimono, Yukio; Tsutsui, Yuji; Miyuki, Shigeru; Watanabe, Takao; and Mizota, Hideaki, 4,174,761, Cl. 180-6.700.

Mizokami, Kazunori; and Kawarada, Osamu, to Olympus Optical Co., Ltd. Adapter for electronic flash unit. 4,174,896, Cl. 354-132.000.

Mizota, Hideaki: *See*—
Matsuyoshi, Hideaki; Shimono, Yukio; Tsutsui, Yuji; Miyuki, Shigeru; Watanabe, Takao; and Mizota, Hideaki, 4,174,761, Cl. 180-6.700.

Mizukami, Fujio; and Imamura, Juichi, to Director-General of the Agency of Industrial Science and Technology. Method for the preparation of α-tetralone. 4,175,098, Cl. 260-590.0FA.

Mobil Oil Corporation: *See*—
Chen, Nai Y.; and Yan, Tsoung-Yuan, 4,175,211, Cl. 585-241.000.
Coant, Pierre M.; and Munns, George W., Jr., 4,175,046, Cl. 252-56.00S.
Driscoll, Patrick R., 4,175,081, Cl. 548-140.000.
Heiba, El Ahmadi I.; and Dessau, Ralph M., 4,175,089, Cl. 260-343.600.
Herrington, F. John, 4,174,932, Cl. 425-72.00R.
Horodysky, Andrew G., 4,175,043, Cl. 252-32.70E.
Plank, Charles J.; Rosinski, Edward J.; and Rubin, Mae K., 4,175,114, Cl. 423-329.000.
Schick, John W.; and Kaminski, Joan M., 4,175,047, Cl. 252-56.00S.

Modzelevsky, Vilgelm V.: *See*—
Skakunov, Mikhail G.; Lipodat, Konstantin K.; Karasev, Leonid V.; and Modzelevsky, Vilgelm V., 4,174,989, Cl. 156-156.000.

Moertel, George B., to Textron Inc. Molded element tape support for invisible slide fastener and method of manufacture. 4,175,104, Cl. 264-103.000.

Mohring, Edgar; and Muller, Hanns P., to Bayer Aktiengesellschaft. Process for the removal of lead ions from formose. 4,175,015, Cl. 204-131.000.

Moiseev, Viktor I.: *See*—
Lidorenko, Nikolai S.; Evdokimov, Vladimir M.; Zadde, Vitaly V.; Kozlov, Alexandr I.; Ryabikov, Stanislav V.; Potapov, Valery

N.; Strebkov, Dmitry S.; Surianinova, Tatiana I.; Chubrikov, Boris A.; Zatravina, Valentina V.; Korolev, Boris V.; Kulikov, Viktor F.; Zhuravleva, Larisa L.; Unishkov, Vadim A.; Dormidontov, Anatoly A.; Moiseev, Viktor I.; and Kudeshova, Ljubov P., 4,174,978, Cl. 136-89.0PC.

Mol, Hans C., to Pitney Bowes, Inc. Sheet feeder for a collator. 4,174,830, Cl. 270-58.000.

Molins Limited: *See—*
Farrar, David J.; Davies, Robert W.; Carter, David C. M.; Bolt, Reginald C.; and Williams, Robert E., 4,174,780, Cl. 209-536.000

Mondshine, Thomas C., to Texas Brine Corporation. Well completion and work over fluid and method of use. 4,175,042, Cl. 252-8.55R.

Monsanto Company: *See—*
Dobo, Emerick J.; and Graham, Tommy E., 4,175,153, Cl. 428-398.000.

Moon, William T., Jr.; Rogers, Arden D.; Goff, Clifford E.; and Bannon, Harry B., to Robertshaw Controls Company. Pneumatic indicator device and method of making the same. 4,174,564, Cl. 29-622.000.

Moore, Ronald D.; and Bethel, Everett L., to Chivas Products Ltd. Method and apparatus for making padded straps. 4,174,988, Cl. 156-213.000.

Morcom, William R.: *See—*
Sanders, Thomas J.; Morcom, William R.; and Davis, Jacob A., 4,174,562, Cl. 29-578.000.

Moren, Nils F. E.; and Wetterlin, Kjell I. L., to Aktiebolaget Draco. Device for use with medicinal inhalation devices. 4,174,712, Cl. 128-173.00R.

Morgan Construction Company: *See—*
Klusmier, Kenneth L., 4,174,662, Cl. 100-7.000.

Morgan, Denny E., to Bunker Ramo Corporation. Transistor bias circuit. 4,175,250, Cl. 323-22.00T.

Morin, Marius J.; Gabler, Otto L.; and Kilroy, Eugene J., to Mattel, Inc. Air turbine operated vehicle accelerator toy. 4,174,587, Cl. 46-1.00K.

Moriyama, Noboru: *See—*
Shibazaki, Hiroji; Edagawa, Setsuji; Hasegawa, Hisashi; Takeuchi, Takashi; Moriyama, Noboru; and Fukuyama, Yukihiro, 4,175,066, Cl. 260-29.60M.

Morris, James C.: *See—*
Newell, P. Bruce; Morris, James C.; and Waymouth, John F., 4,174,944, Cl. 431-359.000.

Morrow, Richard B. A.: *See—*
Triplett, William C.; and Morrow, Richard B. A., 4,175,263, Cl. 340-573.000.

Moshal, John H.; and Murray, Alan B. Vehicle control speed sensing method. 4,174,765, Cl. 180-313.000.

Moss, Noel S.: *See—*
Bagga, Madan M.; and Moss, Noel S., 4,175,173, Cl. 528-97.000.

Motorola, Inc.: *See—*
Dolikian, Arman V., 4,175,256, Cl. 328-149.000.

Mowli, John C.; and Bala, Harry. Process for wrapping articles and providing reclosable container. 4,174,597, Cl. 53-410.000.

Moyer, William H., Jr., to Bethlehem Steel Corporation. Method for increasing fine coal filtration efficiency. 4,175,035, Cl. 209-5.000.

Mueller, Albrecht: *See—*
Merkle, Hans; Mueller, Albrecht; and Zoller, Karl, 4,175,184, Cl. 544-10.000.

Mueller-Tamm, Heinz: *See—*
Schweier, Guenther; Bachl, Robert; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Gruber, Wolfgang; and Kolk, Erich, 4,175,170, Cl. 526-125.000.

Muller, Hanns P.: *See—*
Mohring, Edgar; and Muller, Hanns P., 4,175,015, Cl. 204-131.000.

Muller, Jean-Claude; and Ramuz, Henri, to Hoffmann-La Roche Inc. 6-Chloro-2,4-pyrimidine-dicarbamate-3-oxides. 4,175,189, Cl. 544-323.000.

Muller, Jean-Claude; and Ramuz, Henri, to Hoffmann-La Roche Inc. 6-Chloro-2,4-pyrimidine-dicarbamate-3-oxides. 4,175,190, Cl. 544-323.000.

Muller, Jurgen; Schmidt, Manfred; and Eickel, Rolf, to AGFA-Gevaert, A.G. Inography imaging method and chamber. 4,175,232, Cl. 250-315.200.

Muller, Lutz: *See—*
Junge, Bodo; Krause, Hans-Peter; Muller, Lutz; Puls, Walter; and Stoltefuss, Jurgen, 4,175,123, Cl. 424-180.000.

Muller, Walter: *See—*
Peetz, Wolfgang; Scheuch, Anton; and Muller, Walter, 4,174,915, Cl. 407-59.000.

Multi Restaurants Inc.: *See—*
Panzini, Michel A., 4,174,594, Cl. 52-65.000.

Mulzet, Alfred P.; and Trudgen, Gary A., to International Business Machines Corporation. Pressure monitoring system. 4,174,637, Cl. 73-730.000.

Munday, Theodore F.; and Walden, John, to FMC Corporation. Removal of phosphine from phosphine-contaminated carbon monoxide gas streams. 4,175,111, Cl. 423-210.000.

Munns, George W., Jr.: *See—*
Coant, Pierre M.; and Munns, George W., Jr., 4,175,046, Cl. 252-56.00S.

Murakami, Kyoichi: *See—*
Tsuchiya, Takao; Akazawa, Susumu; and Murakami, Kyoichi, 4,175,241, Cl. 307-262.000.

Murasaki, Hiroshi; Enoguchi, Yuji; Wada, Kenichi; and Fujiwara, Takao, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying apparatus for copying thick and thin originals. 4,174,904, Cl. 355-8.000.

Murata, Shinji; and Iwaya, Toshio, to Canon Kabushiki Kaisha. Device for detecting a moving body. 4,175,231, Cl. 250-227.000.

Murphey, James D. Method and apparatus for making and dispensing snow cones. 4,174,742, Cl. 141-11.000.

Murphy, Michael P., to General Motors Corporation. Heated solid electrolyte oxygen sensor. 4,175,019, Cl. 204-195.00S.

Murray, Alan B.: *See—*
Moshal, John H.; and Murray, Alan B., 4,174,765, Cl. 180-313.000.

Mutschler, Erich; and Weber, Adam, to SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH. Steering column switch mounting. 4,174,764, Cl. 180-78.000.

Nadelson, Jeffrey: *See—*
Houlihan, William J.; and Nadelson, Jeffrey, 4,175,191, Cl. 546-144.000.

Nagano, Hiroo; Ikeda, Chuki; Takahashi, Kenji; Kato, Naoyoshi; and Sato, Norio, to Hitachi Cable, Ltd. Device for cross-linking of coating material such as rubber or plastic, for electric wire. 4,174,677, Cl. 118-67.000.

Nagy, Laszlo; and Pulk, Donald J., to General Motors Corporation. Transmission and shift linkage. 4,174,644, Cl. 74-477.000.

Nakabayashi, Satoru: *See—*
Seki, Shigeo; Nakabayashi, Satoru; Saito, Toshinori; Fukatsu, Shunzo; Nakajima, Shokichi; and Ishimaru, Toshiyasu, 4,175,185, Cl. 544-28.000.

Nakada, Akira: *See—*
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, 4,174,650, Cl. 84-1.010.

Nakai, Osamu: *See—*
Goto, Yukio; Nakai, Osamu, and Yoshimori, Ikuo, 4,174,557, Cl. 29-157.10R.

Nakajima, Shokichi: *See—*
Seki, Shigeo; Nakabayashi, Satoru; Saito, Toshinori; Fukatsu, Shunzo; Nakajima, Shokichi; and Ishimaru, Toshiyasu, 4,175,185, Cl. 544-28.000.

Nakajima, Yoshikage: *See—*
Kijima, Shizumasa; Yamatsu, Isao; Inai, Yuichi; Igarashi, Toshiji; Nakajima, Yoshikage; and Eisai Co., Ltd., 4,175,139, Cl. 424-343.000.

Nakamura, Akiyoshi, to Minolta Camera Kabushiki Kaisha. Inverted telephoto lens system. 4,174,886, Cl. 350-215.000.

Nakamura, Nagatoshi, to Honda Giken Kogyo Kabushiki Kaisha. Rear carrier device on motorcycles and the like. 4,174,796, Cl. 224-39.000.

Nakamura, Toshiaki, to Olympus Optical Co., Ltd. Apparatus for automatically stopping a cassette tape recorder. 4,175,273, Cl. 360-74.300.

Nakano, Ichizo; Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; and Yamamoto, Yoichi, to Nippon Telegraph and Telephone Public Corporation; and Sharp Kabushiki Kaisha. Grooved deflection electrodes in an ink jet system printer. 4,175,266, Cl. 346-75.000.

Nakata, Kiyohiro, to Kabushiki Kaisha Mitutoyo Seisakusho. Measuring instrument. 4,174,575, Cl. 33-164.00R.

Narita, Noboru: *See—*
Imataki, Hiroyuki; Toma, Hitoshi; and Narita, Noboru, 4,174,883, Cl. 350-126.000.

Nash, Alfred C.: *See—*
Hargett, Jerry D.; and Nash, Alfred C., 4,174,873, Cl. 339-10.000.

Nash, Lawrence H. Piperidinyldithiocarbonic acid derivatives 4,175,194, Cl. 546-189.000.

National Drying Machinery Corp. of America, The: *See—*
Parkes, Ralph C., 4,174,941, Cl. 431-3.000.

National Union Electric Corporation: *See—*
Brooks, Joseph F., 4,174,858, Cl. 285-7.000.

Natsugari, Hideaki: *See—*
Kuwada, Yutaka; Natsugari, Hideaki; and Meguro, Kanji, 4,175,079, Cl. 260-243.300.

Naud, Henry: *See—*
Legrand, Paul J.; and Naud, Henry, 4,174,609, Cl. 60-262.000.

Naveaux, Robert J.: *See—*
Bradley, Robert O.; Knighton, Heywood J., and Naveaux, Robert J., 4,174,948, Cl. 432-54.000.

Nazarian, Artashes R.: *See—*
Kremlev, Vyacheslav Y.; Nazarian, Artashes R.; Lubashevsky, Alexei V.; and Kokin, Vilyam N., 4,175,240, Cl. 307-205.000.

NCR Corporation: *See—*
Fulks, Robert G.; Enfield, Robert E.; and Greenwood, Edward H., 4,174,805, Cl. 235-302.000.
Spence, Wendell, 4,175,291, Cl. 365-184.000.

Nedelec, Lucien; Frechet, Daniel; and Dumont, Claude, to Roussel UCLAF. N-Phenethyl-N-propyl-3,4-dihydroxyphenethylamines and salts thereof. 4,175,136, Cl. 424-330.000.

Nederlof, Anton M.; and Asselman, George A. A., to U.S. Philips Corporation. Insulated cylinder sleeve for a hot-gas engine. 4,174,616, Cl. 60-517.000.

Neff, Roger E.: *See—*
Schiller, Arthur M.; Goodman, Richard M.; and Neff, Roger E., 4,175,100, Cl. 525-327.000.

Nelimarkka, Juha A. E. Ball valve with reciprocal and rotatable spindle. 4,174,825, Cl. 251-86.000.

Nelson, Alfred M.; and Davis, David L., to AM International, Inc. Toner transfer system. 4,175,265, Cl. 346-74.100.

Nelson, Norman A., to Upjohn Company, The. 4,5,6-Trinor-3,7,-inter-m-phenylene prostaglandin A_1 analogs. 4,175,202, Cl. 560-53.000.

Nelson, Terry L. Support system. 4,174,704, Cl. 126-438.000

Neuss, Norbert; and Miller, Roger D., to Eli Lilly and Company. Apparatus and method for coordinating chromatographic separation

(HPLC) with UV/VIS absorbency values and with bioautograph test results. 4,174,772, Cl. 435-32.000.

Newell, P. Bruce; Morris, James C.; and Waymouth, John F., to GTE Sylvania Incorporated. Single lead electrically-activated flashlamp. 4,174,944, Cl. 431-359.000.

NFE International Ltd.: *See—*
Dupre, George T.; and DeMarco, Thomas M., 4,174,591, Cl. 51-16.000.

Nichols, Billy M. Tube cleaner having anchored rotatable spiral member. 4,174,750, Cl. 165-94.000.

Nicoli, Jacques A. G., to Societe d'Exploitation de Produits et de Techniques pour l'Aeronautique et l'Automatique. Ultrasonic anemometer. 4,174,630, Cl. 73-194.00A.

Nihon Beru-Haueru Kabushiki Kaisha: *See—*
Osawa, Noriaki, 4,174,892, Cl. 354-25.000.

Nikolaeva, Anastasia V.: *See—*
Makarevich, Ivan F.; Khadzhai, Yaroslav I.; Pavlova, Valeria V.; and Nikolaeva, Anastasia V., 4,175,078, Cl. 260-239.570.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, 4,174,650, Cl. 84-1.010.

Nippon Kogaku K.K.: *See—*
Fukuhara, Toru; and Shimomura, Jun, 4,174,894, Cl. 354-59.000.

Nippon Oil Co., Ltd.: *See—*
Kaiya, Atsushi; Otsuki, Yutaka; and Horii, Hideo, 4,175,068, Cl. 260-31.2MR.

Nippon Petrochemicals Company, Limited: *See—*
Sato, Atsushi; Shimizu, Isoo; and Matsuzaka, Eiichi, 4,175,278, Cl. 361-315.000.

Nippon Steel Corporation: *See—*
Ikeno, Teruo; Kado, Satoshi; Otoguro, Yasuo; Miyoshi, Yasuhiko; Kato, Chuichi; and Azami, Tadao, 4,175,163, Cl. 428-553.000.

Nippon Telegraph and Telephone Public Corporation: *See—*
Nakano, Ichizo; Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; and Yamamoto, Yoichi, 4,175,266, Cl. 346-75.000.

Nishimoto, Shigeru: *See—*
Senuma, Masaru; Ishihara, Nobuhiko; Nishimoto, Shigeru; Yamato, Eisaku; and Shigematsu, Noboru, 4,175,206, Cl. 562-444.000.

Nissan Motor Company, Limited: *See—*
Anzai, Makoto, 4,174,680, Cl. 123-32.0EE.
Hosaka, Akio, 4,174,689, Cl. 123-119.0EC.

Niwa, Kazuo; Shibagaki, Masahiro; and Horiike, Yasuhiro, to Tokyo Shibaura Electric Co., Ltd. Apparatus for the plasma treatment of semiconductors. 4,175,235, Cl. 250-542.000.

Noguchi, Masaaki; Sanda, Shougo; and Takizawa, Masaaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine with a subsidiary combustion chamber. 4,174,679, Cl. 123-30.00D.

Noji, Tasuku, to Alps Electric Co., Ltd. Construction of preset plate for VHF tuner. 4,175,259, Cl. 334-49.000.

Norman, Lloyd E.: *See—*
Hunter, Arthur C.; and Norman, Lloyd E., 4,175,286, Cl. 364-737.000.

Norris, David W.: *See—*
Buchwald, Warren G.; and Norris, David W., 4,175,283, Cl. 364-117.000.

Norteman, William E., Jr., to Union Carbide Corporation. Alkaline-MnO_2 cell having a zinc powder-gel anode containing P-N-V-P or P.M.A. 4,175,052, Cl. 252-182.100.

Northern Engraving Company: *See—*
Peters, Arnis E., 4,174,889, Cl. 353-12.000.

Nortron Corporation: *See—*
Curchod, Donald B., 4,174,760, Cl. 177-211.000.

Nowak, Manfred: *See—*
Viertel, Lothar, and Nowak, Manfred, 4,174,864, Cl. 296-97.00H.

Noweck, Klaus: *See—*
Wassermann, Martin; Noweck, Klaus; and Meyer, Arnold, 4,175,118, Cl. 423-628.000.

Nozawa, Takamitsu; Goto, Takayuki; Kishi, Takao; and Iizuka, Shigeo, to Yoshino Kogyosho Co., Ltd. Sprayer usable in both erect and inverted states. 4,174,790, Cl. 222-321.000.

Nubert, Ingomar: *See—*
Kleemann, Axel; Kiel, Reinhold; and Nubert, Ingomar, 4,175,088, Cl. 549-59.000.

Numakura, Toshihiko; and Hirai, Jun, to Sony Corporation. Video signal processing circuitry for compensating different average levels. 4,175,272, Cl. 360-34.000.

Nusser, Hermann: *See—*
Greiner, Max; Peters, Klaus J.; Schelhas, Peter; Stiefel, Peter; and Nusser, Hermann, 4,175,102, Cl. 261-50.00A.

O. F. Mossberg & Sons, Inc.: *See—*
Liedke, Carl F., 4,174,654, Cl. 89-191.00A.

Obata Industry & Commerce Co., Ltd.: *See—*
Ito, Tateo; and Kaneko, Tomijiro, 4,175,146, Cl. 427-304.000.

Obayashi, Nobuharu; Hashizume, Hikaru; Sakashita, Noriji; Kameyama, Seiji; Ezawa, Sadaaki; Watanabe, Hironori; Kondo, Tatsunori; Kugisawa, Toshio; and Washiyama, Yutaka, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument. 4,174,649, Cl. 84-1.010.

Oberthur, Heinrich, to ITT Industries, Inc. Brake force regulator for a motorcycle hydraulic brake system. 4,174,867, Cl. 303-6.00C.

O'Bryan, Henry M., Jr.: *See—*
Fleming, James W., Jr.; O'Bryan, Henry M., Jr.; and Thomson, John, Jr., 4,175,060, Cl. 252-518.000.

Obsomer, Marc, to Solvay & Cie. Hollow body made from a thermoplastic. 4,174,782, Cl. 215-1.00C

Occidental Oil Shale, Inc.: *See—*
Compton, Leslie E., 4,174,751, Cl. 166-256.000.

Ochi, Shigeyuki; Yamazaki, Hiroshi; and Yamanaka, Seisuke, to Sony Corporation. Solid state color camera. 4,175,268, Cl. 358-44.000.

Odell, John R.: *See—*
Holko, Kenneth H.; and Odell, John R., 4,175,225, Cl. 219-121.00P.

Odenwalder, Heinrich; and Ranz, Erwin, to AGFA-Gevaert, A.G. Light sensitive photographic material. 4,174,969, Cl. 430-445.000.

Offermanns, Heribert: *See—*
Beschke, Helmut; Friedrich, Heinz; and Offermanns, Heribert, 4,175,195, Cl. 546-250.000.

Officine Savio S.p.A.: *See—*
d'Agnolo, Armando, 4,174,799, Cl. 226-7.000.

Ogolikhin, Viktor M.: *See—*
Grakov, Anatoly N.; Grebennik, Oleg I.; Dudin, Jury A.; Lutsker, Vladimir L.; Makarov, Valery N.; Ogolikhin, Viktor M.; and Khrustaleva, Tatyana P., 4,174,929, Cl. 417-437.000.

Oguro, Tomokatsu: *See—*
Ishida, Yoshio; Sakai, Masao; Tsuzurahara, Mamoru; Inamura, Ichiro; and Oguro, Tomokatsu, 4,175,245, Cl. 315-39.710.

O'Hara, Kim L.: *See—*
Beals, Charles D.; Fitzpatrick, George I.; and O'Hara, Kim L., 4,175,169, Cl. 526-64.000.

Ohmae, Tsutomu; and Marumoto, Katsuji, to Agency of Industrial Science and Technology, The. Automatic change-gear control device for use in electromobile. 4,174,645, Cl. 74-866.000.

Ohmura, Ryuichi, to Fuji Kogyo Co., Ltd. Line guide assembly for fishing rods. 4,174,583, Cl. 43-24.000.

Ohta, Hirofumi; Futami, Toshio; and Umeyama, Kazuo, to Hitachi, Ltd. Magnetic bubble memory devices. 4,175,288, Cl. 365-2.000.

Ohtake, Toshiro. Construction for a water closet. 4,174,546, Cl. 4-420.000.

Oishi, Hideo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Air conditioning display system for vehicles. 4,174,749, Cl. 165-11.000.

Oldendorf, William H. Method and apparatus for ultra sound imaging utilizing Rayleigh backscatter. 4,174,635, Cl. 73-606.000.

Olin Corporation: *See—*
Knollmueller, Karl O., 4,175,049, Cl. 252-78.300.
Martin, Richard H.; and Owens, William F., Jr., 4,174,719, Cl. 131-10.00A.
Sakowski, Walter J., 4,175,038, Cl. 210-62.000.

Olson, Leslie C., to University of Minnesota, The Regents of the. Sterile surgical cord and tube retractor. 4,174,816, Cl. 242-47.500.

Olympus Optical Co., Ltd.: *See—*
Mizokami, Kazunori; and Kawarada, Osamu, 4,174,896, Cl. 354-132.000.
Nakamura, Toshiaki, 4,175,273, Cl. 360-74.300.
Tsuchihashi, Yasutaka; and Omoto, Tatsuhiko, 4,174,876, Cl. 339-96.000.

O'Mahony, John S.: *See—*
Hyldon, Roy G.; and O'Mahony, John S., 4,175,124, Cl. 424-180.000.

Omoto, Tatsuhiko: *See—*
Tsuchihashi, Yasutaka; and Omoto, Tatsuhiko, 4,174,876, Cl. 339-96.000.

Ondetti, Miguel A.; and Weisenborn, Frank L., to E.R. Squibb & Sons, Inc. Substituted acyl derivatives of amino acids. 4,175,199, Cl. 548-336.000.

Oogami, Eiryo, to Yoshida Kogyo K.K. Lower frame for pivoted window. 4,174,590, Cl. 49-504.000.

Orova, Josef: *See—*
Podrapsky, Jiri; and Orova, Josef, 4,174,697, Cl. 123-148.00E

Orrell, Michael G.: *See—*
Lucey, George K., Jr.; and Orrell, Michael G., 4,174,666, Cl. 102-216.000.

Osawa, Masanori: *See—*
Ito, Akira; Sasaki, Heizo; Osawa, Masanori; Iwao, Tetsuya; and Iwata, Kenji, 4,175,171, Cl. 526-125.000.

Osawa, Noriaki, to Nihon Beru-Haueru Kabushiki Kaisha. Automatic focusing system. 4,174,892, Cl. 354-25.000.

Osuga, Kunio: *See—*
Yamanaka, Tsutomu; Yasuda, Hiroshi; and Osuga, Kunio, 4,175,130, Cl. 424-270.000

Otis Engineering Corporation: *See—*
Roark, James T.; and McCracken, Oliver W., 4,174,729, Cl. 137-487.500

Otoguro, Yasuo: *See—*
Ikeno, Teruo; Kado, Satoshi; Otoguro, Yasuo; Miyoshi, Yasuhiko; Kato, Chuichi; and Azami, Tadao, 4,175,163, Cl. 428-553.000.

Otsuki, Yutaka: *See—*
Kaiya, Atsushi; Otsuki, Yutaka; and Horii, Hideo, 4,175,068, Cl. 260-31.2MR.

Owens-Illinois, Inc.: *See—*
Juvinall, John W., 4,175,236, Cl. 250-566.000.

Owens, William F., Jr.: *See—*
Martin, Richard H.; and Owens, William F., Jr., 4,174,719, Cl. 131-10.00A.

Oxy Metal Industries Corporation: *See—*
Howell, John K., Jr.; and Kulick, Leonard, 4,174,980, Cl. 148-6.14R.

Oxygen Enrichment Co., Ltd.: *See—*
Blackmer, Richard H.; and Hedman, Jonathan W., 4,174,955, Cl. 55-158.000

Ozawa, Kohe; Hosoya, Kazuhiro; Kurita, Jiro; and Honda, Makoto, to Asahi Kasei Kogyo Kabushiki Kaisha. Solvent resistant acrylic resin composition. 4,175,176, Cl. 526-309.000.

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P. R. Mallory & Co. Inc.: *See*—
Sandler, Louis M., 4,175,239, Cl. 307-116.000.
Pace, Marshall O.: *See*—
Christophorou, Loucas G.; James, David R.; Pace, Marshall O.; and Pai, Robert Y., 4,175,048, Cl. 252-63.500.
Pacific Marine & Supply Co., Ltd.: *See*—
Seidl, Ludwig H., 4,174,671, Cl. 114-61.000.
Pagano, Dominick A. Two wheel ultrasonic rail testing system and method. 4,174,636, Cl. 73-636.000.
Pai, Robert Y.: *See*—
Christophorou, Loucas G.; James, David R.; Pace, Marshall O.; and Pai, Robert Y., 4,175,048, Cl. 252-63.500.
Pallay, Eduard, to Vyzkumny ustav bavlnarsky. Method of and apparatus for spinning yarn in an air vortex in a spinning tube. 4,174,605, Cl. 57-58.890.
Pampuch, Klaus, to Auergesellschaft GmbH. Connection between two different parts of a person's protective covering. 4,174,710, Cl. 128-142.700.
Panzica, Nace J.; and Cruze, Tyrone A. Foot rest assembly for motorcycle. 4,174,852, Cl. 280-291.000.
Panzini, Michel A., to Multi Restaurants Inc. Closable sales kiosk. 4,174,594, Cl. 52-65.000.
Papageorgion, Konstantin: *See*—
Berger, Johann; Berger, Josef; and Papageorgion, Konstantin, 4,174,738, Cl. 139-384.00R.
Parker-Hannifin Corporation: *See*—
Scott, Lynn S., 4,174,846, Cl. 277-205.000.
Parkes, Ralph C., to National Drying Machinery Corp. of America, The. Sleeve and damper for oil burner. 4,174,941, Cl. 431-3.000.
Parr, Alan J.; and Brown, Bryan O., to Freeman Chemical Corporation. Light-colored unsaturated polyester resins containing at least 2% bromine by weight. 4,175,072, Cl. 528-299.000.
Parrish, Charles A., to Sperry Rand Corporation. Telescoping lateral limit link. 4,174,603, Cl. 56-208.000.
Parrish, Charles A.: *See*—
Webb, Bryant F.; and Parrish, Charles A., 4,174,602, Cl. 56-208.000.
Parsons, James D.; and Sivak, Jerome A., to Union Tank Car Company. Methods for loading and unloading liquids from a railroad tank car. 4,174,741, Cl. 141-2.000.
Partus, Fred P., to Western Electric Company, Incorporated. Non-contacting seal for treating chamber through which elongated material is moved. 4,174,842, Cl. 277-3.000.
Paschal, Gloria C.: *See*—
Thompson, Gerald L.; Paschal, Gloria C.; and Conrad, Robert A., 4,175,080, Cl. 260-244.400.
Paschetto, Paul E. Golf putter aligning device. 4,174,838, Cl. 273-163.00A.
Pasqualucci, Carmine: *See*—
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,175,077, Cl. 260-239.30P.
Paulson, Danton L.; and Worthington, Robert B., to United States of America, Interior. Powder agglomerator and its method of use. 4,174,937, Cl. 425-222.000.
Pavlova, Valeria V.: *See*—
Makarevich, Ivan F.; Khadzhai, Yaroslav I.; Pavlova, Valeria V.; and Nikolaeva, Anastasia V., 4,175,078, Cl. 260-239.570.
Payton, Alan J., to Corning Glass Works. Electrode membrane. 4,175,028, Cl. 204-296.000.
Peetz, Wolfgang; Scheuch, Anton; and Muller, Walter, to Hawera Probst GmbH & Co. Milling cutter, especially contour milling cutter. 4,174,915, Cl. 407-59.000.
Pelchuck, John, Jr.: *See*—
Rasero, Lawrence J.; Pelchuck, John, Jr.; and Howard, Gordon H., 4,174,739, Cl. 139-388.000.
Perry, Clifford R.: *See*—
Belvin, David S.; Perry, Clifford R.; and Watkins, Dale F., 4,174,987, Cl. 156-197.000.
Persik, Gerald E.: *See*—
Persik, James E.; and Persik, Gerald E., 4,174,559, Cl. 29-509.000.
Persik, James E.; and Persik, Gerald E., to J.J. & M. Fastening method. 4,174,559, Cl. 29-509.000.
Person, Norman D.: *See*—
Mathes, Arnold; Person, Norman D.; and Vermeer, Stanley J., 4,174,661, Cl. 100-5.000.
Peters, Arnis E., to Northern Engraving Company. Travel monitor. 4,174,889, Cl. 353-12.000.
Peters, Klaus J.: *See*—
Greiner, Max; Peters, Klaus J.; Schelhas, Peter; Stiefel, Peter; and Nusser, Hermann, 4,175,102, Cl. 261-50.00A.
Peterson, Donald J., to Procter & Gamble Company, The. Base reactant. 4,175,053, Cl. 252-192.000.
Peterson, Earl C., to Electroosmosis Inc. System for heave reduction in highways due to frost or moisture in expansive clay or shale materials. 4,174,912, Cl. 404-27.000.
Petitpierre, Jean C.: *See*—
Balli, Heinz; Gunzenhauser, Sigmund; and Petitpierre, Jean C., 4,174,856, Cl. 282-27.500.
Petraglia, Vincent J.: *See*—
Goller, Glen J.; Petraglia, Vincent J.; and Salonia, Joseph R., 4,175,055, Cl. 252-425.300.
Petrolite Corporation: *See*—
Tait, William S.; and Greenlee, Roy W., 4,175,054, Cl. 252-331.000.
Pfenning, Dwight B.; Higginbottom, Lonnie C.; and Sliepcevich, Cedomir M., to Sliepcevich, Cedomir M. Apparatus for exchanging energy between high and low pressure systems. 4,174,925, Cl. 417-225.000.
Pfister, Rudolf: *See*—
Binder, Dieter; Hromatka, Otto; Pfister, Rudolf; and Zeller, Paul, 4,175,085, Cl. 549-65.000.
Pfizer Inc.: *See*—
Kadin, Saul B., 4,175,193, Cl. 546-153.000.
Taylor, Colin R., 4,175,128, Cl. 424-263.000.
Pharmacia Fine Chemicals AB: *See*—
Carlsson, Jan P. E.; Axen, Rolf E. A. V.; Drevin, Hakan N. Y.; and Lindgren, Goran E. S., 4,175,073, Cl. 260-112.00R.
Philbrick, Richard S.: *See*—
Lauritsen, Richard L.; and Philbrick, Richard S., 4,175,223, Cl. 200-159.00R.
Pilgram, Kurt H. G., to Shell Oil Company. Anilide derivative herbicides. 4,174,958, Cl. 71-88.000.
Pitegoff, Alexander D., to Teradyne, Inc. Analyzing electrical circuit boards. 4,175,253, Cl. 324-62.000.
Pitney Bowes, Inc.: *See*—
Mol, Hans C., 4,174,830, Cl. 270-58.000.
Pizzolato, Giacomo: *See*—
Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,175,086, Cl. 549-51.000.
Pizzorno, Augusto, to Industrie Pirelli S.p.A. Apparatus for automatically handling a mold for tires with a rigid segmented core. 4,174,940, Cl. 425-577.000.
Plank, Charles J.; Rosinski, Edward J.; and Rubin, Mae K., to Mobil Oil Corporation. Method for producing zeolites. 4,175,114, Cl. 423-329.000.
Plavskikh, Vladimir D.: *See*—
Kostylev, Alexandr D.; Chepurnoi, Nikolai P.; Plavskikh, Vladimir D.; and Cherednikov, Evgeny N., 4,174,758, Cl. 175-19.000.
Plewes, John T.: *See*—
Chin, Gilbert Y.; Jin, Sungho; Plewes, John T.; and Wonsiewicz, Bud C., 4,174,983, Cl. 148-102.000.
Plewka, Anna. Headlight glare reduction devices for vehicles. 4,175,280, Cl. 362-61.000.
Podrapsky, Jiri; and Orova, Josef, to Robert Bosch GmbH. System for advancing the ignition time in ignition systems having a magneto generator. 4,174,697, Cl. 123-148.00E.
Pohl, Douglas R.: *See*—
Blakey, Bruce H.; and Pohl, Douglas R., 4,174,703, Cl. 126-430.000.
Poitte, Jacques, to Societe Technique des Entreprises Chimiques. Process for extracting uranium from ores. 4,175,108, Cl. 423-20.000.
Polaroid Corporation: *See*—
Burgarella, John P.; and Carcia, Peter P., 4,174,893, Cl. 354-29.000.
Pollack, Warren J.: *See*—
Harris, Robert R.; and Pollack, Warren J., 4,175,063, Cl. 260-22.00R.
Pollard, Ray E. T. Portable pocket for pocket watches. 4,174,798, Cl. 224-253.000.
Porter, Garry L. Composition and method to prevent accidental and intentional overdosage with psychoactive drugs. 4,175,119, Cl. 424-10.000.
Possis Corporation: *See*—
Dammar, Raymon H., 4,174,815, Cl. 242-7.05B.
Posson, Chester A. Rotary engine. 4,174,930, Cl. 418-36.000.
Potapov, Valery N.: *See*—
Lidorenko, Nikolai S.; Evdokimov, Vladimir M.; Zadde, Vitaly V.; Kozlov, Alexandr I.; Ryabikov, Stanislav V.; Potapov, Valery N.; Strebkov, Dmitry S.; Surianinova, Tatiana I.; Chubrikov, Boris A.; Zatravina, Valentina V.; Korolev, Boris V.; Kulikov, Viktor F.; Zhuravleva, Larisa L.; Unishkov, Vadim A.; Dormidontov, Anatoly A.; Moiseev, Viktor I.; and Kudeshova, Ljubov P., 4,174,978, Cl. 136-89.0PC.
Potts, James E., to Union Carbide Corporation. Crosslinkable copolymer of a lactone and a polyfunctional acrylate. 4,175,177, Cl. 528-354.000.
Powell, Peter J.: *See*—
Armstrong, William A.; and Powell, Peter J., 4,175,168, Cl. 429-229.000.
Power Conversion, Inc.: *See*—
Rosansky, Martin G., 4,175,166, Cl. 429-56.000.
PPG Industries, Inc.: *See*—
Darlington, William B., 4,175,024, Cl. 204-252.000.
Gacesa, Gerald R., 4,175,018, Cl. 204-181.00T.
Gagne, Robert, 4,174,956, Cl. 65-99.00A.
Precision Industries, Inc.: *See*—
Kezran, Mitchell, 4,174,916, Cl. 407-108.000.
Preiss, Manfred: *See*—
Auchter, Bruno; Wagner, Karl-Heinz; Glimm, Gunter; and Preiss, Manfred, 4,174,791, Cl. 222-333.000.
Procter & Gamble Company, The: *See*—
Garrison, Charles M.; Youngquist, Rudolph W.; and Taylor, Harry M., 4,175,075, Cl. 260-123.500.
Peterson, Donald J., 4,175,053, Cl. 252-192.000.
Puff, Roger M.: *See*—
Delessard, Serge L.; and Puff, Roger M., 4,174,947, Cl. 432-15.000.
Pugliese, John P.; and Robbins, Thomas J., to Econo-Brew, Inc. Coffee brewer. 4,174,659, Cl. 99-306.000.
Pulk, Donald J.: *See*—
Nagy, Laszlo; and Pulk, Donald J., 4,174,644, Cl. 74-477.000.
Puls, Walter: *See*—
Junge, Bodo; Krause, Hans-Peter; Muller, Lutz; Puls, Walter; and Stoltefuss, Jurgen, 4,175,123, Cl. 424-180.000.
Purdue Research Foundation: *See*—
Tsao, George T.; Ladisch, Michael R.; and Bose, Arindam, 4,174,976, Cl. 127-37.000.

Quaker Oats Company, The: *See*—
Clanton, W. Porter, 4,174,588, Cl. 46-44.000.
Hyldon, Roy G.; and O'Mahony, John S., 4,175,124, Cl. 424-180.000.
Kottke, Roger H.; and Menard, Scott S., 4,175,067, Cl. 260-30.40R.
Quinn, Thomas M.: *See*—
Chen, Stephen Y.; and Quinn, Thomas M., 4,175,071, Cl. 260-42.440.
R. A. Pearson Company: *See*—
Graham, Robert H., 4,174,658, Cl. 93-51.0HW.
Radke, John C.: *See*—
Jankelson, Bernard; and Radke, John C., 4,174,706, Cl. 128-741.000.
Rady, Bruce A.: *See*—
Flint, John R.; and Rady, Bruce A., 4,174,891, Cl. 353-26.00A.
Johnson, Delmar R.; Flint, John R.; Wells, Thomas R.; Erikson, Rolf B.; and Rady, Bruce A., 4,174,890, Cl. 353-26.00A.
Raleigh, William J., to General Electric Company. Silicone emulsions for treating silicate particulate matter. 4,175,159, Cl. 428-405.000.
Ralston Purina Company: *See*—
Daly, Thomas W.; Hoer, Ralph A.; Walsh, James E.; and James, Henry T., 4,174,975, Cl. 106-161.000.
Ramuz, Henri: *See*—
Muller, Jean-Claude; and Ramuz, Henri, 4,175,189, Cl. 544-323.000.
Muller, Jean-Claude; and Ramuz, Henri, 4,175,190, Cl. 544-323.000.
Ranz, Erwin: *See*—
Odenwalder, Heinrich; and Ranz, Erwin, 4,174,969, Cl. 430-445.000.
Rappaport, Alfred A. Disposable catalytic heater. 4,174,702, Cl. 126-208.000.
Rasero, Lawrence J.; Pelchuck, John, Jr.; and Howard, Gordon H., to Fenner America Ltd. Tubular fabric. 4,174,739, Cl. 139-388.000.
Rasheed, Khalid; and Warkentin, James D., to Ansul Company, The. Biocidally-active, 1,3-benzodithiole-2-one and 1,3-benzodithiole-2-thione compounds. 4,175,186, Cl. 544-145.000.
Raven, John, to American Chain & Cable Company, Inc. Bridge circuits. 4,174,639, Cl. 73-766.000.
Raychem Corporation: *See*—
Simpson, Damon G., 4,174,563, Cl. 29-628.000.
RCA Corporation: *See*—
Credelle, Thomas L.; and Spong, Fred W., 4,174,881, Cl. 350-3.630.
Rebikoff, Dimetri. Underwater TV surveillance of pipelines. 4,175,269, Cl. 358-99.000.
Recognition Equipment Incorporated: *See*—
Ferguson, Sammy J.; and Yohe, William R., 4,174,995, Cl. 156-494.000.
Reed, Robert D., to John Zink Company. Fuel gas preheat for excess oxygen maintenance. 4,174,943, Cl. 431-41.000.
Reichelt, Karl-Ludvig: *See*—
Boler, Jan B.; and Reichelt, Karl-Ludvig, 4,175,084, Cl. 260-326.440.
Reid, F. Joseph: *See*—
Rhodes, William H.; and Reid, F. Joseph, 4,174,973, Cl. 106-73.200.
Reid, Richard K. Device for citizens band radio users to determine highway location. 4,174,674, Cl. 116-307.000.
Reiner, Lawrence: *See*—
Hennig, Michael; and Reiner, Lawrence, 4,174,833, Cl. 273-1.00E.
Reinink, Arend; and Sheldon, Roger A., to Shell Oil Company. Preparation of α-cyano esters. 4,175,093, Cl. 260-465.00D
Reinink, Arend; and Sheldon, Roger A., to Shell Oil Company. Preparation of esters. 4,175,094, Cl. 260-465.00D
Reitz, Gunther; and Boehmke, Gunther, to Bayer Aktiengesellschaft. Alkoxylated perfluoroalkanesulphonamides. 4,175,096, Cl. 260-556.00F.
Repco Research Proprietary Limited: *See*—
Hadaway, Bernard M., 4,174,845, Cl. 277-134.000.
Research Corporation: *See*—
Schmer, Gottfried, 4,175,182, Cl. 536-21.000.
Research Triangle Institute: *See*—
Adams, Daniel M., Jr.; Barach, Jeff T.; and Speck, Marvin L., 4,175,141, Cl. 426-522.000.
Reuben, Harold, to Akro Corporation, The. Process of laminating carpet to elastomeric backing. 4,174,991, Cl. 156-242.000.
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Auchter, Bruno; Wagner, Karl-Heinz; Glimm, Gunter; and Preiss, Manfred, 4,174,791, Cl. 222-333.000.
Rhodes, William H.; and Reid, F. Joseph, to GTE Laboratories Incorporated. Transparent yttria ceramics containing magnesia or magnesium aluminate. 4,174,973, Cl. 106-73.200.
Rhone-Poulenc Industries: *See*—
Decor, Jean-Pierre, 4,175,205, Cl. 560-260.000.
Lombardi, Bernard; and Lunel, Jean, 4,175,126, Cl. 424-263.000.
Rhone-Poulenc Textile: *See*—
Guillermin, Rene; Joly, Jean; and Sangalli, Silvio, 4,175,157, Cl. 428-369.000.
Rhyan, William C., to Clarke Carrier Corporation. Carrier readily attachable to a support. 4,174,866, Cl. 297-194.000.
Richard, Gerard Y., to Societe d'Applications de Procedes Industriels et Chimiques S.A.P.I.C. Process and apparatus for the continuous preparation of a mixture for foundry molds or the like, with formation of a premix. 4,174,906, Cl. 366-6.000.
Richard, Michel M.: *See*—
Drouzy, Michel L.; Richard, Michel M.; Huet, Francois P.; and Lacau, Henri M., 4,174,972, Cl. 106-64.000.
Richards, Gordon S.; Douglas, Peter E.; and Abraham, Alan G., to International Standard Electric Corporation. Method and apparatus for transferring control information between two members. 4,175,230, Cl. 250-199.000.
Richards Manufacturing Co., Inc.: *See*—
Treace, Harry T., 4,174,716, Cl. 128-350.00R.
Richardson, Victor E., to Dresser Industries, Inc. Latching mechanism for reciprocating impact tools. 4,174,848, Cl. 279-19.500.
Richings, Richard R. Casket. 4,174,556, Cl. 27-7.000.
Richter, Johan C. F. C., to Kamyr Aktiebolag. Method and apparatus for continuous hydrolysis of cellulosic fiber material. 4,174,997, Cl. 162-19.000.
Ricker, Charles W.: *See*—
Lewis, John G.; Martin, Alfred J.; Meinke, William W.; Ricker, Charles W.; and Teitel, Robert J., 4,175,016, Cl. 204-157.10H.
Riddel, John W., to General Motors Corporation. Vacuum latching dump valve. 4,174,727, Cl. 137-111.000
Riedel, Tilo, to S.A. Establissements Francois Salomon & Fils. Ski brake with brake elements adapted to form a tread body engageable by a ski boot and with inwardly bent spring wire. 4,174,853, Cl. 280-605.000.
Riehle, Frederick W., to A-T-O Inc. Zero pressure accumulating conveyor and method. 4,174,777, Cl. 198-781.000.
Riley, Douglas C., Jr.: *See*—
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Rippel, Kurt: *See*—
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Ritzenthaler, Richard L.: *See*—
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Roark, James T.; and McCracken, Oliver W., to Otis Engineering Corporation. Pressure sensing safety device. 4,174,729, Cl. 137-487.500.
Robbins, Daniel H., to Itek Corporation. End of roll detector. 4,174,817, Cl. 242-57.000.
Robbins, Thomas J.: *See*—
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Robert Bosch GmbH: *See*—
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Greiner, Max; Peters, Klaus J.; Schelhas, Peter; Stiefel, Peter; and Nusser, Hermann, 4,175,102, Cl. 261-50.00A.
Honig, Guenther; Kiencke, Uwe; and Zechnall, Martin, 4,174,688, Cl. 123-117.00D.
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Wessel, Wolf; Stumpp, Gerhard; and Knapp, Heinrich, 4,174,692, Cl. 123-139.0AW.
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Usnick, George B.; Ward, Gene T.; Blair, Henry O.; Roberts, James W.; and Warner, Terry N., 4,174,728, Cl. 137-240.000.
Robertshaw Controls Company: *See*—
Moon, William T., Jr.; Rogers, Arden D.; Goff, Clifford E.; and Bannon, Harry B., 4,174,564, Cl. 29-622.000.
Rockwell International Corporation: *See*—
Duffey, Donn W., 4,174,656, Cl. 92-134.000.
Fuhrman, James L., 4,175,287, Cl. 364-900.000.
Immorlica, Anthony A., Jr., 4,174,982, Cl. 148-13.100.
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Rogers, Arden D.: *See*—
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Rogier, Edgar R.: *See*—
MacKay, Kenneth D.; and Rogier, Edgar R., 4,175,012, Cl. 204-108.000.
Rohde, Wolfgang, to Bergwerksverband GmbH. Process for drying coal in two-stage flow-through circulation heaters. 4,174,946, Cl. 432-14.000.
Roland Corporation: *See*—
Kakehashi, Ikutaro, 4,174,651, Cl. 84-1.110.
Rombusch, Konrad: *See*—
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Roozenbeek, Herman: *See*—
Jundt, Werner; Bodig, Bernd; Decker, Heinz; Schmidt, Gunther; Wurst, Bert; Seeger, Karl; and Roozenbeek, Herman, 4,174,696, Cl. 123-148.00E.
Rosansky, Martin G., to Power Conversion, Inc. Sealed container construction capable of safely venting internal pressure. 4,175,166, Cl. 429-56.000.
Roschmann, Josef: *See*—
Kirchweger, Karl; and Roschmann, Josef, 4,174,574, Cl. 33-126.70R.
Rose, Leslie C.: *See*—
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Roseby, Bernard; and Hallmann, Eckhard P. Variable stroke internal combustion engine. 4,174,684, Cl. 123-48.00B.

Rosinski, Edward J.: *See—*
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Ross, William J.; Todd, Alex; and Verge, John P., to Lilly Industries Limited. Oxazole ureas formulations and asthma treatment. 4,175,131, Cl. 424-272.000.
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, to ARCHIFAR Industrie Chimiche del Trentino S.p.A. Rifamycin compounds. 4,175,077, Cl. 260-239.30P.
Rossi, Gene A.: *See—*
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Ryabikov, Stanislav V.: *See—*
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Saito, Tamaki: *See—*
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Sakowski, Walter J., to Olin Corporation. Purification of waste streams containing available chlorine. 4,175,038, Cl. 210-62.000.
Salonia, Joseph R.: *See—*
Goller, Glen J.; Petraglia, Vincent J.; and Salonia, Joseph R., 4,175,055, Cl. 252-425.300.
Sammons, John K.; and Fox, Charles H., Jr., to Continental Oil Company. Centrifugal water oil separator. 4,175,040, Cl. 210-78.000.
Sanda, Shougo: *See—*
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Sanders, Carlos L.; and Gebhardt, James L., to Mead Corporation, The. Adjustable indicating device. 4,174,580, Cl. 40-518.000.
Sanders, Thomas J.; Morcom, William R.; and Davis, Jacob A., to Harris Corporation. Process for forming metallic ground grid for integrated circuits. 4,174,562, Cl. 29-578.000.
Sandler, Louis M., to P. R. Mallory & Co. Inc. Detection means for touch control switches. 4,175,239, Cl. 307-116.000.
Sandoz, Inc.: *See—*
Barcza, Sandor, 4,175,091, Cl. 260-448.2N.
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Sankokiki Kabushiki Kaisha: *See—*
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Sato, Atsushi; Shimizu, Isoo; and Matsuzaka, Eiichi, to Nippon Petrochemicals Company, Limited. Electric insulating oil compositions. 4,175,278, Cl. 361-315.000.
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Saunders, Elerington. Agglomerating particulate perlite. 4,175,158, Cl. 428-402.000.
Sautter, Wilfried: *See—*
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Savelkouls, Leonardus J. Apparatus for metal coatings. 4,174,994, Cl. 156-380.000.
Sawada, Eiji, to Denki Onkyo Co., Ltd. Deflection yoke. 4,175,261, Cl. 335-210.000.
Schaefer, Donald W., to International Business Machines Corporation. R/W Arm that prevents catastrophic failure. 4,175,275, Cl. 360-104.000.
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Scheuch, Anton: *See—*
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Schick, John W.; and Kaminski, Joan M., to Mobil Oil Corporation. Synthetic ester and hydrogenated olefin oligomer lubricant and method of reducing fuel consumption therewith. 4,175,047, Cl. 252-56.00S.
Schiff, Peter. Electronic synchronizer-monitor system for controlling the timing of mechanical assistance and pacing of the heart. 4,175,264, Cl. 340-747.000.
Schiller, Arthur M.; Goodman, Richard M.; and Neff, Roger E., to American Cyanamid Company. Preparation of anionic polymers for use as scale inhibitors and anti-precipitants. 4,175,100, Cl. 525-327.000.
Schliesser, Carroll G., to Schliesser, Myrtle M. Animal guard for field pipe. 4,174,913, Cl. 405-94.000.
Schliesser, Myrtle M.: *See—*
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Schlumberger Technology Corporation: *See—*
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Schmer, Gottfried, to Research Corporation. Separation of high-activity heparin by affinity chromatography on supported protamine. 4,175,182, Cl. 536-21.000.
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Schneider, Werner: *See—*
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Schreiber, Hinda S.; Lindahl, Eugenie Z.; and Smith, Polly P., to SLS, Inc. Athletic brassiere. 4,174,717, Cl. 128-494.000.
Schrewelius, Nils G., to Bulten-Kanthal Aktiebolag. Silicon carbide body containing a molybdenum disilicide alloy. 4,174,971, Cl. 106-44.000.
Schroeder & Co.: *See—*
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Schrougham, Benton; and Lee, John W. Coupling device for animal collars. 4,174,553, Cl. 24-74.00R.
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Schweier, Guenther; Bachl, Robert; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Gruber, Wolfgang; and Kolk, Erich, to BASF Aktiengesellschaft. Manufacture of olefin polymers. 4,175,170, Cl. 526-125.000.
Scott, Lynn S., to Parker-Hannifin Corporation. Sealing ring. 4,174,846, Cl. 277-205.000.
Scott, William F.: *See—*
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Seeger, Karl: *See—*
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Seidl, Ludwig H., to Pacific Marine & Supply Co., Ltd. Semisubmerged ship. 4,174,671, Cl. 114-61.000.
Seki, Shigeo; Nakabayashi, Satoru; Saito, Toshinori; Fukatsu, Shunzo; Nakajima, Shokichi; and Ishimaru, Toshiyasu, to Meiji Seika Kaisha Ltd. Process for preparing cephalosporanic acid derivatives. 4,175,185, Cl. 544-28.000.
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Selwitz, Charles M.; and McNulty, John G., to Gulf Research and Development Company. Etherification process. 4,175,210, Cl. 568-689.000.
Semicon, Inc.: *See—*
House, Robert E.; Irvin, Robert A.; and Kane, Daniel F., 4,174,561, Cl. 29-572.000.
Senior, Robert B.; and Yarbrough, Paul A., to Cooper Industries, Inc. Tool for applying connectors to flexible cable. 4,174,560, Cl. 29-566.100.
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Senuma, Masaru; Ishihara, Nobuhiko; Nishimoto, Shigeru; Yamato, Eisaku; and Shigematsu, Noboru, to Tanabe Seiyaku Co., Ltd. Process for preparing a hydroxyphenylglycine compound. 4,175,206, Cl. 562-444.000.
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Shabanowitz, Jeffrey: *See—*
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Shallenberg, Robert L.; Hufton, Austen B.; Blomgren, Roland A.; and Copeland, William M., to ServiceMaster Industries, Inc. Apparatus and method for mopping floors. 4,174,977, Cl. 134-6.000.
Shane, Charles F. Door frame protector. 4,174,862, Cl. 292-346.000.
Sharp Kabushiki Kaisha: *See—*
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Masuda, Toshiyuki; and Sasaki, Takehiko, 4,174,606, Cl. 58-39.500.
Nakano, Ichizo; Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; and Yamamoto, Yoichi, 4,175,266, Cl. 346-75.000.
Shaw, Stuart W. K.; and Fontaine, Paul L., to International Nickel Company, Inc., The. Nickel-base alloys of improved high temperature tensile ductility. 4,174,964, Cl. 75-122.000.
Shea, Christopher J., to Stanley Works, The. Oven latch assembly with adjustable unlocking temperature sub-assembly. 4,174,860, Cl. 292-113.000.
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Reinink, Arend; and Sheldon, Roger A., 4,175,094, Cl. 260-465.00D.
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Reinink, Arend; and Sheldon, Roger A., 4,175,094, Cl. 260-465.00D.
van den Bussche, Hendrik K. J.; van Soldt, Nicolaas J.; van de Krogt, Adrianus H.; and Drinkwaard, Willem, deceased, 4,174,628, Cl. 73-151.000.
Shepard, Michael L., to Westvaco Corporation. Adjustable profile finger setting jig. 4,174,576, Cl. 33-181.00R.
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Shepherd, Patrick Joseph: *See—*
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Shiel, Leslie E., to Associated Portland Cement Manufacturers Limited, The. Preflocculated filler compositions for use in the manufacture of paper. 4,174,998, Cl. 162-168.00N.
Shigematsu, Noboru: *See—*
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Shrontz, Michael J.; and Harvey, Robert M., to Inland Container Corporation. Multicell corrugated bulk container. 4,174,803, Cl. 229-15.000.
Shrum, Lorne R. Tank for explosive forming. 4,174,624, Cl. 72-56.000.
Shuraym, George P., to Texas Instruments Incorporated. Multi-mode process control computer with bit processing. 4,175,284, Cl. 364-200.000.
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Buchner, Klaus, 4,174,705, Cl. 128-660.000.
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Kusebauch, Walter; Kostka, Hana; Henkel, Hans-Joachim; Koch, Christian; de Bucs, Eugen S.; and Weber, Theo, 4,174,954, Cl. 48-212.000.
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Simpson, Damon G., to Raychem Corporation. Wire wrap post terminator for stranded wire. 4,174,563, Cl. 29-628.000.
Sims, Eugene F.; and Dierlam, Trueman, to CRC-Crose International, Inc. Apparatus for transporting heavy equipment on a pipeline. 4,175,224, Cl. 219-60.00R.
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Skakunov, Mikhail G.; Lipodat, Konstantin K.; Karasev, Leonid V.; and Modzelevsky, Vilgelm V. Method of fabricating double-curvature shells. 4,174,989, Cl. 156-156.000.
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Slater, Frank W.; and Fuqua, Dale. Secondary recovery method and system for oil wells using solar energy. 4,174,752, Cl. 166-303.000.
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Smith, Arthur W.; and Kimble, George D. Autocycling control circuit for heating and/or air conditioning systems. 4,174,807, Cl. 236-47.000.
Smith, Clarence E., Jr. Toilet stool ventilating device. 4,174,545, Cl. 4-217.000.
Smith, John G., to Burroughs Corporation. Insertion tool for integrated circuit packages. 4,174,566, Cl. 29-758.000.
Smith, Peter W.; and Mastrioanni, Rudolph G., to United Technologies Corporation. Modular microwave power combiner. 4,175,257, Cl. 330-287.000.
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Snelling, Christopher, to Xerox Corporation. Combined processing station for use in an electrophotographic printing machine. 4,174,903, Cl. 355-3.0CH.
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Societe Anonyme D.B.A.: *See—*
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Societe Anonyme des Imprimerie et Papeterie de l'Est: *See—*
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Hermans, Johny C., 4,175,174, Cl. 528-168.000.
Hermans, Johny C., 4,175,178, Cl. 528-373.000.
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Societe d'Applications de Procedes Industriels et Chimiques S.A.P.I.C.: *See*—
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Societe d'Etudes pour la Recuperation Electrolytique du Zinc: *See*—
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Societe d'Exploitation de Produits et de Techniques pour l'Aeronautique et l'Automatique: *See*—
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Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See*—
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Societe Technique des Entreprises Chimiques: *See*—
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Sony Corporation: *See*—
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Speigel, Kenneth, to GTE Sylvania Incorporated. Color cathode ray tube phosphors coated by a wetting agent. 4,175,143, Cl. 427-71.000.
Spence, Wendell, to NCR Corporation. Non-volatile random access memory cell. 4,175,291, Cl. 365-184.000.
Sperry Rand Corporation: *See*—
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Spiliotis, Nicholas J., to Allied Chemical Corporation. Sulfate-free method of etching copper pattern on printed circuit boards. 4,175,011, Cl. 204-15.000.
Spokane Crusher Manufacturing Co.: *See*—
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Spong, Fred W.: *See*—
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Stauffer Chemical Company: *See*—
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Timony, Peter E., 4,175,045, Cl. 252-56.00S.
Stedman, Robert N., to Caterpillar Tractor Co. Material ripping vehicle. 4,174,757, Cl. 172-292.000.
Steigerwald, Karl H.: *See*—
Kappelsberger, Erwin; Anderl, Peter; and Steigerwald, Karl H., 4,175,226, Cl. 219-121.0EM.
Steigerwald Strahltechnik GmbH: *See*—
Kappelsberger, Erwin; Anderl, Peter; and Steigerwald, Karl H., 4,175,226, Cl. 219-121.0EM.
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Steinwart, Johannes; Maurhoff, Gerhard; and Bauder, Armin, to Audi NSU Auto Union Aktiengesellschaft. Fuel injection system having pressurized damping means. 4,174,693, Cl. 123-139.0AW.
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Sutton, Christopher J.; and Trigg, Leonard, to Desmo Limited. Motor vehicle rear-view mirrors. 4,174,823, Cl. 248-582.000.
Sutton, Roger F.: *See*—
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Suverison, Lyle B., to General Motors Corporation. Electrical connector. 4,174,879, Cl. 339-217.00S.
SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH: *See*—
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Swis, Philip E.; and Hill, Jere L., to Sun Electric Corporation. Test stand for an internal combustion engine testing system. 4,174,627, Cl. 73-116.000.
Swisher, George W., Jr., to CMI Corporation. Burner and exhaust control assemblies for use with an apparatus for conveying particulate material. 4,174,949, Cl. 432-58.000.
Swiss Aluminium Ltd.: *See*—
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Tachi, Katsuichi, to Sony Corporation. Method and apparatus of inserting an address signal in a video signal. 4,175,267, Cl. 358-4.000.
Tait, William S.; and Greenlee, Roy W., to Petrolite Corporation. Use of hydrocarbon polymers in demulsification. 4,175,054, Cl. 252-331.000.
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Takahashi, Kihei; and Terada, Seiko, to Yoshida Kogyo K.K. Apparatus for manufacturing a slide fastener stringer having a woven coiled coupling element. 4,174,736, Cl. 139-35.000.
Takano, Rikuo: *See*—
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Takeda Chemical Industries, Ltd.: *See*—
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Takemori, Fumio, to Akebono Brake Industry Co., Ltd. Caliper carrying structure for tilting type disc brake. 4,174,768, Cl. 188-72.300.
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Takita, Nobuhiro; and Shintani, Tadashi, to Dainippon Screen Seizo Kabushiki Kaisha. Film squeegee mechanism of automatic film developing apparatus. 4,174,901, Cl. 354-322.000.
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Tanabe Seiyaku Co., Ltd.: *See*—
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Tanaka, Harumi, to Minolta Camera Kabushiki Kaisha. Film advance device for cameras. 4,174,899, Cl. 354-213.000.
Tanaka, Yukio, to Showa Machine Industries Co., Ltd. Tap holder. 4,174,918, Cl. 408-139.000.
Tarkan, Stuart E.: *See*—
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Tatum, Joe F.; and Lewis, Thomas H., to C. E. Equipment Co., Inc. Apparatus for preventing end effect in anodes. 4,175,021, Cl. 204-196.000.
Taylor, Colin R., to Pfizer Inc. Method for treating congestive heart failure. 4,175,128, Cl. 424-263.000.
Taylor, Harry M.: *See*—
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Teledyne, Inc.: *See*—
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Temp-Stik Corporation: *See*—
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Teodorescu, Constantin; and Ardeleanu, Stefan, to Institutul National Pentru Creatie Stiintifica Si Tehnica - Increst. Process and plant for the continuous unloading of the heavy-duty containers in a pneumatic transport system. 4,174,921, Cl. 414-387.000
Ter Borg & Mensinga's Machinefabriek N.V.: *See*—
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Texaco Development Corp.: *See*—
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Texaco Inc.: *See*—
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Texas Brine Corporation: *See*—
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Texas Instruments Incorporated: *See*—
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Textron Inc.: *See*—
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Moertel, George B., 4,175,104, Cl. 264-103.000.
Thomas, Donald K., Jr. Grating opening in a working table for vertical storage. 4,174,668, Cl. 108-25.000.
Thompson, Charles W. Friction type exercise device. 4,174,832, Cl. 272-133.000.
Thompson, Gerald L.; Paschal, Gloria C.; and Conrad, Robert A., to Eli Lilly and Company. Process of producing 5'-hydroxyleurosine and related compounds. 4,175,080, Cl. 260-244.400.
Thompson, H. Lytle, to UOP Inc. Closed-loop vacuum fractionation process. 4,175,034, Cl. 208-321.000.
Thomson-CSF: *See*—
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Tideland Signal Corporation: *See*—
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Timex Corporation: *See*—
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Timony, Peter E., to Stauffer Chemical Company. Compressor lubrication. 4,175,045, Cl. 252-56.00S.
Tishkov, Anatoly Y.: *See*—
Kreimer, Vladimir I.; Tishkov, Anatoly Y.; Grigoriev, Vitaly M.; Gendlina, Ljudmila I.; and Zimonin, Leonid V., 4,174,776, Cl. 198-771.000.
Tobler, Hugh J. Method and apparatus for supplying ingredients to a concrete mixer. 4,174,740, Cl. 141-1.000.
Tocha, Klaus, to Messer Griesheim GmbH. Apparatus for controlling the pressure of a gas in a gas line. 4,174,619, Cl. 62-52.000.
Todd, Alex: *See*—
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Toh, Tagao: *See*—
Iwaoka, Kazuo; Toh, Tagao; and Fukada, Minoru, 4,175,107, Cl. 422-114.000.
Tokyo Denki Kagaku Kogyo Kabushiki Kaisha. *See*—
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Tokyo Shibaura Electric Co., Ltd.: *See*—
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Niwa, Kazuo; Shibagaki, Masahiro; and Horiike, Yasuhiro, 4,175,235, Cl. 250-542.000.
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Toledo Engineering Company: *See*—
Bradley, Robert O.; Knighton, Heywood J.; and Naveaux, Robert J., 4,174,948, Cl. 432-54.000.
Tolley, William K., to UOP Inc. Recovery of titanium metal values. 4,174,963, Cl. 75-101.00R
Tolley, William K., to UOP Inc. Recovery of titanium metal values. 4,175,110, Cl. 423-83.000.
Toma, Hitoshi: *See*—
Imataki, Hiroyuki; Toma, Hitoshi; and Narita, Noboru, 4,174,883, Cl. 350-126.000.
Toppan Printing Co., Ltd.: *See*—
Abe, Takashi; Kudo, Kazuo; and Kazato, Keiji, 4,174,783, Cl. 215-1.00C
Torbett, Edward L. Safety nozzle and rack. 4,174,810, Cl. 239-283.000.
Torres, Manuel M. Storage roller thruster device for continuous strip paper feeders. 4,174,800, Cl. 226-113.000.
Toyo Kogyo Co., Ltd.: *See*—
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
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Hori, Osamu; and Kondo, Katsumi, 4,175,144, Cl. 427-126.000.
Noguchi, Masaaki; Sanda, Shougo; and Takizawa, Masaaki, 4,174,679, Cl. 123-30.00D.
Sumiyoshi, Masaharu, 4,174,690, Cl. 123-119.0EC.
Treace, Harry T., to Richards Manufacturing Co., Inc. Myringotomy tube. 4,174,716, Cl. 128-350.00R.
Trexler, Charles H., Sr. Fuel-air supply system for internal combustion engines. 4,174,691, Cl. 123-133.000.
Triad & Associates, Inc.: *See*—
Triplett, William C.; and Morrow, Richard B. A., 4,175,263, Cl. 340-573.000.
Trigg, Leonard: *See*—
Sutton, Christopher J.; and Trigg, Leonard, 4,174,823, Cl. 248-582.000.
Triplett, William C.; and Morrow, Richard B. A., to Triad & Associates, Inc. Technique for monitoring whether an individual is moving from a particular area. 4,175,263, Cl. 340-573.000.
Trudgen, Gary A.: *See*—
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Tsao, George T.; Ladisch, Michael R.; and Bose, Arindam, to Purdue Research Foundation. Acid hydrolysis of cellulose to yield glucose. 4,174,976, Cl. 127-37.000.
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Tsukamoto, Kotaro. Silent gear wheel. 4,174,643, Cl. 74-443.000.
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Tung, Wei-Ling; and Kwan, Steven. Low pressure warning tire air valve cap. 4,174,673, Cl. 116-34.00R.
Turner Quick-Lift Corporation: *See*—
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Tuzson, John J., to Borg-Warner Corporation. Flow valve. 4,174,724, Cl. 137-56.000.
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Linnman, Sven N. J.; Isoz, Peter; Branderud, Nils P.; and Udden, Per E. C., 4,175,255, Cl. 328-7.000.
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Drnevich, Raymond F.; Venkataraman, Kallidaikurichi N.; and Walder, Thomas E., 4,175,041, Cl. 210-188.000.
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Norteman, William E., Jr., 4,175,052, Cl. 252-182.100.
Potts, James E., 4,175,177, Cl. 528-354.000.
Vadla, Jostein J.; and Wilder, Harold J., 4,175,022, Cl. 204-243.00R.
van Lier, Johannes A., 4,175,167, Cl. 429-59.000.
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U.S. Philips Corporation: *See—*
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Koel, Gerrit J.; and Gerkema, Jan, 4,175,010, Cl. 204-15.000.
Mixner, Ingomar, 4,174,568, Cl. 30-34.100.
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United Technologies Corporation: *See—*
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Usnick, George B.; Ward, Gene T.; Blair, Henry O.; Roberts, James W.; and Warner, Terry N., to United States of America, Energy. Sliding-gate valve. 4,174,728, Cl. 137-240.000.
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Vadla, Jostein J.; and Wilder, Harold J., to Union Carbide Corporation. Electrolytic cell bottom barrier formed from expanded graphite. 4,175,022, Cl. 204-243.00R.
Valente, Domenico. Pneumatic apparatus for the rotation of valve rods. 4,174,655, Cl. 92-122.000.
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Vandenberg, Ervin K., to Turner Quick-Lift Corporation. Wheeled vehicle axle suspension system. 4,174,855, Cl. 280-711.000.
Van Den Bergh, William, to Utility Contracting Co. Cable spraying apparatus. 4,174,678, Cl. 118-307.000.
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., to Janssen Pharmaceutica N.V. Antiemetic 1-(benzoxazolylalkyl)-piperidine derivatives. 4,175,129, Cl. 424-267.000.
van den Bussche, Hendrik K. J.; van Soldt, Nicolaas J.; van de Krogt, Adrianus H.; and Drinkwaard, Willem, deceased (by Drinkwaard, Adriana, nee Goossen, personal representative), to Shell Oil Company. Marine riser measuring joint. 4,174,628, Cl. 73-151.000.
Van der Aa, Marcel J. M. C.: *See—*
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Vanderpool, Clarence D., to GTE Sylvania Incorporated. Coated phosphors and articles employing same. 4,175,160, Cl. 428-407.000.
van de Weerd, Berend, to Ter Borg & Mensinga's Machinefabriek N.V. Rub-threshing machine. 4,174,718, Cl. 130-30.00J.
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van Soldt, Nicolaas J.: *See—*
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Venzke, Charles E., to A-T-O Inc. Sortation conveyor tip-up and mounting apparatus. 4,174,773, Cl. 198-365.000.
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Viertel, Lothar; and Nowak, Manfred, to Gebr. Happich GmbH. Lighted sun visor for vehicles. 4,174,864, Cl. 296-97.00H.
Villers, Roger L.: *See—*
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Visbach, Dirk M., to B.V. Neratoom. Method of temporarily sealing open ends of fluid conduits terminating in a header space. 4,174,735, Cl. 138-97.000.
Vistins, Maris, to Becton, Dickinson and Company. Textured apron. 4,174,542, Cl. 2-48.000.
Vivian, Howard C. High efficiency variable expansion ratio engine. 4,174,683, Cl. 123-48.00C.

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Wada, Toyoji, to Tokyo Shibaura Electric Co., Ltd. Nuclear fuel pellet with oppositely bottomed holes. 4,175,002, Cl. 176-66.000.
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Walker, Brooks; and Williamson, James. Pile sizer. 4,174,746, Cl. 144-134.00R.
Walkiewicz, John W., to United States of America, Interior. High coercive force rare earth metal-cobalt magnets containing copper and magnesium. 4,174,966, Cl. 75-170.000.
Wallace Murray Corporation: *See—*
Smithson, Charles L., Jr., 4,174,924, Cl. 416-132.00A.
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Wassermann, Martin; Noweck, Klaus; and Meyer, Arnold, to Condea Chemie GmbH. Method for manufacturing a high porous alumina having a large surface area and a low bulk density. 4,175,118, Cl. 423-628.000.
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Watson, Gary Q. Anchor eye protector. 4,174,595, Cl. 52-166.000.
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Webb, Bryant F.; and Parrish, Charles A., to Sperry Rand Corporation. Header suspension and stabilization means. 4,174,602, Cl. 56-208.000.
Webb, Jack; and Schwartz, Stanley L., to Hydrosoil Corporation. Synthetic growing medium and method of preparing it. 4,174,957, Cl. 71-24.000.
Weber, Adam: *See—*
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Wedmore, William R., to GTE Automatic Electric Laboratories Incorporated. Apparatus and method for a pulse regeneration system. 4,175,214, Cl. 179-15.0BW.
Wehler, Herbert, to U.S. Philips Corporation. Printer comprising a printing head controlled by a sensor. 4,174,908, Cl. 400-56.000.
Weineck, Paul: *See—*
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Weissler, Alain. Optical viewer with adjustable angular convergence. 4,174,884, Cl. 350-138.000.
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Wessel, Wolf; Stumpp, Gerhard; and Knapp, Heinrich, to Robert Bosch GmbH. Fuel injection device. 4,174,692, Cl. 123-139.0AW.
Wessel, Wolf; and Sautter, Wilfried, to Robert Bosch GmbH. Fuel injection control system. 4,174,694, Cl. 123-140.0MC.
West, John B., to Maryland Cup Corporation. Soup dispenser. 4,174,789, Cl. 222-240.000.
West Rand Engineering Works (Proprietary) Limited: *See—*
Kramer, Petrus H., 4,174,767, Cl. 184-55.00A.
Western Electric Company, Incorporated: *See—*
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Beuchel, Peter H.; and Cooper, Eric G., 4,175,003, Cl. 176-76.000.
Burns, David C., 4,174,999, Cl. 176-19.00R.
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Johnston, Robert J.; Laycuk, Stephen G.; and Dobrosielski, Stephen S., 4,175,220, Cl. 200-4.000.
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Westvaco Corporation: *See—*
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Wetterlin, Kjell I. L.: *See—*
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Wetzel, Alvin L. Wheelbarrow type carrier. 4,174,849, Cl. 280-47.300.
Wetzler, Justin J. Hospital bed structure. 4,174,547, Cl. 5-68.000.
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Whirlpool Corporation: *See—*
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White, Douglas J., to Bio-Pharmaceutical Packaging Corp. Culture specimen collection and transport package. 4,175,008, Cl. 435-295.000.
White-Westinghouse Corporation: *See—*
Long, Olan L., 4,174,723, Cl. 134-144.000.
Whitfield, Dwight B.; and Ferryman, Kenneth K., Jr., to Lake Center Industries. Electric power actuator. 4,175,248, Cl. 318-467.000.
Wiesler, Mordechai, to Teledyne, Inc. Precision centering device. 4,174,847, Cl. 279-1.00L.
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Vadla, Jostein J.; and Wilder, Harold J., 4,175,022, Cl. 204-243.00R.
Wilgus, Donovan R.; and King, John M., to Chevron Research Company. Mannich base composition and lubricating oil compositions containing same. 4,175,044, Cl. 252-42.700.
Willbanks, Charles E., to Milliken Research Corporation. Blade for sculpturing pile fabric. 4,174,555, Cl. 26-16.000.
Willbanks, Charles E.: *See—*
Arnott, Robert C.; and Willbanks, Charles E., 4,174,664, Cl. 101-127.000.
Wm. Wrigley Jr. Company: *See—*
Hupalowsky, Joseph, 4,174,781, Cl. 211-49.00D.
Williams, Lewis M. Telephone headset. 4,175,217, Cl. 179-156.00R.
Williams, Robert E.: *See—*
Farrar, David J.; Davies, Robert W.; Carter, David C. M.; Bolt, Reginald C.; and Williams, Robert E., 4,174,780, Cl. 209-536.000.
Williams, Roy K., International Telephone and Telegraph Corporation. Safety system for hydraulic vertical press. 4,174,663, Cl. 100-53.000.
Williamson, Glen A. Wind driven engine. 4,174,923, Cl. 415-2.000.
Williamson, James: *See—*
Walker, Brooks; and Williamson, James, 4,174,746, Cl. 144-134.00R.
Williamson, Timothy J.: *See—*
Benton, Kenneth C.; and Williamson, Timothy J., 4,175,101, Cl. 525-88.000.

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Wilson, David J., Jr.: *See—*
Wilson, David J., Sr.; and Wilson, David J., Jr., 4,174,604, Cl. 56-237.000.
Wilson, David J., Sr.; and Wilson, David J., Jr. Hedge trimmer apparatus. 4,174,604, Cl. 56-237.000.
Wilson, Jeffrey V.; Schaefer, James H.; Glowacz, Anthony A.; and Bayha, Jack, to United States of America, Navy. Coaxial wet connector with spring operated piston. 4,174,575, Cl. 339-91.00P.
Windmoller & Holscher: *See—*
Bosse, Frank, 4,174,804, Cl. 229-55.000.
Wirth, Friedhelm: *See—*
Gelsdorf, Gunter; and Wirth, Friedhelm, 4,174,970, Cl. 106-44.000.
Wisowaty, Sigmund. Storage receptacle. 4,174,793, Cl. 224-240.000.
Woerner, Douglas C.: *See—*
Faust, Kenneth J.; and Woerner, Douglas C., 4,175,154, Cl. 428-313.000.
Wolfs, Andreas G. J.; and Goessens, Lambertus H., to Eerste Nederlandse Cement Industrie (ENCI) N.V.; and C.B.R. Cementbedrijven N.V., a part interest to each. Method for working-up waste slag from the oxygen steel production. 4,174,961, Cl. 75-30.000.
Woltjen, Duane W., to UMC Industries, Inc. Torque limiting overload coupling. 4,174,621, Cl. 64-29.000.
Wonsiewicz, Bud C.: *See—*
Chin, Gilbert Y.; Jin, Sungho; Plewes, John T.; and Wonsiewicz, Bud C., 4,174,983, Cl. 148-102.000.
Woo, Kenneth: *See—*
Feinberg, Albert E.; and Woo, Kenneth, 4,175,246, Cl. 315-101.000.
Woods, Lee O., to General Electric Company. Relay device, methods of assembling and mounting, and system. 4,175,260, Cl. 335-202.000.
World Energy Systems: *See—*
Hamrick, Joseph T.; and Rose, Leslie C., 4,174,926, Cl. 417-334.000.
Worthington, Robert B.: *See—*
Paulson, Danton L.; and Worthington, Robert B., 4,174,937, Cl. 425-222.000.
Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., to Upjohn Company, The. Composition of matter and process. 4,175,006, Cl. 435-55.000.
Wozniak, Walter J.: *See—*
Breslow, Jeffrey D.; Ferris, Michael J.; Arias, Henry; and Wozniak, Walter J., 4,174,835, Cl. 273-101.000.
Wuchse, Gunther R., to Alfa-Laval AB. Apparatus for cleaning milking systems. 4,174,721, Cl. 134-58.00R.
Wulff, Gunther, to Balzers Patent- und Beteiligungs Aktiengesellschaft. Metering device for a vacuum deposition apparatus. 4,174,676, Cl. 118-688.000.
Wurst, Bert: *See—*
Jundt, Werner; Bodig, Bernd; Decker, Heinz; Schmidt, Gunther; Wurst, Bert; Seeger, Karl; and Roozenbeek, Herman, 4,174,696, Cl. 123-148.00E.
Wust, Willi: *See—*
Carduck, Franz-Josef; Klotzer, Dietrich; Schneider, Werner; and Wust, Willi, 4,175,050, Cl. 252-91.000.
Wuthrich, Paul, to Timex Corporation. Mechanism for self-wind watches. 4,174,607, Cl. 58-82.00A.
Xerox Corporation: *See—*
Snelling, Christopher, 4,174,903, Cl. 355-3.0CH.
Yamada, Shigeru: *See—*
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, 4,174,650, Cl. 84-1.010.
Yamamoto, Tomio: *See—*
Yasue, Setsuo; and Yamamoto, Tomio, 4,174,797, Cl. 224-42.210.
Yamamoto, Yoichi: *See—*
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Yamanaka, Seisuke: *See—*
Ochi, Shigeyuki; Yamazaki, Hiroshi; and Yamanaka, Seisuke, 4,175,268, Cl. 358-44.000.
Yamanaka, Tsutomu; Yasuda, Hiroshi; and Osuga, Kunio, to Yoshitomi Pharmaceutical Industries, Ltd. Oxazole- and thiazole-alkanoic acid compounds. 4,175,130, Cl. 424-270.000.
Yamato, Eisaku: *See—*
Senuma, Masaru; Ishihara, Nobuhiko; Nishimoto, Shigeru; Yamato, Eisaku; and Shigematsu, Noboru, 4,175,206, Cl. 562-444.000.
Yamatsu, Isao: *See—*
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Yamazaki, Hiroshi: *See—*
Ochi, Shigeyuki; Yamazaki, Hiroshi; and Yamanaka, Seisuke, 4,175,268, Cl. 358-44.000.
Yan, Tsoung-Yuan: *See—*
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Yarbrough, Paul A.: *See—*
Senior, Robert B.; and Yarbrough, Paul A., 4,174,560, Cl. 29-566.100.
Yasuda, Hiroshi: *See—*
Yamanaka, Tsutomu; Yasuda, Hiroshi; and Osuga, Kunio, 4,175,130, Cl. 424-270.000.
Yasue, Setsuo; and Yamamoto, Tomio, to Sankokiki Kabushiki Kaisha. Spare wheel holding apparatus. 4,174,797, Cl. 224-42.210.
Yohe, William R.: *See—*
Ferguson, Sammy J.; and Yohe, William R., 4,174,995, Cl. 156-494.000.
Yokota, Sekiji: *See—*
Fujii, Toshihiro; and Yokota, Sekiji, 4,174,992, Cl. 156-244.110.
Fujii, Toshihiro; and Yokota, Sekiji, 4,174,993, Cl. 156-244.110.
Yoo, Jin S.: *See—*
Sun, Jui-Yuan; Yoo, Jin S.; Burk, Emmett H., Jr.; and Masologites, George P., 4,174,953, Cl. 44-1.00R.
Yoshida Kogyo K.K.: *See—*
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Takahashi, Kihei; and Terada, Seiko, 4,174,736, Cl. 139-35.000.
Yoshimori, Ikuo: *See—*
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Yoshino Kogyosho Co., Ltd.: *See—*
Nozawa, Takamitsu; Goto, Takayuki; Kishi, Takao; and Iizuka, Shigeo, 4,174,790, Cl. 222-321.000.
Yoshitomi Pharmaceutical Industries, Ltd.: *See—*
Yamanaka, Tsutomu; Yasuda, Hiroshi; and Osuga, Kunio, 4,175,130, Cl. 424-270.000.
Youngquist, Rudolph W.: *See—*
Garrison, Charles M.; Youngquist, Rudolph W.; and Taylor, Harry M., 4,175,075, Cl. 260-123.500.
Youtsey, Karl J.: *See—*
Carnahan, Robert D.; Holt, William C., Jr.; and Youtsey, Karl J., 4,175,152, Cl. 428-242.000.
Yu, Peter H.: *See—*
Crnojevich, Ranko; Wiewiorowski, Edward I.; and Yu, Peter H., 4,175,014, Cl. 204-130.000.
Zabler, Erich; Jansche, Walter; and Heintz, Frieder, to Robert Bosch GmbH. Pressure pickup for measuring the pressure in the intake manifold of an internal combustion engine. 4,174,638, Cl. 73-728.000.
Zadde, Vitaly V.: *See—*
Lidorenko, Nikolai S.; Evdokimov, Vladimir M.; Zadde, Vitaly V.; Kozlov, Alexandr I.; Ryabikov, Stanislav V.; Potapov, Valery N.; Strebkov, Dmitry S.; Surianinova, Tatiana I.; Chubrikov, Boris A.; Zatravina, Valentina V.; Korolev, Boris V.; Kulikov, Viktor F.; Zhuravleva, Larisa L.; Unishkov, Vadim A.; Dormidontov, Anatoly A.; Moiseev, Viktor I.; and Kudeshova, Ljubov P., 4,174,978, Cl. 136-89.0PC.
Zahn, Ulrich. Recording device for the dispensing of goods. 4,174,806, Cl. 235-381.000.
Zahnradfabrik Friedrichshafen AG: *See—*
Liebert, Karl-Heinz, 4,174,612, Cl. 60-384.000.
Zatravina, Valentina V.: *See—*
Lidorenko, Nikolai S.; Evdokimov, Vladimir M.; Zadde, Vitaly V.; Kozlov, Alexandr I.; Ryabikov, Stanislav V.; Potapov, Valery N.; Strebkov, Dmitry S.; Surianinova, Tatiana I.; Chubrikov, Boris A.; Zatravina, Valentina V.; Korolev, Boris V.; Kulikov, Viktor F.; Zhuravleva, Larisa L.; Unishkov, Vadim A.; Dormidontov, Anatoly A.; Moiseev, Viktor I.; and Kudeshova, Ljubov P., 4,174,978, Cl. 136-89.0PC.
Zechnall, Martin: *See—*
Honig, Guenther; Kiencke, Uwe; and Zechnall, Martin, 4,174,688, Cl. 123-117.00D.
Zeller, Paul: *See—*
Binder, Dieter; Hromatka, Otto; Pfister, Rudolf; and Zeller, Paul, 4,175,085, Cl. 549-65.000.
Zenzefilis, George E. Method and apparatus for recording and reproducing video. 4,175,270, Cl. 358-128.000.
Zettelmeyer Maschinenfabrick GmbH & Co. KG Konz: *See—*
Spicka, Roland; Krob, Adolf; Seidel, Detlev; and Viefhaus, Paul, 4,174,854, Cl. 280-702.000.
Zhuravleva, Larisa L.: *See—*
Lidorenko, Nikolai S.; Evdokimov, Vladimir M.; Zadde, Vitaly V.; Kozlov, Alexandr I.; Ryabikov, Stanislav V.; Potapov, Valery N.; Strebkov, Dmitry S.; Surianinova, Tatiana I.; Chubrikov, Boris A.; Zatravina, Valentina V.; Korolev, Boris V.; Kulikov, Viktor F.; Zhuravleva, Larisa L.; Unishkov, Vadim A.; Dormidontov, Anatoly A.; Moiseev, Viktor I.; and Kudeshova, Ljubov P., 4,174,978, Cl. 136-89.0PC.
Zimmerman, Dennis M., to Eli Lilly and Company. 1,3,4-Trisubstituted-4-aryl-1,4,5,6-tetra-hydropyridines. 4,175,197, Cl. 546-339.000.
Zimmerman, Sheldon B.; and Chalmers, John H., Jr., to Merck & Co., Inc. Process for producing antibiotic A21A. 4,175,007, Cl. 435-105.000.
Zimonin, Leonid V.: *See—*
Kreimer, Vladimir I.; Tishkov, Anatoly Y.; Grigoriev, Vitaly M.; Gendlina, Ljudmila I.; and Zimonin, Leonid V., 4,174,776, Cl. 198-771.000.
Zobens, Arthur, to Crane Packing Company. Mechanical seal. 4,174,844, Cl. 277-85.000.
Zoller, Karl: *See—*
Merkle, Hans; Mueller, Albrecht; and Zoller, Karl, 4,175,184, Cl. 544-10.000.
Zuk, Paul, to Bell Telephone Laboratories, Incorporated. Voltage surge protector. 4,175,277, Cl. 361-120.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF NOVEMBER, 1979

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Cyanamid Company: *See—*
Gustafson, William R., Re. 30,155, Cl. 208-216.0PP.
Bose Corporation: *See—*
Jarvis, Arthur B., Re. 30,154, Cl. 403-290.000.
Brinckmann, Paul C., to Harshaw Chemical Company, The. Sodium activated cesium iodide scintillator. Re. 30,156, Cl. 252-301.40H.
Bucklin, James B.; and Utken, Jay, to P. R. Mallory & Co. Inc. Fusing resistor. Re. 30,158, Cl. 337-166.000.
Burress, George T., to Mobil Oil Corporation. Xylene isomerization. Re. 30,157, Cl. 585-411.000.
Busch, Thomas N.; and Hoadley, Cyrus E., to Youngstown Sheet and Tube Company. Tree harvester. Re. 30,153, Cl. 144-3.00D.
Davis, Lewis K., to Deere & Company. Swingable shield assembly for tractor power take-off. Re. 30,152, Cl. 64-32.00R.
Deere & Company: *See—*
Davis, Lewis K., Re. 30,152, Cl. 64-32.00R.
Gustafson, William R., to American Cyanamid Company. Hydrotreating of petroleum distillates using shaped catalyst particles. Re. 30,155, Cl. 208-216.0PP.
Harris-Hub Co., Inc.: *See—*
Nowell, Richard A., Re. 30,151, Cl. 5-181.000.
Harshaw Chemical Company, The: *See—*
Brinckmann, Paul C., Re. 30,156, Cl. 252-301.40H.
Hoadley, Cyrus E.: *See—*
Busch, Thomas N.; and Hoadley, Cyrus E., Re. 30,153, Cl. 144-3.00D.
Jarvis, Arthur B., to Bose Corporation. Joining. Re. 30,154, Cl. 403-290.000.
Mobil Oil Corporation: *See—*
Burress, George T., Re. 30,157, Cl. 585-411.000.
Nowell, Richard A., to Harris-Hub Co., Inc. Adjustable bed-frame. Re. 30,151, Cl. 5-181.000.
P. R. Mallory & Co. Inc.: *See—*
Bucklin, James B.; and Utken, Jay, Re. 30,158, Cl. 337-166.000.
Utken, Jay: *See—*
Bucklin, James B.; and Utken, Jay, Re. 30,158, Cl. 337-166.000.
Youngstown Sheet and Tube Company: *See—*
Busch, Thomas N.; and Hoadley, Cyrus E., Re. 30,153, Cl. 144-3.00D.

LIST OF PLANT PATENTEES

Bringhurst, Royce S.; and Voth, Victor, to University of California, The Regents of the. Strawberry plant. 4,487, 11-20-79, Cl. 49.000.
Bringhurst, Royce S.; and Voth, Victor, to University of California, The Regents of the. Strawberry plant. 4,488, 11-20-79, Cl. 49.000.
Bringhurst, Royce S.; and Voth, Victor, to University of California, The Regents of the. Strawberry plant. 4,489, 11-20-79, Cl. 49.000.
Reiter, J. Miles. Raspberry plant. 4,485, 11-20-79, Cl. 46.000.
Reiter, J. Miles. Raspberry plant. 4,486, 11-20-79, Cl. 46.000.
University of California, The Regents of the: *See—*
Bringhurst, Royce S.; and Voth, Victor, 4,487, Cl. 49.000.
Bringhurst, Royce S.; and Voth, Victor, 4,488, Cl. 49.000.
Bringhurst, Royce S.; and Voth, Victor, 4,489, Cl. 49.000.
Voth, Victor: *See—*
Bringhurst, Royce S.; and Voth, Victor, 4,487, Cl. 49.000
Bringhurst, Royce S.; and Voth, Victor, 4,488, Cl. 49.000.
Bringhurst, Royce S.; and Voth, Victor, 4,489, Cl. 49.000.

LIST OF DESIGN PATENTEES

A - Betong AB: *See—*
Limmergard, Sten; and Thim, Stig H. G., 253,491, Cl. D25-74.000.
Abruzzo, Joseph, Jr., to Holson Company, The. Photograph album. 253,482, 11-20-79, Cl. D19-26.000.
Action Industries, Inc.: *See—*
Salladay, Mack, 253,448, Cl. D6-256.000.
Ailes, William B., II. Planter or similar article. 253,463, 11-20-79, Cl. D11-143.000.
Airwick Industries, Inc.: *See—*
Hoyt, Earl, 253,488, Cl. D23-150.000.
Hoyt, Earl, 253,489, Cl. D23-150.000.
American Optical Corporation: *See—*
Canavan, Richard W., III, 253,477, Cl. D16-65.000.
Canavan, Richard W., III, 253,478, Cl. D16-65.000.
Canavan, Richard W., III, 253,481, Cl. D16-65.000.
Johnsen, David W., 253,479, Cl. D16-65.000.
Johnsen, David W., 253,480, Cl. D16-65.000.
Winig, Stephen U., 253,442, Cl. D6-162.000.
Winig, Stephen U., 253,446, Cl. D6-235.000.
Ashe, Herbert J.: *See—*
Sit-Lae, Yeung, 253,494, Cl. D48-24.00A.
Astatic Corporation, The: *See—*
Peterson, Donald W., 253,468, Cl. D14-12.000.
Augurt, Thomas A., to Propper Manufacturing Co., Inc. Sterilization indicator. 253,492, 11-20-79, Cl. D24-99.000.
Barbee, Marvin L.: *See—*
Butcher, Donald A.; and Barbee, Marvin L., 253,450, Cl. D6-157.000.
Beder, Samuel L., to Le-Bo Products Company, Inc. Record rack. 253,443, 11-20-79, Cl. D6-185.000.
Beene, Geoffrey, to Geoffrey Beene, Inc. Bottle. 253,455, 11-20-79, Cl. D9-145.000.
Bodine, Dale P., to Clark Equipment Company. Electric lamp housing for vehicles. 253,495, 11-20-79, Cl. D48-32.00R.
Bon-Aire Industries, Inc.: *See—*
Tack, Suen S., 253,452, Cl. D7-164.000
Bothun, Eugene L.; and Cannon, Thomas G., to Clarke-Gravely Corporation. Carpet cleaner. 253,471, 11-20-79, Cl. D15-53.000.
Bothun, Eugene L.: *See—*
Cannon, Thomas G.; and Bothun, Eugene L., 253,472, Cl. D15-54.000.
Bridgeport Metal Goods Manufacturing Company, The: *See—*
White, John C., 253,460, Cl. D9-168.000.
Bridgestone Tire Company Limited: *See—*
Ezura, Sakae, and Kojima, Hiroshi, 253,467, Cl. D12-147.000.
Kojima, Hiroshi; Takayama, Masahiro; and Nishio, Hideaki, 253,466, Cl. D12-141.000.
Butcher, Donald A.; and Barbee, Marvin L., to Marquette Electronics, Inc. Fabric display rack. 253,450, 11-20-79, Cl. D6-157.000.
Canavan, Richard W., III, to American Optical Corporation. Pair of spectacles. 253,477, 11-20-79, Cl. D16-65.000.
Canavan, Richard W., III, to American Optical Corporation. Pair of spectacles. 253,478, 11-20-79, Cl. D16-65.000.
Canavan, Richard W., III, to American Optical Corporation. Pair of spectacles. 253,481, 11-20-79, Cl. D16-65.000.
Cannon, Thomas G.; and Bothun, Eugene L., to Clarke-Gravely Corporation. Vacuum cleaner. 253,472, 11-20-79, Cl. D15-54.000.
Cannon, Thomas G.: *See—*
Bothun, Eugene L.; and Cannon, Thomas G., 253,471, Cl. D15-53.000.
Champion International Corporation: *See—*
Dempster, Thomas B., 253,461, Cl. D9-245.000.
Chaykin, Robert L. Grinding wheel. 253,474, 11-20-79, Cl. D15-126.000
Clark Equipment Company: *See—*
Bodine, Dale P., 253,495, Cl. D48-32.00R.

Clarke-Gravely Corporation: *See—*
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Cannon, Thomas G.; and Bothun, Eugene L., 253,472, Cl. D15-54.000.
Continental Group, Inc., The: *See—*
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Hasegawa, Gary K.; and Mascia, Carmen T., 253,459, Cl. D9-131.000.
Daniels, George R., to Honeywell Information Systems Inc. Data processing work station or the like. 253,445, 11-20-79, Cl. D6-186.000.
Dart Industries Inc.: *See—*
Fritz, Ann K., 253,449, Cl. D7-41.000.
Data Packaging Corporation: *See—*
Mathus, Gregory; and Yonkers, Edward, 253,444, Cl. D6-185.000.
Dempster, Thomas B., to Champion International Corporation. Carton blank. 253,461, 11-20-79, Cl. D9-245.000.
Earle, W. Horton, to Richardson-Merrell Inc. Bottle. 253,454, 11-20-79, Cl. D9-128.000.
Elder, Roy D. Desk ornament or similar article. 253,464, 11-20-79, Cl. D11-157.000.
Ezura, Sakae; and Kojima, Hiroshi, to Bridgestone Tire Company Limited. Vehicle tire. 253,467, 11-20-79, Cl. D12-147.000.
France, George E. Beam sling unit for suspending poultry cages. 253,493, 11-20-79, Cl. D30-2.000.
Fritz, Ann K., to Dart Industries Inc. Pastry sheet or the like. 253,449, 11-20-79, Cl. D7-41.000.
Garden Maid, Inc.: *See—*
Sheldon, Gary L., 253,469, Cl. D15-12.000.
Sheldon, Gary L., 253,470, Cl. D15-12.000.
Geoffrey Beene, Inc.: *See—*
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Golden Eagle Firearms, Inc.: *See—*
Robinson, Marion M., 253,485, Cl. D22-6.000.
Hamm, Heinz: *See—*
Kramer, Jochen; Schonfeld, Hans; Papke, Friedrich; Mankau, Dieter; Hamm, Heinz; and Westerweck, Lothar, 253,475, Cl. D16-06.000.
Hasegawa, Gary K.; and Mascia, Carmen T., to Continental Group, Inc., The. Can or similar article. 253,458, 11-20-79, Cl. D9-131.000.
Hasegawa, Gary K.; and Mascia, Carmen T., to Continental Group, Inc., The. Can or similar article. 253,459, 11-20-79, Cl. D9-131.000.
Holson Company, The: *See—*
Abruzzo, Joseph, Jr., 253,482, Cl. D19-26.000.
Honeywell Information Systems Inc.: *See—*
Daniels, George R., 253,445, Cl. D6-186.000.
Hoyt, Earl, to Airwick Industries, Inc. Dispenser for air treating material. 253,488, 11-20-79, Cl. D23-150.000.
Hoyt, Earl, to Airwick Industries, Inc. Dispenser for air treating material. 253,489, 11-20-79, Cl. D23-150.000.
Jensen, Margaret A. Foot decoration. 253,437, 11-20-79, Cl. D2-270.000.
Johnsen, David W., to American Optical Corporation. Spectacles frame front. 253,479, 11-20-79, Cl. D16-65.000.
Johnsen, David W., to American Optical Corporation. Pair of spectacles. 253,480, 11-20-79, Cl. D16-65.000.
Jolley, Paul E., to Spencer Wright Industries, Inc. Gated hook for tufting machines. 253,473, 11-20-79, Cl. D15-78.000.
Keller, Huey T., to Vaughan Furniture Company, Inc. Chair. 253,440, 11-20-79, Cl. D6-70.000.
Keyes Fibre Company: *See—*
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Kramer, Jochen; Schonfeld, Hans; Papke, Friedrich; Mankau, Dieter; Hamm, Heinz; and Westerweck, Lothar, to Rollei-Werke Franke & Heidecke. Photographic camera. 253,475, 11-20-79, Cl. D16-06.000.
Kretz, Edward J., to Owens-Illinois, Inc. Bottle. 253,453, 11-20-79, Cl. D9-111.000.
Le-Bo Products Company, Inc.: *See—*
Beder, Samuel L., 253,443, Cl. D6-185.000.
Limmergard, Sten; and Thim, Stig H. G., to A - Betong AB. Sealing stripe for a level crossing between a road and a railroad. 253,491, 11-20-79, Cl. D25-74.000.
Lobdell, Thomas. Auto wheel support dolly or similar article. 253,465, 11-20-79, Cl. D12-31.000.
Lynn, George, to W. H. Brine Company. Protective sports helmet. 253,436, 11-20-79, Cl. D2-232.000.
Mankau, Dieter: *See—*
Kramer, Jochen; Schonfeld, Hans; Papke, Friedrich; Mankau, Dieter; Hamm, Heinz; and Westerweck, Lothar, 253,475, Cl. D16-06.000.
Markley, Harold T. Combined work case, pad holder and calculator. 253,438, 11-20-79, Cl. D3-76.000.
Marquette Electronics, Inc.: *See—*
Butcher, Donald A.; and Barbee, Marvin L., 253,450, Cl. D6-157.000.
Reiser, Gerald J., 253,490, Cl. D24-29.000.
Mascia, Carmen T.: *See—*
Hasegawa, Gary K.; and Mascia, Carmen T., 253,458, Cl. D9-131.000.
Hasegawa, Gary K.; and Mascia, Carmen T., 253,459, Cl. D9-131.000.
Masudaya Toy Company Limited: *See—*
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Ng, Win. Butter warmer. 253,451, 11-20-79, Cl. D7-125.000.
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Prevost, Jean. Easy chair. 253,439, 11-20-79, Cl. D6-67.000.
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Augurt, Thomas A., 253,492, Cl. D24-99.000.
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Earle, W. Horton, 253,454, Cl. D9-128.000.
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Jolley, Paul E., 253,473, Cl. D15-78.000.
Tack, Suen S., to Bon-Aire Industries, Inc. Hand-held vacuum cleaner. 253,452, 11-20-79, Cl. D7-164.000.
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Kojima, Hiroshi; Takayama, Masahiro; and Nishio, Hideaki, 253,466, Cl. D12-141.000.
Thim, Stig H. G.: *See—*
Limmergard, Sten; and Thim, Stig H. G., 253,491, Cl. D25-74.000.
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Keller, Huey T., 253,440, Cl. D6-70.000.
W. H. Brine Company: *See—*
Lynn, George, 253,436, Cl. D2-232.000.
Westerweck, Lothar: *See—*
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

LUTRELLE F. PARKER,
July 3, 1979. *Acting Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of October 1979

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Affirmed in part	30
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Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commission of Patents and Trademarks on or before Dec. 21, 1979:

Annett, Leonard L., Suite 2900, 2 Bloor St., East Toronto, Canada M4W 3J5
Cooper, William C., 4421 Lowell St., NW., Washington, D.C. 20016
Cutting, Robert F., 2111 Jefferson Davis Hwy., #1123N, Arlington, Va. 22202
Frenkel, Stuart D., 2000 S. Eads St., #906, Arlington, Va. 22202
Goodman, Philip, 307 Yoakum Pkwy., Alexandria, Va. 22304
Haley, Reuben J., Northern Telecom Ltd., P.O. Box 3511, Sta. C, Ottawa, Ontario, Canada K1Y 4H7
Parr, Eugenia S., 6842 Cerro Bajo, San Antonio, Tex. 78239
Schwartz, Gerald A., 606 W. Windsor Ave., Alexandria, Va. 22302
Wiggs, Blake R., Suite 280, One Bentall Centre, 505 Burrard St., Vancouver, British Columbia, Canada V7X 1M3

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,256,002, Re. S.N. 066,886, Filed Aug. 16, 1979, Cl. 118/60, XEROGRAPHIC FIXING DEVICE, Frederick W. Hudson, Owner of Record: *Xerox Corporation, Rochester, N.Y.,* Attorney or Agent: Harvey M. Brownrout, Ex. Gp.: 166

3,312,548, Re. S.N. 066,889, Filed Aug. 16, 1979, Cl. 96/1.5 R, XEROGRAPHIC PLATES, Virgil E. Straughan, Owner of Record: *Xerox Corporation, Rochester, N.Y.,* Attorney or Agent: Harvey M. Brownrout, et al., Ex. Gp.: 166

3,870,515, Re. S.N. 066,888, Filed Aug. 16, 1979, Cl. 96/1.4, METHOD FOR ELECTROSTATIC PAPER STRIPPING BY NEUTRALIZATION OF TRANSFER CHARGE, Norbett H. Kaupp, Owner of Record: *Xerox Corporation, Rochester, N.Y.,* Attorney or Agent: Harvey M. Brownrout, et al., Ex. Gp.: 166

4,060,003, Re. S.N. 063,967, Filed Aug. 13, 1979, Cl. 73/483, IMBALANCE DETERMINING APPARATUS AND METHOD, Thomas J. Bacsanyi, et al., Owner of Record: *Ransburg Corporation, Indianapolis, Ind.,* Attorney or Agent: Merrill N. Johnson, et al., Ex. Gp.: 244

4,061,279, Re. S.N. 065,825, Filed Aug. 13, 1979, Cl. 241/86.1, HIGH-SPEED ROTATING CRUSHING MACHINERY, Daniel C. Sautter, Owner of Record: *Pennsylvania Crusher Corp., Broomall, Pa.,* Attorney or Agent: Elliott I. Pollock, et al., Ex. Gp.: 322

4,083,545, Re. S.N. 062,536, Filed Jul. 31, 1979, Cl. 267/54 A, SPRING SHACKLE ASSEMBLY, Edward J. Herbenar, Owner of Record: *TRW Inc., Cleveland, Ohio,* Attorney or Agent: Thomas L. Tarolli, et al., Ex. Gp.: 315

4,101,861, Re. S.N. 063,644, Filed Aug. 3, 1979, Cl. 337/368, THERMOSTATIC SWITCH AND METHOD OF ASSEMBLY, Richard L. Jenne, Owner of Record: *Texas Instruments Incorporated, Dallas, Tex.,* Attorney or Agent: John A. Haug, et al., Ex. Gp.: 212

4,147,558, Re. S.N. 067,865, Filed Aug. 20, 1979, Cl. 134/10, METHOD FOR RINSING AND CHEMICALLY SANITIZING FOODWARE ITEMS, Louis F. Fraula, et al., Owner of Record: *Hobart Corporation, Troy, Ohio,* Attorney or Agent: Lawrence B. Biebel, et al., Ex. Gp.: 173

4,147,559, Re. S.N. 067,866, Filed Aug. 20, 1979, Cl. 134/57 D, APPARATUS FOR RINSING AND CHEMICALLY SANITIZING FOOD WARE ITEMS, Louis F. Fraula et al., Owner of Record: *Hobart Corporation, Troy, Ohio,* Attorney or Agent: Lawrence B. Biebel, et al., Ex. Gp.: 242

PATENT NOTICES

Certificates of Correction for the Week of Nov. 27, 1979

Re. 29,892	4,103,051	4,142,806	4,159,233
Re. 30,010	4,108,248	4,142,937	4,159,280
D. 252,211	4,109,200	4,144,033	4,159,311
D. 252,488	4,109,202	4,144,465	4,159,381
D. 252,498	4,109,280	4,144,720	4,159,700
3,878,202	4,114,841	4,145,710	4,159,884
3,919,293	4,115,290	4,146,040	4,159,995
3,927,383	4,116,793	4,146,471	4,159,997
3,930,980	4,116,794	4,146,578	4,159,998
3,944,926	4,116,856	4,148,840	4,160,028
3,960,857	4,116,857	4,150,279	4,160,582
3,984,200	4,116,858	4,151,152	4,160,672
4,004,647	4,120,175	4,152,413	4,160,850
4,005,073	4,120,395	4,152,415	4,161,014
4,005,110	4,120,625	4,153,722	4,161,125
4,012,429	4,121,900	4,153,883	4,161,261
4,019,947	4,124,149	4,154,838	4,161,458
4,021,427	4,126,096	4,154,883	4,161,492
4,021,846	4,127,205	4,155,241	4,161,807
4,026,959	4,127,281	4,155,697	4,161,868
4,028,724	4,128,602	4,155,882	4,162,163
4,029,692	4,128,603	4,156,091	4,162,237
4,033,565	4,130,709	4,156,092	4,162,377
4,038,272	4,130,812	4,156,541	4,162,475
4,038,616	4,131,398	4,156,569	4,162,859
4,045,317	4,131,951	4,156,788	4,163,889
4,054,973	4,132,349	4,156,893	4,164,417
4,074,133	4,133,009	4,157,124	4,164,454
4,078,810	4,133,015	4,157,231	4,164,964
4,083,398	4,133,733	4,157,293	4,165,295
4,087,834	4,133,970	4,157,340	4,165,304
4,090,006	4,134,398	4,157,390	4,165,639
4,091,138	4,134,788	4,157,392	4,166,285
4,092,983	4,135,133	4,157,572	4,166,991
4,093,763	4,136,659	4,158,279	4,167,277
4,095,732	4,137,964	4,158,660	4,167,326
4,095,795	4,138,595	4,158,690	4,167,346
4,097,461	4,140,270	4,158,815	4,167,519
4,098,904	4,140,977	4,158,863	
4,099,658	4,142,656	4,159,014	

Disclaimers

3,328,594.—*Edward E. Sheldon,* New York, N.Y. INSPECTING APPARATUS USING FIBER OPTICS. Patent dated June 27, 1967. Disclaimer filed Apr. 30, 1979, by the inventor.

The term of this patent subsequent to Oct. 18, 1983 has been disclaimed.

3,437,747.—*Edward Emanuel Sheldon,* New York, N.Y. DEVICES FOR INSPECTION USING FIBEROPTIC MEMBERS. Patent dated Apr. 8, 1969. Disclaimer filed Apr. 30, 1979, by the inventor.

The term of this patent subsequent to Oct. 18, 1983 has been disclaimed.

3,788,748.—*Lindsay Charles Knight, Colin Maxwell Finch,* Albury, N.S.W., *Noel Harry Fred Walden,* Southport, *George Racz,* Albury, N.S.W., Australia. INDICATING THE PASSING OF A PROJECTILE THROUGH AN AREA IN SPACE. Patent dated Jan. 29, 1974. Disclaimer filed Sept. 19, 1979, by the assignee, *Australasian Training Aids Proprietor Limited.*

Hereby enters this disclaimer to claims 16, 17, 20 and 29 of said patent.

4,138,362.—*Anthony E. Vassiliades,* Deerfield, and *Cheng H. Chang,* Naperville, Ill. FORMATION OF MICROCAPSULES BY INTERFACIAL CROSS-LINKING, MICROCAPSULES PRODUCED, AND MICROCAPSULAR DISPERSION. Patent dated Feb. 6, 1979. Disclaimer filed Sept. 24, 1979, by the assignee, *Champion International Corporation.*

Hereby enters this disclaimer to claims 13–15 of said patent.

Dedications

3,906,786.—*Carl M. Westbrook,* Beloit, Wis. OVERLOAD PROTECTOR FOR TORQUEMETER. Patent dated Sept. 23, 1975. Dedication filed Sept. 4, 1979, by the assignee, *Dana Corporation.*

Hereby dedicates to the Public the remaining term of said patent.

4,129,674.—*George J. Hannes,* Maumee, *Theodore R. Rohweder* and *Hans W. Dreikorn,* Toledo, Ohio, and *Philip B. Shepherd,* Sedalia, Colo. FIBROUS MAT ESPECIALLY SUITABLE FOR ROOFING PRODUCTS AND A METHOD OF MAKING THE MAT. Patent dated Dec. 12, 1978. Dedication filed Sept. 17, 1979, by the assignee, *Johns-Manville Corporation.*

Hereby dedicates to the Public the remaining term of said patent.

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DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

DEPARTMENT OF THE ARMY, OTJAG
Chief, Intellectual Property Division, Room 2D 444
Pentagon, Washington, D.C. 20310

Patent application 950,501, Fire-Safe Hydrocarbon Fuels. Filed Oct. 11, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St. SW., Washington, D.C. 20324

Patent application 6–011,585. Multiple-Invariant Space-Variant Optical Processing. Filed Feb. 12, 1979.
Patent application 6–017,624. Mouth Mounted Accelerometer Pack. Filed Mar. 5, 1979.
Patent application 6–017,626. Precision Fir Indexing Device for Wind Tunnel Models. Filed Mar. 5, 1979.
Patent application 6–018,697. Automatic Data Restore Apparatus for MNOS Temporary Store Memory. Filed Mar. 8, 1979.
Patent application 6–020,299. Self Biased Ferrite Resonators. Filed Mar. 14, 1979.
Patent application 6–023,416. Uniform Load Piston Ring. Filed Mar. 23, 1979.
Patent application 6–025,413. High Speed Real Time Quantizer and Analog/Digital Converter. Filed Mar. 30, 1979.
Patent application 6–026,866. Channel Sealant Compositions. Filed Apr. 4, 1979.
Patent application 6–029,584. Flow-Closing Bleed Valve Assembly. Filed Apr. 12, 1979.
Patent application 6–029,585. Sense and Inject Moving Target Indicator Apparatus. Filed Apr. 12, 1979.
Patent application 6–029,586. Analysis of Lubricating Oils for Iron Content. Filed Apr. 12, 1979.

Patent application 6–029,947. Continuous Wave Chemically Pumped Atomic Iodine Laser. Filed Apr. 13, 1979.

Patent application 6–032,809. Thermally Stable Aromatic Eryne Polyimides. Filed Apr. 24, 1979.

Patent application 6–033,608. Method for the Preparation of Alkali Metal Salts of Dinitromethane. Filed Apr. 26, 1979.

Patent application 6–033,610. Process for Synthesizing the Alkali Metal Salts of Dinitromethane. Filed Apr. 26, 1979.

Patent application 6–036,252. Self-Determination of Laser Frequency. Filed May 4, 1979.

Patent application 612,435. Low Shear Mixing Process for the Manufacture of Solid Propellants. Filed Sept. 10, 1975.

Patent application 688,840. Low Drag Integration of Laser Beam Pointing Device Into Aircraft. Filed May 27, 1976.

Patent application 936,980. Optical Plummet Azimuth Reference Assembly. Filed Aug. 25, 1978.

Patent 4,147,515. Electro-Chemical Sensors for Gas Detection in Electron Tubes. Filed Dec. 22, 1977. Patented Apr. 3, 1979. Not available NTIS.

Patent 4,154,415. Modulating Verrier Flap Control System. Filed Dec. 30, 1977. Patented May 15, 1979. Not available NTIS.

Patent 4,155,054. Microwave Power Limiter Using Electrically Thin Iris. Filed Nov. 23, 1977. Patented May 15, 1979. Not available NTIS.

Patent 4,155,265. Interface Shear Transducer. Filed Mar. 30, 1978. Patented May 22, 1979. Not available NTIS.

Patent 4,155,308. Sabot for Simulation Testing. Filed Nov. 2, 1977. Patented May 22, 1979. Not available NTIS.

Patent 4,155,579. Rotating Detent Latch Mechanism. Filed Oct. 7, 1977. Patented May 22, 1979. Not available NTIS.

Patent 4,155,780. Method for Prestressing Turbine Disks. Filed Dec. 30, 1977. Patented May 22, 1979. Not available NTIS.

Patent 4,156,514. Cylinder Support Assembly. Filed Mar. 23, 1978. Patented May 29, 1979. Not available NTIS.

Patent 4,156,878. Wideband Waveguide Lens. Filed Jan. 25, 1978. Patented May 29, 1979. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Branch, General Service Division, Federal Bldg., Agricultural Research Service Hyattsville, Md. 20782

Patent application 6–032,850. Crosslinked Starch Halohydrins and Their Nitrogen-Containing Substitution Products. Filed Apr. 24, 1979.

Patent application 6–034,881. Automatic Spinning Strength Tester. Filed Apr. 30, 1979.

U.S. DEPARTMENT OF COMMERCE
National Technical Information Service, Office of Government Inventions and Patents, Springfield, Va. 22161

Patent 4,160,596. Document Reproduction Illumination/Exposure Control System. Filed Oct. 18, 1977. Patented July 10, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts. NW. Washington, D.C. 20240

Patent application 6–006,138. Electrical Cable Coupler With Rotatable Protective Covers. Filed Jan. 24, 1979.

Patent application 6–027,133. Pressure Vent for Explosion-Proof Electrical Enclosures. Filed Apr. 4, 1979.

Patent application 6–029,952. Leaching Gold and Silver Ores. Filed Apr. 13, 1979.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research Code 302, Arlington, Va. 22217

Patent application 6–005,256. Lattice Matching Measurement Device. Filed Jan. 22, 1979.

Patent application 6–006,055. Marine Mammal Retrieval Apparatus. Filed Jan. 24, 1979.

Patent application 6–021,135. Apparatus for Improving the Overall Efficiency of a Marine Screw Propeller. Filed Mar. 16, 1979.

Patent application 6–026,863. Fluorinated Phthalonitriles and Polyphthalocyanines Therefrom. Filed Apr. 4, 1979.

Patent application 6–026,982. Connector-to-Connector Adapter. Filed Apr. 2, 1979.

Patent application 6–028,406. Sampled Speech Compression System. Filed Apr. 9, 1979.

Patent application 6–029,223. Terrain Vehicle Contour Measuring and Storage Device. Filed Apr. 11, 1979.

Patent application 6–030,586. Active High-Power Bandpass Filter. Filed Apr. 16, 1979.

Patent application 6–030,961. A Carrier and Dispersal Mechanism for a Microorganic Mosquito Larvicide. Filed Apr. 18, 1979.

Patent application 6–031,277. Method for Isolating a Spore-Forming Mosquito Larvicide. Filed Apr. 18, 1979.

Patent application 6–033,298. Xenon Fluoride and Mercury Chloride Photodissociation Lasers. Filed Apr. 25, 1979.

Patent application 6,033,590. Vertical Seeking Aircrew Escape System. Filed Apr. 26, 1979.

Patent application 6–034,220. Pressure Differential Seafloor Corer-Carrier. Filed Apr. 30, 1979.

Patent application 6–034,221. System for Placement of Piles Into the Seafloor. Filed Apr. 30, 1979.

Patent application 6–035,663. Laser Annealing Technique for Improving the Detectivity of Detector Elements in Photovoltaic Detector Arrays. Filed May 3, 1979.

Patent application 6–039,241. Surface Elevation Measuring Apparatus. Filed May 15, 1979.

Patent application 6–039,917. Pulse Repetition Interval Generator With Stagger Compensation. Filed May 17, 1979.

Patent application 6–040,014. Pulse Repetition Interval Signal Generator. Filed May 17, 1979.

Patent application 6–042,176. Polyphenylether-Bridged Polyphthalocyanine. Filed May 24, 1979.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

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State	*Name of Library*	*Telephone Contact*
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	Sacramento: California State Library	(916) 322–4572
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	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

V 9 8 8 1 4 N O 2 7 7 9 UMI

REISSUES

V 9 8 8 4 N 0 2 7 7 9 UMI

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF OCTOBER 20, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-1-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-12-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	11-13-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	4-2-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	5-30-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	4-13-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	5-19-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-5-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-31-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-1-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	12-23-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding, Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-17-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking, Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	10-13-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	11-30-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-4-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	7-10-78

Expiration of patents: The patents within the range of numbers indicated below expire during October 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 784), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,056,137 to 3,061,832, inclusive
Plant Patents ..... Numbers 2,178 to 2,188, inclusive

REISSUES

NOVEMBER 27, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,159

FALSE TWIST-CRIMPING MACHINE

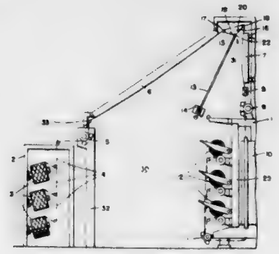
Hermann Kubler, Remscheid-Lüttringhausen, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Remscheid-Lennep, Fed. Rep. of Germany

Original No. 4,058,961, dated Nov. 22, 1977, Ser. No. 701,155, Jun. 30, 1976. Application for reissue Nov. 29, 1978, Ser. No. 964,525

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1975, 2530125; Oct. 4, 1975, 7531545[U]

Int. Cl.[2] **D02G** *1/02*

U.S. Cl. 57—291 **7 Claims**



1. A false-twist crimping machine for processing filament yarn, said machine comprising:

a side frame having a bobbin located thereon for supplying the filament yarn,

a delivery means for guiding said yarn to an upwardly inclined heating zone,

a middle frame carrying a downwardly disposed cooling zone which receives said yarn as it feeds from said heating zone,

a false-twisting means for receiving said yarn as it feeds from said cooling zone,

a take-off for supplying said yarn emitting from said false-twisting means to a winding device located at said middle frame,

said heating zone sloping at an oblique angle between said side frame and said middle frame, and

a yarn guide means positioned at the angle formed between said heating zone and cooling zone in a manner so that said yarn may run over it along a line substantially tangent from the outlet of said heating zone and along a line substantially tangent to the inlet of said cooling zone.

6. A falst-twist crimping machine for processing filament yarn, said machine comprising:

a side frame having bobbins located thereon for supplying filament yarn;

a middle frame laterally spaced from said side frame and defining a service passage therebetween for movement thereabout of a machine operator;

yarn heating means having an inlet end and an outlet end and defining an elongate heating zone terminating above the height of said side frame;

yarn delivery means associated with said side frame and said heating means for guiding the yarn to the inlet end of said heating means;

yarn cooling means associated with said middle frame and having an inlet end and an outlet end and defining an elongate cooling zone;

said heating means and said cooling means being angularly disposed relative to each other so that the inlet end of said heating means and the outlet end of said cooling means are disposed on opposite sides of said service passage, and the outlet end of said heating means and the inlet end of said cooling means are closely adjacent each other and generally form the apex of an acute angle with said apex being located at a height above said side frame, whereby the yarn is directed upwardly in the heating zone and downwardly in the cooling zone during processing;

yarn guide means positioned generally at said apex between the adjacent ends of said heating and cooling means for guiding the yarn from the heating zone to the cooling zone;

false twisting means carried by said middle frame for receiving the yarn from said cooling means; and

winding means carried by said middle frame for winding the processed yarn.

Re. 30,160

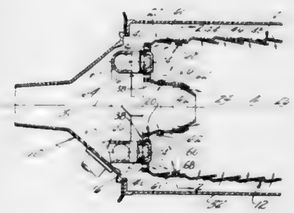
SMOKE REDUCTION COMBUSTION CHAMBER

John M. G. Emory, Jr., Vernon, and Joseph J. Faitani, Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Original No. 3,643,430, dated Feb. 22, 1972, Ser. No. 16,527, Mar. 4, 1970. Application for reissue Jun. 5, 1978, Ser. No. 912,891

Int. Cl.[2] **F02C** *7/00*

U.S. Cl. 60—39.65 **6 Claims**



1. A combustion chamber comprising a housing, a liner supported by the housing and spaced radially therefrom, the liner having a substantially closed end and an open end spaced axially therefrom with a first wall means therebetween, the first wall means having a plurality of openings along its axial length, the liner providing a zone for combustion of a fuel-air mixture, the combustion products being discharged through the open end, and fuel nozzle means positioned at the closed end of the liner for supplying fuel to the combustion zone wherein the improvement comprises:

said fuel nozzle means including a plurality of fuel nozzles, swirl vanes surrounding each fuel nozzle,

the closed end of the liner having a central opening therein, inner wall means extending from the edge of said opening into said liner,

said fuel nozzles being located in said closed end spaced around said inner wall means,

air tube means positioned in said inner wall means and said first wall means downstream of each fuel nozzle and being substantially in axial alignment with the cooperating swirl vanes of the nozzle to direct air into the swirling air from the swirl vanes and the fuel from the fuel nozzle, and

said air tube means and said swirl vanes forming a recirculation zone therebetween.

Re. 30,161

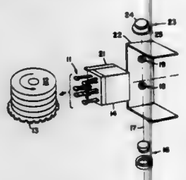
APPARATUS MEASURING RELATIVE VELOCITY OF MOVABLE MEMBERS INCLUDING MEANS TO DETECT VELOCITY FROM THE POSITION ENCODER

Andrew Gabor, Alamo, Calif., assignor to Xerox Corporation, Stamford, Conn.

Original No. 3,839,665, dated Oct. 1, 1974, Ser. No. 157,283, Jun. 28, 1971. Continuation-in-part of Ser. No. 23,569, Mar. 30, 1970, abandoned. Application for reissue Sep. 24, 1976, Ser. No. 726,386

Int. Cl.[2] G05B 5/01

U.S. Cl. 318—616 8 Claims



8. Apparatus for the measurement of relative velocity between two relatively movable members comprising [;] a first winding coupled to one of said members including a plurality of substantially parallel conductors each series connected to its next adjacent conductor whereby adjacent conductors of the winding carry currents in opposite direction; means for applying an electric signal to said first winding; a plurality of windings coupled to said other of said members said windings being arranged in a predetermined space phase with respect to each other; means for juxtaposing said windings in an inductive relationship for respectively producing electric alternating position signals from said plurality of windings in response to relative movement between the windings, said electric signal of said [one] *first* winding inducing said position [signal] *signals* in said other windings, said position signals having periods inversely proportional to the relative velocity between said members the peak amplitude of said position signals being substantially constant with changes in velocity and the slope of said position signals at their zero crossing being proportional to instantaneous relative velocity; means for deriving a velocity signal from said slope information of said position signals including means for differentiating said position signals with respect to time to provide a plurality of velocity signals in said predetermined space phase whose [maximum] instantaneous magnitudes are proportional to instantaneous velocity [;], *and* means for commutating said velocity signals around their maximum amplitudes to provide a unidirectional velocity ripple signal; means for deriving a reference signal from said position signals including means for sampling the peak amplitudes of said position [signal] *signals* to provide a unidirectional reference ripple signal [similar to said velocity ripple signal] and means for comparing said velocity ripple signal with said reference ripple signal to provide an error signal.

PLANT PATENTS

GRANTED NOVEMBER 27, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,490

STRAWBERRY PLANT

Royce S. Bringhurst, Davis, and Victor Voth, Santa Ana, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 23, 1978, Ser. No. 953,817

Int. Cl.[2] A01H 5/03

U.S. Cl. Plt.—49 1 Claim

1. The new and distinct variety of strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

V 9 8 8 / 4 N 0 2 7 7 9 UMI

V 9 8 8 / 4 NOV 27 79 UMI

PATENTS

GRANTED NOV. 27, 1979

ERRATA

For CLASS	See PATENT NO.
433–171	4,175,322
433–126	4,175,323
433–122	4,175,324
433–060	4,175,325
433–080	4,175,326
356–004	4,175,365
346–020	4,175,378
002–173	4,175,411
073–342	4,175,418
408–083.5	4,175,471
123–030 D	4,175,501
123–041.35	4,175,502
123–041.72	4,175,503
123–052 M	4,175,504
123–090.3	4,175,505
123–117 D	4,175,506
123–117 D	4,175,507
123–117 R	4,175,508
123–117 R	4,175,509
433–032	4,175,565
141–363	4,175,600
164–106	4,175,615
269–091	4,175,728
241–046 R	4,175,814
405–043	4,175,882
430–035	4,175,955
430–037	4,175,956
430–031	4,175,957
430–049	4,175,958
430–134	4,175,959
430–058	4,175,960
430–058	4,175,961
430–109	4,175,962
430–296	4,175,963
430–253	4,175,964
430–230	4,175,965
430–438	4,175,966
430–503	4,175,967
430–559	4,175,968
430–539	4,175,969
430–529	4,175,970
430–287	4,175,971
204–159.18	4,175,972
204–159.14	4,175,973

PATENTS

V 9 8 / 4 NOV 27 79 UMI

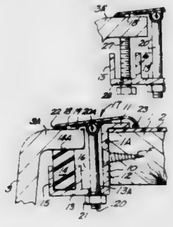
For CLASS	See PATENT NO.
194–001 C	4,175,989
435–094	4,176,006
435–034	4,176,007
435–012	4,176,008
435–024	4,176,009
548–184	4,176,120
548–119	4,176,121
585–629	4,176,140
585–314	4,176,141
525–336	4,176,142
525–463	4,176,143
525–091	4,176,144
525–072	4,176,145
525–338	4,176,146
235–302	4,176,258
235–449	4,176,259
235–475	4,176,260
367–006	4,176,338
367–121	4,176,339

PATENTS

GRANTED NOVEMBER 27, 1979

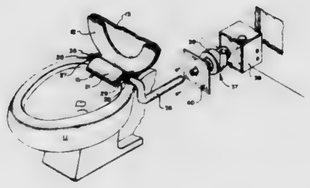
GENERAL AND MECHANICAL

4,175,292
SINK MOUNTING MEANS
Russell F. Morrison, 62 NW. Caribou La., Roseburg, Oreg. 97470
Filed Apr. 10, 1978, Ser. No. 894,684
Int. Cl.[2] E03C *1/18*
U.S. Cl. 4—187 A **12 Claims**



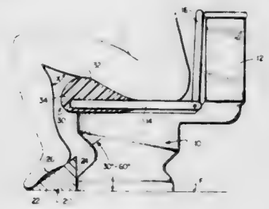
1. Sink mounting means for attachment to a cabinet counter of any thickness defining a sink receiving opening, said sink mounting means including a member of angular section having an upright web adapted for abutting securement against the vertical counter edge defining the sink receiving opening and an inwardly directed flange disposed below a plane containing the counter upper surface, said inwardly directed flange located within said sink receiving opening and defining an upwardly opening recess, a sink support member disposed within said recess, fastening means for securing the web of the sink mounting member to the vertical counter edge, said support member having an upper surface on which the underside of a sink flange is restingly supported, said inwardly directed flange having openings at intervals to receive a downwardly inserted bolt of a trim ring assembly.

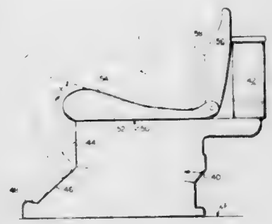
4,175,293
TOILET BOWL ODOR REMOVING APPARATUS AND HINGE
Warren J. Stephens, 2970 S. 1735 East, Salt Lake City, Utah 84106, and Juan F. Nielson, 3665 S. 300 West, Salt Lake City, Utah 84115
Filed Feb. 6, 1978, Ser. No. 875,215
Int. Cl.[2] E03D *9/05*; A47K *13/00*
U.S. Cl. 4—209 R **1 Claim**



1. Odor removing apparatus for use with a conventional toilet comprising
a hood including a rearwardly extended flat flange forming a collection compartment extending fully across the hood, said flange being adapted to be coupled to the rear portion of the rim of a toilet, a pair of spaced apart sidewalls extending forwardly of the flange, and a top wall interconnecting said sidewalls, whereby the sidewalls and top wall will project over the toilet bowl when the flange is coupled to the rear portion of the rim of the toilet;
a pair of tubular spindles, each of said spindles being coupled through an end wall of the hood;
a toilet seat having spaced apart projecting ears journaled on said spindles and a straight rear edge overlying the rim of the toilet and the hood, with a top of the rearwardly extending flat flange being positioned whereby such flange does not obstruct pivoting movement of the toilet seat;
a toilet seat lid having a spaced apart projecting ears journaled on said spindles outside of the ears of the toilet seat and adapted to rest on the toilet seat;
a plug closing the projecting end of one spindle;
a duct fitting coupled to the projecting end of the other spindle and its other end adapted to be connected by a duct to a suction means whereby gases are pulled from the interior of the hood, through a spindle, the duct fitting and the duct to the intake of the suction means, said plug and the duct fitting being reversible with respect to the spindles;
the sidewalls each have a threaded port therethrough and the spindles are exteriorly threaded to be screwed into ports;
a port through the wall at the central rear thereof, said port being adapted to receive either said plug or said duct fitting; and
another plug adapted to close either of said spindles or the port through the wall of the hood.

4,175,294
TOILET CONSTRUCTION
John A. Boyd, 5535 Columbia Pike, Arlington, Va. 22204
Filed Sep. 8, 1978, Ser. No. 940,703
Int. Cl.[2] A47K *13/00*
U.S. Cl. 4—237 **6 Claims**

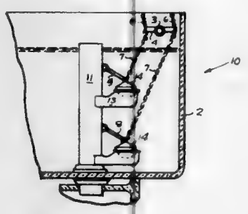




1. An improved toilet construction comprising:
a toilet seat means adapted to fit upon a conventional toilet bowl;
said toilet seat means having an elevated configuration adja-

cent the forward end thereof to raise the user's thighs angularly upward from a horizontal disposition; and
an angled foot engaging means disposed along the lower forward portion of the toilet bowl;
said foot engaging means sloping forwardly and downwardly from said lower forward portion of the toilet bowl;
said foot engaging means being adapted for engagement by the user's feet to raise the user's heels upward and to thus angularly raise the user's feet from a horizontal disposition.

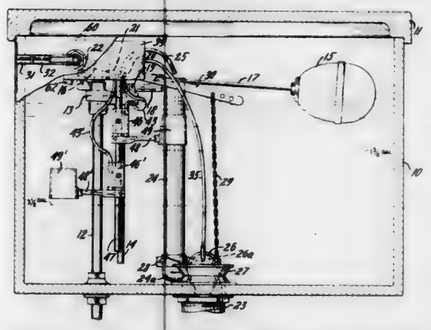
4,175,295
WATER SAVING TOILET
Robert L. Cameron, 6106 Seminole St., Berwyn Heights, Md. 20740
Filed Jun. 22, 1978, Ser. No. 918,109
Int. Cl.² E03D *1/14*
U.S. Cl. 4—327 **6 Claims**



1. A water saving mechanism for a toilet reservoir comprising a water evacuation column connected to a commode, a pair of conduit means communicating with said column and horizontally offset one from the other, valve ball means removeably nested within said conduit means, and linkage means connected to said valve ball means for selectively removing one of the two valve balls so as to provide different volumes of water into the commode bowl by virtue of the different vertical heights of said conduits in which said linkage means includes an upper and lower chain, the upper chain being connected to the upper valve ball, the lower chain being connected to the lower valve ball, and a single lever connected at opposed extremities to the terminal point of each of said chains whereby rotation of said lever in a clockwise direction will actuate one valve ball and rotation of the said lever in the opposite direction will actuate said other valve ball and in which said chains are connected to said lever through ears and in which said lever is spring biased at the opposed extremities so as to return said lever to an initialized state.

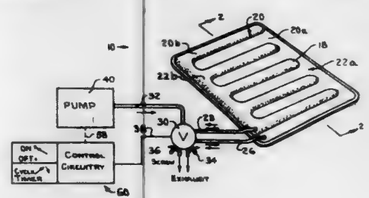
4,175,296
VARIABLE CONTROL FOR TOILET FLUSH TANKS
Harley R. Goldman, 417 Roslyn Rd., Roslyn Heights, N.Y. 11577
Filed Oct. 11, 1977, Ser. No. 840,573
Int. Cl.² E03D *1/14, 1/34, 3/12*; F16K *31/28*
U.S. Cl. 4—325 **9 Claims**

1. For use in a toilet flush tank having a flush discharge opening at the bottom, a discharge valve for closing the discharge opening, a chamber open at the bottom and carried by the discharge valve and means for lifting the discharge valve to flush water from the flush tank through the discharge opening, a flush control apparatus for regulating the amount of water flushed from the tank comprising,
a plurality of vents mounted within the flush tank at different heights,
a water level responsive valve including float control means normally closing each of said vents when the water in the tank is high enough to buoy said float control means,
air passage means adapted to be coupled between the chamber in said discharge valve and said vents, and
selector means coupled to said vents and said air passage means for selecting the operative vent, whereby air trapped within the chamber when the discharge valve is



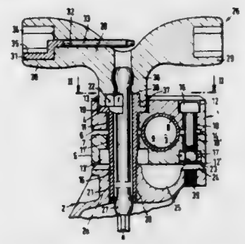
unseated retains the discharge valve in floating condition until the water level in the tank falls to a level at which the water level responsive valve associated with the selected vent is opened to vent the entrapped air in said chamber to cause the discharge valve to drop to seated position and close the discharge opening.

4,175,297
INFLATABLE PILLOW SUPPORT
William E. Robbins, 4850 Sutton Ave., and Robert H. Richardson, 8361 Sylvan Dr., both of Melbourne, Fla. 32901
Filed Feb. 3, 1978, Ser. No. 875,124
Int. Cl.² D47C *7/74*
U.S. Cl. 5—284 **15 Claims**



1. An alternating pressure support for the human body, said apparatus comprising in combination:
a flexible pillow having a plurality of fluid-impervious pockets adapted to assume a substantially flat position when deflated and to support an adjacent section of the human body when inflated with a fluid under pressure, with said pockets interspersed and grouped into an operably coupled first set of pockets and an operably coupled second set of pockets;
pumps means including,
(a) an opposing pair of pumping chambers each for periodically receiving and then expelling said fluid under pressure,
(b) electrical means operably coupled between said pumping chambers for alternately compressing one of said pumping chambers while expanding the other one of said pumping chambers, thereby alternately pumping said fluid under pressure from each of said pumping chambers; and
valve means operably coupled between said pump means and said flexible pillow for alternately inflating and exhausting said fluid under pressure through said first pockets and said second pockets, thereby alternately supporting interspersed sections of the body adjacent said first and said second sets of pockets.

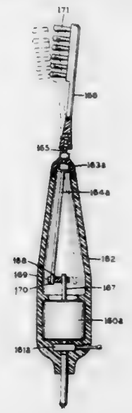
4,175,298
HANDLE FOR FREE-CUTTING DEVICES
Erich Müller, Waiblingen, and Joachim Kottke, Neckargröningen, both of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 724,972, Sep. 20, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,485
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1975, 7529517
Int. Cl.² B25F *1/00*; B26B *7/00*
U.S. Cl. 7—138 **19 Claims**



1. A handle for a free-cutting device, which includes: a handle section comprising clamping means operable to receive and clamp therebetween handle bar means so that the latter project from both sides of said clamping means, carrier means supported by said handle section for carrying a free-cutting device, and means included cooperative with said clamping means and said carrier means for selectively permitting pivoting of that portion of said clamping means which is adapted to receive and clamp said handle bar means therebetween relative to said carrier means and to arrest said portion of said clamping means in at least two positions.

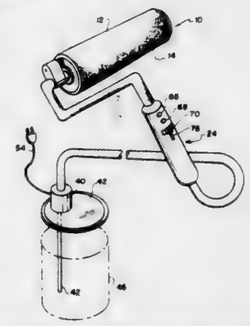
4,175,299
POWER TOOTHBRUSH OR THE LIKE WITH ORBITAL BRUSH ACTION
Walter D. Teague, Jr., Tweed Blvd., Nyack, N.Y. 10960, and Arthur T. Sempliner, 37-04 Van Nostrand Pl., Douglaston, N.Y. 11363
Filed Nov. 7, 1977, Ser. No. 848,807
Int. Cl.² A46B *13/02*
U.S. Cl. 15—22 R **1 Claim**

1. A powered toothbrush appliance or the like, which comprises
(a) a housing including an opening at the topmost portion thereof,
a cap member, formed of a resilient material, supported by said housing and extending generally over said opening,
(c) a wobble shaft,
(d) said resilient cap member mounting said wobble shaft non-rotatably and for limited universal pivoting movement,
(e) said shaft extending axially through said resilient cap member and including a portion disposed outside said housing and a portion disposed within said housing,
(f) said portion of the wobble shaft within the housing having a lower end portion
(g) cooperating means on said wobble shaft and said resilient cap member to prevent axial displacement of said wobble shaft relative to said cap member,
(h) an electrical motor having a rotary output shaft extending within said housing,
(i) a rotary displacement member carried by said rotary output shaft,
(j) said rotary displacement member including an opening,
(k) the lower end portion of said wobble shaft being received through the opening whereby the wobble shaft is driven



through an orbital path as a function of the effective radius and rotation of said displacement member, and
(l) a working element being supported by said wobble shaft at the end thereof disposed outside said housing.

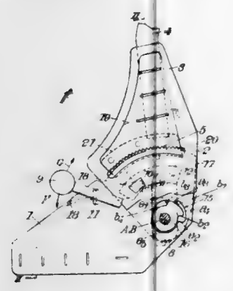
4,175,300
PAINT ROLLER CONSTRUCTION
John J. McGlew, and John J. McGlew, Jr., both of 432 Terrace Ave., Hasbrouck Heights, N.J. 07604
Continuation of Ser. No. 684,728, May 10, 1976, abandoned. This application Feb. 2, 1978, Ser. No. 874,508
Int. Cl.² B05C *1/00*
U.S. Cl. 15—103.5 **24 Claims**



1. A liquid applicator for applying a liquid such as a paint to a receiving surface, comprising a handle support having a rotational support portion, a hollow cylindrical roller having a porous cylindrical outer surface rotatably supported on said rotational support portion of said handle support, a plurality of conduits defined through said handle support and said rotational support and connected into the interior of said cylindrical roller at axially spaced locations therein, means mounted on said handle support for selectively controlling the rate of flow through each of said conduits, a pump connected to said conduits and to said handle support for supplying a liquid through said conduits and into said cylindrical roller for passage through the porous surface thereof, and a motor carried by

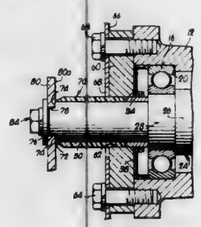
said handle support and connected to said hollow cylindrical roller to rotate said porous surface at a predetermined speed.

4,175,301
SEATHINGE
Alain Letournoux, Orleans, and Charles Canals, Mennecy, both of France, assignors to Societe Industrielle Bertrand Faure, Etampes, France
Filed Jan. 6, 1978, Ser. No. 867,492
Claims priority, application France, Jan. 13, 1977, 77 00876
Int. Cl.[2] E05D *11/10*
U.S. Cl. 16—146 **4 Claims**



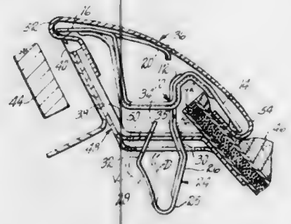
1. A seat-hinge for connecting the back to the sitting portion of a seat and comprising a first member to be fixed relative to the sitting portion and carrying a first toothed sector centered on an axis A, said axis A extending, in operation, horizontally and transversely of the sitting portion, a second member to be fixed relative to the back and carrying a second toothed sector centered on an axis B parallel to axis A, the sectors being engageable and disengageable with one another in response to movement of the two axes A and B towards and away from coincidence and the second member being provided with an opening which is centered on axis B and houses a hub; a rotary cam fixed to said hub, a control handle accessible, in use, to a person sitting on the seat and linked to the cam so that the operation of this handle causes rotation of the cam about axis B, a surface defined by the first member for coacting with an active area of the rotary cam, and a spring means for angularly urging the cam and the handle in the direction which corresponds to the mutual engagement of the two toothed sectors, the active area of the rotary cam being formed by an outward projection from the remainder of the rim of the cam and the radially outermost surface of the projection having the form of an arc of a spiral about axis B and having ends of greater and smaller radius which are joined to the said remainder of the rim by a narrower neck portion such that at least the said end of the greater radius overhangs the adjacent portion of the said remainder of the rim of the cam, the surface defined the first member for coacting with the active surface of the cam forming part of the edge of an aperture in the first member and having a first section in the form of an arc of a spiral about axis A upon which, in operation, the spiral arc surface of the cam projection slides and against which said surface of said cam projection then jams, responsive to rotation of the cam in a first direction, so as to lock the hinge, and an adjacent cut-out section providing a bearing zone against which the said end of greatest radius of the spiral arc surface of the cam projection bears, responsive to reverse rotation of the cam, to unlock the hinge such that, in operation, the cam rocks about this bearing zone to cause axes A and B to move apart and disengage the toothed sectors.

4,175,302
SEALED FEATHER PICKING UNIT
Donald J. Scheier; David R. Crawford, both of Kansas City, Mo., and David M. McDonald, Kansas City, Kans., assignors to Simon-Johnson, Inc., Kansas City, Mo.
Filed Jul. 28, 1978, Ser. No. 929,121
Int. Cl.[2] A22C *21/02*
U.S. Cl. 17—11.1 R **8 Claims**



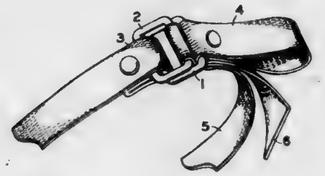
1. A rotary feather picking unit including:
an open-ended housing;
bearings within said housing;
a shaft supported by said bearings for rotation about the longitudinal axis of the shaft and projecting outwardly through and beyond the open end of the housing;
feather-engaging means secured to said shaft at the outer end of the latter for rotation therewith;
an annular seal outwardly adjacent said bearings and circumscribing said shaft in sealing relationship with the latter and with the housing so as to close said open end of the housing;
a close-fitting sleeve surrounding said shaft from said feather-engaging means inwardly toward said seal; and
means for holding said sleeve stationary with the seal and the housing during rotation of the shaft.

4,175,303
MOLDING CLIP
Nicholas M. Benedetti, Sterling Heights, Mich., assignor to USM Corporation, Farmington, Conn.
Filed Jan. 9, 1978, Ser. No. 867,764
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—73 FT **5 Claims**



1. A clip for retaining an elongated trim strip in a bridging position over a gap between two spaced members wherein the clip is attached to a panel disposed within the gap, comprising a body portion having a pair of resilient arms extending outwardly from one side thereof for engagement with one edge of the elongated trim strip, and a resilient tongue extending outwardly from the opposite side of said body portion for engagement with the opposite edge of the trim strip, a resilient leg extending downwardly from said body portion into said gap with said arms and said tongue engaged in said trim strip bridging said gap, said leg being of substantially diamond shaped cross-section and having a lower V shaped portion comprising a bight from which extends a pair of divergent lower leg portions and an upper portion comprising a pair of convergent upper leg portions, a first of said upper leg portions connecting said leg to said body portion to form an obtuse angle with one of said lower leg portions and a second of said upper leg portions connected to the other of said lower leg portion to form an obtuse angle therewith and terminating in a free end in spaced relation with said first upper leg portion, whereby said lower leg portion facilitates entry of said leg into a slotted opening in said panel disposed in said gap and upper leg portion serves to retain said leg in said slotted opening with said lower leg portion extending entirely through said slotted opening, and a pair of elongated spring fingers disposed one on each of said arms and extending generally toward said tongue and crosswise of a portion of a trim strip having one edge thereof engaged with said arms and the opposite edge engaged with said tongue.

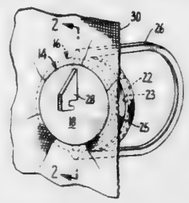
4,175,304
STRAP CLOSURE
Richard P. Bentley, Box 786, Tupper Lake, N.Y. 12986
Division of Ser. No. 801,330, May 27, 1977, Pat. No. 4,142,734.
This application Dec. 12, 1978, Ser. No. 968,852
Int. Cl.[2] A44B *11/18*
U.S. Cl. 24—197 **1 Claim**



1. A strap closure comprising an assembly of two rectangular rings and a release loop, said rectangular rings held together by means of a single loop of strap, or other material, passing through both rings, said loop passing through both rings providing the means to attach said strap closure to a strap or other structure, and said release loop comprising a piece of strap, or other material with similar surface friction, attached to one of the rectangular rings by means of a portion of said release loop fastened around that portion of said rectangular ring opposite and parallel to said single loop passing through both rings, said closure assembly openably joined to a mating strap by means of said mating strap end being threaded through the release loop equipped rectangular ring, on through the second rectangular ring, around the outside of said second rectangular ring, and back through the release loop equipped rectangular ring between the mating strap and said release loop.

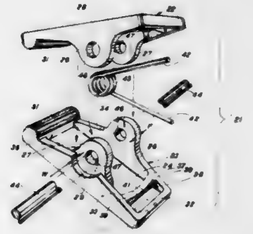
4,175,305
CLIP FOR GRIPPING FABRIC OR THE LIKE
Robert E. Gillis, P.O. Box 67, Santa Cruz, Calif. 95003
Filed Aug. 17, 1977, Ser. No. 825,410
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—245 R **3 Claims**

1. A fastener for attachment to a web of flexible material comprising in combination:
a. female element comprising a collar having a side wall formed as a hollow cylinder and a flat out-turned rim surface surrounding said side wall at a right angle to said cylinder,
b. a male element having a plug portion having an external cylindrical wall and an out-turned rim extending around said plug, said external cylindrical wall being complementary to said hollow cylinder and said out-turned rim having a flat surface adapted to lie against the flat out-turned rim surface of the female element,
c. whereby said female element can be placed against said web on a first side of the web and said male element can be placed on the opposite side of the web and pushed through said female element, distorting said web, and brought back to lie substantially against the female element with the



web engaged (1) between the flat surfaces of the two out-turned rims, and (2) between the side wall of the hollow cylinder and the external cylindrical wall of the male element wherein the flat surfaces of the web held between the two out-turned rims is parallel to the main portion of the web,
d. wherein said female element has a loop bridging opposite sides of the collar.

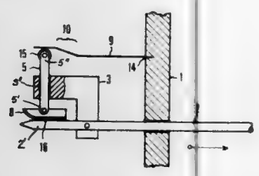
4,175,306
MOLDED SPRING-BIASED GARMENT CLAMP
Jerome J. Bigelow, Bethel, Conn., and Jeffrey A. Bigelow, Rte. 53, West Redding, Conn. 06896, assignors to Jeffrey A. Bigelow, West Redding, Conn.
Continuation-in-part of Ser. No. 793,294, May 5, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 914,398
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—253 **9 Claims**



1. An economical pivoting spring biassed garment clamp for use as a clothespin or garment hanger clip comprising a pair of identical and interchangeable molded clamp jaws designed for facing interfitting pivoting engagement, each jaw having
an elongated back bounded by side edges;
a convex gripping sector end protruding inward toward the facing clamp jaw;
a manually depressible actuating end opposite the convex gripping sector end;
a first flush trunnion flange protruding inward from one side edge and having a convex free end;
a second inset trunnion flange protruding inward from a zone of the back near the other side edge and laterally spaced toward the first flush trunnion flange by a concave step having substantially the same width as the width of the first flush trunnion flange providing flush non-snagging alignment of an outer face of each first flush trunnion flange with the juxtaposed side edge of the interfitting clamp jaw;

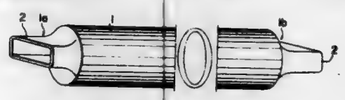
means forming alignable pivoting apertures extending laterally through both trunnion flanges;
a pivot rod extending through the alignable pivoting apertures holding the clamp jaws in angular pivoting engagement with their trunnion flanges interfitting to provide laterally-spaced wide stable anchoring pivot support for both clamp jaws;
a resilient spring urging the manually depressible actuating ends apart while simultaneously maintaining the pair of clamp jaws in axial facing alignment and thereby urging the gripping sectors together in clamping juxtaposition.

4,175,307
THREAD GRIPPER
Alois Altenweger, Uster, Switzerland, assignor to Zellweger Uster AG, Uster, Switzerland
Filed Mar. 16, 1978, Ser. No. 887,440
Claims priority, application Switzerland, May 10, 1977, 5820/77
Int. Cl.[2] D03J *1/18*
U.S. Cl. 28—211 **8 Claims**



1. A thread gripper for engaging and holding threads at a textile machine, especially warp-tying machines and the like, comprising:
means defining at least two clamping surfaces which coact with one another in a pair for frictionally engaging and holding threads;
said means defining said at least two clamping surfaces providing a thread gripper device;
means for imparting predetermined movements to said thread gripper device;
means for varying the intensity of the frictional force acting upon the engaged threads as a function of the path of travel through which the thread gripper device moves;
said means defining said at least two clamping surfaces including
a support member capable of moving relative to the textile machine and operated by said means for imparting said predetermined movements to said thread gripper device;
at least one pivotably mounted clamping plate;
means for movably mounting said clamping plate at said movable support member;
clamping plate guide member mounted on said support member and carrying said means for movably mounting said clamping plate;
said means for varying the intensity of the frictional force comprising a fixedly mounted control cam having a surface forming a transition phase; and
spring means cooperating with the surface forming the transition phase of said control cam such that the clamping force changes in a predetermined manner as a function of the movement of the support member relative to the textile machine.

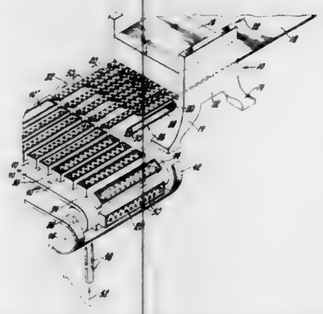
4,175,308
GATHERING THE ENDS OF HEAT-CONDUCTING PIPES IN HEAT EXCHANGERS
Akira Togashi, 14-31, 6-chome, Ryoke, Urawa-shi, Saitama-ken, Japan
Filed Mar. 15, 1976, Ser. No. 667,108
Claims priority, application Japan, Mar. 19, 1975, 50-33227
Int. Cl.[2] B23P *15/26*
U.S. Cl. 29—157.3 C **6 Claims**





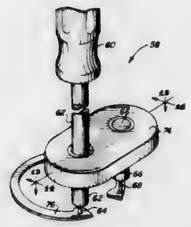
1. In the manufacture of a heat exchanger, in which a fluid to be preheated is passed in the heat-conducting pipes having oval cross sections and a hot fluid is passed through a gap formed between these oval pipes, thereby causing heat transfer between said fluid in the pipes and said hot fluid in the gap between the pipes, a method of gathering and holding ends of plural heat-conducting pipes characterized in radially distorting the ends of adjacent oval pipes and flattening portions of the ends to form faces by deforming inwardly parallel to longest dimensions of the oval cross sections and forming thereby relatively long faces and deforming outwardly parallel to shortest dimensions of the oval cross sections and forming thereby relatively short outward extended joining faces and gathering these ends and abutting and joining together said joining faces of each pipe with joining faces of other pipes, and surrounding the joined ends with a thermal strain-compensating frame made of the same material as the pipes.

4,175,309
CONVEYORIZED FIN ACCUMULATOR
James A. Barnard, Olcott, N.Y., assignor to General Motors Corporation, Detroit, Mich.
Filed Jun. 15, 1978, Ser. No. 915,891
Int. Cl.[2] B23P *15/26*
U.S. Cl. 29—157.3 R **3 Claims**



1. A method of forming elongated heat exchanger fins from a continuous sheet of material having a width equal to a multiple of the width of a single fin and for collecting the fins in stacked relationship comprising:
forming the sheet into longitudinally continuous adjacent fin strips with a width equal to the width of the fins, forming successive portions of each fin strip into integrally interconnected fins, severing each fin strip into adjacent finite fins with the fins in one strip being longitudinally staggered with respect to the fins in each adjacent strip and with the fins in alternate and intermediate strips being transversely aligned, simultaneously progressing the finite fins of the alternate and the intermediate fins strips in the longitudinal direction, collecting the transversely aligned fins of the alternate fin strips, moving the collected fins one fin width in the transverse direction, collecting the transversely aligned fins of the intermediate fin strips over the respective fins of the alternate fin strip.

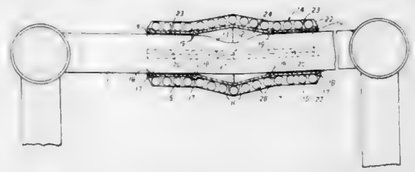
4,175,310
SNAP RING TOOL
William R. Boyd, 3757 Rosewood Ave., Los Angeles, Calif. 90066
Filed Jul. 5, 1977, Ser. No. 812,998
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—229 **11 Claims**



1. A tool for snap rings of the type having an eyelet opening and mounted in a groove of a member, comprising:
an elongated element rotatable about its major longitudinal axis, said element having a circular periphery at one end concentric to said major axis for rolling engagement against the member;
an elongated pin mounted to said one end of the element and extending longitudinally therefrom in offset relation to said major axis, said pin configured for insertion within the eyelet opening of a snap ring with the circular periphery of said element in rolling engagement against the member whereby rolling rotation of said element causes radial displacement of said pin to pry the snap ring from the groove;
a second elongated element of circular configuration for rolling engagement against the member, said second element extending parallel to said first mentioned element;
drive means for rotating said second element oppositely to rotation of said first element; and
a second elongated pin mounted to and extending from said second element in offset relation to the rotational axis of said second element, said second pin configured for insertion within another eyelet opening of the snap ring with the second element in rolling engagement with the member, whereby rolling rotation of said first and second element causes radial displacement of the associated pins to pry the snap ring from the groove.

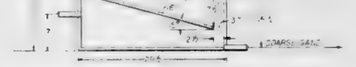
4,175,311
JOINTS
Thomas W. Bunyan, London, England, assignor to Pilgrim Engineering Developments Limited, London, England
Filed Jun. 15, 1977, Ser. No. 806,647
Claims priority, application United Kingdom, Jun. 16, 1976, 4520/76; Mar. 11, 1977, 10489/77
Int. Cl.[2] B23P *7/00*
U.S. Cl. 29—402.18 **6 Claims**

1. A method of repairing a damaged structural tubular member including the steps of providing a sleeve which is divided longitudinally and has cylindrical end portions and an enlarged central portion, placing the said divided sleeve around said structural tubular member with said enlarged portion around said damaged part, so that there is a space between each cylindrical end portion of the sleeve and the adjacent part of the



tubular member, closing the ends of at least the said spaces between the cylindrical end portions and the tubular member, injecting a hardenable composition through the wall of the sleeve into the space between the closed ends, and maintaining the composition under pressure until set.

4,175,312
METHOD OF ASSEMBLING A SETTLING TANK
Fan-Sheng Tao, Morro Bay, Calif., and John E. Warner, Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.
Division of Ser. No. 827,914, Aug. 26, 1977, Pat. No. 4,122,016, which is a continuation-in-part of Ser. No. 710,076, Jul. 30, 1976, abandoned. This application May 30, 1978, Ser. No. 910,400
Int. Cl.[2] B23P *19/00*
U.S. Cl. 29—428 **4 Claims**



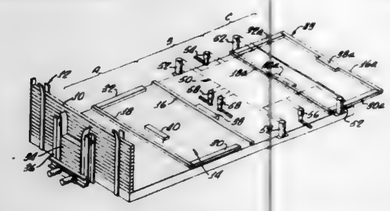
1. A method for assembling a settling tank for resolving a mixture of oil, solids, and water comprising,
(a) forming an upright tank with an inlet in the lower back side thereof for injecting the mixture of oil, solids, and water across the length of the tank from back to front and with a bottom,
(b) mounting two vertically spaced apart baffles in the tank each declined forwardly for forming lower, intermediate, and upper compartments,
(c) forming a lower port in the lower front end of the lower declined baffle in the tank for receiving fluid flow up from the lower compartment for flowing to the intermediate compartment,
(d) forming a port in the upper rear end of the tank upper declined baffle for fluid flow from said intermediate compartment upwardly to the upper compartment,
(e) the tank bottom and the two baffles forming means for receiving solids from the mixture of oil, solids, and water as it passes thereover,
(f) forming a water outlet in the tank in the lower end of the upper compartment for discharge of solids-free and oil-free water, and
(g) forming an oil outlet in the tank for the upper compartment above the water outlet for drawing off solids-free and water-free oil.

4,175,313

METHOD AND APPARATUS FOR MANUFACTURING DOOR FRAMES

Paul G. Neumann, 1324 Hickory La., Orange, Calif. 92666

Filed Apr. 20, 1978, Ser. No. 898,108
Int. Cl.² B27F 7/02
U.S. Cl. 29—430 **5 Claims**



1. A method for making a door frame including a lockblock comprising the steps of:
- providing an elongated assembly platform having a rear end portion and a forward end portion;
- positioning on said rear end portion of lockblock;
- positioning a forward stile to the rear of said lockblock, said forward stile having end portions and a mid-portion;
- positioning a rear stile to the rear of said forward stile;
- positioning a pair of headers between said forward and rear stiles;
- providing supporting means for said end portions of said forward stile and for said lockblock;
- aligning said lockblock along the mid-portion of said forward stile in contact therewith and fastening said lockblock to said mid-portion;
- conveying said forward stile with said lockblock fastened on the forward side thereof along said assembly platform;
- terminating said supporting means of said lockblock while maintaining said supporting means for said end portions of the forward stile;
- rotating said forward stile about its longitudinal axis until said lockblock is positioned to the rear thereof and in a common substantially horizontal plane therewith;
- conveying said headers and rear stile forwardly to form a rectangle with said forward stile; and
- fastening said stiles and headers at the corners of said rectangle, thereby forming said door frame with the lockblock fastened inside along the midportion of the forward stile thereof.

4,175,314

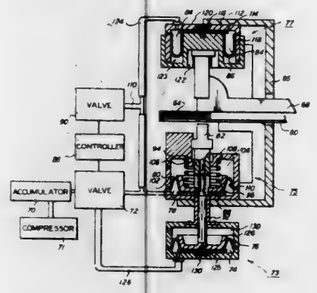
PNEUMATICALLY CONTROLLED STAPLING SYSTEM

Charles W. Spehrley, Jr., Quechee, Vt., assignor to Xerox Corporation, Stamford, Conn.

Filed May 1, 1978, Ser. No. 901,929
Int. Cl.² B25C 7/00
U.S. Cl. 29—432.1 **14 Claims**

1. A method of stapling at least two sheets to one another, including the steps of:
- applying a pressurized fluid to a staple driver so as to force a staple through the sheet; and
- exhausting the pressurized fluid from the staple driver to a staple clincher so as to clinch the portion of the staple legs protruding through the sheets.

3. An apparatus for stapling at least two sheets to one another, including:
- means for driving a staple through the sheets;
- means for clinching the portion of the staple legs protruding through the sheets;
- a source of pressurized fluid; and
- control means for placing said pressure source in communication with said driving means to actuate said driving means, said control means placing said clinching means in



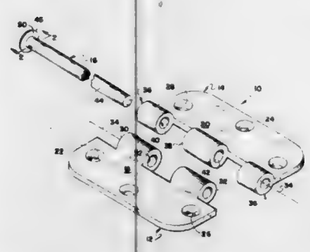
communication with said driving means so that the fluid exhausting therefrom activates said clinching means.

4,175,315

ALL PLASTIC HINGE HAVING A NON-RISING PIN AND METHOD OF MAKING THE SAME

Frank F. Hayes, Sr.; Frank F. Hayes, Jr, and John C. Hayes, all of 3120 El Dorado, Las Vegas, Nev. 89120

Filed May 9, 1977, Ser. No. 795,218
Int. Cl.² B23P 11/02; B29C 25/00; B29D 31/00
U.S. Cl. 29—453 **4 Claims**



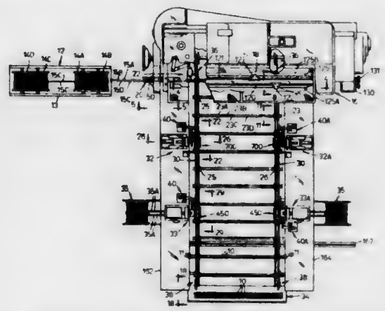
1. A method of making a door hinge half comprising hinge leaf having a plurality of knuckles thereon providing an axial pin receiving passage wherein one of the knuckles provides axially spaced first and second passages of lesser and greater dimension transverse to the axis respectively, comprising
- placing an organic polymeric material in a mold having a knuckle cavity traversed by a mold pin, of generally constant cross-sectional dimension, establishing the passage sections;
- creating a temperature differential in the mold wherein the mold adjacent the second passage section is hotter than adjacent first passage section;
- withdrawing the molded hinge half from the mold when the temperature of the knuckle adjacent the second passage section is greater than the temperature of the knuckle adjacent the first passage section;
- cooling the knuckle to ambient temperature and allowing the knuckle adjacent the second passage section to shrink a greater amount than adjacent the first passage section.

4,175,316

WIRE LEAD CLAMPING MECHANISM FOR WIRE LEAD PRODUCTION APPARATUS

Ragnar Gudmestad, West Allis, Wis., assignor to Artos Engineering Company, New Berlin, Wis.

Filed Jun. 5, 1978, Ser. No. 912,718
Int. Cl.² H01R 43/04; H02G 1/12
U.S. Cl. 29—564.4 **7 Claims**



1. Apparatus for high-speed production of sets of accurately and identically sized wire leads comprising:
- a feed mechanism having means for simultaneously drawing a plurality of separate strands of wire from a plurality of wire reels;
- mechanism having means for simultaneously straightening and arranging the strands drawn therethrough in parallel spaced apart relationship in a common generally horizontal plane;
- a severing mechanism having means for simultaneously severing sets of wire segments of predetermined length from the strands;
- conveyor clamps having means for receiving sets of wire segments from said feed mechanism and for releasably gripping said sets of wire segments in parallel spaced apart relationship in a common generally horizontal plane;
- at least one processing mechanism having means for performing a work operation on the ends of said sets of wire segments;
- a collecting station for receiving said leads after the work operation has been performed thereon;
- conveyor means for advancing the conveyor clamps and sets of wire segments therein through said processing mechanism and to said collecting station;
- and conveyor clamp actuator mechanisms having means for causing the conveyor clamps to initially receive sets of wire segments from said feed mechanism for conveyance and to subsequently release the finished leads for deposit at said collecting station.

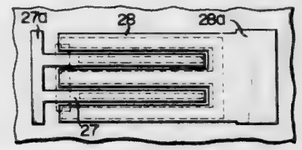
4,175,317

METHOD FOR MANUFACTURING JUNCTION TYPE FIELD-EFFECT TRANSISTORS

Kiyoshi Aoki, and Hisao Kamo, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 22, 1977, Ser. No. 853,868
Claims priority, application Japan, Nov. 24, 1976, 51/140214
Int. Cl.² B01J 17/00
U.S. Cl. 29—571 **10 Claims**

1. A method for manufacturing a junction field-effect transistor comprising a first step for preparing a semi-conductor substrate of a high impurity concentration and one conductivity type, a second step for forming on the substrate a semiconductor layer of a low impurity concentration and the same conductivity type as that of said substrate, a third step for forming in one side of said semiconductor layer at least one portion of a gate region of a conductivity type opposite to that of said substrate, a fourth step for forming on the side of said semiconductor layer an insulating film with a partial opening, a fifth step for forming in the side of said semiconductor layer the other portion of said gate region of a conductivity type opposite to that of said substrate by introducing an impurity into said semiconductor layer through said opening, said gate region surrounding a part of said semiconductor layer, a sixth step for partially removing said insulating film located over said part of said semiconductor layer surrounded by said gate



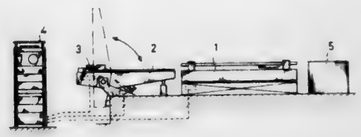
region, a seventh step for forming in the surface of said part of said semiconductor layer surrounded by said gate region and spaced apart therefrom a source region with a conductivity type opposite to that of said gate region by introducing an impurity into said semiconductor layer through the removed portion of said insulating film, and an eighth step for forming gate electrodes and source electrodes attached to said other portion of said gate region and to said source region respectively, said source electrodes extending across said one portion of said gate region on said insulating film.

4,175,318

APPARATUS OF ASSEMBLING FUEL ROD BUNDLE

Mitsuaki Matsuura, Yokohama; Tsuyoshi Hidano, and Masahiro Suzuki, both of Tokai, all of Japan, assignors to Doryokuro Kakuneryo Kaihatsu Kigyodan, Tokyo, Japan

Filed Apr. 28, 1977, Ser. No. 791,824
Claims priority, application Japan, May 22, 1976, 51-58524
Int. Cl.² B23P 19/00
U.S. Cl. 29—723 **15 Claims**



1. An apparatus for assembling a fuel rod bundle which has a number of fuel rods arranged in parallel with each other and fixed at given positions by means of a plurality of spacers and a lower tie plate comprising:
- a fuel rod supply apparatus including
- a base movable in a direction at right angles to a longitudinal direction of the fuel rods to be assembled and being stopped at any one of several selected given positions,
- a mechanism arranged on the movable base and being movable in the direction at right angles to the longitudinal direction of the fuel rods for carrying and positioning the successive fuel rods at a given position, and
- a mechanism arranged on said movable base for moving upwardly the fuel rod positioned at said given position and feeding the raised fuel rod in its longitudinal direction; and
- a bundling apparatus arranged on a line extending from said supply apparatus and including an elongated base,
- a mechanism arranged on the elongated base for holding the lower tie plate,
- a plurality of mechanisms arranged on the elongated base

along its longitudinal direction for holding said plurality of spacers,

a main shaft extending through said mechanisms, and

a mechanism for rotating said main shaft so as to rotate in an interlocking manner the lower tie plate and spacers held by said holding mechanisms, whereby after said movable base is moved at the given position and said lower tie plate and spacers are rotated to given angular positions the raised fuel rod positioned at the given position is inserted into the spacers and lower tie plate at given positions.

4,175,319

APPARATUS FOR ASSEMBLING ROLLER BEARINGS

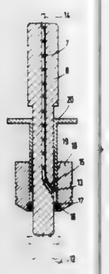
Josef Frauenhoffer, Mühlheim, and Gerd Rüger, Heusenstamm, both of Fed. Rep. of Germany, assignors to Löhr & Bromkamp GmbH, Offenbach, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,359

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1977, 2708990

Int. Cl.[2] B23P *19/04*; F16C *43/06*

U.S. Cl. 29—724 **5 Claims**



1. An apparatus for assembling roller bearings in a bearing bushing comprising an axially immovable outer sleeve member, an applicator sleeve carried within and coaxial with said outer sleeve member for axial sliding movement with respect to said outer sleeve member between a first position and a second position, a piston coaxial with and carried within said applicator sleeve for rotatable movement with respect thereto, said piston axially fixed with respect to said outer sleeve member, said piston and said applicator sleeve forming an annular channel therebetween when said applicator sleeve is in said first position, a collector channel extending substantially axially through said piston, a delivery opening at one end of said collector channel extending through said piston obliquely of said collector channel and communicating between said collector channel and said annular channel, and means connected with the other end of said collector channel for supplying roller bearings thereto, whereby a plurality of said roller bearings are fed into said annular channel for simultaneous insertion into a bearing bushing when said applicator sleeve is moved from the first position into the second position.

4,175,320

CONDUCTOR TERMINATING APPARATUS

John P. Nijman, West Hill, Canada, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation-in-part of Ser. No. 772,222, Feb. 25, 1977, abandoned. This application Sep. 8, 1977, Ser. No. 831,470

Int. Cl.[2] H01R *43/04*

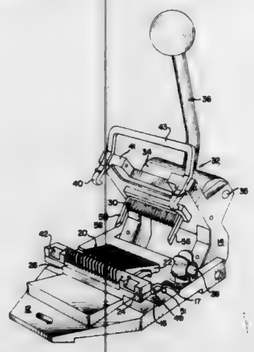
U.S. Cl. 29—749 **14 Claims**

1. Apparatus for simultaneously terminating a plurality of insulated conductors in the contact members of an electrical connector, comprising:

a base including means for supporting the connector in conductor-receiving position;

a carriage pivotally attached to said base and movable between an open position wherein said carriage is remote from said connector and an operating position wherein said carriage is adjacent said connector;

an insertion tool mounted for reciprocal movement in said carriage and including means for engaging and pressing said conductors into respective contact members of the connector when said carriage is in said operating position to thereby terminate said conductors in said respective contact members;



rotatable cam means mounted on said carriage for moving said insertion tool into and out of conductor-terminating engagement with said connector, said cam means including cam actuating means for rotating said cam means; and

self-locking latch means on said carriage adjacent its distal end for retaining said carriage in said operating position and including release means located adjacent said cam actuating means when said insertion tool is in conductor-terminating engagement with said connector.

4,175,321

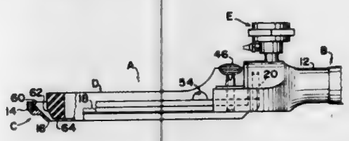
TRIMMING KNIFE

Louis A. Bettcher, Amherst, Ohio, assignor to Bettcher Industries, Inc., Birmingham, Ohio

Continuation-in-part of Ser. No. 842,585, Oct. 17, 1977, Pat. No. 4,142,291. This application Oct. 2, 1978, Ser. No. 947,487

Int. Cl.[2] B26B *29/00*

U.S. Cl. 30—276 **4 Claims**



1. A hand-held and manipulated knife for trimming a comestible product such as, meat and having a frame assembly including a handle projecting radially from an annular member of short axial length in which a ring-like blade of short axial length having an annular cutting edge at one end is rotatably supported and power driven, a gauge assembly comprising a tubular-like member within the blade and having a base part at one side connected to the frame assembly of the knife and a flexible arcuate gauge part proper having at least one end connected to the base part and being spaced from the interior surface of the blade to provide a gap or space between the blade and the flexible arcuate gauge part of the gauge assembly for the passage of a product slice therethrough and a gauge adjusting member connected to the frame assembly and to the gauge assembly for adjusting the gauge assembly axially of the knife blade characterized by the gauge adjusting member being located at the outer circumference of the gauge assembly.

4,175,322

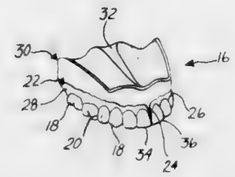
COMPLETE DENTURE PROSTHESES AND METHOD OF FITTING

Kenneth E. Tureaud, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 21, 1977, Ser. No. 835,143

Int. Cl.[2] A61C *13/00*

U.S. Cl. 433—171 **20 Claims**



1. A denture comprising:

a segmented hard base structure of a configuration generally in conformance with human mandibular or maxillary ridges, each segment of said hard base structure formed of a hard rigid material and means joining said segments together into said general configuration allowing said segments to be laterally adjusted in position relative to each other;

a plurality of prosthetic teeth disposed about and bonded to the lower portion of each segment of said hard base structure, said prosthetic teeth shaped and positioned on said hard base structure so as to simulate human natural dentition;

a deflectable tray layer bonded to said hard base structure, said deflectable tray layer being able to be molded to the wearer's oral contours during fitting thereof, whereby said segmented hard base structure may also be laterally adjusted during said fitting to align said prosthetic teeth generally with said mandibular or maxillary ridges.

4,175,323

DENTAL HANDPIECE

Eugen Eibofner, and Heinz Balsys, both of Biberach an der Riss, Fed. Rep. of Germany, assignors to Kaltenbach & Voigt GmbH & Co., Biberach an der Riss, Fed. Rep. of Germany

Filed Nov. 15, 1977, Ser. No. 852,601

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1977, 2736285

Int. Cl.[2] A61C *1/12*

U.S. Cl. 433—126 **10 Claims**



1. A dental handpiece comprising: supply lines running axially inside a longitudinal handpiece sleeve, with said handpiece sleeve and supply lines being divided transversely to form several handpiece sections, said handpiece sections having ends, one of two facing ends of two adjacent handpiece sections having an axially projecting sleeve into which the end of the other handpiece section can be inserted; two facing ends of adjacent handpiece sections having a screw thread each to form a detachable connection; said screw thread being an inside thread of the projecting sleeve forming a pipe-stub like threaded portion of the end inserted in the sleeve of the other handpiece section; an engaging portion; one of two pipe-stub like threaded portions having at least one cutout extending axially from the free end of said handpiece section and forming threaded spring-like tongues; said one of two threaded portions being radially spring-like pretensioned in the unthreaded state of the two adjacent handpiece sections away from the other threaded portion with threads not engaged, said one of two pipe-stub like threaded portions being rotatable relative to said engaging portion of the handpiece section having a threaded portion with at least one cutout about an axis of said handpiece section; said engaging portion having startup surfaces placeable on said threaded portion and radially moving said threaded portion during relative rotation of said threaded portion and said engaging portion against a spring-like pretension towards the thread of the other threaded portion till the threads of the two threaded portions are engaged; said threaded portion having at least one cutout being rotatable relative to its handpiece section about an axis thereof and having engagement means engaging counter engagement means on the last-mentioned handpiece section for pushing together the ends of said two adjacent handpiece sections during the relative rotation of said threaded portion and handpiece section; said engaging means and counter engaging means for pressing together the ends of the two adjacent handpiece sections comprising helical guide slot means in said threaded portion having at least one cutout; and a radial cam located on the handpiece section and projecting into said guide slot means.

4,175,324

DENTAL TREATMENT TOOL

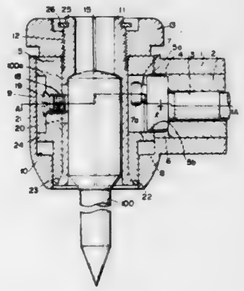
Toshio Arai, Tokyo, Japan, assignor to Kabushiki Kaisha Morita Sanshoku, Japan

Filed Jul. 26, 1977, Ser. No. 819,507

Claims priority, application Japan, Jun. 23, 1977, 52-82611[U]

Int. Cl.[2] A61C *1/10, 5/02*

U.S. Cl. 433—122 **8 Claims**



1. A dental treatment tool comprising:

a casing;

a rotation drive shaft supported in said casing for rotation about an axis of said drive shaft;

a rotation cylinder supported in said casing for rotation about and axial movement along an axis of said rotation cylinder extending perpendicular to said axis of said drive shaft;

said rotation cylinder including means for fixedly supporting a dentral drill;

said rotation cylinder having therein, on the outer periphery thereof, a concave recess defined by two axially extending, circumferentially spaced surfaces;

said rotation cylinder having extending from the outer periphery thereof two shoulders defined by axially spaced surfaces extending transverse to said rotation cylinder axis;

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said rotation drive shaft having integral with the inner end thereof a rotation plate having a diameter larger than that of said rotation drive shaft, said rotation plate having an axis eccentrically located with respect to said rotation drive shaft axis;

said rotation plate being positioned between said two shoulders with an outer peripheral surface of said rotation plate in contact with both of said axially spaced surfaces of said shoulders, such that rotation of said rotation drive shaft will cause eccentric rotation of said rotation plate, and contact of said peripheral surface of said rotation plate with said shoulders of said rotation cylinder will cause reciprocating axial movement of said rotation cylinder with respect to said casing;

said rotation plate having integral therewith and extending therefrom a drive pin having a rounded arcuate peripheral surface, said drive pin being located at a position other than the center of said rotation plate; and

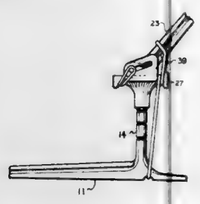
said drive pin being positioned within said concave recess with said rounded arcuate peripheral surface in contact with both of said axially extending, circumferentially spaced surfaces, such that said eccentric rotation of said rotation plate will cause eccentric rotation of said drive pin, and contact of said rounded arcuate peripheral surface with said axially extending, circumferentially spaced surfaces will cause reciprocating rotation of said rotation cylinder through a limited angle about said axis of said rotation cylinder.

4,175,325

DENTAL ARTICULATOR

Edward K. Beckwith, 303 La Marina, Santa Barbara, Calif. 93109

Filed Nov. 25, 1977, Ser. No. 854,523
Int. Cl.² A61C *11/00*
U.S. Cl. 433—60 **3 Claims**



1. In a dental articulator having an upper and lower bow with inner and outer ends and a hinge structure joining the two inner ends, the improvement comprising:

(a) a flat lower surface on the lower bow, which surface supports the entire articulator;

(b) a flat upper surface on the upper bow, which surface supports the entire articulator, when it is inverted;

characterized by said bows being tapered from wide at the hinge end to narrower at the outer end so that plaster masses formed over the base may be removed by sliding them outwardly the upper surface of the lower bow and the lower surface of the upper bow have projecting dovetails that are tapered from wide at the inner end to narrow at the outer end.

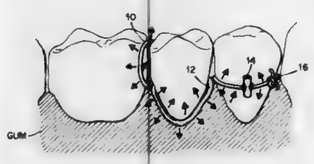
4,175,326

HOLLOW-FIBER DEVICES FOR AND A METHOD OF THE TREAMENT AND DIAGNOSIS OF ORAL DISEASES

Jo M. Goodson, Cambridge, Mass., assignor to Forsyth Dental Infirmary for Children, Boston, Mass.

Filed Oct. 26, 1977, Ser. No. 845,587
Int. Cl.² A61C *19/06*
U.S. Cl. 433—80 **19 Claims**

1. A capillary hollow fiber suitable for diagnostic use in the detection of a dental disease in the oral cavity of a patient, which fiber comprises a flexible, semipermeable, polymeric material having an outside diameter of not greater than 500 microns and a wall thickness of from about 1 to 100 microns, the lumen of the fiber containing a known quantity of an indicator-diagnostic agent wherein the indicator agent is selected from the group of acid-base indicator agents, oxidation-reduction indicators, tooth-corrosive-action indicators and



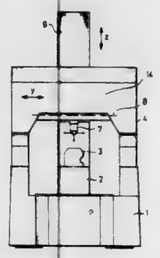
proteinaceous proteolytic-action indicators which provides diagnostic information by undergoing chemical reaction with the products elaborated by the localized disease process in the oral cavity whose diagnosis is desired, the indicator agent capable of diffusing out of the fiber at a rate controlled by the permeability of the fiber.

4,175,327

MEASURING MACHINE

Klaus Herzog, Oberkochen, Fed. Rep. of Germany, assignor to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Apr. 24, 1978, Ser. No. 898,800
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1977, 2718506
Int. Cl.² G01B *7/02*
U.S. Cl. 33—1 M **4 Claims**



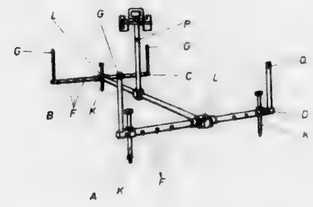
1. In a measuring machine wherein a base supports a workpiece to be contacted by a probe of a measurement head for base-referenced determination of the positional coordinates of the probe-contacted point on the workpiece, and wherein a gantry is movable along spaced parallel ways in the base and on opposite sides of the workpiece, the measurement head being movably carried by the arch of the gantry, the improvement in which drive means for positioning the gantry along said ways is so mounted to the base as to apply gantry-positioning force at an elevation above the workpiece and at the arch region of the gantry, and a gantry-displacement measuring scale fixed with respect to the base and oriented parallel to the direction of such gantry-displacement force.

4,175,328

ARRANGEMENT FOR PRODUCING PHOTOGRAPHIC PICTURES SUITABLE FOR PHOTOGRAMMETRIC SURVEY OF SPATIAL OBJECTS

Helmut Kellner, Wolfsgarten 14, 3406 Bovenden 1, Fed. Rep. of Germany

Filed Jul. 11, 1977, Ser. No. 814,147
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1976, 2631226
Int. Cl.² B43L *13/20*; G01C *11/12*
U.S. Cl. 33—1 A **12 Claims**



1. A method for producing photographic pictures suitable for photogrammetric survey of a spatial object, particularly after traffic accidents, comprising the steps of: establishing control points in said spatial object; taking two photographs using central projection with different positions of a projection center; evaluating said photographs by determining image coordinates of said control points and selected object points, said control points being part of a control point system, said system comprising: a reference plane with at least four points having known position coordinates defining a quadrangle, and at least two space points located outside said reference plane having position coordinates relative to said reference plane, at least the position coordinates of one of said space points and the space coordinates of the other of said space points being known; recording image coordinates of said six points and solving transformation equations of collinear transformation of said four image points of the quadrangle onto four points of said reference plane; recording spatial positions of the two projection centers; projecting image coordinates of selected object points onto the reference plane by applying transformation equations for determining transformed image points; forming intersection of two straight lines between the projection center and one of said transformed image points for determining space coordinates of a selected object point.

4,175,329

ATTACHMENT FOR MOTION TRANSLATING MACHINE

Otto K. Schimmel, Scottsdale, Ariz., assignor to Amba Marketing Systems, Inc., Tempe, Ariz.

Filed Mar. 31, 1978, Ser. No. 892,257
Int. Cl.² B43L *13/10*; D05B *21/00*; D05C *9/04*
U.S. Cl. 33—23 R **6 Claims**

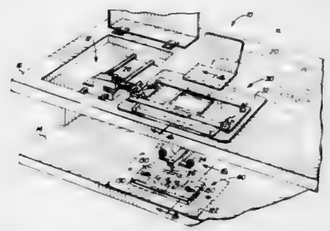
1. In a machine of the type having a motion translating mechanism for moving a workpiece at a first location and in response to movement imparted at a tracing mechanism at a second location, the improvement comprising:

(a) a base including connecting means for attaching said base to said motion translating mechanism at said first location;

(b) locking means carried on said base;

(c) detachable guaging means having an orienting surface corresponding to at least a portion of the workpiece, said detachable guaging means being cooperable with said locking means to detachably secure said guaging means to said base plate whereby said guaging means may be selectively interchanged; and

(d) clamping means associated with said base for securing said workpiece on said base and in engagement with at least the orienting surface of said detachable guaging



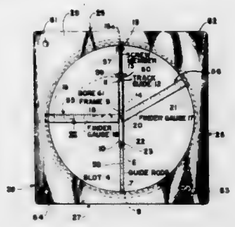
members whereby the workpiece is securable in a work position at said second location.

4,175,330

ADJUSTABLE COMPASS DEVICE

Wayne D. Hermann, 623 N. 3rd St., La Crescent, Minn. 55947

Filed Nov. 20, 1978, Ser. No. 962,227
Int. Cl.² B43L *9/04*
U.S. Cl. 33—27 C **5 Claims**



1. An adjustable compass device for making circles and parts of circles of variable diameter, said adjustable compass comprising

an annular slide member having an inner circular surface and an outer circular surface, said slide member having a circular slot formed in its inner surface;

mounting means for rotatably mounting the slide member for free rotation about its axis;

a guide rod having spaced opposite first and second ends, said guide rod having an axial bore formed in its first end and a projection extending from its second end into the slot of the slide member;

a tube-like frame having spaced opposite first and second ends, said frame accommodating the first end of the guide rod in the area of the first end of said frame;

a track guide having guide means for accommodating a marking device, said track guide being affixed to the second end of said tube-like frame and having an internally threaded bore; and

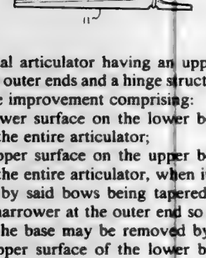
a screw member having spaced opposite first and second ends, the first end being accommodated in the second end of the frame and threadedly coupled in said track guide and the second end being in the slot of the slide member whereby the guide rod, the frame, the track guide and the screw member function as a variable length diameter of the slide member freely rotatable about the axis of said slide member for marking a circle or part of a circle of any diameter smaller than that of said slide member.

4,175,331

ELECTRONIC CIRCUIT FOR CONTROLLING THE ENERGIZATION OF A PLURALITY OF LOADS

Jean-Claude Lecoy, Paris, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jan. 3, 1978, Ser. No. 866,611
Claims priority, application France, Jan. 7, 1977, 77 00322
Int. Cl.² H03K *17/60*
U.S. Cl. 307—252 B **5 Claims**



1. An electronic circuit for controlling the energization of a plurality of loads, comprising:

a plurality of switching means, each of said switching means having a control input and a pair of output terminals, each of said switching means being connected in series with a respective one of said loads;

a plurality of control means, each of said control means having a control output connected to the control input of a respective one of said switching means;

a plurality of first diodes, each of said first diodes having its anode connected to the control output of a respective one of said control means;

a plurality of second diodes, each of said second diodes having its cathode connected to the cathode of a respective one of said first diodes;

a plurality of third diodes, each of said third diodes having its anode connected to the anode of a respective one of said first diodes;

a plurality of fourth diodes, each of said fourth diodes having its cathode connected to the anode of a respective one of said second diodes;

a first common conductor connected to the anodes of said second diodes and to the cathodes of said fourth diodes;

a second common conductor connected to the cathodes of said third diodes and to the anodes of said fourth diodes;

a first resistor connected between said first common conductor and a first terminal of a source of energization;

a second resistor connected between said second common conductor and a second terminal of said source of energization;

a first capacitor connected between said first common conductor and said second terminal of said source of energization;

a second capacitor connected between said second common conductor and said second terminal of said source of energization;

a first control transistor having its base connected to said first common conductor, its collector connected to said first terminal of said source of energization, and its emitter connected to said second terminal of said source of energization;

a second control transistor having its base connected to said second common conductor, its collector connected to said first terminal of said source of energization, and its emitter connected to said second terminal of said source of energization;

a first control resistor connected between said first terminal of said source of energization and the base of said first control transistor;

a second control resistor connected between said first terminal of said source of energization and the base of said second control transistor;

a first control capacitor connected between the base of said first control transistor and said second terminal of said source of energization;

a second control capacitor connected between the base of said second control transistor and said second terminal of said source of energization;

a first control diode having its anode connected to the base of said first control transistor and its cathode connected to the collector of said first control transistor;

a second control diode having its anode connected to the base of said second control transistor and its cathode connected to the collector of said second control transistor;

a first coupling diode having its anode connected to the collector of said first control transistor and its cathode connected to the base of said second control transistor;

a second coupling diode having its anode connected to the collector of said second control transistor and its cathode connected to the base of said first control transistor;

a first coupling capacitor connected between the collector of said first control transistor and the base of said second control transistor;

a second coupling capacitor connected between the collector of said second control transistor and the base of said first control transistor;

a first control input terminal connected to the base of said first control transistor;

a second control input terminal connected to the base of said second control transistor;

a first control output terminal connected to the collector of said first control transistor; and

a second control output terminal connected to the collector of said second control transistor.

4,175,332

ELECTRONIC CIRCUIT FOR CONTROLLING THE ENERGIZATION OF A PLURALITY OF LOADS

Jean-Claude Lecoy, Paris, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jan. 3, 1978, Ser. No. 866,612
Claims priority, application France, Jan. 7, 1977, 77 00323
Int. Cl.² H03K *17/60*
U.S. Cl. 307—252 B **5 Claims**

1. An electronic circuit for controlling the energization of a plurality of loads, comprising:

a plurality of switching means, each of said switching means having a control input and a pair of output terminals, each of said switching means being connected in series with a respective one of said loads;

a plurality of control means, each of said control means having a control output connected to the control input of a respective one of said switching means;

a plurality of first diodes, each of said first diodes having its anode connected to the control output of a respective one of said control means;

a plurality of second diodes, each of said second diodes having its cathode connected to the cathode of a respective one of said first diodes;

a plurality of third diodes, each of said third diodes having its anode connected to the anode of a respective one of said first diodes;

a plurality of fourth diodes, each of said fourth diodes having its cathode connected to the anode of a respective one of said second diodes;

a first common conductor connected to the anodes of said second diodes and to the cathodes of said fourth diodes;

a second common conductor connected to the cathodes of said third diodes and to the anodes of said fourth diodes;

a first resistor connected between said first common conductor and a first terminal of a source of energization;

a second resistor connected between said second common conductor and a second terminal of said source of energization;

a first capacitor connected between said first common conductor and said second terminal of said source of energization;

a second capacitor connected between said second common conductor and said second terminal of said source of energization;

a first control transistor having its base connected to said first common conductor, its collector connected to said first terminal of said source of energization, and its emitter connected to said second terminal of said source of energization;

a second control transistor having its base connected to said second common conductor, its collector connected to said first terminal of said source of energization, and its emitter connected to said second terminal of said source of energization;

a first control resistor connected between said first terminal of said source of energization and the base of said first control transistor;

a second control resistor connected between said first terminal of said source of energization and the base of said second control transistor;

a first control capacitor connected between the base of said first control transistor and said second terminal of said source of energization;

a second control capacitor connected between the base of said second control transistor and said second terminal of said source of energization;

a first control diode having its anode connected to the base of said first control transistor and its cathode connected to the collector of said first control transistor;

a second control diode having its anode connected to the base of said second control transistor and its cathode connected to the collector of said second control transistor;

a first coupling diode having its anode connected to the collector of said first control transistor and its cathode connected to the base of said second control transistor;

a second coupling diode having its anode connected to the collector of said second control transistor and its cathode connected to the base of said first control transistor;

a first coupling capacitor connected between the collector of said first control transistor and the base of said second control transistor;

a second coupling capacitor connected between the collector of said second control transistor and the base of said first control transistor;

a first control input terminal connected to the base of said first control transistor;

a second control input terminal connected to the base of said second control transistor;

a first control output terminal connected to the collector of said first control transistor; and

a second control output terminal connected to the collector of said second control transistor.

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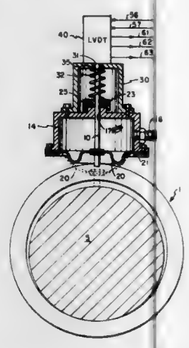
SHAFT BEARING WEAR MEASURING APPARATUS

Everett M. Johnson, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 745,252, Nov. 26, 1976, abandoned. This application Jan. 3, 1978, Ser. No. 866,594

Int. Cl.[2] G01B *7/02, 7/31*

U.S. Cl. 33—172 E **5 Claims**



1. On-line apparatus for measuring the wear of a ship's propeller shaft bearing, comprises determining means for determining the displacement of the ship's propeller shaft in a vertical direction and providing an electrical signal corresponding thereto, the determining means includes a movable member, spacially related to the shaft, moving means connected to the member for moving the member in the vertical direction until the member makes contact with the shaft, said moving means includes an open bottom first housing having a sealed upper opening through which the member passes and a port through which a fluid may enter or exit; a diaphragm affixed to said member and to the bottom portion of said housing forming an expandable chamber within said first housing so that as a fluid enters the expandable chamber the diaphragm is distended in the direction of the shaft, moving the member into contact with the shaft, a supply of fluid, and manually operative means connected to the port in the first housing and to the fluid supply for providing fluid from said supply and for releasing fluid from the expandable chamber, and electrical signal means connected to the movable member for providing the electrical signal in accordance with the position of the movable member; and measurement means connected to the electrical signal means for providing a measurement of the shaft bearing wear in accordance with the electrical signal.

4,175,332

METHOD OF MEASURING DIRECTIONAL PROPERTIES OF SURFACE OF SHAFTS

Yasuo Mikami, Fukushima, Japan, assignor to Nippon Oil Seal Industry Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1978, Ser. No. 884,167

Claims priority, application Japan, Mar. 8, 1977, 52-25190; Jan. 17, 1978, 53-3548

Int. Cl.[2] G01C *5/28*

U.S. Cl. 33—174 R **5 Claims**

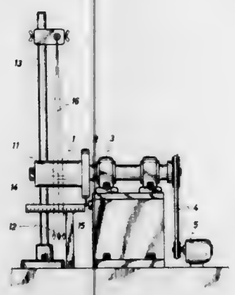
1. A method for measuring directional properties of the surface of a shaft, said method comprising the steps of:

rotatably supporting said shaft with a horizontal rotational axis;

supporting a measuring contact terminal against the surface of said shaft and for horizontal movement;

rotating said shaft in the forward direction;

rotating said shaft in the reverse direction; and



measuring the number of revolutions of said shaft and the amount of horizontal movement said measuring contact terminal undergoes during the shaft rotating steps.

4,175,333

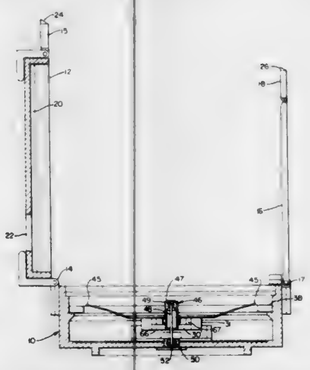
MAGNETIC COMPASS

Melvin G. Kramer, Riverton, Wyo., assignor to The Brunton Company, Riverton, Wyo.

Filed May 16, 1978, Ser. No. 906,427

Int. Cl.[2] G01C *17/04*

U.S. Cl. 33—344 **6 Claims**



1. A magnetic compass comprising in combination:

an annular body having a bottom wall;

an upstanding pivot member including a pivot pin having a spherical end surface at its upper end, said pivot pin being centrally located to project upwardly from said bottom wall;

a needle assembly mounted on said pivot member including a centrally located pivot mount provided with an axially extending pin-receiving bore therein terminating in a downwardly facing concave seat at the upper end of sid pivot mount, said concave surface resting upon the upper spherical end surface of said pivot pin, pointer arms extending radially in diametrically opposite directions from a location on said pivot mount vertically spaced substantially beneath said concave seat, and magnets disposed beneath said pointer arms; and

an azimuth ring disposed in outer spaced concentric relation to said pivot mount.

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4,175,334

METHOD OF AND APPARATUS FOR FREEZE-DRYING PREVIOUSLY FROZEN PRODUCTS

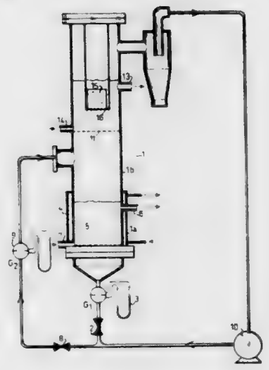
Henri Gibert, Montpellier, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Dec. 30, 1977, Ser. No. 866,012

Claims priority, application France, Dec. 31, 1976, 76 39864

Int. Cl.[2] F26B *5/06*

U.S. Cl. 34—5 **11 Claims**



1. A method of freeze-drying a previously frozen product comprising fluidising a finely divided solid particulate water vapour adsorbent by placing said absorbent in suspension in a carrier gas having a low moisture content in an enclosure, placing said frozen product in said fluidised adsorbentm adjusting the temperature of the fluidised adsorbent and the partial pressure of water vapour in said enclosure to levels at which frozen water contained in said product will sublime.

4,175,335

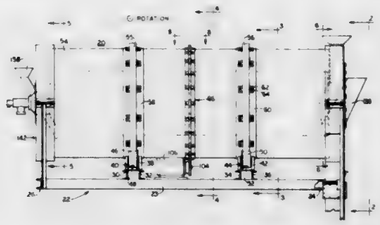
MACHINE FOR DRYING GRANULAR MATERIALS

Arthur C. Avril, P.O. Box 17087, Cincinnati, Ohio 45217

Filed Dec. 8, 1977, Ser. No. 858,618

Int. Cl.[2] F26B *11/04*

U.S. Cl. 34—128 **9 Claims**



1. A machine for drying and mixing sand and gravel which comprises an outer cylinder having an inlet end and an outlet end, an inner cylinder having an inlet end and an outlet end, the inner cylinder being mounted inside of and coaxially with the outer cylinder, the inlet end of the outer cylinder being adjacent the outlet end of the inner cylinder, the outlet end of the outer cylinder being adjacent the inlet end of the inner cylinder, means for rotating the cylinders in unison, means for introducing moist sand into the inlet end of the inner cylinder, means for introducing gravel into the inlet end of the outer cylinder, means for moving the sand along the inner cylinder toward the outlet end of the inner cylinder in heat exchange relation with the inner cylinder, a burner at the outlet end of the inner cylinder directing products of combustion into the outlet end of the inner cylinder to pass therealong and heat the moist sand in the inner cylinder to evaporate water therefrom, a vent stack communicating with the inlet end of the inner cylinder for receiving and discharging the products of combustion, means for directing the heated sand from the outlet end of the inner cylinder into an inlet end portion of the outer cylinder to mix with the gravel to form a sand-gravel mixture, impeller assembly means mounted on the interior of the outer cylinder for engaging the sand-gravel mixture to raise the sand-gravel mixture as the cylinders rotate to cause the sand-gravel mixture to advance along a space between the cylinders toward the outlet end of the outer cylinder and to cascade against an outer wall of the inner cylinder, and catch plate assembly means mounted on the outer wall of the inner cylinder and extending outwardly therefrom to catch the sand-gravel mixture as the sand-gravel mixture cascades against the outer wall of the inner cylinder to hold the sand-gravel mixture in heat exchange relation to the inner cylinder as the cylinders revolve.

4,175,336

BRIDGE PLAYING APPARATUS

Theodore G. Heck, 10 Haddon Pl., Fort Washington, Pa. 19034

Filed Feb. 24, 1978, Ser. No. 880,769

Int. Cl.[2] G09B *19/22;* **A63F** *1/06*

U.S. Cl. 35—8 B **9 Claims**



1. Bridge playing apparatus adapted for use with the bridge column appearing in certain publications such as newspapers and the like comprising:

(a) an outer housing having a pair of windows cut therethrough, said housing also having a pair of opposed wall members which together define an interior channel in said housing;

(b) a first inner member slidably disposed within said channel, and communicating with one of said housing windows to selectively cover and uncover certain bridge playing indicia printed in the bridge column, and

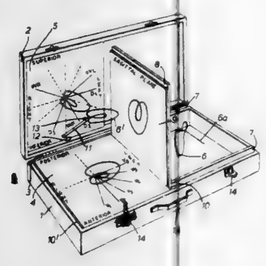
(c) a second inner member slidably disposed within said channel and communicating with the other window in said housing to selectively uncover and cover certain other bridge playing indicia printed in the bridge column, said first and second inner members being disposed in a common plane for sliding movement there-along in said channel.

4,175,337

APPARATUS FOR ASSISTING THE UNDERSTANDING OF ELECTRO-CARDIOGRAPHY AND VECTOR-CARDIOGRAPHY

Cezar Benjo, Rua Santa Clara No. 50, sala 808, Rio de Janeiro, Brazil

Filed Jun. 6, 1978, Ser. No. 913,168
Int. Cl.[2] G09B *23/28*
U.S. Cl. 35—17 **13 Claims**



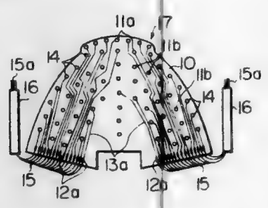
1. An apparatus for assisting the understanding of electrocardiography and vectorcardiography comprising first and second mirrors for placement in substantially horizontal and vertical planes representative, respectively, of the horizontal and frontal planes of electrode placement on a patient, said first horizontal mirror being marked with lines representing the leads of the principal horizontal electrodes on the patient's body, said lines emanating from a generally central point of said first mirror, and said second frontal plane mirror being marked with lines emanating from a generally central point of said second mirror and indicating the leads of the frontal plane electrodes on the patient's body; a series of standard three dimensional vector-cardiographic loops representative of normal and pathological heart conditions; a support portion on each said loop; and support means adapted for receiving said support portion of a selected one of said loops between said mirrors, substantially in a position in which an observer may view the reflection of the projection of said loop in either one of said first and second mirrors with the starting point of said loop coinciding with said central points of said mirrors.

4,175,338

ARTIFICIAL PALATE FOR USE IN DYNAMIC PALATOGRAPHICAL SPEECH RESEARCHES AND IMPROVEMENTS AND METHOD OF FABRICATING THE SAME

Kiyotoshi Takinishi, and Junichi Hattori, both of Tokyo, Japan, assignors to Rion Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1977, Ser. No. 837,039
Claims priority, application Japan, Sep. 29, 1976, 51-117009
Int. Cl.[2] G09B *19/04*
U.S. Cl. 35—35 R **5 Claims**



1. An artificial palate for use in dynamic palatographical speech research and which is of the type comprising a structure to be intimately fitted to a particular user's palate, said structure including a plurality of sensing electrodes supported by said structure so as to be contacted by a user's tongue during use, lead wires each connected at one end to a respective electrode, the other ends of said wires extending from at least an end portion of the structure, and means on the structure for mounting the structure within the user's mouth, the improvement wherein said structure comprises:

a shell body formed of electrically insulative material in the shape of a particular user's palate, and

a base board formed separately of said shell body of flexible electrically insulative material, with said lead wires formed on said base board in the form of a printed circuit applied with said base board being substantially flat,

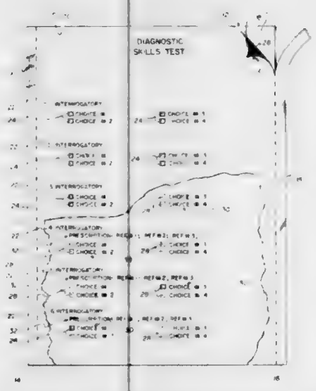
said base board being secured to a lower surface of said shell body such that said lead wires are sandwiched therebetween, and said base board being held in the shape of the user's palate solely by the connection between said base board and said shell.

4,175,339

DIAGNOSTIC SKILLS TEST

S. E. Jones, 7120 Birchwood Dr., Dallas, Tex. 75240

Filed Dec. 27, 1977, Ser. No. 856,630
Int. Cl.[2] G09B *3/02*
U.S. Cl. 35—48 A **4 Claims**



1. A diagnostic test for students which facilitates determination of the student's present knowledge and identifies materials for additional study if the student has insufficient knowledge, which test comprises:

first and second sheets of paper, said second sheet disposed adjacent to and underlying said first sheet;

writing on the top surface of said first sheet posing interrogatories to be answered by the student;

predetermined spaces provided on the top surface of said first sheet for such answers, which predetermined spaces are in close proximity to the interrogatories;

a coating on the bottom surface of said first sheet, portions of said coating being transferrable to underlying portions of the top surface of said second sheet upon the application of pressure to corresponding portions of the top surface of said first sheet;

predetermined answer spaces on the top surface of said second sheet which register with corresponding predetermined answer spaces on the top surface of said first sheet, whereby a student responding to the interrogatories written on the top surface of said first sheet by selectively applying pressure to portions of said predetermined answer spaces on the top surface of said first sheet to indicate one or more answers will cause portions of the coating on the bottom surface of said first sheet to be transferred to

portions of said predetermined answer spaces on the top surface of said second sheet;

indicia within or in close proximity to said predetermined answer spaces on the top surface of said second sheet which indicate the correct answers to the interrogatories contained on the top surface of the first sheet, whereby it can be determined whether the student's answers represented by said portions of transferred coating are correct or incorrect by comparison with said indicia;

writing on the top surface of said second sheet prescribing one or more source references of information which will supply remediation for incorrect responses to the interrogatories; and

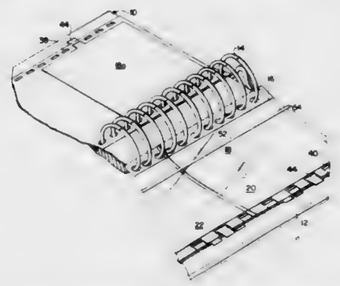
removable binding means for temporarily binding margins of said first and second sheets in abutment to prevent visual inspection of the top surface of said second sheet until said means are removed permitting separation of said paper sheets.

4,175,340

FORM BOOK

Howard E. Deutch, 6826 Casselberry Way, San Diego, Calif. 92119

Filed Sep. 30, 1977, Ser. No. 838,060
Int. Cl.[2] B42D *1/08*
U.S. Cl. 35—53 **14 Claims**



1. A device for holding elements containing information which are selectively combinable to form a compiled document having a plurality of pages, the device comprising:

a binder having a plurality of rings;

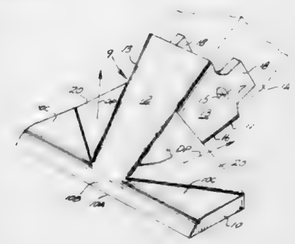
a plurality of first and second element holding means attached to the rings of said binder, each of said second element holding means being adapted to hold a plurality of elements arranged in a plurality of stacks, the stacks being arranged in juxtaposition with each other with one edge of each element being attached to the rings of said binder, said second element holding means including holding means for holding the top element in each stack in a predetermined position, the elements in each stack being movable in order from said second element holding means to a preceding one of said first element holding means to position a desired element as the top element thereby forming one page of the compiled document, each of said first element holding means including means for holding elements moved from the succeeding second element holding means, the compiled document being formed by selectively arranging the elements in a plurality of said second element holding means.

4,175,341

SUBSURFACE CUTTING TOOL FOR A TRACTOR RIPPER SHANK

William M. Mortimore, 38474 McKenzie Hwy., Springfield, Oreg. 97477

Filed Jan. 3, 1978, Ser. No. 866,549
Int. Cl.[2] E02F *9/28*
U.S. Cl. 37—2 R **2 Claims**



1. A tool for cutting and lifting buried wooden debris for attachment to the ripper shank of a tractor, said tool comprising,

a blade block for subterranean travel in a path substantially parallel to the ground surface, said blade block having a forward substantially straight cutting edge extending transversely across the blade block and disposed normal to the blade block path,

a socket secured to said blade block and extending rearwardly and upwardly from said edge relative to the path of blade block travel, said socket adapted to lockably receive the lower end of the shank,

debris deflector plates integral with said blade block and socket, each of said plates inclined upwardly and rearwardly along two axes so as to provide plate surfaces serving to elevate the severed material to the ground surface, and

said socket and said plates jointly extending the length of the blade block to provide surfaces acting to elevate all of the debris severed by the blade block cutting edge.

4,175,342

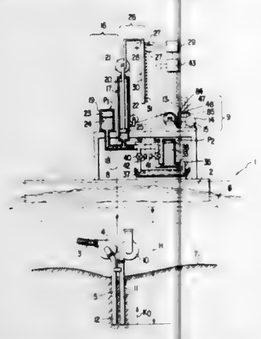
SUCTION DREDGER

Jan de Koning, Amsterdam, and Gerrit H. van Zeggelaar, Utrecht, both of Netherlands, assignors to Goyo Ballast Company Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 517,028, Oct. 22, 1974, abandoned, which is a continuation of Ser. No. 327,402, Jan. 29, 1973, abandoned. This application Feb. 23, 1976, Ser. No. 660,044
Claims priority, application Netherlands, Jan. 28, 1972, 7201218
Int. Cl.[2] E02F *3/88*
U.S. Cl. 37—58 **7 Claims**

1. A suction dredger comprising a vessel and a suspension conveying conduit provided with a pump and having a nozzle adapted to be inserted in the bottom below the vessel and suspended by means of at least one cable of a lifting device on the vessel, said lifting device including a winch drum provided with control means for hauling and veering cable in order to adjust the depth of the nozzle with respect to the vessel, cable length variator means connected with said cable between said lifting device and said nozzle and comprising at least one piston which is movable in a cylinder and which has a travel corresponding with the variations of the rise and fall of said vessel as a result of sea level movement, said variator means also including an accumulator connected with said cylinder and a quantity of liquid within said cylinder and accumulator and a quantity of compressible gas trapped within said accumulator whereby the disposition of the working stroke within said

cylinder determines the variations in the tension on said cable, sensing means for picking up the travel of the piston, a conduit communicating with the cylinder for controllable supplying and discharging liquid to said accumulator and cylinder whereby selectively to increase and decrease said quantity of liquid, and control means for controlling the supply and discharge of the liquid in dependence on the travel picked up by the sensing means to shift the movements of said piston into a



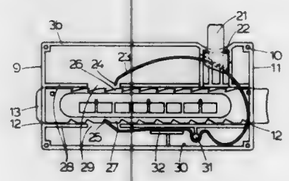
prescribed stroke only when said travel exceeds first maximum and/or minimum positions within said cylinder in which said first maximum and minimum positions are widely spaced on opposite sides of the central position of said piston within said cylinder, the control means including means for actuating the control means of the winch drum only when the travel of the piston exceeds second maximum and/or minimum positions which are beyond said first positions.

4,175,343
NEEDLEWORK STAND
Margaret R. Mathews, Rte. 3, Box 485, Cut-in-Shoot, Tex. 77302
Filed Nov. 25, 1977, Ser. No. 854,705
Int. Cl.[2] D06C 3/08
U.S. Cl. 38—102.1 **3 Claims**



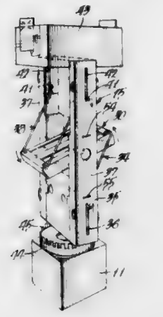
1. A stand for holding needlework stretcher frames comprising:
base means for supporting said stand in a free standing position;
bracket means comprising an elongated bar provided with a plurality of openings for selectively releasably attaching needlework stretcher frames of various sizes;
support means for supporting said bracket means from the upper end of said base means,
said support means including lockable vertical adjustment means and lockable universal joint means, whereby said needlework stretcher frame may be selectively rigidly positioned at any desired height and angle with respect to said base means.

4,175,344
VIEWER FOR THE SUCCESSIVE VIEWING OF A NUMBER OF TRANSPARENT IMAGES
Izak (Piet) Cohen, Amsterdam, Netherlands, assignor to Sales Promotion Spits B.V., Amsterdam, Netherlands
Filed Dec. 29, 1977, Ser. No. 865,779
Claims priority, application Netherlands, Jun. 10, 1977, 7706434
Int. Cl.[2] G02G 27/22
U.S. Cl. 40—364 **18 Claims**



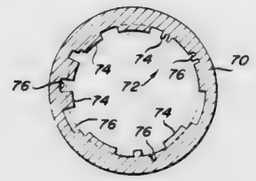
1. A viewer for the successive viewing of a number of transparent images, comprising a casing with a viewing aperture provided with a lens and a counter-aperture aligned therewith which apertures are formed in two opposite faces of said casing, and further comprising a carrier which is detachably fitted in the casing and which supports a number of images in such a way that they are visible from both sides of said carrier, which carrier can be advanced by means of an advancing member that is connected movably to said casing and that is operated manually, said carrier comprising a strip-shaped slide which can move lengthwise through said casing by operating said advancing member and which is provided with means for detachably fixing a film strip thereon, said advancing member co-operating with a spring having a first end portion which can engage said slide so as to impart a lengthwise displacement to said slide, the other end portion of said spring being in engagement with said slide, so as to accurately fix said slide in its successive positions, a manually operated advancing member in the form of a push button which can be moved up and down in said casing, said slide being provided on its opposite longitudinal edges with feed teeth and detaining teeth, respectively, the pitch of said feed teeth and detaining teeth corresponding to the pitch width of an image of said film strip, while the first end portion of said spring, as a result of an elastic deformation of said spring upon depression of the push button engaging said spring, meshes with a cavity between two successive feed teeth on the one slide edge, displaces said slide positively in the working direction during its further elastic deformation, and during its recoil, when said push button has been released, initially takes said slide along in the direction opposite to its working direction due to the friction between said first end portion of said spring and the slide edge involved, while the other end portion of said spring continuously engages the detaining teeth on the other slide edge and allows displacement of said slide in the working direction but during the return motion of said slide meshes with a cavity between successive detaining teeth, thus locking said slide against a further return displacement.

4,175,345
DISPLAY DEVICE
Robert K. Rutchik, Vernon Hills, Ill., assignor to Rapid Mounting & Finishing Company, Chicago, Ill.
Filed Apr. 14, 1978, Ser. No. 896,493
Int. Cl.[2] G09F 11/02
U.S. Cl. 40—473 **14 Claims**



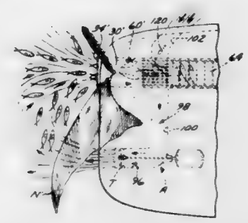
1. In a display device having a base, a first display, and rotary drive means carried by the base and drivingly connected to said first display to cause rotation thereof about a first axis, the improvement comprising:
first motion translating means carried by said base;
second motion translating means carried by said first display in operative association with said first motion translating means;
a control lever having a midportion pivotally mounted to said first display for reciprocable pivoting about a second axis transverse to said first axis;
first connecting means responsive to movement of said second motion translating means to reciprocably pivot said control lever about said second axis;
a second display adjacent said first display and
second connecting means connected between a portion of said control lever spaced from said second axis and said second display for causing reciprocation of said second display relative to said first display while said first and second displays are being rotated concurrently about said first axis.

4,175,346
FIREARM AND BULLET IDENTIFICATION
Michael D. Zemsky, P.O. Box 2965, Arlington, Va. 22202
Filed Sep. 16, 1977, Ser. No. 833,970
Int. Cl.[2] F41C 21/00; F41F 17/10
U.S. Cl. 42—76 R **23 Claims**



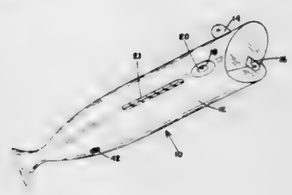
1. A firearm which will mark a bullet fired therefrom with identifying markings, comprising:
(a) a firearm having a barrel with a bore;
(b) marking elements formed from the material of said bore, said marking elements being an integral part of said bore surface; and
(c) said marking elements arranged according to a predetermined code so as to indicate the identifying number of that firearm whereby a bullet fired from said firearm will have markings applied to its surface corresponding to the marking element array which markings will indicate the identification number of said firearm.

4,175,347
STERN FISHING SYSTEM
Mario J. Puretic, 259 6th Ave. North, Tierra Verde, Fla. 33715
Continuation-in-part of Ser. No. 784,278, Apr. 4, 1977, Pat. No. 4,125,955. This application Jun. 8, 1977, Ser. No. 804,748
Int. Cl.[2] A01K 81/04
U.S. Cl. 43—6.5 **6 Claims**



1. Fishing apparatus for use with a fishing boat, said apparatus comprising:
an aperture through which fish are urged;
a water passage in said boat forwardly of said aperture to receive fish from said aperture;
a conveyor that receives fish from said water passage;
a power-driven thruster pump having an impeller disposed in said water passage to direct water passing through said water passage;
with said water passage being in communication with said aperture whereby rotation of said thruster impeller creates a suction pressure within said aperture to urge said fish therethrough;
a suction grill in said water passage over which the fish pass to reach said conveyor;
a valve disposed in said water passage upstream of said impeller to control the magnitude of the suction pressure at said suction grill.

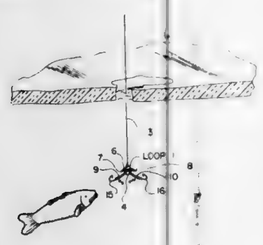
4,175,348
ILLUMINATED FISHING LURE WITH MAGNETIC SWITCH
William E. Ray, P.O. Box 104, Korbel, Calif. 95550
Filed Jul. 12, 1978, Ser. No. 924,047
Int. Cl.[2] A01K 85/01
U.S. Cl. 43—17.6 **4 Claims**



1. A fishing lure comprising:
a hollow body configurated to simulate a fish;
translucent eyes on opposite sides of said body;
a pair of light emitting diodes positioned in said body to be seen through said eyes;
a source of electricity in said body;

an electric circuit connecting said source to said light emitting diodes; and
a switch in said circuit in condition to be opened and closed by contacting said body, said switch comprising:
a magnetic reed switch;
a non-magnetic tube mounted adjacent said magnetic reed switch;
magnetic members carried at each end of said tube; and
a permanent magnet in said tube;
said tube and switch being so positioned relative to each other that when said magnet is at one end of the tube the switch is closed thereby, and when said magnet is at the other end of said tube the switch is open.

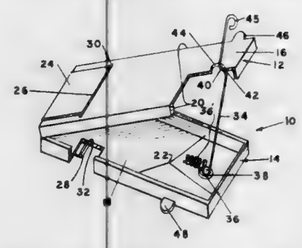
4,175,349
FISH LURE
Derryl D. Engel, Box 1908, Leduc, Alberta, Canada
Filed Jun. 30, 1978, Ser. No. 920,732
Int. Cl.[2] A01K *85/04*
U.S. Cl. 43—42.02 **2 Claims**



1. A fish lure, comprising
a closed loop having a top part affixed to a fishing line, a spaced opposite bottom part and an intermediate part between the top and bottom parts;
a top plate-like strip mounted on the loop in the intermediate part thereof and extending substantially diametrically across the loop substantially perpendicularly to the line, said top strip having spaced opposite ends extending beyond and spaced from the loop on diametrically opposite sides thereof, said top strip being essentially planar and bent in the areas of its opposite ends to form obtuse angles opening away from said line; and
a pair of bottom plate-like strips mounted on the loop in the bottom part thereof and extending at an angle with each other, each of said bottom strips having spaced opposite first and second ends and being mounted on the loop at its first end in angular relation with said top strip, each of said bottom strips being essentially planar and curving slightly at its second end and affixed at its second end to a fish hook.

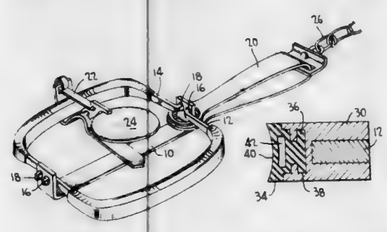
4,175,350
ANIMAL TRAP WITH SENSITIVE TRIGGERING DEVICE
Joseph L. Preston, 219 Orlemann Ave., Oreland, Pa. 19075
Filed Mar. 31, 1978, Ser. No. 892,211
Int. Cl.[2] A01M *23/24*
U.S. Cl. 43—82 **10 Claims**

1. An animal trapping apparatus, comprising:
a pair of box-shaped jaw members each having vertical walls that have contacting surfaces that are in physical contact with one another,
a means connected to, and surrounding a pair of adjacent end portions of said jaws tending to bias said walls of said jaws into said surface to surface contacting position,
said other opposite end portions of said jaws having a trigger in the form of a rod whose entire length is of a cylindrical cross shape configuration, said trigger rod being positioned to extend between said last mentioned jaw portions to retain the jaw in an open position against the force of said biasing means,
one end portion of said rod being mounted on an inner dished out base portion of one of said box-shaped jaw members for pivotal clockwise and counter clockwise rotary movement about a vertical axis,
another oppposite end portion of said cylindrical rod having a bent portion which forms a catch of said trigger,



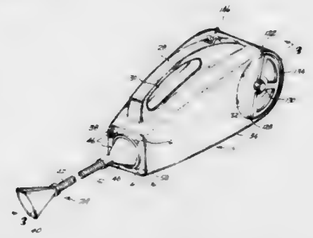
a wall forming a cylindrical passageway in the other one of said box-shaped jaw members that is of a size sufficient to allow the free passage of the rod therethrough and
said bent catch portion of the cylindrical rod being bent to an angle sufficient to engage an edge portion of the wall of said passageway and thereby provide a sensitive triggering means for holding said jaw members in an open trigger set position.

4,175,351
PADDED JAW ANIMAL TRAP
Anthony J. Souza, Lancaster, Pa., assignor to Woodstream Corporation, Lititz, Pa.
Filed Dec. 19, 1977, Ser. No. 862,029
Int. Cl.[2] A01M *23/26*
U.S. Cl. 43—90 **27 Claims**



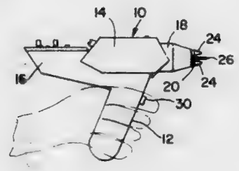
1. In an animal trap including a pair of elongated jaw means for releasably holding an animal, the jaw means including jaw faces, an actuator means for urging the jaw means about a pivot axis from a set position to a sprung position wherein the jaw faces are juxtaposed, latch means for releasably retaining the jaw means in the set position, and trigger means for releasing the latch means, the jaw faces including padding means carried by each jaw means, the padding means including resiliently padded face portions juxtaposed in the sprung position of the trap, said padding means having a compressive resistance in a direction from said face portion to said jaw face, each of the face portions of the padding means extending beyond its respective jaw face of the jaw means towards the other jaw face in the sprung position, the improvement comprising:
absorber means defining an intermediate portion of said padding means interposed between said face portion and said jaw face of each jaw means, said absorber means having a lower compressive resistance than said padding means.

4,175,352
SPRING POWERED, PORTABLE, HAND HELD SUCTION AND BLOWER APPARATUS
Richard E. Catlett, 1011 S. Peabody St., Port Angeles, Wash. 98362
Filed Oct. 31, 1977, Ser. No. 847,132
Int. Cl.[2] A01M *1/06*; A47L *5/24*
U.S. Cl. 43—139 **5 Claims**



1. A portable, hand held, air suction and blower apparatus, comprising:
(a) a body having front and rear end portions;
(b) said body front end portion including a transverse front face having an air inlet opening and a substantially smaller air outlet opening aligned with said air inlet opening;
(c) a tangential fan journaled in said body rear end portion for rotation about an axis generally parallel to said transverse front face, for drawing air into said body through said inlet opening and then forcing such same air forwardly out of said body through said outlet opening;
(d) a manually energized flat spiral spring motor mounted within said body, said motor being geared to said fan for rotating said fan; and
(e) a diffuser detachably connectable to said body front end portion for directing air into said body through said inlet opening.

4,175,353
TOY SIMULATED RAY GUN
Vaughn A. Pickett, 1684 Sacramento St., Berkeley, Calif. 94702
Filed Jan. 3, 1978, Ser. No. 866,753
Int. Cl.[2] A63H *33/26*
U.S. Cl. 46—227 **11 Claims**



1. A toy gun device for producing controllable audio and visual effect simulating a fictitious "ray" type weapon, said device comprising:
a body in the general shape of a hand gun having a handle attached to a central section with a barrel-like front end portion;
power means in said body;
lamp means at said front end portion;
audio speaker means in said central section;
circuit means connected to said power means including audio generation means connected to said speaker means and said power means and including control means for producing a continuously warbling vibrato sound at a preselected level and frequency, and lamp control means for actuating said lamp means to flash on and off during the warbling sound produced by said audio generation means;
and trigger means on said handle for simultaneously activating said lamp control means and said audio generation means to simulate the firing of said gun-like toy device.

4,175,354
PLANT GROWING DEVICE
Clarence A. Anderson, 724 Beechnut La., Martinsville, Va. 24112
Filed May 24, 1976, Ser. No. 689,564
Int. Cl.[2] A47G *7/02*; A01G *27/00*
U.S. Cl. 47—39 **3 Claims**



1. A device for promoting plant growth by rotating a plant container and delivering water to a plant within said container, comprising:
(a) a base having an upper section and a lower section, said upper section being rotatably disposed with respect to said lower section;
(b) means for controllably rotating said upper section relative to said lower section;
(c) water supply containment means including a chamber defined in said lower section by a horizontally-disposed intermediate wall dividing the interior of said lower section into upper and lower chambers, said lower chamber containing a supply of water therein; and means for replenishing the water in said lower chamber; and
(d) means cooperating with said rotating means for delivering water from said containment means to said plant container, said water delivering means comprising:
(a) a water delivery tube extending externally of said plant container and having one end extending into said water supply containment means, the other end of said tube terminating at a point adjacent to said plant container such that water is delivered to said plant;
(b) a flexible elongated tubular member disposed within said water supply containment means, one end of said tubular member being anchored to said water containment means so that said water has free access to the interior of said tubular member, and the other end of said tubular member being attached in a fluid-communicating manner to the end of said delivery tube extending into said water supply containment means;
(c) a roller member in rotatable depressing engagement with the upper, outer surface of said tubular member to compress the area of said tubular member below said roller to provide pressure for forcing said water through said tubular member into said water delivery tube; and
(d) means coupling said roller member to said rotatable upper section such that said roller member depresses said

tubular member during rotational movement of said upper section.

4,175,355

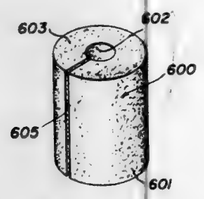
ROOTING MEDIA AND METHODS OF MAKING THE SAME

Richard R. Dedolph, Naperville, Ill., assignor to Gravi-Mechanics Co., Naperville, Ill.

Division of Ser. No. 712,393, Aug. 6, 1976, which is a continuation-in-part of Ser. No. 474,269, May 29, 1974, Pat. No. 3,973,353. This application Jul. 28, 1978, Ser. No. 928,986

Int. Cl.[2] A01G *7/00*

U.S. Cl. 47—64 **19 Claims**



1. A rooting medium for use in plant propagation and growing comprising a resilient, integral body of spongy open-celled hydrophilic polymer forming a first essentially continuous phase extending throughout said body and having passages therethrough forming a second essentially continuous phase extending throughot said body, a quantity of particles of soil mix distributed throughout said body of spongy polymer and held thereby with a substantial portion of the surface area of said particles of soil mix exposed and in communication with said passages, the exposed particles of soil mix providing colloidal contact exchange surfaces in communication with said passages and having collectively a porosity maintenance capacity and a water holding capacity and an ion exchange capacity and and a pH buffering capacity, said passages facilitating the growth of roots through said body and against the exposed surfaces of said particles of soil mix and the contact exchange surfaces provided thereby so as to effect direct ion uptake therewith, said passages also providing ready entry for water and air throughout said body and against the exposed surfaces of the particles of soil mix and the roots growing in said passages, whereby to provide a highly advantageous rooting medium for growing plants.

4,175,356

PLANT AERATOR TUBE

Donovan J. Allen, Rte. 4, Berry Rd., Greer, S.C. 29651

Filed Oct. 31, 1977, Ser. No. 846,925

Int. Cl.[2] A01G *27/00*

U.S. Cl. 47—66 **2 Claims**

1. An aerator tube for delivering air to the root system of an associated plant surrounded by a support media comprising:

an elongated tubular member having opposed ends;

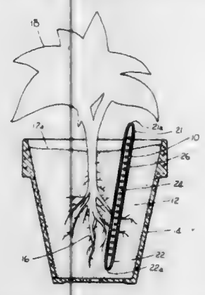
a central axial bore extending generally between said ends;

at least one of said ends tapering inwardly toward the central axis of said tubular member and terminating at a substantial point for being inserted in said media;

a plurality of radial openings formed in a sidewall of said tubular member spaced generally along the entire length thereof communicating the interior of said axial bore with the exterior surrounding said tubular member;

a number of said openings being disposed below the surface of said support media when implanted in said media so that air from above said media level is delivered and distributed at different levels to the root system supported in said media; and

the other of said opposing ends being tapered inwardly toward the center of said tubular member terminating substantially at a point, said axial bore extending through



both of said tapered opposing ends opening outwardly therefrom.

4,175,357

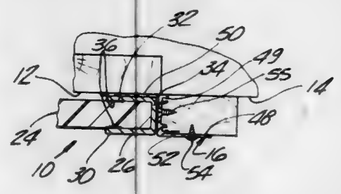
PROTECTIVE ENCLOSURE FOR BUILDING OPENINGS

Marvin L. Goldhaber, 1005 Talbot, Huntington Woods, Mich. 48070

Continuation-in-part of Ser. No. 423,273, Dec. 10, 1973, Pat. No. 3,978,614. This application May 16, 1975, Ser. No. 578,083

Int. Cl.[2] E05C *9/00;* **E06B** *3/30, 7/00*

U.S. Cl. 49—395 **4 Claims**



1. A protective enclosure for a building opening, said enclosure comprising:

a peripheral frame member circumscribing said opening, said frame member having a Z-shaped cross section including first and second parallel walls connected by a transverse wall, the inner surfaces of said walls adapted to abut a complementary shaped edge of said building openings;

first and second fastening means, respectively, extending through said transverse wall and said first wall for securing said frame member to said edge of said building opening;

a transparent shielding window unit comprising a peripheral metal member having an inner channel; and a transparent shielding material, the edges of which are mounted in said channel and enclosed by said peripheral member, said shielding material being fabricated from a plastic material of sufficient strength to prevent the breakage thereof by the application of a manual force, said transparent shielding window unit being carried by said frame and movable from a first opened position to a second closed position wherein the peripheral side edge of said metal member abuts said first wall to cover said second fastening means, and the peripheral bottom edge of said metal member snugly engages said transverse wall to cover said first fastening means;

locking means for securing said unit to said frame when said unit is in said closed position, said locking means being disposed on the inside surface of said frame and cooperating with said unit and said frame to prevent the opening of said unit;

hinge means extending along one edge of said unit for pivotally attaching said one edge of said unit to an edge of said frame member such that said unit may be moved toward and away from said frame member to open and close said building opening; said hinge means comprising:

a first element carried by said one edge of said frame and extending the full length of the adjacent edge of said unit, said first element having first and second spaced, lengthwise recesses;

a second hinge element integrally formed to the lengthwise edge of said unit, said hinge element having a pivot member of a circular configuration extending the full length thereof, said pivot member being pivotally received within one of said recesses to permit said unit to be pivoted with respect to said first hinge element; and

said second hinge element having a second non-circular projection receivable in the other of said recesses to lockingly secure said unit to said hinge when said unit is pivoted toward said frame to enclose said fastening means.

4,175,358

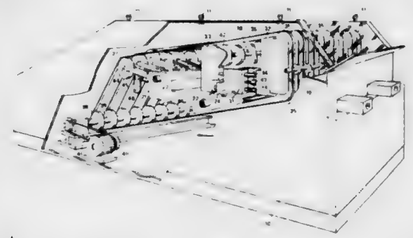
PLUNGE-GRINDER, ESPECIALLY FOR GRINDING THE CAMS OF ENGINE TIMING SHAFTS

Ido Bischeri, Via F.lli Rizzi 1, Proserpio (Como), Italy

Filed Dec. 15, 1977, Ser. No. 860,930

Int. Cl.[2] B24B *17/00*

U.S. Cl. 51—142 **4 Claims**



1. A plunge-type grinding machine for grinding cams of a camshaft comprising a baseplate having a front end and a rear end, a table with means for rotatably supporting a camshaft, means adjustably securing said table on said baseplate to facilitate movement of said table in a direction perpendicular to the axis of a camshaft to be rotatably supported thereon, a stationary eross-piece mounted on said baseplate and having means for rotatably supporting a pattern piece generally parallel to the camshaft with cams to be ground, motive and drive-transfer means for rotating the camshaft with cams to be ground and the pattern piece in phase with each other, and a plurality of independent machining units carried by said cross-piece, said machining units being equal in number to that of the cams of the camshaft to be subjected to a grinding operation, each of said independent machining units including a front head, a rear head, and a central supporting member disposed between said front and rear heads associated therewith, said front and rear heads being rigidly connected to each other by bars passing through one of said central supporting members in reciprocating sliding relationship therewith and extending perpendicular to the axis of a camshaft to be subjected to a grinding operation whereby said front and rear heads of each of said independent machining units may be moved toward and away from a camshaft to be subjected to a grinding operation, each of said rear heads carrying an idle roller and the respective central supporting member associated therewith being movable parallel to the axis of the camshaft to be subjected to a grinding operation whereby said idle rollers may be maintained in cam-follower relationship with cam sections of the pattern piece and thus move said independent machining units toward and away from the cams of a camshaft in a controlled manner, each of said front heads carrying pair of idler pulleys, pulley means disposed at the rear end of said baseplate, a grinding tape extending in a closed loop around said pair of idler and said pulley means to present a tightened rectilinear section at the front end to perform a cam grinding operation, hydraulic-jack means for thrusting said front and rear heads towards a machining position in which the respective idle rollers are in cam-follower contact with corresponding cam sections of the pattern piece and the rectilinear sections of the respective grinding tapes are in machining contact with a corresponding cam of a camshaft to be ground.

4,175,359

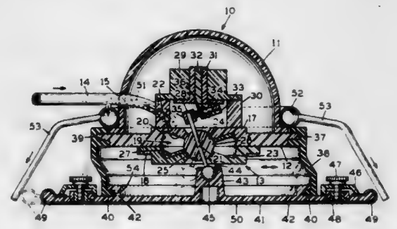
FLUID POWERED ORBITAL WET SANDER AND THE LIKE

Walter D. Teague, Jr., Tweed Blvd., Nyack, N.Y. 10960, and Arthur T. Sempliner, 37-04 Van Nostrand Pl., Douglaston, N.Y. 11363

Filed Nov. 7, 1977, Ser. No. 848,806

Int. Cl.[2] B24B *23/00*

U.S. Cl. 51—170 MT **10 Claims**



1. A fluid-driven positive displacement nutating action abrading-type appliance, which comprises

(a) a motor housing,

(b) a wobble plate mounted in said housing for universal tilting movement within predetermined limits,

(c) means communicating with said housing providing for ingress and egress of fluid for driving said wobble plate,

(d) an angularly disposed, orbitally movable rod-like output element carried by said wobble plate,

(e) a support structure associated with said motor housing and being relatively rigid in vertical compression and relatively resilient in the transverse direction,

(f) an abrading-type utilization device mounted by said support structure in spaced relation to said motor housing, and

(g) means forming a direct universal coupling between said output rod and said utilization device whereby said utilization device is positively displaced through an orbital path while being restrained against rotation by said support structure.

4,175,360

COFFERED CEILING SYSTEM

Gerard E. Mulvey, 57 Mobile Dr., Toronto, Ontario, Canada

Filed May 2, 1977, Ser. No. 793,133

Claims priority, application Canada, Feb. 25, 1977, 272724

Int. Cl.[2] B66B *9/00;* **E04H** *6/06*

U.S. Cl. 52—28 **29 Claims**

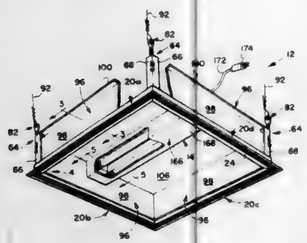
1. A suspended ceiling structure closing a ceiling void in a building which comprises a plurality of coffered ceiling modules wherein each ceiling module is adapted to be selectively removably fitted with a lighting fixture whereby the lighting arrangement in said ceiling structure may be varied to provide

lighting in some such modules, and no lighting in other such modules, each said module comprising;

upwardly directed side walls, and a horizontal top wall, formed of sound attenuating material, and forming a hollow box-like structure having a downwardly directed open side;

suspension means on each of said modules whereby each said module is independently suspended from above;

ceiling panel support means extending outwardly along the lower edges of said box-like structure whereby ceiling panels are supported between adjacent modules;



unobstructed opening means in said top wall of predetermined length and width communicating with said ceiling void for removably receiving a said lighting fixture therein from below,

and said ceiling structure further comprising lighting fixtures of predetermined length and width, dimensioned to fit within said opening means and be removably installed in at least some said opening means from below, any other of said opening means being closed by removable panel means whereby those modules without lighting fixtures will present a finished appearance.

4,175,361

OPENABLE CANOPY HOUSING

Masami Kumode, Tokyo, Japan, assignor to Kiyomitsu Tanaka, Nagoya, Japan, a part interest

Filed Oct. 13, 1977, Ser. No. 841,838

Int. Cl.² L04B *1/346*

U.S. Cl. 52—66 **11 Claims**

1. An openable canopy housing comprising:

a base for said housing;

a horizontal beam mounted a predetermined distance above said base of said housing;

said horizontal beam having a major longitudinal axis;

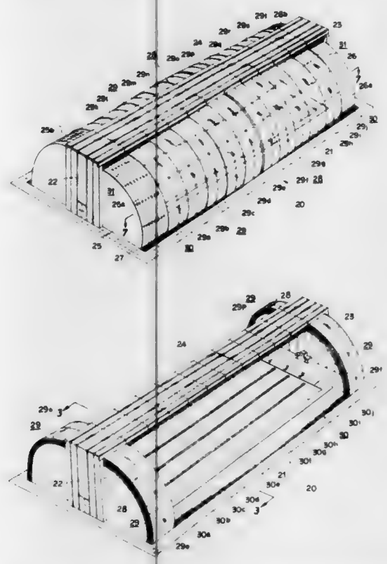
a plurality of transparent arched panels arranged on both sides of said horizontal beam;

said plurality of transparent arched panels being extended at their lower ends to said base of said housing;

said plurality of transparent arched panels being movable parallel to said major longitudinal axis of said horizontal beam of said housing;

said transparent arched panels being arranged in the direction of said major longitudinal axis of said horizontal beam; and

said transparent arched panels having radii of curvature varying in accordance with the order of arrangement of said transparent arched panels so that when said panels are



moved in the direction of said major longitudinal axis of said horizontal beam, said panels will overlap each other.

4,175,362

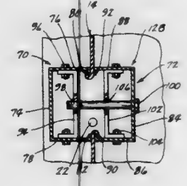
WALL STRUCTURE

Charles V. Frederick, Rte. #5, New Virginia, Iowa 50210

Filed Feb. 21, 1978, Ser. No. 879,064

Int. Cl.² E04B *1/00*

U.S. Cl. 52—274 **7 Claims**



1. A building structure comprising,

a supporting surface,

a plurality of vertically disposed and horizontally spaced-apart columns secured at their lower ends to said supporting surface and extending upwardly therefrom,

at least one vertically disposed panel member positioned between each pair of adjacent columns, each of said panel members having opposite side edge portions,

each of said columns being comprised of a plurality of column members secured together to form the said column,

each column having complementary flanges provided thereon which extend therefrom into the interior of said column,

the side edge portions of said panel members having generally U-shaped channels which are received between a pair

of adjacent flanges of adjacent column members of a column,

bolt means securing together the column members of each of said columns, and

one of said flanges on each of said column members being received in a single U-shaped channel of separate panel members, whereby said panel members are secured against horizontal movement outwardly of said columns.

4,175,363

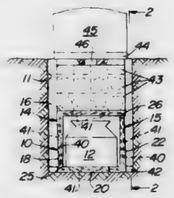
FOOTERS FOR SUPPORTING MONUMENTS FOR CEMETERIES AND THE LIKE

Benson Moskowitz, 221 Edgehill Dr., Havertown, Pa. 19083

Filed Dec. 14, 1977, Ser. No. 860,297

Int. Cl.² E02D *27/00*

U.S. Cl. 52—294 **20 Claims**



1. A stable, multi-component footer for supporting monuments for cemeteries and the like, said footer forming a hollow, generally rectangular structure for installation within a grave containing a casket and having capacity for ease of assembly, said footer including

(a) a pair of horizontally spaced, vertical side members, said side members each being integral and being spaced apart sufficiently to accommodate a casket therebetween,

(b) said side members each having upper end portions and lower end portions, said upper end portions terminating at locations adjacent the upper surface of a casket deposited in the grave and said lower end portions terminating adjacent the bottom of the grave,

(c) a horizontal support member extending between the two side members and connected to the spaced upper ends of said side members, said horizontal support member being located proximate the upper surface of the casket,

(d) said horizontal support member and one of the vertical side members comprising an integral L-shaped member, said horizontal support member having a proximal end joined integrally to the upper end portion of its said integral side member, and

(e) locking means detachably securing the upper end of the second side member to the horizontal support member,

(f) said locking means comprising engageable complementary male and female elements adapted to provide stability to the footer when the members thereof are assembled.

4,175,364

CASE PACKER HEAD

Michael L. Becker, Akron, and William G. Wilfong, Mogadore, both of Ohio, assignors to A-T-O Inc., Willoughby, Ohio

Filed Mar. 27, 1978, Ser. No. 890,496

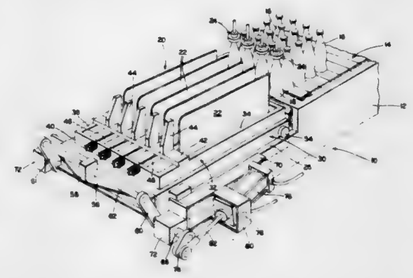
Int. Cl.² B65B *21/16*

U.S. Cl. 53—539 **11 Claims**

5. In an article packing apparatus having a frame, a case packer head including a grid frame means for receiving a plurality of rows of abutted articles therein, an upstream end of said grid frame means being supported on said packing apparatus frame, a skid blade frame carried by said grid frame for support of articles moved into said grid frame means but movable laterally in relation to said grid frame for article release, the improvement characterized by

support means for said grid frame means including a pivotal control arm engaging the downstream end of said grid frame means to support the same, and

control members engaging said control arm to pivot the



same and move said downstream end of said grid frame means vertically to incline said grid frame means downwardly for article loading action and to position said grid frame means horizontally for article release.

4,175,365

METHOD AND APPARATUS FOR MEASURING DISTANCES

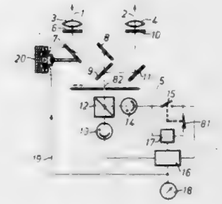
Ludwig Leitz; Knut Heitmann; Eckart Schneider, all of Wetzlar, and Horst Schmidt, Nauborn, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Continuation of Ser. No. 480,825, Jun. 19, 1974, abandoned, which is a continuation of Ser. No. 309,809, Nov. 27, 1972, abandoned. This application Feb. 26, 1976, Ser. No. 661,761

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1971, 2158761

Int. Cl.² G01C *3/08*

U.S. Cl. 356—4 **6 Claims**



1. In an apparatus having an extended object of a plurality of discrete structures reproduced by a first objective having a first line of sight and a second objective having a second line of sight for the evaluation of stereoscopic images by the determination of the maximum degree of correlation of a first image reproduced by said first objective and a second image identical with the first reproduced by said second objective, the improvement comprising:

(a) a first filter (**6**) positioned in the first line of sight and a second filter (**10**) positioned in the second line of sight to filter said images for physical characterization;

(b) a first and second means for projecting unidirectionally the filtered images into a plane (**5**) along an image axis;

(c) means provided with at least one specific spatial frequency component and located in said plane along said image axis, said means being adapted for comparing areal structures composed of a plurality of points in said images by optical correlation and generating from said compari-

son optically discernible signals indicative of the position of said object;

(d) a beam splitter located along said image axis projecting said first image in a first direction and said second image in a direction at an angle of 90° to said first direction;

(e) first and second photoelectrical means receiving said split images and generating first and second output signals, means for differentiating connected in series with said first photoelectrical means and and receiving said first output signals;

(f) circuit means for an additional electrical correlation of said output signals connected to said second photoelectrical means and said means for differentiating;

(g) means for indicating connecting to said circuit means; and

(h) means for controlling the position of said first means for projecting.

4,175,366

HARVESTER LIFT AND FLOAT MECHANISM

George B. Cicci, Burr Ridge, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Jun. 12, 1978, Ser. No. 914,320

Int. Cl.² A01D *47/00*

U.S. Cl. 56—15.8 **5 Claims**



1. A mobile crop harvester comprising: a wheel supported main frame including a pair of generally vertical laterally disposed frame members and a horizontal beam extending laterally between said vertical members;

an elongated crop harvesting header mounted to said frame by a pivotal linkage including an upper link and a pair of laterally disposed lower swing links for movements of the header between a lowered operating position and a raised transport position, said header further comprising a cutting apparatus disposed across the forward edge thereof and ground shoes for gaging the height of said cutting apparatus in the operating position; and

floatation spring means interconnecting the upper portion of said vertical frame members with the intermediate portion of said lower swing links, the pivotal connection of said floatation spring means to said lower swing links being below a line interconnecting the pivotal mountings of said lower links to said frame and to said header and being below the pivotal mounting of said lower link to said frame in the operating position.

4,175,367

DEVICE FOR FIXING THE KNIVES OF ROTARY MOWERS

Jacques E. Bouet, Villeneuve d'Ascq, France, assignor to International Harvester Company, Chicago, Ill.

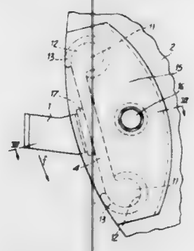
Filed Dec. 19, 1977, Ser. No. 861,738

Claims priority, application France, Dec. 30, 1976, 76 39557

Int. Cl.² A01D *55/18*

U.S. Cl. 56—295 **2 Claims**

1. In a rotary mower, a rotary cutting unit comprising a cutting element mounted on said mower for rotation in a generally horizontal plane, a plurality of separate elongated elastomeric members, each having both of its ends attached to said cutting element at circumferentially spaced locations thereon, each of the ends of said elastomeric member comprises a bulge and the cutting element has a housing in which the bulge is imprisoned, and a plurality of cutting knives corresponding to said elastomeric members, each knife being attached to the central portion of its respective elastomeric member in a manner permitting the knife to move substantially radially relative to said cutting element subject to the centrifugal forces acting on said elastomeric member.



4,175,368

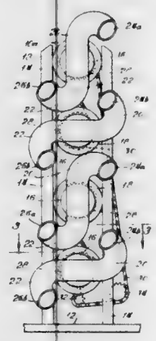
HARVESTING APPARATUS AND PROCESS

Edward D. Scheffler, Coloma, Mich., assignor to Ag Superior, Inc., Riverside, Mich.

Filed Aug. 15, 1977, Ser. No. 824,815

Int. Cl.² A01D *46/00*

U.S. Cl. 56—328 R **30 Claims**



1. Apparatus for harvesting fruit from trees which comprises air blast-producing means for directing a blast of air into said tree from the circumference of a circle which lies in a substantially vertical plane apposed to the foliage expanse of said tree, and moving means for causing said blast of air to move about the said circumference as a rotating unit which rotates about the center of said circle, in which said air blast-producing means comprises a plurality of nozzles spaced along said circumference and oriented to direct a blast of air into the foliage of said tree, and said moving means comprises means for shifting said blast of air from one nozzle to the next adjacent nozzle in succession.

4,175,369

HAYMAKING MACHINE WITH LATERAL DISCHARGE WINDROWING AND CENTRAL TEDDING

Frédéric Gerlinger, Ottersthal, France, assignor to Kuhn S.A., Saverne, France

Filed Nov. 4, 1977, Ser. No. 848,593

Claims priority, application France, Nov. 5, 1976, 76 34063

Int. Cl.² A01D *79/00*

U.S. Cl. 56—370 **5 Claims**

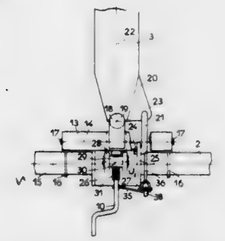
1. A combined haymaking machine, permitting of carrying

out lateral discharge windrowing work and central tedding work, said machine comprising:

at least two rotary rake heads interconnected by a chassis,

a control member the actuation of which causes the chassis of the machine to rotate about a first axis parallel with the longitudinal axis of the said chassis,

an intermediate element articulated to the chassis about said first axis, and



a beam extending between said chassis and a hitch device, said beam being articulated in relation to the intermediate element about a second substantially vertical axis while being connected to the said chassis by a connecting rod which is eccentric in relation to the longitudinal axis of the said beam and is articulated about a substantially vertical axis and about a substantially horizontal axis.

4,175,370

PIECING APPARATUS FOR AN OPEN-END SPINNING MACHINE

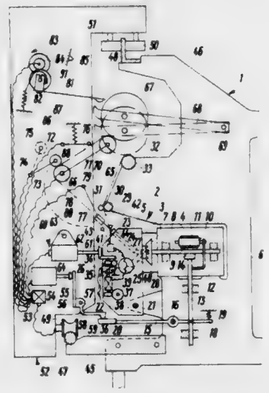
Fritz Stahlecker, Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed Jun. 5, 1978, Ser. No. 912,418

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1977, 2728003

Int. Cl.² D01H *15/00*

U.S. Cl. 57—263 **21 Claims**



1. A piecing device for an open-end spinning machine of the type having a plurality of spinning assemblies which each include a rotatable storage spool for storing yarn as it is spun at said spinning assembly, spool drive means for driving said spool during spinning operations, and yarn guide means for guiding the yarn between the rotor of the spinning assembly and the spool during spinning operations; said piecing device comprising:

auxiliary spool drive means for driving the spool at a spinning assembly during piecing operations at said spinning assembly,

auxiliary yarn guide means for guiding the yarn between the spool and a yarn outlet of a spinning rotor of the spinning assembly during piecing operations, said auxiliary yarn guide means including auxiliary driven feed means for said yarn,

and control means for controlling the course of the yarn between the auxiliary driven feed means and the spool so as to reduce formation of a loop in the yarn during acceleration of the drawing off of the yarn during piecing.

4,175,371

BROKEN END-COLLECTING INSTALLATION AND METHOD OF OPERATING THE SAME

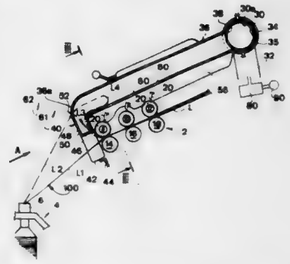
Hermann Gasser, Zürich, and Karl Cüriger, Pfaffikon, both of Switzerland, assignors to Luwa AG, Zurich, Switzerland

Filed Mar. 21, 1978, Ser. No. 888,754

Claims priority, application Switzerland, Mar. 28, 1977, 3864/77

Int. Cl.² D01H *5/68, 11/00*

U.S. Cl. 57—304 **20 Claims**



1. A broken-end collecting installation for the drafting gears of spinning machines, each defining gear having cooperating upper and lower rollers, including at least one pair of feed rollers defining a spinning triangle, through which fiber material passes on to guide means of a twisting head comprising:

a suction head provided for each drafting gear;

means defining an air pressure sink operatively connected with said suction head;

said suction head incorporating a substantially slot-shaped suction opening operatively associated with the feed rollers of the related drafting gear;

said slot-shaped suction opening extending from a first end thereof situated closer to the spinning triangle to a second end thereof situated closer to the air pressure sink in the flow direction of the air;

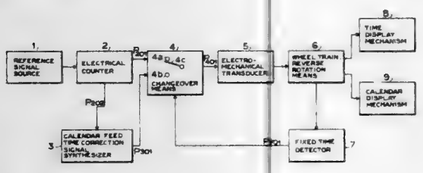
said slot-shaped suction opening also extending in a direction with respect to said flow direction whereby said second end is transversely spaced from said first end, whereby upon rupture of the fiber material at a location subsequent to the guide means the fiber material extending to the guide means is induced to be sucked towards said second end and further delivered fiber material passes into the suction opening adjacent said first end.

4,175,372

ELECTRONIC TIMEPIECE

Munetaka Tamaru, Tokyo; Kazunari Kume; Minoru Watanabe, both of Tokorozawa; Hideshi Ohno, Sayama, and Minoru Natori, Nishitama, all of Japan, assignors to Citizen Watch Co. Ltd., Tokyo, Japan

Filed Mar. 16, 1977, Ser. No. 778,159
Claims priority, application Japan, Mar. 16, 1976, 51-28253
Int. Cl.[2] G04B *19/24, 27/00;* **G04C** *21/32*
U.S. Cl. 58—5 **14 Claims**



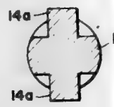
1. An electronic timepiece comprising:
(a) a reference signal source;
(b) an electronic counter connected to said reference signal source and having first and second outputs;
(c) a changeover means having a first input connected to the first output of said electric counter and a second input and an output;
(d) a calendar feed and time correction signal synthesizer connected between the second output of said electrical counter and the second input of said changeover means;
(e) an electro-mechanical transducer connected to the output of said changeover means;
(f) mechanical display driving means connected to said electro-mechanical transducer and having first, second and third outputs;
(g) a fixed time detector connected between said changeover means and the third output of said mechanical display driving means to form a feedback loop;
(h) a time display means connected to the first output of said mechanical display driving means; and
(i) a calendar display means connected to the second output of said mechanical display driving means.

4,175,373

DIGITAL CLOCK

Kazuo Miyamoto, Showa; Isao Suzuki, Tochigi, and Hideo Koide, Urawa, all of Japan, assignors to Rhythm Watch Company Limited, Tokyo, Japan

Filed Dec. 30, 1977, Ser. No. 865,937
Claims priority, application Japan, Aug. 16, 1977, 52/98503
Int. Cl.[2] G04B *23/00;* **G04C** *21/16;* **G04B** *19/02*
U.S. Cl. 58—16 D **10 Claims**



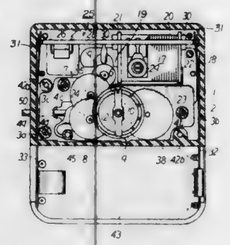
1. A digital display clock comprising:
a driving section including a means for generating time signals which produce rotating driving power;
an indicating display including a one-minute indicating wheel, a ten-minute indicating wheel, and an hour indicating wheel which receive rotation driving power from said driving section and which are mounted on an indicating wheel shaft to be driven intermittently, said one-minute indicating wheel, said ten-minute indicating wheel and said hour indicating wheel being mounted on an indicating wheel shaft;
a (frist) first Geneva-gear mechanism which transmits the rotation driving power through said driving section for an intermittent driving power at intervals of one minute to said indicating wheel shaft, and, one-minute indicating wheel rotating with said indicating wheel shaft;
a driving shaft (separately secured from) laterally mounted with respect to said indicating wheel shaft, a single gear on said driving shaft, (and simultaneously rotated with) said ten-minute indicating wheel being freely rotatable on said indicating wheel shaft and being engaged by said gear for rotation;
a second Geneva-gear mechanism (which transmits the intermittent rotation of) connected to said one-minute indicating wheel and to said driving shaft (and) to transmit intermittent motion to said ten-minute indicating wheel through said gear as an intermittent driving power at intervals of ten minutes; and
a third Geneva-gear mechanism (which transmits the intermittent rotation of) connected between said driving shaft (to) and said hour indicating wheel for an intermittent driving power to said hour indicating wheel at intervals of one hour, each of said Geneva-gear mechanisms being positioned at the ends of said driving shaft and only said single gear being positioned intermediate the ends of said indicating display so that said indicating display is substantially uninterrupted by lateral spacing.

4,175,374

TIMEPIECE

Keiichi Yoshizawa, Tokyo, Japan, assignor to Kabushiki Kaisha Seikosha, Japan

Filed Jul. 22, 1977, Ser. No. 818,324
Claims priority, application Japan, Jul. 23, 1976, 51-87873
Int. Cl.[2] G04B *13/02;* **G04C** *3/00*
U.S. Cl. 58—23 R **8 Claims**



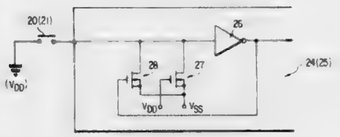
1. A timepiece comprising:
an upper case;
a middle plate connected to said upper case with a predetermined space therebetween;
a lower case removably connected with said upper case and spaced from said middle plate;
hands for indicating time;
a movement comprising a motor block and a circuit block for actuating said hands, secured to and supported by said upper case and said middle plate;
and means comprising a gear train for transmitting rotation from said motor block to said hands, said gear train being supported between said upper case and said middle plate independently of said lower case;
whereby said movement is operable with said lower case removed.

4,175,375

ELECTRONIC WATCH HAVING IMPROVED LEVEL SETTING CIRCUIT

Tsuneo Takase, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kanagawa, Japan

Filed Oct. 26, 1977, Ser. No. 845,549
Claims priority, application Japan, Dec. 15, 1976, 51/150456
Int. Cl.[2] G04B *19/24;* **G04C** *3/00;* **G04B** *19/30, 27/00*
U.S. Cl. 58—23 R **4 Claims**



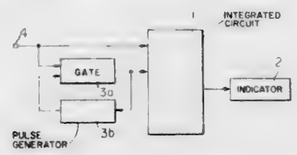
1. An electronic watch comprising:
(a) a switch input means,
(b) level setting means connected to the switch input means and consisting of a switching element with an input electrode, and resistive means, respectively connected between the switch input means and a power source, and an inverter circuit whose input portion is connected to the switch input means and whose output portion is connected to the input electrode of the switching element,
(c) a control circuit connected to the level setting means,
(d) a time computer connected to the control circuit for producing a standard clock pulse, and
(e) display means connected to receive the output of the time computer for displaying time, said display means being connected to the control circuit, wherein the switching element is arranged closer to the switch input means than the resistive means.

4,175,376

DEVICE FOR CORRECTING TIME INDICATION AND THE LIKE IN AN ELECTRONIC CLOCK

Sukehiro Hasebe, and Masanao Oyamada, both of Tokyo, Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Sep. 2, 1977, Ser. No. 830,144
Claims priority, application Japan, Sep. 10, 1976, 51-108635
Int. Cl.[2] G04C *3/00;* **G04B** *27/08*
U.S. Cl. 58—23 R **7 Claims**



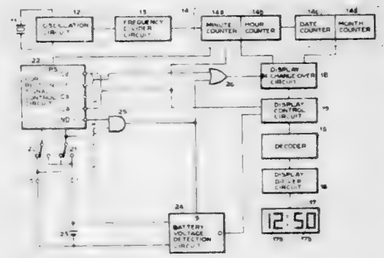
1. Device for correcting time indication in an electronic clock having a clock circuit in which reference clock pulses are frequency divided so as to be applied to a time indicating device for stepwise switching the time indication therein one by one unit of time for indicating the time, and the time indication is corrected stepwise one by one unit of time in timed relationship to said reference clock pulses by applying time correction pulses to said clock circuit until the correction of time is achieved, wherein the improvement comprises a gate circuit for opening and closing the application of said reference clock pulses to said clock circuit and a control circuit for applying pulses of variable frequency to said gate circuit so as to control the same to be opened and closed, said reference clock pulses being applied through said gate circuit to said clock circuit during the time said gate circuit is opened thereby permitting the speed of stepwise correction of time to be adjusted arbitrarily in timed relationship to said reference clock pulses.

4,175,377

TIMEPIECE WITH DISPLAY DEVICE FOR WARNING BATTERY LIFE

Singo Ichikawa, Sayama, Japan, assignor to Citizen Watch Co. Ltd., Tokyo, Japan

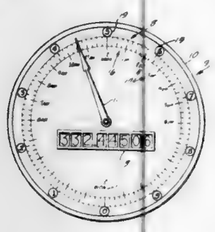
Filed Nov. 4, 1977, Ser. No. 848,666
Claims priority, application Japan, Nov. 5, 1976, 51-132988
Int. Cl.[2] G04C *17/00*
U.S. Cl. 58—23 BA **8 Claims**



1. In a timepiece provided with a display device for warning a battery life, comprising:
(a) time reference signal generation means for generating a time reference signal;
(b) time counting unit signal preparing means for preparing a time counting unit signal from the time reference signal delivered from said time reference signal generation means;
(c) time counter means for counting the time counting unit delivered from said time counting unit signal preparing means;
(d) display driving means for receiving a signal delivered from said counter means and delivering a display driving signal;
(e) liquid crystal display means for effecting a digital display of the display driving signal delivered from said display driving means; and
(f) an electric supply source battery for supplying energy to said respective means,
the improvement comprising:
(g) a display change-over control means connected between said time counter means and said display driving means and changing over for controlling the display;
(h) exteriorly operable switch means for controlling functions of the electronic timepiece;
(i) a battery voltage detection means provided with a sampling terminal and an output terminal and detecting a voltage level of said electric supply source battery by means of a sampling pulse supplied to said sampling terminal and generating a warning signal at said output terminal when said voltage level of said electric supply source battery becomes lower than a preset value;
(j) correction signal control means for selecting either an ordinary display mode or a display correcting mode under the control of said exteriorly operable switch means; and
(k) gate means for inhibiting the operation of said battery voltage detection circuit when said correction signal control circuit is in the display correcting mode.

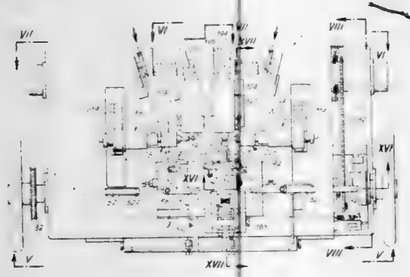
V 9884 / 4 NO 027 79 UMI

4,175,378
DECIMAL TIMEKEEPING INSTRUMENT
Vernon E. Shelton, 775 Battery St., Manhattan Beach, Calif. 90731
Continuation-in-part of Ser. No. 443,728, Feb. 19, 1974, abandoned. This application Aug. 12, 1975, Ser. No. 603,795
Int. Cl.² G01D 9/00; G04B 19/24
U.S. Cl. 346—20 **2 Claims**



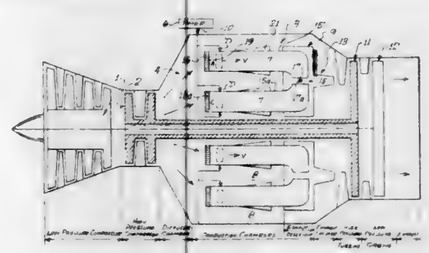
1. A timekeeping instrument for dividing the day into decimal divisions comprising:
a face plate bearing a plurality of indicia which function to divide said face plate into decimal divisions;
a hand mounted for movement relative to said face plate;
means for driving said hand one complete revolution in one day;
a display means mounted on said face plate for digitally displaying thereon the time of day in decimal divisions;
means for receiving card means; and
means for transferring to said card means a record of the display on said display means when said card means is received.

4,175,379
MACHINE FOR MAKING DECORATIVE CHAINS HAVING LINKS OF AT LEAST TWO DIFFERENT SHAPES OR SIZES
Ezio Tega, 2, Via Carpaccio, Arezzo, Italy (I-52100)
Filed Feb. 13, 1978, Ser. No. 877,559
Claims priority, application Italy, Feb. 11, 1977, 9335 A/77; Jul. 29, 1977, 9529 A/77; Jul. 29, 1977, 9530 A/77
Int. Cl.² B21L 11/00
U.S. Cl. 59—16 **17 Claims**



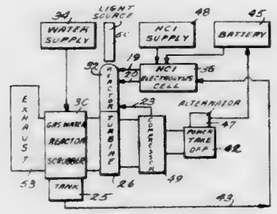
1. In a machine for forming decorative chains having links of two shapes and/or sizes, obtainable according to a modifiable program, involving two feeder units for feeding independent supplies of wire-like material, and a pliers unit adapted to cooperate alternatively with one or the other of said feeder units, the improvement in which each feeder unit includes its own associated counter-pliers system and in which a pliers unit is reciprocably movable between two spaced positions of independent cooperation with one or the other of the respective counter-pliers systems, double-acting actuating means for imparting to said pliers unit a reciprocable displacement into a selected one or the other of said positions, a main camshaft and means for continuously driving the same, first selectively operable means for operatively connecting said camshaft to said actuating means to displace said pliers unit to one of said positions, second selectively operable means for operatively connecting said camshaft to said actuating means to displace said pliers unit to the other of said positions, each counter-pliers system including its own camshaft for counter-pliers actuation, a separate drive connection from said main camshaft to each of said counter-pliers camshafts, each said drive connection including an independently actuable clutch, means responsive to plier-unit displacement to one of said positions for actuating the clutch associated with the cooperating counter-pliers for said one position, and means responsive to pliers-unit displacement to the other of said positions for actuating the clutch associated with the cooperating counter-pliers for said other position.

4,175,380
LOW NOISE GAS TURBINE
Orestes M. Baycura, 2238 Central Park Dr., Campbell, Calif. 95008
Filed Mar. 24, 1978, Ser. No. 889,704
Int. Cl.² F02C 5/00
U.S. Cl. 60—39.06 **10 Claims**



1. A method for effectively cancelling pressure pulse noise from the exhaust of a turbine-driven jet engine of a type having an elongate gas combustion chamber in the opposite ends of which fuel alternately and repetitively is ignited for generating combustion gas pressure pulses in the form of a sinusoidally-pulsating standing wave having pressure anti-nodes and velocity nodes at its ends, comprising:
setting the frequency of said alternating ignitions in accordance with the chamber length to provide a standing wave having an even multiple of quarter wave lengths with a pressure node and velocity anti-node at its midway point,
discharging said combustion gases into a storage reservoir at said midway point,
storing said discharged gases in said reservoir, and
delivering said stored gases to said turbine to produce its drive,
said discharge of said gases at said midway pressure node point effectively cancelling the high pressure of combustion from said stored gases so as to effectively cancel pressure pulse noise from said jet engine exhaust, and said storage of high velocity gases derived from said velocity anti-node discharge smoothing the pulsating characteristics of said gases sufficiently to permit delivery to said turbine at a relatively fixed velocity rate.

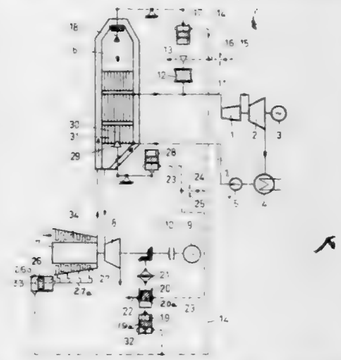
4,175,381
ELECTROMAGNETIC REACTOR ENGINE SYSTEM-APPARATUS AND METHOD
Robert L. Scragg, and Alfred B. Parker, both of Miami, Fla., assignors to Solar Reactor Corporation, Miami, Fla.
Continuation-in-part of Ser. No. 692,495, Jun. 3, 1976, Pat. No. 4,070,861, which is a continuation-in-part of Ser. No. 657,383, Feb. 10, 1976, Pat. No. 4,026,112, which is a continuation-in-part of Ser. No. 588,888, Jun. 20, 1975, Pat. No. 4,024,715, which is a continuation-in-part of Ser. No. 564,087, Apr. 1, 1975, Pat. No. 3,998,205. This application Dec. 6, 1977, Ser. No. 857,895
Int. Cl.² F02B 43/00
U.S. Cl. 60—39.12 **20 Claims**



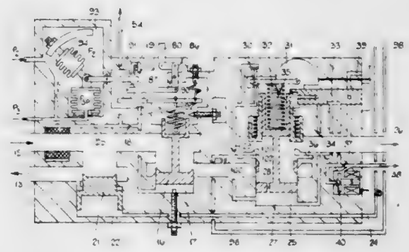
1. An electromagnetic engine system comprising:
an electromagnetic reactor;
a hydrochloric acid electrolysis cell;
means for generating chlorine and hydrogen in said hydrochloric acid cell;
means for controllably coupling said chlorine and hydrogen to said reactor;
means for controllably coupling oxygen to said reactor;
means for directing electromagnetic radiation into said reactor to thereby exothermically react said hydrogen and chlorine in the presence of said oxygen to generate hydrogen chloride at a high pressure and temperature level;
a turbine attached to said reactor to enable said generated hydrogen chloride to drive the rotor of said turbine;
a gas-water reactor scrubber attached to said turbine to receive the spent hydrogen chloride from said turbine;
means for converting said spent hydrogen chloride to hydrochloric acid; and
means for conveying said hydrochloric acid to said hydrochloric acid cell.

4,175,382
STEAM POWER PLANT WITH PRESSURE-FIRED BOILER
Hans Pfenninger, Baden, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland
Continuation of Ser. No. 704,040, Jul. 9, 1976, abandoned. This application Feb. 24, 1978, Ser. No. 880,992
Claims priority, application Switzerland, Aug. 22, 1975, 10896/75
Int. Cl.² F02C 9/04, 9/14
U.S. Cl. 60—39.18 B **4 Claims**

1. Apparatus for regulating a steam power plant of the type including a pressure-fired boiler supplying steam to a turbine group, a charging group for the boiler operating at high pressure ratios, said charging group including an axial flow compressor having adjustable blading and which is driven by a gas turbine for supplying combustion air to the boiler and a speed governor, said gas turbine being driven by combustion gas discharged from the boiler such that the heat content thereof is substantially completely consumed in the turbine and the power delivered by it to the compressor, and a governor in the live steam feed line from the boiler to the steam turbine group, said regulating apparatus comprising first means responsive to a variable control signal produced by said live-steam governor in accordance with a variation in plant load for regulating fuel flow to said boiler, second means responsive to said control signal for regulating the heat content of the combustion gas flowing to said gas turbine and for regulating said speed governor, third means responsive to said control signal for adjusting the compressor blading, and means effecting a sequentially functional relationship between said second and third means such that in the case of a decrease in plant load and a resultant increase in live steam pressure, first the speed of said charging group is decreased to and held at a predetermined value by a reduction in the heat content of the combustion gas flowing to said gas turbine followed by an adjustment of the compressor blading in a direction to reduce its air throughput with the speed of said charging group being held constant at said decreased predetermined value, whereas in the case of an increase in plant load and a resultant decrease in live-steam pressure, first said compressor blading is adjusted in a direction to increase its air throughput followed by an increase in the heat content of the combustion gas flowing to said gas turbine and hence an increase in speed of said charging group.



4,175,383
GAS TURBINE ENGINE FUEL CONTROL SYSTEM
Trevor S. Smith, Sutton Coldfield, England, assignor to Lucas Industries Limited, Birmingham, England
Filed Nov. 17, 1977, Ser. No. 852,313
Claims priority, application United Kingdom, Jan. 7, 1977, 655/77
Int. Cl.² F02C 9/04
U.S. Cl. 60—39.28 R **7 Claims**



1. A fuel control system for a gas turbine engine, comprising a variable metering device, a throttle valve, a flow passage connecting said metering device and said throttle valve in a series arrangement between an inlet zone and an outlet zone, means for varying the fuel pressure at said inlet zone, said pressure varying means being responsive to a difference between the fuel pressure at one of said zones and to a further fuel

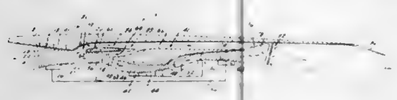
pressure, and selector valve means, operable by said throttle valve, for deriving said further pressure from that in said connecting flow passage when said throttle valve is fully open, and from the pressure at the other of said zones in all other states of said throttle valve, whereby said pressure varying means is responsive to the pressure difference across said metering device when the throttle valve is fully opened and to the pressure difference across said series arrangement in all other states of said throttle valve.

4,175,384

INDIVIDUAL BYPASS INJECTOR VALVES FOR A DOUBLE BYPASS VARIABLE CYCLE TURBOFAN ENGINE

Conrad D. Wagenknecht, and Guy K. Faust, both of West Chester, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Aug. 2, 1977, Ser. No. 821,119
Int. Cl.[2] F02K 3/04
U.S. Cl. 60—226 B **8 Claims**



5. An improved gas turbofan engine of the type having a core engine, a front fan section for pressurizing a flow of air, an outer bypass duct for bypassing a stream of pressurized air around the core engine, an aft fan section for further pressurizing the air discharged from the front fan section and an inner bypass duct for bypassing an airstream from the aft fan section into the outer bypass duct and around the core engine, wherein the improvement comprises:

a common bypass duct for receiving confluent streams from the inner and outer bypass ducts and bypassing the confluent flow around the core engine; and

a variable area bypass injector for selectively modulating and separating the airstreams through the inner and outer bypass ducts including static pressure valve means for varying the area through which the inner bypass duct airstream is injected into the common bypass duct at the point of confluence of the inner and outer bypass ducts, and a bypass selector valve associated with the outer bypass duct and which is operable between two positions, one at which flow through the outer bypass duct is prohibited and another at which flow through the outer bypass duct is permitted.

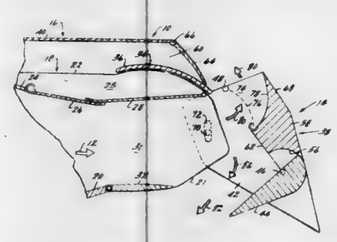
4,175,385

THRUST REVERSER FOR AN ASYMMETRIC AIRCRAFT EXHAUST NOZZLE

Dudley O. Nash, Forest Park, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 12, 1977, Ser. No. 859,515
Int. Cl.[2] F02K 1/20, 1/24
U.S. Cl. 60—230 **10 Claims**

1. A thrust reverser for use with an asymmetric exhaust nozzle having an exhaust casing partially defining to its interior an exhaust stream flow path, said reverser comprising a flap located downstream of the casing and having a leading edge and a trailing edge, a first flap pivot, means for rotating said flap about said first pivot such that the flap leading edge describes an arc intercepting the exhaust stream so that the flap leading edge is immersed in the exhaust stream and separated from the casing by a gap, a second flap pivot located along the arc at a point fixed in relation to said exhaust casing, means for rotating said flap about the leading edge at said second pivot, means associated with the flap leading edge for turing a portion of the exhaust stream upward through an angle greater than ninety degrees and through the rest when said flap is rotated about said first pivot, and means associated with the flap trailing edge for deflecting the remainder of the exhaust



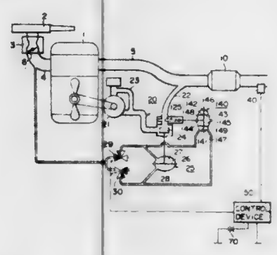
stream downward through an angle greater than ninety degrees when said flap is rotated about said first pivot.

4,175,386

EXHAUST GAS PURIFICATION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Eturou Katahira; Shunzo Yamaguchi, both of Okazaki; Masashi Kida, Nishio, and Yasuhiko Ishida, Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Feb. 25, 1977, Ser. No. 772,277
Claims priority, application Japan, Mar. 8, 1976, 51-24907; Apr. 13, 1976, 51-42146; Apr. 14, 1976, 51-42695
Int. Cl.[2] F01N 3/10
U.S. Cl. 60—276 **7 Claims**



1. An exhaust gas purification apparatus for an internal combustion engine comprising:

exhaust gas reactor means disposed at an intermediate portion of an exhaust pipe of an engine, for purifying exhaust gases in said exhaust pipe;

secondary air supply means having an air supply path for supplying secondary air to the exhaust gases, one end of said air supply path being opened in said exhaust pipe on the upstream side of said reactor means;

air-fuel ratio sensor means mounted in said exhaust pipe on the downstream side of said one end of said air supply path for sensing the air-fuel ratio of the exhaust gases to produce an output signal;

a control device electrically connected to said air-fuel ratio sensor means, for producing an actuation signal in accordance with the output signal of said air-fuel ratio sensor; and

a first air flow control valve disposed in said air supply path for fully opening said air supply path in one condition and fully closing the same in the other condition in accordance with said actuation signal to produce pulsating air flow so that said exhaust gases in said exhaust pipe are supplied with said secondary air intermittently at a position upstream of said reactor means;

a second air flow control valve disposed in said air supply path in series with said first air flow control valve to variably control the passage area thereof; and

an actuating means coupled to said second air flow control valve to actuate the same, said actuating means actuating said second control valve in accordance with the movement of said first control valve, the passage area of said air supply path being increased when the duration of opening of said first control valve is increased, and the passage area of said air supply path being decreased when the duration of closing of said first control valve is increased.

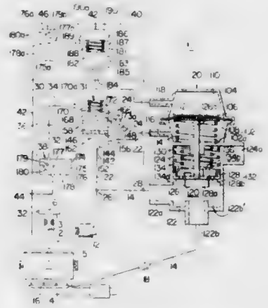
whereby the air-fuel ratio of the exhaust gases to be entered into said reactor means is maintained substantially constant.

4,175,387

SECONDARY AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Motohisa Miura, Toyota, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 24, 1978, Ser. No. 871,933
Claims priority, application Japan, Jan. 26, 1977, 52/7985
Int. Cl.[2] F01N 3/10
U.S. Cl. 60—290 **2 Claims**



1. A secondary air supply system for an internal combustion engine, comprising:

an air pump adapted to be driven by an engine;

a secondary air supply line extending between said air pump and the engine exhaust system;

valve means in said secondary air supply line for controlling the secondary air supply from said air pump into said engine exhaust system;

a valve actuator operatively associated with said valve means and comprising first and second air pressure chambers, a diaphragm between said air pressure chambers, a first spring member disposed in said first air pressure chamber to yieldably act on said diaphragm and restricted passage means intercommunicating said first and second air pressure chambers;

a first control pressure line through which the air pressure produced by said air pump is supplied into said first air pressure chamber;

first controlling means in said first control pressure line for controlling the air pressure supply to said first air pressure chamber;

a second control pressure line through which the air pressure produced by said air pump is supplied into said second air pressure chamber; and

second controlling means in said second control pressure line for controlling the air pressure supply to said second air pressure chamber;

said valve means including a valve housing defining therein a space provided with air inlet and outlet ports connected to said air pump and said engine exhaust system, respectively, and an air release port;

said valve means further including a valve seat member disposed in said space between said air inlet and release ports for movement, the outer periphery of said valve seat member being in sealing and slidable engagement with the inner peripheral surface of said space, said valve seat member defining a main air release opening and at least one auxiliary air release opening all adapted to be communicated with said air release port;

said valve means further including a first valve member disposed in said space between said air outlet port and said main air release opening in said valve seat member and operatively connected to said diaphragm for movement thereby to control the communication between said air inlet and outlet ports and between said air inlet port and said main air release opening in said valve seat member, a stop means for limiting the movement of said valve seat member toward said first valve member, a second spring member yieldably urging said valve seat member against said stop means, a second valve member disposed in said space between said valve seat member and said air release port to control the communication between said auxiliary air release opening in said valve seat member and said air release port, and a third spring member yieldably urging said second valve member against said valve seat member to cause said second valve member to interrupt the communication between said auxiliary air release opening and said air release port;

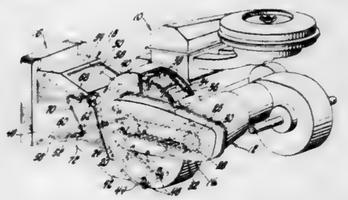
said first controlling means being operative to supply the air pressure into said first air pressure chamber at least at the initial stage of an engine acceleration operation while said second controlling means is operative to interrupt the supply of the air pressure into said second air pressure chamber at least at the initial stage of the engine acceleration operation whereby said valve actuator moves said first valve member together with said valve seat member and said second valve member away from said air outlet port against said second and third spring members.

4,175,388

RADIATOR COOLING SYSTEM

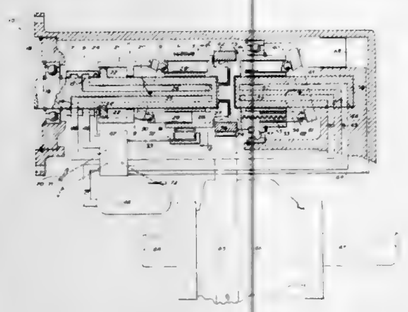
Herman C. Milbreath, Washington, and Alverson B. Williams, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 17, 1978, Ser. No. 887,489
Int. Cl.[2] F16D 33/00
U.S. Cl. 60—337 **6 Claims**



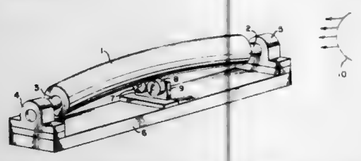
1. A cooling system for use with an engine and a transmission having a casing operatively connected therebetween, said casing having a torque converter housing rotatably mounted therein so as to be rotated by said engine, and a radiator including a coolant, said cooling system comprising a plurality of circumferentially spaced cooling fan blades formed on the outer surface of said torque converter housing for rotation therewith, first and second opening means formed in a wall of said casing, and a shroud secured at one end thereof to said casing around one of said first and second opening means and operatively mounted at the other end thereof adjacent a face of said radiator for communicating air between said radiator and said cooling fan blades.

4,175,389
HYDROMECHANICAL TRANSMISSION
Samuel Shiber, P.O. Box 110, Vernon Hills, Ill. 60061
Filed Feb. 6, 1978, Ser. No. 875,731
Int. Cl.[2] F15B 1/02, 39/46
U.S. Cl. 60—414 9 Claims



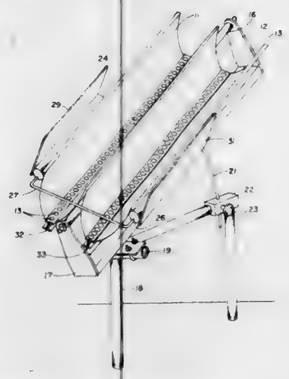
1. A hydrostatic transmission adapted for a plurality of operational modes, comprising in combinations:
- a first pump having a first section serving as a mechanical input member of said transmission, a second section, and inlet port and an outlet port,
- a second variable displacement pump (motor) having a first portion, serving as a mechanical output member of said transmission, coupled to said second section by clutch means, a second anchored portion, a suction port and a discharge port,
- an accumulator for storing fluid under pressure, and
- control means connected to said ports and said accumulator via conduits.

4,175,390
SOLID STRESS MOTOR
George Koslow, 28 Warren St., New York, N.Y. 10007
Continuation-in-part of Ser. No. 536,842, Dec. 27, 1974, abandoned. This application Apr. 6, 1978, Ser. No. 893,994
Int. Cl.[2] F03G 7/06
U.S. Cl. 60—527 14 Claims



1. A solid stress motor comprising at least one rotor having a central portion of circular cross sectional shape, means for supporting said rotor for free rotation about an axis, and deflecting means engaging a circular central portion of said rotor for elastically deflecting said central portion of said rotor laterally of said axis and thereby rendering a portion of said rotor stress-responsive, whereby rotation of said rotor is induced by application of stress-change producing media to said stress-responsive portion of said rotor.

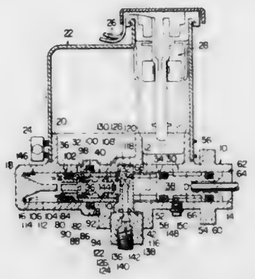
4,175,391
SELF REORIENTING SOLAR TRACKER
Stephen Baer, Corrales, N. Mex., assignor to Dow Corning Corporation, Midland, Mich.
Filed Dec. 12, 1977, Ser. No. 859,624
Int. Cl.[2] F03G 7/02, 7/06
U.S. Cl. 60—531 4 Claims



1. In a solar tracking device comprising a pair of closed containers interconnected in fluid communication and mounted on opposite sides of a pivot axis and containing liquid having a low boiling point, said containers having sun shielding means positioned relative thereto to provide unequal solar radiation on the containers whenever the device is not aimed at the sun thereby causing greater vaporization of said liquid in one container which in turn causes transfer of liquid from that container to the other and rotation of the containers about the pivot until equal radiation is received by both containers, and means for maintaining center of gravity below the pivot axis to control motion around said pivot axis, the improvement which comprises:
- differential cooling means for providing greater rate of heat dissipation from one container than that of the other, whereby the container with high heat dissipation can be placed in the easterly position and therefore will cool faster after sunset thereby causing transfer of liquid from the westerly container and automatic reorientation of the containers in preparation for sunrise.

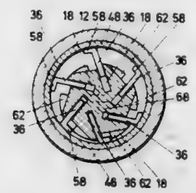
4,175,392
TANDEM MASTER CYLINDER ASSEMBLY
Yoshiro Morimoto, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Japan
Filed Apr. 6, 1977, Ser. No. 785,031
Claims priority, application Japan, Apr. 16, 1976, 51-43942
Int. Cl.[2] B60T 11/06, 11/20
U.S. Cl. 60—561 16 Claims

1. A tandem master cylinder assembly for use in split front and rear brake systems of an automotive vehicle, comprising a fluid reservoir for storing therein fluid for the brake systems; a cylinder body formed with an elongated cylinder bore and primary and secondary ports spaced apart from each other axially of the cylinder body for providing communication between said fluid reservoir and the cylinder bore; primary and secondary pistons interlocked with each other by axial and circumferential mating engagement therebetween and axially movable as a single unit within said cylinder bore, each of the primary and secondary pistons having a hollow axial end portion and being formed with a pair of axial slots open at the leading end of said end portion and diametrically opposite to each other across the center axis of each of the pistons, each of the slots in one of the pistons being contiguous to each of the slots in the other of the pistons so that the pistons jointly form a pair of elongated slots each having closed opposite axial ends, the secondary piston being further formed with axial bore portions having different cross sectional areas; a floating piston axially movable within said bore portions, the primary, secondary and floating pistons jointly forming in said cylinder bore primary and secondary variable-volume pressure chambers communicable with said fluid reservoir through said primary and secondary ports, respectively, one of the pressure chambers being in communication with one of said front and rear brake systems and the other pressure chamber being in communication with the other brake system; sealing elements movable



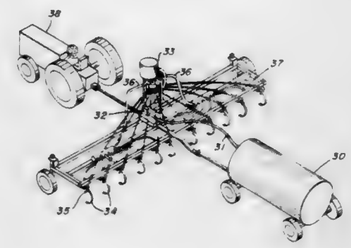
with said primary and secondary pistons between respective positions isolating said primary and secondary variable-volume pressure chambers from said primary and secondary ports, respectively, and respective positions allowing the primary and secondary variable-volume pressure chambers to communicate with the primary and secondary ports, respectively; and a cross member which is fixedly connected to said cylinder body and which has a portion diametrically extending through said cylinder bore, the cross member being passed through said elongated slots jointly formed by said primary and secondary pistons for limiting the axial movement, in the opposite directions, of said floating piston relative to said cylinder body.

4,175,393
ROTARY VANE DRIVE WITH ROTATING CYLINDER
Engelbert Frank, Bahnhofstrasse 26/28, 6461 Hasselroth 1, Fed. Rep. of Germany
Filed Jan. 27, 1978, Ser. No. 872,936
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1977, 2704151
Int. Cl.[2] F01K 25/00; F01C 1/00, 13/02
U.S. Cl. 60—671 8 Claims



1. A drive apparatus utilizing a fluid pressure driven rotor; said apparatus comprising a casing having first and second end walls, a hollow cylindrical chamber defined within said casing between said end walls, a hollow cylindrical box rotatably positioned within said chamber, a cylindrical rotor of smaller diameter than said box and positioned eccentrically within said box, said cylindrical box being coaxial with said chamber and closely conforming thereto, said box having an open end adjacent the second end wall of the casing for communication of the fluid inlet and fluid outlet means with the interior thereof, a projecting shaft fixed axially to said rotor, said shaft being rotatably mounted in said first end wall and mounting said rotor for rotation within said chamber and said box, said rotor having a plurality of generally radial guide slots defined longitudinally therein and at spaced points thereabout, a segment slidably positioned in each slot for a selective generally radial extension and retraction of each segment relative to the eccentrically positioned rotor upon a rotation thereof, said segments, upon extension thereof from the respective slots, engaging the inner surface of said box for selective rotation of the box with the rotor, the segments each including opposed generally flat side faces and an enlarged portion at their outer ends having an outer surface conforming to the inner surface of the hollow cylindrical box, the eccentric positioning of the rotor placing the rotor near to one side of the chamber and defining a crescent-shaped working space about the rotor in the remainder of the chamber, said crescent-shaped working space having opposed ends, fluid inlet means through the second end wall communicating with the crescent-shaped working space toward one end thereof for the introduction of a pressurized fluid, said fluid inlet means having a nozzle configuration and being oriented to direct introduced fluid against the same side face of each of the segments serially to effect a rotation of the rotor in one direction, and fluid outlet means through the second end wall communicating with the crescent-shaped working space toward the second end thereof.

4,175,394
PROCESS AND APPARATUS FOR PRODUCING AND USING COLD AMMONIA
Robert A. Wiesboeck, Stone Mountain, Ga., assignor to United States Steel Corporation, Pittsburgh, Pa.
Filed Jun. 1, 1978, Ser. No. 911,648
Int. Cl.[2] F17C 7/02
U.S. Cl. 62—51 42 Claims



1. A method for carrying out the substantially adiabatic expansion of a pressurized stream of ambient-temperature liquid ammonia to produce a stream of cold liquid ammonia at a reduced pressure and a stream of cold gaseous ammonia at a reduced pressure, which comprises (1) introducing at a velocity of at least about 5000 feet per minute an inlet stream of partially decompressed liquid ammonia tangentially into an expansion chamber, the expansion chamber comprising a substantially vertically elongated barrier means located (a) substantially in the center of the horizontal planes of the expansion chamber and (b) in the path of the expansion cone of the inlet stream, which barrier means assists in imparting a spinning motion to the inlet stream and allows some liquid ammonia to flow down the barrier means and thereby improves the separation of the liquid and gaseous ammonia, (2) imparting a high velocity spinning motion to the liquid ammonia entering the chamber such that rapid flow is produced around the interior of the chamber to thereby provide rapid separation of the liquid and gaseous ammonia in the chamber, and wherein the expansion chamber is provided with an outlet useful for the removal of gaseous ammonia therefrom which outlet is located

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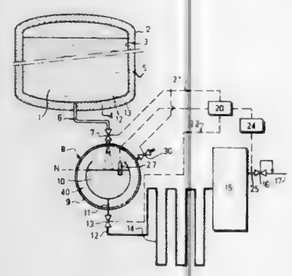
above the paths of liquid flow to minimize the amount of liquid droplets being carried through the gaseous ammonia outlet and another outlet useful for the removal of cold liquid ammonia therefrom, the outlets being provided at opposite ends of the expansion chamber, (3) directing the flow of the cold reduced pressure liquid ammonia within the expansion chamber to the outlet useful for the withdrawal of cold reduced pressure liquid ammonia from the expansion chamber to effect separation between cold liquid ammonia and cold gaseous ammonia within the expansion chamber, and (4) withdrawing through the outlet useful for the removal of gaseous ammonia a stream of cold gaseous ammonia at reduced pressure and a stream of cold liquid ammonia at reduced pressure via the other outlet.

4,175,395

DISTRIBUTION OF GAS UNDER PRESSURE

Roger Prost, Saint Egreve, and Bernard Manhes, Versailles, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Dec. 20, 1977, Ser. No. 862,513
Claims priority, application France, Dec. 23, 1976, 76 38827
Int. Cl.[2] F17C 7/02
U.S. Cl. 62—52 **8 Claims**



1. In apparatus for distributing gases under pressure, of the kind which comprises a storage tank for liquified gas, a distribution circuit under pressure which incorporates a heater and a pressure regulator and reducer, in which the said storage tank is designed for a pressure appreciably lower than the distribution pressure, and in which a confined enclosure of small capacity designed for a pressure at least equal to the distribution pressure is connected by ducts containing valves on the one hand to the said storage tank and on the other hand to the said heater in the distribution circuit, the improvement in which the enclosure of small capacity incorporates an inner receptacle to receive liquid from the storage tank, which is spatially separated from the conductive wall which is not insulated from the exterior of the said enclosure, the connection to the distribution circuit being made by a single duct which opens into the said inner receptacle at a low point.

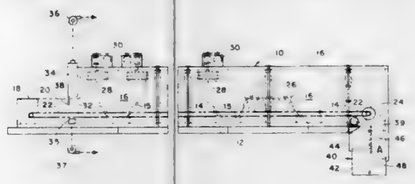
4,175,396

CRYOGENIC EMBRITTLEMENT FREEZER WITH GAS LOCK

Keith A. Miller, Allentown, and Eric C. Osmundson, Bethlehem, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 19, 1978, Ser. No. 907,428
Int. Cl.[2] F25D 13/06
U.S. Cl. 62—63 **9 Claims**

1. A method of operating a cryogenic, tunnel-type freezer having a product inlet and a product outlet comprising:
(a) conveying product to be embrittled from said inlet to said outlet,
(b) contacting product with a cryogenic liquid refrigerant in a contact zone to generate cold refrigerant gas within said tunnel,
(c) generating said gas at a rate sufficient to create a slightly superatmospheric pressure in said contact zone,
(d) mechanically sealing said product outlet with a gas lock to force said refrigerant gas to flow from said contact zone to said product inlet, wherein said step of mechanically sealing comprises alternately pivoting a pair of closure members between open and closed positions during normal operation of said freezer, and simultaneously pivoting both of said closure members to their open and closed positions for de-jamming said gas lock,
(e) circulating said refrigerant gas in contact with said product between said contact zone and said product inlet,
(f) creating a localized low pressure zone adjacent said product inlet, and
(g) withdrawing refrigerant gas through only said product inlet as a negative gas curtain.

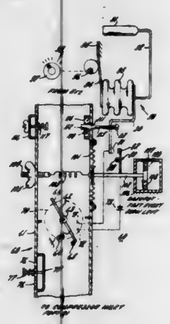


4,175,397

CLOSED LOOP AIR CONDITIONING SYSTEM INCLUDING PRESSURIZATION BY BLOCKAGE AND ASPIRATION

Thomas C. Edwards, Cocoa Beach, and Amir L. Ecker, Cocoa, both of Fla., assignors to The Rovac Corporation, Rockledge, Fla.

Division of Ser. No. 769,958, Feb. 18, 1977, abandoned. This application Oct. 5, 1978, Ser. No. 948,973
Int. Cl.[2] F25B 23/00; F25D 9/00
U.S. Cl. 62—149 **23 Claims**



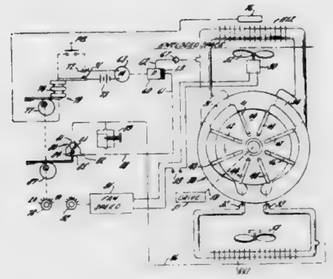
1. In an air conditioning system for an enclosed spaced, the combination comprising a compressor having an inlet port and an outlet port, an expander having an inlet port and an outlet port, the compressor and expander having rotor means including vanes for positive compression and expansion as the rotor means is driven, a primary heat exchanger connected between the compressor outlet port and the expander inlet port, a secondary heat exchanger connected between the expander outlet port and the compressor inlet port to complete a closed loop having a charge of air, one of the heat exchangers being thermally coupled to the enclosed space, a blocking valve associated with the secondary heat exchanger and in the path of the air stream in the loop, an injector valve adjacent the compressor inlet port and capable of communication with the ambient atmosphere, means for momentarily closing the blocking valve thereby to create a relative vacuum at the compressor inlet port, and means for coincidentally opening the injector valve so that additional air is aspirated to join that which is already in the closed loop thereby to raise the pressure in the secondary heat exchanger substantially above atmospheric pressure to increase the heat rate of the system.

4,175,398

CONTROL SYSTEM FOR AIR CONDITIONER

Thomas C. Edwards, Cocoa Beach, and Amir L. Ecker, Cocoa, both of Fla., assignors to The Rovac Corporation, Rockledge, Fla.

Continuation-in-part of Ser. No. 769,958, Feb. 18, 1977. This application Dec. 8, 1977, Ser. No. 858,241
Int. Cl.[2] F25B 45/00
U.S. Cl. 62—172 **19 Claims**



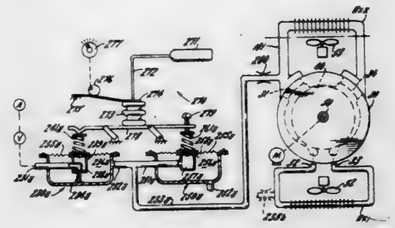
1. In an air conditioning system for an enclosed space, the combination comprising a compressor having an inlet port and an outlet port, an expander having an inlet port and an outlet port, the compressor and expander having rotor means including vanes coupled together for positive compression and expansion as the rotor means is driven, a primary heat exchanger connected between the compressor outlet port and the expander inlet port, a secondary heat exchanger connected between the expander outlet port and the compressor inlet port to complete a closed loop having a charge of single phase gaseous refrigerant, the refrigerant being constantly in the gaseous state throughout the loop, one of the heat exchangers being thermally coupled to the enclosed space, a source of single phase gaseous refrigerant, heat rate control means for changing intermittently the heat rate of the system while maintaining the refrigerant in a gaseous phase throughout the loop under all operating conditions, said heat rate control means including an auxiliary pump of the positive displacement type interposed between the source and the loop and having a driving motor for progressively injecting single phase refrigerant from the source into the loop to increase the pressure in the secondary heat exchanger to substantially above the atmospheric level, control means including a control device correctively settable in response to the temperature of the air in the enclosed space to produce a control signal for energizing intermittently the driving motor to pump single phase gaseous refrigerant into the loop to increase the pressure in the loop and thereby increase the heat rate of the system, and bleeding means for progressively bleeding single phase refrigerant from the loop back to the source for decreasing the loop pressure and thereby decreasing the heat rate of the system so that an equilibrium pressure tends to be established in the secondary heat exchanger which is in accordance with thermal load on the system.

4,175,399

CLOSED LOOP AIR CONDITIONING SYSTEM HAVING AUTOMATIC PRESSURIZING MEANS FOR VARIATION OF HEAT RATE

Thomas C. Edwards, Cocoa Beach, and Amir L. Ecker, Cocoa, both of Fla., assignors to The Rovac Corporation, Rockledge, Fla.

Filed Feb. 18, 1977, Ser. No. 769,958
Int. Cl.[2] F25D 9/00
U.S. Cl. 62—172 **16 Claims**



1. In an air conditioning system for an enclosed space, the combination comprising a compressor having an inlet port and an outlet port, an expander having an inlet port and an outlet port, the compressor and expander having rotor means including vanes coupled together for positive compression and expansion as the rotor means is driven, a primary heat exchanger connected between the compressor outlet port and the expander inlet port, a secondary heat exchanger connected between the expander outlet port and the compressor inlet port to complete a closed loop having a charge of single phase gaseous refrigerant, the refrigerant being constantly in the gaseous stated throughout the loop, one of the heat exchangers being thermally coupled to the enclosed space, control means for producing an output signal in response to a change in the temperature of the controlled space, a source of said single phase gaseous refrigerant, heat rate control means for changing intermittently the heat rate of the system while maintaining the refrigerant in a gaseous phase throughout the loop under all operating conditions, said heat rate control means including means for progressively injecting said single phase refrigerant from the source into the loop to increase the pressure in the secondary heat exchanger to substantially above the atmospheric level, control means including a control device correctively settable in response to the temperature of the air in the enclosed space to produce a control signal for intermittently energizing the injecting means to inject such single phase gaseous refrigerant into the loop to increase the pressure in the loop and thereby increase the heat rate of the system, and bleeding means for progressively bleeding single phase refrigerant from the loop back to the source for decreasing the loop pressure and thereby decreasing the heat rate of the system so that an equilibrium pressure tends to be established in the secondary heat exchanger which is in accordance with thermal load on the system.

4,175,400

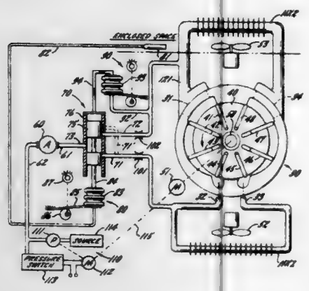
AIR CONDITIONING SYSTEM EMPLOYING NON-CONDENSING GAS WITH ACCUMULATOR FOR PRESSURIZATION AND STORAGE OF GAS

Thomas C. Edwards, Cocoa Beach, Fla., and Amir L. Ecker, Dallas, Tex., assignors to The Rovac Corporation, Rockledge, Fla.

Continuation-in-part of Ser. No. 769,958, Feb. 18, 1977. This application Nov. 8, 1978, Ser. No. 958,650
Int. Cl.[2] F25B 9/00
U.S. Cl. 62—174 **11 Claims**

1. In an air conditioning system for an enclosed space, the combination comprising a compressor having an inlet port and

an outlet port, an expander having an inlet port and an outlet port, the compressor and expander having rotor means including vanes coupled together for positive compression and expansion as the rotor means is driven, a primary heat exchanger connected between the compressor outlet port and the expander inlet port, a secondary heat exchanger connected between the expander outlet port and the compressor inlet port to complete a closed loop having a charge of a non-condensing gas, the loop being free of any intentional restriction in the form of a capillary or the like, one of the heat exchangers being thermally coupled to the enclosed space, an accumulator holding an auxiliary charge of the pressurized gas, the pressure of the gas in the accumulator being in an operating range lower than the operating pressure existing in the primary heat exchanger and higher than the operating pressure existing in the secondary heat exchanger, first intermittently operated valve means for coupling the accumulator to the secondary heat



exchanger so that auxiliary gas is injected into the closed loop thereby to raise the pressure in the secondary heat exchanger above the atmospheric level to increase the heat rate of the system, and second intermittently operated valve means for coupling the accumulator to the primary heat exchanger so that air is bled from the primary heat exchanger to the accumulator thereby to lower the pressure in the loop to decrease the heat rate of the system, a thermostat in the enclosed space and having a responsive member which moves in opposite directions as its temperature in the space respectively rises and falls, the first and second valve means both being coupled to the responsive member for alternative operation as the responsive member moves in its opposite directions thereby correctively varying the heat rate so as to maintain the temperature in the space substantially constant, and auxiliary means for replenishing the accumulator with gas so that the pressure therein remains in the operating range.

4,175,401
REFRIGERATION SYSTEM
Raymond McManus, R.F.D. 5, Carver, Mass. 02330
Filed Jan. 22, 1979, Ser. No. 5,449
Int. Cl.[2] F25D *17/00*
U.S. Cl. 62—180 **4 Claims**

1. An improved refrigeration system for the use of cool ambient air in the atmosphere, which system comprises in combination:

(a) a closed refrigerator container to be maintained at a desired cool temperature;

(b) refrigeration means which includes a compressor to provide for a source of cool refrigerated air for the closed container and including fan means to introduce cool air within the closed container;

(c) an inside thermostatic-control means within the closed container to monitor the temperature within the closed container;

(d) a duct system to control the introduction of cool ambient air of the atmosphere into the closed container, which duct system comprises at least three modular duct units, the duct units in combination providing for a dual-air passageway within the duct units to provide for air communication between the interior of the closed container and the ambient air of the outside atmosphere, which dual passageway comprises

(i) a first passageway having a first inlet and a first outlet to provide for the passage of warm air from the interior of the closed container into the first inlet and to the first outlet and to discharge the warm air to the environment,

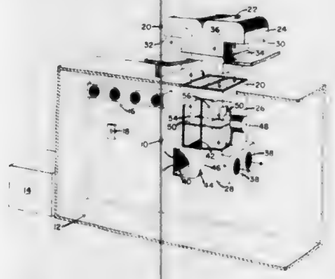
(ii) a second passageway having a second inlet and a second outlet to provide for the passage of cool ambient air from the atmosphere into the interior of the closed container from the second inlet to the second outlet,

(iii) which duct system includes an outside duct unit placed in the ambient outside-air atmosphere and having a hooded passageway over the first outlet and second inlet,

(iv) a control duct unit which comprises a damper within the control duct, the damper adapted to move between a closed position and an opened position, the opened position permitting the passage of air through the first and second passageways and the closed position preventing the passage of air through the first and second passageways,

(v) an electric motor to control the position of the damper means, and

(vi) an interior duct unit which comprises the first inlet

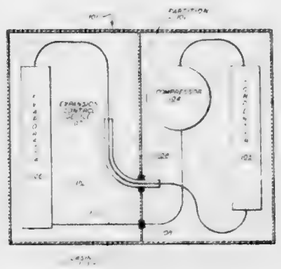


and the second outlet and includes a motorized fan means in the second outlet means to draw cool ambient air from the outside atmosphere through the second inlet and to discharge cool ambient air from the outside atmosphere into the closed container;

(e) an outside thermostatic-control means to sense the temperature of the ambient air in the outside atmosphere; and

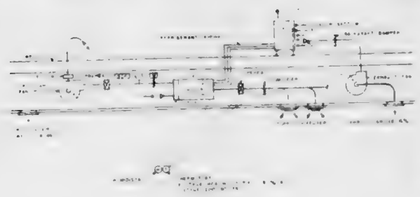
(f) electrical control means in electrical communication with the inside and outside thermostatic-control means, the motor, operating the damper means, the interior fan means and the refrigeration means, including the compressor and refrigeration fans, whereby, when the ambient air in the outside atmosphere falls below a designated cool temperature, the compressor and refrigerator fans are stopped and the motor of the damper means is actuated to place the damper in an opened position and the interior fans of the interior duct unit are actuated, whereby cool ambient air from the outside atmosphere is drawn into the second inlet and is discharged from the second outlet into the closed container, and warm air within the closed container is withdrawn from the first inlet and is discharged to the outside atmosphere through the second outlet, until the temperature of the closed container reaches a desired, preselected, low temperature, at which time the first thermostatic-control means provides for the actuation of the motor for the damper to close the damper and to stop the inside fans of the inside duct unit, and, thereafter, when the closed container temperature rises above the preselected cool temperature within the closed container, another interior thermostatic device actuates the refrigerating fans, unless the ambient air in the outside atmosphere is at or below the preselected temperature, at which time the process of introducing cooler ambient air from the atmosphere is repeated, thereby maintaining a cool temperature in the closed container by the use of cooler ambient air when available.

4,175,402
CAPILLARY PLUG BUTTON
James R. Hile, Kirkville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Aug. 29, 1977, Ser. No. 828,447
Int. Cl.[2] F25D *29/00*
U.S. Cl. 62—263 **12 Claims**



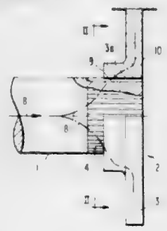
1. A refrigeration machine comprising a condenser, an evaporator, and a compressor forming a refrigeration circuit, an internal wall of the refrigeration machine having an opening therethrough, at least one capillary tube and a capillary plug button for securing the capillary tube including a retainer plate having apertures in which the capillary tube may be secured, said retainer plate having a larger diameter than the opening in the wall and leg means extending from the retainer plate through the opening to fixedly hold the retainer plate to the wall such that the retainer plate contacts one side of the wall and the leg means contacts the opposite side of the wall, said leg means including at least two portions spaced from each other and capable of inward deformation for insertion of the leg means through the opening in the wall.

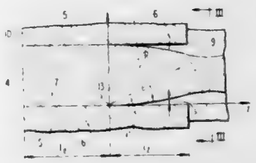
4,175,403
HEAT RECOVERY SYSTEM
Jon Lunde, 1227 Greyrock Crescent, Ottawa, Ontario, Canada (K2C 2A6)
Filed Jun. 6, 1977, Ser. No. 804,056
Claims priority, application Canada, Jun. 7, 1976, 254216
Int. Cl.[2] F25B *13/00;* **F28D** *5/00;* **F25D** *17/06*
U.S. Cl. 62—324 **6 Claims**



1. A heat recovery system for an air conditioning system of a building, operating in the heating mode, including an outdoor heat exchanger and an indoor heat exchanger interconnected by refrigerant piping, the improvement comprising combining with said system an indoor exhaust air system having an indoor exhaust air moving means connected to an outdoor air diffuser, the outdoor heat exchanger being traversed by a flow of outdoor air forced by air moving means associated with the outdoor heat exchanger, said diffuser being located adjacent said outdoor heat exchanger so that the exhaust air from the diffuser is passed through and mixed with outdoor air before passing through the outdoor heat exchanger to recover heat from the exhaust air for reuse in the air conditioning system, thereby reducing the overall energy requirement of the air conditioning system in the heating mode.

4,175,404
SPLINE SHAFT CONNECTION
Hans-Joachim Schopf, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany
Filed Dec. 15, 1977, Ser. No. 860,946
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1976, 2656946
Int. Cl.[2] F16D *3/18, 3/54*
U.S. Cl. 64—9 R **10 Claims**





1. A spline shaft connection between a shaft and a hub with a large number of axially extending tooth and counter tooth means form-lockingly engaging into one another, a tooth flank clearance being provided between the flanks of the mutually contacting tooth and counter tooth means that becomes larger along the direction of the axial dimension and is dimensioned of the order of magnitude of the elastic deformation under load of tooth or counter tooth means, characterized in that a centering length is provided wherein the tooth means and counter tooth means engages into one another at least approximately uniformly and substantially without clearance over a substantial portion of the axial extent of the spline shaft connection and are constructed in a cutting length constituting the remaining part of the axial extent with a tooth flank clearance that becomes larger in the direction toward the end of the spline shaft connection which is opposite to the flow of forces, whereby the enlargement of the tooth flank clearance follows such a relationship that the tooth flank clearance value is a function of the axial coordinate whose first derivative along the axial coordinate is substantially equal to zero at the juncture of the centering and cutting lengths.

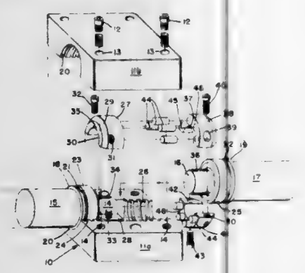
V 9 8 1 4 N 0 2 7 7 9 UMI

4,175,405

SHAFT COUPLING

Joseph F. Smith, and Joseph R. Smith, both of Greensboro, N.C., assignors to PEM-IMS, Inc., N.C.

Filed Sep. 12, 1977, Ser. No. 832,185
Int. Cl.[2] F16D *3/48, 3/00*
U.S. Cl. 64—10 **3 Claims**



1. A shaft coupling comprising at least a pair of releasably connected articulated complementary closure members and a shaft bearing housing, a shaft having a shaft end section bearingly supported in said base for rotation, a first split collar including at least a pair of complementary sections releasably mounted on and encircling said shaft end section, said first split collar having means for releasably securing said collar complementary sections together for retention on said shaft end section and said first collar having a shaft joining face side, said shaft joining face side having a plurality of cylindrical pin-receiving recesses, a second split collar including at least a pair of complementary sections for cooperatively retaining and encircling a shaft to be coupled, said second split collar having means for releasably securing said complementary sections together for retention on said shaft section to be coupled, in juxtaposition with said first surface, said second split collar having a shaft joining face side facing said first surface, said second split collar face side having a plurality of spaced cylindrical pin-receiving recesses, and a series of removable cylindrical pins forming locking means extending into said collar section recesses of said first and second split collars whereby shaft rotation of said first collar will transmit rotation to said second collar and coupled shaft which may be secured by said second collar and disengagement and removal of one split collar or portion thereof will provide for transverse displacement of a shaft end section in the coupling.

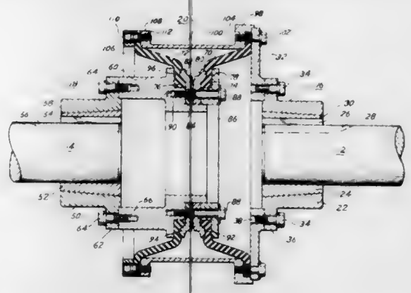
4,175,406

THRUST CANCELLING SHAFT COUPLING

Holmes A. Downey, Bremen, Ind., assignor to Reliance Electric Corporation, Mishawaka, Ind.

Filed Nov. 16, 1977, Ser. No. 852,152
Int. Cl.[2] F16D *3/78*
U.S. Cl. 64—13 **11 Claims**

1. A thrust cancelling shaft coupling comprising a first rotatable element with a flange thereon, a second rotatable element with a flange thereon and in substantially axial alignment with said first element, an axially extending member on said second element projecting toward said first element but spaced therefrom and being smaller in diameter than the periphery of the flange on the first element, a first generally frustoconical flexible torsional element connected at its larger end to the flange on the first rotatable element and at its smaller end to said axially extending member, an axially extending annular means spaced radially outwardly from and overlapping said axially extending member and being of a diameter substantially the same as the diameter of the larger end of said torsional element, means connecting one end of said annular means to the flange of said first rotatable element, and a second generally frustoconical flexible torsional element connected at its larger end to the other end of said annular means and at its smaller end to



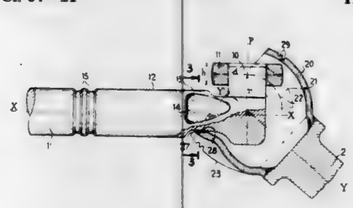
said axially extending member in relatively close proximity to the smaller end of said first flexible torsional element.

4,175,407

HOMOKINETIC JOINT ALLOWING A LARGE ANGULAR DISPLACEMENT

Michel Orain, Conflans Sainte Honorine, France, assignor to Glaenzer Spicer, Poissy, France

Filed Feb. 23, 1978, Ser. No. 880,488
Claims priority, application France, Mar. 4, 1977, 77 06427
Int. Cl.[2] F16D *3/30*
U.S. Cl. 64—21 **11 Claims**



1. A homokinetic joint for a transmission comprising a driving first element having an axis of rotation, a driven second element having an axis of rotation, a first member constituting a tripod which has an axis of rotation and is connected to said first element and defines three trunnions, three part-spherical rollers respectively rotatably and slidably mounted on the trunnions, a second member connected to said second element and having a free peripheral edge and defining three raceways, each raceway being formed by a pair of grooves having a part-circular cross-sectional shape, a mean line of which grooves being an arc of a circle centered substantially in the vicinity of the axis of said second element, an element which is rigid with the tripod and has, in a zone close to the tripod, a substantially triangular cross-sectional shape approximately constituting the envelope of said free edge of the second member when the joint operates with an angular displacement between said first and second elements close to the maximum angular displacement.

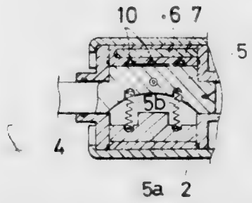
4,175,408

APPARATUS FOR ABSORBING OIL PRESSURE IN AN IMPACT TYPE TOOL

Kaname Kasai; Takaji Mukumoto, both of Kawagoe; Toshikazu Asakura, Sayama, and Ryoji Ueda, Iruma, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 5, 1977, Ser. No. 857,666
Claims priority, application Japan, Dec. 10, 1976, 51-164722[U]
Int. Cl.[2] F16D *3/80*
U.S. Cl. 64—26 **4 Claims**





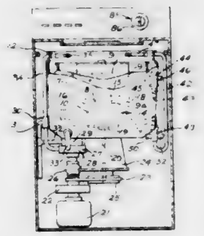
1. An apparatus for absorbing oil pressure in an impact tool employing an eccentric oil chamber, said chamber being formed in a rotatable cylinder connected to an air motor drive having a rotor connected to a spindle, wherein: said rotor by moving relative to said oil chamber in predetermined angular position thereby urges oil into respective partitioned chambers formed outside of the rotor to impart an impact torque to said rotor; and at least one longitudinally extending space chamber formed in the cylinder is in communication with the oil chamber being filled with a closed cell type foam rubber.

4,175,409

CLOTHES WASHING MACHINE

Everett D. Morey, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Continuation-in-part of Ser. No. 695,585, Jun. 14, 1976, abandoned. This application Nov. 4, 1977, Ser. No. 848,536
Int. Cl.[2] D06F *37/00*
U.S. Cl. 68—4 **8 Claims**



1. In a vertical axis clothes washing machine having wash, rinse, and spin extraction operations including a tub, an agitator, a first basket within the tub, a second basket, having a side wall with a plurality of openings particularly at the bottom thereof, disposed within the first basket and positioned on the agitator for movement therewith, water supply means for feeding hot and cold water into the machine, electrically powered drive means for operating the agitator to effect washing of the fabrics and for rotating the baskets to centrifugally extract water from the fabrics, communication means to allow water to flow from the baskets into the tub, recirculating means arranged to take water from the tub and recirculate it into the baskets during the wash and rinse operations, the improvement comprising:

(a) a separate cycle of a continuous wash and rinse operation followed by a spin extraction operation for washing clothes in only the second basket including;

(i) means to continuously introduce fresh water into the second basket during the continuous wash and rinse operation,

(ii) means to continuously flow wash and rinse water from the second basket through the openings therein into the first basket so that said second basket does not fill to a level beyond that necessary to maintain the clothes therein in a sopping wet condition and then from the first basket into the tub,

(iii) diverting means in the recirculation means to continuously direct water to drain from the tub during the combined wash and rinse operation,

(b) means to oscillate back and forth the small basket with the agitator in unison therewith during the continuous wash and rinse operation,

(c) means to reduce the temperature of the fresh water introduced into the second basket part way through the continuous wash and rinse operation to gradually reduce the temperature of the clothes, and

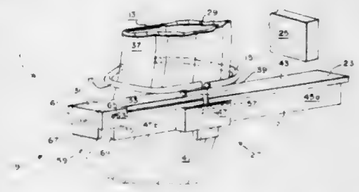
(d) means to stop the flow of fresh water into the second basket prior to the spin extraction operation and take water from the tub and direct the water to drain.

4,175,410

VEHICLE WHEEL ENGAGEABLE BLOCKING DEVICE

John E. Schwaiger, 7556 Raleigh-LaGrange Rd., Cordova, Tenn. 38018

Filed Nov. 3, 1977, Ser. No. 848,279
Int. Cl.[2] B60R *25/00*
U.S. Cl. 70—226 **6 Claims**



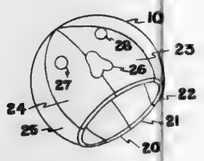
1. A locking device for lockable engagement with a vehicle wheel, said locking device comprising lock-bar means for thwartable engagement with merely one wheel of the vehicle whereby movement of the vehicle is impeded therewith, said lock-bar means intended to be disposed in an essentially parallel arrangement with respect to the rotating axis of the wheel and includes inner and outer ends with the inner end thereof reaching a predetermined distance beyond the inner side-wall of the wheel, inner arcuate arm means disposed substantially intermediate said lock-bar means and being fixedly attached thereto for contiguous engagement with the inner side-wall of the wheel, hingeplate means hingedly attached at the outer end of said lock-bar means for facilitating installing said locking device onto the wheel with said hingeplate means being mov-

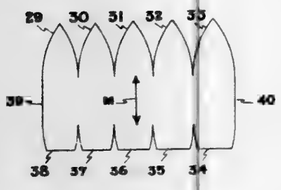
able between locked and unlocked positions, outer arcuate arm means fixedly attached to said hingeplate means for movement therewith and for contiguous engagement with the outer sidewall of the wheel when said hingeplate means is in the locked position thereof, hasp means for coupling said hingeplate means and said lock-bar means one with the other, and lock means engageable with said hasp means for precluding unjustifiable movement of said hingeplate means.

4,175,411
LIGHTWEIGHT COSTUME HEAD

Terry M. Allen, 3021 Millcreek Rd., Salt Lake City, Utah 84404, and William D. Derfler, 440 N. 225 E., North Salt Lake City, Utah 84054

Division of Ser. No. 575,496, May 8, 1975, Pat. No. 4,099,271. This application Jan. 13, 1978, Ser. No. 869,284
Int. Cl.[2] A42B *1/04*
U.S. Cl. 2—173 **11 Claims**





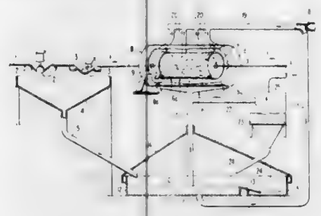
1. An enveloping costume head comprising:
(a) a flexible, crushable, head-enveloping foundation having a substantially circular access opening therein for inserting the head of the wearer, the rim of said opening adapted to rest on the shoulders of a wearer and a snout opening and eye openings therein, said foundation consisting essentially of elastomeric foam sections having a minimum thickness of about one-half inch and having at least ten cuts therein, the edges of said cuts being adhered together to form a substantially spherical shape;
(b) a cloth covering enclosing said foundation, and having a snout opening and eye openings therein, said snout opening and eye openings of said covering located over said snout opening and eye openings of said foundation.

4,175,412
PROCESS AND INSTALLATION FOR MECHANICAL DESCALING STEEL WIRE

Jean Bernot, Saint-Dizier, France, assignor to Trefilunion, Saint-Dizier, France

Filed Mar. 10, 1978, Ser. No. 885,160
Claims priority, application France, Mar. 11, 1977, 77 07579
Int. Cl.[2] B21B *45/04*; B24C *3/12*
U.S. Cl. 72—40 **9 Claims**

1. In a process of removing iron oxide scale from steel rod, including the steps of bending said wire to cause a portion of said scale to be detached from said rod surface, collecting said scale so detached from said rod surface, and projecting collected scale against said rod at a point thereon downstream from the point where said bending occurs, the improvement comprising:
re-collecting said scale after it is projected against said rod;
removing from re-collected scale, scale particles below a predetermined size;
mixing said re-collected scale having scale particles above

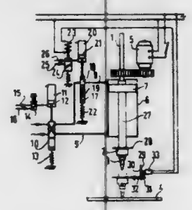


said predetermined size with scale which has not been projected against said rod; and
projecting mixed projected and unprojected scale in an amount greater than the amount of scale originally detached from said rod against said rod at a point thereon downstream from the original point of detachment only said mixed scale being projected against said rod.

4,175,413
METHODS AND APPARATUSES FOR FORMING BY FRICTIONAL HEAT AND PRESSURE HOLES SURROUNDED EACH BY A BOSS IN A METAL PLATE OR THE WALL OF A METAL TUBE

Johannes A. van Geffen, Apeldoorn, Netherlands, assignor to Technisch Handels- en Adviesbureau van Geffen B.V., Apeldoorn, Netherlands

Filed Jan. 24, 1978, Ser. No. 871,974
Claims priority, application Netherlands, Jan. 27, 1977, 7700871
Int. Cl.[2] B21D *28/36*
U.S. Cl. 72—71 **7 Claims**

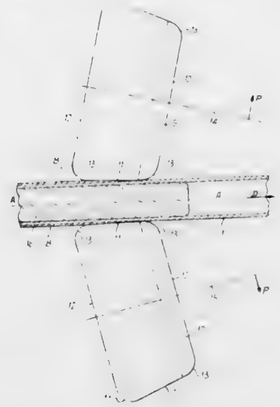


1. A method of forming by frictional heat and pressure a hole of predetermined size and shape surrounded by a boss in a metal plate or the wall of a metal tube with the aid of a piercing tool rotating rapidly about its longitudinal axis and moving through said plate or tube wall, said piercing tool being coaxially attached to the rotatable spindle of a machine tool, of which the spindle is axially movable with controllable feed, said method comprising the step of so controlling the axial feed of the tool as to ensure that the tool is fed, during a determined time from at least the point of time, at which it comes into contact with the plate or the tube wall, with a speed which is lower than a given speed and after that time is fed with a speed which is higher than said given speed.

4,175,414
SMOOTHING ROLLING MILL

Pierre Peytavin, Neuilly-sur-Seine, France, assignor to Vallourec (Usines a Tubes de Lorraine-Escaut et Vallourec Reunies), Paris, France

Filed Feb. 21, 1978, Ser. No. 879,808
Claims priority, application France, Feb. 25, 1977, 77 05566
Int. Cl.[2] B21B *19/10*
U.S. Cl. 72—96 **7 Claims**

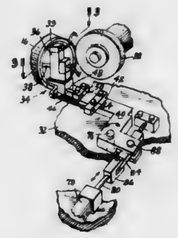


1. In a tube smoothing rolling mill having a back up mandrel within a tube blank to be rolled, means for rotating the tube blank about its longitudinal axis, means for displacing the tube axially, and smoothing rollers positioned symmetrically to the axis of displacement of the tube, the improvement comprising, two smoothing rollers positioned diametrically of the tube and each having a tube engaging surface in the form of a frustum of a cone, said surface of each such roller merging with end surfaces of the roller at zones of curved section, and shaft means mounting said rollers for rotation about axes inclined with respect to the axis of displacement of the tube, said axes converging in the direction of displacement of the tube.

4,175,415
FINISHING TOOL

Richard T. Knorring, Worcester, Mass., assignor to Cincinnati Milacron-Heald Corporation, Worcester, Mass.

Filed Aug. 18, 1978, Ser. No. 934,904
Int. Cl.[2] B21H *1/00*
U.S. Cl. 72—101 **10 Claims**

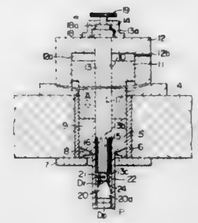


1. A finishing tool assembly for finishing a workpiece, comprising:
(a) a base;
(b) a housing pivotally mounted upon the base about an axis;
(c) a finishing tool, said tool being in the form of an elongated rod with a substantially circular cross-section extending from said housing in a direction transverse to the axis of the housing pivot and having a workpiece interface on its periphery;
(d) means for effectuating relative movement between said housing and a workpiece; and
(e) means for oscillating said housing about its pivotal axis in coordination with said effectuating means.

4,175,416
APPARATUS FOR MANUFACTURING HEAT TRANSFER TUBES

Toshihiko Fukushima, Shimoinayoshi; Kunio Fujie, Tokyo; Akira Arai, Sakuramura; Nobukatsu Arai, Ushikumachi, and Kimio Kakizaki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 11, 1978, Ser. No. 868,664
Claims priority, application Japan, Jan. 18, 1977, 52-3644
Int. Cl.[2] B21C *23/10, 25/04, 1/34, 3/00*
U.S. Cl. 72—254 **19 Claims**



1. Apparatus for manufacturing a heat transfer tube comprising means for conveying a material tube longitudinally, a first mandrel for forming alternate ribs and grooves on the inside of said tube, a second mandrel for forming cuts into said ribs and forcibly bending and joining said ribs successively to the adjacent ones, and a die, said first mandrel having grooves and ridges on the surface for inversely forming said ribs and grooves on the inner wall surface of said tube and also having a longitudinally extending bore coaxial with a stem of said first mandrel, said second mandrel including a tool for forming cuts at given intervals in the ribs formed on the inside of said tube by the grooves and ridges of said first mandrel and also including a tool for forcibly bending the crests of said ribs with said cuts sidewise into pemanent contact with intermediate parts of the adjacent ribs successively and thereby joining said ribs altogether, said second mandrel being inserted into said bore of said first mandrel in such a manner that said tools for forming cuts and joining said ribs to the adjacent ones are both exposed from the end of said first mandrel, said die being located in the vicinity of the portion of said first mandrel formed with said grooves and ridges.

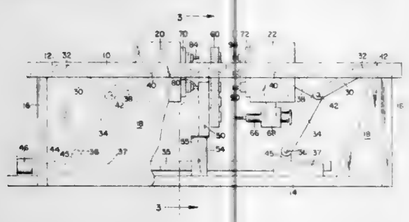
4,175,417
WORKPIECE FORMING MACHINE

Leo H. Vergnani, 7 Spencer St.; John B. Ferrero, 916 Suffield St., both of Agawam, Mass. 01001, and Ernest M. Cassanelli, 93 Grochmal Ave., Springfield, Mass. 01051

Filed Dec. 1, 1977, Ser. No. 856,409
Int. Cl.[2] B21D *22/00*
U.S. Cl. 72—356 **1 Claim**

1. In apparatus for sequentially cold forming a work by changing the configuration thereof through a step-by-step application thereto of opposing mechanical forces, the improvement comprising:
a frame,
a drive motor,
a multiposition turret rotatably mounted in vertical disposition centrally of the frame and about a horizontally-

extending central axis and having a plurality of spaced circularly-arranged work cavities extending horizontally therethrough from one vertical face to the opposite vertical face,
a die receivable in each work cavity,
a cam-operated multistation indexing mechanism driven by the drive motor and rotatively supporting the turret for intermittently rotating and cyclically indexing the turret at stations through a series of sequential angular steps,
a ram vertically-disposed relative to the frame on each side of the turret,
a pair of horizontally-extending ram rails mounted on the frame for supporting the rams coaxially in slidable relationship alternately toward each other in forming strokes and away from each other in non-forming strokes,
a shuttle bar cylinder and piston,
power means for cyclically actuating the piston in alternating forming and non-forming strokes,
a horizontally-extending shuttle bar disposed centrally of the frame and connected to and driven by the piston and reciprocable linearly in forming and non-forming strokes,



a moving assembly at each end of the frame outboard of a respective ram and including a trio of pivotally interconnected power links consisting of an upper power link pivotally interconnected with the frame and a lower power link pivotally interconnected with the shuttle bar and a forward link pivotally interconnected with the respective ram for effecting simultaneous movements of the rams toward each other in forming strokes and away from each other in non-forming strokes,
a tool plate mounted on each ram for supporting a plurality of circularly arranged tools extendable therefrom in planes normal thereto toward the respective confronting vertical turret face,
each tool of the tool plate being disposed in a plane coaxial with the opposed tool of the other tool plate in a tool-couple relationship and with the axis of one of the turret work cavities,
with turret rotation transferring a work to successive stations of operation along a curvilinear path preparatory to the simultaneous linear reciprocation of a pair of the tools toward the work at the station.

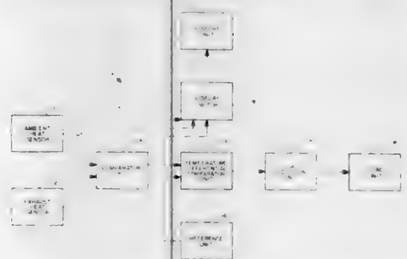
4,175,418

TEMPERATURE MONITORING AND TEMPERATURE DIFFERENTIAL CONTROL DEVICE

Sylvester L. Steffen, R.R. 3, New Hampton, Iowa 50659, and Duaine L. Bollwitt, Monticello, Iowa, assignors to S. L. Steffen, New Hampton, Iowa

Filed May 8, 1978, Ser. No. 903,815
Int. Cl.[2] G01K 1/00
U.S. Cl. 73—342 **15 Claims**

1. Apparatus comprising:
first sensing means for determining the temperature of a first environment and for producing an output voltage corresponding to such temperature said first sensing means including a first operational amplifier having an inverting input, a non-inverting input and an output, a first voltage transducer unit having an output voltage, and first, second, third and fourth resistors each having a first lead and a second lead, such that the first lead of said first resistor is electrically connected to the output of said first voltage transducer unit and the second lead of said first resistor is electrically connected to the inverting input of said first operational amplifier, the first lead of said second resistor is electrically connected to the inverting input of said first operational amplifier and the second lead of said second resistor is electrically connected to the output of said first operational amplifier, the first lead of said third resistor is electrically connected to the non-inverting input of said first operational amplifier and the second lead of said third resistor is electrically connected to ground potential, the first lead of said fourth resistor is electrically connected to the non-inverting input of said first operational amplifier and the second lead of said fourth resistor is electrically negatively biased;
second sensing means for determining the temperature of a second environment and for producing an output voltage corresponding to such temperature said second sensing means including a second operational amplifier having an inverting input, a non-inverting input and an output, a second voltage transducer unit having an output, a fifth, sixth, seventh, and eighth resistors each having a first lead and a second lead, such that the first lead of said fifth resistor is electrically connected to the output of said second voltage transducer unit and the second lead of said fifth resistor is electrically connected to the inverting input of said second operational amplifier, the first lead of said sixth resistor is electrically connected to the output of



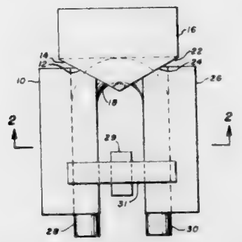
said second operational amplifier, the first lead of said seventh resistor is electrically connected to the non-inverting input of said second operational amplifier and the second lead of said seventh resistor is electrically connected to ground potential, the first lead of said eighth resistor is electrically connected to the non-inverting input of said second operational amplifier and the second lead of said eighth resistor is electrically negatively biased;
first comparator means operably connected to said first and second sensing means for comparing the voltage outputs therefrom and for producing an output voltage corresponding to the temperature differential between the first and second environment;
adjustable reference means for selectively providing an output voltage corresponding to a desired temperature differential;
second comparator means operably connected to said first comparator means and said adjustable reference means for comparing the voltage outputs therefrom and for producing a hysteresis type of "High" or "Low" switching output voltage corresponding to the difference between (a) the temperature differential between the first and second environment, and (b) the desired temperature differential;
a load switch for activating a load responsive to the "High" and "Low" voltage output of said second comparator means;
a display switch selectively and operably connected to the output of said first sensing means, the output of said second sensing means and the output of said first comparator means; and
a display means operably connected to said display switch for producing a visual display of the temperature of the first environment, the temperature of the second environment and the temperature differential between the first and second environment, said display means including means for producing a visual display of the temperature in degrees Fahrenheit.

4,175,419

NO-SIZE SQUEEZING OF 180 DEGREE BOILER-TUBE RETURN BENDS

Thomas L. Mabery, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 31, 1978, Ser. No. 891,958
Int. Cl.[2] B21D 7/03
U.S. Cl. 72—383 **1 Claim**



1. An apparatus for reducing the bend radius of a U-shaped tube having parallel, longitudinal legs joined by a bent section, comprising: a back die hollowed to form a chamber that is shaped to accommodate a least a center of the bent section of the tube and to support the entire circumference of the tube at the center of the bent section, means for squeezing the tube by forcing the legs toward each other but keeping them generally parallel, thereby reducing the bend radius of the bent section and extending the legs longitudinally, the squeezing means including a pair of squeeze dies, each having a tube-engaging surface, the dies being oriented so that the tube-engaging surfaces are generally parallel and face each other, for squeezing a U-shaped tube by engaging the legs and moving them together, each squeeze die including a squeeze-die slide surface, the back die including back-die slide surfaces that are shaped to mate with and positioned to slidably engage the squeeze-die slide surfaces, the slide surfaces being angled such that there is no relative longitudinal movement between the squeeze dies and the legs of the tube when the squeeze dies are forced together.

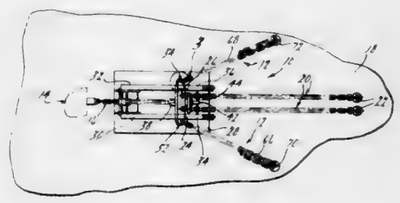
4,175,420

SAFETY TIE DOWN FOR A PULLING APPARATUS

Charles J. Kuhn, 10520 Plainview Ave., Tujunga, Calif. 91042

Filed Mar. 23, 1978, Ser. No. 889,299
Int. Cl.[2] B21D 1/12
U.S. Cl. 72—447 **10 Claims**

1. In a pulling apparatus comprising a pair of spaced vertically extending members having oppositely outwardly facing surfaces, support means supporting said vertically extending members, guide means movably supported between said vertically extending members, pulling means supported on said support means, and flexible connecting means having one end connected to said pulling means extending through said guide means and having the other end adapted to be connected to a workpiece, primary anchor means including at least one flexible connecting means having one end secured to said pulling apparatus, a safety tie down assembly comprising attachment means secured to one of said outwardly facing surfaces of said vertically extending members intermediate the ends thereof, second flexible connecting means having one end secured to said attachment means, said primary anchor means being adapted to be secured to first anchor means and the other end



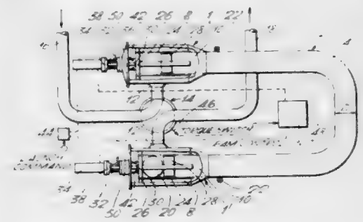
of said second flexible connecting means being adapted to be secured to second anchor means so as to restrain movement of said pulling apparatus along the line in which said pulling force is directed.

4,175,421

METER PROVERS

Kenneth J. Elderfield, Caythorpe, and Charles Griffiths, Wokingham, both of England, assignors to National Carbonising Company Limited, London, England

Filed Jun. 28, 1978, Ser. No. 919,853
Claims priority, application United Kingdom, Jul. 29, 1977, 32066/77
Int. Cl.[2] G01F 25/00
U.S. Cl. 73—3 **7 Claims**



1. A meter prover including a u-shaped calibration conduit, a resilient plug that travels through said conduit, and at each end of the calibration conduit a plug delivery/receiving station in which the plug travels horizontally and which includes means for selectively retaining the plug in the station, each plug delivery/receiving station comprising a chamber having a first port at one end which is adapted to be connected to one end of the calibration conduit, and a second port adapted to be connected via valve means to a main pipe line, and a plug cage within the chamber arranged to extend horizontally from at least partly around said one end of said conduit to receive the plug as it emerges from said conduit end and guide it during limited horizontal travel away from said end to a rest position, and said retaining means comprising a sleeve having a cross-section corresponding to that of the conduit and mounted for horizontal movement to and fro in the gap between said conduit end and said plug in said rest position, the plug being an interference fit in the conduit and within the sleeve, actuator means being provided to move the cage and sleeve horizontally and rectilinearly between a first position in which the sleeve forms an extension of the conduit and a second position in which it engages around said plug in said rest position and there is then a space between said conduit and said sleeve, which space is in communication with said second port, whereby when the sleeve is in said first position fluid pressure admitted through said second port is able to force the plug through the sleeve in the conduit and when the sleeve and plug

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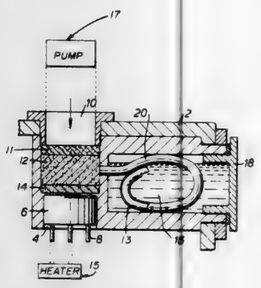
are in said second position the fluid is able to bypass the plug and flow directly into the conduit.

4,175,422

GAS MONITORS

Leslie J. Owen, Porthcawl, Wales, assignor to British Steel Corporation, London, England

Filed Aug. 22, 1977, Ser. No. 826,649
Claims priority, application United Kingdom, Aug. 27, 1976, 35790/76
Int. Cl.[2] G01N 27/04
U.S. Cl. 73—23 13 Claims



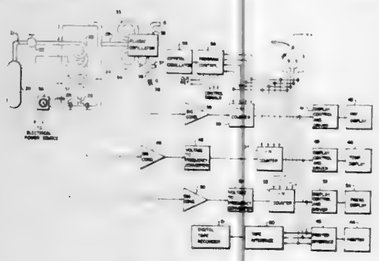
1. A gas sensor, having a sensitive element of semi-conductor type, the sensor being contained within an enclosure adapted to permit gas to come into contact with the element, wherein the enclosure incorporates a humidifier which maintains adjacent the element, a substantially constant relative humidity, and wherein said humidifier comprises a water absorbant pad disposed adjacent the sensor element, and arranged to communicate with a water reservoir.

4,175,423

APPARATUS FOR DETERMINING THE PULSE REPETITION RATE OF A FLUIDIC OSCILLATOR THROUGH WHICH A TEST GAS IS FLOWING

Clarence Braun, and Joseph E. Zupanick, both of Richardson, Tex., assignors to Sun Oil Company (Delaware), Dallas, Tex.

Filed May 1, 1978, Ser. No. 901,884
Int. Cl.[2] G01N 9/32, 9/36
U.S. Cl. 73—30 6 Claims



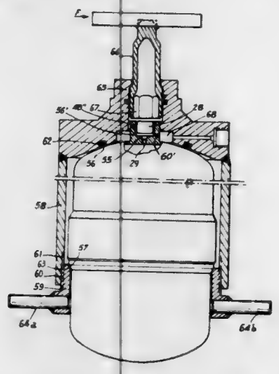
1. Apparatus for determining characteristics of a test gas comprising:
(A) a fluidic astable oscillator having a supply port and alternative state output ports;
(B) supply means for applying the test gas as the working fluid to said oscillator supply port, said supply means including:
(i) a surge tank coupled between a source of the test gas and said oscillator supply port; and
(ii) regulating means for regulating the pressure of the test gas applied to said oscillator supply port;
(C) a first pressure transducer for electrically sensing pressure pulses at one of said output ports;
(D) a second pressure transducer, said second pressure transducer being disposed in communication with the test gas in said surge tank;
(E) a first voltage-to-frequency converter connected to receive the output signal from said second pressure transducer such that the frequency of pulses issued by said first voltage-to-frequency coverter is responsive to the pressure of the test gas within said surge tank;
(F) timing means defining a predetermined time period;
(G) first counter means for accumulating pulses from said first pressure transducer during said predetermined time period such that, at the end of said predetermined time period, the accumulated count is representative of the pulse repetition rate of said fluidic astable oscillator;
(H) first record means for recording the pulse repetition rate at least temporarily;
(I) second counter means for accumulating pulses from said first voltage-to-frequency converter during said predetermined time period such that, at the end of said predetermined time period, the accumulated count is representative of the pressure in said surge tank; and
(J) second record means for recording the pressure of the test gas in said surge tank at leat temporarily.

4,175,424

DEVICE FOR HANDLING AND TESTING A CELL ADAPTED FOR SAMPLING A PRESSURIZED FLUID

Jean-Pierre Bimond, and Flavien Lazarre, both of Pau, France, assignors to Societe Nationale Elf Aquitaine (Production), Paris, France

Filed Jun. 20, 1978, Ser. No. 917,285
Claims priority, application France, Jul. 27, 1977, 77 23017
Int. Cl.[2] G01M 3/32
U.S. Cl. 73—49.2 6 Claims



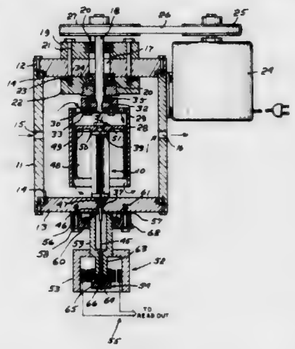
1. A device for handling a cell for sampling a pressurized fluid, comprising a closed receptacle having an internal wall delimiting an internal space equipped with means for fixing said sampling cell in a stable position, and an external wall into which opens, through an aperture, a connecting conduit connected to said internal space, said receptacle being provided with removable sealing means, said external receptacle wall comprising means for fixing said connecting conduit in such a manner that the latter is sealingly applied to the periphery of said aperture, said device further comprising removable testing means for testing said handling device, said testing means delimiting together with said external wall of said receptacle, in the zone surrounding the orifice of said connecting conduit opening into said internal space, a space which communicates with pressure measuring means and which is removably connectable to a storing container containing said fluid, said removable testing means comprising means for controling said removable sealing means of said connecting conduit opening into said internal space of said receptacle.

4,175,425

VISCOMETER

David A. Brookfield, 168 Massapoag Ave., Sharon, Mass. 02067

Continuation-in-part of Ser. No. 786,015, Apr. 8, 1977, abandoned. This application Jun. 21, 1978, Ser. No. 917,470
Int. Cl.[2] G01N 11/14
U.S. Cl. 73—59 11 Claims



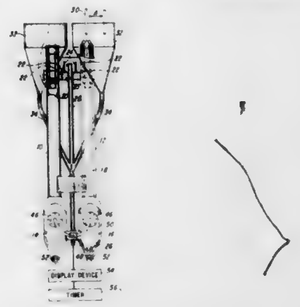
1. A viscometer including a chamber for fluid under pressure, first and second, concentric open ended cylindrical elements within the chamber, one element within the other with a clearance appropriate for the flow of liquid between them, means to rotate one element relative to the other and including a shaft member rotatably entrant of said chamber and connected axially to said one element, a chamber wall member, one of said members having a threaded port extending therethrough and coaxial with said elements and including a supporting portion having an axial passage, torque responsive means to support said inner element and to prevent contact thereof with the outer element, said means including a hub threaded in said port and having an axial passage extending therethrough, a part connected axially to said inner element, means connecting said part to said hub to enable said part to turn relative to said hub, said connecting means including a tube sealed axially to said part and to said hub and means arranged and disposed about said tube to provide lateral stability for said second element and the major percentage of the wanted torsional resistance to the turning thereof, a readout rod within said tube with one end anchored axially of and sealed to the second element and the other end extending freely through the tube and the passage of the supporting portion, the inside diameter of said tube such that the readout rod is close but a free fit therein and the outside diameter of the tube such that the tube provides a minor percentage of said torsional resistance but establishes a wall that is not deformable against the readout rod by the fluid pressure, and a readout device externally of the chamber and including a rotor fixed on the exposed end of the readout rod and a stator surrounding said rotor and fixed on said supporting portion, and a bearing held by the supporting portion, said readout rod extending through and rotatably held by and being unsupported between said bearing and said inner element and said bearing located close to the center of gravity of the rotor.

4,175,426

APPARATUS FOR MEASURING THE SEDIMENTATION CHARACTERISTICS OF PARTICULATE SOLIDS IN LIQUID

Frank R. Rosenblum, Ville St. Laurent, Canada, assignor to Noranda Mines Limited, Toronto, Canada

Filed Sep. 7, 1978, Ser. No. 940,321
Claims priority, application Canada, Apr. 24, 1978, 301784
Int. Cl.[2] G01N 15/04
U.S. Cl. 73—61.4 10 Claims



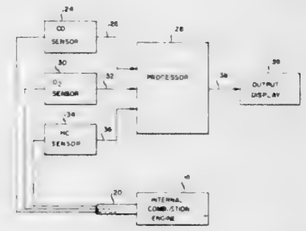
1. An apparatus for measuring the sedimentation characteristics of particulate solids comprising:
(a) two separate vertical housings adapted to be filled with a liquid less dense than the particulate solids to be measured and a bridge interconnecting the two vertical housings adjacent the top thereof for communicating the two housings and so maintain the same level of liquid in the two housings;
(b) means for introducing a sample of particulate solids to be measured in the top of one of said housings;
(c) two pressure sensors located, at the same level, one in each housing; and
(d) a differential pressure transducer connected to said pressure sensors for sensing the differential pressure caused by the sample introduced into one of the housings, said differential pressure transducer providing an output indicative of the weight percent of sample remaining in suspension above the pressure sensors as a function of time.

4,175,427

ENGINE FAULT ANALYSIS ON CATALYTIC CONVERTER EQUIPPED AUTOS

John D. Blanke, Fullerton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Aug. 14, 1978, Ser. No. 933,246
Int. Cl.[2] G01M 15/00
U.S. Cl. 73—118 12 Claims



12. An apparatus for isolating problems in a catalytic converter equipped internal combustion engine having an idle

state and an off idle state, said engine including a carburetor and exhaust, said apparatus comprising:

analyzer means for sensing carbon monoxide emissions, oxygen emissions and hydrocarbon emissions in said exhaust;

first means for producing a first response whenever said carburetor is out of balance as indicated by one of high carbon monoxide emissions while said engine is in said idle state or high hydrocarbon emissions with carbon monoxide emissions are greater than oxygen emissions while said engine is in said idle state;

second means for producing a second response whenever said carburetor needs to be overhauled as indicated by one of high carbon monoxide emissions while said engine is in said off idle state or high hydrocarbon emissions with carbon monoxide emissions greater than oxygen emissions while said engine is in said off idle state;

third means for producing a third response whenever said engine needs a tune up as indicated by high hydrocarbon emissions; and

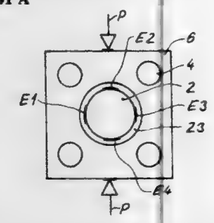
fourth means for producing a fourth response whenever the catalytic converter needs to be replaced as indicated by one of high carbon monoxide emissions with oxygen emissions greater than carbon monoxide emissions or high hydrocarbon emissions with oxygen emissions greater than carbon monoxide emissions.

4,175,428

CAPACITIVE DYNAMOMETER

Nils A. J. Eilersen, Gongehusvej 226, DK-2950 Vedbaek, Denmark

Filed Dec. 27, 1977, Ser. No. 864,798
Claims priority, application Denmark, Dec. 30, 1976, 5891/76
Int. Cl.² G01L *1/14*
U.S. Cl. 73—141 A **10 Claims**



1. A capacitive dynamometer comprising an elastic body for receiving a mechanical force to be measured, said body having a measuring cavity so shaped and located in said body that under the influence of the force to be measured the configuration of its inner wall is differently deformed along different axes, an electrode carrier forming a separate structural member being mounted in said measuring cavity, sets of capacitor electrodes, each including opposed electrode areas carried by said inner wall and said electrode carrier respectively, said sets of capacitor electrodes being so located in different positions along said inner wall that their capacity values depend on dimensional changes of said inner wall along different axes.

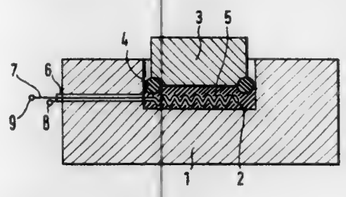
4,175,429

DEVICE FOR THE MEASUREMENT OF FORCES OR PRESSURES

Roland Keck, Dusseldorf, Fed. Rep. of Germany, assignor to Betriesbsforschungsinstitut VDEh Institut fur angewandte Forschung GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 13, 1978, Ser. No. 886,043
Int. Cl.² G01L *5/00*
U.S. Cl. 73—141 A **9 Claims**

1. Arrangement for measuring forces and pressures with a high-pressure sensitivity metal wire according to its resistance value, bedded in a low shear force material such as flexible rubber material, compressed within a load-cell by means of a moving piston, characterised in that, a jacket thermo-element (6,7) is drawn complete with its shank(s) out of the load-cell



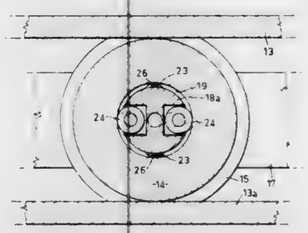
under internal pressure, the said metal wire (5) being connected by its ends to the relevant shanks.

4,175,430

LOAD MEASURING APPARATUS

William R. B. Morrison, and Richard F. Beale, both of Brisbane, Australia, assignors to Utah Development Company, San Francisco, Calif.

Filed Mar. 31, 1978, Ser. No. 892,402
Claims priority, application Australia, Apr. 4, 1977, PC9670
Int. Cl.² G01L *1/04*
U.S. Cl. 73—141 A **16 Claims**



9. In a rolling element having a cavity formed substantially centrally therewithin and comprising one of a plurality of rolling elements co-operating with oppositely arranged raceways to form a rolling element bearing assembly;

measuring apparatus for determining the load applied to said one rolling element, including sensing means adapted to be supported in said cavity to monitor a dimension of the cavity which varies with variations in the load applied to said bearing assembly and communication means operatively associated with said sensing means in such manner as to provide said monitored dimension in a form interpretable as the load applied to said one rolling element.

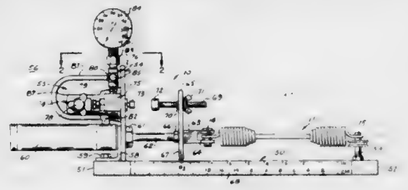
4,175,431

HEAVY DUTY SPRING TESTING APPARATUS AND METHOD

Henry R. DeTournay, 441 Mark Dr., Warson Woods, Mo. 63122

Filed Apr. 24, 1978, Ser. No. 899,411
Int. Cl.² G01N *3/10*
U.S. Cl. 73—161 **6 Claims**

6. A method for the comparative testing and mating of springs to provide matched spring sets having substantially equal size, length and tension characteristics conforming to prescribed specifications therefor, comprising the steps of orienting opposite ends of a spring at relatively fixed and movable locus points corresponding to the prescribed free length specification of the spring, adjusting the movable distance of the movable locus point to correspond to the prescribed tension length specification of the spring, applying a pressure force from a pressure source substantially greater than the prescribed tension force of the spring to the movable locus point and substantially instantaneously moving such locus



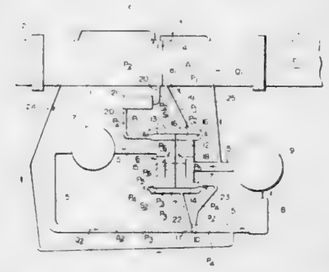
point the movable distance to tension the spring to its prescribed tension length, trapping the applied pressure force to hold the spring under tension and determining the tension force thereof, and releasing the applied pressure force.

4,175,433

METHOD OF AND APPARATUS FOR THE MEASUREMENT OF THE RATE OF FLOW BY MEANS OF A BYPASS

Sotokazu Rikuta, 2-24-7 Koun-cho, Maebashi-shi, Gunma-ken, Japan (371)

Filed Dec. 19, 1977, Ser. No. 861,605
Claims priority, application Japan, Dec. 27, 1976, 51-158025
Int. Cl.² G01F *1/36*
U.S. Cl. 73—196 **6 Claims**



1. Apparatus for measuring the flow rate of a fluid in a main pipe comprising first restriction means in said main pipe for restricting a cross-sectional flow area of said main pipe, a loop circuit comprising pipe of relatively smaller dimension than the main pipe, pump means in said loop circuit for circulating fluid through said loop circuit, fluid flow measuring means for measuring the fluid flow in said loop circuit, second restriction means in said loop circuit for restricting the cross-sectional flow area in said loop circuit, proportional control means in said loop circuit, said proportional control means comprising valve means for regulating the fluid flow through said loop circuit, said proportional control means further comprising first and second pressure-receiving means operatively connected to said valve means, said valve means comprising a valve body having a valve port, a valve plug cooperable within said valve port, said valve plug having a first portion cooperable with said valve port to effect control of fluid through said valve port, said valve plug having a second portion which is hollow and disposed on the downstream side of said valve port, said first port, said first portion of said valve having an outer diameter equal to the inner diameter of said second hollow portion of said valve plug, a valve rod mounting said valve plug such that said valve rod and valve plug are movable as a unit, said valve rod being connected at the opposed ends thereof respectively to said first and second pressure receiving means, and first and second conduit means connecting said first and second pressure-receiving means respectively to said main pipe and said loop circuit upstream and downstream of the respective first and second restriction means, whereby the rate of flow in said loop circuit circulated in the loop circuit by the pump means is adjusted by said valve means to maintain a constant ratio between the pressure differential across said first and second pressure-receiving means respectively such that the rate of flow in said main pipe is determined by the fluid flow measuring means in said loop circuit.

4,175,432

APPARATUS FOR TOWING AN UNDERWATER INSTRUMENTATION PACKAGE

Carl H. Gibson, 9566 La Jolla Farms Rd., La Jolla, Calif. 92037

Filed Jul. 7, 1978, Ser. No. 922,774
Int. Cl.² G01W *1/00*
U.S. Cl. 73—170 A **9 Claims**



1. Apparatus for towing an underwater instrumentation fish, said apparatus comprising:

a main tow line secured to a towing vessel;

depressor means attached to said tow line to depress it below the surface of the water;

means for attaching the fish to said line to permitting movement of the fish along said line;

upper tether means secured to the fish and to an upper tether point on said line;

lower tether means secured to the fish and to a lower tether permit on said line; and

means integral with the fish, for resisting vertical heave forces;

whereby drag forces on said upper and lower tether means are transmitted to the fish and tend to maintain it in an equilibrium position between said upper and lower tether points, and whereby rapid vertical oscillations of said tow line, caused by surface motion of the towing vessel, are heavily damped and not transmitted to the fish.

4,175,434

COMPOUND METER ASSEMBLY

Allen C. Bradham, III, and Edward A. Seruga, both of Milwaukee, Wis., assignors to Badger Meter Inc., Milwaukee, Wis.

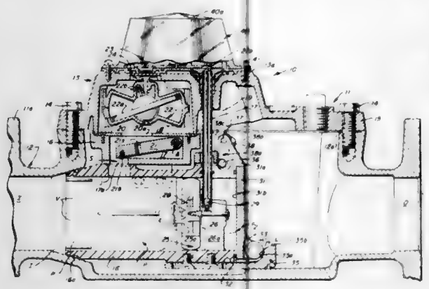
Division of Ser. No. 746,536, Dec. 1, 1976, Pat. No. 4,100,799.
This application Apr. 17, 1978, Ser. No. 897,189
Int. Cl.² G01F *7/00*
U.S. Cl. 73—197 **5 Claims**

1. A method of regulating and measuring fluid flow comprising the steps of:

directing fluid into an assembly having first and second flow

paths with inlets in fluid communication with one another and first and second valve means disposed in said first and second flow paths respectively such that said first flow path is at least partially open and said second flow path is closed by said second valve means at a low rate of flow of said fluid through said assembly, said second valve means being held closed with a predetermined locking force;

substantially precluding fluid flow through said first flow path by substantially closing said first valve means when the rate of fluid flow through said first flow path increases to a first predetermined rate thereby causing an abrupt



increase in the pressure differential acting on said closed second valve means;

utilizing only said increased pressure differential to overcome said predetermined locking force and open said second valve means, thereby opening said second flow path; and

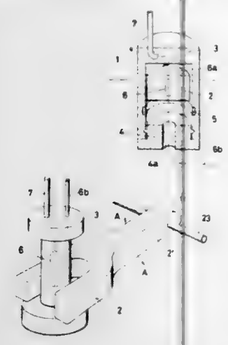
closing said second flow path by closing said second valve means only when the fluid pressure differential thereacross due to the rate of flow therethrough diminishes to a pressure differential substantially lower than the pressure differential thereacross at said first flow rate prior to closure of said first valve.

4,175,435

LIQUID LEVEL DETECTING DEVICE

Kunio Hara, Kawasaki, Japan, assignor to Nifco Inc., Tokyo, Japan

Filed Aug. 10, 1978, Ser. No. 932,735
Int. Cl.² G01F 73/12; H01H 36/00
U.S. Cl. 73—313 **2 Claims**



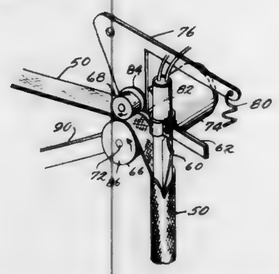
1. A liquid level detecting device, comprising a float provided with an inner hole internally incorporating permanent magnets and a barrel inserted through the inner hole of said float to guide the movement of the float and internally provided with a magnetically operatable lead switch, whereby the movement of the float which constantly follows the movement of a liquid surface selectively actuates the lead switch inside the barrel to permit detection of the liquid said float being formed in the shape of a horseshoe substantially to enclose the barrel and said float being provided with a rod member with a portion of the rod member rotatably fastened on a stationary means so as to permit the float to enjoy freedom of vertical movement relative to the barrel and selectively actuate the lead switch in the barrel.

4,175,436

WET/DRY BULB HYGROMETER WITH AUTOMATIC WICK FEED

William B. Crawford, Greensboro; Vernon T. Daniel, Oak Ridge, and Kenneth Y. Wang, Greensboro, all of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Aug. 28, 1978, Ser. No. 937,199
Int. Cl.² G01N 25/62
U.S. Cl. 73—338.6 **24 Claims**



1. A wet/dry bulb hygrometer for monitoring and/or controlling humidity and temperature of a gaseous fluid having contaminants therein, said hygrometer comprising:

a housing having an inlet and an outlet for a gaseous fluid and a passage extending therethrough from the inlet to the outlet;

blower means in said passage for causing the flow of gaseous fluid therethrough at a predetermined rate of flow;

a dry bulb sensor extending into said passage;

a wet bulb sensor extending into said passage;

a source of wick material for said wet bulb sensor;

means for moving said wick material over said wet bulb sensor to provide a fresh wicking surface therefor; and

means to wet said wick material.

15. In combination:

an apparatus for treating materials with a gaseous fluid, said apparatus having a housing defining chamber for the materials; and

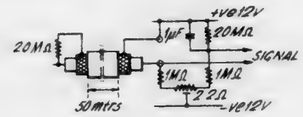
a wet/dry bulb hygrometer for monitoring the humidity and temperature of the gaseous fluid within the chamber, said hygrometer including a housing having a first portion mounted exteriorly of the chamber and having a second portion extending through a wall of the chamber, said hygrometer housing having a passage therethrough extending from an inlet in said second portion positioned within the chamber of said apparatus housing to an outlet in said second portion positioned within the chamber of said apparatus housing, a blower means in said passage in the first portion of said hygrometer housing for causing flow of gaseous fluid therethrough at a predetermined rate of flow, a dry bulb sensor extending through said first portion of said hygrometer housing into said passage, a rod-like wet bulb sensor extending through said first portion of said hygrometer housing into and having a free end in said passage, a source of wick material exterior of said hygrometer housing for said wet bulb sensor, means for moving said wick material through said first portion of said hygrometer housing into said passage and over said wet bulb sensor and then out of said first portion of said hygrometer housing whereby a fresh wicking surface is provided for said wet bulb sensor, and means exterior of said hygrometer housing for wetting said wick material.

4,175,437

FIRE, TEMPERATURE OR HEAT DETECTOR

Dennis W. Burt, The Bungalow, Woodhouse La., Moulton Loosegate, Spalding, Lincolnshire, England

Filed Jun. 19, 1978, Ser. No. 916,533
Int. Cl.² G01K 7/24
U.S. Cl. 73—362 AR **7 Claims**



1. A fire, temperature or heat detection system, comprising a cable having at least two conductors separated by an electrically insulating material whose electrical resistance varies as a continuous function of temperature, and signal deriving means connected to the conductors of the cable for deriving an analog signal proportional to the electrical resistance of the insulating material and thus proportional to the cable temperature.

4,175,438

TEMPERATURE MEASURING PROBE

Josef Wenzl, Hebertshausen, and Günter Meikis, Karlsfeld, both of Fed. Rep. of Germany, assignors to Motoren- und Turbinen-Union Munchen GmbH, Fed. Rep. of Germany

Filed Apr. 17, 1978, Ser. No. 897,059
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1977, 2716884
Int. Cl.² G01K 1/12
U.S. Cl. 73—359 R **11 Claims**



1. A temperature measuring probe which includes precious metal thermo-wires arranged in a substantially tubular-shaped probe body, the thermo-wires extending between temperature sensing means exposed to a flow of a hot medium and coupling means for connecting the probe to at least one of indicating means or control means, the coupling means and the temperature sensing means being arranged in parallel planes laterally offset from one another with at least a portion of the probe body extending in a plane of the coupling means, and a terminal member provided at one end of the probe body, a longitudinal axis of the terminal member extending at a right angle to a longitudinal axis of the probe body between the two parallel planes, the probe body being adapted to cool the thermo-wires, characterized in that an arc-shaped transition member is provided between the probe body and the terminal member, the transition member has a substantially round cross-sectional configuration, and in that the terminal member has a shallow rectangular cross-sectional configuration whereby a substantially laminar flow of the coolant through the probe body is achieved.

4,175,439

APPARATUS AND METHOD FOR COLLECTING, STORAGE AND TRANSPORTING LIQUID SAMPLES FOR DIAGNOSTIC EXAMINATION

Thomas L. Laker, 760-A Green Hill Rd., Madison, Conn. 06443

Filed May 13, 1977, Ser. No. 797,512
Int. Cl.² G01N 1/12
U.S. Cl. 73—425.4 R **3 Claims**



1. A device for collecting, storage, transporting and discharging a liquid sample collected from a liquid supply desired to be examined for medical, industrial or diagnostic purposes comprising

(a) a resilient absorbent member having sufficient capillary structure to absorb a portion of the liquid to be sampled when the absorbent member is placed in contact with the liquid supply or when the member is removed from the liquid supply to discharge the absorbed liquid upon the application of compressive pressure to the absorbent member;

(b) a sealable container for receiving, containing, storage and transporting the absorbent member holding the liquid;

(c) a handling stick for removably attaching the absorbent member thereto for inserting and removing the absorbent member relative to the liquid supply and the container respectively;

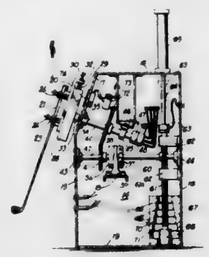
(d) the handling stick is provided at one end with a fork portion having tines for holding the absorbent member.

4,175,440

APPARATUS FOR DYNAMICALLY TESTING GOLF CLUBS

W. Jesse Booth, P.O. Box 1122, Cordele, Ga. 31015

Filed Aug. 10, 1978, Ser. No. 932,441
Int. Cl.² G01M 19/00; G01P 3/26
U.S. Cl. 73—432 SD **13 Claims**



1. An apparatus for dynamically testing golf clubs comprising a rotary inclined shaft having a head, a linear slide carried by said head on a linear movement axis across the head, a club shaft adjustable clasp means carried by the linear slide, the linear movement axis of the slide and the axis of the clasp means being substantially normal to the axis of the rotary inclined shaft and approximating the normal inclination of a

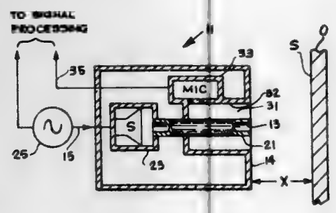
club shaft during actual usage by a golfer, an angular velocity indicator drivingly coupled with the rotary inclined shaft to indicate the angular velocity of a club being tested, means to power said rotary inclined shaft in one direction of rotation to move a club being tested on a backstroke, means to then move the club being tested on a forward power stroke, and fluid pressure responsive means operated by displacement of the linear slide due to centrifugal force acting on the club and slide during the forward power stroke and including a centrifugal force indicator.

4,175,441

GAUGE FOR MEASURING DISTANCE TO PLANAR SURFACES AND THICKNESSES OF PLANAR MEMBERS

Karel Urbanek, Atherton; George J. Kren, Los Altos, and William R. Wheeler, Saratoga, all of Calif., assignors to Tencor Instruments, Mountain View, Calif.

Filed May 8, 1978, Ser. No. 903,493
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—599 **23 Claims**



1. A gauge for measuring gap distance between a planar surface of an object and an orifice comprising,

acoustic means for modulating ambient pressure, said acoustic modulating means having an acoustic output means having a first orifice for emitting acoustic modulation toward the frontal surface of a non-vibrating planar object and establishing acoustic pressure in a gap defined between said acoustic output means and said frontal surface,

acoustic modulation detection means having an acoustic input means, including a second orifice for receiving acoustic modulation, operating at the same time as said acoustic output means and disposed proximate to said acoustic output means, said detection means for producing electrical signals representing the amplitude of detected acoustic modulation in said gap, said acoustic output means and said acoustic input means both facing said frontal surface in an acoustic emission, reflection and detection relationship therewith, and

signal processing means connected to receive said electrical signals, for producing a gap distance measurement signal from the amplitude of said electrical signals in accord with a known relation.

4,175,442

METHOD AND APPARATUS FOR THE ULTRASONIC DETECTION OF FLAWS IN HOT METALLIC OBJECTS

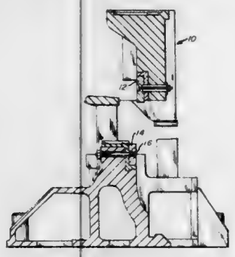
Hazle B. Terry, Birmingham, Ala., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 5, 1978, Ser. No. 867,059
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—627 **2 Claims**

1. A method of determining the optimum crop point of a hot rolled primary mill product, said method comprising:

(1) positioning said mill product with one end thereof between the upper and lower blades of a crop shear, one blade of said crop shear having acoustically coupled therewith an ultrasonic transducer connected to an indicating device,

(2) contacting respectively, the upper and lower surfaces of said product end with the upper and lower blades of the shear and with sufficient pressure to form an acoustic couple between said transducer and said product, and



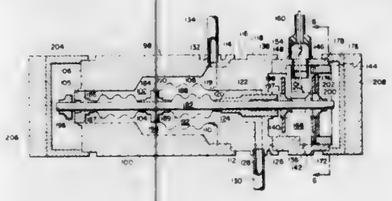
(3) monitoring the indicating device to determine if a primary pipe is in the plane of said crop shear blades.

4,175,443

WET-WET DIFFERENTIAL PRESSURE TRANSDUCER

John C. Schneider; S. Eugene Hanson, and Bruce W. DuVall, all of Colorado Springs, Colo., assignors to Kaman Sciences Corporation, Colorado Springs, Colo.

Filed May 25, 1978, Ser. No. 909,666
Int. Cl.[2] G01L *9/10*
U.S. Cl. 73—722 **12 Claims**



1. Apparatus for measuring a difference between sources of pressure, comprising:

housing means having ends and side walls;

first and second pressure chambers in said housing means each connected to different sources of pressure;

third and fourth pressure chambers positioned respectively within the first and second chambers and provided with fluid tight sealing means sealing same against communication with said first or second pressure chambers, with the ambient atmosphere or with each other;

a first longitudinally movable flexible wall positioned between the first and second chambers;

a second longitudinally movable flexible wall positioned between the first and third chambers;

a third longitudinally movable flexible wall positioned between the second and fourth chambers;

a movable common wall between said first and second chambers;

said first flexible wall having one end connected to the housing means and the other end connected to the common movable wall within the housing;

said second and third flexible walls each having one end connected to the common movable wall and the other end connected to the housing; and

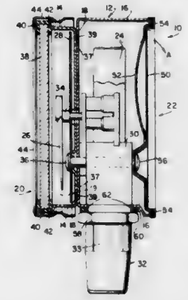
means to measure the displacement of the common wall as a function of the differential pressure within the first and second chambers.

4,175,444

GAUGE ASSEMBLY

Philip W. Harland, Perkasie, Pa., assignor to Ametek, Inc., Sellersville, Pa.

Filed Aug. 10, 1978, Ser. No. 932,517
Int. Cl.[2] G01L *19/06*
U.S. Cl. 73—738 **6 Claims**



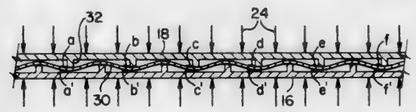
1. A gauge assembly comprising a casing adapted to be liquid filled during operation of said assembly, said casing including front and rear cup members joined together to form a partition wall therein, front and rear covers for sealingly enclosing said front and rear cup members at their opened ends, respectively, said rear cover being constructed and arranged to separate from said rear cup member when the pressure of said liquid within said casing exceeds a given level, indicator means disposed within said front cup member for indicating a physical condition to be measured, and condition responsive means disposed within said rear cup member and coupled to actuate said indicator means in corresponding relationship to said physical condition.

4,175,445

PRESSURE SENSING APPARATUS

John S. Templeton, III, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Sep. 5, 1978, Ser. No. 939,580
Int. Cl.[2] G01L *11/00*
U.S. Cl. 73—768 **15 Claims**



1. A pressure sensing apparatus for measuring pressure forces in an embedding medium comprising:

a housing whose thickness is substantially less than its width having first and second plates which are substantially parallel to one another and which are attached at their peripheral edges and are also responsive to external pressure forces;

a thin, flexible member supported within said housing in spaced relationship between said first and second plates;

a plurality of standoffs whose longitudinal axes are substantially parallel to one another and substantially parallel to one another and substantially normal to the direction of external pressure wherein said standoffs support said member in spaced relationship to permit reverse curvature bending of said member when said first and second plates are exposed to said external pressure defining tension and compression zones on the surfaces of said member such that the stiffness of the pressure sensing apparatus is substantially similar to the average anticipated stiffness of the embedding medium yet said apparatus is insensitive to variations in the stiffness of the embedding medium; and

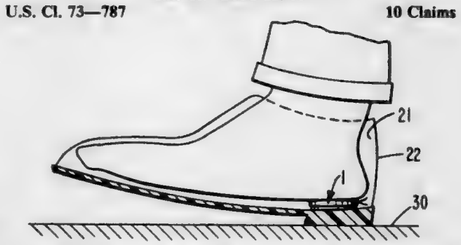
means for measuring the deformation of said member resulting from the reverse curvature bending due to said external pressure forces.

4,175,446

STEP COUNTING DEVICE AND METHOD

Roy D. Crowninshield, and Andrew J. Branch, both of Iowa City, Iowa, assignors to The University of Iowa Research Foundation, Iowa City, Iowa

Filed Apr. 26, 1978, Ser. No. 900,216
Int. Cl.[2] G01C *22/00*
U.S. Cl. 73—787 **10 Claims**



1. Apparatus for counting the steps taken by a subject wearing said device comprising:

(a) a shoe,

(b) a support member mounted on said shoe, at a location which is subjected to compressive forces while walking,

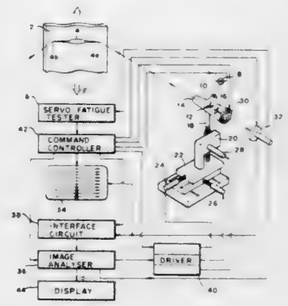
(c) a fatigue life gauge bonded to an area of the support member which is normally relaxed and is strained in response to steps taken on the device by the subject, whereby said fatigue life gauge is strained and the number of steps taken by said subject may be ascertained by measuring the properties of said fatigue life gauge.

4,175,447

APPARATUS FOR DETECTING CRACK LENGTH OF A TEST PIECE IN A FATIGUE TEST

Toshihiko Fukuhara, Hatano, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 25, 1978, Ser. No. 954,600
Claims priority, application Japan, Oct. 26, 1977, 52-127640
Int. Cl.[2] G01N *3/32*
U.S. Cl. 73—799 **10 Claims**



1. An apparatus for detecting crack length of a test piece in a fatigue test:

comprising a light source;

irradiation means for irradiating the crack formed in the test piece by reflecting a light beam from said light source;

camera tube means for displaying an image of the crack thereon by means of reflected light beam from said test piece, said reflected light beam being adapted to pass through said irradiation means before reaching said camera tube means;

memory means for memorizing said image for an extended period;

monitor means connected to said memory means for monitoring said image of the crack;

image analyser means connected to said memory means for analyzing said image of the crack from signals supplied from said memory means, said image analyser means being also adapted to memorize data concerning positions of one of the leading ends of said crack when said leading end is adjusted to locate at a preset position on said monitor means;

transfer means for moving said irradiation means three dimensionally according to output signals from said image analyser means;

fatigue tester means for applying repeating loads on said test piece, said fatigue tester means being connected with said image analyser means and controlled thereby; and

command controller means for controlling an overall time sequence of the apparatus based on load signals fed from said fatigue tester means;

4,175,448

ELECTROMECHANICAL SWITCHING SYSTEM

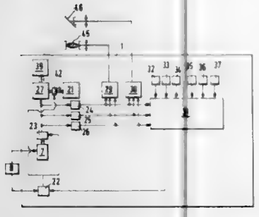
Peter Loew, Wallau, and Wolfgang Hummel, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 21, 1977, Ser. No. 844,468

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 2647787

Int. Cl.[2] **F16H** *3/08, 5/06;* **B60K** *20/10;* **B60L** *5/10*

U.S. Cl. 74—365 **8 Claims**



1. An electromechanical switching system comprising:

a multi-stage gearbox for changing the rotational speed of a drum connected to driving means, said gearbox having a plurality of manually selectable gear ratios;

a lever coupled to said gearbox, which lever is movable into a plurality of different positions for selecting said gear ratios and is coupled to said electromechanical switching system;

means for indicating the gear ratio selected, said indicating means comprising a series of electromechanical switching elements which produce control signals;

means responsive to said gear ratio indicating means for automatically locating at least one component such as optical reproduction means, as, for example, an objective, mirror and the like, said component connected to said switching system in the position corresponding to the selected gear ratio, said locating means comprising motor means connected to said component for positioning said component in response to said control signals; and

means for locking said gearbox in the selected one of said gear ratios.

4,175,449

TILT CAB STEERING COLUMN

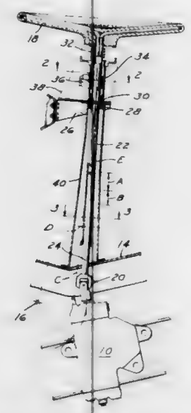
Walter Manning, Little Baddow, and Terry G. Bradley, Chelmsford, both of England, assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 2, 1977, Ser. No. 847,985

Claims priority, application United Kingdom, Feb. 9, 1977, 5272/77; Feb. 9, 1977, 5273/77

Int. Cl.[2] **B62D** *1/18*

U.S. Cl. 74—492 **7 Claims**



1. A steering column assembly comprising an elongate upper column member for connecting with a steering wheel and an elongate lower column member for connection with a steering box,

the steering wheel being secured directly to the upper column member,

the lower column member being telescopically received within the upper column member for sliding movement between an operative and an inoperative position,

the upper column member having a first length of its internal surface adjacent the received end of the lower column member, when in said operative position, dimensioned to fit closely on the inner member and a second length extending from its first length toward its receiving end diverging to provide a clearance,

the portion of the lower column member which lies, in said operative position, within said first length of the upper column member being coated with a low friction polytetrafluoroethylene material,

the upper and lower column members being of non-circular cross section,

the upper column member comprises a tube and the lower column member a rod,

and bearing means supporting the members for rotation about their longitudinal axis and for limited tilting of said axis.

4,175,450

MOTION TRANSMITTING REMOTE CONTROL ASSEMBLY

William G. Bennett, Troy, Mich., assignor to Teleflex Incorporated, Limerick, Pa.

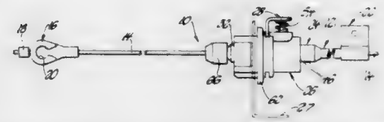
Filed Feb. 21, 1978, Ser. No. 879,455

Int. Cl.[2] **F16C** *1/10*

U.S. Cl. 74—501 P **12 Claims**

1. A motion transmitting remote control assembly comprising; a conduit, a core element movably supported by said conduit with the ends thereof extending from the ends of said conduit, a fitting adjacent a first end of said conduit for attaching said conduit to a support structure, adjustment means

attached to said conduit adjacent the second end thereof, support means adapted for attachment to a support structure and movably supporting said adjustment means, locking means supported by said support means for movement between engaged and disengaged positions for controlling relative movement between said adjustment means and said support means in a direction longitudinally of said conduit when in said engaged position, said adjustment means and said support means including retaining means for preventing removal of said adjustment



means for said support means, said support means including a passageway extending therethrough, said adjustment means being slidably supported in said passageway, said retaining means including at least one flange extending into said passageway from said support means and first and second spaced abutments extending radially from said adjustment means and disposed on opposite sides of said flange for limiting movement of said adjustment means in said passageway and preventing said removal of said adjustment means from said support means.

4,175,451

GUIDANCE SYSTEM USING SPRING-STORED ENERGY

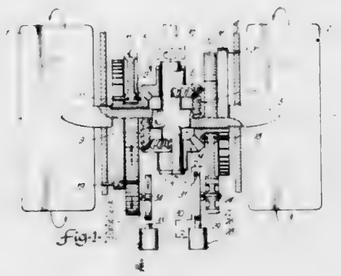
Frederick D. Ward, Quebec, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Quebec, Canada

Filed Nov. 22, 1977, Ser. No. 853,857

Claims priority, application Canada, Dec. 17, 1976, 268087

Int. Cl.[2] **F16H** *1/00*

U.S. Cl. 74—661 **27 Claims**



1. A device for controlling the angular position of a vane comprising:

(a) a first shaft,

(b) a second shaft normal to and solid with said first shaft;

(c) a vane secured adjacent one end of said first shaft;

(d) a differential gear arrangement having a pair of gears rotatably mounted on said first shaft and at least one gear meshing with said pair of gears and rotatably mounted on said second shaft;

(e) drive means drivingly connected to one gear of said pair of gears;

(f) motor means drivingly connected to said drive means to drive the same;

(g) means selectively operable to effect incremental movement of the drive means; and

(h) brake means associated with the second gear of said pair of gears to arrest the same, whereby incremental movement of said drive means causes a change in the angular position of said vane.

4,175,452

MACHINE FOR THE MECHANICAL WORKING OF BAND SAWS

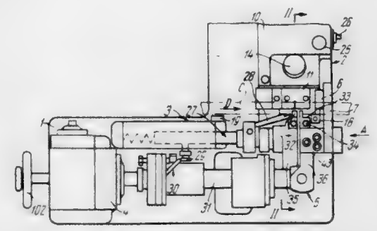
Vladimir V. Idel, Zakarpatskaya oblast, U.S.S.R., assignor to Mukachevsky Stankostroitelny Zavod Imeni S.M. Kirova, U.S.S.R.

Filed Mar. 2, 1977, Ser. No. 773,752

Claims priority, application U.S.S.R., Mar. 30, 1976, 2333522; Mar. 30, 1976, 2333523

Int. Cl.[2] **B23D** *63/00*

U.S. Cl. 76—25 R **4 Claims**



1. Apparatus for setting teeth of band saw blades and cutting thereof, means for advancing a band saw blade longitudinally, a tooth-setting device comprising two pivotally mounted arms having tooth-setting tools thereon, pivot means pivotally mounting said two arms, means for actuating said arms to effect setting of the teeth on said band saw blade, a pair of knives disposed downstream of said tooth setting device for cutting said blade after the teeth thereof have been set, means mounting one of said knives stationary, said pivot means pivotally mounting the other knife of said two knives, means to render said other knife effective when a given number of teeth on a corresponding length of said blade have been set, actuating means on one of said arms for actuating said other knife when rendered effective to cooperate with the stationary knife to effect cutting of said band saw blade.

4,175,453

DEVICE FOR TENSIONING SEVERAL SCREW BOLTS

Gerhard Exner, and Volfango Festinori, both of Berlin, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Mar. 28, 1978, Ser. No. 890,920

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1977, 2718602

Int. Cl.[2] **E21B** *19/00*

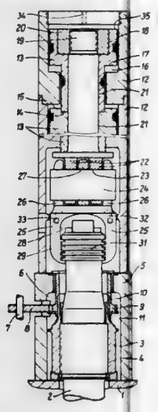
U.S. Cl. 81—57.38 **4 Claims**

1. In a device for tensioning a screw bolt of a nut and screw bolt combination, the device comprising: a support ring having recesses for receiving said screw bolt and nut; a turning unit fastened to said ring for rotating said nut; a lifting cylinder arranged on said support ring and having a piston, the improvement comprising means coupled to the piston for engaging the screw bolt in a positive locking manner in response to only a tensioning movement of the piston, said means including:

(a) a first member connected to the piston for movement therewith in the direction of tensioning;

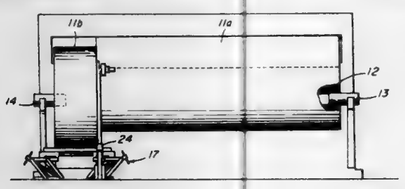
(b) a second member hinged to said first member;

(c) an extending portion of said screw bolt having thereon an engagement surface; and



(d) guide surfaces for pressing said second member against said engagement surface of said screw bolt in a positively-engaging and self-locking manner.

4,175,454
APPARATUS FOR RECOVERING PAPER IN USABLE FORM FROM A DAMAGED ROLL
David J. Goldstein, 6 Oakland St., Fall River, Mass. 02720
Filed Aug. 8, 1977, Ser. No. 822,406
Int. Cl.[2] B23B *5/14*
U.S. Cl. 82—86 **4 Claims**



1. An apparatus for recovering in usable form the undamaged portion of a damaged roll of paper comprising in combination:

(a) unwinding means (**15**) for supporting a damaged roll of paper on its axial core so as to permit unreeling forwardly;

(b) a support means (**20**) spaced rearwardly of said unwinding means (**15**) and positionable along said roll axially thereof;

(c) a rigid arm (**18**) pivotally mounted on said support means (**20**);

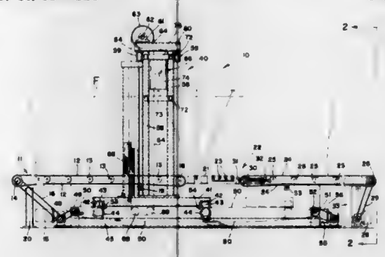
(d) cutting means (**19**) attached to said rigid arm (**18**) and provided with a motor means (**53**);

(e) piston means (**23**) for selectively raising and lowering said rigid arm (**18**) for positioning said cutting means (**19**) adjacent the point at which the paper is unreeled from the undamaged portion of said roll; and,

(f) roller means (**17**) having rollers (**30**) and means (**37**) to adjust said rollers vertically at a fixed adjustable position and means (**60**) permitting adjustable positioning of said rollers axially along said roll to support the damaged portion of the roll from beneath while the undamaged portion is unreeled to stabilize said roll during unreeling;

said apparatus being so arranged so that said cutting means cuts said roll of said paper as it is unreeled to the selected depth so that what is unreeled is the undamaged portion, the damaged portion remaining on the unwinding means (**15**).

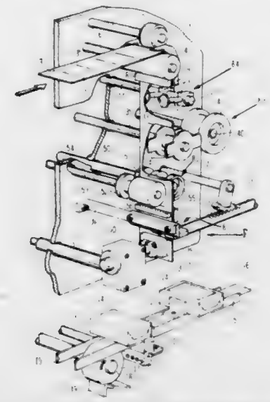
4,175,455
TRAVELLING CUT-OFF SAW
James Genis, Clinton, and William T. Mars, Cuyahoga Falls, both of Ohio, assignors to McNeil Corporation, Akron, Ohio
Filed Mar. 22, 1978, Ser. No. 888,829
Int. Cl.[2] B28B *11/14*
U.S. Cl. 83—110 **6 Claims**



1. Apparatus for severing a continuous material into sections comprising, an infeed conveyor carrying the continuous material in a longitudinal direction, stationary cutting platen means at the end of said infeed conveyor, cutting means above the material and movable longitudinally and vertically to sever the material into sections, outfeed conveyor means adjacent said platen means to carry away the severed sections, sensor means providing an output signal indicative of the speed of said infeed conveyor, first counter means receiving the output signal of said sensor means and providing an output signal when the material carried by said infeed conveyor has travelled a predetermined distance, said predetermined distance being selected according to the desired length of the severed sections of material, the output signal of said first counter means initiating the longitudinal movement of said cutting means, and second counter means receiving a signal indicative of the longitudinal distance between the initial position of said cutting means and said stationary platen means and receiving the output signal of said sensor means to provide an output signal indicative of the amount of longitudinal movement of said cutting means from the point of the initial longitudinal movement thereof and until the point of initial vertical movement thereof so that the vertical movement of said cutting means may be initiated thereby assuring that cutting of the material is completed over said stationary platen means.

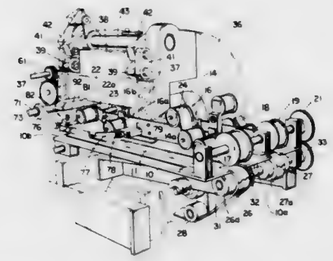
4,175,456
FEEDING AND CUTTING DEVICE FOR SHEET MATERIAL
Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Bologna, Italy
Filed Jan. 16, 1978, Ser. No. 869,522
Claims priority, application Italy, Jul. 27, 1977, 3510 A/77
Int. Cl.[2] B26D *5/22*
U.S. Cl. 83—176 **3 Claims**

1. A feeding and cutting device for sheet material in the form of a continuous web to be cut into pieces at substantially equi-spaced transverse slits provided centrally through the web, the device comprising a web path for said web; cutting means associated with said web path and arranged transversely thereto, said cutting means comprising a cutting movable on a cutting plane through said web path; web feeding means to feed the web to said cutting means in a step-by-step manner; a fixed registering member arranged on said cutting plane on one side of the web path; reciprocating pushing means arranged on the other side of the web path and operable towards the latter to depress the leading edge of one said slit arranged downstream from said cutting plane; and return means to engage the web upstream from said cutting plane and draw the web backwards until said depressed leading edge abuts said registering member at said cutting plane, said return means comprise



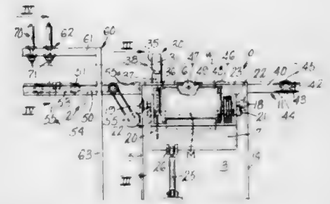
sucker means reciprocating along said web path while remaining substantially stationary in a direction transversely of the web path and substantially continuously engaging said web at a position upstream from said cutting plane and at least during their movement away from said cutting plane.

4,175,457
BINDING HOLE PUNCH APPARATUS
Morris L. Jacobs, 524 W. Somerset Dr., Indianapolis, Ind. 46260, and Hiram J. Dunagan, Moral Rd., Fairland, Ind. 46126
Filed Apr. 7, 1978, Ser. No. 894,539
Int. Cl.[2] B26D *5/22*
U.S. Cl. 83—230 **1 Claim**



1. An apparatus for punching spaced binding holes in discrete stacks of bound pages arriving at relatively high speed from an automatic stitcher-binder or the like, said apparatus comprising a table supported in a generally horizontal plane adapted to receive the bound page stacks at one end margin of the table and to discharge the stacks at its opposite end margin, a powered conveyor belt moved parallel to the surface of said table for moving the bound page stacks in end-to-end relation between said receiving and discharge margins of the table, a unitary die and punch assembly removably mounted adjacent said discharge margin of said table and adapted to receive one-by-one between its die and punch components the bound page stacks moving from said table, a punch bar supported for rectilinear vertical reciprocation between a lowered position in which it actuates said die and punch assembly to punch spaced holes in the bound page stack accommodated in the punch and die assembly and a raised position deactuating said die and punch assembly to permit the punched stack to move off said table and completely through said punch and die assembly, power means for moving said punch bar between its said positions, a stop member mounted for arcuate movement on a first shaft (**71**) for defining when in operative position the position of the leading margin of the accommodated page stack as said die and punch assembly is actuated, a pinch roller mounted for pivotal movement on a second shaft (**23**) for maintaining said accommodated page stack in driving engagement with said conveyor belt, and cam means operated in synchronism with the motion of said punch bar for incrementally rotating said first shaft and said stop member out of operative position as said punch bar ascends and for incrementally rotating said second shaft and said pinch roller out of belt engaging position as said punch bar descends, said cam means comprising a third shaft (**66**) carrying a first cam (**67**) and a second cam (**68**) each independently mounted on said third shaft in spaced relation to each other, said first cam cooperating with said first shaft and said second cam cooperating with said second shaft to provide said incremental motion of the shafts, and power means for rotating said third shaft.

4,175,458
CUT-OFF SAW
Alfonso A. Paris, Jr., and Douglas W. Muscanell, both of South Hill, Va., assignors to New England Log Homes, Inc., Hamden, Conn.
Filed Apr. 13, 1978, Ser. No. 895,925
Int. Cl.[2] B27B *5/18, 27/00*
U.S. Cl. 83—268 **5 Claims**



1. A cut-off saw assembly for cutting longitudinally grooved logs to selected predetermined lengths comprising a saw and clamp station, a feed table, a delivery table, and a stop assembly, the saw and clamp station having

a power driven saw,

a vertically movable support for the saw,

means for moving the saw upward across the path of a workpiece,

a vertically movable clamp, and

means for moving the clamp into engagement with the top of a workpiece,

the feed table having a plurality of rolls and guide means engageable with the longitudinal groove in a workpiece,

the delivery table having a plurality of rolls and guide means engageable with the longitudinal groove in a workpiece, and

the stop assembly being associated with the delivery table and having means for supporting stop devices at selected points above the path of the workpiece and along the length of the delivery table, a plurality of stop devices mounted on said

supporting means and means for actuating selectively any one stop device.

V. 984 NO. 2 7 9 UMI

4,175,459

FLYING SHEARS FOR SEVERING A RUNNING WIRE

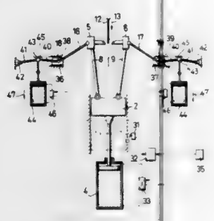
Günter Ditges, Cologne; Wilhelm Mörs, and Rolf Gärtner, both of Weiden, all of Fed. Rep. of Germany, assignors to Meyer, Roth & Pastor Maschinenfabrik GmbH, Cologne, Fed. Rep. of Germany

Filed Apr. 18, 1978, Ser. No. 897,649

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1977, 2732770

Int. Cl.² B23D 25/08

U.S. Cl. 83—315 **11 Claims**



1. A cutting apparatus for severing a wire continuously advanced through the apparatus along a wire path in a feeding direction parallel to the wire axis, comprising:

(a) a machine frame;

(b) a carriage supported for displacement parallel to said feeding direction;

(c) two cutting members;

(d) means connecting said cutting members with said carriage;

(e) a support arm articulated to at least one of said cutting members;

(f) displaceable anchor means comprising a slide;

(g) a support joint arranged on said support arm at a distance from the associated cutting member and articulating said support arm to said displaceable anchor means;

(h) drive means for moving said carriage in and opposite said feeding direction to cause, with the cooperation of said anchor means and said support arm, a motion of the cutting member in an arcuate path towards and, subsequent to severing, away from the wire path and the other cutting member;

(i) a force-exerting means comprising an additional drive means for shifting said anchor means to effect a displacement of said support joint and said support arm for affecting the course of the arcuate path of said cutting member;

(j) means for guiding said slide in said machine frame transversely to said feeding direction; and

(k) a toggle having first and second toggle links connected to one another by a toggle joint; said first toggle link being articulated to said slide and said additional drive means being connected to said toggle joint.

4,175,460

FELT, BELT, AND FABRIC TRIMMER

John D. McPhail, 2125 E. 38th St., Savannah, Ga. 31404

Filed Mar. 27, 1978, Ser. No. 890,303

Int. Cl.² B26D 3/12

U.S. Cl. 83—856 **7 Claims**

1. Trimmer apparatus for trimming the edges of an endless belt, said apparatus comprising:

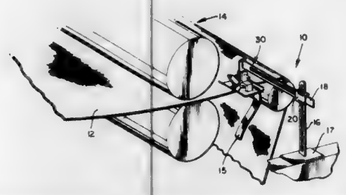
first bracket bar means for attachment of said trimmer apparatus to a machine;

second bracket bar means for attachment to said first bracket bar means;

foot means removably attached to said second bracket bar means and having a region which selectably contacts a belt to be trimmed;

knife means removably attached to said foot means in operative relation to cut a belt which is contacting said region and moving relative to said region; and

means for maintaining the angular relationships of said first



bracket bar means to said second bracket bar means while allowing slidable adjustment of said second bracket bar means along at least a portion of the length of said first bracket bar means.

4,175,461

ELECTROMAGNETIC PICKUP DEVICE

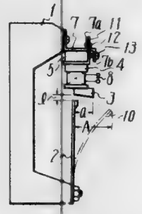
Yukio Nagata; Eiji Satoh, and Keinosuke Tsuchida, all of Kawasaki, Japan, assignors to Nippon Columbia Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1977, Ser. No. 826,991

Claims priority, application Japan, Aug. 25, 1976, 51-101387; Apr. 30, 1977, 52-50236

Int. Cl.² G10H 3/08

U.S. Cl. 84—1.15 **5 Claims**



1. In an electromagnetic pickup device for transducing a mechanical vibration of a vibratory reed into an electric signal, said electromagnetic pickup device comprising, a vibratory reed having a longitudinal axis one end portion of which is fixed to a supporting member and the remaining portion of which is free to vibrate in a predetermined transverse direction, a magnetic means mounted on said supporting member in an alignment relationship to a longitudinal axis of said vibratory reed at a rest position thereof, said magnetic means including a pole piece member, said pole piece member including a surface having an opposing face portion which extends transversely from said rest position to one side of said predetermined transverse direction of a vibration of said reed for a distance such that a substantially constant gap is formed between said reed and said magnetic means so as to maintain constant low magnetic reluctance for a period no longer than one-fourth (¼) cycle of said vibration during vibration from said rest position of said reed, said magnetic means has a magnetizing direction parallel to the longitudinal axis of said reed, and a coil means associated with said magnetic means to generate an electrical signal in response to said vibration of said reed.

4,175,462
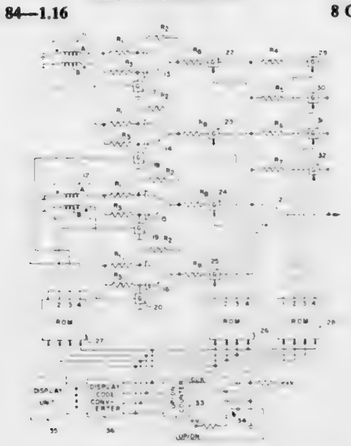
SYSTEM FOR SELECTION AND PHASE CONTROL OF HUMBUCKING COILS IN GUITAR PICKUPS

Jonathan C. Simon, 1451 26th St., Santa Monica, Calif. 90404

Filed Jun. 17, 1977, Ser. No. 807,368

Int. Cl.² G10H 3/00

U.S. Cl. 84—1.16 **8 Claims**



1. A system for the selection and phase control of humbucking coils in a plurality of electromagnetic guitar pickups to permit the musician to easily select different sounds comprising

a plurality of selection gates, each of which may be selected by a digital signal, one for each coil,

a plurality of means, one for each coil, for buffering and selectively inverting or not inverting a coil signal, each of which may be selected by a digital signal,

a summing means having a plurality of input terminals for receiving signals to be summed and amplified, and having a plurality of distinct gain factors each of which may be selected by a digital signal,

said plurality of guitar pickups each having a pair of humbucking coils, each coil having one end connected directly to circuit ground and the other end coupled to said summing means by one of said selection gates and one of said selectively inverting and buffering means in cascade,

digital memory means for storing different combinations of digital signals to select particular ones of said gates for the pickup coils to be used, to select particular ones of said selectively inverting means for selecting the phase of the coils selected, and to select said selectable gain factors of said summing means for the output level of the selected coils combined, and

means for addressing said digital storage means to read out one of said different combinations of digital signals.

4,175,463

RESONATOR FOR A MUSICAL TONE SYNTHESIZER

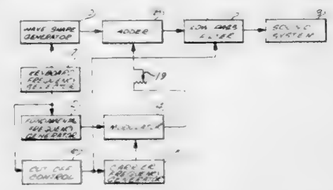
Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co. Ltd., Hamamatsu, Japan

Filed Dec. 5, 1977, Ser. No. 857,436

Int. Cl.² G10H 5/10

U.S. Cl. 84—1.19 **18 Claims**

1. A tone synthesizer having a resonance characteristic comprising means generating an audio tone signal having a plurality of harmonics, means generating a sinusoid signal having a frequency higher than the fundamental of the audio tone, means including a modulation signal source generating a signal having the frequency of the fundamental of the audio tone signal, means amplitude modulating the sinusoid signal,



and means adding the amplitude modulated sinusoid signal to the audio tone signal.

4,175,464

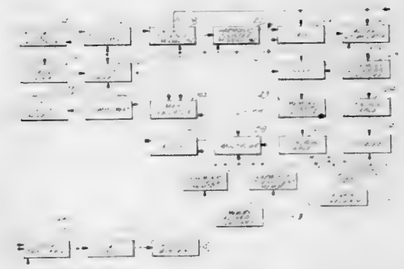
MUSICAL TONE GENERATOR WITH TIME VARIANT OVERTONES

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co. Ltd., Hamamatsu, Japan

Filed Jan. 3, 1978, Ser. No. 866,336

Int. Cl.² G10H 1/04, 1/06

U.S. Cl. 84—1.24 **20 Claims**



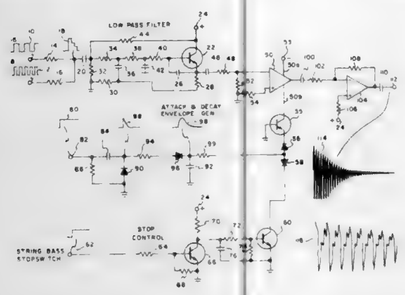
1. A musical tone generator for generating a voltage having a waveform corresponding to musical sounds having overtones that can be varied with time, comprising: a first addressable storage means for storing in predetermined addressable sequence a plurality of orthogonal function values, address generating means generating a series of numerical addresses corresponding to said predetermined addressable sequence, means synchronized with said address generating means for generating a sequence of numbers, a different number for each numerical address from said address generating means, the succession of numbers alternately increasing and then decreasing in value in a periodic manner, scaler means for scaling said sequence of numbers by a predetermined scale factor, means including an adder connected to the output of the means generating addresses and the scaler means for adding the scaled numbers to the numerical addresses for addressing said storage means in response to each sequential address modified by a scaled number and reading out the respective orthogonal function values, and means for converting each of said orthogonal function values to a voltage which varies in amplitude in proportion to changes in said orthogonal function values as they are read out of the storage means in response to the addresses from the adder.

4,175,465

CIRCUIT FOR SIMULATING STRING BASS SOUND

George F. Schmoll, III, Dolton, Ill., assignor to CBS Inc., New York, N.Y.

Filed May 1, 1978, Ser. No. 901,950
Int. Cl.[2] G10H *1/06, 5/12*
U.S. Cl. 84—1.26 6 Claims



1. In an electronic organ including tone generating means for producing a plurality of square wave signals having octavely related frequencies, apparatus for generating an electrical signal which when acoustically reproduced simulates a string bass sound, said apparatus comprising:

first circuit means for producing from said square wave signals pulses having a substantially sawtooth waveform and a preselected repetition frequency,

first amplifier means connected to receive said pulses for controlling the amplification of said pulses in accordance with an envelope signal having a short attack time and a relatively long decay time, and

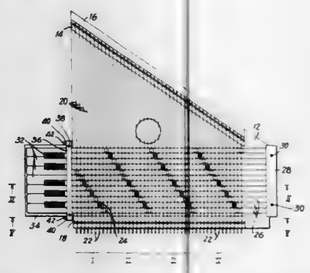
second amplifier means connected to receive amplified pulses from said first amplifier means for altering the harmonic content of the pulses produced at its output as a function of the attack and decay times of said envelope signal and producing an output electrical signal which when acoustically reproduced simulates a string bass sound.

4,175,466

STRINGED MUSICAL INSTRUMENT

Thomas P. Aronis, 95 Christopher St., New York, N.Y. 10014

Filed Jun. 21, 1978, Ser. No. 917,487
Int. Cl.[2] G10D *1/12*
U.S. Cl. 84—288 11 Claims



1. A stringed musical instrument comprising a support;

a plurality of strings secured to said support and adapted to vibrate when strummed, said strings defining a playing area and being arranged in groups of octaves;

a set of manually operable keys disposed outside of said playing area, each key being associated with a corresponding one string in each octave;

a damper bar secured to each key, each damper bar extending in a direction transverse to said strings and disposed beneath said strings, one end of each damper bar being coupled to a pivot point;

a plurality of damper elements secured to each damper bar, the damper elements on a given damper bar being associated with and positioned beneath a respective one string in each of said octaves so that all of said strings are accessible for strumming from above over substantially the entirety of said playing area including portions of said strings overlying said damping elements; and

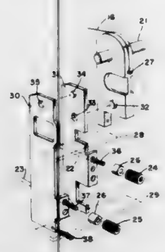
bias means for biasing all of said damper bars to a quiescent position, said bias means being overcome for a damper bar which is pivoted to an operating position in response to the manual operation of the key secured thereto, whereby all of the damper elements secured to said pivoted damper bar are spaced away from their associated strings in each octave to permit said associated strings to vibrate when strummed and all of the damper elements secured to the remaining damper bars are in contact with their associated strings to prevent substantial vibration thereof when said strings are strummed.

4,175,467

STRING MOUNTING APPARATUS

Ronald T. Lashley, Burlington, N.C., assignor to Emmons Guitar Company, Inc., Burlington, N.C.

Filed May 22, 1978, Ser. No. 907,927
Int. Cl.[2] G10D *3/14*
U.S. Cl. 84—312 P 2 Claims



1. A tone adjusting mechanism for a pedal-type musical instrument, comprising:

a string securing bridge member pivotally mounted on an axle, said bridge member adapted to receive a tensioned string thereon;

a first tone changing member pivotally connected to said bridge member;

a second tone change member pivotally connected to said first tone member;

stop means spaced from said axle for providing a rest position for said first and second tone changing members and for providing a pivot fulcrum for said first tone changing member when said second tone changing member is actuated; and

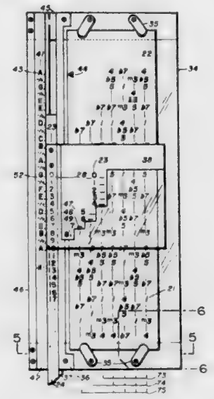
pivot/stop means generally located intermediate said axle and said stop means for providing a pivot fulcrum for said second tone changing member when said second tone changing member is actuated.

4,175,468

METHOD AND APPARATUS FOR MUSIC INSTRUCTION

Robert R. Whitlock, 7138 Hanover Pkwy., Greenbelt, Md. 20770

Filed Oct. 22, 1976, Ser. No. 734,885
Int. Cl.[2] G10G *1/02*
U.S. Cl. 84—485 SR 6 Claims



1. An apparatus for indicating finger pattern information for a musical stringed fingerboard instrument, comprising:

a first base; at least one type of fist indicia on said first base in a fingering pattern specified by pairs of coordinates having first dimension course coordinates representing courses of said stringed fingerboard instrument and second dimension string stop coordinates representing string stops characteristic of musical intervals used in fingering said stringed fingerboard instrument, the direction of increasing said string stop coordinates representing the direction of increasing musical pitch on the stringed fingerboard instrument, said pairs of coordinates forming a mapping image of allowable locations for fingering said stringed fingerboard instrument to sound musical tones of a chord or scale; a tuning reference being present on said first base;

a second base; a string stop series of second indicia on said second base, said second indicia representing an ordinal numbering of string stops of said stringed fingerboard instrument, said ordinal numbering ascending in the same directional sense as the direction of increasing said string stop coordinates of said fingering series, said second indicia having spacings which represent musical intervallic magnitudes characteristically used in stopping the strings of said stringed fingerboard instrument and which are of such size that pairs of indicia of said string stop series align with pairs of string stop coordinates of said fingering pattern, said aligned pairs of string stop coordinates representing the same musical intervallic magnitudes as said spacings of said second indicia thereto aligned, said string stop series being substantially adjacent to said fingering pattern along said second dimension of said fingering pattern, said string stop series and said fingering pattern being alignably repositionable with respect to each other in a direction substantially along said second dimension of said fingering pattern; a principal note reference being present on said second base; and

a third base; a negative principal note series of third indicia being on said third base and being substantially adjacent to said string stop series and said fingering pattern and being repositionable with respect to said string stop series and with respect to said fingering pattern in a direction substantially along said second dimension of said fingering pattern and representing a chromatic ordering of note names descending in musical pitch in the same directional sense as the direction of increasing musical pitch as represented by said string stop coordinates of said fingering pattern, pairs of said third indicia having such spacings as to be alignable with pairs of string stop coordinates of said fingering pattern representing the same musical intervallic magnitudes as characterized by said note names represented in turn by said third indicia so aligned;

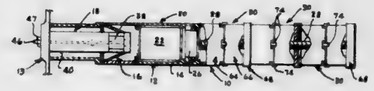
whereby a fingerboard pattern may be indicated for the desired principal note in any one of a plurality of congruent tunings.

4,175,469

CENTRIFUGAL AEROSOL DISPENSER ASSEMBLY

Harold N. Ritland, Bellevue, and George H. Thacker, Kent, both of Wash., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 1, 1978, Ser. No. 882,526
Int. Cl.[2] F11F *5/02*; F42B *13/50*
U.S. Cl. 89—1 B 10 Claims



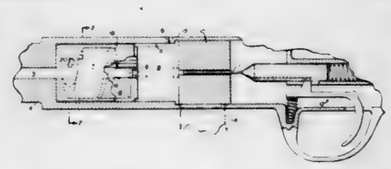
1. A centrifugal aerosol dispenser assembly comprising a mount and a dispenser operatively attached thereto, means for ejecting said dispenser from said mount with a spin motion, a first portion of said ejection means connected to said mount, a second portion of said ejection means connected to said dispenser, a plurality of compartments located within said dispenser, at least one of said compartments being made up of an actuator section and a dispensing section, said dispensing section having removable sides thereon, means located within said actuator section for releasably securing said sides to said dispensing section and means located within another of said compartments for activating said releasing means at a preselected time whereby at said preselected time after ejection of said dispenser from said mount, said releasing means releases said sides of said dispensing section and allows the expulsion of the contents of said dispensing section to take place in a predetermined geometrical configuration.

4,175,470

GUN WITH RAPID FIRING RATE

Frank H. Bell, Brigham City, Utah, assignor to Thiokol Corporation, Newtown, Pa.

Filed Dec. 22, 1977, Ser. No. 863,376
Int. Cl.[2] F41C *13/00*
U.S. Cl. 89—7 4 Claims



1. In a gun having a barrel with a central bore therethrough, and a propellant-cartridge chamber and trigger-operated striker aligned with the bore, the improvement comprising:

a housing, seated between the propellant-cartridge chamber and the bore, having a projectile duct for storing projectiles, a bore alignable with that of the barrel and intersecting both the projectile duct and the propellant-cartridge chamber, and a gas port joining the propellant-cartridge

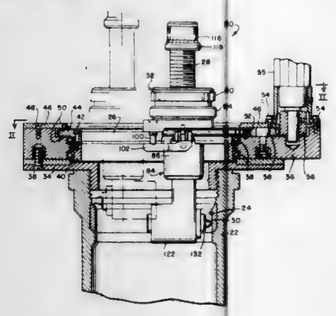
chamber with the projectile duct, entering the projectile duct at a distance from intersection of the projectile duct with the bore that is equal to the sum of the diameters of the number of projectiles selected to be ejected when a single propellant cartridge is fired.

4,175,471

CUTTING APPARATUS AND VERTICAL DRIVE MECHANISM THEREFOR

John F. Wilger, Honolulu; Gregory S. Nakano, Pearl City; Tadao Uyetake, Honolulu; Stephen Orillo, Jr., Wahiawa, and Teikichi Higa, Pearl City, all of Hi., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 19, 1977, Ser. No. 861,911
Int. Cl.[2] B23C *1/20*
U.S. Cl. 408—83.5 **9 Claims**



1. A cutting apparatus for in-place machining of an internal valve surface comprising:

a turntable, means for rotatably mounting said turntable on the valve above the internal valve surface,

a feed shaft mounted through the turntable so as to be rotatable therewith, the longitudinal axis of the feed shaft being spaced from the axis of rotation of the turntable;

a bottom end of the feed shaft having means adapted to receive a cutter for machining the internal valve surface;

vertical drive means mounted on the feed shaft for vertically driving the feed shaft, said vertical drive means being rotatable with the feed shaft and in turn, with the turntable;

the vertical drive means including nut means threaded on the feed shaft and further including gear means operatively connected to the nut means;

means for mounting the vertical drive means to the turntable fixedly along and rotatable about said longitudinal axis of the feed shaft;

said gear means having: a first gear means portion which is fixedly connected to the nut means, a second gear means portion which is fixed in operative engagement with the first gear means portion, and a third gear means portion which is fixed in operative engagement with the second gear means portion; and

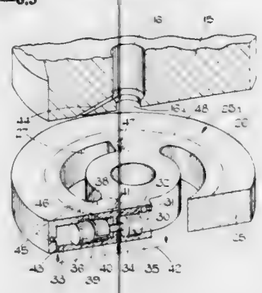
said third gear means portion being mounted rotatably in frictional slidable engagement about said nut means so that the firctional engagement of the third gear means portion about the nut means will cause the third gear means portion to rotate with the nut means, however, upon stopping the rotation of the third gear means portion with respect to the nut means, the nut means will frictionally slidably rotate within the third gear means portion, whereby said gear means is operatively connected with the nut means so that, upon rotating the turntable and stopping the rotation of the third gear means portion with respect to the nut means, the second gear means portion is rotated which rotates the first gear means portion which rotates the nut means which then causes the drive shaft to be fed vertically.

4,175,472

ROTARY HYDRAULIC MACHINE

Thomas E. E. Roberts, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 9, 1977, Ser. No. 858,944
Claims priority, application United Kingdom, Jan. 27, 1977, 3284/77
Int. Cl.[2] F01B *13/04*
U.S. Cl. 91—6.5 **4 Claims**



1. A rotary hydraulic machine, comprising a rotor having a plurality of bores which open onto a face of the rotor, piston means responsive to rotation of the rotor, for causing liquid displacement within said bores to accompany said rotation, a port plate against one face of which said rotor face is engaged, said port plate including a first port with which said bores can successively communicate, valve means, between said first port and said port plate face responsive to pressures in said first port and in said bores for varying the precompression angle at which a liquid within the bores can first flow to said first port, said valve means including a second passage in said port plate communicating with said first port and with port means which open onto said port plate face, said port means being spaced from said port, in the direction of the path of movement of said bores across said face, so that said bores communicate, in use, with said port means before communicating with said first port, said port means extending in said direction of movement, and a control element responsive to an increase in pressures in said bores for progressively uncovering said port means in a direction away from said first port, and to an increase in pressure in said port for progressively covering said port means in a direction towards said first port, and means for admitting liquid to said bores including a plurality of passages in said rotor communicating with respective ones of said bores and having openings onto said rotor face, and a first passage in said port plate, opening onto said port plate face in a loction which lies on the path thereover of said rotor passage openings, said high pressure liquid being applied, in use, to said first passage.

4,175,473

FLUID CIRCUIT

Tomomitsu Iizumi, Tokyo, Japan, assignor to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1977, Ser. No. 785,206
Claims priority, application Japan, Jun. 8, 1976, 51-73232[U]; Oct. 27, 1976, 51-143497[U]; Oct. 27, 1976, 51-144309[U]
Int. Cl.[2] F15B *13/042, 11/04*
U.S. Cl. 91—443 **1 Claim**

1. A fluid circuit comprising:

an actuator having a piston-head-side chamber and a piston-rod-side chamber and a first piston separating said chambers;

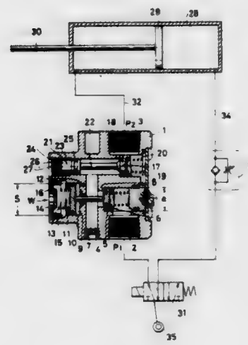
a flow-rate-control, pressure-regulating valve assembly having an inlet port and an outlet port;

a flow-direction change-over valve connected to the inlet port of said flow-rate control, pressure-regulating valve assembly; and

a pressure source connected to said flow-direction change-over valve;

said piston-rod-side chamber being connected to the outlet port of said flow-rate-control, pressure-regulating valve assembly and from the inlet port thereof to said flow-direction change-over valve and through said change-over valve to said pressure source, thereby establishing a first fluid path for a return stroke of said first piston, and a second fluid path connecting said piston-head-side chamber in bypassing relationship around said flow-rate-control pressure regulating valve assembly to said flow-direction change-over valve and therethrough to said pressure source, thereby establishing said second fluid path for an advancing stroke of said first piston,

said flow-rate-control, pressure-regulating valve assembly comprises: a fluid passage in said assembly leading from



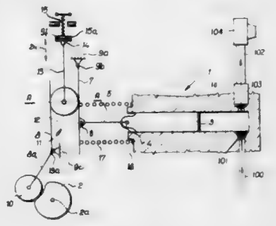
said inlet port via a pressure regulating valve and then a flow-rate control valve to said outlet port; said flow rate control valve having a valve body, a valve stem and a valve-stem-position adjustable portion, said valve body being spring loaded so as to be urged against the top of said valve stem, thereby restricting said fluid passage; said pressure regulating valve including a valve body spring-loaded in the direction to close said fluid passage, and a second piston which is spring-loaded so as to force said valve body in the direction to open said fluid passage through the medium of a rod confined between said valve body and said second piston, whereby said second piston permits said pressure regulating valve to maintan a predetermined pressure in a fluid flowing through said fluid passage, said pressure regulating valve further including a communicating hole allowing the introduction of a fluid from said fluid passage to said second piston, whereby when a pressure of a level exceeding a given pressure level is introduced into said fluid passage said second piston is displaced against the spring-loaded effect and hence said rod is pushed back by the spring-loading in said valve body, thereby closing flow through said fluid passage.

4,175,474

VARIABLE DISPLACEMENT PUMP

Ladislav Ševčík, Chrastava; Josef Dvořák, and Jiří Mlynář, both of Liberec, all of Czechoslovakia, assignors to Elitex, Koncern textilniho strojirenstvi, Liberec, Czechoslovakia

Filed Nov. 15, 1977, Ser. No. 851,784
Claims priority, application Czechoslovakia, Dec. 13, 1976, 8109/76
Int. Cl.[2] F01B *31/14*; F15B *15/24*
U.S. Cl. 92—13.5 **4 Claims**



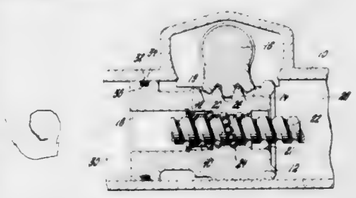
1. In a variable delivery fluid pump adapted for the feeding of liquid to the nozzle of a jet loom, the pump having a cylinder, a piston which reciprocates in the cylinder, said piston having a piston rod the outer free end of which extends outside an end of the cylinder, and a piston driving means including a driven eccentric means for reciprocating the piston, the improved piston driving means which comprises first and second generally parallel levers disposed outwardly of the outer free end of the piston rod, the levers extending at a substantial angle with respect to the path of reciprocation of the piston, means for pivotally mounting each of the levers for oscillation toward and away from the cylinder, the first lever being disposed nearer the cylinder and being drivingly connected to the outer end of the piston rod, the second lever being disposed further from the cylinder and coacting with the eccentric means so as to be oscillated thereby, and means mounted for adjustment along the length of the levers coupling them for joint oscillatory movement, adjustment of the last named means along the lengths of the levers changing the transmission ratio of both levers.

4,175,475

WORM THREAD SEAL FOR STEERING GEAR

Dennis C. Eckhardt, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 30, 1977, Ser. No. 855,883
Int. Cl.[2] F01B *3/08*; F16J *15/40*
U.S. Cl. 92—33 **3 Claims**



1. A vehicle power steering gear comprising a housing, a piston nut slidably mounted in said housing and separating said housing into a pair of primary fluid pressure chambers, said nut having an axially extending bore formed therein, a cylindrical worm extending through said bore into said nut, said worm having a helical thread, thread engaging means carried by said nut and operatively engaged with said thread of said worm so that rotation of said worm will axially slide said nut in said housing, a seal assembly for restricting the fluid passage be-

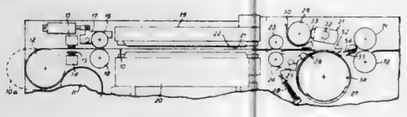
tween said chambers through said helical thread of said worm, said seal assembly comprising a resilient body terminating in radially extending sealing surface means, said bore being enlarged to form a cavity for said seal assembly and to provide a radial contact wall for said sealing surface means thereof, said resilient body having internal thread means for engaging the helical thread of said worm, backing means laterally spaced from said contact wall and carried by said nut for trapping said resilient body in said cavity, said seal assembly cooperating with said radial contact wall and said backing means for forming an auxiliary pressure chamber between said nut and said resilient body, said auxiliary pressure chamber being concentrically outwardly of said resilient body so that when one of said primary fluid pressure chambers is pressurized said sealing surface means axially and sealingly engages said radial wall and said seal body is constricted by pressure fluid fed from said one of said chambers into said auxiliary pressure chamber radially inwardly against said worm to effect radial sealing therewith to thereby prevent fluid communication between said primary fluid pressure chambers through the thread of said worm.

4,175,476

METHOD AND APPARATUS FOR FORMING REINFORCED TOP FILE FOLDERS

Arthur H. Kidd, Menomonee Falls, Wis., assignor to H. G. Weber & Co., Inc., Kiel, Wis.

Filed Mar. 27, 1978, Ser. No. 890,293
Int. Cl.² F15B *21/04*
U.S. Cl. 93—1 E **7 Claims**



1. An apparatus for forming reinforced top file folders which comprises:
- means for feeding a paperboard web to a cutting and scoring station,
- means at said cutting and scoring station for severing the web transversely and also for forming a score line a relatively short distance behind the leading edge of the portion thus severed, thereby defining a tab portion,
- applicator means for applying an adhesive to a portion of the web immediately behind said score line,
- hold down means beyond said applicator means having a portion arranged to be seated in said score line,
- turnover means positioned beyond said hold down means for folding the tab portion at right angles to said web while said score line is seated in said hold down means, and
- pressure means beyond said turnover means positioned to fold the tab portion while at right angles to said web against the adhesive striped web to thereby produce a double thickness at the leading edge of said web.

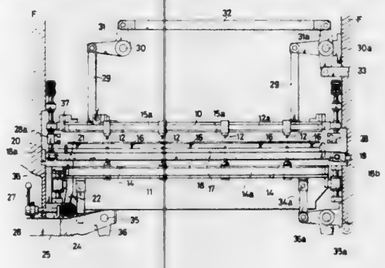
4,175,477

PLATE TYPE PUNCHING MACHINE

Tadao Inose, 20-52, 2-chome, and Minoru Hirota, 20-13, 2-chome, both of Higashi, Koga-shi, Ibaragi-ken, Japan

Filed Nov. 10, 1977, Ser. No. 850,346
Claims priority, application Japan, Jul. 5, 1977, 52-79455
Int. Cl.² B31B *1/74*
U.S. Cl. 93—36 A **3 Claims**

1. A plate type punching machine comprising a machine frame, rails along both sides of the machine frame, endless chain belts guided by the rails, sheet holding pawls carried by the belts, a board on which a sheet held by the sheet holding pawls is placed, a support for said board, a mount on which the support is mounted, rods pivotally joined to one side end of the mount, a first gear, eccentric shafts connecting the first gear and the rods, a handle, and a second gear connected to the handle and meshed with the first gear, said mount having its other side end pivotally joined to the machine frame so that



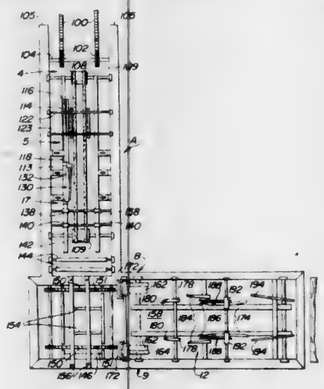
when one side end of the mount is pivoted downwardly by operation of the handle the board and support is drawn out from below the rails to one side of the machine frame.

4,175,478

EXPANSIBLE GUSSET ENVELOPE AND METHOD AND APPARATUS FOR FABRICATING SAME

John G. Tripler, La Mirada, Calif., assignor to American Fiber Velope Manufacturing Co., Collingdale, Pa.

Filed Mar. 13, 1978, Ser. No. 886,331
Int. Cl.² B31B *29/26*
U.S. Cl. 93—62 **9 Claims**



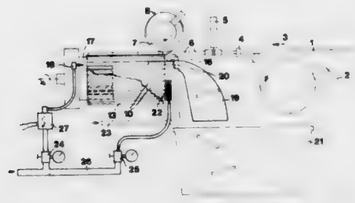
1. In a machine for fabricating an expansible gusset envelope from a blank having first and second panels hinged to each other along triple transverse fold lines defining inwardly collapsible bottom gusset sections therebetween, scored isosceles triangular portions at the margins of said bottom gusset sections having apices facing each other along the medial transverse fold line, break-away flaps at the margins of said second panel defined by lateral fold lines coextensive with the apices, side flaps hinged to the lateral edges of said first along triple longitudinal fold lines which define inwardly collapsible side gusset sections therebetween, and triangular tabs hinged to the side gusset sections along a line registering with the inboard transverse fold line and hinged to each other along a line registering with the medial longitudinal fold line to define isosceles triangular projections substantially congruent with said scored isosceles triangular portions, apparatus comprising:
- (a) bendling means for folding said isosceles triangular projections into overlying disposition with the lower margins of said side gusset sections, and inwardly folding said bottom gusset sections so that said second panel is in overlying disposition with said first panel,
- (b) flaring means for outwardly folding said break-away panels along the lateral fold lines so that the isosceles triangular portions break open and are in exposed side-by-side disposition with the isosceles triangular projections
- (c) means for folding said flaps so that the isosceles triangular projections are adhesively secured to said isosceles triangular portions
- (d) curling means for outwardly then inwardly folding said side flaps along the medial and outboard fold lines and adhesively securing said side flaps to the outer margins of said second panel, wherein all gusset sections are inwardly collapsed with doged corners.

4,175,479

CIGARETTE-FILTER-MAKING APPARATUS

Marcel-François Roullier, Préverenges, Switzerland, assignor to Baumgartner Papiers S.A., Crissier, Switzerland

Filed Jun. 12, 1978, Ser. No. 914,418
Claims priority, application Switzerland, Jun. 21, 1977, 7626/77
Int. Cl.² A24C *5/50*
U.S. Cl. 93—77 FT **7 Claims**



1. Cigarette-filter-making apparatus comprising means for forming a cigarette-filter-string, separating means for cutting the cigarette-filter-string into individual filter sections of a given length, a pick-up drum rotatable about its longitudinal axis and provided along its circumference with longitudinally extending retaining grooves for the accomodation of the individual filter sections and lateral delivery of the filter sections retained in said grooves to a laterally adjacent discharge as well as quality control means for continuously controlling the cigarette-filter string and/or the individual filter sections prior to their delivery into the retaining grooves of the pick-up drum, characterised in that the pick up drum (**9**) is provided with a guide element (**13**) extending continuously over a cylindrical surface from the pick-up point (**11**), to the delivery station (**12**) of the drum (**9**), viewing in the direction of drum rotation, to prevent the filter sections (**6**) from dropping out of the retaining grooves (**10**), and in that ejector blasting means (**18**) are provided outside of the drum which are operatively associated with the quality control device (**4**) and controlled by the latter to blow filter sections (**6**) out of the retaining grooves (**10**) on the drum (**9**) in the longitudinal direction of said grooves.

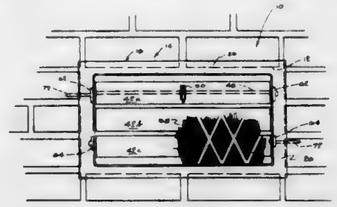
4,175,480

WALL VENTILATOR CONSTRUCTION

Dennis A. Beam, Jr., Westfield Rd., and Paul M. Sarazen, Jr., 214 Fairway Dr., both of Shelby, N.C. 28150

Filed Jan. 13, 1978, Ser. No. 869,057
Int. Cl.² F24F *7/00*
U.S. Cl. 98—37 **5 Claims**

1. An improved ventilator construction for a building wall comprising:
- a. a generally rectangular support frame having opposed top and bottom walls and side walls defining a passageway therethrough, flange means attached to and extending outwardly from said walls generally perpendicular to the axis of said passageway for overlying the peripheral portion of an opening in a wall, and spaced openings through opposed of said support frame walls for receiving fastening means therethrough;
- b. a generally rectangular ventilator box having opposed top and bottom walls and side walls defining an air passageway therethrough, screen means disposed across said air passageway, adjustable closure means in said ventilator box passageway and supportably attached to said ventilator box for opening and closing said passageway to the flow of air, and a plurality of spaced apart connection



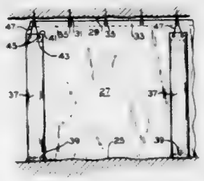
elements secured to opposed wall portions of said box generally parallel to the axis of said air passageway therethrough, said connection elements being spaced apart, protruding beyond the outer surface of said screen means and including openings disposed therethrough for alignment with said spaced openings in said support frame walls when said support frame and ventilator box are positioned in contiguous relation with their passageways aligned, whereby fastening means may be inserted through said aligned openings to secure said support frame and ventilator box together and within the opening of a building wall.

4,175,481

MINE VENTILATION SYSTEM AND ELEMENTS THEREOF

James V. Burgess, Jr., Madison, W. Va., assignor to Mine Ventilation Systems, Inc., Madison, W. Va.

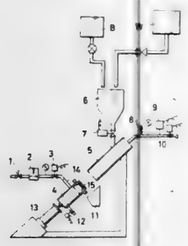
Filed Jul. 5, 1977, Ser. No. 812,719
Int. Cl.² E21F *1/14*
U.S. Cl. 98—50 **7 Claims**



1. A mine ventilation control system providing a barrier for the segregation of gas flow between at least two regions of a mine cavity; said system comprising:
- a flexible substantially gas impervious sheet material extending between said regions to impede gas flow therebetween;
- means for securing marginal edge portions of said sheet material to an adjacent mine surface;
- an elongate envelope of flexible sheet material for containing a fluid mass;
- a fluid mass in said envelope; and
- means to maintain said fluid filled envelop proximate to and extending generally vertically along said sheet material

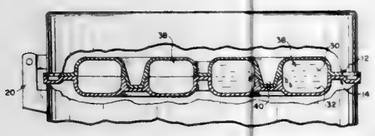
whereby said mass and the stiffness of said filled envelope militate against ballooning of said sheet material.

4,175,482
AUTOMATIC HIGH-PRESSURE FLASH COOKER
Teruo Kumagaya, Iida, Japan, assignor to Asahimatsu Koridofu Kabushiki Kaisha, Nagano, Japan
Filed Sep. 12, 1978, Ser. No. 941,792
Claims priority, application Japan, Sep. 22, 1977, 52/114059
Int. Cl.² A47J 27/04
U.S. Cl. 99—330 2 Claims



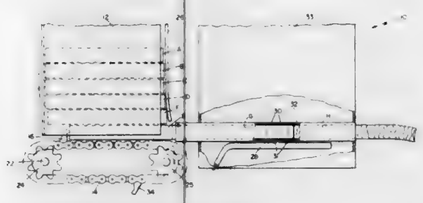
1. An automatic high-pressure flash cooker comprising a cylindrically-shaped steaming chamber which is set in a slanted position with its lower end open, and a drain collector which has at its upper end a perforated plate permitting passage of water and is connectable with the open end of said steaming chamber, said steaming chamber being communicated with a feed hopper for supply of water and beans, said drain collector being communicated with a vapor source and provided with an opening for exhausting water therefrom.

4,175,483
DONUT MAKER APPLIANCE WITH IMPROVED MEANS FOR COATING BATTER WITH COOKING OIL
Robert H. Clark, Columbia, Mo., assignor to McGraw-Edison Company, Elgin, Ill.
Filed May 18, 1978, Ser. No. 907,045
Int. Cl.² A21B 3/08
U.S. Cl. 99—354 4 Claims



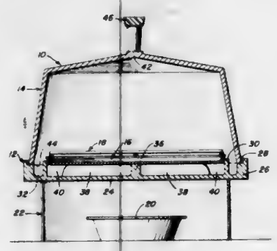
1. In a donut maker device including upper and lower grids movable into and out of mating engagement along first surfaces thereof, means for heating said grids to a predetermined temperature, each of said first surfaces of said upper and lower grids defining a recess of a predetermined shape with a central core, the recess of the lower grid having a predetermined depth, the recess of the upper grid being disposed for cooperation with the recess of the lower grid upon bringing the upper and lower grids into mating engagement, thereby to produce a predeterminedly shaped cooking cavity in which batter placed therein is baked to produce a similar shaped cake, the improvement comprising cooking oil dispersion means including plunger means of a predetermined shape provided on the first surface of said upper grid at the central core of said concave recess extending outwardly therefrom and well means defined on the first surface of said lower grid at the central core of said annular recess for receiving cooking oil, said well means being predeterminedly dimensioned to have a depth substantially equal to the depth of the lower grid said well means further being shaped complementarily to said plunger means and positioned for receipt thereof upon bringing the first surfaces of the upper and lower grids into mating engagement, receipt of said plunger means in said well means serving to dispose cooking oil therein onto the batter as well as to align the upper and lower grids.

4,175,484
FOOD SMOKING
Frederic S. Tobey, P.O. Box L, Brewster, Mass. 02631
Filed Jun. 23, 1978, Ser. No. 918,461
Int. Cl.² A23B 4/04
U.S. Cl. 99—482 19 Claims



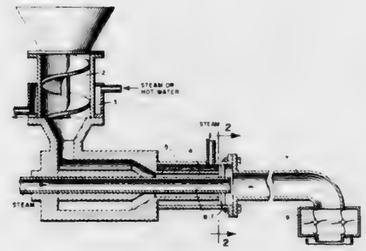
1. A smoking apparatus comprising:
a container for a stack of smoke-producing members,
a guide retort,
said guide retort having
an inlet for receiving successive members from said stack,
a pair of vertically spaced guide surfaces for guiding successive members therebetween, and
an outlet for permitting expelling of members guided through said retort by said guide surfaces,
the upper of said guide surfaces having a plurality of holes therethrough for permitting smoke from said members to leave said retort,
means to drive successive members of said stack into said guide retort,
heating means positioned adjacent to and outside of said guide retort, and
a food enclosure positioned adjacent to said guide retort to receive smoke passing through the holes of said upper guide surface.

4,175,485
QUICK SMOKER
Harold F. Wojahn, 303 Ibis La., Satellite Beach, Fla. 32937
Filed Oct. 27, 1978, Ser. No. 955,191
Int. Cl.² A23B 4/04
U.S. Cl. 99—482 9 Claims



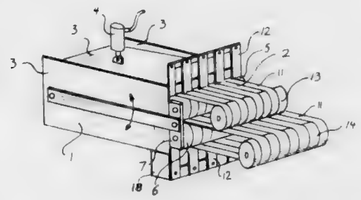
1. In a portable food smoker, a base and a cooperating lid, said base comprising a planar bottom panel, a side wall projecting inwardly from said bottom panel peripherally thereabout, said side wall having a top edge, an inwardly directed support ledge defined along the top edge of the side wall, a partition wall projecting upwardly from said bottom panel in inwardly spaced generally parallel relation to said side wall, said partition wall being generally coextensive with said side wall and defining a moisture retaining channel between the partition wall and the side wall inwardly of said support ledge, said lid being of a generally dome-shaped configuration and including a peripheral lower edge adapted to seat directly on said support ledge completely about said base whereby moisture collecting within said lid will travel downwardly for collection within said moisture channel.

4,175,486
PROTEIN TEXTURIZATION
William M. Hildebolt, Mickleton, and Murray T. Hundt, Maple Shade, both of N.J., assignors to Campbell Soup Company, Camden, N.J.
Division of Ser. No. 645,613, Dec. 31, 1975, Pat. No. 4,095,001.
This application Jan. 10, 1978, Ser. No. 868,451
Int. Cl.² A23C 3/02
U.S. Cl. 99—483 11 Claims



1. Apparatus for texturizing protein material comprising:
(a) die means for extruding a continuous, relatively thin sheet of semi-rigid protein material;
(b) means for externally applying heat to both surfaces of said thin sheet as it passes through said die means to effect surface texturization of said thin sheet;
(c) means defining a confined treating zone communicating with said die means;
(d) means for directing a heated gaseous stream at said extruded thin sheet as it enters said confined zone to break off the leading segment of said extruded sheet; and
(e) means for recovering said texturized protein material.

4,175,487
BALE FORMING APPARATUS
Joseph Molitorisz, 624 81st Ave. NE., Bellevue, Wash. 98004
Filed Jul. 12, 1978, Ser. No. 923,829
Int. Cl.² B65B 13/20
U.S. Cl. 100—8 2 Claims



1. A bale forming apparatus to compress loose fibrous agricultural crops or industrial products into substantially rectangular bales which are being held together by twine, wire or belts, said bale forming apparatus comprising; a longitudinally extending and substantially rectangular bale forming channel assembly, and a feeder-compactor assembly, said bale forming channel assembly having a substantially rectangular intake port, and being confined by longitudinally extending lateral boundaries, at least one of said lateral boundaries being flexibly suspended and inwardly biased by suitable biasing means, said inwardly biased lateral boundaries being in frictional contact with said formed bale exerting frictional resistance against the movement of said formed bale in said bale forming channel, said bale forming apparatus having a suitable mechanism to wrap and tie said wire, twine or belt around said formed bale, said feeder-compactor assembly consisting of; a plurality of feeder-compactor rollers rotatably supported by a common frame and being held substantially parallel relative to each other and at an adjustable distance to confine a transverse intake opening between their adjacent rotational peripheral surfaces, each of said feeder-compactor rollers having a longitudinally extending shaft holding a plurality of substantially cylindrical compactor disks securely fastened to said shaft to receive rotational drive, said compactor disks being separated from each other by substantially cylindrical pulleys, said pulleys being rotatably mounted on said shaft, said feeder-compactor assembly being guided by suitable means to move in a plane at or near to said intake port of said bale forming channel between two of the opposite boundaries of said intake port, said feeder-compactor assembly being suspended by a plurality of belts, chains or ropes being securely attached to said compactor disks of said feeder-compactor rollers, allowing said belts, chains or ropes to wrap around said compactor disks when said feeder-compactor rollers receive rotational power drive, the opposite ends of said belts chains or ropes being securely attached to suitable structural components of said bale forming channel, said belts, chains or ropes being extended between said feeder-compactor rollers and said suitable structural components of said bale forming channel in such way that those chains, belts or ropes being securely attached to the compactor disks of said upper feeder-compactor roller are also being securely attached to said suitable structural component at or near the upper boundaries of said bale forming channel, said chains, belts or ropes being securely attached to said compactor disks of said lower feeder-compactor roller are also being securely attached to said suitable structural component at or near said lower boundaries of said bale forming channel, said belts, chains or ropes being used to suspend said feeder-compactor assembly and to partially cover said intake port of said bale forming channel, holding the deposited layers of the bale being formed in said bale forming channel, said feeder-compactor rollers receiving external power drive to cause simultaneous rotational motion for each of said feeder-compactor rollers, said simultaneous rotational motion being in identical direction at a substantially identical peripheral speed of said feeder-compactor rollers, said simultaneous rotational motion of said feeder-compactor rollers being reversed at suitably selected intervals causing the wrapping of said chains, belts or ropes around said compactor disks inducing the movement of said feeder-compactor assembly in said plane between or beyond said upper and lower boundaries of said intake port of said bale forming channel, said rotatably mounted pulleys of said feeder-compactor rollers being connected to suitably positioned feeder-rollers by a plurality of endless chains, belts or ropes, said feeder-rollers being journally mounted in a suitable frame and receiving power drive to cause their rotation in such a way that the interaction between said plurality of said endless chains, belts or ropes connecting said feeder-compactor rollers and said corresponding feeder-rollers compress the loose fibrous material into a sheet like configuration and convey said sheet of compressed material to said intake port of said bale forming channel regardless of the direction of rotation of said feeder-compactor rollers, said feeder-compactor rollers receiving and laying said compressed sheet of fibrous material in a plane which is confined by the lateral boundaries of said intake port of said bale forming channel, said laying of the compressed sheet of fibrous material being accomplished in a continuous process by reversing the direction of the movement

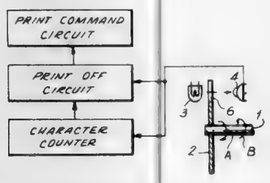
of said feeder-compactor assembly in said plane at or near said intake port of said bale forming channel at properly selected positions relative to said upper and lower boundaries of said intake port of said bale forming channel, said reversal of the direction of motion of said feeder-compactor assembly in said plane at or near said intake port of said bale forming channel causing the reversal of the laying of said compressed fibrous sheet, folding said sheet at or near to said upper and lower boundaries of said intake port of said bale forming channel resulting in the building up the body of said formed bale by depositing and compressing the subsequently folded layers in said bale forming channel, said feeder-compactor rollers exerting compressive forces on said formed bale composed of a plurality of layers of folded compressed sheets of said fibrous material causing the compaction and sliding movement of said formed bale in said bale forming channel, said formed bale having reached its desired length being tied together by a suitable tying mechanism with twine, wire or belt, said formed and tied bale being forced out from said bale forming channel at its discharge end by the subsequently formed bales, said individual bales being separated by said tying means.

4,175,488

PRINTER

Masshiro Minowa, Shiojiri, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation of Ser. No. 483,753, Jun. 27, 1974, abandoned. This application May 12, 1976, Ser. No. 685,582
Claims priority, application Japan, Jun. 27, 1973, 48-72422
Int. Cl.² B41J 1/44
U.S. Cl. 101—99 **4 Claims**



1. In a printer including a character ring having print characters circumferentially disposed thereabout, said print characters being selectively positioned in a print position by rotation of said character ring in a first rotational direction from a rest position to a print position, the improvement comprising a detection means for generating character selection timing pulses representative of each rotational position of said character ring, said detection means further producing return timing pulses in response to the rotation of said character ring in a second rotational direction from said print position to said rest position, and print-off producing means for sensing the last said return timing pulses and in response thereto producing a print-off pulse.

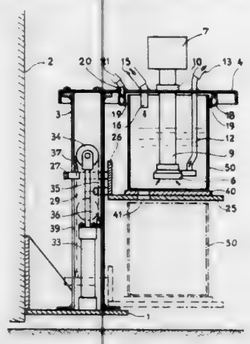
4,175,489

INKING AND WASHING CIRCUIT FOR A FLEXOGRAPHIC PRINTING MACHINE

Yves Gattus, Villeurbanne, France, assignor to S. A. Martin, Villeurbanne, France

Filed May 31, 1978, Ser. No. 911,144
Int. Cl.² B41F 31/08, 35/04
U.S. Cl. 101—366 **2 Claims**

1. An inking and washing device for use in the inking and washing circuit of a flexographic printing machine which circuit comprises a feed pump assembly of the immersion type, said feed pump assembly comprising a feed pump for drawing ink from a reservoir and having a delivery tube, and a drive motor for driving said pump, a circuit for feeding ink from said pump delivery tube to inking rollers, and a circuit for returning ink to the reservoir, said inking and washing device comprising: a fixed horizontal plate; means for mounting said plate on the framework of the printing machine; means supporting said feed pump assembly on said plate with said drive motor above said plate, said pump below said plate and said delivery tube passing through said plate; means fixedly connecting said delivery tube above said plate to said ink feed circuit; a fixed ink return tube which passes through said plate; means fixedly connecting said return tube above said plate to said ink return circuit; washing nozzle means fixed underneath said plate and above a closed shape which surrounds the components of said pump assembly and said ink return tube; means fixedly con-



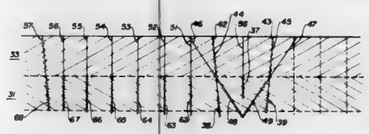
necting said washing nozzle means to a water-feed circuit; at least one container for forming an ink reservoir and having a top opening which fits inside said closed shape but surrounds the components of said pump assembly and said ink return tube; at least one washing container having a top opening which fits outside said closed shape and includes an overflow connectable to waste; and lifting means for selectively receiving one of said ink reservoir container or one of said washing container, and for moving said one selectively received container under said plate between a high position in which its upper edge is adjacent said plate and low position in which its upper edge lies below said pump.

4,175,490

PROCESS FOR PRODUCING AN UNDERGROUND ZONE OF FRAGMENTED AND PERVIOUS MATERIAL

Keith C. Britton, San Leandro, and Mitchell A. Lekas, Concord, both of Calif., assignors to Geokinetics Inc., Concord, Calif.

Filed Nov. 3, 1977, Ser. No. 848,091
Int. Cl.² F42D 3/04
U.S. Cl. 102—23 **55 Claims**



1. The process for converting subterranean rock into an enclosed rubble-ized zone overlain by an overburden comprising:

lifting a defined area of overburden as a substantially monolithic land mass to produce a void space and a free face proximate said rock, said raised overburden providing a substantially impervious closure for said space and said zone as provided herein;

placing an explosive charge in said rock proximate to and for blasting against said face; and

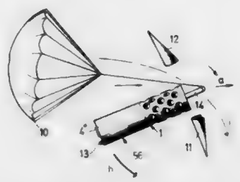
exploding said charge for fragmenting and rock to distribute said space, thus producing fractured pervious rubble-ized rock in a defined enclosed zone.

4,175,491

WARHEAD AND ANTI-TANK MISSILE CONSTRUCTION

Franz R. Thomanek, Landkreis Schrobenhausen, Fed. Rep. of Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 692,928, Jun. 4, 1976, abandoned, which is a continuation of Ser. No. 767,529, Oct. 14, 1968, abandoned, which is a continuation-in-part of Ser. No. 670,520, Sep. 21, 1967, abandoned. This application Dec. 7, 1977, Ser. No. 858,335
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1966, 89257; Oct. 14, 1967, 94951
Int. Cl.² F42B 13/10
U.S. Cl. 102—56 SC **3 Claims**



1. A ground-to-ground missile construction for use against an armored target or the like arranged to be fired in a parabolic trajectory extending generally in the horizontal direction comprising an axially extending body having a head portion at the forward end and a tail portion at the rearward end in the as fired position of the missile, a tubular casing portion adjacent said head portion and extending rearwardly therefrom in the axial direction of said body and having an explosive charge disposed therein, braking and stabilizing means carried by said body in the head portion thereof and being selectively deployable outwardly from the head portion of said body for temporarily destabilizing the missile out of its as fired parabolic trajectory path and turning the missile approximately 90° with the axis of said body portion being displaced from a generally horizontal position to a generally vertical position and with said head portion positioned vertical above said tail portion by decreasing the speed thereof whereby upon restabilization the missile drops substantially vertically with the tail portion thereof leading in the downward direction trailed by the head portion onto the target, and an ignition device mounted on and projecting outwardly from said tail portion in the axial direction of said body and connected to said charge so that when said tail portion lands at the target area said ignition device extending said tail portion contacts the target area and explodes the charge.

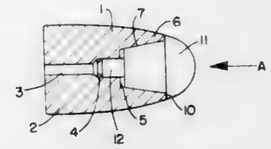
4,175,492

PROJECTILE, PARTICULARLY FOR HAND FIREARMS AND LONG FIREARMS

Jurgen Knappworst; Uwe Brede, both of Furth, and Erich Zeiher, Furth-Vach, all of Fed. Rep. of Germany, assignors to Dynamit Nobel, AG, Fed. Rep. of Germany

Filed Oct. 28, 1977, Ser. No. 846,546
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1976, 2650136; Jun. 22, 1977, 2728040
Int. Cl.² F42B 11/10
U.S. Cl. 102—92.6 **29 Claims**

1. A projectile for hand and long firearms comprising a projectile body having a longitudinal axis, a front face and a rear face, deformation cavity means extending partially into the projectile body at the front face thereof, continuous axial bore means provided in the projectile body in communicating relationship with the rear face and the deformation cavity means, the projectile body having a wall thickness in the region surrounding the deformation cavity means which is substantially smaller than the wall thickness in the region surrounding the axial bore means, and cap means initially disposed in the region of the front face of the projectile body for covering at least the deformation cavity means, the cap means being separated from the projectile body within the barrel of the firearm during firing of the projectile and exiting from the



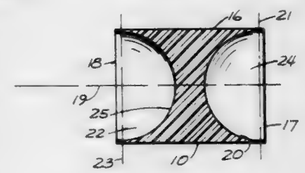
barrel in front of the projectile body, the projectile body being configured such that the projectile body upon impingement on a soft target is radially expanded in the region surrounding the deformation cavity means so that the projectile body is substantially enlarged in cross section whereas the projectile body upon impingement on a hard target is radially expanded to a smaller extent and axially compressed to a larger extent in the region surrounding the deformation cavity means than upon impingement on a soft target.

4,175,493

PATCH FOR MUZZLE LOADING FIREARMS

John Daily, P.O. Box GG, Jackson Hole, Wyo. 83001

Filed Nov. 7, 1977, Ser. No. 848,808
Int. Cl.² F42B 13/16
U.S. Cl. 102—93 **5 Claims**



1. A patch for loading a unitary spherical projectile within the rifled bore of muzzle loading firearms having alternating lands and grooves, comprising:

a solid integral body of yieldable material having a longitudinal length measured along a central axis;

an exterior cylindrical wall extending uninterrupted and continuously along the full longitudinal length of said body and centered along said central axis, said wall terminating at opposed ends of said body along planes perpendicular to said axis, the diameter of said wall being substantially equal to the bore diameter of the rifled bore in which it is to be inserted;

a first indentation extending axially inward from one end of the body and centered along said axis, the surface configuration within the first indentation being spherical and being radially sized to result in a slight interference fit between the first indentation and a projectile, the spherical center of said first indentation being located inward from said one end of the body;

a second indentation extending axially inward from the remaining end of the body and centered along said axis;

the combined axial depth of the two indentations being less than the longitudinal length of said body, whereby the indentations are axially separated by a central body portion having a solid cylindrical configuration.

4,175,494

FLUID PRESSURE ACTUATOR INTERCONNECTED BOGIES

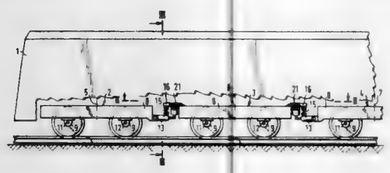
Peter Moser, Dietlikon, Switzerland, assignor to Schweizerische Lokomotiv-und Maschinenfabrik, Winterthur, Switzerland

Filed Jul. 17, 1975, Ser. No. 596,836

Claims priority, application Switzerland, Jul. 25, 1974, 10261/74

Int. Cl.² B61F *3/08, 5/22, 5/38, 5/50*

U.S. Cl. 105—176 **13 Claims**



1. A rail vehicle comprising

at least two bogies, each having an end proximal to the other and being rotatable about a vertical axis; and

a coupling means coupling said two bogies together, said coupling means including two pairs of fluid pressure operated reciprocating actuators, each actuator of each said pair of actuators having a longitudinal axis extending downwardly at an inclined angle toward to a longitudinal central vertical plane through a respective bogies and being positioned on one of respective opposite sides of said plane and pivotally connected at one end to a proximal end of a respective bogie and at an opposite end to a body to rotate in a universal manner, each said actuator including a pair of chambers for receiving fluid and a piston slidably mounted between said chambers, and pressure lines connected to each of said chambers to interconnect said actuators whereby a rotary movement of one of said bogies in one direction causes a rotary movement of the other of said bogies in an opposite direction.

4,175,495

ENTRANCE STEP ARRANGEMENT FOR A SHORT DISTANCE TRANSPORT VEHICLE

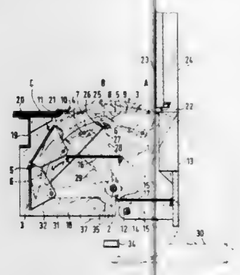
Karl-Heinz Kleim, Nürnberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nürnberg, Fed. Rep. of Germany

Filed May 11, 1977, Ser. No. 795,755

Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620683

Int. Cl.² B61D *23/02;* **B61K** *13/04;* **B60R** *3/02*

U.S. Cl. 105—450 **15 Claims**



1. A vehicle, especially short distance rail vehicle, having a door opening, a door for closing and opening said door opening, flooring means adjacent said door opening and partly defining a recess means below said flooring means, at least one intermediate step arranged in said recess means, a foldable guard plate likewise partly defining said recess means and provided with a tread having an edge therewith, said guard plate being pivotable into a position to a level lower than said at least one intermediate step and offset relative to the latter so as to form a stair-like arrangement with said at least one step, said flooring means having a passage therethrough to permit a person to pass therethrough, foldable cover means including at least two leaves operable selectively to move pivotally from a first position behind the tread edge in which it closes said passage means while forming a part of said flooring means to a second position in said recess in which it frees said passage and is spaced from said foldable guard plate so as to permit a person stepping on said at least one intermediate step to pass through said passage, and guiding cam means including rollers and a track engaged thereby at the start of opening movement of said foldable cover means as well as a saddleshaped surface engaged by the rollers in the second position.

4,175,496

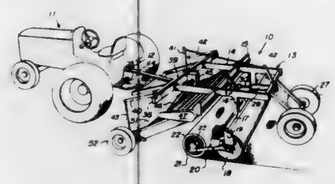
EARTH WORKING IMPLEMENT

Glenn Rehbein, Circle Pines, Minn., assignor to Robark, Inc., Circle Pines, Minn.

Filed Dec. 12, 1977, Ser. No. 859,974

Int. Cl.² A01C *1/04;* **A01B** *59/00*

U.S. Cl. 111—1 **1 Claim**



1. In an apparatus for installing netting beneath a layer of seeded topsoil for producing net-reinforced grass sod, said apparatus adapted to be trailed behind a tractor and including means for transferring power from said tractor to said apparatus, and further comprising a net roller for dispensing a layer of netting along the ground as the apparatus is trailed, earth moving blades moveable about an apron for lifting soil from the earth and transporting it rearwardly along said apron to deposit it on the netting, and a compacting roller to compact said soil after deposit onto said netting, the improvement comprising:

a pair of wheels rotatably mounted to said apparatus and moveable between a first operating position wherein said net roller, said earth moving blades and said compacting roller are all at least in part contact with the ground; and a second traveling position wherein said net roller, said earth moving blades and said compacting roller are raised above the ground and said apparatus may be freely trailed behind said tractor; and

a first lever arm operably connected to a support frame for said pair of wheels, said first lever arm having a hydraulic cylinder connected thereto on a first side of its rotational axis and a chain connected thereto on a second side of its rotational axis, said chain being further connected to a second lever arm, said second lever arm being operably connected to a support frame for said apron, actuation of said cylinder causing said first arm to rotate and to in turn rotate said second arm by tension on said chain, whereby actuation of said cylinder simultaneously causes said wheels to move to said traveling position and said net roller, earth moving blades, and compacting roller to be raised.

4,175,497

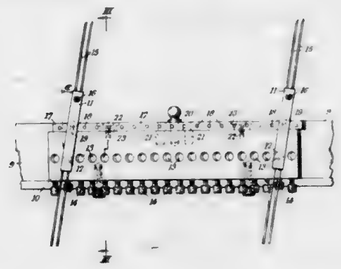
KNIFE ASSEMBLY FOR A TUFTING MACHINE

Ernest K. Lund, Accrington, England, assignor to Edgar Pickering (Blackburn) Ltd., Blackburn, England

Filed Dec. 6, 1977, Ser. No. 858,027

Int. Cl.² D05C *15/24*

U.S. Cl. 112—79 R **4 Claims**



1. A knife assembly for a tufting machine comprising a knife bar, a plurality of knife blocks mounted side by side on the knife bar, the knife blocks carrying projecting pegs respectively extending from each of said knife blocks into one of a row of uniformly spaced retaining holes in one side of the knife bar, a clamping screw positioned to maintain each projecting pin in a retaining hole, a plate mounted on top of the knife bar, a row of uniformly spaced pins carried by the plate which engage corresponding slots in the faces of the knife blocks from which the pegs project to determine their orientation with respect to the knife bar, the pins being laterally offset by the same amount with respect to the retaining holes, means for detachably connecting the plate to the knife bar in at least two alternative positions providing orientatation of the knife blocks to the knife bar at different angles, and knives mounted in the knife blocks.

4,175,498

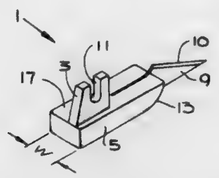
SEWED SEAM RIPPER

Dean Walters, 10581 Folsom Blvd., Rancho Cordova, Calif. 95670

Filed Feb. 1, 1978, Ser. No. 874,128

Int. Cl.² D05B *37/04*

U.S. Cl. 112—129 **8 Claims**



1. A seam ripper adapted for mounting on a sewing machine in place of the pressure foot comprising a solid quadrilateral foot having a downwardly and rearwardly slanted front face and a rearwardly extending elevational slit adapted to receive a frictionally engageable cutting blade, a shank secured to said foot and disposed upwardly therefrom and said shank having a downwardly extending notch therein, blade retaining means on said foot and a vertically disposed cutting blade frictionally engaged in said slit and retained in said foot by said blade retaining means, the bottom edge of the blade being substantially co-extensive with the bottom edge of the foot.

4,175,499

METHOD AND APPARATUS FOR FORMING AN OVEREDGE STITCH

Gerald S. Navlyt, Woodstock, Ill., assignor to Union Special Corporation, Chicago, Ill.

Division of Ser. No. 829,303, Aug. 31, 1977, Pat. No. 4,117,792. This application Jul. 20, 1978, Ser. No. 926,187

Int. Cl.² D05B *1/22*

U.S. Cl. 112—165 **6 Claims**



1. A sewing machine comprising:

a pair of thread carrying needle means;

a first means operative to secure the thread of one of said needle means in said workpiece and to seize and distend the thread of the other needle means, said first means operative including means for carrying a thread; and

a second means operative to cooperate with said first means operative and the threads carried thereby in the formation of an overedge stitch.

4,175,500

DEVICE FOR ALIGNING CHAINS OF STITCHES IN A TWO-NEEDLE SEWING MACHINE

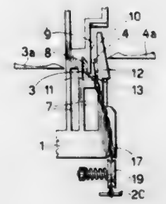
Angelo Radice, and Giovanni Palacino, both of Milan, Italy, assignors to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed Apr. 3, 1978, Ser. No. 893,114

Claims priority, application Italy, Apr. 28, 1977, 22903 A/77

Int. Cl.² D05B *1/10, 49/00*

U.S. Cl. 112—166 **4 Claims**



1. A needle plate with spaced needle holes for a two needle sewing machine of the type for simultaneously forming a straight stitch chain and an overcast stitch chain in a workpiece and with a separate looper and looper thread operatively associated with each needle, the improvement comprising:

(a) means interconnecting the spaced needle holes for permitting movement of the straight stitch chain into alignment with the overcast stitch chain upon completion of each sewing cycle;

(b) a thread adding means operatively associated with the looper functioning in cooperation with the needle forming the straight stitch chain for increasing the quantity of looper thread in the sewing area and facilitate alignment of the stitch chains; and

(c) means for maintaining the aligned chains of stitches along the sewing axis of the overcast chain stitch for incorporat-

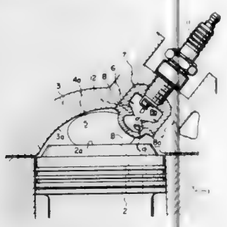
ing both chains in the initial stitches formed in the following workpiece.

4,175,501

INTERNAL COMBUSTION ENGINE WITH AN AUXILIARY COMBUSTION CHAMBER

Masaaki Noguchi, Nagoya; Shougo Sanda, Numazu, and Masaaki Takizawa, Mishima, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 29, 1977, Ser. No. 820,248
Claims priority, application Japan, Jun. 1, 1977, 52-63169
Int. Cl.[2] F02B *19/08*
U.S. Cl. 123—30 D **6 Claims**



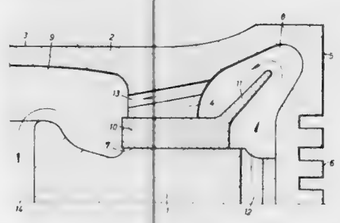
1. An internal combustion engine comprising:
a cylinder having a cylinder block and a cylinder head fixed onto said cylinder block;
a piston reciprocally movable in said cylinder block;
a main combustion chamber formed between a top surface of said piston and an inner surface of said cylinder head;
an intake valve movably mounted on the cylinder head for leading a combustible mixture into the main combustion chamber;
an exhaust valve movably mounted on the cylinder head for discharging an exhaust gas into the atmosphere;
means to supply fuel directly only to said main combustion chamber,
said cylinder head having therein an auxiliary combustion chamber extending symmetrically about an axis, said auxiliary combustion chamber having a circumferential inner wall including a raised annular portion defining a restricted opening interconnecting and of smaller diameter than a substantially spherically shaped first portion of said auxiliary combustion chamber located near the main combustion chamber and a second portion of said auxiliary combustion chamber located further from the main combustion chamber than the first portion, wherein said restricted opening is the only opening in said second portion of said auxiliary combustion chamber, the volume of said first portion of said auxiliary chamber is smaller than the volume of said second portion of said auxiliary chamber, the ratio of the diameter of said annular portion to the diameter of said second portion of said auxiliary chamber is less than 0.8, and the diameter of the second portion of the auxiliary chamber is greater than the axial length of said second portion,
a single passage means connecting the main combustion chamber and the auxiliary combustion chamber through the circumferential wall of said first portion of said auxiliary chamber, the inner end of said passage means being substantially tangentially disposed relative to the circumferential wall of said first portion of said auxiliary chamber and extending to the main combustion chamber so as to create a swirling motion of a combustible mixture in the first and second portions of said auxiliary combustion chamber, and
a spark plug having a spark gap located in the vicinity of said symmetrical axis and the second portion of said auxiliary combustion chamber, said restricted opening allowing the flow of a combustion gas from said second portion to said first portion, both of which portions are of greater diameter than the restricted opening, said combustion gas being collected in the vicinity of said symmetrical axis after said combustible mixture is ignited, while said restricted opening prevents outflow of unburned mixture from said second portion to said first portion, said unburned mixture being collected on the peripheral region in said second portion removed from said symmetrical axis due to the centrifugal force caused by said swirling motion of said combustible mixture, and
wherein said single passage means has an opening which is directed in a circumferential direction with respect to the inner wall of said main combustion chamber.

4,175,502

LIQUID-COOLED, ASSEMBLED PISTON FOR INTERNAL COMBUSTION ENGINES

Horst Moebus, Neckarsulm, Fed. Rep. of Germany, assignor to Karl Schmidt GmbH, Neckarsulm, Fed. Rep. of Germany

Filed May 22, 1978, Ser. No. 908,421
Claims priority, application Fed. Rep. of Germany, May 25, 1977, 2723619
Int. Cl.[2] F01P *3/10*
U.S. Cl. 123—41.35 **9 Claims**



1. In a liquid-cooled, assembled piston for an internal combustion engine of the type having a lower piston part, an upper piston part connected to the lower piston part, an annular cooling passage disposed in the upper piston part behind the top land and at least part of the ring-carrying portion thereof, an input coolant conduit in the lower piston part, a central cooling chamber disposed between the two piston parts, and a supporting ring concentrically disposed on the underside of the upper piston part and between the annular cooling passage and the central cooling chamber, wherein the improvement comprises: means providing communication between the annular cooling passage and the central cooling chamber, and oil-guiding means for effecting the flow of the oil along the periphery of the cooling passage as it enters same from the input coolant conduit, the liquid guiding means comprising an oil guiding ring including a flange gripped between the two piston parts and a lip connected to the flange and protruding into the annular cooling passage.

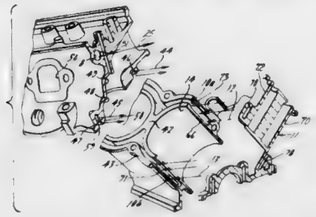
4,175,503

METHOD OF MAKING AIR ENGINE HOUSING

Robert P. Ernest, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 753,343, Dec. 22, 1976. This application Jun. 15, 1978, Ser. No. 915,857
Int. Cl.[2] F02F *1/14*
U.S. Cl. 123—41.72 **11 Claims**

1. An engine head for an internal combustion engine, comprising:
(a) an elongated housing comprised entirely of aluminum and having walls defining a top closure for a galley of aligned cylinders opening onto the bottom face of said housing, said housing having walls defining passages for inducting a combustible mixture and exhausting combusted gases, said closure walls extending upwardly from the bottom face of said housing,
(b) means defining a series of interconnected hemicylindrical grooves in said housing extending upwardly from the bottom face of said housing and consecutively along each of said cylinders, said grooves limiting the lower portion of said top closure walls to a thin-sectioned cylinder, said grooves being so interconnected as to leave a solid siamese connection between each of said thin-sectioned cylinders,



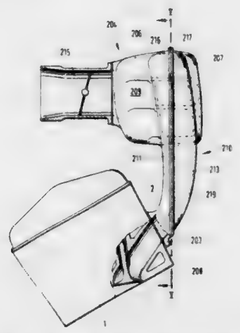
said grooves cooperating in forming two independent flow paths on opposite sides of a centerline extending between each of said cylinders, each of said flow paths extending transversely and consecutively from one cylinder to the next,
(c) means in said housing defining a third flow path arranged as a cylindrical boring located at the upper side of said housing spaced generally midway between said grooves, each of said three flow paths being commonly supplied with fluid from one end of said housing.

4,175,504

AIR INDUCTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Georg Ederer, Munich; Adolf Fischer, Haar am Jagdfeld; Paul Rosche; Helmar Troll, both of Munich; Wolfgang Wurst, Dachau; Helmut Hengl, and Jiri Seidl, both of Munich, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke AG, Munich, Fed. Rep. of Germany

Division of Ser. No. 598,086, Jul. 22, 1975, Pat. No. 4,111,163. This application Mar. 20, 1978, Ser. No. 888,262
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1975, 2501305
Int. Cl.[2] F02B *75/18*
U.S. Cl. 123—52 M **8 Claims**



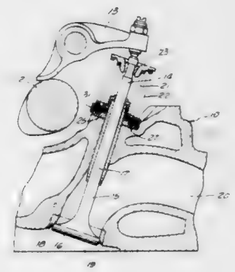
1. In combination, an internal combustion engine and an air induction system therefor, said air induction system comprising a distributor housing having an air inlet opening, and a plurality of induction passages having respective inlets whereby the interior of the distributor housing communicates with the interiors of the passages respectively and having respective oulets for connection to respective inlet ports of the engine, the internal cross section of each induction passage widening towards one or both ends thereof, said induction system being formed from a first pressure die cast part which defines a first portion of each induction passage and is formed integrally with flange means at the outlet ends of the induction passages for mounting said first part on a face of the engine, and a second part which defines a second portion of each induction passage and is joined to said first part in a plane which cuts lengthwise through the induction passages.

4,175,505

VALVE ROTATOR ASSEMBLY

Shinichi Shimada, Kamifukuoka, and Takenori Makino, Okegawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1977, Ser. No. 847,231
Claims priority, application Japan, Nov. 11, 1976, 51/150610[U]; Dec. 2, 1976, 51/160476[U]
Int. Cl.[2] F01L *1/32*
U.S. Cl. 123—90.3 **1 Claim**



1. For use with a poppet valve assembly for a combustion chamber of an internal combustion engine, said assembly including a poppet valve having a stem, a pair of concentric coil compression springs encircling a portion of the stem and a retainer removably attached to the valve stem and contacted by the upper end of each spring, the improvement comprising, in combination: a stationary support member encircling the valve stem and having a concentric upward facing continuous groove therein, a garter spring in said groove and projecting slightly out of the groove, an annular rotator plate engaging said garter spring, and a retainer ring resting on said rotator plate and providing an upward facing shoulder for supporting the lower end of each of said coil springs at the same elevation, said retainer ring having integral fingers projecting therefrom contacting the outside of the outer coil spring and also having an inner cylindrical lip contacting the inside of the inner spring to hold these springs in concentric position.

4,175,506

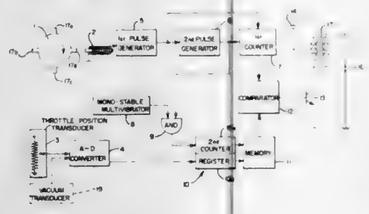
ELECTRIC IGNITION CONTROL SYSTEM

Shinichi Sakamoto, and Takao Sasayama, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 10, 1977, Ser. No. 757,932
Claims priority, application Japan, Jan. 9, 1976, 51/1491
Int. Cl.[2] F02P *5/04*
U.S. Cl. 123—117 D **7 Claims**

1. In an ignition control system comprising:
an ignition coil for producing high voltage so as to create an ignition spark in the gap of a spark plug;
switching means to produce or interrupt an energizing current through the ignition coil;
a memory for storing data relating to the ignition timing corresponding to at least one engine driven condition;

detecting means to detect an engine drive condition;
memory driving means responsive to the signals representing an engine drive condition from said detecting means for generating an address signal corresponding to such engine drive condition, said address signal being applied to said memory to read out selected ignition timing data;
means for detecting an instantaneous crankshaft position; and
comparator means for controlling said switching means so as to interrupt the energizing current of the ignition coil when the instantaneous crankshaft position becomes equal to the output of said memory;
the improvement characterized in that the instantaneous crankshaft position detecting means comprises
first pulse generator means for producing series reference pulses with a predetermined interval of the crankshaft revolution;
second pulse generator means for producing a predetermined number of crankshaft position pulses during the predetermined interval, said each pulse corresponding to a predetermined degree of the interval of the crankshaft revolution; and



first counting means for counting the crankshaft position pulses to apply the instantaneous crankshaft position signal to said comparator means;
said second pulse generating means including:
third pulse generating means for generating series pulses of a predetermined constant frequency which is higher than that of the reference pulses from the first pulse generator means and the crankshaft position pulses from the second pulse generator means;
second counting means having a counting cycle for counting a predetermined number of pulses, the second counting means outputting one pulse and being resumed itself to start count again when the predetermined number of the series pulse from the third pulse generating means has been received;
third counting means for counting the series pulses from the third pulse generating means, which has a reset terminal to clear the count of said third counting means to zero;
fourth counting means for counting the output of the second counting means; and
second comparator means for outputting pulses to the first counting means when the count of the third counting means reaches the output digital value of the fourth counting means.

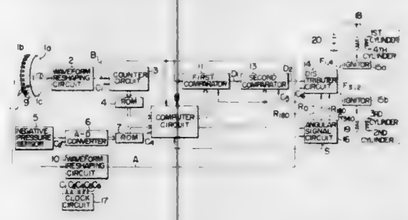
4,175,507

ELECTRONIC IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Hisasi Kawai, Toyohashi, and Kazuo Iwase, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 2, 1977, Ser. No. 847,815
Claims priority, application Japan, Dec. 17, 1976, 51/152567
Int. Cl.² F02P *1/00, 5/04*
U.S. Cl. 123—117 D **3 Claims**

1. An electronic ignition timing control system comprising:
rotation angle means for producing a train of rotation pulses each of which is indicative of a predetermined angular rotation of an output shaft of an engine;
reference angle means for producing a reference pulse indicative of a rotation of said output shaft of said engine to a predetermined reference angle;
clock means for producing a train of clock pulses at a fixed frequency;
computing means for computing a desired ignition retard angle in accordance with operating conditions of said engine, said first computing means producing a first output value indicative of a quotient obtained by dividing said ignition retard angle by an angular interval of each of said rotation pulses and a second value indicative of a residual obtained by dividing said ignition retard angle by said angular interval;
converting means for converting said second value produced from said first computing means into a retard time in response to a rotation speed of said output shaft of said



engine, said converting means producing a third value indicative of said retard time;
first comparison means for comparing a number of said rotation pulses produced after said reference pulse with said first value produced from said computing means, said first comparison means producing a first comparison output when said number of said rotation pulses reaches said first value;
second comparison means for comparing a number of said clock pulses produced after said first comparison output with said third value produced from said converting means, said second comparison means producing a second comparison output when said number of said clock pulses reaches said third value; and
ignition means for producing an ignition voltage in response to said second comparison output.

4,175,508

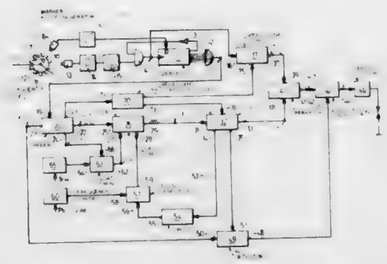
METHOD AND APPARATUS TO GENERATE A TRIGGER PULSE WITHIN A TIME RANGE, PARTICULARLY IGNITION PULSES IN INTERNAL COMBUSTION ENGINES

Jürgen Wesenmeyer, Nüremberg; Georg Haubner, Berg, and Werner Meier, Rednitzhembach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 869,616
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1977, 2702208
Int. Cl.² F02P *5/04*
U.S. Cl. 123—117 R **14 Claims**

1. System to trigger an ignition pulse to determine the ignition instant in an internal combustion engine with respect to a reference position of the crankshaft of a piston thereof comprising
a marker pulse generator (**6, 7**) providing a marker pulse when the piston has reached a predetermined position;
a sequential pusle generator (**11, 12, 13**) providing a continuously occurring plurality of pulses during operation of the apparatus, a predetermined number of said pulses, upon occurrence of said marker pulse, forming a pulse train;
count and store circuit (**32**);
condition signal generating means (**60, 65**) generating at least

one engine operating signal representative of an operating or operation condition of the engine;
a pulse generator means (**57**) generating a sequence of pulses;
a gating circuit (**26**) connected to the condition signal generating means (**60,65**) and having the sequential pulses from the pulse generating means (**57**) applied thereto, and applying the pulses from said frequency generating means during the occurrence of said pulse train to the count and store circuit (**32**);
said count and store circuit alternately counting and storing the pulses applied by said gating circuit; and
a comparator (**40**) comparing the pulses stored in the memory of the count and store circuit (**32**) and the pulses derived from the sequential pulse generator and forming said pulse train, and providing said ignition signal when a predetermined relation between the pulses applied to the comparator exists, wherein, in accordance with the invention,



to generate said predetermined number of pulses forming said pulse train a counter means (**1**) is provided having said plurality of pulses from said sequential pulse generator (**11, 12, 13**) applied thereto,
the counter being further connected to said marker pulse generator to start counting said pulses from the sequential pulse generator (**11, 12, 13**) upon occurrence of the marker pulse; and
decode means (**2, 3, 4**) connected to a predetermined stage of the counter means (**1**) and deriving a pulse having a time length representative of rotation of the shaft of the engine through a predetermined angular range, including gating means (**2**) connected to at least one predetermined count output stage of the counter means (**1**) whereby stepping of the counter means in synchronism with the pulses and gating a counter means signal at a predetermined count stage will provide a time interval signal having a timing duration representative of said angular range of rotation.

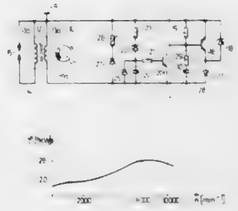
4,175,509

MAGNETO IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Josef Orova, Schwabach, and Jiri Podrapsky, Buchschwabach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 869,617
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1977, 2601750
Int. Cl.² F02P *3/02*
U.S. Cl. 123—117 R **7 Claims**

1. In a magneto ignition system for an internal combustion engine having
a magnet (**11**) rotating with the engine;
a magneto armature (**12**) in magnetically coupled relation to the rotating magnet and having a primary coil (**13***a*) connected to a primary circuit, and a secondary coil (**13***b*) connected to a spark plug (**15**);
a semiconductor switch (**16**) having a control path (base-emitter) connected in the primary circuit;
a control circuit (**20–25**) connected to the control path of the semiconductor switch (**16**) and to the primary circuit of the ignition coil, including
means (**22**) sensing the voltage level across said primary circuit,
and connection means (**20, 21**) responsive to said voltage level connected to and controlling conduction and cut-off, respectively, of the semiconductor switch as a function of said voltage level to provide, upon conduction of the semiconductor switch, for current flow through the primary coil, and sudden interruption of current flow upon cut-off and to generate a spark in said spark plug at a predetermined angular position with respect to top dead center (TDC) position of a piston of the engine,
means to advance the spark upon increase of speed of the engine comprising



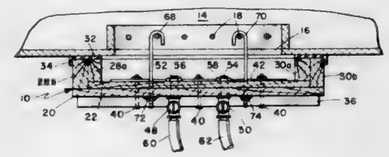
means (**28, 29, 30**) modifying the voltage level across said primary circuit as a function of increasing speed of the engine in a direction to cause response of said voltage level sensing means, and hence of said connection means to control said semiconductor switch (**16**) to cut off at an advanced angular position with respect to TDC position of a piston of the engine, said modifying means comprising a frequency responsive circuit (**28, 29, 30**) connected to the primary circuit and providing an output changing the voltage level in said primary circuit as a function of change of frequency of the current flow in the primary circuit upon change of speed of rotation of the magnet as the speed of the engine changes.

4,175,510

COFFERDAM

Thomas H. Devine, 147 Jefferson Ave., Chula Vista, Calif. 92012

Filed Oct. 25, 1977, Ser. No. 845,355
Int. Cl.² B63B *43/16*
U.S. Cl. 114—227 **11 Claims**



1. A cofferdam for closing off underwater openings in ships' hulls, comprising:
a first wall constructed of a plurality of sheets of marine plywood laminated together having a generally planar configuration defining a stepped portion extending around the perimeter thereof, and dimensioned to exceed the area of an opening to be covered in a ship's hull;
a second wall constructed of multiple wooden beams laminated together defining a step extending along the entire length of said second wall, said second wall extending

around the perimeter of, and at right angles to said first wall for engaging said ship's hull around said opening for spacing said first wall a predetermined distance from said ship's hull for defining a cavity therebetween;

said step and said stepped portion defining a stepped overlapping joint extending around the perimeter of and connecting said first wall and said second wall together at the intersection thereof;

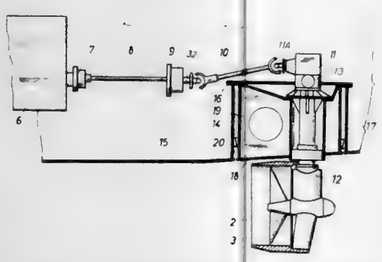
seal means extending around the periphery of said second wall for sealing the engagement thereof with a ship's hull; and

mounting means for securing said cofferdam to a ship's hull for covering an opening therein.

4,175,511
TUGBOAT OR THE LIKE

Franz Krautkremer, Spay, Fed. Rep. of Germany, assignor to Schottel-Werft Josef Becker GmbH & Co. KG, Rheinland, Fed. Rep. of Germany

Filed Nov. 16, 1977, Ser. No. 852,031
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1976, 2655667
Int. Cl.[2] B63H *5/12*
U.S. Cl. 115—35 **7 Claims**



1. A drivable propeller arrangement for a watercraft, comprising:

a watertight compartment formed in the lower hull of said watercraft and having a downwardly open port therefrom to below said watercraft, the upper end of said watertight compartment being positioned above the waterline on said watercraft;

a hollow housing removably mounted in said compartment, the maximum peripheral dimension of said housing in a horizontal plane being less than the minimum peripheral dimension of said compartment in a horizontal plane thereby defining a spacing therebetween, said housing having a lower wall flush with the surface of said lower hull;

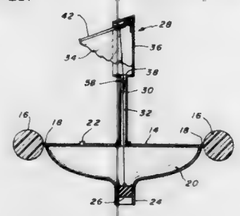
steerable propeller means mounted on said housing, said steerable propeller means extending through the hollow part of said housing and through said lower wall and having a propeller means supported for rotation about a horizontal axis on a lower end thereof below said lower wall, the maximum peripheral dimension of said propeller means in a horizontal plane being less than said peripheral dimension of said compartment; and

support means for said housing including a laterally extending flange on said housing which rests on the upper end of said watertight compartment and plural thrust blocks received in said spacing to thereby stabilize said housing with said compartment.

4,175,512
ICE THICKNESS INDICATOR

Douglas W. Iwanicki, 120 Lynnfield St., Peabody, Mass. 01960

Filed Aug. 3, 1978, Ser. No. 930,751
Int. Cl.[2] G01D *11/00;* **G01K** *11/06*
U.S. Cl. 116—217 **12 Claims**



1. A device for indicating whether the surface of a body of water has frozen to a predetermined thickness comprising:

a hollow housing adapted to be filled fully with water, said housing having a downwardly extending lower portion adapted to be submerged in the body of water and an opening formed in the downwardly extending lower portion;

a member carried by the housing and covering the opening in the downwardly extending lower portion in sealing relation to the housing, the member being movable with respect to the housing, to define an expansible chamber in cooperation with the housing, said movable member being movable toward and away from the more upwardly disposed portions of the housing;

means for supporting said housing so that predetermined portion thereof is disposed at reference surface said movable member is disposed at a predetermined depth below the surface of the body of water;

said movable member being movable downwardly in response to expansion of water within the housing as the water in the housing freezes;

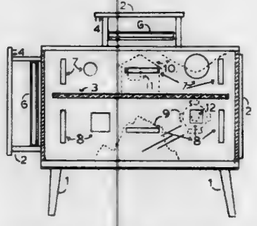
indicator means carried by the housing at a location above the level of the housing; and

means connecting the indicator means to said movable member to enable the indicator means to provide an indication of the position of the movable member and, thereby an indication of the thickness of the ice at the surface of the body of water.

4,175,513
QUICK STEP ECOLARIUM

Otto A. Roehrick, 1333 Elkhorn Blvd., Rio Linda, Calif. 95673

Filed Oct. 4, 1976, Ser. No. 729,306
Int. Cl.[2] A01K *64/00*
U.S. Cl. 119—5 **11 Claims**



1. For an ecology tank system comprising a lower aquarium compartment and a terrarium upper compartment, said compartments being separated by a shelf or platform horizontally disposed therebetween, in combination:

(A) means for supporting said tank and controlling the light to said tank for illuminating ornamentation and algae control, the combination comprising a stand, a vertical light chamber rising upward from the back of said stand having an external shape corresponding to the external shape and size of said ecology tank, said light chamber having an opaque back wall, opaque bottom member with end and top members having apertures therein for receiving light drawers, the front wall of said light chamber having light dispensing apertures of predetermined size and shape and locations, said light chamber containing an electrical circuit with a female outlet at each drawer opening and at least one additional outlet,

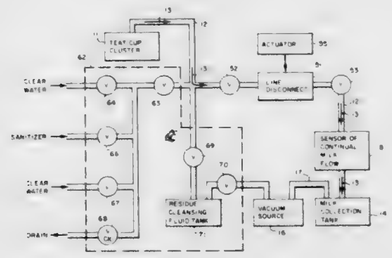
(B) light drawers extending the light bulbs inward from the side and top walls to a predetermined location said light drawers having the male connector for engaging said light when the drawer is closed,

(C) ornamental light dispensing objects to be used on the inside of said ecology tank having bottom and top walls a front wall, side walls, and no back wall, the front and side walls having at least one ornamental light dispensing aperture.

4,175,514
AUTOMATIC MILKING MACHINE CONTROL AND CLEANSING

Frank F. Souza, Hilmar; Vernon A. Silva, and Tony Cabral, both of Turlock, all of Calif., assignors to Frank F. Souza, Inc., Turlock, Calif.

Filed May 19, 1977, Ser. No. 798,292
Int. Cl.[2] A01J *7/00*
U.S. Cl. 119—14.08 **7 Claims**



1. In automatic apparatus for successively milking a plurality of cows with a cow milking teat cup cluster and for internally cleansing the teat cup cluster between the milking of successive cows therewith, comprising the combination of:

means normally communicating said teat cup cluster with a milk receptacle for the flow of milk therebetween;

means to control milking a cow with said teat cup cluster;

means to prevent operation of said means to control milking a cow, during internal cleansing of said teat cup cluster;

means to interrupt fluid communication of said cluster with said milk receptacle, during internal cleansing of said cup cluster;

means to pass cleansing fluid through said cluster; and

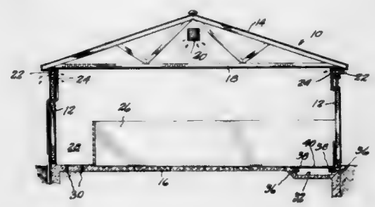
means to control operation of said fluid communication interrupting means and said cleansing fluid passing means, which control means directs said cleansing fluid passing means to pass said cleansing fluid through said cluster only when fluid communication of said cluster with said milk receptacle is interrupted;

said means to interrupt said fluid communication of said cluster with said milk receptacle including means both to disconnect fluid communication between and to physically separate and space away from one another in a direction having a directional component extending along the path of normal fluid communication therebetween, the fluid communicating parts of a pair of adjacent flow components providing a continuous flow path therebetween for milk.

4,175,515
SANITARY UNIT FOR CONFINED ENVIRONMENTAL CONTROLLED FEEDING OF HOGS

Kenneth M. Bradley, Rte. 5, Meadow Brook, Dowagiac, Mich. 49047

Filed Dec. 5, 1977, Ser. No. 857,295
Int. Cl.[2] A01K *1/00, 1/01*
U.S. Cl. 119—16 **8 Claims**



1. In a sanitary unit for confined environmental controlled feeding of hogs,

a building having walls, a roof and a floor,

means in said building forming a plurality of pens for confining hogs,

means in each pen providing feeding and watering stations for hogs,

means controlling the environment and temperature in said building,

the floor of said building including an elongated trough extending through each pen spaced from said feeding and watering stations, said trough having a bottom inclined longitudianlly to a discharge outlet,

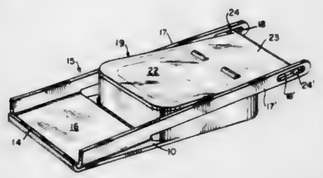
a multi-section removable grill covering said trough, and

means for periodically directing and discharging jets of water at a pressure in the order of 50 psi or more diagonally into said trough below said grill at points spaced apart in the order of 4 ft. along the length of and at each side of the trough.

4,175,516
PET FEEDING DEVICE

Richard T. Savage, Greenlake Ave., Leeds, N.Y. 12451

Filed Sep. 28, 1977, Ser. No. 837,609
Int. Cl.[2] A01K *1/10*
U.S. Cl. 119—62 **1 Claim**



1. A pet-operated closeable feeding device comprising:

(a) a frame;

(b) an open food receptacle in fixed position on and integral with said frame and having forward and rearward edge portions;

(c) an actuator unit pivotably mounted on said frame for-

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ward of the forward edge portion of said food receptacle comprising:

i. a flat pedal portion disposed between the pivotable mounting of the actuator unit and the forward edge portion of said food receptacle, and

ii. a pair of parallel arm portions extending from said pedal portion rearwardly to each side of and beyond the rearward edge portion of said food receptacle, each of said arm portions being formed with a longitudinal slot; and

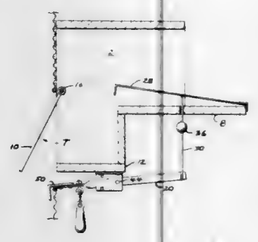
(d) a lid unit pivotably hinged to said frame adjacent the rearward edge portion of said food receptacle and comprising:

i. a transparent flat cover portion adapted to overlie and enclose said food receptacle when said lid unit is in said closed position, and

ii. an end portion extending rearwardly and including a pair of coaxial opposed trunnions extending outwardly in slideable contact with the respective slots in the actuator unit arm portions;

(e) whereby a downward turning force on said pedal portion causes the lid unit cover portion to pivot upwardly to an open position while the point of sliding contact of the lid unit trunnions and the actuator unit arm portion slots moves forwardly toward the pivotable mounting of the actuator unit.

4,175,517
CAT PROOF PIGEON TRAP
Doyle G. Kilgore, 1303 Gober St., Houston, Tex. 77017
Filed Aug. 1, 1978, Ser. No. 929,934
Int. Cl.[2] A01K *29/00*
U.S. Cl. 119—155 **4 Claims**



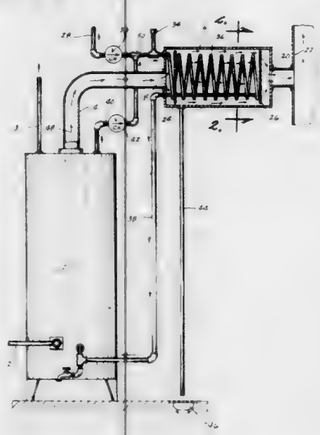
1. A pigeon trap comprising a walkway divided into an outer walkway having an outer end open to the atmosphere and an inner walkway having an inner end open to an aviary except for the usual bobs pivotally suspended from a horizontal pin disposed above such inner end, such bobs normally hanging approximately vertically and having free lower ends,

a balance beam extending below both said walkways and pivotally mounted proximate its midpoint with an outwardly extending portion having its end connected to said outer walkway by a connecting rod and its inwardly extending portion having an end provided with a number of through openings registering with and adapted to receive the lower ends of said bobs,

said outer walkway being pivoted and having a normally raised position when no weight rests on it and a depressed position when a weight less than that of the average pigeon does rest on it,

whereby when there is no weight on the outer walkway it assumes its raised position and it acts on said balance beam through the connecting rod to raise the outer end of the beam and depress the inner end of the beam to keep such inner end spaced away from the lower ends of the bobs and allow a pigeon standing on the inner walkway to push the bobs out of its way so that it can pass by them into the aviary, and when a pigeon or other animal rests a portion of its weight on the outer walkway, such outer walkway assumes its depressed position and rotates the balance beam so that its outer end is depressed and its inner end is raised to engage said lower ends of the bobs and lock said bobs against rotation.

4,175,518
PREHEATER DEVICE FOR HOT WATER HEATERS
Cedric (Ted) A. Reames, Jr., R.R. #2, Adel, Iowa 50003
Filed Feb. 21, 1978, Ser. No. 879,063
Int. Cl.[2] F22B *1/18*; F22D *1/00*
U.S. Cl. 122—20 B **9 Claims**



1. A preheater for water heaters and the like comprising:

a cold water line in connection with a source of cold water;

a water container having upper and lower ends, an inlet line connected adjacent said lower end and a hot water outlet line, a source of heat, and a flue to carry away the products of combustion from said heat source;

a manifold imposed in said flue above said upper end of said container,

a coil line imposed within said manifold and having a second end in connection with said inlet line of said container, and a first end in communication with said cold water line, whereby cold water will pass through said coil line prior to entering said container adjacent said lower end thereof;

a recirculating line connected adjacent said upper end of said container and in connection with said cold water line upstream of said coil;

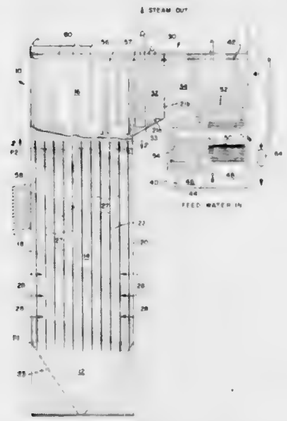
a first check valve means in said recirculation line above said container to permit flow of water from said recirculating line only in a direction away from said container, and

a second check valve means in said cold water line upstream from said manifold and said recirculating line to permit cold water to flow only towards said manifold and to prevent water from said recirculating line from entering said cold water line.

4,175,519
VAPOR GENERATOR UTILIZING VERTICAL BARS FOR SUPPORTING ANGULARLY ARRANGED FURNACE BOUNDARY WALL FLUID FLOW TUBES
Harry H. Pratt, West Orange, and Dudley P. Money, Parsippany, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.
Filed Mar. 31, 1978, Ser. No. 892,061
Int. Cl.[2] F22B *37/24*
U.S. Cl. 122—510 **10 Claims**

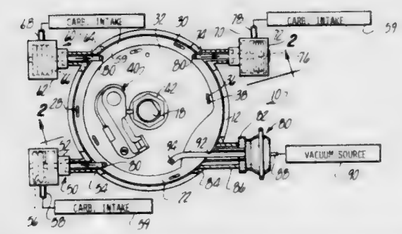
1. A vapor generator comprising an upright furnace section

the boundary walls of which are formed by a plurality of tubes, and means for passing fluid through said tubes to apply heat to said fluid; one portion of each of said walls being formed by tubes extending at an acute angle with respect to a horizontal plane and another portion of each of said walls being formed by tubes extending substantially vertically, and a plurality of substantially vertically extending support bars disposed at spaced intervals across said boundary walls and connected



along their lengths to said tubes along both portions of said walls for supporting said tubes, the portion of each support bar connected to said angularly extending tubes having a series of substantially semi-circular notches formed therein for receiving a plurality of said latter tubes and the portion of each support bar connected to said vertically extending tubes having an elongated notch formed therein for receiving one of said latter tubes.

4,175,520
DISTRIBUTOR ASSEMBLY
Albert C. Russell, deceased, late of Belleair, Fla., and Mary K. Russell, administratrix, One Eastwood La., Belleair, Fla. 33516
Filed Jan. 16, 1978, Ser. No. 869,524
Int. Cl.[2] F02P *5/04*
U.S. Cl. 123—117 A **8 Claims**



1. A distributor assembly for use with an internal combustion engine, said distributor assembly comprising:

a distributor housing,

a first distributor plate and means for rotatably mounting said first plate in the housing between a first and second rotational position,

a second distributor plate and means for coaxially rotatably mounting said second plate onto said first plate between a first and second rotational positon,

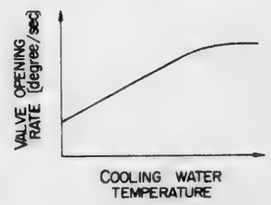
switch means mounted to said second plate,

a distributor shaft rotatably mounted through said housing and coaxially through said plates and means connected to said shaft for selectively actuating said switch means upon rotation of said shaft,

means for controlling the rotational position of one of said plates in response to the manifold vacuum of said engine, and

means for controlling the rotational position of the other plate in response to the temperature and pressure of an air source.

4,175,521
AIR-FUEL RATIO ADJUSTING SYSTEM
Tadashi Hattori, Okazaki; Akira Takata; Tamotsu Fukuda, both of Toyota, and Takamichi Nakase, Gamagori, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan
Filed Mar. 30, 1977, Ser. No. 782,733
Claims priority, application Japan, Apr. 14, 1976, 51-42697
Int. Cl.[2] F01N *3/15*; F02M *37/00*
U.S. Cl. 123—119 D **9 Claims**



1. An air-fuel ratio adjusting system for an internal combustion engine which includes main air supply means having a throttle valve therein, for producing air-fuel mixture to be supplied to the engine, and an exhaust system for emitting exhaust gases, comprising:

an air-fuel ratio sensor disposed in the exhaust system, for sensing the air-fuel ratio of the mixture from oxygen content of the exhaust gases;

additional air supply means including a bypass valve, for supplying additional air into the main air supply means on a downstream side of the throttle valve, the amount of the additional air corresponding to the degree of opening of the bypass valve;

bypass valve driving means connected to said bypass valve for moving said bypass valve;

an engine warm-up condition sensor for sensing the warm-up condition of the engine to produce an engine condition signal; and

a control unit connected to said air-fuel ratio sensor, said bypass valve driving means, and said engine warm-up condition sensor, for controlling said bypass valve driving means to move said bypass valve at a speed which varies with the engine condition signal, and in a direction of maintaining the air-fuel ratio of the mixture at a target value, the moving speed of said bypass valve in a leaner direction being varied to decrease said target value until said air-fuel ratio sensor has been activated completely.

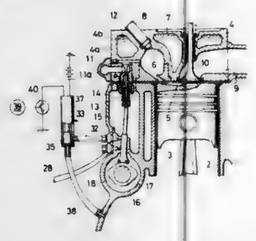
V 9884 NO 27 79 UMI

4,175,522

EXHAUST GAS RECIRCULATION DEVICE FOR INTERNAL COMBUSTION ENGINE WITH AUXILIARY COMBUSTION CHAMBER

Hideo Kawamura, Yamato; Hideo Ohta, Kohza, and Kimi Kubota, Chigasaki, all of Japan, assignors to Isuzu Motors Limited, Kawasaki, Japan

Filed Jan. 16, 1978, Ser. No. 869,962
Claims priority, application Japan, Jan. 24, 1977, 52/6652
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **4 Claims**



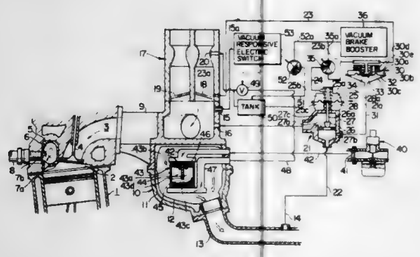
1. In a multicylinder, four cycle compression ignition internal combustion engine of the type employing auxiliary combustion chambers in which fuel is injected in timed sequence, an exhaust gas recirculating device comprising:
an exhaust gas expansion manifold communicating with each of said auxiliary combustion chambers through separate exhaust passages,
a plurality of cam operated valves, one located in each of said separate exhaust passages for controlling the flow of exhaust gas between said auxiliary combustion chambers and said exhaust gas expansion manifold, said cam operated valves being driven by a common cam shaft to open in the expansion stroke and again in the suction stroke of their corresponding cylinders, and
hydraulic control means for preventing the opening of said plurality of cam operated valves under condition of high load operation.

4,175,523

INTERNAL COMBUSTION ENGINE AND A METHOD FOR OPERATION THEREOF

Masaaki Noguchi, Nagoya; Masaharu Sumiyoshi, Toyota; Tsuchio Bunda, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 27, 1978, Ser. No. 890,901
Claims priority, application Japan, Mar. 29, 1977, 52-35008
Int. Cl.[2] F02M *25/06*; F02B *43/08*
U.S. Cl. 123—119 A **18 Claims**



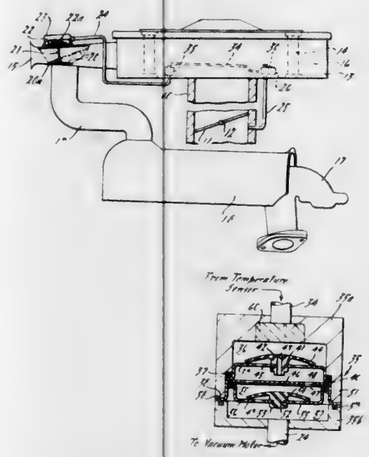
1. A method of operating an internal combustion engine of the type that comprises a combustion chamber, an intake system having a fuel circuit for feeding a mixture of air and gasoline into said combustion chamber, an ignition system, an exhaust system, an EGR system for recirculating a part of the engine exhaust gases from the exhaust system back into said intake system, and a fuel reforming system for converting a mixture of air and a fuel into a reformed combustible gaseous mixture rich with free hydrogen, said method comprising the steps of:
detecting the load on the engine;
supplying said combustion chamber with the air-gasoline mixture while recirculating the engine exhaust gases at a rate not higher than a predetermined first EGR rate when the engine load as detected is lower than a predetermined load level; and
feeding said combustion chamber with the reformed combustible gaseous mixture in addition to the air-gasoline mixture supply and substantially simultaneously increasing the exhaust gas recirculation to a rate higher than said predetermined first EGR rate when the engine load as detected exceeds said predetermined load level.

4,175,524

INLET AIR TEMPERATURE CONTROL FOR AUTOMOBILE ENGINE

Thomas T. Coddington, Troy, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 17, 1977, Ser. No. 852,424
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—122 D **12 Claims**



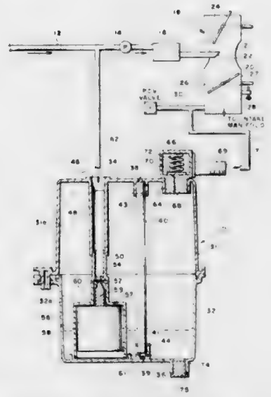
1. In an internal combustion engine having an inlet air passage, first and second air inlet means for supplying ambient air and preheated air respectively to said passage, means for controlling the ratio of the ambient air to the preheated air supplied to said passage from said first and second inlet means to control the temperature of the air flow in said passage comprising proportioning valve means for controlling the communication between said passage and said air inlet means, a pressure actuated motor responsive to sub-ambient pressures for urging said proportioning valve means to decrease said ratio, temperature actuated means responsive to temperatures related to engine operation for modulating a pressure related to engine operation to effect a modulated motor actuating pressure comprising a function of the last named temperatures, and conduit means for applying the modulated pressure to said motor, the combination of check valve means for restricting the rate of fluid flow in said conduit means in one direction to said motor and for enabling fluid flow in said conduit means freely in the reverse direction from said motor, and second temperature actuated means responsive to temperatures related to engine operation and below a predetermined value for blocking said restricted fluid flow in said conduit means in said one direction to said motor.

4,175,525

FUEL VAPORIZER SYSTEM FOR INTERNAL COMBUSTION ENGINES

Edward E. Johnson, Richardson, Tex., assignor to Auto-Miser International Manufacturing Corp., Fort Worth, Tex.

Filed Apr. 8, 1977, Ser. No. 785,750
Int. Cl.[2] F02P *5/04*; A61M *15/00*
U.S. Cl. 123—134 **7 Claims**



1. A fuel distribution system comprising:
(a) a carburetor including a throttle valve and connected to the intake manifold of an internal combustion engine;
(b) fuel supply means for supplying fuel to said carburetor including a fuel reservoir, a pump, a first fuel line connecting said reservoir and said pump and a second fuel line connecting said pump and said carburetor;
(c) conduit means connected between said intake manifold downstream from said throttle valve and a PCV valve;
(d) a fuel vaporizer having fuel inlet means, air inlet means and outlet means, said vaporizer comprising:
(i) a top wall, a bottom wall and side walls defining a sealed enclosure;
(ii) a fuel conduit depending internally from the top wall of said enclosure, the lower end of said fuel conduit containing an orifice defining a valve seat, said valve seat being positioned substantially equidistant from said top and bottom walls and a substantial distance from any side wall, the upper end of said fuel conduit communicating with said fuel inlet means;
(iii) float means supporting a needle valve aligned with and adapted for mating with said valve seat and preventing fuel flow therethrough when a predetermined fuel level is contained in the lower portion of said enclosure;
(iv) cage means affixed to said fuel conduit defining a housing coaxial with said valve seat surrounding the vertical sides of said float means and extending below said predetermined fuel level, thereby preventing lateral movement of said float means with respect to said valve seat and damping vertical movement of said float means;
(v) an upstanding boss extending from said bottom wall spaced from and completely surrounding the lower end of said cage means to prevent air bubbles from entering said cage means;
(vi) air conduit means for conducting air from said air inlet means to a point below said predetermined fuel level; and
(vii) check valve means controlling fluid flow through said outlet means, said check valve means preventing fluid flow into said enclosure through said outlet means and permitting fluid flow from said enclosure through said outlet means only when there is a predetermined pressure differential across said check valve means;
(e) first conduit means for conducting fuel from said first fuel line to said fuel inlet means; and
(f) second conduit means for conducting fluid from said check valve into said conduit means connected between said intake manifold downstream from said throttle valve and said PCV valve.

4,175,526

APPARATUS FOR VENTING FUEL VAPORS FROM A CARBURETOR FUEL BOWL

Michael B. Phelan, Florissant, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Nov. 7, 1977, Ser. No. 848,986
Int. Cl.[2] F02M *59/42*
U.S. Cl. 123—136 **9 Claims**

1. Apparatus for venting fuel vapors present in the fuel bowl of a carburetor for an internal combustion engine, said carburetor having a passage through which air is drawn into the engine and a throttle valve positioned in the passage and movable between an open and a closed position to control the flow of air therethrough, the apparatus comprising:
an evacuable chamber;
a first fluid flow path extending between said air passage and said chamber and a second fluid flow path extending between said chamber and said fuel bowl, said second fluid flow path having means positioned therein for adsorbing fuel vapors drawn from said fuel bowl; and
control means responsive to the operation of said engine for unblocking said first fluid flow path and blocking said second fluid flow path when said engine is running whereby said chamber is evacuated and a vacuum is created therein and for blocking said first fluid flow path and unblocking said second fluid flow path when said engine is not running whereby fuel vapors in said fuel bowl are drawn off to the chamber by the vacuum created therein thereby venting the fuel bowl.

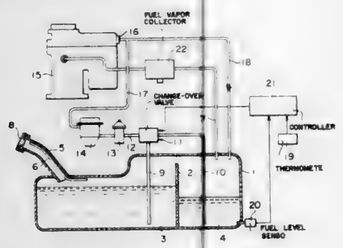
V 9 8 1 4 N 0 2 7 7 9 UMI

4,175,527

FUEL SUPPLY SYSTEM FOR ENGINES

Masakatsu Sanada; Toshimitsu Ito, both of Toyota, and Masahiko Nakada, Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 24, 1977, Ser. No. 809,759
Claims priority, application Japan, Mar. 22, 1977, 52/31357
Int. Cl.[2] F02M *59/00*
U.S. Cl. 123—136 **8 Claims**



1. A fuel supply system, for an internal combustion engine equipped with a carburetor, comprising:
- a fuel tank which comprises a fuel supply port, a first chamber which receives fuel supplied into the fuel supply port, and a second chamber;
- a fuel supply passage means, which supplies fuel from the fuel tank to the carburetor, and which incorporates a fuel pump and a change-over valve which changes over connection of the fuel supply passage means between the first and the second chamber of the fuel tank;
- a fuel return passage means, which returns excess fuel supplied to the carburetor back to the second chamber of the fuel tank;
- a thermometer which senses a temperature which represents the temperature of the fuel;
- a vapor bleed passage means for bleeding vapor out of the upper region of the second chamber;
- and a controller which controls the operation of the change-over valve in accordance with the temperature sensed by the thermometer, so that the fuel in the second chamber is supplied to the carburetor only when the temperature sensed by the thermometer is higher than a predetermined value.

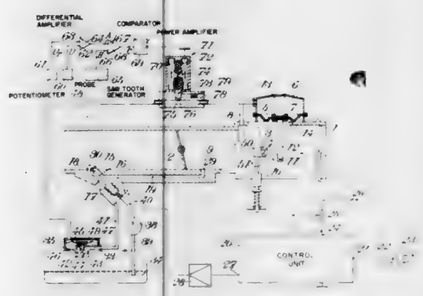
4,175,528

FUEL SUPPLY DEVICE FOR INTERNAL COMBUSTION ENGINE

André L. Mennesson, Neuilly-sur-Seine, France, assignor to Societe Industrielle de Brevets et d'Etudes S.I.B.E., Neuilly sur Seine, France

Filed Sep. 17, 1976, Ser. No. 724,363
Claims priority, application France, Sep. 30, 1975, 75 29916
Int. Cl.[2] F02M *39/00*
U.S. Cl. 123—139 AW **7 Claims**

1. A fuel supplying device for an internal combustion engine comprising:
- an intake pipe,
- operator actuatable main throttle means in said pipe,
- auxiliary throttle means located in said intake pipe upstream of said main throttle means, said auxiliary throttle means automatically and progressively opening in proportion to the increase in the flow rate of air in said intake pipe,
- a source of fuel under pressure having a delivery circuit which opens into a portion of the intake pipe downstream of the main throttle means,
- first solenoid valve means controlling the flow of fuel in said delivery circuit,
- a metering system which is responsive to the degree of opening of the auxiliary throttle means having means delivering repeating pulse signals and arranged to supply said first solenoid valve means with at least one energization signal per pulse signal repetition period, said energization signal being applied for a fraction of the repetition period which depends on said degree of opening, and
- pressure regulator means with said delivery circuit and including
- a relief valve having a closure member, said relief valve being subjected to an opening force by the fuel pressure in said delivery circuit and subjected to a closure force by the vacuum in a control chamber connected by connecting duct means to that portion of the intake pipe between the two throttle means,



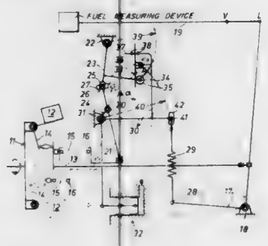
second solenoid valve means controlling communication between said duct means and the atmosphere, and
- an energizing electric circuit for said second solenoid valve comprising means responsive to at least one engine operating parameter which is modified upon a change in the fuel injection pressure, said electric circuit supplying said second solenoid valve with repetitive excitation signals having a duration which varies in dependence on said parameter, the total time during which the second solenoid valve means is fully open during a predetermined time period depending upon the value of said parameter.

4,175,529

REGULATING DEVICE

Salahaddin Geafer, Markdorf, and Gerhard Zbikowski, Salem, both of Fed. Rep. of Germany, assignors to Motoren- und Turbinen-Union Friedrichafen GmbH, Fed. Rep. of Germany

Filed Jul. 6, 1977, Ser. No. 813,300
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1976, 2631381
Int. Cl.[2] F02D *1/04*
U.S. Cl. 123—140 R **17 Claims**



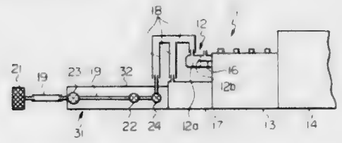
1. Regulating arrangement for an internal combustion engine, the arrangement comprising a centrifugal governor means having a governor spring, a first linkage means for altering a pretension of the governor spring, means for coupling the centrifugal governor with a fuel measuring device, said coupling means being mounted so as to be displaceable by said centrifugal governor means, restoring linkage means operatively connected with the coupling means for changing the position of said first linkage means in dependence upon the displacement of the coupling means, an adjustable control means for controlling a positioning of one of said linkage means, means for mounting said control means so as to be pivotable about a first pivot axis for adjustment thereof and for connecting said control means with said one of said linkage means, a moving element operatively cooperating with said control means, means defining a second pivot axis for connecting said moving element with the other of said linkage means such that the moving element is pivotable about a second pivot axis, said control means and said moving element being arranged between said first linkage means and said restoring linkage means, and means provided on at least one of the linkage means for enabling a selective adjustment of at least one of the pivot axis of said control means and the pivot axis of the moving element so that the first and second pivot axes may be selectively adjusted so as to be coaxial with respect to one another in every position of the coupling means.

4,175,530

PNEUMATIC GOVERNOR CONTROL APPARATUS FOR ENGINE FUEL INJECTION SYSTEM

Eijiro Asano, and Ryuichi Komori, both of Higashi-Matsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jan. 19, 1978, Ser. No. 870,661
Claims priority, application Japan, Jan. 21, 1977, 52-6140[U]
Int. Cl.[2] F02D *1/04*
U.S. Cl. 123—140 FG **10 Claims**



1. In a fuel injection system for an internal combustion engine having a pneumatic governor which varies an amount of fuel injection in accordance with air pressure applied to the governor, a control apparatus comprising:
- an engine driven air pump producing an output air pressure corresponding to engine speed;
- a first passageway connecting the air pump to the governor;
- a second passageway connecting the first passageway to the atmosphere; and
- a variable control valve provided in the second passageway.

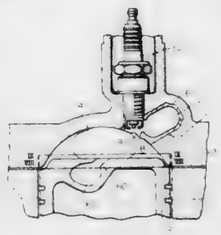
4,175,531

INTERNAL COMBUSTION ENGINE WITH AN AUXILIARY COMBUSTION CHAMBER

Toshio Tanahashi, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 25, 1977, Ser. No. 781,423
Claims priority, application Japan, Apr. 12, 1976, 51-40405
Int. Cl.[2] F02B *19/00*
U.S. Cl. 123—191 S **6 Claims**

1. An internal combustion engine comprising:
- a cylinder block having a cylinder bore therein;
- a cylinder head on said cylinder block;
- a piston reciprocally movable in said cylinder bore, said piston and said cylinder head defining a large main combustion chamber therebetwen when said piston is in its top dead center position;
- an intake valve movably mounted on said cylinder head through which a combustible mixture is fed into said main combustion chamber;
- an exhaust valve movably mounted on said cylinder head through which exhaust gas is discharged from said main combustion chamber;
- means defining a first auxiliary combustion chamber in said cylinder head;
- a first passage directly fluidly communicating said first auxiliary combustion chamber and said main combustion chamber, said first passage extending obliquely relative to the axis of said piston is a direction downward and toward one side of the main combustion chamber;
- means defining a second auxiliary combustion chamber in said piston;



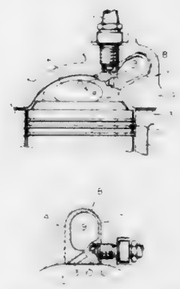
- a single second passage in said piston directly fluidly communicating said second auxiliary combustion chamber and said main combustion chamber, said second passage opening into said main combustion chamber at a position near the position at which the first passage opens into said main combustion chamber, said second passage also extending obliquely to the axis of the piston in a direction upward and toward a side of the main combustion chamber opposite said one side and having an axis substantially parallel to the axis of the first passage; and
- a spark plug having a spark gap in one of said first passage and said first auxiliary combustion chamber, said second passage and said second auxiliary combustion chamber not having a spark gap of a spark plug therein.

4,175,532

COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

Takashi Kato, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 23, 1978, Ser. No. 889,874
Int. Cl.[2] F02B *19/16*
U.S. Cl. 123—191 S **8 Claims**



1. An internal combustion engine comprising: a main combustion chamber; a cylinder head positioned over one end of said main combustion chamber and having therein a cavity

defining an auxiliary combustion chamber; an intake valve movably mounted in said cylinder head for leading a combustible mixture into said main combustion chamber; an exhaust valve movably mounted in said cylinder head for discharging exhaust gas into the atmosphere; a substantially straight connecting passage in said cylinder head and directly fluidly communicating said main combustion chamber with said auxiliary combustion chamber for leading the combustible mixture in said main combustion chamber into said auxiliary combustion chamber at the time of the compression stroke, one end of said connecting passing opening directly into said main combustion chamber and the other end of said connecting passage opening directly into said auxiliary combustion chamber; a spark plug having a spark gap in said connecting passage; an additional passage in said cylinder head and directly fluidly communicating said connecting passage with said main combustion chamber, one end of said additional passage opening directly into said connecting passage and the other end of said additional passage opening directly into said main combustion chamber, and said one end of said additional passage pointing toward said spark gap.

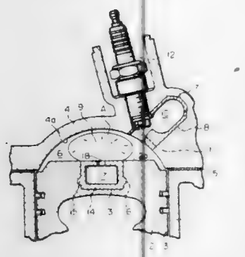
5. An internal combustion engine comprising: a main combustion chamber; a cylinder head positioned over one end of said main combustion chamber and having therein a cavity defining an auxiliary combustion chamber; an intake valve movably mounted in said cylinder head for leading a combustible mixture into said main combustion chamber; an exhaust valve movably mounted in said cylinder head for discharging exhaust gas into the atmosphere; a substantially straight connecting passage in said cylinder head and directly fluidly communicating said main combustion chamber with said auxiliary combustion chamber for leading the combustible mixture in said main combustion chamber into said auxiliary combustion chamber at the time of the compression stroke, one end of said connecting passage opening directly into said main combustion chamber and the other end of said connecting passage opening directly into said auxiliary combustion chamber, a spark plug having a spark gap in said connecting passage; an additional passage in said cylinder head and directly fluidly communicating said connecting passage with said main combustion chamber, one end of said additional opening directly into said connecting passage in a region thereof closer to the main combustion chamber than the spark gap and the other end of said additional passage opening directly into said main combustion chamber.

4,175,533

INTERNAL COMBUSTION ENGINE WITH AN AUXILIARY COMBUSTION CHAMBER

Kenji Goto; Masato Yokota, and Hideo Kobayashi, all of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 4, 1977, Ser. No. 848,759
Claims priority, application Japan, May 20, 1977, 52-57559
Int. Cl.[2] F02B 23/00
U.S. Cl. 123—191 S **8 Claims**



1. An internal combustion engine comprising:

a cylinder block having a cylinder bore therein;

a cylinder head mounted on said cylinder block and having therein a cavity for defining a first auxiliary combustion chamber;

a piston reciprocally moving in said cylinder bore and having a top face, said piston and said cylinder head forming a main combustion chamber therebetween;

at least one connecting passage communicating said main combustion chamber with said first auxiliary combustion chamber and having an opening which is arranged to be directed to the central portion of the top face of said piston when said piston reaches the top dead center;

an intake valve mounted on said cylinder head for leading a combustible mixture into said main combustion chamber;

an exhaust valve mounted on said cylinder head for discharging an exhaust gas into the atmosphere;

an ignition means for igniting the combustible mixture in said first auxiliary combustion chamber;

a second auxiliary combustion chamber formed in said piston, and;

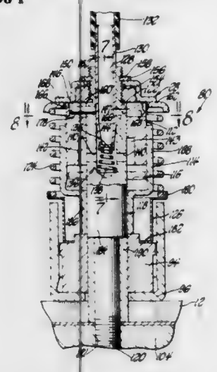
a connecting means communicating said main combustion chamber with said second auxiliary combustion chamber and having at least one opening which opens onto the central portion of the top face of said piston.

4,175,534

VALVE DEACTIVATOR FOR INTERNAL COMBUSTION ENGINES

Edgar R Jordan, 32260 W. 12 Mile Rd., Farmington, Mich. 48018

Filed Jul. 14, 1977, Ser. No. 815,743
Int. Cl.[2] F02D 13/06
U.S. Cl. 123—198 F **4 Claims**



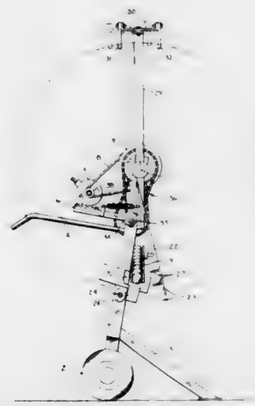
1. An internal combustion engine cylinder valve deactivator comprising: first and second cylindrical members sealingly slidable in an axial relationship with each other to define a cavity therebetween of a volume that varies upon relative axial sliding between the members; an elongated support having an inner end mountable on an engine and an outer end extending axially through the cylindrical members to axially fix the first cylindrical member relative to the engine while permitting rotation thereof; said second cylindrical member being located between the engine and the first cylindrical member for movement toward and away from the engine; a bearing movable toward the engine with the second cylindrical member; a rocker arm including an intermediate portion mounted by the bearing and having push rod and valve actuating ends on opposite sides of the bearing; an inlet passage for feeding pressurized fluid to the cavity in a first rotational position of the first cylindrical member to move the second cylindrical member axially toward the engine so that the rocker arm is positioned by the bearing to actuate an associated engine cylinder valve; an exhaust passage for exhausting the pressurized fluid from the cavity in a second rotational position of the first cylindrical member so that the second cylindrical member is movable away from the engine block to deactivate the valve operation; and a helical spring that encircles the first and second cylindrical members and includes a first end axially fixed with respect to the support and also includes a second end seated by the bearing so as to bias the bearing and rocker arm toward the engine to thereby provide lash takeup of the bearing and rocker arm when the cavity is exhausted.

4,175,535

RANDOM PROPELLING DEVICE FOR BALLS AND THE LIKE

Carl H. Diem, 3969 68th St., Franksville, Wis. 53126

Filed Sep. 6, 1977, Ser. No. 830,595
Int. Cl.[2] F41B 3/04
U.S. Cl. 124—7 **11 Claims**



1. A device for propelling a plurality of balls or the like in succession through space, comprising, in combination:

(a) a frame,

(b) a ball propelling arm mounted for pivotal swinging relative to said frame, and adapted to cyclically propel a succession of balls,

(c) drive means to pivotally swing said arm,

(d) means disposed in the path of said arm to impede the swinging of said arm,

(e) means to build up torsional energy in said arm while its swinging is impeded,

(f) means to release said arm from said swing impeding means to thereby release the torsional energy therein so that said arm acceleratingly swings,

(g) and means associated with said swing impeding means to cause release of said arm therefrom at random time intervals from cycle to cycle.

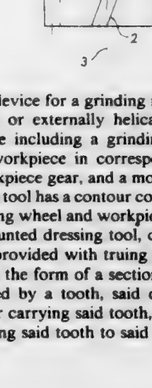
4,175,536

COMBINATION OF A BOW AND A POWER HANDLE

Richard F. Carella, 35572 Strathcona, Mt. Clemens, Mich. 48043

Filed Oct. 3, 1977, Ser. No. 839,022
Int. Cl.[2] F41B 5/00
U.S. Cl. 124—23 R **13 Claims**

1. An archery bow assembly comprising; a bow having limbs, a bowstring interconnecting said limbs and movable to a drawn position to impart energy to an arrow upon release of the bowstring from the drawn position, and power means adapted to be gripped by an archer and connected to said bow for movement in the plane formed by the bow and the bowstring between an energy-storing position and a bowstring release position, said power means storing energy when the power means is acted upon by a force by an archer during the draw and for releasing said stored energy to be bow in said



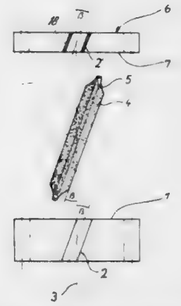
plane to move the entire bow forwardly upon release of the bowstring from the drawn position and relaxation of the force applied to the power means by an archer said power means including a connecting portion for connection to said bow.

4,175,537

DRESSING ARRANGEMENT FOR GRINDING WHEEL OF A GEAR FORM GRINDING MACHINE

Dieter Wiener, Tulpenstrasse 9, D-7501 Bruchhausen, Fed. Rep. of Germany

Continuation of Ser. No. 501,663, Aug. 29, 1974, abandoned. This application Nov. 14, 1977, Ser. No. 851,428
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1973, 2343494
Int. Cl.[2] B24B 53/06
U.S. Cl. 125—11 CD **25 Claims**



1. A dressing device for a grinding machine for form grinding of internally or externally helically geared wheels, the grinding machine including a grinding wheel inclined with respect to the workpiece in correspondence with the helix angle of the workpiece gear, and a movably mounted dressing tool, the dressing tool has a contour corresponding to a contact line of the grinding wheel and workpiece gear being copied by the movably mounted dressing tool, characterized in that the dressing tool is provided with truing flank means, said truing flank means is in the form of a section of the workpiece gear and is constituted by a tooth, said dressing tool includes a carrier means for carrying said tooth, means are provided for releasably securing said tooth to said carrier means, at least a

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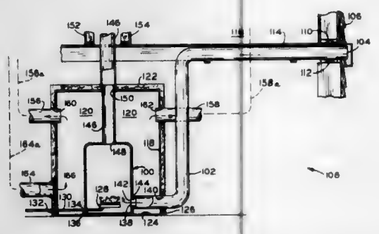
portion of the truing flank means are provided with an abrasive material consisting of diamond grains, spaced axle means are provided for respectively mounting said dressing tool, the grinding wheel and the workpiece gear, the spacing between said dressing tool and the grinding wheel and between the grinding wheel and the workpiece gear are equal, and in that said dressing tool is movably mounted for radial adjustment only.

4,175,538

ENERGY SAVING FURNACE CONSTRUCTION

Jimmie G. McCarty, 2805 Bethany Rd., Anderson, Ind. 46011

Filed Jan. 23, 1978, Ser. No. 871,637
Int. Cl.² F24C 3/00
U.S. Cl. 126—85 B **17 Claims**



1. A fuel burning furnace construction for heating an enclosed interior defined by and separated from the exterior by a floor, a roof, and a wall construction between the floor and roof, comprising:

a fireproof shell positioned in the interior;

a furnace having a fuel burning enclosure situate in said shell; said shell and said furnace being spaced from one another to define a fluid chamber therebetween;

means for pneumatically sealing said fuel burning enclosure from said interior;

an inlet conduit having a first end opening exteriorly of said interior and a second end opening into fluid communication with said enclosure;

means for pneumatically sealing said inlet conduit from said interior and for providing combustion supporting fluid for the fuel exclusively from without said interior:

a flue having a first end opening exteriorly of said interior and a second end opening into said enclosure; said flue being pneumatically sealed from said interior to thus prevent combustion gasses from said interior;

heating medium means for providing heat transfer relative said chamber and disposed to transfer heat to a medium in the interior for heat transfer to and heating of the interior.

4,175,539

FIREPLACE HEATER AND HOME PRESSURIZATION SYSTEM

C. James McGuire, Kansas City, Mo., assignor to Fireplace Energy Inc., Kansas City, Mo.

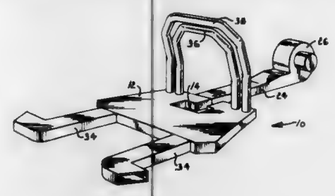
Filed Jan. 30, 1978, Ser. No. 873,272
Int. Cl.² F24B 7/00
U.S. Cl. 126—121 **8 Claims**

1. A device for extracting heat from a fireplace, said device comprising:

a heat conductive shell adapted for installation in the fireplace and presenting a substantially hollow chamber therein for accommodating a flow of air, said shell having an inlet for directing incoming air into said chamber and an outlet for discharging air therefrom;

partition means in said shell dividing said chamber into an inlet side communicating with said inlet and an outlet side communicating with said outlet;

a heat conductive conduit extending generally above said shell, said conduit having a first end communicating with the inlet side of said chamber and a second end communicating with the outlet side of said chamber, and baffle means disposed in said shell between said inlet and the first



end of said conduit, said baffle means acting to direct air throughout the inlet side of said chamber;

whereby air entering said inlet flows from the inlet side of said chamber and through said conduit prior to passing through the outlet side of said chamber and out said outlet.

4,175,540

SOLAR ENERGY COLLECTOR

William J. Roantree, and Paul S. Bartini, both of Port Washington, N.Y., assignors to Mel Modern Systems, Incorporated, Port Washington, N.Y.

Filed May 18, 1977, Ser. No. 797,906
Int. Cl.² F24J 3/02
U.S. Cl. 126—425 **15 Claims**



1. A solar energy collector wherein circulating air is heated in a heat transfer element by concentrated radiation from a cylindrical reflector maintained in shape by air pressure and having means for tracking the sun powered by said circulating air.

4,175,541

SOLAR HEATING SYSTEM

Calvert H. Midgley, 2200 Gravenstein Hwy., Sebastapol, Calif. 95472

Filed Nov. 14, 1977, Ser. No. 851,102
Int. Cl.² F24J 3/02
U.S. Cl. 126—429 **4 Claims**

1. A solar heating system comprising:

a collector panel having a front side adapted for exposure to solar radiation and a back side;

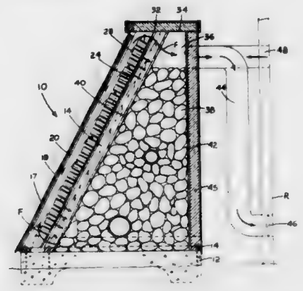
a heat absorbing coating on said front side;

a plurality of circular openings through said panels;

a plurality of hollow metallic cylinders in said openings with most of the lengths thereof extending upward from said front side;

end closures on said cylinders on the end exposed from said front side;

heat absorbing coatings on the outer surfaces of said end closures and exterior portions of said cylinders exposed from said front side; and



top closures with reflective surfaces on at least some of said cylinders exposed through the back side of said panel;

wherein said panel is part of an enclosure and including an accumulation of materials having heat retaining characteristics in said inclosure rearward of the back side of said panel;

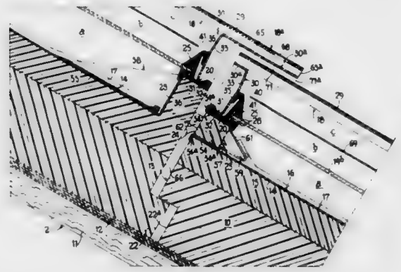
whereby, said cylinders radiate heat directly to said materials.

4,175,542

DEVICE FOR COLLECTING SOLOR ENERGY WITH MAT OF INTERMINGLED FIBERS

Georges Duchene, Saint Bonnet le Chateau, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Jul. 27, 1977, Ser. No. 819,563
Claims priority, application France, Jul. 30, 1976, 76 23454
Int. Cl.² F24J 3/02
U.S. Cl. 126—449 **19 Claims**



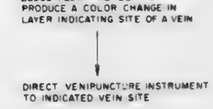
1. A device for collecting solar energy comprising in combination support means defining a trough having a fluidtight side, a heat and liquid absorbent mat of dark colour in said trough and supported by said fluidtight side, at least one translucent sheet creating a glasshouse effect supported by the support means and interposed between the mat and the sun and spaced from the mat to define with the mat a chamber, liquid inlet means disposed at a first end of the trough and liquid outlet means disposed at a second end of the trough opposed to said first end in a given direction, said liquid inlet means extending transversely of said direction and adjacent the mat and operative to provide an even distribution of the liquid transversely of the mat, and venting means putting said chamber in communication with the atmosphere to ensure that vapours from the liquid and from the mat can escape to the atmosphere and to ensure that the liquid flows freely under atmospheric pressure from the inlet means to the outlet means, the mat comprising intermingled fibres which define interstices which constitute guiding and spreading means, by the effect of capillarity and gravity, for the liquid in the course of the heating of the liquid by the solar energy.

4,175,543

VENIPUNCTURE METHOD

Fred K. Suzuki, Arlington Heights, and Thomas W. Davison, Streamwood, both of Ill., assignors to Liquid Crystal Products, Inc., Arlington Heights, Ill.

Continuation-in-part of Ser. No. 716,376, Aug. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 658,407, Feb. 17, 1976, Pat. No. 4,015,591. This application Mar. 23, 1978, Ser. No. 889,284
Int. Cl.² A61B 10/00
U.S. Cl. 128—736 **20 Claims**



1. A method of effecting venipuncture in the human body which comprises the steps of:

(a) cooling the skin over a venous area of the body by applying a cold pack thereto for a period of at least 3 seconds and providing on the cooled skin in heat exchange relation thereto a layer of an enantiotropic cholesteric liquid crystalline phase material exhibiting a mesophase color change at a temperature reached by the skin upon warming by venous blood flow, the lower limit of the mesophase temperature range of said material being below the initial temperature of the skin over said area, said cooling being effected to bring the skin over said area to a temperature below said lower limit;

(b) warming the cooled skin by venous blood flow in said area thereby to produce a mesophase color change in the material in said layer delineating a vein beneath the layer; and

(c) directing an instrument for venipuncture to a site in said area indicated by said delineation to constitute the location of a vein.

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4,175,544

IODO-ARYL CARBONATES FOR USE IN METHODS IN RADIOGRAPHY

Barry N. Newton, Lafayette, Ind., assignor to Lafayette Pharmacal Inc., Lafayette, Ind.

Continuation-in-part of Ser. No. 766,062, Feb. 7, 1977, abandoned, which is a division of Ser. No. 679,393, Apr. 22, 1976, Pat. No. 4,022,814, which is a continuation-in-part of Ser. No. 501,169, Aug. 28, 1974, abandoned. This application Jun. 28, 1978, Ser. No. 920,114

Int. Cl.[2] A61B *5/00;* **A61K** *29/02*

U.S. Cl. 128—654 **9 Claims**

1. A method for visualizing an inner body cavity in an animal comprising:

(a) placing an effective amount of a pharmaceutically acceptable iodinated phenyl carbonate compound into a body cavity in an animal; and

(b) X-raying the body cavity.

4,175,545

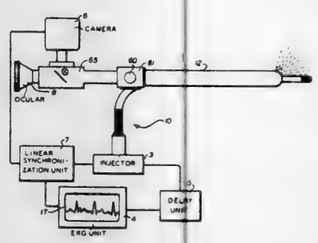
METHOD AND APPARATUS FOR FIBER-OPTIC CARDIOVASCULAR ENDOSCOPY

Zafer A. Termanini, Brooklyn, N.Y., assignor to Zafmedico Corp., Brooklyn, N.Y.

Continuation-in-part of Ser. No. 776,302, Mar. 10, 1977. This application Aug. 8, 1977, Ser. No. 822,560

Int. Cl.[2] A61B *1/06*

U.S. Cl. 128—666 **21 Claims**



1. In an improved fiber-optic catheter for use in cardiovascular endoscopy of the type including: a flexible sheath defining a longitudinally extending lumen, said sheath having a proximal end and a distal end; an afferent fiber-optic bundle disposed in said sheath for transmitting light from the proximal end of said catheter to the distal end thereof; and an efferent fiber-optic bundle disposed in said sheath for returning light from said distal end to said proximal end, the improvement comprising:

said sheath having an aperture extending therethrough from said lumen, said aperture being located proximally of said sheath distal end;

a tubular member comprising a longitudinally extending peripherally continuous wall defining a channel, said tubular member being slidably disposed within said lumen of said sheath, the distal portion of said tubular member having a distal end face and an aperture extending through said wall from said channel, said tubular member being longitudinally slidably movable in said lumen between a first position wherein said tubular member aperture communicates with said sheath aperture and a second position wherein said tubular member aperture is out of communication with said sheath aperture; and

means for indicating when said tubular member is in said first position.

4,175,546

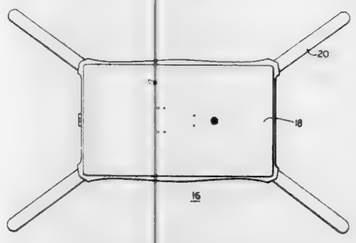
DEVICE FOR MEASURING SENSITIVITY TO VIBRATION

Samuel Goldblatt, Amberly Village, and Waller M. Scott, Jr., Union Township, Butler County, both of Ohio, assignors to Ahron P. Leichtman, Amberly, Ohio

Filed Sep. 6, 1977, Ser. No. 830,654

Int. Cl.[2] A61B *10/00*

U.S. Cl. 128—739 **3 Claims**



1. A device for measuring the sensitivity of a patient to externally applied vibration which comprises a pallometer head, a vibratable probe mounted on the head, means in the head for causing the probe to vibrate with a selected amplitude and at a selected frequency, a table having an opening therein, and means for supporting the head beneath the table with the probe extending through the opening in the table so that the probe can be engaged by a member of the patient as the member rests on the table, the means for supporting the head including a beam, means for attaching the head to the beam, means for pivotally supporting the beam, and counterweight means mounted on the beam to counterbalance the head so that the load of the probe on the member of the patient is constant.

4,175,547

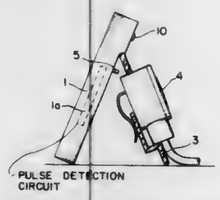
SPHYGMOMANOMETER AID

Sohachi Kurihara, 2-9 Daito 1-chome, Daito-ku, Tokyo, Japan

Filed Jul. 28, 1977, Ser. No. 820,035

Int. Cl.[2] A61B *5/02*

U.S. Cl. 128—680 **1 Claim**



1. An auxiliary device for use with a conventional non-electronic sphygmomanometer of the type including an inflatable bladder which is wrapped around the arm of a patient and a manometer gauge connected to the inflatable bladder, said auxiliary device being employable with such conventional non-electronic sphygmomanometer for the electronic measurement of blood pressures of the patient, said auxiliary device comprising:

a housing containing an electronic circuit including means for sensing and indicating pulses of a patient;

a board member pivotally connected to said housing and movable with respect thereto between a closed position and an open inclined position;

said board member including means for supporting a manometer gauge of a conventional non-electronic sphygmomanometer at an inclined orientation when said board member is in said open position;

electronic transducer means, electrically and flexibly attached to said electronic circuit, for sensing pulses of the patient; and

said transducer means having integral therewith means for attaching said transducer means to a cuff of an inflatable bladder of a conventional sphygmomanometer.

4,175,548

MASSAGE BACK BRACE

Robert J. Henry, Kelso, Wash., assignor to Harry A. Wood, Longview, Wash., a part interest

Filed Aug. 30, 1977, Ser. No. 829,197

Int. Cl.[2] A61H *1/00;* **A61F** *5/02*

U.S. Cl. 128—24 R **9 Claims**



1. A massage back brace, comprising, in combination:

(a) a support member;

(b) resilient means mounted on the support member for massaging the back of a user of the brace including a strip of self-supporting sheet material having a face, and a plurality of codirectionally extending, coiled compression springs mounted in spaced relation about the face of the strip; and

(c) cover means arranged over the resilient means for covering the resilient means.

4,175,549

BED FOR PATIENTS

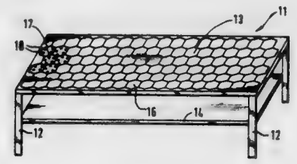
Geerd Hamer, Vorm Heiligen Kreuz 15, 6108 Weiterstadt, Fed. Rep. of Germany

Filed Aug. 29, 1977, Ser. No. 828,280

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1976, 2639072

Int. Cl.[2] A61H *1/00*

U.S. Cl. 128—24 R **14 Claims**



1. A bed comprising a substantial plurality of polygonal shaped lying surfaces dividing up and forming a major portion of the lying surface of the bed, which can be fixed in a wide range of spatial relation positions relative to each other to stably support and position the body portions of a user thereon, means including power storage means, for individually adjusting the vertical position of each polygonal lying surface against the force of the power storage,

means for individually adjusting the angle of inclination of each polygonal lying surface,

locking means for locking the elevation of the polygonal lying surfaces, and locking means for locking the inclination of the polygonal locking surfaces.

4,175,550

THERAPEUTIC BED

James R. Leininger, and John H. Vrzalik, both of 3417 Steen, San Antonio, Tex. 78219

Filed Mar. 27, 1978, Ser. No. 890,457

Int. Cl.[2] A61H *1/00*

U.S. Cl. 128—24 R **14 Claims**



1. A therapeutic bed for immobilized patients, comprising:

a motor-driven oscillating patient support platform mounted for longitudinal rotation about longitudinally extending axes;

a counter balance keel means extending below the patient support platform for mounting counter balance weight means to minimize unbalancing of the bed due to a patient resting on the patient support platform; and

a slip clutch means connecting the motor with the oscillating patient support platform and set to slip at a predetermined value when the counter balance weight means does not balance with the weight of a patient on the patient support platform.

4,175,551

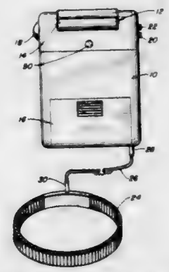
ELECTRICAL MASSAGE DEVICE

Irnee J. D'Haenens, Thousand Oaks, and Charles P. Lederger-ber, Beverly Hills, both of Calif., assignors to Electromed Incorporated, Beverly Hills, Calif.

Filed Nov. 11, 1977, Ser. No. 850,745

Int. Cl.[2] A61H *29/00*

U.S. Cl. 128—24.4 **8 Claims**



1. An electrical stimulator and massage apparatus comprising:

a housing;

a plurality of elongate, adjacent roller electrodes forming a massaging head in said housing;

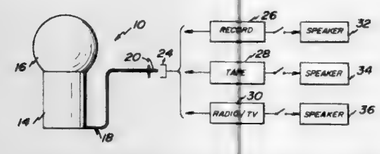
electrical means for applying an electrical pulse to said roller electrodes;

a flexible expansion band indifferent electrode which may be slipped over a wrist or ankle whereby a particular area of

the body may be mechanically massaged and electroneurologically stimulated simultaneously; and

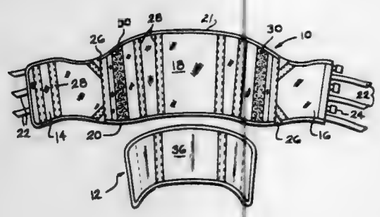
means for connecting said expansion band electrode to said electrical means.

4,175,552
VIBRATION DEVICE
Brian G. Johnson, 65 Wolfe Pl., Hillside, Del. 07205
Filed Sep. 1, 1977, Ser. No. 829,653
Int. Cl.[2] A61H *1/00*
U.S. Cl. 128—32 **5 Claims**



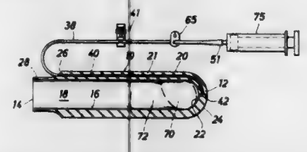
1. A device for providing a pleasurable sensation when it is touched comprising a base, an audio speaker and a housing, said speaker including a circular rim comprised of rigid material, said housing comprising a hollow sphere supported on said base and completely enclosing said speaker with the entire periphery of said rim being in engagement with the wall of said housing to enable said housing to support said speaker and to enable the vibrations of said speaker to be transmitted to said wall to vibrate said wall, said wall being of sufficient thickness to muffle the sounds emanating from said speaker, an aperture in said wall, means for energizing said speaker, a portion of said last named means extending through said aperture and being in electrical connection with said speaker, another portion of said last named means being connected to an audio output so that said housing vibrates in response to the signal received from said audio output while the sounds from said speaker are muffled, and the rim of said speaker is disposed at about a right angle to said base so that said speaker faces upwardly within said housing.

4,175,553
LUMBOSACRAL-ORTHOSIS ORTHOPEDIC SUPPORT
Henry W. Rosenberg, East Brunswick, N.J., assignor to Camp International, Inc., Jackson, Mich.
Filed Dec. 9, 1977, Ser. No. 859,088
Int. Cl.[2] A61F *5/02*
U.S. Cl. 128—78 **9 Claims**



1. A lumbosacral orthopedic device adapted to encircle the torso and having a removable orthosis appliance comprising, in combination, a flexible band member having inner and outer surfaces, a central region, end regions and upper and lower edges, mutually interconnectable connection means defined on said end regions, a substantially rigid frame disposed adjacent said inner surface at said central region, said frame including C-shaped substantially rigid and horizontal spaced members interconnected by substantially rigid elongated strips, and interengaging releasable fastening means defined on said frame and said band member releasably fastening said frame to said band member central region.

4,175,554
PROSTHESIS OF MALE IMPOTENCE
Frank J. Gerow, 1200 Moursund, Room 186, Houston, Tex. 77030
Filed Mar. 16, 1978, Ser. No. 887,224
Int. Cl.[2] A61F *5/00*
U.S. Cl. 128—79 **12 Claims**

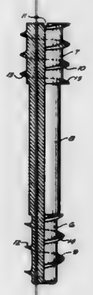


1. A device for treating male impotence, comprising

a substantially cylindrical hollow body made of a flexible and elastic material, said body having a distal closed end and a proximal open end, said open end terminating in a thin flexible sleeve-like portion that can be rolled up over said thick-walled body portion to permit the distal end of a male penis to engage the inner walls of said hollow body, said thin flexible sleeve-like portion further functioning as a seal about the male penis when returned to its unrolled condition, and

a length of flexible tubing at least a portion of which is disposed longitudinally in the wall of said body, one end of said tubing communicating with the most distal end of the interior of said hollow body, the other end of said tubing freely extending from said body for permitting the evacuation of the air in the interior of said hollow body forward of said engaged male penis for exerting a vacuum therein for drawing said male penis to its anatomic limit into the interior of said hollow body.

4,175,555
BONE SCREW
Timothy J. Herbert, Redfern, Australia, assignor to Interfix Limited, Hong Kong, Hong Kong
Filed Feb. 22, 1978, Ser. No. 880,099
Claims priority, application Australia, Feb. 24, 1977, PC9179
Int. Cl.[2] A61F *5/04*; A61B *17/18*
U.S. Cl. 128—92 B **4 Claims**



1. A bone screw for connecting a fractured portion of a bone to a parent bone, comprising:

(a) a shaft comprising a leading end portion, a trailing end portion and a central unthreaded portion;

(b) said central portion spacing said end portions apart and being axially longer than either of said end portions;

(c) a first uniformly pitched screw-thread on said leading end portion;

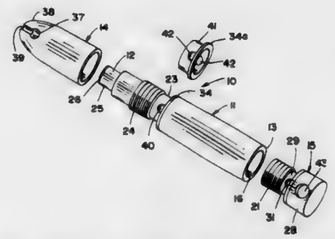
(d) a second uniformly pitched screw-thread on said trailing end portion, which relative to said first screw-thread, is like-handed but of different pitch;

(e) said second uniformly pitched screw-thread extending radially wholly beyond the circumference of said central portion, and the crest diameter of said second thread being greater than the diameter of any other part of the screw, thereby to adapt the screw for entire encasement within the bone portions to be connected thereby;

(f) both of said threads being adapted to thread in the cancellous material of the respective bone portions to be joined by the screw; and

(g) means on the trailing end of said trailing portion to accommodate a tool for driving the screw.

4,175,556
INHALER WITH FLOW-THROUGH CAP
Winthrop J. Freezer, 57 Hallam, San Francisco, Calif. 94103
Filed Apr. 7, 1978, Ser. No. 894,321
Int. Cl.[2] A61M *15/08*
U.S. Cl. 128—198 **8 Claims**



1. A tubular inhaler with a flow-through nose cap and having adjustments for controlling the concentration of a medicament dispensed when in use, comprising:

a cylindrical hollow barrel having open top and bottom ends with an internal compartment for absorbent means to store a medicament;

an end plug removably received in said bottom end of said barrel operable to sealingly close said bottom end of said barrel when fully inserted, said end plug having a vent means operable to control the flow of air into said bottom end of said barrel as said end plug is progressively removed; and

a bullet-shaped nose cap with a blind bore adjustably received on the top end of said barrel, said nose cap having an internal sealing means located in said blind bore operable to close the top end of the barrel when said cap is fully received on said barrel and also having a cross-bore means which communicates with said blind bore, allowing air/vapor flow from inside said barrel through said nose cap when it is adjusted to open said top end of said barrel without removing the nose cap.

4,175,557
POLYMERIC SHEETS
John H. Hung, Monroe, N.Y., assignor to International Paper Company, New York, N.Y.
Continuation-in-part of Ser. No. 634,908, Nov. 14, 1975, Pat. No. 4,034,751. This application Nov. 1, 1976, Ser. No. 735,671
Int. Cl.[2] A61F *13/00*; A61L *15/01*
U.S. Cl. 128—156 **18 Claims**

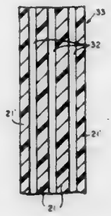
1. A drapable wound covering having a fabric texture on one surface thereof, comprising:

(a) a first layer of cured high-release non-sticking polymer forming one surface of the wound covering;

(b) a second layer of cured polymer having a tensile strength and tear strength for a 25 mil thick cured film thereof of at least about 400 pounds per square inch and at least about 20 pounds per inch, respectively, joined to the first layer of polymer; and

(c) a third layer of fabric texture joined to the second layer of polymer and forming the other surface of the wound covering, the wound covering having a water vapor phase transfer rate of about 2 to 10 mg./hr.-cm.[2], two dimensional elongation of at least about 100% in each direction, and anti-microbial barrier layer properties; and

wherein the layer of fabric texture is an integral, continuous, substantially non-woven, non-fibrous, non-filamentary,



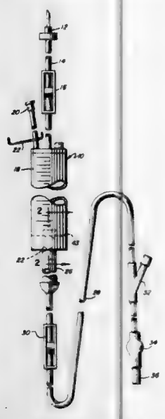
non-foamed, drapable polymeric sheet, at least one side of which has a fabric texture and comprises a plurality of interbonded continuous polymeric ribs defining between them recessed portions in the at least one side of the sheet; the ribs containing a plurality of elongated continuous channels interiorly located therein which extend in a direction generally parallel to the plane of the sheet to form a network of voids within the ribs which extend continuously throughout the at least one side of the sheet; and the sheet having a water vapor phase transfer rate of about 2 to 20 mg./hr.-cm.[2], two dimensional elongation of at least about 100% in each direction, and an open area between the ribs of zero to about 60%.

4,175,558
APPARATUS FOR ADMINISTERING PARENTERAL LIQUID IN SEQUENTIAL UNITS PROVIDED WITH A BALL VALVE FLOAT
John M. Hess, III, Carpentersville, and Herbert Mittleman, Deerfield, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Jul. 15, 1977, Ser. No. 816,107
Int. Cl.[2] A61M *5/14*
U.S. Cl. 128—214 C **9 Claims**

1. In a parenteral liquid administering device which comprises tubular means for connecting said device to a source of said liquid, and an enlarged, liquid-holding chamber positioned in flow communication with said tubular means, said chamber including a bottom flow aperture, and a valve controlling flow through said aperture, the improvement comprising, in combination:

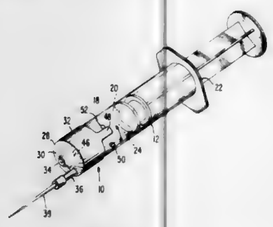
said valve including: a buoyant float ball, a valve seat positioned about said bottom flow aperture to receive said ball in air-tight sealing relation in the absence of sufficient liquid to float said ball, and apertured retention means surrounding said ball and proportioned to permit it to float in spaced relation from said valve seat in the presence of liquid passing through said apertured retention means, said apertured retention means defining a generally cylindrical chamber, said chamber defining an annular step positioned upstream from said valve seat and extending in generally normal relation to the axis of said enlarged

liquid holding chamber, said annular step being positioned about said float ball when positioned on the valve seat



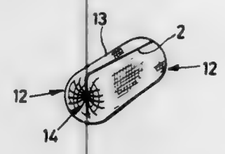
whereby turbulent flow of liquid is created upon filling said retention means with the liquid.

4,175,559
SEALABLE SYRINGE
Robert J. Kreb, III, Rolling Hill Rd., Skillman, N.J. 08558
Filed Apr. 6, 1978, Ser. No. 893,922
Int. Cl.² A61M 5/00
U.S. Cl. 128—218 R **10 Claims**



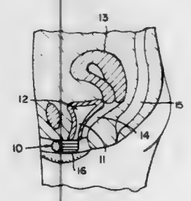
1. A sealable syringe comprising:
(a) a housing defining a chamber therein which is sterile, said housing including a headwall, a sidewall and an open end, said headwall defining a housing aperture therein and a stem member mounted extending axially outward therefrom;
(b) a plunger located within said chamber and being movable axially with respect to said housing to vary the total volume of said chamber;
(c) a cap member including a head portion and a side portion located about said headwall and said sidewall of said housing, respectively, said side portion of said cap member being in snug fitting abutment with said side wall of said housing, said head portion being disposed in spaced relation with respect to said sidewall to provide an insulating space therebetween, said cap member being rotatably attached to said stem member to allow rotation of said cap member with respect to said headwall of said housing, said cap member including a nipple means which is hollow and defines a nipple aperture therein, said nipple aperture being selectively alignable with said housing aperture in said headwall to allow fluid flow between said nipple means and said sterile chamber; and
(d) sealing means positioned between said housing aperture in said headwall and said nipple aperture in said head portion to seal fluid flow therebetween when in alignment and to prevent fluid flow therebetween when not in alignment.

4,175,560
SWAB
Ernst Knoll, Herrengassle 3, 7801 Umkirch bei Freiburg, Fed. Rep. of Germany, assignor to Paul Hartmann AG; Ernst Knoll and Werner Thieme, all of, Fed. Rep. of Germany
Continuation of Ser. No. 743,930, Nov. 22, 1976, abandoned. This application Jul. 1, 1977, Ser. No. 812,435
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1975, 2552172
Int. Cl.² A61M 35/00
U.S. Cl. 128—269 **13 Claims**



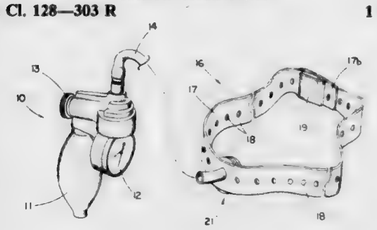
1. A swab comprising: a strip of material having two spaced ends interconnected by spaced lateral edges, said strip of material being wound about an axis extending transversely to a longitudinal direction of the material so as to form a plurality of individual layers disposed one above the other with one of said individual layers defining an outermost surface of the swab, and wherein each lateral edge of each of said individual layers of the swab is tucked into a center of the wound strip of material.

4,175,561
FEMININE HYGIENIC PADS WITH IMPROVED ABSORPTION
Shalom Z. Hirschman, 110-11 Queens Blvd., Forest Hills, N.Y. 11375
Filed Feb. 10, 1977, Ser. No. 767,586
Int. Cl.² A61F 13/00, 13/20
U.S. Cl. 128—296 **5 Claims**



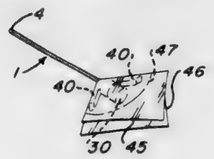
1. A feminine hygienic pad with improved surface sorption properties for use in the interlabial space in the area of the female urethral meatus and vaginal meatus for sorption of urine and other undesirable exudations comprising an elongated fibrous pad base of rod-like configuration having a continuous exposed exterior surface thereabout, the pad base including exposed integral surface protuberances of sorptive cells, said protuberances projecting perpendicularly outward from the exterior surface of said pad at equally spaced points spaced longitudinally and peripherally about substantially the entire exterior surface thereof; said protuberances comprising parallel side walls, said protuberances adding multiple sorptive surfaces to the exposed exterior surface of the pad base and increasing the effective exposed exterior sorptive surface area of the pad, and holes formed in at least selected ones of said protuberances and opening outward through said exterior surface to expose additional sorptive surfaces.

4,175,562
INTRAOCULAR PRESSURE APPLICATOR
Paul R. Honan, P.O. Box 588, 1720 N. Lebanon St., Lebanon, Ind. 46052
Filed Jun. 30, 1977, Ser. No. 811,549
Int. Cl.² A61B 17/00
U.S. Cl. 128—303 R **1 Claim**



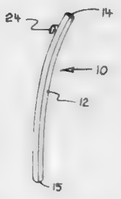
1. A device for lowering intraocular pressure in preparation for intraocular surgery comprising a headband adapted to extend around the head of the surgery patient, a single, circular, cup-shaped member attached to said headband and forming a chamber having a movable wall at one end, said chamber forming member having a bellows configuration with said movable wall of the chamber being integral with its pleated sidewall and formed of elastomeric material, the end of said member opposite said moveable wall being rigid and attached to said headband, means for the attachment of said member to the headband permitting limited pivotal movement of the member with respect to the headband, said member being adapted to be positioned at the orbital cavity of and in overlying relation to that eye of the patient to be subjected to surgery with said movable wall contiguous with the closed eyelid of said eye, and means for increasing the pressure in said chamber in monitored increments to thereby apply through said movable wall a predetermined amount of pressure on said eye.

4,175,563
BIOLOGICAL DRAINAGE SHUNT
Irving K. Arenberg, 6209 S. Highlands, Madison, Wis. 53705, and John B. Newkirk, 24400 Snow Valley Rd., Evergreen, Colo. 80439
Filed Oct. 5, 1977, Ser. No. 839,405
Int. Cl.² A61M 27/00
U.S. Cl. 128—350 V **11 Claims**



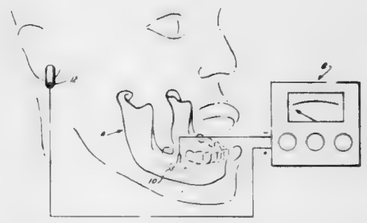
1. A body fluid drainage apparatus such as an inner ear shunt, comprising:
(a) an elongated tube composed of a material which will maintain its shape on being implanted and having two open ends;
(b) a flexible extension tube fixedly secured to and telescoping over one end of said elongated tube;
(c) a soft resilient closure means in the opposite end of said flexible tube and having at least one valve therein;
(d) an outer generally cylindrical housing fixedly secured to said elongated tube and having a cylindrical bore therein which generally encompasses a portion of said elongated tube and said extension tube;
(e) a pair of radially, oppositely extending arms fixedly secured to said elongated tube and said housing; and
(f) a pair of superposed, generally rectangular thin, flexible, resilient flaps fixedly secured to said housing and said arms encompassing said flexible extension tube and said closure to prevent tissue form impinging thereon.

4,175,564
NASAL GASTRIC TUBE INSERTION GUIDE AND METHOD
In S. Kwak, 2846 Galahad Dr., Atlanta, Ga. 30345
Filed Mar. 13, 1978, Ser. No. 885,609
Int. Cl.² A61M 27/00
U.S. Cl. 128—350 R **4 Claims**



1. A guide for guiding a nasal gastric tube of preselected outside diameter into the esophagus and stomach of a patient for evacuation of stomach fluids and with said guide comprising an arcuately shaped tube formed with an end to end slit and having an inside diameter greater than the nasal gastric tube outside diameter, and a pull tab mounted to the exterior of said guide tube radially opposite said slit, whereby the nasal gastric tube may be inserted into the guide tube through a guide tube end and subsequently extracted through the guide tube slit by pulling the nasal gastric tube and the guide pull tab apart as the arcuately shaped guide tube is introduced into the patient's mouth and esophagus.

4,175,565
METHOD AND APPARATUS FOR STIMULATING OSTEOGENIC ACTIVITY IN BONE STRUCTURE ADJACENT A DENTAL IMPLANT
Angelo R. Chiarenza, Islip, and Charles M. Weiss, New York, both of N.Y., assignors to Oratronics, Inc., New York, N.Y.
Filed Jun. 22, 1977, Ser. No. 808,724
Int. Cl.² A61N 1/20
U.S. Cl. 433—32 **28 Claims**



1. A method of stimulating osteogenic activity in bone structure adjacent to the contours of a dental implant comprising the steps of:
a. permanently imbedding in the jawbone a first electrode

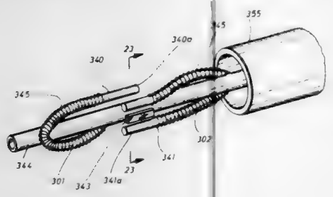
comprising an electroconductive dental implant a portion of which extends into the oral cavity;
b. non-permanently affixing a second electroconductive electrode on the body of the subject; and
c. applying a direct current to said implant and said second electrode, said implant acting as a cathode and said second electrode acting as an anode.

4,175,566

CATHETER FLUID-VELOCITY FLOW PROBE

Huntly D. Millar, Houston, Tex., assignor to Millar Instruments, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 602,655, Aug. 7, 1975, abandoned. This application Apr. 21, 1976, Ser. No. 679,066
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—692 **32 Claims**



1. A fluid-velocity flow probe for insertion into a vessel carrying conductive fluid in a subject, which probe is suitable for attachment to the distal end of a catheter, which probe develops a voltage which is proportional to the velocity of the conductive fluid passing the probe, and which prope comprises:
a housing;
means for attaching the housing to a catheter;
two electromagnets disposed in the housing of the probe for generating two separate magnetic fields, which electromagnets have ferromagnetic cores with gaps between poles;
two electrodes located in the housing with outer surfaces for fluid-electrode interface, said outer surfaces being exposed to the conductive fluid, each electrode being disposed such that the exposed outer surface for the fluid-electrode interface is substantially in the gap between the poles of the respective electromagnets;
electrical conductors associated with said electromagnets and electrodes;
electrically insulating bonding material encapsulating the electromagnets and forming the housing, the bonding material being formed to permit exposure of the outer surfaces of the electrodes so that conductive fluid flowing past the probe will come in direct contact with the electrodes.

4,175,567

METHOD OF LOCATING THE EPIDURAL SPACE

Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.

Division of Ser. No. 680,955, Apr. 28, 1976, abandoned. This application Mar. 23, 1978, Ser. No. 889,477
Int. Cl.[2] A61B 5/00
U.S. Cl. 128—748 **6 Claims**

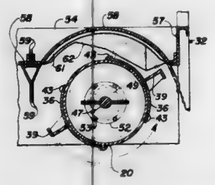
1. A method of locating the epidural space in a patient's body with a needle assembly having a distal tip, a proximal indicating surface, a flexible film overlying the indicating surface and permitting vision of said surface through the film when the film flexes toward the indicating surface, and a passageway communicating between the tip and a closed space intermediate the indicating surface and film, comprising the steps of:
positioning the tip and a distal passageway portion of the assembly inside the patient's body with the tip located adjacent the epidural space and with the film and indicating surface located outside the patient's body; and
advancing the assembly into the body while determining whether the visibility of the indicating surface is modified through the film or the film flexes away from the indicating surface to ascertain the position of the needle assembly tip in the patient's body.

4,175,568

MATERIAL FLOW RETARDERS

Ray E. Nooyen, Leola, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Jul. 14, 1978, Ser. No. 924,546
Int. Cl.[2] A01F 12/20
U.S. Cl. 130—27 T **8 Claims**



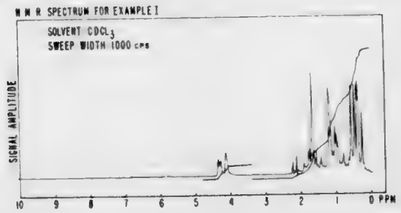
1. In a crop harvesting and threshing machine with axial flow threshing and separation having:
(a) a casing with an infeed area to receive crop material and a discharge area with a suitable outlet to dispose of the crop material residue defining therebetween a generally axial path, the casing further having an upper portion of solid periphery and a lower portion;
(b) a rotatable threshing and separating member within the casing extending generally rearwardly from the infeed area to the discharge area, and about which crop material axially flows;
(c) shaft means protruding from one end of the threshing and separating member adjacent the discharge area and about which the threshing and separating member is rotatably supported and driven;
(d) drive means for rotating the threshing and separating member;
(e) rasping means affixed to the threshing cylinder at predetermined spaced intervals;
(f) separator means affixed to the threshing and separating member rearwardly of the rasping means and adjacent the discharge area for separating the grain from the residue;
(g) a concave of predetermined length supported by the lower portion of the casing for cooperation with the rasping means thereby defining a threshing region;
(h) a separating assembly of predetermined length supported by the lower portion of the casing and rearwardly of the concave cooperatively interacting with the separator means to thereby define a separating region;
(i) truncated generally helical crop transport means attached to the upper portion of the casing at predetermined intervals to facilitate the axial flow of the crop material about the threshing and separating member as the crop material moves from the infeed area of the casing rearwardly toward the discharge area;
(j) a plurality of crop material flow inhibiting means affixed to the upper portion of the casing adjacent the discharge end in a reverse generally helical pattern to the crop transport means comprising at least a first member and a second member, the first member being generally elongate, the second member being contoured in shape to conform to the shape of the separator means as the separator means rotates on the threshing and separating member about the shaft means so that the crop material axially transported from the infeed area to the discharge area is decelerated and stripped from the separator means and deflected into the discharge outlet such that it is prevented from wrapping about the shaft means.

4,175,569

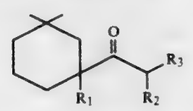
SUBSTITUTED-1-OCETYL-3,3-DIMETHYLCYCLOHEXANE EMPLOYED IN FLAVORING TOBACCO COMPOSITIONS

John B. Hall, Rumson; Mark A. Sprecker, Sea Bright; Frederick L. Schmitt, Holmdel, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 753,617, Dec. 22, 1976, Pat. No. 4,081,429, which is a continuation-in-part of Ser. No. 713,429, Aug. 11, 1976, Pat. No. 4,021,480. This application Sep. 19, 1977, Ser. No. 834,501
Int. Cl.[2] A24B 3/12; A24D 1/00, 1/18
U.S. Cl. 131—9 **3 Claims**



2. A smoking article comprising (i) tobacco or a tobacco substitute and (ii) a flavorant for said tobacco or tobacco substitute comprising the compound having the structure:



wherein R_1 is methyllyl, R_2 is hydrogen and R_3 is hydrogen, or wherein R_1 is hydrogen, R_2 is methyllyl and R_3 is methyllyl.

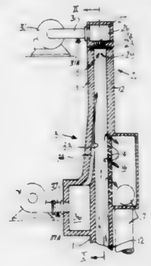
4,175,570

APPARATUS FOR BUILDING A CONTINUOUS TOBACCO STREAM

Uwe Heitmann, Schwarzenbek, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co., KG., Hamburg, Fed. Rep. of Germany

Filed May 10, 1977, Ser. No. 795,560
Claims priority, application Fed. Rep. of Germany, May 26, 1976, 2623547
Int. Cl.[2] A24C 5/39; B65G 53/30; A24B 7/14
U.S. Cl. 131—84 B **14 Claims**

1. Apparatus for building a continuous tobacco stream, comprising a source of tobacco particles; an endless driven foraminous conveyor having an elongated portion; a suction chamber at one side of said portion; a duct having an inlet and an outlet which constitutes a narrow channel and is adjacent to the other side of said portion and is elongated in the direction of movement of said portion; means for feeding tobacco particles from said source into said duct by way of said inlet; and means for accelerating and advancing the particles in said duct toward said outlet and against the other side of said portion independently of said feeding means, said duct having a wall provided with at least one opening which is immediately adjacent to said portion of said conveyor and said advancing means including a source of compressed gaseous fluid and means for supplying compressed fluid from said last mentioned source to said opening, said supplying means including means for admitting to said opening a current of compressed fluid having a component of movement in said direction and said advancing



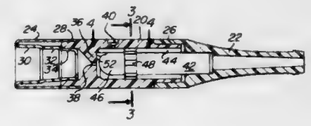
means further comprising means for transporting tobacco particles from said inlet into the range of said current.

4,175,571

CIGARETTE FILTERS

Gerald T. Swanson, Fort Collins, Colo., assignor to Teledyne Industries, Inc., Ft. Collins, Colo.

Filed Aug. 29, 1977, Ser. No. 828,505
Int. Cl.[2] A24D 1/04; A24F 7/02, 7/04
U.S. Cl. 131—171 A **2 Claims**



1. In a system for progressively withdrawing from smoking and which has a plurality of cigarette filters each of which includes:
a barrel, a mouthpiece coupled to one end of said barrel and a tubular cigarette-receptive tip coupled to the other end of said barrel, including an improvement in each filter which comprises:
a transverse wall located internally of said barrel adjacent to said tip;
means defining a restricted orifice through said wall;
means defining an air inlet through the wall of said barrel at a location downstream from said transverse wall;
a stem received within said barrel and defining a passage for the flow of smoke from said tip through said orifice to said mouthpiece with said inlet also communicating to said passage for the flow of air through said inlet to said mouthpiece in mixture with said smoke, said stem including a nose facing but spaced from the outlet end of said orifice and defining a collection area for particulate matter included in said smoke;
and means for mounting said stem within said barrel;
and the further improvement in which each successive different one of said filters has an orifice of respectively decreased diameter and an inlet of respectively increased diameter, the relationship of said diameters as between the different ones of said filters establishing a substantially constant impedance to the drawing of fluid through the corresponding mouthpiece.

V 9 8 1 4 N 0 2 7 7 9 UMI

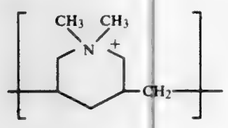
4,175,572

HAIR CONDITIONING WAVING AND STRAIGHTENING COMPOSITIONS AND METHODS

Du Y. Hsiung, Park Forest, and William H. Mueller, Oak Park, both of Ill., assignors to Johnson Products Co., Inc., Chicago, Ill.

Filed Jul. 22, 1977, Ser. No. 818,282
Int. Cl.[2] A45D *7/00*
U.S. Cl. 132—7 **10 Claims**

1. A hair conditioning composition for use under highly alkaline conditions comprising an aqueous dispersion containing from about 1 to about 20 weight percent of mineral oil, from about 1 to about 20 weight percent of a fatty alcohol having 12 to 18 carbon atoms, from about 1 to about 15 weight percent of a non-ionic emulsifier, and from about 0.05 to about 20 weight percent of a quaternary polymer having recurring units of the formula:

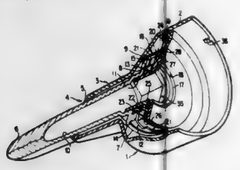


4,175,573

MANICURE ATTACHMENT

Paul D. Burian, Elmsford, N.Y., assignor to Clairol Incorporated, New York, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,891
Int. Cl.[2] A45D *29/05*
U.S. Cl. 132—73.6 **8 Claims**



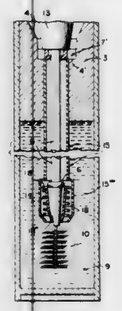
1. A cuticle attachment for rotary manicuring units comprising
- a casing,
- a power transfer member mounted for rotation in said casing, said power transfer member having
- a plurality of driving cam teeth arranged symmetrically about the axis of rotation thereof,
- a pusher member in said casing mounted for reciprocation therein,
- an aperture in said casing aligned with the axis of reciprocation of said pusher member, a portion of said pusher member being extended through said aperture, said pusher member having
- a plurality of follower cam teeth arranged opposite said driving cam teeth and symmetrically about the axis of rotation of said power transfer member,
- biasing means for normally biasing said driving cam teeth and said follower cam teeth axially from each other,
- means for confining said pusher member against rotation with said power transfer member, and
- mounting and driving means for mounting said casing on a rotary manicuring unit with the power transfer member in driven engagement therewith.

4,175,574

COSMETICS APPLICATOR DEVICE

Carlos A. Zulberti, Ramos Mejia (Prov. de Buenos Aires), Argentina

Filed Dec. 29, 1977, Ser. No. 866,165
Claims priority, application Argentina, May 16, 1977, 267640
Int. Cl.[2] A45D *40/26*
U.S. Cl. 132—88.7 **5 Claims**



1. An improved device for the application of cosmetics of the type comprising, a tank body having an open mouth, a sleeve fitted in said mouth and having a conduit which is coaxial and slightly tapering towards the inside of the tank body until terminating in a cylindrical portion having a flat annular seat, said conduit provided with a central bore followed by a widened portion the broader part of which is oriented towards said tank body a cap having within its opening a coaxial cylindrical body, a stem projecting from the center of said coaxial cylindrical body, an applicator at the end of said stem, a collar affixed to said stem, the outside diameter of said collar registering with the diameter of the bore of said sleeve and being able to pass freely therethrough, said stem being provided with an annular disc of elastomer material which is capable of sliding in tight engagement along said stem and the outside diameter of which is slightly larger than the inner diameter of the coaxially tapered conduit of the sleeve inserted into the mouth of the tank body, wherein said annular disc slidingly mounted on said stem has at least three openings which at spaced points interrupt the cylindrical continuity of the perimeter of said disc, a tube projecting axially from the inner end of said sleeve and which receives said stem and its applicator, the lengths of the tube and stem being dimensioned in such a manner that only said applicator is immersed in the cosmetic contained in said tank body in a location immediately adjacent to a tapered, calibrated diameter mouth provided in the free end of said tube, a collar on said stem, said collar located adjacent to said applicator, said collar having a diameter which is slightly smaller that the inside diameter of said tube in order to define therewith an air-venting passage while the applicator is being inserted.

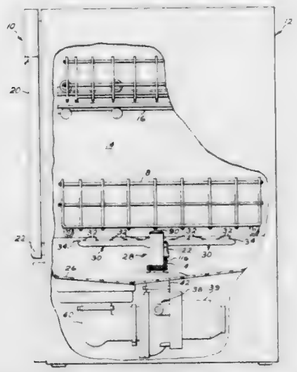
4,175,575

DISHWASHER WITH OSCILLATING ROTARY SPRAY ARM

Donald S. Cushing, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 27, 1978, Ser. No. 890,428
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—176 **19 Claims**

1. A dishwasher including a dishwasher cabinet having an interior space provided therein; rack means for positioning dishware items within said cabinet interior space; and means for directing jet sprays of cleaning liquid at said items of dishware, said means including:
- a spray arm comprised of an elongated hollow member;
- means rotatably mounting said spray arm within said cabinet interior space for rotation about a central axis transverse to the longitudinal axis of said spray arm;
- means for causing said cleaning liquid to be circulated under pressure into the interior of said spray arm;
- a plurality of jet spray openings formed along the length of said spray arm on either side of the axis of rotation thereof;
- whereby said cleaning liquid passes under pressure out through said jet spray openings to direct washing jet sprays at said dishware items;



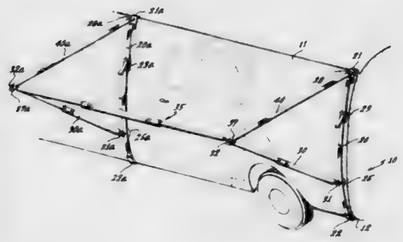
- means for causing said spray arm to continuously rotate in a single direction about said central transverse axis whenever said cleaning liquid is circulated into said spray arm;
- means for producing oscillation of said spray arm about its longitudinal axis, said means including drive means responsive to said rotation of said spray arm about said central transverse axis to continuously oscillate said spray arm about said longitudinal axis;
- whereby said spray arm is oscillated by said rotation of said spray arm about said central axis.

4,175,576

TENT

Jack Iby, 9553 Natick Ave., Sepulveda, Calif. 91343

Filed Aug. 18, 1978, Ser. No. 935,024
Int. Cl.[2] E04F *10/06*
U.S. Cl. 135—1 A **6 Claims**



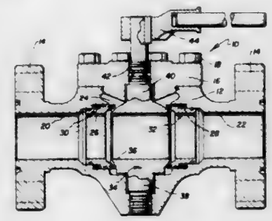
1. A tent for attachment to the side of a van or similar kind of vehicle, comprising:
- a pair of frame straps to be hooked with one end each on a gutter edge of the van and with the respective other end around the bottom edge of a van side;
- a pair of poles serving as braces and being respectively hooked with one end to the straps at points between the strap ends;
- a pair of holding straps each detachably fastened by one end to the ends of the frame straps adjacent to gutter, the other ends of the holding straps being detachably fastened to the respective other ends of the poles;
- a cross pole detachably fastened to said other ends of the poles of the pair;
- tent sides hung from the corners of a rectangle as defined by the upper frame strap clamps and upper ends of the poles of the pair; and
- a canopy mounted on the corners of said rectangle.

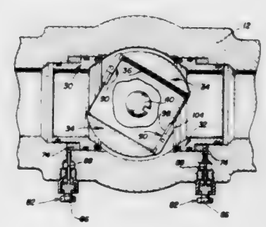
4,175,577

MEANS AND METHOD FOR IN-LINE REMOVAL OF SEAT RINGS IN BALL VALVES

Gary W. Kacal, Rosenberg, and Charles C. Partridge, Houston, both of Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

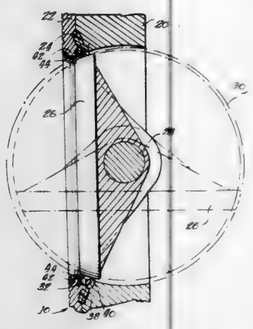
Filed May 3, 1978, Ser. No. 902,324
Int. Cl.[2] F16K *43/00, 25/00*
U.S. Cl. 137—15 **11 Claims**





1. A method for removing a spring-loaded seat ring from a ball valve having a body in which a ball is mounted for rotation and a cover plate is removably connected to the body for permitting removal of the ball and seat ring, the seat ring being mounted for longitudinal movement between a retracted position spaced from the ball and an extended position biased into sealing relation with the ball; said method comprising the following steps:
- removing the cover plate from the valve body to permit access to the ball;
- inserting a cam within the valve body and positioning the cam on the ball in a spaced relation to the adjacent seat ring;
- then rotating the ball so that the cam engages the seat ring upon such rotation and cams the seat ring into a retracted position spaced from the ball;
- actuating a seat ring retainer manually to hold the seat ring in the releasable retracted position;
- then removing the cam and ball;
- and releasing the seat ring for removal from the valve body.

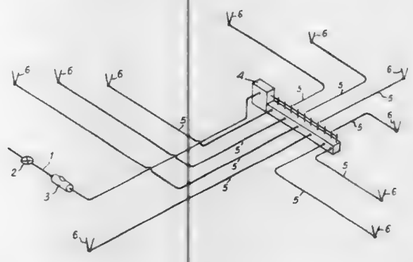
4,175,578
FIRE RESISTANT SEAT FOR BUTTERFLY AND BALL VALVES
Werner K. Priese, Barrington, Ill., assignor to Hills-McCanna Company, Carpentersville, Ill.
Filed Oct. 11, 1977, Ser. No. 840,601
Int. Cl.[2] F16K *1/22*
U.S. Cl. 137—67 11 Claims



1. In a flow control valve for providing emergency sealing action upon inadvertant, thermally induced failure of the primary seal, the combination comprising: valve body means defining a fluid flow aperture; a selectively positionable valve element disposed in said fluid flow aperture; primary sealing means cooperating with said valve element for sealing said fluid flow aperture when said valve element is in a valve closed position; and a secondary, emergency seal adapted to cooperate with said valve element for sealing said aperture upon subjection of said valve to a thermal event, said secondary seal comprising an annular member of substantially incombustible material capable of releasing stored stresses upon being heated above a predetermined temperature mounted on said valve body means and including a first portion hermetically connected to valve body means and a second, lip portion free to move with respect to said valve body means, at least said lip portion of said annular member having prestressed regions normally situating said lip portion out of firm contacting relationship with respect to said valve element, and upon thermal relief of the stresses stored in said prestressed regions, said lip portion reacting to dispose at least a portion thereof into sealing engagement with said valve element when in the valve closed position.

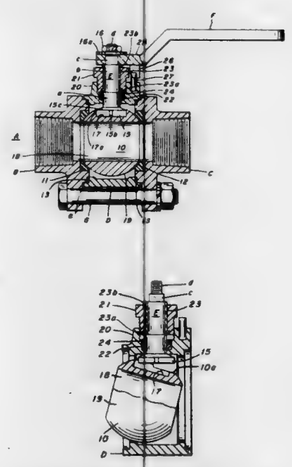
4,175,579
DEVICE FOR AUTOMATIC, SELECTIVE WATERING OF PLANTS
Louis Richard, Cholet, France, assignor to Jean Ollivier, Mortagne-sur-Sevre, France
Filed May 3, 1977, Ser. No. 793,423
Claims priority, application France, May 4, 1976, 76 13228
Int. Cl.[2] G05D *11/00*
U.S. Cl. 137—119 5 Claims

1. Apparatus for the automatic and selective watering of plants or the like with a supply of water under pressure and with the aid of a number of individual water distribution pipes, said apparatus comprising a reduction gear housed in a gear case, a driving element for driving said reduction gear, means for supplying water under pressure to drive said driving element, said gear case having a lateral face with an outlet opening for the water and a rotatable shaft which carries a plurality of spaced cams and which is driven by said reduction gear, a plurality of valve means of the type operated by a pilot valve, each said valve means having, on one side, a water inlet port having a selected shape and, on the opposite side thereof, a water outlet port having a shape that is complementary to said selected shape so that said inlet port of a said valve means can interfit to couple with the outlet port of an adjacent valve means, each said valve means having an internal chamber in flow communication with said inlet and outlet ports of each said valve means, another outlet port for the distribution of water when said valve means are open, said plurality of valve



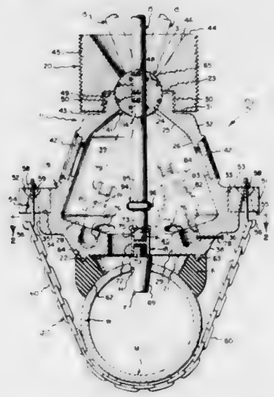
means being coupled in parallel flow series with the first valve means adjacent said lateral face of said gear case and having its water inlet port coupled to said outlet opening disposed in said lateral face, said cams cooperating each respectively with the valve means to control the opening and closing thereof during rotation of said output shaft.

4,175,580
BOTTOM ENTRY POSITIVE ACTING BALL VALVE
Adolphe W. Kalbfleisch, Box 64, Jeannette, Pa. 15644
Filed Nov. 21, 1977, Ser. No. 853,120
Int. Cl. F16k *43/00, 5/00*
U.S. Cl. 137—315 17 Claims



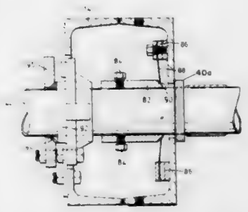
1. An improved bottom entry stem and ball valve assembly which comprises, an open-end passageway defining housing body, a boss having a bore open to the passageway from a side of said body, an axially extending operating stem mounted within the bore of said boss and having a latching spline at its inner end that is of larger diameter than the bore and that is positioned in the passageway of said housing body, a valve ball operatively positioned in said body and having a fluid flow passageway therethrough and a latching recess in its outer wall, said spline and recess each having at least three end-connected depthwise extending side wall length portions that define enclosing continuous side walls for said spline with at least one cooperating pair of "in" and "out" pivot-shaped corner portions and with side wall length portions of said recess fully encircling and providing a closed angular area about said spline, said spline and recess being substantially complementary in shape, and said spline being of slightly smaller size than said recess for pivotal-slidable entry into and removal from said recess when said ball is tilted at said recess from one end of the passageway of said housing body and with respect to a side wall length portion of said spline that is in a substantially cross-aligned position facing the one end of the passageway.

4,175,581
APPARATUS FOR REMOVING A FITTING
Ralph L. Peterson, 27 Woodward Dr., West Seneca, N.Y. 14224
Filed Mar. 29, 1978, Ser. No. 891,073
Int. Cl. F16K *43/00*
U.S. Cl. 137—319 5 Claims



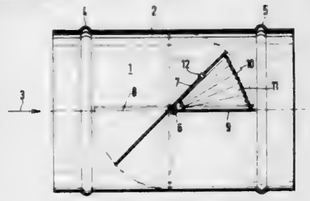
1. Apparatus for moving a fitting relative to a hole provided in a wall, comprising:
a housing provided with a chamber therewithin and having a first opening and a second opening, each of said openings communicating said chamber with the atmosphere, a marginal portion of said housing about said second opening having a concave surface configured as a segment of a surface of revolution;
mounting means adapted to secure said housing to said wall such that a marginal portion of said housing about said first opening will sealingly surround said hole;
a pivotal member having a convex outer surface configured as a segment of a surface of revolution and provided with a through-bore, said pivotal member being sealingly mounted in said second opening such that said convex surface is arranged to face said concave surface to enable pivotal movement of said member relative to said housing about an axis normal to the axis of said through-bore;
a rod sealingly and slidably mounted in said throughbore and having one marginal end portion arranged for selective movement toward and away from said first opening; and
engagement means carried by said rod marginal end portion and adapted to engage a fitting;
whereby when said engagement means is engaged with a fitting, said rod may be pivotally and axially manipulated to move said fitting relative to said hole.

4,175,582
ISOLATING/PRESSURE RELIEF DAMPER
Ronald A. Ashdown, Redhill; Keith Ewing, Chorleywood, and Stuart I. Birkenhead, London, all of England, assignors to Foster Wheeler Energy Corporation, Livingston, N.J.
Filed Apr. 11, 1978, Ser. No. 895,326
Int. Cl.[2] F16K *49/00*
U.S. Cl. 137—334 10 Claims



1. A damper for controlling the passage of hot gases through a duct, said damper comprising:
(i) a frame,
(ii) at least one opening defined within said frame,
(iii) at least one damper positioned within said opening,
(iv) a shaft for each damper, said shaft being rotatable whereby said damper blade is movable between a closed position in which said damper blocks said opening and an open position in which gases can pass through said opening,
(v) at least one passageway in said frame,
(vi) means for passing a coolant through said passageway in said frame,
(vii) a bearing for one end of said shaft, said one end passing through said frame and said bearing being attached to said frame and cooled by passage of coolant through said passageway in said frame, and
(viii) a one-way seal provided where said one end of said shaft passes through said frame to allow flow of coolant from said passageway into said duct and prevent flow in reverse.

4,175,583
REGULATOR VALVE
Wolfgang Finkelstein, Neukirchen-Vluyn; Gregor Baumeister, Krefeld, and Josef Haaz, Neukirchen-Vluyn, all of Fed. Rep. of Germany, assignors to Gebruder Trox, Gesellschaft mit Beschrankter Haftung, Neikirchen-Vluyn, Fed. Rep. of Germany
Filed Jul. 11, 1977, Ser. No. 814,177
Int. Cl.[2] G05D *7/01*
U.S. Cl. 137—504 7 Claims



1. A regulator valve for maintaining a constant volumetric flow comprising a flap having upstream and downstream faces installed within a flow duct and pivotable from an open position to a closed position, means biasing said flap toward said open position, a support plate lying in a plane defined by the

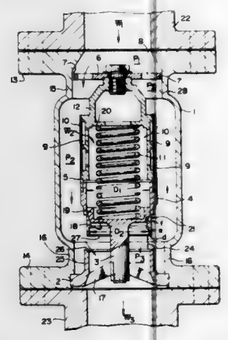
pivoting axis of said flap and the longitudinal axis of said duct, a bellows supported on said support plate on the downstream side of said flap and connected to said flap, inlet means establishing a flow passage from the upstream side of said flap to the interior of said bellows and being open against the direction of flow for transmitting dynamic pressure of flow to the interior of said bellows for expanding said bellows and thereby urging said flap toward said closed position.

4,175,584

CONTROL VALVE FOR KEEPING THE RATE OF FLOW AT A FIXED VALUE

Sotokazu Rikuta, No. 24-7, 2-chome, Koun-cho, Maebashi, Gumma, Japan

Filed Aug. 31, 1977, Ser. No. 829,548
Int. Cl.[2] F16K *31/12*
U.S. Cl. 137—504 **5 Claims**



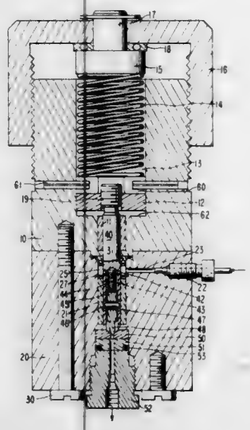
1. A constant flow regulating valve comprising a valve casing having inlet and outlet ports in spaced locations therein, a tubular guide member mounted fixedly and coaxially within said valve casing at said outlet port, said tubular guide member having a first annular peripherally extending surface at one axial end thereof, a hollow slide means positioned coaxially within said valve casing and spaced from said valve casing to define an annular fluid chamber therebetween, said slide means comprising a hollow cylindrical valve plug and a hollow valve cylinder connected thereto, said valve plug having a second annular peripherally extending surface at one axial end thereof, said valve plug being disposed such that said second annular surface is located in flow restricting relationship relative to said first annular surface on said tubular guide member to thereby define a variable flow control passage between said first and second annular surfaces, a support element fixedly mounted on said tubular guide member, said support element extending coaxially into said hollow slide means, a spring means disposed coaxially within and enclosed within said hollow slide means, said spring means being biased between said support element and said slide means to urge the slide means axially away from said tubular guide member, said valve cylinder having a plurality of ports permitting the flow of fluid from said annular chamber into said hollow slide means such that the pressure of fluid in said hollow slide means is equal to the pressure in said annular chamber, an orifice plate carried by said slide means for movement within said valve inlet port and having at least one aperture therein for the flow of fluid therethrough from said inlet port to said annular chamber such that the pressure differential on opposite sides of the orifice plate is counterbalanced by the bias of said spring means to thereby effect constant flow regulation, said cylindrical valve plug having an outer diameter at the axial end portion thereof which is closer to said outlet port which is equal to the inner diameter at the other axial end portion thereof to effect pressure balancing of the valve plug.

4,175,585

PRESSURE REGULATOR WITH MINIMUM DEAD VOLUME

Detlef R. Boehme, Walnut Creek, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 772,785, Feb. 28, 1977, abandoned.
This application Mar. 17, 1978, Ser. No. 889,599
Int. Cl.[2] F16K *31/12*
U.S. Cl. 137—509 **2 Claims**



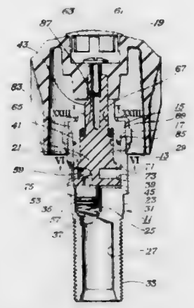
1. A pressure regulating valve for use in a high-pressure liquid chromatography fluid flow line, said valve comprising:
a housing,
a cylindrical slidable piston structure having an axial bore therein such that said piston structure has a partially hollow interior volume having a bore opening, cylindrical walls and a bore bottom, said cylindrical walls surrounding said hollow interior volume having a radial port therethrough immediately adjacent said bore bottom, said piston structure fitted in said housing and slidable in respect thereto,
a valve seat structure disposed externally of said piston structure, said valve seat structure including a valve seat,
means for urging said piston structure toward said valve seat structure at a selectable pressure,
means for preventing contact of said piston structure with said valve seat,
a cylindrical needle structure disposed within said piston structure, and
spring biasing means disposed entirely within said bore of said piston structure for urging said needle structure toward said valve seat structure,
said piston structure being configured so that the flow line fluid in the interior volume of said piston structure urges said piston structure away from said valve seat structure when the pressure of said flow line fluid is greater than the selected pressure at which said piston structure is urged toward said valve seat structure, thereby establishing an equilibrium between said flow line pressure and said selected pressure, said needle structure moving toward contact with said valve seat structure when the pressure in said flow line is slightly less than said selected pressure, thereby tending to close said valve,
conduit means connectable to said flow line, said conduit means terminating in an annular space formed in said housing substantially surrounding said piston structure immediately adjacent said port, said annular space having a larger dimension than said port in the direction in which said housing is slidable, said bore containing said spring bias means and said needle structure and whereby the entire bore is directly in a non-branching flow path between said flow line and said valve seat so that there are minimum trapped fluid areas and rapid purging of said bore is attainable.

4,175,586

FAUCET VALVE WITH DUAL FLOW CONTROL

Dennis J. Hayman, Abilene, Tex., assignor to Wallace-Murray Corporation, New York, N.Y.

Filed Jul. 19, 1977, Ser. No. 817,102
Int. Cl.[2] F16K *25/00*
U.S. Cl. 137—614.11 **12 Claims**



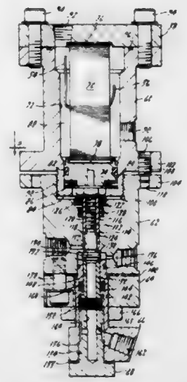
1. A faucet valve comprising:
a. a valve body having a cylindrical cavity with a sidewall, a bottom wall and an open top;
b. an inlet opening communicating with said cavity via said bottom wall and including inlet seal means, and an outlet opening communicating with said cavity via said sidewall;
c. a generally cylindrical control member including a control disc portion merging with a body portion which merges with a stem portion;
i. said control disc portion having an enlarged diameter portion forming a flange with an upwardly facing seating surface and a substantially planar bottom surface disposed to engage said inlet seal means, and a first control opening of a predetermined configuration for cooperation with said inlet seal means, and with said flange merging with said substantially planar bottom surface;
ii. said body portion having a side opening of predetermined configuration communicating with said first control opening;
d. a generally cylindrical retainer member having an exterior surface that is received in mating relation by the said valve body cylindrical cavity sidewall, and having a central bore an upper portion of which is received in mating relation by said control member stem portion and a lower portion of which is received in mating relation by said control member body portion;
i. said central bore lower portion forming with a lower portion of the retainer member exterior surface a retainer member open ended skirt portion having a downwardly facing bottom surface disposed in mating relation with said flange upwardly facing seating surface;
ii. said retainer member skirt portion having an opening therein of predetermined configuration disposed for cooperation with said control member body portion side opening and communicating with said outlet opening;
whereby, rotation of said control member about its longitudinal axis controls fluid communication between said inlet and outlet opening, first by coaction of said first control opening with said inlet opening and second, by coaction of said control member body portion side opening, said retainer member skirt portion opening and said outlet opening.

4,175,587

FUEL INJECTION SYSTEM AND CONTROL VALVE FOR MULTI-CYLINDER ENGINES

Alexander Chadwick, South Lyon; Magdi K. Khair, Birmingham, and Jay C. McCombie, W. Bloomfield, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Oct. 31, 1977, Ser. No. 846,756
Int. Cl.[2] F02M *51/00*
U.S. Cl. 137—625.65 **4 Claims**



1. A fuel injection system control valve comprising:
a valve body having an inlet connected to a source of high pressure fuel and being in fluid communication with a first chamber, an outlet connected to a fuel injector and in fluid communication with a second chamber, and a drain connected to a fuel dump and in communication with a third chamber;
a valve seat element disposed between said outlet and said drain; said valve seat having spring biasing means associated therewith to bias said valve seat towards said first chamber and positioning means to hold and position said valve seat to a predetermined position within the valve body;
a valve element controlling fuel flow between the three chambers said valve element having an enlarged head located within said second chamber, said valving element being normally biased into a first closed position blocking said first chamber from said second chamber which prevents flow from said inlet to said outlet and allows flow between said second and said third chamber, and a second open position wherein said valve element is in contact with said valve seat blocks said second chamber from said third chamber and allows fuel flow from said inlet through first chamber to said second chamber and out said outlet;
means to move said valve element from said first position to said second position into contact with said valve seat.

4,175,588

AIR PRESSURE BRAKE ARRANGEMENT FOR TRACTOR AND SEMI-TRAILER COMBINATIONS

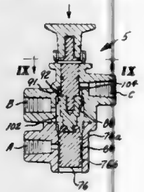
Robert M. Gute, Corunna, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Division of Ser. No. 790,309, Apr. 25, 1977, Pat. No. 4,088,374.
This application Dec. 16, 1977, Ser. No. 861,375
Int. Cl.[2] F16K *11/02*
U.S. Cl. 137—625.4 **3 Claims**

1. A three port valve comprising:
a housing, and a plunger movable lengthwise of a rectilinear passageway formed by said housing, said plunger having a handle supported exteriorly of the housing;
said passageway having, in the order named, a first portion

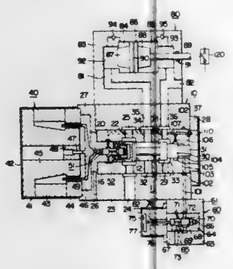
nearest the handle of smallest diameter, a second portion of intermediate diameter, a third portion of largest diameter, and a fourth portion furthest from said handle of said intermediate diameter, said third portion having radial and longitudinally extending flutes at opposite ends thereof which do not extend radially inwardly beyond cylindrical projections of the second and fourth passageway portions; said housing forming three ports spaced along said passageway and extending laterally therefrom, said ports being separately contiguous with said second, third and fourth passageway portions;

said plunger having a first portion complementary in diameter to said first passageway portion, a second portion having a diameter approximately that of said intermediate passageway diameter defining an end surface adapted to



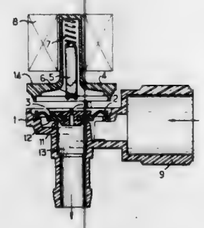
seat against a shoulder defined by the junction of said first and second passageway portions and adapted by the length of the first plunger portion to reciprocate into the third passageway portion beyond the second passageway portion, a third plunger portion spaced from the second plunger portion to reciprocate from a position wholly within said third passageway portion to a position within said fourth passageway portion, and a fourth plunger portion separated from said third plunger portion by a neck and spaced from the third plunger portion to reciprocate in a section of the fourth passageway portion beyond said port thereof; said plunger being articulated in a section thereof connecting the second and third plunger portions and comprising lost motion connecting means enabling lateral adjustment of the first and second plunger portions relative to the third and fourth plunger portions.

4,175,589
FLUID PRESSURE DRIVE DEVICE
Ichiro Nakamura, Katsuta; Ken Ichiryu, Mito, and Masatoshi Kuwayama, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan
Filed May 26, 1977, Ser. No. 800,948
Claims priority, application Japan, Jul. 28, 1976, 51-89177
Int. Cl.[2] F15B *13/043*
U.S. Cl. 137—625.64 **10 Claims**



1. A fluid-pressure drive device comprising a plurality of drive portions which are operated in sequence including a primary drive portion and a secondary drive portion responsive to the operation of said primary drive portion, said primary drive portion including a sleeve and said secondary drive portion including a spool, said spool having first and second opposed fluid pressure bearing surfaces for driving said spool between a first position and a second position, fluid pressure on said first fluid pressure bearing surface resulting in a first force urging said spool towards said first position, fluid pressure on said second fluid pressure bearing surface resulting in a second force urging said spool toward said second position, the areas of said first and second fluid pressure bearing surfaces and the fluid pressure applied thereto being such that said first force is greater than said second force whereby said spool is maintained in said first position, first fluid passage means for providing fluid pressure to said first fluid pressure bearing surface, second fluid passage means for providing pressure fluid to said second fluid pressure bearing surface, third fluid passage means for relieving the pressure of fluid against said first fluid pressure bearing surface in response to operation of said primary drive portion whereby said spool is driven from said first position to said second position, the sleeve of the primary drive portion and the spool of said secondary drive portion being in telescoped relation so as to allow the length of fluid passages in said device to be relatively short whereby a relatively high operational speed of said device can be attained and wherein said primary drive portion forms part of a pilot valve means of said device and said secondary drive portion forms part of a control valve means of said device, and wherein operation of said primary drive portion closes said first fluid passage means and opens said third passage means to relieve the pressure of fluid against said first fluid pressure bearing surface whereby said spool is driven from said first position to said second position.

4,175,590
ELECTRIC VALVES
Gerard Grandclement, Cap d'Ail, France, assignor to International Cold Forging Corporation, Monaco
Filed Jul. 18, 1977, Ser. No. 816,335
Claims priority, application Monaco, Jul. 20, 1976, 1206
Int. Cl.[2] F16K *27/10, 31/40*
U.S. Cl. 137—883 **11 Claims**



1. An electric valve comprising a casing which has an inlet and an outlet connection, a seat for a membrane, a magnetically actuated valve shutter, a flexible, impervious membrane, clamped at its periphery, and an insert tightly held in the midportion of said membrane and having a hole therethrough, said membrane being in contact with said seat so as to define with the casing and the insert a control chamber which communicates with the outlet connection by said hole provided in said insert, which hole is normally closed by said valve shutter, said control member also communicating with the inlet connection by a restricted passage, and magnetic means for actuating said valve shutter so that it disengages from the hole, and further comprising the improvement which consists in that:

said casing is made of a first portion and a second portion both made of the same thermoplastic material, said first portion being shaped as a valve body and said second portion being shaped as a cap for said valve body shape and defining said control chamber with said membrane and said insert thereof and also supporting said valve shutter and said magnetic actuating means;

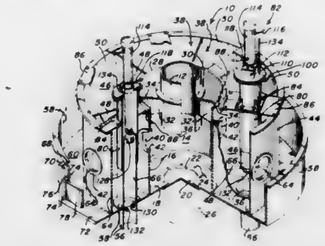
said control chamber, outlet connection, membrane, insert and actuator have an axis common to surface-of-revolution shaping of each of them;

said membrane has an annularly cylindrical peripheral rim having at least one cylindrical surface substantially coaxial with said axis and said rim is restrained in a radial direction by a cylindrical surface of one of said casing portions likewise coaxial with said axis; and

said first and second portions respectively have opposite stepped portions where they meet which are formed by cylindrical riser surfaces coaxial with said axis offset radially by surfaces perpendicular to said axis, two opposed pairs of said step riser surfaces being overlapped and fused by ultrasonic thermomechanical bonding under axial forcing together of said portions by reason of the diameter of the external riser surface of the casing portion that fits inside the other casing portion at their joint being slightly greater than the internal diameter of the internal riser surface of said outer casing portion at the joint, said two pairs of fused step riser surfaces being separated by an intermediate pair of said step riser surfaces of said respective casing portions which are separated from each other by the width of a pair of said radially offsetting surfaces likewise separated from each other, so that an annular cavity is formed thereby which is at least partially filled with material squeezed out from at least one of the fused overlaps of said adjacent opposed pairs of riser surfaces of said respective casing portions,

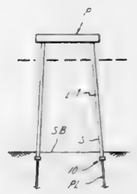
whereby axially and radially offset tandem sealed annular bonds are provided joining said first and second casing portions and seal said casing peripherally independently of the manner in which said membrane is held therein.

4,175,591
APPARATUS FOR DISTRIBUTING SLURRIES
Merrill Welker, Denver, Colo., assignor to Humphreys Engineering Company, Denver, Colo.
Filed Sep. 12, 1977, Ser. No. 832,421
Int. Cl.[2] G01F *11/32*
U.S. Cl. 137—883 **19 Claims**



1. A stationary slurry distributor which comprises: a horizontally-disposed base; first wall means supported on said base cooperating therewith to define an open-topped reservoir effective to receive and retain a slurry delivered thereto; second wall means surrounding said first wall means in spaced relation outside thereof cooperating therewith and with said base to define a chamber encircling said reservoir; partition walls dividing the interior of said chamber into a plurality of individual compartments; the portions of said base underlying each compartment having a discharge opening therein, the portions of said first wall separating each compartment from the reservoir containing an inlet opening, the portions of said second wall within each compartment containing bypass means, and said bypass means and inlet opening within each compartment being angularly-offset relative to one another such that the slurry entering said compartment from the reservoir will essentially all leave the latter through said discharge opening when it is open; and, stopper-type valve means within each compartment selectively and independently operable to plug and unplug the discharge opening therein.

4,175,592
TUBULAR MEMBER SEAL ENCLOSING AND ENCLOSURE RELEASING APPARATUS
Malcolm G. Coone, Houston, Tex., assignor to Lynes, Inc., Houston, Tex.
Filed Sep. 18, 1978, Ser. No. 943,596
Int. Cl.[2] E02D *5/00;* **F02B** *17/04*
U.S. Cl. 138—89 **7 Claims**

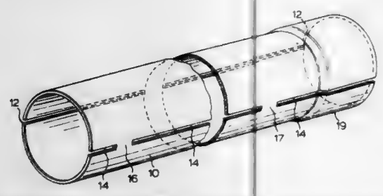


1. A combination tubular member seal enclosing and enclosure releasing apparatus, comprising: elastomeric sealing means having interior and exterior edges, the interior edge thereof being disposed immediate one end of said tubular member and engaged therearound for sealing across the interior of said tubular member; first and second flange members initially defining a housing for securement of the interior edge of said sealing means, said flange members being cicumferentially extendible within said tubular member; first and second seal extending means having an end thereof secured to a respective flange member; telescoping piston means comprising a piston housing having a port therein and a piston element slidably disposed with respect to said housing, one of said seal extending means having another end thereof engaged with one of said piston housing and said piston element and the other of said seal extending means having another end thereof engaged with the other of said piston housing and said piston element; piston chamber means between said piston housing and said piston element for initial fluid pressure expansion between said piston housing and said piston element; plug means initially sealingly disposed within and selectively disengageable from said port; and means for selectively disengaging said plug from said port for telescopically expanding said piston means to urge and release at least one of said first and second flange members away from and out of securement with said elastomeric sealing means.

4,175,593
SPLIT DUCT WITH INTEGRAL HINGE
Stanley F. Sack, St. Andrews East, Canada, assignor to Canadian General Electric Company Limited, Toronto, Canada
Filed Dec. 28, 1976, Ser. No. 755,109
Int. Cl.[2] F16L *57/00*
U.S. Cl. 138—110 **11 Claims**

1. A tubular duct suitable for installation upon an existing cable run, said duct being axially elongated and constructed from a resilient self supporting glass fiber reinforced plastic material and characterized by a first wall portion thereof being axially slit along the length of said duct, and a second wall portion generally radially opposed to said first wall portion being weakened by providing therein at least three axially aligned slots extending along about 90 to 99 percent of the axial

length of said duct to form a pair of spaced apart integral hinges whereby said duct may be resiliently opened along the



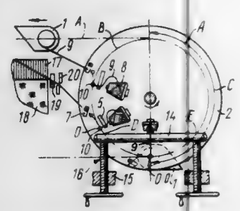
length thereof to permit the introduction of said cable therein through said slit.

4,175,594

APPARATUS FOR THREADING WEFT CARRIERS FOR TRAVELLING-WAVE LOOM

Eduard A. Onikov, ulitsa Panferova, 5, korpus 2, kv. 106; Alexandr L. Galperin, ulitsa Moldagulovoi, 10, korpus 3, kv. 166; Alexandr A. Zabotin, Belyaevo-Bogorodskoe, kvartal 45, korpus 26, kv. 87, all of Moscow; Evgeny D. Loschilin, Kashirskoe shosse, 36, kv. 87, Domodedovo Moskovskoi oblasti, and Nikolai I. Kolobanov, Leninsky prospekt, 94a, kv. 54, Moscow, all of U.S.S.R.

Filed May 3, 1978, Ser. No. 902,548
Int. Cl.[2] D03D *47/26*
U.S. Cl. 139—436 **2 Claims**



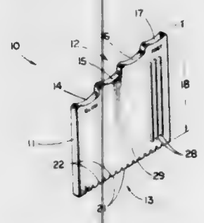
1. In an apparatus for threading weft carriers for a travelling-wave loom, wherein the carriers are conveyed along a closed trajectory, comprising: a rotatable disk arranged in a horizontal plane above a part of the closed trajectory of movement of the carriers and having upper and lower sides, said disk adapted to be rotated; winding members mounted on the under side of said rotatable disk, with a trajectory of movement thereof converging with and becoming vertically aligned, as the disk rotates, with that portion of the trajectory of movement of the carriers wherein the latter are being threaded, whereby prior to the trajectories converging and becoming vertically aligned, a zone is formed wherein said winding members encounter the carriers; grips for the end of the weft thread, mounted on the under side of said disk near said winding members; a package holder mounted on the upper side of said disk and adapted to accommodate the weft thread packages; grips for the weft thread, located on the upper side of said rotatable disk and intended for fixing the weft thread running from the package after the carriers have been threaded; the improvement comprising apparatus for controlling the length of the cut end of the weft thread including means for conveying the weft thread in a direction opposite to the movement thereof in the process of threading, designed for forming a short end protruding from the grip for the end of the weft thread and formed by a rod located over said disk at a position such that the weft thread encounters said rod prior to the point at which said trajectories converge and become vertically aligned to convey the thread upwardly through the disk; the rod of said conveying means being stationary above said disk beneath said grip of the weft thread and being located in the zone wherein the carriers encounter the winding members so that in plan the rod intersects the trajectory of movement of said winding members at two points, one of the points being located in front of the region of coincidence of the trajectories and the other, above the region of coincidence of the trajectories.

4,175,595

GASOLINE FLOW CONTROL DEVICE AND METHOD FOR USING SAME

Frank H. Noe, 8105 Conarroe Dr., Indianapolis, Ind. 46278

Filed Sep. 22, 1977, Ser. No. 835,578
Int. Cl.[2] B65B *3/04*; G05G *5/06*
U.S. Cl. 141—1 **5 Claims**



1. A gasoline flow control device for regulating the flow of gasoline through a gasoline pump handle, comprising:

(a) a body having an upper and a lower spaced-apart surface thereon, the upper surface having a plurality of concave steps therein varying in distance from the lower surface of said body, the lower surface on said body including a plurality of ridges and valleys cut therein to better grip the trigger guard on a gasoline pump handle; and

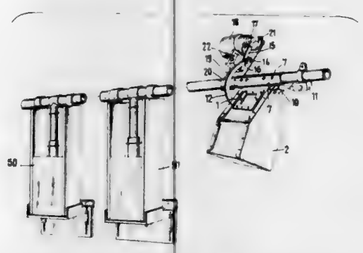
(b) means for positioning said body between a trigger and a trigger guard on a gasoline pump handle to regulate the flow of gasoline therethrough, the ridged lower surface on said body contacting the trigger guard with the trigger resting against one of the concave steps on the upper surface thereof.

4,175,596

STOP DEVICE TO BE USED IN AUTOMATIC FEEDING SYSTEMS

Niels Jørgensen, Herning, Denmark, assignor to Aktieselskabet Funki Maskinfabrik, Herning, Denmark

Filed Jan. 23, 1978, Ser. No. 871,461
Claims priority, application Denmark, Dec. 1, 1977, 103/77
Int. Cl.[2] B65B *3/28*; A01K *5/02*
U.S. Cl. 141—18 **14 Claims**



1. A stop device for use in automatic animal feeding systems which include a series of successive feed dispensers communicating with a common conveyor conduit, means for transporting animal feed through said conduit for successive distribution to each of said feed dispensers, and drive means for driving said

transporting means within said conveyor conduit at timed intervals.

said stop device comprising a container operatively associated with said conveyor conduit and positioned downstream of the last feed dispenser for detecting the completion of the distribution of a selected amount of feed to said feed dispensers,

means mounting said container for movement between an inactive position, a stop position, and a discharge position,

said container, in said inactive position, communicating with the interior of said conveyor conduit and being positioned to receive feed gradually from said conveyor as said feed is moved by said transporting means,

said container being adapted to move from said inactive position to said stop position in response to the accumulation of a selected quantity of feed therein,

switch means operatively connected to said drive means for deenergization thereof upon actuation of said switch means, said switch means being positioned to be engaged and actuated by said container when the latter moves to its stop position, and

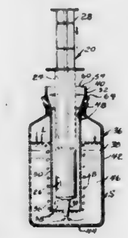
power driven means coupled to said container for moving the latter from said stop position to said discharge position in which said accumulated feed is emptied from said container.

4,175,597

IRRIGATION SOLUTION DEVICE

James J. Peterson, Palatine, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Aug. 1, 1977, Ser. No. 820,512
Int. Cl.[2] B65B *3/32*
U.S. Cl. 141—23 **12 Claims**



1. An irrigation solution device, comprising:

a syringe having a barrel and a tip;

a container having sidewalls and a lower wall defining a solution receiving chamber, and an opening adjacent an upper portion of the container, said chamber containing a sterile irrigation solution;

an elongated barrier member having a first outer opening, an inner end portion defining a second opening, and a channel to receive said syringe, said barrier member being insertable through the container opening into an operative position with the inner end portion of the barrier member located adjacent the container lower wall and with said second opening of the barrier member communicating with the container chamber, said channel having a width slightly larger than the syringe barrel to closely receive the syringe barrel while permitting passage of air between the atmosphere and the second opening, said barrier member having a sufficient length to substantially cover the syringe barrel when positioned in said channel, said barrier member being removed from the container and said syringe being removed from the barrier member with said barrier member having a closure member releasably attached to an outer end portion of the barrier member and closing said second opening of the barrier member from the atmosphere; and

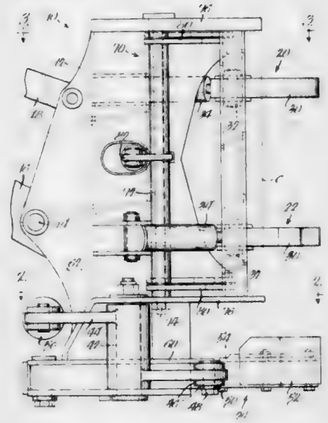
means for sealingly engaging the barrier member to the container in said container opening responsive to insertion of the barrier member into the container to said operative position, whereby said barrier member may be inserted into the container to said operative position with the inner end portion of the barrier member in said solution and with said closure member attached to the barrier member to form an air column in the barrier member channel and a lower level of the solution adjacent said second opening, the closure member may be removed from the barrier member to expose said channel, and said syringe may be inserted into the channel to form a sterile solution containing device.

4,175,598

APPARATUS FOR FELLING AND ACCUMULATING TREES

Terry A. Stoychoff, Schofield, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed May 12, 1978, Ser. No. 905,137
Int. Cl.[2] A01G *23/08*
U.S. Cl. 144—34 E **6 Claims**



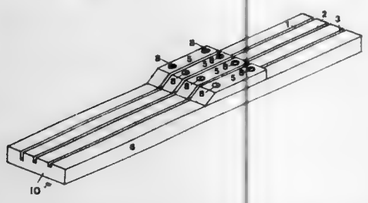
1. A tree harvester head for cutting and accumulating trees comprising a frame having a cutter supported thereon in a cutting area and an accumulator area above said cutter located between a base of said frame and the cutting area, means for actuating said cutter, accumulator arm means on said frame for holding trees in the accumulator area, drive means for moving said accumulator arm means between open and closed positions respectively opening and closing the accumulator area, said accumulator arm means including first and second arms respectively pivoted on first and second pivot axes on said frame on opposite sides of said accumulator area, said arms having arcuate peripheral surfaces respectively spaced from said pivot axes which terminate in tips having a predetermined dimension from said pivot axes and in which said predetermined dimension for each arm defines a minimum spacing between each arcuate surface and its associated pivot axis, grapple arms pivoted on said frame, said grapple arms extending away from said frame and having free ends spaced from said accumulator arm means, and pivoting means for pivoting said grapple arms to positively grip a growing tree between said accumulator arm means and grapple arms with said accumulator arm means in a closed position to retain accumulated trees in the accumulator area and said accumulator arm means being movable to an open position after the growing tree is severed to allow said grapple arms to move said tree into the accumulator area.

4,175,599

BALSAWOOD STRIPPER

Eugene Dubois, P.O. Box C, Acushnet, Mass. 02743

Filed Apr. 11, 1978, Ser. No. 842,742
Int. Cl.[2] B27C *1/14;* **B27L** *7/00*
U.S. Cl. 144—175 **7 Claims**



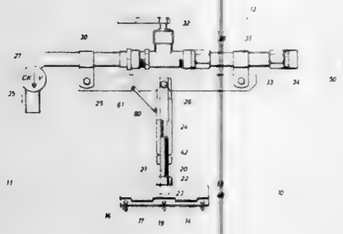
1. A strip cutting device comprising a base having a face with a plurality of substantially parallel slots in said face for guiding work therealong, said slots being of different depth, a cutter disposed over said slots intermediate the ends of the slots for cutting work slid along a selected slot, means detachably mounted on said base for holding said cutter in place, said slots extending on either side of the cutter for guiding the work to and from the cutter.

4,175,600

ANTI-SYPHON SAFETY DISPENSER

Sherwin Wallick, 5012 Westbriar, Houston, Tex. 77056

Filed May 11, 1978, Ser. No. 904,880
Int. Cl.[2] B65B *3/04;* **B67C** *3/00*
U.S. Cl. 141—363 **3 Claims**



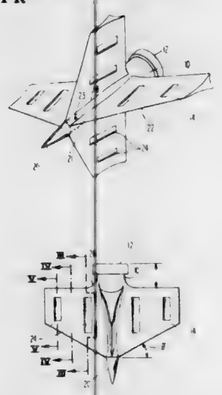
1. An improved fluid dispenser comprising a base plate adapted to be connected to a fluid receiving tank having a feed opening, a pedestal member extending upwardly from said base plate, a collar member in surrounding relationship to said pedestal member and adjustably mounted with respect thereto, a carriage assembly including a fluid feed line attached to the upper end of said collar member, valve means in said feed line to control the flow of fluid therein, said collar member being vertically adjustable on and revolvably mounted with respect to the pedestal member by means of corresponding and mating screw threads on each of said collar member and said pedestal member, means for pivotally mounting said carriage assembly to the upper end of said collar member, said carriage assembly including a pair of bracket members attached thereto and in surrounding relationship to said feed line, said feed line including a hose connector means at one end thereof, said feed line further including a spigot having a check valve therein at the other end thereof, a pair of spaced locking nuts in surrounding relationship to said pedestal member and interposed between said base plate and said collar member, one of said pair of locking nuts being located adjacent said base plate and the other of said locking nuts being located adjacent said collar member to vertically adjust said collar member on said pedestal member, said base plate being channel-like in configuration and including a pair of flange members with each of said flange members having bar means in association therewith for extending into openings in said fluid receiving tank to mount said dispenser on said tank, and wherein said flange members are hinged to said base plate to accomodate different sized fluid receiving tanks.

4,175,601

HAND-HELD WEDGE TOOL FOR SPLITTING WOOD

Gustave C. Meyer, III, P.O. Box 187, Pottstown, Pa. 19460

Filed Jan. 30, 1978, Ser. No. 873,595
Int. Cl.[2] B26B *23/00*
U.S. Cl. 145—1 R **9 Claims**



1. An improved hand-held tool for splitting wood billets, comprising:

a plurality of blades extending outwardly from a central root area, said blades being spaced one from the other by substantially equal increments;

each of said blades having a sharp leading edge and a trailing edge, said leading edges having substantially identical rake angles in the range of from 15° to 50°;

an enlarged head upstanding from the juncture of said trailing edges of said blades for receiving blows from hand-held striking implements;

the flanks of each of said blades having a non-uniform taper whereby substantially the leading half of each blade, seen at its inward extremity, having a first small taper of from zero to 6°, and substantially the trailing half of each blade, seen at its inward extremity, having a second taper substantially greater than the taper of said leading half;

said flanks being substantially symmetrical about the center of each blade, and each said blade having a rectangular cross-section in a horizontal plane; and

a locating point extending from the leading edge of said central root area.

4,175,602

BAG HOLDER AND DISPENSER

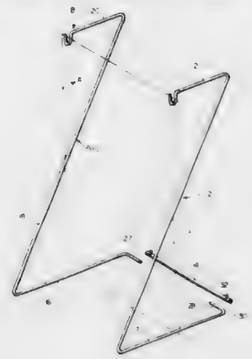
Michael T. Cavalaris, 1733 Nebraska Ave., Palm Harbor, Fla. 33563, and Michael E. Spanondis, P.O. Box 1547, Tarpon Springs, Fla. 33589

Filed Jun. 9, 1978, Ser. No. 914,214
Int. Cl.[2] A45C *13/00*
U.S. Cl. 150—3 **7 Claims**

1. In combination a flexible bag having a mouth, and a frame means for supporting said bag and holding said mouth in an open position to facilitate the loading of articles through said mouth into said bag, the improvement comprising:

said frame means including a pair of side frames with support means for holding said bag at two diametrically opposed positions on said bag mouth;

transverse linkage means between said side frames;



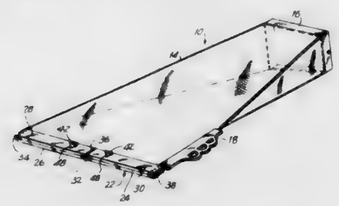
pedal means associated with said transverse linkage means for pulling said side frames toward each other in response to an actuating force on said pedal means to thereby bow open said bag mouth.

4,175,603

GRASS BAG CLAMP AND SPREADER

Albert Iaboni, and Biagio Iaboni, both of 89-27 198th St., New York, N.Y. 11423

Filed May 31, 1977, Ser. No. 802,120
Int. Cl.[2] B65D *33/16*
U.S. Cl. 150—4 **2 Claims**



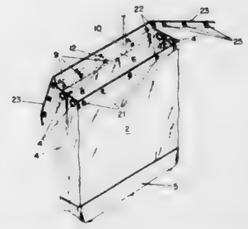
1. In a waste bag for mounting on lawn mowers and the like and including an elongated sleeve formed with first and second openings on opposed ends thereof and a first fixed frame mounted in said first opening for defining an entrance to said waste bag, the improvement comprising a second selectively openable and closable frame mounted in said second opening for selectively opening and closing said second opening to define an exit from said sleve, said second frame comprising first, second, third and fourth elongated members, hinge means joining said first member to said second and fourth members and said third member to said second and fourth members at their respective ends to define a parallelogram-shaped opening selectively closable so that said first and second members and said third and fourth members are in facing relation when said second frame is in a closed position; and means for releasably securing said second frame in its closed position, said securing means including a first twist-nut means extending through an aperture in said first member and formed with a pair of laterally extending heads in spaced relation on opposed sides of said first member, said securing means further including a second twist-nut means extending through an aperture in said fourth member and formed with a pair of laterally extending heads in spaced relation on opposed sides of said fourth member, the head of said first twist-nut means facing said second member when said second frame is in its closed position, said head of said first twist-nut means having one lateral dimension greater than another lateral dimension, the head of said second twist-nut means facing said third member when said second frame is in the closed position, said head of said second twist-nut means having one lateral dimension greater than another lateral dimension, said second member being formed with an opening positioned and dimensioned to receive said facing head of said first twist-nut means when said second frame is in its closed position, said third member being formed with an opening positioned and dimensioned to receive said facing head of said second twist-nut means when said second frame is in its closed position, each said opening being shaped so that the head of the associated twist-nut means passes through the opening at one rotational orientation of the associated twist-nut means and is prevented from passing through the opening at another rotational orientation of the associated twist-nut means to effect positive locking for retaining said second frame in its closed position.

4,175,604

TAMPER PROOF SECURITY MAIL AND BANK COLLECTION BAG

Cletus D. Bonner, 328 Beaver St., Beaver, Pa. 15009

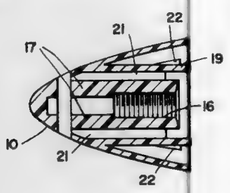
Filed Nov. 7, 1978, Ser. No. 958,374
Int. Cl.[2] B65D *33/34*
U.S. Cl. 150—15 **7 Claims**



1. A tamper proof security mail and collection bag comprising front and rear wall panels, inwardly foldable gussets forming end walls, flat strip means secured to the mouth end of said front wall and having spaced flat reinforcing plate means associated therewith to enable hinging of said strip means in the mid section thereof, flat strip means secured to the mouth end of said rear wall, flat foldable flap means formed on said rear strip means having reinforcing plate means associated therewith, spaced apertured pins mounted on said flap means and projecting angularly therefrom, wing members foldably connected to said flap means and extending laterally from opposing ends thereof, reinforcing plate means associated with said members, spaced apertures in said front and rear strip means, gussets and wing members whereby when said mouth is closed, said flap means is single folded over said front strip means to project said pins through the apertures in both of said strip means, and said wing members are folded inwardly relative to said strip means with said pins projecting through the apertures therein, and locking means associated with at least one of said apertured pins for flatly closing and securing the mouth end of the bag against tampering and unauthorized opening, and whereby when said mouth is open said reinforced front strip means will hinge midway and be movable outwardly to form an enlarged generally V-shaped opening.

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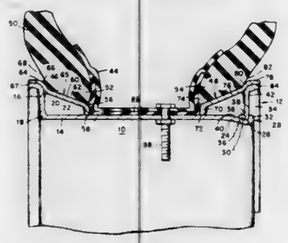
4,175,605
PROPELLER NUT
Gary E. Johnson, Alameda, Calif., assignor to Johnson Propeller Company, Oakland, Calif.
Filed Dec. 23, 1977, Ser. No. 863,731
Int. Cl.[2] F16B *39/284;* **B63H** *5/06*
U.S. Cl. 151—7 **2 Claims**



1. A one-piece self locking propeller nut for retention of a marine propeller on a threaded propeller shaft, comprising:
an outer housing having a front end and a back end;
an inner body within the outer housing, including a central threaded bore adapted to be screwed onto the threaded end of a propeller shaft, said threaded bore having threads which taper from a larger diameter near the front end of the housing to a smaller diameter inside the housing;
the inner body and the housing being integrally connected at the back end of the inner body, said inner body being generally cylindrical with its axis as the central axis of the nut, and being recessed from the front end of the nut, and web means integrally connecting the outside of the inner body with the inside of the housing, said web means including means spaced radially outwardly from the inner body for bearing against the back face of a sleeve member positioned on the shaft and associated with the propeller, whereby, when the propeller nut is screwed tightly onto the shaft, the bearing means of the propeller nut pushes against the back face of said sleeve member associated with the propeller, and the threaded inner body exerts an axial pulling force on the propeller shaft threads, with said web means between the inner body and the bearing means springingly deformed to a slight extent, so that said pulling force is maintained continuously on the threads, adding further friction on the threads and helping retain the nut on the shaft; and
said one-piece nut being of a non-rigid, yieldable plastic material;
whereby said threads retain the nut tightly on the shaft, resisting vibrational forces which tend to loosen a propeller nut.

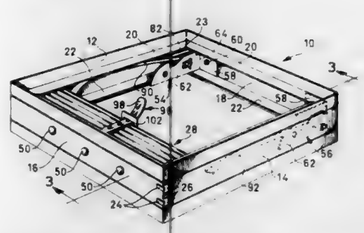
4,175,606
ASSEMBLY FOR MOUNTING TUBELESS TIRES
Clifford E. Bailey, 201 E. Ellis St., Jefferson City, Tenn. 37760, assignor to Clifford E. Bailey, Jefferson City, Tenn.
Filed Apr. 28, 1977, Ser. No. 791,734
Int. Cl.[2] B60C *7/24*
U.S. Cl. 152—399 **10 Claims**

1. In an apparatus for mounting tube type tires on a conventional wheel rim having a substantially cylindrical wall, said rim wall including a first annular flange integrally formed with said rim wall and radially projecting from the first axial end portion thereof, said rim wall defining at its opposite axial end, a circumferential groove offset from said further end of said rim wall by a shoulder, an assembly for mounting a tubeless type tire having a pneumatic inner tube disposed therein, said tubeless tire including companion beads, each of said beads having a sloped base integrally formed with said wall of said bead, said assembly including: a first annulus having an internal diameter substantially equivalent to the external diameter of said cylindrical rim wall whereby said first annulus can be telescoped on said rim and moved into engagement with said first annular flange, said first annulus defining a seating surface for receiving one bead of said tubeless tire, and a further annulus having an internal diameter substantially equivalent to the external diameter of said cylindrical rim wall, whereby said further annulus can be telescoped onto said cylindrical rim wall at said opposite axial end of said rim wall to a position inwardly of said circumferential groove, said further annulus defining a seating surface for receiving the companion bead of



said tubeless tire, and annulus locking means having an internal diameter less than the external diameter of said cylindrical rim wall, said annulus locking means being split and adapted for being expanded over said rim wall shoulder and for seating in said circumferential groove such that said locking annulus means lockingly engages said opposite axial end of said rim thereby preventing movement of said further annulus axially outwardly of said rim.

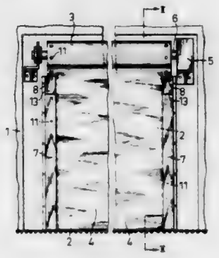
4,175,607
LATCH PLATE
James R. Tatum, 20 Winterton Dr., Islington, and Barry R. Dayus, 2021 Ardleigh Rd., Oakville, both of Canada
Filed Apr. 24, 1978, Ser. No. 899,284
Int. Cl.[2] E05F *15/20;* **E06B** *3/94*
U.S. Cl. 160—1 **8 Claims**



1. A fire damper comprising;
a quadrilateral frame having first and second mutually parallel side walls and, generally perpendicular thereto, first and second mutually parallel end walls, each of said side walls and said end walls being provided with inwardly projecting first and second guide flanges disposed respectively in mutually spaced apart first and second planes;
a shutter comprising a plurality of pivotally interconnected blade members extending between said side walls of said frame between said first and second guide flanges thereof, said shutter being terminally anchored to said first end wall of said frame for movement between an open position in which said blade members are disposed in a folded concertina-like configuration near said first end wall of said frame and a closed position in which said shutter extends completely between said first and second end walls of said frame to close said frame, said shutter being guided during such movement between said first and second guide flanges on each of said side walls;

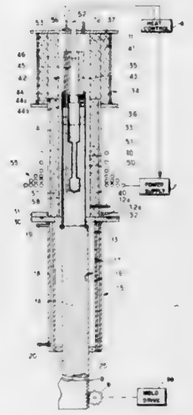
two unitary latch plates, one at each side of said frame, and fastened to said second end wall thereof, each said latch plate comprising an end flange secured to said second end wall of said frame in proximity to said first side wall thereof; an essentially planar side flange integrally formed with said end flange, projecting therefrom in generally parallel disposition to but spaced apart inwardly from an adjacent said side wall of said frame, and having an edge surface extending from one end of said side flange in proximity to the adjacent first guide flange on said adjacent side wall of said frame progressively and angularly toward said second guide flange on that side wall in the direction toward said second end wall of said frame for guiding a free end one of the blade members of said shutter during its movement into said closed position thereof, at least one notch being provided in said edge surface of said side flange of said latch plate for receiving a corresponding projection on said free end one of said blade members when said shutter is in said closed position thereof; and a tongue integrally formed with said side flange and projecting transversely therefrom toward said adjacent side wall of said frame extending along an axis parallel to the axis of said second end wall, said tongue being formed by stamping out a rectangular portion of said side flange, and being rooted thereto at one end and free at the other end, and being formed with an arcuate cross-section, having a semi-cylindrically shaped surface facing towards said second end wall;
a blade tension spring encircling said tongue of said latch plate and terminally secured at a free end thereof to said shutter to urge said shutter into said closed position thereof and said projection then into said notch; and
a thermally actuable catch mechanism on said frame and normally engaging said shutter to hold said shutter in said open position thereof against the action of said spring but releasable in the event of an increase in the temperature of said catch mechanism above a predetermined value to release said shutter and to allow said shutter to move into said closed position thereof under the action of said spring.

4,175,608
CLOSURE STRUCTURE, ESPECIALLY FOR OPENINGS IN A BUILDING
Kurt Alten, Ringstr. 14, 3015 Wennigsen, Fed. Rep. of Germany
Filed Feb. 14, 1978, Ser. No. 877,750
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1977, 2706233
Int. Cl.[2] E06B *9/20*
U.S. Cl. 160—273 R **16 Claims**



1. A closure structure especially for buildings, which includes: wall means comprising two substantially parallel vertical side wall sections spaced from each other in horizontal direction, and also comprising at least one horizontal wall section interconnecting said vertical side wall sections and defining therewith a wall opening, a closure member movable selectively upwardly and downwardly for respectively opening and closing said wall opening, lateral guiding means connected to said side walls for laterally guiding said closure member, said closure member having transverse passage means therethrough, latching means operable during the downward movement of said closure member from the outside of said guiding means to enter said transverse passage means and through the latter partly to enter said guiding means for cooperation with said guiding means to prevent said closure member to slip out of said guiding means, and means associated with said guiding means and operable in response to the upward movement of said closure member to bring about removal of said latching means from said passage means and said guiding means, motor driven reel means located near the upper end of said wall opening for winding said closure member up and off said reel means, a magazine arranged between said reel means and the upper end of one of said lateral guiding means for receiving and releasing said latch means, said magazine having an upper section with an entrance opening into said magazine, a stationary ejector arranged on said guiding means opposite said last mentioned opening for feeding latching means from said closure member into said magazine, said magazine having a lower section with a discharge opening for the latching means in said magazine, said magazine also being provided with a spiral chute leading from said entrance opening to said discharge opening, and said discharge opening having associated therewith a closing element normally closed and adapted to be opened in response to the downward movement of said closure member.

4,175,609
PROCESS AND APPARATUS FOR THE MOLDING OF SHAPED ARTICLES FROM A COMPOSITE METALLIC REFRACTORY MATERIAL
Maurice El Gammal, Clamart, and Maurice Rabinovitch, Chatillon, both of France, assignors to O.N.E.R.A. - Office National d'Etudes et de Recherches Aerospatiales, Chatillon, France
Filed Aug. 5, 1977, Ser. No. 822,261
Claims priority, application France, Aug. 11, 1976, 76 24539
Int. Cl.[2] B22D *25/06*
U.S. Cl. 164—60 **16 Claims**



1. A process for molding an article of complex shape from a composite metallic refractory material by a unidirectional solidification of the composite material in a mold, comprising the steps of:
(a) providing a bath of a heat-exchange liquid metal in the form of a substantially cylindrical column;
(b) heating an upper part of said column above the melting point of said composite material while cooling a lower part of said column below said melting point;
(c) fulling immersing a charge-receiving part of said mold in

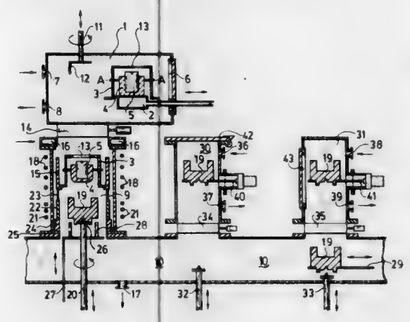
said bath with the bottom of said mold at an intermediate level between said upper and lower parts at which the bath temperature substantially equals said melting point;
(d) maintaining the immersion of the mold in the bath throughout the process;
(e) introducing said composite material into the mold to form a charge therein heated by the surrounding bath above said melting point; and
(f) controlling the heating of said column to maintain the bath temperature at said intermediate level substantially at said melting point while progressively lowering said mold within the bath with reference to said intermediate level for continuously advancing a solidification front in the composite material from the bottom of said mold to the top of said charge.

9. An apparatus for molding an article of complex shape from a composite metallic refractory material by a unidirectional solidification of the composite material in a mold, comprising:
an upright container for a bath of heat-exchange liquid metal forming therein a substantially cylindrical column;
adjustable heat-generating means surrounding said container and including a heater for raising the temperature of an upper portion of said column above the melting point of said composite material and a cooler for maintaining the temperature of a lower portion of said column below said melting point, said heater and said cooler being vertically separated by a neutral zone;
temperature-sensing means in said neutral zone operatively coupled with said heat-generating means for establishing an intermediate level at which the bath temperature substantially equals said melting point;
mounting means for supporting a mold immersed in said bath, said mounting means being vertically movable with respect to said heat-generating means and said temperature-sensing means; and
drive means coacting with said mounting means for lowering said mold from a starting position, in which the bottom of said mold lies at said intermediate level, to an end position in which a charge formed in said mold from said composite material lies below said intermediate level, said column extending upwardly above said intermediate level to keep said charge fully liquefied in said starting position whereby a solidification front coinciding with said intermediate level advances continuously from the bottom to the top of the charge upon progressive lowering of the mold into said end position.

4,175,610
PROCESS AND APPARATUS FOR THE SEMICONTINUOUS PRODUCTION OF SILICON MOLDINGS
Helmut Zauhar; Bernhard Authier, both of Burghausen; Roland Luptovits, Emmerting, and Leonhard Schmidhammer, Kirchheim, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany
Filed Jul. 17, 1978, Ser. No. 925,506
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1977, 2745247
Int. Cl.[2] B22D *15/00, 25/06;* **B22C** *9/20*
U.S. Cl. 164—60 **18 Claims**

1. A process for the semi-continuous production of silicon castings having a columnar structure composed of monocrystalline zones having a preferential crystallographic orientation, comprising the steps of:
(a) introducing a charge of silicon into an evacuable, vacuum-tight casting station, under an atmosphere which is inert with respect to silicon;
(b) introducing said silicon charge into an empty mold disposed in said casting station which is exposed to a vertically-oriented temperature gradient of 200° C. to 1,000° C. by means of a heating device and effecting the solidification of said silicon in said temperature gradient to produce a casting;
(c) transferring the mold and casting into a vacuum-tight transport chamber which communicates with said casting station;
(d) transferring the mold and casting from said transport chamber into a cooling station which is connected to said transport chamber via a vacuum-tight valve means and cooling said casting and mold in said cooling station;
(e) withdrawing said casting and mold from said cooling station following cooling thereof while conveying an empty mold from a loading station via said transport chamber into said casting station; and
(f) repeating steps (a)–(e) in a cyclical manner so as to produce silicon castings in a semi-continuous manner.

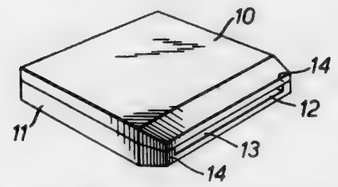
8. Apparatus for the semi-continuous production of silicon castings having a columnar structure composed of monocrystalline zones having a preferential crystallographic orientation, comprising:
a vacuum-tight casting station which can be evacuated and which includes a vacuum-tight valve means;



a mold for receiving a molten charge of silicon which is movable in at least one spatial direction;
a holder for moving said mold in said at least one spatial direction;
a melting vessel disposed above said mold which is essentially resistant to silicon and which is configured and supported to permit release of a molten charge of silicon contained therein into said mold;
a transport chamber which communicates with said casting station and which includes means for moving said mold in at least two spatial directions;
inlet and outlet gas lines leading respectively, into and out from, said casting station and said transport chamber;
at least one cooling station which is connected to said transport chamber via a vacuum-tight isolation device and which includes an inlet and an outlet gas line for feeding a cooling gas therethrough and a holder for supporting a mold, said cooling station being isolated from the outside atmosphere via a further vacuum-tight isolation device.

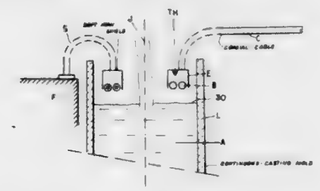
4,175,611
PLASMA FLAME SPRAY COATED GRAPHITE DIES
John M. Fletcher, Sheffield, England, assignor to British Steel Corporation (Chemicals) Limited, England
Filed Apr. 27, 1978, Ser. No. 900,561
Claims priority, application United Kingdom, Apr. 28, 1977, 17804/77
Int. Cl.[2] B05D *3/06, 7/24;* **B32B** *15/04, 9/04*
U.S. Cl. 164—418 **9 Claims**

1. A method of producing a graphite die for use in continuous casting of non-ferrous metals, the graphite die having wearing surfaces, said method comprising applying a first layer of aluminum or a mixture of aluminum and alumina and then



applying a second layer of alumina, both layers being applied by plasma or combustion flame spraying.

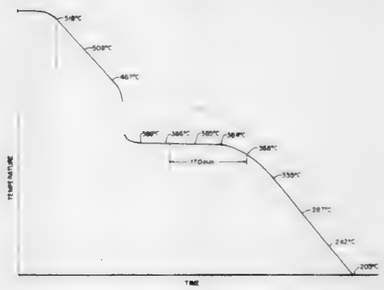
4,175,612
APPARATUS FOR MEASURING AND CONTROLLING THE LEVEL OF MOLTEN STEEL IN A CONTINUOUS-CASTING MOLD
Jean Baumert, Esch, Luxembourg, assignor to ARBED Acieries Reunies de Burbach-Eich-Dudelange S.A., Luxembourg, Luxembourg
Filed Nov. 15, 1977, Ser. No. 851,635
Int. Cl.[2] B22D *11/16, 1/02*
U.S. Cl. 164—449 **5 Claims**



1. The combination with a continuous-casting mold of an apparatus for controlling the level of liquid steel is said continuous-casting mold, said apparatus comprising:
an oscillator having a resonant network including a coil in said mold surrounding a stream of steel flowing into the mold, and a capacitor, said ascillator generating a frequency constituting a function of the location of the steel-melt surface within said mold;
circuit means connected to said oscillator for controlling the rate of feed of molten steel to said mold, said coil having a plurality of rigid turns supported and surrounded by a refractory material and disposed in the interior of said mold concentrically therewith in a horizontal plane;
an annular downwardly open static metallic crown receiving said coil and said refractory material and disposed in said mold above said surface, said crown is connected to a coaxial conductor forming intrinsically part of said capacitor and having a conductive member connected to said crown; and
means for supporting said coil within said mold from a location outside the latter and independently of movement of said mold.

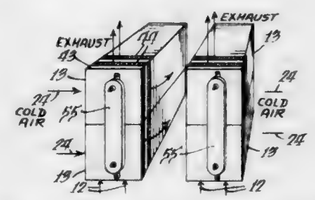
4,175,613
METHOD OF STORING ENERGY
Talbot A. Chubb, 5023 N. 38th St., Arlington, Va. 22207
Division of Ser. No. 802,395, Jun. 1, 1977, Pat. No. 4,119,556.
This application Jun. 30, 1978, Ser. No. 920,890
Int. Cl.[2] C09K *5/06*
U.S. Cl. 165—1 **7 Claims**

1. A method of storing thermal energy which comprises:
transfering thermal energy to a liquid, thereby causing said liquid to become a gas;
transporting said gas to a surface thermally connected to a thermal-energy storage material comprising a ternary salt mixture of sodium chloride, potassium chloride, and magnesium chloride in $NaCl:KCl:MgCl_2$ weight-ratio range of 22.5 to 26.5:18.5 to 22.5:53.0 to 57.0 and an additive salt selected from the class consisting of calcium, barium, and



strontium chloride, sodium, potassium, and magnesium bromide, sodium, potassium, and magnesium fluoride and mixtures thereof in an amount sufficient to reduce the melting point of said thermal-energy storage material below that of said ternary salt mixture and not to exceed 10 weight percent of the total composition; and
condensing said gas at said surface, thereby releasing thermal energy to said storage material.
2. The method of claim 1 wherein said liquid is m-terphenyl.

4,175,614
HEAT EXCHANGER DEVICE
Homer D. Huggins, Racine, Wis., assignor to Modine Manufacturing Company, Racine, Wis.
Filed Jun. 1, 1978, Ser. No. 911,332
Int. Cl.[2] F28G *13/00*
U.S. Cl. 165—95 **6 Claims**



1. A heat exchanger device for recovering waste heat from a contaminated hot gas that carries solid and precipitable contaminants capable of being liquified by heat, comprising: a heat exchanger having a plurality of spaced heat conducting first passage means therethrough for said contaminated hot gas and a plurality of spaced heat conducting second passage means therethrough for a cooler second gas to be heated by heat exchange with said hot gas, said first passages and said second passages being interleaved for efficient heat transfer between the two gases; a heat conducting fin in each of said second passages for aid in transferring heat between said gases, each said fin comprising means for providing gas flow paths for said second gas, said interleaved first and second passages being defined at their sides by heat conducting sheets common to both passages on which the contaminants are deposited from said contaminated hot gas on the said first passages surfaces of

V 9 8 8 4 N 0 2 7 7 9 UMI

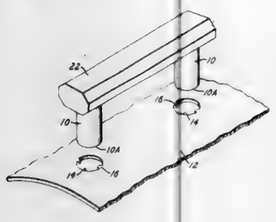
said sheets; and means for applying heat to said sheets that define the outer extremities of the outermost said second passages for heat transfer by way of said fins to the sheets defining said first passages in order to heat liquify contaminants deposited thereon.

4,175,615

PIPE HEADER-CYLINDRICAL TANK JOINT AND METHOD OF JOINING SAME

Lloyd S. Blair, Hickory, N.C., assignor to General Electric Company, Philadelphia, Pa.

Filed Jan. 19, 1978, Ser. No. 870,916
Int. Cl.² F28F 9/18; B23K 31/02; F16L 41/08
U.S. Cl. 165—106 **12 Claims**



1. A method of joining an end portion of a first tubular member to an arcuate surface, comprising the steps of:
(a) providing said end portion with an end surface which is substantially flat;
(b) providing a first aperture in said arcuate surface, said aperture having a configuration which closely matches at least a portion of said end surface of said tubular member and being related in dimension thereto such that said end portion of said tubular member adjacent to said matching end surface can be moved into said aperture when said end surface and said aperture are in aligned relation, another portion of said aperture including non-matching means of a configuration which prevents an end portion adjacent to another portion of said end surface from moving into said aperture when said end surface and said aperture are in aligned relation, said non-matching means comprising at least two tabs projecting inwardly from said aperture, said tabs being recessed with respect to the surrounding portion of said arcuate surface which defines said aperture, said two tabs being disposed in substantially opposed relation around said aperture, said tabs being effective when engaged by said end surface of said end portion to prevent movement of said end portion into said aperture;
(c) aligning said end surface of said end portion with said aperture, the aligning step including moving said matching portion of said end surface into said aperture and engaging said other portion of said end surface with said non-matching means of said aperture until said end portion is in a pivotal position in said aperture, said aperture configuration providing sufficient clearance to said end portion so that said end portion is transversely pivotable with respect to said arcuate surface; and
(d) joining said end portion to said arcuate surface.

4,175,616

EQUALIZATION TANK FOR COOLING LIQUID

Rolf Pabst, Neuhausen, and Siegfried Jenz, Illingen, both of Fed. Rep. of Germany, assignors to Dailmler-Benz Aktiengesellschaft and Suddeutsche Kuhlerfabrik Julius Fr. Behr, both of, Fed. Rep. of Germany

Division of Ser. No. 601,330, Aug. 1, 1975, Pat. No. 4,064,848. This application Aug. 17, 1977, Ser. No. 825,373
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1974, 2437502
Int. Cl.² F28D 15/00; F01P 3/22
U.S. Cl. 165—107 D **7 Claims**



1. An equalization tank for volume equalization and air separation of a liquid heat carrier flowing through a circulating system, especially for a circulatory system for combustion engine cooling spaces and the like, comprising:
separation chamber means,
air chamber space means arranged above said separation chamber means,
venting means communicating the air chamber space means and the separation chamber means for accommodating escape of entrapped air from the liquid flowing through the separation chamber means to the air chamber space means,
the separation chamber means being constructed and arranged to form liquid-air separating means and including a plurality of separate separation chambers with partition means therebetween, a first of the separation chambers including an inlet portion coupled with a separation flow entrance leading from the circulating system and an outlet portion in said partition means coupled directly with a second of the separation chambers, the outlet portion being constructed of a lower connection near the tank bottom for permitting cooling liquid low in gas bubbles to flow therethrough from the first separation chamber to the second separation chamber, and an upper vent connection near the tank top, and
guide means arranged in a central zone of the first separation chamber and spaced between an opening of the inlet portion and the partition means for guiding cooling liquid enriched in bubbles in the direction toward the tank ceiling and said upper vent connection, and away from said lower connection.

4,175,617

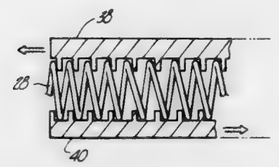
SKEWED TURN COILED TUBE HEAT EXCHANGER FOR REFRIGERATOR EVAPORATORS

Thomas M. Hahn, Jeffersontown; Ivar Lohmus, Louisville, and David E. Oakley, Fairdale, all of Ky., assignors to General Electric Company, Louisville, Ky.

Filed Dec. 27, 1977, Ser. No. 864,367
Int. Cl.² F28D 7/02; F28F 1/38
U.S. Cl. 165—122 **9 Claims**

1. A heat exchanger comprising:
a tube wound into generally helical coil, each of the turns in said coil being spaced apart and skewed at variable helical angles through each of said turns to present portions of each of said turns at varying degrees of obliqueness to a direction transverse to said coil axis;
a fin array comprising fins secured to said tube along the length thereof and extending in the general direction of the radius of said coil turns at the point whereat each of said fins is secured to said tube;

means for directing fluid through said coil in said transverse direction across said coil axis whereby increased fluid



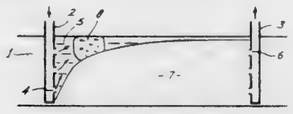
flow contact with said fin array is achieved by said skewing of said turns into the path of said fluid flow.

4,175,618

HIGH VERTICAL AND HORIZONTAL CONFORMANCE THERMAL OIL RECOVERY PROCESS

Ching H. Wu, Golden, Colo.; Alfred Brown, Houston; Wilbur L. Hall, Bellaire, both of Tex., and Russell D. Shupe, Ponca City, Okla., assignors to Texaco Inc., White Plains, N.Y.

Filed May 10, 1978, Ser. No. 904,703
Int. Cl.² E21B 43/22, 43/23
U.S. Cl. 166—252 **24 Claims**



1. A method of recovering viscous petroleum from a subterranean, viscous petroleum-containing, permeable formation penetrated by at least one injection well and by at least one production well, in fluid communication with the formation, comprising:
(a) injecting a thermal recovery fluid comprising steam into the formation and producing fluids from the formation via the production well for a predetermined period of time, thereby forming a steam-swept zone in the formation;
(b) injecting an emulsifying fluid into the steam-swept zone, said emulsifying fluid comprising water having dissolved therein a surfactant capable of forming a viscous emulsion with formation petroleum at the temperature and water salinity present in the steam-swept zone, said water containing the emulsifying surfactant forming a viscous emulsion in the steam-swept zone with residual petroleum present in that zone, thereby decreasing the permeability of that zone, said surfactant comprising an organic sulfonate selected from the group consisting of petroleum sulfonate having a median equivalent weight from 325 to 475, and syntheic sulfonates of the formula

$$RSO_3X$$

wherein R is an alkyl, linear or branched, having from 8 to 24 carbon atoms, or an alkylaryl including benzene or toluene having attached thereto at least one alkyl group, linear or branched, and containing from 6 to 18 carbon atoms in the alkyl chain, and X is sodium, potassium, lithium or ammonium; and
(c) thereafter injecting steam into the formation well via the injection well and recovering fluids including petroleum from the formation via the producing well.

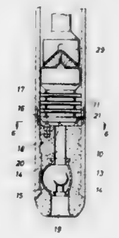
24. A method of recovering viscous petroleum from a subterranean, viscous petroleum-containing, permeable formation penetrated by at least one injection well and by at least one production well, both wells being in fluid communication with the formation, comprising:
(a) injecting a thermal recovery fluid comprising steam into the formation and producing fluids from the formation via the production well for a predetermined period of time, thereby forming a steam-swept zone in the formation;
(b) injecting an emulsifying fluid into the steam-swept zone by means of the same well as was used for recovering petroleum, said emulsifying fluid comprising water having dissolved therein a surfactant capable of forming a viscous emulsion with formation petroleum at the temperature and water salinity present in the steam-swept zone, said water containing the emulsifying surfactant forming a viscous emulsion in the steam swept zone with residual petroleum present in that zone, thereby decreasing the permeability of that zone; and
(c) thereafter injecting steam into the formation well via the injection well and recovering fluids including petroleum from the formation via the producing well.

4,175,619

WELL COLLAR OR SHOE AND CEMENTING/DRILLING PROCESS

Carl A. Davis, P.O. Box 12326, Houston, Tex. 77017

Filed Sep. 11, 1978, Ser. No. 941,166
Int. Cl.² E21B 33/16
U.S. Cl. 166—291 **10 Claims**



1. In a well shoe or collar pipe attachment having a cement tube adapted to receive a pump down wipe plug, the improvement which consists of at least one drillable protrusion extending upward from the top surface of the cement tube, said protrusion having a sharp upper end capable of engaging, denting, penetrating and rending a pump down wipe plug and strong enough to withstand the torque exerted by the tendency of a pump down wipe plug to rotate when in contact with a rotating drill bit.

9. An improved well cementing and drilling process comprising:
(a) pumping wet cement into the well pipe string;
(b) inserting a top pump down wipe plug between the wet cement and a forcing fluid used to pump the wet cement to the desired level;
(c) pumping the plug and the wet cement down the well with the forcing fluid until the bottom of the plug contacts the top of a cement tube of a well shoe or collar pipe attachment having at least one drillable tooth-like means capable of engaging; denting, penetrating and rending said plug;
(d) allowing the cement to harden;
(e) contacting the top of the plug with a rotating drill bit so that the bottom of the plug is forced on to the tooth-like means thereby retarding the tendency of the plug to rotate and enhancing the drilling action of the bit on the plug.

4,175,620

METHODS AND APPARATUS FOR ANCHORING OFFSHORE PIPELINE

Clyde E. Nolan, Jr., Houston, and William S. Tillinghast, Humble, both of Tex., assignors to Brown & Root, Inc., Houston, Tex.

Filed Dec. 6, 1977, Ser. No. 857,981
Int. Cl.[2] E21B 7/12
U.S. Cl. 166—343 20 Claims



1. An offshore flowline installation assembly operable to receive pipeline means and comprising:

wellhead base means;

generally upright well conduit means projecting through said wellhead base means;

pipeline anchor means connected with said wellhead base to form therewith a unit that can be lowered onto a seabed;

said pipeline anchor means being shiftably positionable relative to said wellhead base means; and

pin pile means operable to secure said pipeline anchor means to the seabed so as to isolate said pipeline anchor means from said wellhead base means in relation to forces transmitted from said pipeline means to said pipeline anchor means;

said pin pile means defining generally upright pivot axis means about which said pipeline anchor means is rotatably shiftable; and

said pin pile means being anchoringly engaged with said seabed and connected in generally lateral force isolating relation with said pipeline anchor means in order to substantially prevent the transmission of lateral force from said pipeline anchor means to said generally upright well conduit means.

4,175,621

FRUIT DISLODGER FOR A HARVESTING MACHINE

David M. Seem, Seem Dr., Kutztown, Pa. 19530

Filed Aug. 25, 1977, Ser. No. 827,475
Int. Cl.[2] A01D 17/00, 45/00
U.S. Cl. 171—14 5 Claims

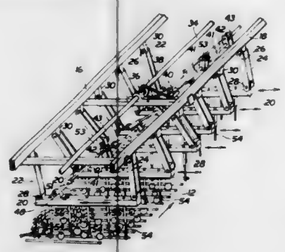
1. In combination with a tomato harvester having a main frame, cutting means for severing tomato plants below ground, and means for depositing the severed plants on a movable conveyor on which the tomatoes are separated from the vines, means for physically dislodging tomatoes from the vines as said tomato plants are being conveyed on said conveyor comprising:

(a) a pair of frame members connected to said main frame and extending longitudinally over said conveyor in the direction of movement of said conveyor,

(b) a plurality of cross bars connected to said frame members are disposed over said conveyor to swing back and forth out of the phase with one another transverse to the direction of movement of said conveyor,

(c) a plurality of flexible spring-like elements connected to each of said cross bars extending vertically downwardly towards said conveyor,

(d) the ends of said flexible elements being spaced from said conveyor, and



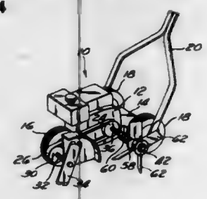
(e) means for moving said cross bars transversely back and forth across said conveyor to move said flexible elements into contact with said tomato plants as they are conveyed to assist in dislodging the tomatoes from said vines.

4,175,622

EDGER FAN APPARATUS

Conrad G. Summerfelt, 2161 Cooley Pl., Pasadena, Calif. 91104

Filed Jan. 23, 1978, Ser. No. 871,207
Int. Cl.[2] A01G 3/06
U.S. Cl. 172—14 1 Claim



1. In combination with an edger having a housing mounted on wheels for movement across hard, substantially planar surfaces such as cement sidewalks, a motor mounted on said housing, said motor causing rotation of an output shaft, a cutting blade driven by said output shaft, said cutting blade being adapted to cut vegetation located directly adjacent an edge of said hard, substantially planar surface, the improvement comprising;

fan means mounted on said housing in close proximity to said cutting blade but spaced therefrom, said fan means to be rotatably driven by power means;

said fan means including a plurality of separate fan blades, each said fan blade being formed of a flexible sheet material, each said fan blade being connected to a fan hub by means of a flexible connection, said hub comprising a spool forming an inner disc and an outer disc, each said fan blade being connected to both said inner disc and said outer disc, each said flexible connection permitting movement of its respective fan blade with respect to said hub within the plane of rotation of said fan means, whereby upon a fan blade contacting an exterior object such as a users hand or leg the fan blade will readily bend causing little or no injury to the user;

a shaft extension being fixedly mounted to said output shaft, said hub being slidably mounted upon said shaft extension, said hub having a forwardmost planar surface, a washer member connected to said shaft extension having an inner planar surface, said forwardmost planar surface being in continuous frictional contact with said inner planar surface, said hub being normally rotatably driven with said shaft extension but capable of sliding movement in respect thereto upon encountering a restricting force; and

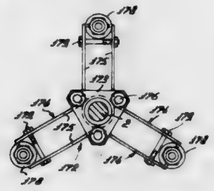
coil spring biasing means located between said hub and a stop means on said shaft extension, said blasing means exerting a continuous force against said hub to frictionally engage together said forwardmost planar surface and said inner planar surface to cause said hub to normally rotate with said shaft extension.

4,175,623

SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Filed Nov. 30, 1976, Ser. No. 746,088
Claims priority, application Netherlands, Dec. 1, 1975, 7513962
Int. Cl.[2] A01B 33/06
U.S. Cl. 172—59 8 Claims



1. A soil cultivating implement comprising a plurality of soil working members mounted on corresponding upwardly extending shafts that define axes of rotation, at least one working member having support means comprising radially extending arms and downwardly extending tines mounted adjacent the outer ends of said arms, said tines extending generally parallel to the corresponding axis of rotation and said arms comprising planar strips of resilient material with respective widths that are substantially vertical, said tines and corresponding strips being deflectable in either of two opposite directions away from a normal equilibrium position, against the resilient opposition of said strips, and substantially perpendicular to the planes of said strips, at least one of said tines having a fastening portion and means mounting said fastening portion between the outer ends of said strips, said mounting means including clamping means and said fastening portion being supported between outer ends by the clamping means.

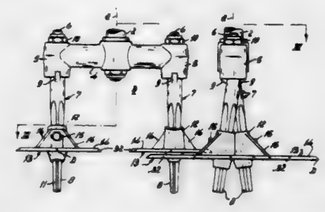
4,175,624

SOIL CULTIVATING IMPLEMENT

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Aug. 8, 1977, Ser. No. 822,661
Claims priority, application Netherlands, Aug. 9, 1976, 7608815
Int. Cl.[2] A01B 33/06
U.S. Cl. 172—59 19 Claims

1. A soil cultivating implement comprising frame means and tined soil working members rotatably supported on said frame means, said members being mounted for rotating about corresponding upwardly extending axes, each member having two elongated and downwardly extending tines that are spaced apart and positioned around the respective axis of rotation, a plural sided tool being fastened to each tine, said tool being planar and having cutting edges that surround said tine, said edges meeting at points, said soil working members being mounted in a row to work overlapping paths and the tools of



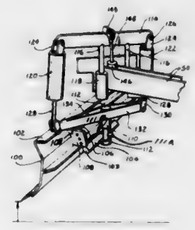
neighboring members being positioned at different levels to avoid fouling.

4,175,625

ARTICULATING GRADER HAVING STRUCTURE FOR RAISING AND LOWERING MOLD BOARD WITHOUT DISTURBING SETTING

Robert O. Puckett, 2814 Scenic Hwy., Snellville, Ga. 30278

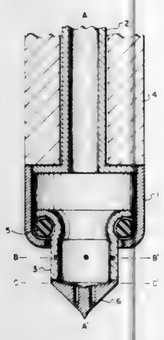
Filed Jun. 23, 1977, Ser. No. 809,447
Int. Cl.[2] E02F 3/76
U.S. Cl. 172—791 12 Claims



1. In a grader machine having a wheel supported machine frame, steering means for steering the machine, power means for driving the machine, a mold board supported and mounted for movement on and extending substantially transversely of said frame, and adjusting and support means for supporting and setting the transverse angle and relative vertical angle and height of said mold board to adjust the height of respective mold board ends with respect to the ground, the improvement comprising: said adjusting and support means comprising independent first and second generally vertically oriented power means extensible and retractable for adjusting and setting the relative vertical angle and height of said mold board, means for simultaneously raising and lowering both of said first and second extensible and retractable power means and said mold board therewith while maintaining the vertical and transverse angle setting thereof and without disturbing the setting of said first and second power means whereby said mold board may be set and thereafter raised and lowered above ground without disturbing the vertical and transverse angle setting and therefore without resetting said mold board each time it is raised, said raising and lowering means simultaneously raising and lowering said mold board and the said first and second extensible and retractable power means approximately straight up and down above the ground whereby the angular relationship of the mold board ends is not affected, said raising and lowering means comprising third generally vertically oriented power means.

V 9,88,4 NO 027 79 UMI

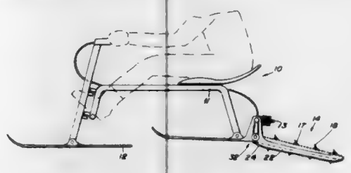
4,175,626
FLUID-JET DRILL
Harold Tummel, 4630 Cole St., Dallas, Tex. 75205
Filed Sep. 15, 1978, Ser. No. 942,642
Int. Cl.[2] E21B *7/18*
U.S. Cl. 175—422 **4 Claims**



1. A fluid-jet drill for subsurface drilling, comprising:
a first cylindrical sleeve, having its forward edge curved inward;
a second cylindrical sleeve, coaxial with the first cylindrical sleeve, having an outside diameter of lesser measure than the measure of the inside diameter of the first cylindrical sleeve, such that the forward end of the second cylindrical sleeve is flared to threadedly connect with the rearward end of the first cylindrical sleeve;
a ring of circular cross-section, having a maximum outside diameter of measure slightly less than the measure of the inside diameter of the first cylindrical sleeve, such that it is retained forwardly by the forward curved edge of the first cylindrical sleeve;
a third cylindrical sleeve, coaxial with the first cylindrical sleeve, extending forwardly out of the first cylindrical sleeve, having an outside diameter of lesser measure than the measure of the inside diameter of the first cylindrical sleeve, having its rearward edge curved outward, such that it extends through the center of said ring and such that its rearward edge retains rearwardly said ring;
a solid cone, coaxial with the first cylindrical sleeve, having a maximum outside diameter of measure equal to the measure of the outside diameter of the the third cylindrical sleeve, such that it is permanently rearwardly affixed at the end of its maximum outside diameter to the forward end of the third cylindrical sleeve;
a means for causing the rotation of the third cylindrical sleeve with respect to the first cylindrical sleeve about their common axis;
a means for accelerating and expelling forwardly through said cone a pressurized fluid, such that this accelerated and expelled fluid might impinge upon the substance to be drilled.

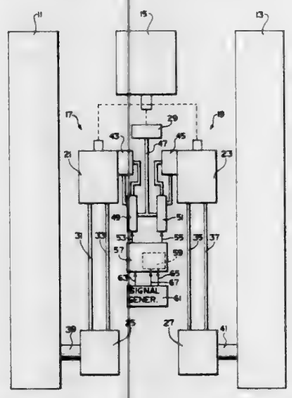
4,175,627
PROPULSION SYSTEM FOR A SNOW GOING DEVICE
Royce H. Husted, Wheaton, Ill., assignor to Saroy Engineering, Wheaton, Ill.
Continuation-in-part of Ser. No. 790,655, Apr. 25, 1977, Pat. No. 4,095,849, which is a continuation-in-part of Ser. No. 599,003, Jul. 25, 1975, Pat. No. 4,035,035. This application Mar. 31, 1978, Ser. No. 892,085
Int. Cl.[2] B62M *27/00*
U.S. Cl. 180—190 **2 Claims**

1. In a ski-bob type of a device, a propulsion system comprising in combination:
a tread having a chain carrying a plurality of cleats with resilient snow engaging portions,
an undersurface defining a longitudinal groove, said groove adapted to slidingly contain said chain and to provide a longitudinal bearing for it, supporting said cleats through said chain,



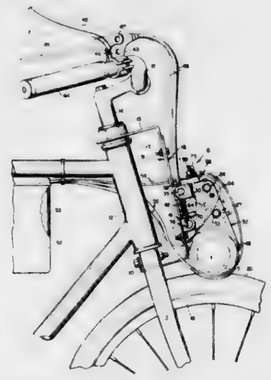
wherein said chain is made of links having side-plates and cross-members, and wherein said longitudinal bearing slidingly and directly supports said chain through said cross members.

4,175,628
STEERING CONTROL SYSTEM FOR DUAL PATH HYDROSTATIC VEHICLE
Charles R. Cornell, Battle Creek, Mich., and Dennis D. Simpson, Spencer, Iowa, assignors to Eaton Corporation, Cleveland, Ohio
Filed Jul. 10, 1978, Ser. No. 922,939
Int. Cl.[2] B62D *11/04;* **F15B** *18/00;* **F16H** *39/46;* **B60K** *23/00*
U.S. Cl. 180—6.48 **8 Claims**



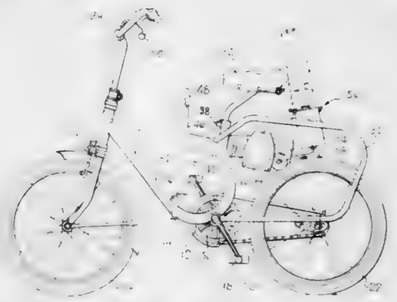
1. A steering control system for a vehicle having first and second hydrostatic transmissions, each of said transmissions including a fluid pump unit and a fluid motor unit, one of said units being variable displacement, the vehicle further having a main control system including means for generating a command signal representative of the desired vehicle speed and vehicle direction, and first and second control means operable in response to changes in the command signal to vary the displacement of the variable displacement unit of the first and second transmissions, respectively, the steering control system comprising:
(a) means for generating a steering signal representative of the commanded steering ratio and steering direction;
(b) means for electrically sensing vehicle direction and commanded steering direction and generating an electrical switch signal having a first condition when it is necessary to modify the speed of the first transmission to achieve the desired orientation, and having a second condition when it is necessary to modify the speed of the second transmission to achieve the desired vehicle orientation;
(c) means for electrically multiplying said steering signal and the command signal to generate a speed modification signal representative of the change in speed of one of the first and second transmissions necessary to achieve the commanded steering ratio; and
(d) electrical switching means operable to transmit said speed modification signal to the first control means in response to said switch signal being in said first condition and to transmit said speed modification signal to the second control means in response to said switch signal being in said second condition.

4,175,629
ELECTRIC DRIVE UNIT FOR VEHICLES
Albert A. Kalajzich, Brooklawn, N.J., assignor to General Engines Co., Inc., Thorofare, N.J.
Filed Mar. 23, 1978, Ser. No. 889,336
Int. Cl.[2] B62D *61/02, 61/08;* **B60K** *1/00, 17/14*
U.S. Cl. 180—220 **5 Claims**



1. An electric drive unit for a vehicle having a front fork, a handlebar connected to said front fork, a front wheel rotatively mounted in said fork, and a tire mounted on said wheel, said drive unit comprising support means secured to said fork, a motor supporting bracket, means connecting said motor supporting bracket to said support means for up and down movement, an electric motor carried by the motor supporting bracket and having a drive wheel disposed over said tire, a clamp secured to the handlebar, a lever pivotally connected to the clamp for swinging movement toward and away from a part of the handlebar, a cable having a lower end connected to a part of the support means and an upper end connected to said lever and slidably engaging said clamp, said motor supporting bracket having a part slidably engaging said cable above the connection of the cable to the support means, a flexible sheath in which a part of the cable is slidably encased, said sheath being formed of a material incapable of contracting, said sheath having one end abutting said clamp and an opposite end abutting said part of the motor supporting bracket which slidably engages the cable, whereby when the lever is swung toward the handlebar for exerting a pull on the cable end connected thereto said sheath will be distorted for exerting a downward thrust on said part of the motor supporting bracket engaged thereby, for displacing said bracket downwardly to move the drive wheel into engagement with said tire, a compression spring interposed between a part of the support means and a part of said motor supporting bracket for raising the motor supporting bracket to move the drive wheel out of engagement with the tire when pressure is released from said lever and for returning the cable and sheath to their normal positions, said means connecting the motor supporting bracket to the support means including upper and lower platform members extending outwardly from said support means, means pivotally connecting the platform members to the support means for up and down swinging movement, means carried by each platform member and swivelly engaging said motor supporting bracket and forming a connection between said bracket and the support means, said last mentioned means being spaced outwardly from said platform pivots, a current source carried by said vehicle, an electric circuit connecting said motor to said source, said circuit including a normally open electric switch supported by and movable with one of said platform members and a stationary switch actuator carried by the support means for engaging and closing the switch when the motor supporting bracket is displaced downwardly.

4,175,630
MOTORIZED BICYCLE WITH REMOVABLE FUEL TANK
Seymour Fleisher, 9 Kirkbride Ter., Towaco, N.J. 07082, and Warner Rosenschein, 19 Truman Blvd., Oakland, N.J. 07436
Filed Dec. 2, 1977, Ser. No. 857,017
Int. Cl.[2] B62D *27/06;* **F02B** *77/08*
U.S. Cl. 180—225 **12 Claims**

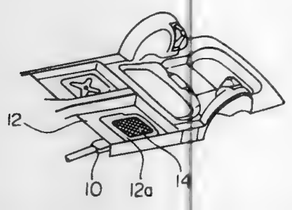


1. In combination with a motorized bicycle having a frame, a gasoline motor mounted on said frame, a drive spool rotated by said motor, and control means for selectively engaging said drive spool with a wheel of the bicycle, the improvement which comprises:
a gasoline tank which is selectively removable from said bicycle so as to render said bicycle, when removed therefrom, devoid of gasoline tanks for facilitating safe transport of same; and
housing means mounted on said frame for selectively retaining or releasing said gasoline tank and including a fuel line extending therefrom to said gasoline motor, and means for placing said fuel line in fluid communication with said gasoline tank only upon insertion of said tank into said housing means.

4,175,631
HEAT ABSORPTION MEANS OPERATIVE AT PRESCRIBED TEMPERATURE FOR SUPPRESSION OF HEAT TRANSFER FROM ABNORMALLY HEATED AUTOMOTIVE EXHAUST SYSTEM TO ARTICLE ON BOARD
Kiminori Ishii, and Katsuhiko Nishizawa, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Nov. 16, 1977, Ser. No. 851,956
Claims priority, application Japan, Dec. 28, 1976, 51-159425
Int. Cl.[2] B60R *23/00;* **B60K** *13/04*
U.S. Cl. 180—309 **5 Claims**

1. In an automobile having a body including a floor and as a component of an exhaust system an exhaust gas purifying device, in which occurs exothermic oxidation of unburned

fuel, located beneath the floor, the improvement comprising a heat absorption layer which is particularly operative at a prescribed temeperature within the range from about 100° C. to about 1200° C. and located within a space bounded on its upper and lower sides by a horizontal plane slightly above the upper surface of the floor and the outer and upper surface of the



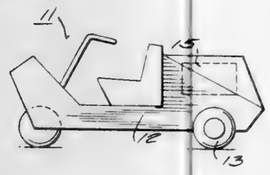
purifying device, respectively, a principal material of said heat absorption layer being a substance which absorbs a large amount of heat at a temperature which is specific to said substance and agrees with said prescribed temperature, said heat absorption layer consisting of a container made of a heat-conductive and uncombustible metal foil material and said substance packed in said container.

4,175,632

DIRECT CURRENT MOTOR DRIVEN VEHICLE WITH HYDRAULICALLY CONTROLLED VARIABLE SPEED TRANSMISSION

George G. Lassanske, 1303 Riverdale Dr., Oconomowoc, Wis. 53066

Filed Apr. 22, 1977, Ser. No. 789,797
Int. Cl.[2] B60K *25/10*
U.S. Cl. 180—65 R 9 Claims



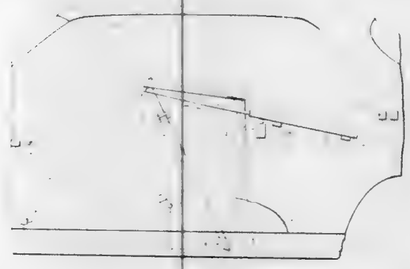
1. A vehicle comprising a frame, a drive wheel supported by said frame, a direct current motor supported by said frame, a drive train connecting said direct current motor and said drive wheel and including a variable speed "V" belt drive with a rotatably carried pulley including a non-axially movable sheave and an axially movable sheave, and means biasing said axially movable sheave away from said non-axially movable sheave, a hydraulic circuit for regulating the axial position of said axially movable sheave and including a pump driven by said motor, hydraulic cylinder piston means in communication with said pump and mechanically connected to said axially movable sheave for applying a force urging said axially movable sheave toward said non-axially movable sheave, and control means for regulating the pressure of the fluid in said hydraulic cylinder piston means to regulate the axial force applied to said axially movable sheave.

4,175,633

INSTALLATION FOR FEEDING THE LOCK TONGUE AND/OR THE BELT BAND OF A BELT SYSTEM

Rudolf Andres, Sindelfingen, and Eduard Ament, Gechingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 21, 1978, Ser. No. 888,745
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1977, 2713172
Int. Cl.[2] B60R *21/02*
U.S. Cl. 180—270 22 Claims



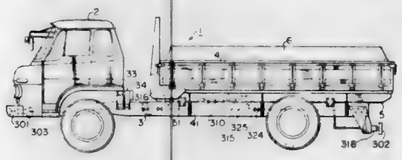
1. An installation for feeding a part of a safety belt system into a position favorable for the engagement of the belt, comprising servo-means operable after boarding of the vehicle to transfer said part from a rear position essentially allowing unimpaired access to the rear seat into a forward position accessible to the drive or co-driver, characterized in that the servo-means is operable to return said part into the rear position substantially immediately after the termination of the belt-engaging operation and after a predetermined time interval should said belt-engaging operation fail to be performed.

4,175,634

TRUCK WITH HYDRAULIC MEANS FOR ABSORBING IMPACT ENERGY

Akira Yamanaka, Yokohama, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 678,136, Apr. 19, 1976, Division of Ser. No. 506,796, Sep. 17, 1974, Pat. No. 3,993,352. This application Feb. 21, 1978, Ser. No. 879,453
Int. Cl.[2] B62D *27/06*
U.S. Cl. 180—274 7 Claims



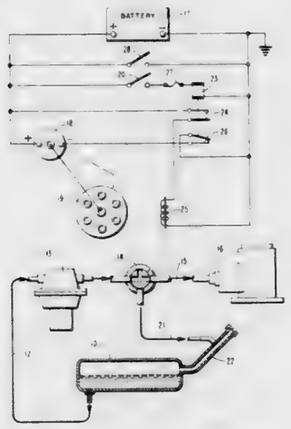
1. A truck, comprising:
a truck frame structure,
a cab for the driver mounted on said frame structure,
a load carrier structure mounted on said frame structure for frictional sliding movement longitudinally of said frame structure when a longitudinal impact exceeding a predetermined value is imposed on said frame structure,
a first hydraulic unit connected between said frame structure and said carrier structure and comprising a cylinder extending longitudinally of said structure and a piston slidable in said cylinder and fixed to the other of said structures,
a first bumper at the front of said frame structure and means mounting said front bumper comprising a second hydraulic unit comprising a cylinder fixed to said frame structure and a piston slidable in said cylinder and fixed to said front bumper,
a rear bumper at the rear of said frame structure and means mounting said rear bumper comprising a third hydraulic unit comprising a cylinder fixed to said frame structure and a piston slidable in said cylinder and fixed to said rear bumper,
conduit means connecting the cylinder of said second hydraulic unit with the cylinder of said first hydraulic unit to transmit fluid pressure from said second hydraulic unit to said first hydraulic unit in a direction to move said carrier structure rearwardly of said frame structure in the event of an impact on said front bumper, and
conduit means connecting the cylinder of said third hydraulic unit with the cylinder of said first hydraulic unit to transmit fluid pressure from said third hydraulic unit in a direction to move said carrier structure forwardly of said frame structure in the event of an impact on said rear bumper.

4,175,635

ANTI-THEFT DEVICE FOR INTERNAL COMBUSTION ENGINE OF A MOTOR VEHICLE

James Thomas, R.D. 5, Box 31A, Dover, Del. 19901

Filed Jul. 6, 1978, Ser. No. 922,486
Int. Cl.[2] B60R *25/04*
U.S. Cl. 180—287 1 Claim



1. An anti-theft device for an internal combustion engine of a motor vehicle comprising, in combination,
a fuel tank,
a fuel pump,
a carburetor,
a three-way solenoid valve,
an ignition circuit including an ignition coil and a distributor, and
a return fuel line located between said fuel tank and said three-way solenoid valve, said three-way solenoid valve being connected between said fuel pump and said carburetor and activated by a switch known to the operator and independent of the normal ignition system in said motor vehicle, said three-way solenoid valve upon activation causing stoppage of the flow of gasoline from said fuel pump to said carburetor and at the same time causing diversion of gasoline back to said gas tank, activation of said switch also breaking the circuit between said ignition coil and said distributor.

4,175,636

HEAVY LIFT AIR CUSHION AMPHIBIOUS VEHICLE

Jacksel M. Broughton, 4096 Bonita View Dr., Bonita, Calif. 92002

Filed Jan. 27, 1978, Ser. No. 873,015
Int. Cl.[2] B60V *1/00*
U.S. Cl. 180—119 26 Claims



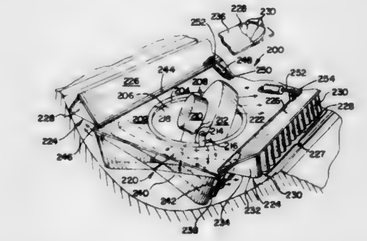
1. An air cushion vehicle operable over land, water and ice separately and in combination, and including; an elongated hull of rectangular configuration having a flat bottom extending from side to side and from bow to stern, a perimeter skirt coextensive of the hull sides bow and stern and comprised of air inflated cylinders in continuous abutted end to end engagement attached tangentially to marginal edges of the hull bottom, inboard curtains extending diagonally outward from the hull bottom and tangentially to the skirt cylinders to restrain the same, ducted fan lift means discharging vertically through the hull and from the bottom thereof and into a plenum defined by the perimeter skirt cylinders and restraining curtains, propeller propulsion means thrusting longitudinally of the hull, and steering means operable to laterally deflect the thrust of the propulsion means.

4,175,637

SURFACE EFFECT VEHICLES AND GUIDEWAYS THEREFOR

William R. Bertelsen, 2720 31st Ave., Rock Island, Ill. 61201

Division of Ser. No. 321,948, Jan. 8, 1973, Pat. No. 3,845,716, which is a continuation-in-part of Ser. No. 871,765, Jul. 31, 1970, Pat. No. 3,712,406, which is a continuation-in-part of Ser. No. 633,357, Apr. 21, 1967, which is a continuation-in-part of Ser. No. 731,001, Apr. 25, 1958, abandoned. This application Nov. 4, 1974, Ser. No. 520,795
Int. Cl.[2] B60V *1/16*
U.S. Cl. 180—128 6 Claims



1. An improved air cushion vehicle comprising, in combination, means including an upper deck and a skirt depending from the peripheral edge of said deck and arranged so as to define the periphery of a primary air support plenum beneath said deck for supporting said vehicle above a surface, and means forming at least one secondary plenum lying laterally of said primary plenum, said secondary plenum being at least partially defined by a secondary plenum skirt depending from rigid means hingedly mounted with respect to said upper deck, means for supplying a volume of air under pressure to said primary plenum, with bleed air openings being provided in said skirt defining said primary plenum, so as to permit said air under pressure to flow from said primary plenum into said

secondary plenum, said primary plenum being of a size relative to said secondary plenum so that said vehicle may be supported above said surface entirely by said primary plenum alone, with said secondary plenum being swingable outwardly and upwardly to a position for cooperation with a supporting surface when said supporting surface is in the form of a track having an upwardly and outwardly curved surface portion.

4,175,638

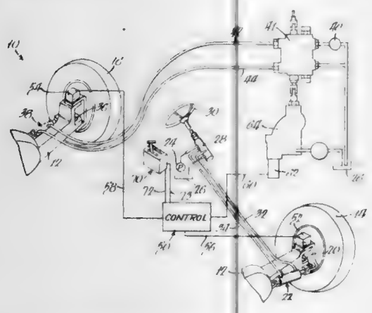
ELECTRONICALLY CONTROLLED FOUR-WHEEL STEERING

Robert F. Christensen, Racine, Wis., assignor to J. I. Case Company, Racine, Wis.

Continuation-in-part of Ser. No. 941,186, Sep. 11, 1978, abandoned, which is a continuation of Ser. No. 844,509, Oct. 21, 1977, abandoned. This application Dec. 4, 1978, Ser. No. 965,855

Int. Cl.[2] B62D 5/08

U.S. Cl. 180—140 **19 Claims**



17. A steering system for a vehicle including front and rear pairs of wheels with first means for simultaneously controlling the turning movement of said front wheels, second means for simultaneously controlling the turning movement of said rear wheels, first sensing means producing a first signal which is a function of the angular position of said front wheels, second sensing means producing a signal which is a function of the angular position of said rear wheels, control means receiving said signals, said control means including switch means movable to define a plurality of positions for selecting a plurality of modes of controlling the turning movement of said rear wheels in response to turning movement of said front wheels and a rear steering mode where said rear wheels are controlled independent of said front wheels, and control means for actuating said switch means, the improvement of said control means including a fixed support with said switch means secured to said support, a selector member mounted for rotation between extreme positions on said support and connected to said switch means to move said switch means to said plurality of positions, signal producing means on said support and connected to said control means for introducing a control signal to said control means to produce independent turning movement of said rear wheels, said signal producing means including a switch actuator for varying said control signal to turn said rear wheels independently of said front wheels, and safety limiting means normally preventing said selector member from being rotated from one extreme position to the other extreme position.

4,175,639

NOISE BARRIER

Leslie S. Wirt, Newhall, Calif., assignor to Lockheed Corporation, Burbank, Calif.

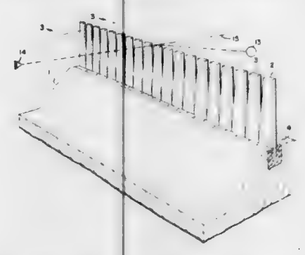
Filed Nov. 16, 1976, Ser. No. 742,404

Int. Cl.[2] G10K 11/00; B64F 1/26; E10F 15/00

U.S. Cl. 181—210 **7 Claims**

1. An acoustical barrier for interposition between a noise source and a noise receiver located within the acoustical shadow zone of the barrier, comprising:

a barrier member having an acoustically opaque base portion and having contiguous therewith an upwardly extending transition portion comprising a plurality of identical spaced apart elements each of which has an effective surface area which continuously decreases in said upwardly extending direction whereby the sound transmissibility between said elements follows a gradient and the sound transmitted between said elements tends to apply a phase opposition to the sound arriving at the noise receiver by diffraction around the acoustical barrier through a region outside said shadow zone and thereby effectively redirect such diffracted sound away from said noise receiver.



4,175,640

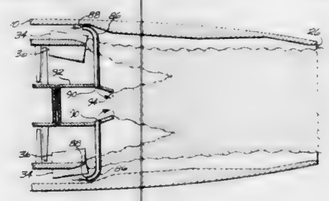
VORTEX GENERATORS FOR INTERNAL MIXING IN A TURBOFAN ENGINE

Stanley F. Birch, Bellevue; John A. Lawler, and Gerald C. Paynter, both of Seattle, all of Wash., assignors to Boeing Commercial Airplane Company, Seattle, Wash.

Continuation-in-part of Ser. No. 563,548, Mar. 31, 1975. This application Dec. 23, 1976, Ser. No. 754,046

Int. Cl.[2] E04B 1/99; G10K 11/04

U.S. Cl. 181—213 **14 Claims**



1. In a turbofan engine having an annular fan fluid flow exhaust passageway located between an outer engine cowling and a splitter wall structure, and an annular primary fluid flow exhaust passageway located inside of said splitter wall structure, apparatus for internal mixing of fan exhaust with primary exhaust forward of the nozzle exit plane of said engine comprising:

a vortex generator attached to said splitter wall structure at least one nozzle diameter forward of said nozzle exit plane and extending radially into one of said annular passageways a distance of at least 30% of the width of the passageway, and mounted to have an angle of attack with respect to the local flow direction ranging from 5° to 25°.

4,175,641

STEP LADDER LEG SUPPORT

George Q. Reyes, 154 Farrell Dr., San Antonio, Tex. 78227

Filed Jan. 20, 1978, Ser. No. 871,033

Int. Cl.[2] E06C 1/22

U.S. Cl. 182—172 **2 Claims**



1. In a stepladder support load equalizing means, pivotal members extending laterally therefrom, means for vertically adjusting the pivotal members individually to maintain the stepladder secure, pivotal feet horizontally mounted on the extended end of said members, collars mounted on the upper portion of the stepladder and the pivotal members extending from said collars and an equalizing bar mounted on the upper portion of said stepladder and extending through said collar.

4,175,642

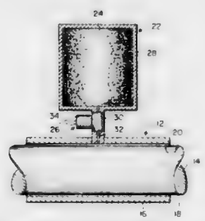
PASSIVE LUBRICATION METHOD AND SYSTEM

Maurice P. Bianchi, Palos Verdes Estates, and Louis A. Rosales, Manhattan Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jan. 13, 1978, Ser. No. 869,341

Int. Cl.[2] F16N 7/12

U.S. Cl. 184—1 E **15 Claims**



14. The method of lubricating surfaces, comprising the steps of:

containing lubricating oil with an oil receptacle comprising a porous oleophobic body containing a myriad of capillary pores impregnated with said oil, and

communicating said receptacle to said surfaces to effect transfer of oil from said receptacle to said surfaces by capillary expulsion of oil from the pores in said body to said surfaces.

4,175,643

LUBRICATING SYSTEM FOR POWER TRANSMITTING APPARATUS

David K. Jenkins, Lathrup Village, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Dec. 11, 1975, Ser. No. 639,931

Int. Cl.[2] F16N 7/36

U.S. Cl. 184—11 A **1 Claim**

1. A lubricating system for a forward bearing and a rear bearing of a shaft in an interaxle differential assembly, said interaxle differential assembly being of the type which includes a housing having a liquid lubricant sump therein and a number of elements thereof capable of rotating within said housing to splash said liquid lubricant about the interior of said housing, said lubricating system comprising:

a first supply port and a second supply port through said housing respectively aligned with said forward bearing and said rear bearing capable of supplying liquid lubricant thereto by gravity flow;

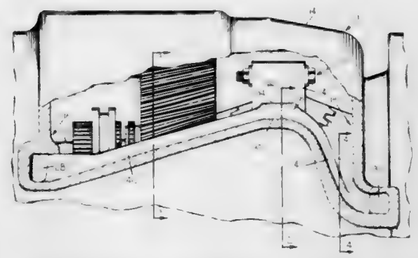
an interaxle differential housing having a casing and being mounted on said shaft between said bearings for rotation therewith, said casing having an outer surface thereon coaxially aligned with said shaft;

means for removing said liquid lubricant from said outer surface during rotation of said shaft, said means for removing said liquid lubricant from said outer surface being an oil scraping device which is formed integrally with said housing and extends rigidly from an interior surface thereof toward said outer surface in close proximity thereto;

a first open channel extending forwardly and downwardly of said oil scraping device to said first supply port for gravity transfer of said liquid lubricant thereto;

a second open channel extending rearwardly and downwardly of said oil scraping device to said second supply port for gravity transfer of said liquid lubricant thereto; and

said first channel and said second channel being formed integrally with said housing and extending rigidly from said interior surface thereof.



4,175,644

SCISSORS LIFT

Bert J. Sikli, Venice, Calif., assignor to Robert Staines, Paramount, Calif.

Continuation-in-part of Ser. No. 542,508, Jan. 20, 1975, Pat. No. 3,983,960, which is a continuation-in-part of Ser. No. 406,260, Oct. 15, 1973, abandoned. This application Jul. 7, 1975, Ser. No. 593,637

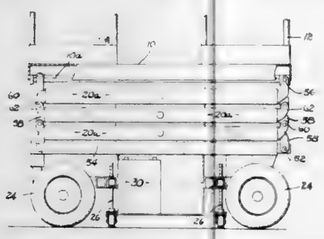
The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.

Int. Cl.[2] B66B 11/04; E04G 1/22

U.S. Cl. 187—18 **19 Claims**

7. A load lifting scissors lift assembly comprising a lower frame, an upper platform, a lower tier and a next adjacent upper tier of vertically-extensible parallel scissors-type linkages interposed between said lower frame and said upper platform, each of the linkages in said tiers being comprised of a first lever arm and a second lever arm which form the linkages of each tier, and each of said arms having longitudinal centerlines passing through the longitudinal axis of each of said arms and being equidistant between upper and lower surfaces on each of said arms, coupling means for pivotally coupling the end of a first arm of a lower tier to the associated end of a second arm of the next upper tier, said coupling means comprising an upwardly located first ear-shaped bracket member mounted at

the end of the first arm of the lower tier, said coupling means also comprising a downwardly located second ear-shaped bracket member mounted at the end of the second arm of the next upper tier, said first bracket member having an aperture located above the upper surface of said first arm to which said bracket is mounted, said second bracket member having an aperture alignable with the aperture in said first bracket and being located below the lower surface of said second arm to which said bracket is mounted such that the apertures are substantially equidistantly spaced from the centerlines of the arms in the brackets mounted to said arms, a pivot pin located in said aligned apertures and being located above the lower surface of said last-named second arm and above the upper surface of said last-named first arm and being substantially



equidistantly spaced from the centerlines of the two arms which are so pivotally coupled to displace the pivot axis of the adjacent pairs of arms away from the longitudinal axis of the respective arms to permit the linkages to be collapsed to a position in which the arms of each pair lie in juxtaposed relationship to the arms of the next lowermost pair, an essentially vertically positioned extensible drive unit, at least one first transverse cross-bar connected to the first arms of each of said tiers of said linkages, at least one second transverse cross-bar connected to second arms of each of said tiers of said linkages, first connection means pivotally connecting a first cross-bar of one of said tiers to said drive unit, and second connection means pivotally connecting a second cross-bar of another of said tiers to said drive unit.

4,175,645

ELECTRICALLY RESETTABLE RAILWAY BRAKE

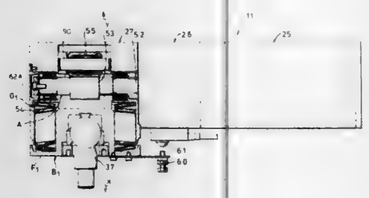
Franz Brinkert, Duisburg, Fed. Rep. of Germany, assignor to Raco-Elektro-Maschinen GmbH, Schwelm, Fed. Rep. of Germany

Filed Mar. 7, 1978, Ser. No. 884,158

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1977, 2710585

Int. Cl.² F16D *63/22*

U.S. Cl. 188—72.1 **24 Claims**



1. A brake comprising:
a drive motor having a rotary motor output;
a free-running transmission having a rotary transmission input connected to said motor output and a rotary transmission output, said transmission operating at a relatively high transmission ratio such that said transmission input rotates at a speed many times greater than said transmission output;
an eccentric mounted on said transmission output for rotation therewith about the axis thereof;
a follower operatively radially engageable with said eccentric and radially displaceable thereby in a predetermined radial direction on rotation of said eccentric about said axis;
an abutment spaced a fixed distance in said direction from said axis;
at least one spring operatively engaged between said abutment and said follower and compressible thereby;
a braking member displaceable transverse to said direction adjacent said follower; and
a braking body connected to said follower and engageable in said direction with said member on radial displacement of said follower in said direction away from said axis.

4,175,646

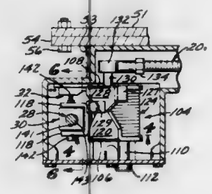
ELECTRIC PARKING BRAKE

Bruce H. Eikelberger, 2396 California Ave., Long Beach, Calif. 90806

Filed May 3, 1978, Ser. No. 902,348

Int. Cl.² F16D *65/36*

U.S. Cl. 188—156 **7 Claims**



3. A parking brake for a vehicle employing an electrical power producing system and a hydraulic brake system including a hydraulic brake cylinder comprising:
a housing immobilized with respect to the vehicle frame and coupled to a said brake cylinder,
a ram positioned for reciprocal movement relative to said brake cylinder to alternatively increase and decrease hydraulic pressure in said cylinder,
an electric motor electrically connected to said electrical power producing system and mechanically linked to drive said ram in alternative directions of movement,
limit switches associated with said motor to break the electrical connection therefrom to said electrical power producing system upon rotation of said motor to limits in opposite directions of rotation,
an actuating switch for initially completing connection of said electric motor to said electrical power producing system to initiate actuation of said electric motor for rotation in a selected direction, and
a spring loaded accumulator interposed between said electric motor and said ram to compensate for variations in hydraulic volume within said parking brake cylinder.

4,175,647

HYDRODYNAMIC RETARDER FOR VEHICLES, ESPECIALLY FOR MOTOR VEHICLES

Hans Hanke, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

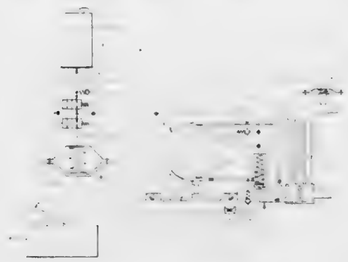
Filed Mar. 13, 1978, Ser. No. 886,120

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1977, 2710927

Int. Cl.² F16D *57/04, 65/78*

U.S. Cl. 188—274 **14 Claims**

1. A hydrodynamic retarder for vehicles, the retarder comprising at least one rotating and at least one stationary blade wheel disposed in a working space means of the retarder, an internal working circulatory system for supplying working fluid to the working space means, an external cooling circulatory system operatively connected to the internal working circulatory system, line means for filling and discharging the cooling circulatory system to and from a filling means, a control valve means for interrupting a flow of the external cooling circulatory system, lubricating line means for operatively connecting sealing spaces at a shaft of the retarder a center of the working space means and also with a control member of the control valve means, and with a fluid reservoir tank, a closure



valve means for operatively connecting the reservoir tank with the filling and discharge line means, characterized in that a first check valve means opening in a direction toward the working space means is arranged in a connection portion of the lubricating line means to the center of the working space means, a further line means independent of the lubricating line means for connecting an inlet of the retarder with the reservoir tank, a second check valve means is arranged in the further line means for venting the retarder to the reservoir tank, said second check valve means opening in a direction toward the retarder inlet, and in that a throttle means is arranged in the further line means upstream of the second check valve means for controlling a flow through the second check valve means.

for displacing the first brake shoe to said operative position when the brake handle means is displaced; restoring means for returning said first brake shoe to said inoperative position when the brake handle means is released; said operation means comprising a first hydraulically actuatable pressure member operatively coupled to said first brake shoe for displacing the first brake shoe to said operative position, a hydraulic cylinder operatively coupled to said brake handle means for being actuated thereby, and hydraulic circuit means connecting said hydraulic cylinder and said first hydraulically actuatable pressure member for pressurizing said first hydraulically actuatable pressure member when the hydraulic cylinder is actuated by the brake handle means, each of said first pressure member and hydraulic cylinder comprising a bellows member having variable volume thereof, the bellows members of said first pressure member and said hydraulic cylinders having interior volumes connected by said hydraulic circuit means and being filled with hydraulic brake fluid, each said bellows member comprising a plurality of interconnected annular elements displaceable with respect to one another and constituting a liquid-tight wall, an inner sealing lining within said wall forming said interior volume and a restoring spring coaxially arranged within said inner sealing lining, said handle means comprising a handle portion pivotable between an operative position and an inoperative position, an adjustable shaft operatively connected to said handle portion and movable thereby into an engaging position, said hydraulic cylinder including an axial pin extending therefrom in axial alignment with said adjustable shaft for undergoing axial displacement when said handle portion moves from the inoperative to the operative position for compressing said bellows member of the hydraulic cylinder and concurrent expansion of the bellows member of the first pressure member, said spring within each said bellows member opposing deformation thereof and returning the respective bellows member to initial state with the handle released and returned to inoperative position.

4,175,648

DEVICE FOR THE BRAKING OF BICYCLES

Sandor Sule, Steigstrasse 77, CH 8200 Schaffhausen, Switzerland

Filed Oct. 20, 1977, Ser. No. 844,042

Int. Cl.² B62L *1/10, 3/02*

U.S. Cl. 188—344 **2 Claims**



1. Bicycle braking apparatus comprising: a first brake shoe positioned adjacent a wheel of the bicycle and displaceable between an inoperative position spaced from the wheel and an operative position in which the first brake shoe contacts the wheel and applies braking force thereto; movable brake handle means mounted on a portion of the bicycle; operation means connecting said brake handle means and said first brake shoe

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4,175,649

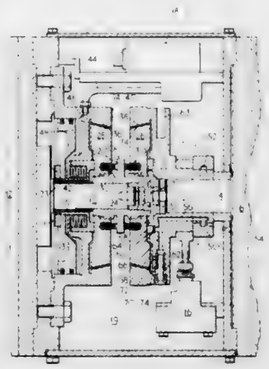
CONVEYOR DRIVES

Harry Monks, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

Continuation of Ser. No. 350,785, Apr. 13, 1973, abandoned. This application Mar. 24, 1975, Ser. No. 561,291

Int. Cl.² F16D *67/04*

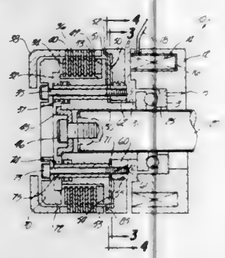
U.S. Cl. 192—18 A **12 Claims**



1. A drive mechanism for a conveyor, comprising:
(a) a driving stage;
(b) a motor for driving said driving stage;
(c) a driven stage to drive the conveyor;
(d) a clutch for drivably engaging said driving stage to said

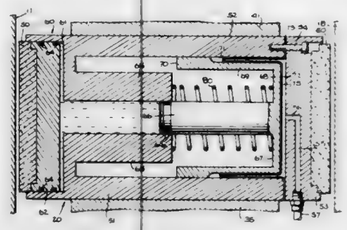
driven stage, said clutch being biased to disengage said driving and driven stages;
(e) a brake biased to contact said driven stage to brake the conveyor; and
(f) means to prevent said motor from starting under load of the conveyor, including a pump connected to and driven by said driving stage for pumping fluid under pressure, and control means connected to said pump to deliver the fluid to said brake and said clutch to control said brake and said clutch, said control means including means to enable the fluid pressure to increase to release said brake from said driven stage before said clutch engages said driving stage with said driven stage after said motor has started and is running at substantially full speed.

4,175,650
SELF-ADJUSTING ELECTROMAGNETIC DISC CLUTCH
Donald L. Miller, Horseheads, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.
Filed Mar. 11, 1977, Ser. No. 776,676
Int. Cl.[2] F16D *13/75, 27/10*
U.S. Cl. 192—84 C **7 Claims**



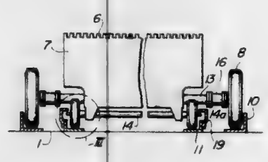
1. An electromagnetic friction device for transmitting torque comprising:
input means;
output means coaxially disposed with said input means;
means for driving said output means, said driving means translating torque from said input means to said output means, said driving means further comprising:
an inner body member coaxially disposed with said input means for rotating therewith;
means for frictionally engaging said inner body member with said output means;
bearing means mounted coaxial with and adjacent to said inner body member;
electromagnetic means for actuating said friction device;
an armature member disposed adjacent said electromagnetic means and coaxially mounted with said inner body member whereby when said electromagnetic means is energized a circuitous flux path is formed between said electromagnetic means and said armature member;
first means for biasing said frictional engaging means, said biasing means comprising:
an annular ring member disposed coaxially with said armature member and said inner body member;
a pressure plate member, said plate member having one end disposed adjacent said annular ring member and an opposite end disposed adjacent said frictional engaging means;
second means for biasing disposed between said inner body member and said opposite end of said plate member;
an annular retarder member coaxially disposed with said armature member, said retarder member further communicating with said one end of said plate member for axial but nonrotatable movement with respect to said pressure plate member;
means for mounting said annular ring member to said one end of said pressure plate member; and
means for engaging said opposite end of said pressure plate member with said frictional means.

4,175,651
AIR/MERCURY ACTUATION OF BRAKES AND CLUTCHES
Edwin J. Montalvo, Sr., 1375 Forest Ave., Portland, Me. 04103
Filed Mar. 28, 1977, Ser. No. 782,234
Int. Cl.[2] F16D *25/04*
U.S. Cl. 192—85 AB **20 Claims**



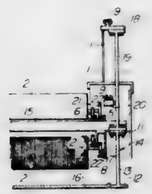
1. A mechanism for selectively frictionally coupling two relatively rotatable bodies comprising two parallel friction plates connected to a first one of said bodies transverse to the axis of rotation of said first body, the second of said bodies carrying an expandible piston and cylinder means mounted between said friction plates for engagement of friction members carried by said piston and cylinder means with said friction plates upon expansion of said piston and cylinder means, said piston and cylinder means being mounted to float in a cylinder carrying member on said second body for applying equal force against both said friction plates upon expansion of said piston and cylinder means, said piston and cylinder means having a seepage resistant hydraulic medium within a cylinder chamber.

4,175,652
ESCALATOR WITH STEP LEVELERS
Yoshihiko Satou, and Katsuya Teranishi, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan
Filed Dec. 23, 1976, Ser. No. 753,886
Claims priority, application Japan, Dec. 29, 1975, 50-155987
Int. Cl.[2] B66B *9/12*
U.S. Cl. 198—/332 **9 Claims**



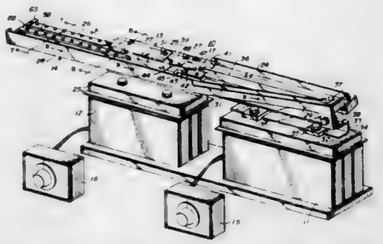
1. An escalator comprising:
steps connected with each other in an endless fashion;
front wheels and rear wheels rotatably supported by each of said steps through a front shaft and a rear shaft, respectively;
a first pair of guide rails on which said front wheels roll, and a second pair of guide rails on which said rear wheels roll;
projections extending coaxially outwardly from the ends of said rear shaft; and
a pair of upthrust rails disposed in a juxtaposed relation to said projections and adapted to engage with said projections, upon the upward pivotal movement of the step, to prevent the further upward pivotal movement of the step,
wherein each of said second pair of guide rails includes a horizontal section defining a rolling surface for said rear wheel, and a vertical section on the edge of said horizontal section at the side where said projection is located, and wherein each of said pair of upthrust rails includes a horizontal section disposed above said projection, and wherein a clearance between the tip of the projection and the vertical section of said upthrust rail and a clearance between the rear wheel and the edge of the horizontal section of said upthrust rail are greater than that between the rear wheel and the vertical section of said second guide rail, whereby damage to said projection and upthrust rail can be prevented upon lateral shifting of said steps.

4,175,653
MAN CONVEYOR
Masayuki Kubota, Nakaminato, and Masamitu Hanano, Katsuta, both of Japan, assignors to Hitachi, Ltd., Japan
Filed Oct. 25, 1977, Ser. No. 844,990
Claims priority, application Japan, Oct. 29, 1976, 51-129467
Int. Cl.[2] B66B *9/14*
U.S. Cl. 198—332 **6 Claims**



1. A man conveyor comprising:
a plurality of steps linked in an endless belt and each having front and rear wheels mounted on both lateral sides thereof;
a plurality of balustrades located on both sides of said plurality of steps in an adjacent relationship thereto;
a pair of guide members each mounted on one of said pair of balustrades, each said guide members having an upper end of said balustrade connected to the underside thereof in a position above and laterally near said plurality of steps;
a pair of endless handrails each guided by one of said pair of guide members for movement in the same direction and the same speed as said plurality of steps;
a pair of main frame members each in the form of an I-beam located on either side of said plurality of steps, each of said pair of main frame members being disposed below one of said pair of balustrades as an entity separate from said balustrade and consisting of a horizontal upper edge portion including a horizontal surface, a horizontal lower edge portion including a horizontal surface and a vertical portion interposed between said upper and lower horizontal edge portions and formed integrally therewith;
upper and lower connecting members interconnecting said upper horizontal edge portions of said plurality of main frame members on both sides of the plurality of steps and said lower horizontal edge portions thereof respectively, said upper and lower connecting members and said plurality of main frame members being arranged in a manner to form a box-shaped cross section;
a plurality of guide rails mounted on upper and lower surfaces of said upper connecting members for guiding said front and rear wheels of said plurality of steps during the travel of said steps between a passenger boarding area and a passenger alighting area of the main conveyor in both normal and reverse directions; and
a plurality of struts each rigidly secured at an upper end thereof to the underside of one of said pair of guide members in a position laterally spaced from the position in which one of said pair of balustrades is connected to said guide member and secured at a lower end thereof to the horizontal upper edge portion of each said main frame members upon said horizontal surface.

4,175,654
VIBRATORY FEEDER SYSTEM AND MECHANISM
Maurice H. Lodge, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 21, 1977, Ser. No. 844,342
Int. Cl.[2] B65G *47/24*
U.S. Cl. 198—398 **6 Claims**



1. A vibratory feeder system for orienting and feeding devices which have two parallel sides out of one side of which there projects one centrally disposed terminal and out of the other side of which there project two symmetrically disposed terminals, the ends of each of said terminals extending away from the adjacent major surface of said device comprising,
a vibratory feeder track for advancing oriented devices thereon,
inventory means connected to said feeder track,
groove means on said track in line with said feed direction for being engaged by said terminals,
said feeder track having an angularly downwardly disposed feeder surface for gravity assist in device orientation and rejection of upside down and other misoriented devices,
lead-in means disposed on said angular surface and having an angular edge sloping downwardly in the direction of device travel for enabling the preponderance of devices which are engaged by said groove, to be engaged by said one terminal, rejecting means having an edge disposed adjacent said groove for rejecting devices whose terminals are in said groove and the devices are upwardly disposed,
slot means beyond said rejecting means and whose lower edge is adjacent said groove for receiving and recycling devices not rejected by said rejecting means,
lead-out means terminating said groove for disposing devices on said angle surface,
first rail means having a ledge for retaining devices on said angle surface following said lead out means, and
second rail means disposed away from the ledge of said first rail means to form a path for receiving oriented devices.

4,175,655
PANEL TURNER
Arthur M. Baldwin, Cordova, S.C., assignor to Champion International Corporation, Stamford, Conn.
Filed Mar. 29, 1978, Ser. No. 891,066
Int. Cl.[2] B65G *47/24*
U.S. Cl. 198—403 **12 Claims**

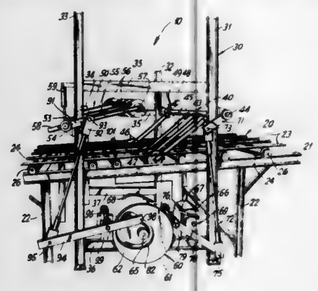
1. An apparatus for inverting a panel member comprising: a conveyor for transporting the panel in a horizontal direction, said conveyor including a plurality of spaced apart substantially parallel endless belts;

a frame member including first and second pairs of opposed uprights disposed above the conveyor and enclosing said conveyor;

a panel raising mechanism for engaging the leading edge of the panel as the panel moves along the conveyor, said panel raising mechanism including a transverse bar rotatably mounted above the conveyor on the second pair of opposed frame uprights, a plurality of spaced apart extension members rigidly connected to said transverse bar, and roller means rotatably connected to the free end of each of said extension members, said roller means being spaced apart from each other such that each of said roller means can fit in the space between the adjacent conveyor belts;

means separate from the panel for pivoting said panel raising rollers about their respective transverse bar above and below the conveyor comprising;

a cam plate rotatably mounted on a shaft connected to the frame, said shaft being connected to a driving motor, one surface of said cam plate having a cam surface, said means further including a link member rigidly connected at one end to the panel raising transverse bar, the other end of said link member being pivotally connected to an extension lever, a cam lever pivotally connected at one end to the other end of said extension lever, the other end of said cam lever including a cam follower, said cam follower engaging the cam surface of the cam plate such that as the cam plate rotates the cam follower transverses the path of the cam surface and imparts a pivoting motion to the panel



raising mechanism through the cam lever, the extension lever, and the link member connected thereto;

a panel lowering mechanism for engaging the leading edge of the panel after the panel has been raised past the vertical, said panel lowering mechanism including a transverse bar rotatably mounted above the conveyor on the first pair of opposed frame uprights, a plurality of spaced apart extension members rigidly connected to said transverse bar, and roller means rotatably connected to the free end of each extension member, said roller means being spaced apart from each other such that each can fit in the space between adjacent conveyor belts, said panel lowering mechanism being disposed opposite said panel raising mechanism such that the extension members of said mechanisms extend towards each other;

means separate from the panel for pivoting said panel lowering rollers about their respective transverse bar above and below the conveyor;

means responsive to the presence of the panel for actuating said apparatus; and

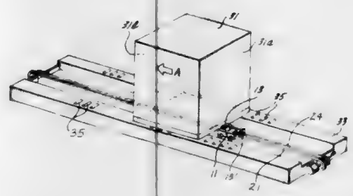
a means separate from said panel for coordinating said panel raising and lowering mechanisms such that when the leading edge of the panel first engages the panel raising mechanism the rollers of said panel raising mechanism are disposed below the conveyor and the rollers of the panel lowering mechanism are disposed above the conveyor, and such that when the panel raising mechanism has raised the panel to a vertical position the rollers of both the panel raising and panel lowering mechanisms are disposed above the conveyor, and such that when the panel lowering mechanism deposits the leading edge of the panel back onto the conveyor the rollers of said panel lowering mechanism are disposed below the conveyor while the panel raising rollers are disposed above the conveyor.

4,175,656

TRACK MOUNTED CARGO SHUTTLE

John M. Lang, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 27, 1977, Ser. No. 864,734
Int. Cl.[2] B65G *25/04*
U.S. Cl. 198—748 **9 Claims**



1. An apparatus for transporting cargo over a load-bearing surface comprising:

track means extending along the path of travel of the cargo;

a shuttle carriage including a frame, said carriage being supported by and positioned for movement along said track means;

first and second cargo engaging pawls;

first and second rocker arms, each of said rocker arms having first and second ends;

first means for mounting said first pawl on said first end of said first rocker arm for rotation of said first pawl between an erect position and a reclined position;

second means for mounting said second pawl on said first end of said second rocker arm for rotation of said second pawl between an erect position and a reclined position;

biasing means associated with said first and second pawls for biasing said first and second pawls into said erect positions;

third means for pivotally attaching said second end of said first rocker arm to said frame for movement of said first rocker arm and said first pawl between an extended position in which said first pawl extends beyond said frame for engagement with said cargo and a nested position in which said first pawl lies substantially within said frame;

fourth means for pivotally attaching said second end of said second rocker arm to said frame for movement of said second rocker arm and said second pawl between an extended position in which said second pawl extends beyond said frame for engagement with said cargo and a nested position in which said second pawl lies substantially within said frame;

control means disposed within said track means for controlling the position of said pawl; and,

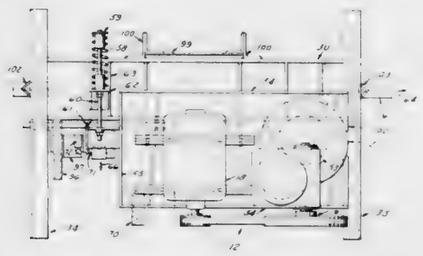
a scissors linkage means associated with said control means and said first and second rocker arms, said scissors linkage means being operable by movement of said control means along the path of the cargo relative to said frame to place said first pawl in said extended position when said second pawl is in said nested position and to place said second pawl in said extended position when said first pawl is in said nested position.

4,175,657

DRIVE UNIT FOR A CONVEYOR CHAIN

Clarence A. Dehne, Farmington Hills, and Martin Pachuta, Troy, both of Mich., assignors to Jervis B. Webb Company, Farmington Hills, Mich.

Filed Jan. 13, 1978, Ser. No. 869,218
Int. Cl.[2] B65G *23/14*
U.S. Cl. 198—833 **10 Claims**



1. In a drive unit for propelling a conveyor chain along a path defined by a conveyor track, said drive unit including a fixed frame and drive means supported thereby for engaging the conveyor chain; a reducer having an output shaft connected to the drive means, an input shaft, and a housing; a motor drivingly connected to the input shaft; and means supporting the motor and reducer for resiliently opposed pivotal movement about the axis of the reducer output shaft in response to torque thereon; the improvement wherein:

said means supporting the motor and reducer comprises bearing means carried by the fixed frame for supporting the reducer housing by the reducer output shaft with the housing spaced from the fixed frame;

a movable frame attached to and supported by the reducer housing, said movable frame forming a cantilever arm which extends in radial relation to the axis of the reducer output shaft and which pivots about said axis with the reducer housing in response to torque on the reducer output shaft; and,

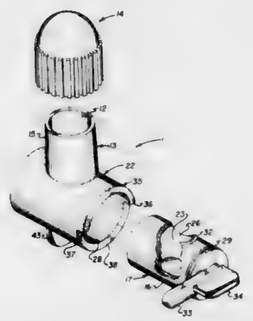
means for mounting the motor on said movable frame.

4,175,658

DISPOSABLE DENTAL AMALGAM CAPSULE

Billy G. Moser, 1673 Park Vista Dr., and Otto (Bo) Suter, Jr., 1662 Park Vista Dr., both of Chico, Calif. 95926

Filed Feb. 8, 1979, Ser. No. 10,413
Int. Cl.[2] B65D *25/08*
U.S. Cl. 206—221 **4 Claims**



1. A capsular container for storing separate ingredients subsequently to be mixed together within the container, said container comprising:

a. a longitudinal hollow cylinder defining a storage and mixing chamber, said cylinder being open at both ends;

b. a transverse cylinder, intersecting at right angles and in communication with one open end of said longitudinal cylinder, said transverse cylinder being closed at one end and open at the other end;

c. a rotary cylinder including a mercury storage compartment, said rotary cylinder being inserted within said transverse cylinder through said other end, said mercury storage compartment being capable of interfacing with the inner wall of said transverse cylinder in a first angular position of said transverse cylinder and interfacing the open end of said longitudinal cylinder in a second angular position of said transverse cylinder; and,

d. a removable cup-shaped cap, capable of sealing the open end of said longitudinal cylinder opposite the end intersecting and in communication with said transverse cylinder.

4,175,659

CLEANING KIT

Richard C. Horian, 1740 Strickland Dr., Bloomfield Hills, Mich. 48013; James Horian, 7340 Indiana, Dearborn, Mich. 48126, and Robert Horian, 5721 Culpepper Ct., W. Bloomfield, Mich. 48033

Filed Jun. 15, 1978, Ser. No. 916,031
Int. Cl.[2] B65D *85/00*
U.S. Cl. 206—223 **7 Claims**



1. A cleaning kit comprising: a rectangularly shaped receptacle including a base member and a cover movable between closed and open positions with respect to said base member; cleaning tools received within the receptacle for storage when the cover is in the closed position; each tool having an elongated handle including oppositely facing recesses; and a tool rack including a pair of projections for securing each tool by an interference fit with the tool handle within its oppositely facing recesses such that the tools are accessible for removal and use when the cover is moved to the open position.

7. A method for providing cleaning tool storage along with boxes for magnetic tape cassettes playable on sound reproducing equipment that can be cleaned by the tools, the method comprising: providing a rectangularly shaped receptacle that is openable and has a length of about 4 and 5/16 inches, a width of about 2 and ¾ inches, and a height of about 11/16 inches whereby the receptacle can be conveniently stored along with or in the space normally provided for tape cassette boxes of a conventional size; and inserting cleaning tools within the opened receptacle for storage upon subsequent closing of the receptacle such that the tools are accessible for removal and use when the receptacle is thereafter opened.

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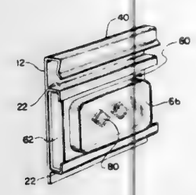
DISPLAY PACKAGE FOR JEWELRY AND THE LIKE

Jeffrey A. Feibelman, Cranston, R.I., assignor to A & H Mfg. Co., Cranston, R.I.

Continuation-in-part of Ser. No. 810,366, Jun. 27, 1977, abandoned. This application Aug. 3, 1978, Ser. No. 930,519

Int. Cl.[2] B65D *73/00*

U.S. Cl. 206—468 **9 Claims**



1. A device for the display of jewelry articles and the like comprising a first panel having means for suspending said device in a generally vertical plane, said first panel including a front face and an opposed rear face, a pair of integral spaced parallel flanges extending rearwardly from said rear panel face and extending transversely of said panel in a side-to-side direction, a second panel received between said flanges and spaced from said rear panel face, said second panel having a pair of end walls at opposite ends thereof extending toward and contacting said first panel rear face, whereby when said second panel is in its assembled position, a complete enclosure is defined at the rear of said first panel for receiving at least a portion of the jewelry article being displayed, said second panel being removably positioned with respect to said first panel, said second panel having walls at all of its edges including said end walls, said second panel having a planar portion substantially parallel to said first panel, said substantially parallel planar portion further having a rearwardly extending deformation in part forming a portion of said enclosure which portion in turn extends rearwardly of said flanges.

4,175,661

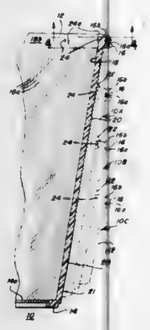
STACKABLE LIGHT REFRACTOR

Jocelyn T. Barnes, Charlevoix, Mich., assignor to Lexalite International Corporation, Charlevoix, Mich.

Filed Aug. 28, 1978, Ser. No. 937,160

Int. Cl.[2] B65D *21/02*; **F21V** *3/00*

U.S. Cl. 206—519 **15 Claims**



1. A light refractor comprising:

an annular, hollow tubular shaped element of light transmissive material having a large end and a pair of spaced apart inner and outer surfaces tapering toward a small end;

said outer surface including a plurality of annular, outwardly projecting ridges of prism shaped transverse cross-section spaced between said larger and smaller ends for directing light rays from a light source centrally disposed in said annular element to pass outwardly therethrough;

one of said prism shaped ridges spaced a distance closer to said larger end than said smaller end projecting outwardly a substantially greater distance than the other ridges of prism shaped cross-section; and

a stacking element adjacent said larger end of said refractor extending radially inwardly of said inner surface and remote from said ridges for stacking engagement with a stop surface on said one prism shaped ridge of an adjacent refractor in coaxial stacked relation therewith for preventing wedging engagement between the ridges of said adjacent refractor and the inside surface of said refractor.

4,175,662

METHOD AND DEVICE FOR SORTING PARTICLES SUSPENDED IN AN ELECTROLYTE

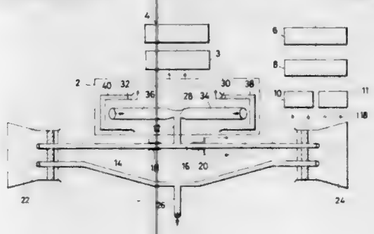
Tibor Zöld, Schmale Strasse 19, 44 Münster, Fed. Rep. of Germany

Filed Mar. 22, 1978, Ser. No. 888,900

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1977, 2716095

Int. Cl.[2] B07C *5/04*, *5/342*

U.S. Cl. 209—552 **38 Claims**



1. Method to direct the flow of electrolyte and especially the motion of particles or cells in an electrolyte suspension to sort these particles or cells from a mixture into different containers according to their preselected properties, characterized in that the suspension flows in a middle channel along a preselected length of its trajectory in the form of a very thin stream and can be deflected into at least one side channel, that a pair of control electrodes is located in at least one of the side channels, which produces gas by electrolysis when being activated by an electric current impulse of sufficient amplitude, and that the production of a gas impulse in all side channels with activated control electrodes results in a deflection of the suspension stream into those side channels with inactivated or no control electrodes.

4,175,663

INDEX CARD REGISTER WITH SELECTOR DEVICE

Hans Halm, Herne, Fed. Rep. of Germany, assignor to Firma Niveau AG, Basel, Switzerland

Filed Jul. 10, 1978, Ser. No. 923,388

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1977, 2647067

Int. Cl.[2] B07C *9/00*

U.S. Cl. 209—610 **6 Claims**

1. An index card register with selector means for index cards, comprising:

a housing having a cover member and a bottom member;

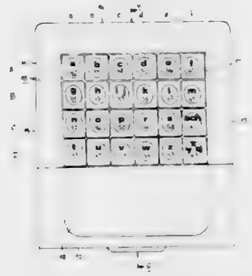
a plurality of plate-shaped selector keys arranged next to one another and rearward or forward of one another;

a drawer biased by a compression spring and adapted to be locked by a locking mechanism;

index cards accommodated within the drawer, the index cards having selector cutouts in their rearward marginal portions and forming a stack of cards;

wherein each selector key is attached to a pivot arm constructed as a lever, which lever is held in its initial position by resilient means and carries at its free end a card retainer device;

wherein the card retainer devices interact with the index cards in such a manner that when a selector key is depressed all those index cards which lie on top of the index card to which this key is assigned are retained when the drawer is drawn out, while the selected index card and all index cards arranged thereunder can be moved out together with the drawer; and



means for unlocking the drawer and releasing the index card which was selected by means of a selector key by pushing out the drawer by means of the compression spring, the drawer being provided with entrainment cams adapted to engage entrainment apertures of the index cards;

said plate-shaped selector keys being square or rectangular and connected with said pivot arms in such a manner that the rearward selector key cantilevers to the left and the forward selector key cantilevers to the right relative to their respective pivot arms.

4,175,664

SEAL ARRANGEMENT FOR A SEPARATING MECHAMISM

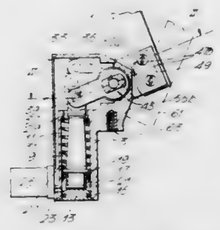
Hans A. Sandbank, London, England, assignor to GEC Medical Equipment Limited, Wembley, England

Filed Feb. 13, 1978, Ser. No. 876,869

Claims priority, application United Kingdom, Feb. 25, 1977, 8044/77

Int. Cl.[2] B07C *9/00*

U.S. Cl. 209—657 **7 Claims**



1. A separating mechanism comprising at least one separating unit comprising: a substantially closed casing; a movable finger disposed outside the casing; operating means housed in the casing for moving said finger to effect a separating operation; an axially rotatable shaft extending through the casing and coupled between said movable finger and said operating means whereby motion is transmitted from said operating means to said finger; and a rotary seal arrangement whereby said shaft is sealed to the casing.

4,175,665

DISPLAY CONTAINER FOR ROUNDED ARTICLES

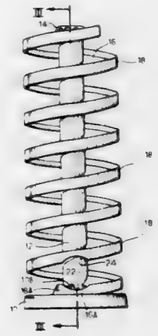
Amilcare Dogliotti, Alba, Italy, assignor to P. Ferrero & C. S.p.A., Alba, Italy

Filed Dec. 16, 1977, Ser. No. 861,338

Claims priority, application Italy, Feb. 7, 1977, 52895/77[U]

Int. Cl.[2] A47F *1/00*

U.S. Cl. 211—49 D **1 Claim**



1. A display container and dispenser for spherical articles, comprising:

a base,

a support pillar rigidly secured to and projecting upwardly from said base,

a plurality of turns of a continuous helical web surrounding said support pillar with the innermost edge in contact with said pillar and attached thereto,

a transverse flange extending from the radially outer edge of said web, said flange projecting in opposite directions from said web generally parallel to said support pillar to define, with said web, a helical chute for articles to be contained by said container,

abutment means on said base extending radially with respect to said pillar, said abutment means serving to restrain the lowermost article in said chute,

recess means in said transverse flange at a position adjacent said abutment means whereby to facilitate removal of the lowermost article from said chute by displacing it radially with respect to said support pillar, and

said lowermost end of said helical web being spaced from said abutment means and from said base whereas said transverse flange extends substantially up to said abutment thereby forming a pocket for the lowermost article in said chute.

4,175,666

TANK SUPPORT ASSEMBLIES

Robert G. Smith, Chesterfield, Mo., assignor to Kleen-Rite, Inc., St. Louis, Mo.

Filed Apr. 3, 1978, Ser. No. 893,017

Int. Cl.[2] A47F *5/00*

U.S. Cl. 211—71 **8 Claims**

1. A tank support assembly comprising:

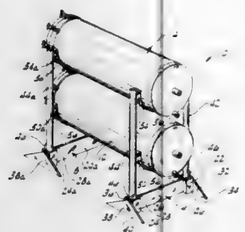
a first elongated base member adapted to rest upon a floor surface;

a second elongated base member adapted to rest upon such floor surface and being spaced from and parallel to said first base member;

said first and second base members each including, adjacent each end thereof, socket means which are vertically oriented in a stable manner

a first and second vertical post member supported within respective ones of said socket means of said first base member;

a third and fourth vertical post member supported within respective ones of said socket means of said second base member;
at least one hanger bracket on each of said post members;
a first tank support member carried by and between said



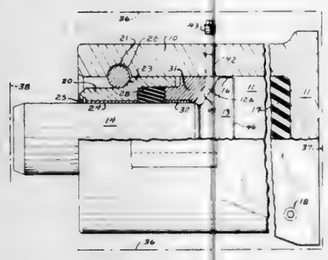
hanger brackets on said first and second post members, and a second tank support member carried by and between said hanger brackets on said third and fourth post members; and
an elongated tank supported on said first and second tank support members.

4,175,667

METHOD OF PRESHORTENING DRAFT GEAR

Arthur M. Dillner, Riverdale, and Walter H. Merker, Jr., Downers Grove, both of Ill., assignors to Miner Enterprises, Inc., Geneva, Ill.

Continuation-in-part of Ser. No. 732,902, Oct. 15, 1976, abandoned. This application Jul. 27, 1977, Ser. No. 819,258
Int. Cl.[2] B61G *9/02, 9/04, 9/06, 11/00*
U.S. Cl. 213—40 R **15 Claims**



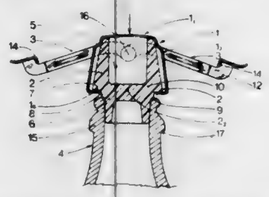
1. A draft gear for insertion into a pocket in a railway car which pocket has space limitations, said draft gear comprising a body having two ends and defining a cylinder cavity, a piston rod extending into said cavity at one of said ends, a piston secured to said piston rod, positioned within said cavity and movable within said cavity between a retracted position and a position at which the piston rod is fully extended, said piston having two faces, one of which faces surrounds said piston rod, the area of said one face being significantly smaller than the area of the other of said faces, a pressurized fill of flowable, normally solid means within said cavity for resisting draft and buff forces, and means defining a restricted flow passage from one side of the piston to the other through which said fill can flow as draft and buff forces are applied to the draft gear, said draft gear being of a size such that, prior to the draft gear being inserted into the pocket, the distance between the distal end of the piston rod when fully extended and the other end of the body is greater than said space limitations of said pocket, said draft gear prior to installation being characterized by:
said piston being sufficiently retracted within said cavity so that the distal end of the piston rod projects insufficiently far beyond the body to cause the overall configuration of the draft gear to exceed said space limitations;
a first portion of said fill being in the part of the cavity surrounding said piston rod and being sufficiently solid to prevent movement of the piston toward the position at which the piston rod is fully extended in the absence of said forces being applied to the draft gear, and substantially the remaining portion of the fill being in the part of the cavity at the opposite side of the piston, the remaining portion of said fill being less dense than said first portion;
whereby the draft gear is easily insertable into said pocket.

4,175,668

REUSABLE STOPPER FOR SEALING CONTAINERS PROVIDED WITH A BEADED NECK SUCH AS BOTTLES

Jean-Claude Hebert, 34-36 rue de General Leclerc, 51200 Epernay, France

Filed Jun. 2, 1978, Ser. No. 911,943
Int. Cl.[2] B65D *45/04*
U.S. Cl. 215—354 **5 Claims**



1. In a reusable stopper for a container having a neck with an annular bead,
a hollow metal cap having a crimping means,
a one-piece circular deformable body composed of an integral head, collar and skirt,
said head secured within said cap by said crimping means,
the collar disposed between the head and the skirt and having a diameter intermediate the diameter of the head and the skirt but greater than the inner diameter of the container neck,
said skirt having an outer diameter adapted to fit within the container neck and which diameter is less than the diameter of the collar,
the head being generally cup-shaped and open at the top,
the collar depending from the bottom wall of the head and being long enough to prevent the metal cap from contacting the container neck,
a pair of straps pivotally secured to the cap and having arms and having projecting jaws at the ends of the arms to engage the annular bead of the container neck when the skirt is inserted into the container neck.

4,175,669

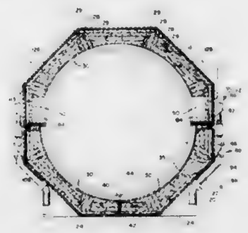
OVERPACK FOR NUCLEAR FUEL CONTAINER

William R. Housholder, 807 Mullins St., Johnson City, Tenn. 37601, and Norman L. Greer, 1409 Central Ave., Elizabethton, Tenn. 37643

Filed Jul. 1, 1976, Ser. No. 701,893
Int. Cl.[2] B65D *7/02*
U.S. Cl. 220—5 A **4 Claims**

1. An overpack having an elongated shell split longitudinally into an upper section and a lower section, each of said sections comprising dual, spaced, and sealed metal side and end walls tightly surrounding layered oriented wood planks and welded together in an essentially airtight manner, said upper section having a projection on the periphery of its chord face, said lower section having a recess in the periphery of its chord face adapted to receive said projection in a nesting manner, a compressible seal between said chord faces, conduit means in said lower section extending generally longitudinally and radially

inwardly therethrough, a plurality of toggle units longitudinally spaced along each side of the outer walls of said sections, for removably securing said sections together, each of said inner end walls being provided with a bumper assembly comprising arcuate, spaced segments of cushioning material secured at their outer surfaces to the end wall at a position adjacent the periphery thereof and carrying on their inner surfaces



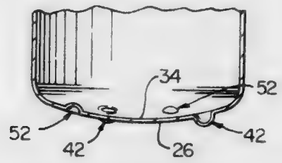
a metal bumper plate, and a skid assembly secured to each end wall and extending radially from between said segments to a point beyond the chord of the end wall, said skid assembly comprising at least one bracket member secured at its outer surface to the end wall and removably carrying on its inner surface a skid plate, cushioning material secured to the end wall and carrying a metal plate on its inner surface in sliding contact with said skid plate.

4,175,670

CONTAINER CONSTRUCTION

William G. Reynolds, Richmond, and Horst F. W. Arfert, Midlothian, both of Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Mar. 22, 1978, Ser. No. 889,037
Int. Cl.[2] B65D *7/44*
U.S. Cl. 220—70 **12 Claims**



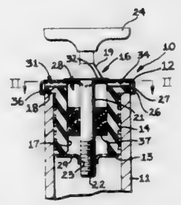
1. In an easily hand-held metal container construction having a downwardly convex bottom wall and an adjoining side wall defined as a single-piece seamless structure with said side wall terminating at a top portion adapted to have a top closure fixed thereon, said top portion, when viewed on a plane perpendicular to the longitudinal axis of said container construction, having a circular cross-section configuration and having a particular diameter, the improvement wherein said bottom wall, when viewed on any cross-sectional plane coinciding with said longitudinal axis of said container construction, has a central part which extends in a circular first radius and a peripheral part defined by a side portion which blends smoothly with said central part and said side wall, said side portion extending on a second radius, said first radius, when measured along the longitudinal axis of said container, being within the range of 2 to 7 times greater than the dimension of said particular diameter and said second radius being within the range of 1/10 to 1/5 the dimension of said particular diameter, said first radius and said second radius having a dimensional ratio which provides a smooth transition between their respective central and peripheral parts which is free of sharp corners and with minimum wrinkling, said downwardly convex bottom wall having a plurality of integral feet for supporting said construction thereon, each of said feet being defined by a downwardly convex dimple having a base portion provided with an outer periphery, and said bottom wall also having a plurality of dimples to rigidify said bottom wall, said rigidifying dimples each being defined by a downwardly concave dimple having a base portion provided with an outer periphery, said outwardly convex dimples and said outwardly concave dimples having a wall thickness which is substantially the same as the remainder of said bottom wall and each of said convex and concave dimples having a central axis and having the outer periphery of its base portion disposed radially inward from said side wall by a distance of at least equal to one-half the minimum dimension across said outer periphery when measured through said central axis, said central part and said peripheral part blending smoothly together substantially on an imaginary circular line and each of said convex and concave dimples being disposed so that the central axis of each dimple is disposed adjacent said imaginary circular line and said concave dimples being symmetrically disposed between said convex dimples.

4,175,671

BREATHER CAP

Harold H. Holl, Oswego, and Walter R. Hupe, Champaign, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 1, 1978, Ser. No. 901,408
Int. Cl.[2] B65D *53/00, 51/16*
U.S. Cl. 220—235 **2 Claims**



1. In a breather cap having first and second plates positioned at opposite ends of a resilient cylindrical element and means for selectively moving the plates toward one another and radially expanding the resilient element, the improvement comprising:
first means for passing air through the breather cap, said first means including a bore extending longitudinally through said resilient element, an orifice extending through said second plate and in communication with said bore, a disc positioned between said first plate and said resilient element, said disc having a central opening in communication with the bore of said resilient element and a groove in the disc connecting the central opening with ambient;
second means for filtering the air passing through the first means; and
wherein said resilient element has a flange extending radially outwardly at the end adjacent the first plate, said first plate having a lip extending longitudinally toward said second plate encircling the flange of the resilient element and spaced therefrom a predetermined distance forming an annular opening, said groove being in communication with said annular opening.

4,175,672

CLOSURE ASSEMBLY

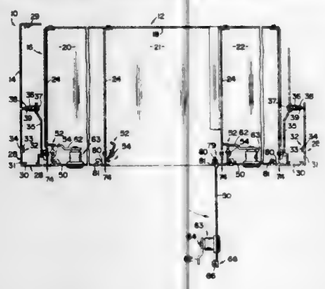
Henry T. Moser, 1451 Cattleman Rd., Sarasota, Fla. 33577

Filed Nov. 20, 1978, Ser. No. 961,956
Int. Cl.[2] B65D *43/14, 51/04*
U.S. Cl. 220—334 **17 Claims**

1. A container structure of the type including a movably mounted closure means providing and preventing access to the interior of such container structure, said container structure

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comprising housing means, said closure means comprising at least one closure element pivotally mounted to said housing means and disposable to removably block access to the interior of at least a portion of said housing means, locking means pivotally mounted on said housing and disposed into locking engagement relative to a predetermined portion of said closure



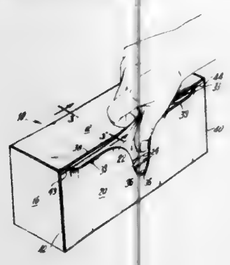
element, said locking means comprising a substantially elongated configuration extending along at least a major portion of the length of said predetermined portion of said closure element and disposed to at least partially define barrier means disposed between the interior of said housing and a junction between said closure means and a substantially correspondingly positioned portion of said housing means.

4,175,673

DISPENSING CARTON FOR CORRUGATED PLASTIC BAGS

James A. McDonald, Palos Heights, and Mark C. Novak, Chicago, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,756
Int. Cl.[2] B65D *85/67*
U.S. Cl. 221—63 **5 Claims**



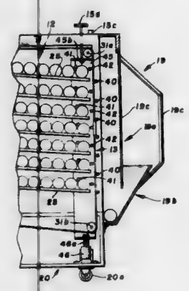
1. In combination, a box-like dispensing carton comprising, a top wall, a bottom wall, end walls and side walls, a single removable access panel located exclusively on one side wall of said carton, and a plurality of bags each having an open end and a closed end, said bags being arranged within the carton in a corrugated configuration with the open end of each bag lying in tandem parallel to said one side wall and being in closer proximity thereto than the closed end of each bag and with said removable access panel forming, upon its removal, a single aperture in the side of the carton for dispensing said bags one at a time, with said aperture having at least one portion defined by an elongated opening of a predetermined width located substantially about the center of said one side wall along its smaller dimension and having a width substantially limited in dimension to an average measurement based upon the placement of a person's thumb lengthwise within said opening and having a length extending a distance along said smaller dimension equal to at least one-half the width of said one side wall measured from the top edge of the carton.

4,175,674

DEVICE FOR SINGULAR DISPENSING OF PACKAGED ARTICLES

Ralph W. Johnson, New Brighton; Emil D. Burrs, St. Paul; Gary L. Smith, Minnetonka; Ronald G. Freund, Bloomington, all of Minn., and Edward Patula, Rhinelander, Wis., assignors to Total Systems, Inc., Minnetonka, Minn.

Filed Aug. 24, 1977, Ser. No. 827,246
Int. Cl.[2] B65G *65/60*
U.S. Cl. 221—88 **9 Claims**



1. A dispensing device including:
a. a support frame;
b. a storage section carried by said support frame including at least one article storage and guiding means and arranged to deliver articles placed thereon from one rearward end thereof to the other forward end thereof;
c. a belt member having at least one article passing opening therein;
d. positioning means carried by said support frame and positioning said belt member with respect to said storage section for the control of the delivery of articles from the forward end thereof;
e. means for shifting said belt to bring said article passing opening into registration with said forward end of said storage section for the delivery of articles therethrough upon registration of said opening with said storage section, said belt retaining the articles within said storage section when said opening is out of registration with said forward end of said storage means; and,
f. article retaining means arranged in close association to said forward end of said storage means to normally retain articles therein and means for shifting said retaining means to permit articles to move forwardly upon shifting of said retaining means.

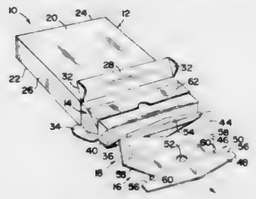
4,175,675

CONTAINER AND DISPENSING PACKAGE

Leo V. Maisonneuve, 4480 N. 40th St., St. Petersburg, Fla. 33714

Continuation-in-part of Ser. No. 730,846, Oct. 8, 1976, Pat. No. 4,109,826. This application Apr. 20, 1978, Ser. No. 898,375
Int. Cl.[2] B65D *5/38*
U.S. Cl. 221—72 **4 Claims**

1. A container and dispensing package for storing and dispensing contents therefrom comprising an outer carton having an opening therein; together with an inner and outer end flap each movable between a first and second position to selectively permit access to the interior of said outer carton through said opening and an opening means comprising an end wall and a separation member each movable between a first and second position to selectively move said inner and outer end flaps from said second position, an inner wrapper fixedly attached to said outer carton to protect the contents thereof and disposed to extend outwardly from said opening when said inner and outer end flaps are in said second position and said opening means further includes a pair of wrapper folding and opening elements on opposite sides of said separation member to accom-



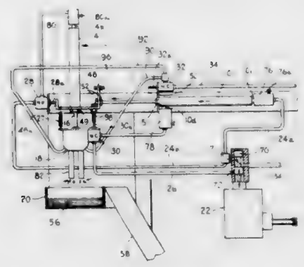
modate folds of said inner wrapper therearound and to open said inner wrapper when said inner and outer end flaps are in said second position, said end wall is disposed inwardly relative to said inner end wrapper and said separation member is disposed between said inner and outer end flaps when each is in said first position.

4,175,676

APPARATUS FOR AUTOMATICALLY FEEDING COLLAR STAYS

Ronnie C. Renaud, Rte. 1, Liberty, S.C. 29675, and Jerry D. Goins, 404 Laurel Rd., Easley, S.C. 29640

Filed Sep. 29, 1977, Ser. No. 838,010
Int. Cl.[2] B65G *59/04*; **B65H** *5/14*; **B23Q** *7/04*
U.S. Cl. 221—211 **17 Claims**



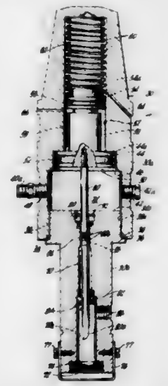
1. Automatic feeder apparatus for feeding collar stays to an associated sewing device and the like comprising:
a first fluid cylinder having a pair of inlets and a laterally reciprocating piston rod extending therefrom;
a second fluid cylinder having an inlet and a vertically reciprocating piston rod extending therefrom;
carriage means carried by said piston rod of said first fluid cylinder, said second fluid cylinder being carried by said carriage means;
a pick-up device carried by said piston rod of said second fluid cylinder for picking up a collar stay from an associated magazine;
first valve means having a first position for delivering a fluid from a pressurized fluid source to one of said inlets of said first cylinder and said inlet of said second cylinder to move said pick-up device in first and second directions, respectively, to a stay pick-up position;
said first valve means having a second position for delivering the fluid to the other of said inlets of said first cylinder to move said pick-up in a third direction opposite to said first direction to a stay delivery position;
fluid supply conduit means connecting said first valve means and said inlets of said first and second fluid cylinders for delivering said fluid;
second valve means connected in said fluid supply conduit means between said first valve means and said inlet of said second cylinder responsive to said pick-up device reaching the end of lateral movement at a predetermined lateral position in said first direction for terminating fluid delivery to said second cylinder; and
third valve means connected in said fluid supply conduit between said first valve means and said other inlet of said first cylinder responsive to said pick-up device reaching the end of vertical movement at a predetermined vertical position in a fourth direction opposite to said second direction for allowing delivery of fluid to said other inlet.

4,175,677

SELF-CONTAINED ACTUATION AND DETECTION DEVICE

Paul M. Poeschl, Marinette, and David L. Stockwell, Waukesha, both of Wis., assignors to The Ansul Company, Marinette, Wis.

Filed Aug. 11, 1977, Ser. No. 823,869
Int. Cl.[2] A62C *37/06*
U.S. Cl. 222—5 **10 Claims**



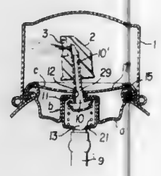
1. A self-contained detection and actuation device for use with a pressurized fluid container having a frangible disc comprising:
an elongate housing having a centrally located pressure cavity;
a first piston chamber adjacent said cavity with one end opening thereto, said first piston chamber having a diameter smaller than said cavity;
a second piston chamber axially aligned with said first piston chamber and having one end opening thereto, said second piston chamber being smaller in diameter than said first chamber;
a passageway extending axially from said cavity opposite said piston chambers;
means for coupling said pressurized container at the end of said passageway with said frangible disc presented thereto;
a double ended piston assembly including first and second pistons slidably received in said first and second piston chambers, respectively, and means interconnecting said pistons for conjoint movement;
means in said second piston chamber for biasing said piston assembly toward said cavity;
an elongate rod axially connected to said first piston and extending through said passageway, the free end of said rod having a piercing element thereon for puncturing said

frangible disc when said piston assembly is moved by said biasing means;
sealing means for dividing said passageway into high pressure and low pressure portions; and
means between said sealing means and said coupling means for withdrawing high pressure fluid from said high pressure portion of the passageway.

4,175,678
EXPLOSION PROOF DEVICE FOR A PRESSURE ACCUMULATOR HAVING A VALVE PORTION

Motoo Fukuda, No. 522, 1305 To, 3-1, Shiomi-Dai, Isogo-Ku, Yokohama-Shi, Kanagawa-Ken, Japan

Filed May 6, 1977, Ser. No. 794,601
Claims priority, application Japan, May 7, 1976, 51-51274
Int. Cl.² B65D *83/14*
U.S. Cl. 222—54 **3 Claims**

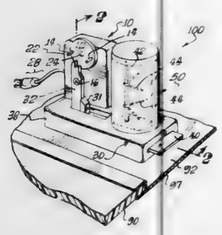


1. In a pressure accumulator having a valve member adapted to be opened for exhausting gas and other materials from said accumulator by movement of said valve member in a given direction against a biasing force tending to maintain said valve in a closed position, the improvement comprising:
means disposed between said accumulator and said valve member, being responsive to heat of a predetermined degree, for automatically operating said valve member to open said valve for exhausting gas and other material from said accumulator, said means for operating said valve member comprising a bimetallic plate having an opening therethrough for receiving said valve member.

4,175,679
TIMER-CONTROLLED AUTOMATIC ANIMAL FEED DISPENSER

Phillip Ponce, Valinda, and John T. Kamon, Altadena, both of Calif., assignors to Carolyn M. Smith, Los Angeles, Calif., a part interest

Filed Jul. 31, 1978, Ser. No. 929,330
Int. Cl.² G01F *11/10*
U.S. Cl. 222—70 **12 Claims**

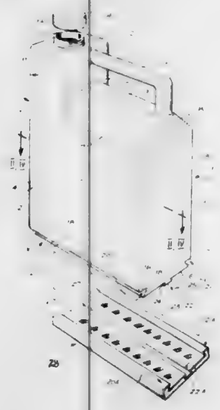


1. A timer-controlled automatic animal feed dispenser, comprising:
powered timer means including a rotary cam with at least one pin,
a rocker arm pivotally mounted and adapted to engage said timing means,
shuttle means reciprocable between first and second positions and having a metering chamber and a cam follower for engagement by said rocker arm,
spring means biasing said shuttle means toward the first position,
a container for animal feed generally above the shuttle means,
a transfer port in the base of said container communicating with the metering chamber when the shuttle means is in said second position, and
means defining a discharge opening communicating with said metering chamber when the shuttle means is in said first position.

4,175,680
DISPENSING CONTAINERS

Nicholas Sammut, 220 Newbridge Rd., Moorebank, New South Wales, Australia (2170)

Filed Jun. 8, 1978, Ser. No. 913,603
Claims priority, application Australia, Jun. 9, 1977, 0390/77
Int. Cl.² B65D *47/28*
U.S. Cl. 222—465 **2 Claims**

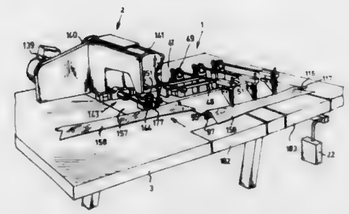


1. A container having a top and bottom and side and end walls, the top of the container having a handle and a filling spout communicating with the interior of the container, the bottom of the container having an array of openings therein, a closure member having an array of openings therein, the side walls of the container and the bottom of the container being provided with slide channels, said slide channels cooperating with slide channel engaging means on said closure member to secure the closure member to the bottom of the container, said closure member being movable from a closed position where the array of openings in the closure member are out of register with the array of openings in the bottom of the container to an open position where the array of openings in the closure member are in register with the array of openings in the bottom of the container for the purpose of dispensing the contents of the container.

4,175,681
APPARATUS FOR MARKING AND TRIMMING COLLARS

Hans Scholl, Oerlinghausen-Lipperreihe, and Helmut Tiemann, Bielefeld, both of Fed. Rep. of Germany, assignors to Koch Adler AG, Bielfeld, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 622,734, Oct. 15, 1975, abandoned. This application Sep. 28, 1977, Ser. No. 837,564
Int. Cl.² A41H *9/00*
U.S. Cl. 223—2 **16 Claims**

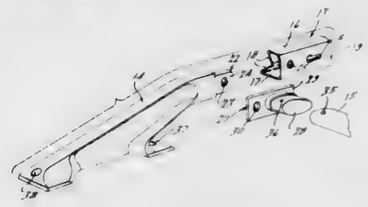


1. An auxiliary apparatus for the final operation of a sewn collar consisting of a bottom fabric layer with a joining edge and a top fabric layer, before sewing onto a shirt or blouse, comprising
a base plate,
marking means mounted on said base plate for marking a collar at a plurality of spots of the bottom fabric layer and at matching spots of the top fabric layer, said marking means including
marking tools,
means for adjusting said marking tools with respect to various collar sizes, and
means on said plate for varying said marking tools for different collar contours,
cutting means mounted on said base plate adjacent said marking means for trimming a joining edge of said bottom fabric layer of said collar after marking by said marking means,
means for feeding a collar during trimming, and
means for guiding a collar along said cutting means, said marking means, said trimming means and said guiding means being operable in timed relationship.

4,175,682
LUGGAGE RACK

John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Filed Jun. 16, 1977, Ser. No. 807,071
Int. Cl.² B60R *9/04*
U.S. Cl. 224—309 **4 Claims**



1. In a luggage rack for an automobile,
a pair of spaced apart side members,
at least one transversely extending cross member,
a pair of stanchions located one at each end of said cross member, with each of said stanchions being associated with one end of one of said side members,
a pair of retainer members associated one with each of said stanchions and with one end of said cross member, and
each of said stanchions having a projecting end portion adapted for telescopic engagement with the end of the associated side member,
each of said side members having an opening and a keyhole slot formed on the interior side thereof,
each of said stanchions having an opening which is aligned with the opening in the associated side members upon telescopic engagement of said stanchions therewith,
each of said retainer members having an opening and an outwardly projecting boss which is insertable into one end of the keyhole slot of the associated side member and moveable longitudinally therewithin to a position wherein said retainer opening is aligned with said stanchion and side members openings of the associated side member and stanchion, and a pair of fastening members wherein a fastening member extends through said aligned openings of each associated set of retainer members, stanchions and side members.

4,175,683
SKI POLE BASKET AND CARRYING ASSEMBLY

Michael P. Shields, 5977 Reseda Blvd., Tarzana, Calif. 91356

Filed Mar. 31, 1977, Ser. No. 783,170
Int. Cl.² B65D *71/00*
U.S. Cl. 224—45 S **4 Claims**



1. A basket assembly for a ski pole for use in securing together a pair of skis and a pair of ski poles to facilitate the carrying thereof, said basket assembly comprising a body member having an aperture extending therethrough for receiving a first ski pole, a first recessed area therein for receiving a portion of a second ski pole, the area defining a curvilinear gripping surface for retaining said second ski pole within said recessed area, said gripping surface defining an outer opening to said recessed area of reduced transverse dimension and a second recessed area radially disposed within said body member at about 90° with respect to said first recessed area for receiving a transverse portion of a pair of adjacently disposed skis, a U-shaped ski locking member defining a bar and leg portions, the bar portion of said ski locking member extending across the outer open end of said second recessed area and being adapted to be disposed about the transverse portion of said skis extending from said second recessed area and the leg portions of said ski locking member extending into said body member about said second recessed area and including means for locking said second portion of said ski locking member within said body member.

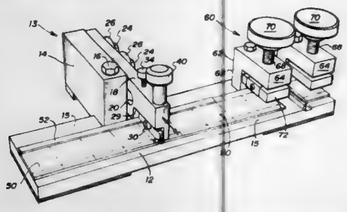
4,175,684
MECHANICAL GLASS KNIFE SCORER/BREAKER

James K. Butler, 1412 Woodbine Ct., Arlington, Tex. 76012

Filed Jul. 31, 1978, Ser. No. 929,856
Int. Cl.² C03B *33/02*
U.S. Cl. 225—2 **19 Claims**

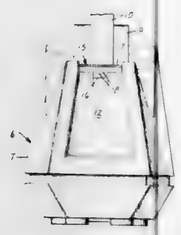
8. An apparatus for preparing a glass microtome knife of the Ralph-type, comprising:

(a) a rigid base;
(b) a scoring apparatus on one end of the base, including an arm capable of making straight excursions across the top of the base and parallel to the top surface thereof, with said arm carrying a hardened cutting means which is adjustable in height so as to produce a desired score line on a piece of glass supported by a mat on the base;
(c) a glass-breaking apparatus affixed to the other end of the base, with said glass-breaking apparatus having a horizontal mat for catching and supporting broken pieces of glass, with the elevation of said supporting mat in the glass-breaker apparatus being identical to the elevation of a



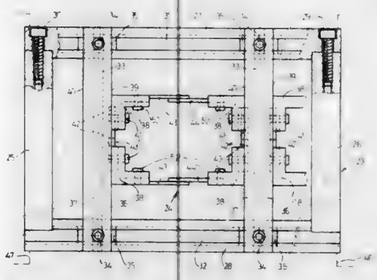
supporting mat in the glass-scoring apparatus, such that an elongated piece of resilient material may serve both the glass-scoring apparatus and the glass-breaking apparatus; and
(d) the glass-breaking apparatus having a pair of similarly oriented and open-face clamps with movable pressure pads thereon, and there being a linear fulcrum fixed to the base between said pair of clamps, such that a piece of glass may be positioned in the two clamps and over the fulcrum in such a way that applying pressure with the two clamps can cause a glass piece to fracture along a line which is generally parallel to the fulcrum.

4,175,685
TAPE DISPENSER WITH BLADE GUARD
Gerald J. Niles, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jun. 23, 1978, Ser. No. 918,349
Int. Cl.² B26F *3/02*; B26D *7/22*
U.S. Cl. 225—19 **2 Claims**



1. A pressure-sensitive adhesive tape dispenser comprising
a frame,
a first support on said frame for supporting a roll of convolutely wound tape,
a second support on said frame which is spaced from said first support and including a smooth surface to which said tape will lightly and detachably adhere by its pressure-sensitive coating and a receptacle for a cutting blade,
said cutting blade comprising a razor blade with a self-contained guard in the form of a flexible material spirally wound to conform with the contour of the blade surface, and capable of being pressed against the razor blade edge by said tape without severance of the flexible material.

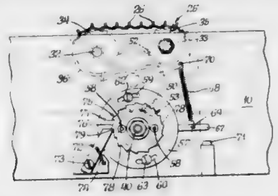
4,175,686
DEVICE FOR STRIPPING BLANKS FROM A DIE CUT SHEET OF BLANKS
Pierre Lang, Ecublens, Switzerland, assignor to J. Bobst & Fils, S.A., Lausanne, Switzerland
Filed May 24, 1978, Ser. No. 909,034
Claims priority, application Switzerland, May 26, 1977, 6478/77
Int. Cl.² B26F *3/02*
U.S. Cl. 225—97 **7 Claims**



1. In a device for stripping blanks from a die cut sheet of blanks, said device including a set of punches mounted on a punch frame and a matrix being supported on a support frame and having openings corresponding to the outlines of both the punches and blanks, one of said frames being movable relaive to the other so that the punches can extend into the openings of the matrix to force the blanks through the matrix openings to strip them from the sheet, the improvements comprising each of the punches of said set of punches comprising a plurality of punch members and means extending between adjacent punch members to close the outline of each punch, said punch members being adjustably mounted on a first set of bars supported on the punch frame and slidable therealong to vary the size of the outline of each punch, said matrix comprising a first set of parallel extending members, a second set of parallel extending members and a plurality of removable fastening means for interconnection, said support frame being rectangular with one set of parallel sides being at one level and second set of parallel sides being at a different level, said first set of parallel extending members being adjustably mounted on said first set of parallel sides and shiftable therealong to adjust the distance therebetween, said second set of parallel extending members being adjustably mounted on said second set of parallel sides to overlie and extend across the first set and being shiftable therealong to adjust the distance therebetween so that the size of the rectangular opening formed by adjacent parallel members of the first and second sets is adjustable, said removable fastening means being disposed at each cross over point between the first and second set for interconnecting the members together.

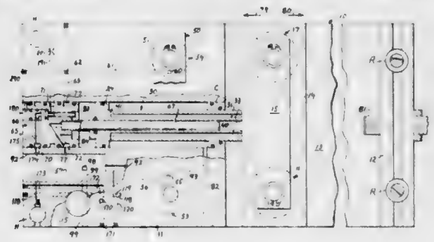
4,175,687
UNIFORM INDEXING OF PAPER FORMS
Grant F. Kenworthy, Des Plaines, Ill., assignor to Weber Marking Systems, Inc., Arlington Heights, Ill.
Filed Dec. 27, 1977, Ser. No. 864,336
Int. Cl.² G03B *1/30*
U.S. Cl. 226—74 **3 Claims**

1. An indexing mechanism for a continuous web having margin holes comprising a tractor engaging said margin holes, means actuating said tractor including a clutch driving element and a clutch driven element, gearing joining said clutch driven element to said tractor, a ratchet wheel joined to said clutch driven element, a pawl engaging said ratchet wheel, a spring motor, said spring motor having a friction disc engaging said ratchet wheel, said spring motor energized by rotation of said ratchet wheel when said clutch driven element is engaged with said clutch driving element, said spring motor acting through its said friction disc to reverse the direction of the tractor when



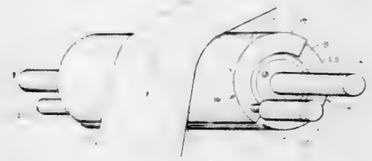
the clutch driving and driven elements are disengaged, and means limiting the amount of reverse movement.

4,175,688
SEMI-AUTOMATIC STOCK FEEDER
Albert W. Scribner, 6 Country Club Rd., Darien, Conn. 06820
Filed Jan. 23, 1978, Ser. No. 871,490
Int. Cl.² B65H *17/36*
U.S. Cl. 226—158 **16 Claims**



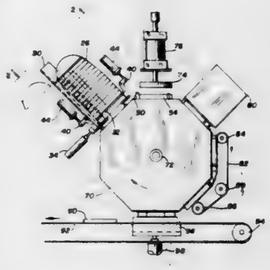
1. A pneumatic feeder for intermittently advancing strip stock into the work station of a punch press that has a reciprocating working ram; said feeder comprising
a frame;
feed slide means mounted on said frame for reciprocating movement in feed and index directions;
stock gripping means carried by said feed slide means;
a first fluid motor means for actuating said feed slide means;
a second fluid motor means for actuating said stock gripping means;
a main fluid valve means adapted to be shifted between first and second operative conditions;
a third fluid motor means for shifting said main valve means between said first and second operative condition;
a control plunger means adapted to move between first and depressed positions in response to the movement of said press ram;
pneumatic control means adapted to cause said feed slide means to be normally disposed in an indexed position and to cause initiation of a feed stroke of said feed slide means in response to movement of said plunger means from its said depressed position back to its said first position in response to the upward movement of said press ram; and
reversing means adapted to be operated in response to the terminal portion of a feed stroke of said feed slide means for causing said first, second and third fluid motor means to initiate an index stroke of said feed slide means whereby said feed slide means returns to and remains in its said indexed position until said plunger means is again moved from its said first to its said depressed position and then returned to its said first position in response to the downward and upward movements respectively of said ram, the next feed index cycle of movement of said feed slide means being initiated in response to this return movement of said control plunger means from its said depressed position back to its said first position.

4,175,689
APPARATUS FOR CENTERING STRIPS IN ROLLING MILLS AND THE LIKE
Calvin E. Parker, 1506 Amber Ct., Ontario, Calif. 91762
Filed Aug. 25, 1977, Ser. No. 827,732
Int. Cl.² B65H *23/02, 25/26, 27/00*
U.S. Cl. 226—190 **7 Claims**



1. A steering roll for a strip handling system having a shaft, which roll comprises:
(a) an inner member;
(b) attachment means fixedly engaging said inner member to said shaft for rotation of said inner member with said shaft;
(c) a hollow cylindrical outer shell positioned over said inner member and having two substantially semi-cylindrical segments;
(d) shift means carried within and projecting through said inner member for attaching said outer shell segments to said inner member so that said outer shell segments are held rigidly away from said inner member in the radial direction, and rotate with and may be axially displaced with respect to said inner member; and
(e) spring means carried in said inner member and disposed parallel to the axis of said shaft and engaging said shift means for urging said shift means to a centered position.

4,175,690
APPARATUS AND METHOD FOR PRODUCING SECTIONED EDIBLES
Mary L. Bova, and Ralph G. Bova, both of 80 Poplar Ave., Deal, N.J. 07723
Filed Jul. 31, 1978, Ser. No. 929,809
Int. Cl.² B23Q *7/10*
U.S. Cl. 227—76 **23 Claims**



1. Apparatus for automatically slicing and sectioning an edible such as fruit and delivering said sections to a given station for further processing, said automatic apparatus including: (a) a chute for receiving a plurality of edibles such as fruit, said chute having a discharge sized to pass only one edible at a time to a delivery station; (b) a pusher at said delivery station and reciprocably movable to two limits of movement and at a first limit of movement the pusher allows one edible to pass

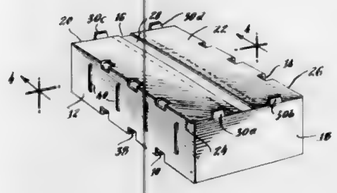
from the chute and in way of the pusher when the space below the chute and in front of the pusher is empty; (c) means for reciprocably moving the pusher to two extremes of movement; (d) means carried by the pusher to close the chute discharge to a downward flow of edibles except when the pusher is at said first limit of movement; (e) a slicing grid in the path of an edible as moved by the pusher, the grid disposed to slice the edible into segments of determined thickness when pushed to and through the grid by the advancing and advanced pusher; (f) means on the pusher face to accommodate the grid while advancing the edible sufficiently through the grid for slicing of the edible, this means providing for repeated advancing of the pusher to a second limit of movement without damage to or disarrangement of the grid; (g) means for delivering useful sliced segments of the edible product to a gravity fed slide member; (h) means for transferring and delivering the lowermost slice to an indexing apparatus while means for retaining the above slices is actuated to prevent the unwanted dropping of the stack of slices to the transferring means; (i) means for advancing the indexing apparatus and a single sliced segment to a sectioning station; (j) means for substantially centering the slice and then advancing a sectioning cutter into and through the sliced segment while oppositely disposed means is provided for preventing the sliced product from moving away from the sectioning cutter; (k) means for advancing the index mechanism and the sectioned product as well as the sectioning cutter to a discharge station; (l) means for withdrawing the sectioning cutter from the sectioned slice at this discharge station and depositing the sectioned pieces onto a receiving means, and (m) means for transporting the sectioned segments to other operations which may include individual wrapping of the sections.

23. A method for automatically slicing and sectioning an edible such as fruit and delivering said sections to a given station for further processing, said method including the steps: (a) receiving and placing a plurality of edibles such as fruit in a chute having a discharge sized to pass only one edible at a time to a delivery station; (b) arranging a pusher at said delivery station and moving this pusher to two limits of movement and at a first limit of movement of the pusher allowing one edible to pass from the chute and in way of the pusher when the space below the chute and in front of the pusher is empty; (c) reciprocably moving the pusher to the extremes of movement during which means carried by the pusher closes the chute discharge to downward flow of edibles; (d) placing a slicing grid in the path of an edible as moved by the pusher, and slicing the edibles into slices of determined thickness when said edible is pushed to and through the grid by the advancing and advanced pusher; (e) providing means on the pusher face to accommodate the grid while advancing the edible sufficiently through the grid for slicing of the edible, this means providing for a repeated advancing of the pusher to a second limit without damage to or disarrangement of the grid; (f) delivering useful sliced segments of the edible product to a gravity fed slide member; (g) transferring and delivering the lowermost slice to an indexing apparatus while retaining the above slices to prevent the unwanted dropping of the stack of slices to the transferring means; (h) advancing the indexing apparatus and a single sliced segment to a sectioning station; (i) substantially centering the slice and then advancing a sectioning cutter into and through the sliced segment while oppositely disposed means is provided for preventing the sliced product from moving away from the sectioning cutter; (j) advancing the index mechanism and the sectioned product as well as the sectioning cutter to a discharge station; (k) withdrawing the sectioning cutter from the sectioned slice at this discharge station and depositing the sectioned pieces into a receiving means, and (l) transporting the sectioned segments to other operations which may include individual wrapping of the sections.

4,175,691
STACKABLE CARTON FOR PERISHABLE COMMODITIES

William F. Cornell, Fresno; John P. Vear, Salinas, and E. Anthony Pascuzzi, El Toro, all of Calif., assignors to Champion International Corporation, Stamford, Conn.

Filed Aug. 24, 1978, Ser. No. 936,612
Int. Cl.[2] **B65D** *13/00, 5/32*
U.S. Cl. 229—36 **12 Claims**



1. A stackable storage and shipping tray comprising:

a generally rectangular floor panel having openings at opposite edges thereof;

first and second side wall panels extending generally upright from opposite edges of said floor panel, each of said side wall panels including side wall flaps extending from opposite ends thereof and a side cover flap extending from the free side thereof, each said side cover flap including recesses adjacent its side edges;

first and second end wall panels extending generally upright from the remaining opposite edges of said rectangular floor panel, with the inner surface of each said end wall panel being adhesively connected to the outer surface of the associated side wall flaps of said side wall; and

first and second stacking panels, each having at least one tab extending upwardly from an upper edge and at least one recess at its lower edge in vertical alignment with said tab, with the outer surface of each said stacking panel being adhesively connected to the inner surface of the associated side wall flaps of said side wall;

said end wall panels, side wall flaps and stacking panels forming triple-ply adhesively connected end wall assemblies wherein each tab on a stacking panel extends through the recess in one of said side cover flaps and each opening at an edge of said floor panel is aligned with a recess at the lower edge of a stacking panel.

4,175,692
ERROR CORRECTION AND DETECTION SYSTEMS

Yutaka Watanabe, Hadano, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 22, 1977, Ser. No. 863,089
Claims priority, application Japan, Dec. 27, 1976, 51-156536
Int. Cl.[2] **G06F** *11/12;* **G11C** *29/00*
U.S. Cl. 235—312 **6 Claims**

1. A data error correcting and detecting system for correcting an m-bit error and for detecting an (m+1) or more bit error using a Hamming code comprising:

first means for receiving data and for generating a Hamming code comprising a prescribed number of redundant bits and data bits;

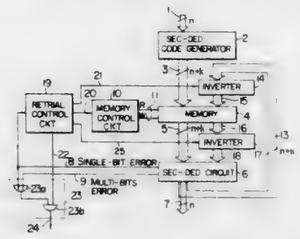
second means, coupled to said first means, for controllably storing said Hamming code;

third means, coupled to said second means, for correcting the bit error in said Hamming code and generating a first indication signal representative thereof in response to the bit error in said Hamming code being an m-bit or less error, and for generating a second indication signal in response to the bit error in said Hamming code being an (m+1) or more bit error;

fourth means, coupled to said third means, for controllably inverting the bit error corrected Hamming code produced by said third means;

fifth means, coupled to said second means, for controllably inverting the Hamming code stored therein;

sixth means, coupled to said second, third, fourth, and fifth means, and responsive to said first indication signal, for controlling said fourth means so that said fourth means inverts the bit error-corrected Hamming code produced by said third means and supplies the inverted-corrected Hamming code to said second means for storage therein,



and for controlling said fifth means so that said fifth means inverts the inverted-corrected Hamming code stored in said second means and supplies the output of said fifth means to said third means; and

seventh means, coupled to said sixth means and coupled to receive said first and second indication signals from said third means, for producing a third indication signal representative of whether or not the operation of said third means has accurately corrected an m-bit or less error in said Hamming code.

4,175,693
METHOD FOR ENHANCING THE RELIABILITY OF OUTPUT DATA FROM A LABEL READER

Sadao Nakanishi; Kazuhiro Suzuki; Nobufumi Tokura, and Shinichiro Endo, all of Ise, Japan, assignors to Shinko Electric Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1978, Ser. No. 891,219
Claims priority, application Japan, Apr. 7, 1977, 52/40141
Int. Cl.[2] **G06K** *7/14, 9/13*
U.S. Cl. 235—463 **4 Claims**



1. A method for enhancing the reliability of the output data from a label reader having a scanner and adapted to read a bar code consisting of a plurality of bars comprising the steps of:

obtaining a set of binary signals, each signal in said set being representative of a particular different point along a particular bar as scanned by the scanner;

forming a first sum equal to the number of binary "1" signals in said set;

forming a second sum equal to the number of binary "0" signals in said set;

computing the ratio (R) of said first sum to said second sum;

providing a binary "1" output decision for the particular bar if $R>(1+\alpha)$ where $\alpha>0$;

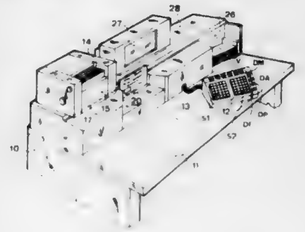
providing a binary "0" output decision for the particular bar if $R>(1-\beta)$ where $0<\beta<1$; and

determining that a reliable output decision cannot be made for the particular bar if $(1-\beta)\leqq R\leqq(1+\alpha)$.

4,175,694
METHOD AND APPARATUS FOR PROCESSING DOCUMENTS

Claude J. Donabin, Angers, France, assignor to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme), Paris, France

Filed Jan. 18, 1978, Ser. No. 870,569
Claims priority, application France, Feb. 3, 1977, 77 02963
Int. Cl.[2] **G06K** *13/00;* **B25J** *3/00;* **B65H** *5/22, 5/12*
U.S. Cl. 235—475 **12 Claims**



1. A method of processing documents which carries information of a first kind identifiable only by the human eye and information of a second kind identifiable by an automatic recognition device, in which method each document is subjected to two recurrent operating phases including an operation involving the reading and transcribing of the information which it carries and an operation involving the recording of fresh data on the document, the method comprising advancing the documents one after another past a first reading station reading the information of the second kind recorded on a given document by an automatic recognition device at said first reading station, advancing the documents to a second reading station, visually reading at said second reading station the information of the first kind carried by the document and transcribing said information of said first kind by means of an encoding device, advancing said documents to a recording station and recording fresh data on a document which was subjected to a reading operation in the course of the two preceding operating phases while simultaneously reading information of the first and second kind on other documents at said first and second stations.

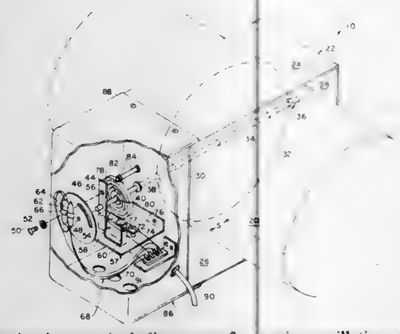
4,175,695
FAIL-SAFE STACK DAMPER CONTROL SYSTEM

Don E. Cresswell, Dubbs Rd., Sparks, Md. 21152

Filed Apr. 14, 1978, Ser. No. 896,482
Int. Cl.[2] **F23N** *3/00*
U.S. Cl. 236—1 G **12 Claims**

1. In a system for use with a furnace, including means for moving a damper in a flue length for isolating furnace from chimney flue during furnace-off cycle, with a bimetallic strip having heating means, and circuit means for enabling furnace operation in damper-open position and for preventing furnace operation in damper-closed position, the improvement comprising: said means for moving including: a control rod diametrally through the flue length mounting the damper coaxially in the flue length and having extension beyond the flue length, means rotatably mounting the control rod, the bimetallic strip being a coil with the inner end having connection to the control rod and the outer end having connection to the flue length

for rotating the control rod from damper-closed position to damper-open position when heated by the heating means, and



the circuit means including means for causing oscillation of the damper proximate the damper-open position.

4,175,696

THERMOSTATIC VALVE

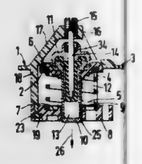
Bernhard W. Braukmann, Mosbach, Fed. Rep. of Germany, assignor to Braukmann Armaturen AG, Rothrist, Switzerland

Filed Nov. 23, 1976, Ser. No. 744,384

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1975, 7537523[U]

Int. Cl.[2] F01P *7/02*

U.S. Cl. 236—34.5 **2 Claims**



1. A thermostatic valve having a working element, a housing enclosing said working element, said housing having a valve seat supported on one side by a yoke and connected on the other side to a plurality of spaced apart holding arms, a guide member for said working element below said valve seat, said plurality of spaced apart arms being attached to said guide member through a corresponding number of slots therein, each of said arms at its free end removed from said valve seat having a claw, each of said slots having a step therein providing a first opening large enough to permit normally disposed passage therethrough of an individual claw and a second opening, communicating with said first opening, to permit lateral passage of the arm supporting said claw on rotation of said arm, thereby resulting in said claw overlying the step in a respective slot, a valve plate above said guide member engageable with said valve seat, and a compression spring mounted on said guide member and bearing against said valve plate, said spring forcing said steps against an individual overlying claw after said arms have been rotated to enter the respective said second openings.

4,175,697

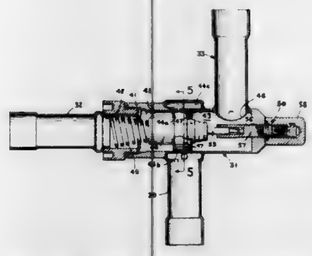
THERMALLY ACTUATED PHASE CHANGE OPERATED CONTROL VALVE FOR USE IN AN ENERGY CONSERVATION SYSTEM

Richard C. Dreibelbis, Fair Lawn, N.J., assignor to Emerson Electric Co. (H&H Precision Products Div.), St. Louis, Mo.

Filed Sep. 1, 1977, Ser. No. 829,777

Int. Cl.[2] G05D *23/00*

U.S. Cl. 236—93 A **7 Claims**



1. A thermally actuated phase change operated valve for controlling flow of fluid comprising:

a. valve body means having walls therein defining a main fluid flow chamber,

b. said valve body means having medially disposed openings through the walls thereof defining first port means, manifold means about said wall means defining a collecting chamber, said first port means connecting said main fluid flow chamber with said collecting chamber,

c. conduit means connected to said valve body means for passing fluid to and from said collecting chamber,

d. said valve body means having second port means and a third port means through the walls thereof respectively disposed on opposite sides of said first port means,

e. at least one other conduit connected to said valve body means for communication with said second port means for passing fluid to and from said main fluid flow chamber,

f. phase change power means freely disposed for sliding movement in said main fluid flow chamber and including, valve head means fixedly connected about the periphery of the medial section of the phase change power means and moveable therewith from an initial calibrated setting relative said first port means,

g. said valve head means having a width less than the width of the openings for said first port means to insure at least a minimum flow of fluid through said main fluid flow chamber at all times and moveable to vary the respective areas of flow through the openings for said first port means to the respective opposite sides of the main fluid flow chamber relative to the valve head means, and

h. said phase change power means operated responsive to variations in temperature of the fluid in said main fluid f flow chamber to move the valve head means to and fro proportional to said variations in temperature for varying the area of the respective openings of the first port means.

4,175,698

METHOD AND APPARATUS FOR CONSERVATION OF ENERGY IN A HOT WATER HEATING SYSTEM

Karl H. Brosenius, Stockholm, Sweden, assignor to Tekram Associates, Inc., North Haven, Conn.

Division of Ser. No. 916,855, Jun. 19, 1978, abandoned. This application Oct. 26, 1978, Ser. No. 954,909

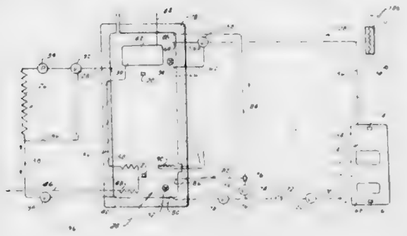
Claims priority, application Sweden, Nov. 11, 1977, 7712275

Int. Cl.[2] F24D *3/00, 3/10*

U.S. Cl. 237—19 **14 Claims**

1. Apparatus for conservation of energy in a hot water heating system of the type comprising a water heating unit and a radiator, the apparatus comprising first and second ports

located near the top and bottom of the unit, respectively; a water storage tank having a capacity greater than the capacity of the unit; third, fourth and fifth ports located near the top, bottom, and a point spaced from the bottom of the tank, respectively; a first conduit operatively connecting said first and third ports, a second conduit operatively connected to said



fifth port, a third conduit operatively connected to said fourth port, valve means operatively connected to said second and third conduits for connecting a selected one of said second and third conduits to said second port, pump means effective, when actuated, to pump water between said unit and said tank and means for connecting said tank to said radiator.

4,175,699

SUPPLEMENTAL AIR CIRCULATOR FOR HOT-AIR FURNACES

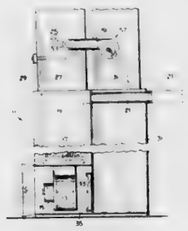
Charles F. Engeling, R.R. #1, Morrisonville, Ill. 62546, and Ralph F. Staubly, 84 Danbury, Springfield, Ill. 62704

Continuation-in-part of Ser. No. 611,357, Sep. 8, 1975, Pat. No. 4,044,950. This application Jul. 12, 1977, Ser. No. 814,899

The portion of the term of this patent subsequent to Aug. 30, 1994, has been disclaimed.

Int. Cl.[2] F24B *7/02*

U.S. Cl. 237—55 **2 Claims**



1. In a forced-circulation air-heating system comprising a conventional fuel-burning hot-air furnace including a hot-air-feed duct system and a cold-air-return duct system, a pipe for conducting flue gases away from said furnace, a first thermostatic switch responsive to the temperature of the space to be heated, fuel-supply means controlled by said first thermostatic switch, a relatively high-power motorized blower for forcing air from said return system through said furnace and to said feed system, an air filter in the air-flow path to and through and from said furnace, a second thermostatic switch located in the hot-air portion of said air-flow path for energizing said high-power motorized blower upon a selected rise in furnace air temperature, the improvement comprising: a relatively low-power motorized blower, and duct means connecting said latter blower so as to force air from said return system into said feed system in bypassing relation to said furnace and its air filter, and means for energizing said low-power motorized blower, whereby during relatively non-heating periods when said high-power motorized blower and said furnace are inactivated, a gentle temperature-stratification-reducing air-flow is produced.

4,175,700

SUPPORT AND/OR LOCATING MEANS FOR RAILS IN RAIL TRACKS

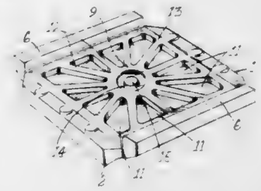
Erich F. Gehrke, Krugersdorp, South Africa

Filed Jun. 10, 1977, Ser. No. 805,455

Claims priority, application South Africa, Jun. 11, 1976, 76/3479; Aug. 26, 1976, 76/5129

Int. Cl.[2] E01B *9/40*

U.S. Cl. 238—299 **5 Claims**



1. A rail pad made of substantially rigid, electrically insulating material and having a rail engaging face and an opposite sleeper engaging face;

said rail pad having a hardness within one of the following ranges of hardness:

(a) 60–80 Shore A,

(b) 62–68 Shore D, and

(c) 60–80 DIN 53456 scale of ball indentation;

said pad having a pair of upstanding, spaced, parallel, rail locating formations on its rail engaging face to operatively receive therebetween a rail foot and having oppositely directed pad locating formations on its sleeper engaging face to operatively co-operate with a sleeper to locate the pad relative to the sleeper;

said pad being provided with a series of recesses in its sleeper engaging face and an unrecessed area outside said recesses;

the unrecessed area of said face being dimensioned to carry an operative load of a required magnitude and the said material being deformable under a predetermined stress to cause said material to flow into said recesses.

4,175,701

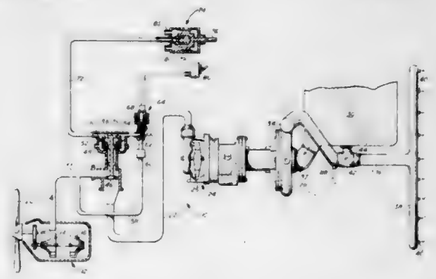
AIRCRAFT SPRAYING SYSTEM AND METHOD

James P. Wojciehowski, and John D. Sullivan, both of Phoenix, Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed May 15, 1978, Ser. No. 905,711

Int. Cl.[2] B05B *17/02*

U.S. Cl. 239—11 **18 Claims**



2. Liquid spraying apparatus for use with an aircraft pow-

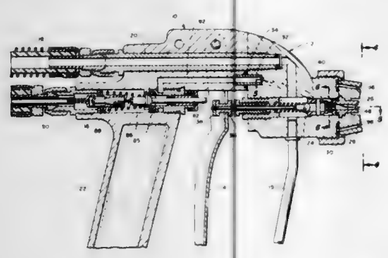
ered by a turbomachinery-type heat engine characterized by the development of a pressurized airflow in the working cycle thereof, said apparatus comprising: an air turbine motor; bleed air duct means for delivering a flow of pressurized bleed air from said working cycle of the engine to said motor to drive the latter; electropneumatic regulating means operably associated with said bleed air duct means for regulating the pressure of said flow of bleed air to said motor to control the speed of said motor; a reservoir for liquid to be sprayed; a liquid centrifugal pump for receiving liquid from said reservoir and discharging a pressurized liquid flow from said pump; and nozzle means receiving said pressurized liquid flow for spraying said liquid from the aircraft at a rate related to the speed of said pump, said pump mechanically driven by said motor whereby said regulating means are operable to regulate said rate of spray of liquid discharged through said nozzle means.

4,175,702

AIR NUCLEATING SPARY GUN

Robert D. Hetherington, Sunland, and David W. Goelz, Burbank, both of Calif., assignors to Poly-Glas Systems, Sun Valley, Calif.

Filed Jan. 6, 1978, Ser. No. 867,654
Int. Cl.[2] B05B *7/08, 15/02*
U.S. Cl. 239—113 **23 Claims**



1. In a spray gun having a handle body with a trigger for controlling the flow of plural components supplied to one or more nozzles the improvement comprising:
a nozzle body attached to said handle body;
a plurality of nozzles attached to said nozzle body, each of said nozzles adapted to spray a separate component;
atomizing means for atomizing one of said components at the outlet to one of said nozzles; and
said atomizing means including deflecting means for creating turbulent flow for mixing said component with forced air before delivery to said nozzle.

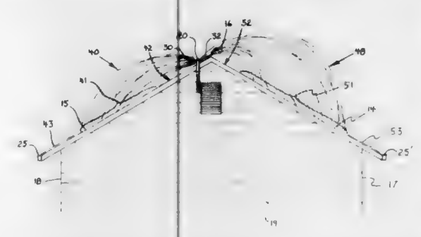
4,175,703

SPRAY COOLING SYSTEM FOR GABLE ROOF

Edgar W. Valiant, Woodstock, Ga., assignor to Spraycool, Inc., Roswell, Ga.

Filed Dec. 9, 1977, Ser. No. 859,168
Int. Cl.[2] B05B *15/00*
U.S. Cl. 239—208 **7 Claims**

1. A spray cooling system for a gable roof (in accordance with claim 1) having inclined first and second roof sections that intersect at a roof summit, said spray cooling system comprising a conduit mounted atop said first roof section adjacent said roof summit adapted to be connected with a supply of liquid coolant, and with said conduit having a first series of ports in a side of said conduit facing said first roof section and a second series of ports facing said roof summit, and wherein said conduit is of generally hollow, cylindrical configuration and is mounted atop said roof first section substantially horizontally (whereby) with a horizontal plane (bisects) bisecting the conduit into upper and lower conduit halves, and wherein said first series of ports is located in said lower conduit half and said second series of ports is located in said upper conduit half, whereby liquid coolant may be sprayed onto the first roof section from the first series of ports and sprayed over the roof



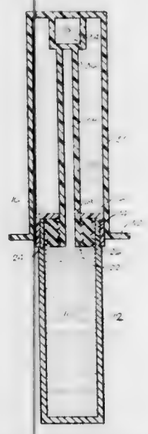
summit upon the second roof section from the second series of ports.

4,175,704

NON-AEROSOL CONTINUOUS SPRAY DISPENSER

Milton J. Cohen, 9201 Persimmon Tree Rd., Potomac, Md. 20854

Division of Ser. No. 658,469, Feb. 17, 1976. This application Sep. 19, 1977, Ser. No. 834,250
Int. Cl.[2] B05B *9/04*
U.S. Cl. 239—320 **14 Claims**



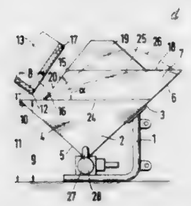
1. A portable hand operated non-aerosol spray device comprising an unsupported elongate container, a plunger slidable within the container in sealing engagement with the side walls of the container, an elongate tubular member having a passage extending continuously therethrough, one end of the tubular member extending through the plunger for communication with the interior of the container, a spray nozzle communicating with the bore at the other end of the tubular member for dispensing liquid material which passes from the interior of the container through the bore of the tubular member to the nozzle in response to decrease in volume occupied by the liquid between the plunger and the bottom of the container, means for effecting relative movement between the plunger and the container limited to the direction towards each other for continued reduction in volume between the plunger and the bottom wall of the container, said means providing a finger grip forming a part of the portable device.

4,175,705

MACHINE FOR THE SPREADING OF MATERIAL IN GRANULAR AND POWDER FORM

Heinz Dreyer, Hasbergen-Gaste, Fed. Rep. of Germany, assignor to Amazonen-Werke H. Dreyer, Hasbergen-Gaste, Fed. Rep. of Germany

Filed May 3, 1977, Ser. No. 793,448
Claims priority, application Fed. Rep. of Germany, May 8, 1976, 2620413
Int. Cl.[2] A01C *17/00;* **B65G** *65/30;* **E01C** *19/20*
U.S. Cl. 239—651 **13 Claims**



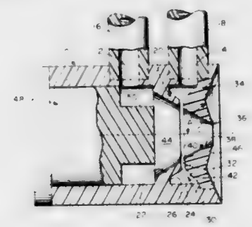
1. A spreader for mounting on a tractor for spreading material in granular and powder form, comprising a hopper-shaped supply container having inwardly, downwardly extending front, side, and rear container walls wherein the front container wall and the side container walls each include an upwardly extending prolongation connected thereto, the prolongations of the side container walls adjoining the prolongation of the front container wall, and the rear edges of the prolongations of the side container walls being inclined forwardly, and distributing means receptive of the material from the container for spreading same during movement of the machine, whereby the carrying capacity of the supply container is increased while an open area is provided above the upper edge of the rear wall and between the side walls for loading of the spreader with said material.

4,175,706

SPRAY NOZZLE

Joseph Gerstmann, Sudbury, Mass., assignor to Scientific Energy Systems Corporation, East Natick, Mass.

Filed Jul. 18, 1977, Ser. No. 816,487
Int. Cl.[2] B05B *7/26*
U.S. Cl. 239—414 **17 Claims**



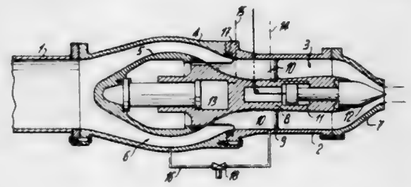
1. A spray nozzle particularly suitable for forming a liquid spray of high droplet uniformity with a low pressure gas comprising:
a nozzle body having therein a tubular chamber of generally circular cross-section, said tubular chamber having an axially extending wall surface;
a discharge orifice at one end of said chamber generally coaxial thereto and provided externally of said chamber with a bounding surface which forms an included angle toward the chamber with the axis of said chamber of less than 110°;
an annular outlet in said axially extending wall surface extending as an annulus about the axis of said chamber;
passage means in said body arranged to supply a flow of liquid to be sprayed to said annular outlet for discharge of the same through said annular outlet into said chamber as an annulus about the axis of said chamber; and
means for directing gas under pressure into said chamber in a flow path past said annular outlet and out said orifice, any wall portions of said chamber defining said flow path between said annular outlet and said orifice being convergent toward said orifice in the direction of flow.

4,175,707

HYDRAULIC INSTALLATION

Pierre Piguet, Onex, Switzerland, assignor to Ateliers des Charmilles S.A., Geneva, Switzerland

Filed May 9, 1978, Ser. No. 904,929
Claims priority, application Switzerland, May 12, 1977, 5931/77
Int. Cl.[2] F01D *9/02*
U.S. Cl. 239—456 **1 Claim**



1. A hydraulic installation for feeding a turbine, comrpising a gate valve and an injector mounted in series in a water inlet conduit, an annular outer casing housing said injector, a nozzle secured to one end of said casing, said injector including a central body, a tip at one end of said central body within said nozzle, a first servo-motor controlling said gate valve, a second servo-motor controlling the tip of the injector, said servo-motors each being disposed in said central body, a single crosspiece securing said central body to said annular outer casing, said crosspiece absorbing the hydraulic forces exerted on the gate valve as well as those exerted on the injector.

4,175,708

METHOD OF TRANSPORTING LIQUID PITCH CONTAINING LUMPY COKES AND APPARATUS THEREFOR

Naoshi Kawabe; Hisatsugu Kaji; Naotaka Miwa, all of Ichihara; Hajime Nakanishi, Fujisawa; Fumiaki Tanaka, Sagamihara, and Tatsuya Inoue, Yokohama, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1978, Ser. No. 870,804
Claims priority, application Japan, Jan. 27, 1977, 52-7304
Int. Cl.[2] B02L *23/00*
U.S. Cl. 241—16 **8 Claims**



1. A method of transporting liquid pitch containing lumpy

coke produced upon thermal cracking of heavy petroleum oil or coal tar in a reactor, which comprises the steps:

(a) introducing the liquid pitch removed from the reactor into a reception vessel provided with internal means for pulverizing solids, with a side discharge outlet having means for filtration, and with a bottom opening beneath said pulverizing means;

(b) filtering a first portion of the liquid pitch in the reception vessel and removing the filtrate from the vessel through the side discharge outlet;

(c) pulverizing the lumpy coke in the vessel and removing the pulverized coke with a second portion of liquid pitch, as a slurry, through the bottom opening; and

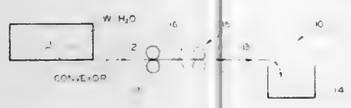
(d) mixing the filtrate and the slurry containing the pulverized coke and feeding the resultant mixture to the suction side of a pump.

4,175,709

METHOD AND APPARATUS FOR SEPARATING FIBERS FROM AGGLOMERATED MASSES THEREOF

Stephen J. Fraenkel, Winnetka, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Mar. 20, 1978, Ser. No. 888,233
Int. Cl.² B02C *4/30*
U.S. Cl. 241—21 **10 Claims**



1. In an apparatus for separating fibers from an agglomerated mass thereof:

(a) at least one pair of rolls having roll surfaces of elastomeric material and arranged to rotate along roll axes to cause said surfaces to move into conjugacy and engage the fiber masses in the nip of said rolls;

(b) each of said rolls having randomly dispersed protuberances thereon which are distorted in random fashion as the roll surfaces move into conjugacy;

(c) said protuberances having initial deformations existing prior to the protuberances moving into conjugacy and being caused by the presence of masses of said fibers;

(d) said protuberances having further deformations causing slipping between the surfaces of the protuberances as they undergo further deformation by the movement into conjugacy to induce shearing and tearing action of said fiber masses and to separate discrete fibers from said masses.

4,175,710

HIGH PERFORMANCE SHREDDER APPARATUS

Steven J. Robertson, 209 Oak St., Cocoa, Fla. 32922

Filed Aug. 11, 1977, Ser. No. 823,649
Int. Cl.² B02C *18/22*
U.S. Cl. 241—55 **9 Claims**

1. A shredder apparatus comprising

a housing having side walls and a circumferential end wall defining a hollow chamber,

a rotor located in said chamber,

a plurality of shred heads located on said rotor,

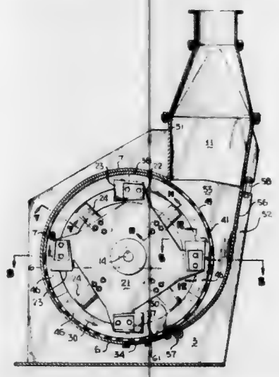
a replaceable ripper screen comprising an arcuate member having a plurality of openings therethrough,

said ripper screen being located along the path of movement of said shred heads and spaced outwardly therefrom by a distance such that objects located between said shred heads and said ripper screen are crushed and torn,

a liner lying adjacent and generally in contact with said ripper screen along the side thereof remote from said shred heads,

a plurality of side wear liners located along said side walls and spaced inwardly from said end wall to define grooves along each side of said chamber, said liners and said ripper screen having edges located in and retained in said grooves, and

a door providing access to said hollow chamber,



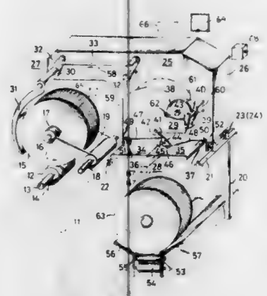
said door having a surface defining one of said side walls whereby upon opening said door said ripper screen may be removed.

4,175,711

DEVICE FOR WITHDRAWING AND TRANSPORTING A WOUND COIL AWAY FROM A WINDING DEVICE FOR TEXTILE FILAMENTS

Heinz Kamp, Rickelrath, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Mönchengladbach, Fed. Rep. of Germany

Continuation of Ser. No. 626,266, Oct. 28, 1975, abandoned.
This application Apr. 18, 1977, Ser. No. 788,160
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1974, 2451001
Int. Cl.² B65H *54/20, 54/26*
U.S. Cl. 242—35.5 A **7 Claims**



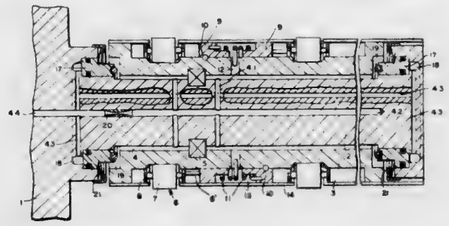
1. Device for withdrawing and transporting a wound coil away from a winding device for textile filaments comprising a traveling coil exchanging device for sequentially servicing a plurality of winding devices, said coil exchanging device including means for withdrawing a wound coil from a respective winding device, coil storage and delivery means for storing therein the coil withdrawn from the respective winding device, said coil storage and delivery means including a closure device secured on said traveling coil exchanging device against vertical displacement relative thereto and openable in a downward direction for discharging the wound coil therefrom, said coil storage and delivery means comprising a mechanism for opening the same to discharge the wound coil stored therein, and including a timing mechanism for controlling said withdrawing means and means actuable by the weight of a wound coil in said coil storage and delivery means for initiating operation of said opening mechanism.

4,175,712

CHUCKING SPINDLE FOR THE RECEPTION OF A BOBBIN CARRIER

Heinz Schippers, and Erich Lenk, both of Remscheid, Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik Ag, Remscheid-Lennep, Fed. Rep. of Germany

Filed May 3, 1978, Ser. No. 902,386
Claims priority, application Fed. Rep. of Germany, May 4, 1977, 2719853; Switzerland, Apr. 17, 1978, 4087/78
Int. Cl.² B65H *54/54*
U.S. Cl. 242—46.4 **12 Claims**



1. In a thread winding device of the type wherein a chucking spindle adapted for the reception of a removable bobbin carrier is turnably borne on an arm extending from the frame of the machine, and a plurality of clamping places are axially distributed about the outer circumference of the chucking spindle which have clamping elements disposed therein, said clamping elements being radially movable between an extended position in which the bobbin carrier is secured to the chucking spindle and a retracted position in which the bobbin carrier is released to freely slide over said chucking spindle, the improvement comprising:

an actuating means for moving said clamping elements into their retracted position by creating a thrust component which is axially parallel to the axis of said chucking spindle, said actuating means including an annular piston ring which is slidably mounted on and about said chucking spindle and will rotate therewith, a cylinder space into which compressed air is forced to actuate said annular piston ring, said cylinder spaced being arranged behind said piston ring and bounded by said chucking spindle outer circumference and a mantle shell which is arranged coaxially to said chucking spindle, and a compressed air feed channel leading from the frame of said device into a hollow space in the chucking spindle, said hollow space then being connected with said cylinder space by means of bores formed in said chucking spindle.

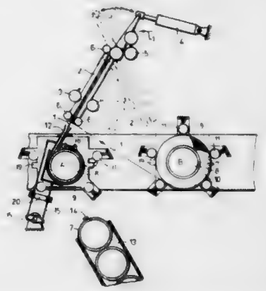
4,175,713

CONTINUOUSLY OPERATING AUTOMATIC STRIP WINDING DEVICE

Willi Jores, Leverkusen, Fed. Rep. of Germany, assignor to AGFA-Gevaert, A. Ktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 9, 1978, Ser. No. 914,053
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1977, 2726856
Int. Cl.² B65H *19/26, 19/30*
U.S. Cl. 242—56 R **4 Claims**

1. An automatic strip-winding device for continuously winding a plurality of strips into completed rolls comprising pivotal winding heads, winding starting devices for the strips and depositing devices for the completed rolls, characterized in that there is provided for each of the strips a pivotal threading device with a cutting device thereon and conducting and pressure rollers for supplying running lengths of the strips, two similar winding heads arranged side-by-side at stations A and B with winding motors, a winding starting sleeve at each of stations A and B, tube supply means for providing empty winding tubes to the winding heads, axial moving means on each of the sleeves for applying it over the winding heads and tube to start the winding means for pivoting the threading device between a first position at the first station to first conduct the strip into the sleeve to start it winding on the tube, a second central position between the first and second stations to allow winding the roll completely at the first or second and a third position at the second station shortly before completion of the winding on the winding head at the first station wherein after cutting the strip by means of the cutting device, the strip for the next roll is conducted into the sleeve at the second station to be wound up on the winding head, means to hold the



completed roll together to fix the end of the strip on the circumference of the roll, the winding motors each being mounted on a pivot shaft, a conveyor belt disposed adjacent the first and second stations, means to pivot the winding heads approximately 180° around the shaft of the winding motor to bring a completed roll over the conveyor belt, lifting means connected to the conveyor belt for lifting it against the winding head carrying the completed roll to receive the roll and to lower and carry away the completed roll, the tube supply means including means to take up a new winding tube and apply it to the winding head, whereby after unloading the completed roll the winding head is pivoted approximately 180° C. to the winding and starting position again, the threading device is brought to the second central winding position for completing the winding at the second station and shortly before finishing the roll at the second station is brought to the first position to repeat the winding in an alternating manner.

4,175,714

METHOD AND APPARATUS FOR REELING A PLURALITY OF RIBBONS

George L. Dreher, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed May 18, 1978, Ser. No. 907,186
Int. Cl.² B65H *17/08, 17/24, 35/02, 35/04*
U.S. Cl. 242—65 **5 Claims**

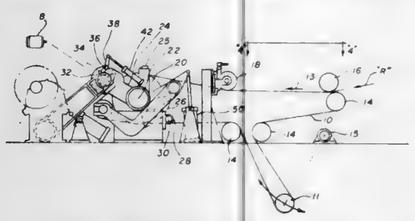
1. Apparatus for simultaneously reeling a plurality of traveling ribbons onto a spool comprising, in combination:

a reel including a rotatably mounted drum and a movable pair of primary arms for receiving a spool and selectively positioning the spool circumferentially about the drum and into nipping engagement therewith;

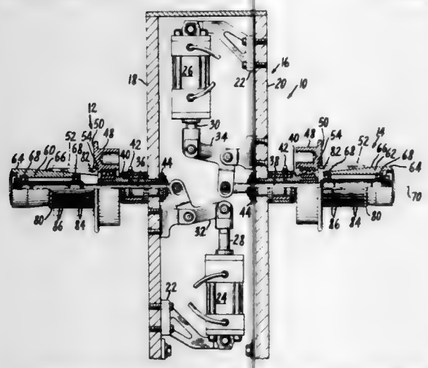
a motor operatively connected with the drum for rotatably driving the drum;

a conveyor for receiving a plurality of traveling ribbons, said conveyor comprising a belt looped about the drum whereby the plurality of ribbons are conveyed over the

drum and into proximity with the spool positioned about the drum surface;
means for selectively moving the conveyor into a first position about the spool for urging the traveling ribbon into initial reeling engagement with the spool and into a second position whereby the ribbons are conveyed over the drum while being wound onto the spool;
a pair of secondary arms movably mounted about the drum for receiving the spool wrapped with ribbons from the primary arms and removing the spool from proximity with the drum.

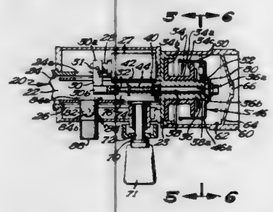


4,175,715
QUICK CHANGE SPINDLE MANDREL
Robert H. Raynor, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.
Filed Nov. 13, 1978, Ser. No. 959,849
Int. Cl.[2] B65H *75/18, 17/02*
U.S. Cl. 242—72.1 **5 Claims**



1. In spindle apparatus for mounting a reel for winding and unwinding of web material on and off said reel, said apparatus including
a shaft slidable along a fixed axis,
a wedging core fixed to said shaft and concentric with said fixed axis, and
an expandable-contractable mandrel encircling said wedge core and on which said reel is received, sliding of said shaft in one direction effecting movement of said wedging core into contact with said mandrel for expanding same against said reel, sliding of said shaft in an opposite direction effecting movement of said wedging core out of contact with said mandrel for allowing same to contract, the improvement wherein said mandrel comprises
a hollow cylindrical sleeve having an external flange at one end, the sleeve being further characterized by the presence of a plurality of axially directed slits therein extending circumferentially uniformly spaced around the sleeve, adjacent ones of said slits extending from opposite tip ends of said sleeve in the direction of the other sleeve end and terminating closely adjacent to but spaced from the said other sleeve end, the slits intervening a like plurality of ribs in said sleeve, each rib having connecting structure at one end thereof integral with the succeeding next adjacent rib in said plurality and connecting structure at the other end thereof integral with the preceding next adjacent rib in said plurality.

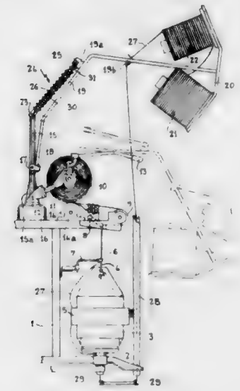
4,175,716
AUTOMATIC SPIN CAST REEL
James R. Reichow, 2912 N. 82nd Cir., Brooklyn Park, Minn. 55444
Filed Apr. 19, 1978, Ser. No. 897,788
Int. Cl.[2] A01K *89/01*
U.S. Cl. 242—84.2 A **9 Claims**



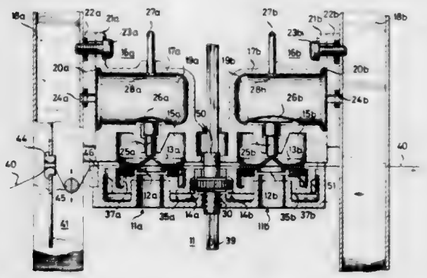
1. An automatic cast fishing reel comprising;
a spool for windably storing fishing line,
means for winding fishing line upon said spool,
said winding means being moveable between a winding position such that the fishing line may be wound upon said spool and a casting position whereby the line is free to unwind during a cast, said winding means being normally in said winding position; and
switching means for moving said winding means between said winding position and said casting position, said switching means being sensitive to the angular orientation of said reel and operative upon movement of said reel to a predetermined angular position relative to the horizontal during casting to move said winding means from said winding position to said casting position to free line for casting, and at least part of said switch means being rotatably mounted to said reel and such that it may be rotated relative to said reel in the plane in which casting takes place in order to adjust said predetermined angle.

4,175,717
OVERHEAD CREEL FOR TWISTING MACHINES
Henri Mathiolon, 18 Rue de Tourvielle, 69005 Lyon, and Simon Charbonnier, 10 Rue Louis Thevenet, 69004 Lyon, both of France
Filed Apr. 21, 1978, Ser. No. 898,594
Claims priority, application France, Mar. 2, 1978, 78 06589
Int. Cl.[2] B65H *49/02*
U.S. Cl. 242—131 **10 Claims**

1. A creel for supporting bobbins on a continuous thread twisting machine of the type having a frame and a twisting spindle, the creel comprising:
a bobbin holder plate;
plate support means mounted on the frame of the machine and supporting the plate, the support means being moveable between an operating position in which the bobbin holder plate is elevated above the spindle, and a loading position in which the bobbin holder is lowered to approach the level of the spindle; and
means for locking the plate support means selectively in said operating position or in said loading position, said locking means comprising telescoping slide elements respectively connected to the frame of the machine and to the plate support means, and releasable catch means connected to the slide elements and automatically engaging when the plate support means reaches either one of the positions to latch the slide elements to prevent movement of the plate support means toward the other position.



4,175,718
THREAD BRAKE
Josef Derichs, and Gerhard Koslowski, both of Mönchen Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., München Gladbach, Fed. Rep. of Germany
Filed Dec. 26, 1978, Ser. No. 973,531
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1977, 2758335
Int. Cl.[2] B65H *59/22*
U.S. Cl. 242—150 R **3 Claims**



1. Thread brake comprising a lower dish and upper dish, said dishes having confronting surfaces for engaging a thread passing therebetween, a device for applying a load with adjustable pressure to said upper dish for biasing said upper dish towards said lower dish, said device comprising a chamber, an elastic container of variable volume received in said chamber, and a central compressed-gas supply connected to said elastic container, said elastic container being of such size in nonpressurized condition thereof that, upon being pressurized, the elastic wall thereof is not stretched, and plunger means for transmitting the pressure from said elastic container to said upper dish, said plunger means extending through an opening formed in a wall of said chamber and having a contact surface of predetermined size directed against said elastic container.

4,175,719
MICROFILM CASSETTE MODULE
Lawrence Speckman, Westland, Mich., and Jack Beery, Fairport, N.Y., assignors to Burroughs Corporation, Detroit, Mich.
Filed Mar. 17, 1978, Ser. No. 887,594
Int. Cl.[2] G03B *23/02*
U.S. Cl. 242—197 **5 Claims**

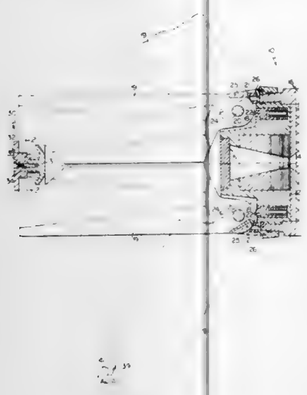


1. An assembly for housing strip material comprising:
a first cartridge;
a second cartridge;
connecting means for detachably connecting said first cartridge to said second cartridge in a connected position along an axis of the assembly, said axis being perpendicular to a plane formed by the junction of said first and second cartridges and extending through a pivot point, each of said first and second cartridges having a base plate and a cover plate fastened together to define each of said cartridges, said connecting means pivotably connecting said base plates together at said pivot point to allow each of said cartridges to rotate about said axis at said pivot point;
fastener means for detachably fastening each of said cover plates to said corresponding base plate;
a first projecting member connected to said first cartridge and perpendicular to said axis; and
a second projecting member connected to said second cartridge and perpendicular to said axis, said projecting members being spaced from said axis to locate a portion of a strip material to extend parallel to and spaced from said axis between said first and second projecting members.

4,175,720
RETAINER/RELEASE MECHANISM FOR USE ON FIN STABILIZED GUN FIRED PROJECTILES
W. Dale Craig, King George, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Apr. 5, 1978, Ser. No. 893,635
Int. Cl.[2] F42B *13/32*
U.S. Cl. 244—3.28 **2 Claims**

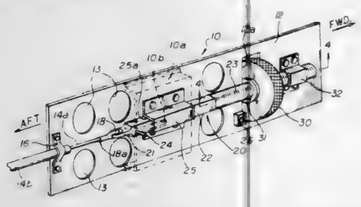
1. A retainer and release mechanism for the centrifugally deployed fins on a fin-stabilized, gun-launched, guided projectile and operable from the forces of projectile launch comprising:
a fin latch of generally cylindrical configuration provided with a plurality of circumferentially spaced notches adapted to engage similarly configured notches formed in the inner edges of the projectile fins thereby defining a plurality of inclined plane mating surfaces sloping inwardly in the forward direction toward the projectile axis, the mass of said fin latch being sufficient when acted upon by the set back or inertial forces of gun launch to hold the notches engaged and retain the fins within the projectile diameter against the urging of centrifugal forces on the fins due to projectile spin during travel down the gun tube, the mass being insufficient to retain the fins when the set back force ceases upon exit of the projectile from the

gun tube whereby centrifugal forces still acting on the fins will cause the fin latch to slide forward along the inclined planes until the notches disengage and the fins are able to complete centrifugal deployment while the fin latch falls away; and



means for retaining said fin latch in engagement with the fins during stowage and handling, said retaining means being designed to fail when set back forces are first applied during launch thereby releasing said fin latch.

4,175,721
TRIM TAB CONTROL MECHANISM
Bernard J. Lempa, Jr., 8422 Carvel St., Houston, Tex. 77036
Filed Jun. 30, 1977, Ser. No. 811,907
Int. Cl.[2] B64C *13/04, 13/30*
U.S. Cl. 244—83 F **9 Claims**



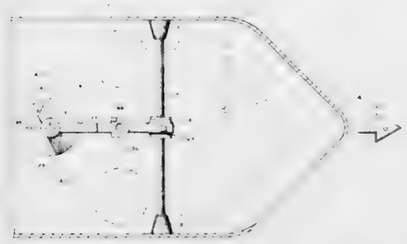
1. Apparatus for controlling the movement and position of the trim tab of an aircraft having a cockpit therein comprising:
elongated stabilizer means mounted in said cockpit of said aircraft for reciprocal forward and aft movement and having a threaded portion and a portion of substantially square cross-section thereon, said square portion being mounted in a bracket having a substantially square opening so as to permit said forward and aft movement of said stabilizer means but preventing rotation thereof;
cable means connecting said stabilizer means to said trim tab for said movement and positioning thereof in response to said reciprocal movement of said stabilizer means; and
a control member threadedly engaging said threaded portion of said stabilizer means and manually engageable and rotatable from inside said cockpit for translating rotation of said control member to said reciprocal movement of said stabilizer means.

4,175,722
CONTROL SYSTEM FOR RAM AIR GLIDING PARACHUTE
Michael W. Higgins, 6431 Oakhurst Pl., Dayton, Ohio 45414
Filed Mar. 30, 1978, Ser. No. 891,877
Int. Cl.[2] B64D *19/00, 17/02, 17/18*
U.S. Cl. 244—152 **2 Claims**



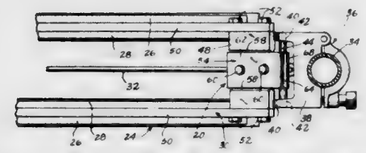
1. In combination with a ram air parachute for supporting a load and having an airfoil shaped canopy with a first fabric layer forming the upper surface of the airfoil shaped canopy and a second fabric layer spaced from the first layer and forming the bottom surface of the airfoil shaped canopy; a plurality of fabric layers interconnecting the first fabric layer and the second fabric layer and dividing the space between the first and second fabric layers into a plurality of channels with the number of channels on one side of a centerline passing through the center of the canopy and the center of the load being equal to the number of channels on the other side of said centerline; said channels being closed at the rearward end of the canopy and having ram air inlets at the forward end of the canopy; a system for inducing turning moments in said canopy, comprising: means, in the upper surface of said canopy, for selectively reducing the lift to drag ratio of said canopy on one side of said centerline and means, in the upper surface of said canopy, for selectively reducing the lift to drag ratio of the upper surface of the canopy on the other side of said centerline; said means for selectively decreasing the lift to drag ratio on the upper surface of the airfoil on one side and the other side of said centerline including means for providing a plurality of first porous areas in the upper surface of said canopy on one side of said centerline and a plurality of second porous areas in the upper surface of said canopy on the other side of said centerline; non-porous closure elements within said channels for covering said porous areas; means for holding said closure elements over said porous areas; means for selectively opening the closure elements on one side of said centerline and means for selectively opening the closure element on the other side of said centerline; said closure elements comprise a plurality of flap elements secured to the bottom surface of said first fabric layer adjacent the porous areas and on the ram air inlets side of the porous areas; said means for holding the closure elements over said porous areas including resilient means secured to said flap elements and to the first fabric layer on the side of said porous areas remote from said ram air inlets; said means for selectively opening the closure elements including a plurality of control lines passing through the second fabric layer, with each of the control lines having one end attached to one of said flap elements adjacent the position where the resilient means are secured.

4,175,723
METHOD AND APPARATUS FOR NEUTRALIZING THE EFFECT OF ACCELERATING AND DECELERATING FORCES
Frederick L. Shea, Jr., Johnson City, Tenn., assignor to Great Lakes Carbon Corporation, New York, N.Y.
Filed Apr. 3, 1978, Ser. No. 892,998
Int. Cl.[2] B64G *1/00;* **B64D** *11/06*
U.S. Cl. 244—162 **4 Claims**



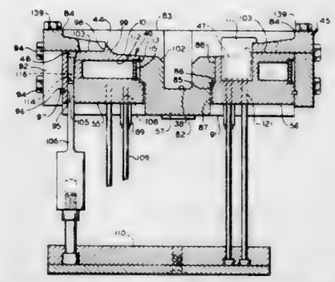
1. In a flight or space travel vehicle developing extreme forces of acceleration, a first means to orient one or more occupants of said vehicle in form-fitting restraints effective in all axes such that an imaginary Z-axis parallel to the spinal column and through the center of mass of cross-section of the body and the head perpendicular to the Z-axis is oriented normal to the resultant of said forces of acceleration at any time that a predetermined level of said forces is exceeded, with second means to rotate said occupants about said Z-axis, said first means comprising a rigid axle transverse to the longitudinal axis of said vehicle, a first swivel joint with a rigid extension angularly movable through 360° in a first plane normal of said axle being mounted on said axle, on said rigid extension a second pin swivel joint angularly movable through 180° in a second plane coincident with and in the plane of said axle, a personnel carrier with said form-fitting restraint dependent from said second pin swivel joint, a means for rotating said personnel carrier about said Z-axis, the whole having freedom of movement such that said Z-axis is automatically positioned normal to the resultant of said forces of acceleration, and said personnel carrier is rotated about said Z-axis at any time that a predetermined level of said resultant of forces of acceleration is attained.

4,175,724
SPRING CLIP BREAK-AWAY
Robert S. Bauman, St. Charles, Mo., assignor to St. Louis Die-casting Corporation, Bridgeton, Mo.
Filed Aug. 1, 1977, Ser. No. 820,813
Int. Cl.[2] B63H *21/26;* **F16M** *1/02*
U.S. Cl. 248—642 **17 Claims**



1. A boat motor retracting device having a plurality of support arms, said support arms extending between the boat and the boat motor, at least one yieldable attachment means securing the boat motor to a support arm, said yieldable attachment means including a spring means and a pin means, said spring means comprising two opposing members, each member having an arcuate section defining a recess, said recesses cooperating to yieldably retain the pin means, and means to maintain said spring means aligned with said pin means as said yieldable attachment operates to thereby minimize the force applied to said spring means.

4,175,725
BATTERY STRAP AND POST CAST-ON MULTI USE MOLD
John D. Cattano, Castalia, Ohio, assignor to Dale Products, Inc., Fremont, Ohio
Filed Nov. 10, 1977, Ser. No. 850,100
Int. Cl.[2] B22D *9/06, 9/08, 19/04, 23/04*
U.S. Cl. 249—81 **13 Claims**

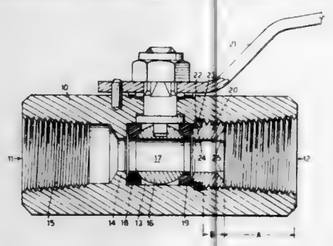


1. A mold assembly for casting straps and posts on plates of lead-acid storage batteries, comprising a base having an upper surface provided with an elongate channel defined by side-wall portions and having a molten metal receiving region cooperating with said elongated channel and a molten metal exit region spaced from said receiving region cooperating with said elongate channel, said channel being adapted to be selectively blocked, by blocking means associated with said exit region, to the flow of molten metal downstream of said receiving region to cause the flowing metal introduced at said receiving region to overflow the side wall portions of said elongate channel; an insert associated with said base having a generally horizontal upper surface and having a hollow interior beneath said generally horizontal upper surface; means maintaining said insert in molten metal tight relationship to said base adjacent said channel with said upper surface of the insert in molten metal overflowing relationship to said channel side wall portions; means operatively associated with the insert for introducing a coolant fluid into the hollow interior of said insert; a mounting surface on said insert; an adapter member separably mounted on said mounting surface of said insert in molten metal tight relationship to said mounting surface, said adapter member having a top surface higher than said mounting surface of said insert when mounted thereon and provided with cavities located in the top surface thereof, said upper surface of said insert having a plurality of cavities adapted to be filled by overflowing metal from said channel; and a perimeter dam associated with said adapter member surrounding said cavities in said insert and adapter member and said channel in said base for containing said overflowing molten metal on said upper and top surfaces.

4,175,726
BALL VALVE AND SEAL
Cecil G. Richards, Aspley, Australia, assignor to B.C. Richards & Co. Pty. Ltd., Geebung, Australia
Filed Aug. 8, 1977, Ser. No. 822,943
Claims priority, application Australia, Aug. 6, 1976, PC6904
Int. Cl.[2] F16K *5/06*
U.S. Cl. 251—315 **1 Claim**

1. A ball valve of the type having a body; a ball chamber in the body; inlet and outlet passages in the body; the inlet passage leading to, and the outlet passage leading from, the ball chamber; a diametrically apertured ball in the ball chamber;

means for rotating the ball to open or close the way from the inlet passage to the outlet passage; a pair of sealing rings engaging the ball about the inlet and outlet passages; an annular insert threadedly engaged in the outlet passage and adapted to be screwed into the outlet passage towards the ball to force the sealing ring in said outlet passage into firm engagement with the ball, said annular insert being substantially cylindrical and engaged in a cylindrical threaded inner part of the outlet passage, the outer part of the outlet passage being formed with an internal tapered thread tapering towards the said cylindrical threaded inner part of the outlet passage; a peripheral annular rebate at the axially inner end of the annular insert, the rear



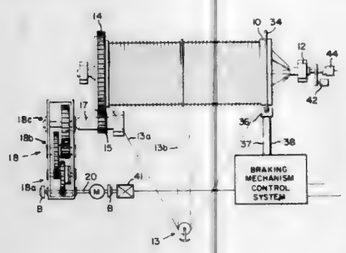
face of said rebate forming a radially extending contact surface; an annular groove formed in said body about the inner part of said outlet passage; and a deformable ring positioned partly in said peripheral rebate and partly in said annular groove, the front face of said deformable ring, when said annular insert is in an assembled position, contacting the front face of said groove and the outer peripheral edge of the rear face of said sealing ring in said outlet passage, and the rear face of said deformable ring contacting the radial rear face of said rebate thereby to provide solid line contact at both the front and rear faces of said deformable ring to provide a fluid tight seal.

4,175,727

SINGLE FAILURE PROOF CRANE

Charles W. Clarke, Seattle, Wash., assignor to Ederer Incorporated, Seattle, Wash.

Filed Mar. 6, 1978, Ser. No. 883,531
Int. Cl.² B66D *1/48*
U.S. Cl. 254—173 R **14 Claims**



1. A safety system for a hoisting crane having a drum, a cable on the drum, a high-speed motor, a load drive train coupling the motor to the drum, said load drive train including a speed reduction unit, the improvement comprising:

emergency holding means for stopping instantaneously rotation of the drum, said holding means being located outside of the load drive train so that the drum will not rotate where a failure occurs in any portion of the load drive train,

said speed reduction unit having at least higher-speed and lower-speed reducing stages, passive energy-absorption torque-limting means located in and comprising a part of the higher-speed stage for allowing continued movement of the higher-speed stage and motor when the drum is stopped by the holding means and for dissipating the kinetic energy of the higher-speed stage and motor until the motor and higher-speed stage are brought to rest,

means for detecting a failure of said load drive train,

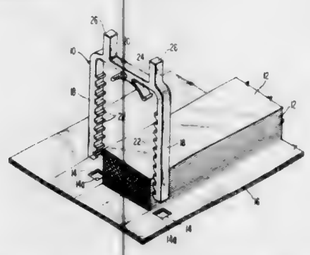
means for engaging the holding means in response to said detecting means when a failure condition is detected.

4,175,728

ADJUSTABLE CABLE CLAMP FOR USE WITH BELTED CABLES

Thomas R. Ferguson, Levittown, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 1, 1979, Ser. No. 8,610
Int. Cl.² B25B *5/14*
U.S. Cl. 269—91 **7 Claims**



1. A clamp for use with at least a single belted electrical cable routed between a pair of apertures formed in an equipment chassis comprising:

a substantially U-shaped structure including a pair of legs and a base, said base supporting said legs in substantial orthogonal relationship therewith and in parallel spaced-apart relationship with each other, said pair of legs having respective pluralities of homologously disposed teeth on opposed inner surfaces thereof,

a spring member disposed on the inner surface of said base between said pair of legs,

a pair of spaced-apart projectons disposed on the outer surface of said base,

said pair of legs being adapted to be inserted respectively in said pair of apertures formed in said chassis and to be advanced in the direction of said cable until said spring member is in firm contact therewith, said chassis then being forcibly engaged by corresponding teeth in the respective pair of legs, the subsequent removal of said clamp being effected by the movement of said pair of projections toward each other and the resultant disengagement of said teeth with said chassis.

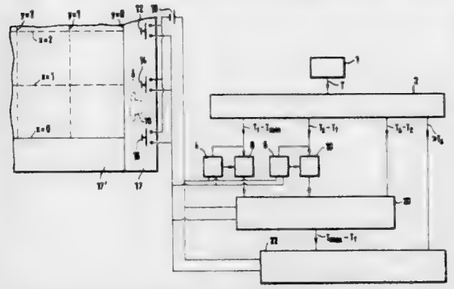
4,175,729

METHOD AND APPARATUS FOR PRODUCING METAL BLANKS, IN PARTICULAR STEEL SLABS, WHICH AT LEAST IN A PREDETERMINED SURFACE AREA HAVE SUBSTANTIALLY NO DEFECTS

Per-Olle Karlsson, Oxelösund, Sweden, assignor to Svenskt Stal Aktiebolag, Sweden

Division of Ser. No. 677,070, Apr. 15, 1976, Pat. No. 4,138,277.
This application Jan. 13, 1978, Ser. No. 869,291
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1975, 2558966
Int. Cl.² B23K *7/06*
U.S. Cl. 266—51 **10 Claims**

1. Apparatus for producing metal blanks, in particular steel slabs, which at least in a predetermined surface area have substantially no defects therein, at least a surface portion to be made free of defects being divided by a coordinate system into coordinate fields and, at least one inspecting means for systematically and substantially completely scanning the coordinate fields for detecting defects and the depth thereof occurring within respective coordinate fields and/or within adjacent coordinate fields, means for classifying the detected defects into a plurality of depth classes, means responsive to the maximum defect depth or maximum defect depth class determined for at least one coordinate field for controlling the working depth of a working means for removing the detected defects, means for detecting the number of defects and the depth thereof occurring within a coordinate field and/or within



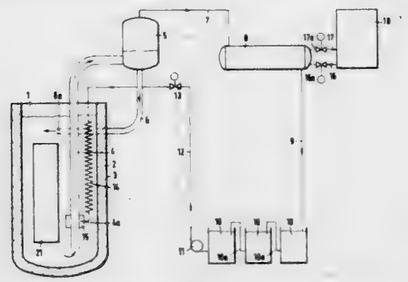
adjacent coordinate fields, and means for marking at least a portion of the coordinate field or adjacent coordinate fields of the surface portion of the metal blank when the detected number of defects exceeds a predetermined defect minimum number and/or for changing the weighting accorded the detected defects with respect to a single defect in the classification of at least one selected maximum defect depth or maximum defect depth class when the detected number of defects of the at least one maximum defect depth or maximum defect depth class exceeds a predetermined minimum number of defects.

4,175,730

DEVICE FOR COOLING A QUENCHING BATH OF MELTED SALT

Berthold Kranz, Duren, Fed. Rep. of Germany, assignor to Firma Carl Canzler, Düren, Fed. Rep. of Germany

Division of Ser. No. 593,256, Jul. 7, 1975, Pat. No. 4,072,298.
This application Feb. 3, 1978, Ser. No. 874,814
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1974, 2433539
Int. Cl.² C21D *1/64, 1/66*
U.S. Cl. 266—120 **9 Claims**



1. A device for cooling a treatment bath of melted salt into which heat is being introduced by the work or substance which is being treated therein, as when hot workpieces are quenched, for example, the salt bath cooling device comprising in combination:

a treatment tank holding therein said treatment bath of melted salt;

means associated with said tank for heating and initially melting the salt for said treatment bath;

a circulation pipe mounted in such a way in relation to the treatment tank that the pipe has a lower open end immersed in the salt bath and an upper end portion leading out of the salt bath to a level above the latter;

an expansion tank communicating with the upper end of the circulation pipe;

a return pipe running from the expansion tank to the treatment tank;

a condensation tank connected to the expansion tank by means of a steam conduit, and including means for cooling and condensing a medium flowing through the condensation tank;

condensate recirculation means establishing a flow connection between the condensation tank and the bottom portion of the circulation pipe inside the treatment tank;

means for adjusting the condensate flow rate in the condensate recirculation means; and

heat exchanger means associated with said condensate recirculation means for heating a medium flowing therethrough; and wherein

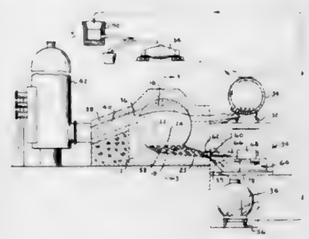
the recited constituent parts of the salt bath cooling device are adjusted to cooperate in such a way that a primary cooling medium, having a vaporization temperature which is considerably lower than the normal temperature of the melted salt, when flowing through the condensate recirculation means to the treatment tank, is partially evaporated by said heat exchanger means, prior to entering said circulation pipe at its bottom portion, thereby coming in direct contact with the salt bath and evaporating in its entirety, while moving upwardly inside said circulation pipe to said expansion tank and entraining with it a flow of melted salt, and this melted salt flow is separated from the gaseous cooling medium in the expansion tank, returning to the treatment tank via said return pipe, while the cooling medium flows through said steam conduit to the condensation tank, where it is condensed, prior to re-entering the condensate recirculation means.

4,175,731

METHOD AND MEANS FOR UTILIZING WASTE HEAT OF MOLTEN SLAG

John S. Overdeck, 425 McKinley, Hobart, Ind. 46342, and John M. Overdeck, 9650R Covered Wagon Dr., Laurel, Md. 20810

Filed May 12, 1975, Ser. No. 576,350
Int. Cl.² C21B *3/04*
U.S. Cl. 266—142 **10 Claims**



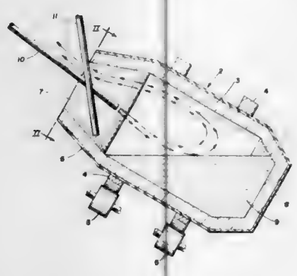
1. A waste heat and molten metal recovery system comprising:

a molten slag producing apparatus;

a reservoir basin for said molten slag, said basin comprising end walls, side walls, a floor, and a cover, a slag discharge opening in one of said end walls of said basin, said floor being slanted upward toward said slag discharge opening, a plugged aperture in a side wall of said basin at the nadir of said floor slant, and a slag entry aperture in said side wall of said basin elevated above the level of said slag

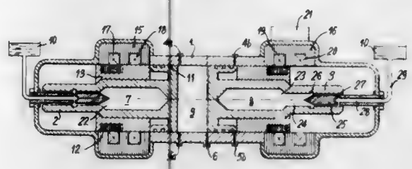
discharge opening and adjacent the other end wall of said basin;
a slag conveying means exterior of said basin at said slag discharge opening of said basin;
a heat utilizing apparatus exterior of said basin;
a heat insulated passageway connecting said basin and said heat utilizing apparatus and communicating the interior of said basin above said slag discharge opening with said heat utilizing apparatus;
track means between said slag producing apparatus and said slag entry aperture of said basin;
a second track means extending from said first mentioned track means to below said plugged aperture of said basin; and
a vessel movable on said first and second track means for receiving molten slag from said slag producing apparatus and discharging said molten slag through said slag entry aperture into said basin, and for receiving molten metal from said plugged aperture when unplugged.

4,175,732
MELTING OF FINE PARTICULATE MATERIAL IN A HIGH-SPEED ROTARY FURNACE
Louis H. Jaquay, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.
Division of Ser. No. 764,083, Jan. 31, 1977, Pat. No. 4,094,667. This application Mar. 24, 1978, Ser. No. 889,743
Int. Cl.[2] F27B *7/32, 7/34*
U.S. Cl. 266—213 **2 Claims**



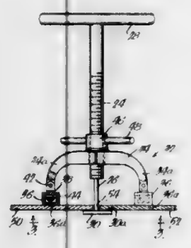
1. Apparatus for melting finely divided particulate material, comprising:
(a) an axially rotatable furnace of circular transverse section with an open forward end and having a closed rear end, the interior of the furnace having an area arranged to retain a pool of the molten material therein terminating inwardly from said open forward end, the interior of the furnace being lined with refractory;
(b) a material feeding lance projecting into the furnace through said open end, the lance having a discharge end terminating adjacent the lining of the furnace and the forward edge of the pool area of a pool of molten material when the pool has reached the limit which the furnace is designed to retain, the furnace lining sloping downwardly at the lowest point of revolution of the furnace lining adjacent the discharge end of the material feeding lance toward the rear end of the furnace but forwardly of the pool of molten material whereby particulate material discharged by the lance while the furnace is rotating will melt and drain into the pool area;
(c) a burner lance entered into the said open end of the furnace at a level above the discharge end of said material feeding lance, arranged to project a flame downwardly and toward the closed end of the furnace at an angle such that the flames impinge the surface of molten material in the pool at a level above the discharge end of the material feeding lance, the open end of the furnace providing the outlet for the combustion gases generated by the burner whereby the lining of the furnace at a level removed from the discharge end of the material feeding lance is heated as the furnace rotates to melt the particulate material after it has been deposited on the lining while avoiding entraining to any substantial extent the particulate material in said combustion gases; and
(d) means for rotating the furnace about its axis of rotation at a speed sufficient to centrifugally retain said solid material against the refractory lining as it is carried by rotation of the furnace upwardly away from said low point of revolution until it liquefies and flows into the molten metal pool retaining area.

4,175,733
HYDRAULIC INERTIA FILLED SPRING
Jacques H. Jarret, 32 allée des Soudanes, 78430 Louveciennes, and Jean M. B. Jarret, 30, avenue Raphaël, 75016 Paris, both of France
Filed Apr. 28, 1978, Ser. No. 900,869
Claims priority, application France, May 5, 1977, 77 13691
Int. Cl.[2] F16F *9/22*
U.S. Cl. 267—126 **6 Claims**



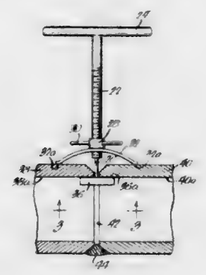
1. Hydraulic inertia filled springs particularly for alternating machines, comprising a fixed part with a free end, a moving part, means for displacing the moving part with respect to the fixed part between a position of outer dead center and a position of inner dead center, the fixed part being innerly provided on at least a portion of its length with an axial bore, a reservoir of liquid communicating with said axial bore, the axial bore having at least one outlet aperture, the moving part being filled with the same liquid as the reservoir and surrounding the fixed part on a portion of its length, the portion of the moving part surrounding the fixed part having an inside recess, the inside recess of the moving part being substantially in front of the outlet aperture of the fixed part at the position of outer dead center and substantially in front of the free end of the fixed part at the position of inner dead center.

4,175,734
DEVICE FOR ALIGNING PLATES TO BE JOINED
Stanley B. Williams, 2088 E. Empire Lot 151, Benton Harbor, Mich. 49022
Filed Jun. 23, 1978, Ser. No. 918,467
Int. Cl.[2] B25B *5/14*
U.S. Cl. 269—49 **3 Claims**



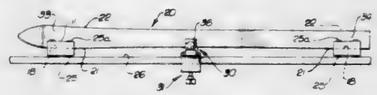
1. A device for positioning a pair of plates in aligned edge to edge relationship with the edges closely spaced together in order that the edges may be joined by welding or the like, comprising a first plate clamp engageable with the surfaces of the plates on one side thereof when adjacent plate edges to be joined are in closely spaced relationship; a second plate clamp engageable with the surface of the plates on the opposite sides thereof when the edges are in the closely spaced relationship, said second plate clamp comprising a main body member having at least four legs extending therefrom for engaging the other plate surfaces with ends thereof, and means for selectively moving said first and second clamps toward and away from each other to grip the plates therebetween to hold the same in position for joining the edges thereof and for releasing the plates for removal of the device therefrom, said first plate clamp being generally in the shape of a bar and having a relatively long dimension and a relatively short dimension perpendicular thereto enabling extension and retraction of said clamp to adjacent the one side of the plates through the space between the adjacent edges of the plates when said long dimension extends generally parallel to the length of the space, and enabling engagement of said first guide with the surface on the one side of the plates when said clamp is adjacent the surfaces and said long dimension extends generally perpendicular to the length of the space, and including an elongated rod, said first plate clamp being secured to one end of said rod and said second plate clamp being movable along said rod, said moving means providing for movement of said second clamp along said rod toward and away from said first clamp, said first clamp and said rod thereat being extendable through the space between the adjacent edges of the plates, said body member of said second plate clamp having a passage formed therethrough, said rod extending through said passage and being formed with threads at least along a medial portion thereof, said second clamp being movable along said rod with said passage around said rod, said moving means including an adjustment lever threadably engaged with said threaded portion of said rod and rotatable to selectively move said second clamp along said rod toward said first clamp or to enable said second clamp to be moved along said rod away from said first clamp, and further including a plate engaging pad at the end of each body member leg, each pad being pivotally connected with its associated leg for movement in orthogonal directions to accommodate uniform movement of said pad against the plate surface despite irregularities in the linearity of the surface.

4,175,735
DEVICE FOR ALIGNING PIPES TO BE JOINED
Jerry R. Griffin, 476 E. Blue Grass Rd., Mt. Pleasant, Mich. 48858
Filed Jun. 23, 1978, Ser. No. 918,466
Int. Cl.[2] B25B *5/14*
U.S. Cl. 269—49 **6 Claims**



1. A device for positioning a pair of pipes in aligned relationship end to end in order that the ends may be joined by welding or the like, the pipes having passages therethrough of substantially equal diameter, comprising an inner pipe guide engageable with the surfaces of the pipe passages when adjacent pipe ends to be joined are in closely spaced relationship; an outer pipe guide engageable with the outer surfaces of the pipes when the adjacent ends are in the closely spaced relationship, and means for selectively moving said inner and outer guides toward and away from each other to grip the pipes therebetween to hold the same in position for joining the ends thereof and for releasing the pipes for removal of the device therefrom, said inner pipe guide having a relatively long dimension and a relatively short dimension or thickness perpendicular thereto enabling insertion and removal of said inner guide into and from the pipe passages through the space between adjacent ends of the pipes when said long dimension extends generally perpendicular to the lengths of the pipes, and enabling engagement of said inner guide with the pipe passage surfaces when said guide is in the passages and said long dimension extends generally along the lengths of the pipes, and including an elongated rod, said inner pipe guide being secured to one end of said rod and said outer pipe guide being movable along said rod, said moving means providing for movement of said outer guide along said rod toward and away from said inner guide, said inner guide and said rod thereat being extendable through the space between the adjacent ends of the pipes, said outer pipe guide being generally elongate and having a slot formed therethrough, said rod extending through said slot and being formed with threads at least along a medial portion thereof normally exterior of the pipes, said moving means including an adjustment lever threadably engaged with said threaded portion of said rod and rotatable to selectively move said outer guide along said rod toward said inner guide or to enable said outer guide to be moved along said rod away from said inner guide.

4,175,736
SKI HOLDING SYSTEM
Robert W. Dietlein, 3040 Deer Run Rd., Carson City, Nev. 89701
Filed May 15, 1978, Ser. No. 905,595
Int. Cl.[2] A63C *11/04*
U.S. Cl. 269—88 **15 Claims**



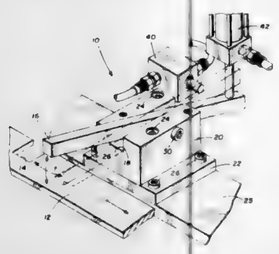
1. A non-skid ski holder, comprising
(a) a block having first and second opposite sides, and opposite ends,
(b) a longitudinally elongated slot sunk in the block from said first side, the slot extending through said opposite ends, said first and second sides extending in the direction of said slot, and with relative taper angularity corresponding to ski camber, and
(c) non-skid means carried by the block and exposed at both said first and second sides, said non-skid means having generally longitudinally spaced portions,
(d) whereby a ski may be placed downwardly in said slot and retained in position by the block with said non-skid means at said second side engaged against a supporting surface, and a ski upper surface may alternatively be placed downwardly on the non-skid means on said first side.

4,175,737

STOP MECHANISM

Steven K. Foss, Carrollton, Tex., assignor to Krestmark Industries, Inc., Lewisville, Tex.

Filed Jun. 23, 1978, Ser. No. 918,650
Int. Cl.[2] B23Q *3/00*; B26D *5/28*
U.S. Cl. 269—317 **15 Claims**



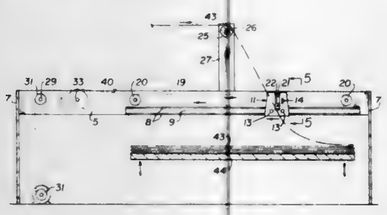
1. For use in controlling advancement of a workpiece along a feed path, a stop mechanism comprising:
structure located adjacent the feed path and defining a predetermined groove with bottom and side walls;
an arm supported in the groove for pivotal movement about first and second substantially orthogonal axes;
said arm being supported about an aperture therethrough defined by inwardly tapered surfaces intersecting at a circular edge between opposite sides of said arm, said circular edge defining means for pivoting said arm about one of said orthogonal axes;
means for biasing the front end of the arm pivotally about the first axis into engagement with the workpiece;
means for biasing the front end of the arm pivotally about the second axis in a direction against the feed direction of the workpiece.

4,175,738

HORIZONTAL FOLDER WITH VARYING SPEED TRAVERSE

Frank Catallo, 84 Wheatley Rd., Old Westbury, N.Y. 11568

Filed Feb. 13, 1978, Ser. No. 876,982
Int. Cl.[2] B65H *29/46*
U.S. Cl. 270—30 **13 Claims**



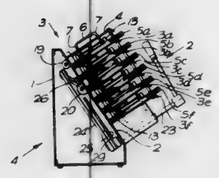
1. In a folder for a continuously advancing fabric web; a pair of horizontal longitudinally extending spaced parallel frame members; a transverse guide roll assembly supported by said frame members for reciprocation therealong and including a pair of rotatable guide rolls; said guide rolls being rotated at a substantially uniform speed; transverse draw roll fixedly mounted on said frame members in a plane above that of said guide rolls for advancing the fabric web to said guide roll assembly; means for driving said draw-roll at a substantially uniform speed; and continuously operable cyclic means for both reciprocating said guide roll assembly and for progressively increasing the speed of reciprocation thereof at the beginning portion of each stroke of reciprocation to a maximum speed during the middle portion of each said stroke and then progressively slowing the speed of reciprocation thereof as said assembly approaches the end of each said stroke.

4,175,739

PAPER COLLATING MACHINES

Jack V. L. Kemp, Dunstable, England, assignor to Kemp Applications Sales Limited, New Malden, England

Filed Jun. 22, 1978, Ser. No. 918,187
Claims priority, application United Kingdom, Jul. 21, 1977, 30697/77
Int. Cl.[2] B65H *39/05*
U.S. Cl. 270—58 **12 Claims**



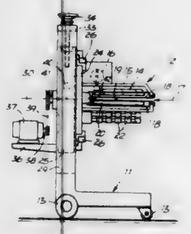
1. In a paper collating machine comprising a plurality of paper holders, each of which is adapted to hold a stack of rectangular sheets of paper, means mounting said paper holders in a row, and means for feeding the top sheet from the stack of sheets of paper in each holder in a predetermined direction with one edge of each sheet leading, the improvement wherein said means mounting said paper holders supports said paper holders in a position inclined transverse to said predetermined direction, means defining a lower side edge of each holder, means defining a supporting surface at said lower side edge of each of said holders parallel to said predetermined direction, said supporting surface, in use, being operative to engage and support one side edge of said stack in said holder and said mechanism being operative to feed said sheets slidingly along said supporting surfaces, and all of said supporting surfaces lying in a common plane whereby said sheets from all of said stacks are laterally aligned with each other as they are fed in said predetermined direction by said feed mechanism.

4,175,740

FOLDING MACHINE

Emil Klenk, Murrhardt, Fed. Rep. of Germany, assignor to Maschinenbau Oppenweiler GmbH, Oppenweiler, Fed. Rep. of Germany

Filed May 1, 1978, Ser. No. 901,334
Claims priority, application Fed. Rep. of Germany, May 3, 1977, 2719784
Int. Cl.[2] B65H *45/18*
U.S. Cl. 270—83 **14 Claims**



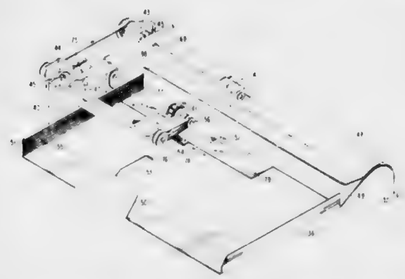
1. Folding machine having a machine frame and a knife folding mechanism for folding a sheet introduced in said folding machine, said knife folding mechanism comprising a folding knife, said folding knife being mounted for reciprocating movement in an essentially vertical direction, an essentially horizontal aligning plane for aligning the sheet to be folded with respect to said folding mechanism, a conveyor means for conveying a sheet introduced into said folding machine to said aligning plane in a feeding direction, a pair of folding rollers between which the sheet to be folded is introduced by said folding knife from said aligning plane, said knife folding mechanism being rotatably mounted in said machine frame about an axis of rotation which is located in said aligning plane and parallel to said feeding direction, said folding machine further comprising locking means for locking said folding mechanism in a selected one of at least two angular positions about said axis of rotation, and drive means for driving said folding knife, said conveyor means and said folding rollers.

4,175,741

CUT-SHEET XEROGRAPHIC COPIER HAVING COMBING WHEEL SHEET FEED AND A DUPLEX BIN WITH AN ADJUSTABLE BOTTOM-OF-THE-BIN PAD

Donald F. Colglazier; John L. Fallon; George P. Kimble, all of Longmont, and Fred R. Mares, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1977, Ser. No. 861,914
Int. Cl.[2] B65H *3/06*
U.S. Cl. 271—3.1 **9 Claims**



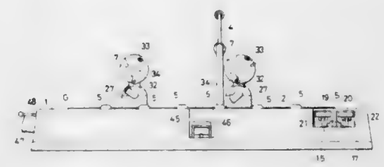
1. A sheet fed printing device capable of selectively operating in a simplex or a duplex copy mode, having at least one paper supply drawer and a duplex bin wherein side-one printed sheets are stored prior to side-two printing, and having means operable to control the serial feeding of sheets from said duplex bin to a printing station, said duplex bin comprising:
a fixed position, substantially horizontal surface member adapted to support side-one copied sheets;
a movable mounted combing wheel overhanging said surface member so as to cooperate with the top sheet of paper in the duplex bin, said combing wheel normally being raised from said surface member to facilitate the automatic depositing of side-one printed sheets in said duplex bin, said combing wheel comprising a rotatable support member rotatable about an axis and carrying a series of independently rotatable rollers at its periphery;
combing wheel control means operable to control movement of said combing wheel to shingling engagement with the top sheet in said duplex bin;
a resilient pad mounted on said surface member below said combing wheel, said resilient pad being movable in the direction of combing wheel movement so as to enhance shingling of the bottom several sheets in said duplex bin; and
means facilitating adjustment of said pad generally parallel to said axis so as to control the direction of shingling of said bottom several sheets by said combing wheel.

4,175,742

GAME BOARD

Masatoshi Todokoro, 2-33 Koganehara 2-chome, Matsudo, Chiba, Japan (270)

Filed Dec. 16, 1977, Ser. No. 861,123
Claims priority, application Japan, Jul. 29, 1977, 52/101368[U]
Int. Cl.[2] A63F *9/14*
U.S. Cl. 273—1 R **7 Claims**



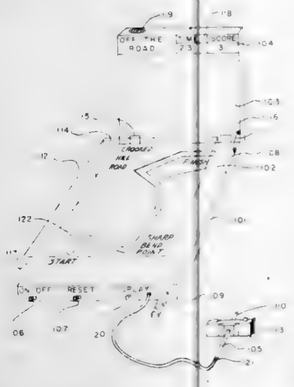
1. A game board comprising in combination:
(a) a base board with an upper surface and an underside, a suitable number of elongated slots defined in said upper surface;
(b) a bar with a horizontal portion bridging said elongated slots, said bar having rods suspended from said horizontal portion opposite said respective elongated slots, said rods having a lower end, each of said rods having magnetically attached to said lower end an object to be caught;
(c) endless belts along said slots and moving means to move said endless belts along said respective elongated slots, and moving means being provided at the underside of said base board beneath said respective elongated slots, each of said belts having thereon an animated figure with a body portion so disposed that said body portion rises above said upper surface;
(d) a first bar supported in the body portion of each of said animated figures so as to be vertically movable, said first bar having a bar portion extending from the top of said body portion to its bottom and a projecting portion projecting out from the underside of the base board, the projecting portion of said bar being loaded with a bias spring adapted to force said bar to its lowermost position while the bar portion extending in the body portion of each of said animated figures is sheathed by a slide cylinder, said slide cylinder being mounted with a hollow head portion of the animated figure, said head portion being split so that it may open, said head portion also having a second bar engaged with said first bar so as to open or close the head portion in accordance with the movement of said vertically movable first bar;
(e) a first spring disposed between the vertically movable first bar and the associated slide cylinder, said first spring urging said slide cylinder to close the head portion of the animated figure;
(f) a second spring disposed between each of said slide cylinders and the body portion of each animated figure, said second spring being adapted to press said slide cylinder against said first bar when the latter moves up and to disengage said first bar from said slide cylinder when the slide cylinder has ascended a predetermined distance together with said first bar; and, d
(g) a push-up bar provided horizontally along the area of passage of the lower end of each of said vertically movable first bars, said push-up bar being adapted to push up said vertically movable first bar.

4,175,743

ELECTRONIC GAME

Gene Messina, 12 Buccaneer La., East Setauket, N.Y. 11733

Filed Dec. 19, 1977, Ser. No. 861,847
Int. Cl.[2] A63F 9/14
U.S. Cl. 273—1 E 2 Claims



1. A game comprising:
(a) a pair of two generally parallel conductors shaped to form a track,
(b) a wand having a handle for controlling the position of said wand by hand, and a conductive tip with a width less than the spacing between said conductors to pass said tip between said conductors without contacting them when the wand's position is carefully controlled by hand,
(c) an indicator to indicate contact of the tip with either conductor,
(d) means for electrically connecting said indicator to said track and to said tip to transmit a signal to said indicator when there is contact between the tip and track,
(e) a reflective surface positioned for indirect viewing of said track,
(f) means for controllably preventing direct viewing of the track by the operator, said means, for preventing direct viewing is a cover and said provision for controlling the wand beneath the cover includes a first opening in said cover for controlling said wand directly by hand, said cover is a polarized filter which passes light from a nonpolarized light source and blocks light from a cross polarized light source,
(g) a cross polarized light source positioned to illuminate said track,
(h) a nonpolarized light source positioned to illuminate said track, and
(i) means for selectively activating each light, whereby the game may be viewed directly through the cover when the nonpolarized light source is activated, but can only be viewed indirectly by way of the reflective surface when only the polarized light is activated.

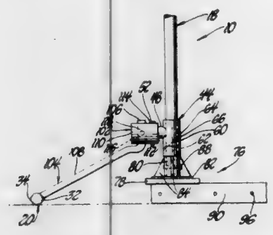
4,175,744

EYE-HAND COORDINATOR

Link W. Llewellyn, Flint, Mich., assignor to Chi Rho Corporation, Flint, Mich.

Filed Mar. 30, 1978, Ser. No. 891,553
Int. Cl.[2] A63B 69/40
U.S. Cl. 273—26 E 11 Claims

1. An eye-hand coordinator assembly comprising; a standard, an arm having a support end and a ball end, a ball connected to said ball end by first connecting means, cam means connected by second connecting means to said support end of a ball-supporting arm and attached to said standard for allowing the arm and said ball to be displaceable from an initial position to various angular positions relative to the longitudinal axis of said standard in response to an impact to the ball, said cam means including an upper cam to which said arm is connected and a lower cam, said upper cam being movable for rotation and axial shifting from a rest position relative to said



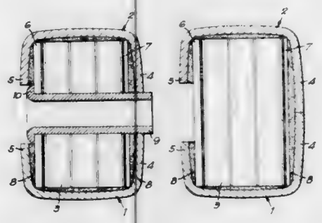
lower cam, biasing means positioned on the outside of said standard and interconnecting said upper cam and said lower cam for resisting said rotation and axial shifting of said upper cam relative to said lower cam and for urging said upper cam to said rest position thereby returning the arm to said initial position after an impact to the ball.

4,175,745

RACKET

Georges A. Gevers, Liége, and Philippe M. Jeghers, Esneux, both of Belgium, assignors to FN International Societe Anonyme, Luxembourg

Filed Jan. 31, 1978, Ser. No. 873,951
Claims priority, application Belgium, Jul. 8, 1977, 256066; Luxembourg, Jan. 12, 1978, 78855
Int. Cl.[2] A63B 49/02
U.S. Cl. 273—73 C 3 Claims



1. A racket having a generally planar frame consisting of a loop for supporting stringing and a shaft integral with and extending from said loop, said frame comprising a pair of identical metallic members and a strip of honeycomb ribbon between said metallic members, said metallic members and honeycomb ribbon being adhesively secured together, said metallic members being at least partly of U-shaped cross section with their concave sides facing each other, said ribbon extending between said metallic members throughout said loop and the length of said shaft, wherein the U-shaped cross section of said metallic members comprises inner legs, on the inner periphery of said loop, being longer than the legs on the outer periphery of said loop, the ends of said outer legs being spaced apart.

4,175,746

GAME APPARATUS WITH FENCE-LIKE BOUNDARY DEFINING MEMBERS

Charles A. McRitchie, 49700 Cross St., Belleville, Mich. 48111

Filed Apr. 19, 1978, Ser. No. 897,817
Int. Cl.[2] A63B 67/04
U.S. Cl. 273—85 R 3 Claims



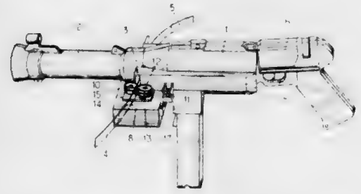
1. Game apparatus consisting of an elevated circular playing field divided into an offensive area and a defensive area, removable fence-like members defining the outer boundary of each area, and a removable backboard and basket assembly mounted at a point in the said defensive area, in which the fence-like member defining the outer boundary of the offensive area is higher than the member defining the outer boundary of the defensive area.

4,175,747

LIGHT PROJECTOR SHOOTING APPARATUS WITH MOVABLE, PERFORABLE, TARGET SUPPORT

Robert H. Hudson, Seekonk, Mass., assignor to Les Jouets Educatifs Universels, Drancy, France

Filed Aug. 29, 1977, Ser. No. 828,954
Claims priority, application France, Aug. 31, 1976, 76 26269
Int. Cl.[2] A63F 9/02; F41J 9/00
U.S. Cl. 273—101.2 1 Claim



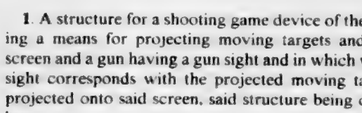
1. A shooting apparatus involving, in combination, a light projector having a source of light, an objective and a sighting device permitting placement in an interchangeable manner a perforable support carrying some targets through the light beam between the source of light and the objective in order to project the image of a target on a screen, and a member with hammer of a pistol type mounted in a movable manner with respect to the projector and driving by the means of said hammer a tapered element susceptible of perforating the support at a point somewhere on its surface: characterized in that the projector includes means for threading the perforable support bearing the targets to pass through said light beam continuously, the means for threading continuously the perforable support comprising a spring motor provided within a removable unit fixed on the exterior wall of the projector at the level of the sighting device, the motor being provided with a shaft extending through the wall of the unit and supporting at the free end thereof a driving pulley: a pressure pulley being susceptible to cooperate with the driving pulley in such a way that, during the functioning of the motor, the perforable support, previously inserted between the two pulleys, is driven continuously through the sighting device; the pressure pulley being carried by an axle provided on one of the extremities of a bent lever mounted within the unit in such a way as to be able to pivot between an active position in which it applies the pressure pulley against the driving pulley and an inactive position in which the pressure pulley is spaced from the driving pulley slightly, the lever being maintained in its active position under the influence of a leaf spring pushing on it in the neighborhood of the axle of the pressure pulley and being susceptible of being brought into its inactive position by pivoting said lever against the counter action exerted by the spring.

4,175,748

SHOOTING GAME DEVICE WITH PROJECTOR AND PHOTOELECTRIC DETECTOR

Gunpei Yokoi, Kyoto, Japan, assignor to Nintendo Co., Ltd., Kyoto, Japan

Filed Nov. 29, 1977, Ser. No. 855,607
Int. Cl.[2] F41G 3/26; F41J 5/02, 9/14
U.S. Cl. 273—101.2 4 Claims



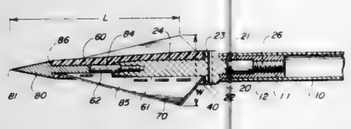
1. A structure for a shooting game device of the type including a means for projecting moving targets and hits onto a screen and a gun having a gun sight and in which when the gun sight corresponds with the projected moving target a hit is projected onto said screen, said structure being characterized by:

a photoelectric element coupled to said gun such that it moves vertically and horizontally as the gun moves vertically and horizontally; and

a means for projecting a light mark in near proximity to said photoelectric element which is indicative of a position of a projected target on said screen, said means for projecting a light mark and said photoelectric element being arranged and configured such that when said light mark and said photoelectric element coincide, said photoelectric element generates a hit signal which causes a hit to be projected on said screen in lieu of said moving target, said means for projecting a light mark together with said means for projecting moving targets and hits comprising a projector having film disposed therein, each frame of said film being divided into a A track and a B track, said A track containing images for projecting said moving target in various stages of movement, said B track containing, at corresponding positions with said moving target, positioning signal marks for generating a light mark for acting upon said photoelectric element and images for projecting said moving targets in various stages of destruction and a first beam of light for displaying said moving target passing through said A track of said film and a second beam of light for displaying either a light mark or a hit scene passing through said B track whereby said moving target and said light mark or hit scene simultaneously projected from said projector.

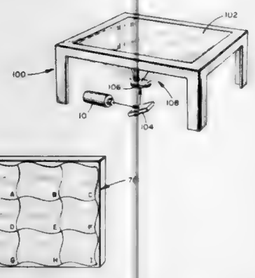
V 9,988,743 NOV 27 1979 UMI

4,175,749
ARROWHEAD BODY
Miroslav A. Simo, Riverside, Ill., assignor to New Archery Products Corp., Riverside, Ill.
Continuation-in-part of Ser. No. 738,030, Nov. 2, 1976, Pat. No. 4,093,230, which is a continuation-in-part of Ser. No. 619,824, Oct. 6, 1975, Pat. No. 4,006,901. This application Nov. 21, 1977, Ser. No. 853,488
The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.
Int. Cl.² F41B 5/02
U.S. Cl. 273—106.5 B **17 Claims**



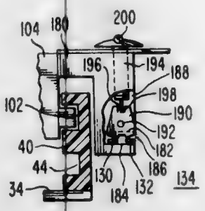
1. An elongated arrowhead blade carrying body symmetrical about its long axis and having a through opening centered on its long axis, said opening adapted to receive a shaft portion of a nosepiece or adapter forming an assembled archery arrow having said blade carrying body between said nosepiece and arrow shaft, said blade carrying body having two to seven blades firmly mounted therein and extending further from the exterior of said body toward the arrow shaft and providing a streamlined shape.

4,175,750
HOLOGRAPHIC PUZZLE
Norman M. Rugheimer, Rte. 2, Box 350, Bozeman, Mont. 59715, and Scott R. Chestnut, 5 Heatherwood La., Billings, Mont. 59102
Filed Jan. 9, 1978, Ser. No. 867,886
Int. Cl.² A63F 9/12
U.S. Cl. 273—157 R **16 Claims**



1. Puzzle apparatus, intended to be assembled by at least one player, said puzzle apparatus comprising:
- a plurality of individual segments formed of a developed hologram having thereon an interference pattern of a subject, each of said individual segments being of a size so that the unaided eye can discern a complete holographic image of said subject with no degradation;
- a support surface; and
- an illumination means associated with said support surface and arranged such that the angle of illumination is identical to the angle of the reference beam used to form said developed hologram, whereby the player arranges and orients said individual segments on said support surface so that upon illumination by said illumination means said subject is visually holographically reproduced to said player.

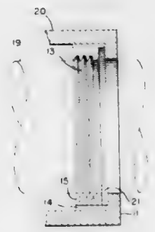
4,175,751
TOGGLE MECHANISM FOR VIDEO DISC PLAYER
Larry D. Huff, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.
Filed Nov. 29, 1978, Ser. No. 964,529
Claims priority, application United Kingdom, Feb. 13, 1978, 05729/78
Int. Cl.² G11B 17/06
U.S. Cl. 274—13 R **10 Claims**



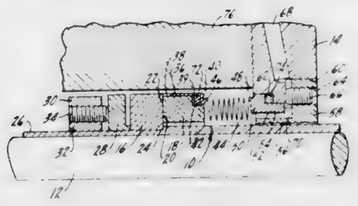
1. In a player for use with a disc record; said player including a turntable for centering and supporting said record; a mechanism for rotating said turntable; a pickup stylus for recovering prerecorded information from said record during playback; a carriage for supporting said pickup stylus; a mechanism for causing motion of said pickup stylus relative to said carriage between a depressed position, permitting stylus/record engagement, and an elevated position, precluding stylus/record engagement; a play belt for translating said carriage toward the center of said turntable at a speed correlated to the speed of rotation of said turntable; a search belt for translating said carriage toward and away from said turntable center at a speed independent of the speed of rotation of said turntable; apparatus comprising:
- (A) a mechanical toggle switch;
- (B) means for mounting said toggle switch to said carriage for motion between a first location, a second location and a third location; said toggle switch in said first location coupling said carriage to said play belt to the exclusion of said search belt; said toggle switch, when disposed in said second location, decoupling said carriage from said belts; said toggle switch, while occupying said third location, coupling said carriage to said search belt to the exclusion of said play belt; and
- (C) means for selectively actuating said toggle switch to occupy a selected one of said locations.

4,175,752
TWO STAGE LABYRINTH PATTERN INCLUSION DEVICE
David C. Orlowski, Rock Island, Ill., assignor to Inpro, Inc., Rock Island, Ill.
Filed Nov. 25, 1977, Ser. No. 854,827
Int. Cl.² F16J 15/44
U.S. Cl. 277—53 **5 Claims**

1. A sealing ring comprising a ring member having a first axial face and a second opposite axial face, said second opposite axial face having an annular axially extending flange extending from the outer portion thereof, said ring member having an inner periphery having at least one annular groove, a first longitudinally extending groove in said inner periphery communicating between said at least one annular groove and said first axial face but not with said second face, said ring member having an outer periphery, said outer periphery having a second longitudinally extending groove extending from said first face to said opposite axial face including said flange.



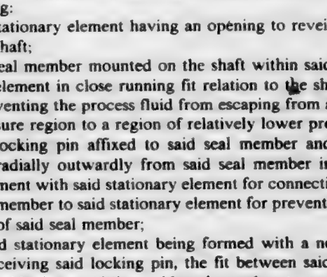
4,175,753
MECHANICAL SEAL
Robert S. Wentworth, Jr., Temecula, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.
Division of Ser. No. 837,790, Sep. 29, 1977, Pat. No. 4,124,218. This application Jun. 1, 1978, Ser. No. 911,632
Int. Cl.² F16J 15/10
U.S. Cl. 277—87 **2 Claims**



1. A mechanical seal comprising a stationary seal ring and a rotatable seal ring, said seal rings having engaging seal faces;
- a ferrule surrounding and in contact with the outer surface of one of said seal rings and having a depending flange;
- a substantially rectangular section, annular cavity defined by a groove in said one of said seal rings and a portion of said ferrule and its flange; and
- a gasket of fragile material characterized by poor elasticity and conformability in said cavity, said gasket having an initial cross-section of a parallelogram and being expanded radially and deformed to an ultimate cross section matching that of said cavity when assemblying said ferrule and said one of said seal rings.

4,175,754
SEAL FOR FLUID DUCTS
William E. Wilhelm, Marietta, Ga., assignor to Lockheed Corporation, Burbank, Calif.
Filed May 8, 1978, Ser. No. 903,931
Int. Cl.² F16L 51/04; F16J 15/08
U.S. Cl. 277—128 **3 Claims**

1. A seal to prevent the leakage of fluid from ducts connected end to end across flanges carried by the connected ducts, said seal being formed by a pair of sides having dimensions substantially equal to and in surface to surface abutment with the adjacent faces of said flanges throughout substantially the entire area thereof, said sides being interconnected at and along one edge by an integral wall disposed outwardly of said flanges and defining an internal chamber, said sides further terminating at and along their other edges in integral extensions laterally disposed in diverse directions.



4,175,755
MECHANICAL SEAL ASSEMBLY
Carl H. Geary, Greensburg, Pa., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Dec. 11, 1978, Ser. No. 968,067
Int. Cl.² F16J 15/00, 15/34
U.S. Cl. 277—137 **4 Claims**

1. A shaft seal assembly for use in a rotary machine for preventing a process fluid from escaping about the shaft comprising:
- a stationary element having an opening to reveive a rotary shaft;
- a seal member mounted on the shaft within said stationary element in close running fit relation to the shaft for preventing the process fluid from escaping from a high pressure region to a region of relatively lower pressure;
- a locking pin affixed to said seal member and extending radially outwardly from said seal member into engagement with said stationary element for connecting said seal member to said stationary element for preventing rotation of said seal member;
- said stationary element being formed with a notch for receiving said locking pin, the fit between said notch and said pin permitting said seal member to move radially outward relative to said shaft; and
- bearing means affixed to the stationary element and being disposed normal to said locking pin for defining a roller bearing surface in contact with a radially extending surface of said pin for permitting the pin and seal member to freely move radially outward into said notch.

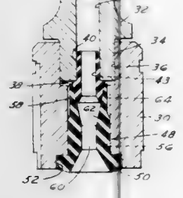
V 9 8 4 N 0 2 7 7 9 UMI

4,175,756
COMBINATION THRUST WASHER AND SEAL ARTICLE, APPARATUS
Dennis N. Denton, Gaston County, and Martin E. Benjamin, Gastonia, both of N.C., assignors to Garlock Inc., Longview, Tex.
Filed Feb. 14, 1977, Ser. No. 768,070
Int. Cl.[2] F16J 15/10
U.S. Cl. 277—189 **32 Claims**



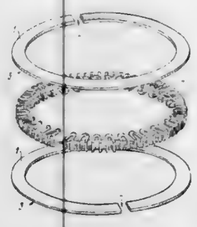
1. An article comprising a combination thrust washer and seal, said thrust washer and seal including a thrust washer and an annular seal body connected to said thrust washer, said thrust washer comprising a flat, solid, rigid, metal ring and a layer of material of said seal body substantially covering at least one radial side of said ring, said thrust washer having a pair of flat, continuous radial surfaces that are perpendicular to the axis of the thrust washer and that are adapted to carry an axial load, at least one of said radial surfaces being adapted to accommodate rotary motion between itself and an associated machine member in contact therewith, said seal body including an anchor portion connected to said washer and an axially extending sealing lip having a proximal end adjacent the I.D. of said washer and extending axially away from said washer and having a distal end adapted to sealingly contact at least one of an I.D. and an O.D. cylindrical surface.

4,175,757
SEALANT SYSTEM FOR ROOF DRILLING APPARATUS
Kenneth C. Emmerich, Lexington, Ky., assignor to Fansteel Inc., North Chicago, Ill.
Filed Jun. 15, 1977, Ser. No. 806,822
Int. Cl.[2] F16J 15/10
U.S. Cl. 277—212 F **2 Claims**



1. A sealant system for a mining drill system which includes a series of drilling and driving elements releasably connected end to end in driving engagement and having central passages to carry coolant water to a drilling area to cool the drilling tip and flush chips and dust away from the drilling tip which comprises:
(a) an elongate hollow driving element to be driven by a rotating power source,
(b) a hollow drilling tip element to be driven by said driving element having a portion to be telescopically received in and driven by said driving element,
(c) one or more hollow, elongate intermediate driving elements each having an end to telescopically and drivingly engage with an end of a driving element and an end of a drilling tip element and selectively with additional intermediate driving elements,
(d) a sealing insert to seal the joints between each of said adjacent elements formed as a resilient, deformable, tubular nipple having a central passage therethrough comprising a first portion on one end to be received and retained in an axial recess of one of said elements, and a second projecting portion at the other end to be received in another of said adjacent elements in telescoping relation with said one element to seal the internal passages formed by said telescoping elements, one of said portions being enlarged circumferentially to be received in an enlarged recess in one of said elements to position the insert longitudinally, and
(e) said enlarged recess in one of said adjacent elements comprising a second insert within the central bore of said one adjacent element having a cylindrical portion at one end lodged in a cylindrical recess in said adjacent element, and an enlarging recess at the other end to receive the projecting portion of the first insert.

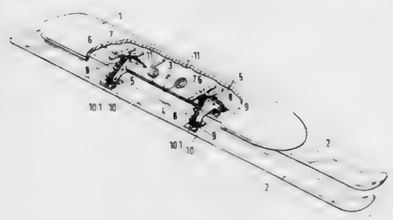
4,175,758
TANGENTIAL EXPANDER FOR OIL CONTROL PISTON RINGS
Anatoly V. Adamovich, 2 ulitsa Mariinoi Roschi, 14a, kv. 35; Lev A. Burov, Kutuzovsky prospekt, 33, kv. 253; Rusaam S. Nemets, Sirenevy bulvar, 57, kv. 50; Efim S. Gorbulev, Tovarischesky pereulok, 9/11, kv. 5, all of Moscow; Boris S. Eremenko, Moskovsky prospekt, 96a, kv. 273, Kharkov; Felix A. Brainman, ploschad Vosstania, 1, kv. 1, Kharkov; Viktor P. Moldavanov, ulitsa Pionerskaya, 10, kv. 6, Odessa; Jury M. Kontsov, ulitsa Krasnova, 14, kv. 29, Odessa; Viktor F. Axenov, ulitsa Grekova, 4, kv. 277, Moscow, and Matvei I. Averbukh, ulitsa Pastera, 50, kv. 12, Odessa, all of U.S.S.R.
Filed Feb. 27, 1978, Ser. No. 882,203
Int. Cl.[2] F16F 1/34, 9/36
U.S. Cl. 277—220 **1 Claim**



1. A tangential expander for oil control piston rings in the form of a sinuous profiled spring bent into a split ring U-shaped in the cross section, formed by the side flanges bent off at the end in the form of thrust shoulders; a joint connecting the ends of said split ring and made in the form of the cut-off tooth-like portions of the U-shaped profile bent into the U-shaped profile to a distance equal to not less than the sum of the thickness of the initial material of the spring plus the height of the thrust shoulder so that each of said teeth is flexibly locked inside the U-shaped profile in the opposite end of the tangential expander.

4,175,759
WINTER SPORT DEVICE
Harald Strunk, Dilsbach-Str. 21, 6107 Reinheim 3, Fed. Rep. of Germany
Filed Feb. 21, 1978, Ser. No. 879,486
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1977, 2707364
Int. Cl.[2] B26B 13/00
U.S. Cl. 280—16 **9 Claims**

1. A winter sport device, comprising a pair of elongated parallel skids; a user support above said skids; and means mounting said support on said skids for converting a tilting movement of said support about a first axis parallel to the elongation of said skids into a corresponding tilting movement of said skids about respective second axes paralleling said first axis, said means including two bridge-shaped supports longitudinally spaced from each other, each end of each of said bridge-shaped supports being fixed on one of said skids, two carriers each fixedly connected to said user support and each mounted on one of said two bridge-shaped supports, a member



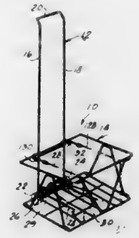
mounted on said bridge-shaped support for tilting said skids, said member being rigidly connected at one side to said carriers and at the other side to each of said skids so as to keep said skids parallel to said user support during their corresponding tilting movement, and a chain drive including an endless chain operatively connected with a driving chain wheel rigidly connected to said carriers, and two driven chain wheels each of which is rigidly connected to one of said skids.

4,175,760
SKI-SLED
Thomas A. Gustafson, 6266 Halverson Dr., Rockford, Ill. 61109
Filed Nov. 7, 1977, Ser. No. 849,220
Int. Cl.[2] B62B 13/14
U.S. Cl. 280—16 **12 Claims**



1. A ski sled, comprising: a body having a forward end and a rearward end, and having means defining a generally horizontal seating surface between the forward and rearward ends thereof, adjacent the rearward end; at least one forward ski carried by the forward end of the body; steering means at the rear end of the sled, including a transversely extending steering beam pivotally connected about a vertical axis to the rearward end of the body, and having opposite, outer ends projecting outwardly beyond the opposite sides of the body; a rear ski carried by the steering beam at each of the outer ends thereof, giving lateral stability to the sled; and a pair of steering arms pivoted to the body and having connecting links connected to the steering beam on opposite sides of the body to pivot the steering beam about the vertical axis and effect turning of the sled, the rear placement of the seating surface and steering means resulting in more effective steering action.

4,175,761
COMBINATION LUGGAGE CARRIER AND CART
Thomas B. Marshall, 346 Drovers La., Palatine, Ill. 60067
Filed Nov. 4, 1977, Ser. No. 848,708
Int. Cl.[2] B62B 1/12
U.S. Cl. 280—47.18 **16 Claims**

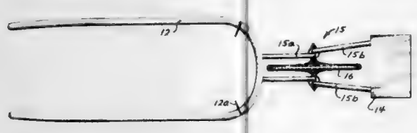


1. A collapsible basket for a hand truck type wheeled carrier, comprising:
a generally flat open, rectangular upper frame including a pair of first sides and a pair of second sides;
a generally flat, closed, bottom frame forming the bottom of the basket and including a pair of first sides and a pair of second sides;
said means pivotally connected to at least one of said frames and releasably connectible to the other of said frames and extending from said first sides of said upper frame to said first sides of said bottom frame and from at least one of said second sides of said upper frame to the corresponding side of said bottom frame to form sides for the basket; and
connecting means for connecting said basket to the carrier,
said upper frame including a wire bent to form said first and second sides,
said bottom frame including a plurality of wires and a peripheral wire connected to said plurality of wires and defining said first and second sides, and
said side means including pivotally-mounted wires,
each of said pivotally-mounted wires including a resilient generally V-shaped structure with a first portion oblique to the legs of the V at the intersection of the legs giving a flattened V appearance, and second portions at the distal ends of the legs of the V extending parallel to said first portion,
the respective frame including a first tube about said first wire portion forming the pivot therefor, and
the respective other frame including, for each V-shaped wire structure, a pair of second tubes, spaced apart less than the spacing of, and for receiving said second portions so that the V-shaped structures must be flexed to move the legs toward each other to permit engagement of said second portions and said second tubes under the bias of the resiliency of the wire structure.

4,175,762
SULKY
Damon A. Vaughn, 525 N. Main St., and Herbert F. Hoffman, 336 S. Main St., both of Henderson, Ky. 42420
Filed Jan. 23, 1978, Ser. No. 871,196
Int. Cl.[2] B62C 1/08
U.S. Cl. 280—78 **5 Claims**

1. A sulky comprising a frame adapted to receive and partly surround an animal, a single wheel supporting said frame, and a seat for the driver of the sulky disposed on said frame and positioned behind said single wheel in a direction opposite to the path of movement of the sulky, where said frame and said

driver's seat are integral and vertically adjustable with respect to said single wheel through supporting structure which ex-



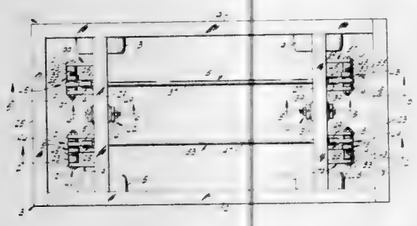
tends downwardly and is received in hollow cylinders on which said single wheel is rotatably positioned.

4,175,763

SUSPENSION SYSTEM FOR LAND VEHICLES

William R. Conner, Jr., Shelbyville, Tenn., assignor to Kellwood Company, St. Louis, Mo.

Filed Jul. 28, 1978, Ser. No. 928,736
Int. Cl.[2] B60P *1/00*
U.S. Cl. 280—104 **33 Claims**



1. A vehicle comprising a frame, first and second wheel carriers spaced longitudinally of the frame, wheels carried by the wheel carriers at opposite sides of the vehicle, and a suspension system for supporting the frame on the wheel carriers, said suspension system comprising:

a first connection between the frame and the first carrier generally centrally of the first carrier, said first connection transferring part of the weight of the frame to the first carrier and allowing the frame and the first carrier to rock relative to one another about an axis extending generally longitudinally of the vehicle;

a second connection between the frame and the second carrier generally centrally of the second carrier, said second connection transferring part of the weight of the frame to the second carrier and allowing the frame and the second carrier to rock relative to one another about an axis extending generally longitudinally of the vehicle;

a third connection between the frame and the first carrier on one side of the first connection for transmitting force from the first carrier to the frame on said one side of the first connection; a fourth connection between the frame and the first carrier on the other side of the first connection for transmitting force from the first carrier to the frame on said other side of the first carrier;

said third and fourth connections permitting the relative rocking movement of the frame and the first carrier;

a fifth connection between the frame and the second carrier on one side of the second connection for transmitting force from the second carrier to the frame on said one side of the second connection;

a sixth connection between the frame and the second carrier on the other side of the second connection for transmitting force from the second carrier to the frame on said other side of the second connection;

said fifth and sixth connections permitting the relative rocking movement of the frame and the second carrier;

first means interconnecting said third and fifth connections for transmitting force from the first carrier to the second carrier on relative rocking movement of the first carrier and the frame in one direction and causing relative rocking movement of the second carrier and the frame in the opposite direction, and for transmitting force from the second carrier to the first carrier on relative rocking movement of the second carrier and the frame in said one direction and causing relative rocking movement of the first carrier and the frame in the opposite direction; and

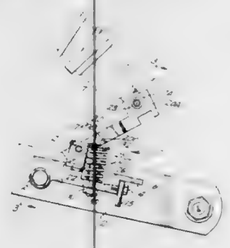
second means interconnecting said fourth and sixth connections for transmitting force from the first carrier to the second carrier on relative rocking movement of the first carrier and the frame in said opposite direction and causing relative rocking movement of the second carrier and the frame in said one direction, and for transmitting force from the second carrier to the first carrier on relative rocking movement of the second carrier and the frame in said opposite direction and causing relative rocking movement of the first carrier and the frame in said one direction.

4,175,764

MOTORCYCLE WHEEL SUSPENSION DEVICE

Roger P. Johnson, 2977 Coker Butte Rd., Medford, Oreg. 97501

Filed Apr. 6, 1978, Ser. No. 893,959
Int. Cl.[2] B62K *25/20*
U.S. Cl. 280—284 **6 Claims**



1. A wheel suspension device for a motorcycle swing arm to receive the lower end of an extensible motorcycle suspension component, said device comprising,

a base, means securing said base to the swing arm,

an upwardly and rearwardly inclined arm member pivotally mounted at its lower end to said base, said arm member pivotally attached at its upper end to said suspension component,

resilient means on said base and acting on the pivotally mounted end of said arm member urging the latter to a raised position relative to the base whereby the attached motorcycle suspension component is advantageously disposed for repositioning the swing arm and returning the wheel carried thereby into ground contact after momentary separation from the ground, and

the pivotally mounted end of said arm member and said base having opposed surfaces against which said resilient means acts.

4,175,765

PARALLEL HITCH FOR A BELLY MOUNTED TRACTOR APPLIANCE

George W. Murphy, Hopewell, Ohio, assignor to Dura Corporation, Southfield, Mich.

Filed May 15, 1978, Ser. No. 905,779
Int. Cl.[2] A01D *35/12*
U.S. Cl. 280—460 A **7 Claims**

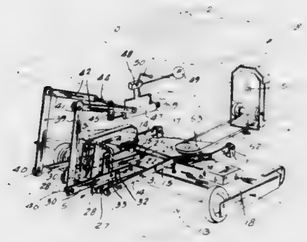
1. In combination with a tractor,

a belly mounted appliance having an upper flat plane horizontal deck with upstanding clevis-like anchor post means at one end in which is supported pivot pin means and upstanding journal post means at its opposite end and having horizontal journal head means supported thereby,

an axle rod fixed on the tractor and disposed in spaced relation to said appliance,

first lever arm means pivotally connected to said axle rod and having a lost motion connection to said clevis-like anchor post means at said pivot pin means,

second lever arm means shorter than said first lever arm means and pivotally connected to said axle rod and having a bearing slot engaging said journal post means at said journal head means,



and power operated actuation means for lifting said first and second lever arm means comprising a leverage system connected to said tractor and having a third lever arm means pivotally connected to a fixed point on the tractor above said first and second lever arm means between said axle rod and said journal post means,

and first and second link means between said third lever arm means and said first and second lever arm means, respectively,

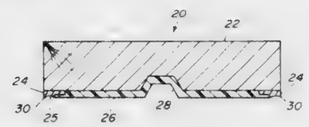
whereby operation of the actuation means will actuate said leverage system and through said link means will lift the appliance while keeping said horizontal deck generally level.

4,175,766

SKI EDGE

Raymond K. Barwin, 14463 Twelve Mile Rd., Apt. D, Warren, Mich. 48093

Filed Jun. 23, 1978, Ser. No. 918,345
Int. Cl.[2] A63C *5/04*
U.S. Cl. 280—608 **6 Claims**



1. A ski for skiing on snow having an edge member attached to the outer edges of the bottom of said ski, said edge member comprising:

a hidden edge;

a plastic surface attached to the bottom partially covering and retaining the hidden edge;

a plurality of separate and partial undercuts employed along the length of said edge member each undercut forming together with the outer wall of the edge member a lip having an included angle of less than 90 degrees between the outer wall and the bottom surface of the edge member;

said undercuts extending from the lip to the edge of the plastic surface and increasing a surface area of said edge member contacting the snow thereby increasing the bite of the ski when turning on hard snow or ice; and said undercuts omitted at a lip and tail portion of said member.

4,175,767

SKI STRUCTURES

Franz Scheruebl, Schwemmberg 117, Radstadt, (Salzburg), Austria

Filed Dec. 9, 1977, Ser. No. 859,043
Claims priority, application Austria, Dec. 10, 1976, 9131/76
Int. Cl.[2] A63C *5/12*
U.S. Cl. 280—610 **4 Claims**



4. A ski structure comprising, in combination:

(a) a top chord,

(b) a bottom chord,

(c) core means disposed between said top and bottom chords and varying in height lengthwise of the ski structure,

(d) at least one intermediate chord dividing said core means longitudinally of the ski structure,

(e) the ski structure being shaped to have a toe portion, a middle portion and a heel portion,

(f) and at least one intermediate chord disposed closely adjacent and following said top chord at said toe and heel portions and with said chord being spaced by a substantially constant distance from said bottom chord in said middle portion,

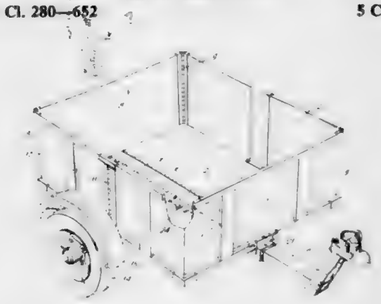
(g) said intermediate chord being disposed at a distance from said top chord which progressively diminishes towards said toe and heel portions.

4,175,768

COLLAPSIBLE TRAILERS

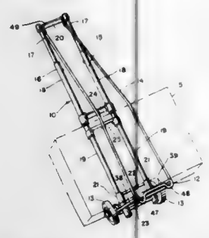
Ronald A. Thackray, Great Baddow, England, assignor to Stow-A-Way Trailers Limited, Essex, England

Filed Feb. 21, 1978, Ser. No. 879,603
Claims priority, application United Kingdom, Feb. 23, 1977, 7655/77
Int. Cl.[2] B62B *11/00*
U.S. Cl. 280—652 **5 Claims**



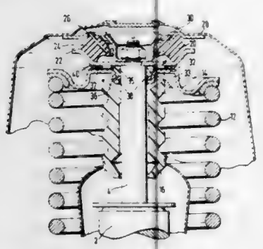
1. In a collapsible road trailer comprising a central main beam, a base comprising separate side members and means hingeing said side members to said main beam, a collapsible wall structure, means for removably securing said wall structure to said base, two wheel assemblies and means for removalby securing said wheel assemblies to said base, the improvement comprising said main beam being hollow, a tow bar telescoped within said main beam and means locking said tow bar at a predetermined position within said main beam, said locking means being operated by the hingeing down of said side members of said base.

4,175,769
PORTABLE LUGGAGE CARRIER
Eugene A. Kazmark, 5 Remin La., Joliet, Ill. 60433
Filed May 1, 1978, Ser. No. 901,571
Int. Cl.[2] B62B *11/00*
U.S. Cl. 280—654 **7 Claims**



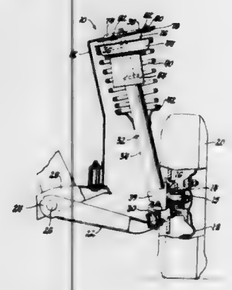
1. A portable luggage carrier comprising an elongated frame having upper and lower ends, a base for supporting luggage having a pair of spaced-apart rods pivotally mounted on the frame adjacent the lower ends thereof and movable between a storage position in which the rods extend generally parallel to the frame and a luggage-supporting position in which the rods extend perpendicularly to the frame, said frame including a pair of spaced-apart frame members and a detent bracket mounted on each of said frame members, an axle extending through said detent brackets, and a pair of wheels mounted on said axle, each of said detent brackets including a projection for releasably holding one of the rods in its luggage-supporting position, each projection having camming surfaces which are engageable with one of the rods whereby the projection can be cammed away from the rod to permit the rod to move to and from its luggage-supporting position.

4,175,770
MOTOR VEHICLE SUSPENSION STRUTS
Adolf Draisbach, Kelsterbach, and Kurt H. Fiedler, Geinsheim, both of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.
Filed Dec. 19, 1977, Ser. No. 861,860
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658835
Int. Cl.[2] B60G *11/14*
U.S. Cl. 280—668 **6 Claims**



1. A suspension strut for a motor vehicle, comprising a telescopic damper having a housing forming a support for a steering knuckle, a piston rod projecting from the housing, support bracket means secured to the damper housing, a spring support plate surrounding the piston rod, a helical suspension spring having opposite ends thereof seated on the support bracket means and on the spring support plate respectively, a support flange secured to the piston rod, resilient mounting means connected to the support flange to form a resilient mounting permitting limited piston rod movement relative to a body portion of the vehicle, a rolling bearing interposed between the spring support plate and the piston rod support flange, and a friction element of resilient plastic material in parallel relationship with said bearing operatively disposed between the spring support plate and the piston rod support flange and in direct frictional engagement therewith to provide a predetermined amount of bearing friction therebetween.

4,175,771
RESILIENT MOUNTING MEANS FOR MACPHERSON STRUT
Richard A. Muzechuk, Kettering, Ohio, and Marvin J. Hyma, Pontiac, Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Jul. 27, 1978, Ser. No. 928,508
Int. Cl.[2] B60G *15/00*
U.S. Cl. 280—696 **3 Claims**

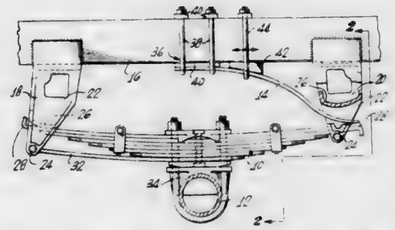


1. In a vehicle suspension system including sprung and unsprung masses, a shock absorber operatively connected between the sprung and unsprung masses, the shock absorber outer casing being operatively connected at its lower end to the unsprung mass and having a piston rod extending exteriorly of its upper end and flexibly connected to the sprung mass adjacent an opening formed in the sprung mass, and a coil spring mounted around the shock absorber and being operatively connected at its lower end to a retainer flange formed on the outer casing and having its upper end flexibly connected to the sprung mass, the improvement comprising a dual-rate elastomeric mounting means adapted to being secured to the sprung mass and operatively connected to the piston rod and the upper end of the coil spring, the dual-rate elastomeric mounting means including a single elastomeric ring, mounting means adapted to preloading the elastomeric ring between the mounting means and concentric with the opening in the sprung mass, bearing means operatively connected to the bottom portion of the elastomeric ring, and a spring retainer flange mounted between the bearing means and the upper end of the coil spring for subjecting the outer portion of the elastomeric ring to compression forces during jounce and rebound conditions, and the piston rod being operatively connected to the center portion of the elastomeric ring for subjecting the center portion thereof to shear forces during such jounce and rebound conditions, thereby providing predetermined different stiffness characteristics for the shock absorber and the coil spring.

4,175,772
VEHICLE SUSPENSION SYSTEM HAVING AUXILIARY SPRING FOR LIGHTLY LOADED CONDITIONS
Albert J. Lampert, San Clemente, Calif., assignor to Cambria Spring Company, Los Angeles, Calif.
Filed Apr. 1, 1977, Ser. No. 783,661
Int. Cl.[2] B60G *11/04*
U.S. Cl. 280—718 **8 Claims**

1. A suspension system for a vehicle comprising:

a main leaf spring connected to at least one axle of said vehicle;
hanger means attached to the frame of said vehicle for retaining said mainspring while permitting vertical travel thereof within a predetermined range;
an auxiliary spring attached to said frame and disposed between said frame and said mainspring, said auxiliary spring extending continuously along said frame toward said hanger means from the point of attachment thereof to said frame and downwardly biasing said mainspring toward the lower limit of said range of travel, said auxiliary having a portion adjacent said point of attachment that is substantially parallel with said frame and a portion



of said auxiliary spring located between said point of attachment and said hanger having a slight S-curvature, said auxiliary spring having a spring rate substantially lower than that of said mainspring, whereby said vehicle rides on said auxiliary spring when lightly loaded but rides on said mainspring when heavily loaded; and
a wedging member attached to said frame and engaged by said auxiliary spring, for flexing of said spring thereat in both vertical directions said wedging member being disposed between said hanger means and the point of attachment of said auxiliary spring to said frame, the force exerted on said mainspring by said auxiliary spring being dependent on the position of said wedging member.

4,175,773
PASSIVE SEAT BELT SYSTEM
Larry D. Miller, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jul. 10, 1978, Ser. No. 922,998
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—803 **3 Claims**



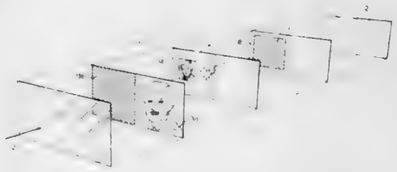
1. In combination with a vehicle body defining an occupant compartment in which an occupant seat is accessible through a door opening selectively opened and closed by a movable door, a passive occupant restraining belt arrangement comprising:
a shoulder belt having first and second ends;
a shoulder belt anchor mounted on the door generally adjacent the shoulder of the occupant and slidably receiving the shoulder belt intermediate the first and second ends thereof;
means attaching the first end of the shoulder belt inboard the occupant and generally adjacent the occupant hip;
retracting means mounted on the vehicle body inboard and generally adjacent the hip of the occupant and having the second end of the shoulder belt attached thereto for extending the second end of the shoulder belt upon outward opening movement of the door and sliding movement of the shoulder belt through the door mounted shoulder belt anchor;
a lap belt having first and second ends;
means attaching the first end of the lap belt on the vehicle door generally adjacent the hip of the occupant;
and means attaching the second end of the lap belt to the shoulder belt at a point thereon traveling from inboard the occupant adjacent the hip when the door is closed to a position intermediate the retracting means and the door mounted anchor loop upon opening movement of the door whereby the lap belt is moved from the normal door closed restraining position to a nonrestraining position when the door is open.

4,175,774
NON-COPYING PRINTED DOCUMENT AND METHOD OF PRINTING SAME
Gerald A. Tonges, Sycamore Township, Hamilton County, and Eugene L. Elmlinger, Springdale, both of Ohio, assignors to American Standard Inc., Cincinnati, Ohio
Filed Mar. 23, 1978, Ser. No. 889,229
Int. Cl.[2] B42D *15/00*
U.S. Cl. 283—6 **3 Claims**



1. A document including a sheet and a background printed on the sheet, the background including a first portion formed of small dots and a second portion formed of larger dots, the dots being of a single color, the larger dots being of a size which is reproduced by a copying machine, the small dots being of a size which is not reproduced by the copying machine.

4,175,775
ACCESS CONTROL SYSTEM
Herman Kruegle, Rivervale, N.J., assignor to Visual Methods, Inc., Westwood, N.J.
Filed Jan. 11, 1978, Ser. No. 868,522
Int. Cl.[2] G02B *27/14*; G09F *3/02*
U.S. Cl. 283—7 **7 Claims**



1. An improved identification card of the type that includes

a first region bearing visible indicia descriptive of the authorized holder of the card, wherein the improvement comprises:

a second region of said card bearing further visible indicia descriptive of said holder, said further visible indicia being recorded on a photographic transparency; and

means for inhibiting detection of said further visible indicia when said card is illuminated by visible radiation of normal intensity and wavelength, said inhibiting means comprising:

a reflecting medium downstream of said photographic transparency; and

an optical filter upstream of said photographic transparency.

4,175,776

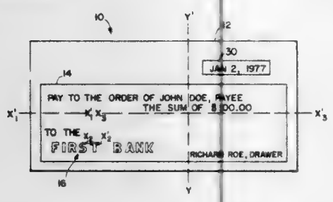
COUNTERFEIT RESISTANT DOCUMENT

Carmine J. Ranauro, Arlington, Mass., assignor to New England Mutual Life Insurance Company, Boston, Mass.

Filed Jan. 5, 1978, Ser. No. 867,117

Int. Cl.[2] B42D *15/00*

U.S. Cl. 283—8 B **6 Claims**



1. A counterfeit resistant document having a set of indicia on a background field wherein said set of indicia and said background field are characterized by different optical absorption spectra with respect to incident light having wavelengths within the response spectrum of the human eye, and are substantially non-absorbing with respect to incident light having wavelengths within the response spectrum of a color xerographic copier, said document comprising:

a substrate underlying said set of indicia and said background field, and having a surface which is substantially non-absorbing with respect to incident light having wavelengths within the response spectrum of a color xerographic copier,

at least two types of ink particles deposited on said substrate surface over said background field with different non-uniform distributions,

said ink particle distributions defining said set of indicia with at least one of said distributions providing substantially no ink particles overlying said substrate surface within the contours of said set of indicia and providing a plurality of ink particles on said substrate surface adjacent to and exterior to the contours of said set of indicia,

wherein said ink particles of each of said types are characterized by optical absorption spectra different from each other and from said substrate surface with respect to incident light having wavelengths within the response spectrum of the human eye, and wherein the particles of said one distribution are substantially non-absorbing with respect to incident light having wavelengths within the response spectrum of a color xerographic copier.

4,175,777

BOOK INDEX AND SUBJECT FINDER

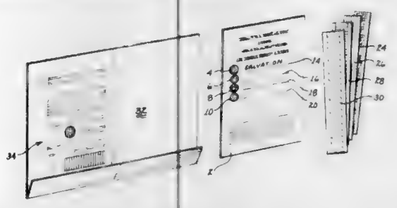
Sherrye J. Horn, 5747 W. Missouri, Sp. 89, Glendale, Ariz. 85301

Filed Jun. 29, 1978, Ser. No. 920,575

Int. Cl.[2] B42F *21/00*

U.S. Cl. 283—42 **4 Claims**

1. A book index comprising an index page adapted for permanent attachment to the body of a page of the book; color indicia carried by said page; subject identification means associated with said color indicia; separate subject markers comprising transparent colored sheets keyed to the colors of said color indicia and adapted to self-adhere to the pages of said



book to cover pertinent subject matter desired to be marked and extend to the margin of said page, whereby said color indicia is visible when the book to which said sheets are applied is closed.

4,175,778

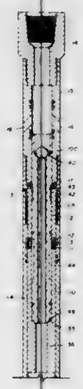
RELEASING TOOL

Carl W. Nunez, and Joseph S. Squyres, both of Lafayette, La., assignors to Halliburton Company, Duncan, Okla.

Filed May 1, 1978, Ser. No. 901,397

Int. Cl.[2] E21B *23/00;* **F16L** *37/14*

U.S. Cl. 285—3 **1 Claim**



1. A releasing tool having one end thereof being adapted to be releasably attached to a hook-up nipple having a bore therethrough of a gravel pack screen assembly while having the other end thereof adapted to be releasably attached to a tubing string, said releasing tool comprising:

case means for releasably attaching said releasing tool to said tubing string, said case means including:

adapter means having a bore therethrough for releasably attaching said releasing tool to said tubing string;

ported case means having a bore therethrough, having a plurality of ports therein for communicating the bore of said ported case means with the exterior of said ported case means and having annular seal means disposed in the wall of the bore through said ported case means on opposite sides of said ports; and

releasing body means having a bore therethrough and a plurality of apertures therein;

releasing block means retained within the apertures in said releasing body means of said case means for releasably attaching said releasing tool to said hook-up nipple of said gravel pack screen assembly;

releasing mandrel means slidably disposed within said case means for alternately allowing said releasing block means to engage and disengage an annular channel in said hook-up nipple of said gravel pack screen assembly when said releasing mandrel means is moved from a first position in said case means maintaining said releasing block means engaging said hook-up nipple to a second position in said case means allowing said releasing block means to disengage said hook-up nipple, said releasing mandrel means including:

a cylindrical member slidably disposed within said case means, said cylindrical member having a bore therethrough, a first annular channel in the exterior surface thereof, and a second annular channel in the exterior surface thereof for receiving said releasing block means therein when said releasing mandrel means is in said second position allowing said releasing block means to disengage said hook-up nipple;

shear pin means securing said ported case means to said releasing mandrel means thereby maintaining said releasing mandrel means in said first position in said case means; and

snap ring means retained in an annular cavity formed when a portion of one end of said ported case means abuts a portion of one end of said releasing body means, said snap ring means engaging the first annular channel in said releasing mandrel means when said releasing mandrel means is in said second position thereby retaining said releasing mandrel means in said second position.

4,175,780

LATCH MECHANISM

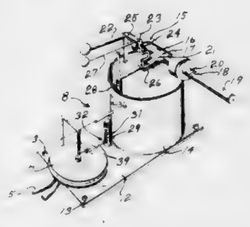
Ulderic S. Hill, C.P. 68 Co. Stanstead, Rock Island, Quebec, Canada

Division of Ser. No. 680,965, Apr. 27, 1976, Pat. No. 4,084,519. This application Oct. 5, 1977, Ser. No. 839,733

Claims priority, application Canada, May 2, 1977, 277375

Int. Cl.[2] E05C *3/02*

U.S. Cl. 292—201 **8 Claims**



1. A latch mechanism comprising a support, a latch finger including a root portion and a latch pin portion freely pivotable at one end to one end of said root portion about a transverse axis relative to the longitudinal axis of said root portion, said root portion maintained horizontal by said support and rotatable therein about said longitudinal axis between a latching position in which said transverse axis is upright and said latch pin portion is maintained horizontal and in alignment with said root portion, and a releasing position in which said transverse axis is horizontal and said latch pin is allowed to freely pivot about said transverse axis to a downwardly hanging position, biasing means acting on said root portion to urge rotation of the latter in said support from said latching position to said releasing position, a catch device releasably holding said root portion in said latching position against the action of said biasing means and a trigger device selectively operating said catch device to cause the latter to release said root portion permitting rotation of the latter from said latching position to said releasing position under the action of said biasing means.

4,175,779

STRESS CONTROL COLLAR

William R. Apblett, Jr., Florham Park, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jan. 18, 1978, Ser. No. 870,393

Int. Cl.[2] F16L *13/04, 5/02;* **B01J** *8/06*

U.S. Cl. 285—115 **4 Claims**

1. A welded interconnection for connecting a cylindrical member in registry with an opening extending through a second member, said members being subjected to thermally induced relative bending therebetween, said interconnection comprising a tubular extension connected at one end to said second member and defining a through bore in registry with said opening, said tubular extension having a counterbore at its other end for receiving an end portion of said cylindrical member, a first weld connecting said other end of said tubular extension to an outer surface portion of said cylindrical member, a collar for displacing from the region of said weld the mechanical stress caused by said bending, said collar extending over a portion of said cylindrical member with the inner end of said collar located proximate to said first weld, and a second weld connecting said inner end of said collar with said first weld and said cylindrical member, said collar being fabricated from the same material as said cylindrical member.

4,175,781

LATCHING ARRANGEMENT FOR MANHOLE COVER

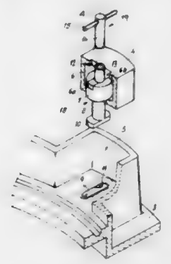
Robert Dumortier, 9 rue Duchartre, Béziers (Hérault), France

Filed Jan. 3, 1978, Ser. No. 866,708

Claims priority, application France, Jan. 5, 1977, 77 00650; Nov. 25, 1977, 77 36458

Int. Cl.[2] E05C *3/10*

U.S. Cl. 292—218 **9 Claims**



1. A latching arrangement for a manhole, said arrangement comprising:

a disk-shaped manhole cover formed with a cavity and upper and lower throughgoing apertures opening into said

cavity and both lying on a cavity axis along the periphery of the cover;

a latching member rotatable in said cavity about said axis and having a lower end projecting through said lower aperture and an upper end underneath said upper aperture and formed at said axis with a socket opening toward said upper aperture, said socket and said upper aperture being of similar shape and having like radial extensions;

a ring-shaped support having a seat snugly engageable with said cover and including means having a formation cooperating with said lower end of said latching member for locking said cover and support together in a locking angular position of said latching member relative to said axis and for permitting separation of said cover and support in an angularly offset freeing position of said latching member relative to said support, said extensions being axially and angularly aligned only in said locking position; and

a key having a tip of substantially the same cross-sectional shape as said upper aperture and said socket and engageable through said upper aperture into said socket only in said locking position.

4,175,782

DEVICE FOR CLOSING BAGS

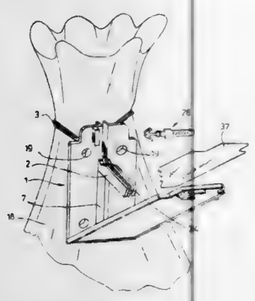
Eduardo de Lima Castro Neto, Rua São Luiz Gonzaga 912, 20,000 Rio de Janeiro - RJ, Brazil

Filed Mar. 9, 1978, Ser. No. 885,043

Claims priority, application Brazil, Oct. 20, 1977, 7707028

Int. Cl.² B05D *33/34*

U.S. Cl. 292—307 R **8 Claims**



1. A device for closing bags comprising:

(a) a lever provided with means for fixing one end of a string or the like to at least one point along its length and a guide for the string or the like at a fixed point on the lever which is spaced from a first end thereof;

(b) an element defining an open topped elongated cavity for the lever and having means for fixing the other end of the string or the like to at least one point thereof, said element being provided with string guide means disposed substantially axially with respect to the cavity and a support in said cavity for said first end of the lever so that, on placing the lever within the cavity, the contact point between said first end and the support lies between the guide on the lever and the guide means on said element, defining approximately a straight line; and

(c) a closure member for closing said top of the cavity with the lever therein, said closure member and said element being provided with means permitting their immobilization with respect to each other by the application of a security seal, said string fixing means on at least one of said element and lever defining a plurality of fixing points to permit the adjustment of the length of the string or the like.

4,175,783

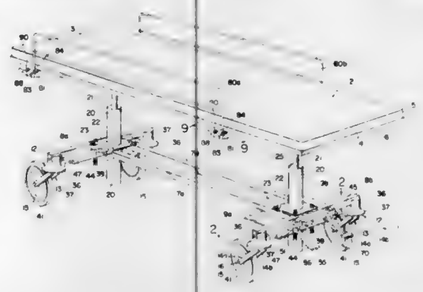
STRETCHER

Michael J. Pioth, 5900 Center Rd., Valley City, Ohio 44280

Filed Feb. 6, 1978, Ser. No. 875,674

Int. Cl.² A61G *3/00*

U.S. Cl. 296—20 **1 Claim**



1. In a stretcher suitable for supporting and transporting patients in hospitals and the like comprising a chassis and a bed portion overlying said chassis and carried by said chassis, said chassis having (1) a frame comprising two laterally spaced longitudinal members of rectangular cross-section running longitudinally and horizontally the substantial length of the stretcher and horizontal cross members also of rectangular cross section one of which is welded perpendicular to and at each end of said longitudinal members, said cross members extending equidistantly beyond the two longitudinal members, and (2) a castor wheel assembly rotatably carried in a swivel frame, carried at each end of each cross member, and (3) brake means which comprises four inverted cup-like brake shoes, one to bear against each wheel, each of said brake shoes having a cylindrical portion concentric with the axis of swivel of one said castor wheels and a flared perpheral lip that overlies a tire, suitable spring means to normally hold said brake shoes in an upward position away from said tire, and hydraulic means for controllably moving each of said brake shoes toward the tire that it overlies, the improvement which comprises an annular downwardly extending portion that is the outer annular terminus of said perpheral lip of said brake shoes, said downwardly extending portion having a radius that is no greater than the radius of swivel of the center of said wheels.

4,175,784

DEVICE FOR MOUNTING THE GUIDE SLEEVE OF A DRIVE CABLE FOR A SLIDING TOP OF AN AUTOMOBILE ROOF

Walter Schätzler, Aufhausen, and Erich Handler, Starnberg, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Jul. 12, 1978, Ser. No. 924,003

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1977, 2731408

Int. Cl.² B60J *7/10*

U.S. Cl. 296—137 E **24 Claims**



1. Device for mounting the guide sleeve of a pressure-resistant drive cable for a sliding top of an automobile roof of the type wherein the sliding top is covered toward the inside of the automobile by a displaceable headliner, wherein the guide sleeve has a longitudinal slot, and the drive cable is attached, by means of a retaining device penetrating the longitudinal slot, to a transport bridge connected to the sliding top, characterized in that a guide support means is attached to the sliding headliner, this guide support means supporting the guide sleeve at least in a pushed-back open position of the sliding headliner.

4,175,785

MOTOR VEHICLE ROOF

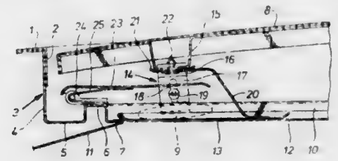
Robert Leiter, Krailling, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Aug. 2, 1977, Ser. No. 821,236

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1976, 2637839

Int. Cl.² B60J *7/04*

U.S. Cl. 296—137 E **14 Claims**



1. Movable vehicle panel apparatus including a vehicle panel which is movable to and from a closed position closing an opening in a vehicle body portion defining a passenger space, said panel comprising:

a cover part which faces away from the interior of the vehicle passenger space when said panel member is in said closed position,

a headlining spaced from said cover part and disposed to face the interior of the vehicle passenger space when said panel member is in said closed position,

and resilient leaf spring means attached to and between the cover part and headlining for interconnecting said cover part and said headlining in such a manner as to resiliently movably support said headlining means with respect to said cover part, and so as to resiliently push said headliner against a surrounding relatively fixed vehicle frame part when said panel member is in said closed position, the attachment of said leaf spring means to the cover part being forward of its attachment to the headlining in the closing direction of movement.

4,175,786

DEVICE FOR TRANSPORTING CHILDREN ON CHAIR LIFT SEATS

Herta Schaller, and Herbert Schaller, both of Gusshausstrasse 6, Vienna, Austria (A-1040)

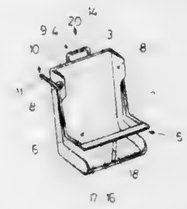
Filed Nov. 8, 1977, Ser. No. 849,626

Claims priority, application Austria, Nov. 9, 1976, 8305/76

Int. Cl.² A47C *1/08*

U.S. Cl. 297—254 **10 Claims**

1. A safety transport device for accommodating a child which is adapted to be detachably connected to an adult chair lift seat comprising, a safety seat having a seat portion and a connected back portion formed of a unitary construction, said safety seat being sized to accommodate a small child and to be fitted on a seat portion of an adult chair lift, a safety bar, said safety bar including a pair of side arm portions, and an interconnected cross bar adapted to extend across the lap of a small child seated in said safety seat, said side arm portion being L-shaped to extend forwardly and upwardly, said upwardly extending portions being disposed along the sides of said back portion of said safety seat, pivot means for pivotally connecting said upwardly extending portions to said back portion of said safety seat for pivoting said safety bar into an operative position, said upwardly extending portions having their respective upper ends laterally bent to extend rearwardly of said back portion of said safety seat, said rearwardly bent upper ends being adapted to extend over and contact the back portion of the chair lift seat when the safety device is connected to the chair lift seat, said rearwardly bent upper ends preventing a pivoting of and locking said safety bar in the operative position of said safety seat when said ends extend over and contact the



back portion of the chair lift, a linking means for linking said safety seat to said chair lift seat, said linking means including a member connected to and disposed rearwardly of said safety seat which is slidably mounted relative to said safety seat, said member being adapted to hook over the back portion of the chair lift seat in the operative position of said safety seat and be slid downwardly behind the chair lift seat back portion, and said member defining a handle to facilitate the handling of said safety seat, and a central support connected to said cross bar, said central support extending between said cross bar and the seat portion of said safety seat.

4,175,787

DOUBLE SHOULDER LAP SAFETY BELT

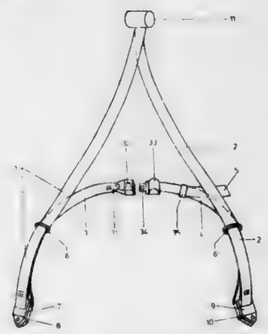
Kurt (Ulrich) Muskat, Hamburg, Fed. Rep. of Germany, assignor to Klippan GmbH Sicherheitsgerate, Hamburg, Fed. Rep. of Germany

Filed Mar. 13, 1978, Ser. No. 887,099

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1977, 2710591

Int. Cl.² A62B *35/00*

U.S. Cl. 297—484 **6 Claims**



1. A vehicle safety belt system for a passenger seat having a back rest and seat cushion comprising:

(a) a continuous length of seat belt webbing forming two shoulder belt portions adapted to extend down over the shoulders of a vehicle occupant and a lap belt portion comprising a releasable buckle and tongue interconnection;

(b) a first anchoring means for anchoring the upper portion

of said shoulder belt portions behind the upper back rest area;

(c) a second anchoring means for anchoring the lower portion of said shoulder belt portions on each side of the seat adjacent the bottom thereof, said second anchoring means having pass-through fittings;

(d) a third anchoring means for anchoring the lower portion of said lap belt portion on each side of the seat adjacent the bottom thereof, said third anchoring means having pass-through fittings; and

(f) a fastening and guiding means for fastening said lap belt portion and said shoulder belt portions to each other above said second and third anchoring means and for jointly guiding said lap belt portion and said shoulder belt portions such that one belt portion lies on top of the other, said fastening and guiding means being disposed in the area of the line of contact between the seat cushion and the back rest.

4,175,788

PAVEMENT CUTTING MACHINE

Carl C. Jacobson, Tempe, and Gaius P. Crosby, Mesa, both of Ariz., assignors to Crafco, Inc., Phoenix, Ariz.

Filed Apr. 10, 1978, Ser. No. 894,923
Int. Cl.[2] E01C *23/09*
U.S. Cl. 299—1 **11 Claims**



1. A pavement cutting machine comprising:

(a) a carriage of open configuration having a pair of spaced side rails, a rear cross rail and a front cross bar;

(b) a pair of axially aligned wheels each attached to a different one of the side rails of said carriage intermediate the front and rear ends thereof;

(c) a downwardly opening shroud having its front end pivotably coupled to the front cross bar of said carriage and disposed to lie in a central location intermediate the side rails thereof;

(d) cutter wheel means rotatably journaled in said shroud so as to lie in a central location intermediate said pair of wheels with its axis of rotation possible through the axis of said pair of wheels when said shroud pivotably moved;

(e) linear actuator means having one of its ends coupled to said shroud and having its other end coupled to the rear cross rail of said carriage and actuatable for pivotably moving said shroud to lower said cutter wheel means into a pavement cutting position below said carriage;

(f) an engine mounted on top of said shroud for movement therewith; and

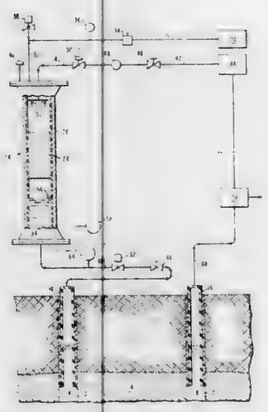
(g) drive means connected between said engine and said cutter wheel means for rotatable driving thereof.

4,175,789

SOLUTION MINING UTILIZING DISSOLVED OXYGEN WITH ELIMINATION OF ENTRAINED GAS

Wolfram H. Kube, Denver, and David L. Shuck, Littleton, both of Colo., assignors to Wyoming Mineral Corporation, Lakewood, Colo.

Filed Apr. 25, 1978, Ser. No. 900,038
Int. Cl.[2] E21B *43/28*
U.S. Cl. 299—4 **9 Claims**



1. A method for leaching mineral values from an underground ore body, in situ, comprising:

drilling at least one well into said ore body;

casing and sealing said well;

contacting an oxygen-bearing gas with a leach solution above ground and causing oxygen to become dissolved in said leach solution while eliminating entrained oxygen-bearing gas from said leach solution prior to injection into said well;

introducing said leach solution through said well and into said ore body where said leach solution contacts and oxidizes said mineral values with said mineral values becoming dissolved in said leach solution;

recovering said leach solution with said mineral values dissolved therein; and

treating said leach solution to extract said mineral values therefrom.

4,175,790

PROCESS FOR THE PRECONCENTRATION OF METALLIFEROUS PRODUCTS

Jean-Jacques Predali, Elancourt, France, assignor to Minemet Recherche, Trappes, France

Filed Feb. 16, 1978, Ser. No. 878,458
Claims priority, application France, Feb. 16, 1977, 77 04361
Int. Cl.[2] B02C *23/08, 23/18*
U.S. Cl. 299—7 **22 Claims**

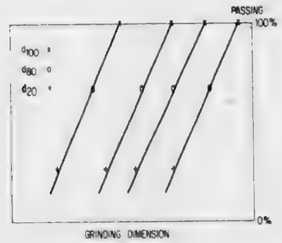
1. A process for the preconcentration of metalliferous values contained in a metal-bearing ore material selected from the group consisting of an ore and a byproduct thereof, comprising:

(a) subjecting the ore material to careful attrition, so that the fraction d_{80}/d_{20}, wherein

d_{80} represents the smallest mesh which permits 80% of the ore material to pass through, and

d_{20} represents the smallest mesh which permits 20% of the ore material to pass through

increases in the course of successive attritions; and



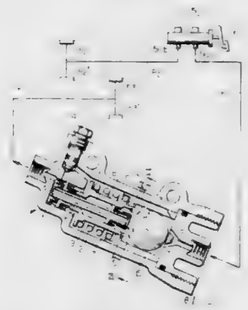
(b) recovering a cut containing the metalliferous values in concentrated form from the resulting attrited particle mixture.

4,175,791

HYDRAULIC BRAKE PRESSURE CONTROL APPARATUS FOR MOTOR VEHICLES

Tomoyuki Nogami, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 17, 1978, Ser. No. 887,739
Claims priority, application Japan, Apr. 15, 1977, 52-47622[U]
Int. Cl.[2] B60T *8/14*
U.S. Cl. 303—24 A **6 Claims**



1. In an apparatus for controlling hydraulic pressure delivered to hydraulic brake cylinders for rear wheels of a motor vehicle comprising:

a housing having a first hydraulic chamber hydraulically communicated with a master brake cylinder and a second hydraulic chamber hydraulically communicated with the hydraulic brake cylinders for the rear wheels;

a communication passage for communication between said first and second chambers;

a valve element disposed in said first hydraulic chamber and operable to close said communication passage; and

a differential piston having first and second pressure receiving regions exposed, respectively, in said first and second hydraulic chambers and adapted to control increase in the hydraulic pressure in said rear wheel brake cylinders in response to increase in the hydraulic pressure within said master cylinder after said communication passage has been closed by said valve element;

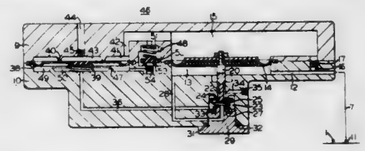
the improvement wherein said differential piston is disposed in series with said valve element and is displaceable in the direction toward said first hydraulic chamber to bear against said valve element thereby to prevent said valve element from closing said communication passage in dependence on load states of said motor vehicle, said first pressure receiving region of said differential piston being exposed in said first hydraulic chamber and having a smaller effective area than said second pressure receiving region exposed in said second hydraulic chamber so that said differential piston tends to move in the direction toward said first hydraulic chamber when said first and second fluid chambers are communicated with each other through said communication passage, spring means being disposed in said housing for resiliently urging said differential piston in the direction toward said second hydraulic chamber.

4,175,792

CONTINUAL QUICK SERVICE VALVE DEVICE

James E. Hart, Trafford, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Division of Ser. No. 779,672, Mar. 21, 1977. This application Sep. 14, 1978, Ser. No. 942,234
Int. Cl.[2] B60T *15/44*
U.S. Cl. 303—37 **5 Claims**



1. In a fluid pressure brake equipment, the combination of a brake pipe normally charged with fluid to a certain chosen pressure and a continual quick service valve device comprising:

(a) a control volume; (b) choke means for controlling the rate of flow of fluid pressure from said brake pipe to said control volume, whereby said control volume is charged to the pressure in said brake pipe;

(c) a piston abutment to one side of which is connected fluid pressure directly from said control volume and to the opposite side of which is connected fluid pressure from said brake pipe;

(d) a first annular valve seat;

(e) a valve element;

(f) first bias means for urging said valve element toward engagement with said first valve seat, said piston abutment being operative to unseat said valve element responsive to a pressure differential thereacross whenever a reduction of said brake pipe pressure arises;

(g) a second annular valve seat;

(h) a diaphragm valve subject opposingly to said brake pipe and control volume pressures;

(i) second bias means for urging said diaphragm valve toward engagement with said second valve seat;

(j) a delivery passage via which said brake pipe pressure is connected from said opposite side of said piston abutment to said diaphragm valve to urge said diaphragm valve toward engagement with said second valve seat in concert with said second bias means;

(k) a third annular valve seat coaxial with and spaced apart from said second annular valve seat such that said diaphragm valve is disposed therebetween for engagement with said third seat upon disengagement from said second seat;

(l) a one-way flow valve via which brake pipe pressure is connected from said delivery passage to said control volume only when said diaphragm valve is disengaged from said third valve seat; and

(m) an exhaust passage connected to said delivery passage, said exhaust passage having said first valve seat arranged therewith so as to effect local venting of said brake pipe

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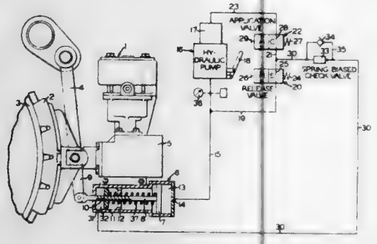
pressure when said valve element is unseated, said local venting of said brake pipe pressure effecting a pressure differential across said diaphragm valve to disengage said diaphragm valve from said second valve seat and, in turn, vent said control volume pressure via said second valve seat sufficient to counteract the pressure differential across said piston abutment.

4,175,793

PARKING BRAKE CONTROL SYSTEM FOR RAILWAY VEHICLES

Clemmons, Quenten T., Irwin, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Oct. 2, 1978, Ser. No. 947,970
Int. Cl.[2] B60T *17/16*
U.S. Cl. 303—89 **7 Claims**



1. Parking brake apparatus for use in conjunction with a tread brake unit of a railway vehicle including a brake shoe pivotally suspended on a brake shoe hanger through which braking forces are applied to the brake shoe, said parking brake apparatus comprising:

(a) a locking cylinder device mechanically connected to the brake shoe hanger, said locking cylinder device having a normal release position in which braking forces on the brake shoe hanger are released, and being operable responsively to fluid pressure to an application position in which braking forces are applied to the brake shoe hanger;

(b) fluid pressure supply means for supplying fluid pressure to said locking cylinder device for causing it to be operated to its said application position;

(c) locking nut means in said locking cylinder device operable, when subjected to said fluid pressure from said fluid pressure supply means subsequently to operation of the locking cylinder device to its said braking position, to a locking position for maintaining the locking cylinder device in its said application position;

(d) delay means interposed between said fluid pressure supply means and said locking nut means for allowing operation of the locking cylinder device to its said application position ahead of operation of the locking nut means to its said locking position; and

(e) release valve means for effecting operation of said locking nut means to an unlocked position in which said locking piston device is released from its said application position.

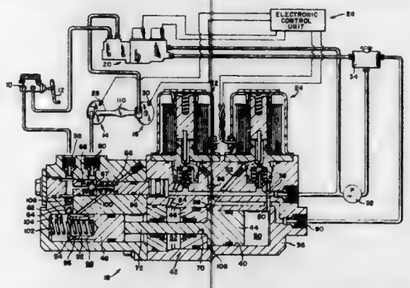
4,175,794

MODULATOR VALVE FOR A SPINNING AND SKIDDING WHEEL ASSEMBLY

Edward M. Pauwels, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed May 1, 1978, Ser. No. 901,405
Int. Cl.[2] B60T *8/08*
U.S. Cl. 303—105 **10 Claims**

1. In a brake system having a fluid pressure generator communicating pressurized fluid to a rotatable wheel assembly, a control unit responsive to the speed of rotation of the wheel assembly, a modulator valve controlling fluid communication between the fluid pressure generator and the wheel assembly and a pressure source communicating with the modulator valve, the improvement wherein the modulator valve comprises a housing having at least one bore and a piston assembly is slidably mounted in the one bore to substantially define a pair



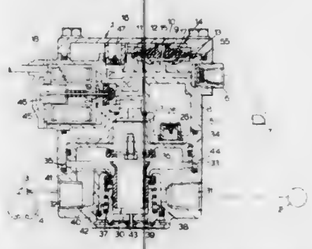
of pressure chambers the control unit cooperating with the modulator valve to vent one of said pair of pressure chambers when a skidding condition exists for the wheel assembly and the control unit cooperating with the modulator valve to vent said other pressure chamber when a spinning condition exists for the wheel assembly.

4,175,795

FLUID-PRESSURE OPERATED ANTI-SKID BRAKING SYSTEM FOR VEHICLES

Ivan Mortimer, Solihull, and Charles T. Layton, Birmingham, both of England, assignors to Girling Limited, Birmingham, England

Filed Jul. 6, 1978, Ser. No. 922,331
Claims priority, application United Kingdom, Jul. 9, 1977, 28885/77
Int. Cl.[2] B60T *8/02*
U.S. Cl. 303—118 **9 Claims**



1. A fluid-pressure operated anti-skid braking system for vehicles comprising a brake for braking a wheel, a supply of operating fluid under pressure for operating said brake, fluid-flow control valve means through which fluid from said supply is supplied to said brake, deceleration responsive means responsive to a skid signal for operating said valve means to relieve the brake pressure of fluid supplied to said brake at a skid point when the deceleration of said wheel is excessive and exceeds a predetermined value, a memory chamber for storing a memory pressure dependent upon the brake pressure occurring at said skid point to provide a changeover point between first and second stages of brake re-application, said first stage comprising the re-application of said operating fluid from said supply until a pressure less than the pressure of said skid point is attained at said changeover point, and said second stage comprising the continued re-application of said operating fluid but at a reduced rate of pressure increase, operator-controlled

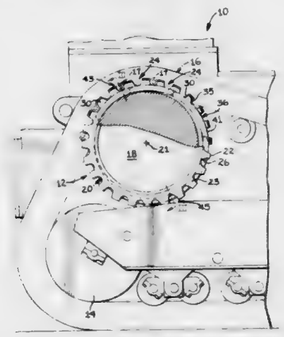
means for providing a control pressure, means defining an application chamber to which said control pressure is supplied, a relay valve operable in response to control pressure in said application chamber for controlling said brake pressure, a supply passage through which said control pressure is supplied to said application chamber from said operator-controlled means, a latch valve disposed in said supply passage, a connection between said supply passage and said memory chamber downstream of said latch valve, and a one-way valve permitting flow through said connection only into said memory chamber, said latch valve being movable between an open position in which said control pressure can be supplied to said application chamber and to said memory chamber through said supply passage and a closed position, and a restricted passage through which said control pressure can be supplied to said application chamber and to said memory chamber at least when said latch valve is closed, wherein said deceleration responsive means includes a valve member movable between a first position in which said application chamber is isolated from an exhaust port and said supply passage is in communication with both said application chamber and said memory chamber and a second position at the skid point in which said supply passage is isolated from said application chamber and said memory chamber, and said application chamber and said supply passage at least on the downstream side of said valve member are exhausted to said exhaust port so that braking is relieved, skid correction returning said valve member to said first position with said latch valve closing so that brake re-application can occur rapidly during the first stage with said control pressure supplied to said application chamber through said restricted passage until said changeover point is reached at which pressure in said application chamber equals said memory pressure in said memory chamber, whereafter re-application in the second stage continues at a reduced rate since said control pressure supplied through said restricted passage has also to increase said pressure of said memory chamber.

4,175,796

TRACK-TYPE VEHICLE WHEEL CLEANING APPARATUS

Roger L. Boggs, East Peoria, and Jon C. Christensen, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 26, 1978, Ser. No. 909,760
Int. Cl.[2] B62D *55/14*
U.S. Cl. 305—11 **9 Claims**



1. In a wheel having a hub, a rim having an outer surface and being connected to the hub, and teeth being positioned about the outer surface of the rim and being arcuately spaced one from the other by a root area, said root areas having an outer periphery and defining a root diameter, the improvement comprising:

said wheel having an annular opening having an inner diameter and an inner surface and being in communication with the outer periphery of the root areas, said inner diameter being less than the root diameter; and

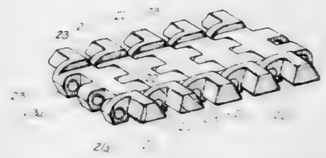
a hoop having inner and outer diameters and being positioned in the annular opening and free from connection with the wheel, said inner and outer diameters being greater than the inner diameter of said annular opening and the root diameter, respectively.

4,175,797

GROUND ENGAGING TREAD OR TRACK COMPRISED OF IMPROVED ARTICULATED CRAWLER PADS, FOR TREADED VEHICLES SUCH AS MINING MACHINES AND THE LIKE

Claude B. Krekeler, Cincinnati, Ohio, assignor to The Cincinnati Mine Machinery Company, Cincinnati, Ohio

Filed Oct. 12, 1977, Ser. No. 841,573
Int. Cl.[2] B62D *55/20*
U.S. Cl. 305—53 **5 Claims**



1. An improved crawler pad for a crawler tread such as may be used on mining machines and the like, said crawler pad being comprised of an uninterrupted solid central portion extending from one end of said crawler pad to the other end thereof, the length of said crawler pad from end to end determining the width of a said tread; a first solid end portion at said one end, said first solid end portion constituting an integral continuation of said solid central portion, and a second solid end portion at said other end, said second solid end portion constituting an integral continuation of said solid central portion, and said first and said second solid end portions providing a pair of shoulders extending upwardly from said solid central portion; at least one first main grouser element extending from one side of said solid central portion at right angles thereto and spaced from both of said solid end portions; at least two second main grouser elements extending from an opposite side of said solid central portion and at right angles thereto, said second main grouser elements being spaced from one another such that said first main grouser element is opposite the space defined by said second main grouser elements, and one of said second main grouser elements being spaced from the said solid end portion which is nearest to said one of said second grouser elements whereby to define a tooth receiving space; all of said first and of said second main grouser elements being substantially co-extensive with said solid central portion, both of said second main grouser elements which are nearest their respective said solid end portions being provided with upstanding portions constituting a continuation of the said shoulders; pintle receiving bores in all of said grouser elements, said grouser elements being otherwise solid in the manner of said solid central portion and of said solid end portions; the said bores being so located in their respective main grouser elements that when, in making up a crawler tread, a first said main grouser element on one of said pads is located between the second main grouser elements on an adjacent said pad, the said pintle receiving bores of interdigitated grouser elements will be aligned so as to be capable of receiving a pintle to articulately join the interdigitated pads; the said tooth receiving space being open ended in a sideways direction from said one of said second main grouser elements along the length of said pad towards that said solid end portion which is nearest to the said one of said second main grouser elements, said tooth receiving space being beyond said grouser elements and out-

V 9 8 1 4 N 0 2 7 7 9 UMI

side of said shoulders and outside of said upstanding portions, and the said tooth receiving space being sufficient to permit the tooth of a drive sprocket to drivingly engage the said last mentioned solid end portion of said pad, whereby to provide a maximum bearing surface for a said tooth.

4,175,798

ENDLESS TREAD OF THE SINGLE-PIN TYPE

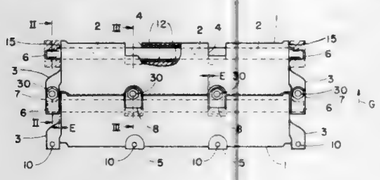
Otto Körner, Wermelskirchen, and Christian Bardiani, Wuppertal, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremburg, Fed. Rep. of Germany

Filed Apr. 6, 1978, Ser. No. 894,116

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1977, 2755412

Int. Cl.² B62D *55/20*

U.S. Cl. 305—58 R **10 Claims**



1. Endless tread pursuant to the single-pin type including a rubber-supported bolt in a tread member, and connecting components in the form of a clamp connection for nonrotative fastening of said bolt to said tread member, characterized through the combination of:

a bolt being provided with rubber rings vulcanized thereon and being pressable into a transverse bore in said tread member;

clamping lugs being slidable onto said bolt and clamping the latter to form a detachable connection with an adjoining tread member; and

said tread includes, in the travel direction, at least two cogs on one side of said tread member and, on the other side, in the region of said bolt includes free recesses for the assembly and fastening of said clamping lugs, and said clamping lugs being form-fittingly but releasably fastened to said cogs and said bolt.

4,175,799

HYDRODYNAMIC BEARING HAVING ANTICAVITATION RECESSES

Billy J. Davis, East Peoria; Cletus M. Kinsey; Hwa J. Shen, both of Peoria, and James R. Weber, Chillicothe, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 26, 1978, Ser. No. 909,754

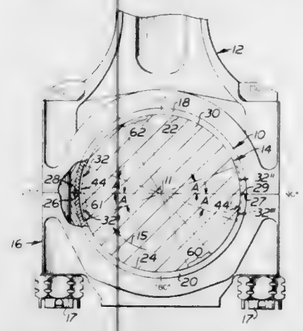
Int. Cl.² F16C *9/02*

U.S. Cl. 308—9 **8 Claims**

1. In a hydrodynamic bearing (**10**) having an axis (**11**), first and second bearing halves (**18,20**), each half (**18,20**) having a bearing face (**22,24**), first and second ends (**26,27**) (**28,29**), first and second sides (**40,42**) and extending about 180° around a shaft member (**30**) with the first and second respective ends (**26,28**) (**27,29**) contacting, the improvement comprising:

a slot (**32**) having a bottom surface (**34**), a pair of substantially parallel sidewalls (**38**), and an uninterrupted inner end wall (**36**) connected between the sidewalls (**38**), the slot (**32**) being formed in at least one of said bearing faces (**22,24**) and extending from a respective end (**26,27,28,29**)

a preselected peripheral distance (L) along the bearing face (**22/24**) to the inner end wall (**36**) and being spaced from each of the sides (**40,42**) to form opposite fluid containment barrier ribs (**43**) and a fluid trap of preselected volumetric capacity, said inner end wall (**36**) being substantially parallel to the axis (**11**) and defining a substantially 90° outer edge (**56**) relative to the bearing face



(**22/24**), and said bottom surface (**34**) being of substantially uniform depth from the bearing face (**22/24**).

4,175,800

FLUID BEARING SUPPORTING SYSTEM FOR ROTARY DRUMS AND THE LIKE

David H. Chaffee, Neenah, and Earl L. Tipler, Winnecone, both of Wis., assignors to Overly, Inc., Neenah, Wis.

Filed Jan. 9, 1978, Ser. No. 867,792

Int. Cl.² F16C *32/06*

U.S. Cl. 308—9 **13 Claims**



2. A supporting system for a generally cylindrical drum comprising fixed parking saddle means supporting the drum in stationary position, hydraulic fluid bearing means to lift the drum free of contact with said saddle means and to float the same out of contact with any physical support, and means to rotate the drum while thus floating, said fluid bearing means comprising a plurality of expansible pads of large face area emitting liquid in direct fluid contact with the drum over the large face area of the pads at a pressure less than approximately 50 P.S.I.

4,175,801

BEARING HAVING A TAB

Donald A. Coil, Washington; John L. Johnson, Jr., Brimfield, and Horace J. Swinland, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 813,586, Jul. 7, 1977, abandoned. This application Aug. 2, 1978, Ser. No. 930,449

Int. Cl.² F16C *3/06*

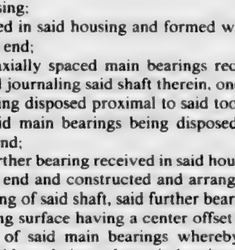
U.S. Cl. 308—23 **15 Claims**

1. A bearing insertable into a cavity of preselected configuration defined by structure including first and second members, said structure defining a reduced cross-sectional area of said cavity at a preselected location of said structure, comprising:

a body having a periphery and being positionable in contact with one of the first and second members in response to inserting said bearing into the cavity;

a surface on said body; and

at least one tab extending from said periphery adjacent said surface, said tab being of a different cross-sectional dimension than said body and of a construction sufficient for insertion into said preselected cavity at said reduced cross-sectional area for insertion of said bearing into said preselected cavity with said surface oriented toward only a



preselected one of the first and second members, and being free from engagement with said structure and spaced a preselected distance from said structure at the preselected location in response to said body of the bearing being in contact with the other one of the preselected one of said first and second members.

4,175,802

BORING SPINDLE WITH AUTOMATIC TOOL LIFTOFF

Horst Voll, Hassfurt; Franz Kessler, Ebern, and Max Herla, Schwebheim, all of Fed. Rep. of Germany, assignors to Kugelfischer Georg Schafer & Co., Schweinfurt, Fed. Rep. of Germany

Filed Mar. 3, 1978, Ser. No. 883,049

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1977, 2709448

Int. Cl.² B23B *29/034*

U.S. Cl. 308—9 **8 Claims**

1. A spindle unit for the fine boring of a workpiece, comprising:

a spindle housing;

a shaft received in said housing and formed with a tool end and a drive end;

at least two axially spaced main bearings received in said housing and journaling said shaft therein, one of said main bearings being disposed proximal to said tool end and the other of said main bearings being disposed proximal to said drive end;

at least one further bearing received in said housing proximal to said tool end and constructed and arranged to take up the journaling of said shaft, said further bearing having an inner running surface having a center offset from the axis of rotation of said main bearings whereby, during the boring of said workpiece, the main bearings are effective to journal the shaft and said further bearing is received with radial play in the housing while during return movement of the shaft, the said one of said main bearings being received with radial play in the housing while said further bearing is effective to journal the shaft about its axis;

a respective frustoconical support ring for at least one of the bearings proximal to said tool end, the radial play of said one of the bearings proximal to said tool end being produced by axial displacement of said frustoconical bearing support ring;

a hydraulic piston operatively connected to said bearing support ring for axially displacing same; and

a spring bearing upon said bearing support ring in a direction opposite the direction in which said piston is effective.

4,175,803

BEARING ASSEMBLY BETWEEN INNER AND OUTER SHAFTS HAVING TWO ROLLER BEARINGS AND TWO HYDRODYNAMIC OR SQUEEZE FILM BEARINGS

Derek A. Roberts, Bristol, England, assignor to Rolls-Royce Limited, London, England

Filed May 30, 1978, Ser. No. 910,671

Claims priority, application United Kingdom, Jun. 14, 1977, 24888/77

Int. Cl.² F16C *27/04*

U.S. Cl. 308—9 **3 Claims**



1. A bearing assembly comprising two respectively radially inner and outer rotary members, first and second rotary motion bearings each arranged radially between said members and each having an inner and an outer race, said inner member and the inner race of the first rotary motion bearing being radially relatively fixed, said outer member and the outer race of the first rotary motion bearing being radially relatively movable, means defining a first hydrodynamic film bearing between said outer member and the outer race of the first rotary motion bearing, said outer member and the outer race of the second rotary motion bearing being radially relatively fixed, said inner member and the inner race of the second rotary motion bearing being radially relatively movable, and means defining a second hydrodynamic film bearing between said inner member and inner race of the second rotary motion bearing.

4,175,804

FLEXIBLE SPRING BEARING

Hans U. Pannwitz, P.O. Box 67, Odessa, Fla. 33556

Filed Sep. 20, 1977, Ser. No. 834,903

Int. Cl.² F16C *27/06*

U.S. Cl. 308—26 **19 Claims**

1. A flexible spring bearing having a substantially cylindrical configuration and comprising at least one arcuate portion extending circumferentially about at least one section of said cylindrical configuration;

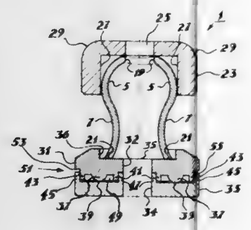
a main bearing race with an aperture therein concentric with the said cylindrical configuration and disposed contiguous with an end portion of said cylindrical configuration;

a thrust race disposed contiguous to said main bearing race;

bearing means disposed between said main bearing race and said thrust race whereby said main bearing race may rotate upon said thrust race;

said bearing means including at least one protrusion integrally extending from one of said races and annularly

disposed concentric with said cylindrical configuration; and



said main bearing race further comprising an inner annular skirt and an outer annular skirt thereby forming a channel about said bearing means located therein for receiving a lubricant.

4,175,805

ONE-PIECE INTERMEDIATE MEMBER FOR ANTI-FRICTION BEARINGS

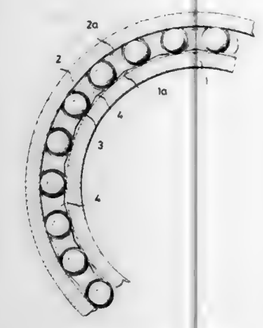
Dieter Becker, Lippstadt-Esbeck, and Alois Stenert, Lippstadt, both of Fed. Rep. of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Continuation of Ser. No. 777,127, Mar. 14, 1977, abandoned. This application Jul. 13, 1978, Ser. No. 924,342

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1976, 2610705.

Int. Cl.[2] F16C *19/20*

U.S. Cl. 308—199 **8 Claims**



1. For use in connection with an anti-friction bearing having an inner raceway and an outer raceway and a plurality of anti-friction bodies movably arranged between said inner and outer raceways; a spacer member having two oppositely located end faces defining a central axis as well as an interior of the spacer member therewith and consisting of a single integral piece for insertion between and engagement with two adjacent anti-friction bodies of said anti-friction bearing and including: peripheral supporting means insertable between the inner and outer raceways of said anti-friction bearing, a partition arranged radially inwardly of said peripheral supporting means and being substantially parallel to said end faces while dividing the interior of said spacer member into two compartments, each one of said compartments comprising a grate-like structure including strip-shaped reinforcing means coaxially arranged with and in spaced relationship to the central axis of said spacer member which is substantially perpendicular to said partition, said grate-like structure also including webs connecting said reinforcing means to said supporting means and also including ribs connecting said supporting means to said partition, said ribs having free inner ends spaced from said central axis, and said ribs and said reinforcing means and said webs defining surface sections curved in conformity with the curvature of the peripheral surface of the anti-friction bodies to be engaged by said spacer member.

4,175,806

RADIUS ROD OR ROCKER ARM BUSHES

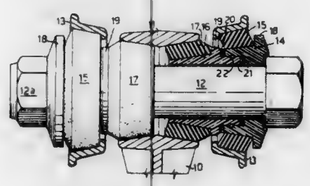
Gordon J. Taylor, 18 Seng St., Graceville, Queensland, Australia (4075)

Filed Apr. 6, 1978, Ser. No. 894,109

Claims priority, application Australia, Apr. 6, 1977, PC9702

Int. Cl.[2] F16C *27/00*

U.S. Cl. 308—238 **5 Claims**



1. A bearing for oscillatory motion including:
a pair of fixed side members,
coaxial coned apertures in said side members, tapering towards each other,
a pin passing through and spaced from said coned apertures in the side members,
an oscillatable member,
an eye on the oscillatable member, a passage through the eye being tapered from both ends and being about and spaced from the pin,
a pair of outer spacers on the pin,
a pair of resilient outer bushes engaged on the outer spacers and compressed between said outer spacers and the coned apertures of said fixed side members,
a pair of tubular inner spacers freely rotatable on the pin, inwardly of said outer spacers, and
a pair of resilient inner bushes engages on the inner spacers, each inner bush being compressed between the adjacent inner spacer and a tapered part of the passage through the eye of the oscillatable member,
wherein each inner spacer is releasably engaged coaxially with an adjacent outer spacer by a spigot and socket connection permitting relative rotational movement between the inner and outer spacers.

4,175,807

MODULAR CONSTRUCTIONAL UNITS FOR A COMBINED STORAGE BIN AND DISPLAY ASSEMBLY

Joel H. Kranich, 1 Parkton Pl., Pittsburgh, Pa. 15232; Robert A. Adam, and Charles L. Culbertson, both of Pittsburgh, Pa., assignors to Joel H. Kranich, Pittsburgh, Pa.

Filed Nov. 16, 1978, Ser. No. 961,350

Int. Cl.[2] A47B *53/00;* **A47F** *3/00;* **A47B** *47/00*

U.S. Cl. 312—118 **17 Claims**

1. A combined storage bin and display assembly for decorative paper and the like, said assembly comprising vertically-stacked and horizontally-adjoined modular constructional units extending along an essentially straight-line path while forming storage bins and displays disposed at an angle with respect to said straight-line path, said modular constructional units each essentially including a horizontal wall section to define in a vertical stack of constructional units at least a bin ceiling or a bin floor, and a side wall section extending vertically from said horizontal wall section along two intersecting peripheral edge portions thereof, said side wall section defining a rear end wall and a longitudinal bin side wall having an outwardly-facing vertical display area extended beyond the

forward edge of said horizontal wall section, said horizontal wall section and said side wall section each having support



surfaces for either vertical stacking or horizontal adjoining of modular constructional units.

4,175,808

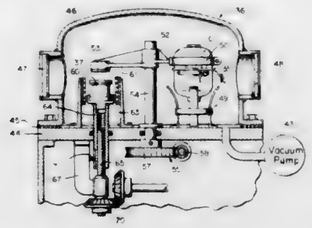
METHOD AND APPARATUS FOR PRODUCING ELECTRONIC DEVICES

Serge Paksweer, Elmhurst, and Constantin S. Szegho, Chicago, both of Ill., assignors to Ni-Tec, Inc., Niles, Ill.

Filed Jan. 3, 1966, Ser. No. 518,478

Int. Cl.[2] H01J *9/18*

U.S. Cl. 316—19 **9 Claims**



1. The method of constructing an electronic device comprising a first component and a second component having an opening for receiving said first component to form therewith a closed system, which method comprises the following steps:
processing at least a portion of said first component in an enclosure having an environment substantially free of contaminants harmful to said processed portion;
locating said enclosure in a transfer chamber containing said second component and having a transfer environment which may include said harmful contaminants;
opening said enclosure;
and assembling said first and second components to form said closed system while exposing said processed portion of said first component to said transfer environment for only a predetermined short time.

4,175,809

ROTATABLE ELECTRICAL CONNECTOR UNITS AND LIGHTING DEVICES INCORPORATING SAME

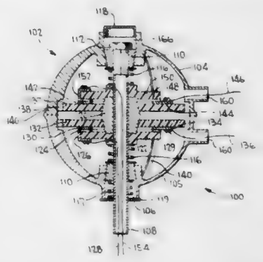
Joseph R. Dusko, 3436 Cascade Dr., Youngstown, Ohio 44511

Filed Apr. 7, 1978, Ser. No. 894,394

Int. Cl.[2] H01R *39/00*

U.S. Cl. 339—1 L **16 Claims**

1. A rotatable electrical connector unit adapted for use in a lighting device comprising a shaft which is at least partially hollow, at least three electrically insulating discs mounted transversely on said shaft, each of said discs carrying at least one electrical contact ring, said electrical contact rings arranged on said discs such that there are two pairs of electrical contact rings, each pair separated from each other, and such that the contact rings of each pair are in slidable electrical contact with each other, a housing including two portions capable of rotating relative to each other and about said shaft and said discs, the housing portions fixed to each end of the shaft and the shaft includes a rotatable joint within the housing which allows the end portions of the shaft and their respective housing portions to be rotated with respect to each other about



the longitudinal axis of the shaft, one portion of the housing engaging at least one of the discs such that when the housing portion is rotated relative to the shaft, the engaged disc is caused to rotate about the shaft, and at least four electrical conductors extending from the unit, each electrical conductor attached to a different contact ring.

4,175,810

ELECTRICAL INTERCONNECTION BOARDS WITH LEAD SOCKETS MOUNTED THEREIN AND METHOD FOR MAKING SAME

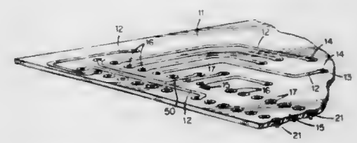
Richard C. Holt, Fairhaven, Mass.; Neil F. Damon, Manville, R.I., and Richard J. Hanlon, Attleboro, Mass., assignors to AUGAT Inc., Attleboro, Mass.

Continuation-in-part of Ser. No. 744,134, Nov. 22, 1976, Pat. No. 4,097,101. This application Nov. 18, 1977, Ser. No. 852,720

The portion of the term of this patent subsequent to Jun. 27, 1995, has been disclaimed.

Int. Cl.[2] H01R *13/40*

U.S. Cl. 339—17 C **16 Claims**



1. An electrical interconnection device comprising:
a flat generally rectangular sheet of electrically insulative compliant material;
electrically conductive material secured in discrete areas on at least one side of said sheet, said sheet having a multiplicity of holes therethrough, at least some of said holes normally intercepting at least some of said areas of electrically conductive material;
electrically conductive plating material on the inside surfaces of at least some of said holes thereby forming plated-through holes, said plating material being electrically interconnected with said respective intercepted discrete areas of electrically conductive material;
a lead socket formed with a substantially non-compliant cylindrical body portion having a circumferential groove therein intermediate the ends of said body portion, an axial opening through said lead socket, a plurality of flexible fingers normally converging toward one another at one end of said body portion and a tapered entry opening at the other end, one of said lead sockets being mounted in each of at least some of said plated-through holes, said

body portion having an external diameter larger than the internal diameter of said plated-through holes thereby forming an interference fit therewith, some of said plating material in said plated-through holes, which material is relatively compliant with respect to said body portion, being radially displaced by said body portion upon insertion thereof and partially filling said circumferential groove when said lead socket is fully seated with said groove positioned within said hole;

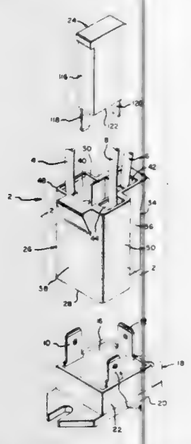
whereby said tapered entry is adapted to receive an electronic component lead, said fingers are adapted to frictionally engage said lead as it projects through said lead socket, and air flow is permitted through said lead socket.

4,175,811

CONNECTOR HAVING SNUBBER NETWORK FOR TRIAC

Daniel R. Coldren, Enola; Paul R. Krider, Camp Hill, and Benjamin C. Williams, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 27, 1978, Ser. No. 881,468
Int. Cl.² H01R *31/06*
U.S. Cl. 339—19 **5 Claims**



1. An electrical connector for connecting first, second, and third wires to first, second, and third main terminal tabs respectively and for connecting a network between said first and second main tabs, said main tabs extending normally from a surface of a triac or the like, said connector comprising:

an insulating housing having a mating face and a wire-receiving face, first, second, and third terminal-receiving cavities extending through said housing from said wire receiving face to said mating face,

first, second, and third terminals in said first, second, and third cavities, said terminals being proximate to said mating face, and being crimped onto said first, second, and third wires, said wires extending from said wire receiving face, each of said terminals having a main receptacle at said mating face which is mateable with one of said main tabs,

each of said first and second terminals only having a secondary receptacle integral therewith, said secondary receptacles being parallel to and beside, their associated main receptacles,

a module-receiving cavity extending into said housing from said wire-receiving face, said module-receiving cavity communicating with said first and second terminal-receiving cavities,

a snubber module in said module-receiving cavity, said snubber module having first and second network terminal tabs extending therefrom, said network terminal tabs being mated with said first and second secondary receptacles whereby,

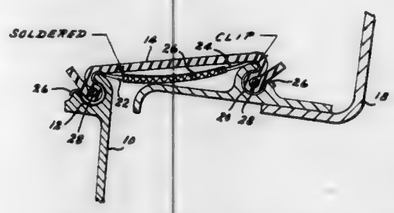
upon movement of said mating face against said surface of said triac, said first, second, and third wires are connected to said first, second, and third main terminal tabs, and circuitry contained in said snubber module is connected across said first and second main terminal tabs.

4,175,812

ELECTRICALLY CONDUCTIVE BONDING STRAP FOR CONNECTING MOVABLE PARTS

Arlo K. Palmer, Renton, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 30, 1978, Ser. No. 891,873
Int. Cl.² H02G *13/00*
U.S. Cl. 339—29 R **5 Claims**



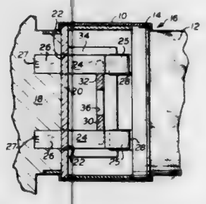
1. A bonding strap assembly located between relatively movable panels having corresponding arcuate grooves and a seal extending between said panels and held securely in said grooves by a means sufficiently large to expand said seal and prevent its removal from the grooves the improvement comprising an elongated electrically conductive means having a first and second connecting means affixed to opposite ends thereof, wherein said connecting means are shaped to conform to the internal surface of said grooves and are held within different ones of said grooves by said means.

4,175,813

TAMPER-PROOF ADAPTOR FOR AN ELECTRIC METER

John P. Mentesana, 1430 Seigart Blvd., Far Rockaway, N.Y. 11691

Filed Mar. 24, 1978, Ser. No. 890,009
Int. Cl.² G01R *1/00*
U.S. Cl. 339—36 **8 Claims**



1. A tamper-proof adaptor for an electric meter of the type normally having contact prongs extending from the rear of the meter for insertion into a wall pan to measure electric current flowing therethrough, comprising:

(a) a housing having a wall with openings therein:

(b) a plurality of extension prongs, equal in number to the number of contact prongs of the meter, supported within the housing;

(c) each of said extension prongs having a socket at one end adapted to receive a separate contact prong of the meter,

the opposite ends of each of said extension prongs projecting through an opening in said housing wall and adapted to be received in a separate socket of a wall pan to provide electrical contact between said meter and said pan;

(d) electrical insulator means supported within the housing and disposed for movement from a non-blocking position to a blocking position between said extension and meter prongs;

(e) bias means operatively connected to said insulator means to move said insulator means to its blocking position when said extension prongs become disengaged from the meter prongs to prevent the engagement thereof and;

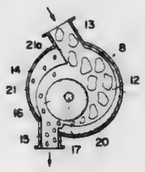
(f) said extension prongs being slideably supported within the housing for movement in a plane intersecting the path of movement of said insulator means, and being positioned to restrain movement of said insulator means to its blocking position when said prongs are engaged with the meter prongs, said extension prongs disengaging from the meter prongs when a force is exerted to disconnect said adaptor from the wall pan thereby to move said extension prongs out of the path of travel of said insulator means and permit movement of said insulator means to its blocking position by said bias means.

4,175,814

CRUSHER FOR SOLID MATERIALS TRANSPORTED BY PRESSURIZED LIQUID

Masahiro Ozasa, Tokorozawa; Kenya Murayama, Kawagoe, and Masako Okumura, Osaka, all of Japan, assignors to Ohbayashi-Gumi Co., Ltd. and KYC Machine Industry Co., both of, Japan

Filed Apr. 3, 1978, Ser. No. 892,674
Int. Cl.² B02C *23/36*
U.S. Cl. 241—46 R **4 Claims**



1. A crusher for crushing relatively large solid blocks carried by a pressurized liquid comprising:

a laterally extending stationary cylindrical housing having an inflow port and an outflow port, said inflow port being provided at the upper portion of said housing through which the relatively large solid blocks are fed with the pressurized fluid, said outflow port being provided at the lower portion of said housing through which the crushed solid particles are discharged into a transportation pipe, and

a cylindrical rotor eccentrically rotatable inside said cylindrical housing, said cylindrical rotor and housing defining a crushing passage therebetween, said crushing passage becoming narrower toward said outflow port,

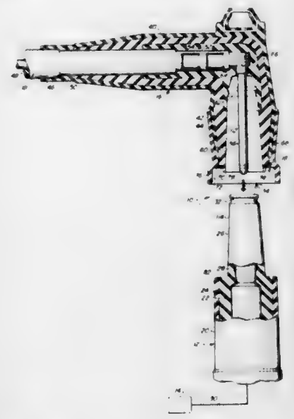
said inflow port being tangentially inclined relative to the cylindrical side wall of said housing and directed to the upper part of said crushing passage whereby the relatively large solid blocks and the pressurized liquid will be fed together into said crushing passage in the direction in which said cylindrical rotor rotates.

4,175,815

CONNECTOR ELEMENT WITH MEANS FOR REDUCING EFFECTS OF RADIAL VOID IN ELECTRICAL CONNECTION

Charles E. Andersen, and Craig W. Simons, both of Hackettstown, N.J., assignors to Amerace Corporation, New York, N.Y.

Filed May 31, 1978, Ser. No. 911,157
Int. Cl.² H01R *13/52, 15/06*
U.S. Cl. 339—61 R **7 Claims**



1. A first high voltage electrical connector element, such as a connector elbow, which is to be connected to a second high voltage electrical connector element, such as a bushing in a power distribution system, the first and second connector elements including first and second axially-extending interengageable surfaces, respectively, and first and second radially-extending surfaces, respectively, which will confront one another upon interengagement of the interengageable surfaces:

said first connector element including a housing member including at least a first part of insulating material, at least a portion of the first radially-extending surface provided by the first part; and

an annular lip of insulating material integral with the first part of the housing member and extending axially beyond at least said portion of the first radially-extending surface, the lip intersecting the radially innermost portion of the first radially-extending surface at all circumferential locations thereof, the lip being flexible such that upon completion of the interengagement of the interengageable surfaces the lip will be flexed outwardly so as to extend radially between the confronting first and second radially-extending surfaces and at least partially fill any gap which would otherwise be therebetween.

4,175,816

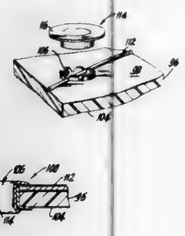
MULTI-WIRE ELECTRICAL INTERCONNECTING MEMBER HAVING A MULTI-WIRE MATRIX OF INSULATED WIRES MECHANICALLY TERMINATED THEREON

Robert P. Burr, Huntington; Ronald Morino, Sea Cliff, and Raymond J. Keogh, Huntington, all of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Division of Ser. No. 762,118, Jan. 24, 1977, Pat. No. 4,094,572, which is a continuation of Ser. No. 604,204, Aug. 13, 1975, Pat. No. 4,065,850. This application Mar. 31, 1978, Ser. No. 892,199
Int. Cl.² H01R *5/06*
U.S. Cl. 339—95 R **9 Claims**

1. A multi-hole, multi-wire electrical interconnection circuit board member comprising:

a multi-wire matrix including insulated wire; and
wire-retaining members;
said wire retaining member includes first and second conductive members mounted in the holes of the circuit board;
each of said first conductive members having a flange which extends outwardly beyond the edge of a hole and contacts one surface of the circuit board when said first conductive member is positioned in a hole;



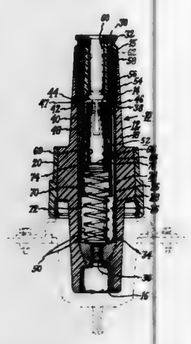
each of said second conductive members having a flange which extends outwardly beyond the edge of a hole contacting the opposite surface of the circuit board, a portion of said second conductive member extending through said first conductive member to provide an interference fit therewith; and
said flanges of said conductive members having slots for displacing the insulation of the insulated wires and establishing a gas-tight electrical connection with the conductive cores of the insulated wires when said conductive members are installed in the holes.

4,175,817

ELECTRICAL CONNECTOR SWITCHING MODULE

Henry N. Tachick, Blairstown, N.J.; Reginald S. Arnold, Pittsfield, Mass.; James E. Belcher, Dalton, Mass., and Joseph A. St. Jacques, New Ashford, Mass., assignors to General Electric Company, Philadelphia, Pa.

Continuation of Ser. No. 751,692, Dec. 17, 1976, Pat. No. 4,119,358. This application Jul. 28, 1978, Ser. No. 929,135
Int. Cl.[2] H01R *13/52*
U.S. Cl. 339—111 **9 Claims**



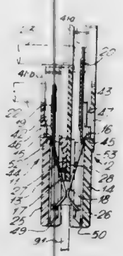
1. A separable electrical connector module for coupling with a mating connector module, comprising:
(a) an insulating housing having an elongated receiving passageway therein, and
(b) a switch insert closely fitted in said passageway, said insert comprising:
(i) a rigid conductive container tube having an outer end for receiving a rod contact member of the mating connector module, an inner end, an axial portion of uniform diameter;
(ii) a snuffer tube in said container tube, said snuffer tube having a central bore for receiving said rod contact member and having inside said bore a layer of ablative material;
(iii) a bore contact member adjacent said inner end of said container tube, said contact member comprising a gas port;
(iv) a piston fixed to said bore contact member and adapted for driving said contact member along the axis of said container tube toward said outer end of said container tube in response to gas generated by arcing in said bore, said piston being keyed to said container tube to prevent it from rotation in said container tube; and
(v) resiliently sliding contact member fixed to said piston and pressing outwardly against the inside wall of said container tube to establish continuous electrical contact with said inside wall while said piston is in motion:
(a) said inside wall including at least three axially extending keyribs, said keyribs being substantially equally spaced angularly about the axis of said container tube, each of said keyribs including an inner surface for electrically contacting said sliding contact member; and
(b) said sliding contact member comprising a sleeve contact fixed at one end to said piston and flared outwardly to the other end for resiliently engaging said inner surfaces of said keyribs to provide said continuous electrical contact with said inside wall while said piston is in motion.

4,175,818

ELECTRICAL CONNECTORS

Friedrich J. A. Kourimsky, Bensheim, and Heinrich John, Rodgau, both of Fed. Rep. of Germany, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 1, 1978, Ser. No. 911,723
Claims priority, application United Kingdom, Jun. 3, 1977, 23624/77
Int. Cl.[2] H05K *1/07;* **H01R** *13/42*
U.S. Cl. 339—176 MP **2 Claims**



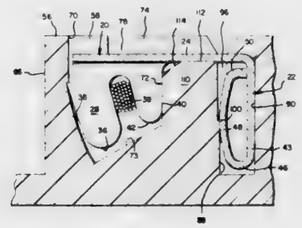
1. An electrical connector for interconnecting wires to a printed circuit board, which comprises:
a. a first terminal of conductive material having at one end a contact portion with an intermediate curved contact surface projecting laterally outwardly and a relatively short wire connecting portion extending axially at the other end;
b. a second terminal of conductive material having at one end a contact portion with an intermediate curved contact surface projecting laterally outwardly and a relatively long wire connecting portion extending axially at the other end; and
c. first and second housing modules, releasably coupled together in back to back fashion, each module having a passageway in which the first and second terminals are respectively positioned, an aperture being located in the back walls at one end through which the terminals' intermediate curved contact surfaces project to provide in combination, a receptacle for a tab or printed circuit board, and further, wire lead out apertures in the front wall of the first module and the back wall of the second module intersecting the passageways in registration with the respective terminal's wire connecting portions, said aperture in the first module being displaced longitudinally so that the wires which may be connected to the wire connecting portions lead away from the modules in the same lateral direction without interferring with each other.

4,175,819

CONNECTING MEANS FOR CONNECTING COIL WIRES TO LEAD WIRES

Donald W. K. Hughes, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 17, 1978, Ser. No. 925,502
Int. Cl.[2] H01R *13/02*
U.S. Cl. 339—176 M **8 Claims**



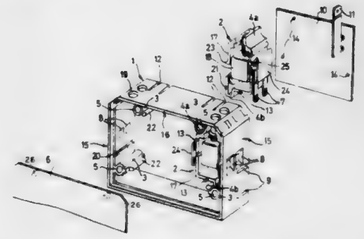
1. Electrical connecting means for connecting a first wire to a second wire, said connecting means comprising:
an insulating housing having a terminal-receiving face and having first and second terminal-receiving cavities extending into said terminal-receiving face, sidewalls and endwalls surrounding said terminal-receiving face, one of said sidewalls constituting a first wire-admitting sidewall, a first wire-admitting opening in said first wire-admitting sidewall communicating with said first cavity,
first wire-supporting means in said first cavity for supporting said first wire upon placement of said first wire in said opening with its axis extending transversely across said first cavity,
a second wire-admitting opening in one of said sidewalls communicating with said second cavity, means in said second cavity for supporting said second wire upon placement of said second wire in said second wire-admitting opening,
terminal means comprising first and second contact terminals which are connected to each other by a deformable connecting neck, said second terminal being dimensioned to have a force fit in said second cavity and having contact means thereon for establishing electrical contact with a second wire disposed in said second cavity upon insertion of said second terminal into said second cavity,
said first terminal being insertable into said first cavity with accompanying bending of said connecting neck after insertion of said second terminal into said second cavity, said first terminal having a first wire-receiving portion which is dimensioned to receive and establish
electrical contact with said first wire upon movement of
said wire-receiving portion past said first wire whereby, upon placement of said second wire in said second cavity, and insertion of said second contact terminal into said second cavity, said second wire will be placed in electrical contact with said second terminal and said terminal means will be securely held on said housing, and upon subsequent placement of said first wire in said first wire-admitting opening and in said first cavity, and upon movement of said first terminal into said first cavity with accompanying deformation of said connecting neck, said first wire will be received by said wire-receiving portion of said first terminal whereby said first wire is connected to said second wire.

4,175,820

MODULAR HOUSING MEANS FOR ELECTRICAL AND ELECTRONIC COMPONENTS

Manfred Wilmes, Detmold; Torsten Finger, Lemgo; Arno Fitzler, Herford; Wolfgang Kretzschmar, and Heinrich Franke, both of Detmold, all of Fed. Rep. of Germany, assignors to C. A. Weidmuller KG, Detmold, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 842,828
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646616
Int. Cl.[2] H01R *9/10, 9/16*
U.S. Cl. 339—198 R **9 Claims**



1. A housing for electrical and electronic components, comprising a generally prismatic frame-like housing member having two parallel major faces of which at least one is open, and a plurality of minor faces defined by walls extending between said major faces, at least one said wall containing at least one aperture providing access to the internal space of the housing member, the housing member being provided internally with at least one pair of parallel, generally cylindrical locating ribs each extending internally along a said wall and substantially perpendicular to said major faces for locating releasably in plug-in manner at least one terminal unit for connecting external leads to a said component or components when housed in said housing, said terminal unit comprising an electrically insulating body and at least one terminal housing therein, said insulating body and at least one terminal housing therein, said insulating body being shaped to cooperate slidably with said pair of ribs, for locating said terminal unit in said housing member, said terminal unit being releasably engageable with and disengageable from the locating ribs in plug-in manner by movement of said terminal unit through said at least one open major face, and in the engaged position thereof serving to locate said at least one terminal in alignment with a said aperture, for access of at least one external conductor to said at least one terminal.

4,175,821

ELECTRICAL CONNECTOR

Bradley L. Hunter, Hollis, N.H., assignor to Teradyne, Inc., Boston, Mass.

Filed May 15, 1978, Ser. No. 905,959
Int. Cl.[2] H01R *13/12*
U.S. Cl. 339—258 R **1 Claim**

1. An electrical socket contact for conductively engaging a post, said contact comprising:
a base including
a first end portion for connection with an electrical circuit and
a second end portion spaced longitudinally from said first

end portion and separated into a plurality of transversely spaced arms,
at least one of said arms being curved transversely and
at least one of said arms being bent outwardly from said base such that at least two arms overlap each other, the outward direction being perpendicular to the transverse and longitudinal directions; and
a socket portion adjoining said second end portion of said base and including a pair of generally longitudinally extending beams,
said beams each being cantilevered from at least one of said overlapping arms,
said beams being outwardly spaced apart and transversely aligned,
said beams including contact portions near their unsupported ends for conductively engaging said post, and



said beams and arms having sufficient outward springiness to springily grip said post between said contact portions; wherein
said second end portion of said base is separated into three arms,
the two transversely outside arms are bent outwardly from said base and curved transversely toward each other so as to join at a junction and overlap the third arm positioned centrally between them, and
one of said beams extends from said junction between said two curved arms; and wherein
said arms, beams and base are integral and
the aperture defined inside the two joined outside arms corresponds in shape to the third arm and cantilevered beam extending from it,
whereby a U-shaped cut made longitudinally in said contact produces inside the U-shape the third arm and beam and outside the U-shape the two joined arms and beam.

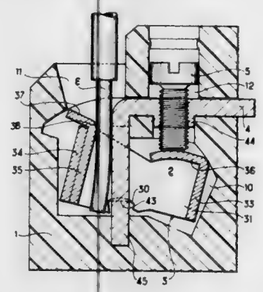
4,175,822

AXIAL CONNECTION TERMINAL

Jean Debaigt, Maisons Laffitte, France, assignor to CGEE Alsthom, Levallois Perret, France

Filed Oct. 11, 1978, Ser. No. 950,348
Claims priority, application France, Oct. 26, 1977, 77 322541
Int. Cl.[2] H01R *9/10*
U.S. Cl. 339—266 R **8 Claims**

1. An axial connection terminal for receiving a conductor wire, said connection terminal comprising: firstly a wire-clamping cage, said cage comprising a metal sheet folded in the form of a sleeve of rectangular cross-section formed by two opposite end walls and by two opposite side walls, a first end wall which includes at its upper edge a first rounded extension with a concave part turned inwards against the upper edges of the side walls, said side walls including respectively notches at the center of their lower edges; and secondly a connection strip having at one end a folded-down portion, said folded down portion having an end portion widened and limited by shoulders, said folded down portion being disposed between the side walls of the wire-clamping cage and each shoulder being disposed to press against one of the notches, a clamping screw threaded through said connection strip and bearing on said first rounded extension, said notches pivoting against said shoulders by the action of the end of said clamping screw which bears against said first extension, and said conductor



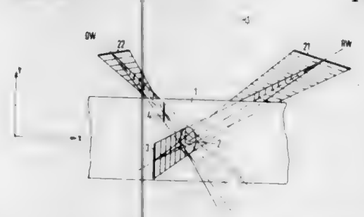
wire being clamped between the second end wall and the folded portion of the connection strip.

4,175,823

PROCESS FOR HOLOGRAPHIC RECORDING OF DATA IN THE FORM OF ELECTRICAL SIGNALS

Dietlind Pekau, Taufkirchen; Hartwig Ruell, Otterfing; Eckhard Storck, Munich, and Horst Kiemle, Neuried, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 521,390, Nov. 6, 1974, abandoned. This application Jun. 29, 1976, Ser. No. 700,839
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1973, 2355683
Int. Cl.[2] G02B *27/00*
U.S. Cl. 350—3.79 **1 Claim**



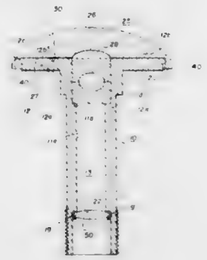
1. In a process of holographically recording information on a moving light-sensitive storage medium including projecting a reference wave and an object wave which is pulse modulated with the information to be recorded onto the moving storage medium to record a hologram thereon, the improvements comprising splitting the object wave into a plurality of parallel beams; separately pulse modulating each of the plurality of parallel beams with bits of information to be recorded to produce an object wave with a plurality of pulse modulated beams; focusing the object wave with the bits of information in parallel; focusing the reference wave, said steps of focusing of the object wave and reference wave producing astigmatic object and reference waves respectively with horizontal focal lines of each of said wave extending substantially parallel to the direction of feed and vertical focal lines of each wave extending perpendicular to the direction of feed, said steps of focusing adjusting the positions of the focal lines of the waves with the horizontal focal lines being disposed on one side of the storage medium and substantially in a plane extending parallel to the storage medium and the vertical focal lines being mirror symmetrical to the storage plane and closer to the storage plane than said horizontal focal lines so that the holograms, which have parallel stored bits, are recorded on the medium and are Fourier invariant at right angles to the direction of feed; and controlling the rate of feed of the storage medium so that the holograms partially overlap in the direction of feed of the storage medium.

4,175,824

DOOR VIEWER WITH BARREL FLANGE AND MATING LENS RECESS

Nicholas G. Daley, 1316 Cavalier, Suite 412, Richardson, Tex. 75080

Filed Sep. 13, 1977, Ser. No. 832,976
Int. Cl.[2] G02B *23/00*
U.S. Cl. 350—8 **1 Claim**



1. A door viewer, comprising:
(a) a generally cylindrical shaped barrel having an interior wall defining an axially extending elongated bore, said barrel terminating at its forward end in a generally circular shaped flange,
(b) first lens means retained within the forward end of said bore, and second lens means retained within said bore and axially spaced from said first lens means,
(c) said flange having a substantially flat forward surface, and
(d) a wide angle viewing lens secured to the flat surface of, and removably coupled with, said flange, said wide angle viewing lens having an outside diameter at least equal to the outside diameter of said flange and further having a centrally disposed recess in the base portion thereof for mateable reception of said flange, the circumferential end portion of said wide angle viewing lens resiliently engaging said flange.

4,175,825

OPTICAL TRANSMISSION SYSTEM WITH A PECHAN PRISM FOR EQUALIZING OPTICAL PATHS

Alfred H. Koppensteiner, Torrance, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 6, 1978, Ser. No. 883,563
Int. Cl.[2] G02B *23/12, 23/02*
U.S. Cl. 350—34 **10 Claims**



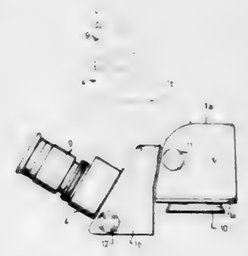
3. An optical coupling arrangement comprising:
viewing optics;
first and second imaging optics having respective focal planes occurring at different distances from said viewing optics;
a pivoted mirror disposed between said viewing optics and said first and second imaging optics, said mirror having first and second positions, said mirror in said first position reflecting a first image scene from said first imaging optics to said viewing optics, said mirror in said second position reflecting a second image scene from said second imaging optics to said viewing optics; and
a Pechan prism disposed between said mirror and one of said first and second imaging optics and having an air equivalent optical path so as to equalize the length of the optical paths from said viewing optics to said respective focal planes of said first and second imaging optics.

4,175,826

ADJUSTABLE VIEWING HEAD FOR A STEREOSCOPIC MICROSCOPE

Erich Blaha, Essingen, and Kurt Schulz, Oberkochen, both of Fed. Rep. of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Nov. 29, 1977, Ser. No. 855,673
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2654778
Int. Cl.[2] G02B *21/22*
U.S. Cl. 350—36 **2 Claims**



1. As an article of manufacture, a binocular viewing head for a stereoscopic microscope, said head comprising a first housing having a ray-inlet side adapted to be mounted to a microscope body and adapted to accommodate two laterally spaced stereoscopically related inlet-ray bundles, said bundles being on axes defining an inlet plane, a second housing having a ray-outlet side and adapted to mount binocular viewing elements on spaced parallel axes defining an outlet plane, said housings being pivotally interconnected on an axis parallel to the geometrical intersection of said inlet and outlet planes, the range of pivotal relative movement of said housings being less than 180°, and a single plane-surface mirror contained within at least one of said housings at the region of their pivotal connection of said housings and including mechanical tilt-stabilizing and angle-dividing connections to both housings, said mirror being of such effective area proportions as to accept incidence of both inlet-ray bundles within said first housing and to reflect said bundles alike within said second housing regardless of the instantaneous angular pivoted relation between said housings, said second housing including optical means accepting both reflected ray bundles and transmitting the same with equal path length and in spaced relation for binocular viewing on the respective axes of said outlet side; like binocular-viewing elements mounted to said second housing, each binocular-viewing element comprising an axis-offsetting arm mounted to said second housing for adjustable rotation about one of said spaced parallel axes of the outlet plane, like folding mirrors on each of the spaced parallel axes of the outlet plane, said mirrors being adjustably mounted to permit precision parallel alignment of said axes for said binocular viewing elements, and a single control member carried by said second housing and connected

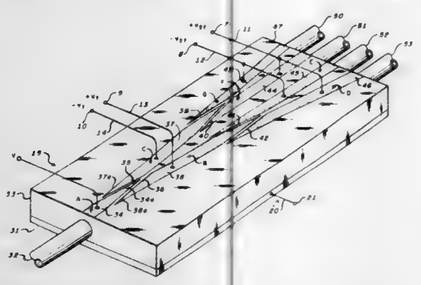
to said axis-offsetting arms for counter-rotating adjustment actuation thereof.

4,175,827

ELECTRO-OPTICAL MULTIPLEXER HAVING MULTIPLE FREQUENCY RESONANT EXCITATION

Donald H. McMahon, Carlisle, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 21, 1978, Ser. No. 879,309
Int. Cl.² G02B 5/14
U.S. Cl. 350—96.14 **20 Claims**



1. Switchable optical coupling apparatus comprising:
a plate of optically transparent material characterized by an electrically variable effective index of refraction,
first isolated electrode means for establishing a first electric field through said plate for changing the effective index of refraction thereof at a first location, thereby establishing a first pair of selectable diverging light paths within said plate normal to said variable electric field,
said first isolated electrode means being excited by a fundamental frequency sinusoidal voltage, and
second and third isolated electrode means disposed in cooperative relation with said respective first pair of selectable diverging light paths for establishing second and third electric fields through said plate for changing the effective index of refraction thereof at respective second and third locations spaced from said first location, thereby establishing second and third pairs of selectable diverging light paths within said plate respectively normal to said second and third variable electric fields,
said second and third isolated electrode means being excited by a frequency that is harmonic of said fundamental frequency sinusoidal voltage,
said fundamental and harmonic sinusoidal frequency voltages being phased in a predetermined manner whereby discrete ones of said second and third pairs of selectable diverging light paths are selected.

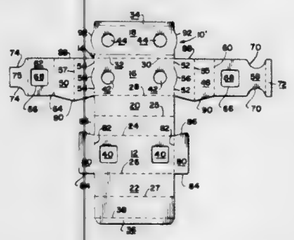
4,175,828

COLLAPSIBLE STEREOSCOPIC VIEWER

Robert G. Carver, Ashland, Ohio, assignor to Creative Cartons of Ashland, Inc., Ashland, Ohio

Filed May 11, 1978, Ser. No. 904,857
Int. Cl.² G02B 27/22
U.S. Cl. 350—140 **21 Claims**

1. A collapsible stereoscopic viewer for viewing photographic slides, said viewer comprising:
(a) a front wall having a pair of light-admitting openings therein;
(b) a reinforced rear wall assembly having a pair of viewing apertures therein with optical axes coincident with said light-admitting openings;
(c) a pair of magnification lenses disposed in said apertures;
(d) a top wall contiguous with both of said front wall and said rear wall assembly along a pair of spaced, transverse fold lines;
(e) a bottom wall contiguous with said front wall along a transverse fold line and adhered to said rear wall assembly;
(f) a pair of opposing side walls contiguous with said rear wall assembly along a pair of spaced longitudinal fold lines;
(g) a pair of glue flaps contiguous with said front wall along a pair of spaced longitudinal fold lines, said glue flaps being adhered to portions of said side walls; and,



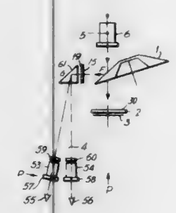
(h) a film strip receiving channel outwardly proximate said front wall, said channel including:
(i) a channel wall comprised of a pair of continuous extensions of said side walls in partially overlapping engagement;
(ii) a pair of light-admitting openings in said channel wall coincident with said optical axes; and,
(iii) light-diffusing elements disposed in each of said openings in said channel wall.

4,175,829

3-DIMENSIONAL CAMERA DEVICE

Alvin M. Marks, 166-35 9th Ave., Whitestone, and Mortimer Marks, 166-25 Cryders La., Beechhurst, both of N.Y. 11357

Division of Ser. No. 516,676, Oct. 21, 1974, Pat. No. 3,990,087.
This application Oct. 22, 1976, Ser. No. 734,976
Int. Cl.² G02B 27/26
U.S. Cl. 350—132 **2 Claims**



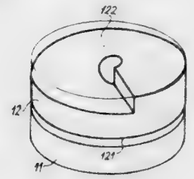
2. An optical device comprising a lens, said lens having an object plane and an image plane, first and second sets of mutually extinguishing filters, said first filter set being positioned on one side of the said lens, and said second filter set being positioned on the other side of said lens, said first filter set being positioned between said object plane and said lens, and said second filter set being positioned between said image plane and said lens.

4,175,830

WAVE MODE CONVERTER

Georges R. P. Marié, 17, Avenue Raymond Croland, Fontenay-aux-Roses, France (92260)

Filed Dec. 22, 1977, Ser. No. 863,235
Claims priority, application France, Dec. 23, 1976, 76 38960
Int. Cl.² G02B 5/00
U.S. Cl. 350—157 **13 Claims**



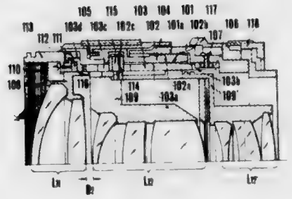
1. A wave mode converter for converting an electromagnetic, light and infrared wave into an outgoing wave having a mode confining the particles of a plasma from a target material, comprising means for converting said incoming wave into a circular polarized wave beam, means for phase shifting with respect to time at any given point of the beam said circular polarized wave beam proportionally to the azimuth of said given point around the axis of propagation of the beam, means for focusing the phase shifted outgoing wave beam on to said target material and a generator of a d.c. magnetic field directed along said outgoing beam.

4,175,831

PHOTOGRAPHIC LENS ASSEMBLY

Masaharu Ito, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 644,318, Dec. 24, 1975, abandoned.
This application Oct. 25, 1977, Ser. No. 844,839
Claims priority, application Japan, Dec. 28, 1974, 50-2496
Int. Cl.² G02B 7/02
U.S. Cl. 350—255 **13 Claims**



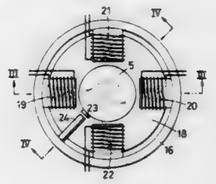
9. A lens assembly for use with a camera body, comprising:
(A) a lens system including at least first and second lens groups, said lens system having an optical axis, and said first and second lens groups being shiftable along the optical axis for focusing the lens system;
(B) an outer cylinder adapted to be fixed to the camera body, said outer cylinder having a first helical thread with a given pitch on an inner surface thereof and axially regulating means fixedly provided on a portion thereof;
(C) a middle cylinder having:
a second helical thread with the same pitch as that of said first helical thread of the outer cylinder, said second helical thread being provided on an outer surface of the middle cylinder;
a third helical thread, said third helical thread being provided on an inner surface of the middle cylinder; and
a right circular cylindrical groove on the inner surface of the middle cylinder, said groove terminating radially before reaching the outer surface and extending about the optical axis;
said first helical thread of the outer cylinder being engaged with said second helical thread;
said middle cylinder being operatively coupled with said outer cylinder through the thread engagement of the second helical thread thereof with the first helical thread of the outer cylinder and movable along the optical axis relative to the outer cylinder according to the pitch of the second helical thread by its own rotation around the optical axis relative to the outer cylinder;
(D) an inner cylinder having a fourth helical thread on an outer surface thereof with the same pitch as that of said third helical thread of the middle cylinder and a guide slot substantially parallel to the optical axis, said third helical thread of the middle cylinder being engaged with said fourth helical thread, said inner cylinder being movable along the optical axis in response to rotation of the middle cylinder while being prevented from rotation around the optical axis by said axially regulating means of said outer cylinder;
said first lens group being fixedly connected with said inner cylinder and shifted along the optical axis by the axial movement of the inner cylinder when said middle cylinder is rotated around the optical axis; and
(E) connecting means for operatively connecting said second lens group with said middle cylinder, said connecting means being fixedly connected with the second lens group and engaging with said groove of the middle cylinder while projecting through said guide slot of the inner cylinder;
said second lens group being guided along the optical axis by said guide slot of the inner cylinder and shifted along the optical axis by the axial movement of said middle cylinder through engagement of said connecting means with said groove of the middle cylinder when the middle cylinder is rotated; said connecting means transmitting axial movement of said middle cylinder to move said second lens group along the optical axis without causing rotation so that said first lens group is actuated with the help of the combined pitch of said second and third helical threads while said second lens group is actuated with the help of only the pitch of the second helical thread.

4,175,832

TWO-AXIS MIRROR CONTROL APPARATUS

Nobutomo Umeki, Yokohama, and Mikio Sugiki, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 24, 1978, Ser. No. 881,118
Claims priority, application Japan, Mar. 4, 1977, 52/23556
Int. Cl.² G02B 27/17
U.S. Cl. 350—285 **11 Claims**



1. Control apparatus for allowing pivotal movement of a mirror in two directions and preventing rotation thereof in a third direction, said apparatus comprising:
a mirror;
a support member comprising a substantially pointed end against which said mirror is held and about which said mirror can pivot in two directions;

first magnetic means affixed to said mirror to pivot therewith; and

second magnetic means rigidly attached to said support member and spaced from said first magnetic means and polarized with respect to said first magnetic means to provide an interlocking magnetic field attracting said first magnetic means to urge said mirror toward said support and to prevent said mirror from rotating in a third direction on said support member.

4,175,833

ELECTRICALLY CONTROLLABLE OUTER REARVIEW MIRROR FOR VEHICLES

Yorck Talbot, Ebersstr. 80, D-1000 Berlin 62, Fed. Rep. of Germany

Filed Aug. 9, 1977, Ser. No. 823,525

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1976, 2637555

Int. Cl.² G02B 5/08

U.S. Cl. 350—289 **16 Claims**



1. In a remotely controlled, electrically operable outer rearview mirror for a vehicle, a combination comprising a cut-shaped housing having one end open; a mounting support connected to the other end of said housing to fix the latter to the vehicle; a removable cup-shaped insert matching an inner wall portion of said housing and defining an open side coinciding with the open end of said housing; a mirror assembly including an angularly adjustable mirror carrier for supporting a mirror and electrically controllable driving means for said carrier; means for connecting said mirror assembly to said insert; and fastening means for detachably connecting said insert together with said mirror assembly to said housing.

4,175,834

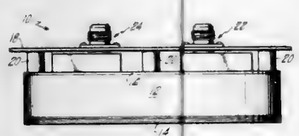
LASER MIRROR WITH COOLANT FLUID TRANSFER MANIFOLD

Warren R. Sigman, North Palm Beach, and Robert K. Stalcup, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 24, 1978, Ser. No. 899,626

Int. Cl.² G02B 7/18

U.S. Cl. 350—310 **13 Claims**



1. A fluid transfer manifold adapted for isolating a mirror, adapted for being cooled with a coolant flowing therethrough, from hydraulic pressure loads resulting from the coolant flowing therethrough comprises:

a housing having a first passage, a second passage adapted for communicating with a heat exchanger distribution system within the mirror, a third passage internal to the housing connecting the first and second passages and adapted for passing coolant therebetween, means for attaching the housing to the mirror, a protrusion extending from a bottom surface of the housing and having the second passage passing therethrough said protrusion adapted for a slip fit engagement with the mirror for passing coolant therethrough, and means for venting the first passage to the atmosphere; and

an interface fitting adapted for a slip fit engagement within the housing and for partial insertion into the first passage wherein the interface fitting has a cylindrical body with a bore centrally located therein along a longitudinal axis of the body extending from a first end adapted for connection to a source of coolant and terminating short of a second end of the interface fitting, a plurality of slots circumferentially disposed about the cylindrical body proximate to the second end adapted for passing coolant between the bore and the third passage within the housing and means for attaching the interface fitting to a mounting plate adapted for supporting the mirror.

4,175,835

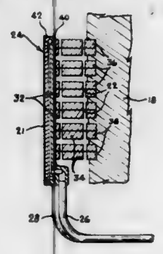
FLOATING HEAD LASER MIRROR ASSEMBLY

Ralph F. Kuhn, Jr., Calabasas, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 20, 1978, Ser. No. 926,358

Int. Cl.² G02B 7/18

U.S. Cl. 350—310 **9 Claims**



1. A floating head laser mirror assembly comprising a base structure, a mirror head, a plurality of flexure elements, each of said flexure elements being operably connected between said mirror head and said base structure for supporting said mirror head with respect to said base structure in a floating relationship and at least one of said flexure elements having at least one post in direct contact therewith and located between said mirror head and said base structure, for adding a predetermined amount of rigidity to said one flexure element, said post being positioned so as to expose a predetermined portion of said one flexure element whereby said mirror head is capable of expanding in the radial direction during a wide temperature variance between said mirror head and said base structure.

4,175,836

METHOD AND APPARATUS FOR FORMING VISIBLE IMAGES

Michael J. Redman, Datchworth, and David W. Satchell, Welwyn Garden City, both of England, assignors to Xerox Corporation, Stamford, Conn.

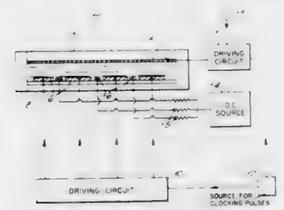
Filed Apr. 4, 1977, Ser. No. 784,492

Claims priority, application United Kingdom, Aug. 31, 1976, 36057/76

Int. Cl.² G02F 1/17

U.S. Cl. 350—357 **4 Claims**

1. Apparatus for causing coloration of an electrochromic material comprising an electrochromic cell structure which comprises spaced electrodes with said electrochromic material sandwiched between and in contact with said electrodes, means for passing between said electrodes an electrical pulse of a predetermined polarity, for a minimum time of 200 microseconds, which causes coloration at a potential above a coloration threshold potential for the material, and means for simultaneously applying to said material a D.C. potential of said pre-



determined polarity and of magnitude less than said threshold potential, wherein said means for applying the D.C. potential comprises electrode means separate from said spaced electrodes.

4,175,837

ELECTROCHROMIC DISPLAY CELL

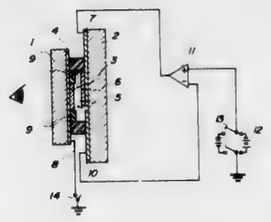
Kohzo Yano; Yasuhiko Inami, both of Tenri, and Hisashi Uede, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 15, 1978, Ser. No. 877,884

Claims priority, application Japan, Feb. 17, 1977, 52-16933

Int. Cl.² G02F 1/17, 1/23

U.S. Cl. 350—357 **9 Claims**



1. An electrochromic display cell comprising two substrates defining the electrochromic display cell, a display electrode formed on one of said two substrates, an electrochromic layer formed on said display electrode, and a liquid electrolyte disposed between said two substrates, wherein

said liquid electrolyte comprises γ-Butyrolactone and lithium perchlorate, and

said electrochromic layer comprises a transition metal oxide film not soluble in said liquid electrolyte, said transition metal oxide film being formed on said display electrode under the condition where said one of the two substrates is held at a temperature between 250° C. and 400° C.

4,175,838

ELECTRO-OPTIC DEVICE

Jean-Paul Randin, Cortaillod, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

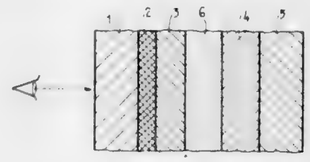
Filed Sep. 1, 1977, Ser. No. 829,798

Claims priority, application Switzerland, Sep. 14, 1976, 11631/76

Int. Cl.² G02F 1/17, 1/23

U.S. Cl. 350—357 **9 Claims**

1. Electro-optic device comprising a transparent conductive layer, and electrochromic layer consisting of a transition metal oxide applied on the said transparent layer, these two first elements constituting together an electrode, a counter-electrode maintained at distance from the said first electrode, and an electrolyte ensuring an ionic connection between the electrode and the counter-electrode, characterized by the fact that the said electrolyte is polystyrene sulfonic acid containing a reductant able to form, during the operation of the device, a redox couple with an equilibrium more anodic than the oxidation potential of the electrochromic layer, so as to prevent an increase of the potential during bleaching of the electrochromic layer that would produce the deterioration of the electrolyte.



4,175,839

SLIT-LAMP APPARATUS

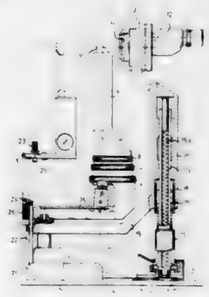
Ortwin Müller, Lorch; Karl Grunvogel, Aalen, and Kurt Schulz, Oberkochen, all of Fed. Rep. of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Oct. 18, 1977, Ser. No. 843,236

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 7633232

Int. Cl.² A61B 3/10, 3/00, 9/00

U.S. Cl. 351—14 **7 Claims**



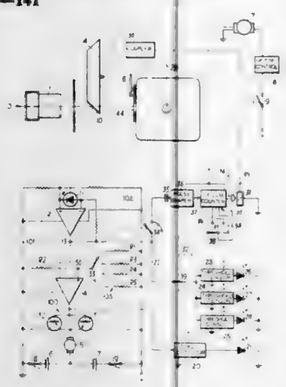
1. Slit lamp for ophthalmological examinations, consisting of a slit projector, a microscope, an instrument base, a power pack and a tonometer support, characterized by the fact that the slit projector includes a plurality of discrete slit diaphragms of different width arranged on a rotatable disc for selective placement in the ray path of the slit projector and that, in order to adjust the height of slit, a trumpet-shaped diaphgram is arranged rotatably in the ray path of the slit projector, that the microscope consists of an achromatic principal objective and a binocular straight tube of short structural length, that a guide column is fastened in the foundation plate of the instrument base, and operating elements for the horizontal and vertical movement of the slit lamp are provided coaxial to the guide column, that the power pack for the slit lamp is installed in the instrument base, and that a tonometer support which is adjustable in height is provided in the free space thus resulting between the doctor and the patient.

4,175,840

MOTION PICTURE CAMERA WITH MULTIPLE EXPOSURE

Gerd Kittag, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed May 17, 1978, Ser. No. 906,862
Claims priority, application Austria, May 18, 1977, 3572/77
Int. Cl.[2] A03B *7/08*
U.S. Cl. 352—141 **7 Claims**



1. In a motion-picture camera provided with an objective for the illumination of successive frames of a film, a movable shutter in line with said objective, drive means for moving said shutter whereby the light path from said objective to the film is periodically blocked and unblocked, and transport means normally synchronized with said drive means for advancing the film by one frame in a blocking position of the shutter,

the combination therewith of:

photosensing means for measuring the intensity of incident light; and

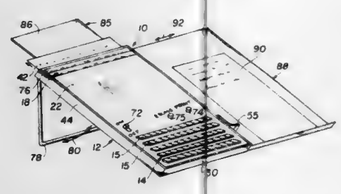
control means responsive to said photosensing means for temporarily deactivating said transport means independently of said drive means in the presence of less than a predetermined level of illumination to arrest the film and expose a given frame during a plurality of successive shutter movements.

4,175,841

PHOTO-TYPEWRITER

Gordon J. LaPorte, 60 W. 25th St., New York, N.Y. 10010

Filed Jan. 31, 1978, Ser. No. 873,851
Int. Cl.[2] B41B *13/10*
U.S. Cl. 354—5 **16 Claims**



1. A typewriter comprising

A. portable housing means,

B. a typewriter keyboard comprising a plurality of individual finger keys on said housing means and being readily engageable by the user thereof,

C. chamber means in said housing means for containing a replaceable supply of paper, said paper having an emulsion sensitive to one portion of the light spectrum as an activating agent for producing tonal changes in the emulsion, and sensitive to another portion of the light spectrum as a retarder to stop further tonal change in said emulsion, said chamber being sealed to prevent light from entering therein,

D. grid means operatively associated with said housing means and extending in a substantially straight line to produce printed lines, said grid means comprising printing filaments to which said paper is exposed, said filaments being capable of producing light in said portion of the spectrum for producing said tonal changes in the emulsion, such that said paper receiving impressions is exposed only to light produced by said filaments emitting a light glowing image,

E. coupling means electrically interconnecting said keys to said grid means so as to progressively activate said grid means across said line in response to each of the keys on said keyboard being engaged during typing,

F. said light glowing image of said grid means corresponds to the letter, numeral, or punctuation being touched on said keyboard, and the character image is then transferred photo-sensitively to the emulsion on said paper surface,

G. advancing means for moving said paper from said chamber means relative to said grid means, so as to produce line by line exposure of said paper to said grid means, such that the printed grid line is thereafter exposed to the light of said other portion of the light spectrum so as to stop said tonal change in said emulsion, such that printed typewritten lines are produced on said paper,

H. means operatively associated with said housing means for inclining same in the operative position thereof so as to facilitate use of said keyboard, and

I. means for activating said grid means in another portion of the light spectrum to erase or reverse the chemical reaction initiated by said first portion of the light spectrum to which said paper was first exposed.

4,175,842

EXPOSURE CONTROL SYSTEM FOR A CAMERA

Nobuaki Sakurada; Tadashi Ito, both of Yokohama; Nobuhiko Shinoda, Tokyo; Fumio Ito, Yokohama; Hiroyashu Murakami, Tokyo, and Masaharu Kawamura, Hino, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 660,826, Feb. 24, 1976, abandoned. This application Jan. 4, 1978, Ser. No. 866,827
Claims priority, application Japan, Feb. 28, 1975, 50/24687; Jul. 3, 1975, 50/82270; Dec. 8, 1975, 50/146157
Int. Cl.[2] G03B *17/00*
U.S. Cl. 354—23 D **26 Claims**

3. An exposure control circuit for a camera, comprising:

(a) a single photographic information setting means for mechanically and selectively setting a shutter speed value or aperture value;

(b) single electrical signal forming means coupled to said photographic information setting means for producing an electrical signal at a common output terminal corresponding to the shutter speed or aperture value set by said photographic information setting means;

(c) a light measuring circuit for producing an electrical signal corresponding to the intensity of light;

(d) a mode selection means for selecting a shutter speed value preset mode or an aperture value preset mode;

(e) an operation circuit which is connected to said light measuring circuit and electrical signal forming means for producing an electrical signal corresponding to the shutter speed value based on a preset aperture value and intensity of light when said aperture value preset mode is selected, and producing an electrical signal corresponding to the aperture value based on a preset shutter speed value and intensity of light when said shutter speed value preset mode is selected;

(f) a shutter time control circuit for controlling a shutter time based on a supplied electrical signal;

(g) an aperture control means for controlling the aperture value based on a supplied electrical signal; and

(h) a change over means coupled to said mode selection means for connecting said output of operation circuit to



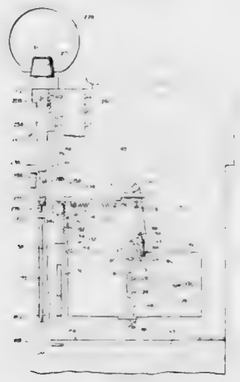
said shutter control circuit and connecting electrical signal forming means to said aperture control means when said aperture value preset mode is selected, and for connecting said output of operation circuit to said aperture control means and connecting said electrical signal forming means to said shutter control circuit when said shutter speed value preset mode is selected.

4,175,843

DUEL FOCAL PLANE PHOTOCELLS

Lawrence M. Douglas, South Easton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 4, 1978, Ser. No. 893,488
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—31 **5 Claims**



1. A camera for exposing successive portions of the same light sensitive surface of a film unit comprising:

means for exposing successive portions of a film unit including first and second objective lenses having parallel optical axes;

means for supporting a film cassette containing at least one film unit within the camera such that adjacent first and second portions of the film unit are located in alignment with and in the focal plane of said first and second lenses, respectively, during exposure of the film unit;

first and second photocells for responding to the light intensity and for participating in the determination of the extent to which the adjacent portions of the film unit are exposed;

first and second opaque means for alternatively supporting said first and second photocells directly in front of said focal plane such that the intensity of the light reaching said first and second photocells closely approximates the intensity of the light to which the second and first adjacent portions of the film unit, respectively, are subsequently exposed to, said first photocell being positionable between the first portion of the film unit and said first lens, and said second photocell being positionable between the second portion of the film unit and said second lens;

means for moving said first and second opaque supporting means between a first position, wherein said second opaque supporting means overlies the second portion of the film unit so as to prevent exposure thereof and said first opaque supporting means is located beyond the light path between said first lens and the first portion of the film unit, and a second position wherein said first opaque supporting means overlies the first portion of the film unit so as to prevent exposure thereof and said second opaque supporting means is located beyond the light path between said second lens and the second portion of the film unit; and

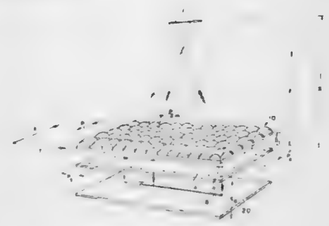
means for initiating an exposure cycle so as to allow the passage of scene light into the camera by way of said first and second lenses whereby when said first and second opaque supporting means are located in said first position the light passing through said first lens exposes the first portion of the film unit and the light passing through the second lens strikes said second photocell so as to control the exposure of the first portion of the film unit.

4,175,844

OPTICAL IMAGING SYSTEM

Isaia Glaser-Inbari, Tucson, Ariz., assignor to Yeda Research & Development Co. Ltd., Rehovot, Israel

Continuation-in-part of Ser. No. 733,194, Oct. 8, 1976, abandoned. This application Jul. 17, 1978, Ser. No. 925,563
Claims priority, application Israel, Oct. 19, 1975, 48318/75
Int. Cl.[2] G03B *35/00*
U.S. Cl. 354—110 **20 Claims**



1. Optical apparatus for producing a relatively large image of an object with a relatively small distance between the front of the apparatus and an image surface, comprising:

lens means for producing a plurality of images, said lens means including a surface distribution of lenslets in a predetermined arrangement disposed intermediate an object and an image surface, each of said lenslets being a size not substantially larger than the smallest size resolvable by the unaided human eye;

sampling means disposed intermediate said plurality of lenslets and said image surface for defining a plurality of discrete light transmission paths, said paths being arranged

V 9 8 4 N 0 2 7 7 9 UMI

such that each path transmits light representing a different portion of each image of said plurality of images to said image surface, whereby the sum of the contributions of each of said light paths produces a completed image on said image surface; and

image surface means for holding means for recording an image at said image surface, said image surface means being disposed as to maintain the means for recording an image at a sufficient distance from said sampling means to allow each said light transmission paths to be distributed onto an area approximately equal to the area of a single lenslet.

4,175,845

WINDING UP DEVICE OF A CAMERA

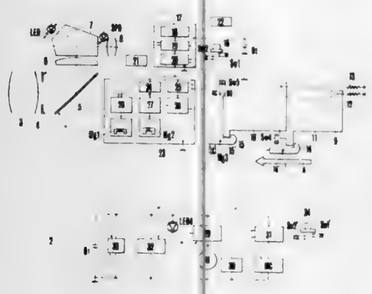
Tomonori Iwashita, Fuchu; Hiroyuki Takimoto, Urawa; Yukio Mashimo, Tokyo, and Teiji Hashimoto, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1977, Ser. No. 834,505

Claims priority, application Japan, Sep. 22, 1976, 51-114188

Int. Cl.[2] G03B *1/18, 17/42;* **F16D** *11/06*

U.S. Cl. 354—173 **12 Claims**



1. A photographic system having a film winding up device and a camera, the system comprising:

(a) said camera having a shutter means, a shutter release mechanism and a film winding up mechanism having a film wind up member, the camera including:

(1) detecting means for detecting an exposure completion signal in response to the operation of said shutter means, the detecting means being operatively coupled to switching means which performs a switching action in response to a film winding up completion signal; and

(2) inhibiting means for inhibiting the operation of the film winding up mechanism by the film winding up completion state of the film winding up mechanism; and

(b) said film winding up device including:

(1) an electric power source;

(2) terminal means operatively coupled to said switching means;

(3) a winding up motor which is caused to produce a driving force by electric power supply from said electric power source;

(4) driving force transmitting means being provided with connecting means for connection to said winding up motor and also with coupling means for coupling with a film winding up mechanism provided on the camera side;

(5) electromagnetic clutch means arranged between the winding up motor and the driving force transmitting means to transmit the driving force of the winding up motor to the driving force transmitting means;

(6) clutch switching means connected to said electromagnetic clutch means, said power source and said terminal means to form an electric power supply network for the electromagnetic clutch means, the clutch switching means being arranged to perform a switching action to cut off power supply to the electromagnetic clutch means in response to the switching action of the switching means; and

(7) motor control means connected to said power source and to said winding up motor to cut off power supply to the winding up motor immediately before the operation of said inhibiting means in response to the switching action of said switching means.

4,175,846

MOTOR-OPERATED FILM WINDING APPARATUS

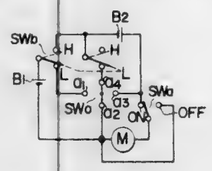
Shiyozo Nozawa; Saburo Hokari, both of Kawasaki; Shigeru Yamaga, and Akira Takahashi, both of Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed May 23, 1978, Ser. No. 908,621

Claims priority, application Japan, May 24, 1977, 52-60238

Int. Cl.[2] G03B *1/18;* **H02J** *7/00*

U.S. Cl. 354—173 **10 Claims**



1. In a motor-operated film winding apparatus for use with cameras of the type operable through a plurality of photographic cycles and having a film winding member for winding a film therearound, a motor for driving the film winding member, and a power source, for the motor-operated film winding apparatus, comprising at least two batteries and convertible into a high voltage power source and a low voltage power source by switching different numbers of batteries into circuit connection with the motor, in use, the improvement comprising:

film winding speed switching means operable to set the winding speed of the film at one of two preset speeds consisting of a high speed and a low speed, and

power supply switching means operable to switch a different battery into circuit connection with said motor, responsive to and at the completion of each photographic cycle,

said power supply switching means being operated only when the winding speed of the film is set at the low speed by said film winding speed switching means.

4,175,847

SHUTTER-CONTROL MECHANISM FOR BELLOWS CAMERA

Goetz Schrader, Frankfurt am Main, Fed. Rep. of Germany, assignor to Plaubel, Feinmechanik & Optik GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 7, 1977, Ser. No. 831,279

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1976, 2640434

Int. Cl.[2] G03B *17/04*

U.S. Cl. 354—187 **15 Claims**

1. A camera comprising:

a housing adapted to receive a photographic film to be exposed;

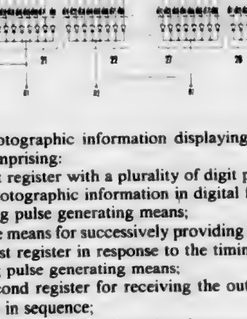
a lens mount provided with an objective centered on an optical axis, said lens mount being receivable in said housing in a collapsed position and being axially separable therefrom for movement into a picture-taking position;

an extendible linkage interconnecting said lens mount and said housing, said linkage including a knee joint with first and second hingedly interconnected legs of equal length having ends respectively articulated to said housing and to said lens mount;

a bellows forming a lighttight enclosure between said lens mount and said housing;

an exposure-control member on said lens mount in line with said objective;

actuating means on said housing for operating said member; and



a gear train operatively connecting said member with said actuating means, said gear train being supported on a part of said linkage, said gear train including a driving gear on the articulated end of said first leg, and driven gear on the articulated end of said second leg, a middle gear of the same size as said driving and driven gears centered on the hinge axis of said legs, and an even number of intermediate gears between said middle gear and said driving and driven gears, said intermediate gears being symmetrically disposed on said legs.

4,175,848

PHOTOGRAPHIC INFORMATION DISPLAYING APPARATUS FOR A CAMERA

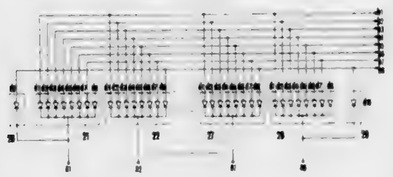
Hiroyashu Murakami, Tokyo; Tadashi Ito, Yokohama; Fumio Ito, Yokohama; Nobuaki Sakurada, Yokohama; Masaharu Kawamura, Hino, and Nobuhiko Shinoda, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 675,236, Apr. 9, 1976, abandoned. This application Jun. 2, 1978, Ser. No. 911,912

Claims priority, application Japan, Apr. 16, 1975, 50-46011

Int. Cl.[2] G03B *17/20*

U.S. Cl. 354—289 **4 Claims**



1. A photographic information displaying apparatus for a camera comprising:

(a) a first register with a plurality of digit positions for storing photographic information in digital form;

(b) timing pulse generating means;

(c) a gate means for successively providing the data stored in the first register in response to the timing pulse from the timing pulse generating means;

(d) a second register for receiving the outputs of said gate means in sequence;

(e) decoding means for decoding the content of said second register;

(f) first display means for displaying outputs of said decoding means, said first display means having a plurality of display elements each composed of a plurality of segments, at least one of said plurality of display elements having at least one segment which is not used normally at the time of displaying, said non-used segment being disconnected from the decoding means; and

(g) second display means for displaying predetermined indicia, said second display means having a segment to be connected to the decoding means, which segment operates to provide indication in response to a signal from the decoding means for controlling the non-used segment.

4,175,849

PHOTOGRAPHIC DRUM PROCESSOR INSERTS

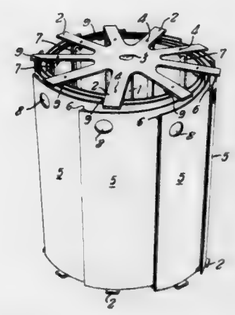
Peter R. S. Wilkinson, Chessington, England, assignor to Wilkinson Photographic Products Limited, England

Filed May 27, 1977, Ser. No. 801,252

Claims priority, application United Kingdom, May 28, 1976, 22373/76

Int. Cl.[2] G03D *3/10*

U.S. Cl. 354—329 **8 Claims**



1. A drum processor insert for use in a photographic drum processor, the insert comprising:

a frame comprising a central axially extending member, and, on each end of the member, a spider having a number of equiangularly spaced arms, a plurality of arcuate holders each adapted to hold a sheet of photographically sensitised material, each arm of each spider bearing a pivot and each holder being swingably mounted about an axis between two such pivots on oppositely facing arms, all such axes being parallel and being parallel to the straight edges of the arcuate holder, and each arm of each spider being resilient so that two opposite arms may be sprung apart to release a swingable holder held between them,

each holder being swingable from a closed position in which the frame and holders constitute a substantially cylindrical shape, the holders overlapping each other and the straight edges of the holders being distributed about the periphery of the cylinder, and an open position in which the face of each holder adapted to receive a sheet of photographically sensitised material can be reached.

4,175,850

CONTROL SYSTEM FOR A RECIPROCATING CARRIAGE DRIVE SYSTEM

David P. Bujese, Toms River, N.J., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Apr. 28, 1978, Ser. No. 901,204

Int. Cl.[2] G03G *15/00*

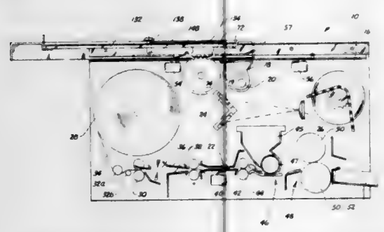
U.S. Cl. 355—13 **4 Claims**

1. In an electrophotocopy machine having illuminating means, a carriage movable from a home position for carrying a document across the illuminating means, a web of photosensi-

tive copy paper and severing means for severing copy sheets from the web for receiving an image of the illuminated document, an imaging station for imaging the illuminated document on the photosensitive copy sheet, and means for feeding the photosensitive copy sheet to the imaging station, a control system comprising:

means disposed at the imaging station for sensing the leading and trailing edges of the copy sheet; and

common controlling means responsive to the sensing means for:



A. energizing the illuminating means, initiating the movement of the carriage from the home position across the illuminating means, and enabling the severing means for subsequent actuation, all in response to the sensing of the leading edge of the copy sheet at the imaging station; and

B. initiating the return of the carriage to the home position and de-energizing the illuminating means both in response to the sensing of the trailing edge of the copy sheet at the imaging station.

4,175,851

RECORDING POSITION ADJUSTER

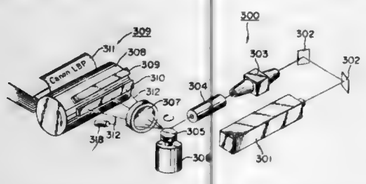
Takashi Kitamura, Yokohama; Asao Watanabe, Higashikurume; Takashi Nakano, Yokohama; Katsumi Masaki, Kodaira; Kazuhiro Hirayama, Yokohama; Yasushi Sato, Kawasaki, and Taisuke Tokiwa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 616,675, Sep. 25, 1975, Pat. No. 4,059,833. This application Sep. 9, 1977, Ser. No. 831,921

Claims priority, application Japan, Feb. 3, 1975, 50-14544; Feb. 4, 1975, 50-14530; Feb. 4, 1975, 50-14534; Feb. 13, 1975, 50-18528; Mar. 1, 1975, 50-25120

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—14 R **16 Claims**



1. A recording apparatus for providing a variable top margin comprising:

(a) beam forming means which, by application of a recording signal, forms a beam modulated by the recording signal;

(b) deflecting means which deflects the beam obtained from said beam forming means;

(c) an image forming member which, upon irradiation with the modulated and deflected beam, forms an image corresponding to the recording signal;

(d) transfer means for transferring the image on said image forming member;

(e) reference signal generating means for generating a reference signal for commencing image formation on said image forming member;

(f) timing means for measuring a certain time interval after said reference signal is generated by said reference signal forming means, wherein said timing means is adjustable to vary the time interval to be measured; and

(g) conveying means which, once the certain time interval has been measured by said timing means begins to convey a transfer member, on which the image formed on said image forming member is to be transferred, to the transfer means.

4,175,852

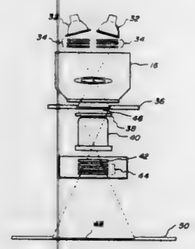
TEST SYSTEM FOR PHOTOGRAPHIC PRINTERS

Victor R. Baert, Anoka, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Mar. 11, 1977, Ser. No. 776,873

Int. Cl.[2] G03B *27/78*

U.S. Cl. 355—35 **6 Claims**



1. In a photographic printer for producing photographic prints on print paper by passing light through photographic film and exposing the print paper, the photographic printer having light source means for providing the light along a light path, filter means interposable into the light path to terminate individually exposure of the print paper in each of a plurality of color channels, shutter means having a first position in the light path for blocking light and a second position out of the light path for permitting light to expose the print paper, and exposure control means for controlling operation of the filter means and the shutter means during exposure cycles, the improvement comprising:

test switch means controllable by an operator to selectively provide a signal to the exposure control means to cause the shutter means to remain in the first position during a test exposure cycle while permitting the light source means, the exposure control means and the filter means to operate, thereby permitting the operator to test operation of the light source means, exposure control means, and filter means without exposing the print paper.

4,175,853

PHOTOGRAPHIC PRINTER WITH DICHROIC FILTER RESET INDICATORS

Ronald B. Harvey, Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Feb. 27, 1978, Ser. No. 881,422

Int. Cl.[2] G03B *27/78*

U.S. Cl. 355—38 **10 Claims**

1. In a photographic printer using variable exposure times, the improvement comprising:

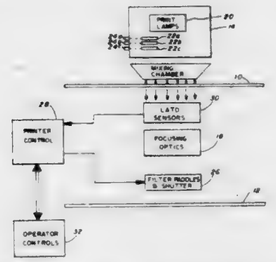
light source means for providing light for printing;

a plurality of filters movable into and out of the light to adjust the intensity of the light in a plurality of color channels;

sensing means for sensing density in each color channel of a film positioned in the path of the light, and providing sensor signals as a function of the sensed densities;

storage means for storing, for each of a plurality of setups, a signal indicative of an exposure time for each of the color channels to be used in printing a print of desired densities from a reference film associated with the setup, and sensor signal values produced when the filters are in their desired filter positions to print the print of desired densities from the reference film using the exposure time for each of the color channels;

setup select means for selecting one of the plurality of setups;



means for comparing, during re-establishing of color balance for a selected setup, the stored sensor signal values and sensor signals for the sensing means for each color channel indicative of sensed densities of the reference film then in the path of the light; and

means for providing signals indicative of the direction of movement, if any, necessary to move the filters to the desired filter positions for the selected setup based upon the comparison.

4,175,854

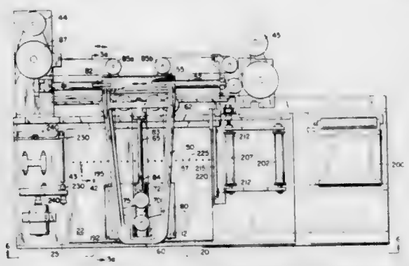
MICROFICHE RECORDER

Stephen K. Ammann, Cupertino, and Peter E. Herborn, Menlo Park, both of Calif., assignors to Quantor Corporation, Mountain View, Calif.

Filed Feb. 1, 1978, Ser. No. 874,170

Int. Cl.[2] G03B *27/44*

U.S. Cl. 355—54 **40 Claims**



1. Apparatus for recording a multiplicity of images in a rectilinear fashion on a microfiche, the apparatus comprising: means for projecting an image into an image plane; film holding means adapted to receive a microfiche to be exposed to images generated by the projecting means; an X-carriage; means for guiding the X-carriage in an X-direction; a Y-carriage; means mounted to the X-carriage for guiding the Y-carriage in a Y-direction perpendicular to the X-direction; connector means mounting the film holding means to the Y-carriage; means for independently reciprocating the X-carriage and the Y-carriage along the respective guiding means in the X-direction and the Y-direction; and means permitting arcuate movement of the X-carriage and, therewith, of the Y-carriage and the film holding means in a Z-direction which is substantially perpendicular to the X- and Y-directions.

4,175,855

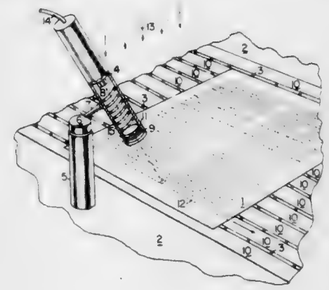
ELECTRONIC EXPOSURE CONTROL

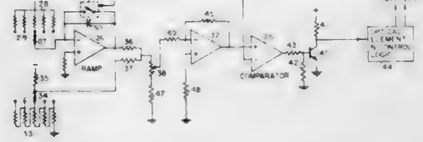
William C. Turner, Northridge; William R. Limburg, Torrance, and John S. Burton, Los Angeles, all of Calif., assignors to Terminal Data Corporation, Woodland Hills, Calif.

Continuation of Ser. No. 458,167, Apr. 4, 1974, abandoned. This application Jan. 20, 1976, Ser. No. 650,642

Int. Cl.[2] G03B *27/74, 27/78*

U.S. Cl. 355—68 **15 Claims**





3. An exposure control system operative on a rapidly moving document, comprising;

(a) means to illuminate (**13**) said moving document (**1**),

(b) optical means (**9,11**) to accept reflected said illumination from a selected portion of said moving document,

(c) photoelectric responsive means (**8**) to accept said reflected illumination from said optical means and having a selected spectral response to said reflected illumination,

(d) electronic means (**19–24**) connected to said photoelectric responsive means to provide an output

that is related to the peak magnitude of the response of said photoelectric responsive means, and

(e) an optical element (**44**) connected to said electronic means and controlled in its performance by the electrical output of said electronic means,

whereby photographic exposure by said optical element is controlled by the peak magnitude of the selected spectral characteristic of said reflected illumination.

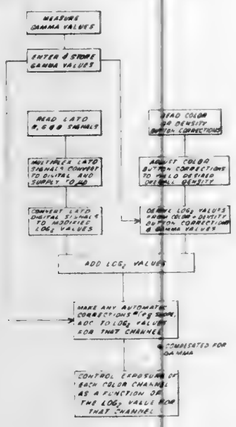
V 9 8 4 N 0 2 7 9 UMI

4,175,856

PHOTOGRAPHIC PRINTER WITH AUTOMATIC DENSITY AND COLOR CORRECTIONS FOR PAPER GAMMA

John Pone, Jr., Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Nov. 4, 1977, Ser. No. 848,739
Int. Cl.[2] G03B 27/78
U.S. Cl. 355—68 **5 Claims**



2. In a photographic printer for printing photographic images on a photographic medium, the improvement comprising:

means for storing gamma values of the photosensitive medium;

means for supplying correction signals indicative of desired incremental corrections in density; and

means for modifying exposure in the printer as a function of the correction signals and the gamma values to produce the desired incremental corrections in density.

4,175,857

PHOTOGRAPHIC COPYING MACHINE

Heinz Rapp, Munich; Ernst Biedermann, Taufkirchen, and Dieter Wittenbrink, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Jan. 18, 1978, Ser. No. 870,604
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1977, 2701943
Int. Cl.[2] G03B 27/60
U.S. Cl. 355—73 **22 Claims**



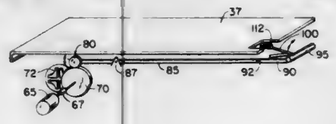
1. Apparatus for transferring sheets from a predetermined position in a first plane into a second plane, particularly for transferring sheets into the copying plane of a photographic copying machine, comprising a suction chamber including a perforated wall having an outer side which defines said second plane and is in register with a sheet in said predetermined position; means for evacuating air from said chamber whereby air which flows into said chamber by way of perforations in said wall attracts and effects the transfer of a sheet from said first into said second plane; means for subdividing the interior of said chamber into at least two groups of sections one of which directly communicates with said evacuating means and each of which communicates with different perforations of said wall, said subdividing means including partitions separating the other of said groups from said one group and having respective passages therein which permanently and indirectly communicate said other group with said evacuating means via said one group and which have such dimensions as to offer substantial resistance to the outflow of air from said other into said one group whereby that portion of a sheet in said predetermined position which is adjacent to perforations communicating with said one group of sections is transferred into said second plane prior to transfer of that sheet portion which is adjacent to perforations communicating with said other group of sections.

4,175,858

FILM DUPLICATOR

John W. Meadows, Los Altos, Calif., assignor to Quantor Corporation, Mountain View, Calif.

Filed Apr. 17, 1978, Ser. No. 897,080
Int. Cl.[2] G03B 27/04
U.S. Cl. 355—99 **20 Claims**



1. In a film duplicator for making copies of a microfiche master, the duplicator having an exposure station, means for indexing the master at the exposure station, and means for storing a supply of copy film, the improvement comprising:

a rotatable element having camming means associated therewith;

motor means for driving the rotatable element in a predetermined direction;

means operatively coupled to the rotatable element for advancing copy film from the supply to the exposure station during a first portion of the rotatable element's rotation;

means operatively coupled to camming means of the rotatable element for severing an exposed length of copy film during a second portion of the rotatable element's rotation, the second portion being completely distinct from the first portion; and

means operatively coupled to camming means of the rotatable element for biasing the copy film in an overlying relationship into intimate contact with the master during a third portion of the rotatable element's rotation and for releasing the copy film during a fourth portion of the element's rotation;

whereby activation of the motor means causes a cyclical film transport, film severance, film biasing, and film release.

4,175,859

APPARATUS FOR AUTOMATED CLASSIFICATION OF WHITE BLOOD CELLS

Akihide Hashizume, Hachioji; Ryuichi Suzuki, Kokubunji; Hisatake Yokouchi, Hachioji; Hideyuki Horiuchi, Kokubunji, and Shinji Yamamoto, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 14, 1977, Ser. No. 815,824
Claims priority, application Japan, Jul. 23, 1976, 51-87286
Int. Cl.[2] G01N 33/16
U.S. Cl. 356—39 **5 Claims**



1. An apparatus for automated classification of white blood cells, comprising:

means for generating light having components of at least one of green light, blue light and red light and for passing the light through a blood specimen;

green light converting means for converting the green light passing the blood specimen into an electric output signal;

first detecting means for detecting the maximum and minimum values of the output signal produced from said green light converting means and providing maximum and minimum value output signals;

difference means for detecting the difference between the maximum and minimum value output signals provided from said first detecting means and producing an output signal which is a predetermined percentage of said detected difference;

second detecting means for detecting the output signal of said green light converting means greater than the output signal of said difference means and providing an output signal for indicating the zone where the nucleus of white blood cells exists;

blue light converting means for converting the blue light passing the blood specimen into an electric output signal;

maximum value means for detecting the maximum value from the output signal produced from said blue light converting means and providing a maximum value output signal;

third detecting means for detecting, from the output signal produced from said blue light converting means, the values greater than the output signal from said maximum value means;

position means by which the positions in both horizontal and vertical directions of the white blood cells in the blood specimen are detected from the output signal produced from said second detecting means and providing the output signal indicative thereof;

address calculation means controlled by the output signal from said position means and storing the output signal from said green light converting means when there exists no output signal from said third detecting means and providing an output signal; and

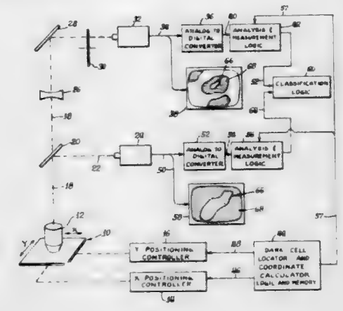
minimum value means for detecting the minimum value which is produced at the termination of variation of the output signal from said address calculation means and providing a minimum value signal for indicating the nucleus of the white blood cell.

4,175,860

DUAL RESOLUTION METHOD AND APPARATUS FOR USE IN AUTOMATED CLASSIFICATION OF PAP SMEAR AND OTHER SAMPLES

James W. Bacus, Hinsdale, Ill., assignor to Rush-Presbyterian-St. Luke's Medical Center, Chicago, Ill.

Filed May 31, 1977, Ser. No. 801,623
Int. Cl.[2] G01N 33/16
U.S. Cl. 356—39 **7 Claims**



1. A method of analyzing and automatically classifying a large number of cells in a field on a support, comprising the steps of:

prescreening the field of cells and designating the locations of objects in the field as subject cells for closer examination, bringing the subject cells into a position for a detailed analysis at a low resolution of the entire cell and at a higher resolution of an internal or nuclear portion of the cell,

producing a large field of view image at high resolution including a high resolution image of the entire cell, demagnifying the large field of view image to produce a low resolution image of said entire cell with sufficient detail to extract features relating to the total cell,

using only an internal portion of said large field of view to produce a high resolution image of substantially only the internal or nuclear portion of said subject cell and excluding substantially the remainder of the cell,

simultaneously performing measurements and analysis on said low resolution image of the entire cell and on the internal or nuclear portion high resolution image including the extracting of features relating to texture of its internal or nuclear portion,

and classifying the cells in the field based on the features extracted simultaneously from said different images having said different resolutions.

4,175,861

SYSTEM FOR THE ALIGNMENT OF A LASER BEAM TRANSMITTER WITH A SIGHTING MECHANISM SET UP IN ANOTHER PLACE

Rolf Kottas, Hamburg, Fed. Rep. of Germany, assignor to "Laser-Light" Gesellschaft mit beschrankter Haftung, Hamburg, Fed. Rep. of Germany

Filed Feb. 23, 1977, Ser. No. 770,079
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1976, 2607280
Int. Cl.[2] G01B 11/27
U.S. Cl. 356—153 **4 Claims**

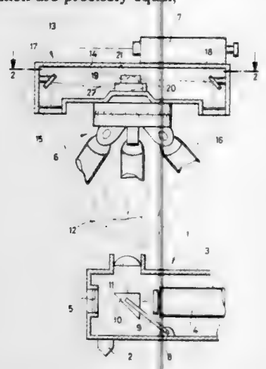
1. A system for the alignment of a laser beam generator instrument and a remotely located sighting instrument comprising:

a. a projection device mounted on one of said instruments including a laser generator (4) for generating a laser beam and a fixed optical member (11) mounted in the path of

said laser beam which projects a fan-shaped beam (12) on the longitudinal axis of said other instrument;

b. a receiving device (13) having a pair of windows fitted with ground glass screens (15) and (16) spaced along the longitudinal axis of said receiving device which form an image of axially displaced portions of said fan-shaped beam on said ground glass screens;

c. a system of optical elements (17–20) which deflect said fan-shaped beam images from each of said screens at angles which are precisely equal;



d. an eyepiece (21) positioned for the simultaneous observation of said beam images formed on said screens (15) and (16) through said optical elements (17–20); and

e. said optical system includes a five-sided prism (20) and a 90° prism (19), the axes of which are normal to the principal axes of said instruments and reflect said fan-shaped beam images received on said screens (15) and (16) via the reflectors (17) and (18) by 90°, so that relative angular movement of the principal axis of said instruments causes said fan-shaped beam images appearing on said screens (15) and (16) to move in opposite directions as viewed in said eyepiece (21).

4,175,862

ARRANGEMENT FOR SENSING THE GEOMETRIC CHARACTERISTICS OF AN OBJECT

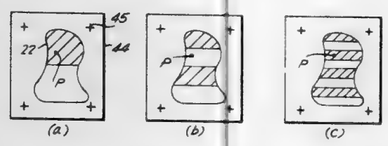
Paul L. DiMatteo, Huntington; Joseph A. Ross, Fort Salonga, and Howard K. Stern, Greenlawn, all of N.Y., assignors to Solid Photography Inc., Melville, N.Y.

Filed Aug. 27, 1975, Ser. No. 608,265

The portion of the term of this patent subsequent to Feb. 11, 1992, has been disclaimed.

Int. Cl.[2] **G01B** *11/00;* **G01C** *11/02, 11/12*

U.S. Cl. 356—375 **62 Claims**



1. A method for sensing and locating points on a surface comprising the steps of: generating a projection field directed onto a surface; subdividing said projection field into a number of sections; irradiating said surface with different variations of said subdivided projection field so that each section is illuminated at least once; recording within a field of view images of said surface as irradiated by the subdivided projection field; recording a calibrated reference surface and reading said recorded images in relation to said reference surface to define the location of a predetermined point on said first-mentioned surface and appearing within said field of view; projecting in sequence by said projection field preselected patterns onto the surface for subdividing the projection field into predetermined sections, said projected patterns on said surface having irradiated sections and non-irradiated sections, each pattern of irradiated sections and non-irradiated sections corresponding to an assigned code; said reading step comprising further reading each projected pattern of irradiated and non-irradiated sections and reading the sections in which a preselected point appears; combining said patterns for obtaining a predetermined total number of sections, said projection field being subdivided into said total number of sections, the number of said patterns and the total number of sections being related by said assigned code; and relating the patterns and sections in which the point appears to identify the position in three-dimensional space of the point on said surface.

4,175,863

GRAPHITE TUBE ATOMIZER FOR FLAMELESS ATOMIC ABSORPTION SPECTROSCOPY

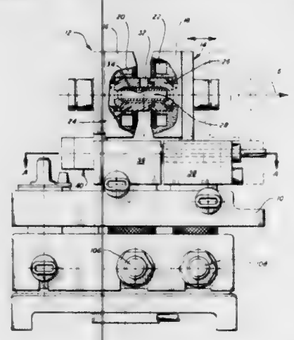
Rolf G. Tamm, Salem; Günter Grosser, and Toma Tomoff, both of Uberlingen, all of Fed. Rep. of Germany, assignors to Bodenseewerk Perkin-Elmer & Co. GmbH, Uberlingen, Fed. Rep. of Germany

Filed Apr. 13, 1977, Ser. No. 787,036

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1976, 2617928

Int. Cl.[2] **G01J** *3/30;* **H01R** *13/54, 13/62*

U.S. Cl. 356—312 **5 Claims**



1. A graphite tube atomizer for atomic absorption spectroscopy having a graphite tube disposed to permit passage of a measuring beam through the graphite tube, said atomizer comprising;

first and second housing portions,

an annular contact piece carried by each of said first and second housing portions and adapted for electrical connection to current conducting cables,

means for mounting said first housing portion for movement relative to said second housing portion,

drive means connected to said first and second housing portions for selectively moving said first portion between a first position with its contact piece in contact with one end of the graphite tube under a substantially constant predetermined bearing pressure and a second position with its contact piece spaced from the one end of the graphite tube,

said drive means including a cylinder housing carried by one of said first and second housing portions and a piston disposed in said cylinder housing and connected to the other of said first and second housing portions, and

a source of gas under pressure,

said drive means including valve means connected between said cylinder housing and said source of pressurized gas for selectively communicating gas from said source to said cylinder housing and thereby to relatively displace said cylinder housing and said piston to move said first housing portion between said first position and said second position and maintain the contact piece carried by said first housing portion in contact with the one end of the graphite tube under a substantially constant predetermined bearing pressure when said first housing portion is in said first position.

4,175,864

ASTIGMATIC ILLUMINATING SYSTEM IN AN INTERNAL REFLECTION SPECTOMETER

Anthony C. Gilby, Darien, Conn., assignor to The Foxboro Company, Foxboro, Mass.

Filed Feb. 21, 1978, Ser. No. 879,197

Int. Cl.[2] **G01J** *3/42*

U.S. Cl. 356—326 **19 Claims**



1. An internal reflection spectrometer comprising:

a light source;

means for forming first and second astigmatic images of said light source;

an internal reflectance crystal having a light-entrance end surface and a light-exit end surface, and two opposed internally reflecting surfaces extending between said end surfaces to multiply internally reflect light therebetween, said internal reflectance crystal being so positioned that one of said astigmatic images having a distorted height is formed at about said entrance end surface and the other of said astigmatic images having a distorted width is formed at about said exit end surface;

means for positioning a test sample adjacent at least one of said internally reflecting surfaces; and

means for detecting light passing through the exit end surface of said internal reflectance crystal.

4,175,865

SMOKE DETECTOR

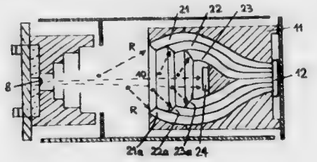
Zoltan Horvath, Männedorf, and Erwin Tresch, Zollikon, both of Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed Mar. 14, 1977, Ser. No. 777,396

Claims priority, application Switzerland, Apr. 5, 1976, 4138/76

Int. Cl.[2] **G01N** *21/26*

U.S. Cl. 356—338 **23 Claims**



1. An optical smoke detector comprising:

a measuring chamber for receiving gases which are to be analysed for the presence of particles stemming from a combustion process;

a radiation source located in said measuring chamber for transmitting radiation through a predetermined spatial region defining a region of direct radiation;

at least one radiation receiver positioned in said measuring chamber for receiving radiation scattered by the particles located in said region of direct radiation;

a plurality of radiation-conducting elements for conducting radiation by reflection positioned in said measuring chamber for removing radiation in a substantially ring-shaped zone located about said region of direct radiation which has been scattered forwardly at an acute angle with respect to the radiation direction and for delivering such removed forwardly scattered radiation receiver; and

said radiation-conducting elements comprising substantially bulb-shaped elements possessing substantially ring-shaped inlet openings and an apex portion arranged in spaced relationship from said substantially ring-shaped inlet openings;

said substantially ring-shaped inlet openings being located at a substantially ring-shaped zone disposed about the region of the direct radiation; and

said apex portion being located adjacent said radiation receiver.

4,175,866

METHOD OF OPERATING A FOUNDRY SAND MIXING MACHINE

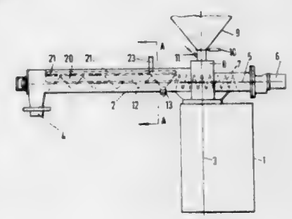
Albert Edwards, Bourne, England, assignor to Baker Perkins Holdings Limited, Peterborough, England

Continuation-in-part of Ser. No. 742,670, Nov. 17, 1976, abandoned. This application Apr. 10, 1978, Ser. No. 894,724

Claims priority, application United Kingdom, Nov. 26, 1975, 48553/75

Int. Cl.[2] **B28C** *5/00*

U.S. Cl. 366—2 **11 Claims**



1. A method of inhibiting the gross build-up of a cold-setting foundry sand mixture upon elements of a mixing machine exposed to the mixture during the process of mixing the mixture, the foundry sand mixture having a tendency to adhere to and to set upon said elements to build-up a coating on said elements; the method comprising the steps of first discharging on to said elements while the mixing machine is substantially empty a fluid inhibitor operable to prevent or retard the setting of the mixture on said elements, and subsequently introducing the mixture into the mixing machine for the mixing operation.

4,175,867

PROCESS AND APPARATUS FOR STATIC MIXING

Matthew R. Piazza, Nichols, Conn., assignor to Maso-Therm Corp., Bridgeport, Conn.

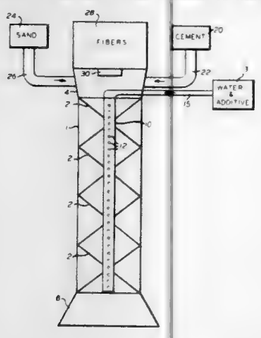
Filed Mar. 1, 1978, Ser. No. 882,484

Int. Cl.[2] **B01F** *15/02*

U.S. Cl. 366—9 **6 Claims**

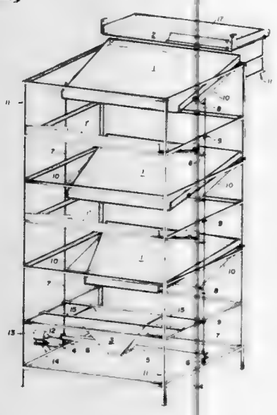
1. A static mixing apparatus comprising:

a static mixing column having a plurality of static mixing elements therein;
spraying means disposed along the length of the column and having a plurality of spraying apertures therein and receptive of liquid for spraying same through the apertures and into material to be mixed in the column to mix therewith



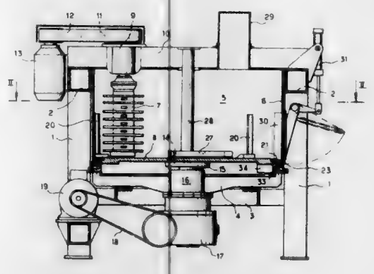
wherein the spraying means comprises a jacket disposed around and including inner the wall of the column and wherein the apertures are disposed in the inner wall of the column and in communication with the jacket; and
a chamber disposed at the top of the column and in communication therewith and receptive of the materials to be mixed in the column.

4,175,868
PROCESS FOR INCORPORATING REINFORCING FIBERS IN CEMENTING MATRICES, USING AN APPARATUS COMPRISING VIBRATING TRAYS
José M. Restrepo, Calle 85 No. 30 Piso 14-70, Bogotá, Colombia
Filed May 5, 1978, Ser. No. 903,207
Int. Cl.² B28C 5/04
U.S. Cl. 366—9 **9 Claims**



1. A process for homogeneously incorporating fibrous reinforcing material into a matrix of pastes of cementing materials, comprising,
charging in alternating relationship into a supplying station horizontal strata of cementing material paste and horizontal uniform strata of fibrous material;
withdrawing from said supplying station a stream of cementing material paste containing a proportionate layered amount of fibrous reinforcing material;
gravity flowing under laminar flow conditions said stream along a succession of stream lengths, with each of the stream lengths flowing on respective vertically spaced apart slopes;
free-fall discharging each upper stream length from its downstream end onto the upstream end of the next succeeding stream length flowing along a corresponding lower slope;
reversing the direction of flow of each of said stream length of said succession, following each free fall discharge; and
collecting cementing material paste having fibrous reinforcing material homogeneously incorporated therein, at the end of said succession of stream lengths; wherein said stream of cementing material paste containing fibrous material is caused to flow along said succession of stream lengths in the condition of thin layer, while each of said layers is subjected to vibration.

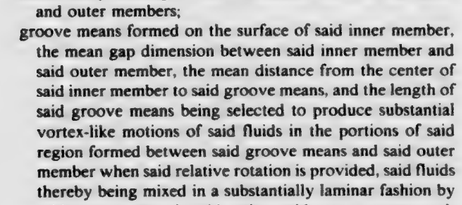
4,175,869
MIXER FOR DIFFERENT PRODUCTS AND IN PARTICULAR FOR FOUNDRY SANDS
Henri A. Churlaud, Brunoy, France, assignor to Societe Anonyme des Etablissements Ph. Bonvillan & E. Ronceray, Choisy-le-Roi, France
Filed Jun. 19, 1978, Ser. No. 917,120
Claims priority, application France, Jun. 29, 1977, 77 20007
Int. Cl.² B01F 7/16
U.S. Cl. 366—42 **9 Claims**



1. A mixer for foundry sands comprising:
a frame;
a mixing tank supported by said frame, said tank comprising:
a bottom member of said tank arranged to rotate in a substantially horizontal plane about a vertical axis; and
a cylindrical side wall fixed to said frame;
a turbine extending substantially vertically into said tank at a location displaced from the axis of said bottom member;
means for rotating said bottom member;
means for rotating said turbine; and
an emptying trap in said side wall of said tank, said trap being circumferentially displaced from the location of said turbine.

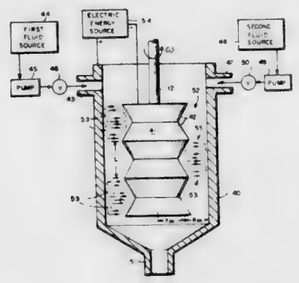
4,175,870
APPARATUS FOR FEEDING WASTE YARN TO AN EXTRUDER
Fred M. Warzel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Jan. 17, 1978, Ser. No. 870,156
Int. Cl.² B01F 7/24
U.S. Cl. 366—76 **2 Claims**

1. An apparatus for feeding yarn into a mass of moving particles moving through a conduit or hopper, typically on their way to the screw of an extruder or into a molding machine, which comprises in combination an aspirator-jet forwarding means, means to activate said aspirator-jet forwarding means, means in combination with said jet forwarding means to receive and to compress yarn being emitted from said jet forwarding means and means extending from said last-mentioned means into said hopper or conduit to feed wadded yarn into a mass moving through said hopper, said means for feeding the wad into said hopper or conduit being shaped as a hood or



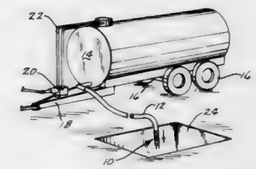
shield and being positioned to fend moving particles or other material moving in said hopper or conduit away from said wad until said wad and thus protecting said wad until it has emerged into within the mass of material moving in said hopper or conduit.

4,175,871
FLUID MIXING APPARATUS
Nam P. Suh, Sudbury; Christopher A. Rotz, Watertown, and Lewis Erwin, II, Belmont, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Continuation of Ser. No. 584,985, Jun. 9, 1975, abandoned. This application Jan. 5, 1978, Ser. No. 867,327
Int. Cl.² B29B 1/04
U.S. Cl. 366—79 **20 Claims**



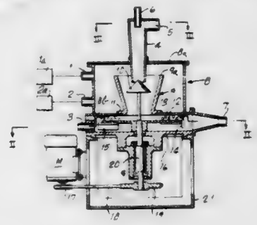
1. A laminar mixing apparatus comprising
an outer member;
an inner member concentrically mounted for rotation within said outer member;
means for introducing at least two fluids into the region between said inner and outer members;
means for providing a relative rotation between said inner and outer members;
groove means formed on the surface of said inner member, the mean gap dimension between said inner member and said outer member, the mean distance from the center of said inner member to said groove means, and the length of said groove means being selected to produce substantial vortex-like motions of said fluids in the portions of said region formed between said groove means and said outer member when said relative rotation is provided, said fluids thereby being mixed in a substantially laminar fashion by said groove means in said region, said groove means tending to prevent the interface between said fluids from becoming aligned in parallel with the streamlines of said fluids; and
means for removing the mixture of said fluids from said apparatus.

4,175,872
METHOD AND MEANS FOR AGITATING LIQUID MANURE
David R. Primus, Mt. Auburn, Iowa 52303
Filed Sep. 28, 1978, Ser. No. 946,827
Int. Cl.² B01F 13/06, 15/02
U.S. Cl. 366—139 **10 Claims**



1. An adapter for a liquid manure vacuum agitator having a tank, a hose connected to said tank at one end and having a free end, and means for applying a vacuum to said hose for collecting a manure water mixture through said free end; said adapter comprising:
an elongated cylindrical tubular member having opposite ends and an internal annular bore defined by the interior cylindrical wall of said tubular member;
a continuous spiraling blade attached to said interior cylindrical wall said spiraling blade having sufficient width to extend radially inwardly from said cylindrical wall to an inner edge which is spaced from axial centerline of said tubular member, thereby leaving an open center through said tubular member along said longitudinal centerline thereof; and
means for connecting one end of said tubular member to said free end of said hose.

4,175,873
PROCESS AND APPARATUS FOR MECHANICALLY MIXING TWO IMMISCIBLE LIQUIDS AND ONE OR MORE OTHER SUBSTANCES
Hiroyuki Iwako, and Shigeki Ando, both of Tokyo, Japan, assignors to Funken Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 819,544, Jul. 27, 1977, abandoned. This application Oct. 6, 1978, Ser. No. 949,220
Claims priority, application Japan, Sep. 10, 1976, 51-107892
Int. Cl.² B01F 3/08, 3/12, 7/16, 13/10
U.S. Cl. 366—165 **22 Claims**



1. A continuous flow mixer comprising:
tank means having two inlets for respectively receiving two immiscible liquids therein;
means forming an inverted truncated conical surface coaxially disposed within said tank means, and having an upper circumferential rim communicating with the interior of said tank means and a lower open end sealed from the interior of said tank means;
means for feeding two immiscible liquids into said tank means so as to overflow said rim and create a continuous

downwardly flowing dual-layer liquid film on said conical surface from said rim to the open lower end;
means for feeding a third substance into said tank means;
means for centrifugally dispersing said third substance into said flowing liquid film on said conical surface;
compartment means communicating with said lower open end for receiving the downwardly flowing dual-layer liquid film containing the third substance dispersed therein; and
means in said compartment means for producing a shearing action on the liquids and third substance therein to mix and emulsify the two immiscible liquids and the third substance dispersed therein.

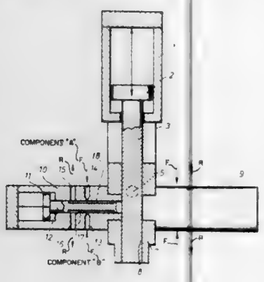
13. A process for mechanically mixing two immiscible liquids and one or more other substances comprising the steps of:
feeding two immiscible liquids into a first chamber containing an inverted truncated conical surface having an upper circumferential rim communicating with the interior of said tank means and a lower open end sealed from the interior of said tank means;
causing said immiscible liquids to flow over said conical surface rim for creating a continuous downwardly flowing dual-layer liquid film on said surface from said rim to the upper lower end;
feeding a flow of a third substance into said first chamber and centrifugally dispersing said third substance into said downwardly flowing dual layer of liquid film;
receiving the downwardly flowing dual-layer liquid film containing the third substance dispersed therein in a second chamber through the open end of said truncated conical surface; and
producing a shearing action on the liquids and third substance in said second chamber to mix and emulsify the two immiscible liquids and the third substance dispersed therein.

4,175,874

HIGH PRESSURE INJECTION MIXING HEAD FOR MULTI-COMPONENT PLASTICS, PARTICULARLY POLYURETHANE

Fritz W. Schneider, Strasslach, Fed. Rep. of Germany, assignor to Elastogran Maschinenbau GmbH & Co., Munich, Fed. Rep. of Germany

Filed Aug. 11, 1977, Ser. No. 823,663
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1976, 2645937
Int. Cl.² B01F *15/00*
U.S. Cl. 366—182 **6 Claims**



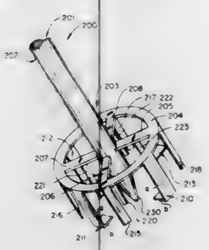
1. A high pressure mixing and injection apparatus from which mixed multi-component plastics, particularly polyurethane, may be discharged in a stabilized jet, said apparatus including a plurality of mixing assemblies each having a cylindrical mixing chamber with in-feed and return flow port means for the several components and also having piston means slidable in the mixing chamber for controlling the flow of the components and to alternately open the port means to allow mixing of the components in the chamber and close the port means to component flow transversely across the mixing chamber while connecting in-flow and return flow port means for each component, the mixing chambers of the mixing assemblies having outlet ports, a transfer cylinder with a diameter significantly greater than the diameter of the mixing chambers, the outlet ports of the mixing chambers communicating with the transfer cylinder for unobstructed flow, an ejector piston slidably disposed in said transfer cylinder, the axes of said cylindrical mixing chambers and the piston means therein extending perpendicularly of and radially toward the axis of the transfer cylinder and said axes also being symmetrically arranged with respect to each other and in a common plane disposed with respect to the transfer cylinder so that the angles between the adjacent axes of the mixing chambers and piston means of the several mixing assemblies are of substantially equal size, and the transfer cylinder having an open end from which flow of the mixed multi-component plastics is discharged in stable jets.

4,175,875

HAND MIXING APPARATUS

Judd Van Horbek, 575 Sheridan St., Mount Angel, Oreg. 97362

Continuation-in-part of Ser. No. 736,711, Oct. 29, 1976, Pat. No. 4,065,107. This application Dec. 9, 1977, Ser. No. 859,008
The portion of the term of this patent subsequent to Oct. 18, 1994, has been disclaimed.
Int. Cl.² B01F *7/16*
U.S. Cl. 366—343 **9 Claims**



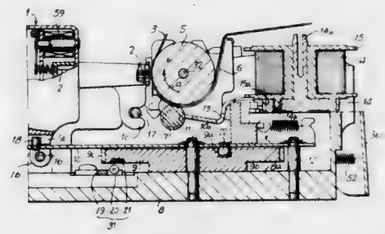
1. An apparatus for mixing comprising:
a handle having an upper section and a lower section;
a pivot point terminating the lower section for providing a low-friction bearing surface to support the handle on the bottom of a container and to provide a clearance between the bottom of mixing blades attached thereto and the bottom of the container when the apparatus is being held against and rotated on the bottom;
a circular ring-shaped mixing blade;
a plurality of supporting mixing blades rigidly attached to and extending radially in a plane perpendicular to the axis of the handle from the lower section of the handle to the interior edge of the ring-shaped mixing blade for supporting the ring-shaped mixing blade concentrically about the lower section of the handle; and
a plurality of mixing blades which extend in planes perpendicular to the plane of the supporting and ring-shaped mixing blades.

4,175,876

DRIVE MECHANISM FOR PRINTER

Seiji Hanaoka, Shiojiri, Japan, assignor to Shinshu Seiki Kabushiki Kaisha and Kabushiki Kaisha Suwa Seikosha, both of Tokyo, Japan

Filed Nov. 15, 1977, Ser. No. 852,001
Claims priority, application Japan, Nov. 15, 1976, 51-137151
Int. Cl.² B41J *3/12, 23/14, 33/04*
U.S. Cl. 400—124 **42 Claims**



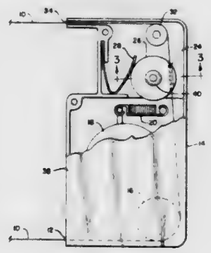
1. A printer for printing characters on recording tape means by impacting printing means into an ink ribbon against the tape means comprising;
a frame;
disc means rotatably mounted to said frame;
lever means pivotally mounted to said frame and operatively engaged with said disc means for reciprocatively pivoting said lever means in response to rotation of said disc means;
printing means slideably mounted to said frame and engaged with said lever means for reciprocative displacement across the tape means in response to pivoting of said lever means for effecting printing in at least one direction of said displacement;
tape feeding means mounted to said frame and cooperatively engaged with said disc means for incrementally feeding said tape means at least in part in response to rotating of said disc means; and
ribbon winding means mounted to said frame and operatively coupled to said lever means for incrementally winding said ribbon means at least in part in response to pivoting of said lever means.

4,175,877

RIBBON CARTRIDGE HAVING A CONVOLUTE-FORMING ROLLER

John E. Randolph, Palatine, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Mar. 6, 1978, Ser. No. 883,771
Int. Cl.² B41J *33/10*
U.S. Cl. 400—196 **7 Claims**



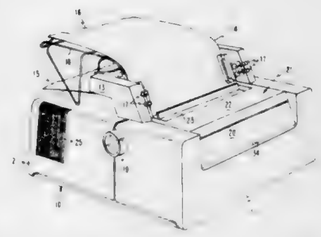
1. An improved ribbon cartridge of the type in which an endless ribbon is stored within a cartridge housing prior to use of the ribbon, the cartridge being mountable in an apparatus so that in the mounting operation the ribbon is withdrawn from a convoluted storage within the cartridge housing and is guided in operation through the cartridge housing, wherein the improvement comprises:
a convolute-forming roller rotatably mounted in the cartridge;
a chord-oriented guide path in the roller through which the ribbon passes in operation; and
means for limiting extraneous rotation of the roller.

4,175,878

PRINTER COVER ASSEMBLY

James W. Wing, Zumbro Falls, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 12, 1977, Ser. No. 786,922
Int. Cl.² B41J *29/02*
U.S. Cl. 400—693 **3 Claims**



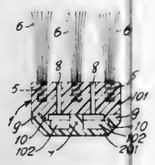
1. A printer having a print mechanism, a roller platen and a continuous form paper tractor for moving a continuous paper web over said platen comprising
a base member which is connected to and supports said print mechanism;
a cover assembly that shrouds at least a portion of said print mechanism;
said cover assembly having front and rear sections supported on said base member and abutting one another along an interface surface;
slotted opening means formed in said cover assembly extending from said interface surface;
support means carried by said paper tractor which extend through said slotted opening means and are connected to said print mechanism whereby said paper tractor is supported exterior of said cover assembly sections;
releaseable retaining means for securing said cover assembly front section and said cover assembly rear section to said base member;
said front section being removeable from said base member in a forward direction, upon release of said releaseable retaining means, without removal or disassembly of said paper tractor and
said rear section being removeable from said base member in a rearward direction, upon release of said releaseable retaining means, without removal or disassembly of said paper tractor;
whereby said cover assembly can be removed from said base member to expose said print mechanism without removal or disassembly of said paper tractor.

4,175,879

TOOTHBRUSH

Pietro Molinari, 8, Piazza Foraggi, Trieste, Italy (34100)

Filed May 27, 1977, Ser. No. 801,268
Claims priority, application Italy, May 31, 1976, 59809/76[U]
Int. Cl.² A46B *11/02*
U.S. Cl. 401—287 **2 Claims**



1. A toothbrush comprising

(a) a handle having a portion carrying a plurality of rows of bristles at one end thereof, and a duct extending longitudinally through said handle;

(b) at least two rows of water-dispensing bores in between said rows of bristles;

(c) a water inlet connecting member being provided at the other end of said handle and communicating with said bore via said duct, said connecting member being connectable, by means of a flexible tube, to a water supply source;

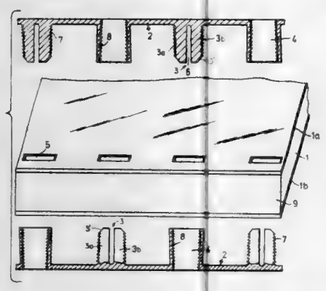
(d) said handle comprising first and second longitudinal plastic halves, the first said half having said at least two rows of bores between said rows of bristles, the second said half being designed for complementary fit with the first said half and having a longitudinal substantially centrally located rib extending continuously substantially the length of said rows of bores and abutting the first said half, whereby said duct is divided into two parallel ducts extending longitudinally below said bristle-carrying portion and separating said rows of bores.

4,175,880

DEVICE FOR INTERLOCKING PERFORATED WRITING MATERIAL

Wilhelm Müller, Frankfurt, Fed. Rep. of Germany, assignor to Postalia GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Sep. 16, 1977, Ser. No. 831,107
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1978, 2640090
Int. Cl.² B42F *3/02*
U.S. Cl. 402—48 **13 Claims**



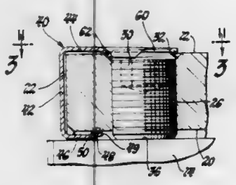
1. Device for interlocking a stack of writing material having perforations formed therein along a margin thereof, the perforations formed in the writing material being aligned in the stack thereof so as to form respective through-bores extending from opposite marginal surfaces of the stack that are disposed adjacent to and on both sides of a back surface of the stack, comprising two binding strips of monolithic identical construction, each of said binding strips having a first portion engageable with the back of the writing-material stack for covering at least part thereof, and a second portion engageable with and covering a respective one of the opposite marginal surfaces of the stack, each of said binding strips further having stringing rods and sleeves extending from the respective second portion thereof, said rods and sleeves being disposed in mutually alternating sequence and having a mutual equal spacing corresponding to the spacing of the aligned holes formed in the stack of writing material, said rods being formed with outer detents along the length thereof and said sleeves being formed with corresponding inner detents along the length thereof, the rods of each of the two binding strips being lockingly engageable in the sleeves of the other of the two binding strips by said detents thereof within the respective through-bores formed in the stack of writing material.

4,175,881

SELF-ALIGNMENT CLIP FOR ALIGNING HUBS TO FLAT SHAFTS

John H. Loos, Dayton, Ohio, assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Dec. 4, 1978, Ser. No. 966,358
Int. Cl.² F16D *1/06*
U.S. Cl. 403—13 **1 Claim**



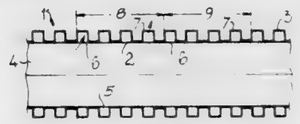
1. An alignment clip for aligning a hub for a rotary structure with a shaft which has a flat portion extending from one end thereof and engageable with a set screw or the like, said hub having a generally cylindrical bore therein which extends therethrough from one end to another, said bore being circular in cross section so as to normally receive said shaft in any angular relation, said hub also having a radial bore which is oriented with its principal axis generally perpendicular with respect to the longitudinal axis of said cylindrical bore and intersecting said cylindrical bore, said radial bore outer end periphery having an edge portion beveled at a defined angle, said clip comprising a U-shaped resilient sheet metal member in cross-section including a base portion and two relatively flat outer and inner parallel arms extending normally from the opposite ends of said base portion, said inner arm having a free end terminating in a tab inclined toward said outer arm, said clip being adapted for assembly with the hub one end with its outer arm extending parallel with the axis of said cylindrical bore on the exterior of the hub and its inner arm extending within the cylindrical bore with the clip base portion closely adjacent the hub one end, the distal end of said clip outer arm including an axially extending open-ended slot formed with an inner radiused closed end for substantially concentric location with said radial bore, said slot inner radiused closed end formed with an integral lip portion extending toward said inner arm and adapted for snap-on retention engagement with the radial bore beveled edge portion such that said inclined tab free end is adapted to be spaced a defined axial distance from the inner edge of said radial bore, whereby said clip is positioned with respect to the axes of said cylindrical bore and said radial bore to form a plane with said inner leg as a chord of said hub cylindrical bore substantially normal to the axis of said radial bore to provide shaft alignment means in cooperation with the flat on the shaft, whereby during telescopic insertion of the shaft into the other end of the hub bore the shaft end contacts said inner arm inclined tab permitting the flat of the shaft to be positioned in juxtaposed substantially parallel relation with the plane of said inner arm only when the hub and shaft are in the desired angular relationship with respect to said radial bore, whereby the set screw or the like received in the radial bore must engage the flat of the shaft to hold the hub in fixed assembled relation with the shaft.

4,175,882

HOSE CONDUITS FOR DRIP- OR TRICKLE EMISSION

Gideon Gilead, 5 Nicaragua St., Jerusalem, Israel

Filed Dec. 29, 1976, Ser. No. 755,482
Claims priority, application Israel, Jan. 8, 1976, 48810
Int. Cl.² E02B *13/00*; B05B *15/00*
U.S. Cl. 405—43 **8 Claims**



8. A laminated structure for use in irrigation, said laminated structure comprising:

a first longitudinal layer of flexible flat foil; and

a second longitudinal layer of flexible flat foil substantially coextensive with said first layer and provided with at least one longitudinally extending area of embossed, raised groove patterns, each of said groove patterns being formed as an elongated circuitous path including a plurality of adjacent raised communicating portions, said elongated path having walls defined by said second longitudinal layer, said walls of said adjacent communicating portions being separated from each other by intermediate areas of said second layer at which said first and second longitudinal layers lie in touching relationship and are fused together;

said groove patterns being spaced from opposite longitudinal edges of said first and second layers by flat margins free of said embossed groove patterns; and

a plurality of bosses formed on said second longitudinal layer extending from the surface of said second foil in the direction of and outwardly from said embossed grooved patterns, said bosses being longitudinally spaced by predetermined distances from one another, the interior of each said boss being in communication with the interior of one of said groove patterns;

said first and second layers being fused together in face-to-face confronting relationship at said flat margins, the concavity of said groove patterns being directed toward said first layer, there being at least one hole through said second layer in each said groove pattern and at least one hole through said first layer communicating with a groove in each said groove pattern, the outermost portions of said bosses being adapted to be cut away to form outlets from each said groove pattern;

said substantially flat laminated structure of said first and second layers being folded along its median longitudinal line so that said flat margins are in face-to-face contact and are secured together, to define a double wall hose having a single seam and wherein said groove patterns form a portion of the wall of said irrigation hose;

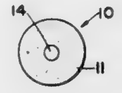
whereby the substantially flat folded laminated structure is easily rolled and transported and is adapted to conduct fluid through the interior of said thus formed irrigation hose, fluid flowing through the interior thereof communicating with said groove patterns from the interior of said hose through said holes in said first layer and being emitted from said irrigation hose through said bosses.

4,175,883

COMPOSITE STRUCTURAL MEMBERS AND FASTENING METHODS

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Sep. 2, 1977, Ser. No. 830,063
Int. Cl.² B25G *3/00*; F16B *7/00*
U.S. Cl. 403—347 **11 Claims**



1. An elongated composite structural member for use in constructing assemblies above the ground comprising in combination:

an elongated metal structural core member,

one end of said structural core member being shaped to permit and facilitate its penetration of the ground,

a sheathing formed of structural cellular plastic resin,

said structural cellular plastic sheathing covering a portion of said core member with the portion of said elongated structural core member which is shaped to facilitate insertion of the composite structural member into the ground being void of said structural cellular plastic resin defining said sheathing,

the upper end of said metal core member being exposed to the exterior of said sheathing to permit force to be applied directly to the end of said core member without damaging the upper end of the structural cellular plastic sheathing to permit forcing said composite structural member into the ground a degree such that the elongated structural member may be supported by and above the ground.

4,175,884

ASSEMBLY STRUCTURE OF TENON AND MORTISE

Shui-Shan Cheng, No. 29 Ta She Rd., Lu Chu Kaohsiung, Taiwan

Filed Jun. 6, 1978, Ser. No. 912,968
Int. Cl.² F16B *12/10*
U.S. Cl. 403—353 **3 Claims**



1. For use in forming a tenon and mortise-type joint structure, an element having a projection defining a tenon of dovetail form comprising side walls tapering outwardly from a surface of said element towards an outer surface of the tenon, said tenon further tapering lengthwise from a cross section of maximum dimension located at a central section of the tenon to a cross section of lesser dimension at one end of the tenon and said outer surface of the tenon including a first portion extending from said central portion of the tenon to said one end of the tenon and a second portion extending from said central section of the tenon to said other end of the tenon, said first portion being substantially parallel to said surface of the element and said second portion being inclined downardly from said central section of the tenon towards the other end of the tenon, said second portion of the outer surface facilitating insertion of the tenon into a closed-end mortise-type groove of complementary shape to the tenon but of limited length.

4,175,885

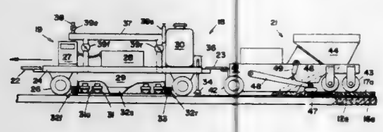
METHODS FOR SEALING AND RESEALING CONCRETE USING MICROWAVE ENERGY

Morris R. Jeppson, Carmel, Calif., assignor to Giselle V. Laurmann, Carmel, Calif.; Richard R. Blurton and Claire M. Blurton, both of Incline Village, Nev., part interest to each

Continuation-in-part of Ser. No. 756,365, Jan. 3, 1977. This application Dec. 14, 1977, Ser. No. 860,158

Int. Cl.[2] E01C *7/06*

U.S. Cl. 404—77 **19 Claims**



1. A method for sealing cement concrete pavement comprising the steps:

directing microwave energy into said cement concrete pavement to generate heat within sub-surface regions of said concrete pavement,

applying a layer of thermoplastic sealant to the surface of said heated cement concrete pavement, said sealant being temporarily in a hot, at least semi-liquid condition while in contact with said heated cement concrete pavement,

applying an overlayer of asphaltic concrete on said sealant layer, and

compacting said overlayer of asphaltic concrete and said sealant layer against said concrete pavement while still in a heated condition to produce a sealed composite pavement which may be resealed at a later time by a repeated heating and recompaction.

4,175,886

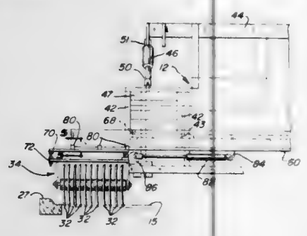
ASPHALT CUTTING APPARATUS

Frank F. Moench, and Lawrence R. Moench, both of P.O. Box 6484, Albuquerque, N. Mex. 87107

Filed May 15, 1978, Ser. No. 906,273

Int. Cl.[2] E01C *23/12*

U.S. Cl. 404—90 **6 Claims**



1. In apparatus for cutting or breaking up a paved asphalt surface comprising:

a wheeled vehicle;

a main frame pivotally attached at a front end portion to said vehicle for vertical movement relative to said pivotal attachment and having an orientation generally parallel to a longitudinal axis of said vehicle;

a hydraulic clamp cylinder coupled to said frame to adjust the elevation of the rear end portion of said frame and to hold said frame at a selected elevation;

a generally horizontal slide support adjustably movably attached to said frame to position said slide support at different angles to the longitudinal axis of said main frame;

a cutter disc support carriage comprising a slide plate slidably mounted to the slide support, a pivot plate pivotally attached to said slide plate and a pair of spaced parallel cutter disc support plates attached to the pivot plate at substantially right angles to said pivot plate;

a stationary support shaft mounted to said support plates of said support carriage; and

a plurality of circular cutter discs freely rotatably mounted in series to said support shaft with each cutter disc having a sharpened outer circumferential edge,

whereby as the vehicle is moved in a direction parallel to its longitudinal axis along the asphalt surface the cutter discs are pulled across the surface and are forced into the asphaltic material by said clamp cylinder and roll through and cut or break up the asphaltic material,

said slide support being adjustably movable at an angle to the longitudinal axis of said vehicle so that the cutter discs are oriented at an angle to the direction of motion of said main frame for windrowing the broken-up material,

said slide plate of the support carriage being adjustably movable laterally axially along the slide support for changing the horizontal location of the cutter discs,

said pivot plate of the support carriage being pivotal with respect to said slide plate for changing the lateral slope and thereby the cutting depth of the cutter discs relative to one another for cutting a sloped surface.

4,175,887

ANTI-SWELL PROTECTIVE DEVICE

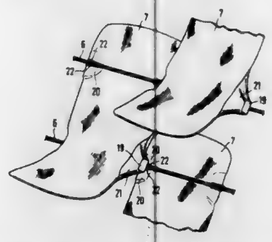
Georges L. Mougin, Paris, France, assignor to ITI Limited, Paris, France

Filed Feb. 15, 1978, Ser. No. 877,845

Claims priority, application France, Oct. 3, 1977, 77 29629

Int. Cl.[2] E02B *3/00*

U.S. Cl. 405—25 **10 Claims**



1. A device for protecting an off-shore structure from the effects of ocean swell, the device being stretched, in use, between two floating towers, wherein the device comprises two vertical arrays of horizontal cables stretched between the two floating towers, a first one of the arrays supporting an assembly of deflection panels and the other array serving to brace the first array against movement in a direction generally perpendicular to its plane.

4,175,888

BLOCK FOR CONSTRUCTING BREAKWATER

Takeshi Ijima, Fukuoka, Japan, assignor to Iida Kensetsu Co., Ltd., Fukuoka, Japan

Filed Jun. 12, 1978, Ser. No. 914,719

Int. Cl.[2] E02B *3/06*

U.S. Cl. 405—31 **9 Claims**

1. A block for constructing a breakwater comprising:

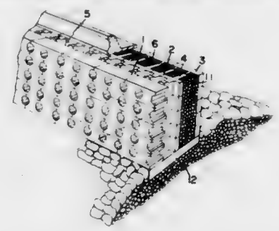
a front wall,

an intermediate wall disposed in parallel and spaced-apart relationship relative to said front wall,

a rear wall disposed in parallel and spaced-apart relationship relative to said intermediate wall,

a pair of parallel and spaced-apart partition walls, said partition walls being disposed perpendicularly to said front, intermediate, and rear walls and integrally connecting said three walls to form a first vertical open-ended chamber between said front and intermediate walls and a second vertical open-ended chamber between said intermediate and rear walls,

said front wall having a horizontal hole disposed in the central portion thereof for introducing water into said first chamber, said front wall also having cut-out portions



disposed at both sides thereof, each of said cut-out portions having a cross-sectional area substantially equal to one-half of the cross-sectional area of said horizontal hole,

said horizontal hole and said cut-out portions constituting 25 to 35 percent of the total area of said front wall, whereby water passing through said horizontal hole and cut-outs serve to alleviate the impulse pressure received by the breakwater.

4,175,889

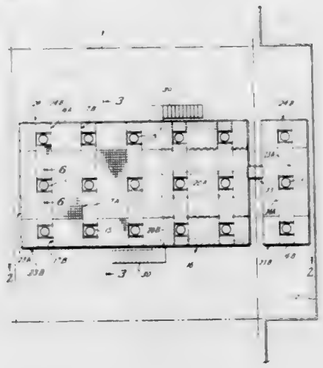
SUBFLOOR FOR OFFSHORE PRODUCTION PLATFORM

Charles W. Phaup, Dallas, and Joseph D. Lower, Houston, both of Tex., assignors to JBC Enterprises, Inc., Houston, Tex.

Filed Jun. 12, 1978, Ser. No. 914,963

Int. Cl.[2] E02D *21/00;* **E04G** *1/36*

U.S. Cl. 405—195 **5 Claims**



1. A modular type subfloor in the well bay area to facilitate access to laterally and longitudinally extending rows of Christmas trees rising above the cellar deck beneath the main deck of the well bay area of an offshore production platform, said subfloor comprising a first set of modules each comprising a floor supported on legs and adapted to be moved laterally into end-to-end position between adjacent lateral rows of trees to dispose their floors in horizontal alignment adjacent an intermediate level of the trees, a second set of modules each also comprising a floor supported on legs and adapted to be moved laterally into position on the outer side of each of the adjacent lateral rows of trees to dispose their floors in horizontal alignment with one another and with the floors of the first set of modules, and panels movable into positions spanning the spaces between and supported on the modules of the first and second sets intermediate adjacent trees in each lateral row of trees, each panel comprising a floor which is horizontally aligned with the floors of the other panels and the floors of the modules when so supported.

4,175,890

JOINTS FOR ANCHORING STRUCTURES TO THE SEA BED

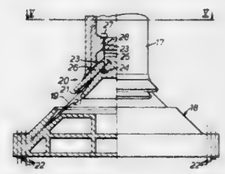
Reginald S. Taylor, Gerrards Cross, England, assignor to Taylor Woodrow Construction Limited, Middlesex, England

Filed Feb. 6, 1976, Ser. No. 655,981

Claims priority, application United Kingdom, Feb. 6, 1975, 5189/75; Jul. 16, 1975, 29895/75

Int. Cl.[2] E02D *27/04*

U.S. Cl. 405—202 **18 Claims**



1. A joint for anchoring a structure to the sea bed such that the structure can articulate; the joint comprising a first member that is to be located with respect to the sea bed, and a second member for attaching to the first member a structure to be anchored; the first and second members being connected by flexible tendons with a clearance between the members such that pivotal motion between the two members is permitted without the members coming into bearing contact, wherein said tendons are attached to one of the members at two or more levels.

4,175,891

AUXILIARY WALKING MINE SUPPORT

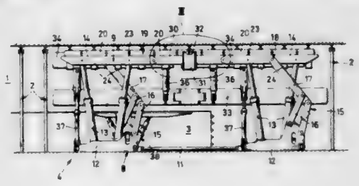
Gerhard von Klinggräff, Neukirchen-Vluyn; Peter Marr, and Karlheinz Bohnes, both of Bochum, all of Fed. Rep. of Germany, assignors to Bochumer Eisenhütte Heintzmann GmbH & Co., Bochum, Fed. Rep. of Germany

Filed Oct. 10, 1978, Ser. No. 950,536

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1977, 2745358

Int. Cl.[2] E21D *15/44*

U.S. Cl. 405—291 **15 Claims**



1. A walking mine support, particularly for supporting the area where a face gallery opens into a roadway provided with longitudinally spaced stationary supports, comprising a pair of adjacent supporting frames each having a multipartite sole plate and a multipartite roof shield; four-bar linkages connecting the sole plate with the roof shield of each frame; rams

supporting the roof shield of each frame on the sole plate thereof with freedom of vertical adjustment; a multi-section overshield above each of said roof shields; a plurality of supports connecting each multi-section shield to the respective roof shield; and means for effecting step-wise advancement of said frames relative to one another in direction lengthwise of the roadway.

4,175,892
PARTICLE MONITOR

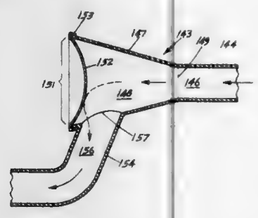
Robert J. De brey, 1830 E. 42nd St., Minneapolis, Minn. 55407

Continuation of Ser. No. 487,676, Jul. 11, 1974, abandoned, which is a continuation of Ser. No. 252,323, May 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 37,157, May 14, 1970, Pat. No. 3,674,316. This application Sep. 5, 1978, Ser. No. 939,384

The portion of the term of this patent subsequent to Jul. 4, 1989, has been disclaimed.

Int. Cl.[2] B65G *53/66*

U.S. Cl. 406—35 **19 Claims**



9. An apparatus for sensing particles in a flowing fluid comprising: first means having a first passage for carrying fluid, second means having a second passage for carrying fluid, connecting means joining the first means with the second means, said first means extended toward the connecting means and said second means extended away from the connecting means, said connecting means comprising a housing having an inside wall surrounding a large chamber open to the first passage and an outlet opening open to the second passage, said housing having an inlet opening in communication with the first passage and an open end generally aligned with the inlet opening, said open end being substantially larger than the inlet opening, said chamber generally increasing in cross section as a function of distance away from the inlet opening toward the open end, particle sensing means mounted on said housing and located across the open end of said housing opposite the inlet opening adjacent the outlet opening and inclined with respect to the longitudinal axis of the first passage, said sensing means comprising a flexible sheet member located across the open end of the housing, said sheet member having an outer peripheral portion and a portion extendible in a concave shape into the chamber to provide a barrier for particles moving with the fluid flowing through said chamber whereby when said particles strike said sheet member a readable sound signal related to the flow of particles through the chamber is established, means mounting only said outer peripheral portion of the sheet member on said housing, said second means adapted to be coupled to means for applying a vacuum force whereby fluid and particles flow from the first passage through said chamber to the second passage, said sheet member being placed under tension by vacuum force applied to the chamber, said sheet member having a thickness and flexibility so that portions of the sheet member that are hit by particles moving with the fluid flowing through the chamber are repetitively moved outwardly by the moving particles and moved inwardly by the vacuum force, whereby said portions of the sheet member have repetitive wave-like movements which inhibit collection of particles on the sheet member.

4,175,893
METHOD AND APPARATUS FOR FEEDING A CARDING GROUP WITH PNEUMATIC CONVEYING SYSTEM

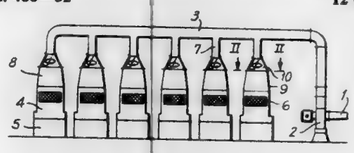
Ulrich Vollrath, Neuss, and Ferdinand Leifeld, Kempen, both of Fed. Rep. of Germany, assignors to Trutzschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed May 4, 1978, Ser. No. 903,028

Claims priority, application Fed. Rep. of Germany, May 8, 1977, 2720340

Int. Cl.[2] B65G *53/36, 53/48, 53/60*

U.S. Cl. 406—52 **12 Claims**



1. A method for separating fiber flakes from a transporting air stream, particularly for feeding a carding group, comprising the steps of: feeding a plurality of feed chutes; breaking up said fiber flakes for converting compacted fiber flow into substantially loose flakes; distributing the flake flow with uniform circular motion; distributing said fiber flakes in a horizontal plane; pressing said fiber flakes against a cylindrical or cone-shaped inner jacket surface; forming a flake layer with circular cross section; transforming said flake layer into a form of rectangular cross section for producing a flake fill with substantially uniform height distribution and substantially free of regions of heavier and lighter density; depositing said fiber flakes as flake layer of rectangular cross section for providing a uniform carding layer.

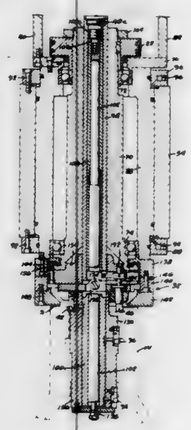
4,175,894
BORING MACHINE

Frank C. Skrentner, Bloomfield Hills, Mich., assignor to F. Jos. Lamb Company, Warren, Mich.

Filed May 19, 1978, Ser. No. 907,684

Int. Cl.[2] B23B *35/00, 39/02, 41/00*

U.S. Cl. 408—1 R **22 Claims**



22. The method of simultaneously machining two counterbores around two laterally spaced openings in a workpiece, each to a precise depth measured from locating surface on the workpiece extending around each of the openings which comprises: mounting two boring bars on a movable support for independent sliding movement along parallel axes spaced apart

laterally a distance corresponding to the distance between the axes of the two counterbores to be machined; mounting on each boring bar first and second cutting tools which are located in generally the same plane on each boring bar spaced axially from a stop on each boring bar adapted to engage the respective locating surfaces around each opening, the first cutting tool on each boring bar having its cutting edge spaced radially from the axis of its respective boring bar to machine the side wall of the respective counterbore to the desired diameter, the second cutting tool on each boring bar being located radially inwardly of the first cutting tool with its cutting edge spaced axially from the stop on the respective boring bar a distance corresponding to the depth of the respective bore to be machined; rotating said boring bars and simultaneously moving said support in a rectilinear path parallel to the axes of the boring bars toward the workpiece to introduce the two boring bars into the two openings in the workpiece; continuing movement of the support at least slightly beyond its position when the last of the two stops engages its respective locating surface on the workpiece such that each of the first-mentioned cutting tools machines the side wall of its respective counterbore to at least the approximate depth of the counterbore; and, thereafter, feeding each of the second tools radially outwardly to machine the face of each counterbore to the precise depth relative to its respective locating surface.

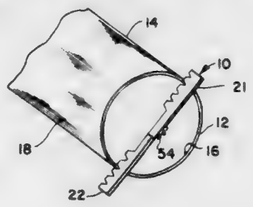
4,175,895
TUBING REAMER

H. Willard Burroughs, 225 Country Club Dr., D 142, Largo, Fla. 33541

Filed Apr. 24, 1978, Ser. No. 899,327

Int. Cl.[2] B23D *79/08*

U.S. Cl. 408—228 **13 Claims**



1. A device for finishing the end of a tubing, the tubing having an inside tubing surface and an outside tubing surface, comprising in combination:

a first member having first groove means defining an inside cutting edge and an outside cutting edge;

said inside and outside cutting edges of said first member being fixed in position in said first member with at least a portion of said inside cutting edge forming an acute angle with at least a portion of said outside cutting edge;

a second member having second groove means defining an inside cutting edge and an outside cutting edge;

said inside and outside cutting edges of said second member being fixed in position in said second member with at least a portion of said inside cutting edge forming an acute angle with at least a portion of said outside cutting edge; and

connecting means for adjustably connecting said first member to said second member enabling said inside and outside cutting edges of said first and second members to respectively finish the inside and the outside tubing surfaces of the tubing end upon rotation of said first and second members relative to the tubing.

4,175,896
BALL ENDMILL

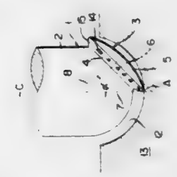
Tateshi Kishinami, Sapporo, and Makoto Sato, Kanagawa, both of Japan, assignors to Toshiba Tungaloy Co., Ltd., Sapporo and Makino Milling Machine Co., Ltd., Kanagawa, both of, Japan

Filed Jul. 19, 1978, Ser. No. 926,023

Claims priority, application Japan, Jul. 25, 1977, 52-88935; Jul. 25, 1977, 52-88936; Aug. 8, 1977, 52-94852; Aug. 13, 1977, 52-97297

Int. Cl.[2] B23B *51/00, 51/14;* **B26D** *1/12*

U.S. Cl. 408—230 **6 Claims**



1. A ball endmill comprising a cylindrical body and a cutting element provided with one end of the cylindrical body and having a face and at least one arcuate cutting edge, said face being convexed and forming a part of the surface of an imaginary cone whose axis is inclined to the axis of the cylindrical body, and said arcuate cutting edge having a starting point located near the axis of the cylindrical body so as to cut a part or all of a spherical concave in a workpiece as the cylindrical body is rotated.

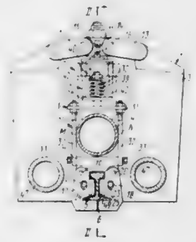
4,175,897
APPARATUS FOR REMOVING FLASH FROM RESISTANCE BUTT-WELD JOINTS IN RAILS

Sergei I. Kuchuk-Yatsenko, ulitsa Filatova, 1/22, kv. 47; Ivan K. Golomovzjuk, ulitsa Vetryanaya, 28, kv. 1; Valery G. Krivenko, ulitsa Ordzhonikidze, 3, kv. 35; Alexandr I. Kulesh, ulitsa 40 let Oktyabrya, 114/2, kv. 51; Vasily A. Sakharnov, ulitsa Solomenskaya, 41, kv. 93; Ivan L. Lazebny, ulitsa Metrologicheskaya, 1, and Fedor K. Porkhun, ulitsa Malokitaevskaya, 73, kv. 56, all of Kiev, U.S.S.R.

Filed Jan. 5, 1978, Ser. No. 867,318

Int. Cl.[2] B23D *1/08;* **B26D** *3/06*

U.S. Cl. 409—300 **7 Claims**



1. An apparatus for removing flash from resistance butt-weld in rails, the rails having a plane of symmetry, a top portion, a foot, and side surfaces interconnecting the top portion and the foot, the apparatus comprising:

a base split along the plane of symmetry of the rail and having the form of a claw clamp with two grips for engaging the rail;

clamping cylinder mounted on said base substantially on the plane of symmetry thereof and comprising a housing, a

piston movably mounted in the housing, and a rod fixedly connected with the piston;

an upper cutter whose cutting edge is shaped in conformity with the shape of the top portion of the rail head, said upper cutter being kinematically linked with said clamping cylinder;

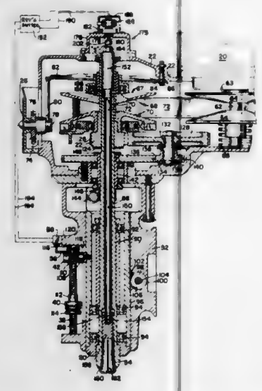
two side cutters whose cutting edges are shaped in conformity with the shape of the side surfaces and foot of the rail; said side cutters being adapted to be hingedly connected with said upper cutter and being adapted to be coupled with the grips of said claw clamp so that, with the latter closed, the cutting edges of said side cutters jointly with the cutting edge of said upper cutter form a closed outline embracing the cross-sectional perimeter of the rail;

two first hinge joints for hingedly connecting said upper cutter with said side cutters;

two second hinge joints, each of which couples one of said side cutters with a respective grip so that said side cutters can move parallel to the plane of symmetry of said closed outline;

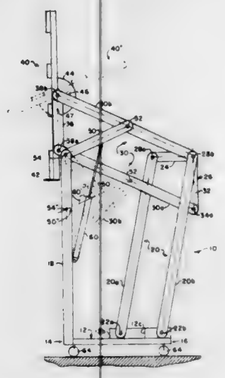
clearance take-up mechanism providing for the displacement of said upper and side cutters along the plane of symmetry of said closed outline into engagement with the underside of the rail foot and kinematically linking said upper cutter with the rod of said clamping cylinder; said clearance take-up mechanism comprises a pull member connected with said upper cutter.

4,175,898
TOOL CHANGING APPARATUS
Edward H. Wood, Rte. 12, Box 494, Sanford, N.C. 27330
Filed Feb. 13, 1978, Ser. No. 876,992
Int. Cl.² B23C 5/26
U.S. Cl. 409—233 **5 Claims**



1. An apparatus for power assisted locking and unlocking of tools received within the tool holder of a machine, said apparatus comprising, in combination, a tool receiving collet, a drawbar including a drawbar head portion, a shank portion and a collet engaging portion opposite said drawbar head portion, means forming a part of said apparatus for supporting said drawbar against said axial movement thereof toward said collet, a drawbar drive motor for rotating said drawbar in at least one direction, and a drawbar driving member associated with said motor, cooperating means on said drawbar driving member and said drawbar head portion for providing driving engagement between said motor and said drawbar in at least one position of said drawbar, drawbar positioning means for moving said drawbar between said one position in which said drawbar head is engaged with said driving member and at least one other, second position wherein said drawbar head and said driving member are spaced apart, means for energizing said motor when said drawbar head and said drawbar drive are in said position of driving engagement, said energizing means being operatively connected to said drawbar positioning means so as to energize said motor only when said drawbar is in said one position, and means for preventing unintentional movement of said drawbar from said other position to said one position.

4,175,899
LIFTING DEVICE
Robert R. Tipton, 249 El Caminito, Livermore, Calif. 94550
Filed Dec. 30, 1977, Ser. No. 865,841
Int. Cl.² B66F 7/22
U.S. Cl. 414—11 **1 Claim**



1. Apparatus for lifing an object comprising

a support base having a front portion, a back portion and two ends,

a support bracket attached to said support base proximate the front portion thereof and extending upwardly therefrom and terminating in an upper end,

an angle member having two legs,

a first parallelogram member having a lower end pivotally connected to said support base and an upper end pivotally connected to said angle member,

a movable support platform,

a second parallelogram member having one end pivotally connected to said movable support platform and the other end pivotally connected to said angle member,

said second parallelogram member comprises an upper and lower leg member, one end of each leg member pivotally connected to one leg of said angle member, and the other end of each leg member pivotally connected to said support platform,

a spacer arm having one end pivotally connected to said support bracket and the other end pivotally connected to said second parallelogram member between said angle bracket and said support platform, and

said point of connection of said spacer arm to said support base is of a height above said support base approximately equal to the height above said support base of the pivotal connection to said angle member and said leg member to which said spacer arm is connected when said first parallelogram member is in the vertical position, and

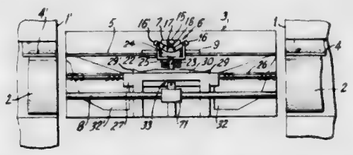
means for raising and lowering said support platform.

4,175,900
PLUG-IN BALE MOVER
John L. Etzler, Rte. 2, Box 239, Troutville, Va. 24175
Filed Aug. 16, 1977, Ser. No. 825,168
Int. Cl.² E02F 3/81
U.S. Cl. 414—787 **7 Claims**



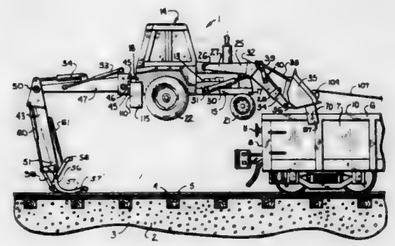
1. An assembly of tines for use with a hitch assembly comprising three tines located in a common plane, mounting means and pointed ends integral with said tines, means attached to said tines between said mounting means and said pointed ends for spacing said tines one from the other and maintaining said tines in a predetermined relationship, a safety bar, with abutment means forming a blunt end thereon, means for maintaining said safety bar in a predetermined relationship to said tines, said abutment means being spaced from said maintaining means, said safety bar being spaced above said tines, between said outermost tines, wherein said safety bar and one of said tines define a plane which is perpendicular to said common plane.

4,175,901
AUTOMATIC COMMODITY STORING APPARATUS
Yoichi Tabata, Osaka, Japan, assignor to Itoki Kosakusho Co., Ltd., Osaka, Japan
Filed Dec. 29, 1977, Ser. No. 865,691
Claims priority, application Japan, Dec. 29, 1976, 51/159640
Int. Cl.² B65G 1/02
U.S. Cl. 414—282 **5 Claims**



1. Automatic apparatus for the storage of commodities, comprising, a plurality of shelves arranged to provide storage positions in the vertical and horizontal direction, a commodity carriage containing a commodity to be stored, and arranged, to move up and down and left and right along a front face of said shelves, means to position said commodity carriage at a point facing a predetermined storage position in the shelves, means for insertion and retrieval of said commodity, said insertion and retrieval means being slidably displaceable, and means operationally coupled to said insertion and retrieval means for slidable displacement therewith for pushing aside adjacent ones of said commodity to facilitate retrieval and insertion of said commodity into said predetermined storage position.

4,175,902
APPARATUS FOR LOADING AND UNLOADING RAILROAD CARS
Stanley M. Herzog, and Randy L. Poggemiller, both of St. Joseph, Mo., assignors to Herzog Contracting Corporation, St. Joseph, Mo.
Filed May 5, 1978, Ser. No. 903,177
Int. Cl.² B65G 67/24
U.S. Cl. 414—339 **10 Claims**



1. A mobile apparatus for loading and unloading an open top railroad car and the like having spaced, parallel side walls with upper surfaces, said apparatus comprising:

(a) a mobile, powered apparatus having front and rear ends and front and rear wheels movable over ground surface;

(b) a power actuated front boom structure pivotally mounted at said apparatus front end, said front boom structure being of a length to reach below ground surface when said apparatus is positioned on the ground surface for elevating said front wheels above said ground surface and including a front supportive foot member having surfaces engageable with said side wall upper surfaces for supporting said apparatus front end thereon and including lateral movement limiting arm members extending therefrom and engageable with side surfaces of said side walls;

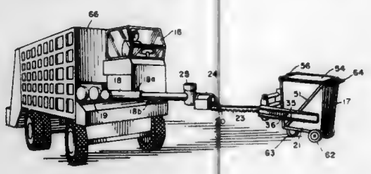
(c) power actuated, outwardly swingable outrigger arms pivotally connected adjacent to said apparatus rear end and movable toward said side wall upper surfaces, said outrigger arms including free ends having rear supportive foot members engageable with said side wall upper surfaces for supporting said apparatus rear end thereon and respectively including lateral movement limiting arm members extending therefrom and engageable with side surfaces of said side walls; and

(d) a power actuated rear boom structure pivotally mounted at said apparatus rear end and being of a combined length to reach the ground surface when said apparatus is positioned on the upper surfaces of said side walls, said rear boom structure having respective arm lengths with a material engaging device connected thereto and operable to handle materials for loading and unloading operations relative to said railroad car when said apparatus is positioned upon the upper surfaces of the railroad car side walls.

4,175,903
PICK-UP APPARATUS AND CONTAINING ASSEMBLY
William S. Carson, 218 Escambia Dr., Winter Haven, Fla. 33880
Filed Dec. 20, 1976, Ser. No. 752,194
Int. Cl.² B65F 3/14
U.S. Cl. 414—408 **12 Claims**

1. A container and pick-up assembly comprising in combination a container and a pick-up apparatus, the container having a top and bottom and a plurality of tubular members between the top and bottom, the pick-up apparatus having a pick-up arm, means for raising and lowering the pick-up arm, a pair of clamping arms movably mounted on the pick-up arm for movement toward and away from each other, means for moving the clamping arms toward and away from each other, each

of the clamping arms having a plurality of spaced-apart flexible and resilient projections mounted thereon and extending toward the other clamping arm, the spaced-apart projections on each clamping arm providing grooves therebetween for



receiving the tubular members on the container whereby the container may be lifted by positioning the container between the clamping arms and moving the clamping arms toward each other to clamp the projections thereon about the tubular members of the container.

4,175,904

APPARATUS FOR MOUNTING, DEMOUNTING, AND TIPPING VEHICLES

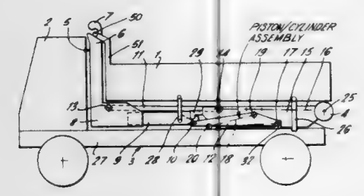
Markku Airaksinen, Iisalmi, Finland, assignor to Multilift Oy, Raisio, Finland

Continuation of Ser. No. 713,893, Aug. 12, 1976, abandoned. This application Apr. 10, 1978, Ser. No. 894,687

Claims priority, application Finland, Aug. 22, 1975, 752382; Fed. Rep. of Germany, Apr. 15, 1976, 2616813

Int. Cl.² B60P *1/64*

U.S. Cl. 414—421 **6 Claims**



1. Apparatus for mounting, demounting or tilting a container relative to the flat bed of a vehicle through the use of an L-shaped lever having a normally vertical arm pivotally and detachably engageable at its upper end to the front end of said container, and a normally horizontal arm positioned beneath said container and parallel to and above said flat bed, wherein the improvement comprises a pair of transverse, longitudinally spaced-apart pivots, means detachably securing said pivots to said bed, a pair of transversely spaced brackets connected at one end to the rearward of said pivots and at the other end pivotally connected to the rearward end of said horizontal arm, a thrust rod connected at one end to the forward of said pivots and at its other end pivotally connected to the junction of the vertical and horizontal arms of said lever, whereby when said pivots are attached to said bed, that portion of the bed interconnecting the spaced pivots, said thrust arm, said brackets and the horizontal arm of said lever form a rigid four bar linkage defining the path of movement of the upper end of the vertical arm of said L-shaped lever and hence the movement of the front end of said container, and a piston-cylinder assembly for moving said four bar linkage to mount and demount said container, said piston-cylinder assembly being pivotally connected at one end to said bed at a point forward of said spaced pivots, and at its other end pivotally connected to said brackets at a point intermediate their ends.

4,175,905

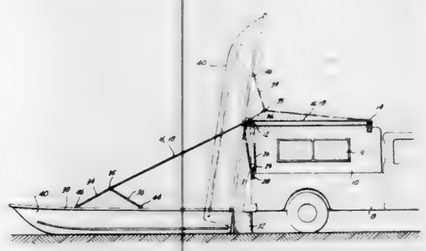
BOAT LOADER

Ray L. Garrison, deceased, late of Klamath Falls, Oreg., and R. Leonard Garrison, Jr., 300 Summit, San Rafael, Calif. 94902

Filed Feb. 16, 1979, Ser. No. 12,823

Int. Cl.² B60R *9/00*

U.S. Cl. 414—462 **9 Claims**



1. A boat loading and unloading mechanism for elevating a boat to the top carrying position on a vehicle comprising:

(a) a load supporting frame means for carrying a load above a vehicle, said frame means including transversely positioned support elements, at least one of said support elements being a rotatively mounted roller means;

(b) first and second running lines wrapped about said roller means exiting forwardly from the bottom thereof, said lines being trained about a forwardly positioned support element and extending rearwardly therefrom across the top of said roller means, each of said running lines having a straddle rigging means at the end thereof for straddle attachment to forwardly and rearwardly located lifting locations positioned adjacent a respective gunwale of a boat, said rearwardly positioned lifting location on each gunwale being positioned forwardly of the transom of said boat a distance less than the height of said roller means from the ground surface upon which the vehicle is positioned, said forwardly positioned lifting location being positioned forwardly of the transom a distance exceeding the height of said roller above said ground surface; whereby rotation of said boat into a position with the transom thereof on the ground causes said straddle rigging means to engage said roller.

4,175,906

VIBRATOR FOR DUMPING VEHICLE

William T. Johnston, 3214 Laubert Rd., Atwater, Ohio 44201, and N. Glen Barker, 1010 Jefferson Ave., Alliance, Ohio 44601

Filed Nov. 10, 1977, Ser. No. 850,343

Int. Cl.² B60P *1/58*

U.S. Cl. 414—469 **9 Claims**



1. Apparatus for dumping a mass of particulate material from a dumping body or a vehicle comprising:

a source of hydraulic fluid under pressure;

expansible hydraulic cylinder means on said vehicle in fluid communication with said source for lifting the forward end of said body relative to the chassis of the vehicle;

vibrator means on said body including hydraulic motor means for driving a vibrator to vibrate said dumping body; and

a valve means, in fluid communication between said source and said motor means, for actuating said motor means in response to the pressure of the hydraulic fluid in said cylinder means and adapted to open and start said motor means when the pressure in said cylinder means exceeds a predetermined pressure level and to close and stop said motor means when the pressure in said cylinder means drops below said level.

4,175,907

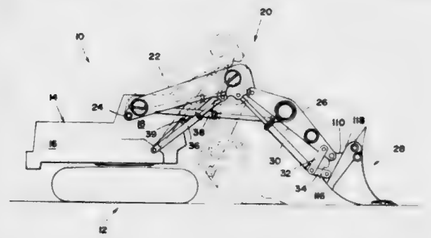
SHOVEL LINKAGE

Harvey A. Knell, Yorkville, Ill., and Stephen H. Gill, Mentor, Ohio, assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 7, 1977, Ser. No. 813,728

Int. Cl.² E02F *3/38*

U.S. Cl. 414—715 **9 Claims**



3. A shovel linkage for a hydraulic excavator or the like comprising a boom pivotedly mounted on said excavator and actuable by first hydraulic cylinder means pivotedly connected to said excavator and said boom, and a stick pivotedly connected to said boom at the distal end thereof and actuable with respect to said boom by second hydraulic cylinder means pivotedly connected to said stick and said boom, said stick having its distal end adapted for attachment of bucket means thereto, and wherein said boom and said stick comprise spaced parallel rails, said rails having side walls joined by top and bottom walls in a generally box-like configuration, and cross tubes connecting said boom rails and said stick rails, said cross tubes comprising cylindrical members extending through the sidewalls of said rails, and between said rails and having flanges secured thereto immediately adjacent to the side walls of the rails; and

wherein the side walls of the boom rails include portions near the distal end thereof which depend below the bottom walls and have axially aligned pivot means provided therein, and wherein ends of said first hydraulic cylinder means are pivotally connected therebetween, whereby forces exerted by said cylinders will by transmitted along the centerlines of the boom and stick rails.

4,175,908

METHOD OF LOADING AND UNLOADING HEAVY OBJECTS FROM A VESSEL

Bengt V. Andersson, Västerås, Sweden, assignor to AB Resmastservice, Skövde, Sweden

Filed Jun. 9, 1977, Ser. No. 805,211

Claims priority, application Sweden, Jun. 11, 1976, 7606685

Int. Cl.² B65G *63/04*

U.S. Cl. 414—786 **7 Claims**

1. A method of transferring a heavy object between a first station and a second station, said first station having a vertically stationary position while the vertical position of said second station is variable in response to the load thereon, said first and second stations having adjacent facing edges, said method comprising the steps of:

(a) transferring said object onto said first station on a movable support;

(b) lifting said object vertically from said support by means of a lifting means above said first station;

(c) moving said lifting means with said object horizontally in the direction of said second station along first support means extending in cantilever fashion horizontally over



said first station beyond said edge thereof and substantially up to the adjacent edge of said second station;

(d) displacing into alignment with said first support means a second support means horizontally disposed above said second station, said second support means being mounted on said second station for vertical up-and-down movement with respect thereto;

(e) moving said lifting means with said object from said first support means onto said second support means to a position above said second station; and

(f) lowering said object onto said second station.

4,175,909

VALVE MEANS FOR USE IN CONTROLLING OPERATION OF A HYDRAULIC MOTOR

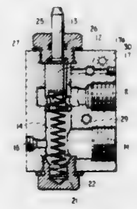
Gordon D. White, Tewkesbury, England, assignor to Bullough Limited, Epsom, England

Filed Jul. 25, 1977, Ser. No. 818,833

Claims priority, application United Kingdom, Jul. 23, 1976, 30922/76

Int. Cl.² F15B *13/04*

U.S. Cl. 415—145 **4 Claims**



1. A hydraulic control circuit comprising a high pressure supply line for connection to a high pressure hydraulic fluid source, a low pressure discharge line for returning hydraulic fluid to said source, a hydraulic motor having an inlet port and an outlet port and control valve means including a valve member movable between a first position in which the high pressure

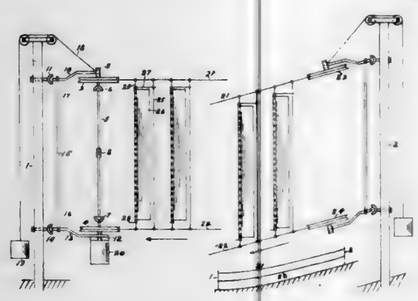
supply line is connected to the inlet port of the hydraulic motor and a second position in which the high pressure supply line is connected to the discharge line, the valve member including a spool having a hollow interior which is connected permanently to the discharge line and the outlet port of the motor and having a cylindrical wall formed with ports which are closed in the first position of the valve member to prevent flow from the high pressure hydraulic fluid source into the interior of the spool and between the interior of the spool and the inlet port of the motor but which are open when the valve member is in its second position, the spool being movable within a valve block having a lubricant supply passage, the lubricant supply passage being closed when the spool is in its second position but being opened when the spool is moved from its second position towards its first position and before the spool reaches its first position.

4,175,910

WINDMOTOR AS A WINDBREAK

Reinhold H. Nilberg, 463 Beachview Dr., N. Vancouver, Canada (V7G 1P5)

Filed Jan. 7, 1977, Ser. No. 757,763
Int. Cl.[2] F03D *5/02*
U.S. Cl. 416—8 **1 Claim**



1. A belt conveyor type windmotor, moving horizontally and consisting of two synchronized endless cables, wheels for supporting said cables, vanes attached to said cables as a belt of vanes, means for wind operated control of the pitch angle of said vanes so that said vanes are taking up the motion energy from the wind and said wheels are taking up the motion energy from said cables for transfer to a generator, wherein the improvement comprises,

means for supporting and synchronizing sagged cables of said belt of vanes consisting of following structural elements in combination,

sheaves of variable diameter to compensate for elongation of cables and to support said cables,

notches in the grooves of said sheaves for the rods attached to the cables to prevent shifting of cables in the grooves in order to ensure synchronization,

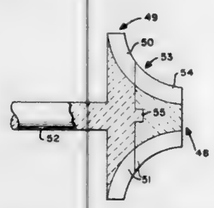
means for self-alignment of said sheaves to sagged cables so that sagged cables are running tangentially into the grooves of said sheaves, thereby reducing wear between cables and grooves.

4,175,911

RADIAL TURBINE WHEEL FOR A GAS TURBINE

Eberhard Tiefenbacher, Ludwigsburg, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 697,193, Jun. 17, 1976, Pat. No. 4,125,344. This application May 10, 1978, Ser. No. 904,593
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1975, 2527498
Int. Cl.[2] F01D *5/28*
U.S. Cl. 416—183 **1 Claim**



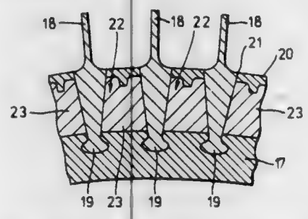
1. A radial turbine wheel for a gas turbine, comprising: a turbine wheel body formed with blades, said turbine wheel body having a first part made of a ceramic material, said first part comprising an outer section of blades, and having a second part made of a different ceramic material, said second part comprising an inner centrally curved section of blades; and a turbine shaft on which said turbine wheel body is mounted, the turbine shaft and the first part of said turbine wheel body being made in one piece.

4,175,912

AXIAL FLOW GAS TURBINE ENGINE COMPRESSOR

John L. Crane; Robert W. Archdale, both of Bristol, and Alan E. Webb, Berkeley, all of England, assignors to Rolls-Royce Limited, London, England

Filed Oct. 4, 1977, Ser. No. 839,292
Claims priority, application United Kingdom, Oct. 19, 1976, 43250/76
Int. Cl.[2] F01D *5/22*
U.S. Cl. 416—193 A **6 Claims**



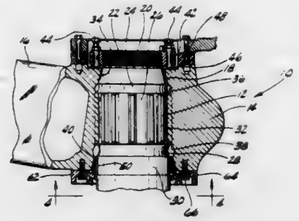
1. A rotor blade stage for the compressor of a gas turbine engine, said rotor blade stage comprising a rotor disc, a plurality of rotor blades and an infilling mixture, said rotor blades being equally spaced apart and mounted on the periphery of said rotor disc, each of said blades having opposing sides which diverge radially outwardly, the spaces between the facing sides of adjacent ones of said rotor blades in the region of the periphery of said rotor disc being infilled with said infilling mixture, said infilling mixture comprising reinforcing filaments enclosed in a matrix comprising a cured epoxy resin and a filler material, means radially outwardly of said mixture for retaining it in position between said rotor blades upon the rotation of said disc, said retaining means having sides which conform to and abut the facing sides of adjacent rotor blades and extending between the facing sides of adjacent rotor blades.

4,175,913

HELICOPTER ROTOR HEAD MOUNTING ASSEMBLY

Robert C. Rybicki, Trumbull, Conn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 13, 1978, Ser. No. 869,185
Int. Cl.[2] B64C *11/02*
U.S. Cl. 416—244 R **3 Claims**



1. In a helicopter rotor head mounting assembly having an elogated rotor drive shaft, said rotor shaft being substantially cylindrical with an inward taper near the upper end thereof, and having a threaded portion beginning proximate the smallest diameter portion of said taper and extending upwardly the remaining length of said drive shaft, said rotor shaft having a vertically splined portion about the outer surface thereof below said taper, a rotor hub adapted to carry a plurality of helicopter rotor blades received by said rotor shaft, said hub having a longitudinal bore therethrough with a first tapered portion at the upper end thereof conforming to said taper on said rotor shaft, said bore being internally splined below said first tapered portion to conform to and mate with said splined portion of said rotor shaft for secure rotation therewith, said bore expanding radially outwardly and downwardly at a location below the internal splines thereof to produce a second tapered portion therewithin, means associated with said threaded portion for applying a force downwardly on said hub to firmly engage said taper of said rotor shaft with said first tapered portion of said hub; the improvement comprising: an annular split cone mounted between said rotor shaft and said hub at the location of said second tapered portion, said split cone having a cylindrical inner surface conforming to said rotor shaft and a tapered outer surface conforming to and mating with said second tapered portion of said hub bore, said split cone having an upper edge free from engagement with both said rotor shaft and said hub, an annular plate, means securing said plate to the bottom of said hub around said rotor shaft, a plurality of circumferentially spaced loading means carried by said plate, each of said loading means being adapted to apply a radially directed force to said split cone independently, thereby distributing the radially directed force to effect a uniform forced engagement between said rotor shaft and said inner surface of said split cone.

4,175,914

HYDRAULIC STOP

Dennis R. Unruh, Buhler, and Robert J. Martin, Hutchinson, both of Kans., assignors to The Cessna Aircraft Company, Hutchinson, Kans.

Filed May 31, 1977, Ser. No. 802,149
Int. Cl.[2] F04B *1/30*
U.S. Cl. 417—218 **3 Claims**

1. A hydraulic stop for a cam plate positioning actuator of a variable displacement axial piston pump comprising:

a back plate having a set of pump ports including a charging port;

a stationary portion of the actuator mounted to the back plate;

a slidable portion of the actuator mounted on the stationary portion and fully retracted when the cam plate is in its maximum displacement position;

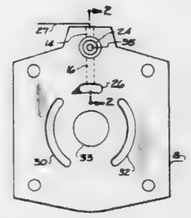
a chamber in the back plate adjacent to the stationary portion of the actuator;

a charging passage through the back plate connecting the charging port with the chamber in the back plate;

a spring which biases the slidable portion of the actuator toward its fully retracted position;

a chamber within the actuator for the pressurized fluid which operates the actuator;

a pressure and flow compensator operatively connected to the actuator;



a drain line from the compensator to the chamber in the back plate; and

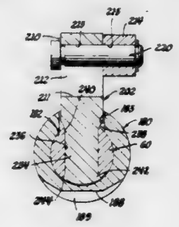
means for valving the drain port by the slidable portion of the actuator sliding over and blocking the drain port when the actuator is close to its fully retracted position which blocking causes the pressurized fluid to flow from the chamber in the back plate through the drain line from the compensator, reversing its draining direction, to the compensator and thence to the positioning actuator chamber providing the hydraulic stop so that the slidable portion of the actuator does not make metal to metal contact with the back plate.

4,175,915

DRIVE SHAFT LUG FOR VARIABLE DISPLACEMENT COMPRESSOR

Dennis A. Black, and Raymond N. Mantey, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich. and General Motors Corporation, Detroit, Mich.

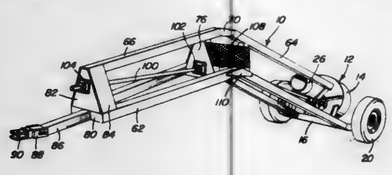
Filed Apr. 27, 1978, Ser. No. 900,744
Int. Cl.[2] F04B *1/06*
U.S. Cl. 417—222 **1 Claim**



1. In a variable output compressor having a housing, a cylinder block disposed in said housing, a circular drive shaft having its one end journaled in one wall of said housing and its other end journaled in said cylinder block, said cylinder block having a plurality of cylinder bores formed therein substantially parallel to the axis of said drive shaft, pistons arranged to reciprocate in said cylinder bores, a wobble plate operated in response to rotation of said shaft and drivingly connected to said pistons, compressor output modulation means including a movable member for varying the angle of said wobble plate

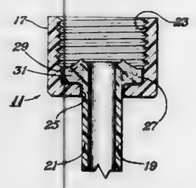
relative to said drive shaft and thus the stroke of said pistons in said cylinder bores, said modulation means including a sleeve surrounding said drive shaft in sealing relation therewith and connected to said movable member for axial movement as a unit along the axis of said shaft while maintaining said sealing relation, a longitudinally extending slot in said sleeve, said wobble plate having a pivotal connection with respect to said sleeve for pivotal movement relative to said sleeve and said drive shaft during said axial movement of said sleeve to vary the angle of said wobble plate with respect to said drive shaft, and a radial lug on said drive shaft having a rotary driving connection to said wobble plate, said driving connection including means forming a cam track at least partially offset from the axis of said lug and a follower in said cam track for interconnecting said wobble plate and said drive shaft and movable therein to a position offset from said lug axis in response to movement of said sleeve whereby said angle of said wobble plate is varied with respect to said drive shaft to infinitely vary the stroke of said pistons in said cylinder bores and thus the output of said compressor and whereby the position of said follower as it moves periodically in said cam track to said position offset from the axis of said lug tends to twistingly move and fret said lug in said shaft bore, said lug having a predetermined dimension relative to said slot such that when said lug is received in said slot a longitudinal clearance space is provided between said lug and the sides of said slot throughout the axial movement of said sleeve, the improvement wherein said radial lug comprises a solid generally cylindrical body formed with a radially outer flat sided wobble plate connection portion and radially inner shank portion having a predetermined diameter less than the diameter of said wobble plate connection portion, said drive shaft formed with a through bore the axis of which intersects said shaft axis, said shaft bore having a diameter sufficiently larger than the diameter of said shank portion to provide a clearance fit between said bore and said shank portion when said shank portion is received in said shaft bore, said lug having a radiused neck portion flaring outwardly from said shank portion in a transition from said shank portion to said wobble plate connection portion, said shaft bore formed with a flared open end complementary to at least a portion of the neck portion of said lug, and means formed on the end of said shank portion opposite from said neck portion and cooperating with said shaft for securing said lug on said shaft; said securing means when said shank portion is received in said shaft bore causing the flare on said neck portion to pull into snug coincidental engagement with the flared open end of said shaft bore while maintaining the clearance fit between said bore and said shank portion, whereby to eliminate the tendency of the follower to twistingly move said lug such that said lug has extended fatigue life throughout the operating life of said compressor by eliminating fretting at the connection of said lug with said drive shaft.

4,175,916
PUMP WITH STEEP-ANGLE HITCH AND UNIVERSAL DRIVE JOINT
Angelo J. Crisafulli, P.O. Box 1051, Glendive, Mont. 59330
Filed Nov. 18, 1977, Ser. No. 852,712
Int. Cl.² F04B *17/06, 35/06*
U.S. Cl. 417—231 **8 Claims**



1. In a portable pump supported on an elongated rigid frame having ground engaging wheels at the rear thereof and means at the front for connecting the frame in trailing relation to a tractor or other towing vehicle, a drive shaft connected to the pump and being journaled on the frame and driven from the towing vehicle whereby the pump can be moved into a body of material to be pumped by following the contours of the retaining surface for the material to be pumped, that improvement comprising said elongated frame having a rear section attached to the pump and a front section extending toward the towing vehicle with the front and rear sections being angulated in relation to each other and joined at the center with the central portion of the frame being elevated above the end portions thereof to enable the supporting wheels to follow the retaining surface for the material to be pumped as the pump is moved thereinto, the area of the frame below the front and rear sections and the elevated central portion being free of obstructions, said drive shaft including a universal coupling at the elevated portion of the frame, said frame including vertically spaced bottom and top frame members, each frame member including a rear portion and a front portion joined together in angular relation with the included angle below the joined portions being a shallow obtuse angle, said universal coupling being disposed closer to the bottom of the frame than the top whereby the drive shaft defines a more obtuse angle than the frame members.

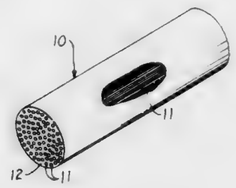
4,175,917
APPARATUS FOR FORMING INTEGRAL TUBING AND WASHER
Roger C. Cotten, 299 Vincent St., Metairie, La. 70002
Division of Ser. No. 881,641, Feb. 27, 1978, Pat. No. 4,140,739.
This application Aug. 21, 1978, Ser. No. 935,332
Int. Cl.² B29C *17/00, 24/00*
U.S. Cl. 425—142 **7 Claims**



1. Apparatus for automatically forming a washer integrally with walls of a thermoplastic tubing comprising:
a. a structural framework;
b. feed means for feeding a first end of the tubing on which the washer is to be formed; said feed means being disposed adjacent one end of said apparatus and aligned therewith;
c. first sensing means for automatically sensing when said tubing has been fed into place; said first sensing means being disposed so as to be responsive to said tubing being fed to said apparatus;
d. grabber means for holding said tubing; said grabber means being operatively connected with said first sensing means so as to automatically clamp said tubing upon a first signal on said first sensing means;
e. cutter means for cutting said tubing; said cutter means being operatively connected with said first sensing means so as to automatically cut said tubing upon said first signal from said first sensing means; said cutter means being disposed and adapted to cut at a predetermined location that automatically effects the correct length of tubing;
f. heater means for heating said first end of said tubing to its softening temperature; said heater means bieng disposed in alignment with said first end of said tubing for receving said tubing and being connected with a source of energy for supplying the heat for heating said first end to its softening temperature;

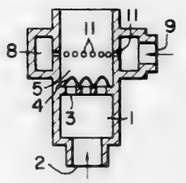
g. timer means connected with said heater means for controlling the time and duration of heating of said first end;
h. guide pin means for being inserted within said first end of said tubing a predetermined distance for maintaining the internal diameter of said first end and any washer formed thereon; said guide pin means being carried by said structural framework and at least movable into alignment with said tubing before insertion;
i. first insertion means for effecting relative longitudinal movement between said guide pin means and said tubing so as to effect insertion of said tubing over said guide pin means and said guide pin means within said tubing said predetermined distance;
j. mold carried by said structural framework so as to be movable about said first end of said tubing to hold said tubing against longitudinal movement; said mold having a washer cavity to define the exterior dimensions and form of a shaped piece to serve as said washer; said mold being disposed such that said first end of said tubing extends into said mold cavity in operation;
k. plunger disposed about said guide pin means and in alignment with said washer cavity so as to be able to compress and to fold in accordion fashion the walls of said first end longitudinally of said guide pin means and said cavity so as to form said washer;
l. second insertion means for inserting said plunger within said washer cavity with sufficient force to compress and to fold accordion fashion said walls longitudinally of said guide pin means and said washer cavity and into conformance with the mold space between said guide pin means and the walls of said washer cavity to form said shaped piece;
m. finalizing means for holding said plunger and guide pin means in their forward position for a predetermined length of time long enough to form said washer and adhere a film about and to the accordioned walls and thereafter:
i. effect opening said mold;
ii. effect retraction of said guide pin means; and
iii. effect retraction of said plunger; so as to allow said tubing with said washer to fall free; said finalizing means being carried by said structural framework; and
n. repeating and safety means for starting said feed means and repeating said cycle automatically responsive to the falling free of said tubing and washer and to prevent falling starting of another cycle and sound an alarm if said tubing and washer does not fall free.

4,175,918
ELONGATE CONSOLIDATED ARTICLE AND METHOD OF MAKING
John G. Frantzreb, Sr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Dec. 12, 1977, Ser. No. 859,497
Int. Cl.² B22F *3/00*
U.S. Cl. 428—567 **7 Claims**



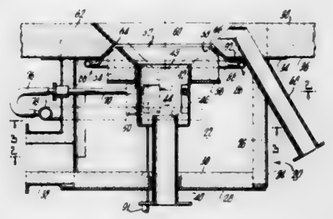
1. An elongate consolidated article for controlled insertion into a molten iron for altering same comprising:
a coherent matrix including a treating agent consisting essentially of a ferrosilicon; and
a multiplicity of elongate metallic fibers embedded within the matrix, said elongate metallic fibers extending generally along a longitudinal axis of the article and being formed from a ferrous material which will melt in the heat range of molten iron.

4,175,919
GAS BURNER
Michiaki Matsumoto, Tokyo; Juichi Honda, Fujisawa, and Sadao Mimori, Saitama, all of Japan, assignors to Hitachi, Ltd., Japan
Filed Jun. 1, 1977, Ser. No. 802,462
Claims priority, application Japan, Jun. 4, 1976, 51/64516
Int. Cl.² F23D *15/02*
U.S. Cl. 431—114 **23 Claims**



1. A preliminary mixing type gas burner comprising:
a combustion chamber and means for producing low noise and high load combustion in the combustion chamber;
a flame port means for supplying a predominantly laminar flow of a premixed gaseous fuel and primary air to said combustion chamber, said flame port means being position upstream of a primary combustion zone; and
at least one secondary air port means positioned for supplying a predominantly turbulent flow of secondary air to a location within said combustion chamber corresponding to that at which an outer flame portion downstream of a trailing stream of an inner flame is formed around said flame port means in use.

4,175,920
MULTIPLE FUEL SUPPLY SYSTEM FOR STAGED AIR BURNERS
Robert P. Guerre, Dover; Dennis L. Juedes, Morris Plains, and Ross R. Ruland, Hopatcong, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.
Filed Jul. 31, 1975, Ser. No. 600,730
Int. Cl.² F23C *5/28;* **F23M** *9/00;* **B05B** *7/10*
U.S. Cl. 431—175 **3 Claims**



1. In a staged air burner, cylindrical swirl chamber means for creating a first swirl flow path for primary combustion air betwen an inlet and outlet thereof, tangential duct means communicating tangentially with said inlet of said swirl chamber means for creating a second tangential flow path for primary air entering said swirl chamber means to flow therein along said swirl flow path, passage means located axially down-

stream of and substantially adjacent said outlet of said swirl chamber means and surrounding and converging toward a central axis of said swirl chamber means for creating a third converging flow path for secondary combustion air to be directed inwardly toward said axis downstream of and substantially adjacent said outlet of said swirl chamber means, and at least two fuel supply means respectively situated at least in part at two of said first, second and third flow paths for selectively supplying at least one combustible fuel to said two flow paths, so that fuel from both of said fuel supply means may be simultaneously fired, wherein said swirl chamber means includes an outer cylndrical wall surrounding said axis and said tangential duct means includes a plurality of ducts respectively communicating through said cylindrical wall with the interior of said swirl chamber means and respectively projecting tangentially from said wall while being distributed about said axis, one of said two fuel supply means including a plurality of fuel injectors respectively situated in corresponding ones of said tangential ducts.

4,175,921

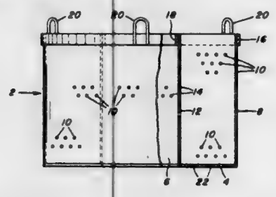
APPARATUS FOR REMOVING GASES FROM PARTICLES

Raymond L. Southern, Lower Burrell, and Orville W. Reen, New Kensington, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 749,958, Dec. 13, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 881,203

Int. Cl.[2] C21D *9/00*

U.S. Cl. 432—261 **2 Claims**



1. An apparatus for removing gases from particles in a heating furnace, the improvement comprising a cylindrical container for said particles; said container including a peripheral vertical wall, a bottom for supporting said particles, a vertical, cylindrical tubular member located centrally in said container, and an open top, wherein the peripheral wall of said container includes an outer member having a smooth inner surface and a corrugated sheet adjacent said inner surface extending completely around the periphery, and said tubular member includes an inner member having a smooth outer surface and a corrugated sheet adjacent said outer surface extending completely around the periphery, both of said corrugated sheets having closely spaced openings therein constructed of less diameter than said particles, such that the particles will not plug or pass therethrough while evolved gases will pass through the openings to the surrounding atmosphere.

4,175,922

DEHAIRING SKIN AND HIDE

Günter Eckert, Limburgerhof; France Knaflic, Frankenthal; Franz-Friedrich Miller, Ludwigshafen, and Alfred Zissel, Frankenthal, all of Fed. Rep. of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 15, 1972, Ser. No. 306,671

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1971, 2157034

Int. Cl.[2] C14C *1/06*

U.S. Cl. 8—94.16 **6 Claims**

1. In a drumming process for dehairing animal skin and hide using sulfur compounds in the presence of alkali or alkaline earth metal hydroxides the improvement which comprises carrying out the dehairing by drumming the animal hides or skins in the presence of air in a liquor of 10 to 50 parts by weight with reference to 100 parts by weight of raw hide, the liquor containing 1 to 2 parts by weight, with reference to 100 parts by weight of raw hide, of an α- or β-mercaptoalkanol of 2 to 6 carbon atoms and 2 to 4 parts by weight, with reference to 100 parts by weight of raw hide, of an alkali or alkaline earth metal hydroxide.

4,175,923

METHOD AND APPARATUS FOR OCCULT BLOOD TESTING IN THE HOME

William G. Friend, 9039 SE. 59th, Mercer Island, Wash. 98040

Filed Jun. 26, 1978, Ser. No. 919,395

Int. Cl.[2] G01N *21/20, 33/16*

U.S. Cl. 23—230 B **15 Claims**

1. A method for determining the presence of occult blood in the bowl of a toilet containing water and fecal matter comprising the steps of:

applying a developing solution to an absorbent substrate impregnated with a guaiac reagent to form an activated test substrate,

contacting the activated test substrate with the water in said toilet bowl, and

observing whether a portion of the test substrate is dyed blue.

4,175,924

TREATMENT OF COAL WITH METAL CONTAINING COMPOUNDS

James K. Kindig, Arvada, and Ronald L. Turner, Golden, both of Colo., assignors to Hazen Research, Inc., Golden, Colo.

Filed Feb. 10, 1977, Ser. No. 767,352

Int. Cl.[2] C10L *9/10;* **C10B** *57/00*

U.S. Cl. 44—15 R **20 Claims**

1. A process for improving coal comprising treating raw coal with a metal containing compound selected from the group consisting of:

organic iron containing compounds which exert sufficient vapor pressure, with iron as a component in the vapor, so as to bring the iron into contact with the impurity at the reaction temperature;

organic iron containing compounds in solution at the injection temperature;

solid organic iron containing compounds capable of being directly mixed in solid form at the mixing temperature with the coal; and

ferrous chloride, ferric chloride, and alkyl aluminum compounds; under conditions so as to enhance the magnetic susceptibility of various impurity components contained in the raw coal, thereby permitting their removal by magnetic separation.

4,175,925

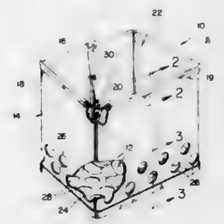
CHARCOAL-STARTER APPARATUS

Yongik Paek, and Ardis I. Paek, both of 16841 Roque La., Huntington Beach, Calif. 92647

Filed Dec. 18, 1978, Ser. No. 970,201

Int. Cl.[2] C10L *11/08, 11/00*

U.S. Cl. 44—35 **7 Claims**



1. A fire-starter apparatus for charcoal briquets and like combustible materials, wherein the apparatus comprises:

a disposable bag-like container formed having a first inner, vertical, upright wall structure, and a second outer, vertical, upright wall structure, wherein each wall structure is formed from a non-combustible material of thin metal foil;

a chimney flue defined by said inner and outer wall structures wherein the upper end thereof defines an opening;

a bottom wall member secured to said vertical wall structures, said bottom wall member being formed from a combustible material so as to be consumed during the ignition of said charcoals;

a plurality of air vents disposed about the lower portion of said wall structures, and additional air vents disposed in said bottom wall member, to provide air flow through said chimney flue;

means mounted to said wall structure to support said wall structure in a vertical position; and

fire-starter means secured to said upper portion of said container, and arranged to engage and ignite said charcoal or an igniting fuel.

4,175,926

POLYMER COMBINATION USEFUL IN FUEL OIL TO IMPROVE COLD FLOW PROPERTIES

Max J. Wisotsky, Highland Park, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 715,530, Aug. 18, 1976, abandoned, which is a continuation of Ser. No. 507,242, Sep. 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 411,482, Oct. 31, 1973, abandoned. This application Jan. 16, 1978, Ser. No. 869,647

Int. Cl.[2] C10L *1/18*

U.S. Cl. 44—62 **10 Claims**

1. A fuel composition comprising a fuel consisting of wax-containing middle distillate pertroleum light fuel oil boiling in the range of 250° to 900° F., having a viscosity of 1.6 to 7.5 centistokes at 100° F., having less than 1 wt. %, based on the total weight of the fuel, of n-paraffin wax boiling above 350° C., and of which at least 5 wt. % of said oil boils above 700° F. according to ASTM-D-1160, which oil has been improved in its low temperature flow properties, said oil containing in the range of about 0.005 to 0.1 wt. %, based on the weight of the total composition, of a synergistic flow improving combination of one part by weight of an oil soluble ethylene backbone middle distillate pour point depressing polymer having a number average molecular weight in the range of about 1000 to 6000 per (b) 0.2 to 4 parts by weight of a second oil soluble polymer having a number average molecular weight in the range of about 1000 to 100,000;

wherein said ethylene backbone polymer is selected from the group consisting of branched polyethylene, and copoly-

V 9 8 8 4 N 0 2 7 7 9 UMI

mers consisting essentially of 4 to 20 molar proportions of ethylene with a molar proportion of ethylenically unsaturated alkyl ester of the formula:



wherein R_1 is hydrogen or methyl; R_2 is a $-OOCR_4$ or $-COOR_4$ group wherein R_4 is a C_1 to C_4 alkyl group, and R_3 is hydrogen, and mixtures of said comonomers,

and wherein said second polymer is a polymer selected from the group consisting of:

(a) ester copolymers consisting of dialkyl fumarate copolymerized with 5 to 70 mole % of a comonomer selected from the group consisting of vinyl acetate and alkyl methacrylate, wherein said alkyl groups of said fumarate and said methacrylate consist essentially of C_6 to C_{16} straight chain alkyl groups; and

(b) polymers consisting essentially of C_8 to C_{18} alpha monoolefin moieties.

4,175,927

FUEL COMPOSITIONS FOR REDUCING HYDROCARBON EMISSIONS

Leonard M. Niebylski, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 27, 1978, Ser. No. 890,494

Int. Cl.² C10L 1/18

U.S. Cl. 44—68 **36 Claims**

1. As a composition of matter, a gasoline for an internal combustion engine comprising

(i) an organomanganese compound, and

(ii) an exhaust emission reducing amount of a compound selected from a dimer acid, a trimer acid or a mixture of a dimer and trimer acid produced by the polymerization or condensation of an unsaturated aliphatic monocarboxylic acid having between 16 and 18 carbon atoms per molecule.

4,175,928

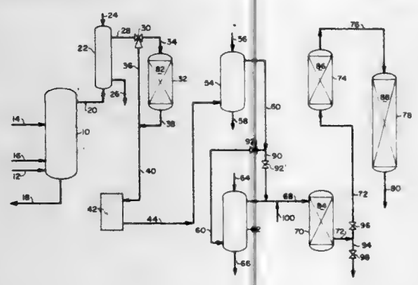
HYDRODESULFURIZATION PURIFICATION PROCESS FOR COAL GASIFICATION

Michael W. Britton; Eugene A. Harlacher; John N. Dew, all of Ponca City, Okla., and Joseph A. Kleinpeter, McMurray, Pa., assignors to Conoco Methanation Company, Stamford, Conn.

Continuation-in-part of Ser. No. 808,425, Jun. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 725,761, Sep. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 637,919, Dec. 5, 1973, abandoned. This application Jul. 27, 1978, Ser. No. 928,339

Int. Cl.² C10K 1/20

U.S. Cl. 48—197 R **6 Claims**



1. In a method for removing organic sulfur compounds selected from the group consisting of carbonyl sulfide, carbon disulfide, mercaptans and thiophenes from a gaseous mixture comprising hydrogen, carbon monoxide and said organic sulfur compounds, said carbon monoxide being present in an amount equal to at least 10 mol percent of said mixture and said hydrogen being present in an amount such that the ratio H_2/CO is from about 2.0 to about 4.0, to produce a gaseous mixture containing less than 0.2 ppmv sulfur by converting said organic sulfur compounds into hydrogen sulfide in the presence of a sulfided catalyst consisting essentially of at least one metal component selected from the group consisting of nickel and nickel compounds and cobalt and cobalt compounds and at least one second metal component selected from the group consisting of molybdenum and molybdenum compounds supported on a suitable catalyst carrier and subsequently removing at least a major portion of the hydrogen sulfide from said gaseous mixture, the improvement comprising adjusting the composition of said gaseous mixture to a hydrogen sulfide content from about 25 to about 100 ppmv and a water content from about 0.1 to about 15 weight percent to produce an adjusted gaseous mixture and contacting said adjusted gaseous mixture with said catalyst at a space velocity from about 1500 to about 5000 hr^{-1} and a temperature from about 425° to about 700° F. without inducing excessive methanation and without desulfurizing the catalyst.

4,175,929

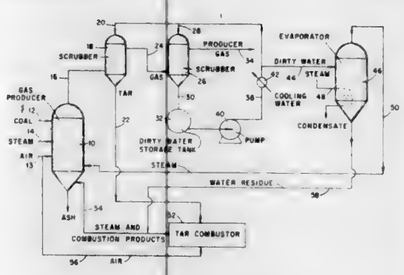
PROCESS FOR CONTROL OF POLLUTANTS GENERATED DURING COAL GASIFICATION

Robert Frumerman, Pittsburgh, and Harold M. Hooper, Sewickley, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 29, 1978, Ser. No. 937,903

Int. Cl.² C10J 3/16

U.S. Cl. 48—202 **6 Claims**



1. A process for converting coal into combustible gases wherein environmental pollutants comprising particulate material and non-aqueous condensable material including tars that are generated during the conversion of the coal and entrained in the combustible gases are essentially eliminated as environmental pollutants by the steps of heating the coal in a gasification chamber in the presence of steam and reactive gas to a temperature sufficient to provide the combustible gases, withdrawing the combustible gases from the gasification chamber, contacting the combustible gases with water in a condensing zone at a temperature above the aqueous dew point to evaporate the water and condense tars in the combustible gases, conveying the resulting essentially water-free liquid tars from the condensing zone to a combustion zone operated at pressure at least as great as that in said gasification chamber, burning the tars in the combustion zone, and conveying the products of combustion from the combustion zone into the gasification chamber.

4,175,930

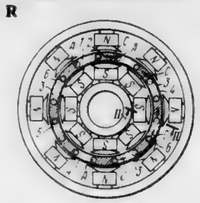
METHOD FOR FINISHING SURFACES OF NON-MAGNETIC ARTICLES BY MEANS OF FERROMAGNETIC ABRASIVE POWDER IN MAGNETIC FIELD

Faddei J. Sakulevich, pereulok Dalny, 3; Leonid K. Minin, ulitsa D. Serdicha, 54, kv. 47; Jury A. Bazarnov, ulitsa Golodeda, 51, korpus, kv. 72; Alexandr A. Baubel, 2 pereulok Bagrationa, 19, kv. 376, and Nikolai Y. Skvorchevsky, ulitsa Karbysheva, 11, kv. 152, all of Minsk, U.S.S.R.

Filed Apr. 27, 1978, Ser. No. 900,517

Int. Cl.² B24B 31/00

U.S. Cl. 51—281 R **6 Claims**



1. A method for finishing surfaces of non-magnetic articles by means of ferromagnetic abrasive powders in a magnetic field which is produced by oppositely positioned unlike poles of a magnetic system, comprising the following: introducing a ferromagnetic abrasive powder in said magnetic field to form a cutting brush from said powder; placing said non-magnetic articles in said magnetic field; causing said articles to be moved relative to said cutting brush; placing a ferromagnetic body between each of said non-magnetic articles and causing said body to move relative to said cutting brush so that the latter is continuously restored.

4,175,931

ABRASIVE MATERIAL AND PROCESS FOR MANUFACTURING THE SAME

Eckart Teschner, Hunstetten-Limbach; Harald Riedel, Mainz, and Richard Sattelmeyer, Schlangenbad-Georgenborn, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 29, 1977, Ser. No. 837,929

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1976, 2644552

Int. Cl.² B24D 3/28

U.S. Cl. 51—297 **9 Claims**

1. A process for the manufacture of an abrasive material which comprises the steps

(i) applying a basic binder layer to a substantially flat flexible support;

(ii) scattering abrasive particles onto the said basic binder layer;

(iii) drying the product of step (ii) in a horizontal drying unit having an air temperature of from 100° to 140° C. and subsequently cooling the product in an air stream having a temperature of not more than 40° C., the drying process being effected for a time sufficient to allow the said basic binder layer to attain sufficient adhesive strength to prevent displacement of the abrasive particles disposed therein when the product is cooled;

(iv) applying a second binder layer as sizer to the cooled product of step (iii);

(v) drying the sizer in a horizontal drying unit having an air temperature of from 100° to 140° C. and subsequently cooling the product in an air stream having a temperature of not more than 40° C., the drying process being effected for a time sufficient to allow the said sizer to become imprint resistant;

(vi) loosely rolling up the product of step (v); and

(vii) curing the product of step (vi) by gradual heating to 110° to 140° C. followed by gradual cooling to a temperature of about 50° C., wherein the gradual heating and gradual cooling is effected by passing a heating or cooling air stream, as required, substantially axially through the rolled-up product;

wherein the said basic and second binder layers each comprise an aqueous mixture with solids content of at least 55% by weight, based on the total composition, and a viscosity of no more than 5,000 mPa.s of (A) at least one predominantly ortho-structured resol having a molar ratio of phenolic component to formaldehyde of from 1:(1.1 to 2.5), and (B) at least one polyvinyl alcohol in an amount of from 5 to 30% by weight, based on the weight of solid phenolic resin.

4,175,932

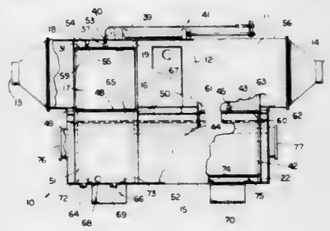
METHOD FOR CONTINUOUS VAPOR RECOVERY

Larry J. Durr, 4714 Lynton Ct., Indianapolis, Ind. 46254; Larry L. Durr, 8707B Pemberton Cir., Indianapolis, Ind. 46260, and B. Jan Clay, 7650 Eagle Valley Pass, Indianapolis, Ind. 46234

Continuation-in-part of Ser. No. 779,471, Mar. 21, 1977, abandoned, which is a continuation of Ser. No. 673,931, Apr. 5, 1976, abandoned. This application Mar. 13, 1978, Ser. No. 886,290

Int. Cl.² B01D 53/04

U.S. Cl. 55—59 **12 Claims**



1. A method for removing material in vapor form from a gas comprising the following steps:

a. flowing the gas containing said material through a charcoal filter, said filter absorbing said material;

b. placing said filter in water to submerge the charcoal in the water;

c. heating said water to vaporize a mixture of said water and said material, whereby substantial movement of the charcoal is produced resulting in an efficient desorption process and the release of fine particles in the filter;

d. collecting the vaporized mixture of said water and said material; and

e. separating and collecting said material from said vaporized mixture.

5. A method for removing material in vapor form from a continuous gas stream comprising the following steps:

a. flowing the gas stream containing said material through first and second charcoal filters, said first and second filters absorbing said material;

b. isolating said first filter from said continuous gas stream, said gas stream continuing to pass through said second filter;

c. placing said first filter in water to submerge the charcoal in the water;

d. heating said water to vaporize a mixture of said water and said material, whereby substantial movement of the charcoal is produced resulting in an efficient desorption process and the release of fine particles in the filter;

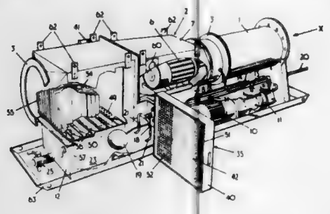
e. collecting the vaporized mixture of said water and said material;

f. separating and collecting said material from said vaporized mixture;

g. removing said first filter from said water;

h. flowing the gas containing said material through said first filter, said first filter absorbing said material;
i. repeating steps b through h with said second filter.

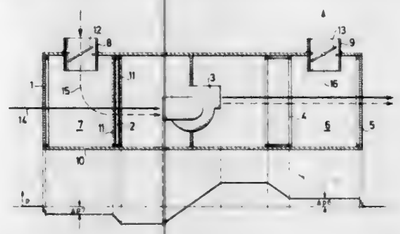
4,175,933
DUST FILTER APPARATUS
Granville C. James, Ashby-de-la-Zouch, England, assignor to Coal Industry (Patents) Limited, London, England
Continuation of Ser. No. 836,828, Sep. 26, 1977, abandoned. This application Sep. 20, 1978, Ser. No. 944,101
Claims priority, application United Kingdom, Oct. 22, 1976, 43927/76
Int. Cl.² B01D 47/00
U.S. Cl. 55—259 **13 Claims**



1. Dust filter apparatus comprising a chamber providing a gaseous flow duct, a filter unit including a filter panel arranged across the duct, and nozzle means for spraying liquid into the gaseous flow duct upstream of the filter panel, an impeller positioned in the duct between the nozzle means and the filter panel, an inclined plate provided around a wall of the duct, and a drain in the duct near the inclined plate for draining excess water thrown from the impeller, the filter panel comprising a plurality of filter layers arranged side by side, each filter layer extending across the duct and the filter layers comprising alternating pairs of fine filter layers and pairs of coarse filter layers defining at least portions of passageways for liquid flowing down the filter panel between two adjacent filter layers, flow of liquid in the panel tending to be restrained by the filter layers such that in use a liquid curtain is formed across the duct, the pairs of relatively coarse filter layers presenting a lower resistance to downward flow of water than that presented by the pairs of relatively fine filter layers.

4,175,934
CLEAR AIR DEVICE
Arnold Lang, Marburg-Wehrda, and Hans-Peter Hortig, Hattersheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Continuation of Ser. No. 655,412, Feb. 5, 1976, abandoned. This application Dec. 19, 1977, Ser. No. 862,130
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1975, 2505137
Int. Cl.² B01D 51/00
U.S. Cl. 55—267 **3 Claims**

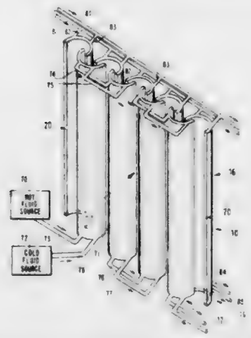
1. A device for drawing and cleansing circulated air from a room and fresh air from the outer atmosphere, the circulated and fresh air being at an atmospheric pressure, and passing a first portion of the cleansed circulated and fresh air back into the room and a second portion of the cleansed circulated and fresh air, as off air, into the atmosphere comprising a hollow casing having within said casing first and second openings which communicate with the outer atmosphere, air inlet grid means, air outlet grid means, a preliminary filter, a high efficiency particulate air filter unit, and means for drawing air into and blowing air out of said casing, said inlet grid means and said preliminary filter being positioned in said casing to define a first chamber therebetween, said first opening providing communication between said first chamber and the outer atmosphere, said means for drawing and blowing air being positioned in said casing between said preliminary filter and said high efficiency particulate air filter unit, said high efficiency particulate air filter unit and said outlet grid means being positioned within said casing to define a second chamber therebetween, said second opening providing communication between the second chamber and the atmosphere, the means for drawing and blowing air first drawing circulated air through the inlet grid means and fresh air through the first opening, next drawing the circulated and fresh air through the preliminary filter and into the means for drawing and blowing air, next blowing the circulated and fresh air out of the means for drawing and blowing air and through the high efficiency particulate air filter unit and finally blowing a first portion through the air outlet grid means and a second portion through the second opening into the outer atmosphere, said means for drawing and



blowing air comprising means for increasing the pressure of the circulated and fresh air entering and being blown out of the means for drawing and blowing air, to a pressure above the atmospheric pressure, said air inlet grid means comprising means for reducing the pressure of circulated air introduced at the air inlet grid means to a pressure below atmospheric pressure before the circulating air exits the inlet grid means and passes into the first chamber and said air outlet grid means comprising means for maintaining the pressure of the cleansed circulated and fresh air blown into said second chamber at a pressure above the atmospheric pressure and reducing the pressure of the first portion of cleansed circulated and fresh air introduced at the air outlet grid means to atmospheric pressure before the first portion exits the outlet grid means and passes back into the room.

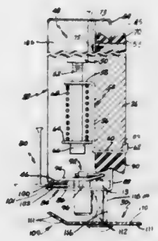
4,175,935
PLANAR CONDENSOR ARRAY OF HOLLOW INTERLEAVED PROFILES
Paul Gutermuth, Augustastrasse 48, D-6456 Langenselbold, Fed. Rep. of Germany; Oetjen Heinrich, August-Bebel-Strasse 11, D-6451 Bruchkobel, Fed. Rep. of Germany, and Paul Gutermuth, Jr., Augustastrasse 48, D-6456 Langenselbold, Fed. Rep. of Germany
Filed Sep. 16, 1977, Ser. No. 834,021
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1976, 2641765
Int. Cl.² B01D 5/00, 35/18, 45/06
U.S. Cl. 55—269 **3 Claims**

1. A self-cleaning apparatus for condensing gaseous contaminants and/or precipitating particles entrained in a flowing gaseous mixture, comprising:
(a) a generally planar condensor array disposed with the plane of the array substantially perpendicular to a flow direction of the gaseous mixture,
(b) said array comprising first and second rows of generally U-shaped, hollow, alternately interleaved, spaced profile elements disposed such that the free edges of the elements in the first row overlap the free edges of the elements in the second row so that the gaseous mixture flows into the array through the spaces between the elements in the first row thereof and is deflected by the elements of the second row towards the elements of the first row and out of the array through the spaces between the elements in the second row thereof,
(c) an internal heat insulating partition wall within each of said hollow elements, each of said walls being of the same U-shape as said elements to divide the interiors of said elements into two separate chambers,
(d) means for supplying to one of the separate chambers in



each of said hollow elements a fluid at a sufficiently low temperature to form a condensate on the element wall portions in contact with said one of the separate chambers, and
(e) means for supplying to the other of said separate chambers in each of said hollow elements a fluid at a sufficiently high temperature to melt off any condensate on the element wall portions in contact with said other of said separate chambers.

4,175,936
DIFFUSER WITH REPLACEABLE FILTER
Wendell J. Lough, and Donald E. Bishop, both of Hampstead, N.H., assignors to Weber Technical Products Division of Craig Systems Corp., Lawrence, Mass.
Filed Sep. 6, 1977, Ser. No. 830,658
Int. Cl.² B01D 35/02
U.S. Cl. 55—385 A **16 Claims**



11. An improved diffuser unit for supplying clean air to a work area, said unit being of the type including a downwardly opening hood, a filter housing extending around the periphery of said hood and dimensioned to rest on a ceiling support gridwork, and a filter panel having upper and lower peripheral surfaces and being disposed within said filter housing, wherein the improvement comprises:
a first sealing gasket extending all the way around the upper peripheral surface of said filter panel;
a second sealing gasket extending all the way around the lower peripheral surface of said filter panel;
resilient support and clamping means secured to said filter housing and engaging said filter panel for supporting said filter panel within said housing, said housing including a downturned flange extending therearound, said support and clamping means biasing said first gasket into engagement with said downturned flange to thereby define a knife edge seal; and
grill means sealingly engaging said housing for defining a knife edge seal with said second sealing gasket and thereby defining a sealed annulus with said filter housing and said filter panel.

4,175,937
GAS-CONTAMINANT SEPARATOR
Steven G. Brandau, and Robert L. Carmichael, both of Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.
Continuation-in-part of Ser. No. 685,102, May 10, 1976, abandoned. This application Oct. 20, 1977, Ser. No. 844,019
Int. Cl.² B01D 45/06
U.S. Cl. 55—419 **9 Claims**



5. A separator for separating blow-by combustion gas-oil contaminant mixtures into combustion gas and oil contaminants comprising: an inverted V-shaped housing having a generally inverted V-shaped bottom; said inverted V-shaped housing having an inlet port opening into each leg of said inverted V-shaped housing for receiving flows of the mixtures and having an outlet port opening from the vertex of said inverted V-shaped housing for exhausting combustion gas from said inverted V-shaped housing; said inverted V-shaped housing having first baffle means proximate said inlet ports for directing the mixtures from said inlet ports towards and into contact with one another; said inverted V-shaped housing having second baffle means above said first baffle means cooperating with said inverted V-shaped bottom to cause the mixtures to contact one another and a first portion of the contaminants to be sedimentarily precipitated from the mixtures, said second baffle means cooperating with said first baffle means for causing a first retroversion of the mixtures away from and out of contact with one another so as to centrifugally precipitate a second portion of the contaminants from the mixtures; said inverted V-shaped housing having third baffle means above said second baffle means cooperating therewith for causing a second retroversion of the mixtures towards and into contact with one another; said inverted V-shaped housing having fourth baffle means above said third baffle means cooperating with said third baffle means to cause the mixtures to contact one another and a third portion of the contaminants to be sedimentarily precipitated from the mixtures, said fourth baffle means cooperating with said third baffle means for causing a third retroversion of the mixtures away from and out of contact with one another so as to centrifugally precipitate the remaining portion of the contaminants from the mixtures; said inverted V-shaped housing having inside surfaces cooperating with said fourth baffle means for causing a fourth retroversion of the mixtures towards and into contact with one another.

4,175,938

APPARATUS FOR THE SEPARATION OF LIQUID DROPLETS FROM A GAS STREAM ENTRAINING SAME

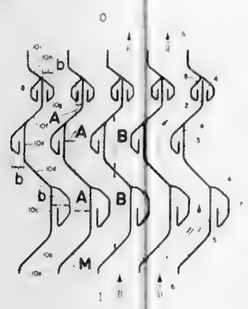
Ulrich Regehr, Süsterfeldstr. 65, 5100 Aachen, Fed. Rep. of Germany; Horst Hannemann, and Ludwig Speitkamp, both of Aachen, Fed. Rep. of Germany, assignors to Ulrich Regehr, Aachen, Fed. Rep. of Germany

Filed Jun. 12, 1978, Ser. No. 914,780

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1977, 2726524

Int. Cl.[2] **B01D** *45/04*

U.S. Cl. 55—440 **5 Claims**



1. An apparatus for the removal of particles from a gas stream entraining same, said apparatus comprising a housing having an inlet and an outlet and traversed by said stream from said inlet to said outlet, and a multiplicity of separator plates in said housing defining flow passages between them, said flow passages being traversed by said gas stream in a flow direction from said inlet to said outlet, each of said plates being corrugated and having, at least on one side of each plate, alternating corrugation crests separated by a corrugation trough with the crests and troughs of the plates extending transversely to said direction, at least the corrugation crests of said plates being provided with members overhanging the respective crest and defining respective phase-separating chambers having inlet gaps opening into the oncoming gas stream opposite to said direction, the successive crests and troughs of each of said plates away from said inlet toward said outlet having a progressively decreasing amplitude measured perpendicular to a median plane of the respective plate, the trough and crest widths of succeeding troughs and crests in said direction progressively decreasing for each plate, the inlet gaps of each of said phase-separating chambers being formed by a flange extending generally in said direction and into the respective phase-separating chamber to serve as a guide flange and reverse-flow blocking member.

4,175,939

METHOD AND APPARATUS FOR INTRODUCTION OF GLASS FILAMENT STRAND ONTO FEED ROLLER OF CHOPPED GLASS FILAMENT STRANDS MANUFACTURING SYSTEM

Koji Nakazawa; Toshiaki Kikuchi, and Toshihito Fujita, all of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Jun. 30, 1978, Ser. No. 920,836

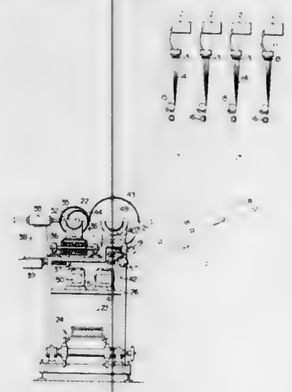
Claims priority, application Japan, Jul. 11, 1977, 52-82855

Int. Cl.[2] **C03B** *37/02*

U.S. Cl. 65—2 **4 Claims**

1. A method of introducing a strand of glass filaments onto a feed roller or a system for manufacturing chopped strands of glass filaments wherein a multiplicity of glass filaments extruded through orifices in the bottoms of at least two spinning furnaces and applied with a sizing agent are collected to form at least two strands of glass filaments, which are thereafter brought into contact with the circumferential surface of the feed roller through a predetermined angle so as to be drawn and attenuated by frictional force exerted by the contact with the circumferential surface of the feed roller while the strands of glass filaments are cut into chopped strands of a predetermined length with a cutter roller in contact with the circumferential surface of the feed roller, comprising: providing an auxiliary feed roller disposed adjacent one end of said main feed roller in axial alignment therewith and adapted to be driven independently of said main feed roller; providing an auxiliary cutter roller adapted to contact under pressure the circumferential surface of said auxiliary feed roller to rotate therewith; maintaining stationary or driving said auxiliary feed roller at a relatively low rotation speed while rotation of said main feed roller is maintained at a normal attenuation speed; causing said auxiliary feed roller to take up a strand of glass filaments to be introduced onto said main feed roller; gradually increasing the rotation speed of said auxiliary feed roller to a normal attenuation speed; and moving the strand wrapped around said auxiliary feed roller onto said main feed roller.

2. In a system for manufacturing chopped strands of glass filaments wherein the system comprises at least two spinning furnaces having orifices in each bottom thereof for extruding separate streams of molten glass to provide a multiplicity of glass filaments, means for applying a sizing agent to said glass



filaments, means for collecting said glass filaments to form at least two strands of glass filaments, a guide roller having at least two circumferential grooves for guiding said strands in parallel with each other, a feed roller having a circumferential surface for drawing the attenuating said strands from said guide roller by frictional force when the strands are brought into contact with the circumferential surface through a predetermined angle, and a cutter roller adapted to contact the peripheral surface of said feed roller for cutting said strands into chopped strands of a predetermined length, an apparatus for introducing a strand of glass filaments onto said feed roller comprising: an auxiliary feed roller disposed adjacent one end of said main feed roller in axial alignment therewith; means for driving said auxiliary feed roller at a variable speed independently of said main feed roller; an auxiliary cutter roller adapted to contact under pressure the circumferential surface of said auxiliary feed roller to rotate therewith; an auxiliary guide roller for guiding a strand of glass filaments to introduce the strand onto the circumferential surface of said main feed roller; means for moving said auxiliary guide roller parallel with the axis of said main and auxiliary feed rollers from a first position laterally adjacent to said auxiliary feed roller to a second position laterally adjacent to said main feed roller; and means for releasing the strand guided by said auxiliary guide roller therefrom and positioning the release strand in the corresponding circumferential guide groove of said main guide roller when the auxiliary guide roller is moved from said first position to said second position.

4,175,940

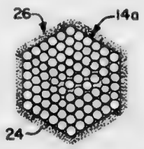
METHOD FOR MAKING FIBER OPTICS FUSED ARRAYS WITH IMPROVED BLEMISH QUALITY

Walter P. Siegmund, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Jun. 19, 1978, Ser. No. 916,980

Int. Cl.[2] **C03C** *23/20, 15/00;* **C03B** *11/08*

U.S. Cl. 65—4 A **10 Claims**



1. The method of making a fused fiber optics array with improved blemish quality comprising:

tightly juxtapositioning a multiplicity of optical fibers into the overall cross-sectional configuration desired of component building blocks of said array, said juxtapositioned fibers constituting a preform of said building blocks;

covering the sides of said preform with a layer of removable material having a melting temperature and coefficient of expansion compatible with said preform;

heating and drawing said covered preform into a section having a reduced cross-sectional size which corresponds to that desired of said building blocks;

separating a length of said drawn section from said preform;

removing said layer of covering material from said separated length of said drawn section;

dividing said length of said drawn section into a plurality of relatively short building blocks each of a length approximately corresponding to the thickness desired of said fused array;

tightly juxtapositioning said number of said shorter sections;

said step of dividing of said length of said drawn section being performed at a preselected stage between said step of drawing said preform and said step of juxtapositioning said shorter building block sections; and

fusing said tightly juxtapositioned shorter sections together to produce said array.

4,175,941

INTERNAL COATING PROCESS FOR GLASS TUBING

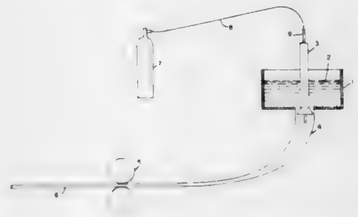
Costas C. Lagos, Danvers; Ricardo A. Lanio, Andover; John L. Crowley, Rowley, all of Mass., and Norman A. Moreau, Hampton, N.H., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 901,177, Apr. 28, 1978, abandoned. This application Oct. 20, 1978, Ser. No. 953,246

Int. Cl.[2] **C03C** *17/18*

U.S. Cl. 65—60 B **5 Claims**

1. The method of depositing a conductive film of tin oxide on the inner surface of tubular or blown glassware comprising the steps of: drawing hot glass from a glass melt through a bag state where the glass is above its softening temperature; and dispensing into the hot bag an aqueous solution containing tin



chloride and hydrofluoric acid, while the hot bag is being formed into tubing or blown ware.

4,175,942

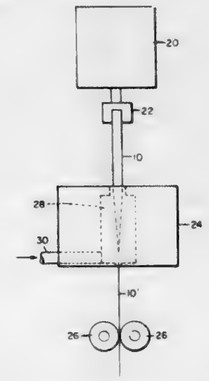
METHOD OF GLASS DRAWING

George D. Lipp, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Apr. 12, 1978, Ser. No. 895,539

Int. Cl.[2] **C03B** *17/00*

U.S. Cl. 65—60 B **4 Claims**



1. A method of drawing glass to form an article comprising, heating a source of glass to at least a semi-molten condition, drawing glass from said heated semi-molten source thereof, introducing water vapor into the atmosphere surrounding the drawing area of said glass and surrounding said newly drawn semi-molten glass with said water vapor, permeating the atmosphere with water vapor in the area wherein said semi-molten drawn glass is being initially formed and prior to rigidifying such glass, and cooling such glass into a rigid article.

4,175,943

WATER-SOLUBLE FERTILIZERS

Pieter J. Jordaan, and Jacobus P. van Deventer, both of Strand, South Africa, assignors to Triomf Fertilizers, Johannesburg, South Africa

Continuation of Ser. No. 534,354, Dec. 18, 1974, abandoned. This application Jan. 18, 1978, Ser. No. 870,451

Claims priority, application South Africa, Dec. 19, 1973, 73/9564

Int. Cl.[2] **C05C** *9/00*

U.S. Cl. 71—29 **10 Claims**

1. A method of manufacturing water soluble mixed NPK fertilizer composition in solid form comprising the steps of (a) dissolving urea in phosphoric acid to form a urea phosphoric

acid adduct solution, (b) adding one or more potassium salts to said adduct while agitating to form a mixture in solid or slurry form and (c) cooling the mixture thus formed, so as to crystallize the solid soluble fertilizer granules when the mixture is a slurry, the constituents of the mixture so chosen that the final product contains between 5 and 42% nitrogen, between 2 and 15% phosphorus and between 1 and 38% potassium, these values being elemental mass as a percentage relating to the total mass of the composition, the resulting composition, in 10% aqueous solution, having a pH of between 1.2 and 2.0.

4,175,944

REMOVAL OF FLUORINE DURING PRODUCTION OF FERTILIZER

George C. Johnson, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 26, 1978, Ser. No. 918,992
Int. Cl.² C05B *11/06, 11/00*
U.S. Cl. 71—39 **4 Claims**

1. An improved process for recovering fluorine liberated during the production of fertilizer by the steps comprising

(1) reacting a phosphate source with nitric acid;

(2) separating unreacted solids from the liquid and reacting the liquid with sulfuric acid or ammonium sulfate to precipitate gypsum;

(3) filtering and reacting ammonia with the filtrate so that the filtrate reaches a pH of up to about 7.0;

(4) filtering to remove the precipitate; and

(5) evaporating water from the step (4) filtrate to recover the fertilizer;

the improvement whereby in step (1) the reaction is carried out at a temperature of from ambient to about 60° C. and in step (2) the reaction is carried out at a temperature of from ambient to about 80° C., and whereby the precipitate from step (4) is heated to about 450° C. to about 550° C. in an ammonia atmosphere to remove the fluorine as an ammonium fluoride.

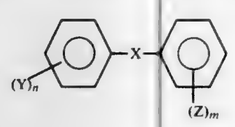
4,175,945

BENZOPHENONES AND BENZHYDROLS

Robert H. Meisinger, Warminster, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 659,609, Feb. 19, 1976, Pat. No. 4,120,687.
This application Apr. 3, 1978, Ser. No. 892,456
Int. Cl.² A01N *5/00*
U.S. Cl. 71—78 **5 Claims**

1. A method for controlling the growth of suckers in growing tobacco plants which comprises applying to the plants an effective amount of a compound of the formula



wherein

X is a group of the formula —CHOH—,

each Y and each Z independently is a halogen atom, a (C_1–C_8)alkyl group, a trifluoromethyl group, a (C_1–C_4)alkoxy group, a hydroxy group, a nitro group, or a (C_1–C_4)alkylthio group, m is 0, 1, or 2, and n is 0, 1, 2, or 3.

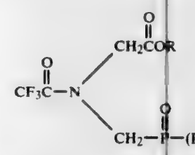
4,175,946

THIO DERIVATIVES OF N-TRIFLUOROACETYL-N-PHOSPHONOMETHYLGLYCINE

John E. Franz, Crestwood, and Robert J. Kaufman, University City, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jul. 10, 1978, Ser. No. 922,900
Int. Cl.² A01N *9/36*
U.S. Cl. 71—87 **24 Claims**

1. A compound of the formula



wherein R is an alkyl group containing from 1 to 10 carbon atoms, a chloro lower alkyl group containing from 1 to 4 carbon atoms and 1 to 3 chlorine groups, a lower alkoxy lower alkyl group containing from 3 to 6 carbon atoms or an alkoxyalkoxyalkyl group containing from 5 to 9 carbon atoms and R′ is a member of the group consisting of lower alkylthio, lower alkenylthio, benzylthio, phenylthio, or substituted phenylthio wherein the phenyl group contains 1 to 2 substituents selected from the group consisting of halo, lower alkyl and lower alkoxy.

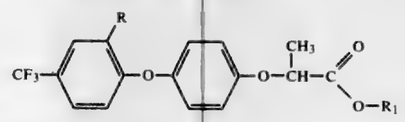
4,175,947

PHENOXY-PHENOXYPROPIONIC ACID ESTERS

Manfred Koch, Kelkheim; Reinhard Handte, Hofheim; Gerhard Hörlein, Frankfurt am Main; Hermann Bieringer, Eppstein, and Peter Langelüddeke, Hofheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 21, 1977, Ser. No. 789,673
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1976, 2617804
Int. Cl.² A01N *9/24, 9/28;* **C07C** *69/76;* **C07D** *307/24*
U.S. Cl. 71—88 **20 Claims**

1. A compound of the formula



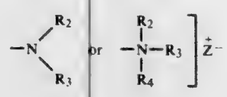
I

wherein

R is hydrogen or halogen,

R_1 is

(a) linear or branched (C_1–C_{12})alkyl substituted by phenoxy which may be optionally mono- or trisubstituted by halogen and/or (C_1–C_4)-alkyl, (C_1–C_4)-acyl or a radical of the formulae



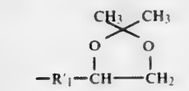
II III

(b) cyclohexenyl or phenyl-(C_3–C_4)-alkenyl;

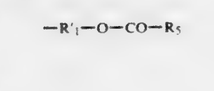
(c) (C_3–C_4)-alkinyl, which may be mono- or disubstituted by linear or branched (C_1–C_4)-alkyl, phenyl or

halogenophenyl with the proviso that R_1 cannot be an unsubstituted propargyl or butinyl radical;

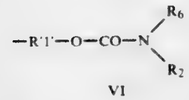
(d) a radical of the formulae



IV

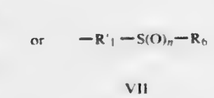


V



VI

or



VII

or

(e) (C_1–C_2)alkyl substituted by furyl, tetrahydrofuryl, or oxiranyl;

R_2 and R_3 are (C_1–C_4)alkyl,

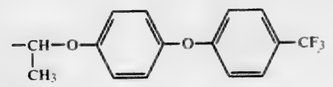
R_4 is (C_1–C_4)alkyl,

Z is the anion of an inorganic acid,

R_1' is linear or branched (C_1–C_{12})alkylene,

R_5 is (C_1–C_4)halogenoalkyl or a radical of the formula

VIII



R_6 is (C_1–C_4)alkyl or phenyl and

n is zero to 2.

14. An herbicidal composition consisting essentially of an inert carrier and an herbicidally effective amount of a compound as defined in claim **1**.

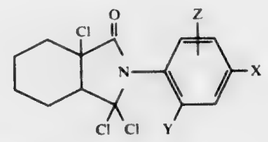
4,175,948

SUBSTITUTED ISOINDOLES

Steven J. Goddard, West Grove, Pa., and George Levitt, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 709,820, Jul. 29, 1976, Pat. No. 4,120,693.
This application Jul. 26, 1978, Ser. No. 928,193
Int. Cl.² A01N *9/22;* **C07D** *209/46*
U.S. Cl. 71—96 **21 Claims**

1. A compound of the formulae



wherein X is H, F, Cl, Br, CN, NO_2 or OCH_3; Y is H, F or CH_3; and Z is H, F, Cl, Br or OCH_3 provided that

(1) when Y is CH_3, X is F, Cl or Br;

(2) when Z is 6-Cl or 6-Br, Y is F; and,

(3) X, Y and Z may not all be H simultaneously.

8. A composition for the control of undesirable vegetation consisting essentially of a compound of claim **1**, and at least one of (a) a surface-active agent and (b) a solid or liquid diluent.

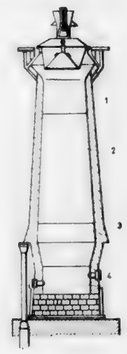
15. A method for the control of undesirable vegetation comprising applying to the locus of such undesired vegetation a herbicidally effective amount of a compound of claim **1**.

4,175,949

PROCESS FOR PERISHING WASTE RUBBER MATERIALS, ESPECIALLY WORN OUT MOTOR VEHICLE RUBBER TIRES BY RECOVERING THEIR COMPONENTS FOR INDUSTRIAL PURPOSES

Endre Breznay, Juhasz Gyula u. 6, Budapest H1039, Hungary

Filed Jul. 31, 1978, Ser. No. 929,276
Claims priority, application Hungary, Aug. 15, 1977, BE 1305
Int. Cl.² C21B *5/00*
U.S. Cl. 75—42 **5 Claims**



1. In a process for producing pig iron by heating, in a blast furnace, a charge containing iron ore, coke and a slag forming additive, to produce said pig iron and blast furnace gas, wherein the improvement comprises, adding waste rubber material to said charge prior to introduction of the charge into the blast furnace and in an amount sufficient to permit reduction of the specific amount of coke employed in said charge to produce a unit of pig iron and sufficient to increase combustion of the blast furnace gas, said waste rubber material being added in an amount less than 20% of the produced pig iron.

4,175,950

PREPARATION OF PHOSPHORUS CONTAINING METALLIC GLASS FORMING ALLOY MELTS

Robert C. Linares, Warren, and Wiktor Ambasz, Metuchen, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jul. 17, 1978, Ser. No. 925,579
Int. Cl.² C22B *9/10*
U.S. Cl. 75—53 **7 Claims**

1. In the process of melting phosphorus-containing glass forming transition metal alloys the improvement which comprises covering the exposed surface of said metal alloy with a layer of a molten flux composition comprising boron trioxide of at least about 95 weight percent purity.

4,175,951

METHOD AND APPARATUS FOR PREPARING A REDUCING GAS STREAM

Charles A. Rubio, Houston, Tex., assignor to CVG-Siderurgica del Orinoco, C.A., Venezuela

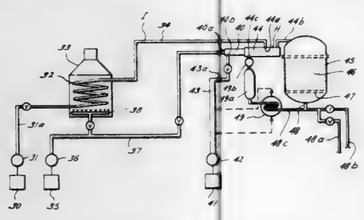
Filed May 11, 1978, Ser. No. 904,977
Int. Cl.² C22B *5/12*
U.S. Cl. 75—91 **11 Claims**

1. A method of producing a stream of hot reducing gas for introduction of said hot reducing gas into a vessel containing comminuted ore oxides to produce reduced metal, comprising the steps of:

combusting a fuel with air in such proportions to produce a heating gas having an absence of free oxygen; and

directing said heating gas and an initially preheated reducing

gas stream to a mixing zone to mix said heating gas with said preheated reducing gas to produce a hot reducing gas stream at a temperature below the fusion point of such ore oxides without spending any of the reducing constituents



in said initially preheated reducing gas stream for introduction of said hot reducing gas stream into such vessel containing comminuted ore oxide to convert said ore oxides to reduced metal.

4,175,952

RECOVERY OF IRON AND TITANIUM METAL VALUES

William K. Tolley, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 19, 1978, Ser. No. 925,902
Int. Cl.² C21B *15/00*; C01G *23/04*
U.S. Cl. 75—101 R **9 Claims**

1. A process for the recovery of iron values and titanium values from ilmenite which comprises the steps of:
(a) crushing said ilmenite;
(b) subjecting said crushed ilmenite to a reductive roast at a temperature of from about 600° to about 1000° C. in the presence of hydrogen, carbon monoxide, or a mixture of carbon monoxide and hydrogen;
(c) leaching the resultant reduced ilmenite with a leach solution comprising hydrogen chloride;
(d) separating insoluble gangue from the soluble metal chlorides;
(e) precipitating titanium dioxide from the soluble metal chlorides by treatment with ferric oxide;
(f) separating said titanium dioxide from soluble iron chloride and recovering said titanium dioxide;
(g) reducing the temperature of the soluble iron chloride sufficiently to crystallize the iron chloride;
(h) reducing a major portion of said iron chloride to form metallic iron and hydrogen chloride and recovering the metallic iron;
(i) oxidizing the other portion of said iron chloride to form ferric oxide; and
(j) recycling said ferric oxide to step (e) of the process.

4,175,953

NON-PRECIOUS DENTAL ALLOY OF CO-NI-CR CONTAINING SI AND B

Robin F. Jones, Titusville, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Jun. 29, 1978, Ser. No. 920,430
Int. Cl.² C22C *30/00, 19/05*
U.S. Cl. 75—134 F **9 Claims**

1. A dental alloy of good polishability and useful in the fabrication of dental prosthetic devices such as crowns and bridges which have a porcelain covering bonded thereto consisting essentially of from 13 to 25 percent Cr, 20 to 40 percent Ni, 3 to 7.5 percent Mo, 0.2 to 1 percent B, 2.75 to 5 percent Si, less than 5 percent Mn and from 30 to 60 percent Co, by weight.

4,175,954

SELF-DISINTEGRATING RANEY METAL ALLOYS

Laurance L. Oden, Salem, and James H. Russell, Corvallis, both of Oreg., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 24, 1978, Ser. No. 927,235
Int. Cl.² C22C *21/00*
U.S. Cl. 75—138 **11 Claims**



10. A self-disintegrating nickel-aluminum alloy comprising about 49.6 weight percent nickel, about 49.6 weight percent aluminum and about 0.8 weight percent carbon with the nickel, aluminum, and carbon being present in the alloy as an aluminum carbide phase, a Ni_2Al_3 phase, a $NiAl_3$ phase and a Al-$NiAl_3$ eutectic phase.

4,175,955

ELECTROPHOTOGRAPHIC PROCESSES USING A PRE-EXPOSURE

Kuniki Seino, Kawasaki; Shoji Kondo, Tokyo; Susumu Tanaka, and Takashi Sugiyama, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 20, 1977, Ser. No. 834,972
Claims priority, application Japan, Sep. 24, 1976, 51-114897; Oct. 27, 1976, 51-144858[U]
Int. Cl.² G03G *13/22, 13/04*
U.S. Cl. 430—35 **5 Claims**

1. An electrophotographic process for repetitively forming an electrostatic latent image corresponding to an original onto a photosensitive member having hysteresis characteristics in which the photosensitivity of said photosensitive member in an image exposing step varies in accordance with the exposing and/or charging level of previous latent image forming steps, comprising the steps of:
pre-exposing said photosensitive member with an exposure level greater than 10^3 lx-sec;
uniformly charging said photosensitive member with a specific charge polarity to a predetermined surface potential;
uniformly exposing said photosensitive member with light of a predetermined exposure level;
uniformly charging said photosensitive member with the same charge polarity as in the first charging step; and
exposing the image corresponding to the original onto the uniformly charged photosensitive member, whereby influence from said hysteresis characteristics is avoided by said pre-exposing step and the first uniform charging and exposing steps enable a predetermined specific history to be formed on said photosensitive member to obtain increased and constant photosensitivity.

4,175,956

ELECTROPHOTOSENSITIVE MATERIALS FOR MIGRATION IMAGING PROCESSES

Neil F. Haley, Fairport, N.Y.; James J. Krutak, Kingsport, Tenn., and Robert J. Ott, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

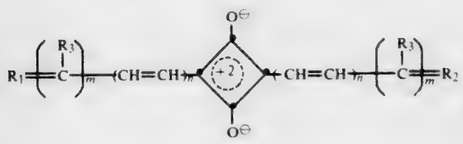
Filed Feb. 10, 1978, Ser. No. 876,795
Int. Cl.² G03G *17/04*
U.S. Cl. 430—37 **3 Claims**

1. An electrophoretic migration imaging process which

comprises subjecting an electrically photosensitive colorant material positioned between at least two electrodes to an applied electric field and exposing said materials to an image



pattern of radiation to which the material is photosensitive, thereby obtaining image formation on at least one of said electrodes, characterized in that at least a portion of said electrophotosensitive material has the structure:



wherein
R_1 and R_2, which may be the same or different, represent a monovalent or divalent substituted or unsubstituted 5 to 13 member heterocyclic nucleus or a substituted or unsubstituted 5 to 10 member saturated or unsaturated carbocyclic nucleus and said hetero atom is selected from the group consisting of O and N;
R_3 represents H, alkyl, aryl, or cyano and carboxy-esters;
m represents 0 or 1; and
n represents 0, 1, 2 or 3; and
said substituted R_1 and R_2 substituents are selected from the group consisting of alkyl, hydroxy, phenyl, oxo, benzyl, carbamoyl, acetamido, nitro, piperidinyl, halo, and substituted amino.

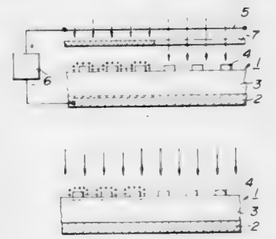
4,175,957

ELECTROPHOTOGRAPHIC PROCESS USING INSULATING DOT OVERLAYER

Eiichi Sato, Tama, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Dec. 22, 1977, Ser. No. 863,167
Claims priority, application Japan, Jan. 14, 1977, 52/2360
Int. Cl.² G03G *13/24*
U.S. Cl. 430—31 **3 Claims**

1. An electrographic process comprising using a photosensitive screen consisting of an electrically conductive support, a photoconductive member coated on the electrically conductive support and a dot-, line- or mesh-shaped insulating member coated on the surface of the photoconductive member, said photoconductive member being exposed to the ambient atmosphere through said insulating member, uniformly charging said photosensitive screen and at the same time illuminating said photosensitive screen by a light image, and uniformly exposing said photosensitive screen to light so as to produce,



on said insulating member only, an electrostatic latent image corresponding to said light image.

4,175,958

DRY PLANOGRAPHIC PRINTING METHOD AND PLATE MADE BY ELECTROPHOTOGRAPHIC METHOD USING CONDUCTIVE TONER

Tsutomu Naganuma, Funabashi; Hisao Hoshi, Tokorozawa; Hiroji Kumagai, Narashino, and Kaneki Yoshida, Kodaira, all of Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1977, Ser. No. 862,607
Claims priority, application Japan, Dec. 23, 1976, 51/155474; Sep. 8, 1977, 52/108196
Int. Cl.² G03G *13/26*
U.S. Cl. 430—49 **4 Claims**



1. A dry planographic printing method comprising charging the surface of a dry planographic printing plate, reversal-developing said printing plate by means of a toner, transferring said toner to a transfer material, and fixing said toner; said dry planographic printing plate being prepared by charging and image-exposing a photosensitive plate including an electrically conductive support and a photoconductive layer formed on said support, said photoconductive layer comprising a resin binder and a photoconductive powder dispersed in said binder; and then developing said photosensitive plate by means of a conductive toner and fixing said conductive toner.

2. A dry planographic printing method according to claim 1, wherein said photoconductive layer consists essentially of said resin binder and said photoconductive powder disbursed in said binder.

4,175,959

PRECIPITATION OF PARTICULATE TRIGONAL SELENIUM FOR USE IN ELECTROPHOTOGRAPHY

Ronald E. Karam, Webster, N.Y., and David J. Swarthout, Allston, Mass., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 607,648, Aug. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 481,587, Jun. 21, 1974, abandoned. This application Dec. 23, 1976, Ser. No. 753,957

Int. Cl.[2] G03G *5/08, 5/087*

U.S. Cl. 430—134 **7 Claims**

1. A method for the preparation of an electrostatographic photosensitive device which comprises:

(a) forming an alkaline solution containing selenide and/or polyselenide ions and hydroxyl ions wherein the hydroxyl ions are in stoichiometric excess;

(b) maintaining the solution at a temperature not in excess of 70° C.;

(c) adding an oxidizing agent to the solution to oxidize the selenide and/or polyselenide ions to thereby form and precipitate elemental selenium, said addition being carried out at a rate sufficient to cause the precipitation of submicron, generally spherically shaped particles of trigonal selenium;

(d) separating the particles of trigonal selenium from the solution;

(e) dispersing the particles of trigonal selenium with an electrically active or insulating organic resin in a solvent to form a uniform dispersion;

(f) applying the dispersion to a substrate in an even layer;

(g) removing the solvent from the layer to form a smooth continuous binder layer of trigonal selenium dispersed in a matrix of the organic resin.

4,175,960

MULTI-ACTIVE PHOTOCONDUCTIVE ELEMENT HAVING AN AGGREGATE CHARGE GENERATING LAYER

Martin A. Berwick, Kendall; Charles J. Fox, and William A. Light, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 534,979, Dec. 20, 1974, abandoned. This application Dec. 9, 1975, Ser. No. 639,039

Int. Cl.[2] G03G *5/06, 3/14*

U.S. Cl. 430—58 **47 Claims**

1. A photoconductive insulating element having at least two layers comprising a charge-generation layer in electrical contact with a charge-transport layer,

(a) said charge-generation layer comprising a continuous, electrically insulating polymer phase and dispersed in said continuous phase a discontinuous phase comprising a finely-divided, particulate co-crystalline complex of (i) at least one polymer having an alkylidene diarylene group in a recurring unit and (ii) at least one pyrylium-type dye salt, said co-crystalline complex, upon exposure to activating radiation for said complex, capable of generating and injecting charge carriers into said charge-transport layer, the particulate, co-crystalline complex of said discontinuous phase having a size of about 0.01 to about 25 microns, said charge generation layer having a maximum radiation absorption at a wavelength at least about 10 nm. different from the wavelength of maximum absorption of said pyrylium-type dye salt solubilized with said alkylidene diarylene group-containing polymer in a homogeneous composition,

(b) said charge-transport layer being an organic composition free from said co-crystalline complex and said pyrylium-type dye salt, and comprising as a charge-transport material an organic photoconductive material capable of accepting and transporting injected charge carriers from said charge-generation layer.

4,175,961

MULTI-ACTIVE PHOTOCONDUCTIVE ELEMENTS

Hal E. Wright, Rochester, and Martin A. Berwick, Kendall, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 753,390, Dec. 22, 1976, Pat. No. 4,111,693. This application Apr. 3, 1978, Ser. No. 892,640

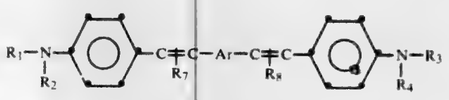
Int. Cl.[2] G03G *5/06, 5/14*

U.S. Cl. 430—58 **11 Claims**

1. A photoconductive insulating element comprising a charge-generation aggregate photoconductive layer in electrical contact with a charge-transport photoconductor containing layer, wherein:

(a) said photoconductor containing layer, comprises an organic photoconductors;

(b) said aggregate photoconductive layer comprising (i) a continuous, electrically insulating polymer phase and (ii) a discontinuous phase dispersed in said continuous phase comprising a finely-divided, particulate, co-crystalline complex of at least one polymer having an alkylidene diarylene group in a recurring unit and at least one pyrylium-type dye salt, and (iii) at least one compound having the structure:



in which

Ar represents a substituted or unsubstituted arylene group, wherein said substituent is an electron withdrawing group or an electron accepting group;

R_1, R_2, R_3, and R_4 which may be the same or resent a substituted or unsubstituted alkyl group having from 1 to 18 carbon atoms or a substituted or unsubstituted aryl group; and

R_7 and R_8, which may be the same or different represent an electron withdrawing group or hydrogen except that when Ar is unsubstituted phenylene or unsubstituted anthrylene, R_7 and R_8 must be other than hydrogen.

4,175,962

ELECTROSTATOGRAPHIC TONER MATERIAL

Shigeru Sadamatsu, Odawara; Tooru Nozaki; Yoshihiko Yamada, both of Minami-ashigara, and Tsuneo Noami, Odawara, all of Japan, assignors to Rank Xerox, Ltd., London, United Kingdom

Filed Oct. 12, 1976, Ser. No. 731,075

Claims priority, application Japan, Mar. 22, 1976, 51-029851

Int. Cl.[2] G03G *9/10*

U.S. Cl. 430—109 **10 Claims**

1. An electrostatographic developer mixture comprising finely-divided toner particles electrostatically clinging to the surface of carrier particles, said toner particles comprising from between about 1 percent and about 20 percent by weight of a colorant based on the weight of said particles, and at least about 60 percent by weight, based on the weight of said toner particles, of a homogeneous resin mixture consisting essentially of between about 40 and about 90 parts by weight of a styrene resin and from about 10 to about 60 parts by weight of an epoxy resin, said styrene resin having a molecular weight of between about 1,000 and about 30,000, and said epoxy resin having a molecular weight of between about 500 and about 10,000.

4,175,963

METHOD OF EXPOSING AND CURING AN EPOXY COMPOSITION CONTAINING AN AROMATIC ONIUM SALT

James V. Crivello, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 638,994, Dec. 9, 1975, Pat. No. 4,069,055, which is a continuation of Ser. No. 466,378, May 2, 1974, abandoned. This application Sep. 30, 1977, Ser. No. 838,153

Int. Cl.[2] G03C *5/04, 1/68*

U.S. Cl. 430—296 **7 Claims**

1. A method for effecting the cationic polymerization of epoxy resin which comprises,

(1) forming a mixture consisting essentially of epoxy resin and an effective amount of a radiation sensitive aromatic onium salt of a Group Va element of the formula,

$$[(R)_a(R^1)_b(R^2)_cX]_d^+ [MQ_e]^{-(e-f)},$$

which is capable of effecting the cure of such mixture when exposed to radient energy,

(2) exposing said mixture to radiant energy to effect the cure of the organic material,

where R is a monovalent aromatic organic radical selected from carbocyclic radicals and heterocyclic radicals, R^1 is a monovalent organic aliphatic radical selected from alkyl, alkoxy, cycloalkyl and substituted derivatives thereof, R^2 is a polyvalent organic radical forming an aromatic heterocyclic or fused ring structure with X, X is a Group Va element selected from N, P, As, Sb and Bi, M is a metal or metalloid, Q is a halogen radical, a is a whole number equal to 0 to 4 inclusive, b is a whole number equal to 0 to 2 inclusive, c is a whole number equal to 0 to 2 inclusive, and the sum of a+b+c is a value equal to 4 or the valence of X,

d=e-f

f=valence of M and is an integer equal to from 2 to 7 inclusive

e is >f and is an integer having a value up to 8.

4,175,964

METHOD OF MAKING A LITHOGRAPHIC PRINTING PLATE

Toshio Uchida; Yorimiti Yabuta, and Teppei Ikeda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jun. 7, 1977, Ser. No. 804,481

Claims priority, application Japan, Jun. 7, 1976, 51-66353

Int. Cl.[2] G03C *11/12, 5/00, 1/94*

U.S. Cl. 430—253 **14 Claims**

1. In a process for preparing a lithographic printing plate which comprises (1) preparing a light-sensitive lithographic printing plate precursor comprising a metal support having thereon, in succession, a light-sensitive composition layer and a transparent film, said light-sensitive composition layer having a stronger adhesion to one of said support and said film than the other one in its unexposed state and having a stronger adhesion to said the other one than said one in its exposed state, by coating said light-sensitive composition layer on said support and then placing said transparent film over said light-sensitive composition layer and thereafter (2) imagewise exposing said precursor and (3) peeling said imagewise exposed precursor apart to remove, together with said film, areas which have a stronger adhesion to said film in said imagewise exposed light-sensitive composition layer by utilizing the difference in adhesion to said support and to said film between the exposed areas and the unexposed areas of said light-sensitive composition layer, whereby to obtain the lithographic printing plate, the improvement which comprises prior to said coating, subjecting the surface of said support to be adjacent said light-sensitive composition layer to an anodic oxidation treatment and then treating said surface successively with (1) an aqueous solution containing phosphoric acid, and (2) an aqueous solution containing at least one water soluble silicic acid or salt thereof selected from the group consisting of a silicic acid or silicic acid salt and then coating the treated surface with said light-sensitive composition layer.

4,175,965

OFFSET PRINTING PLATE

Akio Yoshida; Yasuo Tsubai, and Seigo Ebato, all of Nagaoka-kyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

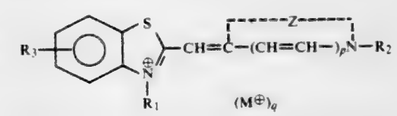
Filed Oct. 27, 1977, Ser. No. 846,024

Claims priority, application Japan, Nov. 1, 1976, 51-131371; Sep. 26, 1977, 52-115299

Int. Cl.[2] G03C *5/54, 1/48*

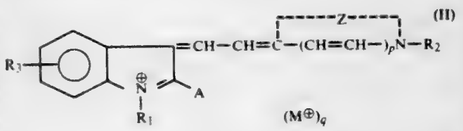
U.S. Cl. 430—230 **14 Claims**

1. In a direct offset printing plate which cmprises a support of a waterproof paper or synthetic resin film the surface of which is rendered hydrophillic and on which are coated a photographic emulsion layer mainly composed of a silver halide emulsion and a film layer which contains nuclei for physical development and to which an image formed in said emulsion layer is transferred from the emulsion layer comprising a direct positive silver halide emulsion which comprises silver chlorobromide, silver iodobromide, silver chloroiodobromide or silver bromide grains containing at least 80 mol % of bromide, the surface of which has an electron acceptor and at least one sensitizing dye selected from the group consisting of those having the following general formula (I):



(I)

and those having the following general formula (II):



(II)

(wherein Z represents non-metal atom group necessary to complete a 5- or 6-membered nitrogen-containing heterocyclic nucleus, at least one of R_1 and R_2 represents a sulfoalkyl group of 1–5 carbon atoms or a carboxyalkyl group of 1–5 carbon atoms and the remainder of R_1 and R_2 represent an alkyl group of 1–5 carbon atoms, a substituent-containing alkyl group of 1–5 carbon atoms, an aralkyl group, an aryl group or an alkenyl group of 1–5 carbon atoms, R_3 represents nitro group, a halogen atom or hydrogen atom, A represents an aryl group, M represents an alkali metal atom or ammonium group and p and q each represents each represents 0 or 1) and which is fogged with a compound of a metal more electropositive than silver without a reducing agent and wherein said film layer containing nuclei for physical development has a thickness less than 20–30 A.

4,175,966

LIGHT-SENSITIVE BLACK-WHITE SILVER HALIDE PHOTOGRAPHIC MATERIAL FOR FORMING A HIGH-CONTRAST SILVER IMAGE AND METHOD OF TREATING THEREOF

Mitsuto Fujiwhara; Syunji Matsuo; Toyoaki Masukawa; Yutaka Kaneko, and Mikio Kawasaki, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 710,385, Aug. 2, 1976, abandoned. This application Oct. 4, 1978, Ser. No. 948,539

Claims priority, application Japan, Aug. 2, 1975, 50-94295

Int. Cl.² G03C *5/30, 1/06, 1/28*

U.S. Cl. 430—438 **5 Claims**

1. A method of forming a high-contrast black and white silver image by use of a light-sensitive silver halide photographic material having a support and a hydrophilic colloidal layer thereon which method comprises imagewise exposing said photographic material to light and processing said exposed photographic material by a developer having superadditivity and a pH value of 8.5 to 12.5 and containing hydroquinone-metol or hydroquinone-phenidone, said photographic material containing at least one substantially non-diffusible compound capable of oxidizing hydrquinone, said substantially non-diffusible compound being selected from the group consisting of: N-chloro-p-dodecylbenzenesulfonamide sodium; N-chloro-p-nonylbenzenesulfonamide sodium; 2-dodecylbenzoquinone, 2,5-dioctylbenzoquinone; 2-dodecyl-5-methylbenzoquinone; 2-(benzothiazol-2-yl)-3-phenyl-5-dodecyl-2H-tetrazolium bromide; 2,3-diphenyl-5-(4-t-octyloxyphenyl)-2H-tetrazolium chloride; stearic peracid; palmitic peracid; tetraphenylphosphonium bichromate; tetraphenylphosphonium permanganate; tetraphenylarsonium perchromate; and a salt of an anion and a cation, said anion being selected from the group consisting of: p-dodecylbenzenesulfonic acid anion, lauryl sulfate anion, di-2-ethylhexyl sulfosuccinic acid anion, ethylpolyethenoxy sulfate anion, stearic acid anion, and said cation being selected from the group of a tetrazolium cation, a triazolium cation, 1,1′-dimethyl-4,4′-bipyridinium, 1,1′-diethyl-4,4′-bipyridinium and 1,1′-dibenzyl- 4,4′-bipyridinium.

4,175,967

MULTIPART PHOTOSENSITIVE ELEMENT WITH INDEPENDENT CONTRAST CONTROL OF CONSTITUENT PART RECORDS

Donald Krause, 5 Old Towne Rd., Apt. #236, Ayer, Mass. 01432

Filed Nov. 1, 1977, Ser. No. 847,583

Int. Cl.² G03C *1/76, 3/00*

U.S. Cl. 430—503 **10 Claims**

1. A multipart photosensitive element comprising: a support; a plurality of partial record portions carried on said support; all of said partial record portions together forming a full record; each of said partial record portions having a preselected density range of said full record and all of said partial record portion densities combined forming the total density range of said full record; each of said partial record portions including a variable contrast emulsion for varying the contrast of that partial record portion over its preselected density range; each of said variable contrast emulsions being photoresponsive in a different spectral region from the other emulsions in the other partial record portions for independently selectively varying the contrast in each of the partial record portions.

4,175,968

COLOR PHOTOGRAPHIC MATERIALS CONTAINING ANTI-FOGGING AGENTS

Hans-Heinrich Credner, Hohenschaeftlarn, and Karl-Wilhelm Schranz, Odenthal, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

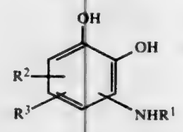
Filed Jul. 17, 1978, Ser. No. 925,226

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2732971

Int. Cl.² G03C *1/40, 1/06*

U.S. Cl. 430—559 **4 Claims**

1. Light sensitive color photographic material comprising at least one silver halide emulsion layer, containing in at least one of its light sensitive or non-light-sensitive layers a non-diffusing antistaining agent corresponding to the following formula:



in which

R^1 represents an acyl group rendering the compound resistant to diffusion derived from aliphatic or aromatic carboxylic acids or sulphonic acids, including aliphatic or aromatic carbamic acids or carbonic acid monoesters;

R^2 and R^3 which may be the same or different represent hydrogen or substituents selected from the group consisting of alkyl having 1 to 4 carbon atoms, halogen such as chlorine, sulpho, carboxyl.

4,175,969

ANTISTATIC PHOTOGRAPHIC X-RAY FILM HAVING A UNIFORM PROTECTIVE SURFACE COATING OF SURFACTANT OLIGOMER OF TETRAFLUOROETHYLENE

E. Scudder Mackey, Binghamton, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed Mar. 17, 1978, Ser. No. 887,763

Int. Cl.² G03C *1/38*

U.S. Cl. 430—539 **2 Claims**

1. An X-ray sensitive photographic element having an antistatic and protective layer thereon which is a uniform, coatable, non-photoactive gelatin-containing composition exhibiting an excellent sensitometric response comprising about 1 to about 3.5% by weight, based upon the gelatin content of said composition, of a fluorocarbon surfactant which is a mixture of low molecular weight oligomers of tetrafluoroethylene having hydrophilic fluorocarbon branching in the fluorocarbon chain, wherein said oligomers have the formula $(C_2F_4)_n$, where n is 4, 5 or 6, and comprise primarily the pentamer oligomer.

4,175,970

PROCESS FOR SENSITIZING PHOTOGRAPHIC SILVER HALIDE EMULSIONS

Raymond J. LeStrange, Hendersonville, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

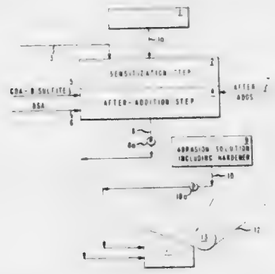
Filed Jul. 24, 1978, Ser. No. 927,050

Int. Cl.² G03C *1/78, 1/28*

U.S. Cl. 430—529 **9 Claims**

1. A process for the sensitization of a light-sensitive gelatino-silver halide emulsion prior to coating it upon a support, in which process the gelatino-silver halide emulsion is made up in a supply vessel and subsequently introduced into a coater for application to a film support, the improvement which comprises adding to the emulsion in the supply vessel (1) either glutaraldehyde bisulfite, succinaldehyde bisulfite, or a substituted glutaraldehyde bisulfite, in a concentration of between

0.05 and 0.3% by weight, based on the weight of total gelatin in the emulsion, and (2) an aromatic sulfinic acid, or a water-



soluble salt thereof, in a concentration of 0.5 to 15 grams per mole of silver halide in the emulsion.

4,175,971

LIGHT-SENSITIVE PHOTOPOLYMERIZABLE COMPOSITION

Fumiaki Shinozaki; Yasuo Washigawa; Tomoaki Ikeda; Sho Nakao, and Syunichi Kondoh, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sep. 13, 1977, Ser. No. 832,864

Claims priority, application Japan, Sep. 14, 1976, 51-110151

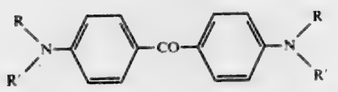
Int. Cl.² G03C *1/68;* **C08F** *2/46*

U.S. Cl. 430—287 **6 Claims**

1. A light-sensitive composition consisting essentially of at least one ester of an ethylenically unsaturated double bond-containing organic acid and an aliphatic polyhydric alcohol, said ester having a molecular weight of about 1000 or less, and a photopolymerization initiator, said photopolymerization initiator consisting essentially of a combination of the components

(1) benzanthrone, a benzanthrone substituted with one or more of halogen atoms, alkyl groups having 1 to 5 carbon atoms or alkoxy groups having 1 to 5 carbon atoms, a 1,2-benzanthraquinone or a benzanthraquinone substituted with one or more of halogen atoms, alkyl groups having 1 to 5 carbon atoms or alkoxy groups having 1 to 5 carbon atoms, or a mixture thereof and

(2) a compound represented by the formula (a):



(a)

wherein R and R′, which may be the same or different, each represents a methyl group or an ethyl group, wherein the weight ratio of component (1) to component (2) of said photopolymerization initiator ranges from about 10:1 to about 1:100 and the amount of said photopolymerization initiator ranges from about 0.1 to about 20% by weight to the weight of the ester.

4,175,972

CURABLE EPOXY COMPOSITIONS CONTAINING AROMATIC ONIUM SALTS AND HYDROXY COMPOUNDS

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 638,982, Dec. 9, 1975, Pat. No. 4,058,401, which is a continuation of Ser. No. 466,374, May 2, 1974, abandoned. This application Oct. 6, 1977, Ser. No. 840,092

The portion of the term of this patent subsequent to Nov. 15, 1994, has been disclaimed.

Int. Cl.² G03C *1/68;* **C03F** *8/18;* **C08F** *2/46*

U.S. Cl. 204—159.18 **8 Claims**

1. Photocurable compositions consisting essentially of

(A) an epoxy resin polymerizable to a higher molecular weight state containing a hydroxy functional flexibilizer, and

(B) from 0.1% to 15% by weight of a radiation sensitive aromatic onium salt of a Group VIa element capable of effecting the cure of (A) by exposure to radiant energy,

where the radiation sensitive aromatic onium salt has the formula,

$$[(R)_a(R^1)_b(R^2)_cX]_d^+[MQ_e]^{-(e-f)},$$

R is a monovalent aromatic organic radical, R^1 is a monovalent organic aliphatic radical selected from alkyl, cycloalkyl and substituted alkyl, R^2 is a polyvalent organic radical forming a heterocyclic or fused ring structure selected from aliphatic radicals and aromatic radicals, X is a Group VIa element selected from sulfur, selenium and tellurium, M is a metal or metalloid, Q is a halogen radical, a is a whole number equal to 0 to 3 inclusive, b is a whole number equal to 0 to 2 inclusive, c is a whole number equal to 0 or 1 where the sum of a+b+c is a value equal to 3 or the valence of X,

d=e−f,

f=valence of M and is an integer equal to from 2 to 7 inclusive,

e is >f and is an integer having a value up to 8.

4,175,973

CURABLE COMPOSITIONS

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 638,994, Dec. 9, 1975, Pat. No. 4,069,055, which is a continuation of Ser. No. 466,378, May 2, 1974, abandoned. This application Oct. 27, 1977, Ser. No. 845,928

Int. Cl.² G03C *1/68*

U.S. Cl. 204—159.14 **14 Claims**

1. Photocurable compositions consisting essentially of

(A) an epoxy resin polymerizable to a higher molecular weight state containing modifying reactive alcohols and

(B) an effective amount of a radiation sensitive aromatic onium salt of a Group V*a* element capable of effecting the cure of (A) when exposed to radiant energy where the aromatic onium salt of a Group Va element has the formula,

$$[(R)_a(R^1)_b(R^2)_cX]_d^+[MO_e]^{-(e-f)}$$

where R is a monovalent aromatic organic radical selected from carbocyclic radicals and heterocyclic radicals, R^1 is a monovalent organic aliphatic radical selected from alkyl, alkoxy, cycloalkyl and substituted derivatives thereof, R^2 is a polyvalent organic radical forming an aromatic heterocyclic or fused ring structure with X, X is a Group V*a* element selected from N, P, As, Sb and Bi, M is a metal or metalloid, Q is a halogen radical, a is a whole number equal to 0 to 4 inclusive, b is a whole number equal to 0 to 2 inclusive, c is a whole number equal to 0 to 2 inclusive and the sum of a+b+c is a value equal to 4 or the valence of X,

d=e−f,

f=valence of M and is an integer equal to from 2 to 7 icnlusive,
e is >f and is an integer having a value up to 8.

4,175,974
SLIDING SHUTTERS OF BASIC REFRACTORY MATERIAL

Bernd E. Grabner, and Mario G. Heinricher, both of Carinthia, Austria, assignors to Oesterreichisch-Amerikanische Magnesit Aktiengesellschaft, Carinthia, Austria

Continuation of Ser. No. 703,366, Jul. 8, 1976, abandoned. This application Jul. 19, 1977, Ser. No. 817,351
Claims priority, application Austria, Jul. 16, 1975, 5481/75
Int. Cl.² C04B *35/04, 35/42*
U.S. Cl. 106—58 **4 Claims**

1. In a combination comprising a vessel for receiving molten metals, said vessel having a discharge opening and a sliding shutter for opening and closing said opening, the improvement comprising:
said sliding shutter consisting essentially of a chemically bonded, unfired, basic refractory material selected from the group consisting of magnesia and magnesia-chromite mixtures, the basic refractory material having an MgO content of 55 to 98.5%, said sliding shutter having substantially greater resistance to thermal shock when subjected to a torch test than a fired sliding shutter or a sliding shutter made by melt casting of the same composition.

4,175,975
AQUEOUS SUSPENSIONS

Dalton C. MacWilliams, Alamo, Calif., and James R. Wirt, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 644,675, Dec. 29, 1975, abandoned. This application Feb. 27, 1978, Ser. No. 881,481
Int. Cl.² C04B *7/42*
U.S. Cl. 106—100 **38 Claims**

1. In the wet process for the production of cement solids wherein limestone and clay are ground in the presence of water to form a pumpable kiln feed slurry, the improvement which comprises adding to said slurry an amount of a water-demand reducing system sufficient to synergistically reduce the water demand of said slurry, said system comprising (1) a water-soluble salt of a polyacrylic acid having a molecular weight of from about 2000 to about 50,000 and (2) a compound selected from the group consisting of alkali metal carbonates, bicarbonates, oxalates, silicates, aluminates and borates and ammonium carbonates, bicarbonates, oxalates and borates, (1) and (2) being employed in a ratio of from about 1:1 to about 1:80 by weight.

4,175,976
NON-DUSTING AGENT AND METHOD OF MANUFACTURE

Fitzhugh L. Avera, 1809 Yale Dr., Alameda, Calif. 94501

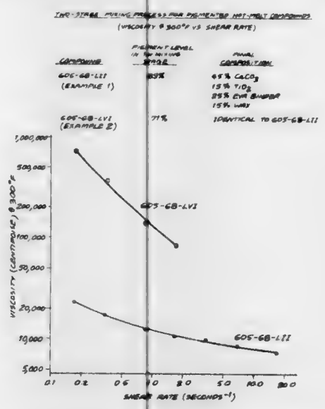
Continuation-in-part of Ser. No. 758,076, Jan. 10, 1977, Pat. No. 4,116,711, which is a continuation-in-part of Ser. No. 590,420, Jun. 26, 1975, abandoned. This application Apr. 10, 1978, Ser. No. 894,839
Int. Cl.² C09C *1/44, 1/58;* **C09D** *3/10*
U.S. Cl. 106—162 **9 Claims**

1. A flake-like, particulate mass consisting essentially of coherent, brittle flakes having a dry thickness in excess of about 25 microns, said coherent, brittle flakes consisting essentially of:
(a) about 2 to about 20 weight-% of a solid, non-toxic, biodegradable, water-soluble, essentially crystalline hexahydric alcohol matrix which is essentially free of chemically unassociated water, said hexahydric alcohol comprising a major amount of mannitol blended with sorbitol, and
(b) entrapped within and uniformly distributed through said matrix, about 80 to about 98 weight-% of solid particles having an average particle size less than 5% of the thickness of said flakes, said particles being insoluble in said matrix and being generally inert toward water and hexahydric alcohols and generally water-insoluble and having a melting point greater than 100° C.

4,175,977
PROCESS FOR PRODUCING A FLOWABLE, HIGHLY PIGMENTED, LOW VISCOSITY, HOT-MELT COATING COMPOUND

Michael J. Heaton, and James R. Quick, both of Warwick, N.Y., assignors to International Paper Company, New York, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,089
Int. Cl.² C08J *3/22;* **C08L** *91/06*
U.S. Cl. 106—272 **6 Claims**



1. A process for preparing in two or more stages a flowable, nonaqueous, solvent-free, highly pigmented, low viscosity, thermoplastic, hot-melt coating compound, which comprises the steps of:
(a) mixing in an initial stage from about 70% to about 95%, by weight, of pigment with from about 5% to about 30%, by weight, of a low viscosity thermoplastic binder material selected from the group consisting of polyethylene, ethylene-vinyl acetate copolymers, ethylene-organic acid copolymers, ethylene-vinyl acetate-organic acid terpolymers, polypropylene, polystyrene, polyamides, paraffin wax, microcrystalline wax, polyterpene resins, and mixtures thereof, having a melt viscosity less than about 100,000 centipoises at a temperature in the range of from about 250° F. to about 300° F. and at a shear rate of from about 0.2 to about 2.0 reciprocal seconds for a period of time sufficient to obtain a homogeneous concentrate; and
(b) mixing in one or more subsequent stages the homogeneous concentrate of step (a) with sufficient additional amounts of low viscosity thermoplastic binder material selected from the group consisting of polyethylene, ethylene-vinyl acetate copolymers, ethylene-organic acid copolymers, ethylene-vinyl acetate-organic acid terpolymers, polypropylene, polystyrene, polyamides, paraffin wax, microcrystalline wax, polyterpene resins, and mixtures thereof, to yield a final homogeneous, flowable hot melt coating compound having a melt viscosity less than about 200,000 centipoises at a temperature in the range of about 250° F. to about 300° F. and at a shear rate of from about 0.2 to about 2.0 reciprocal seconds and comprising from about 30% to about 70%, by weight of pigment and from about 30% to about 70%, by weight, of low viscosity thermoplastic binder material.

4,175,978
ROAD PAVEMENT AND REPAIR

Alfred Marzocchi; Michael G. Roberts, and Charles E. Bolen, all of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 17, 1977, Ser. No. 778,415
Int. Cl.² C08L *95/00*
U.S. Cl. 106—281 R **14 Claims**



1. An upper surface wear course for a road pavement consisting essentially of (a) at least 90% by weight of a stone aggregate and (b) the balance of an organic matrix consisting essentially of (1) an asphalt and (2) flake glass particles, said flake glass particles being interspersed with the asphalt and uniformly distributed therein and the stone aggregate being dispersed in a continuous phase of the organic matrix.

4,175,979
PROCESS FOR THE MANUFACTURE OF A PIGMENT COMPOSITION IN BEAD FORM

George H. Robertson, Paisley, and John A. Stirling, Glasgow, both of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 602,339, Aug. 6, 1975, abandoned. This application Oct. 3, 1977, Ser. No. 838,592
Claims priority, application United Kingdom, Aug. 21, 1974, 36700/74
The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.
Int. Cl.² C09C *3/00*
U.S. Cl. 106—309 **14 Claims**

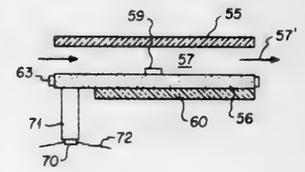
1. A process for the production of a pigment composition in bead form which comprises contacting with agitation, in the presence of from 0.2% to 5% by weight based on the amount of pigment plus carrier of an aqueous protective colloid, 1 part of a water insoluble carrier selected from the group consisting of fatty alcohols, fatty esters, amides of monocarboxylic fatty acids, phthalate esters, fatty oxazolines, water insoluble carboxylic acids, alkylimides, alkyl hydantoins, or mixtures of the aforementioned carriers and rosin acids or modified rosin acids, and water insoluble metal salts of said acids or a mixture of said acids with fatty primary amines, fatty secondary amines, or fatty imidazolines, said carrier melting below 100° C. and an aqueous dispersion of 0.25–2.3 parts of a pigment or water insoluble dyestuff, said process being conducted at a temperature above the melting point of the carrier and allowing the aqueous phase to become substantially free of pigment or water insoluble dyestuff by its association with the carrier and recovering the resulting pigmented beads, said pigmented beads having a particle size from 0.5 to 5 mm. diameter.

4,175,980
LUMINESCENT SOLAR COLLECTOR

Robert R. Davis, Arcadia, Calif.; Richard C. Sill, Reno, Nev., and John W. Yerkes, Granada Hills, Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 18, 1978, Ser. No. 970,771
Int. Cl.² H01L *31/04*
U.S. Cl. 136—89 FC **3 Claims**

1. A luminescent solar collector comprising at least one luminescent member having at least one photovoltaic means operably associated therewith, said photovoltaic means being physically removed from said luminescent member and optically coupled with said luminescent member by optic means, said luminescent member having at least one side which is adapted to be oriented toward the sun and an edge face, a light transparent member carried adjacent to and in spaced relation

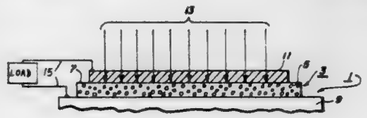


from said sun-side of said luminescent member, said transparent member being essentially coextensive with said luminescent member.

4,175,981
PHOTOVOLTAIC CELL COMPRISING METAL-FREE PHTHALOCYANINE

Rafik O. Loutfy; Lloyd F. McIntyre, both of Mississauga, and James H. Sharp, Oakville, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 3, 1978, Ser. No. 921,302
Int. Cl.² H01L *31/06*
U.S. Cl. 136—89 SJ **30 Claims**

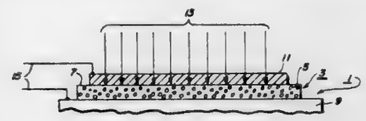


1. A photovoltaic apparatus comprising a device having a first, ohmic electrode and a second, barrier electrode having sandwiched therebetween a photoactive layer comprising metal-free phthalocyanine dispersed in an electrically insulating binder and leads connecting each of said electrodes to an electrical circuit forming a load circuit wherein said device is the power source.

4,175,982
PHOTOVOLTAIC CELL

Rafik O. Loutfy, Mississauga; Cheng-Kuo Hsiao, Toronto, and James H. Sharp, Oakville, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 3, 1978, Ser. No. 921,289
Int. Cl.² H01L *31/04*
U.S. Cl. 136—89 SJ **25 Claims**



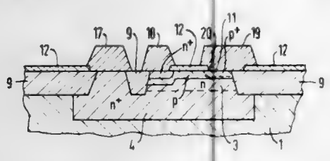
1. A photovoltaic device comprising a first, ohmic electrode and a second, barrier electrode and sandwiched therebetween a photoactive layer comprising metal-free phthalocyanine dispersed in an electrically insulating binder wherein the barrier electrode comprises a metal the oxide of which is electrically conductive.
2. The device of claim 1 wherein the barrier electrode is selected from the group consisting of indium and tin.

4,175,983

PROCESS FOR THE PRODUCTION OF A HIGH FREQUENCY TRANSISTOR

Ulrich Schwabe, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 14, 1978, Ser. No. 915,368
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1977, 2728845
Int. Cl.² H01L *21/22, 21/26, 29/72*
U.S. Cl. 148—1.5 **6 Claims**



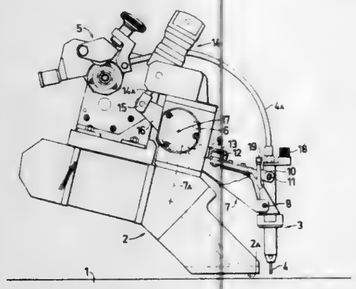
1. A method for the production of a high frequency transistor formed in insulated fashion within a semiconductor body of an integrated circuit, comprising the steps of:
(a) providing a semiconductor substrate of first conductivity type;
(b) diffusing a collector region of second conductivity type in the substrate and exposed at a surface of the substrate;
(c) providing an insulating region in the collector region;
(d) diffusing a base contact zone of first conductivity type in the collector region;
(e) providing an insulating layer over the exposed surface of the collector region;
(f) opening an emitter window in the insulating layer over a portion of the exposed surface of the collector region between the insulating region and base contact zone;
(g) ion implanting an active base zone through the window and simultaneously through the insulating layer to create a connecting zone between the active base zone and the base contact zone; and
(h) diffusing an emitter zone of second conductivity type in the active base zone.

4,175,984

METHOD AND A DEVICE FOR INITIATING AN OXYGEN DESEAMING PROCESS

Bengt A. Johansson, Göthenburg, Sweden, assignor to Centro-Maskin Goteborg AB, Gothenburg, Sweden

Filed May 10, 1978, Ser. No. 904,411
Claims priority, application Sweden, May 12, 1977, 7705545
Int. Cl.² B23K *7/08*
U.S. Cl. 148—9.5 **6 Claims**



1. A method for initiating a gas deseaming process on a workpiece by melting of the surface of the workpiece to ignition temperature by means of a point heat source, characterized in that the point heat source is given a motion parallel to the orifice of the planing nozzle in direct connection to this, oxidizing gas simultaneously flowing through the planing nozzle.

4,175,985

METHOD OF PRODUCING STEEL SECTIONS OF IMPROVED QUALITY

Emile Blondelot, Esch-sur-Alzette, Luxembourg; Marios Economopoulos, Liege, and Stephan H. Wilmotte, Chaudfontaine, both of Belgium, assignors to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Belgium and ARBED Acieries Reunies de Burbach-Eich-Dudelange S.A., Luxembourg

Filed May 11, 1978, Ser. No. 904,901
Claims priority, application Belgium, May 13, 1977, 854647
Int. Cl.² C21D *1/18, 1/20*
U.S. Cl. 148—12.4 **6 Claims**

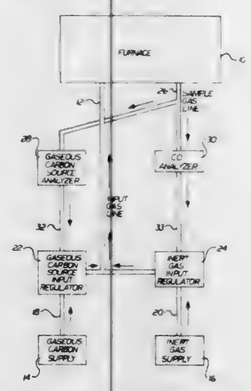
1. A method of improving the quality of a steel section having a thickness of 6 to 40 mm, emerging from a hot rolling mill at a temperature of 1000° to 800° C., the method comprising subjecting the section to surface quenching for 2 to 6 seconds, wherein the cooling rate during the surface quenching is of the order of 1.5 to 5 MW/m^2, and the equalization temperature of the section due to subsequent self-tempering is 500° to 700° C.

4,175,986

INERT CARRIER GAS HEAT TREATING CONTROL PROCESS

Leonard J. Ewalt, Lafayette, Ind., and Som N. Kaushal, Lebanon, Tenn., assignors to TRW Inc., Cleveland, Ohio

Filed Oct. 19, 1978, Ser. No. 952,657
Int. Cl.² C21D *1/48*
U.S. Cl. 148—16.5 **25 Claims**



1. A method of heat treating ferrous articles comprising
introducing a gaseous carbon source and an inert carrier gas into a heat treating furnace containing ferrous articles being heat treated in a furnace atmosphere containing carbon monoxide,
determining the amount of carbon monoxide in the furnace atmosphere, and
controlling the flow of inert carrier gas into the furnace to maintain the amount of carbon monoxide in the furnace atmosphere below about 3% by volume to control the carbon potential to a desired level by minimizing the effect of equilibrium reactions.

4,175,987

LOW ALLOY TEMPERED MARTENSITIC STEEL

Patrick W. Rice, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Continuation of Ser. No. 821,645, Aug. 4, 1977, abandoned. This application Jul. 28, 1978, Ser. No. 928,855
Int. Cl.² C22C *38/22*
U.S. Cl. 148—36 **9 Claims**

1. An improved hydrogen sulfide service, cryogenic steel consisting of:

Element	Percent by Weight
Carbon	0.22–0.30
Manganese	0.85–1.30
Phosphorous	0.035 max.
Sulphur	0.035 max.
Silicon	0.65 max.
Chromium	0.77–1.13
Molybdenum	0.33–0.47

Balance Iron and not more than approximately 1% incidental steel-making residual elements, said steel having been heat treated and water quenched (H = at least approximately 1.5) to develop a 50% tempered martensite micro-structure at the center of the thickest section thereof.

4,175,988

MELT-FORMED POLYCRYSTALLINE CERAMICS AND DOPANT HOSTS CONTAINING PHOSPHORUS

James E. Rapp, Oregon, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 887,264, Mar. 16, 1978, Pat. No. 4,141,738. This application Aug. 14, 1978, Ser. No. 933,294
Int. Cl.² H01L *21/223*
U.S. Cl. 148—189 **9 Claims**

1. In a process of doping a semiconductor wherein a semiconductor and a planar dopant host for vapor phase transport of P_2O_5 are maintained in vapor phase communication at a temperature and for a time sufficient to form a zone of N-type conductivity in said semiconductor, the improvement comprising using a dopant host which is a melt-formed polycrystalline ceramic body having an average linear coefficient of thermal expansion of less than 32×10^{-7}/°C. over the range from zero to 300° C. and less than 42×10^{-7}/°C. over the range from zero to 700° C., said ceramic body having a composition consisting essentially of

Oxide	Mole Percent
P_2O_5	45–75
Al_2O_3	11–28
Ta_2O_5	6.5–13
SiO_2	0–20
La_2O_3	0–7

where $P_2O_5+Al_2O_3+Ta_2O_5$ is at least 75 mole percent of the composition and the mole ratio P_2O_5/Al_2O_3 is at least 2.

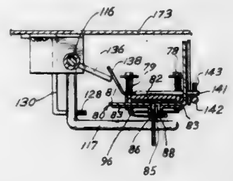
4,175,989

NEWSPAPER VENDING MACHINE

Albert R. Pospischil, South Beloit, Ill.; Michael L. Bruegman, and Erlang W. Granberg, both of Beloit, Wis., assignors to Precision Fabricators, Inc., South Beloit, Ill.

Filed Mar. 27, 1978, Ser. No. 890,183
Int. Cl.² G07F *1/04*
U.S. Cl. 194—1 C **7 Claims**

1. A coin receiver for use with a newspaper or the like vending machine having dispensing means therein, comprising first and second frame members defining a chute for receiving coinage, said frame members being biased toward one another and being actuable away from one another to release coinage from the chute, lever means for extending into the chute to set the chute for receiving predetermined coinage, a receptacle for storing coinage, first actuating means operatively connected to one of said frame members for moving said frame member relative to the other frame member in response to actuation of the dispensing means to discharge the coinage into said receptacle, and second actuating means operatively connected to said one frame member for moving the said one frame member further relative to said other frame member.



4,175,990

WATER-GEL EXPLOSIVE AND A METHOD OF PRODUCING THE SAME

Katsuhide Hattori, and Masao Takahashi, both of Aichi, Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1978, Ser. No. 916,724
Claims priority, application Japan, Jun. 27, 1977, 52/75485
Int. Cl.² C06B *45/02*
U.S. Cl. 149—21 **21 Claims**

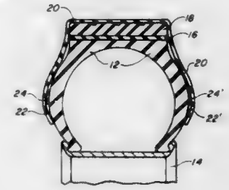
1. A water-gel explosive comprising (a) ammonium nitrate alone or in admixture with other inorganic oxidized acid salt, (b) water, (c) nitroparaffin having 1 to 3 carbon atoms, (d) a gelatinizing agent for water, (e) a gelatinizing agent for nitroparaffin, (f) glass hollow microspheres and (g) an amide.

4,175,991

TIRE RETREADING METHOD

Albert A. Harrelson, Jr., Asheboro, N.C., assignor to Harrelson Rubber Company, Asheboro, N.C.

Filed Nov. 14, 1977, Ser. No. 851,205
Int. Cl.² B29H *17/36*
U.S. Cl. 156—96 **10 Claims**



1. In a tire retreading method of the type including the formation of an assembly comprised of a tire, a layer of cushion gum binder material and an overlying replacement tread strip encircling the circumferential surface of said tire, and a flexible envelope having a central portion overlying said replacement tread strip and marginal edge portions overlying the sidewalls of the tire; said tread strip being adapted to be permanently bonded to said tire by treatment of said assembly within a chamber having means associated therewith for elevating the temperature and pressure therewithin, and for evacuating fluid from beneath said envelope; the improvement comprising:
providing said assembly, prior to its treatment within said chamber, with first and second annular bands of cushion gum binder material respectively extending between said envelope marginal edge portions and said tire sidewalls overlaid thereby; said bands of cushion gum binder mate-

US 4,175,983 7 9 UM1

rial being ineffective, prior to treatment of said assembly within said chamber, to establish fluid-type sealed relationships between said envelope marginal edge portions and said tire sidewalls;

placing the assembly within said chamber;

increasing the temperature and pressure within said chamber to cause plastic flow of said bands of cushion gum material and thereby to cause the same to then establish fluid-tight sealed relationships between said envelope marginal edge portions and said tire sidewalls overlaid thereby;

evacuating fluid from beneath said envelope following the establishment within said chamber of said fluid-tight sealed relationships between said envelope marginal edge portions and said tire sidewalls overlaid thereby;

maintaining said assembly at an elevated temperature and pressure within said chamber for a period of time sufficient to cause permanent bonding of said tread strip to said tire, and then terminating the chamber treatment of the assembly;

and removing said envelope and said bands from said assembly following termination of said chamber treatment thereof.

4,175,992

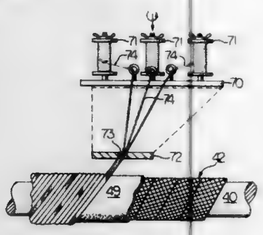
METHOD OF MAKING HIGH PRESSURE REINFORCED HYDRAULIC HOSE

Charles E. Grawey, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 673,187, Apr. 2, 1976, abandoned. This application Mar. 23, 1978, Ser. No. 889,832

Int. Cl.[2] B65H *81/00*

U.S. Cl. 156—143 **9 Claims**



1. A method of forming cable reinforced hose comprising:

forming a hollow elastomer core on a mandrel;

winding a plurality of cable reinforcing elements on said elastomer core in side-by-side spiral convolutions to form a first cylindrical reinforcing ply, each of said cable elements being composed of multiple strands of wire, each strand being separately tensioned as it is twisted with other strands and wound on the core structure, thereby forming a cable in situ;

winding a plurality of cable elements on said first cylindrical reinforcing ply in side-by-side spiral convolutions to form a second cylindrical reinforcing ply, said spiral convolutions of said second reinforcing ply angularly crossing those of said first reinforcing ply, each of said cable elements in said second reinforcing ply being composed of multiple strands of wire, each strand being separately tensioned as it is twisted with other strands and wound, thereby forming a cable in situ;

encircling the built-up cable reinforced hose structure with jacket elastomer to form its outer covering; and

subsequently vulcanizing said core, said reinforcing elements and said jacket elastomer into an integral unit to form cable reinforced hose.

4,175,993

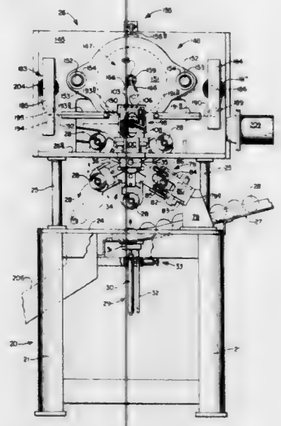
ARTICLE DECORATING MACHINE AND METHOD

Elmer L. Robertson, Overland Park, Kans., assignor to Ethyl Development Corporation, Baton Rouge, La.

Filed Nov. 9, 1977, Ser. No. 849,803

Int. Cl.[2] B65C *3/12*

U.S. Cl. 156—234 **16 Claims**



1. A method for applying indicia to the surface of a generally cylindrical article comprising:

(a) vertically elevating said article horizontally positioned and gripping the sidewall surface of said article at an article-loading station by gripping means carried by a rotating article transport assembly;

(b) rotating said article transport assembly about a horizontal axis to bring said article to a fixedly positioned, combined orienting and indicia transfer station;

(c) supporting said article for rotation about its longitudinal axis at said combined orienting and indicia transfer station;

(d) releasing said article from the grip of said gripping means;

(e) orienting said article to properly position the selected portion of the sidewall surface thereof for receiving the indicia by rotating said article with means fixedly positioned at said orienting and indicia transfer station;

(f) drivingly rotating said article on its axis while pressing a moving strip of indicia printing material between said selected portion of said bottle sidewall surface while contacting the other side of said strip with a hot die carrying the indicia to be printed on said article;

(g) stopping said rotation of the article after indicia transfer is completed and gripping the sidewall surface of said article by said gripping means;

(h) rotating said article transport assembly to bring said article to an eject station; and

(i) opening said gripping means to release said article.

2. An apparatus for applying indicia to generally cylindrical articles comprising:

(a) article elevating means adapted to receive a horizontally positioned single article and to elevate said article in a direct vertical path to an article-receiving station;

(b) turret means mounted for rotation about a horizontal axis, said turret means having a plurality of radially extending, article-gripping means mounted thereon for gripping the sidewalls of a plurality of said articles;

(c) means for rotating said turret in incremental steps including rotating coupling means for directly applying power to said turret;

(d) means independent of said turret means for rotatively holding and orienting an article at an indicia-applying station;

(e) means for applying indicia to an article at said indicia-applying station after said article is oriented;

(f) means to simultaneously

(i) open said gripping means to receive an article at said article-receiving station,

(ii) release a gripped article after it is received by said holding and orienting means at said indicia-applying station, and

(iii) release a gripped article at a discharge station; and

(g) means to simultaneously close said gripping means at said article-receiving station and at said indicia-applying station to hold said articles securely while said articles are transported from said receiving station to said indicia-applying station and from said indicia-applying station to said discharge station.

4,175,994

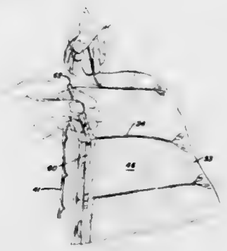
METHOD OF MANUFACTURING A FLEXIBLE COLLAPSIBLE CONTAINER WITH A STIFFENING MEMBER

William W. Norton, Deerfield, and Henry Boehmer, Mt. Prospect, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 17, 1977, Ser. No. 852,422

Int. Cl.[2] B32B *31/18, 31/20*; B65D *35/14*

U.S. Cl. 156—251 **6 Claims**



1. The method of forming flexible, collapsible containers from a pair of facing sheet sections and a stiffener bar positioned between said sheet sections, which comprises:

passing said pair of facing sheet sections along a process path through a sealing die, with a continuous length of said stiffener bar being positioned between said sheet sections and passed along said process path with said sheet sections; forming seal lines with said sealing die between said facing sheet sections to define a group of said collapsible containers, each carrying said stiffener bar in transverse relation thereto; cutting through at least one of said sheet sections and incompletely cutting said stiffener bar at positions adjacent the edges of said collapsible containers; cutting said one sheet section and stiffener bar at a position within each edge of each collapsible container; and removing the cut-away edge portions of said stiffener bar, to facilitate the separation of the formed, collapsible containers, carrying separated stiffener bar sections, from each other whereby each remaining stiffener bar section is of less width than each collapsible container in its as-made configuration.

4,175,995

PROCESS OF PRODUCING A DEEP-DRAWN CONTAINER

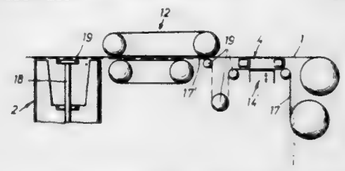
Kurt Walter, Glauburg, Fed. Rep. of Germany, assignor to Hassia Verpackung GmbH, Ranstadt, Fed. Rep. of Germany

Filed Sep. 9, 1977, Ser. No. 831,846

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1976, 2642366

Int. Cl.[2] B29C *17/03*

U.S. Cl. 156—285 **8 Claims**



1. A process for the production of deep-drawn containers in the form of cups, pans or the like which containers are adapted to be covered with a material such as a metal foil after filling, said process comprising the steps of:

(a) positioning a banderole in a deep-drawing mold on the side wall thereof;

(b) positioning a bottom blank in the deep-drawing mold on the bottom wall thereof in such a manner as to permit suction from said mold between said banderole and bottom blank;

(c) feeding a length of thermo-deformable material to the deep-drawing mold;

(d) deep-drawing the thermo-deformable material;

(e) locating the lower edge of the banderole so that it will be in overlapping relationship with the peripheral edge of the bottom blank after the container is formed and,

(f) securing the banderole and the bottom blank to the external side and bottom wall surface of the deep-drawn, thermo-deformable material.

4,175,996

GLUE FOR ARTICLES IN THE TOBACCO INDUSTRY AND METHOD EMPLOYING SAME

Jean-Claude Battard, Saran, and Jean Buisson, Orleans, both of France, assignors to Service d'Exploitation Industrielle des Tabacs et des Allumettes, Paris, France

Division of Ser. No. 872,471, Jan. 26, 1978, which is a continuation of Ser. No. 685,750, May 13, 1976, abandoned. This application Mar. 2, 1978, Ser. No. 882,764

Int. Cl.[2] C09J *3/02*

U.S. Cl. 156—336 **4 Claims**

1. A method of glueing articles of the tobacco industry comprising:

preparing a glue characterized by the fact that at ambient temperature it is in gel form composed mainly of water and gelatine, the gelatine concentration being in the 25–180% range in relation to the water weight, and a minor quantity of plasticizer for the gelatine in aqueous solution, belonging to the food polymers group comprising natural and modified vegetable gums and cellulose ethers, the plasticizer's concentration being within the 0.25–8% range in relation to the weight of the gelatine alone, and being adjusted so that the temperature at which the liquified gel viscosity remains superior to 50 centipoises and becomes lower than 1000 centipoises is within the 40°–70° C. range;

glueing an article of the tobacco industry with said glue; and

drying said glue.

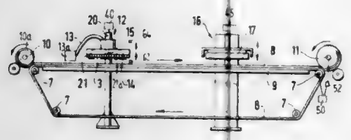
V.9.8.8.4 NO 27 79 UMI

4,175,997

APPARATUS FOR THE APPLICATION OF INDIVIDUAL PATTERN ELEMENTS IN SERIES TO A WEB-LIKE FLAT STRUCTURE

Hermann Müller, Herisau, Switzerland, assignor to Aktiengesellschaft Cilander, Herisau, Switzerland

Filed Jan. 30, 1978, Ser. No. 873,671
Claims priority, application Sweden, Feb. 10, 1977, 771650
Int. Cl.² B65C *9/08*
U.S. Cl. 156—362 **13 Claims**



1. An apparatus for the series patterning of a spread, web-like flat structure by means of individual pattern elements which can be bonded thereto by applying pressure heat, or both, comprising:

a plurality of work stations;

a transport device for the step-wise transport of the flat structure to which the pattern is to be applied past said plurality of work stations;

at least one stack of pattern elements;

support means for supporting said stack of pattern elements;

at least one device for lifting at least one pattern element from said stack arranged upon said support means, for transporting the lifted pattern element over the flat structure and for depositing such thereon at a first one of said work stations;

means for bonding the deposited pattern element at the flat structure;

said bonding means being arranged at a work station located after said first work station with respect to the direction of transport of the flat structure;

control means for controlling the step-wise transport of the flat structure past the work stations and the working operations of both said lifting device and bonding means, such that when the flat structure is at standstill there are deposited thereon pattern elements, and at the same time pattern elements which have been previously deposited are bonded with said flat structure;

said lifting device comprises at least one suction device having a plurality of suction elements;

a pipe system for operatively connecting said plurality of suction elements with one another;

means for defining a source of negative pressure operatively connected with said suction elements by means of said pipe system;

adjustable stop means cooperating with said support means for locating said pattern element stack in a predetermined position in staggered relationship to the pipe system;

said pipe system being arranged with respect to the adjustable stop means such that, with the suction device lowered onto the support means, said stop means are not contacted by said suction elements or the pipes of the pipe system.

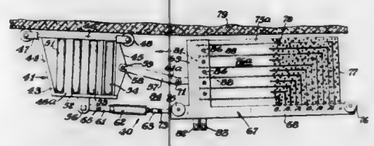
4,175,998

FOAM WELDING APPARATUS

Robert A. Hay, II, Midland, and John S. Boruszewski, Saginaw, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 17, 1978, Ser. No. 925,586
Int. Cl.² H05B *3/20;* **B29C** *27/22;* **B32B** *31/04;* **B65H** *81/04*
U.S. Cl. 156—391 **6 Claims**

1. In an insulation applying apparatus comprising in cooperative combination a first support means, a means to propel the first support means about the periphery of an object to be insulated, an insulation depositing means supported by the first support means and selectively moveable relative to the first support means, the depositing means adapted to trace a generally spiral path over at least a portion of an object to be insulated, means to heat surfaces of adjacent thermoplastic foam strips to a temperature sufficient to fuse the thermoplastic foam strips together, the improvement which comprises the means to heat surfaces is a generally planar heating element of sufficient size to engage surfaces of adjacent thermoplastic foam strips, the heating element having a first generally unheated



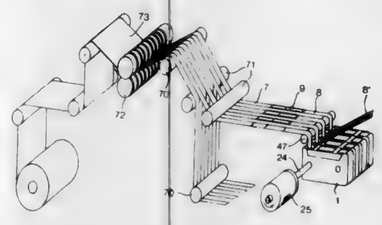
leading end, a second or heatable trailing end, the heat element having a first or tank side and a second or exterior side, the heating element defining a plurality of generally L-shaped interdigitated slots, the slots being generally parallel to the ends and sides of the heating element, the heating element defining an electrical serpentine path, the heating element being of electrically conductive material and defining a region of greater electrical resistance adjacent the trailing end and means to maintain the heating element in generally fixed lateral relationship relative to the foam strips being welded.

4,175,999

APPARATUS FOR LOADING MAGNETIC TAPE CASSETTES WITH MAGNETIC TAPE

Klaus Schoettle, Heidelberg; Peter Dobler, Ludwigshafen; Lothar Gliniorz, Frankenthal; Volker Scherer, Willstaett, and Heinz Brombach, Oberkirch-Stadelhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 5, 1977, Ser. No. 839,660
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1976, 2650457
Int. Cl.² B31F *5/06;* **B65H** *69/06*
U.S. Cl. 156—505 **4 Claims**



1. Apparatus for the simultaneous loading with magnetic tape of a plurality of otherwise finished magnetic tape cassettes provided with leader tape, comprising:

(a) a device for cutting a web of base film provided with a magnetic coating longitudinally into a plurality of magnetic tapes;

(b) means for guiding each of said tapes from said web cutting device downstream to the remainder of said apparatus;

(c) a holder for magnetic tape cassettes to be arranged one next to another;

(d) a drive with a splined shaft which can be inserted into the hubs of said magnetic tape cassettes and withdrawn therefrom;

(e) means for simultaneously transversely severing each of said magnetic tapes and simultaneously dispensing and pressing strips of splicing tape onto the ends of said magnetic tapes produced by said severing, which severing and splicing tape dispensing and pressing means are located on a frame and can be moved at right angles to the surfaces of said magnetic tapes; and

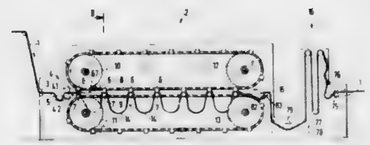
(f) a splicing station for simultaneously joining said severed magnetic tape ends provided with splicing tape to corresponding leaders of said magnetic tape cassettes, which station is associated with said severing and splicing tape dispensing and pressing means and is arranged between said holder and said guide means.

4,176,000

APPARATUS FOR MAKING CHAINS OF SACKS

Fritz Achelpohl, and Horst Schneider, both of Lengerich of Westphalia, Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich of Westphalia, Fed. Rep. of Germany

Filed Dec. 14, 1977, Ser. No. 860,635
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1976, 2659202
Int. Cl.² B32B *31/00;* **B30B** *15/34*
U.S. Cl. 156—510 **32 Claims**



1. Apparatus for applying transfer weld seams to superposed webs of plastics film, preferably for the production of chains of sacks from semi-tubular plastics webs, comprising:

a plurality of welding tools arranged in pairs;

welding tool holder means for supporting each pair of welding tools;

means for guiding said welding tool holder means so that said pairs of welding tools are guided along a planar processing path that is traversed by the webs, enclose the webs between each other, extend transversely of the webs, and act on each other to weld the webs, said means for guiding including pairs of upper and lower endless chains disposed on both sides of the webs, said welding tool holder means including pairs of upper and lower members carrying said welding tools, one of each of said pairs of upper and lower members being connected to and driven by its respective chains, the other of said pairs of upper and lower members being connected to its respective chains in such manner that said other members can be uncoupled and moved with respect to its chains into a position wherein said other member, while being connected to its chains, is coupled to and driven by the other chains.

4,176,001

STOCKING MENDING APPARATUS

Bernard B. Bringman, and Genevieve M. Goodwin, both of 1111 N. 8th St., Boise, Id. 83702

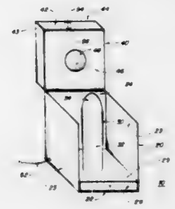
Filed Sep. 11, 1978, Ser. No. 940,983
Int. Cl.² B32B *31/00;* **B30B** *15/34*
U.S. Cl. 156—581 **10 Claims**

1. Stocking mending apparatus comprising

a base including an enclosure;

a vertically upstanding stocking form, having a substantially ovoid head portion, supported on said enclosure;

a housing cover engageable with said base, said cover including on its under surface a recessed heat conducting



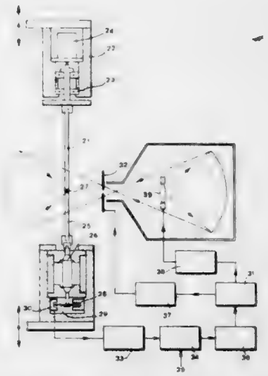
cap operable to matingly receive the head portion of said stocking form; and means for heating said cap.

4,176,002

CONTROLLING THE MELT TEMPERATURE DURING ZONE REFINING AND CZOCHRALSKI CRYSTAL GROWTH BY SENSING THE VISCOUS TORQUE OF THE MELT ZONE DURING OPERATION

Jean-Michel Quenisset; Rober Naslain, and Paul Hagenmuller, all of Talence, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Continuation of Ser. No. 605,343, Aug. 18, 1975, abandoned. This application Apr. 6, 1977, Ser. No. 785,184
Claims priority, application France, Aug. 21, 1974, 74 28762
Int. Cl.² B01J *17/10, 17/18*
U.S. Cl. 156—601 **12 Claims**



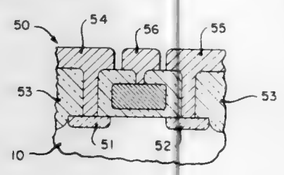
1. In the production of an ingot of fusible inorganic material by the moving melting zone method wherein a viscous molten zone is formed in a vertical ingot of said material and said zone is moved along said ingot thereby concentrating in said zone the impurities in said ingot, and the viscosity of the melt in said zone fluctuates as said zone is moved along said bar, the improvement which comprises: applying torque to one of the ends of said ingot thereby rotating said end about its axis at constant speed, continuously detecting variations in the viscous torque due to the viscous friction generated in said molten zone during the operational period of the heating cycle during which the molten zone is moved along the ingot, and increasing the temperature of said molten zone when said viscous torque increases and decreasing the temperature of said molten zone as said viscous torque decreases, thereby maintaining substantially constant (a) the torque on said end of said ingot and (b) the viscosity of said molten zone, and thereby producing a purified ingot of substantially uniform diameter.

4,176,003

METHOD FOR ENHANCING THE ADHESION OF PHOTORESIST TO POLYSILICON

Ronald W. Brower, Dayton; Jerome Cohen, Centerville, both of Ohio, and Peter C. Chen, Sunnyvale, Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 22, 1978, Ser. No. 879,933
Int. Cl.² H01L *21/306, 21/312, 21/316*
U.S. Cl. 430—313 **6 Claims**



4. A process for etching a polysilicon surface comprising:
subjecting the surface in a vacuum chamber to an oxide plasma provided by rf power of about 90 milliwatts per chamber cubic centimeter operating on oxygen flowing in an ambient pressure of about 0.5–2.0 torr to form a monolayer of silicon oxide on the surface;
forming an organic photoresist to a predetermined masking pattern on the polysilicon surface; and
etching the polysilicon surface in a vacuum chamber in the presence of the photoresist mask by exposing the masked polysilicon surface to a freon plasma generated by rf power of about 20 milliwatts per chamber cubic centimeter operating on freon flowing in an ambient pressure of about 1.5–2.5 torr.

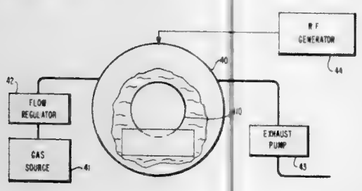
5. The process of claim 1 or 4 wherein the oxygen plasma oxidation technique is employed after the etching step to remove the photoresist.

4,176,004

METHOD FOR MODIFYING THE CHARACTERISTICS OF A SEMICONDUCTOR FUSIONS

Joseph E. Johnson, and Edward Dombrowski, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 21, 1978, Ser. No. 935,429
Int. Cl.² H01L *21/306*
U.S. Cl. 156—643 **8 Claims**



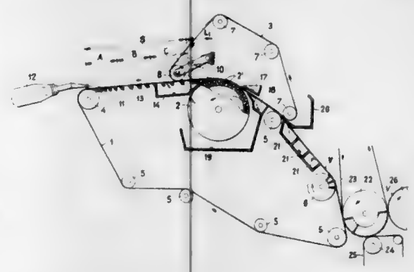
1. A method for etching a thyristor fusion to lower the firing current to a desired value, consisting of the steps of:
(a) disposing at least one thyristor fusion in a plasma etching chamber, said fusion comprising a body of semiconductor material including an anode emitter region therein and an anode electrode affixed thereto, an anode base region, a cathode base region and a gate electrode affixed thereto with portions of said body of semiconductor material exposed in an area adjacent to said gate electrode and a cathode emitter region having a cathode electrode affixed thereto, each of at least one thyristor fusion having a firing current in excess of a desired predetermined value;
(b) establishing a predetermined flow rate of a selected gas mixture through said plasma etching chamber;
(c) establishing an RF field in said etching chamber whereby said selected gas ionizes to produce ions which react with said exposed portions of said body of semiconductor material to produce gaseous etching by-products;
(d) thereby etching said exposed portions of said body of semiconductor material;
(e) continuing said etching for a predetermined time interval; and
(f) removing said at least one fusion from said plasma etching chamber and measuring the firing current of said at least one fusion.

4,176,005

DOUBLE FILTER PAPERMAKING MACHINE

Alfred Bubik, Ravensburg, and Siegfried Reutter, Gerbertshaus, both of Fed. Rep. of Germany, assignors to Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Dec. 26, 1978, Ser. No. 973,071
Claims priority, application Switzerland, Jan. 16, 1978, 406/78
Int. Cl.² D21F *1/24, 9/02*
U.S. Cl. 162—256 **12 Claims**



1. A double filter papermaking machine comprising:
two endless movable filters defining a first filter and a second filter;
a dewatering cylinder positioned below and cooperating with said two endless filters;
said two endless filters serving to guide a paper web located therebetween along part of the surface of the dewatering cylinder;
said first filter defining an inner filter located closer to said dewatering cylinder than said second filter;
said first filter having a linear section disposed forwardly of the filter and deviating from the horizontal direction by at most 45°;
headbox means cooperating with the first filter for the infeed of a stock suspension for forming the paper web;
a slide shoe having a curved surface;
said slide shoe being arranged between said linear section and said dewatering cylinder;
said curved surface of said guide shoe being curved in the same direction as said dewatering cylinder and having a radius which is larger than the radius of the dewatering cylinder;
said second filter defining an outer filter located further from said dewatering cylinder than said first filter;
an adjustable guide roll cooperating with said second filter;
means for adjusting the position of said guide roll;
said guide roll, depending upon its position, enabling displacement of a contact line defining the location where the outer filter contacts the inner filter;
said slide shoe being arranged directly forwardly of said dewatering cylinder; and
said adjustable guide roll enabling an adjustment of the contact line between a starting region of the slide shoe and a location at the dewatering cylinder disposed externally of the slide shoe.

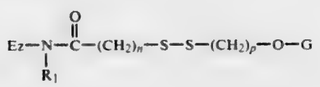
4,176,006

ENZYME IMMOBILIZATION WITH A DISULPHIDE BRIDGE

Richard A. Cormier, St. Hubert, and Claude F. Gagnon, Repentigny, both of Canada, assignors to Redpath Sugars Limited, Montreal, Canada

Filed Jan. 13, 1978, Ser. No. 869,239
Int. Cl.² C12D *13/00;* **C07G** *7/02*
U.S. Cl. 435—74 **18 Claims**

1. An insolubilized, enzymatically active substance comprising an enzyme linked by a disulphide group containing covalent bridge to a support carrier, and having the formula (V)



(V)

in which



is the residue of an enzyme having lost a hydrogen atom from an amino group, n and p, which may be the same or different, are integers of 1 to 6; and G represents a support carrier comprising glass beads having a specific pore size of 200Å to 1000Å and a surface area of 5 to 10 sq. m/g.

4,176,007

METHOD AND APPARATUS FOR ELIMINATING LUMINOL INTERFERENCE MATERIAL

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Eldon L. Jeffers, LaPorte, Tex. and Richard R. Thomas, Mountain View, Calif.

Filed Feb. 9, 1978, Ser. No. 876,440
Int. Cl.² C12K *1/04, 1/10*
U.S. Cl. 435—34 **18 Claims**



1. A method of eliminating interfering luminescence produced by agents unrelated to the concentration of bacteria contained in a selected fluid during a chemiluminescent assay thereof, comprising the steps of
drawing a preselected quantity of the selected fluid,
reacting said preselected quantity of the selected fluid with a first reagent for a predetermined time period to reduce luminescence producing organic agents contained in the selected fluid below a selected level, said first reagent being a hydrogen peroxide solution having a preselected concentration and said predetermined time period is determined by the concentration of said hydrogen peroxide solution,
thereafter reacting said first reagent and selected fluid combination with a second reagent for releasing predetermined components of the bacteria cells containing in the selected fluid and reacting with said released components and with inorganic agents contained in the selected fluid to cause luminescence representative of the concentrations of bacteria and said inorganic agents contained in said selected fluid, said second reagent including sodium hydroxide for rupturing all bacteria cells to release iron porphyrins contained therein, and a luminol/hydrogen peroxide mixture for producing said luminescence upon reaction with said iron porphyrins,
allowing said reaction fluid to luminesce for a preselected period of time for maximizing the decay of said luminescence produced by said inorganic agents,
thereafter measuring the level of luminescence remaining in said reaction fluid, and
visually displaying said luminescence measurement as an indication of the concentration of the bacteria contained in the selected fluid.

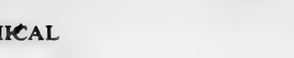
4,176,008

METHOD, COMPOSITION AND ELEMENT FOR THE DETECTION OF NITROGEN-CONTAINING COMPOUNDS

John Figueras; Roger W. Nelson, and Richard C. Sutton, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 24, 1978, Ser. No. 880,828
Int. Cl.² G01N *33/16*
U.S. Cl. 435—12 **25 Claims**

1. An element for the determination in an aqueous sample of nitrogen-containing analyte capable of releasing ammonia upon enzymatic action, said element comprising a spreading layer and a reagent layer in fluid contact and containing (a) at least one enzyme which catalyzes the decomposition of the analyte to ammonia, and (b) a diketone of the formula



wherein R^1, R^2, R^3 and R^4 are the same or different, and are each hydrogen, aryl of from 6 to 20 carbon atoms, a straight- or branched-chain alkyl or aralkyl of up to about 20 carbon atoms, or a cycloalkyl of from about 5 to about 7 carbon atoms.

4,176,009

METHOD OF MEASURING COLLAGENASE ACTIVITY

Shumpei Sakakibara, Suita; Yutaka Nagai, Koshigaya; Kenji Fujiwara, and Takahiro Sakai, both of Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Division of Ser. No. 761,020, Jan. 21, 1977, Pat. No. 4,138,394. This application Nov. 21, 1977, Ser. No. 853,302
Claims priority, application Japan, Jan. 24, 1976, 51/6926; Aug. 30, 1976, 51/103505; Aug. 30, 1976, 51/103506
Int. Cl.² G01N *31/14*
U.S. Cl. 435—24 **9 Claims**

1. A method of measuring collagenase activity which comprises contacting a compound having the structure

A-Pro-B-Gly-C-Ala-Gly-E

with collagenase in an aqueous medium whereby said compound is hydrolyzed to release peptide fragments, extracting the released peptide fragments containing A with an organic solvent, and assaying the extract by subjecting the extract to colorimetry, said A being a hydrophobic, and neutral or acidic chromophore selected from the group consisting of 2,4-dinitrophenyl, 5-dimethyl-amino-1-naphthalene-sulfonyl, p-phenylazobenzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-(4-hydroxy-1-naphthylazo)-benzenesulfonyl and p-phenylazobenzoyl, said B being an amino acid residue of an alpha-amino

acid having up to 15 carbon atoms occurring in protein, said C being Ile or Leu, said E being Gln-D-Arg-OH or D-Arg-OH, and all the amino acid residues except for Gly being L-configuration unless otherwise stated.

4,176,010

METHOD OF PRODUCING PETROLEUM COKE CALCINATE

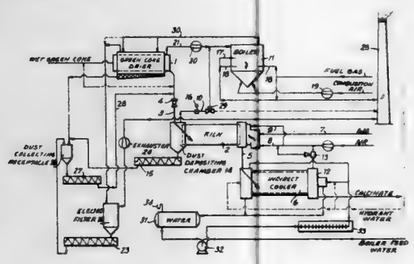
Max Dudek, and Otto Tieke, both of Lingen, Fed. Rep. of Germany, assignors to Wintershall Aktiengesellschaft, Kassel, Fed. Rep. of Germany

Filed Jul. 18, 1977, Ser. No. 817,115

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1976, 2633789

Int. Cl.[2] C10B *49/06, 51/00*

U.S. Cl. 201—27 **3 Claims**



1. An improved method of producing petroleum coke calcinate with a residual hydrocarbon content of not more than 0.1% by weight from wet green coke in a cylindrical rotary kiln with a one-way gas flow comprising the steps of

(1) indirectly drying the wet coke in a revolving dryer with flue gas having a temperature of 400°–450° C. to a residual moisture content of about 0.5–7.0% by weight;

(2) calcining and heating the dried green coke from step (1) in a revolving calciner;

(3) indirectly cooling the product of step (2) in a revolving cooler at a temperature of 100°–200° C.;

(4) removing simultaneously the dust-laden vapors from the indirect drying and calcining steps (1) and (2) and mixing the same with lean gas;

(5) burning the vapor-gas mixture from step (4) in a boiler-steam generator with air to a flue gas at a temperature of 400°–450° C.;

(6) conducting said flue gas to the indirect drying step (1) for heating purposes whereby the temperature of the flue gas decreases to about 280°–320° C.;

(7) separating coke dust from the cooled flue gas from step (6) electrostatically to a residual dust content on a dry basis of less than 100 mg/nm^3 in said flue gas;

(8) discharging the gas from step (7) to the atmosphere; and

(9) feeding coke dust collected in process steps (1), (2) and (7) in dose quantities to the dried-green coke being calcined in order to maintain a uniform flow behavior of the coke during calcination.

4,176,011

METHOD FOR OPERATING COKE OVEN CHAMBERS IN CONNECTION WITH A PREDRYING PLANT FOR THE COAL

Johannes Knappstein, Recklinghausen, Fed. Rep. of Germany, assignor to Firma Carl Still, Fed. Rep. of Germany

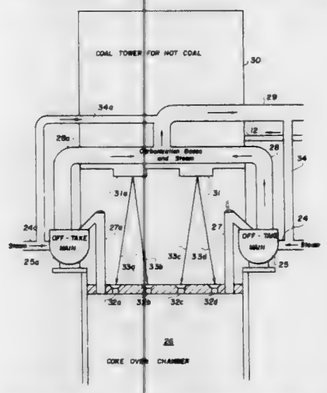
Filed Oct. 14, 1977, Ser. No. 842,100

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1976, 2647079

Int. Cl.[2] C10B *27/00, 57/10*

U.S. Cl. 201—40 **6 Claims**

1. A method of operating a coke oven battery in connection with a plant for predrying and preheating a coal to be coked, comprising preheating and/or predrying moist coke oven charge coal by bringing it into contact with a current of hot inert gas to remove water from the charge coal, and with the inert gas comprising a gas containing only a small amount of oxygen and the balance of nitrogen, carbon dioxide and steam, charging the preheated and/or predried coal into the coke



oven for heating the coal to form coke and coke oven gases, directing the coke oven gases generated in the coke oven out through an offtake, and adding an amount of steam to the offtake which corresponds approximately to the amount of water removed from the charge coals during preheating and/or predrying.

4,176,012

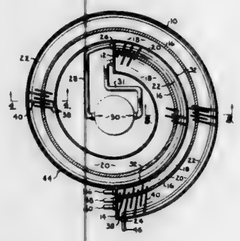
ADJACENT LOOP DISTILLATION

Jeffrey J. Bryant, 6727 Woodland, Shawnee, Kans. 66218

Filed Jan. 10, 1978, Ser. No. 868,440

Int. Cl.[2] C02B *1/06*

U.S. Cl. 202—172 **19 Claims**



1. Distillation apparatus comprising:

a substantially deaerated conduit having an inlet end and an outlet end with one of said ends being an inner end and the other an outer end, said conduit arranged in a generally spiral-like configuration about said inner end to present a plurality of generally laterally adjacent loops of said conduit extending continuously from said inner end to said outer end, each pair of adjacent loops presenting therein an upstream loop and downstream loop relative to said inlet end;

a partial partition in said conduit extending from said inlet to said outlet end and dividing the conduit into an inside distilland trough and an outside distillate trough for carrying an impure liquid to be distilled and the distillate derived therefrom, respectively; and

means communicating with said inlet end for delivering the impure liquid to the distilland trough at a selected temperature and pressure and for flow of said impure liquid and vapor arising therefrom along said distilland trough toward said outlet end and accompanying flow of said vapor under centrifugal force across said partition to said distillate trough, whereby said vapor will tend to collect in said distillate trough and condense therein,

each pair of adjacent, upstream and downstream loops of said conduit having a common, heat-conducting wall between the distillate trough of the upstream loop and the distilland trough of the adjacent downstream loop,

said common wall of each pair of adjacent loops transferring heat to the downstream distilland trough given off as the evaporating liquid condenses in the distillate trough of the upstream loop, whereby the impure liquid is continuously vaporized and condensed.

4,176,013

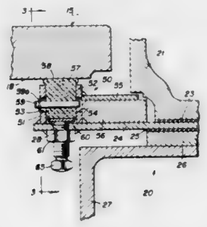
COKE OVEN DOOR SEAL ASSEMBLY

Donald R. Garthus, Perrysburg, and L. T. Robinson, Swanton, both of Ohio, assignors to Interlake, Inc., Oak Brook, Ill.

Filed Jan. 23, 1978, Ser. No. 871,182

Int. Cl.[2] C10B *25/16*

U.S. Cl. 202—242 **7 Claims**



1. In a coke oven having a door opening with a first surface extending around the periphery thereof and a door with a second surface extending around the periphery thereof and disposable in a closed configuration for closing the door opening, a door seal assembly comprising two spaced-apart retaining members mounted on one of said first and second surfaces and extending outwardly therefrom and cooperating therewith to define a channel, said retaining members being respectively provided with longitudinally spaced-apart pairs of laterally aligned openings therethrough, a resilient heat-resistant seal body secured in said channel between said retaining members and extending outwardly therebeyond for sealing engagement with the other of said first and second surfaces around the entire periphery thereof when the door is disposed in the closed configuration thereof, attachment pins respectively extending through said pairs of aligned openings and through said seal body for securing said seal body in said channel, continuous bearing means disposed in said channel between said seal body and said one of said first and second surfaces and extending substantially around the entire periphery thereof, and control means adjustably mounted for engagement with said bearing means to urge it throughout its length into engagement with said seal body with a variable pressure, whereby adjustment of said control means effects a corresponding adjustment of the pressure with which said seal body engages the other one of said first and second surfaces when the door is disposed in the closed configuration thereof.

4,176,014

PROCESS FOR THE PRODUCTION OF COIN BLANKS

Michael J. H. Ruscoe, St. Albert; Maurice A. Clegg, Fort Saskatchewan; Willie H. Seibt, Edmonton, and Kshitindra M. Sarkar, Saskatoon, all of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Jan. 2, 1979, Ser. No. 36

Claims priority, application Canada, Oct. 31, 1978, 315495

Int. Cl.[2] C25D *7/00, 5/50, 17/20*

U.S. Cl. 204—23 **2 Claims**

1. A process for the production of coin blanks suitable for minting into coins, including providing metal coin core pieces of disc-like shape each having opposed faces from about 14 mm to about 40 mm in diameter and a face to face thickness of from about 0.5 mm to about 2.6 mm, loading a charge of core pieces into a non-conducting perforated container with a diameter of from about 15 cm to about 50 cm, the number of core pieces in the container being such that the core pieces occupy from about ¼ to about ½ of the container volume, placing the container in an electroplating bath, electroplating a metallic cladding on the core pieces, while moving the container angularly about a horizontal axis, at a voltage of from about 6 volts to about 18 volts and a current density of from about 470 A/m^2 to about 1400 A/m^2 based on the exposed area of the charge until a plating thickness of from about 0.03 mm to about 0.08 mm of metal has been deposited on each face of each core piece and a thickness of from about 2 to about 4 times the face thickness has been deposited on the circumference of each core piece, removing the cladded core pieces from the container, and heating the cladded core pieces to form a metallurgical bond between the metallic cladding and core piece of each cladded core piece and to reduce the hardness to less than 65 on the Rockwell 3OT hardness scale.

4,176,015

METHOD FOR CHROMIUM ELECTROPLATING OF BARS

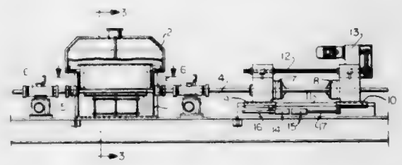
Sergio Angelini, Milan, Italy, assignor to Fiat, S.p.A., Turin, Italy

Filed Oct. 19, 1977, Ser. No. 843,553

Claims priority, application Italy, Oct. 27, 1976, 28736 A/76

Int. Cl.[2] C25D *5/22, 7/00*

U.S. Cl. 204—28 **6 Claims**



1. A method for electroplating metal bars which comprises:

mechanically and electrically connecting said bars to form an uninterrupted row,

immersing in an electroplating bath an anode means adapted to substantially surround at least a portion of a bar while being spaced therefrom,

said anode means having a longitudinal slot therein,

mounting a stationary brush means in said slot adapted to contact a bar in the anode means,

passing the bars through the anode means in a straight path while rotating the bars about their longitudinal axes, and

concurrently slideably forcing said stationary brush means against the bar,

whereby the bar surface is continuously cleaned by a brushing action during electroplating.

V 9 8 1 4 N 0 2 7 7 9 UMI

4,176,016
FORMING ELECTRICALLY INSULATING LAYERS BY SPUTTER DEPOSITION

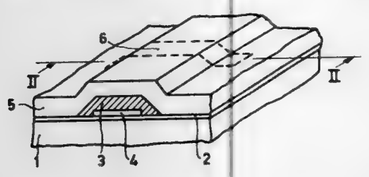
Gerrit J. Koel, and Lambertus Postma, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 13, 1978, Ser. No. 877,167

Claims priority, application Netherlands, Feb. 15, 1977, 7701559

Int. Cl.[2] C23C *15/00*

U.S. Cl. 204—38 R **5 Claims**



1. A method of manufacturing an electrical device in which at a certain stage of the manufacture an electrically insulating layer is formed on the surface of a substrate bearing a metal pattern projecting above said substrate surface, said method comprising the step of growing the metal pattern on the substrate by electrodeposition and producing the electrically insulating layer by means of a two-stage sputter deposition process, characterized in that during the first stage of the sputter deposition process, a sputter-etching step is simultaneously performed at a rate which removes both electrically insulating material sputtered on to the edges of the metal pattern and electrodeposited metal at the edges and sides of the metal pattern so as to produce sides of said metal pattern which are inclined with respect to the substrate surface, but which rate of sputter-etching is just not sufficient to entirely remove the electrically insulating material sputtered on to the surface of the metal pattern which is substantially parallel to said surface of the substrate, the sputter etching step then being terminated and during the second stage of the sputter deposition process the sputtering of the electrically insulating layer being continued until said layer has a desired thickness.

4,176,017
BRIGHTENING COMPOSITION FOR ACID ZINC ELECTROPLATING BATH AND PROCESS

Sylvia Martin, Detroit, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

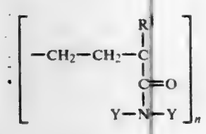
Filed Jan. 31, 1979, Ser. No. 7,740

Int. Cl.[2] C25D *3/22*

U.S. Cl. 204—55 R **9 Claims**

1. An aqueous zinc electroplating bath having a pH of about 0 up to about 6.5 containing an effective amount of a mixture of

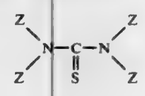
(a) a primary brightener comprising a polymer selected from the group consisting of polyacrylamide polymers and N-substituted polyacrylamide derivatives and copolymers thereof of the formula:



wherein:

Y may be the same or different and is R or RX, where R is H or C_{1-10} aliphatic radical, where X is H, OH, $COOR^1$, $COON[R^1]_2$, SO_3M, CN, $N[R^1]_2$ or OR, where M is H or a Group I or II metal; R^1 is H or C_{1-2} alkyl radical; and n is 2 to 2,000,000, and copolymers of said polymer and a solubilizing agent present in an amount up to 25 mole percent of the copolymer selected from the group consisting of methacrylic acid, acrylic acid, acrylonitrile, methacrylonitrile, vinyl C_{1-5} alkyl esters, vinyl halide, eiphalohydrin, vinylidine halide, alkylene oxide and mixtures thereof; and

(b) a secondary brightener and mixtures thereof selected from the group consisting of boric acid and Group I and II metal salts thereof; and/or thiourea and N-substituted derivatives thereof of the formula:



wherein:

Z may be the same or different and is R^2 or R^2X^1, where R^2 is H, C_{1-8} aliphatic radical, C_{6-10} aryl radical, C_{5-9} heterocylic nitrogen radical; where X^1 is H, OH, $COOR^3$, $COON[R^3]_2$, SO_3M^1, CN, $N[R^3]_2$, OR^3, or PO_4M^1, where R^3 is H or C_{1-2} alkyl radical and M^1 is H or a Group I or II metal, and where Z on one N can form a cyclic with Z on other N; and further including the sulfur adducts of said thiourea and N-substituted derivatives thereof selected from the group consisting of propane sultone, haloacetic acid, halosulfonic acid, and mixtures thereof.

4,176,018
ELECTROLYTE AND PROCESS FOR ELECTROLYTIC PRODUCTION OF FLUORINE

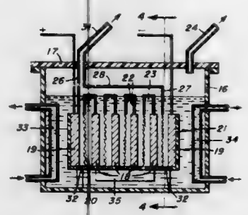
Robert Faron, Nyons, and Annie Cathala, Livron, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Continuation-in-part of Ser. No. 666,495, Mar. 12, 1976, Pat. No. 4,139,447. This application Nov. 3, 1978, Ser. No. 957,447

Claims priority, application France, Mar. 21, 1975, 75 09564

Int. Cl.[2] C25B *1/24, 9/00*

U.S. Cl. 204—60 **5 Claims**



1. In a process for the production of fluorine by electrolysis of a ternary electrolyte comprising as essential constituents $NH_4F+KF+HF$ in an electrolytic cell, the improvement comprising:

(a) operating the cell with the ternary electrolyte having the composition:

NH_4F = about 5 to about 20 mol % of NH_4F+KF

HF = about 40 to about 45% in weight percent of $NH_4F+KF+HF$;

and

(b) maintaining the working temperature of the electrolyte between about 50 and about 75° C.

4,176,019
PROCESS AND APPARATUS FOR TREATMENT OF WASTE GASES

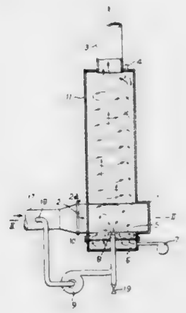
Finn H. Dethloff, Oslo, Norway, assignor to Ardal og Sunndal Verk a.s., Oslo, Norway and Alcan Research and Development Limited, Montreal, Canada

Filed Mar. 10, 1978, Ser. No. 885,209

Claims priority, application United Kingdom, Mar. 10, 1977, 10212/77

Int. Cl.[2] B04C *3/06;* **B01D** *53/06;* **B01J** *8/14;* **C25C** *3/06*

U.S. Cl. 204—67 **25 Claims**



24. In a method of operating a group of electrolytic cells for the electrolytic production of aluminium by passage of electric current between an anode and a cathode in electrical contact with a molten bath of a fluoride-containing flux in which alumina is dissolved, including drawing off a waste gas stream from said group of cells and passing said waste gas stream to a scrubbing system for removal of gaseous fluoride values therefrom, said system including one or more treatment chambers, the improvement which comprises diminution of gaseous fluoride components from said waste gas stream by treatment of said waste gas with a flow of particulate alumina in an amount substantially less than the total requirements of the group of cells by causing said waste gas stream to follow an upward helical path in said treatment chamber or chambers, introducing a flow of particulate alumina into said helical path, allowing said alumina to descend through said gas stream travelling in said helical path, collecting said alumina after contact with said gas in said helical path, supplying said collected alumina to a part of said group of cells and supplying fresh alumina to the remainder of said cells.

4,176,020
PROCESS FOR ELECTROLYTIC DIMERIZATION OF N-SUBSTITUTED PYRIDINIUM SALT

Teruyuki Misumi; Susumu Furuhashi, both of Yokohama, and Masaaki Shiga, Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 16, 1978, Ser. No. 887,131

Claims priority, application Japan, Mar. 23, 1977, 52/31108; Jan. 31, 1978, 53/8959

Int. Cl.[2] C25B *3/10*

U.S. Cl. 204—72 **8 Claims**

1. A process for the preparation of an N,N'-disubstituted tetrahydro-4,4'-bipyridyl by electrolytic dimerization of the corresponding N-substituted pyridinium salt which process is characterized by the steps of:

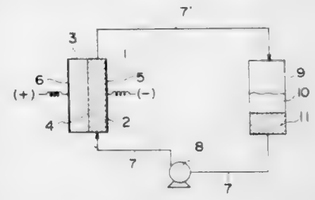
(1) flowing an aqueous catholyte containing an N-substituted pyridinium salt through an electrolytic cell having an anode, a cathode and at least one diaphragm disposed between the anode and the cathode at its cathode chamber at a linear velocity, in the cathode chamber, of at least 0.1 m/sec., said electrolytic cell being connected, through a circulation passage comprising a transferring passage and a feeding passage, with an extractor disposed outside said electrolytic cell, while applying electric current between said anode and said cathode, thereby to form an N,N'-disubstituted tetrahydro-4,4'-bipyridyl corresponding to said N-substituted pyridinium salt on the surface of the cathode and simultaneously remove said bipyridyl from the surface of the cathode into the aqueous catholyte flowing through the electrolytic cell;

(2) transferring the aqueous catholyte containing said bipyridyl to the extractor through the transferring passage and contacting said aqueous catholyte containing said bipyridyl with a water-immiscible organic solvent in said extractor to extract said bipyridyl into said organic solvent;

(3) separating the resulting aqueous phase from the resulting organic phase;

(4) feeding the separated aqueous phase alone back to the electrolytic cell through the feeding passage; and

(5) continuously repeating the steps (1), (2), (3) and (4).



4,176,021
FABRICATION OF ALKALINE BATTERIES

Thomas D. O'Sullivan, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 27, 1978, Ser. No. 973,712

Int. Cl.[2] C25B *1/00;* **C25C** *7/02*

U.S. Cl. 204—96 **12 Claims**

1. A process for producing alkaline batteries with nickel electrodes in which the nickel electrodes are made by electrolytic loading of a porous structure including the step of passing current through the porous structure, an aqueous electrolyte comprising nickel ions, and a counter electrode characterized in that the counter electrode is at least partially coated with a substance comprising cobalt compound with 50–60 weight percent cobalt.

4,176,022
REMOVAL OF PART PER BILLION LEVEL HARDNESS IMPURITIES FROM ALKALI METAL CHLORIDE BRINES

William B. Darlington, Portland, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 27, 1978, Ser. No. 900,457

Int. Cl.[2] C25B *1/16, 1/26;* **C01F** *25/32*

U.S. Cl. 204—98 **32 Claims**

1. A method of electrolyzing an alkali metal chloride brine in an electrolytic cell having an anolyte compartment separated from a catholyte compartment by a semi-permeable barrier which method comprises:

maintaining a calcium ion containing brine alkaline;

adding a phosphate chosen from the group consisting of phosphoric acid, sodium orthophosphate, sodium metaphosphate, sodium polyphosphate, potassium orthophosphate, potassium metaphosphate, potassium polyphosphate, and mixtures thereof to said alkaline brine whereby to form an insoluble precipitate having the stoichiomatic formula $(CaX_2) \cdot (Ca(PO_4)_2)_3$ wherein X is chosen from the group consisting of F, Cl and OH;

separating the precipitate from the brine;

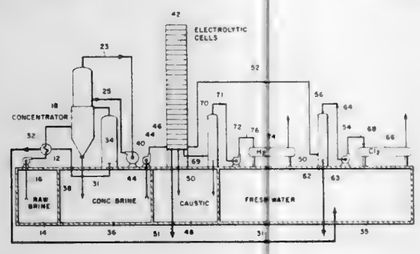
feeding the brine, containing less than 20 parts per billion of calcium ion, to the anolyte compartment of the cell; and

passing an electrical current through the cell.

4,176,023
DELSALINIZATION AND CHEMICAL EXTRACTION PROCESS

Donnie D. Childress, Braggs, Okla., assignor to Desal-Chem, Inc., Tulsa, Okla.

Filed Oct. 5, 1978, Ser. No. 948,668
Int. Cl.² C25B *1/28, 1/20;* **B01D** *3/10;* **C25B** *1/02*
U.S. Cl. 204—98 **3 Claims**



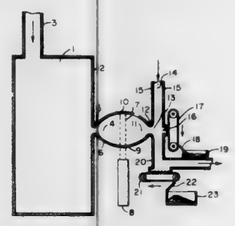
1. A combined desalinization and chemical extraction process for brinewater having a salinity of 7½% to 9% which method comprises introducing said brinewater into a concentrator of the type having closed upper and lower chambers interconnected by a plurality of parallel spaced vertical tubes surrounded by a closed shell extending between said chambers; heating said brinewater within said concentrator until the brinewater reaches its boiling temperature; withdrawing vapors from said upper chamber and separately compressing said vapors so as to create a partial vacuum within said upper chamber; introducing the compressed vapors into the concentrator in the spaces between said tubes and said shell so as to allow condensation in said spaces; removing condensed fresh water from said spaces between said tubes; removing brinewater concentrated to 28% salinity from said lower chamber; conducting said concentrated brinewater to a plurality of electrolytic cells having positively charged anodes and negatively charged cathodes; electrolyzing with low-voltage direct current said concentrated brinewater within said cells to release chlorine gas, caustic alkali containing primarily sodium hydroxide, a small amount of hydrogen gas and an inert material containing calcium and magnesium oxides; conducting said caustic alkali from said electrolytic cells; conducting said inert material from said electrolytic cells; conducting said chlorine gas from said electrolytic cells to a mist extractor separator to remove any impurities; compressing said pure chlorine gas to form liquid chlorine; and removing said hydrogen gas from said electrolytic cells.

4,176,024
GAS DYNAMIC REACTION PROCESS AND SYSTEM FOR LASER CHEMISTRY

Max Garbuny, Wilkinsburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 28, 1975, Ser. No. 599,494
Int. Cl.² B01J *1/10;* **B01K** *1/00*
U.S. Cl. 204—157.1 R **28 Claims**

16. A method of preferentially activating an isotopic species in an isotopically mixed gas comprising producing a moving, unidirectional stream of said gas, the individual members of which have a forward component of velocity at least 10 times greater than their lateral component of velocity, directing a substantially monochromatic light beam at said stream, said light having a frequency which preferentially activates an isotopic species of said gas to an excitation state suitable for chemical reaction, said light beam being incapable of significantly deflecting activated members from non-activated members in said stream, and permitting said activated members and said non-activated members to travel intermixed together as a

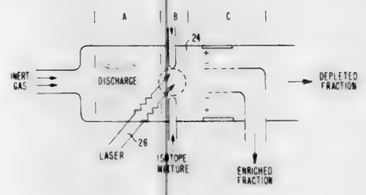


single stream without contact with non-gaseous matter until collected.

4,176,025
ISOTOPE DISSOCIATION SELECTIVE ELECTRON ATTACHMENT AND SEPARATION

Cheng-Lin Chen, and Peter J. Chantry, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 27, 1975, Ser. No. 608,306
Int. Cl.² B01J *1/10*
U.S. Cl. 204—157.1 R **7 Claims**

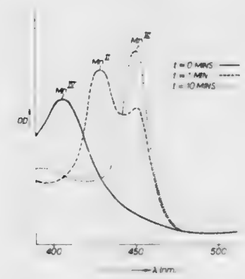


1. A method for separating a preselected fragment of a given molecule comprising a preselected isotope out of a gaseous mixture including the given molecule including the steps of:
at least partially confining the gaseous mixture within a bounded container;
selectively exciting the given molecule within the gaseous mixture with only one photon to raise the given molecule to an excited state below its ionization state;
exposing the excited molecules to free electrons generated from an electron source external of the gaseous mixture, having energy at least equal to the dissociation energy of the given molecule in its ground state minus the sum of the energy of the given molecule in its excited state over its ground state and the electron affinity of the fragment of the given molecule to which the electron attaches, which then dissociates to form fragments one of which is the preselected fragment;
concentrating the preselected fragments of the given molecule within a portion of the gaseous mixture so that the portion of the gaseous mixture receiving the concentration of the preselected fragments is substantially enriched in the preselected fragments; and
separating the portion of the gaseous mixture enriched in the preselected fragments resulting from dissociative electron attachment from the remainder of the gaseous mixture so the enriched portion can be processed to recover the preselected isotope in a preferred form.

4,176,026
PROCESS FOR CATALYTIC PHOTO-OXIDATION OF WATER

Anthony Harriman, and George Porter, both of London, England, assignors to National Research Development Corporation, London, England

Filed Apr. 12, 1978, Ser. No. 895,555
Claims priority, application United Kingdom, Apr. 13, 1977, 15369/77
Int. Cl.² B01J *1/10*
U.S. Cl. 204—157.1 R **19 Claims**



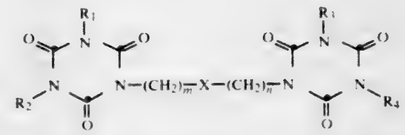
1. A process for the catalytic photo-oxidation of water by visible light which process comprises irradiating with light in the visible region of the spectrum a solution comprising:
(i) water,
(ii) as photocatalyst, a starting manganese complex which is a manganese (II) or manganese (III) complex of formula Mn L wherein L is a phthalocyanine ligand, a 5,10,15,20-tetraphenylporphyrin ligand or a 5,10,15,20-tetrapyridyl porphyrin ligand, each of said ligands optionally being substituted by further substituents, the said starting manganese complex being capable of undergoing a transition into an excited state on irradiation with visible light with subsequent conversion to the corresponding manganese (IV) complex, and
(iii) a compound which is an electron acceptor and which is a sufficiently powerful oxidising agent to abstract electrons from the excited manganese complex, the pH of the reaction mixture being chosen so that upon irradiation, the starting manganese complex will be oxidised to the corresponding manganese (IV) complex and the electron acceptor will be reduced to form a reduced electron acceptor and so that, subsequently, the manganese (IV) complex will be reduced back to the corresponding manganese (II) complex with concomitant conversion of water into oxygen.

4,176,027
SHAPED ARTICLE OF RADIATION CROSSLINKED TRIAZINE-TRIONE POLYMERIC COMPOSITION

Alan J. Gotcher, Sunnyvale; Paul B. Germeraad, Palo Alto, and Larry J. White, San Jose, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Sep. 13, 1977, Ser. No. 832,969
Int. Cl.² C08F *8/00*
U.S. Cl. 204—159.15 **2 Claims**

1. A shaped article which article is the product of the process of subjecting a composition comprising a radiation crosslinkable polymer and from about 0.1 weight percent up to about 50 weight percent of at least one compound of the structural formula:



wherein R_1, R_2, R_3 and R_4 are independently vinyl, allyl, methallyl, propargyl, crotyl, C_1 to C_{18} alkyl or an aryl moiety having 6 to 14 ring carbons, any of which R_1 through R_4 groups may be unsubstituted or substituted with one or more inert substituent groups; wherein the X moiety is a saturated or unsaturated aliphatic moiety of 1 to 12 carbons, or saturated or unsaturated C_1 to C_{18} heteroaliphatic, a C_5 to C_{18} heteroaromatic, or C_5 to C_{18} alicyclic or heterocyclic, and wherein m and n are independently 0 or an integer of 1 to 12 to at least one forming operation at a temperature in excess of the melting point of the major polymeric constituent of said composition and thereafter subjecting said article to ionizing radiation at a dose level of about 1 to 40 megarads.

4,176,028
PLASTISOLS MADE WITH POLYELECTROLYTE BINDERS

Boynton Graham, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

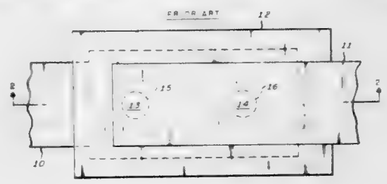
Filed Mar. 22, 1977, Ser. No. 780,086
Int. Cl.² C08F *263/00*
U.S. Cl. 204—159.16 **11 Claims**

1. A thermally coalescible non-aqueous resin dispersion plastisol or organosol of single-phase particles of a random polymer or copolymer which comprises an organic polyelectrolyte that contains at least 1% by weight of an ionizable monomer or comonomer, said organic polyelectrolyte being polymer produced by the addition polymerization of ethylenically unsaturated monomer, dispersed in a medium that comprises a liquid that is nonvolatile at room temperature and is compatible with and a plasticizer for the resin, the liquid portion of said dispersion containing a photopolymerizable ethylenically unsaturated monomeric compound and at least one photoinitiator, said dispersion being coalescible to a clear dry film containing said organic polyelectrolyte and liquid plasticizer.

4,176,029
SUBMINIATURE BORE AND CONDUCTOR FORMATION

Don W. Jillie, Jr., Arlington, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 2, 1978, Ser. No. 882,826
Int. Cl.² C23C *15/00*
U.S. Cl. 204—192 S **8 Claims**

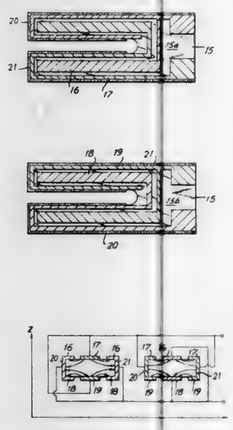


1. The method making a current controlling device including the steps of:
selecting a substrate,
depositing a first electrically super- conductive layer on said substrate,

depositing a first electrically insulative permanent layer on said first electrically super-conductive layer,
depositing a second electrically insulative permanent layer on said first electrically insulative permanent layer,
forming a resist pattern exposing a predetermined portion of said second electrically insulative permanent layer where said hole is to be formed through said insulative permanent layers,
exposing said second electrically insulative permanent layer to bombardment by reactive energized gaseous ions for forming a first portion of said hole,
removing said resist pattern,
exposing said first electrically insulative permanent layer to an acid etch for forming a second portion of said hole, and
depositing a linking super-conductor within said hole and said second electrically super-conductive layer upon said second insulative permanent layer as an integral entity.

4,176,030
METHOD FOR FORMING A QUARTZ CRYSTAL VIBRATOR

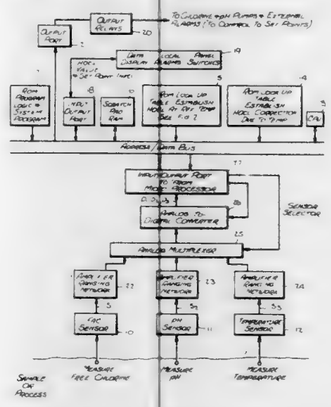
Mutsumi Negita, Minowa, Japan, assignor to Matsushima Kogyo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 801,982, May 31, 1977. This application Apr. 26, 1978, Ser. No. 900,222
Claims priority, application Japan, May 31, 1976, 51-63135
Int. Cl.² C23C 15/00
U.S. Cl. 204—192 R **3 Claims**



1. A method of forming a quartz crystal vibrator comprising the steps of coating a quartz crystal plate having opposed planar surfaces with a thin conductive film material adapted to be selectively resistant to a first predetermined etchant; coating said thin film conductive layer with a photo-resist layer to define at least a two electrode configuration on said opposed planar surfaces; applying a first etchant capable of cutting said quartz crystal plate to thereby form the shape of said quartz crystal vibrator; applying a second etchant to remove the thin film conductive material on the opposed planar surfaces of said plate that are free of said photo-resist layer and thereby define said electrode configurations on the opposed planar surfaces of said quartz crystal plate; and sputtering a thin conductive film layer on at least a portion of the side surfaces of said quartz crystal vibrator plate to electrically connect electrode configurations formed on the periphery of the opposed planar surfaces of the quartz crystal plate together.

4,176,031
DIGITAL HYPOCHLOROUS ACID ANALYZER

Richard Rosenblum, Doylestown, Pa., assignor to Fischer & Porter Co., Warminster, Pa.
Filed Mar. 17, 1978, Ser. No. 887,482
Int. Cl.² G01N 27/46
U.S. Cl. 204—195 R **9 Claims**



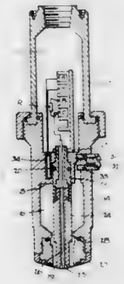
1. An analyzer for continuously and accurately determining the hypochlorous acid content of chlorinated water containing free available chlorine having a hypochlorous acid component (HOCl) which is highly reactive, and a hypochlorite ion component (OCl^-) which is a less reactive disinfectant, said analyzer comprising:
first second and third probes to sense respectively the free available chlorine content (FAC), the pH factor and temperature in a sample of the chlorinated water to produce respective analog signals representative of these variables;
means to convert said analog signals into corresponding digital input data; and
a digital computer responsive to said input data to produce output data indicative of the HOCl content of the sample, said computer including a first memory storing the relationship existing at a reference temperature between the percentage of HOCl and OCl^- in a predetermined range of pH values, and a second memory storing the relationship existing between temperature and the equilibrium constant of HOCl, means consulting the first memory and responsive to the input pH data to establish the percentage of HOCl in the sample, means consulting the second memory and responsive to the input T data to correct the established percentage of HOCl to produce a temperature-corrected HOCl percentage value, and means to multiply the temperature-corrected percentage value with the input FAC data to produce an output representing the HOCl content.

4,176,032
CHLORINE DIOXIDE ANALYZER

Roberts G. Stevenson, Jr., New Britain, Pa., assignor to Fischer & Porter Co., Warminster, Pa.
Filed Mar. 3, 1978, Ser. No. 883,284
Int. Cl.² G01N 27/46
U.S. Cl. 204—195 P **9 Claims**

1. A system adapted to continuously and accurately measure the concentration of chlorine dioxide dissolved in water which also has oxygen dissolved therein, the system being provided with a sensor immersed in the water being tested to afford in situ measurements, said sensor comprising:
(A) an insulating casing having an electrolyte chamber therein whose open mouth is exposed to the water being tested, said chamber being filled with an electrolyte constituted by a halide salt in a water solution;

(B) a membrane assembly covering the mouth of the chamber to isolate the chamber from the water, said assembly being provided with a hydrophobic diffusing membrane permeable to chlorine dioxide and impermeable to water whereby chlorine dioxide dissolved in the water diffuses through the membrane to enter into said chamber and react with said electrolyte;
(C) an electrode assembly disposed within said chamber, said assembly including a noble-metal measuring electrode and an oxidizable-metal counter electrode, said electrodes being bridged by the electrolyte to define an electrochemical cell which in the absence of chlorine dioxide produce a reaction causing the measuring electrode to become negatively polarized and the counter electrode to become positively charged and which in the presence of chlorine

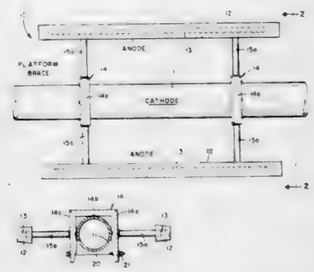


dioxide produces a reaction causing the measuring electrode to become partially depolarized to render it receptive to electrons resulting from the oxidation of the counter electrode whereby the resultant current flow has an intensity depending on the concentration of the chlorine dioxide, said noble-metal being selected from a class consisting of gold and platinum and the oxidizable metal being selected from a class consisting of copper and silver, said electrolyte including a complexing agent to react with ions produced by the counter electrode to inhibit the build-up of an oxide layer thereon, thereby maintaining said counter electrode clean and functional; and
(D) means to impress a potential across said electrodes causing said cell to function in a current region in which dissolved oxygen in the water being tested offers no interference with said current flow as a function of chloride dioxide concentrations.

4,176,033
ANODE CLAMP ASSEMBLY AND METHOD OF INSTALLATION

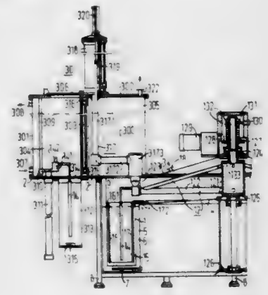
James M. Council, Slidell, La., assignor to Exxon Production Research Company, Houston, Tex.
Filed Apr. 10, 1978, Ser. No. 895,212.
Int. Cl.² C23F 13/00
U.S. Cl. 204—197 **20 Claims**

1. An anode clamp assembly for connection to a submerged cylindrical support member for an offshore platform comprising:
at least two U-shaped members each having three straight sides;
means for connecting the free ends of two of said sides of each U-shaped member to each other to clamp said U-shaped members to said support member, said sides of each of said U-shaped members contacting said support member at at least three spaced-apart points;
at least one metallic anode spaced from said U-shaped members and extending longitudinally of said support member;
a metallic core embedded in said anode and extending longitudinally therewith; and
at least two laterally extending arms connecting said core to at least one side of each of said U-shaped members providing electrical contact between said anode and said U-shaped members, each of said U-shaped members extending over said support member to facilitate clamping said U-shaped members to said support member.



4,176,034
APPARATUS FOR THE ELECTRODEPOSITION OF ALUMINUM

Klaus Stöger; Richard Dötzer, both of Nuremburg; Josef Stadter, Erlangen, and Johann Gehring, Spardorf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Apr. 14, 1978, Ser. No. 896,378
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1977, 2716805
Int. Cl.² C25D 3/44, 5/34
U.S. Cl. 204—200 **14 Claims**



1. Apparatus for the electrodeposition of aluminum from aprotic, oxygen- and water-free, organo-aluminum electrolytes, comprising an electroplating trough which is closed to the outside and to which a protective gas can be admitted; a contact and holding device arranged within the electroplating trough; and a lock chamber which is arranged above the electroplating trough, can be flooded with protective gas and in which a work piece transfer device is arranged which can be operated from the outside, characterized by the feature that the lock chamber (**30, 40**) is subdivided by means of an intermediate door (**303, 403**) into an outer chamber (**304, 404**) with an outer lock door (**306, 406**) and a main chamber (**305, 405**) which is connected to the electroplating trough (**1, 2, 3, 4**) by an opening (**9, 10**), and that a work piece transfer device (**317, 417**) is provided which can be moved between the outer chamber (**304, 404**) and the main chamber (**305, 405**) if the intermediate door (**303, 403**) is open.

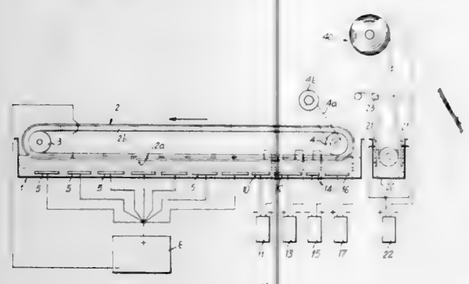
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4,176,035

INSTALLATION FOR THE PRODUCTION OF A COPPER FOIL INTENDED TO BE APPLIED TO A DIELECTRIC SUBSTRATE

Antonio Pedone, Tournai, Belgium, assignor to Societe dite Coppertron S.A., Tournai, Belgium

Filed May 5, 1978, Ser. No. 903,120
Claims priority, application Belgium, May 10, 1977, 854450
Int. Cl.² C25D *17/00, 3/10, 3/38*
U.S. Cl. 204—205 **4 Claims**



1. An installation for the production of copper foils intended to be applied particularly to substrates of plastic material, comprising;

a first tank for containing an electrolytic solution therein;

an endless belt made of electrically conductive material mounted in said tank for continuous movement of the lower portion of the belt in one direction including means for immersing the lower surface of said lower portion in an electrolyte, contained in said tank

a first series of plates to be immersed in said electrolyte spaced from an upstream section of said lower portion of said endless belt, said series of plates comprising anodes and said endless belt comprising a cathode when subjected to an electrical potential having the appropriate polarity;

a second series of plates to be immersed in said electrolyte spaced from said belt and successively spaced downstream from said first series of plates;

means to apply to each of said second series of plates and to the respective portions of said belt adjacent each of said plates direct current potentials of respective alternate polarities whereby a layer of copper electrolytically deposited on said belt will be subjected to sudden interruptions of deposition;

and a second tank disposed downstream of said first tank for containing another electrolytic solution for depositing on the layer of copper from said first tank a thin layer of metal chemically compatible with said copper and with a plastic material with which the copper layer is to be associated.

4,176,036

ELECTRODE FOR PORTABLE ELECTROPLATING

Felix R. Rapids, 5050 S. East End Ave., Chicago, Ill. 60615

Continuation-in-part of Ser. No. 792,657, May 2, 1977, abandoned. This application Jul. 26, 1978, Ser. No. 928,070
Int. Cl.² C25D *17/14*
U.S. Cl. 204—224 R **8 Claims**

1. A plating applicator for electroplating a relatively soft metal onto a substrate comprising

an anode composed of said relatively soft metal,

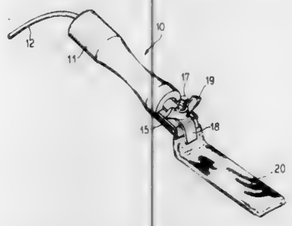
an electrically insulating handle,

a backing composed of a metal substantially harder than said relatively soft metal secured to said handle,

said backing having a plurality of countersunk apertures therethrough,

said anode being in firm contact with one face of said backing and having integral protuberances extending therefrom and exactly filling said apertures,

said protuberances having flattened terminal portions extending flush with the other face of said backing by cold flow of said portions into the countersunk apertures to hold said soft metal anode into firm engagement with said backing.

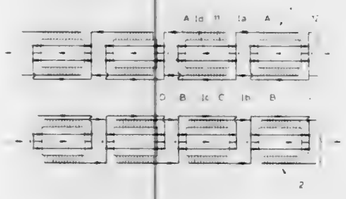


4,176,037

CONDUCTOR ARRANGEMENT FOR COMPENSATING FOR HORIZONTAL MAGNETIC FIELDS IN POTS CONTAINING A MOLTEN ELECTROLYTIC BATH

Hans G. T. Nebell, Snaroya, Norway, assignor to Årdal og Sunndal Verk a.s., Norway

Filed Jun. 16, 1978, Ser. No. 917,019
Claims priority, application Norway, Jul. 14, 1977, 772507
Int. Cl.² C25C *3/16*
U.S. Cl. 204—243 M **4 Claims**



1. In a plant for the melt-electrolytic production of aluminum, said plant being of the type including a plurality of pots arranged in at least one longitudinal row, means for serially passing current through said row of pots from one end of said row to the opposite end thereof, such that each of said pots has a positive upstream end and a negative downstream end, taken in the longitudinal direction of said row, said passing means including, for each said pot, anode means for receiving said current from the adjacent upstream pot and for introducing said current into the said positive upstream end of said each pot, and cathode means for collecting said current from said each pot and supplying said current to the said anode means of the adjacent downstream pot, the improvement comprising:

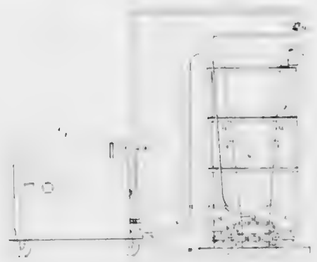
means for compensating for detrimental magnetic horizontal fields occurring at the said positive upstream end of each said pot, said compensating means comprising, for each said pot, at least one conductor means for bypassing a minor portion of said current from said positive upstream end of said each pot to said negative downstream end thereof, and for supplying said minor portion of said current to said negative downstream end, said minor portion comprising a maximum of 20% of the total anode current supply to said each pot, said conductor means extending longitudinally beneath said each pot, centrally thereof, and closely adjacent the bottom thereof.

4,176,038

WATER PURIFICATION METHOD AND APPARATUS

Karl Moeglich, Williamsville, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 663,790, Mar. 4, 1976, Pat. No. 4,094,755, which is a continuation-in-part of Ser. No. 613,289, Sep. 15, 1975, which is a continuation of Ser. No. 487,730, Jul. 11, 1974. This application Mar. 22, 1978, Ser. No. 888,939
Int. Cl.² C02B *1/82;* **C25B** *9/00*
U.S. Cl. 204—277 **15 Claims**



1. An apparatus for purifying water to agglomerate solids suspended therein for subsequent removal comprising:

a vessel having front, rear, and side walls, and having an inlet therein for admitting water to be purified and an outlet for water and agglomerated solids, the side walls of said vessel lying in a plane disposed at a vertical angle to the horizontal axis of said vessel;

at least one pair of upstanding electrodes disposed within said vessel between the inlet and the outlet, said electrodes having opposed, spaced, metal faces defining with the side walls of said vessel a water treatment chamber, said chamber being in communication with the vessel inlet and outlet;

means coupled to said electrodes for applying an alternating current thereto of a frequency of from 0.2 to 800 Hz with a current density of 0.08 to 6 amps per square inch;

means carried by said device for directing water to be purified through the inlet into said vessel, through the treatment chamber and subsequently for directing treated water from said vessel through the outlet;

means carried by said device for agitating the water to be purified, within the treatment chamber, to maintain said water in turbulence while said water is disposed between said electrodes;

conductive means disposed within said chamber between said electrodes for enhancing the alternating electrical field across said electrodes when water to be purified is disposed within said chamber.

4,176,039

ELECTROPLATING RACK

Joseph C. Wismer, 10 Sussex Rd., Bergenfield, N.J. 07621

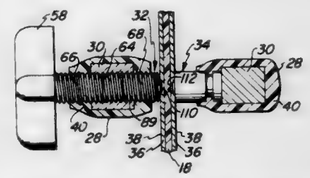
Filed Mar. 2, 1979, Ser. No. 16,806
Int. Cl.² C25D *17/06, 17/08;* **H01R** *7/08*
U.S. Cl. 204—297 W **38 Claims**

1. In an electroplating rack in which an item to be plated is secured upon the rack for immersion in a plating solution and electrical contact is made between the rack and the item, a clamp for securing and electrically connecting the item to the rack, said clamp comprising:

a clamp frame including a core of conductive material connected to the rack and a sheath of resilient insulating material covering the core;

a threaded opening in the clamp frame, the threaded opening including a first threaded portion extending through the core and having opposite ends, a second threaded portion extending from one of the opposite ends through a corresponding portion of the sheath and a third threaded portion extending from the other of the opposite ends through a further corresponding portion of the sheath;

a clamp screw having an actuating head, a clamp face and a threaded shank extending axially between the actuating head and the clamp face for reception within the threaded opening, the threaded shank including a first threaded portion of electrically conductive material for engaging the first threaded portion of the threaded opening and making electrical contact therewith, a second threaded portion of resilient insulating material extending axially between the first threaded portion of the threaded shank and the head for engaging the second threaded portion of the threaded opening, the relative dimensions and the relative resilience of the second threaded portion of the threaded shank and the second threaded portion of the threaded opening being such that a first seal is established upon engagement of said second threaded portions, a third threaded portion of resilient insulating material extending between the first threaded portion of the threaded shank and the clamp face for engaging the third threaded portion of the threaded opening, the relative dimensions and the relative resilience of the third threaded portion of the threaded shank and the third threaded portion of the threaded opening being such that a second seal is established upon engagement of said third threaded portions, whereby the first and second seals effectively isolate the engaged first threaded portions from the plating solution;



the clamp face including a conductive surface for engaging the item;

conductive means interconnecting the conductive surface with the first threaded portion of the threaded shank; and

a clamp pad on the clamp frame opposite the threaded opening for enabling the item to be clamped between the clamp screw and the clamp pad.

4,176,040

COAL LIQUEFACTION

Robert N. Hazlett, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 8, 1978, Ser. No. 903,464
Int. Cl.² C10G *1/00;* **C10B** *57/12*
U.S. Cl. 208—8 LE **15 Claims**

1. A method for converting coal to liquid hydrocarbon or oil-soluble solids which comprises:

contacting said coal with oxygen for at least 15 minutes at a temperature from about 90° to about 225° C. to produce oxidized coal, said coal being a powder or admixed with a liquid which is nonreactive with oxygen, nitrogen, and coal and comprises an aromatic or heteroaromatic liquid hydrocarbon without any oxygen or sulfur in the ring structure;

heating said oxidized coal to a temperature from about 250° C. to about 450° C.; and

maintaining said temperature for at least about 15 minutes.

4,176,041

METHOD FOR REFORMING LOW GRADE COALS

Kenji Mori, Nishinomiya; Mamoru Taniuchi, and Shigeo Yaguchi, both of Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Feb. 23, 1978, Ser. No. 880,708
Claims priority, application Japan, Feb. 24, 1977, 52/19615; Feb. 25, 1977, 52/20531
Int. Cl.² C10G 1/06
U.S. Cl. 208—10 **12 Claims**

1. A method for reforming low grade coal for the production of metallurgical coke which comprises:

admixing a steam coal, the ash content of which is not more than 5 weight percent, an iron oxide catalyst containing at least 40 weight percent of iron in a proportion of no more than 3 weight percent based on said coal, on an ash-free, dry basis and sulfur as a co-catalyst with a solvent to prepare a slurry;

heat-treating the slurry in a reducing gaseous atmosphere at an elevated pressure and at a temperature in the range of 400° to 450° centigrade; and

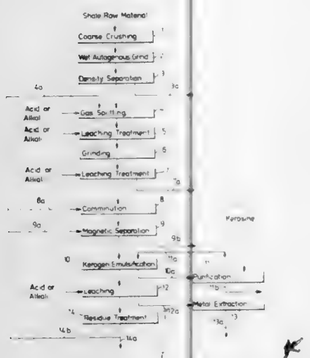
distilling the resultant reaction mixture at a reduced pressure of 40 to 150 mmHg and an elevated temperature of 280° to 350° centigrade to separate a reformed coal carbonaceous material suitable for the production of metallurgical coke.

4,176,042

METHOD OF TREATING SHALES

Per A. H. H. Fahlström, Akers Runö, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Continuation of Ser. No. 778,966, Mar. 18, 1977, abandoned.
This application Oct. 25, 1978, Ser. No. 954,429
Claims priority, application Sweden, Mar. 25, 1976, 7603646
Int. Cl.² C10G 1/04
U.S. Cl. 208—11 LE **13 Claims**



1. A method of recovering kerogen from bituminous sedimentary rock comprising crushing the sedimentary rock and finely-dividing the crushed rock in a plurality of comminuting stages to a particle size of a fineness sufficient to substantially free the major part of the kerogen and any sulphides present in the rock so as to permit a subsequent separation of kerogen and any sulphides, subjecting the sedimentary rock, at least prior to the final one of said comminuting stages, to a leaching treatment with a leaching solution selected from acidic and basic solutions operative to selectively weaken mechanical bonds between minerals contained in said sedimentary rock to enable said rock to be more readily divided in said final comminuting stage, and subsequent to said final comminuting stage, recovering kerogen and any sulphides by physically separating the same from the leached and finally comminuted rock.

4,176,043

PROCESS FOR PREPARING BINDER PITCHES

Johannes N. van Eijk, Uithoorn, Netherlands, assignor to Cindu Chemie B.V., Uithoorn, Netherlands

Filed Jun. 20, 1977, Ser. No. 808,175
Claims priority, application Netherlands, Jun. 23, 1976, 7606820
Int. Cl.² C10C 1/16, 3/02
U.S. Cl. 208—44 **11 Claims**

1. A process for preparing a binder pitch which comprises: intimately contacting a mixture, with a weight ratio of from 9:1 to 1:9, of a petroleum residual fraction selected from the group consisting of high aromatic residue pitch having a ring and ball softening point of 50° to 80° C. and oil cracking residual oil having a boiling range of about 300° to 400° C. and a coal tar fraction selected from the group consisting of coal tar pitch having a ring and ball softening point of at least 80° C. and tar oil having an initial boiling point above 350° C. at a temperature above 300° C. with a dehydrogenating agent selected from the group consisting of oxygen, chlorine and sulfur for a sufficient length of time to form a binder pitch having a ring and ball softening point of 50° to 200° C., a C_2 resin content of at least 15% and a coke number of at least 40%.

4,176,044

PROCESS FOR ALKYLATING WAXY HYDROCARBONS WITH C_3–C_5 CARBON ATOM SECONDARY ALCOHOLS AS CATALYST

Anthony M. White, Brights Grove, Canada, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 824,276, Aug. 15, 1977, abandoned.
This application May 22, 1978, Ser. No. 908,525
Int. Cl.² C10G 23/52
U.S. Cl. 208—46 **14 Claims**

1. A process for alkylating normally solid, waxy hydrocarbons to liquid hydrocarbons boiling primarily in the lube oil range which comprises contacting said waxy hydrocarbons with a low molecular weight olefin and with a catalyst consisting essentially of one or more C_3–C_5 carbon atom secondary alcohols at elevated temperature and pressure to alkylate a substantial portion of the wax to relatively high VI, low pour point lube oil components.

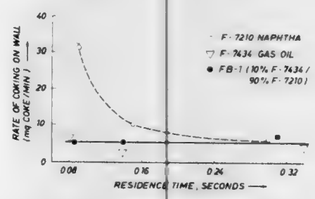
11. A process for dewaxing a wax-containing lube oil stock which comprises contacting said stock with a C_2–C_{10} carbon atom olefin in a reaction zone at elevated temperature and pressure and with a catalyst consisting essentially of one or more C_3–C_5 carbon atom secondary alcohols to alkylate a portion of said wax to lube oil components thereby producing a lube oil stock of reduced wax content and reduced pour point.

4,176,045

PYROLYSIS COKE INHIBITION

Harry P. Leftin, and David S. Newsome, both of Houston, Tex., assignors to Pullman Incorporated, Chicago, Ill.

Filed Jul. 10, 1978, Ser. No. 923,519
Int. Cl.² C10G 9/16; C07C 11/04
U.S. Cl. 208—48 R **6 Claims**



1. In a process for the production of olefins by steam pyrolysis of normally liquid hydrocarbon feedstock at a residence time of from about 0.02 to about 0.2 seconds in a tubular furnace wherein coke deposits on the interior surface of the furnace tubes, the improvement which comprises:

(a) blending an inhibiting portion of normally liquid hydrocarbon having a Coking Inhibition Index (CII) greater than about 10 into a steam pyrolysis feedstock having a CII less than about 10 to form a blended feedstock wherein the minimum inhibiting portion expressed as weight percent of the blended feedstock equals

$$\frac{100}{\text{Average } CII} \text{ and}$$

Average CII = Arithmetical Average of the Coking Inhibition Indeces (CII) of blended feedstock components

$$CII = 153.4 - \left[5.1 \sqrt{BMCI} \left(1 + \frac{S}{1.3}\right) + 2API \right]$$

$$BMCI = \frac{48640}{VABP} + 473.7\,(SG) - 456.8$$

$VABP$ = volume average boiling point (°K.)
SG = specific gravity (15.6° C./15.6° C.)
S = weight percent sulfur

$$API = \frac{141.5}{SG} - 131.5$$

(b) introducing the blended feedstock to the tubular furnace, and

(c) recovering an olefins-containing effluent from the tubular furnace.

4,176,046

PROCESS FOR UTILIZING PETROLEUM RESIDUUM

James R. McConaghy, Jr., Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Oct. 26, 1978, Ser. No. 955,278
Int. Cl.² C10G 9/14, 37/02
U.S. Cl. 208—50 **4 Claims**



1. A process for making premium delayed coke from a petroleum refinery vacuum residuum feedstock comprising:

(a) subjecting said feedstock to a hydrogen donor diluent cracking step;

(b) subjecting the effluent from the cracking step to a flash separation;

(c) subjecting the liquid effluent from said flash separation to a catalytic hydrodesulfurization step;

(d) fractionating the effluent from said hydrodesulfurization step to produce light ends, distillates, a hydrogen donor diluent stream and a bottoms stream;

(e) utilizing said hydrogen donor diluent stream as the hydrogen donor diluent in step (a); and

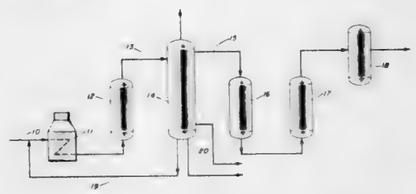
(f) subjecting said bottoms stream to a delayed coking process conducted at premium coking conditions and recovering premium delayed coke.

4,176,047

REMOVAL OF ORGANIC COMPOUNDS FROM COKER GASOLINE

Derrell D. Orrell, and Melvin M. McFeeters, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Apr. 10, 1978, Ser. No. 894,978
Int. Cl.² C10G 37/00
U.S. Cl. 208—51 **4 Claims**



1. In a refinery process including a delayed coking operation in which organic silicon compounds are added to the coker feedstock to control foaming, and wherein a hydrocarbon stream in the gasoline boiling range obtained by fractionation of overhead vapors from the coking step is processed through a desulfurizer and then through a reformer unit, the improvement comprising:

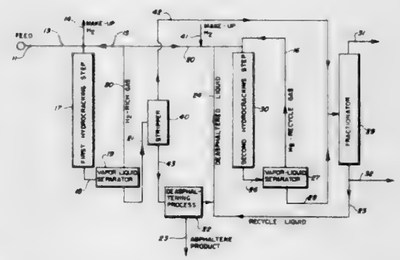
passing said coker gasoline, prior to passing it through said desulfurizer, through a bed of spent desulfurization catalyst capable of removing a substantial portion of said organic silicon compounds.

4,176,048

PROCESS FOR CONVERSION OF HEAVY HYDROCARBONS

Joseph B. Corns, Munster, Ind.; Thomas D. Nevitt, and Waldemar R. Hertwig, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 31, 1978, Ser. No. 956,280
Int. Cl.² C10G 23/02, 37/06, 13/02
U.S. Cl. 208—59 **8 Claims**



1. A process for treating a heavy hydrocarbon stream containing asphaltenes which process comprises: hydrocracking said heavy hydrocarbon stream in the presence of hydrogen and a hydrocracking catalyst in a first hydrocracking zone, removing asphaltenes from the liquid effluent of said first hydrocracking zone to form a deasphaltened liquid, and hydrocracking said deasphaltened liquid in the presence of hydrogen and a hydrocracking catalyst in a second hydrocracking zone.

V 9884 N 0279 UMI

4,176,049

CATALYTIC CRACKING PROCESS

William E. Winter, and William L. Schuette, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 3, 1978, Ser. No. 892,938
Int. Cl.[2] C10G 37/10
U.S. Cl. 208—70 15 Claims

1. A process for the production of a high octane gasoline comprising

cracking a sulfur-bearing hydrocarbon feed in a first cracking zone over a cracking catalyst at conditions sufficient to obtain a cat cracked naphtha product containing from about 10 percent to about 60 percent olefins, based on the weight of said product,

withdrawing said cat cracked naphtha as a product from said first cracking zone,

splitting said product into components inclusive of a fraction having a low end boiling point ranging from about 150° F. to about 250° F. and a high end boiling point ranging from about 350° F. to about 450° F.,

recracking said cat cracked naphtha fraction, without dilution with other hydrocarbons, over a crystalline aluminosilicate zeolite catalyst in a second cracking zone to desulfurize said feed, and saturate at least about 50 percent of said olefins, based on the weight of said cat cracked naphtha,

hydrofining the product of said second cracking zone over a hydrogenation catalyst at hydrofining conditions in a hydrofining zone sufficient to form a feed suitable for reforming over a sulfur-sensitive noble metal reforming catalyst, and then

reforming said hydrofined, recracked fraction over a sulfur sensitive noble metal reforming catalyst at reforming conditions to form a high octane gasoline.

4,176,050

PRODUCTION OF HIGH V.I. LUBRICATING OIL STOCK

Nai Y. Chen, Titusville; William E. Garwood, Haddonfield, and Alan W. Peters, Moorestown, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 4, 1978, Ser. No. 966,419
Int. Cl.[2] C10G 13/02; C07C 5/24; B01J 29/28
U.S. Cl. 208—111 15 Claims

1. In a process for manufacturing a refined lubricating oil stock having a V.I. of at least 85 and a pour point not greater than +20° F. from a waxy stock boiling within the range of from about 450° to about 1050° F., said process comprising catalytically dewaxing said waxy stock to a pour point not greater than +20° F., the improvement whereby effecting said dewaxing with increased selectivity, which comprises: contacting said waxy stock with a catalyst comprising macrocrystalline ZSM-5 at a LHSV of from 0.1 to 5.0, a temperature from about 500 to about 750° F., and under a total pressure greater than about 100 psia; and recovering a dewaxed oil stock with a pour point not greater than +20° F.

4,176,051

PROCESS FOR CATALYTICALLY HYDROCRACKING A HEAVY HYDROCARBON OIL

Marten Ternan, and Basil I. Parsons, both of Ottawa, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources, Ottawa, Canada

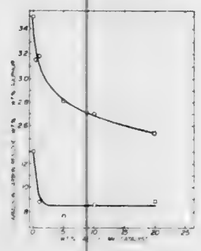
Filed Nov. 9, 1978, Ser. No. 959,256
Claims priority, application Canada, Nov. 18, 1977, 291229
Int. Cl.[2] C10G 13/02, 23/02; B01J 35/02
U.S. Cl. 208—112 7 Claims

1. A process for catalytically hydrocracking a heavy hydrocarbon oil, comprising,

(a) heating the heavy hydrocarbon oil to a temperature in the range 50° C. to 400° C., then

(b) mixing the heavy hydrocarbon oil, while at the temperature in the range 50° C. to 400° C., with a particulate catalyst mass to form a slurry, the particulate catalyst mass being in the range 0.1 to 10 weight percent of the slurry and comprising discrete catalyst supports of at least one material selected from the group consisting of coal and coke with each catalyst support coated with a catalytically active aluminum compound and at least one catalytically active material selected from the group consisting of compounds of metals of Group VI (b) and Group VIII of the Periodic Table of Elements,

(c) mixing the slurry with hydrogen gas and heating the mixture to a temperature in the range 250° C. to 550° C., then



(d) continuously feeding the mixture while at the temperature in the range 250° C. to 550° C. to a lower end portion of a catalytic hydrocracking reactor vessel,

(e) causing the mixture to flow upwardly in the reactor vessel at a pressure in the range 100 to 3,500 psig and at a temperature in the range 400° C. to 500° C. so that gaseous and vapour phase components liberated from the mixture in the reactor vessel rise rapidly therein and separate from residual liquid phase and entrained particulate solids components which flow slowly upwardly therein, and

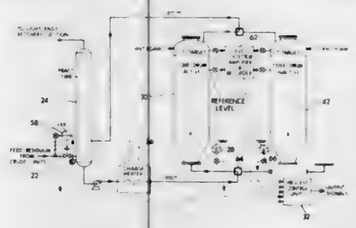
(f) continuously withdrawing the gaseous and vapour phase components and the liquid phase with entrained particulate solids from an upper portion of the reactor vessel.

4,176,052

APPARATUS AND METHOD FOR CONTROLLING THE RATE OF FEEDING A PETROLEUM PRODUCT TO A COKING DRUM SYSTEM

Charles R. Bruce, Littleton; Irvin D. Johnson, Englewood, both of Colo., and Lawrence H. McGrievy, Robinson, Ill., assignors to Marathon Oil Company, Findlay, Ohio

Filed Oct. 13, 1978, Ser. No. 954,941
Int. Cl.[2] C10G 9/5; G06G 7/58
U.S. Cl. 208—131 13 Claims



1. A system for producing a coke product from a petroleum product in combination with a process control unit for automatically predicting an optimal flow rate of petroleum into the system, said combination comprising:

a coking drum for forming a coke product from the petroleum and having a preestablished coking drum level;

measuring means for producing a first signal representative of measuring the flow rate of the petroleum product as it flows into said coking drum;

analog-to-digital converter means for producing binary signal information corresponding to said first signal;

integrating means for computing an incremental quantity of petroleum delivered to said coking drum from said binary signal information representing said flow rate;

accumulator means for receiving each incremental quantity of petroleum delivered and storing a totalized quantity thereof;

storage means for receiving predetermined coking system parameters;

means for predicting an optimal flow rate of petroleum using said totalized quantity stored in said accumulator means and said predetermined coking system parameters so that an optimal quantity of coke is produced in said coking drum;

first output means responsive to said predicting means to produce a data output signal representing said optimal flow rate of petroleum;

digital-to-analog converter means for producing a first analog signal corresponding to said optimal flow rate; and

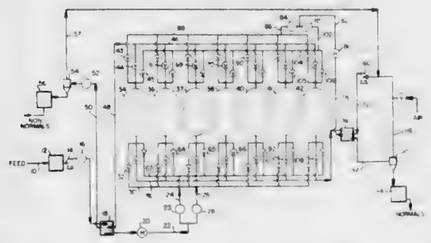
flow rate control means responsive to said digital-to-analog converter means for adjusting the flow rate of petroleum so that the petroleum is delivered to said coking drum at said optimal flow rate.

4,176,053

N-PARAFFIN - ISOPARAFFIN SEPARATION PROCESS

Thomas C. Holcombe, Scarsdale, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 31, 1978, Ser. No. 892,334
Int. Cl.[2] C10G 25/04
U.S. Cl. 208—310 Z 5 Claims



1. In the process for separating normal paraffins from admixture with non-normal paraffins which comprises passing a feedstock mixture of same in the vapor state and at superatmospheric pressure periodically in sequence through each of at least four fixed beds of a system containing a zeolitic molecular sieve adsorbent having effective pore diameters of substantially 5 Angstroms, each of said beds cyclically undergoing the stages of:

(a) adsorption-fill, wherein the vapor in the bed void space consists principally of a non-sorbable purge gas and the incoming feedstock forces the said non-sorbable purge gas from the bed void space out of the bed without substantial intermixing thereof with non-adsorbed feedstock fraction;

(b) adsorption, wherein the feedstock is cocurrently passed through said bed and the normal constituents of the feedstock are selectively adsorbed into the internal cavities of the crystalline zeolitic adsorbent and the non-adsorbed constituents of the feedstock are removed from the bed as an effluent reduced in content of non-feedstock constituents;

(c) void space purging, wherein the bed loaded with normals adsorbate to the extent that the stoichiometric point of the mass transfer zone thereof has passed between 85 and 97 percent of the length of the bed and containing in the bed void space a mixture of normals and non-normals in essentially feedstock proportions, is purged countercurrently, with respect to the direction of adsorption stage (b), by passing through the bed a stream of a non-sorbable purge gas in sufficient quantity to remove said void space feedstock vapors but not more than that which produces about 50 mole percent of adsorbed feedstock normals in the bed effluent; and

(d) purge desorption, wherein the selectively adsorbed feedstock normals are recovered as a product stream by passing a non-sorbable purge gas countercurrently with respect to adsorption stage (b) through the bed until the major proportion of adsorbed normals has been desorbed and the bed void space vapors consist principally of non-sorbable purge gas;

the improvement which comprises recycling directly in the vapor phase in combination with feedstock the mixture of normals and non-normals purged from each bed of the system during stage (c) to another bed of the system undergoing stage (b) adsorption.

4,176,054

WASTE PAPER RECYCLING

Joseph A. Kelley, 65 W. Jackson Blvd., Chicago, Ill. 60604

Filed May 16, 1977, Ser. No. 796,897
Int. Cl.[2] B03C 1/00
U.S. Cl. 209—8 20 Claims

1. A method of treating paper comprising the steps of:

providing a magnetic material in an adhesive substance to form a magnetic adhesive for binding together paper sheets;

applying said magnetic adhesive to a selected part of said paper sheets for securing said sheets together along a common edge;

cutting said secured together sheets of paper into a plurality of relatively small pieces so that a first group of said pieces has bits of said magnetic adhesive adhering thereto and a second group of said pieces is free of said magnetic adhesive;

passing all said pieces through a magnetic field for attraction toward a magnetic collector only those pieces of said first group having said magnetic adhesive adhering thereto; and

separating the unattracted pieces of said second group of pieces from those magnetically attracted pieces of said first group of pieces.

4,176,055

ROTARY AIR CLASSIFIER

Patrick Corrigan, Retford, England, assignor to Newell Dunford Engineering Limited, England

Filed Nov. 1, 1977, Ser. No. 847,495
Claims priority, application United Kingdom, Aug. 15, 1977, 34238/77
Int. Cl.[2] B07B 4/06
U.S. Cl. 209—152 8 Claims

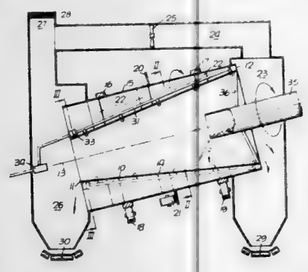
1. In a classifier comprising a vessel having an axis and opposite open ends, means mounting the vessel for rotation in one direction about the axis with said axis inclined, said open ends being an upper open end and a lower open end, means for feeding material to be classified into the upper open end, and means for introducing into the vessel a flow of air in a direction substantially tangential to the interior wall of the vessel, the improvement comprising:

(a) means for rotating the vessel in the same direction as the direction of said flow of air about said axis,

(b) a plurality of individual jet orifices arranged along at least a portion of the length of said vessel for said introduction of the flow of air as a plurality of concentrated jets, and

(c) said vessel being frusto-conical in shape with said upper open end being larger than said lower open end and with

the lower surface of the interior wall of the vessel sloping downwards towards said lower open end,
whereby said flow of air from said jet orifices causes an



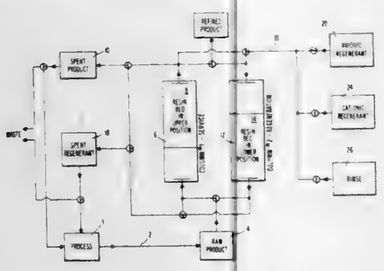
induced additional flow of air from said lower open end to said upper open end and itself smoothly flows spirally within the conical vessel towards said upper open end during use of said classifier.

4,176,056

CYCLIC OPERATION OF A BED OF MIXED ION EXCHANGE RESINS

Jesse G. Grier, Gilbertsville, Ky., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 27, 1978, Ser. No. 900,454
Int. Cl.[2] B01D *15/04*
U.S. Cl. 210—20 **10 Claims**



1. In a cyclic method for the removal of ions from an aqueous feed solution by passing said feed solution through a column containing a bed of mixed anion and cation exchange resins having a specific gravity difference, said difference being no more than about 0.2, said bed being capable of moving upward or downward en masse in said column, and thereafter removing said ions from said bed and regenerating said exchange resins, the improvement which comprises the steps of:

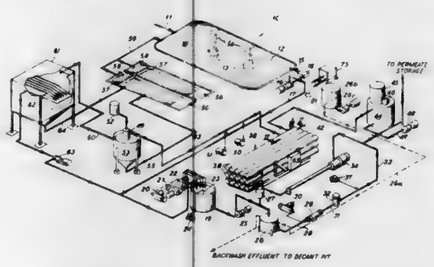
(a) passing said feed solution upward through said bed at a rate sufficient to move said bed upward en masse whereby ions are removed from said feed solution by adsorption on at least one of said exchange resins;
(b) after terminating the flow of said feed solution through said bed, passing an ion accepting aqueous solution through said bed whereby said ions are at least substantially removed from said bed;
(c) after terminating the flow of said ion accepting aqueous solution, passing an aqueous regenerating solution through said bed for regenerating the exchange resin which adsorbed said ions; and
(d) after terminating the flow of the regenerating aqueous solution, repeating said steps.

4,176,057

METHOD AND APPARATUS FOR RECOVERING LIQUID AND SOLID CONSTITUENTS OF WATER SOLUTIONS CONTAINING SPARINGLY SOLUBLE SOLIDS

Robert T. Wheatley, and Louis J. Kosarek, both of El Paso, Tex., assignors to El Paso Environmental Systems, Inc., El Paso, Tex.

Filed Jun. 24, 1977, Ser. No. 809,751
Int. Cl.[2] B01D *31/00, 13/00*
U.S. Cl. 210—23 H **13 Claims**



2. The method of recovering liquid and solid constituents of water solution containing sparingly soluble solids which comprises:

adjusting the temperature of the water solution within a temperature range of about 60° to 95° F.,
adjusting the pH of the solution within the range of about 7 to 8,
filtering the thus adjusted solution,
reducing the pH of the filtered solution within the range of about 5 to 5.5,
reacting the solution with a polyphosphonate to increase the solubility of the solids in the solution,
pumping the reacted solution through a reverse osmosis unit to separate the solution into a permeate and a brine containing the dissolved solids,
decarbonating the permeate from said unit to produce purified water,
adjusting the pH of the brine from said unit to about 7,
subjecting the adjusted brine to the following reactions:

1. $X_2(Y)_3 + 3Z(HCO_3)_2 \rightarrow 3ZY + 2X(OH)_3 + 6CO_2$

2. $X(HCO_3)_2 + Z(OH)_2 \rightarrow 2ZCO_3 + 2H_2O$

wherein:

X is a trivalent cation such as boron, aluminum, scansium, reduced titanium, chromium, manganese, oxidized iron, oxidized cobalt, oxidized nickel, gallium, arsenic, yttrium, reduced niobium, reduced molybdenum, rhodium, indium, reduced antimony, lanthanum, iridium, gold, oxidized thallium, reduced bismuth or the rare earths,
Y is a divalent anion such as sulfate, molybdate, phosphate, chromate, mangnate, arsenate, borate, fluorosilicate, germanate, nitrite, oxalate, sulfite, tellurite, thiosulfate, tungstate or uranate,
Z is a divalent cation such as beryllium, magnesium, calcium, reduced vanadium, reduced chromium, reduced manganese, reduced iron, reduced cobalt, reduced nickel, copper, zinc, strontium, palladium, cadmium, barium, reduced platinum, oxidized mercury, lead, polonium, or radium,

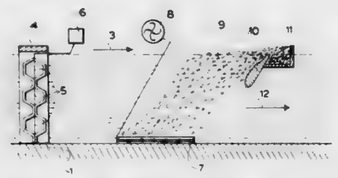
separating the liquid and solid products of said reactions, and recycling the separated liquid to the water solution for further recovery therewith.

4,176,058

METHOD MEANS FOR DE-SILTING WATER

Jacobus J. Grobler, Sophia St. 25, Risiville, Vereeniging 1930, Transvaal, South Africa

Continuation of Ser. No. 517,526, Oct. 24, 1974, abandoned.
This application Jan. 29, 1976, Ser. No. 653,302
Int. Cl.[2] B01D *21/01;* **C02B** *1/20*
U.S. Cl. 210—44 **22 Claims**



1. A method for removing silt particles from a natural flow of water having a substantial concentration of natural, essentially inorganic silt, which comprises:

(a) essentially non-specifically, with the aid of a chemical agglomerating agent, agglomerating at least a major portion of the silt particles to form the same into agglomerated particles of substantially increased size,
(b) hydrophobically treating the agglomerated particles, essentially in a non-specifically manner, whereby the same are imparted with hydrophobic properties,
(c) preventing settling of said treated particles by bubbling air through the water thereby floating the agglomerated particles to the surface of the water, and
(d) removing the floated agglomerated particles.

4,176,059

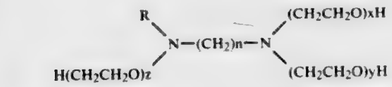
ANTI-CORROSION COMPOSITION FOR USE IN AQUEOUS SYSTEMS

Fumiko Suzuki, Guelph, Canada, assignor to Quatic Chemicals Limited, Guelph, Canada

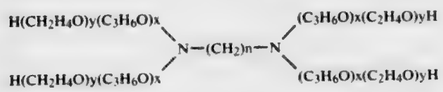
Filed Jun. 8, 1978, Ser. No. 913,555
Int. Cl.[2] C02B *5/04, 5/06;* **C23F** *11/08*
U.S. Cl. 210—58 **13 Claims**

1. A water treatment composition for addition to water for contacting metal surfaces to inhibit corrosion thereof and deposition of scale thereon, said composition consisting essentially of:

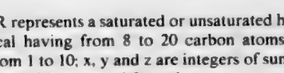
from about 3 to about 100 parts by weight of water soluble molybdate ion,
from about 0.5 to about 100 parts by weight of at least one water soluble or dispersible organic non-ionic or cationic surfactant
said surfactant being selected from the group consisting of:
(i) surfactants of the general formula:



wherein R represents a saturated or unsaturated hydrocarbon radical having from 8 to 20 carbon atoms; n is an integer from 1 to 10; x, y and z are integers of sum 0 to 15;
(ii) surfactants of the general formula:



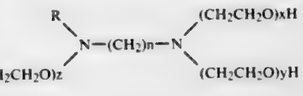
wherein n is an integer from 1 to 10; each x represents an independently selected integer such that the average molecular weight of each group (C_3H_6O) is from about 3,000 to about 10,000; each y represents an independently selected integer such that the polyethylene oxide groups (C_2H_4O) constitute from about 10% to about 30% of the total molecular weight of the surfactant molecule;
(iii) surfactants of the general formula:



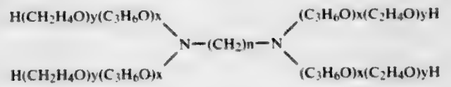
in which R represents a saturated or unsaturated aliphatic hydrocarbon radical having 8 to 20 carbon atoms; x is an integer from about 90 to about 140; and
(iv) ethylene oxide-propylene oxide polymers having a molecular weight of from about 2000 to about 5000;

from about 0.3 to about 100 parts by weight of an inorganic water soluble polyphosphate;
and from about 0.05 to about 30 parts by weight of an azole selected from the group consisting of triazoles, pyrazoles, imidazoles, isooxazoles, isothiazoles, thiazoles and thiadiazoles, said composition being effective in corrosion inhibition when added to water in amounts of from about 3 to about 330 parts of composition per million parts of water.

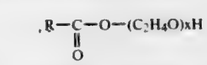
7. A process of controlling metal corrosion and scale deposition of metal surfaces exposed to aerated aqueous systems, which comprises including in one million parts by weight of the aqueous system a corrosion and scale inhibiting, substantially water soluble amount in the range from about 3 to about 330 parts by weight of a composition consisting essentially of:
from about 3 to about 100 parts by weight of water soluble molybdate ion,
from about 0.5 to about 100 parts by weight of at least one water soluble or dispersible organic non-ionic or cationic surfactant
said surfactant being selected from the group consisting of:
(i) surfactants of the general formula:



wherein R represents a saturated or unsaturated hydrocarbon radical having from 8 to 20 carbon atoms; n is an integer from 1 to 10; x, y and z are integers of sum 0 to 15;
(ii) surfactants of the general formula:



wherein n is an integer from 1 to 10; each x represents an independently selected integer such that the average molecular weight of each group (C_3H_6O) is from about 3,000 to about 10,000; each y represents an independently selected integer such that the polyethylene oxide groups (C_2H_4O) constitute from about 10% to about 30% of the total molecular weight of the surfactant molecule;
(iii) surfactants of the general formula:



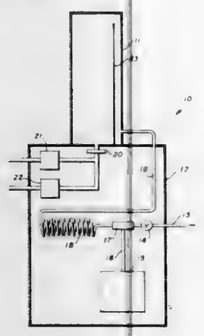
in which R represents a saturated or unsaturated aliphatic hydrocarbon radical having 8 to 20 carbon atoms; x is an integer from about 90 to about 140; and
(iv) ethylene oxide-propylene oxide polymers having a molecular weight of from about 2000 to about 5000;

from about 0.3 to about 100 parts by weight of a water soluble inorganic polyphosphate;
and from about 0.05 to about 30 parts by weight of an azole selected from the group consisting of triazoles, pyrazoles, imidazoles, isooxazoles, isothiazoles, thiazoles and thiadiazoles.

4,176,060
PROCESS FOR SOLUBLE CYANIDE REMOVAL FROM WASTEWATER STREAMS
Yel S. Sury, and Melvin J. Guillory, Jr., both of Baton Rouge, La., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Jan. 3, 1978, Ser. No. 866,439
Int. Cl.² C02B *1/36*
U.S. Cl. 210—62 **11 Claims**

1. A method for removing soluble iron cyanide complexes present in an aqueous stream which comprises contacting said aqueous stream containing measurable amounts of cyanide with a concentration of hydrochloric acid sufficient to lower the pH of the system to a level of 3 or below, heating the acidic system to a temperature of at least about 80° C. and contacting the heated acidic system with a source of chlorine.

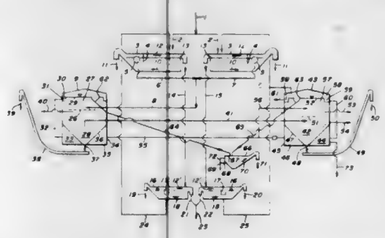
4,176,061
APPARATUS AND METHOD FOR TREATMENT OF FLUID WITH OZONE
Karel Stopka, 625 Rhode Island, Apt. 3, San Francisco, Calif. 94107
Filed Mar. 6, 1978, Ser. No. 883,401
Int. Cl.² C02B *1/38*
U.S. Cl. 210—63 Z **7 Claims**



1. An apparatus for purifying water comprising:
a first ozone generator, said first ozone generator including a pair of spacially displaced electrodes and means for creating an ionizing electrostatic field between said electrodes, said electrodes defining a passage for the flow of gas through said first ozone generator;
at least a second ozone generator, said second ozone generator including a pair of spacially displaced electrodes and means for creating an ionizing electrostatic field between said electrodes, said electrodes of said second ozone generator defining a passage for the flow of gas through said second ozone generator;
means connecting the gas flow passages of said first and second ozone generators in a series, said connecting means comprising a conduit;
means for delivering air to a first end of the gas flow passage of said first ozone generator whereby a corona discharge will be established in said first ozone generator and the air will be partially ozonated, the ozone concentration in the air thereafter being increased in said second ozone generator to a percent by weight of the air exiting said second ozone generator exceeding 1.2%;
a fluid treatment conduit, said fluid treatment conduit being partially in the form of a spiral and having a length of at least 10 feet, said fluid treatment conduit having an inner diameter of less than 1 inch and being free of turbulence promoting irregularities;
means for supplying water to be purified to a first end of said fluid treatment conduit under a pressure of at least two atmospheres;
means for producing and causing entrainment of microbubbles in the water flowing through said fluid treatment conduit, said microbubbles having an average diameter in the range of 10 to 20 microns and being uniformly dispersed in the water, said entrainment causing means being located adjacent the first end of said conduit;
means for delivering the ozonated air exiting the gas flow passage of said second ozone generator as the supply gas to said entrainment causing means whereby the microbubbles entrained in the water include ozone molecules; and
storage tank means, said storage tank means being connected to the discharge end of said fluid treatment conduit.

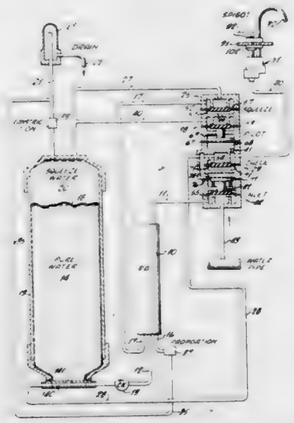
7. A method for the purification of water comprising:
establishing a corona discharge in an air stream to partially ionize the air and generate ozone molecules;
establishing a second corona discharge in the stream of partially ionized air to increase the percent by weight of ozone in the air stream to an amount exceeding 1.2%, the sequential subjection of the air stream to the first and second corona discharges being spaced in time;
dividing the ionized air stream into microbubbles having an average diameter of from 10 to 20 microns;
entraining the microbubbles in a stream of water to be purified;
maintaining a hydraulic pressure of at least two atmospheres in said stream of water while causing the stream to travel along a spiral path for a distance of at least ten feet while the ozone molecules are dissolved therein; and
collecting the water stream in a storage container.

4,176,062
PROCESS FOR THE SEPARATION OF FOAM FROM EFFLUENTS OF COKE OVEN PLANTS
Lee K. Husher, Bethel Park, Pa.; Heinrich Weber, and Kurt Tippmer, both of Recklinghausen, Fed. Rep. of Germany, assignors to United States Steel Corporation, Pittsburgh, Pa.
Continuation of Ser. No. 656,211, Feb. 9, 1976, abandoned. This application Jan. 4, 1977, Ser. No. 756,700
Int. Cl.² B01D *35/18*; C10C *1/03, 3/18*
U.S. Cl. 210—72 **2 Claims**



1. In a process for the separation of the mixture of tar and ammonia liquor produced in the manufacture of coke from finely divided coal, wherein a mixture consisting of tar, ammonia liquor and condensate is freed from coarse particles in a primary decanter with concomitant development of a surface suspension and foam of "swimming tar", the improvement wherein the suspension and foam floating on the surface of the ammonia liquor in the primary decanter is removed by traveling mechanical skimmers, delivered to a foam separator, and permitted to reside in the foam separator for at least two hours to effect separation of a water phase, removing the water phase from the foam separator, and recycling it to the primary decanter.

4,176,063
WATER PURIFIER SYSTEM AND VALVE
Truman V. Tyler, Grass Valley, Calif., assignor to Richard W. Beall, Jr., Manhattan Beach; Robert B. Sprague, Long Beach; Louis J. Favara, Thousand Oaks and Gausewitz, Carr & Rothenberg, Orange, all of, Calif., part interest to each
Filed Oct. 21, 1977, Ser. No. 844,374
Int. Cl.² C02B *1/82*
U.S. Cl. 210—101 **36 Claims**



1. A reverse-osmosis water purification system, which comprises:
(a) a reverse-osmosis filter element,
(b) a storage tank having movable means therein to separate said tank into a pure water chamber and a squeeze chamber,
(c) means to conduct tap water under pressure to said filter element and to cause water to flow through said filter element into said pure water chamber,
(d) means to conduct waste water from said filter element to a drain,
said means (d) including proportioning means to determine the ratio of said waste water to pure water,
(e) a single water conduit connected at one end to said pure water chamber, and adapted to be connected at the other end to an outlet valve which controls discharge of purified water to a point of use,
said water conduit being the sole conduit between the water purification system and the region of said outlet valve,
(f) means, including a squeeze-control valve to conduct water under pressure to said squeeze chamber,
whereby to move said movable means and thus expel purified water from said pure water chamber through said single conduit to said outlet valve,
(g) means to reduce greatly the water pressure in said squeeze chamber after closing of said squeeze-control valve,
whereby to create a large pressure drop across said filter element, with consequent increased rate of filtration,
(h) means to maintain substantial water pressure in said single conduit after said reduction in water pressure in said squeeze chamber, so that purified water will flow immediately out said outlet valve upon opening thereof,
(i) means, responsive to the pressure reduction caused by said opening of said outlet valve and consequent reduction in the water pressure in said single conduit, to open said squeeze-control valve and thus effect expulsion of purified water through said single conduit to a point of use, and
(j) means, responsive to filling of said storage tank with a predetermined quantity of purified water, to prevent flow of water through said proportioning means to said drain, whereby to prevent loss of water after a desired amount of purified water is present.

4,176,064
MIXTURE CONCENTRATOR
Donald S. Black, Edmonton, Canada, assignor to Palmer Engineering Company Ltd., Edmonton, Canada
Continuation-in-part of Ser. No. 808,276, Jun. 20, 1977, Pat. No. 4,126,181. This application Nov. 15, 1978, Ser. No. 960,841
Int. Cl.² B01D *45/14*
U.S. Cl. 210—196 **30 Claims**



1. A concentrator for removing part of a medium from a mixture of media comprising:
an elongate vessel having an intake for the mixture, a concentrated mixture outlet, and a removed medium outlet; and
an elongate rotor rotatably mounted for rotation in a forward direction inside said vessel so as to define a concentric channel between said vessel and said rotor, said concentric channel being in communication with said mixture intake and said concentrated mixture outlet, said rotor having an internal passageway and comprised of an intake impeller means in communication with said rotor passageway for permitting flow into said rotor passageway of medium removed from the mixture introduced into said vessel at said intake, and removed medium discharge means for discharging the removed medium from said passageway to said removed medium outlet, said concentric channel providing a flow path for the mixture being concentrated by the removal of the medium.

4,176,065
MAGNETIC FILTER
Robert J. Cook, Clinton, Mo. 64735
Filed Nov. 21, 1977, Ser. No. 853,082
Int. Cl.² B01D *35/06*
U.S. Cl. 210—223 **3 Claims**



1. An elongated magnetic element that is insertable into the central cavity of an annular screening element, said magnetic element comprising:
a. clusters of elongated magnets, said clusters being aligned in an end-to-end relationship on a common longitudinal axis, the magnets of a cluster being spaced apart from each other, oriented axially in relation to said axis, and located outwardly from said axis in a radial pattern,
b. spacers that are located along said axis at intervals, the magnets of said cluster being abutted with at least one of said spacers and retentively engaged thereon, and wherein the maximum width of said cluster is greater than the

maximum width of the spacer with which the magnets of said cluster are abutted,

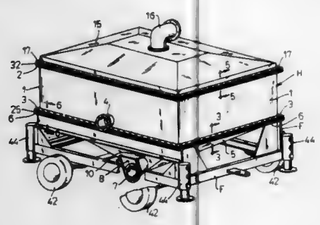
c. said spacers having a body portion with two ends, a periphery that extends around said axis, and said recesses are peripheral recesses that originate at one end of said body portion and lead inwardly thereon.

4,176,066

GRAVITATIONAL FLOW SEPARATOR OF THE MULTIPLE, APERTURED TUBE TYPE FOR SEPARATING WATER FROM SAND, GRAVEL OR THE LIKE

Albert H. Sloan, 4201 Kean Rd., Fort Lauderdale, Fla. 33314

Filed Jul. 5, 1978, Ser. No. 922,038
Int. Cl.² B01D *23/06*
U.S. Cl. 210—241 **19 Claims**



19. A dewatering device for separating water from sand and gravel or the like, said device including an enclosing housing, a series of vertically disposed tubular members in said housing and having upper ends connected together by means of an upper generally horizontal wall, said housing including an upper cover located above said tubular members, a solids and water mixture inlet located adjacent the top of said cover whereby said mixture is introduced into said cover for flooding over said horizontal wall and into said tubular members, each of said tubular members having a series of small horizontally disposed slits therein, a lower generally horizontal floor in said housing and around the lower end of said tubular members and connecting the latter, said housing also including a downwardly and convergingly tapering bottom section located beneath said tubular members and said floor for receiving sand and gravel from said tubular members, a discharge outlet adjacent the bottom of said bottom section for solid material which is collected adjacent the bottom of said bottom section, and means to divert a portion of water which has been discharged through said slits to gravity flush solid material through said discharge outlet, and a gate valve adjacent a lower part of said bottom section, said floor receiving water that has been discharged through said slits in said tubular members, said horizontal floor having means for removably supporting said tubular members therein, and a water outlet in said housing for conducting said water from said housing after said water has passed through said slits.

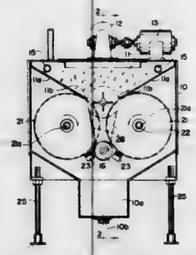
4,176,067

LABEL ACCUMULATOR AND CAUSTIC SEPARATOR

Michael Vamvakas, Rocky River, Ohio, assignor to Niagara Bottle Washer Mfg. Company, Cleveland, Ohio

Filed Jun. 29, 1978, Ser. No. 920,238
Int. Cl.² B01D *33/06*
U.S. Cl. 210—256 **5 Claims**

1. Apparatus for separating loose paper pieces from a bath of caustic soda comprising a housing having generally imperforate sides and bottom, a reservoir in the upper part of said housing to receive a quantity of a mixture of caustic soda and pieces of paper, said reservoir having a bottom with perforated openings about 1/16 inch in diameter, said bottom sloping toward the center and having terminating edges in an elongated opening at the center, means for agitating the contents of said reservoir, means for flushing said sloping bottom toward the center, an elongated helical screw conveyor in said housing spaced below and parallel to said elongated opening discharging outside of said housing, means for driving said conveyor when desired, a perforated conveyor sleeve closely surrounding said conveyor on the bottom and sides leaving an open top, two cylindrical drums mounted in said housing for intermittent rotation on axes parallel to said screw conveyor and spaced intermediate the level of said elongated opening and the level of said screw conveyor and equally on opposite sides of a line between said opening and said conveyor, and there being a



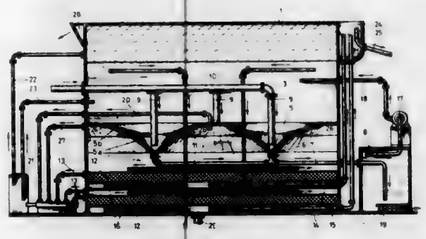
slight clearance between each of said drums and said terminating edges of said reservoir bottom and also between said drums and the longitudinal sides of said open top of said conveyor sleeve, said drums providing a space between their peripheries, and means for removing caustic soda from the bottom of said housing, whereby a mixture of caustic soda and pieces of paper may be pumped into said reservoir and caustic soda is filtered through said perforated bottom of said reservoir and intermittingly said conveyor may be started and said drums rotated to propel paper from said reservoir to said conveyor and thence outside of said housing, thus recovering caustic soda for reuse.

4,176,068

METHOD FOR THE SEPARATION FROM EACH OTHER OF THE COMPONENTS OF A MIXTURE OF WATER, OIL AND DIRT (SLUDGE) AS WELL AS APPARATUS FOR PERFORMING SAID METHOD

Hendrik J. Ankersmit, Havendijk 177, Schiedam, Netherlands

Filed May 8, 1978, Ser. No. 904,123
Claims priority, application Netherlands, May 10, 1977, 7705154
Int. Cl.² B01D *23/02*
U.S. Cl. 210—295 **9 Claims**



1. Apparatus for separating the components of a mixture of water, oil and sludge on the basis of their differing physical properties, comprising a container, a conduit for the supply of the mixture to be treated, a conduit for the discharge of oil separated in the upper part of the container and a conduit for the discharge of water separated from and collected below the oil, the container being divided into a first chamber and a second chamber positioned generally below said first chamber,

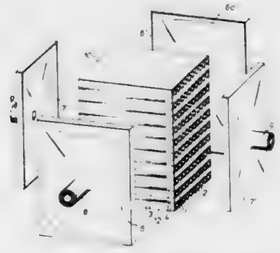
the bottom of the first chamber being provided with one or more upwardly widening separating chambers into each of which a supply conduit debouches for the mixture to be separated and a discharge conduit for heavy sludge being connected to the narrow part of said one or more upwardly widening separating chambers, said discharge conduit being dimensioned to have a flow capacity corresponding to the sludge volume supply, whereas one or more conduits are provided connecting the first chamber and the second chamber, said conduit or conduits having upper inlets positioned above the level of the mouthes of the supply conduits for the transfer of light fractions of the mixture from the first chamber to the second chamber and upper side of a filter disc or package formed by a plurality of filter discs, said second chamber having conduits for the discharge of separated oil from the upper side of the filter disc or discs, for the discharge of cleaned water and for the discharge of sludge adjacent to the lower side of said filter disc or discs.

4,176,069

DEVICE FOR EXCHANGING SUBSTANCES AND METHOD OF MANUFACTURING THE DEVICE

Hellmut Metz, and Henning Kage, both of Wedel, Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Fed. Rep. of Germany

Filed May 23, 1977, Ser. No. 799,518
Claims priority, application Fed. Rep. of Germany, May 21, 1976, 2622684
Int. Cl.² B01D *31/00*
U.S. Cl. 210—321 B **6 Claims**



1. A device for exchanging first and second substances, in particular an oxygenator or dialyzer, comprising a casing, a stack of alternate layers of semi-permeable membrane layers having a plurality of substantially parallel capillary tubes extending therethrough for flow in one direction and porous tissue layers for flow therethrough in a direction transverse to said one direction, spacer means disposed at each end of said tissue confining the flow through the tissues therebetween, said alternate layers being disposed in said casing, first and second connecting pieces connected to respective sides of said casing at respective sides of said stack having a first inlet conduit at one end of said tubes for the flow of the first substance to said capillary tube and a first outflow conduit at the opposite end of said casing and said tubes for the flow of the first substance out of said capillary tubes, and first and second connecting pieces connected to respective ends of said casing and said tissue layers having a second inflow conduit for the inflow of the second substance into said porous tissues and a second outflow conduit for the outflow of the second substance out the other end of said porous tissues.

4,176,070

SEMI-PERMEABLE MEMBRANES OF REGENERATED CUPRAMMONIUM CELLULOSE AND METHOD FOR HEAT STERILIZATION THEREOF IN PHYSIOLOGICAL SALINE

Yutaka Sakurada, Kyoto; Kimihisa Sunahara, Saiki, and Kazuhisa Yamauchi, Kyoto, all of Japan, assignors to Kuraray Co., Ltd. and Kawasumi Laboratories, Inc., both of Kurashiki, Japan

Filed Mar. 15, 1978, Ser. No. 886,949
Claims priority, application Japan, Mar. 18, 1977, 52-30782; Oct. 27, 1977, 52-130159; Nov. 14, 1977, 52-137139
Int. Cl.² A61L *1/00;* **B01D** *13/04, 39/18*
U.S. Cl. 210—500 M **7 Claims**

1. A method for sterilizing a semi-permeable membrane of regenerated cuprammonium cellulose which comprises subjecting said semi-permeable membrane to heat treatment at a temperature of 105° to 140° C. in the presence of physiological saline.

6. A hollow fiber membrane of regenerated cuprammonium cellulose which has a sonic modulus of at least 6.5×10^{10} dynes/cm^2 and has been sterilized at a temperature of 105° to 140° C. in the presence of physiological saline.

4,176,071

CORROSION INHIBITOR MIXTURE FOR AMMONIUM SULFATE FIRE-RETARDANT COMPOSITIONS AND METHOD FOR INHIBITING CORROSIVITY OF SUCH COMPOSITIONS

Robert L. Crouch, Phoenix, Ariz., assignor to Early California Industries, Inc., Phoenix, Ariz.

Filed Jun. 26, 1978, Ser. No. 919,166
Int. Cl.² C09K *3/28*
U.S. Cl. 252—8.1 **2 Claims**

1. A corrosion inhibitor mixture for ammonium sulfate fire-retardant compositions, said compositions generally including
ammonium sulfate,
a thickening agent, and
water,
said mixture comprising:
(a) a water-soluble cyanide compound; and
(b) a water-soluble ortho-phosphate compound,
said components of said corrosion inhibitor system being present in said fire-retardant composition in a minor effective amount at least sufficient to inhibit the corrosivity of said fire-retardant composition to aluminum, mild steel and brass to less than 1 mil per year.

4,176,072

DIESEL ENGINE CRANKCASE LUBRICATING OIL COMPOSITION

Philip F. Jackisch, Royal Oak, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 22, 1978, Ser. No. 889,015
Int. Cl.² C10M *1/48*
U.S. Cl. 252—32.7 E **5 Claims**

1. A lubricating oil composition especially adapted for use in the crankcase of diesel engines in the presence of blow-by carbon soot, said composition comprising a major amount of lubricating oil and the combination of an oil soluble zinc dihydrocarbyldithiophosphate and about 0.25–3.0 weight percent of a sulfurized fatty acid ester of an anhydrohexitol, said zinc dihydrocarbyldithiophosphate in the absence of said sulfurized fatty acid ester tending to increase engine wear due to soot and said zinc dihydrocarbyldithiophosphate is present in an amount sufficient to provide from 0.005 to 0.5 weight percent zinc to the composition

4,176,073

MOLYBDENUM COMPLEXES OF LACTONE OXAZOLINE DISPERSANTS AS FRICTION REDUCING ANTIWEAR ADDITIVES FOR LUBRICATING OILS

Jack Ryer, East Brunswick; Esther D. Winans, Colonia; Stanley J. Brois, Westfield, and Antonio Gutierre, Mercerville, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 18, 1978, Ser. No. 943,206
Int. Cl.[2] C10M *1/54, 1/48;* C10L *1/30;* C07F *11/00*
U.S. Cl. 252—32.7 E 17 Claims

1. An oil-soluble molybdenum complex of a lactone oxazoline dispersant having from 0.5 to 20 wt. % molybdenum based on the weight of said dispersant.

4,176,074

MOLYBDENUM COMPLEXES OF ASHLESS OXAZOLINE DISPERSANTS AS FRICTION REDUCING ANTIWEAR ADDITIVES FOR LUBRICATING OILS

Keith Coupland; Juan M. Salva, both of Sarnia, and Clinton R. Smith, Camlachie, all of Canada, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 18, 1978, Ser. No. 943,342
Int. Cl.[2] C10M *1/48, 1/54;* C10L *1/30;* C07F *11/00*
U.S. Cl. 252—32.7 E 17 Claims

1. An oil-soluble molybdenum complex of an ashless oxazoline dispersant having from 0.5 to 20 wt.% molybdenum based on the weight of said dispersant.

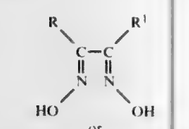
4,176,075

DIOXIME AND HYDROXY BENZOIC ACID METAL SALT ANTIOXIDANTS FOR LITHIUM SOAP GREASE COMPOSITIONS

A. Gordon Alexander, and Keith Coupland, both of Sarnia, Canada, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

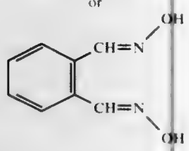
Filed Sep. 13, 1978, Ser. No. 941,859
Int. Cl.[2] C10M *5/20, 7/32, 7/30, 5/14*
U.S. Cl. 252—42.1 14 Claims

1. A lubricating grease composition which comprises a major proportion of lubricating oil, from about 2 to about 30 weight percent of a thickener system containing a lithium soap of a C_{12} to C_{24} hydroxy fatty acid and an antioxidant system which comprises from about 0.01 to about 10 weight percent of an alkali metal salt of hydroxy benzoic acid and from about 0.01 to about 10 weight percent of a dioxime compound having the general formula:



(I)

or



(II)

where R and R′ represent independently selected alkyl groups of 1 to 12 carbon atoms, and alkali metal salts of (I) and (II).

4,176,076

MONOALKANOLAMIDE BORATES, COMPOSITIONS CONTAINING THE SAME, AND THE USE THEREOF AS RUST-INHIBITORS AND AS SYNERGISTIC LUBRICATIVE-ENHANCIVE ADDENDA

David A. Waldstein, 622 Bergen Ave., Jersey City, N.J. 07304

Continuation-in-part of Ser. No. 674,322, Apr. 7, 1976, abandoned, which is a division of Ser. No. 450,565, Mar. 13, 1974, Pat. No. 3,969,236. This application Nov. 10, 1977, Ser. No. 850,132
The portion of the term of this patent subsequent to Jul. 13, 1993, has been disclaimed.
Int. Cl.[2] C10M *1/10*
U.S. Cl. 252—49.6 1 Claim

1. A composition comprising a liquid carrier constituting a hydraulic fluid base on mineral oils, water-in-oil emulsions, oil-in-water emulsions, and synthetic lubricating oil and a rust-inhibiting-effective amount of the reaction product of orthoboric acid and a primary alkanolamine selected from the group consisting of monoethanolamine, monomethanolamine, 1-isopropanolamine, mono-n-propanolamine and 2-amino-2-methylpropanolamine in a ratio of 1 gram mole of boric acid to 1 to 2 gram moles of alkanolamine, the reaction taking place in a closed reactor for about 4 to 5 hours at a temperature between about 130° C. to about 165° C. with the water formed being removed during the reaction.

4,176,077

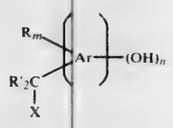
HALOALKYL HYDROXY-AROMATIC CONDENSATION PRODUCTS AS LUBRICANT ADDITIVES

David E. Ripple, Kirtland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

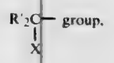
Division of Ser. No. 684,818, May 10, 1976, Pat. No. 4,108,783, which is a continuation-in-part of Ser. No. 459,424, Apr. 9, 1974, abandoned. This application Apr. 28, 1978, Ser. No. 901,174
Int. Cl.[2] C10M *1/32*
U.S. Cl. 252—51.5 R 16 Claims

1. A lubricant composition comprising a major amount of at least one lubricating oil and a minor, but engine sludge dispersing, amount of a product made by the process comprising reacting at a temperature ranging from about 100° C. to about 300° C.

(A) at least one alpha haloalkyl hydroxy aromatic compound of the general formula



wherein Ar is a hydrocarbyl aromatic nucleus of 6 to about 30 carbon atoms, said aromatic nucleus substituted with one or more up to 3 each of lower alkoxy, lower alkylthio, chloro, or nitro substituents, each R is a nonfused hydrocarbyl group of about 25 to about 700 carbon atoms, X is a halogen atom, each R′ is independently a hydrogen atom, an alkyl group of 1 to 36 carbon atoms, or a halogen-substituted alkyl group of 1 to about 36 carbon atoms, n is 1 to 3 and m is 1 to 5 with the provisos that (i) the total number of carbon atoms in both the R′ groups does not exceed 36 and (ii) where m exceeds 1, one of the R groups can also be a



group.

with

(B) at least one alpha-beta olefinically unsaturated compound selected from the group consisting of C_{2-40} hydrocarbyl nitriles, and ammonium and metal salts of said C_{2-40} carboxylic acids; the ratio of (A) to (B) is between about 0.5:1 to about 2:1, and the reaction of (A) with (B) resulting in the formation of a carbon-to-carbon bond, said bond including the carbon of at least one



group.

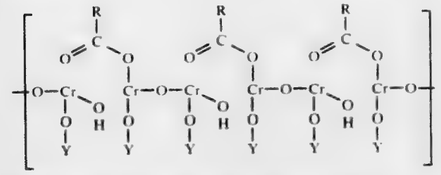
4,176,078

FIELD DEPENDENT TONER HAVING CHROME COMPLEX COATED MAGNETIC PARTICLES

Chin H. Lu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 2, 1977, Ser. No. 802,770
Int. Cl.[2] G03G *9/14*
U.S. Cl. 430—109 4 Claims

1. A field dependent toner comprising a resin coated magnetic particles wherein the surface of said particles is represented by the formula



wherein R represents a fatty acid radical of between 7 and 17 carbon atoms and Y represents negative polar surface groups of the magnetic particles, said toner having a resistivity greater than about 10^{12} ohm-cm at fields up to about 100 volts/cm.

4,176,079

WATER-SOLUBLE ENZYME-CONTAINING ARTICLE

Raymond E. Guerry, Forest Park, and David D. Whyte, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 20, 1977, Ser. No. 789,323
Int. Cl.[2] C11D *17/06*
U.S. Cl. 252—90 27 Claims

1. A granular detergent composition comprising from about 1% to about 40% of a surface-active agent selected from the group consisting of water-soluble anionic, nonionic, amopholytic and zwitterionic surface-active agents and mixtures thereof and from about 10% to about 60% of a detergent builder selected from the group consisting of sodium and potassium polyphosphates, carbonates, bicarbonates, silicates, polyacetates, carboxylates, polycarboxylates and polyhydroxysulfonates and containing a nondusting article, said article comprising an enzyme selected from the group consisting of proteolytic enzymes, amylolytic enzymes and mixtures thereof dispersed in a water-soluble resin film, said resin selected from the group consisting of polyvinyl alcohol, cellulose ethers, polyethylene oxide, starch, polyvinylpyrrolidone, polyacrylamide, polyvinylmethylethermaleic anhydride, polymaleic anhydride, polystyrene-maleic anhydride and mixtures thereof, wherein one dimension of said article is at least about 20 millimeters in size and the thickness of said article is not more than about 50 mils.

4,176,080

DETERGENT COMPOSITIONS FOR EFFECTIVE OILY SOIL REMOVAL

Rodney M. Wise, and Sharon J. Mitchell, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 3, 1977, Ser. No. 839,221
Int. Cl.[2] C11D *7/24*
U.S. Cl. 252—162 14 Claims

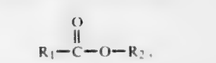
1. A cleaning product composition for removing oily soil from fabrics in an aqueous washing medium consisting essentially of:

(1) a discrete unit of an oily soil dissolving agent consisting essentially of:

(a) from about 20% to about 97% by weight of a water-insoluble solvent selected from the group consisting of:

(i) alkanes and alkenes having a flash point not lower than about 65° C. (Tag closed cup), an initial boiling point not lower than about 130° C., a solidification point not above about 20° C. and a carbon chain length from about 10 to about 18; and

(ii) fatty acid esters of the formula



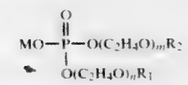
in which R_1 is an alkyl group with from about 7 to about 17 carbon atoms and R_2 is an alkyl group with from 1 to about 10 carbon atoms, the sum of carbon atoms in R_1 and R_2 being from about 8 to about 23;

(b) from about 3% to about 30% by weight of a water-in-oil emulsifier soluble in said solvent, said emulsifier having an HLB value of from about 2 to about 12 and consisting essentially of from about 25% to 100% of emulsifier compounds with at least two alkyl groups each having from about 9 to about 20 carbon atoms and selected from the group consisting of:

(i) dialkyl sulfosuccinic acid and alkali metal, alkaline earth metal, ammonium, and mono-, di-, and tri-C_{1-4} alkyl and alkanol ammonium salts of dialkyl sulfosuccinic acid, said alkyl groups each containing from about 9 to about 20 carbon atoms;

(ii) quaternary ammonium compounds with more than one long chain alkyl group selected from the group consisting of di-C_{9-20} alkyl ammonium chloride, bromide, methyl sulfate, nitrate and acetate and di-C_{9-20} alkyl imadazolinium quaternary ammonium compounds;

(iii) alkyl or alkyl ethoxy diesters of phosphoric acid having the formula



in which both R_1 and R_2 are alkyl groups containing from about 9 to about 20 carbon atoms, n and m are from zero to about 8 and M is hydrogen or a salt forming cation, and

(iv) mixtures thereof;

(c) from 0% to about 77% water; and

(d) from 0% to about 77% detergency builders selected from the group consisting of water soluble orthophosphates, polyphosphates, phosphonates, carbonates, bicarbonates, polyhydroxysulfonates, silicates, carboxylates and polycarboxylates, water-insoluble aluminosilicates and mixtures thereof,

(2) a discrete unit or units of a solvent stripping agent consisting essentially of from about 5% to 100% of a water-soluble surfactant having an HLB value of from about 11 to about 18, selected from the group consisting of anionic,

nonionic, zwitterionic, amphoteric and cationic surfactants and mixtures thereof, from 0% to about 95% water and from 0% to about 95% detergency builders selected from the group consisting of water soluble orthophosphates, polyphosphates, phosphonates, carbonates, bicarbonates, polyhydroxysulfonates, silicates, carboxylates and polycarboxylates, water-insoluble aluminosilicates and mixtures thereof, said discrete unit comprising from about 10% to about 80% by weight of the total cleaning product.

9. A method of removing oily soil from fabrics consisting essentially of:

(1) contacting said fabrics with an aqueous washing medium consisting essentially of:

(a) from about 0.01% to about 3% by weight of a water-insoluble solvent selected from the group consisting of:

(i) alkanes and alkenes having a flash point not lower than about 65° C. (Tag closed cup), an initial boiling point not lower than about 130° C., a solidification point not above about 20° C. and a carbon chain length from about 10 to about 18; and

(ii) fatty acid esters of the formula

$$R_1-\overset{O}{\overset{\|}{C}}-O-R_2$$

in which R_1 is an alkyl group with from about 7 to about 17 carbon atoms and R_2 is an alkyl group with from 1 to about 10 carbon atoms, the sum of carbon atoms in R_1 and R_2 being from about 8 to about 23;

(b) from about 0.01% to about 0.5% by weight of a water-in-oil emulsifier soluble in said water-insoluble solvent having an HLB value of from about 2 to about 12 and consisting essentially of from about 25% to 100% of emulsifier compounds with at least two alkyl groups each having from about 9 carbon atoms to about 20 carbon atoms and selected from the group consisting of:

(i) dialkyl sulfosuccinic acid and alkali metal, alkaline earth metal, ammonium, and mono-, di-, and tri-C_{1-4} alkyl and alkanol ammonium salts of dialkyl sulfosuccinic acid, said alkyl groups each containing from about 9 to about 20 carbon atoms;

(ii) quaternary ammonium compounds with more than one long chain alkyl group selected from the group consisting of di-C_{9-20} alkyl ammonium chloride, bromide, methyl sulfate, nitrate and acetate and di-C_{9-20} alkyl imadazolinium quaternary ammonium compounds;

(iii) alkyl or alkyl ethoxy diesters of phosphoric acid having the formula

$$MO-\overset{O}{\overset{\|}{P}}(-O(C_2H_4O)_nR_2)-O(C_2H_4O)_nR_1$$

in which Both R_1 and R_2 are alkyl groups containing from about 9 to about 20 carbon atoms, n and m are from zero to about 8 and M is hydrogen or a salt forming cation, and

(iv) mixtures thereof; and

(c) from about 90% to about 99.6% water;

(2) allowing said fabrics to remain in contact with said washing medium for at least 30 seconds; and

(3) adding or releasing to said aqueous medium containing said fabric from about 0.01% to about 1% by weight of a water-soluble surfactant having an HLB value of from about 11 to about 18, selected from the group consisting of anionic, nonionic, zwitterionic, amphoteric and cationic surfactants and mixtures thereof.

4,176,081

SOLUTIONS OF ACRYLAMIDOALKANESULFONIC ACID SALTS IN ORGANIC LIQUIDS AND METHOD FOR THEIR PREPARATION

Donald L. Surbey, Lyndhurst; Alan C. Clark, Mentor, and Leonard E. Miller, Chagrin Falls, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 816,117, Jul. 15, 1977, abandoned. This application Feb. 15, 1978, Ser. No. 877,940

Int. Cl.[2] **C07C** *143/14;* **C08F** *220/46;* **C08K** *5/42*

U.S. Cl. 252—182 **20 Claims**

1. A method for preparing a solution in a polar organic liquid of a metal salt of at least one acrylamidoalkanesulfonic acid which comprises reacting said acrylamidoalkanesulfonic acid in said liquid with at least a stoichiometric amount of at least one metal base selected from the group consisting of metal salts of weak acids and cation exchange resins in the metal salt form in the presence of an inhibitor of free radical polymerization and at a temperature below the temperature of polymerization, said reaction being continued until the neutralization number of the solution to phenolphthalein is a base number or, if an acid number, is no higher than about 1.0.

4,176,082

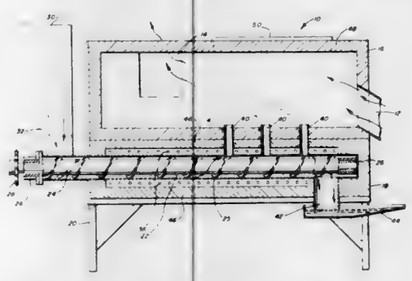
CLOSED SMOKE GENERATING APPARATUS

Clarence W. West, 208 S. La Salle St., Chicago, Ill. 60604

Filed May 13, 1977, Ser. No. 796,629

Int. Cl.[2] **A23B** *4/04*

U.S. Cl. 252—359 A **6 Claims**



1. A closed smoke generating apparatus isolated from the atmosphere for destructive distillation of particulate materials, comprising:

(a) a pair of elongated housings arranged one above the other, closely adjacent and substantially parallel;

(b) conduit means interconnecting said housings to provide at least one smoke passageway from the lower housing directly into the upper housing;

(c) means for continuously feeding organic particulate materials into one end of the lower housing without leakage of air into or out of said one end of said lower housing, including

(i) a feed device arranged to continuously supply said particulate materials to said one end of said lower housing,

(ii) a rotatable elongated feed auger mounted in said lower housing for advancing said materials from said one end toward the other end of said lower housing, and

(iii) means for rotating said auger;

(d) means providing a source of heat surrounding a portion of said lower housing downstream of said one end for generating smoke by destructive distillation of said particulate materials;

(e) means connected to said other end of said lower housing for discharging residual matter from said lower housing without leakage of air into or out of said other end;

(f) the upper housing comprising a smoke collection chamber, including

(i) inlet means adapted to receive a supply of carrier gas, and

(ii) outlet means spaced from said inlet means and adapted to discharge smoke mixed with said carrier gas from said upper housing.

4,176,083

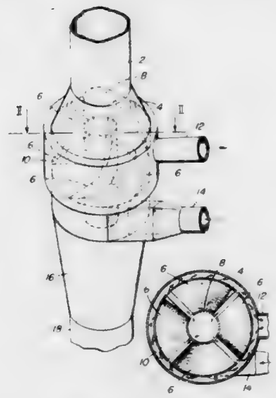
SEPARATING FLUE GAS FROM REGENERATED CRACKING CATALYST

Stephen J. McGovern, Deptford; Klaus W. Schatz, Wenonah, and Zrinscak, Sr. Fred S., Woodbury Heights, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 25, 1978, Ser. No. 937,035

Int. Cl.[2] **B01J** *21/20, 29/38;* **C10G** *13/18;* **B04C** *3/06*

U.S. Cl. 252—411 R **6 Claims**



1. In a process for stripping hot regenerated catalyst with a fuel gas before passage to a hydrocarbon conversion operation, the improved method of stripping which comprises,

passing hot regenerated catalyst with entrained CO_2 containing flue gas downwardly as a confined stream into a zone imparting a centrifugal annular catalyst flow to said downwardly flowing confined stream about a centrally positioned zone closed at its upper end but open in the bottom end thereof,

contacting said annular flowing catalyst stream with fuel gas and displacing CO_2 from the catalyst,

withdrawing fuel gas with displaced CO_2 into said centrally postioned zone for withdrawal from the stripping operation, and

withdrawing regenerated catalyst displaced from CO_2 from beneath said centrally positioned zone for transfer to a hydrocarbon conversion zone.

2. The method of claim 1 wherein the fuel gas has been separated from hydrogen sulfide before displacing said flue gas.

4,176,084

PROCESS FOR REGENERATING METAL-CONTAMINATED HYDROCARBON CONVERSION CATALYSTS

Edward C. Luckenbach, Mountainside, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

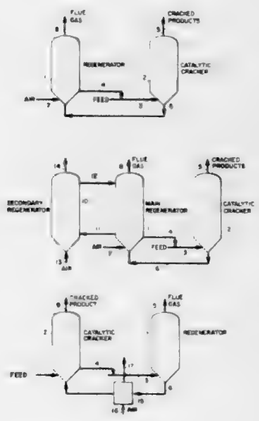
Continuation of Ser. No. 594,121, Jul. 8, 1975, abandoned. This application Nov. 11, 1977, Ser. No. 850,716

Int. Cl.[2] **B01J** *21/20, 29/38;* **C10G** *11/04, 11/18*

U.S. Cl. 252—417 **8 Claims**

1. In a hydrocarbon conversion process whereby a metal contaminated hydrocarbon feed containing more than 10 PPM of nickel and vanadium is contacted in a conversion zone with a hydrocarbon conversion catalyst to produce lower boiling hydrocarbon products and a spent catalyst having coke and said metal contaminant deposited thereon and wherein said spent catalyst is reactivated in a fluid bed regeneration zone operated at elevated temperatures in the presence of oxygen at a concentration level which is insufficient to completely combust said coke on the catalyst to CO_2 thereby producing a regenerated catalyst and a flue gas containing more than 2 volume % CO, the improvement which comprises periodically operating said fluid bed regeneration zone at conditions of excess oxygen and at a temperature in excess of 1300° F. so that the level of oxygen therein is for a period ranging from 1 to 20% of the time said fluid bed regenerator is in operation in excess of the amount required to completely burn said deposited coke to CO_2, thereby reducing the poisoning effect of the deposited metals present on the regenerated catalyst.

5. In a hydrocarbon conversion process whereby a metal contaminated hydrocarbon feed containing more than 10 PPM of nickel and vanadium is contacted in a conversion zone with a hydrocarbon conversion catalyst to produce lower boiling



hydrocarbon products and a spent catalyst having coke and said metal contaminants deposited thereon, and wherein said spent catalyst is reactivated in a fluid bed main regeneration zone operated at elevated temperatures in the presence of oxygen at a concentration level which is insufficient to completely combust said coke on the catalyst to CO_2, thereby producing a partially regenerated catalyst and a flue gas containing more than 2 volume % CO, the improvement which comprises circulating a portion of said partially regenerated catalyst between said main regeneration zone and a secondary regeneration zone segregated from said main regeneration zone, said secondary regeneration zone being maintained at a temperature in excess of 1300° F. and containing oxygen in an amount which is in excess of that required to completely combust the coke remaining on said partially regenerated catalyst to CO_2 such that the flue gas from said secondary regeneration zone will contain oxygen, thereby producing a regenerated catalyst from which the poisoning effect of the deposited metals on the catalyst has been reduced.

4,176,085

PALLADIUM-CONTAINING CATALYST

Jin S. Yoo, South Holland, Ill., and Ronald L. Milam, Media, Pa., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Division of Ser. No. 320,164, Jan. 2, 1973, Pat. No. 3,920,763, and a continuation of Ser. No. 53,654, Jul. 9, 1970, abandoned. This application Jun. 9, 1975, Ser. No. 585,227

Int. Cl.² B01J *31/22*

U.S. Cl. 252—428 **11 Claims**

1. A catalyst composition which comprises a minor amount of a π-allyl complex of:

(A) a palladium source capable of forming a π-allyl complex,

(B) a monotertiary phosphine electron donor ligand represented by the structural formula:

$$(R)_3P$$

wherein R is hydrocarbyl having from 1 to about 20 carbon atoms,

(C) combination of reducing agent capable of reducing the palladium to an oxidation state of less than 2 and Lewis acid capable of forming a coordination bond with palladium represented by the structural formula:

$$R'_{(n-y)}MX_y,$$

wherein M is a metallic element of coordination number n whose halides are Lewis acids, X is a halogen having an atomic number of 9 to 53, R' is hydrocarbyl having up to about 20 carbon atoms, and y is a number having a value from 1 to at least one less than n, supported on

(D) acidic, solid, silica-based material; wherein the molar ratio of (B) to (A) is from about 0.5 to 15:1, the molar ratio of (C) to (A) is from about 2 to 40:1 and the π-allyl complex is formed from a conjugated diene having up to 10 carbon atoms.

4,176,086

CATALYST PREPARATION

Cecil O. Carter, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 25, 1977, Ser. No. 827,519

Int. Cl.² B01J *31/22, 31/24*

U.S. Cl. 252—429 B **9 Claims**

1. A process for preparing a catalyst system comprising a hydrocarbon-soluble nickel compound which comprises the steps of:

(a) reacting a hydrate of a nickel compound with an organic complexing agent in a hydrocarbon solvent under conditions to form a complex of said nickel compound and said complexing agent which also contains water of hydration,

(b) allowing the complex formed in (a) to settle and separate into a water phase and a hydrocarbon solution of the complex, and

(c) drying said hydrocarbon solution of complex separated in (b) by subjecting same to azeotropic distillation under temperature and pressure conditions sufficient to remove entrained water overhead along with hydrocarbon solvent and as bottoms substantially anhydrous hydrocarbon solution of complex.

4,176,087

METHOD FOR ACTIVATING A HYDRODESULFURIZATION CATALYST

John N. Dew; Michael W. Britton; Eugene A. Harlacher, all of Ponca City, Okla., and Joseph A. Kleinpeter, McMurray, Pa., assignors to Conoco Methanation Company, Stamford, Conn.

Filed Jun. 20, 1977, Ser. No. 808,013

Int. Cl.² B01J *27/02*

U.S. Cl. 252—439 **6 Claims**

1. A method for sulfiding a hydrodesulfurization catalyst useful in reacting a sulfur-containing synthesis gas stream containing carbon oxides and hydrogen, said catalyst consisting essentially of at least one member selected from the group consisting of nickel, nickel compounds, cobalt, cobalt compounds, molybdenum and molybdenum compounds supported on a catalyst carrier material comprising at least one of the group consisting of aluminum oxides, silica, kaolin, and kieselguhr, said method consisting essentially of sequentially

(a) passing an inlet gaseous stream comprising carbon oxides, H_2 and at least one sulfur-containing compound selected from the group consisting of H_2S, COS, C_2S, mercaptans and thiophenes, into contact with said catalyst at a temperature from about 400° to about 700° F. and a space velocity greater than about 500 hr^{-1} until the outlet gaseous stream has a sulfur content substantially equal to the sulfur content of said inlet gaseous stream;

(b) increasing the temperature in said catalyst bed incrementally, until a desired operating temperature is reached; and

(c) further contacting said catalyst at said increased temperature which said inlet stream after each incremental temperature increase until said outlet gaseous stream again has a sulfur content substantially equal to the sulfur content of said inlet gaseous stream.

4,176,088

SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE COMPRISING PLATINUM GROUP METAL AND RHENIUM

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 888,708, Mar. 20, 1978. This application Oct. 30, 1978, Ser. No. 956,111

Int. Cl.² B01J *23/64, 21/04;* **C10G** *35/08*

U.S. Cl. 252—441 **15 Claims**

1. A bimetallic catalytic composite comprising a reduced combination of a cataytic effective amount of rhenium and platinum prepared by adsorbing a rhenium compound comprising a rhenium oxide or a rhenium compound convertible to the oxide form on a porous carrier which has a uniform dispersal of said catalytically effective amount of platinum, wherein said platinum is maintained in the elemental metallic state, at least a portion of said rhenium compound is adsorbed on the surface of said elemental metallic platinum and wherein said rhenium compound is reduced in a substantially water-free atmosphere consisting essentially of a hydrogen-containing inert gas to the elemental metallic rhenium metal at reduction conditions during which said platinum group component is maintained in said elemental metallic state.

2. A bimetallic catalytic composite as defined in claim 1 wherein the porous carrier material contains a catalytically effective amount of a halogen component.

4,176,089

PROCESS FOR THE PREPARATION OF SILICA-TITANIA AND CATALYSTS COMPRISING THE SAME

Neville L. Cull, Baker, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 3, 1978, Ser. No. 930,573

Int. Cl.² B01J *37/02, 29/00*

U.S. Cl. 252—452 **37 Claims**

1. A process for the preparation of a silica-titania composition which comprises the steps of:

(a) mixing a silicon alkoxide, titanium alkoxide and an organic diluent, and

(b) adding the resulting mixed alkoxides mixture to a hydrolysis mixture comprising water and an organic solvent to hydrolyze said mixed alkoxides and form a silica-titania precipitate.

2. The process of claim 1 wherein said silica-titania composition has a surface area ranging from about 100 to about 400 m^2/g and a bulk density ranging from about 0.2 to about 0.60 g/cc.

19. A process for the preparation of a catalyst which comprises compositing a metal or a compound of a metal selected from the group consisting of Groups IB, IIA, IIB, IVA, IVB, VIB, VIIB and VIII and mixtures thereof and a silica-titania composition prepared by steps which comprise:

(a) mixing a silicon alkoxide, a titanium alkoxide and an organic diluent, and

(b) adding the resulting mixed alkoxides mixture to a hydrolysis mixture comprising water and an organic solvent to hydrolyze said mixed alkoxides and to form a silica-titania precipitate.

4,176,090

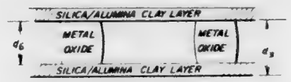
PILLARED INTERLAYERED CLAY MATERIALS USEFUL AS CATALYSTS AND SORBENTS

David E. W. Vaughan, Columbia; Roger J. Lussier, and John S. Magee, Jr., both of Ellicott City, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 805,672, Jun. 13, 1977, abandoned, which is a continuation-in-part of Ser. No. 704,358, Jul. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 633,053, Nov. 18, 1975, abandoned. This application Mar. 10, 1978, Ser. No. 885,408

Int. Cl.² B01J *29/06*

U.S. Cl. 252—455 Z **21 Claims**



1. An interlayered smectite clay product which includes an inorganic oxide selected from the group consisting of alumina, zirconia and mixtures thereof between the layers thereof, and which possesses an interlayer distance of from about 6 to 16 Å, said interlayered clay having greater than about 50 percent of its surface area in pores of less than 30 Å in diameter.

8. A process for preparing an interlayered smectite which comprises:

(a) reacting a smectite with a mixture of a polymeric cationic hydroxy inorganic metal complex selected from the group comprising aluminum and zirconium complexes and mixtures thereof and water to obtain a smectite having greater than 50 percent of its surface area in pores of less than 30 Å in diameter after dehydration; and

(b) separating the interlayered smectite from the mixture.

19. A hydrocarbon conversion catalyst comprising the interlayered clay of claim 1, admixed with a crystalline aluminosilicate zeolite which comprises a member selected from the group consisting of inorganic oxides and a matrix clay, and mixtures thereof.

4,176,091

DENITRATING CATALYSTS HAVING POROUS COATING AND PROCESS FOR PRODUCING SAME

Hideya Inaba; Hisao Ogiyama; Masayoshi Ichiki; Yasumi Kamino; Nobuo Matsumoto; Kenichi Nagai, and Masami Suzuki, all of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Jul. 24, 1978, Ser. No. 927,096

Int. Cl.² B01J *21/08, 23/26, 23/22, 23/72*

U.S. Cl. 252—456 **20 Claims**

1. A process for producing a denitrating catalyst comprising the step of forming a carrier having a porous silica coating by immersing a catalyst base of porous metal in a silica-containing coating bath and drying the base, and the step of causing the carrier to support an active component thereon by immersing the carrier in a solution containing the active component and drying the resulting carrier.

4,176,092

PROCESS FOR THE DEPYROPHORIZATION OF PYROPHORIC METAL CATALYSTS AND CATALYSTS PREPARED BY THE PROCESS

Udo Birkenstock, Ratingen, and Josef Haydn, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 13, 1977, Ser. No. 806,238

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1977, 2713373

Int. Cl.² B01J *25/02*

U.S. Cl. 252—472 **23 Claims**

1. A non-pyrophoric, highly active metal catalyst, requiring essentially no pre-activation, and prepared from a pyrophoric metal catalyst by treating a suspension of the pyrophoric metal catalyst in water and/or an organic solvent with an organic nitro compound or a nitroso compound.

4,176,093

NEUTRON ABSORBING ROOM TEMPERATURE VULCANIZABLE SILICONE RUBBER COMPOSITIONS

Harold L. Zoch, 55 Scribner Ave., Middleburgh, N.Y. 12122

Filed Feb. 22, 1977, Ser. No. 770,331

Int. Cl.² G21F *1/10*

U.S. Cl. 252—478 **20 Claims**

1. A neutron absorbing one component room temperature vulcanizable silicone rubber composition comprising (a) 100 parts by weight of a silanol-terminated diorganopolysiloxane having a viscosity varying from 100 to 500,000 centipoise at 25° C., where the organo groups are monovalent hydrocarbon radicals; (b) from 25 to 300 parts by weight of a neutron absorber selected from the class consisting of boron compounds and boron powder; (c) from 1 to 15 parts by weight of a silane or siloxane having functionality selected from the class consisting of alkoxy functionality and acetoxy functionality and; (d) from 0.01 to 5 parts by weight of a catalyst.

4,176,094

METHOD OF MAKING STOICHIOMETRIC LEAD AND BISMUTH PYROCHLORE COMPOUNDS USING AN ALKALINE MEDIUM

Harold S. Horowitz, Clark; John M. Longo, New Providence, and Joseph T. Lewandowski, Middlesex, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 856,648, Dec. 2, 1977, Pat. No. 4,129,525. This application Aug. 31, 1978, Ser. No. 938,374

Int. Cl.² H01B *1/08*

U.S. Cl. 252—518 **27 Claims**

1. A method of preparing compounds having the formula:

$$A_2B_2O_{7-1}$$

wherein A is selected from the group consisting of lead, bismuth and mixtures thereof, wherein B is selected from the group consisting of ruthenium, iridium and mixtures thereof, wherein y is a value such that $O \leq y \leq 1$, comprising:

reacting A cations and B cations, in approximately stoichiometric amounts, from an aqueous solution source of these cations in a liquid alkaline medium having a pH of at least about 13.5 in the presence of an oxygen source at a temperature below about 200° C. for a sufficient time for reaction to occur.

V 9 8 8 4 N 0 2 7 7 9 UMI

4,176,095

REINFORCED XYLENE-FORMALDEHYDE RESIN COMPOSITIONS

Walid Y. Aziz, Warrensville, and Lawrence E. Ball, Cuyahoga Falls, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Jul. 19, 1978, Ser. No. 925,914
Int. Cl.[2] C08L *1/02, 5/00*
U.S. Cl. 260—9 **7 Claims**

1. The composition comprising a blend of a thermoplastic xylene-formaldehyde polymer and a reinforcing agent wherein the xylene-formaldehyde polymer is one having a softening point of at least 120° C. and containing less than 2% oxygen by weight and having a molecular weight greater than 20,000 and wherein the reinforcing agent is at least one member selected from the group consisting of carbon fibers, cotton flock, wood flour, granulated cork, mica and glass fibers.

4,176,096

PREDISPERSED COMPOSITION FOR USE IN THERMOSETTING ACRYLIC AUTOMOTIVE FINISHES

George Patterson, Philadelphia; Edgar N. Putman, New Hope, and John B. McCool, III, Ottsville, all of Pa., assignors to PFD/Penn Color, Inc., Doylestown, Pa.

Continuation of Ser. No. 707,489, Jul. 22, 1976, abandoned. This application Mar. 13, 1978, Ser. No. 885,529
Int. Cl.[2] C08L *1/14*
U.S. Cl. 260—15 **16 Claims**

1. A method of making a durable automotive spray-paint, comprising the steps of:

(a) predispersing a pigment into a dispersant composition consisting essentially of 30–70 weight percent aryl sulfonamide formaldehyde resin and 30–70 weight percent cellulose acetate butyrate to produce a dry, predispersed composition containing 60–85 weight percent of said pigment;

(b) dissolving said predispersed composition in a preselected amount of solvent solution to produce a liquid predispersed composition; and

(c) mixing said liquid predispersed composition with a preselected amount of thermosetting acrylic resin to produce an automotive paint containing between 15 and 22 weight percent of said pigment, said preselected amount of solvent solution being selected to produce a paint of a sprayable viscosity.

4,176,097

ASBESTOS-FREE TAPE SEALANT

Roy A. Fox, Medford, N.J., and Bradford T. Mortimer, Wheaton, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 25, 1978, Ser. No. 899,720
Int. Cl.[2] C08L *1/02*
U.S. Cl. 260—17.4 BB **15 Claims**

1. A sealant composition comprising the following components:

Component	Approximate wt. % Range
cotton fiber (up to 0.25 inch)	2–20
amorphous polypropylene (200–1800 centipoises)	1–10
butyl rubber (Mooney vicosity 40–65)	0.5–25
inorganic filler	30–80
polybutene (200–1000 centipoises)	15–40
polyisobutlylene (molec. wt. 20,000–50,000)	0–40

4,176,098

ARC RESISTANT COMPOSITION

Donald G. Needham, Ramona, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 837,651, Sep. 30, 1977, abandoned, which is a continuation-in-part of Ser. No. 701,728, Jul. 1, 1976, abandoned. This application Jun. 12, 1978, Ser. No. 914,837
Int. Cl.[2] C08L *81/04*
U.S. Cl. 260—18 R **20 Claims**

1. An arc resistant composition which comprises:

a poly(arylene sulfide);

about 20 to about 50 weight percent of the total composition of at least one additive chosen from among clay and talc; and

about 1 to about 5 percent by weight of the total composition of lithium carbonate.

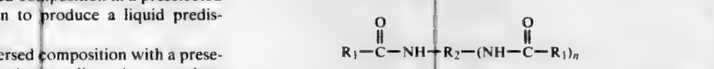
4,176,099

SELF-CROSSLINKING CATIONIC RESIN EMULSIONS FOR USE IN ELECTRODEPOSITION PAINTS

Georgios Pampouchidis, and Helmut Hönig, both of Graz, Austria, assignors to Vianova Kunstharz, A.G., Vienna, Austria

Filed Feb. 2, 1978, Ser. No. 874,562
Claims priority, application Austria, Feb. 7, 1977, 756/77
Int. Cl.[2] C08L *33/21*
U.S. Cl. 260—18 TN **14 Claims**

1. Emulsions of binders which are cathodically depositable in an electrodeposition system comprising (A) 10 to 99.9 percent by weight of at least one self-crosslinking polymeric resin, and (B) 0.1 to 90 percent by weight of at least one basic urethane compound having the formula



wherein n is an integer of 1, 2, or 3; R is an aromatic, cycloaliphatic, or aliphatic hydrocarbon radical; R_1 is the moiety of a dialkylalkanolamine remaining after reaction with an isocyanate, and R_2 is the moiety of at least one member of the group consisting of monohydroxyalkyl(meth)acrylate, monohydroxyalkoxy(meth)acrylate, and a monohydroxyallylether of a polyol after reaction with an isocyanate; the components (A) and (B) being selected to provide an emulsion having a basicity corresponding to at least 0.5 and a double bond number of at least 0.5.

4,176,100

TEXTURED SURFACE COATING

Nathan R. Rider, Sparta, Mich., assignor to Kay Tex Products, Inc., Grand Rapids, Mich.

Filed Oct. 3, 1978, Ser. No. 948,291
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—22 R **22 Claims**

1. A textured surface coating composition based on polyvinyl acetate and mineral fillers, the improvement in said composition comprising: said mineral fillers including from about 5 to about 10% by weight acicular zinc oxide; said composition having an overall pigment volume concentration of from about 49% to about 53%.

4,176,101

MELT STRENGTH IMPROVEMENT OF PET

John P. Leslie, Levittown; Constance A. Lane, Philadelphia, and R. Peter Grant, Newtown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 830,240, Sep. 2, 1977, Pat. No. 4,145,466. This application Aug. 21, 1978, Ser. No. 935,226
Int. Cl.[2] C08G *63/76*; C08K *5/09, 5/20*
U.S. Cl. 260—22 T **7 Claims**

3. A composition for thermoplastic processing to form amorphous articles comprising PET (A) a polyanhydride selected from the group consisting of pyromellitic dianhydride, mellitic trianhydride, tetrahydrofuran dianhydride, and polyanhydride containing at least two unsubstituted or substituted phthalic anhydride radicals, and (B) a fatty acid or N-substituted fatty acid amide having at least 10 carbon atoms in the acid portion of the molecule, said composition being free of crystallization promoter.

4,176,102

SEALANT COMPOSITION

Theodore Favata, 3196 Ramona St., Pinole, Calif. 94564

Filed Oct. 2, 1978, Ser. No. 947,957
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—28.5 AS **16 Claims**

1. A sealant composition comprising:

A. approximately 50 to 80 parts by volume asphaltic emulsion;

B. approximately 20 to 50 parts by volume of a copolymer prepared by the copolymerization of a vinyl acetate monomer with an organic acid; and

C. approximately 0.5 to 2.0 parts by volume of a nonionic surfactant having a hydrolyptic balance from approximately 11 to 14.

4,176,103

POLYMER LATICES

John M. Cruden; Alan J. Bignold, both of Harlow; Roger H. Green, Chelmsford, and Ronald J. Grisenthwaite, Harlow, all of England, assignors to Harlow Chemical Company Limited, Harlow, England

Filed Nov. 5, 1973, Ser. No. 412,967
Claims priority, application United Kingdom, Nov. 16, 1972, 53001/72; Jul. 9, 1973, 32517/73
Int. Cl.[2] C08L *29/00*
U.S. Cl. 260—29.6 RW **17 Claims**

1. A polymer latex composition comprising a polymer latex containing at least one component which contains a group which has hydrazone or azine linkages produced by the reaction of a keto or aldehydo carbonyl group on the polymer and a hydrazine in an amount sufficient to improve the wet adhesion properties of the polymer latex composition.

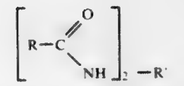
4,176,104

POLYSTYRENE PHONOGRAPH RECORD INJECTION MOLDING COMPOSITIONS OF IMPROVED TRANSPARENCY

Henry Alsberg, Northbrook; Dale Skalla, Cicero, and William C. Meisenhelder, Downers Grove, all of Ill., assignors to The Richardson Company, Des Plaines, Ill.

Filed Jul. 7, 1978, Ser. No. 922,794
Int. Cl.[2] C08L *25/06*; C08F *2/44*
U.S. Cl. 260—28.5 R **22 Claims**

1. A phonograph record injection molding composition comprising a modified styrene polymer composition, said modified styrene polymer being a polymerization product of styrene polymerized with a lubricity-enhancing modifier dissolved therewithin, said lubricity-enhancing modifier having the following structure:



wherein R is alkyl having from about 14 to about 19 carbon atoms and R' is alkane having from about 2 to about 5 carbon atoms, said modified styrene polymer being a polystyrene matrix having said lubricity-enhancing modifier generally molecularly distributed within and throughout said matrix, and said modified styrene polymer being a substantially transparent phonograph record injection molding composition.

4,176,105

HIGH TEMPERATURE MINERAL FIBER BINDER

Patrick M. Miedaner, Parkville, Mo., assignor to Certain-Teed Corporation, Valley Forge, Pa.

Filed Sep. 6, 1977, Ser. No. 830,590
Int. Cl.[2] C08L *61/06*
U.S. Cl. 260—29.3 **8 Claims**

1. A heat curable aqueous binder composition for use as a glass fiber binder capable, when cured, of withstanding temperatures in the range of 750° F. to 900° F., consisting essentially of the reaction mixture of a water soluble modified phenol formaldehyde condensate, boric acid, ammonium hydroxide and urea; wherein said modified phenol formaldehyde condensate, consisting essentially of the reaction product of phenol, formaldehyde and a di-functional nitrogenous compound, is initially prepared by reacting one mole of a di-functional compound in which said functional groups are amido or imino groups capable of reacting with the hydroxymethylene groups of the poly-hydroxymethyl phenols formed by the condensation of phenol and formaldehyde, with about 2.5 to 3 moles of phenol and about 6 to 7.5 moles of formaldehyde such that said modified phenol formaldehyde condensate contains less than 2% by weight of free phenol and less than 5% by weight of free formaldehyde and about 12 to 15% by weight of nitrogen with substantially no unreacted nitrogenous compound; and, thereafter reacting said modified phenol formaldehyde condensate with about 12 to 16 parts by wt. of boric acid for each 100 parts by weight of said condensate, and about 40 to 80 parts by wt. of urea for each 100 parts by weight of said condensate and sufficient ammonium hydroxide so that the final composition has a pH of about 7 to 9.

4,176,106

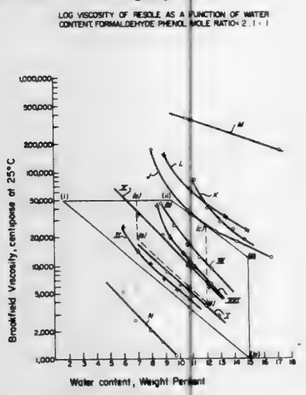
PHENOL/FORMALDEHYDE RESOLES AND CELLULAR PRODUCTS DERIVED THEREFROM

Wallace G. Reid, Katonah, N.Y.; Rakesh Saini, Somerville, N.J., and Kenneth E. Atkins, South Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jul. 28, 1977, Ser. No. 820,020
Int. Cl.[2] C08L *61/08, 61/10*
U.S. Cl. 260—29.3 **13 Claims**

1. A phenolic resole capable of being foamed to a phenolic foam having a density from 1.90 to 3.70 pounds per cubic foot and, within said density range, a friability of less than 35 percent weight loss (after 10 minutes) and a compressive strength (parallel of at least 20 pounds per square inch which resole has been produced by the base-catalyzed condensation of formaldehyde and phenol at a formaldehyde-to-phenol mole ratio from about 1.6:1 to about 2.2:1, the aqueous alkaline condensate having been brought to a pH from about 5.0 to about 7.0 by the addition thereto of a salt-forming acidic compound, said resole being characterized by an average molecular weight such that a plot of log viscosity as a function of water content of the resole falls within the area defined by straight line interconnection in series of points (i)-(iv) where points (i)-(iv) are as follows for the indicated formaldehyde-to-phenol mole ratios:

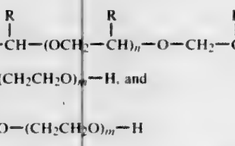
(a) at a formaldehyde-to-phenol mole ratio of at least 1.9:1 and no more than about 2.2:1, points (i)–(iv) are:
(i) a viscosity of about 50,000 centipoise at a water content of about 1.7 weight percent;
(ii) a viscosity of about 50,000 centipoise at a water content of about 9.5 weight percent;
(iii) a viscosity of about 12,000 centipoise at a water content of about 15.0 weight percent; and
(iv) a viscosity of about 1,000 centipoise at a water content of about 15.0 weight percent;
(b) at a formaldehyde-to-phenol mole ratio of at least 1.7:1 and less than 1.9:1, points (i)–(iv) are:
(i) a viscosity of about 50,000 centipoise at a water content of about 3.0 weight percent;
(ii) a viscosity of about 50,000 centipoise at a water content of about 14.0 weight percent;



(iii) a viscosity of about 25,000 centipoise at a water content of about 16.0 weight percent; and
(iv) a viscosity of about 1,000 centipoise at a water content of about 16.0 weight percent;
(c) at a formaldehyde-to-phenol mole ratio of at least about 1.6:1 and less than 1.7:1, points (i)–(iv) are:
(i) a viscosity of about 50,000 centipoise at a water content of about 6.5 weight percent;
(ii) a viscosity of about 50,000 centipoise at a water content of about 12.5 weight percent;
(iii) a viscosity of about 25,000 centipoise at a water content of about 16.0 weight percent; and
(iv) a viscosity of about 3,000 centipoise at a water content of about 16.0 weight percent;
wherein the said viscosity values are Brookfield at 25° C.

4,176,107
WATER-SOLUBLE DISPERSIONS OF HIGH MOLECULAR WATER-SOLUBLE POLYMERS CONTAINING A SURFACTANT AND A WATER-SOLUBLE ORGANIC CARRIER WHICH IS A HYDROXY COMPOUND CONTAINING REPEATING ALKYLENE OXIDE UNITS
John D. Buckman; Wood E. Hunter; John D. Pera, and Robert M. Taylor, all of Memphis, Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.
Filed Jan. 20, 1978, Ser. No. 871,051
Int. Cl.² C08L 33/02
U.S. Cl. 260—29.6 E **19 Claims**

1. A composition comprising a water-soluble vinyl addition polymer, water, at least one surfactant and a water-soluble organic carrier selected from the group consisting of



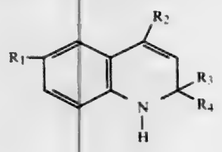
wherein R is hydrogen or methyl; R^1 is alkyl containing 6 to 26 carbon atoms or alkyl substituted benzene in which the alkyl substituent is branched or straight chain and contains 8 to 12 carbon atoms; R^2 is alkyl containing 5 to 17 carbon atoms; n varies from 2 to 20 and m varies from 3 to 10.

4,176,108
HEAT-COAGULABLE LATEX BINDERS AND PROCESS FOR THE PREPARATION THEREOF
Ronald J. Caimi, Somerset, and Walter F. Schlauch, Bridgewater, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.
Continuation-in-part of Ser. No. 828,700, Aug. 29, 1977, abandoned. This application Apr. 17, 1978, Ser. No. 897,042
Int. Cl.² C08K 3/24
U.S. Cl. 260—29.6 TA **10 Claims**

1. In a process for preparing copolymer latex binders of the type wherein the copolymer latex is formed by emulsion polymerization of acrylate or vinyl acetate monomers or mixtures thereof and from 0.1 to 10% by weight of 2-hydroxyethyl or 2-hydroxypropyl acrylate or methacrylate monomers, the improvement which comprises employing in combination with said copolymer a surfactant system consisting of 0.2–10% by weight, based on latex solids, of an anionic surfactant and 0.3–15% by weight, on latex solids, of a nonionic surfactant, wherein the ratio of anionic to nonionic surfactant is between 1:1.5 and 1:3, and adding to said copolymer latex after polymerization from 1 to 40% by weight, based on latex solids, of a water-soluble salt, the resulting latex binder being characterized by its stability to coagulation at room temperature and its ability to coagulate at a temperature between 40° and 85° C.

4,176,109
WATER-SOLUBLE COATING COMPOSITION
Atsushi Kaiya, Kawasaki; Yutaka Otsuki, and Hideo Horii, both of Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan
Division of Ser. No. 518,824, Oct. 29, 1974, abandoned, which is a continuation of Ser. No. 851,905, Nov. 16, 1977, Pat. No. 4,145,501. This application Oct. 25, 1977, Ser. No. 844,543
Claims priority, application Japan, Nov. 1, 1973, 48/123042
Int. Cl.² C08K 5/09
U.S. Cl. 260—31.2 MR **12 Claims**

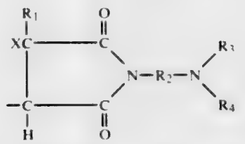
1. A water-soluble coating composition comprising an adduct (1) of a butadiene lower polymer or lower copolymer (A) which has a number average molecular weight in a range of 200–10,000 and is liquid or semi-liquid at room temperature and α,β-ethylenically unsaturated dicarboxylic acid compound (B) resulting from the reaction of said (A) and (B) at a temperature in the range of 120° to 250° C. in the presence of at least one quinoline derivative (C) in an amount of 0.005 to 5 percent by weight of said (A), said quinoline derivative being of the general formula:



in which R_1 is a hydrgen atom or an alkoxy group having 1 to 5 carbon atoms, and R_2, R_3 and R_4 are the same or different alkyl groups each having 1 to 5 carbon atoms; a hydrophilic solvent (2) in an amount of less than 100 parts by weight to 100 parts by weight of said (A); and a neutralizer (3) in a range of 0.2 to 2.0 equivalents to said (A).

4,176,110
ELECTROCOATING COMPOSITION FOR CATHODIC ELECTRODEPOSITIONS
Yutaka Otsuki, Yokohama; Yoshihiko Araki, Kawasaki, and Kazuho Aoyama, Tokyo, all of Japan, assignors to Nippon Petroleum Company, Limited, Tokyo, Japan
Filed Jan. 31, 1978, Ser. No. 873,902
Claims priority, application Japan, Feb. 4, 1977, 52-10803
Int. Cl.² C08K 5/09; C08L 63/00
U.S. Cl. 260—31.8 N **12 Claims**

1. An electrocoating composition for cathodic electrodepositions which comprises a water-miscible mixture composed of (A) a substituted conjugated diene polymer or copolymer having a molecular weight of 300–5000 and containing basic groups of the general formula:



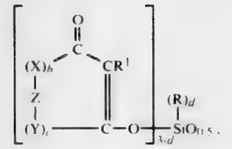
wherein R_1 is a hydrogen atom, a halogen atom or an organic residue with 1–3 carbon atoms; R_2 and R_3 are organic residues with 1–20 carbon atoms; R_4 is a hydrogen atom or an organic residue with 1–20 carbon atoms; and X is a hydrogen atom or a bond, and if X is a bond the carbon atom to which R_1 is attached and the carbon atom adjacent to said carbon atom and carrying the hydrogen atom may be part of the main chain, in a proportion of 0.05–0.5 moles per 100 grams of the said conjugated diene; and (B) not more than 30 parts by weight per 100 parts by weight of (A) of at least one resin selected from epoxy resins, said mixture of (A) and (B) being neutralized with an acid.

4,176,111
MOISTURE CURABLE ORGANOPOLYSILOXANES
James A. Cella, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Jul. 24, 1978, Ser. No. 927,289
Int. Cl.² C08L 83/06
U.S. Cl. 260—37 SB **5 Claims**

1. Moisture curable organopolysiloxane compositions comprising an organopolysiloxane consisting essentially of chemically combined units of the formula,



and having terminal siloxy units of the formula,



where R is a $C_{(1-13)}$ monovalent organic radical, R^1 is selected from hydrogen, halogen and R, X and Y are divalent radicals selected from —O—, —S— and



Z is a divalent $C_{(1-13)}$ organic radical selected from alkylene, cycloalkylene, arylene and a fused ring structure, b and c are equal to 0 or 1, R^2 is selected from hydrogen and R, and d is a whole number having a value of 0 or 1.

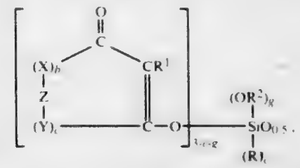
5. A moisture curable organopolysiloxane composition in accordance with claim 1, reinforced with silica filler.

4,176,112
MOISTURE CURABLE ALKOXY ORGANOPOLYSILOXANES
James A. Cella, Clifton Park, and Tyrone D. Mitchell, Albany, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Jul. 24, 1978, Ser. No. 927,284
Int. Cl.² C08L 83/06
U.S. Cl. 260—37 SB **5 Claims**

1. Moisture curable organopolysiloxane compositions comprising an organopolysiloxane consisting essentially of chemically combined units of the formula,



and having terminal alkoxysiloxy units of the formula,



where R is a $C_{(1-13)}$ monovalent organic radical, R^1 is selected from hydrogen, halogen and R, R^2 is a $C_{(1-8)}$ alkyl radical, X and Y are divalent radicals selected from —O—, —S— and



Z is a divalent $C_{(1-13)}$ organic radical selected from alkylene, cycloalkylene, arylene and a fused ring structure, b and c are equal to 0 or 1, R^3 is selected from hydrogen and R, e is a whole number having a value of 0 or 1, g is equal to 1 or 2, and the sum of e+g is equal to 1 or 2.

U.S. PATENT 4,176,107 NOV. 27, 1979 UMI

4,176,113

PROCESS FOR DYEING POLYESTERS IN THE MELT

Arnold Wick, Therwil, and Max Jost, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

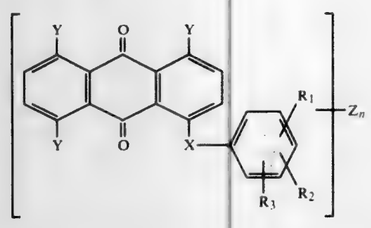
Filed Oct. 21, 1977, Ser. No. 844,326

Claims priority, application Switzerland, Nov. 2, 1976, 13793/76

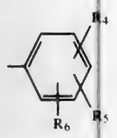
Int. Cl.² C08K 5/08

U.S. Cl. 260—40 P **9 Claims**

1. A process for dyeing polyesters in the melt, by intimately mixing with said polyester in the melt, an anthraquinone derivative of the formula



wherein R_1 is hydrogen, halogen, alkyl or alkoxy having 1–4 C atoms, and R_2 and R_3 are hydrogen, halogen or alkyl having 1–4 C atoms, with R_2 and R_3 being hydrogen if R_1 is alkoxy, X is an —NH— group or an —S— atom, one Y is the radical of the formula —NHCOR and the other two Y groups are hydrogen, with R being alkyl having 1–4 C atoms, a mononuclear five- or six-membered heterocyclic radical or a radical of the formula



in which R_4 is hydrogen, halogen, hydroxyl, alkyl or alkoxy having 1–4 C atoms, phenyl or phenoxy, R_5 is hydrogen, halogen or alkyl having 1–4 C atoms and R_6 is hydrogen or halogen, with R_6 being halogen if R_4 is halogen or alkyl, Z is halogen and n is O, 1, 2 or 3, and 1–3 Z's can be bound as substituents R_1 to R_3 and/or as substituents on the anthraquinone nucleus or on the radical R.

4,176,114

PROCESS FOR MANUFACTURING SAND CORES OR MOLDS

Patrick H. Stewart, and Wayne D. Woodson, both of Danville, Ill., assignors to C L Industries, Inc., Danville, Ill.

Filed Jan. 24, 1978, Ser. No. 871,772

Int. Cl.² C08K 3/36

U.S. Cl. 260—42.29 **15 Claims**

1. A process for the manufacture of sand cores or molds which comprises mixing sand with an acid-curing condensation-type resin comprising high viscosity poly furfuryl alcohol, adding a liquid or solid oxidant to said sand, forming said resin-sand-oxidant mixture into a predetermined shape, treating said shaped resin composition with sulfur dioxide at ambient temperature for a period between a few seconds and a few minutes to form sulfuric acid in situ and effect a rapid resin cure.

4,176,115

FIRE-RESISTANT CONSTRUCTION MATERIAL

Seymour Hartman, Mahopac, and Catherine M. Sheridan, Pawling, both of N.Y., assignors to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 613,476, Sep. 15, 1975, abandoned. This application May 6, 1977, Ser. No. 794,368

Int. Cl.² C08K 3/32, 3/34, 5/17, 5/05

U.S. Cl. 260—39 R **10 Claims**

1. A method for producing a fire-resistant construction material comprising preparing an essentially anhydrous, powdered and homogenously admixed blend comprising at least one incombustible component and from about 30 to 70% by total weight of melamine formaldehyde resin and applying sufficient heat and pressure to cure said resin and transform said blend into a rigid, continuously adherent network having a predetermined construction material configuration.

4,176,116

DIPEPTIDE DERIVATIVES

Cedric H. Hassall, Welwyn; William H. Johnson, Hitchin, and Noel A. Roberts, Welwyn Garden City, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

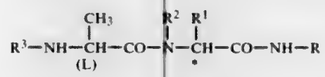
Filed Jun. 8, 1977, Ser. No. 804,681

Claims priority, application United Kingdom, Jun. 21, 1976, 25645/76; Aug. 4, 1976, 32496/76; Mar. 22, 1977, 11997/77

Int. Cl.² C07C 103/52; C07G 7/00

U.S. Cl. 260—112.5 R **24 Claims**

1. Dipeptide derivatives of the formula



(I)

wherein R is methyl, ethyl, propyl or isopropyl; R^1 and R^2 each is hydrogen or methyl, with the proviso that R^1 and R^2 are not simultaneously hydrogen or R^1 and R^2 together are trimethylene; R^3 is selected from unsubstituted alkanoyl containing at least 3 carbon atoms or halo-alkanoyl, nitro-alkanoyl, cyano-alkanoyl, cycloalkylcarbonyl, cyclo-alkyl-alkanoyl, aroyl, aryl-alkanoyl, alkoxycarbonyl, aryloxycarbonyl, arylsulphonyl, alkylsulphonyl, cycloalkylsulphonyl, cyclo alkylsulphinyl, cyclo-alkyl-alkylsulphonyl or cycloalkyl-alkylsulphinyl and the asterisk denotes the configuration at the carbon atom so-marked is L when R^1 is other than hydrogen.

4,176,117

PROCESS FOR OBTAINING GELATIN

Léon Oudem, Av. Casper Libero, 573-1° And. Conj. 3, Sao Paulo, Brazil

Filed Aug. 30, 1977, Ser. No. 828,991

Claims priority, application France, Mar. 11, 1977, 77 07254

Int. Cl.² C09H 7/00; A23J 1/10; C09H 3/00

U.S. Cl. 260—118 **11 Claims**

1. A process for manufacturing gelatin from collagen, said collagen being prepared from animal waste, wherein said animal waste forming the raw materials and constituted by scraps of hides, sinews, tendons, are treated immediately after slaughter of the animal and are subjected to the following successive operations:

(a) the raw materials (derms of hides, sinews or tendons) are washed and de-greased in a solution of sodium hydroxide enabling the pores to dilate and facilitating elimination of the blood and fatty substances;

(b) the materials are subjected to a chopping operation reducing them to the state of paste.

(c) the pH of the paste is adjusted to neutralise the sodium hydroxide returning from initial washing phase (a) and the paste thus returned to a neutral pH is washed several times in cold water and rinsed.

(d) the paste is then subjected to filtration by pressing to express the water therefrom and to conserve only the solid matter forming the cake constituted by substantially pure collagen.

4,176,118

AROMATIC URETDIONE-DIISOCYANATE-DISULPHONIC ACIDS

Marcel Petinaux, Krefeld; Dieter Dieterich, Leverkusen, and Peter Markusch, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

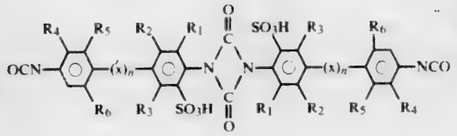
Continuation of Ser. No. 690,494, May 27, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 848,969

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1975, 2524476

Int. Cl.² C07D 205/10

U.S. Cl. 260—239 A **9 Claims**

1. Pulverulent crystalline aromatic uretdione diisocyanate disulphonic acids corresponding to the following formula:



wherein

R_1, R_2, R_3, R_4, R_5 and R_6 each represent a hydrogen, chlorine or bromine atom or a methyl, ethyl or C_1–C_4 alkoxy group;

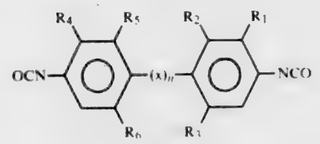
x represents —O—, >C=O, $>SO_2$, or



wherein R_7 and R_8 each represent a hydrogen atom, a methyl or ethyl group or, when taken together with the carbon atom to which they are attached represent a cyclohexyl group; and

n represents 0 or 1.

2. A process for the preparation of pulverulent crystalline aromatic uretdione diisocyanate disulphonic acids, characterized in that a diisocyanate corresponding to the following general formula:



wherein

R_1, R_2, R_3, R_4, R_5 and R_6 each represent a hydrogen, chlorine or bromine atom or a methyl, ethyl or C_1–C_4 alkoxy group;

x represents —O—, >C=O, $>SO_2$, or



wherein R_7 and R_8 each represent a hydrogen atom, a methyl or ethyl group or, when taken together with the carbon atom to which they are attached represent a cyclohexyl group; and

n represents 0 or 1,

is reacted with sulphur trioxide at temperatures of from −30° to +100° C. in anhydrous solvents which are inert towards SO_3 and isocyanate groups.

4,176,119

2,4-PYRIMIDINE-DICARBAMATE-3-OXIDES

Jean-Claude Müller, Rixheim, France, and Henri Ramuz, Birsfelden, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

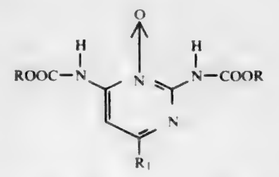
Division of Ser. No. 873,183, Jan. 27, 1978, Pat. No. 4,150,131. This application Dec. 26, 1978, Ser. No. 973,788

Claims priority, application Austria, Feb. 4, 1977, 745/77; Luxembourg, Dec. 5, 1977, 78640

Int. Cl.² C07D 239/50, 401/04, 403/04

U.S. Cl. 260—243.3 **12 Claims**

1. A compound of the formula



(II)

wherein R is alkyl, alkoxyalkyl, haloalkyl, aralkyl or aryl, and R_1 is dialkylamino, 4-alkyl-1,2,5,6-tetrahydropyridin-1-yl, piperidino, azabicyclononyl, azabicyclooctyl, 3-pyrrolin-1-yl, 3-hydroxy-1-piperidinyl or 4-hydroxy-1-piperidinyl or, when R is haloalkyl, aralkyl or aryl, R_1 can also be 1,2,5,6-tetrahydropyridin-1-yl.

4,176,120

2-[4-(POLYHALO-2-HYDROXY-2-PROPYL)ANILINO]-THIAZOLIN-4-ONES

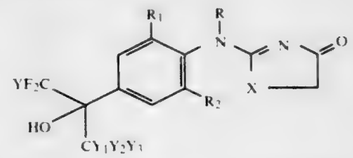
Bernard R. Neustadt, West Orange, and Nicola Zampaglione, Fairfield, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 731,236, Oct. 12, 1976, Pat. No. 4,103,018. This application Apr. 24, 1978, Ser. No. 899,625

Int. Cl.² C07D 277/04

U.S. Cl. 548—184 **6 Claims**

1. A compound of the formula



(I)

wherein X is sulfur; R is hydrogen or lower alkyl; R_1 and R_2 are independently hydrogen, lower alkyl, lower alkoxy or halogen; and Y, Y_1, Y_2 and Y_3 are independently hydrogen, chlorine or fluorine.

4,176,121

1,3-OXAZOLE PHOSPHATES AND PHOSPHONATES

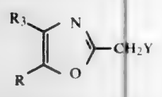
Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 850,764, Nov. 11, 1977, Pat. No. 4,137,308. This application Oct. 25, 1978, Ser. No. 954,495

Int. Cl.² C07D *263/32, 263/46*

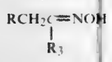
U.S. Cl. 548—119 **3 Claims**

1. A compound having the formula



in which R is phenyl, phenylthio, phenoxy or lower alkylthio; R_3 is lower alkyl and Y is chloro or bromo, provided that when R is isopropylthio, R_3 is a lower alkyl group containing from 1 to 3 carbon atoms.

2. A process for producing a compound as defined in claim **1** comprising reacting a methyl ketone oxime having the formula



with between a two-fold and a ten-fold stoichiometric excess of chloroacetyl chloride or bromide in the absence of an acid acceptor.

4,176,122

PROCESS FOR THE PREPARATION OF BICYCLIC ENONE COMPOUNDS

István Székely Szentendre; István Tömösközi, Budapest; Gábor Kovács, Budapest; Vilmos Simonidesz, Budapest; Marianna Lovász née Gáspar, Budapest; Borbála née Ördög Keresztes, Budapest; Julia née Rádöczi Remport, Budapest; István Stadler, Budapest; Zsuzsa née Gombos Visky, Budapest, and Csaba Szántay, Budapest, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek, Budapest, Hungary

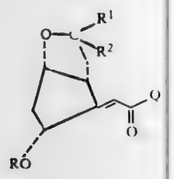
Filed Feb. 22, 1977, Ser. No. 770,997

Claims priority, application Hungary, Feb. 23, 1976, CI 1645

Int. Cl.² C07D *307/93*

U.S. Cl. 260—343.3 P **8 Claims**

1. A process for the preparation of a racemic or optically active compound formula V,



V

wherein

R is hydrogen, acyl, or silyl,

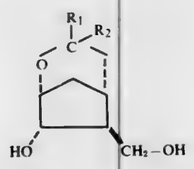
R^1 and R^2 together form an oxo group or

R^1 is lower alkoxy, which can be substituted with one, two or three halogen atom(s) and

R^2 is hydrogen,

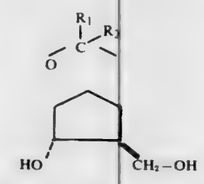
Q is a straight or branched chained alkyl alkenyl or alkinyl having one to 10 carbon atoms, said alkenyl containing one double bond, said alkinyl containing one triple bond,

which comprises reacting a racemic or optically active lactone diol derivative of formula III



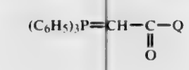
(III)

with an oxidant selected from the group which consists of thioanisole, effective sulfide complexes with chlorine, sulfoxides and effective chromium complex oxidants, then further reacting the thus obtained aldehyde of formula II



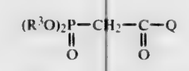
(II)

with a phosphorous compound of formula VI



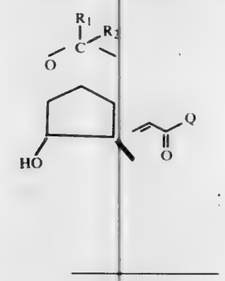
(VI)

or VII



(VII)

wherein R^3 is lower alkyl then acylating or silylating the hydroxyl of the obtained compounds of formula VIII



(III)

4,176,123

STEROID INTERMEDIATES

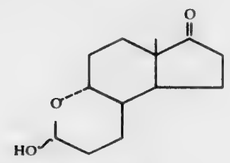
John C. Knight, and Merle G. Wovcha, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 873,101, Jan. 30, 1978, abandoned, which is a division of Ser. No. 767,369, Feb. 10, 1977, abandoned, which is a division of Ser. No. 632,650, Nov. 17, 1975, Pat. No. 4,042,459. This application Nov. 20, 1978, Ser. No. 961,965

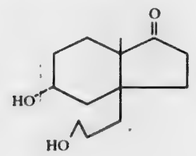
Int. Cl.³ C07D *311/02;* **C07C** *49/28*

U.S. Cl. 260—345.2 **2 Claims**

1. A compound of the formula



2. A compound of the formula



4,176,124

SILICON-MODIFIED PHTHALIC ACID DERIVATIVES

Roland Darms, Therwil; Siegfried Wyler, Dornach, both of Switzerland, and Gerd Greber, Bad Vöslau, Austria, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 30, 1978, Ser. No. 938,171

Claims priority, application Switzerland, Sep. 9, 1977, 11066/77

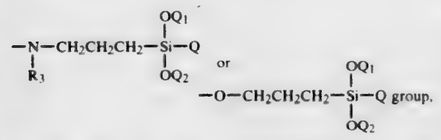
Int. Cl.² C07F *7/02, 7/04, 7/18*

U.S. Cl. 260—346.3 **4 Claims**

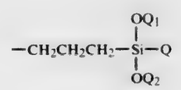
1. A compound of the formula I

(I)

in which R_1 and R_2 independently of one another are —OH, alkoxy with 1–12 C atoms or phenoxy or R_1 and R_2 together are the —O— group, X is a



R_3 is alkyl with 2–7 C atoms, cycloalkyl with 5–7 C atoms, benzyl or



Q is methyl, phenyl or $—OQ_3$ and Q_1, Q_2 and Q_3 independently of one another are alkyl with 1–6 C atoms or phenyl.

4,176,125

PROCESS FOR PRODUCING 1,4-DIHYDROANTHRAQUINONE

Ryo Matsuura, Yamato; Shuichi Nakatani; Yukio Nomiyama, both of Yokohama, and Tadashi Ninomiya, Kawasaki, all of Japan, assignors to Kawasaki Kasei Chemicals Ltd., Tokyo, Japan

Filed Nov. 17, 1977, Ser. No. 852,432

Int. Cl.² C07C *49/68*

U.S. Cl. 260—369 **3 Claims**

1. In a process for producing 1,4-dihydroanthraquinones by oxidizing 1,4,4a,9a-tetrahydroanthraquinone or 1,4-dihydroanthrahydroquinone which may contain inert substituents with molecular oxygen, the improvement which comprises carrying out said oxidation at a reaction temperature of from 10° C. to 70° C. and a pH of 8.5 to 12 in an aqueous medium in the presence of a quinone type redox catalyst, said inert substituents being selected from the group consisting of C_1–C_8 alkyl, halogen, haloalkyl, and phenyl.

4,176,126

NOVEL CORTICOIDS

Klaus Annen; Henry Laurent; Helmut Hofmeister; Rudolf Wiechert; Hans Wendt, and Joachim-Friedrich Kapp, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

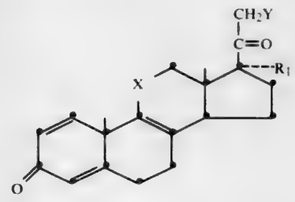
Filed Oct. 4, 1977, Ser. No. 839,486

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1976, 2645104

Int. Cl.² C07J *71/00*

U.S. Cl. 260—397.45 **15 Claims**

1. Corticoids of the formula



wherein

X is β-hydroxymethylene, β-fluoromethylene or carbonyl;

Y is fluorine or chlorine; and

R_1 is acyloxy of 1–10 carbon atoms.

4,176,127

PROCESS FOR THE PRODUCTION OF SILANES FROM OLEIC ACID ESTERS

Hans-Ulrich Hempel, Overath Vrlkerath; Hans-Jürgen Klüeppel, and Peter Volgnandt, both of Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 959,944

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1977, 2752973; Aug. 17, 1978, 2836054

Int. Cl.² C08H *3/00;* **C07F** *7/02*

U.S. Cl. 260—407 **8 Claims**

1. In the process for the production of a long chain silane consisting essentially of reacting a hydrogen silane with a commercial oleic acid ester with a lower alkanol in the presence of a catalyst at a temperature above 50° C. and recovering said long chain silane, the improvement consisting essentially of utilizing a commercial oleic acid ester with a lower alkanol containing less than 4% by weight to poly-unsaturated compounds, as said oleic acid ester.

2. The process of claim **1** wherein said commercial oleic acid

V 9 8 8 1 4 N O 0 2 7 7 9 UMI

ester with a lower alkanol containing less than 4% by weight of poly-unsaturated compounds was derived from a commercial oleic acid ester with a lower alkanol having over 4.1% of poly-unsaturated compounds.

3. The process of claims 1 or 2 wherein the proportion of poly-unsaturated compounds in said commercial oleic acid ester with a lower alkanol was reduced by dimerization of these compounds.

4,176,128

PROCESS FOR INCREASING THE MOLECULAR WEIGHT OF SILICON COMPOUNDS

Bernward Deubzer, Burghausen, and Norbert Egerter, Emmerting, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 26, 1978, Ser. No. 973,787

Claims priority, application Fed. Rep. of Germany, Jan. 1, 1978, 2801779

Int. Cl.² C07F 7/08

U.S. Cl. 260—448.2 E **2 Claims**

1. A process for increasing the molecular weight of silicon compounds containing Si-bonded alkoxy groups which comprises hydrolyzing silicon compounds containing the Si-bonded alkoxy groups as essentially the only hydrolyzable groups at increased temperature in the presence of a hydrated salt selected from the group consisting of a salt of ammonium hydroxide and a metal of the first to the third principal group of the Periodic System of elements according to Mendeleeff, in an amount of at least 8 grams of hydrated salt per mol of hydrolyzable group while distilling off the alcohol as it is evolved to form a product which does not solidify when cooled to at least room temperature.

4,176,129

PROCESS FOR THE PREPARATION OF TRIS(HYDROXYMETHYL)-AMINOMETHAN-LACTATE-DIHYDROXYALUMINATE

Massimo Fazzini, Milan, Italy, assignor to Scharper S.p.A. Per l'Industria Farmaceutica, Italy

Filed May 26, 1978, Ser. No. 910,085

Claims priority, application Italy, Jun. 7, 1977, 24428 A/77

Int. Cl.² C07F 5/06

U.S. Cl. 260—448 R **4 Claims**

1. A process for the production of tris (hydroxymethyl)-aminomethan-lactate-dihydroxyaluminate which comprises reacting equimolar quantities each of: (a) lactic acid, (b) tris(-hydroxymethyl)aminomethane, and (c) aluminum isopropylate.

4,176,130

PROCESS FOR PREPARING ACYLOXYSILANES AND ACYLOXYSILOXANES

Peter John, Burghausen, Fed. Rep. of Germany; Wolfgang Feichtner, Ach, Austria; Werner Graf, and Volker Frey, both of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 28, 1978, Ser. No. 974,200

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1978, 2801780

Int. Cl.² C07F 7/08

U.S. Cl. 260—448.2 E **7 Claims**

1. A process for preparing acyloxysilanes by reacting a chlorosilane with an aliphatic carboxylic acid in a column at an elevated temperature, the improvement which comprises passing an aliphatic carboxylic acid in the vapor phase upwards from the bottom of the column countercurrent to the flow of the chlorosilane, in which the aliphatic carboxylic acid is introduced into the column at such a rate that the carboxylic acid does not exceed 1.3 mol per gram atom of Si-bonded chlorine in the column while removing the acyloxysilane at the bottom of the column.

4,176,131

CHEMICAL PROCESS

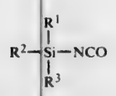
Kun M. Shih, East Syracuse, and Derek Walker, Jamesville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Dec. 4, 1978, Ser. No. 966,177

Int. Cl.² C07F 7/10, 7/18

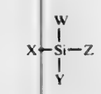
U.S. Cl. 260—448.2 E **10 Claims**

1. A process for the preparation of a silyl isocyanate of the formula



I

wherein R^1, R^2 and R^3 each are independently hydrogen, isocyanato, (lower)alkyl, (lower)alkoxy, phenyl, phenoxy, phenyl(lower)alkyl, phenyl(lower)alkoxy or cycloalkyl; which process comprises reacting a halogen compound of the formula



II

wherein W is R^1, chloro, bromo, fluoro or iodo; X is R^2, chloro, bromo, fluoro, or iodo; Y is R^3, chloro, bromo, fluoro or iodo; and Z is chloro, bromo, fluoro or iodo; with from about 1 to about 1.5 equivalents of an alkali metal cyanate for each halogen present in compound II, in an inert solvent having a dielectric constant below about 10, at a temperature of from about 0° C. to about 200° C., in the presence of a crown ether as a catalyst.

4,176,132

REACTION OF ORGANIC DIISOCYANATES WITH WATER

Akira Ide, and Sojiro Matsumoto, both of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 1, 1978, Ser. No. 882,466

Claims priority, application Japan, Mar. 1, 1977, 52-21882; Jan. 20, 1978, 53-5053; Feb. 6, 1978, 53-12097

Int. Cl.² C07C 119/042, 119/045, 119/048

U.S. Cl. 260—453 A **22 Claims**

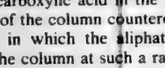
1. In a process for the preparation of an organic polyisocyanate which comprises reacting an aliphatic, alicyclic or araliphatic diisocyanate monomer with water, the improvement which comprises conducting the reaction

(a) at a reaction temperature of at from about 70° C. to about 200° C.;

(b) in the presence of a solvent mixture comprising a mixture of at least one ethylene glycol derivative of the formula (I):

$$R_1O(CH_2CH_2O)_nR_2 \quad (I)$$

wherein R_1 and R_2, which may be the same or different, each represents an alkyl group having 1 to 4 carbon atoms, which may be straight chain or branched chain, or an acetyl group and n is an integer of 1 to 2; and at least one phosphoric acid derivative of the formula (II):



(II)

wherein R_3, R_4 and R_5, which may be the same or different, each represents a methyl group or an ethyl group;

(c) with the proportion of the solvent mixutre in the reaction mixture being 10 to 80 wt%; and

(d) with the proportion of the ethylene glycol derivative (I) in the solvent mixture being 30 to 90 wt% and the proportion of the phosphoric acid derivative (II) in the solvent mixture being 10 to 70 wt%, wherein the molar ratio of the diisocyanate monomer to water ranges from about 5:1 to about 40:1, said solvent mixture providing the dual effects of substantially completely eliminating the formation of by-product polyurea and inhibiting the amounts of monomer present after long term storage of the reaction product.

4,176,133

PROCESS FOR ISOLATING N,N-DIMETHYLAMINOACETONITRILE FROM WATER MIXTURES

Manfred Lenthe, Odenthal, and Gerhard Dankert, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 19, 1978, Ser. No. 953,048

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1977, 2748964

Int. Cl.² C07C 121/43

U.S. Cl. 260—465.5 R **7 Claims**

1. In the recovery of N,N-dimethylaminoacetonitrile from a mixture thereof with water by extraction with an organic solvent thereby to form an aqueous phase and an organic solvent phase containing the nitrile, separating the organic phase, and recovering the nitrile from the organic solvent, the improvement which comprises effecting the extraction at about 5° to 90° C. with about 1.5 to 10 parts by weight of 1,2-dichlorobenzene per part by weight of the water/nitrile mixture.

4,176,134

AROMATIC SULFONAMIDE SULFONYL CHLORIDE COMPOUNDS

Hideo Ueda, and Hiroshi Sawaguchi, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

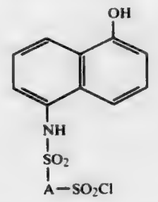
Filed Jan. 9, 1978, Ser. No. 868,164

Claims priority, application Japan, Jan. 11, 1977, 52-1797

Int. Cl.² C07C 143/70

U.S. Cl. 260—543 R **2 Claims**

1. An aromatic sulfonamide sulfonyl chloride compound represented by the following general formula (I)



(I)

wherein A represents a divalent benzene nucleus in which the bonding thereto is symmetrical.

4,176,135

PROCESS FOR PREPARING HYDRAZODICARBONAMIDE

Shigeaki Ohno, Naruto; Toshiyuki Kazuta, Tokushima, and Takeshi Iwata, Naruto, all of Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Osaka, Japan

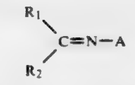
Filed Jan. 23, 1978, Ser. No. 871,410

Claims priority, application Japan, Mar. 24, 1977, 52-33111

Int. Cl.² C07C 133/02

U.S. Cl. 260—554 **13 Claims**

1. A process for preparing hydrazodicarbonamide by reacting a compound represented by the formula



(1)

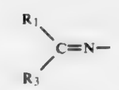
wherein

R_1 is hydrogen atom or alkyl having from 1 to 4 carbon atoms;

R_2 is alkyl having from 1 to 4 carbon atoms, cycloalkyl having from 4 to 8 carbon atoms or aryl having from 6 to 10 carbon atoms;

R_1 and R_2, when taken together with the carbon atom to which they are attached, form an aliphatic ring or heterocyclic ring; and

A is NH_2— or



wherein

R_1 is as defined above,

R_3 is alkyl having from 1 to 4 carbon atoms, cycloalkyl having from 4 to 8 carbon atoms or aryl having from 6 to 10 carbon atoms, and R_1 and R_3, when taken together with the carbon atom to which they are attached, form an aliphatic ring or heterocyclic ring,

wherein urea in an aqueous medium with heating in the absence of any added mineral acid and in the presence of a salt selected from the group consisting of metal salts of mineral acid, ammonium salts of mineral acid, metal salts of organic acid and ammonium salts of organic acid, having a solubility of at least about 0.1 wt. % in the aqueous medium and wherein the compound of formula (1) is continuously or intermittently introduced into the reaction system while the carbonyl compound and ammonia produced are being withdrawn from the reaction system.

4,176,136

PROCESS FOR PREPARING ETHYLIDENE-BIS-ACETAMIDE

Daniel J. Brenzel, Menlo Park, Calif., assignor to Dynapol, Palo Alto, Calif.

Filed May 31, 1977, Ser. No. 801,485

Int. Cl.² C07C 102/00

U.S. Cl. 260—561 R **13 Claims**

1. The process for preparing ethylidene bisacetamide which comprises contacting a liquid admixture comprising acetamide, acetaldehyde and water in an amount of up to 500% by weight inclusive based on the amount of acetaldehyde and acetamide with a solid cation exchange resin in H^+ form at a weight hourly space velocity of from about 0.01 to about 2 kilograms of acetaldehyde per kilogram of resin per hour and a temperature of from about 25° C. to about 110° C. thereby forming an ethylidene bis/acetamide-containing reaction product and thereafter separating said reaction product from said cation exchange resin.

4,176,137

MANUFACTURE OF CARBOXYLIC ACID AMIDES

Rolf Platz, Mannheim; Toni Dockner, Meckenheim; Jürgen Heners, Lingen, and Herbert Krüg, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 959,733

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1977, 2751236

Int. Cl.[2] **C07C** *102/08*

U.S. Cl. 260—561 N **16 Claims**

1. A process for the manufacture of carboxylic acid amides by addition reaction of water with nitriles in the presence of a copper-containing catalyst, wherein the reaction is carried out with a catalyst which contains copper and a magnesium silicate produced in the presence of a copper compound by precipitation of a magnesium compound with an alkali metal silicate, the catalyst being treated with a reducing gas at an elevated temperature, and wherein the magnesium silicate prepared as described above and separated from the precipitation medium is mixed with from 3 to 50 percent by weight, based on magnesium silicate, of a cement having a particle size of from 1 to 100 micrometers.

4,176,138

PROCESS FOR PREPARING P-AMINOPHENOL IN THE PRESENCE OF DIMETHYLDODECYLAMINE SULFATE

Sharad S. Sathe, Maryland Heights, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Oct. 27, 1978, Ser. No. 955,442

Int. Cl.[2] **C07C** *89/00*

U.S. Cl. 260—575 **6 Claims**

1. A method for preparing p-aminophenol, with aniline as a by-product, by the catalytic hydrogenation of nitrobenzene in an acidic reaction medium containing dimethyldodecylamine sulfate.

4,176,139

PROCESS FOR PREPARING UNSATURATED SPIRANIC DERIVATIVES

Ferdinand Naf, Geneva, and Rene Decorzant, Onex, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

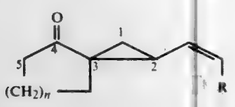
Filed Aug. 18, 1978, Ser. No. 934,828

Claims priority, application Switzerland, Aug. 26, 1977, 10435/77

Int. Cl.[2] **C07C** *45/00, 49/54*

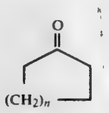
U.S. Cl. 260—586 C **8 Claims**

1. Process for preparing an unsaturated spiro derivative of formula



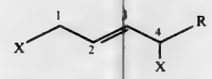
(I)

wherein index n represents integer 1 or 2 and wherein symbol R defines a lower alkyl radical, which comprises treating, in the presence of a strong base, a cycloalkanone of formula



(II)

wherein index n has the above given meaning, with a dihaloalkene of formula



(III)

wherein symbol R is defined as above and X represents a halogen atom.

4,176,140

DEHYDROGENATION OF HYDROCARBONS WITH ZINC TITANATE CATALYST

Brent J. Bertus, and Darrell W. Walker, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 743,193, Nov. 19, 1976, abandoned. This application Oct. 27, 1977, Ser. No. 844,931

Int. Cl.[2] **C07C** *11/12*

U.S. Cl. 585—629 **22 Claims**

1. A process for catalytically dehydrogenating a dehydrogenatable hydrocarbon feedstock having at least one



grouping which comprises: contacting said feedstock with a regenerable dehydrogenation catalyst in the substantial absence of free oxygen under dehydrogenation conditions wherein said regenerable dehydrogenation catalyst is prepared by calcining a mixture of zinc oxide and titanium dioxide and a metal selected from the group consisting of lithium and magnesium at a temperature in the range of from about 650° to about 1050° C.

4,176,141

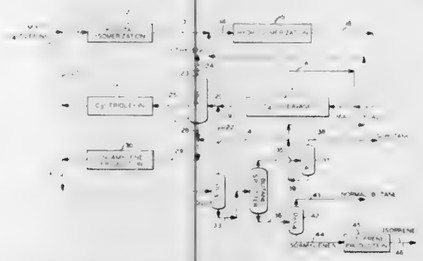
ISOAMYLENES FROM BUTENES

Rolland E. Dixon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 18, 1978, Ser. No. 952,355

Int. Cl.[2] **C07C** *11/10, 3/62, 5/22*

U.S. Cl. 585—314 **6 Claims**



1. A process for converting mixed butenes to isoamylenes which comprises the steps of

(a) passing a first stream comprising mixed butenes to a skeletal isomerization zone and therein subjecting same to isomerization conditions sufficient to convert normal butenes to isobutylene,

(b) passing the reaction product from (a) to a hydroisomerization zone and therein subjecting same to double bond isomerization conditions sufficient to convert butene-1 to butenes-2,

(c) passing the effluent from (b) comprising ethylene, isobutane, normal butane, butenes-2, isobutylene, butene-1, and amylenes to a butenes-2 cleavage zone or disproportionation zone wherein butenes-2 are converted to propylene in the presence of ethylene,

(d) separating the effluent from (c) into an overhead ethylene-rich stream, a propylene-rich side stream, and a bottoms stream comprising isobutylene, isobutane, normal butane, propylene, some butylenes, and some amylenes,

(e) passing said bottoms stream (d) to a disproportionation zone and therein subjecting same to disproportionation conditions such that isobutylene and propylene react to form isoamylenes and ethylene, and

(f) separating the effluent from (e) into separate streams comprising (1) an ethylene/propylene-rich stream, (2) an isobutane-rich stream, (3) a normal butane-rich stream, (4) an isobutane/isobutylene/isobutene-1 containing stream, and (4) an isoamylenes-rich stream.

4,176,142

POWDER COATING COMPOSITION

Robert B. Lewis, Lower Makefield Township, Bucks County, Pa., and Terri A. Giversen, Delaware Township, Hunterdon County, N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed May 22, 1978, Ser. No. 908,592

Int. Cl.[2] **C08L** *63/00*

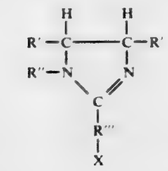
U.S. Cl. 525—336 **12 Claims**

1. A powder coating composition which comprises:

at least one 1, 2 polyepoxy compound;

a functionally terminated elastomer;

a curing agent mixture comprising (1) an imidazoline derivative having the structural formula of



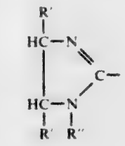
wherein

R′ is selected from the group of hydrogen, alkyl and aryl;

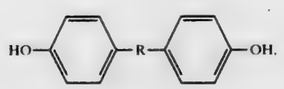
R″ is selected from the group of cycloalkyl, heterocycloalkyl and R′;

R‴ is selected from the group of alkylene and arylene and the foregoing substituted by alkyl and/or aryl; and

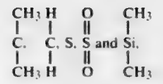
X is hydrogen or the radical



wherein R′ and R″ are as defined previously and (2) an adduct of (a) a polyhydroxyl compound having a structural formula of



where R is selected from the group consisting of



and (b) a diglycidyl ether of said polyhydroxyl compound (a), where reactant (b) is present in less than an equimolar amount to reactant (a).

4,176,143

HIGHLY REACTIVE POWDER RESIN COMPOSITIONS CONTAINING POLYCARBOXYLIC ACID ANHYDRIDES

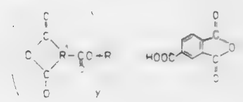
Kürt Kraft, Auringen, and Gerd Walz, Breckenheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

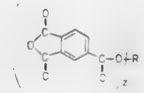
Filed Dec. 13, 1976, Ser. No. 750,135

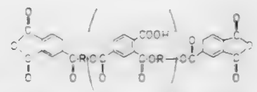
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1975, 2556182

Int. Cl.[2] **C08L** *63/00, 67/00*

U.S. Cl. 260—835 **16 Claims**







1. A highly-reactive powder resin composition suitable for use in the production of coatings consisting essentially of a mixture of (A) one or more polymers containing groups selected from hydroxyl and 1,2 epoxy-groups, having a melt viscosity of 2,000 to 20,000 cP at 160° C. and a melting range of from 45° to 95° C., and mixtures of said polymers; and (B) one or more compounds of formula (I) of the attached drawings wherein R represents a radical selected from the group consisting of

(a) an unsubstituted mono- to pentavalent aliphatic hydrocarbon group containing from 1 to 28 carbon atoms,

(b) a radical (a) being substituted by one of the groups an ester group containing from 1 to 6 carbon atoms and a carboxy group,

(c) a radical (a) being interrupted at least once by one of the linkages an O-ether linkage and a —HC═CH group,

(d) a piperazine group, and

(e) a group of one of the formulae (XVI) and (XVII) of the attached drawings an aromatic group containing from 6 to 43 carbon atoms of one of the formulae (X) to (XV) of the attached drawings wherein R^3 is a member selected from the group consisting of hydrogen, a halogen atom, an alkyl and an alkoxy group each containing from 1 to 6 carbon atoms and X represents a member selected from the group consisting of an oxygen atom, sulphinyl, sulphonyl, carbonyl and a group of the formulae (XVa) of the attached drawings in which n has the value 1 to 8; R^1 represents a radical selected from the group consisting of phenyl, naphthyl, phenanthryl, aminonaphthyl and a heterocyclic tetranhydrofu-

ryl group such that the anhydride grouping is attached to the said R^1 group on vicinyl carbon atoms; and y is an integer from 2 to 4

said component B having a melt viscosity of 50 to 15,000 cP at 160° C. and a melting range of 40° to 250° C; the combination of A and B having a melt viscosity of from 500 to 20,000 cP at 160° C., a stability of from 1 to 15 at 100° C., a flow time of from 20 to 600 s at 160° C., and a gel time of from 35 to 1,200 s at 160° C.

4,176,144

BLOCK COPOLYMERS

Frederick C. Schwab, Metuchen, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 19, 1978, Ser. No. 870,791
Int. Cl.² C08L 9/06, 9/02
U.S. Cl. 525—91 **8 Claims**

1. A block copolymer comprising a polar segment and a non-polar segment, the polar segment comprising 1 to 50 percent by weight of the copolymer and being derived from ethylene oxide or ethylene sulfide, the non-polar segment being a hydrogenated copolymer of a diene and methyl ethenyl benzene, the methyl ethenyl benzene being derived from a polymerizable mixture of isomers of methyl ethenyl benzene consisting essentially of 1-methyl-3-ethenyl benzene, at least 85 percent by weight of the mixture of 1-methyl-4-ethenyl benzene, and 0 to 0.1 percent 1-methyl-2-ethenyl benzene.

4,176,145

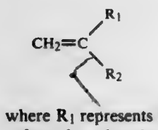
PHOTODEGRADABLE POLYMER COMPOSITIONS COMPRISING BLENDS OF POLYMERS WITH KETONE-CONTAINING BLOCK OR GRAFT COPOLYMERS

James E. Guillet, 34 Sagebrush La., Don Mills, Canada

Filed Feb. 1, 1977, Ser. No. 764,548
Int. Cl.² C08L 51/00, 53/00
U.S. Cl. 525—72 **12 Claims**

1. A synthetic polymer composition having accelerated degradation on exposure to ultraviolet radiation, comprising an intimate admixture of:

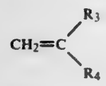
(a) a major proportion of a normally solid synthetic polymer of at least one monomer having the general formula I:



(I)

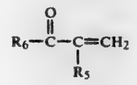
where R_1 represents a hydrogen atom or an alkyl group of from 1 to 6 carbon atoms, and R_2 is selected from the group consisting of a hydrogen atom, an alkyl group of from 1 to 6 carbon atoms, a phenyl group, a carboxylic acid group, a carboxylic acid lower alkyl ester group, a lower acyloxy group, a cyano group, an amido group and an alkenyl group of from 1 to 6 carbon atoms; and

(b) a minor proportion of a compatible polymeric product of graft copolymerization of a grafting member onto a polymeric backbone, said polymeric backbone being a polymer of a first monomer of general formula II:



(II)

wherein R_3 represents a hydrogen atom or an alkyl group of from 1 to 6 carbon atoms and R_4 is selected from the same group of atoms or groups as R_2 above, and said grafting monomer having the general formula III:



(III)

wherein R_5 represents a hydrogen atom or an alkyl group of from 1 to 6 carbon atoms, and R_6 is selected from the group consisting of alkyl groups having from 1 to 6 carbon atoms, aryl groups, alkaryl groups having up to 9 carbon atoms and alkenyl groups having up to 6 carbon atoms, said product of graft copolymerization containing from about 0.2 to about 20 weight percent of ketone carbonyl groups.

4,176,146

PROCESS FOR PRODUCING CURABLE COATING RESINS

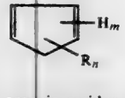
Shozo Tsuchiya, Tokyo; Hideo Hayashi; Makoto Sasaki, both of Yokohama; Kiyoshi Goto, and Kazuyoshi Ihida, both of Tokyo, all of Japan, assignors to Nippon Oil Co., Ltd. and Toyo Ink Manufacturing Co., Ltd., both of Tokyo, Japan

Filed Dec. 14, 1977, Ser. No. 860,367
Claims priority, application Japan, Dec. 22, 1976, 51/153436
Int. Cl.² C08F 8/04, 8/14
U.S. Cl. 525—338 **7 Claims**

1. A process for preparing a radiation or heat curable coating resin (III) comprising the steps of:

hydrogenating selectively the double bonds of a hydroxyl group containing resin (I) produced by reacting

(A) a compound selected from the group consisting of five-membered cyclic compounds having unsaturated conjugated double bonds and being represented by the following general formula



wherein R is an organic residue having 1 to 3 carbon atoms, and m and n are each an integer and are 6 in total, and Diels-Alder's reaction products of the five-membered cyclic compound, with (B) (meth) allyl alcohol to obtain a hydrogenated, hydroxyl group-containing resin (II) and then

esterifying the thus obtained resin (II) with at least one member selected from the group consisting of acrylic and methacrylic acids thereby to obtain a curable coating resin (III).

4,176,147

PLASTICIZED POLYVINYL CHLORIDE BLANKS AND CARTONS

David Moir, Woodcliff Lake, N.J., assignor to Alford Industries, Inc., Ridgefield Park, N.J.

Filed Apr. 21, 1978, Ser. No. 898,537
Int. Cl.² H05B 3/00; B31B 15/00
U.S. Cl. 264—25 **4 Claims**

1. A continuous process for preparing blanks of a plasticized polyvinyl chloride, said plasticized poly-vinyl chloride comprising 1 to 10 parts of a plasticizer per 100 parts of polyvinyl chloride, said plasticizer being an aliphatic acid ester of an alcohol or a glycol wherein each of the acid, alcohol and glycol moreties contains from 6 to 20 carbon atoms, which comprises the steps:

(a) passing a sheet or roll of the plasticized poly-vinyl chloride under infra-red light to raise the temperature of the sheet to about 130° to 160° F.,

(b) passing the heated sheet into a reciprocating action creaser and die cutter, and

(c) simultaneously scoring and cutting blanks.

4,176,148

METHOD OF MANUFACTURING MICROPOROUS PAPER-LIKE BUTENE-1 POLYMER SHEETS

Jules Magder, and Murray H. Reich, both of Princeton, N.J., assignors to Princeton Chemical Research, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 335,639, Feb. 26, 1973, abandoned, which is a continuation of Ser. No. 175,988, Aug. 30, 1971, abandoned. This application Jul. 12, 1974, Ser. No. 488,135
Int. Cl.² B29D 27/00
U.S. Cl. 264—41 **7 Claims**



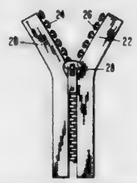
1. The process for making paper-like sheet material which comprises extruding a composition comprising (a) about 20 to 97% by weight of a butene-1 film-forming polymer having a molecular weight in excess of about 20,000, an isotacticity of at least about 25% and a butene-1 content of at least about 50% by weight, and (b) about 3 to 80% by weight of at least one normally solid filler insoluble in said polymer, to form a sheet, and stretching said sheet below about 60° C. at least about 5% beyond its yield strain substantially over its entire surface, whereby the surface of said sheet is rendered discontinuous due to formation of micropores, said sheet is opacified and rendered paper-like.

4,176,149

APPARATUS AND METHOD OF MANUFACTURE OF TRAINS OF SLIDE FASTENING ELEMENTS

George B. Moertel, Conneautville, Pa., assignor to Textron Inc., Providence, R.I.

Continuation of Ser. No. 659,881, Feb. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 601,787, Aug. 4, 1975, Pat. No. 4,084,296. This application Jan. 30, 1978, Ser. No. 873,649
The portion of the term of this patent subsequent to Apr. 18, 1995, has been disclaimed.
Int. Cl.² B29D 5/00
U.S. Cl. 264—146 **5 Claims**



1. A process of forming a train of fastening elements for a slide fastener comprising

rotating a cavity wheel having a row of elongated cavities formed in a periphery of the wheel, each cavity defining a head forming portion and a pair of leg forming portions extending from opposite sides of the head forming portion along the longitudinal dimension of the cavity, said cavity wheel having a plurality of gate channels each extending from one of the pair of leg forming portions of each cavity;

bringing a band into engagement with the periphery of the cavity wheel during a portion of the angular rotation of the cavity wheel to enclose the cavities such that the gate channels extend to one side of the band;

injecting a flowable synthetic polymer resin having long chain molecules into each of the gate channels at the one side of the band such that the flowable synthetic polymer resin flows laminarly in one direction from each gate channel into each respective cavity sequentially along the one leg forming portion, the head forming portion and the other leg portion; and

hardening the flowable synthetic polymer resin in the cavities to form a train of fastening elements.

3. A process of forming a train of fastening elements for a slide fastener comprising

rotating a cavity wheel,

feeding two pairs of connecting filaments into respective pair of spaced grooves extending around the periphery of the cavity wheel and intersecting elongated cavities of respective rows of a pair of spaced rows of fastening element forming cavities formed in the periphery of the cavity wheel,

engaging a pair of bands over spaced portions of the periphery of the cavity wheel to enclose the respective pair of rows of spaced fastening element forming cavities and to enclose gate portions of a row of runner channels extending between pairs of element forming cavities in the respective rows of the element forming cavities during a predetermined angle of rotation of the cavity wheel, portions of the runner channels being exposed between the pair of bands,

injecting a flowable synthetic polymer resin into the exposed portions of the runner channels between the pair of bands such that the synthetic polymer resin flows through the gate portions into the cavities,

hardening the flowable synthetic polymer resin in the cavities and runner channels to form a train of fastening elements with attached runners,

disengaging the pair of bands at the end of the predetermined angle of rotation of the cavity wheel and stripping the hardened train of fastening elements and attached runners from the cavity wheel,

separating the runners and pair of trains of fastening elements from the bands, and

severing the runners from the respective trains of fastening elements.

5. A process of forming a train of fastening elements for a slide fastener comprising

rotating a cavity wheel having a row of elongated cavities formed in a curved periphery of the wheel, each cavity defining a head forming portion and a pair of leg forming portions extending from opposite sides of the head forming portions along the longitudinal dimension of the cavity, said cavity wheel also having a plurality of gate channels extending in the curved periphery of the wheel from the respective cavities;

bringing a band into engagement with a portion of the curved periphery of the cavity wheel during a portion of the angular rotation of the cavity wheel to enclose the cavities such that the gate channels are left exposed in the curved periphery of the wheel on one side of the band;

injecting a flowable synthetic polymer resin against the curved periphery of the cavity wheel and into each of the gate channels at the one side of the band such that the flowable synthetic polymer resin flows through each gate channel under an edge of the band into each respective cavity; and

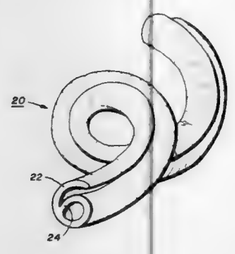
hardening the flowable synthetic polymer resin in the cavities to form a train of fastening elements.

4,176,150

PROCESS FOR TEXTURED YARN

James E. Bromley, and Jing-Peir Yu, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 18, 1977, Ser. No. 778,913
Int. Cl.[2] D01D 5/22
U.S. Cl. 264—168 **2 Claims**



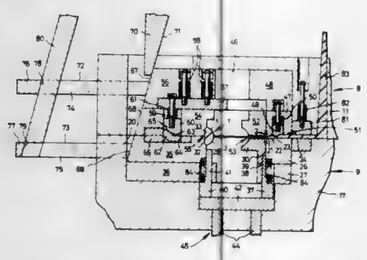
1. A process for melt spinning a filament, comprising:
a. extruding at a given extrusion rate molten melt-spinnable polyester polymer of fiber-forming molecular weight through a spiral cross-section orifice to form a molten stream;
b. quenching said molten stream in a quench zone into a filament by cooling the outer portion of said spiral more quickly than the inner portion of said spiral, and
c. withdrawing said filament from said quench zone at a sufficiently high rate that said filament has an elongation below 65% in the absence of a further step of drawing.

4,176,151

METHOD FOR MANUFACTURING AN ARTICLE STOPPER DEVICE

Tadashi Suzuki, Kita-Adachi, Japan, assignor to Sato Gosei Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1977, Ser. No. 865,920
Claims priority, application Japan, Jul. 22, 1977, 52-87466; Oct. 29, 1977, 52-130169
Int. Cl.[2] B29C 17/02
U.S. Cl. 264—291 **3 Claims**



1. A method of stretching and releasing from a mold an integrally molded, thermoplastic resin stopper device said stopper device having a filament portion, a head portion on one end of said filament portion and a crossbar portion on the other end of said filament portion wherein said head portion has an end part, side faces and an end face, said mold including a first mold means surrounding said crossbar portion of said stopper device, a second mold means surrounding said filament portion and end face of said head portion of said stopper device, and a third mold means surrounding the side faces and end part of said head portion, said third mold means having separable upper and lower mold portions, said upper and lower portions being separable in a plane which includes the axis of said filament, said method of stretching and releasing said stopper device from said mold comprising:
(a) separating said second and third mold means by moving at least one of said second and third mold means away from the other in a direction along the axis of said filament portion of said stopper device, said side faces and end part of said head being adhered to said third mold means wherein said filament is stretched in its axial direction;
(b) stopping movement of one of said upper and lower portions of said third mold means and continuing the movement of the other of said upper and lower portions of the third mold means, thereby separating the side faces and end part of the head portion from the one of said upper and lower portions of the third mold means; and
(c) separating said stopper device from the other of said upper and lower portions of said third mold means, and from said first and second mold means thereby releasing said stopper device from said mold.

4,176,152

HEATING AND STRATIFICATION METHOD FOR AN INJECTION MOLDING MACHINE

Nickolas N. Sokolow, Cheshire, Mass., assignor to Beloit Corporation, Beloit, Wis.

Continuation-in-part of Ser. No. 738,460, Nov. 3, 1976, abandoned, which is a division of Ser. No. 635,791, Nov. 28, 1975, Pat. No. 4,015,916. This application Dec. 1, 1977, Ser. No. 856,306
Int. Cl.[2] B29F 1/12
U.S. Cl. 264—329 **5 Claims**

1. A method of forming a plastic article in an injection molding machine of the type having a screw that reciprocates and rotates in a barrel said method comprising the steps of:
(1) Introducing unmelted plastic material into the injection molding machine;
(2) partially and incompletely plasticizing said material by the rotary action of the screw;
(3) prior to complete plasticization of the plastic material, stratifying said material by moving the plastic material from the rotary screw to a heating zone comprising a plurality of elongated stratified passageways which extend substantially continuously for the entire length of said heating zone;
(4) heating said material in said stratified passageways by conduction to totally plasticize the plastic material without mixing; and
(5) injecting the plasticized material into a closed mold.

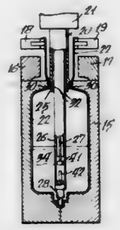
4,176,153

UNITARY, HERMETICALLY-SEALED BUT PIERCEABLE DISPENSING CONTAINER

Gerhard H. Weiler, South Barrington; Dieter H. Nagel, Des Plaines, and Louis T. Pagels, Hanover Park, all of Ill., assignors to Automatic Liquid Packaging, Inc., Arlington Heights, Ill.

Filed Feb. 10, 1978, Ser. No. 876,730
Int. Cl.[2] B29C 17/07
U.S. Cl. 264—524 **6 Claims**

6. A method of forming, filling and hermetically sealing a pierceable container having a desired content which comprises the steps of
providing an open assembly of sectional mold parts defining a container-forming mold cavity therein when closed;
extruding a parison in the form of a semi-solid, elongated hollow tube between said mold parts;
severing a predetermined tube length from the parison to provide an access opening into the severed tube length for receiving a composite mandrel which includes a blowing and filling nozzle and a forming ram member;
closing said assembly about said severed predetermined tube length so as to confine a portion of the tube length between the mold parts and within said container-forming cavity while closing one end of the confined tube length and permitting the access opening to remain open at the other end of the tube length;
positioning said composite mandrel so as to close the access opening blade and blow-forming said tube length so as to provide semi-solid walls defining said container;
forming a pierceable wall region of predetermined dimensions in said container by urging said forming ram member against a selected semi-solid wall region of the blow-formed container so as to compressively mold from within the blow-formed container a wall region of predetermined dimensions;



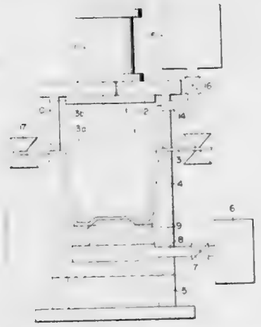
filling the blow-formed container with the desired contents through said composite mandrel;
retracting said forming ram member from said selected wall region;
providing forming and sealing means for closing the open end of said confined tube length so as to hermetically seal the filled container;
operating said forming and sealing means to hermetically seal the filled container; and
opening said assembly to remove the filled and hermetically-sealed but pierceable container.

4,176,154

METHOD FOR THERMOFORMING PLASTIC SHEETS

Kyosuke Miki, Yokohama, and Masahiro Takeuchi, Yamato, both of Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan

Filed May 23, 1977, Ser. No. 799,867
Claims priority, application Japan, May 27, 1976, 51/60595
Int. Cl.[2] B29C 17/03, 17/04
U.S. Cl. 264—547 **8 Claims**



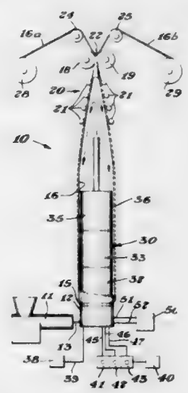
1. A method for producing a shaped article by thermoforming a thermoplastic resin sheet, which comprises:
heating a thermoplastic polypropylene sheet, having a crystal melting point of Tm, at a temperature ranging from (Tm−10)° C. to (Tm−40)° C.;
fixing said heat-softened thermoplastic polypropylene sheet between a concave forming mold the edge of which defines an open mouth and a concave ancillary mold the edge of which defines an open mouth, said molds being placed mouth to mouth in opposition to one another, and said ancillary mold having a molding assist in the form of a flat plate which is movable by means of a moving mechanism toward and away from the mouth of said ancillary mold;
providing said molding assist in said ancillary mold adjacent the mouth thereof such that the distance between the molding assist surface to be contacted with the sheet and the level of the fixed sheet is 1/10 to ½ of the depth of the shaped article;
introducing a pressurized fluid at a pressure of 1.5 kg/cm^2 to 5 kg/cm^2 into the forming mold to expand the sheet into the ancillary mold thereby contacting first the central part of the sheet with the flat surface of the molding assist and successively increasing the contacting area of the sheet until the peripheral part of the sheet contacts the flat surface of the molding assist;
moving the molding assist backwardly by means of pressure of the pressurized fluid applied to the surface of the molding assist through the sheet from the forming mold side while expanding the sheet into the ancillary mold until the height of the flat surface of the molding assist in contact with the sheet reaches a depth from about ½ to about the same as the depth of the intended shaped article, whereby the peripheral portion of the sheet which is not in contact with the molding assist is stretched and said stretching extends to the central portion of the sheet as the molding assist is so moved backwardly into the concavity of the ancillary mold; and
immediately thereafter introducing a pressurized fluid at a pressure of 1.0 kg/cm^2 to 7.0 kg/cm^2 into the ancillary mold to press the sheet against the interior surface of the forming mold, thereby forming the sheet into the desired shape.

4,176,155

METHOD AND APPARATUS FOR MAKING FILM

Herbert W. Heisterkamp, Cleveland, and Carl B. Havens, Findlay, both of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 853,615, Aug. 22, 1969, abandoned, which is a continuation of Ser. No. 545,591, Apr. 27, 1966, abandoned. This application Aug. 12, 1974, Ser. No. 496,493
Int. Cl.[2] B29D 23/04; B29F 3/08
U.S. Cl. 264—564 **7 Claims**



1. Apparatus for the production of thermoplastic seamless tube comprising an extrusion head having an annular extrusion orifice and means centrally located adjacent said extrusion

head for cooling and radially directing cooling gas against the internal surface of continuously extruded thermoplastic tubing said means for cooling and radially directing cooling gas comprising a stationary housing having an elongated chamber therein, said chamber extending in an axial direction with respect to said annular extrusion orifice and having an inlet for the cooling gas at the end opposite said extrusion orifice, means for directing a stream of cooling gas from said inlet through said chamber, cooling means in said chamber for cooling said stream of gas as it passes therethrough, and nozzle means between said stationary housing and said extrusion head, said nozzle means comprising a second housing which is rotatably mounted, said rotatable housing having a further chamber therein having an inlet at one end thereof for receiving said cooling gas from said stationary housing and an annular substantially radially directed outlet passage, said outlet passage being unobstructed whereby upon rotation of said second housing a uniform omni-radial stream of cooling gas is directed against the interior surface of the extruded tube and along a path away from said extrusion head and contiguous to the interior surface of the extruded tube towards said inlet in said chamber of said stationary housing.

3. In a method for producing a thermoplastic seamless tube, the steps comprising

continuously extruding thermoplastic material in the form of seamless tubing,

continuously withdrawing the tubing from the point of extrusion,

directing a cooling gas stream through the extruded tubing in an axial direction opposite to the direction of withdrawal of said tubing towards the point of extrusion,

imparting a helical motion to said stream as said stream moves in said axial direction, and then

directing said stream having a helical flow pattern radially along a path against the interior surface of said tubing and away from said point of extrusion to cool the tubing.

4,176,156

METHOD FOR HEAT-STERILIZING ARTIFICIAL KIDNEYS

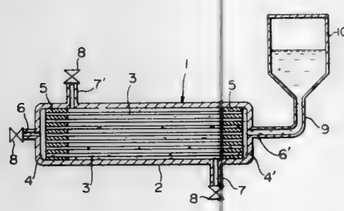
Akira Asanuma; Nobuo Taneda; Ryozo Hasegawa; Shohei Jindai, and Toshio Morishita, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Nov. 1, 1977, Ser. No. 847,619

Claims priority, application Japan, Nov. 5, 1976, 51-132301; Nov. 9, 1976, 51-133738; Nov. 9, 1976, 51-133739; May 25, 1977, 52-66284[U]; May 26, 1977, 52-66912[U]

Int. Cl.² A61M *1/03;* **A61L** *1/00*

U.S. Cl. 422—25 **10 Claims**



1. A method for heat sterilizing an artificial kidney comprising a receptacle having accommodated therein permselective hollow filaments and including inlet and outlet ports for the blood and inlet and outlet ports for a dialyzate, which comprises

(a) filling a primer consisting of water or a water solution into the artificial kidney,

(b) connecting a pressure buffer tank to at least one of the inlet and outlet ports, a conduit being provided between said at least one port and the pressure buffer tank, one end of the conduit being connected to said at least one port and the other end of the conduit being connected to the pressure buffer tank thereby to connect said at least one port to the pressure buffer tank,

(c) sealing the remaining ports by stopper means,

(d) heating the artificial kidney to a temperature of 80° to 130° C. to heat sterilize it, and moving gas and a part of the primer in the artificial kidney, which have been expanded by the heating, to the pressure buffer tank,

(e) cooling the artificial kidney to return the primer in the buffer tank to the artificial kidney, and

(f) aseptically sealing the port connected to the pressure buffer tank.

4,176,157

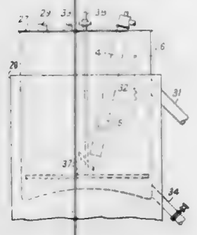
CALCINING CALCIUM SULPHATE DIHYDRATE

James S. George, Brampton; Arthur G. T. Ward, Wilford, and Percy N. Pastakia, Dunkirk, all of England, assignors to BPB Industries Limited, London, England

Division of Ser. No. 708,461, Jul. 26, 1976, abandoned, which is a continuation of Ser. No. 523,936, Nov. 14, 1974, abandoned. This application Aug. 18, 1977, Ser. No. 825,755

Int. Cl.² B01J *6/00;* **C04B** *11/02*

U.S. Cl. 422—114 **7 Claims**



1. Apparatus for calcining calcium sulfate dihydrate (gypsum) comprising an open-topped, closed-bottom, calcination vessel adapted to contain a mass of calcining gypsum having a lid thereon to close said vessel; a combustion chamber located beneath the closed bottom of said vessel and a heat source means in said combustion chamber to supply heat to the exterior of said vessel; inlet means adapted for feeding raw gypsum into said vessel; a heat-supplying tube mounted in the lid and extending into said vessel, said tube having a closed end, an open end and distribution holes near the open end with said open end and distribution holes placed in the interior of said vessel; a source of hot combustion gases located near the closed end of said tube whereby said hot combustion gases pass through said tube and are directly introduced into the interior of said vessel through said open end and said distribution holes of said tube and into the mass of gypsum; agitation means mounted on a rotatable shaft and extending into said vessel; and a product overflow tube leading from an opening in the side wall of said vessel.

4,176,158

PROCESS FOR CONCENTRATING TECHNETIUM-99M

John B. Laidler, and Roy H. Abrahams, both of Amersham, England, assignors to The Radiochemical Centre Ltd., England

Filed Feb. 3, 1976, Ser. No. 654,877

Claims priority, application United Kingdom, Feb. 3, 1975, 4618/75

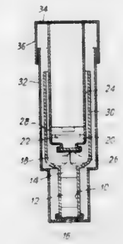
Int. Cl.² C01G *57/00*

U.S. Cl. 423—2 **9 Claims**

1. A method of increasing the radioactive concentration of technetium-99m in an aqueous solution containing the technetium-99m as pertechnetate ion TcO_4^- which method consists essentially of the steps of:

(1) if the solution is not already acid, acidifying it,

(2) contacting the resulting acid solution with a bifunctional ion-exchange material which is an anion-exchanger under acid conditions and a cation-exchanger under alkaline conditions, the pH of the solution being such that the bifunctional ion exchange material in contact with it acts as an anion-exchanger and adsorbs pertechnetate thereon, and recovering the acid bifunctional ion-exchange material with pertechnetate ion carried thereon and an acid liquid substantially free of pertechnetate ion,



(3) contacting the material resulting from step (2) with an aqueous alkaline liquid, of smaller volume than the aqueous starting solution treated in step (1), the pH of the aqueous alkaline liquid being such that the bifunctional ion-exchange material in contact therewith acts as a cation-exchanger and releases pertechnetate adsorbed thereon, and recovering an aqueous alkaline solution containing pertechnetate ion, and

(4) neutralizing the alkaline solution recovered in step (3) to obtain an aqueous solution containing pertechnetate ion at a higher concentration than the starting material.

4,176,159

PROCESS FOR CONCENTRATION OF TITANIUM CONTAINING ANATASE ORE

Jose Marcio Jardim Paixao, Costa Pinto St., 170, Belo Horizonte, Minas Gerais, and Paulo Ayres Falcao de Mendonca, Eng 2 Eranani Cotrim St., 86 Ap. 104, Rio de Janerio, both of Brazil

Continuation-in-part of Ser. No. 741,625, Nov. 15, 1976, abandoned. This application Jun. 19, 1978, Ser. No. 917,072

Int. Cl.² C01G *23/00, 23/04*

U.S. Cl. 423—80 **4 Claims**

1. A process for the concentration of titanium containing anatase ore comprising:

(a) calcining the said anatase ore in a non-reducing atmosphere at a temperature below that of rutilization;

(b) cooling said calcined ore;

(c) reducing the cooled ore in a reducing atmosphere at temperatures between 400° C. and 600° C.;

(d) cooling the reduced ore to below 200° C. in an atmosphere to prevent reoxidation;

(e) subjecting the reduced ore to magnetic separation to produce a concentrated titanium containing non-magnetic fraction;

(f) subjecting the non-magnetic fraction to mineral acid leach to remove additional impurities; and

(g) neutralizing and washing said acid leached fraction to produce a concentrated titanium fraction.

4,176,160

PROCESS FOR PURIFYING A ZINC SULFATE SOLUTION

Engelhard Pavonet, Chockier, Belgium, assignor to Societe de Prayon, Belgium

Continuation-in-part of Ser. No. 500,598, Aug. 26, 1974, abandoned, which is a continuation of Ser. No. 264,563, Jun. 20, 1972, abandoned. This application Mar. 6, 1978, Ser. No. 883,451

Claims priority, application Belgium, Jun. 23, 1971, 104968

Int. Cl.² C01G *9/06*

U.S. Cl. 423—104 **16 Claims**

1. A process for the preparation of zinc sulfate solution from roasted zinc bearing ore containing iron which comprises treating said ore in a first stage with sulfuric acid to yield a solution of zinc sulfate mixed with solids containing further zinc sulfate in solution admixed with the solids, adding excess roasted zinc ore to maintain said solution at a pH of about 4 to 5.5, separating the solids from the solution in a second stage by continuously decanting one part of said solution substantially free of solids from the upper portion of a decantation vessel to yield a first solution of zinc sulfate from which zinc is recoverable by further treatment electrolytically, continuously withdrawing the other part of solution rich in solids from the lower portion of said vessel and passing the solution rich in solids to a horizontal plane filter to obtain a filter cake consisting essentially of said solids mixed with further zinc sulfate solution, rapidly washing the filter cake successively with a plurality of continuous countercurrent washings of wash water, separating the zinc sulfate solution from said solids with substantially no hydrolysis insolubilizing zinc in the cake to solid zinc compounds in the filter cake, thus separating and recovering a further solution of zinc sulfate from which zinc is recoverable by further treatment electrolytically.

9. Process for purifying an iron-containing zinc sulfate solution using a continuous planar filter, which comprises precipitating iron from said solution in slurry form at a pH which is maintained lower than 4, said iron being in at least one of the following forms: basic sulfate, jarosite or goethite, filtering said slurry on a planar filter and forming a cake on said planar filter, washing the cake directly on the planar filter at least twofold countercurrently without substantially forming a new slurry by mixing any portion of the cake with any of the wash liquids, and thus freeing the cake from water soluble zinc and copper compounds promptly before hydrolysis thereof insolubilizes said compounds as basic sulfates, whereby the solid residue in the cake does not contains substantially more insoluble zinc content than it contained in the slurry being fed to the filtration.

4,176,161

OXIDATION OVER SYNTHETIC AMORPHOUS SILICAS

Thomas O. Mitchell, Trenton, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 738,788, Nov. 4, 1976, abandoned, which is a continuation-in-part of Ser. No. 638,405, Dec. 8, 1975, Pat. No. 4,003,825, which is a division of Ser. No. 450,967, Mar. 14, 1974, Pat. No. 3,983,055. This application Feb. 10, 1978, Ser. No. 876,787

Int. Cl.² B01D *53/34*

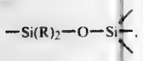
U.S. Cl. 423—213.5 **17 Claims**

1. An oxidation process comprising contacting an exhaust effluent from an internal combustion engine with a solid catalytic material in the presence of oxygen and under conditions including a temperature from about 150° C. to about 900° C., a pressure of about atmospheric and a gas hourly space velocity, expressed at standard temperature and pressure, of from about 15000 hr^{-1} to about 70,000 hr^{-1}, said solid catalyst material containing a synthetic amorphous solid prepared by the steps of hydrolyzing and polymerizing in the presence of water a silane having the formula $R(Si)X_3$, wherein R is a nonhydro-

lyzable organic group, X is a hydrolyzable group and (Si) is selected from the group consisting of



and



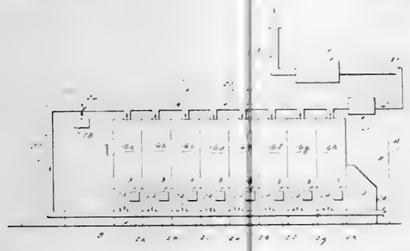
and calcining the polymerized product, said silane being admixed with a second compound, R'_nMY_m, wherein R' is selected from the group consisting of the same groups as R, Y is selected from the group consisting of the same groups as X and oxygen, M is at least one member selected from the group consisting of the elements of Group VIII of the Periodic Table, m is any number greater than 0 and up to 8 and n is from 0 to any number less than 8.

4,176,162

METHOD AND APPARATUS FOR CONSERVATION OF ENERGY IN A THERMAL OXIDATION SYSTEM FOR USE WITH A PRINTING PRESS

Nathan Stern, Caldwell, N.J., assignor to Bobst-Champlain, Inc., Roseland, N.J.

Filed Jul. 11, 1977, Ser. No. 814,145
Int. Cl.² B01D *53/34*; F23G *7/06*
U.S. Cl. 423—210 **16 Claims**



11. A method for removing solvents from the dryer exhaust of a printing press or the like comprising the steps of:

heating a bed or ceramic heat exchanger elements having first and second sections;

passing a first portion of the exhaust through each of the first and second sections of the bed in sequence;

passing a second portion of the exhaust through only one of the first and second sections so as to bypass the other section;

regulating the first and second exhaust portions so as to control the degree to which the exhaust is preheated;

introducing the preheated exhaust into an oxidation chamber; and

heating the oxidation chamber to promote oxidation of the exhaust therein.

4,176,163

SODIUM OXIDE FUME FOR SULFUR OXIDE REMOVAL

Hugh W. Nelson, West Hartford, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 12, 1977, Ser. No. 859,764
Int. Cl.² C01B *17/00*; B01D *53/34*
U.S. Cl. 423—242 **11 Claims**

1. A method of reducing the sulfur oxide content of flue gases containing sulfur oxides, comprising the steps of:

a. providing a bed consisting essentially of carbonaceous material and sodium carbonate;

b. maintaining a reducing environment and a temperature above approximately 1620° F. (880° C.) in the bed, thereby producing sodium gas that rises from the bed;

c. supplying oxygen to the surface of the bed, thereby allowing the sodium gas to react to produce sodium oxide fume;

d. adding the sodium oxide fume to the flue gas, thereby converting oxides of sulfur to sodium sulfate; and

e. precipitating the sodium sulfate particles from the flue gas.

4,176,164

TREATMENT OF SULFUR OXIDES WITH AQUEOUS GLYOXYLIC ACID SOLUTIONS

William H. Stark, Cincinnati, Ohio, and Cheng-Hsien Chu, Etobicoke, Canada, assignors to Spring Chemicals Limited, Toronto, Canada

Continuation-in-part of Ser. No. 717,082, Aug. 24, 1976, Pat. No. 4,115,517. This application Jul. 26, 1977, Ser. No. 819,136
The portion of the term of this patent subsequent to Sep. 19, 1995, has been disclaimed.
Int. Cl.² C01B *17/00*; C01F *11/46*
U.S. Cl. 423—243 **2 Claims**

1. A process for the removal of sulfur dioxide and sulfur trioxide from an industrial gas which process comprises:

(a) passing the industrial gas at a temperature between about 50° C. and about 1000° C. to a cooling zone to cool the gas to a temperature between about 20° C. and about 40° C.;

(b) passing the industrial gas at a temperature between about 20° C. and about 40° C. through an absorption zone in contact with an absorbent composition stream comprising from about 10% to about 25% glyoxylic acid and from about 90% to about 75% water;

(c) absorbing sulfur dioxide and sulfur trioxide in said absorbent composition;

(d) passing the absorbent composition containing absorbed sulfur dioxide and absorbed sulfur trioxide as sulfuric acid to a stripping zone and stripping absorbed sulfur dioxide from the absorbent composition stream;

(e) removing from the stripping zone stripped aqueous glyoxylic acid solution containing sulfuric acid;

(f) removing sulfuric acid from the stripped aqueous glyoxylic acid solution by contacting the solution with a sulfuric acid removing agent; and

(g) passing the aqueous glyoxylic acid solution to the absorption zone of step (b).

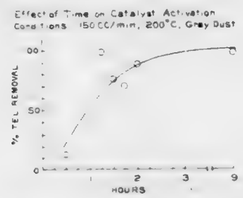
4,176,165

TREATMENT OF ALKYL LEAD-CONTAINING GAS STREAM

William D. Hargett, and Thorowgood T. Broun, both of Beaumont, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 863,275, Dec. 22, 1977, abandoned. This application Nov. 8, 1978, Ser. No. 958,861
Int. Cl.² B01D *53/34*
U.S. Cl. 423—245 **19 Claims**

1. A method for treating a gaseous stream containing alkyl lead which comprises contacting the gas stream with at least a catalytic amount of lead dioxide at temperatures in the range



between 60° C. and 225° C. for a time sufficient to reduce the alkyl lead content of the gaseous stream.

4,176,166

PROCESS FOR PRODUCING LIQUID SILICON

Justice N. Carman, Tarzana, Calif., assignor to John S. Pennish, Los Angeles, Calif., as part interest

Filed May 25, 1977, Ser. No. 800,191
The portion of the term of this patent subsequent to Oct. 18, 1994, has been disclaimed.
Int. Cl.² C01B *33/02*
U.S. Cl. 423—350 **9 Claims**

1. In a method of producing silicon, the steps of:

maintaining a pool of liquid silicon in a first chamber having an inner wall of silica;

continuously mixing hydrogen and at least one halogenated silane in the gaseous state directly over the pool of liquid silicon;

heating the hydrogen and halogenated silane, with the hydrogen and silane reacting to produce additional liquid silicon in the pool;

maintaining the pool of liquid silicon substantially saturated with oxygen; and

continuously withdrawing liquid silicon from the pool.

4,176,167

PROCESS FOR CONVERTING ALKALI METAL IODATES TO PERIODATES

Robert T. Jernigan, and Byford D. Sheffield, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 19, 1977, Ser. No. 834,608
Int. Cl.² C01B *11/22*
U.S. Cl. 423—476 **7 Claims**

1. A process for preparing one or more alkali metal periodates in the tri-, tetra- or pentabasic state from one or more alkali metal iodates which process comprises heating a mixture containing as components

(1) an alkali metal iodate or mixture of such iodates,

(2) an alkali metal hydroxide or mixture of such hydroxides in which the alkali metal portion of such hydroxide or mixtures thereof can be the same as or different from the alkali metal portion of said iodate or mixture thereof;

at a temperature of from about 150° C. to about 600° C. in the presence of at least a stoichiometric quantity of oxygen and less than about 100 moles of water per mole of alkali metal iodate and the molar ratio of component (2): component (1) is from about 0.5:1 to about 10:1.

4,176,168

PROCESS FOR PRODUCING CHLORINE DIOXIDE

Nobutaka Goto, Tokyo, Japan, assignor to Chlorine Engineers Corp., Ltd., Tokyo, Japan

Filed Jun. 1, 1978, Ser. No. 911,548
Claims priority, application Japan, Jun. 8, 1977, 52-66607
Int. Cl.² C01B *11/02*
U.S. Cl. 423—478 **9 Claims**



1. A process for producing chlorine dioxide which comprises

(1) feeding hydrochloric acid and an excess on a stoichiometric basis of sodium chlorate produced in an electrolytic cell for producing sodium chlorate into a reaction zone for producing chlorine dioxide;

(2) reacting the hydrochloric acid and the sodium chlorate in the reaction zone at a temperature of about 65° to about 80° C. under a reduced pressure of about 100 to about 700 mmHg to form a gaseous reaction product containing chlorine dioxide and chlorine and so that sodium chloride produced is precipitated to form a slurry-like residual reaction mixture containing the precipitated sodium chloride;

(3) continuously removing the chlorine dioxide as the gaseous reaction product;

(4) simultaneously withdrawing the slurry-like residual reaction mixture containing the precipitated sodium chloride continuously from the reaction zone;

(5) feeding water to the thus withdrawn residual reaction mixture to dissolve the sodium chloride and form a solution containing sodium chloride;

(6) blowing air or an inert gas through the solution containing sodium chloride to remove any residual chlorine dioxide and chlorine from the solution;

(7) recycling the chlorine dioxide and chlorine removed from the solution to the reaction zone through an equalizing line; and

(8) then recycling the solution to an electrolytic cell for the production of sodium chlorate.

4,176,169

METHOD OF EXTRACTING IODINE FROM LIQUID MIXTURES OF IODINE, WATER AND HYDROGEN IODIDE

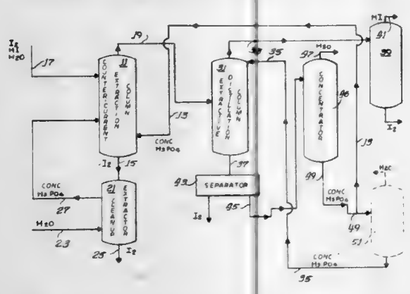
Karol J. Mysels, La Jolla, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Jul. 3, 1978, Ser. No. 921,435
Int. Cl.² C01B *17/14*
U.S. Cl. 423—501 **13 Claims**

1. A process for separating the components of a liquid solution containing more than 50 w/o iodine plus HI and water wherein much of said iodine may be complexed with the HI in the form of hydrogen polyiodides, which process comprises

continuously treating said liquid solution by countercurrent extraction, at a temperature sufficient to maintain iodine in liquid form, with phosphoric acid containing an equivalent weight percent of H_3PO_4 of at least about 90 w/o to produce two continuous streams, a bottom stream which is generally completely molten iodine dissociated from

any hydrogen polyiodide complexes and an overhead stream containing water, HI, H_3PO_4 and no more than a



minor amount of iodine relative to the amount of iodine in said original liquid solution.

4,176,170

TERNARY IONIC CONDUCTORS

Horst M. Kasper, Warren; Benjamin Tell, Matawan, and Sigurd Wagner, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 783,649, Apr. 1, 1977, Pat. No. 4,115,633. This application Jul. 13, 1978, Ser. No. 924,188

Int. Cl.[2] H01M *6/18;* **C01B** *19/00*

U.S. Cl. 423—508 **5 Claims**

1. The composition represented by the formula AB_5C_8 wherein A is a metallic atom with atomic number no greater than 55 which has a +1 oxidation state, B is a group III A metallic atom, and C is a group VI A atom.

4,176,171

HIGH PORE VOLUME ALUMINA FROM DILUTE HIGH INJECTION ALKOXIDE FEED

Larry L. Bendig, Ponca City, Okla.; John F. Scamehorn, Austin, Tex., and Donald E. Stowell, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Aug. 14, 1978, Ser. No. 933,310

Int. Cl.[2] C01F *7/02*

U.S. Cl. 423—628 **4 Claims**

1. An improved method for producing alumina having from about 25 to about 60% of the total pore volume of the alumina from about 1,000 to about 10,000 angstroms from the water hydrolysis of aluminum alkoxides, the improvement comprising diluting the aluminum alkoxide with from about 20% to about 70% by weight with an alkanol containing from about 2 to about 8 carbon atoms, then injecting the diluted aluminum alkoxides into a hydrolysis reactor at velocities greater than 40 feet per second, said velocity defined by the formula $V=F/PA$ wherein V is velocity in feet per second, F is the rate of flow as pounds per second of dilute feed, P is density in pounds per cubic foot, and A is the orifice area in square feet.

4,176,172

PARTICLE GAMMA FERRIC OXIDE

Leonard M. Bennetch; Harry S. Greiner, both of Bethlehem; Kenneth R. Hancock, Easton, all of Pa., and Mark Hoffman, Phillipsburgh, N.J., assignors to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 643,346, Dec. 22, 1975, abandoned, which is a division of Ser. No. 370,635, Jun. 18, 1973, abandoned, which is a division of Ser. No. 225,636, Feb. 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 125,331, Mar. 17, 1971, abandoned. This application Nov. 28, 1977, Ser. No. 855,430

Int. Cl.[2] C01G *49/06*

U.S. Cl. 423—634 **1 Claim**

1. Synthetic magnetic gamma ferric oxide in the form of very fine-grained, needle-like crystalline particles having a length to width ratio of up to about 20:1 and a length up to about 2 microns, said ferric oxide providing an orientation ratio of at least 2.4 in a 1000 oersted field and a half peak width of the switching field distribution of up to about 79 oersteds when incorporated with a binding medium to form a magnetic impulse record member.

4,176,173

RADIOGRAPHIC COMPOSITIONS

Harry S. Winchell, Lafayette; Tz-Hong Lin, Fremont, and Charles A. Panneciere, Alemeda, all of Calif., assignors to Medi-Physics, Inc., Emeryville, Calif.

Filed Jul. 18, 1977, Ser. No. 816,618

Int. Cl.[2] A61K *29/02*

U.S. Cl. 424—5 **6 Claims**

1. A method of preparing a patient for radiographic examination of the gastrointestinal tract which comprises orally administering to said patient an amount of a composition comprising an aqueous solution of a stable, non-toxic, hydrated complex of a metal selected from the group consisting of hafnium and tantalum and an organic acid complexing agent selected from the group consisting of:

(a) an organic acid containing from 2 to 7 carbon atoms and at least one hydroxyl group;

(b) an amino acid containing from 2 to 7 carbon atoms: and

(c) a phosphonic acid selected from the group consisting of ethylenediaminetetramethylenephosphonic acid, diethylenepentamethylenephosphonic acid and diphosphonic acids represented by the formula



wherein R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, lower alkyl, amino, halogen, hydroxyl and $-CH_2-COOH$

and pharmaceutically acceptable salts thereof, said salts being selected from the group consisting of the ammonium salt, the sodium salt and the potassium salt, said composition containing from about 1% to about 25% weight to volume of said metal, effective for said examination.

4,176,174

VIRAL ANTIBODY DIAGNOSTIC TEST SYSTEM

Stuart M. Russell, Bromley, and Leonard W. J. Bishop, Beaconsfield, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 596,989, Jul. 18, 1975, abandoned. This application Sep. 27, 1978, Ser. No. 946,439

Claims priority, application United Kingdom, Jul. 19, 1974, 32050/74

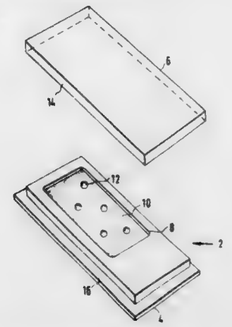
Int. Cl.[2] G01N *31/00, 31/14, 33/16*

U.S. Cl. 424—8 **2 Claims**

1. A specific viral antibody detecting diagnostic system suitable for measuring the amount of antibodies in a test fluid comprising a layer of gel from 0.1 to 5 mm thick, which contains:

(a) intact erythrocytes having appropriate viruses adhering to the surface thereof;

(b) an erythrocyte preservative;



(c) a bacteriocidal/fungicidal agent; and wherein one or more wells are cut in the gel for receiving test fluid.

4,176,175

SUGAR-COATED SOLID DOSAGE FORMS

Hideyuki Maekawa, Osaka; Kinzaburo Noda, Itami, and Noboru Hoshi, Higashikurume, all of Japan, assignors to Shionogi & Co., Ltd., Osaka and Shin-Etsu Chemical Co., Ltd., Tokyo, both of, Japan

Filed Jun. 6, 1977, Ser. No. 803,853

Claims priority, application Japan, Jun. 9, 1976, 51-67918

Int. Cl.[2] A61K *9/36*

U.S. Cl. 424—35 **15 Claims**

1. A sugar-coated solid dosage form comprising at least one coating layer formed in direct contact with the surface of the solid dosage form and containing from 0.5 to 25% by weight of a hydroxypropylcellulose having hydroxypropoxy groups in an amount ranging from 4 to 16% by weight.

4,176,176

HAIR SHAMPOO AND CLEANSER COMPOSITIONS

John A. Cella, Plandone Mills, N.Y., and August E. Fiebig, Jr., Chicago, Ill., assignors to Alberto-Culver Company, Melrose Park, Ill.

Filed May 31, 1974, Ser. No. 474,955

Int. Cl.[2] A61K *7/06*

U.S. Cl. 424—70 **6 Claims**

1. A hair shampoo in liquid or paste form for use on human hair attached to the human head which includes a water carrier, a non-perfluorinated water-soluble quaternary ammonium compound detergent, and which contains, as an additional ingredient thereof, a hydrophobic-lipophobic compound of anionic, cationic, nonionic or amphoteric character, corresponding to the formula

$$CF_3-(CF_2)_x-(CH_2)_y-Z$$

where Z is a member selected from the class consisting of a water-solubilizing group and an oil-solubilizing group, x is an integer from 2 to 17, and y is an integer from 0 to 4, said compound being present in proportions, based on the weight of the shampoo, in the range of about 0.5% to about 2%, said compound being present in proportions less than the proportions of said detergent.

4,176,177

INHIBITION OF BONE RESORPTION

Klaus E. Kuettner, Chicago, Ill., assignor to Rush-Presbyterian-St. Luke's Medical Center, Chicago, Ill.

Filed Nov. 16, 1978, Ser. No. 961,296

Int. Cl.[2] A61K *35/24, 35/44, 35/32*

U.S. Cl. 424—95 **10 Claims**

1. A method for regulating bone resorption comprising exposing the bone to an effective amount of a composition of matter obtained from avascular or poorly vascularized tissue by extracting the tissue with an aqueous extraction medium which includes a solute which does not irreversibly denature the proteinaceous matter to be extracted, separating the resultant aqueous extract from the tissue, recovering from the aqueous extract substances having a molecular weight below about 50,000, and treating the fraction of aqueous extract having a molecular weight below about 50,000 to remove salts therefrom.

4,176,178

2-DEOXY-2'-N-ACYL AND ALKYL FORTIMICINS A AND B

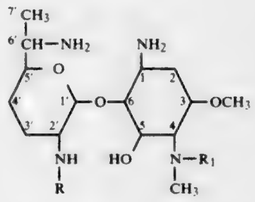
Jerry R. Martin; John S. Tadanier, both of Waukegan, and Paulette Collum, Zion, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.,

Filed Dec. 21, 1977, Ser. No. 863,011

Int. Cl.[2] A61K *31/71;* **C07H** *15/22*

U.S. Cl. 424—180 **12 Claims**

1. A compound of the formula:



wherein: R is acyl, aminocyl, N-monoloweralkylaminoacyl, N,N-diloweralkylaminoacyl, hydroxy-substituted aminoacyl, an amino acid residue, loweralkyl, aminoloweralkyl, hydroxyloweralkyl, N-loweralkylaminoloweralkyl, N,N-diloweralkylaminoloweralkyl, aminohydroxyloweralkyl, N-loweralkylaminohydroxyloweralkyl, or N,N-diloweralkylaminohydroxyloweralkyl; and R_1 is acyl, aminoacyl, N-monoloweralkylaminoacyl, N,N-diloweralkylaminoacyl, hydroxy-substituted aminoacyl, an amino acid residue, loweralkyl, aminoloweralkyl, hydroxyloweralkyl, N-loweralkylaminoloweralkyl, N,N-diloweralkylaminoloweralkyl, aminohydroxyloweralkyl, N-loweralkylaminohydroxyloweralkyl, N,N-diloweralkylaminohydroxyloweralkyl or hydrogen and wherein acyl is represented by the formula



Y being loweralkyl; and the pharmaceutically acceptable salts thereof.

12. A pharmaceutical composition comprising a compound of claim 1 and a pharmaceutically acceptable carrier or diluent.

4,176,179

METHOD FOR TREATING ARTHRITIS

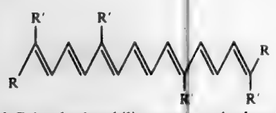
John L. Gainer, Charlottesville, Va., assignor to The University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Filed Apr. 17, 1978, Ser. No. 897,002

Int. Cl.[2] A61K *31/13, 31/19, 31/23, 31/70*

U.S. Cl. 424—180 **4 Claims**

1. A method for treatment of rheumatoid arthritis in a mammal which comprises administering to said mammal in need of treatment an effective dose sufficient to alleviate the symptoms of rheumatoid arthritis, of a water soluble carotenoid having the formula



wherein each R is a hydrophilic group, and wherein each R' is hydrogen or methyl.

4,176,180

PHARMACEUTICAL COMPOSITION COMPRISING ERYTHROMYCIN AND METOCLOPRAMIDE AND METHOD OF PREPARING SAME

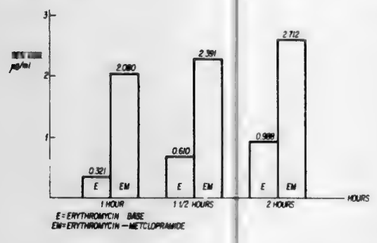
Pierre Barbier, Paris, France, assignor to Societe d'Etudes Scientifiques et Industrielles, Paris, France

Filed Jun. 1, 1978, Ser. No. 911,611

Claims priority, application United Kingdom, Jun. 3, 1977, 23727/77

Int. Cl.[2] A61K *31/71, 31/165*

U.S. Cl. 424—181 **6 Claims**



6. A method of suppressing inactivation of erythromycin by gastric acidity and increasing the total amount of erthromycin absorbed in a human following oral administration of erythromycin to said human, said method comprising orally administering an effective amount of a pharmaceutical composition comprising 60 parts by weight of erythromycin per part by weight of metoclopramide or the equivalent amount, in the form of the base, of a therapeutically acceptable salt thereof.

4,176,181

COMBATING PESTS WITH N-(AMINOMETHYLENE)-(MONOTHIO AND DITHIO)-PHOSPHORIC ACID DIESTER-AMIDES

Hellmut Hoffmann, Wuppertal; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

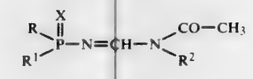
Filed Aug. 4, 1978, Ser. No. 931,046

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1977, 2737403

Int. Cl.[2] A01N *9/36;* **C07F** *9/24*

U.S. Cl. 424—211 **10 Claims**

1. An N-(aminomethylene)-(monothio and dithio)-phosphoric acid diester-amide of the formula



wherein

R and R^1 each independently is alkoxy or alkylthio,

R^2 is alkyl, and

X is oxygen or sulphur.

2. A method of combating arthropods or nematodes which comprises applying to the arthropods or nematodes, or to a habitat thereof, an arthropodicially or nematicidally effective amount of a compound according to claim 1.

4,176,182

SULFAMOYL DERIVATIVES OF 8-β-AMINOMETHYLERGOLINE

Giorgio Ferrari, and Vittorio Vecchietti, both of Milan, Italy, assignors to SIMES Societa Italiana Medicinali e Sintetici S.p.A., Milan, Italy

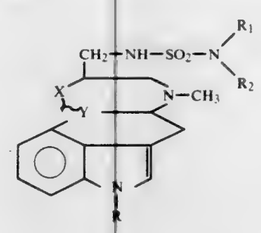
Filed Nov. 3, 1977, Ser. No. 848,530

Claims priority, application Italy, Nov. 24, 1976, 29704 A/76

Int. Cl.[2] C07D *457/02;* **A61K** *31/48*

U.S. Cl. 424—248.5 **18 Claims**

1. Sulfamoyl compounds of 8-β-aminoemethylergoline having the formula:



wherein

x~y is CH=C or CH_2—CH

R is hydrogen, C_1-C_3 alkyl, C_3-C_5 alkenyl or C_3-C_4 alkyne,

R_1=R_2=C_1-C_3 alkyl, or R_1 and R_2 are connected to each other to form a ring with the adjacent nitrogen atom which ring is the piperazino, piperidino, morpholino, pyrrolidino, or hexahydroazepino group.

14. Pharmaceutical compositions, useful as anti-migrainic, anti-hypertensive and psychopharmaceutically active drugs, characterized in that they contain, as the active ingredient, a compound according to claim 1 and the pharmaceutically acceptable salts thereof with non toxic, organic or inorganic acids.

4,176,183

NOVEL NAPHTHYRIDINES

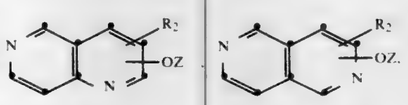
John J. Baldwin, and Gerald S. Ponticello, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 792,752, May 2, 1977, abandoned. This application Jul. 17, 1978, Ser. No. 925,577

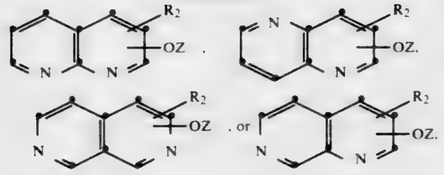
Int. Cl.[2] A61K *31/44;* **C07D** *221/00*

U.S. Cl. 424—248.52 **25 Claims**

1. A compound having the formula



-continued



and pharmaceutically acceptable salts thereof wherein

Z is $—CH_2—CHOR—CH_2—NHR_1$ wherein

R is hydrogen or C_2-C_{12} acyl and

R_1 is C_1-C_{12}alkyl, and

R_2 is H, Cl, Br, F, CN, $—NH_2$, NO_2, CF_3, $—COOR_4$ wherein R_4 is H, C_1-C_6alkyl or C_6-C_{12}carbocyclic aryl, $—CONR_5R_6$ wherein R_5 and R_6 when separate, are H or C_1-C_6alkyl and when joined, are $—CH_2—(CH_2)_3—CH_2—$, $—CH_2—CH_2—O—CH_2—CH_2—$, $—CH_2—CH_2—NH—CH_2—CH_2—$, or $—CH_2—CH_2—N(CH_3)—CH_2—CH_2—$, $—C_1$-C_6alkylthio, $—C_1$-C_6 alkylsulfinyl or $—C_1$-C_6alkylsulfonyl.

22. A pharmaceutical composition useful for effecting β-adrenergic blockade or treating hypertension containing an effective amount of a compound of claim 1.

4,176,184

IMIDAZOISOQUINOLINE-DIONES AND SALTS THEREOF

Volkhard Austel; Eberhard Kutter, both of Biberach; Joachim Heider, Warthausen; Wolfgang Eberlein, Biberach, all of Fed. Rep. of Germany; Walter Kobinger; Christian Lillie, both of Vienna, Austria; Willi Diederen, and Walter Haarmann, both of Biberach, Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

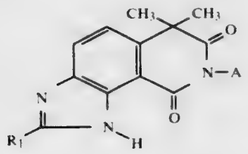
Filed Jul. 17, 1978, Ser. No. 925,461

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2732906; Jul. 21, 1977, 2732951

Int. Cl.[2] A61K *31/535;* **C07D** *471/04*

U.S. Cl. 424—248.52 **12 Claims**

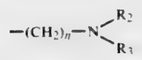
1. A compound of the formula



wherein

R_1 is lower alkyl of 1 to 6 carbon atoms; phenyl-lower alkyl; cycloalkyl of 3 to 6 carbon atoms; phenyl; or mono- or di-substituted phenyl, where the substituents are each halogen, hydroxyl or methoxy, or one of them is methylmercapto, methylsulfinyl, methylsulfonyl or benzyloxy or both are identical methyl-mercapto, methylsulfinyl, methylsulfonyl or benzyloxy groups; and

A is hydrogen or



where

R_2 is hydrogen or lower alkyl;

R_3 is lower alkyl of 1 to 6 carbon atoms or dimethoxyphenyl-lower alkyl; or

R_2 and R_3, together with each other and the nitrogen atom to which they are attached, are piperidino, morpholino or N'-lower alkyl-piperazino; and

n is 2 or 3;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,176,185

SPIRO-QUINOLYLHYDANTOINS

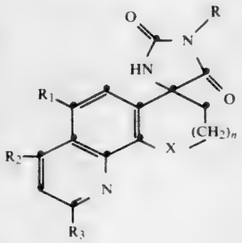
Rodney C. Schnur, Noank, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jan. 22, 1979, Ser. No. 5,278

Int. Cl.[2] C07D *491/20;* **A61K** *31/47;* **C07D** *513/20*

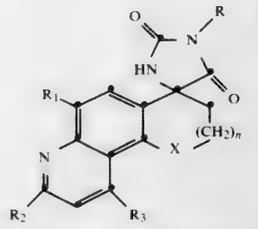
U.S. Cl. 424—258 **17 Claims**

1. A compound selected from the formulae



I

and



II

and the base salts thereof with pharmaceutically acceptable cations, wherein

X is selected from oxygen and sulfur;

n is zero, one or two;

R is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms and benzyl;

and R_1, R_2 and R_3 are each selected from the group consisting of hydrogen, chloro, bromo, fluoro and alkyl of 1 to 3 carbon atoms.

15. A method of treating a diabetic host for diabetic cataracts, neuropathy or retinopathy which comprises administering to said host an effective amount of a compound of claim 1.

4,176,186

QUATERNARY DERIVATIVES OF NOROXYMORPHONE WHICH RELIEVE INTESTINAL IMMOBILITY

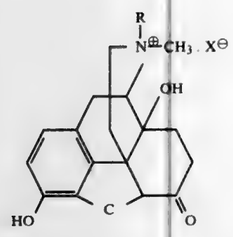
Leon I. Goldberg, Chicago, Ill.; Herbert Merz, Ingelheim am Rhein, and Klaus Stockhaus, Bingen, both of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Jul. 28, 1978, Ser. No. 928,821

Int. Cl.[2] A61K *41/485;* **C07D** *489/00*

U.S. Cl. 424—260 **4 Claims**

1. A compound of the formula



wherein

R is allyl, chloroallyl, cyclopropylmethyl or propargyl; and

X is a chloride, bromide, iodide, or methylsulfate anion.

3. An intestinal immobility relieving pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective intestinal immobility relieving amount of a compound of claim 1.

4. The method of preventing or relieving the intestinal mobility inhibiting side-effect of narcotic analgesics in a warm-blooded animal, which comprises administering to said animal an effective intestinal immobility relieving amount of a compound of claim 1.

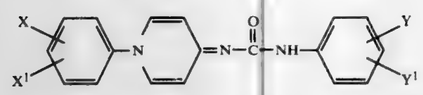
4,176,187

SUBSTITUTED DIHYDROPYRIDINE UREAS

William V. Ruyle, Scotch Plains, and Michael H. Fisher, Bridgewater, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 29, 1978, Ser. No. 920,528
Int. Cl.[2] A61K *31/44;* **C07D** *213/75*
U.S. Cl. 424—263 **26 Claims**

1. A compound having the formula



and pharmaceutically acceptable salts thereof wherein

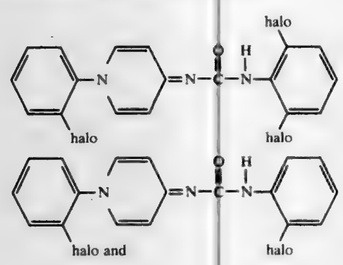
X is H, C_1–C_6 alkyl, CN, halo, SR or —OR wherein R is C_1–C_6 alkyl,

X^1 is H, C_1–C_6 alkyl, CN, halo, SR^1 or OR^1 wherein R^1 is C_1–C_6 alkyl,

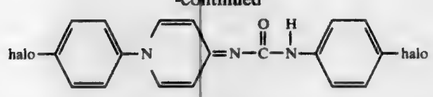
Y is H, halo, C_1–C_6 alkyl, CN, CF_3, NO_2, $COOC_1$–C_6 alkyl, NR^2R^3 wherein R^2 and R^3 are H or C_1–C_6 alkyl, SR^4, SOR^4, SO_2R^4 or OR^4 wherein R^4 is C_1–C_6 alkyl and

Y^1 is H, halo, C_1–C_6 alkyl, CN, CF_3, NO_2, $COOC_1$–C_6 alkyl, NR^2R^3 wherein R^2 and R^3 are H or C_1–C_6 alkyl, SOR^4, SO_2R^4 or OR^4 wherein R^4 is C_1–C_6

excluding compounds having the formulae:



-continued



24. A method of treating hypertension which comprises administering orally or parenterally to a human in need of such treatment an antihypertensive effective amount of a compound of claim 1.

4,176,188

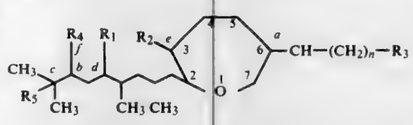
UTERO-EVACUANTS

Ramesh M. Kanojia, Somerville; Michael P. Wachter, Bloomsbury, and Robert H. K. Chen, Belle Mead, all of N.J., assignors to Ortho Pharmaceutical Corp., Raritan, N.J.

Division of Ser. No. 742,940, Nov. 18, 1976, Pat. No. 4,102,895.
This application May 8, 1978, Ser. No. 903,456
Int. Cl.[2] A61K *31/335*
U.S. Cl. 424—270 **19 Claims**

1. A compound selected from the group consisting of:

I



wherein R_1 and R_2 are each —XY wherein X is hydrogen or hydroxy provided that when X is hydrogen, Y is hydrogen; methyl; hydroxy; lower alkoxy; cycloalkoxy; phenoxy; substituted phenoxy wherein the substituent is nitro, halo or lower alkyl having 1–5 carbon atoms; trialkylsilyloxy; —OCOR′ wherein R′ is lower alkyl, cycloalkyl, phenyl, and substituted phenyl wherein the substituent is nitro, halo or lower alkyl having 1–5 carbon atoms; a sulfate, nitrate or phosphate radical; thiol; alkylthio; phenylthio and substituted phenylthio wherein the substituent is nitro, halo or lower alkyl having 1–5 carbon atoms; halo; amino; alkylamino; dialkylamino; phenylamino and substituted phenylamino wherein the substituent is nitro, halo or lower alkyl having 1–5 carbon atoms; and the quaternary ammonium and acid addition salts thereof; acylamino wherein the acyl group is derived from a lower alkanoic acid having 1–8 carbon atoms or from benzoic acid or substituted benzoic acid wherein the substituent is nitro, halo or lower alkyl having 1–5 carbon atoms; —O-CONHR wherein R is hydrogen or lower alkyl; and when X is hydroxy, Y is cyano; lower alkyl; lower alkenyl; lower alkynyl; propadienyl; benzyl, substituted benzyl wherein the substituent is nitro, halo or lower alkyl having 1–5 carbon atoms; phenyl; substituted phenyl wherein the substituent is nitro, halo or lower alkyl having 1–5 carbon atoms; provided that when d or e is unsaturated R_1 and R_2 are either X or Y; and $R_1$and/or R_2 are oxo; thioxo; hydroxyimino; alkoxyimino; phenyloxyimino and substituted phenyloxyimino wherein the substituent is nitro, halo or lower alkyl having 1–5 carbon atoms; acyloxyimino wherein the acyl group is derived from a lower alkanoic acid having 1–8 carbon atoms or from benzoic acid or substituted benzoic acid wherein the substituent is nitro, halo, or lower alkyl having 1–5 carbon atoms; hydrazono; alkylhydrazono; phenylhydrazono or substituted phenylhydrazono wherein the substituent is halo, nitro or lower alkyl having 1–5 carbon atoms; phenylsulfonylhydrazono or substituted phenylsulfonylhydrazono wherein the substituent is halo, nitro, or lower alkyl having 1–5 carbon atoms; carbamoylhydrazono; ethylenedioxy; ethylenedithio; ethylenethiooxy; dialkoxy; thiazolidinyl; methylenyl; alkylidenyl; alkylimino; or phenylamino and

substituted phenylamino wherein the substituent is halo, nitro, or lower alkyl having 1–5 carbon atoms;

R_3 is —CHXY wherein X is hydrogen or hydroxy provided that when X is hydrogen, Y is hydrogen, methyl, hydroxy; lower alkoxy; cycloalkoxy; phenoxy; substituted phenoxy wherein the substituent is halo, nitro or lower alkyl having 1–5 carbon atoms; trialkylsilyloxy; heterocycloalkyloxy wherein the hetero atom is nitrogen, oxygen or sulfur and the cycloalkyl group contains 4–5 carbon atoms; —OCOR′ wherein R′ is lower alkyl, cycloalkyl, phenyl, or substituted phenyl wherein the substituent is halo, nitro or lower alkyl having 1–5 carbon atoms; a sulfate, nitrate or phosphate radical; thiol; lower alkylthio; phenylthio or substituted phenylthio wherein the substituent is halo, nitro or lower alkyl having 1–5 carbon atoms; halo; amino; lower alkylamino; lower dialkylamino; phenylamino or substituted phenylamino wherein the substituent is halo, nitro or lower alkyl having 1–5 carbon atoms; and the quaternary ammonium and acid addition salts thereof, acylamino wherein the acyl group is derived from a lower alkanoic acid having 1–8 carbon atoms or from benzoic acid or substituted benzoic acid wherein the substituent is nitro, halo or lower alkyl having 1–5 carbon atoms; —OCONHR wherein R is hydrogen or lower alkyl; and when X is hydroxy, Y is cyano; lower alkyl; lower alkenyl; lower alkynyl; propadienyl; benzyl, substituted benzyl wherein the substituent is halo, nitro or lower alkyl having 1–5 carbon atoms; phenyl; substituted phenyl wherein the substituent is halo, nitro or lower alkyl having 1–5 carbon atoms; and R_3 is —CHZ wherein Z is oxo, thioxo; hydroxyimino; lower alkoxyimino; phenyloxyimino or substituted phenyloxyimino wherein the substituent is halo, nitro or lower alkyl having 1–5 carbon atoms; acyloxyimino wherein the acyl group is derived from a lower alkanoic acid having 1–8 carbon atoms and benzoic acid or substituted benzoic acid wherein the substituent is nitro, halo or lower alkyl having 1–5 carbon atoms; hydrazono; lower alkylhydrazono; lower dialkylhydrazono; phenylhydrazono or substituted phenylhydrazono wherein the substituent is nitro, halo or lower alkyl having 1–5 carbon atoms; phenylsulfonylhydrazono or substituted phenylsulfonylhydrazono wherein the substituent is nitro, halo or lower alkyl having 1–5 carbon atoms; carbamoylhydrazono; ethylenedioxy; ethylenedithio; ethylenethiooxy; lower dialkoxy; thiazolidinyl; methylenyl; lower alkylidenyl; lower alkylimino; or phenylimino or substituted phenylimino wherein the substituent is halo, nitro or lower alkyl having 1–5 carbon atoms; and R_3 is carboxy; —COOR′ wherein R′ is lower alkyl, cycloalkyl, phenyl or substituted phenyl wherein the substituent is nitro, halo or lower alkyl having 1–5 carbon atoms; —COR″ wherein R″ is amino, lower alkylamino, lower dialkylamino, phenylamino or substituted phenylamino wherein the substituent is halo, nitro or lower alkyl having 1–5 carbon atoms; halo; hydrazino, lower alkylhydrazino, lower dialkylhydrazino, phenylhydrazino and substituted phenylhydrazino wherein the substituent is halo, nitro or lower alkyl having 1–5 carbon atoms; phenylsulfonylhydrazino and substituted phenylsulfonylhydrazino wherein the substituent is halo, nitro or lower alkyl having 1–5 carbon atoms; cyano; and ammonium, alkali metal and alkaline earth metal salts thereof where R_3 is carboxy;

R_4 is hydrogen; methyl or methylenyl;

R_5 is hydrogen; hydroxy; hydroperoxy or —OCOR‴ wherein R‴ is lower alkyl;

and n is an integer from 0–5, provided that C_3 does not have the R configuration and the orientation at the a double bond does not have the E configuration when n=0, a and c are unsaturated, b, d, e and f are saturated, R_1 is oxo, R_2 is —XY wherein X and Y are hydrogen and hydroxy, R_3 is —CH_2OH and R_4 is hydrogen and when n=0, a and b are unsaturated, c, d, e and f are saturated, R_1 is oxo, R_2 is —XY wherein X and Y are hydrogen and hydroxy, R_3 is —CH_2OH, R_4 is methyl and R_5 is hydrogen.

18. A method of interrupting preqnancy which comprises administering to female animals a compound of claim 1 in an amount sufficient to interrupt pregnancy.

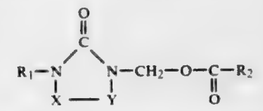
4,176,189

INSECTICIDAL AND ACARICIDAL HYDANTOIN N-METHYLOL ESTERS

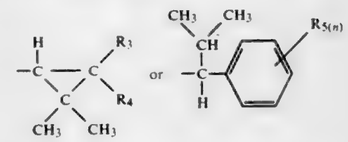
Nobushige Itaya, Nishinomiya, and Masachika Hirano, Ibaraki, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 24, 1978, Ser. No. 909,107
Claims priority, application Japan, Jun. 20, 1977, 52-73721
Int. Cl.[2] A61K *31/415;* **C07D** *233/72, 405/12*
U.S. Cl. 424—273 R **29 Claims**

1. A compound represented by the formula,



wherein one of X and Y is a carbonyl group and the other is a methylene, ethylidene or propylidene group, R_1 is a lower alkyl, lower alkenyl or lower alkynyl having up to 3 carbon atoms, R_2 is a group represented by the formula,



in which R_3 is a hydrogen atom or a methyl group; when R_3 is a hydrogen atom, R_4 is a methoxyiminomethyl or 2,2-disubstituted vinyl group in which substituents can be selected from the group consisting of methyl, vinyl, fluorine, chlorine and bromine, or both of substituents may form a tetramethylene chain; when R_3 is a methyl group, R_4 is a methyl group; R_5 is a methyl, methoxy, fluorine, chlorine, bromine or 3,4-methylenedioxy group; and n is 1 or 2.

27. An insecticidal and acaricidal composition comprising an inert carrier and as the active ingredient an insecticidally and acaricidally effective amount of a compound according to claim 1.

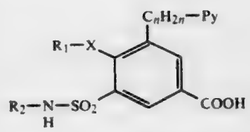
4,176,190

DIURETIC AND SALIURETIC SULPHAMOYLBENZOIC ACIDS

Ernst Habicht, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 14, 1977, Ser. No. 860,533
Claims priority, application Switzerland, Dec. 24, 1976, 16309/76
Int. Cl.[2] A61K *31/40;* **C07D** *207/32*
U.S. Cl. 424—274 **10 Claims**

1. A 4-substituted 3-sulphamoyl-5-pyrrolylalkylbenzoic acid of the formula I



(I)

in which R_1 is phenyl or phenyl substituted by lower alkyl,

lower alkoxy, halogeno, trifluoromethyl and/or amino, X is oxygen or sulphur, R_2 is hydrogen, lower alkyl, lower alkoxymethyl or R_1, Py is 1-pyrrolyl or 1-pyrrolyl substituted by lower alkyl and n is an integer from 1 to 4; or a therapeutically useful, non-toxic salt thereof.

9. A diuretic pharmaceutical formulation containing a diuretically effective amount of a compound of of the formula I claimed in claim **1**, together with a pharmaceutically usable excipient.

10. The method of treating high blood pressure of edema in mammals, which comprises administering to said mammals enterally or parenterally an effective amount of a compound of the formula I claimed in claim **1**, as diuretic acid saluretic agent.

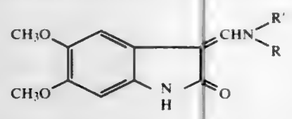
4,176,191

AMINOMETHYLENE OXINDOLES

Martin Winn, Deerfield, and John J. Kyncl, Lake Forest, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

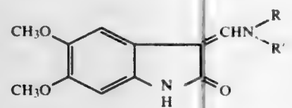
Division of Ser. No. 830,722, Sep. 6, 1977, Pat. No. 4,145,422.
This application Nov. 6, 1978, Ser. No. 958,272
Int. Cl.[2] **A61K** *31/40;* **C07D** *209/34*
U.S. Cl. 424—274 **9 Claims**

1. A compound represented by the formula



wherein R is H; R′ is aralkyl; and the pharmaceutically acceptable acid addition salts thereof.

7. A method of treating hypertension in a mammal comprising administering to a mammal so afflicted, a therapeutically effective amount of a compound represented by the formula



wherein R is H; R′ is aralkyl; and the pharmaceutically acceptable acid addition salts thereof.

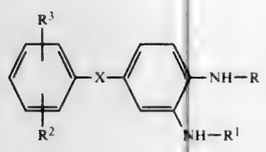
4,176,192

SUBSTITUTED PHENYLGUANIDINES AND PROCESS FOR THEIR MANUFACTURE

Heinz Loewe, Kelkheim; Josef Urbanietz, Schwalbach; Dieter Duwel, Hofheim, and Reinhard Kirsch, Niederjosbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

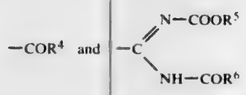
Filed Feb. 25, 1977, Ser. No. 772,234
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1976, 2608238
Int. Cl.[2] **A61K** *31/27;* **C07C** *143/68*
U.S. Cl. 424—300 **9 Claims**

1. A substituted phenylguanidine of the general formula:



in which

R and R_1 are different and each represent one of the radicals



R^4 is a radical selected from alkyl of 1 to 6 carbons, cycloalkyl of 3 to 10 carbons, carbocyclic aryl of 6 to 10 carbons, amino, alkoxy of 1 to 4 carbons, carbocyclic aralkyl with 6 to 10 carbons in the aryl moiety, and the alkyl radical may be substituted by methoxy,

R^5 is alkyl of 1 to 6 carbons,

R^6 is hydrogen or a radical selected from alkyl of 1 to 6 carbons, cycloalkyl of 3 to 10 carbons, alkoxy of 1 to 4 carbons, carbocyclic aryl of 6 to 10 carbons, and carbocyclic aralkyl with 6 to 10 carbons in the aryl moiety,

R^2 and R^3 may be different and are selected from hydrogen, alkoxy of 1 to 4 carbons, halogen, trifluoromethyl, alkyl of 1 to 4 carbons and CN, and

X is the group —O—SO_2— or —SO_2O—.

6. A pharmaceutical composition for treating helmintic infections in mammals containing as the active ingredient an effective amount of a substituted phenylguanidine as claimed in claim **1**, in admixture with a pharmaceutically suitable carrier.

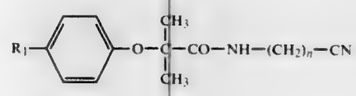
4,176,193

THERAPEUTIC ISOBUTYRAMIDES

André Esanu, Paris, France, assignor to Societe d'Etudes de Produits Chimiques, Paris, France

Continuation of Ser. No. 778,729, Mar. 17, 1977, abandoned.
This application Nov. 17, 1978, Ser. No. 962,129
Int. Cl.[2] **A01N** *9/20;* **C07C** *121/78*
U.S. Cl. 424—304 **1 Claim**

1. A method of treating hyperlipemia, hypertriglyceridemia and hypercholesterodemia comprising the administration in a pharmaceutically acceptable carrier of an effective amount of a compound having the formula:



wherein:

R_1 is a halogen

n is an integer from 2 to 6.

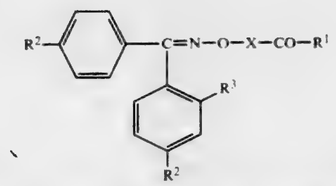
4,176,194

OXYALKANOIC ACID DERIVATIVES

Wilson S. Waring, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 17, 1978, Ser. No. 887,858
Claims priority, application United Kingdom, Apr. 1, 1977, 13837/77
Int. Cl.[2] **A61K** *31/24;* **C07C** *131/00*
U.S. Cl. 424—309 **5 Claims**

1. A compound of the formula:



wherein R^1 is a hydroxy or C_{1-4}-alkoxy radical; R^2 is a halogen atom; R^3 is hydrogen or a halogen atom; and X is a methylene diradical; or, when R^1 is a hydroxy radical, a pharmaceutically acceptable base-addition salt thereof.

4,176,195

PESTICIDAL α-CYANOBENZYL ESTER ENANTIOMER PAIR

Donald W. Stoutamire, Modesto, Calif., assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 20, 1978, Ser. No. 926,366
Int. Cl.[2] **A01N** *9/06, 9/20;* **C07C** *121/50, 121/60*
U.S. Cl. 424—304 **4 Claims**

1. An enantiomer pair consisting of S-α-cyano-3-phenoxybenzyl S-α-isopropyl-p-chlorophenylacetate and R-α-cyano-3-phenoxybenzyl R-α-isopropyl-p-chlorophenylacetate, said pair substantially free of other stereoisomers of α-cyano-3-phenoxybenzyl α-isopropyl-p-chlorophenylacetate.

3. A pesticidal composition which comprises, (a) as active ingredient, a pesticidally effective amount of an enantiomer pair consisting of S-α-cyano-3-phenoxybenzyl S-α-isopropyl-p-chlorophenylacetate and R-α-cyano-3-phenoxybenzyl R-α-isopropylp-chlorophenylacetate and (b) at least one surface-active agent or pesticide carrier, said composition substantially free of other stereoisomers of α-cyano-3-phenoxybenzyl α-isopropyl-p-chlorophenylacetate.

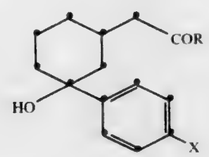
4,176,196

HYPOGLYCEMIC ARYLCYCLOHEXANE ACETIC ACIDS

Lawrence S. Melvin, Jr., Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Nov. 4, 1977, Ser. No. 848,537
Int. Cl.[2] **A01K** *31/19, 31/215;* **C07C** *69/76*
U.S. Cl. 424—308 **5 Claims**

1. A method for lowering blood sugar in the treatment of a diabetic subject, which comprises administering to said subject an effective blood sugar lowering amount of a compound of the formula



I

wherein R is selected from —OR_1 and —NH_2;

X is selected from hydrogen and —OR_1;

R_1 is selected from hydrogen and alkyl of 1 to 4 carbon atoms;

and the pharmaceutically-acceptable salts of those compounds wherein R is —OH.

4,176,197

METHOD FOR TREATING ACNE VULGARIS

B. Newell Olson, Norwich, N.Y., assignor to Dominion Pharmacal, Inc., Norwich, N.Y.

Filed Feb. 3, 1978, Ser. No. 874,843
Int. Cl.[2] **A61K** *31/14, 31/195*
U.S. Cl. 424—319 **3 Claims**

1. A method of treating patients afflicted with acne which comprises topically applying to the skin of said patients a liquid solution consisting essentially of allantoin N-acetyl DL methionine complex in the order of 0.25 percent and quaternary ammonium chloride in the order of 0.13 percent and sufficient alkali to produce a final pH in the range of from pH 3 to 7.

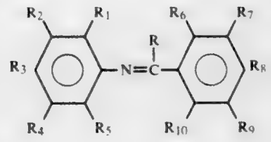
4,176,198

METHOD OF TREATMENT

George W. Nuss, Jr., Lansdale; Norman J. Santora, Roslyn, and George H. Douglas, Malvern, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Filed Oct. 6, 1977, Ser. No. 839,960
Int. Cl.[2] **A61V** *31/275*
U.S. Cl. 424—330 **27 Claims**

1. A method of treating inflammation in warm-blooded animals comprising the topical administration to said animal of an effective amount of a pharmaceutically-active compound of the formula:



where:

R is hydrogen or alkyl;

R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, R_{10} may be the same or different and are:

hydrogen,
alkyl,
cyano,
nitro,
amino,
haloloweralkoxy,
haloloweralkyl,
halo,
loweralkoxy and
hydroxy.

4,176,199

EXTRACTION OF PROTEIN FROM EDIBLE BEEF BONES AND PRODUCT

Arthur N. Vollmer, and George E. Rainey, both of Canton, Ohio, assignors to Sugardale Foods, Incorporated, Canton, Ohio

Filed May 15, 1978, Ser. No. 906,029
Int. Cl.[2] **A23J** *1/10;* **A23L** *1/313*
U.S. Cl. 426—59 **8 Claims**

1. The method of making edible gelatin bone, tallow and aqueous protein broth products from edible beef bones which consists in crushing edible beef bones to form bone fragments having a maximum dimension of up to ⅜"; forming an aqueous mixture of approximately equal amounts by weight of said bone fragments and water; adding to the aqueous mixture papain based proteolytic enzymes of the class consisting of Tona-300 and Papain 90L enzymes in the amount by weight of the bone fragments of about 3½% Tona-300 enzymes or 1/10th of 1% Papain 90L enzymes; heating and agitating the aqueous bone-enzyme mixture during a heating cycle at about at least 125° F. but not exceeding about 155° F. for approximately 3–3½ hours, and then at step-up temperatures of up to, but not exceeding, 195° F. for a total heating cycle time not exceeding 6

hours; maintaining a final 195° F. heating temperature for a time duration at the end of said heating cycle sufficient to inactivate the enzymes; said heating cycle treatment simultaneously separating the tallow from the bone fragments, and hydrolyzing and solubilizing protein in the bone fragments; filtering and screening the solids from the liquid in the heated mixture while maintaining the mixture at a temperature of between 135° F. and 190° F. to produce separated edible gelatin bone products having a maximum dimension not greater than ⅜", and a minimum dimension not less than 3/16" and a separated liquid; centrifuging the separated liquid while maintaining the temperature thereof between 135° F. and 190° F., to obtain edible tallow products, and an edible aqueous 4% to 7% by weight protein broth.

4,176,200

METHOD FOR REDUCING THE SURFACE DISCOLORATION OF FOOD SPREADS AND FOOD SPREADS PRODUCED THEREBY

Henricus M. Princen, Englewood, N.J., and Michael P. Aronson, Valley Cottage, N.Y., assignors to Lever Brothers Company, New York, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,604
Int. Cl.[2] A23L *1/275;* **A23D** *5/04*
U.S. Cl. 426—250 **8 Claims**

1. A method for reducing the discoloration of the surface of a margarine-like, water-in-oil emulsion food spread comprising at least about 40% fat or oil, or mixtures thereof, occasioned by the evaporation of water therefrom, comprising the step of incorporating into the food spread an amount of good grade white pigment effective to cause the optical properties of said food spread when deydrated, to be comparable to the optical properties of a freshly made food spread.

4,176,201

SWEETENING COMPOSITION

Marvin K. Cook, Port Charlotte, Fla., assignor to MacAndrews and Forbes Company, Camden, N.J.

Filed Nov. 25, 1977, Ser. No. 854,604
Int. Cl.[2] A23L *1/236*
U.S. Cl. 426—548 **3 Claims**

1. A sweetening composition consisting essentially of about 85% to about 95% sorbitol, about 2.5% to about 7.5% potassium bitartrate, about 2.5% to about 7.5% ammoniated glycyrrhizin and about 0.025% to about 0.075% of a 5'-nucleotide, said percentages being by weight, based on the weight of the composition.

4,176,202

VEGETABLE PROTEIN INGREDIENT FOR KAMABOKO PRODUCTS

Carl D. Decker, St. Louis, Mo., and S. Kent Holt, Tokyo, Japan, assignors to Ralston Purina Company, St. Louis, Mo.

Continuation of Ser. No. 826,510, Aug. 22, 1977, abandoned. This application Oct. 4, 1978, Ser. No. 948,596
Int. Cl.[2] A23L *1/325*
U.S. Cl. 426—574 **13 Claims**

1. A kamaboko-type gelled fish product comprising comminuted fish flesh obtained from fresh fish or frozen surimi and a composition consisting essentially of between about 60 and 90% by weight of a vegetable protein isolate and about 10–40% by weight of a fat emulsion having a fat content exceeding 20% by weight, wherein the level of said composition does not exceed about 90% by weight of the fish flesh.

4,176,203

PROCESS AND AN APPARATUS FOR ALKALI-TREATMENT OF LIGNOCELLULOSIC MATERIAL

Gösta B. Lagerström, Ängelholm, Sweden, assignor to Boliden Aktiebolag, Sweden

Filed Feb. 25, 1977, Ser. No. 772,073
Claims priority, application Sweden, Feb. 27, 1976, 7602799
Int. Cl.[2] A23K *1/12*
U.S. Cl. 426—636 **6 Claims**

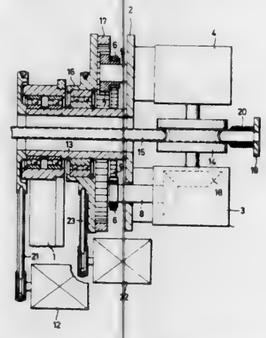
1. A process for increasing the feed value of lignocellulosic materials by treatment with a solution of a base and subsequent neutralization with an acid, comprising applying the alkaline solution on top of a mass of lignocellulosic material within a limited zone, and travelling said zone across the whole upper surface of said mass, said alkaline solution being applied at a rate essentially corresponding to the rate of uptake of said alkaline solution by the straw, draining and recirculating residual alkaline solution and subsequently neutralizing the alkali treated straw with an acid.

4,176,204

PROCESS FOR SHIRRING TUBULAR FILMS AND PRODUCT THEREOF

Bruno Winkler, Am Hummelberg 9, D-694 Weinheim-Oberflockenbach, Fed. Rep. of Germany

Division of Ser. No. 543,073, Jan. 22, 1975, Pat. No. 4,085,483. This application Sep. 23, 1977, Ser. No. 836,047
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1975, 2403740
Int. Cl.[2] A22C *13/02*
U.S. Cl. 426—140 **5 Claims**



1. A process for the manufacture of shirred tubular films, wherein an unshirred tube is passed over a shirring mandrel and pressed against a fixed stop and is at the same time subjected to a shirring action at its periphery by symmetrical shirring members which in the region engaging the tube move substantially in the direction of travel of the tube, wherein the shirring members which engage on the periphery of the tubes are caused to continuously rotate about the axis of the shirring mandrel in a selected direction.

2. A process according to claim 1 wherein the shirring action is produced by rotation of shirring rollers, each rotating on an axis perpendicular to said mandrel axis and each having a plurality of substantially identical teeth.

4,176,205

FINGERPRINT POWDER AND METHOD OF APPLICATION

Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 24, 1976, Ser. No. 669,926
Int. Cl.[2] A61B *5/10*
U.S. Cl. 427—1 **19 Claims**



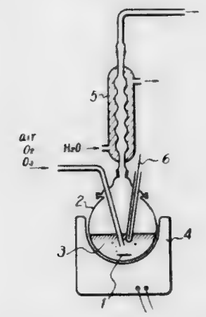
1. A method for detecting or developing a latent fingerprint on a surface, which comprises applying to said surface a composition comprising a carrier powder selected from the group consisting of talc and silica, and mixtures thereof, and a coloring agent capable of forming a colored pattern of the fingerprint in conjunction with said carrier powder, said coloring agent being a fluorescent dye, and viewing said surface containing the developed fingerprint under lighting conditions to obtain a colored fluorescent fingerprint pattern.

4,176,206

METHOD FOR MANUFACTURING AN OXIDE OF SEMICONDUCTOR

Makoto Inoue, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 2, 1976, Ser. No. 747,256
Claims priority, application Japan, Dec. 13, 1975, 50-150011
Int. Cl.[2] B05D *5/12*
U.S. Cl. 427—82 **9 Claims**



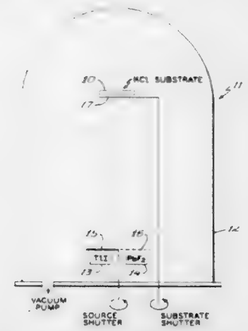
1. The method of manufacturing an oxide layer of semiconductor composition, comprising the steps of immersing a semiconductor compound substrate in heated water, and blowing an oxidizing gas in said water to dissolve at least as much as the maximum solubility of oxidizing gas at the temperature of said water between room temperature to boiling temperature.

4,176,207

NON-BIREFRINGENT THALLIUM IODIDE THIN FILMS FOR SURFACE PROTECTION OF HALIDE OPTICAL ELEMENTS

Thomas J. Moravec, Eden Prairie, and Richard A. Skogman, Minneapolis, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 19, 1978, Ser. No. 952,764
Int. Cl.[2] G02B *1/10;* **B05D** *1/36*
U.S. Cl. 427—160 **4 Claims**



1. A method of preparing a non-birefringent cubic thallium iodide thin film protective coating on potassium chloride optical elements, the method comprising:
(a) provide an evaporative vacuum deposition system having therein a thallium iodide evaporation source and an optical buffer material evaporation source;
(b) provide a shutter for the evaporant sources;
(c) place a potassium chloride optical element to be coated in said evaporative deposition system;
(d) evacuate the vacuum deposition system to 5×10^{-6} torr pressure or lower;
(e) heat the evaporant sources to obtain deposition rates of not more than about 2000 A per minute from each;
(f) position the shutter to deposit first on said element a layer of cubic thallium iodide to a thickness of up to approximately 500 A;
(g) deposit next optical buffer material to a thickness of from about 5 A to about 50 A;
(h) repeat steps f and g a plurality of times to produce a coating of required thickness comprising alternating layers of cubic thallium iodide and optical buffer material;
(i) repeat step f to complete the coating.

4,176,208

PRODUCTION OF INHOMOGENEOUS FILMS BY SEQUENTIAL LAYERS OF HOMOGENEOUS FILMS

Thomas J. Moravec, Eden Prairie, and Richard A. Skogman, Minneapolis, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 24, 1978, Ser. No. 963,550
Int. Cl.[2] G02B *1/10;* **B05D** *1/36*
U.S. Cl. 427—160 **9 Claims**

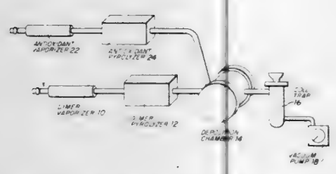
1. Preparation of a graded refractive index in an optical film antireflective coating on an optical element comprising the steps of:
(a) provide an evaporative vacuum deposition system having first and second evaporation sources of different optical coating materials of differing indices of refraction such that the values of the two indices satisfy the relationship for antireflecting characteristics at the desired wavelength;
(b) provide a shutter for the evaporant sources;
(c) place an optical element to be coated in said evaporative deposition system;

(d) evacuate the vacuum deposition system to 5×10^{-6} torr pressure or lower;
(e) heat the evaporant sources to obtain desired deposition rates;
(f) deposit a plurality of thin film layer pairs of the two materials, that is, the first material followed by the second material onto the optical element, the first of the



layer pairs having the second material thin compared to the first material, the last of the layer pairs having the first material thin with respect to the second material, and the other layer pairs shifting between the thin second material and the thin first material relation in a predetermined manner to thereby provide a desired graded refractive index film.

4,176,209
PROCESS FOR FORMING POLYMERIC PARAXYLYLENE COATINGS AND FILMS POSSESSING IMPROVED OXIDATION RESISTANCE
Thomas E. Baker, Northboro; George L. Fix, Grafton, and John S. Judge, Lexington, all of Mass., assignors to Raytheon Corporation, Lexington, Mass.
Filed Jan. 9, 1978, Ser. No. 868,159
Int. Cl.² C23C *11/00, 13/00*
U.S. Cl. 427—248 B **10 Claims**



1. In a chemical vapor deposition process for forming polymeric paraxylylene including the steps of producing vaporous polymeric paraxylylene precursor and subsequently condensing said precursor;
the improvement comprising condensing vaporized antioxidant simultaneously with said precursor, said antioxidant being a vaporizable and vapor-transportable material, to thereby incorporate said antioxidant into the polymeric paraxylylene formed.

4,176,210
PROCESS FOR MAKING URETHANE COATED DECORATIVE SHEET-TYPE COVERING MATERIAL
David B. Skinner, Allentown, Pa., assignor to GAF Corporation, New York, N.Y.
Filed Apr. 12, 1977, Ser. No. 786,885
Int. Cl.² B05D *5/00, 1/36*
U.S. Cl. 427—258 **5 Claims**

1. Process for making decorative sheet-type covering material comprising the steps of:
(a) forming sheet material comprising a layer of gelled foamable PVC plastisol or organosol on a substrate, said layer containing a blowing agent;
(b) applying a layer of nonfoamable PVC plastisol or organosol to said gelled foamable layer;
(c) gelling said layer of nonfoamable PVC plastisol or organosol;
(d) applying a layer of uncured polyurethane to the gelled layer of nonfoamable PVC plastisol or organosol; and
(e) then heating said sheet material to a temperature sufficient to decompose said blowing agent and cure all of said PVC and polyurethane layers.

4,176,211
C-SHAPED POLYESTER FILAMENTS
Henry G. Jackson, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed May 2, 1978, Ser. No. 902,199
Int. Cl.² B28B *21/54*
U.S. Cl. 428—397 **11 Claims**



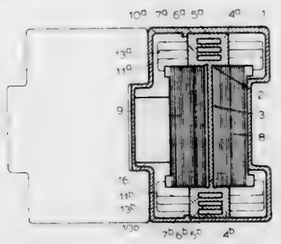
1. A method for producing a polyester filament having a cross-section of C-shape, comprising extruding molten polyester through a spinneret having at least one array of circular holes in a pattern comprising a center hole with eight holes equally spaced around said center hole wherein each hole has an equal diameter of about 0.15 to about 0.75 mm and the radius at the center of each of the outside holes from the center of the central hole is up to about three times the diameter of the holes.

4,176,212
RADIATION AND MOISTURE CURABLE COMPOSITIONS AND METHOD OF USE
Karl Brack, Holliston, Mass., assignor to Design Cote Corporation, Natick, Mass.
Filed Jan. 25, 1978, Ser. No. 872,197
Int. Cl.² B05D *3/06*
U.S. Cl. 428—423 **25 Claims**

1. A radiation curable coating composition which comprises a compound containing both radiation curable and moisture curable reaction groups, said composition also containing both an isocyanate and an oxazolidine.

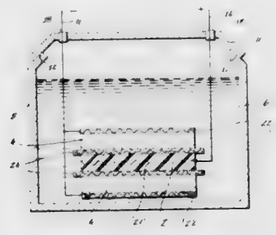
10. A method of coating or printing a substrate which comprises applying to said substrate a composition comprising a compound containing both radiation curable and moisture curable reaction groups, said composition also containing both an isocyanate and an oxazolidine and thereafter exposing said composition to radiation and to moisture.

4,176,213
BATTERY UNIT, CONTAINING ONE OR MORE FUEL-CELL BLOCKS
Jacques van Linden, Stein, Netherlands, assignor to Electrochemische Energieconversie, N.V., Mol, Belgium
Filed Jun. 29, 1978, Ser. No. 920,541
Claims priority, application Netherlands, Jun. 29, 1977, 7707180
Int. Cl.² H01M *8/04*
U.S. Cl. 429—12 **21 Claims**



1. A battery unit comprising a plurality of fuel-cell blocks, each containing one or more fuel-cells, in which blocks duct means are provided for the supply and removal of fuel and oxidizing agent to and from said fuel-cells, wherein the said battery unit further comprises an elongate beam against which the fuel-cell blocks are placed, primary ducts in or on said beam for the transport of fuel and oxidizing agent, and secondary ducts connected to said primary ducts for the supply and removal of fuel and oxidizing agent, which secondary ducts are joined to the duct means in the fuel-cell blocks.

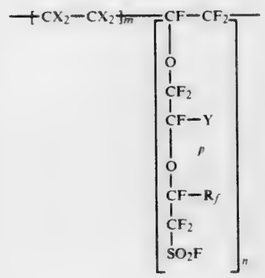
4,176,214
LITHIUM-LEAD SULFATE PRIMARY ELECTROCHEMICAL CELL
Keith A. Klinedinst, Marlborough, and Carl R. Schlaikjer, Winchester, both of Mass., assignors to GTE Laboratories Incorporated, Stamford, Conn.
Filed Dec. 26, 1978, Ser. No. 973,648
Int. Cl.² H01M *4/58*
U.S. Cl. 429—194 **12 Claims**



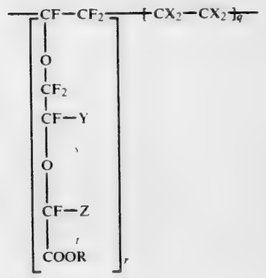
1. A primary electrochemical cell comprising:
(a) an anode comprising lithium metal;
(b) a cathode comprising lead sulfate; said anode and cathode being spaced from each other and in contact with
(c) an electrolytic solution which comprises a dissociable lithium salt dissolved in a liquid organic solvent.

4,176,215
ION-EXCHANGE STRUCTURES OF COPOLYMER BLENDS USEFUL IN ELECTROLYTIC CELLS
Charles J. Molnar, Wilmington, Del.; Edward H. Price, Kennett Square, Pa., and Paul R. Resnick, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Mar. 13, 1978, Ser. No. 886,338
Int. Cl.² C25B *1/00*; B01D *3/04*
U.S. Cl. 521—27 **12 Claims**

1. A film or membrane of a blend of 10 to 90% by wt. of a first fluorinated polymer which has repeating units



where
m is 3 to 15,
n is 1 to 10,
p is 0, 1 or 2,
the X's taken together are four fluorines or three fluorines and one chlorine,
Y is F or CF_3, and
R_f is F, Cl, or a C_1 to C_{10} perfluoroalkyl radical, and 90 to 10% by wt. of a second fluorinated polymer which has repeating units



where
q is 3 to 15,
r is 1 to 10,
s is 0, 1 or 2,
t is 2,
the X's taken together are four fluorines or three fluorines and one chlorine,
Y is F or CF_3,
Z is F or CF_3, and
R is lower alkyl.

4,176,216

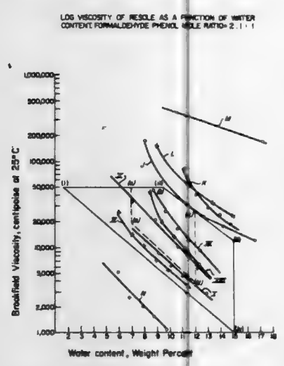
CELLULAR PRODUCTS DERIVED FROM PHENOL/FORMALDEHYDE RESOLES

Wallace G. Reid, Katonah, N.Y.; Rakesh Saini, Somerville, N.J., and Kenneth E. Atkins, South Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 820,020, Jul. 28, 1977. This application Sep. 29, 1978, Ser. No. 947,340

Int. Cl.[2] **C08J** *9/14;* **C08L** *61/08, 61/10*

U.S. Cl. 521—106 **21 Claims**



1. A phenolic foam having a density from about 1.90 to about 3.70 pounds per cubic foot and, within said density range, a friability of less than about 35 percent weight loss (after 10 minutes) and a compressive strength (parallel) of at least about 20 pounds per square inch, which foam is produced by foaming a reaction mixture containing a phenolic resole, an acidic catalyst, a blowing agent and a surface active agent,

wherein the said resole has been produced by the base-catalyzed condensation of formaldehyde and phenol at a formaldehyde-to-phenol mole ratio from about 1.6:1 to about 2.2:1, the aqueous alkaline condensate having been brought to a pH from about 5.0 to about 7.0 by the addition thereto of a salt-forming acidic compound, which resole is characterized by an average molecular weight such that a plot of log viscosity as a function of water content of the resole falls within the area defined by straight line interconnection in series of points (i)–(iv) where points (i)–(iv) are as follows for the indicated formaldehyde-to-phenol mole ratios:

(a) at a formaldehyde-to-phenol mole ratio of at least 1.9:1 and no more than about 2.2:1, points (i)–(iv) are:
  (i) a viscosity of about 50,000 centipoise at a water content of about 1.7 weight percent;
  (ii) a viscosity of about 50,000 centipoise at a water content of about 9.5 weight percent;
  (iii) a viscosity of about 12,000 centipoise at a water content of about 15.0 weight percent; and
  (iv) a viscosity of about 1,000 centipoise at a water content of about 15.0 weight percent;
(b) at a formaldehyde-to-phenol mole ratio of at least 1.7:1 and less than 1.9:1, points (i)–(iv) are:
  (i) a viscosity of about 50,000 centipoise at a water content of about 3.0 weight percent;
  (ii) a viscosity of about 50,000 centipoise at a water content of about 14.0 weight percent;
  (iii) a viscosity of about 25,000 centipoise at a water content of about 16.0 weight percent; and
  (iv) a viscosity of about 1,000 centipoise at a water content of about 16.0 weight percent;
(c) at a formaldehyde-to-phenol mole ratio of at least about 1.6:1 and less than 1.7:1, points (i)–(iv) are:
  (i) a viscosity of about 50,000 centipoise at a water content of about 6.5 weight percent;
  (ii) a viscosity of about 50,000 centipoise at a water content of about 12.5 weight percent;
  (iii) a viscosity of about 25,000 centipoise at a water content of about 16.0 weight percent; and
  (iv) a viscosity of about 3,000 centipoise at a water content of about 16.0 weight percent; wherein the said viscosity values are Brookfield at 25° C.

4,176,217

PROCESS FOR THE MANUFACTURE OF FOAMED PLASTICS WITH IMPROVED COMBUSTION CHARACTERISTICS

Leopold Golser, Leonding; Hubert Czepel, and Gernard Stern, both of Linz, all of Austria, assignors to Chemie Linz Aktiengesellschaft, Austria

Continuation of Ser. No. 819,503, Jul. 26, 1977, abandoned. This application Jan. 4, 1979, Ser. No. 895

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1976, 2634418

Int. Cl.[2] **C08J** *9/00*

U.S. Cl. 521—106 **7 Claims**

1. In a process for the production of foamed plastics with improved combustion characteristics by a condensation reaction of aminoplast precondensates with organic isocyanates with at least two isocyanate groups, in the presence of acid curing catalysts and an accelerator for polyurethane formation selected from the group consisting of tertiary amines and tin salts with metal-organic bonds, the improvement which consists essentially of: conductance passive

using as starting material an aqueous solution of a water-soluble aminoplast precondensate of formaldehyde and urea, the solution having a water content of 13 to 40% by weight;

adding this aqueous solution to the organic isocyanate which is already mixed with the accelerator for polyurethane formation, said accelerator being used in an amount of 0.5 to 5% by weight, relative to the foamable mixture;

adding to said organic isocyanate/accelerator mixture, at the same time as the aqueous solution of the aminoplast precondensate is added to the isocyanate/accelerator mixture, but separately from said solution of the aminoplast precondensate, the acid curing catalyst, said catalyst being used in an amount of 0.5–5% by weight, relative to the foamable mixture;

the proportion of isocyanate in the reaction mixture being 12 to 330% by weight, relative to the arithmetical solids content of the aqueous solution of the aminoplast precondensate;

whereby the ratio of water to organic isocyanate prior to the start of the reaction is 0.14 to 1.5 parts per weight water to 1 part per weight of organic isocyanate.

4,176,218

HIGH RESILIENCE FLEXIBLE FOAMED POLYURETHANES, FOAMABLE MIXTURES AND PROCESS THEREFOR

John G. Demou, Lincoln Park, and Edward R. Pray, Dearborn, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

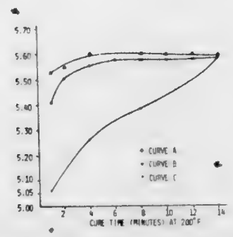
Filed Oct. 17, 1977, Ser. No. 842,621

Int. Cl.[2] **C08G** *18/24, 18/22, 18/63;* **C09K** *3/00*

U.S. Cl. 521—129 **15 Claims**

1. A process for the manufacture of high resilience, flexible, closed-mold, cold-cure, non-shrinking, foamed polyurethanes comprising reacting in the presence of a co-catalyst therefor a foamable mixture consisting of a co-catalyst, an organic polyisocyanate, water, and a polyol selected from the group consisting of (a) a polymer dispersion containing a hydroxyl-terminated, polyether-graft copolymer prepared by the in-situ polymerization of an ethylenically unsaturated monomer in a polyol and mixtures of (a) with (b) a polyoxyalkylene polyether polyol, wherein the proportion of said co-catalyst is

about 0.05 percent to about 5.0 percent by weight of at least one tertiary amine and about 0.01 percent to about 1 percent by weight of at least one metal-containing basic catalyst, said proportion being based upon the weight of said polyol and wherein said basic catalyst is selected from the group consisting of at least one of an alkali metal hydroxide, an alkaline earth metal hydroxide, and a basic metal salt thereof derived



from the reaction of said hydroxides with a weak inorganic acid or an organic acid.

12. The composition of claim 1 wherein said metal-containing basic catalyst is derived from the reaction of at least one alkali metal hydroxide or an alkaline earth metal hydroxide and an organic acid wherein said basic catalyst is selected from the group consisting of alkali metal or alkaline earth metal carboxylates alkoxides and phenates.

4,176,219

PROCESS FOR THE PRODUCTION OF 1,2-POLYBUTADIENE WITH REGULATED MOLECULAR WEIGHT

Kenya Makino, Kuwana; Tsunezo Ishikawa, Suzuka, and Koei Komatsu, Tokyo, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed May 30, 1978, Ser. No. 910,429

Claims priority, application Japan, May 30, 1977, 52-62230

Int. Cl.[2] **C08F** *4/74*

U.S. Cl. 526—92 **26 Claims**

1. A process for producing 1,2-polybutadiene with a regulated molecular weight which comprises contacting 1,3-butadiene with a catalyst composed of (A) a cobalt compound selected from the group consisting of cobalt chloride, cobalt bromide, cobalt iodide, cobalt naphthenate, cobalt octanoate, cobalt trisacetylacetonate, cobalt bisacetylacetonate and cobalt carbonyl, (B) an organic phosphine compound selected from the group consisting of triethylphosphine, triisopropylphosphine, a tri-n-butylphosphine, triphenylphosphine, tri-m-phenylphosphine, tri-m-xylylphosphine, and tri-m-tolylphosphine, (C) a trialkylaluminum and (D) water in an amount of 0.55 to 1.5 moles per mole of said trialkylaluminum in the presence of (E) at least one compound selected from the group consisting of allyl halides, alkyl-substituted allyl halides, benzyl halides, alkyl-substituted benzyl halides, and tertiary aliphatic halides, in an amount of 0.01 to 10 moles of component (E) per mole of component (C).

4,176,220

CATALYST COMPOSITION FOR RING-OPENING POLYMERIZATION OF NORBORNENE DERIVATIVES AND PROCESS FOR POLYMERIZING SAME

Hiroharu Ikeda; Shuichi Matsumoto, and Kenya Makino, all of Yokohama, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Division of Ser. No. 512,790, Oct. 7, 1974, Pat. No. 4,068,063. This application Sep. 27, 1977, Ser. No. 836,990

Claims priority, application Japan, Oct. 9, 1973, 48/113585; Oct. 9, 1973, 48/113586; Oct. 9, 1973, 48/113587

Int. Cl.[2] **C08F** *4/66, 4/70, 4/78*

U.S. Cl. 526—97 **32 Claims**

1. A process for producing a polymer or copolymer of a norbornene derivative, which comprises contacting at least one norbornene derivative having at least one ester group, or a monomer mixture of at least one of said norbornene derivatives and at least one cycloolefin other than cyclohexene, with a catalyst composition consisting essentially of a reaction mixture of (A) at least one member selected from the group consisting of compounds of W, Mo, Re and Ta, (B) at least one member selected from the group consisting of organometallic compounds of elements of Groups IA, IIA, IIB and IIIA of the Deming Periodic Table, and (C) at least one member selected from the group consisting of oxides, hydroxides, nitrates, sulfates, phosphates, acetylacetone complexes, and ammine complexes of V, Cr and Mn; oxides, sulfates, phosphates, acetylacetone complexes, cyclopentadienyl complexes, hydride complexes and silicides of elements of Group IVB of the Deming Periodic Table; and oxides, peroxides, hydroxides, sulfates, phosphates, acetylacetone complexes, and ammine complexes of elements of Group VIII of the Deming Periodic Table.

4,176,221

SOLUBLE RESINOUS PRODUCTS OF POLYEPOXIDE-AMINE ADDUCTS AND CYCLIC DICARBOXYLIC ACID ANHYDRIDES

David A. Shimp, Prospect, Ky., assignor to Celanese Polymer Specialties Company, Louisville, Ky.

Filed Jul. 14, 1978, Ser. No. 924,778

Int. Cl.[2] **C08G** *59/14;* **C08L** *63/00;* **C08G** *59/06*

U.S. Cl. 528—103 **14 Claims**

1. A resinous composition comprising the acid-amide reaction product of

(A) an adduct of

  (1) a polyepoxide resin derived from a dihydric phenol and an epihalohydrin, said polyepoxide resin having a 1,2-epoxide equivalent weight of about 450 to about 4000; and
  (2) an alkyl primary monoamine or a polyamine having at least 2 amine nitrogen atoms per molecule and at least 3 amine hydrogen atoms per molecule, said amines having no other groups reactive with epoxide groups; and

(B) maleic or succinic anhydride wherein about one mol of (2) is reacted with each epoxide equivalent of (1) and wherein about 0.5 to 1 mol of (B) is reacted per each amine nitrogen atom in said adduct.

4,176,222

PRODUCTION OF AROMATIC POLYETHERS

Michael B. Cinderey, Stevenage, and John B. Rose, Letchworth, both of England, assignors to Imperial Chemical Industries Limited, Great Britain

Filed Jan. 30, 1978, Ser. No. 873,478

Claims priority, application United Kingdom, Feb. 1, 1977, 4009/77

Int. Cl.[2] **C08G** *65/40*

U.S. Cl. 528—126 **13 Claims**

1. A process for the production of an aromatic polyether containing —SO_2— and/or —CO— linkages comprising heating in the temperature range 100° to 400° C. (i) a substantially equimolar mixture of (a) at least one bisphenol and (b) at least one dihalobenzenoid compound, or (ii) at least on halophenols, in which dihalobenzenoid compound or halophenol the halogen atoms are activated by —SO_2— or —CO— groups ortho or para thereto, with a mixture of sodium carbonate or bicarbonate and a second alkali metal carbonate or bicarbonate, the alkali metal of said second alkali metal carbonate or bicarbonate having a higher aromatic number than that of sodium, the amount of the second alkali metal carbonate or bicarbonate being such that there are 0.001 to 0.2 gram atoms of said alkali metal of higher atomic number per gram atom of sodium, the total amount of alkali metal carbonate or bicarbonate being such that there is at least one alkali metal atom for each phenol group present, and thereafter separating the polymer from alkali metal halide.

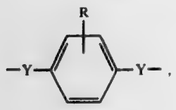
4,176,223

POLYIMIDE-ESTERS AND FILAMENTS PREPARED FROM 4-(4'-CARBOXYPHTHALIMIDO)BENZOIC ACID OR 4-(4'-HYDROXYPHTHALIMIDO)PHENOL

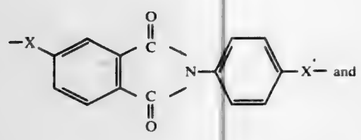
Robert S. Irwin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 18, 1978, Ser. No. 970,234
Int. Cl.[2] C08G *73/16*
U.S. Cl. 528—170 **5 Claims**

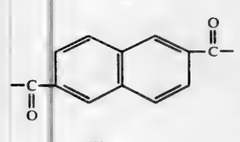
1. A filament-forming polyimide-ester consisting essentially of units having the structural formulas



I



II



III

such that when X is



Y is —O—; R is Cl or 1 to 2 carbon alkyl; unit III is present in an amount of from 5–20 mole percent based on the total number of moles of units; and the sum of moles of units II and III is substantially equal to the number of moles of unit I; and when X is —O—; Y is



R is H; unit III is present in an amount of from 5–20 mole percent based on the total number of moles of units; and the sum of moles of units I and III is substantially equal to the number of moles of unit II.

4,176,224

POLY (ETHYLENE/ALKYLENE) TEREPHTHALATES WHICH CRYSTALLIZE RAPIDLY

Peter Bier; Rudolf Binsack, and Hugo Vernaleken, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 23, 1978, Ser. No. 889,584
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2715932
Int. Cl.[2] C08G *63/18*
U.S. Cl. 528—309 **13 Claims**

1. A highly crystalline, thermoplastic terephthalic acid copolyester which crystallizes rapidly and consists of at least about 90 mol %, relative to the dicarboxylic acid component, of terephthalic acid radicals, about 98 to 99.9 mol %, relative to the diol component, of ethylene glycol radicals and about 0.1 to 2.0 mol %, relative to the diol component, of 2-ethylhexane-1,3-diol radicals.

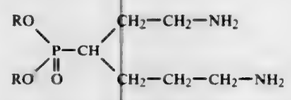
4,176,225

NYLON POLYCONDENSATE FROM DIAMINO PHOSPHONATE

Georges Sturtz, 22, rue Léon Blum, 29200 Brest, and Jean-Claude Clement, 76106 Résidence Bois des Roches, 91240 Saint Michel sur Orge, both of France

Division of Ser. No. 693,686, Jun. 7, 1976, abandoned. This application May 31, 1977, Ser. No. 801,809
Claims priority, application France, Jun. 10, 1975, 75 18179
Int. Cl.[2] C08G *69/26*
U.S. Cl. 528—337 **10 Claims**

1. A nylon polycondensate formed from a phosphonate of the formula:



wherein R is C_{1-5} alkyl and a dicarboxylic acid of the formula HOOC—R″—COOH wherein R″ is a divalent aromatic or aliphatic hydrocarbon radical.

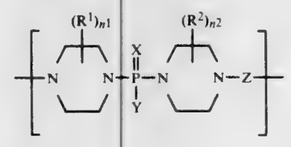
4,176,226

BISPIPERAZIDO PHOSPHORUS POLYAMIDES

Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

Division of Ser. No. 628,262, Nov. 3, 1975, Pat. No. 4,098,768. This application Jun. 23, 1978, Ser. No. 918,248
Claims priority, application United Kingdom, May 21, 1975, 21974/75
Int. Cl.[2] C08G *79/02*
U.S. Cl. 528—332 **12 Claims**

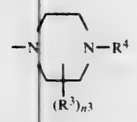
1. A solid polymer consisting essentially of repeating units of the formula:



wherein

(i) X is absent or represents oxygen or sulphur or =N—R;

(ii) Y represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group; or —OR or —NR_2; or —NR_2 in which the two R groups, together with the nitrogen atom to which they are attached, represent an N-containing heterocyclic ring; or a group of the formula:



wherein R, R^1, R^2, and R^3 represent hydrogen, or an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group;

(iii) R^4 represents hydrogen or an aliphatic group, a cycloaliphatic group, an N-containing heterocyclic group, an acyl group, a sulfonyl group, or an unsubstituted carbamoyl group;

(iv) n^1, n^2, and n^3 each represent zero or an integer;

(v) Z represents —OC—R^5—SO_2—; and

(vi) R^5 represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon radical, or an N-containing heterocyclic radical.

4,176,227

PROCESS FOR INCORPORATING CaF_2 INTO POLYAMIDES

William M. Baggett, and LeMoyne W. Plischke, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 2, 1978, Ser. No. 947,799
Int. Cl.[2] C08G *69/49*
U.S. Cl. 528—488 **11 Claims**

1. A process for incorporating calcium fluoride into a nylon comprising reacting a calcium salt with a fluoride salt in a molten nylon.

4,176,228

POTASSIUM-MAGNESIUM-CALCIUM GLYCYRRHIZIN

Harold A. Hartung, West Collingswood, N.J., assignor to MacAndrews and Forbes Company, Camden, N.J.

Filed Sep. 14, 1978, Ser. No. 942,313
Int. Cl.[2] C07H *15/20*
U.S. Cl. 536—4 **9 Claims**

7. Potassium-magnesium-calcium glycyrrhizin of the formula $K_xMg_yCa_zG$ wherein G is glycyrrhizic acid and the sum of x, 2y and 2z is 2.

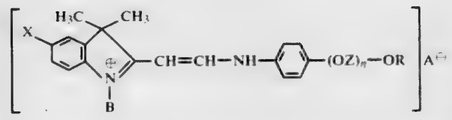
4,176,229

BASIC DYES

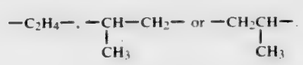
Hellmut Kast, Bobenheim-Roxheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 2, 1978, Ser. No. 930,200
Int. Cl.[2] C07D *209/04*
U.S. Cl. 542—422 **2 Claims**

1. A basic dye of the general formula



where $A^{\ominus}$ is an anion, B is methyl, ethyl, benzyl or β-hydroxyethyl, n is 1 or 2, R is alkyl of 1 to 4 carbon atoms, X is hydrogen, methoxy, ethoxy or chlorine and Z is



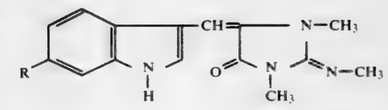
4,176,230

5-(6-ALKYLINDOL-3-YLMETHYLENE)-1,3-DIMETHYL-2-(METHYLIMINO)-4-IMIDAZOLIDINONES

Andrew D. Batcho, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 4, 1977, Ser. No. 821,854
Int. Cl.[2] C07D *403/06*
U.S. Cl. 542—444 **3 Claims**

1. A compound of the formula



I

wherein R is lower alkyl, its geometric isomers, or a pharmaceutically acceptable acid addition salt thereof.

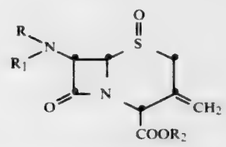
4,176,231

PROCESS FOR PREPARING 3-EXOMETHYLENECEPHAM SULFOXIDES

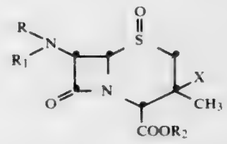
John R. Corfield, Runcorn, and Clifford G. Taylor, Warrington, both of England, assignors to Lilly Industries Limited, London, United Kingdom

Filed Jun. 1, 1978, Ser. No. 911,621
Claims priority, application United Kingdom, Dec. 24, 1977, 53897/77
Int. Cl.[2] C07D *501/04*
U.S. Cl. 544—16 **4 Claims**

1. A process for the preparation of a 3-exomethylenecepham sulfoxide of the formula



by reacting a 3-halo-3-methylcepham sulfoxide of the formula



with mercuric or mercurous perchlorate in an inert organic solvent wherein the above formula R and R_1 are independently hydrogen or an acyl group derived from a carboxylic acid, R_2 is a carboxylic acid protecting group and X is bromine or iodine.

4,176,232

SULFONIC ACID SALTS OF ACYLOXYALKYLAMINES

Sheldon N. Lewis, Willow Grove, and Jerome F. Levy, Dresher, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jun. 27, 1968, Ser. No. 740,480
Int. Cl.[2] C07C *69/54*
U.S. Cl. 560—222 **8 Claims**

1. An alkyl, cycloalkyl, alkaryl, aralkyl, or halogen-substituted alkyl, cycloalkyl, alkaryl, or aralkyl sulfonic acid salt of 2-aminoethyl methacrylate or 2-aminoethyl acrylate.

4,176,233

STEREOSELECTIVE PREPARATION OF HEXAHYDRO DIBENZOPYRANONES AND INTERMEDIATES THEREFOR

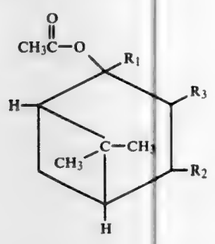
Robert A. Archer, and William A. Day, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 740,502, Nov. 10, 1976, Pat. No. 4,102,902. This application Apr. 21, 1978, Ser. No. 898,610

Int. Cl.[2] C07C *69/16*

U.S. Cl. 560—249 **3 Claims**

1. A compound of the formula



wherein:

R_1 is acetoxy or, taken together with R_3, forms a double bond;

R_2 is acetoxy or, taken together with R_3, forms a double bond; and

R_3, taken together with R_1 or with R_2, forms a double bond, provided that when one of R_1 or R_2 is acetoxy, the other, taken with R_3, forms a double bond, and that R_1 and R_2 both are not acetoxy.

4,176,234

PROCESS FOR THE OXIDATION OF OLEFINS TO ALDEHYDES AND ACIDS

Robert K. Grasselli, Garfield Heights; Arthur F. Miller, Cleveland, and Harley F. Hardman, Lyndhurst, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 676,039, Apr. 12, 1976, abandoned, which is a continuation of Ser. No. 112,782, Feb. 4, 1971, abandoned. This application May 26, 1977, Ser. No. 800,980

Int. Cl.[2] C07C *45/04, 51/32, 57/04*

U.S. Cl. 562—546 **13 Claims**

1. The process for the conversion of an olefin selected from the group consisting of propylene, isobutylene and mixtures thereof, to the corresponding unsaturated aldehydes and unsaturated carboxylic acids, comprising reacting in the vapor phase at a temperature of from about 500° to 900° F. and at a pressure of from about 0.5 to 5 atmospheres said olefin with a molecular oxygen-containing gas in the presence of a catalyst of the empirical formula:

$$A_aB_bC_cFe_dBi_eMo_fO_x$$

wherein A is an alkali metal, B is phosphorus or arsenic or both, and C is at least one element selected from Group IIA of the Periodic Classification of elements, and wherein (a) is 0, (b) is a number from 0 to 3, (c) is a number from 0.1 to 10, (d) and (e) are each a number from 0.1 to 6, (f) is a number from 8 to 16, and (x) is a number determined by the valence requirements of the other elements present.

4,176,235

SUBSTITUTED ACYL DERIVATIVES OF AMINO ACIDS

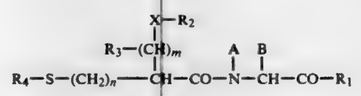
Miguel A. Ondetti, Princeton, and Frank L. Weisenborn, Titusville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 889,768, Mar. 24, 1978, which is a division of Ser. No. 747,280, Dec. 3, 1976, Pat. No. 4,116,962. This application Dec. 4, 1978, Ser. No. 966,285

Int. Cl.[2] C07C *153/07, 149/20*

U.S. Cl. 562—556 **10 Claims**

1. A compound of the formula



and salts thereof,

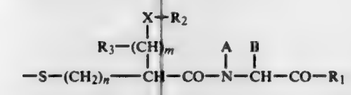
wherein

R_1 is hydroxy or lower alkoxy;

R_2 is hydrogen, lower alkyl or lower alkanoyl;

R_3 is hydrogen or lower alkyl;

R_4 is hydrogen, lower alkanoyl, benzoyl or



A is hydrogen, lower alkyl or hydroxy-lower alkylene;

B is hydrogen, lower alkyl, hydroxy-lower alkylene, amino-lower alkylene, guanidino-lower alkylene, mercapto-lower alkylene, lower alkylmercapto-lower alkylene, carbamoyl-lower alkylene or carboxy lower alkylene; X is oxygen or sulfur;

m is 0, 1 2, 3 or 4; and

n is 0 or 1.

4,176,236

COMPOSITION AND PROCESS

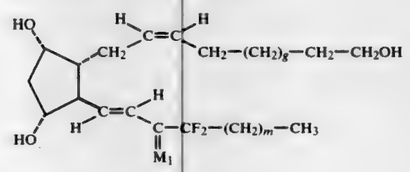
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,369, Jan. 28, 1976, Pat. No. 4,032,576. This application Apr. 6, 1977, Ser. No. 784,995

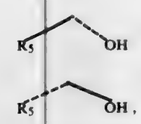
Int. Cl.[2] C07C *177/00*

U.S. Cl. 568—838 **8 Claims**

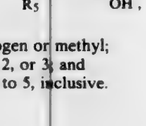
1. A prostaglandin analog of the formula



wherein M_1 is



or



wherein R_5 is hydrogen or methyl;

wherein g is one, 2, or 3; and

wherein m is one to 5, inclusive.

4,176,237

FOUR A INDUCTION

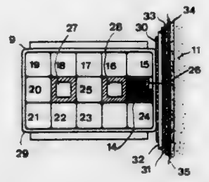
Roald Bingen, Marcinelle, Belgium, assignor to Ateliers de Constructions Electriques de Charleroi (ACEC), Charleroi, Belgium

Filed Jan. 31, 1978, Ser. No. 873,843

Claims priority, application Belgium, Feb. 1, 1978, 17916

Int. Cl.[2] H05B *5/16*

U.S. Cl. 13—27 **9 Claims**



3. An induction furnace having at least one coil connected to a source of alternating current of a predetermined frequency wherein the coil is constituted by at least one loop of a composite conductor constituted by strands of elementary conductors twisted between themselves by parallel transposition and the said strands being twisted by parallel transposition around at least one conduit of cooling liquid constituted by a succession of spacers placed one after the other with spaces between successive spacers and by an outer sheating of the said composite conductor.

4,176,238

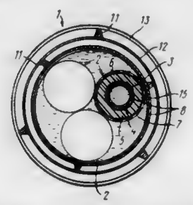
COOLED MULTIPHASE AC CABLE

Mikhail L. Vulis; Valery A. Golenchenko; Igor V. Rybin, and Pavel B. Shenderovich, all of Moscow, U.S.S.R., assignors to Gosudarstvenny Nauchno-Issledovatelsky Energeticheskv Institut Imeni G.M. Krzhizhanovskogo (ENIN), Moscow, U.S.S.R.

Filed Jan. 19, 1978, Ser. No. 870,860

Int. Cl.[2] H01B *12/00*

U.S. Cl. 174—15 S **5 Claims**



1. A cooled multiphase ac cable comprising:

a helically wound internal layer of stabilized superconducting material per phase;

a layer of material, per phase, serving as an electrostatic shield of a respective phase, arranged helically on said internal layer of stabilized superconducting material and concentrically thereto;

a layer of dielectric, per phase, arranged helically on said layer of material serving as an electrostatic shield of a respective phase and concentric ally thereto;

a second layer of material, per phase, serving as an electrostatic shield of a respective phase, arranged helically on said layer of dielectric and concentrically thereto;

an external layer of stabilized superconducting material, per phase, arranged helically on said second layer of material serving as an electrostatic shield of a respective phase and concentrically thereto;

a plurality of closed conductors of superconducting material serving as a means for protecting said multiphase ac cable against the effect of the axial magnetic flux;

a group of said closed conductors of said plurality of conductors, embracing the surface of said internal layer of each said phase;

a group of said closed conductors of said plurality of conductors, embracing said external layers of said phases and being electrically associated.

4,176,239

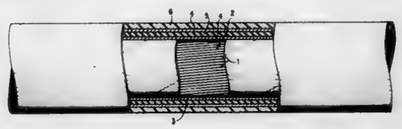
INSULATED ELECTRICAL CABLE CONTAINING AN AGENT FOR DECONTAMINATING AND SEALING THE INTERIOR SPACE THEREOF

Melvin Brauer, East Brunswick, and Thaddeus F. Kroplinski, Bound Brook, both of N.J., assignors to N L Industries, Inc., New York, N.Y.

Continuation of Ser. No. 728,339, Sep. 30, 1976, abandoned, which is a division of Ser. No. 632,180, Nov. 17, 1975, Pat. No. 4,008,197, which is a continuation-in-part of Ser. No. 432,479, Jan. 11, 1974, abandoned. This application Mar. 9, 1978, Ser. No. 884,976

Int. Cl.[2] H01B *7/28, 3/30*

U.S. Cl. 174—23 C **13 Claims**



1. An insulated electrical device containing a plurality of insulated wire conductors, said device having interior spaces between the insulated wire conductors which contain a cured, cross-liked, mineral oil extended polyurethane which is non-spewing, comprising:

(a) from about 8 to about 45 parts by weight, of polyurethane, said polyurethane being prepared by reacting,

(i) a polyol selected from the group consisting of castor oil, polyether polyols, hydroxyl bearing homopolymers of butadiene, hydroxyl bearing copolymers of butadiene and styrene, and combinations thereof, with

(ii) a polyisocyanate prepolymer prepared by reacting a polyisocyanate with a polyol selected from the group consisting of castor oil, polyether polyols, hydroxyl bearing homopolymers of butadiene, hydroxyl bearing copolymers of butadiene and styrene, and combinations thereof,

(b) from about 25 to about 75 parts, by weight, of mineral oil, and

(c) from about 10 to about 35 parts, by weight, of coupling agent, said coupling agent being characterized by

(i) being miscible in all proportions with said mineral oil,

(ii) having a solubility parameter between 7.0 and 9.5,

(iii) having a hydrogen bonding index number in the range of from 6.0 to 12.0, and

(iv) being non-reactive with the polyurethane percursor, and

wherein the cured, cross-linked, mineral oil extended polyurethane is further characterized by the presence of a polybutadiene moiety in the polyurethane structure.

4,176,240

FILLED ELECTRICAL CABLE

Raffaele A. Sabia, Atlanta, Ga., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 30, 1978, Ser. No. 910,192

Int. Cl.[2] H01B *7/28*

U.S. Cl. 174—23 C **3 Claims**

1. A cable comprising:

a plurality of conductors contained within a sheath leaving voids between the conductors, and between the conductors and the sheath, and a filling material filling the voids

the invention characterized in that the filling material comprises a mixture of:

(X) ASTM Type 104A (napthenic) oil having a minimum sp. gr. of 0.860, a minimum SUS viscosity at 210 degrees F. of 45, a maximum pour point ASTM D 97 of 10 degrees F. and a maximum of 5 percent aromatic oils,

(Y) a styrene-ethylene butylene-styrene block copolymer having a styrene-rubber ratio of approximately 0.4 and

(Z) polyethylene having a softening point of 110 degrees C. to 130 degrees C.

the ingredients X, Y and Z having relative proportions falling within the shaded area bounded by ABCDEF of the FIGURE.

4,176,241

FLUID-TIGHT PROTECTIVE SYSTEM FOR AN ELECTROMECHANICAL COMPONENT

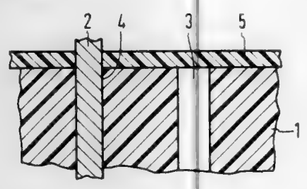
Helmut Schedele, Hoegling, and Romuald von Tomkewitsch, Ebenhausen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 1, 1977, Ser. No. 783,838

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1976, 2616299

Int. Cl.² H05K *5/06*

U.S. Cl. 174—52 S **14 Claims**



1. A fluid-tight protection system for an electromechanical component in a casing in which an insulating sealing absorbent covering layer is disposed as a seal over substantially all portions of the casing requiring sealing, said sealing covering layer comprising a fleece material means with high capillary absorption capacity which is impregnated with a sealing compound and which distributes the sealing compound evenly by said high capillary absorption capacity, said sealing compound having a thin liquid form when impregnating.

4,176,242

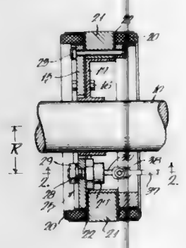
DIODE HOUSING

Phillip S. Linscott, Jr., Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 16, 1978, Ser. No. 869,754

Int. Cl.² H05K *5/06*

U.S. Cl. 174—52 H **1 Claim**



1. A dynamo-electric machine comprising, in combination, a rotatable shaft with a maximum rotational speed and having a mounting member extending radially thereof, a diode having a body and a stem extending therefrom with a disc of glass-type insulating material positioned therebetween, a mounting member extending from said diode body in a direction opposite from said stem and connected to said mounting member to have said diode in axially parallel relation with said shaft, an electrical lead connected to the stem at a mounting hole in the stem by attaching means, and said disc having a thickness to prevent fracture by a bending moment imparted to the stem resulting from centrifugal force of the stem and connected structure, and said thickness having a minimum value of t min in inches, in the equation:

$$t_{min} = 6.886 \times 10^{-8} \times W \times N^2 \times R \times L/D^4$$

wherein

W = weight of the stem and parts supported thereby measured in grams;

N = maximum rotational speed of the rotatable shaft in revolutions per second;

R = radial distance from centerline of the rotatable shaft to the centerline of the stem in inches;

L = axial length of stem from an exposed face of the disc to the centerline of the mounting hole in inches; and

D = diameter of stem in inches.

4,176,243

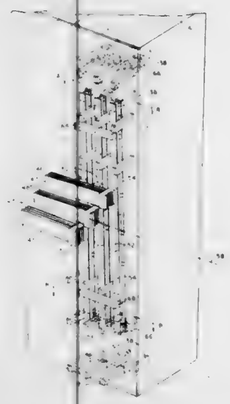
BUS CONNECTOR FOR WELDED ELECTRICAL SWITCHBOARD BUS STRUCTURE

George N. Kovatch, Monroeville; Richard Rosey, Plum Borough, both of Pa., and Ned H. Simon, Queeny Township, St. Louis County, Mo., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 756,035, Dec. 30, 1976, Pat. No. 4,099,220. This application Mar. 17, 1978, Ser. No. 887,896

Int. Cl.² H02B *1/04*

U.S. Cl. 174—72 B **7 Claims**



1. In an electrical power distribution switchboard bus system having a plurality of parallel-connected main horizontal bus bars electrically connected to a vertical riser bus, an improved bus connector block comprising:

a pair of end surfaces;

a bottom surface welded to the vertical riser bus; and a pair of side surfaces non-parallel to said bottom surface,

at least one of said side surfaces comprising locating means positioning and receiving the ends of the main horizontal bus bars which are welded to said bus connector block.

4,176,244

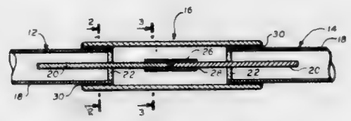
METALLURGICAL BONDED CONNECTOR FOR COAXIAL CABLES

Towheed Ramy, Jersey City, and Lal M. Hore, Fanwood, both of N.J., assignors to General Cable Corporation, Greenwich, Conn.

Filed Sep. 8, 1977, Ser. No. 831,415

Int. Cl.² H02G *15/08*

U.S. Cl. 174—88 C **10 Claims**



1. A coaxial cable connection for joining the ends of lengths of coaxial cable that have a center inner conductor, an outer aluminum conductor, and means for holding the inner and outer conductors in coaxial relation with one another including in combination an end of one outer conductor which is spaced longitudinally back from an end of an inner conductor of said cable, an outer conductor sleeve with opposite end portions that are constructed to extend around the outside and confront the circumference of the outer conductor of one of said lengths of cable, and similarly around the outside of the outer conductor of said other length of cable that is spaced from the first length of cable, the connector sleeve having the final shape to join the cable ends before being brought to the cables, at least one of the confronting faces of the sleeve and outer conductor at each end of the sleeve being coated with a metallurgical bonding agent which is subjected to heat when in the final assembled position, said bonding agent having a fusion temperature that does no damage to the insulation within the cable, so that the connector sleeve is metallurgically bonded to the outer face of both of the outer conductors, and the length of the outer conductor sleeve extends beyond the ends of the outer conductors that are spaced back axially from the inner conductors of the coaxial cable.

4,176,245

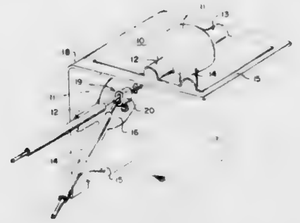
WIRE SPLICE INSULATORS

William A. Merlack, and John H. Royston, both of Pittsburgh, Pa., assignors to Royston Laboratories, Inc., Pittsburgh, Pa.

Filed Apr. 18, 1978, Ser. No. 897,353

Int. Cl.² H02G *15/08*

U.S. Cl. 174—92 **6 Claims**



1. A wire splice insulator comprising a pair of substantially rigid flat base members in side by side relationship, a sheet of soft conformable self-sealing cohesive elastomer beneath and adhered to said base members, a dome extending outwardly from each said base member and elastomer sheet generally centrally of the base member and forming a cavity in the base member and elastomer sheet, a plurality of semi-tubular sheaths in each base member and elastomer sheet extending from the dome to adjacent the edge of the base members and forming semi-cylindrical cavities in said base members and sheets, said domes and tubular sheaths in the pair of base members being mirror images of each other, a soft non-hardening mastic adhesive insulating material filling the cavities in the elastomer and a parting sheet on the elastomer sheet and mastic opposite the base members, said insulator forming on folding the base members and elastomer sheet together a unitary insulated and sealed whole.

4,176,246

APPARATUS FOR THE TRANSMISSION END-ENCIPHERING AND RECEPTION END-DECIPHERING OF INFORMATION

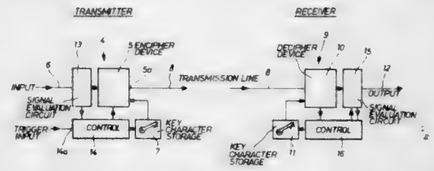
Robert Gaetzi, Steinhausen, Switzerland, assignor to Anstalt Europaische Handelsgesellschaft, Liechtenstein

Filed Mar. 14, 1978, Ser. No. 886,532

Claims priority, application Switzerland, Mar. 16, 1977, 3307/77

Int. Cl.² H04L *9/00*

U.S. Cl. 178—22 **5 Claims**



1. An apparatus for the transmission end-enciphering and reception end-deciphering of information, comprising:

means defining a transmitter station;

said transmitter station comprising:

an enciphering device for receiving plain text in the form of information signal groups separated from one another by separation signals;

a key character-information storage connected with said enciphering device;

said key character-information storage delivering key character-information needed for enciphering to said enciphering device;

a controllable control circuit connected with said key character-information storage;

means defining a receiver station;

said receiver station comprising:

a deciphering device for deciphering the received information;

a key character-information storage connected with said deciphering device;

said key character-information storage delivering the key character-information needed for deciphering to said deciphering device;

a control circuit connected with said key character-information storage;

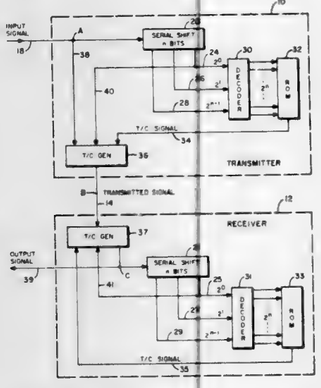
said key character-information storage at the transmitter station and said key character-information storage at said receiver station storing at least two different types of key character-information which can be selectively delivered to the related enciphering device and the deciphering device;

said control circuit at the transmitter station, when activated, causing a change of the key character-information delivered by the key character-information storage at the transmitter station to the enciphering device and replacing the separation signals between the information signal groups, by virtue of such change, with control signals representative of the key character-information;

said control circuit at the receiver station upon detection of the control signals indicative of the change of the key character-information causing a corresponding change of the key character-information delivered by the key cha-

racter-information storage at the receiver station to the deciphering device, and replacing such control signals by the separation signals originally introduced at the transmitter station, so that there appears at the output side of the deciphering device at the transmitter station a signal sequence which again corresponds to the signal sequence entered to the enciphering device at the receiver station.

4,176,247
SIGNAL SCRAMBLER-UNSCRAMBLER FOR BINARY CODED TRANSMISSION SYSTEM
Robert M. Englund, Golden Valley, Minn., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Oct. 10, 1973, Ser. No. 405,219
Int. Cl.[2] H04L *9/00*
U.S. Cl. 178—22 **11 Claims**



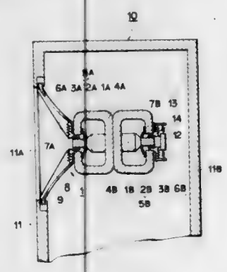
1. In a transmission system of a binary digital signal, a signal scrambler comprising:
a shift register having a plurality of bit positions;
a memory having a plurality of addressable locations for storing the alternative True state or Complement state in each of said addressable locations, each of said stored True or Complement states generating a corresponding True or Complement output when selected by said shift register;
means responsively coupling said memory to said shift register for selecting one of said addressable locations;
a True/Complement generator;
a node A for receiving an uncoded input signal of alternative binary digits of 0 or 1;
a node B for emitting an encoded transmitted signal of alternative binary digits of 0 or 1;
means coupling said node A to a first bit position of said shift register;
means coupling said node A to said True/Complement generator;
means coupling the True or Complement output of said memory to said True/Complement generator;
means coupling a second bit position of said shift register to said True/Complement generator for forcing said True/Complement generator to couple the True of said uncoded input signal to said node B until said second bit position receives its initial 1 bit from said node A and thereafter forcing said True/Complement generator to couple the True or the Complement of said uncoded input signal to said node B under control of the True or the Complement output of the memory addressable location that is selected by said shift register.

4,176,248
SYSTEM FOR IDENTIFYING AND CORRECTING THE POLARITY OF A DATA SIGNAL
Laurence L. Sheets, Atkinson, N.H., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 23, 1977, Ser. No. 863,870
Int. Cl.[2] H04L *1/00*
U.S. Cl. 178—67 **10 Claims**



1. A method for identifying the polarity of a transmitted message signal comprising the steps of (1) generating an asymmetrical signal, (2) adding said asymmetrical signal to said message signal before transmission to mark the polarity of said message signal, and (3) detecting the polarity of said asymmetrical signal after transmission to identify the polarity of said transmitted message signal.

4,176,249
DELETERIOUS MECHANICAL VIBRATIONS FROM DYNAMIC LOUDSPEAKER OFFSET BY ADDITIONAL DYNAMIC DEVICE
Kiyofumi Inanaga; Saburo Egawa, both of Tokyo; Akio Shimizu, Niiza, and Keijiro Maeda, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Jul. 24, 1978, Ser. No. 927,007
Claims priority, application Japan, Jul. 25, 1977, 52-88351
Int. Cl.[2] H04R *9/06*
U.S. Cl. 179—1 E **11 Claims**



1. A dynamic loudspeaker comprising a diaphragm having a voice coil, first drive means for driving said diaphragm to originate sounds, a massive member vibratably coupled to said first drive means, and second drive means for vibrating said massive member so as to eliminate reaction force generated by said diaphragm.

4,176,250
TIME DIVISION MULTIPLEXING SYSTEM FOR AN AUTOMOBILE
Bradford L. Berglind, Marietta, Ga., assignor to General Motors Corporation, Detroit, Mich.
Filed Jun. 30, 1978, Ser. No. 920,994
Int. Cl.[2] G08C *15/12*
U.S. Cl. 179—1 VE **7 Claims**

6. A time division multiplexing system for an automobile having first and second manually operated control switches at first and second locations respectively within the automobile and a load device intended to be operated independently by either of said switches, said system comprising:

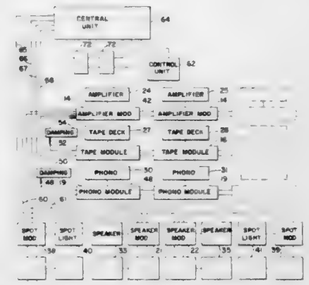
transmitter means mounted at said first location, receiver means mounted at said second location and bidirectional transmission line means interconnecting said transmitter means with said receiver means,
said transmitter means transmitting serial time division multiplexed information in successive time slots in a pulse width modulated format, respective ones of said time slots containing address bits and data bits, one of the time slots containing address bits assigned to the second control switch and data bits having a pulse width representative of a zero binary state, another one of the time slots containing address bits assigned to said load device,
receiver means at said second location including means responsive to the address assigned to said second control



switch for lengthening the pulse width of at least one of said zero state data bits in response to actuation of said second control switch,
said transmitter means further including storage means for storing the data bits supplied by the receiver means, said transmitter means further including means responsive to actuation of said first control switch or the state of said storage means for supplying data bits indicative of the status of said first or second control switches during the time slot containing the address of said load device,
said receiver means responsive to receipt of the address assigned to said load device for controlling said load device in accordance with the accompanying data bits whereby said load device is actuable independently by either of said control switches.

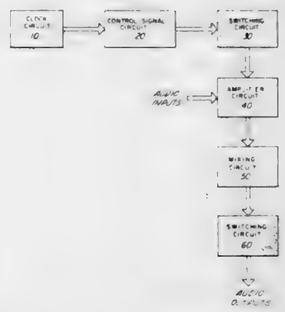
4,176,251
MODULAR SWITCHING SYSTEM
Lars Odlen, Lund, and Anders Hansson, Trelleborg, both of Sweden, assignors to Transcale A.B., Vasteras, Sweden
Filed May 15, 1978, Ser. No. 905,888
Int. Cl.[2] H04Q *5/00*
U.S. Cl. 179—1 SW **21 Claims**

1. A logic circuit responsive to a train of address pulses in accordance with its position in a cascade of similar logic circuits comprising address terminal means, transfer terminal means, means responsive to said train of address pulses at said address terminal means for subtracting one of said pulses and passing the remainder to said transfer terminal means, and



means responsive to the receipt of only a single pulse at said address terminal means for providing an output signal.

4,176,252
MULTI-DIMENSIONAL AUDIO PROJECTOR
Steven J. E. Dutkovich, Los Angeles, Calif., assignor to Dutko Incorporated, Los Angeles, Calif.
Filed Nov. 22, 1977, Ser. No. 854,041
Int. Cl.[2] H04R *5/00*
U.S. Cl. 179—1 G **20 Claims**



15. A multi-dimensional signal distribution device having
input means adapted to receive at least one input signal,
output means adapted for connection to a plurality of output devices for defining a first information plane,
control signal means,
variable gain amplifier means responsive to said input means and connected to said output means for amplifying said input to an amplitude determined by said control signal means to move said first information plane.

4,176,253

CURRENT LOADED PNEUMATICALLY DRIVEN LOUDSPEAKER ARRANGEMENTS

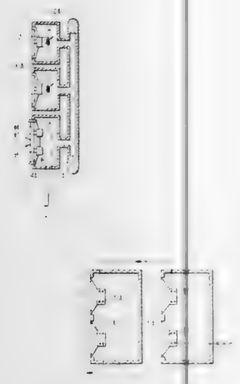
Saad Z. M. Gabr, 81 Old Dover Rd., Canterbury, Kent, England

Continuation-in-part of Ser. No. 827,313, Aug. 24, 1977, abandoned. This application Apr. 28, 1978, Ser. No. 901,147

Claims priority, application United Kingdom, May 20, 1977, 21383/77

Int. Cl.[2] **H04R** *1/22, 1/24, 3/12*

U.S. Cl. 179—1 E **3 Claims**



1. A loudspeaker assembly comprising a first enclosure, first and second loudspeakers each having a diaphragm means, each said first and second loudspeaker being different from the other as to the frequency range to which it responds and as to its efficiency at various frequencies, means mounting said first and second loudspeakers in said first enclosure with said diaphragm means thereof pneumatically coupled together within said first enclosure, an electro-mechanical transducer driven by said diaphragm means of said second loudspeaker, a second enclosure, a third loudspeaker having a diaphragm means, means mounting said third loudspeaker in said second enclosure, means for applying an electrical input to said first loudspeaker, and means for supplying the electric output of said electro-mechanical transducer to drive said third loudspeaker, said second loudspeaker being driven solely by said pneumatic coupling of said diaphragm means of said first and second loudspeakers, said diaphragm means of said first, second and third loudspeakers being exposed to the outside of said first and second enclosures.

2. A loudspeaker assembly having chassis means, a first loudspeaker comprising first diaphragm means, first means suspending said first diaphragm means in said chassis means, electro-mechanical transducer means adapted to act between said first diaphragm means and said chassis means, a second loudspeaker comprising second diaphragm means, second means suspending said second diaphragm means in said chassis, said first and second diaphragm means being acoustically exposed to each other in the interior of a closed chamber within said chassis means, said transducer means driving said first diaphragm means and said first diaphragm means pneumatically driving said second diaphragm means and being the sole drive of said second diaphragm means, a current-consuming device loading said second diaphragm means, and a partition subdividing said chamber into two compartments one individual to each said diaphragm means, said compartments communicating directly with each other past said partition within said chamber.

4,176,254

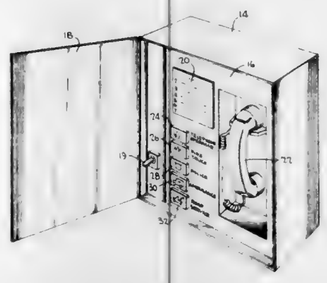
EMERGENCY ROADSIDE TELEPHONE SYSTEM

Lauren P. Tuttle, Herndon, and Paul H. Dluehosh, Manassas, both of Va., assignors to Telcom, Inc., Vienna, Va.

Filed Dec. 27, 1977, Ser. No. 864,869

Int. Cl.[2] **H04M** *11/04*

U.S. Cl. 179—5 R **8 Claims**



1. An emergency telephone terminal for use in an emergency roadside telephone system to communicate with a central station comprising

transmitter means and receiver means for communicating with the central station;

a handset having a receiver and a transmitter and being movable between on-hook and off-hook positions;

first circuit means for connecting said handset transmitter with said transmitter means and said handset receiver with said receiver means when said handset is in said off-hook position;

a plurality of emergency switches symbolically marked with pictorial symbols to correspond to various emergency conditions and adapted to be manually actuated; and

second circuit means responsive to said handset being in said off-hook position for coupling said emergency switches with said transmitter means whereby said emergency telephone terminal permits voice and emergency switch communications with said central station.

4,176,255

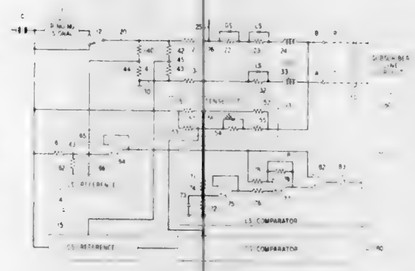
ADJUSTABLE IMPEDANCE BATTERY FEED CIRCUIT

John A. Rudisill, Jr., Flanders, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 24, 1978, Ser. No. 889,859

Int. Cl.[2] **H04M** *1/76, 19/00*

U.S. Cl. 179—16 F **10 Claims**



1. A battery feed circuit of the type having first and second circuit paths for supplying direct current from a source of direct current potential to a transmission line and including line build-out impedance elements serially connected in circuit in the first and second circuit paths for limiting the magnitude of the supplied current, CHARACTERIZED BY, means responsive to first control signals and supplied with a potential developed between the source of direct current potential and a prescribed circuit point in the battery feed circuit for generating a first signal which is a controllably adjusted predetermined portion of said developed potential, means responsive to said first signal for generating first control signals, and at least first controllable line build-out impedance means responsive to said first control signals and being serially connected in circuit in the first circuit path between said source of potential and said prescribed circuit point and being responsive to said first control signals for adjusting the line build-out impedance value in the battery feed circuit thereby controllably limiting the magnitude of current supplied to the transmission line.

4,176,256

CIRCUIT ARRANGEMENT FOR TIME-DEPENDENT MONITORING OF THE STATE OF LINES

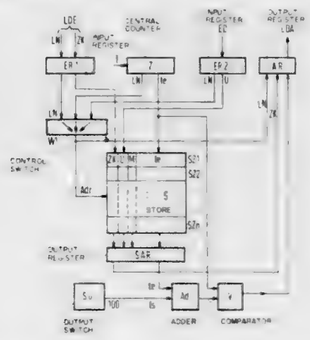
Albert Fruth, Germering, and Jürgen Harenberg, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 28, 1978, Ser. No. 919,824

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1977, 2732392

Int. Cl.[2] **H04M** *3/22*

U.S. Cl. 179—18 FG **5 Claims**



1. Circuit arrangement for the time-dependent monitoring of the states occurring on lines, comprising a device in which, on the occurrence of a change in state on a line, a line address which identifies the line and a state criterion which indicates the change in state are formed, comprising a store, a central counter, a control switch, a store which can be operated via said control switch by a line address, by a count of said central counter or by an address input, said store having a plurality of sets of storage cells which are each assigned to a line, there being an input for the store criterion, a monitoring criterion which indicates the monitoring, and an event time which indicates the time of the occurrence of the change in state, all said storage cells of said store being consecutively interrogated under the control of said central counter, and following each interrogation cycle which covers all the storage cells, the value of said event time being increased by 1 in accordance with the current count of said central counter, the interrogation result being logic-linked in an adder circuit with a theoretical time which indicates the duration of the monitoring, and a comparator being provided in which the result formed in said adder circuit is compared with the current count of said central counter and which in the case of a positive comparison emits an item of message information which comprises the relevant line address and the state criterion.

4,176,257

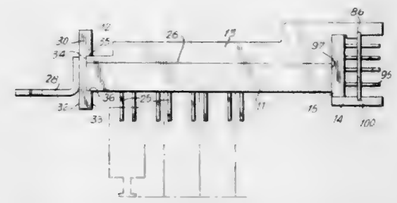
TELEPHONE CONNECTOR BLOCK

Paul V. DeLuca, Syosset, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Jun. 20, 1978, Ser. No. 926,574

Int. Cl.[2] **H04Q** *1/02;* **H01R** *9/00*

U.S. Cl. 179—98 **3 Claims**



1. Improved telephone connector block structure comprising: a generally planar main panel element having a pair of oppositely disposed principal surfaces, mutually interconnected connector pins projecting from each of said surfaces, said panel elements having an end edge surface interconnecting with said pair of surfaces; a pin block element of generally planar configuration and having first and second oppositely disposed principal surfaces, said first surface being mounted upon said end edge surface, there being a plurality of connector pins extending from said second surface, the axes of said pins lying in plane substantially parallel to the plane of said panel element; and a plurality of jumper conductors interconnecting at least some of the pins on one of said pair of principal surfaces with corresponding pins on said pin block element; a cover element overlying said last-mentioned jumper conductors, and an edge surface of said pin block element; said cover element extending past said pin block element and defining a groove, a support element carried by said pin block element on a side opposite that contacting said cover element and defining a second oppositely disposed groove; and a pin comb marking member having first and second side edges, each disposed within one of said grooves, said marking member having transversely extending slots therein, each slidably engageable with individual rows of pins on said pin block element.

4,176,258

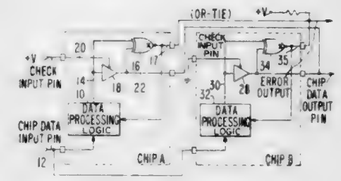
METHOD AND CIRCUIT FOR CHECKING INTEGRATED CIRCUIT CHIPS

Daniel K. Jackson, Hillsboro, Oreg., assignor to INTEL Corporation, Santa Clara, Calif.

Filed May 1, 1978, Ser. No. 901,527

Int. Cl.[2] **G01R** *31/28*

U.S. Cl. 235—302 **10 Claims**

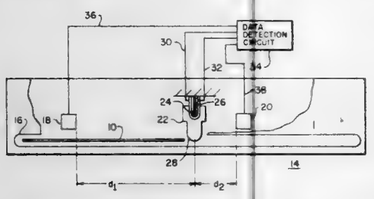


1. The method of checking integrated circuit chips having data processing logic and error-checking circuitry on each chip, each chip having off-chip outputs connected in parallel with the off-chip outputs of one or more other chips, comprising:

inputting data from substantially identical sources to the data processing logic on each chip;

outputting data from said logic on each chip to its error-checking circuit and to its off-chip output;
inhibiting the off-chip output of one of said chips so that said data does not reach said off-chip output; and
connecting said off-chip output of each chip to its own error-checking circuit, so that data generated internally on said one chip may be checked with respect to data generated externally from the other chip.

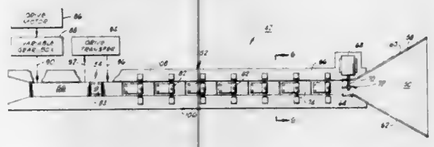
4,176,259
READ APPARATUS
Ernest P. Lee, Acton, Mass., assignor to Honeywell Information Systems, Inc., Waltham, Mass.
Filed Oct. 4, 1976, Ser. No. 729,336
Int. Cl.[2] G06K *7/08, 7/10;* **G11B** *5/09*
U.S. Cl. 235—449 **21 Claims**



1. Apparatus for processing bits of information recorded on a magnetic medium wherein the magnetic medium is being moved at a variable speed, wherein both the bit cell time period and the time of occurrence of an information bit within the bit cell time period may vary, said apparatus comprising:
means for reading the bits of recorded information so as to produce a single train of spaced pulses having variable spaces therebetween said pulses corresponding to each magnetic flux reversal sensed;
timing means, responsive to the train of spaced pulses, for producing a train of first timing pulses and a train of second timing pulses, said first and second timing pulses being operative to define separate portions of variable bit cell lengths of time;
means for detecting the binary value of successive bits of recorded information, said detecting means being responsive to the train of first timing pulses;
means, responsive to the second timing pulses, for storing the binary values of the detected bits of recorded information; and
character recognition means, responsive to the second timing pulses, for counting the detected bits of recorded information, said character recognition means being operative to recognize when a full character of information has been detected.

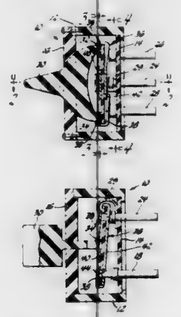
4,176,260
INVENTORY CONTROL SYSTEM
Theodore W. Ward, and Danny W. Ward, both of 2314 S. Central, Oklahoma City, Okla. 73129
Filed May 16, 1977, Ser. No. 797,324
Int. Cl.[2] B65H *3/04*
U.S. Cl. 235—475 **10 Claims**

1. In a system of business stock inventory accounting, coded item ticket sorting apparatus, comprising:
means for receiving a plurality of said item tickets and directing flow of such tickets to a constricted area;
rotational drive means and resilient finger means contacting said item tickets for moving said item tickets through the constricted area in reduced quantity;
channel means receiving said item tickets from the constricted area and conveying said tickets linearly along a narrow channel that is approximately as wide as said item tickets;
plural contacting means disposed along said narrow channel to contact said item tickets passing thereby to insure passage of but a single item ticket at a time in emergence from said narrow channel;



transparent plate means that is smaller in length than said item tickets receiving said tickets thereacross upon emergence from said narrow channel; and
deposit conveyor means carrying said item tickets away from said transparent plate means.

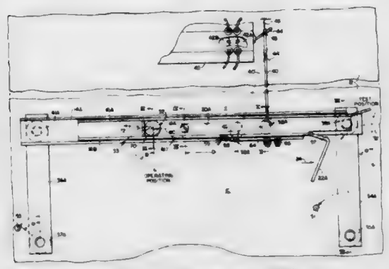
4,176,261
ELECTRIC SWITCH FOR MOTOR REVERSING
Peter C. Epple, Harper Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jun. 16, 1978, Ser. No. 916,105
Int. Cl.[2] H01H *9/00;* **H01H** *21/24*
U.S. Cl. 200—1 V **2 Claims**



1. An electric switch for use in selectively controlling energization of either a first or second electric circuit, said switch comprising a housing having a base member and a cover member, two rows of first, second and third terminals carried by said base member, said terminals being spaced from each other and each having a conducting surface facing interiorly of said housing with the conducting surface of one of said second terminals extending interiorly beyond the other terminals, an actuator button pivotally mounted in said cover member, oppositely disposed actuator elements formed on said actuator button and extending interiorly of said housing, a contact assembly including an insulator disc adapted to being normally engaged at adjacent opposite edge portions thereof by said oppositely disposed actuator elements, first and second contact strips carried by said disc across opposite sides thereof in a criss-crossing pattern with the ends of each contact strip folded onto the opposite side of said disc in a spaced relationship with the other contact strip, a spring element secured at one end thereof to said base member by the other of said second terminals so as to engage said first contact strip and normally urge said second contact strip into pivotal contact with said one of said second terminals and said first and second contact strips into contact with the first and third terminals adjacent said other of said second terminals, said disc being selectively pivotable about said one of said second terminals and either said first or third terminals adjacent the other of said second terminals by manual movement of said actuator button in one direction or the other so as to bring one of said first and second

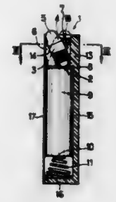
contact strips into engagement with the other of the first or third terminals to provide a conductive path between respective first or third terminals and thereby complete one of said first or second electric circuits.

4,176,262
AUTOMATIC FAIL-SAFE MECHANISM-OPERATED CELL SWITCH FOR METAL-CLAD SWITCHGEAR
James W. McMillen, Wilkins Township, Allegheny County, and Anthony Tomeo, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jun. 14, 1977, Ser. No. 806,396
Int. Cl.[2] H01H *9/20*
U.S. Cl. 200—50 AA **5 Claims**



1. Circuit interrupter apparatus, comprising:
(a) a cabinet having spaced fixed terminals which are interconnected with a circuit which is to be opened and closed in a controlled manner;
(b) main circuit interrupter means movable between an operating position and a test position within said cabinet, said main circuit interrupter means being interconnected electrically with said fixed terminals when in said operating position to thus open and close said circuit as the separable main contacts of said main circuit interrupter means are opened and closed respectively, said main circuit interrupter means being disconnected electrically from said fixed terminals when in said test position, said main circuit interrupter means having a lever means which moves in response to the operation of said separable main contacts between a first lever position when said separable main contacts are opened and a second lever position when said separable main contacts are closed;
(c) auxiliary contact means disposed within said cabinet, said auxiliary contact means having a contact actuating member;
(d) motion transfer support means movably disposed within said cabinet means, said motion transfer support means being interconnected with said auxiliary contact actuating member for moving said actuating member; and
(e) extender means slidably disposed upon said motion transfer support means in either of a first or second slidable position, said extender means being in said first slidable position and in a disposition of mechanical interlinkage with said lever means when said main circuit interrupter means is in said operating position to thus cause said auxiliary contact means to be actuated to change state as said lever means is moved between said first and said second lever positions, said extender means remaining in said first slidable position and not in a disposition of mechanical interlinkage with said lever means when said main circuit interrupter means is in said test position unless said extender means has been manually moved to said second slidable position in which case it becomes mechanically interlinked with said lever means to thus cause said auxiliary contact means to be actuated to change state as said lever is moved between said first and said second lever means positions, said extender means always being driven to said first slidable position by said lever means as said main circuit interrupter is moved to said operating position.

4,176,263
SWITCH FOR POCKET TORCH
Jean-Pierre Rousseau, 4, Andersen, L'Oree de Senart, 91210 Draveil, France
Filed Dec. 23, 1977, Ser. No. 863,735
Claims priority, application France, Jan. 11, 1977, 77 00618
Int. Cl.[2] F21V *23/00*
U.S. Cl. 200—60 **6 Claims**



1. A flashlight comprising
a casing,
means defining an elongated slot extending through said casing,
a light bulb in said casing, said bulb having a lens end having a tip surrounded by a shoulder,
said tip extending into the slot from within the casing and being exposed for manual manipulation from outside the casing,
and said shoulder engaging the casing at each side of the slot to retain the bulb in the casing,
said bulb having a base with an end terminal and a side terminal,
means defining a generally parallelepedic space in said housing for guiding said bulb between a first position and a second position,
a battery in the casing,
a conductive terminal in said casing engaging said end terminal of said bulb and connecting the bulb to a first terminal of the battery,
resilient means for urging said terminal toward said bulb,
a conductive element in said casing at one side of said space for engaging said bulb in said first position and for connecting said side terminal of the bulb to a second terminal of the battery,
insulating means in said casing at the other side of said space for insulating said bulb from said second terminal in said second position of said bulb,
said slot, parallelepid space, conductive terminal, and resilient means comprising means mounting said bulb for snap over center movement between said first and second positions in response to manual manipulation of said exposed tip of the bulb so that the bulb remains in its manually set position and functions as the switch of the flashlight.

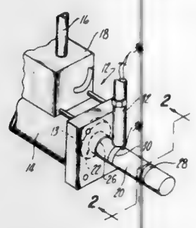
4,176,264
LINEAR PROGRAMMER FOR AN ACTUATOR
David Tann, Detroit, Mich., assignor to Electro-Mechanical Products, Detroit, Mich.
Continuation of Ser. No. 711,433, Aug. 4, 1976, abandoned. This application Apr. 17, 1978, Ser. No. 897,100
Int. Cl.[2] H01H *35/38*
U.S. Cl. 200—82 E **5 Claims**

1. A linear programmer arrangement in combination with an actuator, said actuator including:
a movable actuator member;

means supporting said actuator member for linear movement, including a housing and bearing means slidably receiving a portion of said actuator member for movement into and out of containment by said housing;

at least one programming insert mounted within a recess formed in said portion of said actuator member and configured to be flush with the surface thereof so as to be able to be slidably received by said bearing means, said programming insert being formed from a different material than said movable actuator member;

responder means mounted to be fixed with respect to said movable actuator member and having a portion adjacent said actuator portion in line with said actuator portion and located to come into juxtaposition with said programming



insert during said movement of said actuator member, said responder means including means generating an electrical signal in response to said programming insert coming into juxtaposition with said responder portion, whereby said electrical signal is generated whenever said movable actuator member is in a predetermined relationship with said housing member corresponding to the position of said programming insert,

wherein said movable actuator member comprises a piston head and a piston shaft slidably supported in said bearing means and wherein said programming insert is recessed into the surface of said piston shaft and having an outer surface thereof flush with respect to the surface of said shaft circumference, whereby said programming insert is moved through said bearing means.

4,176,265

ILLUMINATED ELECTRIC SWITCHES

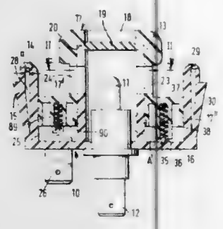
Dietmar Mobus, Trebur; Günter Ehrenberger, Rüsselsheim, and Wolfgang Jobst, Nauheim, all of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 27, 1977, Ser. No. 864,635

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1977, 2702839

Int. Cl.² H01H 9/18

U.S. Cl. 200—316 **3 Claims**



1. A rotary switch provided with a light source for indicating the location of the switch when installed, and its condition, said rotary switch comprising a stationary carrier member including a base plate having concentric outer and inner cylindrical walls integrally formed therewith and extending therefrom so as to provide a space therebetween, a manually operable switch knob having a hollow cylinder portion mounted for rotation about said inner cylindrical wall between an "OFF" position and an "ON" position, a radially extending flange formed with said cylinder portion and extending between said inner and outer cylindrical walls so as to fill said space therebetween, a tubular housing integrally formed with said flange, detent means located within said tubular housing and cooperating with a recess formed in said base plate for maintaining said switch knob in said "OFF" and "ON" positions, a light bulb supported by said base plate and located within said inner cylindrical wall and said cylinder portion of said switch knob, said switch knob having a first opening formed therein to permit light rays emitted by said light bulb to be projected through said opening longitudinally of said cylinder portion so as to indicate the location of the rotary switch, and said inner cylindrical wall and said switch knob having apertured portions adapted to receive light projected laterally of said inner cylindrical wall from said bulb and arranged so that rotation of said switch knob brings the apertured portion of the switch knob into and out of radial alignment with the apertured portion of said inner cylindrical wall and effects a simultaneous change in the visible aspect of an indicator region of the switch, between said outer cylindrical wall and said cylindrical portion of the switch knob, which is illuminable by said light projected laterally from said bulb, and thereby indicates to a viewer that the switch is in an "ON" or "OFF" condition.

4,176,266

MICROWAVE HEATING APPARATUS

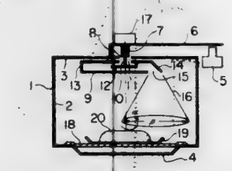
Yoichi Kaneko, Tokorozawa, and Katsuhiro Kimura, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 27, 1977, Ser. No. 763,088

Claims priority, application Japan, Feb. 2, 1976, 51-10143

Int. Cl.² H05B 9/06

U.S. Cl. 219—10.55 F **15 Claims**



1. Heating apparatus wherein an article to-be-heated placed in an oven is irradiated by microwaves from a microwave source and is thus heated, comprising:

means for generating a microwave beam, and

means to relatively rotate the microwave beam with respect to an article to-be-heated about an axis of rotation and to impart heating energy to the article to-be-heated, the microwave beam having an energy pattern distributed in a plane perpendicular to the rotational axis in such a manner as to be more narrow in an angular direction with respect to the axis of rotation than in a radial direction with respect to the axis of rotation.

4,176,267

MICROWAVE ENERGY TRAP

Werner Rueggeberg, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed May 12, 1978, Ser. No. 905,295

Int. Cl.² H05B 9/06

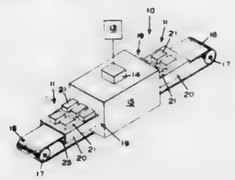
U.S. Cl. 219—10.55 A **5 Claims**

1. A microwave energy trap for use in conjunction with a microwave oven having a conductive enclosure wherein materials are treated with microwave energy, the enclosure having

access ports and a conveyor means passing through the access ports and conductive enclosure, said energy trap comprising:

(a) a tunnel means with walls enclosing one of the access ports of said oven outside of said enclosure, said conveyor means passing through the tunnel means;

(b) a plurality of resonant slot means passing through one or more of the walls of said tunnel means;



(c) a plurality of closed waveguide chamber means disposed on the outside of said tunnel means over said resonant slot means for entrapping microwave energy; and

(d) a plurality of energy absorbing means disposed within said waveguide chamber means for dissipating microwave energy.

4,176,268

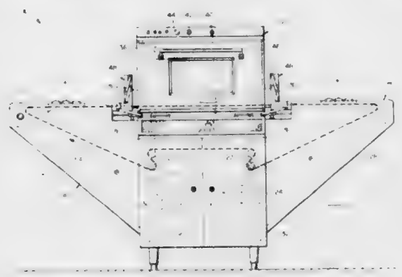
SYSTEM FOR HEATING USING A MICROWAVE OVEN ASSEMBLY AND METHOD

John E. Gerling, Cupertino, Calif., assignor to Gerling Moore, Inc., Santa Clara, Calif.

Filed Mar. 15, 1978, Ser. No. 886,885

Int. Cl.² H05B 9/06

U.S. Cl. 219—10.55 A **23 Claims**



1. A microwave oven assembly, comprising:

(a) a housing defining an internal chamber for heating articles therein and including at least one vertically extending opening for passage of said articles into and out of said chamber;

(b) means for producing microwave energy within said chamber for heating said objects therein;

(c) a first L-shaped door section fixedly connected with said housing and including

(i) a vertical subsection positioned around said opening, and

(ii) a horizontal subsection extending from the bottom edge of said vertical subsection away from said opening;

(d) a second L-shaped door section connected with said housing for movement between a first position a sufficient distance from said opening to allow said articles to pass readily therethrough and a second position for closing said opening to the passage of said articles, said movable door section including

(i) a vertical subsection having a surface which is located in confronting relationship with a surface on the vertical subsection of said fixed door section and extending across said opening when said movable section is in its closed position, and

(ii) a horizontal subsection having a surface which is located in confronting relationship with a surface on the horizontal subsection of said fixed door section when said movable section is in its closed position;

(e) said door sections together defining a gap extending between said horizontal subsections and into said opening when said movable door section is in its closed position, said gap being sufficiently large to allow an object carrying conveyance mechanism to extend into said chamber through said gap;

(f) means for moving said movable door section between its open and closed positions, and

(g) seal means for reducing the amount of microwave energy escaping from within said heating chamber along the periphery of said movable door section and said gap to a level below a predetermined standard when said movable section is in its closed position.

4,176,269

CLAMPING APPARATUS FOR WELDING CIRCUMFERENTIAL ARTICLES

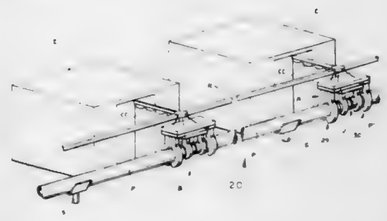
George J. Merrick, Franklin; George E. Cook, Brentwood, and Donald D. Modglin, Nashville, all of Tenn., assignors to Merrick Welding International, Inc., Nashville, Tenn.

Division of Ser. No. 654,975, Feb. 3, 1976, Pat. No. 4,145,593.

This application Dec. 5, 1977, Ser. No. 857,226

Int. Cl.² B23K 9/02

U.S. Cl. 219—60 A **10 Claims**



1. Apparatus for welding a circumferential joint interconnecting adjacent lengths of pipe which have an outer protective layer, comprising:

first means for selectably clamping onto said outer protective layer of said adjacent lengths of pipe so as to be supported by said pipe lengths while spanning said joint;

second means supported by said first means for a limited extent of movement in plural degrees of freedom relative to said first means to permit said second means to assume a certain alignment with a joint that may be angularly and axially misaligned relative to said outer protective layer on the pipe;

clamp means carried by said second means for clamping said second means to portions of said lengths of pipe lacking said protective layer and in fixed relation to said joint,

track means carried by said second means and defining a predetermined path of movement in proximate circumferential relation to said joint,

carriage means supported for movement about said track means; and

welding torch means carried by said carriage means in welding relation with said joint.

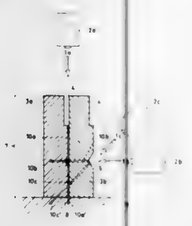
V 9,8 8 4 N 0 2 7 7 9 UMI

4,176,270

ROLL AND ROLL-MANUFACTURING METHOD

Vaino Sailas, Vaajakoski, Finland, assignor to Valmet Oy, Helsinki, Finland

Continuation-in-part of Ser. No. 802,316, Jun. 1, 1977, Pat. No. 4,104,773. This application Jun. 10, 1977, Ser. No. 805,460
Claims priority, application Finland, Jun. 15, 1976, 761730
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 EM **13 Claims**



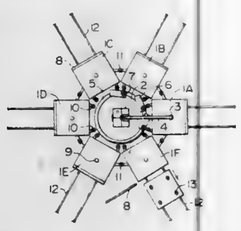
1. In a method of manufacturing a roll of the type which is used in a paper machine, comprising the steps of surrounding an inner roll body with a plurality of outer strip portions which are distributed along the axis of the roll body, which engage the exterior surface thereof, and each of which extends circumferentially around the roll body, each of said strip portions having side surfaces with the side surfaces of successive strip portions engaging each other defining an interface between adjacent strip portions so as to provide a covering which covers the entire exterior surface of said inner roll body, and welding the successive strip portions simultaneously to each other and to said roll body surface by an electron beam for preventing them from moving apart from each other at least in the direction of the axis of said inner roll body.

4,176,271

METHOD FOR PERFORMING ELECTRON BEAM WELDING

Kiyohide Terai, Ashiya, and Muneharu Kutsuna, Takarazuka, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Mar. 17, 1978, Ser. No. 887,721
Claims priority, application Japan, Mar. 18, 1977, 52/29292; Mar. 18, 1977, 52/29294
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 EM **6 Claims**



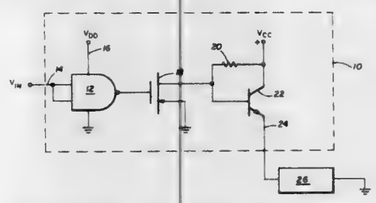
1. Method for electron beam welding including steps of placing parts to be welded in a welding chamber, evacuating the chamber, welding the parts together at a junction therebetween by energizing an electron beam gun mounted on the chamber so that an electron beam is applied to the parts at the junction, opening the chamber and taking the welded parts out of the chamber, the improvement comprises the fact that a plurality of fixed chambers each separated one from another are provided for operation with different phases of said steps each separate fixed chamber being provided with receptacle means allowing quick connection and disconnection of the electron beam gun, and sequentially applying evacuation means and a single electron beam gun to the one of the chambers which is undergoing the welding step.

4,176,272

MOS-BIPOLAR PRINTER DRIVER CIRCUIT

Vernon B. Powers, St. Petersburg, Fla., assignor to E-Systems, Inc., Dallas, Tex.

Filed Nov. 3, 1977, Ser. No. 848,336
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—216 **9 Claims**



1. A thermal printer driver circuit connected to a thermal printer resistive heating element comprising:
an MOS transistor having a binary input signal provided to the gate terminal thereof and having a first terminal grounded,
a resistor connected between a second terminal of said MOS transistor and a voltage source, and
a bipolar transistor having the base terminal thereof connected to said second terminal of said MOS transistor, the collector terminal thereof connected to said voltage source and the emitter terminal thereof connected to the thermal printer resistive heating element.

4,176,273

LIGHT AND HEAT WRITING PEN FOR PHOTOSENSITIVE MATERIAL

Tetsuo Fujie, Yokohama, and Hiromi Ito, Hachioji, both of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Oct. 18, 1977, Ser. No. 843,347
Claims priority, application Japan, Oct. 19, 1976, 51/140320[U]; Oct. 20, 1976, 51/125029
Int. Cl.[2] H05B *1/00*; B43K *29/10*
U.S. Cl. 219—220 **2 Claims**



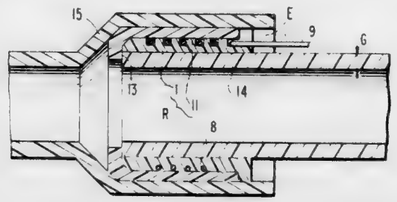
1. A writing pen for heat developing type photoconductive material comprising: a pen having a pen nib formed of material having good thermal conductivity and light-perviousness and adapted to be brought into contact with photosensitive heat developing type material; a light source in said pen for illuminating through said light pervious pen nib the photosensitive heat developing type material contacted by said pen nib; and a heater embedded in said pen nib and for heating at least a portion of said nib adapted to contact the photosensitive material to a predetermined temperature.

4,176,274

METHOD OF COUPLING PLASTIC PIPES BY WELDING AND A CONNECTION PIECE FOR COUPLING SAME

Noël Lippera, Blenod les Pont-A-Mousson, France, assignor to Pont-A-Mousson S.A., Nancy, France

Filed Apr. 20, 1977, Ser. No. 789,327
Claims priority, application France, Jun. 3, 1976, 76 17182
Int. Cl.[2] H05B *3/58*
U.S. Cl. 219—522 **3 Claims**



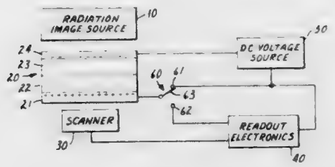
1. A connecting piece for electrical resistance welding of an inserted male end of one plastic pipe to the socket end of a second plastic pipe, said connecting piece constituting a sealing member interfitted between the male end and the socket end of said plastic pipes and comprising: two complementary concentric plastic rings fitted one to the other, said complementary rings comprising an internal ring having grooves on its radially exterior periphery, an electrical heating resistance element mounted within the base of said grooves, and an outer ring froming the sheath of the connecting piece and having an internal surface defining an attachment cavity which is cylindrical and smooth and having an inner diameter corresponding to the outer diameter of the inner ring, and wherein said internal ring is axially received by such outer ring and is concentric therewith, whereby said electrical heating resistance element is centered between said concentric pipe ends to insure by energizing said electrical heating resistance element uniform melting of the inner and outer rings and high integrity welding of the male end and socket ends of said pipes together.

4,176,275

RADIATION IMAGING AND READOUT SYSTEM AND METHOD UTILIZING A MULTI-LAYERED DEVICE HAVING A PHOTOCONDUCTIVE INSULATIVE LAYER

Donald M. Korn, Denmark Township, Washington County, and Owen L. Nelson, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 22, 1977, Ser. No. 826,369
Int. Cl.[2] H01J *31/50*
U.S. Cl. 250—213 R **14 Claims**



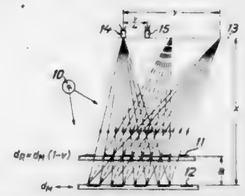
1. A system for establishing an electrostatic charge image and then providing a readout of the image including a multilayered photoconductive device including a first conductive layer, an insulative layer, a photoconductive insulative layer and a second conductive layer in that order wherein at least the latter three layers are successively contiguous; a D.C. voltage source for providing a high electric field between said first and second conductive layers; a radiation image source for exposing the device to a radiation image with the D.C. voltage source operatively connected between said first and second conductive layers to produce an electrostatic charge image at a layer of the device; and a scanner for scanning the device with readout radiation and readout electronics operatively connected in series with said D.C. voltage source, such series combination operatively connected between said first and second conductive layers when the scanner is scanning the device whereby the readout electronics detects the charge flow caused by readout radiation from said scanner.

4,176,276

PHOTOELECTRIC INCIDENT LIGHT DISTANCE MEASURING DEVICE

Dietmar Kaul, Solms, and Jörg Willhelm, Nauborn, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Nov. 23, 1977, Ser. No. 854,380
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1976, 2653545; Mar. 31, 1977, 2714324
Int. Cl.[2] H01J *3/14*
U.S. Cl. 250—237 G **6 Claims**



1. A photoelectric incident light distance measuring device, comprising a light source; a reflecting scale grating; a reference grating with a lattice constant differing from that of the scale grating; said reference grating being transparent and displaceable with respect to said scale grating; an air space between the two gratings; said scale grating illuminated through said reference grating; and a plurality of photoelectric receivers placed at intervals in the direction of the distance to be measured for scanning the scale grating through the reference grating whereby vernier strips are produced, and wherein at least two of said photoelectric receivers are arranged approximately at a distance "x", measured in the direction of the light, from the grating with the larger optically effective lattice constant, wherein:

$$x = a/v$$

with
a = optically effective air space between the reference and scale gratings;
$v = d_M(y + d_M)$ — distortion factor;
Y = distance of the vernier strips produced by the two gratings;
and with
d_M as the optically effective lattice constant of the scale grating, related to the optically effective lattice constant d_R of the reference grating by the relationship

$$d_R = d_M(1 \pm v).$$

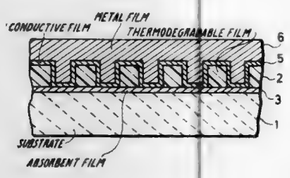
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4,176,277

THERMOSENSITIVE DATA-CARRIER DESIGNED FOR THE RECORDING OF INFORMATION AND A METHOD OF RECORDING INFORMATION ON SUCH A DATA-CARRIER

Claude Bricot; Jean-Claude Dubois; Francois LeCarvennec; Jean-Claude Lehureau, and Henriette Magna, all of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed Oct. 18, 1977, Ser. No. 843,508
Claims priority, application France, Oct. 22, 1976, 76 31867
Int. Cl.² G01C *5/16*
U.S. Cl. 250—316.1 **2 Claims**



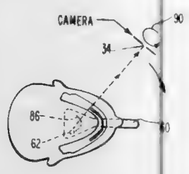
1. A thermo-sensitive data-carrier for the recording of information by etching with a concentrated recording radiation, comprising at least a thermo-sensitive film deposited upon a thermally insulating substrate, said thermo-sensitive film being formed by an absorbent film in contact with the substrate and a film thermodegradable at a temperature T_1, affixed to the absorbent film, the etching radiation incident upon the thermodegradable film passing through said film and being absorbed to a small extent only, the major absorption of it taking place in the absorbent film which converts said radiation into heat and selectively diffuses said heat to said thermodegradable film.

4,176,278

PANORAMIC DENTAL RADIOGRAPHY EMPLOYING INTRAORAL RADIATION SOURCE AND IMAGE INTENSIFYING MEANS

Robert H. Cushman, Princeton, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 30, 1978, Ser. No. 955,999
Int. Cl.² G01N *21/00, 23/00;* **G21K** *5/06, 5/08*
U.S. Cl. 250—439 P **12 Claims**



1. In a machine for providing panoramic radiographs of dental arch structures of a patient seated in a chair which includes a cooperating chin rest assembly for maintaining head of said patient in a secured position and wherein a film holder assembly is provided with a slot in a front panel thereof, said slot being capable of permitting radiation passing through said dental arch structures to pass through said slot for activation of film carried by said film holder assembly, said machine including means for controllably continuously moving said film in said film holder assembly past said slot at a controlled rate of speed and other means for orbiting said slot and said film holder assembly about said dental arch structures of said patient, the combination therewith of the improvement thereto comprising

intraoral container means containing a radiation source,

pulley and lever means for effecting arcuate travel of said container means from one side of oral cavity of said patient to other side, said container means having an opening therein for passing radiation emitted by said radiation source therethrough while said container means rotatably scans said dental arch structures while disposed in oral cavity of said patient during said arcuate travel,

additional means cooperating with said other means for rotating said pulley and lever means for maintaining said opening in constant collimated alignment with said slot as said slot and film holder assembly orbit said patient whereby said radiation passing through said container means during said arcuate travel within said oral cavity and entering said slot continuously activates said film to provide said panoramic radiograph.

4,176,279

TOMOGRAPH FOR PRODUCING TRANSVERSE LAYER IMAGES

Günter Schwierz, and Wolfgang Häerer, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 14, 1978, Ser. No. 896,396
Claims priority, application Fed. Rep. of Germany, May 24, 1977, 2723401
Int. Cl.² A61B *6/00*
U.S. Cl. 250—445 T **4 Claims**



1. In a tomographic apparatus for producing transverse layer image of a radiography subject including a patient couch, a radiation measuring arrangement having a radiation source which produces a fan-shaped beam of rays penetrating the radiography subject, whose cross sectional extent perpendicular to the layer plane is equal to the layer thickness and in the layer plane is of such a magnitude that the entire radiography subject is penetrated, and having a radiation receiver consisting of a row of detector elements each of which is at least partially with is said fan shaped beam and which detects the radiation intensity behind the subject, a rotary drive device for the measuring arrangement and a measured value converter for the transformation of the signals supplied by the radiation receiver into a layer image, characterized in that the radiation receiver (**2**) is arranged so that its axis of symmetry (**23***a*) and the axis of symmetry (**24***a*) of the x-ray beam (**4**) are always at a distance from each other in the layer plane.

4,176,280

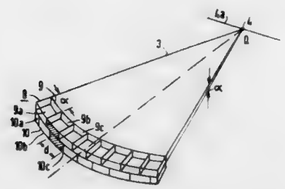
TOMOGRAPHIC X-RAY APPARATUS FOR PRODUCING TRANSVERSE LAYER IMAGES

Walter Greschat, Dormitz, and Guenter Schwierz, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 15, 1978, Ser. No. 886,958
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1977, 2717349
Int. Cl.² A61B *6/00*
U.S. Cl. 250—445 T **6 Claims**

1. Tomographic apparatus for producing transverse layer images of a radiographic subject, comprising an x-ray measuring arrangement including an x-ray source which produces a fan-shaped x-ray beam which penetrates the radiographic subject, the cross-sectional extent of which perpendicular to the layer plane is generally equal to the layer thickness, and a

radiation receiver which determines the intensity of radiation behind the subject; and a drive device for the measuring arrangement for producing rotary movements, and a measured value converter for transforming the signals supplied by the radiation receiver into a layer image, the radiation receiver being composed of a number of individual detectors, characterized in the radiation receiver (**8**, **17** to **20**) having two or



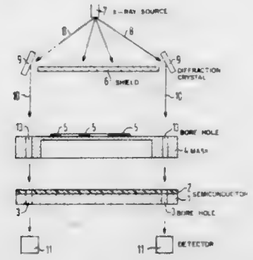
more detector rows (**9**, **10**; **19**, **20**) arranged adjacent and parallel to one another, the detectors (**9***a* etc.) of one detector row (**9**, **19**) overlapping the detectors (**10***a* etc.) of the other detector row (**10**, **20**) by approximately half the detector width (d), and a control device (**8***b*, **21**, **21***a*) for the radiation receiver (**8**, **17** to **20**) for actuating the same to selectively respond to the x-ray beam (**3**) by way of one of the detector rows (**9**, **10**, **19**, **20**) in each instance.

4,176,281

METHOD FOR ADJUSTING A SEMICONDUCTOR DISK RELATIVE TO A RADIATION MASK IN X-RAY PHOTOLITHOGRAPHY

Peter Tischer, Strasslach, and Eckart Hundt, Haar, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,480
Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722958
Int. Cl.² A61K *27/02;* **G01M** *21/00*
U.S. Cl. 250—492 A **3 Claims**



1. A method for the adjustment of a semiconductor disk relative to a radiation mask in x-ray photolithography, in which the semiconductor disk and the radiation mask are provided with adjusting marks corresponding with one another, and whereby the adjustment results with the aid of x-radiation and with one or several detectors sensitive to x-rays, characterized in that bores are utilized as adjusting marks for the semiconductor disk and the radiation mask, said bores completely penetrating the semiconductor disk and the photolacquer layer situated on the semiconductor disk and the radiation mask, respectively, the axes of said bores extending perpendicularly in relation to the surface of the semiconductor disk and of the radiation mask, characterized in that the adjustment proceeds with the aid of a pair of perpendicular x-ray beams whose paths extend in parallel to one another and perpendicular to the surface of the semiconductor disk and of the radiation mask, and characterized in that a point-shaped x-ray source is utilized for the adjustment and that two parallel x-ray beams are produced with the aid of two diffraction crystals.

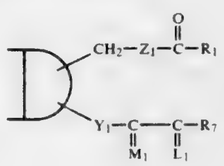
4,176,282

2-DECARBOXY-2-ALKYLCARBONYL-3,7-INTER-M-PHENYLENE-3-OXA-4,5,6-TRINOR-PGF$_1$ COMPOUNDS

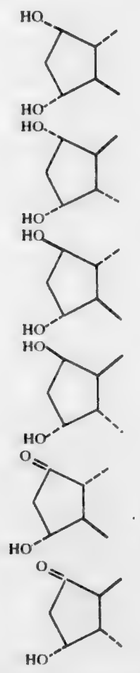
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 888,695, Mar. 21, 1978, Pat. No. 4,123,463.
This application Jul. 17, 1978, Ser. No. 925,262
Int. Cl.² C07C *177/00*
U.S. Cl. 260—590 C **37 Claims**

1. A prostaglandin analog of the formula



wherein D is



or

wherein R_1 is alkyl of one to 4 carbon atoms, inclusive; wherein L_1 is

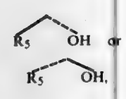


or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;

wherein M_1 is

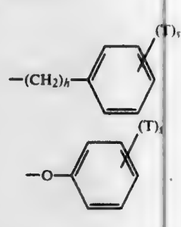


wherein

R_5 is hydrogen or methyl;

wherein R_7 is

(1) $-(CH_2)_m-CH_3-$,



(2)

(3)

wherein h is zero to three, inclusive, wherein m is one to 5, inclusive, s is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms or alkoxy of one to 3 carbon atoms, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;

wherein Y_1 is

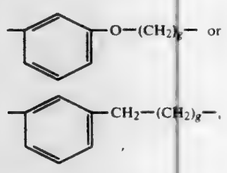
(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) $-CH_2CH_2-$, or

(4) $-C\equiv C-$; and

wherein Z_1 is



(1)

(2)

wherein g is one, two, or three.

4,176,283

WATER POWERED GENERATOR

Richard H. McLaren, 7280 Cloverblossom La. NE., Bremerton, Wash. 98310

Filed Nov. 23, 1977, Ser. No. 854,388

Int. Cl.² F01D *15/10*

U.S. Cl. 290—52 **3 Claims**

1. An electric generating device, comprising,

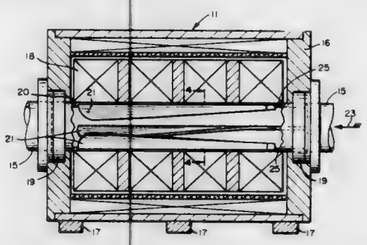
a stator,

an armature rotatable in a central opening in said stator and having therethrough an axial bore,

means rotatably mounting said armature in a water main coaxially thereof and

drive means mounted in the bore of said armature and responsive to the flow of water therethrough to impart rotation to said armature at a substantially constant rate,

said drive means comprising a plurality of resilient vanes



projecting radially inwardly into the bore in said armature to cause said rotation of the latter when water flows through said bore, and

each of said vanes being disposed to flex slightly in response to variations in the water pressure in said main thereby to allow said rotation of the armature to be substantially constant.

4,176,284

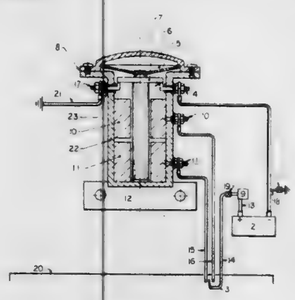
AUTOMOTIVE BATTERY POWER CIRCUIT BREAKER

Edward W. Higgs, 124 South 250 East, North Salt Lake City, Utah 84054

Filed Dec. 27, 1977, Ser. No. 864,485

Int. Cl.² H01H *35/14*; H02H *7/18*

U.S. Cl. 307—10 BP **3 Claims**



SECTION A-A

1. A dual coil solenoid operated automotive battery power circuit disconnect master switch installed preferrably on the ground side of the battery and having a movable plunger with an integral contact ring and a belleville spring system, the contact ring being located such that disconnect or connect of battery power is effected due to its position with respect to the battery ground and vehicle ground terminal ends which extend through the solenoid body and are located within the inner cavity, and said solenoid having dual coils with windings in opposite circumferential direction such that the force imparted to the plunger due to current flow within the coils is in one direction for operation of one coil and in the opposite direction for current flow in the other coil, and each coil having a separate exterior terminal for attachment of a conductor lead from the vehicle ignition switch such that, depending on the selected position of the ignition switch be it clockwise or counterclockwise, one coil is energized to effect plunger movement for battery disconnect and the other coil is energized for battery connect, and which plunger has integral with it or acting on it a belleville spring system which is capable of holding the plunger in the open or closed positions so that continuous solenoid power is not required to maintain the plunger position, the plunger position being determined by the solenoid coil last energized by the operator manipulating the ignition switch and which master switch having additional terminals for battery ground and vehicle ground and a solenoid body having a mounting provision, and which master swtich when open provides the desired result that no short circuit is possible at any device or accessory and not even at the positive or power terminal of the battery itself.

4,176,285

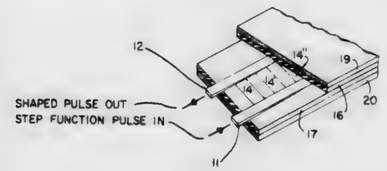
ELECTRICAL PULSE GENERATOR

Neil J. Norris, Santa Barbara, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 11, 1978, Ser. No. 868,584

Int. Cl.² H03K *3/02, 6/00*

U.S. Cl. 307—106 **5 Claims**



1. In a technique for generating a highly reproducible, high voltage, dynamic range electrical pulse having an increasing pulse amplitude as a function of time by a completely passive system, the apparatus comprising a ground plane, a pair of conductors of selected length separated from said ground plane by a suitable dielectric, and a plurality of entirely passive, entirely resistive elements positioned along said length each of which couples said pair of conductors, the conductance of each of said passive resistive elements increasing with position along said length whereby the application of a step function pulse to one of said conductors produces said pulse having an increasing pulse amplitude with time as an output at the other of said conductors.

4,176,286

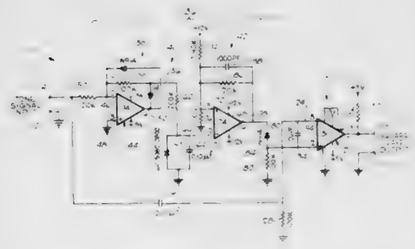
SIGNAL TRANSLATOR WITH SQUELCH

Thomas E. Shuffield, Jr., N. Little Rock, Ark., assignor to BEI Electronics, Inc., Little Rock, Ark.

Filed Mar. 8, 1978, Ser. No. 884,599

Int. Cl.² H03K *5/153*

U.S. Cl. 307—237 **12 Claims**



1. A signal translator, comprising

a square wave generator including an operational amplifier having a tone signal input for receiving tone signals and a square wave output for delivering square wave output signals corresponding to said tone signals,

said operational amplifier having a switching input for receiving a first control voltage for activating said amplifier and a second control voltage for squelching said amplifier,

and squelch control voltage generating means for receiving said tone signals and producing said first control voltage when said tone signals exceed a predetermined level while producing said second control voltage when said tone signals are less than said predetermined level,

said squelch control voltage generating means including control signal producing means for converting said tone signals into a corresponding control signal,

and comparator means for receiving said control signal and producing said first control voltage when said control signal exceeds an established level while producing said second control voltage when said control signal is less than said established level,

whereby said amplifier is activated when said control signal exceeds the established level but is squelched when said control signal is less than the established level.

4,176,287

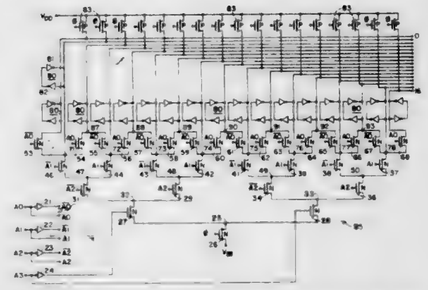
VERSATILE CMOS DECODER

James J. Remedi, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 13, 1978, Ser. No. 896,071

Int. Cl.² H03K *17/60, 5/18, 13/00*

U.S. Cl. 307—251 **13 Claims**



1. A two of n decoder for decoding a digital signal where n is the number of outputs of the decoder and is a function of the number of bits in the digital signal being decoded, comprising:

first controllable means for precharging a first node to a first voltage potential; a plurality of second controllable means for controllably precharging each of the decoder outputs to a second voltage potential, the plurality of second controllable means being equal to n; a first plurality of transistors controllable by at least significant bit of the digital signal, the first plurality of transistors being equal to n-1; a second plurality of transistors coupled to the first plurality of transistors and controllable by a most significant bit of the digital signal, the second plurality of transistors being equal to two; and at least a third plurality of transistors coupled between the plurality of first and second transistors, the at least a third plurality of transistors being controllable by bits of the digital signal between the least and the most significant bits, the at least a third plurality of transistors being equal to n-1 divided by two, the first, second and third plurality of transistors being coupled in series between the first node and the outputs for forming a controllable path between the first node and a predetermined two of the outputs.

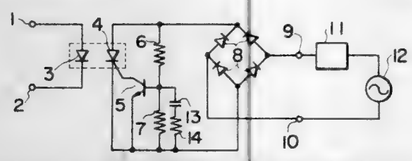
V 9 8 8 1 4 N 0 2 7 7 9 UMI

4,176,288

ZERO VOLTAGE SWITCHING SOLID STATE RELAY

Isamu Komatsu, Takahagi; Toru Sugawara, and Tsukasa Yamauchi, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 6, 1977, Ser. No. 830,663
Claims priority, application Japan, Sep. 6, 1976, 51-107145
Int. Cl.² H03K *17/72*
U.S. Cl. 307—252 A **8 Claims**
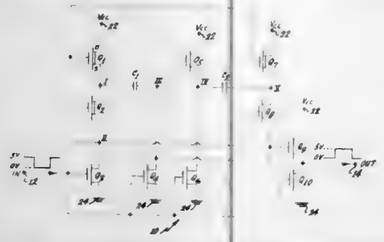


1. In a zero voltage switching solid state relay having a semiconductor controlled rectifier element which is ignited by an external control signal to feed a load with an alternating current, a transistor whose collector and emitter are respectively connected to the gate and the cathode of said semiconductor controlled rectifier element, and a voltage divider including first and second resistors connected in series across said rectifier element, the point of connection of said resistors being connected to the base of said transistor; the improvement comprising: a capacitor and a resistor connected in series between the base and the emitter of said transistor and which has a time constant sufficient to attain a hysteresis characteristic, and said semiconductor controlled rectifier element is a photothyristor which is operated by a light emitting diode adapted to emit light by the external control signal.

4,176,289

DRIVING CIRCUIT FOR INTEGRATED CIRCUIT SEMICONDUCTOR MEMORY

George S. Leach, and Timothy R. O'Connell, both of Phoenix, Ariz., assignors to Electronic Memories & Magnetics Corporation, Encino, Calif.

Filed Jun. 23, 1978, Ser. No. 918,394
Int. Cl.² H03K *17/12, 17/04, 17/60, 3/353*
U.S. Cl. 307—270 **5 Claims**



1. A drive circuit operable in response to applied first and second signals to supply to an output terminal a signal of predetermined potential substantially equal to a supply potential, said drive circuit comprising:

a first charging circuit including a first capacitor and a first switchable depletion mode field effect device selectively switchable conductive for charging said first capacitor to the supply potential;

a second charging circuit including a second capacitor and a second switchable depletion mode field effect device selectively switchable conductive for charging said second capacitor to the supply potential;

an output circuit, including an output field effect device switch receiving the supply potential and drivable for coupling the supply potential to the output terminal; and

a control circuit coupled to said first and second charging circuits, said control circuit being responsive to the first signal for switching conductive said first and second switchable depletion mode devices to charge said first and second capacitors to the supply potential,

said control circuit being operable in response to the second signal for switching said first and second depletion mode devices non-conductive and for raising the base reference potential of said second capacitor towards the supply potential,

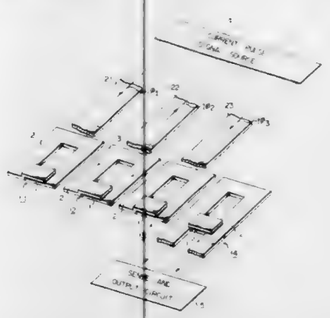
said control circuit being further responsive to the second signal for serially interconnecting and cascading said first and second capacitors to apply the combination of their individual potentials and the raised base reference potential to said output circuit for overdriving said output switch with a predetermined portion of the combined potentials to couple substantially the full supply potential to the output terminal.

4,176,290

SUPERCONDUCTIVE JOSEPHSON CIRCUIT DEVICE

Akira Ishida, Tokyo, and Hajime Yamada, Tokorozawa, both of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Oct. 19, 1977, Ser. No. 843,596
Claims priority, application Japan, Oct. 27, 1976, 51-128232; Dec. 25, 1976, 51-157194
Int. Cl.² H03K *3/38, 19/195;* **G11C** *19/32*
U.S. Cl. 307—306 **8 Claims**



1. A superconductive Josephson circuit device for use in a shift register, comprising:

at least three superconductive closed loops, each of said superconductive closed loops including at least one Josephson junction capable of carrying Josephson current I_J and having a Josephson junction free portion including inductance L, wherein the inductance-Josephson current product, LI_J, is selected around magnetic flux quantization unit, $\Phi_o = 2.07 \times 10^{-15}$ Webers, whereby trapping and releasing of a magnetic flux quantum are made therein, each closed loop having no resistive component of impedance;

coupling means for providing a predetermined amount of loop-to-loop coupling so that said superconductive closed loops are magnetically coupled with each other in series fashion such that said Josephson junction-free portion of each superconductive closed loop is located close to the Josephson junction free portion of at least two adjacent superconductive closed loops; and

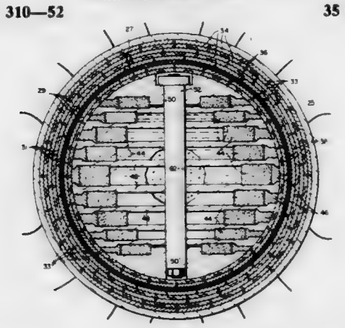
shift operation control means for providing a magnetic flux into each of said superconductive closed loops and for causing a magnetic flux quantum to be trapped into the loops or to be released from the loops, whereby a magnetic flux quantum representing a logic "1" data information is sequentially shifted from loop to loop in shift register fashion.

4,176,291

STORED FIELD SUPERCONDUCTING ELECTRICAL MACHINE AND METHOD

Mario Rabinowitz, Menlo Park, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed May 27, 1977, Ser. No. 801,241
Int. Cl.² H02K *9/00*
U.S. Cl. 310—52 **35 Claims**



1. Apparatus for providing a magnetic field in a superconducting, rotating electrical machine, said machine having an axis of rotation, comprising:

(a) a housing for supporting the electrical machine;

(b) an elongate flux trapping cylindrical means fabricated of superconductive material and mounted in the housing for trapping a magnetic field therein, said superconductive material in the cylindrical means having an annular cross section normal to the axis of rotation of the machine and a unitary length along the axis of rotation substantially equal to the length of the machine, said trapped magnetic field forming a magnetic circuit with an armature winding mounted in the housing;

(c) means within the housing and attached thereto for generating a magnetic pattern field in the cylindrical means; and

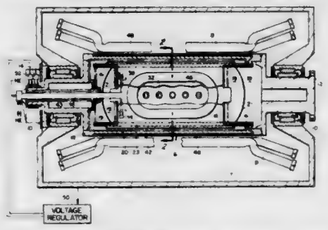
(d) means within the housing and attached thereto for cooling the cylindrical means so that a magnetic field can be trapped in the cylindrical means from the pattern field, said trapped magnetic field thereby providing a magnetic field in the machine.

4,176,292

AUXILIARY FIELD WINDING FOR A SUPERCONDUCTIVE ALTERNATING CURRENT ELECTRICAL MACHINE AND METHOD OF EXCITING SAME

Swarn S. Kalsi, Clifton Park, and Madabushi V. K. Chari, Schenectady, both of N.Y., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Sep. 2, 1977, Ser. No. 830,155
Int. Cl.² H02K *9/00*
U.S. Cl. 310—52 **14 Claims**



1. Apparatus in a superconductive alternating current electrical machine having both a stator and a rotor, said rotor rotates inside of and with respect to the stator which is stationary, comprising:

(a) a superconductive main field winding housed in the rotor in the machine for providing a substantially steady-state magnetic field to an armature winding attached to the stator in the machine;

(b) an auxiliary field winding in the rotor in the machine for providing a transient magnetic field to the armature winding in cooperation with the main field winding, said auxiliary field winding having a substantially shorter time constant than the main field winding;

(c) means in the rotor for supporting the main field and auxiliary field windings in the machine; and

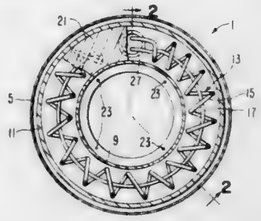
(d) voltage regulating means, electrically connected to the main field and auxiliary field windings through low voltage and main exciter means for varying the excitation in the main field and auxiliary field windings, during steady-state load conditions said voltage regulating means exciting only the main field winding, during transient load conditions said voltage regulating means exciting the auxiliary field winding to make up the difference between the magnetic field required by the armature winding to meet the instantaneous load placed on the machine and the magnetic field supplied by the main field winding so that during both steady-state and transient operations the voltage regulation necessitated by the load is provided.

4,176,293

THERMIONIC CATHODE HEATER HAVING REDUCED MAGNETIC FIELD

Robert H. Giebeler, Sunnyvale, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Feb. 17, 1978, Ser. No. 879,017
Int. Cl.² H01J *1/15, 19/08;* **H01K** *1/02*
U.S. Cl. 313—343 **11 Claims**



1. In a thermionic electron emitter, an electrical resistance heater comprising at least nearly one turn of a first curved hollow helical conductor, and a second conductor extending through said first conductor in spaced electrically insulative relationship therewith, said first and second conductors being electrically interconnected at one common end thereof, the other ends of said conductors being electrically discrete, whereby a source of electric power connected between said discrete ends will cause current to flow serially through said first and second conductors, the direction of current in the two conductors being in the opposite sense and stray magnetic field due to the movement of said current are minimized.

4,176,294

METHOD AND DEVICE FOR EFFICIENTLY GENERATING WHITE LIGHT WITH GOOD RENDITION OF ILLUMINATED OBJECTS

William A. Thornton, Jr., Cranford, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 619,544, Oct. 3, 1975, abandoned, which is a continuation of Ser. No. 96,744, Dec. 10, 1970, abandoned, which is a continuation-in-part of Ser. No. 742,291, Jul. 3, 1968, abandoned. This application Dec. 3, 1976, Ser. No. 747,141
Int. Cl.² H01J *61/62, 63/04, 61/00*
U.S. Cl. 313—485 **31 Claims**

1. A device which efficiently generates white light and

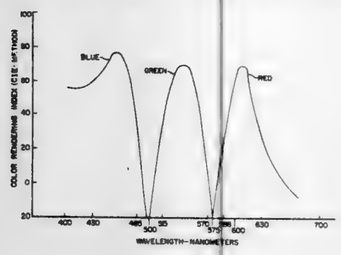
illuminates objects with a color appearance which is reasonably representative of their color appearance under natural light, said device comprising:

(a) a three-component, light-generating medium forming an operative part of said device;

(b) means for connecting said device to a source of predetermined electric potential to energize said medium to a visible-light-generating condition;

(c) a first component of said medium when energized exhibiting a green to yellow-green emission located substantially in the wavelength range of from 515 nm to 570 nm;

(d) a second component of said medium when energized exhibiting an orange to red emission located substantially in the wavelength range of from 588 nm to 630 nm;



(e) the third component of said medium when energized enhibiting a purplish-blue to greenish-blue emission located substantially in the wavelength range of from 430 nm to 485 nm; and

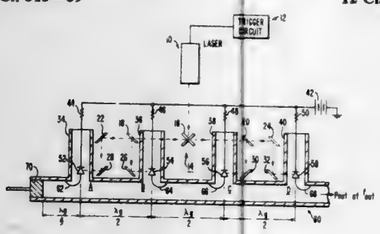
(f) the relative proportions of said components of said light-producing medium being such that when their emissions are blended, there is produced white light of predetermined ICI coordinates.

4,176,295

HIGH PEAK POWER MICROWAVE GENERATOR USING LIGHT ACTIVATED SWITCHES

Michael C. Driver, Penn Hills; James G. Oakes, Franklin, and John R. Davis, Export, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 15, 1978, Ser. No. 915,649
Int. Cl.² H03K *3/42, 3/57*
U.S. Cl. 315—39 **12 Claims**



1. A microwave generator comprising:

(a) wave guide means;

(b) at least two resonant transmission lines connected at intervals along the length of said wave guide means;

(c) light sensitive switch means electrically connected respectively to each of said transmissions lines;

(d) direct current energizing means connected to said transmission lines; and

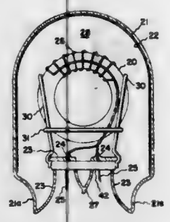
(e) means for periodically sending a laser beam to said light sensitive switch means, whereby the actuation of said switch means causes the electromagnetic energy in the transmission lines to be coupled into the wave guide means from whence it is propagated as a pulse train.

4,176,296

CORE MOUNTING FOR SOLENOIDAL ELECTRIC FIELD LAMPS

John M. Anderson, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 22, 1978, Ser. No. 917,940
Int. Cl.² H05B *41/24;* **H01F** *15/02, 27/02*
U.S. Cl. 315—71 **17 Claims**



1. An apparatus for supporting a toroidal magnetic core within a gas discharge lamp, comprising:

a first wire loop passing over both sides of said core in chord-like fashion, said first loop adapted for attachment to anchor points distally spaced from said core;

a second wire loop passing over both sides of said core in chord-like fashion, said second loop having substantially the same dimensions as said first loop, said second loop also adapted for attachment to anchor points distally spaced from said core, said second loop being positioned on said core in mirror image fashion with respect to said first loop; and

a third wire loop encircling said core and said first and second loops in chord-like fashion, said third loop chord intersecting those chord ends of said first and second loops which are nearest the portion of said loops adapted for attachment.

9. A solenoidal electric field discharge lamp comprising:

a translucent envelope internally coated with a phosphor material which emits electromagnetic radiation at visible wavelengths upon stimulation by electromagnetic radiation, said envelope including a header;

an ionizable fill gas disposed within said envelope;

a radio frequency electric energy source;

a toroidal magnetic core disposed within said envelope and supported on the header thereof by the apparatus of claim 1; and

an insulated winding with a plurality of turns looping through said core and coupled to said energy source.

4,176,297

ULTRA VIOLET INITIATED GAS DISCHARGE VISUAL DISPLAY MATRIX

William G. Thistle, Manotick, and Joseph G. G. Dionne, Loretteville, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Sep. 19, 1977, Ser. No. 834,567
Claims priority, application Canada, Oct. 26, 1976, 264198
Int. Cl.² H05B *41/00;* **H01J** *61/02;* **G11C** *11/28*
U.S. Cl. 315—150 **13 Claims**

1. A visual display assembly of the type incorporating a matrix of small gas plasma discharge elements, said assembly comprising:

(i) an electrically conductive cathode with a low work function photo-emissive coating thereon, said coating emitting electrons when irradiated with ultra-violet light;

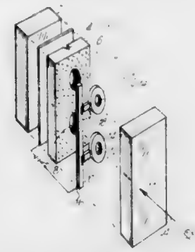
(ii) an insulating plate, in gas sealing arrangement with said coating, said plate having a plurality of cavities formed therein;

(iii) a plurality of anodes on said insulating plate each having an aperture therein axially aligned with an associated cavity;

(iv) a plurality of electrical resistive means on said insulating plate connected one each to said anode for limiting discharge current in said cavities and anodes;

(v) electrical supply means to apply a dc potential to said anodes through the resistive means associated therewith at a level below that required to initiate a discharge;

(vi) a cover member which is transparent to U.V. light and which is in sealing engagement with said insulating plate and enclosing said anodes and said cavities;



(vii) a mixture of noble gases capable of luminous discharge in each of said cavities;

(viii) U.V. illuminating means aligned with selected cavities for directing U.V. light through said cover plate into said selected cavities thereby to strike the said cathode and initiate discharge within said cavities, said dc potential being sufficient to sustain said discharge; and,

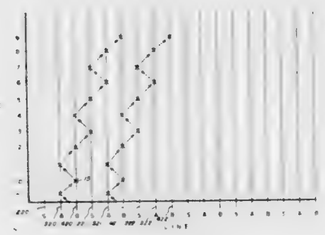
(ix) switch means to disconnect said dc potential from selected anodes.

4,176,298

DISPLAY PANEL APPARATUS AND METHOD OF DRIVING

Richard K. Kirchner, Bloomington; William N. Mayer, and Nicholas C. Andreadakis, both of White Bear Lake, all of Minn., assignors to Modern Controls, Inc., Minneapolis, Minn.

Filed May 23, 1977, Ser. No. 799,342
The portion of the term of this patent subsequent to Mar. 21, 1995, has been disclaimed.
Int. Cl.² H05B *37/00, 39/00, 41/00*
U.S. Cl. 315—169.2 **14 Claims**



1. A method of voltage-exciting a gas display panel of the type having a plurality of parallel gas channels and a further plurality of orthogonal parallel conductors separated from said channels by a dielectric medium, wherein said conductors are sequentially grouped in triplets for purposes of defining gas cell regions in said gas channels and the shifting forward along said channels of an ignited or unignited gas cell region is accomplished by predictable control of electric surface charges along said dielectric medium, comprising the steps of:

(a) shifting said electric surface charges backward one adjacent conductor position along said channel;

(b) shifting said electric surface charges forward two adjacent conductor positions along said channel; and

(c) repeating steps a) and b) two additional times.

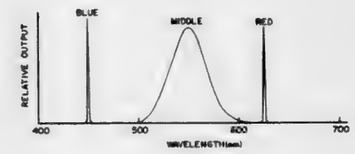
4,176,299

METHOD FOR EFFICIENTLY GENERATING WHITE LIGHT WITH GOOD COLOR RENDITION OF ILLUMINATED OBJECTS

William A. Thornton, Jr., Cranford, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 747,141, Dec. 3, 1976, which is a continuation of Ser. No. 619,544, Oct. 3, 1975, abandoned, which is a continuation of Ser. No. 96,744, Dec. 10, 1970, abandoned, which is a continuation-in-part of Ser. No. 742,291, Jul. 3, 1968, abandoned. This application Jan. 11, 1978, Ser. No. 868,578
Int. Cl.² H01J *61/48*
U.S. Cl. 315—326 **11 Claims**





1. The method of efficiently producing white light which illuminates objects with a color appearance which is reasonably representative of their color appearance under natural light, which method comprises:

(a) blending together a first light component which is green to yellow-green in color with a second light component which is orange to red in color and a third light component which is purplish-blue to greenish-blue in color, said first light component is principally confined within a wavelength range of from 515 nm to 570 nm, said second light component is principally confined within a wavelength range of from 588 nm to 630 nm, and said third light component is principally confined within a wavelength range of from 430 nm to 485 nm, said blended light having at most only a limited amount of radiations of a wavelength shorter than 430 nm and at most only a limited amount of radiations of a wavelength longer than 630 nm as well as at most only a limited amount of radiations of a wavelength of about 575 nm and at most only a limited amount of radiations of a wavelength of about 500 nm; and

(b) controlling the relative light intensities of said first, second and third light components to produce white light of predetermined ICI coordinates.

4,176,300

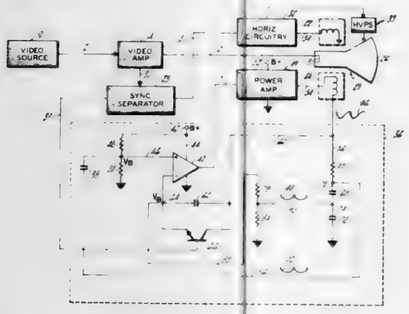
DEFLECTION WAVEFORM GENERATOR

Glenn C. Waehner, Riverside, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 779,643, Mar. 21, 1977, abandoned. This application Jul. 21, 1978, Ser. No. 926,691
Int. Cl.² H01J *29/70*
U.S. Cl. 315—371 **4 Claims**

1. A waveform generator to be used in conjunction with a CRT having a deflection yoke, comprising:

an operational amplifier means having an inverting and a non-inverting inputs in which the input time constants are substantially equal, and an output from which a signal waveform suitable for driving a CRT deflection yoke can be derived, and further including integrating means coupled to said inverting input for creating a basic sawtooth;
means coupled to said deflection yoke of said CRT for integrating the current waveform driving said deflection yoke; and



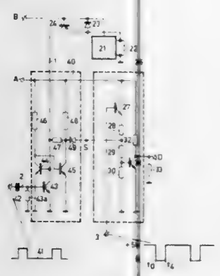
feedback means having a first path which is connected to said inverting input of said operational amplifier and a second path which is connected to said non-inverting input of said operational amplifier, both paths having substantially equivalent time constants whereby a pair of similarly shaped parabolic waveforms are presented to said inputs of said operational amplifier so that said yoke deflection current waveform is "S" corrected.

4,176,301

CIRCUIT ARRANGEMENT FOR SUPPLYING A PROTECTION SIGNAL FOR A TELEVISION PICTURE DISPLAY TUBE

Paul Sonnenberger, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 17, 1978, Ser. No. 887,675
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1977, 2711636
Int. Cl.² H01J *29/52*
U.S. Cl. 315—384 **12 Claims**



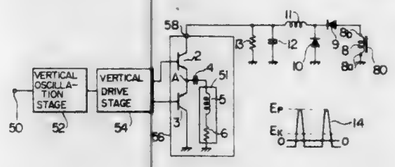
1. A circuit arrangement for supplying a protection signal to a display tube in the event of a disturbed deflection during which a periodic pulse shaped first signal having the deflection frequency is not produced, said circuit comprising a capacitor coupled to receive a periodic second signal of the same frequency and independent relative to said first signal, said second signal initiating charging said capacitor to provide for the generation of said protection signal, a switch means coupled to said capacitor having a control input means for receiving said first signal and for discharging said capacitor upon receiving said first signal, and a threshold means coupled to said capacitor for providing said protection signal when the capacitor voltage exceeds a threshold voltage.

4,176,302

VERTICAL DEFLECTION OUTPUT CIRCUIT

Fumio Inoue, Yokohama, and Michio Masuda, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 15, 1977, Ser. No. 787,843
Claims priority, application Japan, Apr. 19, 1976, 51-43552; Apr. 19, 1976, 51-43557; Apr. 19, 1976, 51-43558; Apr. 19, 1976, 51-43559; Apr. 19, 1976, 51-43560; Apr. 19, 1976, 51-43561
Int. Cl.² H01J *29/70*
U.S. Cl. 315—397 **10 Claims**



1. A vertical deflection output circuit comprising:
a vertical deflection yoke;
a single-ended push-pull circuit for supplying a vertical deflection current to said vertical deflection yoke; and
power supply means for supplying to said single-ended push-pull circuit a first operating voltage for feeding to said vertical deflection yoke a predetermined vertical deflection current during a vertical scan period, and a second operating voltage, which is higher than said first operating voltage, for restoring the vertical deflection current during a vertical retrace period from its magnitude corresponding to the end of the vertical scan period to its magnitude corresponding to the start of the vertical scan period, said power supply means comprising:
a power source for generating a periodic voltage waveform whose peak value is equal to or higher than said second operating voltage and whose mean value in the same polarity as said peak value is equal to or lower than said first operating voltage; and
choke-input means coupled between said power source and said single-ended push-pull circuit for producing a d.c. voltage whose level decreases from said peak value to said mean value in accordance with an increase of a d.c. load current thereof from zero to a predetermined current level which is less than the maximum vertical deflection current; and
wherein said power source comprises a winding of a horizontal flyback transformer across which a horizontal flyback pulse is developed during the horizontal cycle.

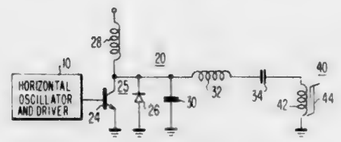
4,176,303

TELEVISION S-CORRECTION LINEARITY DEVICE

William E. Babcock, Warren, N.J., and Ronald L. Hess, Zionsville, Ind., assignors to RCA Corporation, New York, N.Y.

Filed May 17, 1978, Ser. No. 906,836
Int. Cl.² H01J *29/70, 29/76*
U.S. Cl. 315—400 **7 Claims**

1. An arrangement for deflecting the electron beam for a wide-angle kinescope, comprising:
a deflection winding disposed about the kinescope;
deflection current generator means coupled to said deflection winding for promoting the flow of a recurrent deflection current at a deflection rate in said deflection winding for causing the kinescope beam to scan a raster on the face of the kinescope, said raster having a bilateral-geometric distortion having the appearance of progressive expansion towards the raster sides and progressive compression towards the raster center;
S-correction capacitance means serially coupled with said deflection winding for symmetrically correcting said compression towards said raster center, said S-correction means causing excessive correction of said progressive expansion towards said raster sides;



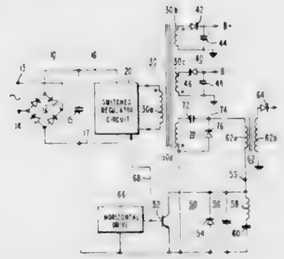
variable impedance means coupled with said deflection winding and varied for linearity correction;
wherein the improvement resides in that said variable impedance means varies in a bilateral manner at said deflection rate to increase the time rate of change of said deflection current towards said raster sides.

4,176,304

REGULATING TELEVISION HORIZONTAL DEFLECTION ARRANGEMENT

Howard M. Scott, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 9, 1978, Ser. No. 904,451
Int. Cl.² H01J *29/00*
U.S. Cl. 315—411 **6 Claims**



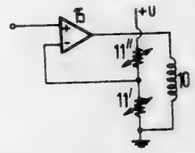
1. An improved energizing circuit for a television horizontal deflection circuit comprising:
a source of alternating voltage, the voltage cycling at the horizontal deflection rate between first and second magnitudes relative to an average value, said second magnitude being variable and said first magnitude being maintained constant by variation of the relative duration during the cycle of first and second intervals, respectively, during which said first and second voltage magnitudes recur;
a transformer, the primary of which is coupled to said source of alternating voltage and including a secondary winding;
a storage capacitor serially coupled with a rectifier, the serial combination being coupled across said secondary winding for charging said capacitor during said recurrent first intervals;
a horizontal deflection stage including a horizontal switching transistor having a main current conduction path and a horizontal deflection winding coupled across said main current conduction path; and
inductance means coupling said current conduction path across said rectifier means for applying the sum of said capacitor and transformer secondary voltage to said inductance means during said second intervals for causing a constant energy to be stored in said inductance means for operating said horizontal output stage during each deflection cycle.

4,176,305

GALVANO MAGNETIC POSITION CONTROL SYSTEM

Hans-Hellmuth Cuno, Waldetzenberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 30, 1977, Ser. No. 855,899
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658528
Int. Cl.² G05B *1/06*
U.S. Cl. 318—653 **3 Claims**



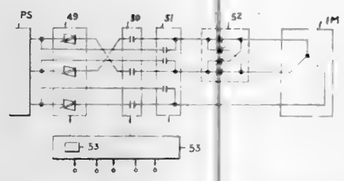
1. A position control system for control of electrodynamic drives having an air gap penetrated by a magnetic field and a drive coil located for movement in that air gap in a first direction essentially perpendicular to the magnetic field and in a direction opposite that first direction, the drive coil having a first and a second terminal, comprising:
a first and a second resistor each mechanically affixed in spaced relation to the drive coil such that as the drive coil moves in the first direction and opposite to the first direction each said resistor moves substantially perpendicular to the magnetic field in said first direction or in said opposite direction, and said spaced relation being such that as the coil and said resistors move in said first direction, said first reactor moves out of the magnetic field simultaneously as said second resistor moves into the magnetic field and such that as the coil and said resistors move opposite said first direction said first resistor moves into the magnetic field simultaneously as said second resistor moves out of the magnetic field;
each said resistor having a first and a second terminal with the resistive characteristic measurable between said first and second terminals of each said resistor being a known function of the position of each said resistor with respect to the magnetic field in the air gap;
means for electrical control including an operational amplifier having a first and a second input terminal and an output terminal with said first terminal being a signal input terminal and with said second terminal being a feedback terminal;
said output terminal of said operational amplifier being connected to the first terminal of the drive coil, said first terminal of said first resistor being connected to a voltage input terminal, said second terminal of said first resistor being connected to said first terminal of said second resistor, said second terminal of said second resistor being operatively connected to the second terminal of the drive coil and to a ground point of said means for electrical contrl with said second terminal of said operational amplifier being operatively connected to said junction of said second terminal of said first resistor and said first terminal of said second resistor;
whereby said electrical control means is operable so that any difference between the signals applied to said first and said second terminals of said operational amplifier is amplified and applied to the drive coil causing it to move so as to minimize the aforesaid difference between the signals. control

4,176,306

SPEED CONTROL APPARATUS

Tetsumasa Asano; Osamu Yatsuki; Kazuyuki Fujimoto, and Harutoshi Hashimoto, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 643,926, Dec. 23, 1975, abandoned.
This application Apr. 27, 1978, Ser. No. 900,664
Claims priority, application Japan, Dec. 27, 1974, 49-2613; Jan. 24, 1975, 50-10792; Feb. 20, 1975, 50-21598; Feb. 21, 1975, 50-22031; Mar. 7, 1975, 50-28196
Int. Cl.[2] H02P 5/40
U.S. Cl. 318—772 **3 Claims**



1. A speed control apparatus comprising:
(1) switch means for use during high speed operation disposed between a three phase AC power source and a motor;
(2) switch means for use during low speed operation disposed between the AC power source and the motor and including at least one semiconductor switch for each phase and a plurality of phase connection contactors;
(3) low speed control means for controlling turn-on and off of the semiconductor switch by generating a $1/(6n\pm1)$ frequency dividing turn-on pulse wherein n is an integer, the control means including
(a) a plurality of synchronizing signal generators connected to the phases of the power source;
(b) a ring counter operated by one of the synchronizing signals;
(c) frequency control means for logically processing the synchronizing signals and the output of the ring counter to generate a low frequency output; and
(d) turn-on control means responsive to the low frequency output for generating the turn-on signal of the semiconductor switch;
(4) speed reduction switch means for switching the motor from high speed to low speed; and
(5) switch control means for shifting the phase connection order in the high speed and the phase connection order in the low speed.

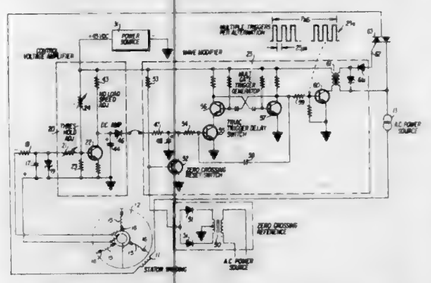
4,176,307

ENERGY ECONOMIZING AC POWER CONTROL SYSTEM

Louis W. Parker, 2040 N. Dixie Hwy., Ft. Lauderdale, Fla. 13305

Filed May 17, 1978, Ser. No. 906,702
Int. Cl.[2] H02P 7/36
U.S. Cl. 318—798 **8 Claims**

1. An energy economizing AC power control system operative to reduce the iron and copper losses in an induction motor, comprising an AC induction motor having a stator winding and a rotor adapted to be coupled to a load, a sine wave power source for energizing said stator winding to effect rotation of said rotor, said rotor comprising a plurality of shorted windings and also comprising unshorted additional winding means carried by said rotor, said additional winding means being operative to generate an AC voltage during rotation of said rotor having a frequency which is the same as the frequency in said shorted windings and an amplitude which is proportional to the load on said motor, and closed loop positive feedback control means operative to control the energization of said stator winding from said power source during a limited range of motor speeds near the full speed of said motor, said closed loop positive feedback means comprising rectifier means coupled to said additional winding means on said rotor for rectifying said AC signal to produce a substantially DC signal, control means responsive to said DC signal from said rectifier means for producing a control voltage which is a function of the speed of said motor, wave modifier means coupled to the output of said control means and responsive to said control voltage, said wave modifier means including switching means disposed between said sine wave power source and said stator winding, the conduction time of said switching means being controllable during each cycle from said power source as a function of the magnitude of said control voltage, said wave modifier means being operative to apply full sine waves of



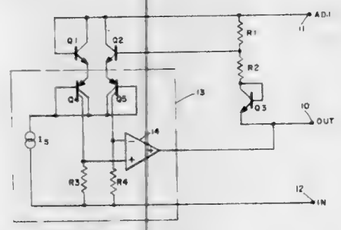
voltage from said power source to said stator winding during rotational start-up and speed build-up of said motor and, as said motor approaches full speed, then being operative to vary the electrical angle of each cycle of said power source which is actually coupled to said stator winding to provide varying fractions of each sine wave of voltage from said power source to said stator winding in accordance with the energy requirements imposed on said motor by the rotor load at any given moment, whereby said closed loop positive feedback control means functions to substantially reduce the iron and copper losses of said conventional motor by causing the average current supplied from said power source to said stator windings to be supplied primarily as a function of the load on said motor as the load on said motor varies.

4,176,308

VOLTAGE REGULATOR AND CURRENT REGULATOR

Robert C. Dobkin, Hillsborough, and Robert A. Pease, San Francisco, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sep. 21, 1977, Ser. No. 835,243
Int. Cl.[2] G05F 1/58, 1/60
U.S. Cl. 323—4 **20 Claims**



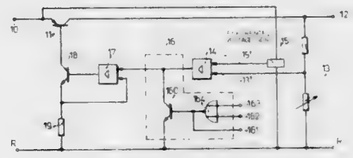
1. A voltage regulator comprising:
an output terminal for providing an output voltage;
an adjustment terminal; and
a control circuit connected to the output terminal and the adjustment terminal for maintaining the voltage at the output terminal at a level that differs from the voltage at the adjustment terminal by a predetermined voltage difference; characterized by the control circuit comprising:
a resistive divider coupled between the output terminal and the adjustment terminal;
a pair of transistors having their collectors connected in common and their bases respectively coupled to the resistive divider to provide a portion of said voltage difference between the output terminal and the adjustment terminal across said bases, wherein the two transistors are adapted for operating at different circuit densities for providing a predetermined ratio in current flow through the pair of transistors when the voltage difference between the output terminal and the adjustment terminal is said predetermined voltage difference; and
a high-gain amplifier circuit connected to the emitters of the pair of transistors and to the output terminal for driving the output terminal to a maintained voltage level at which said current flow through the pair of transistors is at said predetermined current ratio and the voltage difference between the output terminal and the adjustment terminal is said predetermined voltage difference.

4,176,309

STABILIZED VOLTAGE REGULATOR CIRCUIT, PARTICULARLY FOR USE WITH A SERIALLY CONNECTED PNP TRANSISTOR

Alfred Schulz, Oberriexingen; Uwe Kiencke, Ludwigsburg, and Günther Hönig, Markgröningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 27, 1978, Ser. No. 890,416
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1977, 2716500
Int. Cl.[2] G05F 1/56
U.S. Cl. 323—4 **11 Claims**



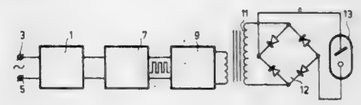
1. Direct current voltage regulator circuit adapted for connection to unregulated input terminals (10,R) and provide a regulated output voltage at output terminals (12,R) having
a control transistor (11), serially connected between an input terminal (10) and an output terminal (12);
reference voltage generating means (15) generating a reference voltage;
a first control loop (13, 14, 15) comprising
a comparator-control amplifier (14) having said reference voltage applied thereto and additionally connected to a voltage representative of the actual output voltage and generating a control error signal to control the conduction of said control transistor (11),
and a second control loop (17, 18, 19) comprising
means (19) deriving a signal representative of actual base current flow in the control transistor (11);
a second comparator (17) having said control error signal applied thereto and additionally connected to the signal representative of actual base current of the control transistor, and connected to and controlling the flow of base current of the control transistor (11).

4,176,310

DEVICE COMPRISING A TRANSFORMER FOR STEP-WISE VARYING VOLTAGES

Cornelis W. Elenga; Pieter van Dijk, and Alfred J. van der Zwart, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,635
Claims priority, application Netherlands, Mar. 30, 1977, 7703425
Int. Cl.[2] G05F 3/00
U.S. Cl. 323—7 **10 Claims**



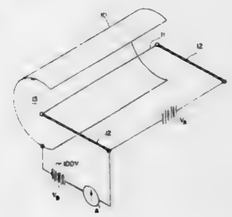
1. A device for suppressing oscillations in a transformer comprising, a pair of input terminals for connection to a source of stepwise varying voltage, a transformer having a primary winding for coupling to said input terminals and a secondary winding for coupling to a load, said transformer exhibiting a leakage inductance and a parasitic capacitance of a value to produce oscillations in the secondary winding in response to a stepwise voltage applied to the primary winding, a circuit having first and second connection terminals, means connecting said circuit in series with said primary winding across the input terminals, said circuit including inductance means and rectifier means connected together so that the current through the inductance means does not reverse its direction of flow when the polarity of the voltage across the first and second connection terminals of said circuit is reversed, the inductance of said inductance means being at least 10 times larger than the leakage inductance of the transformer.

4,176,311

POSITIVE ION SMOKE DETECTOR USING A TUNGSTEN WIRE PREHEATED IN HYDROGEN TO INCREASE SENSITIVITY

William D. Davis, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 23, 1976, Ser. No. 753,774
Int. Cl.[2] G01N 27/62
U.S. Cl. 324—468 **8 Claims**



1. A method for detecting smoke in an ambient atmosphere comprising:
disposing a heated wire opposite a collector electrode, said heated wire comprising tungsten which has been fired in hydrogen gas;
applying a negative electric potential on said electrode with respect to said wire;
introducing a sample of a test gas between said wire and said electrode; and
determining the presence of smoke particles in said test gas by an increase in electrical current flow between said wire and said electrode.

V 9 8 4 N 0 2 7 7 9 UMI

4,176,312

ELECTRICAL CIRCUITRY FOR MEASURING LOW LEVEL SIGNALS

Joseph F. Wrinn, North Quincy, Mass., assignor to Teradyne, Inc., Boston, Mass.

Filed Feb. 24, 1978, Ser. No. 880,789
Int. Cl.[2] G01R *27/00*
U.S. Cl. 324—57 N **6 Claims**



1. In electrical circuitry for measuring low level signals comprising a source of ac signals to be measured, a synchronous detector clocked at the frequency of said ac, and a transformer coupling said source to said detector, that improvement comprising, between said transformer and said detector,

a wideband amplifier for amplifying both the information signal and noise present in the transformer output, followed by

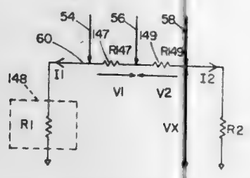
a filter having a passband of width intermediate those of said amplifier and said detector and centered on the clock frequency of the detector.

4,176,313

ANALYZING ELECTRICAL CIRCUIT BOARDS

Joseph F. Wrinn, North Quincy, Mass., assignor to Teradyne, Inc., Boston, Mass.

Filed Feb. 24, 1978, Ser. No. 880,792
Int. Cl.[2] G01R *27/02*
U.S. Cl. 324—62 **30 Claims**



1. Apparatus for locating a faulty IC on the node of a circuit board having a plurality of ICs thereon, comprising

first means for measuring the internal resistance R_1 of a selected IC on the node,

second means for measuring the parallel resistance R_2 of the other ICs on the node, and

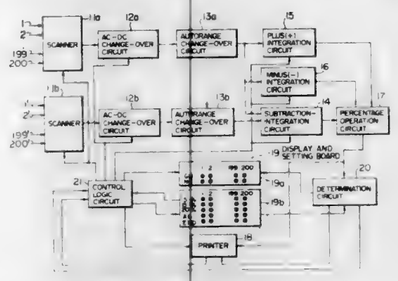
third means for comparing at least one of R_1 and R_2 with a predetermined value K, where K is no smaller than the expected value of the internal resistance R_d of an active driving IC on said node.

4,176,314

DOUBLE INTEGRATION METHOD FOR MEASURING DEVIATION OF STANDARD AND REFERENCE ANALOG QUANTITIES

Toyohiko Yamada, Nagoya, Japan, assignor to Shin-Shirasuna Electric Corp., Aichi, Japan

Filed Oct. 31, 1977, Ser. No. 847,235
Claims priority, application Japan, Nov. 15, 1976, 51-137008
Int. Cl.[2] G01R *17/00, 15/12, 31/02*
U.S. Cl. 324—140 D **1 Claim**



1. A method of measuring electrical analog quantities comprising subtracting a first analog signal representing a first electrical analog quantity which is to be a reference from a second analog signal representing a second electrical analog quantity which is to be compared with said first analog quantity, to thereby obtain a difference signal, integrating said difference signal for a pre-determined time to thereby obtain a third analog signal and simultaneously therewith integrating said first analog signal for said pre-determined time to obtain a fourth and a fifth analog signal representing the positive and the negative value of said integration, obtaining the sum of the integral of said third analog signal and said fifth or said fourth analog signal in accordance with the positive or the negative sign of said third analog signal to thereby obtain a sixth analog signal, detecting the time from the point whereat said integration for obtaining said sixth analog signal is started till the point whereat said sixth analog signal becomes zero to thereby obtain a digital signal, and measuring the ratio of the difference between said first electrical analog quantity and said second electrical analog quantity to said first electrical analog quantity in accordance with said digital signal.

4,176,315

MINIATURE ELECTRICAL VOLTAGE AND CONTINUITY TESTER WITH CIRCUIT COMPARTMENT AND TEST LEAD COMPARTMENT CASING

Earl D. Sunnarborg, Star Rte. 4, Box 1, Hibbing, Minn. 55746

Filed May 11, 1978, Ser. No. 904,784
Int. Cl.[2] G01R *1/04, 31/02*
U.S. Cl. 324—156 **14 Claims**

1. A miniature electrical tester comprising:

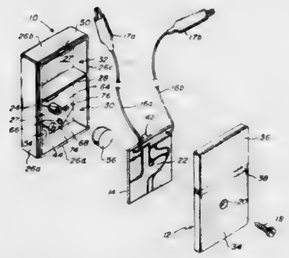
a molded plastic front case having a front wall and four side walls, a partition which separates the front case into a circuit compartment and a test lead compartment, a plurality of bosses on an inner surface of the front case for holding a plurality of batteries in position in the circuit compartment, and a plurality of holding pins on an inner surface of the front case for holding a battery interconnecting wire in position in the circuit compartment;

a circuit board for supporting and connecting electrical circuit components into testing circuitry, the components including an indicator light which is controlled by the testing circuitry, the indicator light being exposed through an indicator light aperture in the front wall of the front case when the circuit board is in position in the circuit compartment, the circuit board further including

battery contacts for making electrical connection between the batteries and the circuit board;

first and second test leads connected to the circuit board for connecting an input to the test circuitry when in use and and which may be stored in the test lead compartment when not in use;

a molded plastic back cover having a circuit cover section for covering the circuit compartment, a test lead cover section for covering the test lead compartment, and a flexible hinge section located between the circuit cover



and test lead cover sections and essentially covering the partition;

latch means for releasably holding the test lead cover section in closed position covering the test lead compartment;

screw means for holding the circuit cover section in position covering the circuit compartment; and

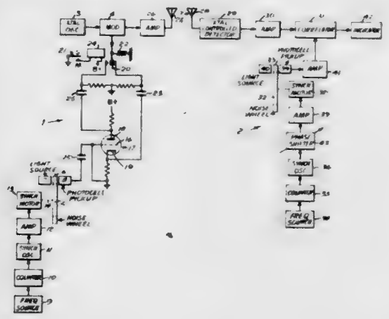
means between the circuit cover section and the circuit board for holding the circuit board in position with the battery contacts in contact with the batteries when the screw means holds the circuit cover section in position.

4,176,316

SECURE SINGLE SIDEBAND COMMUNICATION SYSTEM USING MODULATED NOISE SUBCARRIER

Louis A. DeRosa, Bloomfield, and Mortimer Rogoff, Nutley, both of N.J., assignors to International Telephone & Telegraph Corp., Nutley, N.J.

Filed Mar. 30, 1953, Ser. No. 345,296
Int. Cl.[2] H04K *1/02*
U.S. Cl. 325—32 **13 Claims**



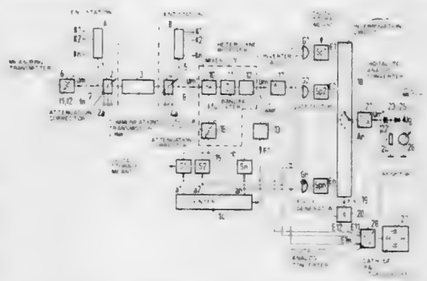
10. A transmitter for a secret communication system comprising a source of carrier frequency energy, a source of cyclically repetitive noise energy, means to synchronize the cyclical repetition rate of said noise energy with a sub-multiple of the frequency of said carrier frequency energy, means to reverse the phase of portions of said noise energy in accordance with a predetermined message code, means to modulate said carrier frequency energy with said encoded noise energy and means to transmit the suppressed carrier single sideband component of said carrier modulation.

4,176,317

CIRCUIT ARRANGEMENT FOR DETERMINING THE FREQUENCY DEPENDENT AMPLITUDE FLUCTUATION CHARACTERISTIC OF A COMMUNICATIONS TRANSMISSION LINK

Alfred Manfreda, Germering, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 22, 1977, Ser. No. 770,266
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2613054
Int. Cl.[2] H04B *1/62*
U.S. Cl. 325—62 **3 Claims**



1. A circuit arrangement for determining the frequency dependent amplitude fluctuation characteristic of a communications transmission link, including a measuring transmitter which produces a measuring signal of constant amplitude and at a frequency which is variable within the transmission frequency band, and a measuring device which receives said measuring signal, after it has passed through the communications transmission link, and said measuring device measures the frequency-dependent amplitude fluctuations of said measuring signal, and wherein said measuring transmitter (6) delivers a series of n individual frequencies (f1, f2 . . . fn) which lie in the frequency gaps between the individual communications transmission channels (K1 . . . Kn) of said communications transmission link, an analog to digital converter (17) receiving the output of said communications transmission link, a plurality of n digital storage means (Sp1, Sp2 . . . Spn) each of them being individually assigned to the n frequencies (fl, f2 . . . fn) and into which the received measuring signals (Um') are individually supplied from the output of said analog to digital converter (17), an interrogation circuit (18) to consecutively interrogate said digital storage means (Sp1, Sp2 . . . Spn), a digital to analog converter (21) connected to the output of said interrogation circuit, , a capacitor (22) which cuts off the DC mean value connected to the output of said analog to digital converter, a rectifier circuit (23, 24) connected to said capacitor to produce a voltage (Ug) which indicates the frequency-dependent amplitude fluctuation of the measuring signal (Um'), and a voltmeter (26) connected to the output of said rectifier circuit (23, 24).

4,176,318

RADIO TRANSMITTER DISPLAY INDICATOR

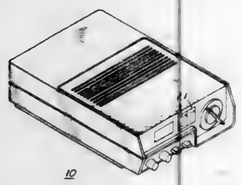
James A. Johnson, Buffalo Grove, and Paul E. Kerfoot, Streamwood, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 28, 1977, Ser. No. 782,274
Int. Cl.[2] H04B *1/02, 17/00*
U.S. Cl. 325—133 **12 Claims**

1. Apparatus for visually indicating an operational condition of a radio transmitter comprising:

radio communication equipment having a transmit circuit for emitting a transmit signal;

at least one character display module coupled to said radio communication equipment, said module having an integral character display portion for visually indicating one operative condition of said radio communication equipment and an integral decimal point display portion;



transmit circuit condition means coupled to said radio communication equipment for deriving a signal indicative of a transmit circuit condition different from said one condition; and

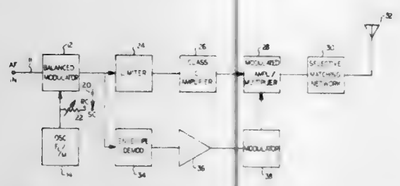
means for coupling said indicative signal to said decimal point display portion to visually indicate said transmit circuit condition by said decimal display portion while said character display portion simultaneously visually indicates said one condition.

4,176,319

DOUBLE SIDEBAND TRANSMISSION SYSTEM

Leonard R. Kahn, 137 E. 36th St., New York, N.Y. 10016

Filed Dec. 4, 1975, Ser. No. 637,660
Int. Cl.[2] H04B *1/68*
U.S. Cl. 325—138 **18 Claims**



1. The method of producing a double-sideband wave at a desired frequency, comprising the following steps:

(a) generating a double-sideband wave at an odd sub-harmonic frequency of the desired frequency,

(b) demodulating the envelope modulation component of the double-sideband wave, and

(c) amplitude modulating the phase modulation component of the double-sideband wave by the demodulated envelope component in an amplitude modulated stage operating as an odd factor frequency multiplier.

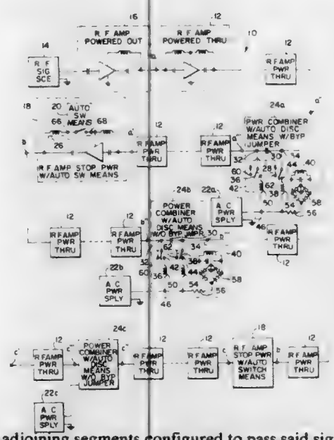
4,176,320

TRANSMISSION TRUNK POWERING SYSTEM

Victor Leshkowitz, 6 Airway Dr., Bellmore, N.Y.

Filed Sep. 28, 1978, Ser. No. 946,719
Int. Cl.[2] H04N *7/10*
U.S. Cl. 325—308 **9 Claims**

1. In a system for conveying a relatively high frequency signal along an elongated section of transmission line, said line comprising a plurality of sequential line segments, a different group of signal amplifiers associated with each line segment being disposed in series with said segment in spaced apart relationship along said segment for maintaining the level of signal to compensate for losses along said segment; a different source of relatively low frequency power associated with each line segment; a different power combiner means associated with each line segment coupling said power source associated with said segment to a point intermediate said line segment for impressing power on said segment; each of the amplifiers of said group being coupled to said segment in a manner for receiving power therefrom and allowing power to flow in parallel with said amplifier and first filter means in series between adjoining segments configured to pass said signal and to block flow of power therebetween; the improvement comprising: first automatic switch means associated with said first filter means for providing a power path between said adjoining line segments in response to the loss of power on either said adjoining segments.

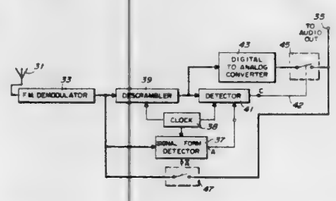


4,176,321

DELTA MODULATION DETECTOR

Paul H. Horn, Franklin Park, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 2, 1977, Ser. No. 830,256
Int. Cl.[2] H04B *1/10, 1/16;* **H04N** *7/16*
U.S. Cl. 325—325 **5 Claims**



1. A detector for detecting a delta modulated signal comprising;

a timing circuit for providing a timing signal having a predetermined time interval,

a counter responsive to the timing signal for counting the digital bit occurrences of the delta modulated signal within the predetermined time interval and providing a count signal giving the count of the digital bit occurrences of the delta modulated signal within the given time interval,

a decoder responsive to the timing signal and receiving the count signal from the counter and providing a binary signal of a first state when a count signal indicates number of bit occurrences of the delta modulated signal above a predetermined high level of count or below a predetermined low level of low count and providing a binary signal of a second state when the count signal indicates the number of digital bit occurrences fall between the predetermined high level count and the low level count,

a latch circuit responsive to the output of the decoder, and

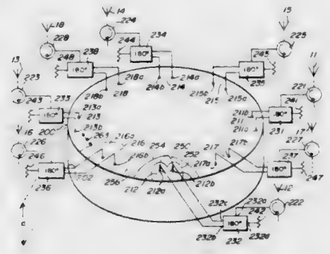
a code detect signal representing detection of a predetermined code signal, the latch circuit providing an output signal in response to the binary signal of the first state from the decoder and the code detect signal.

4,176,322

RADIO FREQUENCY LENS

Richard S. Kommrusch, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 29, 1977, Ser. No. 828,566
Int. Cl.[2] H01Q *3/26*
U.S. Cl. 325—369 **23 Claims**



1. A radio frequency (RF) lens for receiving and focusing a plurality of RF signals, comprising:

a transmission cavity means, including a plurality of probe sites therein, the cavity being of predetermined construction to transmit RF signals among said probe sites;

a plurality of probe pairs, each pair predeterminedly positioned at each probe site;

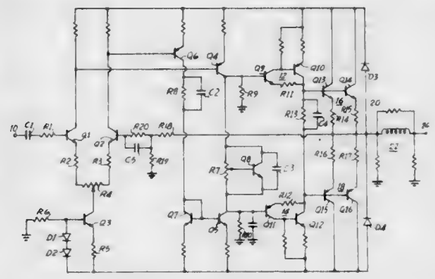
coupler means for coupling each one of said plurality of RF signals to one of said probe pairs, the coupler means coherently combining RF signals received by each probe of a probe pair to provide a first summed output and incoherently combining the RF signals received by each probe of the respective probe pair to provide a second difference output.

4,176,323

TRANSISTORIZED POWER AMPLIFIER

Robert Odell, Pasadena, Calif., assignor to Harman International Industries, Inc., Lake Success, N.Y.

Filed Jun. 21, 1978, Ser. No. 917,738
Int. Cl.[2] H03F *3/18, 3/30*
U.S. Cl. 330—263 **2 Claims**



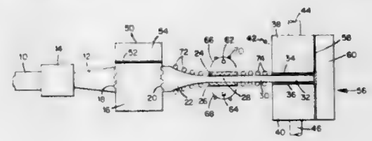
1. A transistor amplifier comprising an input, a push-pull driver transistor pair operatively connected to said input, first and second output stages, and first and second compound buffer stages respectively operatively connected intermediate the outputs of said push-pull driver and said first and second output stages, each of said first and second buffer stages comprising a first transistor and a second complementary transistor, the base of said first transistor being orperatively connected to an output of said push-pull driver, the collector of said first transistor being operatively connected to the base of said second transistor, the emitter of said first transistor being operatively connected to the collector of said second transistor, and the collector of said second transistor being operatively connected to an input of said output stage.

4,176,324

HIGH PERFORMANCE DYE LASER AND FLOW CHANNEL THEREFOR

Henry R. Aldag, Boston; Richard G. Morton, N. Reading, and Jaime A. Woodroffe, Andover, all of Mass., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Sep. 20, 1976, Ser. No. 724,862
Int. Cl.[2] H01S *3/02*
U.S. Cl. 331—94.5 T **12 Claims**



1. A flow channel for liquid fluent laser material of a laser comprising:

an input plenum positioned to receive a liquid fluent laser material;

a pair of optically transmissive windows in facing relationship to each other with generally parallel inner surfaces;

means for applying excitation radiation through said first and second windows;

a conduit for directing a continuous flow of fluent material from said input plenum to the region between said windows and transverse thereto, said conduit having walls bordering said continuous flow which provide a generally decreasing cross-sectional area between said input plenum and said windows;

the applied radiation producing heat of said conduit walls from radiation from the fluent material in the region between said windows;

means for abating temperature effects to reduce refractive index gradients in fluent laser material received by said input plenum within the region between said windows; said means comprising:

cooling ducts associated with said conduit and located adjacent and in thermal contact with said conduit walls at positions bordering said conduit flow at least upstream of and away from the region between said windows;

said ducts thus operative to cool said conduit walls in the region of said walls adjacent said windows and thus exposed to said heating by said radiation from the region between said windows and thereby to reduce temperature gradients in fluent laser material flowing past said windows;

an output plenum positioned to accept fluent laser material after flowing between said windows along an extension of said conduit;

means for exhausting fluent laser material from said output plenum.

4,176,325

SEMICONDUCTOR LASER DEVICE

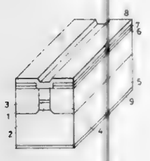
Takashi Kajimura, Kokubunji; Kazutoshi Saito; Noriyuki Shige, both of Hachioji; Michiharu Nakamura, Tokyo; Jun-ichi Umeda, and Masayoshi Kobayashi, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 19, 1977, Ser. No. 843,365

Claims priority, application Japan, Oct. 22, 1976, 51-126044; Mar. 18, 1977, 52-29205

Int. Cl.² H01S *3/19*

U.S. Cl. 331—94.5 H **22 Claims**



1. A semiconductor laser device comprising:
a semiconductor substrate;
an optical confinement region formed of a semiconductor material assembly disposed above said substrate and including
a multilyaer semiconductor laminated structure formed of
a first semiconductor layer having a prescribed thickness which is no greater than the oscillation wavelength of light produced by said laser device,
a second semiconductor layer disposed beneath said first semiconductor layer, and
a third semiconductor layer disposed above said first semiconductor layer,
the refractive indices of said second and third semiconductor layers being lower than the refractive index of said first semiconductor layer, and the conductivity types of said second and third semiconductor layers being opposite each other, and
a fourth semiconductor layer having first and second portions disposed alongside and contacting opposite side faces of each of the first, second, and third semiconductor layers of said multilayer semiconductor laminated structure, so that said first semiconductor layer is buried within structure formed by said second, third, and fourth semiconductor layers, said fourth semiconductor layer having a band gap greater than that of said first semiconductor layer, and having a refractive index which is higher than the refractive indices of said second and third layers and which is higher than the effective refractive index of the buried first semiconductor layer;
a first electrode disposed upon one surface of said optical confinement region; and
a second electrode disposed upon one surface of said semiconductor substrate; and
means, including said optical confinement region, for forming a resonant optical cavity for optical radiation travelling in a direction parallel to said opposite side faces.

4,176,326

CF_4 LASER

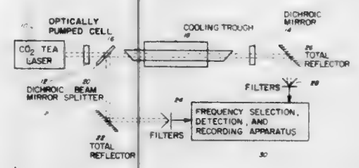
Curt Wittig, Santa Monica, and Joe J. Tiee, Los Angeles, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 20, 1977, Ser. No. 844,086

Int. Cl.² H01S *3/223*

U.S. Cl. 331—94.5 G **8 Claims**

1. A laser for producing near 16 μm coherent radiation comprising:
line tunable CO_2 excitation means for emitting coherent radiation in the absorption spectrum of CF_4 molecular gas;
an optically pumped cell aligned with said CO_2 excitation means;
means for cooling said optically pumped cell;
molecular CF_4 gas retained within said optically pumped cell;



optical resonant cavity means surrounding said optically pumped cell such that said molecular CF_4 gas is optically pumped by said CO_2 excitation means to stimulate emission near 16 μm from the transition $\nu_2+\nu_4 \rightarrow \nu_2$ of CF_4 molecular gas.

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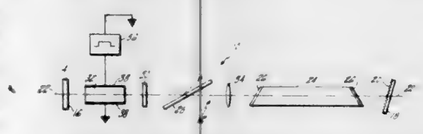
METHOD FOR CAVITY DUMPING A Q-SWITCHED LASER

Robert J. Wayne, Glastonbury; Peter P. Chenausky, Avon, and Carl J. Buczek, Manchester, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 25, 1978, Ser. No. 872,274

Int. Cl.² H01S *3/11*

U.S. Cl. 331—94.5 M **13 Claims**



1. A method of obtaining pulses of radiation having pulse widths capable of being controllably variable over a submicrosecond time interval with a laser having a gaseous gain medium, means for controlling the polarization state of radiation capable of oscillating within the laser, and means responsive to the polarization state for coupling out radiation from the laser comprising:
energizing the gain medium to obtain a population inversion therein capable of providing continuous wave radiation oscillating within the laser;
providing a first polarization state, to at least a portion of radiation within the laser incident onto the means responsive to the polarization state, with the means for controlling the polarization state of the radiation wherein the means responsive to the polarization state is adapted for coupling out of the laser radiation having the first polarization state thereby providing a high coupling loss to the laser to maintain the gain of the laser below threshold for producing an output beam;
on switching the means for controlling the polarization state of the radiation to change quickly the first polarization state to a second polarization state wherein radiation having the second polarization state is transmitted through the means responsive to the polarization state thereby producing low coupling loss to the laser to allow a Q-switch buildup of optical flux within the laser;
off switching the means for controlling the polarization state of the radiation to change the second polarization state to the first polarization wherein the optical flux having the Q-switch buildup is cavity dumped by the means responsive to the polarization state to obtain an output pulse having a submicrosecond duration; and
controlling the time duration of off switching the means for controlling the polarization state to control the pulse width of the output pulse.

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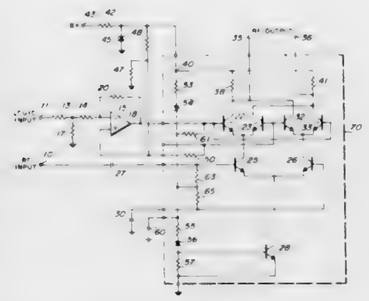
DC COUPLED BI-PHASE MODULATOR

Kenneth H. Brown, Scottsdale, and John W. Shepard, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 30, 1978, Ser. No. 910,402

Int. Cl.² H04L *27/20*

U.S. Cl. 332—16 T **6 Claims**



1. A DC coupled bi-phase modulator comprising:
(a) a switching circuit having a signal input and output, a bias input and a control input wherein the switching circuit is a differential amplifier circuit with the bias input being coupled to cause a first mode of operation when the amplitude of a signal at the control input exceeds the predetermined bias at the bias input and a second mode of operation when the amplitude of the signal at the control input is less than the predetermined bias;
(b) comparing means having an output DC coupled to the control input of said switching means, a reference input coupled to the bias input of said switching means and a logic signal input; and
(c) bias means coupled to the bias input of said switching circuit for providing a predetermined bias thereon.

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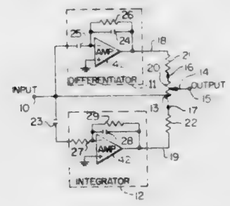
TONE CONTROL CIRCUIT

Jacob F. Moskowitz, Brookline, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 649,400, Jan. 15, 1976, abandoned. This application Jul. 11, 1977, Ser. No. 814,696

Int. Cl.² G10H *1/00*

U.S. Cl. 333—28 T **6 Claims**



1. An electronic tone control circuit comprising,
an integrator circuit having an input terminal and an output terminal,
a differentiator circuit having an input terminal and an output terminal,
first means for electrically connecting the input terminals of said integrator circuit and differentiator circuit to each other to provide the tone control circuit input terminal,
a potentiometer having end terminals, a wiper arm terminal, and a center-tap terminal,
second means for electrically connecting the output terminals of said integrator circuit and said differentiator circuit to said potentiometer end terminals, respectively; the wiper arm terminal providing the output terminal of said tone control circuit,
third means for electrically connecting said center-tap terminal of the potentiometer to the control circuit input terminal.

4,176,330

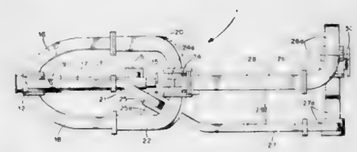
DIPLEXER APPARATUS

Joseph G. DiTullio, Woburn; Leonard I. Parad, Framingham, both of Mass., and Donald J. Sommers, Brookline, N.H., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 23, 1977, Ser. No. 863,808

Int. Cl.² H01P *1/16, 1/20, 5/20*

U.S. Cl. 333—122 **12 Claims**



1. Diplexer apparatus comprising:
first transducer means having first and second input ports and an output port, said first transducer means being operative to receive first and second signals within a first frequency bandwidth at the first and second input ports, respectively, and to establish said signals at the output port thereof to be orthogonal and linearly-polarized with respect to each other;
first polarizer means coupled to the first transducer means and operative to transform the orthogonal linearly-polarized signals at the output port of the first transducer means to orthogonal circularly-polarized signals;
electromagnetic wave conducting means having a first port coupled to the first polarizer means and a second port, said electromagnetic wave conducting means being operative to pass the circularly-polarized signals from the first polarizer means to the second port thereof, said electromagnetic wave conducting means further having third, fourth, fifth and sixth ports and being further operative to receive first and second circularly-polarized signals within a second frequency bandwidth at the second port thereof and to couple orthogonal vectoral components of said circularly-polarized signals to the third, fourth, fifth and sixth ports thereof;
first, second, third and fourth sections of waveguide respectively coupled to the third, fourth, fifth and sixth ports of the electromagnetic wave conducting means, said first and third sections of waveguide being operative to pass therethrough vectoral components of the circularly-polarized signals at the third and fifth ports of the electromagnetic wave conducting means and said second and fourth sections of waveguide being operative to pass therethrough orthogonal vectoral components of the circularly-polarized signals at the fourth and sixth ports of the electromagnetic wave conducting means;
first combining means having first and second inputs coupled respectively to the first and third sections of waveguide and operative to combine at an output thereof the

vectoral components in the first and third sections of waveguide derived from the first and second circularly-polarized signals;

second combining means having first and second inputs coupled respectively to the second and fourth sections of waveguide and operative to combine at an output thereof the vectoral components in the second and fourth sections of waveguide derived from the first and second circularly-polarized signals;

second and third polarizer means coupled respectively to the outputs of the first and second combining means and operative to introduce a predetermined phase shift differential between the vectoral components at the outputs of the first and second combining means, said second and third polarizer means respectively including first and second sections of rectangular waveguide each having a row of pins therein; and

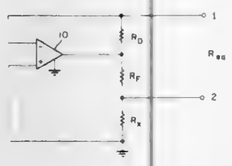
third combining means having first and second inputs coupled to the sections of waveguide of the second and third polarizer means, respectively, and operative in response to the vectoral components from the second and third polarizer means to establish at first and second outputs thereof first and second resultant orthogonal linearly-polarized signals each corresponding to a different one of the circularly-polarized signals.

4,176,331

NETWORK FOR SIMULATING LOW-NOISE-TEMPERATURE RESISTORS

Robert L. Forward, Oxnard, and Gary D. Thurmond, Calabasas, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 27, 1978, Ser. No. 881,296
Int. Cl.² H03H *11/00, 5/04*
U.S. Cl. 333—213 **6 Claims**



1. A two-terminal network for simulating a resistance comprising, in combination:

an amplifier having first and second differential input terminals, an output terminal and a common ground;

a first resistor R_D;

means for connecting said first resistor between said first differential input terminal and said output terminal;

second and third resistors R_F and R_X, respectively;

means for serially connecting said second and third resistors between said output terminal and ground;

means for connecting said second differential input terminal to ground;

one of said network terminals being connected to said first differential input terminal, the other of said network terminals being connected to the junction of said second and third resistors and

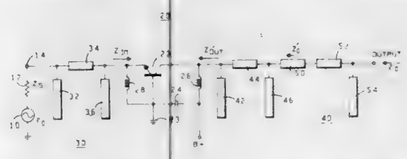
wherein the resistance simulated at said network terminals is substantially proportional to R_D.

4,176,332

FREQUENCY MULTIPLIER

Peter Bachert, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 18, 1977, Ser. No. 852,892
Int. Cl.² H01P *1/20;* **H03B** *19/14*
U.S. Cl. 333—218 **13 Claims**



1. A frequency multiplier circuit for receiving a signal of frequency f_0 and producing a signal of frequency $k_x f_0$, where $k=2, 4, 6, 8 \ldots$, at a desired output impedance Z_0, said multiplier circuit comprising:

harmonic generating means adapted for receiving said signal of frequency f_0 and producing signals at frequency harmonics thereof, including a harmonic signal of frequency $k \times f_0$, the amplitude of said harmonic signals increasing with an increased signal at f_0 in said harmonic generating means, said harmonic generating means exhibiting an output impedance Z_{out};

coupling means for coupling said signal of frequency f_0 to said harmonic generating means;

output loading means coupled to said harmonic generating means and providing a load circuit thereto, said output loading means comprising:

(a) first and second series coupled transmission line means for coupling said harmonic generating means produced harmonic signals to the multiplier circuit output, each of said first and second transmission lines having predetermined characteristic impedances for transforming the impedance to signals of frequency $k \times f_0$ at the input thereof to the desired output impedance Z_0 of said frequency multiplier, said first and second transmission lines having predetermined electrical lengths to provide a combined phase shift of 180° to signals of frequency $(2n-1) \times f_0$, where $n=1, 2, 3 \ldots$; and

(b) third transmission line means having an electrical length of one quarter wavelength at frequencies $(2n-1) \times f_0$, where $n=1, 2, 3 \ldots$, coupled to the output of said frequency multiplier such that a short at frequency f_0 is reflected thereto,

whereby the short at frequency f_0 at the output of the multiplier circuit is transformed to a high impedance at f_0 to the output of said harmonic generator.

4,176,333

MAGNETIC CORE FOR SINGLE PHASE ELECTRICAL INDUCTIVE APPARATUS

Saul Bennon, and William D. Albright, both of Muncie, Ind., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 12, 1978, Ser. No. 914,463
Int. Cl.² H01F *27/08, 27/26*
U.S. Cl. 336—60 **5 Claims**

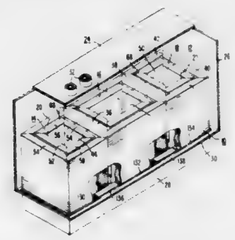
1. Electrical inductive apparatus comprising:

an enclosure;

a first magnetic core structure disposed in said enclosure and having n parallel leg portions and first and second yoke portions formed of stacked metallic laminations, said n leg portions being spaced apart to form $n-1$ apertures therebetween;

$n-1$ second magnetic core structures, each having leg and yoke portions formed of stacked metallic laminations, each of said $n-1$ second magnetic core structures being disposed in one of said apertures in said first magnetic core structure and spaced from adjoining leg and yoke portions of said first magnetic core structure to form a gap completely therearound;

an electrical winding assembly disposed in inductive relation with said first and said $n-1$ second magnetic core structures; and



at least one support member having a flange portion mounted on the bottom of said enclosure and two parallel web portions extending vertically therefrom, said two parallel web portions being of equal length with each web portion extending into the gap between one of said legs of said first magnetic core structure and an adjacent leg of one of said $n-1$ second magnetic core structures.

4,176,334

HIGH VOLTAGE TRANSFORMER AND PROCESS FOR MAKING SAME

Robert S. Buritz, Pacific Palisades; Robert D. Parker, Manhattan Beach; Jack J. Kisch, Huntington Beach, and John Burnham, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 607,513, Aug. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 477,870, Jun. 10, 1974, abandoned. This application Jun. 13, 1977, Ser. No. 805,662
Int. Cl.² H01F *15/04, 27/28*
U.S. Cl. 336—84 C **11 Claims**



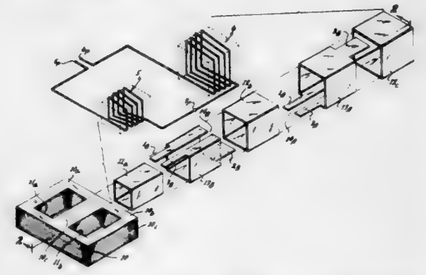
1. A small, lightweight, high voltage transformer utilizing all solid dielectric insulation materials having a specific weight of less than three pounds per kilowatt of transformer power comprising a primary transformer winding disposed about a porous barrier insulation material impregnated with a dielectric resin, a conductively coated epoxy-glass laminate primary shield electrically connected to said primary winding and extending beyond said primary winding in the axial direction and having rounded ends which project in a radial direction away from said winding and maintained in a predetermined spaced relationship to said winding by said impregnated porous barrier insulation material, a conductively coated epoxy-glass laminate secondary shield maintained in a predetermined spaced relationship to said primary shield by said impregnated insulation material and electrically connected to a secondary transformer winding disposed about said secondary shield and an encapsulation system comprised of said dielectric resin which completely surrounds and encapsulates said transformer.

4,176,335

ELECTRICAL CONDUCTING APPARATUS

Douglass E. Charpentier, Pasadena, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 25, 1977, Ser. No. 845,120
Int. Cl.² H01F *27/28*
U.S. Cl. 336—180 **6 Claims**



1. An electrical conductor apparatus for encompassing a magnetic field comprising:

(a) a first pair of spiral shaped electrical strip conductors which are aligned along the longitudinal axis of said magnetic field, and wherein a first one of said conductors spirals clockwise and the other conductor spirals counterclockwise around said axis of said magnetic field,

(b) a second pair of spiral shaped conductors longitudinally aligned along said axis of said magnetic field and wherein a first one of said conductors spirals clockwise and a second one of said conductors spirals counterclockwise around said axis of said magnetic field,

(c) and wherein each of said pair of spiral conductors is insulated from the other and electrically connected such that each spiral pair of conductors forms a balanced pair of half-turn windings via output terminals at one end relative to a center tap at the opposite end which electrically connects said pair of spiral conductors.

4,176,336

LACQUER-ENCAPSULATED CARBON FILM RESISTOR

Peter J. T. Van Den Berk, and Gerrit Verspui, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 7, 1978, Ser. No. 913,292
Claims priority, application Netherlands, Jun. 27, 1977, 7707078
Int. Cl.² H01C *1/024, 1/032, 1/02;* **B05D** *5/12*
U.S. Cl. 338—274 **2 Claims**



1. A lacquer-encapsulated carbon film resistor comprising:

a ceramic substrate;

a carbon film deposited over the entire surface of said ceramic substrate;

an insulating layer of silicon nitride deposited substantially over the entire surface of said carbon film, only the electri-

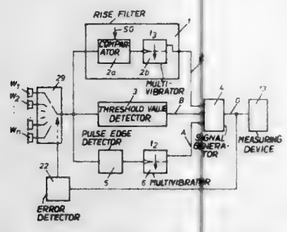
cal connection portions of said carbon film being uncoated;
metal electrode caps positioned tightly against said carbon film at said electrical connection portions;
current conductors welded to said metal electrode caps to serve as leads;
a layer of epoxy resin lacquer coated over said entire carbon film resistor assembly except said leads to encapsulate said resistor.

4,176,337

APPARATUS FOR MEASURING THE TIME BETWEEN RECEIVED PULSES

Burckhard Aechter, Achim, and Manfred Gerlach, Bremen, both of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Fed. Rep. of Germany

Filed Jun. 13, 1978, Ser. No. 915,228
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1977, 2726981
Int. Cl.² G01S 9/68; G01P 5/18
U.S. Cl. 367—131 **9 Claims**



1. For use with a system in which successive pulses, each composed of a train of high frequency oscillations, are emitted by a transmitting transducer, propagated through a transmission medium, and received by a receiving transducer having a given transient behavior, a starting transient period followed by a steady-state response, and a given response band width, apparatus for measuring the time interval between reception of successive pulses by the receiving transducer and for preventing erroneous measurements resulting from propagation of the pulses over indirect paths through the transmission medium, said apparatus comprising:

threshold value detecting means connected to said receiving transducer for receiving the output signal therefrom representative of each pulse received by said receiving transducer, said detecting means having an associated threshold value which is a function of the peak value of the output signal produced by said receiving transducer during steady-state response to a pulse, and said detecting means producing a signal when the output signal from said receiving transducer exceeds said threshold value;

rise filter means including a comparator connected to receive the output signal from said receiving transducer and to produce a trigger signal when the output signal from said receiving transducer exceeds a comparision value which is substantially less than the peak value of the output signal produced by said receiving transducer during steady-state response to a pulse, said rise filter means further including a timer member connected to receive trigger signals from said comparator for producing, in response to each such trigger signal, a rise pulse having a period at least equal to the reciprocal of the band width of said receiving transducer and not greater than the starting transient period of said receiving transducer;

signal generator means connected to said threshold value detecting means and to said rise filter means for producing a signal indicating good reception of a pulse each time said detecting means produces a signal in time coincidence with a rise pulse; and

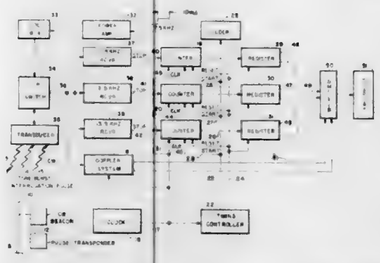
measuring means connected to receive the signals indicating good reception from said signal generator means and responsive thereto for providing an indication of the time interval between reception of successive pulses by said receiving transducer.

4,176,338

HIGH RESOLUTION ACOUSTIC NAVIGATION SYSTEM

Robert C. Spindel, North Falmouth; Robert P. Porter, West Falmouth, and William M. Marquet, Falmouth, all of Mass., assignors to Woods Hole Oceanographic Institution, Woods Hole, Mass.

Filed Aug. 31, 1977, Ser. No. 829,344
Int. Cl.² G01S 5/18
U.S. Cl. 367—6 E **10 Claims**



1. A high resolution underwater acoustic navigation system comprising, in combination:

an object whose movement through water is to be tracked and a plurality of geographically fixed underwater devices;

interrogation means on said object for periodically transmitting acoustic interrogation pulse tones and transponder means at each of said underwater devices for transmitting an acoustic tone burst in response to reception of an interrogation pulse tone, the tone burst transmitted by each transponder means being of a characteristic frequency different from all other tone burst frequencies;

beacon means at each underwater device for continuously transmitting an acoustic tone, the continuous tone transmitted by each beacon means being of a characteristic frequency different from all other continuous tone frequencies;

first receiver means at said object for determining the reception times of said tone bursts relative to said interrogation pulse;

second receiver means at said object for determining the Doppler shifts of the acoustic tones as received from each underwater device; and

computer means connected to said first and second receiver means for determining a reference position of said object based upon said reception times and then tracking movement of said object from said reference position based upon said Doppler shifts.

4,176,339

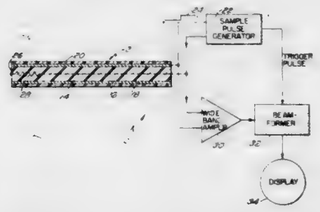
PROPAGATION SAMPLED ACOUSTIC LINE ARRAY

William L. Konrad, Niantic, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 2, 1978, Ser. No. 874,453
Int. Cl.² G01S 3/80
U.S. Cl. 367—121 **8 Claims**

1. An acoustic line array for detecting an acoustic source in a medium which comprises:

a center conductor extending along the array axis for the length of the array;
a flexible material having pressure dependent dielectric constant surrounding said center conductor;
a conducting shield generally concentric with said center conductor;
a resistive means for eliminating signal reflections being connected to a first end of said center conductor;
a pulse generator being connected to second end of said center conductor, said pulse generator also generating trigger pulses;
an amplifying means for amplifying the reflected signals being connected to the second end of the center conductor;
a beam former having the input thereof from the output of said amplifying means and having the trigger pulses from said pulse generator for triggering thereof; and
a displaying means being connected to the output of said beam former for displaying the output thereof.

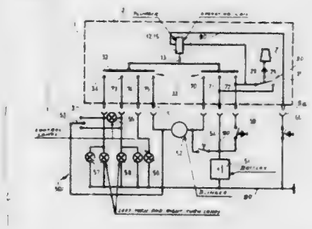


4,176,340

SHOCK-RESPONSIVE ACTIVATING DEVICE FOR EMERGENCY FLASHER SYSTEMS OF AUTOMATIVE VEHICLES

Albert Steinmeier, Ringweg 7, D-7972 Isny-Neutrauchburg, Fed. Rep. of Germany

Filed Feb. 13, 1978, Ser. No. 877,472
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1977, 2706962
Int. Cl.² G08B 21/00
U.S. Cl. 340—52 H **9 Claims**
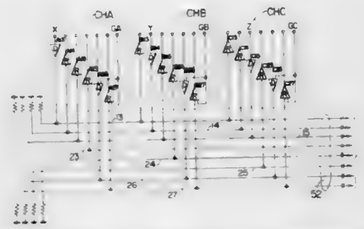


1. The combination of an emergency flasher system which is installed in an automotive vehicle and comprises electric circuit means arranged to furnish a series of signals in response to completion thereof, with a shock responsive activating device including a housing which constitutes an upright cylinder and is secured to the vehicle, a normally open circuit-completing first switch in said housing, an iron plate in said housing, a tiltable activating element disposed at one side of said plate and including a permanent magnet which normally adheres to said plate but permits temporary tilting of said activating element in response to the application of a shock of predetermined magnitude, a normally open second switch in said housing, a relay installed in said housing and including a coil in circuit with said second switch so that said coil is energized on closing of said second switch and a plunger displaceable on energization of said coil to thereby close said first switch and complete said circuit means, said relay further including a spool for said coil, said spool being adjacent to the other side of said plate, movable means for closing said second switch in response to tilting of said activating element to thereby energize said coil, said plate having a central opening for said closing means and said spool also having a central opening for said closing means, a holding circuit for said relay, said first switch including means for completing said holding circuit on closing of said first switch by said plunger, and means for biasing said plunger to a position in which said plunger permits said first switch to open when said coil is deenergized, said spool being disposed between said plate and said first switch and said plunger including a tubular member through which said closing means extends.

4,176,341

INFORMATION TRANSFER APPARATUS

Michio Miyazaki, Odawara, Japan, assignor to Hitachi, Ltd., Japan

Filed Apr. 27, 1977, Ser. No. 791,186
Claims priority, application Japan, May 12, 1976, 51-53297
Int. Cl.² H04Q 9/00
U.S. Cl. 340—147 LP **4 Claims**



1. An information transfer apparatus for connecting between plural channels and at least one input/output control device, comprising a plurality of channel out signal lines each connected to a particular channel to be driven by that particular channel to apply a connection request signal identifying the particular channel to the at least one input/output control device and each of said channel out signal lines also being coupled in common with the remaining channels other than said particular channel to indicate to the remaining channels when the particular channel has applied a connection request signal to the at least one input/output control device.

4,176,342

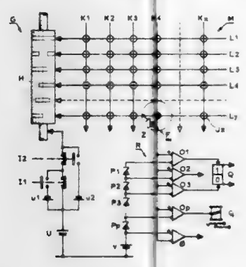
ELECTRICAL CONTROL SYSTEMS FOR TRANSMITTING SIGNALS OF DIFFERENT MAGNITUDES

Andre Gendrot, 78 Boulevard Ornano, 75018 Paris, France

Filed Dec. 22, 1977, Ser. No. 863,323
Claims priority, application France, Dec. 24, 1976, 76 39037
Int. Cl.² H04Q 3/00
U.S. Cl. 340—166 R **9 Claims**

1. In a system for providing controls according to a given code and/or program, a matrix composed of a plurality of mutually insulated electrically conductive lines and a plurality of mutually insulated electrically conductive columns which cross said lines at predetermined locations, and a plurality of connecting means respectively situated at said locations for selectively electrically connecting said lines and columns to each other at said locations where they cross each other, supply means electrically connected with said lines for supplying a given group of input signals thereto, and receiving means electrically connected with said columns for detecting a given group of output signals received from said columns and for

providing predetermined controls in accordance with said group of detected signals received from said columns, said plurality of connecting means respectively including connecting circuits each of which includes a Zener diode connected in an inverse position between a line and column, and said Zener diodes having threshold voltages respectively distributed



among a plurality of different threshold voltages which respectively have different discrete magnitudes, and at least one of said groups of signals also having voltages distributed among a plurality of signal voltages which respectively have different discrete magnitudes corresponding to said magnitudes of said threshold voltages.

4,176,343

PORTABLE REMOTE CONTROL SIGNAL

Charles F. Moore, 3306 Beverly Rd., Baltimore, Md. 21214

Continuation-in-part of Ser. No. 792,778, May 2, 1977, abandoned. This application May 23, 1978, Ser. No. 908,695

Int. Cl.[2] **G08B** *3/00*

U.S. Cl. 340—286 R **8 Claims**



1. A portable remote control signaling device, comprising,

an alarm means;

a remote control means;

an electrical conductor system electrically connected to said alarm means and to said remote control means for activating said alarm means;

said electrical conductor system consisting of:

a first length of two-wire electrical conductor;

an electrical junction box connected to one end of said two-wire electrical conductor;

a first portable base for said junction box and said alarm means;

an electrical transformer affixed to said portable base, with the low voltage side of said transformer being connected to said alarm means, and the high voltage side of said transformer being connected to said junction box;

an electrical plug affixed to the second end of said two-wire electrical conductor;

a second length of two-wire electrical conductor, the first end of which is connected to said remote control means, a second portable base having said remote control means affixed thereto; and

an electrical power source having a plug with a pair of prong-like connecting means on one side thereof, and a pair of sheath-like receptacle connecting means on the opposite side thereof, said prong-like connecting means being electrically connected to said power source, said electrical plug being connected to said second end of first two-wire electrical conductor and being inserted in said sheath-like receptacle connecting means, the first prong of said power source plug being directly connected to a first sheath of said sheath-like receptacles, the second prong of said power source plug being connected within said power-source plug to a first wire of said second two-wire conductor and second wire of said second two-wire conductor being connected to the second sheath of said sheath-like receptables.

4,176,344

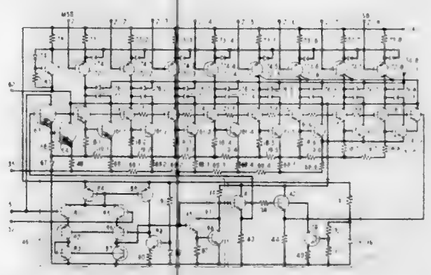
INTEGRATED CIRCUIT BINARY WEIGHTED DIGITAL-TO-ANALOG CONVERTER

Veikko R. Saari, Spring Lake Heights, and Masakazu Shoji, Warren, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 28, 1975, Ser. No. 581,623

Int. Cl.[2] **H03K** *13/02*

U.S. Cl. 340—347 DA **8 Claims**



1. An integrated circuit digital-to-analog converter for developing an analog output signal in response to an applied n-bit digital signal comprising;

a plurality of n transistor current sources S_i, i=1,2, . . . n;

an R-2R ladder network having n sections;

means for connecting the ith section of said ladder network to the emitter electrode of the ith transistor current source, said R-2R ladder network establishing the current level of each of said n transistor current sources so that the current level of the (i+1) transistor current source is I/2 of the current level of the ith transistor current source;

a plurality of n switching means, T_i, i=1,2, . . . n, each switching means, T_i, responsive to the ith bit signal of said applied n-bit digital signal, each switch T_1 connecting each current source S_i to an output terminal of said digital-to-analog converter circuit whenever said i^{th} bit signal assumes a predetermined binary quantity;

a plurality of n-1 resistors, R_i, i=1,2, . . . (n-1), having substantially equal resistance values, each resistor R_i connected between the base electrodes of transistor current sources S_i and $S_{(i+1)}$;

an additional transistor current source having substantially the same transistor geometry as said n transistor current sources, the base electrode of said additional current source connected to the base electrode of transistor current source S_i;

an additional R-2R ladder section connected to said n section R-2R ladder network and to the emitter electrode of said additional transistor current source transistor;

a temperature-dependent voltage supply circuit including a

first and second transistor with the collector electrodes thereof connected to a first bias terminal and the emitter electrodes thereof respectively connected to a second bias terminal by a first and second resistor, a third resistor connected between said first bias terminal and the base electrode of said first transistor, a fourth resistor connected between the base electrodes of said first and second transistors, and a third transistor with the collector electrode thereof connected to said base electrode of said second transistor and the emitter electrode of said third transistor connected to said second bias terminal by a fifth resistor;

said emitter of said first transistor further connected to said base electrode of said additional transistor current source, and said emitter electrode of said second transistor further connected to the base electrode of transistor current source Sn;

circuit means for supplying a predetermined voltage to the base electrode of said third transistor; and

an operational amplifier circuit having an inverting input terminal, a noninverting input terminal, and an output terminal, said noninverting input terminal commonly connected to a reference terminal and to the collector electrode of said additional transistor current source, said inverting input terminal connected to a terminal of fixed potential, and said operational amplifier output terminal connected to the base electrode of said first transistor.

4,176,345

REFLECTING ELECTROSTATIC DISPLAY CELL

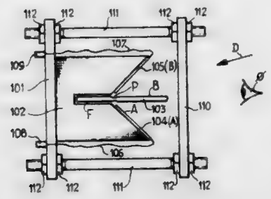
François Micheron, and Jean-Luc Bruneel, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 3, 1978, Ser. No. 866,340

Claims priority, application France, Jan. 4, 1977, 77 00077

Int. Cl.[2] **G08B** *5/00*

U.S. Cl. 340—373 **16 Claims**



1. A reflecting electrostatic display cell for presenting under the control of a control signal two stable configurations, said cell comprising:

a dihedral block having two dihedral surfaces departing from a dihedral edge;

two electrodes extending onto respectively said two dihedral surfaces;

an electret member having a permanently applied electrostatic charge secured to said edge; and

means for electrically coupling said control signal to said electrodes.

4,176,346

SMOKE ALARM NETWORK

Arven Johnson, Kansas City, North, and Willene Stapleton, Platte City, both of Mo., assignors to John O. Stapleton, Platte City, Mo., a part interest

Filed Nov. 21, 1977, Ser. No. 853,119

Int. Cl.[2] **G08B** *25/00, 17/10*

U.S. Cl. 340—524 **10 Claims**

1. A smoke alarm network comprising:

(a) a plurality of stations;

(b) a smoke alarm unit operatively installed at each of said stations, said unit including in a common housing a smoke alarm circuit having an electrical output upon detection of smoke thereby, and an alarm sounding device connected to said circuit within said housing and powered by said electrical output to give audible warning at the station thereof, said smoke alarm unit including means for the remote activation of said sounding device in the absence of smoke;

(c) a control panel remote from said stations;

(d) alarm indicators on said control panel, said alarm indicators being associated respectively with said stations;

(e) switching means having each smoke alarm circuit, each sounding device and means for remote activation thereof,



and each alarm indicator connected thereto, said switching means effecting activation of said alarm indicator in response to the electrical output from said smoke alarm circuit, and said switching means cooperating with the means for remote activation of said sounding device;

(f) a network power source connected to said switching means and providing operating power therefor; and

(g) alert switch means on said control panel, connected to said switching means, and operable to effect the remote activation of selected sounding devices not already activated by the electrical outputs of associated smoke alarm circuits.

4,176,347

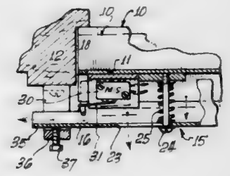
RESTRAINING BAR WITH ALARM

Lorraine E. McIntyre, 828 S. Los Robles, Pasadena, Calif. 91106

Filed May 9, 1977, Ser. No. 794,826

Int. Cl.[2] **G08B** *13/06*

U.S. Cl. 340—545 **9 Claims**



1. An alarm device mounted between a door and its latch frame-casement and activated by a slight movement of the door from its closed position when the device is in its locked configuration, said alarm device comprising:

an inwardly opening door having an inside surface and an outside surface, said door being mounted in a doorframe having a hinge-frame casement and a latch frame casement;

support means affixed against the inside surface of the door;

bar means pivotally and slidingly held by said support means near the end of said support means which is farthest from the latch-frame casement, said bar means being held against the inside surface of the door and having one end

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affixed in a detachable manner to said latch-frame casement;

switch means held between said support means and said bar means, said switch means being activated by a slight movement of said bar means toward said support means; and

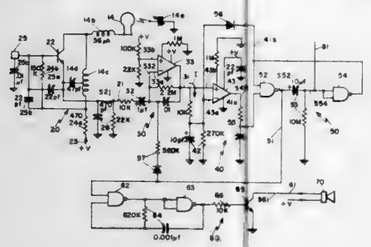
alarm means activated by said switch means whereby an attempt to open said door, when said bar means is affixed to said latch-frame casement, causes said alarm to sound.

4,176,348

ELECTRONIC SECURITY DEVICE

Joseph J. Tobin, San Marcos; David B. Robinson, Carlsbad; Robert L. Peay, Encinitas; Jerry R. Powell, Vista, and Leslie W. Gay, Escondido, all of Calif., assignors to Coded Communications, Carlsbad, Calif.

Filed Mar. 30, 1978, Ser. No. 891,505
Int. Cl.[2] G08B *13/26*
U.S. Cl. 340—562 **14 Claims**



1. A portable electronic device for detecting the presence of absence of objects, said device being comprised of first circuit means for capacitively coupling to any objects within a zone surrounding said first circuit, second circuit means connected to said first circuit means for generating output signals indicating changes in said capacitive coupling, and third circuit means connected to said second circuit means for receiving said output signals and for taking predetermined action when said output signals indicate an intrusion of objects into or movement of objects within said zone, wherein said first circuit means is an antenna comprised of a wire in the shape of a loop for placement onto a doorknob and wherein said wire is covered with an insulator such that said antenna capacitively couples to said doorknob without being in physical contact therewith.

4,176,349

INTRAVENOUS ALARM SYSTEM

Martin S. Fliegel, 8213 Oakdale Ave., Canoga Park, Calif. 91306

Filed Dec. 5, 1977, Ser. No. 857,291
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—613 **9 Claims**

1. A monitoring apparatus comprising:

(a) a container having a top member and a bottom member;

(b) an attaching member for attaching said container to an associated support such that said container extends downward thereform in a generally vertical configuration, said attaching member coupled to said container adjacent said top member;

(c) a plurality of electrical sockets disposed through said container, each said socket adapted to accept an associated electrical plug;

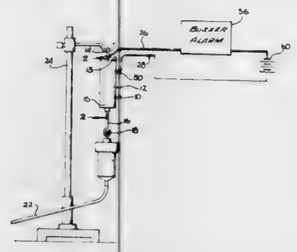
(d) an elongated suspension member slideably disposed in said container adjacent to and extending through said bottom member, said suspension member having:

(i) a shaped section arranged and configured to selectively engage a dispensing container, said shaped section disposed on said suspension member adjacent the bottom thereof, and

(ii) an actuator disposed on said suspension member adjacent the top thereof and having an electrically conductive surface, said surface arranged and configured to selectively engage said electrical plug;

(e) a helical spring disposed in said container, circumferically disposed about said suspension member so as to be journalled between said actuator and said bottom of said container; and

(f) an alarm circuit system, said alarm system having an alarm device electrically coupled to said electrical plug, said electrical plug arranged and configured to be selectively disposed in one of said sockets and extend through said container so as to limit the upward movement of said suspension member by selectively engaging said conductive surface on said actuator, said alarm system further being electrically coupled to said conductive surface on said actuator whereby when said suspension member and said actuator are disposed downward, said helical spring is compressed and said actuator disengages said electrical plug thereby deactivating said circuit, and when said suspension member slideably travels upward toward said top member of said container, said upward movement is stopped upon engagement of said conductive surface with said electrical plug thereby activating said alarm device.

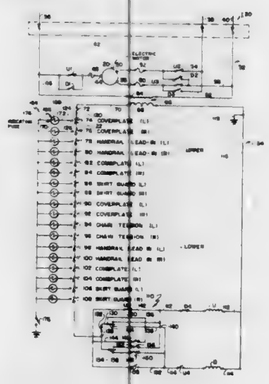


4,176,350

INDICATOR TO SHOW WHETHER A SWITCH HAS OPENED

Billy J. Patterson, 6326 Hanley, Corpus Christi, Tex. 78412

Filed May 18, 1977, Ser. No. 798,108
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—644 **18 Claims**



1. A machine comprising

an electric motor and a circuit for energizing the motor;

a multiplicity of normally closed switches in the circuit for monitoring the operation of the machine any one of which opens in response to the occurrence of an event to shut off the motor and which are capable of reclosing in response to the cessation of the event to place the motor in a condition to restart;

means enabling restarting of the motor upon reclosing of an opened switch; and

means for indicating which of the multiplicity of switches has opened regardless of whether the open switch has reclosed, including a multiplicity of indicators each of which comprises conductive means in circuit with an associated one of the switches in the switch open position which is rendered nonconductive upon opening of its associated switch and upon passage of a given electrical load therethrough and means rendered distinctly different in appearance upon passage of the given electrical load through the conductive means;

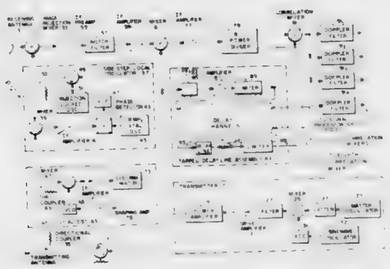
each associated switch being arranged in circuit with its associated conductive means for delivering the given electrical load therethrough upon switch opening.

4,176,351

METHOD OF OPERATING A CONTINUOUS WAVE RADAR

Alphonse J. DeVita, Chelmsford; Earl J. Koester, Bedford; David V. Manoogian, Lynnfield, and Stanley Sharenson, Stoneham, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Aug. 18, 1978, Ser. No. 935,051
Int. Cl.[2] G01S *9/37, 9/44*
U.S. Cl. 343—9 R **3 Claims**



1. The method of operating a continuous wave radar to allow measurement of range and range rate of a moving target in the presence of clutter, such method comprising the steps of:

(a) frequency modulating a radio frequency carrier with a sinusoidal modulation signal and transmitting the resulting signal;

(b) downconverting echo signals to first intermediate frequency signals in a band centered on a first intermediate frequency and attenuating any echo signals adjacent such frequency;

(c) upconverting the remaining portions of the first intermediate frequency signals to produce second intermediate frequency signals and correlating such signals with differently delayed replicas of the sinusoidal modulation signals to produce a plurality of correlation signals;

(d) time multiplexing, in accordance with the Doppler frequency of the individual correlation signals, the frequency components of each one of the correlation signals to produce successive sets of target indicating signals; and

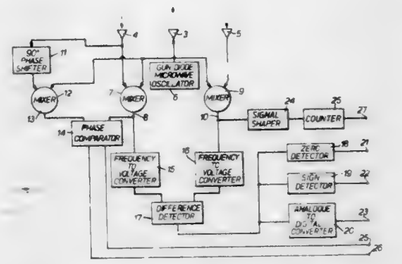
(e) processing the target indicating signals to determine the range and range rate of a target.

4,176,352

APPARATUS FOR DERIVING INFORMATION CONCERNING THE MOVEMENTS OF A VEHICLE

Ronald A. Tyler, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Dec. 31, 1975, Ser. No. 645,714
Claims priority, application United Kingdom, Jan. 2, 1975, 15/75
Int. Cl.[2] G01S *9/50*
U.S. Cl. 343—9 R **1 Claim**



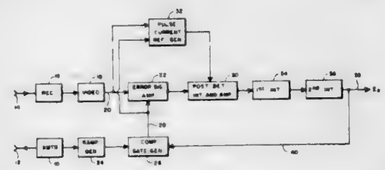
1. An apparatus for deriving information concerning the movements of a surface-borne vehicle comprising means for illuminating the surface over which the vehicle is to travel with electro-magnetic energy, means for receiving reflected electro-magnetic energy from a portion of said illuminated surface to one side of a line extending along the length of said vehicle, means for receiving electromagnetic energy from another portion of said illuminated surface to the other side of said line, means for deriving the Doppler frequency components in the energy received by each receiving means, means for utilizing said two Doppler frequency components to provide information concerning the movement of said vehicle over said surface, means provided for feeding, via a 90° phase shifter, a portion of the electro-magnetic energy received by one of said receiving means to a further means for deriving the Doppler frequency component therein and phase comparator means having one input derived from said further Doppler frequency component deriving means and a second input derived from that one of said first-mentioned two Doppler frequency component deriving means which is associated with that one of the receiving means, whereby said last-mentioned phase comparator provides one output signal if said vehicle is travelling in a forward directon and a different output signal if said vehicle is travelling in a reverse direction, in dependence upon the phase relationship of the signals at its input.

4,176,353

RADAR ALTIMETER TRACKING CIRCUIT APPARATUS

Robert P. Pearson, Roseville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 747,667, Dec. 6, 1976, abandoned. This application Feb. 24, 1978, Ser. No. 880,909
Int. Cl.[2] G01S *9/12*
U.S. Cl. 343—12 A **7 Claims**



4. A radar altimeter for determining the altitude of a craft

above a surface which altimeter includes a signal transmitter, a signal receiver which is adapted to produce a return signal following a signal transmission by the signal transmitter and a closed loop tracking circuit, the improvement comprising:

a gate pulse generator connected in said tracking circuit to form a part thereof and to an output of said transmitter to produce a gate signal pulse positioned in time to represent a previous altitude determination;

pulse signal comparison means connected in said tracking circuit to form a further part thereof and to receive on inputs thereof a return signal from said signal receiver and a signal from said gate pulse generator to produce a control signal having an amplitude indicative of any signal overlap between said return signal and said gate signal pulse;

a reference pulse generating source connected to said pulse signal comparison means and having an output signal whose amplitude represents a predetermined standard for comparison with said control signal from said pulse signal comparison means;

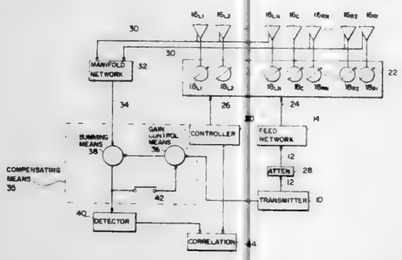
and reference signal control means connected to activate said signal reference pulse generating source only upon the occurrence of an input control signal.

4,176,354

PHASED-ARRAY MAINTENANCE-MONITORING SYSTEM

James K. Hsiao, Oxon Hill, Md., and J. Paul Shelton, Arlington, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 25, 1978, Ser. No. 937,310
Int. Cl.[2] G01S *7/40*
U.S. Cl. 343—17.7 **8 Claims**



1. In a radar system of the type wherein radio-frequency signals generated by a transmitter are propagated in a desired radiation pattern from an array antenna including a plurality of radiating elements, each radiating element having a different associated phase-shifting element, a maintenance monitoring system comprising:

control means for controlling the initial settings of the phase-shifting elements to provide an initial radiation pattern and thereafter selectively controlling the settings of the phase-shifting elements associated with symmetrically located pairs of radiating elements;

manifold means for receiving a portion of the signals radiated from each of said radiating elements and having an output, said manifold means operating on input signals to cause the signals received during the initial radiation pattern from symmetrically located radiating elements to differ by 180° at said output;

compensating means, coupled to the output of said manifold means, for providing an adjustment signal which combines with said output signal to adjust said output signal to approximately zero during said initial radiation pattern, said adjustment signal being maintained at the value which provided said zero output signal during said initial radiation pattern; and

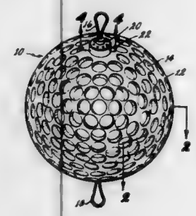
detection means coupled to said adjusted output signal for indicating said adjusted output signal.

4,176,355

RADIATION REFLECTING TARGET SURFACE

Stanley R. Harris, 710 Washington St., Venice, Calif. 90291

Filed Jan. 12, 1978, Ser. No. 868,893
Int. Cl.[2] H01Q *15/18*
U.S. Cl. 343—18 C **20 Claims**



1. A radiation reflector target for use on substantially non-reflective objects, comprising:

a radar reflective sphere having a substantially spherical surface;

a plurality of radar reflective dimples indented from said substantially spherical surface, each dimple having a right angle corner and defining an opening substantially at the surface of said sphere which opening defines a maximum cross-dimension less than the wavelength of radar frequencies to be received; and

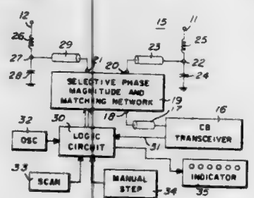
mounting means rotatably coupled to said sphere, and extending beyond said sphere, for connecting said target to an object.

4,176,356

DIRECTIONAL ANTENNA SYSTEM INCLUDING PATTERN CONTROL

L. Curtis Foster, Barrington Hills, and Carl E. Lindholm, North Barrington, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 27, 1977, Ser. No. 810,234
Int. Cl.[2] H04B *7/00*
U.S. Cl. 343—100 CS **49 Claims**



1. A directive antenna system comprising:

a motor vehicle movable in a straight line direction;

first transceiver communication means carried by said motor vehicle and operative at a first frequency for establishing communications with a site remotely located from said first communication means;

second communication means carried by said vehicle and operative at a second frequency for establishing communications with other remote sites;

a plurality of at least two antenna elements mounted to said vehicle and selectively coupled to said first and second communication means for providing radiation patterns for said first and second communication means;

said two antenna elements positioned on said motor vehicle at approximately one quarter of a wavelength apart at the operating frequency of said first transceiver communication means, said two antenna elements mounted along a line substantially parallel to the straight line direction of movement of the motor vehicle;

means including a network coupled to said antenna elements for selectively generating and maintaining any one of a plurality of at least two discrete directive radiation patterns for said first transceiver communication means by simultaneously utilizing said two antenna elements while selectively providing various phase differences between said utilized antenna elements and simultaneously providing for substantially equal magnitude current coupling between said utilized antenna elements and said first communication means, said network also selectively utilizing each one of said two antenna elements to simultaneously generate a separate radiation pattern for each of said first and second communication means, respectively,

said plurality of directive radiation patterns for said first communication means including at least two radiation patterns which have substantial nulls directed in substantially different directions;

first means for indicating which one of said plurality of directive radiation patterns is selectively generated for said first communication means; and

second means for indicating the magnitude of a desired signal transmitted at said remote site and received by said first communication means in the selected directive radiation pattern; and

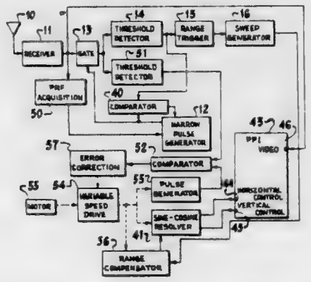
means coupled to said network for automatically selecting one of said directive radiation patterns as an optimum pattern for said first communication means, said automatically selected optimum radiation pattern corresponding to the one pattern of said plurality of directive patterns in which a desired signal is most strongly received by said first communication means.

4,176,357

PASSIVE METHOD AND APPARATUS FOR RADAR LOCATING AND PARASITIC SURVEILANCE

David Fales, III, Baltimore, Md., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Jan. 25, 1960, Ser. No. 4,563
Int. Cl.[2] G01S *5/02*
U.S. Cl. 343—112 R **20 Claims**



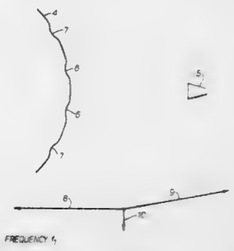
1. Receiving apparatus capable of passively locating a remote emitting radar comprising, receiving means for intercepting and amplifying the pulses and echo signals from the radar so as to produce a video output, gate circuit means connected to receive said video output, gate control circuit means connected to energize said gate circuit means when reception of unreflected main power pulses from the emitting radar is anticipated so that the output of said gate circuit will be a series of pulses corresponding to said main power pulses, range sweep circuit means connected to receive said series of pulses from said gate circuit means and to produce a range sweep output for each of said pulses, indicator means connected to receive said range sweep output, circuit means designed to produce an azimuth sweep output in synchronization with each of said main power pulses received with maximum amplitude from the emitting radar, said azimuth sweep circuit means being connected so as to introduce said azimuth sweep output to said indicator means, and means for connecting said video output of said receiving means to said indicator means, said indicator means being designed to correlate said range sweep output, said azimuth sweep output, and said video output so as to present an indication representative of the radar map that could be observed at the emitting radar whereby the location of the emitting radar can be passively determined and the area surrounding the radar can be kept under passive surveillance.

4,176,358

REFLECTOR ANTENNA WITH MATCHED FEED SYSTEM

Peter J. Wood, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Nov. 17, 1977, Ser. No. 852,483
Claims priority, application United Kingdom, Nov. 18, 1976, 48030/76
Int. Cl.[2] H01Q *19/14*
U.S. Cl. 343—782 **10 Claims**



1. An antenna suitable for operation in at least two bands centered on respective frequencies comprising a circularly symmetric reflector arranged to be illuminated from a feed source of electromagnetic radiation and characterised in that the reflector has a number, equal to the number of bands, of perturbation reflectors arranged about the center of symmetry of the reflector, which perturbation reflectors being arranged integrally with the circularly symmetric reflector and in which the radial width of the perturbation reflectors and the displacement of their reflecting surfaces from the nominal profile of the reflector are small as compared with the radial distance between different adjacent perturbation reflectors, each perturbation reflector being arranged to provide a respective perturbation reflection having a magnitude dependent on the size of that perturbation reflection and a phase dependent on the position of the perturbation reflection such that at the feed source the magnitudes and phases of the perturbation reflections combine, at each frequency, substantially to cancel out the reflection due to the nominal profile of the reflector.

4,176,359

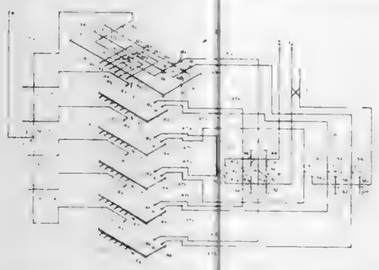
MONOPULSE ANTENNA SYSTEM WITH INDEPENDENTLY SPECIFIABLE PATTERNS

Matthew Fassett, Billerica; Seymour B. Pizette, Framingham, and John F. Toth, Billerica, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jul. 18, 1977, Ser. No. 816,421
Int. Cl.[2] H01Q *3/26*
U.S. Cl. 343—854 **4 Claims**

1. A monopulse antenna adapted to provide independently specifiable sum, azimuth and elevation antenna patterns, such antenna comprising:

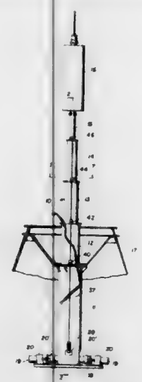
(a) a plurality of rows of antenna elements;
(b) a plurality of feed networks, each one thereof coupled to a corresponding one of the rows of antenna elements and having: First, second and third feed ports; and means for coupling energy between the feed ports and the antenna elements coupled thereto with three independent amplitude and phase distributions, each one of such feed networks comprising:
(i) a first coupling network coupled to the first and second feed ports and having a plurality of output ports;
(ii) a second coupling network coupled to the third feed port and having a plurality of output ports; and
(iii) a plurality of couplers, each one having an "in phase" port, an "out of phase" port and a pair of output ports, the "in phase" ports of the plurality of couplers being



connected to the plurality of output ports of the first coupling network, the "out of phase" ports of the plurality of couplers being connected to the plurality of output ports of the second coupling network, a first one of the pair of output ports of the couplers being coupled to a first portion of the antenna elements in the row coupled thereto and a second one of the pair of output ports of the couplers being coupled to a second portion of the antenna elements in the row coupled thereto, the first and second portions of antenna elements being disposed symmetrically about an azimuth axis; and
(c) means for coupling energy between the first, second and third feed ports of the plurality of feed networks and sum, azimuth and elevation antenna ports with independent amplitude and phase distributions to provide the independent sum, azimuth and elevation antenna patterns.

4,176,360
ANTENNA DEPLOYMENT MECHANISM FOR USE WITH A SPACECRAFT
William A. Leavy, and Charles R. Griffin, both of Bowie, Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Sep. 18, 1978, Ser. No. 943,088
Int. Cl.[2] H01Q *1/10, 1/12*
U.S. Cl. 343—883 **17 Claims**

1. In an antenna structure, a relatively stationary support, a multi-section extensible and retractable antenna mast including base, intermediate mast sections and an innermost mast section having telescoping engagement, the base section of said antenna mast being fixed to said support, power drive means connected with said base section and including a rotary drum, a flexible element engaging said drum and windable thereon and being reeved over guide elements of the base and intermediate antenna mast sections, a terminal member for the ends of said flexible element and fixed thereto and spanning the interior end of the innermost mast section and adapted to drive the innermost mast section outwardly to a deployed position when the flexible element is wound on said drum, a caging means for said innermost mast section including at least a bolt on said base section having cam faces and extending transversely of the antenna mast axis, and a cooperating two part latch on the innermost mast section including a yielding lost motion connection between the two parts of the latch, and said terminal member being engaged drivingly with one of said two parts to effect relative movement between the two parts during initial



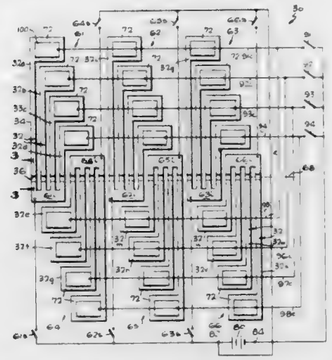
winding of the flexible element on said drum, and said two parts having camming faces for cooperation with said cam faces of said bolt to automatically release the caging means during deployment of the antenna structure.

4,176,361
INK COMPOSITION FOR INK JET PRINTING
Hiroh Kawada; Kiyoshi Goto, and Yoshio Kurita, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Filed May 12, 1976, Ser. No. 685,629
Claims priority, application Japan, May 22, 1975, 50-61691
Int. Cl.[2] C09D *11/00*; G01D *9/00, 15/20*
U.S. Cl. 346—1.1 **4 Claims**

1. In an ink jet printing method, the improvement comprising using, as the printing ink, an ink composition consisting essentially of
a water soluble dye in an amount of 2–12 weight %, and
a mixed solvent consisting of water and 40–80% by weight of said composition of a polyhydric alcohol selected from the group consisting of ethylene glycol, propylene glycol, trimethylene glycol, glycerine, 1,3-butanediol, 2,3-butanediol, 1,4-butanediol, diethylene glycol, 1,5-pentanediol, hexylene glycol, triethylene glycol, dipropylene glycol and 1,2,6-hexanetriol,
said composition having a viscosity of 4 to 20 centipoises at 25° C.

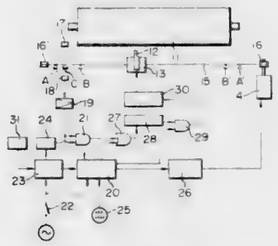
4,176,362
HIGH DENSITY MAGNETIC IMAGE RECORDING HEAD
Alfred M. Nelson, Redondo Beach, Calif., assignor to AM International, Inc., Los Angeles, Calif.
Continuation-in-part of Ser. No. 594,583, Jul. 10, 1975, Pat. No. 4,025,927. This application Jan. 10, 1977, Ser. No. 758,018
Int. Cl.[2] G03G *19/00*; G06K *15/14*; G01D *15/12*
U.S. Cl. 346—74.1 **10 Claims**

1. A recording apparatus comprising:
a plurality of recorder elements having substantially parallel strip portions, each strip portion having a recording location therealong, said recording locations arranged a selected distance from each other substantially along an imaginary recording line which extends substantially perpendicular to said strip portions, a plurality of said recorder elements arranged in a group and a plurality of groups spaced along said recording line with the elements in each group having a common interconnect region on a first side of said recording line and with each element of the group having a separate terminal on a second side of said recording line;
a plurality of cross conductors, each coupled to a selected terminal within each group of elements;
a plurality of common region switch means, each coupled to a different one of said common interconnect regions; and
a plurality of cross conductor switch means, each coupled to a different one of said cross conductors;



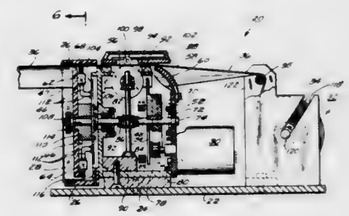
the common region switch means and the cross conductor switch means being disposed such that a source of electricity may be connected between said common region switch means and said cross conductor switch means to apply a current through one of said recorder elements when the particular common region switch means and cross conductor switch means which are both coupled to that recorder element are simultaneously in a closed state.

4,176,363
INK JET PRINTING APPARATUS
Tadashi Kasahara, Tokyo, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Filed Jun. 14, 1978, Ser. No. 915,550
Claims priority, application Japan, Jun. 25, 1977, 52-74948
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—140 R **7 Claims**



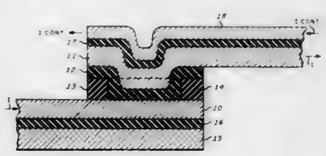
1. In an ink jet printing apparatus wherein a printing head having a plurality of parallel nozzles is moved relatively to a recording medium, and ink droplets are projected selectively from the individual nozzles for printing: the improvement characterized in that the printing head is able to be shifted to an ink-failure preventive ejection position located at a point deviated from the printing region of the recording medium, and a timer for generating a timing signal and a detector for detecting the setting of the printing head at the ink-failure preventive jet position are provided, wherein a print controller for controlling both the relative motion of the printing head to the recording medium and the selective ink ejection from the nozzles in response to print instruction signals is further enabled to control the displacement of the printing head to the ink-failure preventive ejection position in accordance with the timing signal of the timer, also the ink-failure preventive ejection from each nozzle in accordance with the output signal of the detector, and subsequent return of the printing head to the former position to resume the printing.

4,176,364
GROUNDING DEVICE FOR ROTARY ELECTRICAL PRINTER AND METHOD
Olin B. King, Huntsville, Ala., assignor to SCI Systems, Inc., Huntsville, Ala.
Division of Ser. No. 611,785, Sep. 9, 1975, Pat. No. 4,100,551. This application Mar. 22, 1978, Ser. No. 888,966
Int. Cl.[2] G01D *15/08*
U.S. Cl. 346—162 **3 Claims**



1. In a rotary electrical discharge printer having a rotor, a plurality of styli projecting from said rotor, a voltage supply connected at one terminal to said styli, means for moving electrical discharge-sensitive sheet recording material across said rotor in contact with said styli, an electrical contact brush for said material comprising an electrically conductive helical spring positioned on the same side of said material as said styli and extending transversely of the direction of recording material movement to contact and press against said material, and means for connecting said spring to the return terminal of said voltage supply.

4,176,365
JOSEPHSON TUNNEL JUNCTION DEVICE WITH HYDROGENATED AMORPHOUS SILICON, GERMANIUM OR SILICON-GERMANIUM ALLOY TUNNELING BARRIER
Harry Kroger, Sudbury, Mass., assignor to Sperry Rand Corporation, New York, N.Y.
Filed May 8, 1978, Ser. No. 904,051
Int. Cl.[2] H01L *39/22*
U.S. Cl. 357—5 **17 Claims**



1. A Josephson tunnel junction device comprising
first and second layers of superconductive material superposed with respect to each other, and
a barrier layer superposed between said first and second superconductive layers whereby Josephson tunneling

current can flow therethrough between said superconductive layers,

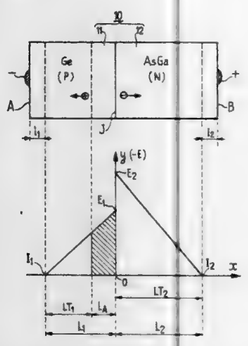
said barrier layer comprised of hydrogenated amorphous semiconductor material selected from the group consisting of silicon, germanium and alloys thereof.

4,176,366

AVALANCHE TRANSIT TIME DIODE WITH HETEROJUNCTION STRUCTURE

Daniel Delagebeaudeuf, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 24, 1978, Ser. No. 871,881
Claims priority, application France, Jan. 28, 1977, 77 02454
Int. Cl.[2] H01L *29/267, 29/90;* **H03B** *9/12*
U.S. Cl. 357—16 **4 Claims**



1. An avalanche transit time diode with heterojunction structure comprising a first zone made of monocrystalline germanium doped in one type of conductivity and a second zone made of gallium arsenide doped in the opposite type of conductivity, the impurity concentrations in atoms per cubic centimeter K_1 and K_2 of the respective first and second zones being bound by the relationship:

$$K_2 > 6.3 \times 10^{-6} (K_1)^{1.3},$$

where

$$K_2 \geq K_1$$

with the result that the avalanche zone is located in the first zone.

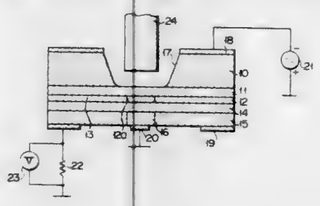
4,176,367

SEMICONDUCTOR OPTICAL DEVICE

Yutaka Uematsu, Yokosuka, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 10, 1978, Ser. No. 885,128
Claims priority, application Japan, Mar. 24, 1977, 52-31034
Int. Cl.[2] H01L *31/12, 33/00*
U.S. Cl. 357—19 **6 Claims**

1. A semiconductor optical device comprising a one-conductivity type semiconductor body through a portion of which light passes; a first semiconductor layer of the other conductivity type formed on one surface of the body to provide a pn junction therebetween and having a light emission section; a second semiconductor layer of said one conductivity type formed on said first semiconductor layer; a region formed in said second semiconductor layer to form a pn junction therebetween and having one end electrically connected to said first semiconductor layer and the other end exposed, said pn junction having a photoelectric conversion function; a first electrode formed on said body to permit a signal entry; a second electrode formed on said second semiconductor layer to permit the signal to be taken therefrom; and a third electrode formed on said region, said portion of the semiconductor body,



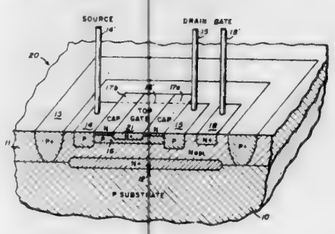
light emission section and region being arranged on the same line.

4,176,368

JUNCTION FIELD EFFECT TRANSISTOR FOR USE IN INTEGRATED CIRCUITS

James B. Compton, Los Gatos, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 10, 1978, Ser. No. 949,831
Int. Cl.[2] H01L *29/80*
U.S. Cl. 357—22 **10 Claims**



1. A junction field effect transistor for incorporation into a bipolar semiconductor integrated circuit substrate, said transistor comprising:

a gate region of one conductivity type into which said transistor is to be fabricated;

a pair of spaced apart regions of the opposite conductivity type extending into said gate region from the surface thereof, said spaced apart regions forming source and drain electrodes in said transistor;

a subsurface channel of said opposite conductivity type extending between said pair of spaced apart regions, said channel extending to a depth in said semiconductor that is substantially less than the depth of said spaced apart regions;

a first ion implanted surface layer of said one conductivity type completely covering and overlapping said channel so as to form an ohmic connection with said gate region, said first ion implanted surface layer having a thickness that is small relative to the thickness of said channel;

a second ion implanted surface layer of said one conductivity type located in the space between said spaced apart regions and extending to completely span said channel thereby to make an ohmic connection to said gate region, said second ion implanted surface layer having a substantially greater conductivity and extending below said surface to a greater extent than said first ion implanted surface layer; and

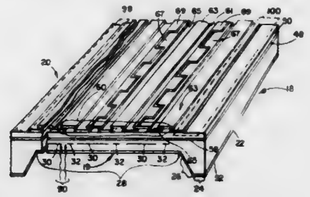
ohmic connections to said pair of spaced apart regions and said gate region to complete said source, drain, and gate electrodes.

4,176,369

IMAGE SENSOR HAVING IMPROVED MOVING TARGET DISCERNMENT CAPABILITIES

Richard D. Nelson, Santa Ana, and A. James Hughes, Tustin, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 5, 1977, Ser. No. 857,633
Int. Cl.[2] H01L *29/78, 31/00*
U.S. Cl. 357—24 **7 Claims**



1. An image sensor comprising:

semiconductor means capable of supporting charge transfer device action;

said semiconductor means being photosensitive to electromagnetic radiation having a wavelength within a predetermined range of interest and photogenerating charge carriers upon photoresponsive absorption of a photon having a wavelength within said predetermined range;

said semiconductor means having front and back surfaces;

said back surface adapted to receive image information in the form of electromagnetic radiation having wavelengths within said predetermined range;

a plurality of buried charge collection means for collecting and temporarily storing photogenerated charge carriers; and

at least two line array charge transfer device means disposed along said front surface of said semiconductive means, wherein each of said at least two line array charge transfer devices means is capable of receiving photogenerated charge selectively and controllably transferred directly thereto from a selected one of said buried charge collection means, said charge transfer device means comprising:

dielectric means disposed on said front surface of said semiconductor means;

a first plurality of charge transfer device control electrode means constituting a first multiphase set disposed on said dielectric means for controlling the transport of charge in a first one of said at least two charge transfer device means;

a second plurality of charge transfer device control electrode means constituting a second multiphase set disposed on said dielectric means for controlling the transport of charge in a second one of said at least two charge transfer device means;

a plurality of charge transfer channel separation means dividing the portion of said semiconductor means in the vicinity of said front surface into at least first and second charge transfer channels, wherein the transport of charge in said first charge transfer channel is controlled by said first plurality of control electrode means and wherein the transport of charge in said second charge transfer channel is controlled by said second plurality of control electrode means;

wherein said first and said second charge transfer channels are each capable of receiving photogenerated charge selectively and controllably transferred thereto from said selected one of said buried charge collection means;

wherein a selected one of said first plurality of charge transfer device control electrode means is capable of transferring a first packet of photogenerated charge from said selected one of said buried charge collection means into said first charge transfer channel;

wherein a selected one of said second plurality of charge transfer device control electrode means is capable of transferring a second packet of photogenerated charge from said selected one of said buried charge collection means into said second charge transfer channel;

wherein said first packet of photogenerated charge may be collected in said selected one of said buried charge collection means over a first time interval distinct from a second time interval in which said second packet of photogenerated charge is collected in said selected one of said buried charge collection means; and

output means for converting charge transported within said charge transfer channels to externally utilizable signals;

wherein said charge collection means is disposed a predetermined distance from said front surface of said semiconductor means, said predetermined distance being large enough to minimize undesired charge communication between charge on said charge collection means and charge in said charge transfer device means and small enough to enable photogenerated charge carriers collected by said charge collection means to be controllably transported from said charge collection means to said charge transfer device means for transportation from said charge collection means to said output means.

6. A charge transfer device array comprising:

a plurality of array charge transfer channels aligned parallel to a first direction, said array channels separated by first channel stop means, said plurality comprising a first plurality of array channels interleaved with at least a second plurality of array channels;

a multiphase set of array CTD charge transfer control electrodes disposed for controlling the potentials within said array channels,

wherein said plurality of array charge transfer channels and said multiphase set of array CTD charge transfer control electrodes constitute a plurality of array charge transfer devices;

wherein control electrodes of at least one phase of said set of array CTD charge transfer control electrodes constitute at least two subsets of electrodes interdigitated with each other, a first subset of electrodes controlling the potential within the portions of said first plurality of array channels thereunder and a second subset of electrodes controlling the potential within the portions of said second plurality of array channels thereunder;

at least first and second output charge transfer devices, each having an output channel aligned substantially parallel to a second direction which is substantially perpendicular to said first direction;

said first output CTD adapted to accept charge from said first plurality of array channels;

said second output CTD adapted to accept charge from said second plurality of array channels;

wherein said plurality of array channels are free of channel stops therein; and

wherein said first subset of electrodes are capable of selectively controlling the potential within said first plurality of array channels to selectively transfer charge along said first plurality of array channels independently of charge transfer along said second plurality of array channels.

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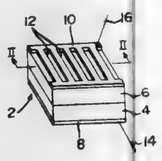
PHOTOVOLTAIC CONVERTER

Nobuyuki Koguchi, and Katashi Masumoto, both of Tokyo, Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Filed Feb. 22, 1978, Ser. No. 880,160
Claims priority, application Japan, Feb. 24, 1977, 52-18677
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—30 **3 Claims**

1. Photovoltaic converter comprising a main unit consisting of a p-n heterojunction of a p- or n-type magnetic semiconductor MCr_2X_4 in which M represents any one of Zn, Cd and Hg

and X represents any one of O, S, Se and Te and an n- or p-type semiconductor $M'In_2S_4$ in which M' represents anyone of Zn, Cd and Hg and which has an optical absorption edge at a shorter wavelength than the optical absorption edge of the



semiconductor MCr_2X_4; a first electrode ohmically fixed to the surface of the semiconductor MCr_2X_4; and a second electrode fixed ohmically to the surface of the semiconductor $M'In_2S_4$ and allowing light to reach the surface of the semiconductor $M'In_2S_4$.

4,176,371

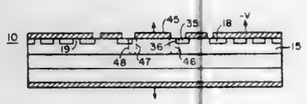
THYRISTOR FIRED BY OVERVOLTAGE

Earl S. Schlegel, Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 647,824, Jan. 9, 1976, abandoned. This application Nov. 3, 1977, Ser. No. 848,007

Int. Cl.[2] H01L *29/74*

U.S. Cl. 357—38 **7 Claims**



1. A thyristor adapted to fire in response to a predetermined forward overvoltage, comprising:

a body of semiconductor material having first and second outer surfaces with four impurity regions of alternative type conductivity disposed in PN junction relationship;

said regions being a cathode emitter region and a cathode base region, each having surfaces forming a portion of the first outer surface of the body, an anode base region and an anode emitter region, said anode emitter region having a surface forming at least a portion of the second outer surface of the body;

said cathode emitter region including an inner auxiliary portion and an outer main portion, said auxiliary portion being disposed to form the central portion of the first outer surface and having an outer boundary of predetermined dimension, and said main portion being radially spaced from the inner portion with at least a portion of the cathode base region forming the first outer surface of the body between the auxiliary and main cathode emitter regions;

an extra diffused impurity region of the same conductivity type as the cathode base region disposed in the cathode base region centrally of the outer boundary of the auxiliary cathode emitter region portion extending from the first outer surface to within five (5) microns of the PN junction formed by the cathode and anode base regions;

said extra impurity region having a higher impurity density gradient adjacent the PN junction formed by the cathode and anode base regions than the density gradient of the PN junction radially adjacent to said extra region under said auxiliary portion of the cathode emitter region, and under the outer main portion of the thyristor;

a metallic electrode in ohmic contact with the first outer surface disposed overlying the PN junction formed at the outer boundary of the auxiliary cathode emitter region and the cathode base region;

a metallic cathode electrode in ohmic contact with the first outer surface formed by the main cathode emitter region portion; and

a metallic anode electrode in ohmic contact with the second outer surface formed by the anode emitter region, whereby a predetermined overvoltage applied to the anode electrode causes the device to avalanche initially in the area of the said extra region of the cathode base region.

4,176,372

SEMICONDUCTOR DEVICE HAVING OXYGEN DOPED POLYCRYSTALLINE PASSIVATION LAYER

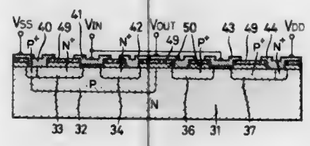
Takeshi Matsushita, Sagamihara; Hisao Hayashi, Atsugi; Teruaki Aoki, Tokyo; Hisayoshi Yamoto, Hatano, and Yoshiyuki Kawana, Atsugi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 682,449, May 3, 1976, abandoned, which is a continuation-in-part of Ser. No. 561,532, Mar. 24, 1975, Pat. No. 4,014,037. This application Dec. 5, 1977, Ser. No. 857,284

Claims priority, application Japan, Mar. 30, 1974, 49-36175; May 7, 1975, 50-54943

Int. Cl.[2] H01L *29/34*

U.S. Cl. 357—52 **2 Claims**



1. An MOS inverter including an N-channel MOS-FET and a P-channel MOS-FET which comprises a monocrystalline silicon semiconductor substrate of N-type impurity having a planar face, a P-type island formed in said planar face, first and second N+ type laterally spaced regions formed in the planar face of said P-type island, first and second P+ type regions formed in the planar face of said substrate laterally spaced from said N+ type regions, a third P+ type region in said planar face of said substrate extending down to the PN junction between said P-type region and said N-type substrate which lies near the outer side edge of the substrate; a third N+ type region extending down from the planar face of said substrate into contact with said substrate, an oxygen doped polycrystalline semiconductor layer interfaced with the planar face of said substrate including said P+ and N+ regions, the oxygen content of said polycrystalline layer being between 2 and 45 atomic percent, the thickness of said polycrystalline layer over the substrate region lying between said first and second P+ regions and the thickness of said polycrystalline layer over the region of said first P-type region lying between said first and second N+ regions being substantially thinner than that lying over the remaining portions of the planar face, a layer of an insulating semiconductor material overlying the thicker portions of said polycrystalline layer, and in two regions in contact with said P-type island and said N-type substrate, a pair of gate electrodes extending down into complete surface contact with said two regions of insulating material, said gate electrodes being externally connected together, a source electrode extending through said insulating layer and said polycrystalline layer into contact with said first N+ region and said third P+ region, a drain electrode extending through said insulating layer and said polycrystalline layer into contact with said second P+ region and said third N+ region, a single contact extending through said insulating layers and said polycrystalline layers at two places into contact with said second N+ region and said first P+ region, the density of the surface states

of the interface between said polycrystalline layer and said substrate being less than 10^{10} states/(cm^2.eV) in the center of the forbidden band, the electrical property of said layer reducing the influence of an electrical field.

4,176,373

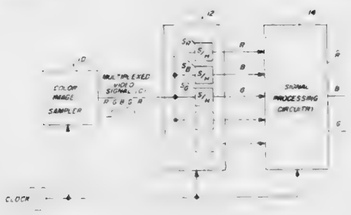
SIGNAL PROCESSING FOR DISCRETE-SAMPLE-TYPE-COLOR-VIDEO SIGNAL

Peter L. P. Dillon, Pittsford, and Bryce E. Bayer, Greece, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 6, 1977, Ser. No. 813,377

Int. Cl.[2] H04N *5/14*

U.S. Cl. 358—37 **7 Claims**



1. For use with a video camera having imaging apparatus for producing a discrete-sample-type-multicolor video signal representative of elemental areas of an image for a set of primary colors, such areas being arranged based on a predefined row-by-row scanning pattern to define respective sampling frequencies and periods for such primary colors, said multicolor video signal representing discrete, periodic updates of said set of primary colors, said updates being staggered among the colors of said set, signal processing apparatus comprising:

(A) means for decoding such video signal to produce a corresponding set of discrete-sample-type-single-color-signals for the respective primary colors, which discrete-sample-type-single-color-signals represent periodic updates of respective primary colors at intervals determined by the corresponding color sampling frequency; and

(B) interpolating means for producing generally continuous primary-color signals in accordance with said discrete-sample-type-single-color-signals, said interpolating means including

(1) respective color signal delay means for receiving the discrete-sample-type-single-color signals, said means having a time delay characteristic matched to the sampling period for the corresponding primary color, and

(2) respective integrating means cooperative with said signal delay means for producing a continuous color signal by integrating the difference between the delayed version and the relatively undelayed version of the corresponding discrete-sample-type-single-color signal.

4,176,374

SENSITIVITY AND CALIBRATION CONTROL FOR TELEVISION CAMERA REGISTRATION SYSTEM

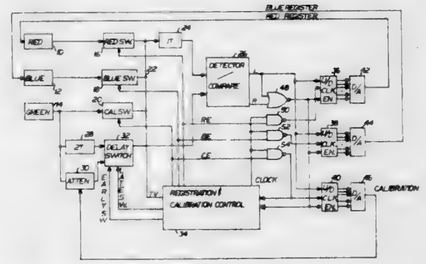
Fred M. Eames, Quincy, Ill., assignor to Harris Corporation, Cleveland, Ohio

Filed Apr. 22, 1977, Ser. No. 790,033

Int. Cl.[2] H04N *9/16*

U.S. Cl. 358—51 **4 Claims**

1. Sensitivity control apparatus for use in an automatic registration system which cyclically registers at least two video signals by in each operating cycle deriving a misregistration signal indicative of misregistration between the two signals and, at the conclusion of each cycle, changing a registration control signal in accordance with said misregistration signal, said apparatus comprising means for, in each operating cycle, determining the reliablity of the misregistration signal derived during that operating cycle, and means for preventing said misregistration signal from changing said registration control



signal at the conclusion of operating cycles in which said misregistration signal is determined to be unreliable.

4,176,375

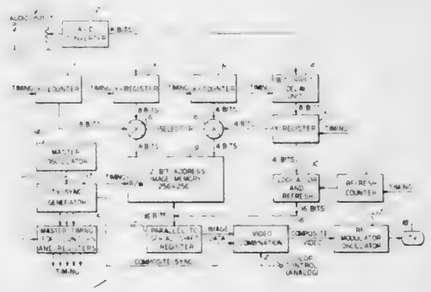
APPARATUS FOR VIDEO DISPLAY OF AUDIO FREQUENCY PATTERNS

Jonathan B. Scarpelli, 11714 Montbrook, Houston, Tex. 77099

Filed Jun. 30, 1978, Ser. No. 920,705

Int. Cl.[2] H04N *7/18*

U.S. Cl. 358—92 **15 Claims**



1. Apparatus for connection to the antenna input connections to a television receiver comprising,

input connections adapted for construction to an audio signal to receive said signal in analog form,

output connections adapted for connection to the antenna input connections to a television receiver,

means to convert an input signal from analog to digital form,

circuit means to supply the digital form signal to said output connections for display on a video tube, and

circuit means to vary the relationship of the x- and y-components of the signal received through said input connections whereby said digital form signal supplied to said output connections will produce on a video tube a pattern of predetermined form varying in size and shape in accordance with the audio input signal.

V 9 8 7 4 N 0 2 7 7 9 UMI

4,176,376

IMAGE PROCESSING SYSTEM

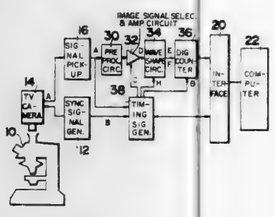
Shinichi Kamachi, Hino; Masao Izawa, Hachioji; Nagahiro Gocho, Hachioji; Yoshio Nakajima, Hachioji, and Shinichiro Hattori, Tokyo, all of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Continuation of Ser. No. 739,051, Nov. 5, 1976, abandoned. This application Jun. 27, 1978, Ser. No. 919,716

Claims priority, application Japan, Nov. 10, 1975, 50/134837

Int. Cl.[2] H04N *7/02*

U.S. Cl. 358—107 **5 Claims**



1. An image processing system, comprising a microscope for observing a sample, a television camera optically coupled to the microscope for converting the microscope image of the sample into electric image signals, an image signal pickup device connected to the camera for extracting a required part of the image signals, a synchronizing signal generator connected to the camera and to said pickup device for generating synchronizing signals for the image signal pickup device, a preprocessing circuit connected to the image signal pickup device for extracting and differentiating a frequency component of the image signal and detecting the number of optical density changes, an image signal selection and amplifying circuit connected to the preprocessing circuit for selecting and amplifying the component of the image signal, a wave shaping circuit connected to the image signal selection and amplifying circuit for quantizing the image information component to obtain a train of rectangular pulses, a digital counter connected to the wave shaping circuit for counting the number of the rectangular pulses and a computing device for memorizing the number of optical density changes and effecting the processing of the image.

4,176,377

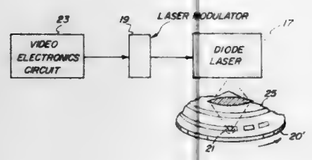
VIDEO DISC CONFIGURATION

Dennis G. Howe, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 10, 1977, Ser. No. 850,162

Int. Cl.[2] G11B *7/26, 25/10;* **G01D** *15/10*

U.S. Cl. 358—128 **10 Claims**



5. In a video record device having a recording sensitive surface comprised of a thermal recording material in which video information can be recorded by exposure to a recording beam focussed to a record spot of predetermined width, said record spot having an irradiance distribution that decreases in intensity away from its center portion, the improvement wherein:

said surface is sensitive to recording along adjacent record tracks and non-sensitive to recording in the region between adjacent record tracks, and wherein the center of one record track and the nearest edge of an adjacent record track are spaced apart a distance less than one-half the width of the record spot.

4,176,378

SIGNAL PICKUP ARM LIFTING/LOWERING AND GROOVE SKIPPER APPARATUS

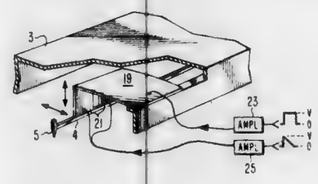
Minoru Toda; Susumu Osaka, both of Machida, and Yasushi Matsumoto, Narashino, all of Japan, assignors to RCA Corporation, New York, N.Y.

Filed Apr. 13, 1978, Ser. No. 895,972

Claims priority, application United Kingdom, Apr. 19, 1977, 16280/77

Int. Cl.[2] H04N *5/76;* **G11B** *3/38, 17/00*

U.S. Cl. 358—128 **5 Claims**



3. A pickup apparatus for use with a disc record having a spiral information track disposed on the surface thereof; said apparatus comprising:

(A) a cartridge body subject to radial translation toward the center of said record during playback;

(B) a pickup arm;

(C) a compliant support member for pivotally securing one end of said pickup arm to said cartridge body;

(D) a signal pickup secured to the other end of said pickup arm; and

(E) transducer means interposed between said other end of said pickup arm and said cartridge body for selectively effecting motion of said other end of said pickup arm toward-and-away from the plane of said record and toward-and-away from said record center upon energization thereof.

4,176,379

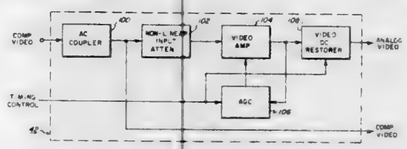
VIDEO INPUT CIRCUITS FOR VIDEO HARD COPY CONTROLLER

Louis E. Wessler, Cupertino, and Kenneth F. Koch, Mountain View, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 17, 1977, Ser. No. 843,006

Int. Cl.[2] H04N *1/40, 5/52*

U.S. Cl. 358—280 **8 Claims**



4. A d-c restorer circuit for use with a video amplifier of the type adapted to amplify a composite video signal comprised of a video data component and a synchronization component, said circuit comprising:

first means coupled to the output of said video amplifier for sampling the voltage level of the amplified composite video signal during a predetermined portion of said synchronization component;

second means coupled to said first means for deriving from said sampled predetermined portion a d-c control voltage; and

third means for summing said d-c control voltage with the amplified composite video signal at the output of said video amplifier whereby said predetermined portion of said synchronization component is maintained in a predetermined relationship relative to a predetermined reference potential.

4,176,380

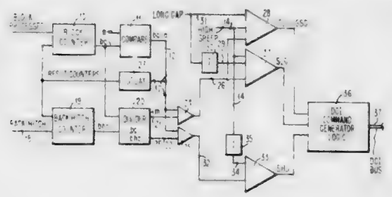
ADAPTIVE SPEED/INTERBLOCK GAP CONTROL FOR TAPE DRIVE

John A. Koski, and Richard B. Weaver, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 9, 1978, Ser. No. 868,005

Int. Cl.[2] G11B *5/09*

U.S. Cl. 360—50 **10 Claims**



1. Apparatus for varying lineal speed of a magnetic tape in a tape transport system adaptively as necessary best to suit the operational mode or availability of a host system, said apparatus comprising:

means normally operative to advance the tape at one speed for processing blocks of digital data continuously, but operative during advancement of the tape at said one speed to provide a backhitch signal in response to a condition requiring a backhitch operation;

means including means responsive to a preselected occurrence rate of said backhitch signals for causing the tape to be advanced at a preselected lower speed less than said one speed, thereby to minimize the likelihood of further backhitches; and

means operative during writing of data on the tape to increase the gaps between adjacent blocks of such data from a normal length to a longer length in response to a predetermined occurrence rate of said backhitch signals.

4,176,381

RECORDING AND/OR REPRODUCING APPARATUS FOR A MAGNETIC RECORD CARRIER IN THE FORM OF A TAPE, PROVIDED WITH A CONTROL SYSTEM FOR THE MAGNETIC HEAD POSITION

Edmond de Niet, and Albert M. A. Rijckaert, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

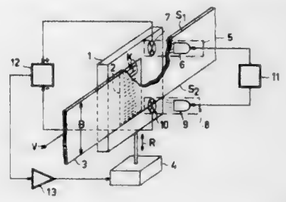
Filed Oct. 16, 1978, Ser. No. 951,688

Claims priority, application Netherlands, Nov. 11, 1977, 7712418

Int. Cl.[2] G11B *21/10*

U.S. Cl. 360—77 **7 Claims**

1. Apparatus for recording and/or reproducing information in a plurality of parallel tracks on a magnetic record carrier in the form of a tape, which apparatus comprises a magnetic head which is adapted to cooperate with the record carrier which is passed along this magnetic head, positioning means for controlling the relative position of the magnetic head with respect to the record carrier in a direction transverse to the direction of transport of the record carrier and in a plane parallel to the plane of the record carrier, and control means for generating and applying to the positioning means a control signal which is representative of the difference between the instantaneous and the desired position of the magnetic head, characterized in that the control means are provided with a first and a second optical system, each comprising a light-emitting element for emitting a radiation beam against an individual edge of the record carrier and a light-receiving element for receiving the amount



of light from the radiation beam emitted by the associated light-emitting element which shines past the record carrier, at least one of the said two elements of each optical system being rigidly connected to the magnetic head, and the control means furthermore being provided with a detection device which is coupled to the light-receiving elements of the two optical systems for generating the control signal for the positioning means in dependence on the relative magnitude of the amounts of light received by the two light-receiving elements.

4,176,382

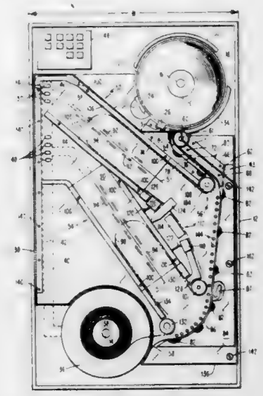
HIGH PERFORMANCE TAPE PATH FOR A 19 INCH TAPE RECORDER

Frederick B. Froehlich; Roy Hennings, both of Boulder, and William J. Schaffer, Loveland, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 22, 1978, Ser. No. 908,491

Int. Cl.[2] G11B *15/58, 15/66*

U.S. Cl. 360—95 **4 Claims**



1. Transport for positioning a flexible media comprising in combination:

a mounting frame;

a rotatable file reel having a first axis of rotation operably mounted on said mounting frame;

a rotatable machine reel having a second axis of rotation, mounted so that the first axis of rotation and the second

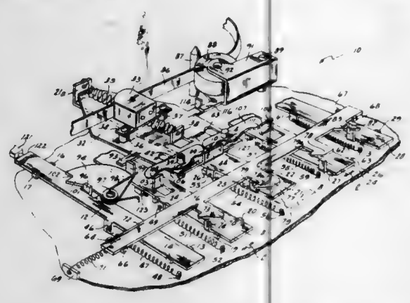
axis of rotation for the file reel and the machine reel are being positioned on a diagonal line;
a vertical channel positioned so as to define a media threading path between the file reel and the machine reel;
a pair of vacuum chambers having a closed end and an opened end with the opened end positioned adjacent to the media threading path and a pair of major axes running between the closed end of each vacuum chamber whereby the axes are inclined at different angles with respect to the media threading path and each other;
a processing station positioned on said mounting frame located out of said media threading path and located for operation on said media on a plane approximately parallel to a first major axes of a first of said vacuum chambers and approximately on a same plane with one wall of the first of said vacuum chambers; and
a capstan positioned intermediate said processing station and a second of said vacuum chambers.

4,176,383

TAPE MACHINE HAVING AUTOMATIC RETURN TO PLAYBACK MODE AFTER FAST FORWARD OR REWIND

Nobuo Suzuki, Sagamihara, Japan, assignor to Technical Incorporated, Japan

Continuation-in-part of Ser. No. 668,386, Mar. 10, 1976, abandoned. This application Mar. 10, 1978, Ser. No. 885,276
Claims priority, application Japan, May 29, 1975, 50-65040
Int. Cl.² G11B *21/22, 5/54*
U.S. Cl. 360—105 **10 Claims**



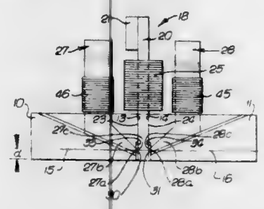
1. A recording and playback tape machine having a magnetic head, a capstan, magnetic tape and a pinch roller comprising, a frame, a playback key lever mounted for limited slide movement on said frame and first means biasing said playback key lever in a first direction, an actuating plate mounted on said frame and engaged by said playback key lever, said magnetic head mounted on said actuating plate, said playback lever when depressed moves said actuating plate toward said tape, a fast forward key lever mounted on said frame and second means biasing it in said first direction, a rewind key lever moveably mounted on said frame and third means biasing it in said first direction, a first actuating lever attached to said frame for pivotal movement and having one end engageable with said actuating plate to move it in said first direction and a second end engageable with said fast forward key lever such that when said fast forward key is depressed, said actuating plate will be moved in said first direction to move said head away from said tape when said playback lever has been depressed and a second actuating lever attached to said frame for pivotal movement relative thereto and having one e . which is engageable with said actuating plate to move it in said first direction and having a second end which is engageable with said rewind key lever such that when said rewind key lever is depressed said actuating plate will be moved in said first direction to move said head away from said tape when said playback lever has been depressed.

4,176,384

MAGNETIC RECORDING HEAD ASSEMBLY DEFINING PRECISION GAPS

Charles S. Yang, Santa Barbara, Calif., assignor to Yang Electromagnetics Systems Inc., Ventura, Calif.

Filed May 15, 1978, Ser. No. 905,734
Int. Cl.² G11B *5/27, 5/42*
U.S. Cl. 360—121 **6 Claims**



1. In a unitary magnetic head assembly, the combination comprising
(a) read/write poles having opposite sides defining upright, parallel vertical planes, said poles having tips,
(b) two ceramic blocks respectively abutting said opposite sides and being in mutual registration, the blocks having local recesses therein extending laterally away from said upright opposite sides and the blocks having upright inner surfaces adjacent said recesses and respectively facing laterally toward said opposite sides,
(c) and two erase poles respectively carried by said blocks, said erase poles having inner surfaces flush with the respective block inner surfaces thereby to define gaps between the erase pole inner surfaces and the read/write pole opposite sides, whereby the gap widths are defined by the widths of the recesses in the blocks,
(d) the blocks having bottom slide surfaces, the erase poles having ends flush with said slide surfaces, and the read/write poles having tips flush with said slide surfaces.

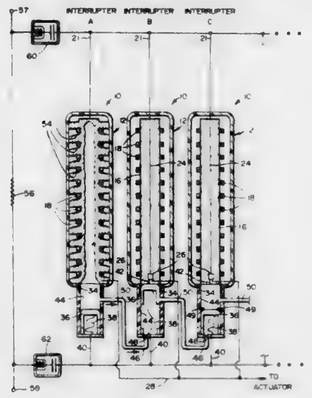
4,176,385

EXPLOSIVELY ACTIVATED FAULT CURRENT LIMITER

Rolf Dethlefsen, Greensburg, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Apr. 24, 1978, Ser. No. 899,539
Int. Cl.² H02H *7/22*
U.S. Cl. 361—58 **23 Claims**

1. An explosively activated current interrupter for use in a system employing a plurality of said interrupters activated in a predetermined sequence of said interrupters to control a succession of power line faults, said interrupter comprising: a housing, a conductive member in said housing for conducting current carried by said power line, switch means in said housing for interconnecting said conductive member with said power line, said switch means having a closed position in which said switch means electrically connects said conductive member with said power line and an open position electrically disconnecting said conductive member from said power line, insertion means for closing said switch means a predetermined time after actuation of said insertion means, explosive means in said housing for breaking said conductive member into a plurality of separated portions upon detonation to interrupt said current carried by said power line and for opening said switch means, and means responsive to the detonation of said explosive means for actuating said insertion means in the next interrupter of said predetermined sequence of said interrupters.



4,176,386

OVERCURRENT RELAY

Kung C. Chow, East Hanover, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 19, 1978, Ser. No. 907,522
Int. Cl.² H02H *3/08*
U.S. Cl. 361—93 **9 Claims**



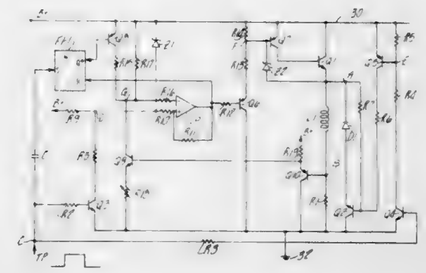
1. An overcurrent relay, comprising:
a current transformer having a primary winding adapted for energization by an alternating current, and a secondary winding,
detector means including a first portion which requires an information signal, and a second portion which requires a power supply,
first means connecting said secondary winding to the first portion of said detector means, to provide said information signal,
and second means connecting said secondary winding to the second portion of said detector means, to provide said power supply,
said second means including non-linear means which, along with the second portion of said detector means, co-operate to provide a constant impedance load on said current transformer, to enable said current transformer to simultaneously supply operating power, and an information signal which varies linearly with the alternating current flowing in said primary winding.

4,176,387

INDUCTIVE DRIVE CIRCUIT FOR SETTING THREE DIFFERENT LEVELS OF LOAD CURRENT INCLUDING A DOWNSHIFT DELAY

Patrick D. Harper, Seaford, Va., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 27, 1978, Ser. No. 881,327
Int. Cl.² H01H *47/32*
U.S. Cl. 361—154 **5 Claims**



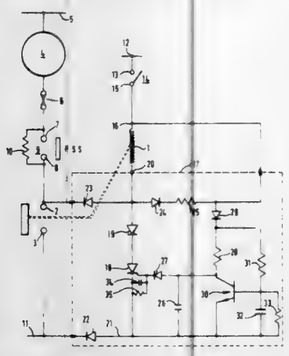
1. A current control circuit, enabled by a load actuation signal, comprising switch means operable to actuate an inductive load by normally increasing the current therethrough above a first level of load current and operable thereafter to alternately connect and disconnect a power supply to said load to maintain load actuation with holding current ranging between second and third levels of current, wherein said second and third levels of current are downshifted from and less than said first level, said control circuit further including:
(a) load current sense means, comprising a sense impedance in series with said inductive load, for generating a sense signal representative of the current drawn through said inductive load;
(b) refer ice means for providing reference signals representative of said first, second and said third current levels, respectively;
(c) comparator means, having a sense input coupled to said sense means, a reference input coupled to said reference means, and an output coupled to said switch means, for comparing said sense signal and said reference signal and for generating a first comparator output level causing said switch means to disconnect said power supply and a second comparator output level causing said switch means to connect said power supply, said first output level being generated after the beginning of said actuation signal when initially said comparison indicates the current through said inductive load exceeds said first current level and thereafter until the end of said actuation signal when said comparison indicates the current through said inductive load exceeds said second current level, said second output level being generated when said comparison indicates the current through said inductive load is less than said third current level; and
(d) time delay means for delaying the downshift of said load current from said first level to the range between said second and third levels when said load current increases to said first level at a rate too fast to actuate said inductive load.

4,176,388

CONTROL CIRCUIT FOR A CONTACTOR

Norman H. G. Palmer, Glenfield, England, assignor to Towmotor Corporation, Mentor, Ohio

Filed Mar. 30, 1978, Ser. No. 891,586
Int. Cl.² H01H *47/18, 47/32*
U.S. Cl. 361—196 **11 Claims**



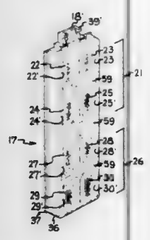
1. In a control circuit for a contactor with at least one pair of contacts and an actuator coil which is energizable by direct current under the control of a switch to cause closure of the contacts, the improvement comprising:
- switching means coupled in series with the actuator coil and in parallel with the contacts;
- first timing means for operating the switching means and energizing the actuator coil a preselected time after closure of the switch and controllably coupling the actuator coil in series with the contacts; and
- second timing means for preventing a second operation of the switching means until after further predetermined period of time.

4,176,389

PHOTOFLASH UNIT WITH TWO-COLOR INDICATOR

William J. Harvey, Trout Run, Pa.; Thomas B. McDonough, San Jose, Calif., and John W. Shaffer, Williamsport, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 25, 1977, Ser. No. 844,872
Int. Cl.² G03B *15/02*
U.S. Cl. 362—5 **11 Claims**



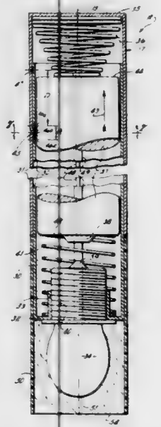
1. A photoflash unit comprising: a closed container having a plurality of sides; a plurality of flashlamps disposed in said container; and at least one flashed lamp indicator located adjacent to a side of said container in radiant-energy-receiving relationship with one of said flashlamps, said indicator comprising, a first layer of film having a first color and composed of a heat-shrinkable material, and a second layer of film juxtaposed with said first layer of film and having a second color, said second layer of film being translucent and composed of a non-shrinkable material which is substantially unaffected by the heat of lamp flashing; whereby upon the flashing of said one of said lamps, the radiant energy therefrom causes said first layer of film to shrink away from an area of said second layer of film to thereby significantly change the visual appearance of said indicator for identifying said one lamp as having been flashed.

4,176,390

LIGHT

David R. Galbert, Cincinnati, Ohio, assignor to Galbert-French, Inc., Lisle, Ill.

Filed Feb. 4, 1977, Ser. No. 765,727
Int. Cl.² B62J *5/00, 5/16*
U.S. Cl. 362—72 **17 Claims**



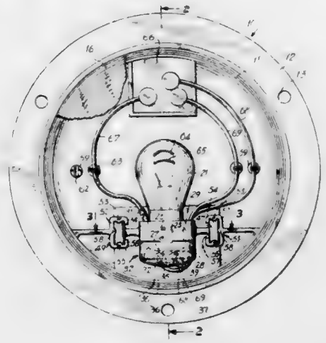
1. A centrifugally operable light for mounting on a bicycle wheel, said light comprising
- a housing adapted to receive a battery therein,
- a light bulb carried in said housing,
- a centrifugally operable switch connecting said battery and said bulb, said switch being movable from an off position at which said light bulb is not lighted to an on position at which said light bulb is lighted in response to centrifugal force generated by rotation of said wheel, and said switch being movable from said on position back to said off position in response to the lack of centrifugal force when rotation of said wheel is stopped,
- a manually operable activator connected in operable relation with said centrifugally operable switch, said activator structure permitting selection by a user of one of (a) an active attitude for said light in which said centrifugally operable switch is rendered operative to turn said lgiht bulb on and off in response to centrifugal force generated by rotation of said wheel or the lack thereof, and (b) an inactive attitude for said light in which said centrifugally operable switch is rendered inoperative to prevent turning said light bulb on in response to centrifugal force generated by rotation of said wheel, and
- a connector adapted to connect said light to said wheel.

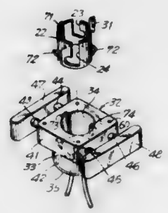
4,176,391

SHOCK ISOLATING LAMP ASSEMBLY

George J. Kulik, Valley Stream, N.Y.; Michael C. Meslink, Ramsey, and James P. Mulder, Oakland, both of N.J., assignors to Abex Corporation, New York, N.Y.

Filed May 26, 1978, Ser. No. 910,155
Int. Cl.² F21V *15/04*
U.S. Cl. 362—390 **11 Claims**





1. A shock isolating vehicle lamp assembly comprising:
- a lamp housing defining a lamp cavity and a lens forming a surface of said assembly;
- a pair of opposed substantially parallel mounting tracks spaced apart from each other and disposed in said lamp housing within said cavity; and
- a resilient shock isolating moldment adapted to be mounted on and between said mounting tracks, said moldment including a central body portion formed with a substantially cylindrical opening therein having a central axis for retaining a metal lamp socket, said moldment further including a pair of opposed arm means extending outwardly in a plane perpendicular to said central axis of said moldment, each said arm means joined to a transverse mounting bar, said mounting bars adapted to be engaged by said opposed pair of mounting tracks.

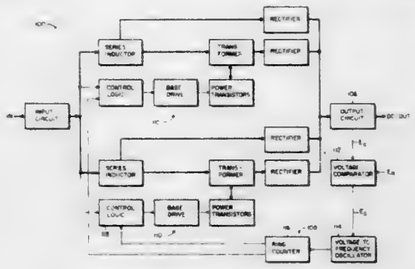
4,176,392

SERIES INDUCTION/PARALLEL INVERTER POWER STAGE AND POWER STAGING METHOD FOR DC-DC POWER CONVERTER

Donald L. Cronin, Anaheim, Calif., and John J. Biess, Canoga Park, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 14, 1977, Ser. No. 860,366
Int. Cl.² H02M *7/00*
U.S. Cl. 363—71 **5 Claims**

1. A DC-DC power converter circuit comprising: input means for receiving DC power from a DC source, output means, a plurality of parallel inverter power stages connected in parallel between said input and output means, each said parallel power stage comprising a transformer having a primary winding connected to said input means and a secondary winding, transistors forming a parallel inverter connected to said primary winding and adapted to be turned on and off alternately for converting DC power from said DC source to a fluctuating current flow in said primary winding to induce a fluctuating current in said transformer secondary winding, and pulsewidth-modulated transistor drive means for applying pulse-width-modulated driving signals to said transistors for turning said transistors on and off alternately, and rectifying



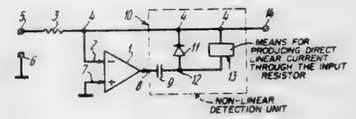
means connecting said transformer secondary winding to said output means for rectifying said fluctuating volttage to a DC voltage and delivering said DC voltage to said output means to provide a DC output voltage from said converter, and feedback means for sensing the converter circuit's output voltage and activating said pulse-width-modulated transistor drive means of said parallel power stages in a variable sequential rate generated in response to said output voltage error to effect power conduction through said parallel stages in phased relation and maintain said output voltage constant.

4,176,393

A.C. TO D.C. VOLTAGE CONVERTER

Toom A. Pungas, Sypruse bulvar, 219, kv. 3; Tynis A. Laud, ulitsa Mustamyae, 147, kv. 198; Kheino A. Reinberg, ulitsa Akademia, 60, kv. 16; Raul-Vello P. Rebane, ulitsa Mustamyae, 181, kv. 137, and Toomas R. Lumi, ultisa Komeedi, 15, kv. 3, all of Tallin, U.S.S.R.

Filed Oct. 4, 1977, Ser. No. 839,349
Int. Cl.² H02M *7/02*
U.S. Cl. 363—125 **9 Claims**



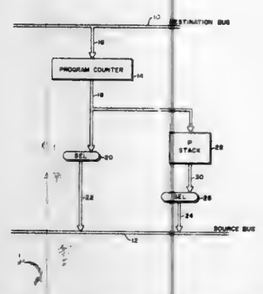
1. An a.c. to d.c. voltage converter comprising:
- an a.c. voltage amplifier having an inverting input, a non-inverting input connected to ground, and an output;
- an input resistor having a first lead connected to said inverting input of said a.c. voltage amplifier, and a second lead connected to a first input of said converter;
- a separating capacitor having a first lead connected to said output of said a.c. voltage amplifier, and a second lead;
- a diode having a first electrode connected to said first lead of said input resistor, and a second electrode connected to said second lead of said separating capacitor; and
- a means for producing direct linear current through said input resistor electrically coupled to the input of said a.c. to d.c. voltage converter and placed in parallel with said diode.

4,176,394

APPARATUS FOR MAINTAINING A HISTORY OF THE MOST RECENTLY EXECUTED INSTRUCTIONS IN A DIGITAL COMPUTER

David G. Kaminski, West St. Paul; Mickiel P. Fedde, Apple Valley, and Robert C. DeWard, Burnsville, all of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jun. 13, 1977, Ser. No. 806,211
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 3 Claims



1. In a digital computer capable of executing instructions and of the type having a program address register for holding the address of the next instruction to be executed, said instructions containing a function code portion and an operand address portion and at least one of said instructions being capable of causing a branch to a program address not in succession with the last program address and containing a main memory for storing said instructions, an apparatus for maintaining a history of which of said instructions have been executed by said digital computer, comprising:

an instruction register for holding the instruction currently being executed by said digital computer and coupled to said main memory for receiving said instructions from said main memory;

decoding means coupled to a portion of said instruction register containing said function code portion for decoding the instruction type and for providing a signal of a first binary significance when the function code portion of said instruction designates a branch instruction and of the opposite binary significance when said function code portion specifies a non-branch instruction;

an incrementable program address register coupled to the portion of said instruction register holding said operand address portion for temporarily holding the address of the next instruction to be executed by said digital computer;

a set of registers whose data inputs are coupled to the output of said portion of said instruction register containing said operand address portion each of said registers capable of holding the value of the contents of said operand portion of said instructions;

an incrementable counter register whose output is coupled to said set of registers for selecting one of said set of registers based upon the value of the contents of said counter registers; and

control means coupled to the output of said decoding means and to said set of registers for causing the contents of said operand portion of said instruction register to be stored in the selected one of said set of registers upon the execution of each instruction by said digital computer and for incrementing the value of the contents of said counter register whenever said decoding means produces a signal of said first binary significance;

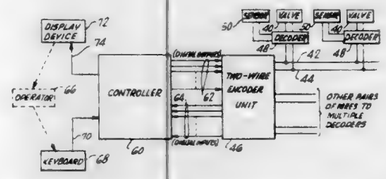
whereby a history is maintained of which of said instructions have been most recently executed.

4,176,395

INTERACTIVE IRRIGATION CONTROL SYSTEM

Rene H. Evelyn-Veere, Torrance, and Richard L. Ruggles, Mount Baldy, both of Calif., assignors to Clemar Manufacturing Corporation, Azusa, Calif.

Filed Nov. 16, 1977, Ser. No. 852,023
Int. Cl.[2] G06F *15/56*; G05B *11/00*; A01G *25/16*
U.S. Cl. 364—420 27 Claims



1. An interactive irrigation control system comprising:

digital control means for controlling a plurality of irrigation valves in accordance with a plurality of independent and repeatable schedules of instructions; and

means for creating or modifying schedules of instructions concurrently with, and without disrupting, operation of said digital control means, said means for creating or modifying schedules of instructions including

schedule storage means, for storing a plurality of schedules of instructions for control of the irrigation valves,

operator input and output means, and

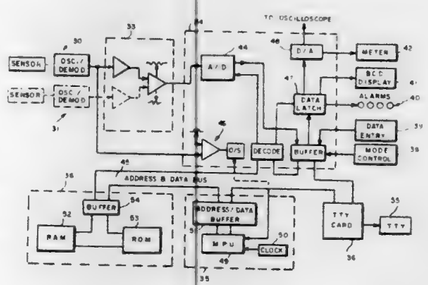
operator input/output service means, for interpreting operator instructions and deriving therefrom schedules for storage in said schedule storage means, and for initiating operator output messages, said operator input/output service means being operable simultaneously with, and without disruption of said digital control means, to provide operator communication without disturbing execution of the schedules of instructions.

4,176,396

APPARATUS FOR DIRECTLY MEASURING MACHINE TOOL WEAR

John R. Howatt, Waltham, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Sep. 23, 1977, Ser. No. 836,220
Int. Cl.[2] G01N *19/02*
U.S. Cl. 364—551 15 Claims



1. A system for determining the wear characteristics of at least one cutting tool comprising

at least one sensing means for producing an output signal representing the cutting profile characteristics of said at least one cutting tool as said tool passes adjacent thereto;

data processing means responsive to said at least one sensing means output signal for storing information concerning said cutting profile characteristics when said cutting tool is initially installed for use and for obtaining up-dated information concerning said cutting profile characteristics during subsequent use of said cutting tool;

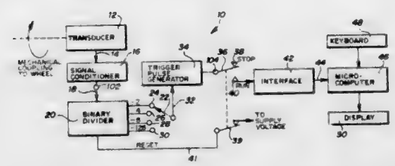
means for comparing said initial stored profile characteristics information with said up-dated profile characteristics information to provide output information concerning the wear characteristics of said at least one cutting tool.

4,176,397

ELECTRICAL ODOMETER

Carol L. Crom, and Elizabeth J. Crom, both of 1813 Arrow La., Garland, Tex. 75042

Filed Dec. 23, 1977, Ser. No. 863,887
Int. Cl.[2] G06F *15/20*
U.S. Cl. 364—561 13 Claims



1. An electrical odometer for use in a wheeled vehicle, comprising:

(a) means for generating a first series of electrical pulses which are related to a given unit of distance traveled by the vehicle;

(b) means for conditioning said first series of pulses to provide a train of shaped pulses which are effective to initiate a computer routine;

(c) a digital display adapted to serve as an odometer register;

(d) means for presetting said digital display to a start count and for placing said start count in the memory of a computer; and

(e) electronic computer means for algebraically summing a predetermined constant upon receiving respective ones of the train of shaped pulses, with a present value in the computer memory being the same as the start count, such that the instantaneous count which is held in the memory is progressively updated as each shaped pulse is received, with the count being displayed on the digital display being the same as the count stored in the computer memory, and said predetermined constant being the actual distance traveled between each consecutive pair of pulses in the train of shaped pulses, and the predetermined constant being based upon all of the relevant parameters which are associated with the vehicle on which the odometer is mounted, with said parameters including vehicle wheel size, tire inflation conditions, vehicle speed, and vehicle loading.

4,176,398

RAMP GENERATOR

Dennis G. Rider, Pataskala, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

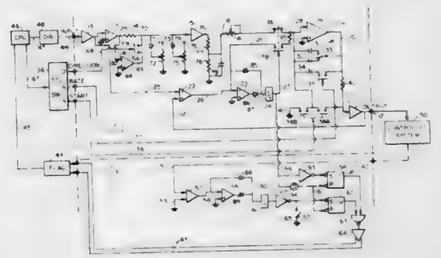
Filed Feb. 27, 1978, Ser. No. 881,848
Int. Cl.[2] G06J *1/00*; H03K *4/08*
U.S. Cl. 364—607 36 Claims

1. Apparatus for receiving a succession of input voltages that may vary in discrete steps in amplitude and polarity with time and providing a substantially linear ramp output voltage responsive thereto, comprising

means for receiving each input voltage and providing a potential responsive thereto,

integrating means for receiving each potential, providing in response thereto an output voltage that changes approximately proportionally with time from its old value responsive to the preceding input voltage and potential to a new value that is responsive to the new input voltage and potential each time an input voltage is received that differs by more than a negligible amount from the preceding one, and then maintaining the output voltage substantially constant until the next such time, and

difference amplifier means for receiving a first voltage porportional to the input voltage and a second voltage proportional to the output voltage and providing a comparison voltage responsive to any more than negligible difference between the first and second voltages, switching



means responsive to the difference amplifier means for connecting the integrating means selectively, either

(a), while such a difference exists, to the potential responsive to the input voltage, for beginning and then continuing its integrating, or

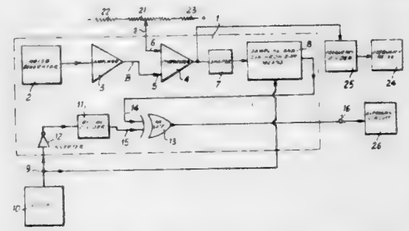
(b), when such a difference does not exist, to the comparison voltage, for correcting the output voltage when necessary, to a value that is a predetermined proportion of the input voltage, and, when the output voltage is correct, maintaining it substantially constant.

4,176,399

ANALOG NOISE GENERATOR

Jean-Claude Hoffmann; Francis Castanié, both of Toulouse; Henri Crabère, l'Union; Jean-Pierre Verdier, Cazeres, and Norbert Voisin, Bruguieres, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Apr. 21, 1978, Ser. No. 898,686
Claims priority, application France, May 6, 1977, 77 13883
Int. Cl.[2] G06F *1/02*; H03B *29/00*
U.S. Cl. 364—717 4 Claims



1. A binary random noise generator for the stochastic coding of digital or analog information, comprising:

means for generating a binary signal with random transitions;

means for sampling said binary signal;

a clock generating a clock signal;

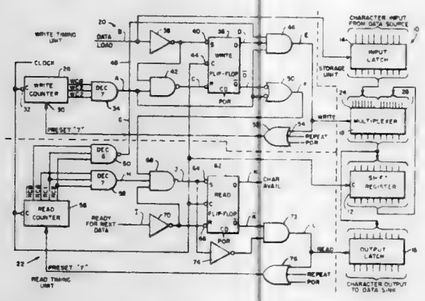
means for synchronizing said sampling means by said clock signal;

a divider dividing said clock signal by two;

an exclusive OR gate having two inputs, one of said inputs receiving the signal from said by-two divider and the other of said inputs receiving the signal from said sam-

pling means, whereby the output of said exclusive OR gate has a strict equiprobability of its two logic states.

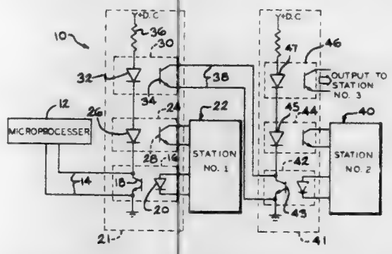
4,176,400
BUFFER STORAGE AND CONTROL
George Heckel, Mundelein, Ill., assignor to Teletype Corporation, Skokie, Ill.
Filed Aug. 10, 1977, Ser. No. 823,248
Int. Cl.[2] G06F *7/38, 3/00*
U.S. Cl. 364—900 16 Claims



1. An intermediate storage memory circuit including a shift register for storing a plurality of multilevel character signals said shift register having an inherent character signal propagation time delay; the shift register having a clocking input receiving a series of clock signals, said shift register advancing the character signals successively therethrough in response to the clock signals comprising:
means responsive to a write signal for alternately switching the multilevel input to said shift register between the output of said shift register and incoming multilevel character signals,
a write timing unit responsive to said incoming multilevel character signals and generating said write signal in response to the presence of an incoming multilevel character signal so that said switching means recirculates character signals through said shift register in the absence of an incoming character signals and introduces an incoming character signal into the input of said shift register in response to said write signal, wherein said write timing unit includes means responsive to a full condition of said shift register for inhibiting the further introduction of incoming character signals into said shift register thus preserving those character signals presently in the shift register, and
means connected to the input of said shift register for providing a readout of selected character signals, and a read timing unit generating a selective read signal to said readout means, the read signal initiating the read out of selected character signals at the input of said shift register so that selected incoming character signals may be read from the input of said shift register prior to passage through the shift register.

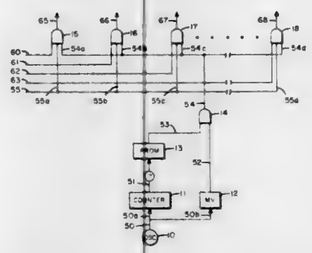
4,176,401
DIGITAL COMMUNICATIONS SYSTEM
John W. Lonberger, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Mar. 1, 1978, Ser. No. 882,499
Int. Cl.[2] H03K *3/42*
U.S. Cl. 364—900 8 Claims

1. A digital serial data interface for connecting a data transmitting and receiving station having an input and an output to the output of a preceding station and to the input of a succeeding station, said interface comprising first, second and third photocouplers each having a drive element optically coupled to a driven element, a voltage source, means connecting the drive elements of said first and second photocouplers and the driven element of said third photocoupler in series with said voltage source, means connecting the output of said preceding station in parallel with said driven element of said third photocoupler, means connecting said drive element of said



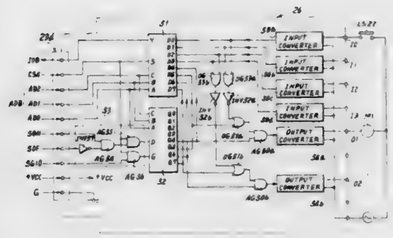
third photocoupler to the output of said data transmitting and receiving station, means connecting said driven element of said second photocoupler to the input of said data transmitting and receiving station, and means connecting said driven element of said first photocoupler to the input of said succeeding station.

4,176,402
APPARATUS FOR SIMULTANEOUSLY MEASURING A PLURALITY OF DIGITAL EVENTS EMPLOYING A RANDOM NUMBER TABLE
Ralph E. Sipple, Shoreview, Minn., assignor to Sperry Rand Corporation, New York, N.Y.
Filed May 24, 1978, Ser. No. 908,886
Int. Cl.[2] G11C *27/02;* G06F *3/04*
U.S. Cl. 364—900 4 Claims



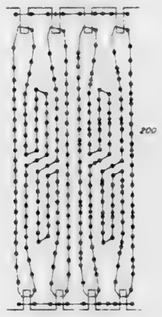
1. An apparatus for measuring the occurrence of digital events within a plurality of subject conductors comprising:
periodic signaling means;
a random number table;
means responsively coupled to said periodic signaling means and said random number table for accessing a different entry of said random number table in response to said periodic signaling means;
means responsively coupled to said accessing means for signaling that a sample should be taken based upon the value of said different entry of said random number table;
means responsively coupled to said subject conductors and said signaling means for simultaneously sampling the state of each of said plurality of subject conductors when said signaling is that a sample should be taken; and
means responsively coupled to said sampling means and said signaling means for recording said state of said subject conductors when said signaling is that a sample should be taken.

4,176,403
PROGRAMMABLE SEQUENCE CONTROLLER
Isao Suzuki, Okazaki; Toshihiko Yomogida, Kariya, and Tsuyoshi Yokota, Okazaki, all of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Aichi, Japan
Filed Jun. 20, 1978, Ser. No. 917,257
Claims priority, application Japan, Jun. 23, 1977, 52-74881
Int. Cl.[2] G06F *7/00, 7/02*
U.S. Cl. 364—900 5 Claims



1. A programmable sequence controller comprising:
memory means for storing a sequence of control instructions, each of said instructions including an operation command and address data associated with said operation command, wherein said operation commands include test commands or output commands;
read-out control means for controlling said memory means so as to successively read out each control instruction in said sequence of control instructions therefrom;
at least one input converter connectable to an external input element for converting an operational state thereof into a logical value;
a data selector connected to said input converter and responsive to said address data for selecting said logical value of said input element when the input element is designated by said address data;
logic operation means responsive to a said test command for testing said selected logical value supplied from said data selector and thereafter responsive to a said output command for generating an output command signal based upon the result of the test;
an addressable output memory having at least two storage locations and adapted to store said output command signal at each of said two storage locations as designated by said address data associated with said output command;
gate means connected to said input converter and said two storage locations for inhibiting passage of said output command signal from one of said two storage locations when receiving said logical value of said input element and for enabling passage of said output command signal from the one of said two storage locations when receiving said output command signal from the other of said two storage locations; and
at least one output converter connectable to an external output element and connected to said gate means for energizing said output element based upon said output command signal supplied therefrom.

4,176,404
BUBBLE MEMORY STRUCTURE WITH ENHANCED DATA DENSITY
Magid Y. Dimyan; Wayne C. Hubbell, both of Richardson; Christopher T. M. Chang, Dallas, and John C. Linn, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Jan. 13, 1978, Ser. No. 869,349
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—12 22 Claims



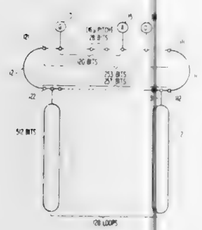
1. A magnetic bubble memory structure comprising:
a planar layer of magnetic material in which magnetic bubbles can be moved,
an overlay pattern of magnetically soft material disposed on a major surface of said planar magnetic layer and defining bubble domain propagation paths of individual propagation elements for guiding the movement of said bubbles in said layer in response to a change in orientation of a rotary magnetic field within the plane of said layer,
said bubble domain propagation paths including a magnetic bubble domain storage section for said magnetic bubble domains,
transfer gate means located adjacent to said magnetic bubble domain storage section for transferring magnetic bubble domains out of said bubble domain storage section, and
said bubble domain storage section comprising a plurality of individual propagation elements prearranged to form individual tracks interconnected to form a loop structure wherein a circuit period defining a predetermined distance between propagation elements in said tracks is such that said propagation elements adjacent to said transfer gate means are separated by a greater circuit period than the propagation elements forming the remainder of said bubble domain storage section.

4,176,405
MAGNETIC BUBBLE DEVICE
Nobuya Yoshioka, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan
Filed Apr. 13, 1978, Ser. No. 895,823
Claims priority, application Japan, Apr. 22, 1977, 52-47078
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—15 2 Claims

1. In a magnetic bubble storage device including a magnetic medium for holding magnetic bubbles; means for giving a bias magnetic field perpendicular to the surface of said magnetic medium; a major loop provided on said magnetic medium; a plurality of minor loops provided on said magnetic medium for storing the magnetic bubbles; and a plurality of gates provided between said major loop and said minor loops for performing transfer of the magnetic bubbles therebetween, the improve-

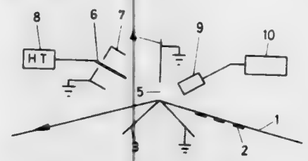
DESIGNS

ment wherein the bit pitch in at least a part of a first region on said major loop other than a second region where said major



loop and said gates are connected is larger than the bit pitch in said second region.

4,176,406
INFORMATION RECORDING AND RECOGNITION
Josef Matkan, Adelaide, Australia, assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.
Filed Nov. 1, 1977, Ser. No. 847,558
Claims priority, application Australia, Nov. 5, 1976, PC8021
Int. Cl.[2] G11C *11/ ?, 11/26*
U.S. Cl. 365—148 **12 Claims**

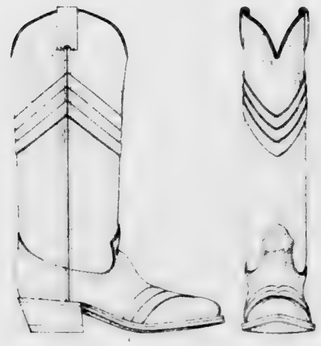


1. A method of information recording and recognition comprising the steps of printing on one surface of a recording member information in the form of ink deposits where such ink deposits contain a substance capable of conferring to such ink deposits electrical conductivity measurable different from that of the non-printed background areas of said recording member, passing said recording member through an information recognition zone, positioning corona generating means adjacent said information recognition zone and directing the ionic emission from said corona generating means towards one face of said recording member, positioning sensor means in said information recognition zone to detect ionization and ion emission changes effected by electrical conductivity differences between said printed ink deposits and non-printed background areas on said recording member and converting the thus detected ionization and ion emission changes into an electrical signal corresponding to said information.

DESIGNS

NOVEMBER 27, 1979

253,496
BOOT
William M. Douglas, Old Hickory, Tenn., assignor to The United States Shoe Corporation, Cincinnati, Ohio
Filed Aug. 23, 1977, Ser. No. 827,120
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—272



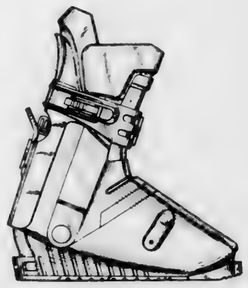
253,497
SKIRT
Doris Brosk, 150 E. 69th St., New York, N.Y. 10023
Filed Dec. 6, 1976, Ser. No. 747,647
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—224



253,498
POCKET-TOP SHOE
Marcella M. Katz, 10573 Le Conte Ave., Los Angeles, Calif. 90024, assignor to Marcella M. Katz, Los Angeles, Calif.
Filed May 23, 1977, Ser. No. 799,561
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—265



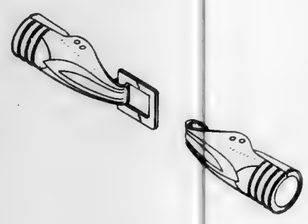
253,499
SKI BOOT
Georges P. J. Salomon, Quintal, France, assignor to Ets. SA Francois Salomon & Fils
Filed Aug. 16, 1977, Ser. No. 826,396
Claims priority, application France, Mar. 3, 1977, 187
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—276



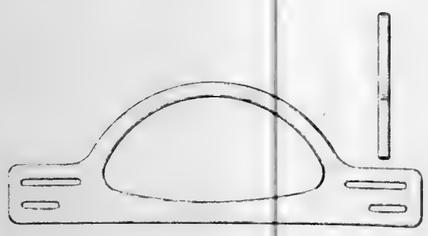
253,500
SHOE SOLE
Joseph P. Famolare, Jr., Putney, Vt., assignor to Famolare, Inc., New York, N.Y.
Filed Apr. 11, 1975, Ser. No. 567,264
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—322



253,501
BELT BUCKLE
Fritz Hoch, Pforzheim, Fed. Rep. of Germany, assignor to Gutos Metallschliessenfabrik Bader & Hoch KG
Filed Apr. 8, 1977, Ser. No. 786,018
Term of patent 3½ years
Int. Cl. D02—*07*
U.S. Cl. D2—418



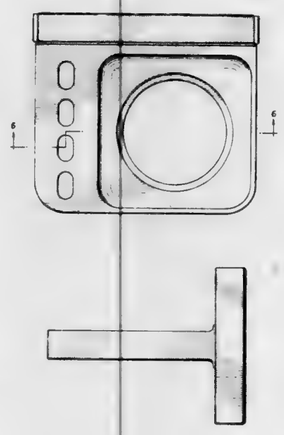
253,502
HANDLE FOR A HANDBAG
Helen Young, Roslyn, N.Y., assignor to N A S Import Corp., New York, N.Y.
Filed Dec. 30, 1977, Ser. No. 866,199
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—54



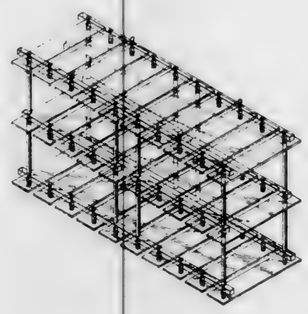
253,503
COMBINED TOWEL BAR AND SHELF UNIT
Gladys Albert, 56-40 Oceania St., Bayside, N.Y. 11364, assignor to Gladys Albert, Bayside, N.Y.
Filed Jun. 1, 1978, Ser. No. 912,048
Term of patent 3½ years
Int. Cl. D6—*04*
U.S. Cl. D6—[illegible]



253,504
COMBINED TOOTHBRUSH AND GLASS HOLDER
Raymond Grosfillex, Arbeat, France, assignor to Grosfillex S.A.R.L., Argent, France
Filed Aug. 1, 1978, Ser. No. 929,911
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—92



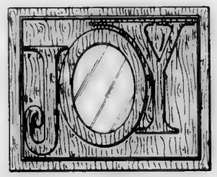
253,505
DRINKING GLASS RACK
Donald B. LeSage, 630 Bushaway Rd., Wayzata, Minn. 55391, and Franklin D. Dutcher, Rte. #1, Box 151, Cambridge, Minn. 55008
Filed Oct. 3, 1977, Ser. No. 839,124
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—113



253,506
CORNER PROTECTOR FOR FURNITURE OR THE LIKE
Henry R. Vigue, Waterville, Me., assignor to Keyes Fibre Company
Filed Jul. 29, 1976, Ser. No. 709,635
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



253,507
PICTURE FRAME
Joseph R. English, 1168 Oakleigh Dr., East Point, Ga. 30344
Filed Dec. 12, 1977, Ser. No. 859,257
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—236



253,508
COMPARTMENTED CONDIMENT DISPENSER
John L. Sutton, 11A S. Manor Rd., Broomall, Pa. 19008, assignor to John L. Sutton, Broomall, Pa.
Filed Jun. 8, 1977, Ser. No. 804,760
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—57

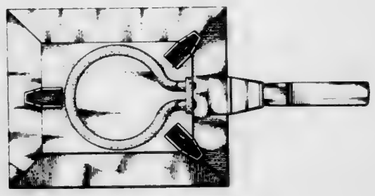


253,509
INSULATED BOTTLE
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011
Filed Jun. 17, 1977, Ser. No. 807,596
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—77

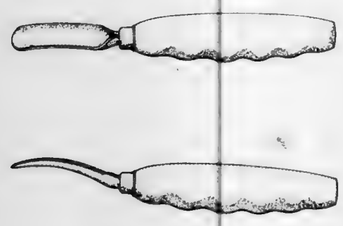


253,510
ELECTRIC CREPE PAN
Robert S. Bardin, 409 Onda, Newport Beach, Calif. 92660
Filed May 24, 1977, Ser. No. 800,093
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—94

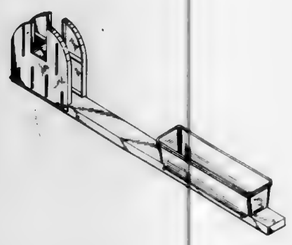




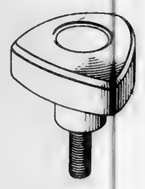
253,511
PEELING UTENSIL FOR HARD BOILED EGGS
Jerry Bogosian, 14378 Fielding, Detroit, Mich. 48223
Filed Apr. 20, 1977, Ser. No. 789,114
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—147



253,512
COMBINED TAPE DISPENSING AND COATING APPARATUS FOR USE WITH DRY WALLS
Ray G. Davenport, 23324 N. Dustin Rd., Acampo, Calif. 95220, and Owen C. McCollum, 3304 McAllen Rd., Stockton, Calif. 95205
Filed Dec. 29, 1978, Ser. No. 974,537
Term of patent 14 years
Int. Cl. D8—*05*; D19—*02*
U.S. Cl. D8—14



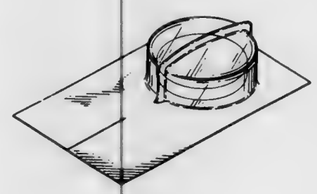
253,513
HANDLE
Alberto Bertani, Via Pascoli, 21, Milan, Italy
Filed Feb. 7, 1978, Ser. No. 875,910
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—307



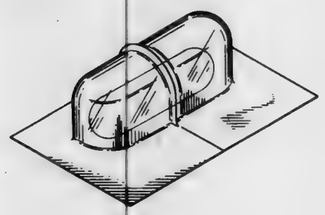
253,514
FOOD CONTAINER
Doris C. Etelson, Cooper Morris Dr., Pomona, N.Y. 10970
Filed Apr. 29, 1977, Ser. No. 792,481
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—185



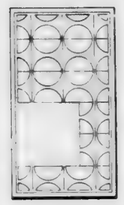
253,515
PHARMACEUTICAL BLISTER PACKAGE
Eugene J. Meierhoefer, Hackettstown, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed May 10, 1977, Ser. No. 795,571
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—192



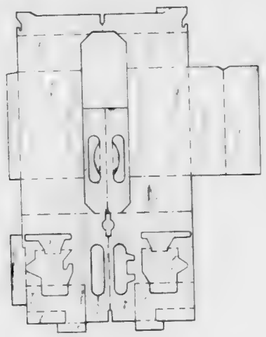
253,516
PHARMACEUTICAL BLISTER PACKAGE
Eugene J. Meierhoefer, Hackettstown, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed May 10, 1977, Ser. No. 795,572
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—192



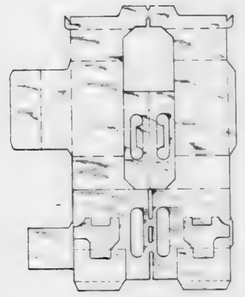
253,517
PACKAGING CONTAINER
Adam J. Grodin, Forest Hills, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
Filed Feb. 15, 1977, Ser. No. 768,921
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—225



253,518
CARTON BLANK
Bruno C. Bonczyk, East Alton, Ill., assignor to Alton Box Board Company, Alton, Ill.
Filed Feb. 4, 1977, Ser. No. 765,686
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—245



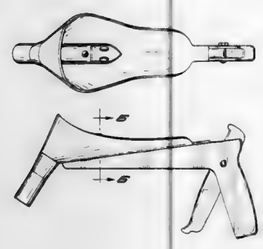
253,519
CONTAINER CARRIER BLANK
Stephen J. Green, Richmond Heights, Mo., assignor to Alton Box Board Company, Alton, Ill.
Filed Mar. 2, 1977, Ser. No. 773,591
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—245



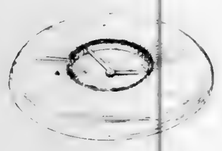
253,520
CARTON BLANK
Thomas B. Dempster, Sioux City, Iowa, assignor to Champion International Corporation, Stamford, Conn.
Filed May 18, 1977, Ser. No. 798,036
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—245



253,521
COMBINED OPENER AND SPOUT FOR AN OIL CAN
Martin A. Makela, Waconia, Minn., assignor to J-Mark, Inc., Minneapolis, Minn.
Filed May 31, 1977, Ser. No. 801,516
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—290



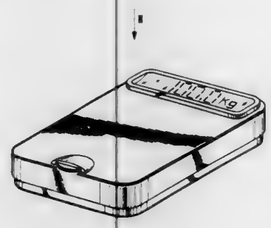
253,522
CLOCK
Uwe Rutenberg, 128 Maitland Ave., Pointe Claire, Quebec, Canada (H9R 3X4)
Filed May 11, 1977, Ser. No. 795,801
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—22



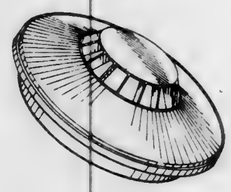
253,523
SCALE
Peter Ackeret, Küsnacht, Switzerland, assignor to Ackeret Design & Engineering, Ebmatingen, Switzerland
Filed Nov. 2, 1977, Ser. No. 847,944
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—92



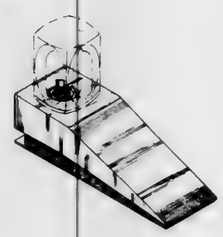
253,524
SCALE
Peter Ackeret, Küsnacht, Switzerland, assignor to Ackeret Design & Engineering, Ebmatingen, Switzerland
Filed Nov. 2, 1977, Ser. No. 847,946
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—92



253,525
SMOKE DETECTOR
Kent R. Wilson, Jefferson County, Colo., assignor to Statitrol Division Emerson Electric Co., Lakewood, Colo.
Filed Dec. 7, 1977, Ser. No. 858,468
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



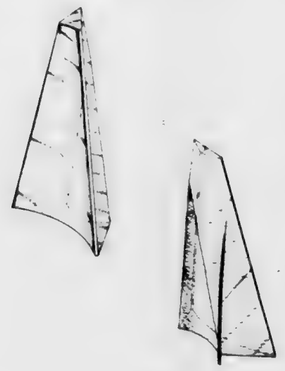
253,526
DOOR-ACTUATED ACTIVATOR FOR FLASHLAMP ARTICLE
Andre C. Bouchard, Peabody, and Harold H. Hall, Jr., Marblehead, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.
Filed Oct. 5, 1977, Ser. No. 839,429
Term of patent 14 years
Int. Cl. D10—*06*; D13—*03*
U.S. Cl. D10—121



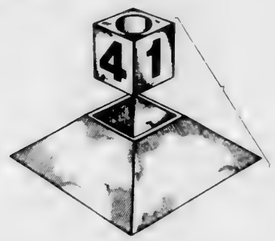
253,527
PIN
Reuben Bellows, 4857 Laurel Grove, North Hollywood, Calif. 91603
Filed Feb. 6, 1978, Ser. No. 875,604
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—55



253,528
ORNAMENT OR THE LIKE
George C. Sun, 530 Rhode Island Ave., Cherry Hill, N.J. 08002
Filed Jan. 27, 1978, Ser. No. 873,091
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—131



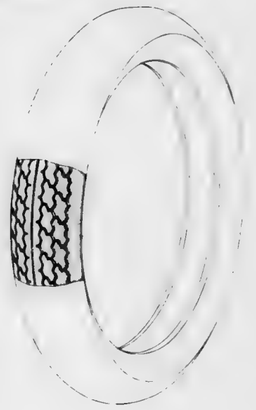
253,529
MOOD INDICATOR
Carl F. Yandt, 703 Oak Ter., La Crescent, Minn. 55947
Filed May 9, 1977, Ser. No. 795,314
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—157



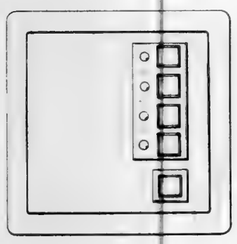
253,530
TRICYCLE
Robert D. Perkins, Toronto, Canada, assignor to Willowdale Handcar and Wagon Works Ltd., Toronto, Canada
Filed Aug. 22, 1978, Ser. No. 936,572
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—112



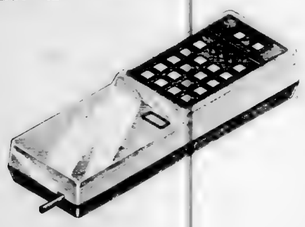
253,531
TIRE
David L. Buck, and David M. Lamb, both of Sutton Coldfield, England, assignors to Dunlop Limited, London, England
Filed Apr. 1, 1977, Ser. No. 783,761
Claims priority, application United Kingdom, Oct. 21, 1976, 977599
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—145



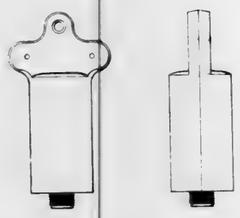
253,532
REMOTE DIMMING CONTROL SYSTEM
Noel Mayo, Philadelphia, Pa., assignor to Lutron Electronics Co., Inc., Coopersburg, Pa.
Division of Ser. No. 726,524, Sep. 27, 1976, Pat. No. Des. 249,141. This application Mar. 8, 1978, Ser. No. 884,727
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32



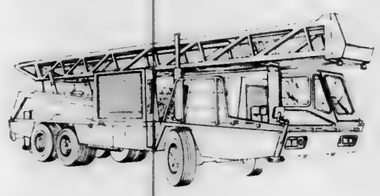
253,533
DATA ENTRY TERMINAL
Jerry J. Sims, Southfield; Richard E. Carell, Plymouth, both of Mich.; Frank C. Donofrio, Norristown, and Warren T. Zivie, Malvern, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.
Filed Sep. 22, 1977, Ser. No. 835,840
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—42



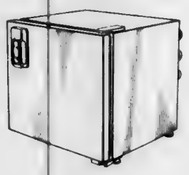
253,534
ANTENNA BALUN
Oliver W. Greene, Bedford, N.H., assignor to Bencher, Inc., Chicago, Ill.
Filed Jun. 27, 1977, Ser. No. 810,045
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D14—90



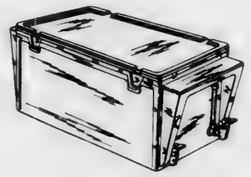
253,535
MOBILE ROTARY DRILL RIG
Walter A. Schmidt; Jack D. Smith, and Jay R. Cory, all of Enid, Okla., assignors to Chicago Pneumatic Tool Co., New York, N.Y.
Filed Jan. 19, 1977, Ser. No. 760,453
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—21

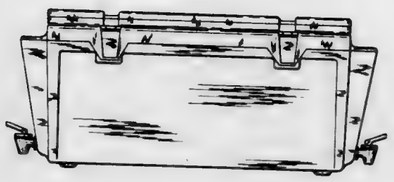


253,536
REFRIGERATOR
Motonari Shibata, and Yuichi Hirayama, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma and Matsushita Reiki Co., Ltd., Osaka, both of, Japan
Filed Oct. 13, 1977, Ser. No. 841,852
Claims priority, application Japan, May 20, 1977, 52-19543
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D15—88

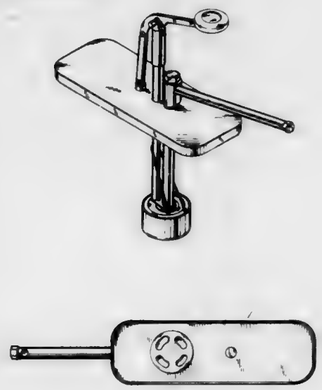


253,537
BEVERAGE CONTAINER AND SERVER
Richard H. Seager, Mystic, Conn., assignor to King-Seeley Thermos
Filed Nov. 21, 1977, Ser. No. 853,645
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D15—115

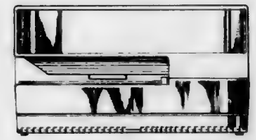




253,538
PUMP DISPENSER FOR SODA FOUNTAINS
James W. Brutsman, Cheyenne, Wyo., assignor to Wyott Corporation, Cheyenne, Wyo.
Filed Jun. 17, 1977, Ser. No. 807,541
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—120

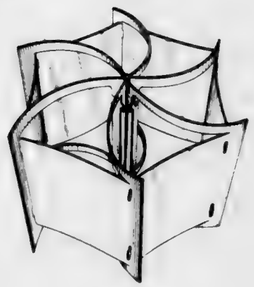


253,539
PRINTER HOUSING
John B. Coppola, Trumbull, and William A. Ottersen, Norwalk, both of Conn., assignors to Bunker Ramo Corporation, Oak Brook, Ill.
Filed May 5, 1977, Ser. No. 794,206
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D18—13



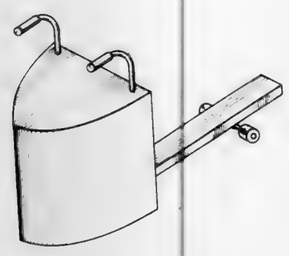


253,540
MULTI-SIDED DISPLAY SUPPORT OR THE LIKE
Alan J. Rothchild, East Northport, N.Y., assignor to Rothchild Printing Company, Ltd., Elmhurst, N.Y.
Filed Aug. 12, 1977, Ser. No. 824,199
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—42

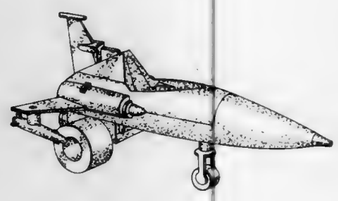


V.988 N.4 N.027 79 UMI

253,541
COASTER
Raymond Fragoso, 1967 Courtland Ave., Oakland, Calif. 94601
Filed Aug. 18, 1977, Ser. No. 825,551
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—81



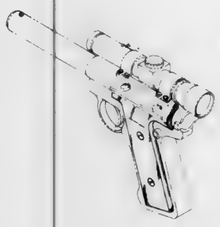
253,542
TOY JET
Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 694,138, Jun. 9, 1976, abandoned. This application Apr. 21, 1978, Ser. No. 899,094
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—87



253,543
SIMULATIVE TOY DESK
Edward M. Ferguson, Nashville, Tenn., assignor to Kusan, Inc., Nashville, Tenn.
Filed Feb. 2, 1978, Ser. No. 874,370
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—121



253,544
OPTICAL SIGHT MOUNT
Ronald E. Elbe, 2830 Cedar St., Davenport, Iowa 52804
Filed Oct. 17, 1977, Ser. No. 842,835
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—7

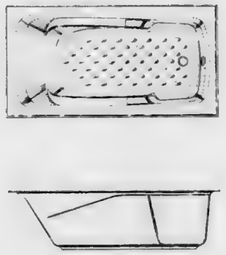


253,545
SIGHTING ATTACHMENT FOR A TELESCOPIC DEVICE
M. Gaines Chesnut, Arvada, Colo., assignor to Outdoor Sports Industries, Inc., Denver, Colo.
Filed Aug. 12, 1977, Ser. No. 823,950
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—8

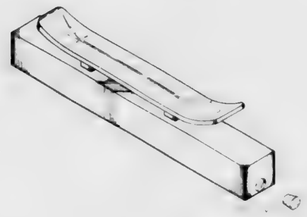
253,546
FISH LURE
William E. Hogreff, 295 D St., Apt. B, Chula Vista, Calif. 92010
Filed Nov. 25, 1977, Ser. No. 855,012
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



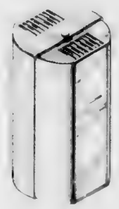
253,547
BATHTUB
Richard S. Beddome, Irvine, and Dean Myers, Santa Ana, both of Calif., assignors to Kimstock, Inc., Santa Ana, Calif.
Filed Nov. 15, 1978, Ser. No. 961,144
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



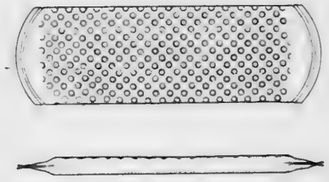
253,548
COMBINED STICK INCENSE BURNER AND STORAGE COMPARTMENT
Morton A. Gruber, 188 Haypath Rd., Old Bethpage, N.Y. 11804
Filed Jan. 25, 1978, Ser. No. 872,345
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—78



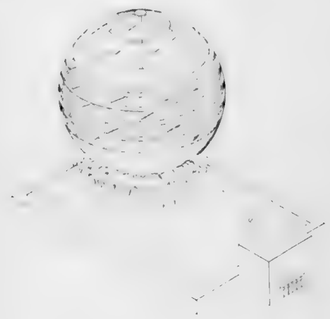
253,549
DEODORIZER HOUSING
Richard J. Seager, Manchester, Conn., assignor to The Risdon Manufacturing Company, Naugatuck, Conn.
Filed Oct. 13, 1976, Ser. No. 732,180
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



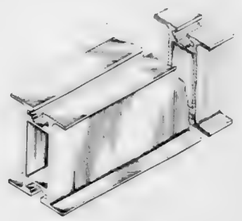
253,550
SANITARY NAPKIN
Robert J. Roeder, Appleton, Wis., assignor to Kimberly-Clark Corporation
Filed Nov. 13, 1978, Ser. No. 960,283
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—51



253,551
COMBINED BUILDING AND FOUNTAIN
Timothy Roberts, Jr., Box R-BHI-HDMC, New York, N.Y. 09202
Filed Oct. 28, 1977, Ser. No. 846,607
Term of patent 3½ years
Int. Cl. D25—*03*
U.S. Cl. D25—7



253,552
EXTRUDED BEAM
James C. Durbin, 2000 Old Lost Mountain Rd., Powder Springs, Ga. 30073
Filed Mar. 3, 1977, Ser. No. 773,945
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—75



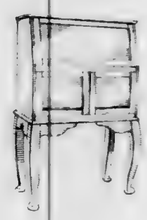
253,553
COMBINED DOOR AND WALL SEALER FOR A GREENHOUSE FRAME
Donald R. Hunter, 20490 Olympia, Detroit, Mich. 48240
Filed Sep. 21, 1977, Ser. No. 835,250
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—76



253,554
ELASTIC FRAME FOR FIREPROOF FEED-THROUGH OF ELECTRIC CABLES IN WALLS OF CONCRETE OR ROCK OR THE LIKE
Erik M. Blomqvist, Karlskrona, Sweden, assignor to AB Lyckeaborgs Bruk, Karlskrona, Sweden
Filed Dec. 21, 1976, Ser. No. 757,224
Claims priority, application Sweden, Sep. 23, 1976, 761851
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—90



253,555
AQUARIUM
Michelle E. Browne, 6678 SW. 140th Ct., Miami, Fla. 33183
Filed Sep. 14, 1978, Ser. No. 942,312
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—9



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF NOVEMBER, 1979

NOTE —Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A & H Mfg. Co.: *See—*
Feibelman, Jeffrey A., 4,175,660, Cl. 206-468.000.
A-T-O Inc.: *See—*
Becker, Michael L.; and Wilfong, William G., 4,175,364, Cl. 53-539.000.
AB Resmastservice: *See—*
Andersson, Bengt V., 4,175,908, Cl. 414-786.000.
Abbott Laboratories: *See—*
Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, 4,176,178, Cl. 424-180.000.
Winn, Martin; and Kyncl, John J., 4,176,191, Cl. 424-274.000.
Abex Corporation: *See—*
Kulik, George J.; Meslink, Michael C.; and Mulder, James P., 4,176,391, Cl. 362-390.000.
Abrahams, Roy H.: *See—*
Laidler, John B.; and Abrahams, Roy H., 4,176,158, Cl. 423-2.000.
ACF Industries, Incorporated: *See—*
Kacal, Gary W.; and Partridge, Charles C., 4,175,577, Cl. 137-15.000.
Phelan, Michael B., 4,175,526, Cl. 123-136.000.
Achelpohl, Fritz; and Schneider, Horst, to Windmoller & Holscher. Apparatus for making chains of sacks. 4,176,000, Cl. 156-510.000.
Adam, Robert A.: *See—*
Kranich, Joel H.; Adam, Robert A.; and Culbertson, Charles L., 4,175,807, Cl. 312-118.000.
Adamovich, Anatoly V.; Burov, Lev A.; Nemets, Rusaam S.; Gorbulev, Efim S.; Eremenko, Boris S.; Brainman, Felix A.; Moldavanov, Viktor P.; Kontsov, Jury M.; Axenov, Viktor F.; and Averbukh, Matvei I. Tangential expander for oil control piston rings. 4,175,758, Cl. 277-220.000.
Aechter, Burckhard; and Gerlach, Manfred, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Apparatus for measuring the time between received pulses. 4,176,337, Cl. 367-131.000.
Ag Superior, Inc.: *See—*
Scheffler, Edward D., 4,175,368, Cl. 56-328.00R.
Agence Nationale de Valorisation de la Rechercha (ANVAR): *See—*
Gibert, Henri, 4,175,334, Cl. 34-5.000.
Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Duchene, Georges, 4,175,542, Cl. 126-449.000.
Quenisset, Jean-Michel; Naslain, Rober; and Hagenmuller, Paul, 4,176,002, Cl. 156-601.000.
AGFA-Gevaert, A.G.: *See—*
Credner, Hans-Heinrich; and Schranz, Karl-Wilhelm, 4,175,968, Cl. 430-559.000.
Jores, Willi, 4,175,713, Cl. 242-56.00R.
Rapp, Heinz; Biedermann, Ernst; and Wittenbrink, Dieter, 4,175,857, Cl. 355-73.000.
Air Products and Chemicals, Inc.: *See—*
Miller, Keith A.; and Osmundson, Eric C., 4,175,396, Cl. 62-63.000.
Airaksinen, Markku, to Multilift Oy. Apparatus for mounting, demounting, and tipping vehicles. 4,175,904, Cl. 414-421.000.
Ajinomoto Co., Inc.: *See—*
Sakakibara, Shumpei; Nagai, Yutaka; Fujiwara, Kenji; and Sakai, Takahiro, 4,176,009, Cl. 435-24.000.
Aktiengesellschaft Cilander: *See—*
Muller, Hermann, 4,175,997, Cl. 156-362.000.
Aktieselskabet Funki Maskinfabrik: *See—*
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Alberto-Culver Company: *See—*
Cella, John A.; and Fiebig, August E., Jr., 4,176,176, Cl. 424-70.000.
Albright, William D.: *See—*
Bennon, Saul; and Albright, William D., 4,176,333, Cl. 336-60.000.
Alcan Research and Development Limited: *See—*
Dethloff, Finn H., 4,176,019, Cl. 204-67.000.
Aldag, Henry R.; Morton, Richard G.; and Woodroffe, Jaime A., to Jersey Nuclear-Avco Isotopes, Inc. High performance dye laser and flow channel therefor. 4,176,324, Cl. 331-94.50T.
Alexander, A. Gordon; and Coupland, Keith, to Exxon Research & Engineering Co. Dioxime and hydroxy benzoic acid metal salt antioxidants for lithium soap grease compositions. 4,176,075, Cl. 252-42.100.
Alford Industries, Inc.: *See—*
Moir, David, 4,176,147, Cl. 264-25.000.
Allegheny Ludlum Industries, Inc.: *See—*
Southern, Raymond L.; and Reen, Orville W., 4,175,921, Cl. 432-261.000.
Allen, Donovan J. Plant aerator tube. 4,175,356, Cl. 47-66.000.
Allen, Terry M.; and Derfler, William D. Lightweight costume head. 4,175,411, Cl. 2-173.000.
Allied Chemical Corporation: *See—*
Linares, Robert C.; and Ambasz, Wiktor, 4,175,950, Cl. 75-53.000.
Alsberg, Henry; Skalla, Dale; and Meisenhelder, William C., to Richardson Company, The. Polystyrene phonograph record injection molding compositions of improved transparency. 4,176,104, Cl. 260-28.50R.
Alten, Kurt. Closure structure, especially for openings in a building. 4,175,608, Cl. 160-273.00R.
Altenweger, Alois, to Zellweger Uster AG. Thread gripper. 4,175,307, Cl. 28-211.000.
AM International, Inc.: *See—*
Nelson, Alfred M., 4,176,362, Cl. 346-74.100.
Amazonen-Werke H. Dreyer: *See—*
Dreyer, Heinz, 4,175,705, Cl. 239-651.000.
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Schimmel, Otto K., 4,175,329, Cl. 33-23.00R.
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Ament, Eduard: *See—*
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Andersen, Charles E.; and Simons, Craig W., 4,175,815, Cl. 339-61.00R.
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American Optical Corporation: *See—*
Siegmund, Walter P., 4,175,940, Cl. 65-4.00A.
American Standard Inc.: *See—*
Tonges, Gerald A.; and Elmlinger, Eugene L., 4,175,774, Cl. 283-6.000.
Ametek, Inc.: *See—*
Harland, Philip W., 4,175,444, Cl. 73-738.000.
Ammann, Stephen K.; and Herborn, Peter E., to Quantor Corporation. Microfiche recorder. 4,175,854, Cl. 355-54.000.
AMP Incorporated: *See—*
Coldren, Daniel R.; Krider, Paul R.; and Williams, Benjamin C., 4,175,811, Cl. 339-19.000.
Hughes, Donald W. K., 4,175,819, Cl. 339-176.00M.
Kourimsky, Friedrich J. A.; and John, Heinrich, 4,175,818, Cl. 339-176.0MP.
Andersen, Charles E.; and Simons, Craig W., to Amerace Corporation. Connector element with means for reducing effects of radial void in electrical connection. 4,175,815, Cl. 339-61.00R.
Anderson, Clarence A. Plant growing device. 4,175,354, Cl. 47-39.000.
Anderson, John M., to General Electric Company. Core mounting for solenoidal electric field lamps. 4,176,296, Cl. 315-71.000.
Andersson, Bengt V., to AB Resmastservice. Method of loading and unloading heavy objects from a vessel. 4,175,908, Cl. 414-786.000.
Ando, Shigeki: *See—*
Iwako, Hiroyuki; and Ando, Shigeki, 4,175,873, Cl. 366-165.000.
Andreadakis, Nicholas C.: *See—*
Kirchner, Richard K.; Mayer, William N.; and Andreadakis, Nicholas C., 4,176,298, Cl. 315-169.200.
Andres, Rudolf; and Ament, Eduard, to Daimler-Benz Aktiengesellschaft. Installation for feeding the lock tongue and/or the belt band of a belt system. 4,175,633, Cl. 180-270.000.
Angelini, Sergio, to Fiat, S.p.A. Method for chromium electroplating of bars. 4,176,015, Cl. 204-28.000.
Ankersmit, Hendrik J. Method for the separation from each other of the components of a mixture of water, oil and dirt (sludge) as well as apparatus for performing said method. 4,176,068, Cl. 210-295.000.
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; Wiechert, Rudolf; Wendt, Hans; and Kapp, Joachim-Friedrich, to Schering Aktiengesellschaft. Novel corticoids. 4,176,126, Cl. 260-397.450.
Anstalt Europaische Handelsgesellschaft: *See—*
Gaetzi, Robert, 4,176,246, Cl. 178-22.000.
Ansul Company, The: *See—*
Poeschl, Paul M.; and Stockwell, David L., 4,175,677, Cl. 222-5.000.
Antos, George J., to UOP Inc. Superactive multimetallic catalytic composite comprising platinum group metal and rhenium. 4,176,088, Cl. 252-441.000.
Aoki, Kiyoshi; and Kamo, Hisao, to Tokyo Shibaura Electric Co., Ltd. Method for manufacturing junction type field-effect transistors. 4,175,317, Cl. 29-571.000.
Aoki, Teruaki: *See—*
Matsushita, Takeshi; Hayashi, Hisao; Aoki, Teruaki; Yamoto, Hisayoshi; and Kawana, Yoshiyuki, 4,176,372, Cl. 357-52.000.
Aoyama, Kazuho: *See—*
Otsuki, Yutaka; Araki, Yoshihiko; and Aoyama, Kazuho, 4,176,110, Cl. 260-31.80N.
Apblett, William R., Jr., to Foster Wheeler Energy Corporation. Stress control collar. 4,175,779, Cl. 285-115.000.
Arai, Akira: *See—*
Fukushima, Toshihiko; Fujie, Kunio; Arai, Akira; Arai, Nobukatsu; and Kakizaki, Kimio, 4,175,416, Cl. 72-254.000.

Arai, Nobukatsu: *See—*
Fukushima, Toshihiko; Fujie, Kunio; Arai, Akira; Arai, Nobukatsu; and Kakizaki, Kimio, 4,175,416, Cl. 72-254.000.
Arai, Toshio, to Kabushiki Kaisha Morita Sanshoku. Dental treatment tool. 4,175,324, Cl. 433-122.000.
Araki, Yoshihiko: *See—*
Otsuki, Yutaka; Araki, Yoshihiko; and Aoyama, Kazuho, 4,176,110, Cl. 260-31.80N.
ARBED Acieries Reunies de Burbach-Eich-Dudelange S.A.: *See—*
Baumert, Jean, 4,175,612, Cl. 164-449.000.
Blondelot, Emile; Economopoulos, Marios; and Wilmotte, Stephan H., 4,175,985, Cl. 148-12.400.
Archdale, Robert W.: *See—*
Crane, John L.; Archdale, Robert W.; and Webb, Alan E., 4,175,912, Cl. 416-193.00A.
Archer, Robert A.; and Day, William A., to Eli Lilly and Company. Stereoselective preparation of hexahydro dibenzopyranones and intermediates therefor. 4,176,233, Cl. 560-249.000.
Ardal og Sunndal Verk a.s.: *See—*
Dethloff, Finn H., 4,176,019, Cl. 204-67.000.
Nebell, Hans G. T., 4,176,037, Cl. 204-243.00M.
Arenberg, Irving K.; and Newkirk, John B. Biological drainage shunt. 4,175,563, Cl. 128-350.00V.
Arfert, Horst F. W.: *See—*
Reynolds, William G.; and Arfert, Horst F. W., 4,175,670, Cl. 220-70.000.
Armstrong Cork Company: *See—*
Rueggeberg, Werner, 4,176,267, Cl. 219-10.55A.
Arnold, Reginald S.: *See—*
Tachick, Henry N.; Arnold, Reginald S.; Belcher, James E.; and St. Jacques, Joseph A., 4,175,817, Cl. 339-111.000.
Aronis, Thomas P. Stringed musical instrument. 4,175,466, Cl. 84-288.000.
Aronson, Michael P.: *See—*
Princen, Henricus M.; and Aronson, Michael P., 4,176,200, Cl. 426-250.000.
Artos Engineering Company: *See—*
Gudmestad, Ragnar, 4,175,316, Cl. 29-564.400.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Ide, Akira; and Matsumoto, Sojiro, 4,176,132, Cl. 260-453.00A.
Misumi, Teruyuki; Furuhashi, Susumu; and Shiga, Masaaki, 4,176,020, Cl. 204-72.000.
Asahimatsu Koridofu Kabushiki Kaisha: *See—*
Kumagaya, Teruo, 4,175,482, Cl. 99-330.000.
Asakura, Toshikazu: *See—*
Kasai, Kaname; Mukumoto, Takaji; Asakura, Toshikazu; and Ueda, Ryoji, 4,175,408, Cl. 64-26.000.
Asano, Eijiro; and Komori, Ryuichi, to Diesel Kiki Co., Ltd. Pneumatic governor control apparatus for engine fuel injection system. 4,175,530, Cl. 123-140.0FG.
Asano, Tetsumasa; Yatsuki, Osamu; Fujimoto, Kazuyuki; and Hashimoto, Harutoshi, to Mitsubishi Denki Kabushiki Kaisha. Speed control apparatus. 4,176,306, Cl. 318-772.000.
Asanuma, Akira; Taneda, Nobuo; Hasegawa, Ryozo; Jindai, Shohei; and Morishita, Toshio, to Teijin Limited. Method for heat-sterilizing artificial kidneys. 4,176,156, Cl. 422-25.000.
Ashdown, Ronald A.; Ewing, Keith; and Birkenhead, Stuart I., to Foster Wheeler Energy Corporation. Isolating/pressure relief damper. 4,175,582, Cl. 137-334.000.
Ateliers de Constructions Electriques de Charleroi (ACEC): *See—*
Bingen, Roald, 4,176,237, Cl. 13-27.000.
Ateliers des Charmilles S.A.: *See—*
Piguet, Pierre, 4,175,707, Cl. 239-456.000.
Atkins, Kenneth E.: *See—*
Reid, Wallace G.; Saini, Rakesh; and Atkins, Kenneth E., 4,176,106, Cl. 260-29.300.
Reid, Wallace G.; Saini, Rakesh; and Atkins, Kenneth E., 4,176,216, Cl. 521-106.000.
Atlantic Richfield Company: *See—*
Davis, Robert R.; Sill, Richard C.; and Yerkes, John W., 4,175,980, Cl. 136-89.0FC.
Yoo, Jin S.; and Milam, Ronald L., 4,176,085, Cl. 252-428.000.
AUGAT Inc.: *See—*
Holt, Richard C.; Damon, Neil F.; and Hanlon, Richard J., 4,175,810, Cl. 339-17.00C.
Austel, Volkhard; Kutter, Eberhard; Heider, Joachim; Eberlein, Wolfgang; Kobinger, Walter; Lillie, Christian; Diederen, Willi; and Haarmann, Walter, to Boehringer Ingelheim GmbH. Imidazoisoquinolinediones and salts thereof. 4,176,184, Cl. 424-248.520.
Authier, Bernhard: *See—*
Zauhar, Helmut; Authier, Bernhard; Luptovits, Roland; and Schmidhammer, Leonhard, 4,175,610, Cl. 164-60.000.
Auto-Miser International Manufacturing Corp.: *See—*
Johnson, Edward E., 4,175,525, Cl. 123-134.000.
Automatic Liquid Packaging, Inc.: *See—*
Weiler, Gerhard H.; Nagel, Dieter H.; and Pagels, Louis T., 4,176,153, Cl. 264-524.000.
Avera, Fitzhugh L. Non-dusting agent and method of manufacture. 4,175,976, Cl. 106-162.000.
Averbukh, Matvei I.: *See—*
Adamovich, Anatoly V.; Burov, Lev A.; Nemets, Rusaam S.; Gorbulev, Efim S.; Eremenko, Boris S.; Brainman, Felix A.; Moldavanov, Viktor P.; Kontsov, Jury M.; Axenov, Viktor F.; and Averbukh, Matvei I., 4,175,758, Cl. 277-220.000.
Avril, Arthur C. Machine for drying granular materials. 4,175,335, Cl. 34-128.000.

Axenov, Viktor F.: *See—*
Adamovich, Anatoly V.; Burov, Lev A.; Nemets, Rusaam S.; Gorbulev, Efim S.; Eremenko, Boris S.; Brainman, Felix A.; Moldavanov, Viktor P.; Kontsov, Jury M.; Axenov, Viktor F.; and Averbukh, Matvei I., 4,175,758, Cl. 277-220.000.
Aziz, Walid Y.; and Ball, Lawrence E., to Standard Oil Company. Reinforced xylene-formaldehyde resin compositions. 4,176,095, Cl. 260-9.000.
B.C. Richards & Co. Pty. Ltd.: *See—*
Richards, Cecil G., 4,175,726, Cl. 251-315.000.
Babcock, William E.; and Hess, Ronald L., to RCA Corporation. Television S-correction linearity device. 4,176,303, Cl. 315-400.000.
Bachert, Peter, to Motorola, Inc. Frequency multiplier. 4,176,332, Cl. 333-218.000.
Bacus, James W., to Rush-Presbyterian-St. Luke's Medical Center. Dual resolution method and apparatus for use in automated classification of pap smear and other samples. 4,175,860, Cl. 356-39.000.
Badger Meter Inc.: *See—*
Bradham, Allen C., III; and Seruga, Edward A., 4,175,434, Cl. 73-197.000.
Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Eckert, Guenter; Knaflic, France; Miller, Franz-Friedrich; and Zissel, Alfred, 4,175,922, Cl. 8-94.160.
Baer, Stephen, to Dow Corning Corporation. Self reorienting solar tracker. 4,175,391, Cl. 60-531.000.
Baert, Victor R., to Pako Corporation. Test system for photographic printers. 4,175,852, Cl. 355-35.000.
Baggett, William M.; and Plischke, LeMoyne W., to Monsanto Company. Process for incorporating CaF_2 into polyamides. 4,176,227, Cl. 528-488.000.
Bailey, Clifford E., to Bailey, Clifford E. Assembly for mounting tubeless tires. 4,175,606, Cl. 152-399.000.
Baker Perkins Holdings Limited: *See—*
Edwards, Albert, 4,175,866, Cl. 366-2.000.
Baker, Thomas E.; Fix, George L.; and Judge, John S., to Raytheon Corporation. Process for forming polymeric paraxylylene coatings and films possessing improved oxidation resistance. 4,176,209, Cl. 427-248.00B.
Baldwin, Arthur M., to Champion International Corporation. Panel turner. 4,175,655, Cl. 198-403.000.
Baldwin, John J.; and Ponticello, Gerald S., to Merck & Co., Inc. Novel naphthyridines. 4,176,183, Cl. 424-248.520.
Ball, Lawrence E.: *See—*
Aziz, Walid Y.; and Ball, Lawrence E., 4,176,095, Cl. 260-9.000.
Balsys, Heinz: *See—*
Eibofner, Eugen; and Balsys, Heinz, 4,175,323, Cl. 433-126.000.
Barbier, Pierre, to Societe d'Etudes Scientifiques et Industrielles. Pharmaceutical composition comprising erythromycin and metoclopramide and method of preparing same. 4,176,180, Cl. 424-181.000.
Bardiani, Christian: *See—*
Korner, Otto; and Bardiani, Christian, 4,175,798, Cl. 305-58.00R.
Barker, N. Glen: *See—*
Johnston, William T.; and Barker, N. Glen, 4,175,906, Cl. 414-469.000.
Barmag Barmer Maschinenfabrik Ag: *See—*
Schippers, Heinz; and Lenk, Erich, 4,175,712, Cl. 242-46.400.
Barnard, James A., to General Motors Corporation. Conveyorized fin accumulator. 4,175,309, Cl. 29-157.30R.
Barnes, Jocelyn T., to Lexalite International Corporation. Stackable light refractor. 4,175,661, Cl. 206-519.000.
Bartini, Paul S.: *See—*
Roantree, William J.; and Bartini, Paul S., 4,175,540, Cl. 126-425.000.
Barwin, Raymond K. Ski edge. 4,175,766, Cl. 280-608.000.
BASF Aktiengesellschaft: *See—*
Kast, Hellmut, 4,176,229, Cl. 542-422.000.
Platz, Rolf; Dockner, Toni; Heners, Jurgen; and Krug, Herbert, 4,176,137, Cl. 260-561.00N.
Schoettle, Klaus; Dobler, Peter; Gliniorz, Lothar; Scherer, Volker; and Brombach, Heinz, 4,175,999, Cl. 156-505.000.
BASF Wyandotte Corporation: *See—*
Demou, John G.; and Pray, Edward R., 4,176,218, Cl. 521-129.000.
Batcho, Andrew D., to Hoffmann-La Roche Inc. 5-(6-Alkylindol-3-ylmethylene)-1,3-dimethyl-2-(methylimino)-4-imidazolidinones. 4,176,230, Cl. 542-444.000.
Battard, Jean-Claude; and Buisson, Jean, to Service d'Exploitation Industrielle des Tabacs et des Allumettes. Glue for articles in the tobacco industry and method employing same. 4,175,996, Cl. 156-336.000.
Battelle Development Corporation: *See—*
Rider, Dennis G., 4,176,398, Cl. 364-607.000.
Baubel, Alexandr A.: *See—*
Sakulevich, Faddei J.; Minin, Leonid K.; Bazarnov, Jury A.; Baubel, Alexandr A.; and Skvorchevsky, Nikolai Y., 4,175,930, Cl. 51-281.00R.
Bauman, Robert S., to St. Louis Diecasting Corporation. Spring clip break-away. 4,175,724, Cl. 248-642.000.
Baumeister, Gregor: *See—*
Finkelstein, Wolfgang; Baumeister, Gregor; and Haaz, Josef, 4,175,583, Cl. 137-504.000.
Baumert, Jean, to ARBED Acieries Reunies de Burbach-Eich-Dudelange S.A. Apparatus for measuring and controlling the level of molten steel in a continuous-casting mold. 4,175,612, Cl. 164-449.000.
Baumgartner Papiers S.A.: *See—*
Roullier, Marcel-Francois, 4,175,479, Cl. 93-77.0FT.

Baxter Travenol Laboratories, Inc.: *See—*
Hess, John M., III; and Mittleman, Herbert, 4,175,558, Cl. 128-214.00C.
Norton, William W.; and Boehmer, Henry, 4,175,994, Cl. 156-251.000.
Baycura, Orestes M. Low noise gas turbine. 4,175,380, Cl. 60-39.060.
Bayer Aktiengesellschaft: *See—*
Bier, Peter; Binsack, Rudolf; and Vernaleken, Hugo, 4,176,224, Cl. 528-309.000.
Birkenstock, Udo; and Haydn, Josef, 4,176,092, Cl. 252-472.000.
Hoffmann, Hellmut; Hammann, Ingeborg; and Homeyer, Bernhard, 4,176,181, Cl. 424-211.000.
Lenthe, Manfred; and Dankert, Gerhard, 4,176,133, Cl. 260-465.50R.
Petinaux, Marcel; Dieterich, Dieter; and Markusch, Peter, 4,176,118, Cl. 260-239.00A.
Bayer, Bryce E.: *See—*
Dillon, Peter L. P.; and Bayer, Bryce E., 4,176,373, Cl. 358-37.000.
Bayerische Motoren Werke AG: *See—*
Ederer, Georg; Fischer, Adolf; Rosche, Paul; Troll, Helmar; Wurst, Wolfgang; Hengl, Helmut; and Seidl, Jiri, 4,175,504, Cl. 123-52.00M.
Bazarnov, Jury A.: *See—*
Sakulevich, Faddei J.; Minin, Leonid K.; Bazarnov, Jury A.; Baubel, Alexandr A.; and Skvorchevsky, Nikolai Y., 4,175,930, Cl. 51-281.00R.
BBC Brown Boveri & Company Limited: *See—*
Pfenninger, Hans, 4,175,382, Cl. 60-39.18B.
Beale, Richard F.: *See—*
Morrison, William R. B.; and Beale, Richard F., 4,175,430, Cl. 73-141.00A.
Beall, Richard W., Jr.: *See—*
Tyler, Truman V., 4,176,063, Cl. 210-101.000.
Beam, Dennis A., Jr.; and Sarazen, Paul M., Jr. Wall ventilator construction. 4,175,480, Cl. 98-37.000.
Becker, Dieter; and Stenert, Alois, to Hoesch Werke Aktiengesellschaft. One-piece intermediate member for anti-friction bearings. 4,175,805, Cl. 308-199.000.
Becker, Michael L.; and Wilfong, William G., to A-T-O Inc. Case packer head. 4,175,364, Cl. 53-539.000.
Beckman Instruments, Inc.: *See—*
Blanke, John D., 4,175,427, Cl. 73-118.000.
Beckwith, Edward K. Dental articulator. 4,175,325, Cl. 433-60.000.
Beery, Jack: *See—*
Speckman, Lawrence; and Beery, Jack, 4,175,719, Cl. 242-197.000.
BEI Electronics, Inc.: *See—*
Shuffield, Thomas E., Jr., 4,176,286, Cl. 307-237.000.
Belcher, James E.: *See—*
Tachick, Henry N.; Arnold, Reginald S.; Belcher, James E.; and St. Jacques, Joseph A., 4,175,817, Cl. 339-111.000.
Bell, Frank H., to Thiokol Corporation. Gun with rapid firing rate. 4,175,470, Cl. 89-7.000.
Bell Telephone Laboratories, Incorporated: *See—*
Kasper, Horst M.; Tell, Benjamin; and Wagner, Sigurd, 4,176,170, Cl. 423-508.000.
O'Sullivan, Thomas D., 4,176,021, Cl. 204-96.000.
Rudisill, John A., Jr., 4,176,255, Cl. 179-16.00F.
Saari, Veikko R.; and Shoji, Masakazu, 4,176,344, Cl. 340-347.0DA.
Sabia, Raffaele A., 4,176,240, Cl. 174-23.00C.
Sheets, Laurence L., 4,176,248, Cl. 178-67.000.
Beloit Corporation: *See—*
Dreher, George L., 4,175,714, Cl. 242-65.000.
Sokolow, Nickolas N., 4,176,152, Cl. 264-329.000.
Bendig, Larry L.; Scamehorn, John F.; and Stowell, Donald E., to Continental Oil Company. High pore volume alumina from dilute high injection alkoxide feed. 4,176,171, Cl. 423-628.000.
Bendix Corporation, The: *See—*
Harper, Patrick D., 4,176,387, Cl. 361-154.000.
Pauwels, Edward M., 4,175,794, Cl. 303-105.000.
Benedetti, Nicholas M., to USM Corporation. Molding clip. 4,175,303, Cl. 24-73.0FT.
Benjamin, Martin E.: *See—*
Denton, Dennis N.; and Benjamin, Martin E., 4,175,756, Cl. 277-189.000.
Benjo, Cezar. Apparatus for assisting the understanding of electro-cardiography and vector-cardiography. 4,175,337, Cl. 35-17.000.
Bennetch, Leonard M.; Greiner, Harry S.; Hancock, Kenneth R.; and Hoffman, Mark, to Pfizer Inc. Particle gamma ferric oxide. 4,176,172, Cl. 423-634.000.
Bennett, William G., to Teleflex Incorporated. Motion transmitting remote control assembly. 4,175,450, Cl. 74-501.00P.
Bennon, Saul; and Albright, William D., to Westinghouse Electric Corp. Magnetic core for single phase electrical inductive apparatus. 4,176,333, Cl. 336-60.000.
Bentley, Richard P. Strap closure. 4,175,304, Cl. 24-197.000.
Berglind, Bradford L., to General Motors Corporation. Time division multiplexing system for an automobile. 4,176,250, Cl. 179-1.0VE.
Bernot, Jean, to Trefilunion. Process and installation for mechanical descaling steel wire. 4,175,412, Cl. 72-40.000.
Bertelsen, William R. Surface effect vehicles and guideways therefor. 4,175,637, Cl. 180-128.000.
Bertus, Brent J.; and Walker, Darrell W., to Phillips Petroleum Company. Dehydrogenation of hydrocarbons with zinc titanate catalyst. 4,176,140, Cl. 585-629.000.

Berwick, Martin A.; Fox, Charles J.; and Light, William A., to Eastman Kodak Company. Multi-active photoconductive element having an aggregate charge generating layer. 4,175,960, Cl. 430-58.000.
Berwick, Martin A.: *See—*
Wright, Hal E.; and Berwick, Martin A., 4,175,961, Cl. 430-58.000.
Betriesbsforschungsinstitut VDEh Institut fur angewandte Forschung GmbH: *See—*
Keck, Roland, 4,175,429, Cl. 73-141.00A.
Bettcher Industries, Inc.: *See—*
Bettcher, Louis A., 4,175,321, Cl. 30-276.000.
Bettcher, Louis A., to Bettcher Industries, Inc. Trimming knife. 4,175,321, Cl. 30-276.000.
Bianchi, Maurice P.; and Rosales, Louis A., to TRW Inc. Passive lubrication method and system. 4,175,642, Cl. 184-1.00E.
Biedermann, Ernst: *See—*
Rapp, Heinz; Biedermann, Ernst; and Wittenbrink, Dieter, 4,175,857, Cl. 355-73.000.
Bier, Peter; Binsack, Rudolf; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Poly (ethylene/alkylene) terephthalates which crystallize rapidly. 4,176,224, Cl. 528-309.000.
Bieringer, Hermann: *See—*
Koch, Manfred; Handte, Reinhard; Horlein, Gerhard; Bieringer, Hermann; and Langeluddeke, Peter, 4,175,947, Cl. 71-88.000.
Biess, John J.: *See—*
Cronin, Donald L.; and Biess, John J., 4,176,392, Cl. 363-71.000.
Bigelow, Jeffrey A.: *See—*
Bigelow, Jerome J.; and Bigelow, Jeffrey A., 4,175,306, Cl. 24-253.000.
Bigelow, Jerome J.; and Bigelow, Jeffrey A., to Bigelow, Jeffrey A. Molded spring-biased garment clamp. 4,175,306, Cl. 24-253.000.
Bignold, Alan J.: *See—*
Cruden, John M.; Bignold, Alan J.; Green, Roger H.; and Grisenthwaite, Ronald J., 4,176,103, Cl. 260-29.6RW.
Bimond, Jean-Pierre; and Lazarre, Flavien, to Societe Nationale Elf Aquitaine (Production). Device for handling and testing a cell adapted for sampling a pressurized fluid. 4,175,424, Cl. 73-49.200.
Bingen, Roald, to Ateliers de Constructions Electriques de Charleroi (ACEC). Four a induction. 4,176,237, Cl. 13-27.000.
Binsack, Rudolf: *See—*
Bier, Peter; Binsack, Rudolf; and Vernaleken, Hugo, 4,176,224, Cl. 528-309.000.
Birch, Stanley F.; Lawler, John A.; and Paynter, Gerald C., to Boeing Commercial Airplane Company. Vortex generators for internal mixing in a turbofan engine. 4,175,640, Cl. 181-213.000.
Birkenhead, Stuart I.: *See—*
Ashdown, Ronald A.; Ewing, Keith; and Birkenhead, Stuart I., 4,175,582, Cl. 137-334.000.
Birkenstock, Udo; and Haydn, Josef, to Bayer Aktiengesellschaft. Process for the depyrophorization of pyrophoric metal catalysts and catalysts prepared by the process. 4,176,092, Cl. 252-472.000.
Bischeri, Ido. Plunge-grinder, especially for grinding the cams of engine timing shafts. 4,175,358, Cl. 51-142.000.
Bishop, Donald E.: *See—*
Lough, Wendell J.; and Bishop, Donald E., 4,175,936, Cl. 55-385.00A.
Bishop, Leonard W. J.: *See—*
Russell, Stuart M.; and Bishop, Leonard W. J., 4,176,174, Cl 424-8.000.
Black, Dennis A.; and Mantey, Raymond N., to General Motors Corporation; and General Motors Corporation. Drive shaft lug for variable displacement compressor. 4,175,915, Cl. 417-222.000.
Black, Donald S., to Palmer Engineering Company Ltd. Mixture concentrator. 4,176,064, Cl. 210-196.000.
Blaha, Erich; and Schulz, Kurt, to Zeiss-Stiftung, Carl. Adjustable viewing head for a stereoscopic microscope. 4,175,826, Cl. 350-36.000.
Blair, Lloyd S., to General Electric Company. Pipe header–cylindrical tank joint and method of joining same. 4,175,615, Cl. 165-106.000.
Blanke, John D., to Beckman Instruments, Inc. Engine fault analysis on catalytic converter equipped autos. 4,175,427, Cl. 73-118.000.
Blondelot, Emile; Economopoulos, Marios; and Wilmotte, Stephan H., to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie; and ARBED Acieries Reunies de Burbach-Eich-Dudelange S.A. Method of producing steel sections of improved quality. 4,175,985, Cl. 148-12.400.
Blurton, Claire M.: *See—*
Jeppson, Morris R., 4,175,885, Cl. 404-77.000.
Blurton, Richard R.: *See—*
Jeppson, Morris R., 4,175,885, Cl. 404-77.000.
Bobst-Champlain, Inc.: *See—*
Stern, Nathan, 4,176,162, Cl. 423-210.000.
Bochumer Eisenhutte Heintzmann GmbH & Co.: *See—*
von Klinggraff, Gerhard; Marr, Peter; and Bohnes, Karlheinz, 4,175,891, Cl. 405-291.000.
Bodenseewerk Perkin-Elmer & Co. GmbH: *See—*
Tamm, Rolf G.; Grosser, Gunter; and Tomoff, Toma, 4,175,863, Cl. 356-312.000.
Boehme, Detlef R., to Varian Associates, Inc. Pressure regulator with minimum dead volume. 4,175,585, Cl. 137-509.000.
Boehmer, Henry: *See—*
Norton, William W.; and Boehmer, Henry, 4,175,994, Cl. 156-251.000.
Boehringer Ingelheim GmbH: *See—*
Austel, Volkhard; Kutter, Eberhard; Heider, Joachim; Eberlein, Wolfgang; Kobinger, Walter; Lillie, Christian; Diederen, Willi; and Haarmann, Walter, 4,176,184, Cl. 424-248.520.

Goldberg, Leon I.; Merz, Herbert; and Stockhaus, Klaus, 4,176,186, Cl. 424-260.000.

Boeing Commercial Airplane Company: *See—*
Birch, Stanley F.; Lawler, John A.; and Paynter, Gerald C., 4,175,640, Cl. 181-213.000.

Boeing Company, The: *See—*
Lang, John M., 4,175,656, Cl. 198-748.000.

Boggs, Roger L.; and Christensen, Jon C., to Caterpillar Tractor Co. Track-type vehicle wheel cleaning apparatus. 4,175,796, Cl. 305-11.000.

Bohnes, Karlheinz: *See—*
von Klinggraff, Gerhard; Marr, Peter; and Bohnes, Karlheinz, 4,175,891, Cl. 405-291.000.

Bolen, Charles E.: *See—*
Marzocchi, Alfred; Roberts, Michael G.; and Bolen, Charles E., 4,175,978, Cl. 106-281.00R.

Boliden Aktiebolag: *See—*
Fahlstrom, Per A. H. H., 4,176,042, Cl. 208-11.0LE.
Lagerstrom, Gosta B., 4,176,203, Cl. 426-636.000.

Bollwitt, Duaine L.: *See—*
Steffen, Sylvester L.; and Bollwitt, Duaine L., 4,175,418, Cl. 73-342.000.

Bonner, Cletus D. Tamper proof security mail and bank collection bag. 4,175,604, Cl. 150-15.000.

Booth, W. Jesse. Apparatus for dynamically testing golf clubs. 4,175,440, Cl. 73-432.0SD.

Borg-Warner Corporation: *See—*
Wentworth, Robert S., Jr., 4,175,753, Cl. 277-87.000.

Boruszewski, John S.: *See—*
Hay, Robert A., II; and Boruszewski, John S., 4,175,998, Cl. 156-391.000.

Bott, John A. Luggage rack. 4,175,682, Cl. 224-309.000.

Bouet, Jacques E., to International Harvester Company. Device for fixing the knives of rotary mowers. 4,175,367, Cl. 56-295.000.

Bova, Mary L.; and Bova, Ralph G. Apparatus and method for producing sectioned edibles. 4,175,690, Cl. 227-76.000.

Bova, Ralph G.: *See—*
Bova, Mary L.; and Bova, Ralph G., 4,175,690, Cl. 227-76.000.

Boyd, John A. Toilet construction. 4,175,294, Cl. 4-237.000.

Boyd, William R. Snap ring tool. 4,175,310, Cl. 29-229.000.

BPB Industries Limited: *See—*
George, James S.; Ward, Arthur G. T.; and Pastakia, Percy N., 4,176,157, Cl. 422-114.000.

Brack, Karl, to Design Cote Corporation. Radiation and moisture curable compositions and method of use. 4,176,212, Cl. 428-423.000.

Bradham, Allen C., III; and Seruga, Edward A., to Badger Meter Inc. Compound meter assembly. 4,175,434, Cl. 73-197.000.

Bradley, Kenneth M. Sanitary unit for confined environmental controlled feeding of hogs. 4,175,515, Cl. 119-16.000.

Bradley, Terry G.: *See—*
Manning, Walter; and Bradley, Terry G., 4,175,449, Cl. 74-492.000.

Brainman, Felix A.: *See—*
Adamovich, Anatoly V.; Burov, Lev A.; Nemets, Rusaam S.; Gorbulev, Efim S.; Eremenko, Boris S.; Brainman, Felix A.; Moldavanov, Viktor P.; Kontsov, Jury M.; Axenov, Viktor F.; and Averbukh, Matvei I., 4,175,758, Cl. 277-220.000.

Branch, Andrew J.: *See—*
Crownnshield, Roy D.; and Branch, Andrew J., 4,175,446, Cl. 73-787.000.

Brandau, Steven G.; and Carmichael, Robert L., to Deere & Company. Gas-contaminant separator. 4,175,937, Cl. 55-419.000.

Brauer, Melvin; and Kroplinski, Thaddeus F., to N L Industries, Inc. Insulated electrical cable containing an agent for decontaminating and sealing the interior space thereof. 4,176,239, Cl. 174-23.00C.

Braukmann Armaturen AG: *See—*
Braukmann, Bernhard W., 4,175,696, Cl. 236-34.500.

Braukmann, Bernhard W., to Braukmann Armaturen AG. Thermostatic valve. 4,175,696, Cl. 236-34.500.

Braun, Clarence; and Zupanick, Joseph E., to Sun Oil Company (Delaware). Apparatus for determining the pulse repetition rate of a fluidic oscillator through which a test gas is flowing. 4,175,423, Cl. 73-30.000.

Brede, Uwe: *See—*
Knappworst, Jurgen; Brede, Uwe; and Zeiher, Erich, 4,175,492, Cl. 102-92.600.

Brenzel, Daniel J., to Dynapol. Process for preparing ethylidene-bisacetamide. 4,176,136, Cl. 260-561.00R.

Breznay, Endre. Process for perishing waste rubber materials, especially worn out motor vehicle rubber tires by recovering their components for industrial purposes. 4,175,949, Cl. 75-42.000.

Bricot, Claude; Dubois, Jean-Claude; LeCarvennec, Francois; Lehureau, Jean-Claude; and Magna, Henriette, to Thomson-Brandt. Thermosensitive data-carrier designed for the recording of information and a method of recording information on such a data-carrier. 4,176,277, Cl. 250-316.100.

Bringman, Bernard B.; and Goodwin, Genevieve M. Stocking mending apparatus. 4,176,001, Cl. 156-581.000.

Brinkert, Franz, to Raco-Elektro-Maschinen GmbH. Electrically resettable railway brake. 4,175,645, Cl. 188-72.100.

Bristol-Myers Company: *See—*
Shih, Kun M.; and Walker, Derek, 4,176,131, Cl. 260-448.20E.

British Steel Corporation: *See—*
Owen, Leslie J., 4,175,422, Cl. 73-23.000.

British Steel Corporation (Chemicals) Limited: *See—*
Fletcher, John M., 4,175,611, Cl. 164-418.000.

Britton, Keith C.; and Lekas, Mitchell A., to Geokinetics Inc. Process for producing an underground zone of fragmented and pervious material. 4,175,490, Cl. 102-23.000.

Britton, Michael W.; Harlacher, Eugene A.; Dew, John N.; and Kleinpeter, Joseph A., to Conoco Methanation Company. Hydrodesulfurization purification process for coal gasification. 4,175,928, Cl. 48-197.00R.

Britton, Michael W.: *See—*
Dew, John N.; Britton, Michael W.; Harlacher, Eugene A.; and Kleinpeter, Joseph A., 4,176,087, Cl. 252-439.000.

Brois, Stanley J.: *See—*
Ryer, Jack; Winans, Esther D.; Brois, Stanley J.; and Gutierre, Antonio, 4,176,073, Cl. 252-32.70E.

Brombach, Heinz: *See—*
Schoettle, Klaus; Dobler, Peter; Gliniorz, Lothar; Scherer, Volker; and Brombach, Heinz, 4,175,999, Cl. 156-505.000.

Bromley, James E.; and Yu, Jing-Peir, to Monsanto Company. Process for textured yarn. 4,176,150, Cl. 264-168.000.

Brookfield, David A. Viscometer. 4,175,425, Cl. 73-59.000.

Brosenius, Karl H., to Tekram Associates, Inc. Method and apparatus for conservation of energy in a hot water heating system. 4,175,698, Cl. 237-19.000.

Broughton, Jacksel M. Heavy lift air cushion amphibious vehicle. 4,175,636, Cl. 180-119.000.

Broun, Thorowgood T.: *See—*
Hargett, William D.; and Broun, Thorowgood T., 4,176,165, Cl. 423-245.000.

Brower, Ronald W.; Cohen, Jerome; and Chen, Peter C., to NCR Corporation. Method for enhancing the adhesion of photoresist to polysilicon. 4,176,003, Cl. 430-313.000.

Brown, Alfred: *See—*
Wu, Ching H.; Brown, Alfred; Hall, Wilbur L.; and Shupe, Russell D., 4,175,618, Cl. 166-252.000.

Brown, Kenneth H.; and Shepard, John W., to Motorola, Inc. DC coupled bi-phase modulator. 4,176,328, Cl. 332-16.00T.

Brown & Root, Inc.: *See—*
Nolan, Clyde E., Jr.; and Tillinghast, William S., 4,175,620, Cl. 166-343.000.

Bruce, Charles R.; Johnson, Irvin D.; and McGrievy, Lawrence H., to Marathon Oil Company. Apparatus and method for controlling the rate of feeding a petroleum product to a coking drum system. 4,176,052, Cl. 208-131.000.

Bruegman, Michael L.: *See—*
Pospischil, Albert R.; Bruegman, Michael L.; and Granberg, Erlang W., 4,175,989, Cl. 194-1.00C.

Bruneel, Jean-Luc: *See—*
Micheron, Francois; and Bruneel, Jean-Luc, 4,176,345, Cl. 340-373.000.

Brunton Company, The: *See—*
Kramer, Melvin G., 4,175,383, Cl. 33-344.000.

Bryant, Jeffrey J. Adjacent loop distillation. 4,176,012, Cl. 202-172.000.

Bubik, Alfred; and Reutter, Siegfried, to Escher Wyss GmbH. Double filter papermaking machine. 4,176,005, Cl. 162-256.000.

Buckman, John D.; Hunter, Wood E.; Pera, John D.; and Taylor, Robert M., to Buckman Laboratories, Inc. Water-soluble dispersions of high molecular water-soluble polymers containing a surfactant and a water-soluble organic carrier which is a hydroxy compound containing repeating alkylene oxide units. 4,176,107, Cl. 260-29.60E.

Buckman Laboratories, Inc.: *See—*
Buckman, John D.; Hunter, Wood E.; Pera, John D.; and Taylor, Robert M., 4,176,107, Cl. 260-29.60E.

Buczek, Carl J.: *See—*
Wayne, Robert J.; Chenansky, Peter P.; and Buczek, Carl J., 4,176,327, Cl. 331-94.50M.

Buisson, Jean: *See—*
Battard, Jean-Claude; and Buisson, Jean, 4,175,996, Cl. 156-336.000.

Bujese, David P., to Pitney-Bowes, Inc. Control system for a reciprocating carriage drive system. 4,175,850, Cl. 355-13.000.

Bullough Limited: *See—*
White, Gordon D., 4,175,909, Cl. 415-145.000.

Bunda, Tsuchio: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Buňda, Tsuchio; and Tanaka, Taro, 4,175,523, Cl. 123-119.00A.

Bundy, Gordon L., to Upjohn Company, The. 2-Decarboxy-2-alkylcarbonyl-3,7-inter-m-phenylene-9-oxa-4,5,6-trinor-PGF_1 compounds. 4,176,282, Cl. 260-590.00C.

Bunker Ramo Corporation: *See—*
Nijman, John P., 4,175,320, Cl. 29-749.000.

Bunyan, Thomas W., to Pilgrim Engineering Developments Limited. Joints. 4,175,311, Cl. 29-402.180.

Burgess, James V., Jr., to Mine Ventilation Systems, Inc. Mine ventilation system and elements thereof. 4,175,481, Cl. 98-50.000.

Burian, Paul D., to Clairol Incorporated. Manicure attachment. 4,175,573, Cl. 132-73.600.

Buritz, Robert S.; Parker, Robert D.; Kisch, Jack J.; and Burnham, John, to Hughes Aircraft Company. High voltage transformer and process for making same. 4,176,334, Cl. 336-84.00C.

Burlington Industries, Inc.: *See—*
Crawford, William B.; Daniel, Vernon T.; and Wang, Kenneth Y., 4,175,436, Cl. 73-338.600.

Burnham, John: *See—*
Buritz, Robert S.; Parker, Robert D.; Kisch, Jack J.; and Burnham, John, 4,176,334, Cl. 336-84.00C.

Burov, Lev A.: *See—*
Adamovich, Anatoly V.; Burov, Lev A.; Nemets, Rusaam S.; Gorbulev, Efim S.; Eremenko, Boris S.; Brainman, Felix A.;

Moldavanov, Viktor P.; Kontsov, Jury M.; Axenov, Viktor F.; and Averbukh, Matvei I., 4,175,758, Cl. 277-220.000.

Burr, Robert P.; Morino, Ronald; and Keogh, Raymond J., to Kollmorgen Technologies Corporation. Multi-wire electrical interconnecting member having a multi-wire matrix of insulated wires mechanically terminated thereon. 4,175,816, Cl. 339-95.00R.

Burroughs Corporation: *See—*
Charpentier, Douglass E., 4,176,335, Cl. 336-180.000.
Ferguson, Thomas R., 4,175,728, Cl. 269-91.000.
Speckman, Lawrence; and Beery, Jack, 4,175,719, Cl. 242-197.000.

Burroughs, H. Willard. Tubing reamer. 4,175,895, Cl. 408-228.000.

Burroughs Wellcome Co.: *See—*
Russell, Stuart M.; and Bishop, Leonard W. J., 4,176,174, Cl. 424-8.000.

Burrs, Emil D.: *See—*
Johnson, Ralph W.; Burrs, Emil D.; Smith, Gary L.; Freund, Ronald G.; and Patula, Edward, 4,175,674, Cl. 221-88.000.

Burt, Dennis W. Fire, temperature or heat detector. 4,175,437, Cl 73-362.0AR.

Burton, John S.: *See—*
Turner, William C.; Limburg, William R.; and Burton, John S., 4,175,855, Cl. 355-68.000.

Butler, James K. Mechanical glass knife scorer/breaker. 4,175,684, Cl. 225-2.000.

C. A. Weidmuller KG: *See—*
Wilmes, Manfred; Finger, Torsten; Fitzler, Arno; Kretzschmar, Wolfgang; and Franke, Heinrich, 4,175,820, Cl. 339-198.00R.

C L Industries, Inc.: *See—*
Stewart, Patrick H.; and Woodson, Wayne D., 4,176,114, Cl 260-42.290.

Cabral, Tony: *See—*
Souza, Frank F.; Silva, Vernon A.; and Cabral, Tony, 4,175,514, Cl. 119-14.080.

Caimi, Ronald J.; and Schlauch, Walter F., to National Starch and Chemical Corporation. Heat-coagulable latex binders and process for the preparation thereof. 4,176,108, Cl. 260-29.6TA.

Cambria Spring Company: *See—*
Lampert, Albert J., 4,175,772, Cl. 280-718.000.

Cameron, Robert L. Water saving toilet. 4,175,295, Cl. 4-327.000.

Camp International, Inc.: *See—*
Rosenberg, Henry W., 4,175,553, Cl. 128-78.000.

Campbell Soup Company: *See—*
Hildebolt, William M.; and Hundt, Murray T., 4,175,486, Cl. 99-483.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources: *See—*
Ternan, Marten; and Parsons, Basil I., 4,176,051, Cl. 208-112.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Thistle, William G.; and Dionne, Joseph G. G., 4,176,297, Cl 315-150.000.
Ward, Frederick D., 4,175,451, Cl. 74-661.000.

Canadian General Electric Company Limited: *See—*
Sack, Stanley F., 4,175,593, Cl. 138-110.000.

Canals, Charles: *See—*
Letournoux, Alain; and Canals, Charles, 4,175,301, Cl. 16-146.000.

Canon Kabushiki Kaisha: *See—*
Ito, Masaharu, 4,175,831, Cl. 350-255.000.
Iwashita, Tomonori; Takimoto, Hiroyuki; Mashimo, Yukio; and Hashimoto, Teiji, 4,175,845, Cl. 354-173.000.
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi, and Tokiwa, Tatsuke, 4,175,851, Cl. 355-14.00R.
Murakami, Hiroyashu; Ito, Tadashi; Ito, Fumio; Sakurada, Nobuaki; Kawamura, Masaharu; and Shinoda, Nobuhiko, 4,175,848, Cl. 354-289.000.
Sakurada, Nobuaki; Ito, Tadashi; Shinoda, Nobuhiko; Ito, Fumio; Murakami, Hiroyashu; and Kawamura, Masaharu, 4,175,842, Cl. 354-23.00D.

Carella, Richard F. Combination of a bow and a power handle. 4,175,536, Cl. 124-23.00R.

Carl Canzler, Firma: *See—*
Kranz, Berthold, 4,175,730, Cl. 266-120.000.

Carl Still, Firma: *See—*
Knappstein, Johannes, 4,176,011, Cl. 201-40.000.

Carl Zeiss-Stiftung: *See—*
Herzog, Klaus, 4,175,327, Cl. 33-1.00M.
Muller, Ortwin; Grunvogel, Karl; and Schulz, Kurt, 4,175,839, Cl 351-14.000.

Carman, Justice N., to Pennish, John S., as part interest. Process for producing liquid silicon. 4,176,166, Cl. 423-350.000.

Carmichael, Robert L.: *See—*
Brandau, Steven G.; and Carmichael, Robert L., 4,175,937, Cl. 55-419.000.

Carrier Corporation: *See—*
Geary, Carl H., 4,175,755, Cl. 277-137.000.
Hile, James R., 4,175,402, Cl. 62-263.000.

Carson, William S. Pick-up apparatus and containing assembly. 4,175,903, Cl. 414-408.000.

Carter, Cecil O., to Phillips Petroleum Company. Catalyst preparation. 4,176,086, Cl. 252-429.00B.

Carver, Robert G., to Creative Cartons of Ashland, Inc. Collapsible stereoscopic viewer. 4,175,828, Cl. 350-140.000.

Cassanelli, Ernest M.: *See—*
Vergnani, Leo H.; Ferrero, John B.; and Cassanelli, Ernest M., 4,175,417, Cl. 72-356.000.

Castanie, Francis: *See—*
Hoffmann, Jean-Claude; Castanie, Francis; Crabere, Henri; Verdier, Jean-Pierre; and Voisin, Norbert, 4,176,399, Cl. 364-717.000.

Catallo, Frank. Horizontal folder with varying speed traverse. 4,175,738, Cl. 270-30.000.

Caterpillar Tractor Co.: *See—*
Boggs, Roger L.; and Christensen, Jon C., 4,175,796, Cl. 305-11.000.
Coil, Donald A.; Johnson, John L., Jr.; and Swinland, Horace J., 4,175,801, Cl. 308-23.000.
Davis, Billy J.; Kinsey, Cletus M.; Shen, Hwa J.; and Weber, James R., 4,175,799, Cl. 308-9.000.
Frantzreb, John G., Sr., 4,175,918, Cl. 428-567.000.
Grawey, Charles E., 4,175,992, Cl. 156-143.000.
Holl, Harold H.; and Hupe, Walter R., 4,175,671, Cl. 220-235.000.
Knell, Harvey A.; and Gill, Stephen H., 4,175,907, Cl. 414-715.000.

Cathala, Annie: *See—*
Faron, Robert; and Cathala, Annie, 4,176,018, Cl. 204-60.000.

Catlett, Richard E. Spring powered, portable, hand held suction and blower apparatus. 4,175,352, Cl. 43-139.000.

Cattano, John D., to Dale Products, Inc. Battery strap and post cast-on multi use mold. 4,175,725, Cl. 249-81.000.

Cavalaris, Michael T.; and Spanondis, Michael E. Bag holder and dispenser. 4,175,602, Cl. 150-3.000.

CBS Inc.: *See—*
Schmoll, George F., III, 4,175,465, Cl. 84-1.260.

Celanese Polymer Specialties Company: *See—*
Shimp, David A., 4,176,221, Cl. 528-103.000.

Cella, James A., to General Electric Company. Moisture curable organopolysiloxanes. 4,176,111, Cl. 260-37.0SB.

Cella, James A.; and Mitchell, Tyrone D., to General Electric Company. Moisture curable alkoxy organopolysiloxanes. 4,176,112, Cl. 260-37.0SB.

Cella, John A.; and Fiebig, August E., Jr., to Alberto-Culver Company. Hair shampoo and cleanser compositions. 4,176,176, Cl. 424-70.000.

Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie: *See—*
Blondelot, Emile; Economopoulos, Marios; and Wilmotte, Stephan H., 4,175,985, Cl. 148-12.400.

Centro-Maskin Goteborg AB: *See—*
Johansson, Bengt A., 4,175,984, Cl. 148-9.500.

Cerberus AG: *See—*
Horvath, Zoltan; and Tresch, Erwin, 4,175,865, Cl. 356-338.000.

Certain-Teed Corporation: *See—*
Miedaner, Patrick M., 4,176,105, Cl. 260-29.300.

Cessna Aircraft Company, The: *See—*
Unruh, Dennis R.; and Martin, Robert J., 4,175,914, Cl. 417-218.000.

CGEE Alsthom *See—*
Debaigt, Jean, 4,175,822, Cl. 339-266.00R

Chadwick, Alexander; Khair, Magdi K.; and McCombie, Jay C., to Chrysler Corporation. Fuel injection system and control valve for multi-cylinder engines. 4,175,587, Cl. 137-625.650.

Chaffee, David H.; and Tipler, Earl L., to Overly, Inc.. Fluid bearing supporting system for rotary drums and the like. 4,175,800, Cl. 308-9.000.

Champion International Corporation: *See—*
Baldwin, Arthur M., 4,175,655, Cl. 198-403.000.
Cornell, William F.; Vear, John P.; and Pascuzzi, E. Anthony, 4,175,691, Cl. 229-36.000.
Hartman, Seymour; and Sheridan, Catherine M., 4,176,115, Cl. 260-39.00R

Chang, Christopher T. M.: *See—*
Dimyan, Magid Y.; Hubbell, Wayne C.; Chang, Christopher T. M.; and Linn, John C., 4,176,404, Cl. 365-12.000.

Chantry, Peter J.: *See—*
Chen, Cheng-Lin; and Chantry, Peter J., 4,176,025, Cl. 204-157.10R.

Charbonnier, Simon: *See—*
Mathiolon, Henri; and Charbonnier, Simon, 4,175,717, Cl. 242-131.000.

Chari, Madabushi V. K. *See—*
Kaisi, Swarn S.; and Chari, Madabushi V. K., 4,176,292, Cl 310-52.000.

Charles Stark Draper Laboratory, Inc., The: *See—*
Howatt, John R., 4,176,396, Cl. 364-551.000.

Charpentier, Douglass E., to Burroughs Corporation. Electrical conducting apparatus. 4,176,335, Cl. 336-180.000.

Chemie Linz Aktiengesellschaft: *See—*
Golser, Leopold; Czepel, Hubert; and Stern, Gernard, 4,176,217, Cl. 521-106.000.

Chen, Cheng-Lin; and Chantry, Peter J., to Westinghouse Electric Corp. Isotope dissociation selective electron attachment and separation. 4,176,025, Cl. 204-157.10R.

Chen, Nai Y.; Garwood, William E.; and Peters, Alan W., to Mobil Oil Corporation. Production of high V.I. lubricating oil stock. 4,176,050, Cl. 208-111.000.

Chen, Peter C.: *See—*
Brower, Ronald W.; Cohen, Jerome; and Chen, Peter C., 4,176,003, Cl. 430-313.000.

Chen, Robert H. K.: *See—*
Kanojia, Ramesh M.; Wachter, Michael P.; and Chen, Robert H. K., 4,176,188, Cl. 424-270.000.

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Chenausky, Peter P.: *See—*
Wayne, Robert J.; Chenausky, Peter P.; and Buczek, Carl J., 4,176,327, Cl. 331-94.50M.
Cheng, Shui-Shan. Assembly structure of tenon and mortise. 4,175,884, Cl. 403-353.000.
Chestnut, Scott R.: *See—*
Rugheimer, Norman M.; and Chestnut, Scott R., 4,175,750, Cl. 273-157.00R.
Chi Rho Corporation: *See—*
Llewellyn, Link W., 4,175,744, Cl. 273-26.00E.
Chiarenza, Angelo R.; and Weiss, Charles M., to Oratronics, Inc. Method and apparatus for stimulating osteogenic activity in bone structure adjacent a dental implant. 4,175,565, Cl. 433-32.000.
Childress, Donnie D., to Desal-Chem, Inc. Delsalinization and chemical extraction process. 4,176,023, Cl. 204-98.000.
Chinoin Gyogyszer es Vegyeszeti Termekek: *See—*
Szekely, Istvan; Tomoskozi, Istvan; Kovacs, Gabor; Simonidesz, Vilmos; Lovasz nee Gaspar, Marianna; Keresztes, Borbala nee Ordog; Remport, Julia nee Radoczi; Stadler, Istvan; Visky, Zsuzsa nee Gombos; and Szantay, Csaba, 4,176,122, Cl. 260-343.30P.
Chlorine Engineers Corp., Ltd.: *See—*
Goto, Nobutaka, 4,176,168, Cl. 423-478.000.
Chow, Kung C., to Westinghouse Electric Corp. Overcurrent relay. 4,176,386, Cl. 361-93.000.
Christensen, Jon C.: *See—*
Boggs, Roger L.; and Christensen, Jon C., 4,175,796, Cl. 305-11.000.
Christensen, Robert F., to J. I. Case Company. Electronically controlled four-wheel steering. 4,175,638, Cl. 180-140.000.
Chrysler Corporation: *See—*
Chadwick, Alexander; Khair, Magdi K.; and McCombie, Jay C., 4,175,587, Cl. 137-625.650.
Coddington, Thomas T., 4,175,524, Cl. 123-122.00D.
Chu, Cheng-Hsien: *See—*
Stark, William H.; and Chu, Cheng-Hsien, 4,176,164, Cl. 423-243.000.
Chubb, Talbot A. Method of storing energy. 4,175,613, Cl. 165-1.000.
Churlaud, Henri A., to Societe Anonyme des Etablissements Ph. Bonvillan & E. Ronceray. Mixer for different products and in particular for foundry sands. 4,175,869, Cl. 366-42.000.
Ciba-Geigy Corporation: *See—*
Darms, Roland; Wyler, Siegfried; and Greber, Gerd, 4,176,124, Cl. 260-346.300.
Habicht, Ernst, 4,176,190, Cl. 424-274.000.
Robertson, George H.; and Stirling, John A., 4,175,979, Cl. 106-309.000.
Sury, Yel S.; and Guillory, Melvin J., Jr., 4,176,060, Cl. 210-62.000.
Wick, Arnold; and Jost, Max, 4,176,113, Cl. 260-40.00P.
Cicci, George B., to International Harvester Company. Harvester lift and float mechanism. 4,175,366, Cl. 56-15.800.
Cincinnati Milacron-Heald Corporation: *See—*
Knorring, Richard T., 4,175,415, Cl. 72-101.000.
Cincinnati Mine Machinery Company, The: *See—*
Krekeler, Claude B., 4,175,797, Cl. 305-53.000.
Cinderey, Michael B.; and Rose, John B., to Imperial Chemical Industries Limited. Production of aromatic polyethers. 4,176,222, Cl. 528-126.000.
Cindu Chemie B.V.: *See—*
van Eijk, Johannes N., 4,176,043, Cl. 208-44.000.
Citizen Watch Co. Ltd.: *See—*
Ichikawa, Singo, 4,175,377, Cl. 58-23.0BA.
Tamaru, Munetaka; Kume, Kazunari; Watanabe, Minoru; Ohno, Hideshi; and Natori, Minoru, 4,175,372, Cl. 58-5.000.
Clairol Incorporated: *See—*
Burian, Paul D., 4,175,573, Cl. 132-73.600.
Clark, Alan C.: *See—*
Surbey, Donald L.; Clark, Alan C.; and Miller, Leonard E., 4,176,081, Cl. 252-182.000.
Clark, Robert H., to McGraw-Edison Company. Donut maker appliance with improved means for coating batter with cooking oil. 4,175,483, Cl. 99-354.000.
Clarke, Charles W., to Ederer Incorporated. Single failure proof crane. 4,175,727, Cl. 254-173.00R.
Clay, B. Jan: *See—*
Durr, Larry J.; Durr, Larry L.; and Clay, B. Jan, 4,175,932, Cl. 55-59.000.
Clegg, Maurice A.: *See—*
Ruscoe, Michael J. H.; Clegg, Maurice A.; Seibt, Willie H.; and Sarkar, Kshitindra M., 4,176,014, Cl. 204-23.000.
Clemar Manufacturing Corporation: *See—*
Evelyn-Veere, Rene H.; and Ruggles, Richard L., 4,176,395, Cl. 364-420.000.
Clement, Jean-Claude: *See—*
Sturtz, Georges; and Clement, Jean-Claude, 4,176,225, Cl. 528-337.000.
Clemmons, Quenten T., to Westinghouse Air Brake Company. Parking brake control system for railway vehicles. 4,175,793, Cl. 303-89.000.
Coal Industry (Patents) Limited: *See—*
James, Granville C., 4,175,933, Cl. 55-259.000.
Monks, Harry, 4,175,649, Cl. 192-18.00A.
Coddington, Thomas T., to Chrysler Corporation. Inlet air temperature control for automobile engine. 4,175,524, Cl. 123-122.00D.
Coded Communications: *See—*
Tobin, Joseph J.; Robinson, David B.; Peay, Robert L.; Powell, Jerry R.; and Gay, Leslie W., 4,176,348, Cl. 340-562.000.
Cohen, Izak (Piet), to Sales Promotion Spits B.V. Viewer for the successive viewing of a number of transparent images. 4,175,344, Cl. 40-364.000.
Cohen, Jerome: *See—*
Brower, Ronald W.; Cohen, Jerome; and Chen, Peter C., 4,176,003, Cl. 430-313.000.
Cohen, Milton J. Non-aerosol continuous spray dispenser. 4,175,704, Cl. 239-320.000.
Coil, Donald A.; Johnson, John L., Jr.; and Swinland, Horace J., to Caterpillar Tractor Co. Bearing having a tab. 4,175,801, Cl. 308-23.000.
Coldren, Daniel R.; Krider, Paul R.; and Williams, Benjamin C., to AMP Incorporated. Connector having snubber network for triac. 4,175,811, Cl. 339-19.000.
Colglazier, Donald F.; Fallon, John L.; Kimble, George P.; and Mares, Fred R., to International Business Machines Corporation. Cut-sheet xerographic copier having coasing wheel sheet feed and a duplex bin with an adjustable bottom-of-the-bin pad. 4,175,741, Cl. 271-3.100.
Collum, Paulette: *See—*
Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, 4,176,178, Cl. 424-180.000.
Combustion Engineering, Inc.: *See—*
Mabery, Thomas L., 4,175,419, Cl. 72-383.000.
Nelson, Hugh W., 4,176,163, Cl. 423-242.000.
Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme): *See—*
Donabin, Claude J., 4,175,694, Cl. 235-475.000.
Compton, James B., to National Semiconductor Corporation. Junction field effect transistor for use in integrated circuits. 4,176,368, Cl. 357-22.000.
Conner, William R., Jr., to Kellwood Company. Suspension system for land vehicles. 4,175,763, Cl. 280-104.000.
Conoco, Inc.: *See—*
McConaghy, James R., Jr., 4,176,046, Cl. 208-50.000.
Conoco Methanation Company: *See—*
Britton, Michael W.; Harlacher, Eugene A.; Dew, John N.; and Kleinpeter, Joseph A., 4,175,928, Cl. 48-197.00R.
Dew, John N.; Britton, Michael W.; Harlacher, Eugene A.; and Kleinpeter, Joseph A., 4,176,087, Cl. 252-439.000.
Container Corporation of America: *See—*
Fraenkel, Stephen J., 4,175,709, Cl. 241-21.000.
Continental Oil Company: *See—*
Bendig, Larry L.; Scamehorn, John F.; and Stowell, Donald E., 4,176,171, Cl. 423-628.000.
Orrell, Derrell D.; and McFeeters, Melvin M., 4,176,047, Cl. 208-51.000.
Cook, George E.: *See—*
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Corfield, John R.; and Taylor, Clifford G., to Lilly Industries Limited. Process for preparing 3-exomethylenecepham sulfoxides. 4,176,231, Cl. 544-16.000.
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Cornell, Charles R.; and Simpson, Dennis D., to Eaton Corporation. Steering control system for dual path hydrostatic vehicle. 4,175,628, Cl. 180-6.480.
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Cotten, Roger C. Apparatus for forming integral tubing and washer. 4,175,917, Cl. 425-142.000.
Council, James M., to Exxon Production Research Company. Anode clamp assembly and method of installation. 4,176,033, Cl. 204-197.000.
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Craig, W. Dale, to United States of America, Navy. Retainer/release mechanism for use on fin stabilized gun fired projectiles. 4,175,720, Cl. 244-3.280.
Crane, John L.; Archdale, Robert W.; and Webb, Alan E., to Rolls-Royce Limited. Axial flow gas turbine engine compressor. 4,175,912, Cl. 416-193.00A.
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Cresswell, Don E. Fail-safe stack damper control system. 4,175,695, Cl. 236-1.00G.
Crisafulli, Angelo J. Pump with steep-angle hitch and universal drive joint. 4,175,916, Cl. 417-231.000.
Crivello, James V., to General Electric Company. Method of exposing and curing an epoxy composition containing an aromatic onium salt. 4,175,963, Cl. 430-296.000.
Crivello, James V., to General Electric Company. Curable epoxy compositions containing aromatic onium salts and hydroxy compounds. 4,175,972, Cl. 204-159.180.
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Cruden, John M.; Bignold, Alan J.; Green, Roger H.; and Grisenthwaite, Ronald J., to Harlow Chemical Company Limited. Polymer latices. 4,176,103, Cl. 260-29.6RW.
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Cushman, Robert H., to Pennwalt Corporation. Panoramic dental radiography employing intraoral radiation source and image intensifying means. 4,176,278, Cl. 250-439.00P.
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Davis, Billy J.; Kinsey, Cletus M.; Shen, Hwa J.; and Weber, James R., to Caterpillar Tractor Co. Hydrodynamic bearing having anticavitation recesses. 4,175,799, Cl. 308-9.000.
Davis, Carl A. Well collar or shoe and cementing/drilling process. 4,175,619, Cl. 166-291.000.
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Davis, William D., to General Electric Company. Positive ion smoke detector using a tungsten wire preheated in hydrogen to increase sensitivity. 4,176,311, Cl. 324-468.000.
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de Lima Castro Neto, Eduardo. Device for closing bags. 4,175,782, Cl. 292-307.00R.
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de Niet, Edmond; and Rijckaert, Albert M. A., to U.S. Philips Corporation. Recording and/or reproducing apparatus for a magnetic record carrier in the form of a tape, provided with a control system for the magnetic head position. 4,176,381, Cl. 360-77.000.
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DeVita, Alphonse J.; Koester, Earl J.; Manoogian, David V.; and Sharenson, Stanley, to Raytheon Company. Method of operating a continuous wave radar. 4,176,351, Cl. 343-9.00R.

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Dreyer, Heinz, to Amazonen-Werke H. Dreyer. Machine for the spreading of material in granular and powder form. 4,175,705, Cl. 239-651.000.
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Edwards, Albert, to Baker Perkins Holdings Limited. Method of operating a foundry sand mixing machine. 4,175,866, Cl. 366-2.000.
Edwards, Thomas C.; and Ecker, Amir L., to Rovac Corporation, The. Closed loop air conditioning system including pressurization by blockage and aspiration. 4,175,397, Cl. 62-149.000.
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Inanaga, Kiyofumi; Egawa, Saburo; Shimizu, Akio; and Maeda, Keijiro, 4,176,249, Cl. 179-1.00E.
Egerter, Norbert: *See—*
Deubzer, Bernward; and Egerter, Norbert, 4,176,128, Cl. 260-448.20E.
Ehrenberger, Gunter: *See—*
Mobus, Dietmar; Ehrenberger, Gunter; and Jobst, Wolfgang, 4,176,265, Cl. 200-316.000.
Eibofner, Eugen; and Balsys, Heinz, to Kaltenbach & Voigt GmbH & Co. Dental handpiece. 4,175,323, Cl. 433-126.000.
Eikelberger, Bruce H. Electric parking brake. 4,175,646, Cl 188-156.000.
Eilersen, Nils A. J. Capacitive dynamometer. 4,175,428, Cl. 73-141.00A.
El Paso Environmental Systems, Inc.: *See—*
Wheatley, Robert T.; and Kosarek, Louis J., 4,176,057, Cl. 210-23.00H.
Elastogran Maschinenbau GmbH & Co.: *See—*
Schneider, Fritz W., 4,175,874, Cl. 366-182.000.
Elderfield, Kenneth J.; and Griffiths, Charles, to National Carbonising Company Limited. Meter provers. 4,175,421, Cl. 73-3.000.
Electric Power Research Institute, Inc.: *See—*
Dethlefsen, Rolf, 4,176,385, Cl. 361-58.000.
Kalsi, Swarn S.; and Chari, Madabushi V. K., 4,176,292, Cl. 310-52.000.
Rabinowitz, Mario, 4,176,291, Cl. 310-52.000.
Electro-Mechanical Products: *See—*
Tann, David, 4,176,264, Cl. 200-82.00E.
Electrochemische Energieconversie, N.V.: *See—*
van Linden, Jacques, 4,176,213, Cl. 429-12.000.
Electromed Incorporated: *See—*
D'Haenens, Irnee J.; and Ledergerber, Charles P., 4,175,551, Cl. 128-24.400.
Electronic Memories & Magnetics Corporation: *See—*
Leach, George S.; and O'Connell, Timothy R., 4,176,289, Cl. 307-270.000.
Elenga, Cornelis W.; van Dijk, Pieter; and van der Zwart, Alfred J., to U.S. Philips Corporation. Device comprising a transformer for stepwise varying voltages. 4,176,310, Cl. 323-7.000.
El Gammal, Maurice; and Rabinovitch, Maurice, to O.N.E.R.A. - Office National d'Etudes et de Recherches Aerospatiales. Process and apparatus for the molding of shaped articles from a composite metallic refractory material. 4,175,609, Cl. 164-60.000.
Eli Lilly and Company: *See—*
Archer, Robert A.; and Day, William A., 4,176,233, Cl. 560-249.000.
Elitex, Koncern textilniho strojirenstvi: *See—*
Sevcik, Ladislav; Dvorak, Josef; and Mlynar, Jiri, 4,175,474, Cl. 92-13.500.
Elmlinger, Eugene L.: *See—*
Tonges, Gerald A.; and Elmlinger, Eugene L., 4,175,774, Cl. 283-6.000.
Emerson Electric Co. (H&H Precision Products Div.): *See—*
Dreibelbis, Richard C., 4,175,697, Cl. 236-93.00A.
Emmerich, Kenneth C., to Fansteel Inc. Sealant system for roof drilling apparatus. 4,175,757, Cl. 277-212.00F.
Emmons Guitar Company, Inc.: *See—*
Lashley, Ronald T., 4,175,467, Cl. 84-312.00P.
Endo, Shinichiro: *See—*
Nakanishi, Sadao; Suzuki, Kazuhiro; Tokura, Nobufumi; and Endo, Shinichiro, 4,175,693, Cl. 235-463.000.
Engel, Derryl D. Fish lure. 4,175,349, Cl. 43-42.020.
Engeling, Charles F.; and Staubly, Ralph F. Supplemental air circulator for hot-air furnaces. 4,175,699, Cl. 237-55.000.
Englund, Robert M., to Sperry Rand Corporation. Signal scrambler-unscrambler for binary coded transmission system. 4,176,247, Cl. 178-22.000.
Epple, Peter C., to General Motors Corporation. Electric switch for motor reversing. 4,176,261, Cl. 200-1.00V.
Eremenko, Boris S.: *See—*
Adamovich, Anatoly V.; Burov, Lev A.; Nemets, Rusaam S.; Gorbulev, Efim S.; Eremenko, Boris S.; Brainman, Felix A.; Moldavanov, Viktor P.; Kontsov, Jury M.; Axenov, Viktor F.; and Averbukh, Matvei I., 4,175,758, Cl. 277-220.000.
Ernest, Robert P., to Ford Motor Company. Method of making air engine housing. 4,175,503, Cl. 123-41.720.
Ernst Leitz Wetzlar GmbH: *See—*
Kaul, Dietmar; and Willhelm, Joerg, 4,176,276, Cl. 250-237.00G.
Leitz, Ludwig; Heitmann, Knut; Schneider, Eckart; and Schmidt, Horst, 4,175,365, Cl. 356-4.000.
Erwin, Lewis, II: *See—*
Suh, Nam P.; Rotz, Christopher A.; and Erwin, Lewis, II, 4,175,871, Cl. 366-79.000.
Esanu, Andre, to Societe d'Etudes de Produits Chimiques. Therapeutic isobutyramides. 4,176,193, Cl. 424-304.000.
Escher Wyss GmbH: *See—*
Bubik, Alfred; and Reutter, Siegfried, 4,176,005, Cl. 162-256.000.
Ethyl Corporation: *See—*
Jackisch, Philip F., 4,176,072, Cl. 252-32.70E.
Niebylski, Leonard M., 4,175,927, Cl. 44-68.000.
Ethyl Development Corporation: *See—*
Robertson, Elmer L., 4,175,993, Cl. 156-234.000.
Etzler, John L. Plug-in bale mover. 4,175,900, Cl. 414-787.000.
Evelyn-Veere, Rene H.; and Ruggles, Richard L., to Clemar Manufacturing Corporation. Interactive irrigation control system. 4,176,395, Cl. 364-420.000.
Ewalt, Leonard J.; and Kaushal, Som N., to TRW Inc. Inert carrier gas heat treating control process. 4,175,986, Cl. 148-16.500.
Ewing, Keith: *See—*
Ashdown, Ronald A.; Ewing, Keith; and Birkenhead, Stuart I., 4,175,582, Cl. 137-334.000.
Exner, Gerhard; and Festinori, Volfango, to Kraftwerk Union Aktiengesellschaft. Device for tensioning several screw bolts. 4,175,453, Cl. 81-57.380.
Exxon Production Research Company: *See—*
Council, James M., 4,176,033, Cl. 204-197.000.
Templeton, John S., III, 4,175,445, Cl. 73-768.000.
Exxon Research & Engineering Co.: *See—*
Alexander, A. Gordon; and Coupland, Keith, 4,176,075, Cl. 252-42.100.
Coupland, Keith; Salva, Juan M.; and Smith, Clinton R., 4,176,074, Cl. 252-32.70E.
Cull, Neville L., 4,176,089, Cl. 252-452.000.
Guerre, Robert P.; Juedes, Dennis L.; and Ruland, Ross R., 4,175,920, Cl. 431-175.000.
Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., 4,176,094, Cl. 252-518.000.
Luckenbach, Edward C., 4,176,084, Cl. 252-417.000.
Ryer, Jack; Winans, Esther D.; Brois, Stanley J.; and Gutierre, Antonio, 4,176,073, Cl. 252-32.70E.
White, Anthony M., 4,176,044, Cl. 208-46.000.
Winter, William E.; and Schuette, William L., 4,176,049, Cl. 208-70.000.
Wisotsky, Max J., 4,175,926, Cl. 44-62.000.
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Skrentner, Frank C., 4,175,894, Cl. 408-1.00R.
Facet Enterprises, Inc.: *See—*
Miller, Donald L., 4,175,650, Cl. 192-84.00C
Fahlstrom, Per A. H. H., to Boliden Aktiebolag. Method of treating shales. 4,176,042, Cl. 208-11.0LE.
Fales, David, III, to Martin Marietta Corporation. Passive method and apparatus for radar locating and parasitic surveilance. 4,176,357, Cl. 343-112.00R.
Fallon, John L.: *See—*
Colglazier, Donald F.; Fallon, John L.; Kimble, George P.; and Mares, Fred R., 4,175,741, Cl. 271-3.100.
Fansteel Inc.: *See—*
Emmerich, Kenneth C., 4,175,757, Cl. 277-212.00F.
Faron, Robert; and Cathala, Annie, to Produits Chimiques Ugine Kuhlmann. Electrolyte and process for electrolytic production of fluorine. 4,176,018, Cl. 204-60.000.
Fassett, Matthew; Pizette, Seymour B.; and Toth, John F., to Raytheon Company. Monopulse antenna system with independently specifiable patterns. 4,176,359, Cl. 343-854.000.
Faust, Guy K.: *See—*
Wagenknecht, Conrad D.; and Faust, Guy K., 4,175,384, Cl. 60-226.00B.
Favara, Louis J.: *See—*
Tyler, Truman V., 4,176,063, Cl. 210-101.000.
Favata, Theodore. Sealant composition. 4,176,102, Cl. 260-28.5AS

Fedde, Mickiel P.; and DeWard, Robert C., 4,176,394, Cl. 364-200.000.
Federal Mogul Corporation: *See—*
Bennett, Robert L., 4,175,779, Cl. 277-152.000.
Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung: *See—*
Hoffmann, Hans-Joachim; and Kuhn, Hans-Peter, 4,175,911, Cl. 425-192.R.
Fenton, Ronald G.; and Hall, Robert J., to Ontario Research Foundation. Method of producing a fuel gas. 4,176,168, Cl. 423-652.000.
Ferguson, Ian J.; and Ferguson, Robert J., to Ferguson Industries Limited. Method of and apparatus for producing a fibrous mat. 4,175,931, Cl. 425-83.000.
Ferguson, Robert J.: *See—*
Ferguson, Ian J.; and Ferguson, Robert J., 4,175,931, Cl. 425-83.000.
Ferrero & C. S.p.A.: *See—*
Dogliotti, Amilcare, 4,175,665, Cl. 211-49.00D.
Fiedler, Kurt H.: *See—*
Draisbach, Adolf; and Fiedler, Kurt H., 4,175,770, Cl. 280-668.000.
Fiedler, Rudolf: *See—*
Kuhn, Hans-Peter; and Fiedler, Rudolf, 4,175,912, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,913, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,914, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,915, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,916, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,917, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,918, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,919, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,920, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,921, Cl. 425-192.R.
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Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,923, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,924, Cl. 425-192.R.
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Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,927, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,928, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,929, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,930, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,931, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,932, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,933, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,934, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,935, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,936, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,937, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,938, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,939, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,940, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,941, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,942, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,943, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,944, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,945, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,946, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,947, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,948, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,949, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,950, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,951, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,952, Cl. 425-192.R.
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Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,954, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,955, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,956, Cl. 425-192.R.
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Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,960, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,961, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,962, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,963, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,964, Cl. 425-192.R.
Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Method and apparatus for producing a fibrous mat. 4,175,965, Cl. 425-192.R.
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Fiedler, Rudolf; and Kuhn, Hans-Peter, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung

Fazzini, Massimo, to Scharper S.p.A. Per l'Industria Farmaceutica. Process for the preparation of tris(hydroxymethyl)-aminomethan-lactate-dihydroxyaluminate. 4,176,129, Cl. 260-448.00R.
Fedde, Mickiel P.: *See—*
Kaminski, David G.; Fedde, Mickiel P.; and DeWard, Robert C., 4,176,394, Cl. 364-200.000.
Feibelman, Jeffrey A., to A & H Mfg. Co. Display package for jewelry and the like. 4,175,660, Cl. 206-468.000.
Feichtner, Wolfgang: *See—*
John, Peter; Feichtner, Wolfgang; Graf, Werner; and Frey, Volker, 4,176,130, Cl. 260-448.20E.
Ferguson, Thomas R., to Burroughs Corporation. Adjustable cable clamp for use with belted cables. 4,175,728, Cl. 269-91.000.
Ferrari, Giorgio; and Vecchietti, Vittorio, to SIMES Societa Italiana Medicinali e Sintetici S.p.A. Sulfamoyl derivatives of 8-β-aminomethylergoline. 4,176,182, Cl. 424-248.500.
Ferrero, John B.: *See—*
Vergnani, Leo H.; Ferrero, John B.; and Cassanelli, Ernest M., 4,175,417, Cl. 72-356.000.
Festinori, Volfango: *See—*
Exner, Gerhard; and Festinori, Volfango, 4,175,453, Cl. 81-57.380.
Fiat, S.p.A.: *See—*
Angelini, Sergio, 4,176,015, Cl. 204-28.000.
Fiebig, August E., Jr.: *See—*
Cella, John A.; and Fiebig, August E., Jr., 4,176,176, Cl. 424-70.000.
Fiedler, Kurt H.: *See—*
Draisbach, Adolf; and Fiedler, Kurt H., 4,175,770, Cl. 280-668.000.
Figueras, John; Nelson, Roger W.; and Sutton, Richard C., to Eastman Kodak Company. Method, composition and element for the detection of nitrogen-containing compounds. 4,176,008, Cl. 435-12.000.
Finger, Torsten: *See—*
Wilmes, Manfred; Finger, Torsten; Fitzler, Arno; Kretzschmar, Wolfgang; and Franke, Heinrich, 4,175,820, Cl. 339-198.00R.
Finkelstein, Wolfgang; Baumeister, Gregor; and Haaz, Josef, to Gebruder Trox, Gesellschaft mit Beschrankter Haftung. Regulator valve. 4,175,583, Cl. 137-504.000.
Fireplace Energy Inc.: *See—*
McGuire, C. James, 4,175,539, Cl. 126-121.000.
Firmenich SA: *See—*
Naf, Ferdinand; and Decorzant, Rene, 4,176,139, Cl. 260-586.00C.
Fischer, Adolf: *See—*
Ederer, Georg; Fischer, Adolf; Rosche, Paul; Troll, Helmar; Wurst, Wolfgang; Hengl, Helmut; and Seidl, Jiri, 4,175,504, Cl. 123-52.00M.
Fischer & Porter Co.: *See—*
Rosenblum, Richard, 4,176,031, Cl. 204-195.00R.
Stevenson, Roberts G., Jr., 4,176,032, Cl. 204-195.00P.
Fisher, Michael H.: *See—*
Ruyle, William V.; and Fisher, Michael H., 4,176,187, Cl. 424-263.000.
Fitzler, Arno: *See—*
Wilmes, Manfred; Finger, Torsten; Fitzler, Arno; Kretzschmar, Wolfgang; and Franke, Heinrich, 4,175,820, Cl. 339-198.00R.
Fix, George L.: *See—*
Baker, Thomas E.; Fix, George L.; and Judge, John S., 4,176,209, Cl. 427-248.00B.
Fleisher, Seymour; and Rosenschein, Warner. Motorized bicycle with removable fuel tank. 4,175,630, Cl. 180-225.000.
Fletcher, John M., to British Steel Corporation (Chemicals) Limited. Plasma flame spray coated graphite dies. 4,175,611, Cl. 164-418.000.
Fliegel, Martin S. Intravenous alarm system. 4,176,349, Cl. 340-613.000.
FN International Societe Anonyme: *See—*
Gevers, Georges A.; and Jeghers, Philippe M., 4,175,745, Cl. 273-73.00C.
Ford Motor Company: *See—*
Ernest, Robert P., 4,175,503, Cl. 123-41.720.
Manning, Walter; and Bradley, Terry G., 4,175,449, Cl. 74-492.000.
Forsyth Dental Infirmary for Children: *See—*
Goodson, Jo M., 4,175,326, Cl. 433-80.000.
Forward, Robert L.; and Thurmond, Gary D., to Hughes Aircraft Company. Network for simulating low-noise-temperature resistors. 4,176,331, Cl. 333-213.000.
Foss, Steven K., to Krestmark Industries, Inc. Stop mechanism. 4,175,737, Cl. 269-317.000.
Foster, L. Curtis; and Lindholm, Carl E., to Motorola, Inc. Directional antenna system including pattern control. 4,176,356, Cl. 343-100.0CS.
Foster Wheeler Energy Corporation: *See—*
Apblett, William R., Jr., 4,175,779, Cl. 285-115.000.
Ashdown, Ronald A.; Ewing, Keith; and Birkenhead, Stuart I., 4,175,582, Cl. 137-334.000.
Pratt, Harry H.; and Money, Dudley P., 4,175,519, Cl. 122-510.000.
Fox, Charles J.: *See—*
Berwick, Martin A.; Fox, Charles J.; and Light, William A., 4,175,960, Cl. 430-58.000.
Fox, Roy A.; and Mortimer, Bradford T., to Standard Oil Company (Indiana). Asbestos-free tape sealant. 4,176,097, Cl. 260-17.4BB.
Foxboro Company, The: *See—*
Gilby, Anthony C., 4,175,864, Cl. 356-326.000.
Fraenkel, Stephen J., to Container Corporation of America. Method and apparatus for separating fibers from agglomerated masses thereof. 4,175,709, Cl. 241-21.000.
Frank, Engelbert. Rotary vane drive with rotating cylinder. 4,175,393, Cl. 60-671.000.
Frank F. Souza, Inc.: *See—*
Souza, Frank F.; Silva, Vernon A.; and Cabral, Tony, 4,175,514, Cl. 119-14.080.
Franke, Heinrich: *See—*
Wilmes, Manfred; Finger, Torsten; Fitzler, Arno; Kretzschmar, Wolfgang; and Franke, Heinrich, 4,175,820, Cl. 339-198.00R.
Frantzreb, John G., Sr., to Caterpillar Tractor Co. Elongate consolidated article and method of making. 4,175,918, Cl. 428-567.000.
Franz, John E.; and Kaufman, Robert J., to Monsanto Company. Thio derivatives of N-trifluoroacetyl-N-phosphonomethylglycine. 4,175,946, Cl. 71-87.000.
Frauenhoffer, Josef; and Ruger, Gerd, to Lohr & Bromkamp GmbH. Apparatus for assembling roller bearings. 4,175,319, Cl. 29-724.000.
Frederick, Charles V. Wall structure. 4,175,362, Cl. 52-274.000.
Freezer, Winthrop J. Inhaler with flow-through cap. 4,175,556, Cl. 128-198.000.
Freund, Ronald G.: *See—*
Johnson, Ralph W.; Burrs, Emil D.; Smith, Gary L.; Freund, Ronald G.; and Patula, Edward, 4,175,674, Cl. 221-88.000.
Frey, Volker: *See—*
John, Peter; Feichtner, Wolfgang; Graf, Werner; and Frey, Volker, 4,176,130, Cl. 260-448.20E.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Aechter, Burckhard; and Gerlach, Manfred, 4,176,337, Cl. 367-131.000.
Friend, William G. Method and apparatus for occult blood testing in the home. 4,175,923, Cl. 23-230.00B.
Froehlich, Frederick B.; Hennings, Roy; and Schaffer, William J., to International Business Machines Corporation. High performance tape path for a 19 inch tape recorder. 4,176,382, Cl. 360-95.000.
Frumerman, Robert; and Hooper, Harold M., to United States of America, Energy. Process for control of pollutants generated during coal gasification. 4,175,929, Cl. 48-202.000.
Fruth, Albert; and Harenberg, Juergen, to Siemens Aktiengesellschaft. Circuit arrangement for time-dependent monitoring of the state of lines. 4,176,256, Cl. 179-18.0FG.
Fuji Photo Film Co., Ltd.: *See—*
Shinozaki, Fumiaki; Washigawa, Yasuo; Ikeda, Tomoaki; Nakao, Sho; and Kondoh, Syunichi, 4,175,971, Cl. 430-287.000.
Uchida, Toshio; Yabuta, Yoshimiti; and Ikeda, Teppei, 4,175,964, Cl. 430-253.000.
Ueda, Hideo; and Sawaguchi, Hiroshi, 4,176,134, Cl. 260-543.00R.
Fujie, Kunio: *See—*
Fukushima, Toshihiko; Fujie, Kunio; Arai, Akira; Arai, Nobukatsu; and Kakizaki, Kimio, 4,175,416, Cl. 72-254.000.
Fujie, Tetsuo; and Ito, Hiromi, to Olympus Optical Company Limited. Light and heat writing pen for photosensitive material. 4,176,273, Cl. 219-220.000.
Fujimoto, Kazuyuki: *See—*
Asano, Tetsumasa; Yatsuki, Osamu; Fujimoto, Kazuyuki; and Hashimoto, Harutoshi, 4,176,306, Cl. 318-772.000.
Fujita, Toshihito: *See—*
Nakazawa, Koji; Kikuchi, Toshiaki; and Fujita, Toshihito, 4,175,939, Cl. 65-2.000.
Fujiwara, Kenji: *See—*
Sakakibara, Shumpei; Nagai, Yutaka; Fujiwara, Kenji; and Sakai, Takahiro, 4,176,009, Cl. 435-24.000.
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kaneko, Yutaka; and Kawasaki, Mikio, to Konishiroku Photo Industry Co., Ltd. Light-sensitive black-white silver halide photographic material for forming a high-contrast silver image and method of treating thereof. 4,175,966, Cl. 430-438.000.
Fukuda, Motoo. Explosion proof device for a pressure accumulator having a valve portion. 4,175,678, Cl. 222-54.000.
Fukuda, Tamotsu: *See—*
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,175,521, Cl. 123-119.00D.
Fukuhara, Toshihiko, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for detecting crack length of a test piece in a fatigue test. 4,175,447, Cl. 73-799.000.
Fukushima, Toshihiko; Fujie, Kunio; Arai, Akira; Arai, Nobukatsu; and Kakizaki, Kimio, to Hitachi, Ltd. Apparatus for manufacturing heat transfer tubes. 4,175,416, Cl. 72-254.000.
Funken Co., Ltd.: *See—*
Iwako, Hiroyuki; and Ando, Shigeki, 4,175,873, Cl. 366-165.000.
Furuhashi, Susumu: *See—*
Misumi, Teruyuki; Furuhashi, Susumu; and Shiga, Masaaki, 4,176,020, Cl. 204-72.000.
G. D. Societa per Azioni: *See—*
Seragnoli, Enzo, 4,175,456, Cl. 83-176.000.
Gabr, Saad Z. M. Current loaded pneumatically driven loudspeaker arrangements. 4,176,253, Cl. 179-1.00E.
Gaetzi, Robert, to Anstalt Europaische Handelsgesellschaft. Apparatus for the transmission end-enciphering and reception end-deciphering of information. 4,176,246, Cl. 178-22.000.
GAF Corporation: *See—*
Mackey, E. Scudder, 4,175,969, Cl. 430-539.000.
Skinner, David B., 4,176,210, Cl. 427-258.000.
Gagnon, Claude F.: *See—*
Cormier, Richard A.; and Gagnon, Claude F., 4,176,006, Cl. 435-74.000.
Gainer, John L., to University of Virginia Alumni Patents Foundation, The. Method for treating arthritis. 4,176,179, Cl. 424-180.000.
Galbert, David R., to Galbert-French, Inc. Light. 4,176,390, Cl. 362-72.000.
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Galbert, David R., 4,176,390, Cl. 362-72.000.

Galperin, Alexandr L.: *See—*
Onikov, Eduard A.; Galperin, Alexandr L.; Zabotin, Alexandr A.; Loschilin, Evgeny D.; and Kolobanov, Nikolai I., 4,175,594, Cl. 139-436.000.
Garbuny, Max, to Westinghouse Electric Corp. Gas dynamic reaction process and system for laser chemistry. 4,176,024, Cl. 204-157.10R.
Garlock Inc.: *See—*
Denton, Dennis N.; and Benjamin, Martin E., 4,175,756, Cl. 277-189.000.
Garrett Corporation, The: *See—*
Wojciehowski, James P.; and Sullivan, John D., 4,175,701, Cl. 239-11.000.
Garrison, R. Leonard, Jr : *See—*
Garrison, Ray L., deceased; and Garrison, R. Leonard, Jr., 4,175,905, Cl. 414-462.000.
Garrison, Ray L., deceased; and Garrison, R. Leonard, Jr. Boat loader. 4,175,905, Cl. 414-462.000.
Garthus, Donald R.; and Robinson, L. T., to Interlake, Inc. Coke oven door seal assembly. 4,176,013, Cl. 202-242.000.
Gartner, Rolf: *See—*
Ditges, Gunter; Mors, Wilhelm; and Gartner, Rolf, 4,175,459, Cl. 83-315.000.
Garwood, William E.: *See—*
Chen, Nai Y.; Garwood, William E.; and Peters, Alan W., 4,176,050, Cl. 208-111.000.
Gasser, Hermann; and Curiger, Karl, to Luwa AG. Broken end-collecting installation and method of operating the same. 4,175,371, Cl. 57-304.000.
Gattus, Yves, to S. A. Martin. Inking and washing circuit for a flexographic printing machine. 4,175,489, Cl. 101-366.000.
Gausewitz, Carr & Rothenberg: *See—*
Tyler, Truman V., 4,176,063, Cl. 210-101.000.
Gay, Leslie W.: *See—*
Tobin, Joseph J.; Robinson, David B.; Peay, Robert L.; Powell, Jerry R.; and Gay, Leslie W., 4,176,348, Cl. 340-562.000.
Geafer, Salahaddin; and Zbikowski, Gerhard, to Motoren- und Turbinen-Union Friedrichafen GmbH. Regulating device. 4,175,529, Cl. 123-140.00R.
Geary, Carl H., to Carrier Corporation. Mechanical seal assembly. 4,175,755, Cl. 277-137.000.
Gebruder Trox, Gesellschaft mit Beschrankter Haftung: *See—*
Finkelstein, Wolfgang; Baumeister, Gregor; and Haaz, Josef, 4,175,583, Cl. 137-504.000.
GEC Medical Equipment Limited: *See—*
Sandbank, Hans A., 4,175,664, Cl. 209-657.000.
Gehring, Johann: *See—*
Stoger, Klaus; Dotzer, Richard; Stadter, Josef; and Gehring, Johann, 4,176,034, Cl. 204-200.000.
Gehrke, Erich F. Support and/or locating means for rails in rail tracks. 4,175,700, Cl. 238-299.000.
Gendrot, Andre. Electrical control systems for transmitting signals of different magnitudes. 4,176,342, Cl. 340-166.00R.
General Atomic Company: *See—*
Mysels, Karol J., 4,176,169, Cl. 423-501.000.
General Cable Corporation: *See—*
Ramy, Towheed; and Hore, Lal M., 4,176,244, Cl. 174-88.00C.
General Electric Company: *See—*
Anderson, John M., 4,176,296, Cl. 315-71.000.
Blair, Lloyd S., 4,175,615, Cl. 165-106.000.
Cella, James A., 4,176,111, Cl. 260-37.0SB.
Cella, James A.; and Mitchell, Tyrone D., 4,176,112, Cl. 260-37.0SB.
Crivello, James V., 4,175,963, Cl. 430-296.000.
Crivello, James V., 4,175,972, Cl. 204-159.180.
Crivello, James V., 4,175,973, Cl. 204-159.140.
Cushing, Donald S., 4,175,575, Cl. 134-176.000.
Davis, William D., 4,176,311, Cl. 324-468.000.
Hahn, Thomas M.; Lohmus, Ivar; and Oakley, David E., 4,175,617, Cl. 165-122.000.
Morey, Everett D., 4,175,409, Cl. 68-4.000.
Nash, Dudley O., 4,175,385, Cl. 60-230.000.
Tachick, Henry N.; Arnold, Reginald S.; Belcher, James E.; and St. Jacques, Joseph A., 4,175,817, Cl. 339-111.000.
Wagenknecht, Conrad D.; and Faust, Guy K., 4,175,384, Cl. 60-226.00B.
General Engines Co., Inc.: *See—*
Kalajzich, Albert A., 4,175,629, Cl. 180-220.000.
General Motors Corporation: *See—*
Barnard, James A., 4,175,309, Cl. 29-157.30R.
Berglind, Bradford L., 4,176,250, Cl. 179-1.0VE.
Black, Dennis A.; and Mantey, Raymond N., 4,175,915, Cl. 417-222.000.
Black, Dennis A.; and Mantey, Raymond N., 4,175,915, Cl. 417-222.000.
Draisbach, Adolf; and Fiedler, Kurt H., 4,175,770, Cl. 280-668.000.
Eckhardt, Dennis C., 4,175,475, Cl. 92-33.000.
Epple, Peter C., 4,176,261, Cl. 200-1.00V.
Milbreath, Herman C.; and Williams, Alverson B., 4,175,388, Cl. 60-337.000.
Miller, Larry D., 4,175,773, Cl. 280-803.000.
Mobus, Dietmar; Ehrenberger, Gunter; and Jobst, Wolfgang, 4,176,265, Cl. 200-316.000.
Muzechuk, Richard A.; and Hyma, Marvin J., 4,175,771, Cl. 280-696.000.
Genis, James; and Mars, William T., to McNeil Corporation. Travelling cut-off saw. 4,175,455, Cl. 83-110.000.
Geokinetics Inc.: *See—*
Britton, Keith C.; and Lekas, Mitchell A., 4,175,490, Cl. 102-23.000.
George, James S.; Ward, Arthur G. T.; and Pastakia, Percy N., to BPB Industries Limited. Calcining calcium sulphate dihydrate. 4,176,157, Cl. 422-114.000.
Gerlach, Manfred: *See—*
Aechter, Burckhard; and Gerlach, Manfred, 4,176,337, Cl. 367-131.000.
Gerling, John E., to Gerling Moore, Inc. System for heating using a microwave oven assembly and method. 4,176,268, Cl. 219-10.55A.
Gerling Moore, Inc.: *See—*
Gerling, John E., 4,176,268, Cl. 219-10.55A.
Gerlinger, Frederic, to Kuhn S.A. Haymaking machine with lateral discharge windrowing and central tedding. 4,175,369, Cl. 56-370.000.
Germeraad, Paul B.: *See—*
Gotcher, Alan J.; Germeraad, Paul B.; and White, Larry J., 4,176,027, Cl. 204-159.150.
Gerow, Frank J. Prosthesis of male impotence. 4,175,554, Cl. 128-79.000.
Gerstmann, Joseph, to Scientific Energy Systems Corporation. Spray nozzle. 4,175,706, Cl. 239-414.000.
Gevers, Georges A.; and Jeghers, Philippe M., to FN International Societe Anonyme. Racket. 4,175,745, Cl. 273-73.00C.
Gibert, Henri, to Agence Nationale de Valorisation de la Recherche (ANVAR). Method of and apparatus for freeze-drying previously frozen products. 4,175,334, Cl. 34-5.000.
Gibson, Carl H. Apparatus for towing an underwater instrumentation package. 4,175,432, Cl. 73-170.00A.
Giebeler, Robert H., to Varian Associates, Inc. Thermionic cathode heater having reduced magnetic field. 4,176,293, Cl. 313-343.000.
Gilby, Anthony C., to Foxboro Company, The. Astigmatic illuminating system in an internal reflection spectometer. 4,175,864, Cl. 356-326.000.
Gilead, Gideon. Hose conduits for drip- or trickle emission. 4,175,882, Cl. 405-43.000.
Gill, Stephen H.: *See—*
Knell, Harvey A.; and Gill, Stephen H., 4,175,907, Cl. 414-715.000.
Gillis, Robert E. Clip for gripping fabric or the like. 4,175,305, Cl. 24-245.00R.
Girling Limited: *See—*
Mortimer, Ivan; and Layton, Charles T., 4,175,795, Cl. 303-118.000
Giversen, Terri A.: *See—*
Lewis, Robert B.; and Giversen, Terri A., 4,176,142, Cl. 525-336.000.
Glaenzer Spicer: *See—*
Orain, Michel, 4,175,407, Cl. 64-21.000.
Glaser-Inbari, Isaia, to Yeda Research & Development Co. Ltd. Optical imaging system. 4,175,844, Cl. 354-110.000.
Gliniorz, Lothar: *See—*
Schoettle, Klaus; Dobler, Peter; Gliniorz, Lothar; Scherer, Volker; and Brombach, Heinz, 4,175,999, Cl. 156-505.000.
Gocho, Nagahiro: *See—*
Kamachi, Shinichi; Izawa, Masao; Gocho, Nagahiro; Nakajima, Yoshio; and Hattori, Shinichiro, 4,176,376, Cl. 358-107.000.
Goddard, Steven J.; and Levitt, George, to Du Pont de Nemours, E. I., and Company. Substituted isoindoles. 4,175,948, Cl. 71-96.000.
Goelz, David W.: *See—*
Hetherington, Robert D.; and Goelz, David W., 4,175,702, Cl. 239-113.000.
Goins, Jerry D.: *See—*
Renaud, Ronnie C.; and Goins, Jerry D., 4,175,676, Cl. 221-211.000.
Goldberg, Leon I.; Merz, Herbert; and Stockhaus, Klaus, to Boehringer Ingelheim GmbH. Quaternary derivatives of noroxymorphone which relieve intestinal immobility. 4,176,186, Cl. 424-260.000.
Goldblatt, Samuel; and Scott, Waller M., Jr., to Leichtman, Ahron P. Device for measuring sensitivity to vibration. 4,175,546, Cl. 128-739.000.
Goldhaber, Marvin L. Protective enclosure for building openings. 4,175,357, Cl. 49-395.000.
Goldman, Harley R. Variable control for toilet flush tanks. 4,175,296, Cl. 4-325.000.
Goldstein, David J. Apparatus for recovering paper in usable form from a damaged roll. 4,175,454, Cl. 82-86.000.
Golenchenko, Valery A.: *See—*
Vulis, Mikhail L.; Golenchenko, Valery A.; Rybin, Igor V.; and Shenderovich, Pavel B., 4,176,238, Cl. 174-15.00S.
Golomovzjuk, Ivan K.: *See—*
Kuchuk-Yatsenko, Sergei I.; Golomovzjuk, Ivan K.; Krivenko, Valery G.; Kulesh, Alexandr I.; Sakharnov, Vasily A.; Lazebny, Ivan L.; and Porkhun, Fedor K., 4,175,897, Cl. 409-300.000.
Golser, Leopold; Czepel, Hubert; and Stern, Gernard, to Chemie Linz Aktiengesellschaft. Process for the manufacture of foamed plastics with improved combustion characteristics. 4,176,217, Cl. 521-106.000.
Goodson, Jo M., to Forsyth Dental Infirmary for Children. Hollow-fiber devices for and a method of the treament and diagnosis of oral diseases. 4,175,326, Cl. 433-80.000.
Goodwin, Genevieve M.: *See—*
Bringman, Bernard B.; and Goodwin, Genevieve M., 4,176,001, Cl. 156-581.000.
Gorbulev, Efim S.: *See—*
Adamovich, Anatoly V.; Burov, Lev A.; Nemets, Rusaam S.; Gorbulev, Efim S.; Eremenko, Boris S.; Brainman, Felix A.; Moldavanov, Viktor P.; Kontsov, Jury M.; Axenov, Viktor F.; and Averbukh, Matvei I., 4,175,758, Cl. 277-220.000.

Gosudarstvenny Nauchno-Issledovatelsky Energeticheskiy Institut Imeni G.M. Krzhizhanovskogo (ENIN): *See—*
Vulis, Mikhail L.; Golenchenko, Valery A.; Rybin, Igor V.; and Shenderovich, Pavel B., 4,176,238, Cl. 174-15.00S.

Gotcher, Alan J.; Germeraad, Paul B.; and White, Larry J., to Raychem Corporation. Shaped article of radiation crosslinked triazine-trione polymeric composition. 4,176,027,°Cl. 204-159.150.

Goto, Kenji; Yokota, Masato; and Kobayashi, Hideo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine with an auxiliary combustion chamber. 4,175,533, Cl. 123-191.00S.

Goto, Kiyoshi: *See—*
Kawada, Hiroh; Goto, Kiyoshi; and Kurita, Yoshio, 4,176,361, Cl. 346-1.100.
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Ihida, Kazuyoshi, 4,176,146, Cl. 525-338.000.

Goto, Nobutaka, to Chlorine Engineers Corp., Ltd. Process for producing chlorine dioxide. 4,176,168, Cl. 423-478.000.

Goyo Ballast Company Ltd.: *See—*
de Koning, Jan; and van Zeggelaar, Gerrit H., 4,175,342, Cl. 37-58.000.

Grabner, Bernd E.; and Heinricher, Mario G., to Oesterreichisch-Amerikanische Magnesit Aktiengesellschaft. Sliding shutters of basic refractory material. 4,175,974, Cl. 106-58.000.

Graf, Werner: *See—*
John, Peter; Feichtner, Wolfgang; Graf, Werner; and Frey, Volker, 4,176,130, Cl. 260-448.20E.

Graham, Boynton, to Du Pont de Nemours, E. I., and Company. Plastisols made with polyelectrolyte binders. 4,176,028, Cl. 204-159.160.

Granberg, Erlang W.: *See—*
Pospischil, Albert R.; Bruegman, Michael L.; and Granberg, Erlang W., 4,175,989, Cl. 194-1.00C.

Grandclement, Gerard, to International Cold Forging Corporation. Electric valves. 4,175,590, Cl. 137-883.000.

Grant, R. Peter: *See—*
Leslie, John P.; Lane, Constance A.; and Grant, R. Peter, 4,176,101, Cl. 260-22.00T.

Grasselli, Robert K.; Miller, Arthur F.; and Hardman, Harley F., to Standard Oil Company. Process for the oxidation of olefins to aldehydes and acids. 4,176,234, Cl. 562-546.000.

Gravi-Mechanics Co.: *See—*
Dedolph, Richard R., 4,175,355, Cl. 47-64.000.

Grawey, Charles E., to Caterpillar Tractor Co. Method of making high pressure reinforced hydraulic hose. 4,175,992, Cl. 156-143.000.

Great Lakes Carbon Corporation: *See—*
Shea, Frederick L., Jr., 4,175,723, Cl. 244-162.000.

Greber, Gerd: *See—*
Darms, Roland; Wyler, Siegfried; and Greber, Gerd, 4,176,124, Cl. 260-346.300.

Green, Roger H.: *See—*
Cruden, John M.; Bignold, Alan J.; Green, Roger H.; and Grisenthwaite, Ronald J., 4,176,103, Cl. 260-29.6RW.

Greer, Norman L.: *See—*
Housholder, William R.; and Greer, Norman L., 4,175,669, Cl. 220-5.00A.

Greiner, Harry S.: *See—*
Bennetch, Leonard M.; Greiner, Harry S.; Hancock, Kenneth R.; and Hoffman, Mark, 4,176,172, Cl. 423-634.000.

Greschat, Walter; and Schwierz, Guenter, to Siemens Aktiengesellschaft. Tomographic x-ray apparatus for producing transverse layer images. 4,176,280, Cl. 250-445.00T.

Grier, Jesse G., to Pennwalt Corporation. Cyclic operation of a bed of mixed ion exchange resins. 4,176,056, Cl. 210-20.000.

Griffin, Charles R.: *See—*
Leavy, William A.; and Griffin, Charles R., 4,176,360, Cl. 343-883.000.

Griffin, Jerry R. Device for aligning pipes to be joined. 4,175,735, Cl. 269-49.000.

Griffiths, Charles: *See—*
Elderfield, Kenneth J.; and Griffiths, Charles, 4,175,421, Cl. 73-3.000.

Grisenthwaite, Ronald J.: *See—*
Cruden, John M.; Bignold, Alan J.; Green, Roger H.; and Grisenthwaite, Ronald J., 4,176,103, Cl. 260-29.6RW.

Grobler, Jacobus J. Method means for de-silting water. 4,176,058, Cl. 210-44.000.

Grosser, Gunter: *See—*
Tamm, Rolf G.; Grosser, Gunter; and Tomoff, Toma, 4,175,863, Cl. 356-312.000.

Grunvogel, Karl: *See—*
Muller, Ortwin; Grunvogel, Karl; and Schulz, Kurt, 4,175,839, Cl. 351-14.000.

GTE Laboratories Incorporated: *See—*
Klinedinst, Keith A.; and Schlaikjer, Carl R., 4,176,214, Cl. 429-194.000.

GTE Sylvania Incorporated: *See—*
DiTullio, Joseph G.; Parad, Leonard I.; and Sommers, Donald J., 4,176,330, Cl. 333-122.000.
Harvey, William J.; McDonough, Thomas B.; and Shaffer, John W., 4,176,389, Cl. 362-5.000.
Lagos, Costas C.; Lanio, Ricardo A.; Crowley, John L.; and Moreau, Norman A., 4,175,941, Cl. 65-60.00B.

Gudmestad, Ragnar, to Artos Engineering Company. Wire lead clamping mechanism for wire lead production apparatus. 4,175,316, Cl. 29-564.400.

Guerre, Robert P.; Juedes, Dennis L.; and Ruland, Ross R., to Exxon Research & Engineering Co. Multiple fuel supply system for staged air burners. 4,175,920, Cl. 431-175.000.

Guerry, Raymond E.; and Whyte, David D., to Procter & Gamble Company, The. Water-soluble enzyme-containing article. 4,176,079, Cl. 252-90.000.

Guillet, James E. Photodegradable polymer compositions comprising blends of polymers with ketone-containing block or graft copolymers. 4,176,145, Cl. 525-72.000.

Guillory, Melvin J., Jr.: *See—*
Sury, Yel S.; and Guillory, Melvin J., Jr., 4,176,060, Cl. 210-62.000.

Gustafson, Thomas A. Ski-sled. 4,175,760, Cl. 280-16.000.

Gute, Robert M., to Midland-Ross Corporation. Air pressure brake arrangement for tractor and semi-trailer combinations. 4,175,588, Cl. 137-625.400.

Gutermuth, Paul; Heinrich, Oetjen; and Gutermuth, Paul, Jr. Planar condensor array of hollow interleaved profiles. 4,175,935, Cl. 55-269.000.

Gutermuth, Paul, Jr.: *See—*
Gutermuth, Paul; Heinrich, Oetjen; and Gutermuth, Paul, Jr., 4,175,935, Cl. 55-269.000.

Gutierre, Antonio: *See—*
Ryer, Jack; Winans, Esther D.; Brois, Stanley J.; and Gutierre, Antonio, 4,176,073, Cl. 252-32.70E.

Gutman, Arnold D., to Stauffer Chemical Company. 1,3-Oxazole phosphates and phosphonates. 4,176,121, Cl. 548-119.000.

H. G. Weber & Co., Inc.: *See—*
Kidd, Arthur H., 4,175,476, Cl. 93-1.00E.

Haarmann, Walter: *See—*
Austel, Volkhard; Kutter, Eberhard; Heider, Joachim; Eberlein, Wolfgang; Kobinger, Walter; Lillie, Christian; Diederen, Willi; and Haarmann, Walter, 4,176,184, Cl. 424-248.520.

Haaz, Josef: *See—*
Finkelstein, Wolfgang; Baumeister, Gregor; and Haaz, Josef, 4,175,583, Cl. 137-504.000.

Habicht, Ernst, to Ciba-Geigy Corporation. Diuretic and saliuretic sulphamoylbenzoic acids. 4,176,190, Cl. 424-274.000.

Haerer, Wolfgang: *See—*
Schwierz, Gunter; and Haerer, Wolfgang, 4,176,279, Cl. 250-445.00T.

Hagenmuller, Paul: *See—*
Quenisset, Jean-Michel; Naslain, Rober; and Hagenmuller, Paul, 4,176,002, Cl. 156-601.000.

Hahn, Thomas M.; Lohmus, Ivar; and Oakley, David E., to General Electric Company. Skewed turn coiled tube heat exchanger for refrigerator evaporators. 4,175,617, Cl. 165-122.000.

Haley, Neil F.; Krutak, James J.; and Ott, Robert J., to Eastman Kodak Company. Electrophotosensitive materials for migration imaging processes. 4,175,956, Cl. 430-37.000.

Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick L.; and Vock, Manfred H., to International Flavors & Fragrances Inc. Substituted-1-ocetyl-3,3-dimethylcyclohexane employed in flavoring tobacco compositions. 4,175,569, Cl. 131-9.000.

Hall, Wilbur L.: *See—*
Wu, Ching H.; Brown, Alfred; Hall, Wilbur L.; and Shupe, Russell D., 4,175,618, Cl. 166-252.000.

Halliburton Company: *See—*
Nunez, Carl W.; and Squyres, Joseph S., 4,175,778, Cl. 285-3.000.

Halm, Hans, to Niveau AG, Firma. Index card register with selector device. 4,175,663, Cl. 209-610.000.

Hamer, Geerd. Bed for patients. 4,175,549, Cl. 128-24.00R.

Hammann, Ingeborg: *See—*
Hoffmann, Hellmut; Hammann, Ingeborg; and Homeyer, Bernhard, 4,176,181, Cl. 424-211.000.

Hanano, Masamitu: *See—*
Kubota, Masayuki; and Hanano, Masamitu, 4,175,653, Cl. 198-332.000.

Hanaoka, Seiji, to Shinshu Seiki Kabushiki Kaisha; and Kabushiki Kaisha Suwa Seikosha. Drive mechanism for printer. 4,175,876, Cl. 400-124.000.

Hancock, Kenneth R.: *See—*
Bennetch, Leonard M.; Greiner, Harry S.; Hancock, Kenneth R.; and Hoffman, Mark, 4,176,172, Cl. 423-634.000.

Handler, Erich: *See—*
Schatzler, Walter; and Handler, Erich, 4,175,784, Cl. 296-137.00E.

Handte, Reinhard: *See—*
Koch, Manfred; Handte, Reinhard; Horlein, Gerhard; Bieringer, Hermann; and Langeluddeke, Peter, 4,175,947, Cl. 71-88.000.

Hanke, Hans, to Daimler-Benz Aktiengesellschaft. Hydrodynamic retarder for vehicles, especially for motor vehicles. 4,175,647, Cl. 188-274.000.

Hanlon, Richard J.: *See—*
Holt, Richard C.; Damon, Neil F.; and Hanlon, Richard J., 4,175,810, Cl. 339-17.00C.

Hannemann, Horst: *See—*
Regehr, Ulrich; Hannemann, Horst; and Speitkamp, Ludwig, 4,175,938, Cl. 55-440.000.

Hanson, S. Eugene: *See—*
Schneider, John C.; Hanson, S. Eugene; and DuVall, Bruce W., 4,175,443, Cl. 73-722.000.

Hansson, Anders: *See—*
Odlen, Lars; and Hansson, Anders, 4,176,251, Cl. 179-1.0SW.

Hara, Kunio, to Nifco Inc. Liquid level detecting device. 4,175,435, Cl. 73-313.000.

Hardman, Harley F.: *See—*
Grasselli, Robert K.; Miller, Arthur F.; and Hardman, Harley F., 4,176,234, Cl. 562-546.000.

Harenberg, Juergen: *See—*
Fruth, Albert; and Harenberg, Juergen, 4,176,256, Cl. 179-18.0FG.

Hargett, William D.; and Broun, Thorowgood T., to PPG Industries, Inc. Treatment of alkyl lead-containing gas stream. 4,176,165, Cl. 423-245.000.

Harlacher, Eugene A.: *See—*
Britton, Michael W.; Harlacher, Eugene A.; Dew, John N.; and Kleinpeter, Joseph A., 4,175,928, Cl. 48-197.00R.
Dew, John N.; Britton, Michael W.; Harlacher, Eugene A.; and Kleinpeter, Joseph A., 4,176,087, Cl. 252-439.000.

Harland, Philip W., to Ametek, Inc. Gauge assembly. 4,175,444, Cl. 73-738.000.

Harlow Chemical Company Limited: *See—*
Cruden, John M.; Bignold, Alan J.; Green, Roger H.; and Grisenthwaite, Ronald J., 4,176,103, Cl. 260-29.6RW.

Harman International Industries, Inc.: *See—*
Odell, Robert, 4,176,323, Cl. 330-263.000.

Harper, Patrick D., to Bendix Corporation, The. Inductive drive circuit for setting three different levels of load current including a downshift delay. 4,176,387, Cl. 361-154.000.

Harrelson, Albert A., Jr., to Harrelson Rubber Company. Tire retreading method. 4,175,991, Cl. 156-96.000.

Harrelson Rubber Company: *See—*
Harrelson, Albert A., Jr., 4,175,991, Cl. 156-96.000.

Harriman, Anthony; and Porter, George, to National Research Development Corporation. Process for catalytic photo-oxidation of water. 4,176,026, Cl. 204-157.10R.

Harris Corporation: *See—*
Eames, Fred M., 4,176,374, Cl. 358-51.000.

Harris, Stanley R. Radiation reflecting target surface. 4,176,355, Cl. 343-18.00C.

Hart, James E., to Westinghouse Air Brake Company. Continual quick service valve device. 4,175,792, Cl. 303-37.000.

Hartman, Seymour; and Sheridan, Catherine M., to Champion International Corporation. Fire-resistant construction material. 4,176,115, Cl. 260-39.00R.

Hartung, Harold A., to MacAndrews and Forbes Company. Potassium-magnesium-calcium glycyrrhizin. 4,176,228, Cl. 536-4.000.

Harvey, Ronald B., to Pako Corporation. Photographic printer with dichroic filter reset indicators. 4,175,853, Cl. 355-38.000.

Harvey, William J.; McDonough, Thomas B.; and Shaffer, John W., to GTE Sylvania Incorporated. Photoflash unit with two-color indicator. 4,176,389, Cl. 362-5.000.

Hasebe, Sukehiro; and Oyamada, Masanao, to Copal Company Limited. Device for correcting time indication and the like in an electronic clock. 4,175,376, Cl. 58-23.00R.

Hasegawa, Ryozo: *See—*
Asanuma, Akira; Taneda, Nobuo; Hasegawa, Ryozo; Jindai, Shohei; and Morishita, Toshio, 4,176,156, Cl. 422-25.000.

Hashimoto, Harutoshi: *See—*
Asano, Tetsumasa; Yatsuki, Osamu; Fujimoto, Kazuyuki; and Hashimoto, Harutoshi, 4,176,306, Cl. 318-772.000.

Hashimoto, Teiji: *See—*
Iwashita, Tomonori; Takimoto, Hiroyuki; Mashimo, Yukio; and Hashimoto, Teiji, 4,175,845, Cl. 354-173.000.

Hashizume, Akihide; Suzuki, Ryuichi; Yokouchi, Hisatake; Horiuchi, Hideyuki; and Yamamoto, Shinji, to Hitachi, Ltd. Apparatus for automated classification of white blood cells. 4,175,859, Cl. 356-39.000.

Hassall, Cedric H.; Johnson, William H.; and Roberts, Noel A., to Hoffmann-La Roche Inc. Dipeptide derivatives. 4,176,116, Cl. 260-112.50R.

Hassia Verpackung GmbH: *See—*
Walter, Kurt, 4,175,995, Cl. 156-285.000.

Hattori, Junichi: *See—*
Takinishi, Kiyotoshi; and Hattori, Junichi, 4,175,338, Cl. 35-35.00R.

Hattori, Katsuhide; and Takahashi, Masao, to Nippon Oil and Fats Co., Ltd. Water-gel explosive and a method of producing the same. 4,175,990, Cl. 149-21.000.

Hattori, Shinichiro: *See—*
Kamachi, Shinichi; Izawa, Masao; Gocho, Nagahiro; Nakajima, Yoshio; and Hattori, Shinichiro, 4,176,376, Cl. 358-107.000.

Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Air-fuel ratio adjusting system. 4,175,521, Cl. 123-119.00D.

Haubner, Georg: *See—*
Wesenmeyer, Jurgen; Haubner, Georg; and Meier, Werner, 4,175,508, Cl. 123-117.00R.

Hauni-Werke Korber & Co., KG.: *See—*
Heitmann, Uwe, 4,175,570, Cl. 131-84.00B.

Hauser, Raimund: *See—*
Kittag, Gerd, 4,175,840, Cl. 352-141.000.

Havens, Carl B.: *See—*
Heisterkamp, Herbert W.; and Havens, Carl B., 4,176,155, Cl. 264-564.000.

Hay, Robert A., II; and Boruszewski, John S., to Dow Chemical Company, The. Foam welding apparatus. 4,175,998, Cl. 156-391.000.

Hayashi, Hideo: *See—*
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Ihida, Kazuyoshi, 4,176,146, Cl. 525-338.000.

Hayashi, Hisao: *See—*
Matsushita, Takeshi; Hayashi, Hisao; Aoki, Teruaki; Yamoto, Hisayoshi; and Kawana, Yoshiyuki, 4,176,372, Cl. 357-52.000.

Haydn, Josef: *See—*
Birkenstock, Udo; and Haydn, Josef, 4,176,092, Cl. 252-472.000.

Hayes, Frank F., Jr: *See—*
Hayes, Frank F., Sr.; Hayes, Frank F., Jr; and Hayes, John C., 4,175,315, Cl. 29-453.000.

Hayes, Frank F., Sr.; Hayes, Frank F., Jr; and Hayes, John C. All plastic hinge having a non-rising pin and method of making the same. 4,175,315, Cl. 29-453.000.

Hayes, John C.: *See—*
Hayes, Frank F., Sr.; Hayes, Frank F., Jr; and Hayes, John C., 4,175,315, Cl. 29-453.000.

Hayman, Dennis J., to Wallace-Murray Corporation. Faucet valve with dual flow control. 4,175,586, Cl. 137-614.110.

Hazen Research, Inc.: *See—*
Kindig, James K.; and Turner, Ronald L., 4,175,924, Cl. 44-15.00R.

Hazlett, Robert N., to United States of America, Navy. Coal liquefaction. 4,176,040, Cl. 208-8.0LE.

Heaton, Michael J.; and Quick, James R., to International Paper Company. Process for producing a flowable, highly pigmented, low viscosity, hot-melt coating compound. 4,175,977, Cl. 106-272.000.

Hebert, Jean-Claude. Reusable stopper for sealing containers provided with a beaded neck such as bottles. 4,175,668, Cl. 215-354.000.

Heck, Theodore G. Bridge playing apparatus. 4,175,336, Cl. 35-8.00B.

Heckel, George, to Teletype Corporation. Buffer storage and control. 4,176,400, Cl. 364-900.000.

Heider, Joachim: *See—*
Austel, Volkhard; Kutter, Eberhard; Heider, Joachim; Eberlein, Wolfgang; Kobinger, Walter; Lillie, Christian; Diederen, Willi; and Haarmann, Walter, 4,176,184, Cl. 424-248.520.

Heinrich, Oetjen: *See—*
Gutermuth, Paul; Heinrich, Oetjen; and Gutermuth, Paul, Jr., 4,175,935, Cl. 55-269.000.

Heinricher, Mario G.: *See—*
Grabner, Bernd E.; and Heinricher, Mario G., 4,175,974, Cl. 106-58.000.

Heisterkamp, Herbert W.; and Havens, Carl B., to Dow Chemical Company, The. Method and apparatus for making film. 4,176,155, Cl. 264-564.000.

Heitmann, Knut: *See—*
Leitz, Ludwig; Heitmann, Knut; Schneider, Eckart; and Schmidt, Horst, 4,175,365, Cl. 356-4.000.

Heitmann, Uwe, to Hauni-Werke Korber & Co., KG. Apparatus for building a continuous tobacco stream. 4,175,570, Cl. 131-84.00B.

Hempel, Hans-Ulrich; Klueppel, Hans-Jurgen; and Volgnandt, Peter, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Process for the production of silanes from oleic acid esters. 4,176,127, Cl 260-407.000.

Heners, Jurgen: *See—*
Platz, Rolf; Dockner, Toni; Heners, Jurgen; and Krug, Herbert, 4,176,137, Cl. 260-561.00N.

Hengl, Helmut: *See—*
Ederer, Georg; Fischer, Adolf; Rosche, Paul; Troll, Helmar; Wurst, Wolfgang; Hengl, Helmut; and Seidl, Jiri, 4,175,504, Cl. 123-52.00M

Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See—*
Hempel, Hans-Ulrich; Klueppel, Hans-Jurgen; and Volgnandt, Peter, 4,176,127, Cl. 260-407.000.

Hennings, Roy: *See—*
Froehlich, Frederick B.; Hennings, Roy; and Schaffer, William J., 4,176,382, Cl. 360-95.000.

Henry, Robert J., to Wood, Harry A., a part interest. Massage back brace. 4,175,548, Cl. 128-24.00R.

Herbert, Timothy J., to Interfix Limited. Bone screw. 4,175,555, Cl. 128-92.00B.

Herborn, Peter E.: *See—*
Ammann, Stephen K.; and Herborn, Peter E., 4,175,854, Cl. 355-54.000

Herla, Max: *See—*
Voll, Horst; Kessler, Franz; and Herla, Max, 4,175,802, Cl. 308-9.000.

Hermann, Wayne D. Adjustable compass device. 4,175,330, Cl. 33-27.00C.

Hermans, Johny C., to s.a. Texaco Belgium n.v. Bispiperazido phosphorus polyamides. 4,176,226, Cl. 528-332.000.

Hertwig, Waldemar R.: *See—*
Corns, Joseph B.; Nevitt, Thomas D.; and Hertwig, Waldemar R., 4,176,048, Cl. 208-59.000.

Herzog Contracting Corporation: *See—*
Herzog, Stanley M.; and Poggemiller, Randy L., 4,175,902, Cl. 414-339.000.

Herzog, Klaus, to Carl Zeiss-Stiftung. Measuring machine. 4,175,327, Cl. 33-1.00M.

Herzog, Stanley M.; and Poggemiller, Randy L., to Herzog Contracting Corporation. Apparatus for loading and unloading railroad cars. 4,175,902, Cl. 414-339.000.

Hess, John M., III; and Mittleman, Herbert, to Baxter Travenol Laboratories, Inc. Apparatus for administering parenteral liquid in sequential units provided with a ball valve float. 4,175,558, Cl. 128-214.00C.

Hess, Ronald L.: *See—*
Babcock, William E.; and Hess, Ronald L., 4,176,303, Cl. 315-400.000.

Hetherington, Robert D.; and Goelz, David W., to Poly-Glas Systems. Air nucleating spary gun. 4,175,702, Cl. 239-113.000.

Hewlett-Packard Company: *See—*
Bowers, Jack L.; Hewlett-Packard Company; and Kniffin, Scott D., 4,176,362, Cl. 358-256.000.
Kniffin, Scott D.; and Hewlett-Packard Company, 4,176,362, Cl. 358-256.000.

Heyden, Theodor: *See—*
Bauer, Kurt H.; Heyden, Theodor; and Sucker, Hermann, 4,176,230, Cl. 536-4.000.

Hicks, Jr., Thomas G.: *See—*
Hicks, Thomas G., Sr.; and Hicks, Jr., Thomas G., 4,176,316, Cl. 29-564.400.

Hicks, Thomas G., Sr.; and Hicks, Jr., Thomas G., 4,176,316, Cl. 29-564.400.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,457, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,458, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,459, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,460, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,461, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,462, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,463, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,464, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,465, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,466, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,467, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,468, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,469, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,470, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,471, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,472, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,473, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,474, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,475, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,476, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,477, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,478, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,479, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,480, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,481, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,482, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,483, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,484, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,485, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,486, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,487, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,488, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,489, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,490, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,491, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,492, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,493, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,494, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,495, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,496, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,497, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,498, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,499, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,500, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,501, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,502, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,503, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,504, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,505, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,506, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,507, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,508, Cl. 84-1.01.

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Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,512, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,513, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,514, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,515, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,516, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,517, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,518, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,519, Cl. 84-1.01.

Hidaka, Yoshiaki; Kawamura, Yoshiaki; and Kawamura, Yoshiaki, to Kawamura Electric Inc. Electronic musical instrument. 4,175,520, Cl. 84-1.01.

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Hidano, Tsuyoshi: *See—*
Matsuura, Mitsuaki; Hidano, Tsuyoshi; and Suzuki, Masahiro, 4,175,318, Cl. 29-723.000.
Higa, Teikichi: *See—*
Wilger, John F.; Nakano, Gregory S.; Uyetake, Tadao; Orillo, Stephen, Jr.; and Higa, Teikichi, 4,175,471, Cl. 408-83.500.
Higgins, Michael W. Control system for ram air gliding parachute. 4,175,722, Cl. 244-152.000.
Higgs, Edward W. Automotive battery power circuit breaker. 4,176,284, Cl. 307-10.0BP
Hildebolt, William M.; and Hundt, Murray T., to Campbell Soup Company. Protein texturization. 4,175,486, Cl. 99-483.000.
Hile, James R., to Carrier Corporation. Capillary plug button. 4,175,402, Cl. 62-263.000.
Hill, Ulderic S. Latch mechanism. 4,175,780, Cl. 292-201.000.
Hills-McCanna Company: *See—*
Priese, Werner K., 4,175,578, Cl. 137-67.000.
Hirano, Masachika: *See—*
Itaya, Nobushige; and Hirano, Masachika, 4,176,189, Cl. 424-273.00R.
Hirayama, Kazuhiro: *See—*
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,175,851, Cl. 355-14.00R.
Hirota, Minoru: *See—*
Inose, Tadao; and Hirota, Minoru, 4,175,477, Cl. 93-36.00A.
Hirschman, Shalom Z. Feminine hygienic pads with improved absorption. 4,175,561, Cl. 128-296.000.
Hitachi, Ltd.: *See—*
Fukushima, Toshihiko; Fujie, Kunio; Arai, Akira; Arai, Nobukatsu; and Kakizaki, Kimio, 4,175,416, Cl. 72-254.000.
Hashizume, Akihide; Suzuki, Ryuichi; Yokouchi, Hisatake; Horiuchi, Hideyuki; and Yamamoto, Shinji, 4,175,859, Cl. 356-39.000.
Inoue, Fumio; and Masuda, Michio, 4,176,302, Cl. 315-397.000.
Kajimura, Takashi; Saito, Kazutoshi; Shige, Noriyuki; Nakamura, Michiharu; Umeda, Jun-ichi; and Kobayashi, Masayoshi, 4,176,325, Cl. 331-94.50H.
Kaneko, Yoichi; and Kimura, Katsuhiro, 4,176,266, Cl. 219-10.55F.
Komatsu, Isamu; Sugawara, Toru; and Yamauchi, Tsukasa, 4,176,288, Cl. 307-252.00A.
Kubota, Masayuki; and Hanano, Masamitu, 4,175,653, Cl. 198-332.000.
Matsumoto, Michiaki; Honda, Juichi; and Mimori, Sadao, 4,175,919, Cl. 431-114.000.
Miyazaki, Michio, 4,176,341, Cl. 340-147.0LP.
Nakamura, Ichiro; Ichiryu, Ken; and Kuwayama, Masatoshi, 4,175,589, Cl. 137-625.640.
Sakamoto, Shinichi; and Sasayama, Takao, 4,175,506, Cl. 123-117.00D.
Satou, Yoshihiko; and Teranishi, Katsuya, 4,175,652, Cl. 198-/332.000.
Watanabe, Yutaka, 4,175,692, Cl. 235-312.000.
Hitachi Shipbuilding & Engineering Co., Ltd.: *See—*
Inaba, Hideya; Ogiyama, Hisao; Ichiki, Masayoshi; Kamino, Yasumi; Matsumoto, Nobuo; Nagai, Kenichi; and Suzuki, Masami, 4,176,091, Cl. 252-456.000.
Hoechst Aktiengesellschaft: *See—*
Koch, Manfred; Handte, Reinhard; Horlein, Gerhard; Bieringer, Hermann; and Langeluddeke, Peter, 4,175,947, Cl. 71-88.000.
Kraft, Kurt; and Walz, Gerd, 4,176,143, Cl. 260-835.000.
Lang, Arnold; and Hortig, Hans-Peter, 4,175,934, Cl. 55-267.000.
Loew, Peter; and Hummel, Wolfgang, 4,175,448, Cl. 74-365.000.
Loewe, Heinz; Urbanietz, Josef; Duwel, Dieter; and Kirsch, Reinhard, 4,176,192, Cl. 424-300.000.
Teschner, Eckart; Riedel, Harald; and Sattelmeyer, Richard, 4,175,931, Cl. 51-297.000.
Hoesch Werke Aktiengesellschaft: *See—*
Becker, Dieter; and Stenert, Alois, 4,175,805, Cl. 308-199.000.
Hoffman, Herbert F.: *See—*
Vaughn, Damon A.; and Hoffman, Herbert F., 4,175,762, Cl. 280-78.000.
Hoffman, Mark: *See—*
Bennetch, Leonard M.; Greiner, Harry S.; Hancock, Kenneth R.; and Hoffman, Mark, 4,176,172, Cl. 423-634.000.
Hoffmann, Hellmut; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. Combating pests with N-(aminomethylene)-(monothio and dithio)-phosphoric acid diester-amides. 4,176,181, Cl. 424-211.000.
Hoffmann, Jean-Claude; Castanie, Francis; Crabere, Henri; Verdier, Jean-Pierre; and Voisin, Norbert, to Societe Nationale Industrielle Aerospatiale. Analog noise generator. 4,176,399, Cl. 364-717.000.
Hoffmann-La Roche Inc.: *See—*
Batcho, Andrew D., 4,176,230, Cl. 542-444.000.
Hassall, Cedric H.; Johnson, William H.; and Roberts, Noel A., 4,176,116, Cl. 260-112.50R.
Muller, Jean-Claude; and Ramuz, Henri, 4,176,119, Cl. 260-243.300.
Hofmeister, Helmut: *See—*
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; Wiechert, Rudolf; Wendt, Hans; and Kapp, Joachim-Friedrich, 4,176,126, Cl. 260-397.450.
Hokari, Saburo: *See—*
Nozawa, Shiyozo; Hokari, Saburo; Yamaga, Shigeru; and Takahashi, Akira, 4,175,846, Cl. 354-173.000.
Holcombe, Thomas C., to Union Carbide Corporation. n-Paraffin - isoparaffin separation process. 4,176,053, Cl. 208-310.00Z.
Holl, Harold H.; and Hupe, Walter R., to Caterpillar Tractor Co. Breather cap. 4,175,671, Cl. 220-235.000.
Holt, Richard C.; Damon, Neil F.; and Hanlon, Richard J., to AUGAT Inc. Electrical interconnection boards with lead sockets mounted therein and method for making same. 4,175,810, Cl. 339-17.00C.
Holt, S. Kent: *See—*
Decker, Carl D.; and Holt, S. Kent, 4,176,202, Cl. 426-574.000.
Homeyer, Bernhard: *See—*
Hoffmann, Hellmut; Hammann, Ingeborg; and Homeyer, Bernhard, 4,176,181, Cl. 424-211.000.
Honan, Paul R. Intraocular pressure applicator. 4,175,562, Cl. 128-303.00R.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Kasai, Kaname; Mukumoto, Takaji; Asakura, Toshikazu; and Ueda, Ryoji, 4,175,408, Cl. 64-26.000.
Shimada, Shinichi; and Makino, Takenori, 4,175,505, Cl. 123-90.300.
Honda, Juichi: *See—*
Matsumoto, Michiaki; Honda, Juichi; and Mimori, Sadao, 4,175,919, Cl. 431-114.000.
Honeywell Inc.: *See—*
Moravec, Thomas J.; and Skogman, Richard A., 4,176,207, Cl. 427-160.000.
Moravec, Thomas J.; and Skogman, Richard A., 4,176,208, Cl. 427-160.000.
Pearson, Robert P., 4,176,353, Cl. 343-12.00A.
Honeywell Information Systems, Inc.: *See—*
Lee, Ernest P., 4,176,259, Cl. 235-449.000.
Honig, Gunther: *See—*
Schulz, Alfred; Kiencke, Uwe; and Honig, Gunther, 4,176,309, Cl. 323-4.000.
Honig, Helmut: *See—*
Pampouchidis, Georgios; and Honig, Helmut, 4,176,099, Cl. 260-18.0TN.
Hooper, Harold M.: *See—*
Frumerman, Robert; and Hooper, Harold M., 4,175,929, Cl. 48-202.000.
Hore, Lal M.: *See—*
Ramy, Towheed; and Hore, Lal M., 4,176,244, Cl. 174-88.00C.
Horian, James: *See—*
Horian, Richard C.; Horian, James; and Horian, Robert, 4,175,659, Cl. 206-223.000.
Horian, Richard C.; Horian, James; and Horian, Robert. Cleaning kit. 4,175,659, Cl. 206-223.000.
Horian, Robert: *See—*
Horian, Richard C.; Horian, James; and Horian, Robert, 4,175,659, Cl. 206-223.000.
Horii, Hideo: *See—*
Kaiya, Atsushi; Otsuki, Yutaka; and Horii, Hideo, 4,176,109, Cl. 260-31.2MR.
Horiuchi, Hideyuki: *See—*
Hashizume, Akihide; Suzuki, Ryuichi; Yokouchi, Hisatake; Horiuchi, Hideyuki; and Yamamoto, Shinji, 4,175,859, Cl. 356-39.000.
Horlein, Gerhard: *See—*
Koch, Manfred; Handte, Reinhard; Horlein, Gerhard; Bieringer, Hermann; and Langeluddeke, Peter, 4,175,947, Cl. 71-88.000.
Horn, Paul H., to Motorola, Inc. Delta modulation detector. 4,176,321, Cl. 325-325.000.
Horn, Sherrye J. Book index and subject finder. 4,175,777, Cl. 283-42.000.
Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., to Exxon Research & Engineering Co. Method of making stoichiometric lead and bismuth pyrochlore compounds using an alkaline medium. 4,176,094, Cl. 252-518.000.
Hortig, Hans-Peter: *See—*
Lang, Arnold; and Hortig, Hans-Peter, 4,175,934, Cl. 55-267.000.
Horvath, Zoltan; and Tresch, Erwin, to Cerberus AG. Smoke detector. 4,175,865, Cl. 356-338.000.
Hoshi, Hisao: *See—*
Naganuma, Tsutomu; Hoshi, Hisao; Kumagai, Hiroji; and Yoshida, Kaneki, 4,175,958, Cl. 430-49.000.
Hoshi, Noboru: *See—*
Maekawa, Hideyuki; Noda, Kinzaburo; and Hoshi, Noboru, 4,176,175, Cl. 424-35.000.
Housholder, William R.; and Greer, Norman L. Overpack for nuclear fuel container. 4,175,669, Cl. 220-5.00A.
Howatt, John R., to Charles Stark Draper Laboratory, Inc., The. Apparatus for directly measuring machine tool wear. 4,176,396, Cl. 364-551.000.
Howe, Dennis G., to Eastman Kodak Company. Video disc configuration. 4,176,377, Cl. 358-128.000.
Hsiao, Cheng-Kuo: *See—*
Loutfy, Rafik O.; Hsiao, Cheng-Kuo; and Sharp, James H., 4,175,982, Cl. 136-89.0SJ.
Hsiao, James K.; and Shelton, J. Paul, to United States of America, Navy. Phased-array maintenance-monitoring system. 4,176,354, Cl. 343-17.700.
Hsiung, Du Y.; and Mueller, William H., to Johnson Products Co., Inc. Hair conditioning waving and straightening compositions and methods. 4,175,572, Cl. 132-7.000.
Hubbell, Wayne C.: *See—*
Dimyan, Magid Y.; Hubbell, Wayne C.; Chang, Christopher T. M.; and Linn, John C., 4,176,404, Cl. 365-12.000.
Hudson, Robert H., to Les Jouets Educatifs Universels. Light projector shooting apparatus with movable, perforable, target support. 4,175,747, Cl. 273-101.200.

Huff, Larry D., to RCA Corporation. Toggle mechanism for video disc player. 4,175,751, Cl. 274-13.00R.
Huggins, Homer D., to Modine Manufacturing Company. Heat exchanger device. 4,175,614, Cl. 165-95.000.
Hughes, A. James: *See—*
Nelson, Richard D.; and Hughes, A. James, 4,176,369, Cl. 357-24.000.
Hughes Aircraft Company: *See—*
Buritz, Robert S.; Parker, Robert D.; Kisch, Jack J.; and Burnham, John, 4,176,334, Cl. 336-84.00C.
Forward, Robert L.; and Thurmond, Gary D., 4,176,331, Cl. 333-213.000.
Koppensteiner, Alfred H., 4,175,825, Cl. 350-34.000.
Hughes, Donald W. K., to AMP Incorporated. Connecting means for connecting coil wires to lead wires. 4,175,819, Cl. 339-176.00M.
Hummel, Wolfgang: *See—*
Loew, Peter; and Hummel, Wolfgang, 4,175,448, Cl. 74-365.000.
Humphreys Engineering Company: *See—*
Welker, Merrill, 4,175,591, Cl. 137-883.000.
Hundt, Eckart: *See—*
Tischer, Peter; and Hundt, Eckart, 4,176,281, Cl. 250-492.00A.
Hundt, Murray T.: *See—*
Hildebolt, William M.; and Hundt, Murray T., 4,175,486, Cl. 99-483.000.
Hung, John H., to International Paper Company. Polymeric sheets. 4,175,557, Cl. 128-156.000.
Hunter, Bradley L., to Teradyne, Inc. Electrical connector. 4,175,821, Cl. 339-258.00R.
Hunter, Wood E.: *See—*
Buckman, John D.; Hunter, Wood E.; Pera, John D.; and Taylor, Robert M., 4,176,107, Cl. 260-29.60E.
Hupe, Walter R.: *See—*
Holl, Harold H.; and Hupe, Walter R., 4,175,671, Cl. 220-235.000.
Husher, Lee K.; Weber, Heinrich; and Tippmer, Kurt, to United States Steel Corporation. Process for the separation of foam from effluents of coke oven plants. 4,176,062, Cl. 210-72.000.
Husted, Royce H., to Saroy Engineering. Propulsion system for a snow going device. 4,175,627, Cl. 180-190.000.
Hyma, Marvin J.: *See—*
Muzechuk, Richard A.; and Hyma, Marvin J., 4,175,771, Cl. 280-696.000.
Iaboni, Albert; and Iaboni, Biagio. Grass bag clamp and spreader. 4,175,603, Cl. 150-4.000.
Iaboni, Biagio: *See—*
Iaboni, Albert; and Iaboni, Biagio, 4,175,603, Cl. 150-4.000.
Iby, Jack. Tent. 4,175,576, Cl. 135-1.00A.
Ichikawa, Singo, to Citizen Watch Co. Ltd. Timepiece with display device for warning battery life. 4,175,377, Cl. 58-23.0BA.
Ichiki, Masayoshi: *See—*
Inaba, Hideya; Ogiyama, Hisao; Ichiki, Masayoshi; Kamino, Yasumi; Matsumoto, Nobuo; Nagai, Kenichi; and Suzuki, Masami, 4,176,091, Cl. 252-456.000.
Ichiryu, Ken: *See—*
Nakamura, Ichiro; Ichiryu, Ken; and Kuwayama, Masatoshi, 4,175,589, Cl. 137-625.640.
Ide, Akira; and Matsumoto, Sojiro, to Asahi Kasei Kogyo Kabushiki Kaisha. Reaction of organic diisocyanates with water. 4,176,132, Cl. 260-453.00A.
Idel, Vladimir V., to Mukachevsky Stankostroitelny Zavod Imeni S.M. Kirova. Machine for the mechanical working of band saws. 4,175,452, Cl. 76-25.00R.
Ihida, Kazuyoshi: *See—*
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Ihida, Kazuyoshi, 4,176,146, Cl. 525-338.000.
Iida Kensetsu Co., Ltd.: *See—*
Ijima, Takeshi, 4,175,888, Cl. 405-31.000.
Iizumi, Tomomitsu, to Shoketsu Kinzoku Kogyo Kabushiki Kaisha. Fluid circuit. 4,175,473, Cl. 91-443.000.
Ijima, Takeshi, to Iida Kensetsu Co., Ltd. Block for constructing breakwater. 4,175,888, Cl. 405-31.000.
Ikeda, Hiroharu; Matsumoto, Shuichi; and Makino, Kenya, to Japan Synthetic Rubber Co., Ltd. Catalyst composition for ring-opening polymerization of norbornene derivatives and process for polymerizing same. 4,176,220, Cl. 526-97.000.
Ikeda, Teppei: *See—*
Uchida, Toshio; Yabuta, Yorimiti; and Ikeda, Teppei, 4,175,964, Cl. 430-253.000.
Ikeda, Tomoaki: *See—*
Shinozaki, Fumiaki; Washigawa, Yasuo; Ikeda, Tomoaki; Nakao, Sho; and Kondoh, Syunichi, 4,175,971, Cl. 430-287.000.
Imperial Chemical Industries Limited: *See—*
Cinderey, Michael B.; and Rose, John B., 4,176,222, Cl. 528-126.000.
Waring, Wilson S., 4,176,194, Cl. 424-309.000.
Inaba, Hideya; Ogiyama, Hisao; Ichiki, Masayoshi; Kamino, Yasumi; Matsumoto, Nobuo; Nagai, Kenichi; and Suzuki, Masami, to Hitachi Shipbuilding & Engineering Co., Ltd. Denitrating catalysts having porous coating and process for producing same. 4,176,091, Cl. 252-456.000.
Inami, Yasuhiko: *See—*
Yano, Kohzo; Inami, Yasuhiko; and Uede, Hisashi, 4,175,837, Cl. 350-357.000.
Inanaga, Kiyofumi; Egawa, Saburo; Shimizu, Akio; and Maeda, Keijiro, to Sony Corporation. Deleterious mechanical vibrations from dynamic loudspeaker offset by additional dynamic device. 4,176,249, Cl. 179-1.00E.
Inose, Tadao; and Hirota, Minoru. Plate type punching machine. 4,175,477, Cl. 93-36.00A.
Inoue, Fumio; and Masuda, Michio, to Hitachi, Ltd. Vertical deflection output circuit. 4,176,302, Cl. 315-397.000.
Inoue, Makoto, to Sony Corporation. Method for manufacturing an oxide of semiconductor. 4,176,206, Cl. 427-82.000.
Inoue, Tatsuya: *See—*
Kawabe, Naoshi; Kaji, Hisatsugu; Miwa, Naotaka; Nakanishi, Hajime; Tanaka, Fumiaki; and Inoue, Tatsuya, 4,175,708, Cl. 241-16.000.
Inpro, Inc.: *See—*
Orlowski, David C., 4,175,752, Cl. 277-53.000.
INTEL Corporation: *See—*
Jackson, Daniel K., 4,176,258, Cl. 235-302.000.
Interfix Limited: *See—*
Herbert, Timothy J., 4,175,555, Cl. 128-92.00B.
Interlake, Inc.: *See—*
Garthus, Donald R.; and Robinson, L. T., 4,176,013, Cl. 202-242.000.
International Business Machines Corporation: *See—*
Colglazier, Donald F.; Fallon, John L.; Kimble, George P.; and Mares, Fred R., 4,175,741, Cl. 271-3.100.
Froehlich, Frederick B.; Hennings, Roy; and Schaffer, William J., 4,176,382, Cl. 360-95.000.
Koski, John A.; and Weaver, Richard B., 4,176,380, Cl. 360-50.000.
Wing, James W., 4,175,878, Cl. 400-693.000.
International Cold Forging Corporation: *See—*
Grandclement, Gerard, 4,175,590, Cl. 137-883.000.
International Flavors & Fragrances Inc.: *See—*
Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick L.; and Vock, Manfred H., 4,175,569, Cl. 131-9.000.
International Harvester Company: *See—*
Bouet, Jacques E., 4,175,367, Cl. 56-295.000.
Cicci, George B., 4,175,366, Cl. 56-15.800.
International Paper Company: *See—*
Heaton, Michael J.; and Quick, James R., 4,175,977, Cl. 106-272.000.
Hung, John H., 4,175,557, Cl. 128-156.000.
International Telephone & Telegraph Corp.: *See—*
DeRosa, Louis A.; and Rogoff, Mortimer, 4,176,316, Cl. 325-32.000.
Irwin, Robert S., to Du Pont de Nemours, E. I., and Company. Polyimide-esters and filaments prepared from 4-(4'-carboxyphthalimido)-benzoic acid or 4-(4'-hydroxyphthalimido)phenol. 4,176,223, Cl. 528-170.000.
Ishida, Akira; and Yamada, Hajime, to Nippon Telegraph and Telephone Public Corporation. Superconductive Josephson circuit device. 4,176,290, Cl. 307-306.000.
Ishida, Yasuhiko: *See—*
Katahira, Eturou; Yamaguchi, Shunzo; Kida, Masashi; and Ishida, Yasuhiko, 4,175,386, Cl. 60-276.000.
Ishii, Kiminori; and Nishizawa, Katsuhiko, to Nissan Motor Co., Ltd. Heat absorption means operative at prescribed temperature for suppression of heat transfer from abnormally heated automotive exhaust system to article on board. 4,175,631, Cl. 180-309.000.
Ishikawa, Tsunezo: *See—*
Makino, Kenya; Ishikawa, Tsunezo; and Komatsu, Koei, 4,176,219, Cl. 526-92.000.
Isuzu Motors Limited: *See—*
Kawamura, Hideo; Ohta, Hideo; and Kubota, Kimi, 4,175,522, Cl. 123-119.00A.
Itaya, Nobushige; and Hirano, Masachika, to Sumitomo Chemical Company, Limited. Insecticidal and acaricidal hydantoin N-methylol esters. 4,176,189, Cl. 424-273.00R.
ITI Limited. *See—*
Mougin, Georges L., 4,175,887, Cl. 405-25.000.
Ito, Fumio: *See—*
Murakami, Hiroyashu; Ito, Tadashi; Ito, Fumio; Sakurada, Nobuaki; Kawamura, Masaharu; and Shinoda, Nobuhiko, 4,175,848, Cl. 354-289.000.
Sakurada, Nobuaki; Ito, Tadashi; Shinoda, Nobuhiko; Ito, Fumio; Murakami, Hiroyashu; and Kawamura, Masaharu, 4,175,842, Cl. 354-23.00D.
Ito, Hiromi: *See—*
Fujie, Tetsuo; and Ito, Hiromi, 4,176,273, Cl. 219-220.000.
Ito, Masaharu, to Canon Kabushiki Kaisha. Photographic lens assembly. 4,175,831, Cl. 350-255.000.
Ito, Tadashi: *See—*
Murakami, Hiroyashu; Ito, Tadashi; Ito, Fumio; Sakurada, Nobuaki; Kawamura, Masaharu; and Shinoda, Nobuhiko, 4,175,848, Cl. 354-289.000.
Sakurada, Nobuaki; Ito, Tadashi; Shinoda, Nobuhiko; Ito, Fumio; Murakami, Hiroyashu; and Kawamura, Masaharu, 4,175,842, Cl. 354-23.00D.
Ito, Toshimitsu: *See—*
Sanada, Masakatsu; Ito, Toshimitsu; and Nakada, Masahiko, 4,175,527, Cl. 123-136.000.
Itoki Kosakusho Co., Ltd.: *See—*
Tabata, Yoichi, 4,175,901, Cl. 414-282.000.
Iwako, Hiroyuki; and Ando, Shigeki, to Funken Co., Ltd. Process and apparatus for mechanically mixing two immiscible liquids and one or more other substances. 4,175,873, Cl. 366-165.000.
Iwanicki, Douglas W. Ice thickness indicator. 4,175,512, Cl. 116-217.000.
Iwase, Kazuo: *See—*
Kawai, Hisasi; and Iwase, Kazuo, 4,175,507, Cl. 123-117.00D.

Iwashita, Tomonori; Takimoto, Hiroyuki; Mashimo, Yukio; and Hashimoto, Teiji, to Canon Kabushiki Kaisha. Winding up device of a camera. 4,175,845, Cl. 354-173.000.
Iwata, Takeshi: *See*—
Ohno, Shigeaki; Kazuta, Toshiyuki; and Iwata, Takeshi, 4,176,135, Cl. 260-554.000.
Izawa, Masao: *See*—
Kamachi, Shinichi; Izawa, Masao; Gocho, Nagahiro; Nakajima, Yoshio; and Hattori, Shinichiro, 4,176,376, Cl. 358-107.000.
J. Bobst & Fils, S.A.: *See*—
Lang, Pierre, 4,175,686, Cl. 225-97.000.
J. I. Case Company: *See*—
Christensen, Robert F., 4,175,638, Cl. 180-140.000.
Stoychoff, Terry A., 4,175,598, Cl. 144-34.00E.
Jackisch, Philip F., to Ethyl Corporation. Diesel engine crankcase lubricating oil composition. 4,176,072, Cl. 252-32.70E.
Jackson, Daniel K., to INTEL Corporation. Method and circuit for checking integrated circuit chips. 4,176,258, Cl. 235-302.000.
Jackson, Henry G., to Phillips Petroleum Company. C-shaped polyester filaments. 4,176,211, Cl. 428-397.000.
Jacobs, Morris L.; and Dunagan, Hiram J. Binding hole punch apparatus. 4,175,457, Cl. 83-230.000.
Jacobson, Carl C.; and Crosby, Gaius P., to Crafco, Inc. Pavement cutting machine. 4,175,788, Cl. 299-1.000.
James, Granville C., to Coal Industry (Patents) Limited. Dust filter apparatus. 4,175,933, Cl. 55-259.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Ikeda, Hiroharu; Matsumoto, Shuichi; and Makino, Kenya, 4,176,220, Cl. 526-97.000.
Makino, Kenya; Ishikawa, Tsunezo; and Komatsu, Koei, 4,176,219, Cl. 526-92.000.
Jaquay, Louis H., to Dravo Corporation. Melting of fine particulate material in a high-speed rotary furnace. 4,175,732, Cl. 266-213.000.
Jarret, Jacques H.; and Jarret, Jean M. B. Hydraulic inertia filled spring. 4,175,733, Cl. 267-126.000.
Jarret, Jean M. B.: *See*—
Jarret, Jacques H.; and Jarret, Jean M. B., 4,175,733, Cl. 267-126.000.
JBC Enterprises, Inc.: *See*—
Phaup, Charles W.; and Lower, Joseph D., 4,175,889, Cl. 405-195.000.
Jeffers, Eldon L.: *See*—
United States of America, National Aeronautics and Space Administration; Jeffers, Eldon L.; and Thomas, Richard R., 4,176,007, Cl. 435-34.000.
Jeghers, Philippe M.: *See*—
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Johnson, Edward E., to Auto-Miser International Manufacturing Corp. Fuel vaporizer system for internal combustion engines. 4,175,525, Cl. 123-134.000.
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Johnson, Gary E., to Johnson Propeller Company. Propeller nut. 4,175,605, Cl. 151-7.000.
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Johnson, Roger P. Motorcycle wheel suspension device. 4,175,764, Cl. 280-284.000.
Johnson, William H.: *See*—
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Baker, Thomas E.; Fix, George L.; and Judge, John S., 4,176,209, Cl. 427-248.00B.
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Guerre, Robert P.; Juedes, Dennis L.; and Ruland, Ross R., 4,175,920, Cl. 431-175.000.
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Fukuhara, Toshihiko, 4,175,447, Cl. 73-799.000.
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Arai, Toshio, 4,175,324, Cl. 433-122.000.
Kabushiki Kaisha Seikosha: *See*—
Yoshizawa, Keiichi, 4,175,374, Cl. 58-23.00R.
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Metz, Hellmut; and Kage, Henning, 4,176,069, Cl. 210-321.00B.
Kahn, Leonard R. Double sideband transmission system. 4,176,319, Cl. 325-138.000.
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Kalajzich, Albert A., to General Engines Co., Inc. Electric drive unit for vehicles. 4,175,629, Cl. 180-220.000.
Kalbfleisch, Adolphe W. Bottom entry positive acting ball valve. 4,175,580, Cl. 137-315.000.
Kalsi, Swarn S.; and Chari, Madabushi V. K., to Electric Power Research Institute, Inc. Auxiliary field winding for a superconductive alternating current electrical machine and method of exciting same. 4,176,292, Cl. 310-52.000.
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Eibofner, Eugen; and Balsys, Heinz, 4,175,323, Cl. 433-126.000.
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Kaman Sciences Corporation: *See*—
Schneider, John C.; Hanson, S. Eugene; and DuVall, Bruce W., 4,175,443, Cl. 73-722.000.
Kamino, Yasumi: *See*—
Inaba, Hideya; Ogiyama, Hisao; Ichiki, Masayoshi; Kamino, Yasumi; Matsumoto, Nobuo; Nagai, Kenichi; and Suzuki, Masami, 4,176,091, Cl. 252-456.000.
Kaminski, David G.; Fedde, Mickiel P.; and DeWard, Robert C., to Sperry Rand Corporation. Apparatus for maintaining a history of the

most recently executed instructions in a digital computer. 4,176,394, Cl. 364-200.000.
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Aoki, Kiyoshi; and Kamo, Hisao, 4,175,317, Cl. 29-571.000.
Kamon, John T.: *See*—
Ponce, Phillip; and Kamon, John T., 4,175,679, Cl. 222-70.000.
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Kaneko, Yoichi; and Kimura, Katsuhiro, to Hitachi, Ltd. Microwave heating apparatus. 4,176,266, Cl. 219-10.55F.
Kaneko, Yutaka: *See*—
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Kapp, Joachim-Friedrich: *See*—
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Karam, Ronald E.; and Swarthout, David J., to Xerox Corporation. Precipitation of particulate trigonal selenium for use in electrophotography. 4,175,959, Cl. 430-134.000
Karl Schmidt GmbH: *See*—
Moebus, Horst, 4,175,502, Cl. 123-41.350.
Karlsson, Per-Olle, to Svenskt Stal Aktiebolag. Method and apparatus for producing metal blanks, in particular steel slabs, which at least in a predetermined surface area have substantially no defects. 4,175,729, Cl. 266-51.000.
Kasahara, Tadashi, to Konishiroku Photo Industry Co., Ltd. Ink jet printing apparatus. 4,176,363, Cl. 346-140.00R.
Kasai, Kaname; Mukumoto, Takaji; Asakura, Toshikazu; and Ueda, Ryoji, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for absorbing oil pressure in an impact type tool. 4,175,408, Cl. 64-26.000.
Kasper, Horst M.; Tell, Benjamin; and Wagner, Sigurd, to Bell Telephone Laboratories, Incorporated. Ternary ionic conductors. 4,176,170, Cl. 423-508.000.
Kast, Hellmut, to BASF Aktiengesellschaft. Basic dyes. 4,176,229, Cl. 542-422.000.
Katahira, Eturou; Yamaguchi, Shunzo; Kida, Masashi; and Ishida, Yasuhiko, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas purification apparatus for an internal combustion engine. 4,175,386, Cl. 60-276.000.
Kato, Takashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Combustion chamber of an internal combustion engine. 4,175,532, Cl. 123-191.00S.
Kaufman, Robert J.: *See*—
Franz, John E.; and Kaufman, Robert J., 4,175,946, Cl. 71-87.000.
Kaul, Dietmar; and Willhelm, Joerg, to Ernst Leitz Wetzlar GmbH. Photoelectric incident light distance measuring device. 4,176,276, Cl. 250-237.00G.
Kaushal, Som N.: *See*—
Ewalt, Leonard J.; and Kaushal, Som N., 4,175,986, Cl. 148-16.500.
Kawabe, Naoshi; Kaji, Hisatsugu; Miwa, Naotaka; Nakanishi, Hajime; Tanaka, Fumiaki; and Inoue, Tatsuya, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method of transporting liquid pitch containing lumpy cokes and apparatus therefor. 4,175,708, Cl. 241-16.000.
Kawada, Hiroh; Goto, Kiyoshi; and Kurita, Yoshio, to Konishiroku Photo Industry Co., Ltd. Ink composition for ink jet printing. 4,176,361, Cl. 346-1.100.
Kawai, Hisasi; and Iwase, Kazuo, to Nippon Soken, Inc. Electronic ignition timing control system for internal combustion engine. 4,175,507, Cl. 123-117.00D.
Kawai Musical Instrument Mfg. Co. Ltd.: *See*—
Deutsch, Ralph, 4,175,463, Cl. 84-1.190.
Deutsch, Ralph, 4,175,464, Cl. 84-1.240.
Kawamura, Hideo; Ohta, Hideo; and Kubota, Kimi, to Isuzu Motors Limited. Exhaust gas recirculation device for internal combustion engine with auxiliary combustion chamber. 4,175,522, Cl. 123-119.00A.
Kawamura, Masaharu. *See*—
Murakami, Hiroyashu; Ito, Tadashi; Ito, Fumio; Sakurada, Nobuaki; Kawamura, Masaharu; and Shinoda, Nobuhiko, 4,175,848, Cl. 354-289.000.
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Matsushita, Takeshi; Hayashi, Hisao; Aoki, Teruaki; Yamoto, Hisayoshi; and Kawana, Yoshiyuki, 4,176,372, Cl. 357-52.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Terai, Kiyohide; and Kutsuna, Muneharu, 4,176,271, Cl. 219-121.0EM.
Kawasaki Kasei Chemicals Ltd.: *See*—
Matsuura, Ryo; Nakatani, Shuichi; Nomiyama, Yukio; and Ninomiya, Tadashi, 4,176,125, Cl. 260-369.000.
Kawasaki, Mikio: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kaneko, Yutaka; and Kawasaki, Mikio, 4,175,966, Cl. 430-438.000.
Kawasumi Laboratories, Inc.: *See*—
Sakurada, Yutaka; Sunahara, Kimihisa; and Yamauchi, Kazuhisa, 4,176,070, Cl. 210-500.00M.
Kay Tex Products, Inc.: *See*—
Rider, Nathan R., 4,176,100, Cl. 260-22.00R.
Kazmark, Eugene A. Portable luggage carrier. 4,175,769, Cl. 280-654.000.
Kazuta, Toshiyuki: *See*—
Ohno, Shigeaki; Kazuta, Toshiyuki; and Iwata, Takeshi, 4,176,135, Cl. 260-554.000.
Keck, Roland, to Betriesbsforschungsinstitut VDEh Institut fur angewandte Forschung GmbH. Device for the measurement of forces or pressures. 4,175,429, Cl. 73-141.00A.
Kelley, Joseph A. Waste paper recycling. 4,176,054, Cl. 209-8.000.
Kellner, Helmut. Arrangement for producing photographic pictures suitable for photogrammetric survey of spatial objects. 4,175,328, Cl. 33-1.00A.
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Conner, William R., Jr., 4,175,763, Cl. 280-104.000.
Kemp Applications Sales Limited: *See*—
Kemp, Jack V. L., 4,175,739, Cl. 270-58.000.
Kemp, Jack V. L., to Kemp Applications Sales Limited. Paper collating machines. 4,175,739, Cl. 270-58.000.
Kendall Company, The: *See*—
Patel, Bhupendra C., 4,175,567, Cl. 128-748.000.
Peterson, James J., 4,175,597, Cl. 141-23.000.
Kenworthy, Grant F., to Weber Marking Systems, Inc. Uniform indexing of paper forms. 4,175,687, Cl. 226-74.000.
Keogh, Raymond J.: *See*—
Burr, Robert P.; Morino, Ronald; and Keogh, Raymond J., 4,175,816, Cl. 339-95.00R.
Keresztes, Borbala nee Ordog: *See*—
Szekely, Istvan; Tomoskozi, Istvan; Kovacs, Gabor; Simonidesz, Vilmos; Lovasz nee Gaspar, Marianna; Keresztes, Borbala nee Ordog; Remport, Julia nee Radoczi; Stadler, Istvan; Visky, Zsuzsa nee Gombos; and Szantay, Csaba, 4,176,122, Cl. 260-343.30P.
Kerfoot, Paul E.: *See*—
Johnson, James A.; and Kerfoot, Paul E., 4,176,318, Cl. 325-133.000.
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Voll, Horst; Kessler, Franz; and Herla, Max, 4,175,802, Cl. 308-9.000.
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Chadwick, Alexander; Khair, Magdi K.; and McCombie, Jay C., 4,175,587, Cl. 137-625.650.
Kida, Masashi: *See*—
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Kidd, Arthur H., to H. G. Weber & Co., Inc. Method and apparatus for forming reinforced top file folders. 4,175,476, Cl. 93-1.00E.
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Pekau, Dietlind; Ruell, Hartwig; Storck, Eckhard; and Kiemle, Horst, 4,175,823, Cl. 350-3.790.
Kiencke, Uwe: *See*—
Schulz, Alfred; Kiencke, Uwe; and Honig, Gunther, 4,176,309, Cl. 323-4.000.
Kikuchi, Toshiaki: *See*—
Nakazawa, Koji; Kikuchi, Toshiaki; and Fujita, Toshihito, 4,175,939, Cl. 65-2.000.
Kilgore, Doyle G. Cat proof pigeon trap. 4,175,517, Cl. 119-155.000.
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Colglazier, Donald F.; Fallon, John L.; Kimble, George P.; and Mares, Fred R., 4,175,741, Cl. 271-3.100.
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Kaneko, Yoichi; and Kimura, Katsuhiro, 4,176,266, Cl. 219-10.55F.
Kindig, James K.; and Turner, Ronald L., to Hazen Research, Inc. Treatment of coal with metal containing compounds. 4,175,924, Cl. 44-15.00R.
King, Olin B., to SCI Systems, Inc. Grounding device for rotary electrical printer and method. 4,176,364, Cl. 346-162.000.
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Davis, Billy J.; Kinsey, Cletus M.; Shen, Hwa J.; and Weber, James R., 4,175,799, Cl. 308-9.000.
Kirchner, Richard K.; Mayer, William N.; and Andreadakis, Nicholas C., to Modern Controls, Inc. Display panel apparatus and method of driving. 4,176,298, Cl. 315-169.200.
Kirsch, Reinhard: *See*—
Loewe, Heinz; Urbanietz, Josef; Duwel, Dieter; and Kirsch, Reinhard, 4,176,192, Cl. 424-300.000.
Kisch, Jack J.: *See*—
Buritz, Robert S.; Parker, Robert D.; Kisch, Jack J.; and Burnham, John, 4,176,334, Cl. 336-84.00C.
Kishinami, Tateshi; and Sato, Makoto, to Toshiba Tungaloy Co., Ltd.; and Makino Milling Machine Co., Ltd. Ball endmill. 4,175,896, Cl. 408-230.000.
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, to Canon Kabushiki Kaisha. Recording position adjuster. 4,175,851, Cl. 355-14.00R.
Kittag, Gerd, to Vockenhuber, Karl; and Hauser, Raimund. Motion picture camera with multiple exposure. 4,175,840, Cl. 352-141.000.
Kleen-Rite, Inc.: *See*—
Smith, Robert G., 4,175,666, Cl. 211-71.000.
Kleim, Karl-Heinz, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Entrance step arrangement for a short distance transport vehicle. 4,175,495, Cl. 105-450.000.
Kleinpeter, Joseph A.: *See*—
Britton, Michael W.; Harlacher, Eugene A.; Dew, John N.; and Kleinpeter, Joseph A., 4,175,928, Cl. 48-197.00R.

Dew, John N.; Britton, Michael W.; Harlacher, Eugene A.; and Kleinpeter, Joseph A., 4,176,087, Cl. 252-439.000.

Klenk, Emil, to Maschinenbau Oppenweiler GmbH. Folding machine. 4,175,740, Cl. 270-83.000.

Klinedinst, Keith A.; and Schlaikjer, Carl R., to GTE Laboratories Incorporated. Lithium-lead sulfate primary electrochemical cell. 4,176,214, Cl. 429-194.000.

Klippan GmbH Sicherheitsgerate: *See*—
Muskat, Kurt (Ulrich), 4,175,787, Cl. 297-484.000.

Klueppel, Hans-Jurgen: *See*—
Hempel, Hans-Ulrich; Klueppel, Hans-Jurgen; and Volgnandt, Peter, 4,176,127, Cl. 260-407.000.

Knaflic, France: *See*—
Eckert, Guenter; Knaflic, France; Miller, Franz-Friedrich; and Zissel, Alfred, 4,175,922, Cl. 8-94.1R.

Knappstein, Johannes, to Carl Still, Firma. Method for operating coke oven chambers in connection with a predrying plant for the coal. 4,176,011, Cl. 201-40.000.

Knappworst, Jurgen; Brede, Uwe; and Zeiher, Erich, to Dynamit Nobel, AG. Projectile, particularly for hand firearms and long firearms. 4,175,492, Cl. 102-92.600.

Knell, Harvey A.; and Gill, Stephen H., to Caterpillar Tractor Co. Shovel linkage. 4,175,907, Cl. 414-715.000.

Knight, John C.; and Wovcha, Merle G., to Upjohn Company, The. Steroid intermediates. 4,176,123, Cl. 260-345.200.

Knoll, Ernst, to Paul Hartmann AG; Knoll, Ernst; and Thieme, Werner. Swab. 4,175,560, Cl. 128-269.000.

Knorring, Richard T., to Cincinnati Milacron-Heald Corporation. Finishing tool. 4,175,415, Cl. 72-101.000.

Kobayashi, Hideo: *See*—
Goto, Kenji; Yokota, Masato; and Kobayashi, Hideo, 4,175,533, Cl. 123-191.00S.

Kobayashi, Masayoshi: *See*—
Kajimura, Takashi; Saito, Kazutoshi; Shige, Noriyuki; Nakamura, Michiharu; Umeda, Jun-ichi; and Kobayashi, Masayoshi, 4,176,325, Cl. 331-94.50H.

Kobe Steel, Ltd.: *See*—
Mori, Kenji; Taniuchi, Mamoru; and Yaguchi, Shigeo, 4,176,041, Cl. 208-10.000.

Kobinger, Walter: *See*—
Austel, Volkhard; Kutter, Eberhard; Heider, Joachim; Eberlein, Wolfgang; Kobinger, Walter; Lillie, Christian; Diederen, Willi; and Haarmann, Walter, 4,176,184, Cl. 424-248.520.

Koch Adler AG: *See*—
Scholl, Hans; and Tiemann, Helmut, 4,175,681, Cl. 223-2.000.

Koch, Kenneth F.: *See*—
Wessler, Louis E.; and Koch, Kenneth F., 4,176,379, Cl. 358-280.000.

Koch, Manfred; Handte, Reinhard; Horlein, Gerhard; Bieringer, Hermann; and Langeluddeke, Peter, to Hoechst Aktiengesellschaft. Phenoxy-phenoxypropionic acid esters. 4,175,947, Cl. 71-88.000.

Koel, Gerrit J.; and Postma, Lambertus, to U.S. Philips Corporation. Forming electrically insulating layers by sputter deposition. 4,176,016, Cl. 204-38.00R.

Koester, Earl J.: *See*—
DeVita, Alphonse J.; Koester, Earl J.; Manoogian, David V.; and Sharenson, Stanley, 4,176,351, Cl. 343-9.00R.

Koguchi, Nobuyuki; and Masumoto, Katashi, to National Research Institute for Metals. Photovoltaic converter. 4,176,370, Cl. 357-30.000.

Koide, Hideo: *See*—
Miyamoto, Kazuo; Suzuki, Isao; and Koide, Hideo, 4,175,373, Cl. 58-16.00D.

Kollmorgen Technologies Corporation: *See*—
Burr, Robert P.; Morino, Ronald; and Keogh, Raymond J., 4,175,816, Cl. 339-95.00R.

Kolobanov, Nikolai I.: *See*—
Onikov, Eduard A.; Galperin, Alexandr L.; Zabotin, Alexandr A.; Loschilin, Evgeny D.; and Kolobanov, Nikolai I., 4,175,594, Cl. 139-436.000.

Komatsu, Isamu; Sugawara, Toru; and Yamauchi, Tsukasa, to Hitachi, Ltd. Zero voltage switching solid state relay. 4,176,288, Cl. 307-252.00A.

Komatsu, Koei: *See*—
Makino, Kenya; Ishikawa, Tsunezo; and Komatsu, Koei, 4,176,219, Cl. 526-92.000.

Kommrusch, Richard S., to Motorola, Inc. Radio frequency lens. 4,176,322, Cl. 325-369.000.

Komori, Ryuichi: *See*—
Asano, Eijiro; and Komori, Ryuichi, 4,175,530, Cl. 123-140.0FG.

Kondo, Shoji: *See*—
Seino, Kuniki; Kondo, Shoji; Tanaka, Susumu; and Sugiyama, Takashi, 4,175,955, Cl. 430-35.000.

Kondoh, Syunichi: *See*—
Shinozaki, Fumiaki; Washigawa, Yasuo; Ikeda, Tomoaki; Nakao, Sho; and Kondoh, Syunichi, 4,175,971, Cl. 430-287.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kaneko, Yutaka; and Kawasaki, Mikio, 4,175,966, Cl. 430-438.000.
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Konrad, William L., to United States of America, Navy. Propagation sampled acoustic line array. 4,176,339, Cl. 367-121.000.

Kontsov, Jury M.: *See*—
Adamovich, Anatoly V.; Burov, Lev A.; Nemets, Rusaam S.; Gorbulev, Efim S.; Eremenko, Boris S.; Brainman, Felix A.; Moldavanov, Viktor P.; Kontsov, Jury M.; Axenov, Viktor F.; and Averbukh, Matvei L., 4,175,758, Cl. 277-220.000.

Koppensteiner, Alfred H., to Hughes Aircraft Company. Optical transmission system with a pechan prism for equalizing optical paths. 4,175,825, Cl. 350-34.000.

Korn, Donald M.; and Nelson, Owen L., to Minnesota Mining and Manufacturing Company. Radiation imaging and readout system and method utilizing a multi-layered device having a photoconductive insulative layer. 4,176,275, Cl. 250-213.00R.

Korner, Otto; and Bardiani, Christian, to Diehl GmbH & Co. Endless tread of the single-pin type. 4,175,798, Cl. 305-58.00R.

Kosarek, Louis J.: *See*—
Wheatley, Robert T.; and Kosarek, Louis J., 4,176,057, Cl. 210-23.00H.

Koski, John A.; and Weaver, Richard B., to International Business Machines Corporation. Adaptive speed/interblock gap control for tape drive. 4,176,380, Cl. 360-50.000.

Koslow, George. Solid stress motor. 4,175,390, Cl. 60-527.000.

Koslowski, Gerhard: *See*—
Derichs, Josef; and Koslowski, Gerhard, 4,175,718, Cl. 242-150.00R.

Kottas, Rolf, to "Laser-Light" Gesellschaft mit beschrankter Haftung. System for the alignment of a laser beam transmitter with a sighting mechanism set up in another place. 4,175,861, Cl. 356-153.000.

Kottke, Joachim: *See*—
Muller, Erich; and Kottke, Joachim, 4,175,298, Cl. 7-138.000.

Kourimsky, Friedrich J. A.; and John, Heinrich, to AMP Incorporated. Electrical connectors. 4,175,818, Cl. 339-176.0MP.

Kovacs, Gabor: *See*—
Szekely, Istvan; Tomoskozi, Istvan; Kovacs, Gabor; Simonidesz, Vilmos; Lovasz nee Gaspar, Marianna; Keresztes, Borbala nee Ordog; Remport, Julia nee Radoczi; Stadler, Istvan; Visky, Zsuzsa nee Gombos; and Szantay, Csaba, 4,176,122, Cl. 260-343.30P.

Kovatch, George N.; Rosey, Richard; and Simon, Ned H., to Westinghouse Electric Corp. Bus connector for welded electrical switchboard bus structure. 4,176,243, Cl. 174-72.00B.

Kraft, Kurt; and Walz, Gerd, to Hoechst Aktiengesellschaft. Highly reactive powder resin compositions containing polycarboxylic acid anhydrides. 4,176,143, Cl. 260-835.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Exner, Gerhard; and Festinori, Volfango, 4,175,453, Cl. 81-57.380.

Kramer, Melvin G., to Brunton Company, The. Magnetic compass. 4,175,333, Cl. 33-344.000.

Kranich, Joel H.; Adam, Robert A.; and Culbertson, Charles L., to Kranich, Joel H. Modular constructional units for a combined storage bin and display assembly. 4,175,807, Cl. 312-118.000.

Kranz, Berthold, to Carl Canzler, Firma. Device for cooling a quenching bath of melted salt. 4,175,730, Cl. 266-120.000.

Krause, Donald. Multipart photosensitive element with independent contrast control of constituent part records. 4,175,967, Cl. 430-503.000.

Krautkremer, Franz, to Schottel-Werft Josef Becker GmbH & Co. KG. Tugboat or the like. 4,175,511, Cl. 115-35.000.

Kreb, Robert J., III. Sealable syringe. 4,175,559, Cl. 128-218.00R.

Krekeler, Claude B., to Cincinnati Mine Machinery Company, The. Ground engaging tread or track comprised of improved articulated crawler pads, for treaded vehicles such as mining machines and the like. 4,175,797, Cl. 305-53.000.

Kren, George J.: *See*—
Urbanek, Karel; Kren, George J.; and Wheeler, William R., 4,175,441, Cl. 73-599.000.

Krestmark Industries, Inc.: *See*—
Foss, Steven K., 4,175,737, Cl. 269-317.000.

Kretzschmar, Wolfgang: *See*—
Wilmes, Manfred; Finger, Torsten; Fitzler, Arno; Kretzschmar, Wolfgang; and Franke, Heinrich, 4,175,820, Cl. 339-198.00R.

Krider, Paul R.: *See*—
Coldren, Daniel R.; Krider, Paul R.; and Williams, Benjamin C., 4,175,811, Cl. 339-19.000.

Krivenko, Valery G.: *See*—
Kuchuk-Yatsenko, Sergei I.; Golomovzjuk, Ivan K.; Krivenko, Valery G.; Kulesh, Alexandr I.; Sakharnov, Vasily A.; Lazebny, Ivan L.; and Porkhun, Fedor K., 4,175,897, Cl. 409-300.000.

Kroger, Harry, to Sperry Rand Corporation. Josephson tunnel junction device with hydrogenated amorphous silicon, germanium or silicon-germanium alloy tunneling barrier. 4,176,365, Cl. 357-5.000.

Kroplinski, Thaddeus F.: *See*—
Brauer, Melvin; and Kroplinski, Thaddeus F., 4,176,239, Cl. 174-23.00C.

Kruegle, Herman, to Visual Methods, Inc. Access control system. 4,175,775, Cl. 283-7.000.

Krug, Herbert: *See*—
Platz, Rolf; Dockner, Toni; Heners, Jurgen; and Krug, Herbert, 4,176,137, Cl. 260-561.00N.

Krutak, James J.: *See*—
Haley, Neil F.; Krutak, James J.; and Ott, Robert J., 4,175,956, Cl. 430-37.000.

Kube, Wolfram H.; and Shuck, David L., to Wyoming Mineral Corporation. Solution mining utilizing dissolved oxygen with elimination of entrained gas. 4,175,789, Cl. 299-4.000.

Kubota, Kimi: *See*—
Kawamura, Hideo; Ohta, Hideo; and Kubota, Kimi, 4,175,522, Cl. 123-119.00A.

Kubota, Masayuki; and Hanano, Masamitu, to Hitachi, Ltd. Man conveyor. 4,175,653, Cl. 198-332.000.

Kuchuk-Yatsenko, Sergei I.; Golomovzjuk, Ivan K.; Krivenko, Valery G.; Kulesh, Alexandr I.; Sakharnov, Vasily A.; Lazebny, Ivan L.; and Porkhun, Fedor K. Apparatus for removing flash from resistance butt-weld joints in rails. 4,175,897, Cl. 409-300.000.

Kuettner, Klaus E., to Rush-Presbyterian-St. Luke's Medical Center. Inhibition of bone resorption. 4,176,177, Cl. 424-95.000.

Kugelfischer Georg Schafer & Co.: *See*—
Voll, Horst; Kessler, Franz; and Herla, Max, 4,175,802, Cl. 308-9.000.

Kuhn, Charles J. Safety tie down for a pulling apparatus. 4,175,420, Cl. 72-447.000.

Kuhn, Ralph F., Jr., to United States of America, Air Force. Floating head laser mirror assembly. 4,175,835, Cl. 350-310.000.

Kuhn S.A.: *See*—
Gerlinger, Frederic, 4,175,369, Cl. 56-370.000.

Kulesh, Alexandr I.: *See*—
Kuchuk-Yatsenko, Sergei I.; Golomovzjuk, Ivan K.; Krivenko, Valery G.; Kulesh, Alexandr I.; Sakharnov, Vasily A.; Lazebny, Ivan L.; and Porkhun, Fedor K., 4,175,897, Cl. 409-300.000.

Kulik, George J.; Meslink, Michael C.; and Mulder, James P., to Abex Corporation. Shock isolating lamp assembly. 4,176,391, Cl. 362-390.000.

Kumagai, Hiroji: *See*—
Naganuma, Tsutomu; Hoshi, Hisao; Kumagai, Hiroji; and Yoshida, Kaneki, 4,175,958, Cl. 430-49.000.

Kumagaya, Teruo, to Asahimatsu Koridofu Kabushiki Kaisha. Automatic high-pressure flash cooker. 4,175,482, Cl. 99-330.000.

Kume, Kazunari: *See*—
Tamaru, Munetaka; Kume, Kazunari; Watanabe, Minoru; Ohno, Hideshi; and Natori, Minoru, 4,175,372, Cl. 58-5.000.

Kumode, Masami, to Tanaka, Kiyomitsu, a part interest. Openable canopy housing. 4,175,361, Cl. 52-66.000.

Kuraray Co., Ltd.: *See*—
Sakurada, Yutaka; Sunahara, Kimihisa; and Yamauchi, Kazuhisa, 4,176,070, Cl. 210-500.00M.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Kawabe, Naoshi; Kaji, Hisatsugu; Miwa, Naotaka; Nakanishi, Hajime; Tanaka, Fumiaki; and Inoue, Tatsuya, 4,175,708, Cl. 241-16.000.

Kurihara, Sohachi. Sphygmomanometer aid. 4,175,547, Cl. 128-680.000.

Kurita, Yoshio: *See*—
Kawada, Hiroh; Goto, Kiyoshi; and Kurita, Yoshio, 4,176,361, Cl. 346-1.100.

Kutsuna, Muneharu: *See*—
Terai, Kiyohide; and Kutsuna, Muneharu, 4,176,271, Cl. 219-121.0EM.

Kutter, Eberhard: *See*—
Austel, Volkhard; Kutter, Eberhard; Heider, Joachim; Eberlein, Wolfgang; Kobinger, Walter; Lillie, Christian; Diederen, Willi; and Haarmann, Walter, 4,176,184, Cl. 424-248.520.

Kuwayama, Masatoshi: *See*—
Nakamura, Ichiro; Ichiryu, Ken; and Kuwayama, Masatoshi, 4,175,589, Cl. 137-625.640.

Kwak, In S. Nasal gastric tube insertion guide and method. 4,175,564, Cl. 128-350.00R.

KYC Machine Industry Co.: *See*—
Ozasa, Masahiro; Murayama, Kenya; and Okumura, Masako, 4,175,814, Cl. 241-46.00R.

Kyncl, John J.: *See*—
Winn, Martin; and Kyncl, John J., 4,176,191, Cl. 424-274.000.

Lafayette Pharmacal Inc.: *See*—
Newton, Barry N., 4,175,544, Cl. 128-654.000.

Lagerstrom, Gosta B., to Boliden Aktiebolag. Process and an apparatus for alkali-treatment of lignocellulosic material. 4,176,203, Cl. 426-636.000.

Lagos, Costas C.; Lanio, Ricardo A.; Crowley, John L.; and Moreau, Norman A., to GTE Sylvania Incorporated. Internal coating process for glass tubing. 4,175,941, Cl. 65-60.00B.

Laidler, John B.; and Abrahams, Roy H., to Radiochemical Centre Ltd., The. Process for concentrating technetium-99m. 4,176,158, Cl. 423-2.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Prost, Roger; and Manhes, Bernard, 4,175,395, Cl. 62-52.000.

Laker, Thomas L. Apparatus and method for collecting, storage and transporting liquid samples for diagnostic examination. 4,175,439, Cl. 73-425.40R.

Lampert, Albert J., to Cambria Spring Company. Vehicle suspension system having auxiliary spring for lightly loaded conditions. 4,175,772, Cl. 280-718.000.

Lane, Constance A.: *See*—
Leslie, John P.; Lane, Constance A.; and Grant, R. Peter, 4,176,101, Cl. 260-22.00T.

Lang, Arnold; and Hortig, Hans-Peter, to Hoechst Aktiengesellschaft. Clear air device. 4,175,934, Cl. 55-267.000.

Lang, John M., to Boeing Company, The. Track mounted cargo shuttle. 4,175,656, Cl. 198-748.000.

Lang, Pierre, to J. Bobst & Fils, S.A. Device for stripping blanks from a die cut sheet of blanks. 4,175,686, Cl. 225-97.000.

Langeluddeke, Peter: *See*—
Koch, Manfred; Handte, Reinhard; Horlein, Gerhard; Bieringer, Hermann; and Langeluddeke, Peter, 4,175,947, Cl. 71-88.000.

Lanio, Ricardo A.: *See*—
Lagos, Costas C.; Lanio, Ricardo A.; Crowley, John L.; and Moreau, Norman A., 4,175,941, Cl. 65-60.00B.

LaPorte, Gordon J. Photo-typewriter. 4,175,841, Cl. 354-5.000.

"Laser-Light" Gesellschaft mit beschrankter Haftung: *See*—
Kottas, Rolf, 4,175,861, Cl. 356-153.000.

Lashley, Ronald T., to Emmons Guitar Company, Inc. String mounting apparatus. 4,175,467, Cl. 84-312.00P.

Lassanske, George G. Direct current motor driven vehicle with hydraulically controlled variable speed transmission. 4,175,632, Cl. 180-65.00R.

Laud, Tynis A.: *See*—
Pungas, Toom A.; Laud, Tynis A.; Reinberg, Kheino A.; Rebane, Raul-Vello P.; and Lumi, Toomas R., 4,176,393, Cl. 363-125.000.

Laurent, Henry: *See*—
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; Wiechert, Rudolf; Wendt, Hans; and Kapp, Joachim-Friedrich, 4,176,126, Cl. 260-397.450.

Laurmann, Giselle V.: *See*—
Jeppson, Morris R., 4,175,885, Cl. 404-77.000.

Lawler, John A.: *See*—
Birch, Stanley F.; Lawler, John A.; and Paynter, Gerald C., 4,175,640, Cl. 181-213.000.

Layton, Charles T.: *See*—
Mortimer, Ivan; and Layton, Charles T., 4,175,795, Cl. 303-118.000.

Lazarre, Flavien: *See*—
Bimond, Jean-Pierre; and Lazarre, Flavien, 4,175,424, Cl. 73-49.200.

Lazebny, Ivan L.: *See*—
Kuchuk-Yatsenko, Sergei I.; Golomovzjuk, Ivan K.; Krivenko, Valery G.; Kulesh, Alexandr I.; Sakharnov, Vasily A.; Lazebny, Ivan L.; and Porkhun, Fedor K., 4,175,897, Cl. 409-300.000.

Leach, George S.; and O'Connell, Timothy R., to Electronic Memories & Magnetics Corporation. Driving circuit for integrated circuit semiconductor memory. 4,176,289, Cl. 307-270.000.

Leavy, William A.; and Griffin, Charles R., to United States of America, National Aeronautics and Space Administration. Antenna deployment mechanism for use with a spacecraft. 4,176,360, Cl. 343-883.000.

LeCarvennec, Francois: *See*—
Bricot, Claude; Dubois, Jean-Claude; LeCarvennec, Francois; Lehureau, Jean-Claude; and Magna, Henriette, 4,176,277, Cl. 250-316.100.

Ledergerber, Charles P.: *See*—
D'Haenens, Irnee J.; and Ledergerber, Charles P., 4,175,551, Cl. 128-24.400.

Lee, Ernest P., to Honeywell Information Systems, Inc. Read apparatus. 4,176,259, Cl. 235-449.000.

Leftin, Harry P.; and Newsome, David S., to Pullman Incorporated. Pyrolysis coke inhibition. 4,176,045, Cl. 208-48.00R.

Lehureau, Jean-Claude: *See*—
Bricot, Claude; Dubois, Jean-Claude; LeCarvennec, Francois; Lehureau, Jean-Claude; and Magna, Henriette, 4,176,277, Cl. 250-316.100.

Leichtman, Ahron P.: *See*—
Goldblatt, Samuel; and Scott, Waller M., Jr., 4,175,546, Cl. 128-739.000.

Leifeld, Ferdinand: *See*—
Vollrath, Ulrich; and Leifeld, Ferdinand, 4,175,893, Cl. 406-52.000.

Leininger, James R.; and Vrzalik, John H. Therapeutic bed. 4,175,550, Cl. 128-24.00R.

Leiter, Robert, to Webasto-Werk W. Baier GmbH & Co. Motor vehicle roof. 4,175,785, Cl. 296-137.00E.

Leitz, Ludwig; Heitmann, Knut; Schneider, Eckart; and Schmidt, Horst, to Ernst Leitz Wetzlar GmbH. Method and apparatus for measuring distances. 4,175,365, Cl. 356-4.000.

Lekas, Mitchell A.: *See*—
Britton, Keith C.; and Lekas, Mitchell A., 4,175,490, Cl. 102-23.000.

Lemelson, Jerome H. Composite structural members and fastening methods. 4,175,883, Cl. 403-347.000.

Lempa, Bernard J., Jr. Trim tab control mechanism. 4,175,721, Cl. 244-83.00F.

Lenk, Erich: *See*—
Schippers, Heinz; and Lenk, Erich, 4,175,712, Cl. 242-46.400.

Lenthe, Manfred; and Dankert, Gerhard, to Bayer Aktiengesellschaft. Process for isolating N,N-dimethylaminoacetonitrile from water mixtures. 4,176,133, Cl. 260-465.50R.

Les Jouets Educatifs Universels: *See*—
Hudson, Robert H., 4,175,747, Cl. 273-101.200.

Leshkowitz, Victor. Transmission trunk powering system. 4,176,320, Cl. 325-308.000.

Leslie, John P.; Lane, Constance A.; and Grant, R. Peter, to Rohm and Haas Company. Melt strength improvement of PET. 4,176,101, Cl. 260-22.00T.

LeStrange, Raymond J., to Du Pont de Nemours, E. I., and Company. Process for sensitizing photographic silver halide emulsions. 4,175,970, Cl. 430-529.000.

Letournoux, Alain; and Canals, Charles, to Societe Industrielle Bertrand Faure. Seathinge. 4,175,301, Cl. 16-146.000.

Lever Brothers Company: *See*—
Princen, Henricus M.; and Aronson, Michael P., 4,176,200, Cl. 426-250.000.

Levitt, George: *See*—
Goddard, Steven J.; and Levitt, George, 4,175,948, Cl. 71-96.000.

Levy, Jerome F.: *See*—
Lewis, Sheldon N.; and Levy, Jerome F., 4,176,232, Cl. 560-222.000.

Lewandowski, Joseph T.: *See*—
Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., 4,176,094, Cl. 252-518.000.

Lewis, Robert B.; and Giversen, Terri A., to Western Electric Company, Inc. Powder coating composition. 4,176,142, Cl. 525-336.000.
Lewis, Sheldon N.; and Levy, Jerome F., to Rohm and Haas Company. Sulfonic acid salts of acyloxyalkylamines. 4,176,232, Cl. 560-222.000.
Lexalite International Corporation: *See—*
Barnes, Jocelyn T., 4,175,661, Cl. 206-519.000.
Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Metz, Hellmut; and Kage, Henning, 4,176,069, Cl. 210-321.00B.
Light, William A.: *See—*
Berwick, Martin A.; Fox, Charles J.; and Light, William A., 4,175,960, Cl. 430-58.000.
Lillie, Christian: *See—*
Austel, Volkhard; Kutter, Eberhard; Heider, Joachim; Eberlein, Wolfgang; Kobinger, Walter; Lillie, Christian; Diederen, Willi; and Haarmann, Walter, 4,176,184, Cl. 424-248.520.
Lilly Industries Limited: *See—*
Corfield, John R.; and Taylor, Clifford G., 4,176,231, Cl. 544-16.000.
Limburg, William R.: *See—*
Turner, William C.; Limburg, William R.; and Burton, John S., 4,175,855, Cl. 355-68.000.
Lin, Tz-Hong: *See—*
Winchell, Harry S.; Lin, Tz-Hong; and Panneciere, Charles A., 4,176,173, Cl. 424-5.000.
Linares, Robert C.; and Ambasz, Wiktor, to Allied Chemical Corporation. Preparation of phosphorus containing metallic glass forming alloy melts. 4,175,950, Cl. 75-53.000.
Lindholm, Carl E.: *See—*
Foster, L. Curtis; and Lindholm, Carl E., 4,176,356, Cl. 343-100.0CS.
Linn, John C.: *See—*
Dimyan, Magid Y.; Hubbell, Wayne C.; Chang, Christopher T. M.; and Linn, John C., 4,176,404, Cl. 365-12.000.
Linscott, Phillip S., Jr., to Sundstrand Corporation. Diode housing. 4,176,242, Cl. 174-52.00H.
Lipp, George D., to Corning Glass Works. Method of glass drawing. 4,175,942, Cl. 65-60.00B.
Lippera, Noel, to Pont-A-Mousson S.A. Method of coupling plastic pipes by welding and a connection piece for coupling same. 4,176,274, Cl. 219-522.000.
Liquid Crystal Products, Inc.: *See—*
Suzuki, Fred K.; and Davison, Thomas W., 4,175,543, Cl. 128-736.000.
Llewellyn, Link W., to Chi Rho Corporation. Eye-hand coordinator. 4,175,744, Cl. 273-26.00E.
Lockheed Corporation: *See—*
Wilhelm, William E., 4,175,754, Cl. 277-128.000.
Wirt, Leslie S., 4,175,639, Cl. 181-210.000.
Lodge, Maurice H., to Motorola, Inc. Vibratory feeder system and mechanism. 4,175,654, Cl. 198-398.000.
Loew, Peter; and Hummel, Wolfgang, to Hoechst Aktiengesellschaft. Electromechanical switching system. 4,175,448, Cl. 74-365.000.
Loewe, Heinz; Urbanietz, Josef; Duwel, Dieter; and Kirsch, Reinhard, to Hoechst Aktiengesellschaft. Substituted phenylguanidines and process for their manufacture. 4,176,192, Cl. 424-300.000.
Lohmus, Ivar: *See—*
Hahn, Thomas M.; Lohmus, Ivar; and Oakley, David E., 4,175,617, Cl. 165-122.000.
Lohr & Bromkamp GmbH: *See—*
Frauenhoffer, Josef; and Ruger, Gerd, 4,175,319, Cl. 29-724.000.
Lonberger, John W., to Owens-Corning Fiberglas Corporation. Digital communications system. 4,176,401, Cl. 364-900.000.
Longo, John M.: *See—*
Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., 4,176,094, Cl. 252-518.000.
Loos, John H., to White Consolidated Industries, Inc. Self-alignment clip for aligning hubs to flat shafts. 4,175,881, Cl. 403-13.000.
Loschilin, Evgeny D.: *See—*
Onikov, Eduard A.; Galperin, Alexandr L.; Zabotin, Alexandr A.; Loschilin, Evgeny D.; and Kolobanov, Nikolai I., 4,175,594, Cl. 139-436.000.
Lough, Wendell J.; and Bishop, Donald E., to Weber Technical Products Division of Craig Systems Corp. Diffuser with replaceable filter. 4,175,936, Cl. 55-385.00A.
Loutfy, Rafik O.; McIntyre, Lloyd F.; and Sharp, James H., to Xerox Corporation. Photovoltaic cell comprising metal-free phthalocyanine. 4,175,981, Cl. 136-89.0SJ.
Loutfy, Rafik O.; Hsiao, Cheng-Kuo; and Sharp, James H., to Xerox Corporation. Photovoltaic cell. 4,175,982, Cl. 136-89.0SJ.
Lovasz nee Gaspar, Marianna: *See—*
Szekely, Istvan; Tomoskozi, Istvan; Kovacs, Gabor; Simonidesz, Vilmos; Lovasz nee Gaspar, Marianna; Keresztes, Borbala nee Ordog; Remport, Julia nee Radoczi; Stadler, Istvan; Visky, Zsuzsa nee Gombos; and Szantay, Csaba, 4,176,122, Cl. 260-343.30P.
Lower, Joseph D.: *See—*
Phaup, Charles W.; and Lower, Joseph D., 4,175,889, Cl. 405-195.000.
Lu, Chin H., to Xerox Corporation. Field dependent toner having chrome complex coated magnetic particles. 4,176,078, Cl. 430-109.000.
Lubrizol Corporation, The: *See—*
Ripple, David E., 4,176,077, Cl. 252-51.50R.
Surbey, Donald L.; Clark, Alan C.; and Miller, Leonard E., 4,176,081, Cl. 252-182.000.
Lucas Industries Limited: *See—*
Roberts, Thomas E. E., 4,175,472, Cl. 91-6.500.
Smith, Trevor S., 4,175,383, Cl. 60-39.28R.
Luckenbach, Edward C., to Exxon Research & Engineering Co. Process for regenerating metal-contaminated hydrocarbon conversion catalysts. 4,176,084, Cl. 252-417.000.
Lumi, Toomas R.: *See—*
Pungas, Toom A.; Laud, Tynis A.; Reinberg, Kheino A.; Rebane, Raul-Vello P.; and Lumi, Toomas R., 4,176,393, Cl. 363-125.000.
Lund, Ernest K., to Edgar Pickering (Blackburn) Ltd. Knife assembly for a tufting machine. 4,175,497, Cl. 112-79.00R.
Lunde, Jon. Heat recovery system. 4,175,403, Cl. 62-324.000.
Luptovits, Roland: *See—*
Zauhar, Helmut; Authier, Bernhard; Luptovits, Roland; and Schmidhammer, Leonhard, 4,175,610, Cl. 164-60.000.
Lussier, Roger J.: *See—*
Vaughan, David E. W.; Lussier, Roger J.; and Magee, John S., Jr., 4,176,090, Cl. 252-455.00Z.
Luwa AG: *See—*
Gasser, Hermann; and Curiger, Karl, 4,175,371, Cl. 57-304.000.
Lynes, Inc.: *See—*
Coone, Malcolm G., 4,175,592, Cl. 138-89.000.
Mabery, Thomas L., to Combustion Engineering, Inc. No-size squeezing of 180 degree boiler-tube return bends. 4,175,419, Cl. 72-383.000.
MacAndrews and Forbes Company: *See—*
Cook, Marvin K., 4,176,201, Cl. 426-548.000.
Hartung, Harold A., 4,176,228, Cl. 536-4.000.
Mackey, E. Scudder, to GAF Corporation. Antistatic photographic X-ray film having a uniform protective surface coating of surfactant oligomer of tetrafluoroethylene. 4,175,969, Cl. 430-539.000.
MacWilliams, Dalton C.; and Wirt, James R., to Dow Chemical Company, The. Aqueous suspensions. 4,175,975, Cl. 106-100.000.
Maeda, Keijiro: *See—*
Inanaga, Kiyofumi; Egawa, Saburo; Shimizu, Akio; and Maeda, Keijiro, 4,176,249, Cl. 179-1.00E.
Maekawa, Hideyuki; Noda, Kinzaburo; and Hoshi, Noboru, to Shionogi & Co., Ltd.; and Shin-Etsu Chemical Co., Ltd. Sugar-coated solid dosage forms. 4,176,175, Cl. 424-35.000.
Magder, Jules; and Reich, Murray H., to Princeton Chemical Research, Inc. Method of manufacturing microporous paper-like butene-1 polymer sheets. 4,176,148, Cl. 264-41.000.
Magee, John S., Jr.: *See—*
Vaughan, David E. W.; Lussier, Roger J.; and Magee, John S., Jr., 4,176,090, Cl. 252-455.00Z.
Magna, Henriette: *See—*
Bricot, Claude; Dubois, Jean-Claude; LeCarvennec, Francois; Lehureau, Jean-Claude; and Magna, Henriette, 4,176,277, Cl. 250-316.100.
Maisonneuve, Leo V. Container and dispensing package. 4,175,675, Cl. 221-72.000.
Makino, Kenya; Ishikawa, Tsunezo; and Komatsu, Koei, to Japan Synthetic Rubber Co., Ltd. Process for the production of 1,2-polybutadiene with regulated molecular weight. 4,176,219, Cl. 526-92.000.
Makino, Kenya: *See—*
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Marie, Georges R. P. Wave mode converter. 4,175,830, Cl. 350-157.000.
Marks, Alvin M.; and Marks, Mortimer. 3-Dimensional camera device. 4,175,829, Cl. 350-132.000.
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Marshall, Thomas B. Combination luggage carrier and cart. 4,175,761, Cl. 280-47.180.
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Martin Marietta Corporation: *See—*
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Mathiolon, Henri; and Charbonnier, Simon. Overhead creel for twisting machines. 4,175,717, Cl. 242-131.000.
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Matsuura, Ryo; Nakatani, Shuichi; Nomiyama, Yukio; and Ninomiya, Tadashi, to Kawasaki Kasei Chemicals Ltd. Process for producing 1,4-dihydroanthraquinone. 4,176,125, Cl. 260-369.000.
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McDonald, David M.: *See—*
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McDonald, James A.; and Novak, Mark C., to Union Carbide Corporation. Dispensing carton for corrugated plastic bags. 4,175,673, Cl. 221-63.000.
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McGovern, Stephen J.; Schatz, Klaus W.; and Zrinscak, Sr. Fred S., to Mobil Oil Corporation. Separating flue gas from regenerated cracking catalyst. 4,176,083, Cl. 252-411.00R.
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McGrievy, Lawrence H.: *See—*
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McGuire, C. James, to Fireplace Energy Inc. Fireplace heater and home pressurization system. 4,175,539, Cl. 126-121.000.
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McLaren, Richard H. Water powered generator. 4,176,283, Cl. 290-52.000.
McMahon, Donald H., to Sperry Rand Corporation. Electro-optical multiplexer having multiple frequency resonant excitation. 4,175,827, Cl. 350-96.140.
McManus, Raymond. Refrigeration system. 4,175,401, Cl. 62-180.000.
McMillen, James W.; and Tomeo, Anthony, to Westinghouse Electric Corp. Automatic fail-safe mechanism-operated cell switch for metal-clad switchgear. 4,176,262, Cl. 200-50.0AA.
McNeil Corporation: *See—*
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McPhail, John D. Felt, belt, and fabric trimmer. 4,175,460, Cl. 83-856.000.
McRitchie, Charles A. Game apparatus with fence-like boundary defining members. 4,175,746, Cl. 273-85.00R.
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Mel Modern Systems, Incorporated: *See—*
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Melvin, Lawrence S., Jr., to Pfizer Inc. Hypoglycemic arylcyclohexane acetic acids. 4,176,196, Cl. 424-308.000.
Mennesson, Andre L., to Societe Industrielle de Brevets et d'Etudes S.I.B.E. Fuel supply device for internal combustion engine. 4,175,528, Cl. 123-139.0AW.
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Merck & Co., Inc.: *See—*
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Merrick, George J.; Cook, George E.; and Modglin, Donald D., to Merrick Welding International, Inc. Clamping apparatus for welding circumferential articles. 4,176,269, Cl. 219-60.00A.
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Meyer, Gustave C., III. Hand-held wedge tool for splitting wood. 4,175,601, Cl. 145-1.00R.
Meyer, Roth & Pastor Maschinenfabrik GmbH: *See—*
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Midland-Ross Corporation: *See—*
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Miedaner, Patrick M., to Certain-Teed Corporation. High temperature mineral fiber binder. 4,176,105, Cl. 260-29.300.
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Miki, Kyosuke; and Takeuchi, Masahiro, to Sumitomo Bakelite Company Limited. Method for thermoforming plastic sheets. 4,176,154, Cl. 264-547.000.
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Miller, Arthur F.: *See—*
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Miller, Franz-Friedrich: *See—*
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Miller, Keith A.; and Osmundson, Eric C., to Air Products and Chemicals, Inc. Cryogenic embrittlement freezer with gas lock. 4,175,396, Cl. 62-63.000.
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Misumi, Teruyuki; Furuhashi, Susumu; and Shiga, Masaaki, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for electrolytic dimerization of N-substituted pyridinium salt. 4,176,020, Cl. 204-72.000.
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Modine Manufacturing Company: *See—*
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Molina, Orlando G., to Rockwell International Corporation. Fingerprint powder and method of application. 4,176,205, Cl. 427-1.000.
Molinari, Pietro. Toothbrush. 4,175,879, Cl. 401-287.000.
Molitorisz, Joseph. Bale forming apparatus. 4,175,487, Cl. 100-8.000.
Molnar, Charles J.; Price, Edward H.; and Resnick, Paul R., to Du Pont de Nemours, E. I., and Company. Ion-exchange structures of copolymer blends useful in electrolytic cells. 4,176,215, Cl. 521-27.000.
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Moravec, Thomas J.; and Skogman, Richard A., to Honeywell Inc. Non-birefringent thallium iodide thin films for surface protection of halide optical elements. 4,176,207, Cl. 427-160.000.
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Mori, Kenji; Taniuchi, Mamoru; and Yaguchi, Shigeo, to Kobe Steel, Ltd. Method for reforming low grade coals. 4,176,041, Cl. 208-10.000.
Morimoto, Yoshiro, to Nissan Motor Co., Ltd. Tandem master cylinder assembly. 4,175,392, Cl. 60-561.000.
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Morrison, William R. B.; and Beale, Richard F., to Utah Development Company. Load measuring apparatus. 4,175,430, Cl. 73-141.00A.
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Moser, Henry T. Closure assembly. 4,175,672, Cl. 220-334.000.
Moser, Peter, to Schweizerische Lokomotiv-und Maschinenfabrik. Fluid pressure actuator interconnected bogies. 4,175,494, Cl. 105-176.000.
Moskowitz, Benson. Footers for supporting monuments for cemeteries and the like. 4,175,363, Cl. 52-294.000.
Moskowitz, Jacob F., to Massachusetts Institute of Technology. Tone control circuit. 4,176,329, Cl. 333-28.00T.
Motoren- und Turbinen-Union Friedrichafen GmbH: *See—*
Geafer, Salahaddin; and Zbikowski, Gerhard, 4,175,529, Cl. 123-140.00R.
Motoren- und Turbinen-Union Munchen GmbH. *See—*
Wenzl, Josef; and Meikis, Gunter, 4,175,438, Cl. 73-359.00R.
Motorola, Inc.: *See—*
Bachert, Peter, 4,176,332, Cl. 333-218.000.
Brown, Kenneth H.; and Shepard, John W., 4,176,328, Cl. 332-16.00T.
Foster, L. Curtis; and Lindholm, Carl E., 4,176,356, Cl. 343-100.0CS.
Horn, Paul H., 4,176,321, Cl. 325-325.000.
Johnson, James A.; and Kerfoot, Paul E., 4,176,318, Cl. 325-133.000.
Kommrusch, Richard S., 4,176,322, Cl. 325-369.000.
Lodge, Maurice H., 4,175,654, Cl. 198-398.000.
Remedi, James J., 4,176,287, Cl. 307-251.000.
Mougin, Georges L., to ITI Limited. Anti-swell protective device 4,175,887, Cl. 405-25.000.
Mueller, William H.: *See—*
Hsiung, Du Y.; and Mueller, William H., 4,175,572, Cl. 132-7.000
Mukachevsky Stankostroitelny Zavod Imeni S.M. Kirova: *See—*
Idel, Vladimir V., 4,175,452, Cl. 76-25.00R.
Mukumoto, Takaji: *See—*
Kasai, Kaname/Mukumoto, Takaji; Asakura, Toshikazu; and Ueda, Ryoji, 4,175,408, Cl. 64-26.000.
Mulder, James P.: *See—*
Kulik, George J.; Meslink, Michael C.; and Mulder, James P., 4,176,391, Cl. 362-390.000.
Muller, Erich; and Kottke, Joachim, to Stihl, Andreas. Handle for free-cutting devices. 4,175,298, Cl. 7-138.000.
Muller, Hermann, to Aktiengesellschaft Cilander. Apparatus for the application of individual pattern elements in series to a web-like flat structure. 4,175,997, Cl. 156-362.000.
Muller, Jean-Claude; and Ramuz, Henri, to Hoffmann-La Roche Inc. 2,4-Pyrimidne-dicarbamate-3-oxides. 4,176,119, Cl. 260-243.300.
Muller, Ortwin; Grunvogel, Karl; and Schulz, Kurt, to Carl Zeiss-Stiftung. Slit-lamp apparatus. 4,175,839, Cl. 351-14.000.
Muller, Wilhelm, to Postalia GmbH. Device for interlocking perforated writing material. 4,175,880, Cl. 402-48.000.
Multilift Oy: *See—*
Airaksinen, Markku, 4,175,904, Cl. 414-421.000.
Mulvey, Gerard E. Coffered ceiling system. 4,175,360, Cl. 52-28.000.
Murakami, Hiroyashu; Ito, Tadashi; Ito, Fumio; Sakurada, Nobuaki, Kawamura, Masaharu; and Shinoda, Nobuhiko, to Canon Kabushiki Kaisha. Photographic information displaying apparatus for a camera. 4,175,848, Cl. 354-289.000.
Murakami, Hiroyashu: *See—*
Sakurada, Nobuaki; Ito, Tadashi; Shinoda, Nobuhiko; Ito, Fumio; Murakami, Hiroyashu; and Kawamura, Masaharu, 4,175,842, Cl. 354-23.00D.
Murayama, Kenya: *See—*
Ozasa, Masahiro; Murayama, Kenya; and Okumura, Masako, 4,175,814, Cl. 241-46.00R.
Murphy, George W., to Dura Corporation. Parallel hitch for a belly mounted tractor appliance. 4,175,765, Cl. 280-460.00A.
Muscanell, Douglas W.: *See—*
Paris, Alfonso A., Jr.; and Muscanell, Douglas W., 4,175,458, Cl. 83-268.000.
Muskat, Kurt (Ulrich), to Klippan GmbH Sicherheitsgerate. Double shoulder lap safety belt. 4,175,787, Cl. 297-484.000.
Muzechuk, Richard A.; and Hyma, Marvin J., to General Motors Corporation. Resilient mounting means for MacPherson strut. 4,175,771, Cl. 280-696.000.
Mysels, Karol J., to General Atomic Company. Method of extracting iodine from liquid mixtures of iodine, water and hydrogen iodide 4,176,169, Cl. 423-501.000.
N L Industries, Inc.: *See—*
Brauer, Melvin; and Kroplinski, Thaddeus F., 4,176,239, Cl. 174-23.00C.
Naf, Ferdinand; and Decorzant, Rene, to Firmenich SA. Process for preparing unsaturated spiranic derivatives. 4,176,139, Cl. 260-586.00C.
Nagai, Kenichi: *See—*
Inaba, Hideya; Ogiyama, Hisao; Ichiki, Masayoshi; Kamino, Yasumi; Matsumoto, Nobuo; Nagai, Kenichi; and Suzuki, Masami, 4,176,091, Cl. 252-456.000.
Nagai, Yutaka: *See—*
Sakakibara, Shumpei; Nagai, Yutaka; Fujiwara, Kenji; and Sakai, Takahiro, 4,176,009, Cl. 435-24.000.
Naganuma, Tsutomu; Hoshi, Hisao; Kumagai, Hiroji; and Yoshida, Kaneki, to Toppan Printing Co., Ltd. Dry planographic printing method and plate made by electrophotographic method using conductive toner. 4,175,958, Cl. 430-49.000.
Nagata, Yukio; Satoh, Eiji; and Tsuchida, Keinosuke, to Nippon Columbia Kabushiki Kaisha. Electromagnetic pickup device. 4,175,461, Cl. 84-1.150.
Nagel, Dieter H.: *See—*
Weiler, Gerhard H.; Nagel, Dieter H.; and Pagels, Louis T., 4,176,153, Cl. 264-524.000.
Nakada, Masahiko: *See—*
Sanada, Masakatsu; Ito, Toshimitsu; and Nakada, Masahiko, 4,175,527, Cl. 123-136.000.
Nakajima, Yoshio: *See—*
Kamachi, Shinichi; Izawa, Masao; Gocho, Nagahiro; Nakajima, Yoshio; and Hattori, Shinichiro, 4,176,376, Cl. 358-107.000.
Nakamura, Ichiro; Ichiryu, Ken; and Kuwayama, Masatoshi, to Hitachi, Ltd. Fluid pressure drive device. 4,175,589, Cl. 137-625.640.
Nakamura, Michiharu: *See—*
Kajimura, Takashi; Saito, Kazutoshi; Shige, Noriyuki; Nakamura, Michiharu; Umeda, Jun-ichi; and Kobayashi, Masayoshi, 4,176,325, Cl. 331-94.50H.
Nakanishi, Hajime: *See—*
Kawabe, Naoshi; Kaji, Hisatsugu; Miwa, Naotaka; Nakanishi, Hajime; Tanaka, Fumiaki; and Inoue, Tatsuya, 4,175,708, Cl. 241-16.000
Nakanishi, Sadao; Suzuki, Kazuhiro; Tokura, Nobufumi; and Endo, Shinichiro, to Shinko Electric Co., Ltd. Method for enhancing the reliability of output data from a label reader. 4,175,693, Cl. 235-463.000.
Nakano, Gregory S.: *See—*
Wilger, John F.; Nakano, Gregory S.; Uyetake, Tadao; Orillo, Stephen, Jr.; and Higa, Teikichi, 4,175,471, Cl. 408-83.500.
Nakano, Takashi: *See—*
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,175,851, Cl. 355-14.00R.
Nakao, Sho: *See—*
Shinozaki, Fumiaki; Washigawa, Yasuo; Ikeda, Tomoaki; Nakao, Sho; and Kondoh, Syunichi, 4,175,971, Cl. 430-287.000.
Nakase, Takamichi: *See—*
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Nakatani, Shuichi: *See—*
Matsuura, Ryo; Nakatani, Shuichi; Nomiyama, Yukio; and Ninomiya, Tadashi, 4,176,125, Cl. 260-369.000.
Nakazawa, Koji; Kikuchi, Toshiaki; and Fujita, Toshihito, to Nitto Boseki Co., Ltd. Method and apparatus for introduction of glass filament strand onto feed roller of chopped glass filament strands manufacturing system. 4,175,939, Cl. 65-2.000.
Nash, Dudley O., to General Electric Company. Thrust reverser for an asymmetric aircraft exhaust nozzle. 4,175,385, Cl. 60-230.000.
Naslain, Rober: *See—*
Quenisset, Jean-Michel; Naslain, Rober; and Hagenmuller, Paul, 4,176,002, Cl. 156-601.000
National Carbonising Company Limited: *See—*
Elderfield, Kenneth J.; and Griffiths, Charles, 4,175,421, Cl. 73-3.000.
National Research Development Corporation: *See—*
Harriman, Anthony; and Porter, George, 4,176,026, Cl. 204-157.10R.
National Research Institute for Metals: *See—*
Koguchi, Nobuyuki; and Masumoto, Katashi, 4,176,370, Cl. 357-30.000.
National Semiconductor Corporation: *See—*
Compton, James B., 4,176,368, Cl. 357-22.000.
Dobkin, Robert C.; and Pease, Robert A., 4,176,308, Cl. 323-4.000.
National Starch and Chemical Corporation: *See—*
Caimi, Ronald J.; and Schlauch, Walter F., 4,176,108, Cl. 260-29.6TA.
Natori, Minoru: *See—*
Tamaru, Munetaka; Kume, Kazunari; Watanabe, Minoru; Ohno, Hideshi; and Natori, Minoru, 4,175,372, Cl. 58-5.000.
Navlyt, Gerald S., to Union Special Corporation. Method and apparatus for forming an overedge stitch. 4,175,499, Cl. 112-165.000.
NCR Corporation: *See—*
Brower, Ronald W.; Cohen, Jerome; and Chen, Peter C., 4,176,003, Cl. 430-313.000.
Nebell, Hans G. T., to Ardal og Sunndal Verk a.s. Conductor arrangement for compensating for horizontal magnetic fields in pots containing a molten electrolytic bath. 4,176,037, Cl. 204-243.00M.
Needham, Donald G., to Phillips Petroleum Company. Arc resistant composition. 4,176,098, Cl. 260-18.00R.
Negita, Mutsumi, to Matsushima Kogyo Kabushiki Kaisha. Method for forming a quartz crystal vibrator. 4,176,030, Cl. 204-192.00R.

Nelson, Alfred M., to AM International, Inc. High density magnetic image recording head. 4,176,362, Cl. 346-74.100.
Nelson, Hugh W., to Combustion Engineering, Inc. Sodium oxide fume for sulfur oxide removal. 4,176,163, Cl. 423-242.000.
Nelson, Norman A., to Upjohn Company, The. Composition and process. 4,176,236, Cl. 568-838.000.
Nelson, Owen L.: *See—*
Korn, Donald M.; and Nelson, Owen L., 4,176,275, Cl. 250-213.00R.
Nelson, Richard D.; and Hughes, A. James, to Rockwell International Corporation. Image sensor having improved moving target discernment capabilities. 4,176,369, Cl. 357-24.000.
Nelson, Roger W.: *See—*
Figueras, John; Nelson, Roger W.; and Sutton, Richard C., 4,176,008, Cl. 435-12.000.
Nemets, Rusaam S.: *See—*
Adamovich, Anatoly V.; Burov, Lev A.; Nemets, Rusaam S.; Gorbulev, Efim S.; Eremenko, Boris S.; Brainman, Felix A.; Moldavanov, Viktor P.; Kontsov, Jury M.; Axenov, Viktor F.; and Averbukh, Matvei I., 4,175,758, Cl. 277-220.000.
Neumann, Paul G. Method and apparatus for manufacturing door frames. 4,175,313, Cl. 29-430.000.
Neustadt, Bernard R.; and Zampaglione, Nicola, to Schering Corporation. 2-[4-(Polyhalo-2-hydroxy-2-propyl)anilino]thiazolin-4-ones. 4,176,120, Cl. 548-184.000.
Nevitt, Thomas D.: *See—*
Corns, Joseph B.; Nevitt, Thomas D.; and Hertwig, Waldemar R., 4,176,048, Cl. 208-59.000.
New Archery Products Corp.: *See—*
Simo, Miroslav A., 4,175,749, Cl. 273-106.50B.
New England Log Homes, Inc.: *See—*
Paris, Alfonso A., Jr.; and Muscanell, Douglas W., 4,175,458, Cl. 83-268.000.
New England Mutual Life Insurance Company: *See—*
Ranauro, Carmine J., 4,175,776, Cl. 283-8.00B.
Newell Dunford Engineering Limited: *See—*
Corrigan, Patrick, 4,176,055, Cl. 209-152.000.
Newkirk, John B.: *See—*
Arenberg, Irving K.; and Newkirk, John B., 4,175,563, Cl. 128-350.00V.
Newsome, David S.: *See—*
Leftin, Harry P.; and Newsome, David S., 4,176,045, Cl. 208-48.00R.
Newton, Barry N., to Lafayette Pharmacal Inc. Iodo-aryl carbonates for use in methods in radiography. 4,175,544, Cl. 128-654.000.
Ni-Tec, Inc.: *See—*
Pakswer, Serge; and Szegho, Constantin S., 4,175,808, Cl. 316-19.000.
Niagara Bottle Washer Mfg. Company: *See—*
Vamvakas, Michael, 4,176,067, Cl. 210-256.000.
Niebylski, Leonard M., to Ethyl Corporation. Fuel compositions for reducing hydrocarbon emissions. 4,175,927, Cl. 44-68.000.
Nielson, Juan F.: *See—*
Stephens, Warren J.; and Nielson, Juan F., 4,175,293, Cl. 4-209.00R.
Nifco Inc.: *See—*
Hara, Kunio, 4,175,435, Cl. 73-313.000.
Nijman, John P., to Bunker Ramo Corporation. Conductor terminating apparatus. 4,175,320, Cl. 29-749.000.
Nilberg, Reinhold H. Windmotor as a windbreak. 4,175,910, Cl. 416-8.000.
Niles, Gerald J., to Minnesota Mining and Manufacturing Company. Tape dispenser with blade guard. 4,175,685, Cl. 225-19.000.
Ninomiya, Tadashi: *See—*
Matsuura, Ryo; Nakatani, Shuichi; Nomiyama, Yukio; and Ninomiya, Tadashi, 4,176,125, Cl. 260-369.000.
Nintendo Co., Ltd.: *See—*
Yokoi, Gunpei, 4,175,748, Cl. 273-101.200.
Nippon Columbia Kabushiki Kaisha: *See—*
Nagata, Yukio; Satoh, Eiji; and Tsuchida, Keinosuke, 4,175,461, Cl. 84-1.150.
Nippon Electric Co., Ltd.: *See—*
Yoshioka, Nobuya, 4,176,405, Cl. 365-15.000.
Nippon Oil Co., Ltd.: *See—*
Kaiya, Atsushi; Otsuki, Yutaka; and Horii, Hideo, 4,176,109, Cl. 260-31.2MR.
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Ihida, Kazuyoshi, 4,176,146, Cl. 525-338.000.
Nippon Oil and Fats Co., Ltd.: *See—*
Hattori, Katsuhide; and Takahashi, Masao, 4,175,990, Cl. 149-21.000.
Nippon Oil Seal Industry Co., Ltd.: *See—*
Mikami, Yasuo, 4,175,332, Cl. 33-174.00R.
Nippon Petroleum Company, Limited: *See—*
Otsuki, Yutaka; Araki, Yoshihiko; and Aoyama, Kazuho, 4,176,110, Cl. 260-31.80N.
Nippon Soken, Inc.: *See—*
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,175,521, Cl. 123-119.00D.
Katahira, Eturou; Yamaguchi, Shunzo; Kida, Masashi; and Ishida, Yasuhiko, 4,175,386, Cl. 60-276.000.
Kawai, Hisasi; and Iwase, Kazuo, 4,175,507, Cl. 123-117.00D.
Noguchi, Masaaki; Sumiyoshi, Masaharu; Bunda, Tsuchio; and Tanaka, Taro, 4,175,523, Cl. 123-119.00A.
Nippon Telegraph and Telephone Public Corporation: *See—*
Ishida, Akira; and Yamada, Hajime, 4,176,290, Cl. 307-306.000.
Nippondenso Co., Ltd.: *See—*
Miura, Motohisa, 4,175,387, Cl. 60-290.000.
Nishizawa, Katsuhiko: *See—*
Ishii, Kiminori; and Nishizawa, Katsuhiko, 4,175,631, Cl. 180-309.000.
Nissan Motor Co., Ltd.: *See—*
Ishii, Kiminori; and Nishizawa, Katsuhiko, 4,175,631, Cl. 180-309.000.
Morimoto, Yoshiro, 4,175,392, Cl. 60-561.000.
Nitto Boseki Co., Ltd.: *See—*
Nakazawa, Koji; Kikuchi, Toshiaki; and Fujita, Toshihito, 4,175,939, Cl. 65-2.000.
Niveau AG, Firma: *See—*
Halm, Hans, 4,175,663, Cl. 209-610.000.
Noami, Tsuneo: *See—*
Sadamatsu, Shigeru; Nozaki, Tooru; Yamada, Yoshihiko; and Noami, Tsuneo, 4,175,962, Cl. 430-109.000.
Noda, Kinzaburo: *See—*
Maekawa, Hideyuki; Noda, Kinzaburo; and Hoshi, Noboru, 4,176,175, Cl. 424-35.000.
Noe, Frank H. Gasoline flow control device and method for using same. 4,175,595, Cl. 141-1.000.
Nogami, Tomoyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic brake pressure control apparatus for motor vehicles. 4,175,791, Cl. 303-24.00A.
Noguchi, Masaaki; Sanda, Shougo; and Takizawa, Masaaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine with an auxiliary combustion chamber. 4,175,501, Cl. 123-30.00D.
Noguchi, Masaaki; Sumiyoshi, Masaharu; Bunda, Tsuchio; and Tanaka, Taro, to Nippon Soken, Inc. Internal combustion engine and a method for operation thereof. 4,175,523, Cl. 123-119.00A.
Nolan, Clyde E., Jr.; and Tillinghast, William S., to Brown & Root, Inc. Methods and apparatus for anchoring offshore pipeline. 4,175,620, Cl. 166-343.000.
Nomiyama, Yukio: *See—*
Matsuura, Ryo; Nakatani, Shuichi; Nomiyama, Yukio; and Ninomiya, Tadashi, 4,176,125, Cl. 260-369.000.
Nooyen, Ray E., to Sperry Rand Corporation. Material flow retarders. 4,175,568, Cl. 130-27.00T.
Noranda Mines Limited: *See—*
Rosenblum, Frank R., 4,175,426, Cl. 73-61.400.
Norris, Neil J., to United States of America, Energy. Electrical pulse generator. 4,176,285, Cl. 307-106.000.
Norton, William W.; and Boehmer, Henry, to Baxter Travenol Laboratories, Inc. Method of manufacturing a flexible collapsible container with a stiffening member. 4,175,994, Cl. 156-251.000.
Novak, Mark C.: *See—*
McDonald, James A.; and Novak, Mark C., 4,175,673, Cl. 221-63.000.
Nozaki, Tooru: *See—*
Sadamatsu, Shigeru; Nozaki, Tooru; Yamada, Yoshihiko; and Noami, Tsuneo, 4,175,962, Cl. 430-109.000.
Nozawa, Shiyozo; Hokari, Saburo; Yamaga, Shigeru; and Takahashi, Akira, to Ricoh Company, Ltd. Motor-operated film winding apparatus. 4,175,846, Cl. 354-173.000.
Nunez, Carl W.; and Squyres, Joseph S., to Halliburton Company. Releasing tool. 4,175,778, Cl. 285-3.000.
Nuss, George W., Jr.; Santora, Norman J.; and Douglas, George H., to William H. Rorer, Inc. Method of treatment. 4,176,198, Cl. 424-330.000.
O.N.E.R.A. - Office National d'Etudes et de Recherches Aerospatiales: *See—*
El Gammal, Maurice; and Rabinovitch, Maurice, 4,175,609, Cl. 164-60.000.
Oakes, James G.: *See—*
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Oakley, David E.: *See—*
Hahn, Thomas M.; Lohmus, Ivar; and Oakley, David E., 4,175,617, Cl. 165-122.000.
O'Connell, Timothy R.: *See—*
Leach, George S.; and O'Connell, Timothy R., 4,176,289, Cl. 307-270.000.
Odell, Robert, to Harman International Industries, Inc. Transistorized power amplifier. 4,176,323, Cl. 330-263.000.
Oden, Laurance L.; and Russell, James H., to United States of America, Energy. Self-disintegrating Raney metal alloys. 4,175,954, Cl. 75-138.000.
Odlen, Lars; and Hansson, Anders, to Transcale A.B. Modular switching system. 4,176,251, Cl. 179-1.0SW.
Oesterreichisch-Amerikanische Magnesit Aktiengesellschaft: *See—*
Grabner, Bernd E.; and Heinricher, Mario G., 4,175,974, Cl. 106-58.000.
Ogiyama, Hisao: *See—*
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Ohbayashi-Gumi Co., Ltd.: *See—*
Ozasa, Masahiro; Murayama, Kenya; and Okumura, Masako, 4,175,814, Cl. 241-46.00R.
Ohno, Hideshi: *See—*
Tamaru, Munetaka; Kume, Kazunari; Watanabe, Minoru; Ohno, Hideshi; and Natori, Minoru, 4,175,372, Cl. 58-5.000.
Ohno, Shigeaki; Kazuta, Toshiyuki; and Iwata, Takeshi, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Process for preparing hydrazodicarbonamide. 4,176,135, Cl. 260-554.000.

Ohta, Hideo: *See—*
Kawamura, Hideo; Ohta, Hideo; and Kubota, Kimi, 4,175,522, Cl. 123-119.00A.
Okumura, Masako: *See—*
Ozasa, Masahiro; Murayama, Kenya; and Okumura, Masako, 4,175,814, Cl. 241-46.00R.
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Richard, Louis, 4,175,579, Cl. 137-119.000.
Olson, B. Newell, to Dominion Pharmacal, Inc. Method for treating acne vulgaris. 4,176,197, Cl. 424-319.000.
Olympus Optical Company Limited: *See—*
Fujie, Tetsuo; and Ito, Hiromi, 4,176,273, Cl. 219-220.000.
Kamachi, Shinichi; Izawa, Masao; Gocho, Nagahiro; Nakajima, Yoshio; and Hattori, Shinichiro, 4,176,376, Cl. 358-107.000.
Sato, Eiichi, 4,175,957, Cl. 430-31.000.
Ondetti, Miguel A.; and Weisenborn, Frank L., to E. R. Squibb & Sons, Inc. Substituted acyl derivatives of amino acids. 4,176,235, Cl. 562-556.000.
Onikov, Eduard A.; Galperin, Alexandr L.; Zabotin, Alexandr A.; Loschilin, Evgeny D.; and Kolobanov, Nikolai I. Apparatus for threading weft carriers for travelling-wave loom. 4,175,594, Cl. 139-436.000.
Orain, Michel, to Glaenzer Spicer. Homokinetic joint aflowing a large angular displacement. 4,175,407, Cl. 64-21.000.
Oratronics, Inc.: *See—*
Chiarenza, Angelo R.; and Weiss, Charles M., 4,175,565, Cl. 433-32.000.
Orillo, Stephen, Jr.: *See—*
Wilger, John F.; Nakano, Gregory S.; Uyetake, Tadao; Orillo, Stephen, Jr.; and Higa, Teikichi, 4,175,471, Cl. 408-83.500.
Orlowski, David C., to Inpro, Inc. Two stage labyrinth pattern inclusion device. 4,175,752, Cl. 277-53.000.
Orova, Josef; and Podrapsky, Jiri, to Robert Bosch GmbH. Magneto ignition system for an internal combustion engine. 4,175,509, Cl. 123-117.00R.
Orrell, Derrell D.; and McFeeters, Melvin M., to Continental Oil Company. Removal of organic compounds from coker gasoline. 4,176,047, Cl. 208-51.000.
Ortho Pharmaceutical Corp.: *See—*
Kanojia, Ramesh M.; Wachter, Michael P.; and Chen, Robert H. K., 4,176,188, Cl. 424-270.000.
Osaka, Susumu: *See—*
Toda, Minoru; Osaka, Susumu; and Matsumoto, Yasushi, 4,176,378, Cl. 358-128.000.
Osmundson, Eric C.: *See—*
Miller, Keith A.; and Osmundson, Eric C., 4,175,396, Cl. 62-63.000.
O'Sullivan, Thomas D., to Bell Telephone Laboratories, Incorporated. Fabrication of alkaline batteries. 4,176,021, Cl. 204-96.000.
Otis Engineering Corporation: *See—*
Rice, Patrick W., 4,175,987, Cl. 148-36.000.
Otsuka Kagaku Yakuhin Kabushiki Kaisha: *See—*
Ohno, Shigeaki; Kazuta, Toshiyuki; and Iwata, Takeshi, 4,176,135, Cl. 260-554.000.
Otsuki, Yutaka; Araki, Yoshihiko; and Aoyama, Kazuho, to Nippon Petroleum Company, Limited. Electrocoating composition for cathodic electrodepositions. 4,176,110, Cl. 260-31.80N.
Otsuki, Yutaka: *See—*
Kaiya, Atsushi; Otsuki, Yutaka; and Horii, Hideo, 4,176,109, Cl. 260-31.2MR.
Ott, Robert J.: *See—*
Haley, Neil F.; Krutak, James J.; and Ott, Robert J., 4,175,956, Cl. 430-37.000.
Oudem, Leon. Process for obtaining gelatin. 4,176,117, Cl. 260-118.000.
Overdeck, John M.: *See—*
Overdeck, John S.; and Overdeck, John M., 4,175,731, Cl. 266-142.000.
Overdeck, John S.; and Overdeck, John M. Method and means for utilizing waste heat of molten slag. 4,175,731, Cl. 266-142.000.
Overly, Inc.: *See—*
Chaffee, David H.; and Tipler, Earl L., 4,175,800, Cl. 308-9.000.
Owen, Leslie J., to British Steel Corporation. Gas monitors. 4,175,422, Cl. 73-23.000.
Owens-Corning Fiberglas Corporation: *See—*
Lonberger, John W., 4,176,401, Cl. 364-900.000.
Marzocchi, Alfred; Roberts, Michael G.; and Bolen, Charles E., 4,175,978, Cl. 106-281.00R.
Owens-Illinois, Inc.: *See—*
Rapp, James E., 4,175,988, Cl. 148-189.000.
Oxy Metal Industries Corporation: *See—*
Martin, Sylvia, 4,176,017, Cl. 204-55.00R.
Oyamada, Masanao: *See—*
Hasebe, Sukehiro; and Oyamada, Masanao, 4,175,376, Cl. 58-23.00R.
Ozasa, Masahiro; Murayama, Kenya; and Okumura, Masako, to Ohbayashi-Gumi Co., Ltd.; and KYC Machine Industry Co. Crusher for solid materials transported by pressurized liquid. 4,175,814, Cl. 241-46.00R.
P. Ferrero & C. S.p.A.: *See—*
Dogliotti, Amilcare, 4,175,665, Cl. 211-49.00D.
Pabst, Rolf; and Jenz, Siegfried, to Dailmler-Benz Aktiengesellschaft; and Suddeutsche Kuhlerfabrik Julius Fr. Behr. Equalization tank for cooling liquid. 4,175,616, Cl. 165-107.00D.
Pachuta, Martin: *See—*
Dehne, Clarence A.; and Pachuta, Martin, 4,175,657, Cl. 198-833.000.
Pack, Ardis I.: *See—*
Pack, Yongik; and Pack, Ardis I., 4,175,925, Cl. 44-35.000.
Pack, Yongik; and Pack, Ardis I. Charcoal-starter apparatus. 4,175,925, Cl. 44-35.000.
Pagels, Louis T.: *See—*
Weiler, Gerhard H.; Nagel, Dieter H.; and Pagels, Louis T., 4,176,153, Cl. 264-524.000.
Paixao, Jose Marcio Jardim; and de Mendonca, Paulo Ayres Falcao. Process for concentration of titanium containing anatase ore. 4,176,159, Cl. 423-80.000.
Pako Corporation: *See—*
Baert, Victor R., 4,175,852, Cl. 355-35.000.
Harvey, Ronald B., 4,175,853, Cl. 355-38.000.
Pone, John, Jr., 4,175,856, Cl. 355-68.000.
Pakswer, Serge; and Szegho, Constantin S., to Ni-Tec, Inc. Method and apparatus for producing electronic devices. 4,175,808, Cl. 316-19.000.
Palacino, Giovanni: *See—*
Radice, Angelo; and Palacino, Giovanni, 4,175,500, Cl. 112-166.000.
Palmer, Arlo K., to United States of America, Air Force. Electrically conductive bonding strap for connecting movable parts. 4,175,812, Cl. 339-29.00R.
Palmer Engineering Company Ltd.: *See—*
Black, Donald S., 4,176,064, Cl. 210-196.000.
Palmer, Norman H. G., to Towmotor Corporation. Control circuit for a contactor. 4,176,388, Cl. 361-196.000.
Pampouchidis, Georgios; and Honig, Helmut, to Vianova Kunstharz, A.G. Self-crosslinking cationic resin emulsions for use in electrodeposition paints. 4,176,099, Cl. 260-18.0TN.
Panneciere, Charles A.: *See—*
Winchell, Harry S.; Lin, Tz-Hong; and Panneciere, Charles A., 4,176,173, Cl. 424-5.000.
Pannwitz, Hans U. Flexible spring bearing. 4,175,804, Cl. 308-26.000.
Parad, Leonard I.: *See—*
DiTullio, Joseph G.; Parad, Leonard I.; and Sommers, Donald J., 4,176,330, Cl. 333-122.000.
Paris, Alfonso A., Jr.; and Muscanell, Douglas W., to New England Log Homes, Inc. Cut-off saw. 4,175,458, Cl. 83-268.000.
Parker, Alfred B.: *See—*
Scragg, Robert L.; and Parker, Alfred B., 4,175,381, Cl. 60-39.120.
Parker, Calvin E. Apparatus for centering strips in rolling mills and the like. 4,175,689, Cl. 226-190.000.
Parker, Louis W. Energy economizing AC power control system. 4,176,307, Cl. 318-798.000.
Parker, Robert D.: *See—*
Buritz, Robert S.; Parker, Robert D.; Kisch, Jack J.; and Burnham, John, 4,176,334, Cl. 336-84.00C.
Parsons, Basil I.: *See—*
Ternan, Marten; and Parsons, Basil I., 4,176,051, Cl. 208-112.000.
Partridge, Charles C.: *See—*
Kacal, Gary W.; and Partridge, Charles C., 4,175,577, Cl. 137-15.000.
Pascuzzi, E. Anthony: *See—*
Cornell, William F.; Vear, John P.; and Pascuzzi, E. Anthony, 4,175,691, Cl. 229-36.000.
Pastakia, Percy N.: *See—*
George, James S.; Ward, Arthur G. T.; and Pastakia, Percy N., 4,176,157, Cl. 422-114.000.
Patel, Bhupendra C., to Kendall Company, The. Method of locating the epidural space. 4,175,567, Cl. 128-748.000.
Patterson, Billy J. Indicator to show whether a switch has opened. 4,176,350, Cl. 340-644.000.
Patterson, George; Putman, Edgar N.; and McCool, John B., III, to PFD/Penn Color, Inc. Predispersed composition for use in thermosetting acrylic automotive finishes. 4,176,096, Cl. 260-15.000.
Patula, Edward: *See—*
Johnson, Ralph W.; Burrs, Emil D.; Smith, Gary L.; Freund, Ronald G.; and Patula, Edward, 4,175,674, Cl. 221-88.000.
Paul Hartmann AG: *See—*
Knoll, Ernst, 4,175,560, Cl. 128-269.000.
Pauwels, Edward M., to Bendix Corporation, The. Modulator valve for a spinning and skidding wheel assembly. 4,175,794, Cl. 303-105.000.
Pavonet, Engelhard, to Societe de Prayon. Process for purifying a zinc sulfate solution. 4,176,160, Cl. 423-104.000.
Paynter, Gerald C.: *See—*
Birch, Stanley F.; Lawler, John A.; and Paynter, Gerald C., 4,175,640, Cl. 181-213.000.
Pearson, Robert P., to Honeywell Inc. Radar altimeter tracking circuit apparatus. 4,176,353, Cl. 343-12.00A.
Pease, Robert A.: *See—*
Dobkin, Robert C.; and Pease, Robert A., 4,176,308, Cl. 323-4.000.
Peay, Robert L.: *See—*
Tobin, Joseph J.; Robinson, David B.; Peay, Robert L.; Powell, Jerry R.; and Gay, Leslie W., 4,176,348, Cl. 340-562.000.
Pedone, Antonio, to Societe dite Coppertron S.A. Installation for the production of a copper foil intended to be applied to a dielectric substrate. 4,176,035, Cl. 204-205.000.
Pekau, Dietlind; Ruell, Hartwig; Storck, Eckhard; and Kiemle, Horst, to Siemens Aktiengesellschaft. Process for holographic recording of data in the form of electrical signals. 4,175,823, Cl. 350-3.790.
PEM-IMS, Inc.: *See—*
Smith, Joseph F.; and Smith, Joseph R., 4,175,405, Cl. 64-10.000.
Pennish, John S.: *See—*
Carman, Justice N., 4,176,166, Cl. 423-350.000.
Pennwalt Corporation: *See—*
Cushman, Robert H., 4,176,278, Cl. 250-439.00P.

Grier, Jesse G., 4,176,056, Cl. 210-20.000.

Pera, John D.: *See—*
Buckman, John D.; Hunter, Wood E.; Pera, John D.; and Taylor, Robert M., 4,176,107, Cl. 260-29.60E.

Peters, Alan W.: *See—*
Chen, Nai Y.; Garwood, William E.; and Peters, Alan W., 4,176,050, Cl. 208-111.000.

Peterson, James J., to Kendall Company, The. Irrigation solution device. 4,175,597, Cl. 141-23.000.

Peterson, Ralph L. Apparatus for removing a fitting. 4,175,581, Cl. 137-319.000.

Petinaux, Marcel; Dieterich, Dieter; and Markusch, Peter, to Bayer Aktiengesellschaft. Aromatic uretdione-diisocyanate-disulphonic acids. 4,176,118, Cl. 260-239.00A.

Peytavin, Pierre, to Vallourec (Usines a Tubes de Lorraine-Escaut et Vallourec Reunies). Smoothing rolling mill. 4,175,414, Cl. 72-96.000.

PFD/Penn Color, Inc.: *See—*
Patterson, George; Putman, Edgar N.; and McCool, John B., III, 4,176,096, Cl. 260-15.000.

Pfenninger, Hans, to BBC Brown Boveri & Company Limited. Steam power plant with pressure-fired boiler. 4,175,382, Cl. 60-39.18B.

Pfizer Inc.: *See—*
Bennetch, Leonard M.; Greiner, Harry S.; Hancock, Kenneth R.; and Hoffman, Mark, 4,176,172, Cl. 423-634.000.
Melvin, Lawrence S., Jr., 4,176,196, Cl. 424-308.000.
Schnur, Rodney C., 4,176,185, Cl. 424-258.000.

Phaup, Charles W.; and Lower, Joseph D., to JBC Enterprises, Inc. Subfloor for offshore production platform. 4,175,889, Cl. 405-195.000.

Phelan, Michael B., to ACF Industries, Incorporated. Apparatus for venting fuel vapors from a carburetor fuel bowl. 4,175,526, Cl. 123-136.000.

Philip Morris Incorporated: *See—*
Raynor, Robert H., 4,175,715, Cl. 242-72.100.

Phillips Petroleum Company: *See—*
Bertus, Brent J.; and Walker, Darrell W., 4,176,140, Cl. 585-629.000.
Carter, Cecil O., 4,176,086, Cl. 252-429.00B.
Dixon, Rolland E., 4,176,141, Cl. 585-314.000.
Jackson, Henry G., 4,176,211, Cl. 426-397.000.
Needham, Donald G., 4,176,098, Cl. 260-18.00R.
Warzel, Fred M., 4,175,870, Cl. 366-76.000.

Piazza, Matthew R., to Maso-Therm Corp. Process and apparatus for static mixing. 4,175,867, Cl. 366-9.000.

Pickett, Vaughn A. Toy simulated ray gun. 4,175,353, Cl. 46-227.000.

Piguet, Pierre, to Ateliers des Charmilles S.A. Hydraulic installation. 4,175,707, Cl. 239-456.000.

Pilgrim Engineering Developments Limited: *See—*
Bunyan, Thomas W., 4,175,311, Cl. 29-402.180.

Pioth, Michael J. Stretcher. 4,175,783, Cl. 296-20.000.

Pitney-Bowes, Inc.: *See—*
Bujese, David P., 4,175,850, Cl. 355-13.000.

Pizette, Seymour B.: *See—*
Fassett, Matthew; Pizette, Seymour B.; and Toth, John F., 4,176,359, Cl. 343-854.000.

Platz, Rolf; Dockner, Toni; Heners, Jurgen; and Krug, Herbert, to BASF Aktiengesellschaft. Manufacture of carboxylic acid amides. 4,176,137, Cl. 260-561.00N.

Plaubel, Feinmechanik & Optik GmbH: *See—*
Schrader, Goetz, 4,175,847, Cl. 354-187.000.

Plischke, LeMoyne W.: *See—*
Baggett, William M.; and Plischke, LeMoyne W., 4,176,227, Cl. 528-488.000.

Podrapsky, Jiri: *See—*
Orova, Josef; and Podrapsky, Jiri, 4,175,509, Cl. 123-117.00R.

Poeschl, Paul M.; and Stockwell, David L., to Ansul Company, The. Self-contained actuation and detection device. 4,175,677, Cl. 222-5.000.

Poggemiller, Randy L.: *See—*
Herzog, Stanley M.; and Poggemiller, Randy L., 4,175,902, Cl. 414-339.000.

Polaroid Corporation: *See—*
Douglas, Lawrence M., 4,175,843, Cl. 354-31.000.

Poly-Glas Systems: *See—*
Hetherington, Robert D.; and Goelz, David W., 4,175,702, Cl. 239-113.000.

Ponce, Phillip; and Kamon, John T., to Smith, Carolyn M., a part interest. Timer-controlled automatic animal feed dispenser. 4,175,679, Cl. 222-70.000.

Pone, John, Jr., to Pako Corporation. Photographic printer with automatic density and color corrections for paper gamma. 4,175,856, Cl. 355-68.000.

Pont-A-Mousson S.A.: *See—*
Lippera, Noel, 4,176,274, Cl. 219-522.000.

Ponticello, Gerald S.: *See—*
Baldwin, John J.; and Ponticello, Gerald S., 4,176,183, Cl. 424-248.520.

Porkhun, Fedor K.: *See—*
Kuchuk-Yatsenko, Sergei I.; Golomovzjuk, Ivan K.; Krivenko, Valery G.; Kulesh, Alexandr I.; Sakharnov, Vasily A.; Lazebny, Ivan L.; and Porkhun, Fedor K., 4,175,897, Cl. 409-300.000.

Porta Systems Corp.: *See—*
DeLuca, Paul V., 4,176,257, Cl. 179-98.000.

Porter, George: *See—*
Harriman, Anthony; and Porter, George, 4,176,026, Cl. 204-157.10R.

Porter, Robert P.: *See—*
Spindel, Robert C.; Porter, Robert P.; and Marquet, William M., 4,176,338, Cl. 367-6.00B.

Pospischil, Albert R.; Bruegman, Michael L.; and Granberg, Erlang W., to Precision Fabricators, Inc. Newspaper vending machine. 4,175,989, Cl. 194-1.00C.

Postalia GmbH: *See—*
Muller, Wilhelm, 4,175,880, Cl. 402-48.000.

Postma, Lambertus: *See—*
Koel, Gerrit J.; and Postma, Lambertus, 4,176,016, Cl. 204-38.00R.

Powell, Jerry R.: *See—*
Tobin, Joseph J.; Robinson, David B.; Peay, Robert L.; Powell, Jerry R.; and Gay, Leslie W., 4,176,348, Cl. 340-562.000.

Powers, Vernon B., to E-Systems, Inc. MOS-bipolar printer driver circuit. 4,176,272, Cl. 219-216.000.

PPG Industries, Inc.: *See—*
Darlington, William B., 4,176,022, Cl. 204-98.000.
Hargett, William D.; and Broun, Thorowgood T., 4,176,165, Cl. 423-245.000.

Pratt, Harry H.; and Money, Dudley P., to Foster Wheeler Energy Corporation. Vapor generator utilizing vertical bars for supporting angularly arranged furnace boundary wall fluid flow tubes. 4,175,519, Cl. 122-510.000.

Pray, Edward R.: *See—*
Demou, John G.; and Pray, Edward R., 4,176,218, Cl. 521-129.000.

Precision Fabricators, Inc.: *See—*
Pospischil, Albert R.; Bruegman, Michael L.; and Granberg, Erlang W., 4,175,989, Cl. 194-1.00C.

Predali, Jean-Jacques, to Minemet Recherche. Process for the preconcentration of metalliferous products. 4,175,790, Cl. 299-7.000.

Preston, Joseph L. Animal trap with sensitive triggering device. 4,175,350, Cl. 43-82.000.

Price, Edward H.: *See—*
Molnar, Charles J.; Price, Edward H.; and Resnick, Paul R., 4,176,215, Cl. 521-27.000.

Priese, Werner K., to Hills-McCanna Company. Fire resistant seat for butterfly and ball valves. 4,175,578, Cl. 137-67.000.

Primus, David R. Method and means for agitating liquid manure. 4,175,872, Cl. 366-139.000.

Princen, Henricus M.; and Aronson, Michael P., to Lever Brothers Company. Method for reducing the surface discoloration of food spreads and food spreads produced thereby. 4,176,200, Cl. 426-250.000.

Princeton Chemical Research, Inc.: *See—*
Magder, Jules; and Reich, Murray H., 4,176,148, Cl. 264-41.000.

Procter & Gamble Company, The: *See—*
Guerry, Raymond E.; and Whyte, David D., 4,176,079, Cl. 252-90.000.
Wise, Rodney M.; and Mitchell, Sharon J., 4,176,080, Cl. 252-162.000.

Produits Chimiques Ugine Kuhlmann: *See—*
Faron, Robert; and Cathala, Annie, 4,176,018, Cl. 204-60.000.

Prost, Roger; and Manhes, Bernard, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Distribution of gas under pressure. 4,175,395, Cl. 62-52.000.

Puckett, Robert O. Articulating grader having structure for raising and lowering mold board without disturbing setting. 4,175,625, Cl. 172-791.000.

Pullman Incorporated: *See—*
Leftin, Harry P.; and Newsome, David S., 4,176,045, Cl. 208-48.00R.

Pungas, Toom A.; Laud, Tynis A.; Reinberg, Kheino A.; Rebane, Raul-Vello P.; and Lumi, Toomas R. A.C. to D.C. voltage converter. 4,176,393, Cl. 363-125.000.

Puretic, Mario J. Stern fishing system. 4,175,347, Cl. 43-6.500.

Putman, Edgar N.: *See—*
Patterson, George; Putman, Edgar N.; and McCool, John B., III, 4,176,096, Cl. 260-15.000.

Quantor Corporation: *See—*
Ammann, Stephen K.; and Herborn, Peter E., 4,175,854, Cl. 355-54.000.
Meadows, John W., 4,175,858, Cl. 355-99.000.

Quatic Chemicals Limited: *See—*
Suzuki, Fumiko, 4,176,059, Cl. 210-58.000.

Quenisset, Jean-Michel; Naslain, Rober; and Hagenmuller, Paul, to Agence Nationale de Valorisation de la Recherche (ANVAR). Controlling the melt temperature during zone refining and Czochralski crystal growth by sensing the viscous torque of the melt zone during operation. 4,176,002, Cl. 156-601.000.

Quick, James R.: *See—*
Heaton, Michael J.; and Quick, James R., 4,175,977, Cl. 106-272.000.

Rabinovitch, Maurice: *See—*
El Gammal, Maurice; and Rabinovitch, Maurice, 4,175,609, Cl. 164-60.000.

Rabinowitz, Mario, to Electric Power Research Institute, Inc. Stored field superconducting electrical machine and method. 4,176,291, Cl. 310-52.000.

Raco-Elektro-Maschinen GmbH: *See—*
Brinkert, Franz, 4,175,645, Cl. 188-72.100.

Radice, Angelo; and Palacino, Giovanni, to Rockwell-Rimoldi S.p.A. Device for aligning chains of stitches in a two-needle sewing machine. 4,175,500, Cl. 112-166.000.

Radiochemical Centre Ltd., The: *See—*
Laidler, John B.; and Abrahams, Roy H., 4,176,158, Cl. 423-2.000.

Rainey, George E.: *See—*
Vollmer, Arthur N.; and Rainey, George E., 4,176,199, Cl. 426-59.000.

Ralston Purina Company: *See—*
Decker, Carl D.; and Holt, S. Kent, 4,176,202, Cl. 426-574.000.

Ramuz, Henri: *See—*
Muller, Jean-Claude; and Ramuz, Henri, 4,176,119, Cl. 260-243.300.

Ramy, Towheed; and Hore, Lal M., to General Cable Corporation. Metallurgical bonded connector for coaxial cables. 4,176,244, Cl. 174-88.00C.

Ranauro, Carmine J., to New England Mutual Life Insurance Company. Counterfeit resistant document. 4,175,776, Cl. 283-8.00B.

Randin, Jean-Paul, to Ebauches S.A. Electro-optic device. 4,175,838, Cl. 350-357.000.

Randolph, John E., to Teletype Corporation. Ribbon cartridge having a convolute-forming roller. 4,175,877, Cl. 400-196.000.

Rank Xerox, Ltd.: *See—*
Sadamatsu, Shigeru; Nozaki, Tooru; Yamada, Yoshihiko; and Noami, Tsuneo, 4,175,962, Cl. 430-109.000.

Rapid Mounting & Finishing Company: *See—*
Rutchik, Robert K., 4,175,345, Cl. 40-473.000.

Rapids, Felix R. Electrode for portable electroplating. 4,176,036, Cl. 204-224.00R.

Rapp, Heinz; Biedermann, Ernst; and Wittenbrink, Dieter, to AGFA-Gevaert, A.G. Photographic copying machine. 4,175,857, Cl. 355-73.000.

Rapp, James E., to Owens-Illinois, Inc. Melt-formed polycrystalline ceramics and dopant hosts containing phosphorus. 4,175,988, Cl. 148-189.000.

Ray, William E. Illuminated fishing lure with magnetic switch. 4,175,348, Cl. 43-17.600.

Raychem Corporation: *See—*
Gotcher, Alan J.; Germeraad, Paul B.; and White, Larry J., 4,176,027, Cl. 204-159.150.

Raynor, Robert H., to Philip Morris Incorporated. Quick change spindle mandrel. 4,175,715, Cl. 242-72.100.

Raytheon Company: *See—*
DeVita, Alphonse J.; Koester, Earl J.; Manoogian, David V.; and Sharenson, Stanley, 4,176,351, Cl. 343-9.00R
Fassett, Matthew; Pizette, Seymour B.; and Toth, John F., 4,176,359, Cl. 343-854.000.

Raytheon Corporation: *See—*
Baker, Thomas E.; Fix, George L.; and Judge, John S., 4,176,209, Cl. 427-248.00B.

RCA Corporation: *See—*
Babcock, William E.; and Hess, Ronald L., 4,176,303, Cl. 315-400.000.
Huff, Larry D., 4,175,751, Cl. 274-13.00R.
Scott, Howard M., 4,176,304, Cl. 315-411.000.
Toda, Minoru; Osaka, Susumu; and Matsumoto, Yasushi, 4,176,378, Cl. 358-128.000.

Reames, Cedric (Ted) A., Jr. Preheater device for hot water heaters. 4,175,518, Cl. 122-20.00B.

Rebane, Raul-Vello P.: *See—*
Pungas, Toom A.; Laud, Tynis A.; Reinberg, Kheino A.; Rebane, Raul-Vello P.; and Lumi, Toomas R., 4,176,393, Cl. 363-125.000

Redman, Michael J.; and Satchell, David W., to Xerox Corporation. Method and apparatus for forming visible images. 4,175,836, Cl. 350-357.000.

Redpath Sugars Limited: *See—*
Cormier, Richard A.; and Gagnon, Claude F., 4,176,006, Cl. 435-74.000.

Reen, Orville W.: *See—*
Southern, Raymond L.; and Reen, Orville W., 4,175,921, Cl. 432-261.000.

Regehr, Ulrich; Hannemann, Horst; and Speitkamp, Ludwig, to Regehr, Ulrich. Apparatus for the separation of liquid droplets from a gas stream entraining same. 4,175,938, Cl. 55-440.000.

Rehbein, Glenn, to Robark, Inc. Earth working implement. 4,175,496, Cl. 111-1.000.

Reich, Murray H.: *See—*
Magder, Jules; and Reich, Murray H., 4,176,148, Cl. 264-41.000.

Reichow, James R. Automatic spin cast reel. 4,175,716, Cl. 242-84.20A.

Reid, Wallace G.; Saini, Rakesh; and Atkins, Kenneth E., to Union Carbide Corporation. Phenol/formaldehyde resoles and cellular products derived therefrom. 4,176,106, Cl. 260-29.300.

Reid, Wallace G.; Saini, Rakesh; and Atkins, Kenneth E., to Union Carbide Corporation. Cellular products derived from phenol/formaldehyde resoles. 4,176,216, Cl. 521-106.000.

Reinberg, Kheino A.: *See—*
Pungas, Toom A.; Laud, Tynis A.; Reinberg, Kheino A.; Rebane, Raul-Vello P.; and Lumi, Toomas R., 4,176,393, Cl. 363-125.000.

Reliance Electric Corporation: *See—*
Downey, Holmes A., 4,175,406, Cl. 64-13.000.

Remedi, James J., to Motorola, Inc. Versatile CMOS decoder. 4,176,287, Cl. 307-251.000.

Remport, Julia nee Radoczi: *See—*
Szekely, Istvan; Tomoskozi, Istvan; Kovacs, Gabor; Simonidesz, Vilmos; Lovasz nee Gaspar, Marianna; Keresztes, Borbala nee Ordog; Remport, Julia nee Radoczi; Stadler, Istvan; Visky, Zsuzsa nee Gombos; and Szantay, Csaba, 4,176,122, Cl. 260-343.30P.

Renaud, Ronnie C.; and Goins, Jerry D. Apparatus for automatically feeding collar stays. 4,175,676, Cl. 221-211.000.

Resnick, Paul R.: *See—*
Molnar, Charles J.; Price, Edward H.; and Resnick, Paul R., 4,176,215, Cl. 521-27.000.

Restrepo, Jose M. Process for incorporating reinforcing fibers in cementing matrices, using an apparatus comprising vibrating trays. 4,175,868, Cl. 366-9.000.

Reutter, Siegfried: *See—*
Bubik, Alfred; and Reutter, Siegfried, 4,176,005, Cl. 162-256.000.

Reyes, George Q. Step ladder leg support. 4,175,641, Cl. 182-172.000.

Reynolds Metals Company: *See—*
Reynolds, William G.; and Arfert, Horst F. W., 4,175,670, Cl. 220-70.000.

Reynolds, William G.; and Arfert, Horst F. W., to Reynolds Metals Company. Container construction. 4,175,670, Cl. 220-70.000.

Rhythm Watch Company Limited: *See—*
Miyamoto, Kazuo; Suzuki, Isao; and Koide, Hideo, 4,175,373, Cl. 58-16.00D.

Rice, Patrick W., to Otis Engineering Corporation. Low alloy tempered martensitic steel. 4,175,987, Cl. 148-36.000.

Richard, Louis, to Ollivier, Jean. Device for automatic, selective watering of plants. 4,175,579, Cl. 137-119.000.

Richards, Cecil G., to B.C. Richards & Co. Pty. Ltd. Ball valve and seal. 4,175,726, Cl. 251-315.000.

Richardson Company, The: *See—*
Alsberg, Henry; Skalla, Dale; and Meisenhelder, William C., 4,176,104, Cl. 260-28.50R.

Richardson, Robert H.: *See—*
Robbins, William E.; and Richardson, Robert H., 4,175,297, Cl. 5-284.000.

Ricoh Company, Ltd.: *See—*
Nozawa, Shiyozo; Hokari, Saburo; Yamaga, Shigeru; and Takahashi, Akira, 4,175,846, Cl. 354-173.000.

Rider, Dennis G., to Battelle Development Corporation. Ramp generator. 4,176,398, Cl. 364-607.000.

Rider, Nathan R., to Kay Tex Products, Inc. Textured surface coating. 4,176,100, Cl. 260-22.00R.

Riedel, Harald: *See—*
Teschner, Eckart; Riedel, Harald; and Sattelmeyer, Richard, 4,175,931, Cl. 51-297.000.

Rijckaert, Albert M. A.: *See—*
de Niet, Edmond; and Rijckaert, Albert M. A., 4,176,381, Cl. 360-77.000.

Rikuta, Sotokazu. Method of and apparatus for the measurement of the rate of flow by means of a bypass. 4,175,433, Cl. 73-196.000.

Rikuta, Sotokazu. Control valve for keeping the rate of flow at a fixed value. 4,175,584, Cl. 137-504.000.

Rion Co., Ltd.: *See—*
Takinishi, Kiyotoshi; and Hattori, Junichi, 4,175,338, Cl. 35-35.00R.

Ripple, David E., to Lubrizol Corporation, The. Haloalkyl hydroxyaromatic condensation products as lubricant additives. 4,176,077, Cl. 252-51.50R.

Ritland, Harold N.; and Thacker, George H., to United States of America, Air Force. Centrifugal aerosol dispenser assembly. 4,175,469, Cl. 89-1.00B.

Roantree, William J.; and Bartini, Paul S., to Mel Modern Systems, Incorporated. Solar energy collector. 4,175,540, Cl. 126-425.000.

Robark, Inc.: *See—*
Rehbein, Glenn, 4,175,496, Cl. 111-1.000.

Robbins, William E.; and Richardson, Robert H. Inflatable pillow support. 4,175,297, Cl. 5-284.000.

Robert Bosch GmbH: *See—*
Orova, Josef; and Podrapsky, Jiri, 4,175,509, Cl. 123-117.00R.
Schulz, Alfred; Kiencke, Uwe; and Honig, Gunther, 4,176,309, Cl. 323-4.000.
Wesenmeyer, Jurgen; Haubner, Georg; and Meier, Werner, 4,175,508, Cl. 123-117.00R.

Roberts, Derek A., to Rolls-Royce Limited. Bearing assembly between inner and outer shafts having two roller bearings and two hydrodynamic or squeeze film bearings. 4,175,803, Cl. 308-9.000.

Roberts, Michael G.: *See—*
Marzocchi, Alfred; Roberts, Michael G.; and Bolen, Charles E., 4,175,978, Cl. 106-281.00R.

Roberts, Noel A.: *See—*
Hassall, Cedric H.; Johnson, William H.; and Roberts, Noel A., 4,176,116, Cl. 260-112.50R.

Roberts, Thomas E. E., to Lucas Industries Limited. Rotary hydraulic machine. 4,175,472, Cl. 91-6.500.

Robertson, Elmer L., to Ethyl Development Corporation. Article decorating machine and method. 4,175,993, Cl. 156-234.000.

Robertson, George H.; and Stirling, John A., to Ciba-Geigy Corporation. Process for the manufacture of a pigment composition in bead form. 4,175,979, Cl. 106-309.000.

Robertson, Steven J. High performance shredder apparatus. 4,175,710, Cl. 241-55.000.

Robinson, David B.: *See—*
Tobin, Joseph J.; Robinson, David B.; Peay, Robert L.; Powell, Jerry R.; and Gay, Leslie W., 4,176,348, Cl. 340-562.000.

Robinson, L. T.: *See—*
Garthus, Donald R.; and Robinson, L. T., 4,176,013, Cl. 202-242.000.

Rockwell International Corporation: *See—*
Jenkins, David K., 4,175,643, Cl. 184-11.00A
Molina, Orlando G., 4,176,205, Cl. 427-1.000
Nelson, Richard D.; and Hughes, A. James, 4,176,369, Cl. 357-24.000

Rockwell-Rimoldi S.p.A.: *See—*
Radice, Angelo; and Palacino, Giovanni, 4,175,500, Cl. 112-166.000.

Roehrick, Otto A. Quick step ecolarium. 4,175,513, Cl. 119-5.000.

Rogoff, Mortimer: *See—*
DeRosa, Louis A.; and Rogoff, Mortimer, 4,176,316, Cl. 325-32.000.

Rohm and Haas Company: *See—*
Leslie, John P.; Lane, Constance A.; and Grant, R. Peter, 4,176,101, Cl. 260-22.00T.
Lewis, Sheldon N.; and Levy, Jerome F., 4,176,232, Cl. 560-222.000.
Meisinger, Robert H., 4,175,945, Cl. 71-78.000.

Rolls-Royce Limited: *See—*
Crane, John L.; Archdale, Robert W.; and Webb, Alan E., 4,175,912, Cl. 416-193.00A.
Roberts, Derek A., 4,175,803, Cl. 308-9.000.

Rosales, Louis A.: *See—*
Bianchi, Maurice P.; and Rosales, Louis A., 4,175,642, Cl. 184-1.00E.

Rosche, Paul: *See—*
Ederer, Georg; Fischer, Adolf; Rosche, Paul; Troll, Helmar; Wurst, Wolfgang; Hengl, Helmut; and Seidl, Jiri, 4,175,504, Cl. 123-52.00M.

Rose, John B.: *See—*
Cinderey, Michael B.; and Rose, John B., 4,176,222, Cl. 528-126.000.

Rosenberg, Henry W., to Camp International, Inc. Lumbosacral-orthosis orthopedic support. 4,175,553, Cl. 128-78.000.

Rosenblum, Frank R., to Noranda Mines Limited. Apparatus for measuring the sedimentation characteristics of particulate solids in liquid. 4,175,426, Cl. 73-61.400.

Rosenblum, Richard, to Fischer & Porter Co. Digital hypochlorous acid analyzer. 4,176,031, Cl. 204-195.00R.

Rosenschein, Warner: *See—*
Fleisher, Seymour; and Rosenschein, Warner, 4,175,630, Cl. 180-225.000.

Rosey, Richard: *See—*
Kovatch, George N.; Rosey, Richard; and Simon, Ned H., 4,176,243, Cl. 174-72.00B.

Ross, Joseph A.: *See—*
DiMatteo, Paul L.; Ross, Joseph A.; and Stern, Howard K., 4,175,862, Cl. 356-375.000.

Rotz, Christopher A.: *See—*
Suh, Nam P.; Rotz, Christopher A.; and Erwin, Lewis, II, 4,175,871, Cl. 366-79.000.

Roullier, Marcel-Francois, to Baumgartner Papiers S.A. Cigarette-filter-making apparatus. 4,175,479, Cl. 93-77.0FT.

Rousseau, Jean-Pierre. Switch for pocket torch. 4,176,263, Cl. 200-60.000.

Rovac Corporation, The: *See—*
Edwards, Thomas C.; and Ecker, Amir L., 4,175,397, Cl. 62-149.000.
Edwards, Thomas C.; and Ecker, Amir L., 4,175,398, Cl. 62-172.000.
Edwards, Thomas C.; and Ecker, Amir L., 4,175,399, Cl. 62-172.000.
Edwards, Thomas C.; and Ecker, Amir L., 4,175,400, Cl. 62-174.000.

Royston, John H.: *See—*
Merlack, William A.; and Royston, John H., 4,176,245, Cl. 174-92.000.

Royston Laboratories, Inc.: *See—*
Merlack, William A.; and Royston, John H., 4,176,245, Cl. 174-92.000.

Rubio, Charles A., to CVG-Siderurgica del Orinoco, C.A. Method and apparatus for preparing a reducing gas stream. 4,175,951, Cl. 75-91.000.

Rudisill, John A., Jr., to Bell Telephone Laboratories, Incorporated. Adjustable impedance battery feed circuit. 4,176,255, Cl. 179-16.00F.

Rueggeberg, Werner, to Armstrong Cork Company. Microwave energy trap. 4,176,267, Cl. 219-10.55A.

Ruell, Hartwig: *See—*
Pekau, Dietlind; Ruell, Hartwig; Storck, Eckhard; and Kiemle, Horst, 4,175,823, Cl. 350-3.790.

Ruger, Gerd: *See—*
Frauenhoffer, Josef; and Ruger, Gerd, 4,175,319, Cl. 29-724.000.

Ruggles, Richard L.: *See—*
Evelyn-Veere, Rene H.; and Ruggles, Richard L., 4,176,395, Cl. 364-420.000.

Rugheimer, Norman M.; and Chestnut, Scott R. Holographic puzzle. 4,175,750, Cl. 273-157.00R.

Ruland, Ross R.: *See—*
Guerre, Robert P.; Juedes, Dennis L.; and Ruland, Ross R., 4,175,920, Cl. 431-175.000.

Ruscoe, Michael J. H.; Clegg, Maurice A.; Seibt, Willie H.; and Sarkar, Kshitindra M., to Sherritt Gordon Mines Limited. Process for the production of coin blanks. 4,176,014, Cl. 204-23.000.

Rush-Presbyterian-St. Luke's Medical Center: *See—*
Bacus, James W., 4,175,860, Cl. 356-39.000.
Kuettner, Klaus E., 4,176,177, Cl. 424-95.000.

Russell, Albert C., deceased; and Russell, Mary K., administratrix. Distributor assembly. 4,175,520, Cl. 123-117.00A.

Russell, James H.: *See—*
Oden, Laurance L.; and Russell, James H., 4,175,954, Cl. 75-138.000.

Russell, Mary K., administratrix: *See—*
Russell, Albert C., deceased; and Russell, Mary K., administratrix, 4,175,520, Cl. 123-117.00A.

Russell, Stuart M.; and Bishop, Leonard W. J., to Burroughs Wellcome Co. Viral antibody diagnostic test system. 4,176,174, Cl. 424-8.000.

Rutchik, Robert K., to Rapid Mounting & Finishing Company. Display device. 4,175,345, Cl. 40-473.000.

Ruyle, William V.; and Fisher, Michael H., to Merck & Co., Inc. Substituted dihydropyridine ureas. 4,176,187, Cl. 424-263.000.

Rybicki, Robert C., to United States of America, Army. Helicopter rotor head mounting assembly. 4,175,913, Cl. 416-244.00R.

Rybin, Igor V.: *See—*
Vulis, Mikhail L.; Golenchenko, Valery A.; Rybin, Igor V.; and Shenderovich, Pavel B., 4,176,238, Cl. 174-15.00S.

Ryer, Jack; Winans, Esther D.; Brois, Stanley J.; and Gutierre, Antonio, to Exxon Research & Engineering Co. Molybdenum complexes of lactone oxazoline dispersants as friction reducing antiwear additives for lubricating oils. 4,176,073, Cl. 252-32.70E.

S. A. Martin: *See—*
Gattus, Yves, 4,175,489, Cl. 101-366.000.

Saari, Veikko R.; and Shoji, Masakazu, to Bell Telephone Laboratories, Incorporated. Integrated circuit binary weighted digital-to-analog converter. 4,176,344, Cl. 340-347.0DA.

Sabia, Raffaele A., to Bell Telephone Laboratories, Incorporated. Filled electrical cable. 4,176,240, Cl. 174-23.00C.

Sack, Stanley F., to Canadian General Electric Company Limited. Split duct with integral hinge. 4,175,593, Cl. 138-110.000.

Sadamatsu, Shigeru; Nozaki, Tooru; Yamada, Yoshihiko; and Noami, Tsuneo, to Rank Xerox, Ltd. Electrostatographic toner material. 4,175,962, Cl. 430-109.000.

Sailas, Vaino, to Valmet Oy. Roll and roll-manufacturing method. 4,176,270, Cl. 219-121.0EM.

Saini, Rakesh: *See—*
Reid, Wallace G.; Saini, Rakesh; and Atkins, Kenneth E., 4,176,106, Cl. 260-29.300.
Reid, Wallace G.; Saini, Rakesh; and Atkins, Kenneth E., 4,176,216, Cl. 521-106.000.

St. Jacques, Joseph A.: *See—*
Tachick, Henry N.; Arnold, Reginald S.; Belcher, James E.; and St. Jacques, Joseph A., 4,175,817, Cl. 339-111.000.

St. Louis Diecasting Corporation: *See—*
Bauman, Robert S., 4,175,724, Cl. 248-642.000.

Saito, Kazutoshi: *See—*
Kajimura, Takashi; Saito, Kazutoshi; Shige, Noriyuki; Nakamura, Michiharu; Umeda, Jun-ichi; and Kobayashi, Masayoshi, 4,176,325, Cl. 331-94.50H.

Sakai, Takahiro: *See—*
Sakakibara, Shumpei; Nagai, Yutaka; Fujiwara, Kenji; and Sakai, Takahiro, 4,176,009, Cl. 435-24.000.

Sakakibara, Shumpei; Nagai, Yutaka; Fujiwara, Kenji; and Sakai, Takahiro, to Ajinomoto Co., Inc. Method of measuring collagenase activity. 4,176,009, Cl. 435-24.000.

Sakamoto, Shinichi; and Sasayama, Takao, to Hitachi, Ltd. Electric ignition control system. 4,175,506, Cl. 123-117.00D.

Sakharnov, Vasily A.: *See—*
Kuchuk-Yatsenko, Sergei I.; Golomovzjuk, Ivan K.; Krivenko, Valery G.; Kulesh, Alexandr I.; Sakharnov, Vasily A.; Lazebny, Ivan L.; and Porkhun, Fedor. K., 4,175,897, Cl. 409-300.000.

Sakulevich, Faddei J.; Minin, Leonid K.; Bazarnov, Jury A.; Baubel, Alexandr A.; and Skvorchevsky, Nikolai Y. Method for finishing surfaces of non-magnetic articles by means of ferromagnetic abrasive powder in magnetic field. 4,175,930, Cl. 51-281.00R.

Sakurada, Nobuaki; Ito, Tadashi; Shinoda, Nobuhiko; Ito, Fumio; Murakami, Hiroyashu; and Kawamura, Masaharu, to Canon Kabushiki Kaisha. Exposure control system for a camera. 4,175,842, Cl. 354-23.00D.

Sakurada, Nobuaki: *See—*
Murakami, Hiroyashu; Ito, Tadashi; Ito, Fumio; Sakurada, Nobuaki; Kawamura, Masaharu; and Shinoda, Nobuhiko, 4,175,848, Cl. 354-289.000.

Sakurada, Yutaka; Sunahara, Kimihisa; and Yamauchi, Kazuhisa, to Kuraray Co., Ltd.; and Kawasumi Laboratories, Inc. Semi-permeable membranes of regenerated cuprammonium cellulose and method for heat sterilization thereof in physiological saline. 4,176,070, Cl. 210-500.00M.

Sales Promotion Spits B.V.: *See—*
Cohen, Izak (Piet), 4,175,344, Cl. 40-364.000.

Salva, Juan M.: *See—*
Coupland, Keith; Salva, Juan M.; and Smith, Clinton R., 4,176,074, Cl. 252-32.70E.

Sammut, Nicholas. Dispensing containers. 4,175,680, Cl. 222-465.000.

Sanada, Masakatsu; Ito, Toshimitsu; and Nakada, Masahiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel supply system for engines. 4,175,527, Cl. 123-136.000.

Sanda, Shougo: *See—*
Noguchi, Masaaki; Sanda, Shougo; and Takizawa, Masaaki, 4,175,501, Cl. 123-30.00D.

Sandbank, Hans A., to GEC Medical Equipment Limited. Seal arrangement for a separating mechamism. 4,175,664, Cl. 209-657.000.

Santora, Norman J.: *See—*
Nuss, George W., Jr.; Santora, Norman J.; and Douglas, George H., 4,176,198, Cl. 424-330.000.

Sarazen, Paul M., Jr.: *See—*
Beam, Dennis A., Jr.; and Sarazen, Paul M., Jr., 4,175,480, Cl. 98-37.000.

Sarkar, Kshitindra M.: *See—*
Ruscoe, Michael J. H.; Clegg, Maurice A.; Seibt, Willie H.; and Sarkar, Kshitindra M., 4,176,014, Cl. 204-23.000.

Saroy Engineering: *See—*
Husted, Royce H., 4,175,627, Cl. 180-190.000.

Sasaki, Makoto: *See—*
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Ihida, Kazuyoshi, 4,176,146, Cl. 525-338.000.

Sasayama, Takao: *See—*
Sakamoto, Shinichi; and Sasayama, Takao, 4,175,506, Cl. 123-117.00D.

Satchell, David W.: *See—*
Redman, Michael J.; and Satchell, David W., 4,175,836, Cl. 350-357.000.

Sathe, Sharad S., to Mallinckrodt, Inc. Process for preparing p-aminophenol in the presence of dimethyldodecylamine sulfate. 4,176,138, Cl. 260-575.000.

Sato, Eiichi, to Olympus Optical Company Limited. Electrophotographic process using insulating dot overlayer. 4,175,957, Cl. 430-31.000.

Sato Gosei Co., Ltd.: *See—*
Suzuki, Tadashi, 4,176,151, Cl. 264-291.000.

Sato, Makoto: *See—*
Kishinami, Tateshi; and Sato, Makoto, 4,175,896, Cl. 408-230.000.

Sato, Yasushi: *See—*
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,175,851, Cl. 355-14.00R.

Satoh, Eiji: *See—*
Nagata, Yukio; Satoh, Eiji; and Tsuchida, Keinosuke, 4,175,461, Cl. 84-1.150.

Satou, Yoshihiko; and Teranishi, Katsuya, to Hitachi, Ltd. Escalator with step levelers. 4,175,652, Cl. 198-/332.000.

Sattelmeyer, Richard: *See—*
Teschner, Eckart; Riedel, Harald; and Sattelmeyer, Richard, 4,175,931, Cl. 51-297.000.

Savage, Richard T. Pet feeding device. 4,175,516, Cl. 119-62.000.

Sawaguchi, Hiroshi: *See—*
Ueda, Hideo; and Sawaguchi, Hiroshi, 4,176,134, Cl. 260-543.00R.

Scamehorn, John F.: *See—*
Bendig, Larry L.; Scamehorn, John F.; and Stowell, Donald E., 4,176,171, Cl. 423-628.000.

Scarpelli, Jonathan B. Apparatus for video display of audio frequency patterns. 4,176,375, Cl. 358-92.000.

Schaffer, William J.: *See—*
Froehlich, Frederick B.; Hennings, Roy; and Schaffer, William J., 4,176,382, Cl. 360-95.000.

Schaller, Herbert: *See—*
Schaller, Herta; and Schaller, Herbert, 4,175,786, Cl. 297-254.000.

Schaller, Herta; and Schaller, Herbert. Device for transporting children on chair lift seats. 4,175,786, Cl. 297-254.000.

Scharper S.p.A. Per l'Industria Farmaceutica: *See—*
Fazzini, Massimo, 4,176,129, Cl. 260-448.00R.

Schatz, Klaus W.: *See—*
McGovern, Stephen J.; Schatz, Klaus W.; and Zrinscak, Sr. Fred S., 4,176,083, Cl. 252-411.00R.

Schatzler, Walter; and Handler, Erich, to Webasto-Werk W. Baier GmbH & Co. Device for mounting the guide sleeve of a drive cable for a sliding top of an automobile roof. 4,175,784, Cl. 296-137.00E.

Schedele, Helmut; and von Tomkewitsch, Romuald, to Siemens Aktiengesellschaft. Fluid-tight protective system for an electromechanical component. 4,176,241, Cl. 174-52.00S.

Scheffler, Edward D., to Ag Superior, Inc. Harvesting apparatus and process. 4,175,368, Cl. 56-328.00R.

Scheier, Donald J.; Crawford, David R.; and McDonald, David M., to Simon-Johnson, Inc. Sealed feather picking unit. 4,175,302, Cl. 17-11.10R.

Scherer, Volker: *See—*
Schoettle, Klaus; Dobler, Peter; Gliniorz, Lothar; Scherer, Volker; and Brombach, Heinz, 4,175,999, Cl. 156-505.000.

Schering Aktiengesellschaft: *See—*
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; Wiechert, Rudolf; Wendt, Hans; and Kapp, Joachim-Friedrich, 4,176,126, Cl. 260-397.450.

Schering Corporation: *See—*
Neustadt, Bernard R.; and Zampaglione, Nicola, 4,176,120, Cl. 548-184.000.

Scheruebl, Franz. Ski structures. 4,175,767, Cl. 280-610.000.

Schimmel, Otto K., to Amba Marketing Systems, Inc. Attachment for motion translating machine. 4,175,329, Cl. 33-23.00R.

Schippers, Heinz; and Lenk, Erich, to Barmag Barmer Maschinenfabrik Ag. Chucking spindle for the reception of a bobbin carrier. 4,175,712, Cl. 242-46.400.

Schlaikjer, Carl R.: *See—*
Klinedinst, Keith A.; and Schlaikjer, Carl R., 4,176,214, Cl. 429-194.000.

Schlauch, Walter F.: *See—*
Caimi, Ronald J.; and Schlauch, Walter F., 4,176,108, Cl. 260-29.6TA.

Schlegel, Earl S., to Westinghouse Electric Corp. Thyristor fired by overvoltage. 4,176,371, Cl. 357-38.000.

Schmidhammer, Leonhard: *See—*
Zauhar, Helmut; Authier, Bernhard; Luptovits, Roland; and Schmidhammer, Leonhard, 4,175,610, Cl. 164-60.000.

Schmidt, Horst: *See—*
Leitz, Ludwig; Heitmann, Knut; Schneider, Eckart; and Schmidt, Horst, 4,175,365, Cl. 356-4.000.

Schmitt, Frederick L.: *See—*
Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick L.; and Vock, Manfred H., 4,175,569, Cl. 131-9.000.

Schmoll, George F., III, to CBS Inc. Circuit for simulating string bass sound. 4,175,465, Cl. 84-1.260.

Schneider, Eckart: *See—*
Leitz, Ludwig; Heitmann, Knut; Schneider, Eckart; and Schmidt, Horst, 4,175,365, Cl. 356-4.000.

Schneider, Fritz W., to Elastogran Maschinenbau GmbH & Co. High pressure injection mixing head for multi-component plastics, particularly polyurethane. 4,175,874, Cl. 366-182.000.

Schneider, Horst: *See—*
Achelpohl, Fritz; and Schneider, Horst, 4,176,000, Cl. 156-510.000.

Schneider, John C.; Hanson, S. Eugene; and DuVall, Bruce W., to Kaman Sciences Corporation. Wet-wet differential pressure transducer. 4,175,443, Cl. 73-722.000.

Schnur, Rodney C., to Pfizer Inc. Spiro-quinolylhydantoins. 4,176,185, Cl. 424-258.000.

Schoettle, Klaus; Dobler, Peter; Gliniorz, Lothar; Scherer, Volker; and Brombach, Heinz, to BASF Aktiengesellschaft. Apparatus for loading magnetic tape cassettes with magnetic tape. 4,175,999, Cl. 156-505.000.

Scholl, Hans; and Tiemann, Helmut, to Koch Adler AG. Apparatus for marking and trimming collars. 4,175,681, Cl. 223-2.000.

Schopf, Hans-Joachim, to Daimler-Benz Aktiengesellschaft. Spline shaft connection. 4,175,404, Cl. 64-9.00R.

Schottel-Werft Josef Becker GmbH & Co. KG: *See—*
Krautkremer, Franz, 4,175,511, Cl. 115-35.000.

Schrader, Goetz, to Plaubel, Feinmechanik & Optik GmbH. Shutter-control mechanism for bellows camera. 4,175,847, Cl. 354-187.000.

Schranz, Karl-Wilhelm: *See—*
Credner, Hans-Heinrich; and Schranz, Karl-Wilhelm, 4,175,968, Cl. 430-559.000.

Schuette, William L.: *See—*
Winter, William E.; and Schuette, William L., 4,176,049, Cl. 208-70.000.

Schulz, Alfred; Kiencke, Uwe; and Honig, Gunther, to Robert Bosch GmbH. Stabilized voltage regulator circuit, particularly for use with a serially connected PNP transistor. 4,176,309, Cl. 323-4.000.

Schulz, Kurt: *See—*
Blaha, Erich; and Schulz, Kurt, 4,175,826, Cl. 350-36.000.
Muller, Ortwin; Grunvogel, Karl; and Schulz, Kurt, 4,175,839, Cl. 351-14.000.

Schwab, Frederick C., to Mobil Oil Corporation. Block copolymers. 4,176,144, Cl. 525-91.000.

Schwabe, Ulrich, to Siemens Aktiengesellschaft. Process for the production of a high frequency transistor. 4,175,983, Cl. 148-1.500.

Schwaiger, John E. Vehicle wheel engageable blocking device. 4,175,410, Cl. 70-226.000.

Schweizerische Lokomotiv-und Maschinenfabrik: *See—*
Moser, Peter, 4,175,494, Cl. 105-176.000.

Schwierz, Guenter: *See—*
Greschat, Walter; and Schwierz, Guenter, 4,176,280, Cl. 250-445.00T.

Schwierz, Gunter; and Haerer, Wolfgang, to Siemens Aktiengesellschaft. Tomograph for producing transverse layer images. 4,176,279, Cl. 250-445.00T.

SCI Systems, Inc.: *See—*
King, Olin B., 4,176,364, Cl. 346-162.000.

Scientific Energy Systems Corporation: *See—*
Gerstmann, Joseph, 4,175,706, Cl. 239-414.000.

Scott, Howard M., to RCA Corporation. Regulating television horizontal deflection arrangement. 4,176,304, Cl. 315-411.000.

Scott, Waller M., Jr.: *See—*
Goldblatt, Samuel; and Scott, Waller M., Jr., 4,175,546, Cl. 128-739.000.

Scragg, Robert L.; and Parker, Alfred B., to Solar Reactor Corporation. Electromagnetic reactor engine system-apparatus and method. 4,175,381, Cl. 60-39.120.

Scribner, Albert W. Semi-automatic stock feeder. 4,175,688, Cl. 226-158.000.

Seem, David M. Fruit dislodger for a harvesting machine. 4,175,621, Cl. 171-14.000.

Seibt, Willie H.: *See—*
Ruscoe, Michael J. H.; Clegg, Maurice A.; Seibt, Willie H.; and Sarkar, Kshitindra M., 4,176,014, Cl. 204-23.000.

Seidl, Jiri: *See—*
Ederer, Georg; Fischer, Adolf; Rosche, Paul; Troll, Helmar; Wurst, Wolfgang; Hengl, Helmut; and Seidl, Jiri, 4,175,504, Cl. 123-52.00M.

Seino, Kuniki; Kondo, Shoji; Tanaka, Susumu; and Sugiyama, Takashi, to Minolta Camera Kabushiki Kaisha. Electrophotographic processes using a pre-exposure. 4,175,955, Cl. 430-35.000.

Sempliner, Arthur T.: *See—*
Teague, Walter D., Jr.; and Sempliner, Arthur T., 4,175,299, Cl. 15-22.00R.
Teague, Walter D., Jr.; and Sempliner, Arthur T., 4,175,359, Cl. 51-170.0MT.

Seragnoli, Enzo, to G. D. Societa per Azioni. Feeding and cutting device for sheet material. 4,175,456, Cl. 83-176.000.

Seruga, Edward A.: *See—*
Bradham, Allen C., III; and Seruga, Edward A., 4,175,434, Cl. 73-197.000.

Service d'Exploitation Industrielle des Tabacs et des Allumettes: *See*—
Battard, Jean-Claude; and Buisson, Jean, 4,175,996, Cl. 156-336.000.
Sevcik, Ladislav; Dvorak, Josef; and Mlynar, Jiri, to Elitex, Koncern textilniho strojirenstvi. Variable displacement pump. 4,175,474, Cl. 92-13.500.
Shaffer, John W.: *See*—
Harvey, William J.; McDonough, Thomas B.; and Shaffer, John W., 4,176,389, Cl. 362-5.000.
Sharenson, Stanley: *See*—
DeVita, Alphonse J.; Koester, Earl J.; Manoogian, David V.; and Sharenson, Stanley, 4,176,351, Cl. 343-9.00R.
Sharp, James H.: *See*—
Loutfy, Rafik O.; McIntyre, Lloyd F.; and Sharp, James H., 4,175,981, Cl. 136-89.0SJ.
Loutfy, Rafik O.; Hsiao, Cheng-Kuo; and Sharp, James H., 4,175,982, Cl. 136-89.0SJ.
Sharp Kabushiki Kaisha: *See*—
Yano, Kohzo; Inami, Yasuhiko; and Ueda, Hisashi, 4,175,837, Cl. 350-357.000.
Shea, Frederick L., Jr., to Great Lakes Carbon Corporation. Method and apparatus for neutralizing the effect of accelerating and decelerating forces. 4,175,723, Cl. 244-162.000.
Sheets, Laurence L., to Bell Telephone Laboratories, Incorporated. System for identifying and correcting the polarity of a data signal. 4,176,248, Cl. 178-67.000.
Sheffield, Byford D.: *See*—
Jernigan, Robert T.; and Sheffield, Byford D., 4,176,167, Cl. 423-476.000.
Shelton, J. Paul: *See*—
Hsiao, James K.; and Shelton, J. Paul, 4,176,354, Cl. 343-17.700.
Shelton, Vernon E. Decimal timekeeping instrument. 4,175,378, Cl. 346-20.000.
Shen, Hwa J.: *See*—
Davis, Billy J.; Kinsey, Cletus M.; Shen, Hwa J.; and Weber, James R., 4,175,799, Cl. 308-9.000.
Shenderovich, Pavel B.: *See*—
Vulis, Mikhail L.; Golenchenko, Valery A.; Rybin, Igor V.; and Shenderovich, Pavel B., 4,176,238, Cl. 174-15.00S.
Shepard, John W.: *See*—
Brown, Kenneth H.; and Shepard, John W., 4,176,328, Cl. 332-16.00T.
Sheridan, Catherine M.: *See*—
Hartman, Seymour; and Sheridan, Catherine M., 4,176,115, Cl. 260-39.00R.
Sherritt Gordon Mines Limited: *See*—
Ruscoe, Michael J. H.; Clegg, Maurice A.; Seibt, Willie H.; and Sarkar, Kshitindra M., 4,176,014, Cl. 204-23.000.
Shiber, Samuel. Hydromechanical transmission. 4,175,389, Cl. 60-414.000.
Shields, Michael P. Ski pole basket and carrying assembly. 4,175,683, Cl. 224-45.00S.
Shiga, Masaaki: *See*—
Misumi, Teruyuki; Furuhashi, Susumu; and Shiga, Masaaki, 4,176,020, Cl. 204-72.000.
Shige, Noriyuki: *See*—
Kajimura, Takashi; Saito, Kazutoshi; Shige, Noriyuki; Nakamura, Michiharu; Umeda, Jun-ichi; and Kobayashi, Masayoshi, 4,176,325, Cl. 331-94.50H.
Shih, Kun M.; and Walker, Derék, to Bristol-Myers Company. Chemical process. 4,176,131, Cl. 260-448.20E.
Shimada, Shinichi; and Makino, Takenori, to Honda Giken Kogyo Kabushiki Kaisha. Valve rotator assembly. 4,175,505, Cl. 123-90.300.
Shimizu, Akio: *See*—
Inanaga, Kiyofumi; Egawa, Saburo; Shimizu, Akio; and Maeda, Keijiro, 4,176,249, Cl. 179-1.00E.
Shimp, David A., to Celanese Polymer Specialties Company. Soluble resinous products of polyepoxide-amine adducts and cyclic dicarboxylic acid anhydrides. 4,176,221, Cl. 528-103.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Maekawa, Hideyuki; Noda, Kinzaburo; and Hoshi, Noboru, 4,176,175, Cl. 424-35.000.
Shin-Shirasuna Electric Corp.: *See*—
Yamada, Toyohiko, 4,176,314, Cl. 324-140.00D.
Shinko Electric Co., Ltd.: *See*—
Nakanishi, Sadao; Suzuki, Kazuhiro; Tokura, Nobufumi; and Endo, Shinichiro, 4,175,693, Cl. 235-463.000.
Shinoda, Nobuhiko: *See*—
Murakami, Hiroyashu; Ito, Tadashi; Ito, Fumio; Sakurada, Nobuaki; Kawamura, Masaharu; and Shinoda, Nobuhiko, 4,175,848, Cl. 354-289.000.
Sakurada, Nobuaki; Ito, Tadashi; Shinoda, Nobuhiko; Ito, Fumio; Murakami, Hiroyashu; and Kawamura, Masaharu, 4,175,842, Cl. 354-23.00D.
Shinozaki, Fumiaki; Washigawa, Yasuo; Ikeda, Tomoaki; Nakao, Sho; and Kondoh, Syunichi, to Fuji Photo Film Co., Ltd. Light-sensitive photopolymerizable composition. 4,175,971, Cl. 430-287.000.
Shinshu Seiki Kabushiki Kaisha: *See*—
Hanaoka, Seiji, 4,175,876, Cl. 400-124.000.
Shionogi & Co., Ltd.: *See*—
Maekawa, Hideyuki; Noda, Kinzaburo; and Hoshi, Noboru, 4,176,175, Cl. 424-35.000.
Shoji, Masakazu: *See*—
Saari, Veikko R.; and Shoji, Masakazu, 4,176,344, Cl. 340-347.0DA.
Shoketsu Kinzoku Kogyo Kabushiki Kaisha: *See*—
Iizumi, Tomomitsu, 4,175,473, Cl. 91-443.000.
Shuck, David L.: *See*—
Kube, Wolfram H.; and Shuck, David L., 4,175,789, Cl. 299-4.000.
Shuffield, Thomas E., Jr., to BEI Electronics, Inc. Signal translator with squelch. 4,176,286, Cl. 307-237.000.
Shupe, Russell D.: *See*—
Wu, Ching H.; Brown, Alfred; Hall, Wilbur L.; and Shupe, Russell D., 4,175,618, Cl. 166-252.000.
Siegmund, Walter P., to American Optical Corporation. Method for making fiber optics fused arrays with improved blemish quality. 4,175,940, Cl. 65-4.00A.
Siemens Aktiengesellschaft: *See*—
Cuno, Hans-Hellmuth, 4,176,305, Cl. 318-653.000.
Fruth, Albert; and Harenberg, Juergen, 4,176,256, Cl. 179-18.0FG.
Greschat, Walter; and Schwierz, Guenter, 4,176,280, Cl. 250-445.00T.
Manfreda, Alfred, 4,176,317, Cl. 325-62.000.
Pekau, Dietlind; Ruell, Hartwig; Storck, Eckhard; and Kiemle, Horst, 4,175,823, Cl. 350-3.790.
Schedele, Helmut; and von Tomkewitsch, Romuald, 4,176,241, Cl. 174-52.00S.
Schwabe, Ulrich, 4,175,983, Cl. 148-1.500.
Schwierz, Gunter; and Haerer, Wolfgang, 4,176,279, Cl. 250-445.00T.
Stoger, Klaus; Dotzer, Richard; Stadter, Josef; and Gehring, Johann, 4,176,034, Cl. 204-200.000.
Tischer, Peter; and Hundt, Eckart, 4,176,281, Cl. 250-492.00A.
Sigman, Warren R.; and Stalcup, Robert K., to United Technologies Corporation. Laser mirror with coolant fluid transfer manifold. 4,175,834, Cl. 350-310.000.
Sikli, Bert J., to Staines, Robert. Scissors lift. 4,175,644, Cl. 187-18.000.
Sill, Richard C.: *See*—
Davis, Robert R.; Sill, Richard C.; and Yerkes, John W., 4,175,980, Cl. 136-89.0FC.
Silva, Vernon A.: *See*—
Souza, Frank F.; Silva, Vernon A.; and Cabral, Tony, 4,175,514, Cl. 119-14.080.
SIMES Societa Italiana Medicinali e Sintetici S.p.A.: *See*—
Ferrari, Giorgio; and Vecchietti, Vittorio, 4,176,182, Cl. 424-248.500.
Simo, Miroslav A., to New Archery Products Corp. Arrowhead body. 4,175,749, Cl. 273-106.50B.
Simon-Johnson, Inc.: *See*—
Scheier, Donald J.; Crawford, David R.; and McDonald, David M., 4,175,302, Cl. 17-11.10R.
Simon, Jonathan C. System for selection and phase control of humbucking coils in guitar pickups. 4,175,462, Cl. 84-1.160.
Simon, Ned H.: *See*—
Kovatch, George N.; Rosey, Richard; and Simon, Ned H., 4,176,243, Cl. 174-72.00B.
Simonidesz, Vilmos: *See*—
Szekely, Istvan; Tomoskozi, Istvan; Kovacs, Gabor; Simonidesz, Vilmos; Lovasz nee Gaspar, Marianna; Keresztes, Borbala nee Ordog; Remport, Julia nee Radoczi; Stadler, Istvan; Visky, Zsuzsa nee Gombos; and Szantay, Csaba, 4,176,122, Cl. 260-343.30P.
Simons, Craig W.: *See*—
Andersen, Charles E.; and Simons, Craig W., 4,175,815, Cl. 339-61.00R.
Simpson, Dennis D.: *See*—
Cornell, Charles R.; and Simpson, Dennis D., 4,175,628, Cl. 180-6.480.
Sipple, Ralph E., to Sperry Rand Corporation. Apparatus for simultaneously measuring a plurality of digital events employing a random number table. 4,176,402, Cl. 364-900.000.
Skalla, Dale: *See*—
Alsberg, Henry; Skalla, Dale; and Meisenhelder, William C., 4,176,104, Cl. 260-28.50R.
Skinner, David B., to GAF Corporation. Process for making urethane coated decorative sheet-type covering material. 4,176,210, Cl. 427-258.000.
Skogman, Richard A.: *See*—
Moravec, Thomas J.; and Skogman, Richard A., 4,176,207, Cl. 427-160.000.
Moravec, Thomas J.; and Skogman, Richard A., 4,176,208, Cl. 427-160.000.
Skrentner, Frank C., to F. Jos. Lamb Company. Boring machine. 4,175,894, Cl. 408-1.00R.
Skvorchevsky, Nikolai Y.: *See*—
Sakulevich, Faddei J.; Minin, Leonid K.; Bazarnov, Jury A.; Baubel, Alexandr A.; and Skvorchevsky, Nikolai Y., 4,175,930, Cl. 51-281.00R.
Sloan, Albert H. Gravitational flow separator of the multiple, apertured tube type for separating water from sand, gravel or the like. 4,176,066, Cl. 210-241.000.
Smith, Carolyn M.: *See*—
Ponce, Phillip; and Kamon, John T., 4,175,679, Cl. 222-70.000.
Smith, Clinton R.: *See*—
Coupland, Keith; Salva, Juan M.; and Smith, Clinton R., 4,176,074, Cl. 252-32.70E.
Smith, Gary L.: *See*—
Johnson, Ralph W.; Burrs, Emil D.; Smith, Gary L.; Freund, Ronald G.; and Patula, Edward, 4,175,674, Cl. 221-88.000.
Smith, Joseph F.; and Smith, Joseph R., to PEM-IMS, Inc. Shaft coupling. 4,175,405, Cl. 64-10.000.
Smith, Joseph R.: *See*—
Smith, Joseph F.; and Smith, Joseph R., 4,175,405, Cl. 64-10.000.

Smith, Robert G., to Kleen-Rite, Inc. Tank support assemblies. 4,175,666, Cl. 211-71.000.
Smith, Trevor S., to Lucas Industries Limited. Gas turbine engine fuel control system. 4,175,383, Cl. 60-39.28R.
Societe Anonyme des Etablissements Ph. Bonvillan & E. Ronceray: *See*—
Churlaud, Henri A., 4,175,869, Cl. 366-42.000.
s.a. Texaco Belgium n.v.: *See*—
Hermans, Johny C., 4,176,226, Cl. 528-332.000.
Societe de Prayon: *See*—
Pavonet, Engelhard, 4,176,160, Cl. 423-104.000.
Societe d'Etudes de Produits Chimiques: *See*—
Esanu, Andre, 4,176,193, Cl. 424-304.000.
Societe d'Etudes Scientifiques et Industrielles: *See*—
Barbier, Pierre, 4,176,180, Cl. 424-181.000.
Societe dite Coppertron S.A.: *See*—
Pedone, Antonio, 4,176,035, Cl. 204-205.000.
Societe Industrielle Bertrand Faure: *See*—
Letournoux, Alain; and Canals, Charles, 4,175,301, Cl. 16-146.000.
Societe Industrielle de Brevets et d'Etudes S.I.B.E.: *See*—
Mennesson, Andre L., 4,175,528, Cl. 123-139.0AW.
Societe Nationale Elf Aquitaine (Production): *See*—
Bimond, Jean-Pierre; and Lazarre, Flavien, 4,175,424, Cl. 73-49.200.
Societe Nationale Industrielle Aerospatiale: *See*—
Hoffmann, Jean-Claude; Castanie, Francis; Crabere, Henri; Verdier, Jean-Pierre; and Voisin, Norbert, 4,176,399, Cl. 364-717.000.
Sokolow, Nickolas N., to Beloit Corporation. Heating and stratification method for an injection molding machine. 4,176,152, Cl. 264-329.000.
Solar Reactor Corporation: *See*—
Scragg, Robert L.; and Parker, Alfred B., 4,175,381, Cl. 60-39.120.
Solid Photography Inc.: *See*—
DiMatteo, Paul L.; Ross, Joseph A.; and Stern, Howard K., 4,175,862, Cl. 356-375.000.
Sommers, Donald J.: *See*—
DiTullio, Joseph G.; Parad, Leonard I.; and Sommers, Donald J., 4,176,330, Cl. 333-122.000.
Sonnenberger, Paul, to U.S. Philips Corporation. Circuit arrangement for supplying a protection signal for a television picture display tube. 4,176,301, Cl. 315-384.000.
Sony Corporation: *See*—
Inanaga, Kiyofumi; Egawa, Saburo; Shimizu, Akio; and Maeda, Keijiro, 4,176,249, Cl. 179-1.00E.
Inoue, Makoto, 4,176,206, Cl. 427-82.000.
Matsushita, Takeshi; Hayashi, Hisao; Aoki, Teruaki; Yamoto, Hisayoshi; and Kawana, Yoshiyuki, 4,176,372, Cl. 357-52.000.
Umeki, Nobutomo; and Sugiki, Mikio, 4,175,832, Cl. 350-285.000.
Southern, Raymond L.; and Reen, Orville W., to Allegheny Ludlum Industries, Inc. Apparatus for removing gases from particles. 4,175,921, Cl. 432-261.000.
Souza, Anthony J., to Woodstream Corporation. Padded jaw animal trap. 4,175,351, Cl. 43-90.000.
Souza, Frank F.; Silva, Vernon A.; and Cabral, Tony, to Frank F. Souza, Inc. Automatic milking machine control and cleansing. 4,175,514, Cl. 119-14.080.
Spanondis, Michael E.: *See*—
Cavalaris, Michael T.; and Spanondis, Michael E., 4,175,602, Cl. 150-3.000.
Speckman, Lawrence; and Beery, Jack, to Burroughs Corporation. Microfilm cassette module. 4,175,719, Cl. 242-197.000.
Spehrley, Charles W., Jr., to Xerox Corporation. Pneumatically controlled stapling system. 4,175,314, Cl. 29-432.100.
Speitkamp, Ludwig: *See*—
Regehr, Ulrich; Hannemann, Horst; and Speitkamp, Ludwig, 4,175,938, Cl. 55-440.000.
Sperry Rand Corporation: *See*—
Englund, Robert M., 4,176,247, Cl. 178-22.000.
Jillie, Don W., Jr., 4,176,029, Cl. 204-192.00S.
Kaminski, David G.; Fedde, Mickiel P.; and DeWard, Robert C., 4,176,394, Cl. 364-200.000.
Kroger, Harry, 4,176,365, Cl. 357-5.000.
McMahon, Donald H., 4,175,827, Cl. 350-96.140.
Nooyen, Ray E., 4,175,568, Cl. 130-27.00T.
Sipple, Ralph E., 4,176,402, Cl. 364-900.000.
Spindel, Robert C.; Porter, Robert P.; and Marquet, William M., to Woods Hole Oceanographic Institution. High resolution acoustic navigation system. 4,176,338, Cl. 367-6.00E.
Sprague, Robert B.: *See*—
Tyler, Truman V., 4,176,063, Cl. 210-101.000.
Spraycool, Inc.: *See*—
Valiant, Edgar W., 4,175,703, Cl. 239-208.000.
Sprecker, Mark A.: *See*—
Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick L.; and Vock, Manfred H., 4,175,569, Cl. 131-9.000.
Spring Chemicals Limited: *See*—
Stark, William H.; and Chu, Cheng-Hsien, 4,176,164, Cl. 423-243.000.
Squyres, Joseph S.: *See*—
Nunez, Carl W.; and Squyres, Joseph S., 4,175,778, Cl. 285-3.000.
Stadler, Istvan: *See*—
Szekely, Istvan; Tomoskozi, Istvan; Kovacs, Gabor; Simonidesz, Vilmos; Lovasz nee Gaspar, Marianna; Keresztes, Borbala nee Ordog; Remport, Julia nee Radoczi; Stadler, Istvan; Visky, Zsuzsa nee Gombos; and Szantay, Csaba, 4,176,122, Cl. 260-343.30P.
Stadter, Josef: *See*—
Stoger, Klaus; Dotzer, Richard; Stadter, Josef; and Gehring, Johann, 4,176,034, Cl. 204-200.000.
Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Piecing apparatus for an open-end spinning machine. 4,175,370, Cl. 57-263.000.
Stahlecker, Hans: *See*—
Stahlecker, Fritz, 4,175,370, Cl. 57-263.000.
Staines, Robert: *See*—
Sikli, Bert J., 4,175,644, Cl. 187-18.000.
Stalcup, Robert K.: *See*—
Sigman, Warren R.; and Stalcup, Robert K., 4,175,834, Cl. 350-310.000.
Standard Oil Company: *See*—
Aziz, Walid Y.; and Ball, Lawrence E., 4,176,095, Cl. 260-9.000.
Grasselli, Robert K.; Miller, Arthur F.; and Hardman, Harley F., 4,176,234, Cl. 562-546.000.
Standard Oil Company (Indiana): *See*—
Corns, Joseph B.; Nevitt, Thomas D.; and Hertwig, Waldemar R., 4,176,048, Cl. 208-59.000
Fox, Roy A.; and Mortimer, Bradford T., 4,176,097, Cl. 260-17.4BB.
Stapleton, John O.: *See*—
Johnson, Arven; and Stapleton, Willene, 4,176,346, Cl. 340-524.000.
Stapleton, Willene: *See*—
Johnson, Arven; and Stapleton, Willene, 4,176,346, Cl. 340-524.000.
Stark, William H.; and Chu, Cheng-Hsien, to Spring Chemicals Limited. Treatment of sulfur oxides with aqueous glyoxylic acid solutions. 4,176,164, Cl. 423-243.000.
Staubly, Ralph F.: *See*—
Engeling, Charles F.; and Staubly, Ralph F., 4,175,699, Cl. 237-55.000.
Stauffer Chemical Company: *See*—
Gutman, Arnold D., 4,176,121, Cl. 548-119.000.
Steffen, S. L.: *See*—
Steffen, Sylvester L.; and Bollwitt, Duaine L., 4,175,418, Cl. 73-342.000.
Steffen, Sylvester L.; and Bollwitt, Duaine L., to Steffen, S. L. Temperature monitoring and temperature differential control device. 4,175,418, Cl. 73-342.000.
Steinmeier, Albert. Shock-responsive activating device for emergency flasher systems of automative vehicles. 4,176,340, Cl. 340-52.00H.
Stenert, Alois: *See*—
Becker, Dieter; and Stenert, Alois, 4,175,805, Cl. 308-199.000.
Stephens, Warren J.; and Nielson, Juan F. Toilet bowl odor removing apparatus and hinge. 4,175,293, Cl. 4-209.00R.
Stern, Gernard: *See*—
Golser, Leopold; Czepel, Hubert; and Stern, Gernard, 4,176,217, Cl. 521-106.000.
Stern, Howard K.: *See*—
DiMatteo, Paul L.; Ross, Joseph A.; and Stern, Howard K., 4,175,862, Cl. 356-375.000.
Stern, Nathan, to Bobst-Champlain, Inc. Method and apparatus for conservation of energy in a thermal oxidation system for use with a printing press. 4,176,162, Cl. 423-210.000.
Stevenson, Roberts G., Jr., to Fischer & Porter Co. Chlorine dioxide analyzer. 4,176,032, Cl. 204-195.00P.
Stewart, Patrick H.; and Woodson, Wayne D., to C L Industries, Inc. Process for manufacturing sand cores or molds. 4,176,114, Cl. 260-42.290.
Stihl, Andreas: *See*—
Muller, Erich; and Kottke, Joachim, 4,175,298, Cl. 7-138.000.
Stirling, John A.: *See*—
Robertson, George H.; and Stirling, John A., 4,175,979, Cl. 106-309.000.
Stockhaus, Klaus: *See*—
Goldberg, Leon I.; Merz, Herbert; and Stockhaus, Klaus, 4,176,186, Cl. 424-260.000.
Stockwell, David L.: *See*—
Poeschl, Paul M.; and Stockwell, David L., 4,175,677, Cl. 222-5.000.
Stoger, Klaus; Dotzer, Richard; Stadter, Josef; and Gehring, Johann, to Siemens Aktiengesellschaft. Apparatus for the electrodeposition of aluminum. 4,176,034, Cl. 204-200.000
Stopka, Karel. Apparatus and method for treatment of fluid with ozone. 4,176,061, Cl. 210-63.00Z.
Storck, Eckhard: *See*—
Pekau, Dietlind; Ruell, Hartwig; Storck, Eckhard; and Kiemle, Horst, 4,175,823, Cl. 350-3.790.
Stoutamire, Donald W., to Sumitomo Chemical Company, Limited. Pesticidal α-cyanobenzyl ester enantiomer pair. 4,176,195, Cl. 424-304.000.
Stow-A-Way Trailers Limited: *See*—
Thackray, Ronald A., 4,175,768, Cl. 280-652.000.
Stowell, Donald E.: *See*—
Bendig, Larry L.; Scamehorn, John F.; and Stowell, Donald E., 4,176,171, Cl. 423-628.000.
Stoychoff, Terry A., to J. I. Case Company. Apparatus for felling and accumulating trees. 4,175,598, Cl. 144-34.00E.
Strunk, Harald. Winter sport device. 4,175,759, Cl. 280-16.000.
Sturtz, Georges; and Clement, Jean-Claude. Nylon polycondensate from diamino phosphonate. 4,176,225, Cl. 528-337.000.
Suddeutsche Kuhlerfabrik Julius Fr. Behr: *See*—
Pabst, Rolf; and Jenz, Siegfried, 4,175,616, Cl. 165-107.00D.

Sugardale Foods, Incorporated: *See—*
Vollmer, Arthur N.; and Rainey, George E., 4,176,199, Cl. 426-59.000.

Sugawara, Toru: *See—*
Komatsu, Isamu; Sugawara, Toru; and Yamauchi, Tsukasa, 4,176,288, Cl. 307-252.00A.

Sugiki, Mikio: *See—*
Umeki, Nobutomo; and Sugiki, Mikio, 4,175,832, Cl. 350-285.000.

Sugiyama, Takashi: *See—*
Seino, Kuniki; Kondo, Shoji; Tanaka, Susumu; and Sugiyama, Takashi, 4,175,955, Cl. 430-35.000.

Suh, Nam P.; Rotz, Christopher A.; and Erwin, Lewis, II, to Massachusetts Institute of Technology. Fluid mixing apparatus. 4,175,871, Cl. 366-79.000.

Sule, Sandor. Device for the braking of bicycles. 4,175,648, Cl. 188-344.000.

Sullivan, John D.: *See—*
Wojciehowski, James P.; and Sullivan, John D., 4,175,701, Cl. 239-11.000.

Sumitomo Bakelite Company Limited: *See—*
Miki, Kyosuke; and Takeuchi, Masahiro, 4,176,154, Cl. 264-547.000.

Sumitomo Chemical Company, Limited: *See—*
Itaya, Nobushige; and Hirano, Masachika, 4,176,189, Cl. 424-273.00R.
Stoutamire, Donald W., 4,176,195, Cl. 424-304.000.

Sumiyoshi, Masaharu: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Bunda, Tsuchio; and Tanaka, Taro, 4,175,523, Cl. 123-119.00A.

Summerfelt, Conrad G. Edger fan apparatus. 4,175,622, Cl. 172-14.000.

Sun Oil Company (Delaware): *See—*
Braun, Clarence; and Zupanick, Joseph E., 4,175,423, Cl. 73-30.000.

Sunahara, Kimihisa: *See—*
Sakurada, Yutaka; Sunahara, Kimihisa; and Yamauchi, Kazuhisa, 4,176,070, Cl. 210-500.00M.

Sundstrand Corporation: *See—*
Linscott, Phillip S., Jr., 4,176,242, Cl. 174-52.00H.

Sunnarborg, Earl D. Miniature electrical voltage and continuity tester with circuit compartment and test lead compartment casing. 4,176,315, Cl. 324-156.000.

Surbey, Donald L.; Clark, Alan C.; and Miller, Leonard E., to Lubrizol Corporation, The. Solutions of acrylamidoalkanesulfonic acid salts in organic liquids and method for their preparation. 4,176,081, Cl. 252-182.000.

Sury, Yel S.; and Guillory, Melvin J., Jr., to Ciba-Geigy Corporation. Process for soluble cyanide removal from wastewater streams. 4,176,060, Cl. 210-62.000.

Suter, Otto (Bo), Jr.: *See—*
Moser, Billy G.; and Suter, Otto (Bo), Jr., 4,175,658, Cl. 206-221.000.

Sutton, Richard C.: *See—*
Figueras, John; Nelson, Roger W.; and Sutton, Richard C., 4,176,008, Cl. 435-12.000.

Suzuki, Fred K.; and Davison, Thomas W., to Liquid Crystal Products, Inc. Venipuncture method. 4,175,543, Cl. 128-736.000.

Suzuki, Fumiko, to Quatic Chemicals Limited. Anti-corrosion composition for use in aqueous systems. 4,176,059, Cl. 210-58.000.

Suzuki, Isao; Yomogida, Toshihiko; and Yokota, Tsuyoshi, to Toyoda-Koki Kabushiki-Kaisha. Programmable sequence controller. 4,176,403, Cl. 364-900.000.

Suzuki, Isao: *See—*
Miyamoto, Kazuo; Suzuki, Isao; and Koide, Hideo, 4,175,373, Cl. 58-16.00D.

Suzuki, Kazuhiro: *See—*
Nakanishi, Sadao; Suzuki, Kazuhiro; Tokura, Nobufumi; and Endo, Shinichiro, 4,175,693, Cl. 235-463.000.

Suzuki, Masahiro: *See—*
Matsuura, Mitsuaki; Hidano, Tsuyoshi; and Suzuki, Masahiro, 4,175,318, Cl. 29-723.000.

Suzuki, Masami: *See—*
Inaba, Hideya; Ogiyama, Hisao; Ichiki, Masayoshi; Kamino, Yasumi; Matsumoto, Nobuo; Nagai, Kenichi; and Suzuki, Masami, 4,176,091, Cl. 252-456.000.

Suzuki, Nobuo, to Technical Incorporated. Tape machine having automatic return to playback mode after fast forward or rewind. 4,176,383, Cl. 360-105.000.

Suzuki, Ryuichi: *See—*
Hashizume, Akihide; Suzuki, Ryuichi; Yokouchi, Hisatake; Horiuchi, Hideyuki; and Yamamoto, Shinji, 4,175,859, Cl. 356-39.000.

Suzuki, Tadashi, to Sato Gosei Co., Ltd. Method for manufacturing an article stopper device. 4,176,151, Cl. 264-291.000.

Svenskt Stal Aktiebolag: *See—*
Karlsson, Per-Olle, 4,175,729, Cl. 266-51.000.

Swanson, Gerald T., to Teledyne Industries, Inc. Cigarette filters. 4,175,571, Cl. 131-171.00A.

Swarthout, David J.: *See—*
Karam, Ronald E.; and Swarthout, David J., 4,175,959, Cl. 430-134.000.

Swinland, Horace J.: *See—*
Coil, Donald A.; Johnson, John L., Jr.; and Swinland, Horace J., 4,175,801, Cl. 308-23.000.

Szantay, Csaba: *See—*
Szekely, Istvan; Tomoskozi, Istvan; Kovacs, Gabor; Simonidesz, Vilmos; Lovasz nee Gaspar, Marianna; Keresztes, Borbala nee Ordog; Remport, Julia nee Radoczi; Stadler, Istvan; Visky, Zsuzsa nee Gombos; and Szantay, Csaba, 4,176,122, Cl. 260-343.30P.

Szegho, Constantin S.: *See—*
Pakswer, Serge; and Szegho, Constantin S., 4,175,808, Cl. 316-19.000.

Szekely, Istvan; Tomoskozi, Istvan; Kovacs, Gabor; Simonidesz, Vilmos; Lovasz nee Gaspar, Marianna; Keresztes, Borbala nee Ordog; Remport, Julia nee Radoczi; Stadler, Istvan; Visky, Zsuzsa nee Gombos; and Szantay, Csaba, to Chinoin Gyogyszer es Vegyeszeti Termekek. Process for the preparation of bicyclic enone compounds. 4,176,122, Cl. 260-343.30P.

Tabata, Yoichi, to Itoki Kosakusho Co., Ltd. Automatic commodity storing apparatus. 4,175,901, Cl. 414-282.000.

Tachick, Henry N.; Arnold, Reginald S.; Belcher, James E.; and St. Jacques, Joseph A., to General Electric Company. Electrical connector switching module. 4,175,817, Cl. 339-111.000.

Tadanier, John S.: *See—*
Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, 4,176,178, Cl. 424-180.000.

Takahashi, Akira: *See—*
Nozawa, Shiyozo; Hokari, Saburo; Yamaga, Shigeru; and Takahashi, Akira, 4,175,846, Cl. 354-173.000.

Takahashi, Masao: *See—*
Hattori, Katsuhide; and Takahashi, Masao, 4,175,990, Cl. 149-21.000.

Takase, Tsuneo, to Tokyo Shibaura Electric Co., Ltd. Electronic watch having improved level setting circuit. 4,175,375, Cl. 58-23.00R.

Takata, Akira: *See—*
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,175,521, Cl. 123-119.00D.

Takeuchi, Masahiro: *See—*
Miki, Kyosuke; and Takeuchi, Masahiro, 4,176,154, Cl. 264-547.000.

Takimoto, Hiroyuki: *See—*
Iwashita, Tomonori; Takimoto, Hiroyuki; Mashimo, Yukio; and Hashimoto, Teiji, 4,175,843, Cl. 354-173.000.

Takinishi, Kiyotoshi; and Hattori, Junichi, to Rion Co., Ltd. Artificial palate for use in dynamic palatographical speech researches and improvements and method of fabricating the same. 4,175,338, Cl. 35-35.00R.

Takizawa, Masaaki: *See—*
Noguchi, Masaaki; Sanda, Shougo; and Takizawa, Masaaki, 4,175,501, Cl. 123-30.00D.

Talbot, Yorck. Electrically controllable outer rearview mirror for vehicles. 4,175,833, Cl. 350-289.000.

Tamaru, Munetaka; Kume, Kazunari; Watanabe, Minoru; Ohno, Hideshi; and Natori, Minoru, to Citizen Watch Co. Ltd. Electronic timepiece. 4,175,372, Cl. 58-5.000.

Tamm, Rolf G.; Grosser, Gunter; and Tomoff, Toma, to Bodenseewerk Perkin-Elmer & Co. GmbH. Graphite tube atomizer for flameless atomic absorption spectroscopy. 4,175,863, Cl. 356-312.000.

Tanahashi, Toshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine with an auxiliary combustion chamber. 4,175,531, Cl. 123-191.00S.

Tanaka, Fumiaki: *See—*
Kawabe, Naoshi; Kaji, Hisatsugu; Miwa, Naotaka; Nakanishi, Hajime; Tanaka, Fumiaki; and Inoue, Tatsuya, 4,175,708, Cl. 241-16.000.

Tanaka, Kiyomitsu: *See—*
Kumode, Masami, 4,175,361, Cl. 52-66.000.

Tanaka, Susumu: *See—*
Seino, Kuniki; Kondo, Shoji; Tanaka, Susumu; and Sugiyama, Takashi, 4,175,955, Cl. 430-35.000.

Tanaka, Taro: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Bunda, Tsuchio; and Tanaka, Taro, 4,175,523, Cl. 123-119.00A.

Taneda, Nobuo: *See—*
Asanuma, Akira; Taneda, Nobuo; Hasegawa, Ryozo; Jindai, Shohei; and Morishita, Toshio, 4,176,156, Cl. 422-25.000.

Taniuchi, Mamoru: *See—*
Mori, Kenji; Taniuchi, Mamoru; and Yaguchi, Shigeo, 4,176,041, Cl. 208-10.000.

Tann, David, to Electro-Mechanical Products. Linear programmer for an actuator. 4,176,264, Cl. 200-82.00E.

Tao, Fan-Sheng; and Warner, John E., to Texaco Inc. Method of assembling a settling tank. 4,175,312, Cl. 29-428.000.

Tatum, James R.; and Dayus, Barry R. Latch plate. 4,175,607, Cl. 160-1.000.

Taylor, Clifford G.: *See—*
Corfield, John R.; and Taylor, Clifford G., 4,176,231, Cl. 544-16.000.

Taylor, Gordon J. Radius rod or rocker arm bushes. 4,175,806, Cl. 308-238.000.

Taylor, Reginald S., to Taylor Woodrow Construction Limited. Joints for anchoring structures to the sea bed. 4,175,890, Cl. 405-202.000.

Taylor, Robert M.: *See—*
Buckman, John D.; Hunter, Wood E.; Pera, John D.; and Taylor, Robert M., 4,176,107, Cl. 260-29.60E.

Taylor Woodrow Construction Limited: *See—*
Taylor, Reginald S., 4,175,890, Cl. 405-202.000.

Teague, Walter D., Jr.; and Sempliner, Arthur T. Power toothbrush or the like with orbital brush action. 4,175,299, Cl. 15-22.00R.

Teague, Walter D., Jr.; and Sempliner, Arthur T. Fluid powered orbital wet sander and the like. 4,175,359, Cl. 51-170.0MT.

Technical Incorporated: *See—*
Suzuki, Nobuo, 4,176,383, Cl. 360-105.000.

Technisch Handels- en Adviesbureau van Geffen B.V.: *See—*
van Geffen, Johannes A., 4,175,413, Cl. 72-71.000.

Tega, Ezio. Machine for making decorative chains having links of at least two different shapes or sizes. 4,175,379, Cl. 59-16.000.

Teijin Limited: *See—*
Asanuma, Akira; Taneda, Nobuo; Hasegawa, Ryozo; Jindai, Shohei; and Morishita, Toshio, 4,176,156, Cl. 422-25.000.

Tekram Associates, Inc.: *See—*
Brosenius, Karl H., 4,175,698, Cl. 237-19.000.

Telcom, Inc.: *See—*
Tuttle, Lauren P.; and Dluehosh, Paul H., 4,176,254, Cl. 179-5.00R.

Teledyne Industries, Inc.: *See—*
Swanson, Gerald T., 4,175,571, Cl. 131-171.00A.

Teleflex Incorporated: *See—*
Bennett, William G., 4,175,450, Cl. 74-501.00P.

Teletype Corporation: *See—*
Heckel, George, 4,176,400, Cl. 364-900.000
Randolph, John E., 4,175,877, Cl. 400-196.000.

Tell, Benjamin: *See—*
Kasper, Horst M.; Tell, Benjamin; and Wagner, Sigurd, 4,176,170, Cl. 423-508.000.

Templeton, John S., III, to Exxon Production Research Company. Pressure sensing apparatus. 4,175,445, Cl. 73-768.000.

Tencor Instruments: *See—*
Urbanek, Karel; Kren, George J.; and Wheeler, William R., 4,175,441, Cl. 73-599.000.

Teradyne, Inc.: *See—*
Hunter, Bradley L., 4,175,821, Cl. 339-258.00R.
Wrinn, Joseph F., 4,176,312, Cl. 324-57.00N.
Wrinn, Joseph F., 4,176,313, Cl. 324-62.000.

Terai, Kiyohide; and Kutsuna, Muneharu, to Kawasaki Jukogyo Kabushiki Kaisha. Method for performing electron beam welding. 4,176,271, Cl. 219-121.0EM.

Teranishi, Katsuya: *See—*
Satou, Yoshihiko; and Teranishi, Katsuya, 4,175,652, Cl. 198-/332.000.

Termanini, Zafer A., to Zafmedico Corp. Method and apparatus for fiber-optic cardiovascular endoscopy. 4,175,545, Cl. 128-666.000.

Terminal Data Corporation: *See—*
Turner, William C.; Limburg, William R.; and Burton, John S., 4,175,855, Cl. 355-68.000.

Ternan, Marten; and Parsons, Basil I., to Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources. Process for catalytically hydrocracking a heavy hydrocarbon oil. 4,176,051, Cl. 208-112.000.

Terry, Hazle B., to United States Steel Corporation. Method and apparatus for the ultrasonic detection of flaws in hot metallic objects. 4,175,442, Cl. 73-627.000.

Teschner, Eckart; Riedel, Harald; and Sattelmeyer, Richard, to Hoechst Aktiengesellschaft. Abrasive material and process for manufacturing the same. 4,175,931, Cl. 51-297.000.

Texaco Inc.: *See—*
Johnson, Everett M., 4,175,331, Cl. 33-172.00E.
Tao, Fan-Sheng; and Warner, John E., 4,175,312, Cl. 29-428.000.
Wu, Ching H.; Brown, Alfred; Hall, Wilbur L.; and Shupe, Russell D., 4,175,618, Cl. 166-252.000.

Texas Instruments Incorporated: *See—*
Dimyan, Magid Y.; Hubbell, Wayne C.; Chang, Christopher T. M.; and Linn, John C., 4,176,404, Cl. 365-12.000.

Textron Inc.: *See—*
Moertel, George B., 4,176,149, Cl. 264-146.000.

Thacker, George H.: *See—*
Ritland, Harold N.; and Thacker, George H., 4,175,469, Cl. 89-1.00B.

Thackray, Ronald A., to Stow-A-Way Trailers Limited. Collapsible trailers. 4,175,768, Cl. 280-652.000.

Thieme, Werner: *See—*
Knoll, Ernst, 4,175,560, Cl. 128-269.000.

Thiokol Corporation: *See—*
Bell, Frank H., 4,175,470, Cl. 89-7.000.

Thistle, William G.; and Dionne, Joseph G. G., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Ultra violet initiated gas discharge visual display matrix. 4,176,297, Cl. 315-150.000.

Thomanek, Franz R., to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Warhead and anti-tank missile construction. 4,175,491, Cl. 102-56.0SC.

Thomas, James. Anti-theft device for internal combustion engine of a motor vehicle. 4,175,635, Cl. 180-287.000.

Thomas, Richard R.: *See—*
United States of America, National Aeronautics and Space Administration; Jeffers, Eldon L.; and Thomas, Richard R., 4,176,007, Cl. 435-34.000.

Thomson-Brandt: *See—*
Bricot, Claude; Dubois, Jean-Claude; LeCarvennec, Francois; Lehureau, Jean-Claude; and Magna, Henriette, 4,176,277, Cl. 250-316.100.

Thomson-CSF: *See—*
Delagebeaudeuf, Daniel, 4,176,366, Cl. 357-16.000.
Micheron, Francois; and Bruneel, Jean-Luc, 4,176,345, Cl. 340-373.000.

Thornton, William A., Jr., to Westinghouse Electric Corp. Method and device for efficiently generating white light with good rendition of illuminated objects. 4,176,294, Cl. 313-485.000.

Thornton, William A., Jr., to Westinghouse Electric Corp. Method for efficiently generating white light with good color rendition of illuminated objects. 4,176,299, Cl. 315-326.000.

Thurmond, Gary D.: *See—*
Forward, Robert L.; and Thurmond, Gary D., 4,176,331, Cl. 333-213.000.

Tiee, Joe J.: *See—*
Wittig, Curt; and Tiee, Joe J., 4,176,326, Cl. 331-94.50G.

Tiefenbacher, Eberhard, to Daimler-Benz Aktiengesellschaft. Radial turbine wheel for a gas turbine. 4,175,911, Cl. 416-183.000.

Tieke, Otto: *See—*
Dudek, Max; and Tieke, Otto, 4,176,010, Cl. 201-27.000.

Tiemann, Helmut: *See—*
Scholl, Hans; and Tiemann, Helmut, 4,175,681, Cl. 223-2.000.

Tillinghast, William S.: *See—*
Nolan, Clyde E., Jr.; and Tillinghast, William S., 4,175,620, Cl. 166-343.000.

Tipler, Earl L.: *See—*
Chaffee, David H.; and Tipler, Earl L., 4,175,800, Cl. 308-9.000.

Tippmer, Kurt: *See—*
Husher, Lee K.; Weber, Heinrich; and Tippmer, Kurt, 4,176,062, Cl. 210-72.000.

Tipton, Robert R. Lifting device. 4,175,899, Cl. 414-11.000.

Tischer, Peter; and Hundt, Eckart, to Siemens Aktiengesellschaft. Method for adjusting a semiconductor disk relative to a radiation mask in x-ray photolithography. 4,176,281, Cl. 250-492.00A.

Tobey, Frederic S. Food smoking. 4,175,484, Cl. 99-482.000.

Tobin, Joseph J.; Robinson, David B.; Peay, Robert L.; Powell, Jerry R.; and Gay, Leslie W., to Coded Communications. Electronic security device. 4,176,348, Cl. 340-562.000.

Toda, Minoru; Osaka, Susumu; and Matsumoto, Yasushi, to RCA Corporation. Signal pickup arm lifting/lowering and groove skipper apparatus. 4,176,378, Cl. 358-128.000.

Todokoro, Masatoshi. Game board. 4,175,742, Cl. 273-1.00R.

Togashi, Akira. Gathering the ends of heat-conducting pipes in heat exchangers. 4,175,308, Cl. 29-157.30C.

Tokiwa, Taisuke: *See—*
Kitamura, Takashi; Watanabe, Asao; Nakano, Takashi; Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Tokiwa, Taisuke, 4,175,851, Cl. 355-14.00R.

Tokura, Nobufumi: *See—*
Nakanishi, Sadao; Suzuki, Kazuhiro; Tokura, Nobufumi; and Endo, Shinichiro, 4,175,693, Cl. 235-463.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Aoki, Kiyoshi; and Kamo, Hisao, 4,175,317, Cl. 29-571.000.
Takase, Tsuneo, 4,175,375, Cl. 58-23.00R.
Uematsu, Yutaka, 4,176,367, Cl. 357-19.000.

Tolley, William K., to UOP Inc. Recovery of iron and titanium metal values. 4,175,952, Cl. 75-101.00R.

Tomeo, Anthony: *See—*
McMillen, James W.; and Tomeo, Anthony, 4,176,262, Cl. 200-50.0AA.

Tomoff, Toma: *See—*
Tamm, Rolf G.; Grosser, Gunter; and Tomoff, Toma, 4,175,863, Cl. 356-312.000.

Tomoskozi, Istvan: *See—*
Szekely, Istvan; Tomoskozi, Istvan; Kovacs, Gabor; Simonidesz, Vilmos; Lovasz nee Gaspar, Marianna; Keresztes, Borbala nee Ordog; Remport, Julia nee Radoczi; Stadler, Istvan; Visky, Zsuzsa nee Gombos; and Szantay, Csaba, 4,176,122, Cl. 260-343.30P.

Tonges, Gerald A.; and Elmlinger, Eugene L., to American Standard Inc. Non-copying printed document and method of printing same. 4,175,774, Cl. 283-6.000.

Toppan Printing Co., Ltd.: *See—*
Naganuma, Tsutomu; Hoshi, Hisao; Kumagai, Hiroji; and Yoshida, Kaneki, 4,175,958, Cl. 430-49.000.

Toshiba Tungaloy Co., Ltd.: *See—*
Kishinami, Tateshi; and Sato, Makoto, 4,175,896, Cl. 408-230.000.

Total Systems, Inc.: *See—*
Johnson, Ralph W.; Burrs, Emil D.; Smith, Gary L.; Freund, Ronald G.; and Patula, Edward, 4,175,674, Cl. 221-88.000.

Toth, John F.: *See—*
Fassett, Matthew; Pizette, Seymour B.; and Toth, John F., 4,176,359, Cl. 343-854.000.

Towmotor Corporation: *See—*
Palmer, Norman H. G., 4,176,388, Cl. 361-196.000.

Toyo Ink Manufacturing Co., Ltd.: *See—*
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Ihida, Kazuyoshi, 4,176,146, Cl. 525-338.000.

Toyoda-Koki Kabushiki-Kaisha: *See—*
Suzuki, Isao; Yomogida, Toshihiko; and Yokota, Tsuyoshi, 4,176,403, Cl. 364-900.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Goto, Kenji; Yokota, Masato; and Kobayashi, Hideo, 4,175,533, Cl. 123-191.00S.
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,175,521, Cl. 123-119.00D.
Katahira, Eturou; Yamaguchi, Shunzo; Kida, Masashi; and Ishida, Yasuhiko, 4,175,386, Cl. 60-276.000.
Kato, Takashi, 4,175,532, Cl. 123-191.00S.
Nogami, Tomoyuki, 4,175,791, Cl. 303-24.00A.
Noguchi, Masaaki; Sanda, Shougo; and Takizawa, Masaaki, 4,175,501, Cl. 123-30.00D.
Sanada, Masakatsu; Ito, Toshimitsu; and Nakada, Masahiko, 4,175,527, Cl. 123-136.000.

Tanahashi, Toshio, 4,175,531, Cl. 123-191.00S.
Transcale A.B.: *See—*
Odlen, Lars; and Hansson, Anders, 4,176,251, Cl. 179-1.0SW.
Trefilunion: *See—*
Bernot, Jean, 4,175,412, Cl. 72-40.000.
Tresch, Erwin: *See—*
Horvath, Zoltan; and Tresch, Erwin, 4,175,865, Cl. 356-338.000.
Triomf Fertilizers: *See—*
Jordaan, Pieter J.; and van Deventer, Jacobus P., 4,175,943, Cl. 71-29.000.
Tripler, John G., to American Fiber Velope Manufacturing Co. Expansible gusset envelope and method and apparatus for fabricating same. 4,175,478, Cl. 93-62.000.
Troll, Helmar: *See—*
Ederer, Georg; Fischer, Adolf; Rosche, Paul; Troll, Helmar; Wurst, Wolfgang; Hengl, Helmut; and Seidl, Jiri, 4,175,504, Cl. 123-52.00M.
Trutzschler GmbH & Co. KG: *See—*
Vollrath, Ulrich; and Leifeld, Ferdinand, 4,175,893, Cl. 406-52.000.
TRW Inc.: *See—*
Bianchi, Maurice P.; and Rosales, Louis A., 4,175,642, Cl. 184-1.00E.
Ewalt, Leonard J.; and Kaushal, Som N., 4,175,986, Cl. 148-16.500.
Tsubai, Yasuo: *See—*
Yoshida, Akio; Tsubai, Yasuo; and Ebato, Seigo, 4,175,965, Cl. 430-230.000.
Tsuchida, Keinosuke: *See—*
Nagata, Yukio; Satoh, Eiji; and Tsuchida, Keinosuke, 4,175,461, Cl. 84-1.150.
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Ihida, Kazuyoshi, to Nippon Oil Co., Ltd.; and Toyo Ink Manufacturing Co., Ltd. Process for producing curable coating resins. 4,176,146, Cl. 525-338.000.
Tummel, Harold. Fluid-jet drill. 4,175,626, Cl. 175-422.000.
Tureaud, Kenneth E., to Warner-Lambert Company. Complete denture prostheses and method of fitting. 4,175,322, Cl. 433-171.000.
Turner, Ronald L.: *See—*
Kindig, James K.; and Turner, Ronald L., 4,175,924, Cl. 44-15.00R.
Turner, William C.; Limburg, William R.; and Burton, John S., to Terminal Data Corporation. Electronic exposure control. 4,175,855, Cl. 355-68.000.
Tuttle, Lauren P.; and Dluehosh, Paul H., to Telcom, Inc. Emergency roadside telephone system. 4,176,254, Cl. 179-5.00R.
Tyler, Ronald A., to Marconi Company Limited, The. Apparatus for deriving information concerning the movements of a vehicle. 4,176,352, Cl. 343-9.00R.
Tyler, Truman V., to Beall, Richard W., Jr.; Sprague, Robert B.; Favara, Louis J.; and Gausewitz, Carr & Rothenberg, part interest to each. Water purifier system and valve. 4,176,063, Cl. 210-101.000.
Uchida, Toshio; Yabuta, Yorimiti; and Ikeda, Teppei, to Fuji Photo Film Co., Ltd. Method of making a lithographic printing plate. 4,175,964, Cl. 430-253.000.
Ueda, Hideo; and Sawaguchi, Hiroshi, to Fuji Photo Film Co., Ltd. Aromatic sulfonamide sulfonyl chloride compounds. 4,176,134, Cl. 260-543.00R.
Ueda, Ryoji: *See—*
Kasai, Kaname; Mukumoto, Takaji; Asakura, Toshikazu; and Ueda, Ryoji, 4,175,408, Cl. 64-26.000.
Uede, Hisashi: *See—*
Yano, Kohzo; Inami, Yasuhiko; and Uede, Hisashi, 4,175,837, Cl. 350-357.000.
Uematsu, Yutaka, to Tokyo Shibaura Electric Co., Ltd. Semiconductor optical device. 4,176,367, Cl. 357-19.000.
Umeda, Jun-ichi: *See—*
Kajimura, Takashi; Saito, Kazutoshi; Shige, Noriyuki; Nakamura, Michiharu; Umeda, Jun-ichi; and Kobayashi, Masayoshi, 4,176,325, Cl. 331-94.50H.
Umeki, Nobutomo; and Sugiki, Mikio, to Sony Corporation. Two-axis mirror control apparatus. 4,175,832, Cl. 350-285.000.
Union Carbide Corporation: *See—*
Holcombe, Thomas C., 4,176,053, Cl. 208-310.00Z.
McDonald, James A.; and Novak, Mark C., 4,175,673, Cl. 221-63.000.
Reid, Wallace G.; Saini, Rakesh; and Atkins, Kenneth E., 4,176,106, Cl. 260-29.300.
Reid, Wallace G.; Saini, Rakesh; and Atkins, Kenneth E., 4,176,216, Cl. 521-106.000.
Union Special Corporation: *See—*
Navlyt, Gerald S., 4,175,499, Cl. 112-165.000.
United States of America
Air Force: *See—*
Kuhn, Ralph F., Jr., 4,175,835, Cl. 350-310.000.
Palmer, Arlo K., 4,175,812, Cl. 339-29.00R.
Ritland, Harold N.; and Thacker, George H., 4,175,469, Cl. 89-1.00B.
Army: *See—*
Cronin, Donald L.; and Biess, John J., 4,176,392, Cl. 363-71.000.
Rybicki, Robert C., 4,175,913, Cl. 416-244.00R.
Energy: *See—*
Frumerman, Robert; and Hooper, Harold M., 4,175,929, Cl. 48-202.000.
Norris, Neil J., 4,176,285, Cl. 307-106.000.
Oden, Laurance L.; and Russell, James H., 4,175,954, Cl. 75-138.000.
Wittig, Curt; and Tiee, Joe J., 4,176,326, Cl. 331-94.50G.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Jeffers, Eldon L.; and Thomas, Richard R. Method and apparatus for eliminating luminol interference material. 4,176,007, Cl. 435-34.000.
National Aeronautics and Space Administration: *See—*
Leavy, William A.; and Griffin, Charles R., 4,176,360, Cl. 343-883.000.
Navy: *See—*
Craig, W. Dale, 4,175,720, Cl. 244-3.280.
Hazlett, Robert N., 4,176,040, Cl. 208-8.0LE.
Hsiao, James K.; and Shelton, J. Paul, 4,176,354, Cl. 343-17.700.
Konrad, William L., 4,176,339, Cl. 367-121.000.
Wilger, John F.; Nakano, Gregory S.; Uyetake, Tadao; Orillo, Stephen, Jr.; and Higa, Teikichi, 4,175,471, Cl. 408-83.500.
U.S. Philips Corporation: *See—*
de Niet, Edmond; and Rijckaert, Albert M. A., 4,176,381, Cl. 360-77.000.
Elenga, Cornelis W.; van Dijk, Pieter; and van der Zwart, Alfred J., 4,176,310, Cl. 323-7.000.
Koel, Gerrit J.; and Postma, Lambertus, 4,176,016, Cl. 204-38.00R.
Sonnenberger, Paul, 4,176,301, Cl. 315-384.000.
Van Den Berk, Peter J. T.; and Verspui, Gerrit, 4,176,336, Cl. 338-274.000.
United States Steel Corporation: *See—*
Husher, Lee K.; Weber, Heinrich; and Tippmer, Kurt, 4,176,062, Cl. 210-72.000.
Terry, Hazle B., 4,175,442, Cl. 73-627.000.
Wiesboeck, Robert A., 4,175,394, Cl. 62-51.000.
United Technologies Corporation: *See—*
Sigman, Warren R.; and Stalcup, Robert K., 4,175,834, Cl. 350-310.000.
Waehner, Glenn C., 4,176,300, Cl. 315-371.000.
Wayne, Robert J.; Chenausky, Peter P.; and Buczek, Carl J., 4,176,327, Cl. 331-94.50M.
University of Iowa Research Foundation, The: *See—*
Crowninshield, Roy D.; and Branch, Andrew J., 4,175,446, Cl. 73-787.000.
University of Virginia Alumni Patents Foundation, The: *See—*
Gainer, John L., 4,176,179, Cl. 424-180.000.
Unruh, Dennis R.; and Martin, Robert J., to Cessna Aircraft Company, The. Hydraulic stop. 4,175,914, Cl. 417-218.000.
UOP Inc.: *See—*
Antos, George J., 4,176,088, Cl. 252-441.000.
Tolley, William K., 4,175,952, Cl. 75-101.00R.
Upjohn Company, The: *See—*
Bundy, Gordon L., 4,176,282, Cl. 260-590.00C.
Knight, John C.; and Wovcha, Merle G., 4,176,123, Cl. 260-345.200.
Nelson, Norman A., 4,176,236, Cl. 568-838.000.
Urbanek, Karel; Kren, George J.; and Wheeler, William R., to Tencor Instruments. Gauge for measuring distance to planar surfaces and thicknesses of planar members. 4,175,441, Cl. 73-599.000.
Urbanietz, Josef: *See—*
Loewe, Heinz; Urbanietz, Josef; Duwel, Dieter; and Kirsch, Reinhard, 4,176,192, Cl. 424-300.000.
USM Corporation: *See—*
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Vamvakas, Michael, to Niagara Bottle Washer Mfg. Company. Label accumulator and caustic separator. 4,176,067, Cl. 210-256.000.
Van Den Berk, Peter J. T.; and Verspui, Gerrit, to U.S. Philips Corporation. Lacquer-encapsulated carbon film resistor. 4,176,336, Cl. 338-274.000.
van der Lely, Cornelis. Soil cultivating implements. 4,175,623, Cl. 172-59.000.
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van Eijk, Johannes N., to Cindu Chemie B.V. Process for preparing binder pitches. 4,176,043, Cl. 208-44.000.
van Geffen, Johannes A., to Technisch Handels- en Adviesbureau van Geffen B.V. Methods and apparatuses for forming by frictional heat and pressure holes surrounded each by a boss in a metal plate or the wall of a metal tube. 4,175,413, Cl. 72-71.000.
Van Horbek, Judd. Hand mixing apparatus. 4,175,875, Cl. 366-343.000.

van Linden, Jacques, to Electrochemische Energieconversie, N.V. Battery unit, containing one or more fuel-cell blocks. 4,176,213, Cl. 429-12.000.
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Vaughan, David E. W.; Lussier, Roger J.; and Magee, John S., Jr., to W. R. Grace & Co. Pillared interlayered clay materials useful as catalysts and sorbents. 4,176,090, Cl. 252-455.00Z.
Vaughn, Damon A.; and Hoffman, Herbert F. Sulky. 4,175,762, Cl. 280-78.000.
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Vergnani, Leo H.; Ferrero, John B.; and Cassanelli, Ernest M. Workpiece forming machine. 4,175,417, Cl. 72-356.000.
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Voll, Horst; Kessler, Franz; and Herla, Max, to Kugelfischer Georg Schafer & Co. Boring spindle with automatic tool liftoff. 4,175,802, Cl. 308-9.000.
Vollmer, Arthur N.; and Rainey, George E., to Sugardale Foods, Incorporated. Extraction of protein from edible beef bones and product. 4,176,199, Cl. 426-59.000.
Vollrath, Ulrich; and Leifeld, Ferdinand, to Trutzschler GmbH & Co. KG. Method and apparatus for feeding a carding group with pneumatic conveying system. 4,175,893, Cl. 406-52.000.
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Vulis, Mikhail L.; Golenchenko, Valery A.; Rybin, Igor V.; and Shenderovich, Pavel B., to Gosudarstvenny Nauchno-Issledovatelsky Energeticheskiy Institut Imeni G.M. Krzhizhanovskogo (ENIN). Cooled multiphase ac cable. 4,176,238, Cl. 174-15.00S.
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Waehner, Glenn C., to United Technologies Corporation. Deflection waveform generator. 4,176,300, Cl. 315-371.000.
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Wallick, Sherwin. Anti-syphon safety dispenser. 4,175,600, Cl. 141-363.000.
Walter, Kurt, to Hassia Verpackung GmbH. Process of producing a deep-drawn container. 4,175,995, Cl. 156-285.000.
Walters, Dean. Sewed seam ripper. 4,175,498, Cl. 112-129.000.
Walz, Gerd: *See—*
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Ward, Frederick D., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Guidance system using spring-stored energy. 4,175,451, Cl. 74-661.000.
Ward, Theodore W.; and Ward, Danny W. Inventory control system. 4,176,260, Cl. 235-475.000.
Waring, Wilson S., to Imperial Chemical Industries Limited. Oxyalkanoic acid derivatives. 4,176,194, Cl. 424-309.000.
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Lough, Wendell J.; and Bishop, Donald E., 4,175,936, Cl. 55-385.00A.
Weiler, Gerhard H.; Nagel, Dieter H.; and Pagels, Louis T., to Automatic Liquid Packaging, Inc. Unitary, hermetically-sealed but pierceable dispensing container. 4,176,153, Cl. 264-524.000.
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Wenzl, Josef; and Meikis, Gunter, to Motoren- und Turbinen-Union Munchen GmbH. Temperature measuring probe. 4,175,438, Cl. 73-359.00R.
Wesenmeyer, Jurgen; Haubner, Georg; and Meier, Werner, to Robert Bosch GmbH. Method and apparatus to generate a trigger pulse within a time range, particularly ignition pulses in internal combustion engines. 4,175,508, Cl. 123-117.00R.
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Westinghouse Electric Corp.: *See—*
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Chow, Kung C., 4,176,386, Cl. 361-93.000.
Driver, Michael C.; Oakes, James G.; and Davis, John R., 4,176,295, Cl. 315-39.000.
Garbuny, Max, 4,176,024, Cl. 204-157.10R.
Johnson, Joseph E.; and Dombrowski, Edward, 4,176,004, Cl. 156-643.000.
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Thornton, William A., Jr., 4,176,294, Cl. 313-485.000.
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Wheatley, Robert T.; and Kosarek, Louis J., to El Paso Environmental Systems, Inc. Method and apparatus for recovering liquid and solid constituents of water solutions containing sparingly soluble solids. 4,176,057, Cl. 210-23.00H.
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White, Anthony M., to Exxon Research & Engineering Co. Process for alkylating waxy hydrocarbons with C_3-C_5 carbon atom secondary alcohols as catalyst. 4,176,044, Cl. 208-46.000.
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Wilhelm, William E., to Lockheed Corporation. Seal for fluid ducts. 4,175,754, Cl. 277-128.000.
Wilkinson, Peter R. S., to Wilkinson Photographic Products Limited. Photographic drum processor inserts. 4,175,849, Cl. 354-329.000.
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Williams, Stanley B. Device for aligning plates to be joined. 4,175,734, Cl. 269-49.000.
Wilmes, Manfred; Finger, Torsten; Fitzler, Arno; Kretzschmar, Wolfgang; and Franke, Heinrich, to C. A. Weidmuller KG. Modular housing means for electrical and electronic components. 4,175,820, Cl. 339-198.00R.
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Wing, James W., to International Business Machines Corporation. Printer cover assembly. 4,175,878, Cl. 400-693.000.
Winkler, Bruno. Process for shirring tubular films and product thereof. 4,176,204, Cl. 426-140.000.
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Wirt, Leslie S., to Lockheed Corporation. Noise barrier. 4,175,639, Cl. 181-210.000.
Wise, Rodney M.; and Mitchell, Sharon J., to Procter & Gamble Company, The. Detergent compositions for effective oily soil removal. 4,176,080, Cl. 252-162.000.
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Wisotsky, Max J., to Exxon Research & Engineering Co. Polymer combination useful in fuel oil to improve cold flow properties. 4,175,926, Cl. 44-62.000.
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Wittig, Curt; and Tiee, Joe J., to United States of America, Energy. CF_4 laser. 4,176,326, Cl. 331-94.50G.
Wojahn, Harold F. Quick smoker. 4,175,485, Cl. 99-482.000.
Wojciehowski, James P.; and Sullivan, John D., to Garrett Corporation, The. Aircraft spraying system and method. 4,175,701, Cl. 239-11.000.
Wood, Edward H. Tool changing apparatus. 4,175,898, Cl. 409-233.000.
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Wrinn, Joseph F., to Teradyne, Inc. Analyzing electrical circuit boards. 4,176,313, Cl. 324-62.000.
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29	4,175,943
39	4,175,944
78	4,175,945
87	4,175,946
88	4,175,947
96	4,175,948

CLASS 72

40	4,175,412
71	4,175,413
96	4,175,414
101	4,175,415
254	4,175,416
356	4,175,417
383	4,175,419
447	4,175,420

CLASS 73

3	4,175,421
23	4,175,422
30	4,175,423
49.2	4,175,424
59	4,175,425
61.4	4,175,426
118	4,175,427
141 A	4,175,428
	4,175,429
	4,175,430
161	4,175,431
170 A	4,175,432
196	4,175,433
197	4,175,434
313	4,175,435
338.6	4,175,436
342	4,175,418
359 R	4,175,438
362 AR	4,175,437
425.4 R	4,175,439
432 SD	4,175,440
599	4,175,441
627	4,175,442
722	4,175,443
738	4,175,444
768	4,175,445
787	4,175,446
799	4,175,447

CLASS 74

365	4,175,448
492	4,175,449
501 P	4,175,450
661	4,175,451

CLASS 75

42	4,175,949
53	4,175,950
91	4,175,951
101 R	4,175,952
134 F	4,175,953
138	4,175,954

CLASS 76

25 R	4,175,452

CLASS 81

57.38	4,175,453

CLASS 82

86	4,175,454

CLASS 83

110	4,175,455
176	4,175,456
230	4,175,457
268	4,175,458
315	4,175,459
856	4,175,460

CLASS 84

1.15	4,175,461
1.16	4,175,462
1.19	4,175,463
1.24	4,175,464
1.26	4,175,465
288	4,175,466
312 P	4,175,467
485 SR	4,175,468

CLASS 89

1 B	4,175,469
7	4,175,470

CLASS 91

6.5	4,175,472
443	4,175,473

CLASS 92

13.5	4,175,474
33	4,175,475

CLASS 93

1 E	4,175,476
36 A	4,175,477
62	4,175,478
77 FT	4,175,479

CLASS 98

37	4,175,480
50	4,175,481

CLASS 99

330	4,175,482
354	4,175,483
482	4,175,484
	4,175,485
483	4,175,486

CLASS 100

8	4,175,487

CLASS 101

99	4,175,488
366	4,175,489

CLASS 102

23	4,175,490
56 SC	4,175,491
92.6	4,175,492
93	4,175,493

CLASS 105

176	4,175,494
450	4,175,495

CLASS 106

58	4,175,974
100	4,175,975
162	4,175,976
272	4,175,977
281 R	4,175,978
309	4,175,979

CLASS 111

1	4,175,496

CLASS 112

79 R	4,175,497
129	4,175,498
165	4,175,499
166	4,175,500

CLASS 114

227	4,175,510

CLASS 115

35	4,175,511

CLASS 116

217	4,175,512

CLASS 119

5	4,175,513
14.08	4,175,514
16	4,175,515
62	4,175,516
155	4,175,517

CLASS 122

20 B	4,175,518
510	4,175,519

CLASS 123

30 D	4,175,501
41.35	4,175,502
41.72	4,175,503
52 M	4,175,504
90.3	4,175,505
117 A	4,175,520
117 D	4,175,506
	4,175,507
117 R	4,175,508
	4,175,509
119 A	4,175,522
	4,175,523
119 D	4,175,521
122 D	4,175,524
134	4,175,525
136	4,175,526
	4,175,527
139 AW	4,175,528
140 FG	4,175,530
140 R	4,175,529
191 S	4,175,531
	4,175,532
	4,175,533
198 F	4,175,534

CLASS 124

7	4,175,535
23 R	4,175,536

CLASS 125

11 CD	4,175,537

CLASS 126

85 B	4,175,538
121	4,175,539
425	4,175,540
429	4,175,541
449	4,175,542

CLASS 128

24 R	4,175,548
	4,175,549
	4,175,550
24.4	4,175,551
32	4,175,552
78	4,175,553
79	4,175,554
92 B	4,175,555
156	4,175,557
198	4,175,556
214 C	4,175,558
218 R	4,175,559
269	4,175,560
296	4,175,561
303 R	4,175,562
350 R	4,175,564
350 V	4,175,563
654	4,175,544
666	4,175,545
680	4,175,547
692	4,175,566
736	4,175,543
739	4,175,546
748	4,175,567

CLASS 130

27 T	4,175,568

CLASS 131

9	4,175,569
84 B	4,175,570
171 A	4,175,571

CLASS 132

7	4,175,572
73.6	4,175,573
88.7	4,175,574

CLASS 134

176	4,175,575

CLASS 135

1 A	4,175,576

CLASS 136

89 FC	4,175,980
89 SJ	4,175,981
	4,175,982

CLASS 137

15	4,175,577
67	4,175,578
119	4,175,579
315	4,175,580
319	4,175,581
334	4,175,582
504	4,175,583
	4,175,584
509	4,175,585
614.11	4,175,586
625.4	4,175,588
625.64	4,175,589
625.65	4,175,587
883	4,175,590
	4,175,591

CLASS 138

89	4,175,592
110	4,175,593

CLASS 139

436	4,175,594

CLASS 141

1	4,175,595
18	4,175,596
23	4,175,597
363	4,175,600

CLASS 144

34 E	4,175,598
175	4,175,599

CLASS 145

1 R	4,175,601

CLASS 148

1.5	4,175,983
9.5	4,175,984
12.4	4,175,985
16.5	4,175,986
36	4,175,987
189	4,175,988

CLASS 149

21	4,175,990

CLASS 150

3	4,175,602
4	4,175,603
15	4,175,604

CLASS 151

7	4,175,605

CLASS 152

399	4,175,606

CLASS 156

96	4,175,991
143	4,175,992
234	4,175,993
251	4,175,994
285	4,175,995
336	4,175,996
362	4,175,997
391	4,175,998
505	4,175,999
510	4,176,000
581	4,176,001
601	4,176,002
643	4,176,004

CLASS 160

1	4,175,607
273 R	4,175,608

CLASS 162

256	4,176,005

CLASS 164

60	4,175,609
	4,175,610
418	4,175,611
449	4,175,612

CLASS 165

1 4,175,613
95 4,175,614
106 4,175,615
107 D 4,175,616
122 4,175,617

CLASS 166

252 4,175,618
291 4,175,619
343 4,175,620

CLASS 171

14 4,175,621

CLASS 172

4,175,622
59 4,175,623
4,175,624
791 4,175,625

CLASS 174

15 S 4,176,238
23 C 4,176,239
4,176,240
52 H 4,176,242
52 S 4,176,241
72 B 4,176,243
88 C 4,176,244
92 4,176,245

CLASS 175

422 4,175,626

CLASS 178

22 4,176,246
4,176,247
67 4,176,248

CLASS 179

1 E 4,176,249
4,176,253
1 G 4,176,252
1 SW 4,176,251
1 VE 4,176,250
5 R 4,176,254
16 F 4,176,255
18 FG 4,176,256
98 4,176,257

CLASS 180

6.48 4,175,628
65 R 4,175,632
119 4,175,636
128 4,175,637
140 4,175,638
190 4,175,627
220 4,175,629
225 4,175,630
270 4,175,633
274 4,175,634
287 4,175,635
309 4,175,631

CLASS 181

210 4,175,639
213 4,175,640

CLASS 182

172 4,175,641

CLASS 184

1 E 4,175,642
11 A 4,175,643

CLASS 187

18 4,175,644

CLASS 188

72.1 4,175,645
156 4,175,646
274 4,175,647
344 4,175,648

CLASS 192

18 A 4,175,649
84 C 4,175,650
85 AB 4,175,651

CLASS 194

1 C 4,175,989

CLASS 198

332 4,175,652
4,175,653
398 4,175,654
403 4,175,655
748 4,175,656
833 4,175,657

CLASS 200

1 V 4,176,261
50 AA 4,176,262
60 4,176,263
82 E 4,176,264
316 4,176,265

CLASS 201

27 4,176,010
40 4,176,011

CLASS 202

172 4,176,012
242 4,176,013

CLASS 204

23 4,176,014
28 4,176,015
38 R 4,176,016
55 R 4,176,017
60 4,176,018
67 4,176,019
72 4,176,020
96 4,176,021
98 4,176,022
4,176,023
157.1 R 4,176,024
4,176,025
4,176,026
159.14 4,175,973
159.15 4,176,027
159.16 4,176,028
159.18 4,175,972
192 R 4,176,030
192 S 4,176,029
195 P 4,176,032
195 R 4,176,031
197 4,176,033
200 4,176,034
205 4,176,035
224 R 4,176,036
243 M 4,176,037
277 4,176,038
297 W 4,176,039

CLASS 206

221 4,175,658
223 4,175,659
468 4,175,660
519 4,175,661

CLASS 208

8 LE 4,176,040
10 4,176,041
11 LE 4,176,042
44 4,176,043
46 4,176,044
48 R 4,176,045
50 4,176,046
51 4,176,047
59 4,176,048
70 4,176,049
111 4,176,050
112 4,176,051
131 4,176,052
310 Z 4,176,053

CLASS 209

8 4,176,054
152 4,176,055
552 4,175,662
610 4,175,663
657 4,175,664

CLASS 210

20 4,176,056
23 H 4,176,057
44 4,176,058
58 4,176,059
62 4,176,060
63 Z 4,176,061
72 4,176,062
101 4,176,063
196 4,176,064
223 4,176,065
241 4,176,066
256 4,176,067
295 4,176,068
321 B 4,176,069
500 M 4,176,070

CLASS 211

49 D 4,175,665
71 4,175,666

CLASS 213

40 R 4,175,667

CLASS 215

354 4,175,668

CLASS 219

10.55 A 4,176,267
4,176,268
10.55 F 4,176,266
60 A 4,176,269
121 EM 4,176,270
4,176,271
216 4,176,272
220 4,176,273
522 4,176,274

CLASS 220

5 A 4,175,669
70 4,175,670
235 4,175,671
334 4,175,672

CLASS 221

63 4,175,673
72 4,175,675
88 4,175,674
211 4,175,676

CLASS 222

5 4,175,677
54 4,175,678
70 4,175,679
465 4,175,680

CLASS 223

2 4,175,681

CLASS 224

45 S 4,175,683
309 4,175,682

CLASS 225

2 4,175,684
19 4,175,685
97 4,175,686

CLASS 226

74 4,175,687
158 4,175,688
190 4,175,689

CLASS 227

76 4,175,690

CLASS 229

36 4,175,691

CLASS 235

302 4,176,258
312 4,175,692
449 4,176,259
463 4,175,693
475 4,175,694
4,176,260

CLASS 236

1 G 4,175,695
34.5 4,175,696
93 A 4,175,697

CLASS 237

19 4,175,698
55 4,175,699

CLASS 238

299 4,175,700

CLASS 239

11 4,175,701
113 4,175,702
208 4,175,703
320 4,175,704
414 4,175,706
456 4,175,707
651 4,175,705

CLASS 241

16 4,175,708
21 4,175,709
46 R 4,175,814
55 4,175,710

CLASS 242

35.5 A 4,175,711
46.4 4,175,712
56 R 4,175,713
65 4,175,714
72.1 4,175,715
84.2 A 4,175,716
131 4,175,717
150 R 4,175,718
197 4,175,719

CLASS 244

3.28 4,175,720
83 F 4,175,721
152 4,175,722
162 4,175,723

CLASS 248

642 4,175,724

CLASS 249

81 4,175,725

CLASS 250

213 R 4,176,275
237 G 4,176,276
316.1 4,176,277
439 P 4,176,278
445 T 4,176,279
4,176,280
492 A 4,176,281

CLASS 251

315 4,175,726

CLASS 252

8.1 4,176,071
32.7 E 4,176,072
4,176,073
4,176,074
42.1 4,176,075
49.6 4,176,076
51.5 R 4,176,077
90 4,176,079
162 4,176,080
182 4,176,081
359 A 4,176,082
411 R 4,176,083
417 4,176,084
428 4,176,085
429 B 4,176,086
439 4,176,087
441 4,176,088
452 4,176,089
455 Z 4,176,090
456 4,176,091
472 4,176,092
478 4,176,093
518 4,176,094

CLASS 254

173 R 4,175,727

CLASS 260

9 4,176,095
15 4,176,096
17.4 BB 4,176,097
18 R 4,176,098
18 TN 4,176,099
22 R 4,176,100
22 T 4,176,101
28.5 AS 4,176,102
28.5 R 4,176,104
29.3 4,176,105
4,176,106
29.6 E 4,176,107
29.6 RW 4,176,103
29.6 TA 4,176,108
31.2 MR 4,176,109
31.8 N 4,176,110
37 SB 4,176,111
4,176,112
39 R 4,176,115
40 P 4,176,113
42.29 4,176,114
112.5 R 4,176,116
118 4,176,117
239 A 4,176,118
243.3 4,176,119
343.3 P 4,176,122
345.2 4,176,123
346.3 4,176,124
369 4,176,125
397.45 4,176,126
407 4,176,127
448 R 4,176,129
448.2 E 4,176,128
4,176,130
453 A 4,176,131
465.5 R 4,176,133
543 R 4,176,134
554 4,176,135
561 N 4,176,137
561 R 4,176,136
575 4,176,138
586 C 4,176,139
590 C 4,176,282
835 4,176,143

CLASS 264

25 4,176,147
41 4,176,148
146 4,176,149
168 4,176,150
291 4,176,151
329 4,176,152
524 4,176,153
547 4,176,154
564 4,176,155

CLASS 266

51 4,175,729
120 4,175,730
142 4,175,731
213 4,175,732

CLASS 267

126 4,175,733

CLASS 269

49 4,175,734
4,175,735
88 4,175,736
91 4,175,728
317 4,175,737

CLASS 270

30 4,175,738
58 4,175,739
83 4,175,740

CLASS 271

3.1 4,175,741

CLASS 273

1 E 4,175,743
1 R 4,175,742
26 E 4,175,744
73 C 4,175,745
85 R 4,175,746
101.2 4,175,747
4,175,748
106.5 B 4,175,749
157 R 4,175,750

CLASS 274

13 R 4,175,751

CLASS 277

53 4,175,752
87 4,175,753
128 4,175,754
137 4,175,755
189 4,175,756
212 F 4,175,757
220 4,175,758

CLASS 280

16 4,175,759
4,175,760
47.18 4,175,761
78 4,175,762
104 4,175,763
284 4,175,764
460 A 4,175,765
608 4,175,766
610 4,175,767
652 4,175,768
654 4,175,769
668 4,175,770
696 4,175,771
718 4,175,772
803 4,175,773

CLASS 283

6 4,175,774
7 4,175,775
8 B 4,175,776
42 4,175,777

CLASS 285

3 4,175,778
115 4,175,779

CLASS 290

52 4,176,283

CLASS 292

201 4,175,780
218 4,175,781
307 R 4,175,782

CLASS 296

20 4,175,783
137 E 4,175,784
4,175,785

CLASS 297

254 4,175,786
484 4,175,787

CLASS 299

1 4,175,788
4 4,175,789
7 4,175,790

CLASS 303

24 A 4,175,791
37 4,175,792
89 4,175,793
105 4,175,794
118 4,175,795

CLASS 305

11 4,175,796
53 4,175,797
58 R 4,175,798

CLASS 307

10 BP 4,176,284
106 4,176,285
237 4,176,286
251 4,176,287
252 A 4,176,288
270 4,176,289
306 4,176,290

CLASS 308

9 4,175,799
4,175,800
4,175,802
4,175,803
23 4,175,801
26 4,175,804
199 4,175,805
238 4,175,806

CLASS 310

52 4,176,291
4,176,292

CLASS 312

118 4,175,807

CLASS 313

343 4,176,293
485 4,176,294

CLASS 315

39 4,176,295
71 4,176,296
150 4,176,297
169.2 4,176,298
326 4,176,299
371 4,176,300
384 4,176,301
397 4,176,302
400 4,176,303
411 4,176,304

CLASS 316

19 4,175,808

CLASS 318

616 Re.30,161
653 4,176,305
772 4,176,306
798 4,176,307

CLASS 323

4 4,176,308
4,176,309
7 4,176,310

CLASS 324

57 N 4,176,312
62 4,176,313
140 D 4,176,314
156 4,176,315
468 4,176,311

CLASS 325

32 4,176,316
62 4,176,317
133 4,176,318
138 4,176,319
308 4,176,320
325 4,176,321
369 4,176,322

CLASS 330

263 4,176,323

CLASS 331

94.5 G 4,176,326
94.5 H 4,176,325
94.5 M 4,176,327
94.5 T 4,176,324

CLASS 332

16 T 4,176,328

CLASS 333

28 T 4,176,329
122 4,176,330
213 4,176,331
218 4,176,332

CLASS 336

60 4,176,333
84 C 4,176,334
180 4,176,335

CLASS 338

274 4,176,336

CLASS 339

1 L 4,175,809
17 C 4,175,810
19 4,175,811
29 R 4,175,812
36 4,175,813
61 R 4,175,815
95 R 4,175,816
111 4,175,817
176 M 4,175,819
176 MP 4,175,818
198 R 4,175,820
258 R 4,175,821
266 R 4,175,822

CLASS 340

52 H 4,176,340
147 LP 4,176,341
166 R 4,176,342
286 R 4,176,343
347 DA 4,176,344
373 4,176,345
524 4,176,346
545 4,176,347
562 4,176,348
613 4,176,349
648 4,176,350

CLASS 343

9 R 4,176,351
4,176,352
12 A 4,176,353

17.7 4,176,354
18 C 4,176,355
100 CS 4,176,356
112 R 4,176,357
782 4,176,358
854 4,176,359
883 4,176,360

CLASS 346

1.1 4,176,361
20 4,175,378
74.1 4,176,362
140 R 4,176,363
162 4,176,364

CLASS 350

3.79 4,175,823
8 4,175,824
34 4,175,825
36 4,175,826
96.14 4,175,827
132 4,175,829
140 4,175,828
157 4,175,830
255 4,175,831
285 4,175,832
289 4,175,833
310 4,175,834
4,175,835
357 4,175,836
4,175,837
4,175,838

CLASS 351

14 4,175,839

CLASS 352

141 4,175,840

CLASS 354

5 4,175,841
23 D 4,175,842
31 4,175,843
110 4,175,844
173 4,175,845
4,175,846
187 4,175,847
289 4,175,848
329 4,175,849

CLASS 355

13 4,175,850
14 R 4,175,851
35 4,175,852
38 4,175,853
54 4,175,854
68 4,175,855
4,175,856
73 4,175,857
99 4,175,858

CLASS 356

4 4,175,365
39 4,175,859
4,175,860
153 4,175,861
312 4,175,863
326 4,175,864
338 4,175,865
375 4,175,862

CLASS 357

5 4,176,365
16 4,176,366
19 4,176,367
22 4,176,368
24 4,176,369
30 4,176,370
38 4,176,371
52 4,176,372

CLASS 358

37 4,176,373
51 4,176,374
92 4,176,375
107 4,176,376
128 4,176,377
4,176,378
280 4,176,379

CLASS 360

50 4,176,380
77 4,176,381
95 4,176,382
105 4,176,383
121 4,176,384

CLASS 361

58 4,176,385
93 4,176,386
154 4,176,387
196 4,176,388

CLASS 362

5 4,176,389
72 4,176,390
390 4,176,391

CLASS 363

71 4,176,392
125 4,176,393

CLASS 364

200 4,176,394
420 4,176,395
551 4,176,396
561 4,176,397
607 4,176,398
717 4,176,399
900 4,176,400
4,176,401
4,176,402
4,176,403

CLASS 365

12 4,176,404
15 4,176,405
148 4,176,406

CLASS 366

2 4,175,866
9 4,175,867
4,175,868
42 4,175,869
76 4,175,870
79 4,175,871
139 4,175,872
165 4,175,873
182 4,175,874
343 4,175,875

CLASS 367

6 E 4,176,338
121 4,176,339
131 4,176,337

CLASS 400

124 4,175,876
196 4,175,877
693 4,175,878

CLASS 401

287 4,175,879

CLASS 402

48 4,175,880

CLASS 403

13 4,175,881
347 4,175,883
353 4,175,884

CLASS 404

77 4,175,885
90 4,175,886

CLASS 405

25 4,175,887
31 4,175,888
43 4,175,882
195 4,175,889
202 4,175,890
291 4,175,891

CLASS 406

35 4,175,892
52 4,175,893

CLASS 408

1 R 4,175,894
83.5 4,175,471
228 4,175,895
230 4,175,896

CLASS 409

233 4,175,898
300 4,175,897

CLASS 414

11 4,175,899
282 4,175,901
339 4,175,902
408 4,175,903
421 4,175,904
462 4,175,905
469 4,175,906
715 4,175,907
786 4,175,908
787 4,175,900

CLASS 415

145 4,175,909

CLASS 416

8 4,175,910
183 4,175,911
193 A 4,175,912
244 R 4,175,913

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

July 3, 1979.

Patent and Trademark Office Study of Court Determinations of Patent Validity/Invalidity, 1973–1977

The Patent and Trademark Office has prepared a summary of the past five years (1973–1977, inclusive) of patent litigation in the Courts of Appeals (CA), District of Courts (DCt), and Court of Claims (CtCl), including:

(1) The number and identification of cases and patents litigated; and

(2) the holdings and rate of patent validity, invalidity and infringement.

The information was extracted from the compiled notices filed in the Patent and Trademark Office by clerks of courts under the provisions of 35 U.S.C. 290, and from the reported decisions appearing in the *United States Patent Quarterly, Federal Second and Federal Supplement.*

The results of the study and of the similar study conducted for the period 1968–1972 are set forth in the accompanying table.

Court Determinations of Validity/Invalidity 1968–1972 and 1973–1977*

	1968–1972				1973–1977			
	Patents Held		Percent Invalid	Infringed	Patents Held		Percent Invalid	Infringed
	Valid	Invalid			Valid	Invalid		
Court of Appeals:								
Utility	78	173	69	64	53	137	72	51
Design	0	8	100	0	2	4	67	2
Reissue	3	9	75	3	6	13	68	6
Plant	0	0	0	0	7	0	0	7
Total	81	190	70	67	68	154	69	66
District Court:								
Utility	247	135	35	503	187	170	48	321
Design	17	9	35	45	7	15	68	34
Reissue	6	14	70	6	7	4	36	16
Plant	0	0	0	1	1	0	0	1
Total	270	158	37	555	202	189	48	372
Court of Claims:								
Utility	17	8	32	17	16	12	43	11
Design	0	0	0	0	0	0	0	0
Reissue	0	1	100	0	1	1	50	0
Plant	0	0	0	0	0	0	0	0
Total	17	9	35	17	17	13	43	11
Grand Total	368	357	49	639	287	356	55	449

*This table compares data for 1973–1977 with data for 1968–1972 which were previously published in 144 Patent, Trademark & Copyright Journal at F-1 (Sept. 13, 1973). The methodology of the two studies is the same—the validity or invalidity of a given patent has been determined by tabulating the holding of the highest court in which the litigation was conducted and such holdings were made in each five year period. Where two or more courts concurred in holding the same patent valid or invalid, that patent was counted as valid or invalid only once in each five year period. Consequently, no attempt should be made to add tabulated data for 1973–1977 to similar tabulated data for 1968–1972 to obtain overall tabulated data for 1968–1977. Inasmuch as some holdings of validity or invalidity at the District Court level in 1968–1972 were duplicated (either affirmed or reversed) at the Court of Appeals level in 1973–1977, such an attempt to add tabulated data would result in some patents being counted twice in the 10 year period.

Explanatory Remarks

In the interest of clarity and elimination of any misconception as to the meaning and interpretation of the data tabulated above, the following explanation is offered.

Number of Patents: The number of individual patents litigated during the 1973–1977 five year period, in which the suit was terminated by dismissal, consent judgment, summary judgment, or holdings of validity, invalidity, injunction, etc., was approximately 2,017 (2,025 in 1968–1972). Of those, the number of patents in which there was judgment of validity, invalidity or infringement totalled 876[1] (989 in 1968–1972)

For reference purposes, it is noted that during this five year period, the Patent and Trademark Office issued approximately 382,000 patents. The percentage of patents litigated (2,017) with respect to the total number of patents issued over this five year period is 0.53%. Further, the number of patents issued by the Patent and Trademark Office covering the time span from the earliest reported litigated patent included in this study (#2,129,332) to the latest reported litigated patent included in the study (#3,995,102) is approximately 1,865,000. The percentage of patents litigated (2,017) with respect to this number is 0.011%.

Patents Held Valid or Invalid: Methods of calculation of validity data vary. For instance, the data may be (a) inclusive of each individual court holding of validity or invalidity, (b) limited to holdings within each of the judicial circuits, (c) restricted to a single holding representing the final adjudication of the patent's validity, or (d) directed only to the decisions of the appellate courts.

[1] Excluded from that number are: (1) awards of priority for or against patentees in interference proceedings; (2) nine patents in which invalidity was predicated on collateral estoppel (*Blonder-Tongue Laboratories, Inc. v. Univ. of Illinois Foundation*, 402 U.S. 313 (1971)) resulting from an adjudication of invalidity occurring prior to January 1, 1973; (3) reported holdings of validity (three) or invalidity (one) rendered by state courts; and (4) holdings of validity (four) by the International Trade Commission.

In this study, the validity or invalidity of a given patent has been determined by tabulating the result of decision of the highest court in which the litigation was conducted and such holdings were made. Where two or more courts concurred in holding the same patent valid or invalid, that patent was counted as valid or invalid only once. In the rare instances where conflicting decisions on validity by coordinate tribunals have occurred, the patent was counted as invalid. It was noted that many court opinions and § 290 notices did not print out whether all, or only some, of the claims of a patent were held valid or invalid. Where it was observed that the court held only some claims of a given patent invalid and made no explicit findings of validity with respect to the remaining claims, the patent was counted as invalid, notwithstanding the presumption of validity accorded the remaining claims by 35 U.S.C. 282 and with full recognition that the resultant statistics would be biased unfavorably toward invalidity as a result. Where a court did explicitly hold some claims valid and other claims invalid, the patent was counted as valid, inasmuch as the patent remains in force with valid claims therein. A consent judgment of validity or invalidity, where denominated as such in the § 290 notice, was counted as a holding of validity or invalidity.[2] However, infringement and injunction holdings, without any mention of validity, were *not* presumed or counted as holdings of validity.

Rate of Patent Invalidity: The term "rate of patent invalidity" appears to have no recognized definite meaning. Such rate may be calculated as a percentage of total patents litigated or only as a percentage of those litigated patents having a holding of validity or invalidity. The latter base has been employed in this study.

It is to be stressed that there is no evident link between the characteristics of the litigated patents which caused them to be litigated and the characteristics of the remaining unlitigated patents which would justify the conclusion that the rate of invalidity noted above can be extrapolated to, or is in any way representative of, the total patent universe.

Infringement: Instances of infringement are not always indicated in the report of the courts' decisions. Often there is no explicit holding that a claim is infringed, although such conclusion would be implicit because the court enjoined the defendant from making, using or selling certain devices. Accordingly, in the absence of any countervailing information, an injunction has been counted as a holding of infringement for statistical purposes. The number of individual patents held to be infringed totalled approximately 449, compared to 540 in the period of 1968–1972.[3]

[2] The number of consent judgments of validity totalled approximately 50, and there was one consent judgment of invalidity.

[3] For the period 1968–1972, the infringement tabulations appearing in the table correspond to holdings of infringement, i.e., many patents were held—and counted—as infringed more than once. In contrast, for the period 1973–1977, a given individual patent held infringed more than once was counted as infringed only once.

Discussion

The Patent and Trademark Office views this study as far more comprehensive and accurate than studies heretofore undertaken which have examined merely, for the most part, reported decisions of the Courts of Appeals. Those previous studies are included as a bibliography to this study.

It is to be noted that the percentage of litigated patents held invalid by the Courts of Appeals (69%) in the five year period 1973–1977 covered by this study corresponds closely to the invalidity percentages found by the other authors and studies mentioned in the bibliography for the period 1940–1972, including the 70% rate found by the previous PTO study for the period 1968–1972. However, the inclusion in this study of unappealed and unreported judgments of the District Courts to obtain a resultant total rate of patent invalidity of approximately 55% places the entire litigated patent validity/invalidity picture in better perspective.

Nevertheless, certain inadequacies in the information available from the 35 U.S.C. 290 notices could result in potentially erroneous statistics even in this study. In that connection, it was found that the notices submitted under 35 U.S.C. 290 had the following defects:

(1) Notices of decisions rendered were not filed in *every* case;[4]

[4] On many occasions, the existence and result of District Court litigation conducted in 1973–1977 was discovered only on reading a later-reported appellate court decision and opinion.

(2) When filed, the notices were not necessarily submitted promptly; and

(3) The data in the notices were incomplete, and, in many instances, incorrect. For example, mere notations of dismissal, which were often indiscriminately employed in the § 290 notices, were found to stand for holdings of validity or invalidity upon comparison with any reported decisions corresponding to those § 290 notices.

A particularly serious problem appears to have developed with respect to 35 U.S.C. 290 notices filed by clerks of the U.S. Circuit Courts of Appeals. Few notices of decision rendered in the Circuit Courts have been received by the Patent and Trademark Office and published in the Official Gazette in the period 1973–1977. Only the 6th Circuit Court of Appeals and, to a lesser degree, the 1st Circuit Court of Appeals, have more or less consistently filed such notices with the Office. That factor, coupled with an increasing tendency by the Federal Courts in general since 1973 to decide litigation accompanied by an unpublished opinion,[5] gives reason for concern with respect to the completeness and accuracy of the data tabulations which have been gathered largely from reported decisions of the Courts of Appeals.

[5] For example, the published decision and opinion of the District Court in *Azoplate Corp. v. Silverlith, Inc.*, 367 F. Supp. 711, 180 USPQ 616 (D.Del. 1973) (concerning which the Office received notice under § 290) was affirmed, 506 F. 2d 1050, 184 USPQ 577 (3rd Cir. 1974) without published opinion and without apparent notice to the Office of the Circuit Court's decision. For purposes of this study, no attempt was made to "Shepardize" reported or unreported District Court decisions involving nearly 400 patents to determine whether a Circuit Court decision in the same case appears in a table of unpublished decisions and opinions.

Additionally, it may be noted that a summary limited to a "five year" period involves certain factors that give an incorrect impression. Thus, aside from the obvious effects of subsequent appeals, a dismissal in one suit (within the five year period) subsequent to, or prior to, a final adjudication of the same patent's validity, or invalidity, in another suit (outside the five year period) has significance different from that of a dismissal in the absence of any other decision. In other words, the complete history of the patent is necessary to a proper appreciation of the patent's validity or invalidity.

Bibliography

(1) Baum, "The Federal Courts and Patent Validity: An Analysis of the Record," 56 JPOS 758 (December 1974).

(2) Bjorge and Beha, "Patent Validity/Invalidity Study," Policy Planning Staff Project 73–2, Patent and Trademark Office, U.S. Dept. of Commerce, April 3, 1974.

(3) Chognard, "Patent Litigation and Validity," 41 JPOS 291 (1959).

(4) Dearborn et al., *Encyclopedia of Patent Practice and Invention Management* (Calvert), page 22, et seq. examined 734 adjudicated patents in the circuit courts from 1953–63.

(5) Federico, "Adjudicated Patents 1948–54," 38 JPOS 233, 244, reported on adjudications from 1925–54.

(6) Gausewitz, "Brief in Support of Proposed Amendment to Section 103, Title 35, Patents, U.S. Code," 51 JPOS 290 (May 1969).

(7) Horn et al., "The Federal Courts' View of Patents—A Different View," 55 JPOS 134 (March 1973) studied 597 adjudicated patents from January 1961 through December 1970.

(8) Koenig, dissertation submitted in partial fulfillment of requirements for S. J. D. degree, New York University Law School, December 1971. She studied adjudications of 854 patents from 1953–67.

(9) Koenig, *Patent Invalidity: A Statistical and Substantive Analysis*, C. Boardman Co., Ltd.: New York, 1974).

(10) Moxon, "Patent Invalidity Study," unpublished, January 17, 1973, examined 284 adjudicated patents in the period 1967–71.

(11) Senate Report No. 167, 90th Congress, 1st Session examined validity of 46 patents before *Graham* v. *John Deere*, 383 U.S. 1 (1966) and 38 patents subsequent to *Graham*.

(12) Tegtmeyer, "For Greater Patent Validity," American University Law Review, Vol. 19, No. 1 (December 1969) studied 869 adjudicated patents from 1953–68.

(13) U.S. Patent Office, *Further Studies on Patent Validity/Invalidity on a Circuit-by-Circuit Basis*, 1968–1972, 165 Patent, Trademark & Copyright J. at D–1 (Feb. 14, 1974).

(14) U.S. Patent Office, *Patent Office Study of Court Determinations of Validity/Invalidity*, 1968–1972, 144 Patent, Trademark & Copyright J. at F–1 (Sept. 13, 1973).

See also Howard T. Markey, "The Status of the U.S. Patent System-Sans Myth, Sans Fiction," 59 JPOS 164 (March 1977), who summarizes the results found by some of the above authors or studies, and includes additional bibliography.

Additional Information

For additional information concerning the Patent and Trademark Office's 1973–1977 study, contact Mr. Gerald H. Bjorge, 703–557–3584.

Date: Nov. 1, 1979.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

Re. 29,786, Re. S.N. 062,573, Filed Jul. 31, 1979, Cl. 334/86, COMBINED 82-POSITION UHF AND VHF TELEVISION TUNER WITH MEMORY FINE TUNING, Morton L. Weigel, Owner of Record: *Sarkes Tarzian, Inc., Bloomington, Ind.,* Attorney or Agent: Richard D. Mason, et al., Ex. Gp.: 256

3,062,536, Re. S.N. 066,883, Filed Aug. 16, 1979, Cl. 271/195, SHEET STRIPPING APPARATUS, John Rutkus, Jr., et al., Owner of Record: *Haloid Xerox Inc., Rochester, N.Y.,* Attorney or Agent: Harvey M. Brownrout, et al., Ex. Gp.: 313

3,347,691, Re. S.N. 066,884, Filed Aug. 16, 1979, Cl. 427/20, XEROGRAPHIC DEVELOPMENT, James M. Lyles, Owner of Record: *Xerox Corporation, Rochester, N.Y.,* Attorney or Agent: Harvey M. Brownrout, et al., Ex. Gp.: 162

3,378,276, Re. S.N. 056,181, Filed Jul. 10, 1979, Cl. 280/43.23, HYDRAULICALLY OPERATED DEMOUNTABLE RUNNING GEAR WITH DIAGONAL RAMS, George M. Fulmer, Owner of Record: *Geichner Mobile Systems, a division of The Union Corporation, Verona, Pa.,* Attorney or Agent: Martin Fleit, et al., Ex. Gp.: 316

3,578,827, Re. S.N. 069,319, Filed Aug. 24, 1979, Cl. 308/5, ARRANGEMENT FOR PROVIDING PRECISE MOVEMENT, Joseph E. Smith, Owner of Record: *Excellon Industries, Torrance, Calif.,* Attorney or Agent: Richard F. Carr, et al., Ex. Gp.: 243

3,601,379, Re. S.N. 069,189, Filed Aug. 23, 1979, Cl. 266/192, COOLING STRUCTURE FOR A METALLURGICAL FURNACE, Karl-Heinz Langlity, et al., Owner of Record: *Demag Aktiengesellschaft, Duisburg, Germany,* Attorney or Agent: David Toren, et al., Ex. Gp.: 111

3,755,715, Re. S.N. 058,011, Filed Jul. 16, 1979, Cl. 361/120, LINE PROTECTOR HAVING ARRESTER AND FAIL-SAFE CIRCUIT BYPASSING THE ARRESTER, Milton A. Klayum, et al., Owner of Record: *Reliable Electric Company, Franklin Park, Ill.,* Attorney or Agent: Richard R. Trexler, et al., Ex. Gp.: 212

3,756,212, Re. S.N. 932,453, Filed Aug. 10, 1978, Cl. 123/148 E, ARRANGEMENTS FOR ELECTRONICALLY DETERMINING AND ADJUSTING THE IGNITION TIME OF AN INTERNAL COMBUSTION ENGINE, Gunter Schirmer, et al., Owner of Record: *Robert Bosch G.m.b.H., Stuttgart, Germany,* Attorney or Agent: Michael J. Striker, et al., Ex. Gp.: 340

3,869,182, Re. S.N. 068,780, Filed Aug. 22, 1979, Cl. 308/187.2, BALL BEARING, Nils Bertil Glifberg, Owner of Record: *Svenska Sockerfabriks Aktiebolaget, Malmo, Sweden,* Attorney or Agent: Joseph A. DeGrandi, et al., Ex. Gp.: 243

3,903,665, Re. S.N. 957,516, Filed Nov. 3, 1978, Cl. 52/171, HEAT ENERGY TRANSMISSION CONTROL PANEL, David C. Harrison, Owner of Record: *Inventor,* Attorney or Agent: George M. Schwab, Ex. Gp.: 350

3,915,501, Re. S.N. 070,934, Filed Aug. 29, 1979, Cl. 299/67, MOUNTING ARRANGEMENT FOR IMPACT ROCK-BREAKER, Delwin E. Cobb, et al., Owner of Record: *Caterpillar Tractor Co., Peoria, Ill.,* Attorney or Agent: Ralph E. Walters, et al., Ex. Gp.: 354

3,936,566, Re. S.N. 070,711, Filed Aug. 29, 1979, Cl. 428/323, PRESSURE SENSITIVE RECORD MATERIAL EMPLOYING DIARYL ALKANE SOLVENTS, Atsushi Sato, et al., Owner of Record: *Nippon Petrochemicals Co., Ltd., Tokyo, Japan,* Attorney or Agent: Arnold B. Christen, et al., Ex. Gp.: 164

3,937,865, Re. S.N. 969,363, Filed Dec. 14, 1978, Cl. 428/413, REINFORCED PLASTICS CARRIER FOR PRINTED CIRCUITS, Hendrik Jongetjes, Owner of Record: *Papierfabrieken Van Gelder Zonen N.V., Amsterdam, Netherlands,* Attorney or Agent: John P. Snyder, et al., Ex. Gp.: 160

4,030,213, Re. S.N. 067,362, Filed Aug. 17, 1979, Cl. 36/30 R, SPORTING SHOE, Alexander C. Daswick, Owner of Record: *Inventor,* Attorney or Agent: Vernon D. Beehler, et al., Ex. Gp.: 353

4,033,846, Re. S.N. 053,530, Filed Jun. 28, 1979, Cl. 204/247, APPARATUS FOR GAS COLLECTION IN ALUMINIUM SMELTING FURNACES, Arne Engesland, Owner of Record: *Lista OG Mosjoen Aluminiumverk, Elkem Aluminum A/S & Co., Oslo, Norway,* Attorney or Agent: William D. Lucas, et al., Ex. Gp.: 114

4,047,607, Re. S.N. 070,457, Filed Aug. 28, 1979, Cl. 400/208, ARTICULATED RIBBON-GUIDING STRUCTURE, Frederick P. Willcox, Owner of Record: *Inventor,* Attorney or Agent: William D. Hall, et al., Ex. Gp.: 337

4,049,962, Re. S.N. 069,235, Filed Aug. 23, 1979, Cl. 250/202, LINE EDGE FOLLOWER, George H. Kallen, Owner of Record: *Union Carbide Corporation, New York, N.Y.,* Attorney or Agent: Harrie M. Humphreys, et al., Ex. Gp.: 252

4,057,977, Re. S.N. 085,436, Filed Oct. 25, 1979, Cl. 62/324, REVERSE CYCLE HEAT PUMP CIRCUIT, Leo B. Chambless, Owner of Record: *General Electric Company, Louisville, Ky.,* Attorney or Agent: Frederick P. Weidner, et al., Ex. Gp.: 344

4,066,659, Re. S.N. 065,873, Filed Aug. 13, 1979, Cl. 260/326.13 F, METHOD OF PREPARATION OF 3-(3-CARBOXY-4-HYDROXYPHENYL)-4,5-DIHYDRO-2-PHENYLBENZ (E)INDOLE AND VALUABLE INTERMEDIATES RELATED THERETO, Richard C. Effland, Owner of Record: *American Hoechst Corporation, Bridgewater, N.J.,* Attorney or Agent: Henry W. Koster, Ex. Gp.: 122

4,075,341, Re. S.N. 032,205, Filed Apr. 23, 1979, Cl. 424/258, 2-SUBSTITUTED PHENYL-5-TRIAZOIS [5,1-A] ISOQUINOLINE COMPOUNDS, Amedeo Omodei-Sale, et

al., Owner of Record: *Gruppo Lepetit S.P.A., Milan, Italy,* Attorney or Agent: Richard G. Waterman, et al., Ex. Gp.: 125

4,095,061, Re. S.N. 068,474, Filed Aug. 20, 1979, Cl. 200/48 KB, GROUP OPERATED CIRCUIT DISCONNECT APPARATUS FOR OVERHEAD ELECTRIC POWER LINES, Ronald P. Bridges, Owner of Record: *Inventor,* Attorney or Agent: Ernest A. Wegner, et al., Ex. Gp.: 241

4,099,120, Re. S.N. 055,625, Filed Jul. 9, 1979, Cl. 324/158 P, PROBE HEAD FOR TESTING PRINTED CIRCUIT BOARDS, Akin Aksu, Owner of Record: *Inventor,* Attorney or Agent: Francis A. Utecht, et al., Ex. Gp.: 252

4,101,830, Re. S.N. 50,695, Filed Jun. 21, 1979, Cl. 324/158 F, MERCURY PROBE, John H. Greig, Owner of Record: *MSI Electronics Inc., Woodside, N.Y.,* Attorney or Agent: Paul S. Martin, Ex. Gp.: 252

4,104,780, Re. S.N. 063,754, Filed Aug. 6, 1979, Cl. 29/107, METHOD AND SYSTEM FOR TIGHTENING JOINT ASSEMBLY, Jerry A. Sigmund, Owner of Record: *SPS Technologies, Inc., Jenkintown, Pa.,* Attorney or Agent: Aaron Nerenberg, et al., Ex. Gp.: 321

4,105,514, Re. S.N. 064,651, Filed Aug. 7, 1979, Cl. 114/204, PROCESS FOR ELECTROLYSIS IN A MEMBRANE CELL EMPLOYING PRESSURE ACTUATED UNIFORM SPACING, David D. Justice, et al., Owner of Record: *Olin Corporation, New Haven, Conn.,* Attorney or Agent: Bruce E. Burdick, et al., Ex. Gp.: 114

4,106,476, Re. S.N. 068,711, Filed Aug. 22, 1979, Cl. 126/140, DOOR FOR FIREPLACE SCREEN, Robert W. Harsha, Owner of Record: *Pacific Fence & Wire Co., Portland, Oreg.,* Attorney or Agent: Daniel P. Chernoff, et al., Ex. Gp.: 345

4,159,914, Re. S.N. 068,927, Filed Aug. 23, 1979, Cl. 136/89 TF, PHOTOVOLTAIC CELL, John F. Jordan, et al., Owner of Record: *Photon Power, Inc., El Paso, Tex.,* Attorney or Agent: Edmund F. Bard, et al., Ex. Gp.: 114

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PATENT NOTICES

Certificates of Correction for the Week of Dec. 4, 1979

D. 251,848	4,114,928	4,151,616	4,163,710
D. 252,504	4,115,072	4,151,844	4,164,215
3,616,058	4,115,348	4,152,200	4,164,334
3,887,813	4,115,383	4,152,511	4,164,352
3,888,693	4,116,929	4,152,959	4,164,378
3,899,210	4,117,371	4,153,164	4,164,449
3,919,327	4,118,425	4,153,203	4,164,560
3,967,492	4,118,435	4,153,831	4,165,014
3,969,196	4,119,194	4,153,975	4,165,217
3,978,457	4,119,646	4,154,154	4,165,552
4,001,926	4,121,660	4,155,829	4,165,820
4,004,284	4,121,958	4,155,927	4,165,831
4,004,936	4,124,707	4,156,194	4,166,040
4,015,645	4,127,846	4,157,585	4,166,139
4,028,354	4,128,604	4,157,846	4,166,151
4,029,961	4,130,509	4,158,072	4,166,270
4,032,536	4,131,069	4,158,124	4,166,303
4,049,574	4,134,993	4,158,504	4,166,614
4,054,948	4,135,245	4,158,982	4,166,653
4,061,569	4,137,802	4,159,267	4,166,722
4,061,845	4,138,325	4,159,318	4,166,776
4,064,810	4,138,466	4,159,488	4,166,781
4,066,591	4,138,734	4,160,039	4,166,968
4,067,004	4,138,992	4,160,131	4,167,103
4,070,117	4,139,125	4,160,243	4,167,311
4,072,451	4,139,292	4,160,995	4,167,330
4,074,172	4,142,904	4,161,221	4,167,379
4,075,262	4,142,973	4,161,281	4,167,561
4,081,470	4,144,554	4,162,029	4,167,566
4,086,144	4,145,734	4,162,453	4,167,817
4,092,867	4,145,828	4,162,600	4,167,818
4,096,130	4,146,528	4,162,662	4,167,823
4,096,769	4,146,805	4,162,741	4,168,186
4,100,385	4,147,585	4,162,906	4,168,414
4,103,385	4,149,952	4,163,022	4,168,419
4,110,128	4,150,243	4,163,261	4,168,677
4,110,760	4,151,199	4,163,341	4,168,930
4,111,395		4,163,598	4,169,779

Disclaimers

3,519,674.—*Yael Arad, Moshe Levy* and *Haim Rosen,* Tel Aviv, and *David Vofsi,* Rehovoth, Israel. HYDRODIMERIZATION OF ACRYLIC ACID DERIVATIVES. Patent dated July 7, 1970. Disclaimer filed May 24, 1979. by the assignee, *U.C.B., Societe Anonyme.*

Hereby enters this disclaimer to all claims of said patent.

3,547,975.—*Yael Arad,* Tel Aviv, *Moshe Levy* and *David Vofsi,* Rehovoth and *Haim Rosen,* Ramat Gan, Israel, PROCESS FOR THE HYDRODIMERIZATION OF ACRYLIC ACID DERIVATIVES. Patent dated Dec. 15, 1970. Disclaimer filed May 24, 1979, by the assignee, *U.C.B., Societe Anonyme.*

Hereby enters this disclaimer to all claims of said patent.

3,674,998.—*Hanspeter Benz,* Santa Clara County, Calif. METHOD AND APPARATUS FOR AUTOMATIC PHASE CONTROL IN A FOURIER ANALYZED READ-OUT OF IMPULSE RESONANCE DATA. Patent dated July 4, 1972. Disclaimer filed Sept. 18, 1978, by the assignee, *Varian Associates, Inc.*

Hereby enters this disclaimer to all claims of said patent..

Disclaimer and Dedication

3,488,041.—*Russell A. Powell* and *Jack Hyde,* Pittsburgh, Pa. BLAST FURNACE STOVE. Patent dated Jan. 6, 1970. Disclaimer and Dedication filed Oct. 3, 1979, by the assignee, *Koppers Company, Inc.*

Hereby disclaims and dedicates to the Public the remainder of the term of said patent.

National Technical Information Service

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Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator, National Technical Information Service.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Branch, General Service Division, Federal Bldg., Agricultural Research Service Hyattsville, Md. 20782

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U.S. DEPARTMENT OF COMMERCE
National Technical Information Service, Office of Government Inventions and Patents Springfield, Va. 22161

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National Institutes of Health, Chief, Patent Branch Westwood Bldg., Bethesda, Md. 20205

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA Code GP–2, Washington, D.C. 20546

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Patent 4,146,332. Spectrometer With Electronic Readout. Filed Apr. 19, 1977. Patented Mar. 27, 1979. Not available NTIS.

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Assistant General Counsel for Patent Matters—NASA Code GP–2, Washington, D.C. 20546

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U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St. S.W., Washington, D.C. 20324

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U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research Code 302, Arlington, Va. 22217

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Patent application 6–037,795. VLF Capacitor Corona Detection. Filed May 10, 1979.

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Patent application 6–044,431. Improved Power Factor Control System for AC Induction Motors. Filed June 1, 1979.

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Patent 4,154,084. Coal-Shale Interface Detection. Filed Nov. 3, 1977. Patented May 15, 1979. Not available NTIS.

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Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 736-0795
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	St. Louis Public Library	(314) 241-2288 Ext. 214
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	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
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	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 3, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-1-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.; Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	11-13-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	2-5-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	5-30-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	4-13-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	5-19-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-5-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-31-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-1-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	12-12-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-17-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	10-13-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	11-30-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-4-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	7-10-78

Expiration of patents: The patents within the range of numbers indicated below expire during November 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,061,833 to 3,066,301, inclusive
Plant Patents..... Numbers 2,189 to 2,197, inclusive

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DEFENSIVE PUBLICATIONS

PUBLISHED DECEMBER 4, 1979

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawing, contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T989,001
HYDROGEN DONOR SOLVENT EXTRACTION OF COAL

Everett Gorin, San Rafael, Calif., assignor to Continental Oil Company, Stamford, Conn.

Filed Dec. 14, 1978, Ser. No. 969,615
Int. Cl.² C10G *1/00, 1/06*
U.S. Cl. 208—8 LE
1 Sheets Drawing. 12 Pages Specification

A coal liquefaction process is provided in which a hydrogen donor solvent is used to at least partially liquefy the coal. The process is maintained in hydrogen donor solvent balance by treatment of products obtained in the course of the coal liquefaction process. The required balance is achieved by catalytically hydrocracking a selected portion of the relatively high boiling distillable components obtained by intensive extraction of the coal. The underlying premise is that the high boiling components of a deeply extracted coal include hydrogen donor solvents or hydrogenatable precursors thereof which may be selectively recovered by solvent fractionation to yield the desired aromatic hydrocarbons for such solvent or precursor.

T989,002
SOLVENT MAKEUP IN HYDROGEN TRANSFER EXTRACTION

Everett Gorin, San Rafael, Calif., assignor to Continental Oil Company, Stamford, Conn.

Filed Dec. 14, 1978, Ser. No. 969,616
Int. Cl.² C10G *1/00, 1/06*
U.S. Cl. 208—8 LE
1 Sheets Drawing. 15 Pages Specification

A coal liquefaction process is provided in which a hydrogen donor solvent is used in the liquefaction of the coal. The process is designed to maintain the hydrogen donor solvent in balance by hydrogenation of the spent hydrogen donor solvent and precursors of the hydrogen donor solvent which are generated in steps of the overall liquefaction process. The principal sources of the desired hydrogenatable precursors are a solids-free and benzene insolubles-free portion of the coal extract, and particularly the coker distillates generated by coking a non-distillable hydrocracked fraction of said solids-free and benzene insolubles-free portion.

T989,003
SOLVENT MAKEUP IN SOLVENT EXTRACTION OF COAL

Everett Gorin, San Rafael, Calif., assignor to Continental Oil Company, Stamford, Conn.

Filed Dec. 14, 1978, Ser. No. 969,750
Int. Cl.² C10G *1/00, 1/06*
U.S. Cl. 208—8 LE
1 Sheets Drawing. 14 Pages Specification

A coal liquefaction process is provided in which a hydrogen donor solvent is used to at least partially liquefy the coal. The process is maintained in hydrogen donor solvent balance by treatment of selected products obtained in the course of the coal liquefaction process. The required balance is achieved by a series of inter-related operations performed on a hydrofined portion of a solids-free fraction of the coal extract. The inter-related operations include the recovery of an aromatic hydrocarbon-rich portion from the solids-free fraction by selective recovery from the solids-free fraction and from the products of a catalytic cracking operation wherein the remaining portion of the solids-free fraction is used as a feedstock. The aromatic hydrocarbon-rich portion boils within the range of the hydrogen donor solvent, and serves as makeup solvent for the required maintenance of solvent balance.

T989,004
HYDROGEN TRANSFER SOLVENT EXTRACTION OF COAL

Everett Gorin, San Rafael, Calif., assignor to Continental Oil Company, Stamford, Conn.

Filed Dec. 14, 1978, Ser. No. 969,752
Int. Cl.² C10G *1/00, 1/06*
U.S. Cl. 208—8 LE
1 Sheets Drawing. 14 Pages Specification

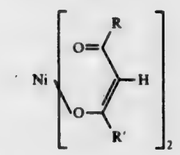
A coal liquefaction process is provided in which a hydrogen donor solvent is used in the liquefaction of the coal. The process is designed to maintain the hydrogen donor solvent in balance by hydrogenation of the spent hydrogen donor solvent and selected precursors of the hydrogen donor solvent which are generated in selected steps of the overall liquefaction process. The principal sources of the desired hydrogenatable precursors are a hydrogenated solids-free and benzene insolubles-free portion of the coal extract, and particularly the coker distillates generated by coking a non-distillable hydrocracked fraction of said hydrogenated solids-free and benzene insolubles-free portion.

T989,005
NICKEL ORGANIC COMPOSITIONS TO IMPROVE DYEABILITY OF POLYMERS

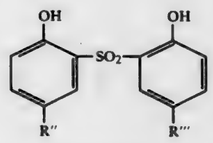
Robert W. Murray, Lebanon, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 21, 1979, Ser. No. 12,978
Int. Cl.² D06P *5/00*
U.S. Cl. 526—4
No Drawing. 17 Pages Specification

Nickel organic compositions prepared from a nickel salt of a 1,3-diketone of the formula



wherein R and R′ are independently C_1–C_8 alkyl; and sulfonyl dialkylphenols of the formula



wherein R″ and R‴ are independently C_1–C_{12} alkyl are used to provide polymer compositions which have improved dyeability after exposure to high temperatures. Preferably, the nickel salt of acetyl-acetone and 2,2′-sulfonylbis-(4-t-octylphenol) are reacted together and the polymer is a polyolefin. Most preferably, the polyolefin is polypropylene.

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PATENTS

GRANTED DEC. 4, 1979

ERRATA

For CLASS	See PATENT NO.
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433–119	4,176,454
409–125	4,176,585
430–308	4,176,602
171–028	4,176,750
270–071	4,176,833
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406–128	4,176,885
430–494	4,177,071
430–302	4,177,072
430–188	4,177,073
430–286	4,177,074
435–125	4,177,106
435–176	4,177,107
435–074	4,177,108
435–024	4,177,109
548–212	4,177,191
549–064	4,177,193
585–253	4,177,217
585–379	4,177,218
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585–505	4,177,220
525–244	4,177,221
525–432	4,177,222
427–117	4,177,308

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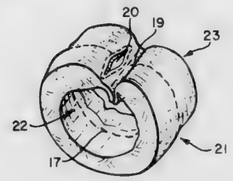
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PATENTS

GRANTED DECEMBER 4, 1979

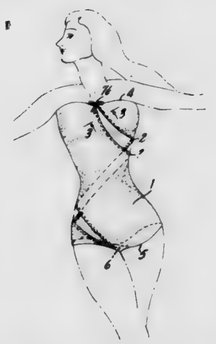
GENERAL AND MECHANICAL

4,176,407
HITTING MITT
Bert Goebel, 5466 Granada Way, and Leo Perez, 5321 Ogan Rd., both of Carpinteria, Calif. 93013
Filed Apr. 10, 1978, Ser. No. 894,743
Int. Cl.[2] A41D *13/ 3*
U.S. Cl. 2—20 4 Claims



1. A hitting mitt including a generally rectangular shaped pad; a cloth covering encasing said pad, said pad and cloth covering being folded about a transverse fold line mid-way of the rectangular shaped pad to form a tube shape; and stitching means securing the pad and cloth in said tube shape, said tube shape having opposite end openings and including a hole formed through the side wall of the tube shape, whereby a person can insert either his right or left hand into one of the end openings and orient said tube shape so that his thumb can extend through said hole with his fingers extending out the opposite end opening, the pad covering both the palm and back of his hand.

4,176,408
GARMENTS FORMED OF HELICALLY COILED PIECES
Harry R. de Polo, 480 Park Ave., New York, N.Y. 10022
Continuation-in-part of Ser. No. 770,034, Feb. 18, 1977, Pat. No. 4,097,933. This application Jul. 3, 1978, Ser. No. 921,180
Int. Cl.[2] A41D *7/00*
U.S. Cl. 2—69 11 Claims



1. A body-type garment comprising a strip of material having side edges and inclined upper and lower end edges defining at least approximately a parallelogram shape, string passages extending at least along said side edges, said strip being coiled into helical form with side edges of adjacent convolutions adjacent one another, string extending through said string passages and means for drawing said string taut and securing it to hold said side edges of adjacent convolutions adjacent one another.

4,176,409
KNIT CAP WITH MULTIPLE LAYER CONSTRUCTION AND PROCESS OF MAKING SAME
Allen D. Everitt, Milwaukee, Wis., assignor to Allen D. Everitt Knitting Company, Milwaukee, Wis.
Filed Jul. 15, 1977, Ser. No. 816,035
Int. Cl.[2] A42B *1/04*
U.S. Cl. 2—173 5 Claims



1. In a multi-layer knitted cap formed of a knitted tubular piece having an initial unfolded length and initial opposite open ends, the tubular piece also including a first tightly knitted gathered area equally spaced between the initial opposite open ends, the improvement comprising:

a second tightly knitted gathered area located between the first tightly knitted area and one of the initial opposite ends, said second tightly knitted area being located nearer to the first tightly knitted area than to the one initial opposite end;

a third tightly knitted gathered area located between the first tightly knitted area and the other one of the initial opposite ends, said third tightly knitted area being symmetrically and oppositely located with said second tightly knitted area relative to the first tightly knitted area;

a first fold line defined by the first tightly knitted area and along which the entirety of the initial unfolded length is folded upon itself, thereby defining a once-folded length of the tubular piece in which said second and third tightly knitted areas are located in general registry with each other and the initial opposite ends are also located in general registry with each other;

a second fold line located between the registry of the initial opposite ends and the registry of said second and third tightly knitted areas and along which the entirety of the once-folded length is folded upon itself, thereby defining a twice-folded length of the tubular piece in which said second and third tightly knitted areas are still located in general registry with each other;

a closed end defined by the initial opposite ends and said first fold line joined in general registry therein;

an open end spaced from said closed end and peripherally bounded by said second fold line;

first and second inner layers folded on themselves about said second fold line;

first and second outer layers folded on themselves and on said first and second inner layers with said first outer layer

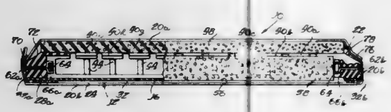
forming the outside surface of said cap and said second outer layer forming the inside surface of said cap; and

whereby said second tightly knitted area extends circumferentially about said first outer layer and said third tightly knitted area extends circumferentially about said second outer layer and in general registry with said second tightly knitted area.

4,176,410
SPORT GOGGLE

Jan H. Matthias, Greispinzgau, Austria, assignor to Carrera International Corporation, Norwood, N.J.

Filed Jun. 2, 1978, Ser. No. 912,023
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 7716671[U]
Int. Cl.² A61F 9/02
U.S. Cl. 2—436 **13 Claims**



1. A goggle comprising a generally rectangular flexible frame having a normally planar configuration when not being worn and being bendable to conform to the wearer's head when worn, said frame being of sufficient longitudinal length to extend across the wearer's face proximate the wearer's eyes when worn and defining a substantially rectangular opening of sufficient area to permit viewing therethrough by both of the wearer's eyes,

a lens mounted on said frame within said opening and having a peripheral edge surface fully engaged by said frame when mounted thereon with the lens covering substantially the full area of said opening,

a pair of flexible straps each of which is secured to an opposite end of said frame so as to extend generally longitudinally therefrom, said straps having mutually cooperable securing means thereon facilitating attachment of the free ends of said straps together around the wearer's head at a desired tightness thereabout, said straps being of sufficient length and transverse width to overlie said opening when said straps are folded, one forwardly and one rearwardly, about said frame so as to protect the lens,

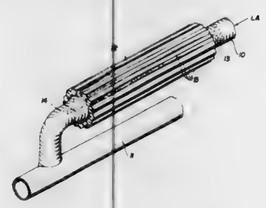
and means located substantially at each end of said frame for cooperation with an end of the strap secured to the opposite frame end so as to releasably retain said straps in said folded lens protecting positions.

4,176,411
CARDIAC ASSIST DEVICE EMPLOYING ELECTRICALLY STIMULATED ARTIFICIAL MUSCLE

Thomas M. Runge, 2501 Galewood Pl., Austin, Tex. 78703

Filed Nov. 28, 1977, Ser. No. 855,219
Int. Cl.² A61F 1/24; A61M 1/03
U.S. Cl. 3—1.7 **9 Claims**

9. An artificial muscle comprising an elastomer matrix, electromagnets embedded within said matrix and adapted to be energized by remote induction means coupled with coils of the electromagnets, particles of magnetically attractable material dispersed within said matrix in spaced relationship to one another and to said electromagnets, said artificial muscle elastomer matrix formed of multiple connected rod-like segments in side-by-side relationship, a plurality of series connected axially arranged spaced electromagnets embedded centrally in each rod-like segment, and a multiplicity of said magnetically



attractable particles disposed in surrounding relationship to the electromagnets in each rod-like segment.

4,176,412
URINE COLLECTION DEVICE

James J. Peterson, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Sep. 15, 1978, Ser. No. 942,524
Int. Cl.² E03D 13/00
U.S. Cl. 4—144.1 **7 Claims**

1. A device for collecting the mid-stream portion of a urine discharge, comprising:

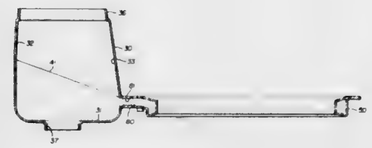
a receptacle having a lower wall and a side wall defining a cavity, said receptacle having an upper rim defining an opening communicating with the cavity; and

a protective member comprising a retaining portion having an inner circumferential flange and an outer circumferential flange connected by an upper edge to said inner flange, with said inner and outer flanges being spaced from each other a distance approximately equal to the thickness of the receptacle rim such that said inner and outer flanges define an annular groove to snugly receive the container rim, and with said retaining portion having a generally U-shape in cross-section and defining an upper portion of the protective member in the region of the receptacle rim, said protective member having an outwardly flared skirt depending from said outer flange and extending around at least a substantial portion of the receptacle and being closely spaced from the receptacle sidewall when the receptacle rim is received in the retaining groove, with said skirt having a lower edge extending around the receptacle sidewall beneath said retaining portion of the protective member, said protective member having an outwardly directed handle to facilitate manipulation of the device.

4,176,413
UNITARY, INTEGRAL PLASTIC TANK AND RIM FOR A TOILET, AND METHOD FOR MAKING SAME

Thomas M. Whitney, Lapeer, and Samuel C. Crosby, Ann Arbor, both of Mich., assignors to Trayco, Inc., Lapeer, Mich.

Division of Ser. No. 801,506, May 31, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 914,315
Int. Cl.² E03D 1/24; B29C 17/07, 17/10
U.S. Cl. 4—300 **4 Claims**



1. In a method of forming an integral, unitary toilet tank and rim flush which is free of any joints, the steps of:

downwardly extruding an essentially tubular elongated parison of thermoplastic material, the parison being thinner at the top due to the weight of the parison and due to that portion of the parison being hotter as a result of its being extruded last;

positioning the tubular thermoplastic parison between the opened sections of a blow mold, each of said sections including (a) a first, generally planar surface having a central, generally oval-shaped raised region circumscribed by a pinch line for blanking out an opening in the blown part and a depression circumscribing the pinch line for forming a rim flush and (b) an essentially planar inclined portion sloping away from the first planar surface, including a cavity for forming a portion of the tank, opposed inclined minor pinch lines blending into a pinch line which is essentially parallel with the plane of the first mold surface, and an essentially semi-cylindrical indent extending between the tank cavity and the depression in the first surface;

closing the blow mold sections and thereby: (a) enclosing the thicker, bottom parison portion within a tank cavity formed by the respective partial tank cavities of the mold sections, (b) pinching the parison shut along essentially concentric oval-lines and enclosing the top parison portion within an annular mold rim cavity, and (c) enclosing the intermediate parison portion within an essentially cylindrical cavity interposed between the rim cavity and the tank cavity; and

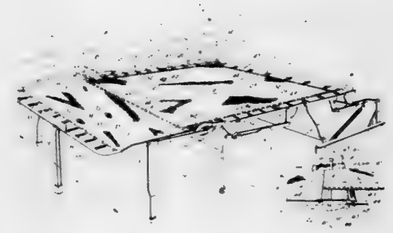
introducing blow air under pressure into the interior of the parison portion within the tank cavity, and flowing a portion of the blow air through a restricted parison portion in the cylindrical cavity and then to the parison portion in the rim cavity to expand the thicker parison portion into contact with the tank cavity walls, to force the intermediate parison portion against the cylindrical cavity and to expand the thinner parison portion into contact with the rim cavity walls, with said thicker portion of the parison within the tank cavity being stretched and expanded to a greater extent than the other portions of the parison.

4. The product formed by the method as defined in claim 1.

4,176,414
SOFA-SLEEPER

Ronald E. Wright, Jasper, Mo.; Ronald J. Kennedy, Ennis, Tex., and Sidney A. Hiatt, Joplin, Mo., assignors to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Mar. 27, 1978, Ser. No. 890,366
Int. Cl.² A47C 17/13
U.S. Cl. 5—13 **7 Claims**



1. An improved sofa-sleeper structure comprising

a bed frame having a front bed frame section, an intermediate bed frame section, and a rear bed frame section, said front, intermediate, and rear sections being pivotable relative one to the other between a folded sofa attitude and a flat bed attitude,

a cloth front deck fixed to said front deck section, said cloth front deck being connected with the foot rail of said front deck section by a plurality of springs,

a cloth rear deck fixed to said rear deck section, said cloth rear deck being connected with the side rails of said rear deck section by a plurality of springs,

at least one stitch line fixedly connecting said cloth front deck to said cloth rear deck, said stitch line being disposed generally transverse to the longitudinal axis of said bed frame, and constituting the only direct connection between said front and rear cloth decks,

a tensioning device including a cloth flap connecting said intermediate deck frame section with the rear edge of said cloth front deck such that said tensioning device induces tension in said cloth front deck in a longitudinal direction relative to the longitudinal axis of the bed frame when said sofa sleeper structure is in the folded sofa attitude, and said tensioning device induces no tensioning in said cloth front deck when said sofa sleeper structure is in the bed attitude,

a one-piece mattress positioned in overlying fashion on said cloth front deck and said cloth rear deck when said bed frame is in the bed attitude, said mattress being doubled over onto itself between said front deck and said rear deck when said bed frame is in the sofa attitude, and

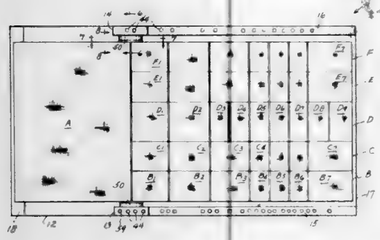
connector means connecting said one-piece mattress to said cloth front deck, and connecting said mattress to said cloth rear deck, around at least a portion of the periphery of said mattress, said connector means functioning to generally stabilize said mattress in position relative to said bed frame as said bed frame is translated between the sofa and bed attitudes, said connector means locating said mattress in general bed position when said bed frame is moved from the sofa attitude to the bed attitude for minimizing re-positioning of said mattress on said bed frame prior to use, and said connector means also locating said mattress in sofa position when said bed frame is in the sofa attitude for minimizing undue stress on said linkage structure as said mattress, bed frame and linkage is moved from the bed attitude to the sofa attitude.

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4,176,415
LOUNGE WITH ARTICULATED SIDE-BY-SIDE INDEPENDENTLY ADJUSTABLE LONGITUDINAL SECTIONS

Evelyn C. Dickerson, 415 N. Ireland St., Burlington, N.C. 27215, and Ronald B. Jones, 901 Sixth St., SW., Washington, D.C. 20024

Filed Mar. 31, 1978, Ser. No. 892,164
Int. Cl.[2] A47C *21/00*
U.S. Cl. 5—66 13 Claims

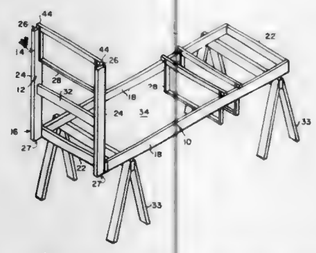


1. A furniture article comprising a base support, an angularly adjustable main forward section pivoted to said base support for rotation on a main fixed transverse horizontal axis, means to lock said forward section in an adjusted angular position, a plurality of side-by-side rearwardly extending longitudinal additional sections independently pivoted to said base support for rotation on said main transverse horizontal axis, means to lock said additional sections in independently adjusted angular positions, wherein said additional longitudinal sections each comprises a plurality of hinged segments, means to lock the segments in angularly adjusted positions relative to each other, and means for independently releasing the last-named segment angular position locking means.

4,176,416
BEE FRAME CADDY

William C. Brittingham, 199 Finnegan's La., North Brunswick, N.J. 08902

Filed Sep. 26, 1977, Ser. No. 836,298
Int. Cl.[2] A01K *51/00*
U.S. Cl. 6—12 R 9 Claims

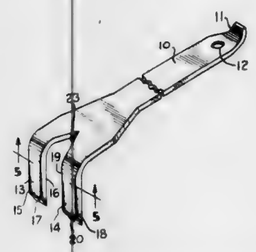


1. A bee frame caddy for extrahive beekeeping operations comprising:
(a) a holding rack having two side bars and two end bars, joined end to end in an open rectangular configuration, defining a central rectangular opening in said rack, said side bars having top surfaces, said rack being dimensioned to receive bee frames and to permit said frames to hang from and be supported by the top surfaces of said side bars; and
(b) at least one upright inspection support having an upper end and a lower end and comprising at least two substantially parallel upright bars having top surfaces and bottom surfaces and at least one cross bar attached to and joining said upright bars, said upper end of the inspection support having an opening dimensioned to receive a bee frame and to permit said frame to hang from and be supported by the top surfaces of said upright bars, said upright inspection support being affixed in a substantially perpendicular fashion, to said holding rack.

4,176,417
ROTARY-TILLER TINE CLEANING TOOL

Glen T. Ruff, Rte. 1, Box 27, DeValls Bluff, Ark. 72041

Filed Jul. 3, 1978, Ser. No. 921,641
Int. Cl.[2] B26B *11/00*
U.S. Cl. 7—161 10 Claims



1. A tool for removing debris from a rotary soil tiller, said tool comprising:
a single piece of inflexible material having an elongate intermediate flat bar portion and first and second end portions projecting therefrom;
the first end portion being curved to define a hook extending rearwardly from said intermediate portion;
the second end portion being bifurcated and defining a pair of coplanar cutting blades extending forwardly in spaced relationship from said intermediate portion;
each of said blades having four linearly extending sides defining in transverse cross section a quadrangle of which two of the enclosed angles are acute angles, the linear junctures of the sides defining the acute angles being disposed respectively along the innermost and outermost lateral margins of each of said blades; and
the projection of said blades being equal in magnitude and at least three times the spacing therebetween.

4,176,418
APPARATUS FOR AUTOMATIC INFLATION OF DIVER FLOTATION MEANS

Lawrence S. Scott, 3570 Columbia St., Seal Beach, Calif. 90740

Filed Nov. 14, 1977, Ser. No. 851,041
Int. Cl.[2] B63C *9/24*
U.S. Cl. 9—313 8 Claims

1. Apparatus for automatic inflation of diver flotation means, said apparatus comprising:
a source of air under pressure;
inflatable flotation means; and
control means connecting said source and said flotation means, including regulator means operative to convert the air pressure of said source to a lower first pressure, and further including valve means automatically operative to apply said first pressure to said flotation means in response

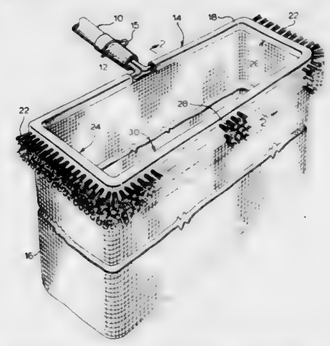


to reduction of the air pressure of said source to a predetermined reserve pressure.

4,176,419
SWIMMING POOL CLEANING DEVICE

Malcolm D. MacDonald, 46 Dogwood Crescent, Scarborough, Ontario, Canada (M1P 3N6)

Filed Aug. 22, 1978, Ser. No. 936,574
Int. Cl.[2] E04H *3/20*
U.S. Cl. 15—1.7 7 Claims



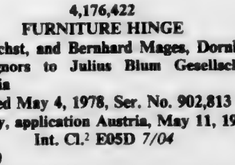
1. A swimming pool cleaning device comprising:
an elongated handle;
a frame attached to one end of the handle, said frame defining an aperture;
flexible strainer means attached to and closing the aperture defined by said frame;
brush elements protruding laterally outwardly from said frame.

4,176,420
SURFACE TREATING PAD

David J. Magid, Doylestown, Pa., assignor to Cello Chemical Company, Warrington, Pa.

Filed Jul. 3, 1978, Ser. No. 921,526
Int. Cl.[2] A47L *13/07*; B21F *45/00*
U.S. Cl. 15—230 1 Claim

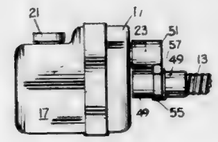
1. A pad adapted to be attached to a rotary buffing machine or the like for treating surfaces such as floors comprising, in combination, a substantially planar, disc-shaped rigid core member of stainless steel wire mesh having a top surface and a bottom surface and a marginal edge, a continuous narrow thin ribbon of stainless steel having a width between approximately 1/16 to ¼ inches and of helical configuration to provide continuous coils extending throughout its length, said ribbon being wound successively and alternately over said core member top and bottom surfaces in random directions diametrically in a plurality of wraps extending around said marginal edge, portions of said wound ribbon being randomly distributed in overlying relationship to form a circular sponge-like mass with said core member disposed centrally within said mass.



4,176,421
SUDS-MAKING AND APPLYING KIT FOR CONVERTING UPRIGHT VACUUM SWEEPERS TO RUG SHAMPOOERS

Thomas E. Baird, 2132 N. 24th St., Springfield, Ill. 62702

Filed Sep. 25, 1978, Ser. No. 945,447
Int. Cl.[2] A47L *11/34*
U.S. Cl. 15—320 7 Claims



1. In an upright vacuum sweeper converted into a rug-type shampooer (1) by having its rotary-brush-type suction-nozzle replaced by a shampooer unit, (2) by having its dust bag replaced by a suds-maker operatively connected to the air-discharge port of said sweeper and including a suds-discharge nipple, and (3) by having a flexible hose interconnecting said suds-maker and said shampooer unit, the suds-maker end of said flexible hose having a frictionally coupling resilient sleeve easily removably engageable over said nipple, the improvement comprising: a suds-flow-stopping cap engageable over and frictionally retainable on said nipple, said cap being attached to said sleeve, whereby loss or replacement of said cap is prevented and whereby the suds-maker end of said hose can by said cap be fastened against flopping during shampooing motions.

4,176,422
FURNITURE HINGE

Erich Röck, Höchst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Hochst, Austria

Filed May 4, 1978, Ser. No. 902,813
Claims priority, application Austria, May 11, 1977, 3349/77
Int. Cl.[2] E05D *7/04*
U.S. Cl. 16—130 2 Claims

1. A hinge for connecting together two furniture parts, said hinge comprising:
an elongated mounting plate adapted to be attached to a first furniture part along a mounting plane;
said mounting plate having a first longitudinal end adapted to be adjacent and facing a second furniture part when said mounting plate is attached to the first furniture part, said first end of said mounting plate having therein a longitudinally extending T-shaped recess defined by surfaces extending in directions longitudinally of said mounting plate and parallel to said mounting plane;

said mounting plate having a second longitudinal end spaced from said first longitudinal end and adapted to face away from the second furniture part when said mounting plate is attached to the first furniture part, said mounting plate having therein, at a position adjacent said second longitudinal end, an internally threaded bore extending transverse to said mounting plane;

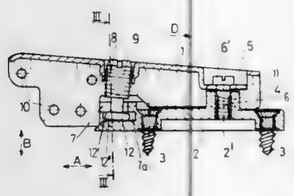
an elongated hinge arm mounted on said mounting plate;

said hinge arm having a first longitudinal end adapted to be adjacent and facing the second furniture part when said hinge arm is mounted on said mounting plate, said first longitudinal end of said hinge arm having therein bearing means for supporting hinge link axles to extend in support directions parallel to said mounting plane and transverse to said surfaces;

said hinge arm having a second longitudinal end spaced from said first longitudinal end of said hinge arm and adapted to face away from the second furniture part when said hinge arm is mounted on said mounting plate, said second longitudinal end of said hinge arm having therein a longitudinally extending slot;

said hinge arm having therein, at a position between said first and second longitudinal ends thereof, an internally threaded bore;

a fastening screw extending through said slot and being threaded into said bore in said mounting plate, such that upon loosening said fastening screw the relative longitudinal position of said hinge arm with respect to said mounting plate may be selectively adjusted;



a joint-adjusting screw having a threaded portion and an enlarged head portion, said threaded portion being threaded into said bore in said hinge arm, said enlarged head portion being longitudinally slidably received in said T-shaped recess of said mounting plate, such that relative rotation of said threaded portion of said joint-adjusting screw with respect to said bore in said hinge arm will change the relative spacing between said first longitudinal end of said hinge arm and said mounting plate; and

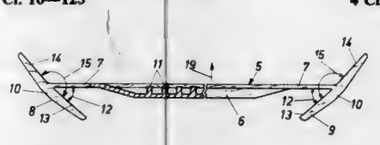
said enlarge head portion having a first surface facing away from said threaded portion and a second portion facing toward said threaded portion, said first surface comprising a conical surface diverging outwardly toward said threaded portion, said second surface comprising a truncated conical surface diverging outwardly away from said threaded portion, and said bore in said hinge arm and said joint-adjusting screw having coincident axes which are inclined with respect to a plane which extends perpendicular to said mounting plane and parallel to said support directions of said bearing means, such that said conical surface and said truncated conical surface contact opposite of said surfaces defining said T-shaped recess, and said enlarged head portion snugly fits within said recess at all relative positions of said joint-adjusting screw with respect to said hinge arm.

4,176,423

CARRYING HANDLE FOR CARRIER BOXES OR LIKE CONTAINERS

Bertil V. Wigemark, Goteborg, Sweden, assignor to Bertil Wigemark AB, Sweden

Continuation-in-part of Ser. No. 725,267, Sep. 21, 1976, abandoned. This application Jan. 13, 1978, Ser. No. 869,172
Claims priority, application Sweden, Sep. 23, 1975, 7510638
Int. Cl.² B65D *25/28*
U.S. Cl. 16—125 **4 Claims**



1. A handle unit for ready attachment to a container having in one side two parallel spaced-apart slots, said handle unit comprising a one-piece molding of flexible resilient plastic material having an elongate central grip portion, two like integral flexible flat band-like strap portions extending from opposite ends of said central grip portion, and an elongate locking plate at the outer end of each of said strap portions, each of said locking plates having a thicker midportion which is the same width as the respective strap portion and is integrally joined thereto and like integral inner and outer wing portions extending in opposite directions from said midportion, said wing portions having flat upper faces and rounded tips and being of decreasing width and thickness proceeding from said midportion to said tips, said strap portions having a length greater than said inner wing portions, and said upper faces of said inner wing portions of said locking plates in relaxed condition of said handle unit unattached to a container, as viewed in side elevation, being inclined at an angle of 20° to 50° to the adjacent strap portion and said upper faces of said outer wing portion being inclined to said strap portion at an angle of approximately 160° to 130° but with the sum of said angles of said upper faces of said inner and outer wing portions to said strap portion being slightly less than 180°, whereby said handle unit is attachable to said container automatically by inserting flat bars in the acute angles between said strap portions and said inclined inner wing portions of the respective locking plates, rotating said flat bars to direct said locking plates toward said slots in the container side and bring said inner wing portions close to said strap portions, moving said flat bars toward said container to insert said locking plates and adjacent strap portions through said slots in said container side, and withdrawing said flat bars, whereupon said locking plates resiliently return to their inclined positions relative to said strap portions, whereby said locking plates are approximately parallel to said container side with said strap portions inclined toward one another, and thereupon exerting tension on said strap portions to bring both said inner and outer wing portions of said locking plates uniformly against the inner face of said container side on opposite sides of said slots so as to distribute the load imposed by said locking plates on said container side.

4,176,424

HINGE CASING

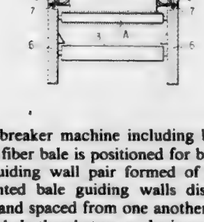
Erich Rock, Hochst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Hochst, Austria

Filed Jan. 30, 1978, Ser. No. 873,536
Claims priority, application Austria, Feb. 9, 1977, 829/77
Int. Cl.² E05D *11/00*
U.S. Cl. 16—148 **2 Claims**

1. A hinge casing adapted to be recessed in an article of furniture and to be connected to hinge links of a hinge, said hinge casing comprising:

an integral single dowel member formed of a plastic material, said dowel member adapted to be inserted into a bore in an article of furniture, said dowel member having an exterior surface having clamping ribs, said dowel member having formed therein a recess defined by a pair of spaced internal walls, each said wall having therein an L-shaped groove having one arm opening onto the outer edge of the respective said wall;

hinge axle means, extending into said dowel member in a direction substantially transverse to said walls, for connecting hinge links of a hinge to said dowel member, whereby when the hinge is closed the hinge links are positioned in said recess;



an integral single cover member formed of a metal material, said cover member including a pair of spaced inwardly extending flanges, each said flange having adjacent a first end thereof a projection, and each said flange having formed in a second end thereof an end recess; and

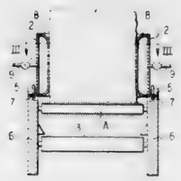
said cover member being mounted on said dowel member with said flanges projecting into said recess and contacting said outer edges of respective said walls, with said projections extending into respective said grooves, and with said hinge axle means fitting in said end recesses, with said dowel member and said cover member being free of any other interconnecting structure.

4,176,425

DEVICE FOR SUPPORTING TEXTILE FIBER BALES DURING BALE BREAKING

Hermann Trützschler, Mönchen-Gladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchen-Gladbach, Fed. Rep. of Germany

Filed Feb. 8, 1978, Ser. No. 876,149
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1977, 2705688
Int. Cl.² D01G *7/06*
U.S. Cl. 19—81 **10 Claims**



1. In a bale breaker machine including breaker means on which a textile fiber bale is positioned for being opened at its underside, a guiding wall pair formed of two substantially vertically oriented bale guiding walls disposed above the breaker means and spaced from one another to accommodate the textile fiber bale therebetween; the improvement comprising

(a) a flexible sheet member bounding a sealed chamber and carried by at least one bale guiding wall at a face thereof oriented to the other bale guiding wall of the guiding wall pair;

(b) means for introducing a pressurized medium into said chamber for inflating said flexible sheet member for moving at least one part thereof away from the associated bale guiding wall and for urging said part into a face-to-face engagement with a side of the textile fiber bale positioned between the bale guiding walls of the guiding wall pair; and

(c) pressing means for resiliently urging said one part of said flexible sheet member towards said face opposing the force of the pressurized medium in said chamber.

4,176,426

WEB FORMING APPARATUS EMPLOYING INTERMEDIATE WEB FORMING AND SPREADING SECTION

Rudolf Neuenschwander, Swarthmore, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Aug. 2, 1978, Ser. No. 930,174
Int. Cl.² D04H *1/00*
U.S. Cl. 19—306 **4 Claims**



1. A web forming apparatus including:

a first conveying duct through which a fluid-entrained stream of fibers is adapted to move from an upstream end to a downstream end thereof;

an intermediate rotatable spreading roll obliquely oriented to the first conveying duct and intercepting the downstream end thereof between laterally spaced-apart duct sidewalls, said roll including a foraminous member having an outer surface for receiving the fluid-entrained fibers thereon and passing the fluid therethrough, said foraminous outer surface having a lateral dimension between the duct sidewalls that is greater than the width of the duct at its open downstream end, as measured between the duct sidewalls in a direction generally normal to the direction of fiber flow;

a second conveying duct having an upstream end spaced from the downstream end of the first conveying duct and being intercepted by the outer surface of the spreading roll; and

means for establishing a pressure differential across the apparatus to aid in initially depositing the fibers on the outer periphery of the intermediate spreading roll and relaunching the fibers into the second conveying duct adjacent the upstream end thereof.

4,176,427

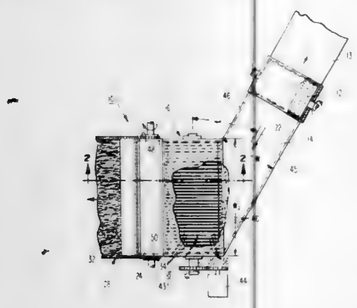
WEB FORMING APPARATUS EMPLOYING SPREADING SECTION

Rudolf Neuenschwander, Swarthmore, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Aug. 2, 1978, Ser. No. 930,175
Int. Cl.² D04H *1/00*
U.S. Cl. 19—306 **6 Claims**

1. An apparatus for increasing the width of a fluid-entrained stream of fibers, said apparatus comprising: a conveying duct

including laterally spaced-apart sidewalls, said duct having an upstream end for receiving the fluid-entrained stream of fibers and a downstream end toward which the stream is directed; a rotatable spreading roll having a plurality of axially spaced-apart disks providing flow-directing channels between them and intercepting the downstream end of the duct between the laterally spaced-apart sidewalls, the rotational axis of the spreading roll being obliquely oriented to the direction of flow through the conveying duct to present an axial dimension



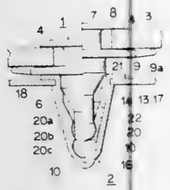
between the spaced-apart duct sidewalls that is greater than the width of the duct at its open downstream end, as measured between said duct sidewalls in a direction generally normal to the direction of fiber flow through the duct; whereby the flow of fluid-entrained fibers is received in the channels over a greater width than the duct width, is diverted by moving through the channels, and is thereafter released from the channels as a stream of fluid-entrained fibers wider than the stream in the conveying duct; and drive means for rotating the spreading roll.

4,176,428

PANEL FASTENER

Shigeru Kimura, Kamakura, Japan, assignor to Nifco, Inc., Tokyo, Japan

Filed Feb. 6, 1978, Ser. No. 875,275
Claims priority, application Japan, Feb. 5, 1977, 52-11223
Int. Cl.² A44B *21/00*
U.S. Cl. 24—73 P **8 Claims**



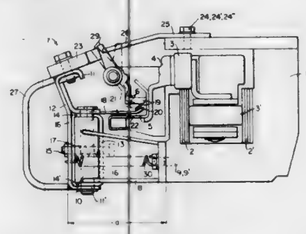
1. A plastic fixing device for mounting a decorative panel on an apertured supportng panel comprising a male member adapted to be fastened to said decorative panel and a female member adapted to be attached to said apertured supporting panel, which device is characterized by the fact that said male member is provided with head means for fastening said male member to the decorative panel, said male member further including a shaft extending from the said head means and terminating in a bulbous engaging portion, said female member including a hollow barrel open at one end, a fitting flange extending outwardly from the periphery of the opening at one end of said barrel and shoulder means protruding from the outer surface of the barrel so that the female member can be attached to said supporting panel by inserting said barrel through a hole perforated in the supporting panel, said female member barrel is further provided inside the hollow interior thereof with a first spherical cavity and a second spherical cavity co-axially spaced so that when the shaft of said male member is telescopically received through the end opening into the hollow barrel interior of the female member and the male and female members are brought into temporary engagement by driving said shaft to a first position of insertion by seating the bulbous engaging portion in said first spherical cavity, the two members are brought into full engagement by axially driving the shaft to a second position of insertion and thereby seating the bulbous engaging portion in said second spherical cavity, whereby the decorative panel is fastened to the supporting panel.

4,176,429

APPARATUS FOR CLEANING CLAMPING SURFACES

Hans Rottensteiner, Schwarzach, Austria, assignor to Lindauer Dornier Gesellschaft mbH, Fed. Rep. of Germany

Filed Feb. 2, 1978, Ser. No. 874,698
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1977, 2712477
Int. Cl.² D06C *3/02*
U.S. Cl. 26—93 **6 Claims**



1. An apparatus for cleaning the clamping surfaces of tenter hook or clip tables and small flaps of tenter hooks or clips during the operation of a tenter hook or clip chain, which comprises a carrier member secured to a tenter hook or clip chain/guide path,

an axle vertically positioned with respect to said path,

a brush mounting unit supported by said axle and having upwardly and downwardly directed rows of brushes,

said brush mounting unit being pivotal on said axle and flexibly connected with the carrier member by resilient means and, in a position of rest thereof, being positioned so as to be pivoted away from the tenter hook or clip,

said brush mounting unit, in the operating position thereof, being pivoted against the tenter hooks or clips in the open position thereof,

and whereby the upper row of brushes scrapes and brushes clamping surfaces of the small flaps, and the lower row of brushes scrapes and brushes clamping surfaces of the tenter hook or clip tables.

4,176,430

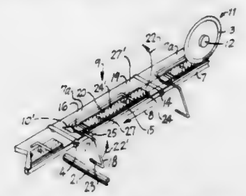
SELVAGE STRIP LIFTING DEVICE

Harvey G. Anderson, 1264 Dogwood Dr., Bridgewater, N.J. 08807, and Karl E. Paansci, 27 Raplh St., Highlands, N.J. 07732

Filed Apr. 13, 1978, Ser. No. 895,995
Int. Cl.² D06C *3/10*
U.S. Cl. 26—96 **3 Claims**

1. A selvage lifting device comprising in combination, for mounting on a fabric edge-carrying traveling-belt device including consecutive links adapted for moving fabric selvage past and into trimming contact with a selvage strip-producing cutting blade while a fabric edge is pin-mounted onto upwardly-extending pins of the consecutive links, and for lifting selvage residual strip from the pins of each link which includes an

elongated base element having a free side-edge extending along a longitudinal axis of the base element, and the base element including a hinge means mounting pivotably a lever element having a handle element connected to the lever element adapted to impart pivotal motion thereto, with the lever element being connected to said handle element and mounted on said hinge means such that when pressure is applied to said handle element said lever element pivots rotatably around a hinge axis of the hinge means, the improvement comprising said lever element being mounted by said hinge means around



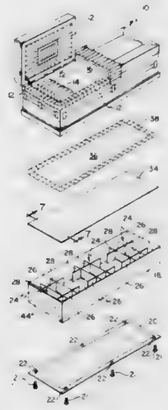
said axis thereof such that the lever element pivots from an upper surface of the base element, with the lever element extending in a direction along said longitudinal axis and extending through said hinge axis to a point beyond said free edge, which hinge axis extends substantially transversely to said longitudinal axis, and the handle element extending beside said free edge from below a level of said base element to the point said, and the handle element being positioned to pivot in a direction extending along said longitudinal axis when pressure is applied thereto.

4,176,431

MULTI-ELEMENT CASKET

Ambrose S. Havey, III, 12 Grove Mews, Chappaqua, N.Y. 10514

Continuation-in-part of Ser. No. 847,403, Oct. 31, 1977, which is a continuation-in-part of Ser. No. 718,114, Aug. 27, 1976, Pat. No. 4,063,337. This application May 18, 1978, Ser. No. 906,931
Int. Cl.² A61G *17/00*
U.S. Cl. 27—2 **19 Claims**



1. A multi-element casket, comprising:

(a) an outer casket shell having a top and sidewalls;

(b) a foldable container bottom, having sidewalls and a bottom, configured and dimensioned to be disposed within said outer casket shell with the sidewalls of said outer casket shell extending around said container bottom;

(c) support means for supporting said container bottom within said outer casket shell;

(d) sheet means configured, dimensioned and positioned to lie above the bottom of said container bottom and adjacent to sidewalls of said container bottom; and

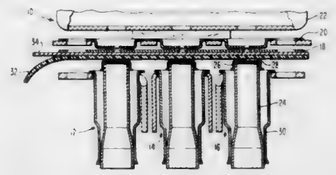
(e) separator means separate from said sheet means for supporting said sheet means in spaced relationship to the bottom of the said container bottom.

4,176,432

METHOD FOR ESTABLISHING UNIFORM CATHODE-TO-GRID SPACING IN AN ELECTRON GUN

Harry E. McCandless, Hopewell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 13, 1978, Ser. No. 969,158
Int. Cl.² H01J *9/18*
U.S. Cl. 29—25.16 **3 Claims**



1. A method for establishing uniform cathode-to-grid spacing in an electron gun including a plurality of cathodes, said method comprising the steps of:

inserting a substantially nondeformable strip and a confronting substantially deformable strip on the cathode side of a grid with the nondeformable strip facing the grid, the sum of the thicknesses of the two strips being the desired cathode-to-grid spacing,

moving the cathodes until the cathodes press against the deformable strip,

affixing the cathodes relative to the grid,

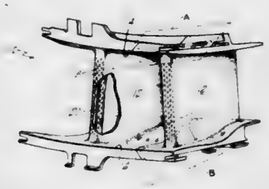
first withdrawing the nondeformable strip and thereafter withdrawing the deformable strip.

4,176,433

METHOD OF REMANUFACTURING TURBINE VANE CLUSTERS FOR GAS TURBINE ENGINES

Jack W. Lee, Palm Beach Gardens, and Charles A. Voehringer, Boynton Beach, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 29, 1978, Ser. No. 920,582
Int. Cl.² B23P *15/04*
U.S. Cl. 29—156.8 B **5 Claims**



1. A method for remanufacturing turbine vane clusters of the type having two or more coated vanes extending between a common inner platform and a common outer platform, comprising the steps of:

inspecting damaged vane clusters and selecting complementary vanes and contiguous platforms for combination into a reconstructed cluster;

stripping the coating materials from the selected vanes and from the portions of the platforms contiguous thereto;

relieving residual stresses in the entire vane clusters in which

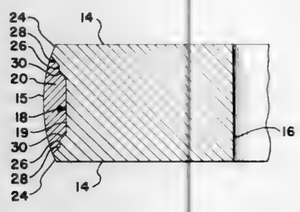
the selected vanes are contained prior to the step of separating the selected vanes from the clusters;
separating the selected vanes and the portions of the platforms contiguous thereto from the vane clusters after the step of relieving stresses from the vane clusters;
machining bond faying surfaces on the platforms of the complementary vanes selected for combination;
cleaning the machined faying surfaces;
bonding the complementary vanes at the faying surfaces to form a reconstructed vane cluster;
solution heat treating the reconstructed vane cluster;
applying corrosion resistant coating to surfaces of the vane cluster which are to be exposed to hot working medium gases;
precipitation hardening the coated vane cluster.

4,176,434

METHOD OF MAKING PISTON RINGS WITH CHROME-FILLED GROOVES

John E. Cromwell; Nicholas Herbert, both of Baltimore, and Glenn F. Hyde, Timonium, all of Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 760,637, Jan. 19, 1977, abandoned, which is a continuation-in-part of Ser. No. 691,501, Jun. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 480,164, Jun. 19, 1974, abandoned. This application May 19, 1978, Ser. No. 907,375
Int. Cl.[2] B23P *15/06*
U.S. Cl. 29—156.63 **4 Claims**



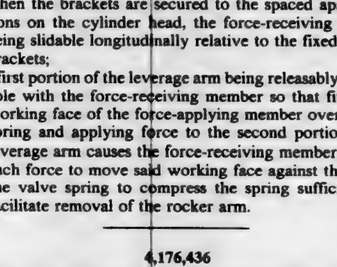
1. A method of making piston rings comprising the steps of:
(a) forming annular grooves in the outer periphery of a plurality of piston ring blanks to form axially-spaced outer bearing shoulders between said grooves and side faces of said rings, each of said grooves including a bottom land and at least one pair of axially-spaced, radially intermediate lands connected to said bottom land and to said outer bearing shoulders by radially outwardly diverging side walls forming stepped sides for said groove;
(b) stacking a plurality of said ring blanks on a rotatable arbor;
(c) electro-depositing a layer of chromium on the outer peripheral surfaces of said ring blanks on said arbor to fill said grooves and cover said bearing shoulders, said electro-depositing resulting in a chromium surface having shallow depressions formed opposite the intermediate and bottom lands, and
(d) removing an outer portion of said chromium layer to expose said bearing shoulders to form an axially convex outer face on said ring, whereby the stepped sides of the intermediate land minimizes the amount of electro-deposited chromium material required to provide said axially convex outer face on said ring by decreasing the depth of the depressions.

4,176,435

APPARATUS FOR REMOVING ROCKER ARMS

John H. Castoe, 10234 McVine St., Sunland, Calif. 91040

Filed Jan. 24, 1978, Ser. No. 871,816
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—220 **8 Claims**



1. Apparatus for removing a rocker arm of a cam shaft-activated valve mechanism in an engine cylinder head, in which a valve spring is biased into engagement with the rocker arm to urge the rocker arm toward the cam shaft, the apparatus comprising:
an elongated force-applying member having a working face at a first end thereof and a second end spaced longitudinally from the first end;
an elongated leverage arm having a first portion and a second portion;
means pivoting an intermediate portion of the leverage arm about a transverse axis of the force-applying member adjacent the second end thereof, the first portion of the leverage arm projecting away from one side of the transverse axis, the second portion of the leverage arm projecting away from an opposite side of the transverse axis;
an elongated force-receiving member;
at least a pair of support brackets each having means for being releasably secured in a fixed upright position on an engine cylinder head, each bracket being movable independently of the other bracket; and
means for slidably securing the force-receiving member to each bracket, each bracket being movable along the length of the force-receiving member independently of the other bracket, the brackets providing means for holding the force-receiving member in a fixed position spaced from the transverse axis of the force-applying member when the brackets are secured to the spaced apart locations on the cylinder head, the force-receiving member being slidable longitudinally relative to the fixed support brackets;
the first portion of the leverage arm being releasably engageable with the force-receiving member so that fitting the working face of the force-applying member over a valve spring and applying force to the second portion of the leverage arm causes the force-receiving member to resist such force to move said working face against the bias of the valve spring to compress the spring sufficiently to facilitate removal of the rocker arm.

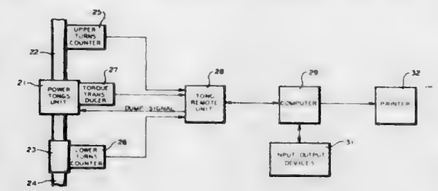
4,176,436

METHOD AND APPARATUS FOR COUNTING TURNS WHEN MAKING THREADED JOINTS

Russell L. McCombs, San Antonio, and James V. Motsinger, Austin, both of Tex., assignors to Baker International Corporation, Orange, Calif.

Filed Sep. 12, 1978, Ser. No. 941,894
Int. Cl.[2] B25B *23/14*
U.S. Cl. 29—240 **8 Claims**

1. In an apparatus for making threaded joints from a pair of threaded members including means for rotating one of the members with respect to the other member, means for generating a signal representing the actual torque applied to the one member by the means for rotating, means for generating a signal representing the average turns made by the one member and means responsive to the actual torque and the average turns signals for indicating the actual torque and the average turns values, the average turns signal generating means comprising: means responsive to the actual torque signal for generating a first signal when the value of the actual torque is greater than the value of a predetermined reference torque and for



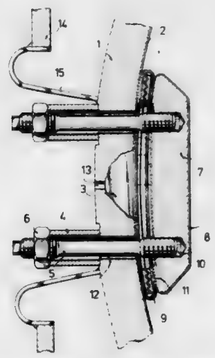
generating a second signal when the value of the actual torque is less than said reference torque value; means responsive to the rotation of the one member for generating a signal representing actual turns made by the one member; means responsive to said actual turns signal for accumulating a count total of the actual turns, said accumulating means being responsive to said first signal for incrementing said count total in response to said actual turns signal and being responsive to said second signal for decrementing said count total in response to said actual turns signal; and means responsive to said count total for generating the average turns signal.

4,176,437

METHOD OF REPAIRING A DEFECTIVE COATED WORKPIECE

Manfred Scholz, Hürth-Hermülheim; Lothar Strie, Boraheim-Merten, and Karl-Heinz Stendenbach, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 19, 1978, Ser. No. 897,674
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1977, 2718238
Int. Cl.[2] B23P *7/00*; B32B *35/00*
U.S. Cl. 29—402.12 **5 Claims**



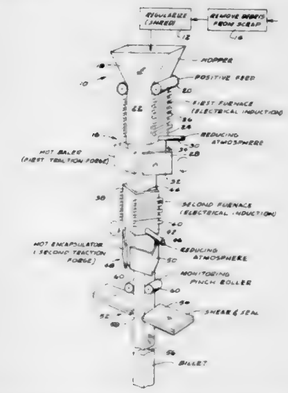
1. A method of repairing a defective coating area on the interior enamel-coated wall of a container comprising the steps of covering the defective coating area with a smooth enamel-coated plate having a greater area than the defective area in a manner which overlaps sound enamel coating, disposing a sealing medium between the outer periphery of the plate and the sound coating surrounding the defective area within the confines of the plate, extending fasteners through the wall of the container into a side of the plate disposed adjacent the interior wall without penetrating the enamel coating on the opposite side of the plate, and firmly securing the fasteners against the outer wall of the container in a manner which urges the plate and sealing medium into firm sealing contact against the inner wall of the container whereby a smooth enamel coating is restored to the interior wall of the container.

4,176,438

METHOD FOR PRODUCING INTEGRALLY SEALED BILLETS FROM SCRAP METAL WITHOUT FULLY REMELTING THE METAL

A. Jack Warden, 945 Ravine Dr., Youngstown, Ohio 44505

Filed Jul. 22, 1977, Ser. No. 818,231
Int. Cl.[2] B22F *3/16*
U.S. Cl. 29—403.1 **21 Claims**



1. A method for producing an integrally sealed, but not fully dense billet from scrap metal fragments without fully remelting the scrap metal thereof, comprising:
loading into a hopper a supply of scrap metal particles having an average particle size that is larger than powder at a sufficient rate to continuously provide a columnar supply of scrap metal particles issuing from the hopper, with an average of about 15–25 percent full density;
while laterally confining an increment of said column in the lumen of a first furnace stationed to be fed by the hopper with the laterally exterior surface of column in extensive guiding contact with an inner peripheral sidewall surface which defines said lumen, heating the increment therein in a reducing atmosphere;
squeezing an increment of the column laterally inwardly and pulling the heated column axially forwardly at a first squeezing and pulling site axially downstream of the first furnace;
said heating, squeezing and pulling, in combination, continuously providing a column with an average of about 40–50 percent full density and which is sufficiently consolidated to be laterally self-supporting;
surrounding an increment of said column, axially downstream of said first squeezing and pulling site with the lumen of a second furnace and heating this increment therein in a reducing atmosphere;
squeezing an increment of the column laterally inwardly and pulling the heated column axially forwardly at a second squeezing and pulling site axially downstream of the second furnace;
the last-described heating, squeezing and pulling, in combi-

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nation, continuously providing a column with an average of about 70–99 percent full density, including a perimetrically complete laterally outer peripheral surface region which is substantially fully dense to a depth of at least one-sixteenth inch as an integral seal therefor.

4,176,439

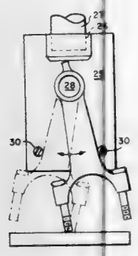
TOOL FOR REMOVING AND INSERTING BOLTS IN CONNECTING RODS

Adolf Jarmann, 23426 Summit Rd., Los Gatos, Calif. 95030

Division of Ser. No. 860,864, Dec. 15, 1977, Pat. No. 4,138,780. This application Sep. 20, 1978, Ser. No. 943,768

Int. Cl.² B23P *19/02*

U.S. Cl. 29—427 **5 Claims**



1. The method of removing bolts from the bolt hole openings in a connecting rod having a wrist pin end with an opening for receiving a wrist pin and a crankshaft end formed to fit over a crankshaft and by use of a power press having a ram which can be actuated towards a platen, the steps comprising:

attaching to the press ram a support having a planar member with one end adapted to be fixed to the ram and including a pintle extending from the planar member in a direction normal to the direction of travel of the ram;

placing the connecting rod on the support with the wrist pin opening over the pintle and the crankcase end extending towards the platen; and

activating the ram to bring the extending bolts into contact with the platen to thereby press the bolts from the connecting rod holes.

4,176,440

SAFE, AND METHOD AND APPARATUS FOR BUILDING IT

Robert J. Lichter, 15571 Placid Cir., Huntington Beach, Calif. 92647

Continuation-in-part of Ser. No. 758,587, Jan. 12, 1977, abandoned. This application Mar. 27, 1978, Ser. No. 890,489

Int. Cl.² E05G *1/00*

U.S. Cl. 29—458 **16 Claims**

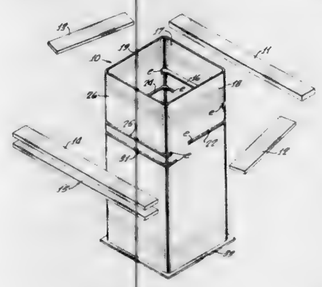
8. A method of constructing a safe, which comprises:

(a) providing exterior and interior forms for concrete and which are spaced from each other sufficiently far that a thick-walled concrete container for valuables will result from pouring of concrete between said forms, the container having an access region into the valuables cavity,

(b) extending a strong, burglar-resistant element into an opening in said interior form in proximity to said access region,

(c) pouring concrete between said forms to embed in concrete portions of said strong element which are not in said opening, and

(d) providing a door in said access region and associated with the part of said strong element which is in said opening, in such manner that said one part aids in maintaining said door closed and resistant to burglars.



4,176,441

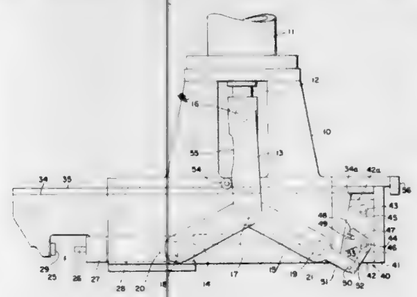
LOCKING JOINT MACHINE

Otto P. Hafner, 1321 Paddock Way, Cherry Hill, N.J. 08034

Continuation-in-part of Ser. No. 764,470, Jan. 31, 1977. This application Dec. 30, 1977, Ser. No. 866,038

Int. Cl.² B23P *19/00*

U.S. Cl. 29—566.1 **12 Claims**



1. A machine for producing locking joints in hard-to-reach locations which require not only joint-producing relative movements between a piercing punch, die and flattening punch which constitute the tool elements of the machine, but which also require additional movements of at least some of these tool elements to position them operatively relative to the locations at which the joints are to be formed, said machine comprising

a main machine frame which remains stationary during both the joint-producing movements and the additional movements,

a plurality of means for holding the three different tool elements, each of said holding means being reciprocably mounted on the stationary frame,

positioning means also mounted on the frame and including means movable to reciprocably change the relative positions between the tool element holding means, and

toggle linkage means also mounted on the frame and adapted to be reciprocably actuated to go through toggle alternately in opposite directions,

a first link of the linkage means imparting the joint-producing reciprocating movement to one of the tool element holding means, and a second link of the linkage means imparting the joint-producing and additional movements to the other tool element holding means, including the

movements for changing the relative positions between tool element holding means.

4,176,442

METHOD FOR PRODUCING A SEMICONDUCTOR FIXED VALUE ROM

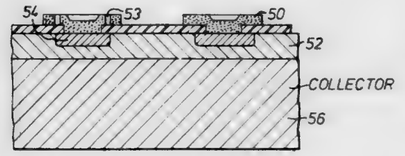
Erich Bischoff, Langenau; Jurgen Dangel, Ulm; Hans Schussler, Ulm; Thomas Ricker, Ulm, and Erich Stein, Ulm, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltung-G.m.b.H., Frankfurt, Fed. Rep. of Germany

Filed Oct. 6, 1976, Ser. No. 730,255

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1975, 2545047

Int. Cl.² H01L *21/72*

U.S. Cl. 29—571 **7 Claims**



1. In a method for producing a fixed value memory in the form of a programmable, monolithically integrated circuit, wherein the fixed information is introduced into a semiconductor memory as a binary coded bit pattern in process stages integrated into or following the conventional production sequence for semiconductor circuits including the direct transfer of occupation of the memory cells as prepared by software, with the elimination of masks comprising the steps of: providing a semiconductor memory which was produced according to the MOS technique and including MOS transistor memory cells arranged to form a matrix and conductor paths substantially connecting the gate terminals of said transistors in rows arranged on the surface of said memory; producing a masking layer corresponding to the desired coded bit pattern on said surface of said memory by applying a layer of radiation sensitive lacquer (electron resist) to said surface of said memory and deflecting a focused electron beam according to a given bit pattern under the control of a computer to illuminate said lacquer layer at selected points to render the lacquer at the illuminated points soluble; and thereafter selectively processing said memory to cause the memory cells of the memory circuit below the masking layer to receive the stored value by removing the portions of the conductor paths disposed below the soluble portions of the lacquer in an etching process; the improvement wherein the potential of the gate terminals of the memory transistors is used as the information carrier and wherein said illuminated points are such as to cause selected gate terminals to be disconnected from the associated conductor during said etching process.

3. A method as defined in claim 1 wherein said step of selectively processing further includes: additionally removing the metallization from the gate terminals of the transistors which are disconnected from the associated conductors according to the desired occupation; and thereafter implanting ions in these gate regions so as to set a stable switching state for the associated MOS transistor memory cell disposed therebelow.

4,176,443

METHOD OF CONNECTING SEMICONDUCTOR STRUCTURE TO EXTERNAL CIRCUITS

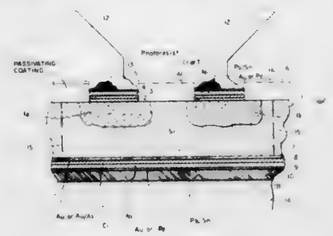
Giulio Iannuzzi; Carlo C. deMartiis, both of Milan; Vittorio Del Bo, Monza, and Luciano Gandolfi, Corsico, all of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Agrate Brianza, Italy

Continuation-in-part of Ser. No. 884,498, Mar. 8, 1978, abandoned. This application Nov. 3, 1978, Ser. No. 957,331

Claims priority, application Italy, Mar. 8, 1977, 21021 A/77

Int. Cl.² B01J *17/00*

U.S. Cl. 29—589 **7 Claims**



1. A method of establishing connections between a crystalline semiconductor structure and external circuitry, said semiconductor structure including a silicon body having a front surface with a plurality of disjointed contact areas and an essentially uniform rear surface, comprising the steps of:

building up a conductive pad on each of said contact areas by successively depositing thereon a base front layer of aluminum, a first intermediate front layer of a metal selected from the group which consists of chromium and titanium, a second intermediate front layer of nickel, and an outer front layer of a noble metal selected from the group which consists of gold and palladium;

successively coating said rear surface with a base rear layer of a conductive materials selected from the group which consists of gold and gold/arsenic alloys, a first intermediate rear layer of chromium, a second intermediate rear layer of nickel and an outer rear layer of said noble metal;

depositing a low-melting metallic bonding agent on each of said outer layers; and

simultaneously soldering said outer layers to respective external conductors by melting said bonding agent in a furnace.

4,176,444

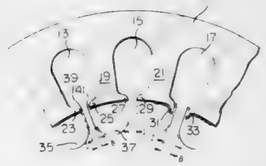
METHOD AND APPARATUS FOR ASSEMBLING DYNAMOELECTRIC MACHINE STATORS

Robert G. Walker, Ossian, Ind., assignor to Industra Products, Inc., Fort Wayne, Ind.

Filed Sep. 19, 1977, Ser. No. 834,106

Int. Cl.² H02K *15/06*

U.S. Cl. 29—596 **12 Claims**



1. A method of making a stator for a dynamoelectric machine having a stator core with a centrally disposed axially

extending generally cylindrical bore, a plurality of axially elongated slots communicating with the bore and a like plurality of stator teeth separating adjacent slots, adjacent tips of the stator teeth forming a gap where the slots communicate with the bore and comprising the steps of:

enlarging the gap between at least certain adjacent pairs of teeth throughout substantially the entire axial extent thereof;

assembling stator windings in selected slots including slots the associated gap of which has been enlarged; and

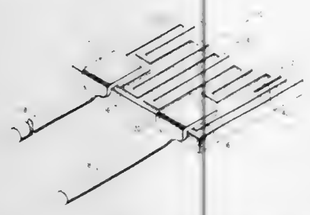
reducing the gap between the at least certain adjacent pairs of teeth throughout substantially the entire axial extent thereof.

4,176,445

METAL FOIL RESISTOR

Benjamin Solow, North Hollywood, Calif., assignor to Angstrohm Precision, Inc., Hagerstown, Md.

Filed Jun. 3, 1977, Ser. No. 803,291
Int. Cl.[2] H01C *7/00*
U.S. Cl. 29—620 **19 Claims**



1. A method of making a metal foil electrical device comprising the steps of:

(a) affixing a thin, conductive metal foil to an insulative substrate;

(b) forming a masking material on said conductive metal foil in the shape of a desired electrical circuit having a plurality of terminals;

(c) subjecting the device to a first acid etching treatment to remove all of the conductive metal foil except that covered by the masking material

(d) removing the masking material from the conductive metal foil;

(e) adjusting the value of the device by subjecting it to a second acid etching treatment which reduces the thickness of the conductive foil forming the electrical circuit;

(f) attaching a connecting lead to each of the terminals and

(g) encapsulating the electrical device such that the connecting leads protrude from said encapsulation.

4,176,446

ASSEMBLY PROCESS OF ELECTRODES IN AN INSULATING MATERIAL

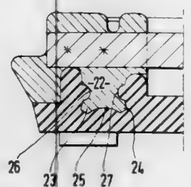
Eugène M. Quere, Brunoy, and Pierre M. Le Rolland, Le Plessis Trevise, both of France, assignors to ITT Industries, Inc., New York, N.Y.

Filed Feb. 10, 1978, Ser. No. 876,770
Claims priority, application France, Mar. 30, 1977, 77 09494
Int. Cl.[2] H01H *11/06*
U.S. Cl. 29—622 **6 Claims**

1. A process of assembling electrodes in an insulating material comprising the steps of:

providing an electrode with cuts for cooperating with the configuration of a housing made in the insulating material for receiving a first set of cuts defining a lug in the electrode, said lug comprising a second set of cuts defining between them two fingers,

providing a housing in the insulating material having a bottom presenting two projections spaced from each other such that the electrode lug fingers may house therein, the width and height of said projections being determined by the dimensions of the first set of cuts which said projections cooperate with when the electrode is positioned within the housing of the insulating material, and



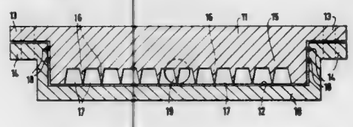
applying a force to introduce the electrode in said housing until said fingers abut the housing bottom, until the free end of the projection abuts the bottom of the first set of cuts, with the electrode fingers then penetrating the insulating material by deformation and deforming the insulating material into the second sets of cuts.

4,176,447

METHOD FOR MAKING AN ELECTRODE

Michael P. J. Brennan, Helsby, England, assignor to Chloride Silent Power Limited, London, England

Filed Dec. 19, 1977, Ser. No. 861,924
Claims priority, application United Kingdom, Dec. 20, 1976, 53197/76
Int. Cl.[2] B29C *15/00, 24/00*; H01M *4/00*
U.S. Cl. 29—623.5 **19 Claims**



1. In the manufacture of a sodium sulphur cell, a method of making an annular cathodic electrode structure having a porous matrix of electronically-conductive material impregnated with an electro-chemical reactant material comprising the steps of enclosing a sheet of compressible matrix material in a heated mould formed so as to compress the matrix material over its whole area and to effect greater compression of the material in pre-selected regions arranged so that the matrix material is formed into a planar assembly of shaped segments, admitting said reactant material in a molten state into said mould to impregnate the matrix segments and cooling the assembly to solidify the reactant material whereby substantially rigid shaped segments of impregnated matrix material are produced, the mould being shaped to leave the segments joined together by thin webs of compressed material.

4,176,448

AUTOPIN MACHINE

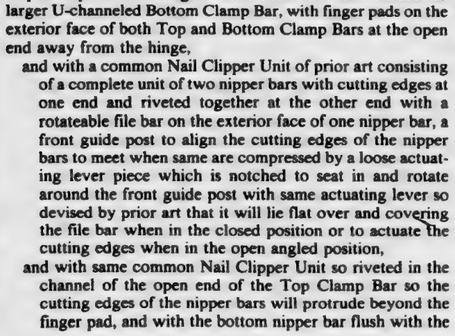
Irwin Zahn, New York, N.Y., and Heinrich F. Meyer, Ormond Beach, Fla., assignors to General Staple Company, Inc., New York, N.Y.

Division of Ser. No. 773,274, Mar. 1, 1977, abandoned. This application Sep. 14, 1978, Ser. No. 942,332
Int. Cl.[2] H05K *3/30*
U.S. Cl. 29—626 **2 Claims**

1. A method for inserting terminal pins into a workpiece; said method comprising:

providing a supply strip of integrally connected preformed terminal pins connected in longitudinally extending end-to-end relationship; wherein said preformed terminal pins terminate in pointed end portions, integrally connected adjacent pointed end portions of adjacent pins forming notched regions in said supply strip;

sequentially advancing said supply strip toward said workpiece;



shearing the leading one of said terminal pins from the remainder of said supply strip at said notched regions;

driving said leading one of said pins into said workpiece; and

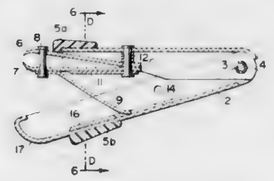
further including the step of holding said leading one of said terminal pins by a holding means after it has been sheared and continuing to hold said pin by said holding means while it is being driven into said workpiece.

4,176,449

GRIP-OPERATED NAIL CLIPPER

George K. C. Lee, and Wanda M. Lee, both of 3843 Old Pali Rd., Honolulu, Hi. 96817

Filed Mar. 22, 1978, Ser. No. 888,916
Int. Cl.[2] A45D *29/02*
U.S. Cl. 30—28 **3 Claims**



1. The invention of a new and improved Grip-Operated Finger and Toe Nail Clipper Unit comprising of a U-channeled Top Clamp Bar Unit hinged at one end to nestle into a second larger U-channeled Bottom Clamp Bar, with finger pads on the exterior face of both Top and Bottom Clamp Bars at the open end away from the hinge,

and with a common Nail Clipper Unit of prior art consisting of a complete unit of two nipper bars with cutting edges at one end and riveted together at the other end with a rotateable file bar on the exterior face of one nipper bar, a front guide post to align the cutting edges of the nipper bars to meet when same are compressed by a loose actuating lever piece which is notched to seat in and rotate around the front guide post with same actuating lever so devised by prior art that it will lie flat over and covering the file bar when in the closed position or to actuate the cutting edges when in the open angled position,

and with same common Nail Clipper Unit so riveted in the channel of the open end of the Top Clamp Bar so the cutting edges of the nipper bars will protrude beyond the finger pad, and with the bottom nipper bar flush with the bottom edge of the Top Clamp Bar so that the file bar of the Nail Clipper Unit can be rotated 90° outward to function as a file accessory, and with the Nail Clipper Unit held firmly in place when same is inserted and seated under the return edges of the ends of the Top Clamp Bar,

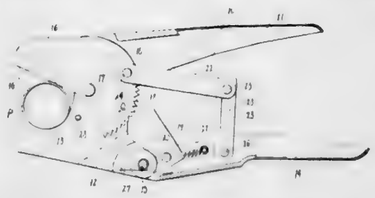
all to form a new unit with new configuration so that the common Nail Clipper Unit can be actuated by a full hand-grip operated set of Top and Bottom Clamp Bars with a firmer grip and more ease and less effort.

4,176,450

CUTTER MAINLY FOR CUTTING SYNTHETIC RESIN ARTICLES

Wasaburo Muromoto, deceased, late of Neyagawa, Japan (by Osamu Muromoto, executor), assignor to Muromoto Iron Works Co., Ltd., Neyagawa, Japan

Filed Jan. 25, 1978, Ser. No. 872,238
Claims priority, application Japan, Jan. 25, 1977, 52-7839[U]
Int. Cl.[2] B26B *13/00*
U.S. Cl. 30—92 **17 Claims**



1. A cutter mainly for cutting synthetic resin articles comprising a main body including a base portion serving as a holder handle and a front half portion serving as a holder portion for holding a workpiece, an operating handle mounted by a pivot on the holder portion and movable toward and away from the holder handle in opposed relation thereto, a cutting blade turnably mounted by a support pin on the holder portion and having a cutting edge in opposed relation to the holder portion for holding the workpiece the cutting blade being formed with ratchet teeth on one side of the support pin opposed to the cutting edge, a pawl pivotally mounted by a pivot pin on the operating handle and engageable with one of the ratchet teeth to provide a ratchet mechanism, and a spring having one end secured to the operating handle and the other end attached to the base end of the pawl for biasing the pawl into engagement with the ratchet toothed portion at all times, said cutter further comprising a first link having one end pivoted to the cutting blade at a position slightly above the ratchet teeth portion thereof and the other end to a second link at one end of said second link; the other end of the second link being pivoted to the base portion of the operating handle, said links moving freely with respect to each other to permit the cutter handles to be opened and closed without interference, said links operating to return the cutter blade from the workpiece after completion of the cutting operation by opening the operating handle.

4,176,451

BLOOD SEGMENT PROCESSOR

John J. McMorrow, 55 Florence Ave., Oyster Bay, N.Y. 11771

Filed Sep. 14, 1978, Ser. No. 942,415
Int. Cl.[2] B26B *17/00*
U.S. Cl. 30—124 **1 Claim**

1. Means to release blood from a segmented plastic tube into a test tube comprising:

a flexible tubular member adapted to fit inside a test tube,

and a spur cutter mounted a predetermined distance from the top in said tubular member,

whereby a segmented plastic tube containing blood may be inserted in said tubular member and pierced by the spur

cutter to punch a hole thereby release the blood into said test tube, without any spillage,



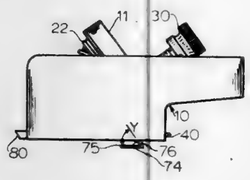
the interior wall of the tubular member being shaped to position the segmented tube so that it is pierced by the spur at a central point on the tubular member.

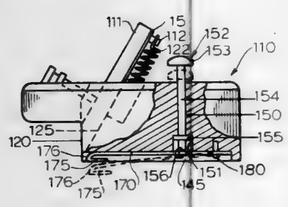
4,176,452

PICTURE FRAME MAT OPENING CUTTER

Richard W. Duggins, Hillsborough, and James W. Rodgers, Durham, both of N.C., assignors to Frameworks, Inc., Cedar Grove, N.C.

Continuation-in-part of Ser. No. 861,258, Dec. 16, 1979, abandoned. This application May 25, 1978, Ser. No. 909,673
Int. Cl.[2] B26B *29/00*
U.S. Cl. 30—293 **14 Claims**





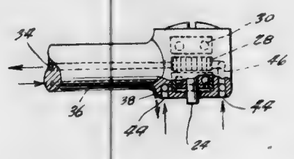
1. A picture frame mat opening cutter comprising:
(a) a cutter body adapted for being manually grasped and manipulated to form an opening in a picture frame mat, said cutter body having a flat bottom surface with a horizontal guide slot formed centrally therein and having an angularly disposed guide slot formed in said cutter body;
(b) a blade support bar slidably mounted in said angularly disposed guide slot and providing a blade mounting surface thereon;
(c) a mat opening cutter blade detachably mounted on said blade support bar surface for slidable movement therewith;
(d) spring means mounted within said cutter body and operative on said blade support bar enabling said blade support bar and said blade mounted thereon to be constantly tensioned in a retracted blade direction;
(e) means mounted on said cutter body and adjustably locate said blade support bar and said blade mounted thereon in a position appropriate to cutting a preselected mat opening; and
(f) an elongated template guide bar movably mounted in said horizontal guide slot, said guide bar having an outwardly angled protrusion at its forward end from which a thin, flat guide vane extends rearwardly from the outer edge thereof to form a hook structure with said protrusion adapted to engage a template edge as a guide for forming a mat opening according to the shape of opening formed in said template.

4,176,453

DENTAL DRILL

Sheldon J. Abbott, 1068 Hicksville Rd., Massapequa, N.Y. 11758

Filed Sep. 13, 1976, Ser. No. 722,554
Int. Cl.[2] A61C *1/08*
U.S. Cl. 433—82 **2 Claims**



1. A dental drill comprising a handpiece having a neck portion, a drill head integral with the end of neck portion and including a housing having an integral lower surface formed of unitary construction with the housing, and a removable cap covering the upper end of the housing, a tubular shaft longitudinally extending at least partially through said housing and adapted to receive a burr inserted therein which can then extend through an opening in said lower surface, a turbine transversely positioned in said housing and coupled to said shaft for rotating said tubular shaft thereby rotating the burr, a water conveying tube axially extending through said neck and connecting to conduits positioned proximate to said shaft and terminating in discharge outlets adjacent the lower surface of said housing and angularly facing toward the extending shaft whereby the water supplied can strike a rotating burr to be dispersed into a mist, and a fixed passage axially extending through said neck and transversely crossing said turbine then downwardly extending toward the lower surface where it splits up into a number of longitudinal extending pipes each terminating in a discrete port formed through the lower surface with the ports being equally spaced about the shaft and positioned adjacent the outer edge of said lower surface, said handpiece adapted to connect the fluid conveying tube to a source of water, and to connect said passage to a source of vacuum to aspirate said water mist and air from the vicinity of the burr whereby the water and air aspirated through the discrete ports pass upward through the individual extending pipes and then join together into said fixed passage to transversely cross the turbine thereby operating the turbine.

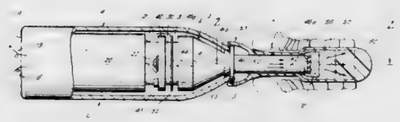
4,176,454

ULTR.ASONIC TOOTH CLEANER

Edward E. Hatter; Richard H. Taylor, both of Irvine, and Richard D. McGunigle, La Habra Heights, all of Calif., assignors to Biosonics International, Ltd., Irvine, Calif.

Filed Apr. 25, 1977, Ser. No. 790,312
Int. Cl.[2] A61C *3/03*
U.S. Cl. 433—119 **3 Claims**

1. An ultrasonic tooth cleaning device comprising:
(a) a hand held housing mounting an ultrasonic energy generator adapted to be positioned outside the mouth;
(b) a power supply connected to said ultrasonic energy generator; and
(c) ultrasonic distributor means driven by said ultrasonic energy generator connected to said housing and terminating in a continuous, unbroken, hard, radiating surface adapted to be inserted through a lip seal into a person's mouth containing a liquid couplant for ultrasonically cleaning the person's teeth when said radiating surface is positioned in close proximity to said teeth, said ultrasonic distributor means including a longitudinally extending hollow tubular body having a head at one end and having



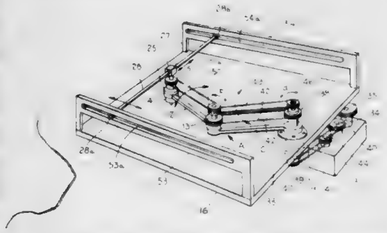
upper and lower transversely extending grooves for receiving upper and lower teeth when said head is inserted into the oral cavity and having acoustical mirror means at one end thereof for impeding the flow of sonic energy axially of said longitudinally extending body and for redirecting such ultrasonic energy toward said transversely extending grooves.

4,176,455

PLOTTING APPARATUS

Thomas M. Copeland, Rte. 1, Box 125-A, Columbia, S.C. 29203; Kenneth J. Feinberg, 619 King St., Apt. 604, Columbia, S.C. 29205, and Alfred H. Vang, 4202 Sequoia Rd., Columbia, S.C. 29206

Filed Feb. 24, 1977, Ser. No. 771,775
Int. Cl.[2] G01D *7/10*
U.S. Cl. 33—1 M **15 Claims**



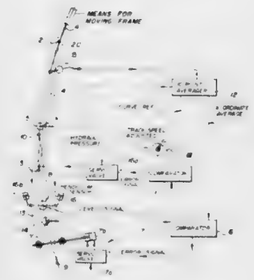
1. A plotting apparatus for use in an automatic reproduction system having an input source for supplying first and second control coordinate signals to control the positioning of said plotting apparatus in making a plot on the associated workpiece, said plotting apparatus comprising:
a work table for supporting said workpiece;
a pivoted arm carried in a superposed postion above said work table;
an instrument head carried by said pivoted arm adjacent a distal end thereof;
a work instrument carried by said instrument head;
power operated means operably connected to said pivoted arm for pivoting said arm through an angle responsive to a first control coordinate signal; and
said power operated means imparting translatory movement to said pivoted arm responsive to a second control coordinate signal.

4,176,456

AUTOMATIC INTEGRATING LINER

Helmuth von Beckmann, Columbia, S.C., assignor to Canron, Inc., New York, N.Y.

Filed Oct. 25, 1977, Ser. No. 844,819
Int. Cl.[2] E01B *33/00*
U.S. Cl. 33—1 Q **15 Claims**



11. An apparatus for reducing railroad track position errors comprising: a first measuring system having a leading point and a trailing point and means for establishing a reference line between said points; a measuring means located between said points for measuring a track position value relative to said reference line; means to move said first measuring system over a section of track for enabling said measuring means to measure a series of said track position values at a series of points extending over a specified distance along the track; means connected to said measuring means to store the series of track position values and to average them; a track correcting means attached to and trailing said first measuring system along the track; an independent track location sensing system for said track correcting means, which locating sensing system includes a leading point and a trailing point and means for establishing a second reference line between said lastmentioned points; sensor means located between the said points of the second reference line, for sensing a track location value relative to said second reference line; comparator means connected to said means to store and average the track position values and to said sensor means to compare said average position value with said location value and provide a position error value; and means connected to said comparator means for applying said position error value to control the operation of the track position correcting means to reduce an existing track position error.

4,176,457

COMBINED DIPSTICK BREATHER TUBE

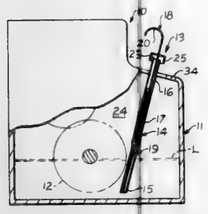
Gary L. Keffeler, Lacon, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 18, 1978, Ser. No. 4,795
Int. Cl.[2] G01F *23/04*
U.S. Cl. 33—126.7 R **12 Claims**

1. A device (13) having means for measuring the level of liquid (L) in a housing (11) notwithstanding turbulence of the liquid therein and defining means for passing gaseous fluids into and from the housing above the level of the liquid therein, said device comprising:
a tube (14) having a first end portion (15) adapted to be received in the liquid (L), an opposite second end portion (16) adapted to project upwardly through a portion (34) of the housing and having an upper open end (23), and a midportion (17) having an opening (22) therein for passing gaseous fluids;
a dipstick (18) extending removably longitudinally within

said tube (14) and having an end portion (20) outwardly of said tube second end portion for manipulation of the dipstick; and

a baffle (26) in said tube midportion (17) inwardly of said opening (22) for preventing liquid passed inwardly



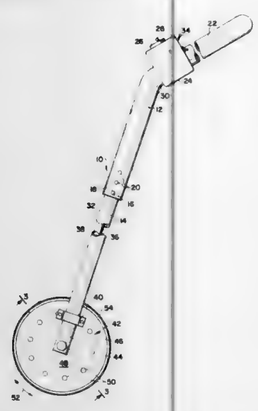
through said opening such as a result of turbulence in the liquid for impinging against said dipstick thereof, said tube and baffle cooperatively defining a gaseous fluid flow passage between said upper end (23) of the tube and said opening (22).

4,176,458

DISTANCE MEASURING APPARATUS

Christopher H. Dunn, 23 Emily St., Parry Sound, Ontario, Canada

Filed Mar. 27, 1978, Ser. No. 890,274
Int. Cl.² G01B 3/12
U.S. Cl. 33—141 E **5 Claims**



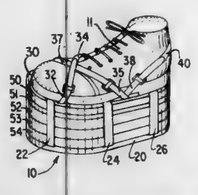
1. A distance measuring apparatus comprising a handle, a wheel, said wheel removeably secured to one end of said handle, said wheel having a plurality of protrusions mounted to a lateral surface thereof, means to optically sense proximity of each of said plurality of said protrusions including a photoelectric cell, a light source, and said protrusions having a light reflective surface for reflecting light emanating from said light source into said photoelectric cell, said photoelectric cell and said light source being disposed adjacent said lateral surface, means to electrically store in memory the number of protrusions that have come into proximate relationship with said photoelectric cell, means to electrically visibly display a proportional number to a count of said numbers, means to selectively modify said proportional number from one system of linear measurement to another system of linear measurement so displayed.

4,176,459

FOOT ELEVATION MEASURING DEVICE

Donald A. Perser, Northbrook, and Donald A. Roman, Des Plaines, both of Ill., assignors to Ballert Orthopedic Corp., Chicago, Ill.

Filed Apr. 3, 1975, Ser. No. 564,845
Int. Cl.² G01B 3/30; A61F 3/00
U.S. Cl. 33—174 D **17 Claims**



1. A device for measuring the relative difference in an individual's leg lengths in order to determine the amount of elevation required in the construction of an orthopedic shoe, to compensate for such difference, said device comprising a flat planar base plate of predetermined thickness; a flat planar sole plate of predetermined thickness and having a plan configuration similar to said base plate and being positionable in an overlying relationship relative thereto; at least one flat planar measuring plate of predetermined thickness and having a plan configuration similar to said base plate, said measuring plate being positionable between said base plate and said sole plate to increase the elevation of said measuring device by the predetermined thickness of said measuring plate; first, second and third pairs of holding straps respectively secured to said base plate adjacent to opposite ends thereof and intermediate the ends thereof, means for detachably connecting said pairs of holding straps to said sole plate to prevent relative movement of said sole plate, base plate and measuring plate; and binding means for securing said assembled sole plate and said base plate to the foot of the associated person, said binding means comprising first and second pairs of binding straps adapted to overlie the toe and ankle portions of the foot of the associated wearer, said binding straps being fixedly secured to said sole plate, a pair of heel binding straps secured to said sole plate and adapted to be connected behind the heel of the associated person, and means for detachably connecting the cooperating ends of respective pairs of binding straps, thereby to fixedly secure said measuring device to the foot of the associated person so as to allow said person to walk with the measuring device attached.

4,176,460

OPTO-MECHANICAL MEASURING SYSTEM

Morton Kaye, 122 Third St., Stamford, Conn. 06905

Continuation-in-part of Ser. No. 713,701, Aug. 12, 1976, Pat. No. 4,112,579. This application Jul. 13, 1977, Ser. No. 814,971
Int. Cl.² G01B 5/02
U.S. Cl. 33—174 L **12 Claims**

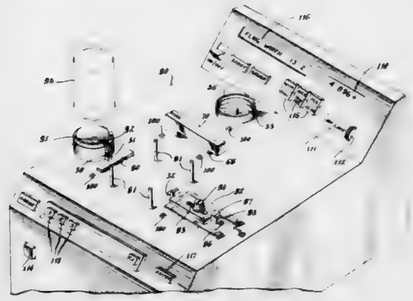
1. A quality control apparatus comprising:

a plurality of test stations, each having means for manually receiving an article of a given type and means for measuring a separate type of parameter of said article,

alphanumeric indicating means,

means coupled to each of said measuring means for producing digital signals corresponding to the parameter measured at the respective station, said digital signal producing means comprising a common digital signal generating means for all of said stations,

control means including a program memory and connected to display instructions on said indicating means sequentially directing the insertion of an article at said station by an operator, and



means connected to apply said digital signals to said indicating means for sequentially displaying data thereon corresponding to the respective parameter measured.

4,176,461

DEVICE FOR MEASURING THE DEVIATION OF OBJECT WITH NOMINALLY CIRCULAR CROSS-SECTION FROM THE ROUND SHAPE

Iosif D. Gebel; Arkady A. Zykov; Askold I. Nefedov; Viktor I. Parshikov, and Viktor F. Khrolenko, all of Leningrad, U.S.S.R., assignors to Spetsialnoe Knostruktorskoe Bjuro PO Proektirovaniju Shlifovalnogo Oborudovania, Leningrad, U.S.S.R.

Continuation-in-part of Ser. No. 466,889, May 3, 1974, Pat. No. 3,942,253. This application Feb. 12, 1976, Ser. No. 657,688
Int. Cl.² G01B 5/20, 5/28
U.S. Cl. 33—178 D **4 Claims**

1. A device for measuring the deviation of objects with nominally circular cross-sections from a round shape, comprising: a base; a displacement transducer secured to said base and including a sensing element for contacting the surface of the object to be measured; a device for visualizing the response of said transducer; a support device mounted on said base and including self-adjusting balance beams mounted to pivot about respective swing axles, arranged in a plurality of support steps, the latter including: at least a first step and a last step, each step except said last step being the preceding step for some other step, and each step except said first step being the subsequent step for some other step; said axles of said first step being directly secured to said base, said axles of said step except said first step being directly secured to respective ends of said beams of said preceding steps, and said beams of said last step having areas for contacting the surface of the object; the disposition of said axles of the first step being determined by central angles defined by radii drawn from a center of relative rotation of the object to said axle of the respective beam of said first step and to the middle of a segment interconnecting said axles of the first step; wherein said beams are symmetrical relative to a plane passing through their respective axles and said center of relative rotation, and a pair of beams of each step except said first step is symmetrical relative to said plane passing through said axle of the respective beam of said preceding step and said center of relative rotation; the disposition of said axles of two beams of each subsequent step of said preceding step being determined by central angles defined by radii drawn from said center of relative rotation to said axle of one of said beams of the preceding step and one of said axles of said subsequent step installed thereon; the disposition of said areas on the beams of said last step, contacting the surface of the object, being determined by central angles defined by radii drawn from said center of relative rotation to said axle of one of the beams of said last step and to the middle of one of said areas situated thereon; all of said central angles being determined on the basis of a condition of minimizing the expression

$$P_{yn} = \left| \frac{\sin n\mu_o}{\sin \mu_o} \prod_{i=1}^{i=k} \frac{\cos n\mu_i}{\cos \mu_i} \right|$$

wherein: P_{yn} is a value determining the amplitude of the harmonic n of displacement of the center of the profile of the cross-section of the object in a direction of a straight line passing through said center of relative rotation and parallel with a plane drawn through said axles of said first step;

n is a serial number of harmonics n=2; 3; 4;

μ_o is a central angle defined by radii drawn from said center of relative rotation to said axles of one of said beams of the first step and to the middle of a segment interconnecting said axles of the first step;

i is a serial number of the step of self-adjusting balance beams $1 \leqq i \leqq k$;

μ_i is a central angle defined by radii drawn from said center of relative rotation of said axles of one of said beams of the step i and one of said beams of the step i+1, mounted thereon, selectively with i=k, to the middle of an area adapted to contact one of said beams of the last step with the surface of the object and said axle of said one beam of the last step;

$\prod_{i=1}^{i=k}$

is a symbol that stands for the product of cofactors ranging from i=1 to i=k;

and wherein said sensing element contacts the surface of the object in a point on said straight line passing through said center of relative rotation and parallel with the plane drawn through said axles of said first step.

4,176,462

APPARATUS FOR INSPECTING THE GEOMETRY OF DUAL ROLLER TRACKS FOR CONTINUOUS CASTINGS

Karl Hölter, and Gustav Wiegard, both of Witten, Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf and Gustav Wiegard Maschinenfabrik, Witten, both of, Fed. Rep. of Germany

Filed Nov. 2, 1978, Ser. No. 957,233
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1977, 2749539
Int. Cl.² G01B 7/00, 7/28
U.S. Cl. 33—182 **6 Claims**

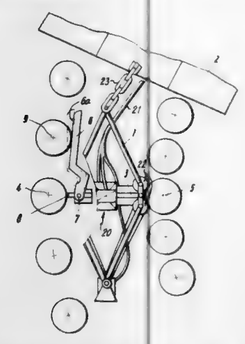
1. Apparatus for determining the relative disposition of rollers in a dual roller track for withdrawing a continuous casting, the apparatus including a foldable frame having two opposing corners each provided with at least one pair of centering rollers for establishing a center line between said corners which extends transversely to the tracks when the pairs of centering rollers engage oppositely located rollers of the track

V 9 8 9 1 DE 4 7 9 UMI

in an operating position of the frame, the improvement comprising:

at least one ruler having an offset portion;

means for pivotally mounting said ruler at said offset portion on a point on said center line at a distance from one of the rollers traversed by said line when said frame is in said operating disposition; and



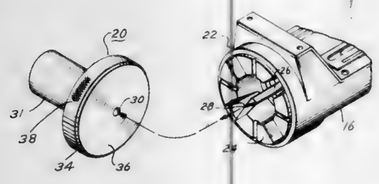
means for measuring the pivot angle of said ruler when engaging a track roller of the same track as the one roller and being disposed next to it, the pivot angle being taken to said center line or a line having a fixed orientation to that center line.

4,176,463

WHEEL ALIGNMENT GAUGE ASSEMBLY AND ADAPTER THEREFOR

Gerald D. Ringle, 3025 W. U.S. 12, Michigan City, Ind. 46360

Filed Jun. 14, 1978, Ser. No. 915,381
Int. Cl.[2] G01B *11/275*
U.S. Cl. 33—203.18 **10 Claims**



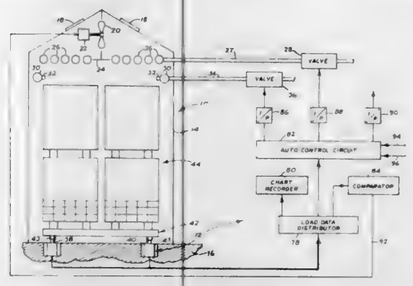
1. An alignment gauge assembly for a vehicle wheel having a spindle with a threaded outer end, comprising an adapter having a shank with a threaded, axially disposed hole in one end thereof for mounting on the threaded end of the wheel spindle in axial alignment therewith, a head of magnetic attractable material disposed on and rigidly attached to the other end of said shank and having an outwardly facing surface on a plane at right angles to the axis of said shank and a means defining a center recess in the face thereof for receiving a centering pin, and a gauge having a permanent magnet therein seating on said outwardly facing surface, a center pin seating in said center recess for centering said gauge with respect to the axis of said shank, and scales thereon for determining the caster and camber of the wheel.

4,176,464

METHOD AND APPARATUS FOR THE CONTROLLED DRYING OF LUMBER AND THE LIKE

George J. J. Randolph, 803 SE. Kane St., Roseburg, Oreg. 97470

Filed Jan. 26, 1978, Ser. No. 872,452
Int. Cl.[2] F26B *5/00, 21/00*
U.S. Cl. 34—16.5 **5 Claims**



1. In a dry kiln and the like including a defined drying zone and control means regulatable to control drying therein, apparatus for guiding the removal of moisture from a charge within said zone, said apparatus comprising

a plurality of spaced-apart weight sensors operable to follow changes in the weights of different portions of a charge placed in said zone, and

means operatively interconnecting said sensors and said regulatable control means for regulating the latter in accordance with the respective weights sensed by the former,

said control means including changeable-direction gas-flow-producing means, and

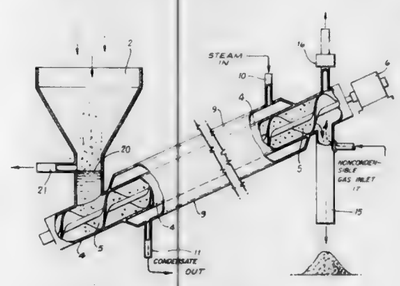
said interconnecting means, including means responsive to differences in the particular weights sensed by said sensors to adjust the direction of gas-flow created by said gas-flow-producing means.

4,176,465

HEAT SAVING METHOD FOR DRYING WET SOLIDS

Robert G. Murray, Palo Alto, and Benjamin J. Gikis, Los Altos Hills, both of Calif., assignors to Natomas Company, San Francisco, Calif.

Filed Jul. 18, 1977, Ser. No. 816,497
Int. Cl.[2] F26B *3/24*
U.S. Cl. 34—31 **4 Claims**



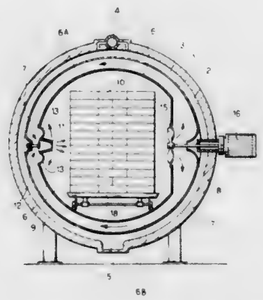
1. In a method for drying wet particulate matter continuously moving upwardly in a screw flight conveyer loaded with said matter which is being heated to vaporize the liquid wetting the particles, the improvement leading to heat savings which comprises maintaining a non-condensable gas barrier at the upper end of the screw flight whereby the vapors formed by heating the wetting liquid are blocked from leaving the flight at said end and whereby said blocked vapors are induced to flow downwardly through the upcoming particulate matter for condensation by the incoming, cooler, wet particulate matter present in the lower end of the screw flight, thereby effecting an internal transfer of the heat of vaporization of the wetting liquid and a consequent reduction in the heat required to dry the particulate matter.

4,176,466

APPARATUS FOR DRYING TIMBER

Ernesto G. Pagnozzi, Via Camponuova, Cairo Montenotte (Savona), and Vincenzo Pagnozzi, Rocchetta di Cairo (Savona), both of Italy

Filed May 6, 1977, Ser. No. 794,587
Claims priority, application Italy, May 12, 1976, 68164 A/76
Int. Cl.[2] F26B *9/06*
U.S. Cl. 34—233 **11 Claims**



1. In a timber drying kiln comprising a kiln chamber for a stack of timber to be dried and means for circulating within the chamber a drying gas for said stack of timber, said means comprising:

a nozzle opening directly into said chamber,

means feeding said nozzle with a flow of said drying gas in heated condition thereby to produce a jet of hot drying gas from said nozzle,

means movably mounting said nozzle so that the latter can be pointed in different directions across the chamber thereby to cause said jet to impinge onto different portions of a lateral face of a stack of timber in said kiln chamber, and

means for controlling the movement of said nozzle whereby to direct the jet of gas sequentially over the entire lateral face of said stack of timber.

4,176,467

APPARATUS FOR ALIGNING THIN SHEETS AT WORK STATION

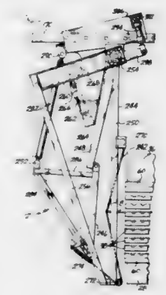
Byron B. Brookhyser, Milton, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Mar. 20, 1978, Ser. No. 888,454
Int. Cl.[2] F26B *25/00*
U.S. Cl. 34—236 **5 Claims**

1. An apparatus for aligning thin sheets within at least one opening of a substantially horizontally disposed work station when the sheets are transported past the back edge of the opening, comprising:

a vertically extending thin resilient flexible backing member positioned adjacent the opening and substantially across the back edge thereof;

a rigid vertically extending movable patting face positioned behind the backing member; and



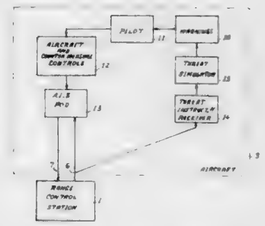
means for moving the patting face from a retracted position to a forward position when a sheet impacts the backing member, thereby realigning the position of the sheet.

4,176,468

COCKPIT DISPLAY SIMULATOR FOR ELECTRONIC COUNTERMEASURE TRAINING

William B. Marty, Jr., 535 Margarita Ave., Coronado, Calif. 92118

Filed Jun. 22, 1978, Ser. No. 918,013
Int. Cl.[2] G09B *9/00*
U.S. Cl. 35—10.4 **10 Claims**



1. In an aircraft used for range training of a pilot in electronic warfare, an apparatus for simulating the detection of impeding threats to the aircraft which comprises:

means for receiving a radio control instruction defining at least one simulated impeding threat;

means, responsive to the control instruction for generating at least one warning control signal; and,

means responsive to said control signal for warning the pilot of said simulated threat.

4,176,469

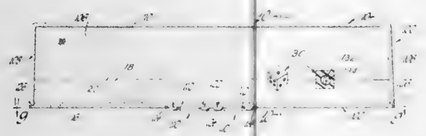
WAVE SIMULATOR

Gary G. Timco, 300 S. Silvery La., Dearborn, Mich. 48124

Continuation-in-part of Ser. No. 852,270, Nov. 17, 1977, abandoned, which is a continuation-in-part of Ser. No. 768,297, Feb. 14, 1977, abandoned. This application Mar. 27, 1978, Ser. No. 890,100
Int. Cl.[2] G09B *23/12*
U.S. Cl. 35—19 R **8 Claims**

1. A wave simulator comprising: an enclosed receptacle of an elongated shape having an elongated interior; non-mixing liquids received within the interior of the receptacle; one of the liquids being alcohol and another being oil such that the alcohol provides a lower liquid layer that simulates wave action upon tipping of the receptacle; the receptacle having a two-

piece construction including an injection molded unitary bottom wall of clear polycarbonate plastic and an upper wall member which is injection molded from clear polycarbonate plastic and has unitary top, side, and end walls; the bottom wall having edges bonded to the side and end walls of the upper wall member; at least one round opening through the bottom wall of the receptacle; the bottom wall also having a downwardly projecting annular rib extending about the opening thereof and defining a recess thereabout; a round flexible diaphragm closing the opening in the bottom wall; said diaphragm having a thickened round peripheral portion secured to the



bottom wall within the recess about the opening thereof and said diaphragm also having a thinner intermediate portion with a first side that faces upwardly in communication with the liquids and a second side that faces downwardly in communication with the environmental atmosphere; and the intermediate diaphragm portion having annular steps that extend vertically from the round periphery of the diaphragm such that the intermediate diaphragm portion flexes upwardly and downwardly to prevent excessive liquid pressure buildup within the receptacle while maintaining the receptacle interior completely filled with the liquids.

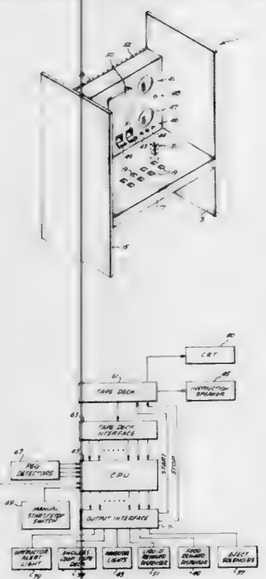
4,176,470

EDUCATIONAL REINFORCEMENT APPARATUS

Emerson O. Fosner, 1118 NE. 185th, Seattle, Wash. 98155, and Vernon L. Post, Kent, Wash., assignors to Emerson O. Fosner, Seattle, Wash.

Filed Sep. 1, 1977, Ser. No. 829,933
Int. Cl.[2] G09B *1/06, 5/06*
U.S. Cl. 35—22 A **5 Claims**

1. An educational reinforcement apparatus comprising:
a work surface including a plurality of holes for receiving coded items;
a plurality of coded items for insertion into said plurality of holes in said work surface;
detecting means mounted in said work surface for detecting the presence of coded items inserted into said holes in said work surface;
instruction and control means including a tape deck for producing audio instructions regarding the insertion of said coded items into said holes in said work surface and control signals related to the nature of said instructions, said instruction and control means also including an instruction speaker and a central processing unit, said central processing unit connected to said detecting means and including control signal storage means and comparing means, said tape deck connected to said instruction speaker and said central processing unit so as to simultaneously apply said audio instructions to said instruction speaker and said control signals to said control signal storage means, said comparing means of said central processing unit connected to said control signal storage means for comparing the detected presence of coded items inserted into said holes with the control signals stored in said control signal storage means related to the instructions given regarding the insertion of coded items into said holes in said work surface;
reward means connected to said instruction and control means for providing a reward when said comparison means determines that coded items have been inserted in said holes in said work surface in accordance with said instructions; and,
an eject solenoid located at the bottom of each of said holes in said work surface, said eject solenoids connected to said central processing unit such that said central processing



unit causes said eject solenoids to eject coded items in said holes in accordance with a predetermined set of instructions

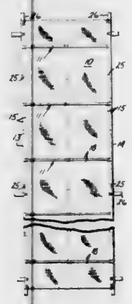
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4,176,471

MARCHING GUIDE

Thomas J. Roe, P.O. Box 261, Rte. 7, Bel-Clare Acres, St. Cloud, Minn. 56301

Filed Dec. 8, 1977, Ser. No. 858,706
Int. Cl.[2] A63B *71/00;* **G09B** *19/00*
U.S. Cl. 35—29 R **18 Claims**



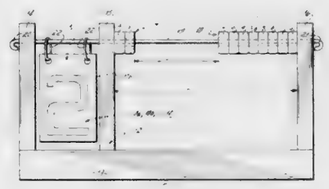
1. A marching guide for instructing step length in marching, comprising an elongate runner of flexible material for spreading on a marching surface, and means for providing tactile reference of a preselected height above the material of the marching surface at spaced intervals of a desired marching step length along said runner to a person marching along said runner, said tactile reference means including means defining a plurality of marker ridges at regular spaced intervals fixed along the runner for engagement by the feet of a person marching along the guide to indicate proper step length, said ridges having sufficient height to cause a tactile response in a person stepping upon one of said ridges.

4,176,472

NUMBERS TEACHING AID

Mary T. Devanney, 2665 Section Rd., Cincinnati, Ohio 45237

Filed Jan. 9, 1978, Ser. No. 867,816
Int. Cl.[2] G09B *19/02*
U.S. Cl. 35—32 **3 Claims**



1. A numbers teaching aid for teaching the significance of numbers, said aid comprising,
a series of flip cards positioned in a set and unchangeable sequence, each card having single digit indicia only thereon, said flip cards being arranged in numerical order as determined by the single digit indicia, and the color of each digit being different from the color of every other digit, and
a plurality of beads positioned in a set and unchangeable sequence, the number of beads being equal in number to the number of flip cards if no flip card is provided with the digit 0 and equal in number to the number of flip cards minus one if one of the flip cards is provided with the digit 0, the color of each bead being different from the color of every other bead, the color sequence of said beads being the same as the color sequence of said digits, and said beads being movable from a storage position into a number equivalent position where the color of the last bead moved to the number equivalent position from the storage position will be the same as the color of that number on an exposed flip card where the number of beads so moved is equal to the digit on the flip card.

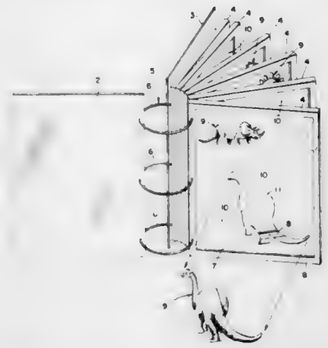
4,176,473

BOOK WITH REMOVABLE THREE DIMENSIONAL FIGURINES

Donald A. Rae, P.O. Box 51, Jenkintown, Pa. 19046

Filed Nov. 18, 1977, Ser. No. 852,801
Int. Cl.[2] G09B *19/00*
U.S. Cl. 35—35 E **10 Claims**

1. A book which comprises a plurality of pages each having a relatively thin, flat area at least partly surrounded by a peripheral frame, the flat area being provided with a cut away area formed to closely approximate the configuration of an object, and a three dimensional object of width greater than the thickness of the flat area, the object being held within the confines of the cut away area by frictional force between the object and the edge of the cut away area, whereby the object is retained within the page, and the object being adapted for subsequent removal from and reinsertion into the page, the peripheral frame being of greater thickness than the width of the object; and wherein



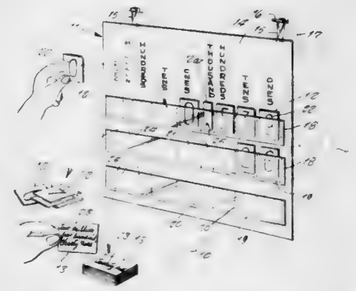
the pages are adapted to fold together with adjacent portions of the peripheral frames in contact respectively.

4,176,474

VISUAL TEACHING AID FOR NUMBER CONCEPT

Rita O'Sullivan, 165 Thomas St., Brentwood, N.Y. 11717

Filed Sep. 1, 1978, Ser. No. 938,880
Int. Cl.[2] G09B *1/08*
U.S. Cl. 35—73 **3 Claims**



1. A visual teaching aid for number concept, comprising in combination, a display board, a first deck of cards for selective display on said board, and a second deck of cards each one of which has a whole number printed thereupon in words, each card of said first deck having a numerical digit printed thereupon, and said board having at least one horizontal row of stations in each of which one said card of said first deck is placable, a right endmost station being identified as "ones", and successively next left stations being identified as "tens", "hundreds", "thousand", "ones", "tens", "hundreds", "million" and "ones".

4,176,475

FOOTWEAR CONSTRUCTED FROM A SINGLE PIECE OF MATERIAL

Lucy M. Arcamonte, 780 Nightingale Ave., Miami Springs, Fla. 33166

Filed May 1, 1978, Ser. No. 901,624
Int. Cl.[2] A43B *1/02*
U.S. Cl. 36—9 R **2 Claims**

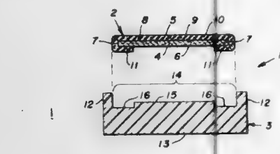
1. A footwear having heel and toe portions produced from a

single piece of material having a fleece-like surface comprising a pair of symmetrically disposed portions folded at a mid-portion, one upon the other in superimposed relation with said outer surfaces in contact relation, said mid-portion forming said heel of said footwear, stitches sewn on said superimposed portions from said heel to said toe along a bottom portion in spaced relation to the outer edges of said superimposed por-



tions forming a pair of first flaps, stitches sewn along a top portion from said toe to a position removed from said heel forming an opening in said footwear, said last named stitches being positioned in spaced relation to the top edge portion to form a second flap whereby upon folding said first and second flaps and turning said footwear inside out, said flaps become inner linings for said footwear with said fleece-like surface exposed on all portions of said footwear.

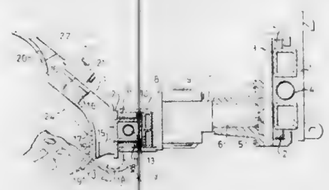
4,176,476
CUSHION INSOLE
Aarno A. Hassell, Storrs, Conn., assignor to Rogers Corporation, Rogers, Conn.
Filed Apr. 14, 1978, Ser. No. 896,169
Int. Cl.[2] A43B *13/40*
U.S. Cl. 36—44 **5 Claims**



1. A cushion insole for shoes consisting essentially of:
means for support which is relatively rigid and stiff; and
a unitary combination sheet material comprising a skin of wear material integral with a layer of resilient foam material, said foam material being adhered to said means for support.

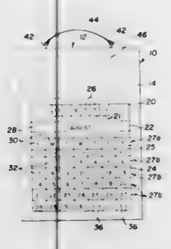
4,176,477
COMPACT UNIT FOR EXCAVATING, COMPACTING AND LOADING
Arne Fardén, Harjagersgatan 7,, 245 00 Staffanstorp, Sweden
Filed Mar. 1, 1978, Ser. No. 882,096
Int. Cl.[2] E02F *5/22*
U.S. Cl. 37—104 **6 Claims**

1. A compact unit for excavating, compacting and loading material on a horizontal or sloping surfaee, comprising an oblong excavation blade (17) and at the lower edge thereof in relation to the advancing direction both forwardly-downwardly directed breaking teeth (19) and behind the same a compactor (18), characterized in that the excavation blade is supported via a plurality of elastic members (15,16) by a carrier beam (12), which is limited pivotal in the horizontal and vertical plane, and at least one amplitude limiter (30) is attached between the excavation blade (17) and the carrier beam (12), which amplitude limiter comprises a sliding body (32) supported by the excavation blade (17) and having an upper top sliding surface (33) and an oblique sliding surface (36), which is formed by a lateral block (35) and preferably has an angle to the top sliding surface of 135°, and a stop member (37), which is supported by the carrier beam (12) and has a top block (39)



above the top sliding surface (33) being adjustable in relation thereto, and a stop member portion (37') extending along the sliding surface (36) of the lateral block, but at a certain small distance thereto.

4,176,478
CALENDAR
Marie-Louise Brewer, 5203 Gaston Ave., Apt. 108, Dallas, Tex. 75214
Filed Jul. 12, 1978, Ser. No. 923,964
Int. Cl.[2] G09D *3/00*
U.S. Cl. 40—107 **4 Claims**

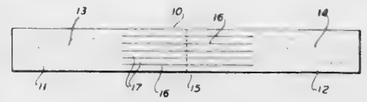


1. A calendar for perpetually displaying the months and years comprising: a body having a flat planar front surface and a cavity formed in the rear surface, said front planar surface having a plurality of lines dividing the front surface into segments for displaying the year, the month, and the days of the month; a plurality of rectangular strips having numeral indicia printed thereon for indicating the year; a plurality of elongated strips having indicia printed thereon for indicating the month; a plurality of strips having indicia indicating the day of the week; strips having indicia printed thereon for indicating the numerical day of the month; tacks having ferris metal therein secured within each of the segments on the planar surface of the body; tacks secured in horizontal lines in spaced relationship in the hollow cavity of the body; magnetic tape secured to the rear portion of each of the strips adapted to be attracted to the tacks on the front surface of the body and the hollow cavity of the body so as to secure the appropriate strip in the appropriate segment; and closure means pivotally secured to the rear portion of the calendar.

4,176,479
LABEL OR TAG
Paul A. L. l'Hoir, Arnhem, Netherlands, assignor to B. V. Etikettenfabriek Gebroeders Mogendorff, Zevenaar, Netherlands
Filed Sep. 17, 1975, Ser. No. 614,279
Int. Cl.[2] B32B *3/10, 3/02*
U.S. Cl. 40—2 R **16 Claims**

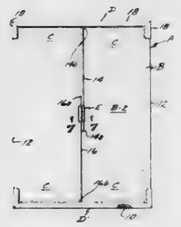
1. A label or tag comprising an elongated, longitudinally extending strip of sheet material, said strip comprising:

a first part adapted to have information marked thereon, said first part having first and second opposite ends, said first end being free and defining the extreme outer longitudinal end of said first part;
a second, elongated, longitudinally extending part of substantial length intended to be secured to an article of merchandise, said second part being connected at one end thereof to said second end of said first part;
said label or tag being provided on only said second part thereof with a plurality of laterally spaced, side-by-side incisions of substantial length extending generally in the



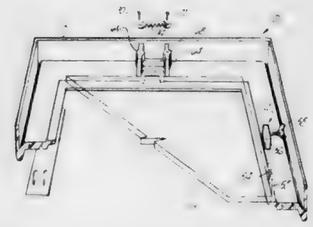
longitudinal direction of said second part and dividing said second part into a number of elongated strips of substantial length;
said strips being of sufficient width and length that said second part of said label or tag is securable to an article of merchandise by securing means which applies a lateral constricting force to said strips to cause at least some of the latter to at least partially overlie one another;
whereby if one or some of said strips is severed the remaining unsevered one or more of said strips will be effective to keep said label or tag secured to said article of merchandise by said securing means.

4,176,480
POSTER SUPPORTING FRAME
Rosendo Euzarraga, Anaheim; Robert J. Winkler, Irvine, and Robert D. Chapman, Mission Viego, all of Calif., assignors to Fred F. Solomon, San Diego, Calif.
Filed Jan. 9, 1978, Ser. No. 867,834
Int. Cl.[2] G09F *1/12*
U.S. Cl. 40—155 **3 Claims**



1. In combination with a pliable rectangular poster that has a forward surface on which decorative material is depicted, a rearward surface, and forward narrow marginal end and side edge surfaces free of said decorative material, a frame for removably supporting said poster in a flat taut condition in a vertical position, said frame of the type that includes identical upper and lower frame assemblies, means for adjustably maintaining said upper and lower frame assemblies in a first vertical spaced relationship, the improvement in each of said frame assemblies for removably gripping one of said end marginal end surfaces and portions of said marginal side surfaces adjacent thereto to support said poster in said taut condition when said frame assemblies are in said first vertical spaced relation, each of said improved frame assemblies including:
A. an elongate rigid member of channel shape transverse cross section that is defined by a web and forward and rearward flanges that extend in the same direction from the longitudinal edges thereof, a pair of transversely aligned ribs that extend towards one another from said rearward and forward flanges and are spaced a substantial distance from said web, and a pair of mitered end extensions on opposite ends of said rigid member that extend therefrom in the same direction and are of the same structure as that of said elongate member, with said poster capable of having one of said marginal end surfaces and portions of said marginal side portions disposed in said frame assembly to overlie said rearward flanges thereof; and
B. a plurality of resilient tubes having diameters substantially greater than the distance between said pair of ribs, each of said resilient tubes of a length substantially less than one of said elongate, rigid members, and each of said tubes when over a marginal edge portion of said poster overlying one of said ribs and into the space between said pair of ribs being diametrically and inwardly deformed, with the inwardly deformed portion of said tube most adjacent said rearward flange pressing said marginal edge portion of said poster into pressure frictional contact with said rib projecting from said rearward flange and portions of said tubing on each side of the rearwardly and inwardly deformed portion thereof pressure and frictionally contacting said marginal edge portion to cooperate with said rib projecting from said rearward web and said rearward and inwardly deformed portion of said tube in holding said marginal edge portion of said poster in a fixed position relative to said rearward flange, and said forward diametrically and inwardly deformed portion of said tube pressure and frictionally engaging said rib on said forward flange to the extent that said tube will not slide relative to said forward flange to be inadvertently displaced therefrom.

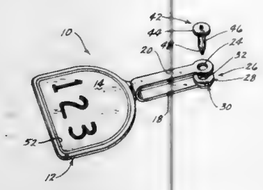
4,176,481
PICTURE FRAME ASSEMBLY
Robert J. Sawyer, P.O. Box 368, Boyne City, Mich. 49712
Filed Feb. 22, 1978, Ser. No. 880,146
Int. Cl.[2] G09F *1/12*
U.S. Cl. 40—156 **7 Claims**



1. A frame assembly for mounting a flat object, the frame assembly comprising:
a unitary box-shaped frame member having a front face and a rear face and a viewing aperture extending therebetween;
a plurality of flat locking flanges disposed adjacent said aperture and extending rearwardly from said rear face and said frame member so that the plane of the flanges is substantially parallel to the axis of the viewing aperture whereby the flat object is freely axially insertable between the locking flanges and, upon insertion, the locking flanges support said flat object against lateral movement;
wherein said locking flanges each include an axially extending through slot opening rearwardly and terminating at their other end proximate said frame member rear face;
a plurality of locking members lockingly engageable with said locking flanges at infinitely adjustable axial positions with respect to said frame member rear face and adapted

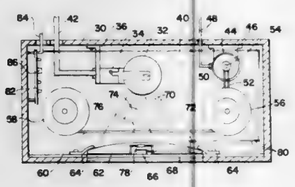
to clampingly engage said flat object to said frame member rear face; said locking members each comprising a T-bolt member having a supporting portion and a threaded shank extending outwardly from the supporting portion; a fastener which threadably engages the shank, said shank being slidably received in said slot when said fastener is partially threaded onto the shank and so that the supporting portion abuttingly engages said flat object, and so that the fastener is positioned on the side of the flange opposite from the flat object, whereby, upon tightening the fastener, the locking member becomes clamped to the locking flange and the supporting portion prevents axial movement of the flat object.

4,176,482
EAR TAG
Lester M. Steckel, Box 235, Taylor, Nebr. 68879
Filed Feb. 8, 1978, Ser. No. 876,056
Int. Cl.[2] G09F *3/00*
U.S. Cl. 40—301 **8 Claims**



1. An animal ear tag comprising,
a flat identification area having a pair of flat supporting arms extending therefrom in a parallel spaced-apart relationship adapted to receive the animal's ear therebetween,
each of said supporting arms having an opening formed therein adjacent the end thereof,
and a pin means extending through said openings and the animal's ear positioned therebetween to maintain the tag on the animal's ear,
said pin means including a shank portion having a pointed ear piercing portion on one end thereof, said shank portion having an enlarged retainer portion inwardly of said pointed ear piercing portion, said pin means including a retainer disc means detachably secured to said shank a retainer disc means detachably secured to said shank portion inwardly of said enlarged retainer portion.

4,176,483
MOBILE VISUAL SIGNALLING DEVICE
Daniel R. Bailey, P.O. Box 783, Lake Ronkonkoma, N.Y. 11779
Filed Nov. 18, 1977, Ser. No. 852,829
Int. Cl.[2] G09F *21/04*
U.S. Cl. 40—467 **10 Claims**



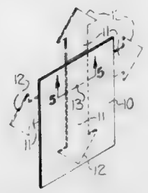
1. A mobile visual signalling device comprising a first display apparatus, a second display apparatus, each of said display apparatuses comprising a housing, a pair of reels journaled within said housing, a strip film, the ends of said strip film secured to said pair of reels, said strip film having a first indicia site and a second indicia site disposed adjacent one another, a light source, said light source being disposed within said housing, a viewing screen, said viewing screen disposed secured to said housing located adjacent said first indicia site, a photo-electric sensing device, said photo-electric sensitive device disposed adjacent said second indicia site and adjacent said viewing screen, said first indicia site carrying display indicia thereon having light transmission characteristics different from the remaining portions of said first indicia site, said second indicia site having an elongated indicia thereon possessing different light transmission characteristics than the remaining portions of said second indicia site, a motor, said motor rotationally coupled to one of said pair of reels, bias means for biasing the other of said pair of reels in a selected rotational direction, said bias means including a spring, one end of said spring fixedly secured to said housing, the other end of said spring fixedly secured to said other of said pair of reels, means to manually selectively energize said motor in an energized state wherein said motor may rotate in one of two directions, means to de-energize said motor upon said second indicia being aligned between said light source and said photoelectric device, an amplifier, said amplifier electrically coupled to said photo-electric device, said amplifier electrically connected to said motor, said means to de-energize said motor including a first relay and a second relay, a counter, said counter electrically coupled between said second relay and said amplifier, each of said first relay and said second relay having a pair of normally closed contacts, said pair of normally closed contacts of said first relay and of said second relay electrically coupled to said motor whereby said photo-electric device provides an output signal responsive to light emanating from said light source and traversing said second indicia so as to selectively operate said first relay and said counter operating said second relay and stopping said motor from further rotation upon selectively a single appearance of said second indicia and multiple appearances of said second indicia adjacent the location of said photo-electric device, whereby said first display apparatus and said second display apparatus each have their respective motors de-energized independently of one another upon said second indicia of each of said apparatuses being individually aligned between said light source and said photo-electric device of each of said apparatuses.

4,176,484
DIRECTIONAL SIGN
James M. Terris, 2126 Dillon Dr., Fayetteville, N.C. 28306
Filed Jul. 24, 1978, Ser. No. 927,644
Int. Cl.[2] G09F *7/00*
U.S. Cl. 40—584 **6 Claims**



1. A directional sign for providing observers with directional information to a particular location or event, said sign comprising a rectangular signboard; indicia provided on one face of the signboard describing the particular location or event; three directional indicators provided on said one face of the signboard closely adjacent three of the four edges of the signboard and oriented respectively upwardly, to the left, and to the right relative to said indicia for indicating three directions which could be followed to the particular location or event; and three respective lines extending across said one face of the signboard respectively between said indicia and said three directional indicators to facilitate removing from view two of the three directional indicators when installing the directional sign for use so that only one directional indicator remains visible on the face of the signboard when the sign is installed and serves for indicating to observers of the sign the one correct direction which should be followed to the particular location or event.

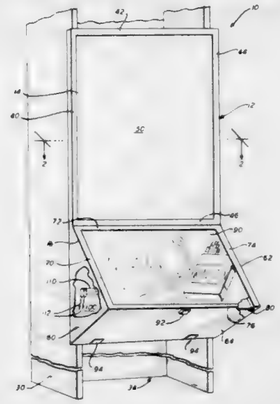
4,176,485
DIRECTIONAL SIGN
James M. Terris, 2126 Dillon Dr., Fayetteville, N.C. 28306
Filed Jul. 24, 1978, Ser. No. 927,645
Int. Cl.[2] G09F *7/00*
U.S. Cl. 40—584 **6 Claims**



1. A changeable direction sign for providing observers with directional information to a particular location or event, said sign comprising a rectangular sign board having a height dimension greater than its width dimension, indicia on the face of said sign board describing the particular location or event, an elongate indicator of a length no greater than the height dimension of said sign board, means pivotally securing said elongated indicator to the rear of said sign board at a predetermined location on the upper medial portion of said sign board so that the indicator when manually positioned either upwardly, to the left, or to the right, extends in projecting relation beyond either the upper or side edges of the sign board to thereby indicate to the observer of the sign that the direction which should be followed to said particular location or event is either straight ahead, to the left, or to the right, and when the indicator is positioned in a downward direction relative to the sign board, the indicator is in a storage position concealed behind and within the periphery of the sign board to facilitate packaging.

4,176,486
ADVERTISING DISPLAY
Lloyd Williams, 30 W. 86 St., New York, N.Y. 10024
Filed Jul. 8, 1977, Ser. No. 813,868
Int. Cl.[2] G09F *7/18*
U.S. Cl. 40—607 **10 Claims**

1. A display for mounting upon pillars of I-beam cross-sectional configuration; comprising:
(a) frame means;
(b) message display means carried by said frame means;
(c) display mounting means coacting with said frame means to support same at a predetermined position upon pillar of I-beam cross-sectional configuration;
(d) said display mounting means including holding means operative to exert forces upon opposed inner faces of the flanges of the I-beam so as to securely lodge said display mounting means therebetween and so as to mount said display to the pillar.



4,176,487
FIREARM BARRELS AND PROJECTILES
John R. Manis, 84-6 Silver Lake Court, Mystic Island, P.O. Box 582, Tuckerton, N.J. 08087
Continuation of Ser. No. 308,755, Nov. 22, 1972, abandoned, which is a continuation of Ser. No. 90,608, Nov. 18, 1970, abandoned. This application Feb. 20, 1974, Ser. No. 444,008
Int. Cl.[2] F41C *21/00*; F41F *17/10*; F42B *11/00*
U.S. Cl. 42—76 R **18 Claims**



1. In a firearm barrel having a main bore,
at least one gas-relief chamber in a bore wall of said barrel constructed and arranged for imparting a rotational motion to a projectile moving along said barrel, said rotational motion being imparted to the projectile directly by the modulated flow of propellant gases moving past a rearward area of the projectile and expanding into said gas-relief chamber.

4,176,488
LINE GUIDE RING
Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Shizuoka, Japan
Filed Oct. 28, 1977, Ser. No. 846,350
Int. Cl.[2] A01K *87/04*
U.S. Cl. 43—24 **1 Claim**

1. A line guide for a fishing rod comprising a fixing ring; a single front supporting leg terminating at its distal end in a front mounting foot adapted to be fitted to the top of a fishing rod; a pair of rear supporting legs terminating at their distal

ends in rear mounting feet adapted to be fitted to opposite sides of the fishing rod, said rear supporting legs being moderately bent from the top of the fixing ring toward both sides of the fishing rod, being inwardly twisted by 90 degrees, and protruding from the top of the fixing ring to locate the tops thereof at a position higher than the upper edge of the fixing ring; said fixing ring, supporting legs, and mounting feet being integral and formed by punching from a single metal plate, and a guide ring mounted in said fixing ring.

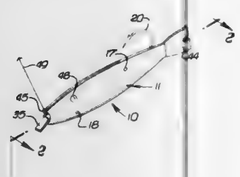


4,176,489

FISHING LURE WITH RETRACTABLE AND AUTOMATICALLY EXTENDABLE HOOK

Frank T. Levstik, 655 E. Main St. (Space 68), San Jacinto, Calif. 92383

Filed Dec. 20, 1977, Ser. No. 862,483
Int. Cl.[2] A01K *85/02*
U.S. Cl. 43—35 **2 Claims**



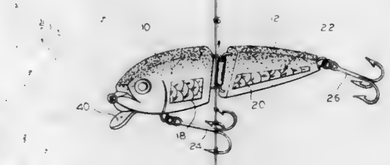
1. In combination:
a bait-fish shaped lure body;
a fish hook mounted in said body to be spring biased into a position extended therefrom;
trigger means for latching said hook in a position retracted into said body and operable when engaged by a fish seizing said lure in its mouth to release said hook causing it to be spring extended from said body and into said fish;
said lure body being molded in two halves which fit together on the longitudinal axial plane of symmetry of said body excepting where one or the other or both of said body halves are recessed laterally from said plane to provide chambers to accommodate the following operative elements in said body;
a hook pivot pin;
said fish hook having a hub, pivoted on said pin;
a radial actuating wire arm provided on said hub;
a hook extending and retracting bar apertured to slideably receive said hub arm and notched on opposite sides to trap a coiled expansive spring thereon;
said bar being notched on one side near its front end to form a cocking shoulder, and forming at its front end a cocking handle for said lure;
a trigger pivot pin near said cocking shoulder; and
a trigger lever pivoting on said pin and swingable into opposition to said cocking shoulder when said handle is pulled forwardly to cock said lure with said hook retracted into said lure, while also swinging the rear end portion of said trigger lever outwardly where it will practically certainly be depressed upwardly into said body by a fish seizing said lure in its mouth thereby releasing the hook biasing spring to extend the hook from the lure and into the fish.

4,176,490

HINGED FISHING LURE

Nicholas A. Philips, P.O. Box 1273, Traverse City, Mich. 49684

Filed Jan. 16, 1978, Ser. No. 869,932
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.15 **9 Claims**



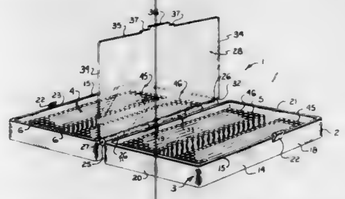
1. A fishing lure in the approximate shape and form of a fish, said lure comprising first and second body parts dimensioned to simulate the fore and aft parts of a fish, hinge means joining said parts together, said hinge means comprising two wire loops individually associated with the fore and aft parts, straight vertical sections in each of said loops positioned in a spaced parallel relationship, an elongated tube enclosing said vertical sections substantially throughout their length, the internal diameter of said tube having a relationship with the external diameter of said wire loops which enable said body parts to pivot freely with a limited amount of non-hinged twisting motion, to enable said first and second parts to move back and forth with a tail-wagging motion which is restricted primarily to virtually a single plane with a slight twisting motion, cavities formed in said body parts to form buoyance chambers which control the level at which said lure floats, and at least one hook attached to said lure.

4,176,491

STORAGE STRUCTURE FOR ARTIFICIAL FLY-TYPE FISHING LURES

John L. Herring, 2626 S. 48th Ter., Kansas City, Kans. 66106

Filed Feb. 28, 1978, Ser. No. 882,103
Int. Cl.[2] A01K *97/06*
U.S. Cl. 43—57.5 R **7 Claims**



1. A storage structure for artificial fly-type fishing lures, said storage structure comprising:
(a) a container having a base and an upstanding side wall; said side wall having a free edge defining an open end of said container;
(b) a closure shaped for mating with and sealing the open end of said container;
(c) a plurality of pegs mounted in said container and arranged in a plurality of elongate rows such that the pegs in adjacent rows are laterally in-line; each of said pegs having one end thereof connected with the base of said container, and a free end thereof extending substantially normally thereof; each of said pegs being semi-rigid, and having a frustroconical shape which tapers inwardly from the one end to the free end thereof, whereby adjacently disposed pegs are adapted to receive and frictionally retain a rigid hook portion of one of said lures thereinbetween for detachably and wedgingly locking said lure in said container.

4,176,492

MAGNETIZED TOY WITH REMOVABLE APPENDAGES

Anson Sims, Granada Hills, and Lawrence T. Jones, Playa Del Rey, both of Calif., assignors to California R & D Center, Culver City, Calif.

Filed Dec. 23, 1977, Ser. No. 863,931
Int. Cl.[2] A63H *3/10*
U.S. Cl. 46—22 **12 Claims**



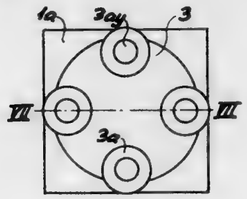
1. An articulated magnetized toy having at least one removable appendage comprising:
a body member;
magnetic means operatively positioned within the body member for removably retaining an articulated appendage, and
a unitary appendage connected to the magnetic means having a U-shape configuration including a base member having means for interconnecting with the magnetic means and a pair of upright members extending on either side of the body member, the pair of upright members being disposed to at least partially surround the body member.

4,176,493

ROTATABLE ELEMENT FOR TOY BUILDING SETS

Erling T. Dideriksen, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland

Filed Nov. 11, 1977, Ser. No. 850,676
Claims priority, application Denmark, Dec. 20, 1976, 5736/76
Int. Cl.[2] A63H *33/06*
U.S. Cl. 46—23 **7 Claims**



1. A rotatable element for a toy building set, said element comprising:
a one-piece base plate having a circular aperture therein;
a one-piece rotatable member, said member comprising a disc of a diameter substantially equal to but slightly less than that of the circular aperture and positioned therein, said disc being rotatable in the circular aperture for rotational movement relative to the base plate;
said base plate comprising four side walls defining a cavity therebetween and a socket connected to the side walls, said socket being in the cavity coaxial with the circular aperture;
said rotatable member comprising a pivot post rotatably mounted in the socket and a plurality of engagement studs on the upper surface of the disc adjacent the periphery thereof, each of said studs extending partly beyond the periphery of the disc to slidably contact the top face of the base plate during rotation of the disc.

4,176,494

AGRARIAN STAKE

Claude Boucher, and Jacqueline Boucher, both of 101 des Prés St., Vaudreuil-sur-le-lac, Canada (J7V 5V5)

Filed May 17, 1978, Ser. No. 907,133
Int. Cl.[2] A01G *9/12*
U.S. Cl. 47—47 **2 Claims**



1. An agrarian stake comprising a straight four sided rod-like, ground engaging element of uniform X-shaped cross-section throughout the major part of its length, said element defining four orthogonally disposed and radially outwardly extending arms having their longitudinal outer edges equally radially spaced from the longitudinal axis of said element, the outer longitudinal edge of each arm having an arrowhead cross-section defining, on each side of said arm, a laterally protruding flange making a 45 degree angle with the associated arm, said arms defining between themselves four similar spaces opening at the four sides of said element, said flanges being co-planar, two by two, and each pair of co-planar flanges forming one side of said element and partially closing said space, and a clasp consisting of a band of resilient material formed into a semi-annular shape for encircling a plant stem, said band having an out turned hook at each end for snap fit removable attachment with any one of said pair of flanges by insertion within the associated space, whereby said clasp may be attached at any point longitudinally of said element and to any of its four sides and said clasp may slide along said element upon a force exerted on the same in a direction substantially parallel to the longitudinal axis of said element.

4,176,495

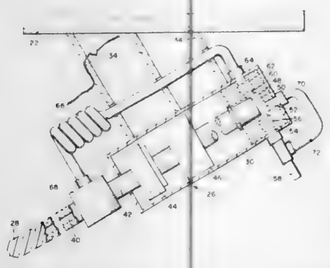
APPARATUS AND METHOD FOR AUTOMATED INJECTION OF TREES WITH A TREATING LIQUID

Warren H. Dale, Hattiesburg, Miss., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 2, 1978, Ser. No. 930,473
Int. Cl.[2] A01G *29/00*
U.S. Cl. 47—57.5 **18 Claims**

1. Apparatus for injecting liquid into a tree comprising:
at least one drill bit having a fluid passageway therethrough;
means for rotating and reversibly advancing said drill bit to form a borehole in said tree;

means in communication with said drill bit for supplying a quantity of liquid substantially proportional to the volume



of said borehole through said passageway and injecting said liquid into said borehole.

4,176,496

GUIDE RAIL ASSEMBLY FOR SLIDING DOORS

Erich Röck, Höchst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed May 4, 1978, Ser. No. 902,816
Claims priority, application Austria, May 13, 1977, 3433/77
Int. Cl.[2] E05D *13/02*
U.S. Cl. 49—410 **7 Claims**



1. A guide rail assembly for sliding doors, particularly sliding doors on pieces of furniture, said guide rail assembly comprising:

an elongated supporting rail for each sliding door and adapted to be fixed to a body of a piece of furniture, said supporting rail having a V-shaped profile defined by first and second elongated flanges extending at an angle of approximately 90° with respect to each other;

an elongated slide rail for each sliding door and adapted to be fixed to such sliding door, said slide rail having a V-shaped profile defined by first and second elongated flanges extending at an angle of approximately 90° with respect to each other;

an elongated roller-carrier assembly for each sliding door, said roller-carrier assembly including first and second groups of rollers, each said roller having a cylindrical surface defined about an axis of rotation, the axes of rotation of all of said rollers of each said group of rollers being parallel, said axes of rotation of said rollers of said first group extending substantially orthogonally to said axes of rotation of said rollers of said second group;

said roller-carrier assembly being loosely positioned between said supporting rail and said slide rail such that said cylindrical surfaces of said rollers of said first group are in rolling contact with said first flange of said supporting rail and said second flange of said slide rail, and said cylindrical surfaces of said rollers of said second group are in rolling contact with said second flange of said supporting rail and said first flange of said slide rail; and

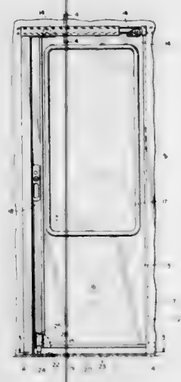
means for attaching said supporting rail to the body of the piece of furniture, and means for attaching said slide rail to the sliding door, such that said first and second flanges of said supporting rail and said first and second flanges of said slide rail extend at angles of approximately 45° to a plane which extends in the direction of movement of the sliding door and substantially transverse to the sliding door.

4,176,497

SLIDING DOOR AND THRESHOLD ARRANGEMENT FOR A RAILWAY PASSENGER CAR COMPARTMENT

Ernest J. Nagy, Munster, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Apr. 17, 1978, Ser. No. 896,943
Int. Cl.[2] E05D *13/02*
U.S. Cl. 49—411 **12 Claims**



1. For a railway passenger car compartment having a floor including an aisle and a pair of longitudinally aligned spaced vertical divider walls adjacent to said aisle and defining an access opening into said compartment, a sliding door and threshold arrangement for said opening, comprising:

a door having a vertical end member and a panel extending laterally of the door connected to said end member,

an elongated threshold plate on the floor and extending the width of the access opening beneath the door, said plate having an upwardly opening longitudinally extending guide channel therein and a plurality of spaced diverging slots extending therefrom and opening to the sides of the plate,

guide plate means depending from the door and having a vertically yieldable lower end portion slidably engaged within said guide channel to secure the lower end of the door against transverse movement, and

said lower end portion being reactive with said threshold plate to scrub foreign matter from the guide channel and move it outwardly through said slots during opening and closing movement of the door.

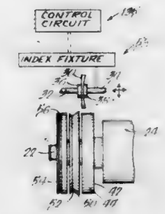
4,176,498

APPARATUS FOR EDGING LENSES

Yordan Vulich, Oak Lawn, and Wilfredo P. Loreto, Hoffman Estates, both of Ill., assignors to AIT Industries, Inc., Schaumburg, Ill.

Filed Feb. 21, 1978, Ser. No. 879,146
Int. Cl.[2] B24B *9/14*
U.S. Cl. 51—101 LG **20 Claims**

1. An apparatus for grinding the peripheries of articles such as optical lenses and the like, comprising a grinding wheel having a grinding surface, means for rotating said grinding wheel about its axis, means for supporting an article, means for moving said supporting means and said grinding wheel together to move the periphery of the article into engagement with a portion which is less than the entirety of said grinding surface, means for rotating the article about an axis while its



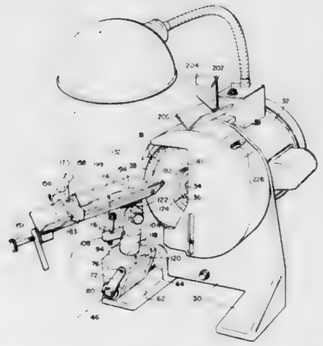
periphery is against only said portion of said grinding surface, and means operative in response to successive articles being ground for operating said moving means to automatically periodically engage the peripheries of at least some of the successive articles against different portions each of which is less than the entirety of said grinding surface to sequentially engage all portions of said surface with the peripheries of articles so that said surface wears evenly and uniformly.

4,176,499

DRILL SHARPENER

Joseph Mazoff, 3136 Federal Ave., El Paso, Tex. 79930

Continuation-in-part of Ser. No. 775,972, Mar. 9, 1977, abandoned, which is a continuation-in-part of Ser. No. 639,221, Dec. 10, 1975, abandoned. This application Oct. 7, 1977, Ser. No. 840,304
Int. Cl.[2] B24B *3/28*
U.S. Cl. 51—124 R **17 Claims**



1. In a sharpener for a drill having a pair of helical flutes, each of which has a trailing edge, a cutting point face having a pair of facets, and a shank:

(a) a frame;

(b) a rotatably mounted grinding wheel supported on said frame and having a grinding face;

(c) a drill guide and holder having a drill axis locating means;

(d) mounting means supporting said guide and holder on said frame for positioning said drill axis locating means so that a drill thereon is at an angle with respect to the grinding face of said grinding wheel for grinding one facet of the cutting points of the drill at a time;

(e) drill flute engaging means on said guide and holder to engage one of said trailing edges with a point contact while each facet of said cutting point is ground by said grinding face;

(f) said grinding wheel being rotatable in a direction to cause one of said facets to create rotary torque that is imparted to the drill to force said trailing edge of said flute against said flute engaging means; and

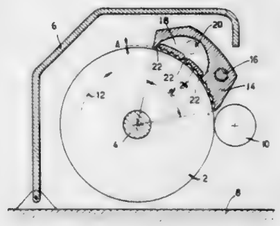
(g) a drill shank abutment means on said guide and holder and disposed to be engaged by said shank to hold said drill in precise longitudinal position in said guide and holder to resist and prevent longitudinal axial movement of said drill in a direction away from said grinding face.

4,176,500

SPRINKLING DEVICE FOR GRINDING WHEELS

Bernard Bourgoin, Saint Etienne, France, assignor to Centre Technique des Industries Mecaniques, France

Filed Sep. 23, 1977, Ser. No. 836,007
Claims priority, application France, Sep. 24, 1976, 76 28732; Sep. 13, 1977, 77 27573
Int. Cl.[2] B24B *55/02*
U.S. Cl. 51—267 **6 Claims**



1. A sprinkling device for grinding wheels and like tools having a guard and a generally cylindrical active surface, said sprinkling device comprising a hollow deflecting shoe to be connected to a source of pressure sprinkling liquid, said hollow deflecting shoe having a U-shaped rigid body forming two cheeks and a deformable deflecting surface extending between said cheeks with a curvature located opposite to said active surface of said grinding wheel, said deflecting surface having two curved ends secured to said rigid body thus forming a chamber, said deflecting surface having sprinkling liquid exit apertures and teeth oriented substantially at right angles to the displacement of said active surface of said grinding wheel in order to turn said sprinkling liquid toward said grinding wheel; central supporting and adjusting means carried by the guard and operatively associated with said U-shaped rigid body for supporting and adjusting said shoe toward and away from said grinding wheel; and central curvature adjusting screw means carried by said U-shaped rigid body operatingly connected to the central portion of said deflecting surface of said shoe for adjusting the curvature of said deflecting surface according to the diameter of said grinding wheel.

4,176,501

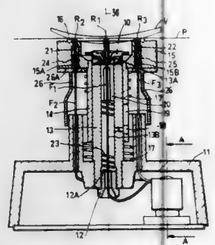
DEVICE FOR ATTACHING ON A SPECTACLE LENS A BLOCK FOR MOUNTING ON AN EDGING OR BEVELLING MACHINE

Pierre Bardonnet, Montgeron, and Jean-René Chamberaud, L'Isle Adan, both of France, assignors to Essilor International (Compagnie Generale d'Optique), Joinville le Pont, France

Filed Mar. 15, 1978, Ser. No. 886,635
Claims priority, application France, Mar. 25, 1977, 77 08951
Int. Cl.[2] B24B *19/00, 13/00*
U.S. Cl. 51—277 **5 Claims**

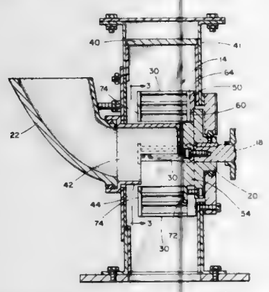
1. A device for attaching, on a spectacle lens, a block for mounting on a lens edging or bevelling machine, comprising:

fixed mounting block holding means; lens holding means located substantially in one plane perpendicular to the axis of said block and lens holding means and movable between a centering position, in which the lens to be blocked is at a distance from the mounting block, and a blocking position for securing the mounting block on the lens; centering marks located substantially in said plane; said centering marks comprising luminous ends of optical fibers made of glass or plastic material, the end of each fiber being mounted in centering



mark holding means, said centering mark holding means each comprising a holder for the end of each fiber and being movable in a direction substantially perpendicular to said plane in such a way that said centering marks are always in contact with the surface of a lens placed on said lens holding means, said surface being the surface adapted to subsequently receive the mounting block when in the blocking position; said lens holding means and centering mark holding means each being normally biased in said centering position.

4,176,502
SPACERLESS BLASTING WHEEL AND BLADE LOCKING ARRANGEMENT THEREFOR
Raymond M Leliaert, South Bend, Ind., assignor to Wheelabrator-Frye Inc., Hampton, N.H.
Filed Feb. 15, 1978, Ser. No. 877,878
Int. Cl.[2] B24C *5/06*
U.S. Cl. 51—434 **6 Claims**



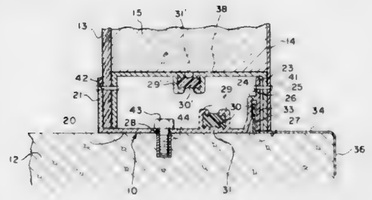
1. A spacerless blasting wheel construction for rotation by a motor driven shaft comprising:
(a) a plurality of blades for projecting particulate, one end thereof being provided with a securing element thereon,
(b) means for engaging said shaft for rotation therewith,
(c) means for securing said blades to said shaft engaging means at said one end only, said blades maintained at a selected location and angular orientation by said securing means, said securing means including a front plate and a back plate, said plates being positioned on opposite sides of said one end of said blade to sandwich said one end therebetween, said front plate being secured to said shaft engaging means flush against said back plate, said back plate having a central recess and slots located at the outer periphery of said central recess into which said blade securing elements are received to prevent outward movement thereof,
said blades rotating with said shaft to project particulate outwardly therefrom, the other end of said blades remaining unsecured.

4,176,503
CONTROLLED RELEASE WALL STRUCTURE
Raymond M. L. Ting, Pittsburgh, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.
Continuation-in-part of Ser. No. 828,922, Aug. 29, 1977, abandoned. This application Feb. 2, 1978, Ser. No. 874,536
Int. Cl.[2] E04C *1/00*
U.S. Cl. 52—1 **27 Claims**



1. In a controlled release wall structure, the combination comprising:
a building framework including a first frame member and spaced therefrom a second frame member;
a composite panel spanning the distance between the first and second frame members and having a panel end lapping said first frame member, said panel comprising an inner skin and an outer skin and a structural core disposed between and securing said inner skin to said outer skin in shear-transferring relation;
confinement means releasably retaining said panel end on said first frame member;
fastening means positively securing the said panel to said second frame member; and
said composite panel having a discontinuity positioned between the first and second frame members and formed in at least one surface of one skin along a line extending generally parallel with and spaced at a selected distance from a proximate edge of said first frame member, said discontinuity reducing the bending strength of said composite panel whereby said wall structure is adapted to disengage from said confinement means at an applied load determined by said selected distance and to collapse in the direction of said applied load, but remain positively connected to said second frame member.

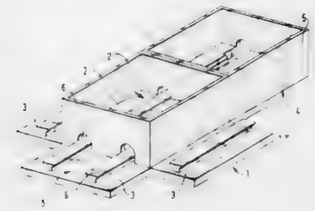
4,176,504
WEATHER PROOF SANDWICH PANEL FLOOR ATTACHMENT DEVICE
Jack G. Huggins, R.D. #2, Box 415, Berlin, Camden County, N.J. 08009
Filed Aug. 21, 1978, Ser. No. 935,483
Int. Cl.[2] E04D *3/38*; E02D *27/00*
U.S. Cl. 52—61 **9 Claims**



1. A device for weather proof attachment of walls comprising sandwich panels of two facia sheets, one exterior and one interior sheet around a core which does not extend to the bottom of the facia sheets forming a cavity along the bottom edge of each panel, the attachment being to a floor base having at least one edge along the periphery of the base exposed to the weather comprising:
(a) a base bracket means extending along the length of the walls under the bottom edge of the sandwich panels comprising:
(1) a base horizontal member extending along the floor base under the bottom edge of the sandwich panels with a width extending from the outside surface of the interior facia sheet to a position under the cavity in the panel near the inside surface of the exterior facia sheet,
(2) an inside upright vertical rail along the length of the base member in a position and shape to extend upwardly along the outside surface of the interior facia sheet, and
(3) a groove means structurally connected to and extending along the length of the edge of the base member under and extending upwardly into the panel cavities, forming a vertical groove along the bottom of the bracket means,
(b) a protection sheet extending along the length of the bracket formed such that one edge engages in the groove means,
(c) a first attachment means structurally attaching the bracket means to the floor base, and
(d) a second attachment means structurally connecting the sandwich panels to the bracket means
wherein one edge of the protection sheet is held in the groove means of the bracket, the intermediate portion of the sheet rests on the surface of the floor base and the outside edge of the protection sheet extends over and around the exterior exposed corner of the floor base.

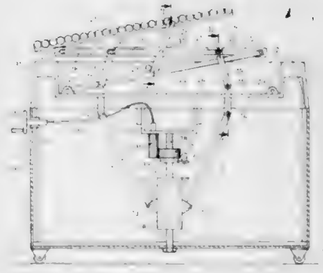
4,176,505
CONNECTING ELEMENT
Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3 (Tumlingen), Fed. Rep. of Germany
Filed Apr. 20, 1978, Ser. No. 898,135
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 7719132[U]
Int. Cl.[2] E04C *1/10*
U.S. Cl. 52—582 **8 Claims**

1. A connecting element for cruciformly connecting quadrangular structural elements each having a connecting surface, comprising a cruciform plate-like member including a central portion having lateral sides, and side portions each located at one of said lateral sides of said central portion, said central portion and said side portions having supporting surfaces arranged to support the connecting surfaces of the structural elements and provided with means for connecting the latter to said plate-like member, the supporting surface of said central portion having dimensions which are at least equal to the dimensions of the connecting surface of the structural element, whereas the supporting surface of each of the side portions has at least one dimension which is smaller than a corresponding dimension of the structural element so that,



when one of the structural elements is connected to said central portion and other structural elements are connected to said side portions of said plate-like member, the structural elements are cruciformly arranged relative to one another, and a section of the connecting surface of each of said other structural elements projects beyond the respective side portion and thus remains free for connection with a further structural element.

4,176,506
VACUUM PACKING MACHINE WITH TILTABLE ROLLER STACKING PLATE
Bruno Landolt, Herisau, Switzerland, assignor to Inauen Maschinen AG, Herisau, Switzerland
Filed Jun. 19, 1978, Ser. No. 916,660
Int. Cl.[2] B65B *31/02*
U.S. Cl. 53—86 **5 Claims**



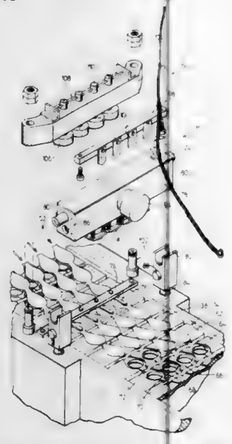
1. A vacuum packing machine including a vacuum chamber and a cover member for sealingly closing the chamber, characterized by:
(a) a generally planar stacking plate for carrying bagged products to be vacuum packed, and
(b) means for raising the plate out of the vacuum chamber to discharge the products and for lowering the plate into the chamber to an adjustable depth, said means comprising a horizontally disposed frame, means for raising and lowering the frame into and out of the chamber and simultaneously horizontally displacing the frame, and means mounting the plate above and to the frame for pivotal and slidable movement relative thereto.

4,176,507

CONDIMENT PACKAGING MACHINE

Derek V. Mancini, Stouffville, Canada, assignor to Consumers Glass Company Limited, Toronto, Canada

Filed Apr. 3, 1978, Ser. No. 893,314
Int. Cl.[2] B65B 7/28
U.S. Cl. 53—478 **18 Claims**



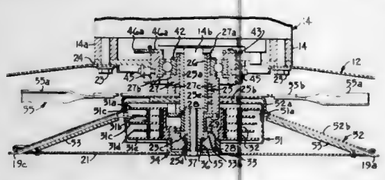
16. A process for heat sealing of an individual rimmed plastic container with the first lid of a thermo reactive series of like lids interconnected by severable tabs comprising the steps of supporting the container rim and momentarily halting its movement, aligning a lid above the container, clamping said series of lids, heat sealing such lid to such container by applying pressure and heat to such lid, severing such interconnecting tab of the sealed lid prior to resumed movement of the container and to unclamping said series of lids, and advancing another container with aligned lid in preparation for the heat sealing step, wherein the movement of the containers causes a responsive movement of said series of lids maintaining the alignment of said series of lids above said containers.

4,176,508

LINE FEED MECHANISM FOR FILAMENT MOWER

James R. Baumann, St. Louis Park; Robert C. Comer, Hopkins, and Jerome F. Yourczek, Minneapolis, all of Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Aug. 2, 1977, Ser. No. 821,145
Int. Cl.[2] A01G 3/06
U.S. Cl. 56—12.7 **16 Claims**



1. In a vegetation cutting device in which a flexible filament is rotatably driven about a substantially vertical axis with a free end of the filament defining a cutting plane, apparatus for metering discrete lengths of the filament comprising:

(a) drive shaft means rotatably driven about said axis;

(b) spool means upon which flexible filament may be wound, the spool means being carried by the shaft means for rotational movement relative thereto and in an axially stationary position thereon;

(c) driving means mounted for rotation with the shaft means and axially movable relative thereto between first and second axial positions;

(d) indexing means mounted for rotation with said shaft means and associated with said driving means to cause said driving means to shift axially in response to axial movements thereof;

(e) driven means mounted for rotation with the spool means;

(f) one of said driving and driven means including first and second engageable means axially spaced in relation to said first and second axial positions, said first and second engageable means being rotationally spaced by a predetermined angular amount;

(g) the other of said driving and driven means including engagement means for selectively engaging the first and second engageable means with the driving means in said first and second axial positions, respectively;

(h) and actuating means, isolated from rotary movement of said indexing means, for axially moving the driving means between said first and second axial positions;

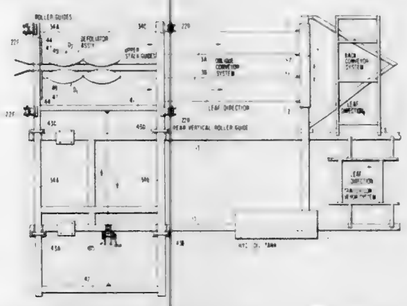
(i) the engageable and engagement means being so constructed that the driving and driven means are in rotatable driving engagement with the driving means in either axial position, and movement of the driving means from axial position to the other causes the driven means to rotate relative to the driving means in an amount corresponding to said predetermined angular amount, and in a direction permitting filament to unwind from the spool means in said discrete amount.

4,176,509

LATERALLY ADJUSTABLE TOBACCO COMBINE

Henry Griner; Wade Griner; Claude Hyars, and Tommy Sweat, all of Patterson, Ga., assignors to G S & H Equipment Corporation, Patterson, Ga.

Continuation-in-part of Ser. No. 503,676, Sep. 6, 1974, Pat. No. 4,035,998. This application Jul. 15, 1977, Ser. No. 816,120
Int. Cl.[2] A01D 45/16
U.S. Cl. 56—27.5 **9 Claims**



1. In a tobacco combine having a first frame assembly on a mobile unit, a second frame assembly mounted on said first frame assembly and extending transversely to the intended direction of forward travel of said mobile unit, said second frame assembly having portions extending above the ground to each side of said mobile unit in cantelever fashion and a tobacco leaf defoliator frame assembly mounted for vertical adjustment on said second frame assembly and to one side of said mobile unit, and a defoliation unit on said tobacco leaf defoliation frame assembly, the improvement comprising:

means releasably mounting said second frame assembly on said first frame assembly to permit adjustment of said second frame assembly relative to said direction of travel, and independently of the vertical adjustment of said tobacco leaf defoliator frame assembly,

power means between said first and said second frame assemblies for effecting said lateral movements of said second frame assembly relative to said direction of travel, and

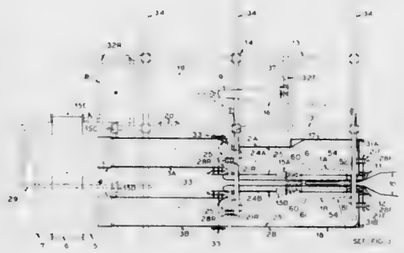
clamp means for clamping said second frame assembly to said first frame assembly after said lateral adjustment thereof.

4,176,510

TOBACCO COMBINE HYDRAULIC MOTOR SYSTEM

Henry Griner; Wade Griner; Claude Hyars, and Tommy Sweat, all of Patterson, Ga., assignors to G S & H Equipment Corporation, Patterson, Ga.

Continuation-in-part of Ser. No. 503,676, Sep. 6, 1974, Pat. No. 4,035,998. This application Jul. 15, 1977, Ser. No. 816,125
Int. Cl.[2] A01D 45/16
U.S. Cl. 56—27.5 **1 Claim**



1. In a tobacco combine for defoliation and subsequent transportation of tobacco leaves, said combine having a pair of hydraulic defoliation motors driving a pair of contrarotating tobacco leaf defoliating means, a pair of hydraulically driven conveyors, one to each side of said pair of contrarotating tobacco leaf defoliating means, each said conveyor conveying said defoliated leaves to a common point, and a hydraulically driven common conveyor for moving tobacco leaves transverse to the direction of conveying of defoliated leaves by said pair of hydraulically driven conveyors, for receiving leaves from each said pair of conveyors are removing the defoliating leaves to a common collection point,

improvement in the hydraulic system for driving said defoliators and said conveyors comprising:

a single hydraulic pump,

said hydraulic motors driving each of said defoliating means in contra-rotating directions for defoliating the leaves of tobacco plants, means constituting hydraulic fluid flow paths connecting said hydraulic defoliator motors in a series hydraulic circuit with said single hydraulic pump,

a hydraulic conveyor motor for each of said pair of hydraulically driven conveyors, respectively,

a 50—50 flow divider connected to receive the hydraulic fluid flow from said single hydraulic pump and provide equal hydraulic fluid flow in a pair of further hydraulic fluid flow paths, one each of said pair of hydraulic flow paths coupled to each said hydraulic conveyor motor, respectively, for each of said conveyors, means for combining the hydraulic fluid flow from said last named hydraulic conveyor motors,

a further hydraulic motor for driving said common conveyor, and means constituting a further hydraulic fluid flow path for connecting said further hydraulic motor between said means for combining and said pump so that said further hydraulic motor is driven by the combined flow of hydraulic fluid from the pair of hydraulic conveyor motors,

said first pair conveyor means each including a horizontal run of a single conveyor run adjacent and below the said defoliator means, and an oblique conveyor run, both said horizontal single conveyor run and said oblique run being articulated to one another and commonly driven by the same hydraulic motor, with the obliqueness of said oblique conveyor run relative to the horizontal being a function of the height of said defoliator unit above ground.

4,176,511

CONVEYOR SYSTEM FOR A HARVESTER

Roy Scudder, Marden, and Alan Bowes, Ulcombe, both of England, assignors to FMC Corporation, San Jose, Calif.

Filed Jul. 6, 1977, Ser. No. 813,400
Claims priority, application United Kingdom, Jul. 6, 1976, 28098/76; Sep. 2, 1976, 36436/76
Int. Cl.[2] A01D 46/00
U.S. Cl. 56—330 **4 Claims**



1. In a harvesting machine for harvesting crops growing on plants such as trees, bushes, canes, vines or the like, having stalks growing from the ground, said harvester having frame means, means for advancing the harvester in a direction along a row of said stalks, means on said frame means for dislodging crop from the plants, endless conveyor means on said frame means having laterally spaced endless flexible side conveyors which straddle the crop along a crop receiving reach, means for driving said conveyors for moving said reach in a conveying direction opposite to the advance direction of said harvester and at zero speed relative to the ground, a row of individual crop catching and conveying trays mounted on each of said side conveyors, means for resiliently urging said trays laterally of the conveying direction of the conveying reach of the conveyor means toward the row of stalks, cam means for retracting the trays at the front of the harvester for initially clearing stalks and for releasing the trays for resiliently engaging and surrounding the stalks as the harvester advances; the improvement wherein said side conveyors, each having laterally spaced flexible inside and outside members, longitudinally spaced rods interconnecting the flexible members of each side conveyor, means for mounting said trays on said rods for laterally slidable non-rotating motion with said trays disposed in a longitudinal row at each side of the longitudinal axis of said harvester, said trays each having smooth side edges that are substantially contiguous to the side edges of adjacent trays for forming a continuous crop catching and conveying surface, said resilient means urging said trays to slide laterally inwardly along said rods to bring the inner ends of the trays of one row into substantially end to end relation with the trays of the other row at substantially the longitudinal axis of the harvester, said resilient means accommodating termination of the sliding action of said trays when their inner ends encounter the lateral sides of the stalks of the crop as the harvester advances, said resilient means causing the trays on the front and rear sides of a stalk to be brought into substantially end to end relation for forming a continuous crop catching reach around the stalk.

4,176,512

ROTOR BRAKING APPARATUS AT EACH SPINNING UNIT OF AN OPEN-END SPINNING MACHINE

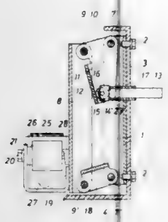
Peter Schwengeler, Winterthur, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland

Continuation of Ser. No. 823,874, Aug. 11, 1977, abandoned. This application Jun. 26, 1978, Ser. No. 919,043

Claims priority, application Switzerland, Aug. 26, 1976, 10823/76

Int. Cl.² D01H 7/22

U.S. Cl. 57—88 10 Claims



1. In a rotor braking apparatus provided at each spinning unit of an open-end spinning machine, wherein each such rotor spinning unit is provided with a rotor which is movable from an operating position away from a drive belt into an idle position for stopping the rotor, in which idle position a shaft of the rotor is contacted by a brake lever having a brake shoe, the improvement which comprises:

an additional mechanism for activating the rotor brake shoe without moving the rotor shaft from its operating position;

said additional mechanism comprising:

a machine frame;

a rigid support member mounted on said machine frame;

a movable member movably connected with said rigid support member mounted on said machine frame;

a working member connected with said movable member; and

a device for urging said movable member into an operative position for effecting disengagement of a drive connection for the rotor and engagement of the brake lever for initiating a braking action of the rotor.

10. In a rotor braking apparatus provided at each spinning unit of an open-end spinning machine, wherein each such rotor spinning unit is provided with a rotor which is pivotable from an operating position away from a drive belt into an idle position for stopping the rotor, in which idle position a shaft of the rotor is contacted by a brake lever having a brake shoe, the improvement which comprises:

an additional mechanism for activating the rotor brake shoe without pivoting the rotor shaft from its operating position;

said additional mechanism comprising:

a working member provided with an extension;

a rotatably supported idler roll carried by said working member;

a pivoting member having at least one shaft and connected with said working member;

a rigid support member having at least one shaft;

a machine frame having a wall;

an intermediate member including a plate and pivotably mounted on said one shaft of the pivoting member and said one shaft of the rigid support member;

said pivoting member being mounted on the machine frame via the intermediate member;

said pivoting member being pivotable about said rigid support member;

a restarting device for exerting a pressure force onto said plate of the intermediate member;

a plunger slidably mounted at said rigid support member and said wall of the machine frame for transmitting said pressure force exerted by said restarting device onto said plate of the intermediate member, said pressure force effecting the pivotal movement of the pivoting member.

4,176,513

STEEL WIRE CORD

Maurice A. Young, Sutton Coldfield, England, and Leonhard W. Hamacher, Bruchköbel-Niederissigheim, Fed. Rep. of Germany, assignors to Dunlop Limited, London, England

Filed Sep. 1, 1977, Ser. No. 829,976

Claims priority, application United Kingdom, Sep. 7, 1976, 36917/76

Int. Cl.² D02G 3/48; D07B 1/06

U.S. Cl. 57—237 13 Claims



1. A steel wire cord which comprises an assembly of strands each having a plurality of filaments of steel, said filaments having been drawn, after at least one heat treatment, to give a reduction in their cross-sectional area after the last heat treatment, of less than 96%, the strand helix angle being not less than 20° and the filament helix angle being not less than 40°.

4,176,514

METHOD OF CONTROLLING THE OPERATING CONDITIONS OF A RING SPINNING MACHINE AND APPARATUS FOR IMPLEMENTING THE METHOD

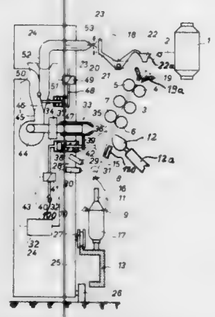
Herbert Stalder, Kollbrunn, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Apr. 24, 1978, Ser. No. 899,220

Claims priority, application Switzerland, May 11, 1977, 5882/77

Int. Cl.² D01H 15/00, 11/00, 13/16

U.S. Cl. 57—261 16 Claims



1. A method of consecutively controlling the operating conditions at a plurality of spinning positions of a ring spinning machine having a suction system, each spinning position having a drafting arrangement containing rolls and supplied with fiber material, a yarn being formed at each spinning position of the ring spinning machine, comprising the steps of:

detecting yarn breakages at each of the spinning positions and lap-up formations on the rolls of the drafting arrangement of each spinning position;

upon detection of a yarn breakage at a predetermined spinning position, deflecting the suction air stream of the suction system at such predetermined spinning position of the ring spinning machine; and

checking said deflected suction air stream for the presence of a fiber stream.

8. A control apparatus for consecutively controlling the operating conditions at a plurality of spinning positions each having a spindle of a ring spinning machine, each spinning position containing a yarn suction device and a drafting arrangement including a pair of cooperating infeed rolls and a pair of cooperating delivery rolls for drafting fiber material which is formed into a yarn, comprising:

said control apparatus embodying means enabling said control apparatus to travel from spinning position to spinning position along the ring spinning machine;

a yarn detector for detecting the presence of the yarn between the delivery rolls of the drafting arrangement and a spindle of the corresponding spinning position;

a fiber stream-deflecting device;

said yarn detector activating said fiber stream-deflecting device in the event of yarn breakage;

a fiber detector cooperating with said fiber stream-deflecting device;

said fiber stream-deflecting device taking-up the fiber stream acted on by the suction air stream of the suction system and transferring it to said fiber detector.

4,176,515

ELECTRONIC CLOCK, PARTICULARLY A QUARTZ CLOCK

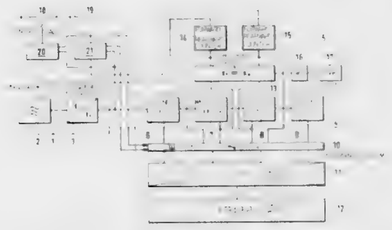
Manfred Stein, Eschborn, and Dieter Busch, Rosbach, both of Fed. Rep. of Germany, assignors to Quarz-Zeit AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 5, 1977, Ser. No. 839,615

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1976, 2645744

Int. Cl.² G04C 21/16

U.S. Cl. 58—19 R 3 Claims



1. An electronic clock, particularly a quartz clock, comprising

a timer transmitting stage means for providing timing count pulses,

an indicator system connected to said timer transmitting stage means, said indicator system including at least a minute counter and an hour counter as well as a decoding stage operatively connected to said counters and a digital indicator board connected to said decoding stage, and

an alarm system including at least a presettable counter associated with minutes and a presettable counter associated with hours, as well as a coincidence stage means.

each of said presettable counters having an output operatively lockable on said indicator system,

said coincidence stage means for comparing output signals of said counters of said indicator system with output signals of said presettable counters of said alarm system, respectively,

each of said presettable counters of said alarm system constitutes a forward-rearward-counter, and

a plurality of switch means for selecting the direction of counting of said forward-rearward-counters, respectively,

each said switch means comprises a rocker type push-button switch, one said rocker type push-button switch is operatively coordinated to each of said forward-rearward-counters, respectively,

a control stage in integrated construction connected between one of said switch means and said forward-rearward-counters, respectively,

said control stage comprises,

a first anticoincidence member having two first inputs and a first output, one of said first inputs is connected with said one of said switch means,

a resistor connected across said first inputs,

a second anticoincidence member having two second inputs and a second output, one of said second inputs of said second anticoincidence member is connected to said first output of said first anticoincidence member,

one of said forward-rearward-counters has a reversing input connected to said second output of said second anticoincidence member and a count input connected to one of said second inputs of said second anticoincidence member,

the other of said first inputs and the other of said second inputs of said anticoincidence members are connected to said timer transmitting stage means and are applied with the timing count pulses.

4,176,516

ARRANGEMENT FOR PUTTING AN ELECTRONIC TIMEPIECE RIGHT WITH MINUTE INDICATION ADVANCED AT FIRST

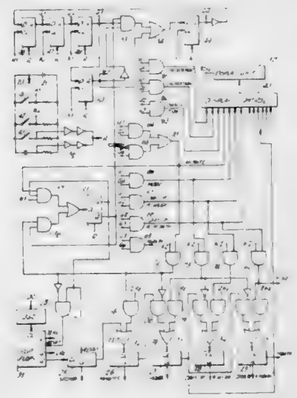
Yukuo Kodama, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 694,967, Jun. 11, 1976, abandoned. This application Feb. 16, 1978, Ser. No. 878,394

Claims priority, application Japan, Jun. 13, 1975, 50-71757; Sep. 27, 1975, 50-1166773

Int. Cl.² G04C 3/00

U.S. Cl. 58—23 R 12 Claims



1. An arrangement for correcting the indication of an electronic timepiece comprising:

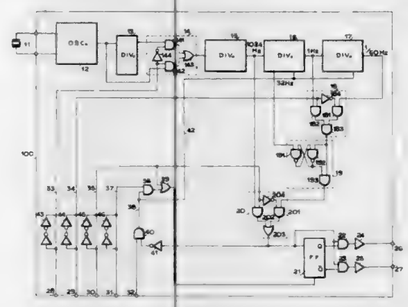
a clock generator generating clock pulses;

first counter means for counting, when put into operation, first input pulses from zero to a predetermined integer in each "minute" to produce first output signals, said first counter means being put, when held in a reset state, in a state of counting zero;

first pulse supply means operatively coupled to said clock generator and responsive to said clock pulses for supplying said first input pulses to said first counter means;

second counter means for counting second input pulses to produce second output signals representative of "minutes" of the indication;
pulse producing means operatively coupled to said clock generator responsive to said clock pulses for producing output pulses of a period of about one "second";
second pulse supply means for supplying, when put in its normal state while said first counter means is kept in operation, said first output signals once in every "minute" to said second counter means as said second input pulses no second input pulses when put in a normal state while said first counter means is in a reset state, and no first output signals when put in a biased state;
third counter means for counting third input pulses to produce third output signals representative of the "hours" of the indication;
third pulse supply means for supplying to said third counter means as said third input pulses said second output signals once every "hour" when put in a normal state, said output pulses when put in a biased state, and none of said second output signals and said output pulses when put in a disabled state;
a display unit;
a first switch manually operable into a selected one of a display and a rest position; and
display control means operatively coupled to said first switch, to said display unit, and to at least said second and third counter means and cyclically put in a plurality of states when said first switch is put into said display position, said plurality of states comprising a sequence of an indication state, a "minute" state, and an "hour" state, said display control means making said display unit display the indication when put in said "minute" state, and at least the "hours" of the indication when put in said "hour" state;
said arrangement comprising;
a second switch manually operable into a selected one of an operative and an inoperative position;
first control means operatively coupled to said first and second switches, said display control means, and said first counter means, said first control means normally being put in a first state for putting said first counter means into operation, switched to a second state when said second switch is put in said operative position while said display control means is kept in said "minute" state, and switched back to said first state when said first switch is put into said display position from said rest position while said first control means is put in said second state, said first control means holding said first counter means in said reset state when put in said second state;
second control means operatively coupled to said second switch, said display control means, and to said second and third pulse supply means for putting said second and third pulse supply means into a biased state and into a disabled state, respectively, when said second switch is put into said operative position while said display control means is kept in said "minute" state and for otherwise leaving said second pulse supply means in its normal state and said third pulse supply means in either of said normal and biased states; and
adjusting means operatively coupled to said first switch, said display control means, and to said first control means for keeping said display control means in said "minute" state even when said first switch is put into said display position from said rest position at least once after said first control means is switched to said second state for the first time after said display control means in put into said "minute" state.

4,176,517
INTEGRATED CIRCUIT FOR TIMEPIECE
Makoto Yoshida, Tokorozawa, Japan, assignor to Citizen Watch Co. Ltd., Tokyo, Japan
Continuation of Ser. No. 617,487, Sep. 29, 1975, abandoned. This application Jul. 22, 1977, Ser. No. 818,014
Claims priority, application Japan, Sep. 30, 1974, 49-112591
Int. Cl.[2] G04C *3/00;* **G04B** *19/30*
U.S. Cl. 58—23 R **12 Claims**



1. A single integrated circuit for use in alternative assembly of a plurality of types of electronic timepieces, said integrated circuit comprising:
a set of first electronic components providing basic functions which are common to the operation of each type of timepiece,
a set of second electronic components providing basic functions, those functions common to the operation of at least one but not all of the plurality of types of timepieces,
a control for operating selected ones of said second electronic components to thereby match said circuit to a selected type of timepiece including an oscillator having an output frequency for use in driving a pulse motor of the timepiece, the set of first electronic components including a main frequency divider means having first and second stages for reducing the frequency of the oscillator before applying the output frequency of the osci-lator to the pulse motor; reset means included with said control circuit for performing a reset function on the frequency divider means; and terminals included in said control circuit for providing two inputs which selectively cause the reset means to reset the first and second stages of the frequency divider means by selectively combining binary values "1" and "0" as inputs on said terminals.

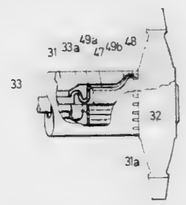
4,176,518
ELECTRONIC CLOCK HAVING AUDIBLE TIME INDICATION
Hakuhei Kawakami; Takeshi Ishihara, both of Neyagawa, and Kenzo Hatada, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 8, 1977, Ser. No. 814,085
Int. Cl.[2] G04C *21/12;* **G08B** *8/00*
U.S. Cl. 58—38 R **7 Claims**



1. An electronic time indicating signal clock comprising:

a time indicating means for indicating the time;
a time measuring means connected to said time indicating means for causing said time indicating means to indicate the time;
a detecting means associated with said time indicating means for detecting when said time indicating means indicates a particular periodic time for which it is desired to generate an audio time indicating signal;
a pulse oscillation means for generating pulses;
a pulse oscillator control means connected to said detecting means and said pulse oscillator means for causing said pulse oscillator means to repetitively generate pulses whenever said detecting means detects one of said particular periodic times until said pulse oscillator control means is reset;
a time indicating signal generating means connected to said pulse oscillator means for generating a time indicating signal whenever said pulse oscillator means generates a pulse;
a counting means connected to said pulse oscillator means for counting the number of pulses generated by said pulse oscillator means;
a memory means for storing the number of time indicating signals desired to be produced;
a comparison means connected to said counting means, said memory means and said pulse oscillator control means, for comparing the count of said counting means with the number stored in said memory means, for resetting said pulse oscillator control means when the count of said counting means equals the number stored in said memory means and for storing in said memory means the number of time indicating signals desired to be produced at the next occurring particular time period; and
a correction means connected to said memory means and said pulse oscillator control means, including a correction switch for activating said pulse oscillator control means to cause said pulse oscillator means to generate pulses, for correcting the number stored in said memory means by storing a number in said memory means related to the number of pulses generated by said pulse oscillator circuit during the activation of said correction switch.

4,176,519
GAS TURBINE HAVING A CERAMIC ROTOR
Sven O. Kronogård, Lomma, Sweden, assignor to United Turbine AB & Co., Kommanditbolag, Malmo, Sweden
Division of Ser. No. 638,052, Dec. 5, 1975, Pat. No. 4,064,690, which is a continuation-in-part of Ser. No. 471,176, May 17, 1974, Pat. No. 3,943,703. This application Oct. 4, 1977, Ser. No. 839,273
Claims priority, application Sweden, May 22, 1973, 07153/73
Int. Cl.[2] F01D *5/28, 5/30*
U.S. Cl. 60—39.16 R **2 Claims**



1. In a gas turbine power plant comprising a compressor, a first turbine rotor mounted upon the same shaft as, and imparting rotary movement to said compressor, at least one further turbine rotor mounted upon a shaft separate from that of said first turbine rotor and compressor combination, and at least one combustion chamber having fuel supply means, receiving air from the compressor and supplying combustion gas to said first and at least one further turbine rotor, the improvement of said shaft mounting said first turbine rotor and said compressor, being hollow, said first turbine rotor being manufactured of ceramic material and being provided with an integral shaft stub, to be introduced into said hollow shaft, means including a resilient clamping member and a tightening rod for engagement with said stub shaft, and mating, interengaging means on said stub shaft and said clamping member, for preventing relative rotation during torque transfer wherein said rotation preventing means include corrugations at said clamping member, running substantially axially, and mating grooves in said stub shaft.

4,176,520
DRIVE SYSTEM FOR DEEP WELL PUMP
James B. Horton, P.O. Box 1758, Kilgore, Tex. 75662
Filed Feb. 27, 1978, Ser. No. 881,757
Int. Cl.[2] F15B *11/15*
U.S. Cl. 60—369 **1 Claim**

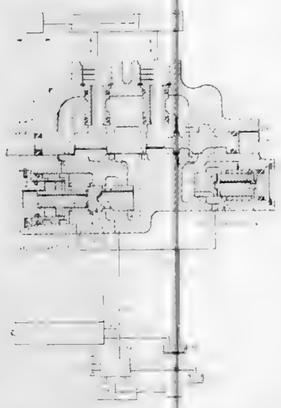


1. A drive system for driving the pump rod of a deep well pump, comprising:
a lift cylinder having a piston movable therein, said piston being connected to the pump rod of the well pump;
a motor having a piston slidable within a cylinder, the motor piston dividing the cylinder into a chamber above and below the piston, with one chamber of the cylinder in fluid communication with the chamber of the lift cylinder below the lift cylinder piston;
means for reciprocating said motor piston to direct fluid from said one chamber of said motor to said lift cylinder to raise said lift cylinder piston, thereby driving the pump rod of the well pump upwardly; and
spring means mounted for compression under the action of the reciprocating means when said reciprocating means is actuated to move the motor cylinder piston in a direction to allow the lift cylinder piston to move downwardly in the lift cylinder, and for extension when the reciprocating means is actuated to move the motor cylinder piston to actuate the lift cylinder piston to move the pump rod of the well pump upwardly.

4,176,521
LOAD RESPONSIVE FLUID CONTROL VALVES
Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022
Division of Ser. No. 731,367, Dec. 6, 1976, Pat. No. 4,112,679. This application Apr. 24, 1978, Ser. No. 899,510
Int. Cl.[2] F16H *39/46*
U.S. Cl. 60—445 **3 Claims**

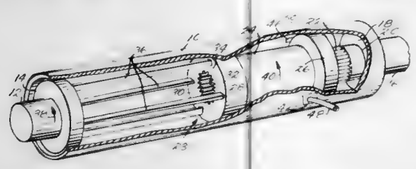
1. A load responsive control system comprising a combination of
(a) a variable delivery fluid pump;
(b) a discharge pressure compensator for varying pump delivery rate in inverse relation to discharge pressure to thereby limit that pressure to a predetermined maximum value;
(c) a multiplicity of fluid motors;

(d) a fluid reservoir;
(e) fluid distributing means between the pump and each motor including a closed center distributing valve capable of throttling fluid for selectively directing discharge fluid from the pump to a motor and exhaust fluid from the motor to the reservoir;
(f) means effective when a number of distributing valves are throttling the exhaust fluid from the motors and discharge pressure is below said maximum predetermined value to vary pump delivery rate to maintain the fluid pressure of exhaust fluid of the motor subjected to highest load at the distributing valve controlling the operation of this motor at a constant preselected level;



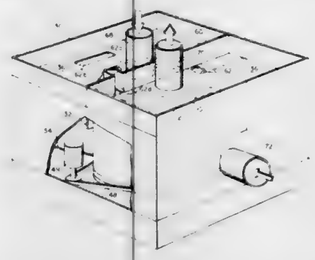
(g) means effective when a number of motors are being operated simultaneously and a distributing valve is controlling the operation of a fluid motor with a smaller load, to vary resistance to fluid flow between the pump and the motor, to maintain fluid pressure of exhaust fluid at the distributing valve at a constant preselected level;
(h) means effective when all the distributing valves are closed for varying pump delivery rate in inverse relation to discharge pressure to thereby maintain said pressure at a level substantially lower than said maximum predetermined value.

4,176,522
TORQUE MONITOR
Mark T. Holtzapple, 8920 Normandale Blvd., Bloomington, Minn. 55437; Robert L. Wehe, Ithaca, N.Y.; Charles G. Myer, Minneapolis, Minn., and William W. Carson, Mendon, Mass., assignors to Mark Holtzapple, Philadelphia, Pa.
Filed Jan. 20, 1978, Ser. No. 871,004
Int. Cl.[2] F15B *15/18*
U.S. Cl. 60—459 **9 Claims**



1. A fluid control apparatus comprising a drive means, a driven means, coupling means for transmitting torque from said drive means to said driven means,
a housing for said coupling means, means for supplying fluid to said housing and means for passing fluid from said housing, said coupling means being movable in said housing between an actuated and a de-actuated position in response to said drive means delivering torque through said coupling means to said driven means, said means for supplying fluid and said means for passing fluid being fixed relative to said housing so that said coupling means is movable relative to said means for supplying fluid and said means for passing fluid, said coupling means including means for controlling the passage of fluid through said housing as said coupling means is moved between said actuated and de-actuated positions, said means for controlling including a shoulder member carried by said coupling means and movable therewith to block at least one of said means for supplying fluid and means for passing fluid.

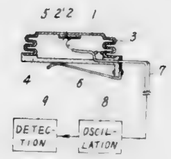
4,176,523
ADSORPTION AIR CONDITIONER
Jean L. I. Rousseau, Redondo Beach, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.
Filed Feb. 17, 1978, Ser. No. 879,014
Int. Cl.[2] F25B *27/00*
U.S. Cl. 62—2 **36 Claims**



1. An air conditioning system for providing temperature controlled air to a conditioned space, said system comprising:
a desiccant bed having a generally cylindrical configuration and a first radial dimension;
regenerator means having a substantially cylindrical configuration and second radial dimension different from said first radial dimension;
means for mounting said desiccant bed and said regenerator means in a generally concentric orientation;
means for directing a first air flow through said desiccant bed and said regenerator means for controlling said conditioned space temperature;
means for directing a second air flow through said regenerator means and said desiccant bed for desorbing said desiccant bed; and
means for substantially isolating said first and second air flows.

4,176,524
FROST DETECTOR
Toshibumi Kamiyama, Neyagawa, and Kunito Miyamoto, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Nov. 2, 1977, Ser. No. 847,814
Claims priority, application Japan, Nov. 10, 1976, 51/136081; Nov. 10, 1976, 51/151933[U]; Nov. 10, 1976, 51/151934[U]; Nov. 10, 1976, 51/151935[U]; Dec. 10, 1976, 51/166451[U]
Int. Cl.[2] G08B *21/00*; F25D *21/02*
U.S. Cl. 62—140 **9 Claims**

1. A frost detector comprising a piezoelectric element for connection as part of an oscillator circuit, a metal diaphragm to which said piezoelectric element is secured inside an air-tight space formed in part by the diaphragm, a base with a securing means and a resilient and heat conductive bellows connecting said diaphragm to said base and completing enclosure of the air-tight space, said diaphragm and said base being made of heat conducting material and said base including securing means for securing it in a heat-conductive manner to a cooling point.

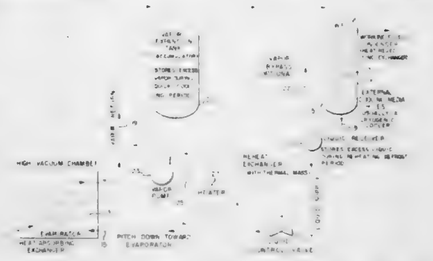


4,176,525
COMBINED ENVIRONMENTAL AND REFRIGERATION SYSTEM
James M. Tucker; Roger W. Dougan, and Jackob Swartzon, all of San Antonio, Tex., assignors to Wylain, Inc., Dallas, Tex.
Filed Dec. 21, 1977, Ser. No. 862,968
Int. Cl.[2] F25B *27/02, 29/00*; F25D *17/00*; F25B *7/00*
U.S. Cl. 62—238 R **17 Claims**



1. An environmental and refrigeration system for supplying conditioned air to a conditioned space comprising:
a condenser connected to a refrigeration system for condensing a refrigeration system working fluid, said condenser having a main section and a sub-cooler section connected together in continuous series flow, the refrigeration system working fluid adapted to pass through said main section and then through said sub-cooler section;
an evaporator connected to an air conditioning system for evaporating an air conditioning system working fluid;
first air flow controlling means for selectively passing a flow of space air from a conditioned space over at least a portion of said main section and/or over said evaporator and for passing outside air from the environment over said sub-cooler;
second air flow controlling means for selectively passing air from said condenser to said conditioned space or said environment;
said first air flow controlling means configured, when said environmental and refrigeration system is in a heating mode, to pass space air over at least a portion of said main section to thereby heat the space air with heat reclaimed from said refrigeration system and to pass outside air over said sub-cooler section to sub-cool said refrigeration system working fluid; and
said second air flow controlling means configured, when said environmental and refrigeration system is in the heating mode, to return the heated space air from said main section to the conditioned space, and to return the outside air from said sub-cooler to the environment.

4,176,526
REFRIGERATION SYSTEM HAVING QUICK DEFROST AND RE-COOL
Dale J. Missimer, San Anselmo, Calif., assignor to Polycold Systems, Inc., San Rafael, Calif.
Continuation-in-part of Ser. No. 800,075, May 24, 1977, abandoned. This application Sep. 22, 1978, Ser. No. 944,961
Int. Cl.[2] F25B *47/00, 19/00*
U.S. Cl. 62—278 **18 Claims**



1. In a refrigeration system having condenser means for cooling and condensing a refrigerant vapor to the liquid phase, an evaporator unit for receiving a flow of said liquid condensate to be cooled thereby and upon which ice forms by condensation of humidity in the surrounding space or atmosphere and from which the refrigerant normally returns to the condenser means in its vapor phase,
a storage tank comprising a source for the refrigerant vapor connected to the condenser means, means for quickly defrosting the evaporator unit comprising:
means for terminating flow of said cooled liquid condensate from the condenser means to the evaporator unit without terminating operation of said condenser means,
a thermal storage unit,
a vapor pump connected directly to the evaporator unit for circulating only the fluid therein in heat exchange relation with said thermal storage unit for reheating and vaporizing the fluid therein to quickly warm the evaporator unit, said thermal storage unit being continuously heated during the defrosting and cooling operations of the evaporator unit.

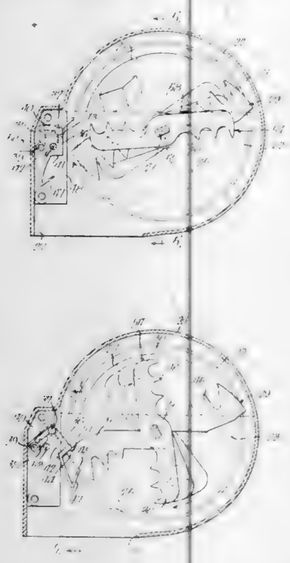
4,176,527
ICE CRUSHER FOR REFRIGERATOR
William J. Linstromberg, and Robert F. Hartman, both of Evansville, Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Jul. 13, 1978, Ser. No. 924,378
Int. Cl.[2] F25C *5/02*
U.S. Cl. 62—320 **19 Claims**

19. In a refrigeration apparatus having an ice storage receptacle and an ice delivery area spaced from said receptacle, an ice delivery apparatus for selectively delivering ice from said receptacle to said delivery area in either uncrushed or crushed form, comprising:
a housing positioned between said receptacle and said delivery area, having an inlet for receiving ice from said receptacle and an outlet in communication with said delivery area;
a shaft mounted for rotation within said housing;
drive means connected to said shaft for selectively causing rotation thereof;
a first set of crusher arms fixed to said shaft for rotation therewith, each of said arms comprising a pair of opposed, radially extending blades having teeth extending in the

direction of rotation, said crusher arms being disposed within said housing so as to intercept ice bodies entering said housing from said inlet and carry the ice bodies to said outlet;

a second set of crusher arms disposed about said shaft interleaved and coaxial with said first crusher arms, each of said second crusher arms comprising a pair of opposed, radially extending blades having teeth extending in the opposite direction of rotation;

frictional coupling means disposed about said shaft for releasably coupling said second crusher arms to said shaft for rotation therewith, said coupling means including



alignment means for causing said second crusher arms to rotate in substantial alignment with said first crusher arms; and,

a selectively movable stop disposed in proximity to said second crusher arms and movable between a first position in which said second crusher arms are permitted to rotate to thereby permit delivery of uncrushed ice bodies to said delivery area and a second position in which said stop contacts said second crusher arms to prevent rotation thereof to thereby cause ice bodies to be crushed between said first and second crusher arms prior to delivery to said delivery area.

4,176,528

CONVEYOR BELT FOR ICE DISPENSER

Edwin H. Frohbieter, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 7, 1978, Ser. No. 922,672

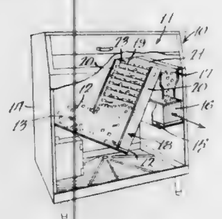
Int. Cl.[2] F25C *5/18*

U.S. Cl. 62—344 **13 Claims**

1. In an ice body maker having means defining an ice body collecting space, means for making ice bodies and delivering the ice bodies to said collecting space, and means defining an ice body dispensing space adapted to receive a removable ice body receiver, the improvement comprising:

a continuous flexible belt defined by a plurality of link plates articulated by cooperating knuckles and each having a front edge and a rear edge, first ice body engaging cleats at said front edge extending forwardly at an angle of less than 90° to the plane of the plate, and second ice body engaging cleats at said rear edge and extending at an angle to the plane of said link plate greater than the angle of said first cleats to the plane of the plate; and

means for driving the belt in an upright loop having a lower end disposed in said collecting space and an upper end disposed superjacent said dispensing space, the second cleats of each preceding link plate being disposed in interdigitated alignment with the first cleats of the following link plate whereby ice bodies are picked up on said first and second cleats as the belt moves upwardly through said



collecting space, the ice bodies picked up on said second cleats sliding forwardly therefrom over the link plate to fall over the front edge of the link plate substantially directly into said dispensing space when the link plate reaches said upper end of the upright loop and the ice bodies picked up on said first cleats sliding forwardly therefrom over the preceding link plate to fall against the back of the first cleats of the preceding link plate and be deflected thereby into said dispensing space when the link plate moves to and slightly beyond said upper end of the upright loop.

4,176,529

ABSORPTION REFRIGERATING UNIT

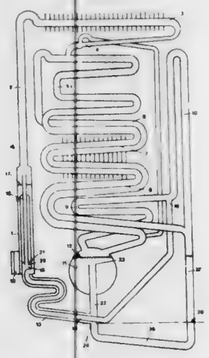
Hans Stierlin, Schlieren, Switzerland, and John R. Ferguson, Grove Hill, England, assignors to Kühlapparate GmbH SIBIR, Switzerland

Filed Sep. 5, 1978, Ser. No. 939,218

Claims priority, application Switzerland, Sep. 7, 1977, 10934/77

Int. Cl.[2] F25B *15/10*

U.S. Cl. 62—490 **8 Claims**



1. In an absorption refrigerating unit of the type which circulates a coolant fluid and a solvent through a generator, a condenser, an evaporator, an absorber and an absorber vessel housing coolant rich solution which contains a corrosion inhibitor, said circulation being induced by a thermosiphon pump forming part of said generator, the combination comprising:

conduit means delivering a supply of said coolant rich solution from said absorber vessel to the vapor forming end of the liquid heat exchanger of said thermosiphon pump;

means for interrupting the supply of said coolant rich solution from said absorber vessel to said vapor forming end of said liquid heat exchanger after the angle of inclination of said absorption refrigerating unit exceeds a permissible angle of inclination at which said thermosiphon pump is able to pump liquid whereby only a limited amount of inhibitor rich solution can be produced during the period of time during which said unit exceeds said permissible angle of inclination.

4,176,530

DEVICE FOR COVERING WARP YARN WITH COVERING YARNS

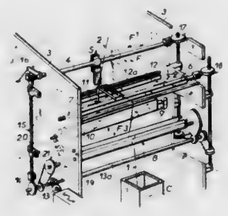
Claudius Cheynet, 18 rue Nationale, 43240 Saint Just Malmont, Haute-Loire, France

Continuation-in-part of Ser. No. 324,075, Jan. 16, 1973, abandoned. This application May 20, 1975, Ser. No. 579,327

Claims priority, application France, Jan. 4, 1972, 72.00862; Dec. 7, 1972, 72.44087

Int. Cl.[2] D04B *23/06;* **D03D** *15/08*

U.S. Cl. 66—203 **4 Claims**



1. A device for covering warp yarns with covering yarns comprising a row of yarn guides for feeding a plurality of elastic warp yarns in parallel longitudinal direction, means supporting said yarn guides for reciprocal movement solely in a direction transversely with respect to said warp yarns, a row of needles extending adjacent said yarn guides in a direction perpendicular thereto, means supporting said needles for reciprocal movement solely in a direction lengthwise of the needles and thereby perpendicular to the reciprocal movement of the yarn guides, means for supplying covering yarns to said needles in a direction substantially parallel thereto and perpendicular to the direction of feed of the warp yarns including a row of covering yarn displacing members extending substantially parallel to said needles and perpendicularly to said yarn guides for the elastic warp yarns, means supporting the covering yarn displacing members solely for reciprocal movement along an axis parallel to the axis of reciprocal movement of the yarn guides for the warp yarn and for pivotal movement in opposite directions about the axis of reciprocal movement of the covering yarn displacing members such that the yarn displacing members cooperate with said row of needles to cover said warp yarns with said covering yarns in the form of rows of loop stitches, means for feeding the thus covered yarns to a loom including a guide proximate said needles having a guide passage for travel of the individual covered warp yarns to the loom in a direction substantially parallel to the direction of feed of the warp yarns to the warp yarn guide, drive means for moving the yarn guides and needles for forming the covered warp yarns, lateral frame members which are spaced from each other, said means supporting the covering yarn displacing members comprising a first weftwise bar which mounts said row of covering yarn displacing members and which is carried by said lateral frame members for weftwise reciprocation and for swinging to-and-fro about a weftwise axis passing through said bar, said means supporting said warp yarn guides comprising a second weftwise bar which mounts the warp yarn guides and which is carried by said lateral frame members for weftwise reciprocation, said means supporting said needles comprising a third weftwise bar which mounts said row of needles and which is carried by said lateral frame members for reciprocation lengthwise of the needles, said guide of the means for directing the covered warp yarns to the loom comprising a fourth weftwise bar which is fixedly carried by said lateral frame members, and a fifth weftwise bar spaced above said fourth weftwise bar, the fourth and fifth weftwise bars guiding the covered warp yarns therebetween.

4,176,531

APPARATUS FOR THE WET TREATMENT OF TENSION-FREE GUIDED MATERIAL

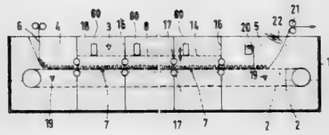
Hans Fleissner, Basel, Switzerland, assignor to Vepa AG, Switzerland

Division of Ser. No. 613,407, Sep. 15, 1975, Pat. No. 4,025,304. This application Feb. 10, 1977, Ser. No. 767,337

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1974, 2444123; Oct. 18, 1974, 2449578; Mar. 6, 1975, 2509700

Int. Cl.[2] D06B *3/02*

U.S. Cl. 68—3 SS **48 Claims**



1. An apparatus for the wet treatment of fibrous material which comprises a container, means for providing a first liquid layer of a treatment liquid within said container, a liquid-permeable support means for supporting and transporting said material through said first liquid layer, said support means having a supporting surface on which the material is transported, and said support means being immersed in the first liquid layer and arranged below the liquid level of said first liquid layer within said container and means for maintaining a second liquid layer of the treatment liquid within said container extending uniformly along the entire length of the immersed supporting surface and spaced underneath said supporting surface of the support means to provide a free air space between said first and second liquid layers whereby liquid in the first liquid layer flows uniformly through the fibrous material supported on said support means by the effect of gravity and via said free air space into the second liquid layer.

4,176,532

APPARATUS FOR CONTINUOUSLY WASHING FABRIC WITH WATER

Takao Mishima, Suita; Shoji Semba, Osaka; Kiichi Ogata, and Osamu Funahashi, both of Wakayama, all of Japan, assignors to Kanebo, Ltd., Tokyo and Wakayama Iron Works, Ltd., Wakayama, both of, Japan

Continuation-in-part of Ser. No. 887,130, Mar. 16, 1978, abandoned. This application Nov. 30, 1978, Ser. No. 964,981

Claims priority, application Japan, Mar. 16, 1977, 52-29490

Int. Cl.[2] D06B *3/12*

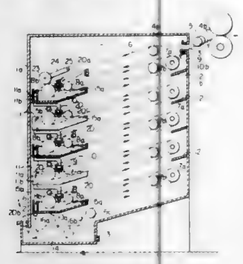
U.S. Cl. 68—19 **13 Claims**

1. An apparatus for continuously washing a fabric with water while causing the fabric to travel in a zigzag path and to be immersed many times in washing water, said apparatus comprising:

at least one roll for introducing a fabric into said apparatus;

a washing assembly located above said introducing roll and comprising a plurality of washing units arranged in a vertical multi-stage form, each washing unit comprising a

vessel for containing washing water, first and second dipping rolls located in said washing water vessel and first and second guide rolls spaced from said washing water vessel and respectively corresponding to said first and second dipping rolls, said first dipping roll and said second guide roll being located between said second dipping roll and said first guide roll, a portion of the peripheral surface of said first guide roll, from which portion the fabric leaves said first guide roll, being located above a portion of the peripheral surface of said first dipping roll, with which portion of said first dipping roll the fabric comes into contact, and a portion of the peripheral surface of said second guide roll, from which portion the fabric leaves



said second guide roll, being located above a portion of the peripheral surface of said second dipping roll, with which portion of said second dipping roll the fabric comes into contact;

at least one roll for withdrawing said fabric from said apparatus, located above said washing assembly;

means for feeding washing water into an uppermost washing water vessel;

means for connecting each of said washing water vessels, except for the lowermost washing water vessel, to the next lower washing water vessel, and;

means for discharging the waste washing water from said apparatus.

4,176,533

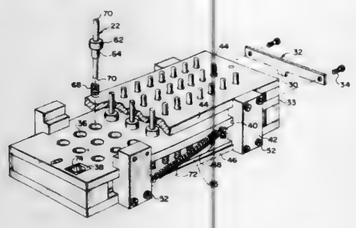
WALL SAFE LOCK

Paul A. Nordendale, 3740 Dauphine Ave., Northbrook, Ill. 60062

Continuation-in-part of Ser. No. 639,250, Dec. 10, 1975, abandoned. This application Oct. 14, 1977, Ser. No. 842,094

Int. Cl.[2] E05B *63/14, 37/16*

U.S. Cl. 70—115 **7 Claims**



1. A permutation wall safe lock having a set of small openings in the front wall of a safe door arranged in a predetermined pattern;

a guide member having a set of like small openings arranged in said predetermined pattern and providing therewith pairs of coaxially aligned openings;

a plate member slidably mounted on the guide member having like small openings coaxial with said set of openings;

resilient means engaging the plate member for urging its like small opening out of alignment with said set of openings;

means for supporting said front wall and guide member in predetermined spaced relation;

a manually operated door lock means including an oscillatable manually movable locking member mounted on said door;

a reciprocable slide bar means having large openings of the same shape as the small openings arranged in the same predetermined pattern and slidable in the spaces between the front wall and said guide member, said slide bar means being movable between two positions in one of which it is releasably interlocked with said manually movable locking member with its openings coaxial with said pairs of openings and in the other unlocked position its openings are held offset from said pairs of openings;

a plurality of freely reciprocable push pins slidably extending through said aligned openings for independent selective manual actuation and having large portions receivable in the large openings for normally inter-engaging in said one position the walls of said pairs of openings and said large openings to maintain said axial alignments and the slide bar in interlocking relationship with said manually movable locking member;

manual means for moving said slide bar means to said other position to dispose said slide bar means in locking engagement with said manually movable locking member; and

said resilient means urging said slide bar means out of engagement with said manually movable locking member when correctly permutated push pins are axially moved in said small openings to clear said slide bar openings for movement of the slide bar to said other position.

4,176,534

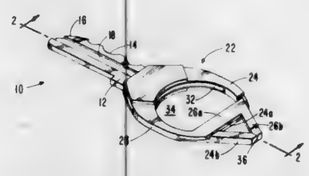
COMBINED CLIP AND QUICK RELEASE KEY

Jon F. Denney, 4443 Driftwood Pl., Boulder, Colo. 80301

Filed Jul. 21, 1978, Ser. No. 927,121

Int. Cl.[2] E05B *19/04*

U.S. Cl. 70—408 **9 Claims**



1. A combined clip and key for quick release or attachment to a keyholder including in combination:

a shank portion;

a bit portion shaped or shapable for operating a lock, said bit portion carried by said shank; and a bow for handling said key, said bow secured to said shank; wherein the improvement comprises, in combination:

said bow formed of a first bow portion and a second bow portion, both said first and second bow portions secured to said shank and located in substantially the same plane as said shank, said portions normally defining a first annular opening, at least one of said bow portions being resiliently movable with respect to said shank and independently moveable of said other bow portion; and

a first bow extension connected to said first bow portion, and a second bow extension connected to said second bow portion, said bow extensions forming a normally closed split ring loop defining a second annular opening, whereby movement of at least one bow portion causes said normally closed split ring loop to split open for use as a clip or for release or attachment to a keyholder.

4,176,535

APPARATUS FOR CROPPING, DIVIDING AND REDUCING ROLLED MATERIAL AT HIGH SPEED

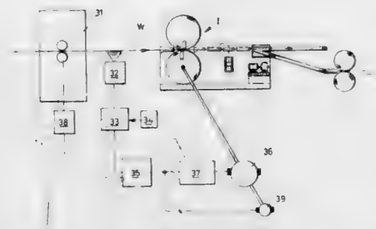
Wolfgang Elsner, Ratingen; Werner Kalter, Duisburg; Rolf Michel, Drensteinfurt, and Jörn Moslener, Dusseldorf, all of Fed. Rep. of Germany, assignors to DEMAG Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

Filed May 4, 1978, Ser. No. 902,955

Claims priority, application Fed. Rep. of Germany, May 5, 1977, 2720136

Int. Cl.[2] B21B *1/00, 41/00*

U.S. Cl. 72—10 **2 Claims**



1. Apparatus for cropping, dividing and chopping rolled material running at high speed from the finishing line of a rolling mill, the combination characterized by

(a) rotary shears disposed in the rolling line of said mill after said finishing line;

(b) said rotary shears including

(1) opposed rotary drums;

(2) opposed radially displaceable cooperating cutter blades in said drums;

(3) reversible fluid acting piston and cylinder units in each said drum for displacing said blades from a non-cutting position in said drums to a cutting position extending partially from said drums;

(4) fluid acting servo valves in each said drum for controlling respective piston and cylinder units therein;

(c) a power operated switch in said rolling line after said rotary shears; said switch for directing successive ones of severed rolled material pieces to two continuing guides, the switch being movable from a first position to a second position while still guiding a rolled piece in the first postion;

(d) said switch including

(1) a guide tube comprised of a plurality of flexibly connected straight tube sections;

(2) the axis of the outlet portion of said guide tube movable from said first position coaxial with one continuing guide to said second position coaxial with the second continuing guide and vice versa;

(3) the outlet end of said outlet portion being spaced from the inlet end of each of said continuing guides;

(e) a chopper in said line after one of said continuing guides;

(f) said chopper including

(1) a pair of opposed rotatable chopper drums;

(2) means for rotating said drums at a peripheral speed greater than the speed of rolled material passing therethrough;

(3) at least one of said pairs of drums having fixed cutter blades over the surface thereof for chopping rolled material passing therethrough;

(4) a space between said opposed drums smaller than the diameter of rolled material passing therethrough;

(g) a laser speed test apparatus in said rolling line before said rotary shears; and

(h) said laser speed test apparatus including

(1) first means for testing the speed of rolled material passing therethrough;

(2) second means for testing the actual speed of the last rolling stand in said mill;

(3) means for correlating the results of said first and second test means for controlling the speed of said rotary shears.

4,176,536

DEVICE FOR PRODUCING A BEAD ON THE CIRCUMFERENCE OF A HOLLOW CYLINDER

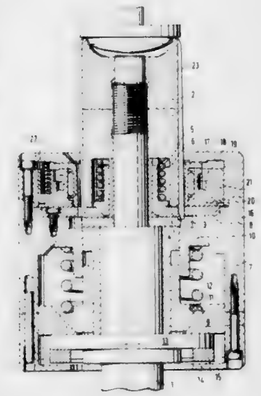
Walter Panknin; Kurt Finsterwalder, both of Göppingen; Reinhard Kannegiesser, Birenbach, and Hans Bässler, Eislingen, all of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

Filed Jul. 17, 1978, Ser. No. 925,296

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1977, 2732263

Int. Cl.[2] B21D *19/06*

U.S. Cl. 72—91 **7 Claims**



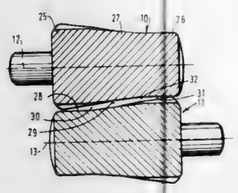
1. Device for producing a bead extending over a circumference of a hollow cylinder, such as a can body, with a circular, rotatable internal tool, of which the outer diameter is smaller than the inner diameter of the hollow cylinder after it has been beaded, and with a rotatable external tool in the form of a circular ring, of which the inner diameter is greater than the outer diameter of the unbeaded hollow cylinder, and the area of the hollow cylinder to be beaded can be rolled and deformed between the outer periphery of the internal tool and the inner periphery of the external tool and the external tool can be adjusted in a controlled manner in the radial direction, characterized in that the internal tool comprises a supporting mandrel and an inner ring, said inner ring being adjacent the supporting mandrel in the axial direction and being capable of being adjusted radially relative thereto, and the external tool comprises an outer ring surrounding the inner ring and a hold-down ring, said hold-down ring being adjacent the outer ring in the axial direction and being capable of being adjusted radially relative thereto.

4,176,537

METHOD OF AND MEANS FOR STRAIGHTENING BARS AND TUBES

Arthur N. Brown, Stourbridge, England, assignor to The Bronz Engineering Company, Ltd., Stourbridge, England

Filed Mar. 31, 1978, Ser. No. 892,160
Claims priority, application United Kingdom, May 5, 1977, 18825/77
Int. Cl.² B21D 3/04
U.S. Cl. 72—98 11 Claims



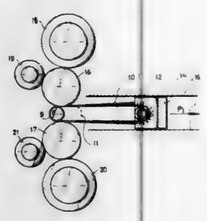
1. In a straightening machine comprising a pair of rolls between which there is defined a non-rectilinear path along which elongate material to be straightened is passed, said rolls are rotatable about respective axes and said axes are inclined to each other and to said path, whereby rotation of the rolls in the same direction about their axes causes the elongate material to move along said path and to rotate about its own longitudinal axis, the improvement wherein said path includes two bends and said bends lie in the same plane.

4,176,538

METHOD AND APPARATUS FOR THE FORMING OF METAL ENDLESS BELTS FROM BLANKS OF TUBULAR MATERIAL

Georg R. W. Kymmell, Waalre; Alexandre Horowitz, Eindhoven, and Rudolf J. G. A. van der Hoorn, Nuenen, all of Netherlands, assignors to Volvo Car B.V., Eindhoven, Netherlands

Filed Jun. 28, 1978, Ser. No. 920,120
Claims priority, application Netherlands, Jun. 28, 1977, 7707172
Int. Cl.² B21B 5/00
U.S. Cl. 72—110 7 Claims



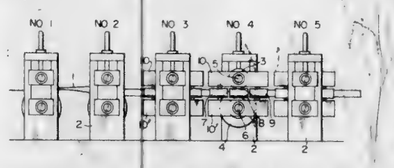
1. A method for forming thin flat endless metal belts from blanks of tubular material by inserting a stretch roll and a tensioning roller of relatively small diameter in parallel to each other through the interior of a said blank, engaging the tubing-stretch roll assembly between a pair of work rolls of relatively large diameter keeping the tube wall under pressure of the said work rolls, while rolling in a position of the said stretch roll offset to one side of a plane containing the axes of the said work rolls, the said tensioning roller being urged at the same time on the other side of the said plane in a direction away from this plane, characterised in that the said stretch roll and the said tensioning roll are inserted through a series of blanks which are spaced side by side along the length of the said stretch and tensioning rolls, the said blanks engaging areas of at least one of the said rolls having a step up range of diameters differing from each other to such an extent that in a final position of the said tensioning roller parallel to the said stretch roll the endless cylindrical belts on the said rolls fit one into the other for the formation of a multiple layer belt wherein the outer diameter of each inserted belt corresponds exactly with the inner diameter of an adjoining outer belt.

4,176,539

COLD-ROLL FORMING STAND

Takeshi Sawada, Yonago, and Takeshi Inoue, Yasugi, both of Japan, assignors to Hitachi Metals, Inc., Japan

Filed Mar. 16, 1978, Ser. No. 887,251
Claims priority, application Japan, Mar. 25, 1977, 52-32166
Int. Cl.² B21D 5/06
U.S. Cl. 72—178 3 Claims



1. A cold-roll forming mill which includes one or a plurality of cold-roll forming stands positioned in tandem for forming a flat metal strip into a desired section, said cold-roll forming stand comprising:

a pair of upper and lower transverse forming rolls adapted to engage an upper and lower surface of the flat metal strip for a lengthwise forming of said flat metal strip;

a pair of upper and lower transversely extending shafts for respectively mounting the pair of upper and lower transverse forming rolls;

a pair of intermediate longitudinal forming rolls for a widthwise forming of said flat metal strip;

a pair of upper and lower housing means extending parallel to a pass direction of the metal strip through the forming stand and being disposed on respective lateral sides of the metal strip for mounting said pair of intermediate longitudinal rolls to said upper and lower transversely extending shafts such that one of said intermediate longitudinal forming rolls is disposed on one lateral side of the metal strip and the other of said intermediate longitudinal forming rolls is disposed on the other lateral side of the metal strip, said upper and lower transversely extending shafts extending through said housing means;

a pair of additional longitudinal forming rolls for widthwise forming of said flat metal strip mounted on said pair of upper and lower housing means at a position upstream of said pair of intermediate longitudinal forming rolls, such that said additional longitudinal forming rolls are disposed on respective lateral sides of the flat metal sheet; and

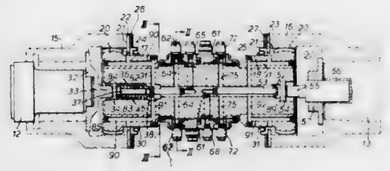
a further pair of longitudinal forming rolls for widthwise forming of said flat metal strip mounted on said pair of upper and lower housing means at a position downstream of said pair of intermediate longitudinal forming rolls such that said further longitudinal forming rolls are disposed on respective lateral sides of the flat metal sheet, whereby said flat metal strip is subjected to both a lengthwise and widthwise bending and curving.

4,176,540

SPLINED ARTICULATED COUPLING

Bernard H. Barber, Sheffield, England, assignor to Davy-Loewy Limited, Yorkshire, England

Filed Mar. 16, 1978, Ser. No. 887,406
Claims priority, application United Kingdom, Mar. 18, 1977, 11614/77
Int. Cl.² B21B 27/08
U.S. Cl. 72—201 10 Claims



1. An articulated coupling comprising:

(a) a rotatable shank;

(b) a sleeve surrounding one end of said shank;

(c) drive coupling means between said end of said shank and said sleeve permitting limited variation in the inclination of the axis of said shank relative to the axis of said sleeve;

(d) a supply system for supplying liquid under pressure to and through said shank and to and through said drive coupling means;

(e) a liquid return conduit leading from said drive coupling means through said shank to withdraw liquid delivered from said means, said return conduit constructed and arranged to rotate with said shank; and

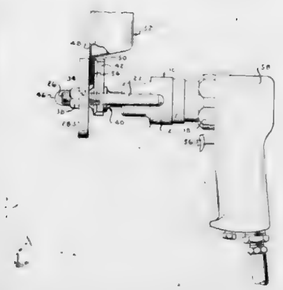
(f) means for withdrawing liquid through said conduit under suction.

4,176,541

HAMMER DEVICE ATTACHMENT

Tallie B. Cooper, 881 E. 36th Ave., Gary, Ind. 46408

Filed Jun. 14, 1978, Ser. No. 915,363
Int. Cl.² B21D 37/14
U.S. Cl. 72—474 5 Claims



1. A hammer attachment for a reciprocating drive means to form sheet metal edges, comprising:

a body member having a longitudinal bore centrally therethrough, one end of said body member having means for connection to said reciprocating drive means;

support means connected to each side of said body member extending longitudinally from the other end of said body members;

an anvil means connected to said support means, said anvil means having a bore in alignment with said bore of said body member; and

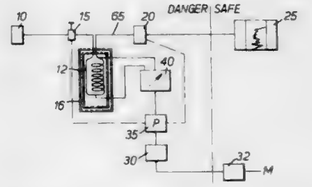
a hammer member, said hammer member having a longitudinal shaft and an impacting pad extending radially from said shaft intermediate the ends thereof, said pad being pivotally movable between said support means, said one end of said longitudinal shaft being reciprocatingly movable in said bore of said body member and the other end of said shaft being reciprocatingly movable in said bore of said anvil means.

4,176,542

ANALYSIS INSTRUMENTS

Robert J. Redding, September House, Cox Green La., Maidenhead, England (S16 3EL)

Filed Nov. 1, 1977, Ser. No. 847,604
Claims priority, application United Kingdom, Nov. 2, 1976, 45397/76
Int. Cl.² G01N 31/08
U.S. Cl. 73—23.1 10 Claims



1. An intrinsically safe chromatographic analysis device to be encapsulated in a rigid body of electrically insulating material, said device having input connections for supply to said device from a source of electric power, and output connections to transmit analysis data from said device to remote monitoring means;

said device further comprising at least one electrically heated analytical element, intrinsically safe electrical energy supply means electrically connected between said input connections and said at least one electrically heated analytical element;

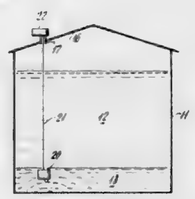
said supply means incorporating storage means to accumulate energy from the said source during periods of low electrical load and control means operable to cause at least partial discharge of the accumulated energy at periods of high electrical load.

4,176,543

SONIC LEAK DETECTOR AND METHOD

David G. Nolte, Houston, and Winthrop K. Brown, Bellaire, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 17, 1978, Ser. No. 961,598
Int. Cl.² G01M 3/24
U.S. Cl. 73—40.5 A 9 Claims



1. Sonic leak detector for use in a liquid storage tank or the like, comprising

a hydrophone for generating electrical signals in accordance with sonic waves in said liquid,

circuit means for amplifying and filtering said electrical signals to pass signals above a predetermined minimum frequency that is below the frequency range of leak generated sonic waves,

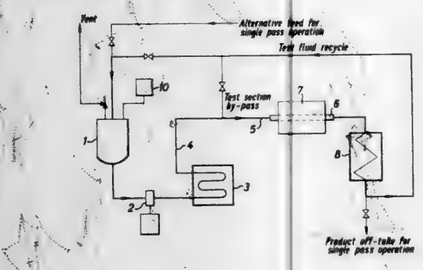
a pair of band pass filters connected to the output of said circuit means,
one of said band pass filters passing a predetermined band of sonic frequencies covering the range of said leak generated sonic waves,
the other of said band pass filters passing a different predetermined band of sonic frequencies outside of said leak generated range of frequencies,
electronic means for blanking output signals from both of said band pass filters upon receipt of an impulse noise signal passed by said other band pass filter and having more than a predetermined amplitude,
a differential amplifier having inputs connected to said band pass filters and having an output, and
leak indicator means connected to said output of said differential amplifier for indicating the existence of a leak when said differential amplifier output signal level exceeds a predetermined amount.

4,176,544

METHOD FOR DETERMINING FOULING

Martin K. Eyles, Addlestone, and Graham L. Wagner, Walton-on-Thames, both of England, assignors to The British Petroleum Company Limited, London, England

Filed May 4, 1978, Ser. No. 902,672
Int. Cl.² G01N *17/00*
U.S. Cl. 73—61.2 **5 Claims**



1. A method for detecting the fouling tendency of a heated hydrocarbonaceous liquid which method comprises heating the liquid, adding to it a solution or suspension containing one or more inorganic and/or organic foulants to give an enhanced concentration of foulant in the liquid, passing the resulting liquid through a heated tubular test section and measuring the increase in pressure drop across the test section over a period of time.

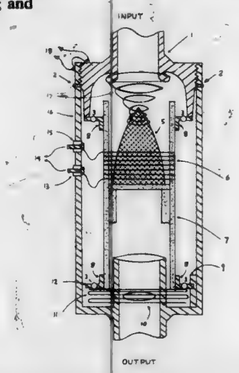
4,176,545

ELECTRONIC ENGINE WEAR DETECTOR

Luigi G. Oddo, Rte. 2, Box 270, Palm Bay, Fla. 32905

Filed Jun. 16, 1978, Ser. No. 916,295
Int. Cl.² G01N *33/30*
U.S. Cl. 73—64 **8 Claims**

1. An apparatus for detecting particles in a fluid stream, comprising in combination:
a housing for receiving and guiding the fluid stream therethrough;
filter means interposed within said housing for blocking and collecting on an exposed surface thereof the particles while enabling the flow of the fluid therethrough;
inductance means for sensing the changes in the permeability of the area adjacent to said filter means corresponding to the collection of the particles on said exposed surface thereof; and



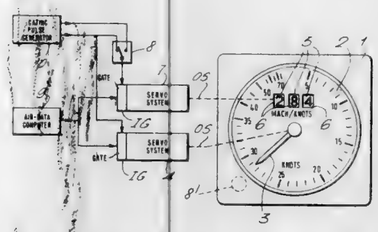
circuit means coupled to said inductance means for displaying the permeability thereof so as to indicate the relative presence of the particles on said filter means.

4,176,546

AIRCRAFT INSTRUMENTS

Harry Gibson, Tewkesbury, and John W. D. Jones, Stonehouse, both of England, assignors to Smiths Industries Limited, London, England

Continuation-in-part of Ser. No. 825,754, Aug. 18, 1977, abandoned. This application Nov. 22, 1978, Ser. No. 963,066
Int. Cl.² G01C *21/10*
U.S. Cl. 73—182 **9 Claims**



1. An aircraft-speed indicating instrument including an index that is moveable against a scale to provide a reading of airspeed, and a digital indicator, and wherein the digital indicator is arranged to provide selectively either a digital reading of Mach number or of said airspeed.

4,176,547

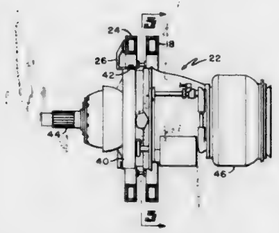
TORQUE CORRELATION RING

John W. McClure, Milford, and George S. Hudson, Hamden, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Nov. 14, 1977, Ser. No. 850,990
Int. Cl.² G01L *3/02*
U.S. Cl. 73—136 R **9 Claims**

1. A torque correlation ring assembly for an engine test stand having frame members extending therefrom, said test stand being useful in measuring performance of an aircraft turboshaft engine having both an output shaft and a casing with mounting points for fixedly suspending said engine, the output shaft being fitted with a propeller of known characteristics, the torque correlation ring assembly comprising:
a first vertically oriented annular ring fixedly attached along one edge to the frame members of said test stand;

a plurality of equally spaced strain gaged beams each fixedly attached at one of its ends to that edge of said first annular ring which is opposite the edge attached to said frame members, each of said strain gaged beams having a central beam section, the centerlines of said central beam sections being oriented so as to coincide with radials extending from the center of said annular ring;
a second vertically oriented annular ring fixedly attached along one edge to the second ends of said strain gaged beams;



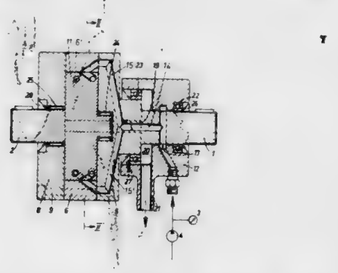
a mounting jig attached at its periphery to the second edge of said second annular ring, the inner edge of said mounting jig being configured for attachment to the mounting points on the casing of said aircraft engine, said aircraft engine being mounted coaxially within said annular rings so that its output shaft extends axially along the centerline of said first and second annular rings;
strain gages attached to each of said central beam sections, the plurality of said strain gages being wired together to produce an electrically combined signal capable of being processed to provide an accurate measurement of the torque applied to said torque correlation ring assembly.

4,176,548

HYDROSTATIC TORQUE MEASURING DEVICE FOR ROTATING SHAFTS

Ivan J. Cyphelly, Neuhaus, Hinteregg, Switzerland (8128)

Filed Jun. 16, 1978, Ser. No. 916,211
Claims priority, application Switzerland, Jun. 20, 1977, 7531/77
Int. Cl.² G01L *3/02*
U.S. Cl. 73—136 D **4 Claims**



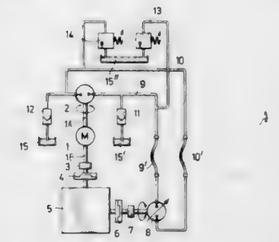
1. In a hydrostatic torque measuring device for rotating shafts, the device comprising an input shaft and an output shaft, one of which is rigidly connected with a rotary wing piston and the other of which is rigidly connected with a cylinder having a wall in which the rotary wing piston is arranged, pressure chambers being formed in the cylinder by the rotary wing piston, to which chambers a pressure medium is supplied and the cylinder being provided with a plurality of cams to form automatically balancing throttle slits with the rotary wing piston in such a manner that the compressive force of the pressure medium, which is in equilibrium with the exerted torque, forms a measure for the magnitude of the torque, the improvement wherein said rotary wing piston is formed with a plurality of radially extending arms, and wherein said plurality of cams project from said cylinder wall with said wing piston arms extending between a frontal surface of said cams in such a manner that said arms of said rotary wing piston, said cams and said cylinder wall define a plurality of pressure chambers and an equal plurality of exhausted chambers, throttling surfaces at one of two edges of said frontal surface of each said cam forming an inner boundary surface of each said pressure chamber, said throttling surfaces forming with opposite surfaces of said arms of said rotary wing piston throttling slits for said pressure chambers in each direction of rotation of said rotary wing piston, and acting as stops therefor, and a return passage for the pressure medium being provided in each said cam and having an opening at said frontal surface thereof.

4,176,549

HYDRAULIC RIGGING DEVICE

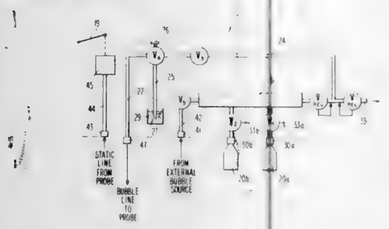
Johann Eichinger, Vaterstetten, Fed. Rep. of Germany, assignor to Carl Hurth Maschinen- und Zahnradfabrik, Munich, Fed. Rep. of Germany

Filed Aug. 30, 1978, Ser. No. 938,071
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1977, 2740197
Int. Cl.² G01M *13/02*
U.S. Cl. 73—162 **12 Claims**



1. A hydraulic rigging device for testing of drive aggregates, as for example shafts, couplings, gears and gearings, comprising:
a pair of hydro-units of which one functions as a pump, the other one functions as a motor, each of said hydro-units having a shaft thereon;
a drive means for driving the shaft on said hydro-unit functioning as a pump;
means defining a high pressure line and a low pressure line connected in circuit with said hydro-units such that an oil circulation circuit is created, whereby each line changes the pressure range upon reversal of the conveying direction of the hydro-unit which functions as a pump;
a testing member having a pair of rotatable shafts thereon interconnected therewith, a driving rotation of either one of said shafts effecting a driven rotation of the other shaft, whereby the torque output on the shaft from the hydro-unit which functions as a motor is included into the power flow consideration of the rigged mechanical system and is used to drive through said testing member said hydro-unit which functions as a pump, so that said drive means must then only yet balance out the occurring losses within the system;
pressure-regulating means for limiting the pressures in said high pressure line and said low pressure line, whereby the pressure difference is co-determining for the magnitude of said rigging; and
means for balancing out the leakage losses which are created in the oil circultion circuit.

4,176,550
DEPTH/FLOW MONITORING INSTRUMENTATION
Charles L. McClure, Malvern, Pa., assignor to Pro-Tech, Inc., Paoli, Pa.
Filed Feb. 6, 1978, Ser. No. 875,225
Int. Cl.[2] G01F *23/14*
U.S. Cl. 73—302 8 Claims

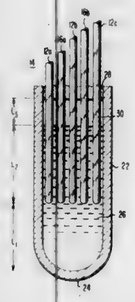


1. Pressure-responsive recorder for use with a bubbler type of sensing probe for monitoring depth or flow of liquid in a sewer or water pipe or conduit, comprising a housing, pressure-responsive means therein, means thereon for supporting a bubble fluid container, means therein for receiving bubble fluid from such container, means therein for regulating the rate of release of bubble fluid from such container means for connecting released bubble fluid to a connecting line to such probe, and means thereon for connecting a static pressure line from such probe to the pressure-responsive means thereon.

4,176,551
FIBER-OPTIC THERMOMETER
Jacob M. Hammer, Plainsboro, N.J., and Clyde C. Neil, Levittown, Pa., assignors to RCA Corporation, New York, N.Y.
Filed Oct. 10, 1978, Ser. No. 949,428
Int. Cl.[2] G01K *5/32*
U.S. Cl. 73—339 R 8 Claims

1. In a fiber-optic thermometer comprising a fiber-optic input for applying input light, a fiber-optic output for extracting output light, and a temperature-sensitive medium optically coupling said fiber-optic input to said fiber-optic output for transferring a proportion of the applied input light from said fiber-optic output, the size of said transferred proportion being a single-valued function of the temperature of said medium; the improvement therein;
wherein said medium comprises a gas-sealing movable reflecting element disposed within a capillary that has one end thereof sealed, and a column of trapped gas situated between said one end of said capillary and said element, said element being supported by the pressure and moved by changes in the pressure of said trapped gas, whereby the length of said gas column and, hence, the position of said element along the length of said capillary is determined by the temperature of said gas, and
wherein each of said fiber-optic input and fiber-optic output extends into the other end of said capillary and terminates at a fixed point along the length of said capillary situated between said element and said other end of said capillary, whereby the proportion of applied input light transferred from said fiber-optic output by reflection from said element is a single-valued function of the position of said element along the length of said capillary.

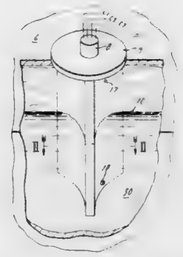
4,176,552
FIBER-OPTIC THERMOMETER
Jacob M. Hammer, Plainsboro, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Oct. 10, 1978, Ser. No. 949,435
Int. Cl.[2] G01K *5/04*
U.S. Cl. 73—339 R 7 Claims



1. In a fiber-optic thermometer comprising a fiber-optic input for applying input light, a fiber-optic output for extracting output light, and a temperature-sensitive medium optically coupling said fiber-optic input to said fiber-optic output for transferring a proportion of the applied input light from said fiber-optic input to said fiber-optic output, the size of said transferred proportion being a single-valued function of the temperature of said medium; the improvement therein:
wherein said medium comprises a fixed amount of a given liquid situated within and partially filling a capillary having a certain length, said liquid exhibiting a predetermined temperature coefficient of expansion,
said fiber-optic input and said fiber-optic output extending in spaced relationship with respect to each other into said capillary in a direction along the length thereof with a portion of each of said fiber-optic input and fiber-optic output being immersed in said liquid, whereby the length of the immersed portion of each of said fiber-optic input and fiber-optic output is a single-valued function of the temperature of said given liquid, and
wherein the light transmission characteristic between said fiber-optic input and said fiber-optic output along the length of the liquid-filled region of said capillary is significantly different from that along the length of the unfilled region of said capillary.

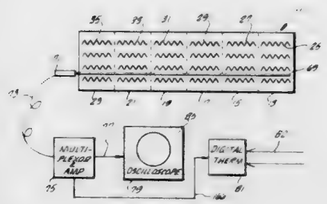
4,176,553
LIQUID LEVEL MEASURING SYSTEM
Tony J. Wood, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Dec. 21, 1978, Ser. No. 971,974
Int. Cl.[2] G01F *23/26*
U.S. Cl. 73—304 C 20 Claims

1. A system for measuring liquid within a tank having a known configuration and referential orientation comprising:
means for sensing the level of said liquid at a plurality of locations in said tank;
means for interrogating said sensing means to derive a separate value signal of said liquid level from each of said plurality of locations;
means for sampling said separate value signals of liquid level and measuring differences between each of said separate value signals;



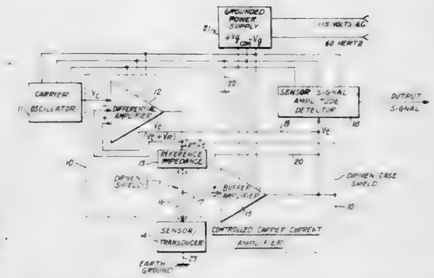
means responsive to one of said separate value signals and said measured differences for producing a liquid level output signal only when said measured differences are below a predetermined amount.

4,176,554
METHOD AND APPARATUS FOR OBTAINING THE TEMPERATURE PROFILE OF A KILN
Casimir W. Kazmierowicz, 26546 Aracena Dr., Mission Viejo, Calif. 92675
Filed Nov. 9, 1977, Ser. No. 849,783
Int. Cl.[2] G01K *7/14*
U.S. Cl. 73—341 18 Claims



1. A system for obtaining the temperature profile of a kiln, comprising:
a temperature probe having a protective metallic sheath, a plurality of thermocouple temperature measuring junctions located in said sheath, each thermocouple being end connected, disposed along the length of the sheath at spaced intervals, all the wire leads of one type from each thermocouple junction being connected together to a single common lead, high temperature insulation surrounding each thermocouple junction and the wire leading thereto and a plurality of intermediate reference junctions, one for each of said temperature measuring junctions and one for the common lead located at one end of said sheath;
multiplexing means receiving the individual signals from each thermocouple junction in said temperature probe for sequentially sampling each signal for a finite period of time; and
display means receiving the sampled signals from said multiplexing means for displaying the received signal samples as an indication of the temperature relationship between the received signal samples.

4,176,555
SIGNAL AMPLIFIER SYSTEM FOR CONTROLLED CARRIER SIGNAL MEASURING SENSOR/TRANSDUCER OF THE VARIABLE IMPEDANCE TYPE
Richard A. Dorman, Troy, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.
Filed Aug. 7, 1978, Ser. No. 931,664
Int. Cl.[2] G01H *11/00*
U.S. Cl. 73—658 10 Claims



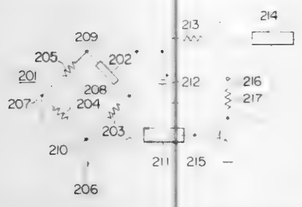
1. A controlled carrier circuit measuring sensor/transducer signal amplifier system including in combination a carrier signal oscillator for providing a carrier oscillatory signal of known frequency and fixed voltage magnitude, differential amplifier means having the carrier oscillatory signal supplied to one of the inputs thereof, reference impedance means and variable impedance sensor/transducer means connected in series circuit relationship across the output of said differential amplifier means, means for feeding back a first feedback signal to a second input to said differential amplifier means, said first feedback signal comprising the sum of the voltages across said reference impedance means and said variable impedance sensor/transducer means in series, buffer amplifier means having the input thereof connected to the juncture of the reference impedance means and the variable impedance sensor/transducer means for deriving an output voltage signal representative of the instantaneous value of the voltage across said variable impedance sensor/transducer means, and means for feeding back said output voltage signal from the output of said buffer amplifier means to a third input to said differential amplifier means in opposition to said first feedback signal for regulating the current supplied through said reference impedance means and said variable impedance sensor/transducer means to a substantially constant magnitude whereby the output voltage signal from said buffer amplifier means provides a measure of the impedance of said variable impedance transducer means.

4,176,556
ELECTRONIC THERMOMETER
Kunio Takenaka, Nagaokakyo, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan
Filed Nov. 8, 1977, Ser. No. 849,805
Claims priority, application Japan, Jun. 17, 1977, 52-72522; Jun. 20, 1977, 52-73756; Jun. 22, 1977, 52-74651; Jun. 22, 1977, 52-74652; Aug. 10, 1977, 52-96346; Aug. 10, 1977, 52-96347
Int. Cl.[2] G01K *7/24*
U.S. Cl. 73—362 AR 10 Claims

1. An electronic thermometer comprising:
a display for displaying a temperature;
a bridge circuit having a temperature responsive transducer in a branch thereof for producing an unbalanced voltage with a predetermined polarity when a reference temperature is exceeded;
a charge-and-discharge circuit including a capacitor connected to said temperature responsive transducer which is charged by said unbalanced voltage;

a microprocessor provided with a reference value corresponding to said reference temperature, a counting means for counting a count equivalent to said reference value and means for discharging said charge-and-discharge circuit if a temperature of said temperature responsive transducer is exceeding said reference temperature when said counting means counts to said counted value; and

an interrupt circuit for applying an interrupt signal to said



microprocessor when said charge-and-discharge circuit discharges down to a predetermined value;

said microprocessor provided with means for computing a temperature corresponding to an added value, said added value being determined by adding a value which is counted from the time of the start of said discharge until the time said interrupt signal is produced to said reference value, said microprocessor further including means for causing a display of said added value on said display.

4,176,557

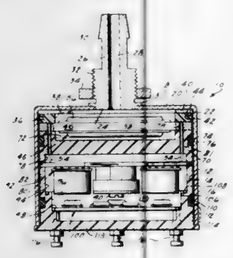
PRESSURE SENSOR

Samuel A. Johnston, Fontana, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 693,436, Jun. 7, 1976, abandoned. This application Apr. 24, 1978, Ser. No. 899,236

Int. Cl.² G01L *7/10*

U.S. Cl. 73—708 **55 Claims**



1. A pressure transducer comprising:

a hollow metal can including a closed end and an open end and a closed end, an aperture in said closed end for receiving fluid pressure;

a first insulator closing said open end of said hollow metal can, said first insulator including a shoulder, and a first groove therein;

a first heater in said first groove;

a second insulator adjacent said closed end of said metal can, said second insulator including a second groove therein;

a second heater in said second groove;

a third insulator within said metal can between said first and second insulators sealing the interior of said can to provide first and second chambers;

a pressure transducer mounted on said third insulator in said first chamber in communication with said aperture, said transducer responsive to pressure to provide a corresponding electrical value;

an electronic sensing circuit mounted on said third insulator within said second chamber and electrically connected to said pressure transducer to provide an electrical signal corresponding to said electrical value; and

a heater circuit mounted on said shoulder of said first insulator, said heater circuit connected to said first and second heaters and operable to maintain the temperature within said housing at a predetermined level.

4,176,558

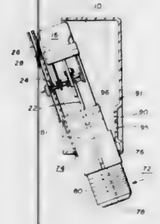
PRESSURE GAUGE CASING-TO-SOCKET CONSTRUCTION

Richard H. Wetterborn, Fairfield, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 17, 1978, Ser. No. 887,588

Int. Cl.² G01L *7/04*

U.S. Cl. 73—741 **13 Claims**



1. In a condition responsive instrument including a condition responsive mechanism operably movable in response to condition changes of a measured condition state to which it is sensitive, a casing surrounding said condition responsive mechanism, a rigid socket member supporting said condition responsive mechanism and extending through an aperture in said casing for communicating a measured condition state from an external source to said condition responsive mechanism and attachment means securing said socket member to an internal surface of said casing at a location on said casing displaced from said aperture and in a manner providing a clearance relation between said condition responsive mechanism and the internal casing surfaces thereat, the improvement comprising interlock means cooperating with said attachment means for affording bidirectionally increased bending resistance of said casing, said interlock means including a contiguous fit formed between a wall surface of said socket member at said aperture and the opposing casing wall defining said aperture thereat.

4,176,559

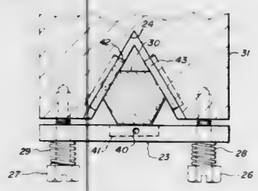
MULTI-PURPOSE TOOL

James E. Williams, 1318 W. 20th, Hastings, Minn. 55033

Filed Sep. 16, 1977, Ser. No. 833,874

Int. Cl.² F16H *21/44*

U.S. Cl. 74—102 **4 Claims**



1. A multi-purpose tool for precision hand-operated reciprocation, comprising:

(a) a tool stand having a support attached thereto;

(b) a tool assembly clamped about said support for adjustable positioning thereon;

(c) a notch cut through an edge of said tool assembly;

(d) a plate bridging said notch, said plate being attached to said tool assembly by bolt and spring members to urge said plate toward said notch;

(e) a top and bottom bearing plate, each having a triangular notch therein and each affixed to said tool assembly and respectively spaced apart with a triangular notch of each respectively aligned with said tool assembly notch;

(f) a plunger having a first and second end and having a hexagonal cross section, said plunger being slidably movable between said bridging plate and said top and bottom bearing plates, two hexagon surfaces of said plunger contacting respective bearing plate triangular notches and one hexagon surface contacting said bridging plate, said plunger having its first end adapted for attachment to a tool;

(g) a handle pivotally connected at one end to said tool assembly and pivotally connected along its length to said plunger second end; and

(h) means for lubricating said plunger hexagon surface, said means being located in said bridging plate; whereby said bridging plate may be adjustably held against said plunger hexagon surface to provide variable resistance to said plunger slidable movement.

4,176,560

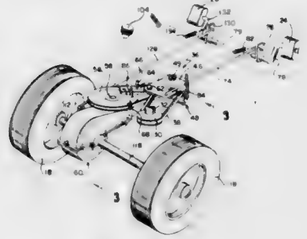
VARIABLE SPEED DRIVE

George C. Clarke, 10509 Penfield Ave., Chatsworth, Calif. 91311

Filed Apr. 27, 1977, Ser. No. 791,226

Int. Cl.² F16H *55/56, 55/36*

U.S. Cl. 74—230.17 A **23 Claims**



1. A variable speed drive comprising a frame; a driving pulley and a driven pulley each rotatably mounted with respect to said frame; a double pulley variable speed sheave assembly; a first belt reeved about said driving pulley and sheave assembly; a second belt reeved about said driven pulley and sheave assembly; first means including a bell crank having a pivot, a first arm carrying said sheave assembly and a second arm; means for shifting the position of said sheave assembly with respect to said driving and driven pulleys for altering the drive ratio of said sheave assembly through a range of low to high speed operating positions; means for attaching the shifting means to the second arm; second means pivotally connected to the bell crank pivot and the frame and means for biasing said sheave assembly generally away from said driving and driven pulleys to maintain said first and second belts under driving tension and for variably controlling the magnitude of driving tension forces on said first and second belts in accordance with operating speed.

4,176,561

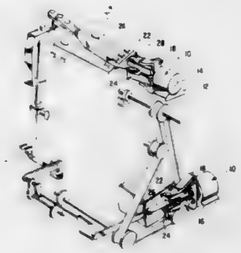
LOW TOLERANCE ROTARY TO LINEAR TRANSMISSION

Donald R. Davidson, Berkely Heights, N.J., assignor to The Singer Company, New York, N.Y.

Filed Nov. 23, 1977, Ser. No. 854,291

Int. Cl.² F16H *1/20*

U.S. Cl. 74—424.8 A **3 Claims**



1. A device for converting rotary motion into linear motion for use in influencing the stitch bight and work feed mechanisms of a sewing machine comprising a mounting base, a shaft journaled in said base, drive means for imparting rotary motion to said shaft, a threaded worm rigidly mounted on said shaft, a pair of threaded split nuts disposed about said worm each in meshing relation therewith, a drive arm pivotally connected to said split nuts, and resilient means anchored on said mounting base and engaging each of said split nuts for urging said split nuts against said worm and for guiding said split nuts along the axis of said worm, whereby rotational motion of said worm is converted into translational motion of said drive arm along the axis of said worm.

4,176,562

ANTI-SKID PROTECTIVE CAP ESPECIALLY OF RUBBER, FOR ACTUATING PEDALS OF A MOTOR VEHICLE

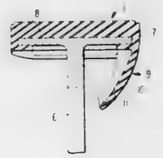
Anton Allert, Stuttgart; Friedrich Weiss, Neuhausen, and Peter Schrape, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 13, 1977, Ser. No. 759,174

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1976, 2603227

Int. Cl.² G05G *1/16;* **C08L** *15/02;* **C08C** *19/12*

U.S. Cl. 74—563 **19 Claims**



1. An anti-skid protective cap for one of a plurality of actuating pedals, such as brake pedals and the like, of a motor vehicle of the type having a plurality of actuating pedals selectively actuated by the shoe of the vehicle operator; said protective cap comprising:

an upwardly facing roughened anti-skid surface portion engageable by an operator's shoe during normal in-use actuation of a pedal having said cap,

means for accommodating attachment of said cap to said pedal,

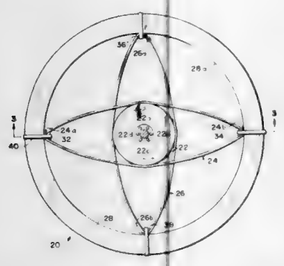
and a shoe deflecting sliding surface portion projecting downwardly from a side edge of said anti-skid surface portion, which side edge faces an adjacent actuating pedal, said shoe deflecting surface portion exhibiting a relatively smooth substantially uninterrupted surface extending over its entire length from the anti-skid surface portion to the bottom of the shoe deflecting surface portion and being of sufficient length so as to accommodate sliding of the vehicle operator's shoe along said shoe deflecting surface portion while preventing said shoe from getting stuck under the pedal during movement of said operator's shoe from the adjacent pedal to the pedal with said cap, said cap, including said anti-skid surface portion and said shoe deflecting portion, being formed as an integral one-piece part.

4,176,563

INERTIAL ENERGY STORAGE ROTOR WITH TENSION-BALANCED CATENARY SPOKES

Francis C. Younger, Berkeley, Calif., assignor to Electric Power Research Institute, Palo Alto, Calif.

Filed Oct. 27, 1976, Ser. No. 736,031
Int. Cl.[2] F16F *15/30*
U.S. Cl. 74—572 **8 Claims**



1. In an inertial energy storage rotor including a central hub and a concentric annular ring radially spaced therefrom, the improvement comprising:

a plurality of spoke elements in the shape of an elongate closed loop having a pair of central segments, a pair of opposed end segments, and curved segments connecting said spoke end segments and said spoke central segments, each of said curved segments having a shape substantially that of a polar catenary curve so that at the operating speed of said rotor said spoke elements are subjected generally only to tension forces directed substantially along the curved segments, said spoke elements being connected to said hub along said central segments and to said ring along said end segments; and

a plurality of weights, each of said weights being secured to a corresponding spoke end segment.

4,176,564

CONTROL ARRANGEMENT FOR VARIABLE POWER TRANSMISSION

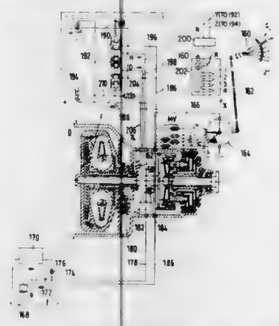
Karl G. Ahlen, Bromma; Per-Olof Bergstrom, Ektorp, and Joseph Supanich, Stockholm, all of Sweden, assignors to S.R.M. Hydromekanik Aktiebolg, Stockholm-Vallingby, Sweden

Filed Oct. 4, 1976, Ser. No. 729,422
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1976, 2621447; United Kingdom, May 26, 1976, 03527/76
Int. Cl.[2] F16H *47/00, 57/10*
U.S. Cl. 74—732 **19 Claims**

1. A variable power transmission for motor vehicles comprising:

a multi-speed planetary gear having primary and secondary shafts journalled with respect to a casing, a planet carrier drivingly engaged with one of said shafts, planet gears rotatively mounted on the planet carrier and having at least two sections of different diameter, at least three annular gears, each engagable with one of the planet gear sections, such that each gear section has at least one annular gear engaged therewith, one of the annular gears being a drive annular gear engaged with a second of said shafts, a friction coupling means for holding each of the annular gears stationary relative to the casing, and a servo-motor non-rotatively mounted in the casing for operating each of said friction coupling means,

a multi-position control valve for selectively controlling



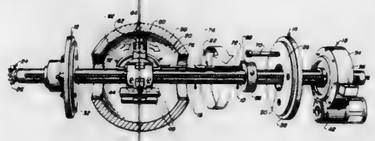
operation of individual ones of said servo-motors to in turn engage their respective friction couplings, a fluid source including a low pressure, high capacity pump, first and second fluid circuits connected in parallel between the fluid source and the multi-position control valve, the first fluid circuit including a low capacity, high pressure pump, and the second fluid circuit including a one-way check valve openable for delivering fluid into the first circuit between the low capacity, high pressure pump and the multi-position control valve for delivering fluid to said multi-position control valve, whereby fluid for delivery to the multi-piston control valve is delivered first through the said one-way check valve, afterwhich pressure thus built up is held by the low capacity, high pressure pump.

4,176,565

SPHERICAL BEARING SEAT CUTTER MACHINE

Dieter Christoph, Streamwood, Ill., assignor to Siegfried Schulz, Rolling Meadows, Ill., a part interest

Filed Sep. 5, 1978, Ser. No. 939,323
Int. Cl.[2] B23B *3/28, 41/00, 3/22*
U.S. Cl. 82—12 **18 Claims**



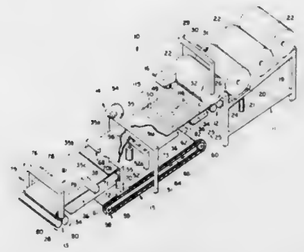
1. A portable spherical bearing seat cutter machine for cutting a spherical bearing seat comprising: a pair of spaced supports adapted for being connected to a workpiece having a spherical bearing seat for supporting the cutter machine on the workpiece; a drive shaft rotatably mounted in the spaced supports; a rotary drive connected to the drive shaft for rotating the drive shaft in the spaced supports; a cutter assembly mounted on the drive shaft rotatable with the drive shaft, said cutter assembly including a cutting tool rotatable with the drive shaft for cutting the spherical bearing seat in the workpiece, and means for determining movement of the cutting tool relative to the drive shaft in an arcuate path; and an arcuate drive connected to the cutting tool for moving the cutting tool relative to the drive shaft in the arcuate path while the drive shaft is rotating.

4,176,566

CREEL LOADING AND CUTTING SYSTEM

Thomas K. Patterson, Dublin; William O. Mitchell; Donald H. Smith, both of Vidalia, and John P. Hunter, Jr., Dunwoody, all of Ga., assignors to Oxford Industries, Inc., Atlanta, Ga.

Division of Ser. No. 766,240, Feb. 7, 1977, Pat. No. 4,082,589.
This application Mar. 16, 1978, Ser. No. 887,061
Int. Cl.[2] B26D *7/00*; D06H *7/00*
U.S. Cl. 83—29 **7 Claims**



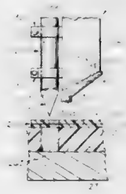
1. A process of cutting garment pattern parts or the like comprising moving sheet material along its length from a supply, projecting an image with cut positions on the moving sheet material and moving the image at a velocity equal to the velocity as the sheet material, severing the sheet material at the cut positions projected on the sheet material, accumulating the cut lengths of sheet material on spools, placing the spools in a creel, pulling the ends of the cut lengths of sheet material from the spools onto a support surface in vertically stacked relationship, and cutting through the stack of cut lengths of sheet material.

4,176,567

METHOD OF MAKING A TEAR LINE-FORMING PERFORATION IN A SEALED MARGINAL PORTION OF A BAG AND A SEALED BAG FORMED THEREBY

Warren Weisberg, 2406 Grant, Evanston, Ill. 60201

Division of Ser. No. 779,033, Mar. 18, 1977, abandoned. This application May 1, 1978, Ser. No. 901,932
Int. Cl.[2] B26F *1/18*
U.S. Cl. 83—30 **8 Claims**



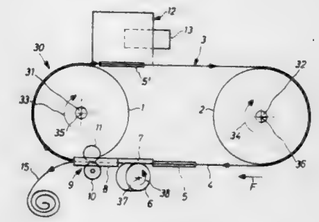
1. A method of making a tear line-forming perforation in a sealed bag made of confronting panels of manually tearable material having marginal portions thereof sealed together to define a sealed compartment within the bag containing a material to be sealed, said method comprising the steps of: providing an outwardly tapering faceted pointed tool head, the faceted tapered pointed tool head being formed by at least three, longitudinal extenting bag material slitting edges converging at a bag-puncturing point at the end of the tool, positioning said bag-puncturing point substantially beyond what is or will be the inner margin of a sealed marginal portion thereof, and forcing the tool head through said bag with an orientation where the bag material slitting edges of the tool head form a multi-legged tear line-forming perforation which terminates outwardly of said inner margin and comprises continuous slits intersecting at a common point with one of the legs of the perforation extending from said common point in a direction away from the adjacent edge of the leg along a line which passes within the sealed portion of the bag, so that the bag is opened when it is torn from the edge thereof through and beyond the latter leg, and then withdrawing the tool head from the punctured bag.

4,176,568

BAND CUTTING APPARATUS

Erik G. Nilsson, Buchs, Switzerland, assignor to Swegea Maschinen AG, Buchs, Switzerland

Filed Apr. 26, 1978, Ser. No. 900,223
Claims priority, application Austria, Apr. 29, 1978, 3069/78
Int. Cl.[2] B23D *19/04*
U.S. Cl. 83—187 **10 Claims**



1. A band cutting apparatus for cutting a fabric web to produce a web-like article by the agency of a cutting means, whereby said fabric web is guided towards said cutting means, comprising a guide means including at least one fabric guide means provided with an uncurling means for uncurling an inwardly directed curl at the edge of said fabric, which fabric guide means is arranged relative to the direction of advancement of said fabric web ahead of said cutting means;

said uncurling means comprising a slot means extending obliquely and oppositely to the direction of advancement of said fabric web, said slot allowing said edge of said fabric to pass through said uncurling means;

said uncurling means also comprising two arms constituting a run-up means arm and a run-down means arm extending substantially parallel thereto whereby said two arms are separated from each other by said slot means;

and said uncurling means and said slot means respectively comprising a first section and a second section disposed at an angle to each other whereby said first section is arranged closer to the fabric edge at which the fabric can curl than the second section, and whereby said first section defines with said edge of said fabric a first small angle and said second section defines with said edge of said fabric a second, larger angle.

4,176,569

MULTIPLE WOUND ROLL DISPENSER FOR FLEXIBLE SHEET MATERIAL

Raymond F. DeLuca, Stamford, Conn., assignor to Georgia-Pacific Corporation, Portland, Oreg.

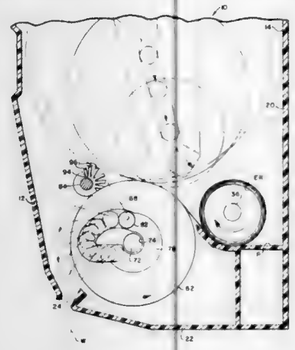
Filed Apr. 18, 1978, Ser. No. 897,431
Int. Cl.[2] A47K *10/36, 10/38*
U.S. Cl. 83—337 **23 Claims**

1. A dispenser for wound rolls of flexible sheet material that

have supporting spindles projecting outwardly from the roll core ends comprising:

a dispenser housing to receive the rolls to be dispensed having inwardly facing tracks on the opposite inner side walls of said housing for the rolls to move downwardly within said tracks with the lower end section of each track slanting away from the longitudinal axis of the main length of the track,

roll driving guide means pivotally mounted adjacent the lower end of each said track with means biasing said guide means inwardly toward the center of the track, each said



guide means providing a friction surface along each slanting track section to engage the periphery of the roll spindle within the track and promote roll rotation during said downward movement of the roll,

a feed roller rotatably mounted within said dispenser housing adjacent the lowermost ends of said tracks so that the periphery of a roll having the spindle therefor engaged by said guide means will engage and be driven by rotation of said feed roller, and

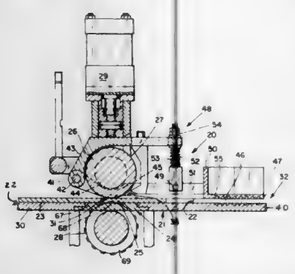
means for leading sheet material leaving said feed roller out of said dispenser housing to a user.

4,176,570

DICER WITH SOFT FEED APPARATUS

Clement A. Hutchins, Andover, Mass., assignor to Bolton-Emerson, Inc., Lawrence, Mass.

Filed Jun. 5, 1978, Ser. No. 912,762
Int. Cl.² B23D *25/00*
U.S. Cl. 83—355 **7 Claims**



1. In a dicer of the type having a horizontal feed platform, a pair of feed rolls having a web feed nip at the platform entrance means for applying roll pressure at said nip; a toothed bed knife and a toothed rotary cutter forming a pellet cutting nip at the platform exit and a plurality of web hold down fingers in the space between said nips the combination of;

a plurality of closely spaced, fine ribs and grooves formed in the upper surface of said horizontal feed platform and extending in the direction of feed of a web there along;

a plurality of closely spaced, fine ribs and grooves formed in the lower surface of said web hold down fingers and extending in the direction of feed of said web;

said ribs and grooves preventing sidewise movement of a web of plastic fed by said rolls across said platform into said pellet cutting nip without requiring undue nip pressure at said feed rolls;

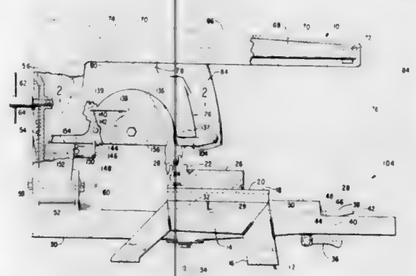
and a pattern of diamond shaped protuberances on the lower feed roll of said pair for preventing wrap around of said roll by webs of limp material.

4,176,571

GUARD MECHANISM FOR RADIAL SAW

William A. Batson, Pickens, S.C., assignor to The Singer Company, New York, N.Y.

Filed Jan. 18, 1978, Ser. No. 870,533
Int. Cl.² B27B *5/20, 5/29;* B27G *19/04*
U.S. Cl. 83—397 **12 Claims**



1. A guard mechanism for a radial saw having a motor powered saw blade mounted in a housing slidable on a support arm of a frame shiftable between a rearwardly non-cutting position and a forwardly cutting position wherein the blade will engage a workpiece lying on a work table connected to the frame, said guard mechanism comprising:

(a) a guard for covering a portion of the blade,

(b) the guard pivotally mounted to the housing, and

(c) means carried by the housing to contact the frame and to raise the guard away from the work table upon the housing being shifted to its rearwardly non-cutting position.

4,176,572

DEVICE FOR SCORING WOOD PANELS PRIOR TO SAWING

Charles A. Pennington, 4626 Valencia Dr., La Verne, Calif. 91750

Filed Jan. 23, 1978, Ser. No. 871,608
Int. Cl.² B27G *19/04*
U.S. Cl. 83—862 **10 Claims**

1. A scoring device for a wood panel or like workpiece, comprising:

a guide bar adapted to guide a saw to saw said workpiece along a predetermined kerf line,

means to clamp said bar to said workpiece parallel to said kerf line,

a scoring device frame having a guided portion configurated to fit onto said guide bar and slidable therealong,

an outboard extension portion of said frame extending generally parallel to the workpiece at substantially a right angle to said guide bar,

a pair of knife-carrying means mounted on said extension portion and adjustable in position therealong,

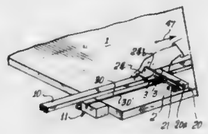
a scoring knife blade attached to each said knife-carrying means,

whereby said knife blades may be adjusted to score simultaneously along either side of said kerf line, said scoring preventing splintering of the surface of said workpiece by said saw,

each said knife-carrying means comprises knife blade arm means having a shaft hole,

shaft means extending through each said shaft hole,

a support in said guided portion of said frame receiving rotatably an inboard end portion of said shaft means,



a bearing suppport in said outboard extension portion of said frame receiving rotatably an outboard end portion of said shaft means,

clamping means to secure each said arm means to said shaft at a selected position along the length of said shaft means,

a resilient clip extending generally around said arm means to hold said knife blade against its side, said blade having a first hole through its side portion,

a first boss on said arm engaging said hole,

a cut in said clip along a side portion thereof and a second hole adjacent said cut, and

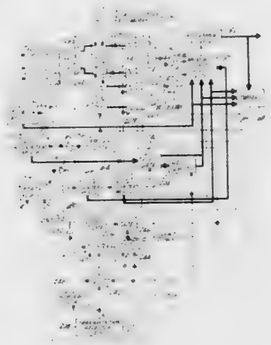
a second boss on said arm engaging said second hole releasably to retain said clip along the length of said arm.

4,176,573

INTRAKEYBOARD COUPLING AND TRANSPOSITION CONTROL FOR A KEYBOARD MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co. Ltd., Hamamatsu, Japan

Filed Oct. 13, 1978, Ser. No. 951,168
Int. Cl.² G10B *3/20;* G10C *3/28;* G10H *1/00*
U.S. Cl. 84—1.01 **11 Claims**



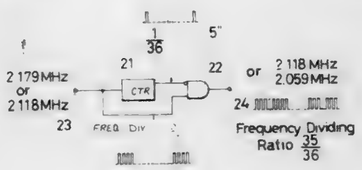
1. In a keyboard switch and assignor circuit of the type in which keys of the keyboard are arranged in groups, each group corresponding to the notes of one octave, the groups being scanned in sequence in synchronism with a master clock, the status of each of the keys of each group as it is scanned being read out in binary form on a corresponding number of parallel output lines, the current status information on each of said lines being compared with the prior status stored in a group of registers to indicate when a key has changed status, a change in status of any of the keys in a group when scanned causing a word identifying the note associated with the key to be stored or cleared in an assignment memory depending on whether the change in status indicates a key has been activated or released, the word stored in the assignment memory identifying the key by note and octave, apparatus for transposing the notes associated with the keys of the keyboard by a selected number of half tones, comprising: shifting means interconnecting the parallel status lines with the status storing registers, means generating electrically coded signals indicating the number of musical half tones to be transposed, and means responsive to said coded signals for setting the shifting means to switch the current status signals on each of the lines to a different one of said status storing registers.

4,176,574

FREQUENCY DIVIDER FOR TONE SOURCE APPARATUS FOR ARABIAN SCALE IN ELECTRONIC ORGAN

Tsunehisa Nogimura, Okegawa, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Oct. 13, 1978, Ser. No. 951,605
Int. Cl.² G10H *5/06*
U.S. Cl. 84—1.01 **4 Claims**



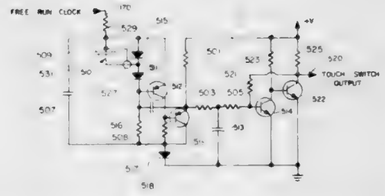
1. A tone source for an Arabian scale comprising a frequency divider including a counter, an AND circuit including two input terminals and an output terminal, and an input terminal connected through the counter to one of said input terminals of the AND circuit and connected directly to the other input terminal of the AND circuit, said counter being a 36 counter such that for every thirty-six input pulses to said counter thirty-five output pulses are produced to obtain musical tone signals at said output terminal which are lower in frequency by 50 cents.

4,176,575

IMPROVED TOUCH OPERATED CAPACITANCE SWITCH CIRCUIT FOR AN ELECTRONIC ORGAN

Walter Munch, Fort Thomas, Ky., assignor to D. H. Baldwin & Company, Cincinnati, Ohio

Filed Jun. 21, 1977, Ser. No. 808,607
Int. Cl.² G10H *1/00, 5/00*
U.S. Cl. 84—1.01 **3 Claims**



1. A touch operated capacitance switch arrangement for use

in connection with an electronic musical instrument having a plurality of modes of operation comprising:

a touch electrode;

a guard electrode interposed between said touch electrode and nearest points of ground potential;

a source of alternating voltage;

circuit means for applying said alternating voltage to said guard electrode and said touch electrode, said guard electrode cooperating with said alternating voltage to reduce the capacitance of said touch electrode to ground; said circuit means further comprising;

means to detect increased current flow to said touch electrode when said touch electrode is touched by a human extremity; and

an output terminal connected to said means to detect, said output terminal caused to have a voltage potential at a first state by said detector means when said touch electrode is not touched, and caused to have a voltage potential at a second state by said detector means when said touch electrode is touched, said output terminal connected to said electronic musical instrument such that the mode of operation of said electronic musical instrument is changed when said voltage of said output terminal goes from said first state to said second state.

4,176,576

ELECTRONIC MUSICAL INSTRUMENT

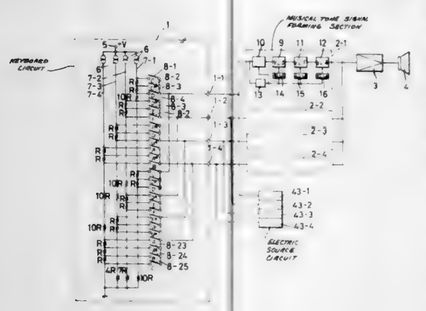
Keiji Murakami, Okegawa, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Sep. 20, 1977, Ser. No. 834,882

Claims priority, application Japan, Sep. 21, 1976, 51-112492; Oct. 6, 1976, 51-119434; Oct. 25, 1976, 51-127327

Int. Cl.[2] G10H *1/02, 5/00*

U.S. Cl. 84—1.01 **7 Claims**



1. An electronic musical instrument comprising: a keyboard with keys; a keyboard circuit connected to said keyboard for generating scale tone voltage signals corresponding to depressed keys of the keyboard; plural musical tone signal forming sections connected respectively to plural output terminals of the keyboard circuit; said keyboard circuit comprising: an electric source, plural series-connected resistance circuits each having plural series-connected resistances connected at one end to said electric source, and plural key-switches arranged to move with said keys, said key-switches being connected so that when plural keys are simultaneously depressed according to a chord, respective scale tone voltage signals corresponding to the respective keys are generated at respective connecting points of the resistances in the respective series-connected resistance circuits and may be respectively transmitted from said plural output terminals.

4,176,577

ELECTRONIC MUSICAL INSTRUMENT OF WAVESHAPE MEMORY READING TYPE

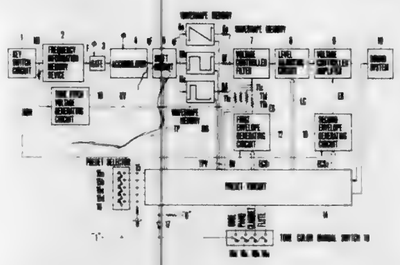
Shigeru Yamada, and Kiyoshi Ichikawa, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 27, 1977, Ser. No. 845,870

Claims priority, application Japan, Oct. 30, 1976, 51-130733; Oct. 30, 1976, 51-130734; Oct. 30, 1976, 51-130735; Oct. 30, 1976, 51-130736; Oct. 30, 1976, 51-130737; Oct. 30, 1976, 51-130738

Int. Cl.[2] G10H *1/02, 5/00*

U.S. Cl. 84—1.01 **9 Claims**



1. An electronic musical instrument comprising a key switch circuit providing output signals representative of depressed keys, a frequency information memory device responsive to the key switch circuit output signals which stores frequency information corresponding to depressed keys, a plurality of musical tone forming means including a waveshape memory device for forming musical tones in response to the information stored in said frequency information memory device, a shift circuit interposed between said frequency information memory device and said musical tone forming means for effecting a footage change of an octave unit, a preset circuit for applying a plurality of preset footage change signals to said shift circuit and for applying other preset signal necessary to form said musical tones to said musical tone means, and a manually operable preset selector for simultaneously determining said preset signals necessary to form said musical tones to said musical tone forming means, and a manually operable preset selector for simultaneously determining said preset signals.

4,176,578

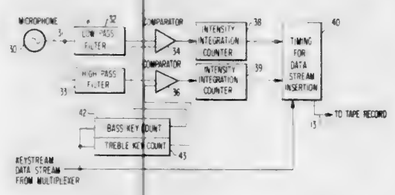
SYSTEM FOR ENCODING OF BASS AND TREBLE EXPRESSION EFFECTS WHILE RECORDING FROM THE KEYBOARD OF AN ELECTRONIC PLAYER PIANO

Joseph M. Campbell, Lewisburg, and Larry J. Minyard, Columbia, both of Tenn., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Aug. 26, 1977, Ser. No. 828,070

Int. Cl.[2] G10F *5/00;* **G10G** *3/04*

U.S. Cl. 84—115 **9 Claims**



1. In a method for recording bass and treble expression effect signals in binary form, respectively, for recreating a musical performance on an electronic player piano wherein serial frames of data cells are provided in a sequence of time division multiplexed frames of data, each frame carrying therein a first group of data bits corresponding to key note actuations of the bass notes on a piano and second group of data bits corresponding to the key note actuations of the treble notes on said piano,

the improvements wherein said first and said second groups of data cells are spaced from each other within said time frame, and

inserting (1) said bass expression effect signal in binary form in said time division multiplexed frames of data cells in advance of the group of data cells receiving said data bits corresponding to key note actuations of said bass notes and (2) said treble expression effect signal in binary form in said time division multiplexed frames of data cells in advance of the group of data cells receiving said data bits corresponding to key note actuations of said treble notes so that upon recreation of the original musical presentation on said electronic player piano a more faithful rendition of the original performance is produced.

4,176,579

CIRCUIT FOR SIMULATING REVERBERATION IN ELECTRONIC ORGANS

Richard H. Peterson, 11748 Walnut Ridge Dr., Palos Park, Ill. 60464

Filed May 24, 1977, Ser. No. 800,109

Int. Cl.[2] G10H *1/02*

U.S. Cl. 84—1.24 **4 Claims**

1. In an electronic organ having a keyboard, and a plurality of tone generators, one for each note to be sounded,

a like plurality of time constant circuit means, one associated with each of said notes, for establishing a predetermined first decay characteristic for each note,

a key-down detector for sensing the key-down condition of any key of the keyboard,

a like plurality of auxiliary circuit means connected one to each of said time constant circuit means and to said key-down detector and operative in response to said key-down detector to cause the sounded notes to have said predetermined first decay characteristic so long as any key of the keyboard is in its key-down position and to cause the sounded notes to have a second decay characteristic having a decay period shorter than the decay period of said first decay characteristic when all keys of the keyboard are in the key-up position.

4,176,580

SUPPORTING BRACKET FOR MUSICAL INSTRUMENTS

Manuel Gallegos, 3734 Franklin, Denver, Colo. 80205

Filed Mar. 6, 1978, Ser. No. 883,525

Int. Cl.[2] G10G *5/00*

U.S. Cl. 84—327 **4 Claims**

1. A supporting bracket for mounting guitars and other stringed musical instruments having finger board portions above a floor surface and selectively at hanging or tilted angles relative to a support having vertical or horizontal wall surfaces comprising a flat generally V-shaped wall mounting plate having its opposing side edges bent outwardly and inwardly to form side channels extending end to end and selectively attachable by attaching means to said vertical and horizontal wall surfaces, a generally inverted L-shaped angular supporting bracket including a vertical converging flat base portion and a horizontally extending flat hanger plate portion formed on the upper end of said flat base portion and projecting at generally right angles relative thereto, said hanger plate portion having two spaced flat converging arms providing a generally U-shaped open area therebetween with a generally concave inner end, said base portion having an elongated slot therein extending from the lower end thereof to a point spaced below the upper end whereby said base portion is sleevable within said



mounting plate channels and said attaching means will project within said slot and permit of the insertion and removal of said base plate portion so as to selectively project outwardly from or inwardly relative to one of said wall surfaces, whereby said finger board portion of said guitar extends between said spaced arms and engages with said concave inner end and is thereby fixedly retained angularly relative to one of said wall surfaces and spaced above said floor surface, and whereby said base plate portion is reversibly sleevable in said wall mounting plate so that said hanger plate portion will either project outwardly from either of said wall surfaces to angularly and outwardly support said guitar or when reversedly sleeved therein the converging arms of said hanger plate portion will extend over and engage the other wall surface and will not project therefrom for inoperative and storage purposes.

4,176,581

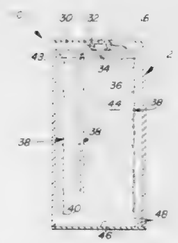
AUDIO AMPLITUDE-RESPONSIVE LIGHTING DISPLAY

Bernard R. Stuyvenberg, 8149 Meadow, Warren, Mich. 48089

Filed Nov. 28, 1977, Ser. No. 855,413

Int. Cl.[2] A63J *17/00;* **A47G** *33/16*

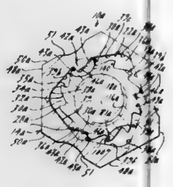
U.S. Cl. 84—464 R **3 Claims**



1. In a system for varying the intensity of a plurality of lights in accordance with plural channel audio amplitude signals, a display comprising:

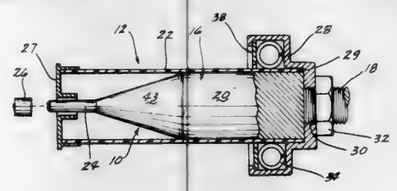
a microphone responsive to ambient sound;
an audio amplifier for amplifying said ambient sound and directing said amplified sound energy to a plurality of audio amplitude responsive channels;
a plurality of colored spotlights directable against the walls and ceiling of a room in which said system is operated, the intensity of said spotlights responsive to said sound amplitude;
a housing having multi-sided prismatic openings through which light paths are provided to permit the passage of light from the interior of said housing, said housing having a top wall, a mirrored back wall and a mirrored bottom wall;
a plurality of banks of lights, each of said banks being responsive to a separate one of the channels of audio amplitude signals, each of said banks including a plurality of lights, each of said banks being responsive respectively to the amplitude of an associated channel of audio sound signals, each of said banks including a plurality of sets connected in parallel, each set being of a selected number of lights connected in series with one flasher unit, said lights being responsive to said separate channels and being turned on and off in a random fashion by said flasher units;
means for mounting a selected number of said banks in a stationary position within said housing;
a motor mounted to the interior surface of said top wall;
a laterally disposed arm member carried by said motor and rotatable in a generally horizontal plane; and
means mounting a selected number of said banks to the opposite ends of said rotating arm member to rotate said last-mentioned banks about a vertical axis.

4,176,582
TORQUE LIMITING NUT ASSEMBLY
Erwin C. Witte, Placentia, Calif., assignor to Microdot Inc., Greenwich, Conn.
Filed Feb. 10, 1978, Ser. No. 876,653
Int. Cl.² F16B *31/02*
U.S. Cl. 85—61 **7 Claims**



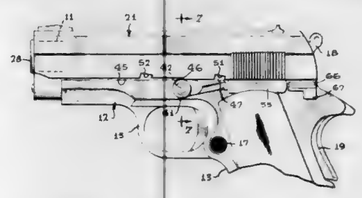
1. A torque limiting nut assembly comprising: a threaded nut member, a wrenching member having an external surface adapted to be engaged by a wrench and having a central opening adapted to receive said threaded nut member, said threaded nut member having a plurality of axially extending fingers circumferentially disposed about its outer surface, each of said fingers having a ramp on one side defined by a radially extending surface inclined radially outwardly in the direction of rotation for application of said nut member onto an associated bolt member, said wrenching member having at least one tooth extending from three generally equiangularly spaced sides of said central opening, each said tooth having a ratchet surface generally similar to that of said ramp and being engageable therewith, said wrenching member being of a resilient construction and permitting elastic deformation of said central opening, said wrenching member having a plurality of external flats defining a generally hexagonal outer surface adapted to be gripped by a wrench and with alternate ones of said flats being generally in radial alignment with an associated one of each said tooth, said alternate ones of said flats having recesses extending radially inwardly at said associated one of each said tooth to define areas of preselected reduced sections, whereby each said tooth can ratchet over said fingers with said central opening expanding in the area of each said tooth at a preselected torque on said wrenching member.

4,176,583
DEVICE FOR CONDITIONING EXPENDED SHOTSHELLS
Frederick A. Lage, Rte. 2, Gladbrook, Iowa 50635
Filed Feb. 13, 1978, Ser. No. 877,125
Int. Cl.² F42B *33/00*
U.S. Cl. 86—24 **5 Claims**



1. A shotshell reconditioner, comprising,
a first support means,
a swedge means secured to said support means and extending therefrom for insertion into the partially crimped portion at the discharge end of the shotshell,
and a ring-shaped spring means mounted to said support means adapted to embrace and engage the exterior portion of said shotshell as said swedge means is inserted into the shotshell whereby said spring means will substantially smooth the said crimped portion as to facilitate a subsequent loading operation,
said ring-shaped spring means having an inside diameter which is less than the outside diameter of the shotshell so that said spring means will firmly slidably embrace the crimped portion of the shotshell as said swedge means is inserted into the shotshell.

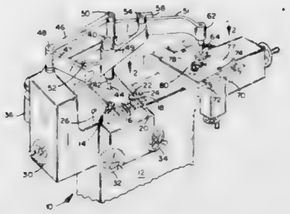
4,176,584
SLIDE LOCKING MECHANISM FOR MAGAZINE-FED FIREARMS
Frank S. Thomas, Jr., deceased, late of West Covina, Calif., and by Phyllis Thomas, executrix, 2122 Pearl St., Santa Monica, Calif. 90405
Filed Jun. 21, 1978, Ser. No. 917,417
Int. Cl.² F41D *11/06*
U.S. Cl. 89—138 **20 Claims**



1. In an automatic or semi-automatic magazine-fed firearm having a barrel fixed to a frame; a slide surrounding said barrel and with the breech thereof defining a cartridge receiver, said slide being reciprocably mounted to said frame for axial movement thereon between a firing chamber-sealing battery position at the muzzle-end of the frame and a full-recoil position at the other end of the frame; resilient means acting between said frame and said slide, urging said slide towards said battery position; and a cartridge magazine releasably insertable into said frame, said magazine including a cartridge-supporting follower and resilient means urging said follower into the path of movement of said slide; slide locking means comprising:

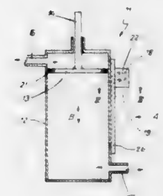
a lever rotatably mounted to said frame and having first caming means formed thereon;
first detent means on said slide, cooperatively engaging said first caming means with said slide in said battery position and thereby restraining said slide against movement out of said battery position;
second caming means on said lever, positioned in the path of movement of said slide; and
cam engaging means on said slide, cooperatively engaging said second caming means in response to movement of said slide into said battery position, for rotating said lever and thereby forcing said first caming means into cooperative engagement with said first detent means, whereby movement of said slide out of said battery position upon discharge of a cartridge is delayed until the gases in said barrel produced by such discharge exit the muzzle, thereby reducing the gas pressure within the barrel to a predetermined safe level.

4,176,585
UNIVERSAL PANOGRAPH PATTERN
Rodney L. Anderson, Fullerton, Calif., assignor to Creative Tool Specialties, Inc., Balboa Island, Calif.
Filed Sep. 16, 1977, Ser. No. 834,062
Int. Cl.² B23Q *35/44*
U.S. Cl. 409—125 **2 Claims**



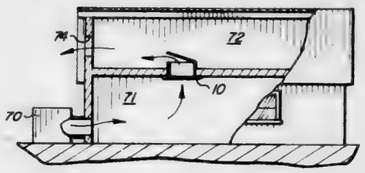
1. A variable pattern for guiding a stylus on a pantograph along a preselected path comprising:
a plate for attachment to a table on a pantograph, an elongated arm having pivot means intermediate the ends thereof, said pivot means connecting said arm to the plate for movement about the axis of said pivot means, said plate including a plurality of index means spaced apart a predetermined distance in a circular pattern concentric with the axis of said pivot means, engagement means supported on said arm and being engagable with the index means for positioning the arm at a selected one of said index means, stylus holder means being slidably supported on said arms for movement along the length thereof, limit means slidably supported on said arm on each side of said stylus holder means, each of said limit means being releasably fixable along said arm for limiting the travel of the stylus holder means therealong, roller bearing means mounted on said arm and spaced from said pivot means and in engagement with said plate for supporting the arm on the plate, and said stylus holder means having bearing means for receiving a stylus and allowing the stylus to move freely therein relative to the stylus holder means.

4,176,586
PISTON AND CYLINDER DEVICE
Kurt Stoll, Lenzhalde 72, Esslingen, and Manfred Rüdle, Thomasäckerweg 17, Esslingen-Berkheim, both of Fed. Rep. of Germany
Continuation of Ser. No. 654,044, Jan. 30, 1976, abandoned. This application Jul. 28, 1977, Ser. No. 819,858
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1975, 7502826
Int. Cl.² F01L *25/08, 31/00;* F01B *31/12*
U.S. Cl. 92—5 R **4 Claims**



1. A piston and cylinder device comprising
an elongated hollow enclosed cylinder having an exposed outer surface;
a piston positioned within said cylinder and capable of reciprocating movement along the elongation direction thereof based on working medium input into said cylinder;
an elongated mounting element positioned on the outer surface of said cylinder and extending parallel to the elongation direction thereof, said elongated mounting element including an elongated base and two elongated webs connected to said base and extending away therefrom in a V-shaped fashion along the elongation direction of said base;
two limit switches mounted on said mounting element, each being respectively mounted on one of said elongated webs so as to be independently movable along the elongation direction of said mounting element and thus said cylinder, each of said two limit switches being activated by movements of said piston past their positions and capable of controlling the admission of working medium into said cylinder and thus the movement of said piston therewithin.

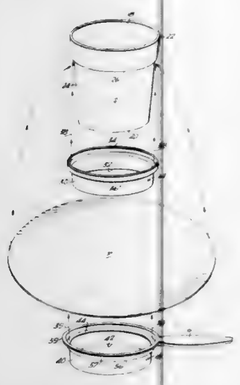
4,176,587
VENTILATING DAMPER ASSEMBLY
Howard W. Cox, Tempe, Ariz., assignor to Mission Marketing Corporation of Arizona, Tempe, Ariz.
Continuation-in-part of Ser. No. 710,920, Aug. 2, 1976, Pat. No. 4,047,475. This application May 27, 1977, Ser. No. 801,082
The portion of the term of this patent subsequent to Sep. 13, 1994, has been disclaimed.
Int. Cl.² F04D *25/08, 25/14;* F24F *7/00, 13/00*
U.S. Cl. 98—116 **2 Claims**



1. In a building of the type cooled by an evaporative cooling

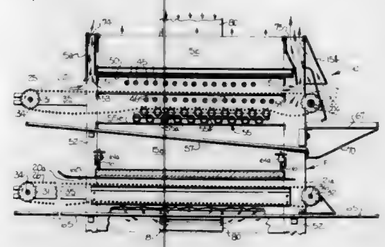
system, having an enclosed living space with a ceiling an enclosed attic above the ceiling, a vent establishing communication between the attic and the atmosphere outside the building, and an evaporative cooling means for continuously drawing air from outside the building through such cooling means and discharging such air into said living space, an improvement comprising a normally closed pressure-actuated ventilating damper assembly located in the ceiling between said living space and said attic and adapted to open in response to greater air pressure within the living space than in the attic to discharge air from the living space through said vent and the attic to the outside of the building whenever air is discharged into the building through said evaporative cooling means.

4,176,588
BREWING APPARATUS
Barnett Baron, 1009 Meridian Ave., Apt. 19, Miami Beach, Fla. 33139
Filed Aug. 1, 1978, Ser. No. 929,919
Int. Cl.[2] A47J *31/06*
U.S. Cl. 99—323 **11 Claims**



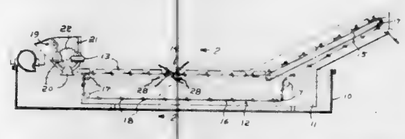
1. A brewing apparatus comprising:
I. a brewing cup having a mouth rim comprising a first abutment surface, and said rim defining an open upper end, said cup including an annular exterior shoulder extending radially outwardly forming a second annular abutment surface adjacent to and axially spaced from said rim, an annular upper side wall extending from said shoulder to said open upper end, said cup having a closed lower end and an annular lower side wall extending axially from said shoulder to said lower end, said lower side wall being of a maximum cross sectional area at said shoulder;
II. a brewing holder comprising:
an inside brewing ring including an open upper end with an exterior shoulder spaced axially from said upper ring end forming an annular ring abutment surface, said inside ring including a skirt portion extending axially away from said inside ring shoulder and upper end, said inside ring being sized to receive said closed lower end of said cup for sliding axial movement over said lower wall into snug abutting relation of said open upper end of said inside ring with said second annular exterior abutment surface of said cup;
an outside brewing ring having an open upper end with an interior shoulder extending radially inwardly adjacent said open upper end of said outside brewing ring forming an interior shoulder sized to mate with said exterior shoulder abutment surface and said outside ring including a skirt extending axially downwardly from said inside ring shoulder, said outside ring being sized to receive the closed lower end of said cup and said inside brewing ring skirt with the interior shoulder in snug abutting relation with the exterior shoulder of said inside brewing ring,
said brewing filter holder being adapted to be nestled about said cup with the open upper end of said outside ring in abutting relation with the exterior shoulder of said cup for forming and shaping a pliable filter paper to conform generally to the shape of the exterior of said lower cup wall and said inside ring being adapted to captivate the filter paper in the formed and shaped configuration when the outside ring is about the cup and paper and the interior shoulder of the outside ring is in mating abutting engagement with the annular inside ring abutment surface and said rings are in telescoping relation with one another and with said cup.

4,176,589
COOKING APPARATUS
Robert M. Stuck, Clover, S.C., assignor to Marshall Air Systems, Inc., Charlotte, N.C.
Filed Feb. 27, 1978, Ser. No. 881,590
Int. Cl.[2] A47J *37/06*
U.S. Cl. 99—386 **13 Claims**



1. A cooking apparatus comprising:
housing means for enclosing a cooking zone,
endless foodstuff chain conveyor means mounted to extend through said cooking zone and for movement along a closed path of travel having upper and lower runs,
heating means mounted in said housing means for heating said cooking zone and for cooking foodstuff conveyed therethrough along said upper run of said conveyor means, and
conveyor cleaning means comprising a plurality of generally cylinderical members stationarily fixed in said housing means to extend generally parallel one to another in a generally horizontal array underlying said lower run for engaging said conveyor means along said lower run and for guiding said engaged conveyor means in a sinuous path for facilitating dislodging therefrom any adhering foodstuff.

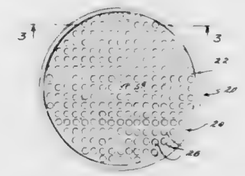
4,176,590
DOUGHNUT FRYING APPARATUS
Kenneth Kochan, Burlington, Vt., assignor to Automated Donut Systems, Inc., Winchester, Mass.
Filed Aug. 7, 1978, Ser. No. 931,387
Int. Cl.[2] A47J *37/12*
U.S. Cl. 99—405 **3 Claims**



1. Apparatus for use in frying doughnuts, said apparatus

including a tank for hot oil, an endless conveyor within said tank and extending lengthwise thereof and including transverse flights, the upper course of said conveyor traveling from a pick-up zone adjacent the rear end of the tank towards the other end thereof with the flights at a level to engage and convey floating doughnuts then to ensure their advance, each two flights defining a space for a transverse series of doughnuts, means midway of the conveyor operable to raise the doughnuts in one space and deposit them other side up in the next adjacent forward space, said means including a transverse shaft in said tank and rotated by said conveyor, diametrically opposed doughnut receivers carried by said shaft and defining an acute angle, each receiver including leading and trailing vanes and having as the shaft turns a first position in which the leading vane is above the trailing vane below the conveyor space next to the shaft on the side thereof towards which the doughnuts advance, the trailing vane passing upwardly through said space, as the shaft turns, to pick up doughnuts therein and carry the picked up doughnuts until they topple forwardly onto the leading vane, other side up, then to be lowered into said next forward conveyor space as said leading vane passes downwardly therethrough into a second receiver position in which the trailing vane is above the last named space.

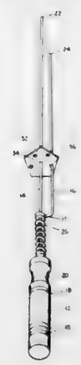
4,176,591
COOKING PAN FOR BAKING PIZZA PIES AND LIKE FOOD PRODUCTS
Douglas P. Power, 1131 N. Westgate, Springfield, Mo. 65802
Filed Apr. 10, 1978, Ser. No. 894,744
Int. Cl.[2] A21B *3/13;* **A47J** *27/00, 36/00*
U.S. Cl. 99—430 **6 Claims**



1. An improved cooking pan for use in baking pizza pies and like crusted food products, said cooking pan being unitary in construction and comprising a substantially flat metal wall portion of predetermined size and shape, said wall portion being of a thickness of between approximately 0.040 and 0.063 inch and having opposed top and bottom surfaces, said wall portion having a plurality of perforations therethrough uniformly distributed throughout the entire extent thereof, wherein the ratio of the total perforated surface area of said wall portion to the total surface area thereof being between approximately 15 to 40 percent, each of said perforations having an upper edge that is filleted, said perforations being round holes arranged in angularly related rows and columns over said metal wall portion, the diameter of said holes being in a range from approximately one-fourth to three-eights inch, and a peripheral pan portion extending upwardly from around the wall portion at an angle thereto whereby the peripheral portion forms a continuation of the wall portion.

4,176,592
SKEWER
Charles E. Doyle, Jr., 940 Sargent, SE., Ada, Mich. 49301
Filed Mar. 10, 1978, Ser. No. 885,292
Int. Cl.[2] A47J *37/04*
U.S. Cl. 99—419 **3 Claims**

3. A skewer comprising:
a substantially cylindrical handle with a convex depression near one end thereof;
a first shaft axially mounted at the end of the handle near the convex depression, the first shaft having a pointed free end and a radially extending flange at the pointed end;
a second shaft having one coiled end with a plurality of coils snugly wrapped about the first shaft for sliding therealong, the coils abutting the flange when the second shaft is in an extended position with respect to the first shaft for preventing the coiled end from sliding off the pointed end of the first shaft;
the opposite end of the second shaft having a point;
the second shaft being spaced apart and substantially parallel to the first shaft;
a transverse radially extending portion of the second shaft connecting the parallel portion to the coiled end;



a plate having a central aperture and a plurality of secondary apertures spaced circumferentially about the central aperture;
the central aperture and each second ary aperture spaced apart a distance equal to the distance between the two shafts;
the central aperture sized to receive one shaft and secondary apertures sized to receive the other shaft;
the plate slidable along the shafts and adapted to abut food skewered on the shafts and manually movable to slide the food off the skewers;
markings on the plate adjacent each secondary aperture to distinguish each secondary aperture.

4,176,593
COOKING DEVICE
Rouben T. Terzian, Chicago, Ill., assignor to Marvin Glass & Assoc., Chicago, Ill.
Filed Aug. 14, 1978, Ser. No. 933,266
Int. Cl.[2] A47J *37/10*
U.S. Cl. 99—422 **8 Claims**

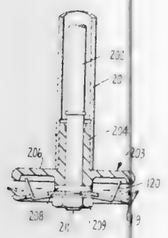


1. A food preparation device, comprising:
heat conductive means for conducting heat and providing a support surface;
means for heating said heat conductive means;
means for containing food including first and second conductive pans, said pans being removably mounted in heat

conductive relationship on said heat conductive means; and

hinge means defined on said heat conductive means for hingedly connecting (said containing means) at least one of said pans to said heat conductive means, said hinge means comprises a slotted flange on said pan and a pair of adjacent, upwardly directed flanges on said heat conductive means for alternate insertion into said slotted flange.

4,176,594
LIVE KNIFE ASSEMBLY
John H. Amstad, Alameda, Calif., assignor to Atlas Pacific Engineering Company, Emeryville, Calif.
Filed Nov. 15, 1977, Ser. No. 851,640
Int. Cl.[2] A23N *7/00*
U.S. Cl. 99—593 **2 Claims**

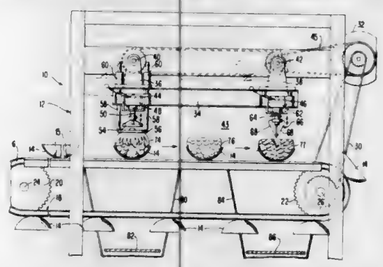


1. An improvement in a cutting machanism which mechanism includes a shaft housing, a shaft positioned within the housing and extending outwardly of the housing at one end thereof, a rotary peeling knife mounted on the shaft one end for rotation with the shaft, a chip breaker mounted on the shaft one end and a guard mounted on the housing for cooperation with the cutter for adjusting the depth of a cut made by the cutter into a piece of fruit during a peeling operation, the improvement comprising:

a unitary guard having a planar portion, a guard rim surrounding said planar portion, said rim being arcuate and extending from said planar portion toward the cutter so that said guard rim closely follows an odd shaped portion of a fruit being peeled, a projection extending upwardly from said planar portion, said projection fitting snugly within the shaft housing so that rotation of said guard with respect to said housing is prevented, said projection having a bore defined therethrough which bore receives the shaft so that said extension provides a bearing for supporting the shaft within the housing, and means on said projection cooperating with means on the shaft for maintaining the shaft within the housing.

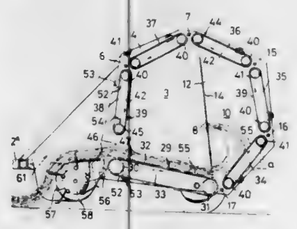
4,176,595
APPARATUS AND METHOD FOR CORING CAULIFLOWER HEADS
Richard A. Shaw, Watsonville, Calif., assignor to Richard A. Shaw, Inc., Watsonville, Calif.
Filed Jul. 25, 1977, Ser. No. 818,497
Int. Cl.[2] A23N *15/02*; A47J *21/00*
U.S. Cl. 99—638 **11 Claims**

1. Apparatus for removing the core from a cauliflower head comprising: a support; means on the support for conveying a cauliflower head along a predetermined path; a ring shiftably mounted on said support above the path for vertical movement into engagement with the head as the head moves along the path for holding the head on said conveying means; first cutter means adjacent to said ring for cutting the base of the head to remove the culls from the head as the head moves along said path and as the ring engages and holds the head on said conveying means; second cutter means spaced from the first cutter means and operable for cutting the remaining portion of the



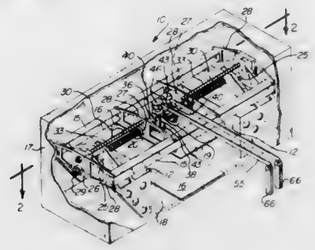
head into a number of parts; and means on the support for receiving each of said culls and said head parts, respectively.

4,176,596
MACHINE FOR FORMING A ROUND BALE OF FIBROUS AGRICULTURAL MATERIAL
Hans O. Sacht, Wolfenbüttel, Fed. Rep. of Germany, assignor to Gebrüder Welger, Wolfenbüttel, Fed. Rep. of Germany
Division of Ser. No. 762,483, Jan. 26, 1977, Pat. No. 4,119,026, which is a division of Ser. No. 612,104, Sep. 9, 1975, Pat. No. 4,009,653. This application Jul. 13, 1978, Ser. No. 924,282
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1974, 2443838
Int. Cl.[2] B30B *5/06*; A01D *39/00*
U.S. Cl. 100—88 **19 Claims**



16. A machine for forming round bales of windrowed fibrous agricultural material and the like comprising a wheeled chassis for travel over a field, a cage-like frame having a horizontal central axis mounted on said chassis, said frame comprising a pair of upwardly extending side walls spaced apart in the horizontal direction, said side walls extending transversely of the horizontal central axis of said frame, conveying means extending between said side walls and combining with said frame to define a generally cylindrically shaped baling zone with said side walls defining the opposite ends of the baling zone and said conveying means defining the cylindrically shaped circumferential periphery of the baling zone for moving the agricultural material in the circumferential direction of the baling zone, said cage-like frame and said conveying means combining to form an inlet opening into the baling zone, said inlet opening having a lower side and an upper side with said conveying means receiving agricultural material through the inlet opening at the lower side and carrying it into the baling zone for forming a bale conforming to the cylindrically shaped configuration of the baling zone, wherein the improvement comprises that said conveying means are arranged for transmitting movement to the agricultural material for the full extent of said conveying means from the lower side of said inlet opening to adjacent the upper side of said inlet opening, said conveying means includes first members extending in substantially parallel relation with the horizontal central axis of the baling zone, said first members are journaled to said frame in a stationary position relative to the horizontal central axis, second members mounted on at least some of said first members and extending in the circumferential direction of the baling zone, said second members supported by and moving over said first members along a fixed path defined by the circumferential periphery of the baling zone.

4,176,597
MANUAL COMPACTOR
Grant E. Stevenson, Aurora, Colo., assignor to Nelson & Johnson Engineering, Boulder, Colo.
Filed Aug. 11, 1977, Ser. No. 823,565
Int. Cl.[2] B30B *1/20*
U.S. Cl. 100—244 **8 Claims**



1. A manual compactor comprising;

an enclosure having a door defined therein;

an elongated support structure positioned within the enclosure;

a pair of pressure plates having face portions, the pressure plates being slidably mounted for reciprocal movement relative to support structure with the face portions opposing one another;

a pair of screw members rotatably mounted to the support structure with one screw member adjacent each pressure plate;

a pair of nut members secured one each to each pressure plate and each engaging a screw member;

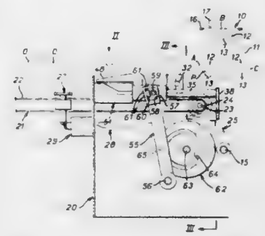
a pair of elongated handles rotatably mounted adjacent one another; and

ratchet means and drive means connecting the handle members through the drive means to the screw members, the screw members, nut members, ratchet means and elongated handles being arranged to move the pressure plates together when the handles are moved with opposite rotational sense;

whereby the rotation of the handle members rotates the screw members through the drive means and moves the pressure plates forcefully together.

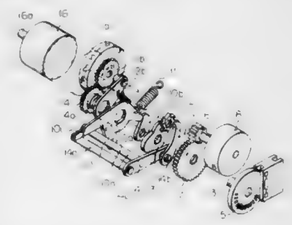
4,176,598
PRINTING MACHINES AND TRANSFER DEVICES THEREFOR
Jean-Louis Dubuit, 74 Boulevard Voltaire, 75011 Paris, France
Filed Oct. 14, 1977, Ser. No. 842,318
Claims priority, application France, Oct. 20, 1976, 76 31497
Int. Cl.[2] B41F *17/22*
U.S. Cl. 101—38 A **13 Claims**

1. A transfer assembly for a printing machine having a printing station, said transfer assembly comprising a transfer device, a feed conveyor for advancing in upright position objects to be printed in synchronism with said transfer device, said transfer device comprising a fixed shaft, a sleeve mounted for sliding movement along said shaft, a transfer member carried by said sleeve and having a pick-up position intersecting the path of movement of upright objects on said feed conveyor where a moving leading object is picked up by said transfer member in upright position from said feed conveyor, a follower and guide track arrangement coupled to said sleeve for imparting translational movement along said shaft and rotational movement about the axis of said shaft to said sleeve, a selected one of said follower and guide track being fixed relative to said sleeve and the other of said follower and guide track being fixed for



movement with respect to said sleeve, whereby in response to the displacement of said sleeve along said shaft said transfer means is rotationally displaced from its pickup position to a drop-off position for introducing in a recumbent position the object carried by said transfer member into said printing station.

4,176,599
DEVICE FOR INTERMITTENTLY DRIVING PRINTING RINGS IN A PRINTER
Katsuhiko Okabe, Tokorozawa, Japan, assignor to Copal Company Limited, Tokyo, Japan
Filed Aug. 31, 1977, Ser. No. 829,480
Claims priority, application Japan, Sep. 2, 1976, 51-118106[U]
Int. Cl.[2] B41J *1/22*
U.S. Cl. 101—95 **11 Claims**



1. In a device for driving printing character supporting means in a printer having control circuit means for issuing a printing selection command to initiate a printing operation in said printer, a plurality of printing character supporting means rotatable about a first axis, each said plurality of printing character supporting means including printing characters thereon, swingable levers each rotatably supporting the respective printing character supporting means and swingable about a second axis so as to move said printing character supporting means towards and against a platen and away therefrom, driving means for rotating each printing character supporting means about said first axis thereby permitting the respective printing character supporting means to be selectively moved towards and against said platen while the respective printing character supporting means is rotated so as to position a selected one of the printing characters at a printing position in cooperation with said platen upon receipt of said printing selection command from said control circuit of the printer so as to print said selected one of the printing characters to be printed onto a paper held between said printing character supporting means and said platen, the improvement wherein

each of said printing character supporting means being independent of each other,

each said printing character supporting means being rotatable by said driving means independently of said other printing character supporting means,

said driving means being controlled by driving pulses for rotation of said printing character supporting means intermittently to select said selected one of said printing characters and upon receipt of the printing character selection command to stop the rotation of said printing character supporting means and commence the swinging movement of said swingable levers,

means responsive to a printing signal for swinging said swingable lever supporting said respective printing character supporting means about said second axis for movement thereof towards and against said platen after said driving means has positioned a selected printing character supporting means at a printing position, and

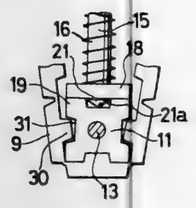
said driving means comprises a single plunger solenoid cooperating with a ratchet wheel guided by a driving shaft for driving said printing character supporting means, and another solenoid and a bell-crank lever associated therewith and said ratchet wheel and cooperating with said single plunger solenoid, said other solenoid being operative with said single plunger solenoid to control the speed of rotation of said printing character supporting means.

4,176,600

TYPE POSITIONING MECHANISM FOR PRINTING DEVICE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato, Tokyo, Japan

Filed Jan. 5, 1978, Ser. No. 867,006
Int. Cl.[2] B41J *1/20*
U.S. Cl. 101—111 **13 Claims**



1. A device for orienting the type faces on the stamp belts of a printing device, wherein said printing device is used for a label printing machine, or the like;

said printing device comprising:

a plurality of stamp belts each having an exterior and each carrying a plurality of types arrayed along its exterior;

a respective positioning member for each said stamp belt and around which each said belt passes and which each said belt engages; said positioning member being multisided, and including a first side, which is engageable with a thrust member and which is out of engagement with said belt, and second side pointing in a printing direction and being in engagement with said belt, such that a said type at said positioning member second side will be printed; said stamp belt being drawn securely around said positioning member, thereby to act in opposition to a biasing means; said positioning member being rotatably supported by said printing device and being rotatable such that every side of said positioning member is at one time a said first side and at another time a said second side;

said type face orienting device comprising:

a respective thrust member for each positioning member, each said thrust member having a first complementary formation on a side thereof facing toward said positioning member; said first complementary formation comprising a projection projecting toward said positioning member; each said positioning member first side having a second complementary formation thereon with which said first formation is engageable in a complementary manner; said second complementary formation comprising a depression intermediate the length of the respective said first side of said positioning member and each said positioning member said first side having corner portions beyond both sides of said depression along the length of the respective said first side of said positioning member; the shapes of said first and second formations being complementary such that upon engagement therebetween, said projection is received in said depression; said projection narrows in shape toward the free and thereof, whereby said projection will be slidable into said depression for being held therein and said positioning member is rotated to a position at which its said second side always is aimed in said printing direction;

biasing means for biasing said thrust member first formation against said positioning member second formation;

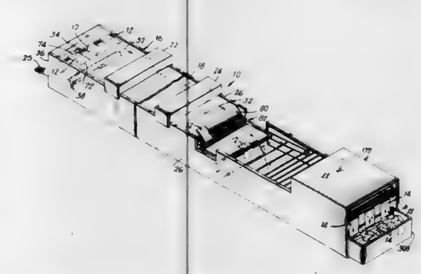
wherein the thrust member side is of a length to substantially span the length of said positioning member first side; said projection extending from said thrust member side toward and into said positioning member depression, whereby said thrust member side, at both sides of said projection therefrom along the length of that said thrust member side, engages and is biased against the respective said positioning member first side at said corner portions at both sides of the said depression therein, thereby to enhance the stability of the engagement between said thrust member side and said positioning member first side.

4,176,601

AUTOMATED TOWEL TRANSFER PRINTING, FEEDING, DRYING AND FOLDING APPARATUS

Sandor Szarka, Franklin Lakes, N.J., assignor to Precision Screen Machines, Inc., Hawthorne, N.J.

Filed Jun. 27, 1977, Ser. No. 810,375
Int. Cl.[2] B41F *15/12*
U.S. Cl. 101—115 **80 Claims**



1. Apparatus for use in combination with a screen printing machine having an endless movable printing blanket and a discharge end, said endless movable printing blanket being capable of having a work piece to be screen printed adhered thereon, said apparatus comprising

transfer means disposed adjacent to the discharge end of a screen printing machine for effecting the movement of said work piece from a printing blanket to said transfer means,

removing means including a series of spaced apart endless belt strips,

said transfer means comprising elevating means for initially lifting the leading edge of said work piece upwardly from said printing blanket so as to suspend the leading edge until the work piece is advanced a predetermined distance for subsequent engagement by said removing means such that the leading edge bridges any spacing between the discharge end of said screen printing machine and said transfer means,

said removing means being disposed in predetermined operating relationship with respect to said elevating means,

gripping means comprising a plurality of needle like elements formed on the surface of said series of spaced apart endless belt strips for gripping the work piece and peelingly stripping said adhered work piece from said printing blanket to effect the transfer of the work piece from said printing blanket to said series of endless belt strips,

said gripping means first engaging the leading edge suspended by said elevating means, and

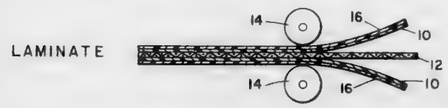
first drive means for driving said endless belt strips in timed relationship to said printing blanket such that during the relative movement therebetween said elevating means lifts the leading edge of the work piece and causes said gripping means to peelingly strip the work piece from said printing blanket.

4,176,602

DRY FILM SCREEN STENCIL AND METHOD OF MAKING

Phyllis A. Feddersen, Pomona, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Continuation-in-part of Ser. No. 609,843, Sep. 2, 1975, abandoned. This application Jun. 10, 1977, Ser. No. 805,493
Int. Cl.[2] B41H *1/24;* B41C *1/14*
U.S. Cl. 430—308 **22 Claims**



1. A method of making a dry film stencil comprising the steps of:

selecting an open mesh support screen

selecting and laminating a facing layer and a backing layer of dry film photoresist together through and from opposite sides of said screen by applying pressure thereto for forming a film laminate,

exposing the film laminate through a transparency for forming an exposed film, and pI developing the film for thereby forming a screen stencil of the developed film laminate.

4,176,603

LABEL STRIP INSERTING DEVICE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan

Filed Sep. 28, 1977, Ser. No. 837,193
Claims priority, application Japan, Oct. 22, 1976, 51-142079[U]
Int. Cl.[2] B41K *3/44;* B41J *15/04;* B41F *1/08*
U.S. Cl. 101—291 **11 Claims**

1. A label strip insertion device for a label printing machine, wherein said machine comprises:

a frame;

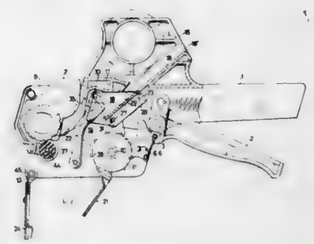
feed means attached to said frame for advancing a label strip along said frame;

an insertion device comprising:

a platen supported on said frame for motion between a lowered first inoperative position relatively further from said feed means and an upraised first operative position relatively nearer to said feed means; said platen having an upwardly facing surface over which a label strip can be fed and said upwardly facing surface being moved nearer to said feed means as said platen is moved to said first operative position;

a label guide member having a lower surface portion generally opposed to said feed means and beneath which the label strip can be fed; said guide member being supported on said frame for motion between an upraised second inoperative position relatively further from said feed means and a lowered second operative position relatively nearer to said feed means; said guide member being so placed that when it is in its second operative position, said lower surface portion thereof urges the label strip against said feed means for engagement thereby; said first and second inoperative positions being such that a widened space between said guide member and said feed means is created upon movement of said guide member and said platen to their respective said second and first inoperative positions;

an operating member supported on said frame for motion between a third position and a fourth position, and connected to both said platen and said guide member, such



that said operating member transmits the motion of said platen to said guide member, whereby said platen and said guide member move simultaneously to their respective said first and second operative position when said operating member is in its said third position and to their respective said first and second inoperative position when said operating member is in its said fourth position;

said operating member having a label strip guide surface which, when said operating member in said fourth position, has a first orientation, which extends along a direction that directs a label strip into said widened space; said operating member label strip guide surface being so shaped and said guide member being so shaped that when said operating member is in said fourth position, a label strip fed past said operating member to said guide member is slightly deflected by said label strip guide surface before it is engaged by said guide member, whereby the label strip may be kept taut.

4,176,604

APPARATUS FOR PRINTING A LABEL ON A WEB

Roger D. Eagen, 5639 Humboldt Ave., and Clarence E. Vogel, 5628 Humboldt Ave., both of Minneapolis, Minn. 55419

Filed Mar. 23, 1978, Ser. No. 889,222
Int. Cl.[2] B41F *31/24*
U.S. Cl. 101—328 **2 Claims**

1. A label printing apparatus for a continuous web having in combination

a web formed of an endless strip of separable containers,

means supporting said web,

a first plate member carried by said means having said web pass thereover,

a second plate member,

means adjustable securing said second plate member to said first plate member in spaced relation thereto,

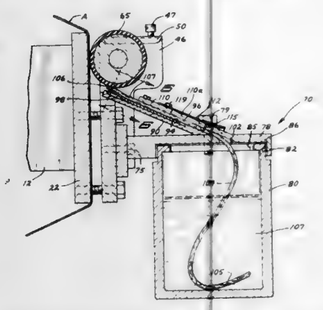
a printing roller,

means supporting said printing roller onto said second plate member in operating engagement with said web,

an ink reservoir,

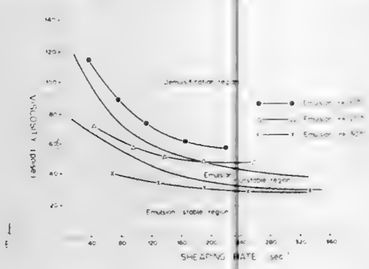
means carried by said second plate member supporting said ink reservoir,

a wick carried by said last mentioned means from said ink well into operating engagement with said printing roller,
a unitary spring plate member underlying said wick,
a multiplicity of spring like fingers unitary with and extending from said plate member underlying said wick edge portion engaging said printing roller, and



said fingers being individually biased in the direction of said printing roller and individually urge their respective engaged portions of said wick into engagement with said printing roller for uniform application of ink onto a non-uniform surface.

4,176,605
LITHOGRAPHIC PRINTING PROCESS
Akihiko Yoshida, Tokyo; Akira Koaki, Mihara; Takahumi Nakano, Hiroshima; Mitsunao Miyake, Mihara; Teijiro Kanai, and Izumi Misono, both of Tokyo, all of Japan, assignors to Toyo Ink Manufacturing Co., Ltd. and Mitsubishi Jukogyo Kabushiki Kaisha, both of Tokyo, Japan
Filed Sep. 7, 1977, Ser. No. 831,312
Claims priority, application Japan, Sep. 13, 1976, 51/108863; Sep. 13, 1976, 51/108864
Int. Cl.² B41L *25/14, 25/02*
U.S. Cl. 101—451 **10 Claims**



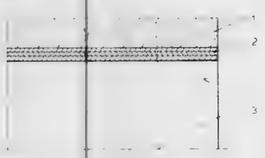
2. A lithographic printing process comprising the steps of:
supplying a stable emulsion ink in an ink fountain,
supplying in an ink fountain an emulsion ink which is stable at ambient temperature but subject to demulsification upon cooling,
demulsifying said emulsion into an oleophilic component and an aqueous component at said region, said demulsifying being effected by said action of said cooling, and
passing said oleophilic and aqueous components so produced to a printing plate in the inking system to thereby obtain highgrowth prints reliably without the need of dampening water.

4,176,606
PYROTECHNIC DEVICES
Colin M. King, Winterbourne Stoke; Michael R. Goddard, Gt. Wishford, and Dudley C. Murray, Salisbury, all of England, assignors to Pains-Wessex Limited, England
Filed Dec. 12, 1977, Ser. No. 859,400
Claims priority, application United Kingdom, Jan. 6, 1977, 319/77
Int. Cl.² F42B *4/26*
U.S. Cl. 102—37.4 **9 Claims**



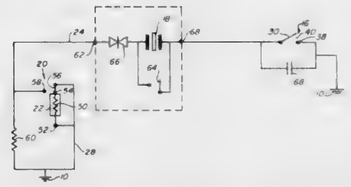
1. A hand-operable pyrotechnic device for containing a charge of pyrotechnic material, the device having
a firing mechanism provided with a safety device and operable to detonate a primer thereby to ignite the pyrotechnic material,
the firing mechanism comprising two members which are movable relatively to one another in a rotational sense from a 'Safe' to an 'Armed' position when located in a predetermined relative axial position, and in an axial sense from an 'Armed' to a 'Fire' position when located in a predetermined relative rotational position,
the mechanism also including a resilient detent which is effective to oppose said axial movement into the 'Fire' position until the force applied to cause said relative axial movement exceeds a predetermined value,
the firing mechanism further comprising a firing pin secured to one of said members and being movable, by the relative axial movement of the said two members, to contact a primer when said primer has been located in position in the other said member.

4,176,607
ROCKET SHELL
Kazuo Kishi, Himeji; Minoru Hayashi, Tatsuno, and Kazuo Naganuma, Himeji, all of Japan, assignors to Daicel LTD., Osaka, Japan
Filed Aug. 31, 1977, Ser. No. 829,511
Claims priority, application Japan, Sep. 3, 1976, 51/105495
Int. Cl.² F02K *9/00*
U.S. Cl. 102—49.3 **5 Claims**



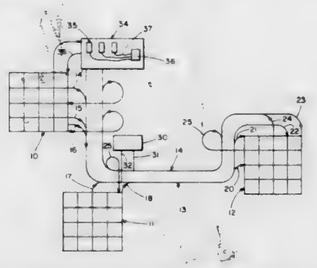
1. A cylindrical rocket shell prepared by rolling up a plurality of turns of a thin sheet of high tensile strength precipitation hardened stainless steel with an organic thermosetting adhesive being disposed between said turns whereby to form an inner cylinder, then winding on the outer surface of said inner cylinder filaments having a high tensile strength and an organic thermosetting adhesive whereby to form an outer cylinder, said filaments being selected from the group consisting of carbon fibers and organic polyamide filaments, and then curing said adhesives to form a unitary cylindrical structure consisting essentially of said inner cylinder united to said outer cylinder.

4,176,608
ELECTRICALLY ENERGIZED IMPACT DETONATED PROJECTILE WITH SAFETY DEVICE
Leonard R. Ambrosini, Bettendorf, Iowa; Joseph O. Juliano, West Orange, N.J., and Charles H. Rarick, Dewitt, Iowa, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed May 8, 1978, Ser. No. 904,052
Int. Cl.² F42C *15/14*
U.S. Cl. 102—216 **5 Claims**



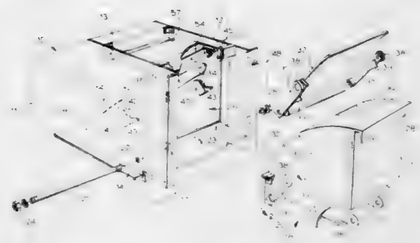
1. A projectile having impact detonation characteristics including:
a firing circuit for energizing a detonator upon target impact, an inertia switch,
a base fuze having said detonator with said inertia switch connecting said detonator into said firing circuit,
a power supply,
an impact switch, and
a voltage threshold limiting device connected in circuit to prevent energization of said circuit when voltages are generated in said circuit below a predetermined threshold level,
said power supply having a setback shorting bar thereacross to prevent circuit energization during setback, said shorting bar thereafter permitting energization upon opening after setback.

4,176,609
ELECTRIC TRANSPORTATION SYSTEM
Dillis V. Allen, 221 Hawthorne Ct., Schaumburg, Ill. 60193
Filed Oct. 28, 1977, Ser. No. 846,534
Int. Cl.² B61J *3/00*
U.S. Cl. 104—88 **5 Claims**



1. A transportation system, comprising; a vehicle trackway having a plurality of entrances and exits, a plurality of vehicles adapted to travel in the trackway or off the trackway, said vehicles having inflatable tire wheel assemblies, each of said vehicles having steering means for at least one of said inflatable tire wheel assemblies, said trackway including a horizontal guide surface and a vertical guide surface, each of said vehicles having guide means engageable with the horizontal guide surface and the vertical guide surface, and means on each of said vehicles for positively moving the guide means vertically into engagement with said horizontal guide surface while the vehicles are moving adjacent the trackway.

4,176,610
SAFE DEPOSIT APPARATUS
Michael H. Markham, Rexdale, and Rudolf S. Ruston, Oakville, both of Canada, assignors to Chubb Industries Limited, Brampton, Canada
Filed Sep. 12, 1978, Ser. No. 941,584
Int. Cl.² E05G *1/026*
U.S. Cl. 109—59 R **13 Claims**



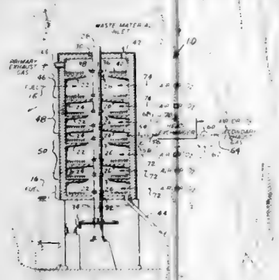
1. Safe deposit apparatus comprising:
a casing defining a door compartment having a frontal access opening and a rear discharge opening;
a sector-shaped door therein horizontally pivoted at its apex axis near the bottom of said access opening, the door being pivotally movable between closed and open positions;
a handle on the outer angle side of said door;
a movable wall member horizontally pivoted near the peripheral corner of the other and inner angle side of said door;
said wall member being normally biassed to a first position at which it forms an interior pocket in the door for receiving articles deposited through said access opening when the door is in open position;
said wall member being pivotally movable from said first position towards a second position for ejecting articles from said pocket;
a first cam track mounted on a side wall of the casing and having a forward end rearwardly displaced from said access opening;
a first cam follower on said door connected to said wall member, said first cam follower being positioned to engage and ride along the cam track when the door is opened for retaining the wall member in its second position, the cam follower disengaging the cam track at said forward end to release the wall member to its first position thereby forming said pocket;
a second cam track on said door connected to said wall member; and
a second cam follower on a side wall of the casing positioned to engage the second cam track as the door is closed for displacing the wall member to its second position thereby to eject articles from said pocket via said discharge opening.

4,176,611
METHOD AND APPARATUS FOR TREATING WASTE MATERIAL
Charles F. von Dreusche, Jr., Ramsey, and Louis T. Barry, Skillman, both of N.J., assignors to Nichols Engineering & Research Corp., Belle Mead, N.J.
Division of Ser. No. 706,615, Jul. 19, 1976, Pat. No. 4,118,220. This application Jul. 18, 1978, Ser. No. 925,810
Int. Cl.² F23G *5/12*
U.S. Cl. 110—225 **8 Claims**

1. In a counter-flow furnace wherein waste material to be processed is introduced at one end thereof and the processed material is discharged from the other end thereof, while simultaneously air is introduced thereto and the gases of combustion are caused to flow in counter-current direction with respect to

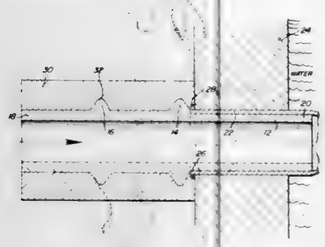
the material being processed and are exhausted at said one end of the furnace and wherein the furnace has a natural tendency to form zones of processing including sequentially from said one end of the furnace, a drying zone, a charring and volatile burning zone, a fixed carbon burning zone and an ash cooling zone, a method comprising the steps of bleeding secondary exhaust gases from the middle of said furnace substantially between said fixed carbon burning zone and said charring and volatile burning zone, and adding supplemental air to said furnace in the charring and volatile burning zone.

5. Apparatus for treating waste material comprising, in combination, a counter-flow furnace wherein waste material to be processed is introduced at one end thereof and the processed



material is discharged from the other end thereof, means for introducing air to said furnace, means for causing the gases of combustion to flow in counter-current direction with respect to the material being processed, a primary exhaust gas outlet disposed at said one end of the furnace, said furnace having a natural tendency to form zones of processing including sequentially from said one end of the furnace, a drying zone, a charring and volatile burning zone, a fixed carbon burning zone and an ash cooling zone, means for bleeding secondary exhaust gases from the middle of said furnace substantially between said fixed carbon burning zone and said charring and volatile burning zone, and means for adding supplemental air to said furnace in the charring and volatile burning zone.

4,176,612
CERAMIC FERRULE
Kenneth Speer, Box 1115, Jal, N. Mex. 88252
Filed Mar. 6, 1978, Ser. No. 884,627
Int. Cl.[2] F23M 9/00
U.S. Cl. 110—323 **10 Claims**



1. An improved ceramic ferrule structure for the protection of fire tube structures through which high temperature gas flows are directed, comprising:

a tubular body member formed of a thermally resistant material; and

at least two annular ferrule rings formed on the external surface of the tubular body member, the rings being spaced apart, a body of refractory material being disposed over at least those portions of the tubular body member on which the ferrule rings are disposed, one of the ferrule rings being disposed substantially medially of the length of the tubular body member.

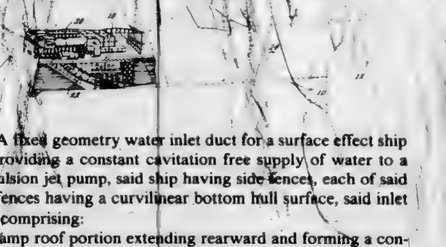
5. In a boiler structure formed of a tube sheet having a fire tube extending therethrough from an outer wall surface thereof to a water bath disposed interiorly of an inner wall surface thereof, a high temperature gas flow being directed through the fire tube, an improved ceramic ferrule member, comprising:

a tubular body member formed of a thermally resistant material, a portion of the tubular body member being received within the fire tube to protect the fire tube and portions of the tube sheet contacting the fire tube from thermal damage, the high temperature gas flow being received through the interior of the tubular body member received within said fire tube;

at least two annular ferrule rings formed on the external surface of the tubular body member, the ferrule rings being disposed on that portion of the tubular body member extending externally of the fire tube from the outer wall surface of the tube sheet, the rings being spaced apart; and

a body of refractory material disposed over that portion of the tubular body member disposed exteriorly of the outer wall surface of the tube sheet, the annular ferrule rings being disposed within the body of refractory material to anchor the ceramic ferrule member therein.

4,176,613
FIXED GEOMETRY WATER JET INLET FOR A SURFACE EFFECT SHIP
Michael A. Richards, La Jolla; Richard K. Ruhe, San Diego; Leonard Meyerhoff, Chula Vista, and James M. Hook, Solana Beach, all of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.
Filed Nov. 25, 1977, Ser. No. 854,637
Int. Cl.[2] B63H 11/02
U.S. Cl. 114—67 A **11 Claims**



1. A fixed geometry water inlet duct for a surface effect ship for providing a constant cavitation free supply of water to a propulsion jet pump, said ship having side fences, each of said side fences having a curvilinear bottom hull surface, said inlet duct comprising:

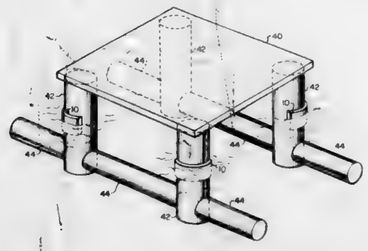
a ramp roof portion extending rearward and forming a continuation of the bottom hull surface and extending rearward to the inlet of said jet pump;

a duct floor portion extending from a position intermediate the forward and aft portions of said ramp roof portion and extending to said inlet of said jet pump, said ramp roof portion and said duct floor portion being continuous for the length of said duct floor portion;

an enlarged lip portion positioned at the leading edge of said duct floor portion; and

a ventilation cavity adjacent said enlarged lip portion.

4,176,614
CONTROL FORCE TANK AND METHOD FOR STABILIZING FLOATING VESSELS
Wilbur H. Goss, Santa Barbara, and Gunnar B. Bergman, Montecito, both of Calif., assignors to SeaTek Corporation, Goleta, Calif.
Continuation of Ser. No. 734,111, Oct. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 731,006, Oct. 8, 1976, abandoned. This application Mar. 30, 1978, Ser. No. 891,543
Int. Cl.[2] B63B 43/06
U.S. Cl. 114—125 **16 Claims**



1. A system for stabilizing a vessel having flotation means, said system comprising:

one or more tanks, having open access to the water, mounted to the outboard surfaces of the flotation means at a point where the ambient surface of the water approximately intersects the flotation means;

said tanks being selectively supplied with air in such magnitudes and phases as are required to develop control forces for producing control forces to stabilize the motion of the vessel in varying water conditions;

said control forces being developed solely by the selective supply of air to said tanks.

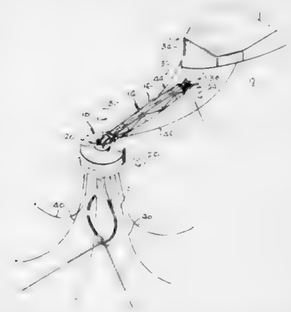
11. A method of applying control forces for stabilizing a vessel having a flotation member, said method comprising the step of applying selectively variable control forces to the outboard surface of the flotation member at a point where said flotation member approximately intersects the ambient surface of the water, independent of the movement of the vessel through the water.

4,176,615
MOORING ATTACHMENT FOR SINGLE POINT MOORING TERMINALS
William R. Reid, Ann Arbor, Mich., and John Vitale, Los Angeles, Calif., assignors to Amtel, Inc., Providence, R.I.
Filed Nov. 21, 1977, Ser. No. 853,291
Int. Cl.[2] B63B 21/00
U.S. Cl. 114—230 **6 Claims**

1. A mooring attachment for substantially permanently connecting a buoy and a vessel that has an end portion comprising:

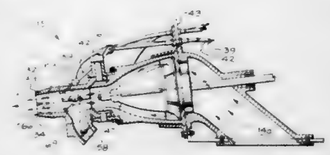
a mooring arm that resists compression, having a first end pivotally coupled to said buoy and a second end pivotally coupled to an end portion of said vessel to permit said vessel to pivot about a largely vertical axis with respect to said arm, so that the vessel can yaw; and

a pair of stop means disposed at opposite sides of said largely vertical axis for preventing yawing of said vessel by more than a predetermined angle which is more than 10° on either side of a center orientation of the vessel, said stop means constructed so they do not resist yawing of said vessel within 10° on either side of the center orientation of



the vessel, whereby to avoid loading of the stop means during small vessel yawing.

4,176,616
VARIABLE THRUST CONTROLLER FOR WATER JET PROPULSION SYSTEM
Thomas L. Robins, 2770 Melendy Dr., #1, San Carlos, Calif. 94070
Filed Jul. 8, 1977, Ser. No. 813,933
Int. Cl.[2] B63H 11/02
U.S. Cl. 115—14 **5 Claims**



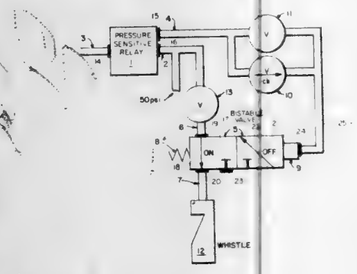
1. In a water jet propulsion system of a type for moving a boat through the water and having an engine and means driven by said engine for discharging a stream of water from the boat to generate thrust serving to move the boat in response thereto, the last named means comprising a discharge nozzle of predetermined diameter serving to discharge the water therethrough to propel said boat at a speed associated with thrust derived from the velocity of said discharging liquid, means for constricting the size of said stream of said discharging water to change the velocity of said stream to vary the thrust applied to the boat, means forming forwardly directed flow passage in fluid communication with said nozzle, first closure means within said nozzle movable between first and second positions for selectively directing the discharging stream rearwardly of said nozzle to provide forward movement to said boat or forwardly via said flow passage to apply a reversing thrust to the boat, a second closure means, said second closure means being disposed in said flow passage, and means coupling said first closure means to said second closure means for disposing said second closure means in fluid blocking relation when disposing the first closure means in fluid transmitting relation rearwardly via said nozzle and vice versa.

4,176,617

LOW PRESSURE ALARM

Mark Pilipski, 89 Mountainside Ter., Clifton, N.J. 07013

Filed Mar. 23, 1978, Ser. No. 889,484
Int. Cl.² F16K 37/00; G08B 3/06
U.S. Cl. 116—70 5 Claims



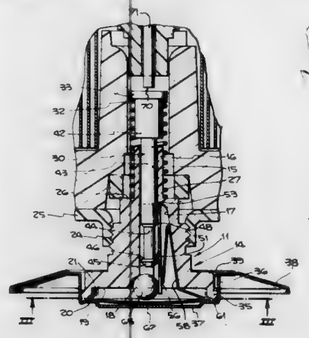
1. A device comprising
a first pressure source,
a second pressure source, said second pressure source being a monitored pressure,
a pressure sensitive relay means, said relay means having at least a first port, a second port, and a third port, said first port connected to the first pressure source, and said second port connected to the second pressure source, said pressure sensitive relay means having an output means which emits an output pressure in response to the second pressure source applied to said second port, said output pressure being either a pressure approximately equal to the first pressure source or a zero or negative pressure; if the monitored pressure is positive, then the output pressure of the pressure sensitive relay means is approximately equal to the pressure of the first pressure source, if the monitored pressure approaches zero or a negative value, then the output pressure of the pressure sensitive relay means will be zero or a negative value, said output pressure is emitted from the said third port,
a bistable valve means, normally biased to an unactuated state, said bistable valve means functionally consisting of a pilot means for actuating said bistable valve means and a means for establishing, when unactuated, an internal passage between at least two ports said internal passage of said parts constituting a fourth port and fifth port, said bistable valve means may be actuated by a pressure, approximately equal to the first pressure source, applied to said pilot means, said pilot means is connected to the output means of the pressure sensitive relay means through
a first valving means, said first valving means functions to direct and control the flow of any fluent substance, gas or liquid to and from the said output means of the pressure sensitive relay means and the said pilot means of the bistable valve means,
a second valving means, said second valving means connected to the first pressure source, said second valving means also being connected to the said fourth port of the bistable valve means, said second valving means functions to control the flow of any fluent substance, from the first pressure source to the said fourth port of the bistable valve means,
and a signal producing means, said signal producing means connected to said fifth port of the bistable valve means, said signal producing means functions to produce a signal whenever any fluent substance flows to said signal producing means.

4,176,618

TRIGGERING DEVICE FOR COMBUSTION DETECTOR

Gustav Hubert, San Gabriel, Calif., assignor to Notifier Company, Lincoln, Nebr.

Filed Jul. 13, 1978, Ser. No. 924,368
Int. Cl.² G08B 17/00
U.S. Cl. 116—102 11 Claims



1. In an alarm device having alarm signal means; the combination of:
a body member having a through bore and a body chamber at one side of said bore at one end thereof;
a pin member longitudinally slideable in said bore and terminating opposite said chamber;
spring means on said body member adjacent the other end of said bore and engaged by said pin member for biasing said pin member in one direction;
a condition sensing and responsive means adjacent the one end of said bore and spaced from the adjacent end of said pin member;
biased latch means in said body chamber engageable with said pin member adjacent the one end of the bore to retain said pin member in one position against the bias of said spring means;
and means opposite to said body chamber in contact with said latch means adapted to be moved toward said body chamber by said condition sensing means to release said latch means from said pin member for movement of said pin member in said one direction to cause actuation of said alarm signal means.

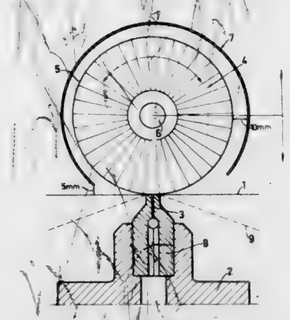
4,176,619

PAPER SURFACE TREATING DEVICE

Rune A. Wäppling, Sundsvall, Sweden, assignor to Sca Development Aktiebolag, Sundsvall, Sweden

Filed Dec. 16, 1977, Ser. No. 861,344
Claims priority, application Sweden, Dec. 21, 1976, 7614343
Int. Cl.² B05C 5/02
U.S. Cl. 118—410 3 Claims

1. A device for applying a fluid surface treatment agent to a paper web, comprising:
a container for receiving said fluid surface treatment agent to be applied to said paper web;
said container including two spaced guide bars forming a fluid applying gap adapted to be disposed in contact with said paper web for applying said fluid surface treatment agent from said container to said paper web;
means for moving said paper web over said guide bars substantially parallel to the upper surfaces of said guide bars;
a rotary brush positioned opposite said container for rotation relative to said paper web;
said rotary brush including soft and fluffy peripheral surfaces for applying pressure to said paper web to press said paper web into contact with said fluid applying gap as said paper web receives said fluid surface treatment agent therefrom, and



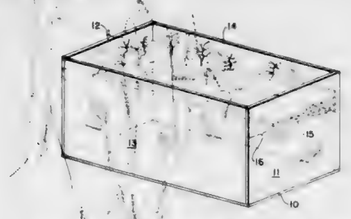
means for adjusting the position and pressure of said rotary brush relative to said paper web to vary the thickness of the coating applied to said paper web independent of the speed of said moving paper web.

4,176,620

AQUARIUM-TERRARIUM TANK

Thomas G. Kassos, 120 Brookmeade Dr., Pittsburgh, Pa. 15237

Filed Oct. 25, 1977, Ser. No. 844,560
Int. Cl.² A01K 64/00
U.S. Cl. 119—5 6 Claims



1. The combination of an aquarium tank having a bottom wall and vertically-extending side walls for containing a body of water, and a terrarium floor adhered along edge surfaces thereof to the vertical face surfaces of said side walls at a location above said bottom wall, said terrarium floor extending in an upwardly-inclined manner relative to said bottom wall to form a terrarium compartment having a triangular cross section formed by said terrarium floor and part of said side walls thereabove, one edge surface of said terrarium floor being spaced from a side wall of said aquarium tank to form an opening therebetween of sufficient size for access to the body of water below the terrarium floor.

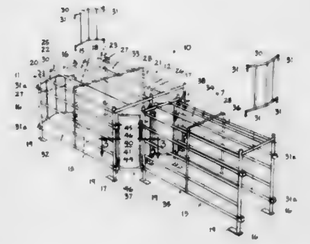
4,176,621

PIG CONFINEMENT STALL ASSEMBLY

Terry A. Dill, Keota, Iowa, assignor to The Jefferson Industries Company, Fairfield, Iowa

Filed Jul. 7, 1978, Ser. No. 922,594
Int. Cl.² A01K 1/02
U.S. Cl. 119—20 3 Claims

1. An assembly of pig confinement stalls comprising:
(a) a first upstanding enclosure of a substantially rectangular shape in horizontal cross section and open at one end,
(b) an upstanding partition wall dividing said enclosure into first and second longitudinally extending stalls each of which has an open end,
(c) a substantially v-shaped, upstanding enclosure section for each of said first and second stalls, each v-shaped enclosure section having an apex end and an open base, with the base of each section being connected to the open end of a corresponding stall to form a pair of continuous pig-retaining enclosures; and



(d) a second upstanding enclosure of a substantially rectangular shape in horizontal cross section having one end connected to the apices of said v-shaped upstanding enclosure sections to form a third continuous pig-retaining enclosure.

4,176,622

FLOOR GRID FOR USE IN KEEPING ANIMALS

Johann Wolf, Scharnstein, Austria, assignor to Johann Wolf Gesellschaft m.b.H. KG, Scharnstein, Austria

Filed Jan. 6, 1977, Ser. No. 757,334
Claims priority, application Austria, Jan. 8, 1976, 2807645/76
Int. Cl.² A01K 1/015
U.S. Cl. 119—28 12 Claims

1. A floor grid for use in keeping animals, which comprises
a plurality of juxtaposed wooden bars, which are transversely spaced apart to define gaps between them, and
a covering provided on top of each bar and having depending longitudinal edge portions that extend downwardly along opposite sides of each bar and laterally protruding portions integral with said downwardly depending longitudinal edge portions and also extending downwardly along the sides of the bars and spaced apart along the bars to space the bars apart laterally.

4,176,623

FLUIDIZED BED BOILER

Henry J. Blaskowski, West Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

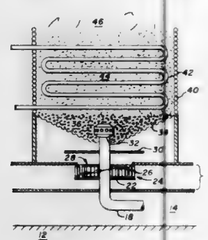
Filed Mar. 8, 1978, Ser. No. 884,651
Int. Cl.² F23D 1/00; F22B 29/00
U.S. Cl. 122—367 PF 5 Claims

1. A fluidized-bed cell, comprising:
a. a combustion region;
b. a static ignition bed, positioned in the combustion region, comprising inert heat-storage particles;
c. a fluidizing region, positioned in the combustion region above and immediately adjacent to the static ignition bed;
d. means for feeding fuel particles into the static ignition bed;
e. means for blowing air up thru the static ignition bed into

the fluidizing region in such a manner as to fluidize the fuel particles but not the inert heat-storage particles, thereby establishing a fluidized bed of coal particles in the fluidizing region; and

f. means for igniting fuel particles supplied to the static ignition bed.

3. A method of performing fluidized-bed combustion of fuel particles in a combustion region, comprising the steps of:



a. providing a static ignition bed of inert heat-storage particles in the combustion region;

b. feeding fuel particles into the static ignition bed of inert heat-storage particles;

c. establishing a fluidized bed of fuel particles in the combustion region above and immediately adjacent to the static ignition bed; and

d. igniting the fuel particles supplied to the static ignition bed.

4,176,624

DIESEL ENGINE WITH ELECTRONIC CONTROL

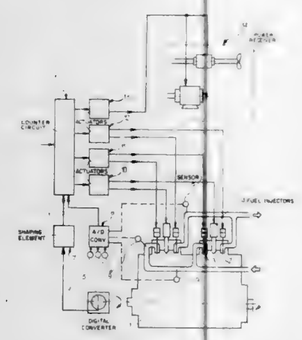
Marek Bielecki, Poznań; Andrzej Bogdański, Warsaw; Andrzej Buxakowski, Poznań; Janusz Chudziński, Poznań; Andrzej Głogowski, Poznań; Marian Kopczyński, Poznań; Andrzej Królikowski, Poznań; Józef Kryszewski, Poznań; Zdzisław Moczulski, Warsaw; Włodzimierz Ochocki, Poznań; Aleksander Pomorski, Warsaw; Karol Rumatowski; Janusz Sawicki, both of Poznań; Henryk Szostakowski; Tadeusz Warowny, both of Warsaw; Teofil Wiśniewski, and Antoni Woźniak, both of Poznan, all of Poland, assignors to Politechnika Poznanska and Zaklady Przemysłu Metalowego, both of Poznań, Poland

Filed Jan. 19, 1977, Ser. No. 760,670

Claims priority, application Poland, Jan. 27, 1976, 186837

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EA **10 Claims**



1. In a multi-cylinder, two- or four-stroke diesel engine with electronic control, comprising an output shaft, a piston-crank assembly with inlet valves and exhaust valves controlled electropneumatically or electrohydraulically, and injectors supplied with fuel under high pressure provided with control means for regulating fuel supply as a function of at least one operational parameter of the engine, said control means including an electromagnet, the improvement comprising a digital converter **5** of angular velocity coupled to the output shaft, a counter circuit **6** having first and second inputs, a shaping element **7** connected to said first input, said digital converter being connected to said shaping element, an assembly of analog-to-digital converters **8** connected to said second input, sensor means **9** of the operational parameter of the engine and of load connected to said analog-to-digital converters, said counter circuit having four outputs, an electronic actuator **10** connected to the first output of the counter circuit to supply to individual injectors a current pulse with a duration corresponding to the operation time of the electromagnet of the control means of the injectors, a second electronic actuator **11** connected to the second output of the counter circuit which transmits, to individual input valves, pulses controlling the actuators for opening and closing said input valves, a third electronic actuator **12** connected to the third output of the counter circuit **6** which transmits, to individual exhaust valves, pulses controlling the actuators for opening and closing of said exhaust valves, and a fourth electronic actuator connected to the fourth output of the counter circuit **6** which acts upon the power receiver of the engine to vary the load thereof according to an optimum setting of the fuel charge for the given rotational speed of the engine.

4,176,625

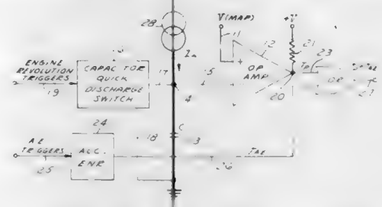
PULSE TIME ADDITION CIRCUIT FOR ELECTRONIC FUEL INJECTION SYSTEMS

Reuben L. Stauffer, Newport News, Va., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 20, 1977, Ser. No. 789,382

Int. Cl.[2] F02B *3/10*; H03K *1/18*

U.S. Cl. 123—32 EH **19 Claims**



1. An electronic fuel injection system for an internal combustion engine having a fuel injection means energized by electrical pulses for periods of time determined by the duration of said pulses; said fuel injection system comprising:

means for generating primary pulses T_p of a duration dependent on the operating parameters of the engine, said T_p pulses generated synchronously with a trigger signal dependent upon the speed of revolution of the engine;

means for generating acceleration enrichment pulses T_{AE} of a duration and frequency dependent upon an acceleration enrichment trigger signal which is responsive to a desired acceleration, wherein said T_{AE} pulses are asynchronous with said T_p pulses; and

a pulse time addition means for combining said T_p pulses and said T_{AE} pulses in order to generate a total pulse signal to said injection means that has a duration equivalent to the sum of said T_p pulses and said T_{AE} pulses, wherein said pulse time addition means interrupts the generation of said primary pulses T_p for a time duration equivalent to said T_{AE} pulses and then permits the completion of the generation of said primary pulses T_p, said pulse time addition means thereby preventing the loss of fuel to the engine when said T_p and T_{AE} pulses overlap.

4,176,626

AIR-FUEL RATIO FEEDBACK CONTROL SYSTEM

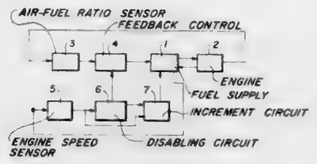
Hideaki Norimatsu, and Yoshiaki Sato, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 5, 1977, Ser. No. 812,560

Claims priority, application Japan, Jul. 3, 1976, 51-79152

Int. Cl.[2] F02B *3/08*; F02M *7/12*; F01N *3/08*

U.S. Cl. 123—32 EE **5 Claims**



1. In combination with a fuel supply system for an internal combustion engine, said fuel supply system controlling the amount of air-fuel mixture to be supplied to an engine in accordance with preset air-fuel ratio characteristics of the fuel supply system, and an air-fuel ratio sensing means for sensing the oxygen concentration of the exhaust gas of an engine and generating an output signal corresponding to the air-fuel ratio of the air-fuel mixture supplied by the fuel supply system, the improvement comprising:

(a) a feedback control circuit connected to the fuel supply system and to the air-fuel ratio sensing means, said feedback control circuit including means for integrating the output signal of the air-fuel ratio sensing means and applying an integrated signal to the fuel supply system;

(b) a disabling circuit connected to the feedback control circuit for disconnecting the feedback control circuit from the fuel supply system when engine speed is above a predetermined value; and

(c) a fuel increment signal generating circuit connected to the fuel supply system and the disabling circuit for generating and applying a compensating signal to the fuel supply system corresponding to engine speed in order to increase the fuel quantity supplied by the fuel supply system when the feedback control circuit is disconnected from the fuel supply system.

4,176,627

FUEL-INTERMITTENT-INJECTION INSTALLATION FOR INTERNAL-COMBUSTION ENGINES

Aldo Bassi, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

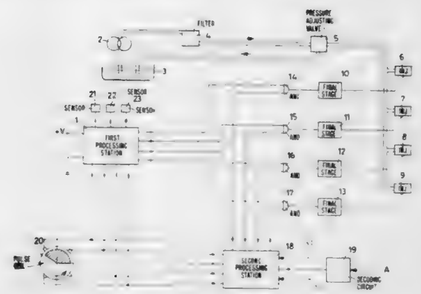
Filed Aug. 25, 1977, Ser. No. 827,685

Claims priority, application Italy, Sep. 6, 1976, 26911 A/76

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EB **3 Claims**

1. An intermittent fuel injection installation for an internal combustion engine having a plurality of cylinders, said installation being characterized in that it comprises an injector for each cylinder of the engine, a fuel-feeding circuit for supplying fuel for said injectors under a preselected pressure, a pulse generator rotatable at a speed proportional to that of the engine and being capable of emitting as many trains of first pulse signals as there are injectors, a processing circuit operatively connected to the pulse generator and being capable of converting said trains of first pulse signals into as many trains of second pulse signals of a preselected magnitude and duration, a control circuit also operatively connected to said pulse generator and further connected to drive means actuable by an operator of the engine and operable to produce drive signals, there being stored in said control circuit preselected and pre-established models of intermittency for the delivery of the fuel by the injectors as a function of the conditions of use of the engine, the control circuit being operable to combine said first pulse signals with said drive signal for generating sequences of control signals for each injector consistent with said models of intermittency stored in said control circuit, the installation further comprising logic circuits in a number equal to the number of the injector and operatively connected to actuation means for the same injectors and also to said processing circuit and said control circuit, each logic circuit effecting a comparison between the pulse signal associated with the injector of a cylinder coming from the processing circuit and the control



signal coming from the control circuit associated with the injector of the same cylinder for selectively generating a consent or inhibition signal for the means of actuation of the injector which feeds the same cylinder, the action of the several logic circuits being commanded by the control circuit and the processing circuit according to a sequence which has been previously established on the basis of the ignition sequence of the cylinders.

4,176,628

COMBUSTION CHAMBER FOR AN INTERNAL COMBUSTION ENGINE OF DIRECT INJECTION TYPE

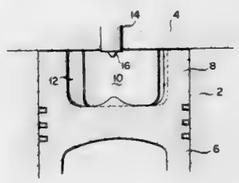
Seikichi Kanai, and Kunihiko Komiyama, both of Oyama, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Nov. 14, 1977, Ser. No. 851,174

Claims priority, application Japan, Nov. 12, 1976, 51/135424

Int. Cl.[2] F02B *23/06*

U.S. Cl. 123—32 A **3 Claims**



1. In an internal combustion engine of the direct injection type including combusion chambers each defined by a cylinder head, a cylinder liner, and a piston head having a wall defining a cavity therein, means for producing an air swirl in said cavity, and fuel injection means each having a plurality of fuel injection nozzles, said fuel injection means being mounted substantially at the central part of said cavity, said nozzles being arranged to inject jets of fuel into said cavity radially against said cavity wall, the improvement wherein said cavity wall is constructed to define a generally toroidal cavity formed in said piston head and a plurality of corner cavities formed continuously to said toroidal cavity, each of said corner cavities being opposed to each of said fuel injection nozzles and

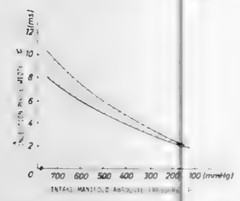
being adapted to receive jets of fuel injected from said fuel injection nozzles, each of said corner cavities being defined by a generally linear wall tangent to one inner peripheral wall of said toroidal cavity and a contiguous generally semi-circular wall interconnecting said linear wall with another inner peripheral wall of said toroidal cavity said another inner wall being adjacent to said one inner wall and, said linear wall being formed on the upstream side of said air swirl.

4,176,629

ELECTRIC CONTROL METHOD FOR FUEL INJECTION AND IGNITION TIMING

Hisasi Kawai, Toyohashi, and Toshikazu Ina, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 1, 1977, Ser. No. 856,509
Claims priority, application Japan, Dec. 10, 1976, 51-149030
Int. Cl.² F02B 41/00, 13/00
U.S. Cl. 123—32 EC 2 Claims



1. A method for controlling a combustion engine having an output shaft driven by mechanical energy converted from heat energy caused by the combustion of air-fuel mixture, said engine being provided thereon with first control means for controlling the amount of fuel metered into said engine and second control means for controlling the timing of sparks supplied to said engine, the method comprising the steps of:

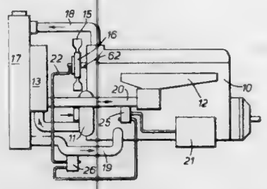
a. generating a binary number electric signal indicative of the amount of air flowing into said engine;
b. generating a binary number electric signal indicative of rotation speed of said output shaft during operation of said engine;
c. detecting a predetermined angular position of said output shaft before the arrival of a piston to its top dead center to generate a reference signal per one rotation of said output shaft;
d. generating a timing signal with a predetermined phase lag in relation to the reference signal;
e. calculating a first value corresponding to setting of said first control means by a computer programmed to calculate the first value from a first function describing a desired relationship among setting of said first control means, the amount of air flowing into said engine and the rotation speed of said output shaft, the calculation of the first value being performed by using the binary number electric signals upon receiving the timing signal;
f. calculating an actual intake manifold pressure by said computer programmed to calculate the actual intake manifold pressure from a second function describing a relationship between an intake manifold absolute pressure and the calculated first value;
g. calculating a second value corresponding to setting of said second control means by said computer programmed to calculate the second value from a third function describing a desired relationship between setting of said second control means and the calculated intake manifold pressure, the calculation of the second value being performed by using the binary number electric signals upon receiving the reference signal;
h. converting the first and second calculated values into the settings of said first and second control means respectively in response to the timing signal and the reference signal; and
i. continuously repeating the above sequence of steps for controlling the amount of fuel and the timing of sparks in response to changes of the binary number electric signals.

4,176,630

AUTOMATIC CONTROL VALVES

Arthur E. H. Elmer, Stroud, England, assignor to Dynair Limited, Gloucestershire, England

Filed Jun. 1, 1977, Ser. No. 802,496
Int. Cl.² F01P 7/12
U.S. Cl. 123—41.12 6 Claims



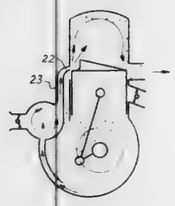
1. Apparatus for controlling the flow of a pressure fluid to a fluid actuator operatively connected to a variable speed drive in the rotary transmission to a cooling fan for a vehicle motor, including two automatic temperature sensing fluid control valves connected in series between a source of pressure fluid and the said fluid actuator, each valve having two operative positions in one of which the valve connects an inlet port to an outlet port, while in the other position it closes the connection between the inlet and outlet ports and connects the outlet port to a relief passage, the arrangement being such that when either valve is in its second position the pressure line leading to the actuator is disconnected from the pressure supply and connected to relief, and in which each of the two valves is directly exposed to a fluid flow associated with said vehicle motor so as to sense the fluid temperature directly.

4,176,631

INTERNAL COMBUSTION ENGINE

Mitsuhiro Kanao, No. 2156-14, Yakeyamacho, Kure-shi, Hiroshima-ken, Japan

Division of Ser. No. 689,892, May 25, 1976, Pat. No. 4,106,439.
This application May 24, 1977, Ser. No. 800,104
Claims priority, application Japan, May 27, 1975, 50-63636; Aug. 31, 1975, 50-105755
Int. Cl.² F02B 33/04
U.S. Cl. 123—73 PP 1 Claim



1. A two-stroke internal combustion engine comprising:

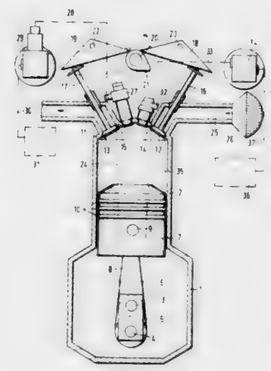
(i) a cylinder
(ii) a piston movable in said cylinder and defining a combustion chamber therein
(iii) a crank-case having an arcuate face
(iv) an air chamber disposed laterally at the upper part of said crank-case
(v) an air inlet on said air chamber, said air inlet having thereon a non-return air inlet valve for said air chamber
(vi) a guide plate spaced from and extending along said arcuate face of said crank-case so as to define therewith an air flow passageway opening at one end into said air chamber and continually open at the other end into the lower portion of said crank-case
(vii) means in said crank-case and cylinder defining a combustible mixture ejecting port communicating at one end with said crank-case and at the other end with said combustion chamber, said port being opened at said other end when the piston is at and approaching bottom dead centre position
(viii) a passage-forming means defining an air ejecting port communicating at one end with said air chamber and at the other end with said combustion chamber adjacent to said mixture ejecting port said air ejecting port being positioned above said mixture ejection port and directed in relation to said mixture ejecting port such that, upon opening of said mixture ejecting port subsequent to the opening of said air ejecting port during passage of said piston during a downstroke, air forced by said piston from said crank-case through said air passageway into said air chamber and thence through said air ejecting port into said combustion chamber is impinged on by fuel mixture ejected by said piston from said crank-case through said mixture ejecting port and is thereby constrained to flow along the wall of the cylinder and form over the whole of said wall a lamina within which said ejected fuel mixture is contained.

4,176,632

INTERNAL COMBUSTION ENGINE

Walter Franke, Hittfelder Kirchweg 22, 2105 Seevetal 3, Fed. Rep. of Germany

Filed Jul. 11, 1977, Ser. No. 814,848
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1976, 2631407
Int. Cl.² F02B 47/02; F02D 19/02
U.S. Cl. 123—75 B 12 Claims



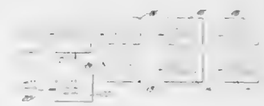
1. An internal combustion engine including cylinder means, piston means operably engaged within said cylinder means, said cylinder means having wall means defining a cylinder working space within which said piston means are reciprocally movable, fuel injection means for delivering fuel mixture to said cylinder means, exhaust means for exhausting spent fuel from said cylinder means, and inlet means for introducing into said cylinder working space an additional fluid medium consisting of at least one of the media air and liquid, said inlet means comprising: a bore extending through said cylinder wall means in at least one location of said cylinder working space and adapted to permit passage therethrough of said additional fluid medium directly into said cylinder working space under a suction effect generated by said piston means moving toward a bottom dead center position of its working stroke; a feed duct connected to a source of said additional fluid medium; a valve chamber disposed immediately adjacent said feed duct and in direct flow communication therewith, said valve chamber having a diameter which is greater than the diameter of said feed duct; a conical wall portion extending from said valve chamber on the side thereof toward said cylinder working space and extending in a tapering configuration narrowing toward said cylinder working space to a diameter smaller than said diameter of said valve chamber; and a valve disk arranged within said valve chamber to be freely movable therein, said valve disk having a diameter which is larger than both said diameter of said feed duct and said small diameter of said conical wall portion to define the limits of free movement of said valve disk within said valve chamber; said valve chamber being formed with a cylindrical wall defining the radially outer limits of said chamber and said valve disk being formed with a generally square configuration having rounded corner portions defined with a radius of curvature which is smaller than the radius of said cylindrical wall.

4,176,633

GOVERNOR APPARATUS AND SYSTEM

Ralph P. McCabe, Troy, Mich., assignor to Colt Industries Operation Corp., New York, N.Y.

Filed Feb. 14, 1978, Ser. No. 877,815
Int. Cl.² B60K 31/00; F02D 11/08
U.S. Cl. 123—102 15 Claims





1. A governor system for a combustion engine having motive fluid induction passage means, comprising variably positionable first and second throttle valve means for controlling the rate of flow of said motive fluid through said induction passage means and into said engine, first means for sensing the speed of monitored moving means associated with said engine and creating a speed signal in response thereto, electrical control means adapted to receive said speed signal and produce in response thereto an electrical output, first pressure responsive motor means comprising pressure responsive first movable wall means operatively connected to said first throttle valve means, means for providing a fluid pressure to at least one side of said first movable wall means, second pressure responsive motor means comprising pressure responsive second movable wall means operatively connected to said second throttle valve means, said means for providing fluid pressure to at least one side of said first movable wall means also providing a fluid pressure to at least one side of said second movable wall means, and solenoid valve means effective for modulating said fluid pressures as to thereby create pressure differentials across each of said first and second movable wall means, said solenoid

valve means being adapted to receive said electrical output and to modulate said fluid pressures in accordance therewith as to thereby vary the magnitude of said pressure differentials in response thereto, said solenoid valve means being effective to increase the magnitude of said pressure differential across said first movable wall means and thereby cause said first movable wall means to move said first throttle valve means toward a more nearly closed position as the speed of said monitored moving means increases and approaches a preselected governed maximum speed while also being effective to decrease the magnitude of said pressure differential across said second movable wall means and thereby be effective for causing said second movable wall means to move said second throttle valve means toward a more clearly closed position as the speed of said monitored moving means increases and approaches said preselected governed maximum speed.

4,176,634

FUEL INJECTION SYSTEM

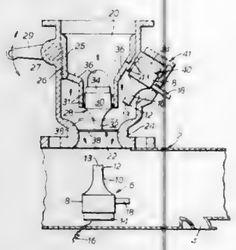
Barrie J. Martin, Shenfield, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Jul. 13, 1977, Ser. No. 815,309

Claims priority, application United Kingdom, Jul. 14, 1976, 29202/76

Int. Cl.[2] F02M *27/08, 7/00*

U.S. Cl. 123—119 EE **7 Claims**



1. Apparatus for injecting atomized fuel into an air stream for an engine, said apparatus comprising:

first vibrating means;

valve means including a valve element for controlling said air stream, said valve element being responsive to said first vibrating means for atomizing fuel injected toward said valve element;

second vibrating means; and

fuel injection means, responsive to said second vibrating means, for atomizing and injecting fuel into said air stream and toward said valve element, wherein said valve element further atomizes any of the fuel not previously atomized by said fuel injection means.

4,176,635

EXHAUST GAS RECIRCULATION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Norihiko Nakamura, Mishima; Noboru Tuyama, and Toyokazu Baika, both of Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

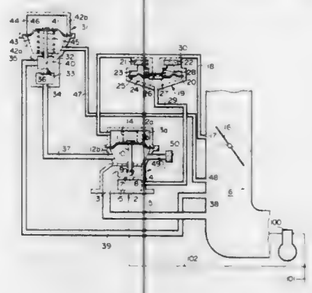
Filed Apr. 19, 1978, Ser. No. 897,870

Claims priority, application Japan, Dec. 29, 1977, 52-159303

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **2 Claims**

1. An exhaust gas recirculation system for an internal combustion engine having an intake passage incorporating a throttle valve therein and an exhaust passage, comprising a recirculation passage for recirculating exhaust gases from said exhaust passage to said intake passage, an exhaust gas recirculation control valve provided at a middle portion of said recirculation passage, said control valve having first and second diaphragm chambers and a throttled opening which opens said second diaphragm chamber to the atmosphere and being adapted to increase its opening in accordance with increase of vacuum supplied to said first diaphragm chamber and to decrease its opening in accordance with increase of vacuum supplied to said second diaphragm chamber, a vacuum port provided in said intake passage so as to be located upstream of said throttle valve when it is fully closed and so as to be located downstream of said throttle valve when it is opened beyond a predetermined opening, a first vacuum passage which connects said vacuum port and said first diaphragm chamber of said exhaust gas recirculation control valve, a vacuum control valve provided at a middle portion of said vacuum passage and adapted to control the vacuum conducted through said vacuum passage in accordance with the pressure of exhaust gases in said



recirculation passage, a second vacuum passage which connects said second diaphragm chamber of said exhaust gas recirculation control valve and said intake passage, and a vacuum switching valve which normally intercepts said second vacuum passage and selectively opens said second vacuum passage, said vacuum switching valve having a valve port, a diaphragm means including first and second diaphragm chambers controlling said valve port, and a throttling passage which connects said first and second diaphragm chambers of said vacuum switching valve, said first diaphragm chamber of said vacuum switching valve being supplied with intake vacuum of the engine, wherein said diaphragm means opens said valve port when the vacuum in said first diaphragm chamber of said vacuum switching valve is greater than that in said second diaphragm chamber of said vacuum switching valve by more than a predetermined difference.

4,176,636

INTERNAL COMBUSTION ENGINE HAVING EXHAUST EMISSION CONTROL SYSTEM

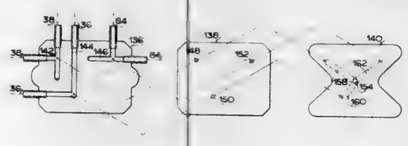
Haruo Mori, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 639,159, Dec. 9, 1975, Pat. No. 4,099,497. This application Apr. 7, 1978, Ser. No. 894,370

Claims priority, application Japan, Dec. 26, 1974, 49/502336

Int. Cl.[2] F02B *33/00*; F02P *5/04*; F16K *47/04*

U.S. Cl. 123—119 A **2 Claims**



1. Air bleeding apparatus for vacuum actuators in an exhaust emission control system for internal combustion engines comprising

a first plate having a flat face formed with a plurality of first grooves, each of said first grooves communicating with a vacuum source at one end and communicating with a vacuum actuator at the other end,

a second plate adjacent to said first plate covering said first grooves to form conduits therewith,

said second plate being formed with orifices communicating with said first grooves, respectively,

a third plate adjacent to said second plate,

said third plate having a vent hole formed therethrough and having a flat face formed with second grooves communicating with said orifices and said vent hole,

said second gooves diverging from said vent hole, said second grooves being covered by said second plate to form channels therewith, said second plate is joined abuttingly to and between said first plate and said third plate, whereby various vacuum pressures applied from the vacuum sources to a plurality of vacuum actuators may be regulated by a single air bleeding apparatus.

4,176,637

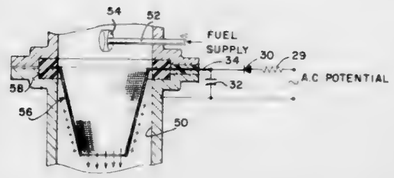
APPARATUS FOR ELECTROSTATIC FUEL MIXING

James D. Cole, Dundee, Ill., assignor to F. D. Farnam Co., Lyons, Ill.

Continuation-in-part of Ser. No. 549,947, Feb. 14, 1975, Pat. No. 4,023,544. This application Apr. 4, 1977, Ser. No. 784,550

Int. Cl.[2] F02M *29/00*; F02C *7/22*

U.S. Cl. 123—119 E **12 Claims**



1. Apparatus for preparing fuel for subsequent combustion comprising:

passage means for discharging a flow of fuel through a mixing zone into a combustion zone, said passage means having an unobstructed passageway therethrough,

electrode means for forming an electrostatic field to induce positive electrostatic charges in said fuel,

means for heating a surface in said mixing zone, and

means for applying a negative charge to a heated surface in the mixing zone, whereby the fuel strikes the surface and provides maximized ratio of fuel surface to fuel volume, the potential difference between the positive and negative charges being about two hundred volts or more.

4,176,638

EGR CONTROL SYSTEM FOR ENGINE EQUIPPED WITH FUEL INJECTION SYSTEM

Hidetoshi Kitamura, and Jun Sato, both of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 18, 1978, Ser. No. 897,516

Claims priority, application Japan, Jun. 27, 1977, 52/84992[U]

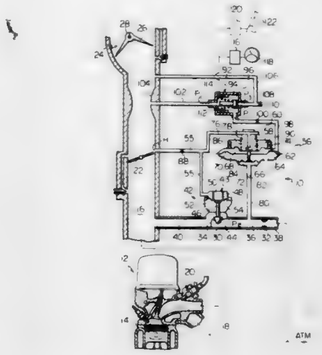
Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **9 Claims**

1. An exhaust gas recirculation (EGR) control system in combination with motor-vehicle internal combustion engine equipped with an electronically controlled fuel injection system, including a combustion chamber, an intake passageway providing communication between the atmosphere and the combustion chamber, a venturi formed in the intake passageway, a throttle valve rotatably disposed in the intake passageway downstream of the venturi, an airflow meter disposed in the intake passageway upstream of the venturi for providing an information of airflow to the fuel injection system, and an exhaust gas passageway providing communication between the combustion chamber and the atmosphere, said EGR control system comprising:

EGR passageway means providing communication between the exhaust gas passageway and the intake passageway to recirculate exhaust gas back to the combustion chamber;

a diaphragm actuated EGR control valve operatively disposed in said EGR passageway means to divide said EGR passageway means into an upstream portion connecting to the exhaust gas passageway and a downstream portion connecting to the intake passageway, the diaphragm of said EGR control valve defining a first chamber which communicates through first passage means with the intake passageway to provide the first chamber with intake vacuum in the intake passageway, said EGR control valve being operative in accordance with the intake vacuum, to control the pressure of the exhaust gas in the upstream portion of said EGR passageway means so as to control the flow of the recirculated exhaust gas;



regulating means for regulating the intake vacuum to be provided to the first chamber of said EGR control valve in accordance with the exhaust gas pressure in the upstream portion and in accordance with the vacuum in the venturi, said regulating means including second passage means connecting to said first passage means and having an inlet port communicating with the atmosphere, a pressure regulating valve movable relative to said inlet port of said second passage means for controlling the flow of atmospheric air bled through said inlet port into said second passage means, first and second flexible diaphragms defining a second chamber and a third chamber communicating with the upstream portion of said EGR passageway means, said first and second flexible diaphragms operatively connect to each other and being operatively connected to said pressure regulating valve so as to operate said pressure regulating valve in response to the pressures in said second

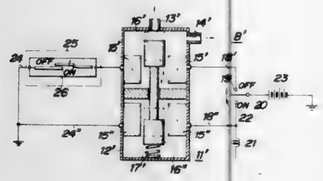
selective means for selectively provide the second chamber of said regulating means with the venturi vacuum generated in the venturi and with at least a vacuum generated in the intake passageway between the airflow meter and the venturi, in accordance with driving conditions of the motor-vehicle.

4,176,639

EVAPORATIVE EMISSION SYSTEM FOR IMPROVING ENGINE STARTING CHARACTERISTICS

Osamu Shinoda, Toyota; Keiichi Okabayashi, Aichi, and Takanori Nagai, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushikikaisha, Aichi, Japan

Filed Aug. 12, 1977, Ser. No. 826,133
Claims priority, application Japan, Jun. 5, 1977, 52-056784[U]
Int. Cl.² F02M *33/02*
U.S. Cl. 123—136 **6 Claims**



1. An evaporative emission system comprising a carburetor, a canister, an ignition key-operated circuit which includes an ON circuit and an OFF circuit, an inlet port connected to said carburetor, outlet port connected to said canister; a valve means communicating said inlet port with said outlet port for opening and closing said inlet port comprising electromagnetic operating mechanism including two separately energized coils one being disposed in said OFF circuit of said ignition key-operated circuit and the other being disposed in said ON circuit of said ignition key-operated circuit, a single valve as closing and opening means against said inlet port coupled to said coils, means forming part of the system which exhibits an operating temperature thereof, and a temperature-sensing switch means in said OFF circuit of said ignition key-operated circuit and responsive to the operating temperature of said means forming part of the system for interrupting current to said electromagnetic mechanism when the operating temperature falls below a given value.

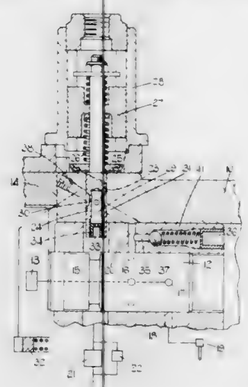
4,176,640

FUEL INJECTION PUMPING APPARATUS

Robert T. J. Skinner, High Wycombe, England, assignor to Lucas Industries, Limited, Birmingham, England

Filed Apr. 14, 1977, Ser. No. 787,521
Claims priority, application United Kingdom, Apr. 20, 1976, 15899/76
Int. Cl.² F02M *59/34, 41/06*
U.S. Cl. 123—139 AQ **4 Claims**

1. A fuel injection pumping apparatus comprising an injection pump operable to deliver fuel during a delivery stroke, a feed pump for supplying fuel to the injection pump during a filling stroke, a housing, a valve within said housing for controlling the output fluid pressure of the feed pump so that the pressure varies in accordance with the speed at which the apparatus is driven, means connecting said feed pump with said injection pump, a throttle within said connecting means for varying the quantity of fuel supplied by the feed pump to the injection pump, said throttle comprising an axially movable member located within a cylindrical portion formed by said housing, said axially moveable member being subjected at one end to said fluid pressure and being movable by an increase in said pressure, resilient means applied to said member in a direction to reduce the amount of fuel supplied by the feed pump to the injection pump said axially moveable member being further provided with a central passage and a groove formed on the outer periphery thereof in communication with said central passage, said passage extending from said one end of said member, an insert secured within said central passage and forming an oriface at the end of said member which is subjected to said fluid pressure, the cylindrical portion formed by said housing and retaining said member including a port in the wall thereof formed by said housing and connecting with said injection pump, the groove and port having variable communication, the extent of which determines the volume of fuel



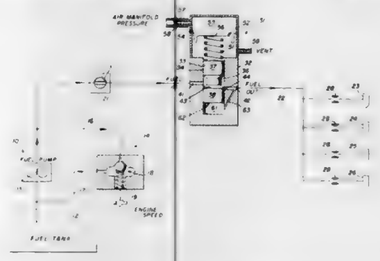
supplied to the injection pump, and fluid pressure responsive means for adjusting the timing of delivery of fuel by said feed pump.

4,176,641

ANEROID FOR A TURBOCHARGED ENGINE

Julius P. Perr, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 30, 1976, Ser. No. 755,784
Int. Cl.² F02D *1/06, 23/02*; F02B *33/00*
U.S. Cl. 123—140 FG **20 Claims**



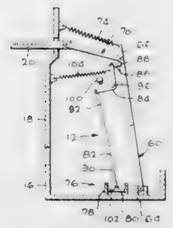
1. An aneroid for use in a fuel supply system for an internal combustion engine including a turbocharger, wherein the quantity of fuel injected in each cycle of the engine is controlled by adjusting the pressure of the fuel in a fuel supply rail, comprising valve means adapted to be connected in said rail and operable to adjust the rail pressure, first means adapted to respond to the pressure boost of the turbocharger and operatively coupled to said valve means for adjusting the rail pressure, and second means adapted to respond to the rail pressure downstream of the aneroid and connected to said valve means for adjusting the rail pressure, said first means being operable to increase the rail pressure with an increase in turbocharger boost and said second means being operable to reduce the rail pressure with an increase in the rail pressure downstream of the aneroid.

4,176,642

DIESEL ENGINE STARTING CONTROL

John H. Shipinski, South Beloit, Ill., assignor to Deere & Company, Moline, Ill.

Filed Dec. 20, 1977, Ser. No. 862,509
Int. Cl.² F02M *59/42*; F02D *1/04*
U.S. Cl. 123—140 R **11 Claims**



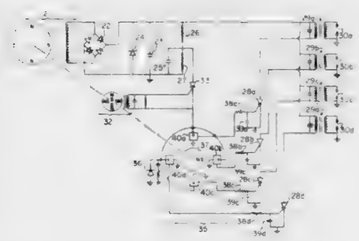
1. In an arrangement in which a governor-operated control rack controls fuel injection in a diesel engine, the control rack being moved into a starting position when the diesl engine is to be started and being moved out of the starting position by the governor upon starting of the diesel engine, the improvement comprising means for retarding movement of the control rack out of the starting position comprising damper means and means coupling the damper means to the control rack to retard movement of the control rack out of the starting position by the damper means, the means coupling the damper means to the control rack including means for permitting at least some movement of the control rack relative to the damper means when the retarding force exerted on the control rack by the damper means and the means coupling exceeds a predetermined value, the damper means retarding movement of the control rack out of the starting position with a force of selected value and resisting movement of the control rack into the starting position with a force substantially less than said force of selected value, the damper means comprising a dashpot having a plunger with a one-way check valve therein.

4,176,643

PULSE GENERATING AND DISTRIBUTING CIRCUITS FOR INTERNAL COMBUSTION ENGINES OR THE LIKE

Bruce R. Beeghly, Youngstown, Ohio, assignor to The Economy Engine Company, Youngstown, Ohio

Filed Jul. 21, 1977, Ser. No. 817,815
Int. Cl.² F02P *1/00, 3/06*
U.S. Cl. 123—146.5 A **5 Claims**



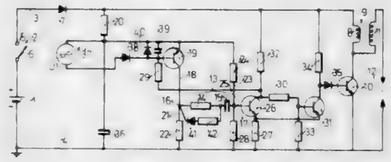
1. A self-powered breakerless pulse generating and distributing system for an internal combustion engine comprising,
a storage capacitor,
means for generating a current for charging said capacitor,
a plurality of electronic power switches in parallel circuits associated with each cylinder of the engine for discharging the storage capacitor,
a pulse generator comprising a rotating member turning in synchronism with said engine arranged to generate timing pulses at given angular positions,
a distributor comprising a rotary member turning in synchronism with said engine and a plurality of Hall effect switches having input, output and power supply terminals, each Hall effect switch arranged to pass a timing pulse to one of said electronic switches when the rotary member is indexed therewith, each Hall effect switch power supply terminal having a current drain associated therewith, each Hall effect switch input and power supply terminal being connected to the output of the pulse generator,
such that each Hall effect switch is arranged to pass the timing pulse to the control terminal of a corresponding power switch when the rotary member is indexed with said Hall effect switch and such that Hall effect switches only drain current during the timing pulse.

4,176,644

ENGINE IGNITION SYSTEM WITH VARIABLE SPARK INTERNAL DURATION

Rainer Hellberg, Straberg-Dormagen; Leo Steinke, Hegnach, and Adolf Fritz, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 26, 1977, Ser. No. 845,610
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1976, 2648531
Int. Cl.² F02P *3/04, 5/00*
U.S. Cl. 123—148 E **16 Claims**



1. An engine ignition system including a final stage transistor having its emitter-collector path (**10**) connected, during engine operation, in series with a dc source and the primary winding of an ignition spark coil and arranged to be recurrently made nonconducting for periods long enough to produce, at a spark plug in the secondary circuit of said spark coil, a main spark discharge and an immediately following discharge tail, and including also an RC circuit branch (**13**) by which the duration of the period of nonconduction of said path of said transistor is determined, said system incorporating also the improvement consisting in that:
a bridging diode (**41**) is provided in a shunt around said resistor (**14**) of said RC circuit branch (**13**), said bridging diode being so poled that it is conducting during the discharge of said storage capacitor (**15**), and
said RC circuit branch (**13**) consists of the series combination of a charging resistor (**14**), and a storage capacitor (**15**) so connected that the said nonconducting period of said path of said transistor ends with the charging of said storage capacitor (**15**) and begins with the discharging of said storage capacitor (**15**);
the flow of current in at least one direction between the remainder of the system and said RC circuit branch, and thereby the rate of charging and/or discharging of said capacitor (**15**), is variable automatically in response to at least one operating parameter of the engine in such a manner that under certain operating conditions of the engine the duration of said period of nonconduction is

terminated before the discharge tail (S) following a main spark discharge (A) has subsided.

4,176,645

MOTOR IGNITION SYSTEM CONTROL CIRCUIT FOR MAINTAINING ENERGY STORAGE IN SPARK COIL CONSTANT IN WIDE SPEED RANGE

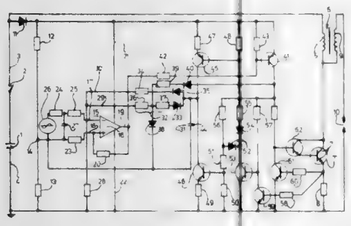
Werner Jundt, Ludwigsburg; Gerhard Sohner, Remshalden; Peter Werner, Stuttgart, and Herman Roozenbeek, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 22, 1976, Ser. No. 734,745

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1975, 2549586

Int. Cl.² F02P *1/00*

U.S. Cl. 123—148 E **28 Claims**



1. In an ignition system for an internal combustion engine, having a spark coil (6) of which a primary winding (5) is connected in series with an electronic interruptor switch (7) and with a source (1) of direct current of which one terminal is grounded to the engine structure, and of which coil a secondary winding (9) is connected to supply ignition potential to one or more spark plugs upon successive sudden interruptions of current in the primary winding (5) by the interruptor switch (7), and having an engine-driven generator (26) of voltage waves for enabling said electronic switch (7) to be operated in step with the operation of the engine, a circuit for energization of said primary winding and control of said interruptor switch, comprising in combination:

a voltage-sensitive electronic switch (15) for providing voltage steps for respectively switching on and off said electronic interruptor switch (7), said voltage-sensitive switch (15) having its input circuit connected to said wave voltage generator (26) and to said direct current source (1) in such a way as to permit its switching threshold voltages to be varied from their respective quiescent-state values; and

means for producing a regulating voltage including an integrator connected so that its direction of output voltage change is determined by the amount of current through said interruptor switch (7) and so as to change its output voltage progressively in one direction from the moment of a switch-on operation of said voltage-sensitive switch (15) until the current through said interruptor switch (7) reaches a predetermined value and thereafter to change its output voltage progressively in the other direction until the moment of a switch-off operation of said voltage-sensitive switch (15),

said predetermined value of current through said interruptor switch (7) being less than that value of current in said primary winding (5) of said spark coil (6) which constitutes a sufficient storage of ignition energy in said spark coil (6) for generation of a fully effective ignition spark;

the output voltage of said integrator being applied to said voltage-sensitive switch to vary the switch-on threshold of said voltage-sensitive switch and said regulating voltage-producing means being also connected in circuit with said voltage-sensitive switch (15) so as to prevent the latter's switch-off threshold from being deviated by the operation of said integrator,

whereby while the duration of current flow through said interruptor switch (7) tends to be excessive, the switch-on voltage threshold of said voltage-sensitive switch is shifted within the peak-to-peak output voltage range of said generator (26) in the direction (A) producing an earlier start of current through said interruptor switch (7) and while the duration of current flow through said interruptor switch (7) tends to be insufficient, the switch-on threshold of said voltage-sensitive switch (15) is shifted in the opposite direction (B) corresponding to a later start of current in said interruptor switch (7).

4,176,646

METHOD OF IGNITING IN AN INTERNAL COMBUSTION ENGINE

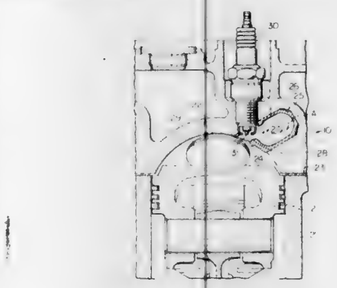
Norihiko Nakamura, Mishima; Takashi Kato, and Tatsuo Kobayashi, both of Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 31, 1977, Ser. No. 801,800

Claims priority, application Japan, Mar. 28, 1977, 52-33308

Int. Cl.² F02P *5/04*; F02B *19/12*; F02M *25/06*

U.S. Cl. 123—148 E **6 Claims**



1. An internal combustion engine comprising a reciprocating piston, a main combustion chamber, an auxiliary combustion chamber, at least one chamber forming a possage connecting said main combustion chamber with said auxiliary combustion chamber and arranged to create a swirl motion of the combustible mixture in said auxiliary combustion chamber at the time of the compression stroke of said piston, a spark plug having a spark gap located in one of said chambers at least in the vicinity of said chamber forming the connecting passage, an intake passage for leading an air-fuel mixture into said main combustion chamber, and an exhaust passage for discharging an exhaust gas from said main combustion chamber to the atmosphere, the ratio of the volume of said auxiliary combustion chamber to the cross-sectional area of said chamber forming the connecting passage being in the range of 5 through 15 cm to create a strong swirl motion in said auxiliary combustion chamber, means to maintain the length of the continuance time of the discharging arc created in the spark gap of said spark plug from about BTDC 40° to about BTDC 10° when the engine is operating at a high speed approaching 5000 rpm, and the ignition timing is controllable in accordance with the level of the load on the engine and is at about BTDC 40° when the engine is operating at the high speed under substantially no load and at about BTDC 20° when the engine is operating at the high speed under a substantial load.

4,176,647

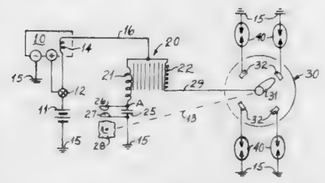
MODULATION IGNITION SYSTEM

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Filed Jul. 5, 1977, Ser. No. 812,912

Int. Cl.² F02P *3/04*; H05B *41/14*

U.S. Cl. 123—148 E **9 Claims**



1. An ignition system, comprising the combination of:

first means, intermittently fed by DC power, for producing transient power during operative mode of the system, said first means including an ignition transformer having a primary winding and a capacitor intermittently in series with the primary winding; and

second means, in series circuit with the first means, for providing alternating current power to intermodulate with the transient power in the first means during said operative mode, said second means including an alternating current power source coupled to said capacitor, wherein said power source is duty cycled.

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ENGINE STARTING DEVICE

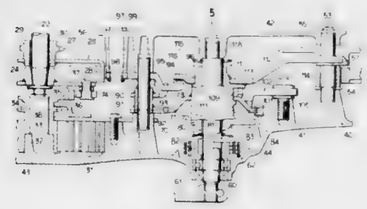
Isamu Gotoh, Tokyo; Yoshinori Okamoto, and Goroei Wakatsuki, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1977, Ser. No. 779,604

Claims priority, application Japan, Mar. 24, 1976, 51-32096; Apr. 24, 1976, 51-51822[U]

Int. Cl.² F02N *5/02*

U.S. Cl. 123—179 S **14 Claims**



1. An engine starting device, comprising:

an input member mechanically and operably connected to an engine;

a spiral spring;

an output member mechanically and operably connected to said spiral spring;

a driving member operably connected to and driven by said engine;

automatic force accumulating means operably connected to said spiral spring for accumulating force in said spiral spring;

said driving member being operably connected to said automatic force accumulating means for driving said automatic force accumulating means;

a winding pressure accumulating mechanism operably connected to said spiral spring;

a first one-way clutch means for selectively connecting said automatic force accumulating means with said winding pressure accumulating mechanism;

means for connecting said output member to said input member when the force accumulated by said spiral spring is released to start said engine;

said automatic force accumulating operation means for said spiral spring driven by said driving member as a cam driven by a driving shaft of said engine;

an artificial force accumulating operation means operated to accumulate a force in said spiral spring by an artificial operation and said winding pressure accumulating mechanism;

said winding pressure accumulating mechanism and each of said force accumulating operation means being connected with each other through a one-way clutch engaging and disengaging them as required;

a one-way clutch means engaging and disengaging with the engine crankshaft;

a driven sprocket, which is a winding input member for said spiral spring, secured at said one end of said spiral spring;

a driving sprocket driving said driven sprocket; and

an artificial force accumulating operation mechanism and an automatic force accumulating operation mechanism are arranged on both sides of said driving sprocket, respectively, in the axial direction through one-way clutches.

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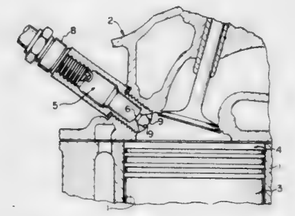
EMISSION CONTROL

Bela Karlovitz, Pittsburgh, Pa., assignor to Toyota Motor Company, Ltd., Toyota, Japan

Continuation of Ser. No. 684,476, May 10, 1976, abandoned. This application Sep. 25, 1978, Ser. No. 945,390

Int. Cl.² F02B *19/08, 19/18*

U.S. Cl. 123—191 SP **14 Claims**



1. A method of operating an internal combustion spark ignition engine having at least one cylinder and a reciprocating piston therein defining a combustion chamber, said combustion chamber being divided into main and auxiliary sections, there being an orifice disposed between the main and auxiliary sections and arranged on a central axis of the auxiliary section, the cross-sectional area of the orifice being smaller than the cross-sectional area of the auxiliary section, comprising the steps of:

introducing a combustible mixture to the combustion chamber;

compressing the combustible mixture in the combustion chamber and thereby forcing part of the mixture in the main section through the orifice into the auxiliary section;

creating turbulence and swirl of the combustible mixture about the axis of and within the auxiliary section for forcing the lighter components of the combustible mixture into the area along the axis by centrifugal force;

igniting the combustible mixture located along the axis of the auxiliary section within the auxiliary section of the combustion chamber from an ignition source, said swirl causing heavier uncombusted components of the combustible mixture to be forced to the peripheral areas of the auxiliary section;

causing a controlled rise in the pressure in the auxiliary section to rapidly inject into the main section a burning jet

of the combustible mixture located along the central axis of the auxiliary section;

causing a gradual propagation of the flame of the ignited mixture toward the periphery of the swirled combustible mixture in the auxiliary section to burn the heavier uncombusted portions of the combustible mixture and to continue to inject a long-burning jet into the main section; and

causing the burning jet to escape through the orifice substantially without swirling motion into the main section creating sufficient turbulence therein to cause part of the mixture to burn at substantially constant volume followed by a substantially constant pressure burning of the rest of the mixture whereby the peak temperature of the cycle is limited and the NO_x emissions are reduced.

4,176,650

METHOD FOR OPERATING A MULTI-CYLINDER JUMP-SPARK IGNITION ENGINE AND OPERATION CONTROL SYSTEM THEREOF

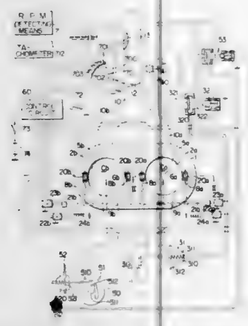
Masaaki Noguchi, Nagoya; Yukiyasu Tanaka, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 3, 1978, Ser. No. 874,931

Claims priority, application Japan, Feb. 10, 1977, 52/13591; Feb. 15, 1977, 52/15263; Feb. 18, 1977, 52/17479; Mar. 4, 1977, 52/24273

Int. Cl.² F02D 13/06

U.S. Cl. 123—198 F **33 Claims**



1. Method for operating a multi-cylinder internal combustion engine comprising the steps of

throttling both a suction flow of air-fuel mixture newly supplied to a first combustion chamber and an exhaust flow of combustion gas flowing out of said first combustion chamber, or throttling only said exhaust flow during a non-load operation of the engine to cause compression ignition combustion to occur in said first combustion chamber; and

stopping a suction flow of air-fuel mixture newly supplied to a second combustion chamber during said non-load operation to stop combustion operation in said second combustion chamber.

12. A 2-cycle internal combustion engine comprising:

a cylinder having first and second cylinder bores;

first and second pistons reciprocally disposed in the respective cylinder bores;

a cylinder head cooperating with said cylinder and said pistons to define first and second combustion chambers, respectively;

first and second spark plugs exposed to said first and second combustion chambers, respectively, for igniting air-fuel mixture introduced therein by spark discharges;

an ignition control device for supplying ignition energy to said first and second spark plugs at respective ignition timings;

means disposed in a suction passage for producing said air-fuel mixture;

a throttle valve pivotally disposed in said suction passage downstream of said air-fuel mixture producing means for controlling the amount of said air-fuel mixture;

first and second suction manifold branches connected to said suction passage downstream of said throttle valve;

first and second suction ports operatively communicated with said first and second suction manifold branches, said first and second suction ports opening to said first and second combustion chambers, respectively, for introducing said air-fuel mixture thereto;

first and second exhaust ports opening to said first and second combustion chambers, respectively, for exhausting combustion gases produced therein;

an exhaust manifold connected to said exhaust ports for conveying the combustion gases to an atmosphere;

first throttle means arranged in at least one of said first suction port, said first exhaust port and said first exhaust manifold, for throttling at least one of a suction flow of the air-fuel mixture supplied to said first combustion chamber through said first suction port and an exhaust flow of the combustion gas flowing out of said first combustion chamber through said first exhaust port and said first exhaust manifold, during non-load operation of said engine, to cause compression ignition operation to occur in said first combustion chamber; and

second throttle means arranged in at least one of said second suction port and said second suction manifold for stopping the supply of suction flow of the air-fuel mixture supplied to said second combustion chamber through said second suction port, during said non-load operation of said engine, to stop combustion operation in said second combustion chamber.

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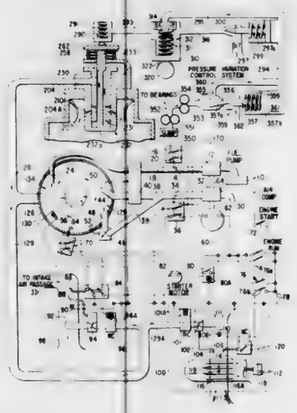
ENGINE COMBUSTION SYSTEM

Harold A. Backus, Wynnewood, Pa., assignor to Backus Devices, Incorporated, Wynnewood, Pa.

Continuation of Ser. No. 683,813, May 6, 1976, abandoned. This application Feb. 7, 1978, Ser. No. 875,806

Int. Cl.² F02B 3/00; F02M 7/00

U.S. Cl. 123—27 GE **10 Claims**



1. A combustion system comprising means defining a combustion volume, fuel control means for intermittently releasing pressurized gaseous fuel into said combustion volume for combustion with air contained in said volume in a cyclic process, said fuel control means including means, including valve means defining an orifice which opens and closes during each cycle and the maximum opening of which is variable from cycle to cycle, for varying the said maximum opening of said valve means substantially in direct proportion to the cyclic frequency so as to correspondingly limit the ratio of fuel to air for each cycle of operation of the system, for limiting the total quantity of fuel flow of each cycle, and for causing the rate of fuel flow per cycle to vary substantially in accordance with the cyclic frequency, further comprising means for supplying combustion air to said combustion volume and means for preheating said combustion air to temperature above the critical temperature for autoignition of the gaseous fuel and air prior to the release of said gaseous fuel.

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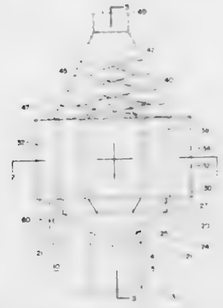
FREE STANDING FIREPLACE

Verland V. Berg, 393 Silver City Dr., Boise, Id. 83704, assignor to Verland V. Berg, Boise and Raymond Tracy, Cascade, both of, Id.

Filed Aug. 19, 1977, Ser. No. 825,969

Int. Cl.² F24B 7/00

U.S. Cl. 126—121 **3 Claims**



1. A free standing fireplace comprising:

a base;

a firepot mounted on said base;

a substantially cylindrical combustion chamber mounted on said base and enclosing said firepot, said combustion chamber including a housing ring encircling said firepot, the housing ring having oppositely disposed downwardly depending air vents opening in opposite directions, a plurality of vertically extending, parallel support braces circularly spaced upon the housing ring, a second housing ring horizontally mounted upon the support braces, a plurality of tempered glass panels vertically disposed between the support braces, sealingly engaging the support braces and the first and second housing rings, and a door operable to open and close said chamber; and

a conical hood having its base sealingly engaging said chamber, said hood having a flue vent at its apex, and said hood having a substantially horizontally projecting, upwardly spiraling flange mounted to its interior wall for imparting a circular motion to combustion fumes.

4,176,653

INFLATABLE ENCLOSURE AND ENERGY EXCHANGE SYSTEM

Turner J. Pittman, P.O. Box 24, Logan, N. Mex. 88426

Filed Feb. 22, 1977, Ser. No. 770,264

Int. Cl.² F24J 3/02; F24H 7/00

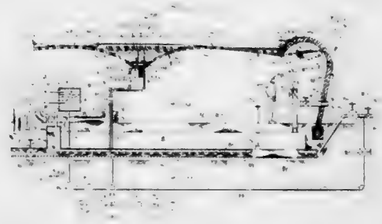
U.S. Cl. 126—428 **5 Claims**

1. A substantially air-tight enclosure comprising a vertically elongated roof edge support assembly, a roof portion, an internal structural support assembly, a blower system, and a heat transfer system and an air inlet system, said enclosure comprising vertically extending air-tight walls supported on the ground and a roof formed of a thin and flexible water-tight and air-tight sheet supported on said walls, said sheet forming the roof being formed into a regular array of a plurality of dimpled downwardly extending upwardly open incremental roof reservoirs of substantially the same shape and size and holding volumes of water that are shallow and wide and separate from each other and have similar surface-volume characteristics,

and an excess of air-pressure in the enclosure over air pressure outside the air-tight enclosure holds some portions of the roof upward to raised positions and a rigid ground-attached frame structure is attached to other portions of the sheet forming said roof reservoirs, said roof reservoirs being connected to upper terminal portions of liquid conduits extending vertically to horizontally extending liquid conduits located in chambers in the ground, walls surrounding said chambers, said chambers and said walls forming ground heat reservoirs, and wherein

(a) the roof edge support assembly comprises a wall structure and a tensioning member, a tension support and a roof sealing member, said wall structure comprising a circular imperforate air-tight rigid vertically extending peripheral wall which is fixed to a foundation and has substantial thickness and rigidity and an air-tight annular horizontally extending raised central wall portion that extends centrally and horizontally from the upper end of said peripheral wall,

(b) said roof portion comprises said roof and a plurality of



shallow bodies of water located on a thin imperforate air-tight flexible yet dimensionally stable sheet and said flexible sheet extends from one side of the roof edge support assembly to the other and is formed into an array of a plurality of downwardly dimpled surfaces and upwardly convex surfaces,

(c) said rigid ground attached frame structure comprises a plurality of generally like internal frame subassemblies arrayed in an axially symmetrical arrangement and

(d) each frame subassembly comprises a pair of like rigid vertically extending support posts, intermediate radial rails, and tangential rails, and said posts are firmly supported at their lower end in the ground and are rigid and, at their upper ends are firmly attached to and support an elevated radially and horizontally extending rigid rail and said horizontally extending rail supports and is attached firmly to a plurality of rigid, elevated, horizontally and tangentially extending and longitudinally extensible tangential rail assembies, and said tangential rail assemblies support thereonplurality of upper conduit terminal support assemblies, and

(e) each said upper conduit terminal support assembly comprises a rigid high level vertical pipe and a rigid low level vertical pipe, an upper rigid clamping plate and a lower rigid clamp plate, the high level pipe and a low level pipe are firmly attached to upper plate, the upper plate and the lower plate are firmly attached together and clamp therebetween a portion of the sheet forming the roof portion, said low level pipe has a automatically closing valve at its

upper end, and the upper open end of the high level pipe is higher than the upper open end of the low level pipe

(f) said blower system comprising an air pump, a motor and a pressure control arranged so that the pump drives air into the enclosure under said roof, said pressure control being sensitive to the pressure in the enclosure and operatively connects a power source to said motor, and an entrance assembly comprising a pair of closable doors spaced apart by an entrance enclosure which provides for ingress to and egress from a ground surface located within said enclosure under said roof while maintaining the air pressure in said enclosure,

(g) said blower having an inlet located in said chambers and two discharge outlets, said first discharge outlet attached by a plurality of air distributor pipes to outlets in said enclosure and said second discharge outlet attached to means for applying pressure to the water in said conduits in said ground heat reservoirs,

(h) said air inlet system comprising valved air duct assemblies, each such air duct assembly comprising a first inlet duct with an orifice located outside of the wall; said duct connects to a tee through a valve openable to said enclosure and another arm of said tee connects to said chambers in the ground, and

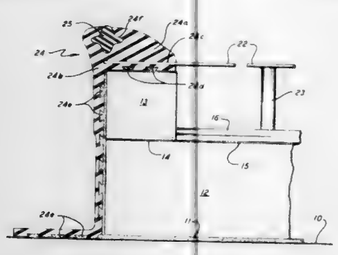
(i) said heat transfer system comprises a heater tank operatively connected to each of said conduits in said chambers in the ground and to said bodies of water in said roof reservoirs.

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SOLAR HEATING APPARATUS

Michael F. Zinn, and Steven E. Kralick, both of Spring Glen, N.Y., assignors to Bio-Energy Systems, Inc., Spring Glen, N.Y.

Filed Jul. 18, 1977, Ser. No. 816,883
Int. Cl.² F24J 3/02; F28F 1/32
U.S. Cl. 126—448 **31 Claims**



1. In a solar collector, the improvement comprising:

(a) at least one fluid-conducting strip of flexible synthetic rubber having an undersurface opposite a radiation-receiving surface, and comprising

i. a plurality of spaced parallel hollow tube portions,

ii. a plurality of web portions joining adjacent pairs of said tube portions, and

iii. a plurality of deflectable projections on the undersurface of said strip defining a plurality of inwardly diverging recesses; and

(b) a deposit of cement which does not substantially bond to said synthetic rubber disposed against the undersurface of said strip and within said recesses;

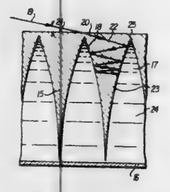
(c) whereby said strip is securable to a base by said cement and is removable by pulling the strip away from the base so that the cement emerges from the recesses.

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SOLAR ENERGY COLLECTION SYSTEM AND APPARATUS FOR SAME UTILIZING LATENT ENERGY STORAGE FLUID

Sidney Levy, 145 W. Cuthbert Blvd., Oaklyn, N.J. 08107

Filed Apr. 26, 1977, Ser. No. 791,044
Int. Cl.² F24J 3/02; C09K 3/18; F03G 7/02
U.S. Cl. 126—436 **19 Claims**



1. A solar energy collector system comprising a lenticulated collector, and substitute-an energy storage fluid comprising a dispersion of a crystalline polymer in a carrier fluid means for controllably circulating said energy storing fluid through said lenticulated collector panel and thence on to a heat engine and a heat exchanger whereby the energy collected in said energy storage fluid is converted to useful shaft work and also exchanged with other fluids for heating.

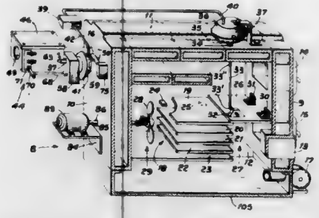
15. A solar collector system energy storage fluid which comprises a dispersion of a crystalline polymer in a heat transfer fluid whereby heat energy is stored as both sensible heat and as latent heat of crystallization in said storage fluid.

4,176,656

NITROGEN-HEAT SEPARATOR FURNACE

Alexander F. Komorowski, 69 E. Fourth St., Bayonne, N.J. 07002

Filed Apr. 10, 1978, Ser. No. 894,895
Int. Cl.² F24D 19/00; F24H 7/00
U.S. Cl. 126—400 **2 Claims**



1. A nitrogen heat separator furnace comprising:

(a) an enclosure having a front, back, top, sides and a base and formed with doors on the front for access to the interior of the enclosure;

(b) a fuel burner mounted in the enclosure;

(c) a furnace temperature control;

(d) an outside temperature control electrically connected to the furnace temperature control to activate the furnace temperature control when outside temperatures fall to a predetermined level;

(e) a plurality of heat absorbing elements containing passages mounted in the central area of the enclosure inward from the front and back walls to provide a front gas passage and rear gas passage for hot gas flow around the heat absorbing elements and through the elements;

(f) a fan operatively mounted at the rear of the enclosure to circulate the heated gas through the enclosure when the fuel burner stops operating;

(g) a baffle movably mounted on the inner face of the front wall being of a predetermined size to extend horizontally from the front wall to the top front edge of the heat absorbing elements and between the side walls;

(h) a baffle rod mounted on the upper face of the baffle;

(i) an exhaust port formed in the upper part of the wall of the enclosure;

(j) a flue pipe connected to and extending outwardly from the exhaust port;

(k) a curtain housing mounted outside of the enclosure at the end of the flue pipe, the curtain housing having a front wall formed with an opening to contain the end of the flue pipe, a back wall formed with an opening leading to a chimney, a top, two side walls and a base;

(1) a movably mounted draft-diverter door being formed in one side wall, said door being closed during the fuel combustion phase of operation of the furnace;

(2) moving means attached to the draft-diverter door;

(3) a heat seal formed inside the front wall, the seal being a frame having a top, two sides and a base, the frame being affixed against the front wall of the curtain housing with its opening surrounding the opening to the flue pipe;

(4) a support channel mounted horizontally across the center of the top of the heat seal;

(5) a heat retaining curtain of inflammable flexible material affixed into the support channel and covering the opening of the frame;

(6) a crank shaft movably mounted through the top of the heat seal between the heat retaining curtain and the front edge of the heat seal, the crank shaft being formed with two downwardly extending arms spaced to lift the heat retaining curtain up into the curtain housing;

(7) pivot connection means operably connected to the shaft and to the pull rod attached to the draft-diverter door to simultaneously raise the arms of the shaft lifting the heat retaining curtain and close the draft-diverter door and thereafter to simultaneously lower the arms of the shaft and open the draft-diverter door;

(8) electronic switching means connected to the pivot connection means;

(l) an air compressor;

(m) tubing;

(n) two diaphragm housings, each having a diaphragm partition, each housing being connected to the air compressor by tubing, one diaphragm housing being connected to the baffle rod attached to the baffle and the second diaphragm housing being attached to the pivotal connection means of the curtain housing; and

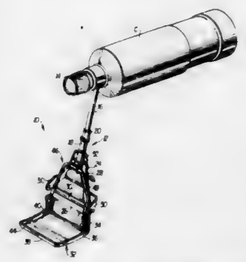
(o) an electrical stack relay operatively connected to the furnace temperature control and outside temperature control and formed to send out current in two legs, one leg being connected to the electronic switching means which is operatively connected to the pivotal connection means of the curtain housing and the second leg connected to activate the air compressor, whereby when the thermostat control is activated, the air compressor will operate to force compressed air into the two diaphragms, one diaphragm forcing down the baffle rod within the enclosure so that the baffle will be down and hot air will be directed into the heat absorbing elements and the second diaphragm moving the pivot connection means connected to the curtain housing, raising the heat retaining curtain, closing the draft diverting door and closing the pivot control switch, which closes the electrical circuit within the furnace to activate the oil burner; when the thermostat has been satisfied the circuit is broken, the air compressor stops, the pivot connection means reverse, the heat retaining curtain falls, the draft diverter door opens to provide a through furnace draft and the pivot control switch opens.

4,176,657

APPARATUS FOR WAXING SKIS

Åke Eriksson, Upplands Väsby, and Åke Norin, Järfälla, both of Sweden, assignors to Primus-Sievert AB, Sundbyberg, Sweden

Filed Oct. 28, 1977, Ser. No. 846,353
Int. Cl.² F24J 3/00; F23C 5/02
U.S. Cl. 126—401 **6 Claims**



1. Apparatus for waxing skis comprising a waxing iron, a gas burner assembly including controllable valve means for attaching said burner assembly to a can of gas, said burner assembly having a burner head, means for releasably attaching said waxing iron to said burner assembly, said waxing iron having a substantially L-shaped longitudinal cross-sectional profile and including a leg portion for receiving said burner head and a base portion for spreading wax over the sole of a ski, said base portion including a plate having top and bottom surfaces, said top surface defining a trough for receiving and retaining a flame emanating from said burner head and adapted to heat said waxing iron, and wherein said bottom surface has a convex configuration whereby only a limited portion of the surface area thereof may contact the surface of a ski thereby preventing burning of the ski or the wax being spread thereon, wherein said means for releasably attaching said waxing iron to said burner assembly is a quick connect-disconnect device including a resilient snap element, said releasably attaching means further including a U-shaped rod pivotally connected at the ends thereof to said waxing iron, said resilient snap element comprising a resilient wire having a generally U-shaped configuration with a bight portion and two leg portions and wherein said leg portions are bent back upon themselves defining a generally V-shaped longitudinal cross-section, the bight portion of said resilient wire being pivotally connected to said U-shaped rod, and wherein when said waxing iron is attached to said burner assembly said resilient wire is pivoted in a first direction and the bent back leg portions thereof snapped under one side of said burner assembly thereby pivoting said U-shaped rod down against the other side of said burner assembly.

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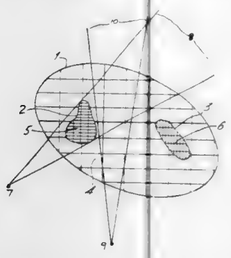
ULTRASONIC ECHOGRAM DISPLAY

George Kossoff, Northbridge, and David E. Robinson, Avalon Beach, both of Australia, assignors to The Commonwealth of Australia, Phillip, Australia

Filed May 8, 1975, Ser. No. 575,714
Int. Cl.² A61B 10/00; G01N 29/00
U.S. Cl. 128—660 **2 Claims**

1. A method of displaying information obtained by ultrasonic echoscopic examination of an object, said examination comprising the steps of transmitting pulses of ultrasonic energy into the object and receiving echoes of said pulses of ultrasonic energy reflected by acoustic impedance discontinuities within the object, which method comprises forming a first display of information representative of the position of acoustic impedance discontinuities within said object, analyzing said echoes to obtain information representative of additional parameters such as velocity of propagation, scattering properties and

attenuation characteristics of said object and simultaneously displaying in said first display said information representative



of additional parameters of said object, wherein the additional information displayed in said first display is displayed by means of changes in gray scale.

4,176,659

CATHETER WITH MEASUREMENT ELECTRODES

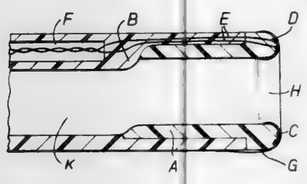
Peter Rolfe, 9, Henwood Dr., Boars Hill, Oxford, England

Filed Jul. 19, 1977, Ser. No. 816,950

Claims priority, application United Kingdom, Jul. 21, 1976, 30288/76

Int. Cl.² A61B *5/00*

U.S. Cl. 128—635 **8 Claims**



1. A catheter comprising a tubular body which defines therewithin a passage which extends to an axially-facing open end of the tubular body and which serves as a sampling port at the tip of the catheter, said catheter further comprising first and second annular electrodes which are arranged in spaced relationship on the rim of the said open end around the sampling port, and electrical connection means for connecting said first and second electrodes to measuring equipment.

4,176,660

DISPOSABLE ESOPHAGEAL AND TRACHEAL MULTI-PROBES

Kenneth C. Mylrea, Tucson, Ariz., and Joseph Demer, Baltimore, Md., assignors to University Patents, Inc., Norwalk, Conn.

Filed Mar. 10, 1978, Ser. No. 885,173

Int. Cl.² A61B *5/02*

U.S. Cl. 128—671 **6 Claims**



1. A disposable esophageal probe comprising a flexible plastic tube having proximal and distal portions and an unobstructed lumen, said tube adapted to be inserted into a patient's mouth and then into the esophagus:

a plurality of conductive pathways longitudinally embedded in the wall of said plastic tube, said pathways having substantially similar flexibility to said plastic tube and being insulated from each other and the patient by the plastic of said tube;

at least a pair of conductive bands encircling said tube's distal portion, each band making contact with at least one embedded conductive pathway and being adapted to receive ECG signals and

a connector plug mounted on the proximal portion of said plastic tube, said connector plug having a plurality of sharp metal connecting pins which pierce and electrically connect to said conductive pathways, said plug further having an unobstructed lumen which mates with the lumen of said tube.

4,176,661

PHOTOENDOSCOPE HAVING A DISTAL ELECTRONIC FLASH-TUBE GUARD

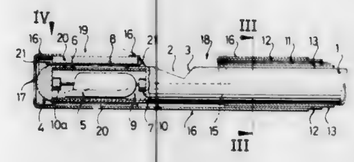
Herbert Schubert, and Siegfried Hiltebrandt, both of Knittlingen, Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Filed Sep. 20, 1977, Ser. No. 834,864

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1976, 2643233

Int. Cl.² A61B *1/04*

U.S. Cl. 128—6 **4 Claims**



1. In a photoendoscope comprising a telescope tube defining a viewing port near its distal end, flash-tube assembly means connected to the distal end of the telescope tube and including a flash-tube proper enveloped in transparent protective sheath means, arranged in a housing defining an aperture for transmitting light from the flash-tube proper, and light conductor means extending along the telescope tube and terminating proximally of said viewing port, the improvement comprising:

(a) a barrel enclosing the flash-tube assembly means and at least the distal end regions of the telescope tube and the light conductor means,

(b) two apertures formed in the barrel and aligned respectively with the viewing port and with the flash-tube assembly light transmitting aperture,

(c) a transparent cylindrical sheath which is secured in the barrel and which covers the flash-tube assembly light transmitting aperture, said transparent cylindrical sheath having a wall thickness which is greater where it covers said flash-tube assembly light transmitting aperture than in the remainder of the sheath.

4,176,662

APPARATUS FOR ENDOSCOPIC EXAMINATION

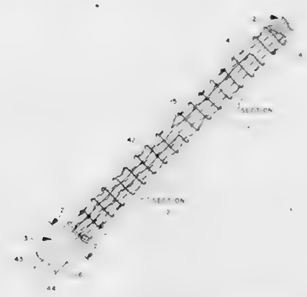
Robert E. Frazer, La Canada, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 17, 1977, Ser. No. 807,597

Int. Cl.² A61B *1/06*; A61M *25/00*

U.S. Cl. 128—6 **2 Claims**

2. An endoscope having a sheath comprised of an inner plastic tube, a braided metal tube over the inner tube, and a plastic outer tube over the braided metal tube with a material in the interstices of the braided metal tube and the space between the inner and outer plastic tubes which has a very sharp melting point slightly above body temperature, said sheath



having different sections wound with insulated heating wires around the braided metal tube and inside the outer tube, and separate insulated wires inside the outer tube to the different heating wires for control of the rigidity of said sheath by sections from the proximal end of the endoscope.

4,176,663

MEDICAL VENTILATION APPARATUS

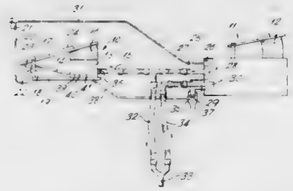
Anthony M. Hewlett, Harrow, England, assignor to National Research Development Corporation, London, England

Filed Oct. 4, 1977, Ser. No. 839,381

Claims priority, application United Kingdom, Oct. 5, 1976, 41302/76

Int. Cl.² A61M *16/00*

U.S. Cl. 128—204.26 **11 Claims**



1. Medical ventilation apparatus comprising:

a pre-set volume flow rate supply of gas, a constant pressure primary reservoir having a first preselected volume connected to said supply, gas delivery means connected to said primary reservoir to convey gas therefrom to a patient on demand for spontaneous respiration, a secondary reservoir having a second preselected volume, means for passing any excess of gas from said supply to said primary reservoir over said first preselected volume to said secondary reservoir, said secondary reservoir being connected to said delivery means, control means operable in response to accumulation of said first preselected volume of gas in said primary reservoir and said second preselected volume of gas in said secondary reservoir to forceably deliver gas to the patient from said secondary reservoir for artificial respiration.

4,176,664

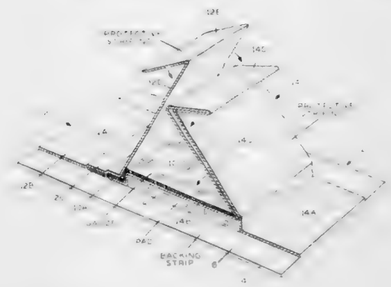
IMPREGNATED BANDAGE

Stanley Kalish, 2727 De Anza Rd., M-22, San Diego, Calif. 92109

Filed Mar. 13, 1978, Ser. No. 885,620

Int. Cl.² A61L *15/00*

U.S. Cl. 128—156 **22 Claims**



1. An impregnated bandage comprising:

(a) a backing having an adhesive surface on one side;

(b) an absorbent pad positioned partially along the length and intermediate the ends of the adhesive strip;

(c) a first protective strip attached to one portion of the adhesive extending beyond one end of the absorbent pad;

(d) a second protective strip having a first leg connected to a second portion of the adhesive extending beyond the other end of the absorbent pad;

(e) said second protective strip having a second leg positioned on the top of the absorbent pad;

(f) an impregnated gauze strip positioned in face-to-face engagement with the upper surface of said second leg of said second protective strip.

4,176,665

STOCKING KNEE BRACE

George I. Terpening, Telford, Pa., assignor to Acro Matic Inc., Warrington, Pa.

Filed Oct. 20, 1977, Ser. No. 843,810

Int. Cl.² A61F *1/60*

U.S. Cl. 128—165 **5 Claims**



1. A stocking knee brace comprising a form fitting sheath

having a knee portion, shin portion, and foot portion, which sheath is adapted to encircle the leg of a person from a position below the ankle to a position above the knee, including

(a) a U-shaped elastic strap inside said sheath, the ends of said strap being secured to said shin portion of said sheath while the strap portion intermediate said ends provides means for engaging the foot of said person,

(b) a pair of vertically elongated openings located on opposing sides of said knee portion of said sheath, and

(c) fastening means on said knee portion of said sheath to restrict said openings and thereby apply compressive pressure to the knee of said person.

4,176,666

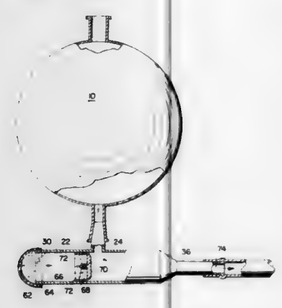
GAS SCAVENGER SYSTEM

Thomas C. Hovey, 23 Mt. Desert Dr., Bangor, Me. 04401

Continuation-in-part of Ser. No. 691,357, Jun. 1, 1976, abandoned. This application Oct. 3, 1977, Ser. No. 838,568

Int. Cl.[2] A61M *17/00*

U.S. Cl. 128—205.24 **7 Claims**



1. A gas scavenger apparatus comprising an accumulating bag, said accululating bag having a pair of openings therein, one of said pair of openings for coupling to a patient's anesthetic circuit, accumulator bag emptying means defining a passageway having first and second inlet parts and an outlet part, said second inlet part located intermediate said first inlet part and said outlet part, vacuum means connected to said outlet part, valve means coupled intermediate said first inlet part and said second inlet part for selectively admitting surrounding air into said passageway, said other of said pair of openings of said accumulating bag for selectively emptying said accumulating bag being connected to said second inlet part of waste gas accumulated therein when said valve means are closed and to discharge said waste gas simultaneously into said vacuum means, bias means for urging said valve means in said closed position when said waste gas is being emptied, said accumulating bag emptying means admitting said surrounding air and simultaneously emptying said accumulating bag when said valve means is in an open position, means to filter said surrounding air passing through said first inlet part when said valve means is in said open position, said valve means including a disc shaped rubber-like member and a flat valve seat, said valve seat having an opening therein, said disc shaped rubber-like member being disposed closing said opening in said flat valve seat when said valve means is in said closed position, the marginal edges of said disc being disposed outwardly from said valve seat when said valve means is in said open position.

4,176,667

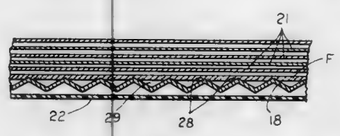
DISPOSABLE LIQUID ABSORBENT PAD AND METHOD

Julian N. Herring, Greenwood, S.C., assignor to Adult Care Products, Inc., Greenwood, S.C.

Filed Oct. 25, 1977, Ser. No. 845,377

Int. Cl.[2] A61F *13/16*; A61L *15/00*; A61F *13/00*

U.S. Cl. 128—287 **3 Claims**



1. The method of making a disposable liquid absorbent pad for use as a diaper sanitary napkin and the like comprising the steps of:

forming a film of polymeric material capable of forming a gel upon application of liquid thereto;

providing a crinkled absorbent sheet having apex portions for receiving said film thereacross; and

producing a controlled amount of gel on said film forming a limited bond with said sheet at the apex portions facilitating wicking of liquid applied to the pad thus formed through voids between apex portions of said crinkled absorbent sheet.

4,176,668

NOVEL RECONSTITUTED TOBACCO SHEETS AND PROCESS

Joseph V. Fiore, Fairfield, and John M. Slanski, Trumbull, both of Conn., assignors to AMF Incorporated, White Plains, N.Y.

Filed May 2, 1977, Ser. No. 793,232

Int. Cl.[2] A24B *3/00, 3/14*

U.S. Cl. 131—17 A **23 Claims**

1. A reconstituted tobacco sheet coated on at least one surface thereof with a hydrophobic coating comprising ethylcellulose and substantially uniformly dispersed therein, a spectrophotometrically-determinable, pharmacologically-acceptable metal cation, naturally occurring in tobacco wherein the weight ratio of said metal cation to ethyl cellulose is from about 1:30 to about 1:80, and said metal cation is present in said coating in a proportion at least three times the amount naturally-occurring in said tobacco sheet, the quantity of said coating per unit area of said sheet varying less than about 5% along the sheet length.

4,176,669

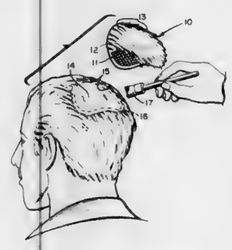
METHOD OF ATTACHING HAIR PIECES

Don Levin, 453 Kelton, Los Angeles, Calif. 90024

Filed May 31, 1977, Ser. No. 801,554

Int. Cl.[2] A41G *3/00*

U.S. Cl. 132—53 **4 Claims**



1. A method of attaching a hair piece to cover a bald area on a person's head wherein the contour of the hair supporting base material of the hair piece has been cut to correspond to the perimeter of the bald area, including the steps of:

(a) coating the perimeter of said bald area with a bonding material which penetrates the pores of the skin and cures in the presence of water to define a marginal track about the peripheral edge of the bald area which is effectively mechanically locked to the scalp;

(b) embedding a reinforcing material in said marginal track while in a tacky state so as to be retained in its set position after said bonding material completely dries; and

(c) stitching the periphery of said hair supporting base material of said hair piece to said reinforcing material in said marginal track.

4,176,670

STORING AND FEEDING DEVICE FOR FLAT PARTS

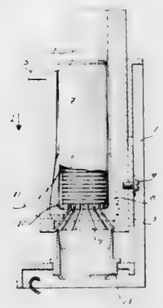
Pierre Repetti, Prilly, Switzerland, assignor to Systems and Technics S.A., Gland, Switzerland

Filed Feb. 17, 1978, Ser. No. 878,943

Claims priority, application Switzerland, Feb. 21, 1977, 2122/77

Int. Cl.[2] G07D *1/00*

U.S. Cl. 133—4 R **9 Claims**



1. Storing and feeding device for flat parts characterized by the fact that it comprises a tube having at least one portion of its internal cross section such that the parts slide freely within the tube and one end portion of which presents an internal wall widening towards the outside, by the fact that the tube comprises, near its widened open end, retaining means defining in storage position an area of smaller dimension than the cross section of the parts to be stored, by the fact that the tube is slidably mounted on a support provided with opening means adapted to widen the retaining means and to liberate the parts in order to feed a machine with which said support cooperates, and by the fact that the flat parts are provided with a packaging comprising an opening strip and at least a sealing flange, the opening strip being accessible from the outside of the tube through a longitudinal opening provided in its wall.

4,176,671

FAST RESPONSIVE VALVE

Paul S. Citrin, Danbury, Conn., assignor to Indicon Inc., Brookfield Center, Conn.

Filed Feb. 21, 1978, Ser. No. 879,532

Int. Cl.[2] F16K *31/02*

U.S. Cl. 137—1 **11 Claims**

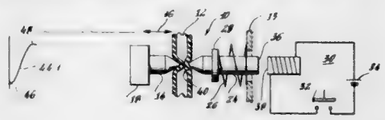
1. A valve for controlling fluid flow through a conduit comprising

a drive element operatively disposed relative to the conduit for repetitive movement between partial fluid flow inhibiting and enabling positions;

means for operatively moving said drive element repetitively between said positions;

a follower mounted generally opposite the drive element to move between fluid flow inhibiting and enabling positions which are complementary to the fluid flow inhibiting and enabling positions of the drive element to effect fluid flow control through the conduit;

means for effectively coupling said follower to the moving means for cooperative repetitive movement with the drive element between said complementary positions;



holding means for retaining said follower in one of said complementary positions for a time period selected to alter the flow of fluid through the conduit; and

means for actuating said holding means and interrupt said cooperative movement between the follower and the drive element when said follower is driven to said one complementary position.

4,176,672

MIXING APPARATUS FOR A FIRST LIQUID COMPONENT WITH AT LEAST ONE ADDITIONAL COMPONENT

Hartmut Borberg, Munich, Fed. Rep. of Germany, assignor to Apparatebau Gauting GmbH, Gauting and Ernst Muller KG., Winnenden, both of, Fed. Rep. of Germany

Filed Dec. 23, 1977, Ser. No. 863,732

Claims priority, application Fed. Rep. of Germany, Nov. 1, 1977, 2700875

Int. Cl.[2] G05D *11/13*

U.S. Cl. 137—99 **2 Claims**



1. An apparatus for mixing a first liquid component with at least one additional liquid component, comprising:

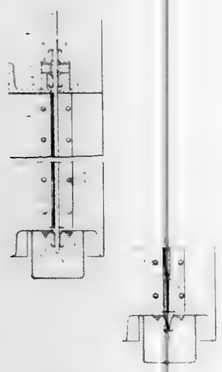
a supply line for each of the components; a fluid flow-through measuring device connected to said supply line for said first component and generating a number of electrical pulses corresponding to the flow volume; a feed pump connected to said supply line for each additional component; an electric driving motor for each feed pump; and a current supply circuit for each driving motor maintaining an adjusted mixing ratio, and to which pulses generated by said flow-through measuring device are fed, wherein said flow-through measuring device is a gear pulser, said driving motor is a stepping motor, said feed pump is a geared pump, and said current supply circuit is a control circuit for generating control pulses, said control circuit comprising a signal processing circuit to which impulses generated by said flow-through measuring device are fed and which generates needle pulses therefrom whose time duration (t_g) is short in relation to the pulse

recurrence time (T_g), said control circuit also comprising a pulse generator which generates pulses with a much shorter recurrence time (T_z) than said flow-through measuring device, and said control circuit also comprising a counter to which the pulses of said pulse generator are fed as counting pulses, either completely or partially depending on the desired mixing ratio (α), and said needle pulses are fed as restorer pulses, and which generates at its output a binary signal corresponding to the number of counted pulses, and said control circuit further comprising an intermediate store to which said binary signal and said needle pulse are fed as the signals to be stored, and said control circuit additionally comprising a divider to which the complete pulses of said generator are fed as well as the binary signal stored by said intermediate store and which generates at its output the control pulses for said stepping motor whose pulse recurrence time (T_g/α) is equal to the pulse recurrence time (T_z) of the pulses generated by said pulse generator divided by the number $\alpha T_z/T_g$ coresponding to the binary signal.

4,176,673
PURGED SLIDING GATE VALVE

Peter J. Connor, Bethlehem, Pa., assignor to Mosser Industries, Inc., Bethlehem, Pa.

Continuation-in-part of Ser. No. 802,892, Jun. 2, 1977, Pat. No. 4,093,245. This application Dec. 19, 1977, Ser. No. 862,133
The portion of the term of this patent subsequent to Jun. 6, 1995, has been disclaimed.
Int. Cl.² F16K *3/02*; F23L *13/06*
U.S. Cl. 137—240 **21 Claims**

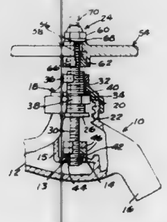


1. In a sliding gate valve comprising
a housing having a fluid flow opening therethrough and an aperture in its wall;
a gate member having opposite upstream and downstream faces and terminating in peripheral edges, said gate member being adapted for sliding movement through the aperture between valve-open position, wherein the gate member is withdrawn from the housing, and valve-closed position, wherein the gate member extends through the aperture and into the housing to restrict the flow of fluid through the housing, two of the peripheral edges of the gate member being side edges, by which is meant opposite edges which are parallel to the direction of sliding movement of the gate member, and one of the peripheral edges being a forward edge, by which is meant the leading edge during movement of the gate member from valve-open position to valve-closed position;
means forming an enclosed void space between at least one of the gate member side edges and the adjacent wall of the housing when the gate member is in the valve-closed position, said void space running substantially the entire length of the side edge, said void space forming means including sealing means cooperating with the gate member when in the valve-closed position to seal against the leakage of upstream and downstream fluids into the void space; and
means for injecting pressurized fluid from a source external to said housing into said void space;
the IMPROVEMENT wherein said sealing means comprise
a downstream seat mounted on the interior wall of the housing in such a manner that the downstream face of the gate member abuts against the seat when in the valve-closed position, and
an upstream seat assembly comprised of a rigid, elongated channel means mounted on the interior wall of the housing in such a manner that the channel is parallel to and upstream of the gate member when in the valve-closed position, said channel having a back wall and at least one side wall, said back wall being substantially parallel to the plane of said gate member; a rope which is resiliently compressible across its width positioned lengthwise in said channel; and elongated metal strip, with opposing front and rear surfaces, being flexibly attached along the first of its two long edges to a side wall of the channel so as to sandwich the rope between the back wall of the channel and the rear surface of the metal strip; said seat assembly being positioned such that when the gate member is in the valve-closed position the gate member's upstream face presses against the front surface of the metal strip in sealing engagement therewith, urging the strip against the rope, the resilience of the rope providing a pressure counter to that exerted by the gate member; said downstream seat and upstream seat assembly being so adapted that in the valve-open position the metal strip's front surface is urged against the downstream seat in sealing engagement, effectively closing the void space, and in positions intermediate valve-open and valve-closed, a generally triangular opening to said void space is formed immediately in front of the forward edge of the gate member.

4,176,674
FAUCET REPLACEMENT VALVE STEM ASSEMBLY

Manuel F. Rodriguez, 4234 Avery Ave., Detroit, Mich. 48208

Filed Aug. 16, 1978, Ser. No. 934,027
Int. Cl.² F16K *43/00*
U.S. Cl. 137—315 **11 Claims**

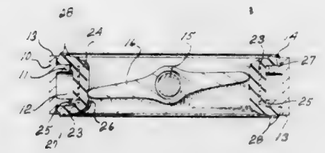


1. A replacement valve stem assembly for a faucet of the type having a vlave seat positioned in alignment with an apertured cap threaded on the faucet body and through which the valve stem of the faucet normally extends comprising, a sleeve which is threaded both internally and externally and having an outer diameter such as to enable the sleeve to extend through the valve stem aperture in said cap, means engaged with the external threads of said sleeve for fixedly attaching the sleeve to said cap so that the sleeve extends through the cap aperture, an externally threaded valve stem engaged with the internal threads of said sleeve and having a length substantially greater than said sleeve so that when the sleeve is secured to said cap and the cap is threaded on the faucet body the inner end of said stem terminates beyond the inner end of said sleeve adjacent the valve seat in the faucet body and the outer end of said stem extends outwardly beyond said cap and the outer end of said sleeve, means threaded on the inner end of said stem for securing thereon a valve washer adapted to seal said valve seat when the stem is rotated in one direction within said sleeve and nut members threaded on the outer end of said stem for securing a faucet handle thereto.

4,176,675
FLOATING SEAT BUTTERFLY VALVE

Richard Liberman, Montreal, Canada, assignor to Crane Co., New York, N.Y.

Filed Apr. 19, 1978, Ser. No. 897,613
Claims priority, application Switzerland, Apr. 20, 1977, 276542
Int. Cl.² F16K *49/00, 1/22, 25/00*
U.S. Cl. 137—340 **2 Claims**



1. A butterfly valve assembly adapted for positioning between opposing, spaced-apart flanges in a fluid flow system, said assembly comprising:
A. a rigid body having opposing external flat parallel end surfaces adapted to mate with the opposing flanges, said body having opposing internal end surfaces spaced inwards from and having a smaller diameter than said external end surfaces, said body adapted to permit fluid flow therethrough and to accept a valve closure member;
B. a valve closure member rotatably mounted within said body and adapted to cooperate with a seat assembly to regulate fluid flow through said rigid body;
C. a seat assembly adapted to co-operate with said valve closure member between an open position and a closed position, said seat assembly comprising:
i. a flexible steel ring disposed in said rigid body for resilient flexible engagement with an annular seat; and,
ii. an annular seat disposed in said rigid body (supporting said flexible ring), said annular seat is an elastomeric material bonded to and about said flexible ring, said seat assembly and said rigid body defining an annular space therebetween adapted for the passage of a fluid medium therethrough, said seat assembly having an external flange on each end adapted to be clamped between its respective internal end surface and one of the opposing flanges, said external flange on each end extending completely about the flexible steel ring thereby forming a seat for said flexible ring of U-shaped half cross-section configuration; and,
D. an inlet connector and an outlet connector communicating with the annular space and adapted to receive and pass a fluid medium therethrough, whereby rotation of said valve closure member to a closed position forces said seat assembly to deform into the annual space and simultaneously permits fluid to pass from said inlet connector through the annular space to said outlet connector.

4,176,676
MEANS FOR CONVERTING A WATER DRIVE CENTER PIVOT IRRIGATION SYSTEM TO AIR DRIVE

Loren R. Townsend, Apartment 4, #5 Olympic Gardens, York, Nebr. 68467

Continuation-in-part of Ser. No. 866,558, Jan. 3, 1978. This application May 3, 1978, Ser. No. 902,440
Int. Cl.² B05B *3/12*
U.S. Cl. 137—344 **1 Claim**



1. A self-propelled sprinkling system comprising,
a water supply pipe movable about a center pivot point,
a plurality of spaced-apart, wheeled drive towers supporting said supply pipe above the area to be sprinkled,
each of said towers comprising a frame means having a pair of spaced-apart drive wheels rotatably mounted thereon,
a trojan bar means reciprocatably mounted on said frame means and movable between first and second positions for engagement with at least one of said drive wheels for driving said wheel when said trojan bar means moves in at least one direction,
an air operated drive means on each of said towers to propel said towers to move said towers and supply pipe about said center pivot point,
a source of compressed air for supplying air under pressure to said drive means,
said air operated drive means comprising an air cylinder mounted on said frame means and being operatively connected to said trojan bar means to reciprocate said trojan bar means, said air cylinder being movable between extended and retracted positions,
and a control means for controlling the operation of said air cylinders so that the associated tower is propelled at the desired rate relative to the other towers in the system,
said control means including means operatively connected to the source of air pressure and said air cylinder for automatically moving said air cylinder between its fully extended and retracted positions so that said trojan bar means is fully reciprocated between its said first and second positions,
said air cylinder having first and second ends,
said air cylinder having first and second valves mounted on its said first and second ends respectively which have valve plungers positioned in said air cylinders and which are operatively engaged by the piston of said air cylinder when said air cylinder is moved to its fully extended and retracted positions respectively,
said first valve being a three-way, normally closed, plunger and pilot operated valve which is opened when said air cylinder is fully retracted, said first valve having an inlet connected to said source of air pressure, said second valve being a three-way, plunger operated, normally closed,

spring return valve which is opened when said air cylinder is fully extended,

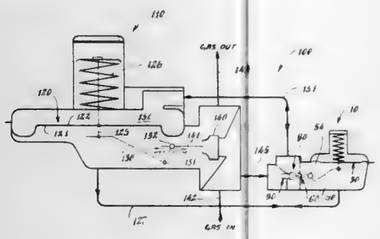
a three-way, pilot operated, normally closed, spring return valve having a pilot portion connected to the outlet of said first valve and an outlet connected to the interior of said air cylinder adjacent said first end,

said control means including an alignment control valve having an inlet operatively connected to said source of air pressure, said alignment control valve permitting system air pressure to flow from its outlet upon being actuated, the outlet of said alignment control valve being connected to said three-way piloted operated valve,

the pilot portion of said first valve being connected to said second valve, said second valve being connected to said source of air pressure, said first valve opening when said air cylinder is fully retracted to permit system pressure to flow through said first valve to the pilot portion of said three-way, pilot operated valve to open said three-way, pilot operated valve so that air from said alignment control valve flows into said air cylinder to cause said air cylinder to commence an extending stroke, said second valve being opened when said air cylinder is fully extended so that system pressure flows into the pilot portion of said first valve to close said first valve thereby exhausting system pressure from the pilot portion of said three-way, pilot operated valve to close said three-way, pilot operated valve and to exhaust the pressure from said air cylinder, and

means operatively connected to said air cylinder to retract said cylinder upon said air cylinder being exhausted.

4,176,677
RELAY PILOT REGULATOR
George C. Hughes, Anderson, Ind., assignor to Textron Inc., Providence, R.I.
Filed Dec. 9, 1977, Ser. No. 859,041
Int. Cl.[2] G05D *16/06*
U.S. Cl. 137—488 **11 Claims**



1. A relay pilot regulator for use in combination with a main regulator in a gas distribution system, the gas distribution system including an inlet conduit supplying gas at an inlet pressure and an outlet conduit for delivering gas at a reduced outlet pressure, the main regulator including a main valve controlling gas flow from the inlet conduit to the outlet conduit and thereby also controlling the outlet pressure, a main regulator diaphragm mechanically linked to the main valve and a loading chamber the loading pressure in which acts on the main regulator diaphragm wherein the loading pressure positions the main regulator diaphragm and the main valve, the relay pilot regulator comprising:

(A) a housing defining

(1) an inlet passage connected to the inlet conduit for supplying gas at the inlet pressure,

(2) a load/unload passage intersecting the inlet passage adjacent the end thereof, the load/unload passage connected to the loading chamber of the main regulator, and

(3) an unload passage intersecting the load/unload passage adjacent the end thereof, the unload passage and the inlet passage being generally aligned, and the unload passage connected to the outlet conduit;

(B) an unloading valve slideably mounted in the unload passage and slideable between a first closed position blocking the unload passage and a second open position unblocking the unload passage and thereby connecting the unload passage with the load/unload passage for permitting gas to flow from the loading chamber to the outlet conduit;

(C) a loading valve slideably mounted to the unloading valve in the load/unload passage and extending to the inlet passage and slideable between a first closed position blocking the inlet passage and a second open position unblocking the inlet passage and thereby connecting the inlet passage with the unload/load passage for supplying gas from the inlet conduit to the loading chamber;

(D) a relay pilot regulator diaphragm and means for applying the outlet pressure thereto, wherein the relay pilot diaphragm monitors the outlet pressure and moves in response to changes in the outlet pressure;

(E) a mechanical linkage connecting the relay pilot regulator diaphragm to the loading valve and the unloading valve, the relay pilot regulator diaphragm and the mechanical linkage operating to

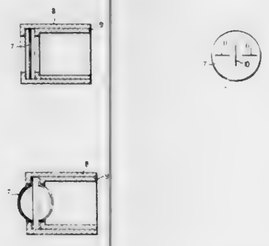
(1) open the loading valve when the outlet pressure is below a given desired outlet pressure, thereby supplying gas at the inlet pressure to the loading chamber of the main regulator for acting on the main regulator diaphragm to open the main valve and increase the outlet pressure to the given desired outlet pressure,

(2) close the loading valve when the outlet pressure is at or above the given desired outlet pressure,

(3) open the unloading valve when the outlet pressure is above the given desired outlet pressure, thereby decreasing the pressure in the loading chamber and causing the main regulator diaphragm to close the main valve and reduce the outlet pressure to the given desired pressure, and

(4) close the unloading valve when the outlet pressure is at or below the given desired outlet pressure.

4,176,678
SAFETY DEVICE FOR VENTING A FUEL TANK
Raymond Marchaix, Paris, and Alain Le Cun, Crespiere, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancoult, France
Filed Dec. 6, 1977, Ser. No. 857,936
Claims priority, application France, Dec. 6, 1976, 76 36642; Jun. 29, 1977, 77 19914; Sep. 16, 1977, 77 28106
Int. Cl.[2] F16K *15/14*
U.S. Cl. 137—493 **11 Claims**

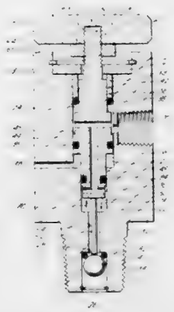


1. A safety device for venting a fuel tank, particularly for automobiles, comprising:

two concentric cylindrical elements having a plurality of flanges and constituting a valve body,

a natural or synthetic hydrocarbon resistant elastomer diaphragm pierced by a plurality of slits and held between the flanges of the two concentric cylindrical elements constituting the valve body, a clearance being provided between the diaphragm and the flanges holding the diaphragm so as to prevent the flanges from causing stresses in the diaphragm capable of deforming the slits and modifying unpredictably gaseous flow through the slits.

4,176,679
CHECK VALVE
Harry Roger, 124 Banks Ave., Lafayette, La. 70506
Filed Mar. 27, 1978, Ser. No. 890,669
Int. Cl.[2] F16K *31/14*
U.S. Cl. 137—495 **6 Claims**



1. A check valve, comprising:

(a) a valve body having:

(i) a bore with first and second sections, the cross sectional area of the first section being smaller than the cross sectional area of the second section,

(ii) an inlet communicating with the first section of said bore for receiving flowing fluid into said valve body,

(iii) a shoulder disposed between the first section of said bore and said inlet for providing a valve seat, and

(iv) an outlet communicating with the second section of said bore for discharging flowing fluid from said valve body;

(b) a valve element mounted within the inlet of said valve body for engaging with the valve seat to shut off fluid flow through said valve body;

(c) a movable piston mounted with said valve body for controlling movement of said valve element, said piston having:

(i) a body portion slidably mounted with the second section of said bore, said body portion having a shoulder facing away from said valve element,

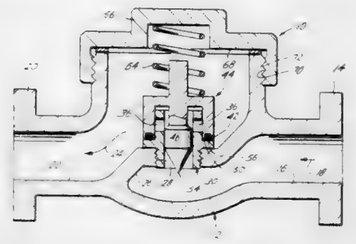
(ii) a male portion extending from said body portion slidably mounted in the first section of said bore, said male portion having a shoulder facing toward said valve element,

(iii) a stem extending from said male portion into the inlet of said valve body, said valve element being mounted with the end of said stem;

(d) a passageway provided in said movable piston for placing the first section of said bore in communication with its second section, an opening force being provided on said movable piston by the pressure from the fluid in the second section on the body portion shoulder, a closing force being provided on said movable piston by the pressure of the incoming fluid acting on said valve element and male portion shoulder; and

(e) said valve element being moved into engagement with the valve seat when the pressure of the incoming fluid is sufficiently great to cause the closing force to override the opening force and thereby check the uncontrolled flow of fluid out of said valve body.

4,176,680
CHECK VALVE
Paul de Launay, 119 W. Farrel, Lafayette, La. 70508
Filed Sep. 30, 1977, Ser. No. 838,148
Int. Cl.[2] F16K *15/02*
U.S. Cl. 137—496 **5 Claims**



1. A check valve used in a fluid flow line, comprising:

A valve body, including

(a) a first portion having

(i) an inlet end for directing the flow of fluid from the flow line through an inlet passageway,

(ii) an outlet end for directing the flow of fluid received from the inlet passageway through an outlet passageway into the fluid flow line,

(iii) a flow channeling shoulder mounted at a junction between the inlet and outlet passageways for directing fluid flow upwardly from the inlet passageway through an opening into the outlet passage,

(b) a second portion having

(i) a tubular section defining a longitudinal passageway with outlet ports extending transversely therefrom, the tubular section being mounted in the opening of the first portion to receive the flowing fluid from the inlet passageway in one end of the longitudinal passageway for fluid flow up the tubular section and out the outlet ports into the outlet passageway,

(ii) a flange extending outwardly from the tubular section at a location below the outlet ports to define an upwardly facing sealing surface, said upwardly facing sealing surface being disposed sufficiently below the outlet ports to inhibit erosion thereof by flowing fluid;

a plunger member mounted within said body, including

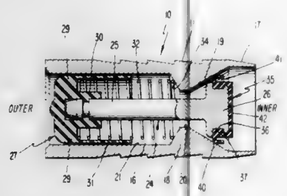
(a) a plug mounted on a lower portion of said plunger member for sliding within the longitudinal passageway of the second portion of said body,

(b) a tubular sleeve mounted with the plunger member and circumscribing the tubular section, said sleeve having a shoulder forming a downwardly facing sealing surface which is engageable with the upwardly facing sealing surface on the flange, the sleeve being moved upwardly by pressure from the fluid in the inlet passageway exerted on the plug; and

a spring mounted within said body urging the downwardly facing sealing surface of said plunger member into engagement with the upwardly facing sealing surface of said body to thereby prevent fluid communication between the inlet and outlet passageways by stopping fluid flow into the outlets ports when the pressure of the fluid within the inlet passageway is insufficient to overcome the force provided by the spring, wherein said plug has a conically shaped lower end with the apex of the cone directed downwardly and the base of the cone being at an elevation which is lower

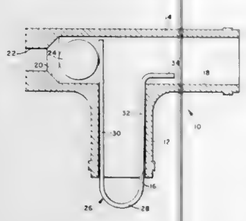
than the downwardly facing sealing surface of said plunger member.

4,176,681
ORAL INFLATION VALVE
Glenn H. Mackal, Buena Vista Dr., Ringwood, N.J. 07456
Filed Sep. 7, 1977, Ser. No. 831,281
Int. Cl.[2] F16K *15/00*
U.S. Cl. 137—516.29 **2 Claims**



1. A check valve, comprising
a valve body having a passage therethrough,
a radially inwardly and axially outwardly converging annular valve seat surrounding the passage,
a movable valve element having a body,
a sealing member having an annular main body mounted on the body of the valve element, the sealing means selectively cooperating with the valve seat to seal the passage when the valve element is in its valve-closed position,
the sealing member being made of elastomeric material and molded in place on the body of the valve element, under increasing thrusting of the sealing member against the valve seat the first portion of the flange on the sealing member being increasingly deformed to narrow the space between the second portion of the flange and the main part of the sealing member, and
upon the imposition of a predetermined thrust of the sealing member against the valve seat the radially inner surface of the second portion of the flange engages the radially outer surface of the main part of the sealing means.

4,176,682
CHECK VALVE BALL STOP CLIP
William K. Diehl, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.
Continuation of Ser. No. 675,614, Apr. 9, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 887,959
Int. Cl.[2] F16K *15/04*
U.S. Cl. 137—533.11 **14 Claims**



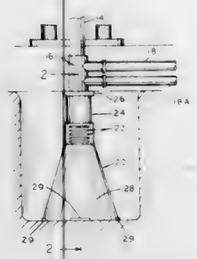
1. In a Tee check valve having a first fluid passage, a second fluid passage intersecting the first fluid passage, a ball valve seat provided in the second fluid passage to one side of the first fluid passage, and a movable ball positioned in the second fluid passage between the seat and first fluid passage, the improvement comprising: an internal stop clip having a generally U-shaped configuration flexible at the base of the U and having an extension at the top of one of the arms of the U extending outwardly from the U in the plane of the U, said stop clip insertable through the first fluid passage of the Tee valve in a compressed condition and expandable to be self-retaining at the intersection of the first and second fluid passages of the Tee check valve with the other one of the arms extending into the second fluid passage so as to retain the ball in the second fluid passage between the seat and first fluid passage.

4,176,683
FLOW REGULATOR
Saul H. Leibinsohn, Rishon-Le-Zion, Israel, assignor to Koninklijke Emballage Industrie Van Leer B. V., Amstelveen, Netherlands
Filed Oct. 4, 1977, Ser. No. 839,303
Claims priority, application Netherlands, Oct. 8, 1976, 7611187; Aug. 17, 1977, 7709108
Int. Cl.[2] F16K *7/04, 47/12*
U.S. Cl. 137—559 **18 Claims**



1. A presettable flow-regulator connectable between two fluid-carrying tubes, comprising: a core connectable at one end to one fluid tube and having a passageway for conducting the fluid therefrom to the outer surface of the core; a flexible sleeve having an open end receivable over said core and connectable at its opposite end to the other fluid tube; said core having an outer diameter slightly smaller than the inner diameter of the flexible sleeve and having a recess of varying cross-section formed in its outer surface and progressing axially of the core; and a ring having an inner diameter slightly smaller than the outer diameter of the flexible sleeve and receivable thereover, said ring being presettable along the length of the flexible sleeve to press the underlying portion thereof against the core at a selected cross-section of said recess to thereby regulate the flow of the fluid between the core and the flexible sleeve from one tube to the other.

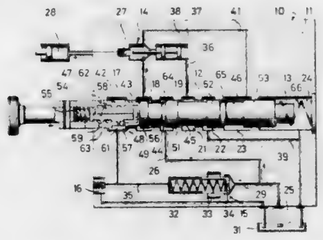
4,176,684
SPLASH DOWN
Richard C. Kelso, and Eileen E. Kelso, both of 588 Summerdale Ave., Glen Ellyn, Ill. 60137
Filed Oct. 26, 1977, Ser. No. 845,486
Int. Cl.[2] E03C *1/00*
U.S. Cl. 137—562 **2 Claims**



1. In combination, a filling and draining attachment joined to a water using appliance, a water faucet spaced above a sink equipped with a lower drain, said attachment connected to the faucet includes a downward vertical discharge outlet, a fluid discharge device comprising:

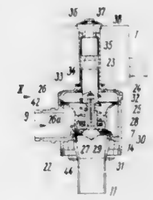
a round hollow truncated cone-shaped body with a tubular structure at the top of the truncated cone,
a movable adjustment tube inserted into the tubular structure portion of the body and extends upward from the body of the device,
said adjustment tube having a series of male shoulder graduations extending around the outside diameter and held by a matching series of female indentations extending around the inside diameter of the tubular structure portion of the body,
said vertical discharge outlet of the faucet attachment is inserted into the top of the adjustment tube and the height of the fluid discharge device is adjusted so that the base of the device rests on the bottom of the sink and encircles the sink drain,
said base of fluid discharge device having magnets embedded into the base of the round truncated cone shaped body to hold the device in use to the bottom of the sink.

4,176,685
VALVE ARRANGEMENT FOR CONTROLLING THE FLOW OF HYDRAULIC FLUID TO AND FROM A USER
Friedrich-Wilhelm Höefer, Ditzingen; Walter Gerschwitz, Moensheim, and Güenther Schwerin, Moeglingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Feb. 9, 1978, Ser. No. 876,216
Int. Cl.[2] F15B *13/04*
U.S. Cl. 137—596.13 **8 Claims**



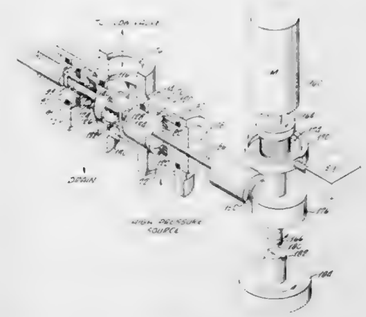
1. In an arrangement for controlling the flow of a hydraulic fluid between a fluid reservoir, a pump and a user, which arrangement is of the type including a main control slide that controls the communication with the fluid reservoir of a pressure chamber which communicates the pump with the user through an input chamber, and that forms an adjustable throttle which influences the operation of a flow-regulating valve which is arranged in parallel to the main control slide between the pump and the fluid reservoir, the arrangement further including a control conduit communicating the flow-regulating valve with a switching chamber the communication of which with the fluid reservoir is controlled by the main control slide, the improvement wherein a control chamber is arranged at the main control slide between the switching chamber and the input chamber, and the main control slide has a control land which interrupts the communication of the switching chamber with the control chamber when the adjustable throttle is fully open; and wherein the adjustable throttle is so arranged as to influence the flow of the hydraulic fluid between the input chamber and the control chamber.

4,176,686
FLOW CONTROL VALVE FOR LIQUIDS
Kurt Stähle, Neuhausen-Steinegg, Fed. Rep. of Germany, assignor to Concordia Fluidtechnik GmbH, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 890,309, Mar. 27, 1978. This application Nov. 20, 1978, Ser. No. 961,927
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1977, 2751775
Int. Cl.[2] F16K *19/00*
U.S. Cl. 137—604 **17 Claims**



1. Flow control valve for liquids, such as water or the like heated to near the boiling point; comprising:
a sealing body,
a valve seat which cooperates with the sealing body to form a throttling point,
ventilating aperture means opening into the flow of liquid through said valve at a position downstream of the throttling point,
said sealing body being formed as a closure element with an elastically yielding tapered part, said valve seat being formed as a relatively thin seating plate that extends inwardly from said aperture means and includes an inner edge which cooperates with the tapered part.

4,176,687
HOLLOW SPOOL VALVE
Harold W. Ensign, Fullerton, Calif., assignor to Cla-Val Co., Costa Mesa, Calif.
Filed Aug. 25, 1977, Ser. No. 827,628
Int. Cl.[2] F15B *13/044*; F16K *31/04*
U.S. Cl. 137—625.65 **23 Claims**



1. A three-way valve comprising
a valve body having first and second mutually spaced chambers, said chambers respectively having first and second external ports for fluid communication with points outside of the valve body, and respectively having first and second internal ports,
a valve seat in each said chamber,

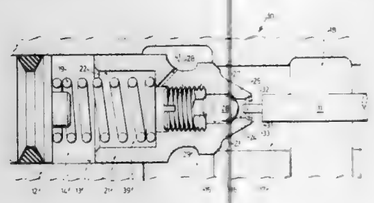
a hollow spool having first and second ends extending into said first and second chambers through said first and second internal ports respectively, said spool being axially slidable in said valve body from a first position wherein said first end of the spool is relatively closer to said seat of said first chamber and said second end of said spool is relatively further from said seat of said second chamber, and a second position in which said first end of the spool is relatively further from said first seat of the first chamber and said second end of the spool is relatively closer to said second seat of said second chamber,

said valve body having a third chamber formed therein adjacent an intermediate portion of said spool, said third chamber having an external port, said intermediate portion of said spool including port means for fluid communication between the interior of said spool and said third chamber, and means for axially shifting said spool.

4,176,688
CHECK VALVE

Günther Schwerin, Möglingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 20, 1978, Ser. No. 871,109
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1977, 2705303
Int. Cl.² F16K *31/385*
U.S. Cl. 137—630.13 **12 Claims**

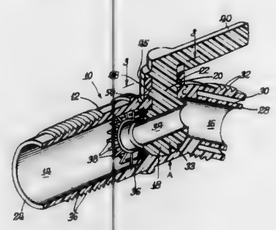


1. A check valve with pilot actuation, for hydraulic systems, comprising a valve housing having a main bore communicating with a consumer chamber and a main seat formed in said main bore; a main valve member movable in said main bore between a closed position seated on said main seat and an open position and having an additional inner bore provided with an additional seat, said main valve member having two spaced ends and said additional bore having a conical mouth at one of said ends, said main valve member being loaded from said consumer chamber to said closed position; a pilot valve member movable in said additional bore between a closed position seated on said additional seat and an open position, said pilot valve member being loaded from said consumer chamber to said closed position; and a push rod operative for moving said pilot valve member to said open position, said push rod having a first portion facing toward said pilot valve member and a second portion having a diameter exceeding the diameter of said first portion, said first portion and said second portion forming a shoulder, said push rod having intermediate said first and second portions a conical transitional portion complementary to said conical mouth, said push rod furthermore having pressure-relief clearances in the region of said transitional portion and shoulder so located that when said transitional conical portion is seated on said conical mouth fluid in said additional bore can pass through said clearances.

4,176,689
FLUID CONTROL VALVE WITH STEM SEAL

Thomas J. Wrasman, 11222 Bluegrass Pkwy., Louisville, Ky. 40299

Filed Oct. 5, 1977, Ser. No. 839,441
Int. Cl.² F16K *5/06, 41/00*
U.S. Cl. 137—797 **11 Claims**

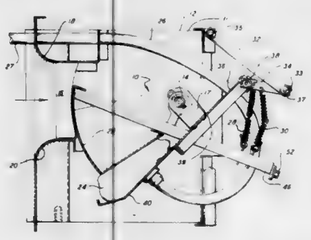


1. A fluid control valve comprising housing means having walls defining an inlet, an outlet and a chamber communicating therebetween, a valve plug disposed within said chamber for regulating the flow of fluid between the inlet and outlet, said valve plug having a passageway therethrough, a valve stem rigidly attached to said valve plug and extending through said housing means for exteriorly rotating said valve plug between an open position in which said passageway flowably communicates with the inlet and outlet and a closed position in which said valve plug blocks any flow between the inlet and outlet, said valve plug being spaced from the adjacent wall of said chamber and having an effective fluid pressure responsive surface providing a net upward force in the direction of said valve stem whenever fluid is present between plug and adjacent housing, said valve stem including a peripheral shoulder interior of said housing means and spaced from said housing means less than said valve plug is spaced from the adjacent wall of said chamber, said net upward force causing said shoulder to tightly engage said housing means, preventing leakage along said valve stem.

4,176,690
REGULATOR FOR A DAMPER ASSEMBLY

William E. Clark, Syracuse, and Carl C. Herb, Camillus, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 7, 1977, Ser. No. 858,141
Int. Cl.² G05D *7/01*
U.S. Cl. 137—8 **13 Claims**



12. A method of regulating the operation of a damper assembly employed to control the flow of conditioned air through a supply duct comprising the steps of:

providing a signal indicative of the conditioned air supply pressure to control the position of the damper assembly within the supply duct to maintain a substantially constant volume air flow irrespective of changes in the supply air pressure;

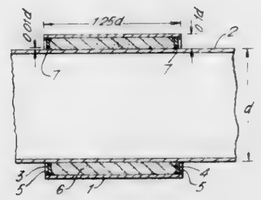
generating a first force at the maximum constant volume flow setting to restrain movement of the damper blade assembly as the position thereof is changed in response to an increase in the supply air pressure; and

generating a second force at reduced levels of constant volume flow settings, with said first and second forces being additive to further restrain movement of the damper blade assembly.

4,176,691
APPARATUS FOR ARRESTING PROPAGATING FRACTURES IN PIPELINES

Dennis W. Jude, Corbridge, and Joseph S. Bell, Blyth, both of England, assignors to British Gas Corporation, London, England

Continuation of Ser. No. 646,542, Jan. 5, 1976, abandoned. This application Apr. 17, 1978, Ser. No. 897,127
Claims priority, application United Kingdom, Jan. 22, 1975, 2722/75
Int. Cl.² F16L *57/00*
U.S. Cl. 138—103 **1 Claim**



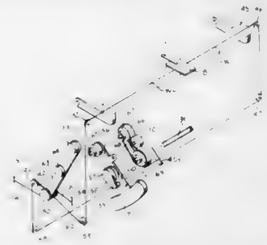
1. In combination, a pipeline and a pipeline fracture-arresting means for arresting fractures in said pipeline, said fracture-arresting means comprising: a single cylindrical sleeve of greater diameter than the pipeline and positioned substantially concentrically around a continuous region of the pipeline so as to define an annular space therebetween, and an annular support means for bridging said annular space, said annular support means comprising a filling of a material having a high compressive strength and being bonded to the internal surface of the sleeve and the external surface of the pipeline, respectively, and two inwardly extending annular plates fixed one at each end of the sleeve, each annular plate having an inside diameter slightly greater than the outside diameter of the pipeline so that the innermost edge thereof is spaced from the external surface of the pipeline.

4,176,692
ROTATING DRIVING MECHANISM FOR IMPARTING RECIPROCATORY MOTION TO A DRIVEN ELEMENT

James W. Simmons, Jr., Atlanta, Ga., assignor to Cox Foundry & Machine Co., Atlanta, Ga.

Filed Aug. 21, 1978, Ser. No. 935,362
Int. Cl.² D03D *39/18*
U.S. Cl. 139—21 **3 Claims**

1. A rotatable driving mechanism for impartingreciprocatory movement to a driven member (C), said mechanism comprising a rotatable drive shaft (**34**), a drive arm (**56**) mounted on and rotatable with said drive shaft (**34**) and having a swing end projecting radially therefrom, a drive link (**63**) oscillatably mounted on the swing end of said drive arm and having a swing end arranged to oscillate in a plane parallel to the plane of rotation of said drive arm and about a center of oscillation (**64**) which is movable with said drive arm, means (**66–70**) for imparting oscillation to said drive link (**63**) which is in synchronism with rotation of said drive arm (**56**) and wherein the improvement comprises counterbalance means (**71,72**) projecting from said drive arm (**56**) and rotatable therewith about said drive shaft (**34**) and arranged to counterbalance the total weight of said drive arm (**56**) and of said drive link (**63**) irrespective of the angular position of said drive link (**63**) relative

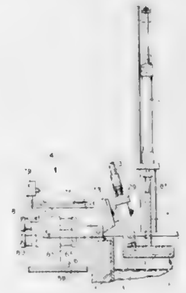


to said drive arm (**56**), and drive link balance means (**73**) projecting from said drive link (**63**) and disposed in alignment therewith so as effectively to counterbalance said drive link for oscillation about its center of oscillation (**64**).

4,176,693
APPARATUS AND METHOD OF OPERATING

Jesse A. Stoner, Scotia, N.Y., and Robert L. Mills, Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Filed Mar. 6, 1978, Ser. No. 883,582
Int. Cl.² B65B *3/04;* **B22D** *41/00*
U.S. Cl. 141—1 **58 Claims**



13. An apparatus comprising means for containing a level of flowable hardenable material therein, means operable for only carrying a part of the hardenable material at least from the level thereof in said containing means to a preselected position beyond the level of the remaining hardenable material in said containing means so that the entire hardenable material part is contained in said carrying means when it is in its preselected position, and means associated with the entire hardenable material part contained in said carrying means when it is in its preselected position for extracting at least some of the hardenable material from the entire part thereof contained in said carrying means.

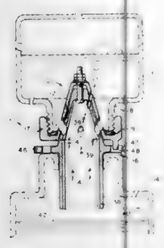
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4,176,694

AUTOMATIC SHUTOFF LIQUID DISPENSING VALVE

Delbert J. Dickerson, Inglewood, Calif., assignor to Donald R. Dickerson, Gig Harbor, Wash.

Filed Mar. 27, 1978, Ser. No. 890,255
Int. Cl.[2] **B65B** *3/26, 57/04;* **B67D** *5/06;* **G01F** *23/00*
U.S. Cl. 141—95 **10 Claims**



1. An automatic shutoff liquid dispensing valve for controlling the flow of liquid from a container into a receptacle comprising:

A. a cap portion to be secured hermetically on the mouth of a liquid container from which liquid is to be dispensed;

B. a stud portion projecting axially from said cap portion to be positioned interiorly of said container when said cap portion is secured on its mouth;

C. at least two passages extending through said stud portion;

(1) one of said passages being a liquid passage for the flow of liquid from said container and the other of said passages being an air passage for the flow of air into said container to permit liquid to flow therefrom;

(2) said passages communicating the interior of said container with a common passageway extending through said cap portion and through which air and liquid flow in opposite directions to audibly interact with one another when liquid is being dispensed from said container; and

(3) said air passage communicating with said common passageway further from said cap portion than said liquid passage whereby air in said common passageway enters said air passage without interference by liquid flowing into said common passageway from said liquid passage; and

D. a conduit portion hermetically communicating with said common passageway and projecting outwardly from said cap portion to have its free end immersed by liquid within said receptacle upon liquid being at a predetermined depth therewithin, said free end of said conduit having an inlet for air into the same and thereby into said common passageway whereby upon said free end of said conduit being immersed by liquid, flow of air through said air inlet is terminated with consequent termination of flow of liquid from said container.

4,176,695

LEVER HOLDING DEVICE FOR FUEL DISPENSING NOZZLE ASSEMBLY

Walter O. A. Raske, 9051 Katy Freeway, Houston, Tex. 77024

Filed Jul. 26, 1978, Ser. No. 928,087
Int. Cl.[2] **B65B** *3/04;* **G05G** *5/06*
U.S. Cl. 141—96 **3 Claims**

1. For use in dispensing fuel into a tank from a nozzle assembly through a flexible hose leading from an upright pump body, wherein

the nozzle assembly includes

a spout for insertion into the inlet of the tank,

a handle having a flowway therethrough to connect the hose with the spout and a valve for regulating the flow of fuel through the passageway,

a lever mounted beneath the handle in position to be lifted in order to move the valve from closed position to open position, and

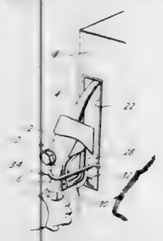
a guard mounted on the handle having a lower portion extending beneath the lever to prevent its accidental displacement, and wherein

the pump body has means thereon to support the nozzle assembly therefrom with the lower portion of the guard adjacent the side of the pump body when the assembly is not in use;

a device for releasably holding the lever in its upper position, comprising

a longitudinally extending base,

a first finger projecting laterally from one side of the base near one end thereof to permit it to be hooked over the top side of the handle, and



a second finger projecting laterally from said one side of the base intermediate its end and being so spaced from the first finger that, with the first finger hooked over the handle, the second finger may be swung into a position in which it is beneath and in tight engagement with the raised lever,

said base extending downwardly along one side of and past the lower guard portion, when said second finger is so positioned, so as to dispose its other end in position to engage the side of the pump body as the assembly is being moved into supported position on the pump body, whereby

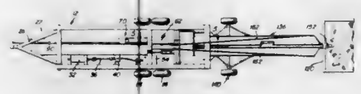
the user of the device is alerted to the fact that said device has not been removed from the assembly.

4,176,696

FIREPLACE WOOD CUTTING MACHINE

Carroll D. Greeninger, Portland, Oreg., assignor to Bunyan's Woodcutter Corp., Portland, Oreg.

Continuation-in-part of Ser. No. 706,290, Jul. 19, 1976, Pat. No. 4,076,061. This application Jan. 23, 1978, Ser. No. 871,160
Int. Cl.[2] **A47J** *42/09;* **B27L** *7/00*
U.S. Cl. 144—3 K **23 Claims**



1. A wood cutting machine comprising:

(a) an elongate support frame;

(b) transport means mounted on said frame for conveying logs placed thereon along said support frame;

(c) shear means, comprising a reciprocal blade having a sharpened edge, mounted on said support frame adjacent to said transport means for cutting log end portions being discharged from the said transport means;

(d) cradle means located on said support means for cooperating with said blade by supporting said log against the movement of said blade when said blade is cutting said log end portions; and

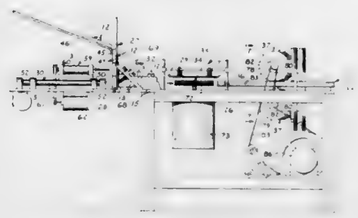
(e) splitting means mounted on said frame adjacent to said shear means for splitting said sheared end portions into multiple log sections.

4,176,697

MACHINE FOR MAKING WOODEN BEE BOX COMPONENTS

John W. Strauser, P.O. Box 991, Walla Walla, Wash. 99362

Filed Dec. 12, 1977, Ser. No. 859,811
Int. Cl.[2] **B27C** *1/08, 5/00, 3/04*
U.S. Cl. 144—7 **6 Claims**



1. An automatic woodworking machine for forming bee box components from elongated wooden stock members, each stock member including: (a) face surfaces spaced apart a first distance defining the thickness dimension of the member; (b) side edge surfaces spaced apart by a second distance defining the width of the member; (c) end edge surfaces spaced apart by a third distance defining the length of the member; said machine comprising:

feed means for positioning the wooden stock members with their facing surfaces upright and transverse to an intended direction of movement and for delivering successive members oriented in this condition to an infeed station;

indexing means cooperating with the feed means for receiving successive stock members from the feed means at the infeed station and for incrementally moving them in the intended direction of travel in a row with the face surface of one stock member engaging a face surface of the immediately preceding stock member;

drill means operated in conjunction with the indexing means for drilling holes through each stock member from one face surface to the other;

first milling means at a first cutting station for milling end grooves in the end edge surfaces between face surfaces as the members progressively move past the first station;

spaced, elongated, end groove guide bars complementary to the dimensions of the end grooves and extending past a second cutting station for riding in the end grooves to guide and support the members by their ends as the members are progressively moved forward past the second station; and

second milling means at the second cutting station for milling a side groove in at least one of the side edge surfaces of each member as the member is moved past the second cutting station supported at its end by the groove guide bars.

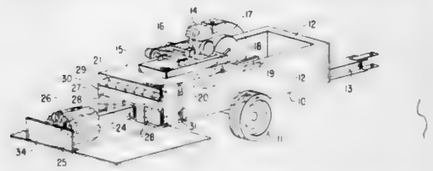
4,176,698

FIREWOOD SPLITTING DEVICE

Christ L. Ahlschlager, Minneota, Minn. 56264; Marvin L. Ahlschlager, Iona, Minn. 56141, and Donald A. Ahlschlager, Balaton, Minn. 56115

Filed Jun. 9, 1978, Ser. No. 914,670
Int. Cl.[2] **B27L** *7/00*
U.S. Cl. 144—193 R **3 Claims**

1. A device for splitting logs comprising platform means on which a log may be held, sidewalls mounted vertically on each lateral side of said platform, plate means slidably disposed on said platform between said walls, crank means rotatably mounted above said platform, pitman means operably connecting said crank means and said plate means, power means including a large flywheel on said crank means adapted to drive said plate means, ram means mounted on said plate means on a



face opposite said crank means, and a stripper plate mounted between said walls and adjacent said ram means.

4,176,699

CHUCK FOR GRIPPING HEAD OF SCREW

Kajetan Leitner, Am Winacker, 8170 Bad Tölz, Fed. Rep. of Germany

Filed Jan. 18, 1978, Ser. No. 870,517
Claims priority, application United Kingdom, Feb. 15, 1977, 6193/77
Int. Cl.[2] **B25B** *23/10*
U.S. Cl. 145—52 **4 Claims**

1. A chuck for gripping the head of a screw (**24**) during rotation comprising

a driving head (**6**) having an end (**7**) adapted to engage and impart rotation to the screw (**24**),

a shank (**2**) having a forward end operatively connected to said head (**6**) for rotating the same,

a carrier sleeve (**8**) slidably mounted lengthwise on said driving head (**6**) and on said shank (**2**),

an operating sleeve (**14**) mounted on a rearward end of said carrier sleeve (**8**),

first spring means (**21**) mounted in compression between said driving head (**6**) and said carrier sleeve (**8**) and urging said carrier sleeve (**8**) to an intermediate position in which an end of said carrier sleeve (**8**) is substantially level with the end (**7**) of said head (**6**),

second spring means (**22**) carried by said shank (**2**) and loading said carrier sleeve (**8**) toward the end (**7**) of said head (**6**),

a circumferentially arranged series of radial bores (**9**) located in said carrier sleeve (**8**) adjacent its forward end,

a series of locking balls (**10**) received and radially displaceable in the series of bores (**9**),

a locking sleeve (**13**) slidably disposed on said carrier sleeve (**8**),

said locking sleeve (**15**) having internal cam surfaces (**16, 17** and **18**) to engage the urge the locking balls (**10**) inwards upon sliding of the locking sleeve (**15**) in a first direction to a forward end (**11**) of said carrier sleeve (**8**), and to

release the locking balls (10) for outward displacement upon sliding of the locking sleeve (15) in an opposite direction,

third spring means (19) mounted in compression between said locking sleeve (15) and said operating sleeve (14) and urging said locking sleeve (15) to move in the first direction,

said head (6) engaging the locking balls (10) in the intermediate position of the carrier sleeve (8) to hold the locking balls (10) outwardly in their bores (9) thereby preventing sliding of the locking sleeve (15) in said one direction, and

said carrier sleeve (8) and said locking sleeve (15) being movable together in said one direction to carry the locking balls (10) beyond the end (28) of the head (6) thereby freeing the locking sleeve (15) for movement in the one direction on the carrier sleeve (8).

4,176,700

FLEXIBLE TUBULAR CASING ARTICLE

Mark F. Mettler, Lombard; Clifford C. Faust, Riverside; Brant A. Loichinger, Orland Park, and Walter T. Forrest, Chicago, all of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jul. 21, 1977, Ser. No. 817,690
Int. Cl.[2] A45C *13/00*
U.S. Cl. 150—3 **15 Claims**



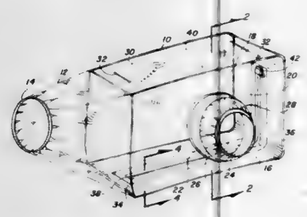
1. A flexible tubular food casing article having an end closure comprising a base portion and a series of triangular flaps extending from said base portion, each of said triangular flaps having a common vertex and being folded over a portion of an adjacent flap, and anchor means for anchoring said flaps against at least a part of said base portion including a connection between said flaps and said base portion, said end closure defines a curved surface.

4,176,701

CAMERA RAIN SHIELD

Peter R. Welgan, 1141 La Mirada, Laguna Beach, Calif. 92651

Filed Sep. 28, 1978, Ser. No. 946,664
Int. Cl.[2] G03B *17/56*
U.S. Cl. 150—52 J **7 Claims**



1. A protective shield for a camera comprising:

an optically transparent body with a bottom, elongated right side containing a opening, a left side, a back and a front with an opening;

an elastic contraction band on the periphery of said opening on said elongated right side to tightly engage one's wrist and inserting one's hand therein;

fastening means on said opening in said front continuing essentially around the periphery of the opening; and

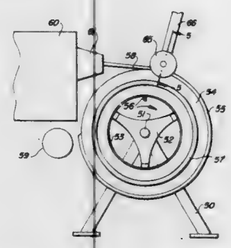
a radial opening extension in the form of a tube with a front and back end, the back end containing mating fastening means correspondingly engaging said opening in front to provide an enclosure in which a camera may be inserted with the lens exposed.

4,176,702

TIRE TREADS AND THEIR MANUFACTURE

Theophilus K. Seiberling, Akron, Ohio, assignor to Mildred Kelly Seiberling, Akron, Ohio, a part interest

Continuation of Ser. No. 702,623, Jul. 6, 1976, Pat. No. 4,139,405, which is a continuation-in-part of Ser. No. 627,136, Oct. 30, 1975, which is a continuation of Ser. No. 395,346, Sep. 7, 1973, Pat. No. 3,933,583, which is a continuation of Ser. No. 321,421, Jan. 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 838,512, Jul. 2, 1969, abandoned. This application Mar. 7, 1977, Ser. No. 774,809
The portion of the term of this patent subsequent to Jan. 20, 1993, has been disclaimed.
Int. Cl.[2] B60C *11/00*
U.S. Cl. 152—209 R **50 Claims**



1. The process of preparing a tire tread stock which includes rubber which is curable by electron irradiation, which process comprises treating and thereby at least partially curing at least a portion of said tire tread stock by exposure to electron irradiation or other means of radiation having the same curing effect on the exposed rubber, before the at least partially uncured tire with said treated tread stock assembled thereon is placed in a mold for the final cure of the tire.

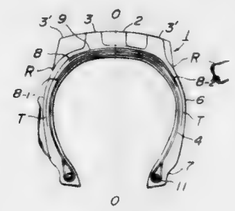
4,176,703

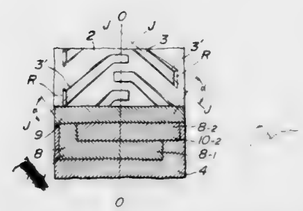
PNEUMATIC TIRE HAVING LUG PATTERN

Hiroshi Nojima, and Masahiro Nishimura, both of Kodaira, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed May 26, 1977, Ser. No. 800,840
Claims priority, application Japan, Jun. 9, 1976, 51-66487
Int. Cl.[2] B60C *11/00, 11/06*
U.S. Cl. 152—209 B **6 Claims**

1. A pneumatic tire having a lug pattern comprising a pair of bead portions, sidewalls joined to said bead portions, a carcass extending from one bead portion to the other, a breaker composed of at least two plies arranged by cords parallel to one another in each ply and disposed between said carcass and a tread portion, tread portion being disposed between said sidewalls and having a lug pattern composed of lugs spaced apart from each other in the circumferential direction of the tire and symmetrically disposed along two directions crossed with each other with respect to the equatorial plane of the tire, the improvement comprising; a textile cord cover layer superimposed around said breaker, said cover layer having side ends extending to each of the side walls, each ply of the breaker having an offset projected from the equatorial plane of the tire so that outer regions of one of the breaker plies and said lugs face each other, the cords of said breaker plies being continuous and being arranged along two directions crossed through said cover layer at an angle of a range between 50° and 130° with respect to the axial direction of said lug, and the outer ends of each of said breaker plies terminating within said sidewalls above said bead portions outside the region of said tread portion.



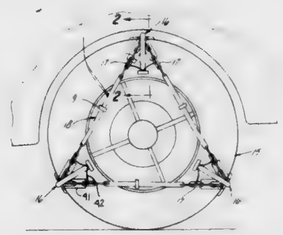


4,176,704

EMERGENCY TRACTION DEVICE

Walter H. Thorpe, 9403 Somerset, Detroit, Mich. 48224

Filed Jan. 24, 1977, Ser. No. 761,593
Int. Cl.[2] B60C *27/00, 27/02*
U.S. Cl. 152—225 C **18 Claims**



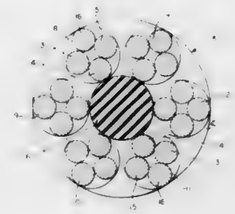
1. An emergency traction device for use on tires and the like having inner and outer sidewalls and including at least three clamp bar assemblies interconnected by suitable connecting means of substantially equal length, wherein each of said clamp bar assemblies has an inwardly and an outwardly extending portion and a pivot point, with said suitable connecting means being connected to said clamp bar assemblies at said pivot point, said pivot point being located near the center of gravity of each of said clamp bar assemblies, on the outwardly extending portion thereof, between the center of gravity and the beginning of the inwardly extending portion of the clamp bar assembly, wherein said inwardly and said outwardly extending portion of the clamp bar assembly both having a straight portion substantially coextensive with the thread of said tire and a curvilinear portion extending radially inwardly of the tire and adapted to contact and exert a pressure on the respective side wall of said tire to grip it while at rest, said curvilinear portion of said outwardly extending portion of each clamp bar assembly being of such a degree of curvature that the center of gravity of the clamp bar assembly will substantially act normally to the tire tread, with said inwardly extending portions of each clamp bar assembly thus being of a configuration such that the mass of the outwardly extending portion of each clamp bar assembly shall be substantially greater than that of the inwardly extending portion of the clamp bar assembly so that the resultant centrifugal force produced during the tire rotation and acting through the center of gravity of the clamp bar assembly located on said outwardly extending portion thereof will produce a moment about said pivot point which causes the inwardly extending straight portion to contact and exert a pressure against the tread of said tire when said tire is in a rotating motion.

4,176,705

TIRE CORD WITH A SYNTHETIC FIBER CORE

C. Paul Russell; Joseph M. Gingo, both of Akron, and Oswald A. Drica-Minieris, Canton, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 649,899, Jan. 16, 1976, abandoned. This application Sep. 15, 1977, Ser. No. 833,466
Int. Cl.[2] B60C *9/00*
U.S. Cl. 152—359 **7 Claims**



1. A composite cord for a tire having a body of corrosion-resistant material, comprising a plurality of metal strands having equal diameters and tensile strengths and a centrally disposed unreinforced non-metallic core having a generally circular cross section around which said strands are cabled, said core having a diameter at least equal to the diameter of each of said metal strands and sufficient to hold said metal strands in a spread condition so that said corrosion-resistant material covers and adheres to said strands to prevent exposure of said metal strands to moisture, and said core having a tensile strength substantially equal to the tensile strength of any one of said metal strands so as to maintain said strands in said spread condition under tension and carry a proportional amount of the load imparted to said strands and said core.

4,176,706

APPARATUS AND METHOD FOR MAKING BRIDGEWORK

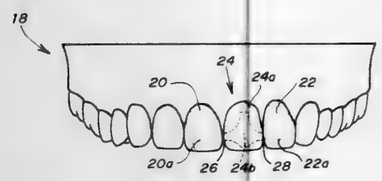
Larry C. Been, 4335 Bonham, Dallas, Tex. 75229

Filed Jun. 29, 1977, Ser. No. 811,427
Int. Cl.[2] B22C *9/04*; A61C *13/22*
U.S. Cl. 164—34 **3 Claims**

1. A method of making a frame for a dental bridge utilizing a die which is a pattern of a patient's teeth including a gap formed between two abutment teeth, which comprises the steps of:

forming a temporary crown pattern on each abutment tooth

of the die of a material capable of being dissipated at a temperature below the vaporizing temperatures of metals,
inserting between said crown patterns a tooth-shaped facing member having a groove on the lingual side which extends between the contact areas thereof, said groove containing a temporary removable rigid insert formed of a material capable of being dissipated at a temperature less than the vaporizing of metals,
joining the ends of said insert to the sides of said crown patterns,



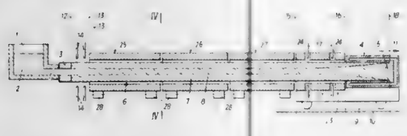
removing said facing member from said insert,
removing said crown patterns and said insert as a unit from said die,
forming a hollow cast by surrounding said unit with casting plaster and dissipating said unit by heating to a temperature below the vaporizing temperature of metals, and
casting a metal frame for a dental bridge from said hollow cast.

4,176,707

METHOD OF CONTINUOUSLY CASTING A STEEL STRAND

Eduard Michaelis, Seewalchen, Austria, assignor to Vereinigte Österreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Aug. 11, 1977, Ser. No. 823,669
Claims priority, application Austria, Aug. 20, 1976, 6184/76
Int. Cl.[2] B22D *11/00*
U.S. Cl. 164—89 **8 Claims**



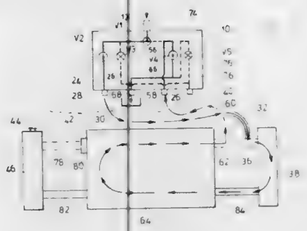
1. In a method of continuously casting a steel strand by using a mould having a closed bottom, the cast strand having a longitudinal extension exceeding that of the mould, said method including the steps of introducing molten steel from a casting container into said mould, moving said mould away from said casting container along a substantially horizontal path for forming the steel strand with a solidified strand skin and a liquid core, and pouring further molten steel through said solidified strand skin in the direction toward the bottom of the mould, the improvement comprising the step of supplying heat to at least a portion of the strand located outside of said mould between the mould and the casting container so as to cause the liquid core in that portion of said strand to have a uniform temperature, said heat being sufficient to keep said core temperature above the liquidus temperature of the steel over most of the longitudinal extension of the cast strand.

4,176,708

FLUSHING OF LIQUID CIRCULATION SYSTEMS

Kenneth L. Joffe, Warner Beach, South Africa, assignor to Wynn Oil Company, Fullerton, Calif.

Division of Ser. No. 727,143, Sep. 27, 1976, Pat. No. 4,127,160.
This application Sep. 13, 1978, Ser. No. 942,135
Claims priority, application South Africa, Sep. 30, 1975, 75/6215
Int. Cl.[2] F28G *9/00*
U.S. Cl. 165—95 **10 Claims**



1. Apparatus for flushing debris from a liquid circulation system that includes a heat-generating unit and two heat-dissipating units, the apparatus comprising an inlet conduit for connection to a source of flushing liquid, a first branch conduit for attachment to a point on the system communicating with the heat-generating unit and a second and third branch conduit for attachment to points on the system each communicating with a heat-dissipating unit, and a drainage conduit; and valve means interconnecting such conduits and settable between at least three positions in each of which a flushing liquid is adapted to pass through the inlet conduit and one of the branch conduits and, after traversing a flow path in the system, reenter the apparatus through another branch conduit and finally leave the apparatus through the drainage conduit, the flow paths differing for different settings of the valve means, and including at least one flow path in which the liquid is adapted to pass through at least two of the units of the system.

4,176,709

STACK-TYPE HEAT EXCHANGER

Willard L. Johnson, 12923 Lincoln Ave., Huntington Woods, Mich. 48070

Filed Feb. 6, 1978, Ser. No. 875,380
Int. Cl.[2] F28F *7/00*
U.S. Cl. 165—99 **10 Claims**

1. An improved heat exchanger device disposed in a stack through which heated gases are vented from a heat generating source, the improvement comprising in combination
a heat exchanger tube section for the heating and passage therethrough of clean input air,
a motor driven fan unit disposed in a fan section connected to and communicating with said tube section, said fan unit drawing said clean input air from a location outside or inside of the building in which said heat generating source is located and forcing said air into and through said tube section,
and coupling and transition members conjoining said tube section to and for communication with stack portions thereabove and therebelow,
said tube section comprising a housing for and a plurality of spaced apart clean air conducting tubes disposed therein transversely of the flow direction of the vented stack gases,
said housing defining a chamber therein for said stack gases to pass therethrough and over and about said tubes therein to heat said tubes and the clean air passing therethrough,
said tubes communicating at their input ends with said fan section to receive said clean air therefrom and conducting said air through said tube section housing to the output ends of said tubes for discharge of heated clean air from said tube section,
said tubes each having a damper plate attached thereto at its output end to modify and restrict the output orifice of said tube so as to generate a positive air pressure in each of said tubes at a valve above and in excess of the static pressure of said vented stack gases passing through said chamber, whereby to prevent said vented stack gases from entering said clean air conducting tubes.



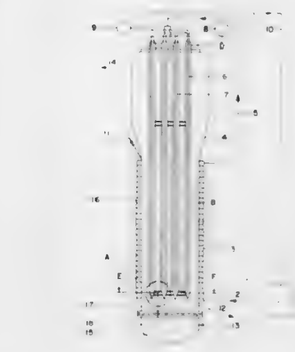
4,176,710

FLUIDIZED BED REACTOR

Jost Gansauge, Burghausen; Johann Muschi, Munich, and Hans Freudlsperger, Neuötting, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 1, 1978, Ser. No. 874,185
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1977, 2704975
Int. Cl.[2] F28C *3/16*
U.S. Cl. 165—104 F **7 Claims**

1. A fluidized bed reactor for the preparation of silicon-halogen compounds from the reaction of a silicon containing contact mass with organic halides, said fluidized bed reactor containing a heat exchange apparatus for conveying a heat transfer medium, said heat exchange apparatus having at least one pipe which is suspended vertically from the top of said reactor into the fluidized bed, said pipe having a conically tapered configuration at its end which is opposite to the direction of gas flow in which the inside of said conically tapered section of the pipe is solid, a jacket on the outside wall of said fluidized bed reactor which forms a serpentine conduit having a rectangular cross section which is enclosed on its outer most surface with a cover having a dome-shaped configuration, said jacket is connected to the pipe so that the heat transfer medium is conveyed through said jacket into said pipe.

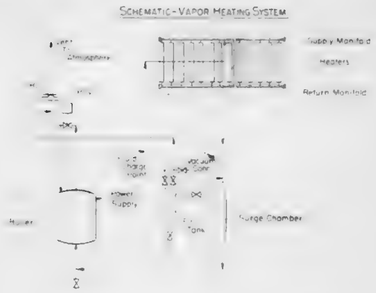


4,176,711

YARN HEATING APPARATUS AND PROCESS

Lee H. Knox, Charlotte, N.C.; Malcolm P. Owens, Lake Charles, La., and George R. Ure, Charlotte, N.C., assignors to Fiber Industries, Inc., New York, N.Y.

Continuation of Ser. No. 226,063, Feb. 14, 1972, abandoned.
This application May 26, 1978, Ser. No. 910,054
Int. Cl.[2] F28D *15/00*
U.S. Cl. 165—105 **4 Claims**



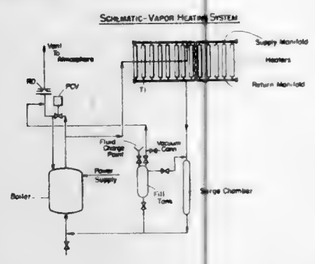
1. An improved heating apparatus of the multiple condensing-vapor substantially air-free type used for uniformly heating moving thread lines of yarn up to 350° C. and which includes a pressurized boiler containing a vaporizable liquid, means for heating the liquid in the boiler to generate hot vapor, means for distributing the hot vapor to the inside of multiple plates where the vapor condenses and thereby heats threadlines of yarn separately moved in frictional contact with an outer yarn-contacting surface of each hot plate, and possibly means for returning the condensate to the boiler wherein the improvement comprises:
having a coating on the inside surface of each said hot plate, said coating having a contact angle with said vaporizable liquid of at least 90°, said coating being a polyethylene glycol having from 4 to 12 carbon atoms and said vaporizable liquid comprising diphenyl ether and trace amounts of said polyethylene glycol.

4,176,712

YARN HEATING APPARATUS AND PROCESS

Lee H. Knox, and Malcolm P. Owens, both of Charlotte, N.C., assignors to Fiber Industries, Inc., New York, N.Y.

Division of Ser. No. 226,063, Feb. 14, 1972, Pat. No. 3,736,469.
This application Jan. 9, 1978, Ser. No. 867,735
Int. Cl.[2] F28D *15/00*
U.S. Cl. 165—105 **8 Claims**



1. An improved heating apparatus of the multiple condensing-vapor substantially air-free type used for uniformly heating downwardly moving threadlines of yarn up to 350° C. and which includes a pressurized boiler containing a vaporizable liquid comprising at least 99% water, means for heating the liquid in the boiler to generate hot vapor, means for distributing the hot vapor to the inside of multiple plates where the vapor condenses and thereby heats at least two threadlines of yarn separately moved in frictional contact with an outer yarn-contacting surface of each hot plate, and means for returning the condensate to the boiler, wherein the improvement comprises the combination of:

(i) an essentially permanent film-type coating on the inside surface of each said hot plate, said coating having a contact angle with said vaporizable liquid of at least 90° and being promotive of heat transfer; said coating being a filming amine selected from the group consisting of octadecylamine, hexadecylamine and dioctadecylamine;

(ii) said vaporizable liquid comprises up to 100 parts per million of said filming amine; and

(iii) each said hot plate comprises a bare steam pipe without a wear strip,

whereby there is an overall coefficient of heat transfer from said vapor to said yarns at least 1000 BTU/sq.ft./hr./° F. differential and said heat treated yarns have improved uniformity of properties such that said heat treated yarns made from said twin threadline process can be merged with a heat treated yarn made from a temporary single threadline process resultant from one of said twin threadlines breaking or running out.

4,176,713

PLATE-TYPE HEAT EXCHANGER

Helmut Fisher, Kunigiberggasse 5, Vienna, Austria (1130)

Filed Feb. 7, 1977, Ser. No. 766,172
Claims priority, application Italy, Feb. 12, 1976, 20115 A/76
Int. Cl.[2] F28F *3/04*
U.S. Cl. 165—166 **7 Claims**

1. A plate-type heat exchanger, which comprises

at least three heat exchange plates which consist of press-formed sheet metal and are arranged in a row and have a fluid-guiding body each, which is formed with a plurality of corrugations which have ridges that define two parallel ridge planes on opposite sides of said plate, and

spacing means which are rigid with each of said plates and flush with one of said ridge planes thereof and extend between said ridges only in part of the length of said corrugations of said plate and contact the ridges of an adjacent plate,

said plates comprising first and second types of plates,

said corrugations of said plates of said first and second types, respectively, extending at equal and opposite, oblique angles to a center plane of said body which is normal to said ridge planes and having the same cross-section so that the center spacing of said plates equals the height of said corrugations,



at least two adjacent ones of said plates having adjacent corrugations which are parallel to each other, and

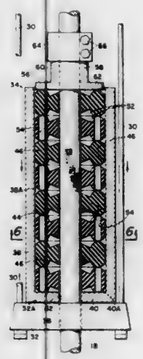
at least two adjacent ones of said plates having adjacent corrugations which copies each other.

4,176,714

SHOCK ABSORBER FOR OIL WELL PUMPING UNIT

Richard W. Case, Tulsa, Okla., assignor to K-Shox, Inc., Tulsa, Okla.

Filed Jun. 15, 1978, Ser. No. 915,594
Int. Cl.[2] E21B *43/00*; F16F *1/34, 1/36, 3/08*
U.S. Cl. 166—72 **2 Claims**



1. A shock absorber for use with an oil well pumping unit having a horizontal hanger bar suspended by cables, the hanger bar being vertically reciprocated by the pumping unit, and a vertical polish rod having the lower end secured to a string of sucker rods for actuation of a pump in a well borehole, the hanger bar having an opening therein slidably receiving the polish rod, the shock absorber providing means of transferring lifting force from the hanger bar to the polish rod, comprising:

a tubular body having an open top and a closed bottom, the bottom having an opening therein slidably receiving the polish rod concentrically of the body tubular axis, the lower end of the body resting on said hanger bar, the body providing an annular area between the interior of the body wall and the exterior of the polished rod;

a plurality of elastomeric discs received in said body, each disc having a diameter slightly less than the interior diameter of the body, and each having an axial opening therein receiving the polish rod, each disc having an annular upper and lower recess intermediate the disc axial opening and its periphery whereby the thickness of each disc is greater adjacent the axial opening and the periphery and of decreased thickness intermediate the axial opening and periphery, the recesses providing annular closed trapped air spaces between adjacent discs, and each disc having a plurality of secondary openings therethrough, the axii of which are spaced from and parallel the axis of the axial opening, the secondary openings being spaced from each other in equal angular relationship, the secondary openings extending through each disc in the area of maximum disc thickness adjacent the disc periphery, the discs being arranged so that the secondary openings are out of register and are thereby closed at each end by the exterior surfaces of the adjacent discs and whereby each secondary opening provides a closed air space;

a circular top plate having an axial opening therein receiving the polish rod, having a diameter slightly less than the internal diameter of the body and having a lower surface engaging the upper surface of the uppermost elastomeric disc; and

a polish rod clamp secured to the polish rod above and contiguous to said top plate, whereby when the pumping unit exerts upward force on the hanger bar the elastomeric discs compress in proportion to the total force transmitted to the polish rod, which compression constricts the volume of air spaces in the disc annular recesses and secondary openings whereby shock absorption is obtained by both the resiliency of the discs and by compressed air.

4,176,715

HIGH TEMPERATURE WELL PACKER

Eugene H. Bigelow, Long Beach, and Burton J. Goldsmith, Redondo Beach, both of Calif., assignors to Baker International Corporation, Orange, Calif.

Filed Dec. 23, 1977, Ser. No. 863,871
Int. Cl.[2] E21B *33/129*
U.S. Cl. 166—138 **20 Claims**



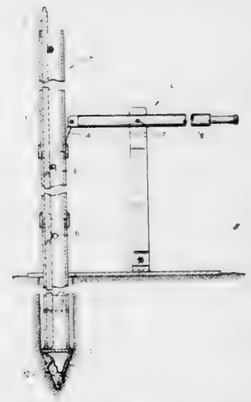
1. A well bore packing adapted to be set in a casing in a well, comprising: an elongated body, normally retracted slip means on said body, expander means on said body for expanding said slip means, control means releasably connecting one of said slip means and expander means to said body and enabling expansion of said slip means by said expander means in response to longitudinal movement of said body following release of said control means, an abutment on said body, a resiliently deformable packing between said abutment and the other of said slip means and expander means to be resiliently deformed into sealing engagement with said body in response to further longitudinal movement of said body following expansion of said slip means, one way locking means enabling said further longitudinal movement of said body and for holding said body shifted with said packing deformed and said slip means engaged with the casing, release means releasably connecting said abutment to said body for permitting relaxation of said packing upon release of said release means, said release means being releasable upon additional longitudinal movement of said body, and means for connecting said body to a pipe string for running and retrieving said packer.

4,176,716

METHOD AND APPARATUS FOR TAPPING GROUNDWATER

Herbert Bielaczek, Frankfurt-Sossenheim, Fed. Rep. of Germany, assignor to Robert Brehm, Grainau, Fed. Rep. of Germany, a part interest

Filed Jul. 11, 1977, Ser. No. 814,773
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1976, 2631642; Dec. 30, 1976, 2659588
Int. Cl.[2] E21B *43/00, 49/02*
U.S. Cl. 166—254 **5 Claims**



1. A method of sinking a shallow well and installing a pump therein, comprising the steps of sinking a probe into the ground, said probe being formed with means for accumulating soil; periodically extracting the probe from ground during its progressive sinking for examining successive soil samples until a water bearing stratum has been located and its depth determined; thereafter driving a riser tube into the ground to the previously determined depth; installing in the riser tube a water conveying conduit having a foot valve; and installing in the region of an upper end of the riser tube suction means which communicate with the conduit to aspirate water through the same.

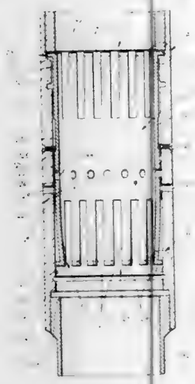
4. In a combination for sinking a shallow well, an apparatus comprising a tubular probe composed of a plurality of longitudinally connectable sections and having a leading end adapted to be driven downwardly into the ground; and a guide rod movably mounted on said probe for movement therewith into the ground and displaceable relative to said probe for movement relative thereof, said rod having a portion located in the region of said leading end and provided with at least one soil-accumulating recess so that soil accumulated in said recess can be inspected for moisture traces when the rod is displaced upwardly and relatively to said probe which is meanwhile stationary in the ground.

4,176,717

CEMENTING TOOL AND METHOD OF UTILIZING SAME

Harold A. Hix, 716 N. Poplar, Kermit, Tex. 79745

Filed Apr. 3, 1978, Ser. No. 893,185
Int. Cl.² E21B *33/13, 33/16*
U.S. Cl. 166—289 **7 Claims**



1. A method for cementing the bore holes of oil or gas wells comprising

a. providing at one or more suitable points along the length of the well liner a cementing collar comprising a pair of cylindrical sleeves slidably positioned one within the other each having a suitable number of spaced portholes adapted to permit the forcing of a slurry of cement into the annular space outside the well liner when the portholes in the two sleeves are in register;

said cylindrical sleeves situated in a first locked position such that the portholes are aligned circumferentially but not axially, the portholes of the inner sleeve being displaced a distance above the portholes of the outer cylinder;

b. inserting into the well liner a generally cylindrically shaped bottom plug designed to fall freely down the well liner but adapted to be engaged and stopped by the inner cylindrical sleeve of the cementing collar when it is in the first locked position thereby sealing off the well bore against a fixed hydraulic pressure;

c. applying a first hydraulic pressure through the well liner sufficient to cause the inner sleeve and plug to move downwardly in the well to a second position wherein the portholes of the inner and outer cylindrical sleeves of the cementing collar are in alignment;

d. pumping cementing slurry downward into the well liner and out through the portholes of the drilling collar sleeves to effect cementing of the bore hole;

e. inserting a cylindrical top plug into the well liner designed to be pumped down to and engage the top of the inner cylindrical sleeve when the inner sleeve is in the second position thereby sealing off the bottom plug against a fixed hydraulic pressure; and thereafter

f. applying a second hydraulic pressure through the well liner sufficient to force the inner sleeve and bottom plug out of the second position and cause them to move downwardly in the well to a third position thereby closing and sealing the port holes against communication with the well bore outside the liner and wherein the bottom plug is disengaged from the inner sleeve and released to fall freely to the well bottom.

2. Apparatus for use in cementing of oil or gas well bore holes and adapted to provide a plurality of portholes which can be opened and closed through the use of hydraulic pressure, which comprises:

an outer tubular member threaded at each end for attachment to sections of well liner, said outer tubular member having a plurality of circumferentially spaced portholes located intermediate the length thereof and extending radially therethrough the inside surface of the outer tubular member being provided with a series of four circumferential grooves suitably positioned two above and two below the plurality of portholes;

an inner tubular member slidably disposed with respect to said outer tubular member and having a plurality of circumferentially spaced openings extending radially therethrough and adapted to align identically with the portholes of said outer tubular member, the inner tubular member having an upper array of resiliently flexible fingers forming an upper collet ring, each of the fingers having an upper head and also having a lower array of resiliently flexible fingers forming a lower collet ring, each of the fingers having a lower head, the collet ring of the inner tubular member adapted to engage and be held by a circumferential groove on the inside surface of the outer tubular member;

the circumferential grooves of said outer tubular member being further defined in that they are sized and spaced in relation to the outer diameter and distance between the two collet rings of the inner tubular member such that when said inner tubular member is in a locked position, the upper heads are received in a first groove, the lower heads abut the interior of said outer tubular member at a location above a third groove with said lower fingers thereby defining a holding surface adapted to receive an opening means and said openings are spaced axially out of register with said ports, with said inner tubular member movably positioned in an intermediate position, the upper heads, adapted to receive a closure means, are disposed in abutting relationship to the inner surface of the outer member, the lower heads are received in a third groove and said portholes and said openings are radially aligned in register and with the inner tubular member movably disposed in a second locked position said upper heads are received in a second groove, said lower heads are received in a fourth locking groove and said openings are spaced axially out of register with said ports;

a locking means for preventing rotation of the inner tubular member with respect to said outer tubular member while at the same time permitting axial movement thereof; and

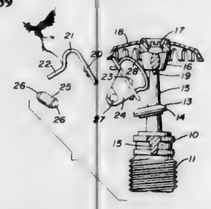
a plurality of seals positioned in spaced apart relation between said outer and said inner tubular members.

4,176,718

ANTI-LODGEMENT BAIL FOR SPRINKLERS

Theodore Vorkapich, Brunswick, Ohio, assignor to A-T-O Inc., Willoughby, Ohio

Filed Jan. 30, 1978, Ser. No. 873,222
Int. Cl.² A62C *37/12*
U.S. Cl. 169—39 **3 Claims**



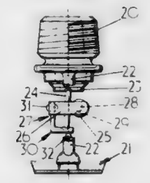
1. The combination of a sprinkler having a body member with a fluid delivery passageway therethrough, oppositely disposed arms on the body member joined at their outer ends to form a frame, a deflector on said frame and a closure on said fluid delivery passageway, an assembly comprising a lever, a strut having a pair of spaced sidewardly extending apertured arms on one side thereof and a fusible element, said assembly disposed between said deflector and said closure; and an anti-lodgement bail on said strut and extending outwardly from the opposite side thereof with respect to said arms, a major portion of said bail being longitudinally arcuate and positioned in spaced substantially parallel relation to said strut, said bail arranged for registry against said frame and deflector of said sprinkler when said assembly is freed by action of the fusible element so as to space said strut and the arms thereon with respect to said frame and said deflector.

4,176,719

HEAT SENSITIVE RELEASE DEVICES

Geddes A. Bray, Manchester, England, assignor to Mather & Platt Limited, Manchester, England

Continuation of Ser. No. 726,057, Mar. 9, 1977, abandoned. This application Dec. 15, 1978, Ser. No. 970,074
Claims priority, application United Kingdom, Mar. 12, 1976, 9915/76
Int. Cl.² A62C *37/08*
U.S. Cl. 169—39 **7 Claims**



1. A heat sensitive release device comprising first and second relatively movable components, and a normally stable strut system located between the components to retain them in fixed positions relative to each other but collapsible on attainment of a predetermined temperature, the strut system comprising:

(a) a heat sensitive element,

(b) a catch element having opposed wings between which the heat sensitive element is retained,

(c) a lever fulcrummed on the first component and joined to the catch element,

(d) a strut engaging at one end on the lever adjacent the fulcrum and at its other end on the second component and bearing against the heat sensitive element to retain the lever and thereby the strut system in a stable condition, and

(e) an impediment joined to the strut system and disposed between the lever and the strut to prevent lever movement towards the strut and removal of the heat sensitive element from the catch element, whereby on attainment of the predetermined temperature the heat sensitive element disengages from the wings of the catch element and permits the lever to pivot about the fulcrum to disengage the strut from the second component which together with the first component are both freed for relative movement.

4,176,720

WELL CEMENTING IN PERMAFROST

William N. Wilson, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 27, 1978, Ser. No. 928,648
Int. Cl.² E21B *33/14*
U.S. Cl. 166—293 **12 Claims**

1. A process for cementing in the permafrost region of a wellbore comprising recovering at least part of the aqueous drilling fluid used in drilling a wellbore in the permafrost region, said drilling fluid containing from about 2 to about 16 volume percent solids, mixing with said drilling fluid an additive selected from the group consisting of lignosulfonate, lignite, tannin, and mixtures thereof in an amount of from about 0.05 to about 0.4 pounds per barrel per equivalent pounds per barrel of bentonite as determined by the methylene blue test, essentially contemporaneous with and/or subsequent to the addition of said additive, mixing with said drilling fluid sufficient of at least one base to raise the pH of the mixture into the range of from about 9 to about 12 and from about 50 to about 250 pounds per barrel of at least one cementitious material which will harden in from about 30 to about 40 hours at about 40° F., pumping the resulting final mixture into the permafrost region of the wellbore to be cemented, and allowing said mixture to harden in said wellbore.

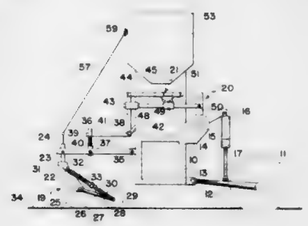
7. A process for treating an aqueous drilling fluid after it has been used in drilling a wellbore in permafrost, said drilling fluid containing from about 2 to about 16 volume percent solids, comprising mixing with said drilling fluid an additive selected from the group consisting of lignosulfonate, lignite, tannin, and mixtures thereof in an amount of from about 0.05 to about 0.4 pounds per barrel per equivalent pounds per barrel of bentonite as determined by the methylene blue test, essentially contemporaneous with and/or subsequent to the addition of said additive, mixing with said drilling fluid sufficient of at least one base to raise the pH of the mixture into the range of from about 9 to about 12 and from about 50 to about 250 pounds per barrel of at least one cementitious material which will harden in from about 30 to about 40 hours at about 40° F.

4,176,721

DEPTH CONTROL FOR GROUND WORKING AGRICULTURAL IMPLEMENTS

Erhard Poggemiller, Luseland, and Ralph Sweet, Forgan, both of Canada, assignors to Kep Enterprises, Luseland and Sweet Manufacturing Ltd., Forgan, both of, Canada

Filed Nov. 28, 1977, Ser. No. 855,277
Claims priority, application United Kingdom, Nov. 30, 1976, 49825/76
Int. Cl.² A01B *63/114*
U.S. Cl. 172—4 **10 Claims**



7. A first sensing means for agricultural implements, a ground engaging element attachable to said implement and means to set the depth of penetration of said ground engaging element with the ground; said first sensing means including a first ground engaging wheel, means mounting same for rotation and castoring action, a second ground engaging wheel journalled for rotation behind and in alignment with said first ground wheel, link means extending rearwardly from said first ground engaging wheel for journalling said second ground engaging wheel for rotation, said link means being pivotally connected to said means mounting said first ground engaging wheel, for movement of said second ground engaging wheel in a vertical plane, and spring means extending between said means mounting said first ground engaging wheel and said link means intermediate the ends thereof, normally urging said second ground engaging wheel into contact with the surface of the ground, said means mounting said first ground engaging wheel including a wheel fork, a spindle spanning said fork, said wheel being journalled for rotation upon said spindle, a fork

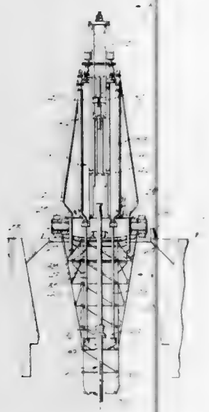
mounting shaft extending upwardly from said fork, means mounting said fork mounting shaft for castoring action of said first sensing means, said spring means including a rod pivotally connected by one end thereof to said link means, a sliding clevis secured to said wheel fork adjacent the upper end thereof, said rod slidably engaging said sliding clevis and a compression spring reacting between said sliding clevis and anchor means on said rod.

4,176,722

MARINE RISER SYSTEM WITH DUAL PURPOSE LIFT AND HEAVE COMPENSATOR MECHANISM

Sherman B. Wetmore, Westminster; James F. McNary, Santa Ana, and Abraham Person, Los Alamitos, all of Calif., assignors to Global Marine, Inc., Los Angeles, Calif.

Filed Mar. 15, 1978, Ser. No. 886,903
Int. Cl.[2] E21B 7/12
U.S. Cl. 175—7 **18 Claims**



1. Apparatus useful in drilling a well at a location submerged below a body of water comprising

a buoyant foundation structure floatable on the surface of the body of water and subject to vertical motion in response to waves and the like,

handling and tensioning means for moving a riser pipe along a substantially vertical line from and to the foundation structure into and out of connection of the lower end of the riser pipe with the submerged location and for applying tension to a riser pipe connected to the submerged location, the handling and tensioning means including vertically disposed hydraulic ram means mounted to the foundation structure at a location fixed vertically relative to the foundation structure, holding means releasably engageable with a riser pipe adjacent the upper end thereof and connected to the ram means for movement along said line in response to operation of the ram means, the ram means having an active first operating mode in which it is operable to lower and raise a riser pipe along said line into and out of said connection to the submerged location and a second operating mode in which it is operable during vertical motion of the foundation structure to apply a selected upward force to a riser engaged by the holding means and connected to the submerged location.

4,176,723

DIAMOND DRILL BIT

Leonce Arceneaux, Spring, Tex., assignor to DTL, Incorporated, Spring, Tex.

Filed Nov. 11, 1977, Ser. No. 850,471
Int. Cl.[2] E21B 9/36
U.S. Cl. 175—329 **17 Claims**



1. A diamond drill bit construction for drilling bores in earth formations and the like, said drill bit construction comprising:

a drill body having connection means formed thereon for connection with a drill stem, said drill body being formed to define internal fluid passage means through which drilling fluid flows during drilling operations;

a plurality of spaced bearing pads being formed on said drill body defining a portion of the external surface area and defining a plurality of fluid courses between adjacent bearing pads, said fluid courses being in communication with said fluid passage means said bearing pads engage said formation and limit penetration of said diamonds into said formation; and

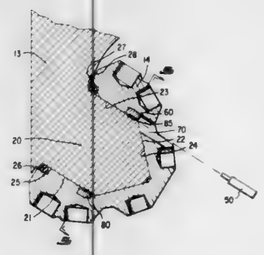
a plurality of diamonds being supported by said drill body and being arranged on each of said bearing pads, the leading portion of each of said diamonds being positioned at the trailing edge of a respective one of said fluid courses said diamonds extending substantially to the center of the bit.

4,176,724

ROTARY ROCK BIT AND METHOD OF MAKING SAME

Edward Vezirian, Fountain Valley, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Nov. 14, 1977, Ser. No. 851,475
Int. Cl.[2] E21B 9/08
U.S. Cl. 175—369 **31 Claims**



1. A rotary rock bit comprising a main bit body having at least one leg extending downwardly therefrom and a cutter assembly, said cutter assembly comprising:

a journal pin projecting from said leg, said journal pin having a cylindrical bearing surface and an annular groove formed thereon;

a cutter element rotatively supported on said journal pin, said cutter element having a radially inward bearing surface frictionally engaging the bearing surface of said journal pin;

an annular thrust member mounted within the groove formed in said journal pin, said thrust member having an outer radial surface engaging the bearing surface of said cutter element, said thrust member including at least one surface which engages a bearing surface of said journal pin for transferring the in-thrust load from the said cutter element to said journal pin; and

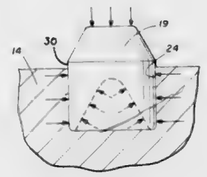
a weld fusing substantially the entire engaging surfaces of said thrust member and said cutter element.

4,176,725

EARTH BORING CUTTING ELEMENT ENHANCED RETENTION SYSTEM

Santos Shields, Arlington, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 17, 1978, Ser. No. 934,292
Int. Cl.[2] E21B 9/08
U.S. Cl. 175—374 **2 Claims**



1. In an earth boring apparatus having a body member retaining at least one insert, wherein upon assembly of said insert in said body member said insert is positioned in a socket in the body member, said insert having a bottom portion and a bottom surface being located in said socket, the improvement comprising:

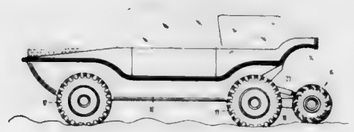
at least a substantial portion of both said bottom surface of said socket and said insert bottom portion having matching tapers so that the insert and socket have an improved fit wherein said bottom surface of said socket and said insert bottom portion are in engagement causing said bottom surface of said insert to tend to diverge when assembled, said divergence increasing the friction between insert and socket.

4,176,726

AMPHIBIOUS VEHICLE

Hans Schaeff, Langenburg, Fed. Rep. of Germany, assignor to HFM Hohenloher Fahrzeuge- und Maschinenvertrieb GmbH, Langenburg, Fed. Rep. of Germany

Continuation of Ser. No. 790,040, Apr. 22, 1977, abandoned.
This application Jun. 6, 1978, Ser. No. 913,237
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1976, 2617834
Int. Cl.[2] B60B 15/00
U.S. Cl. 180—15 **10 Claims**



1. A land vehicle comprising:

an undercarriage having front and rear pairs of ground wheels, at least one of said pairs being driven,

a vehicle body mounted on said undercarriage,

auxiliary drive means comprising thrust roll means extended substantially across the width of the vehicle and being divided into two similar drive roll sections said auxiliary drive means being driveable independently of said at least one pair of driven ground wheels,

each of said drive roll sections being rotatably mounted about a transverse axis with each section being secured to a separately controlled pivot arm pivotally mounted on said vehicle, the pivot arms being operable independently from one another so that one arm may pivot while the other arm remains stationary,

said drive roll sections and said pivot arms being independently movable between a lower position wherein said drive roll sections are biased against the ground and an upper position wherein said sections are partially covered by said vehicle body and out of contact with the ground,

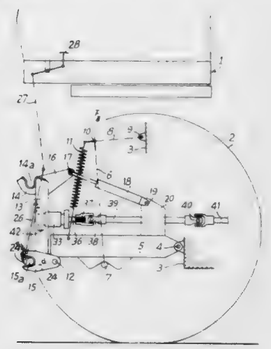
said drive roll sections being of a rubber-like material and having a ribbed pattern thereon.

4,176,727

DEVICES FOR AUTOMATICALLY COUPLING IMPLEMENTS TO SELF-PROPELLED ARTICLES

Philippe Périn, Meudon, France, assignor to Societe Fiat France, S.A., Paris, France

Division of Ser. No. 666,011, Mar. 11, 1976, Pat. No. 4,090,725.
This application Dec. 23, 1977, Ser. No. 863,630
Claims priority, application France, Mar. 19, 1975, 75 08579
Int. Cl.[2] B60D 1/04; B60K 17/28, 25/06
U.S. Cl. 180—53 R **3 Claims**



1. A self propelled vehicle including means for coupling an implement thereto comprising:

(a) a chassis:

(b) a device mounted on the chassis for automatically coupling an implement to said vehicle comprising:

(1) a rigid member having opposed end portions, said member being pivotally connected at one end portion to the chassis and extending generally horizontally,

(2) lifing means mounted on a hitching frame,

(3) suspension means connecting said rigid member to said lifting means,

(4) said hitching frame pivotally mounted at the other end portion of the rigid member, said hitching frame including jaw clamping means for releasably engaging said implement, and

(5) a double-acting ram operative to pivot the hitching frame, said vehicle further comprising

(c) a driving member,

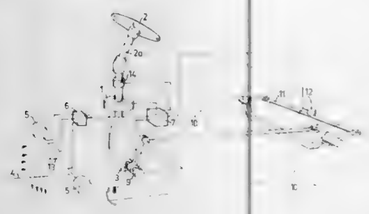
(d) a drive transmitting system connected to the driving member including:

(1) a universal joint

(2) a shaft

(3) a housing mounted on said hitching frame, bearing means mounted in said housing rotatably supporting said shaft,
(4) slide coupling means connecting the shaft to the drive-transmitting system,
(5) driving clutch plate means rigid with the shaft, having teeth with a conical leading edge
(e) an implement having driven components and driven clutch plate means operatively connected to said driven components, said driven clutch plate means having teeth having conical leading edges designed to mate with said teeth of said driving clutch plate means and having entraining surfaces at right angles to the surface of said clutch plate means
(f) said implement further comprising a splined shaft, slideable sleeve means rotatable with said spline shaft, said sleeve means being rigid with the driven clutch plate means, housing means rigid with said spline shaft, said housing means including an abutment, and spring means interposed between the housing means and the driven clutch plate means to bias said driven clutch plate means axially of the splined shaft toward said driving clutch plate means, said abutment restricting axial movement of the driven clutch plate means under the bias of the spring means.

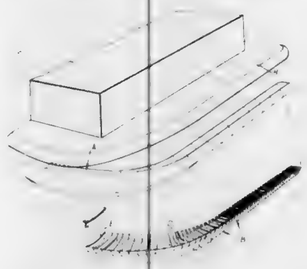
4,176,728
COMBINED AUTOMATIC AND MANUAL GUIDANCE SYSTEM
Sven I. A. Otteblad, Partille; Erner T. O. Brynielsson, Borgholm; Ralph G. Dovertie, Göteborg; Stig E. R. Franzén, Västra Frolunda, and Hans E. O. Brelén, Skövde, all of Sweden, assignors to AB Volvo, Goteborg, Sweden
Filed Mar. 21, 1977, Ser. No. 779,934
Int. Cl.[2] B62D *1/24*
U.S. Cl. 180—168 **7 Claims**



1. A system for combined automatic and manual steering of a vehicle, comprising at least one manual steering means and an automatic equipment with at least one executing means, said executing means being coupled to said manual steering means such that a counterforce is generated in said manual steering means to the force applied by the driver, said counterforce being a function of the deviation, produced by the driver, from a steered path of said vehicle as predetermined by said automatic equipment, said automatic equipment being such that over the whole steering range, said counterforce is less than the force that the driver is able to apply on said manual steering means.

4,176,729
ATTACHMENT OF HOVERCRAFT FINGERS
Clive L. C. Down, Trowbridge, England, assignor to Avon Industrial Polymers (Melksham) Limited, England
Filed Aug. 11, 1977, Ser. No. 823,692
Claims priority, application United Kingdom, Aug. 19, 1976, 34685/76
Int. Cl.[2] B60V *1/16*
U.S. Cl. 180—127 **4 Claims**

1. In a flexible connecting element for connecting at least one finger to a loop in a skirt of a hovercraft and having a first portion for attachment to at least one finger, the improvement comprising a pair of discrete strips of flexible elastomer-coated material forming the element and bonded face-to-face over part of their area to define the first portion, there being in a given cross-section of the element an unbonded part of the area of the strips to define a pair of flaps connected to the first



portion, the bonded part being delimited by a curved edge conforming to the curvature of the undersurface of the loop, each said unbonded part being longitudinally subdivided to define a plurality of the said flaps.

4,176,730
SPEAKER CABINET
Nicholas M. Mushkin, 4755 E. Flaming Rd., Las Vegas, Nev. 89109
Filed Jan. 30, 1978, Ser. No. 873,140
Int. Cl.[2] H05K *5/00*; G10K *11/00*; A47B *81/06*
U.S. Cl. 181—148 **9 Claims**



1. A speaker cabinet having a speaker mounted therein comprising an enclosure having top and bottom, two side and front and back panels, each side panel being contiguous with the top, bottom, front and back panels, a sound post wedged and extending between said front and back panels, said front panel having a sound port for said speaker, and an elongated bar extending towards said top and bottom panels and at least two-thirds of the distance between and secured substantially along its entire length to said front panel and without contact with any other panel.

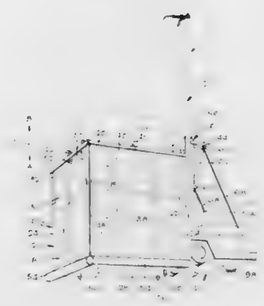
4,176,731
TWO-SECTION EXPONENTIAL ACOUSTICAL HORN
Rex Sinclair, Garden Grove, Calif., assignor to Altec Corporation, Anaheim, Calif.
Filed Nov. 21, 1977, Ser. No. 853,204
Int. Cl.[2] G10K *11/00*
U.S. Cl. 181—192 **6 Claims**

1. A two-section exponential horn comprising:
a first section between the throat of the horn and a predetermined point therealong having a first exponential flare rate, m_1, and



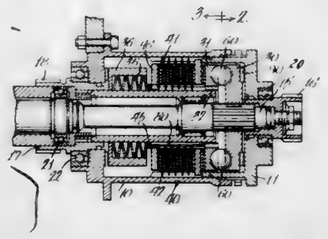
a second section between said predetermined point and the mouth of the horn having a second exponential flare rate, m_2, which is greater than m_1.

4,176,732
SELF-PROPELLED AIRCRAFT PASSENGER ELEVATOR
Robert A. Nordskog, 18135 Karen Pl., Tarzana, Calif. 91356
Filed Jan. 12, 1978, Ser. No. 868,812
Int. Cl.[2] B66F *9/14*
U.S. Cl. 187—9 E **24 Claims**



1. In a self-propelled elevating unit:
a substantially square-shaped cabin adapted to be raised and lowered from one level to another, said cabin including sliding doors providing easy access and exit therefrom, and all-around windows to provide maximum ground visibility;
a self-propelled vehicle for moving said cabin from one location to another, said vehicle including a pair of horizontally-spaced driven front ground wheels a driving rear wheel centrally at the rear of said vehicle for providing directional movement thereto, and a frame and a housing mounted on said frame;
a lift assembly intermediate said cabin and said vehicle, said lift unit including a mast oriented upwardly relative to said vehicle and comprising a first pair of lower stage guide members horizontally spaced and rigidly secured at their lower ends to said frame and housing of said vehicle, and a second pair of upper stage guide members horizontally spaced rigidly secured to said cabin at the rear end thereof, an extendable and retractable lifting member and chain assembly associated with said latter member for effecting telescoping up-and downward movement of said second upper stage guide members relative to said first lower stage guide members to thereby raise and lower said cabin from said one level to the other;
means for mounting said upper stage guide members to said cabin;
stop means for preventing displacement of the mounting means relative to said cabin;
electrically-powered, hydraulically actuating propulsion units in said vehicle within said housing thereof for transmitting motive power to said pair of driven front ground wheels, said lifting member and to said rear wheel to effect steering movement of said latter wheel; and
operating control means in said cabin for controlling said self-propelled vehicle and said cabin.

4,176,733
COMBINATION NO-BACK BRAKE AND TORQUE LIMITER ASSEMBLY
Robert G. Twickler, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.
Filed Apr. 26, 1978, Ser. No. 900,314
Int. Cl.[2] B60T *7/12*
U.S. Cl. 188—134 **14 Claims**

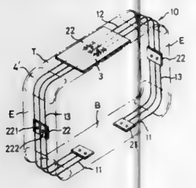


1. A combination no-back brake and torque limiter assembly comprising, a casing, a rotatable input shaft, a rotatable output shaft, a pair of opposing discs rotatably connected one to each of the input and output shafts, brake means associated with the output shaft including at least spaced-apart brake elements carried by the casing and interleaved brake elements therebetween and rotatable with the output shaft, spring means urging the brake elements toward the disc on the output shaft and into no-back braking pressure engagement, means including interacting elements between said opposing discs to increase the space therebetween for acting on the spring means to reduce the pressure engagement of the brake means and then release pressure engagement upon creation of a predetermined torque difference between the input and output shafts, and means including said interacting elements between said opposing discs for further increasing the space between said discs and acting on the spring means and exerting force on the brake means to obtain torque limiting braking pressure engagement as the torque applied to said input shaft approaches a maximum value.

4,176,734
FRAME STRUCTURE FOR SOFT-SHELLED LUGGAGE
Wan-Ching Wang, Taipei, Taiwan, assignor to Kodama Taiwan Industrial Co., Ltd., Taipei, Taiwan
Filed Apr. 24, 1978, Ser. No. 899,169
Int. Cl.[2] A45C *13/04*
U.S. Cl. 190—49 **14 Claims**

12. A soft-shelled luggage having a resilient frame structure, comprising:
a soft luggage shell including front, back and side walls;
at least two wires extending continuously over substantially the entire length of the side walls, said wires spaced apart from each other in a generally parallel arrangement; and

fastening means for securing the wires to the side walls of the luggage, said fastening means including means for
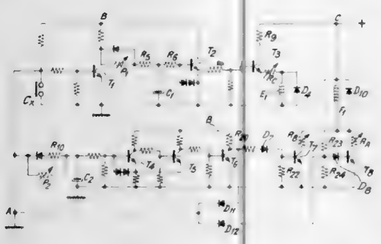


maintaining the wires in the generally parallel arrangement.

4,176,735
HIGH-SPEED APPARATUS FOR OFF-WINDING THREAD

Jacques V. L. Cousin; Marcel E. R. Decroix, and Hyppolite P. Gouy, all of Wervicq-Sud, France, assignors to Cousin Freres S.A., Wervic-Sud, France

Continuation of Ser. No. 621,505, Oct. 10, 1975, abandoned. This application Aug. 15, 1977, Ser. No. 824,742
Claims priority, application France, Oct. 14, 1974, 74 34412
Int. Cl.[2] F16D *67/06*
U.S. Cl. 192—12 D **12 Claims**

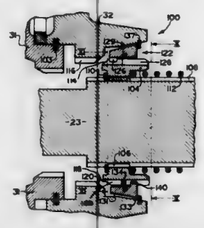


1. An apparatus for off-winding thread comprising a driving shaft, a drive means for rotating the driving shaft, a driven shaft, an electrically operated clutch interconnecting said driven and driving shafts, an electrically operated brake connected to said driven shaft, and an electronic control circuit comprising a first part connected to said clutch and incorporating an integrating circuit for producing gradual engagement of the clutch, a second part connected to said brake and incorporating a pulse generating circuit for producing a large temporary braking force, and a third part connected to said brake and incorporating a constant signal generator for producing a small constant braking force, wherein said brake and clutch are electro-magnetically operated and each has a control winding appropriately connected to said control circuit, said control winding of said brake is also connected to an output of said first part of the electronic control circuit, and diode means are coupled to said control winding of the clutch and said control winding of the brake in such a manner that current can flow through only one of these windings at a given moment.

4,176,736
BLOCKED CHANGE GEAR TRANSMISSION AND IMPROVED BLOCKER AND JAW CLUTCH ASSEMBLY THEREFOR

Elmer A. Richards, and Carl D. Roberts, both of Kalamazoo, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 19, 1977, Ser. No. 861,785
Int. Cl.[2] F16D *23/06*
U.S. Cl. 192—53 F **27 Claims**



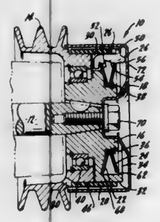
1. An improved blocker and jaw clutch assembly of the type comprising a substantially non-deformable blocker ring splined to a first of two axially engageable positive clutch members for rotation therewith with a predetermined relative rotation therebetween, said blocker ring operable to tend to rotate with said second clutch member at initiation of a clutch engaging operation, said blocker ring and first clutch member each having first projections extending therefrom defining a first array of interacting projections, said first array of projections effective to block relative axial movement of said first clutch member toward said second clutch member if not aligned, said blocker ring having at least one rotational position relative to said first clutch member wherein said first array of projections are aligned and at least one rotational position relative to said first clutch member wherein said first array of projections are misaligned, said blocker effective to sense non-synchronous rotation of said clutch members corresponding to blocker rotation relative to said first clutch member sufficient to cause a misalignment of said first array of projections to block axial engagement of said clutch members, the improvement comprising:

selectively actuated means associated with said blocker ring and said first clutch member effective to cause alignment of said first array of projections upon axial separation of said clutch members.

4,176,737
DRIVE MECHANISM

Richard W. Roberts, Lombard, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 21, 1977, Ser. No. 853,164
Int. Cl.[2] F16D *43/25, 13/08*
U.S. Cl. 192—82 T **6 Claims**

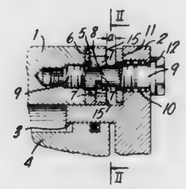


1. A thermally responsive drive mechanism for connecting a driving shaft to a driven pulley including a clutch surface on said shaft and a clutch surface on said pulley, a wrapping coil spring clutch element in engagement with both surfaces, an engaging pawl mounted adjacent said spring, a pair of bimetallic washer means in contact with said pawl, said pair of washer elements causing said pawl to cause said coil spring to connect said shaft and pulley in response to the temperature being within a predetermined range.

4,176,738
PISTON STROKE ADJUSTING ARRANGEMENT FOR DISC-TYPE FRICTION CLUTCHES AND BRAKES

Jury V. Katkov, Moscow, U.S.S.R., assignor to Moskovsky Automobilny Zavod imeni I.A. Likhacheva (Proizvodstvennoe Obiedinenie Zil), U.S.S.R.

Filed Jun. 27, 1977, Ser. No. 810,288
Claims priority, application U.S.S.R., Jun. 29, 1976, 2380121
Int. Cl.[2] F16D *13/75*
U.S. Cl. 192—111 R **3 Claims**

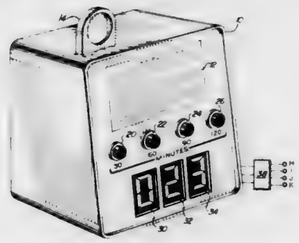


1. A piston stroke adjusting arrangement for disc-type friction brakes and clutches, comprising: a housing; a groove made in said housing; a flange of a cylinder rigidly secured to said housing with aid of a fastening member; a reciprocating piston accommodated in said cylinder; a washer accommodated in said groove and interposed between said housing and said flange of said cylinder, adapted to limit the axial stroke of said piston; radial recesses of different depths, made in said washer; an abutment carried by said flange, coaxially with said fastening member; said abutment being adapted to engage one of said radial recesses and having a width equalling that of this recess.

4,176,739
COIN ACTUATED TIMER WITH AUDIO OUTPUT

Edward J. Corcoran, Jr., 4528 W. Shaw Butte, Glendale, Ariz. 85304

Filed Feb. 10, 1978, Ser. No. 876,747
Int. Cl.[2] G07F *17/00*
U.S. Cl. 194—9 T **9 Claims**



1. Coin operated timing apparatus comprising, in combination:

coin receptor means for receiving a coin;

coin identification means for identifying the coin received by the coin receptor means;

switch means for selecting a time period in response to the coin received by the coin receptor means and identified by the coin identifying means;

timing means for enabling the switch means and for limiting the time in which the switch means may be activated to select the time period;

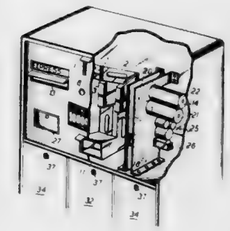
timer means including clock means for counting the selected time period; and

output means for producing an output signal at the end of the selected time period.

4,176,740
AUTOMATICALLY STAMPING MAILBOX

Hsieh Tzu-Yen, No. 8-2, Alley 36, Lane 31, Yu Ying St. Ching Mei Town,, Taipei, Taiwan

Filed Aug. 22, 1977, Ser. No. 826,744
Int. Cl.[2] G07F *17/12*
U.S. Cl. 194—9 R **3 Claims**



1. An automatic coin-operated stamping mailbox comprising:

a casing having a coin slot, a letter slot, a coin return opening, a letter cabinet and a coin cabinet;

a coin selector;

a coin collector;

a coin counter, said selector, collector and counter being mounted in said casing and forming a correct coin path between said coin slot and said coin cabinet, said coin collector comprising a coin controller pivotally arranged in said coin path to be turned to a certain angle by the impact force and weight of a coin, a cam operatively connected to said controller to be turned thereby, and a first normally open spring-loaded electrical switch operatively associated with said cam being closed when said cam is rotated by said controller;

an electrical power source in said casing;

a pilot light, said source and said light being in a first electrical loop with said first switch;

a pair of rollers aligned in parallel with said letter slot in said casing, one of said rollers having a carved stamp mark thereon, said rollers defining a letter path between said letter slot and said letter cabinet;

inking rollers inkingly associated with said pair of rollers to ink said stamp mark;

a second normally open spring-loaded electrical switch mounted before said rollers in said letter path;

a third normally open spring-loaded electrical switch mounted after said rollers in said letter path;

an electrical motor mounted in said casing, said motor being in a second electrical loop with said second switch which includes said source, said light and said first switch and said motor also being in a third electrical loop with said source, said light, and said third switch;

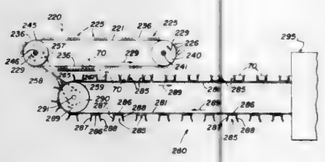
a first gear system mechanically connecting said motor and said pair of rollers to rotate the same; and

a second gear system operatively connecting said motor to said coin controller,

whereby when a correct coin is inserted through said coin slot, said coin controller is turned closing said first switch lighting said light, thereafter when a letter is inserted through said letter slot said second switch is closed starting said motor turning said pair of rollers marking the

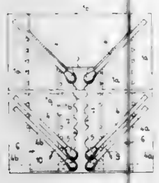
letter, as the letter is marked said third switch is closed, said second gear system permits the coin to continue to said coin cabinet, said third switch opening and stopping said motor only after the letter clears said rollers dropping into said letter cabinet.

4,176,741
ARTICLE TRANSFER MECHANISM
Walter H. Vogel, Hoffman Estates, Ill., assignor to Redington Inc., Chicago, Ill.
Filed Sep. 15, 1977, Ser. No. 833,435
Int. Cl.[2] B65G *47/26*
U.S. Cl. 198—457 **7 Claims**



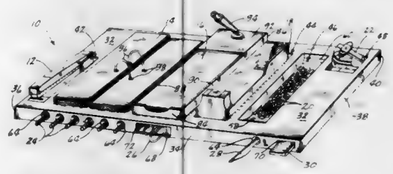
1. Article transfer mechanism for changing the direction of movement of articles while maintaining the orientation of the articles, the transfer mechanism comprising an infeed conveyor for conveying articles in a first direction while maintaining the articles in a predetermined orientation, a transfer conveyor in the form of a continuous belt having a plurality of groups of rollers with windows therebetween open at the tops and bottoms thereof for receiving articles through the tops from said infeed conveyor in the predetermined orientation, an article conveyor having a plurality of pockets thereon open at the tops thereof for receiving articles through the tops thereof from said transfer conveyor in the predetermined orientation for conveying the articles in a direction different from that of said infeed conveyor, retainer structure closing the bottoms of each of said windows as it arrives in position to receive an article from said infeed conveyor and opening the bottom of each of said windows as it arrives in position to deposit an article into one of said pockets on said article conveyor, whereby said article transfer mechanism transfers articles from said infeed conveyor moving in one direction with the articles in a predetermined orientation and deposits the articles in pockets on said article conveyor moving in another direction while maintaining the articles in the predetemined orientation.

4,176,742
MATCH CARRIER INCLUDING FRANGIBLE PROTRUSIONS
Henri Mühlethaler, Yverdon, Switzerland, assignor to Henri Muhlethaler S.A., Vaud, Switzerland
Filed Apr. 13, 1978, Ser. No. 895,745
Claims priority, application Switzerland, Apr. 21, 1977, 4933/77
Int. Cl.[2] A24F *27/20*
U.S. Cl. 206—98 **6 Claims**



1. A match carrier comprising, a support of generally quadrangular plate configuration having a central rib extending along one axis of said support, said rib having two longitudinal lateral faces defining a plurality of alveoles with walls of generally arc-shaped configuration, a plurality of matches arranged in ear way rows upon said support and not extend beyond the edges of said support, a friction-strip carried by said support, a resilient bearing member of generally quadrangular plate configuration secured along its middle portion to said central rib and bearing along two opposed edges thereof on said matches, the axis of said bearing member being aligned with the axis of said support, said matches having ends which extend beyond said two opposed edges of said bearing member and having heads opposite said ends with said heads being partially engaged in said alveoles, whereby exertion of a force on the end of a selected match rotates the match head in ball-joint fashion in its corresponding alveole to move said selected match into a disposition which is perpendicular to an adjacent edge of said support with the end of said selected match extending beyond said edge to permit exertion of a traction force on said selected match to cause said match head to slip on said friction-strip against which it is applied by said bearing member and thereby kindle said selected match.

4,176,743
PORTABLE DESK TOP TRAY
Thomas J. Fitzpatrick, 505 S. 150 Cir., Omaha, Nebr. 68154
Filed Jul. 26, 1978, Ser. No. 927,962
Int. Cl.[2] B43M *17/00*
U.S. Cl. 206—214 **16 Claims**



7. In combination,
a plurality of desk implements,
a portable tray for organizing and arranging said implements, said tray including
a top surface,
means for supporting said top surface in spaced relation above a supporting surface,
said top surface having a plurality of laterally spaced apart openings, each opening being adapted to receive a respective desk implement and being of a configuration to laterally confine the respective implement, when received therein, against substantial horizontal movement, and
at least one elongated socket on said tray, said socket positioned below said top surface and laterally of said openings.

4,176,744
TAPE REEL CONTAINER
Robert A. Borzak, Opelika, Ala., assignor to Ampex Corporation, Redwood City, Calif.
Filed Apr. 21, 1978, Ser. No. 898,655
Int. Cl.[2] B65D *85/67, 85/671*
U.S. Cl. 206—303 **9 Claims**

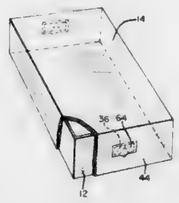
1. A tape reel container of the flat-walled box type having a reel supporting tray portion, characterized in that;
at least two diametrically opposite parts of the periphery of said tray portion are formed with steps having downward and outwardly facing portions confronting corresponding portions of opposite side walls of said container;
said corresponding portions of said side walls are each formed with an inward and downwardly folding flap snugly engaging said tray step, so as to both retain and be retained by said tray portion; and
said tray portion is dimensioned with respect to said box so

that said outwardly facing portions of the tray laterally engage and are snugly bracketed by said corresponding portions of the opposite sides and said tray is securely



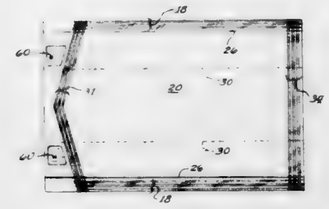
retained by said flaps against removal excepting as by convex upwardly bowed flexing of the entire tray and particularly the middle portion thereof.

4,176,745
SHIPPING CONTAINER
Ray H. Stollberg, Gilroy, Calif., assignor to Crown Zellerbach Corporation, San Francisco, Calif.
Continuation-in-part of Ser. No. 906,190, May 15, 1978. This application Oct. 30, 1978, Ser. No. 955,815
Int. Cl.[2] B65D *85/50*
U.S. Cl. 206—423 **6 Claims**



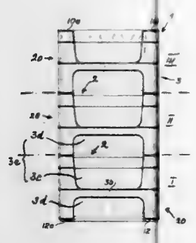
1. A shipping container for cut flowers and the like comprising:
a tray including a bottom wall and a plurality of tray side walls extending from said bottom wall, at least one of said tray side walls having an aperture formed therein and a tray closure flap manually movable between an open and closed position relative to said aperture;
a cover for placement on said tray, said cover including a top wall and depending cover side walls, at least one of said cover side walls having an aperture formed therein, said apertures being in registry when said cover is placed on said tray, said cover additionally including a cover closure flap manually movable between an open and a closed position relative to said cover aperture; and
lock means on said cover closure flap for selectively retaining both said tray and cover closure flaps in open position.

4,176,746
GUSSET POUCH WITH INTEGRAL SEAL SUPPORT AND METHOD OF MAKING SAME
Edward Kooi, Jersey City, N.J., assignor to Arvey Corporation, Chicago, Ill.
Filed Jul. 10, 1978, Ser. No. 923,358
Int. Cl.[2] B65D *27/32*
U.S. Cl. 206—438 **10 Claims**



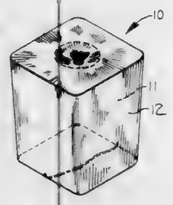
1. A two-ended, tear resistant, gusseted package sealed inwardly of a first end and open at a second end for receiving an article therein and which can be subsequently closed at the second end, said package comprising:
first and second webs of material, said first web having a transverse dimension greater than the second web, said webs having first end edges at said package first end and second end edges at said package second end, said webs further having closure forming means at said first end of said package spaced inwardly of said first end edges for sealing said webs at said first end and thereby defining graspable unsecured margin portions of each web adjacent said first end edges, said webs further having a pair of substantially coterminous opposed side edges, said first web having first and second spaced parallel fold lines adjacent each side edge to produce an inwardly extending first portion and an outwardly extending second portion in overlapping relation whereby a gusset is formed in said first web adjacent each side edge thereof;
means for adhering said first web to said second web to form a seal adjacent the two side edges of said first and second webs;
said closure forming means including 1) means sealing the adjacent facing surfaces of said first and second webs between said second fold lines, 2) means sealing said inwardly extending first portions of said first web to the adjacent facing inner surface of the first web, and 3) means securing the outwardly extending second portions of said first web to the adjacent facing surface of said second web, and
reinforcing means securing the inner surface of said inwardly extending first portions of said first web to the adjacent facing inner surfaces of said first web, said reinforcing means being disposed between said package first end and said closure forming means outwardly of said second fold lines over the major portion of the distance between said first and second fold lines and being disposed with peripheral boundaries generally parallel to said second fold lines for increasing the tear resistance of said first web when said first and second webs are grasped at said graspable margin portions and pulled outwardly relative to each other.

4,176,747
STACKABLE CRATES
Leo E. Aho, Tampere, Finland, assignor to Sarvis Oy, Tampere, Finland
Continuation of Ser. No. 727,846, Sep. 29, 1976, abandoned. This application Mar. 15, 1978, Ser. No. 886,778
Int. Cl.² B65D *21/02*
U.S. Cl. 206—509 7 Claims



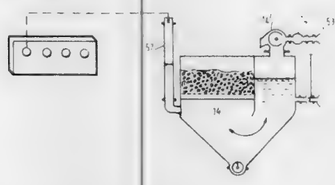
1. A stackable plastic crate (20) for transportation and storage of goods, e.g. containers for fluids and the like, and particularly for milk carton containers, comprising, in combination: a main case (1) constituted by front (3), rear (4) and two side (5, 6) walls, said side walls being shorter than said front and said rear walls; a single detachable, pivotable bottom (2) of the grating (2*a*) type in said main case, which latter has an open top; said side walls having therein a pair of hinges (2*c*) for pivoting said bottom within said main case between a lowered, substantially horizontal closed position and a partly upwardly open position; a peripheral bottom border (12) below said walls and inwardly spaced from bottom edge sufaces (12*a*) of said walls; transversal (9*b*) and peripheral (10, 11) bracing and reinforcing ribs, the latter including a top border (10) above said side walls and said front and said rear walls and defining top edge surfaces (10*a*) thereof, said top border being somewhat wider than said bottom border so that said borders constitute stacking means cooperating with such borders of adjoining identical crates when the crate is made to form part of a vertically superposed stack (I, II, III . . .); at least one of said front and rear walls having therein a pair of axially spaced, substantially rectangular apertures, the upper aperture having a U-shape and being bounded by a bottom edge and two spaced side edges, the spacing of the two side edges defining a discontinuity of the top border and the top edge surfaces, the lower aperture having an inverted U-shape and being bounded by a top edge and two spaced side edges, the spacing of the side edges of the lower aperture defining a discontinuity of the bottom border and the bottom edge surfaces; a narrow transverse wall section (3*b*) between said apertures in said one wall spacing said apertures apart and located about halfway the overall height of said main case; said apertures and said stacking means defining mating means for forming a peripherally enclosed and substantially rectangular access opening between two of the adjoining identical crates when the crate forms part of the stack, said upper aperture of a lower crate (I) and said lower aperture of an upper crate (II) from the two crates in the stack constituting together a contiguous, combined aperture (3*e*) defining said access opening, the opening the total height of which nearly corresponds to that of said main case; whereby goods are removable from the stack of crates laterally through said combined aperture when said bottom of a crate immediately above a combined aperture is in its open position.

4,176,748
SPECIAL PACKAGE AND METHOD
Frank T. Beane, Rte. 7, Hwy. 49, Concord, Cabarrus County, N.C. 28025
Filed May 10, 1978, Ser. No. 904,486
Int. Cl.² B65D *85/54, 19/22, 85/62, 29/00*
U.S. Cl. 206—525 2 Claims



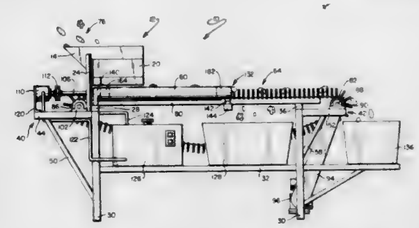
1. A package comprising a molded, slick-surfaced salt block having predetermined cross-sectional dimensions and knitted fabric bag means encircling said block for protecting said block against damage during handling and for enhancing frictional engagement of the package with adjacent surfaces, said bag means comprising crimped, synthetic multifilament yarn formed with locked stitches into a circular knit tube having a diameter when in relaxed condition which is less than said cross-sectional dimensions of said block whereby said bag is tensioned about said block so as to open said stitches of said fabric bag.

4,176,749
MATERIALS SEPARATION
Walter M. Wallace, Carlisle, and Geoffrey F. Craven, Bradford, both of England, assignors to North-Harty Colliery Engineering Limited, England
Filed Jan. 12, 1978, Ser. No. 868,931
Claims priority, application United Kingdom, Jan. 15, 1977, 1659/77; Apr. 30, 1977, 18172/77
Int. Cl.² B03B *5/24*
U.S. Cl. 209—457 21 Claims



1. A method of controlling the operation of a wash box in the form of a vessel divided vertically into water containing compartments and having a perforate grid plate extending across upper parts of the compartments, means being associated with the vessel which is operative to apply pulsations to the water in the compartments to produce a cyclic rise and fall of liquid in the compartments, said method involving the steps of:
(a) transmitting wave energy towards the surface of the liquid in one of said compartments;
(b) receiving a reflected signal therefrom;
(c) comparing a function of the transmitted signal with a function of the received signal to derive a comparative value;
(d) acting arithmetically upon successive comparative values to derive an output signal; and
(e) utilizing said output signal to control the operation of the wash box.

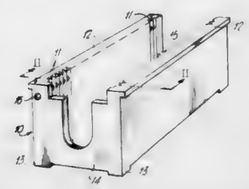
4,176,750
SORTING SYSTEM AND APPARATUS
Robert G. Holmes, Columbus, Ohio, assignor to Ohio Agricultural Research and Development Center, Wooster, Ohio
Continuation-in-part of Ser. No. 778,794, Mar. 18, 1977, Pat. No. 4,116,339. This application Sep. 6, 1978, Ser. No. 940,075
Int. Cl.² B07C *1/00;* A01D *33/02*
U.S. Cl. 209—699 34 Claims



1. Sorting apparatus for objects exhibiting identifiable dynamic response to vibrational phenomena comprising:
means for introducing a quantity of said objects at the entrance location of a sorting zone extending along a given longitudinal axis to an exit location;
means defining an oscillatory surface within said zone and extending along said longitudinal axis;
drive means including a dynamically balanced rotative drive member actuable to impart oscillation of predetermined frequency and amplitude characteristics to said oscillatory surface;
transporter means including a plurality of regularly-spaced parallel carrier components pivotally interconnected in endless chain-like fashion to define a conveyor within said zone extending from said entrance location in parallel relationship with said longitudinal axis, each said carrier component having an upwardly disposed support surface when within said zone extending outwardly from a location adjacent said oscillatory surface at a predetermined angle of inclination with respect to horizontal, said spacing being selected to provide a two position support for said objects upon adjacent said support surfaces while moving them within said zone in orientations promoting the kinetic reaction thereof with said oscillatory surface;
means adjacent said zone for receiving reacted said objects exhibiting predetermined dynamic response characteristics to said kinetic reaction; and
means for simultaneously actuating said drive means and said transporter means.

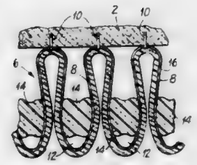
4,176,751
CONTAINER APPARATUS FOR HANDLING SEMICONDUCTOR WAFERS
Michael J. E. Gillissie, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Jan. 27, 1977, Ser. No. 762,862
Int. Cl.² A47G *19/08;* B65B *21/02*
U.S. Cl. 211—41 1 Claim

1. Apparatus for transferring semiconductor wafers, comprising:
a holder of trough shaped cross-section including two opposed parallel sides having top and bottom surfaces;
said top surfaces being flat and including locating means for cooperation with locating means on a further member;
said sides joined at one end by an end wall extending between said sides at said one end and joined at the other end by a bar extending between said sides at said other end, the holder open at top and bottom between said end wall and said bar;
a plurality of parallel Vee shaped grooves formed in an inner surface on each side, the grooves extending from said top surfaces and having inwardly inclined lower ends extending in to the inner surface of the side at a position intermediate the top and bottom surfaces, for reception and retention of a semiconductor wafer in each opposed pair of grooves when said holder is in an upright position, at least a major portion of each wafer below said top surfaces;
a hole extending longitudinally through one side of the holder adjacent to the top surface thereof, the periphery of the hole extending into the Vee grooves at a position above that occupied by a portion of the wafer; and
a rod slidable axially into and out of said hole;



the arrangement such that the rod, when inserted into said hole, extends over the periphery of the wafers at a position remote from the centres thereof to retain the wafers in the holder when said holder is in an inverted position, with the edges of the wafers unobstructed for alignment and prepositioning with respect to grooves of said further member;
said further member including a plurality of Vee-shaped grooves aligned with said Vee-shaped grooves in said holder for reception of wafers therein, a wafer in each groove.

4,176,752
RACK AND GOLF CART
Russell E. Taber, 46 Crystal Cir., Ormond Beach, Fla. 32074
Division of Ser. No. 798,102, May 18, 1977. This application Jun. 21, 1978, Ser. No. 917,504
Int. Cl.² A47B *81/00*
U.S. Cl. 211—120 5 Claims



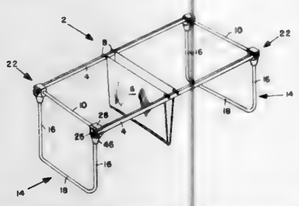
1. A resilient rack device comprising:
a base member;
a strip of flexible resilient plastic material secured to said base member at spaced points, the material of said strip between said spaced points defining resilient elongated parallel loops extending outwardly from said base, adjacent loops being sufficiently close together to conform to and frictionally receive and hold an article therebetween; and
a separate body of resilient foam material in each of said loops holding said loops yieldably expanded toward adjacent loops.

4,176,753

HANGING FILE SUPPORT FRAME

Steven W. Godfrey, Florence, Ky., assignor to Hunt Manufacturing Co., Philadelphia, Pa.

Filed Aug. 9, 1978, Ser. No. 932,263
Int. Cl.[2] A47F 5/10
U.S. Cl. 211—182 **3 Claims**



1. A hanging file folder support frame comprising:
a pair of file folder support rails,
four corner fittings,
legs supporting the corner fittings in an elevated position,
each corner fitting having a bottom wall, a rear wall, and a flexible top wall forming a first opening for the reception of one end of a rail, the top and bottom walls forming a front entry into said first opening for the passage of said one end of a rail into said first opening in a direction transverse to the length of the rail, said rear wall being substantially thicker than the top wall, and the top wall being cantilevered from the rear portion of the rear wall,
means integral with the top and bottom walls of each corner fitting for releasably locking the rail end into the first opening,
a pair of transverse members each having hollow ends,
the rear wall of each corner fitting having a second opening therethrough for the reception of one end of a transverse member, and
a rail backing wall in said first opening of each corner fitting depending from the top wall and having a boss extending towards the second opening in the rear wall and received in the hollow end of a transverse member for restraining the movement of the depending wall and the top wall to prevent inadvertent disengagement of a rail end from the corner fitting.

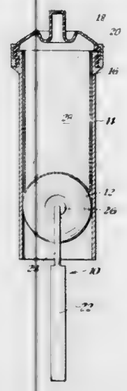
4,176,754

PNEUMATIC BIASING DEVICE FOR PREVENTING AIR FROM ENTERING A NURSING BOTTLE

Diane Miller, 2241 NE. 34 Ct., Lighthouse Point, Fla. 33064

Filed Jun. 23, 1978, Ser. No. 918,409
Int. Cl.[2] A61J 9/00
U.S. Cl. 215—11 E **1 Claim**

1. A device for preventing air from being received into the flexible bag in a conventional nursing bottle, comprising:
a pneumatic biasing means, said pneumatic biasing means being sized to be frictionally engaged in the inside of a conventional nursing bottle;
a means connected to the biasing means for manually positioning the biasing means within said nursing bottle;



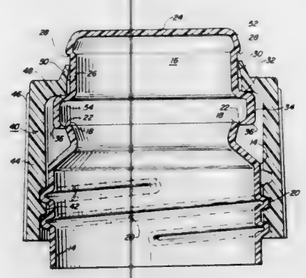
said pneumatic biasing means being donut-shaped and having an outer diameter which is slightly greater than the inner diameter of a conventional nursing bottle.

4,176,755

RESEALABLE POUR BOTTLE WITH SEVERING RING

David A. Winchell, Twin Lakes, Wis., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 26, 1979, Ser. No. 6,977
Int. Cl.[2] B65D 1/02
U.S. Cl. 215—32 **5 Claims**



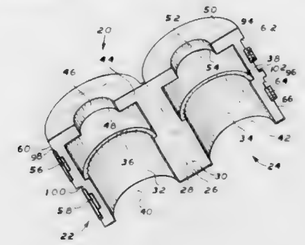
1. A resealable container for storing and dispensing liquids, said container including a neck defining a dispensing outlet and a cap covering said outlet, a frangible section coupling said cap to said neck, the improvement comprising:
said cap having an outwardly extending retaining abutment and an outwardly extending bearing surface spaced downwardly from said retaining abutment;
said neck carrying external threads; and
an outer ring having internal threads for threaded engagement with the external threads of said neck, said outer ring having a plurality of inwardly extending slightly flexible fingers for fitting around the cap intermediate said retaining abutment and bearing surface, whereby downward rotation of said outer ring will force said outer ring against said bearing surface thereby severing the cap from the neck at the frangible section and upper rotation of said outer ring will place said fingers into engagement with said retaining abutment.

4,176,756

STOPPER LOCK FOR CULTURE BOTTLE

Barry N. Gellman, Wayne, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Jun. 27, 1977, Ser. No. 809,972
Int. Cl.[2] B65D 45/32
U.S. Cl. 215—274 **8 Claims**



1. A stopper lock adapted for application to a culture bottle in position to retain the stopper on the culture bottle comprising; a pair of lock halves, fastener means on the lock halves, the lock halves having a configuration permitting their placement on the bottle to engage with the stopper and bottle and to lock the stopper in position in the bottle when the fastener means couples the lock halves together while permitting access to the stopper, the lock halves being hinged together along one adjoining edge to facilitate their positioning on the bottle and stopper in the open position and then rotated into the closed position to lock the stopper in position on the bottle, the fastener means being located on the edge of each half opposite to the hinged edge, the fastener means including at least one laterally extending projection extending from the free edge of one body half, the projection having a narrow free end portion extending into a wider portion terminating in a longitudinal shoulder, at least one receiving slot positioned on the longitudinal edge of the other body half distal from the hinged end and having a size permitting insertion of the lateral projection therein until the projection snaps into position with the shoulder engaging the end wall of the slot thereby locking the lock halves together, the fastener means including permanent lock means to prevent reopening of the stopper lock after it has been closed and thereby providing a one time use stopper lock, the permanent lock means including each laterally extending projection extending from the free edge of one body half having a beveled portion between the narrow free end and the longitudinal shoulder and the opposite side of the shoulder from the beveled portion forming a wall, and each at least one receiving slot being formed by a tapered slot adjacent the longitudinal edge of the other body half and tapering between a wider lateral opening to a narrow opening at the point of the slot distal from the longitudinal edge and a guide bar on the longitudinal edge of the other body half and spaced from the lateral wall forming the entrance to the slot thereby providing an opening therebetween for introduction of the projection, the rear side of the bar forming a wall for interengagement with the wall on the longitudinal shoulder of the projection when the projection is inserted in the slot and to cooperate with the remainder of the slot to retain the projection in locked position therein.

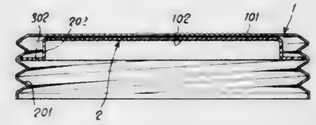
4,176,757

GASKET FOR CLOSURE CAPS FOR CONTAINERS

Armando Podesta, 36, Corso Buenos Aires Milan, Italy

Filed May 1, 1978, Ser. No. 901,695
Claims priority, application Italy, May 2, 1977, 12584 A/77
Int. Cl.[2] B65D 53/00
U.S. Cl. 215—341 **2 Claims**

1. In a closure for containers comprising a closure cap having a disc portion, a skirt depending from the periphery of the disc portion, means for fastening said skirt to the neck of a container to be closed, and a gasket disposed adjacent said disc portion of the closure cap for sealing contact with a rim of a neck of a container to be closed, the improvement wherein said gasket is made of a thin foil of plastics material and has a disc portion adjacent the disc portion of said closure cap, a cylindrical skirt portion depending from the periphery of said disc portion and a flange portion extending radially outwardly from



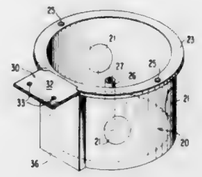
the lower end of said skirt portion, whereby as the gasket is compressed between said closure cap and a rim of a neck of a container, said skirt portion will flex inwardly in a bellows-like manner thereby providing three layers of gasket material between the rim and the closure cap, said three layers being formed by said flange portion, said cylindrical skirt portion, and said disc portion.

4,176,758

UNIVERSAL ELECTRICAL OUTLET BOX AND METHOD OF INSTALLING

Earl Glick, 13015 Lincoln St., NW., Massillon, Ohio 44646

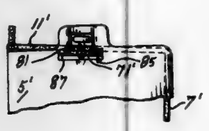
Division of Ser. No. 803,364, Jun. 3, 1977, Pat. No. 4,096,964.
This application Apr. 17, 1978, Ser. No. 897,182
Int. Cl.[2] H02G 3/08
U.S. Cl. 220—3.3 **8 Claims**



1. An electrical outlet box molded from plastics material and having a rear wall and a substantially cylindrical side wall, the outlet box being open forwardly, a screw-threaded metallic post centrally located in the outlet box axially thereof and concentric with said cylindrical side wall, anchor means on one end of said post embedded in said rear wall and integrally connecting said post to said rear wall, said post terminating in said rear wall, a flat faced bearing pad formed on the cylindrical side wall at one locality thereof and constituting a thickened portion of the cylindrical side wall, and having an exterior flat face parallel to the axis of the side wall and post, and a metallic mounting bracket for the outlet box including an apertured attaching web flush with the forward end of the box and projecting radially thereof normal to the axis of the side wall and post and a substantially flat anchor web moldably embedded integrally in the side wall adjacent said bearing pad, said apertured attaching web being normal to said flat face of the bearing pad.

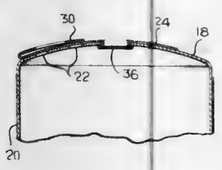
V 9 8 9 / 1
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4,176,759
ELECTRICAL OUTLET BOX
William Nattel, Montreal, Canada, assignor to GTE Sylvania Canada Limited, Montreal, Canada
Division of Ser. No. 761,473, Jan. 24, 1977. This application Feb. 23, 1979, Ser. No. 14,511
Claims priority, application Canada, Dec. 17, 1976, 268114
Int. Cl.[2] H02G *3/08*
U.S. Cl. 220—3.94 3 Claims



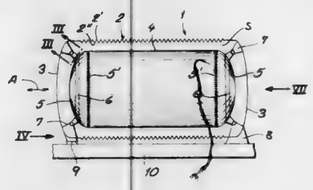
1. An electrical outlet box comprising a spacer member and two side walls, the spacer member having a back wall and a pair of end walls which extend from the ends of the back wall and diverge slightly from each other, first means for connecting one end of each side wall to one end wall; second means for connecting the other end of each side wall to the opposite end wall; the second connecting means having third and fourth cooperating means on the side wall and opposite end wall respectively for camming the end walls to a substantially parallel position and means on said connecting means for locking the third and fourth means together with the end walls in the substantially parallel position, said third cooperating means comprises an opening in the side wall, the opening having a camming surface on one side thereof, the fourth cooperating means comprising a tab projecting from the opposite end wall, the tab insertable into the opening where it can be cammed by the cam surface toward said one end wall.

4,176,760
EASY OPENING CONTAINER UNIT HAVING A DOMED END PANEL
Donald J. Roth, Chicago Heights, Ill., assignor to The Continental Group, Inc., New York, N.Y.
Filed Dec. 8, 1978, Ser. No. 967,763
Int. Cl.[2] B65D *41/00*
U.S. Cl. 220—359 9 Claims



1. An easy opening container unit comprising a domed end panel having an area of maximum projection, permanently formed dispensing opening means in said domed end panel, and a displaceable pull tape temporarily sealing said dispensing opening means, said pull tape extending beyond said dispensing opening means and over and beyond said area of maximum projection.

4,176,761
THERMALLY INSULATED VESSEL ESPECIALLY FOR LIQUEFIED GASES
Horst Göbl, Garching, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany
Filed Dec. 2, 1975, Ser. No. 636,964
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1974, 2457264
Int. Cl.[2] B65D *81/18, 87/24*
U.S. Cl. 220—438 3 Claims

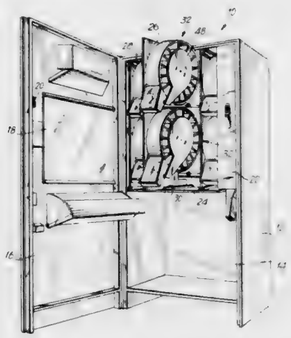


1. An insulated vessel for the storage or transport of liquefied gas comprising:
an inner axially elongated generally cylindrical receptacle receiving said liquefied gas;
an outer axially elongated generally cylindrical receptacle spacedly surrounding said inner receptacle and defining an evacuatable space therewith, said outer receptacle comprising at its ends a pair of opposing shell members and an intermediate member sealingly connected to said shell members and disposed between the shell members, said intermediate member being formed unitarily with stiffening formations preventing radial expansion and contraction but permitting elastic axial expansion and contraction; and
support elements engaging said shell members and supporting said outer receptacle on said inner receptacle, said shell members being formed as dome cylinder bottoms and said intermediate member being a cylindrical wall, said formations extending circumferentially on said wall, said wall being corrugated with the corrugations having crests and troughs lying in planes perpendicular to the axis of said outer receptacle, said inner receptacle having cylinder bottoms at opposite ends thereof, said support elements being rigidly connected to said cylinder bottoms of said inner receptacle.

4,176,762
DRIVE SYSTEM FOR ROTARY MERCHANDISE CARRIERS
Frank T. Scalera, 12 Bowdoin St., Maplewood, N.J. 07040, and Merrill Krakauer, 1 Deer Path, Short Hills, N.J. 07078
Filed Jul. 19, 1978, Ser. No. 926,001
Int. Cl.[2] G07F *11/00*
U.S. Cl. 221—81 10 Claims

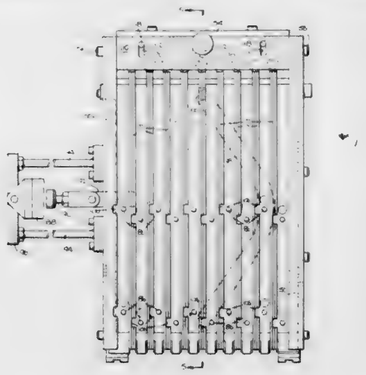
1. In a merchandising machine having a plurality of merchandising units each of which includes a display escrow assembly adapted to be actuated to deliver an article held thereby and a rotary merchandise carrier provided with a plurality of storage compartments and adapted to be driven to position a compartment thereof adjacent to said escrow assembly to which an article can move out of said storage compartment and means responsive to rotation of said carrier for actuating said escrow assembly and a product pusher adapted to be moved into a compartment positioned adjacent to said escrow means, an improved drive system including a plurality of sliders, means mounting said sliders adjacent to the respective carriers for movement with an upward stroke and with a return stroke, respective drag links carried by said sliders, an element on each of said links adapted to engage its associated carrier to rotate the same and to operate the corresponding

pusher, means for constraining an element to move along a first path in which it successively rotates its associated carrier and operates its associated pusher in the course of the upward movement of the corresponding slider and to move along a second path in which it ensures return of its associated pusher and clears its associated carrier in the course of the return



movement of the corresponding slider, a drive member, means mounting said drive member for vertical linear reciprocating movement adjacent to said sliders, normally inoperative interengageable means on said sliders and on said member, means for selectively rendering said interengageable means operative, and means for driving said member with a dwell between the time said carrier rotates and said pusher is actuated.

4,176,763
MAGAZINE FOR TRANSFERRING ROD-SHAPED ARTICLES
Charles J. Klara, Bethlehem; James H. Hohl, Wescoesville, both of Pa., and Wilbur L. Clymer, Phillipsburg, N.J., assignors to Binney & Smith Inc., Easton, Pa.
Continuation-in-part of Ser. No. 738,489, Nov. 3, 1976, abandoned. This application Oct. 31, 1977, Ser. No. 846,896
Int. Cl.[2] B65H *3/40*
U.S. Cl. 221—93 13 Claims



1. A magazine for receiving elongate similar articles from a source retaining said articles in a predetermined parallel array and for transferring said articles to a collector in unscrambled parallel relation with one another, said magazine comprising:
(a) partition means defining a plurality of open-bottomed chambers adjacent to, but isolated from, one another, each of said chambers corresponding in width to the width of any of said articles so that the associated partition means thereby provide loose lateral support for a selected number of said articles in a stacked array, with one said article upon the next;
(b) support means movably disposed in each of said chambers for releasably supporting each said stacked array against free gravitational fall; and
(c) control means operatively associated with said support means for withdrawing all said support means simultaneously with one another from their respective chambers and for thereby releasing each said stacked array for free gravitational fall through the open bottom of its respective one of said chambers.

4,176,764
MECHANICALLY OPERATED MIXING DISPENSER HAVING A PLURALITY OF EXPANSIBLE CHAMBERS AND A PLURALITY OF ACCUMULATING CHAMBERS
Nicholas G. Capra, East Hanover, N.J., and Ronald L. Antenore, Coral Gables, Fla., assignors to James D. Pauls, Ltd., Miami, Fla.
Division of Ser. No. 729,830, Oct. 5, 1976. This application Apr. 26, 1978, Ser. No. 900,323
Int. Cl.[2] B05B *11/02*
U.S. Cl. 222—135 4 Claims



2. A mixing dispenser, comprising:
a container for material to be dispensed;
a dispensing device carried by the container and including first manually operable means accessible exteriorly of the container;
expansible accumulating chamber means carried by the dispensing device for receiving and storing under pressure a quantity of material to be dispensed and comprising a pair of cylinders and a piston reciprocable in each cylinder;
expansible charging chamber means carried by the dispensing device and comprising a pair of cylinders and a piston reciprocable in each cylinder, one of the charging chamber cylinders being in communication with one of the accumulating chamber cylinders, and the other of said charging chamber cylinders being in communication with the other of the accumulating chamber cylinders, valve means connected between the cylinders, whereby said one accumulating chamber cylinder is charged from said one charging chamber cylinder and the other accumulating chamber cylinder is charged from the other charging chamber cylinder, said charging chamber cylinders each being in communication with a different material, whereby each accumulating chamber cylinder is charged with a different material, said expansible charging chamber cylinders each having a smaller cross-sectional area transverse to the longitudinal axis than the expansible accumulating chamber cylinders and repeatedly operable to incrementally introduce quantities of material into the accumulating chamber cylinders to incrementally charge the accumulating chamber cylinders with an amount of material to be dispensed; and
second manually operable means connected with the accumulating chamber cylinders to effect prolonged, pressur-

ized discharge of material from the accumulating chamber cylinders.

4,176,765

SELF-CLEANING BUCKET WHEEL LOCK

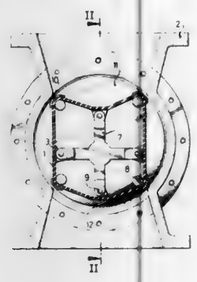
Ursus Thümmler, Erftstadt; Hugo Werner, Hurth-Hermulheim, and Harry Sander, Sindorf, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 9, 1978, Ser. No. 876,250

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1977, 2706047

Int. Cl.² G01F *11/00*

U.S. Cl. 222—218 **10 Claims**



1. Self-cleaning bucket wheel lock with several cells for introducing coalescent material into a closed apparatus, which comprises a casing with a material inlet and discharge outlet; a rotor basket mounted on a driving shaft passing into the casing; a closed elastic hose forced on the rotor basket, said hose having secured to its inside a plurality of lugs being spaced apart from each other; a star with several arms being arranged in the interior of said hose and being connected to the lugs of said hose; and a shaft passing into the casing at its side opposite the driving shaft and extending through the casing so as to provide a rigid connection to the center of said star, said shaft being displaced eccentrically with respect to the driving shaft so as to be spaced therefrom at a separation e, whereby said hose permits the volume of each cell to be varied whenever the driving shaft is caused to rotate.

4,176,766

SOUP DISPENSER

John B. West, Glyndon, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Continuation-in-part of Ser. No. 827,678, Aug. 25, 1977. This application Nov. 16, 1977, Ser. No. 851,950

Int. Cl.² G01F *11/20*

U.S. Cl. 222—238 **30 Claims**

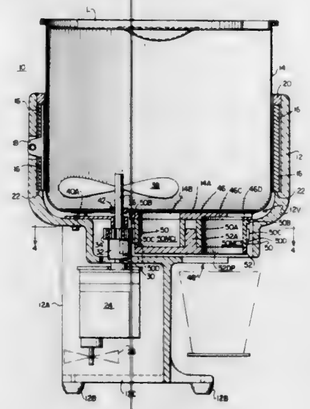
1. A dispensing assembly for dispensing volumes of liquid or semi-liquid food product from the bottom of a reservoir by gravity filling and emptying, comprising:

a rotary dial shaped transfer plate means having a circular pattern of substantially identically configured measuring chambers formed therein and extending therethrough parallel to a central axis of rotation;

a conformal housing for said transfer plate means open at its top and having a supporting plate across the bottom thereof coextensive with said transfer plate means, said supporting plate having a discharge opening formed therein of substantially identical configuration as said measuring chambers for successive registry therewith in response to rotations of said transfer plate means on said central axis of rotation within said housing;

sealing plate means fixed from rotation on said housing over said transfer plate means and overlying an area on said transfer plate means coincident with the said discharge opening and surface areas adjacent thereto and greater than the cross-sectional area of a said measuring chamber and having an intake port formed therein in registry with successive ones of said measuring chambers during rotation of said transfer plate;

said sealing plate means including vent port means in registry with said discharge opening through successive ones of said measuring chambers;



motor means having a rotary output shaft mounted for rotation adjacent said transfer plate means in said housing; and

drive means selectively actuated to interconnect said output shaft with said transfer plate means for rotating the latter in an amount to register a predetermined number of measuring chambers with said discharge opening for each selective actuation of said drive means.

4,176,767

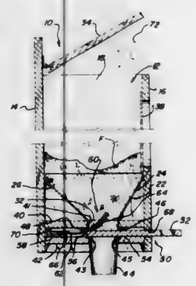
DOG FOOD DISPENSER

Darius C. Franche, IV, 1401 W. Wabansia Ave., Chicago, Ill. 60622

Filed Jan. 5, 1977, Ser. No. 756,785

Int. Cl.² B65D *47/26*

U.S. Cl. 222—243 **17 Claims**



1. In apparatus for storing and dispensing dry pellet-like food particles in which a storage bin has a hopper bottom with an outlet hole at its lower extremity for allowing food particles to flow out of said bin, the improvement comprising:

a slidable gate traversing said outlet hole in said hopper bottom for regulating the flow of food particles out of the bin, said gate having an elongated generally rectangular body and provided with a handle at one end, a solid center section, and an opening at its opposite end such that sliding said gate longitudinally in one direction results in aligning said solid center section with said outlet hole for effectively closing said outlet hole to preclude flow of food particles from said bin and sliding said gate longitudinally in the opposite direction results in aligning said opening with said outlet hole to allow food particles to flow out of the bin;

an upper plate sealed against and extending both in one direction from said outlet hole and in the opposite direction from said outlet hole, said upper plate having a hole therein concentric with said outlet hole to allow food particles to flow therethrough, a lower plate in parallel spaced-apart relation to said upper plate, said lower plate also having a hole therethrough axially aligned with said outlet hole, wiper means extending downwardly from said upper plate adjacent said hole in said upper plate for wiping any food particles on the upper surface of said gate into said opening as said gate is slidably moved open or closed thereby preventing build-up of food particles between said gate and said upper plate which could otherwise inhibit free movement of said gate; and

agitator means on said sliding gate extending upwardly through said outlet hole into said bin for agitating the food particles in the immediate vicinity of said opening as said gate is slidably moved in either direction to encourage removal of the food particles from said bin as said gate is advanced to align said opening with said hole.

4,176,768

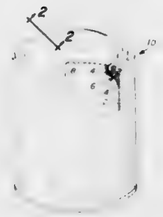
PAINT CAN CORNER FILLER

John C. Ritter, 12645 Duchess, Detroit, Mich. 48224

Filed Jun. 22, 1978, Ser. No. 917,913

Int. Cl.² B67D *3/00*

U.S. Cl. 222—564 **2 Claims**



1. A corner filler for the inside corner of the openable end of liquid carriers comprising:

a ring of resiliant material said ring having an outside diameter larger than the inside diameter of said carrier to sealingly engage said inside diameter, one end of said ring having a thickness and shape approximating the space between the inside wall of said carrier and the inside wall of the outer edge of said carriers sealing lip, and is snugly received therein, the inside wall of said one end following the contour of said space axially toward the other end and radially inward, terminating in a circular sharp edge when the bottom of said sealing lip is half covered radially;

said outside diameter extends axially from said one end for approximately two times the depth of said sealing lip terminating in an oblique corner at said other end, said oblique corner and said circular sharp edge are connected by a slightly concave surface.

4,176,769

FLUTED,-STEPPED, POUR NOZZLE

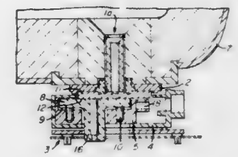
Joseph W. Cudby, Sheffield, England; Christopher F. King, and Nicholas Syred, both of Cardiff, Wales, assignors to USS Engineers and Consultants, Inc., Pittsburgh, Pa.

Filed Mar. 22, 1978, Ser. No. 888,904

Claims priority, application United Kingdom, Apr. 7, 1977, 14724/77

Int. Cl.² B22D *41/08*

U.S. Cl. 222—591 **13 Claims**



1. A flow nozzle for use in the pouring of molten metal comprising:

(a) a hollow body having an inlet opening at one end, a discharge opening at the other end and a metal flow passage therebetween;

(b) a flow impeding constriction in said metal flow passage formed by a substantially annular shoulder about the interior of said hollow body defining an inlet section thereabove;

(c) means forming a duct between said flow impeding constriction and said discharge opening;

(d) a plurality of circumferentially spaced, elongated fins in the inlet section of said metal flow passage, said fins projecting inwardly from the wall of said body and extending generally parallel to the direction of metal flow through said passage; and

(e) the upstream ends of said fins being longitudinally spaced from said inlet opening and forming abruptly bluff, inwardly projecting steps providing a substantially annular shoulder about the interior of said hollow body for obstructing the passage of recirculatory currents in the metal flow from entering said duct.

4,176,770

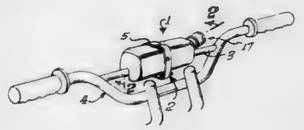
MOTORCYCLE CANTEEN

William K. Griggs, Torrance, Calif., and Harry Holland, Las Vegas, Nev., assignors to Tumbleweed Enterprises, Torrance, Calif.

Filed Aug. 28, 1978, Ser. No. 937,477

Int. Cl.² B62J *7/00*

U.S. Cl. 224—30 A **17 Claims**



1. In a canteen assembly adapted for mounting on the crossbrace of the handlebars of a motorcycle, the improvement consisting of:

(a) a bracket, including clamping means at the left and right ends thereof securing it to said crossbrace,

(b) support means on said bracket for supporting a canteen and, including a rectangular, horizontal, top face bounded by front, rear, left and right edges,

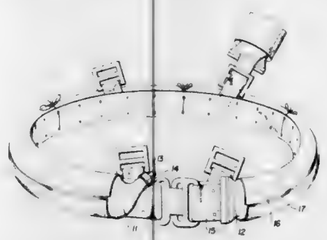
(c) depending from said front and rear edges, respectively, are front and rear rectangular faces the top edges of each being inclined inwardly at an angle of about 10° from vertical,
(d) loop means depending from the bottom edge of said front and rear rectangular faces, respectively, adapted to receive and retain a holding strap,
(e) a length of holding strap threaded through said loop means, said holding strap being provided with securing means at each end for adjustably securing one end to the other end,
(f) said canteen consisting of a bottle main body bounded by 6 walls: top, bottom, front, rear, left and right walls, a threaded neck emerging from the right wall, terminating in a mouth surrounded by a lip sealably engageable with gasket means of a removable screw cap closure engaging the threads of said threaded neck,
(g) said bottom wall of said bottle main body being deeply creased inwardly to form a longitudinal groove traversing the entire length of said main body in sufficient depth and width that the crossbrace of said handlebars can be completely received by said longitudinal groove,
(h) a 2-level cavity depressed into the mid-section of said groove, shaped and dimensioned in its medial deeper level portion to intimately engage said top face and to wedgingly engage said inclined front and rear rectangular faces; two lateral shallower level portions, positioned left and right of said medial deeper level portion, having a depth and diameter sufficient to clear said clamping means at the left and right ends, respectively, of said bracket when said canteen is straddlingly mounted over said bracket which is securely clamped to said crossbrace, and
(i) said holding strap being snugly wrapped around the midsection of said canteen and each of its ends secured one to the other, thereby securing the canteen assembly to the crossbrace of the motorcycle.

4,176,771
CARRIER FOR THREE-WHEEL MOTORCYCLE
Tyrone P. Dubroc, Sr., 4583 Little Farms Dr., Zachary, La. 70791
Filed Jan. 9, 1978, Ser. No. 867,901
Int. Cl.² B62J *7/04*
U.S. Cl. 224—39 **9 Claims**



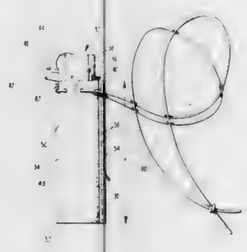
1. A carrier assembly for attachment to a motorcycle having a front wheel and two opposed rear wheels, and having a frame and a pair of opposed foot rests fixedly coupled to the lower portion of said frame, said assembly comprising:
(a) a pair of opposed, spaced apart, upwardly and rearwardly extending leg members, the lower ends thereof being adapted for coupling to said pair of opposed foot rests, said leg members being spaced outwardly of said motorcycle to provide space for the rider's legs therebetween;
(b) a generally U-shaped article support section having a pair of spaced apart side members attached to the upper ends of said leg members and extending toward the rear of said motorcycle and article support means extending between said side members;
(c) brace means attached to an upper part of said frame at one of its ends and attached at one or more points to said U-shaped article support section; and
(d) said carrier assembly being free of any attachment to the rear wheels of said motorcycle.

4,176,772
WATER CONTAINER
David Danon, Rehovot, Israel, assignor to Yeda Research & Development Co. Ltd., Rehovot, Israel
Filed Jul. 5, 1977, Ser. No. 812,910
Claims priority, application Israel, Jul. 5, 1976, 49974
Int. Cl.² A45F *3/20*
U.S. Cl. 224—148 **7 Claims**



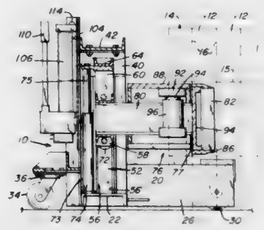
1. A water container comprising: a disposable tubular water-impervious flexible member adapted to contain hermetically sealed therewithin a supply of water, said tubular water-impervious member being substantially the length of a belt; belt means to support said tubular water-impervious flexible member, said belt means comprising a flexible elongated sheathing means having two ends, whereby said sheathing wraps about said tubular flexible member when the same is juxtaposed thereto covering said tubular water-impervious member, means for attaching the sheathing when wrapped about said tubular water-impervious member, and means to attach said two ends together around a person's waist; said tubular water-impervious member being sealed at both ends thereof.

4,176,773
HOLDER FOR CIGARETTE LIGHTER
Elizabeth P. Wilkinson, High Point, N.C., assignor to Joseph Bostick, Estill, S.C.
Filed Jun. 28, 1977, Ser. No. 810,863
Int. Cl.² A45C *11/00*
U.S. Cl. 224—205 **2 Claims**



1. A holder for a cigarette lighter, adapted to be suspended from the neck of a wearer, comprising: a leather sleeve, open at both ends, formed from a generally rectangular flexible sheet of leather, folded to align two opposite edges thereof, wherein portions of the sheet adjacent the aligned edges are stitched together along the aligned edges, to form said sleeve, said sleeve having a roughened inner surface and being dimensioned to substantially cover a cylindrical butane tank and to permit the sleeve to receive and frictionally engage the lighter, so that the lighter is retained within the sleeve without providing a bottom end for the sleeve, and so that a portion of the lighter including an actuation member of the lighter protrudes beyond one of the open ends of said sleeve; and a strap, laced through a plurality of holes in said sleeve in the upper end of the sleeve, the ends of said strap being tied together to form a closed loop, said strap being of sufficient length to encircle the neck of the wearer to permit the lighter to hang loosely from the neck when the lighter is not in use and of sufficient length to permit the lighter to be manually grasped, actuated and positioned upright to light a cigarette in the mouth of the wearer.

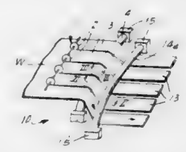
4,176,774
COIL BREAKAWAY DEVICE
John W. Rogers, 22175 Douglas Rd., Shaker Heights, Ohio 44122
Filed Dec. 4, 1978, Ser. No. 966,432
Int. Cl.² B26F *3/00*
U.S. Cl. 225—103 **12 Claims**



11. Apparatus for detaching a wound coil from a horizontally disposed construct having an axial opening therethrough and including a plurality of axially spaced coils interconnected by frangible connections, said apparatus comprising:
(a) a base, open at one end for reception of said construct;
(b) a frame upstanding from said base;
(c) expandable mandrel means projecting from said frame of a size, when contracted, to be received within the axial opening of said construct, said mandrel including:
(i) anchor means vertically movable with respect to said frame;
(ii) means for moving said anchor means into engagement with the surface of said construct within said axial opening to anchor the same with respect to said mandrel.
(iii) radially displaceable means axially spaced from said anchor means adapted, when actuated, to impart a radial force against the surface of said construct opening of a magnitude sufficient to fracture the connections between adjacent coils; and
(iv) means for actuating said radially displaceable means.

4,176,775
INHIBITING NOISE IN SHEET SPREADERS
Roger C. Brendemuehl, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.
Filed Mar. 28, 1977, Ser. No. 782,065
Int. Cl.² B65H *17/32*
U.S. Cl. 226—7 **22 Claims**

1. A method of inhibiting noise in the operation of a sheet spreader of the type wherein just-slit web strips running at high speed are separated laterally by travelling in limited wrapping relation across curvate flotation zones on complementary spaced spreader bars with respect to which the web strips approach and leave tangentially, so that there are tangency angle areas between the bars and the strips outside of the flotation zones, said flotation zones being supplied with strip-lifting antifriction lubricating air layers between the flotation zones and the strips in the flotation zones, said method comprising:
effecting air layer distribution in said flotation zones;



ventilating said tangency angle areas between the bars and the running strips by supplying to the tangency angle areas a sufficient volume of ventilating air for delaying pressure decay in said tangency angle areas;
and thereby avoiding sudden tension fluctuations in the running strips and thus inhibiting noise generating vibrations in the running strips.

4,176,776
FILM-TRANSPORT MECHANISM FOR MOTION-PICTURE PROJECTORS, AND THE LIKE
Karl Ziegler, Nellingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Dec. 2, 1977, Ser. No. 857,043
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1976, 2655821
Int. Cl.² G03B *1/22*
U.S. Cl. 226—51 **6 Claims**



1. An intermittent for motion-picture projectors and the like in which film is transported in forward and reverse directions along a predetermined path, the intermittent comprising, in combination,
a film transport claw provided with at least one film-perforation-engaging tooth;
means mounting the claw for movement in the direction of forward and reverse film transport and mounting the claw for movement in a direction transverse thereto for entry of the tooth into and withdrawal from film perforations;
rotary cam means coupled to the transport claw and operative for controlling movement of the claw in the forward and reverse film transport directions;
in-out control means operating in synchronism with the rotary cam means for controlling the movement of the claw in the direction of entry of the tooth into and withdrawal from film perforations, including means for selecting a forward-transport mode of operation establishing a forward-transport in-movement and a forward-transport out-movement and a reverse-transport mode of operation establishing a reverse-transport in-movement and a reverse-transport out-movement;
the rotary cam means comprising a rotating cam which

rotates in one and the same direction for both forward-transport and reverse-transport operation,

the rotating cam having one cam track which controls the movement of the claw in the film-transport direction for both the forward- and reverse-transport modes of operation,

the one cam track having first and secondary angularly spaced camming sectors,

the first sector being configured to cause the claw tooth to move in the stated order through a distance S_1 in the forward-transport direction, thereafter through a distance S_2 in the forward-transport direction, and thereafter through a distance S_3 in the reverse-transport direction,

the second sector being configured to cause the claw tooth to move in the stated order through a distance S_4 in the reverse-transport direction, thereafter through a distance S_5 in the reverse-transport direction, and thereafter through a distance S_6 in the forward-transport direction,

the forward-transport out-movement and the reverse-transport in-movement occurring subsequent to completion of the S_3 movement and prior to initiation of the S_4 movement,

the forward-transport in-movement and the reverse-transport out-movement occurring subsequent to completion of the S_6 movement and prior to initiation of the S_1 movement,

the S_2 movement constituting the one-frame film-advancement motion of the transport claw for forward film transport but constituting a part of the return stroke of the claw for reverse film transport,

the S_5 movement constituting the one-frame film-advancement motion of the transport claw for reverse film transport but constituting a part of the return stroke of the claw for forward film transport,

the claw, when a transport-effecting tooth thereof is engaging the leading edge of a film perforation and effecting film transport in one direction, needing to move in the opposite direction a predetermined distance before a transport-effecting tooth of the claw reaches and engages the leading edge of a film perforation for effecting film transport in the opposite direction,

said predetermined distance being equal to the sum of the distances S_3+S_4 and being equal to the sum of the distances S_1+S_6,

whereby:

during forward transport the S_1 movement is a movement in which the transport-effecting tooth of the claw is in a film perforation and moves into engagement with the leading edge of such perforation to commence the performance of the S_2 one-frame forward-transport motion,

during forward transport the S_3 movement is a movement in which the transport-effecting tooth of the claw is in a film perforation and moves out of engagement with the leading edge of such perforation preliminary to leaving such perforation,

during reverse transport the S_4 movement is a movement in which the transport-effecting tooth of the claw is in a film perforation and moves into engagement with the leading edge of such perforation to commence the performance of the S_5 one-frame reverse-transport motion,

during reverse transport the S_6 movement is a movement in which the transport-effecting tooth of the claw is in a film perforation and moves out of engagement with the leading edge of such perforation preliminary to withdrawing from such perforation.

4,176,777

SETTING ARRANGEMENT FOR ALIGNMENT AND GAP BETWEEN TWO RAIL ENDS

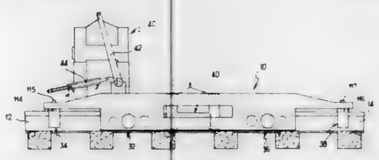
Patrick Bommart, Rueil-Malmaison, France, assignor to C. Delachaux, Gennevilliers, France

Filed Jul. 6, 1978, Ser. No. 922,347

Claims priority, application France, Jul. 8, 1977, 77 21157; Jun. 7, 1978, 78 17029

Int. Cl.² B23K *37/04*

U.S. Cl. 228—5.1 **13 Claims**



1. Apparatus for aligning and setting the gap between two rail ends prior to joining the two ends by fish plating or welding and eventual dressing of the weld, the apparatus comprising a rigid frame for overlapping the two rails and providing an access area around the two ends, two main presses and two end presses mounted in line on the frame and arranged so that the two main presses are located between the two end presses and each combination of a main press and an end press being adapted to grip one of the two rails to be joined, gap setting means adapted to be secured on to the two rails and having rams for moving the rails together or apart and dressing means for removing the weld bead formed after a welding joining operation and comprising a movable dressing tool displaceable by the gap setting means rams.

4,176,778

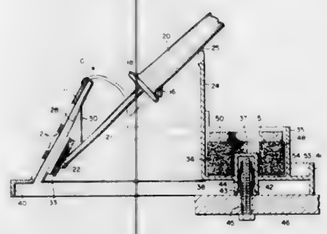
SOLDERING TOOL HOLDER

William S. Fortune, 14250 Dearborn St., Panorama City, Calif. 91402

Filed Feb. 27, 1978, Ser. No. 881,615

Int. Cl.² B23K *3/00*

U.S. Cl. 228—57 **15 Claims**



1. A holder for an electric soldering instrument of the character including a handle portion having an enlarged diameter retaining shoulder about the periphery of its forward end, a working shaft extending axially forwardly therefrom and terminating in a heatable tip element, said holder comprising:

a housing body having a lower portion for housing the working shaft and tip element;

said housing body having an upper portion including intermediate catch means for latching the retaining shoulder of the instrument handle portion to prevent retraction of the instrument from the lower housing portion;

said housing body further including an upper rest means for supporting the handle of the soldering instrument while allowing said handle to be lifted to disengage the catch from the retaining shoulder;

said housing body having an outer grill portion with perforated openings for the circulation of air therethrough; and

a heat shield disposed spaced from and interiorly of said grill portion to provide a rest for the tip element of the instrument and to maintain said housing body at a temperature which can be readily touched by the hand of an operator.

4,176,779

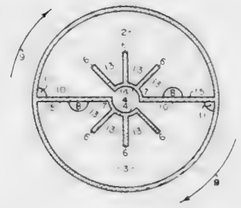
HYDRAULIC INERTIA CENTRIFUGAL CATALYTIC DESALINATION DEVICE

Clair F. Kirk, 856 Pine St., Wheatland, Wyo. 82201, and Samuel A. Kirk, Box 65, Pringle, S. Dak. 57773

Filed Feb. 2, 1978, Ser. No. 874,709

Int. Cl.² B04B *5/04*

U.S. Cl. 233—32 **1 Claim**



1. A device which is a centrifuge rotor with hydrogen gas pressure cavities which trap hydrogen gas to utilize the catalytic properties in the desalination of saline water, said rotor comprising a rotatable high gravity chamber, a first compartment shaft providing an inlet to said chamber, a second compartment shaft providing two compartment outlets to said chamber, said chamber comprising a cylinder arranged to rotate with said first and second shafts, said cylinder being positioned intermediate the inlet portion of said first shaft and the outlet portions of said second shaft, said cylinder sectioned into at least one separating pocket chamber by a wall, extending radially from cylinder center proximity to the circumference and joined to said cylinder internal ends and at the circumference, said wall providing a lagging and leading surface for said rotatable pocket, said first compartment shaft arranged to deliver pressurized mixture to the lagging surface of said pocket, a heavies separation fraction outlet positioned at the circumference end of said lagging surface, means for passing said heavies from said heavies to the first compartment of said second shaft, a heavies rotor outlet from said first compartment of said second shaft, numerous baffles joined at their axial ends and to said cylinder internal ends, extending radially toward the circumference of said cylinder providing hydrogen gas pressure cavities, said baffle adjacent said lagging surface providing a layer developing chamber, a lights separation fraction outlet positioned on the leading surface of said pocket on the arc of the peripheral ends of said baffles, means for passing said lights from said lights outlet to the second compartment of said second shaft, a lights rotor outlet from the said second compartment of the second said shaft.

4,176,780

METHOD AND APPARATUS FOR TESTING PRINTED CIRCUIT BOARDS

Eric Sacher, Phoenix, Ariz., and Thomas E. Trebelhorn, San Diego, Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 6, 1977, Ser. No. 857,950

Int. Cl.² G06F *11/04*; G01R *15/12*

U.S. Cl. 235—302 **30 Claims**

1. A method of testing printed circuit boards having circuit connected electrical devices and input and response nodes, comprising the sequential steps of:

(A) evaluating and improving a test program for said boards by:

(1) applying the program to the input nodes of a printed circuit board, and obtaining from selected response nodes on said board a reference response pattern and reference toggle signatures,

(2) exercising the board to produce an arbitrary response pattern,

(3) applying the program to the board in said arbitrary response state, and obtaining a test response pattern from said selected response nodes,

(4) comparing said reference and test response patterns and, if a valid comparison is not obtained, modifying the program to obtain a valid comparison,

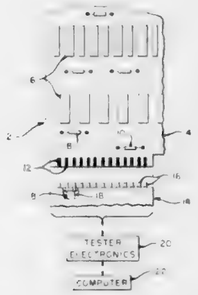
(5) faulting selected input nodes on the board,

(6) applying the program to the board with said selected nodes faulted, and obtaining test toggle signatures from selected response nodes while the program is applied, and

(7) comparing said reference and test toggle signatures to determine the penetration of said faults through the circuit board and, if the faults have not penetrated, modifying the program until penetration is established, and

(B) using said program to test printed circuit boards by:

(1) obtaining a reference response characteristic, by



(a) applying said program to the input nodes of a reference board, and

(b) for each of a plurality of selected response nodes on the reference board

(i) accumulating a running toggle signature number as the program is applied,

(ii) periodically sampling said number at a predetermined sampling rate, and

(iii) storing the samples thus obtained as a reference response characteristic, and

(2) analyzing a test board, by

(a) applying the program to the input nodes of the test board,

(b) for each of a plurality of selected test board response nodes corresponding to the selected response nodes on the reference board,

(i) accumulating a running toggle signature number as the program is applied, and

(ii) periodically sampling said number at sampling intervals corresponding to the sampling rate for the reference board, and

(c) comparing the test samples thus obtained with the corresponding stored reference samples to detect defects manifested by invalid comparisons between a test sample and its corresponding reference sample.

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4,176,781

APPARATUS FOR MONITORING AND CHECKING PROCESSOR OPERATION SEQUENCES
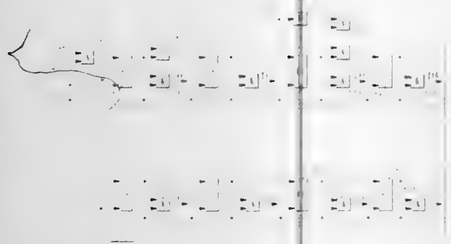
Jüergen Hüesing, Selent, and Hans H. Lampe, Herrenberg, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 3, 1978, Ser. No. 892,455

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2715983

Int. Cl.[2] **G06F** *11/00*

U.S. Cl. 235—304 **8 Claims**



1. Apparatus for monitoring and controlling sequence analysis of processor operations in an electronic digital computer, comprising:

a flip-flop chain in which each flip-flop is associated with an operational step for setting up a monitoring and check sequence;

a flip-flop ring, comprising a group of flip-flops within said chain for controlling the monitoring and check sequence;

means for conducting an oscillator signal to a reset input of all of said flip-flops;

said flip-flop chain including logic means for conducting control signals to a set input of all of said flip-flops;

each of said flip-flops being so designed that a concurrence of signals of the set and reset inputs will cause the flip-flop to change state;

said logic means permitting only one flip-flop to be set at any time;

storage means;

address generating means; and

means connected between said flip-flops and said address generating means, responsive to the concurrence of an oscillator signal and a set state of one flip-flop to cause said address generating means to generate the address in said storage means of a subroutine associated with said one flip-flop.

4,176,782

CONTACTLESS DIGITAL KEY SWITCH

Hiroshi Fukuda, Tokyo, and Haruo Matsuzaka, Yokohama, both of Japan, assignors to Matsu Kyu Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1978, Ser. No. 911,512

Claims priority, application Japan, Jun. 3, 1977, 52-72394[U]

Int. Cl.[2] **G06K** *7/08;* **E05B** *43/00, 35/00;* **G06K** *19/06*

U.S. Cl. 235—449 **3 Claims**

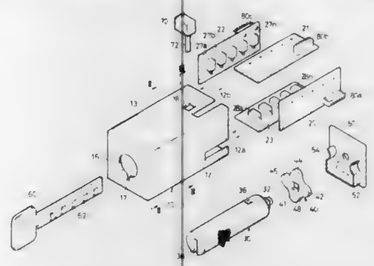
1. A contactless digital key switch comprising:

a plurality of printed circuit substrates each having a predetermined number of magnetic sensor chips longitudinally arranged thereon in spaced relation, said printed circuit substrates disposed in the form of polygon prism with said magnetic sensor chips facing inwardly;

an actuating key member having one or more permanent magnets longitudinally arranged therein in spaced relation and in coded form;

a rotary member adapted to receive said actuating key member and rotated with the same within said polygon prism defined by said printed circuit substrates; and

means drivingly connected to said rotary member for permitting rotation of said rotary member with a snap action and holding said rotary member in a position where said permanent magnets face to the corresponding magnetic



sensor chips on one of said printed circuit substrates every time said rotary member is rotated by a predetermined angle;

whereby a coded output signal corresponding to said permanent magnets arranged in coded form can be provided every time said actuating key member is turned by said predetermined angle.

4,176,783

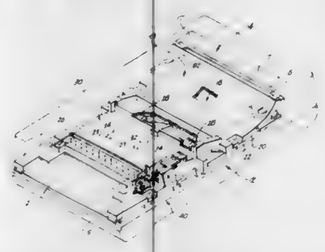
MANUALLY OPERABLE CARD READER INCLUDING COLUMN SENSOR

Helmut Eppich, West Vancouver, Canada, assignor to Ebco Industries, Ltd., Richmond, Canada

Filed Jun. 21, 1978, Ser. No. 917,644

Int. Cl.[2] **G06K** *7/14;* **G08C** *9/06*

U.S. Cl. 235—474 **18 Claims**



1. In combination with a manually operable card reader for reading coded data punches arranged in longitudinally-extending rows and transversely-extending columns on an elongated tabulation card, said manually operable card reader comprising a card guide means having defined therein first and second card openings and an elongated passageway having a pair of oppositely disposed major boundary surfaces and a pair of oppositely disposed minor boundary surfaces, said passageway being dimensioned for the passage of said tabulation card and interconnecting said first and said second card openings, and further comprising a card reading station for supplying a plurality of electrical signals representative of said coded data punches, said card reading station being positioned along said elongated passageway between said first and said second card openings and supplying said plurality of said electrical signals as said card is manually moved through said passageway;

a column sensor for providing an output signal related to the spacing of columns on said card as said card is moved through said passageway, said column sensor including:

(a) a substantially cylindrical member having a circumferential surface;

(b) first means supporting said cylindrical member in proximity to said card reading station for rotation about an axis substantially transverse to the direction of elongation of said passageway, said first means being further adapted to resiliently urge said circumferential surface of said cylindrical member into contact with one of said pair of major boundary surfaces, and

(c) second means responsive to incremental rotation of said cylindrical member as a card is moved through said passageway for providing said output signal representative of the spacing of columns on said card.

4,176,784

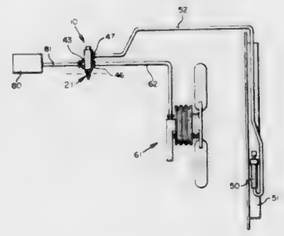
DUAL ACTION CONTROL MECHANISM

Michael R. Ridenour, Angola, Ind., assignor to Evans Products Company, Portland, Oreg.

Filed Oct. 12, 1978, Ser. No. 950,838

Int. Cl.[2] **G05D** *23/02*

U.S. Cl. 236—86 **6 Claims**



1. In a dual action control mechanism for supplying fluid under pressure to a first and a second fluid actuatable device having:

a. a valve body having an inner end and an outer end;

b. a valve chamber located within said valve body;

c. an opening in said valve body for communicating a source of fluid under pressure with said valve chamber;

d. an exhaust chamber communicating with the atmosphere located at the outer end of said valve body;

e. a connecting passageway communicating the valve chamber with the exhaust chamber;

f. a reciprocal valve rod located within said valve chamber, which said valve rod is reciprocally movable from a first position adjacent the inner end of said valve chamber to a second position removed from said inner end, a valve stem extending outwardly from said valve rod and into said connecting passageway, said valve stem having a passageway therein communicating said valve chamber with said connecting passageway in the first position of said valve rod;

g. a thermal sensor located at the inner end of said valve body, said thermal sensor having a push pin extending into the valve chamber and into contact with the inner end of said valve rod, said valve rod being in its first position when said push pin is unextended and in its second position when said push pin is fully extended;

h. a housing member located at the outer end of said valve body, said housing member having a bore communicating with said exhaust chamber, a reciprocal needle valve located and movable within said bore, said needle valve having a conical head portion at its inner end which extends through said exhaust chamber into sealing relationship with the outer terminus of said connecting passageway at the first position of said valve rod and into sealing relationship with the passageway of that portion of the valve stem extending into said connecting passageway at said second position of said valve rod, the bore of said housing member communicating with the atmosphere through a peripherally located exhaust port;

i. a first fluid passageway for communicating the valve chamber with a first fluid actuatable device; and

j. a second fluid passageway for communicating the connecting passageway with a second fluid actuatable device;

the improvement comprising:

an exhaust port communicating said valve chamber with the atmosphere; and

means for sealing communicating between said valve chamber and said first fluid passageway while said valve rod is in said first position, and means for sealing communication between said valve chamber and said exhaust port while said valve rod is in said second position.

4,176,785

AUTOMATIC TEMPERATURE CONTROLLER WITH NIGHT SETBACK AND OPERATING AS A FUNCTION OF OUTSIDE AIR

John J. Allard, Mishicot, and James R. Montz, Two Rivers, both of Wis., assignors to AMF Incorporated, White Plains, N.Y.

Filed Dec. 27, 1978, Ser. No. 946,229

Int. Cl.[2] **F23N** *5/20;* **G05D** *23/00*

U.S. Cl. 236—46 R **13 Claims**



1. In a temperature control system that maintains first temperature within a building during a first period of time and a second temperature within the building during at least a portion of a second period of time, wherein said periods of time repetitively follow each other, said system operating to automatically change said temperatures in an economical manner so that the temperature reaches said first temperature substantially at the time the first period begins, regardless of the characteristics of the outside air, wherein the system includes thermostat means for controlling the operation of a temperature changing controller means to maintain said first temperature within said building during said first period and said second temperature within said building during at least a portion of said second period, said system comprising

a first time scheduler continuously operable over a period of time that includes at least one first period and one second period,

an auxiliary timer,

said auxiliary timer being operable to run in a given direction from its beginning condition and to arrive again at its beginning condition after reaching a predetermined time indication,

auxiliary timer control means operable to control the running of the auxiliary timer,

sensing means for sensing a characteristic of air outside the building,

said sensing means being operably coupled to the auxiliary

timer control means for controlling the running of the auxiliary timer as a function of said sensed air characteristic,

means operable in response to said timer scheduler at the conclusion of the first period for actuating the thermostat means from a first to a second condition that will cause the temperature changing controller means to maintain said second temperature within the building during at least a portion of said second period,

auxiliary timer actuating means operable by said time scheduler at a predetermined number of hours before the next occurrence of the first period for initiating operation of the auxiliary timer under control of the auxiliary timer control means,

means operable in response to the running of said auxiliary timer to a given intermediate condition under control of said sensing means for operating said thermostat means to its first condition to control the building temperature at said first temperature,

means operable in response to said auxiliary timer when said intermediate condition has been reached for continuously running the auxiliary timer in said given direction independently of said sensing means and for stopping the auxiliary timer at its beginning condition,

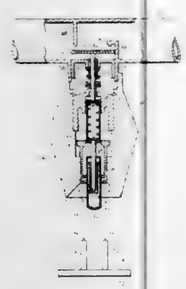
means operable in response to said time scheduler after the thermostat means returns to its first condition for maintaining the building at the first temperature and for conditioning the time scheduler to again actuate the thermostat means to its second condition when the next occupancy period ends.

4,176,786

CONCEALED THERMOSTATIC CONTROL VALVE

Heinz W. Braukmann, Willowdale, Canada, assignor to Braukmann Armaturen AG, Rothrist, Switzerland

Continuation-in-part of Ser. No. 777,115, Mar. 14, 1977. This application Nov. 11, 1977, Ser. No. 850,691
Claims priority, application Canada, Nov. 25, 1976, 266589
Int. Cl.[2] G05D *23/12*
U.S. Cl. 236—99 K **10 Claims**



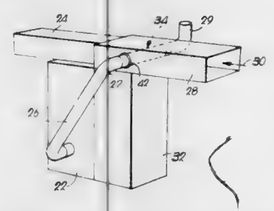
1. A thermostatic control valve for regulating the supply of fluid through a conduit including in combination a valve plate and seal in said conduit, said valve plate having a valve stem extending outwards of said conduit, said valve stem having spring means exterior of said conduit to move said valve stem and plate away from said seal, a housing secured to said conduit, a retractable plunger in said housing operative on said valve stem, a casing for said plunger, means in said casing responsive to change in ambient temperature moving said plunger against said valve stem towards said seat, an interior member threaded in said housing, said interior member being wholly contained in said housing and having an outermost face adjacent an outer face of said housing, removable means engageable with said outermost face of said interior member to rotate same in said housing, said threaded interior member and casing being adapted for contact whereby rotation of said threaded interior member causes adjustment of the position of said plunger with respect to said seat.

4,176,787

HEAT RECOVERY DEVICE FOR USE IN RETURN AIR DUCT OF FORCED AIR FURNACE

Fred J. Gary, R.F.D. #1, Box 164, Glasco, Kans. 67445

Filed Mar. 29, 1978, Ser. No. 891,171
Int. Cl.[2] F24B *7/00*
U.S. Cl. 237—55 **12 Claims**



1. For use with an air heating furnace of the type having a cool air intake section and a flue for conveying hot gases away from said furnace, apparatus for transferring heat from said gases to the cool air flowing into said furnace through said intake section of the latter, including:

a tubular member formed of a heat conductive material and provided with gas inlet and outlet openings at respective opposite extremities thereof,

said member being adapted to be coupled with said flue with said openings of the latter interposed between stretches of said flue,

said member having exterior surface areas thereof disposed within said intake section and in heat exchanging relationship to said cool air flowing through said section;

first means disposed within said member adjacent said surface areas of the latter for transferring heat from said gases to said surface areas of said member,

said first means including structure extending into the flowpath of said gases through said member between said openings in the latter, and being operative to deflect at least a portion of the flow of said gases through said member toward and into heat exchanging contact with interior surface portions of said member, but being operative to allow the remaining portion of said gases to flow thereby;

second means disposed within said member adjacent said surface areas of the latter for storing and transferring heat from said gases to said surface areas of said member,

said second means including a gas pervious, heat conducting material generally positioned within said flowpath and allowing said gases to pass freely therethrough, portions of said material being in heat conducting contact with said interior surface portions of said member; and

third means disposed within said member adjacent said surface areas of the latter for transferring heat from said gases to said surface areas of said member,

said third means including elongate baffle means extending longitudinally within said member and having parts thereof in heat conducting contact with said interior surface portions of said member,

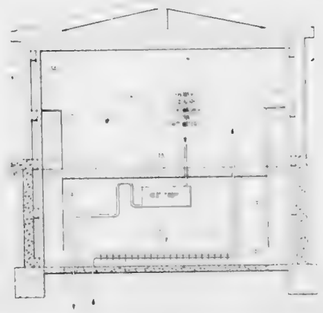
said baffle means presenting a substantial obstruction to the flow of said gas through said member for reducing the volume rate at which said gases flow through said member.

4,176,788

GEOTHERMAL HOME CONSTRUCTION

William P. Holman, P.O. Box 12, Ord, Nebr. 68862

Filed Apr. 12, 1978, Ser. No. 895,803
Int. Cl.[2] F24D *15/00*
U.S. Cl. 237—81 **10 Claims**



1. A method for constructing a geothermal structure having a basement, upstanding walls, and a first floor living area thereover comprising:

providing said basement with a floor level about seven feet below the surrounding ground level;

establishing a minimum ambient temperature within said basement which is approximately the temperature of the floor thereof by insulating the walls of said structure including the basement walls and insulating the ceiling over said living area but not to insulate or cover the floor;

providing air circulating ports through the living area floor extending between the living area and the basement at preselected points adjacent said walls whereby convection currents are established between the living area and the basement so that during winter months air from the living area having a temperature below the ambient basement temperature will circulate to the basement to be warmed thereby establishing a base temperature within said structure equal to the ambient basement temperature, providing a hot water heating means within said structure for furnishing hot wash water; providing waste water collection means within said basement for collecting hot waste wash water; retaining said waste water in said basement until the temperature thereof is equal to the ambient temperature; and subsequently, disposing thereof automatically as hotter water comes in to take the place to the coldest water, and providing hot air grids above the waste water collection means, so as to allow the warmer air to ascend into living quarters; and with vertical panels to keep cold air entering the basement from chilling any warm air at the waste water collection means.

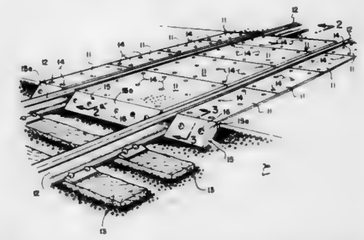
4,176,789

RAILROAD GRADE CROSSING PLATFORM AND AN END CAPPING DEVICE THEREFOR

Brett Rich, Malad City, Id., assignor to Industrial Sales & Marketing Corporation, Malad City, Id.

Filed Aug. 1, 1977, Ser. No. 820,728
Int. Cl.[2] E01B *21/00*
U.S. Cl. 238—8 **3 Claims**

1. An elongate device of right triangular formation in transverse cross-section for protectively capping an exposed end of a railroad grade crossing platform, said device comprising a substantially flat, inclined ramp member whose width extends longitudinally of the device and which has thickness beveled along its width to provide acute angled edges extending along said width at the ramp surface and flat surfaces extending backwardly therefrom as portions of the legs of the triangular formation; ramp-supporting members attached to and extending in mutually-spaced relationship from the underside of the ramp member intermediate its width and substantially normal to the ramp surface, said ramp-supporting members each, along with the ramp member, forming substantially a right triangle whose hypotenuse is on the ramp surface and whose legs are partially formed by the respective ramp-supporting members and partially by the ramp member; and means for securing said device to a railroad track tie at an end of the



grade crossing platform so that the ramp-supporting members engage the grade crossing platform and the upper surface of said tie, respectively, with the ramp surface being exposed as an inclined end for said grade crossing platform, the legs of the triangular formation being of unequal lengths corresponding, respectively, to mutually different standard rail heights, so that the device can be used with either of two rail heights corresponding to said lengths.

4,176,790

COMPOSITION FOR AND METHOD OF CAUSING RAINFALL

Manuel M. Osorio, 5 Oriente 401, Tecamachalco, Puebla, Mexico

Continuation-in-part of Ser. No. 882,875, Mar. 2, 1978, abandoned, which is a continuation of Ser. No. 727,123, Sep. 27, 1976, abandoned. This application Sep. 22, 1978, Ser. No. 944,799
Int. Cl.[2] A01G *15/00*
U.S. Cl. 239—2 R **18 Claims**

1. The method of stimulating cloud formations to cause precipitation including introducing into a cloud formation a composition comprising a precipitation stimulating material suspended in a volatile liquid vehicle and finely dispersed therein, said precipitation stimulating material being substantially unsolubilized in the volatile liquid vehicle, said precipitation stimulating material being chilled by the evaporating liquid upon introduction into the cloud formation.

4,176,791

AUTOMATICALLY CONTROLLED IRRIGATION SYSTEM

Maurizio Cattaneo, and Renzo Masoero, both of Turin, Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed Dec. 2, 1977, Ser. No. 856,950
Claims priority, application Italy, Dec. 30, 1976, 70139 A/76
Int. Cl.[2] B05B *15/00*
U.S. Cl. 239—76 **8 Claims**

4. An irrigation system for distributing an irrigation liquid from a source of supply therefor comprising:

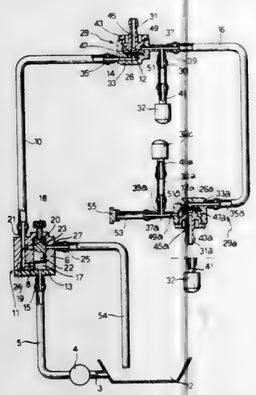
an elongated pipeline,

a plurality of liquid distributing nozzles spaced in series along the pipeline,

a plurality of liquid storage means communicating with the pipeline, each such storage means located adjacent and downstream from a corresponding nozzle,

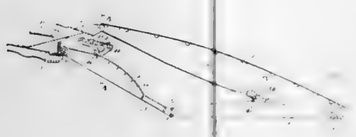
a plurality of pressure responsive valve means in the pipeline, each of such valve means associated with a corresponding nozzle and adapted to open and close the discharge from the nozzle and flow through the pipeline,

each such valve means operable to open the pipeline to allow flow into the corresponding storage means and simultaneously close communication between the pipeline downstream of the nozzle and the nozzle outlet upon predetermined pressure in the pipeline upstream of the



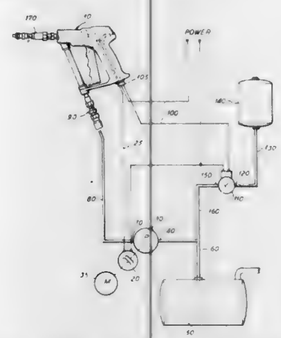
nozzle, and each such valve means operable to close the pipeline and open fluid communication between the nozzle and the downstream portion of the pipeline and storage means upon a lesser predetermined pressure in the pipeline upstream of the nozzle.

4,176,792
VARIABLE AREA EXHAUST NOZZLE
Arthur McCardle, Jr., Greenhills, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Filed Jul. 11, 1977, Ser. No. 814,568
Int. Cl.[2] B64C *15/08*
U.S. Cl. 239—265.41 **14 Claims**



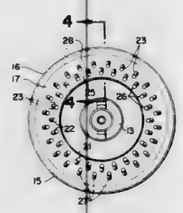
1. In a variable area nozzle of the type having a convergent flap pivotably connected to an exhaust duct and a divergent flap pivotably connected to the convergent flap, a linkage system comprising:
(a) a first link rigidly attached to the exhaust duct and extending outwardly thereof;
(b) a second link having one end pivotably attached to said first link and having its other end pivotably attached to the divergent flap; and
(c) means for rotating the convergent flap about its exhaust duct pivot so as to vary the nozzle area ratio in a predetermined manner.

4,176,793
ELECTRIC CLUTCH CONTROL
Elmer G. Heinrich, Siloam Springs, Ark., assignor to Citation Manufacturing Co., Inc., Siloam Springs, Ark.
Filed Mar. 3, 1978, Ser. No. 883,306
Int. Cl.[2] B05B *7/04*
U.S. Cl. 239—407 **2 Claims**



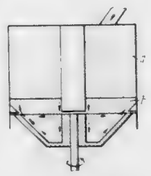
2. The improved cleaning system according to claim 1 wherein said improved spray gun has a compartment, isolated from the path within the gun through which the solvent passes, wherein said switches and said low power cable are located.

4,176,794
LIQUID PARTICLE DEFLECTOR STRUCTURE FOR DISCHARGE NOZZLES
George G. Allenbaugh, Jr., Wadsworth, Ohio, assignor to Premier Industrial Corporation, Cleveland, Ohio
Filed Oct. 27, 1977, Ser. No. 846,146
Int. Cl.[2] B05B *1/12*
U.S. Cl. 239—498 **5 Claims**



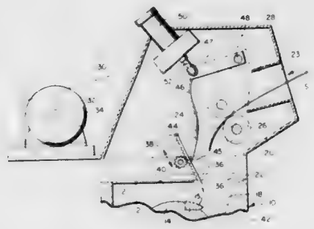
1. In a stream-forming pattern sleeve for a cylindrical liquid discharge nozzle, the combination of an angularly extending tooth-supporting surface provided on the end of said sleeve, a first row of upright circumferentially-spaced teeth projecting from said surface into the path of the discharge stream, a second row of upright circumferentially-spaced teeth projecting from said surface into the path of the discharge stream and radially outwardly of said first row, the teeth of said second row being of lesser width than the teeth of said first row, a stream-deflecting surface presented by each tooth, said stream-deflecting surface having forward portions thereof disposed to deflect said stream angularly toward adjacent teeth, whereby portions of said discharge stream are directed into intercepting relationship with each other to enhance liquid particle breakup of said stream.

4,176,795
METHOD OF DISINTEGRATING A MATERIAL
Alexandr V. Yagupov, Ordzhonikidze, U.S.S.R., assignor to Severo-Kavkazsky Gorno-Metallurgichesky Institut, U.S.S.R.
Filed Nov. 4, 1977, Ser. No. 848,723
Int. Cl.[2] B02C *23/18*
U.S. Cl. 241—21 **6 Claims**



1. A method of disintegrating lumped materials into smaller particles comprising, continuously feeding into a vertical column a lumped, solid material which can be reduced by disintegration into solid smaller particles, directly rotating about the axis of said column of material a lowermost portion of said column of material having a configuration and with a velocity gradient increasing away from the axis and at a maximum rotational speed remote from said axis effective to develop an active horizontal, annular disintegration zone immediately above said lowermost portion of the vertical column of said material in which lumps of said material impact each other directly and the lumped solid material is disintegrated and simultaneously flowing disintegrated solid material from said lower portion outwardly and upwardly along the periphery of said column to continuously allow entry of lumped solid material into said disintegration zone, and disintegrated solid material into said lower portion, while simultaneously flowing the disintegrated solid material away from said column, all of said lumped solid material in said column being above the level of said disintegration zone and being held from rotation, and continuously maintaining a pressure head of said lumped solid material on said solid material in said zone by continuously replenishing said column above the level of said zone.

4,176,796
FEED DEVICE FOR SHEET GRANULATOR AND METHOD OF FEEDING SAME
William Barnes, South Attleboro; Roy W. Gerstenberg, Norfolk; Gomer E. Kropa, North Reading, all of Mass., and Roland A. LeJeune, Cumberland, R.I., assignors to Leesona Corporation, Warwick, R.I.
Filed Feb. 27, 1978, Ser. No. 882,210
Int. Cl.[2] B02C *18/22*
U.S. Cl. 241—30 **12 Claims**



1. In combination with a granulator for size reduction of material, a feeding device for feeding sheet material thereto, said granulator having walls defining a generally enclosed chamber including an upper wall, a rotor mounted for rotation about an axis within said chamber, cutting means affixed on said rotor, bed knife means mounted for projection into said chamber on the rotor downstroke side thereof for cooperative cutting relationship with said cutting means as said rotor is driven, a downstroke wall generally disposed in the chamber and in a quadrant thereof disposed above the horizontal axis of said rotor and on the downstroke side of the vertical axis thereof, said feeding device comprising a primary baffle disposed generally centrally above said rotor and having portions thereof proximate said downstroke wall, at least said portions disposed in said chamber quadrant and below said upper wall, means moving said baffle in said chamber towards and away from said downstroke wall thereof so as to define a variable dimension feed opening for said sheet material between opposed surfaces of said portion of said baffle and said downstroke wall, and means for feeding sheet material into said feed opening, said feeding means disposed in a position radially outwardly of those portions of said primary baffle and said downstroke wall forming said feed opening with respect to said rotor, said primary baffle further simultaneously respectively movable towards and away from said rotor so as to respectively increase and decrease the back pressure in said chamber and to deflect already granulated material from contacting said sheet.

4,176,797
FLUID MIXER AND COMMINUTER
Gibson D. Kemp, 3202 26th St., Lubbock, Tex. 79410
Filed Jun. 8, 1978, Ser. No. 913,573
Int. Cl.[2] B02C *7/02*
U.S. Cl. 241—30 **11 Claims**



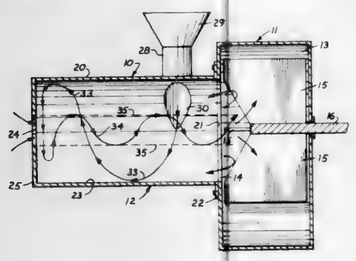
1. The process of blending, mixing and comminuting fluid material using
a. two discs each having an axis,
b. said discs being coaxial,
c. the periphery of said discs being closer together than the discs at their axis; comprising the method of:
d. forcing the fluid material between the discs near the axis, and
e. forcing the material between the peripheries of the discs, while
f. moving one disc relative to the other,
g. spinning one of the discs at high speed thereby
h. slinging fluid outward, the flow of fluid between the two discs
j. decreasing the pressure between the discs, thus
k. forcing the discs together.

4,176,798

METHOD AND APPARATUS FOR INDUCTION AND DISPERSION OF PARTICLES IN AN AIRSTREAM

John W. Talbott, and John M. Kirkwood, both of Moscow, Id., assignors to Washington State University Research Foundation, Inc., Pullman, Wash.

Filed Apr. 27, 1978, Ser. No. 900,433
Int. Cl.[2] B02C *19/06*
U.S. Cl. 241—39 7 Claims



1. An apparatus for induction and dispersion of particulate materials in an airstream, comprising:

a centrifugal blower having a central inlet and a tangential air discharge;

a horizontally oriented cylindrical tube having one end in open communication with the blower central inlet and having a choke orifice at an opposite end of smaller dimension than the opening of the tube to said central blower inlet;

upright particulate material infeed means in open tangential communication with the tube interior;

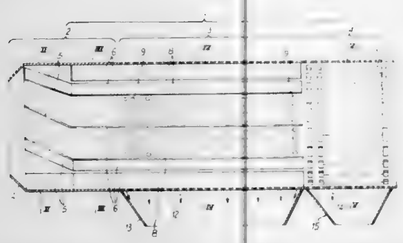
the combined cross-sectional area of said choke orifice and particulate material infeed means being less than the area across the blower inlet.

4,176,799

ROTARY SCREENS

Francois H. Clin; Jean-Noel Gony, both of Orleans, and Francois O. Proust, Olivet, all of France, assignors to Bureau de Recherches Geologiques et Minieres, Paris, France

Filed Dec. 29, 1977, Ser. No. 865,553
Claims priority, application France, Jan. 6, 1977, 77 00262
Int. Cl.[2] B02C *23/00*
U.S. Cl. 241—74 7 Claims



1. A rotary screen device for sorting by differential crushing and grading, particularly for sorting of mixed materials including mainly hollow glass and plastics materials, said screen comprising:

a central portion of said device, said central portion comprising a cylindrically-shaped sleeve of perforated metal sheeting and a plurality of parallel vanes disposed on the inner surface thereof in a direction parallel to the longitudinal axis of said sleeve;

an inlet end portion of said device, said inlet end portion comprising a cylindrically-shaped sleeve of unperforated metal sheeting connected to said sleeve of said central portion and a plurality of straight parallel vanes disposed on the inner surface thereof at an angle transverse to the longitudinal axis of said sleeve of said inlet end portion so as to assist the driving of products from said inlet end portion towards said central portion, each of said vanes of said inlet end portion being connected to one of said vanes of said central portion; and

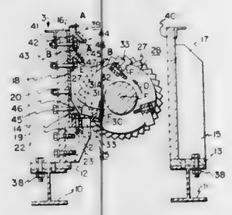
an outlet end portion of said device, said outlet end portion comprising a cylindrically-shaped sleeve of metal connected to said sleeve of said central portion having peripheral evacuation holes therein, said outlet end portion being free of vanes.

4,176,800

MATERIALS REDUCTION STRUCTURE

John C. Brewer, Salt Lake City, Utah, assignor to Garbalizer Corporation of America, Salt Lake City, Utah

Filed Jan. 11, 1978, Ser. No. 868,662
Int. Cl.[2] B02C *18/06*
U.S. Cl. 241—243 6 Claims



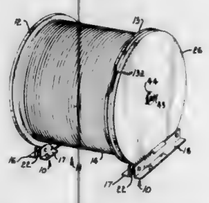
1. In materials' reduction machinery having an hopper, a stationary cutter bar proximate said hopper, and a horizontally journalled, revolvable rotor provided with cutting blades and disposed proximate said cutter bar: an improvement comprising a horizontal, materials' anti-revolvement member, secured to said hopper essentially above said cutter bar and having declining flange means provided with opposite declining parallel surfaces, and longitudinally, continuously, and uniformly spaced, for materials' passage, from said rotor and said blades for all orientations thereof, whereby to wedge and thereby tend to prevent rotation of materials in said hopper proximate said rotor and tending to pass between said member and said rotor such that said rotor is enabled to cut into said materials.

4,176,801

SUPPORT DEVICE FOR CABLE DRUMS

Homer C. Douglas, Kansas City, Kans., assignor to Cable Caddy, Inc., Lenexa, Kans.

Filed Dec. 16, 1977, Ser. No. 861,108
Int. Cl.[2] B65H *75/34, 75/40*
U.S. Cl. 242—54 R 4 Claims



1. A device for rotatably supporting one end of a drum

having a substantially circular flange at each end thereof, said device comprising:

a pair of angle members each having a generally vertical plate portion and a generally flat, horizontal plate portion interconnected with said vertical plate portion, said angle members being interconnected with each other so that the vertical plate portions of said angle members are spaced apart from one another to present a space therebetween large enough to receive said flange and so that the horizontal plate portions of said angle members cooperate to provide a base for supporting said angle members on a surface;

a pair of rollers mounted for rotation in the space between said vertical plate portions and spaced apart from one another to receive the flange thereon, whereby the flange may be rotated about its axis on said rollers; and

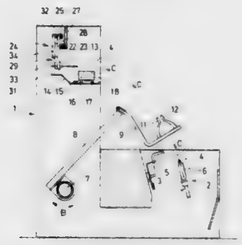
means presenting an opening through one of said vertical plate portions at a location to accommodate cable wound on the drum in proximity to the edge of the flange.

4,176,802

APPARATUS FOR LAYING BALLS OF STRANDED MATERIAL INTO CUPS OF A CONVEYOR

Florian Lucke, Mengen, Fed. Rep. of Germany, assignor to Lucke Apparatebau GmbH, Mengen, Fed. Rep. of Germany

Filed Apr. 28, 1978, Ser. No. 900,917
Claims priority, application Fed. Rep. of Germany, May 28, 1977, 2724424
Int. Cl.[2] B65H *54/66, 67/00*
U.S. Cl. 242—2 5 Claims



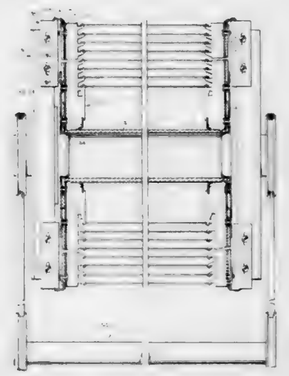
1. In a winding machine for winding walls of stranded material having a conveyor including cups in which wound balls are laid for conveying from the machine, a winding station on one side of the conveyor having a winding flyer and a mandrel for winding a ball of stranded material, an improved apparatus for laying balls of stranded material in cups of the conveyor, comprising a pivotable arm pivotally mounted at its one end and carrying at its free end engagement means located at said one side of the conveyor for engaging on said mandrel a ball having opposite polar ends to bring the ball into position above a cup of the conveyor with the polar ends aligned transversely of the conveyor, an operating linkage mounted adjacent to the conveyor and including a pair of take-off members having points at the ends of the members, said points being located on the other side and above the conveyor, said points being movable toward and away from each other and located relative to said engagement means when the engagement means support the ball above a cup so that the points can be moved to penetrate into said ball adjacent to one polar end thereof and provide between them a horizontal axis on the other side of said conveyor from said engagement means for subsequent pivotal movement of the other polar end of the ball, said points constituting the sole engagement means of the take-off members for engaging the ball, and means for operating the linkage whereby the points on the take-off members are pressed into a ball that has been carried by the pivotable arm to a position above a cup of the conveyor, so that when the ball is released by said engagement means of the pivot arm said other polar end pivots downwardly into the cup about the horizontal axis provided by said points.

4,176,803

MACHINE FOR WINDING PILE FABRIC ON A REEL

Theodore P. Kessler, Rancocas, N.J., assignor to Timron, Inc., Moorestown, N.J.

Filed Dec. 15, 1977, Ser. No. 860,963
Int. Cl.[2] B65H *17/02, 75/02;* B65D *85/671*
U.S. Cl. 242—67.1 R 8 Claims



7. A machine for winding pile fabric on a reel having a pair of end frames, each said end frame including an endboard of polygonal shape and a plurality of radially disposed hook strips secured to said endboard, said machine comprising

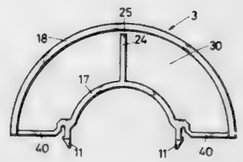
a pair of rotatable holding frames, each said holding frame having a plurality of holding means, each holding means securing an outer end of each hook strip of a reel disposed between said holding frames to each respective holding frame.

4,176,804

REEL FOR TAPE

Tsuneo Nemoto, Sendai, and Kiichiro Toyoshima, Izumi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

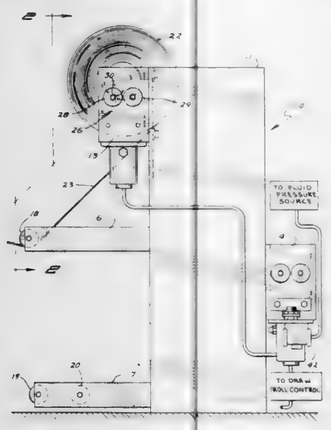
Filed May 15, 1978, Ser. No. 905,893
Claims priority, application Japan, May 20, 1977, 52-65674[U]
Int. Cl.[2] B65H *75/22*
U.S. Cl. 242—68.5 9 Claims



1. A reel for tape comprising first and second segmental reel hubs which are demountable from each other; at least said first segmental reel hub including segmental inner and outer members, connecting members connecting together said segmental inner and outer members at their ends, considered in the circular direction, so that a sectorial space is defined between said segmental inner and outer members, and at least one rib joined to, and extending from one of said segmental inner and outer

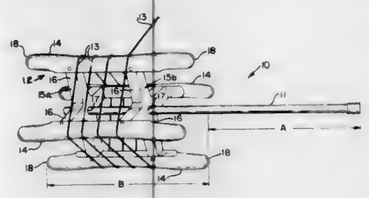
members substantially across said sectorial space to adjacent the other of said inner and outer members with a clearance being defined between said other member and an adjacent edge of said rib.

4,176,805
UNWIND STAND-ROLL BRAKE
Martin A. Jackson, Saunderstown, R.I., assignor to Sheldahl, Inc., Northfield, Minn.
Filed Oct. 25, 1978, Ser. No. 954,430
Int. Cl.[2] B65H *23/06*
U.S. Cl. 242—75.46 **6 Claims**



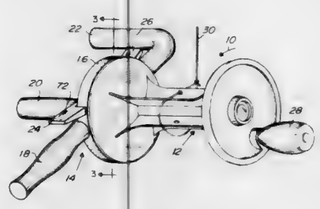
1. Braking system for applying a controllable braking torque to the support shaft of a film supply roll arranged to provide a supply of flexible film to an intermittently operated film draw system, said braking system comprising:
(a) frame means, a support shaft for supporting a film supply roll therearound, bearing means journably supporting said support shaft for free axial rotation within said frame means and including at least two pairs of support rollers with one pair being mounted at each end of said support shaft and arranged in axially spaced apart parallel relationship with said support rollers being journaled for rotation within said frame means and providing a free rotational support cradle for said support shaft therebetween;
(b) a pair of brake yokes mounted on said frame means with one being disposed at each opposed end of said support shaft, each brake yoke comprising a generally "U" shaped shaft receiver with the base of the inner peripheral surface of said shaft receiver being an arcuate segment generally concentric with said support shaft and having an outer shaft contacting surface formed as a friction pad for frictionally restraining free rotation of said support shaft when in contact therewith; and
(c) means for reciprocatorily raising and lowering said brake yokes for bringing said shaft contacting surface into and out of contact with said support shaft to provide lifting support of said support shaft and frictional engagement and braking between said friction pad and the periphery of said support shaft when said brake yokes are raised and to permit free rotation of said support shaft upon said support rollers when said brake yokes are lowered.

4,176,806
REEL ASSEMBLY FOR CONTROLLING CORD WINDING IN KITE FLYING
Nathan J. Kwon, 1625 Greenleaf Ave., Des Plaines, Ill. 60018
Continuation-in-part of Ser. No. 806,922, Jun. 15, 1977, abandoned. This application Jun. 19, 1978, Ser. No. 916,478
Int. Cl.[2] B65H *75/48*
U.S. Cl. 242—96 **10 Claims**



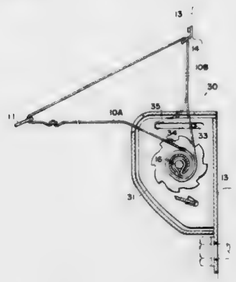
1. A reel assembly for controlling line cord winding in kite flying comprising:
an elongated main hand hold member adapted for controlling the winding of the reel assembly;
an axle member affixed to and coaxially extending from the main hand hold member;
a spool member having a central axis and adapted for receiving, storing, and releasing the cord, the spool member rotatably mounted on the axle member;
a clutch mechanism for releasably fixing the spool member to the main hand hold member;
a plurality of secondary hand hold members affixed to the spool member and extending axially with respect to the spool member and capable of releasably storing the cord; and
at least one support member extending radially with respect to the central axis of the spool member for fixably mounting the secondary hand hold members spaced remotely from each other and from the central axis of the spool member.

4,176,807
KITE-FLYING CONTROL REEL
Nathan J. Kwon, 1625 Greenleaf Ave., Des Plaines, Ill. 60018
Filed Aug. 24, 1978, Ser. No. 936,327
Int. Cl.[2] B65H *75/40*
U.S. Cl. 242—96 **19 Claims**



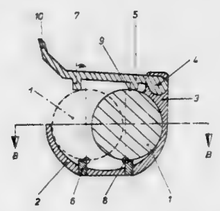
1. A kite-flying control reel comprising:
a first elongated handle;
an axle affixed at a right angle to the first elongated handle;
a second handle affixed to the first elongated handle at a right angle thereto and extending parallel to and away from the axle; and
a spool rotatably mounted on the axle.

4,176,808
PASSENGER RESTRAINING SEAT BELT RETRACTOR
Shiro Sasaki; Jun Yasumatsu, both of Toyota, and Mitsuo Inukai, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho, both of Aichi, Japan
Filed Jul. 25, 1977, Ser. No. 818,302
Claims priority, application Japan, Aug. 6, 1976, 51-105010
Int. Cl.[2] A62B *35/00*; B65H *75/48*
U.S. Cl. 242—107.1 **4 Claims**



1. A seat belt retractor for retracting two seat belts therein comprising:
a base;
two seat belts for restraining a passenger's shoulder and waist positions;
a retractor shaft rotatably supported by said base thereon, and wherein said two seat belts are wound up one over the other;
a means for applying a retracting force to said retractor shaft; and
a means for applying a bending force to one of said two seat belts, said bending force being smaller in magnitude than said retracting force whereby slack is prevented from occurring at said one seat belt when said belts are wound out, said means for applying a bending force comprising a pair of opposing slots in said base, a guide pin extending through and slidable in said slots and engaging with one of said belts and a spring means provided between said guide pin and said base.

4,176,809
ACCELERATION-SENSITIVE DEVICE
Rudy Thomas, Concord, Tenn., and Fred F. Neumann, Rochester, Mich., assignors to N.V. Klippan S.A., Haasrode, Belgium
Filed Jun. 15, 1978, Ser. No. 915,695
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1977, 2731072
Int. Cl.[2] A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.4 A **7 Claims**



1. In an acceleration-sensitive device comprising a rollable, freely movable inertia member supported in a depression provided in a support member, and an actuator means disposed above said inertia member and engageable with a locking means provided in said device, said actuator means being provided with a depression facing said inertia member, the improvement comprising said depression (6) on said support member (2) and said depression (7) on said actuator means (2) being in the form of a ring facing towards said inertia member (1), said inertia member having an approximately spherical shape, each of said rings having inner and outer circumferential edges, said inertia member being normally in contact with said inner edges, and said support member (2) extending laterally outside its ring (6) in an upwards direction so as to at least partially surround said inertia member (1).

4,176,810
LOCK SENSITIVITY ADJUSTOR
Jacques A. Bertrand, Paris, and Robert A. Marechal, Bezons, both of France, assignors to Klippan France, S.A., Paris, France
Continuation of Ser. No. 673,331, Apr. 5, 1976, abandoned. This application Jun. 19, 1978, Ser. No. 916,663
Claims priority, application France, Apr. 7, 1975, 75 10783
Int. Cl.[2] A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.4 B **5 Claims**



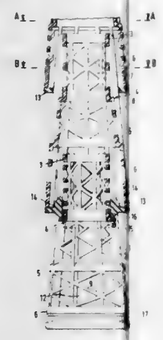
1. In a belt retractor, said retractor including a belt receiving spool rotatably mounted on a frame, comprising:
means for sensing acceleration of said spool in a belt protracting direction;
a mobile support means connected to said frame and movable between a first and second position responsive to sensing of a predetermined acceleration of said spool by said sensing means;
blocking means connected with said mobile support means and actuated by movement of said mobile support means from the first to the second position to block further protractive movement of said spool;
spring means connected to said mobile support means for biasing said mobile support means to said first position;
means for varying the force of the spring on the mobile support means whereby the sensitivity of the blocking means to acceleration of the spool can be varied;
means for actuating said spring force varying means from a weak sensitivity position when the belt is being initially withdrawn to a high sensitivity position when the belt is protracted to a position of use.

4,176,811

CONICAL YARN CARRIER

Josef Becker; Hubert Becker, and Matthias Becker, all of Niederforstbacher Strasse 80-84, 5100 Aachen-Brand, Fed. Rep. of Germany

Filed Jun. 29, 1978, Ser. No. 920,545
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1977, 2730875
Int. Cl.[2] B65H *75/10, 75/20*
U.S. Cl. 242—118.1 5 Claims



1. A conical yarn thread carrier having a longitudinal axis and comprising carrier surface means (2) defined by a frustum jacket surface having a large diameter end and a small diameter end, radially extending openings (10) between said carrier surface means (2), slot means (11) uniformly distributed about the circumference of the yarn carrier, said slot means (11) extending approximately from the middle of the yarn carrier axially to its small diameter end, said slot means forming a portion of said openings, said yarn carrier further comprising stop ring means (13, 14) located on said carrier surface means (2), said stop ring means comprising radially outwardly extending means for receiving the large diameter end of another yarn carrier thereon, and radially inwardly extending projections (14) guided in said slot means (11), whereby said stop ring means is axially displaceable along said yarn carrier over the length of said slot means, means operatively positioned for limiting the axial displacement of said stop ring means (13, 14) to the length of said slot means between said small diameter end and said displacement limiting means, and means at said larger diameter end for the formation of a freely accessible thread reserve.

4,176,812

MIDCABIN DOOR FOR BLENDED WING AIRCRAFT

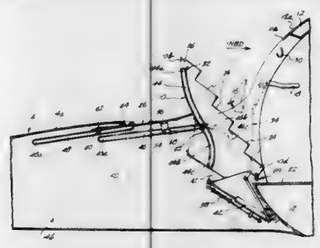
Irwin G. Baker, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 31, 1977, Ser. No. 847,100
Int. Cl.[2] B64C *1/14*
U.S. Cl. 244—129.5 21 Claims

1. In an aircraft of blended wing design having a fuselage and a wing, said wing having an upper surface, that blends smoothly into the fuselage to form a blend region between said wing and said fuselage, said aircraft having a door opening in said fuselage, at least a portion of said opening extending into said upper surface of said wing, a door assembly comprising:

a door having an upper portion and a lower portion and having an exterior panel conforming to the shape of the fuselage and the blend region when the door is in a closed position; and

first means for mounting said door for swinging movement between said closed position wherein said upper portion of the door is adjacent an upper portion of the door opening and said lower portion of said door is adjacent a lower portion of said door opening and an open position wherein said upper portion of said door is located outwardly from



said fuselage and subjacent said upper surface of said wing.

4,176,813

SHARK NOSE FOR AIRCRAFT

Jack W. Headley, Rancho Palos Verdes; Andrew M. Skow, Hermosa Beach, and Andrew Titiriga, Jr., Torrance, all of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 839,583, Oct. 5, 1977, abandoned. This application Dec. 7, 1978, Ser. No. 967,162
Int. Cl.[2] B64C *1/00, 21/10*
U.S. Cl. 244—130 5 Claims



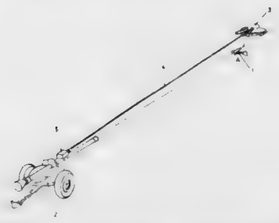
1. A nose and forebody for an aircraft fuselage characterized by a nose tip having a slight radius in planform and flattened profile in elevation, said nose tip tapering broadly rearwardly with relatively sharp lateral edges on each side thereof, said nose tapering more acutely as said nose blends into said forebody, the cross-sectional shape of said forebody rearwardly of said nose tip and said lateral edges gradually thickening in elevation from a relatively narrow elliptical shape to a relatively broad elliptical shape, the dimensions of said nose and forebody varying as functions X/R_B, Y/R_B and Z/R_B where "X" is the distance from the nose tip, "Y" is the distance of the fuselage skin from the centerline of the aircraft fuselage taken transversely, "Z" is the distance of the fuselage taken vertically and R_B is the body planform radius of the fuselage taken at the midpoint of the longitudinal centerline thereof, X/R_B varying between zero and approximately 0.35, Y/R_B varying between zero and approximately 0.284 and Z/R_B varying between zero and approximately 0.09 in a first region between a first station X_0 Y_0 at the nose tip and a second predetermined station X_1 Y_1 and X/R_B varying between approximately 0.35 and 2.0, Y/R_B varying between approximately 0.284 and 0.489 and Z/R_B varying between approximately 0.09 and 0.261 in a second region between the second station X_1 Y_1 and a third station X_2 Y_2.

4,176,814

TERMINALLY CORRECTED PROJECTILE

Kjell A. Albrektsson; Bertil T. Eriksson; Sven W. Eriksson; Hans A. E. Franzén, and Rolf H. Sandlin, all of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden

Filed Mar. 11, 1977, Ser. No. 776,683
Claims priority, application Sweden, Apr. 2, 1976, 7603926
Int. Cl.[2] F42B *15/10, 13/30, 15/02*
U.S. Cl. 244—3.15 11 Claims



1. An apparatus for correcting the terminal portion of the ballistic trajectory of a rotating projectile to direct the projectile to a target, comprising:

targeting means for directing a beam of coherent light at said target;

at least one target detector means disposed for rotation with said rotating projectile and facing obliquely forward in the direction of travel of said projectile to scan in a spiral pattern the area adjacent the projected point of impact of the projectile, said at least one target detector having means for generating a particular ignition signal when the coherent light reflected from said target is detected;

motor means for generating a thrust pulse in response to an ignition signal;

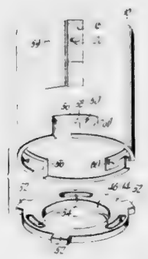
at least one nozzle means connected to said motor means and having plug means responsive to said particular ignition signal to pass said thrust pulse, said at least one nozzle means directing the passed thrust pulse in a direction to correct the trajectory of said projectile.

4,176,815

VARIABLE SPRING HANGER ASSEMBLY

Thomas Davidson, Centerport, N.Y., and Charles Cunneen, Morganville, N.J., assignors to F & S Manufacturing Corporation, Brooklyn, N.Y.

Filed Sep. 8, 1977, Ser. No. 831,587
Int. Cl.[2] F16L *3/00*
U.S. Cl. 248—589 4 Claims



1. A variable spring hanger assembly for supporting a pipe, comprising:

a hollow housing having a lower end portion, said housing having at least two bayonet slot openings defined in said lower end portion,

an upper piston plate slidably mounted within the upper portion of the housing for vertical movement therein,

a lower plate, said plate having at least two fragmented annular openings defined therein spaced from the outer circumference of said plate,

spring means interposed between said upper and lower plates for urging said upper piston plate upwardly away from said lower plate,

and means mounting said lower plate immovably within the lower end of said housing,

said mounting means comprising at least two fingers extending outwardly from said lower plate, and engaging said bayonet slot openings defined in the lower end portion of said housing, the length of said annular openings being approximately equal to the horizontal length of said bayonet slots and in alignment with the major circumferential diameter of said spring means.

3. In the method of assembling a variable hanger assembly in which a spring is inserted against an upper piston plate secured to a housing, and a lower plate is secured against a spring, the improvement comprising providing at least two fingers on the lower plate and providing two complimentary bayonet slots having defined therein an open slot and a blind slot, in the lower end of the housing, further providing fragmented annular openings spaced inwardly from the circumference of the lower plate and in substantial alignment with the spring, introducing means through said openings, to force the spring inwardly within the housing, and sufficiently so that when the plate is completely within the open slot, the spring still does not abut the plate, rotating the plate so that the fingers move from the open slot to the blind slot of the bayonet slots, removing the force means so that the spring moves into contact with the lower plate, said plate fingers engaging said blind slot.

4,176,816

PROCESS FOR IMPROVING IMPACT RESISTANCE OF RIGID NYLON ARTICLES AND THE ARTICLES PRODUCED THEREFROM

Gregory O. Corkery, Valley Park, Mo., assignor to Arundale, Inc., St. Louis, Mo.

Filed Sep. 14, 1977, Ser. No. 833,168
Int. Cl.[2] F16M *11/20;* B29C *25/00*
U.S. Cl. 248—188.9 8 Claims



5. An article of manufacture comprising:

a member formed of molded, rigid nylon adapted to provide impact resistance;

said member defining a chamber therewithin;

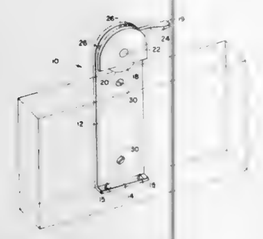
water in said chamber and in intimate contact with said rigid nylon;

said water being in said chamber in sufficient quantity so that said water may be absorbed by said nylon over a long period of time; and

sealing means associated with said member for sealing said water within said chamber.

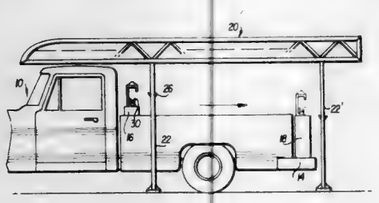
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4,176,817
RELEASABLE HOLDER FOR BOXES
Willard H. Jones, 526 Pratt St., Longmont, Colo. 80501
Filed Sep. 27, 1978, Ser. No. 947,239
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—313 9 Claims



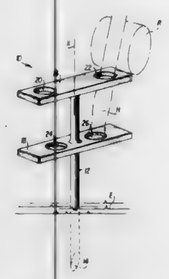
1. A holder for boxes comprising:
a base member having a planar surface defined thereon;
fixed engaging means carried on the planar surface of the base member and adapted to securely engage a surface disposed substantially normal to the planar surface at a position adjacent to the planar surface;
an eccentric member mounted adjacent the planar surface and spaced from the fixed engaging means, the eccentric member being rotatably carried on an axis perpendicular to the planar surface; and
locating means to releasably secure the eccentric member at one of a plurality of predetermined rotational positions.

4,176,818
LOAD-LIFTING AND CENTERING DEVICE
Edwin H. Roxby, 11428 Connecticut Ave., Kensington, Md. 20795
Filed Mar. 10, 1978, Ser. No. 885,414
Int. Cl.[2] B60P *1/64*
U.S. Cl. 248—354 H 10 Claims



1. A supporting apparatus comprising
at least one open V-shaped channel;
means for supporting said channel in a substantially horizontal mode;
an aperture through the apex of said channel between the terminal ends thereof;
a frustum open at both ends with its larger end mounted adjacent said open V-shaped channel substantially above said aperture;
a centering pin of a dimension such that it will pass through said aperture and the smaller end of said frustum;
a V-shaped beam mounted to one end of said centering pin having a configuration to substantially mate with said V-shaped channel; and
means for supporting and moving said V-shaped beam and said pin into mating position with said channel and said aperture respectively.

4,176,819
PORTABLE FISHING ROD HOLDER
Joe A. Lowe, 2437 Cherokee La., Winston-Salem, N.C. 27103
Filed Dec. 16, 1977, Ser. No. 861,346
Int. Cl.[2] A01K *97/10*
U.S. Cl. 248—513 7 Claims

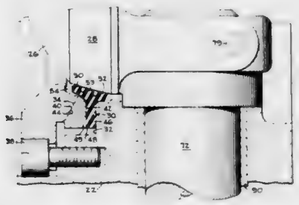


1. A fishing rod device adapted to support a pair of fishing rods in a manner such that the fishing rods are inclined relative to one another comprising an elongate shaft having a longitudinal axis and a pointed free end which is adapted to penetrate the earth, an upper and a lower plate rigidly affixed to said shaft in axially spaced relation to each other along a portion of said shaft opposite said free end, said upper plate having at least two through bores substantially symmetrically arranged to each side of the axis of said shaft, said through bores being spaced apart a given distance, said lower plate having at least two blind bores opening toward said upper plate and substantially symmetrically arranged to each side of the axis of said shaft, said blind bores being spaced apart a distance less than said given distance whereby said pair of fishing rods are inclined outwardly relative to the axis of said shaft and are maintained spaced apart from each other and from said shaft;
an intermediate plate affixed to said shaft between said upper and lower plates, said intermediate plate having at least two through bores substantially symmetrically arranged to each side of the axis of said shaft, the through bores of said intermediate plate being spaced apart a distance less than said given distance and greater than the distance between said blind bores; and
said lower and intermediate plates each having a central bore through which said shaft extends and said upper plate having a central blind bore in which an end of said shaft is secured.

4,176,820
PRESSURE-SENSITIVE TEMPERATURE-RESPONSIVE ROTARY VALVE FOR CRYOGENIC TEMPERATURES
William W. Broadway, Houston, Tex., assignor to FMC Corporation, San Jose, Calif.
Filed Jul. 5, 1977, Ser. No. 812,951
Int. Cl.[2] F16K *1/22*
U.S. Cl. 251—317 10 Claims

1. A pressure-sensitive temperature-responsive rotary valve having a generally annular valve body defining a fluid flow passage, a fluid flow control element rotatably supported in the flow passage for controlling the flow of fluids through the valve, an annular yieldable, pressure-responsive valve seat positioned in the flow passage for cooperation with the flow control element to establish a fluid flow barrier through said passage, a temperature-responsive valve seat energizer ring positioned in the flow passage for imposing a force on the valve seat to cause the seat to establish a fluid-tight seal with the flow control element and the valve body, said energizer ring having an annular frusto-conical surface, and means for retaining the energizer ring in position against the valve seat,

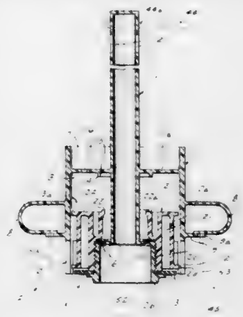
said retaining means having a frusto-conical surface complementary to and in contact with the energizer ring frusto-conical surface and wherein the coefficient of contraction of said energizer ring is greater than the coefficient of contraction of said retainer means and said valve body whereby when the valve is subjected to a reduction in temperature the energizer ring contracts more than the valve body and the retainer means, the contraction of said energizer ring causes a radial inward movement of said energizer ring forcing said frusto-conical surface of said energizer ring against the frusto-conical surface of said retainer means, moving said energizer ring against said valve seat to cause said energizer ring to exert a sealing force radially and axially on said valve seat when the valve is subjected to a reduction in temperature, the improvement in the valve seat comprising:



a leg portion extending generally outward from the flow passage, at least one outer pressure-responsive sealing lip extending in a generally axial direction from the leg portion along the surface of the flow control element when said element is in closed position, and a central sealing lip extending in a generally radial direction from the leg portion toward the flow control element, said outer sealing lip being longer than said central sealing lip causing said outer sealing lip to contact said closed flow control element and causing said central sealing lip to be positioned adjacent to but spaced from said closed flow control element at ambient temperatures, contraction of said energizer ring at lower temperatures forcing said central sealing lip against said closed flow control element to provide an additional flow barrier when the valve is subjected to a reduction in temperature.

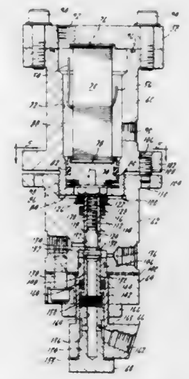
4,176,821
PILOT-OPERATED VALVE ASSEMBLY
Reiner Strangfeld, Minden -Letein, Fed. Rep. of Germany, assignor to Georg Rost & Sohne, Porta Westfalica, Fed. Rep. of Germany
Continuation of Ser. No. 774,428, Mar. 4, 1977, abandoned. This application Oct. 12, 1978, Ser. No. 950,691
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1976, 2609138
Int. Cl.[2] F16K *31/12;* E03D *1/35;* F16K *51/00*
U.S. Cl. 251—38 19 Claims

1. A valve assembly for evacuation of liquids from low pressure vessels of the type including a bottom wall having an outlet opening and a seat surrounding said opening, comprising a main valve including said seat and a buoyant valve element movable up and down between open and closed positions in which a portion of said element is respectively remote from and sealingly engages said seat, said element having an upper surface; a housing defining with said element a liquid-receiving chamber above said upper surface so that the static pressure of the column and having inlet means to allow the flow of liquid into said chamber in said chamber urges said element to said closed position, the buoyancy of said element being such that said element moves and floats from said closed position, in the absence of application of liquid pressure in a direction to lift said element off said seat, when the height of said liquid column is reduced below a predetermined value; and a pilot valve means actuatable to allow the liquid to flow from said chamber into said outlet opening in said closed position of said element and to thus reduce the height of said liquid column below said



predetermined value in response to the actuation of said pilot valve means.

4,176,822
FUEL INJECTION SYSTEM AND CONTROL VALVE FOR MULTI-CYLINDER ENGINES
Alexander Chadwick, South Lyon, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed Oct. 31, 1977, Ser. No. 846,757
Int. Cl.[2] F16K *11/02, 31/04*
U.S. Cl. 251—129 6 Claims



1. A fuel injector control valve comprising:
a valve body having first and second elements, an inlet to the valve body, an outlet from the valve body, a fluid passage connecting the inlet and the outlet, a valve element movably mounted on one of said two body elements for controlling flow through the fluid passage, electro-expensive actuating means on the other body element for actuating said valve element, a seat in said one body element, means biasing said valve element to seat on said seat, and means providing for selectively positioning and locking the two valve body elements with respect to each other so that essentially the full expansion of said electro-expansive actuating means is used to move said valve element away from said seat;
wherein said means providing for selectively positioning and locking the two valve body elements with respect to each other comprises means providing for rotation of the two

valve body elements relative to each other to perform the selective positioning and means for locking the two body elements at discrete increments of relative rotation; and

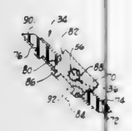
wherein said first valve body element comprises a series of locating holes which are disposed at uniform intervals around a circle concentric with the axis about which the two valve body elements are rotatable and said second valve body element comprises a first set of locating holes disposed at selected points around a circle which is of the same diameter as and concentric with the circle around which said series of holes in said first valve body element is disposed, said second valve body element further comprising a second set of holes disposed on the same circle as the first set of holes and which are angularly related in selected angular relationship to the holes of said first set of holes and locking means disposed in each of said second set of holes which may be actuated to engage selected holes of said series of holes in said first valve body element.

4,176,823

BUTTERFLY VALVE

Themistocles H. Gliatas, Worthington, Ohio, assignor to Ranco Incorporated, Columbus, Ohio

Filed Oct. 7, 1977, Ser. No. 840,163
Int. Cl.[2] F16K 1/226
U.S. Cl. 251—306 **2 Claims**



1. A flow control valve comprising:

(a) a tubular valve body defining a fluid passage;

(b) a butterfly valving member disposed in said passage comprising;

(i) a hub defining an end flange, a barrel portion projecting from said end flange having a transverse opening therethrough, and a skirt-like portion at the end of said barrel portion remote from said end flange;

(ii) a flexible resilient disc-like valving element having an outer peripheral face engageable with the surrounding valve body to block said passage and an inner peripheral face engageable with and extending about said barrel portion; and

(iii) first and second support plates for stiffening and supporting said valving element, said first plate disposed about said barrel portion between one major surface of said valving element and said end flange and said second plate disposed about said skirt-like portion and extending along the opposite major surface of said valving element and said remote end of said barrel portion, said valving element outer peripheral face disposed outwardly of the outer peripheries of said first and second plates;

(iv) said skirt-like portion yieldably deformed to clamp said second support plate against said remote end and into engagement with said valving element, said second plate compressing said valving element against said first plate and into engagement with said barrel; and,

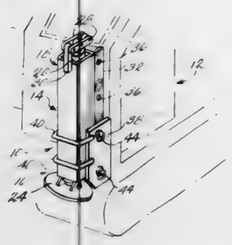
(c) a shaft for actuating said valving member extending transversely through said valve body and supported by said valve body on opposite sides of said valving member, said shaft extending through said opening in said barrel and defining circumferentially spaced spline-like teeth extending into the opening wall with material of said hub being yielded and displaced by said teeth and disposed circumferentially between adjacent teeth to lock said barrel and shaft against relative rotation.

4,176,824

LIFTING APPARATUS

Francis E. Linton, 207 Oak La. S.W., Glen Burnie, Md. 21061, and Richard Lewis, 630 Markham Rd., Baltimore, Md. 21229

Continuation of Ser. No. 765,513, Feb. 7, 1977, abandoned. This application Apr. 5, 1978, Ser. No. 893,274
Int. Cl.[2] B60S 9/08
U.S. Cl. 254—86 R **5 Claims**



1. Apparatus for lifting an object relative to a surface comprising,

(a) an extendable device having an elongated body terminating at a first end fitted with means for engaging the surface and terminating at a second end,

(b) mounting means attached to the second end and offset from the body of the extendable device for adjustably mounting the second end of the extendable device on the object, and having an apertured support portion,

(c) a fixture on the object for slidably receiving the mounting means therein, including two spaced apart structural members receiving said apertured portion therebetween,

(d) at least two apertures through the mounting means apertured portion in a direction at right angles to the lengthwise dimension of the elongated body of the extendable device and in a direction not intersecting the position of the extendable device,

(e) at least two apertures through each spaced apart structural member of the fixture in a direction to align with the apertures through the mounting means apertured portion,

(f) a pair of readily removable pins each passed through an aperture in each of the fixture structural members and an aligned aperture of the mounting means apertured portion, and

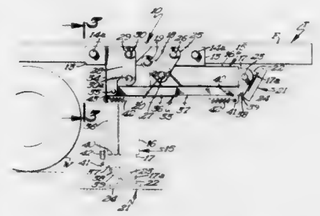
(g) one or both of (i) each of the fixture structural members and (ii) said mounting means apertured portion, having a plurality of apertures therethrough to permit adjustable mounting of the mounting means in the fixture by use of said pins through aligned apertures of the fixture and mounting means so that the extendable device may be mounted in the fixture at various positions for accommodating various distances between the object and the surface, whereby an extendable device may be employed which is extendable for a distance less than would be required if the mounting means were permanently fixed to the object.

4,176,825

JACK DEVICE FOR TRAILERS

Donald D. Schwebke, Box 302, Hampton, Iowa 50441

Filed Feb. 1, 1978, Ser. No. 874,147
Int. Cl.[2] B66F 7/22
U.S. Cl. 254—94 **11 Claims**



1. A jack device for trailers having a frame and having ground engaging wheels, comprising:

a bracket attached to the trailer,

an elongate leg structure including an upper leg member and a lower leg member projecting telescopically into said upper leg member, said lower leg member being extensible and retractable relative to said upper leg member, means pivotally mounting said leg structure on said bracket for swinging movement relative thereto between lowered load supporting position and a raised transport position, said leg structure when in the transport position being supported on the frame above the surface of the ground, and when in the lowered load supporting position being disposed in substantially vertical ground engaging relation and supporting the trailer whereby the adjacent trailer wheel is elevated above the surface of the ground,

an elongate motion-transmitting link member having one end thereof connected to said bracket having the other end thereof connect to said lower leg member, said motion-transmitting link member including an upper link and a lower link and being extensible and retractable relative thereto,

said motion-transmitting link member causing said lower member to be extended when said leg structure is shifted from the transport position to the lowered load supporting position, means operatively connected with said leg structure yieldably resisting movement thereof to the transport position,

and a foot member having a flat lower surface and being pivotally mounted on the lower end of said leg structure for pivotal movement relative thereto whereby said foot member will be maintained in planar contact with the ground surface when the foot member engages the ground surface.

4,176,826

SAFETY CATCH APPARATUS FOR A SUSPENSION SYSTEM

David A. Gray, Waukesha, and Marvin L. Sivertsen, Milwaukee, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Jul. 3, 1978, Ser. No. 921,197
Int. Cl.[2] B66D 1/48
U.S. Cl. 254—175 **9 Claims**

1. A safety catch apparatus for retaining a suspended member in the event that the suspension system fails, comprising:

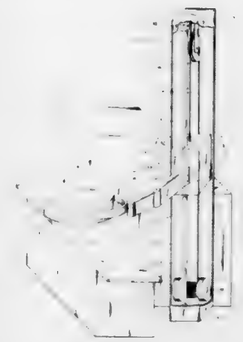
a. a generally vertically supported stationary bar;

b. said suspended member having an aperture adapted to receive said stationary bar;

c. said suspended member further including an inner chamber having an upper and a lower surface communicating with said aperture;

d. a catch block sized to fit within said chamber and including a vertical slot adapted for slideable engagement with said stationary bar, said suspended member with said catch block thus being constrained to jointly move along said stationary bar;

e. said vertical slot having at least one open recess in the sides thereof, each said recess having a base and an inner wall angulated toward said slot;



f. a roller which freely rests in the base of each said recess, each said roller and said base being sized so that the roller is adjacent to, and spaced from, said stationary bar;

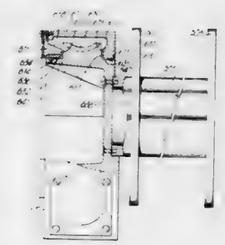
g. means for generating relative motion between each said roller and said catch block in the event of a suspension failure whereby each said roller becomes wedged between said inner wall and said stationary bar such that said stationary bar supports said suspended member.

4,176,827

WINCH DRUM MOUNTED DIRECTLY ON A WORM GEAR DRIVE UNIT

Clay H. Anderson, and Gerard St. Jean, both of North Vancouver, Canada, assignors to C. H. Anderson and Associates Ltd., North Vancouver, Canada

Filed May 2, 1977, Ser. No. 792,870
Int. Cl.[2] B66D 1/00
U.S. Cl. 254—186 R **9 Claims**



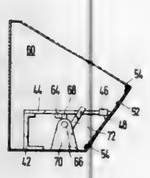
1. A winch comprising:

(a) a rigid housing having first and second spaced apart side walls, one of said side walls having a plate detachably secured thereto and providing a portion of said one of said side walls;

(b) a hub having a pair of spaced apart relatively large diameter circular bearing lands on the outer surface of said hub and journalled for rotation respectively on said first and second side walls, one of said bearing lands being journalled for rotation on said plate, said hub having a central

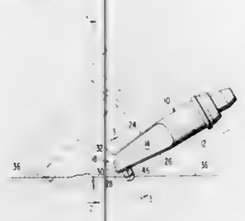
web formed integrally to said hub and said web consisting of a flat face surface positioned in a plane transverse to the axis of rotation of the hub for mounting a winch drum;
(c) teeth formed integrally with the hub and projecting outwardly therefrom at a position between said bearing lands and said teeth providing a gear only slightly larger in diameter than said bearing lands;
(d) a worm gear journalled for rotation in said housing and meshing with said teeth in drive relation;
(e) bearing faces extending outwardly from the hub respectively on opposite sides of the teeth and engageable with the side walls of the housing limiting axial displacement of the hub;
(f) an opening in one of said side walls exposing said hub therethrough; and
(g) said winch drum being detachably secured directly to the web of the hub and cantilevered therefrom, said winch drum being disposed exteriorly of the housing for winding a cable thereon.

4,176,828
FLAME CUTTING ARRANGEMENT
Gerhardt Lange, Frankfurt am Main, Fed. Rep. of Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany
Filed Feb. 22, 1978, Ser. No. 880,039
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1977, 2708140
Int. Cl.² B23K *37/04*
U.S. Cl. 266—65 **6 Claims**



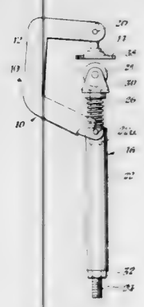
1. In a flame cutting arrangement consisting of a flame cutting machine with a transverse track on which one or more burner carriages carrying cutting torches are mounted so as to be transversely movable and with drive means which are longitudinally movable on guide rails being disposed on both sides of the transverse track and with a support table for holding the workpieces to be processed and being installed underneath the transverse track and between the guide rails, the improvement being hollow feet supporting said support table, a smoke gas suctioning arrangement being provided in said feet, said feet extending along the entire length of said table, openings on the inner side of said feet for communicating with the inner space of said support table beneath the workpiece, each of said openings being closable by a shield, said shield being installed on the inside of the feet wherein said openings are located, each shield being adjustable by means of an adjusting mechanism for determining selectively its open and closed positions, said adjusting mechanism including a lever pivoted at its one end and its free end gripping a shield cam mounted on said shield, a spring resiliently urging said lever in the closed position, and said lever being mounted for being swung by a lever actuating cam which is attached to a shaft extending into said hollow feet.

4,176,829
BURNER TIP DRAG GUIDE
Jack B. Dixon, 7102 Fircrest Ave., Sebastopol, Calif. 95472
Filed Jan. 13, 1978, Ser. No. 869,100
Int. Cl.² B23K *7/10*
U.S. Cl. 266—66 **5 Claims**



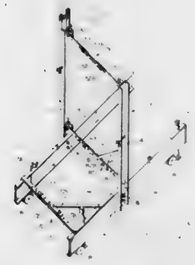
1. In a burner tip used in a metal cutting operation for cutting a channel therein, having an elongated nozzle terminating in an end portion forming gas jets, the improvement comprising:
a drag guide means comprising a ring shaped support member;
a first beveled gun sight drag member mounted on a surface thereof and extending outwardly therefrom;
said support surface forming rounded shoulder members adjacent said gun sight and disposed along either side thereof;
releasable coupling means normally connecting said support and the end portion of said burner tip for mounting said gun sight on the lower surface of said burner tip extending downwardly therefrom in a vertical plane containing the longitudinal axis thereof said coupling means further comprising means cooperable between the inner surface of said support and the outer surface of said burner tip for rotatably mounting said support on said burner surrounding the tip thereof whereby said gun sight will normally ride in the channel cut by said burner and said shoulders will ride on the edges thereof.

4,176,830
TIE DOWN CLAMP FOR VEHICLE MOUNTED CAMPER HOUSING
John C. Isley, 599 SW. 132 Ave., Fort Lauderdale, Fla. 33325
Filed Mar. 13, 1978, Ser. No. 886,045
Int. Cl.² B25B *1/04*
U.S. Cl. 269—6 **2 Claims**



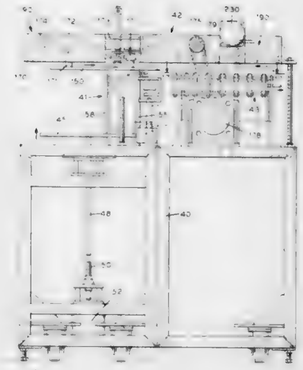
1. A work clamp for holding two objects together, comprising:
a U-shaped body;
a first pivotal connector connected at one end of said U-shaped body;
a locking arm pivotally connected to the other end of said U-shaped clamped body;
a roller rotatably mounted at one end of said locking arm;
a locking arm housing;
a shaft mounted within said housing, said roller being connected at one end to said shaft; and
a spring mounted on said shaft between said housing and said roller whereby said shaft and roller are movable longitudinally and are in spring tension.

4,176,831
TEMPLATE FOR SUPPORTING A DOOR FRAME
Alphonso Adams, Washington, D.C., assignor to Helen H. Adams, Washington, D.C., a part interest
Filed Jul. 14, 1978, Ser. No. 924,558
Int. Cl.² E04F *21/04*
U.S. Cl. 269—17 **7 Claims**



1. A support for positioning a door frame adjacent to an opening in a wall comprising:
two substantially horizontal support members spaced relative to each other by at least first adjustment bar;
said first adjustment bar being adjustable in predetermined incremental units to incrementally space said substantially horizontal support members apart by a predetermined distance;
a substantially vertical support member attached to and projecting upwardly from each of said substantially horizontal support members, said substantially vertical support members being spaced relative to each other by at least one second adjustment bar;
said second adjustment bar being adjustable in predetermined incremental units to incrementally space said substantially vertical support members apart by a predetermined distance;
said predetermined incremental spacing between said substantially horizontal support members being selectively equal to said predetermined incremental spacing between said substantially vertical support members; and
said substantially vertical support members being channel shaped to receive a door frame therein and frame holding means being operatively positioned to releasably secure the door frame thereto.

4,176,832
METHOD AND APPARATUS FOR HANDLING, POSITIONING AND ASSEMBLING FABRIC PLIES
Francis H. Hughes, North Troy; Kenneth O. Morton, Troy; Roger LeMere, Petersburg, and Fred A. Brown, III, Ballston Spa, all of N.Y., assignors to Cluett, Peabody & Co., Inc., New York, N.Y.
Filed May 26, 1976, Ser. No. 689,995
Int. Cl.² B65H *5/00*
U.S. Cl. 271—10 **28 Claims**



1. The method of transporting, aligning and orienting a fabric ply, which comprises
(a) depositing the ply on a generally flat, movable shutter plate, with the leading edge of the ply having a random orientation and alignment with respect to the shutter plate,
(b) advancing the shutter plate, in a direction generally at right angles to the leading edge of the ply, toward a load station,
(c) in the region of the load station, sensing the leading edge of the ply independently at relatively widely spaced positions near the ends,
(d) restraining further advance of the ply in the region of a first one of the sensing positions when the leading edge is sensed at such position, while continuing to advance the shutter plate, and
(e) restraining further advance of the ply in the region of a second one of the sensing position when the leading edge is sensed at such position,
(f) whereby the leading edge of said ply is aligned and oriented in a predetermined manner with respect to the load station.

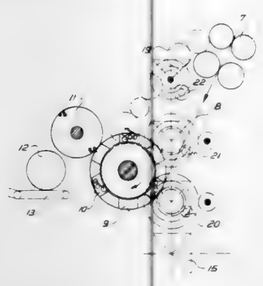
4,176,833
APPARATUS FOR ADJUSTING PRINTING PRESS FOR CHANGES IN PAPER SIZE
Paul Heimlicher, Bolligen, Switzerland, assignor to Maschinenfabrik WIFAG, Bern, Switzerland
Filed Mar. 6, 1978, Ser. No. 883,471
Claims priority, application Sweden, Mar. 7, 1977, 7702541
Int. Cl.² B65H *45/16*
U.S. Cl. 270—71 **10 Claims**

1. Apparatus for adjusting a folding system for different size sheets of paper, or the like, severed from a web thereof and advancing in a path through the system comprising:
a machine frame;
a rotatable machine shaft for operating various elements of said system;
means for printing the web;
a folding apparatus for different size sheets of paper, or the like, said folding apparatus being located downstream in

the path of the web from said means for printing the web; said folding apparatus comprising:

a cutting group, including a cutting roller rotatably supported to said frame; a drive connection to said cutting group from said machine shaft and said drive connection being invariable in its rotational phase with respect to said machine frame;

said folding apparatus further comprising a folding cylinder rotatably supported to said frame and including means for folding a sheet of the web; said folding cylinder being downstream from said cutting group in the path of the sheets of the web of paper, or the like; said folding cylinder being drivingly connected with said machine shaft for being driven to rotate; said folding cylinder being rotatably adjustable in its phase of rotation with respect to said machine frame;



said folding apparatus still further comprising a gripper cylinder for gripping the sheets of the web going past it and being rotatably supported to said frame and being coaxial with said folding cylinder; said gripper cylinder being drivingly connected with said machine shaft for being driven to rotate; said gripper cylinder being rotatably adjustable in its phase of rotation with respect to said folding cylinder around their respective axis;

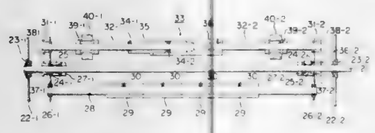
adjusting means for simultaneously adjusting the phase of rotation of both of said folding cylinder and said gripper cylinder in one operation with respect to the phase of rotation of said cutting roller; said adjusting means being operable for adjusting said cylinders at least while said cylinders are being rotated by said machine shaft.

4,176,834

SHEET TRANSFER DEVICE

Yuji Takahashi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1977, Ser. No. 837,373
Claims priority, application Japan, Oct. 1, 1976, 51-118336
Int. Cl.[2] B65H *3/06*
U.S. Cl. 271—116 **12 Claims**



4. A sheet transfer device comprising:

first arm means rotatably mounted at a position;

second arm means rotatably mounted at a different position;

a first supporting shaft rotatably mounted on said first arm means;

a second supporting shaft rotatably mounted on said second arm means;

connecting means for connecting said first and second supporting shafts in mutually rotatable and axially aligned relationship;

a first sheet transfer roller rotatably mounted on said first supporting shaft;

a second sheet transfer roller rotatably mounted on said second supporting shaft;

first driving means for rotationally driving said first supporting shaft; and

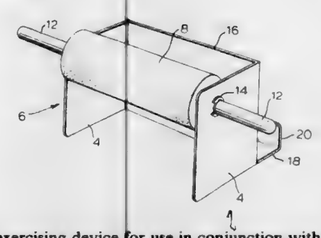
second driving means for rotationally driving said second supporting shaft.

4,176,835

SIT-UP EXERCISING DEVICE

Edward D. Aziz, 47 Crosland Ave., Scarborough, Ontario, Canada

Filed Jan. 16, 1978, Ser. No. 869,586
Int. Cl.[2] A63B *21/00*
U.S. Cl. 272—93 **1 Claim**



1. An exercising device for use in conjunction with a door, comprising a roller having a resilient surface and a length at least equal to the width of two human feet; a frame having side walls and a rear wall presenting a rearward facing door engaging surface, said frame having a floor engaging footing extending in a horizontal plane beneath the roller; a shaft supporting the roller between the side walls and having coaxial extensions passing through said side wall to form elongated generally cylindrical hand grips extending beyond each of the side walls by a distance at least equal to the width of a human hand, the frame having a flange extending rearwardly of the rear wall in the same horizontal plane as said footing and engageable with the bottom of a door, and a further flange upstanding from said rearwardly extending flange and having a forward facing vertical door engaging surface, the frame being so configured that when the rear wall and the flanges are engaged with the faces and bottom of a door and the floor engaging footing is engaged with a floor beneath the door, said roller and said hand grips are supported for rotation on a common axis parallel to and adjacent the bottom of the door and the floor therebeneath in a position such as to allow unobstructed access to said roller and said hand grips respectively by the insteps and palms of a user with said rear wall providing a rest for the soles of a user's feet when the user's insteps are engaged beneath the roller.

4,176,836

VARIABLE RESISTANCE EXERCISING APPARATUS AND METHOD

Randy Coyle, 19 High St., Glen Ridge, N.J. 07028

Filed Jun. 21, 1977, Ser. No. 808,638
Int. Cl.[2] A63B *21/00*
U.S. Cl. 272—120 **4 Claims**

1. Exercising apparatus providing a discrete variable resistance commensurate with the strength curve of the body muscles being exercised, and commensurate with the strength of an exerciser and the desired intensity of the exercise being performed, comprising

a frame including an inclined plane which is discretely curved so that the angle of incline varies instantaneously and automatically;

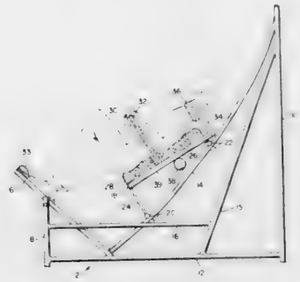
a carriage displaceably carried by the frame and supporting the body of the exerciser;

the carriage carrying a weight commensurate with the strength of the exerciser and the desired intensity of the exercise being performed;

means supported by the frame and the exerciser exerting a force in one sense against said means to displace the carriage in he opposite sense up the inclined plane; and

the exerciser encountering a discrete variable resistance when displacing the carriage up the inclined plane, said resistance varying instantaneously and automatically with the sines of the varying angles of incline and with the strength curve of the body muscles being exercised, and with the strength of the exerciser and the desired intensity of the exercise being performed.

4. A method whereby an exerciser performs an exercise having a discrete variable resistance commensurate with the strength curve of the body muscles being exercised and commensurate with the strength of the exerciser and the desired intensity of the exercise, comprising:



providing an inclined plane which is discretely curved so that the angle of incline varies instantaneously and automatically;

displaceably supporting a carriage on the inclined plane;

positioning the body of the exerciser on the carriage and the exerciser exerting a force for displacing the carriage up the inclined plane;

the exerciser encountering a discrete variable resistance to the carriage displacement, said resistance varying instantaneously and automatically commensurate with the sines of the varying angles of incline and also varying commensurate with the strength curve of the body muscles being exercised, and with the strength of the exerciser and the desired intensity of the exercise; and

the exerciser varying the force exerted for overcoming the varying resistance.

4,176,837

ARM-WRESTLING APPARATUS

Lawrence W. Jeffrey, 1008 Juanita, and Robert D. Jeffrey, 7121 Lowell Ave., both of Glendora, Calif. 91740

Continuation-in-part of Ser. No. 617,428, Sep. 29, 1975, abandoned. This application Aug. 1, 1977, Ser. No. 820,585
Int. Cl.[2] A63B *71/06*
U.S. Cl. 273—1 R **7 Claims**

1. Arm-wrestling amusement apparatus comprising:

a coin acceptor,

a table-like playing surface,

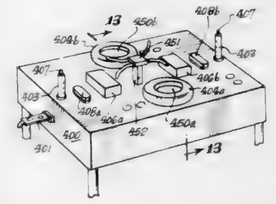
a pair of elbow rest cups thereon, each having a flat central pad portion and a surrounding cup rim portion,

a pair of depressable touch pads for scoring, each linked to an electrical pad switch operable in response to depression thereof,

electrical signal means actuably connected to each said pad switch,

lockout means with a lockout element movable to prevent use of said apparatus for arm-wrestling,

motor drive means to drive said lockout element between a lockout play-preventing position and an unlocked playing position,



a connection from said coin acceptor to said drive means to drive said lockout element to said playing position upon receipt of a coin therein, and

a connection from each said pad switch via a reversing means to said drive means to drive said lockout element to said lockout position after a said pad switch has been actuated.

4,176,838

BATTING BASEBALL TEE

Jacqulyn G. Griffin, 60 Helen La., Fort Myers Beach, Fla. 33931

Filed Oct. 17, 1977, Ser. No. 842,942
Int. Cl.[2] A63B *69/40*
U.S. Cl. 273—26 E **1 Claim**



1. A batting base ball tee device comprising a self uprighting base member comprised of an upwardly hollow shell, providing a hemi-spherical bottom, with a flattened central area, said shell being filled with a suitable heavy material,

a post of a predetermined height having a top end, and a screw threaded lower end engaged in an internally screw threaded receptacle fixed centrally and interiorly of said shell,

an inverted conical helical spring fixed to said top end in an axial relation to said post and shell for nestingly receiving a ball.

4,176,839

WRIST SUPPORT

Alan E. Pinkus, 4 Albert St., Brighton, Victoria, Australia

Filed May 1, 1978, Ser. No. 901,846
Claims priority, application Australia, May 2, 1977, PC9934
Int. Cl.[2] A63B *69/38*
U.S. Cl. 273—29 A **8 Claims**

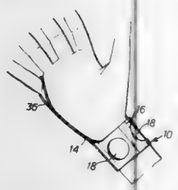
1. In a wrist support device for use in tennis comprising:

a band of a breathable flexible material

means to permit fastening of said band about a persons wrist; and

an integral protruding portion extending from the band in a direction to engage and support the side edge of a person's hand between the wrist and smallest finger;

the improvement wherein the protruding hand engaging



portion extends from the band at an angle to the band in the range 45° to 80° in the plane of the flattened band, and means biasing said protruding portion to an equilibrium position out of said plane on the side of the band to be occupied by the hand, the force required to cause said protruding portion to occupy said plane being greater than ½ kgm force.

4,176,840

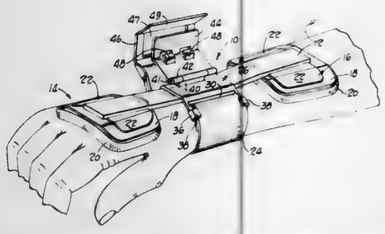
WRIST SUPPORT

Michael E. Lanning, 15734 Hummel Rd., Brook Park, Ohio 44132

Continuation-in-part of Ser. No. 469,213, May 13, 1974, abandoned. This application Mar. 6, 1978, Ser. No. 883,540

Int. Cl.[2] A63B *69/00*

U.S. Cl. 273—54 B **1 Claim**



1. A brace for supporting the wrist of a sportsman comprising: a rigid bar; a pair of support members disposed at opposite ends of said rigid bar, a first of said support members substantially conforming to the shape of a back of a hand, a second of said support members substantially conforming to the shape of a portion of a forearm; fastening means disposed between said first and second support members securing said bar to the user's arm at the wrist, said fastening means including strap means capable of attaining a plurality of lengths in order to adjust to the size of the wrist, a first end of said strap means permanently attached to said rigid bar by a clip, and a second end of said strap means having a clamping means attached thereto; a latching means which cooperates with said clamping means to releasably attach the second end of the strap to said rigid bar; and said brace is mounted on the user's arm by means of said strap encircling the wrist thereof, wherein said clip includes a hinge, and said latch means is connected to the clip at the hinge so that it can rotate about the hinge.

4,176,841

TENNIS RACKET

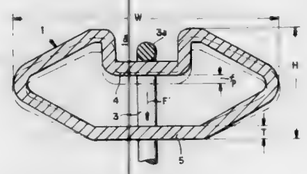
Reinhold Sommer, Helgolandring 68, 43 Essen 1, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 720,413, Sep. 3, 1976, abandoned, which is a continuation of Ser. No. 566,391, Apr. 19, 1975, abandoned. This application Feb. 28, 1978, Ser. No. 882,055

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1974, 2417439

Int. Cl.[2] A63B *49/12*

U.S. Cl. 273—73 H **5 Claims**



1. A tennis racket comprising:

a frame constituted by a hollow profile with a wall thickness of 0.6 to 0.8 mm, consisting to at least 95% by weight of titanium, bent into a pair of generally parallel legs interconnected by a loop, said profile being free from internal reinforcements and having an indentation with a flat bottom generally parallel to an opposite profile wall and with sides perpendicular to said bottom defining an external groove on said frame, said profile having a width parallel to said bottom ranging between 25 and 40 times said wall thickness, said profile further having a height transverse to said bottom ranging between 5 and 20 times said wall thickness;

a web bridging said legs and complementing said loop to a substantially elliptical head;

strings partly received in said external groove and secured to said frame and said head; and

a handle interconnecting extremities of said legs remote from said head.

4,176,842

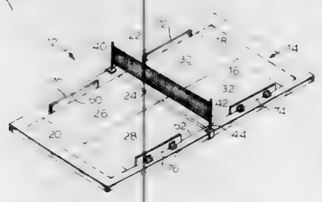
ROLLING BALL GAME

Alcibiades D. Zaldivar, 2974 SW. 23 St., Miami, Fla. 33145

Filed Aug. 17, 1978, Ser. No. 934,587

Int. Cl.[2] A63F *67/04, 7/06*

U.S. Cl. 273—85 R **4 Claims**



1. A simulated tennis game comprising a gameboard having a flat upper surface, indicia on said upper surface defining a playing field and separating said field into a first and a second court along a mid-court line and a net spanning said mid-court line above said playing field a first predetermined dimension and standards to support said net including means to connect to said gameboard and side boundary indicia for said courts and wall members vertically oriented along said side boundary indicia and hinge means to connect the wall members to said gameboard for swinging movement away from said courts and

a playing ball of spherical form of a diameter less than said predetermined distance.

4,176,843

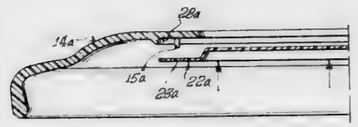
AERODYNAMIC THROWING DISC

Leslie DeWitt, Jr., 9820 Rush St., S. El Monte, Calif. 91733

Continuation of Ser. No. 745,871, Nov. 29, 1976, abandoned. This application Jan. 11, 1978, Ser. No. 868,476

Int. Cl.[2] A63H *27/00*

U.S. Cl. 273—106 B **4 Claims**



1. An aerodynamic throwing disc comprising:

a relatively thin walled annular rim having a circular central opening, a radially outer edge portion which curls toward one side of the rim to define a circumferential lip about the rim, and an annular shoulder at said one side of said rim concentric with and spaced outwardly from the edge of said opening to define an annular seat about the opening,

a circular insert element of uniform thickness thinner than said rim, said insert having an outer radially extending flat annular flange configurated to seat against the annular seat of the rim, and having a raised central portion spaced from the flange by an axially extending side wall, said central portion extending into said opening with its flange engaging the annular seat, and bearing indicia on its surface opposite from said rim annular seat, and

means joining said insert flange to said rim portion.

4,176,844

MULTI-STATION PINBALL GAME

Allen L. Ryan, Chicago; Eric G. Jansons, Schaumburg, both of Ill.; Ronald D. Halliburton, Fort Lauderdale, and James H. Pearson, Sunrise, both of Fla., assignors to Midway Mfg. Co., Franklin Park, Ill.

Filed Jan. 31, 1978, Ser. No. 873,908

Int. Cl.[2] A63F *7/00*

U.S. Cl. 273—121 A **7 Claims**

2. A pinball game apparatus comprising:

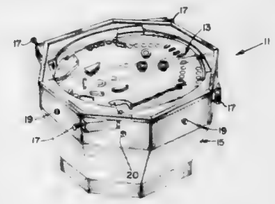
a cabinet;

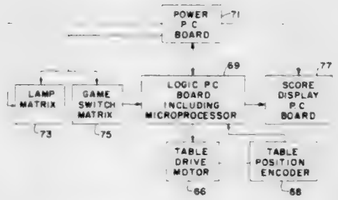
a playfield having a single play initiating position, said playfield being mounted on said cabinet and rotatable relative to said cabinet;

a plurality of discrete playing stations stationarily disposed in spaced relation at fixed positions on said cabinet adjacent said playfield;

a plurality of manually operable shooter means, a shooter means being stationarily located at each of said discrete playing stations; and

an indexing driver means including data processor control means, said data processor control means being programmable to rotate said playfield and selectively stop said playfield to accurately align said play initiating position with the shooter means of an associated playing station in a desired sequence for permitting the respective player at





each playing station to take a turn at playing said pinball game.

4,176,845

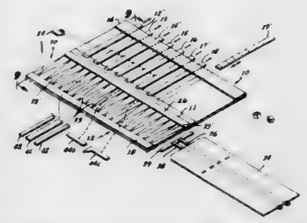
APPARATUS FOR PLAYING A SIMULATED GOLF GAME

John T. Lancaster, 8566A 23 Van Ness St., Huntington Beach, Calif. 92646

Filed Jun. 17, 1977, Ser. No. 807,544

Int. Cl.[2] A63F *7/06*

U.S. Cl. 273—245 **6 Claims**



1. Apparatus adapted for playing a simulated golf game, in combination, chart means, graphics including alignments of numbers including columns and rows of numbers, one alignment having numbers representing yardages and the other alignment having numbers representing chance numbers whereby a yardage can be derived from a particular chance number, the said chart means having an additional alignment of numbers and identifying indicia adapted for identifying particular hazards and penalty conditions with particular numbers of the said chance numbers, identifying indicia including individual removable indicator members positionable with respect to individual chart numbers to indicate hazards and penalty conditions, the said members being constructed to be positioned to be identified by way of a chance number so as to indicate a player has been subjected to a hazard or penalty condition.

4,176,846

ACTUATING MECHANISM FOR A RECORD CHANGER WITH A STACKING SPINDLE

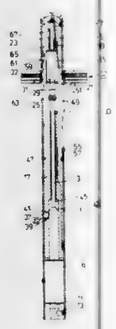
Gerhard Freiter, Berlin, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 18, 1978, Ser. No. 907,303

Claims priority, application Fed. Rep. of Germany, May 21, 1977, 2723077

Int. Cl.² G11B *17/04, 17/12*

U.S. Cl. 274—10 S **8 Claims**



1. An actuating lever mechanism for a record changer having a changer command means, and a stacking spindle having a single actuating rod for record dropping functions, comprising

a chassis,

a pulling lever movably mounted to said chassis, having a lever free end,

means for moving said stacking spindle actuating rod responsive to movement of said free end,

first means for moving said free end in a first direction in response to scanning of a first track on a command means, and

second means for moving said free end in a second direction opposite said first direction in response to scanning of a second track on the command means.

4,176,847

DEVICE FOR PREVENTING SLIPPING OF TURNTABLE OUT OF SHAFT

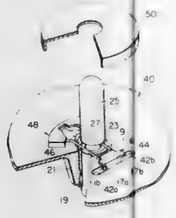
Norio Akai; Nobumasa Inoue, and Kazuo Ohtani, all of No. 1006, Oaza Kadoma, Kadoma City, Osaka, Japan

Filed Jan. 27, 1978, Ser. No. 872,753

Claims priority, application Japan, Jan. 31, 1977, 52-10005

Int. Cl.² G11B *3/60*

U.S. Cl. 274—39 R **3 Claims**



1. A device for preventing slipping of a turntable off a shaft by limiting relative axial movement of the turntable having a boss fixed thereto and the shaft rotatably extending through said boss, the turntable having a generally U-shaped spring having two leg portions terminating in bent ends, respectively, the turntable having integrally formed therewith slot means for receiving the bent ends of the U-shaped spring and a plurality of support projections engaging the generally U-shaped retainer spring to mount the generally U-shaped retainer spring to the turntable, the plurality of support projections and the slot means being configured and arranged such that the generally U-shaped retainer spring is arranged so that the leg portions thereof extend substantially parallel to each other and across a circular axial of end of said boss, the shaft being formed with a radial groove which receives the leg portions of the generally U-shaped retainer spring, said plurality of projections comprising

a first projection, having two opposed faces, which is interposed between said two leg portions by internally and bearingly engaging said two leg portions, respectively, and two lateral portions extending from said two opposed faces respectively;

a second projection interposed between said two leg portions and internally engaging them; and a third projection formed with a space to receive the bottom of the U of said generally U-shaped spring.

4,176,848

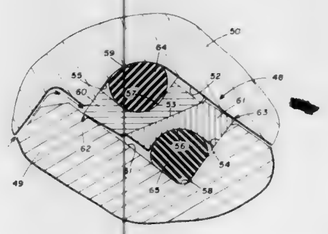
ROTARY BEARING SEAL FOR DRILL BITS

David S. Lafuze, Arlington, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jun. 30, 1978, Ser. No. 920,862

Int. Cl.² F16J *15/16*

U.S. Cl. 277—92 **7 Claims**



1. A rolling cone cutter earth boring bit, comprising:

a bit body;

a cantilevered bearing pin extending from said bit body;

a rolling cone cutter rotatably mounted on said bearing pin;

a seal envelope between said bearing pin and said rolling cone cutter;

a first annular substantially rigid ring positioned around said bearing pin and located in said seal envelope, said first annular substantially rigid ring having a first sealing surface that is inclined with respect to said bearing pin;

a first substantially resilient ring positioned around said bearing pin and located in said seal envelope;

a second annular substantially rigid ring positioned around said bearing pin and located in said seal envelope, said second annular substantially rigid ring having a second sealing surface that is inclined with respect to said bearing pin; and

a second substantially resilient ring positioned around said bearing pin and located in said seal envelope, said first and second annular rigid rings and resilient rings cooperating when said rolling cone cutter is mounted on said bearing pin whereby said first and second resilient rings urge said first and second sealing surfaces of said first and second annular rigid rings into sliding contact as said cone cutter rotates about said bearing pin thereby providing a sliding interface between said first and second annular rigid rings with said sliding interface being inclined to said bearing pin thereby minimizing the size of said seal envelope.

4,176,849

PLASTIC CHILD SEAT BACK FOR CART

Houston Rehrig, 1401 S. Oak Knoll Ave., Pasadena, Calif. 91109

Continuation-in-part of Ser. No. 681,462, Apr. 29, 1976, Pat. No. 4,065,142. This application Apr. 28, 1977, Ser. No. 792,052

Int. Cl.² B62B *3/02*

U.S. Cl. 280—33.99 B **6 Claims**



1. A child seat for a grocery cart or the like having a rear cart panel, comprising:

a movable plastic seat back frame having a lower portion terminating in at least one downwardly curved mounting member,

at least one opening in the lower portion of said rear cart panel for closely receiving said curved member, whereby said seat back frame is pivotally movable between an open position pivoted away from said cart rear panel and a closed position adjacent to said cart rear panel,

a seat panel pivotally attached at one end to said seat back frame and movably attached at the other end to said cart rear panel,

said curved member having a terminal portion substantially parallel to said seat back frame and said opening is oriented substantially perpendicular to said rear cart panel, whereby said curved member can be installed in said opening only when said seat back frame is substantially perpendicular to said rear cart panel, said seat back frame being pivoted upwardly therefrom to an operating position and not disengageable in that position, and whereby said curved member can be removed from said opening only when said seat back frame is substantially perpendicular to said rear cart panel,

wherein said seat back frame further comprises at least one laterally extending opening defined in part by an upper edge, and further comprising seat panel attachment means including a support rod installed in said opening and spaced from said upper edge and a hook extending from said one end having a recess in which said support wire is received, said hook having an opening substantially perpendicular to said seat panel, the distance between said upper edge and said support wire being less than the length of a terminal portion of said hook, whereby said hook can be engaged with said support wire only when said seat panel is oriented downwardly substantially parallel to said seat back frame, and said seat panel cannot be disengaged from said support wire when pivoted upwardly to substantially a horizontal position.

4,176,850

SKATEBOARD TRUCK WITH INDEPENDENT WHEEL SUSPENSION

Robert D. Johnson, 7882 Cedar Lake Ave., San Diego, Calif. 92119

Continuation-in-part of Ser. No. 844,973, Oct. 25, 1977. This application Jun. 22, 1978, Ser. No. 917,872

Int. Cl.² A63C *17/02*

U.S. Cl. 280—87.04 A **10 Claims**



1. In a wheel truck having wheels mounted for rotation about a wheel axis on a yoke which in turn is adapted for mounting on an elongate moveable platform along a support axis which extends through the longitudinal centerline of the platform said yoke being pivotable relative to the platform, the improvement comprising a pair of laterally spaced swing arms having distal ends for rotatably mounting the wheels, and means for mounting the proximal ends of the swing arms on the yoke for resiliently yieldable independent movement of their distal ends through arcs about a transverse axis, with the distal ends of the swing arms disposed so that the axes of rotation of the wheels substantially normally intersect the support axis so that a portion of the weight on the platform is carried through the support axis over the wheels.

4,176,851

CHILD'S BUMPER BIKE

Robert C. Simonson, 258 N. Arnez, Minor Oaks, and Ruben J. Stroud, 602 N. Fulton, both of Ojai, Calif. 93023

Filed Jul. 20, 1978, Ser. No. 926,409

Int. Cl.² B62K *9/00*

U.S. Cl. 280—259 **2 Claims**



1. A child's bumper cycle that cannot tip over including, in combination:

(a) a cycle frame;

(b) a steering fork journalled in a forward end of said frame for steering movements about a generally vertical axis;

(c) a single wheel rotatably mounted in said steering fork;

(d) pedals on said wheel;

(e) handlebars secured to said steering fork;

(f) a seat mounted on a portion of said frame to the rear of said handlebars;

(g) an integral bumper ring secured to said frame in a horizontal plane at a given distance above the ground below said steering fork and including a resilient cushioning material;

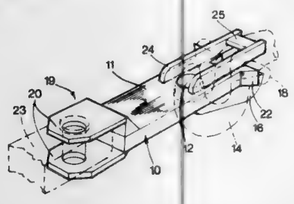
(h) four individual caster wheels coupled to said ring at 90° circumferentially spaced positions engaging the ground to inhibit tipping over of said cycle frame and also serve as a 360° bumper; and

(i) a rear platform secured to an arcuate rear portion of said bumper ring, the forward edge of said platform lying on a chord of said ring, said cycle frame including a single curved tube member lying in a vertical plane having one end secured to the central rear portion of said bumper ring and its other end extending upwardly and forwardly to terminate in the journal for said steering fork, said frame further including rear right and left straight tube members forming an inverted V, the vertex of said V being connected to a mid point on said curved tube and the diverging downwardly extending legs secured at circumferentially spaced points on said bumper ring adjacent to the terminal points of said chord to stabilize said curved tube member.

4,176,852
HITCH ADAPTOR

John Collin, Deene, Near Corby, England, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Jan. 14, 1977, Ser. No. 759,509
Claims priority, application United Kingdom, Jan. 21, 1976, 02266/76
Int. Cl.² B60D *1/04*
U.S. Cl. 280—415 A **3 Claims**



1. A hitch assembly for connecting together a towing vehicle having a hook with a rearwardly disposed free end and a towed vehicle having a forwardly extending draw tongue; said assembly comprising:

cylindrical structure extending laterally outwardly from opposed sides of the root portion of the hook;

an adapter having a clevis at its rear end for attachment to the forward end of the draw tongue, engaging means toward the other end of the adapter engaging the free end of the hook, the other end of the adapter further being provided with additional means having opposed longitudinally extending side walls which cooperate with said engaging means and the root portion of said hook and the cylindrical structure to inhibit movement of the adapter when the hook is engaged, the adapter in use lying in a generally horizontal plane between the draw tongue and the hook.

4,176,853
QUICK DISCONNECT TRAILER HITCH

James H. Brock, Rte. No. 2, Box 194, Brigham City, Utah 84302

Filed Jul. 21, 1978, Ser. No. 926,792
Int. Cl.² B62D *53/04*
U.S. Cl. 280—423 R **7 Claims**

1. A trailer hitch comprising, a tubular member connected to a trailer, a pair of jaws, said jaws having complementary concave surfaces adapted to surround a ball hitching element connected to a tractor vehicle, said jaws being slidably mounted in said tubular member, spring means mounted in said tubular housing for biasing the jaws outwardly of the tubular member to a position wherein the jaws are moved to an open position, a pin oriented between the jaws for guiding said jaws during movement relative to said tubular member, and latch means connected to said tubular member for holding the jaws

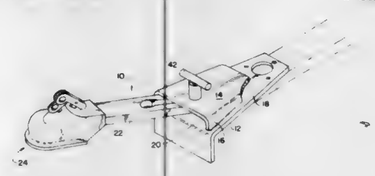


inwardly of the tubular member against the biasing force of said spring means.

4,176,854
CONNECTION FACILITATING HITCH

Wayland W. Hill, P.O. Box 168, Earlimart, Calif. 93319, and Gary L. Hill, 1408 Demaree St., Visalia, Calif. 93277

Filed Jun. 19, 1978, Ser. No. 916,803
Int. Cl.² B60D *1/00*
U.S. Cl. 280—478 R **5 Claims**



1. In a hitch characterized by a housing having a horizontally oriented bottom plate, a horizontally oriented top plate, a horizontally oriented throat and a displaceable coupling arm extended axially from the throat, the improvement comprising:

A. means connecting said arm to said housing supporting the arm for displacement in axial directions from an extended position to a retracted position and for pivotal displacement in directions transversely related to said axial directions including an elongated slot defined in said arm and a retainer pin extended vertically through the slot;

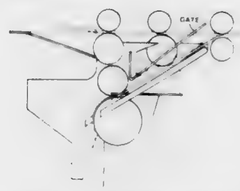
B. means for securing said arm against axial displacement from said retracted position including a bolt receiver comprising a bore defined in the arm in communicating relation with the slot, and a locking bolt integrally related to said retainer pin characterized by a cylindrical wall surface defining a cam surface and an annular bearing surface concentrically related to said bolt, said bolt being adapted to be disposed in coaxial alignment with said bore when the arm is in said retracted position, guide means for establishing coaxial alignment between said bore and said bolt as the arm is displaced toward said retracted position including a relief having a vertical wall defining a cam follower surface for engaging said cam surface, whereby the arm is laterally positioned relative to the bolt as the arm is retracted, and a planar bottom surface for engaging said bearing surface, and a bolt actuator for driving said bolt into said bore in response to the bore being positioned in coaxial alignment with said bolt; and

C. means for securing said link against pivotal displacement including means defining in said housing a second throat disposed in coaxial alignment with said first throat for receiving in confining relation an end portion of the arm.

4,176,855
GATE DEVICE

James R. Ingram, Jr., Dallas, and George A. Kiesel, Irving, both of Tex., assignors to Recognition Equipment Incorporated, Dallas, Tex.

Filed Nov. 13, 1978, Ser. No. 960,211
Int. Cl.² G06K *13/07;* **B65H** *5/22*
U.S. Cl. 235—480 **5 Claims**

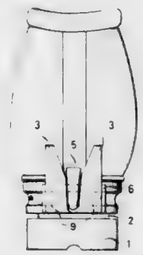


1. A gate device in a reversible document transport positioned across the path of a belt driven document guide comprising; two flexible fingers and a body portion, said body portion rigidly attached to said transports and said fingers extending from said body portion across the document guide so that documents moving in one direction will flex the fingers aside allowing the document to pass along the document guide, said fingers returning to a position across the guide after the document passes and diverting documents to another path when the documents move in an opposite direction.

4,176,856
BINDING FOR CROSS-COUNTRY SKIS

Hans E. Glaser, Ringstrasse 9, D-8591 Wiesau, Fed. Rep. of Germany

Filed Jul. 11, 1978, Ser. No. 923,694
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1978, 2808131
Int. Cl.² A63C *11/12*
U.S. Cl. 280—611 **5 Claims**

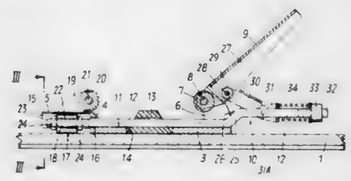


1. An auxiliary binding for cross-country skis, comprising a clasp secured to the side wall of the heel of a ski boot, said clasp having a rounded protuberance positioned in a corresponding groove formed in the heel of the boot, a wedge portion connected to said clasp and extending rearwardly therefrom, said wedge having downwardly converging side walls, a plate secured to the ski, two upstanding prongs integrally connected to one end of said plate, said prongs having upwardly diverging opposed inner edges defining a recess having a width which decreases towards the plate, the upwardly diverging opposed inner edges of the prongs at the upper portions thereof diverging at a substantially greater angle than at the lower portions, said lower portions diverging at an angle corresponding to the downwardly converging side walls of said wedge, whereby the wide upwardly diverging upper portion of the recess provides a guide to facilitate the insertion of the wedge into the lower wedge gripping portion of the recess.

4,176,857
SAFETY SKI BINDING

Roland Bodendorfer, Vienna, Austria, assignor to TMC Corporation, Baar, Switzerland

Filed Mar. 30, 1978, Ser. No. 891,750
Claims priority, application Austria, Apr. 4, 1977, 2325/77
Int. Cl.² A63C *9/08*
U.S. Cl. 280—613 **10 Claims**



1. The combination of a ski boot having a heel with first and second locking surfaces thereon and a safety ski binding releasably operatively connectible to said first and second locking surfaces, said combination comprising:

a base plate adapted to be secured to a ski;

guide means on said base plate;

an elongated pull rod reciprocally guided in said guide means, said pull rod having first ski boot engaging means secured thereto and movable therewith;

tensioning lever means, which includes second ski boot engaging means, operatively connected to said pull rod for effecting a releasable locking engagement of said first and second locking surfaces with said first and second ski boot engaging means; and

upstanding pivot means fixed relative to said ski and means defining a recess in said heel receiving said pivot means therein to facilitate a pivotal support for said heel relative to said ski, said upstanding pivot means being positioned between said first and second ski boot engaging means and on a central longitudinal center line for said base plate.

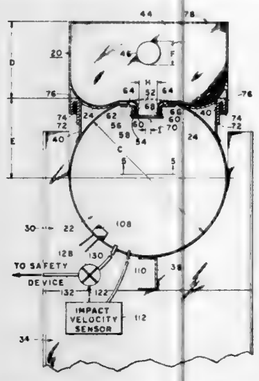
4,176,858
ENERGY ABSORBING BUMPER SYSTEM

Murray Kornhauser, Wynnewood, Pa., assignor to Safety Consultants, Chambersburg, Pa.

Division of Ser. No. 687,513, May 18, 1976, which is a continuation of Ser. No. 430,667, Jan. 4, 1974, Pat. No. 3,971,583, which is a continuation-in-part of Ser. No. 126,155, Mar. 19, 1971, Pat. No. 3,810,668. This application Dec. 17, 1976, Ser. No. 751,841
Int. Cl.² B60R *19/10, 21/06*
U.S. Cl. 280—734 **20 Claims**

1. In a vehicle equipped with at least one inflatable air bag for protecting at least one passenger of the vehicle in case of an accident, wherein an inflation assembly for said bag comprises a pressurized gas tank having a front portion and at least one branch portion in a continuous configuration extending from said front portion of said pressurized gas tank, said branch portion connecting said front portion to said at least one inflatable air bag, said front portion mounted in the front region of the vehicle and extending transversely of the vehicle longitudinal axis from one side to the opposite side of the vehicle; and at least one automatic valve, said one automatic valve connected between the pressurized gas tank and each associated inflatable

air bag, said pressurized gas tank inflating said air bag upon impact during an accident, without the use of separate sensors,



due to a sudden increase in pressure within the gas tank which causes said valve to open.

4,176,859

NON-COUNTERFEITABLE DOCUMENTS

Dennis R. Giordano, Cheektowaga, N.Y., assignor to Safron Printing Company, Detroit, Mich.

Filed May 15, 1978, Ser. No. 905,578
Int. Cl.[2] B42D *15/00*
U.S. Cl. 283—8 R **5 Claims**

1. A process for preventing the counterfeiting of documents through use of office copiers, and comprising preprinting an original document with background which includes an invalidating mark, said mark being effectively camouflaged in the original document as viewed visually but being clearly discernible in xerographic and photocopies made from the original document,

said process including the steps of:

imprinting on said original document a background having two different indicia at two different screen frequencies,

said indicia comprising an invalidating legend printed at a first screen frequency in the range of from about 85 to about 100 lines per inch, and

a background pattern printed at a second screen frequency.

said second screen frequency being higher than said first screen frequency and in the range of from about 130 to about 150 lines per inch, to provide a composite camouflage background,

imprinting a camouflaging pattern on said document, and

overprinting on said background to provide a final document containing selectable information.

4,176,860

STREET ADDRESS LOCATING AID

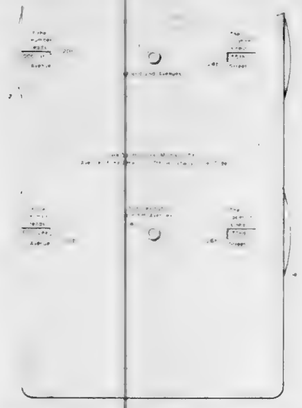
Eugene W. Fowler, Sun City, Ariz., assignor to Gene Fowler and Friends Inc., Sun City, Ariz.

Filed May 25, 1978, Ser. No. 909,214
Int. Cl.[2] G09B *29/00*
U.S. Cl. 283—34 **3 Claims**

1. A street address locating aid comprising: a first printed paper disc having a plurality of street addresses printed in first circles on first and second sides thereof and having a plurality of cross streets printed in second concentric circles on the first and second sides;

a second printed paper disc having a plurality of street addresses printed in first circles on first and second sides thereof and having a plurality of cross streets printed in second concentric circles on the first and second sides;

a printed paper carrier having first and second essentially parallel sheets; the first sheet having two street address apertures at which street addresses on the first circles of the first sides of the first and second discs are exposed and having two locations near apertures at which corresponding cross streets from the second concentric circles on the first sides of the first and second discs are exposed; the second sheet having two street address apertures at which street addresses on the first circles of the second sides of the first and second discs are exposed and having two locations near apertures at which corresponding cross streets from the second concentric circles on the second sides of the first and second discs are exposed, wherein the printed paper carrier being essentially rectangular with a width of less than about 10 cm and length of less than about 13 cm, and wherein the carrier has printed thereon a formula for deriving cross street numbers for selected street addresses not printed on the first and second discs by dividing the address number of the street address by a predetermined number and adding a key number for the street listed in the street address, and wherein the carrier



also has printed thereon a list of key numbers for a plurality of streets;

first and second connecting means for rotatably connecting the first and second discs at their respective centers between the first and second essentially parallel sheets of the carrier, the centers of the first and second discs being positioned less than the radii of the respective discs from an edge of the carrier so that an edge of each of the first and second discs extends beyond the edge of the carrier, and the centers of the first and second discs being spaced from one another by less than the sum of the radii of the discs so that the first and second discs overlap within the carrier, and wherein the first and second discs have diameters greater than the width of the carrier; and

wherein the street addresses in the first circles are arranged on the first and second sides of the first and second discs to provide a reference position in which four different streets with the same selected address number are displayed simultaneously through the four street address apertures, thereby providing a point of reference for a user.

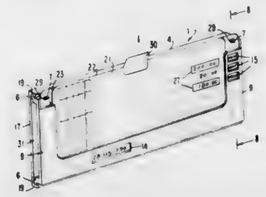
4,176,861

BLANK CHECK SYSTEM

Stuart W. MacKiernan, Jr., 216 Messenger St., Canton, Mass. 02121

Filed Mar. 13, 1978, Ser. No. 886,227
Int. Cl.[2] B42D *11/00*
U.S. Cl. 283—58 **20 Claims**

1. A check writing system, which includes providing a plurality of check blanks stacked in a dispenser frame made of plastic material, each check blank having two portions joined at a fold line, the upper portion being a conventional blank check and the lower portion adapted to be a duplicate or record of the check, said system comprising partially withdrawing the topmost check blank from the frame to a predetermined position, and, while said blank is retained in said posi-



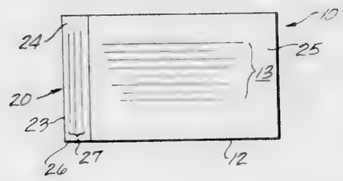
tion, entering thereon the amount of the check being drawn and entering the remaining balance in the account, and thereafter, with the check blank in any convenient position, completing the writing of the check in the usual manner, the remaining balance being inscribed on the next succeeding check blank when the said topmost check blank is fully removed from said dispenser frame.

4,176,862

READ-AWAY FLAP

David M. Targe, Woodbury, N.Y., assignor to Newsday, Inc., Garden City, N.Y.

Filed Aug. 11, 1978, Ser. No. 933,110
Int. Cl.[2] B42D *15/00*
U.S. Cl. 283—64 **3 Claims**



1. In a broad sheet newspaper or newspaper section having a plurality of adjacent sheets of newsprint of equal length and width with a vertical fold and a horizontal fold intersecting the vertical fold, the improvement comprising a cover sheet of newsprint equal in length to the adjacent sheets and slightly more than one-half the width of the adjacent sheets, a back portion of the cover sheet overlying and coinciding completely with the back of the newspaper, a first fold in the cover sheet coinciding with the vertical fold to form a front portion substantially narrower than the front of the newspaper, the front portion overlying a narrow band of the front of the newspaper along the vertical fold, and a second fold in the cover sheet intersecting the first fold and coinciding with the horizontal fold.

4,176,863

LARGE DIAMETER DUCTS FOR USE IN THE OCEAN

Sherman B. Wetmore, Westminster, Calif., assignor to Global Marine, Inc., Los Angeles, Calif.

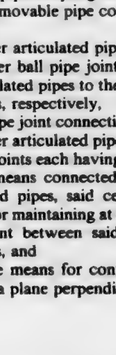
Filed Mar. 15, 1978, Ser. No. 886,904
Int. Cl.[2] F16L *3/00*
U.S. Cl. 285—18 **18 Claims**

1. A large diameter duct structure adapted for vertical disposition in an ocean comprising

an elongate tensile core for the duct adapted to be supported at one end thereof and to be disposed downwardly therefrom,

a plurality of duct wall sections of selected length serially alignable to define a tubular assembly a diameter substantially greater than that of the core,

support means engageable with the core at selected locations along the core and with the wall sections for supporting the wall sections about the core and for securing the wall sections on the core from movement relatively along the core, and



seal means engageable between the adjacent ends of adjacent wall sections disposed about and along the core for defining substantially liquid-tight connections between adjacent sections,

whereby, when the wall sections are disposed about the core in serial arrangement along the core and the seal means are engaged between adjacent sections, there results a fluid flow duct of selected overall length in which the weight of the duct is supported by the core.

4,176,864

PIPE STRING CONNECTION FOR HIGH LOAD OPERATION

Louis Pohl, Julius-Voseller-Str. 55 h, 2000 Hamburg 54, Fed. Rep. of Germany, and Heinz Westerhoff, Mühlheim-Ruhr, Fed. Rep. of Germany, assignors to Louis Pohl, Hamburg, Fed. Rep. of Germany

Filed Oct. 25, 1977, Ser. No. 845,312
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1977, 2731434
Int. Cl.[2] F16L *43/00*
U.S. Cl. 285—181 **8 Claims**

1. In an articulated pipe coupling for connecting a stationary pipe connection to a movable pipe connection, the articulated coupling including,

(a) upper and lower articulated pipes,

(b) upper and lower ball pipe joints connecting said upper and lower articulated pipes to the movable and stationary pipe connections, respectively,

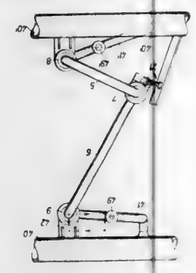
(c) a central ball pipe joint connecting said upper articulated pipe to said lower articulated pipe, said upper, central and lower ball pipe joints each having a spherical sealing ring,

(d) a first guide means connected to said upper and said lower articulated pipes, said central pipe joint located therebetween, for maintaining at said central pipe joint the coaxial alignment between said upper and said lower articulated pipes, and

(e) a second guide means for confining movement of said central joint to a plane perpendicular to its axis,

the improvement comprising:

a resilient tension member, for exerting a force on said upper pipe joint to relieve the loading thereon from the weight of the pipe coupling, said tension member interconnected at an upper end with said upper pipe joint



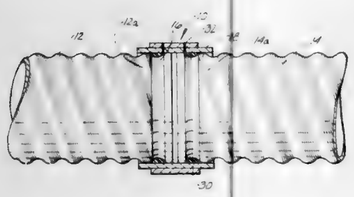
above the upper pipe joint sealing ring and at a lower end with said upper articulated pipe, such that said tension member produces a force on said upper joint in a direction opposing the force exerted on said upper joint by the weight of the pipe coupling.

4,176,865

COUPLING FOR PIPE

Dale D. Felton, Anchorage, Ak., and William R. Jones, Springboro, Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Filed Mar. 21, 1978, Ser. No. 888,537
Int. Cl.[2] F16L *21/06*
U.S. Cl. 285—373 **29 Claims**



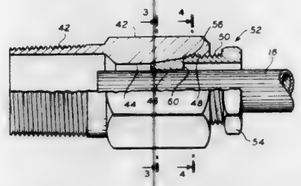
1. A structure comprising, in combination, at least two substantially axially aligned, abutting pipe sections and cooperating coupling means encircling the adjacent ends of said sections to provide a substantially leak tight joint therebetween, each said pipe section being provided at each end thereof with at least one annular, circumferentially continuous, depression, the outside diameter of the exterior surface in which said depression is formed providing continuous surface-to-surface seal with said coupling means about the entire circumference of said pipe section, said coupling means comprising a first band encircling the adjacent ends of said lengths of pipe, said first band having a predominately flat cross section and being of a width to provide said continuous surface seal with the exterior surface in which said depressions are formed, said first band having a pair of free ends adapted to overlap each other, a second band overlying the outer surface of said first band, said second band having a predominately flat cross section, means for tensioning the free ends of said second band together, and a resilient sealing ring positioned in a depression on an abutting end of each of said pipes, said ring being such that it cannot extrude out of its depression and such that it is contiguous with the underside of said first band when the ends of said second band are tensioned together.

4,176,866

STANDARDIZED GLAND ASSEMBLY FOR CABLE CONNECTIONS

Solomon Rubinstein, Fanwood, N.J., assignor to General Cable Corporation, Greenwich, Conn.

Filed May 17, 1978, Ser. No. 906,743
Int. Cl.[2] F16L *25/00*
U.S. Cl. 285—421 **7 Claims**



1. Apparatus for clamping a metal sheathed cable to a gland body having a longitudinally extending opening therein, and a bore constituting a portion of the length of the said opening and constituting a portion of the opening that is of minimum cross-section and into which electrical cables of different size are inserted for connecting the cables with a box of an electrical wiring system, means on one end of the gland body for connecting it with said box, the bore having a tapered cross-section for at least a part of its length, an annular, metallic, clamping ring having a cylindrical inside diameter smaller than the minimum diameter of the bore and that fits around a cable of an outside diameter that fits into the clamping ring for connection with the gland body, the clamping ring having an outside surface with a taper that contacts with the tapered surface of the bore at an axial location corresponding generally to the tapered surface of the bore whereby pressure between the tapered surfaces of the bore and clamping ring is transmitted directly through the metal of the clamping ring and into contact with an outside surface of the cable sheath of a cable in the ring, a pressure element connected with the gland body and movable in a direction to exert axial pressure on the clamping ring for distorting the metal of the clamping ring axially by cold flow into progressively greater pressure with the circumferential surface of the cable, the ring being annealed to a hardness proportional to the mean radial thickness of the ring to facilitate greater distortion of the ring as a result of greater mean radial spacing of the tapered surface of the gland body from the circumference of the outside surface of the cable, the pressure element having an end face that confronts an end face of the ring at the end of the ring which has the greater diameter of the tapered surface for thrusting the end face of the ring axially to distort the annealed metal of the ring to flow axially into clamping contact with the metal sheath of the cable, said end face of the pressure element having an area that will extend over a clamping ring of smaller inside diameter, greater wall thickness, and annealed to lesser hardness for clamping a smaller ring to hold a smaller diameter of cable clamped in the gland.

4,176,867

LOCKING CAP FOR FUEL TANK WITH REMOTE UNLOCKING CONTROL

Paul Lipschutz, Croissy, France, assignor to Neiman S.A., Courbevoie, France

Filed Oct. 3, 1977, Ser. No. 839,080
Claims priority, application France, Oct. 6, 1976, 76 29999
Int. Cl.[2] E05B *47/00*
U.S. Cl. 292—201 **3 Claims**

1. A locking cap for a fuel tank comprising,

(a) a body member,

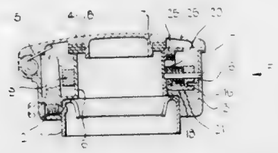
(b) a lid pivotable on the body member,

(c) a pivotable locking device on said body member,

(d) means mounted on the lid engageable by said locking device for holding the lid in a locked position,

(e) a locking slider capable of holding said locking device in a locked position of said lid,

(f) a U-shaped electromagnet on said body member and



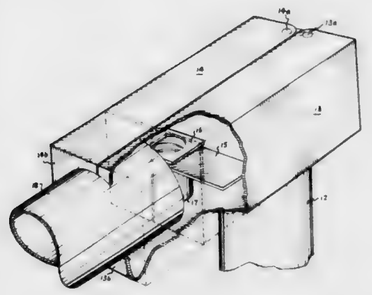
(g) two armatures mounted on said body member for pivoting at an intermediate point of their length and respectively articulated at their extremities remote from the electromagnet to said locking slider.

4,176,868

SECURITY GATE POST

George A. Cole, 4529 Royal Oak Dr. SW., Roanoke, Va. 24015

Filed May 11, 1978, Ser. No. 905,288
Int. Cl.[2] E05C *3/04*
U.S. Cl. 292—258 **4 Claims**



1. A security device for detachably fastening the free end of a cantilever member rigidly to an upright post comprising a pedestal attached to the top of said post, a pair of U-shaped arms pivotally mounted at their ends on said pedestal, the open sides of said arms facing each other in clam-shell fashion, a closure in the free end of each said arm, and an opening in each said closure, said openings together encompassing the end of said member to connect it to said post when said arms are closed together.

4,176,869

GATE LATCHING APPARATUS FOR ANIMAL CLOSURE PANELS

Carl V. Gilst, Goshen, Ind., assignor to Ag Best Corporation, Goshen, Ind.

Filed Jan. 26, 1977, Ser. No. 762,516
Int. Cl.[2] E05C *13/02*
U.S. Cl. 292—304 **25 Claims**

1. Apparatus for detachably hingedly connecting an end of an animal closure panel member with relatively fixed support structure; said apparatus comprising:

a panel member,

panel member detent means attached to the panel member, relatively fixed support structure,

support structure detent means attached to said relatively fixed support structure,

said panel member detent means and said support structure detent means being lockingly engageable when said panel member and said support structure are in a predetermined connected position with one another with said panel member hingedly carried by said support structure for hinged movement about a vertical hinged axis,

and a locking member which is attachable to one of said panel member and said support structure and which is manually movable between a locking position in engagement with the other of said panel member and said support structure to lock said panel member and such support



structure in said connected position and an unlocking position permitting free manual movement of said panel member out of said connected position and away from said support stucture in a manner that an end of the panel member can be selectively manually hingedly connected to support structure and disconnected therefrom independently of any tools and with only parts continuously carried by said panel member and said support structure,

wherein said panel member detent means and said support structure detent means are configured so that said panel member is hingedly vertically supported by said support structure independently of the position of said locking member.

4,176,870

SAFETY DOOR HOLDER

Julian L. Cracraft, 255 Lexington Dr., Daytona Beach, Fla. 32014

Filed Feb. 2, 1978, Ser. No. 874,910
Int. Cl.[2] E05C *17/30*
U.S. Cl. 292—338 **9 Claims**



1. A security device for doors of the type having a doorknob having a shaft portion, said security device comprising an elongated rigid rod having an upper end and a lower end and being of a length greater than the distance from the doorknob to the floor of the room, attachment means including a relatively flexible band member loosely encircling the doorknob shaft portion so as to be easily swingable about the axis of the doorknob shaft and connected on opposite ends to the upper end of the elongated rigid rod for supportingly attaching the

upper end of said elongated rigid rod to said doorknob so that the rigid rod is easily swingable about the axis of the doorknob shaft with the lower end of said elongated rigid rod also being positionable to engage the floor in front of the door at a spaced distance from the door to prevent opening movement of the door by applying a jamming reactive force thereagainst in response to any attempted opening movement of the door.

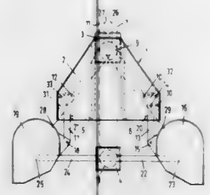
4,176,871
FIREPLACE TONGS
Donald E. Stover, R.R. 1, Box 151, Carey, Ohio 43316
Filed Sep. 14, 1978, Ser. No. 942,381
Int. Cl.[2] A47J *49/14*
U.S. Cl. 294—10 **5 Claims**



1. A fireplace tool comprising a tubular stationary member having grasping means located at one end and one or more downwardly depending claw-like tines attached to the opposite end, a telescoping member having one end slidably received within said stationary member and the opposite end terminating in one or more downwardly depending claw-like tines, and an elongate lift member pivotally attached at one end to the upper side of said telescoping member adjacent said tine bearing end and terminating at its opposite end in grasping means, said telescoping member being shiftable between an open position wherein said one or more tines depending from said stationary member are spaced from said one or more tines depending from said telescoping member for accepting a log therebetween and a closed position wherein said one or more tines depending from said stationary member and said one or more tines depending from said telescoping member may be brought into abutting contact with the outer surfaces of the log.

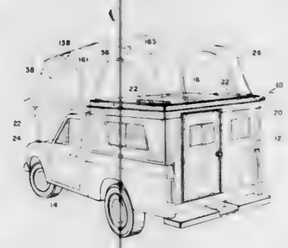
4,176,872
GRAB OR THE LIKE
Leendert van Huuksloot, Zevenbergschen Hoek, Netherlands, assignor to Nemag, B.V., Rotterdam, Netherlands
Filed Jan. 23, 1978, Ser. No. 871,598
Claims priority, application Netherlands, Jan. 27, 1977, 7700847
Int. Cl.[2] E02F *3/44*
U.S. Cl. 294—70 **3 Claims**

1. A grab or the like, substantially comprising a frame or upper structure having a pivoting lever for each grab bucket, at one end of which lever is positioned the pivot point of a grab bucket, each grab bucket being adapted to be brought by means of a rope to the opened position and via a lever system coupled to a pulley block movable in the frame, into the closing position, characterized in that each grab bucket is connected by a lever to a movable pulley block so that in the opened position of the grab buckets the levers are adapted to form an angle of 180°, while the grab buckets, in an intermediate upper position of the movable pulley block, sealingly abut against each other with the lower and side boundary edges and



in the uppermost position of the movable pulley block sealingly abut against each other with the lower boundary edges.

4,176,873
CAMPER TOP TENT ASSEMBLY
Dwight L. Barr; Leslie A. Barr; Benson P. Swett, all of San Diego, and Charles M. Ray, La Mesa, all of Calif., assignors to Barr Industries, Inc., Santee, Calif.
Filed Oct. 31, 1977, Ser. No. 846,887
Int. Cl.[2] B60P *3/34*
U.S. Cl. 296—156 **29 Claims**

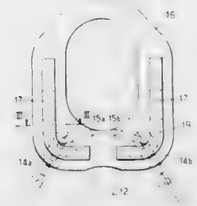


1. A vehicle camper top and bed support assembly comprising in combination:
   a generally rectangular open support frame extending around the top edge of the walls of a vehicle for defining an opening for supporting the top of the vehicle,
   a generally flat rectangular top having inside and outside faces and pivotally connected at one end to said frame about an axis that is transverse to the longitudinal axis of the vehicle on which said frame is mounted and pivotal between closed position for closing said opening, and an open position for defining a bed support for supporting a sleeping pad, and
   a sleeping pad secured by means of an adhesive directly to said inside face of said top and thereby movable therewith to said closed position and to said opened position so that said sleeping pad is retained and supported on said inside face when said top is in the closed position.

4,176,874
LIFTING RINGS FOR CHAIN SLINGS
Jean F. Archer, Villennes, France, assignor to Stas Societe Technique d'Accessoires Specialises, Sartrouville, France
Filed Jul. 6, 1978, Ser. No. 922,509
Claims priority, application France, Jul. 7, 1977, 77 21841
Int. Cl.[2] B66C *1/12*
U.S. Cl. 294—78 A **1 Claim**

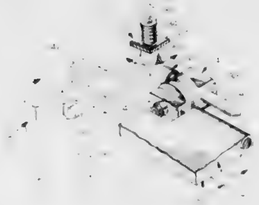
1. A lifting ring for a chain sling, said ring comprising a body having side portions and a bottom portion, two lugs rigid with the body, each lug having means defining an elongate opening

whose width is greater than the thickness of the chain links, but smaller than their width and terminating at the top in an opening of greater width than that of the said links, said lugs being perpendicular to the plane of the body and being bent in such



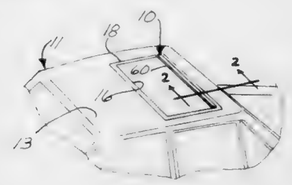
a manner as to extend partly over the side portions of the body and partly over the bottom portion of the body, the bottom portion of the said lugs being directed towards the central plane of the ring.

4,176,875
NOVEL WINDSHIELD VISOR SUPPORT AND ADAPTER
Walter K. Dow, 86 Converse St., Longmeadow, Mass. 01106
Filed Jun. 27, 1978, Ser. No. 919,499
Int. Cl.[2] B60J *3/02*
U.S. Cl. 296—97 K **15 Claims**



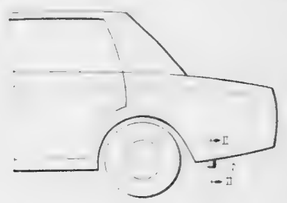
1. In an automobile sun visor assembly, the combination comprising:
   a. a mounting bracket adapted to be mounted upon a vehicle chassis adjacent the windshield;
   b. a shaft member rotatably seated in said mounting bracket and extending therethrough, said shaft member being rotatable within said mounting bracket about a first axis of rotation;
   c. pivot means on said shaft member outwardly of said mounting bracket and having a first pivot element mounted on said shaft member, a shaft seated therein, a second pivot element carried by said shaft and pivotable with respect to said first pivot element about a second axis substantially perpendicular to said first axis, said pivot elements having opposed faces extending substantially perpendicularly to said second axis of rotation, a washer disposed on said pivot means shaft between said opposed faces of said pivot elements, means preventing rotation of said washer relative to one of said pivot elements, and means for adjusting the pressure on the opposing faces of said pivot elements and said washer; and
   d. a visor support rod carried by said second element, whereby the associated visor carried by said visor support rod may be pivoted about said support rod, and said shaft member may be pivoted about said first axis and said support rod may be pivoted about said second axis to effect movement of the visor about a multiplicity of axes for disposition at various locations and elevations relative to the mounting position of said bracket on the vehicle chassis.

4,176,876
WIND DEFLECTOR
Norman L. Sorensen, Detroit, Mich., assignor to Wisco Corporation, Ferndale, Mich.
Continuation-in-part of Ser. No. 820,105, Jul. 29, 1977. This application Sep. 8, 1977, Ser. No. 831,643
Int. Cl.[2] B60T *7/22*
U.S. Cl. 296—137 J **5 Claims**



1. A wind deflector for a vehicle of the type having a roof with a central opening formed therein and a frame formed around the perimeter of the opening including a rigid section attached to and supported by the roof at the perimeter of the opening and extending into the opening, said wind deflector comprising:
   an elongated member adapted to be manually positioned on said frame to extend upwardly from said frame above said vehicle roof and across said opening adjacent the forward edge of said opening; and
   means carried by said member for the releasable attachment of said member to said rigid section for manually attaching and removing said wind deflector to said frame.

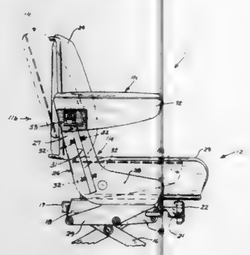
4,176,877
WATER DRAINAGE SPOUT, ESPECIALLY FOR HOLLOW SPACES IN MOTOR VEHICLE STRUCTURES
Manfred Schulz, Wildberg, and Gudrun Kappler, Oberreichenbach, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany
Filed Nov. 1, 1977, Ser. No. 847,494
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1976, 2650679
Int. Cl.[2] B62D *25/00*
U.S. Cl. 296—208 **11 Claims**



1. In a water discharge nozzle for hollow spaces of vehicle structures of the type having a means for preventing penetration of water from the exterior of the nozzle through a discharge opening of the nozzle which includes a unitary structure forming said nozzle and an apron means surrounding the nozzle and extending therebelow, the improvement wherein said unitary structure comprises a generally frusto-conical shaped depression having a peripheral wall and a closed circular vertex, a hollow cylindrically-shaped extension surrounding said depression and forming said apron, and discharge

opening means formed in said depression above said vertex in a portion of the peripheral wall facing said extension and adjacent said vertex, and wherein said vertex is constructed so as to separate from said peripheral wall by pushing thereagainst.

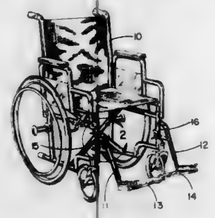
4,176,878
ARMREST STRUCTURE
L. John Koutsky, Milan, Ill., assignor to Sears Manufacturing Company, Davenport, Iowa
Filed Apr. 24, 1978, Ser. No. 899,193
Int. Cl.[2] A47C *13/00*
U.S. Cl. 297—115 **11 Claims**



1. Armrest structure for a vehicle seat having a seat portion and a backrest portion, comprising:
upwardly elongated guide means disposed closely adjacent to the backrest portion;
an adjustment portion carried by the guide means for selective movement of said adjustment portion upwardly and downwardly along the guide means, said adjustment portion including means providing a transverse pivot means;
means for selectively securing the adjustment portion to the guide means at varying elevations relative to the seat portion;
fore-and-aft armrest means having front and rear end portions and having its rear end portion mounted on said pivot means for arcuate swinging thereof relative to the adjustment portion to extend selectively either forwardly from the pivot means or upwardly from the pivot means generally in the transverse plane of the backrest portion and also for bodily movement of said armrest means in unison with the adjustment means as the latter is moved upwardly and downwardly along the guide means;
and stop means cooperative between the armrest means and the adjustment means for limiting downward swinging movement of the armrest means to a forwardly extending position, whereby the armrest means, while extending forwardly, is capable of upward and downward swinging movement of the armrest means to a forwardly extending position, whereby the armrest means, while extending forwardly, is capable of upward and downward movement with the adjustment portion among several travel positions at selected elevations above the seat portion while at the same time being freely swingable arcuately about the pivot means upwardly from and downwardly to the selected travel position irrespective of the selected position of the adjustment portion.

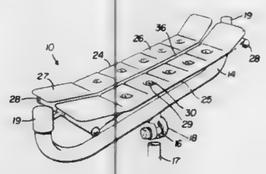
4,176,879
WHEELCHAIR FOOT REST LATCH
Keith S. Rodaway, Santa Monica, Calif., assignor to Everest & Jennings, Inc., Los Angeles, Calif.
Filed Jul. 31, 1978, Ser. No. 929,332
Int. Cl.[2] A47C *7/50*
U.S. Cl. 297—429 **3 Claims**

1. In a wheelchair foot rest latch in which a downwardly biased plunger in a guide support on the frame portion of a wheelchair is normally received in a plunger receiving opening on a swingable foot rest supporting tube to lock the same in a given position,
(a) a plate member secured to the upper end of said plunger to overlie the upper exit end of said guide support and extending laterally from the vertical axis of movement of said plunger; and
(b) a lever member having one end portion passing under said plate member between the plate member and upper end of said guide support and pivoted about an horizontal axis to the end of the laterally extending portion of said plate member, the other end of said lever member extending in an opposite direction so that a mid-portion of the



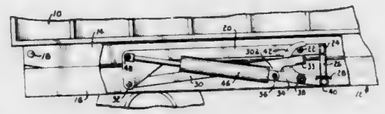
lever between its said one end portion and other end is positioned to be engaged by the upper end of said guide support, said upper end of said guide support serving as a fulcrum for said lever member so that downward movement of said other end of the lever raises said plate member and plunger relative to said guide support, and upward lifting on said other end of said lever raises the lever, plate member and plunger simultaneously whereby said other end of said lever may either be depressed downwardly or lifted upwardly to release the plunger from said plunger receiving opening and thereby permit swinging movement of said foot rest supporting tube to an out-of-the-way position.

4,176,880
BICYCLE SEAT
John L. Marchello, 57751 Grand River, New Hudson, Mich. 48165
Filed Jul. 28, 1978, Ser. No. 929,192
Int. Cl.[2] A47C *7/02*
U.S. Cl. 297—452 **6 Claims**



1. In a bicycle seat having an elongated, U-shaped seat frame having a pair of generally parallel upwardly extending legs interconnected by an elongated base portion having a longitudinal axis, and an elongated, relatively narrow, flexible seating strip formed of a relatively stretch-resistant material, extending between said legs above said seat frame base to define the seat supporting surface extending generally perpendicular to the bicycle longitudinal axis to cradle a rider's adjacent body portion wherein the improvement comprises: a pad, having a center section having a plurality of depressed areas and an end section on each side of the center section wherein the top material of said pad has a frictionally roughened surface and said bottom material is relatively smooth and covers the entire bottom of said pad; a thin sleeve holding said flexible strip between said smooth bottom material and said thin sleeve wherein said thin sleeve covers the bottom of said center section of said pad such that said pad and said thin sleeve form an elongated envelope transversely open near its opposite ends with said flexible strip extending through said envelope.

4,176,881
LOCK DEVICE FOR DUMP TRUCKS
H. Ray Cole, R.R. 1, Rosendale, Mo. 64483
Filed Apr. 27, 1978, Ser. No. 900,414
Int. Cl.[2] B60P *1/16*
U.S. Cl. 298—22 J **9 Claims**



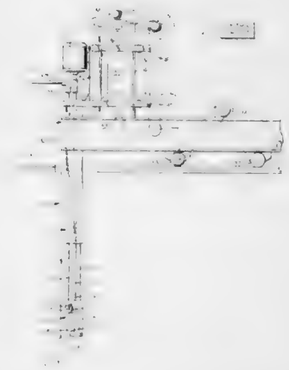
1. A lock device for a dump body mounted to pivot on a frame between a load carrying position and a dumping position, said device comprising:
a hoist mechanism coupled between said body and frame and including extensible power cylinder means for pivoting the body between the load carrying position and the dumping position;
a first lock component coupled with said body;
a second lock component coupled with said frame and engageable with said first lock component to lock said body in the load carrying position; and
a mechanical linkage comprising lost motion means coupling said cylinder means with said frame in a manner to effect automatic engagement of said first and second lock components when the body is in the load carrying position, said lost motion means being arranged such that initial extension of said cylinder means from the load carrying position effects driving movement of said linkage to release said lock components prior to movement of said body away from the load carrying position.

4,176,882
IN SITU OIL SHALE RETORTS WITH GAS BARRIERS FOR MAXIMIZING PRODUCT RECOVERY
Irving G. Studebaker, and Ned M. Hutchins, both of Grand Junction, Colo., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.
Filed Feb. 16, 1978, Ser. No. 878,387
Int. Cl.[2] E21C *41/10*
U.S. Cl. 299—2 **61 Claims**



1. A method of recovering liquid and gaseous products from a plurality of in situ oil shale retorts in a subterranean formation containing oil shale, wherein each retort contains a fragmented permeable mass of formation particles containing oil shale, the method comprising the steps of:
excavating at least one void in each of a plurality of in situ oil shale retort sites, leaving a remaining portion of unfragmented formation within each retort site adjacent such a void;
explosively expanding such a remaining portion of unfragmented formation within each retort site toward such a void for forming a fragmented permeable mass of formation particles containing oil shale in each of a plurality of in situ oil shale retorts;
leaving a gas barrier between the fragmented masses in an adjacent pair of such retorts in the form of a vertically extending partition of substantially unfragmented formation sufficiently thick to inhibit substantial gas flow between the fragmented masses in such adjacent retorts and sufficiently thin that the partition independently supports substantially the same proportionate amount of the load from overburden above the elevation of the retorts as is supported by the fragmented masses in such adjacent retorts for permitting substantially uniform subsidence of overburden above the gas barrier and above the fragmented masses;
establishing a combustion zone in at least one of such fragmented masses;
introducing an oxygen-supplying gas to such fragmented mass for sustaining the combustion zone and for advancing the combustion zone through such fragmented mass, and for retorting oil shale to produce liquid and gaseous products in a retorting zone on the advancing side of the combustion zone; and
withdrawing such liquid and gaseous products from such a fragmented mass on the advancing side of the retorting zone.

4,176,883
OSCILLATING LIQUID JET SYSTEM AND METHOD FOR CUTTING GRANITE AND THE LIKE
Daniel J. Liesveld, 6016 Newcombe St., Arvada, Colo. 80004
Filed May 26, 1977, Ser. No. 800,611
Int. Cl.[2] E21C *25/60, 41/12*
U.S. Cl. 299—17 **26 Claims**



1. The method of cutting hard rock material comprising the steps of:
(a) directing at least one high intensity jet against the surface of the material to be cut;
(b) advancing each said jet along a perdetermined path of travel coinciding with the line to be cut along the surface of the material; and
(c) oscillating the jet along the surface to be cut in a direction transversely of the direction of advancement of said jet along the line to be cut and transversely to the direction of impingement of said jet, said oscillation of the jet being at a rate of speed greater than the rate of speed of travel of said jet along the line to be cut.

4,176,884

ANCHORING APPARATUS FOR A MINING INSTALLATION

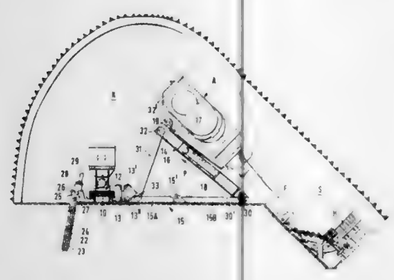
Helmut Erwien, Luner, and Werner Karsten, Gelsenkirchen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Filed Jan. 30, 1978, Ser. No. 873,223

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1977, 2704495

Int. Cl.[2] E21C *29/08*

U.S. Cl. 299—34 **15 Claims**



1. Apparatus for anchoring a mining installation to the floor of a mining working, the apparatus comprising an anchor beam, means for anchoring the anchor beam to the floor, a trolley mounted on the anchor beam for longitudinal movement relative thereto, a guide skid pivotally connected to the trolley, a support skid pivotally connected to the guide skid, a support table for supporting the mining installation, the support table being pivotally connected to the support skid for pivotal movement in a vertical plane, and a support strut pivotally connected to the support table and the guide skid.

4,176,885

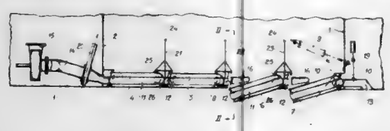
HOPPER VESSEL WITH DISCHARGE VALVE MEMBERS ADAPTED TO SELECTIVELY FUNCTION AS PART OF A DISCHARGE CONDUIT

Jan Alkema, Pijnacker, Netherlands, assignor to Koninklijke Adriaan Volker Baggermaatschappij B.V., Netherlands

Filed Oct. 20, 1977, Ser. No. 844,143

Int. Cl.[2] B65G *53/30*

U.S. Cl. 406—128 **9 Claims**



1. A hopper vessel comprising: a hold having a series of discharge openings in the bottom thereof, a series of valve members mounted for rotation to open and close said discharge openings, said valve members extending horizontally in their closed positions, and a suction conduit having a suction pump at one end and an inlet at the other end, said conduit comprising in part aligned channels through said valve members, characterized in that each valve member is mounted for rotation about a horizontal pivot axis extending transversely of the longitudinal axis of said vessel, said valve members and said conduit in part formed thereby are aligned generally parallel to the longitudinal axis of said vessel, said hold further comprises water supply openings and said valve members are arranged to close said supply openings in the closed position of said valve members, each said valve member is rotatable to an intermediate position thereof inclined to the horizontal in which said discharge opening thereat is closed, said water supply openings thereat are open, said channel therein is disconnected from said conduit and said conduit thereadjacent, in the direction toward said pump, is open to the portion of said hold at said valve member rotated to said intermediate position whereby cargo in said hold may be discharged through said conduit.

4,176,886

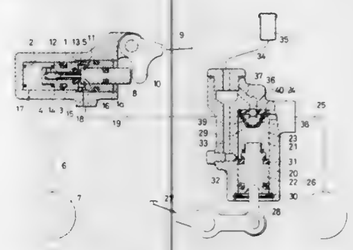
BRAKE APPARATUS FOR MOTORCYCLE

Mamoru Watanabe, Tokyo, Japan, assignor to Watanabe Engineering Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1978, Ser. No. 911,514

Int. Cl.[2] B60T *8/26*

U.S. Cl. 303—6 A **9 Claims**



1. Brake apparatus for a motorcycle, comprising: a piston slidable in a cylinder for a front wheel; a hand-operated lever for actuating said piston, output and input liquid pressure chambers in front and at the back of said piston respectively, at least one auxiliary piston slidable in a cylinder for a rear wheel of said motorcycle, a foot pedal for actuating said auxiliary piston in said cylinder for said rear wheel, at least one output liquid pressure chamber in front of said auxiliary piston, said output liquid pressure chambers of said cylinders for front and rear brakes communicating with front and rear wheel brakes respectively, said output liquid pressure chamber of said cylinder for said rear wheel communicating with said input liquid pressure chamber of said cylinder for said front wheel.

4,176,887

ENDLESS TRACK TRAVELING MECHANISM

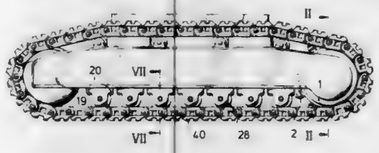
Günther Alpers, and Helmut Bentz, both of Dortmund, Fed. Rep. of Germany, assignors to O&K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed May 3, 1978, Ser. No. 902,388

Claims priority, application Fed. Rep. of Germany, May 6, 1977, 2720332

Int. Cl.[2] B62D *55/12, 55/20*

U.S. Cl. 305—57 **8 Claims**



1. An endless track travelling mechanism for vehicles provided with a self-propelled drive, particularly hydraulic dredges, comprising

an endless track chain comprising a plurality of chain links, the latter bearing travelling mechanism plates, and bolt means for connecting said chain links with one another,

guide wheel means for guiding said endless track chain,

a drive sprocket wheel having cam-shaped teeth arranged thereon in a longitudinal center plane thereof, said teeth being formed on sides facing one another with planar surfaces,

said drive sprocket wheel having an outer periphery forming two running rims thereon abutting said chain links, said running rims being arranged on both sides of said teeth,

said drive sprocket wheel being formed with a wheel flange, said cam-shaped teeth being arranged on said wheel flange, the latter on both sides thereof having inclined surface means for guiding said chain links thereon,

said travelling mechanism plates of said chain links each are formed as double-stud plates and are produced from one piece with a two-sided cam arranged centrally in said chain link, said two-sided cam having engagement surfaces facing said cam-shaped teeth engaging therewith and during engagement constitute contact surfaces for said cam-shaped teeth.

4,176,888

LIMITED SLIDING BALL SPLINE ASSEMBLY

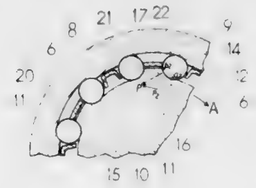
Hiroshi Teramachi, 2-34-8 Higashi-tamagawa Setagaya-ku, Tokyo, Japan

Filed Jul. 27, 1977, Ser. No. 819,285

Claims priority, application Japan, Aug. 18, 1976, 51-097774

Int. Cl.[2] F16C *31/04;* **F16D** *3/06*

U.S. Cl. 308—6 R **5 Claims**



1. A limited sliding ball spline assembly having an outer sleeve member, a shaft member disposed within said sleeve member and a coupling means including ball bearings for coupling said shaft member to said sleeve member for relative rectilinear movement in an axial direction and in relative torque transmitting relationship, the improvement comprising said shaft member and said sleeve member each having formed in their respective complementary inner and outer surfaces thereof a plurality of circumferentially spaced longitudinally extending grooves wherein said sleeve grooves and shaft grooves are sufficiently wide so as to accommodate two spaced apart adjacent rows of ball bearings of said coupling means, said respective sleeve grooves and shaft grooves having the sides thereof formed to complement a circumferential portion of the adjacent ball bearings, said shaft grooves being disposed in out of phased relationship to the sleeve grooves so that a side of a shaft groove and a side of the sleeve groove bear on opposite sides of a ball bearing common thereto, and a retainer disposed between said shaft member and said sleeve member, said retainer having a longitudinally extending rib for retaining the ball bearing in bearing relationship to the respective sides of the sleeve groove and shaft groove adjacent to said ball bearings and said retainer comprising a tubular member having a plurality of elongated slots formed therein, said slots being circumferentially spaced whereby adjacent slots define a pair of rectilinear raceways for containing a row of ball bearings; said rib being defined by said pair of rectilinear raceways having their adjacent edges bent out of the plane of said retainer whereby said row of ball bearings in each raceway is held within their respective raceway by said bent edge and the other edge of said respective raceways.

4,176,889

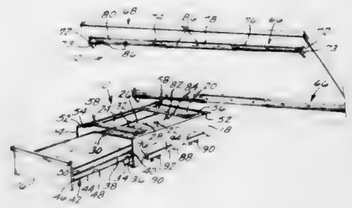
MODULAR STORAGE UNIT ASSEMBLY

Clifford W. Gartung, Newport Beach, Calif., assignor to Pleion Corporation, Santa Ana, Calif.

Filed Jun. 30, 1978, Ser. No. 920,980

Int. Cl.[2] A47B *47/00, 3/06*

U.S. Cl. 312—195 **20 Claims**



1. A desk assembly capable of subjective positioning of storage units, comprising:

a plurality of modular storage units;

A desk top providing a working surface;

means for maintaining the desk top in an operative position;

second means for selectively positioning relative to the working surface and suspendedly mounting at least one storage unit to the desk top, the second means including at least one support channel mounted to a lower surface of the desk top, and a plurality of mounting rails at least one mounting rail being mounted to a top surface of each storage unit, and

third means for suspendedly mounting a storage unit to a lower surface of another storage unit, the first of such storage units being suspendedly mounted to the desk top by the second means.

4,176,890

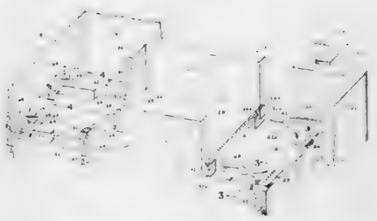
DRAWER AND SUPPORT SYSTEM

Howard B. Gorton, San Gabriel, Calif., assignor to Ajax Hardware Corporation, City of Industry, Calif.

Filed Apr. 5, 1978, Ser. No. 893,677

Int. Cl.[2] A47B *88/04*

U.S. Cl. 312—343 **4 Claims**



1. In a drawer and support system, the combination of a drawer having front and rear walls, a pair of sidewalls and a bottom wall, a pair of drawer rails secured along the lower end of the sidewalls respectively, the rails each having inwardly-facing rollers adjacent the rear wall, a drawer housing having a housing front wall formed with an opening to receive the drawer, and a housing rear wall spaced from and parallel to the front, a pair of elongate tracks having a U-shaped cross section, the tracks being disposed spaced and parallel and extending from the lower margin of the opening in the front housing frame to the rear housing wall, ledge means on the rear wall supporting the rear ends of the tracks against downward movement but permitting lateral movement, the tracks having their

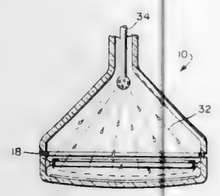
openings facing each other and receiving respectively the rollers, and means confining the tracks to respective locations where they respectively engage the rollers, each sidewall of the drawer being of non-metallic material and the inside surface of each having a groove therealong spaced up from the lower edge, the adjacent edge of the bottom wall extending into the groove, and the associated rail being sheet metal and having a portion which wraps around the bottom of the sidewall up the inside surface and into the groove beneath the bottom wall and to thereby be secured to the sidewall.

4,176,891

SALVAGE METHOD FOR CATHODE RAY TUBES

Ermen S. Antonucci; Duane L. Cadden, both of Waterloo; Albert Regenbrecht, Seneca Falls, and Edward Schwartz, Auburn, all of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sep. 25, 1978, Ser. No. 945,677
Int. Cl.[2] H01J 9/50
U.S. Cl. 316—2 **5 Claims**



1. In a method of salvaging the glass envelope and enclosed metal shadow mask of a color cathode ray tube, said glass envelope comprising a funnel portion open at its narrow end and a dish-shaped face panel sealed to its wide end by means of a glass frit, said metal shadow mask being suspended within said face panel and wherein said funnel and said face panel are separated by etching the external portion of said frit and subsequently causing a temperative differential between said funnel and said panel whereby said frit fractures from thermal shock, the improvement comprising the step of, prior to said separation, depositing upon at least the upper surface of said mask a chemically basic solution.

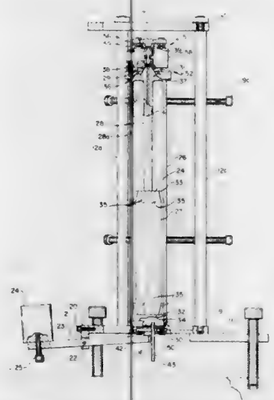
4,176,892

METHOD FOR PRODUCING LASER PLASMA TUBE AND PRODUCT

Dave L. Wright, Palo Alto; Felix J. Schuda, Mountain View, and Joseph J. Spranza, III, Woodside, all of Calif., assignors to Spectra-Physics, Inc., Mountain View, Calif.

Division of Ser. No. 689,039, May 24, 1976. This application Apr. 18, 1977, Ser. No. 788,513
Int. Cl.[2] H01J 9/18
U.S. Cl. 316—19 **11 Claims**

1. In a method for the production of laser tubes comprising an assembly of components including an elongated glass plasma envelope, a cathode assembly, a capillary structure, optical end elements, metal cathode and anode end assemblies for receiving said optical elements and adapted to be joined to said elongated glass plasma envelope, at least one of said metal cathode and anode end assemblies being deformable for aligning said optical elements to define a laser optical cavity and bonding material interposed between said components for bonding said components to one another to seal the laser tube, the steps of coating the abutting surfaces of said components with said bonding material, placing said cathode assembly in said elongated glass plasma envelope, supporting said metal cathode end assembly, seating one end of said elongated glass plasma envelope on one side of said metal cathode end assembly to be supported thereby, placing one of said optical elements against the other side of said metal cathode end assembly, introducing said capillary structure in said elongated glass plasma envelope to be supported within said envelope by the other end of said envelope, seating the metal anode end assembly on said capillary structure, placing the other optical element on said metal anode end assembly, applying an axial force



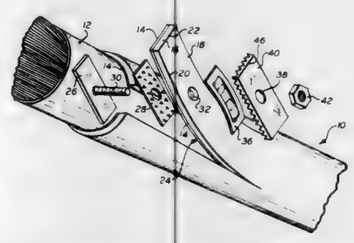
to said assembled components to force them together, heating the assembled parts to cause the bonding material to bond the adjacent surfaces to one another to form the sealed laser envelope, cooling the assembled laser envelope and aligning the optical elements by deforming at least one of said metal end elements.

4,176,893

RELIABLE SHEATH BONDING CONNECTOR AND METHOD OF MAKING

Jerzy A. Olszewski, Edison, and Towheed Ramy, Jersey City, both of N.J., assignors to General Cable Corporation, Greenwich, Conn.

Filed Oct. 25, 1977, Ser. No. 845,039
Int. Cl.[2] H01R 3/06
U.S. Cl. 339—14 R **19 Claims**



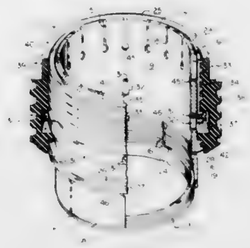
1. A sheath bonding connector for grounding a communication cable that has a core surrounded by a metal shield that is covered on the outside by a plastic jacket, said connector including in combination an inner shoe located on the outside of the core contacts between the metal shield and the outside surface of the inner shoe in position to touch the inner surface of the metal shield, one of the contacts having a surface of non-corrosive metal, a fastening element extending outward from the shoe and through the metal shield and plastic jacket, the fastening element being electrically connected with the inner shoe, a clamping device on the outside of the plastic jacket and secured to the fastening element, a resilient energy-storing device that is held under tension by the clamping element when the connection is fully assembled and held under pressure by said fastening element, the resilient energy-storing device maintaining contact pressure in spite of cold flow of structure of the bonding connector.

4,176,894

INTERNAL ELECTRICAL INTERCONNECT COUPLER

Josiah J. Godbey, 812 Nottingham Dr., Richardson, Tex. 75080

Filed Jan. 30, 1978, Ser. No. 873,267
Int. Cl.[2] H01R 3/04
U.S. Cl. 339—15 **22 Claims**



1. In an electrical conductor assembly of an electrical transmission system for a tubular fluid conductor composed of lengths of pipe and means externally connecting the ends of adjacent lengths of pipe, an inner electrical conductor for the electrical conductor assembly comprising an electrically conductive tube generally coextensive with and mounted within each pipe length in spaced electrically insulated relationship;

means for electrically connecting and insulating the ends of adjacent electrical conductor tubes from the contiguous ends of adjacent pipe lengths including

a generally continuous cylindrical tubular body of electrically conductive material having an external diameter generally equal to the internal diameter of the bores of said tubes for mounting in the end portions of said adjacent tubes so as to extend therebetween and provide electrical contact therewith upon coupling of said external connecting means,

an annular element of elastic dielectric material of less axial length than the tubular body and mounted on the exterior thereof in spaced relation to the ends of said body for engagement with said end portions of said adjacent tubes and deformation into fluid-tight sealing engagement therewith and the contiguous internal surfaces of said adjacent pipe lengths so as to electrically insulate said tube ends from said pipe ends,

means for maintaining the annular elastic dielectric element in its deformed sealing position and said tubular body against displacement upon uncoupling of said external connecting means,

at least one end portion of said body being discontinuous so as to provide discrete resilient members extending longitudinally inward from the outer extremity of said one end portion of said body for flexing radially relative thereto,

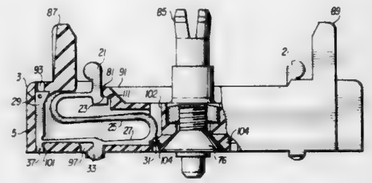
the means for maintaining said elastic dielectric element in its deformed sealing position comprising an annular member within said one end body portion and having wedging engagement with its interior for distending the resilient members to deform said elastic element into said sealing position.

4,176,895

HIGH DENSITY DOUBLE CONTACTING CONNECTOR ASSEMBLY FOR LEADLESS INTEGRATED CIRCUIT PACKAGES

Lionel D. Aldridge, Seminole, Fla., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sep. 27, 1978, Ser. No. 946,280
Int. Cl.[2] H05K 1/12
U.S. Cl. 339—17 CF **18 Claims**



1. A connector assembly for leadless integrated circuit packages comprising:

(a) a plurality of unitary metallic contacts, each of said contacts comprising:
  (i) an elongated S-shaped spring-beam portion;
  (ii) a first contacting portion formed on an upper part of said spring-beam portion;
  (iii) a preloading tab formed on said upper part of said spring-beam adjacent said first contacting area;
  (iv) a substantially flat base portion connected to a lower part of said spring-beam portion; and
  (v) a second contacting portion formed on a lower part of said base portion; and

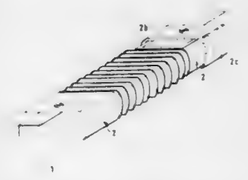
(b) upper and lower dielectric headers each having a plurality of contact receiving cavities formed therein, said cavities separated by a plurality of intermeshing walls, each said cavity of said lower header including channel means for receiving said contact, and each said cavity of said upper header including contact receiving means and preloading means to bias said contact in a preloaded position when said upper header is fitted over said lower header.

4,176,896

CONNECTION FOR ELECTRIC LIGHT RAILS

Karl Wehling, Lemgo, Fed. Rep. of Germany, assignor to Staff KG, Lemgo, Fed. Rep. of Germany

Filed Apr. 17, 1978, Ser. No. 897,068
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1977, 7712356[U]
Int. Cl.[2] H01R 11/32, 35/00
U.S. Cl. 339—29 R **13 Claims**



1. Connection for electrical light rails which have an internal adapter-receiving channel and electrical conducting strips, the ends of the connection being provided with couplings which plug onto the ends of the light rails and between which are flexible electrical connecting wires enclosed within a mantel

which extends into the couplings, characterised in that the ends of the cable mantle within the couplings are provided with collars which are held behind abutments in the couplings, and that the cable mantle is provided with fins the outer contour of which corresponds to the outer contour of the couplings and/or that of the light rails, and which, when the cable mantle is straight, are parallel to each other and perpendicular to the longitudinal axis of the cable mantle.

4,176,897

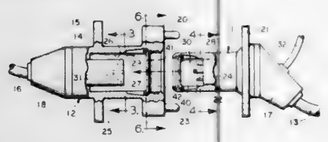
EMI PROTECTED CONNECTOR ASSEMBLY

John K. Cameron, Wheaton, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 743,302, Nov. 19, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,339

Int. Cl.[2] H01R *13/44*

U.S. Cl. 339—40 **31 Claims**



28. A connector assembly comprising, in combination:

a receptacle member including housing means having an open-ended first forward mating portion;

first contact means disposed within said housing means;

a plug member including housing means having a second forward mating portion for telescoping insertion within the open end of said first mating portion to effect electrical contact and electromagnetic shielding therebetween;

second contact means disposed within said second forward mating portion for electrical engagement with said first contact means upon insertion of said plug member into said receptacle member;

closure means disposed at the forward end of said first forward mating portion for enclosing and electrically shielding said first contact means therewithin, said closure means opening upon insertion of said second forward mating portion into and electrical contact with said first forward mating portion to enable said second contact means to engage said first contact means; and

electrically-conductive sealing means disposed between said closure means and said open-ended first forward mating portion for providing environmental and electromagnetic shielding of said first contact means when said closure means is in a closed position, said housing means, said closure means and said electrically-conductive sealing means cooperating to provide complete electromagnetic shielding of said first contact means before, during and after engagement of said plug and receptacle members.

4,176,898

ELECTRIC PLUG AND SOCKET CONNECTORS WITH RESILIENT END-PRESSURE CONTACTS AND SAFETY DISC

Gilles A. G. Marechal, Paris, France, assignor to Societe d'Exploitation des Procedes Marechal SEPM, Paris, France

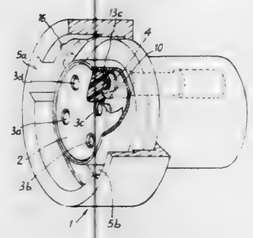
Filed Mar. 27, 1978, Ser. No. 890,164

Claims priority, application France, Apr. 15, 1977, 77 11433

Int. Cl.[2] H01R *13/44*

U.S. Cl. 339—41 **6 Claims**

1. An electric plug and socket connector comprising: a base; a rotary safety disc mounted on the base, said disc defining a plurality of contact positions and a plurality of recesses; a plurality of movable contacts resiliently urged towards a respective one of the contact positions; projecting insulating elements connected to the movable contacts; and a plug provided with fixed pins, wherein said rotary safety disc masks the movable contacts when in its resting position, and is provided with as many openings as there are pins on the plug, sized and arranged suitably to enable said pins to pass through said openings and to become applied end-wise on the movable contacts after rotation of the disc, wherein said plug and socket is adapted so that the angular locking or detention in the resting position and in the contact position of the safety disc is ensured, at least in part, by the same projecting insulating elements, and urged by the resilient means of the latter to be



engaged in the resting position and in the contact position in the separate recesses formed in the disc, and wherein the recesses determining the latter position are substantially coaxial with the openings of the disc while the surfaces and shapes respectively of said projecting elements and of the recesses are suitably chosen to cooperate and to enable the obtaining by a rotation of the disc, at the beginning and at the end of the rotation, respectively, withdrawal of said elements and an engagement of the latter in the recesses.

4,176,899

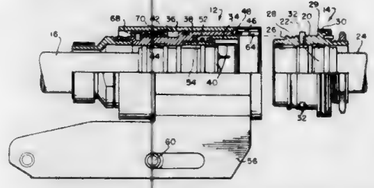
QUICK DISCONNECT ELECTRICAL CONNECTOR HAVING DISASSEMBLY FEATURES FOR REFURBISHMENT

Edward E. Betts, Escondido, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 23, 1978, Ser. No. 953,509

Int. Cl.[2] H01R *13/62*

U.S. Cl. 339—45 M **5 Claims**



4. In the female portion of a quick disconnect of the type having concentric sleeves which are slidable with respect to one another, the forward ends of the sleeves being adapted to receive a male portion of the quick disconnect, the rearward end of one of the sleeves being connected to an elongated element, an annular space provided at the rearward end portions of an inner and outer adjacent pair of the sleeves, and a compression spring within the annular space for urging the adjacent sleeves longitudinally with respect to one another, the improvement comprising:

means located within a rear portion of said annular space and releasably connected to the inner adjacent sleeve for stopping rearward movement of the compression spring; and

means located within a forward portion of the annular space and releasably connected to the outer adjacent sleeve for stopping forward movement of the compression spring whereby, after release and removal of the stop means, the outer sleeve can be slid forwardly and removed entirely from the inner sleeve.

4,176,900

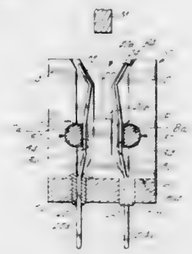
LOW INSERTION FORCE CONNECTOR

Clyde K. Hines, Arcadia; Everett J. Long, Claremont, and Elmer W. Muench, Covina, all of Calif., assignors to Everett/Charles, Inc., Pomona, Calif.

Filed Dec. 23, 1977, Ser. No. 863,786

Int. Cl.[2] H05K *1/07*

U.S. Cl. 339—75 MP **43 Claims**



33. A contact carrier housing for up to two electrical spring contacts comprising:

a nonconductive member comprising substantially oppositely facing first and second outer sides and substantially oppositely facing third and fourth outer sides between the first and second sides, a notch in the member having an open end at the third side and a closed end between the third and fourth sides, a pair of spaced cam openings, each having a cam surface, the notch and a pair of cam openings extending through the member between the first and second sides, at least one recess in the first side of the member communicating with the notch for receiving such spring contacts, and first and second spaced spring contact mounting passages extending through the member from the at least one recess to the fourth side of said member each for receipt of such a spring contact.

4,176,901

BAKABLE MULTI-PINS VACUUM FEEDTHROUGH

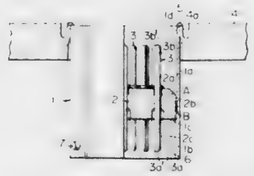
Hajime Ishimaru, Ibaraki, Japan, assignor to National Laboratory for High Energy Physics, Japan

Filed Jun. 1, 1978, Ser. No. 911,329

Claims priority, application Japan, Jun. 5, 1977, 52/66022

Int. Cl.[2] H01B *17/16, 17/26*

U.S. Cl. 339—136 M **8 Claims**



1. In combination with a vacuum vessel having a wall with an aperture therein, a bakable multi-pin vacuum feedthrough comprising a metal cylinder having at one end a thin cylindrical wall portion and at the opposite end a thick cylindrical wall portion with an internal shoulder separating said two cylindrical wall portions, a disc-shaped ceramic pin-holder received in said thin cylindrical wall portion and seating on said shoulder, and a plurality of parallel metal terminal pins extending through said pin-holder and projecting from both faces thereof, said pins having at both ends rounded male portions which are recessed inwardly of the respective ends of said metal cylinder, an end portion of said thin cylindrical wall portion being received in said aperture and circumferentially welded to said wall at a location spaced axially inwardly (toward the evacuated interior of said vessel) from said pin-holder, the portion of said metal cylinder in which said pin-holder is received being free of said wall and said thin wall portion of said metal cylinder serving as a flexible skirt to absorb welding distortion so that it does not affect said pin-holder, first sealing means adjacent the inner (vacuum) face of said pin-holder providing a seal between said pin-holder and each of said pins and second sealing means spaced axially outwardly from the inner face of said pin-holder providing a seal between the periphery of said pin-holder and said thin cylindrical wall portion of said metal cylinder, said second sealing means being displaced axially outwardly from said first sealing means, the axially inner portion of said pin-holder in which said first sealing means is provided being free of said thin cylindrical wall portion of said metal cylinder, and said pin-holder having an annular recess surrounding each of said pins and extending inwardly from the outer (atmosphere) face of said pin-holder.

4,176,902

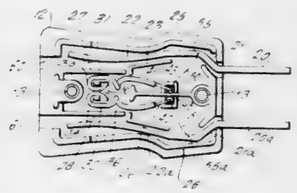
METHOD FOR FUSING MALE PLUG AT END OF POWER LINE CORD

Elliot Bernstein, Rockville Center, N.Y., assignor to Bel Fuse Inc., Jersey City, N.J.

Filed Oct. 27, 1977, Ser. No. 846,036

Int. Cl.[2] H01H *85/12;* **H01R** *13/68*

U.S. Cl. 339—147 P **7 Claims**



1. A fused plug comprising a housing;

a pair of prongs mounted in said housing and having substantially parallel extensions outside said housing;

an opening in said housing;

a line cord extending through said opening into said housing;

said line cord comprising a pair of wires;

a fuse link between the end of at least one wire and a prong adjacent said wire;

wherein a pair of sleeves is positioned in the said housing;

an end of one of said wires and an end of one of said fuse links being inserted in each sleeve and connected by pressure fit therein.

4,176,903

PLUG IN IGNITER UNIT AND METHOD OF MAKING THE SAME

Anthony C. Cairo; Ditmar K. Tillmann, and Gene I. Insley, all of Holland, Mich., assignors to Robertshaw Controls Company, Richmond, Va.

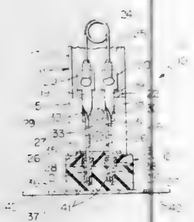
Filed Nov. 21, 1977, Ser. No. 853,284

Int. Cl.[2] F23Q *7/22;* **H01R** *3/00, 5/02*

U.S. Cl. 339—147 R **7 Claims**

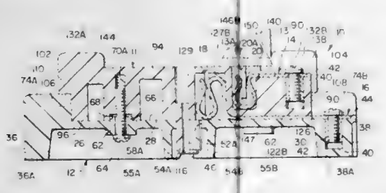
1. In a plug in igniter system for a fuel burning apparatus having at least one electrical receptacle and a plug in igniter

unit provided with a housing means having an electrical igniter therein and terminal means electrically interconnected to said electrical igniter and projecting from said housing means to be received in said receptacle for electrical interconnection thereto, the improvement wherein said terminal means comprises at least one blade-like terminal member having opposed ends respectively being interconnected to said igniter and said receptacle and being twisted between said opposed ends thereof to define a twisted section thereof, said housing means



having a body portion provided with a chamber passing therethrough and receiving said twisted section therein whereby said opposed ends of said terminal member extend outwardly from said body portion in opposite directions, and securing means disposed in said chamber to secure said twisted section to said body portion, the end of said terminal member that is received in said receptacle having precious metal on the outer surface thereof that operatively interconnects with said receptacle.

4,176,904
ELECTRICAL TERMINAL
Edward A. Obuch, Linden, N.J., assignor to Amerace Corporation, New York, N.Y.
Filed Sep. 30, 1977, Ser. No. 838,374
Int. Cl.[2] H01R *9/00, 23/00*
U.S. Cl. 339—192 R **22 Claims**



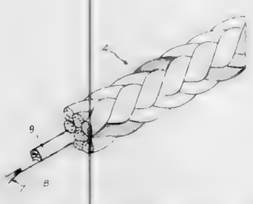
21. An electrical socket for use with electrical devices such as relays, which comprises:

(a) a first section and a second section, said first section being adaptable for being interconnected with said second section, said first section having floor means for receiving therein said second section;

(b) said second section being adapted to be seated on said floor means, said second section having first and second sides and comprising at least one first terminal-receiving cavity disposed in said first side and at least one second terminal-receiving cavity disposed in said second side, and at least one second terminal-receiving cavity being juxtaposed within said second section so as to be electrically insulated and isolated from one another, said at least one first terminal-receiving cavity being adaptable for receiving therein a first corresponding contact member of said electrical device through a first opening in said first side of said second section, and said at least one second terminal-receiving cavity being adaptable for receiving therein a second corresponding contact member of said electrical device through a second opening in said first side of said second section, said first terminal-receiving cavity having disposed therein a corresponding one of first terminal members, said second terminal-receiving cavity having disposed therein a different corresponding one of second terminal members, and wherein an end portion of said first terminal member for connecting to a corresponding external conductor is supported within a recess in an upper portion of said second section, and an end portion of said second terminal member for connecting to a different corresponding external conductor is supported within a recess defined by a lower portion of said second section and by a portion of said floor.

4,176,905
FLEXIBLE ELECTRICAL CONTACT
Gilles Marechal, Paris, France, assignor to Societe d'Exploitation des Procedes Marechal SEPM, Paris, France
Continuation of Ser. No. 791,747, Apr. 28, 1977, abandoned.
This application Aug. 1, 1978, Ser. No. 930,256
Claims priority, application France, Sep. 22, 1976, 76 28500
Int. Cl.[2] H01R *13/16*
U.S. Cl. 339—255 R **4 Claims**

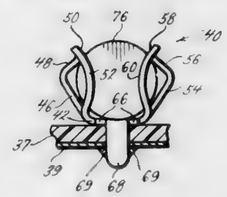




1. An electrical contact having a contact head movable toward and away from a base and connected to the base by an axially collapsible flexible connector and a helical spring surrounding the flexible connector and serving to urge the contact head away from the base, wherein the flexible connector comprises a plaited cable formed by plaiting together a plurality of cords into a solid mass, each of said cords having an outer surface formed by a plurality of strands twisted together in one direction into a solid mass, each of said strands comprising a plurality of filaments twisted together in the other direction.

4,176,906
LOW PROFILE FUSE CLIP
Angelo Urani, St. Louis, Mo., assignor to McGraw-Edison Company, Elgin, Ill.
Continuation of Ser. No. 779,319, Mar. 21, 1977, abandoned.
This application Jun. 2, 1978, Ser. No. 911,820
Int. Cl.[2] H01R *13/12*
U.S. Cl. 339—258 F **12 Claims**

1. A fuse holder that can releasably hold a ferrule-like terminal of a cartridge-type electric fuse and that is securable to a circuit board and that comprises a unitary metal stamping which has a substantially-planar base, a first arm that extends upwardly from one side of said base, a second arm that extends upwardly from the opposite side of said base, a securing projection that extends downwardly below the level of the bottom of said base to telescope into an opening in said circuit board, a second securing projection that extends downwardly below the level of said bottom of said base to telescope into a second opening in said circuit board, said securing projections being spaced apart to coact with said openings in said circuit board to resist shifting of said fuse holder relative to said circuit board, said arms having the upper ends thereof inclined relative to each other to diverge outwardly and upwardly from each other, said uper ends of said arms serving as cam surfaces which can respond to movement of said ferrule-like terminal of said cartridge-type fuse toward said base to cam said upper ends of said arms away from each other and thereby permit said ferrule-like terminal of said cartridge-type fuse to pass between said upper ends of said arms until the bottom of said ferrule-like terminal of said cartridge-type fuse abuts a portion of said base, said arms having the lower ends thereof substantially planar and inclined relative to each other to diverge outwardly and upwardly from each other, said arms having portions that are intermediate said upper ends and said lower ends thereof and that are substantially planar and are inclined relative to each other to converge inwardly and upwardly toward each other, said portion of said base and said bottom of



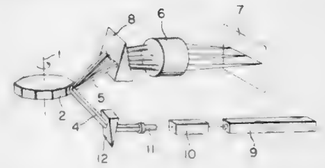
said ferrule-like terminal of said cartridge-type fuse providing a first line contact between said fuse holder and said ferrule-like terminal of said cartridge-type fuse, one of said arms having a portion thereof which engages said ferrule-like terminal of said cartridge-type fuse to provide a second line contact between said fuse holder and said ferrule-like terminal of said cartridge-type fuse that is displaced at least one hundred degrees from said first line contact between said fuse holder and said ferrule-like terminal of said cartridge-type fuse and the other of said arms having a portion thereof which engages said ferrule-like terminal of said cartridge-type fuse to provide a third line contact between said fuse holder and said ferrule-like terminal of said cartridge-type fuse that is displaced at least one hundred degrees from said first line contact between said fuse holder and said ferrule-like terminal of said cartridge-type fuse, the upper edges of said upper ends of said arms not extending above the level of the top of said ferrule-like terminal of said cartridge-type fuse whenever said bottom of said ferrule-like terminal of said cartridge-type fuse abuts said base, whereby said fuse holder has a low profile.

4,176,907
SCANNING DEVICE
Kazuya Matsumoto, Yokohama; Naoto Kawamura, Inagi, and Setsuo Minami, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 2, 1977, Ser. No. 830,340
Claims priority, application Japan, Sep. 3, 1976, 51-105463
Int. Cl.[2] G02B *27/17*
U.S. Cl. 350—6.8 **10 Claims**

1. A scanning device capable of providing a linear scanning line on a surface to be scanned, comprising:

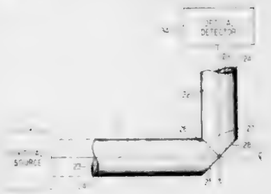
a deflector having a deflecting mirror surface disposed parallel to the rotation axis thereof;

a light source optical system for causing a stationary collimated beam to impinge upon said deflecting mirror surface from a finite angle with respect to a plane crossing both said rotation axis and said deflecting mirror surface at right angles therewith and toward the rotation axis of the deflecting surface; and



a correcting optical element disposed between said deflecting mirror surface and said surface to be scanned for correcting a curved scanning line to a linear scanning line.

4,176,908
DEVICES FOR MONITORING, SWITCHING, ATTENUATING OR DISTRIBUTING LIGHT
Richard E. Wagner, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 14, 1977, Ser. No. 860,155
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.15 **20 Claims**



1. A device comprising

a first fiber having a first longitudinal center axis and a first wedge-shaped end portion with two planar sides, each planar side of the first end portion intersecting the first center axis at an acute angle,

a second fiber having a second longitudinal center axis and a second wedge-shaped end portion with two planar sides, each planar side of the second end portion intersecting the second center axis at an acute angle, and

means for holding one planar side of the first end portion against one planar side of the second end portion, so that the first center axis intersects the second center axis.

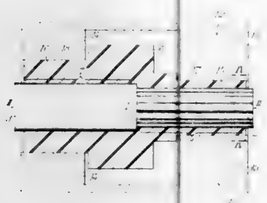
4,176,909
PROCESSES FOR PREPARING A CONNECTOR END ON A FIBER BUNDLE OPTICAL CABLE AND CABLES THUS OBTAINED
Jean-Claude Prunier, Herblay, France, assignor to Sourisu et Cie, Billancourt, France
Filed Jan. 16, 1978, Ser. No. 869,497
Claims priority, application France, Jan. 18, 1977, 77 01315
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.20 **18 Claims**

1. Process for fixing a connector tip to one end of an optical cable of a bundle of fibers surrounded by an outer protector sheath constituted by a thermoplastic material, the tip being also constituted by a thermoplastic material weldable under the effect of heat with that of the outer sheath, said process comprising the sequence of the following steps: removing the sheath of the cable in the vicinity of said end,

placing the tip in position on said end so that it surrounds and is in contact with, on the one hand, a zone of the cable stripped of its outer sheath and, on the other hand, a zone

of the cable provided with its outer sheath and adjacent to said strippd zone,

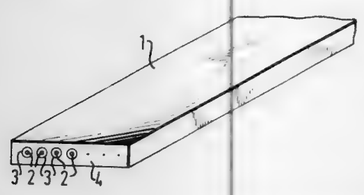
and subjecting the tip to a radial flow of ultrasound at the same time as exerting a radial compressive force on it, by means of which, on the one hand, in the region of the tip surrounding the outer sheath, the surfaces in contact with the tip and with the outer sheath are welded to one another and the outer sheath is grippd around said bundle and on the other hand, in the region of the tip surrounding the zone of the cable stripped of its outer sheath, the softened thermoplastic material of the tip is caused to penetrate between those fibers which are situated at the periphery of the bundle and in the immediate vicinity of the tip and the fibers of the bundle are gripped together.



4,176,910
OPTICAL RIBBON CABLES

Björn Nöethe, Ebersberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 17, 1977, Ser. No. 769,562
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1976, 2606777
Int. Cl.² G02B 5/16
U.S. Cl. 350—96.23 **9 Claims**



1. An optical flat ribbon cable comprised of a pluralality of optically transmissive glass fiber arranged parallel to one another and each having a layer of a separating and lubricating material thereon, said separating and lubricating material being selected from the group consisting of a silicone oil based on polymethylsiloxans or polymethylphenylsiloxans, a hydrocarbon boiling at relatively high temperatures, ester oils analagous to oils for machines or clocks or to softeners, talc, slate powder, mica powder, graphite powder, metal powder, powdered organic materials such as starch flour and mixtures thereof, said glass fibers each having a layer of said separating and lubricating material thereon being enveloped within an outer cable body comprised of a soft cast synthetic resin which is liquid in state during casting at temperatures between 20° and 100° C., and by chemical reaction is crosslinked into a soft solid state, like elastic rubber, by using components in the soft cast resin having a relatively low concentration of reactive groups, as for example, groups of isocyanate or epoxy and further groups of hydroxyl, amino or carboxyl, said layer of separating and lubricating material floatingly suspending said parallelly arranged glass fibers within said outer enveloping cable body composed of said soft cast synthetic resin.

4,176,911
GRADED INDEX OPTICAL FIBER

Enrique A. J. Marcatili, Rumson, and Dietrich Marcuse, Lincroft, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 28, 1976, Ser. No. 681,238
Int. Cl.² G02B 5/14
U.S. Cl. 350—96.31 **8 Claims**

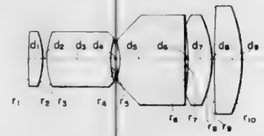


1. A multimode graded-index optical fiber waveguide comprising, in combination, a central core region, a cladding region radially surrounding and forming a boundary with the core region, the core region having a refractive index which continually decreases in a radially outward direction from a maximum value on the fiber axis, the waveguide being normally supportive of optical wave propagation in a first group of guided modes having a field distribution substantially confined within the core region and in a second group of radiating modes having phase constants less than the modes of the first group, the refractive index of the waveguide exhibiting a discrete predetermined decrease in a radially outward direction across the boundary of the core region and the cladding region to effect the generation of a third set of guided modes having a field distribution that extends significantly into the cladding region, the phase constants of the third group of modes being intermediate those of the first group and the second group to effectively isolate the modes in the first group from those in the second group, and means for selectively effecting mode conversion among the so-isolated first modes, said mode conversion effecting means comprising means for introducing periodic perturbations in the axial direction of the waveguide.

4,176,912
MICROSCOPE OBJECTIVE LENS SYSTEM

Tsutomu Tojo, Hachiouji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Mar. 24, 1978, Ser. No. 889,922
Claims priority, application Japan, Apr. 1, 1977, 52-36197
Int. Cl.² G02B 9/60
U.S. Cl. 350—175 ML **7 Claims**



1. A microscope objective lens system comprising a first lens component of a positive lens, a second lens component of a positive meniscus lens having its convex surface faced to the object side, a third lens component of a negative lens, a fourth lens component of a positive meniscus lens having its concave surface faced to the object side, and a fifth lens component of a double-convex lens, and said lens system satisfying the following conditions:

$$0.31f < d_3 < 0.35f \quad (1)$$
$$0.43f < |r_2| < 0.51f \quad (2)$$
$$0.50f < |r_8| < 0.52f$$
$$0.75 < |r_4/r_3| < 0.79 \quad (3)$$
$$4.0d_4 < d_5/n_3 + d_6 + d_7/n_4 < 5.4d_4 \quad (4)$$

-continued

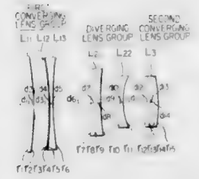
$$\nu_3 = 25.43$$
$$56 > \nu_1 > 53 \quad (5)$$
$$1.73 > n_1 > 1.69$$

wherein the reference symbols r_2, r_3, r_4 and r_8 represent radii of curvature of the surface on the image side of the first lens component, both the surfaces of the second lens component and the surface on the image side of the fourth lens component, respectively d_3, d_5 and d_7 represent thicknesses of the second lens component, the third lens component and the fourth lens component, respectively, d_4 and d_6 represent airspaces between the second lens component and the third lens component and between the third lens component and the fourth lens component, respectively, n_1, n_3 and n_4 represent refractive indices of the first lens component, the third lens component and the fourth lens component, respectively, and ν_1 and ν_3 represent Abbe's numbers of the first lens component and the third lens component, respectively.

4,176,913
TELEPHOTO LENS WITH LARGE RELATIVE APERTURE

Soichi Nakamura, Kamakura, and Kiyoshi Hayashi, Koganei, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 27, 1978, Ser. No. 900,794
Claims priority, application Japan, Apr. 28, 1977, 52-48477
Int. Cl.² G02B 9/62, 9/64
U.S. Cl. 350—214 **11 Claims**



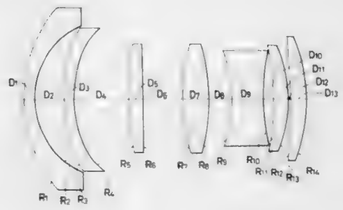
1. A telephoto lens with a large relative aperture comprising a first converging lens group, a diverging lens group and a second converging lens group in this order as viewed from the object side, the first converging lens group comprising two positive lens components and a negative lens component with an air space therebetween, and remaining fixed when focusing, the diverging lens group comprising a cemented negative lens component and a negative lens component with an air space therebetween larger than the sum of the center thicknesses of these components, the second converging lens group comprising a cemented positive lens component, and remaining fixed when focusing, and the first converging lens group and the diverging lens group together forming substantially an afocal system for an object at infinity, and the diverging lens group being movable along the optical axis toward the image side for focusing on an object at a short distance and toward the object side for focusing on an object at a longer distance.

4,176,914
COMPACT RETROFOCUS WIDE ANGLE OBJECTIVE

Kazuo Fujibayashi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1978, Ser. No. 906,852
Claims priority, application Japan, May 26, 1977, 52-61467
Int. Cl.² G02B 9/64
U.S. Cl. 350—214 **1 Claim**

1. A retrofocus wide angle objective lens comprising seven lenses arranged on a common optical axis and of which the first and second counting from the front are negative meniscus lenses convex toward the front, the third is a positive lens convex toward the front, the fourth is a bi-convex lens, the fifth is a bi-concave lens, and the sixth and the seventh are positive meniscus lenses convex toward the rear, said system being characterized by the following numerical values for the



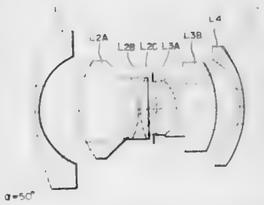
radii of curvature, R, the axial thicknesses or the axial separations, D, the refractive indices, Nd, and the Abbe numbers, ‖ d:

Surface No.	R	D	Nd	νd
1	79.151	5.79	1.60311	60.7
2	44.593	14.21	1	
3	85.091	4.56	1.60311	60.7
4	54.902	27.54	1	
5	184.03	7.09	1.69895	30.1
6	−7813.7	19.86	1	
7	120.79	12.35	1.7725	49.6
8	−107.45	11.33	1	
9	−86.095	15.79	1.80518	25.4
10	113.87	5.09	1	
11	−131.19	7.47	1.713	53.9
12	−65.814	0.7	1	
13	−479.44	8.14	1.7725	49.6
14	−96.351		1	

4,176,915
WIDE ANGLE LENS

Ikuo Mori, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 26, 1977, Ser. No. 845,632
Claims priority, application Japan, Nov. 2, 1976, 51/131221
Int. Cl.² G02B 9/58
U.S. Cl. 350—220 **6 Claims**



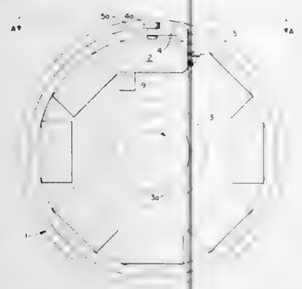
1. A wide angle lens comprising, in the order from the object side;

a divergent first component consisting of a negative meniscus lens element having its convex surface facing the object side,

a compositely convergent second component consisting of three lens elements cemented together and which are in the order from the object side, a biconvex lens element, biconcave lens element and a positive lens element, the center thickness of said biconvex lens element of said

second component being greater than the separation between said first and said second components,
a compositely convergent third component consisting of two lens elements and which are in the order from the object side, a positive lens element and a positive meniscus lens element having its convex surface facing the image side, and
a divergent fourth component consisting of a negative meniscus lens element having its convex surface facing the image side, the separation between said fourth and said third components being less than that between said first and said second components.

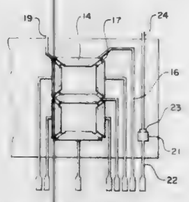
4,176,916
CAM FILTER WHEEL
Frank M. Carpenter, Rockford, Ill., assignor to Neotec Corporation, Silver Spring, Md.
Filed Mar. 14, 1977, Ser. No. 777,052
Int. Cl.[2] G02B 5/22
U.S. Cl. 350—315 **6 Claims**



1. Optical apparatus for continuously varying the bandwidth of light illuminating an object, comprising a source of wide band light for illuminating an object, a filter wheel assembly having a plurality of narrow bandwidth optical interference filters mounted on said wheel assembly, means to rotate said filter wheel about its axis, said interference filters being pivotally mounted on said wheel and positioned relative to the light path defined between said light source and the object such that said filters are swept through said light path individually during rotation of said wheel, means to cause said filters to pivot with respect to said wheel assembly as they are each swept through said light path so as to change their inclination with respect to said light path, whereby the wavelength of the light passing through each of said pivoting filters is varied in accordance with the variation of said inclination of the pivoting filters, said means to cause said filters to pivot comprising a cam track and a cam follower attached to each filter and riding upon said cam track as said filter wheel assembly sweeps each filter through said light path.

4,176,917
LIQUID CRYSTAL DISPLAY DEVICE
Akira Yasutake, Nagaokakyo, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan
Continuation of Ser. No. 697,429, Jun. 14, 1976, abandoned.
This application Jan. 30, 1978, Ser. No. 873,095
Int. Cl.[2] G02F 1/13
U.S. Cl. 350—336 **5 Claims**

1. A liquid crystal display device comprising:
(a) first and second spaced apart transparent substrates:
(b) a liquid crystal material located between said substrates and being adapted to be activated by an electric field placed between said substrates;
(c) a plurality of unconnected first transparent conductive electrodes formed on the inner surface of said first substrate to provide an overall pattern, each of said first electrodes defining an elongated outer periphery having opposite side edges and being of fixed width from one of said side edges to its opposite side edges;
(d) an equal plurality of first electrical leads formed on said inner surface and respectively connected to said electrodes;
(e) a second conductive electrode formed on the inner surface of said second substrate and being defined by a plurality of connected electrode sections equal in number to said first electrodes, each of said electrode sections defining an elongated outer periphery having opposite side edges and being of fixed width from one of its side edges to its opposite side edge, the width of said sections being less than the width of said first electrodes; and
(f) a second electrical lead formed on said inner surface of said second substrate and connected to said second conductive electrode;
(g) said first electrodes and connected first lead and said second electrode and connected second lead being positioned relative to one another such that

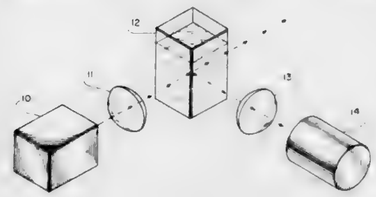


(i) each of said second electrode sections is aligned with a corresponding one of said first electrodes so that its side edges lie entirely within the side edges of said corresponding first electrode, whereby misalignment perpendicular to the side edges of any given first electrode and an aligned second electrode section may occur between said first and second substrates in an amount at most equal to the difference in width between said aligned electrode and electrode section without changing the width of said given electrode and section actually being displayed, and
(ii) said first electrical leads do not have portions which are aligned with said second electrode and said second electrical lead does not have any portion which is aligned with any of said first electrodes whereby, when a voltage is applied between said electrodes, the liquid crystal material therebetween is activated to form a display, said display being adapted to accommodate said misalignment of said first and second substrates before the liquid crystal material opposite any portion of either lead is activated.

4,176,918
FLUORESCENT LIQUID CRYSTAL DISPLAY
Mortimer M. Labes, Philadelphia, Pa., assignor to Temple University, Philadelphia, Pa.
Filed Nov. 14, 1977, Ser. No. 851,393
Int. Cl.[2] C09K 3/34; C02F 1/13
U.S. Cl. 350—346 **12 Claims**

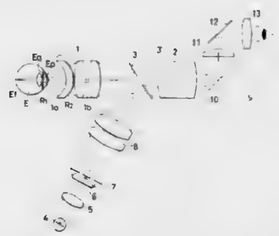
1. Liquid crystal composition adapted to produce high contrast ratio electrically induced light displays, comprising a liquid crystal mixture including a neumatic liquid crystal solvent and a cholesteric or chiral nematogenic compound, which mixture is stable when exposed to ultraviolet radiation and which is adapted to undergo a reversible electrically induced phase transition from a normal cholesteric phase, in which incident ultraviolet radiation is scattered, to an electrically induced nematic phase, in which incident ultraviolet radiation scattering is substantially reduced as compared to the cholesteric phase scattering, said composition further including a sufficient amount of a fluorescent compound, which is soluble in said mixture, which is excited by ultraviolet light scattered strongly in the cholesteric phase of the mixture but not in the electrically induced nematic state, and which significantly enhances the contrast ratio of the liquid crystal composition upon electrically induced phase transition, as viewed in the dark or under low ambient light conditions.

4,176,919
PASSIVE HIGH-SPEED AUTOMATIC SHUTTER FOR IMAGING DEVICES
Howard E. Rast, Jr., Solana Beach, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jan. 31, 1978, Ser. No. 874,093
Int. Cl.[2] G02F 1/00
U.S. Cl. 350—354 **11 Claims**



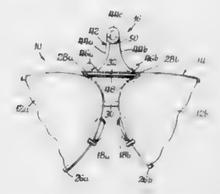
1. A passive, high-speed, automatic shutter for controlling the transmission of light energy of known wavelengths along a predetermined optical axis comprising:
a plurality of contiguously positioned micro-channel optical waveguides axially aligned parallel with said optical axis to intercept said light energy;
a saturable absorber material contained in each of said micro-channel optical waveguides having the property to absorb said known wavelengths of light energy up to a determinable level of intensity, and the saturable absorber material further having the property to transmit said known wavelengths of light energy when said determinable level of intensity is exceeded.

4,176,920
OPHTHALMOSCOPIC SYSTEM WITH A WIDE ANGLE OBJECTIVE LENS
Yuji Ito, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 17, 1977, Ser. No. 797,636
Claims priority, application Japan, May 19, 1976, 51-57466
Int. Cl.[2] A61B 3/14
U.S. Cl. 351—7 **11 Claims**



1. An ophthalmoscopic system provided with a wide angle objective lens comprising;
an objective lens group opposed to a human eye and including at least one meniscus lens and positive lens, and said meniscus lens having a front surface concave to the human eye and being substantially an aplanatic lens having an aplanatic point, the aplanatic point being situated in the front part of the human eye;
a converging lens group positioned in rear of said objective lens group;
an illuminating system having at least one light source and light transmitting means, and the light emergent section of this system being directed toward the human eye; and
an observing optical system having said objective lens group and image transmitting means.

4,176,921
EYEGLASSES HAVING REMOVABLE LENSES
Jan H. Matthias, Greisinzgau, Austria, assignor to Carrera International Corporation, Norwood, N.J.
Filed Jun. 2, 1978, Ser. No. 912,022
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 7717685[U]
Int. Cl.[2] G02B 5/13, 21/26, 7/04
U.S. Cl. 351—106 **15 Claims**

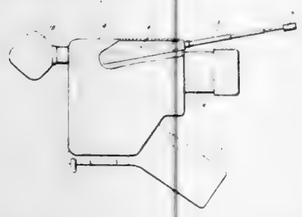


1. Eyeglasses of the type having removable lenses, comprising,
a pair of lenses,
frame means defining a pair of lens support sections and including bridge means interconnecting said lens support sections in laterally spaced relation,
means cooperative with said frame means and adapted to facilitate mounting of the eyeglasses on the wearer in predetermined relation to the wearer's eyes,
support means mounted on each of said lens support sections and adapted to releasably support a separate lens in supporting relation thereon,
and a retaining clip mounted on said frame means intermediate said lens support sections and movable between a first position which permits mounting said lenses on and removal from said lens suppport sections in supported relation with said support means, and a second position adapted for cooperation with said separate lenses to retain said lenses in supported relation on said lens support means so as to prevent removal of said lenses therefrom.

4,176,922
MICROPHONE ARRANGEMENT IN A SOUND MOVIE CAMERA
Johann Roth, Schwabhausen, and Peter Schneider, Kronberg, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany
Filed Apr. 12, 1978, Ser. No. 895,716
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727496
Int. Cl.[2] G03B 31/02
U.S. Cl. 352—27 **7 Claims**

1. In a sound movie camera having a housing accommodating a sound-recording circuitry and a microphone displaceable between a folded position in which the microphone is at least partially received in the housing and an unfolded position in which the microphone is completely removed from the housing, an arrangement comprising
a recess in the housing for accommodating at least a portion of the microphone; and
extendable means fully disposed within said recess when the

microphone is in the folded position thereof and at least partially disposed in said recess when the microphone is in the unfolded position, said means being connected between the housing and the microphone for supporting the latter in the unfolded position out of the housing and



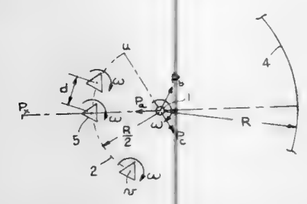
connecting the microphone with the sound-recording circuitry in the housing so as to eliminate the necessity for separate mechanical and electrical connecting elements when the microphone is in the unfolded position, to thereby simplify the operation and handling of the sound movie camera.

4,176,923

STEREOSCOPIC MOTION PICTURE LARGE SCALE SCANNING REPRODUCTION METHOD AND APPARATUS

Robert B. Collender, 709 Patterson Ave., Glendale, Calif. 91203

Filed Oct. 10, 1978, Ser. No. 949,502
Int. Cl.² G03B *35/00*
U.S. Cl. 352—58 **2 Claims**



1. A method of recording and reproducing stereoscopic views for observation by plural observers without visual acids at the eyes of said observers, comprising:

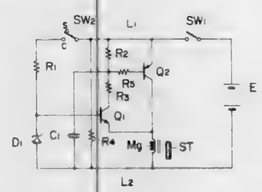
photographing multiple sequential views of a scene from a motion picture camera in a manner such that between each sequential view relative motion takes place between the camera and scene, and the optical axis of the camera for the various views is essentially coincident or parallel with each other; reproducing said views sequentially by projecting the views from a rotating and radially outward projecting multifacet scan projector; said scan projector rotating about a central vertical rotation axis; said views being projected toward a concentric cylindrical arc of elemental scanning mirrors synchronized in motion with said scan projector; said arc of scanning mirrors reflecting said sequential views to a concentric stationary concaved screen on the opposite side of said vertical axis; said screen comprised of highly reflective horizontal corrugated ridges to vertically scatter incident light rays from said scan projector, and to horizontally reflect said light rays; said camera optical axes of said sequential views being coincident with said scan projector optical axis when projecting said views onto the center of said screen, and laterally shifted with respect to said scan projector optical axis for off-center projection on said screen; said shifted camera optical axis occuring in said scan projector and being sufficient to cause said camera's optical axes reflection from said screen to remain essentially parallel during the horizontal sweep motion of said sequential views across said screen by said scan projector; said light rays in projected views reflective from said screen to pass through a vertical aerial exit slit moving in a concentric circle about said central vertical rotation axis; said aerial slit located between said screen and said axis; and the scanning rate of said projector sufficient to be within the period of persistence of vision of an observer.

4,176,924

SHUTTER RELEASE MECHANISM FOR CINECAMERA

Nobuyoshi Hagiuda, Kawasaki, and Hiroaki Tanaka, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 18, 1977, Ser. No. 843,324
Claims priority, application Japan, Oct. 29, 1976, 51/145750[U]
Int. Cl.² G03B *1/00*
U.S. Cl. 352—174 **6 Claims**



1. A shutter release mechanism for a cinecamera having a shutter release button, a rotatable sector serving as a shutter for exposure of a film, a stopper for preventing the rotation of said sector, an electromagnet to be energized to selectively render said stopper operative and an electric circuit for supplying a current to said electromagnet when said shutter is released, said electric circuit comprising:

(a) a D.C. power source circuit for supplying an electric power to said electromagnet;

(b) a normally opened first switch means incorporated in said D.C. power source circuit and ganged with said release button to supply an electric power to said electromagnet when said release button is operated;

(c) a first semiconductor element inserted in said D.C. power source circuit for controlling a current through said electromagnet;

(d) a time constant circuit for allowing said first semiconductor element to flow a sufficient amount of said current to actuate said stopper from shutter latching position to shutter release position during a predetermined period of time after said first switch means closed; and

(e) control means responsive to a reduction of said current through said first semiconductor element to a predetermined value sufficient to hold said actuation of said stopper after said predetermined period of time for holding said predetermined current value wherein said control means comprises;

(a) a constant voltage means; and

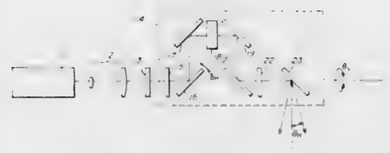
(b) a second semiconductor element for controlling said first semiconductor element so that the difference between said constant voltage and the voltage across said electromagnet is constant to thereby maintain said current through said second semiconductor element and said electromagnet substantially at said predetermined value in spite of variations in said D.C. power source circuit.

4,176,925

LASER SCANNER FOR PHOTOLITHOGRAPHY OF SLOTTED MASK COLOR CATHODE RAY TUBES

Robert C. Kocher, Harvard, and Alfred Piorkow, Sudbury, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jun. 7, 1978, Ser. No. 913,730
Int. Cl.² G03B *41/00*
U.S. Cl. 354—1 **10 Claims**



1. Laser scanning apparatus for use in manufacturing color cathode ray tubes wherein a layer of photosensitive material on the inner surface of a tube faceplate is exposed by scanning a laser beam over an array of light transmitting apertures in a mask disposed adjacent to the layer of material on the faceplate, the apparatus including:

(a) a laser source for creating a light beam having a wavelength spectrum which exposes the photosensitive material;

(b) an optical stage coupled to receive the light beam from said laser source,

(c) a scan cradle enclosure, coupled to receive the light beam from said optical stage, said enclosure comprising

(i) a cradle base,

(ii) a cradle platform adapted for rotary motion with respect to said cradle base,

(iii) a cylindrical lens adapted to receive the light beam from said optical stage,

(iv) means for rotating said cylindrical lens about the axis of said light beam,

(v) a galvanometer,

(vi) a mirror, adapted to be rotated about an axis perpendicular to the axis of said light beam by said galvanometer, oriented to reflect the light beam after it emerges from said cylindrical lens,

(vii) diverging lens, for receiving light from said mirror,

(viii) converging lens, for receiving light from said diverging lens,

(ix) a scanning mirror adapted to receive the light beam from said converging lens,

(x) a first motor,

(xi) linkage coupled to said first motor for rotating said scanning mirror,

(xii) a lead screw assembly affixed to said cradle base for rotating said cradle platform,

(xiii) a second motor for rotating said lead screw assembly,

(xiv) a support frame, having an aperture therewithin, affixed to the top of said scan cradle enclosure, said aperture so oriented that light reflected by said scanning mirror passes therethrough,

(xv) an elevating plate, having an aperture therewithin, supported above said support frame, said plate aperture and said frame aperture being in general alignment,

(xvi) a translating jig plate, having a cut-out therewithin for supporting a face panel of a cathode ray tube, supported on said elevating plate, and adapted to be horizontally adjustable,

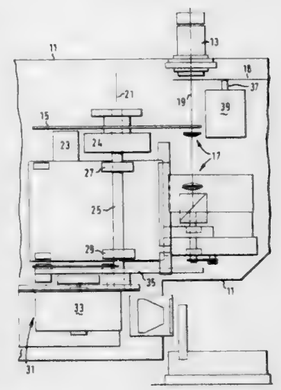
(xvii) a safety cover for covering a face panel supported in said cut-out of said jig plate.

4,176,926

OPTICAL PROJECTION APPARATUS

David W. Eadie, Corfe Mullen, and Charles J. Hancock, Bournemouth, both of England, assignors to Quest Automation Limited, Dorset, England

Filed Sep. 26, 1977, Ser. No. 836,827
Claims priority, application United Kingdom, Sep. 28, 1976, 40196/76; Jun. 3, 1977, 23646/77
Int. Cl.² G03B *29/00*
U.S. Cl. 354—4 **5 Claims**



2. Photodrafting equipment of the type comprising means for mounting a sheet having a photosensitive surface, a carriage movable in orthogonal coordinate directions parallel to said sheet, means for controlling the movement of said carriage, the carriage including means for projecting a beam of light to provide a spot of light on said photosensitive surface, which spot exposes a line on said photosensitive surface as a result of movement of said carriage, and means interposed in the beam of light for selectively defining the size and shape of said spot of light; said carriage movement controlling means including means for controlling the intensity of said spot of light, said intensity controlling means being movable across said beam of light in a timed sequence between stations in which there is provided a constant intensity of said spot of light in a first station, a progressively increasing or decreasing intensity of said spot of light in a second station, and a predetermined intensity of said spot of light for a timed period followed by substantially zero intensity of said spot of light in a third station; said intensity controlling means being operable to provide a constant intensity of said spot of light as said carriage moves at a constant rate and a progressively increasing or decreasing intensity of said spot of light as said carriage accelerates or decelerates from or to a halt condition, and said intensity controlling means being further operable to hold on said spot of light for a predetermined period of time in said halt condition of said carriage after which said intensity controlling means provides substantially zero intensity of said spot of light.

4,176,927

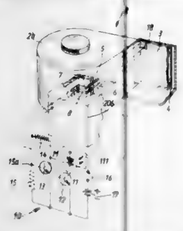
APPARATUS FOR DECODING INFORMATION STORED IN CONTAINERS FOR PHOTOGRAPHIC FILMS

Eduard Wagensonner, Aschheim, Fed. Rep. of Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep of Germany

Filed Jan. 12, 1978, Ser. No. 868,828
Claims priority, application Germany, Jan. 21, 1977, 2702989
Int. Cl.² G03B *17/18*
U.S. Cl. 354—21 **15 Claims**

1. In a photographic apparatus wherein a web of photographic film is transported in a predetermined direction along a predetermined path, together with a backing strip carrying

an opaque layer having a high ohmic resistance and facing one side of the film and wherein at least one portion of the film affords access to said layer from the other side of the film the combination of tracking means adjacent to a portion of said path and including two spaced-apart electric contacts at least one of which engages the other side of the film in line with said



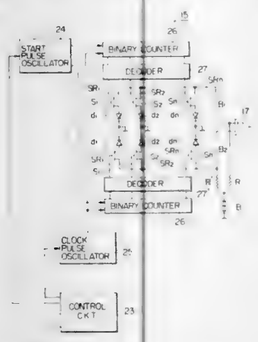
film portion and both of which simultaneously engage said layer when said film portion is adjacent thereto whereby that part of said layer which extends between said contacts, while said contacts simultaneously engage said layer, constitutes a resistor; and means for generating signals in response to simultaneous engagement of said contacts with said layer.

4,176,928

FOCUS DETECTING DEVICE

Kazuo Nakamura, Asaka, and Masao Jyojiki, Tsurugashima, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1977, Ser. No. 861,089
Claims priority, application Japan, Dec. 15, 197[illegible], 51-150432
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—25 **8 Claims**



1. A focus detecting device for use in a camera including first and second groups of photoelectric focus detecting elements symmetrically juxtaposed on a substrate so as to have the same electrical characteristics and light receiving area for receiving light reflected from an object to be photographed through an optical focussing lens system of the camera, the improvement comprising:

a d.c. power source;

a first common load resistance element;

a first group of electrical switching elements having input, output and gate terminals, each of said switching elements being connected in series with a corresponding focus detecting element in said first group of focus detecting elements and all of the output terminals of said first group of switching elements being connected together and coupled to one terminal of said first common load resistance, the other terminal of which is coupled to said power source;

a second common load resistance;

a second group of electrical switching elements having input, output and gate terminals, each of said second group of switching elements being connected in series with a corresponding focus detecting element in said second group of focus detecting elements and all of the output terminals of said second group of switching elements being connected together and coupled to one terminal of said second common load resistance, the other terminal of which is coupled to said power source,

trigger pulse generating means having a plurality of output terminals coupled to the gates of said electrical switching elements, and producing a train of sequential trigger pulses capable of independently triggering the two groups of focus detecting elements;

comparison means having two input terminals coupled with the common connection of one of the load resistors to one group of the photoelectric focus detecting elements and the common connection of the other load resistor to the other group of the photoelectric focus detecting elements; and

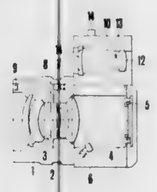
means for detecting the focus condition of the object's image formed through the optical focussing lens system on both the groups of photoelectric focus detecting elements in accordance with an output signal from the comparison means.

4,176,929

EXPOSURE CONTROL DEVICE FOR A CAMERA

Fumio Ito; Tokuichi Tsunekawa, both of Yokohama; Tetsuya Taguchi, Kawasaki, and Isao Harigaya, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1978, Ser. No. 917,375
Claims priority, application Japan, Jun. 21, 1977, 52-73512; Jun. 29, 1977, 52-77448; Jul. 14, 1977, 52-84411
Int. Cl.[2] G03B *7/08, 15/05, 19/12*
U.S. Cl. 354—29 **20 Claims**



1. An exposure control device for a camera, comprising:

a shutter which also functions as a diaphragm;

a first light receiving element which is capable of sensing light beams reflected from a film surface when said shutter is released;

a second light receiving element which is capable of sensing light beams coming from an object before said shutter is released;

an auxiliary diaphragm which is disposed in front of said second light receiving element and is responsive to opening and closing actions on said shutter, said auxiliary diaphragm being arranged to open so as to allow said light beams coming from said object to be incident on said second light receiving element when said shutter closes and to close so as to prevent said light beams from said object from falling on said second light receiving element when said shutter opens; and

light measuring means having the first light receiving element and the second light receiving element, the light measuring means having an operational amplifier for light measuring, which has the first light receiving element and the second light receiving element connected in parallel between input terminals of the operational amplifier;

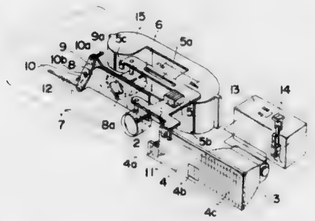
wherein exposure control is performed based on an output value of the operational amplifier corresponding to an amount of incident light into the first light receiving element, and, at the time the shutter is released, delay in transient response of the light measuring means is reduced based on said output value of the operational amplifier corresponding to an amount of incident light into the second light receiving element.

4,176,930

CAMERA WITH SELF-CONTAINED FLASH DEVICE

Toshinori Imura, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Sakai, Japan

Filed Mar. 6, 1978, Ser. No. 883,556
Claims priority, application Japan, Mar. 7, 1977, 52-23924
Int. Cl.[2] G03B *7/00, 9/02, 15/03*
U.S. Cl. 354—59 **9 Claims**



1. A camera comprising;

a camera body having a picture-taking optical path;

a first objective lens having a predetermined focal length and a predetermined F-number;

a second objective lens having a focal length and an F-number greater than those of said first objective lens;

externally operable change-over means for selectively setting said first or second lens into registry with said picture-taking optical path;

a flash device having an irradiating angle substantially coincident with the angle of view of said second objective lens; and

an irradiating angle changing means movable between an inoperative position and an operative position, at which said changing means enlarges the irradiating angle of said flash device to substantially correspond with the angle of view of said first objective lens, said irradiating angle changing-means being responsive to said change-over means and being normally maintaintained in an inoperative position and transferred to its operative position only when said first objective lens is in registry with said picture-taking optical path.

4,176,931

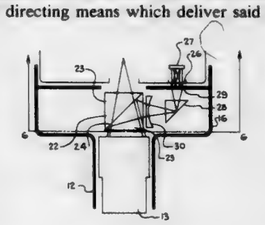
CAMERA TO MICROSCOPE ADAPTER SYSTEM WITH PERIPHERAL IMAGE AVERAGING MEANS FOR EXPOSURE CONTROL

John Taube, 2130 NW. 31st Ave., Apt. F-6, and Andris Taube, 1901 NW. 38th Dr., both of Gainesville, Fla. 32605

Filed May 30, 1978, Ser. No. 910,697
Int. Cl.[2] G03B *17/48;* **G02B** *21/00*
U.S. Cl. 354—79 **8 Claims**

1. In a camera to microscope adapter system of the type that extracts a part of the focused image received from said microscope to operate an exposure control mechanism for said camera having in combination an adapter housing which fastens and aligns said camera to said microscope, means located within and held in place by said adapter housing to separate said part of said focused image and redirect said part of said focused image, and conventional collecting and directing means also connected to said adapter housing which receive and deliver said part of said focused image to said exposure control mechanism, the improvement in said means to separate said part of said focused image for exposure control comprising:

A reflective surface encased within and held in place by said adapter housing, said reflective surface being positioned to cut through the right angle cone of light formed by said focused image below the apex and other than parallel to the base of the cone, said reflective surface being further positioned to direct all parts of said focused image which strike said reflective surface to said conventional collecting and directing means which deliver said parts of said



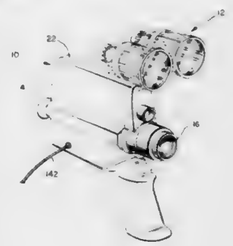
focused image to said exposure control mechanism, said reflective surface having a format opening through said reflective surface which is geometrically defined by the location of said reflective surface relative to said camera and said right angle cone of light to permit only a film format portion of said focused image which falls within the boundaries of the film within said camera to pass through said format opening whereby the remaining peripheral image outside of said format opening strikes said reflective surface, and is directed to said exposure control mechanism.

4,176,932

PHOTOGRAPHIC LIGHTING UNIT

Warren H. Young, Marshfield; Nolan A. Drevitch, South Easton, and Anthony G. Rosati, Salem, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 1, 1977, Ser. No. 847,534
Int. Cl.[2] G03B *15/02, 15/03, 17/02*
U.S. Cl. 354—126 **14 Claims**



1. A lamp accessory for a camera, said accessory comprising:

a pair of lamp-reflector assemblies, each said assembly including a forwardly facing lamp, an open-ended forwardly facing reflector extending around said lamp and a pair of rearwardly extending substantially parallel electrical terminals spaced apart a given distance and having their other ends electrically coupled to said assembly lamp;

a main body support including a base portion adapted to seat on a portion of the camera and a wall portion arranged to face rearwardly when said base portion is properly seated on the camera, said wall portion having a pair of spaced apart tracks formed thereon extending upwardly from

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said base portion and respectively turning in opposite directions intermediate said base portion and the end of said wall portion opposite said base portion and another track formed thereon and extending thereacross spaced from said pair of tracks intermediate said pair of tracks and said end of said wall portion;

a pair of lamp receiving and positioning cup members respectively coupled to opposite sides of said main body support, each said lamp receiving member having heat dissipating openings formed therearound and mounting one of said lamp-reflector assemblies therein with said lamp's electrical terminals extending rearwardly beyond a plane extending through said main body support's wall portion;

means for retaining each of said lamp-reflector assemblies in its respective said lamp receiving member;

a first electrical connector seated in said another track and extending from a first said terminal of one of said lamps to a first said terminal of the other of said lamps;

a second electrical connector seated in one of said pair of tracks and extending from the second said terminal of said one lamp to a point below said base portion of said main body support;

a third electrical connector seated in the other of said pair of tracks and extending from the second said terminal of said other lamp to a point below said base portion of said main body support; and

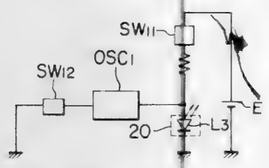
means cooperating with said lamp receiving members and said main body support for capping said electrical terminals of said lamps and said first, second and third electrical connectors.

4,176,933

INDICATING APPARATUS FOR CAMERA

Sakuji Watanabe, Warabi, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 6, 1978, Ser. No. 883,645
Claims priority, application Japan, Mar. 5, 1977, 52-23315
Int. Cl.[2] G03B *15/05, 17/18*
U.S. Cl. 354—127 **7 Claims**



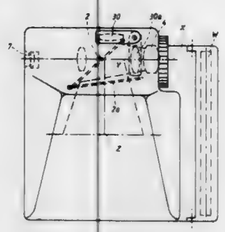
1. An indicating apparatus for indicating the completion of charging of a capacitor of a flash device to be actuated in connection with the shutter release of a camera and also for indicating that the shutter speed selected by a shutter speed setting means of the camera is synchronizable with the light from the flash device, comprising an illuminable indicating element capable of being placed in different states, and operating means responsive to the charging of said capacitor and to said shutter speed setting means for causing said indicating element to have a predetermined first state when charging of said capacitor is complete and the selected shutter speed is synchronizable with the light from said flash device, for causing said indicating element to have a predetermined second state when charging of said capacitor is complete and the selected shutter speed is non-synchronizable with the light from said flash device, and for causing said indicating element to have neither of said first and second states when charging of said capacitor is in process but is incomplete.

4,176,934

ARRANGEMENT OF A PHOTOGRAPHIC CAMERA

Peter Lermann, Narring, and Günter Fauth, Unterhaching, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Mar. 9, 1978, Ser. No. 885,074
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1977, 2710414
Int. Cl.[2] G03B *15/00, 17/50, 17/04, 13/02*
U.S. Cl. 354—150 **8 Claims**



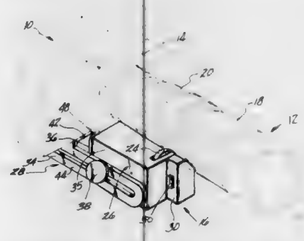
1. In a photographic camera having a housing, an objective in one wall of the housing, means disposed in said housing for supporting a film strip in an image plane, and means for advancing the film strip in a feeding direction, an arrangement comprising a first light reflecting member for deviating light rays travelling from said objective along a first optical axis, a second light reflecting member for deviating light rays travelling thereto from said first light reflecting member along a second optical axis, said second light reflecting member deviating said light rays along a third optical axis towards said film strip supporting means, said first optical axis and said second optical axis defining a first plane that is different from a second plane defined by said second optical axis and said third optical axis.

4,176,935

MOTORIZED LENS RING ADJUSTOR FOR STILL CAMERA LENS

George Smith, 166 Vine Rd., Stamford, Conn. 06905

Filed Oct. 25, 1977, Ser. No. 844,800
Int. Cl.[2] G03B *13/02*
U.S. Cl. 354—195 **14 Claims**



1. A self-contained accessory apparatus for use with a wide variety of shapes and sizes of still cameras of the type having a still camera body, a lens with a first rotatable adjustment ring and an accessory connector, said apparatus comprising:

(a) connector means for releasably attaching the apparatus to one of the camera body and lens;

(b) wheel means for engaging the first adjustment ring;

(c) self-contained motor means for engaging said wheel and rotating the first adjustment ring by rotating said wheel responsive to a signal;

(d) manual switch means, operably connected to said self-contained motor means, for selectively providing said signal in response to manipulation of said switch means regardless of the inclination of the camera; and

(e) bracket means, attached to said motor means and said connector means, for adjustably positioning said wheel means into engagement with the adjustment ring.

4,176,936

MOTOR DRIVE UNIT FOR A CAMERA

Susumu Kozuki; Masanori Uchidoi, both of Yokohama; Nobuaki Date, Kawasaki; Masami Shimizu, Tokyo; Hiroshi Aizawa, Kawasaki, and Yoshiyuki Takishima, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1977, Ser. No. 861,905
Claims priority, application Japan, Dec. 24, 1976, 51/155995
Int. Cl.[2] G03B *7/10, 1/18*
U.S. Cl. 354—38 **17 Claims**



1. A camera having a motor drive device comprising:

A. a camera body including:

(a) light measuring means for producing an electrical signal in accordance with the brightness of the object to be photographed,

(b) shutter time setting means for setting a shutter time value and having adjustable signal forming means for producing an electrical signal in accordance with the shutter time value to be set,

(c) exposure calculating means responsive to the electrical signal from the light measuring means and the electrical signal from the shutter time setting means for producing an electrical signal based on the signals from the light measuring means and the setting means in accordance with the calculated value,

(d) aperture control means for controlling the aperture in accordance with the output of the exposure calculating means,

(e) shutter time control means for controlling the shutter time during an exposure operation in accordance with the electrical signal output of the shutter time setting means,

(f) first drive means for causing adjustment of the signal forming means, and

(g) first drive control means for controlling the first drive means,

B. a motor drive device including:

(h) a second drive means for carrying out a charge operation at the aperture control means and the shutter time control means,

(i) second drive control means for driving the second drive means, second drive control means being enabled upon completion of the exposure operation of the shutter time control means to control the shutter time and being disabled upon completion of the charge operation of the shutter time control means,

(j) signal producing means for producing an electrical signal in accordance with the longest shutter time allowable for one picture frame at a particular picture frame speed, and

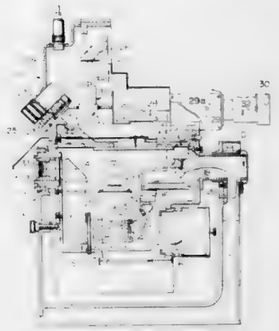
(k) comparison means for comparing the electrical signal of the signal producing means with the electrical signal of the shutter time setting means and for operating the first drive control means in response to a difference at the comparison means.

4,176,937

FINDER SYSTEM FOR PHOTOGRAPHING APPARATUS

Suminosuke Kawase, Ohmiya, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1978, Ser. No. 877,674
Claims priority, application Japan, Feb. 18, 1977, 52-1889577[U]; Feb. 21, 1977, 52-1851377; Feb. 21, 1977, 52-1851477
Int. Cl.[2] G03B *29/00*
U.S. Cl. 354—62 **4 Claims**



1. In a photographing apparatus including a photographing optical axis and a photographing film plane which is inclined from a right angle with respect to the photographing optical axis, a finder system comprising relay lens means, eye lens means having an optical axis and means for reflecting light through the photographing optical axis toward the relay lens means, said relay lens means having a major plane inclined with respect to an optical axis of the eye lens means in such a way that the major plane intersects a plane containing a first image in said finder system in a plane which is perpendicular to the optical axis of the eye lens means and passing through a position wherein a second image is produced.

4,176,938

ROLL FILM CASSETTE

Rudolf Weiss, Grünwald; Werner Kiessling, Unterhaching, and Otto Wiedemann, Starnberg, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Jul. 7, 1978, Ser. No. 922,740
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1977, 7721745[U]
Int. Cl.[2] G03B *17/26*
U.S. Cl. 354—275 **7 Claims**

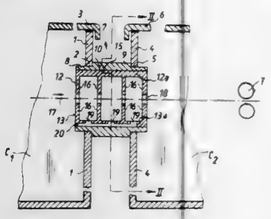
1. A roll film cassette, comprising a film supply chamber for unexposed film and having a film outlet; a film take-up chamber for exposed film and having a film inlet; a web connecting said chambers and having a film window across which the film travels in a plane from said outlet to said inlet; and means on said cassette, including a springy arm intermediate said film window and said inlet and normally extending substantially parallel to said plane, said arm having a free end closer to said

inlet than to said window and provided with a projection riding on the film for engaging in a cut-out proximal to a



trailing end of the film when the same approaches said inlet so as to prevent the trailing film end from entering said inlet.

4,176,939
DEVELOPING APPARATUS WITH CONTACT-FREE LIGHT TRAP
Jürgen Leuchter, Tutzing, Fed. Rep. of Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany
Filed Sep. 6, 1977, Ser. No. 830,442
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1976, 2640634
Int. Cl.[2] G03D *13/04*
U.S. Cl. 354—307 **18 Claims**



1. In an apparatus for developing photographic materials, a combination comprising at least two adjacent containers each adapted to contain a treating bath for photographic material, said containers having respective ports which face one another; and means forming a passage which connects said ports and through which the photographic material travels from one to the other of said containers, including light trap means in said passage which defines for the photographic material a substantially straight-line travel path dimensioned and configurated for avoiding contact of said light-trap means with emulsion-carrying surfaces of said photographic material, said light-trap means including a circumferential wall and a plurality of baffles projecting inwardly of said wall at locations spaced lengthwise of said passage and forming at least two compartments through which the photographic material is compelled to pass.

4,176,940
ELECTROPHOTOGRAPHIC COLOR IMAGE PRODUCING APPARATUS
Noboru Katakabe, Katano; Isao Yamaguchi, Yawata, and Masaru Onishi, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Feb. 28, 1978, Ser. No. 882,951
Claims priority, application Japan, Mar. 9, 1977, 52-26514
Int. Cl.[2] G03G *15/10*
U.S. Cl. 355—10 **18 Claims**

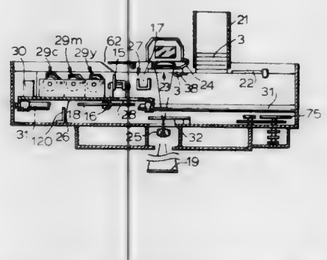
1. An electrophotographic color image producing apparatus for producing on an electrophotographic film a color image of an original, comprising:

a housing

film unit holding means supported by said housing for holding at a processing position a film unit comprising an electrophotographic film having a major surface facing downwards;

processing means arranged in said housing for processing an image on said major surface of said film, said processing means comprising a charger for applying a uniform electrostatic charge on said major surface of said film, an exposure unit for applying light from an original to the charge-bearing major surface of said film to form a latent image, n developer units (n being an integer larger than 1) each containing a liquid developer for developing said latent image to a visible image, and a dryer for drying the visible image-bearing major surface of said film, said exposure unit including a lens unit supported by said housing for focusing said light from the original on said charge-bearing major surface of said film;

a processor table slidably mounted in said housing and reciprocally movable along a horizontal path under said major surface of said film between a first position and a second position, said processor table having said dryer, said plural developer units and said charger mounted thereon in this recited order in the direction from said first position to said second position so that each of said charger, said plural developer units and said dryer passes said processing position for said film unit in this recited order upon the movement of said processor table for performing the charging step, the exposing step, the developing step and



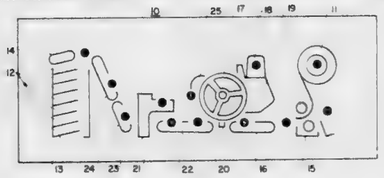
the drying step at said processing position in this recite order;

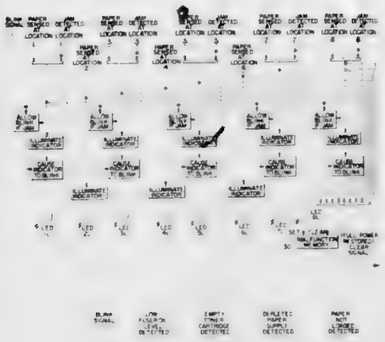
driving means coupled to said processor table for reciprocally moving said processor table between said first position and said second position; and

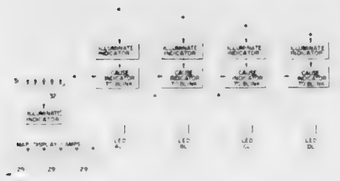
developer operating means for being selectively coupled to the mth one of said n developer units (m being an integer defined by $1 \leqq m \leqq n$) for operating said mth developer unit to apply said liquid developer in said mth developer unit to said major surface of said film when said mth developer unit is positioned at said processing position in an mth reciprocal movement of said processor table, and in one reciprocal movement of said processor table, for being released from said mth developer unit, and for then being coupled to an (m+1)th developer unit for operating said (m+1)th developer unit to apply said liquid developer in said (m+1)th developer unit to said major surface of said film when said (m+1)th developer unit is positioned at said processing position in an (m+1)th reciprocal movement of said processor table;

whereby during n reciprocal movements of said processor table between said first and said second position, n cycles each constituting a charging step, an exposing step, a developing step and a drying step are performed for the respective liquid developers in said n developer units for producing a color image on said major surface of said film.

4,176,941
MALFUNCTION DISPLAY SYSTEM FOR ELECTROPHOTOGRAPHIC COPYING MACHINES
Fred J. Breitenkam, Randolph, and James E. Landrith, Andover, both of N.J., assignors to Van Dyk Research Corporation, Whippany, N.J.
Filed Feb. 27, 1978, Ser. No. 881,195
Int. Cl.[2] G03G *15/00;* **B65H** *7/02*
U.S. Cl. 355—14 R **7 Claims**







1. In combination with an electrophotographic copying machine including:

(a) means for utilizing copy paper and other consumable items and for moving sheets of said copy paper along a predetermined path through said machine while forming visible images on said sheets,

(b) jam detection means for monitoring the movement of paper sheets along said path at preselected points thereof, and for generating (i) a jam occurrence signal indicative of the occurrence of a paper jam along said path, and (ii) a jam location signal indicative of that one of said preselected points at which the jam was detected,

(c) paper detection means for sensing the presence of paper sheets at various points along said path and for generating a number of paper presence signals indicative of the locations of corresponding paper sheets disposed along said path, and

(d) consumable item monitoring means for sensing the quantity of each of said consumable items and for generating a depleted consumable item identification signal indicative of each particular item which has been depleted to a quantity less than a predetermined value,

a malfunction display system comprising:

a pictorial display showing elements of said machine defining said paper path, said display including (i) paper path illuminating means for selectively illuminating portions of said display corresponding to each of said preselected points and each of said various points along said paper path, and (ii) consumable item symbols and means for selectively illuminating a point adjacent each of said symbols;

malfunction display enabling means responsive to said jam occurrence signal and to said depleted consumable item identification signals for illuminating said pictorial display;

jam display means responsive to said jam location signal for actuating said paper path illuminating means to distinctively illuminate the display portion corresponding to that one of said preselected points at which the jam was detected;

paper presence display means responsive to corresponding ones of said paper presence signals for actuating said paper path illuminating means to distinctively illuminate portions of said display corresponding to those of said various points along said paper path at which paper sheets are present; and

depleted consumable item display means responsive to said depleted consumable item identification signals for distinctively illuminating points adjacent those symbols corresponding to consumable items requiring replenishment.

4,176,942
ELECTROPHOTOGRAPHIC COPYING APPARATUS
Susumu Tatsumi, and Shoji Kuroishi, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Jan. 27, 1977, Ser. No. 763,175
Claims priority, application Japan, Feb. 2, 1976, 51-10185
Int. Cl.[2] G03G *15/00, 15/10*
U.S. Cl. 355—14 R **10 Claims**



1. An electrophotographic apparatus comprising:

a photoconductive member;

charging means for electrostatically charging the photoconductive member;

imaging means for radiating a light image of an original document onto the photoconductive member to produce an electrostatic image thereon;

developing means for applying a toner substance to the photoconductive member to develop the electrostatic image into a toner image;

a bias electrode disposed adjacent to the photoconductive member;

light image intensity regulating means for regulating an intensity of the light image to a plurality of different intensities;

bias voltage producing means for producing a bias voltage which is applied to the bias electrode;

limiting means for limiting the bias voltage to a plurality of different bias voltages in accordance with an electrostatic

potential of the electrostatic image on the photoconductive member; and

control means for controlling the limiting means to limit the bias voltage to a first predetermined voltage which is lower than a bias voltage for normal document reproduction when the intensity of the light image is a first intensity which is equal to an intensity for normal document reproduction and controlling the light image intensity regulating means to limit the intensity of the light image to a second intensity which is higher than the first intensity when the bias voltage is a second predetermined voltage which is higher than the first predetermined voltage and equal to a bias voltage for normal document reproduction.

4,176,943

ELECTROPHOTOGRAPHIC APPARATUS

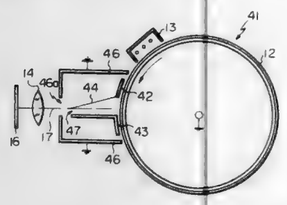
Mitsuo Hasebe, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 11, 1977, Ser. No. 840,614

Claims priority, application Japan, Oct. 18, 1976, 51/124670; Nov. 18, 1976, 51/138980; Nov. 18, 1976, 51/138981

Int. Cl.² G03G *15/00*; G03B *27/76*

U.S. Cl. 355—14 R **14 Claims**



1. An electrophotographic apparatus comprising:

charging means for forming an electrostatic charge on a photoconductive member;

imaging means for radiating a light image of an original document onto the photoconductive member to form an electrostatic image thereon through localized photoconduction;

sensor means for sensing an electrostatic potential of the electrostatic image; and

control means for controlling an intensity of light radiation of the photoconductive member in accordance with the sensed electrostatic potential;

the control means comprising an occluder plate movably provided in an optical path of the light image for varying the intensity of the light image in accordance with a position of the occluder plate, the occluder plate being disposed closely adjacent to the photoconductive member, the occluder plate being positioned by electrostatic force in accordance with an electrostatic potential induced thereon by the photoconductive member.

4,176,944

CORRECTLY POSITIONING SUCCESSIVE ORIGINALS OF A PHOTOGRAPHIC STRIP AT A COPYING OR SEVERING STATION

Bernd Payrhammer, Munich, Fed. Rep. of Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

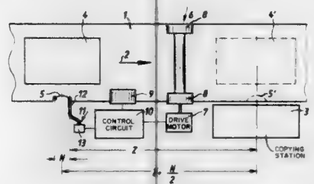
Filed May 2, 1978, Ser. No. 902,267

Claims priority, application Fed. Rep. of Germany, May 12, 1977, 2721368

Int. Cl.² G03B *27/52*; G06K *7/015*; B65H *23/18*

U.S. Cl. 355—18 **10 Claims**

1. In an apparatus for the processing of photographic strips comprised of successive originals transported along a predetermined path, and including a station at which successive originals of the transported strip are to be stopped with accurate positioning of the originals at such station, the originals of the photographic strip being provided with spatially correlated optically detectable reference marks, a positioning arrangement comprising transport means for transporting the strip along the predetermined path through such station; optical mark-sensing means located upstream of such station a predetermined distance and operative for detecting the leading and trailing ends of reference marks on the strip; and control circuit



means connected to the transport means and to the optical mark-sensing means and operative for stopping an original whose reference mark has been sensed by the mark-sensing means at the proper position at such station by delaying the stopping of such original at such station by a time interval dependent upon the distance between the leading and trailing ends of the sensed reference mark associated with that original.

4,176,945

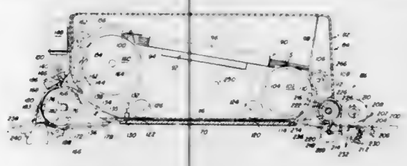
SHEET FEEDING APPARATUS FOR USE WITH COPIER/DUPLICATORS OR THE LIKE

Ronald C. Holzhauser, Holley, N.Y.; Carl H. Zirngibl, DeBary, Fla., and Vincent J. O'Brien, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 12, 1978, Ser. No. 923,874

Int. Cl.² G03B *27/32*, *27/52*

U.S. Cl. 355—23 **11 Claims**



6. A combination recirculating sheet feeder and document positioner for feeding document sheets from supporting means to an exposure station spaced from the supported means, the feeder and positioner comprising:

means defining a recirculating sheet path having a first portion extending from said supporting means to the station and having a second portion extending from the station back to the supporting means;

means defining a non-recirculating sheet path extending to the statior and away from the station and being at least partially coextensive with said recirculating sheet path in the area of the station, said non-recirculating sheet path having entrance and exit portions that diverge from the recirculating sheet path; and

drive means for advancing document sheets along the respective sheet paths.

4,176,946

COLOR PRINTER AND METHOD OF CONTROLLING EXPOSURE TIME THEREFOR

Koji Takahashi, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 19, 1977, Ser. No. 817,059

Claims priority, application Japan, Jul. 20, 1976, 51-86275

Int. Cl.² G03B *27/78*

U.S. Cl. 355—38 **7 Claims**



1. A method of controlling exposure time in a color printer in which at least two different color filters are used and the insertion time thereof is controlled to reproduce a preferable color on prints from a color original comprising the steps of selecting a particular color contained in the color original by (a) measuring three primary color densities of a number of points of the color original and (b) detecting a preselected particular color among the colors of said number of points of the color original, obtaining a relation between the three mean color densities of said particular color in the color original and the preferable insertion time of said color filters to print said particular color into the particular color of preferable color balance and density on the color paper, and controlling the insertion time of said color filters based on the obtained relation according to the said three mean color densities of the particular color in the color original, thereby printing the particular color in the color original into the particular color of preferable color balance and density.

4,176,947

STEP AND REPEAT MECHANISM

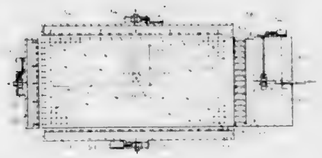
Harry A. H. Spence-Bate, 1 Cheam Pl., Morley, Australia (6062), and Timothy Bain-Smith, Charing, England, assignors to H. A. H. Spence-Bate, Australia

Filed Oct. 3, 1977, Ser. No. 838,724

Claims priority, application United Kingdom, Oct. 4, 1976, 41118/76

Int. Cl.² G03B *27/32*, *27/42*, *27/62*

U.S. Cl. 355—53 **17 Claims**



16. Apparatus for moving sheet material comprising two opposed plates, said plates being separated to provide a space therebetween, ducts formed in at least one of said plates opening into said space to form a gas cushion in said space between the plates for supporting said sheet material in said space, one or more sweep members positioned for movement between the plates to locate an edge of the sheet material in a required X and Y position between the plates.

4,176,948

RECORDING AND COPYING CAMERA

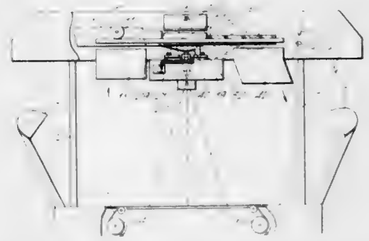
Harry A. H. Spence-Bate, 1 Cheam Pl., Morley, Western Australia 6062, Australia

Filed Mar. 15, 1978, Ser. No. 886,746

Claims priority, application Australia, Mar. 25, 1977, PC9578

Int. Cl.² G03B *27/42*, *27/62*, *27/64*

U.S. Cl. 355—53 **9 Claims**



1. A microfiche camera having a microfiche store at a pick-up station, a camera lens at a filming and copying station, film disposal means at a dump station, film shift means for moving a mcirofiche film along a film shift path from one said station to each other said station, vacuum operated film retaining means comprising a frame having a film retaining surface surounding a masking aperture in the frame and at least one vacuum duct opening into said surface connectable to a source of vacuum, light means arranged to project light through said masking aperture, a shutter closing said aperture and between the aperture and the camera lens, a copying table in the front focal plane of the camera lens and means for positioning said film retaining means at a first reception level within the optical axis of said camera lens for receiving and recording an image and at a second copying level within the optical axis of said lens for copying a recorded image whereby a precise 1:1 record is obtained without refocusing said camera lens.

4,176,949

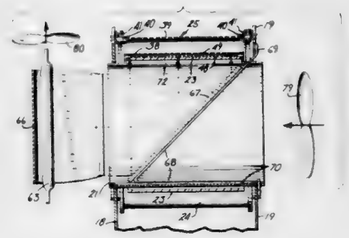
MICROFICHE EXPOSER

Dennis A. Burgess, Minneapolis, Minn., assignor to Burgess Industries, Inc., Minneapolis, Minn.

Filed Aug. 3, 1978, Ser. No. 930,855

Int. Cl.² G03B *27/22*

U.S. Cl. 355—104 **7 Claims**



1. A microfiche exposer comprising:

(a) a housing;

(b) a rotary open-ended tubular drum of transparent material;

(c) means supporting said drum in said housing for rotation on its own axis;

(d) a pair of spaced apart feed rolls journaled within said housing on axes parallel to the axis of said drum;

(e) a flexible belt entrained over said feed rolls and having a

feeding flight between said rolls entrained over a circumferentially extended outer surface portion of said drum for reception of a master film and a sensitized sheet in face-to-face engagement between said outer surface portion of the drum and said feeding flight;

(f) an ultraviolet lamp mounted in said housing axially outwardly of one end of said drum and disposed to direct ultraviolet light axially into said drum;

(g) a mirror;

(h) means mounting said mirror in a stationary position within said drum and disposing said mirror to reflect light from said lamp in a direction radially of said drum toward the interior surface of the area thereof engaged by said belt;

(i) means for imparting film and sheet conveying movement to said belt and rotation to said drum;

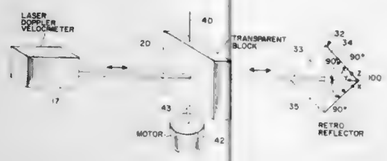
(j) and means for moving a current of cooling air longitudinally through said drum.

4,176,950

LASER DOPPLER VELOCITY SIMULATOR

John M. Franke, Norfolk, Va., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 28, 1978, Ser. No. 929,083
Int. Cl.[2] G01P *3.36;* G01J *1/02*
U.S. Cl. 356—28 **9 Claims**



4. A laser doppler velocity simulator comprising a uniformly refractive transparent block and means to rotate said block to continuously change the optical path length of a laser light beam passing therethrough thereby inducing a doppler frequency shift in the laser light beam.

4,176,951

ROTATING BIREFRINGENT ELLIPSOMETER AND ITS APPLICATION TO PHOTOELASTICIMETRY

André J. Robert, Paris; Claude G. Bourdon, Igny; Nessim C. Msika, Sarcelles; Etienne G. Chorlay, Paris, and Jean-Louis Euzenade, St. Michel sur Orge, all of France, assignors to Etat Francais as represented by the Pelegue General pour l'Armement, Paris, France

Filed Sep. 20, 1977, Ser. No. 835,004
Claims priority, application France, Sep. 23, 1976, 76 28555
Int. Cl.[2] G01J *4/04;* G01L *1/24*
U.S. Cl. 356—33 **21 Claims**

1. An ellipsometer for measuring the polarization parameters α and λ of an elliptically polarized light wave wherein α corresponds to the orientation of the major axis of the ellipse with respect to a reference direction and λ corresponds to the flatness of the ellipse, comprising

an orientable quarter-wave plate having an orientation β,

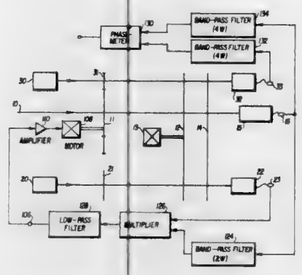
a birefringent plate rotatable at a constant angular speed ω,

a first polarizer,

a first photodetector for receiving said light wave and generating signal components having angular frequencies of 2ω and 4ω, said light wave traversing said quarter-wave plate, said birefringent plate and said polarizer before impinging on said first photodetector,

first and second reference signal generating means for generating signals having angular frequencies of 2ω and 4ω respectively,

synchronous detection means coupled to said first photodetector and to one of said first and second reference signal generating means for synchronously detecting the signal components at the output of said first photodetector, said polarization parameter α being obtained by adjusting said quarter-wave plate until the synchronously detected signal component is reduced to zero, the orientation of said quarter-wave plate then corresponding to α, and,



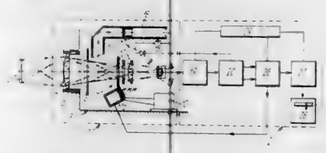
phase measuring means coupled to said first photodetector and said second reference signal generating means for measuring the phase of the component at the output of said first photodetector having an angular frequency of 4ω, said phase corresponding to the polarization parameter λ.

4,176,952

PHOTOELECTRIC PYROMETER FOR MEASURING TEMPERATURE OF BODIES OF SMALL CROSS-SECTIONAL DIMENSIONS WHICH VARY WITH RESPECT TO OPTICAL AXIS OF PYROMETER

Anatoly S. Bezvulyak; Ilya M. Gelfand; Efim M. Torchinsky; Sergei B. Pushkin; Rudolf K. Vedernikov; Gennady P. Kulachenkov, all of Magnitogorsk Chelyabinskoi; Petr F. Tkachuk, Kolomnya Ivano-Frankovskoi, and Viktor F. Karyagin, Magnitogorsk Chelyabinskoi, all of U.S.S.R., assignors to Vsesojuznynauchno-Issledovatelsky Institut Metiznoi Promyshlennosti (Vniimetiz), U.S.S.R.

Filed Mar. 31, 1978, Ser. No. 892,091
Int. Cl.[2] G01J *5/52, 5/62*
U.S. Cl. 356—47 **1 Claim**



1. A photoelectric pyrometer for measuring temperatures of bodies of small cross-sectional dimensions which vary with respect to the optical axis of said pyrometer, comprising:

a housing;

an objective secured movably in said housing, said objective being intended to pass a radiation flux emitted by a heated body and produce an image of said heated body;

a stationary field diaphragm having an aperture and arranged in said housing behind said objective, across the path of said radiation flux, said radiation flux passing through said aperture of said stationary field diaphragm;

a slit obturator having a slit and a leg and arranged in said housing behind said stationary field diaphragm, across the path of said radiation flux, and intended to produce a first train of light pulses as its slit scans the image of the heated body;

an aperture diaphragm having an aperture and arranged in said housing behind said slit obturator, across the path of said first train of light pulses, which light pulses are passed through said aperture of said aperture diaphragm;

a condenser arranged in said housing behind said aperture diaphragm, across the path of said first train of light pulses, said condenser being sighted at said aperture of said stationary field diaphragm and intended to produce a sharp pulsating-illuminance image of said aperture of said stationary field diaphragm in its sharp image plane;

an optical feedback radiation source having an input and intended to emit a luminous flux to be converted by said leg of said obturator into a second train of light pulses;

a photoelectric converter having a light-sensitive surface and an output, and arranged in said sharp image plane of said condenser, said light-sensitive surface receiving said first and second trains of light pulses converting said two trains of light pulses into two trains of trapezoidal electric pulses of a variable duration and on-off ratio;

an amplifier having an input and an output, and connected with its input to said output of said photoelectric converter;

a device for converting said amplified electric pulses into square pulses of a fixed duration and amplitudes equal to the amplitudes of said amplified electric pulses in their middles, said device having an input, a first output and a second output, and being connected with its input to said output of said amplifier;

a storage and comparison device having a first input, a second input, a first output, and a second output, and connected with its first input and second input to said first output and second output, respectively, of said device for converting said amplified electric pulses into square pulses of a fixed duration, said storage and comparison device being electrically coupled with its first output to said input of said optical feedback radiation source;

a secondary recording instrument having an input and electrically coupled with its input to said second output of said storage and comparison device, and intended to indicate the temperature of said heated body.

4,176,953

METHOD AND APPARATUS FOR MEASURING THE MOTILITY OF SPERM CELLS

Benjamin Bartoov, Moshav Chemed; Abraham Mayevsky, Bnei Brak; Shmuel Mendel, Givataim, and Amiram Orén, Ramat Aviv, all of Israel, assignors to SEM Israel Limited, Ramat Gan, Israel

Filed May 22, 1978, Ser. No. 908,531
Int. Cl.[2] G01N *21/26, 21/00*
U.S. Cl. 356—73 **16 Claims**



1. A method of measuring the motility of sperm cells, comprising: introducing a suspension of the sperm cells in a transparent container; continuously examining a predetermined field of said suspension to detect the variations in optical density caused by the collective wave-like motion of batches of the sperm cells through said field; generating an amplitude-modulated analog electrical signal in response to said variations in optical density; and counting the peaks and valleys of said amplitude-modulated analog signal over a predetermined period of time to provide an index of sperm motility.

4,176,954

EQUIPMENT FOR MEASURING THE LENGTH OF DIELECTRIC ELEMENTS TRANSMITTING OPTICAL FREQUENCIES

Rémy A. Bouillie, route de Treguier, and Gérard M. Beauvillain, Residence Corlay, both of Lannion, France (22300)

Continuation of Ser. No. 592,166, Jul. 1, 1975, abandoned. This application Feb. 2, 1978, Ser. No. 874,688
Claims priority, application France, Jul. 26, 1974, 74 25995
Int. Cl.[2] G01N *21/00;* G01B *11/02*
U.S. Cl. 356—73.1 **1 Claim**



1. Equipment for measurement of propagation time for light waves passing through a dielectric element comprising:

a diode laser source of short periodically repeated bursts of light impulses serving as the light waves passing through said dielectric element;

an adjustable electrical pulse generator for generating an adjustable repetition frequency and a current amplifier connecting said generator to said laser source;

a holder for said dielectric element;

an optical separator interposed along the axis of the laser beam of light emitted by said laser source between said source and said holder which divides the light impulses of said laser beam into a first path of light pulses and a second path of light pulses directed into said dielectric element on said holder;

first detecting means in said first path to receive said light pulses not directed into said dielectric element and convert said light pulses into first electric signals;

optical focusing means interposed along the axis of the laser beam of light between the laser source and said optical separator to direct said light pulses of said second path into the inlet side of said dielectric element;

second detecting means receiving the light pulses which emerge from the output side of said dielectric element after being delayed by passing through the dielectric medium of said element which converts the light pulses into second electrical signals; and

display means for said first and second detecting means for displaying successive pulses of said first electrical signals and successive pulses of said second electrical signals in which light impulses of adjustable repetition frequency achieve visual coincidence on the display of a delayed impulse succeeded by a non-delayed impulse.

4,176,955

EXPOSURE METER

Seiji Yamada, Sakai; Ichiro Yoshiyama, Kobe, and Mashio Kitaura, Tondabayashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 28, 1977, Ser. No. 820,034
Claims priority, application Japan, Aug. 4, 1976, 51-93416; Aug. 10, 1976, 51-95500
Int. Cl.[2] G01J *1/42;* G03B *7/08*
U.S. Cl. 356—222 **22 Claims**

1. An exposure meter comprising:

a luminance detection means for detecting the luminance of

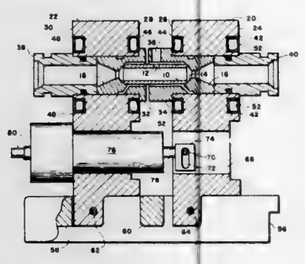
a plurality of portions of an objective scene, and for producing output information corresponding to the luminance of said plurality of portions of said objective scene;
a first memory means connected to said luminance detection means for recording said output information corresponding to the luminance of a first portion of said plurality of portions of said objective scene;
a second memory means connected to said luminance detection means for recording said output information corresponding to the luminance of a second portion of said plurality of portions of said objective scene; and
a display means connected to said first and second memory means for providing a simultaneous comparison display of said output information recorded in said first and second memory means for indicating a luminance range defined between the luminances of said first and second portions of said objective scene.

4,176,956

SAMPLE TUBE MOUNTING STRUCTURE FOR FLAMELESS ATOMIC ABSORPTION SPECTROSCOPY

Toma Tomoff, Überlingen, and Rolf G. A. Tamm, Salem, both of Fed. Rep. of Germany, assignors to Bodenseewerk Perkin-Elmer & Co. GmbH, Überlingen, Fed. Rep. of Germany

Filed Mar. 27, 1978, Ser. No. 890,730
Int. Cl.[2] G01J *3/30*
U.S. Cl. 356—312 **11 Claims**



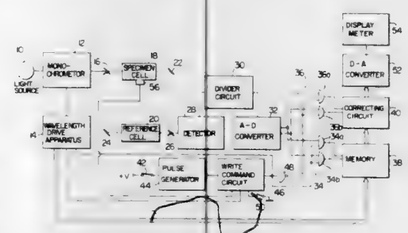
1. In a sample tube mounting structure for flameless atomic absorption spectroscopy, first and second electrode members for supporting the ends of a sample tube and for applying heating current therethrough, first and second cooling jacket housings having coaxial apertures, each for supporting one of the said electrodes, and power actuating means for separating said housings to enable the removal of said sample tube, the improvement comprising:
at least one channel in each of the first and second cooling jacket housings, said channels being in close proximity to the respective electrode supporting aperture; and
a seamless coolant tubing within each said channel in surface to surface heat transfer contact with the corresponding housing and adapted to carry a flow of cooling liquid to cool the corresponding housing and electrode member carried thereby.

4,176,957

METHOD AND APPARATUS FOR OPTICALLY ANALYZING SPECIMEN BY USING TWO LIGHT BEAMS

Yoshio Maeda; Koichi Matsumoto, both of Katsuta; Kenji Fukuda, Mito, and Isao Shindo, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 17, 1977, Ser. No. 760,130
Claims priority, application Japan, Jan. 30, 1976, 51-8518
Int. Cl.[2] G01J *3/42*
U.S. Cl. 356—319 **10 Claims**



1. A method for optically analyzing a speciment by using two light beams, comprising the steps of automatically initiating a wavelength scanning operation of a monochromator after a power source has been turned on and when a predetermined time required to stabilize the operation of the system has elapsed, sampling a signal representative of the ratio between a specimen light intensity and a reference light intensity in the state in which no specimen to be measured is yet disposed at a measuring position during the period of the wavelength scanning and storing the sampled ratio signal in a volatile memory, obtaining a measure signal representative of ratio between the specimen light intensity and said reference light intensity during the wavelength scanning period by means of said monochromator in the state in which said speciment to be measured is disposed at the measuring position, and correcting and processing said measure signal with the signal read out from said volatile memory in accordance with the wavelength of said measure signal.

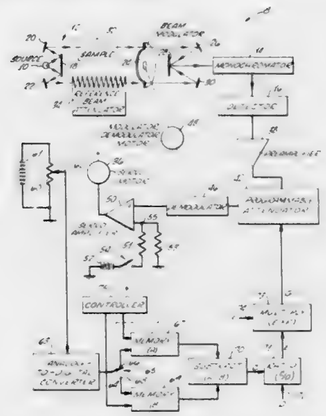
4,176,958

AUTOMATIC LOOP GAIN ADJUSTMENT FOR OPTICAL NULL SPECTROPHOTOMETERS

Allan S. Way, Irvine, and Taylor A. Reid, Costa Mesa, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 24, 1978, Ser. No. 881,082
Int. Cl.[2] G01J *3/42*
U.S. Cl. 356—321 **20 Claims**

1. In a double beam, optical null analyzer of the type including a radiation source, means defining reference and sample beam paths, a variable reference beam attenuator positioned in said reference beam path, drive means for positioning said attenuator in said reference beam path, radiation sensing means responsive to the reference and sample beams in said paths for generating an electrical error signal as a function of the difference therebetween, means for adjusting the gain of said error signal, means coupling said gain adjusted error signal to said attenuator drive means, and means selectively coupling an offset signal to said attenuator drive means to deflect said attenuator, a method for setting said gain adjusting means comprising the steps of:
setting said gain adjusting means to a predetermined initial gain setting;
generating a signal as a function of the position of said attenuator;
determining the difference between said position signal with said offset signal coupled to said drive means and said position signal without said offset signal coupled to said drive means;
determining the ratio of said determined difference to a reference difference, said reference difference being a function of said offset signal;



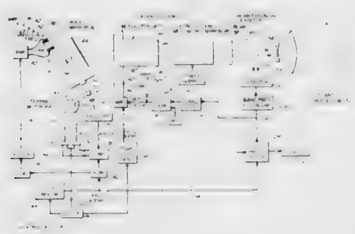
detemining the product of said ratio and said initial gain setting; and
setting the gain of said gain adjusting means to the value of said product.

4,176,959

HIGH GAIN LASER SPECTROMETER

Wayne H. Keene, Medfield; Robert I. Rudko, Holliston, and Charles M. Sonnenschein, Brookline, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Apr. 17, 1978, Ser. No. 897,062
Int. Cl.[2] G01J *3/42*; G01N *21/04*
U.S. Cl. 356—325 **13 Claims**



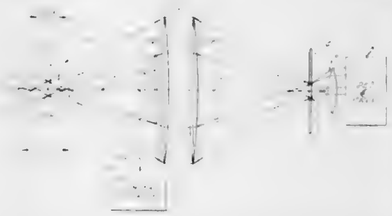
1. A laser spectrometer comprising:
a lasing medium;
first and second reflecting means positioned at opposite ends of said lasing medium, said first reflecting means including interferometer means for selecting a single oscillatory band of a set of oscillatory bands of said lasing medium;
means for directing radiation produced by said lasing medium through a region of space having material to be analyzed, said radiation propagating through said region back to said lasing medium to provide an amplified received radiation signal;
means for altering a frequency of oscillation of said lasing medium prior to the return to said lasing medium of said radiation from said region for maximizing the amplification of said received radiation signal;
means coupled to said first reflecting means to produce a succession of radiations each of which has a specific frequency of oscillation; and
means coupled to said lasing medium for combining data of individual ones of said radiation signals received prior to the entry of said material into said region with data of individual ones of said radiation signals at corresponding frequencies received subsequent to the entry of said material into said region to provide a measure of the concentration of said material.

4,176,960

SPATIAL RESOLUTION ENHANCEMENT IN COAXIAL LIGHT SCATTERING SYSTEMS

Alan C. Eckbreth, Glastonbury, and Jack W. Davis, East Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 624,491, Oct. 21, 1975, abandoned. This application Dec. 9, 1977, Ser. No. 858,937
Int. Cl.[2] G01N *21/22*
U.S. Cl. 356—338 **5 Claims**



1. Coaxial optical apparatus having increased spatial resolution along a desired length L, comprising:
an aperture of diameter A and having an optical axis;
collection means, having a focal length f, disposed on said optical axis on a first side of said aperture and spaced a distance Q therefrom, said collection means collecting light from a sample volume including the image of said aperture spaced along said optical axis a distance P+Q from said aperture and on the opposite side of said collection means therefrom, where $1/f=1/P+1/Q$;
illumination means including a source of radiation for illuminating the sample volume from a point on said optical axis between the sample volume and said collection means in a manner such that backscattering of radiation from the sample volume as result thereof is collected by said collection means;
optically responsive means disposed along said optical axis on a second side of said aperture for detecting and processing backscattered radiation directed from said volume through said aperture by said collection means and
obscuration means consisting of a disk having an effective obscuring diameter equal to $2\ P^2A/QL$ disposed on said optical axis between said aperture and the sample volume for limiting the extent of the sample volume along said optical axis to said desired length L.

4,176,961

METHODS AND APPARATUS FOR IMPROVING THE RESOLUTION OF MEASURED PARAMETERS

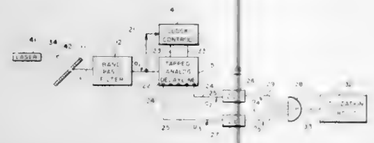
Ralph E. Frazee, Jr., Spotswood Borough, and David H. Smithgall, Sr., East Windsor Township, Mercer County, both of N.J., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Sep. 26, 1977, Ser. No. 836,809
Int. Cl.[2] G01B *9/02*; H03B *19/00*; H03K *5/00*
U.S. Cl. 356—355 **11 Claims**

1. A method of improving the resolution of a measuring system in which the period, T, of a substantially periodic elec-

trical signal is proportional to a measured parameter, the method comprising the steps of:

(a) forming more than two replicas of the periodic electrical signal having a predetermined delay therebetween;



(b) generating a pulse at selected corresponding points of all the replicas of the periodic electrical signal to form a pulse train for each replica; and

(c) interleaving the pulse trains to form a single output pulse train having an interpulse interval that is a fraction of the period T.

4,176,962

METHOD FOR DETERMINING A STRAIGHT LINE INTERSECTING THE AXIS OF AN OPTICAL RADIATION BEAM OF A PHOTOELECTRIC LEVELLING APPARATUS AND ARRANGEMENT FOR EXECUTION OF THIS METHOD

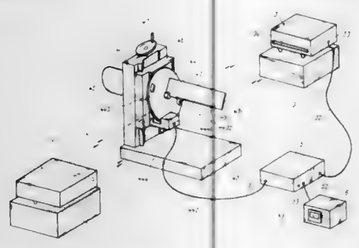
Emil Šípek, and Tomislav Šimeček, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Nov. 2, 1977, Ser. No. 847,750

Claims priority, application Czechoslovakia, Nov. 11, 1976, 7273-76; Nov. 11, 1976, 7274-76; Sep. 21, 1977, 6124-77

Int. Cl.² G01B *11/26*

U.S. Cl. 356—400 **7 Claims**



1. An optical alignment method, comprising the steps of:

transmitting a light beam along a predetermined path to a photodetector;

eccentrically rotating an opaque member without an alignment axis transverse and adjacent to said path, to alternately intercept said light beam from opposite sides thereof;

sensing when said light beam is about to be intercepted from each side thereof;

providing a first signal indicative of the mean value of light transmitted along said path to said photodetector when the opaque member is on one side of said beam, and providing a second signal indicative of the mean value of light transmitted along said path to said photodetector when the opaque member is on the opposite side of the beam;

providing an output signal corresponding to the difference between said mean values; and

moving said alignment axis until the difference between said mean values is zero.

4,176,963

DEVICE FOR DETERMINING THE NITROGEN OXIDE CONCENTRATION IN A GASEOUS MIXTURE

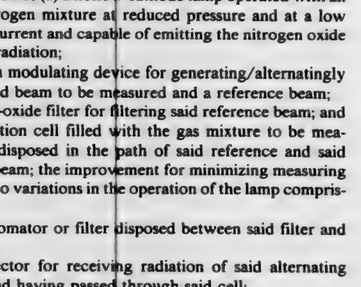
Walter Fabinski, Hattersheim, and Reimar Faulhaber, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hartman & Braun AG., Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 9, 1976, Ser. No. 740,307

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 2553565

Int. Cl.² G01J *3/48;* **G01N** *21/22;* **G01J** *3/46*

U.S. Cl. 356—418 **5 Claims**



1. An apparatus for determining the nitrogen-oxide concentration in a gaseous mixture;

under utilization of (a) a hollow cathode lamp operated with an oxygen-nitrogen mixture at reduced pressure and at a low discharge current and capable of emitting the nitrogen oxide resonance radiation;

(b) a radiation modulating device for generating/alternatingly an unfiltered beam to be measured and a reference beam;

(c) a nitrogen-oxide filter for filtering said reference beam; and

(d) an absorption cell filled with the gas mixture to be measured and disposed in the path of said reference and said unfiltered beam; the improvement for minimizing measuring errors due to variations in the operation of the lamp comprising:

a monochromator or filter disposed between said filter and said cell;

a first detector for receiving radiation of said alternating beams and having passed through said cell;

first signal processing means connected to said detector for acquiring two alternating detector signals corresponding to the unfiltered beam and the reference beam, both having passed through said absorption cell;

a ray splitter disposed in the path of said beams ahead of said cell to provide a second, different beam path but permitting some radiation to reach the first detector;

a second radiation detector disposed in said additional path;

second signal processing means connected to the second detector for acquiring alternately two detector signals corresponding also to the unfiltered beam and the reference beam but which have not passed the absorption cell; and

third signal processing means connected to said first and second signal processing means for arithmetically combining said four detector signals to obtain a signal indicative of absorption by the absorption cell, under elimination of variations in a ratio between unfiltered and reference beam on account of variations in the operation of said lamp.

4,176,964

DETERMINATION OF EXTREME DENSITY VALUES OF A TRANSPORTED STRIP OF PHOTOGRAPHIC ORIGINALS

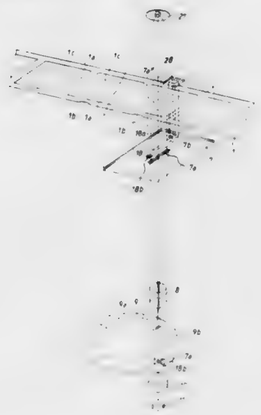
Bernhard Knör; Bernd Payrhammer, and Helmut Treiber, all of Munich, Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Sep. 6, 1977, Ser. No. 830,867

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1976, 2640442

Int. Cl.² G01N *21/30*

U.S. Cl. 356—444 **7 Claims**



1. In an apparatus for determining the extreme density values of successive photographic originals in a strip of photographic originals continuously transported along a predetermined path through a scanning station, in combination, a light source at the scanning station operative for transmitting light through an original located at the scanning station; light-sensing means operative for receiving light transmitted through the original and generating an electrical signal indicative of the intensity of received light; a rotary scanning disk located in the path of light between the light source and the light-sensing means and provided with a plurality of equiangularly distributed radial scanning slots; light-blocking means located in the path of light intermediate the light source and the scanning disk and defining a transverse scanning slot extending transverse to the direction of strip transport; projecting means operative for receiving light transmitted through both the original at the scanning station and the transverse scanning slot and projecting a corresponding slot image onto the surface of the scanning disk, the radial and transverse scanning slots accordingly cooperating during rotation of the scanning disk to define a scanning spot which performs successive line-scan operations each constituted by the movement of one radial scanning slot across the slot image on the surface of the scanning disk, the angular span between adjoining radial scanning slots being greater than the angular span of the slot image projected onto the surface of the scanning disk, thereby establishing interruptions in the transmission of light through the original to the light-sensing means during intermediate time intervals between successive line-scan operations; means operative during the intermediate time intervals for directing onto the light-sensing means reference light from the light source along a reference light path not passing through the strip of originals; and evaluating circuit means receiving both the signal produced by the light-sensing means during the line-scan operations and the signal produced by the light-sensing means during the intermediate time intervals and operative in dependence upon the values of both signals for producing a signal whose value is indicative of the density of the extreme-density scanned spot on the scanned original.

4,176,965

METHOD AND APPARATUS FOR WEIGHING AGGREGATES

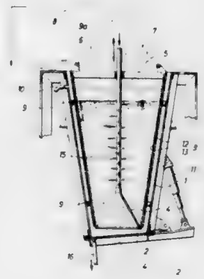
Yasuro Ito; Hideharu Kaga, both of Tokyo; Yasuhiro Yamamoto, Kawasaki; Kenji Kuroha, Tokyo, and Mitsutaka Hayakawa, Kamakura, all of Japan, assignors to Yasuro Ito and Taisei Corporation, both of Tokyo, Japan

Filed Dec. 8, 1977, Ser. No. 858,635

Claims priority, application Japan, Dec. 9, 1976, 51-147180

Int. Cl.² B28C *7/04*

U.S. Cl. 366—8 **24 Claims**



1. A method of preparing aggregate to be utilized to prepare concrete or mortar, comprising the steps of:

loading aggregate in a container;

pouring water into said container to a level to completely immerse said aggregate therein;

weighing aggregate while it is being immersed in said water to determine the volume of the aggregate;

discharging the water from said container; and

removing water remaining in the interstice of said aggregate to adjust said aggregate to at least a capillary state.

4,176,966

MIXING APPARATUS

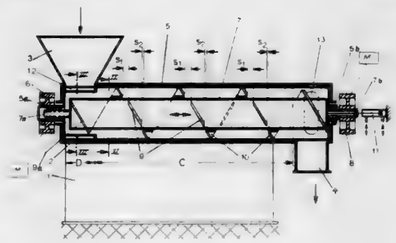
Hans-Joachim Bornemann, Vellmar, Fed. Rep. of Germany, assignor to Thyssen Industrie Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Jul. 3, 1978, Ser. No. 921,261

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1977, 2730283

Int. Cl.² B01F *15/00*

U.S. Cl. 366—78 **5 Claims**



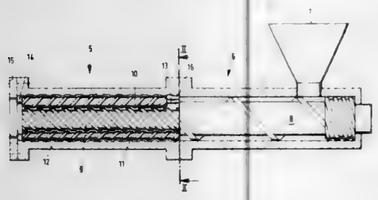
1. A mixing apparatus for continuously preparing thermoplastic synthetic material in pulverous to granular form, which apparatus comprises in combination:

a tubular, rotatable, horizontal container having two ends;
inlet means associated with one of said ends of said container for supplying said material to said container;
outlet means associated with the other one of said ends of said container for the discharge of said material from said container;
a shaft rotatably and concentrically arranged within said container, said shaft extending at least substantially over the entire length of said container and being longitudinally displaceable with respect to said container;
first mixing instruments attached directly to the inner surface of said container and extending radially inwardly up to the outer surface of said shaft; and
second mixing instruments attached directly to said shaft and extending radially outwardly up to the inner surface of said container, said first and second mixing instruments, between said inlet and outlet means, forming a plurality of complementary sections of an at least single-threaded worm particularly having a conveying effect upon said material simultaneously with continuously preparing and mixing the material without any accumulator effect, said sections, in the longitudinal direction of said shaft, being attached alternately to said shaft and to the inner surface of said container, adjacent sections in said longitudinal direction being spaced from one another.

4,176,967
APPARATUS FOR THE PREPARATION OF THERMOPLASTIC MATERIALS

Heinz Brinkmann, Bennigsen, and Horst Spielhoff, Aligse, both of Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hannover Kleefeld, Fed. Rep. of Germany

Filed Jun. 8, 1978, Ser. No. 913,846
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1977, 2726962
Int. Cl.[2] B29B *1/10*
U.S. Cl. 366—83 **5 Claims**

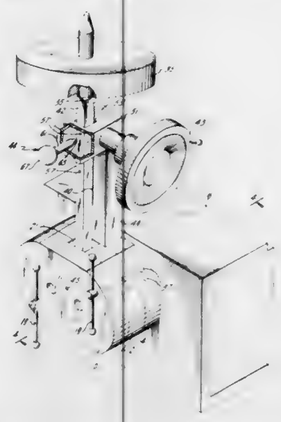


1. Apparatus for the preparation and extrusion of extrudable material in an extruding cylinder, comprising a planet rolling extruder and a feed portion ha ing a feed-screw disposed upstream in said cylinder, said planet rolling extruder including a main shaft and planet shafts surrounding said main shaft, said main shaft being driven jointly with said feed-screw of said feed portion, wherein at least certain of said planet shafts at their ends adjacent said feed-screw are reduced in section to form transfer shaft portions having regions of reduced diameter relative to the root circle of said planet shafts, said regions of reduced diameter forming receiving chambers for material fed to said planet rolling extruder by said feed portion, said receiving chambers avoiding excessive feeding of material to said planet shafts thereby avoiding excessive stress on said plant shafts.

4,176,968
THREE SECTIONED MIXER HAVING INDIVIDUAL THERMAL CONTROLS

Heiner M. Kromer, New York, N.Y., and John Ossman, Clifton, N.J., assignors to Haake, Inc., Saddle Brook, N.J.

Continuation-in-part of Ser. No. 713,627, Aug. 11, 1976, abandoned, which is a continuation-in-part of Ser. No. 710,795, Aug. 2, 1976, Pat. No. 4,033,587. This application Jul. 3, 1978, Ser. No. 921,429
Int. Cl.[2] B29B *1/06*
U.S. Cl. 366—97 **11 Claims**

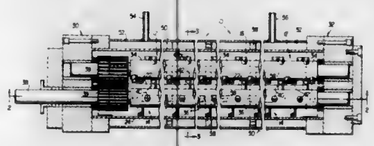


1. An apparatus for preparing and testing material samples, comprising:
a back plate;
a center section having two mixing chambers, each of said mixing chambers having an interior surface with a first angulation sloping down toward said back plate, said center section being releasably secured to said back plate;
a pair of contra-rotating rotors, each rotor having an axial shaft and being axially disposed within one of said mixing chambers, each rotor exhibiting an exterior surface angulation opposite in slope to said first angulation of said mixing chambers; and
a front plate adapted to be releasably secured to said center section,
wherein the counter-rotation of said rotors within said mixing chambers results in the thorough mixing of a flowable sample material within said mixing chambers.

4,176,969
MIXER AND/OR HEAT EXCHANGER DEVICE

Robert A. Wallace, Santa Ana, and J. L. McCurdy, Corona Del Mar, both of Calif., assignors to Polymer Research, Inc., Big Spring, Tex.

Filed Jun. 16, 1978, Ser. No. 916,350
Int. Cl.[2] B01F *7/04, 15/06*
U.S. Cl. 366—149 **8 Claims**



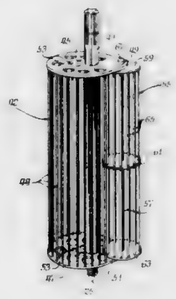
1. A mixer for thoroughly mixing, without any dead space, a flowable composition comprising

(a) first and second parallel, adjacent mixing chambers having cylindrical inner walls each having a diameter D, said cylindrical walls intersecting along the entire length of the mixing chambers to define a common open channel between the chambers, said open channel lying in a plane extending through the intersections between the circumferences of the inner walls of the chambers and corresponding in width substantially to the chordal distance between said intersections;
first and second rotatable carriers extending axially concentrically through said first and second chambers, respectively, the carriers being supported for synchronized rotation about their axes in opposite directions;
(c) a plurality of blades each having a radial free length L mounted upon and extending radially from each carrier along substantially the entire length of each carrier, the blades on each carrier being sequentially and progressively offset circumferentially from each adjacent blade about the periphery of the carrier and each carrier having a maximum diametrical dimension d where it joins the free length of each blade;
(d) each blade on said first carrier lying in the same radial plane as one blade on said second carrier to form a plurality of blade pairs, the blade pairs intermeshing with each other between the carriers when the carriers are oppositely rotated, each blade having a width m extending along the axis of the chamber;
(e) the distance between the axes of the chambers being slightly greater than D minus L, and each assembly of a carrier, its respective blades, and the inner wall of its respective chamber having a dimensional relationship substantially in accordance with the formula: $D=d+2L$, whereby said blades, when in rotation, pass in close proximity to said cylindrical inner walls except when passing through said common open channel, and when passing through said open channel, pass in close proximity to the other carrier; and
(f) inlet and outlet means at opposite ends of the chambers for a composition to be mixed.

4,176,970
DASHER

Philip H. Blaetz, Barrington, Ill., assignor to Kraft, Inc., Glenview, Ill.

Division of Ser. No. 638,291, Dec. 8, 1975, Pat. No. 4,068,832. This application Aug. 29, 1977, Ser. No. 828,512
Int. Cl.[2] B01F *7/02*
U.S. Cl. 366—280 **5 Claims**

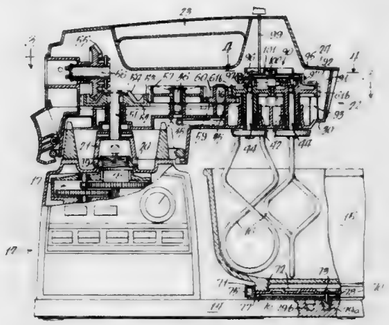


1. In an elongated cylindrical chamber, a dasher for whipping fluid food products passing axially through said chamber, said dasher comprising a drive shaft defining an axis of rotation, a main cage supported on said drive shaft, said main cage comprising a plurality of first frame members spaced axially on said drive shaft and a plurality of first elongated elements supported by said first frame members circumferentially of said drive shaft and extending substantially parallel with each other and with the axis of rotation of said drive shaft, and at least one satellite cage mounted on said main cage for rotation with respect thereto about an axis eccentric to the axis of said drive shaft, said satellite cage including a plurality of spaced second frame members and a plurality of second elongated elements supported by said second frame members and extending substantially parallel with each other and with the axis of rotation of said second satellite cage, said satellite cage being mounted on said main cage such that each of said second elongated elements passes outwardly of an envelope defined by said first elongated elements during rotation of said satellite cage.

4,176,971
MULTI-PURPOSE KITCHEN APPLIANCE

Peter J. Ernster, Glendale; George H. Schaefer, Wauwatosa, both of Wis., and Michael G. Neal, Hixson, Tenn., assignors to Sunbeam Corporation, Chicago, Ill.

Filed Jul. 19, 1978, Ser. No. 925,735
Int. Cl.[2] B01F *7/32*
U.S. Cl. 366—298 **13 Claims**



1. In a multi-purpose kitchen appliance, the combination comprising a power unit, a housing enclosing and supporting a gear train which is driven by said power unit, said gear train including reduction gearing driving a pair of output spindles at speeds having a preselected different ratio to each other, said spindles being mounted in said housing for rotation about parallel spaced axes and having implement receiving bores the axis of each of said bores being coincident with said axes of rotation of said spindles, a mixing element insertable into one of said bores for driving connection with one of said spindles, a mixing element insertable into the other of said bores for driving connection with the other of said spindles, means supporting said housing and a bowl with said mixing elements disposed in said bowl for mixing material therein, said mixing elements being spaced around the periphery of said bowl and both being positioned closely adjacent the wall of said bowl for thorough mixing of said material therein.

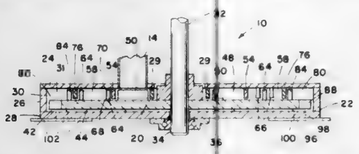
4,176,972
COAXIAL PUMP MIXER

Rodney A. Stiling, Snyder, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Filed Aug. 9, 1978, Ser. No. 932,302
Int. Cl.[2] B01F *7/26*
U.S. Cl. 366—304 **9 Claims**

1. A mixer comprising a rotatably mounted substantially flat circular rotor disk, a fixed housing disposed over said rotor disk having a top wall and a radially outwardly disposed annular wall, said rotor disk, said top wall and said annular wall forming a thin, circular hollow chamber within which ingredients to be mixed are centrifugally propelled radially outward,

a liquid inlet opening in said top wall disposed above a radially innermost first circular zone of said rotor disk, a solids inlet opening in said top wall disposed above a second circular zone of said rotor disk which is radially outward of said innermost zone, a radially outermost third circular zone of said rotor disk over which solids and liquids must pass in order to exit from



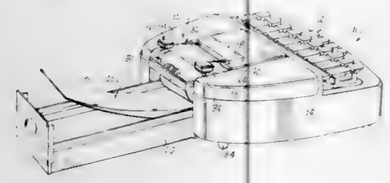
said chamber, a plurality of centrifugal pump impeller vanes on said disk in said first circular zone, an outlet for mixed liquids and solids in the radially outer periphery of said housing and a plurality of teeth on said disk outer periphery disposed between said hollow chamber and said outlet, whereby said mixed liquids and solids must pass between the rotating teeth to get to the said outlet.

4,176,973

STENOTYPE TAPE MARKING ATTACHMENT

Stephen A. Gregory, 13532 Wynant Dr., Westminster, Calif. 92683, and Joseph A. Welzen, 11338 Barbi La., Los Alamitos, Calif. 90720

Filed Jul. 29, 1977, Ser. No. 820,256
Int. Cl.[2] B41J *3/26, 29/00*
U.S. Cl. 400—91 **21 Claims**



1. A tape marking attachment for a stenotype machine comprising:
- a mounting base for attachment to the machine,
- a marking pad,
- a resilient spring wire arm means carrying said marking pad spaced from the mounting base, and
- means hingedly supporting the resilient arm means on the base with the pad in an upward retracted position,
- said arm means comprising a resiliently flexible arm which bends in response to light manual downward pressure on said marking pad into an extended downward marking position.

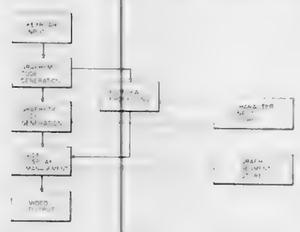
4,176,974

INTERACTIVE VIDEO DISPLAY AND EDITING OF TEXT IN THE ARABIC SCRIPT

Wilson B. Bishai, Stoneham, and John H. McCloskey, Cambridge, both of Mass., assignors to Middle East Software Corporation, Cambridge, Mass.

Filed Mar. 13, 1978, Ser. No. 886,276
Int. Cl.[2] B41J *0/00*
U.S. Cl. 400—111 **3 Claims**

2. A system for mechanical reproduction of Arabic-script letters in a highly acceptable esthetic manner conforming to the traditional norms and conventions of that script, specifically in the matter of producing cursive output, comprising in combination: a keyboard having a key for the basic form of each of the Arabic letters in the Arabic alphabet, a first storage means associated with said keyboard for storing upon activation of any key, a graphemically coded representation of the basic letter corresponding to said key, means for converting said graphemic representation into a fuller graphetic coded representation wherein the context-conditioned graphic variation of Arabic letters is recognized, a second storage device containing the appropriate digitized graphic output element or elements corresponding to each of the graphetic coded repre-



sentations, a video medium, and means for progressively and continuously displaying each new output element on said video medium including means for modifying as necessary all previously displayed output elements to conform them to a state of calligraphic correctness on the assumption that the new output element is terminal and means for then displaying said new output element on said medium as though it were terminal.

4,176,975

METALLOID FILAMENT WIRE MATRIX PRINT HEAD

Wentzle R. DeBoskey, and Robert A. Sebrosky, both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,627
Int. Cl.[2] B41J *3/10*; C01B *35/02, 31/04*
U.S. Cl. 400—124 **3 Claims**



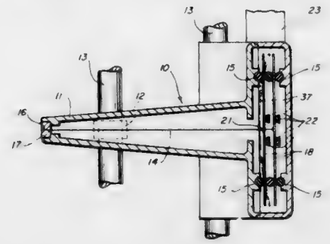
1. An improved dot matrix printer apparatus having at least one print wire means for impacting a medium to form a mark, at least one electromagnetic print wire driver operably connected with said print wire means for axially reciprocating the same to impact said medium wherein said improvement comprises:
- said print wire means being at least one continuous unitary filament of elemental metalloid material boron.

4,176,976

MOSAIC PRINTING HEAD

Josef Lendl, Ottensoos, Fed. Rep. of Germany, assignor to Triumph Werke Nurnberg A.G., Nuremberg, Fed. Rep. of Germany

Filed Mar. 16, 1978, Ser. No. 887,023
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1977, 2716618
Int. Cl.[2] B41J *3/12*; H01L *41/04*
U.S. Cl. 400—124 **5 Claims**



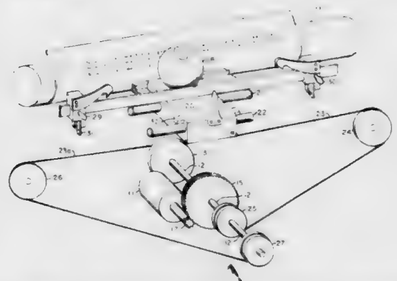
1. In a mosaic printing head for use in forming a printed pattern on a record carrier, the combination comprising:
- a housing having a bore in a first end thereof,
- a plurality of elongated strip shaped piezoelectric driving elements mounted in a second end of said housing, said piezoelectric driving elements exhibiting flexure upon application of an excitation signal thereto,
- mounting means for said driving elements, said mounting means being fixed relative to said housing and contacting said elements on spaced nodal points thereof, and
- an array of printing members supported in said housing and extending from said first end to said second end, each of said printing members being attached to a middle portion of one of said driving elements between the spaced nodal points thereof.

4,176,977

PROPORTIONAL CARRIER CONTROL AND MOVING MECHANISM FOR ELECTRIC TYPEWRITER

Francis H. Shepard, Jr., Summit, N.J., assignor to Realty & Industrial Corporation, Morristown, N.J.

Filed Mar. 8, 1978, Ser. No. 884,560
Int. Cl.[2] B41J *19/58*
U.S. Cl. 400—320 **9 Claims**



1. A carrier control arrangement for an electric typewriter having a printing element mounted on a linearly movable carrier the movement of which is proportional to the angle of rotation of a carrier drive shaft, the direction of said movement corresponding to the direction of rotation of said drive shaft, said arrangement comprising:
- an encoding disk rotationally coupled to said drive shaft;
- first and second stationary pulse generating sensors coupled to said disk for generating first and second pulses corresponding to predetermined incremental rotational movements of said disk, each of said pulses having a given duty cycle when said carrier moves at a constant velocity;
- a logic circuit responsive to said pulses for generating third and fourth control pulses corresponding to predetermined clockwise and counterclockwise incremental rotational movements of said disk respectively;
- a distributor circuit responsive to said third and fourth pulses and to carrier stepping pulses for generating a first directional count pulse for each one of said stepping pulses provided thereto and for each one of said control pulses provided thereto corresponding to a direction of rotation of said shaft to advance said carrier in a given direction, said distributor circuit generating a second directional count pulse for each one of said control pulses provided thereto corresponding to a direction of rotation of said shaft to return said carrier in the opposite direction;
- a bidirectional digital counter for counting in one direction in response to said first directional count pulses and counting in the opposite direction in response to said second directional count pulses, the output of said counter being set to a predetermined value in response to a carrier returned signal;
- a digital-analog converter for generating an analog signal corresponding to the output of said counter;
- an amplifier for generating a motor drive signal in response to said analog signal; and
- a motor for rotating said drive shaft and disk in response to said motor drive signal, so that said carrier is caused to move a predetermined incremental linear distance in said given direction in response to each of said stepping pulses, and to return in the opposite direction in response to a carrier return signal.

4,176,978

PENCIL SHEATH AND COMPOSITION THEREFOR

Jan Ružicka, No. 630 Marxova; Jindřich Lorenz, No. 678 Sídliste, both of Kralupy n/Vlt.; Vladimir Marek, No. 3 Komenskeho, and Miroslav Tusl, No. 10 Komenskeho, both of Ceske Budejovice, all of Czechoslovakia

Continuation-in-part of Ser. No. 871,947, Jan. 24, 1978, abandoned. This application Jan. 9, 1979, Ser. No. 2,104
Claims priority, application Czechoslovakia, Jan. 26, 1977, 51588/77
Int. Cl.[2] C08J *9/06*
U.S. Cl. 401—96 **4 Claims**

1. A composition, particularly adapted for sheaths of graphite and similar rods in the manufacture of pencils, comprising in combination:
- 100 parts of polyvinylaromatic plastic,
- 1 to 9.5 parts of polyethylene,
- a component selected from group A consisting of the following compounds:

A	{	1 to 30 parts of polypropylene, 1 to 30 parts of polyvinylchloride, 1 to 30 parts of polyvinylacetate.

- 1 to 30 parts of a combination of at least two of said compounds of group A,
- 1 to 20 parts of talc,
- 5 to 50 parts of glass fibers,
- 0.3 to 2.0 parts of a foaming agent with a decomposition temperature between 170° and 240° C., and
- a component selected from group B consisting of the following compounds:
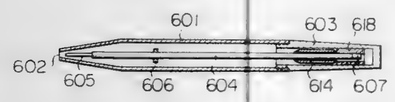
B	{	0.3 to 2.0 parts by weight of a foaming agent with a decomposition temperature between 100 and 160° C., 1 to 20 parts by weight of foamable polymer of

-continued

anethylenic unsaturated monomer.

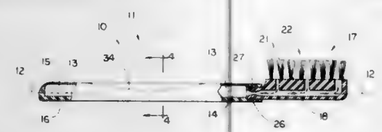
said 1 to 20 parts by weight of foamable polymer of an ethylenic unsaturated monomer containing from 0.3 to 2.0 parts by weight of a foaming agent with a decomposition temperature between 100° and 160° C.,
all parts being weight.

4,176,979
BALL-POINT PEN
Yasushi Saida, 20-24, Tsurumaki 5-chome, Setagaya-ku, Tokyo, Japan (154)
Filed Oct. 31, 1977, Ser. No. 846,825
Int. Cl.[2] B43K *7/12, 24/04, 21/04*
U.S. Cl. 401—100 **1 Claim**



1. A ball-point pen comprising an ink tube having a ball-point at one end, a lid of a magnetizable material at the other end and a projection intermediate said ends, an outer case for housing therein said ink tube and comprising a holder part and a cap part, a weight slidably mounted on the outer surface of the ink tube, a tubular magnet carried by said outer case and defining at an end thereof nearest the ball-point a generally radial step for engaging said lid of the ink tube when said ball-point is extended out of an opening of the holder part to exert mechanical and magnetic locking forces on said lid to hold said ball-point in the extended position, said tubular magnet receiving said lid therein when said ball-point is retracted inside the holder for magnetically attracting and holding said lid to retain the ball-point in the retracted position, said weight being slidable toward said lid when the pen is inverted to release said lid from engagement with said step.

4,176,980
DISPOSABLE TOOTHBRUSH AND DENTIFRICE COMBINATION
Chester L. O'Neal, 101 S. Locust, Greencastle, Ind. 46135, and Danny C. O'Neal, 1652 Lorraine Dr., Corona, Calif. 91720
Filed Dec. 2, 1977, Ser. No. 857,008
Int. Cl.[2] A46B *11/02*
U.S. Cl. 401—162 **3 Claims**

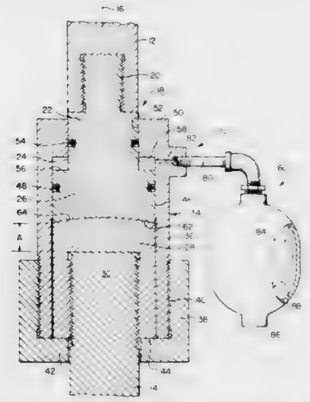


1. A disposable toothbrush dentifrice combination comprising:
(a) an elongated handle having a central axis and an elongated cavity offset from the central axis therein, the offset cavity containing an amount of dentifrice material and defining a thin-walled portion and a thick-walled portion in said handle, said thick-walled portion located closer to said axis than said thin-walled portion;
(b) a head having an inner elongated cavity through which said axis extends and a plurality of bristles defining a brushing surface thereon, said head further including a plurality of outlet openings in the brushing surface connected to the inner cavity therein;
(c) means for attaching said head to said handle and for connecting the inner cavity in said head with the offset cavity in said handle; and wherein:
(d) said thin-walled portion in said handle is movable toward said thick-walled portion along the entire length of said handle to force the dentifrice material into the cavity in said head and out through the outlet openings in the brushing surface, the thick-walled portion in said handle being generally rigid and not compressible;
(e) the inner cavity in said head includes a constricted passage with opposite flared ends through which said axis extends and wherein said dentifrice material flows through said constricted passage at a higher velocity and a lower pressure than at either of said flared ends when said thin-walled portion is moved toward said thick-walled portion, one of said opposite flared ends opens directly into said offset cavity;
said handle is one integral piece of a resilient thermoplastic material, said means for compressing and for forcing comprising means for compressing the resilient thin-walled portion in said handle within its elastic limit a sufficient amount to collapse the offset cavity in said handle, and said handle includes air intake means for allowing air to flow into the offset cavity in said handle after the thin-walled portion thereof has been compressed;
said air intake means includes an aperture through which said axis extends with said aperture in said handle opening into the offset cavity therein; and an inner flap hingedly attached inside the cavity and positioned to cover the inner opening of said aperture, said hinged flap being responsive to close said aperture when the resilient thin-walled portion in said handle is compressed, said hinged flap being responsive to open said aperture and allow air to enter the offset cavity after the compressing and while the resilient thin-walled portion returns to its original configuration;
the outlet openings in the brushing surface on said head vary in size, the outlet openings nearer said handle being increasingly smaller than the openings more distant therefrom.

4,176,981
DEVICE FOR COUPLING A PAIR OF RODS
Robert L. Clapper, Pittsburgh, Pa.; E. Frederick Schoneweis, Kearny, Nebr.; Andrew Hankosky, and Earl A. Bake, both of Pittsburgh, Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.
Filed Mar. 6, 1978, Ser. No. 884,088
Int. Cl.[2] F16B *37/00;* **F16L** *15/00*
U.S. Cl. 403—31 **2 Claims**

1. A device for operably coupling a first rod to a second rod having a common axis and being capable of movement along said axis for transmitting force therebetween, said device comprising:
an extension of said first rod having an intermediate portion with an exterior surface which is parallel with said axis and an end portion extending radially from said exterior surface to define a piston member;
a cylinder member mounted at an end of said second rod and including a cylindrical wall that extends by said piston member for sliding, sealed contact therebetween, said cylinder member having an end thereof remote from said second rod which includes an opening therethrough;
said intermediate portion of said extension being received within said opening for sliding, sealed contact between said exterior surface and an interior surface of said opening;
said extension of said first rod and said cylinder member having mating surfaces thereon transverse to said axis for engagement therebetween to establish a maximum axial distance between said first rod and said second rod;

a chamber within said cylinder member defined by said cylindrical wall, said end of said cylinder member, said exterior surface and a first side of said piston member;
said piston member having a second side capable of engaging a contacting surface on structure within the cylinder member located at a predetermined distance from said end of said second rod to establish a minimum axial distance between said first rod and said second rod;
an accumulator connected to said cylinder member with an interior thereof communicating with said chamber;



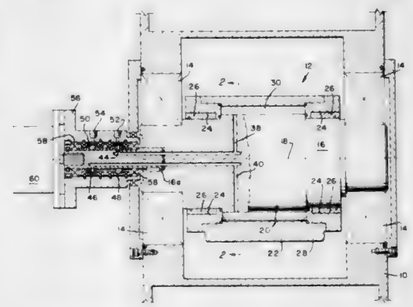
said accumulator including gas at a precharged pressure acting on hydraulic fluid therein which said fluid communicates with and fills said chamber; and
said hydraulic fluid in said chamber biasing said first rod toward said second rod and limiting tensile force being transmitted from said first rod to said second rod when a relative distance therebetween is less than said maximum axial distance and greater than said minimum axial distance.

4,176,982
BICYCLE PATH TRANSPORT SYSTEM
James W. Boswell, 9610 Deering Ave., Livonia, Mich. 48150
Filed Oct. 31, 1977, Ser. No. 847,405
Int. Cl.[2] E01C *5/00*
U.S. Cl. 404—34 **8 Claims**



1. A bicycle path transport system of indefinite length mounted on a berm or similar supporting surface, comprising a plurality of pairs of flexible rails connected end-to-end and supported in spaced parallel relationship on said berm or similar supporting surface, each rail having a groove extending longitudinally of the rail in the inner side wall thereof facing the opposite parallel rail, a plurality of flexible runners connected end-to-end and extending lengthwise in the space between said pairs of rails to provide a smooth continuous surface therebetween for bicycle travel, the outer edges of said runners being retained in the grooves of the adjacent rails so that the runners span the space between the parallel rails, said rails and said runners being flexible to a degree sufficient to allow flexing of the rails and runners to accommodate contours in the berm or similar supporting surface, certain of said runners being curved in a horizontal plane to provide curves in the path when initially installing the system, and shim members positioned between said rails and the berm or similar supporting surface for supporting said rails at desired elevations so that the runners can be curved to either side, sloped up or down and tilted at any angle on the supporting surface.

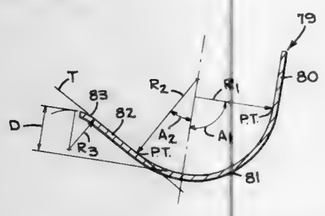
4,176,983
VARIABLE ECCENTRIC DEVICE
James F. Gardner, Cranbury, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed Jul. 17, 1978, Ser. No. 924,921
Int. Cl.[2] E01L *19/38*
U.S. Cl. 404—117 **14 Claims**



4. A variable eccentric device, for a vibratory mechanism for an earth compactor, or other device, comprising:
first means defining a shaft having a rotary axis;
said shaft having a mass which is eccentric to said axis;
second means defining an annular sleeve in envelopment of said mass and an axial portion of said shaft;
said sleeve having a weighted portion which is eccentric to said axis;
said shaft and said sleeve being coupled together for relative rotary motion thereof between a first relative positioning, in which said mass and said weighted portion are juxtaposed in radial alignment, and a second relative positioning, in which said mass and said weighted portion are diametrically opposed; and
means coupled to one of said first and second means operative for effecting said relative rotary motion of said shaft and said sleeve; wherein
said motion-effecting means comprises means for addressing motive, pressured fluid to a sleeve-enveloped surface of said shaft and to a shaft-enveloping surface of said sleeve;
said shaft has a rib projecting radially therefrom which rotatably and slidably engages said surface of said sleeve;
said sleeve has a rib projecting radially therefrom which rotatably and slidably engages said surface of said shaft;
said ribs are substantially closed upon each other during said second relative positioning of said shaft and said sleeve,

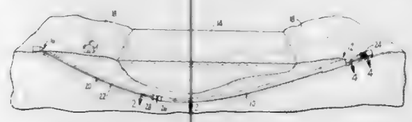
and substantially diametrically opposite each other during said first relative positioning of said shaft and said sleeve;
said fluid-addressing means comprises means for introducing pressured fluid between said ribs to cause said ribs to close upon, and move apart from, each other;
said eccentric mass is defined by a radial sector of said shaft which, relative to said rotary axis, comprises a greatest radius;
said shaft rib projects from the midpoint of said sector; and
said fluid-addressing means includes a first fluid conduit formed in said shaft and opening, at one end thereof, through a first port formed in a surface of said shaft in immediate adjacency to said shaft rib.

4,176,984
FISH HOLDING PAN ON TRAVELING WATER SCREEN AND METHOD OF FLUSHING SAME
Richard J. Sommers, New Britain, Pa., assignor to FMC Corporation, San Jose, Calif.
Filed Sep. 26, 1977, Ser. No. 836,929
Int. Cl.[2] F02B 8/08
U.S. Cl. 405—81 **5 Claims**



1. An elongated pan for dipping water and aquatic life from a body of water, said pan being adapted to be flushed by water flowing laterally through the pan for gently removing aquatic life therefrom, said pan having a curved bottom portion with inner and outer sides projecting upwardly therefrom and a discharge lip located at the top of the outer side, said discharge lip extending horizontally in a direction lengthwise of the pan to provide a uniform level over which water is discharged from the pan, said pan having a smoothly curved interior surface profile taken on a transverse section through the pan with the inner and outer sides being tangential to the curved bottom portion, said outer side and said discharge lip having an upward and outward inclination that does not exceed the slope of an extended tangent line from the point of tangency between the outer side and the curved bottom portion, whereby spray water directed against the inner side is deflected downward to flow smoothly about the curved bottom portion and then to flow upward and outward over the outer side and the discharge lip without any further transitional increase in slope, said pan interior surface profile on a transverse section across the discharge lip being curved from the outer side in a direction reverse to the curved bottom portion, said pan interior surface profile on a transverse section across the curved bottom portion being defined by compound curves having arcs totaling 120°, said curved bottom portion being defined by a first curve section that is tangent to the inner side, said first curve section having a radius of 2 inches with a central angle of 90°; and a second curve section continuing from the first curve section, said second curve section having a radius of 2½ inches with a central angle of 30°.

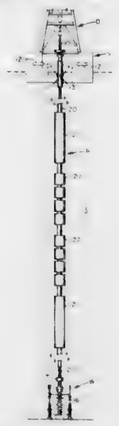
4,176,985
SYSTEM AND METHOD FOR INSTALLING PRODUCTION CASINGS
Martin D. Cherrington, Carmichael, Calif., assignor to Reading and Bates Construction Co., Houston, Tex.
Continuation-in-part of Ser. No. 595,830, Jul. 14, 1975, Pat. No. 4,043,136. This application Nov. 10, 1976, Ser. No. 740,570
Int. Cl.[2] F16L 1/04
U.S. Cl. 405—184 **7 Claims**



1. A method for emplacing a casing beneath an obstacle between first and second locations at or near to ground level comprising the steps of:
excavating a liquid-occupied passageway having a preselected diameter along an invert arcuate path under said obstacle between said locations; introducing a casing of lesser diameter than said passageway along said passageway thereby defining a region between said casing and said passageway; introducing through a supply conduit within said casing a transport fluid at the site of said excavating; entraining the cuttings from said excavating in the transport fluid; non-rotatably advancing said casing into and along the arcuate path of said passageway; sealing the outer circumference of said casing and the circumscribing ground from the interior of said casing to form a sealed-off annulus; withdrawing said transport fluid and entrained cuttings from the site of said excavating to prevent said cuttings from settling in the ground circumscribing the advancing casing; causing said transport fluid and entrained cuttings to flow through a return conduit within said casing; sealing off the interior of said casing proximate the site of said excavating to provide buoyancy to the casing within the passageway; and selecting the weight and size of said supply and return conduits passing through the interior of said casing so that the weight of said conduits and their respective contents substantially neutralizes said buoyancy to minimize friction between the casing and the sidewalls of the passageway to facilitate advancement of said casing into the passageway.

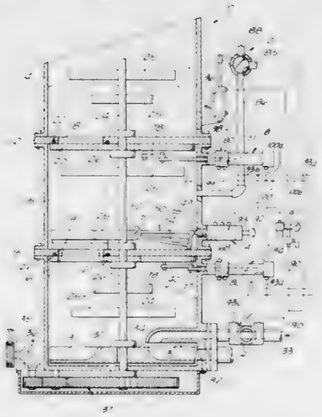
4,176,986
SUBSEA RISER AND FLOTATION MEANS THEREFOR
Daniel G. Taft, and Joe K. Heilhecker, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.
Filed Nov. 3, 1977, Ser. No. 848,170
Int. Cl.[2] E21B 7/12
U.S. Cl. 405—211 **22 Claims**

1. A buoyancy can for use on a self-standing riser at subsea depths having a slip joint in the upper portion thereof, said buoyancy can comprising:
(a) a housing defining a buoyancy chamber adapted to receive a compressed gas, said housing having a port formed in an upper portion thereof providing fluid communication between said buoyancy chamber and the exterior of said housing, said port having a flow area of sufficient size to enable venting of compressed gas from said chamber upon disconnection of said riser before the buoyancy of said can extends said slip joint to its upper limit;
(b) a fail-safe valve member positioned within said housing, said valve member having a biasing means to bias said valve to a first position wherein said port is open and said valve being movable to a second position wherein said port is closed, said valve member in the open position permitting the equalization of pressure between said chamber and ambient pressure opposite said port; and



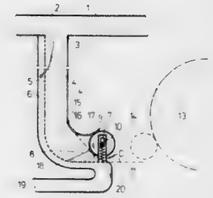
(c) a closing means capable of moving said valve to said second position, said closing means becoming inoperable upon disconnection of said riser to enable said biasing means to move said valve to said first position.

4,176,987
FLUENT MATERIAL HANDLING APPARATUS
Frank A. Reed, deceased, late of South El Monte, Calif., and by Paul M. Diemert, executor, 23 Woodsbluff Run, Fogelsville, Pa. 18051, assignors to Paul M. Diemert, Fogelsville, Pa.
Filed Mar. 13, 1978, Ser. No. 885,621
Int. Cl.[2] B65G 53/40
U.S. Cl. 406—10 **22 Claims**



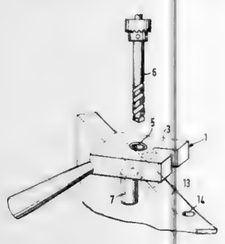
1. Pneumatically operated fluent material feeding apparatus comprising:
(a) first, second and third chambers arranged in a vertical stack and separated from one another by first and second pneumatically operable valves said first chamber being uppermost and vented to the atmosphere and said second and third chambers including means normally maintaining the same charged with pressurized air;
(b) said third chamber being lowermost and equipped with pneumatically powered means for discharging a pressurized stream of fluent material and air therefrom;
(c) non-electrical fluent material level sensing means in said second chamber;
(d) normally closed pneumatically-operable air vent means for said second chamber; and
(e) pressurized air flow control means responsive to said level sensing means when the material in said second chamber reaches a predetermined low level to close said second valve, interrupt the supply of pressurized air to said second chamber, open said air vent means and open said first valve in predetermined order and in out-of-phase sequence thereby to recharge said second chamber with fluent material from said first chamber while continuing to discharge a pressurized stream of fluent material and air from said third chamber.

4,176,988
APPARATUS FOR SEPARATING OPENED FIBRE FLOCKS FROM A TRANSPORTING AIR STREAM
Werner Lattmann, Winterthur, and Paul Stäheli, Wilen b. Wil, both of Switzerland, assignors to Rieter Machine Works Ltd., Winterthur, Switzerland
Filed Jul. 10, 1978, Ser. No. 922,815
Claims priority, application Switzerland, Jul. 18, 1977, 8849/77
Int. Cl.[2] B65G 53/60
U.S. Cl. 406—171 **6 Claims**



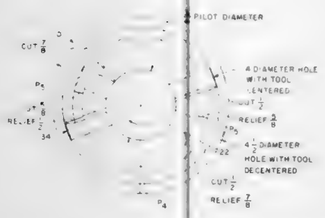
1. An apparatus for separating opened fibre flocks from a transporting air-stream, moving through a transporting duct, comprising:
at least one chute operatively connected with the transporting duct;
an exhaust duct cooperating with said chute;
said chute being provided with at least one air-permeable separating wall for guiding transporting air into said exhaust duct;
said chute having a lower end region;
a driven take-off device arranged at said lower end region of said chute comprising a take-off roll arranged facing said air-permeable separating wall and leaving free a small cross-section through which pass the deposited fibres;
said take-off device forming a fibre layer by compressing said deposited fibres between said take-off roll and said air-permeable separating wall;
said exhaust duct extending at least into a zone of smallest clearance between the take-off roll and said air-permeable separating wall;
said chute containing a further wall; and
means for sealing the take-off roll with respect to said further wall.

4,176,989
AUXILIARY DEVICE FOR BORING OF DOWEL HOLES IN BOARDS
Robert Wolff, im Kiesacker, Engeln, Fed. Rep. of Germany
Filed Aug. 17, 1978, Ser. No. 934,411
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1977, 2750868; Feb. 27, 1978, 2808277
Int. Cl.[2] B23B *49/02, 47/28*
U.S. Cl. 408—115 R 9 Claims



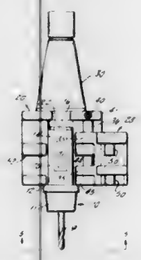
1. An auxiliary device for the boring of dowel holes in boards that are to be doweled together comprising:
a flat plate having a centrally located guide hole lined by means of a bore bushing for receiving a boring tool;
said plate provided on one of its flat sides with two round projecting vertical pegs which are disposed diametrically opposite to and at equal distances from said guide hole;
the space between said vertically projecting pegs forming a dowel scanning part having a flat board contacting surface lying on the surface of said plate;
an elongated slit at a front edge of said plate having an inside width equal to that of the guide hole; and
said slit having longitudinal walls which lie in two planes which are oriented both in parallel to one axial plane of said guide hole and perpendicular to the board-contacting surface of the dowel scanning part.

4,176,990
BORING TOOL
Russell D. Gover, Sr., 97 Wise Ave., Baltimore, Md. 21212
Filed Apr. 14, 1978, Ser. No. 896,483
Int. Cl.[2] B23B *51/00, 29/034*
U.S. Cl. 408—189 7 Claims



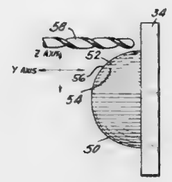
1. In a boring tool rotatable by a holder about an axis of rotation, the boring tool having a substantially flat bottom with an outboard cutting edge and an inboard cutting edge having asymmetrical spacings along a portion of said substantially flat bottom for cutting respectively contiguous paths in work to be bored, the improvement comprising: in combination: the boring tool being elongate transverse to said axis of rotation, the axis of rotation passing through the boring tool between the ends thereof, the outboard cutting edge and the inboard cutting edge being respectively on opposite ends of the boring tool relative to said axis of rotation, the asymmetrical spacing including the outboard cutting edge having greater spacing from said axis of rotation than the inboard cutting edge spacing, and the inboard cutting edge having a length which is greater than the outboard cutting edge length.

4,176,991
HINGED TOOL HOLDER
Henry O. Egli, Riverside Dr., Sidney, N.Y. 13838
Filed Mar. 23, 1978, Ser. No. 889,234
Int. Cl.[2] B23B *31/10*
U.S. Cl. 408—239 R 2 Claims



1. In a machine having an operating spindle, a clamp carried by said spindle for supporting a tool co-axially with said spindle;
said clamp having a main body secured to said spindle;
a recess in said main body co-axial with said spindle;
said main body having one section defining said recess and another section comprising a gate hingedly mounted on one side of said main body and rotatable at the side of said main body in a plane normal to said recess to close said recess;
means on the other side of said main body for locking said gate in place; and
a tool having an extension receivable in said recess by movement of said extension in a direction normal to the axis of said recess when said gate is open;
means for positioning said extension axially in said recess; and
means for securing said extension in said recess;
said means for securing said extension in said recess comprising a lock screw in said gate extendable into said recess and a flat section on said extension against which said lock screw may bear;
the means for positioning said extension axially in said recess comprising a member extending into said recess from a wall of one of said extension and recess and a corresponding opening in the other of said extension and recess for receiving said member;
said hinged mounting of said gate comprising a pin carried by said main body parallel to the axis of said recess; said gate having a plurality of openings rotatable and slidable on said pin; and
the side of the gate opposite said hinged mounting having a plurality of pins extending parallel to the axis of said recess and the corresponding side of the housing having a plurality of openings adapted to slidably receive said pins on movement of said gate in a direction parallel to the axis of said recess and to lock said gate.

4,176,992
NUMERICALLY CONTROLLED MILLING WITH PARABOLIC PROFILE TOOLS FOR SURFACE SMOOTHNESS
Joseph A. Ross, Fort Salonga, and Howard K. Stern, Greenlawn, both of N.Y., assignors to Solid Photography Inc., Melville, N.Y.
Filed May 31, 1977, Ser. No. 801,818
Int. Cl.[2] B23C *1/00, 5/02*
U.S. Cl. 409—131 1 Claim



1. A method for machining a surface comprising the steps of: establishing points within a first plane on said surface; establishing points within at least a second plane on said surface, said second plane being parallel to said first plane and spaced therefrom by an increment; establishing the desired slopes to be machined on said surface between said planes; positioning a cutting tool with a predetermined cutting surface against said surface so that the periphery of the tool in contact with said surface has substantially the same slope as said desired slope to be machined; applying relative displacement in increments between said cutting tool and material to be machined to remove surface material between said planes with a preselected part of the cutting tool corresponding to the desired slope at each point; and moving thereafter said tool perpendicular to said plane by a predetermined increment corresponding substantially to said space for further machining the surface within a space between said second plane and a third parallel plane using parts of the cutting tool with slopes corresponding to the desired slopes on said surface between said second and third planes; said cutting tool storing cutting surfaces with varied slopes, said slopes being selectable to substantially conform to said desired slope to be machined, said tool being selectively positioned for locating the cutting surface conforming to the desired slope against the surface to be machined within said increment between said planes; said slopes extending over an area dependent in size on the displacement increments of the tool in movement between said planes and dependent on the displacement increments perpendicular to said planes and wherein said steps of applying relative displacement and moving said tool by a predetermined increment are repeated for machining a surface of predetermined size, said cutting tool having a parabolic profile, said profile being comprised of straight-line cutting surfaces interconnected to form said parabolic profile, the slopes on said cutting tool varying in value from zero to infinity, said cutting tool having an axis of rotation and a free end, said cutting tool having cutting edges with slopes varying in value from substantially infinity at said free end of said tool to zero at a predetermined distance along said axis of rotation from the end of said tool, said tool and said material being displaced with respect to a reference position for applying said relative displacement between said cutting tool and said material to be machined.

4,176,993
APPARATUS FOR FORMING STACKS OF FLAT OBJECTS
Pierre Luginbühl, Neuhausen am Rheinfall, Switzerland, assignor to S I G Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland
Filed Feb. 8, 1978, Ser. No. 876,148
Claims priority, application Switzerland, Feb. 11, 1977, 1697/77
Int. Cl.[2] B65G *57/00*
U.S. Cl. 414—106 8 Claims



8. In apparatus for forming stacks of flat objects, including a toothed wheel to which juxtaposed objects are fed while traveling on an at least approximately horizontal input path, and between the teeth of which the objects are accommodated and are then moved to the area of a stacking station by way of rotation of the toothed wheel, the improvement wherein said toothed wheel is composed of two toothed discs spaced apart along the axis of said wheel and each provided with circumferentially spaced teeth defining object retaining pockets between successive teeth, a given spacing existing between successive pockets along the circumference of said wheel, and said apparatus further comprises plunger means operatively associated with said wheel for pushing each object arriving at the end of the input path into a respective pocket when such pocket is situated at the top of said toothed wheel and for braking the next following object on the input path to synchronize the introduction of objects with the rotation of said wheel, said wheel being driven in continuous rotation and objects being supplied continuously thereto during operation of said apparatus, and wherein said plunger means include a member having an L-shaped profile composed of an at least approximately horizontal arm for injecting each object into a respective pocket, and an at least approximately vertical arm, said member being movable in a manner such that the corner point of said profile traverses a complete cycle of a path defined by a closed curve during each rotation of said wheel by an amount equal to the given spacing between successive pockets, while the leading narrow side of the object following that being injected into a pocket abuts on the face of the vertical arm of said member.

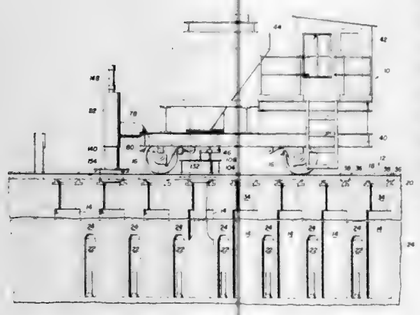
4,176,994
COKE OVEN CHARGING APPARATUS
William H. Sangster, Collinsville, Ill., assignor to National Steel Corporation, Pittsburgh, Pa.
Filed Jan. 30, 1978, Ser. No. 873,365
Int. Cl.[2] B66C *17/08;* C10B *31/04*
U.S. Cl. 414—163 36 Claims

1. Coupling means comprising,
a generally vertically extending pipe having an open bottom end,
a generally horizontal wall spaced below the open bottom end of the pipe,
an opening in the generally horizontal wall, said opening having a circular top peripheral rim portion,
seal means having an open center and including an annular upwardly directed substantially planar surface, and a downwardly and inwardly inclined substantially spherical annular sealing surface for engaging and making sealing contact with said top peripheral rim,
elongated substantially cylindrical sleeve means for cooper-

ating with said seal means to establish a closed communication path between said open bottom end of the generally vertically extending pipe and said opening in the generally horizontal wall, said sleeve having an open bottom end disposed in a plane extending at right angles to the longitudinal axis of the sleeve and adapted to engage the upwardly directed planar surface of the seal means around its full periphery to form a seal with said upwardly directed planar surface,

mounting means supporting the sleeve means for coaxial telescoping movement along the pipe between a raised position spaced above the seal means and a lowered position in which its open bottom end projects below the open bottom end of the generally vertically extending pipe to engage and form a seal with said substantially planar surface on the seal means, said mounting means including power means operable to move the sleeve between the lowered and raised positions, and

collapsible linkage means connected between the sleeve means and the seal means for supporting the seal means in suspended coaxial relation with and spaced beneath the



open bottom end of the sleeve means and with the spherical sealing surface spaced above the generally horizontal wall when the sleeve means is in the raised position, the collapsible linkage means permitting limited lateral movement of the seal means relative to the sleeve means, the length of the collapsible linkage means and the extent of movement of the sleeve means between the raised and lowered positions being such that, when the sleeve means is moved from the raised to the lowered position, the spherical sealing surface engages said top peripheral rim portion of the opening in the generally horizontal wall before the sleeve means reaches the lowered position with the linkage means thereafter collapsing to permit further downward movement of the sleeve means to the lowered position in which the open bottom end of the sleeve means rests upon and forms a substantially gas-tight seal with the upwardly directed planar surface of the seal means around the full periphery of the sleeve means despite limited axial misalignment between the sleeve means and the seal means and despite limited displacement of said circular top peripheral rim portion from the horizontal.

4,176,995

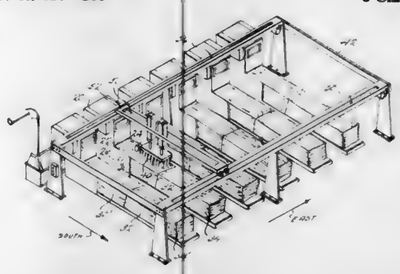
AUTOMATIC PICKUP AND UNLOADING CRANE

Cecil S. Wise, Dallas, N.C., assignor to Fiber Controls Corporation, Gastonia, N.C.

Continuation of Ser. No. 615,092, Sep. 19, 1975, abandoned, which is a continuation of Ser. No. 526,919, Nov. 25, 1974, abandoned, which is a continuation of Ser. No. 295,356, Oct. 5, 1972, abandoned. This application Nov. 30, 1976, Ser. No. 746,014

Int. Cl.[2] **B65G** *47/00;* **B66C** *17/00*

U.S. Cl. 414—266 **6 Claims**



1. In a control circuit for operating an overhead crane mounted on a frame for movement vertically and in horizontal directions to pick up material from one of a number of sources, transport that material and permit it to drop onto one of a number of given locations from which the material is removed, there being at each said location means for sensing the level of material at each of said locations and providing a demand signal when that level is less than a predetermined level, the improvement in means for automatically causing said crane to move to supply material to each of said locations having a sensing means providing a demand signal so that each location is supplied with material from a plurality of sources, comprising:

a plurality of electric motors including a north motor for moving the crane in a first horizontal direction, a south motor for moving the crane in a second horizontal direction opposite to said first direction, an east motor for moving the crane in a third horizontal direction transverse to said first and second directions, a west motor for moving the crane in a fourth direction opposite to said third direction, an up motor for raising said crane, a down motor for lowering said crane, a close motor for causing a quantity of said material to be picked up and an open motor for causing a quantity of said material to be released

west means connected to said sensing means for completing a current path through said west motor whenever any one of said sensing means is producing a demand signal so that said crane is moved in said fourth direction, and for interrupting the current path through said west motor when said crane is in line with a given location having a sensing means producing a demand signal,

means for completing a current path through said north motor when said current path through said west motor is interrupted so that said crane moves in said first direction,

indicating means having an output condition indicating from which source material is to be picked up,

north means for interrupting the current path through said north motor when said crane is over the source indicated by said indicating means and completing a current path through said down motor,

down sensing means for sensing when said crane has moved down to a position for picking up material and providing a down signal,

down means connected to said down sensing means for interrupting the current path through said down motor when said down sensing means provides said down signal,

and for completing a current path through said close motor,

close means for interrupting the current path through said close motor when said material is held and completing a current path through said up motor,

up means for interrupting the current path through said up motor when said crane is up and completing a current path through said south motor so that said crane moves in said second direction,

south means for interrupting the current path through said south motor when said crane is over the given location and completing a current path through said open motor,

open means for interrupting the current path through said open motor after the picked material has fallen at the given location,

first recycle means for recompleting a current path through said north motor to repeat the above until said indicating means indicates enough material has been picked up from said indicated source for said given location and released by said open means at said given location,

second recycle means for recompleting a current path through said west motor to cause said crane to move in said fourth direction until said crane is in line with another given location having a sensing means producing a demand signal, and

east means for completing a current path through said east motor to cause said crane to move in said third direction, when said crane has moved past all of said given locations, back to the initial position,

wherein said west means includes:

a plurality of normally open sensing switches connected in parallel and serially with said west motor, each switch being respectively associated with a sensing means and shifting to a closed position when the associated sensing means is producing a demand signal,

a normally open east limit switch serially connected with said plurality of sensing switches,

a west relay connected to said west motor having first and second controlled switches,

a second plurality of serially connected sensing switches which are each normally closed and respectively associated with a sensing means and shifting to an open position when the associated sensing means is producing a demand signal, and

a plurality of normally closed serially connected position switches connected in parallel with said second plurality of serially connected sensing switches and opening respectively when the crane is in line with an associated given location,

said west motor being connected in series with said first controlled switch and therethrough to said second plurality of sensing switches.

4,176,996

AUTOMATIC POSITIONING SYSTEM FOR A CARRIAGE IN A STORAGE AND RETRIEVAL SYSTEM

Nobuyuki Oku, Osaka, Japan, assignor to Itoki Kosakusho Co., Ltd., Osaka, Japan

Filed Dec. 29, 1977, Ser. No. 865,694

Claims priority, application Japan, Dec. 29, 1976, 51-159639

Int. Cl.[2] **B65G** *1/04*

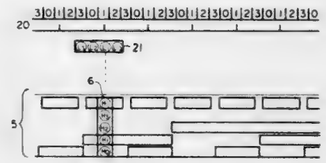
U.S. Cl. 414—273 **8 Claims**

1. An automatic positioning system for a commodity carriage in an automatic storage system, comprising, shelves arranged to have commodity storage positions extending in the vertical and horizontal direction,

a commodity carriage adopted to move up and down and right and left along a front face of the shelves,

vertical position code marks and horizontal position code marks identifying said storage positions, said code marks arranged within the movable range of the carriage, a code scanning device included within the carriage for reading said position code marks,

a control circuit responsive to an output of said code scanning devices for controlling the operation of the carriage and for stopping the carriage at a position facing a designated storage position, said position code marks identifying N storage positions in either the vertical or horizontal direction as one group of storage spaces, wherein N is a natural number larger than 1 but much less than the total number of storage positions extending in either the vertical or horizontal direction, each group of N storage spaces including a reference mark at a predetermined position within the N storage spaces,



N mark scanning devices for detecting the N marks are installed on the carriage to correspond to N spaces of storing positions face to face, the detecting circuit is built into the above-mentioned first control circuit to detect which one of the N pieces of mark detective devices has output, and the feature controlling the movement of the carriage to receive output from the mark detective device corresponding to the designated storing position.

4,176,997

BULK-STORAGE RECEPTACLE WITH HELICAL CHUTE

Paul Hungerbach, Essen-Bredeney, Fed. Rep. of Germany, assignor to Thyssen Schachtbau GmbH, Muhlheim, Fed. Rep. of Germany

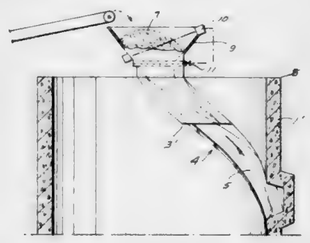
Division of Ser. No. 775,403, Mar. 7, 1977. This application Dec. 19, 1977, Ser. No. 862,125

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1976, 7607102; Mar. 9, 1976, 7607103; Mar. 10, 1976, 2609797

The portion of the term of this patent subsequent to Sep. 5, 1995, has been disclaimed.

Int. Cl.[2] **B65G** *11/06*

U.S. Cl. 414—299 **12 Claims**



1. A bulk-storage receptacle comprising:

a structure formed with an upright wall defining a storage chamber for flowable bulk material;

means forming a helical chute opening toward said chamber and spiraling downwardly along said wall, said helical chute having a ramp receiving said material and extending generally transversely to said wall while being formed with a first tangential inclination and a first radial inclination; and

means for feeding bulk material to said helical chute, said wall and said chute being constituted of panels mounted in mutually contiguous relationship, each of said panels having an elastic inner layer, an adhesive layer applied to

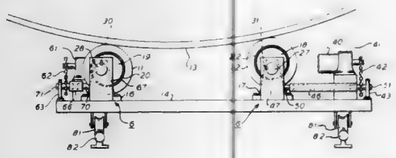
said inner layer for anchoring the panels to said wall and a wear-resistant outer layer adapted to define the chamber for receiving said material.

4,176,998

FIT-UP TURNING ROLL SYSTEM

John H. Wittenrich, Freedom, N.Y., assignor to Airco, Inc., Montvale, N.J.

Filed Feb. 21, 1978, Ser. No. 878,838
Int. Cl.[2] B65G 7/00
U.S. Cl. 414—433 **6 Claims**



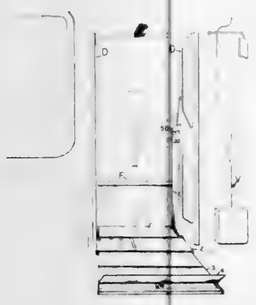
1. In apparatus for positioning a first substantially cylindrical workpiece in alignment with a second workpiece, comprising: a base, at least two substantially parallel idler rolls and corresponding shafts being mounted upon the base for supporting said first workpiece, the improvement which comprises means for mounting each roll for free rotation about an eccentric axis of the corresponding shaft, and motor means for individually rotating each said shaft to cause the axis of the corresponding roll to be rotated about the axis of the shaft to enable horizontal and vertical repositioning of said first workpiece.

4,176,999

WHEELCHAIR LIFT

Graham R. Thorley, San Diego, Calif., assignor to Transportation, Design & Technology, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 769,636, Feb. 2, 1977, Pat. No. 4,081,091. This application Mar. 13, 1978, Ser. No. 885,714
Int. Cl.[2] B60P 1/46
U.S. Cl. 414—540 **8 Claims**



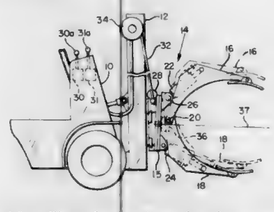
1. In the doorway of a vehicle, a wheelchair lift which in its slowed position forms the normal entrance steps comprising:
- a multisectional load carrying platform which comprises:
  - at least three continguous sections
  - means for articulately connecting each section to at least one other section
  - means for moving the platform between ground level and vehicle floor level;
  - means for rotating at least one section to a substantially vertical position, and for placing at least one other section continguous to said rotatable section into a substantially horizontal position whereby said vertically and horizontally positioned sections form a step structure,
- wherein one of said sections comprises:
  - a first flat element forming substantially one half of said section, having its edge nearest to the center of said section and parallel to other sections slidingly interlocking with a second flat element;
  - the second flat element forming substantially the second half of said section, having an edge slidingly interlocking with said edge of the first flat element; and
  - means for slidingly moving the first flat element in a common plane and in relation to the second flat element, whereby the width of the section is modified.

4,177,000

ROTATABLE LOAD CLAMP ADAPTED FOR SELECTIVE LOAD POSITIONING IN RESPONSE TO SELECTIVE ROTATIONAL POSITIONING OF CLAMP

Harry F. Weinert, Portland; Larry D. McCart, Lake Oswego, and David J. Weisgerber, Gresham, all of Oreg., assignors to Cascade Corporation, Portland, Oreg.

Filed Mar. 22, 1978, Ser. No. 888,925
Int. Cl.[2] B66C 1/42
U.S. Cl. 414—620 **3 Claims**



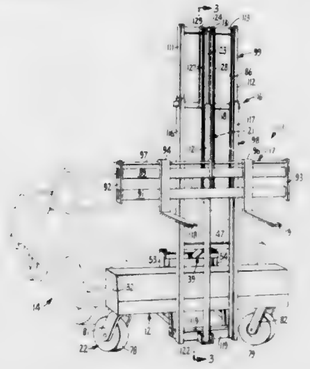
1. A load-handling clamp adapted to be mounted upon the lifting apparatus at the forward end of a lift truck for engaging a load, comprising:
- (a) a frame adapted to be mounted upon said lifting apparatus so as to be selectively movable vertically by said lifting apparatus;
- (b) rotating means for rotating said frame with respect to said lifting apparatus about a generally forwardly-extending axis of rotation;
- (c) first and second selectively openable and closeable opposing clamp arms mounted upon said frame projecting therefrom in a forward direction, each of said clamp arms having a forward end and a rear end respectively;
- (d) powered mounting means movably connected said clamp arms to one another and to said frame including a first fluid motor for selectively opening and closing said clamp arms and a second fluid motor for selectively moving said clamp arms in unison generally perpendicular to said axis of rotation between a position of equal extension, wherein the forward ends of said clamp arms are spaced apart from one another by a predetermined distance and extend a substantially equal distance forwardly of said frame, and a position of unequal extension wherein the forward ends of said clamp arms are spaced apart from one another by said predetermined distance and the forward end of one clamp arm extends a greater distance forwardly of said frame than the forward end of the other clamp arm, said powered mounting means including rotation-responsive fluid valve means responsive to the rotational position of said frame and operatively connected to said first and second fluid motors respectively for permitting the selective operation of said first fluid motor while simultaneously preventing the operation of said second fluid motor at a first rotational position of said frame where said clamp arms are substantially one above the other and at a second rotational position of said frame where said clamp arms are substantially side-by-side horizontally and, alternatively, permitting selective operation of said second fluid motor while simultaneously preventing the operation of said first fluid motor at intermediate rotational positions of said frame which are between said first and second rotational positions; and
- (e) a fluid line interconnecting said first fluid motor with said rotation-responsive fluid valve means for conducting fluid to said first motor tending to open said clamp arms, and pilot-operated valve means connected to said first fluid motor for sensing pressure in said fluid line and preventing the opening of said clamp arms whenever the pressure of fluid in said fluid line is below a predetermined pressure, further including bypass means interconnecting said fluid line with said rotation-responsive fluid valve means for relieving the pressure of fluid in said fluid line, as sensed by said pilot-operated valve means, so as to prevent said pressure from reaching said predetermined pressure whenever said frame is in one of said intermediate rotational positions and for preventing the relief of the pressure of fluid in said fluid line through said bypass means whenever said frame is in either said first or second rotational position.

4,177,001

FORKLIFT ATTACHMENT FOR HIGHWAY VEHICLES

William A. Blackwood, 2966 Boeing Rd., Shingle Springs, Calif. 95682

Filed Aug. 5, 1977, Ser. No. 822,193
Int. Cl.[2] B66F 9/20
U.S. Cl. 414—628 **27 Claims**



1. A forklift attachment for lifting and transporting cargo with highway vehicles, comprising
- a frame,
- attachment means adapted for connecting said frame to the front end of a road vehicle for movement therewith,
- a vertically telescoping mast carried upright on said frame,
- fork means mounted for upward and downward movement along said upright mast and having forwardly projecting cargo support members,
- power means for effecting said upward and downward movement of said fork means,
- and wheel means mounted on said frame and formed for supporting the weight of said frame and fork means and cargo supported on said members during both lifting and transport.

4,177,002

COOPERATIVE DRIVE ROBOT

Kenro Motoda, Tokyo, and Kensuke Hasegawa, Yokohama, both of Japan, assignors to Motoda Denshi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1978, Ser. No. 888,148
Claims priority, application Japan, Jun. 8, 1977, 52/67592; Jun. 13, 1977, 52/69677; Dec. 8, 1977, 52/147665
Int. Cl.[2] B25J 3/00; B66C 23/00
U.S. Cl. 414—751 **9 Claims**



1. A cooperative drive robot arrangement for moving a load to a desired position, said robot arrangement comprising:
- a main robot including a load holding section, means for actively moving said holding section in opposite substantially rectilinear directions, and means for enabling said moving means to be passively moved in directions parallel to a plane transverse to said rectilinear directions, said main robot being free of means for actively moving said moving means or said holding section in directions parallel to said plane;
- at least one sub robot including a guide device within said plane, and a drive device mounted on said guide device for active movement therealong in directions within said plane, said drive device being prevented from movement relative to said guide device in said rectilinear directions; and
- connecting means for flexibly connecting said holding section to said drive device such that said holding section is actively moved by said drive device in directions parallel to said plane, thereby enabling said moving means of said main robot to be passively moved in directions parallel to said plane, and such that said holding section is passively movable with respect to said drive device in said rectilinear directions upon active movement of said holding section in said rectilinear directions by said moving means of said main robot.

4,177,003

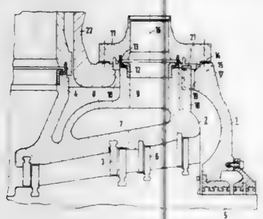
INSTALLATION FOR CENTERING THE INNER HOUSING OF A STEAM TURBINE

Axel Remberg, and Willi Triesch, both of Mülheim, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Aug. 8, 1977, Ser. No. 822,797
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1976, 2635980
Int. Cl.[2] F01D 25/26
U.S. Cl. 415—108 **4 Claims**

1. Installation for centering, in an outer housing, an inner housing of a steam turbine having an extraction interstage comprising a tubular shaped portion formed on the inner housing and communicating with the extraction interstage, the outer housing having a wall formed with a passageway wherein said tubular shaped portion is received, an extraction connecting pipe disposed on the outer housing over said passageway thereof, said extraction connecting pipe having sealing surfaces engaging with corresponding sealing surfaces

formed on said wall of the outer housing, the mutually engaging sealing surfaces being disposed eccentrically to said passageway and to said tubular shaped portion, said tubular shaped portion having a projection with lateral flanks extending therefrom and engaging with clearance in a corresponding lateral recess formed in said wall of the outer housing, and key means disposed in the clearance between said lateral flanks of said projection and said wall of the outer housing for centering the inner housing in the outer housing.

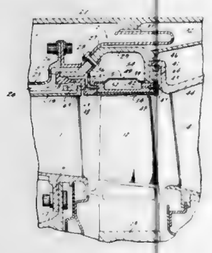


4,177,004

COMBINED TURBINE SHROUD AND VANE SUPPORT STRUCTURE

Charles F. Riedmiller, Greenhills, and Melvin Bobo, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 31, 1977, Ser. No. 846,958
Int. Cl.² F02C *7/12, 7/20*
U.S. Cl. 415—116 **8 Claims**



1. In a turbomachine support structure of the type extending radially inward to provide radial support for the forward end of a turbine shroud and axial support for a vane outer band, an improved support arrangement comprising:

(a) a shroud for placement in close radial relationship with a row of turbine blades;

(b) a shroud support segment interconnecting said shroud and a surrounding support element, said support element having a forward flange extending independently forward from the point where said shroud support segment connects to said shroud support element;

(c) a ring disposed between the vane outer band and said support element, said ring comprising an axial leg with its front end abutting said forward flange and a radial leg integrally attached to and extending radially inward from the rear end of said axial leg to frictionally engage and provide axial support to the vane outer band; and

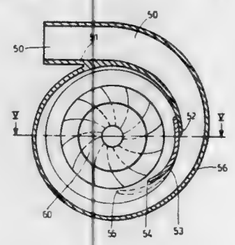
(d) means for introducing cooling air in the space partially defined by said ring and said shroud segment wherein said means comprises a plurality of circumferentially spaced holes formed in said ring for conducting the flow of cooling air therethrough.

4,177,005

VARIABLE-THROAT SPIRAL DUCT SYSTEM FOR ROTARY STREAM-FLOW MACHINES

Hans-Günther Bozung, Neusäss-Westheim, and Hans Mendle, Augsburg, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft (M.A.N.), Augsburg, Fed. Rep. of Germany

Continuation of Ser. No. 720,735, Sep. 7, 1976, abandoned. This application Jul. 19, 1978, Ser. No. 926,021
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1975, 2539711
Int. Cl.² F01D *9/00, 17/12*
U.S. Cl. 415—128 **5 Claims**



1. A variable-throat spiral duct system for a stream-flow machine in which shaft motion is coupled to flow of a gas or liquid, comprising:

a machine having an axial shaft and a rotor carrying thereon means for engaging a flow medium;

at least one spiral duct leading spirally inwards to said rotor and having a radially outer wall and also a radially inner wall of less circumferential length than said radially outer wall;

a tongue-bearing insert member (11) rotatably and coaxially mounted in the structure of said machine and formed as part of a tubular pipe forming part of the flow path of said medium on the axially and functionally opposite side of said machine from said spiral duct system;

at least one tongue affixed to said insert member and thereby mounted slidably and snugly adjacent to the extremity of said inner wall and having a free end portion of spiral curvature and another portion having a surface of circular curvature, said inner wall extremity having a matching inwardfacing surface portion of circular curvature, and being tapered towards its circumferential extremity in the vicinity of said tongue, such a tongue (7,8) being provided for the inner wall (5,6) extremity of each said spiral duct (1,2), and

means for so shifting each said tongue, by moving said tongue-bearing member, as to provide a variable extension of said inner wall(s) and thereby to reduce the throat cross-section of the duct between the tongue and said radially outer wall of the duct.

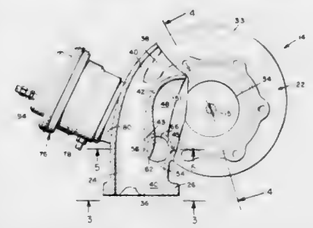
4,177,006

TURBOCHARGER CONTROL

James H. Nancarrow, Torrance, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Sep. 29, 1977, Ser. No. 837,799
Int. Cl.² F01D *17/14, 17/18*
U.S. Cl. 415—151 **36 Claims**

1. A turbocharger comprising a compressor; and a fluid driven turbine drivingly coupled to said compressor, said turbine including a turbine housing having a fluid inlet portion and a generally scroll-shaped portion, a radially inwardly extending meridonal septum dividing said inlet and scroll-shaped portions into a pair of axially displaced primary fluid flow paths, wall means formed integrally with said turbine housing for closing a portion of the radially inner boundary of said primary paths and for defining a radially inwardly open secondary flow path in communication with said primary paths, and valve means disposed along the secondary flow path and controllably movable between a first position opening said secondary path to allow fluid flow through both said primary and secondary paths, and a second position substantially closing said secondary path to fluid flow.

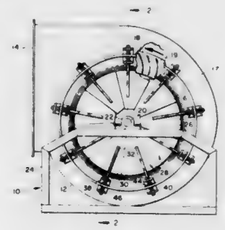


4,177,007

CENTRIFUGAL BLOWER CONTROL APPARATUS

Andrew J. Schlangen, La Crescent, Minn.; Jerry W. McClead, La Crosse, and Thomas A. Garavalia, Stoddard, both of Wis., assignors to The Trane Company, La Crosse, Wis.

Filed Jan. 25, 1978, Ser. No. 872,136
Int. Cl.² F01D *17/14*
U.S. Cl. 415—160 **25 Claims**



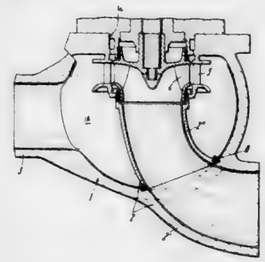
1. A centrifugal blower apparatus including a centrifugal blower housing having an outlet opening and a side wall having an inlet opening; a centrifugal blower wheel disposed in said housing and mounted for rotation about an axis extending axially outwardly through said inlet opening; a plurality of radially outwardly extending inlet guide vanes disposed about said axis at said inlet opening each having a radially outer edge; and pivot means, including a pivot at each of said vanes, for pivotally adjusting a major portion of each of said vanes between a fully closed position disposed in an area axially inwardly of said side wall and a fully open position disposed axially outwardly of said side wall.

4,177,008

CENTRIFUGAL PUMP

Dusan Florjancic, Winterthur, Switzerland, and Heinz-Bernd Matthias, Frankenthal, Fed. Rep. of Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Fed. Rep. of Germany

Continuation of Ser. No. 622,017, Oct. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 436,689, Jan. 25, 1974, abandoned. This application Jan. 4, 1978, Ser. No. 866,933
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1973, 2303718
Int. Cl.² F04D *29/42*
U.S. Cl. 415—206 **9 Claims**



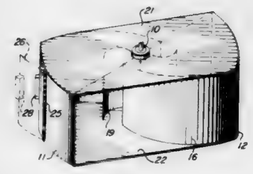
1. In a centrifugal pump, particularly in a primary recirculating pump for use in pressurized water and boiling water nuclear reactors, a combination comprising a substantially spherical hollow pump housing having a sealable opening; an impeller rotatable in said housing; an inlet having an outer section which is rigid with said housing and inclined with respect to the axis of said impeller and which has a discharge port for inflowing fluid, and a discrete inner section installed in said housing to receive inflowing fluid from said discharge port of said outer section and to convey the fluid into the range of said impeller, said inner section comprising a plurality of axially adjacent communicating tubular portions, said impeller and said inner section of said inlet being removable from said housing by way of said opening; and an outlet for conveying pressurized fluid from said housing, the plane of said discharge port of said outer section of said inlet being at least closely adjacent to said outlet.

4,177,009

ROTOR ASSEMBLY

Joseph W. Baum, Sr., Rte. #1, Box 250, Scottsdale, Ariz. 85257, and Dave A. Timothy, 2340 E. University Dr., Tempe, Ariz. 85281

Continuation of Ser. No. 749,771, Dec. 13, 1976, abandoned. This application Apr. 5, 1978, Ser. No. 893,800
Int. Cl.² F03D *3/02, 7/06*
U.S. Cl. 416—45 **12 Claims**



1. A rotor assembly including in combination:

a rotatable shaft;

first and second curved side rotor plate members each formed as a section of a cylinder having a radius R1, said

plate members each being concentrically located a distance R1 from the axis of said shaft on diametrically opposite sides of said rotatable shaft, each of said first and second rotor plate members having first and second edges parallel to said shaft;

third and fourth rotor plate members each formed as identical concave elongated sections and each attached respectively to the diametrically opposite first edges of said first and second rotor plate members at a distance R1 from the axis of said shaft to form discontinuities of curvature in the form of apexes along the lines of attachments thereof, said third and fourth rotor plate members curving toward said shaft and terminating in respective edges thereof parallel to said shaft, spaced less than the distance R1 from the axis of said shaft, and equidistant from a plane defined by the diametrically opposite second edges of said first and second side rotor plate members; and

first and second end plate members attached to said first, second, third and fourth rotor plate members and located in spaced parallel planes perpendicular to the axis of said shaft to form end walls for said rotor assembly.

4,177,010

COOLED ROTOR BLADE FOR A GAS TURBINE ENGINE

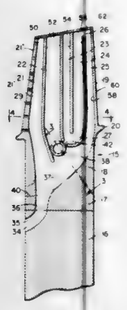
Terence M. Greaves, Kilburn, and Robert D. Summers, Long Eaton, both of England, assignors to Rolls-Royce Limited, London, England

Filed Mar. 22, 1978, Ser. No. 888,972

Claims priority, application United Kingdom, Jan. 4, 1977, 13808/77

Int. Cl.[2] F01D *5/18*

U.S. Cl. 416—97 R **6 Claims**



1. A cooled rotor blade for a gas turbine engine comprising:

an integrally cast hollow aerofoil portion, hollow shank portion, and root portion, said aerofoil portion having a leading edge, a trailing edge, and convex and concave flanks, said aerofoil portion further having a plurality of chordal-spaced and spanwise partitions extending between the convex and concave flanks from adjacent its tip portion and terminating in and/or adjacent the hollow interior of said shank portion, a hollow bush extending transversely through said shank portion and having at least one end open to the exterior of the shank portion for receiving a cooling fluid, said hollow bush engaging at least two adjacent partitions to define at least one cooling passage separate from at least another cooling passage which communicates with the hollow interior of said shank portion, said bush having an aperture in its wall opening to a space between the at least two partitions for supplying cooling fluid to the said at least one cooling passage, and a cooling fluid entry aperture in at least one of said root portion and said shank portion communicating with the hollow interior of said shank portion, said last-mentioned cooling fluid entry aperture supplying cooling fluid to the hollow interior of said shank portion and then to the said at least another cooling passage.

4,177,011

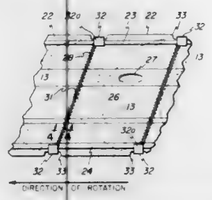
BAR FOR SEALING THE GAP BETWEEN ADJACENT SHROUD PLATES IN LIQUID-COOLED GAS TURBINE

John H. Eskesen, and Herman M. Leibowitz, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 21, 1976, Ser. No. 678,950

Int. Cl.[2] F01D *9/04*

U.S. Cl. 416—191 **5 Claims**



1. In an elastic fluid-utilizing apparatus wherein are mounted a rotor member rotatable about a central axis, an annular row of vanes mounted on said rotor member, a shroud plate segment affixed to each of said vanes, said shroud plate segments having adjacent end faces spaced apart and defining longitudinally extending gaps therebetween, flow discharge means interconnecting each of said vanes and the radially outer surface of the shroud plate segment affixed thereto to provide for the passage of fluid discharged from said vanes to the region radially outward of said shroud plate segments, said region being defined in part by rib portions extending along each side of each shroud plate segment, the improvement comprising:

each of said adjacent end faces of said shroud plate segments having a chamfer extending longitudinally along the radially inner edge thereof as a planar surface, each pair of adjacent chamfered portions defining a straight longitudinally-extending recess,

a single longitudinally-extending sealing bar disposed in and along each such recess by means of holding means rigidly affixed to each end of said sealing bar, each holding means having a tab portion overlying the radially outer surfaces of a pair of adjacent shroud plates whereby each sealing bar can move only a limited distance in the radially inward direction and is moved into contact with the juxtaposed chamfered portions when subjected to sufficient centrifugal force.

4,177,012

FAN BLADE WITH BENDS FORMING GENERAL BLADE CURVATURE

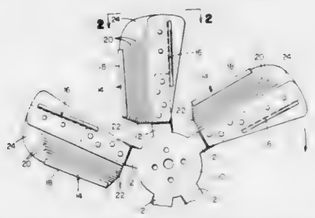
Herbert N. Charles, Chatham, Canada, assignor to Fram Corporation, East Providence, R.I.

Filed Mar. 15, 1978, Ser. No. 886,678

Int. Cl.[2] F04D *29/38*

U.S. Cl. 416—132 A **6 Claims**

1. An automotive cooling fan comprising a plurality of generally radially extending fan blades of flexible, resilient blade material secured to arms of a fan spider projecting radially from a hub, said blades fastened to said arms at their leading edges, defined by the direction of fan rotation, and extending transversely behind said blades to trailing edges, said blades curved in a downstream direction, relative to the direction of air flow, between said leading and trailing edges, and said blades free to flex and decamber in an upstream direction with increasing rotational speeds, characterized in that a multiplicity of generally radially extending bends are provided in each said flexible, resilient blade between said leading and trailing



edges behind said arm said bends spaced apart and forming the downstream general curvature of said blade.

4,177,013

COMPRESSOR ROTOR STAGE

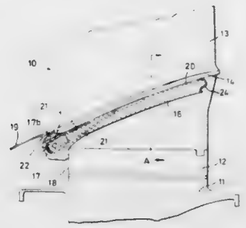
James Patterson, Allestree, and Peter G. G. Farrar, Mickleover, both of England, assignors to Rolls-Royce Limited, London, England

Filed Jan. 9, 1978, Ser. No. 868,228

Claims priority, application United Kingdom, Jan. 11, 1977, 862/77

Int. Cl.[2] F01D *5/22, 5/10*

U.S. Cl. 416—193 A **8 Claims**



1. A rotor stage for a gas turbine engine comprising:

a rotor disc;

an annular array of aerofoil blades, each of said aerofoil blades being provided with a root portion adapted to locate in said rotor disc and circumferentially extending platforms spaced radially outwardly of said root portion and arranged so as to be circumferentially spaced apart from platforms of adjacent blades; and

a plurality of elongated dampers made from an elastomeric material, each of said elastomeric dampers having an enlarged head portion at one of its extents, said enlarged head portion being located against a radial face of said rotor disc and against adjacent platform and roots of adjacent blades in such a manner that the remainder of said elastomeric damper is permitted to be circumferentially urged into engagement with said platforms but is constrained against movement in an axial direction, said enlarged head portion of each damper being further provided with an inlaid portion arranged to resist fretting between the head portion and the platform and root portions of said adjacent blades and against the radial face of said rotor disc.

4,177,014

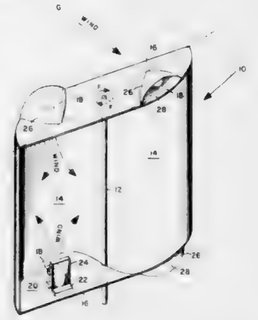
FLUID OPERATED ROTOR

John W. Kephart, Jr., 1115 Norsam Rd., Gladwyne, Pa. 19035

Filed Jan. 22, 1979, Ser. No. 5,083

Int. Cl.[2] F03D *3/06*

U.S. Cl. 416—197 A **9 Claims**



1. A fluid operated rotor device comprising

A. a main body having a pair of fluid receptive dished sections rotatably mounted side by side with the inner sides thereof presenting in opposite directions,

B. passageways through the rims of said dished sections placing the inner sides thereof in direct communication with atmosphere,

C. means overlying each passageway presenting in the direction opposite to that in which the inner side of the associated dished section presents and operative for directing fluid into said passageway, and

D. a unidirectional valve for each of said passageways arranged for being automatically opened by said fluid when the inner side of the associated dished section presents in the direction of fluid flow, and arranged for being automatically closed by said fluid when the inner side of the dished section presents in the opposite direction.

4,177,015

ELECTROMAGNETIC PUMPS

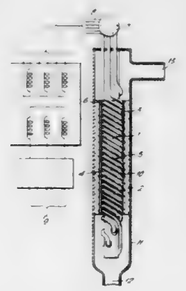
Daniel F. Davidson, Altrincham, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 9, 1978, Ser. No. 885,016

Claims priority, application United Kingdom, Mar. 23, 1977, 12345/77

Int. Cl.[2] H02N *4/20*

U.S. Cl. 417—50 **5 Claims**



1. An electromagnetic pump for liquid metal comprising a tubular pump housing,

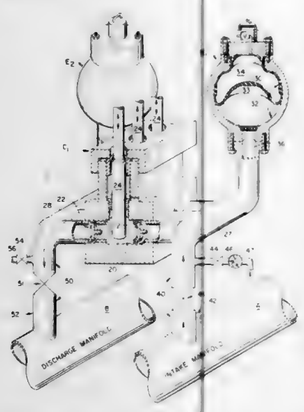
a core co-axially disposed within a bore of the housing to define an annular flow passage between the wall surface of the core and the wall surface of the bore,

polyphase helical windings arranged co-axially with the core, the helical windings being located in equally angularly spaced helical slots formed in one of the wall surfaces, the windings of each phase comprising a plurality of loops of metal sheathed mineral insulated electrical conductor arranged in series and extending in each longitudinal direction along the wall surface within a discrete pair of diametrically opposed slots, each winding being adapted for connection to an external source of electricity supply.

4,177,016
SELF CLEANING MANIFOLD CONNECTION FOR SLURRY PUMP

Thomas C. Aude, Orinda, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Filed Apr. 17, 1978, Ser. No. 896,964
Int. Cl.[2] F04B *39/00*
U.S. Cl. 417—53 **7 Claims**

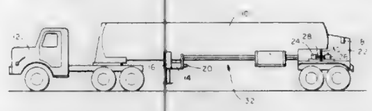


1. Apparatus in a slurry pipeline station for pumping slurry containing particulate matter entrained in a fluid, said station having an intake manifold for receiving slurry from a slurry pipeline and at least one pump for passing slurry from said intake manifold to a discharge manifold and preventing back flow from said discharge manifold to said intake manifold and inlet and outlet piping for connecting said pumps to said respective inlet and outlet manifolds, the improvement in said inlet and outlet piping including: inlet piping to said pump from said inlet manifold having a slope and length sufficient to permit downward settlement of said particulate matter in said slurry, said length of inlet piping being above said intake manifold a sufficient distance to prevent turbulence in said fluid from causing substantial penetration of the particulate matter of said slurry above said length of inlet piping into an occluded passageway formed by said piping when said pump is stopped and fluid does not pass across said pump between said intake and discharge manifolds; an intake isolation valve above said length of inlet piping for closing and isolating the intake of said pump from said intake manifold against said fluid of said slurry upon settlement of said particulate matter from said fluid; outlet piping from said pump to said discharge manifold having a slope and length sufficient to permit downward settlement of said particulate matter of said slurry, said preselected length of outlet piping being above said discharge manifold a sufficient interval to prevent turbulence in said fluid from causing substantial penetration of the particulate matter of said slurry above said length of inlet piping into an occluded passage formed by said discharge piping when said pump is stopped and fluid does not pass across said pump between said discharge and intake manifolds; and an outlet isolation valve above said slurry penetration level for closing and isolating the outlet of said pump from said discharge manifold against said fluid of said slurry upon settlement of the particulate matter of said slurry.

4,177,017
PUMP SYSTEM FOR CRYOGENIC LIQUID DELIVERY VEHICLES

Jeffrey A. Schultz, East Rochester, N.H., assignor to Process Engineering, Inc., Plaistow, N.H.

Continuation of Ser. No. 741,193, Nov. 12, 1976, abandoned. This application Jun. 5, 1978, Ser. No. 912,540
Int. Cl.[2] F04B *9/08, 17/00;* F17C *7/02;* B60P *3/22*
U.S. Cl. 417—231 **4 Claims**



1. A pumping system for cryogenic liquid delivery vehicles that include a tractor and trailer that is substantially longer than the tractor having forward and rear ends comprising;

self-contained internal combustion engine means having control means associated therewith,

means for mounting the internal combustion engine means at a forward end of the trailer remote from the rear end of the trailer,

hydraulic pump means also mounted at the forward end of the trailer operatively coupled from and operated by the internal combustion engine means, and having control means for varying the displacement of said hydraulic pump means including a manually-operated control member,

said hydraulic pump means operating up to 60 horsepower at speeds up to 4000 r.p.m.,

a reservoir coupled to the hydraulic pump means,

hydraulic motor means,

means for mounting the hydraulic motor means at the rear end of the trailer,

said hydraulic motor means including a high speed hydraulic motor capable of transmitting up to 60 horsepower at speeds up to 7500 r.p.m.,

hydraulic fluid line means intercoupled between the hydraulic pump and hydraulic motor means and forming therewith a closed loop hydrostatic transmission system including a main flow line and a return line carrying a hydraulic fluid that is a phosphate-ester composition,

means defining an enclosed cabinet at the rear end of the trailer having a control panel,

said hydraulic pump control member and internal combustion engine control means being disposed in said cabinet and associated with said control panel,

and a cryogenic liquid pump means disposed at the rear end of the trailer adjacent the hydraulic motor means and driven from the hydraulic motor means,

said liquid pump means for pumping cryogenic liquid from the vehicle,

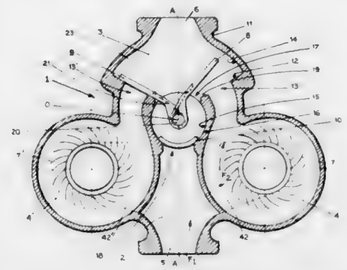
safety barrier means separating the hydraulic motor means and liquid pump means,

said internal combustion engine means being disposed for safety purposes sufficiently remote from said cryogenic liquid pump means.

4,177,018
APPARATUS FOR REGULATING THE PASSAGE AND FLOW-RATE OF A LIQUID

Jacques R. Granet, Laval, France, assignor to Le Material Telephonique, Boulogne-Billancourt, France

Filed Jan. 4, 1978, Ser. No. 866,841
Claims priority, application France, Jan. 4, 1977, 77 00058
Int. Cl.[2] F04B *23/04, 41/06*
U.S. Cl. 417—338 **2 Claims**

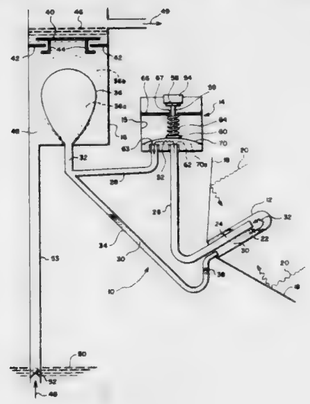


1. A liquid pumping unit comprising two centrifugal pumps disposed in a common casing (1) providing an inlet chamber (2) and an outlet chamber (3) for the liquid, each pump comprising an impeller mounted in a volute (4, 4') and adapted to be driven by a motor, each volute having an inlet (42, 42') and an outlet (13, 13') communicating with the inlet and outlet chambers (5, 6) respectively, a two flap type check valve (8, 9) is rotatably mounted on a common shaft (20), each flap being able to close one outlet of a volute (13, 13'), the shaft (20) has a regulating valve (10) secured thereto and controlled thereby, the regulating valve being mounted in a passage (17–18) connecting said outlet and inlet, to block or adjustably permit the flow of fluid in said passage, and thus can by-pass the fluid from the outlet(s) to the inlet(s) of the volute(s) when the flap(s) are open.

4,177,019
HEAT-POWERED WATER PUMP

Duane G. Chadwick, Logan, Utah, assignor to Utah State University Foundation, Logan, Utah

Filed Mar. 27, 1978, Ser. No. 890,095
Int. Cl.[2] F04B *17/00;* F03G *7/02, 7/06*
U.S. Cl. 417—379 **15 Claims**



4. A water pump comprising:

a vapor generator;

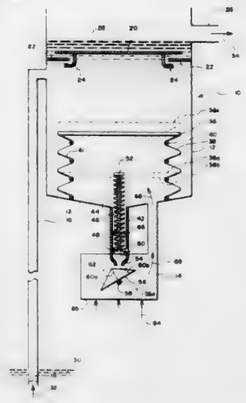
valve means for controlling release of vapor from the vapor generator the valve means being configurated to have a first, greater resistance to initial opening and is held open under a second, lesser opening force by vapor from the vapor generator; and

a pumping chamber having a pumping member operable by said vapor to expel water from the pumping chamber.

4,177,020
HEAT-POWERED WATER PUMP

Duane G. Chadwick, Logan, Utah, assignor to Utah State University Foundation, Logan, Utah

Filed Mar. 31, 1978, Ser. No. 891,993
Int. Cl.[2] F04B *17/00;* F03G *7/02, 7/06*
U.S. Cl. 417—379 **12 Claims**



4. A heat-powered water pump comprising:

a pumping chamber;

an inflatable pumping member in the pumping chamber;

a vapor generator comprising condensate metering means for metering condensate to a heat means, the heat means vaporizing the condensate, the condensate metering means comprising a condensate reservoir and valve means for releasing condensate from the condensate reservoir, the condensate metering means further comprising a tipping bucket configurated with two buckets, each bucket accommodating receipt of a predetermined quantity of condensate before becoming over-balanced and discharging condensate from the bucket; and

means for directing vapor from the vapor generator into the pumping chamber.

4,177,021
THROUGH FLOW SUMP PUMP

Karl O. Niedermeyer, 17W068 North St., Bensenville, Ill. 60106

Filed May 3, 1977, Ser. No. 793,402
Int. Cl.[2] F04B *17/00, 35/04*
U.S. Cl. 417—424 **16 Claims**

1. A pump for use as a sump pump or the like in pumping a liquid and utilizing pipe of standard sizes of internal and external diameter about an axis, said pump comprising:

an electric motor including a waterproof housing of a given diameter, and a motor shaft defining an axis and with a portion of the shaft externally of said housing;

a pump impeller affixed to said portion of said shaft;

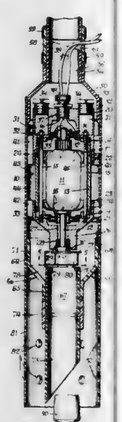
a length of a first size of said pipe having an internal diameter significantly greater in internal diameter than is said given diameter, said length surrounding said motor and having a

first end adjacent the said impeller and a second end adjacent the other end of the motor;

means affixing the motor to the length of pipe and spacing said housing at all sides thereof from said pipe whereby there is space substantially all about said motor for the flow of liquid in a generally axial direction;

conduit means connected to said second end of said length of pipe and forming the discharge for said pump;

a reducer having a large end and a small end, said large end telescopically mating with and engaging said first end of said length of pipe, said small end being of a size substantially smaller than said given diameter and including conduit means extending to a location adjacent said impeller and forming the intake for said pump, said large end of said reducer being in the form of a cylindrical sleeve of an external diameter substantially corresponding to said given diameter and extending within said first end, and said small end of said reducer being in the form of a cylin-



drical sleeve having an internal diameter substantially corresponding to the external diameter of another of said standard sizes, said other standard size being substantially smaller than said first size, whereby the last mentioned sleeve can be used as a coupling for said other size, said first mentioned cylindrical sleeve extending only partially into said first end and having a portion externally of said first end;

another length of said pipe of said first size, said other length being telescopically mounted on said external portion, said other length having openings therethrough whereby said liquid may flow through said openings into the interior of the other length and the other length acts as a pump screen; and

a piece of pipe of said other of said standard sizes telescopically mounted in said smaller of said sleeves and projecting outwardly therefrom and into said other pipe of said first size to serve as an intake conduit for said pump.

4,177,022

VESSEL PUMP

Peter F. Roth, Schmittenackerstrasse 14, 8304 Wallisellen, Switzerland

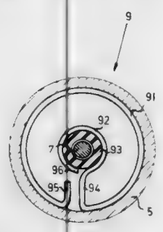
Filed Mar. 29, 1978, Ser. No. 891,406

Claims priority, application Switzerland, Mar. 30, 1977, 4012/77

Int. Cl.² F04B *35/04*

U.S. Cl. 417—424 **11 Claims**

1. A vessel pump comprising a driving motor, a driving shaft driven by said motor and extending in a delivery pipe and having a delivery rotor arranged in the lower region of said driving shaft, characterized by the fact that said driving shaft is provided in at least one location with a resilient bearing supported in said delivery pipe, said bearing comprising two concentrically arranged annular retainer springs consisting of a



single piece, the inner annular retainer spring holding a replaceable slide bearing sleeve through which said driving shaft extends and the outer annular retainer spring adjacent and supported by said delivery pipe.

4,177,023

PNEUMATIC SYSTEM FOR SMOOTHING DISCHARGE PRESSURE FROM AIR

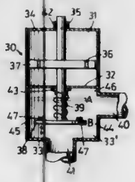
Tamotsu Kamiya, Kariya, and Shigeru Miyao, Toyoda, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyoda, Japan

Continuation of Ser. No. 586,589, Jun. 13, 1975, abandoned. This application Apr. 18, 1977, Ser. No. 788,450

Claims priority, application Japan, Feb. 25, 1975, 50-25697

Int. Cl.² F04B *11/00*

U.S. Cl. 417—540 **1 Claim**



1. In a pneumatic system including an air pump, air passage switching means and operating components, said air passage switching means being communicated with said air pump via a conduit and being communicated with each of said operating components for delivering pressurized air from said air pump to said operating components, the improvements comprising pressure smoothing means for smoothing the surge pressure being discharged from said air pump, said pressure smoothing means being between said air pump and said air-passage switching means and comprising:

a chamber defined by a circular top plate, a circular bottom plate having an air inlet which communicates with said air pump, and a cylindrical peripheral wall which has an air outlet communicating with said air-passage switching means and which surrounds said top plate and said bottom plate;

a partition wall dividing said chamber into an air chamber on one side thereof which faces said bottom plate and an oil chamber on the other side thereof which faces said top plate, said air chamber including said air inlet and said air outlet and said partition wall being parallel to said top plate;

a rod slidingly extending through said partition wall and said top plate in coaxial relation to said air inlet;

a piston secured to said rod within said oil chamber and having through-holes defined therein for oil;

a pressure receiving plate secured to said rod within said air chamber and having a periphery spaced from the peripheral wall of said air chamber to define a clearance therebetween, said pressure receiving plate being disposed in opposing relation to said air inlet;

a compression spring between said pressure receiving plate and said partition wall; and

oil filled in said oil chamber.

4,177,024

VANE AIR MOTOR WITH ECCENTRIC ADJUSTMENT RING AND BEARING RING FOR VANE ENDS

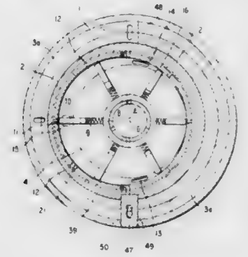
Gerd Löhn, Biberach, Fed. Rep. of Germany, assignor to Kaltenbach & Voigt GmbH & Co., Biberach an der Riss, Fed. Rep. of Germany

Filed May 5, 1977, Ser. No. 794,227

Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621485

Int. Cl.² F01C *1/00, 21/16;* **F16C** *35/00, 35/04*

U.S. Cl. 418—16 **15 Claims**



1. A pneumatic vane-type motor for a dental handpiece to drive a dental tool operable by compressed air and comprising:

a sleeve-like housing having a cylindrical inner surface which is circular in cross-section and which forms a stator, said stator forming a rotor chamber; a rotor mounted for rotation in said rotor chamber about an axis which extends parallel to the axis of said inner surface;

axially extending slots provided in said rotor;

rotor vanes radially movably mounted in said slots and extending with their radially outer ends towards said inner surface of the housing;

air inlet means communicating with said rotor chamber for supplying compressed air to drive the rotor;

air outlet means communicating with said rotor chamber;

an adjusting ring positioned between said inner surface of the housing and said outer ends of the vanes, said ring being rotatable relative to said inner surface of the housing;

a cylindrical outer surface provided on said adjustment ring which engages said inner surface of the housing;

a cylindrical inner surface provided on said adjustment ring and towards which the vanes extend, the inner and outer surfaces of said adjustment ring being circular in cross-section and having axes which are spaced from each other; and a bearing ring positioned between said inner surface of the adjustment ring and said outer ends of the vanes, said bearing ring being co-axial with and freely rotatable relative to said inner surface of the adjustment ring, and said outer ends of the vanes bearing against said bearing ring.

4,177,025

HIGH-PRESSURE ROTARY FLUID-DISPLACING MACHINE

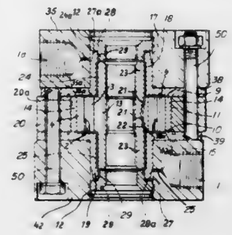
Siegfried Eisenmann, and Hermann Härle, both of Aulendorf, Fed. Rep. of Germany, assignors to Fürstlich Hohenzollernsche Hüttenverwaltung Laucherthal, Hohenzollern, Fed. Rep. of Germany

Filed Jul. 1, 1977, Ser. No. 812,392

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1976, 2630222

Int. Cl.² F04C *15/00*

U.S. Cl. 418—133 **25 Claims**



1. A high-pressure rotary fluid-displacing machine suitable for use as a motor or pump comprising

(a) a housing composed of at least two parts and having a first channel in said housing for conveying medium under high-pressure therethrough and a second channel in said housing for conveying medium under lower pressure therethrough,

(b) an internally toothed annular gear;

(c) an externally toothed pinion arranged eccentrically within said annular gear and intermeshing therewith, an engagement-free crescent shaped gap being left between the addendum circles of said pinion and of said annular gear, respectively, on the side thereof opposite the contact point of the pitch circle of said pinion with the pitch circle of said annular gear;

(d) a shaft bearing said pinion and being adapted for transmitting torque;

(e) a gap-filling member in said gap having an inner and an outer curved surface, said inner surface being sealingly contacted by the addendum surfaces of the teeth of said pinion, and said outer surface being sealingly contacted by the addendum surfaces of the teeth of said annular gear,

(f) at least a first lateral plate member held in place by at least one part of said housing and being adapted for closing off laterally a work space intermediate the teeth of said pinion and the teeth of said annular gear and disposed in axial direction on one side of said pinion and annular gear, the central region of said plate member being movable with a slight clearance relative to said pinion, said plate member having an external rim portion clamped in between two parts of said housing; and

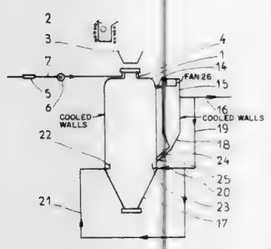
(g) a collar on said plate member and projecting from the face of the latter away from said pinion and annular gear and adapted for bearing said shaft therein; said housing having an internal chamber into which said collar protrudes, said internal chamber being in free communication with said first channel, whereby said plate member can be subjected to high-pressure exerted by said high-pressure medium.

4,177,026

DEVICE FOR THE MANUFACTURE OF SPHERICAL METALLIC POWDER

Yves C. Honnorat, Imphy; Gerard D. Raisson, and Jean G. Morlet, both of Nevers, all of France, assignors to Creusot-Loire, Paris, France

Filed Sep. 26, 1977, Ser. No. 836,711
Claims priority, application France, Oct. 1, 1976, 76 29654
Int. Cl.[2] B22D *23/08*
U.S. Cl. 425—7 **6 Claims**



1. In a device for the manufacture of a metallic powder by atomizing liquid metal, the device comprising a vertical cylindro-conical vessel having cooled walls comprising:
- in its upper part, means for introducing a stream of liquid metal into said vessel, means for atomizing the stream of metal using jets of gas under pressure, and
- at least one gas outlet for gas charged with fine particles of the metal,
- in its lower part, a funnel for receiving and discharging the powder,
- in its lower half, gas inlet means for providing one or more jets of gas tangentially to a common cylinder centered on the axis of said vessel and forming an angle of between 0° and 60° with a horizontal plane, for generating vortices of gas charged with fine particles of the metal along an ascending spiral centered on the axis of said vessel so as to multiply the impacts between the fine particles of the powder and the cooled walls of said vessel and thus to increase the heat exchanges between the matter located in said vessel, consisting of the gas and the falling powder, and the cooled walls of said vessel,
- a cyclone dust remover having cooled walls and connected between said gas outlet means and having a fan operable to cause circulation of gas between said gas outlet and said gas inlet means located in the lower half of said vessel
- the improvement consisting of a duct joining the funnel of said cyclone dust remover to said vessel in the immediate vicinity of said gas inlet means, said duct allowing the fine particles of the powder recovered by said dust remover to be reintroduced into said vessel.

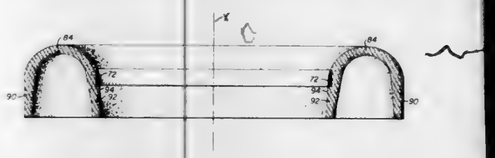
4,177,027

CORE PORTION FOR A TUBE TIRE

Charles E. Grawey; Glenn A. Ball, both of Peoria, and Donald G. Zook, Metamora, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 635,812, Nov. 28, 1975, abandoned, which is a continuation of Ser. No. 491,841, Jul. 25, 1974, abandoned, which is a division of Ser. No. 370,204, Jun. 15, 1973, Pat. No. 3,883,287. This application Mar. 20, 1978, Ser. No. 888,706
Int. Cl.[2] B29H *5/18*
U.S. Cl. 425—49 **7 Claims**

1. An annular core portion, combinable with another like annular core portion for defining a hollow core upon which a tube tire can be formed, comprising; an annular substantially inextensible member and a mixture of granular material and a binder formed about said annular substantially inextensible member, said core portion having a generally U-shaped cross sectional configuration having inner and outer legs, said inner leg having a surface facing the axis of the annular core portion,



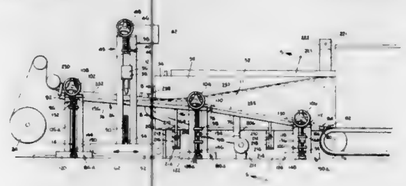
said annular substantially inextensible member being positioned at said surface of the inner leg.

4,177,028

ADJUSTABLE APPARATUS FOR PRODUCING A FOAM MATERIAL

James G. Dillard, Grand Rapids, Mich., assignor to Edge Saw Manufacturing Co., Grand Rapids, Mich.

Filed Oct. 4, 1977, Ser. No. 839,323
Int. Cl.[2] B29D *27/04*
U.S. Cl. 425—89 **13 Claims**



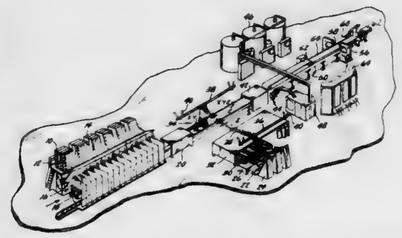
1. An apparatus for continuously molding a foamable material comprising:
- a conveyor support having a flat upper plate at a declination to the horizontal slight enough to substantially preclude liquid foamable reactants from flowing therealong, a flat lower support member in abutting relationship to the upper plate and at a declination to the horizontal greater than that of the upper plate; and a longer horizontal curing portion joined to the lower support member;
- means operatively associated with said conveyor support for conveying the foamable material over the conveyor support from the upper plate to the horizontal curing portion thereof;
- means mounted above the conveyor support upper plate or supplying unfoamed liquid foam reactants to the conveying means at the upper plate of the conveyor support;
- the length of the upper plate being sufficient to permit creaming thereon of the unfoamed liquid reactants which are supplied thereto by said liquid foam reactants supply means;
- the length of the lower support member being sufficient to permit substantially complete foaming of the creamed foamable reactants thereon;
- means for controlling the upper contour of the molded foam including side wall surfaces moving along adjacent the conveying means and at an inclined angle with respect to the lower support member of the conveying means;
- means connected to the supplying means for adjusting the longitudinal position of the supplying means to adjust the lay-down point of the foamable materials on the conveyor with respect to the upper plate of the conveyor support;
- means for adjustably moving at least one side wall surface in a direction transverse to the plane of the side wall surfaces to control the width of the space between the side wall surfaces;
- means for adjusting the width of the upper plate and lower support member of the conveyor support to correspond to adjustments to the side wall position; and
- means for adjusting the relative angle of the upper plate and lower support member of the conveyor support to control the angles thereof with respect to the horizontal.

4,177,029

APPARATUS FOR CONTINUOUSLY FABRICATING THREE-DIMENSIONAL FILAMENT REINFORCED FOAM INSULATION

William B. Goldsworthy, Palos Verdes, Calif., and Harald E. Karlson, Eugene, Oreg., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Division of Ser. No. 669,819, Mar. 24, 1976, Pat. No. 4,079,106, which is a continuation of Ser. No. 516,412, Oct. 21, 1974, abandoned. This application Oct. 31, 1977, Ser. No. 847,238
Int. Cl.[2] B29D *27/04*
U.S. Cl. 425—112 **6 Claims**



1. Apparatus for continuously forming three-dimensional filament reinforced foam insulation, comprising means for extending a plurality of continuous first layers of spaced X fibers in a longitudinal direction, said first layers being spaced vertically from each other, means for extending a plurality of second layers of spaced Y fibers in a transverse direction, said second layers being spaced vertically from each other, and forming an X-Y array, means operatively associated with both of said extending means, for continuously moving said layers of X and Y fibers together in a path of travel in a longitudinal direction, means for inserting Z fibers through said layers to form an X-Y-Z array during said longitudinal movement of said layers of X and Y fibers, and means for foaming an insulation material through said array during continuous movement of said X-Y-Z array in a longitudinal direction.

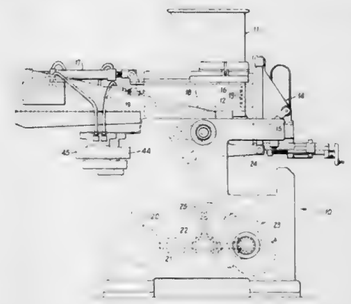
4,177,030

DOUGH DIVIDER

Samuel O. Seiling, Richmond, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed May 1, 1978, Ser. No. 901,410
Int. Cl.[2] B29C *1/00*
U.S. Cl. 425—238 **6 Claims**

1. In a dough divider having a repetative operating cycle for successively making groups of equal lumps of dough, a combination comprising:
- a charging chamber and dividing means for dough disposed in one end of said chamber; and
- ram means movable toward and away from said dividing means twice during each operating cycle and causing dough to load said chamber each time it moves away from said dividing means;
- said ram means exerting a constant force moving dough through said dividing means and out of said chamber the first time it moves toward said dividing means during each cycle, and purging dough from said chamber the second time it moves toward said dividing means during each cycle.

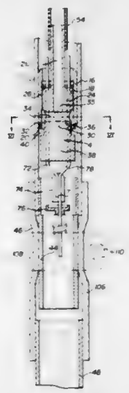


4,177,031

APPARATUS FOR CASTING TUBULAR, POLYMERIC MEMBRANES FOR REVERSE OSMOSIS AND ULTRAFILTRATION

William L. Thayer; Lucien Pageau, and Srinivasa Sourirajan, all of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Mar. 3, 1978, Ser. No. 883,267
Int. Cl.[2] B29D *23/08, 27/04*
U.S. Cl. 425—460 **2 Claims**



1. In an apparatus for casting tubular, polymeric membranes for reverse osmosis and ultrafiltration, comprising:
- (a) a plurality of upwardly extending casting tubes,
- (b) a casting bob assembly for insertion in the lower end of the bore of each of the casting tubes,
- (c) mounting means for mounting each casting tube, with the casting bob assembly in the lower end thereof, for relative movement therebetween, whereby the casting bob assembly may be displaced along the bore of each casting tube when placed therein,
- (d) means for supplying a casting solution to the casting bob assembly,
- (e) means for supplying a gas to the bore of each casting tube, below the casting bob assembly, when the casting bob assembly is inserted therein,
- (f) means for feeding a gelation liquid to the bore at the lower

end of each casting tube when the casting bob assembly is inserted therein, and wherein:

(g) the casting bob assembly comprises:

(i) a centering sleeve, slidably along the bore of each casting tube, and having an open ended, upwardly extending bore, at least a portion of which is screw threaded, and a lower cylindrical extension inwardly spaced from each casting tube when placed therein,

(ii) a casting bob having an upper portion which has a downwardly extending casting solution passage therethrough and which is screw threaded externally with the screw thread screwed into the screw threaded portion of the centering sleeve, an intermediate portion which is integral with the upper portion and protrudes from a lower end of the bore of the centering sleeve and defines an annular, casting solution outlet with the centering sleeve, the intermediate portion having casting solution passage means for distributing around the annular casting solution outlet, casting solution from the downwardly extending passage, and a lower cylindrical portion integral with the intermediate portion and beneath the cylindrical extension and defining an annular, casting solution outlet gap therewith which is adjustable by screwing the upper portion into the centering sleeve, the lower portion being spaced from casting tube when placed therein to define an annular casting space therewith, the improvement comprising:

(h) the casting bob assembly includes:

(i) a transport sleeve slidable upwardly as a press fit around the lower portion of the casting bob to seal against and around the lower, cylindrical extension and seal the annular, casting solution outlet gap while the casting bob assembly is being transported from one casting tube to another, the transport sleeve being slidable along the bore of each casting tube when inserted therein; and

(ii) securing means for releasably securing the transport sleeve in the lower end of each casting tube and sealing the lower end of each casting tube to the mounting means.

4,177,032

MOLDING CORE FOR THE MANUFACTURE OF HOLLOW BODIES CONSISTING OF FIBER-REINFORCED SYNTHETIC RESIN

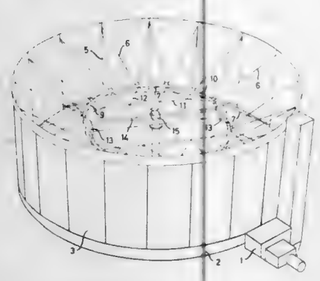
Peter H. Selden, Ludwigshafen; Joachim Duerkop, Frankenthal; Wolfgang Albrecht, Ludwigshafen, and Heinz Weissenmayer, Boehl-Iggelheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 26, 1977, Ser. No. 845,720

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1976, 2652862

Int. Cl.[2] **B29C** *1/12*

U.S. Cl. 425—468 **1 Claim**



1. An internal molding core for the manufacture of hollow, fiber-reinforced synthetic resin bodies of various diameters, said molding core comprising:

a plurality of curved rectangular flexible metal plates which are positioned in a circular arrangement with their vertical side edges abutting one another,

detachable connecting members interconnecting said abutting vertical side edges,

tensioning means interconnecting the vertical side edges of each flexible metal plate in a manner so as to permit the radius of curvature of said plates to be adjusted.

two of said flexible metal plates which are diametrically opposed to each other and which devide said molding core into two halves being hinged along one vertical side edge thereof so as to permit their inward rotation toward the center of said molding core,

a pair of frames which vertically and inwardly support the flexible metal plates located on each molding half by means of adjustable support members extending between each frame and the flexible metal plates between said opposed rotatable plates which comprise each of said molding halves, and

a common drive means interconnecting said frames which allows said frames to be moved toward one another after said opposed rotatable plates have been inwardly rotated in a manner so as to reduce the distance between said molding halves and permit said hollow body to be removed from about said molding core,

said flexible metal plates being mounted about their lower edges on a rotatable, annularly-shaped platform which permits the rotation of said molding core as said hollow body is formed thereabout.

4,177,033

FLAME DETECTION ARRANGEMENTS AND THE LIKE

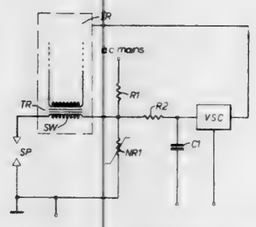
Malcolm R. Wallace, Fareham, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Nov. 22, 1977, Ser. No. 853,873

Claims priority, application United Kingdom, Nov. 25, 1976, 49219/76

Int. Cl.[2] **F23H** *5/08*

U.S. Cl. 431—78 **8 Claims**



1. A circuit arrangement for detecting flame or hot gas in an air gap using the flame "rectification effect" comprising electrode means defining said air gap and connected on one side to an a.c. source and on the other side to a suitable potential for permitting current to flow in said air gap when flame or hot gas is present therein, non-linear resistance means connected across said air gap, voltage sensing means for detecting the voltage across the non-linear resistance means which is indicative of the presence or absence of flame or hot gas in said air gap, and filter means connected in the input path to the voltage sensing means so that any voltage appearing at the input to the voltage sensing means is a d.c. voltage with a small ripple superimposed thereon.

4,177,034

RETROFIT IGNITER

Richard E. Jones, Los Alamitos, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

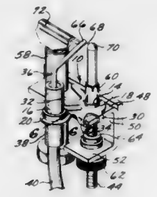
Filed Dec. 29, 1977, Ser. No. 865,406

Int. Cl.[2] **F23N** *5/10;* **F23Q** *9/00;* **F16L** *3/08;* **H01L** *35/00*

U.S. Cl. 431—264 **5 Claims**

1. A bracket for retro-fit conversion of a continuous to an intermittent operating gas pilot burner having a pilot burner and a flame sensor mounted in side-by-side alignment on a support member which comprises:

(a) a flat web with first and second spaced-apart distal apertures and upstanding peripheral flanges about said apertures;



(b) stiffening rib means in the central portion of said web between, and parallel to the alignment of, said apertures;

(c) a pair of bendable tabs laterally projecting from said web adjacent one of said apertures; and

(d) a second pair of bendable tabs projecting from opposite side edges of the central portion of said web toward the other of said apertures.

4,177,035

TUNNEL KILN FOR FIRING CERAMIC WARE

Gregor Buschermohle, Ibbenbueren, Fed. Rep. of Germany, assignor to Keller Ofenbau GmbH, Fed. Rep. of Germany

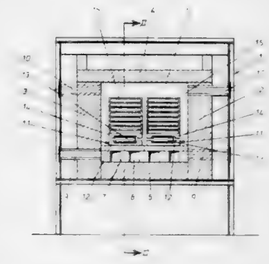
Filed Mar. 16, 1978, Ser. No. 887,385

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726199; Sep. 22, 1977, 2742599

Int. Cl.[2] **F27B** *9/06*

U.S. Cl. 432—121 **10 Claims**

1. A tunnel kiln through which carriers carry ceramic ware to be fired comprising elongated tunnel means having a closed bottom, a stationary flue at the bottom of said tunnel means, at least one transport way disposed in said tunnel means above said stationary flue, carriers carried by said transport way through the tunnel means, said transport way comprising a support means, and rolling means between said support means and said carrier for movably carrying said carriers along said transport way, said support means comprising a pair of spaced and elongated cylindrical members having their longitudinal



axes disposed parallel to the elongated tunnel means, said rolling means rolling on said spaced cylindrical members.

4,177,036

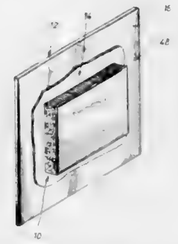
HIGH TEMPERATURE INDUSTRIAL FURNACE

Robert A. Sauder, Emporia, Kans., assignor to Sauder Industries, Inc., Emporia, Kans.

Continuation-in-part of Ser. No. 694,562, Jun. 10, 1976, abandoned. This application Sep. 6, 1977, Ser. No. 830,612

Int. Cl.[2] **F27D** *1/00*

U.S. Cl. 432—247 **20 Claims**



1. A high temperature industrial furnace comprising:

a metal chamber wall having an inside surface and an outside surface;

an insulation module positioned over said inside surface of said wall;

a flexible adhesive intermediate said inside surface of said wall and said module, said flexible adhesive being operable to support said module over said wall and flexibly resist cracking during thermal movement of said wall during operation of said furnace.

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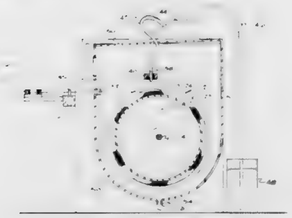
UMI

4,177,037

METHOD FOR MULTICOLOR DYEING OF TEXTILE YARNS

Harald Anderson, deceased, late of Summit, N.J., by Aelita Anderson, administrator, 18 King's Hill Court, Summit, N.J. 07901, and by Michael S. Cozine, administrator, 140 Market St., Paterson, N.J. 07505

Division of Ser. No. 712,186, Aug. 6, 1976, Pat. No. 4,068,502.
This application Sep. 23, 1977, Ser. No. 836,069
Int. Cl.[2] D06B *1/02*
U.S. Cl. 8—149 4 Claims



1. A method for the high speed dyeing of a moving yarn strand to obtain a multicolored yarn product having uniformly dyed lengths of different color with sharply defined color boundaries therebetween, comprising the simultaneous steps of:

(a) winding a running yarn strand onto a rotating support member to form a plurality of yarn layers thereon;

(b) applying a plurality of discrete cohesive streams of dye to the outer surface of said layers while said yarn is being wound to form a plurality of radial bands of selected color in said layers located along the length of the support member;

(c) rotating said support member at a sufficient rate of speed to cause centrifugal flow of portions of dye in inner yarn layers in said radial bands of color radially outwardly in said bands to penetrate outer yarn layers therein; and

(d) traversing the yarn strand across the support member to locate selected lengths of yarn in each of said radial bands of color.

4,177,038

METHOD FOR THE PRODUCTION OF A VEHICLE SUBSTANCE WHICH IS CAPABLE OF COVALENT BONDING WITH BIOLOGICALLY ACTIVE MATTER

Christof Biebricher, Adelebsen, and Rüdiger Luce, Herzberg, both of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschafen e.V., Göttingen, Fed. Rep. of Germany

Filed May 17, 1977, Ser. No. 797,677
Claims priority, application Fed. Rep. of Germany, May 18, 1976, 2621974
Int. Cl.[2] D06M *13/42*; C08B *15/06, 37/02*
U.S. Cl. 8—192 26 Claims

1. In a method for the production of a vehicle substance capable of covalent bonding with a biologically active matter which is synthetized from a vehicle containing preferably several free $-NH_2$ or $-OH$ groups and at least a bonding agent containing at least two reactive groups, the improvement wherein the vehicle under anhydrous conditions is reacted with an excess of organic diisocyanate in an anhydrous organic aprotic solvent in the presence of a strong basic catalyst, and the resultant vehicle substance is isolated in a storable form.

4,177,039

DISPERSANT FOR COAL INTO OILS

Kouhei Sakuma, Tokyo; Toshiyuki Ukigai, Yachiyo; Tatsuji Yamashita, and Osamu Yamaki, both of Chiba, all of Japan, assignors to Lion Yushi Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1978, Ser. No. 964,266
Claims priority, application Japan, Nov. 29, 1977, 52-143179
Int. Cl.[2] C10L *1/32*
U.S. Cl. 44—51 5 Claims

1. A dispersant for coal into oils which comprises:

(a) a metal salt of a dialkyl sulfosuccinate of the general formula:

$$[R^1O_2C-CH_2-\underset{\displaystyle SO_3}{\underset{|}{CH}}-CO_2R^2]_n \cdot M$$

wherein R^1 and R^2 each represent an alkyl group having at least 4 carbon atoms, n represents an integer of 1~3 and M represents a metal having a valency of n, and

(b) at least one lower aliphatic alcohol selected from the group consisting of a monohydric alcohol having 1~5 carbon atoms, a polyhydric alcohol having 2~5 carbon atoms and an alcohol with 2~5 carbon atoms having an alkoxy group with 1~5 carbon atoms.

4,177,040

STARTER FLUID FOR INTERNAL COMBUSTION ENGINES

Fay E. Kaiser, Jr., Niles, Mich., assignor to U.S. Aviex Corp., Niles, Mich.

Filed Jul. 3, 1978, Ser. No. 921,845
Int. Cl.[2] C10L *1/16*
U.S. Cl. 44—52 3 Claims

1. A starter fluid for internal combustion engines confined in a sealed pressure-charged, valved aerosol type spray container consisting essentially of:

a lower alkyl ether, from 35 to 65% by vol.;

a pressurizing gas from 3 to 5% by vol.;

a hydrocarbon propellant from 4 to 8% by vol.; and

a petroleum distillate of the class consisting of 5 to 8 carbon chains or any isomer thereof, from 36 to 52% by volume.

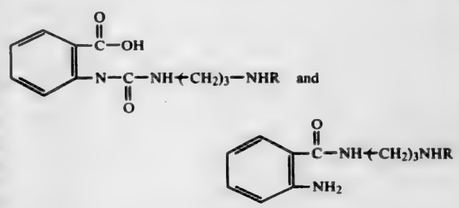
4,177,041

CARBURETOR DETERGENTS

Rodney L. Sung, Fishkill, and Ronald W. Von Allmen, Poughkeepsie, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 22, 1978, Ser. No. 944,938
Int. Cl.[2] C10L *1/22*
U.S. Cl. 44—71 4 Claims

1. A carburetor detergent consisting of a mixture of products of the formulas:



and

wherein R is an alkyl group derived from a fatty acid having from 6 to 18 carbon atoms in the chain.

4,177,042

COAL GASIFICATION PLANT

Andrew Wood, Dunfirmline, Scotland, assignor to British Gas Corporation, London, England

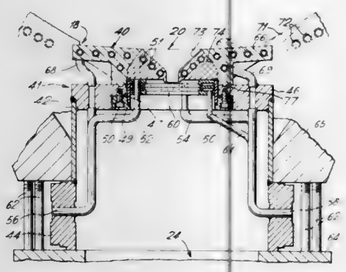
Division of Ser. No. 771,330, Feb. 23, 1977. This application Apr. 3, 1978, Ser. No. 892,969

Claims priority, application United Kingdom, Mar. 22, 1977, 11445/76

The portion of the term of this patent subsequent to Nov. 28, 1995, has been disclaimed.

Int. Cl.[2] **C10J** *3/72*

U.S. Cl. 48—87 **6 Claims**



1. An annular hearth member for use in a coal slagging gasifier having a slag tap member, said annular hearth member comprising a solid mass of high thermal conductivity material having means defining an integrally formed passageway for circulating a coolant liquid through said mass, the uppermost annular surface of said hearth member sloping downwardly inwardly towards its center, the inner peripheral wall of said hearth member being formed in a surface of revolution whose cross-sectional profile corresponds to the external surface profile of the slag tap member of said slagging gasifier over which slag tap the annular hearth member is sized to be a close fit, and means defining an inlet and outlet communicating said passageway exteriorly of said solid mass.

4,177,043

CHEMICAL TREATMENT FOR IMPROVING ELECTROSTATIC PRECIPITATION OF DUST PARTICLES IN ELECTROSTATIC PRECIPITATORS

Vincent M. Albanese, Lockport, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed May 22, 1978, Ser. No. 908,313

Int. Cl.[2] **B03C** *1/00*

U.S. Cl. 55—5 **2 Claims**

1. A method of improving the conductivity of fly ash particles entrained in a stream of particle-laden gas formed by the burning of coal, which fly ash particles are collected by an electrostatic precipitator which comprises treating said particles prior to their precipitation in an electrostatic precipitator with a treatment chemical comprising ammonium sulfate plus triethylamine sulfate combined in a weight ratio of 0.5–12:1 said treatment chemical being added at a level of from 0.125–2.0% by weight of the fly ash present in said particle laden gas.

4,177,044

PROCESS FOR REMOVING OXYGEN FROM AND ADDING CARBON DIOXIDE TO A LIQUID WATER

Åke S. Jernqvist, Lund, Sweden, assignor to Alfa-Laval AB, Tumba, Switzerland

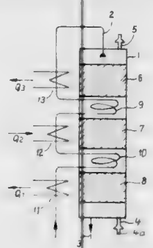
Filed Sep. 1, 1977, Ser. No. 829,951

Claims priority, application Sweden, Sep. 6, 1976, 7609798

Int. Cl.[2] **B01D** *19/00*

U.S. Cl. 55—48 **2 Claims**

1. A process for removing oxygen from and adding carbon dioxide to a liquid, such as water, wherein the liquid and a carbon dioxide containing gas are brought into intimate contact with each other during counter-current flow thereof, the process being characterized in that the liquid is caused to flow through a first contact zone at a relatively low temperature t_1 to take up carbon dioxide, then through a second contact zone for delivering carbon dioxide and oxygen to said gas at a higher temperature t_2, and finally through a third contact zone to take up carbon dioxide at a lower temperature t_3 with respect to the temperature t_2.



4,177,045

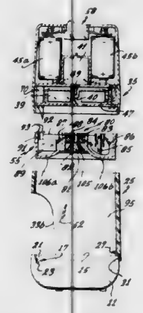
SELF-ACTING SMOKE SORBING DEVICE

Jeannette V. Orel, 10501 Wilshire Blvd., Los Angeles, Calif. 90024

Filed Jul. 10, 1978, Ser. No. 923,100

Int. Cl.[2] **B03C** *3/36, 3/38;* **B01D** *50/00*

U.S. Cl. 55—102 **4 Claims**



1. A self activating smoke sorbing and filtering device comprising:

an ashtray including a wall terminating in a rim for supporting an object having a smoke producing end, such as a cigarette or the like, such that the smoke producing end is positioned within the ashtray,

a shroud contacting the wall of the ashtray, said shroud including wall means extending above the ashtray and operative to confine within the shroud the smoke produced by the object positioned within the ashtray and including an aperture in the upper end of said shroud,

said shroud having an opening in the wall means thereof such that the shroud contacts only a portion of the wall of the ashtray such that the smoke producing object may be inserted through the opening to rest within the ashtray,

said opening defining spaced side walls of the shroud which are recessed back to expose a portion of the rim of the ashtray forward of said side walls,

housing means supported solely by said shroud,

said housing means having an opening generally vertically above the ashtray and said opening being in communication with said aperture,

said housing means including a discharge opening spaced from said opening of said housing means and cooperating with said opening in the wall means to form a passageway extending into said housing means from the outside environment,

power driven air moving means supported within said housing means and on said shroud and positioned over said opening in said housing means and within said passageway for drawing air through the opening in the wall means of said shroud and into said passageway for discharge through the opening in said housing means through the remainder of said passageway and through the discharge opening and into the environment, the movement of air through said shroud being operative to carry with it the smoke produced by said object within the confines of the shroud,

detection means supported inside said shroud and contiguous to said housing means coupled electrically to said power driven air moving means for detecting smoke and purifying air, said means, on sensing said smoke, being operative to concurrently separate said smoke from said air and energize said air moving means for drawing the smoke and air through said passageway and said detection means and propelling the purified air into the environment, and,

filter means supported within said housing means and radially outward of said air moving means above said detection means for filtering the once-purified air drawn through said passageway by said power driven air moving means.

4,177,046
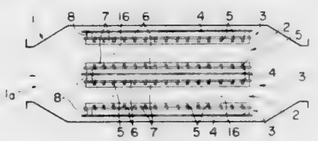
AC TYPE DUST COLLECTING APPARATUS

Toshio Moriyama, 14-10, Eifuku 1-chome, Suginami-ku, Tokyo-to, Japan

Filed Aug. 30, 1978, Ser. No. 937,986

Int. Cl.[2] **B03C** *3/04, 3/47*

U.S. Cl. 55—123 **1 Claim**



1. An AC type dust collecting apparatus comprising: a plurality of discharge electrodes; and a dust collecting electrode assembly, said dust collecting electrode assembly having a grounded dust collecting plate and a plurality of grid elements which are electrically insulated from said dust collecting plate, said grid elements being J-shaped in section and being arranged in spaced, parallel relationship with one another and with said dust collecting plate, with the curved portion of each J-shaped grid element faced towards said plurality of discharge electrodes and with the open edges of each grid element faced towards said dust collecting plate, an AC power source connected to said discharge electrodes to apply alternating current to said discharge electrodes.

4,177,047

ELECTROSTATIC PRECIPITATORS

Yaacov Goland, Pacific Palisades, Calif., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

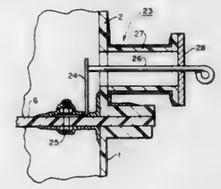
Filed Jul. 27, 1978, Ser. No. 928,766

Int. Cl.[2] **B03C** *3/49, 3/64*

U.S. Cl. 55—146 **11 Claims**

1. An electrostatic precipitator comprising a casing made of corrosion resistant material and having a gas inlet and a gas outlet, a plurality of collecting electrodes, and a plurality of high-voltage electrodes, each of said collecting electrodes being made of an insulating resin reinforced with fiberglass and having an integral conductive surface layer on its collecting surface, said surface layer consisting of a layer of said resin containing graphite powder and at least one graphite veil substantially coextensive with the surface.

11. A collecting electrode adapted for use in conjunction with a high voltage electrode of an electrostatic precipitation apparatus to maintain an electrical field which is effective for electrostatic precipitation of contaminants from a flow of gas



processed through such electrostatic precipitation apparatus, said collecting electrode comprising: an electrode body member formed to cooperate with such high voltage electrode to maintain such electrical field; said body member including a layer of insulating resin reinforced with fiberglass and having an integral conductive layer formed on the surface thereof with said conductive layer including a collecting surface on which such contaminants accumulate during electrostatic precipitation operations; and said conductive layer consisting of a layer of insulating resin containing graphite powder and at least one graphite veil substantially coextensive with said collecting surface.

4,177,048

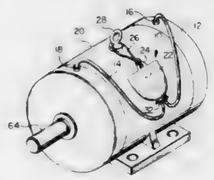
BEARING BREATHER DESICCANT DEVICE

Morris R. Rivers; Ralph G. Osterman, both of Vancouver, Wash., and George H. Warmuth, Portland, Oreg., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Continuation of Ser. No. 767,373, Feb. 10, 1977, abandoned. This application May 26, 1978, Ser. No. 910,026

Int. Cl.[2] **B01D** *39/00;* **H02K** *5/16*

U.S. Cl. 55—275 **16 Claims**



1. Rotor bearing apparatus, including bearing breather, comprising:

rotor means mounted on bearings;

housing means containing at least a portion of said rotor means including the rotor bearings and having a bearing lubrication passage for said bearings;

drying means containing a desiccant material for removing moisture from air transmitted therethrough from an inlet to an outlet of the drying means;

inlet means for transmitting air into the inlet of the drying means and through the desiccant to provide a source of dry air at the outlet of said drying means; and

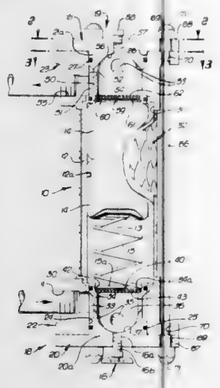
output means for transmitting said dry air from the outlet of said drying means through said lubrication passage to the rotor bearings to supply said dry air to said bearings.

4,177,049

COMPRESSED GAS FILTER

John A. Haslett, Jr., San Marino, Calif., assignor to Flo Dri Company, Los Angeles, Calif.

Filed Nov. 25, 1977, Ser. No. 854,838
Int. Cl.[2] B01D *25/06, 27/02, 29/24, 29/14*
U.S. Cl. 55—483 **11 Claims**



1. In a filter assembly to remove impurities from a pressurized fluid stream, the combination comprising:

(a) a longitudinally elongated barrel, first and second end structures at opposite ends of the barrel, said structures including end caps, and elongated tie members spaced about the barrel and removably interconnecting said end caps,

(b) there being flexible container means in the barrel containing fluid stream filtering material, and a spring located within the barrel between one of said end structures and said flexible container means to pressurize the latter for expanding same sidewardly against the barrel, and

(c) the first end structure containing a fluid inlet and an annular plenum communicating with said inlet, said first end structure having an annular wall extending about a cavity in endwise longitudinal alignment with the barrel interior, said plenum extending about said wall which contains multiple through openings angled to pass pressurized fluid from the plenum to the cavity in streams which are caused to impinge upon one another and turbulently mix together to detrain liquid and solid impurities from the fluid streams prior to flow thereof through the filter material in the barrel,

(d) said first end structure end cap forming a concave interior wall facing toward said spring, said cavity being interiorly open to facilitate said turbulent mixing interiorly of the cavity, said openings in said annular wall angled transversely and longitudinally toward said concave interior wall and in direction away from the spring, the spring spaced from the cavity, there being a perforated filter plate extending across the end of the open cavity opposite said concave interior wall, the spring located at the side of said plate opposite the cavity, and

(e) the second end structure defining a fluid outlet communicating with the barrel to receive fluid that has passed through said filtering material,

(f) said spring comprising a coil spring having a lowermost turn adjacent said filter plate, the spring located between said cap and said filter material container means, there also being liquid coalescing filter means extending parallel to and proximate said filter plate at a level above the level of the openings,

(g) said first openings in said annular wall being angled to extend transversely inwardly and downwardly generally tangentially relative to and toward said concave interior wall, said wall being upwardly concave so that liquid impurities drain toward the lowermost extent of said wall, there being a drain opening through said cap proximate the lowermost extent of said wall, and a drain valve controlling said drain opening,

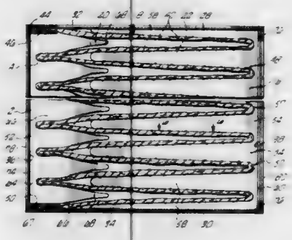
(h) and including a safety cage surrounding said barrel to protect against inadvertent bursting thereof.

4,177,050

AIR FILTER ASSEMBLY

Robert M. Culbert, Manhattan Beach, and Robert R. Raber, Jr., Los Alamitos, both of Calif., assignors to Farr Company, Los Angeles, Calif.

Continuation of Ser. No. 716,644, Aug. 23, 1976, abandoned.
This application May 5, 1978, Ser. No. 903,204
Int. Cl.[2] B01D *46/02*
U.S. Cl. 55—499 **3 Claims**



2. A filter assembly comprising an open ended housing defining an inlet end and an outlet end for the passage of air therethrough, a continuous length of high loft filtering media disposed within said housing and extending between opposite side walls thereof and a pleated configuration wherein each of the pleats defined by said media extends substantially from said inlet to said outlet end of said housing, a first plurality of pleat support members disposed in said housing at said inlet end thereof, each of said members having a web portion and a plurality of tapered finger portions, each of said web portions extending across said inlet end of said housing and each of said finger portions extending from said web portion along a first radius of curvature inwardly of said housing between the pleats defined by said media, and a corresponding second plurality of pleat support members disposed in said housing at said outlet end thereof, each of said second plurality of support members having a web portion and a plurality of tapered finger portions, each of said web portions extending across said outlet end of said housing and each of said finger portions extending from said web portions along a second radius of curvature inwardly of said housing between said pleats, said second radius of curvature being larger than said first radius of curvature and said first and second pluralities of pleat members defining a segmented inclined support surface pressing against said filtering media and maintaining said media configuration upon directing a flow of air through said housing.

4,177,051

METHOD AND APPARATUS FOR SEPARATION, REFINEMENT, EXTRACTION AND/OR CONCENTRATION BY LIQUATION

Clyde M. Adams, Jr., 3509 Biddle St., Cincinnati, Ohio 45220

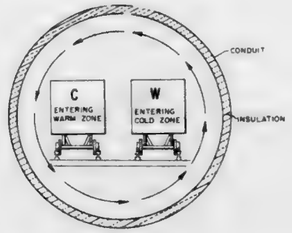
Filed Feb. 28, 1978, Ser. No. 882,256
Int. Cl.[2] B01D *9/04*
U.S. Cl. 62—532 **4 Claims**

1. A process for separation of a substantially liquid mixture containing solvent and dissolved and/or undissolved foreign matter comprising the steps of:

cooling separate mixtures by moving them in opposite directions through a substantially closed environment at a controlled and very slow rate of freezing sufficient to produce large plate-like crystals of substantially pure solvent, with counter-flow heat transfer being effected, respectively, between relatively warmer and cooler mixtures passing in opposite directions;

said cooling step being effected with the original mixtures constantly maintained in a substantially quiescent, undisturbed state;

raising the temperature of the combination of crystals and



intercrystalline matter rich in solute, resulting from said cooling of each mixture, at a controlled and very low rate of heat absorption said mixture being conveyed in containers past stationary zones in said closed environment wherein said cooling and heating steps take place;

effecting removal of liquid rich in solute from spaces between said crystals during said step of raising temperature; and

recovering the relatively pure solvent produced by continued heating and melting of said liquid crystals.

4,177,052

PROCESS FOR PREPARING DICALCIUM PHOSPHATE CONTAINING FERTILIZER

Karl Entzmann, A-8672 St. Kathrein, Austria; György Kálmán, Ságvári endre u. 15., Tatabánya I., Hungary; János Varga, Kolbai k. u. 4., Mosonmagyaróvár, Hungary; Vecsei Miklós, Terffy Gy. u. 34., Komárom, Hungary; Gabor Jankovics, Ifjumunkás u. 29., Tatabánya v., Hungary, and Lászlóné Kozicz, Mártirok u. 86., Tatabánya, Hungary

Filed May 5, 1978, Ser. No. 902,931
Claims priority, application Hungary, May 6, 1977, TA 1439
Int. Cl.[2] C05B *3/00*
U.S. Cl. 71—33 **9 Claims**

1. A process for preparing a fertilizer containing dicalcium phosphate from a tricalcium phosphate of mineral origin, said preparing being in the presence of monocalcium phosphate, which process comprises granulating the grains of the sized or unsized phosphate of mineral origin which are larger than 5 mm to a grain size of 1 to 4 mm, admixing the mineral phosphate with monocalcium phosphate and activating the phosphate crystals such that defects are formed in the crystal lattice of the resulting phosphate by colliding the grains of the mixture with each other at a speed of 70 to 120 m/sec for a time sufficient to prepare said fertilizer containing dicalcium phosphate.

4,177,053

METHOD FOR THE PRODUCTION OF PHOSPHORIC ACID WITH HIGH CONTENTS OF FERTILIZER-NUTRIENTS

Hans-Friedrich Kurandt, Lüneburg, Fed. Rep. of Germany, assignor to Veba-Chemie Aktiengesellschaft, Gelsenkirschen-Buer, Fed. Rep. of Germany

Continuation of Ser. No. 513,982, Oct. 11, 1974, abandoned.
This application Jul. 6, 1976, Ser. No. 703,034
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1973, 2351031; Mar. 15, 1974, 2412503
Int. Cl.[2] C05B *11/06*
U.S. Cl. 71—36 **16 Claims**

1. A process for decomposing phosphate rock with nitric acid in order to produce phosphoric acid having a high fertilizer-nutrient content and as a by-product a well filterable semihydrate of calcium sulfate which consists essentially of:

(A) decomposing phosphate rock having a P_2O_5 content up to 40% by weight

(B) with nitric acid, the amount of acid adjusted to a molar ratio of $H^+:P_2O_5$ equal to or greater than 7 but less than or equal to 17 and

(C) adjusting the water content of the decomposing mixture such that the produced nitrogen-containing phosphoric acid has a water content of 20 to 55% by weight, recycling amounts of wash water from step (G);

(D) adjusting the sulfate ion content so that there are at least 10 and up to 150 g free sulfate ions per liter of solution;

(E) agitating the resulting slurry thereby effecting precipitation and recrystallization of calcium ions as well as filterable calcium sulfate semihydrate;

(F) separating said well filterable calcium sulfate semihydrate from supernatant liquid;

(G) washing the separated calcium sulfate semihydrate with wash water and recycling at least a portion of such wash water to step (C) to adjust the water content thereof; and

(H) recovering as the liquid a nitrogen-containing phosphoric acid.

11. A process for decomposing phosphate rock with nitric acid of 35 to 60% HNO_3 by weight to produce phosphoric acid having a high fertilizer-nutrient content and as by-product a well filterable semihydrate of calcium sulfate which consists essentially of:

(A) decomposing phosphate rock having a P_2O_5 content up to 40% by weight

(B) with nitric acid in the absence of sulfuric acid, the amount of acid adjusted to a molar ratio of $H^+:P_2O_5$ equal to or larger than 7 but less than or equal to 17;

(C) adjusting the resulting decomposition solution to an actual nitric acid content of 35 to 60% by weight;

(D) adding sulfate in the form of ammonium sulfate or potassium sulfate such that the sulfate ion is present in an amount of at least 10 to up to 150 g free sulfate ions per liter solution;

(E) agitating this slurry whereby under the conditions of temperature and concentration recrystallization of substantially all calcium ions is effected together with precipitation of a well filterable calcium sulfate semihydrate;

(F) separating said well filterable calcium sulfate semihydrate from supernatant liquid;

(G) washing said well filterable calcium sulfate semihydrate with water and employing the resultant wash water in step (C) to adjust the nitric acid concentration in step (C); and

(H) recovering as liquid phase of the process a nitrogen-containing phosphoric acid.

4,177,054

1,2,3-THIADIAZOLE-5-CARBOXYLIC ACID DERIVATIVES, HERBICIDAL AND GROWTH REGULATING COMPOSITIONS CONTAINING THE SAME AND PROCESS FOR MAKING SAME

Friedrich Arndt; Hans-Rudolf Krüger, and Reinhart Rusch, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

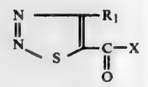
Filed Jun. 23, 1978, Ser. No. 918,462

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728523

Int. Cl.[2] **C07D** *285/06;* **A01N** *9/12*

U.S. Cl. 71—90 **66 Claims**

1. A comound of the formula



I

wherein

R_1 is hydrogen, C_1-C_4 alkyl, chloromethyl, or bromomethyl; and

X has the formula



where R_3 and R_4 are the same or different and are hydrogen, C_1-C_{18} alkyl, mono- or disubstituted C_1-C_{18} alkyl substituted in the 1-, 2- or 3-position by halogen, C_1-C_6 alkoxy, phenoxy, dimethylamino, diethylamino, methoxycarbonyl, ethoxycarbonyl or cyano, tetrahydrofurfuryl, C_3-C_8 cycloalkylmethyl, C_2-C_8 2- or 3-alkenyl or alkinyl, phenyl or diphenyl C_1-C_3 alkyl, mono- or disubstituted benzyl substituted by one or more of halogen, methylenedioxy, C_1-C_6 alkyl, C_1-C_6 alkoxy, trifluoromethyl or nitro, α-methyl- or α,α-dimethylbenzyl, pyridyl, furfuryl, C_3-C_8 cycloalkyl, C_1-C_6 alkyl or ethinyl substituted C_3-C_8 cycloalkyl, phenyl, mono- or disubstituted phenyl substituted by one or more of halogen, methylenedioxy, C_1-C_6 alkyl, C_1-C_6 alkoxy, trifluoromethyl or nitro, or naphthyl, or R_3 and R_4 together with the adjoining nitrogen atom constitute a morpholine, piperidine or pyrrolidine group.

2. A herbicidal and growth regulating composition for plants comprising about 10 to 80% by weight of the active agent defined in claim 1 and about 90 to 20% by weight of liquid or solid carrier materials in which composition part of the carrier materials may be replaced by up to 20% by weight of surface active agents.

4,177,055

1-ACYLOXYMETHYL-4,5-DICHLORO-IMIDAZOLE-2-CARBOXYLIC ACID DERIVATIVES AND THEIR USE AS PLANT PROTECTION AGENTS

Florin Seng; Klaus Sasse, both of Berg. Gladbach; Gunther Beck; Ludwig Eue, both of Leverkusen, and Robert R. Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

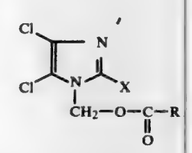
Filed Sep. 21, 1977, Ser. No. 835,093

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1976, 2646142

Int. Cl.[2] **C07D** *233/68;* **A01N** *9/22*

U.S. Cl. 71—92 **17 Claims**

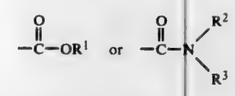
1. A 1-acyloxymethyl-4,5-dichloro-imidazole-2-carboxylic acid derivative of the formula



(I)

in which

X represents a group



in which

R^1 represents a straight or branched alkyl radical of 1 to 6 carbon atoms or a straight or branched alkenyl or alkynyl radical each with up to 6 carbon atoms, which radicals each can be carrying one or more substituents selected from halogen, alkoxy with 1 to 6 carbon atoms and alkylmercapto with 1 to 6 carbon atoms,

R^2 represents hydrogen, alkyl with 1 to 8 carbon atoms, alkenyl with up to 8 carbon atoms or the formyl group,

R^3 represents alkyl with 1 to 8 carbon atoms or alkenyl or alkynyl each with up to 8 carbon atoms, it being possible for each of these alkyl, alkenyl and alkynyl radicals to carry one or more substituents selected from alkoxy with 1 to 4 carbon atoms, alkylmercapto with 1 to 4 carbon atoms, or

R^2 and R^3 conjointly with the adjoining nitrogen atoms form a heterocyclic ring selected from pyrrolidinyl, piperidinyl and hexamethyleneimidinyl and

R represents alkyl with 1 to 6 carbon atoms.

4,177,056

WATER-INSOLUBLE HYDROPHILIC COPOLYMERS USED AS CARRIERS FOR MEDICAMENTS AND PESTICIDES

Karl F. Mueller, New York, and William R. Good, Yorktown Heights, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 581,065, May 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 483,743, Jun. 27, 1974, abandoned. This application Jan. 25, 1978, Ser. No. 872,191

Int. Cl.[2] **A01N** *9/22;* **A61K** *31/78*

U.S. Cl. 71—93 **20 Claims**

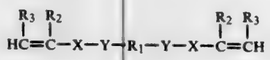
1. A controlled, sustained release composition comprising

(a) a pharmaceutically, insecticidally or herbicidally effective agent in an amount at least sufficient for the total dosage during a treatment period, and

(b) a water-insoluble hydrophilic gel comprising the cross-linked copolymerization product of

(A) about 30 to about 90% by weight of said gel of (a) a water-soluble monoolefinic monomer, or mixture of said monomers, or (b) a water-soluble monomer, or mixture of said monomers with 1 to 50% by weight of total monomers of a water-insoluble monoolefinic monomer, or mixture of said water-insoluble monomers, with

(B) about 10 to about 70% by weight of said gel of a terminal diolefinic hydrophobic macromer having a molecular weight from about 400 to about 8000, said macromer having the formula



wherein R_1 is a polycondensate chain having a molecular

weight from about 200 to about 8000, which is the residue of a poly(propylene oxide) or poly(tetramethylene oxide) glycol having ether linkages; R_2 is hydrogen, methyl or $—CH_2COOR_4$, wherein R_4 is hydrogen or an alkyl group with up to 10 carbon atoms; R_3 is hydrogen or $COOR_4$, with the proviso that at least one of R_2 and R_3 is hydrogen; X is oxa,—COO—, or $—CONR_5$—wherein R_5 is hydrogen or alkyl with up to 5 carbon atoms and Y is a direct bond or the radical $—R_6—Z_1—CO—NH—R_7—NH—CO—Z_2—$, wherein R_6 is linked to X and represents branched or linear alkylene with up to 7 carbon atoms; Z_1 and Z_2 is oxa or NR_5 and R_7 is the diradical of aliphatic or aromatic diisocyanate, with the proviso that in case X is oxa, Y is different from a direct bond, and R_2 and R_3 are hydrogen.

4,177,057

HERBICIDAL BENZIMIDAZOLES

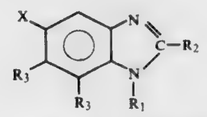
Don L. Hunter, Anaheim, Calif., and Wayne S. Belles, Moscow, Id., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 844,777, Oct. 25, 1977, abandoned. This application Jun. 19, 1978, Ser. No. 916,669

Int. Cl.[2] **A01N** *9/22*

U.S. Cl. 71—92 **13 Claims**

1. The method for controlling weed growth which comprises applying to the locus of said weeds a phytotoxic amount of a compound of the formula



in which each of R_1 and R_2 are lower alkyl of one to about three carbon atoms, X represents a lower alkylsulfonyl or fluoro-lower alkylsulfonyl group and each of said R_3's is selected from hydrogen, halo, lower alkoxy, nitro and amino groups.

4,177,058

METHOD FOR PRODUCING A NON-SPLIT METAL WORKPIECE FORMED AS A CAST HOLLOW BILLET WITH A BOTTOM PART

Boris E. Paton; Boris I. Medovar, both of Kiev; Georgy E. Tsukanov, Moscow; Alexei G. Bogachenko, Kiev; Viktor L. Artamonov, Kiev; Grigory A. Timashov, Kiev; Jury P. Shtanko, Kiev; Alexandr M. Marchenko, Kiev; Boris B. Fedorovsky, Kiev; Ilya I. Kumysh, Kiev; Anatoly D. Chepurnoi, Zhdanov Donetskoi oblasti; Vladimir Y. Saenko, Kiev, and Gennady M. Semin-Vadov, Moscow, all of U.S.S.R., assignors to Institut Elektrosvarki Imeni E.O. Patona Akademii Nauk Ukrainskoi SSR, Kiev, U.S.S.R.

Filed Oct. 26, 1977, Ser. No. 845,679

Claims priority, application U.S.S.R., Sep. 22, 1977, 2520640

Int. Cl.[2] **C22B** *4/00;* **B22D** *27/02*

U.S. Cl. 75—10 C **15 Claims**

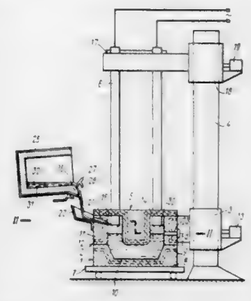
1. A method of producing a metal workpiece having an upper part and a lower base part comprising the steps of:

premelting a metal having the same composition as that specified for the metal of the base part of said workpiece being produced in an amount determined by the mass of metal of the base part of the workpiece;

premelting slag in an amount sufficient to form a slag pool;

pouring the molten slag and molten metal into a receptacle, the molten slag forming a slag pool on top of the molten metal and the molten metal solidifying to produce the base part;

electroslag remelting at least one consumable electrode in the slag pool to produce the upper part, the composition of said electrode being the same as that specified for the metal of the upper part of the workpiece being produced,



the mass of the electrode being sufficient to form the upper part of the workpiece being produced.

4,177,059

PRODUCTION OF YTTRIUM

Joseph G. Day, Holmer Green, England, assignor to Johnson, Matthey & Co., Limited, London, England

Filed Jul. 5, 1978, Ser. No. 922,194

Claims priority, application United Kingdom, Jul. 5, 1977, 28072/77

Int. Cl.[2] **C22B** *4/04*

U.S. Cl. 75—10 R **6 Claims**

1. A process for the production of yttrium metal and alloys thereof in which calcium metal and yttrium fluoride are reacted together by the use of electric resistance heating in a molten slag which contains the calcium metal, the yttrium fluoride and a preponderant amount of calcium fluoride.

4,177,060

REDUCTION OF STABLE OXIDES

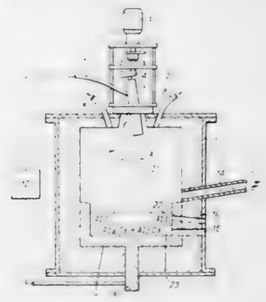
Józef K. Tylko, Faringdon, England, assignor to Tetronics Research & Development Company Limited, Faringdon, England

Filed Aug. 22, 1977, Ser. No. 826,695

Claims priority, application United Kingdom, Aug. 23, 1976, 35076/76

Int. Cl.[2] **C22B** *21/02*

U.S. Cl. 75—10 R **9 Claims**



1. A process for the carbothermal reduction of alumina comprises supplying a feed of alumina and carbon to a molten reaction bed maintained in a reaction chamber, exhausting evolved gases from said reaction chamber and supplying energy to said reaction bed by contacting said bed with plasma or plasma effluents derived from at least one plasma gun orbiting

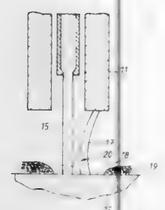
about the vertical axis of the reaction chamber and generating plasma within an essentially conoidal zone within said reaction chamber.

4,177,061

METHOD FOR MAKING IRON-CHROMIUM ALLOYS

Sven-Einar Stenkvist, and Björn Widell, both of Vesteras, Sweden, assignors to ASEA Aktiebolag, Vesteras, Sweden

Filed Jun. 7, 1978, Ser. No. 913,040
Claims priority, application Sweden, Jun. 9, 1977, 7706700
Int. Cl.² C21C *5/52*
U.S. Cl. 75—11 **4 Claims**



1. A method for making an iron-chromium alloy in an electric arc furnace having a hearth, side wall and arcing electrode; said method comprising charging the furnace with carbon-containing steel scrap so as to form a pile of the scrap on the hearth, applying DC power to the electrode and pile with the electrode cathodic and the pile anodic and forming an arc between the electrode's tip and the pile to start melting the scrap with the arc initially between said tip and the top of the pile and with melting of the scrap the arc and tip boring down into the pile with the scrap surrounding the arc and forming a shield absorbing the radiated arc energy so as to protect the furnace's side wall from said energy, said arc forming an arc spot on the forming melt resulting from said melting and said power being adjusted to a high value causing the arc to rapidly melt the scrap after said shield is formed and until a time when said shield ultimately is reduced to ineffectiveness by continued melting of the scrap, and not later than when said time occurs continuing said power at said high value while protecting the furnace's side wall by absorbing the arc energy by continuously feeding particulated chromium oxide to said arc spot so as to reduce said oxide by endothermic reaction with carbon contained by the melt via the scrap's carbon and so as to add chromium to the melt to form said alloy.

4,177,062

METHOD FOR REMOVING OIL FROM MILL SCALE AND RECOVERING METALLIC VALUES THEREIN

Paul R. Pack, Munster, Ind., assignor to Harsco Corporation, Camp Hill, Pa.

Filed May 23, 1978, Ser. No. 908,894
Int. Cl.² C21B *3/04*
U.S. Cl. 75—28 **17 Claims**

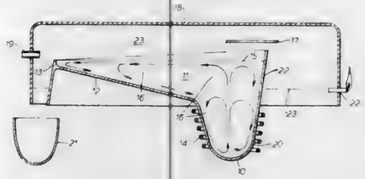
1. In a steelmaking method wherein an initial ore charge is smelted to crude iron in a reduction furnace, the smelted product is refined into steel in a steelmaking operation, the resulting steel is rolled in the presence of rolling mill oil to produce rolled steel and an oil coated oxide scale is stripped from said rolled steel; including the steps of separating the hot slag produced in said steelmaking operation from said steel and processing and recycling said slag for recovery of metallic values contained therein, the improvement comprising contacting said stripped oil coated oxide scale with said separated hot slag at a temperature above the ignition temperature of the oil whereby the oil is ignited and substantially completely flashed away, the said de-oiled oxide scale reporting to said slag for processing and recycling to recover metallic values contained therein.

4,177,063

METHOD AND APPARATUS FOR REDUCING METAL OXIDE

Eric W. Dickson, Taunton, England, assignor to The Glacier Metal Company Limited, Middlesex, England

Filed Mar. 17, 1978, Ser. No. 887,515
Claims priority, application United Kingdom, Mar. 16, 1977, 11020/77
Int. Cl.² C21C *7/00*
U.S. Cl. 75—62 **9 Claims**



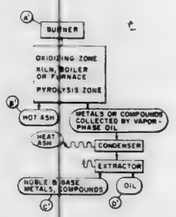
1. A method of reducing metal oxide on the surface of a bath of molten metal, wherein the geometry and the heat source in said bath are arranged so as to create a temperature difference on the surface of said bath comprising a first hotter region A and a second cooler region B, with a temperature difference between said regions of about 500°–700° C., which comprises
supplying metal oxide to said hotter region A,
circulating the molten metal bath by means of convection currents so that the surface of said bath moves continuously from said region A to said region B, thereby
carrying said metal oxide continuously on the surface of said bath from said region A to said region B,
contacting the surface of said bath with a reducing atmosphere, thereby reducing said continuously moving metal oxide to metal, and
removing metal at said region B by means of a lip present in said bath.

4,177,064

METAL RECOVERY PROCESS AND METHOD

Fritz W. Wanzenberg; Frederick W. Wanzenberg, and Andrew K. Wanzenberg, all of 9 Campbell La., Larchmont, N.Y. 10538

Filed Apr. 9, 1977, Ser. No. 783,846
Int. Cl.² C22B *11/00*
U.S. Cl. 75—83 **9 Claims**



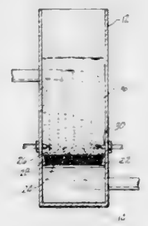
1. A method of treating solid materials recovered by mining, said solid mined materials including oil shale, low grade coal, and mixtures thereof, said mined materials being comprised of a first, refractory, inorganic ore gangue portion, a second, hydrocarbon portion and a third, composite organic portion, said third portion containing recoverable precious and semi-precious metal values, said method being adapted to recover said metal values from said third portion and to create heat by combustion of at least parts of said second and third portions, said method comprising physically reducing the particle size of said mined material, separating said third composite organic portion from said gangue portion to form a concentrate of said third, metal-containing organic material, treating said metal-containing organic concentrate portion with both an aqueous solution of a strong oxidizing agent and gas phase oxygen in a combined amount sufficient to supply the stoichiometric amount of oxygen required to fully oxidize said composite material, thereby producing a treated composite organic concentrate material, heating said treated composite organic material until said material ignites, and allowing complete combustion of said treated composite organic material and a portion of said hydrocarbon material recovering the metal and metal oxides resulting from said combustion, and generating significant useable heat from the process of combustion of said second and third materials.

4,177,065

METHOD FOR THE DEGASSING AND FILTRATION OF MOLTEN METAL

Joseph A. Clumpner, Creve Coeur, Mo., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 914,511, Jun. 12, 1978. This application Jan. 12, 1979, Ser. No. 2,843
Int. Cl.² C22B *9/02, 9/08*
U.S. Cl. 75—93 E **3 Claims**



1. A method for the degassing of molten metal by passing said molten metal through a chamber and purging said molten metal with a fluxing gas by passing said fluxing gas through said metal, the improvement comprising providing a chamber having an elongated side wall portion, providing said chamber with molten metal inlet means at a first height, molten metal outlet means at a second height below said first height and fluxing gas inlet means at a third height below said first height, tangentially positioning said molten metal inlet means with respect to said side wall portion such that said molten metal swirlingly flows in a clockwise or counterclockwise manner from said molten metal inlet to said molten metal outlet as said fluxing gas percolates through said molten metal.

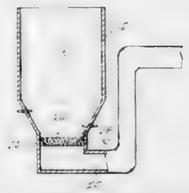
4,177,066

METHOD AND APPARATUS FOR THE REMOVAL OF IMPURITIES FROM MOLTEN METAL

Joseph A. Clumpner, Creve Coeur, Mo., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation-in-part of Ser. No. 914,511, Jun. 12, 1978. This application Feb. 21, 1979, Ser. No. 13,029
Int. Cl.² C22B *9/02, 9/08*
U.S. Cl. 75—93 E **30 Claims**

1. An improved apparatus for use in the degassing of molten metal which comprises:
chamber means having an elongated side wall portion and a central axis;
inlet means at a first height for introducing said molten metal into said chamber;
outlet means at a second height below said first height for removing said molten metal from said chamber;
at least two fluxing gas inlet means located below said first height for introducing said fluxing gas into said chamber, said first fluxing gas inlet means being located at a first radial distance from said central axis of said chamber means and said second fluxing gas inlet means being located at a second radial distance from said central axis of said chamber means; and



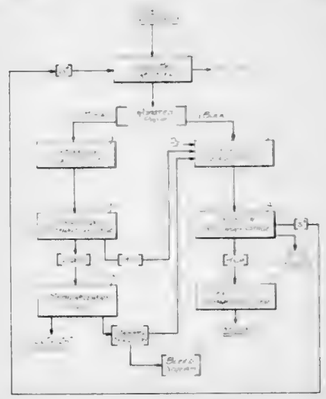
wherein said molten metal inlet means is located with respect to said side wall portion for tangentially introducing said molten metal into said chamber such that said molten metal swirlingly flows from said molten metal inlet towards said molten metal outlet as said fluxing gas percolates up through said molten metal.

4,177,067

RECOVERY OF SILVER, COPPER AND ZINC FROM PARTIALLY ROASTED PYRITE CONCENTRATE BY FERRIC SULPHATE LEACHING

Terry W. Pepper, Golden, and Harry G. Bocckino, Lakewood, both of Colo., assignors to Texasgulf Inc., Stamford, Conn.

Filed Apr. 17, 1978, Ser. No. 897,016
Int. Cl.² C22B *11/06, 15/08, 13/04*
U.S. Cl. 75—104 **14 Claims**



1. A process for the recovery of silver, copper and zinc from a pyrite concentrate, comprising the steps of:
(a) partially roasting the pyrite concentrate to open the pyrite matrix to solution penetration by driving off a portion of the sulphur contained therein;
(b) leaching under oxidizing conditions the bulk of the roasted pyrite concentrate to extract the silver, copper and zinc from therein;
(c) cooling the oxidation leached pulp and recovering the elemental sulphur generated during the leaching;
(d) heating the elemental sulphur pellets to recover silver and the portion of the copper and zinc contained therein;
(e) subjecting the solution resulting from the oxidation leach, containing the copper and zinc metals to a reduction leach stage wherein ferric ions contained therein are reduced to ferrous ions; and

(f) introducing the reduced solution from said reduction stage to a metal recovery stage wherein the copper and zinc are recovered therefrom.

4,177,068

EXTRACTION OF GOLD AND SILVER

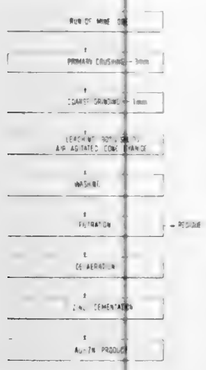
Ramachandran Balakrishnan, Reading, and Geoffrey F. Skinner, Maidenhead, both of England, assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Feb. 27, 1978, Ser. No. 881,335

Claims priority, application United Kingdom, Mar. 4, 1977, 9230/77

Int. Cl.[2] **C22B** *11/08*

U.S. Cl. 75—105 **8 Claims**



1. A process for the extraction of a noble metal selected from the group consisting of gold and silver from their respective ores comprising the steps of:

(a) reducing said ore to a particle size of about 1 mm or less,

(b) mixing said particles with an alkaline solution having a concentration of from 0.10 to 5% by weight of lixiviant for said noble metal such lixiviant selected from the group consisting of sodium cyanide and potassium cyanide in an amount to provide a liquor content of from 8 to 12% by weight of the mixture of lixiviant and ore, the concentration of said lixiviant being sufficient to solubilize all said noble metal in the ore and any other lixiviant consuming materials present,

(c) allowing the mixture from step (b) to react in a static bed at a temperature of 10° to 40° C. for a period between 12 and 48 hours and sufficient for the lixiviant to extract said noble metal, while said bed is being aerated,

(d) reslurrying said bed with water, and

(e) filtering the solution from step (d) to recover said metal.

4,177,069

PROCESS FOR MANUFACTURING SINTERED COMPACTS OF ALUMINUM-BASE ALLOYS

Mituki Kobayashi; Takao Awao; Yujiro Mizusaki; Kunio Sato; Akio Kato, all of Kawahigashimura, and Hisao Mituishi, Tokyo, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed Apr. 3, 1978, Ser. No. 892,740

Claims priority, application Japan, Apr. 9, 1977, 52-40827; Apr. 9, 1977, 52-40828

Int. Cl.[2] **B22F** *1/00*

U.S. Cl. 75—213 **15 Claims**

1. Process for manufacturing sintered compacts of aluminum-base alloys comprizing a step of mixing at least one powder selected from the first group consisting of aluminum powder and powder of Al-Si alloy containing Si at the most of 2.1% by weight with at least one powder selected from the second group consisting of powders of Al-Cu-Mg-Si alloy, Al-Cu-Si alloy, Al-Mg-Si alloy, Cu-Mg-Si alloy, Al-Cu-Mg alloy, Al-Cu alloy, Al-Mg alloy, Mg-Cu alloy, Cu and Mg in such a mixing proportion, that the over-all composition of the resulting powder mixture will correspond to the figures

Cu 1.0~6.0% by weight
Mg 0.2~2.0% by weight
Si 0.2~2.0% by weight
Al Rest

and wherein the powder of said first group will amount to at least 70%, based on the total weight of the resulting powder mixture; a step of compacting the resulting powder mixture into predetermined shapes to obtain green compacts and a step of sintering the green compacts at a temperature of from 500° to 650° C. in the air.

4,177,070

EXOTHERMIC SLAG-FORMING MIXTURE

Leonid I. Krupman, ulitsa R. Ljuxemburg 30a, kv. 17; Jury G. Yaroslavtsev, prosperkt Ilicha 10, kv. 15; Alexandr E. Sochnev, ulitsa Naberezhnaya 147, kv. 2, all of Donetsk; Jury P. Shamil, ulitsa 40 let Sovetskoi Ukrainy 13, kv. 2, Zaporozhie; Abram I. Khitrik, ulitsa pravdy 45a, kv. 10, Zaporozhie; Grigory I. Antipenko, ulitsa Lenina 153, kv. 8, Zaporozhie; Jury G. Smetanin, ulitsa Divnogorskaya 27, Zaporozhie; Albert N. Samsonov, prospekt Lenina 144, kv. 194, Zaporozhie; Vadim M. Ljudkovsky, ulitsa pobedy 99, kv. 51, Zaporozhie; Leonid M. Pokrass, ulitsa Pionerskaya 98, Donetsk; Anatoly A. Kurdjukov, bulvar Pushkina 25, kv. 13, Donetsk; Abram M. Ofengenden, ulitsa Tkachenko 135, kv. 20, Donetsk, and Georgy G. Zhitnik, bulvar Pushkina 25, kv. 21, Donetsk, all of U.S.S.R.

Continuation of Ser. No. 775,929, Mar. 9, 1976, abandoned. This application Apr. 27, 1978, Ser. No. 901,009

Int. Cl. C22B *9/10*

U.S. Cl. 75—257 **4 Claims**

1. An exothermic slag-forming mixture for refining metals, said mixture comprising an aluminium powder, sodium or potassium nitrate, a silica-containing component, calcium oxide, a compoent selected from the group consisting of expanded pearlite and fluorspar, and a silicon-containing component, said silicon being in elemental form.

4,177,071

RAPIDLY PROCESSABLE RADIOGRAPHIC MATERIALS

Luc A. De Brabandere, Lier; Hendrik A. Borginon, Mortsel; Herman A. Pattyn, Kapellen, and Robert J. Pollet, Vremde, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Sep. 12, 1977, Ser. No. 832,662

Claims priority, application United Kingdom, Oct. 7, 1976, 41752/76

Int. Cl.[2] **G03C** *5/04, 5/24, 1/06, 1/28*

U.S. Cl. 430—494 **14 Claims**

1. A radiographic material for direct-exposure to penetrating radiation without fluorescent screens, comprising a transparent support and on one or both sides thereof a layer of a hydrophilic colloid silver halide emulsion whereby the total amount of silver halide per sq.m. corresponds to from about 13 g to about 40 g of silver nitrate, wherein:

(1) the halide of the silver halide emulsion substantially consists of bromide but may comprise at most 10 mole % of chloride and at most 3 mole % of iodide,

(2) the ratio of hydrophilic colloid to silver halide, expressed as silver nitrate, is at most about 1.0,

(3) the silver halide grains have an average grain diameter of at least 250 nm and are for at least 80% by weight regular in shape, and

(4) the emulsion is such that it has a surface sensitivity, measured at density 0.30 above fog according to normal photographic techniques by coating a test portion of the non-chemically sensitized emulsion on a conventional support at a coverage of silver halide corresponding to 10 g of silver nitrate per sq.m. at a pH of 6.00 and a pAg of 8.00, exposing for 10^{-4} sec in a Mark VI Sensitometer of EG & G, Inc., Boston, Mass. USA using a General Electric type FT 118 electronic flash tube with a radiant energy of 100 Wattsec and developing for 10 min at 20° C. in the surface developer described hereinafter, at least equal to its internal sensitivity measured at density 0.50 above fog by coating and exposing an identical test portion in the same way as the first test portion, then bleaching the portion for 5 min at 20° C. in an aqueous bleaching solution containing 30 g of potassium hexacyanoferrate (III) and 30 mg of phenosafranine pro liter, and developing it for 15 min at 20° C. in the internal developer set forth hereinafter—

Surface developer
p-monomethylaminophenol sulphate: 2.50 g
ascorbic acid: 10.0 g
potassium bromide: 1.0 g
sodium metaborate-4-water: 35.0 g
water to make: 1.0 l

Internal developer
Same composition as surface developer to which 10 g of anhydrous sodium thiosulphate was added per liter.

4,177,072

PROCESS FOR PREPARING A LITHOGRAPHIC PRINTING PLATE WITH A THIOUREA WETTING SOLUTION

Yoshihiro Ono; Shigeo Harada; Yuzo Mizobuchi, and Tomoaki Ikeda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jun. 2, 1978, Ser. No. 912,150

Claims priority, application Japan, Jun. 2, 1978, 53/65151

Int. Cl.[2] **G03F** *7/02;* **G03C** *5/24*

U.S. Cl. 430—302 **7 Claims**

1. A process for preparing a lithographic printing plate which comprises

imagewise exposing a lithographic printing plate material comprising a support having thereon a light-sensitive layer comprising, as essential components, (a) an inorganic material selected from the group consisting of a chalcogenide, a chalcogenide composition, and a halide, and (b) at least one member selected from the group consisting of a metal, a metal oxide, a metal halide when (a) is a sulfur group element or a chalcogenide composition, and a metal sulfide which is not the same as the inorganic material (a), with both of the inorganic material (a) and the metal or metal compound (b) being in a state of contact with each other, and which, upon irradiation with said electromagnetic radiation, react with each other to form a mutually diffused state and, as a result, a difference in the hydrophilic property or in the oleophilic property occurs between the areas irradiated with said electromagnetic radiation and the non-irradiated areas, to electromagnetic radiation, and

then wetting the light-sensitive layer with a wetting solution containing (i) at least one compound selected from the group consisting of thiourea and a thiourea derivative and (ii) as an acid component, at least one compound selected from the group consisting of an inorganic acid, an acidic inorganic salt and an organic acid.

4,177,073

PHOTOSENSITIVE RESIN COMPOSITION COMPRISING CELLULOSE ETHER AROMATIC CARBOXYLIC ESTER

Yukinori Hata; Tsutomu Watanabe, and Fumio Itoh, all of Tokyo, Japan, assignors to Oji Paper Co., Ltd., Japan

Filed Nov. 17, 1977, Ser. No. 852,540

Claims priority, application Japan, Jun. 23, 1977, 52-73885

Int. Cl.[2] **G03C** *1/52, 1/68;* **C08L** *1/00, 3/00*

U.S. Cl. 430—188 **9 Claims**

1. A photosensitive composition comprising:

(A) a photosensitive resinous material selected from the group consisting of

(1) mixtures of at least one aromatic azido compound and at least one resin selected from the group consisting of novolak resins and hydroxypolystyrene resins and

(2) mixtures and reaction products of at least one resin selected from the group consisting of novolak resins and polycarbonate resins with an ortho-quinone diazido compound selected from the group consisting of benzoquinone- (1,2)-diazido and naphthoquinone-(1,2)-diazido, and;

(B) at least one cellulose ether aromatic carboxylic ester which is a reaction product of an aromatic polybasic carboxylic anhydride with a cellulose ether compound selected from the group consisting of those of the formulae (I) and (II);

$$R_a^1 R_b^2 A \quad (I)$$

and

$$R_c^3 R_d^4 R_e^5 A \quad (II)$$

wherein R^1 represents a hydroxyalkyl radical having 3 or 4 carbon atoms; R^2 and R^5 are a hydrogen atom or an alkyl radical having 1 or 2 carbon atoms, respectively; R^3 and R^4 represent a hydroxyalkyl radical having 2 to 4 carbon atoms, respectively, and are different from each other; A represents a cellulose residue, and; a, b, c, d and e, respectively, represent a positive number.

4,177,074

BUTADIENE/ACRYLONITRILE PHOTOSENSITIVE, ELASTOMERIC POLYMER COMPOSITIONS FOR FLEXOGRAPHIC PRINTING PLATES

Stephen Proskow, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 25, 1978, Ser. No. 872,082

Int. Cl.[2] **G03G** *1/68*

U.S. Cl. 430—286 **18 Claims**

1. A photosensitive, elastomeric composition which comprises, based on the total composition,

(a) 55 to 85% by weight of a high molecular weight butadiene/acrylonitrile copolymer having a number average molecular weight of 20,000 to 75,000, an acrylonitrile content of 10 to 50% by weight, and a carboxyl content of 1 to 15% by weight;

(b) 5 to 40% by weight of a low molecular weight butadiene polymer having a number average molecular weight of 750 to 10,000, an acrylonitrile content of 0 to 50% by weight, and a carboxyl content of 0 to 15% by weight, with the proviso that the combination of the high molecular weight butadiene/acrylonitrile copolymer and the low molecular weight butadiene polymer contains at least 2% by weight of carboxyl groups;

(c) 2 to 40% by weight of a nongaseous, ethylenically unsaturated compound containing at least one terminal ethylenic group, said compound being capable of forming a high polymer by free-radical initiated, chain-propagating addition polymerization and being compatible with polymers (a) and (b); and

(d) 0.001 to 10% by weight of an organic, radiation-sensitive,

V 9 8 9 1 D E 4 7 9 UMI

free-radical generating system, activatable by actinic radiation which initiates polymerization of the unsaturated compound.

2. The photosensitive, elastomeric composition of claim 1 in which high molecular weight copolymer (a) and low molecular weight polymer (b) both have a carboxyl content of 2 to 10%.

4,177,075

JET PRINTING INK CONTAINING AMMONIUM FORMATE ELECTROLYTE

Ishwar R. Mansukhani, Neenah, Wis., assignor to M&T Chemicals Inc., Stamford, Conn.

Filed Jun. 5, 1978, Ser. No. 912,227
Int. Cl.² C09D *11/08*
U.S. Cl. 106—30 **2 Claims**

1. In an ink composition suitable for ink jet printing on metal surfaces, the ink incorporating, in solution, a colorant, a resin component, an alcohol-water solvent and an electrolyte, proportioned to give the ink properties of low surface tension, low viscosity and a low resistivity, the improvement comprising the presence of ammonium formate as an electrolyte thereby preventing color degradation or mutation.

4,177,076

WATER OR ALCOHOL SOLUBLE PRINTING INK COMPOSITION

Hisatake Sato, Yokohama, Japan, assignor to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Apr. 10, 1978, Ser. No. 895,124
Claims priority, application Japan, Apr. 15, 1977, 52-43363; Apr. 15, 1977, 52-43364; Apr. 19, 1977, 52-44122
Int. Cl.² C09D *11/00*; C08F *212/08*
U.S. Cl. 106—32 **6 Claims**

1. A water soluble or alcohol soluble printing ink composition comprising:

(A) 10 to 50% by weight of a resin, said resin being prepared by radical-polymerizing a mixture consisting essentially of (a) an unsaturated aromatic hydrocarbon, (b) a monoacrylate or monomethacrylate of a polyhydric alcohol and (c) an α,β-unsaturated carboxylic acid in the presence of an organic solvent, said resin having an acid value of 5 to 150 and a hydroxyl value of 30 to 120;

(B) 30 to 80% by weight of a solvent selected from the group consisting of an alcohol having 1 to 10 carbon atoms, a mixed solvent of alcohol aqueous solution of an alkali and an aqueous solution of an alkali; and

(c) ~~1 to 40%~~ by weight of a pigment or die.

4,177,077

GLASS COMPOSITION FOR FIBERIZATION

Lawrence V. Gagin, Littleton, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 847,621, Oct. 31, 1977, abandoned. This application Sep. 19, 1978, Ser. No. 943,837
Int. Cl.² C03C *13/00, 3/08*
U.S. Cl. 106—50 **9 Claims**

1. A glass composition of improved moisture resistance in the form of fibers consisting essentially of by weight:

	Parts
SiO_2	54–57
Al_2O_3	3–4
CaO	10–13
Na_2O	16–19
B_2O_3	9–12
ZnO	1–3.5

and having a softening temperature of about 1207° F. to 1221° F., a Liquidus temperature of about 1700° F. to 1740° F., and a temperature at a viscosity of 1000 poises of 1690° F. to 1730° F.

4,177,078

THERMAL STABILIZATION OF SOIL

Walton W. Welna, and Lowell C. Frank, both of Saint Paul, Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 793,933, May 5, 1977, abandoned. This application Apr. 6, 1978, Ser. No. 894,100
Int. Cl.² C04B *35/66*
U.S. Cl. 106—67 **3 Claims**

1. A process for providing a thermally stable environment for underground electrical equipment comprising the steps of:

(a) placing said equipment in an open trench;

(b) backfilling said trench with soil in which from about 1 to about 10 percent by weight of a stabilizing agent is thoroughly mixed in the presence of water, said stabilizing agent comprising a mixture of clay and a dispersing agent for said clay, wherein said dispersing agent comprises at least about 0.25% by weight of said stabilizing agent.

4,177,079

ASPHALTIC PAVING COMPOSITIONS AND METHOD OF PREPARATION FROM SOLID ORGANIC WASTES

Wilton F. Espenscheid, De Soto, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 20, 1978, Ser. No. 897,997
Int. Cl.² C08L *95/00*
U.S. Cl. 106—274 **10 Claims**

1. A process for liquefaction of solid organic waste material to provide asphaltic compositions suitable for use as paving binders which comprises forming a slurry of comminuted solid organic waste with sulfur and a petroleum solvent having a boiling point between about 450° F. and 1100° F. which has

(a) an H_{Ar} proton content between about 30 and 50 percent,

(b) a H_α proton content of at least 30 percent,

(c) a H_β proton content below 20 percent,

(d) a H_γ proton content below 13 percent, and

(e) a H_α/H_β proton ratio above about 1.4;

heating the slurry at a temperature in the range between about 300° F. and 1000° F. for a period of time sufficient to dissolve the slurry, and thereafter recovering a flowable heavy oil having a pitch-like consistency.

4,177,080

METHOD AND APPARATUS FOR RECYCLING ASPHALT-AGGREGATE COMPOSITIONS

Robert L. Mendenhall, 1770 Industrial Rd., Las Vegas, Nev. 89102

Continuation-in-part of Ser. No. 718,063, Aug. 26, 1976. This application Dec. 27, 1977, Ser. No. 864,673
Int. Cl.² B28C *1/22*; C08L *95/00*
U.S. Cl. 106—281 R **18 Claims**



1. A process for producing asphalt-aggregate composition comprising

introducing non-asphalt containing aggregate particles in a hot zone of a rotatable drum and gradually heating and advancing said aggregate toward an output drum end,

introducing solid particles of used asphaltic concrete comprising a mixture of asphalt and aggregate radially into said drum downstream from said hot zone in a cooler temperature zone,

gradually mixing and heating said aggregate with said asphaltic concrete particles, and

adding and mixing liquid asphalt with said particles downstream from said hot zone to produce said asphalt-aggregate composition.

4,177,081

TITANIUM DIOXIDE PIGMENT SLURRIES TO IMPART HIGH GLOSS TO WATER-BASED ACRYLIC PAINT SYSTEMS

Raymond L. DeColibus, Camden, Tenn., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 857,676, Dec. 5, 1977, abandoned, which is a continuation-in-part of Ser. No. 753,460, Dec. 22, 1976, abandoned. This application Dec. 4, 1978, Ser. No. 966,253
Int. Cl.² C09C *1/36*
U.S. Cl. 106—300 **5 Claims**

1. An aqueous slurry of titanium dioxide pigment to provide a high-gloss finish to paint films derived from acrylic water-based systems, said slurry containing from 60 to 80 percent titanium dioxide, from 0.2 to 1 percent of a compound selected from the formula



where

M is alkali metal,

R_1 to R_4 is H, $-CH_3$ or C_2H_5,

X is —CN or $-COOR_5$ where R_5 is hydrogen or lower alkyl of 1–4 carbon atoms,

Y is —COOH or —COONa, and

a and b are 10 to 100,

from 0.1 to 0.6 percent of 2-amino-2-methyl-1-propanol and the remainder water.

4,177,082

PROCESS FOR GRANULATING PIGMENT COMPOSITIONS

George H. Robertson, Cincinnati, Ohio, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 20, 1978, Ser. No. 888,606
Claims priority, application United Kingdom, Mar. 18, 1977, 11633/77
Int. Cl.² C09C *3/08*
U.S. Cl. 106—309 **15 Claims**

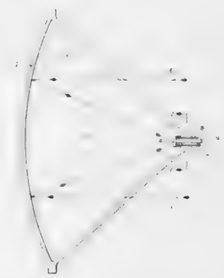
1. A process for producing a pigment of dyestuff composition in the form of dustless readily-dispersible granules which comprises contacting, with agitation, (1) an aqueous dispersion of a pigment, (2) an aniline which is liquid at temperatures below 100° C., insoluble in water at pH values above 7, and soluble in water at pH values below 7, and (3) an organic carrier, which has a melting point above 40° C. and is soluble in, or at least softened by, the aniline and is insoluble or can be rendered insoluble in water throughout the pH range used in the process, the pH value being first above 7, maintaining the temperature above the melting point of the aniline and stirring at least until the pigment has migrated from the aqueous phase to the organic phase, consisting of the organic carrier and the aniline, and then reducing the pH to below 7 to render the aniline soluble in water, and recovering the resulting granules in a solvent free condition.

4,177,083

PHOTOVOLTAIC CONCENTRATOR

William S. Kennedy, San Jose, Calif., assignor to Acurex Corporation, Mountain View, Calif.

Filed Sep. 6, 1977, Ser. No. 830,780
Int. Cl.² H01L *31/04*
U.S. Cl. 136—89 CA **1 Claim**



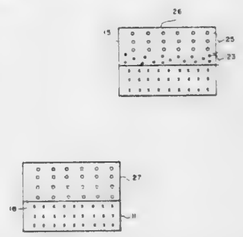
1. A photovoltaic concentrator comprising photocell means for converting received light to electrical energy; reflector means for receiving sunlight and focusing such light onto said photocell; air tight enclosure means in a fixed physical relationship and containing an inert atmosphere, said enclosure means including first and second halves consisting of substantially identical transparent material each having matching extremities and joined together at such extremeties, said first half having an apex at which said photocell means is located within said enclosure and said second half being coated with reflective material to provide said reflector means.

4,177,084

METHOD FOR PRODUCING A LOW DEFECT LAYER OF SILICON-ON-SAPPHIRE WAFER

Silvanus S. Lau; James W. Mayer, both of Pasadena, Calif., and Thomas W. Sigmon, Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif., by Thomas W. Sigmon, a part interest

Filed Jun. 9, 1978, Ser. No. 913,982
Int. Cl.² H01L *21/265, 7/00*
U.S. Cl. 148—1.5 **6 Claims**



1. A method for producing a silicon-on-sapphire wafer having a silicon layer on a sapphire substrate said method comprising the steps of:

epitaxially depositing a layer of monocrystalline silicon on the sapphire substrate;

performing an ion implantation into the silicon layer to form an amorphous region in the silicon layer near the surface of the sapphire substrate, but leaving substantially monocrystalline silicon in another region extending from the amorphous region to the surface of the silicon layer; and

annealing the wafer to convert the amorphous silicon to

monocrystalline silicon by regrowing the silicon from the remaining substantially monocrystalline silicon region toward the surface of the sapphire substrate.

4,177,085

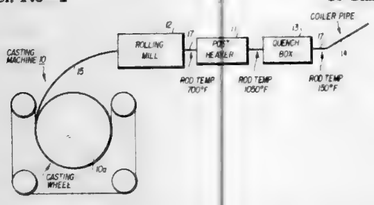
METHOD FOR SOLUTION HEAT TREATMENT OF 6201 ALUMINUM ALLOY

Kenneth E. Chadwick; E. Henry Chia, and Frank M. Powers, all of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Continuation-in-part of Ser. No. 681,925, Apr. 30, 1976, abandoned. This application Oct. 12, 1977, Ser. No. 841,275

Int. Cl.² C22F 1/04

U.S. Cl. 148—2 **16 Claims**



1. A method of continuously casting and rolling a heat treatable hot formed aluminum base alloy product comprising: casting a molten aluminum base alloy metal in a continuous casting mold; cooling said molten aluminum base alloy metal during casting to form a cast bar at a temperature above that temperature at which the alloying metals present in said aluminum base alloy metal would precipitate to the grain boundaries of said aluminum base alloy metal and at a rate at which solidification shrinkage will not occur; continuously removing said cast bar from said continuous casting mold and passing said cast bar to a hot rolling mill wherein said cast bar is hot formed into a wrought rod; initiating the step of hot forming the cast bar while the cast bar is at a temperature within the hot forming temperature range of the metal and which temperature is a solutionizing temperature of the metal, continuing the hot forming step while maintaining the temperature of the cast bar within the hot forming temperature range; immediately after the hot forming step and before any substantial cooling of the wrought rod, continuously passing the wrought rod to an in-line heater for approximately five seconds or less wherein the temperature of said wrought rod is raised to a temperature which is a solutionizing temperature of the metal and maintaining the temperature of the wrought rod for a time sufficient to solution heat treat said wrought rod and reducing the temperature of the wrought rod after the solution heat treating step at a rate so as to reduce the temperature of the wrought rod from the solutionizing temperature to a temperature at which no substantial immediate precipitation of alloying metal occurs.

2. A method of continuously casting an aluminum base alloy rod containing from about 0.5 to about 0.9 weight percent silicon, about 0.6 to about 0.9 weight percent magnesium and the remainder essentially aluminum comprising the steps of:

(a) pouring a molten aluminum base alloy containing from about 0.5 to about 0.9 weight percent silicon, about 0.6 to about 0.9 weight percent magnesium and the remainder essentially aluminum into the casting groove of a continuous casting wheel at a temperature above the melting point of the aluminum base alloy;
(b) cooling the molten aluminum base alloy in the casting groove to form a cast bar at a rate at which solidification shrinkage will not occur;
(c) removing the cast bar from the casting groove at a temperature below 940° F.;
(d) continuously hot forming the cast aluminum base metal at a temperature within the hot forming range to form a rod;
(e) immediately after the hot forming step and before any substantial cooling of the rod, continuously passing the rod through an in-line heater for approximately five seconds or less to raise the temperature of the rod to a temperature above the temperature at which the alloying metals will precipitate to the grain boundaries of the aluminum base metal; and
(f) continuously quenching the rod to a temperature below the temperature level at which immediate substantial precipitation of the alloying metals occur.

4,177,086

PROCESS FOR THE THERMAL TREATMENT AND THE QUENCHING OF FORGED ARTICLES

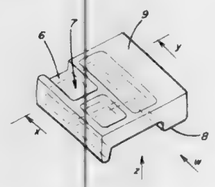
Jean-Marie A. Bouvaist, Grenoble, and Georges Lacoste, Issoire, both of France, assignors to Societe pour le Forgeage et l'Estampage des Alliages Legers FORGEAL, Paris, France

Filed Mar. 27, 1978, Ser. No. 890,680

Claims priority, application France, Mar. 31, 1977, 77 10496

Int. Cl.² C22F 1/04

U.S. Cl. 148—12.7 A **6 Claims**



1. In the process for the treatment of a finished or semi-finished forged product having a relatively thick section made from billets or cast plates of age-hardening aluminum alloys useful in aeronautical applications, the improvement comprising:

thermally treating said product between the solidus temperature of equilibrium (T_1) and the liquidus temperature (T_2) for a period of 0.5 to 12 hours; coating the entire surface of said product with an insulating coating to increase the hardness of said product;

solution heat treating said coated product; and quenching said coated product in hot or boiling water.

4,177,087

MANUFACTURE OF SUPERCONDUCTING MEMBERS

James A. Lee; Peter E. Madden, both of Harwell, and Ronald F. Hills, Newbury, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Continuation-in-part of Ser. No. 779,507, Mar. 21, 1977, abandoned. This application Aug. 7, 1978, Ser. No. 931,321

Claims priority, application United Kingdom, Mar. 23, 1976, 11708/76

Int. Cl.² H01L 39/24

U.S. Cl. 148—11.5 R **5 Claims**

1. A method of manufacturing a superconducting member embodying a superconductor of A15 crystal structure having the general formula A_3B where A comprises niobium or vanadium and B comprises one or more of the elements of the group consisting of aluminium, gallium, indium, silicon, germanium, gold, platinum, antimony, rhodium, palladium, osmium, ruthenium, cobalt, thallium, lead, arsenic, bismuth, iridium and tin, which method comprises forming an alloy of copper with one or more of the elements B, including phosphorus in the alloy, contacting the alloy with a base material essentially consisting of the metal A, forming the contacted alloy into a unitary structure, the formation of the alloy being carried out such that, at least where it is in contact with the base material, the phosphorus concentration in the alloy is in the range 0.01 to 0.1 percent by weight, and heat treating the said unitary structure

to cause reaction between the base material and the B element or elements to form superconducting A_3B compound.

4,177,088

PROCESS AND INSTALLATION FOR HEAT TREATING SPHEROIDAL OR LAMELLAR GRAPHITE CAST IRON PIPES

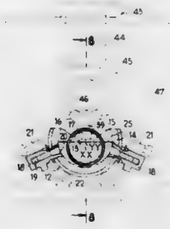
Michel Pierrel, Pont-a-Mousson, France, assignor to Pont-a-Mousson S.A., Nancy, France

Filed Mar. 1, 1978, Ser. No. 882,470

Claims priority, application France, Mar. 2, 1977, 77 06076

Int. Cl.² C21D 1/48

U.S. Cl. 148—15 **16 Claims**



1. A process for effecting a heat treatment of a metal pipe, comprising engaging end portions of the pipe by rotary driving means in a region of the pipe above the axis of the pipe, driving the pipe in rotation about the axis of the pipe by said rotary driving means while suspending the pipe in a substantially horizontal position and partly immersing the pipe in a bath of molten metal at the desired temperature so that said region of the pipe and said rotary driving means are located above the level of the molten metal.

4,177,089

MAGNETIC PARTICLES AND COMPACTS THEREOF

Billye Bankson, Harvard, Ill., assignor to The Arnold Engineering Company, Marengo, Ill.

Continuation of Ser. No. 680,770, Apr. 27, 1976, abandoned. This application Apr. 24, 1978, Ser. No. 899,135

Int. Cl.² C04B 35/00

U.S. Cl. 148—31.55 **13 Claims**

1. Magnetic powders for compaction into cores consisting essentially of a blend of

(1) 30 to 70% by weight iron particles, and
(2) 70 to 30% by weight particles of an iron alloy consisting essentially of 7 to 13% by weight silicon, 4 to 7% by weight aluminum and the balance being iron,

said particles containing a coating of an electrical insulator thereon to electrically insulate each of the particles from the other.

8. A core as defined in claim 6 wherein the insulator is an inorganic insulator.

4,177,090

MUFFLER MADE OF MANGANESE ALLOY

Silvestre Sanchez Torres, 30 Poniente No. 1512, Interior 2, Puebla, Pue, Mexico

Division of Ser. No. 891,258, Mar. 29, 1978, Pat. No. 4,147,527, which is a continuation-in-part of Ser. No. 699,599, Jun. 24, 1976, abandoned. This application Dec. 11, 1978, Ser. No. 967,941

Int. Cl.² C22C 22/00

U.S. Cl. 148—32 **2 Claims**

1. A muffler having as a sheet metal component thereof a quenched rust-resistant alloy for high temperature use consisting essentially of:

1.0%–2.0% silicon
0.9%–1.9% copper
0.5%–0.12% carbon
0.5%–0.9% iron
0.2%–2.3% titanium
15.0%–22.0% chromium
2.5%–4.0% molybdenum
5.0%–10.0% aluminum
0.1%–0.3% selenium

and the balance manganese being present in amount less than about 70.0%.

4,177,091

METHOD OF PRODUCING SILICON-IRON SHEET MATERIAL, AND PRODUCT

Howard C. Fiedler, Schenectady, N.Y., assignor to General Electric Company, N.Y.

Filed Aug. 16, 1978, Ser. No. 934,194

Int. Cl.² H01F 1/04

U.S. Cl. 148—111 **10 Claims**

1. The method of producing grain oriented silicon-iron sheet having superior magnetic properties and good weld characteristics which comprises the steps of providing a silicon-iron melt containing 2.2 to 4.5 percent silicon, between about three and 35 parts per million boron, between about 30 and 75 parts per million nitrogen in the ratio to boron of one to 15 parts per part of boron, from 0.02 to 0.05 percent manganese, less than 0.010 percent sulfur, tin in amounts ranging from 0.01 to 0.10 percent, and from 0.002 to 0.010 percent selenium, casting the melt and hot rolling the resulting billet to form an elongated sheet-like body, cold rolling the hot rolled body to provide a sheet of final gauge thickness, and subjecting the resulting cold-rolled sheet to a final heat treatment to decarburize it and to develope (110) [001] secondary recrystallization texture in it.

4,177,092

DIFFUSING AN ELEMENT INTO A METAL

Graham J. Thursby, Whitchurch, Wales, assignor to National Research Development Corporation, London, England

Filed Jan. 19, 1978, Ser. No. 870,645

Claims priority, application United Kingdom, Jan. 31, 1977, 03786/77

Int. Cl.² C21D 1/78

U.S. Cl. 148—113 **26 Claims**

1. A method of diffusing an element into a transition series metal, for the purpose of improving a property, such as a magnetic property, of said metal, comprising:

selecting said element from the group consisting of silicon and aluminum,

forming an aqueous paste comprising the element in powdered form and sodium silicate in the ratio of 0.1 g to 6 g of said element per gram of sodium silicate.

applying to the metal said aqueous paste, and

firing the pasted metal at a temperature from 680° C. to 1100° C. for a time period of from 15 minutes to 6 hours to produce a diffusion concentration gradient of said element into said metal smoothly varying from at least 5% at the surface of said metal to a maximum of 4% at the center of said metal.

15. The method of claim 1, further comprising annealing the metal after firing.

4,177,093

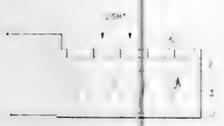
METHOD OF FABRICATING CONDUCTING OXIDE-SILICON SOLAR CELLS UTILIZING ELECTRON BEAM SUBLIMATION AND DEPOSITION OF THE OXIDE

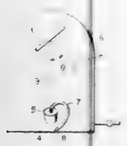
Tom Feng, Morris Plains, and Amal K. Ghosh, New Providence, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 919,569, Jun. 27, 1978, abandoned. This application Nov. 22, 1978, Ser. No. 963,023

Int. Cl.[2] H01L *21/203, 27/14, 21/26*

U.S. Cl. 148—174 **10 Claims**





1. In the process of preparing a heterojunction device having an N-type oxide selected from tin oxide and indium tin oxide coating on N-type silicon substrate by directing an electron beam generated vapor stream of said oxide to impinge on said silicon substrate whereby the oxide is deposited thereon, the improvement comprising directing said vapor stream to impinge on said substrate such that the angle of incidence is sufficient to provide a maximum in the engineering efficiency of the cell wherein said angle of incidence is between 40 and 70.

4,177,094

METHOD OF TREATING A MONOCRYSTALLINE BODY UTILIZING A MEASURING MEMBER CONSISTING OF A MONOCRYSTALLINE LAYER AND AN ADJOINING SUBSTRATUM OF DIFFERENT INDEX OF REFRACTION

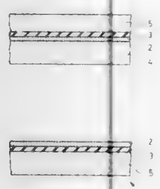
Simon G. Kroon, Stadskanaal, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 13, 1978, Ser. No. 941,969

Claims priority, application Netherlands, Sep. 16, 1977, 7710164

Int. Cl.[2] H01L *21/66, 21/20*

U.S. Cl. 148—175 **7 Claims**



1. A method of manufacturing a semiconductor device which comprises the steps of:

providing a monocrystalline semiconductor body;

subjecting said body to a treatment in a gas atmosphere which changes the thickness of said body;

controlling the thickness of said body by means of a measuring member which is subjected to the same treatment, said member comprising a monocrystalline layer and an adjoining substratum of a material having a refractive index differing from that of the monocrystalline layer, the process of obtaining said measuring member comprising the steps of:

providing a substrate;

depositing said monocrystalline layer on said substrate;

forming the substratum on said monocrystalline layer; and

forming the measuring member by removing said substrate so as to leave a composite structure of said monocrystalline layer and said substratum.

4,177,095

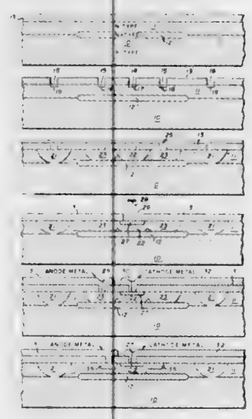
PROCESS FOR FABRICATING AN INTEGRATED CIRCUIT SUBSURFACE ZENER DIODE UTILIZING CONVENTIONAL PROCESSING STEPS

Carl T. Nelson, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 772,375, Feb. 25, 1977, Pat. No. 4,127,859. This application Aug. 14, 1978, Ser. No. 933,946

Int. Cl.[2] H01L *21/20, 29/90*

U.S. Cl. 148—175 **10 Claims**



1. The process of making a zener diode for incorporation into an integrated circuit using only the process steps associated with making the conventional integrated circuit, said process comprising the steps of:

depositing an epitaxial layer of one conductivity type on a wafer of the opposite conductivity type;

diffusing an impurity of said opposite conductivity type into a first limited surface region of said epitaxial layer;

continuing said first limited surface area diffusion to extend said diffusion completely through said epitaxial layer after the fashion of conventional integrated isolation diffusion thereby to create a first diode element;

diffusing an impurity of said one conductivity type, after the fashion of a transistor emitter diffusion, into said first diode element concentric therewith and smaller in diameter thereby to create a second diode element in P-N junction relation with said first diode element, said P-N junction having a zener breakdown voltage related to the concentration of said isolation diffusion;

forming ohmic connections to said first and second diode elements by the additional steps of:

diffusing an impurity of said opposite conductivity type into a second limited surface region of said epitaxial layer simultaneously with the diffusion of said first limited surface region and spaced therefrom; continuing said second limited surface region diffusion simultaneously with continuing said first limited surface region diffusion to extend said diffusion completely through said epitaxial layer to form a diffused contact;

adjusting said spacing between said first and second limited surface regions so that after all diffusions are completed the edges of said first and second limited surface regions merge and the edges of said second limited surface region and said second diode element do not merge; and

establishing ohmic metal connections to said diffused contact and said second diode element.

4,177,096

METHOD FOR MANUFACTURING A SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

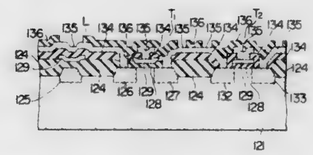
Tomisaburo Okumura, Kyoto; Hiroshi Okazaki, Takatsuki, and Akira Tsuchitani, Johyo, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Jan. 25, 1977, Ser. No. 762,301

Claims priority, application Japan, Jan. 30, 1976, 51/9870

Int. Cl.[2] H01L *21/22*

U.S. Cl. 148—187 **4 Claims**



1. A method of manufacturing a semiconductor integrated circuit device having insulated gate field effect transistors which employs both a self-alignment diffusion process for forming self-aligned transistors and interconnections and a non-self-alignment diffusion process for forming non-self-aligned transistors and interconnections, characterized in that said method comprises the steps of

(a) forming an oxidation prevention layer of a material which prevents thermal oxidation of a semiconductor on the entire surface of a semiconductor substrate having a first type of conductivity;

(b) selectively removing said oxidation prevention layer by a photo-etching process using a mask having a perforated pattern for establishing areas on said substrate where said oxidation prevention layer is not removed and self-alignment diffusion and non-self-alignment diffusion will subsequently occur to respectively form said self-aligned and non-self-aligned transistors;

(c) carrying out a high temperature heating treatment to thermally oxidize those areas of said semiconductor substrate which are exposed and not covered by said oxidation prevention layer;

(d) removing said oxidation prevention layer from those areas on said substrate where non-self-alignment diffusion is to occur except areas which will correspond to the gates of non-self-aligned transistors, and thereafter carrying out a diffusion process to form first source and drain regions of the non-self-aligned transistors as well as first non-self-alignment interconnection regions, said first source, drain and interconnection regions having a second type of conductivity with respect to said substrate;

(e) removing all said oxidation prevention layers remaining over said substrate at those areas designated for self-alignment diffusion and all oxidation prevention layers remaining over said substrate at those areas designated for non-self-alignment diffusion to thereby expose said substrate, and, thereafter, forming a gate oxide film on said substrate over those exposed areas where the oxidation prevention layers have been removed;

(f) forming a gate electrode layer over the entire surface area of said substrate, and thereafter selectively removing said gate electrode layer to establish desired gate electrode regions where said gate electrode layer is not removed;

(g) selectively removing said gate oxide film using said gate electrode layers at the areas over said substrate designated for said self-alignment diffusion as a mask, and thereafter carrying out a diffusion process to form second source and drain regions of said self-aligned transistors as well as second self-aligned interconnection regions, said second source, drain and interconnection regions having said second type of conductivity; and

(h) forming electrodes connected to specified regions of the resulting integrated circuit device.

4,177,097

METHOD AND APPARATUS FOR CONTROLLING THE FILLING OF A CABLE

James A. Hudson, Jr., Atlanta; Raymond A. Levandoski, Doraville, and Allen K. Long, Roswell, all of Ga., assignors to Western Electric Co. Inc., New York, N.Y.

Division of Ser. No. 737,752, Nov. 2, 1976, Pat. No. 4,117,398, which is a continuation-in-part of Ser. No. 642,852, Dec. 22, 1975, abandoned. This application Jul. 7, 1978, Ser. No. 922,474

Int. Cl.[2] G01R *27/26;* **H01B** *13/00*

U.S. Cl. 156—48 **6 Claims**



1. A method of controlling the filling effectiveness of the filling operation in the manufacture of waterproof cables having a plurality of conductors therein, which comprises the steps of:

continuously monitoring the change in capacitance of an outer pair of conductors as the cable passes through a filling chamber;

continuously monitoring the change in capacitance of an inner pair of conductors as the cable passes through the filling chamber;

comparing the monitored changes in capacitance of the outside pair and the inside pair with each other to ascertain the filling effectiveness of the filling operation; and

generating control signals in response to deviations in filling effectiveness to vary a parameter of the filling operation to maintain such deviations within acceptable limits.

4,177,098

METHOD FOR STIFFENING FLEXIBLE WORKPIECES

Robert F. Gorini; Herbert Johnson, and Frederick S. Sillars, all of Beverly, Mass., assignors to USM Corporation, Farmington, Conn.

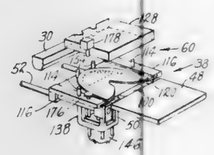
Division of Ser. No. 656,931, Feb. 10, 1976, Pat. No. 4,063,527. This application Jul. 8, 1977, Ser. No. 814,035

Int. Cl.[2] B29C *27/14;* **B29B** *3/00*

U.S. Cl. 156—80 **3 Claims**

1. The method of stiffening predetermined portions of flexible workpieces comprising depositing molten thermoplastic adhesive on a chilled surface so that the deposited adhesive is of substantially uniform thickness over a major portion of said surface and the upper surface of said adhesive includes a ridge of greater thickness adjacent to the marginal edge of the uniform thickness, the temperature of the chilled surface being selected to rapidly cool an under layer of the deposited adhe-

sive while permitting the portion of the ridge away from said surface to remain molten, bringing the chilled surface into adhesive transfer relation to the predetermined workpiece portion to be stiffened, next pressing the chilled surface and the



workpiece portion together to cause said portion of the ridge of still molten adhesive of greater thickness to be laterally exuded for hardening on the work with a reduced thickness, and thereafter relatively separating said surface from the workpiece to release the latter with the adhesive thereon.

4,177,099

METHOD OF BONDING POLYURETHANE SHEETING TO ACRYLIC OR POLYURETHANE SHEETING IN PRODUCTION OF TRANSPARENT WINDOWS

John Radzwill, Arnold, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 2, 1975, Ser. No. 609,331
Int. Cl.[2] B32B *17/00*
U.S. Cl. 156—99 **6 Claims**

1. A method of forming a transparent laminated window comprising a sheet of acrylic plastic bonded to a preformed sheet of polymerized polyurethane with a minimum of opacity problems resulting from applying a primer to bond said sheets together, said method comprising applying a liquid composition containing 1 to 4 parts by weight of particles of a polymerized polyester urethane dissolved in 100 parts of chloroform as a primer to a surface of said sheet of acrylic plastic destined to be an interfacial surface between said sheet of acrylic plastic and said sheet of polyurethane in a transparent laminated window comprising said sheets, in an amount sufficient to form a film of dissolved polymerized polyester urethane on said applied surface, volatilizing said chloroform from said applied surface, assembling said sheets with said applied acrylic surface in face to face relation to a surface of said polyurethane sheet, and subjecting said assembly so formed to a temperature of approximately 160° F. to 300° F. (approximately 70° C. to 149° C.) for 30 minutes to 300 minutes at an elevated pressure for sufficient time to laminate said sheets and form a transparent laminate free of opacity problems.

4,177,100

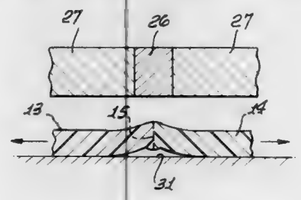
PLASTIC SHEET SEALING PROCESS AND APPARATUS

William Pennington, 317 S. West St., Anaheim, Calif. 92805

Continuation of Ser. No. 749,828, Dec. 13, 1976, abandoned. This application Apr. 27, 1978, Ser. No. 900,529
Int. Cl.[2] B29C *27/02*; B65H *69/06*
U.S. Cl. 156—157 **5 Claims**

1. In the method of forming an improved weld between plastic sheets, the steps that include:
(a) initially forming a butt weld between the sheets by sealing the sheets together at overlaying edges thereof and thereafter deforming the butt weld and portions of the two sheets closest to the butt weld into a volumetric position substantially defined by two undeformed sample sheets positioned in edge-to-edge position, the work sheets and sample sheets having the same thickness, said deforming step including unfolding the sheets and stretching the sheets to stretch the butt weld, and
(b) heating the deformed work sheets under pressurization at and adjacent said butt weld to soften them during said sheet stretching and also relieving said stretching at the time of softening, thereby to form an improved weld therebetween characterized in that the sheet thickness is substantially constant at and proximate the weld.

4. In apparatus for forming an improved weld between plastic sheets that have been sealed along overlaying edges thereof to form a butt weld, the combination comprising:
(a) means for stretching the sheets and the butt weld therebetween into a volumetric position substantially defined by two undeformed sample sheets positioned in edge-to-edge position, the work sheets and sample sheets having the same thickness, and
(b) means for compressing and heating the stretched work



sheets at and proximate said butt weld to locally soften them during said stretching to form an improved weld therebetween characterized in that the sheet thickness is substantially constant at and proximate the weld, said means for stretching the sheets and butt weld being operable to relieve said stretching at the time of softening, and
(c) auxiliary means including cool surfaces to engage portions of the work sheets on opposite sides of the butt weld and maintain said portions in non-melted condition, said cool surfaces being substantially coplanar with the surface of said compressing and heating means facing said sheets to thereby establish the resultant thickness of the sheets at and proximate the weld.

4,177,101

METHOD AND APPARATUS FOR LAMINATING PANELS

Ralph M. Evans, Phoenix, Ariz., assignor to Evans Rotork, Inc., Glendale, Ariz.

Filed Jan. 19, 1978, Ser. No. 870,608
Int. Cl.[2] B32B *31/00*; C09J *7/00*
U.S. Cl. 156—300 **42 Claims**



16. A method for adhering first and second laminates to lower and upper surfaces, respectively, of an at least semi-rigid substrate, said method comprising the steps of:
(a) applying a pattern of adhesive to the upper and lower opposed surfaces of the substrate;
(b) locating and positionally maintaining the first laminate in a fixed location to contactingly receive the lower surface of the substrate;
(c) transporting the substrate into an indexed relationship with the first laminate at the fixed location;
(d) indexing the substrate upon the first laminate and maintaining the substrate in indexed relationship thereto, including the steps of inserting the lateral and longitudinal edges of the substrate interior to the commensurate edges of the first laminate;
(e) locating and positionally maintaining the second laminate at the fixed location to contactingly engage the upper surface of the substrate in indexed relationship thereto; and
(f) overlapping the lateral and longitudinal edges of the second laminate with respect to the corresponding edges of the substrate; whereby, the lateral and longitudinal edges of the composite unit overlaps the corresponding edges of the substrate.

4,177,102

SINGLE FACER FOR MANUFACTURING SINGLE-FACED CORRUGATED BOARD

Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 778,613, Mar. 17, 1977, abandoned. This application Jul. 21, 1978, Ser. No. 926,853
Claims priority, application Japan, Apr. 19, 1976, 51-45136; Dec. 30, 1976, 51-158989
Int. Cl.[2] B31F *1/00*
U.S. Cl. 156—472 **12 Claims**



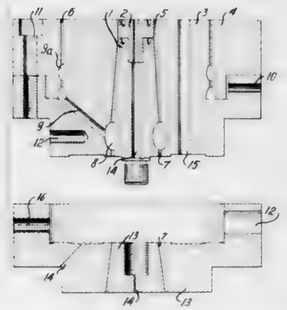
1. A single facer for manufacturing single-faced corrugated board comprising:
(a) a first corrugating roll;
(b) a hollow second corrugating roll meshing with said first corrugating roll to form a nip for receiving a sheet medium to corrugate the same;
(c) a source of suction connected to the hollow portion of the second corrugating roll to maintain pressure within the hollow portion below atmospheric pressure;
(d) plural axially spaced circumferential grooves disposed about the periphery of the second corrugating roll;
(e) plural suction conduits connecting the hollow portion of the second corrugating roll to at least some of the circumferential grooves, whereby suction attracts and holds the corrugated medium onto a portion of the peripheral surface of the second corrugating roll;
(f) sealing means having members engaging within the grooves to seal at least some of the conduits disposed in that portion of the second corrugating roll not lapped by the corrugated medium;
(g) means for applying adhesive to the peaks of the flutes of the corrugated medium; and
(h) a pressure roll for pressing a sheet linerboard against the corrugated medium after the adhesive has been applied, to bond the linerboard to the corrugated medium.

4,177,103

APPARATUS FOR THE PREPARATION OF A MULTILAYER FILM

Josef Kubát, Solna, and Kenneth S. Berggren, Mölndal, both of Sweden, assignors to Celloplast AB Norrkoeping, Norrköping, Sweden

Division of Ser. No. 630,786, Nov. 11, 1975, Pat. No. 4,076,568, which is a continuation of Ser. No. 448,640, Mar. 4, 1974, abandoned. This application Sep. 6, 1977, Ser. No. 830,579
Claims priority, application Sweden, Mar. 16, 1973, 7303751
Int. Cl.[2] B30B *11/22*; B31B *31/30*; B29D *23/04*
U.S. Cl. 156—500 **3 Claims**



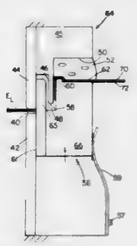
1. An apparatus comprising an extruder, a film blowing die and a drawing and winding means wherein the film blowing die comprises an inner cone, an intermediate part, an outer ring, at least two concentric slots situated in the same plane, the exterior concentric slot being formed between the intermediate part and the outer ring and having a diameter at least four times larger than the diameter of the interior concentric slot formed between the inner cone and the intermediate part, a feed slot for introducing a plastic melt material from the extruder into the blowing die, a portion of the feed slot being enlarged and designed to divide the plastic melt material between said interior slot and channels communicating with the exterior slot, said channels having enlarged portions in relation to the exterior slot, and a gas channel formed in the inner cone.

4,177,104

APPARATUS FOR SEPARATING LAMINATED LAYERS

Robert H. Parker, Thiensville, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Nov. 14, 1977, Ser. No. 851,307
Int. Cl.[2] B32B *35/00, 07/12*
U.S. Cl. 156—584 **2 Claims**



1. Apparatus for separating layers of a laminate at an end thereof, comprising
means for supporting said laminate to permit bending thereof at said end, and
means for bending both said layers sharply in one direction

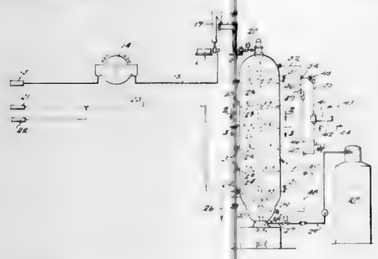
at one portion of said laminate close to said end, and bending both said layers sharply in the opposite direction at a lengthwise-adjacent portion of said laminate closer to said end, to cause shearing and lengthwise offset between said layer, and then releasing both said layers at said end to permit them to spring back from said bending.

4,177,105

APPARATUS FOR DELIGNIFYING AND BLEACHING CELLULOSE PULP

Oliver A. Laakso, and Michael I. Sherman, both of Glens Falls, N.Y., assignors to Kamyr, Incorporated, Glens Falls, N.Y.

Continuation of Ser. No. 362,924, May 22, 1973, abandoned. This application Jun. 11, 1976, Ser. No. 695,559
Int. Cl.[2] D21C *7/12*
U.S. Cl. 162—237 **1 Claim**



1. An apparatus for treating cellulose pulp with oxygen gas in an exothermic reaction comprising

a vertically elongated pressure vessel provided with a plurality of vertically spaced pulp support decks,

means for supplying cellulose pulp into the uppermost of said decks,

means for passing the thus supplied pulp downwardly and sequentially from one deck to another,

means for supplying oxygen into the bottom of said vessel for passage upwardly through said vessel for contact with and treatment of the pulp at each deck, and means for supplying steam into the bottom of said vessel for passage upwardly through said vessel for contact with and treatment of the pulp at each deck,

means for washing the treated pulp at the bottom of said vessel and means for discharging the washed pulp therefrom, and

means for controlling the temperature of the pulp on the various decks throughout said vessel, said last-named means comprising means for withdrawing hot oxygen gas from the vessel after the gas has contacted pulp in said vessel, means for dividing the withdrawn gas into two separate portions, means for cooling one of these portions of withdrawn gas, means for combining the two portions after the one portion has been cooled, means for returning the combined portions to said vessel and means for distributing the thus returned gas into the vessel at a plurality of points therein adjacent different decks of said vessel so that the distribution of the cooled return gas is generally even and so that the formation of hot spots is prevented.

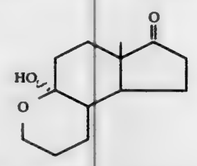
4,177,106

PROCESS FOR PREPARING 3Aα-H-4α-[3′-PROPANOL]-7Aβ-METHYLHEXAHYDRO-1,5-INDANEDIONE HEMIKETAL

Thomas R. Pyke, Portage, and Marion P. Salmond, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 768,025, Feb. 14, 1977, Pat. No. 4,097,335. This application Feb. 21, 1978, Ser. No. 879,775
Int. Cl.[2] C12D *13/00*
U.S. Cl. 435—125 **8 Claims**

1. A process for preparing a compound, of the formula



1

which comprises cultivating a mutant microorganism selected from the group consisting of Arthrobacter, Bacillus, Brevibacterium, Corynebacterium, Nocardia, Protaminobacter, Serratia, and Streptomyces, said mutant being characterized by its ability to selectively degrade steroids with or without a 17-alkyl side chain of from 2 to 10 carbon atoms, inclusive, and accumulate predominantly 3aα-H-4α-[3′-propanol]-7aβ-methylhexahydro-1,5-indanedione hemiketal in the fermentation beer, in an aqueous nutrient medium at a pH of 3.0 to 6.0 under aerobic conditions in the presence of a steroid with or without a 17-alkyl side chain containing from 2 to 10 carbon atoms, inclusive and recovering said compound from the cultivated medium.

4,177,107

PROCESS FOR PRODUCING COMPOSITION CONTAINING INSOLUBILIZED ENZYME AND/OR INSOLUBILIZED BACTERIAL CELLS

Minoru Kumakura; Masaru Yoshida, and Isao Kaetsu, all of Takasaki, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

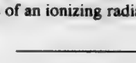
Filed Jan. 28, 1977, Ser. No. 763,601
Claims priority, application Japan, Jan. 31, 1976, 51-9702
Int. Cl.[2] C07G *7/02*
U.S. Cl. 435—176 **4 Claims**

1. A process for producing a composition containing insolubilized enzyme and/or insolubilized bacterial cells which comprises (i) the step of mixing (a) an aqueous solution of enzyme and/or an aqueous dispersion of bacterial cells, (b) at least one porous adsorbent and (c) at least one vitrifiable monomer selected from the group consisting of a compound having the formula:

$$CH_2{=}CX{-}C(=O){-}O{-}R^1{-}R^2$$

wherein X is H or methyl, R^1 is $+CH_2+_n$ wherein n is an integer of 1 to 6,

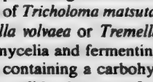
$+CH_2{-}CH_2{-}O+_m$ wherein m is an integer of 2 or more, or



wherein l is an integer of 2 or more, and when R^1 is $+CH_2+_n$ or



R^2 is —OH, —OCH_3 or

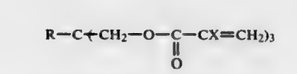


wherein X is as defined above, when R^1 is $+CH_2{-}CH_2+_m O$ or

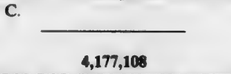
R^2 is hydrogen, methyl, or



wherein X is as defined above; or a compound having the formula:



wherein X is as defined above; a compound having the formula



wherein R is ethyl, n-propyl or isopropyl and X is as defined above; and mixtures thereof, and (ii) the step of irradiating the mixtures by means of an ionizing radiation at a temperature of less tnan −10° C.

4,177,108

PROCESS FOR PRODUCING EMITANIN

Koji Sakakida, 26-11, 5-chome, Kamisaginomiya, Nakano-ku, Tokyo, Japan (165), and Tetsuro Ikekawa, 12-5, 1-chome, Sodegaura, Narashino-shi, Chiba-ken, Japan (275)

Filed Feb. 27, 1978, Ser. No. 881,744
Claims priority, application Japan, Mar. 2, 1977, 52-021456; Jun. 17, 1977, 52-071130
Int. Cl.[2] C12D *13/00*
U.S. Cl. 435—74 **19 Claims**

1. A process for producing EMITANIN which comprises inoculating mycelia of *Tricholoma matsutake, Tricholoma bakamatsutake, Volvariella volvaea* or *Tremella fuciformis* in a medium for growing mycelia and fermenting the grown mycelia in a liquid medium containing a carbohydrate and a nitrogen source and isolating solid substance of mycelia from a broth and extracting the solid substance of mycelia with a hot water and isolating the active ingredients.

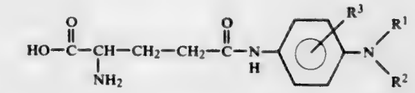
4,177,109

γ-GLUTAMYL-P-AMINOANILIDE DERIVATIVES FOR MEASURING ACTIVITY OF γ-GLUTAMYL TRANSPEPTIDASE

Takanori Tohyama, and Masaaki Nakahata, both of Kawagoe, Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed May 30, 1978, Ser. No. 910,830
Claims priority, application Japan, May 30, 1977, 52/63061
Int. Cl.[2] G01N *33/14*
U.S. Cl. 435—24 **7 Claims**

1. A method for measuring γ-glutamyl transpeptidase activity in a living sample which comprises using as a substrate the γ-glutamyl-p-aminoanilide derivative of the formula:



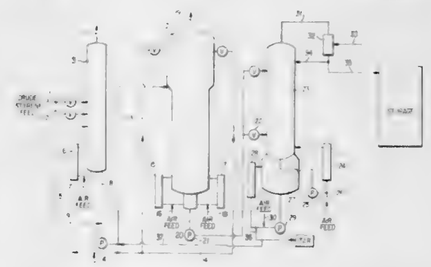
wherein R^1 and R^2 are independently a lower alkyl group; and R^3 is hydrogen, a lower alkyl group, a carboxyl group, or a sulfo group, and determining colorimetrically the amount of p-phenylenediamine derivative liberated by the action of γ-glutamyl transpeptidase.

4,177,110

METHOD FOR THE DISTILLATION OF VINYL AROMATIC COMPOUNDS USING POLYMERIZATION INHIBITORS WITH LOW-VOLATILITY

James M. Watson, Big Spring, Tex., assignor to Cosden Technology, Inc., Big Spring, Tex.

Filed Jul. 18, 1978, Ser. No. 925,817
Int. Cl.[2] B01D *3/34*; C07C *7/18*
U.S. Cl. 203—9 **13 Claims**



1. A process for the distillation of a readily polymerizable vinyl aromatic compound employing as a polymerization inhibitor the combination of phenothiazine ($C_{19}H_9NS$) and tertiarybutylcatechol (TBC), comprising the steps of:

(a) introducing a feed of impure vinyl aromatic compound into a distillation train containing a recycle column and a finishing column, said feed being introduced into the recycle column;

(b) introducing as a separate stream into the upper portion of said recycle column an effective polymerization inhibiting amount of said inhibitor combination in a volatile aromatic hydrocarbon diluent; and,

(c) distilling said feed under distillation conditions in the presence of oxygen to recover from the finishing column of said distillation train an overhead product of high purity vinyl aromatic compound and a residual bottoms fraction.

4,177,111

PROCESS FOR THE RECOVERY OF DIMETHYLACYLAMIDES

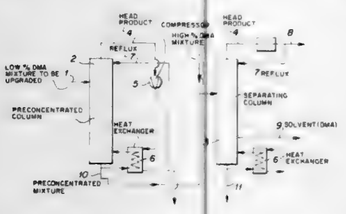
Christian Pieper, Neuss; Surinder S. Sandhu, Dormagen; Günter Schümmer, Cologne, and Karlheinz Feltgen, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 23, 1977, Ser. No. 809,494

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1976, 2631734

Int. Cl.[2] **B01D** *3/00;* **C07C** *99/12, 103/36*

U.S. Cl. 203—14 **4 Claims**



1. A process for the recovery of dimethylacylamides from mixtures containing dimethylacylamides and water formed during the production of synthetic fibers comprising: segregating low proportion dimethylacylamide and water mixtures containing up to 50% dimethylacylamide from high proportion dimethylacylamide and water mixtures containing greater than 90% dimethylacylamide, pre-concentrating the segregated low porportion mixtures which contain dimethylacylamide in amounts of up to 50% in at least one first distillation column, in which a sump product is concentrated to dimethylacylamide contents of 30 to 90% at pressures above 300 Torr and in which an overhead vapor product is formed, compressing the overhead vapor product and utilizing the latent heat of condensation of the overhead vapor product, after compression, for heating the first distillation column, and removing the sump product from the first distillation column and further distilling said sump product in a second distillation column along with nonpreconcentrated mixtures the latter which contain the high proportion of dimethylacylamides.

4,177,112

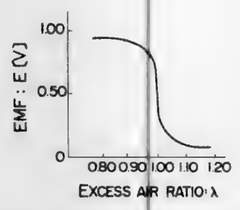
OXYGEN CONCENTRATION DETECTOR AND METHOD OF USE THEREOF

Masatosi Suzuki, Kariya; Kazuya Soda, Takahama, and Yasuo Nakamura, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 27, 1978, Ser. No. 890,903

Int. Cl.[2] **G01N** *27/58*

U.S. Cl. 204—1 T **9 Claims**



1. In an oxygen concentration detector having an oxygen concentration sensor made of an oxygen ion conductive metal oxide which produces an electromotive force in accordance with the difference between an oxygen concentration in gas components of a gas under test and the oxygen concentration in a reference gas, including a first electrode formed on the side of said oxygen concentration sensor which is to be exposed to the gas under test, and a second electrode formed on the side of said oxygen concentration sensor which is to be exposed to said reference gas so that the electromotive force produced by said oxygen concentration sensor is measured across said first and second electrodes;

the improvement comprising;

(i) a first porous coating of a refractory metal oxide coated on the surface of said first electrode, the grain size of said first porous coating being finer than about 250 mesh and said first porous coating having pores through which the gas under test can pass; and

(ii) a second porous coating of a refractory metal oxide coated on the surface of said first coating, the grain size of said second porous coating being about 250 to about 100 mesh and said second porous coating having pores whose average diameter is larger than that of the pores of said first coating.

8. A method of detecting the oxygen concentration in the exhaust gas comprising oxygen, phosphorus, lead and oil from an internal combustion engine comprising:

a. exposing to said exhaust gas an oxygen concentration detector having an oxygen concentration sensor of an ion conductive metal oxide producing an electromotive force in accordance with the difference between the gas coponents of said exhaust gas and the oxygen concentration of a reference gas containing oxygen, said sensor including:

(1) a first electrode formed on the portion of said sensor exposed to the exhaust gas;

(2) a second electrode formed on the portion of said sensor exposed to said reference gas such that in operation an electromotive force is produced across said first and second electrodes;

(3) a first porous coating of a refractory metal oxide coated on the surface of said first electrode,

the grain size of said first porous coating being smaller than about 250 mesh and having pores therein through which said exhaust gas passes;

(4) a second porous coating of a refractory metal oxide coated on the surface of said first coating,

the grain size of said second coating being about 250 to about 100 mesh and having pores therein whose average diameter is larger than that of the pores of said first coating;

b. exposing said second electrode to said reference gas; and

c. measuring the electromotive force produced between said first and second electrodes thereby determining the oxygen concentration in said exhaust gas.

4,177,113

METHOD OF ELECTROFORMING SHEETS AND SELF-STRIPPING CATHODE

Willie Seibt, Edmonton, Canada, assignor to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Jul. 27, 1978, Ser. No. 928,347

Claims priority, application Canada, Apr. 28, 1978, 302292

Int. Cl.[2] **C25D** *1/04, 1/20*

U.S. Cl. 204—12 **6 Claims**



1. A method of obtaining a metal from a solution thereof by electrodeposition on a cathode, including depositing said metal on a cathode having a hollow body with opposed, spaced sheet-like parallel walls with outer faces, said body having outer surfaces between said outer faces of said walls upon which substantially no metal is deposited during use of the cathode so that metal is deposited as two separate sheets, one sheet on each wall, said walls being resiliently deformable, and connecting the hollow body to a source of reduced pressure, after metal has been deposited on said walls, to cause said walls to bow inwardly towards one another with resultant separation of the deposited metal sheets from the walls.

4,177,114

SILVER-ELECTROPLATING PROCESS

Yoshihiro Suzuki; Mitsuru Ura, both of Hitachi, and Hiroshi Takahashi, Higashi Ibaraki, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 29, 1978, Ser. No. 937,803

Claims priority, application Japan, Sep. 2, 1977, 52-104888

Int. Cl.[2] **C25D** *5/34*

U.S. Cl. 204—38 B **18 Claims**

1. A process for silver-plating which comprises the steps of preplating a substrate material in an aqueous preplating solution comprising 10^{-5} to 0.02 mole/l of silver and more than 0.01 mole/l of a silver complexing agent under non-current density, to preplate a sufficient thickness of silver to restrain or substantially prevent substitution plating, and then electroplating the preplated substrate material by supplying an electric current to said material in an aqueous silver plating solution comprising silver and thiocyanic ions and having a pH in a range of from 0.5 to 10.5.

4,177,115

ELECTROCHEMICAL PRODUCTION OF ORGANIC HYPOHALITE COMPOUNDS IN AN UNDIVIDED CELL

Ronald L. Dotson, Cleveland, and Richard W. Lynch, Chattanooga, both of Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Aug. 28, 1978, Ser. No. 937,223

Int. Cl.[2] **C25B** *3/02*

U.S. Cl. 204—78 **40 Claims**

1. A process for the preparation of organic hypohalites in an electrolytic cell having an electrolytic chamber containing therein an anode and a cathode separated by a gap distance, which comprises:

(a) charging an electrolyte comprised of a mixture of a halide-containing brine, and an organic alcohol in an organic solvent into said electrolytic chamber wherein said organic alcohol is selected from the group consisting of secondary alcohols, tertiary alcohols, cyclic alcohols, and mixtures thereof,

(b) passing an electric current between said anode and said cathode, whereby said organic alcohol reacts with said halide to form the corresponding organic hypohalite in said electrolyte, and

(c) recovering said organic hypohalite from said electrolytic chamber.

4,177,116

ELECTROLYTIC CELL WITH MEMBRANE AND METHOD OF OPERATION

Oronzio DeNora, Milan, and Alberto Pellegri, Luino, both of Italy, assignors to Oronzio DeNora Impianti Elettrochimici S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 864,855, Dec. 27, 1977, abandoned. This application May 30, 1978, Ser. No. 910,494

Claims priority, application Italy, Jun. 30, 1977, 25251 A/77

Int. Cl.[2] **C25B** *1/46, 11/03, 15/00*

U.S. Cl. 204—98 **18 Claims**

1. An electrolysis cell comprising an anode compartment containing an electrolyte permeable anode and a cathode compartment containing a cathode separated by an ion exchange membrane supported on the electrolyte permeable anode, means to impress an electrolysis current on the cell, means for introducing anolyte to the anode compartment, means to introducing catholyte to the cathode compartment, means for removing spent anolyte and electrolysis products from the anode compartment and means for removing spent catholyte and electrolysis products from the cathode compartment, the cathode being a static bed of electrically conductive catholyte-resistant particulate material filling the cathode compartment whereby the membrane is pressed against the anode.

2. An electrolytic cell comprising a container of cathodically resistant metal, a valve metal top on said container electrically insulated from said container, at least one tubular valve metal anode connected to and extending from said top substantially to the bottom of said container, perforations through a portion of the walls of said anode inside said container and an imperforate portion of said anode extending from just below the top of said container to said valve metal top, said anode being open at both ends, an ion permeable membrane on the perforated walls of said anode, a porous, static bed of electrically conductive particulate cathodic material between said membrane and the



walls of said container, openings into the tubular anode through the bottom of said container, means to feed electrolyte into the bottom of said tubular anode, means to electrically insulate said anode at the top and bottom from said container, means to convey positive electric current to said anode, means to convey negative electric current from said container, means to conduct gaseous products produced on said anode and electrolyte out of said container, means to conduct gaseous cathodic products produced in said container out of said container, means to introduce liquid into the cathodic compartment of said container between said membrane and the walls of said container and means to convey liquid cathodic products out of said container.

7. Method for the production of halogen and a hydroxide of an alkali metal by electrolysis of an aqueous solution of the respective alkali metal halide in the cell of claim **2**.

4,177,117

BIPOLAR REFINING OF LEAD

Robert C. Kerby, Rossland, Canada, assignor to Cominco Ltd., Vancouver, Canada

Filed May 30, 1978, Ser. No. 910,947

Claims priority, application Canada, Apr. 6, 1978, 300642

Int. Cl.[2] **C25C** *1/18*

U.S. Cl. 204—114 **38 Claims**

1. A process for the electrorefining of lead from lead bullion using an aqueous electrolyte containing lead fluosilicate and hydrofluosilicic acid contained in an electrolytic cell, which comprises interposing in the cell between an anode and a cathode one or more electrically unconnected lead bullion bipolar electrodes, allowing electrolysis to proceed to deposit refined lead and recovering said refined lead.

4,177,118

PROCESS FOR ELECTROLYZING WATER

Barrie C. Campbell, Payson, Utah, assignor to Billings Energy Corporation, Provo, Utah

Continuation-in-part of Ser. No. 661,788, Feb. 26, 1976, Pat. No. 4,056,452, and a continuation-in-part of Ser. No. 661,789, Feb. 26, 1976, Pat. No. 4,057,479. This application Oct. 25, 1977, Ser. No. 845,319

Int. Cl.[2] C25B *1/10*

U.S. Cl. 204—129 6 Claims

1. A method for electrolysis of a liquid consisting essentially of water to produce hydrogen and oxygen therefrom, said method comprising positioning a solid polymer electrolyte membrane between an anode comprising lead dioxide and a cathode, said anode and cathode contacting mutually opposite sides of said membrane; wetting with water the surfaces of the anode and cathode which abut said membrane; and passing a current through said membrane from the anode to the cathode to generate hydrogen gas at the cathode and oxygen gas at the anode.

4,177,119

PROCESS FOR RECOVERY OF WASTE H_2SO_4 AND HCl

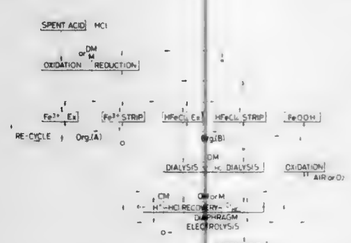
Morio Watanabe, Amagasaki, and Sanji Nishimura, Kyoto, both of Japan, assignors to Solex Research Corporation, Osaka, Japan

Continuation of Ser. No. 773,657, Mar. 2, 1977, Pat. No. 4,113,588. This application Aug. 24, 1978, Ser. No. 936,595

Claims priority, application Japan, Mar. 9, 1976, 51/25223; Mar. 25, 1976, 51/33029; Oct. 4, 1976, 51/118598

Int. Cl.[2] C25B *1/22*

U.S. Cl. 204—151 12 Claims



1. A process for the recovery of waste HCl from an aqueous metal pickling solution which contains large amounts of Fe ions comprising:

1. converting the Fe^{2+} ions in the waste to Fe^{3+} ions;
2. extracting the Fe^{3+} ions from the converted solution from step 1 with an organic solvent C to form an $FeCl_3$-complex therein and to produce an aqueous raffinate;
3. regenerating solvent C by contacting it with an aqueous extractant to extract the Fe^{3+} therefrom;
4. subjecting the raffinate from step 2 to diaphragm electrolysis to recover HCl therefrom.

4,177,120

PHOTOLYTIC PROCESS FOR GASIFICATION OF CARBONACEOUS MATERIAL

Stephen Zenty, Rockville, Md., assignor to Solarco Corporation, Rockville, Md.

Continuation-in-part of Ser. No. 792,446, Apr. 29, 1977, abandoned. This application Apr. 14, 1978, Ser. No. 896,484

Int. Cl.[2] B01J *1/10*

U.S. Cl. 204—157.1 R 11 Claims



1. A photolytic process for the gasification of coal comprising the step of directly solar irradiating coal and carbon dioxide in an air free environment, and at elevated temperatures to produce carbon monoxide.

4,177,121

METHOD OF PRODUCING N-FORMYLAMINE

Wataru Ando, Sakura, and Kazuo Watanabe, Kiryu, both of Japan, assignors to K. K. Pollution Preventing Research Laboratory, Tokyo, Japan

Filed Jul. 21, 1978, Ser. No. 926,717

Claims priority, application Japan, Jul. 22, 1977, 52/87304

Int. Cl.[2] B01J *1/10*

U.S. Cl. 204—158 R 7 Claims

1. A direct method of producing an N-formylamine and a lower oxo by-product comprising conducting a photosensitized oxygenation of a reaction mixture, in the presence of a solvent therefor, said mixture comprising (a) an aldehyde having at least one α-hydrogen and at least two carbon atoms, (b) an aliphatic or heterocyclic secondary amine and (c) a sensitizer, whereby a carbonyl transfer to the secondary amine occurs which results in a reduction in the carbon atoms of the aldehyde.

4,177,122

PHOTOPOLYMERIZABLE HYDROXY-BENZOPHENONE DERIVATIVE COMPOUNDS AND PHOTOCURABLE COMPOSITIONS

Kozi Sato, Tokyo, Japan, assignor to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1978, Ser. No. 970,902

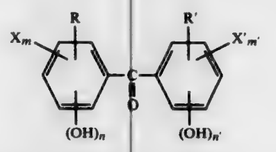
Claims priority, application Japan, Jan. 13, 1978, 53-2037

Int. Cl.[2] C08F *2/46, 8/00*

U.S. Cl. 204—159.16 10 Claims

1. A process for preparing a photopolymerizable photosensitizing compound comprising the steps of:

addition reacting with an alkylene oxide a benzophenone derivative represented by the following general formula (I)



(I)

wherein R and R′ are an alkyl or alkoxy group having 1 to 20 carbon atoms, n is an integer of 1 to 3, n′ is an integer of 0 to 3, X and X′ are a halogen atom, and m and m′ are an integer of 0 to 3, to obtain a hydroxyl group-containing reaction product and then

esterifying the thus obtained reaction product with an unsaturated carboxylic acid to obtain the photopolymerizable photosensitizing compound.

4,177,123

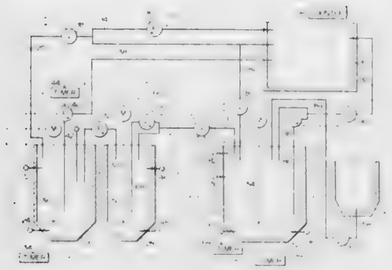
METHOD FOR SUPPLYING BINDER INTO A COATING BATH AND ITS APPARATUS

Nobuo Siozawa; Uhee Kikuchi; Suguru Kimura, all of Sayama; Nobuaki Todoroki, Warabi; Jun-ichi Yasukawa, Chigasaki, and Satoru Kamiyama, Tokyo, all of Japan, assignors to Taikisha Ltd.; Honda Motor Co., Ltd., both of Tokyo and Shinto Paint Co., Ltd., Amagasaki, all of, Japan

Filed Oct. 31, 1978, Ser. No. 956,345

Int. Cl.[2] C25D *13/22, 13/24*

U.S. Cl. 204—181 C 2 Claims



1. A method for supplying binder into a coating tank for electrophoretic powder coating comprising:

a first step for transferring into a solid/liquid separation tank a proper amount of plating bath liquid contained in the coating tank of which the binder component is reduced as a result of the work for coating a given number of articles to be coated;

a second step in which the bath liquid in the solid/liquid separation tank is left as it is for a given time period to permit a powder component in the bath liquid to precipitate so that the bath liquid is separated into a supernatant liquid and a residual liquid, said supernatant liquid having a powder component ratio less than a given value;

a third step in which the supernatant liquid in the solid/liquid separation tank is transferred into a supernatant liquid tank where it is reserved while being agitated;

a fourth step in which the residual liquid in the solid/liquid separation tank is returned to the coating tank while being agitated;

a fifth step in which mother binder liquid corresponding in amount to the reduced binder component is supplied from a mother binder liquid tank into a mixing tank;

a sixth step in which, following the fifth step, a given amount of supernatant liquid is supplied from the supernatant liquid tank into the mixing tank where it is mixed with the mother binder liquid while being agitated;

a seventh step in which, after the sixth step is completed, the plating bath liquid from the coating tank is supplied by a proper amount into the mixing tank while being agitated, to produce replenisher bath liquid; and

an eighth step in which the replenisher bath liquid is supplied from the mixing tank into the coating tank for replenishing the reduced binder component.

4,177,124

PROCESS FOR ELECTRODEPOSITION OF GRAFT COPOLYMER

Isidor Hazan, Clementon, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 902,887, May 9, 1978. This application Dec. 15, 1978, Ser. No. 969,930

Int. Cl.[2] C25D *13/06*

U.S. Cl. 204—181 C 3 Claims

1. In a process for electrocoating with paint a cathodically-charged substrate immersed in a coating bath containing an aqueous dispersion of said paint, said bath having a cathode zone containing said substrate and an anode zone containing a charged anode, the charged electrodes being maintained in electrical contact with each other by means of said bath, wherein said bath comprises a cationic film-forming polymer, an acidic ionizing agent, the improvement which comprises:

employing an organic acid which is volatile at temperatures used to crosslink the film-forming polymer as the acidic ionizing agent;

employing as the cationic film-forming polymer a graft copolymer comprising a mono-epoxide portion grafted onto an acrylic-amine backbone portion, which portions consist essentially of, by weight based on the graft copolymer about:

(a) 25–60% of an acrylic-amine backbone copolymer contributing:

14.7–35% of secondary amine acrylate or methacrylate, giving 0.08 to 0.2 equivalent of tertiary amine per 100 grams of graft copolymer,

7–17% of hydroxy-functional acrylate or methacrylate,

3–7.3% ethyl acrylate or methyl methacrylate, and

0.3–0.7% mercaptoethanol, giving primary terminal hydroxyl functionality,

graft copolymerized with (b) and (c):

(b) 33–60% of an epoxy-fatty acid copolymer of a condensation polymer of equimolar proportions of epichlorohydrin and bisphenol A, said condensation polymer being reacted with fatty acid in the range of 1/1.4–1.7, and

(c) 7–15% of a glycidyl ester of a tertiary carboxylic acid containing 7 to 9 carbon atoms,

and subsequently curing the paint to crosslink the film-forming polymers.

4,177,125

ELECTROCHEMICAL DETECTOR OF THE OXYGEN CONTENT OF THE EXHAUST GASES OF COMBUSTION ENGINES

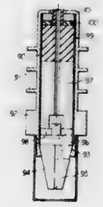
Jean-Louis M. Barnabé, Le Vesinet, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed May 25, 1978, Ser. No. 909,494

Claims priority, application France, May 25, 1977, 77 15916

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—195 S 6 Claims



1. An electronic detector for detecting the oxygen content of the burned gases of a combustion engine, said detector comprising:

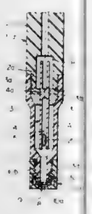
two electrode bodies on the surface of a porous ceramic body, said porous ceramic body being composed of zirco-

nium oxide stabilized with between 8% and 14% yttrium oxide;
one of said electrodes being composed of a metal exhibiting no catalytic activity;
the other of said electrodes being composed of porous platinum of a thickness between 0.5 and 2μ;
said ceramic body being defined by a body of revolution which is positioned in a metallic housing; said metallic housing being attached to an exhaust manifold and having at least one passage for at least one lead connected to at least one of said electrodes, said ceramic body being held in said metallic housing in a semi-rigid condition by an elastic packing;
a silicone rubber plug located in the coolest part of said housing body for damping vibrations and compensating for thermal expansion; and
cooling fins on said housing for avoiding overheating of said plug;
wherein said electrodes are located in the flow of burned gases and the richness of carburization is measured by determining the difference in potential between the electrode exhibiting a significant catalytic activity and that exhibiting none.

4,177,126
REFERENCE ELECTRODE

Masakatu Imaki; Hidehiko Hagiwara, and Seiji Usui, all of Kyoto, Japan, assignors to Horiba, Ltd., Japan

Filed Jun. 20, 1978, Ser. No. 917,352
Claims priority, application Japan, Jun. 20, 1977, 52/80962[U]
Int. Cl.² G01N *27/28, 27/40*
U.S. Cl. 204—195 F **3 Claims**

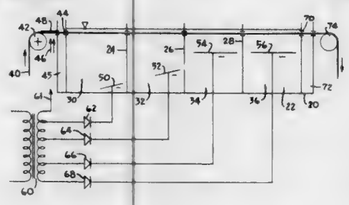


1. A reference electrode for use in testing or measuring serum or blood samples, said reference electrode comprising:
a cylindrical holder member including a cylindrical upper holder having upper and lower ends and a cylindrical lower holder having upper and lower ends, said lower end of said upper holder and said upper end of said lower holder being joined by meshing screw threads;
said lower holder having an interior forming a chamber for containing a reference liquid;
an inner electrode positioned within said chamber, said inner electrode being connected to an electric lead extending through said upper end of said upper holder;
means for spporting said inner electrode within said chamber and for sealing said chamber adjacent said upper end of said lower holder;
a liquid junction comprising a hydrophilic polypropylene membrane coated with a surface active agent, said membrane including a flat portion abutted against and closing said lower end of said lower holder and a tubular flange portion integral with and extending from said flat portion, said tubular flange portion fitting about an exterior surface adjacent said lower end of said lower holder; and
a removable push ring surrounding said tubular flange portion and pressing said tubular flange portion tightly against said exterior surface.

4,177,127
DEVICE FOR THE PRODUCTION OF ANODIZED MATERIAL

Harald Severus-Laubenfeld, Winterthur, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 764,001, Jan. 31, 1977, Pat. No. 4,158,079, which is a continuation of Ser. No. 489,417, Jul. 17, 1974, abandoned. This application Jul. 20, 1978, Ser. No. 926,280
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1973, 2340962
Int. Cl.² C25D *1/04, 11/04*
U.S. Cl. 204—207 **12 Claims**

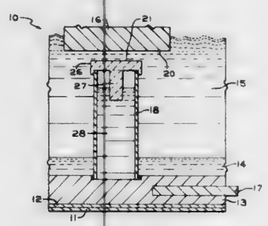


1. A device for the production of anodized aluminum or aluminum alloy foil which comprises: a strip of said foil; an electrolyte bath and an entry point to said bath; an anode roll spaced from said entry point and bath over which the foil passes on its way to said entry point and bath; cooling means for cooling the foil between said anode roll and point of entry; and at least one cathode in said electrolyte bath through which the foil passes, whereby deformation due to excessive heating is avoided.

4,177,128
CATHODE ELEMENT FOR USE IN ALUMINUM REDUCTION CELL

Henry W. Rahn, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 20, 1978, Ser. No. 971,605
Int. Cl.² C25C *3/00, 3/06, 3/16*
U.S. Cl. 204—243 R **5 Claims**

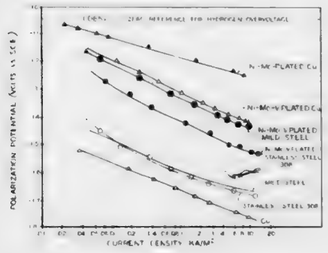


1. In an electrolytic cell wherein metal is produced in the molten state by electrolyzing a compound of the metal between anodic and cathodic surfaces said molten metal collecting in a pad on the floor of the cell the improvement wherein said cathodic surface is provided by a cathode element comprising at least one elongated hollow body having confined therein a quantity of molten metal, said hollow body extending upwardly through the molten metal pad and terminating proximate the anodic surface, the end of said hollow body terminating proximate the anodic surface being provided with a cap element formed of an electrically conductive material, the upper surface of the cap element confronting the surface of the anode in spaced relationship thereto, the cap element being in electrically conductive communication with the molten metal confined within the hollow body.

4,177,129
PLATED METALLIC CATHODE

Han C. Kuo, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 892,554, Apr. 3, 1978. This application Nov. 1, 1978, Ser. No. 956,557
Int. Cl.² C25B *11/04*
U.S. Cl. 204—290 R **3 Claims**

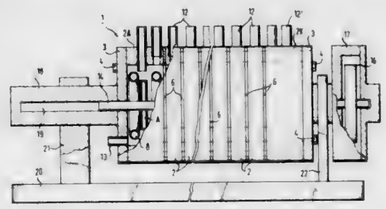


1. A low overvoltage cathode for an electrolytic cell, said cathode comprising a support formed from a metal selected from the group consisting of copper and a copper base alloy, at least a portion of which is conductively covered by a catalytic coating of a thickness within the range from about 1 to about 5 μm thick of an alloy consisting essentially of more than 50 percent molybdenum alloyed with a metal selected from the group consisting of cobalt and nickel so that the hydrogen overvoltage of said low overvoltage cathode in a chlor-alkali cell is reduced to less than 200 millivolts when tested in 20 percent caustic soda at 80° C. at 20 amp/dm² cathode current density.

4,177,130
APPARATUS FOR SEPARATING IONS PRESENT AS SOLUTES

Fritz Herrmann, Bruchwiesenweg 15, D-6450 Hanau 9, and Abdel-Latif Bilal, Kaiserdamm 88, D-1000 Berlin 19, both of Fed. Rep. of Germany

Filed Oct. 11, 1978, Ser. No. 950,363
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1977, 2746089
Int. Cl.² B01D *13/02;* C02B *1/82*
U.S. Cl. 204—299 R **10 Claims**



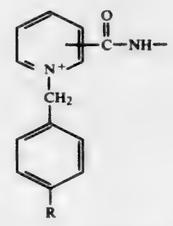
1. Apparatus for separating ions present as solutes in a solution comprising:
(a) a separating column having an axis and extending in a closed loop about said axis to define a cavity, said column being capable of holding said solution in said cavity;
(b) a plurality of partitions permeable to said solution and axially dividing said cavity into a plurality of chambers,
(1) the portions of said column exposed to said solution in said cavity and said partitions consisting of electrically insulating material; and
(c) two electrodes in respective, axially spaced chambers.

4,177,131
METHOD FOR OBTAINING BRIGHT ZINC AND CADMIUM ELECTROPLATES USING CARBOXAMIDE ADDITIVES

Renven Merker, Englewood Cliffs, and Salvatore Lucca, Paramus, both of N.J., assignors to The Metalux Corporation, Carlstadt, N.J.

Continuation-in-part of Ser. No. 835,296, Sep. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 688,270, May 20, 1976, abandoned. This application Jul. 24, 1978, Ser. No. 927,419
Int. Cl.² C25D *3/24, 3/28*
U.S. Cl. 204—50 Y **15 Claims**

1. In an aqueous alkaline electroplating bath containing metal ions selected from the group consisting of zinc and cadmium, the improvement which comprises having present in the bath from about 0.01 grams per liter to saturation of an inner salt of a quaternized pyridine carboxamide having the formula

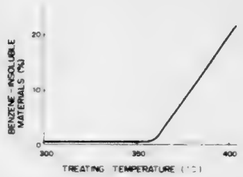


wherein R is hydrogen or a nicotinamide radical, said carboxamide being dissolved in the bath to yield a metal deposit of improved brightness.

4,177,132
PROCESS FOR THE CONTINUOUS PRODUCTION OF PETROLEUM-DERIVED PITCH

Seiichi Uemura; Syunichi Yamamoto, both of Kawasaki; Takao Hirose, Kamakura; Hiroaki Takashima, Kawasaki; Osamu Kato, Yokohama, and Minoru Nagi, Kawasaki, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Nov. 8, 1977, Ser. No. 849,701
Claims priority, application Japan, Nov. 12, 1976, 51-135236
Int. Cl.² C10C *3/00*
U.S. Cl. 208—22 **3 Claims**



1. A process for the continuous production of petroleum-derived pitch consisting essentially of:
providing as the starting oil a heavy fraction boiling above 150° C., the heavy fraction being obtained by the steam cracking or thermocracking of petroleum-derived hydrocarbons.
feeding said heavy fraction continuously into a first-step agitating vessel maintained at a pressure of at least 2 Kg/cm² and a temperature of from 300° to 360° C., where the heavy fraction is heat treated for an average residence time of 15 minutes up to 5 hours,

withdrawing the first-step treated fraction continuously from the first-step agitating vessel,

feeding the thus-withdrawn first-step treated fraction continuously into a second-step agitating vessel maintained at a temperature of from 370° to 450° C., where the first-step treated fraction is heat treated for an average residence time of from 30 minutes to 10 hours,

withdrawing the second-step treated fraction continuously from the second-step agitating vessel and

removing the light fraction of boiling point below 400° C. from the second-step treated fraction, thereby to obtain the petroleum-derived pitch.

4,177,133

PROCESS FOR PRODUCING HIGH-CRYSTALLINE PETROLEUM COKE

Kiyoshige Hayashi, Tokyo; Mikio Nakaniwa, Ohme; Nobuyuki Kobayashi, Ichihara; Minoru Yamamoto, Ichichara, and Yoshihiko Hase, Ichihara, all of Japan, assignors to Maruzen Petrochemical Co., Ltd., Tokyo, Japan

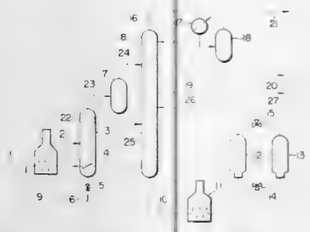
Continuation of Ser. No. 787,305, Apr. 14, 1977, abandoned, which is a continuation-in-part of Ser. No. 613,541, Sep. 15, 1975, Pat. No. 4,049,538. This application Jul. 14, 1978, Ser. No. 924,804

Claims priority, application Japan, Sep. 25, 1974, 49/110316

The portion of the term of this patent subsequent to Sep. 20, 1994, has been disclaimed.

Int. Cl.² C10G *9/14*

U.S. Cl. 208—50 **10 Claims**



1. A process for producing a high-crystalline petroleum coke from a petroleum feedstock containing a substantial amount of non-crystalline carbon-forming substances which comprises the steps of:

heating petroleum feedstock containing a substantial amount of non-crystalline carbon-forming substances in a tube heater to a temperature of 433°–520° C. under a pressure of 4–20 Kg/cm^2G;

maintaining the feedstock in the tube heater at that temperature for further 30–500 seconds to effect cracking and soaking thereof;

introducing the feedstock thus heat-treated into a high-temperature flashing column, and effecting therein flash distillation of said feedstock at a temperature of 380°–480° C. under a pressure of 0–2 Kg/cm^2G;

continuously removing non-crystalline substances contained in the feedstock as pitch from the bottom of the flashing column;

fractionating in a fractionating column the distillate from the flashing column into cracked gas, gasoline, gas oil and heavy residue; and

introducing the heavy residue, after heating to a temperature required for the subsequent delayed coking, into a coking drum, where it is subjected to delayed coking at a temperature of 430°–460° C. under a pressure of 4–20 Kg/cm^2G for at least 20 hours, thereby forming a high-crystalline petroleum coke having a coefficient of thermal expansion in the direction parallel to the extrusion of less than 1.0×10^{-6}/°C. over 100°–400° C. when measured in the form of an extruded graphite artefact thereof.

4,177,134

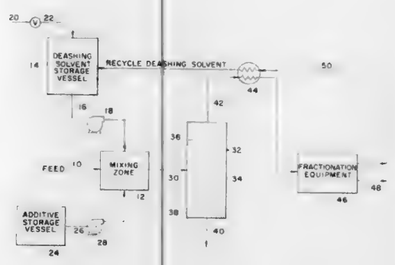
SEPARATION TECHNIQUE IN A COAL DEASHING PROCESS

Donald E. Rhodes; Roger A. Baldwin, and Robert E. Davis, all of Oklahoma City, Okla., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Mar. 20, 1978, Ser. No. 887,867

Int. Cl.² C10G *21/16*

U.S. Cl. 208—177 **12 Claims**



1. A process comprising:

providing a feed mixture comprising a deashing solvent, insoluble coal products and soluble coal products;

providing an additive, said additive consisting essentially of at least one substance selected from the group consisting of:

(i) asphaltenes derived either from petroleum, coal shale or tar sand, said asphaltenes being insoluble in aromatic hydrocarbons;

(ii) tannins;

(iii) "chlorophyll a" having the molecular formula $C_{55}H_{72}MgN_4O_5$;

(iv) "chlorophyll b" having the molecular formula $C_{55}H_{70}MgN_4O_6$;

(v) materials of chemical composition corresponding to the emphirical chemical formula $C_{61}H_{46}N_2O_4$, having molecular weights of about 870 or greater; and

(vi) asphaltols from coal dissolution processes or coal pyrolysis processes, said asphaltols being insoluble in aromatic hydrocarbons;

admixing predetermined quantities of said additive with said feed mixture to provide a new feed mixture;

introducing said new feed mixture into a first separation zone;

maintaining said first separation zone at a first temperature level lower than about 750 degrees F. and a pressure level in a range of from about 600 psig to about 1500 psig to separate said new feed mixture in said first separation zone into a first heavy fraction comprising the insoluble coal products, some deashing solvent, some soluble coal products and at least a portion of the additive and a light fraction comprising the deashing solvent and soluble coal products;

withdrawing said first heavy fraction from said first separation zone; and

withdrawing said first light fraction from said first separation zone.

4,177,135

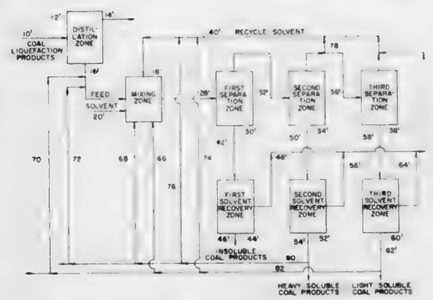
USE OF SPECIFIC COAL COMPONENTS TO IMPROVE SOLUBLE COAL PRODUCT YIELD IN A COAL DEASHING PROCESS

Donald E. Rhodes, Oklahoma City, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Mar. 20, 1978, Ser. No. 887,926

Int. Cl.² C10G *21/14*

U.S. Cl. 208—177 **14 Claims**



1. A coal liquid deashing process comprising:

providing a feed comprising soluble coal products and insoluble coal products;

providing a solvent, said solvent consisting essentially of at least one substance having a critical temperature below 800 degrees F. selected from the group consisting of aromatic hydrocarbons having a single benzene nucleus and normal boiling points below about 310 degrees F., cycloparaffin hydrocarbons having normal boiling points below about 310 degrees F., open chain mono-olefin hydrocarbons having normal boiling points below about 310 degrees F., open chain saturated hydrocarbons having normal boiling points below about 310 degrees F., mono-, di, and tri-open chain amines containing from about 2–8 carbon atoms, carbocyclic amines having a monocyclic structure containing from about 6–9 carbon atoms, heterocyclic amines containing from about 5–9 carbon atoms, and phenols containing from about 6–9 carbon atoms and their homologs;

providing an additive comprising recycled heavy soluble coal products;

admixing the feed, solvent and additive to form a mixture, said additive being present in said mixture in a quantity sufficient to provide a ratio by weight of feed to additive of from about 1:5 to about 20:1;

introducing said mixture into a first separation zone maintained at a temperature level in the range of from about 400 degrees F. to about 700 degrees F. and a pressure level in the range of from about 600 psig to about 1500 psig to effect a separation of said mixture into a first light phase and a first heavy phase comprising insoluble coal products and some solvent;

withdrawing said first light phase from said first separation zone, said first light phase containing soluble coal products extracted from the insoluble coal products by the interaction of said additive with said feed and solvent;

introducing said first light phase from said first separation zone into a second separation zone maintained at a temperature level above the temperature level of said first separation zone and a pressure level substantially no greater than the pressure level in said first separation zone to effect a separation of said first light phase into a second light phase and a second heavy phase comprising heavy soluble coal products and some solvent;

introducing the second light phase from said second separation zone into a third separation zone;

separating said second light phase in said third separation zone into a third light phase comprising solvent and a third heavy phase comprising light soluble coal products;

withdrawing said third heavy phase from said third separation zone as a product of the process; and

recycling at least a portion of said light soluble coal products to provide said additive in said mixture being introduced into said first separation zone.

3. A coal liquid deashing process comprising:

providing a feed comprising soluble coal products and insoluble coal products;

providing a solvent, said solvent consisting essentially of at least one substance having a critical temperature below 800 degrees F. selected from the group consisting of aromatic hydrocarbons having a single benzene nucleus and normal boiling points below about 310 degrees F., cycloparaffin hydrocarbons having normal boiling points below about 310 degrees F., open chain mono-olefin hydrocarbons having normal boiling points below about 310 degrees F., open chain saturated hydrocarbons having normal boiling points below about 310 degrees F., mono-, di, and tri-open chain amines containing from about 2–8 carbon atoms, carbocyclic amines having a monocyclic structure containing from about 6–9 carbon atoms, heterocyclic amines containing from about 5–9 carbon atoms, and phenols containing from about 6–9 carbon atoms and their homologs;

providing an additive comprising recycled light soluble coal products;

admixing said feed, solvent and additive to form a mixture, said additive being present in said mixture in a quantity sufficient to provide a ratio by weight of feed to additive of from about 1:5 to 20:1;

introducing said mixture into a first separation zone maintained at a temperature level in the range of from about 400 degrees F. to about 700 degrees F. and a pressure level in the range of from about 600 psig to about 1500 psig to effect a separation of said mixture into a first light phase and a first heavy phase comprising insoluble coal products and some solvent;

withdrawing said first light phase from said first separation zone, said first light phase containing soluble coal products extracted from the insoluble coal products by the interaction of said additive with said feed and solvent;

introducing said first light phase from said first separation zone into a second separation zone maintained at a temperature level above the temperature level of said first separation zone and a pressure level substantially no greater than the pressure level in said first separation zone to effect a separation of said first light phase into a second light phase and a second heavy phase comprising heavy soluble coal products and some solvent;

withdrawing said second heavy phase from said second separation zone as a product of the process; and

recycling at least a portion of said heavy soluble coal products in said second heavy phase to provide said additive in said mixture being introduced into said first separation zone.

4,177,136

HYDROTREATING PROCESS UTILIZING ELEMENTAL SULFUR FOR PRESULFIDING THE CATALYST

Daniel R. Herrington, Chesterland, and Albert P. Schwerko, Solon, both of Ohio, assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Division of Ser. No. 866,208, Jan. 3, 1978. This application May 12, 1978, Ser. No. 905,322

Int. Cl.² C10G *23/02*

U.S. Cl. 208—215 **6 Claims**

1. In a process of hydrotreating a hydrocarbon feed stock, which contains compounds with carbon-sulfur bonds, carbon-nitrogen bonds, and carbon-oxygen bonds, by contacting the hydrocarbon feed stock with hydrogen at an elevated temperature and with a hydrotreating catalyst to remove sulfur, nitro-

gen and oxygen from the hydrocarbon feed stock the improvement comprising using as at least part of a sulfided catalyst, a supported metal oxide catalyst, wherein said supported metal oxide catalyst is presulfided by the step of:

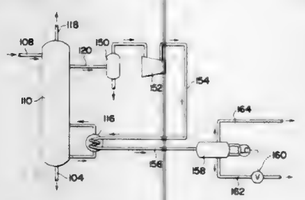
contacting said supported metal oxide catalyst with elemental sulfur in the absence of hydrogen in such a manner that said elemental sulfur is at least partially incorporated in the pores of said catalyst.

4,177,137

AROMATICS EXTRACTION PROCESS

Larry W. Kruse, Strongsville, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Filed Nov. 7, 1977, Ser. No. 849,299
Int. Cl.[2] C10G *21/28*
U.S. Cl. 208—321 **8 Claims**



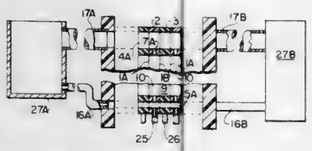
1. In the process for recovery of aromatics from a petroleum fraction containing aromatics, comprising a first column wherein a solvent is contacted with the petroleum fraction to extract aromatics therefrom, and a second column wherein the aromatics are stripped from the solvent, the improvement comprising removing a vapor sidestream containing aromatics from the upper half of the second column, compressing said sidestream containing aromatics, and passing said compressed sidestream in indirect heat exchange with the second column to provide at least part of the heat necessary to strip the aromatics from the solvent.

4,177,138

DIALYSIS METHOD AND APPARATUS THEREFOR

Harumi Mastuzaki, Hitachi; Katsuya Ebara, Mito, and Sankichi Takahashi, Hitachi, all of Japan, assignors to Hitachi Plant Engineering & Construction Co., Ltd. and Hitachi, Ltd., both of Tokyo, Japan

Filed May 26, 1977, Ser. No. 800,970
Claims priority, application Japan, May 26, 1976, 51-60162
Int. Cl.[2] B01D *13/02, 13/00*
U.S. Cl. 210—22 C **6 Claims**



4. A dialysis apparatus comprising:

a plurality of ion exchange membranes arranged vertically with predetermined intervals therebetween;

a plurality of frame members having peripheral portions, said ion exchange membranes and said frame members arranged alternately and secured tightly at the peripheral portions to define thereby a plurality of dilution chambers and concentration chambers alternately;

first and second passage means defined in the lower portions of said frame members for introducing solution into said dilution and concentration chambers respectively;

third and fourth passage means defined in the upper portions of said frame members for discharging diluent in said dilution chambers and concentrate in said concentration chambers therefrom respectively;

a plurality of aerating conduits provided in lower portions of said dilution and concentration chambers for introducing air into each of said dilution and concentration chambers;

a plurality of air vent means provided in the upper portions of said dilution and concentration chambers for discharging air introduced in said dilution and concentration chambers out of said dilution and concentration chambers;

first tank means fluidly connected to said first and third passage means for containing diluent;

means maintaining the level of the diluent in said first tank means equal to the level of diluent in said third passage means, whereby diluent will be recirculated according to air lift; and

second tank means fluidly connected to said second and fourth passage means for containing therein concentrate;

means maintaining the level of the concentration in said second tank means equal to the level of concentrate in said fourth passage means, whereby concentration will be recirculated according to air lift; and

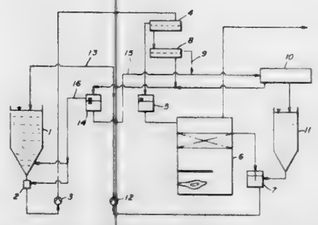
means for passing air through said aerating conduits to bubble up through said dilution and concentration chambers and discharge from said air vent means for providing the sole means for circulating solution respectively through said chambers, passage means and tank means.

4,177,139

PROCESS FOR TREATING PARTICLES OF ADSORBENT USED TO REMOVE PHENOL FROM WASTE WATER

Ulrich Hahn, Dortmund, and Klaus Stumpe, Essen, both of Fed. Rep. of Germany, assignors to C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Jan. 18, 1978, Ser. No. 870,389
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1977, 27018151
Int. Cl.[2] B01D *15/06*
U.S. Cl. 210—33 **6 Claims**



1. In a process for removing phenol from waste water by passing phenol-bearing waste water through an adsorber filled with an adsorbent of active carbon or aluminum oxide having a desired given nominal particle size, the process for regenerating said adsorbent including the steps of:

discharging said adsorbent from said adsorber,

draining waste water from the discharged adsorbent,

separating the adsorbent into a first adsorbent fraction including adsorbent particles having said given nominal particle size and into an undersized second adsorbent fraction consisting of adsorbent particles having a size less than the given nominal particle size but a particle size which is greater than 10% of the given nominal particle size,

feeding said first adsorbent fraction into a regenerator oven,

regenerating the first adsorbent fraction by heating within said regenerator oven,

feeding said undersized second adsorbent fraction into a processing plant,

processing the undersized second adsorbent fraction in said processing plant until the processed adsorbent particles define said given nominal particle size, and

returning said regenerated adsorbent particles together with said processed adsorbent particles into said adsorber.

4,177,140

METHOD FOR REMOVING A WEAK ACID FROM AN AQUEOUS SOLUTION

Robert Smakman, Nigtevecht, Netherlands, assignor to Akzona Inc., Asheville, N.C.

Filed Jan. 27, 1978, Ser. No. 872,843
Claims priority, application Netherlands, Jan. 26, 1977, 7700763
Int. Cl.[2] C02B *1/60*
U.S. Cl. 210—37 R **6 Claims**

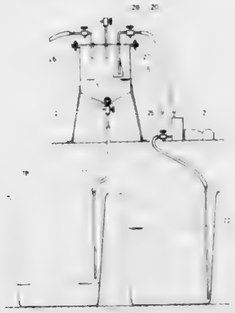
4. A method for removing a weak acid from an aqueous solution containing said acid, comprising contacting said solution with an anion exchanger containing both strongly basic and weakly basic groups, said exchanger having a cross-linked matrix comprising a copolymer of styrene and not more than about 20%, by weight, of a cross-linking agent, from about 3% to about 90% of the total basic groups being strongly basic groups of the quaternary ammonium type having the structure $-CH_2N^+R_1R_2R_3$, wherein R_1, R_2, and R_3 are independently selected from the group consisting of $-CH_3$, $-C_2H_5$, and $-C_2H_4OH$, and the ratio of the number of strongly basic groups to the number of weakly basic groups is from about 3:97 to about 90:10.

4,177,141

FILTER MEDIUM, PROCESS FOR PREPARATION THEREOF, FILTERING METHOD AND FILTERING APPARATUS

Akio Nakamura, 4-6, Inohana 3, and Hirosi Isizuka, 48, Minatocho, both of Chiba City, Chiba Pref., Japan

Filed Mar. 30, 1978, Ser. No. 891,919
Int. Cl.[2] B01D *37/02*
U.S. Cl. 210—70 **7 Claims**



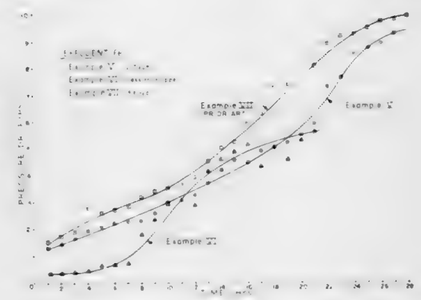
1. In a method for separating at least one filtrate from a dispersed phase using a filter medium comprising a body of the filter medium having the space thereof partitioned three-dimensionally, irregularly and manifoldly by bent linear members having a strength sufficient to prevent substantially any deformation when the filtrate flows therethrough, such that voids are formed wherein the filtrate passes through said voids, and an effluent pipe connected to the body of the filter medium and having an opening located in the interior of the body of the filter medium, the filtrate flowing out of said filter medium through said effluent pipes the improvement comprising, pre-impregnating said filter medium body with dispersed phase free filtrate such that said filter medium is completely immersed in said filtrate and thereafter feeding a flow of said filtrate with said dispersed phase therein towards the surface of said filter medium body so as to provide a constant and steady operation state wherein said filtrate continues to flow through said filter medium body and through said effluent pipe and said dispersed phase is formed around said filter medium body but separated therefrom with the filtrate interposed between the dispersed phase and the surface of the filter medium body.

4,177,142

MIXTURE OF OPPOSITELY CHARGED FILTER AID MATERIAL

Christopher J. Halbfoster, Greenbrook, N.J., assignor to Ecodyne Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 457,821, Apr. 4, 1974, abandoned. This application Sep. 27, 1977, Ser. No. 836,967
Int. Cl.[2] B01D *37/02*
U.S. Cl. 210—75 **24 Claims**



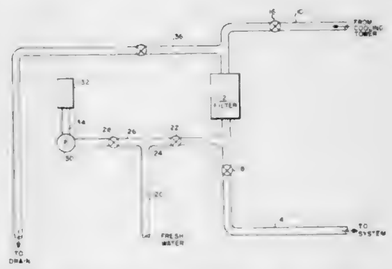
1. A method for removing impurities from a liquid comprising: passing said liquid through a filter bed comprising a mixture of oppositely charged particles of filter aid material, said mixture producing a clumping phenomenon, said particles normally all having the same surface charge in aqueous suspension, wherein 5 to 95% of said material has been treated with an electrolyte-type compound that produces a surface charge opposite to said normal surface charge by bonding to the surface of said filter aid material.

4,177,143

ELIMINATION OF STRAINER FOULING IN RECIRCULATING COOLING WATER SYSTEMS

Richard E. Myers, Hinsdale, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

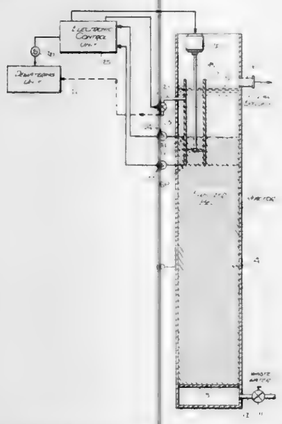
Filed Oct. 25, 1978, Ser. No. 954,717
Int. Cl.[2] B01D *29/38*
U.S. Cl. 210—82 **4 Claims**



1. A method of improving the operation of filters of the type used to filter cooling waters which are used intermittently in direct heat exchange relationship to cool large office buildings and similar structures, which method comprises maintaining the filters when not in use in contact with water which con-

tains a preservative amount of an industrial biocide, said preservative amount being greater than the normal dosage used to treat the cooling water under conditions of normal operation.

4,177,144
EXCESS-GROWTH CONTROL SYSTEM FOR FLUIDIZED-BED REACTOR
Robert F. Hickey, Florence, Mass., and Roger W. Owens, Deer Park, N.Y., assignors to Ecolotrol, Inc., Bethpage, N.Y.
Filed Jul. 19, 1978, Ser. No. 926,207
Int. Cl.[2] B01D *15/02*
U.S. Cl. 210—86 **20 Claims**



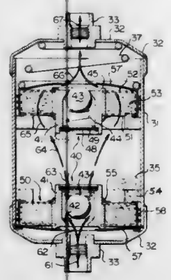
1. A control system for preventing accumulation of excessive cellular material in a fluidized-bed reactor wherein waste water or other liquid to be processed is conducted upwardly therein at a velocity conducive to fluidization through a bed of particles which function as a carrier for the growth of the material, a head of effluent being developed above the bed from which the effluent is discharged from the reactor; the system comprising:

(A) a separator column disposed in the reactor with its low end extending toward the fluidized bed and its high end extending toward the effluent head, said column having a draw-off port somewhat below the surface of the effluent head;

(B) an agitator arrangement associated with the column to effect, when activated, shearing of the excess cellular material from the particles to produce in the column a mixture of sheared material and partially-stripped carrier particles; and

(C) means to activate said arrangement when the expansion of the fluidized bed, as a result of said growth, reaches an alarm limit indicative of excessive growth to provide an exit flow rate at the draw-off port which results in an upward flow velocity in the separator column that is lower than the settling velocity of the partially-stripped carrier particles but higher than the settling velocity of the sheared material whereby the sheared material is washed away through the draw-off port.

4,177,145
TWO-WAY FILTER-DRIER FOR HEAT PUMP SYSTEMS
Ernest W. Schumacher, De Soto, Tex., assignor to Virginia Chemicals Inc., Portsmouth, Va.
Filed May 3, 1978, Ser. No. 902,398
Int. Cl.[2] B01D *15/00*
U.S. Cl. 210—136 **21 Claims**



1. A bi-directional filter-drier, comprising:

A. a shell having line connectors at each end thereof;

B. an adsorption/filtration unit, comprising:

(1) an adsorption space filled with an adsorbent;

(2) a valve assembly at each end of said adsorption space, each comprising:

(a) a valve bushing having a passageway therethrough, and

(b) a check valve within said passageway for allowing flow of liquid therethrough only from one said line connector toward said adsorption space, and

(3) a pad assembly at each end of said adsorption space, each comprising:

(a) a main filter pad which is radially disposed and is annularly positioned between said valve bushing and said shell;

(b) a filter pad support means for positioning and supporting said main filter pad, and

(c) an elastomeric annular diaphragm which is positioned between said bushing and said shell, said diaphragm being adapted to prevent flow in the direction permitted by the nearer check valve and to permit flow in the opposite direction thereto; and

C. a retaining means for positioning said adsorption unit within said shell.

4,177,146
METHODS AND APPARATUS FOR CONTINUOUSLY ENDOWING LIQUID WITH MECHANICAL ENERGY BY OSMOSIS
Karel Popper, P.O. Box 637, Willits, Calif. 95490, and Wayne M. Camirand, 844 Madison St., Albany, Calif. 94706
Filed May 5, 1975, Ser. No. 574,302
Int. Cl.[2] B01D *13/00*
U.S. Cl. 210—137 **3 Claims**

1. Apparatus for endowing liquid with energy by osmosis comprising an osmosis cell including an osmotic membrane and a sealed chamber having the hypertonic surface of said membrane as one of its boundaries;

a lock-type valve for feeding solid solute into said sealed chamber;

a governable outlet for said chamber from which liquid can issue;

means for creating turbulence in liquid within said chamber; and

the hypotonic surface of said membrane being so exposed and said apparatus being adapted to be so oriented that liquid can flow against and the away from the hypotonic surface under the action of gravity.

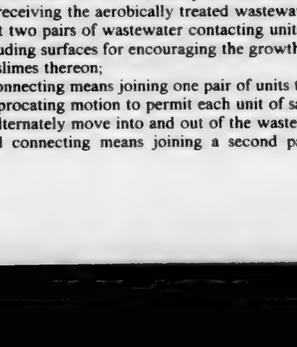
2. Apparatus for endowing liquid with energy by osmosis comprising an osmosis cell;

means for continuously flowing hypotonic liquid against and then away from the hypotonic surface of the membrane of said cell;

means for continuously flowing hypertonic liquid against the hypertonic surface of said membrane;

means for, at least in part, then flowing said hypertonic liquid together with permeate emerging across said membrane, away from said membrane to a prime mover to drive said prime mover;

means for causing said liquid, as it issues from said prime mover, to evaporate into the atmosphere, at least in part, so as to produce solute in solid form from said liquid;



means for embodying said solute in a relatively concentrated liquid constituting a source of the hypertonic liquid for said second mentioned means to flow against said hypertonic surface of said membrane, said means for embodying said solute in a relatively concentrated liquid comprising a closed chamber and a lock-type feed valve for feeding solid solute into said chamber;

means for conveying to said feed valve for feeding to said chamber solid solute formed by evaporation of the effluent from said prime mover;

means for flowing a part of the hypertonic liquid and permeate away from said hypertonic surface into said closed chamber; and

means for supplying hypertonic liquid from said chamber to said means for continuously flowing hypertonic liquid against said membrane, all of said five means immediately hereinbefore mentioned, except said conveying means, being arranged in a pressure-tight closed system.

4,177,147
BIOLOGICAL TREATING SYSTEMS
Robert L. Roberts, Boothwyn, Pa., assignor to Roberts Filter Manufacturing Company, Darby, Pa.
Filed Mar. 20, 1978, Ser. No. 887,952
Int. Cl.[2] C02C *1/04*
U.S. Cl. 210—151 **15 Claims**

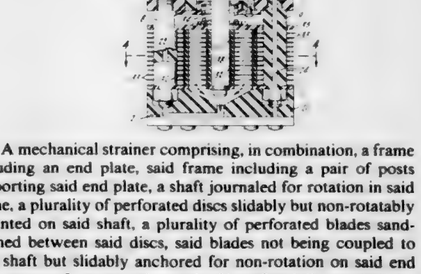
1. An aerobic biological treating system for wastewater, said system including:

a treating tank for wastewater having inlet means for receiving wastewater to be aerobically treated and outlet means for receiving the aerobically treated wastewater;

at least two pairs of wastewater contacting units, said units including surfaces for encouraging the growth of biological slimes thereon;

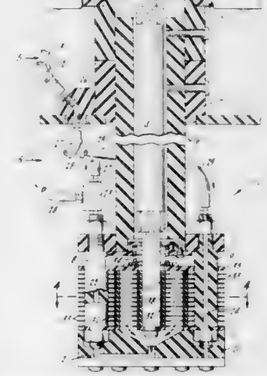
first connecting means joining one pair of units together for reciprocating motion to permit each unit of said one pair to alternately move into and out of the wastewater;

second connecting means joining a second pair of units together for reciprocating motion to permit each unit of the second pair to alternately move into and out of the wastewater; and



drive means for reciprocating the first and second connecting means to alternately move each unit of each pair into and out of the wastewater as said wastewater is being directed through the tank from said inlet means to said outlet means.

4,177,148
MECHANICAL STRAINER
Clifford C. Hach, Ames, Iowa, and Wayne P. Zemke, Port Washington, Wis., assignors to Hach Chemical Company, Loveland, Colo.
Filed Mar. 3, 1978, Ser. No. 883,205
Int. Cl.[2] B01D *33/00*
U.S. Cl. 210—396 **1 Claim**



1. A mechanical strainer comprising, in combination, a frame including an end plate, said frame including a pair of posts supporting said end plate, a shaft journaled for rotation in said frame, a plurality of perforated discs slidably but non-rotatably mounted on said shaft, a plurality of perforated blades sandwiched between said discs, said blades not being coupled to said shaft but slidably anchored for non-rotation on said end posts, means for urging the stack of interfitted discs and blades together and against said end plate completely enclosing the disc and blade perforations, means on said frame for slowly and continuously driving said shaft, said end plate being formed with a passage opening to the perforations in said discs and blades, and means including a passage through one of said

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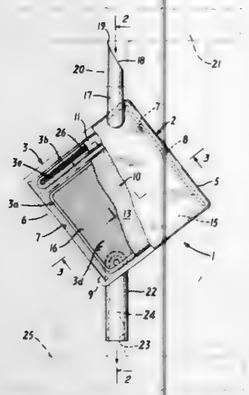
posts that opens to said end plate passage for coupling a tube to said passage so that water leaking between said relatively rotating discs and blades finds its way to said tube while foreign particulate matter is stopped at the peripheries of the discs and blades.

4,177,149

FILTER ASSEMBLY FOR INTRAVENOUS LIQUID ADMINISTRATION APPARATUS

David J. Rosenberg, Glen Cove, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Jul. 21, 1978, Ser. No. 926,766
Int. Cl.² C02C *1/14*
U.S. Cl. 210—436 **8 Claims**



1. A filter for gravity-feed intravenous liquid administration, comprising a plastic filter housing in at least two generally rectilinearly shaped portions bonded together and defining a filter chamber therebetween; an inlet member located generally at a first corner of said housing and an outlet member located generally at a second corner of said housing diagonally opposite said first corner in fluid flow communication with the filter chamber, the inlet member being arranged to be oriented up when so installed for gravity feed of intravenous liquid from the supply, with the outlet member down; a liquid-permeable filter that is gas-impermeable when filled with liquid disposed in the filter chamber across the line of gravity-feed fluid flow through the chamber from the inlet member to the outlet member so that all through flow must pass through the filter, and extending vertically when the pointed member is oriented up; the chamber being divided into two vertically-extending portions, one upstream and one downstream of the filter; a vent in an uppermost portion of the housing when the pointed member is oriented up, in flow communication with the upstream portion of the filter chamber; and a liquid-impermeable gas-permeable porous member extending vertically when the pointed member is oriented up and disposed above the filter across the line of flow through the vent, so that all vent flow must pass through the member, the member passing to the vent flow gas rising to the top of the upstream portion of the filter chamber and restricting such flow to gas to which it is permeable; the inlet member being shaped for attachment to a supply of liquid for intravenous administration; and the outlet member being shaped for attachment to an intravenous liquid administration apparatus, the upper walls of the filter chamber on the upstream side of the filter being arranged to funnel gas rising in the chamber towards the inlet member and vent, and to permit liquid flowing downwardly to spread out over the filter surface, the lower walls on the upstream side of the filter drawing inwardly towards the bottom of the chamber to maintain a uniform flow over the filter surface as the liquid diminishes in volume due to flow through the filter; and the lower walls of the filter chamber on the downstream side being arranged to funnel liquid flowing downwardly in the chamber towards the outlet member.

4,177,150

DRIED POROUS ACRYLONITRILE POLYMER MEMBRANE, PROCESS FOR PRODUCING SAME AND SEPARATORS MADE THEREFROM

Akio Inoue; Tadahiro Kobayashi, and Toshio Iwasa, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1977, Ser. No. 831,017
Claims priority, application Japan, Sep. 8, 1976, 51/106613
Int. Cl.² B01D *13/04*
U.S. Cl. 210—500 M **1 Claim**



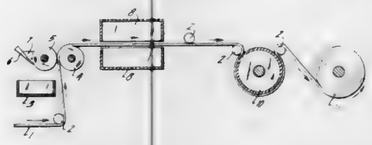
1. A dried porous membrane composed of acrylonitrile polymer walls separating predominantly interconnecting small-size pores, which comprises surface layers integral with a support layer to form a single continuous acrylonitrile polymer phase, each of the surface layers having pores of from 0.001 to 0.05 micron in average size and a thickness of from 0.1 to 20 microns, the support layer having pores of a larger average size than the pores in the surface layers, and said membrane having a porosity of from 20% to 70% by volume and a fragility of below 30.

4,177,151

FABRIC-CONDITIONING ARTICLE FOR USE IN A CLOTHES DRYER

Ting Y. Siu, Englishtown, and Daniel Ackley, Waldwick, both of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Jun. 30, 1978, Ser. No. 921,023
Int. Cl.² D06M *13/00*
U.S. Cl. 252—8.6 **23 Claims**



1. In a fabric-conditioning article comprising a flexible substrate carrying at least one fabric-conditioning agent and suitable for use by commingling with damp fabrics in a laundry dryer, the improvement wherein said substrate comprises a sheet of flexible, resilient, polyurethane foam having a density of from about 1.1 to about 1.8 pounds per cubic foot, a thickness of from about 0.025 inch to about 0.250 inch and a cell count of from about 20 to about 100 cells per linear inch, and at least one surface of said foam sheet has a discontinuous coating of said fabric- conditioning agent, said coating penetrating said surface to an average depth of no more than about one-third the thickness of said sheet without extending appreciably above said surface and at least the center core of said sheet being free from said fabric-conditioning agent, the improvement providing more efficient utilization of said fabric-conditioning agent.

4,177,152

METHOD OF EXTINGUISHING METAL FIRES

Jean P. Sarrut, La Varenne St. Hilaire, France, assignor to CECA S.A., Villacoublay and Le Carbone Lorraine, Paris, both of, France

Filed Nov. 17, 1977, Ser. No. 852,238
Claims priority, application France, Nov. 22, 1976, 76 35125; Sep. 5, 1977, 77 26857
Int. Cl.² C09K *3/28; G21C 9/04*
U.S. Cl. 252—2 **22 Claims**

1. A method for extinguishing a metal fire comprising isolating the burning metallic surface from the ambient atmosphere by application of a product comprising an exfoliable graphite complex wherein the graphite is associated with a complexing material or materials selected from the group consisting of
nitric acid (HNO_3)
sulfuric acid (H_2SO_4)
hydrofluoric acid (HF)
orthophosphoric acid (H_3PO_4)
trifluoroacetic acid (CF_3CO_2H)
ferric chloride ($Fe\ Cl_3$)
ferric chloride/ammonia ($FeCl_3\ NH_3$)
antimony pentachloride ($SbCl_5$)
calcium ammonia ($Ca\ NH_3$)
barium/ammonia ($Ba\ NH_3$)
strontium/ammonia ($SrNH_3$),
and wherein exfoliation occurs when the product is applied to the metal fire.

15. A metal fire extinguishing product comprising an exfoliable graphite complex wherein the graphite is associated with a complexing material or materials selected from the group consisting of
nitric acid (HNO_3)
sulfuric acid (H_2SO_4)
hydrofluoric acid (HF)
orthophosphoric acid (H_3PO_4)
trifluoroacetic acid (CF_3CO_2H)
ferric chloride ($Fe\ Cl_3$)
ferric chloride/ammonia ($FeCl_3\ NH_3$)
antimony pentachloride ($SbCl_5$)
calcium ammonia ($Ca\ NH_3$)
barium/ammonia ($Ba\ NH_3$)
strontium/ammonia ($Sr\ NH_3$),
and is exfoliable when the product is applied to the metal fire.

4,177,153

LUBRICATING OIL ADDITIVE COMPOSITION

Warren Lowe, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 31, 1978, Ser. No. 892,446
Int. Cl.² C10M *1/48*
U.S. Cl. 252—32.7 E **10 Claims**

1. An additive composition for use in crankcase lubricating oils comprising:
(1) an oil-soluble antioxidant selected from aromatic or alkyl sulfides and polysulfides, sulfurized olefins, sulfurized carboxylic acid esters, and sulfurized ester-olefins, and
(2) an oil-soluble tertiary amine of the formula $(R)_3N$, wherein each R is independently C_1-C_{35} alkyl and at least one R contains at least 11 carbon atoms, wherein the weight ratio of said antioxidant to said tertiary amine is 1:0.001-21.

4,177,154

SYNTHETIC AQUEOUS BASED METAL WORKING FLUID COMPOSITIONS

Paritosh M. Chakrabarti, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,438
Int. Cl.² C10M *1/46, 3/40*
U.S. Cl. 252—32.5 **11 Claims**

1. Synthetic metal working composition concentrates comprising phosphoric acid esters of poly (2-10) ethyleneoxy n butane 1,4-diols in aqueous solution having the pH of the composition adjusted to the alkaline side.

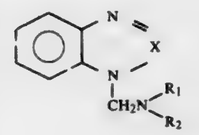
4,177,155

ADDITIVES FOR WATER-BASED FUNCTIONAL FLUIDS

Alan F. Popplewell, deceased, late of Manchester, England (by Margaret R. Popplewell, legal representative), and David R. Clark, Sale, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

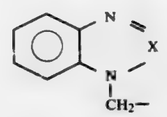
Continuation-in-part of Ser. No. 649,109, Jan. 14, 1976, abandoned. This application May 19, 1977, Ser. No. 798,517
Claims priority, application United Kingdom, Jan. 23, 1975, 2929/75
Int. Cl.² C07D *235/08, 249/18, 403/06*
U.S. Cl. 252—49.3 **24 Claims**

1. A compound having the formula



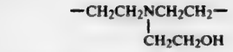
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wherein
X is N or CR,
R is hydrogen or an alkyl of 1 to 4 carbon atoms,
R_1 and R_2 are the same or different and each is a residue of the formula
$R_3O[(alkylene)O]_xalkylene$,
R_3 is hydrogen or alkyl of 1 to 2 carbon atoms,
"alkylene" is a straight or branched chain alkylene of 2 to 3 carbon atoms,
x is 0, 1, 2, 3 or 4; or
R_1 is said residue and R_2 is hydrogen, alkyl of 1 to 4 carbon atoms, cyclohexyl, benzyl or a radical of the formula



II;

or R_1 and R_2 together are



16. A composition comprising
(a) a water-based functional fluid, and
(b) from 0.001 to 5% by weight based on the total composition of a compound according to claim 1, said compound acting as a metal passivator.

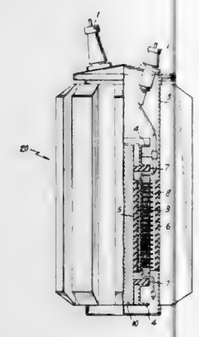
24. A composition according to claim 16 wherein the functional fluid is a metal working fluid.

4,177,156

DIELECTRIC COMPOSITIONS COMPRISING MIXTURES OF POLYCHLORINATED BENZENES AND ALKYLAROMATIC HYDROCARBONS

Pierre Jay, Saint-Didier Au Mont D'Or, and Pierre Bonhomme, Meyzieu, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Mar. 10, 1978, Ser. No. 885,381
Claims priority, application France, Mar. 10, 1977, 77 08080
Int. Cl.[2] C10M 3/24; H01B 3/24, 3/22
U.S. Cl. 252—66 19 Claims



1. A liquid, non-flammable dielectric composition, comprising [1] from 75% to 90% by weight of a mixture of polychlorobenzenes, which comprises (i) from 75% to 95% by weight an at least one polychlorobenzene having at least 3 chlorine atoms and (ii) from 25% to 5% by weight of orthodichlorobenzene, and [2] from 25% to 10% by weight of a member selected from the group consisting of (iii) an alkylaromatic hydrocarbon selected from the group consisting of a mono- or polyalkylbiphenyl, a mono- or polyalkylterphenyl, and mixtures thereof, and wherein each alkyl substituent contains from 1 to 5 carbon atoms, and (iv) a member selected from the group consisting of an at least 10% hydrogenated biphenyl and an at least 10% hydrogenated terphenyl.

4,177,157

PRECOAGULATED PTFE-BOUND ELECTRODES

Richard L. Adams, Ferndale, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 5, 1978, Ser. No. 893,695
Int. Cl.[2] H01M 4/62, 4/32, 4/52
U.S. Cl. 252—182.1 2 Claims

1. In the process of making alkaline battery electrodes of the non-sintered, polymer-bound type including the principal steps of slurrying comminuted electrode active material and coagulated binder in a suitable suspension medium, filtering the slurry to remove said active material and binder from said medium as a filter cake, integrating said filter cake with a conductive current collector, compressing the current collector and cake, and drying the thusly formed compress, the improvement comprising: mixing a coagulant with an aqueous dispersion of fine polytetrafluoroethylene particles to form a coagulum of said particles; mechanically dispersing said coagulum in water such as to subdivide said coagulum into small irregularly shaped, sticky clots of said particles and suspend them in the water; and mixing the thusly formed aqueous suspension with said active material to form said slurry, whereby said clots become coated with said active material during said slurrying, and said coated clots interlock together during said compressing for forming a coherent mass thereof.

4,177,158

METHOD FOR PRODUCING AN ATTRITION-RESISTANT ADSORBENT FOR SULFUR DIOXIDE, THE RESULTING COMPOSITION AND A PROCESS USING SAME

Emanuel M. Blue, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 13, 1978, Ser. No. 877,434
Int. Cl.[2] B01D 53/12; B01J 8/24; C09K 3/00
U.S. Cl. 252—189 12 Claims

1. A method for improving the attrition resistance of a particulate solid selected from limestone and dolomite comprising the steps of:

(a) forming a mixture of said particulate solid with a finely divided solid material including at least one glaze-forming flux having a melting point lower than said particulate solid selected from phosphates, silicates and borates of alkali and alkaline earth metals and oxides of boron, said mixture containing from 0.002 to 1 part, by weight, of said finely divided solid per 100 parts of said particulate solid; and

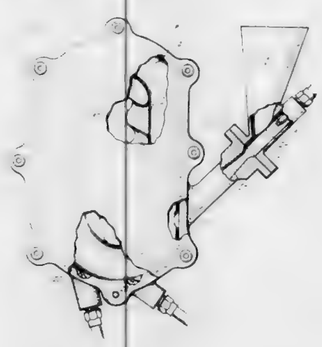
(b) glazing a fraction of the exterior of said particulate solid with said finely divided solid maintaining said mixture at a temperature below the melting temperature of said particulate solid and high enough to melt said flux for about 0.1 to 30 minutes in a fluidized bed.

4,177,159

CATALYTIC DRY POWDER MATERIAL FOR FUEL CELL ELECTRODES COMPRISING FLUOROCARBON POLYMER AND PRECATALYZED CARBON

Roger M. Singer, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 28, 1978, Ser. No. 920,035
Int. Cl.[2] B01J 31/02; H01M 4/04, 4/96
U.S. Cl. 252—428 5 Claims



1. A finely divided dry powder having a maximum particle size of about five microns and a mean particle size of about one micron or less, said powder comprising precatalyzed carbon and polytetrafluoroethylene, the polytetrafluoroethylene having a molecular weight of at least 10^6.

2. The finely divided powder according to claim 1 wherein said powder consists of floc particles formed by floccing a co-suspension of said precatalyzed carbon particles and polytetrafluoroethylene particles, drying the floc so formed, and reducing the floc to a powder having said maximum particle size.

4,177,160

CATALYTIC COMPONENTS AND CATALYSTS FOR THE POLYMERIZATION OF OLEFINS

Giuliano Cecchin; Luciano Luciani, and Pier Luigi Griselli, all of Ferrara, Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 712,306, Aug. 6, 1976, abandoned. This application Nov. 14, 1978, Ser. No. 960,664
Claims priority, application Italy, Aug. 8, 1975, 26231 A/75
Int. Cl.[2] C08F 4/64
U.S. Cl. 252—429 B 8 Claims

1. Catalyst-forming components for use in preparing catalysts for polymerization of olefins, said components consisting of a product of the following composition:

$$TiCl_3.(AlR_mX_{3-m})_aA_p$$

wherein:

R is a hydrocarbon radical containing from 1 to 20 carbon atoms;

$0 \leqq m \leqq 2.5$;

X is halogen;

a is a number lower than 0.4;

A is an ether selected from the group consisting of monoethers of formula R'OR'' wherein R' and R'' are alkyls containing from 1 to 10 carbon atoms, aryls, cycloalkyls, alkylaryls or aralkyls, and polyethers of the class of polyalkylenglycol-dialkyl-ethers and 1,2-diphenoxyehtane, said ether being capable of forming complexes or coordination products with Al halides or alkyl-Al halides, which complexes or coordination products are soluble in the ether itself or in aromatic or aliphatic hydrocarbons or in the halogenated derivatives thereof; and

p is zero or a number greater than zero but lower than 0.5 and said catalyst-forming components being characterized in that, in the X-rays spectrum thereof, diffraction lines apper at the following lattice distances:

d = 5.4 A (intense line); d = 2.75 A (line of medium intensity);

d = 2.12 A (line of medium to weak intensity);

d = 1.98 A (very weak line); d = 1.77 A (medium line), and in that the surface area thereof is comprised between 2 and 20 m^2/g and the porosity is lower than 0.1 cc/g.

4,177,161

CATALYTIC OXIDATIVE PROCESS FOR PRODUCING MALEIC ANHYDRIDE

Sumio Umemura; Kyoji Ohdan; Fumihiko Sakai; Yasuo Bando, and Harumi Ikezawa, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Division of Ser. No. 816,916, Jul. 19, 1977, Pat. No. 4,110,350, which is a continuation of Ser. No. 623,448, Oct. 17, 1975, abandoned. This application May 5, 1978, Ser. No. 902,935
Claims priority, application Japan, Oct. 22, 1974, 49-121009; Jul. 1, 1975, 50-80527
Int. Cl.[2] B01J 27/14
U.S. Cl. 252—435 15 Claims

1. Catalyst composition consisting essentially of oxides defined by the following formula:

$$VP_aTi_bX_cO_d$$

wherein said oxides of titanium and vanadium are the product of calcining a mixture of a vanadium-containing compound and titanium dioxide at a temperature of 650° to 1500° C., X is at least one element selected from the group consisting of sodium, calcium, magnesium, iron, zirconium, boron, manganese, silver and molybdenum, and "a" is 1.0 to 5.0, "b" is 2.0 to 12.0, "c" is 0 to 1.0, and "d" is a number within the range of 8 to 40 satisfying the average valency of the vanadium, phosphorous, titanium and X, wherein after calcining said titanium dioxide is rutile titanium dioxide.

4,177,162

SULFIDING AND REOXIDATION OF CHROMIUM CATALYST

Max P. McDaniel, and Melvin B. Welch, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 5, 1977, Ser. No. 857,556
Int. Cl.[2] B01J 27/02, 31/02, 31/12
U.S. Cl. 252—439 17 Claims

1. A process for activating a catalyst consisting essentially of a chromium component and a silica-containing base comprising a first step wherein said catalyst is contacted with a sulfur-containing ambient at a temperature of at least 370° C. and a subsequent second step wherein it is contacted with an oxygen-containing oxidizing ambient at a temperature within the range of 400°-900° C.

4,177,163

SUPPORTED CATALYST FOR DEMETALATION AND DESULFURIZATION OF HYDROCARBON OILS

Stephen M. Oleck, Moorestown, and Howard S. Sherry, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 8, 1978, Ser. No. 884,521
Int. Cl.[2] B01J 23/10, 21/04, 23/84, 27/04
U.S. Cl. 252—439 13 Claims

1. A catalyst for the hydrodemetalation of a metal and sulfur-contaminated hydrocarbon oil, said catalyst comprising 1-10% of an iron group metal and 5-25% of a Group VIB metal, said metals being present as the oxides or sulfides on a support precalcined at a temperature of about 1300° to about 1700° F., said precalcined support comprising at least 85 wt.% alumina and about 0.5 to about 7.0 wt.% rare earth oxide.

4,177,164

HYDROALKYLATION COMPOSITION AND PROCESS FOR PRODUCING SAID COMPOSITION

Timothy P. Murtha; William A. Jones, and Ernest A. Zuech, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 744,060, Nov. 22, 1976, Pat. No. 4,093,671. This application Dec. 28, 1977, Ser. No. 865,157
Int. Cl.[2] B01J 29/06
U.S. Cl. 252—455 Z 13 Claims

1. A composition comprising:

at least one platinum compound supported on a calcined, acidic, nickel and rare earth-treated crystalline zeolite wherein the rare earth content of the calcined, acidic, nickel and rare earth-treated crystalline zeolite is within a range of from about 2 to about 25 percent by weight of the composition.

4,177,165

HYDROALKYLATION COMPOSITION AND PROCESS FOR PRODUCING SAID COMPOSITION

Timothy P. Murtha, and Ernest A. Zuech, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 767,413, Feb. 10, 1977, Pat. No. 4,094,918. This application Dec. 28, 1977, Ser. No. 865,158
Int. Cl.[2] B01J 29/06
U.S. Cl. 252—455 Z 21 Claims

1. A composition comprising:

at least one rhodium or palladium compound or mixture thereof supported on a calcined, acidic, nickel and rare earth-treated crystalline zeolite; wherein the rare earth content of the calcined, acidic, nickel and rare earth-treated crystalline zeolite ranges from about 2 to about 25 percent by weight; and

wherein the nickel content of the calcined, acidic, nickel and rare earth-treated crystalline zeolite ranges from about 0.01 to about 12 percent by weight.

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4,177,166
HYDROALKYLATION COMPOSITION AND PROCESS FOR PRODUCING SAID COMPOSITION

Timothy P. Murtha, and Ernest A. Zaech, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 739,152, Nov. 5, 1976, Pat. No. 4,118,434.
This application Dec. 28, 1977, Ser. No. 865,159
Int. Cl.[2] B01J 29/06
U.S. Cl. 252—455 Z 11 Claims

1. A composition consisting essentially of:
a calcined, acidic nickel and rare earth-treated crystalline zeolite support impregnated with at least one ruthenium compound subsequent to calcination wherein the ruthenium content is within the range of about 0.01 to about 1 percent by weight of the composition.

4,177,167
CATALYST FOR THE PREPARATION OF DIMETHYL ETHER

Giovanni Manara; Bruno Notari, and Vittorio Fattore, all of San Donato Milanese, Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Filed Dec. 20, 1977, Ser. No. 862,575
Claims priority, application Italy, Dec. 23, 1976, 30800A/76
Int. Cl.[2] B01J 21/12
U.S. Cl. 252—455 R 6 Claims

1. A catalyst for the production of dimethyl ether consisting essentially of a mixture of an oxide of aluminum with at least one other oxide selected from the group consisting of the oxides of chromium, lanthanum, manganese, copper and zinc, wherein the atomic content of said aluminum is in the range of 10% to 70% and at least said aluminum oxide is stabilized by means of a silicon compound containing hydrolyzable groups selected from the group represented by the formula:



wherein X, Y, Z and W represent —R, —OR, —Cl, —Br, $-SiH_3$, —COOR, $-SiH_nCl_m$, in which R is a member of the group consisting of hydrogen, alkyl, cycloalkyl, aromatic, alkylaromatic, and cycloalkyl having from 1 to 30 C atoms, and n and m represent numbers from 1 to 3, through a thermal treatment wherein said aluminum oxide is impregnated with the silicon compound and then heated in an inert atmosphere to the boiling temperature of the silicon compound so as to react the silicon compound with the aluminum oxide and distill off reaction products and excess silicon compound and thereafter heated in the present of steam so as to react hydrolyzable groups bound to silicon with water.

4,177,168
CATALYST BED FOR USE IN A CATALYTIC FLAMELESS HEATER DEVICE

Patrick J. Denny, Stockton-on-Tees; David L. Harrison, and Martyn H. Stacey, both of Runcorn, all of England, assignors to Imperial Chemical Industries Limited, London, England

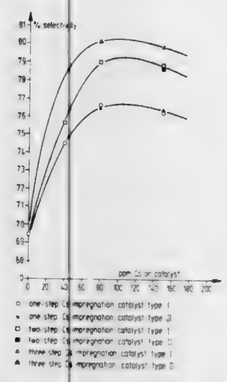
Filed Oct. 31, 1974, Ser. No. 519,656
Claims priority, application United Kingdom, Nov. 7, 1973, 51593/73
Int. Cl.[2] B01J 23/64, 23/72, 23/74
U.S. Cl. 252—470 1 Claim

1. A catalyst bed for use in a catalytic flameless heater device for the oxidation of a vaporous fuel consisting essentially of synthetic inorganic polycrystalline metal oxide fibers and a combustion catalyst supported by the fibers, said catalyst comprising a metal selected from the group consisting of platinum, palladium and rhodium and present at a concentration of 0.01% to 0.5% by weight of the fibers, said catalyst is combined with a metal oxide selected from the group consisting of the oxides of chromium, cobalt, copper, manganese and iron, said fibers having a BET surface area of 5 to 200 square meters per gram and a bulk density in the bed of 0.01 to 0.2 grams per cubic centimeter.

4,177,169
PROCESS FOR IMPROVING THE ACTIVITY OF USED SUPPORTED SILVER CATALYSTS

Siegfried Rebsdat, Burg; Sigmund Mayer, Burgkirchen; Josef Alfranseder, Marktl, and Josef Riedl, Burgkirchen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 26, 1977, Ser. No. 845,563
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649359
Int. Cl.[2] B01J 23/50, 23/96; C07D 301/10, 303/04
U.S. Cl. 252—476 2 Claims



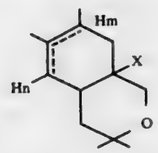
1. In a process for improving the selectivity of a supported silver catalyst for the direct oxidation of ethylene to ethylene oxide with molecular oxygen or air, of the type wherein on the used catalyst is applied caesium, rubidium or mixture thereof by impregnating the used catalyst with an impregnating solution containing a compound of caesium, rubidium or mixture thereof, the improvement which comprises making said application at two different times interrupted by a period of using the catalyst, as follows:
(a) making a first application on the catalyst of 10 to 300 ppm caesium, rubidium or mixture thereof;
(b) thereafter using the catalyst for the production of ethylene oxide by direct oxidation of ethylene with molecular oxygen or air;
(c) then interrupting said production after about 2 to 60 weeks, at the end of which time the selectivity of the catalyst is still at about the level which was achieved by said first application;
(d) and next making a second application on the catalyst of 5 to 100 ppm caesium, rubidium or mixture thereof followed by using the resulting catalyst again for said production.

4,177,170
3,3,7,8-TETRAMETHYL-2-OXABICYCLO-[4,4,0]-DECANE DERIVATIVES AND THEIR USE IN PERFUME COMPOSITIONS

Richard C. Cookson, Salisbury, England, and Lorenzo D. Ferro, New York, N.Y., assignors to Bush Boake Allen Limited, London, England

Filed Jun. 19, 1978, Ser. No. 916,494
Claims priority, application United Kingdom, Jun. 21, 1977, 25863/77
Int. Cl.[2] C11B 9/00
U.S. Cl. 252—522 10 Claims

1. A compound having the formula:



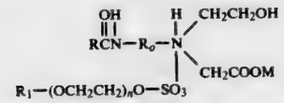
wherein X represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms, m has a value of 0 or 1, n has a value of 1 or 2 n+m=2 and the dashed line indicates alternative positions for a unit of unsaturation.

4,177,171
SHAMPOO

John M. Waits, Clark, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 3, 1975, Ser. No. 628,309
Int. Cl.[2] C11D 1/88, 1/94
U.S. Cl. 252—541 3 Claims

1. A low irritation shampoo composition having a viscosity greater than 4,000 centipoise as measured at 23°-25° C. comprising;
(a) 5–20% by weight, based on the total weight of the composition, of an amphoteric anionic surfactant of the formula



where R is a 9–17 carbon alkyl radical, R_o is an alkylene group of 2–4 carbon atoms, R_1 is a member of the group consisting of $C_{13}H_{27}$ and $C_{12}H_{25}$, n is 2–6, and M is a member of the group consisting of alkali metals, triethanolamine mixtures of an alkali metal with hydrogen and mixtures of triethanolamine with hydrogen, and
(b) 8 to 20% by weight of a 16–18 carbon atom fatty acid monoester of sorbitan reacted with 60 to 100 moles of ethylene oxide.

4,177,172
AQUEOUS NITROCELLULOSE/ALKYD RESIN DISPERSION

Hans-Joachim Traenckner, Krefeld; John Goossens, Cologne; Wolfgang Kremer, Kerken, and Heinz Krönke, Bomlitz, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 871,610, Jan. 23, 1978, abandoned, and a continuation-in-part of Ser. No. 871,611, Jan. 23, 1978, abandoned. This application Dec. 14, 1978, Ser. No. 969,557
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1977, 2702986; Jan. 26, 1977, 2703075
Int. Cl.[2] C08L 1/18
U.S. Cl. 260—15 5 Claims

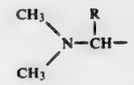
1. An aqueous dispersion of a binder for coating compositions said dispersion comprising
(a) 5–50% by weight of nitrocellulose,
(b) 5–30% by weight, based on (a), of plasticizer for (a),
(c) 5–50% by weight of alkyd resin having an oil content of 5–50% by weight, based on alkyd resin,
(d) 30–80% by weight of water, and
(e) 0.5–10% by weight of emulsifier, the percentages of a, c, d and e being based on the sum of components (a) to (e), in which the emulsifier is a member of the group consisting of
(i) a partially saponified polyvinyl acetate having a degree of hydrolysis of 70–97%,
(ii) a polyvinyl pyrrolidone, and
(iii) a hydrolyzed vinyl acetate/vinyl pyrrolidone copolymer, the particle size of the dispersed phase being from 0.1 to 1.5μ.

4,177,173
POLYEPOXIDE CURING BY POLYMERCAPTANS CATALYZED BY DIMETHYLAMINO ALKYL ETHERS

Brian J. Carr, Fairfax, Calif., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Dec. 20, 1978, Ser. No. 971,434
Int. Cl.[2] C08G 59/66, 59/68
U.S. Cl. 260—18 EP 36 Claims

1. A curing system for curing polyepoxides comprising:
(a) at least one polymercaptan, and
(b) at least one catalyst which is poly[(N,N-dimethylamino) alkyl] ether containing two, three or four N,N-dimethylaminoalkyl substituents of the formula



where R represents hydrogen or straight or branched chain alkyl radicals having from 1 to 10 carbon atoms and in any one compound R can be the same or different and with the proviso that the dimethylamino groups are one, two or three carbon atoms removed from ether oxygen.

4,177,174
EPOXY RESIN COMPOSITION CURED BY REACTION PRODUCT OF PHENOL CARBOXYLIC ACIDS WITH POLYAMINO COMPOUNDS

Masaaki Hayashi, Kamakura; Kazuyoshi Tsuneta; Hiroshi Takada, both of Yokohama; Nobuhiro Kenmotsu, and Hiroharu Sasaki, both of Kamakura, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Filed May 9, 1977, Ser. No. 795,125
Claims priority, application Japan, May 14, 1976, 51-55025; May 20, 1976, 51-57275
Int. Cl.[2] C08G 59/44
U.S. Cl. 260—18 PN 11 Claims

1. An epoxy resin coating compositions comprising (1) an

epoxy resin containing in the molecule at least 2 epoxy groups and (2) a curing agent composition formed by condensing an amino compound containing in the molecule at least two nitrogen atoms and active hydrogen atoms bonded thereto with 5 to 30% by weight, based on the amino compound, of at least one member selected from the group consisting of protocatechuic acid and gallic acid and esters thereof, said esters being formed with alcohols containing 1–12 carbon atoms, said amino compound being at least one member selected from the group consisting of amine adduct resins and polyamide resins.

4,177,175

ORGANOTHIOL-CONTAINING SILOXANE RESINS AS ADHESION PROMOTERS FOR SILOXANE RESINS

Ronald H. Baney, Midland, and Len A. Harris, Rhodes, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 863,968, Dec. 23, 1977, abandoned. This application Jun. 7, 1978, Ser. No. 913,423

Int. Cl.[2] C08J *3/02*; C08L *83/04*

U.S. Cl. 260—29.2 M **13 Claims**

1. A composition of matter which is a pigment-free aqueous coating composition comprising a mixture of (A) a dispersion of colloidal silica in lower aliphatic alcohol-water solution of the partial condensate consisting essentially of of a silanol of the formula $RSi(OH)_3$ or a dispersion of colloidal silica in ether esters of ethylene or propylene glycol-water solution, of the partial condensate consisting essentially of of a silanol of the formula $RSi(OH)_3$ in which R is selected from the group consisting of alkyl radicals of 1 to 3 inclusive carbon atoms, the vinyl radical, the 3,3,3-trifluoropropyl radical, the gamma-glycidoxypropyl radical, the gamma-methacryloxypropyl radical and the phenyl radical, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, said composition containing 10 to 50 weight percent solids consisting essentially of 10 to 70 weight percent colloidal silica and 30 to 90 weight percent of the partial condensate, said composition containing sufficient acid to provide a pH in the range of 2.5 to 6.0, having added thereto sufficient (B) to give 1–5 weight percent of the solids of (B) based on the weight of the total solids of (A) and (B) in the composition wherein (B) is an aqueous composition comprising a dispersion of colloidal silica in lower aliphatic alcohol-water solution of a partial condensate of a silanol of the formula $R'Si(OH)_3$ or a dispersion of colloidal silica in ether esters of ethylene or propylene glycol-water solution of a partial condensate of a silanol of the formula $R'Si(OH)_3$ in which R' is selected from $HSR''-$ and $(HS)_2R''-$ wherein R'' is selected from a group consisting of a divalent or trivalent aliphatic hydrocarbon radical having 1–6 carbon atoms and phenylene, the colloidal silica in (B) being present in the amount of 34 to 50 weight percent and the amount of $R'Si(OH)_3$ present in (B) being 50 to 66 weight percent both being based on the total weight of solids contained in (B), said composition (B) containing 10 to 50 weight percent solids, said composition (B) containing sufficient acid to provide a pH in the range of 2.8 to 5.2 until it is added to composition (A).

4,177,176

TREATMENT OF FIBRES

Peter M. Burrill, and Frank S. Rankin, both of S. Glamorgan, Wales, assignors to Dow Corning Limited, Barry, Wales

Filed May 7, 1976, Ser. No. 684,201

Claims priority, application United Kingdom, May 17, 1975, 21101/75

Int. Cl.[2] C08L *83/08*

U.S. Cl. 260—29.2 M **8 Claims**

1. A composition consisting of (A) a polydiorganosiloxane having a molecular weight of at least 2500 and terminal —OX radicals wherein X represents a hydrogen atom or an alkyl or alkoxyalkyl radical having up to 15 carbon atoms, at least two of the silicon-bonded substituents present in said polydiorganosiloxane being monovalent radicals composed of carbon, hydrogen, nitrogen and, optionally, oxygen, which radicals contain at least two amine groups and are attached to silicon through a silicon to carbon linkage, and at least 50 percent of the total substituents in said polydiorganosiloxane being methyl, radicals, any remaining substituents being monovalent hydrocarbon radicals having from 2 to 20 inclusive carbon atoms, and (B) an organosiloxane having at least three silicon-bonded hydrogen atoms in the molecule and in which the organic radicals are alkyl radicals having less than 19 carbon atoms.

4,177,177

POLYMER EMULSIFICATION PROCESS

John W. Vanderhoff, 345 9th Ave., Bethlehem, Pa. 18018; Mohamed S. El-Aasser, 1201 N. Maxwell St., Allentown, Pa. 18103, and John Ugelstad, SINTEF, 7034 Trondheim-NTH, Trondheim, Norway

Continuation of Ser. No. 670,908, Mar. 26, 1976, abandoned. This application Jan. 27, 1978, Ser. No. 873,067

Int. Cl.[2] C08L *83/04*

U.S. Cl. 260—29.2 M **28 Claims**

1. A polymer emulsification process comprising first intimately dispersing a liquified water insoluble polymer phase having a viscosity of less than about 10,000 cps in an aqueous liquid medium phase in an approximate polymer phase:aqueous phase weight ratio of 0.1:1 to 2:1 at a temperature of about 40° to about 90° C., said aqueous phase containing about 0.1 to about 5%, by weight of the water therein, of at least one nonionic, anionic or cationic oil-in-water functioning emulsifying agent, in the presence of about 0.2 to about 12%, by weight of said polymer phase, of a compound selected from the group consisting of those hydrocarbons and hydrocarbyl alcohols, ethers, amines, halides and esters which are inert, nonvolatile, water insoluble, liquid at said temperature and contain a terminal aliphatic hydrocarbyl group of at least about 8 carbon atoms, and mixtures thereof, and then subjecting the resulting crude emulsion to the action of comminuting forces sufficient to enable the production of a stable, sedimentation-resistant aqueous emulsion containing polymer particles averaging less than about 0.5μ in size.

4,177,178

THERMOSETTING ACRYLIC COPOLYMER COMPOSITIONS

Suryya K. Das, Pittsburgh, and Charles M. Kania, Tarentum, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 17, 1978, Ser. No. 897,087

Int. Cl.[2] C08G *33/00*; C08L *33/02, 61/32*; C08K *3/10*

U.S. Cl. 260—29.4 A **6 Claims**

1. In an aqueous thermosetting resinous coating composition of a dispersed acrylic copolymer containing active hydrogens selected from the class consisting of hydroxyl, primary amine, secondary amine, amido, thiol and carboxylic acid, and a curing agent stable in the presence of said acrylic polymer at room temperature but reactive with the active hydrogens of the acrylic polymer at an elevated temperature to form a cured product, the improvement comprising:

an at least partially base neutralized acrylic polymer which has a weight average molecular weight of about 15,000 to 100,000, as determined by gel permeation chromatography using a polystyrene standard, and which is prepared from copolymerizing in the presence of a free radical initiator:

(A) 20 to 40 percent by weight of a vinyl aromatic compound,

(B) 10 to 35 percent by weight of an alkyl ester of methacrylic acid having 1 to 3 carbon atoms in the alkyl group,

(C) 15 to 40 percent by weight of an alkyl ester of acrylic acid having 2 to 12 carbon atoms in the alkyl group or an alkyl ester of methacrylic acid having 4 to 12 carbon atoms in the alkyl group,

(D) 2 to 20 percent by weight of an acrylic monomer containing active hydrogens selected from the class consisting of hydroxyl, primary amine, secondary amine, amido and thiol,

(E) 2 to 15 percent by weight of an alpha, beta-ethylenically unsaturated carboxylic acid,

(F) 2 to 20 percent by weight of an alkyl ester of an alpha, beta-ethylenically unsaturated carboxylic acid having 14 to 20 carbon atoms in the alkyl group,

the percentage by weight of the acrylic monomers presented above being based on total weight of acrylic monomers; said coating composition containing from 20 to 60 percent by weight resin solids.

4,177,179

AQUEOUS COLD SETTING PAINT

Kenji Kurihara, Atsugi; Shigekazu Kasahara, Sagamihara, and Takashi Suzuki, Chofu, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Aug. 3, 1978, Ser. No. 930,697

Claims priority, application Japan, Aug. 26, 1977, 52/101732

Int. Cl.[2] C08L *39/00*

U.S. Cl. 260—29.6 NR **17 Claims**

1. An aqueous cold setting paint which comprises

(A) a copolymer obtained by a solution polymerization of

(a) a monomer having ethylenic unsaturated double bond and a nitrogen-containing base,

(b) a monomer having ethylenic unsaturated double bond and a phosphoric acid group or a salt thereof or an ester thereof,

(c) a monomer having ethylenic unsaturated double bond and carboxylic acid group or a salt thereof, and

(d) a monomer having ethylenic unsaturated double bond which is copolymerizable with the component (a), (b) or (c); or

(B) a copolymer obtained by treating the copolymer (A) with a base and

(C) an epoxy resin being soluble in an alcoholic solvent.

4,177,180

COMPOSITION COMPRISING RESIN AND PIGMENT FOR AUTODEPOSITION

Wilbur S. Hall, Plymouth Meeting, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Continuation-in-part of Ser. No. 613,717, Sep. 15, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 718,605

Int. Cl.[2] C08L *9/08, 9/10*

U.S. Cl. 260—29.7 H **22 Claims**

1. An aqueous composition consisting essentially of a mixture of latex which includes resin particles and an aqueous dispersion of pigment particles, the resin and pigment particles having an affinity for each other, and in which substantially all of the resin particles are associated with pigment particles in a manner such that the particles resist being dissociated even when subjected to vigorous mixing.

4,177,181

FLAME-RETARDANT ADHESIVE COMPOSITIONS

Michio Tsurumi; Takashi Sakakiyama; Kichiya Tazaki, and Masaoki Koyama, all of Yokohama, Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Mar. 15, 1978, Ser. No. 886,852

Claims priority, application Japan, Mar. 18, 1977, 52-29306

Int. Cl.[2] C08F *236/18*

U.S. Cl. 260—29.7 H **10 Claims**

1. A copolymer latex which is obtained from emulsion copolymerization, in aqueous medium, of monomers consisting essentially of from about 5 to about 60 weight percent of an aliphatic conjugated diolefin, from about 5 to about 55 weight percent of a monoolefinic monomer selected from the group consisting of aromatic vinyl monomers, acrylate esters and methacrylate esters, from about 0.5 to about 10 weight percent of an ethylenically unsaturated carboxylic acid, and from about 25 to about 70 weight percent of vinylidene chloride, said copolymerization being arranged such that a first monomer mixture containing substantially all of the vinylidene chloride monomer and also containing acrylate or methacrylate ester monomer is first subjected to emulsion copolymerization and, then, a second monomer mixture containing substantially all of the aliphatic conjugated diolefin and substantially all of any aromatic vinyl monomer employed is subjected to emulsion copolymerization in the presence of the first copolymerization product.

4,177,182

POLYVINYL CHLORIDE SERIES RESIN MEDICAL PRODUCT IMPLEMENTS AND METHOD OF MANUFACTURING THE SAME USING SILOXANE OIL ADDITIVE

Toshiji Ichikawa, Tokyo, Japan, and Osamu Minoo, Bratislava, Czechoslovakia, assignors to Terumo Corp., Tokyo, Japan

Filed Sep. 23, 1975, Ser. No. 615,978

Claims priority, application Japan, Oct. 28, 1974, 49-123469

Int. Cl.[2] C08J *3/00*

U.S. Cl. 260—29.1 SB **5 Claims**

1. The method of reducing the leaching of plasticizer from medical product implements made of resin composition consisting essentially of polyvinyl chloride series resin plasticized with 20 to 80% by weight of plasticizer based on the weight of polyvinyl chloride series resin which comprises incorporating in such resin composition 0.2 to 7% by weight of silicone oil based on the weight of polyvinyl chloride series resin, said silicone oil being at least one siloxane compound selected from the group consisting of polymethyl phenyl siloxane, polydimethyl siloxane, polydiphenyl siloxane, polydimethyl phenyl siloxane and polydimethyl hydrogen siloxane.

4,177,183

PROCESS FOR THE PREPARATION OF COATINGS COMPOSED OF POLYHYDROXY COMPOUNDS

Horst Dalibor, Norderstedt, Fed. Rep. of Germany, assignor to Hoechst Aktiengeselischaft, Fed. Rep. of Germany

Filed Apr. 21, 1977, Ser. No. 789,660

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1976, 2618810

Int. Cl.[2] C09D *3/74, 3/52*

U.S. Cl. 260—31.4 R **7 Claims**

1. A coating binder composition, dissolved in solvents which do not contain active hydrogen atoms, composed of a binder (A) comprising a mixture of a copolymer which contains hydroxyl groups and which is a reaction product from mixtures of polymerizable vinyl compounds which contain α,β-ethylenically unsaturated monocarboxylic acids and styrene and glycidyl esters and (B), polyisocyanate wherein component A consists of 60–80 percent by weight of hydroxyl group containing copolymers, having a total hydroxyl group content of 3.5 to 6.5 percent by weight, prepared in the presence of a mixture of a diacyl peroxide or perester and an alkyl hydroperoxide or dialkyl peroxide as polymerization initiators, from:

(a) 5–24 percent by weight of glycidyl ester of alkanemonocarboxylic acids selected from the group consisting of α-alkyl-alkanemonocarboxylic acids and α,α-dialkylalkanemonocarboxylic acids of the following empirical formula $C_{12\text{-}14}H_{20\text{-}26}O_3$, and slow, uniform addition to said glycidyl esters (a) of

(b) 12–30 percent by weight of compounds selected from the group consisting of hydroxyethyl acrylate and hydroxyethyl methacrylate,

(c) 1–10 percent by weight of acrylic acid,

(d_1) 20–50 percent by weight of styrene, and

(d_2) 5–35 percent by weight of methyl methacrylate,

the components a, b, c, d_1, and d_2, based on 100 percent by weight of components a to d_2, and the polymerization and condensation reactions taking place simultaneously and jointly, with the additional condition that components a, b, and c are employed in such quantities that the copolymer component A

has a hydroxyl group content of 3.5 to 6.5 percent by weight, and component B consists of 20 to 40 precent by weight of an organic polyisocyanate, it being necessary that components A and B together give a numerical value of 100 percent by weight.

4,177,184

POLYMERIC BLEND FOR AUTOMOTIVE APPLICATIONS

Nancy J. Condon, Missouri City, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 26, 1978, Ser. No. 918,755

Int. Cl.[2] C08K *5/20*

U.S. Cl. 260—32.6 A **10 Claims**

1. A composition comprising the admixture obtained by mixing:

(a) 100 parts by weight of a selectively hydrogenated monoalkenyl arene-conjugated diene multiblock copolymer;

(b) 5 to 200 parts by weight of a polymeric alpha-olefin;

(c) 5 to 200 parts by weight of a filler;

(d) 5 to 200 parts by weight of a synthetic rubberizing polymer; and

(e) 0.05 to about 15.0 parts by weight of a fatty acid amide wherein said rubberizing polymer is selected from the group consisting of non-hydrogenated monoalkenyl arene-conjugated diene multi-block copolymers; selectively hydrogenated monoalkenyl arene-conjugated diene A′-B′ two block copolymers; ethylene-propylene copolymers; EPDM-type terpolymers; polyisobutylene; butyl rubber; polybutadiene and neoprene.

4,177,185

FLAMEPROOF POLYAMIDE MOULDING COMPOSITION

Peter Tacke; Dieter Neuray, and Dietrich Michael, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 3, 1979, Ser. No. 752

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1978, 2800467

Int. Cl.[2] C08K *3/32, 5/51*

U.S. Cl. 260—38 **6 Claims**

1. A self-extinguishing thermoplastic moulding composition which comprises:

(1) from 40 to 95%, by weight, of a polyamide,

(2) from 0.5 to 20%, by weight, of a phenol/aldehyde resin;

(3) from 0.2 to 12%, by weight, of a polymeric phosphoryl nitride oxide and/or a precursor thereof consisting of:

(a) from 20 to 50.8%, by weight, of P,

(b) from 15 to 23%, by weight, of N,

(c) from 45 to 26.2%, by weight, of O,

(d) from 12 to 0%, by weight, of C and

(e) from 8 to 0%, by weight, of H;

and, optionally,

(4) from 0 to 50%, by weight, of one or more reinforcing materials and/or fillers.

4,177,186

STABILIZATION OF LIGHT-SENSITIVE POLYMERS

Jean Rody, Basel, Switzerland; Gerd Greber, Bad Vöslau, Austria, and Helmut Müller, Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

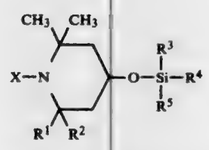
Continuation-in-part of Ser. No. 687,825, May 19, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,655

Claims priority, application Switzerland, May 28, 1975, 6831/75

Int. Cl.[2] C07D *211/18*; C08K *5/34*

U.S. Cl. 260—45.8 N **13 Claims**

1. A compound of formula I



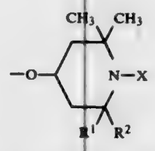
(I)

wherein

R^1 and R^2 independently from one another represent alkyl having 1–4 C-atoms or together with the C-atom to which they are attached form a cyclopentane or cyclohexane or a 2,2,6,6-tetramethylpiperidine ring,

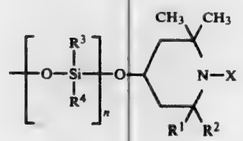
R^3 is hydrogen, methyl, phenyl or vinyl,

R^4 and R^5 independently from one another represent hydrogen, methyl, phenyl, vinyl, alkoxy having 1–8 C-atoms, alkoxyalkoxy having 3–10 C-atom, cyclohexyloxy, aralkoxy having 7 or 8 C-atoms, phenoxy which is unsubstituted or substituted by chlorine, alkyl or alkoxy having each 1–4 C-atoms, or a group of the formula Ia



(Ia)

and, if R^3 and R^4 are hydrogen, methyl, phenyl or vinyl, R^5 may also be a group of the formula Ib



(Ib)

wherein n is an integer of from 1 to 20, and

X is hydrogen, alkyl having 1–12 C-atoms, alkenyl having 3–6 C-atoms, alkoxyalkyl having 3–14 C-atoms, aralkyl having 7 or 8 C-atoms or an aliphatic acyl group having 1–4 C-atoms or one of the groups $—CH_2COOR^6$, $—CH_2—CH(R^7)—OR^8$ or $—COOR^9$ wherein

R^6 is alkyl having 1–8 C-atoms, alkenyl having 3–6 C-atoms, phenyl, aralkyl having 7 or 8 C-atoms or cyclohexyl,

R^7 is hydrogen, methyl or phenyl,

R^8 is hydrogen or an aliphatic, aromatic, araliphatic or alicyclic acyl group having up to 18 C-atoms, which may be substituted in its aryl moiety with chlorine, alkyl having 1–4 C-atoms, alkoxy having 1–8 atoms and/or hydroxy, and

R^9 is alkyl having 1–8 C-atoms, benzyl, phenyl or cyclohexyl, with the proviso that, when X is hydrogen and

R^3 is phenyl, one of R^4 and R^5 is different from a 2,2,6,6-tetramethylpiperidine-4-oxy residue.

11. A composition of matter stabilized against photodeterioration comprising an organic polymer, normally subject to deterioration by light, and from 0.01 to 5.0 percent by weight of a compound as claimed in claim 1.

4,177,187

STABILIZERS FOR HALOGENATED RESINS

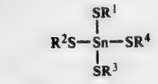
Joseph M. Bohen, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 29, 1977, Ser. No. 828,703

Int. Cl.[2] C08K *5/58*

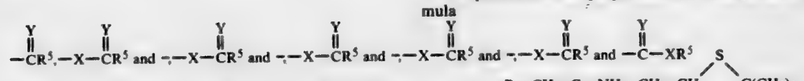
U.S. Cl. 260—45.75 S **11 Claims**

1. A composition comprising a mixture of (a) from about 20 to 80 weight percent of a tin tetrakis (mercaptide) having the formula:



where

R^1, R^2, R^3 and R^4 are hydrocarbon radicals having from 1 to 22 carbon atoms and are independently selected from the group consisting of alkyl, cycloalkyl, aryl, mixed alkyl-aryl and said hydrocarbon radicals having a substituent selected from the group consisting of halogen, —XH, $—XR^5$,



where R^5 is a hydrocarbon radical having from 1 to 20 carbon atoms and is selected from the group consisting of alkyl, alkenyl, cycloalkyl, aryl and mixed alkyl-aryl, and X and Y are independently either oxygen or sulfur; and (b) from about 80 to 20 weight percent of an overbased organic complex of an alkali or alkaline earth metal base having the formula

$$R_n{}^6M_x{}^1A_{n'}$$

where

R^6 is a residue of an organic acid selected from the group consisting of carboxylic, thiocarboxylic, sulfonic, sulfinic, phosphonic, phosphinic, thiophosphonic, thiophosphinic, phenolic, and thiophenolic;

n and n′ are independently 1 or 2;

M and M^1 are independently selected from the group consisting of alkali and alkaline earth metals; x is a positive integer greater than zero; and

A is an anion of the base material selected from the group consisting of OH^{-1}, $CO_3{}^{-2}$, O^{-2}, $SO_4{}^{-2}$, $SO_3{}^{-2}$, $HCO_3{}^{-1}$ and S^{-2}.

8. The composition of claim 1 dispersed in poly(vinyl chloride)resin.

4,177,188

PROCESS FOR RECOVERING PURIFIED ALBUMIN FROM BLOOD PLASMA USING PEG AND CAPRYLIC ACID

Jørgen F. Hansen, Rødovre, Denmark, assignor to Nordisk Insulinlaboratorium, Gentofte, Denmark

Filed Jan. 10, 1978, Ser. No. 868,253

Claims priority, application Denmark, Jan. 21, 1977, 258/77

Int. Cl.[2] C07G *7/00*

U.S. Cl. 260—122 **3 Claims**

1. A process for recovering purified albumin suitable for intravenous injection from human blood plasma without denaturing the globulins present therein, comprising the steps of:

(a) mixing the blood plasma with 150 to 300 g polyethylene glycol (PEG) per liter of liquid mixture and adjusting the mixture to a pH of 6 to 7 for precipitating fibrinogen and globulins while forming a supernatant containing albumin;

(b) separating the supernatant from the formed precipitate;

(c) adjusting the pH of the supernatant to a pH of 4.5 to 5.3; for precipitating albumin;

(d) redissolving the albumin with entrained PEG in an aqueous medium;

(e) subjecting the resulting albumin solution formed during step (d) to thermocoagulation at 50 to 65° C. and a pH of 4.6 to 5.0 in the presence of a stabilzing amount of caprylic acid; and

(f) isolating the purified albumin from the solution by precipitation.

4,177,189

PROCESS FOR THE PREPARATION OF HYDROXYPHOSPHINYLUREIDOBENZYLPENICILLINS

Piet J. Akkerboom, Zoetermeer; Geertruida J. Lower, Geleen, and Willem J. Timp, Delft, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

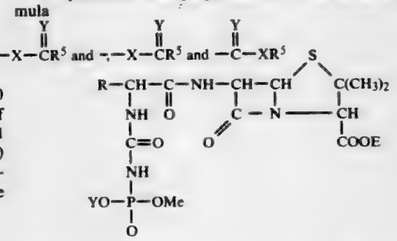
Filed May 22, 1978, Ser. No. 908,221

Claims priority, application United Kingdom, Jun. 1, 1977, 23227/77

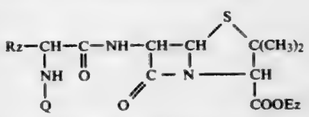
Int. Cl.[2] C07D *499/68*

U.S. Cl. 260—239.1 **14 Claims**

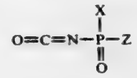
1. A process for the preparation of a compound of the formula



wherein R is phenyl optionally substituted with one to two members which may be the same or different selected from the group consisting of hydroxy, lower alkyl and lower alkoxy, Y is selected from the group consisting of Me, lower alkyl, aryl(-lower)alkyl and aryl in which the aryl is optionally substituted by at least one alkyl, Me is a metal cation and E is selected from the group consisting of hydrogen and a metal cation which may be the same or different from the metal cation Me, comprising reacting a compound of the formula



wherein Q is selected from the group consisting of hydrogen atom and silicon atom carrying substituents selected from the group consisting of lower alkyl, lower haloalkyl, aryl, aralkyl and lower alkoxyalkyl and halogen, Rz has the same significance as R as defined above with the proviso that any hydroxy group(s) present on the phenyl group are replaced by —OQz wherein Qz is a silicon atom carrying substituents selected from the group consisting of lower alkyl, lower haloalkyl, aryl, aralkyl and lower alkoxyalkyl and halogen and Ez is a carboxyl protecting group with a compound of the formula



wherein Z is halogen, and X is selected from the group consist-

ing of OY and Z at a temperature below 0° C. under anhydrous conditions in an organic solvent medium, carefully hydrolyzing the resulting product thus either with an amount of water just sufficient to remove any protecting groups present in the intermediate product and to hydrolyze Z to hydroxy and, still under anhydrous or substantially anhydrous conditions, converting hydroxy formed by hydrolysis of Z into OMe, wherein Me is as defined above by reaction with an organic acid salt having a salt-forming cation Me or in the case wherein the organic solvent used in insoluble or substantially insoluble in water, with an excess of water, washing the mixture with water at a pH-value of 0 to 3 extracting the organic layer formed with water at a pH-value of 5 to 8 by adding a hydroxide or a salt having a salt-forming cation Me to convert hydroxy formed by hydrolysis of Z into OMe and Ez into Me wherein Me is as defined above.

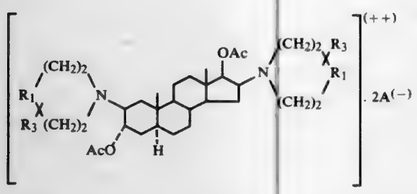
4,177,190

DIAMINO-ANDROSTANES AND A PROCESS FOR THE PREPARATION OF THE SAID COMPOUNDS

Zoltán Tuba; Maria Marsai; Katalin Biro; László Szporny; Egon Karpati, and Szabolcs Szeberényi, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Continuation of Ser. No. 709,325, Jul. 28, 1976, Pat. No. 4,101,545. This application Mar. 14, 1978, Ser. No. 886,450
Claims priority, application Hungary, Aug. 1, 1975, RI 575
Int. Cl.[2] **C07J** *43/00*
U.S. Cl. 260—239.5 **10 Claims**

1. A process for the preparation of a di-quaternary salt of the formula



(1a)

wherein

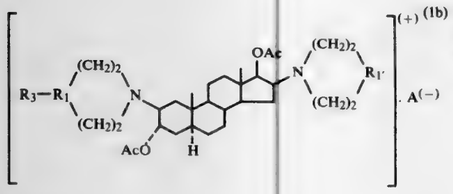
Ac is an alkyl carbonyl group having 1 to 4 carbon atoms in the alkyl moiety, one of

R_1 and R_1' is a methylene group and the other is a group of the formula $>N—R_2$ wherein R_2 is a $C_{1\text{-}3}$ alkyl group,

R_3 is an alkyl group containing 1 to 4 carbon atoms or an allyl group,

A is halogen,

or of a mono-quaternary salt of the formula



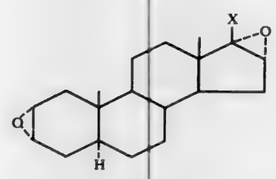
(1b)

wherein

Ac, A and R_3 have the same meaning as defined above,

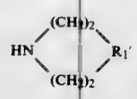
R_1' is a methylene group and

R_1 is a group of the formula $>R—R_2$ wherein R_2 is as defined above, which comprises selectively reacting the 16,17 epoxy group of a compound of the formula



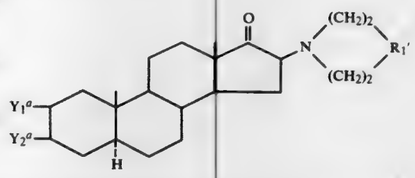
(V)

wherein X is halogen—with a compound of the formula



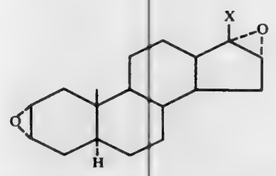
(VI')

in the presence of a hydrogen halide wherein R_1' is a methylene group or a $>N—R_2$ group to form a compound of the formula



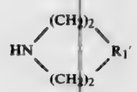
(IVa)

wherein Y_1^a is halogen and Y_2^a is hydroxy; or selectively reacting the 16,17-epoxy group of a compound of the formula



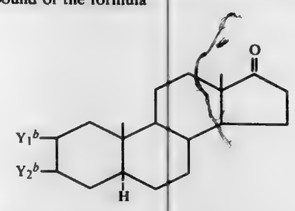
(V)

wherein X is halogen with a compound of the formula



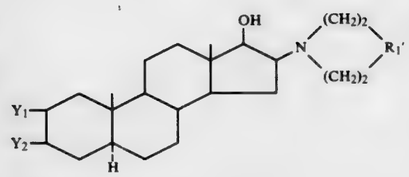
(VI')

wherein R_1' is a methylene group or a $N—R_2$ group, to form a compound of the formula



(IVb)

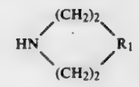
wherein Y_1^b and Y_2^b form together an epoxy group, and reducing the compound IVa or IVb to form a compound of the formula:



(III)

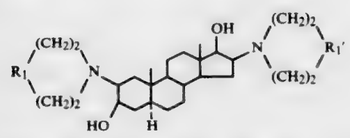
wherein Y_1 is halogen, Y_2 is hydroxyl or Y_1 and Y_2 form together an epoxy group;

reacting the compound formed above with a compound of the formula:



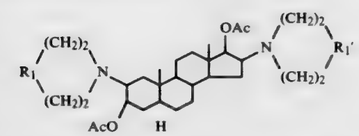
(VI)

to yield a compound of the formula



(II)

acylating the compound formed above with a C_1 to C_5 aliphatic carboxylic acid, C_1 to C_5 aliphatic carboxylic acid anhydride or C_1 to C_5 aliphatic carboxylic acid halogenide to yield a compound of the formula



(I)

and converting the compound above into a quaternary salt thereof of the formula 1a or 1b.

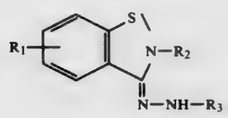
4,177,191

2-ALKYL-3-(SUBSTITUTED HYDRAZINO)BENZISOTHIAZOLINES

Peter C. Wade, Pennington, N.J.; B. Richard Vogt, Yardley, Pa., and Thomas P. Kissick, Princeton, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

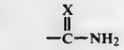
Filed Jul. 20, 1978, Ser. No. 926,467
Int. Cl.[2] **A61K** *31/425;* **C07D** *275/04*
U.S. Cl. 548—212 **15 Claims**

1. A compound having the formula



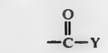
or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, alkyl, alkoxy, halogen or nitro; R_2 is alkyl; and R_3 is

(i)



wherein X is oxygen, sulfur or imino, or

(ii)



wherein Y is alkoxy, alkyl, or arylalkyl; wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 6 carbon atoms and the term "aryl" refers to phenyl or phenyl substituted with a halogen, alkyl, alkoxy, hydroxy or nitro group.

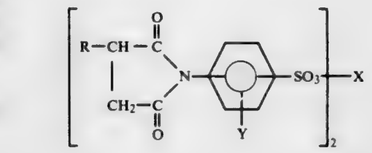
4,177,192

SUCCINIMIDES OF AMINO AROMATIC SULFONIC ACID SALTS

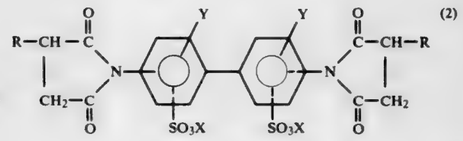
El-Ahmadi I. Heiba, Princeton; Robert E. Kinney, Lawrenceville, and George E. Stead, South Plainfield, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 634,812, Nov. 24, 1975, Pat. No. 4,053,425, which is a division of Ser. No. 391,178, Aug. 24, 1973, abandoned. This application Apr. 22, 1977, Ser. No. 790,096
Int. Cl.[2] **C07D** *403/12, 207/40*
U.S. Cl. 260—326.22 **7 Claims**

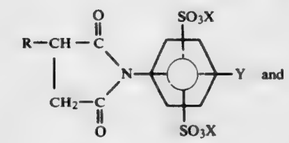
1. A compound of one of the formulae:



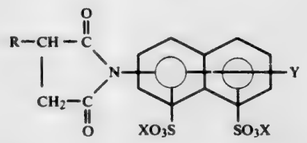
(1)



(2)



(3) and



(4)

wherein X is selected from the group consisting of (1) HNR'_3, wherein R' is hydrogen, an alkyl group, an aminoalkyl group or a poly(aminoalkyl) group, said alkyl having from 1 to 20 carbon atoms, and (2) metal, Y is selected from the group consisting of hydrogen, halo, hydroxy and an alkyl group of from 1 to 20 carbon atoms and R is an alkenyl of from 5 to 1000 carbon atoms.

4,177,193

THIENOTHIAZINE DERIVATIVES

Otto Hromatka; Dieter Binder, both of Vienna, Austria; Rudolf Pfister, Basel, and Paul Zeller, Allschwil, both of Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

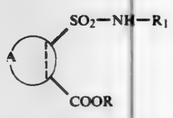
Division of Ser. No. 852,385, Nov. 17, 1978, Pat. No. 4,134,898, which is a division of Ser. No. 606,563, Aug. 21, 1975, Pat. No. 4,076,709. This application Oct. 30, 1978, Ser. No. 955,567

Claims priority, application Switzerland, Aug. 26, 1974, 11582/74; Sep. 9, 1974, 12157/74; Sep. 9, 1975, 8963/75

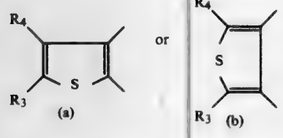
Int. Cl.[2] C07C *333/18, 333/24*

U.S. Cl. 549—64 **1 Claim**

1. A compound of the formula



wherein A together with the two carbon atoms to which it is attached forms the group



and the broken line represents the double bond present in group (a); R_1 and R represent a lower alkyl group; and R_3 and R_4 each represent a hydrogen atom or a lower alkyl group.

4,177,194

TOTAL SYNTHESIS OF THE UTERO-EVACUANT SUBSTANCE D,L-ZOAPATANOL

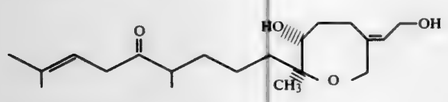
Robert H. K. Chen, Belle Mead, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Jun. 29, 1978, Ser. No. 920,432

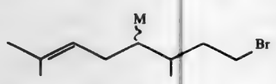
Int. Cl.[2] C07D *313/04*

U.S. Cl. 260—333 **8 Claims**

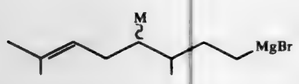
1. The process for the preparation of a compound of the formula



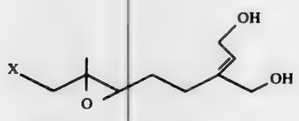
which comprises reacting a compound of the formula



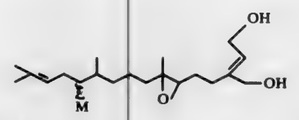
with magnesium to provide a Grignard reagent of the formula



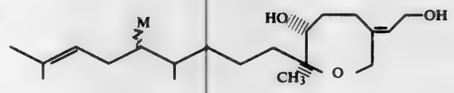
reacting the Grignard reagent with a compound of the formula



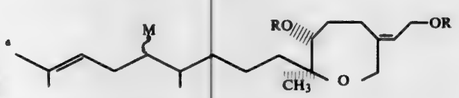
to produce a compound of the formula



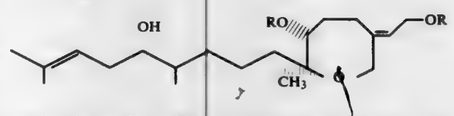
and reacting the product with a Lewis acid or a protic acid to produce a compound of the formula



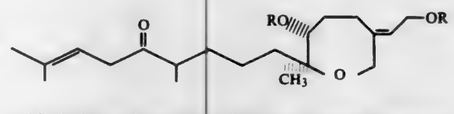
reacting the product with an acylating agent to produce a compound of the formula



reacting the acylated product with an acid to produce a compound of the formula



reacting the product with an oxidizing agent to form a compound of the formula



and hydrolyzing the product with a base, wherein R is an acyl group having 2–5 carbon atoms, M is an tetrahydropyran-2-yloxy or 1-ethoxyethoxy group, and X is bromo, chloro, iodo, tosyl, mesyl and brosyl.

4,177,195

ORGANIC PIGMENTS DERIVED FROM BENZOCOUMARIN

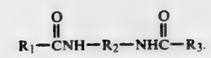
Richard C. Bingham, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 20, 1978, Ser. No. 898,443

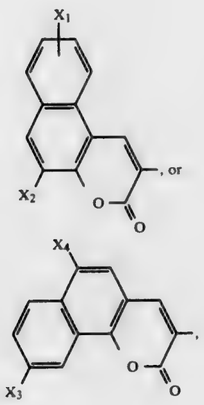
Int. Cl.[2] C07D *311/92, 405/14*

U.S. Cl. 260—343.21 **9 Claims**

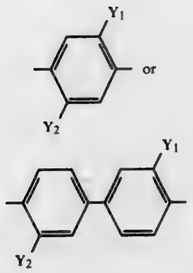
1. A compound of the formula



where R_1 and R_3 are



and R_2 is



wherein

X_1 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, chlorine or bromine;

X_2 is hydrogen or CONHAr, wherein Ar is phenyl and phenyl substituted with alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 4 carbon atoms, chlorine, bromine, carbonamido, sulphonamido, or phthalimido;

X_3 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, chlorine or bromine;

X_4 is hydrogen, alkyl of 1 to 4 carbon atoms, chlorine or bromine; and

Y_1 and Y_2 are each hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, chlorine or bromine.

4,177,196

EPOXIDATION

Anthony M. Hildon, Tattenhall, and Peter F. Greenhalgh, Widnes, both of England, assignors to Interox Chemicals Limited, London, England

Continuation-in-part of Ser. No. 649,747, Jan. 16, 1976, Pat. No. 4,071,541. This application Jun. 15, 1977, Ser. No. 806,944

The portion of the term of this patent subsequent to Jan. 31, 1995, has been disclaimed.

Int. Cl.[2] C07D *301/14*; C07C *179/10, 179/12*

U.S. Cl. 260—348.25 **8 Claims**

1. A continuous process for the production of a peracid in a chlorinated hydrocarbon solvent comprising the steps of:

(a) providing an aqueous phase comprising sulphuric acid, hydrogen peroxide and water;

(b) providing an organic phase comprising a chlorinated hydrocarbon solvent and carboxylic acid selected from the group consisting of acetic acid and propionic acid; and

(c) contacting said aqueous and organic phases countercurrently to produce an aqueous solution comprising sulphuric acid and water and an organic product solution comprising chlorinated hydrocarbon solvent and a peracid corresponding to said carboxylic acid.

8. A process for the production of an oxirane comprising:

(a) providing an aqueous phase comprising sulphuric acid, hydrogen peroxide and water;

(b) providing an organic phase comprising a chlorinated hydrocarbon solvent and carboxylic acid selected from the group consisting of acetic acid and propionic acid;

(c) continuously contacting said aqueous and organic phases countercurrently to produce an aqueous solution comprising sulphuric acid and water and an organic product solution comprising chlorinated hydrocarbon solvent and a peracid corresponding to said carboxylic acid; and

(d) reacting at least a portion of the peracid in said organic solution with an alkene to produce an oxirane.

4,177,197

CYCLIZATION SUBSTRATES AND 7α-SUBSTITUTED 19-NORSTEROID DERIVATIVES

Filippus J. Zeelen, Heesch, and Marinus B. Groen, Schayk, both of Netherlands, assignors to Akzona Inc., Asheville, N.C.

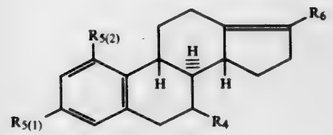
Filed Feb. 22, 1978, Ser. No. 880,151

Claims priority, application Netherlands, Feb. 24, 1977, 7701972

Int. Cl.[2] C07J *3/00*

U.S. Cl. 260—397.5 **4 Claims**

1. A compound of the formula



wherein:

(a) R_4 is a hydrocarbyl of one to two carbons substituted by halogen or alkoxy of one to two carbons, or alkoxy of one to four carbons;

(b) $R_{5(1)}$ and $R_{5(2)}$ are each H, alkyl, hydroxy, esterified hydroxy group of one to about ten carbons or etherified hydroxy group of one to about ten carbon atoms; and

(c) R_6 is an alkyl of one to about four carbon atoms.

4,177,198

PROCESS FOR PREPARING ALKALINE EARTH METAL MERCAPTIDES

Joseph M. Bohen, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 3, 1978, Ser. No. 866,738
Int. Cl.[2] C08H *3/00*; C07C *69/00, 149/00*
U.S. Cl. 260—399 **18 Claims**

1. A process for preparing alkaline earth metal mercaptides of the general formula $M(SR)_2$, wherein M is alkaline earth metal selected from group IIa of the periodic table consisting of barium, calcium, magnesium and strontium and R is a hydrocarbon radical having from 1 to 22 carbon atoms and is selcted from the group consisting of alkyl, cycloalkyl, aryl and mixed alkyl-aryl, said hydrocarbon radicals can optionally have a noninterfering substituent selected from the group consisting of halogen,

$$-XH, -XR^2, -X-\overset{Y}{\overset{\|}{C}}R^2 \text{ and } -\overset{Y}{\overset{\|}{C}}-XR^2$$

where R^2 is a hydrocarbon radical having from 1-20 carbon atoms and is selected from the group consisting of alkyl, alkenyl, cycloalkyl, aryl and mixed alkyl-aryl with the proviso that R^2 may be further substituted with inert substituents and X and Y are independently selected from the group consisting of oxygen and sulfur, comprising:

(1) forming a mixture in a reactor of:
  (a) a metal oxide of the general formula MO or a metal hydroxide of the formula $M(OH)_2.xH_2O$, wherein x is a number from 0 to 16; and
  (b) an alcohol of the general formula R'OH wherein R' is a hydrocarbon radical of 1-22 carbon atoms selected from the group consisting of alkyl, cycloalkyl, aryl, and mixed alkyl-aryl, with the proviso that said hydrocarbon radical may be optionally substituted with noninterfering inert substituents;
(2) subjecting the mixture of (1) to reaction conditions for sufficient time to form a metal alkoxide $M(OR')_2$ and water;
(3) separating the water from the mixture of (2) to provide the metal alkoxide $M(OR')_2$;
(4) forming a reaction mixture of the metal alkoxide $M(OR')_2$ of (3) and a mercaptan of the general formula HSR;
(5) subjecting the mixture of (4) to reaction conditions for sufficient time to provide the metal mercaptide $M(SR)_2$; and then
(6) separating the metal mercaptide $M(SR)_2$ from the remainder of the mixture of (5).

4,177,199

SILVER SALTS OF PHOSPHANILIC ACID

Edmund S. Granatek, Syracuse; Frank D. Ruva, Auburn, and Frederick L. Grab, Fayetteville, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Dec. 11, 1978, Ser. No. 968,315
Int. Cl.[2] C07F *1/10*
U.S. Cl. 260—430 **12 Claims**

1. A silver salt of phosphanilic acid.

4. The process for preparing a silver salt of phosphanilic acid which comprises mixing an aqueous suspension of phosphanilic acid with an aqueous solution containing approximately either one or two moles of silver nitrate per mole of phosphanilic acid to form a mixture which is then mixed with a water-miscible organic solvent to precipitate the desired product.

4,177,200

SILYL PHOSPHATES AS NEUTRALIZING AGENTS FOR ALKALI METAL HYDROXIDES

John S. Razzano, Watervliet; Louis P. Petersen, Latham, and Bruce A. Ashby, Schenectady, all of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Nov. 25, 1977, Ser. No. 854,562
Int. Cl.[2] C07F *7/08*
U.S. Cl. 260—448.2 N **24 Claims**

1. A silyl phosphate which is an improved neutralizing agent for alkali metal hydroxides in silicone reactions comprising the reaction product of a siloxane selected from the class consisting of siloxanes of the formula,

$$\left[R-\overset{R}{\overset{|}{Si}}-R\right]_2O$$

and siloxane of the formula,

$$R_3Si\left[O\overset{R}{\overset{|}{Si}}\right]_xOSiR_3$$

with a halophosphorous compound selected from the class consisting of $POCl_3$ and $POBr_3$ where R is a hydrocarbyl radical free of aliphatic unsaturation and x varies from 1 to 20.

4,177,201

PREPARATION OF SILICON-FUNCTIONAL POLYORGANOSILOXANES

Armand de Montigny, Leverkusen, and Hans-Heinrich Moretto, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 29, 1978, Ser. No. 974,412
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1978, 2802668
Int. Cl.[2] C07F *7/08*
U.S. Cl. 260—448.2 E **4 Claims**

1. A process for the preparation of an equilibrated acyloxy-containing organopolysiloxane comprising reacting at a temperature of up to about 135° C. a chlorosilane of the formula

$$R_aR'_bSiCl_{(4-a-b)}$$

wherein
  a=0, 1, 2 or 3
  b=0, 1, 2 or 3, and
  a+b is at most 3,
or a partial hydrolysis product thereof, with one or more organosiloxanes, which can contain in appropriately alternating arrangement the units

$$[R_2R''-SiO_4]\ [RR''-SiO]\ [R''-SiO_{3/2}]\ [SiO_2]$$

wherein
  R and R' each independently is hydrogen or an aliphatic, aromatic saturated or unsaturated optionally halogen or cyano-substituted monovalent hydrocarbon radical with up to 18 C atoms, and
  R'' is hydrogen, chlorine, hydroxyl, or an optionally halogen or cyano-substituted monovalent hydrocarbon radical with up to 18 C atoms,
in the presence of a proton acid siloxane-equilibration catalyst, and at least about 1.1 times the molar amount of a monobasic carboxylic acid based on the silicon-bonded chlorine atom, the number of all the Si—Cl groups in the reactants exceeding the number of all the Si—OH groups.

4,177,202

METHANATION OF SYNTHESIS GAS

Clarence D. Chang, Princeton, and William H. Lang, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 775,133, Mar. 7, 1977, abandoned. This application Jun. 26, 1978, Ser. No. 918,878
Int. Cl.[2] C07C *1/04*
U.S. Cl. 260—449 R **1 Claim**

1. In a process for converting synthesis gas comprising carbon monoxide and hydrogen to gases rich in methane and increased ethane which comprises,
  contacting synthesis gas at a temperature in the range of 700° to 1500° F. and pressure in the range of 20 to 100 atmospheres in the presence of a sulfur reactant material with a catalyst comprising vanadium and molybdenum on an alumina support material and
  recovering a high BTU product gas rich in methane and ethane.

4,177,203

PROCESS FOR THE PRODUCTION OF HYDROCARBONS AND OXYGEN-CONTAINING COMPOUNDS AND CATALYSTS THEREFOR

Herbert Kölbel, and Klaus D. Tillmetz, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Continuation of Ser. No. 657,470, Feb. 12, 1976, abandoned. This application Oct. 6, 1977, Ser. No. 840,059
Int. Cl.[2] C07C *1/04, 27/06*
U.S. Cl. 260—449.6 R **6 Claims**

1. A process for the synthesis of gaseous hydrocarbons and oxygenated derivatives thereof, in which the product distribution spectrum is shifted in the direction of chain lengths of C_2 to C_4, said process including the steps of pretreating a catalyst with an activating gas selected from the group consisting of (1) carbon monoxide and hydrogen in admixture and (2) carbon monoxide and hydrogen in succession, at an activating temperature of about 10° C. to about 60° C. in excess of the synthesis start-up temperature, the pretreatment with activating gas (1) being performed by contacting the activating gas with the catalyst until the carbon dioxide content of the residual gas asymptotically tends toward a limit value, the pretreatment with activating gas (2) being performed by contacting the carbon monoxide with the catalyst until the carbon dioxide content of the residual gas asymptotically tends toward a limit value and by contacting hydrogen with the catalyst for 10 to 24 hours, said catalyst comprising a composition selected from the group consisting of (a) an oxide or hydroxide of manganese and (b) oxides or hydroxides of manganese and iron, the composition containing manganese in amount of at least about 70% and iron in amount of less than about 30% of manganese plus iron, by weight, and thereafter lowering the temperature of the activated catalyst to the synthesis start-up temperature, and contacting the activated catalyst with a synthesis gas containing carbon monoxide and hydrogen at synthesis temperatures from about 220° C. to about 375° C. and at pressures from about 1 bar to about 60 bars.

4,177,204

PEROXY COMPOUNDS

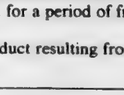
Orville L. Mageli, Kenmore, N.Y., and William A. Swarts, Dover, N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 596,778, Jul. 17, 1975, Pat. No. 4,129,700. This application Aug. 28, 1978, Ser. No. 937,658
Int. Cl.[2] C07C *69/02*
U.S. Cl. 260—453 RZ **2 Claims**

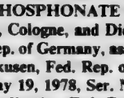
1. A peroxy compound of the formula:

$$R_1-CH(Z)-D-\overset{R_3}{\overset{|}{C}}(O-O-R_4)-R_2$$

where:
(a) R_1 is hydrogen or an alkyl of 1–4 carbons;
(b) R_2 and R_3 are an alkyl of 1–4 carbons;
(c) R_4 is



(d) Z is



(e) R_6 and R_8 are independently H, an alkyl of 1–8 carbons, cycloalkyl of 5 or 6 carbons, phenyl or alkylphenyl of 7–10 carbons; and
(f) D is ethynyl diradical, diethynyl diradical or alkyl diradical having 1–8 carbons.

4,177,205

PROCESS FOR THE PREPARATION OF HIGHLY STABLE LIQUID CARBODIIMIDE-CONTAINING POLYISOCYANATE COMPOSITIONS

Robert L. Schaaf, Wyandotte; Peter T. Kan, Plymouth, and Moses Cenker, Trenton, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 20, 1978, Ser. No. 962,232
Int. Cl.[2] C07C *119/055*
U.S. Cl. 260—453 AM **7 Claims**

1. A process for the preparation of highly stable liquid carbodiimide-containing 4,4'-diphenylmethane diisocyanate having an isocyanate content of from 20 to 32 percent by weight comprising
  (a) heating 4,4'-diphenylmethane diisocyanate or mixtures containing same at a temperature of from 60° C. to 120° C. for a period of from one hour to ten hours in the presence of tris(chloromethyl)phosphine oxide,
  (b) stopping the carbodiimide formation by adding to the reaction mixture a quenchant selected from the group consisting of magnesium chloride hydrate, stannous chloride and trichlorosilane,
  (c) maintaining the reaction mixture at a temperature of from 60° C. to 120° C. for a period of from 0 hour to six hours and
  (d) cooling the product resulting from (c) to room temperature.

4,177,206

POLYISOCYANATES CONTAINING SULPHONIC ACID AND PHOSPHONATE GROUPS

Hans-Joachim Scholl, Cologne, and Dieter Dieterich, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 19, 1978, Ser. No. 907,515
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725208
Int. Cl.[2] C07C *119/048, 143/24, 143/68*; C07F *9/09*
U.S. Cl. 260—456 P **7 Claims**

1. Polyisocyanate mixtures which are liquid at room temperature and which

(a) contain from 10–42%, by weight of aromatically bound isocyanate groups optionally partly present in the form of carbamic acid chloride,
(b) contain from 0.5–5% by weight of sulphur in the form of sulphonic acid groups which may be partly neutralized or esterified,
(c) contain from 0.5–5% by weight of phosphorus in the form of phosphonic acid alkyl ester groups or phosphonic acid aralkyl ester groups and
(d) have a viscosity of from 10–50,000 cP at 25° C., and which are prepared by reacting aromatic polyisocyanate mixtures with chlorosulphonic acid at −10° C. in the presence of a trialkyl phosphite or tris-(aralkyl)-phosphite which may be substituted with halogen.

4,177,207

PETROLEUM SULFONATES

Marvin L. Nussbaum, Skokie, and Edward A. Knaggs, Deerfield, both of Ill., assignors to Stepan Chemical Company, Northfield, Ill.

Continuation-in-part of Ser. No. 676,470, Apr. 13, 1976, Pat. No. 4,148,821, which is a continuation-in-part of Ser. No. 515,013, Oct. 16, 1974, abandoned, which is a continuation-in-part of Ser. No. 432,439, Jan. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 9,065, Feb. 5, 1970, abandoned. This application Mar. 3, 1978, Ser. No. 883,128
The portion of the term of this patent subsequent to Apr. 10, 1996, has been disclaimed.
Int. Cl.[2] **C07C** *139/00;* **C09K** *3/00*
U.S. Cl. 260—504 R **50 Claims**

1. A method for preparing petroleum sulfonates comprising the sequential steps of
(I) intimately contacting from about 5 to 40 parts by weight of sulfur trioxide with 100 parts by weight of a flowable liquid mixture, which comprises on a 100 weight percent total mixture basis:
(A) from about 85 to 99.5 weight percent of a petroleum oil feed stock, and
(B) from about 0.5 to 15 weight percent of an additive, said petroleum oil feed stock being characterized by
(a_1) having an API gravity ranging from about 5° to 60° at 60° F.,
(a_2) having a boiling point (corrected atmospheric) ranging from about −20° to 1400° F., and
(a_3) containing from about 10 to 95 weight percent (100 weight percent total stock basis) of sulfonatable components,
said additive being characterized by
(b_1) being comprised of unsulfonatable organic radical portions possessing an average molecular weight range from about 55 to 6000,
(b_2) having a boiling point in the range from about 212° to 932° F. corrected atmospheric, and
(b_3) a preponderance of such radicals each having attached at least one proton replaceable by a sulfo group and at least one moiety selected from the group consisting of an aromatic nucleus, an olefinic carbon pair, and an oxygen atom directly bonded to a carbon atom by at least one bond,
said contacting being conducted at a temperature of from about 77° to 392° F., said contacting being continued for a time at least sufficient to sulfonate at least about 10 weight percent of the total sulfonatable components present in said petroleum oil feed stock so as to attain a crude acidic sulfonation reaction mixture; and
(II) intimately contacting said crude acidic reaction mixture with about 0.5% to about 20% by weight, on a 100 weight percent total reaction mixture basis, of water and maintaining the so-attained mixture at a temperature of about 50° to about 150° C. for a period of time ranging from about one minute to about 60 minutes.

4,177,208

PROCESS FOR PREPARING SULPHONIC ACIDS AND SULPHONATES

Aristide Boy; Henri Galy, both of Pau; Raoul Ivaldi, Orthez, and Hubert Passedroit, Gan, all of France, assignors to ATO Chemie, Paris, France

Continuation-in-part of Ser. No. 732,120, Oct. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 645,092, Dec. 29, 1975, abandoned, which is a continuation of Ser. No. 507,246, Sep. 18, 1974, abandoned, which is a continuation of Ser. No. 169,145, Aug. 4, 1971, abandoned. This application Apr. 12, 1978, Ser. No. 895,795
Claims priority, application France, Aug. 7, 1970, 70.29211; Jul. 22, 1971, 71.26794
Int. Cl.[2] **C07B** *13/00;* **C07C** *143/02*
U.S. Cl. 260—504 S **10 Claims**

1. A process for separating the sulphonic acids in an untreated paraffin sulphonic solution containing in addition to said paraffin sulphonic acids, sulphuric acid, water, and non-sulphonated paraffins, which comprises:
(a) admixing with the paraffin sulphonic acid solution, at least one slightly polar alcohol selected from the group consisting of aliphatic and cycloaliphatic alcohols containing at least 5 carbon atoms, having a solubility in water less than 7% by weight which forms an azeotrope with water, thereby forming a mixture having an organic phase containing paraffin sulphonic acids dissolved therein and an aqueous phase containing the sulphuric acid;
(b) separating said organic phase from said aqueous phase;
(c) neutralizing said separated organic phase by admixture with a composition selected from the group consisting of alkali metal hydroxides, alkali metal carbonates, alkaline earth metal oxides, alkaline earth metal hydroxides, and alkaline earth metal carbonates thereby converting the sulphonic acids present in said organic phase into sulphonates, and forming a neutralized organic phase wherein the ratio of the amount of water to the amount of slightly polar alcohol in said neutralized phase is at most equal to the corresponding ratio for the azeotrope which forms between water and the slightly polar alcohol; and
(d) removing the volatile components from the neutralized organic phase to recover the sulphonates under temperature and pressure conditions whereby said sulphonates are in a molten state.

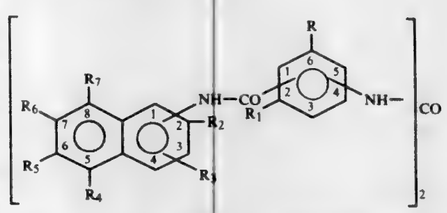
4,177,209

UREYLENEBIS(ANIONIC SUBSTITUTED PHENYLENE CARBONYL)IMINO NAPHTHALENE SULFONIC ACIDS AND NAPHTHALENE CARBOXYLIC ACIDS AND THEIR SALTS

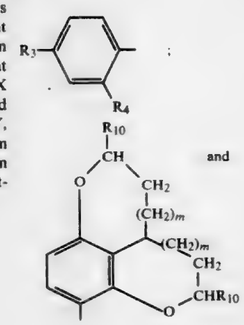
Ransom B. Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 778,398, Mar. 17, 1977, Pat. No. 4,129,590. This application Oct. 4, 1978, Ser. No. 948,604
Int. Cl.[2] **C07C** *143/30, 143/83*
U.S. Cl. 260—506 **8 Claims**

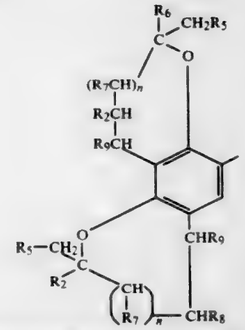
1. A compound of the formula:



wherein R is COOY, wherein Y is selected from the group consisting of hydrogen, alkali metal and C_1–C_6 alkyl; R_1 is hydrogen; R_4, R_5 and R_6 are selected from the group consisting of hydrogen and SO_3X, wherein X is alkali metal; R_2 is hydrogen; with the proviso that there is no R_1 or R_2 substituent when the bridgehead carbonylimino is attached at the carbon 2-position of the respective ring; with the further proviso that each naphthalene moiety must contain two or three SO_3X substituents, wherein X is as previously defined; R_3 is selected from the group consisting of hydrogen, SO_3X and COOY, wherein X and Y are as previously defined; R_7 is selected from the group consisting of hydrogen, hydroxy and SO_3X, wherein X is as previously defined; and other pharmaceutically acceptable salts thereof.



and



wherein R_3 and R_4 each represent lower alkoxy; R_5, R_6, R_7, R_8, R_9 and R_{10} are each independently selected from the group consisting of hydrogen and lower-alkyl; and n and m are integers from 0 to 1; with
(b) at least 2 moles, per mole of said bis-(phenyl)alkane, of an aniline acid addition salt at a temperature in the range of 100° to 250° C.

4,177,210

HYDRATION OF ACRYLONITRILE TO ACRYLAMIDE

William N. Vanderkooi, and Gary L. Jewett, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 5, 1978, Ser. No. 922,133
Int. Cl.[2] **C07C** *102/08*
U.S. Cl. 260—561 N **16 Claims**

1. In a process for hydration of acrylonitrile to acrylamide comprising contacting acrylonitrile with water at a temperature between about 50° C. and about 175° C. in the presence of a heterogeneous nitrile hydration catalyst, the improvement wherein the acrylonitrile and water are substantially free of oxazole.

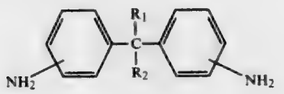
4,177,211

PROCESS FOR THE PREPARATION OF BIS(AMINOPHENYL)ALKANES

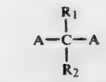
Kwok K. Sun, Hamden, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 21, 1978, Ser. No. 898,646
Int. Cl.[2] **C07C** *85/02*
U.S. Cl. 260—570 D **15 Claims**

1. A process for the preparation of a bis(aminophenyl)alkane having the formula



wherein R_1 and R_2, taken individually, represent methyl and lower-alkyl, respectively, and R_1 and R_2 taken together with the C atom to which they are attached represent the residue of a 1,1-cycloalkylidene group having from 5 to 7 ring carbon atoms, inclusive; which process comprises reacting
(a) the appropriately substituted bis(phenyl)alkane having the formula:



wherein R_1 and R_2 have the significance defined above and A is a member selected from the class consisting of

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4,177,212

PROCESS FOR PREPARING BIS(N,N-DIALKYLAMINO)ALKYL ETHERS EMPLOYING SULFUR OXYCHLORO-CONTAINING COMPOUNDS

Fedor Poppelsdorf, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 1, 1978, Ser. No. 901,812
Int. Cl.[2] **C07C** *85/24, 93/10*
U.S. Cl. 260—584 R **17 Claims**

1. A process for producing bis-(N,N-dialkylamino)-alkyl ether having the formula $(R_2NR')_2O$, wherein R is a methyl or ethyl group and R′ is a bivalent alkylene group having from 2 to 3 carbon atoms, which comprises:
(a) reacting sodio N,N-dialkylaminoalkoxide of the formula $R_2NR'ONa$, wherein R and R′ are defined above, with a sulfur oxychloro-containing compound selected from the group consisting of sIfuryl chloride, thionyl chloride and chlorosulfonic acid in an amount of from about 0.10 to about 0.50 moles of said sulfur oxychloro-containing compound per mole of sodio N,N-dialkylaminoalkoxide at a temperature of from about 15° C. to about 115° C. in the presence of:
(I) an organic diluent/dispersant in an amount ranging from 0 to about 60 weight percent based on the amount of sodio N,N-dialkylaminoalkoxide and N,N-dialkylaminoalkanol employed, and
(II) an N,N-dialkylaminoalkanol of the formula $R_2NR'OH$, wherein R and R′ are defined above, that is

present in an amount such that the molar ratio of sodio N,N-dialkylaminoalkoxide to N,N-dialkylaminoalkanol ranges from about 1:1 to about 1:5,

to produce an intermediate reaction product mixture,

(b) heating the intermediate reaction product mixture from step (a) to an elevated temperature and maintaining said elevated temperature for a time period sufficient to produce bis(N,N-dialkylamino)alkyl ether, and

(c) recovering the bis-(N,N-dialkylamino)alkyl ether.

4,177,213
PROCESS FOR BENZYLATING KETONES

Andreas Schmidt, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

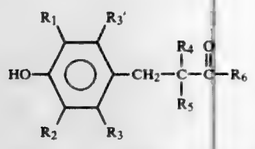
Continuation of Ser. No. 682,000, Apr. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 517,356, Oct. 23, 1974, abandoned. This application Sep. 16, 1977, Ser. No. 833,941

Claims priority, application Switzerland, Nov. 1, 1973, 15404/73

Int. Cl.[2] **C07C** *45/00*

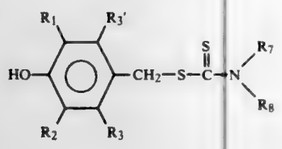
U.S. Cl. 260—590 R **5 Claims**

1. A process for the manufacture of compounds of the formula I



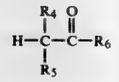
(I)

in which R_1 denotes a straight-chain or branched alkyl group, a cycloalkyl group or an aralkyl group, R_2 denotes hydrogen, a straight-chain or branched alkyl group, a cycloalkyl group or an aralkyl group, R_3 and R'_3 independently of one another denote hydrogen or a lower alkyl group, or R_1 conjointly with R'_3, or R_2 conjointly with R_3, denote tetramethylene, R_4 and R_5 independently of one another denote hydrogen, phenyl or alkyl or conjointly denote alkylene, R_6 denotes alkyl, phenyl or alkylphenyl, or, conjointly with R_4 and R_5, denotes alkanetriyl, characterised in that 1 mol of a compound of the formula II



(II)

wherein R_1, R_2, R_3 and R'_3 have the meaning indicated above and R_7 and R_8 independently of one another denote a straight-chain or branched alkyl group, or conjointly, with the inclusion of the nitrogen atom, denote a saturated, heterocyclic ring, is reacted in the presence of a base selected from an alkali metal hydroxide or alcoholate at a temperature of −20° C. to +150° C. with one mol of a compound of the formula III



(III)

wherein R_4, R_5 and R_6 have the meaning indicated above.

4,177,214
PROCEDURE FOR THE PREPARATION OF SATURATED AND UNSATURATED DIALDEHYDES

Francesco Siclari, Barlassina; Pietro P. Rossi, Garlasco; Cesare Guaita, Tradate, and Vito L'Acqua, Milan, all of Italy, assignors to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed Dec. 28, 1977, Ser. No. 865,248

Claims priority, application Italy, Dec. 29, 1976, 30939 A/76

Int. Cl.[2] **C07C** *45/22*

U.S. Cl. 260—601 R **16 Claims**

1. A method for the preparation of unsaturated α,ω-dialdehydes of the formula:



where R represents an olefin chain having one or more unsaturations, comprising selectively hydrogenating the monoozonide of the polyunsaturated cycloolefin represented by the formula:



in a polar solvent solution at a temperature from the freezing point of said solvent to 100° C. with excess hydrogen gas at a pressure from ambient to 50 atmospheres in the presence of a catalyst system comprising:

(A) 0.1 to 1 percent by weight based on said monoozonide of a noble metal selected from the group consisting of palladium and platinum and carried on a carrier selected from the group consisting of alumina, coal, and barium sulphate, and

(B) 0.5 to 10 times the weight of said noble metal of at least one compound of a heavy metal selected from the group consisting of lead, bismuth, cadmium, and antimony, until no more hydrogen is taken up, whereby only the peroxide function of said monoozonide of a poly-unsaturated cycloolefin is hydrogenated, thereby leaving the double bonds unaffected.

4,177,215
RECOVERY OF TRIARYLBORANES

William C. Seidel, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 17, 1978, Ser. No. 925,550

Int. Cl.[2] **C07F** *5/02*

U.S. Cl. 260—606.5 B **7 Claims**

1. A process for separating triarylboranes from other aryl substituted boranes wherein the boranes are present in a basic solution and wherein the weight ratio of the trisubstituted boranes to the other substituted boranes in the solution is sufficiently low so that coprecipitation of the boranes can occur which process comprises neutralizing said solution to a pH not less than the pH defined by the equation

$$pH = pKn + \log (X)$$

wherein pKn is negative log of the product of the dissociation constant and the solubility constant, and X is the molar concentration of the substituted boranes other than the triaryl substituted borane while maintaining the ionic strength of the solution at at least about 1 molar upon completion of the neutralization.

4,177,216
NOVEL TRIBUTYL (2,5-DIHYDROXYPHENYL)PHOSPHONIUM HYDROXIDE INNER SALTS

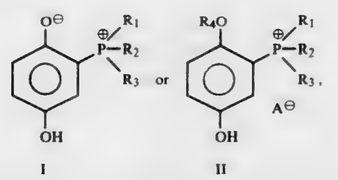
George A. Doorakian, Waltham, and Lawrence G. Duquette, Maynard, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 674,019, Apr. 5, 1976, Pat. No. 4,132,706, which is a continuation of Ser. No. 481,599, Jun. 21, 1974, abandoned. This application Sep. 26, 1978, Ser. No. 945,945

Int. Cl.[2] **C07F** *9/54*

U.S. Cl. 260—606.5 F **5 Claims**

1. A tri-n-butyl(2,5-dihydroxyphenyl)phosphonium hydroxide inner salt or a hydrolyzed derivative thereof corresponding to the formula



I II

wherein R_1–R_3 are each n-butyl, R_4 is hydrogen, benzyl or lower alkyl,, and $A^{\ominus}$ is a compatible neutralizing anion.

4,177,217
CONTINUOUS PROCESS FOR CONVERSION OF DIMETHYLDICYCLOPENTADIENE TO ENDO-DIMETHYLDICYCLOPENTADIENE, A MISSILE FUEL

Edward J. Janoski, Havertown; Richard E. Mitchell, Boothwyn, and Abraham Schneider, Overbrook Hills, all of Pa., assignors to Suntech, Inc., Philadelphia, Pa.

Filed Sep. 28, 1977, Ser. No. 837,127

Int. Cl.[2] **C07C** *13/00*

U.S. Cl. 585—253 **5 Claims**

1. Process for the continuous conversion of endodimethyldicyclopentadiene to exo-tetrahydrodimethyldicyclopentadiene comprising:

a. hydrogenating endo dimethyldicyclopentadiene by contacting the diene with nickel on a silica-alumina catalyst wherein the volume of the diene charged to the volume of the catalyst per hour is in the range from about 0.1 to about 2.0 and the moles of hydrogen present per mole of the diene is in the range from about 5 to about 40 and the contacting temperature is in the range of between from about 165° C. to about 204° C. and the pressure is in the range from about 200 psig to about 3000 psig and continuing the contacting until the diene is hydrogenated to tetrahydrodimethyldicyclopentadiene; and

b. isomerizing, in the presence of hydrogen, the tetrahydrodimethyldicyclopentadiene by contacting it with nickel on a silica-alumina catalyst wherein the volume of the tetrahydrodimethyldicyclopentadiene charged to the volume of the catalyst per hour is in the range from about 0.1 to about 3.0 and the contacting temperature is in the range from about 220° C. to about 260° C., and the pressure is in the range from about 10 psig to about 1500 psig and continuing the contacting of the tetrahydrodimethyldicyclopentadiene until exo-tetrahydrodimethyldicyclopentadiene is formed.

4,177,218
DEHYDROGENATION PROCESS UTILIZING MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 803,693, Jun. 6, 1977, Pat. No. 4,101,418, which is a continuation-in-part of Ser. No. 699,748, Jun. 24, 1976, Pat. No. 4,046,711. This application Jun. 5, 1978, Ser. No. 912,708

The portion of the term of this patent subsequent to Jul. 18, 1995, has been disclaimed.

Int. Cl.[2] **C07C** *5/36*

U.S. Cl. 585—379 **17 Claims**

1. A process for the catalytic dehydrogenation of a dehydrogenatable hydrocarbon which comprises passing said hydrocarbon in contact with a germanium-promoted platinum group metal catalyst at a liquid hourly space velocity of from about 1 to about 40, a temperature of from about 375° to about 650° C., a pressure of from about 0.1 to about 10 atmospheres, and a hydrogen/hyrocarbon mole ratio of from about 1:1 to about 20:1, said catalyst having been prepared by impregnating a porous high surface area carrier material with a non-aqueous solution of a platinum group metal compound and a halo-substituted germane selected from the group consisting of chloro-, fluoro-, bromo-, and iodo-substituted germanes containing less than 4 halo substituents in an amount to provide a final catalyst containing from about 0.05 to about 1.0 wt. % platinum group metal and from about 0.05 to about 1.0 wt. % germanium, and drying, calcining and reducing the thus impregnated carrier material.

4,177,219
PROCESS FOR SELECTIVE ETHYL SCISSION OF ETHYLAROMATICS TO METHYLAROMATICS

Allen I. Feinstein, Wheaton, Ill.; Ralph J. Bertolacini, Chesterton, Ind., and Dae K. Kim, Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 24, 1978, Ser. No. 899,314

Int. Cl.[2] **C07C** *3/58*

U.S. Cl. 585—489 **15 Claims**

1. A process for selective ethyl scission of ethyl aromatics to methyl aromatics which process comprises contacting an alkylaromatic feed stream comprising ethyltoluene with hydrogen in the presence of a catalyst composition comprising a metal component selected from the group consisting of a Group VIII metal and a Group VIII metal promoted with zinc, the said group VIII metal selected from the gooup consisting of ruthenium, rhodium, and iridium, upon a high surface area carrier of highly purified alumina with a surface area of at least 100 m^2/g. and containing essentially no silica at a temperature within the range from about 600° F. to about 1000° F., and wherein about 0.01 to about 20 weights of hydrocarbon per weight of catalyst is present.

4,177,220
1-OCTEN-7-YNE PRODUCTION

Kenzie Nozaki, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 6, 1978, Ser. No. 957,780

Int. Cl.[2] **C07C** *3/06, 11/28*

U.S. Cl. 585—505 **9 Claims**

1. The process for preparing 1-octen-7yne which comprises reacting vinyl acetylene and butadiene in the presence of formic acid or a salt of formic acid, optionally a solvent, a catalytic amount of palladium and a tertiary organosphosphorus ligand having the formula:

$$(RO)_aPR_b$$

wherein R is aryl, alkyl, aralkyl or alkaryl with less than about 20 carbon atoms wherein the Rs attached to the phosphorus

are the same or different, O is oxygen, a is an integer from 0 to 3 and b is 3-a.

4,177,221

SUBSTRATE-LESS, THERMOSETTING SYNTHETIC RESIN FOIL

Eckehard Schamberg, Essen-Kupferdreh; Jürgen Fock, Düsseldorf; Otto Klocker, Essen, and Eberhard Esselborn, Gelsenkirchen-Horst, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Fed. Rep. of Germany

Filed Nov. 2, 1977, Ser. No. 847,753

Claims priority, application United Kingdom, Nov. 8, 1976, 46377/76

Int. Cl.[2] C08L 29/14

U.S. Cl. 525—244 **6 Claims**

1. A thermosetting, substrate-free, storage-resistant synthetic resin foil which is hard, scratch- and abrasion-proof in the hardened state, comprising:
(a) about 60 to 95% by weight of an unsaturated hardenable polyester resin,
(b) about 1 to 15% by weight of a cross-linking agent for the polyester resin,
(c) about 5 to 40% by weight of a polyvinyl acetal,
(d) about 1 to 15% by weight of the N-methoxy methylamide of acrylic or methacrylic acid,
(e) and at least one hardening catalyst, and optionally dyestuffs, pigments and/or fillers.

4,177,222

BLOCK COPOLYMER OF POLY(DIOXA-AMIDE) AND POLYAMIDE

Robert M. Thompson, Wilmington, Del., assignor to Suntech, Inc., Philadelphia, Pa.

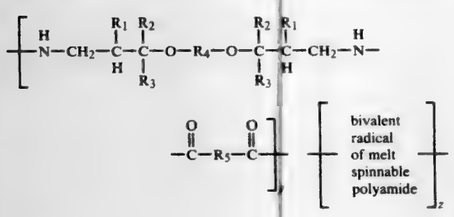
Division of Ser. No. 970,409, Dec. 18, 1978, which is a continuation-in-part of Ser. No. 769,246, Feb. 16, 1977, Pat. No. 4,130,602, which is a continuation-in-part of Ser. No. 557,717, Mar. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 418,524, Nov. 14, 1973, abandoned. This application Jan. 19, 1979, Ser. No. 4,777

The portion of the term of this patent subsequent to Nov. 28, 1995, has been disclaimed.

Int. Cl.[2] C08L 77/00

U.S. Cl. 525—432 **6 Claims**

1. A block copolymer having a molecular weight of about 5000–100,000 and the following repeating structural formula:



wherein
R_1, R_2 and R_3 are selected from the group consisting of H, C_1–C_{10} alkyls and C_3–C_{10} isoalkyls;
R_4 is selected from the group consisting of C_1–C_{10} alkylenes and C_3–C_{10} isoalkylenes;
R_5 is selected from the group consisting of C_0–C_{10} alkylenes and C_3–C_{10} isoalkylenes;
said melt spinnable polyamide is selected from the group consisting of nylon 6, 10; nylon-6; nylon-6,6; nylon-11; MXD-6; PACM-9; PACM-10 and PACM-12; and
y=4–200
z=4–200.

4,177,223

PRESS-CURABLE FLUOROPOLYMER COMPOSITIONS AND PROCESS

Richard J. Arhart, and Arthur Nersasian, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 27, 1977, Ser. No. 864,606

Int. Cl.[2] C08F 8/00, 14/22

U.S. Cl. 525—331 **17 Claims**

1. A vulcanizable highly fluorinated fluoroelastomer composition comprising
(A) a copolymer of vinylidene fluoride with at least one other ethylenically unsaturated fluoromonomer,
(B) an accelerator effective in promoting the crosslinking of copolymer (A) with an aromatic polyhydroxy compound in a weakly basic system,
(C) a substance selected from the group consisting of divalent metal oxides, divalent metal hydroxides, and a mixture of such oxides or hydroxides with metal salts of weak acids, and
(D) a blocked vulcanizing agent for copolymer (A) consisting of an acetal or thioacetal obtained by an acid catalyzed reaction of an appropriate vinyl ether or thioether with a polyhydroxylic compound selected from the group consisting of di-, tri-, and tetrahydroxybenzenes, -naphthalenes, and -anthracenes; and bisphenols; all the above compounds being unsubstituted or substituted with chlorine, bromine, fluorine, carboxyl, or acyl; and 2,4-dihydroxybenzophenone;
the vinyl ether or thioether having the following formula (1):


(1)

wherein
Z is O or S;
R^1 can be hydrogen; each of R^1 and R^2 independently can be a C_1–C_{18} alkyl, phenyl or substituted phenyl, a C_5–C_7 cycloalkyl or substituted cycloalkyl, a C_3–C_8 alkenyl, a C_3–C_8 alkynyl, or a C_5–C_7 cycloalkenyl;
when at least one of R^1 and R^2 is substituted phenyl or substituted cycloalkyl, their substituents being selected from the group consisting of C_1–C_6 alkyl, halogen, and C_1–C_6 alkoxy groups; or R^1 and R^2 can be joined together, the above compound of formula (1) being a ring having 5–7 members, which may be unsubstituted or substituted; if the ring is substituted, the substituents being selected from the same groups as those recited above for R^1 and R^2 other than hydrogen;
provided that when R^1 and R^2 are not joined together, Z can only be O.

4,177,224

ALTITUDE COMPENSATION VALVE

Minoru Yamanaka, and Akira Ii, both of Toyotashi, Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kogyo Kabushiki Kaisha, both of Aichi, Japan

Filed Apr. 24, 1978, Ser. No. 899,698

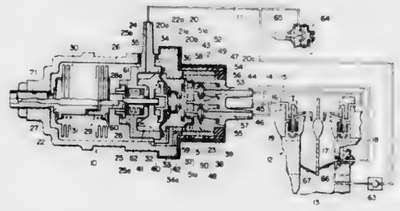
Claims priority, application Japan, Apr. 25, 1977, 52-47526

Int. Cl.[2] F02M 7/24

U.S. Cl. 261—39 A **8 Claims**

1. A device for maintaining the same absolute ratio of air by fuel in the combustible mixture in the intake manifold of the vehicle engine regardless of whether the engine is moved to high altitude, said device comprising:
housing means defining in part first and second chambers connected to each other by a fluid passage and both connected to atmospheric pressure,

a flexible vacuum operated diaphragm extending in the second chamber to separate therefrom a cavity;
biasing means for urging the diaphragm to a first position;
first valve means through which the cavity and the first chamber is in intercommunication;
second valve means engaging the diaphragm and having an opening variable in proportion to a distance of vacuum actuated movement of the diaphragm, said second valve means being connected to the second chamber;
port means connecting to the second valve means for delivering air therefrom;
conduit means connecting the port means to the vehicle engine carburetors adjacent to a fuel injection nozzle;
an expansible bellows means in the first chamber containing an internal pressure approximately absolute vacuum;



means operatively connecting said bellows means to said first valve means so that expansion of the bellows means is in a direction to close the first valve means;
conduit means interconnecting said cavity with the carburetor of the engine downstream of the throttle valve for reducing pressure within the cavity so that responsive movement of the diaphragm with the transmitting member is in a direction to enlarge opening of the second valve means, and
means operatively connecting said bellows means to the diaphragm so that a distance of vacuum actuated movement of the diaphragm from the first position to a second position is in accordance with the expansion of the bellows.

4,177,225

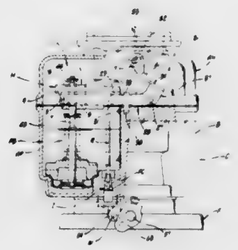
FUEL METERING ROD POSITION CONTROL

Kenneth A. Berkbigler, 1710 Vandover Rd., Fenton, Mo. 63026

Filed Jun. 12, 1978, Ser. No. 914,374

Int. Cl.[2] F02M 7/22

U.S. Cl. 261—50 A **4 Claims**



1. In a carburetor for an internal combustion engine, the carburetor comprising a carburetor body having an induction passage through which air is drawn into the engine, a throttle valve positioned in the passage and movable between an open and a closed position to control the quantity of air drawn into the engine, a fuel circuit through which fuel is drawn from a fuel bowl to the induction passage for mixing with air to form an air-fuel mixture combusted in the engine, a fuel metering rod responsive to movement of the throttle valve for varying the quantity of fuel flowing from the fuel bowl through the fuel circuit, the fuel metering rod being vertically movable relative to the fuel circuit inlet, a staging valve positioned in the induction passage and movable between an open and a closed position, the staging valve comprising a disk mounted on a rotatable shaft and functioning as a choke valve during engine cranking and warm-up and as an air valve during other engine operating conditions, the improvement comprising means responsive to opening and closing movements of the staging valve when it functions as an air valve for positioning the fuel metering rod relative to an inlet to the fuel circuit to control the quantity of fuel flowing through the fuel circuit as demand for air by the engine increases or decreases, the control means operating independently of the throttle valve to control the quantity of fuel flow and including a hangar assembly having a rotatable carrier from which the fuel metering rod is suspended, rotation of the carrier moving the fuel metering rod relative to the inlet, the hangar assembly having a stationary arm and the carrier being hingedly attached to one end of the stationary arm, a cam fixedly mounted on the shaft, and a bell crank pivotally mounted to the other end of the stationary arm, the bell crank being in contact with both the cam on the staging valve shaft and the movable carrier from which the fuel metering rod is suspended whereby movement of the staging valve produces rotation of the bell crank and a consequent rotation of the carrier thereby to change the position of the fuel metering rod relative to the fuel circuit inlet.

4,177,226

DEVICE FOR INJECTION OF A GAS IN A LIQUID

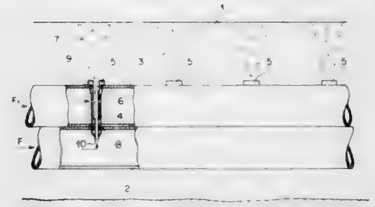
François Danel, St Martin d'Uriage, France, assignor to Alsthom-Atlantique, France

Continuation of Ser. No. 797,036, May 16, 1977, abandoned. This application Aug. 10, 1978, Ser. No. 932,642

Claims priority, application France, May 25, 1976, 76 15785

Int. Cl.[2] C02C 5/04

U.S. Cl. 261—124 **1 Claim**



1. Apparatus for injecting separate small bubbles of gas into a body of liquid to be treated by such gas, comprising a plurality of spaced elongated tubes of small inside diameter, each of said tubes having an outer end portion in communication with the liquid to be treated and provided with a bubble emission opening adjacent to such liquid body, and each of said tubes having an inner end portion provided with a gas admission opening, a tubular member enclosing the outer end portion of each of said tubes and forming therewith a concentric annular chamber having a closed inner end and an open outer end located close to the emission opening of the enclosed tube, port means in each tubular member located intermediate the outer and inner ends of the chamber formed thereby and spaced inwardly from the bubble emission opening of the tube enclosed by said tubular member, means supplying gas under pressure through the admission openings of said tubes to cause the formation of successive, separate bubbles at the bubble emission openings of said tubes, and means supplying liquid under pressure into said annular chambers through the port

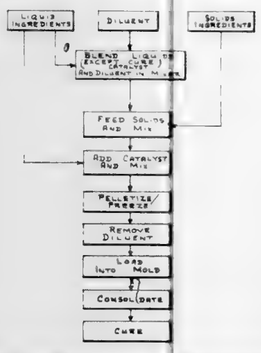
means of each tubular member to provide an annular liquid current along the outer end portion of the tube enclosed thereby and capable of generating an annular thrust on the gas bubbles forming at the emission opening of such tube, thereby causing such bubbles to be detached from such emission opening while small into said body of liquid, said means supplying gas under pressure to said tubes including a first conduit, and said means supplying liquid under pressure to said tubular members including a second conduit, the gas admission openings in said tubes being in communication with the interior of said first conduit, and said tubes and tubular members extending transversely of said second conduit through opposed inner and outer openings provided in said second conduit, the bubble emission openings of said tubes and the open outer ends of said annular chambers being both adjacent to said outer conduit openings, said first and second conduits being superimposed, the outer ends of said tubular members being secured to the edges of said outer openings provided in said second conduit, and the inner end of each of said tubular members being secured to the edge of its associated inner opening in said second conduit and the edge of an adjacent outer opening in said first conduit and coupling said conduits together.

4,177,227

LOW SHEAR MIXING PROCESS FOR THE MANUFACTURE OF SOLID PROPELLANTS

Kenneth L. Harvey, Pleasant Grove, and Howard D. Dixon, Salt Lake City, both of Utah, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 10, 1975, Ser. No. 612,435
Int. Cl.[2] C06B *45/10*
U.S. Cl. 264—3 R **2 Claims**



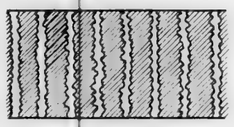
1. A low shear mixing process for preparing high solids, high viscosity solid rocket propellants consisting essentially of the steps of (a) blending the liquid and solid propellant ingredients with an inert diluent liquid selected from the group consisting of methylene chloride, heptane, 2—2 dimethyl butane, 1—1 dichloroethane and n-hexane; (b) freezing the blended mix and granulating the same to form propellant granules; (c) removing the diluent by freeze drying said granules under vacuum conditions; (d) loading said diluent-free granules into a mold under vacuum conditions to effect the consolidation and curing of said granules to produce a high solids loaded solid rocket propellant characterized by having a solids load in excess of 90 percent.

4,177,228

METHOD OF PRODUCTION OF A MICRO-POROUS MEMBRANE FOR FILTRATION PLANTS

Ludwig Prölss, Bellach, Switzerland, assignor to Kilcher-Chemie AG, Recherswil, Switzerland

Filed Jun. 23, 1978, Ser. No. 918,584
Claims priority, application Switzerland, Jul. 15, 1977, 8765/77
Int. Cl.[2] B29D *27/04*
U.S. Cl. 264—24 **15 Claims**



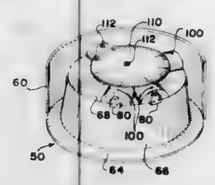
1. A method for production of a micro-porous membrane comprising the steps of:
   - mixing a quantity of finely divided particulate material into a fluid, membrane-forming polymer material; said particulate material being insoluble in said polymer material;
   - forming the particle-containing fluid polymer material into a thin layer and aligning the particles in said layer substantially normal to the surface of said layer while said polymer material is in the fluid state;
   - solidifying said layer containing the aligned particles to form an aligned particle containing membrane; and
   - extracting particles from the aligned particle containing membrane without destroying the membrane to produce a micro-porous membrane having aligned pores substantially normal to the surface of the membrane.

4,177,229

METHOD FOR PRODUCTION OF PRECAST MANHOLE BASES

Wayne O. Moore, P.O. Box 961, Mt. Vernon, Ill. 62864

Division of Ser. No. 790,547, Apr. 25, 1977, Pat. No. 4,103,862. This application Mar. 16, 1978, Ser. No. 887,007
Int. Cl.[2] B28B *7/04*
U.S. Cl. 264—40.5 **3 Claims**



1. In a method for producing precast concrete manhole bases wherein a mold jacket is positioned in surrounding relationship relative to a mold form, said form defining a base extending to the interior face of said jacket and a central portion extending upwardly from said base in inwardly spaced relationship with said interior face of said jacket, the central portion having a top surface for supporting channel forming members, and wherein concrete is poured over said mold form for solidification of the concrete between the mold form and the jacket and over the mold form, the improvement comprising the steps of locating a first channel forming member on said top surface, said first channel forming member consisting of a central section and a radially extending section, and at least one additional member on said top surface extending radially outwardly from said central section, said central section of said first member defining a curved outer surface and the inner end of said additional member defining a mating curved surface, fixing said first member in position, positioning a protractor on said first member and fixing the position of the protractor, providing reference points on said additional member, moving said additional member over said top surface, holding said inner end against said central section during movement of said additional member over said top surface, said mating surface and end providing accurate positioning of said additional member relative to said first member, measuring the angular relationship between said first member and said additional member by means of said protractor, and locking said additional member to said top surface when a desired angular relationship is achieved.

4,177,230

PROCESS FOR PRODUCING REACTION SINTERED SILICON NITRIDE OF INCREASED DENSITY

Khodabakhsh S. Mazdiyasni, Xenia, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 2, 1978, Ser. No. 911,746
Int. Cl.[2] C04B *35/56, 35/58;* C01B *21/06*
U.S. Cl. 264—60 **3 Claims**

1. A process for treating a porous reaction sintered silicon nitride body containing a trace amount of silicon oxynitride so as to increase its density and improve its room temperature strength, said process comprising the steps of:
   (a) heating the silicon nitride body and an organosilicon compound under a vacuum to a temperature in the range of about 250° to 300° C. over a period of about 15 to 30 minutes, said organosilicon compound being a silazane having the following formula:

$$[(C_6H_5)_2SiNH]_3$$

or a polysilane having the following formula:



wherein the ratio of x to y ranges from 1:4 to 1:20, z ranges from about 1 to 100, Me is methyl, and Ph is phenyl;
   (b) continuing the heating at a temperature in the range of about 250° to 300° C. for a period of about 4 to 6 hours, the heating being conducted in a nitrogen atmosphere when the organosilicon compound is silazane and in an argon atmosphere when the organosilicon compound is a polysilane;
   (c) heating the resulting silicon nitride body infiltrated with the organosilicon compound to a temperature of about 1300° to 1400° C. over a period of 5 to 7 hours, the heating being conducted in a nitrogen atmosphere when the organosilicon compound is silazane and in an argon atmosphere when the organosilicon compound is a polysilane;
   (d) continuing the heating at the temperature in the range of about 1300° to 1400° C. for about 0.5 to 2 hours, the organosilicon compound being thereby decomposed in pores of the silicon nitride body to α-Si_3N_4 when the compound is the silazane and to β-SiC when the compound is the polysilane; and
   (e) allowing the infiltrated silicon nitride body substantially free of silicon oxynitride to cool to room temperature.

4,177,231

PROCESS FOR IMPROVING THE SLIDING PROPERTIES OF LINEAR POLYESTER MATERIAL IN SPINNING OPERATIONS

Rolf Kleber, Neu-Isenburg, and Ulrich Cuntze, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 7, 1978, Ser. No. 884,363
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1977, 2710640
Int. Cl.[2] B29H *21/04*
U.S. Cl. 264—130 **2 Claims**

1. Process for improving the sliding properties of linear polyester material in spinning operations, which comprises treating this material after the drawing with a mixture containing the following components:
   (a) 50 to 90% by weight, preferably 60 to 80%, of a condensation product of the general formula I

$$R_1-\overset{\overset{O}{\|}}{C}-O-(C_2H_4O)_x-(C_3H_6O)_y-(C_2H_4O)_z-H \quad (I)$$

in which R_1 is C_{10}–C_{22} alkyl or alkenyl, preferably C_{18}, y is a number of from 20 to 40, preferably from 25 to 35 and x plus z have a weight of less than 20% by weight of the polypropylene oxide portion, and
   (b) 50 to 10% by weight, preferably 40 to 20%, of a compound of formulae II and/or III

$$R_2-\overset{\overset{O}{\|}}{C}-O-(C_2H_4O)_x-H \quad (II)$$

and/or

$$R_3-O-(C_2H_4O)_y-H \quad (III)$$

in which R_2 and R_3 are C_8–C_{18}alkyl or alkenyl, and x and/or y are numbers of from 5 to 20.

4,177,232

COATING UNCURED CEMENTITIOUS SURFACES

Henry Day, Sydney, Australia, assignor to Concrete Industries (Monier) Limited, Chatswood, Australia

Filed Jul. 5, 1977, Ser. No. 812,970
Claims priority, application Australia, Jul. 5, 1976, PC6533; Oct. 20, 1976, PC7799
Int. Cl.[2] C04B *41/04*
U.S. Cl. 264—133 **13 Claims**

1. A method of making a concrete tile comprising the steps forming the body of the tile by casting, extruding or drawing, applying a cementitious slurry to the surface of said body and, before the slurry layer has cured, applying to said layer an aqueous emulsion of a film-forming polymeric material; characterized in that the body of the tile is formed with a moisture content of less than 8%.

4,177,233

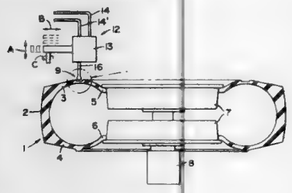
METHOD FOR FORMING SIDE-WALL STRIP IN A TUBE

Durward T. Roberts, Jr., Fairlawn, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 25, 1978, Ser. No. 899,954
Int. Cl.[2] B29H *17/00;* B29C *5/04, 9/00*
U.S. Cl. 264—134 **8 Claims**

1. The method of manufacturing a tire which comprises
   providing a tire with a sidewall having a circumferential groove therein,
   mounting said tire with said groove lying in a substantially horizontal plane and, while rotating said tire,

applying a major portion of a fluid stream of elastomer into the corners of said groove,



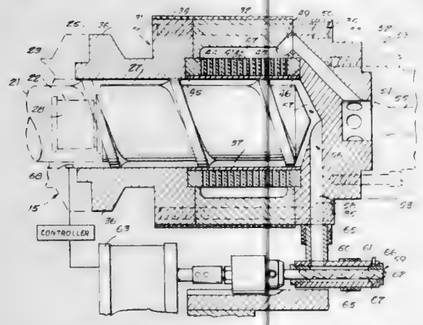
and positively directing lateral portions of the stream against the side surfaces of said groove, forming a strip in said sidewall having a concave meniscus.

4,177,234

METHOD AND APPARATUS FOR CLEANING THERMOPLASTIC MATERIALS

George W. Lowry, Ashley, Ind., assignor to Metals & Plastics, Inc., Ashley-Hudson, Ind.

Filed Oct. 5, 1977, Ser. No. 839,444
Int. Cl.[2] B29B *1/03*; B29C *29/00*; B29F *3/06*
U.S. Cl. 264—140 **11 Claims**



1. A method of cleaning contaminated thermoplastic material comprising the steps of heating thermoplastic material containing small pieces of contaminants to a temperature such that the thermoplastic material is melted but contaminants are not melted, extruding the heated material to provide a confined stream of material under pressure, filtering a portion of said stream to provide a filtrate composed of melted thermoplastic material containing unmelted contaminants having a size smaller than a preselected size and controlling the flow rate of the remainder portion of said stream to maintain said stream under pressure where it is being filtered whereby most of said stream is caused to flow in said filtrate and said remainder of said stream carries away contaminants separated by said filtering step, said controlling of flow rate step including chilling the remainder portion to reduce the speed of its flow and removing the chilled material at a controlled rate.

4,177,235

METHOD OF MANUFACTURING ELECTRICALLY FUSED CORUNDUM

Manfred Neidhardt, Siegburg, and Gerhard Rehfeld, Aachen, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Dec. 14, 1977, Ser. No. 860,525
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658124
Int. Cl.[2] C04B *35/10*
U.S. Cl. 264—140 **13 Claims**

1. A method for preparing an α-corundum composition having an α-corundum content of at least 99.95 weight percent from an alumina containing at least one impurity of the group consisting of TiO_2, Fe_2O_3, CaO and MgO which comprises heating said alumina which has an alkali content of between 0.05 and 0.60 weight percent and an Al_2O_3 content of more than 95 weight percent with SiO_2 in an electric arc furnace at a temperature sufficient to form a melt thereof, cooling said melt whereby to form a composition comprising an α-corundum phase in a siliceous matrix and thereafter separating said siliceous matrix from said α-corundum phase.

4,177,236

PROCESS FOR PRODUCING REGENERATED CELLULOSE CONTAINING CROSS LINKED SODIUM LIGNATE OR SODIUM LIGNOSULFONATE

Neal E. Franks, Suffern, N.Y., assignor to Akzona Inc., Asheville, N.C.

Continuation-in-part of Ser. No. 706,995, Jul. 20, 1976, abandoned. This application Mar. 17, 1978, Ser. No. 887,793
Int. Cl.[2] D01F *2/00*
U.S. Cl. 264—187 **6 Claims**

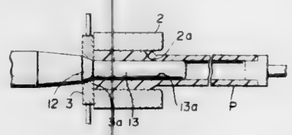
1. A method of making a shaped regenerated cellulose article which comprises mixing an extrudable viscose solution with about 1 to 40% by weight of a water insoluble polymer selected from the group of sodium lignate cross linked with at least about 3.8% by weight of formaldehyde or sodium lignosulfonate cross linked with at least about 10% by weight of formaldehyde, an aliphatic ether thereof, or mixtures thereof wherein said sodium lignate of sodium lignosulfonate contains not more than about 5% sulfur and spinning the resulting mixture.

4,177,237

METHOD OF MOLDING SOCKET OF PLASTIC RESIN TUBE

Yoshio Ueno; Takeshi Ikeda, both of Hiratsuka, and Masaru Isozaki, Kanagawa, all of Japan, assignors to Mitsubishi Plastics Industries Limited, Tokyo, Japan

Filed Aug. 24, 1977, Ser. No. 827,260
Claims priority, application Japan, Nov. 24, 1976, 51-141034
Int. Cl.[2] B29D *23/00*
U.S. Cl. 264—296 **4 Claims**



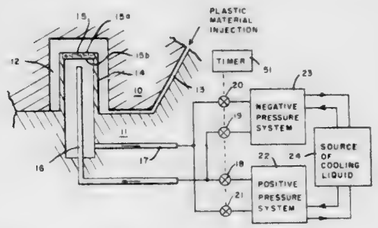
1. A method for molding a socket end for a plastic tube comprising the steps of:
heating the end of a resin tube to soften it;
fitting said end axially upon the small diameter part of a male mold having a small diameter part, a tapered part and a large diameter part;
surrounding said small diameter part of said male mold with a female mold consisting of a barrel having an inner surface spaced from the small diameter part by a distance greater than the thickness of the resin tube, and a stopper having an edge perpendicular to the axis of the resin tube which contacts the small diameter part of the male mold adjacent the boundary between the small diameter part and the tapered part;
pushing the resin tube in the direction of said male mold large diameter part so that said resin tube abuts the perpendicular wall of said stopper and fills said space so as to form a thickened end portion having an edge perpendicular to the axis of the resin tube;
removing said female mold from about said male mold; and
pushing the resin tube in the direction of said male mold larger diameter part whereby the end of the resin tube having increased thickness is forced to expand and be fitted about said larger diameter part so as to form a socket end having a perpendicular edge and a thickness at least equal to that of the remainder of the resin tube.

4,177,238

FLUID COOLING OF INJECTION MOLDED PLASTIC ARTICLES

Paul E. Allen, Newtown, Conn., assignor to Logic Devices, Inc., Bethel, Conn.

Filed Dec. 14, 1977, Ser. No. 860,370
Int. Cl.[2] B29C *5/00*; B29F *1/00*
U.S. Cl. 264—328 **12 Claims**



1. A method for cooling a plastic article that is formed by the injection of plastic material into a mold cavity formed by mold dies which have a cooling passageway adjacent at least a portion of the mold cavity comprising the steps or providing a fluid permeable porous plug communicating between the cavity and the passageway, injecting plastic material into the cavity, supplying a cooling liquid in the passageway that has a normal less than atmospheric pressure at the plug and altering the cooling liquid pressure at the plug to a greater than atmospheric pressure to change the direction of the flow of cooling fluid in the plug between the cavity and the cooling passageway.

4,177,239

BLOW MOLDING METHOD

Franz Gittner, Soltendieck; Arnaldo Gläser, Bodenteich, and Klaus D. Kötke, Lüder, Reinstorf, all of Fed. Rep. of Germany, assignors to Bekum Maschinenfabriken GmbH, Berlin, Fed. Rep. of Germany

Filed Apr. 6, 1978, Ser. No. 893,833
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1977, 2717365
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—530 **11 Claims**

1. In a method of transforming a hollow thermoplastic preform which is closed at one end and open at the other end into a hollow shaped article, which method comprises the steps of introducing a blow tube into the open end of the pre-form and confining the pre-form in the cavity of a blow mold wherein the cavity is bounded by a bottom surface which is remote from the open end of the pre-form in the mold, a peripheral surface which surrounds the major portion of the pre-form in the mold between the open end of the pre-form and close to the bottom surface and an intermediate surface between the peripheral and bottom surfaces; mechanically stretching the pre-form in the mold; admitting into the pre-form a blowing fluid at a first pressure via the blow tube in the course of said stretching step; and admitting into the pre-form a blowing fluid



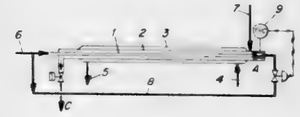
at a higher second pressure upon at least substantial completion of said stretching step, the improvement which consists in maintaining said first pressure at a level at which said major portion of the pre-form in the mold is expanded into contact with the peripheral surface and in such selection of said second pressure as to effect abrupt biaxial pneumatic expansion of the remaining portion of the pre-form against the intermediate and bottom surfaces of the mold.

4,177,240

TUBULAR REACTOR FOR THE HIGH PRESSURE POLYMERIZATION OF ALPHA-OLEFINES

Alberto Dal Bianco, Ferrara, Italy, assignor to Montedison S.p.A., Milan, Italy

Filed Jul. 8, 1977, Ser. No. 814,169
Claims priority, application Italy, Jul. 12, 1976, 25228 A/76
Int. Cl.[2] B01J *3/04*
U.S. Cl. 422—115 **6 Claims**



1. A tubular high thermal exchange reactor for the catalyzed production of alpha-olefine polymers and copolymers thereof from process fluid alpha-olefines under high pressure, which comprises three coaxially-arranged spaced-apart tubes consisting of:
(1) innermost tube means comprising a tube having an inlet opening at one end for the entry of said alpha-olefine process fluid and an outlet opening at the other end for the emission of said alpha-olefine process fluid, said innermost tube having perforations in the walls thereof in open communication with
(2) intermediate tube means comprising a tubular wall and an upstream end wall and a downstream end wall with an opening therein for said innermost tube, said tube and said end walls encompassing the entire perforated area of said innermost tube, the walls of said intermediate tube being adapted to withstand high reaction pressures and which define an annular interspace with the walls of said innermost tube for the passage therethrough of said alpha-olefine process fluid, said outlet opening of said innermost tube terminating adjacent but spaced apart from the upstream end wall of said intermediate tube thereby forming the inlet means of said intermediate tube for receiving said alpha-olefine process fluid directly from said outlet opening of said innermost tube and having separate inlet means

for entry of a polymerization catalyst for said alpha-olefine near the inlet means for said alpha-olefine process fluid and an outlet opening for alpha-olefine polymer or copolymer fluid at said downstream end wall,

(3) heat exchange means comprised of an outermost tube having a tubular wall and end walls, the walls defining an annular interspace with the walls of said intermediate tube means for the passage therethrough of a refrigerating fluid, and

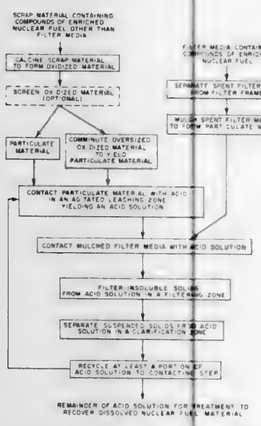
(4) conduit means for diverting alpha-olefine process fluid externally between said innermost tube process fluid inlet and said innermost tube process fluid outlet.

4,177,241

APPARATUS AND PROCESS FOR RECOVERING NUCLEAR FUEL FROM SCRAP MATERIAL

Larry A. Divins, and Larry E. Short, both of Wilmington, N.C., assignors to General Electric Company, San Jose, Calif.

Filed Sep. 8, 1977, Ser. No. 831,689
Int. Cl.² G21F 9/30
U.S. Cl. 423—20 **11 Claims**



1. A process for recovering in solution form enriched nuclear fuel compounds from scrap materials, said process comprising the steps of:

(a) calcining the scrap material that is readily combustible to yield an oxidized material;

(b) comminuting the oxidized material to form a particulate material of particle size less than about 250 microns;

(c) contacting the particulate material with an acid containing some recycled acid from step (g) in a mechanically agitated leaching zone of a slab-shaped nuclear-safe configuration to dissolve said compounds and yield an acid solution of said compounds;

(d) mulching non-combustible material such as filter media so that it is in the form of particulate material;

(e) contacting the mulched non-combustible material with the acid solution of (c);

(f) filtering the nonsuspended insoluble solids from the acid solution in a filtering zone;

(g) separating the suspended solids from the acid solution in a clarification zone;

(h) recycling at least a portion of the acid solution of (g) from the clarification zone to the leaching zone; and

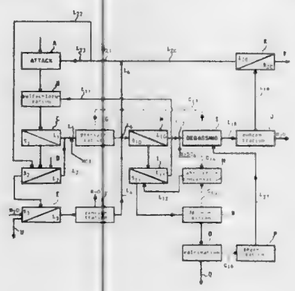
(i) collecting the remainder of the acid solution for subsequent treatment.

4,177,242

METHOD OF OBTAINING PURE ALUMINA BY ACID ATTACK ON ALUMINOUS MINERALS CONTAINING OTHER ELEMENTS

Joseph Cohen, and Alain Adjemian, both of Aix en Provence, France, assignors to Aluminum Pechiney, Lyon, France

Filed Feb. 9, 1978, Ser. No. 876,205
Claims priority, application France, Feb. 28, 1977, 77 06531
Int. Cl.² C01F 7/20; C01G 15/00; C22B 21/00
U.S. Cl. 423—83 **17 Claims**



1. A method of obtaining alumina of high purity from aluminous mineral containing iron and titanium values as impurities by

(a_1) attacking the mineral with a sulphuric acid liquor,

(a_2) separating the resulting liquor from a residue which remains after the attack,

(a) mixing the resulting liquor from step (a_2) with an HCl and H_2SO_4 liquor,

(b) introducing HCl gas into the mixture of step (a),

(c) cooling the mixture from step (b) to precipitate hydrated aluminum chlorosulphate crystals having the formula $AlSO_4Cl.6\text{–}7H_2O$,

(d) separating the crystals of hydrated aluminum chlorosulphate from the liquor,

(e) heating the crystals separated in step (d) to a temperature within the range of 300° C. to a temperature that does not exceed 600° C. to yield a mixture of aluminum sulphates and hydrochloric gases,

(f) thermally decomposing the aluminum sulphates from step (e) to yield alumina of high purity and sulphuric gases SO_2 and SO_3,

(g) degassing the liquor of step (d) to yield HCl gas,

(h) concentrating the degassed liquor from step (g), and

(j) recycling the concentrated liquor from step (h) to the attack on the aluminous mineral.

4,177,243

PROCESS FOR PRODUCTION OF PHOSPHATE ROCK SLURRIES HAVING REDUCED WATER CONTENT AND VISCOSITY

Joel Schwartz, Ringwood, and Joseph P. Fleming, East Brunswick, both of N.J., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Mar. 1, 1976, Ser. No. 662,877
Int. Cl.² C01B 25/22
U.S. Cl. 423—167 **8 Claims**

1. A process for producing an aqueous slurry of ground phosphate rock for use in phosphoric acid manufacture, the process comprising admixing with the slurry, an effective amount of sodium naphthaleneformaldehyde sulfonate to obtain a pumpable slurry having reduced moisture content or reduced viscosity so that the slurry is pumpable during use in phosphoric acid manufacture.

4,177,244

PROCESS FOR PURGE STREAM TREATMENT IN REMOVAL OF SULFUR DIOXIDE

Ullrich Neumann, Kiefernweg, 5038 Rodenkirchen, and Kurt Rudolph, Benfleetstr. 16, 5000 Cologne 40, both of Fed. Rep. of Germany

Continuation of Ser. No. 818,722, Jul. 25, 1977, abandoned. This application Aug. 3, 1977, Ser. No. 821,481
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1976, 2633423
Int. Cl.² C01B 17/00, 17/45
U.S. Cl. 423—242 **11 Claims**

1. In the process for removing sulfur dioxide from a gas whereby sulfur dioxide is absorbed by an aqueous sodium sulfite-containing absorbing solution to thereby form a sodium bisulfite-enriched solution, which bisulfite-enriched solution is subsequently thermally decomposed to evaporate sulfur dioxide and water therefrom, thereby forming an aqueous slurry comprising solid sodium sulfite and a mother liquor containing dissolved salts including sodium sulfite, sodium pyrosulfite, sodium sulfate and dissolved impurities selected from the group consisting of sodium thiosulfate, sodium chloride and selenium, the improvement which comprises:

a. mixing at least a portion of said mother liquor with a neutralizing agent selected from sodium hydroxide, sodium carbonate or both;

b. cooling the resulting neutralization mixture to crystallize sodium sulfite hydrate therefrom;

c. separating said crystallized sodium sulfite hydrate from said neutralization mixture thereby leaving a residual liquor containing the dissolved impurities;

d. recycling said separated sodium sulfite hydrate to the sulfur dioxide absorbing solution; and

e. discarding at least a portion of said residual liquor in order to remove dissolved impurities from the process.

4,177,245

SCALE SUPPRESSION IN LIME AND LIMESTONE SCRUBBERS

Harvey S. Rosenberg, Columbus, and Henry M. Grotta, Delaware, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed May 24, 1978, Ser. No. 908,806
Int. Cl.² C01B 17/00; B01D 5/00; C09K 15/00
U.S. Cl. 423—242 **7 Claims**

1. In a method for reducing calcium sulfate scale formation in a known lime or limestone wet scrubbing process for flue gas desulfurization wherein SO_2-laden flue gas is exposed to the lime or limestone and the SO_2 is absorbed therein for removal, wherein the improvement comprises

adding to the flue gas, prior to the absorption step, an oxidation inhibitor comprising gaseous NO.

4,177,246

WET OXIDATION OF MATERIALS

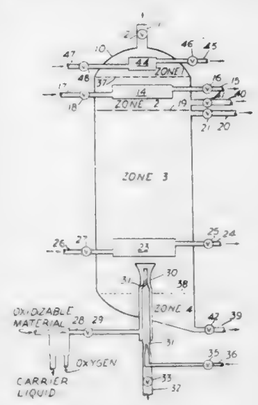
Xerxes T. Stoddard, 4617 W. 27th Ave., Denver, Colo. 80212; Vesper A. Vaseen, 9840 W. 35th Ave., Wheatridge, Colo. 80033, and Ruel C. Terry, 3090 S. High St., Denver, Colo. 80210

Filed Feb. 24, 1978, Ser. No. 881,012
Int. Cl.² C22B 26/10; C01B 31/20; D21C 11/12
U.S. Cl. 423—437 **3 Claims**

1. A method of wet oxidizing cellulose into ash residue comprising the steps of

establishing a reaction zone, the said reaction zone being maintained both within the range of temperatures between 100° F. and 610° F. and within the range of pressures between 30 psia and 3200 psia,

injecting into the said reaction zone a slurry composed of cellulose suspended in a liquid, the said liquid being inert and having the capability of taking oxygen into solution and being selected from a group of fluorocarbons containing eight or more carbon atoms,



injecting oxygen into the said slurry, and

wet oxidizing the said cellulose into residue.

4,177,247

PROCESS FOR PRODUCING DITHIONITES

Eiichi Yonemitsu; Hiroshi Miyamori, both of Kashiwa; Takanari Nawata, Tokyo; Tomio Fujioka, Matsudo; Akira Ito, and Makoto Kobayashi, both of Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed May 8, 1978, Ser. No. 903,496
Claims priority, application Japan, May 17, 1977, 52-56934
Int. Cl.² C01B 17/66
U.S. Cl. 423—515 **47 Claims**

1. A process for preparing a dithionite, which process comprises reacting

(A) a member selected from the group consisting of (1) and (2), these being

(1) bisulfite, pyrosulfite, alkylsulfite, and arylsulfite salts of elements of Groups Ia, IIa and IIb of the Periodic Table, and ammonium, and

(2) a combination of

(i) substances capable of producing the salts as mentioned in 1) above by reaction with sulfur dioxide or sulfurous acid, and

(ii) sulfur dioxide or sulfurous acid, with

(B) a hydroquinone.

4,177,248

PRODUCTION OF SULFUR DIOXIDE FROM WASTE SULFURIC ACID

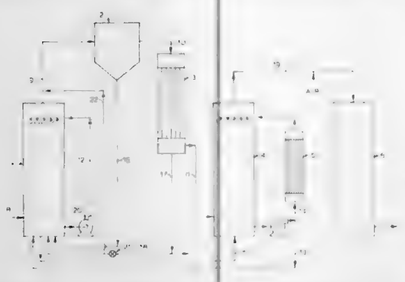
Wilfred T. Richard, Houston, Tex., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 706,401, Jul. 19, 1976, abandoned, which is a continuation of Ser. No. 656,766, Feb. 9, 1976, abandoned, which is a continuation of Ser. No. 568,958, Apr. 17, 1975, abandoned, which is a continuation of Ser. No. 438,091, Jan. 30, 1974, abandoned. This application Dec. 12, 1977, Ser. No. 860,035
Int. Cl.² C01B 17/50, 17/52, 17/72
U.S. Cl. 423—540 **2 Claims**

1. A process for the production of SO_2 gas suitable for use in producing H_2SO_4 comprising the steps of:

(a) heating spent sulfuric acid containing 25 weight percent to 92 weight percent of H_2SO_4 in a furnace at a temperature of from 1600° F. to 2300° F. to produce a gaseous effluent of sulfur dioxide, water vapor and gaseous products;

(b) passing the effluent to a waste heat boiler to remove heat;
(c) contacting the gaseous effluent from the waste heat boiler in a scrubbing zone with sulfuric acid maintained at a strength of from about 45 weight percent to about 65 weight percent H_2SO_4, the sulfuric acid make-up for the scrubbing zone being obtained from the pre-drying zone wherein the acid is maintained at a strength of from about 40 weight percent to about 60 weight percent H_2SO_4 and thereby cooling the effluent to a temperature of from about 150° F. to about 260° F.;
(d) removing acid mist from the effluent from the scrubbing zone to form a gaseous effluent essentially free of H_2SO_4 and SO_3;
(e) cooling the effluent from the acid mist removal zone to a temperature of from about 100° F. to about 130° F. thereby condensing at least a portion of the water vapor



remaining in the effluent, said condensed water vapor being virtually free of sulfuric acid;
(f) contacting the gaseous effluent from the condensation zone in a pre-drying zone with sulfuric acid of from about 45 weight percent to about 65 weight percent H_2SO_4 obtained from the scrubbing zone thereby stripping moisture from said gaseous effluent while maintaining the concentration of sulfuric acid in the pre-drying zone at from about 40 weight percent to about 60 weight percent H_2SO_4 while any excess pre-drying zone sulfuric acid is transferred to the scrubbing zone as makeup for the scrubbing zone sulfuric acid; and
(g) contacting the effluent from the pre-drying zone with sulfuric acid having a concentration of from about 93% to 98% H_2SO_4 in a final drying zone to produce a dry effluent gas containing SO_2 for use in the production of H_2SO_4.

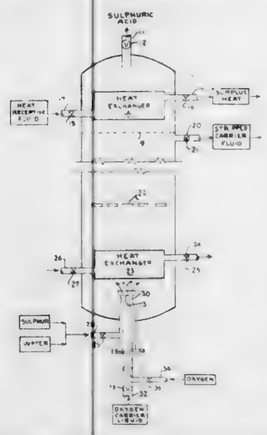
4,177,249

WET OXIDATION OF SULPHUR AND THE CAPTURE OF GENERATED HEAT

Xerxes T. Stoddard, 4617 W. 27th Ave., Denver, Colo. 80212; Vesper A. Vaseen, 9840 W. 35th Ave., Wheatridge, Colo. 80033, and Ruel C. Terry, 3090 S. High St., Denver, Colo. 80210

Filed Sep. 12, 1977, Ser. No. 832,635
Int. Cl.² C01B *17/72*
U.S. Cl. 423—522 **6 Claims**

1. In a method for the production of sulphuric acid which comprises reacting elemental sulphur with oxygen dissolved in an inert liquid at temperatures between 250° F. and 750° F. and pressures between 30 psia and 3200 psia in the presence of water to form sulphuric acid, the improvement which comprises using as said inert liquid a compound selected from the group consisting of trifluorocarbon amines, cyclic fluorocarbon oxides and perfluorocarbons, each such compound having eight or more carbon atoms.



4,177,250

METHOD OF REMOVING ACETYLENE AND SULFUR COMPOUNDS FROM GASES BY ABSORPTION IN DIMETHYL FORMAMIDE

Howard B. Irvin; Fred T. Sherk, and Alfred A. Hoffman, Jr., all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 714,934, Aug. 16, 1976, Pat. No. 4,086,288. This application Oct. 18, 1977, Ser. No. 843,198
Int. Cl.² B01D *53/34*; C01B *17/04*
U.S. Cl. 423—573 G **8 Claims**



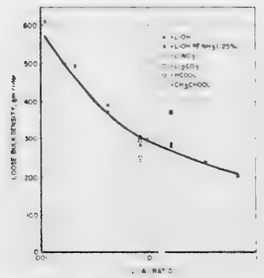
1. A process for the simultaneous desulfurization of and acetylene removal from a gas which process comprises
contacting a gas stream comprising an olefin and oxygen, and, as contaminants, acetylenes and at least one oxidizable sulfur compound selected from the group consisting of H_2S, COS, and CS_2, in an absorption zone with liquid dimethyl formamide such as to produce a gaseous effluent comprising the olefin and being essentially acetylene-free and a liquid effluent comprising dimethyl formamide, acetylenes, and sulfur,
introducing a liquid hydrocarbon selected from the group consisting of paraffinic hydrocarbons having 4–8 carbon atoms per molecule, containing at least one tertiary carbon atom per molecule, and aromatic hydrocarbons having 6–10 carbon atoms per molecule into the absorption zone at a location above the location of introduction of said dimethyl formamide, and
withdrawing a gaseous effluent stream from said absorption zone comprising said olefin and said hydrocarbon and being essentially acetylene and sulfur-free and introducing at least a portion of said gaseous effluent into an alkylation zone and reacting said olefin and said hydrocarbon in the presence of an alkylation catalyst to form an alkylate in said alkylation zone.

4,177,251

PRODUCTION OF LOW LOOSE BULK DENSITY ALUMINA

Larry L. Bendig, Ponca City; Donald E. Stowell, Oklahoma City, both of Okla., and Laura A. Starks, New Orleans, La., assignors to Conoco, Inc., Ponca City, Okla.

Filed Oct. 23, 1978, Ser. No. 954,042
Int. Cl.² C01F *7/02*
U.S. Cl. 423—628 **5 Claims**



1. A method for lowering loose bulk density of alumina obtained from the water hydrolysis of aluminum alkoxide comprising hydrolyzing said aluminum alkoxides by contacting with water containing lithium ions in a concentration of at least 0.06 percent by weight based on the weight of hydrolysis water to obtain alumina and alcohols, removing the alcohols, recovering aluminum trihydrate having a lithium ion content of from about 700 parts per million to about 15,000 parts per million when determined as a dry uncalcined powder and drying said aluminum trihydrate.

4,177,252

LOW TEMPERATURE SHIFT CONVERSION PROCESS

Godfrey C. Chinchen, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 2, 1978, Ser. No. 902,109
Claims priority, application United Kingdom, May 9, 1977, 19379/77
Int. Cl.² C01B *1/02, 2/10*
U.S. Cl. 423—656 **10 Claims**

1. A process for producing hydrogen and carbon dioxide according to a low temperature shift reaction, said process comprising contacting a gaseous mixture containing carbon monoxide and steam with a fixed-bed of a copper-containing catalyst, wherein:
(a) said fixed-bed comprises an inlet zone where the reacting gas first encounters said catalyst and an outlet zone where gases subsequently encounter said catalyst;
(b) the outlet temperature is less than about 300° C; and
(c) the volume-to-surface area ratio of the catalyst pieces in the inlet zone is less than the volume-to-surface ratio of the catalyst pieces in the outlet zone,
whereby the inlet zone catalyst absorbs poisoning compounds at high effectiveness and decreases poisoning of the outlet zone catalyst.

4,177,253

MAGNETIC PARTICLES FOR IMMUNOASSAY

George E. Davies, Macclesfield, England, and Jiri Janata, Salt Lake City, Utah, assignors to Imperial Chemical Industries Limited, United Kingdom

Filed Jul. 6, 1977, Ser. No. 813,422
Claims priority, application United Kingdom, Jul. 30, 1976, 31839/76
Int. Cl.² G01N *33/00*
U.S. Cl. 424—1 **25 Claims**

1. Composite magnetic particles each particle comprising a core having a density of less than 1.5 gm/cc, at least a proportion of the surface of the core being coated with a coating of magnetic material and a biologically active component on the surface of the core and/or the said coating.

4,177,254

ORALLY ADMINISTRABLE PHARMACEUTICAL COMPOSITION

Karrar A. Khan, Worthing, and Brian Cook, Goring-by-Sea, both of England, assignors to Beecham Group Limited, England

Continuation of Ser. No. 750,609, Dec. 15, 1975, abandoned. This application Jul. 13, 1978, Ser. No. 923,933
Claims priority, application United Kingdom, Jan. 2, 1976, 00023/76
Int. Cl.² A61K *9/16, 9/36, 31/43*
U.S. Cl. 424—16 **15 Claims**

1. A process for the preparation of water-soluble or water-dispersible granules of water-insoluble penicillins, said granules being reconstitutable to syrup form, which comprises coating particulate sugar, mannitol or sorbitol with a suspension of the water-insoluble penicillin in a sucrose solution binder, and drying the resultant particles or agglomerates of particles, the process being carried out by fluid bed granulation using water as solvent for the binder.

4,177,255

RUMEN-STABLE PELLETS

Clarence C. Dannelly, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 2, 1977, Ser. No. 830,279
Int. Cl.² A61K *9/24, 9/32, 9/36*
U.S. Cl. 424—21 **7 Claims**

1. A pellet adapted for oral administration to a ruminant comprising a core material beneficial to the ruminant postruminally, and a coating surrounding said core material which protects the core material in the rumen and releases it in the abomasum, said coating comprising
(a) a physiologically acceptable polymeric matrix insoluble in the environment of the rumen and abomasum consisting essentially of at least one polymer, copolymer, or blend of polymers or copolymers selected from the group consisting of cellulose esters, poly(vinylchloride), copolymers of vinylidene chloride, polystyrene, poly(methyl methacrylate), poly(dimethylsiloxane), polyesters made from dicarboxylic acids having from 8 to 22 carbon atoms and glycols having from 4 to 16 carbon atoms, polyamides from amino acids having from 8 to 22 carbon atoms or from dicarboxylic acids having from 8 to 22 carbon atoms condensed with diamines having from 4 to 16 carbon atoms, and polymethacrylates having silicone or fluorine substituted alcohol moieties of from 2 to 8 carbon atoms, and
(b) a substance dispersed in said polymeric material which is stable in the environment of the rumen, but which leaches from said matrix below pH of about 4 in the environment of the abomasum thereby allowing said polymeric matrix to lose its integrity and release the core material,
said coating comprising from about 35% to about 65% by volume of said dispersed substance, and said coating having a sticking temperature of at least about 50° C.

4,177,256

OSMOTIC BURSTING DRUG DELIVERY DEVICE

Alan S. Michaels, San Francisco, Calif., and Mark S. Guillod, Kaneohe, Hi., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 578,979, May 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 465,276, Apr. 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 354,359, Apr. 25, 1973, abandoned. This application Nov. 29, 1977, Ser. No. 855,605

Int. Cl.[2] A61K *9/22, 9/26, 9/52, 9/54*

U.S. Cl. 424—22 12 Claims

1. A drug delivery device for administering drug continuously to an aqueous body environment for a prolonged time period at a controlled rate, said device being in the form of a solid, unit body that:

(a) is sized and shaped for placement in the environment; and

(b) consists essentially of a mixture that defines a surface of predetermined area that is exposed to the water in said environment, said mixture consisting essentially of

(i) about 1% to about 50% by volume, of discrete depots 0.1 to 250 microns, surface area average diameter, in size of a drug composition that is an osmotically effective solute, said depots being dispered in

(ii) about 50% to about 99%, by volume, of a polymer such that the depots are surrounded substantially individually by a layer of the polymer, the polymer being substantially impermeable to the drug composition, insoluble in the environment at least during the prolonged time period, and permeable to water and having a tensile strength, Young's modulus, and a maximum elongation such that the cohesive strength of said layer is exceeded by the pressure that the depot the layer surrounds is able to generate by imbibing water, whereby when the device is placed in the environment, water is imbibed by the depots in a serially inwardly manner beginning with the depots nearest said surface and said pressure is generated therein, causing the polymer layers surrounding said depots to rupture thereby releasing drug composition therefrom to the environment.

4,177,257

CYCLIC SULPHUR COMPOUNDS

Harold F. Hodson, Hayes, and John F. Batchelor, Beckenham, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

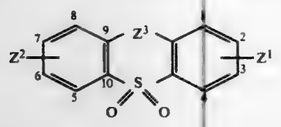
Division of Ser. No. 394,424, Sep. 5, 1973, Pat. No. 4,025,635. This application Mar. 11, 1977, Ser. No. 776,936

Claims priority, application United Kingdom, Sep. 6, 1972, 41429/72; May 4, 1973, 21174/73

Int. Cl.[2] A61K *9/14, 9/04, 31/41, 31/39*

U.S. Cl. 424—46 26 Claims

1. A method for the treatment or prophylaxis of an allergic condition of a mammal comprising administration to the mammal of a therapeutically or prophylactically effective anti-allergic dose of a tricyclic compound of formula I



(I)

wherein

Z^1 is a substituent in the 1-, 2-, 3-, or 4-position and is carboxyl, 5-tetrazolyl, 5-(1-alkyl)tetrazolyl, or 5-(2-alkyl)tetrazolyl in which the alkyl groups have 1 to 6 carbon atoms and are each optionally subsituted by a hydroxyl group;

Z^2 is hydrogen or a substituent in the 5-, 6-, 7-, or 8 -position selected from the values of the group Z^1 as defined above or is alkylsulphonyl, alkylsulphinyl, thioalkyl, amino, acylamino, nitro, cyano, halogen preferably chlorine or bromine, acyl, alkyl or alkoxy wherein the "alkyl" moiety of each of the acyl, alkyl, alkoxy, thioalkyl, acylamino, alkylsulphinyl and alkylsulphonyl groups has 1 to 6 carbon atoms; and

Z^3 represents a bond or is oxygen, sulphur, sulphoxide or methylene; provided that when Z^3 is oxygen Z^1 is carboxyl

together with pharmaceutically acceptable salt thereof.

4,177,258

DENTIFRICE FOR DENTAL REMINERALIZATION

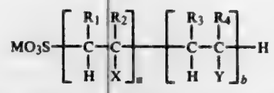
Maria C. S. Gaffar, and Abdul Gaffar, both of Somerset, N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 951,893, Oct. 13, 1978. This application Mar. 14, 1979, Ser. No. 20,377

Int. Cl.[2] A61K *7/18, 7/22*

U.S. Cl. 424—52 15 Claims

1. A remineralizing dentifrice comprising an aqueous humectant vehicle having dissolved therein at least 50 ppm of calcium ions and at least 50 ppm of a source of phosphate ions, the ratio of calcium to phosphate ions being from about 0.01 to about 100:1, the amount of calcium ions and phosphate ions being insufficient to precipitate and sufficient to effect remineralization of dental enamel; said dentifrice further comprising a gelling agent, a compound which provides fluoride anticaries agent and an antinucleating agent selected from the group of acids and orally acceptable water-soluble salts thereof consisting of: diamine tetramethylenephosphonic acids of the formula $(M_2O_3PH_2C)_2N(CH_2)_nN(CH_2PO_3M_2)_2$, wherein n is an integer from 1 to 10; phosphonoacetic acid or salt thereof of the formula $M_2O_3PCH_2COOM$; peroxydiphosphate of the formula $M_4P_2O_8$; an oligomer



in which M is hydrogen or an orally acceptable cation; R_1, R_2, R_3, and R_4 are independently hydrogen, methyl or ethyl; Y is at least one hydrophilic member of the group consisting of —COOM, —$CONH_2$ and CH_2OH; X is at least one hydrophobic member of the group consisting of —CN, —COOR, —$COOR_5OR$, —CONHR and —$COONHR_5COR$: R is C_{1-8} alkyl; R_5 is C_{1-4} alkylene; a is 0–7 and a+b is about 4–15; said dentifrice having a pH of about 5 to 9.

4,177,259

WATERPROOF MAKEUP AND METHOD OF PREPARING SAME

Graham Barker, Fair Lawn, and Martin J. Barabash, Montvale, both of N.J., assignors to Witco Chemical Corporation, New York, N.Y.

Filed Jul. 14, 1977, Ser. No. 815,477

Int. Cl.[2] A61K *7/021*

U.S. Cl. 424—63 8 Claims

1. A method of preparing a stable waterproof makeup having a water disperse phase and an oil continuous phase which comprises (A) admixing (a) a cosmetic emulsion oil and (b) a cosmetic pigment and (c) an emulsifier combination comprising (i) a stearate selected from the group consisting of aluminum stearate, calcium stearate and mixtures thereof, and (ii) a polyhydric alcohol ester of a liquid fatty acid having an HLB value less than 5 and selected from the group consisting of polyglycerol (4) monooleate, sorbitan sesquioleate and glycerol monooleate; and (B), while agitating, blending at 90° C.-95° C. therewith (d) water which has been heated to a temperature in the range of about 90° C. to about 95° C.

4,177,260

COSMETIC PREPARATIONS

Theodor Wajaroff, Darmstadt, Fed. Rep. of Germany, assignor to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

Filed Apr. 5, 1977, Ser. No. 784,662

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1976, 2614723

Int. Cl.[2] A61K *7/09, 7/11, 7/155*

U.S. Cl. 424—71 9 Claims

1. A cosmetic composition for shaping hair comprising an aqueous preparation containing (a) 2–12 wt. % of a keratin softening agent selected from the group consisting of alkali, mercapto compounds, sulfites and sulfides and (b) a nitrogen-containing swelling and penetrating agent, wherein the improvement comprises that said swelling and penetrating agent is 0.5–30 wt. % of imidazolidinone-(2).

4,177,261

PHARMACEUTICAL COMPOSITION AND METHOD OF STIMULATING BLOOD CIRCULATION AND WOUND HEALING

Günther Dietze, and Matthias Wicklmayr, both of Munich, Fed. Rep. of Germany, assignors to Thera Gesellschaft für Patentverwertung mbH, Herrsching, Fed. Rep. of Germany

Filed Dec. 30, 1977, Ser. No. 865,912

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1977, 2700043

Int. Cl.[2] A61K *35/14, 37/42*

U.S. Cl. 424—101 6 Claims

1. A pharmaceutical composition useful for improving and stimulating blood circulation and thereby improving the healing of wounds, said composition comprising (a) albumin-freed calf blood extract, and (b) from about 0.001 to about 2.5 micrograms of a kinin selected from the group consisting of Brady kinin and kallidin per milligram of dry albumin-freed calf blood extract.

4,177,262

PLASMINOGEN COMPOSITIONS CONTAINING PREACTIVATED PLASMINOGENS WITH OR WITHOUT NATIVE PLASMINOGENS, PROCESS FOR MAKING SAME, PHARMACEUTICAL COMPOSITIONS AND CONTROL OF BLOOD CLOTS

Jean-Claude Lormeau, Maromme-la-Maine; Jean Choay, Paris, and Jean Goulay, Oissel, all of France, assignors to Choay S.A., Paris, France

Continuation-in-part of Ser. No. 533,631, Dec. 17, 1974, Pat. No. 4,115,551. This application Apr. 6, 1977, Ser. No. 785,166

Claims priority, application France, Apr. 7, 1976, 76 10143

Int. Cl.[2] A61K *35/50, 35/14*

U.S. Cl. 424—105 42 Claims

1. A water-soluble biological composition which has plasminogen activity capable of activation to plasmin, which composition is essentially free of plasmin and which comprises: native plasminogen, which native plasminogen is amino-terminal glutamic acid and a preactivated plasminogen, said preactivated plasminogen having a lower molecular weight than the native plasminogen and differing from the native plasminogen by the absence of a peptide fragment which fragment includes said terminal amino acid, said preactivated plasminogen being present in a proportion of at least about 40% by weight of the total plasminogens, and said preactivated plasminogen comprising lysyl plasminogen.

6. A water-soluble biological composition which has plasminogen activity capable of activation to plasmin, which composition is essentially free of plasmin and essentially free of glutamyl-plasminogen, which composition has its isoelectric points higher than 6.7, and comprises water-soluble preactivated plasminogens, having principally methionine or lysine as the terminal —NH_2 aminoacids, derived from glutamyl-plasminogen by its loss of a peptide fragment, which fragment includes amino-terminal glutamic acid, and which composition is capable of being fixed essentially in its entirety on a fibrin clot and to remain so fixed after washing with a solution buffered to a neutral pH.

4,177,263

ANTI-ANIMAL TUMOR METHOD

Barnett Rosenberg, Holt; Loretta VanCamp, East Lansing, and Thomas Krigas, Okemos, all of Mich., assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 405,184, Oct. 10, 1973, abandoned, which is a continuation of Ser. No. 230,533, Feb. 28, 1972, abandoned, which is a continuation of Ser. No. 30,239, Apr. 20, 1976, abandoned. This application Dec. 27, 1976, Ser. No. 754,512

Int. Cl.[2] A61K *33/24, 31/28*

U.S. Cl. 424—131 4 Claims

1. A method of treating animal malignant tumor cells sensitive to cis-$Pt(II)(NH_3)_2Cl_2$ in animals which comprises parenterally administering to an animal afflicted with said tumor cells a solution containing cis-$Pt(II)(NH_3)_2Cl_2$ in an amount sufficient to cause regression of the animal tumor cells.

4,177,264

N-BENZYL ANTHRACYCLINES

Helen Y. Wu, San Jose; Thomas H. Smith, San Carlos, both of Calif., and David W. Henry, Chapel Hill, N.C., assignors to SRI International, Menlo Park, Calif.

Continuation-in-part of Ser. No. 842,787, Oct. 17, 1977, abandoned. This application Oct. 2, 1978, Ser. No. 947,874

Int. Cl.[2] A61K *31/71;* C07H *15/24*

U.S. Cl. 424—180 15 Claims

14. A pharmaceutical composition in sterile aqueous form for treating leukemia L1210 and P388 in mice comprising an amount within the range from about 0.1 to about 500 mg, effective to ameliorate leukemia, of at least one compound selected from the group consisting of N-benzyldaunomycin, N-benzyl-13-dihydrodaunomycin, N-benzyladriamycin, N-benzyl-13-dihydroadriamycin, N,N-dibenzyldaunomycin, N,N-dibenzyl-13-dihydrodaunomycin and N,N-dibenzyladriamycin and their pharmaceutically acceptable acid addition salts, together with a pharmaceutically acceptable nontoxic, sterile, inert, aqueous carrier or diluent therefor.

4,177,265

PROCESS FOR THE PURIFICATION OF AMPHOTERICIN B AND A SOLUBILIZING MEDIA USEFUL IN THAT PROCESS

Gerd W. Michel, Princeton, and Elizabeth A. Fralick, North Brunswick, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 2, 1977, Ser. No. 773,584

Int. Cl.[2] A61K *31/71, 35/00*

U.S. Cl. 424—181 13 Claims

6. A process for the purification of amphotericin B which comprises:

(i) forming a solution of amphotericin B in a salt saturated solution wherein the salt is sodium iodide or sodium thiocyanate and the solvent is acetone or methanol;

(ii) separating out amphotericin B extract from insolubles;

(iii) combining the amphotericin B extract with a solvent mixture comprising N,N-dimethylformamide, methanol, and water;

(iv) heating the slurry of amorphous material to form crystalline amphotericin B; and

(v) recovering the crystalline amphotericin B.

4,177,266

PAIN RELIEF COMPOSITION AND METHOD OF PREPARING SAME

Mary A. Moore, Carlisle, Ky., assignor to James Richard Bean, Laurel, Md.

Filed Jan. 2, 1979, Ser. No. 167
Int. Cl.[2] A61K *35/78*
U.S. Cl. 424—195 **10 Claims**

1. A pain relief composition prepared by the process comprising:
(a) establishing a predetermined quantity of roots from the genus Phytolacca and Burdock in an aqueous environment to form an initial mixture;
(b) heating said initial mixture for a predetermined time interval to form a suspension including an extract of a combination of said Phytolacca, Burdock and remaining bulk material thereof;
(c) cooling said aqueous suspension; and,
(d) incorporating a predetermined quantity of isopropyl alcohol to said aqueous suspension.

4,177,267

ENHANCING TISSUE PENETRATION OF PHYSIOLOGICALLY ACTIVE STEROIDAL AGENTS WITH DMSO

Robert J. Herschler, Camas, Wash., assignor to Crown Zellerbach, San Francisco, Calif.

Division of Ser. No. 69,155, Sep. 2, 1970, Pat. No. 3,711,606, which is a continuation-in-part of Ser. No. 753,231, Aug. 16, 1968, Pat. No. 3,551,554, which is a continuation-in-part of Ser. No. 329,151, Dec. 9, 1963, abandoned. This application Nov. 6, 1972, Ser. No. 304,283
Int. Cl.[2] A61K *31/10, 37/40*
U.S. Cl. 424—238 **10 Claims**

1. A method of enhancing the penetration into and across an external membrane barrier of a human or animal subject to a physiologically active steroidal agent capable of eliciting a physiological effect upon topical application thereof, which comprises the concurrent topical administration to the external membrance of an amount of said steroidal agent effective to produce the desired physiological effect and an amount of DMSO sufficient to effectively enhance penetration of said steroidal agent to achieve the desired physiological effect.

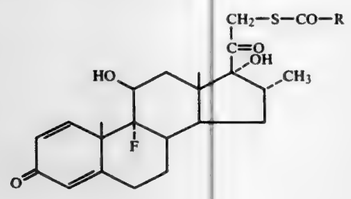
4,177,268

METHOD OF ALLEVIATING INFLAMMATION BY ADMINISTRATION OF DEXAMETHASONE DERIVATIVES

Dieran R. Torossian, Bourg-la-Reine; Gilbert G. Aubard, and Jacky M. Legeai, both of Palaiseau, all of France, assignors to Jouveinal S.A., Cachan, France

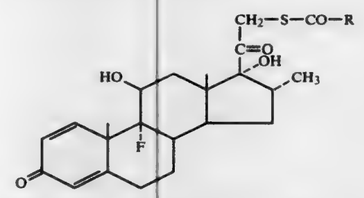
Continuation-in-part of Ser. No. 473,388, May 28, 1974, Pat. No. 4,014,909. This application Jan. 4, 1977, Ser. No. 756,601
Claims priority, application France, May 30, 1973, 73 19734
Int. Cl.[2] A61K *31/56;* **C07J** *7/00, 31/00*
U.S. Cl. 424—243 **18 Claims**

1. A method for the alleviation of inflammation without causing any noticeable systemic effect which comprises administering to a host a antiinflammatory-effective amount of a dexamethasone derivative of the formula



in which R represents an alkyl radical comprising a number of carbon atoms between 4 and 9 or a para-fluoro-phenyl radical.

15. A pharmaceutical composition comprising 0,005 to 5% of a dexamethasone derivative of the formula



in which R represents an alkylradical having from 4 to 9 carbon atoms or the para-fluoro phenyl radical, and an acceptable pharmaceutical carrier, this composition being presented in the form of a lotion, a spray, ear, ophtalmic or nasal drops, a mouthwash, injectable solutions, pastilles, ointments, creams, oral or rectal suspensions, and the like.

18. The 21-p-fluoro-thio-benzoate of dexamethasone.

4,177,269

NOVEL 17-ESTERS OF 17α-HYDROXY GESTOGENS, COMPOSITIONS CONTAINING SUCH COMPOUNDS, PROCESSES FOR THEIR PREPARATION AND METHODS OF TREATMENT THEREWITH

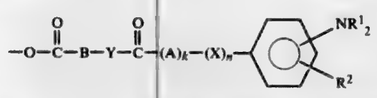
Hans Fex; Bertil Hansen, both of Helsingborg; Krister Holmberg, Angelholm; Bertil Högberg, and Imre Könyves, both of Helsingborg, all of Sweden, assignors to Aktiebolaget Leo, Sweden

Filed Jan. 17, 1977, Ser. No. 760,152
Claims priority, application United Kingdom, Jan. 22, 1976, 02419/76
Int. Cl.[2] A61K *31/56*
U.S. Cl. 424—243 **18 Claims**

1. Novel compounds having the general formula

St—R

wherein R is



where R^1 is a β- or γ-halogensubstituted alkyl group having 2 to 4 carbon atoms, the halogen being chlorine or bromine;
where R^2 is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, and halogen;
where A is a straight hydrocarbon chain having at most 4 carbon atoms and being saturated or containing one double bond, at most 2 hydrogen atoms of A being replaced by lower alkyl and at most one of the hydrogen atoms situated at the carbon atom adjacent to a



group being replaced by a group selected from the group consisting of amino and lower alkanoylamino;
where B is a straight saturated hydrocarbon chain having at most 4 carbon atoms, at most 2 hydrogen atoms of B being replaced by lower alkyl;
where X and Y are independently selected from the group consisting of —O—, —NH, and —S—;

where k and n are independently selected from the group consisting of zero and one, n always being zero when k is zero; and
where St is the radical of a steroid having a cyclopentanophenanthrene carbon-carbon skeleton containing up to a maximum of 40 carbon atoms, inclusive of substituents, said carbon-carbon skeleton having a steroid nucleus selected from the group consisting of pregnane and 19-norpregnane nuclei, having up to a maximum of two double bonds, said steroid radical being attached at its 17-position to R, said position being identified according to steroid nomenclature, wherein said steroid radical St, has a nucleus selected from the group consisting of: pregn-4-ene-3,20-dione, pregna-4,6-diene-3,20-dione, and 19-norpregn-4-ene-3,20-dione nuclei; and
wherein any further substitution present in the carbon-carbon skeleton of said steroid nucleus of said steroid radical is at most a tetrasubstitution, where the positions of the steroid carbon-carbon skeleton which are substituted are selected from the positions consisting of 1-, 2-, 6-, and 16-positions, where the substitution, if any, comprises at least one substituent selected from the group consisting of methyl, methylene, fluoro, and chloro.

14. A pharmaceutical composition, comprising about 0.01 to about 75 weight percent of a compound of claim 1 and a pharmaceutical carrier.

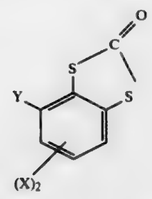
4,177,270

SOIL FUNGICIDAL (NITROGEN HETEROCYCLIC)-SUBSTITUTED-1,3-BENZODITHIOLE-2-ONES

Khalid Rasheed, Weslaco, and James D. Warkentin, McAllen, both of Tex., assignors to The Ansul Company, Marinette, Wis.

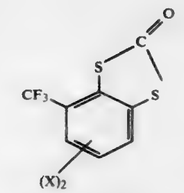
Division of Ser. No. 618,255, Sep. 30, 1975, Pat. No. 4,084,954. This application Dec. 14, 1977, Ser. No. 860,455
Int. Cl.[2] A01N *9/22;* **C07D** *265/30*
U.S. Cl. 424—248.51 **9 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein Y is selected from nitro and trifluoromethyl; each X independently is selected from alkyl and alkenyl of up to six carbon atoms, nitro, trichloromethyl, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, trifluoromethylsulfoxyl, trifluoromethylsulfonyl, methoxymethyl, cyano, carboxy, carbamyl, halogen (F, Cl, Br, I), hydroxy, acetylamino, amino, N-phenylamino, N,N-diallylamino, alkoxy, dimethylaminodithiocarbamyl, carboalkoxy, alkylthio, mono- and dialkylamino, N-alkylcarbamyl, N,N-dialkylcarbamyl, alkylsulfoxy, alkylsulfonyl, N-morpholino, N-piperidino, N-piperazino or N-pyrrolidino, said alkyl and alkoxy groups containing from 1 to 4 carbon atoms, wherein at least one of said X groups is selected from N-morpholino, N-piperidino, N-piperazino or N-pyrrolidino; and a salt thereof.

6. A method of treating soil fungi associated with growing plants to beneficially enhance the growth and/or yield-potential of said growing plants which comprises applying a soil fungicidally active amount of a compound selected from the group consisting of those of the formula:



wherein each X independently is selected from alkyl and alkenyl of up to six carbon atoms, nitro, trichloromethyl, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, trifluoromethylsulfoxyl, trifluoromethylsulfonyl, methoxymethyl, cyano, carboxy, carbamyl, halogen (F, Cl, Br, I), hydroxy, acetylamino, amino, N-phenylamino, N,N-diallylamino, alkoxy, dimethylaminodithiocarbamyl, carboalkoxy, alkylthio, mono- and dialkylamino, N-alkylcarbamyl, N,N-dialkylcarbamyl, alkylsulfoxy, alkylsulfonyl, N-morpholino, N-piperidino, N-piperazino, N-pyrrolidino, said alkyl and alkoxy groups containing from 1 to 4 carbon atoms, wherein at least one of said X groups is selected from N-morpholino, N-piperidino, N-piperazino or N-pyrrolidino; and salts thereof, at a rate of from 0.25 to 40.0 lbs. a.i./acre.

4,177,271

HYDROXY- AND OXO-SUBSTITUTED α-BENZYLIDENYLCYCLOALKANES

Francois M. J. Vallet, Paris, France, assignor to Unicler, Paris, France

Filed Jul. 25, 1978, Ser. No. 927,777
Claims priority, application France, Aug. 4, 1977, 77 24062
Int. Cl.[2] C07D *317/48, 407/08*
U.S. Cl. 424—248.57 **4 Claims**

1. 2-piperonylidene-6-morpholinomethylcyclohexanol.
2. 2-piperonylidene-6-methylcyclohexanol.

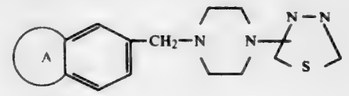
4,177,272

DISUBSTITUTED PIPERAZINES

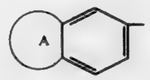
Gilbert Regnier, Chatenay-Malabry; Roger Canevari, Elancourt; Michel Laubie, Vaucresson, and Jean-Claude Poignant, Bures sur Yvette, all of France, assignors to Science Union et Cie, Suresnes, France

Filed Dec. 27, 1977, Ser. No. 864,204
Claims priority, application United Kingdom, Dec. 31, 1976, 54398/76
Int. Cl.[2] A61K *31/50;* **C07D** *417/14*
U.S. Cl. 424—250 **7 Claims**

1. A compound of the formula



wherein the group



is selected from the group consisting of naphthyl, benzo [b] furanyl, benzo [b] thienyl, benzodioxolyl, benzodioxanyl, benzodioxacycloheptanyl, coumaranyl, chromanyl, Δ^3-chromenyl, thiochromanyl and Δ^3-thiochromenyl.

6. A pharmaceutical composition for treating peripheral vascular disorders or Parkinson's disease containing as active ingredient an effective amount of a compound of claim 1, together with a suitable pharmaceutically acceptable carrier.

4,177,273

6-(SUBSTITUTED PHENYL)-4,5-DIHYDRO-PYRIDAZIN-3(2H)-ONES

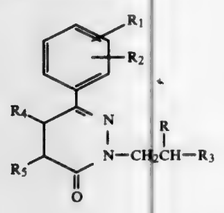
Gregory B. Bennett, Mendham, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 768,558, Feb. 14, 1977, abandoned. This application Jun. 14, 1978, Ser. No. 915,549

Int. Cl.[2] C07D *237/04*; A61K *31/50*

U.S. Cl. 424—250 **14 Claims**

1. A compound of the formula



where

R is lower alkyl having 1 to 4 carbon atoms and

R_1 and R_2 each independently represent hydrogen, fluorine, chlorine, lower alkyl having 1 to 4 carbon atoms, lower alkoxy having 1 to 4 carbon atoms, amino, nitro or trifluoromethyl,

R_3 is hydrogen, hydroxy or lower alkanoyloxy having 2 to 5 carbon atoms,

R_4 is hydrogen or lower alkyl having 1 to 4 carbon atoms; and

R_5 is hydroxy or lower alkanoyl having 2 to 5 carbon atoms, provided (a) that when both R_1 and R_2 represent trifluoromethyl or tert-butyl they are on other than adjacent carbon atoms; (b) that when R_1 is nitro, R_2 is hydrogen or nitro; (c) that when R_3 is hydrogen, R_5 is hydroxy; and (d) that when R_3 is alkanoyloxy, R_5 is lower alkanoyl having the same number of carbon atoms as R_3.

12. A pharmaceutical composition useful as a minor tranquilizer, anti-convulsant, and muscle relaxant comprising a minor tranquilizer, anti-convulsant, and muscle relaxant effective amount of a compound according to claim 1 and a pharmaceutically acceptable carrier therefore.

4,177,274

SUBSTITUTED IMIDAZO [1,2-A] PYRIDINES

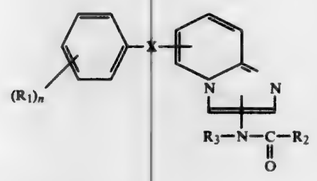
Richard J. Bochis, East Brunswick, and Peter Kulsa, Plainfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 718,652, Aug. 26, 1976, Pat. No. 4,096,264, Continuation-in-part of Ser. No. 639,034, Dec. 9, 1975, abandoned. This application Jun. 5, 1978, Ser. No. 912,594

Int. Cl.[2] C07D *471/04*; A61K *31/44*

U.S. Cl. 424—256 **11 Claims**

1. A compound having the formula:



(I)

wherein:

X is oxygen;

R_1 is halogen, trifluoromethyl, loweralkyl, loweralkoxy, loweralkoxycarbonyl, loweralkylthio, loweralkylsulfinyl, loweralkylsulfonyl, loweralkanoyl, hydroxy, sulfonamido, mono- or di-loweralkylsulfonamido, amino, mono- or di-loweralklyamino, carboxy, carboxamido, mono- and di-loweralkylcarboxamido, loweralkanolyloxy, loweralkoxycarbonylamino, loweralkanoylamino, cyano or nitro;

n is 1 or 2, such that when n is 2, the two R_1 groups need not be identical;

R_2 is loweralkyl or loweralkoxy; and

R_3 is hydrogen, loweralkyl, loweralkenyl, or loweralkyl substituted with loweralkoxy, loweralkoxycarbonyl, carboxy, loweralkylthio, loweralkylsulfinyl, loweralkylsulfonyl, amino and mono- or di-loweralklylamino, phenyl, halophenyl, or loweralkoxyphenyl.

10. An anthelmintic composition which comprises a pharmaceutically acceptable inert carrier and an effective amount of a compound having the formula:

(I)

wherein

X is oxygen,

R_1 is halogen, trifluoromethyl, loweralkyl, loweralkoxy, loweralkoxycarbonyl, loweralkylthio, loweralkylsulfinyl, loweralkylsulfonyl, loweralkanoyl, hydroxy, sulfonamido, mono- or di-loweralkylsulfonamido, amino, mono- or di-loweralkylamino, carboxy, carboxamido, mono- and di-loweralkylcarboxamido, loweralkanoyloxy, loweralkoxycarbonylamino, loweralkanoylamino, cyano or nitro;

n is 1 or 2, such that when n is 2, the two R_1 groups need not be identical;

R_2 is loweralkyl or loweralkoxy; and

R_3 is hydrogen, loweralkyl, loweralkenyl, or loweralkyl substituted with loweralkoxy, loweralkoxy carbonyl, carboxy, loweralkylthio, loweralkylsulfinyl, loweralkylsulfonyl, amino and mono- or di-loweralkylamino, phenyl, halophenyl, or loweralkoxyphenyl.

4,177,275

TENSION REDUCING 2,3,4,4a,9,13b-HEXAHYDRO-1H-DIBENZO[b,f] PYRIDO[3,4-d]AZEPINE DERIVATIVES

Willem J. van der Burg, Heesch, Netherlands, assignor to Akzona Inc., Asheville, N.C.

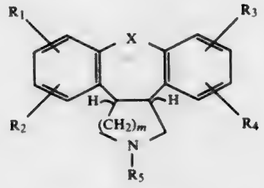
Division of Ser. No. 798,222, May 18, 1977, Pat. No. 4,145,434. This application Jun. 26, 1978, Ser. No. 918,883

Claims priority, application Netherlands, May 24, 1976, 7605526

Int. Cl.[2] A61K *31/445*; C07D *471/04*

U.S. Cl. 424—256 **28 Claims**

28. Method of reducing tension in humans, comprising administering to a human a tension-reducing amount of a compound of the formula:



or a pharmaceutically acceptable non-toxic salt or nitrogen oxide thereof;

wherein:

R_1, R_2, R_3, and R_4 represent a member selected from the group consisting of hydrogen, hydroxy, halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6 alkylthio, and trifluoromethyl;

R_5 represents hydrogen, C_1–C_6 alkyl or aralkyl having from 7 to 10 carbon atoms;

X represents



wherein R_6 is a hydrogen or C_1–C_6 alkyl; and

m represents the number 2.

4,177,276

SUBSTITUTED 2-VINYL-CHROMONES AND PROCESS FOR THEIR PREPARATION

Gianfederico Doria, Milan; Ciriaco Romeo, Serino; Francesco Lauria, Milan; Maria L. Corno, Milan; Piernicola Giraldi, Milan, and Marcello Tibolla, Canale d'Agordo, all of Italy, assignors to Farmitalia Carlo Erba, S.p.A., Milan, Italy

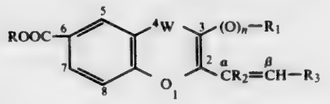
Division of Ser. No. 803,947, Jun. 6, 1977. This application Jul. 24, 1978, Ser. No. 927,594

Claims priority, application Italy, Jun. 16, 1976, 24356 A/76; Jan. 12, 1977, 19193 A/77

Int. Cl.[2] C07D *401/06*

U.S. Cl. 424—263 **8 Claims**

1. A compound of formula



(I)

wherein

n is zero;

R is hydrogen or C_1–C_{12} alkyl, unsubstituted or substituted by a C_2–C_5 alkanoyloxy or by a



group, wherein each of R_4 and R_5 is independently selected from the group consisting of hydrogen and C_1–C_{10} alkyl;

R_1 is C_2–C_4 alkyl or C_3–C_4 alkenyl;

R_2 is hydrogen or methyl;

R_3 is pyridyl, unsubstituted or substituted by a methyl group;

W is >C=O or >C=S, and a pharmaceutically acceptable salt thereof.

4,177,277

METHOD FOR ALLEVIATING HYPERTENSION

Miguel A. Ondetti, Princeton, and Michael E. Condon, Lawrenceville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 846,738, Oct. 31, 1977, Pat. No. 4,146,611, which is a continuation-in-part of Ser. No. 759,685, Jan. 17, 1977, Pat. No. 4,113,715. This application Sep. 15, 1978, Ser. No. 942,563

Int. Cl.[2] C01F *17/00*

U.S. Cl. 424—263 **14 Claims**

1. A method for alleviating hypertension in hypertensive mammals which comprises administering an effective dose of a compound having the formula

or salt thereof,

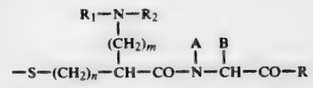
wherein

R is hydroxy or lower alkoxy

R_1 is hydrogen, lower alkanoyl or amino(imino)methyl;

R_2 is hydrogen, lower alkyl or phenyl-lower alkylene;

R_3 is hydrogen, lower alkanoyl, benzoyl or



A is hydrogen, lower alkyl or hydroxy-lower alkylene;

B is hydrogen, lower alkyl, phenyl, phenyl-lower alkylene, hydroxy-lower alkylene, hydroxyphenyl-lower alkylene, amino-lower alkylene, guanidino-lower alkylene, imidazolyl-lower alkylene, indolyl-lower alkylene, mercapto-lower alkylene, lower alkylthio-lower alkylene, carbamoyl-lower alkylene or carboxy lower alkylene; or A and B together form a $(CH_2)_p$ bridge which completes an unsubstituted ring of 5 or 6 atoms with the nitrogen and carbon to which they are joined or said ring substituted with a hydroxy group;

m is 1, 2, 3 or 4;

n is 0 or 1; and

p is 3 or 4.

4,177,278

2-ALKYLENEAMINODIHYDROPYRIDINES COMPOUNDS, THEIR PRODUCTION AND THEIR MEDICINAL USE

Friedrich Bossert, Wuppertal; Egbert Wehinger, Velbert; Arend Heise, Wuppertal; Stanislav Kazda, Wuppertal; Kurt Stoepel, Wuppertal; Robertson Towart, Wuppertal; Wulf Vater, Leverkusen, and Klaus Schlossmann, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

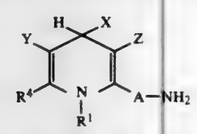
Filed Mar. 15, 1978, Ser. No. 886,971

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1977, 2715182; Sep. 6, 1977, 2740080

Int. Cl.[2] **C07D** *213/55;* **A61K** *31/44*

U.S. Cl. 424—266 **17 Claims**

1. A 2-Alkleneaminodihydropyridine of the general formula or pharmaceutically acceptable salts thereof



(I)

in which R^1 is hydrogen, alkyl having from 1 to 4 carbon atoms, alkoxyalkyl having a total of from 2 to 4 carbon atoms or aralkyl having 6 to 10 carbon atoms in the aryl moiety and 1 to 4 carbon atoms in the alkyl moiety

A is a straight-chain or branched divalent alkylene radical, having 1 to 4 carbon atoms,

Y and Z are the same or different and each is

(a) a grouping $COOR^2$,

wherein

R^2 is alkyl, alkenyl, alkinyl, alkoxyalkyl, hydroxyalkyl, aminoalkyl, alkylaminoalkyl, alkylaminoaralkyl or aralkyl, wherein each of the alkyl groups and moieties have 1 to 4 carbon atoms, each of said alkenyl and alkinyl groups have 2 to 6 carbon atoms and each of said aralkyl groups and moieties have 6 to 10 carbon atoms;

R^4 is hydrogen, or alkyl having 1 to 4 carbon atoms, optionally substituted by alkoxy having 1 to 4 carbon atoms, or is a radical $A—NH_2$, wherein A has the same meaning as defined hereinbefore, and

X is phenyl or naphthyl optionally substituted by from one to two identical or different substituents each of which is halogen, nitro, cyano, trifluoromethyl, amino, alkoxy having from 1 to 4 carbon atoms, or alkylmercapto having from 1 to 4 carbon atoms.

4,177,279

1-[(3-INDOLYL)-ALKYL]-PIPERIDYL UREAS AND HYPOTENSIVE COMPOSITIONS

John L. Archibald, Windsor, and John L. Jackson, Royston, both of England, assignors to John Wyeth & Brother Ltd., Taplow, England

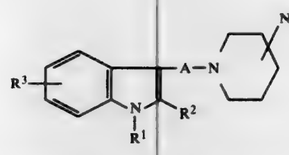
Continuation-in-part of Ser. No. 511,415, Oct. 2, 1974, abandoned. This application Jul. 21, 1975, Ser. No. 597,841

Claims priority, application United Kingdom, Oct. 10, 1973, 47208/73; Jan. 25, 1974, 03531/74; Feb. 18, 1974, 07277/74

Int. Cl.[2] **A61K** *31/445;* **C07D** *401/06*

U.S. Cl. 424—267 **18 Claims**

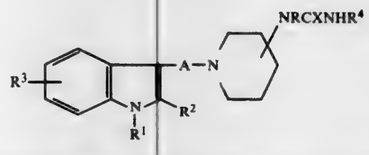
1. A compound of general formula I



I

and pharmaceutically acceptable acid addition and quaternary ammonium salts thereof, wherein R represents hydrogen or lower alkyl, R^1 represents hydrogen or lower alkyl, R^2 represents hydrogen or lower alkyl, R^3 represents hydrogen, halogen, lower alkoxy, hydroxy, or lower alkyl, R^4 represents hydrogen, lower alkyl, cycloalkyl of 5 to 7 carbon atoms, thienyl, furyl, phenyl; phenyl mono- or disubstituted by halogen, lower alkyl, lower alkoxy, hydroxy or trifluoromethyl; or benzoyl, halobenzoyl, lower alkanoyl, cycloalkanoyl of 6 to 8 carbon atoms, or thienoyl, A represents an alkylene radical having from 1 to 5 carbon atoms and X is oxygen or sulphur.

17. A pharmaceutical composition for use in treatment of the cardiovascular system which comprises a hypotensive amount of a compound of the formula:



and pharmaceutically acceptable acid addition and quaternary ammonium salts thereof, wherein R represents hydrogen or lower alkyl, R^1 represents hydrogen or lower alkyl, R^2 represents hydrogen or lower alkyl, R^3 represents hydrogen, halogen, lower alkoxy, hydroxy, or lower alkyl, R^4 represents hydrogen, lower alkyl, cycloalkyl of 5 to 7 carbon atoms, thienyl, furyl, phenyl; phenyl mono- or disubstituted by halogen, lower alkyl, lower alkoxy, hydroxy or trifluoromethyl; or benzoyl, halobenzoyl, lower alkanoyl, cycloalkanoyl of 6 to 8 carbon atoms, or thieno A represents an alkylene radical having from 1 to 5 carbon atoms and X is oxygen or s and a pharmaceutically acceptable carrier.

4,177,280

BICYCLO[3.1.0]HEXYL-SUBSTITUTED CARBONYLAMINOPHENOXY CARDIOVASCULAR AGENTS

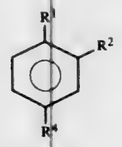
Karl G. Untch; Belig Berkoz, both of Los Altos, and Stefan H. Unger, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 3, 1978, Ser. No. 921,371

Int. Cl.[2] **C07C** *103/19, 127/15;* **A61K** *31/42, 31/17*

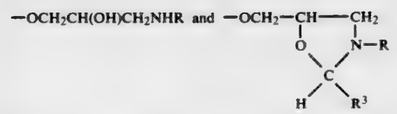
U.S. Cl. 424—272 **61 Claims**

1. A compound of the formula

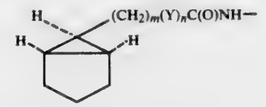


(I)

wherein R^1 is selected from the group



and R is C_1 to C_4 linear or branched alkyl; R^2 is selected from the group hydrogen, halo, nitrile, C_1 to C_2 alkyl, C_1 to C_2 alkoxy, acetyl and propanoyl; R^3 is hydrogen, C_1 to C_4 linear or branched alkyl or C_6 to C_{10} carbocyclic aryl optionally substituted with halo, C_1 to C_4 linear or branched alkyl, C_1 to C_4 linear or branched alkoxy, C_2 to C_4 linear or branched acyl, C_1 to C_4 linear or branched carboalkoxy, nitrile or nitro; and R^4 is the group



where Y is the radical



where R^5 is hydrogen or C_1 to C_4 linear or branched alkyl, n is the integer 0 or 1 and m is the integer 1 to 4 and pharmaceutically acceptable salts thereof.

21. A pharmaceutical composition for treating cardiovascular disorders in mammals by blocking the beta-adrenergic receptor sites, consisting essentially of a pharmaceutically acceptable carrier and an amount effective to block said beta-adrenergic receptor sites of an agent selected from the group of compounds of claim 1 and mixtures thereof.

4,177,281

THERAPEUTIC TREATMENT FOR MEASLES VIRAL INFECTION

James B. Mercer, 13109 W. 95th St., Lenexa, Kans. 66215

Continuation-in-part of Ser. No. 656,336, Feb. 9, 1976, Pat. No. 4,073,928. This application Feb. 10, 1978, Ser. No. 876,618

Int. Cl.[2] **A61K** *31/415*

U.S. Cl. 424—273 R **4 Claims**

1. A method for treating a human host having a measles infection comprising:

(a) repeatedly orally administering anti-measles infection effective amounts of a pharmaceutical composition which contains, as an active ingredient, 1-(β-hydroxethyl)-2-methyl-5-nitromidazole to a human host in need of said treatment.

4,177,282

HYDANTOIN THERAPEUTIC AGENTS

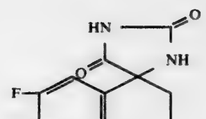
Reinhard Sarges, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 799,586, May 23, 1977, Pat. No. 4,130,714. This application Aug. 22, 1978, Ser. No. 935,979

Int. Cl.[2] **A61K** *31/415*

U.S. Cl. 424—273 R **3 Claims**

1. A method of treating a diabetic host to prevent or alleviate ocular or neuritic diabetes-associated chronic complications, which comprises administering to said diabetic host an alleviating or prophylactically effective amount of a compound selected from the group consisting of the dextrorotatory isomers of asymmetric spirohydantoins of the formula:



and the base salts thereof with pharmacologically acceptable cations, where Y is oxygen or sulfur.

4,177,283

AROMATIC PROSTAGLANDIN ANALOGUES

Frederick Cassidy, Harlow, and Gordon Wootton, Sawbridgeworth, both of England, assignors to Beecham Group Limited, England

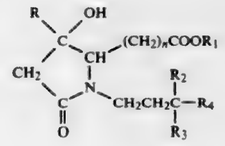
Division of Ser. No. 732,726, Oct. 15, 1976, Pat. No. 4,138,407. This application May 5, 1978, Ser. No. 903,143

Claims priority, application United Kingdom, Oct. 25, 1975, 43990/75; May 22, 1976, 21278/76

Int. Cl.[2] **C07D** *207/26;* **A61K** *31/40*

U.S. Cl. 424—274 **18 Claims**

1. A compound of the formula:



wherein

n has a value of from 4 to 8;

R is hydrogen or alkyl of 1 to 4 carbon atoms;

R_1 is hydrogen, alkyl of 1 to 12 carbon atoms, phenyl, benzyl or toluyl;

R_3 is hydroxy, alkanoyloxy of 1 to 4 carbon atoms or benzyloxy;

R_2, when taken independently of R_4, is hydrogen or alkyl of 1 to 9 carbon atoms; and

R_4 is cycloalkyl of 5 to 8 carbon atoms, phenyl, naphthyl or alkyl of 1 to 6 carbon atoms substituted with cycloalkyl of 5 to 8 carbon atoms, phenyl or naphthyl, said phenyl and naphthyl being unsubstituted or substituted with from one to three members selected from the group consisting of halo, trifluoromethyl, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms and nitro; or

R_2 and R_4 together with the carbon atom to which they attached are cycloalkylidene of 5 to 8 carbon atoms, and the pharmaceutically acceptable salts thereof when R_1 is hydrogen.

17. A pharmaceutical composition having natural prostaglandin-like activity consisting essentially of a compound according to claim 1 in an effective amount for such activity and a pharmaceutically acceptable carrier.

4,177,284

2-SUBSTITUTED-3-METHYL-γ-PYRONE TRICVCLIC DERIVATIVES AND PROCESS THEREFOR

Adolf H. Philipp, St. Laurent, and Ivo L. Jirkovsky, Montreal, both of Canada, assignors to Ayerst McKenna & Harrison Ltd., Montreal, Canada

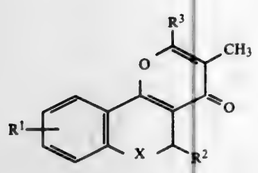
Filed Nov. 28, 1977, Ser. No. 855,538

Int. Cl.[2] **A61K** *31/38;* **C07D** *495/04*

U.S. Cl. 424—275 **15 Claims**

1. A compound of formula I

(I)



in which R^1 is hydrogen, halogen, nitro, trifluoromethyl, lower alkyl or lower alkoxy; R^2 is hydrogen or lower alkyl; R^3 is hydroxy, or $COOR^4$ wherein R^4 is hydrogen or lower alkyl, and X is S, SO or SO_2, or a therapeutically acceptable salt thereof.

4,177,285

[1-OXO-2-THIENYL-2-SUBSTITUTED-5-INDANYLOXY (OR THIO)]ALKANOIC ACIDS AND DERIVATIVES THEREOF

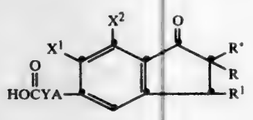
Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 585,434, Jun. 10, 1975, Pat. No. 4,096,267, which is a continuation-in-part of Ser. No. 492,651, Jul. 30, 1974, abandoned, which is a continuation-in-part of Ser. No. 405,736, Oct. 11, 1973, abandoned. This application Mar. 23, 1978, Ser. No. 889,161

Int. Cl.[2] **A61K** *31/125;* **C07D** *333/10*

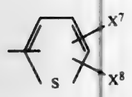
U.S. Cl. 424—275 **18 Claims**

5. A pharmaceutical composition useful in the treatment of edema and hypertension which also maintains uric acid at pretreatment levels or causes a decrease in uric acid levels which comprises a therapeutically effective amount of a compound of the formula:



wherein

R^o is



A is oxygen or sulphur;

R is lower alkyl, lower alkenyl, phenyl lower alkyl, phenyl lower alkenyl, phenyl, thienyl, cycloalkyl, or cycloalkyl lower alkyl;

R^1 is hydrogen, lower alkyl, or aryl; or

R^1 and R may be joined together to form a cycloalkylene;

Y is alkylene or haloalkylene containing from 1 to about 4 carbon atoms;

X^7 is hydrogen, lower alkyl or halogen;

X^8 is hydrogen or lower alkyl;

X^1 is hydrogen, halo or methyl;

X^2 is halo, methyl or trihalomethyl; or

X^1 and X^2 may be joined together to form a hydrocarbylene chain containing from 3 to about 4 carbon atoms;

and the non-toxic, pharmacologically acceptable salt, amide, anhydride, and ester derivatives thereof, and a pharmaceutically acceptable carrier.

4,177,286

SUBSTITUTED 2-VINYL-CHROMONES AND PROCESS FOR THEIR PREPARATION

Gianfederico Doria, Milan; Giriaco Romeo, Serino; Francesco Lauria, Milan; Maria L. Corno, Milan; Piernicola Giraldi, Milan, and Marcello Tibolla, Canale D'Agordo, all of Italy, assignors to Farmitalia Carlo Erba, S.p.A., Milan, Italy

Division of Ser. No. 803,947, Jun. 6, 1977. This application Jul. 24, 1978, Ser. No. 927,008

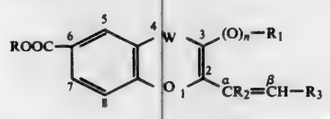
Claims priority, application Italy, Jun. 16, 1976, 24356 A/76; Jan. 12, 1977, 19193 A/77

Int. Cl.[2] **C07D** *407/06*

U.S. Cl. 424—283 **8 Claims**

1. A compound of formula

(I)



wherein

n is zero

R is hydrogen or C_1–C_{12} alkyl, unsubstituted or substituted by a C_2–C_5 alkanoyloxy or by a



group, wherein each of R_4 and R_5 is independently selected from the group consisting of hydrogen and C_1–C_{10} alkyl;

R_1 is C_2–C_4 alkyl or C_3–C_4 alkenyl;

R_2 is hydrogen or methyl;

R_3 is unsubstituted furyl

W is >C=O or >C=S, and a pharmaceutically acceptable salt thereof.

4,177,287

PHARMACEUTICAL COMPOSITIONS OF N_1-ACYL-N_2-PHENYLDIAMINOPROPANOLS AND PROCESS FOR THEIR PREPARATION

Hans Liepmann; Rolf Hueschens, both of Hanover; Wolfgang Milkowski, Burgdorf; Horst Zeugner; Henning Heinemann, both of Hanover; Klaus-Ulrich Wolf, Haenigsen; Insa Hell, and Reinhard Hempel, both of Hanover, all of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

Filed Apr. 28, 1978, Ser. No. 900,973

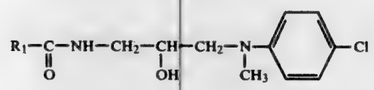
Claims priority, application Fed. Rep. of Germany, May 10, 1977, 2720908

Int. Cl.[2] **A61K** *31/34, 31/165*

U.S. Cl. 424—285 **16 Claims**

1. A pharmaceutical composition in dosage-unit-form for oral administration comprising an ulcus-inhibiting effective amount of from about 50 to about 150 mg per single dosage-unit of at least one pharmacologically active compound selected from the group of N_1-acyl-N_2-(4-chlorophenyl)-1,3-diaminopropan-2-ols, having the formula

(I)



wherein R_1 represents 3,4-dimethoxyphenyl, 2-fluorophenyl, 2-trifluoromethylphenyl, or furyl, and pharmaceutically acceptable acid addition salts thereof, and a pharmaceutically acceptable diluent.

4,177,288

COMPOSITION FOR CONTROLLING FUNGI

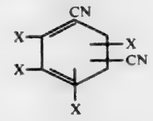
Arthur F. Gohlke, Atlanta, Ga., assignor to Cities Service Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 798,725, May 19, 1977, abandoned. This application Aug. 28, 1978, Ser. No. 937,392

Int. Cl.[2] **A01N** *9/02*

U.S. Cl. 424—294 **7 Claims**

1. A fungicide composition comprising, in combination, from about 19 wt % to about 50 wt % of a halogenated aromatic dinitrile having the structure



wherein each X is selected from the group consisting of hydrogen, chlorine, fluorine and bromine with at least one X being other than hydrogen; from about 19 wt % to about 50 wt % of copper salts of fatty and rosin acids, from about 0.05 wt % to about 15 wt % surfactant, and from about 2 wt % to about 60 wt % carrier, said copper salts comprising from about 20 wt % to about 30 wt % copper oleate, from about 15 wt % to about 25 wt % copper linoleate, from about 45 wt % to about 55 wt % copper abietate, from 1 wt % to about 2 wt % copper palmitate and copper stearate.

4,177,289

PESTICIDAL USE OF N-CHLOROCROTYL ACYL COMPOSITIONS

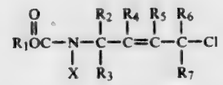
Francis A. Daniher, Ann Arbor, Mich., and Alexis A. Oswald, Mountainside, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 579,455, May 21, 1975, Pat. No. 4,146,557, which is a continuation-in-part of Ser. No. 688,308, Dec. 6, 1967, Pat. No. 3,884,963. This application Apr. 24, 1978, Ser. No. 899,079

Int. Cl.[2] **A01N** *9/20*

U.S. Cl. 424—300 **11 Claims**

1. A method of controlling soil fungi comprising applying to soil containing said fungi an effective quantity of a fungicide composition of the formula



wherein R_2 to R_7 are selected from the group consisting of hydrogen, chlorine, fluorine and alkyl groups having from 1 to 30 carbon atoms, R_1 is selected from the group consisting of C_1 to C_{30} alkyl or substituted alkyl wherein the substituents are selected from the group consisting of halo and nitro and X is selected from the group consisting of hydrogen and chlorine.

4,177,290

ACETAMIDE DERIVATIVES

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, Maisons Alfort, France

Filed Mar. 9, 1978, Ser. No. 885,009

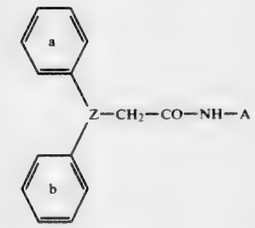
Claims priority, application United Kingdom, Mar. 31, 1977, 13579/77

Int. Cl.[2] **A61K** *31/165;* **C07C** *103/22, 103/82, 103/76*

U.S. Cl. 424—324 **6 Claims**

1. An acetamide derivative selected from the compounds of formula I

(I)



wherein ring a and ring b are each substituted zero, one or more times by substituents selected from the group consisting of fluoro, chloro, bromo, trifluoromethyl, nitro, amino, alkyl of 1 to 4 carbon atoms, inclusive, alkoxy of 1 to 4 carbon atoms, inclusive, and methylenedioxy; wherein Z is the radical >CHSO—; and wherein A is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms, inclusive, hydroxyalkyl of 1 to 4 carbon atoms, inclusive, and a group of formula R_1R_2N—Y—wherein Y is a divalent linear or branched chain hydrocarbon radical having 1 to 4 carbon atoms, inclusive, in the chain, and R_1 and R_2, being the same or different, are selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms, inclusive; and addition salts of the compounds wherein A is a basic group.

5. A pharamaceutical composition having activity on the central nervous system and consisting of, as an essential active ingredient, an active amount of a compound of claim 1.

4,177,291

COMPOUNDS HAVING ANTIDEPRESSIVE ACTIVITY

Ulf H. A. Lindberg; Svante B. Ross, both of Södertälje; Seth O. Thorberg, Järna, and Sven O. Ögren, Södertälje, all of Sweden, assignors to Astra Lakemedel Aktiebolag, Södertälje, Sweden

Filed Aug. 23, 1977, Ser. No. 827,085

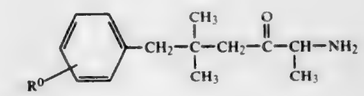
Claims priority, application Sweden, Aug. 25, 1976, 7609385

Int. Cl.[2] **A01N** *9/20, 9/24;* **C07C** *97/10*

U.S. Cl. 424—330 **15 Claims**

1. A compound of the general formula

(I)



or a pharmaceutically acceptable acid addition salt thereof, in which formula the group R^o is selected from the group consist-

ing of hydrogen, chlorine, bromine, methyl, trifluoromethyl and methoxy.

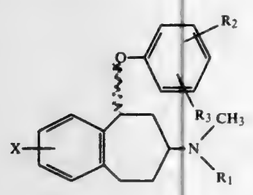
4,177,292

NOVEL 5H-BENZOCYCLOHEPTEN-7-AMINES

Lucien Nedelec, Le Raincy; Daniel Frechet, Paris; Claude Dumont, Nogent-sur-Marne, and Peter Hunt, Gonesse, all of France, assignors to Roussel Uclaf, Paris, France

Filed Nov. 13, 1978, Ser. No. 959,943
Claims priority, application France, Nov. 18, 1977, 77 34738
Int. Cl.[2] A61K *31/135;* **C07C** *91/16, 91/28, 91/40*
U.S. Cl. 424—330 **26 Claims**

1. A compound of the formula



wherein R_1 is selected from the group consisting of hydrogen and methyl, R_2 and R_3 are individually selected from the group consisting of hydrogen, fluorine, chlorine, bromine, nitro, amino, $-CF_3$ and methoxy, X is selected from the group consisting of hydrogen and halogen and their non-toxic, pharmaceutically acceptable acid addition salts and the wavy line indicates that the substituent in the 5 position may be in the cis or trans form.

4,177,293

PROCESS OF MANUFACTURE OF A BUTTER SPREAD

Ladislav Formán; Zdenek Pech, both of Prague, and Václav Vondrúska, Liberec, all of Czechoslovakia, assignors to Mlekarensky prumysl, generalni reditelstvi, Prague, Czechoslovakia

Filed Nov. 15, 1978, Ser. No. 960,787
Int. Cl.[2] A23C *9/12*
U.S. Cl. 426—43 **13 Claims**

1. Process for the manufacture of a butter-spread comprising the steps of forming a mixture of sweet cream and a thickening agent selected from the group consisting of dried milk, protein concentrates and mixtures thereof, pasteurizing said mixture, cooling the pasteurized mixture, adding a clean milk culture, submitting the cooled mixture to a first homogenizing step at temperatures between about 20° C. and 30° C. and pressures between about 10 to 25 MPa, and maturing the mixture until it is acidified to a degree between about 68° to 112° Dornic, adding a foodstuff water stabilizer in amount between about 0.5 to 5% by weight, submitting the mixture to a second homogenizing step at temperatures between about 65° C. and 80° C. and at a pressure of about 5 MPa, cooling the second homogenized mixture to at least about 10° C. to further cure the butterspread.

4,177,294

AQUEOUS CLEANING CONCENTRATE FOR THE CLEANING OF FOODSTUFF

Hans-Jüergen Lehmann, Mettmann; Rolf Bietz, Monheim, and Jüergen Wegner, Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Oct. 3, 1978, Ser. No. 948,221
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1977, 2745371
Int. Cl.[2] A23L *3/34*
U.S. Cl. 426—271 **8 Claims**

1. An aqueous concentrate for the cleansing of foodstuffs of animal or vegetable origin, consisting of:
(a) from 0.1% to 10% by weight of water-soluble to water-dispersible proteins,
(b) from 0.01% to 3% by weight of water-soluble polymers having a molecular weight of at least 10,000,
(c) from 1% to 15% by weight of a water-soluble sequestering agent,
(d) from 0.01% to 1% by weight of water-soluble food preservatives,
(e) from 0 to 0.5% by weight of food colors and food odorants, and
(f) the remainder to 100%, water.

4,177,295

METHOD FOR STABILIZING COLLOIDAL AND TASTE QUALITIES OF BEVERAGES

Vladimir Kubánek, Kralupy n. Vlt.; Gabriela Bassařová, Prague; Jaroslav Králiček, Prague; Josef Skach, Prague; Zdenek Fencl, Prague; Jiří Budin, Sezimovo Usti; Jaroslava Kondelikovä, Prague, and Eduard Sittler, Sezimovo Usti, all of Czechoslovakia, assignors to Vysoka skola chemicko-technologicka, Prague, Czechoslovakia

Filed Apr. 20, 1978, Ser. No. 898,413
Int. Cl.[2] A23L *1/26*
U.S. Cl. 426—330.3 **13 Claims**

1. Method for stabilizing the colloidal and taste qualities of beverages evidencing turbidity precursors and enzymes which comprises the steps of:
(a) contacting the beverage with an organic polymer selected from the group consisting of polyethylene terephthalate, isophthalic acid modified polyethylene terephthalate, and a mixture of polyethylene terephthalate and polybutylene terephthalate and at a temperature ranging from 28.4° to 176° F., in an amount sufficient to reduce the concentration of cloudiness precursors and undesirable enzymes and
(b) separating the polymer from said beverage.

4,177,296

PROCESS FOR THE PREPARATION OF PEANUT-CURD

Keizo Mochizuki, and Iwao Hachiya, both of Kawasaki, Japan, assignors to Meiji Seika Co., Ltd., Tokyo, Japan

Filed Jul. 17, 1978, Ser. No. 925,240
Int. Cl.[2] A23L *1/01, 1/20*
U.S. Cl. 426—632 **10 Claims**

1. A process for the preparation of peanut-curd, which comprises the steps of roasting raw peanuts with the red skin intact for 60 to 15 minutes at a temperature of from 110° C. to 120° C., removing the red skin pressing the deskinned peanuts to partially remove peanut oil therefrom in an amount of from 10 to 30% by weight of the roasted peanuts, pulverizing the pressed peanuts to about 325 mesh (ASTM) at a temperature of −40° C. or below, dissolving the pulverized peanuts in from 5 to 8.5 parts by weight of water per part of pulverized peanuts, the water being at a temperature ranging from 5° C. to 50° C., boiling the resulting mixture for 1 to 5 minutes, cooling the mixture to 70° C. to 80° C., and adding thereto a coagulant to solidify the cooled mixtureand thereby obtain peanut-curd.

4,177,297

MAGNETIC BUBBLE LATTICE DEVICE

Richard M. Josephs, Willow Grove, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

Continuation of Ser. No. 618,868, Oct. 2, 1975, abandoned. This application Feb. 4, 1977, Ser. No. 765,157
Int. Cl.[2] H01F *10/02*
U.S. Cl. 427—38 **9 Claims**



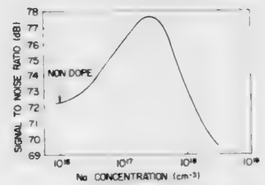
1. The method of fabricating magnetic domain wall structures of a bubble lattice and stabilizing same comprising:
a. forming a non-magnetic substrate material having a preferred crystallagraphic axis;
b. tilting said substrate by an angle with respect to said preferred crystallographic axis;
c. depositing a magnetic bubble material on said tilted substrate; said material incorporating more than two bubble types wherein each has different said magnetic domain wall structures,
d. implanting ions into the surface of said magnetic bubble material
e. to provide two stable said domain wall types in the bubble lattice to define different binary information;
f. said two domain wall types being stabilized without use of an external in-plane field.

4,177,298

METHOD FOR PRODUCING AN INSB THIN FILM ELEMENT

Junji Shigeta, Fuchu; Tetsu Oi, Tokyo; Nobuo Kotera, Kokubunji; Muneyasu Nakashima, Tokyo, and Nobuo Miyamoto, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 20, 1978, Ser. No. 888,465
Claims priority, application Japan, Mar. 22, 1977, 52/30328; Mar. 25, 1977, 52/32189
Int. Cl.[2] H01L *21/22, 21/203, 21/205*
U.S. Cl. 427—85 **24 Claims**



1. A method for producing an InSb thin film element, comprising the step of forming by an evaporation method an InSb polycrystalline thin film having a thickness of 0.1 μm–3 μm on a predetermined substrate, the step of subjecting said thin film to zone melting to melt and recrystallize the InSb polycrystalline thin film at a temperature above the melting point of InSb, and then the step of holding a diffusion source in contact with said thin film, said diffusion source comprising at least one substance containing at least one element selected from the group consisting of Cu, Au, Ag, Zn, Na, K, Cd, B, Li, Ca, Fe, Mg, Ba, Al and Pb, and heating said thin film at a temperature below the melting point of InSb so as to dope the thin film with said at least one element to have a dopant concentration of not greater than 1×10^{18} cm^{-3}, whereby a thin film element having a high signal-to-noise ratio is formed.

4,177,299

ALUMINUM OR ALUMINUM ALLOY ARTICLE AND PROCESS

Harald Severus, Schaffhausen, and Horst Birkmaier, Neuhausen am Rheinfall, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation-in-part of Ser. No. 872,751, Jan. 27, 1978, abandoned. This application Jul. 12, 1978, Ser. No. 923,825
Int. Cl.[2] B32B *15/20;* **C23F** *5/04*
U.S. Cl. 427—287 **14 Claims**

1. An object made out of aluminum or aluminun alloys in a form such as foil, sheet and containers for use in preparing colored articles by a thermal transfer printing process, said object having an oxide layer produced by anodic oxidation wherein the oxide layer is 5 to 25 μm thick, exhibits a crack-free elongation of at least 0.65 parts per thousand in the non-sealed condition and the ratio of crack-free elongation of the oxide in the non-sealed condition to the crack-free elongation in the colored and non-sealed condition lies between 1:1.2 and 1:5.5.

8. In a thermal transfer printing process for coloring a shaped article of aluminum or aluminum alloys, the step of coloring said article by a thermal transfer printing method, wherein said article has an oxide layer produced by anodic oxidation wherein the oxide layer is 5 to 25 μm thick, exhibits a crack-free elongation of at least 0.65 parts per thousand in the non-sealed condition and the ratio of the crack-free elongation of the oxide in the non-sealed condition to the crack-free elongation in the colored and non-sealed condition lies between 1:1.2 and 1:5.5.

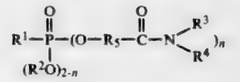
4,177,300

PHOSPHONOXYCARBOXAMIDE FLAME RETARDING COMPOSITIONS

Edward N. Walsh, New City, and Ralph B. Fearing, Bardonia, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 837,072, Sep. 28, 1977. This application May 12, 1978, Ser. No. 905,307
Int. Cl.[2] C07F *9/11, 9/40*
U.S. Cl. 427—390 D **7 Claims**

1. A flame-retardant composition comprising:
(1) at least one compound represented by the formula:



wherein R^1 and R^2 are selected from the group consisting of aryl and alkyl having from 1–6 carbon atoms and may be the same or different; R^3 represents hydrogen or $-CH_2OH$; R^4 represents hydrogen, $-CH_3$, $-CH_2OH$, or $-C_2H_4OH$, R^5 represents an alkyl group having 1–5 carbon atoms and n represents 1 or 2;
(2) an aminoplast; and
(3) an acid catalyst.

4,177,301
PRIMER COMPOSITIONS FOR ADHERING SILICONE COMPOSITIONS

Alfred H. Smith, Jr., Ballston Lake, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 736,381, Jan. 28, 1977. This application Dec. 22, 1977, Ser. No. 863,118
Int. Cl.² B05D *1/36, 7/02*
U.S. Cl. 427—401 **8 Claims**

1. A method for adhering silicone compositions to plastic substrates comprising (a) applying to said substrate a layer of (1) the reaction product of a reaction mixture of an alkyl acrylate or alkyl methacrylate where the alkyl group can be methyl or butyl and mixtures thereof and of an acrylate silane of the formula,

$$X\ Si\ Y_3$$

in an organic solvent where X is selected from the class consisting of

$$CH_2=CHCOO(CH_2)_3-$$

and

$$CH_2=C(CH_3)COO(CH_2)_3-$$

and Y is a hydrolyzable radical wherein there is present prior to reaction from 1 to 12 mols of said methacrylate per mole of said silane, and (2) a silane of the formula, X Si Y_3 where X and Y are as specified above, and (b) covering said layer with a silicone composition.

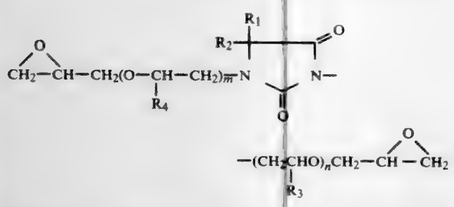
4,177,302
TOP COAT COMPOSITION TO IMPROVE MARINE ANTIFOULING PERFORMANCE

Jonas Weiss, Portchester, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 30, 1978, Ser. No. 910,256
Int. Cl.² B32B *27/38*; B63B *9/00*
U.S. Cl. 427—407 C **8 Claims**

1. An improved process for controlling the rate of leaching of toxicant from a marine antifouling paint by applying on the surface of the paint an incompletely cured topcoat and allowing it to cure thereon, wherein the improvement comprises the topcoat being derived from an ambient-temperature curing system which comprises

(1) a diglycidyl derivative of 5,5-dilower-alkylhydantoins which have the following formula



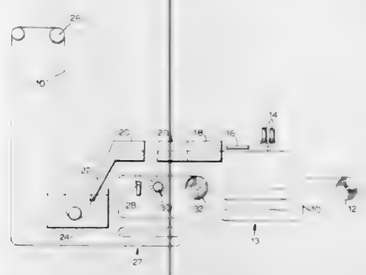
in which R_1 and R_2 each denote a lower alkyl residue having 1 to 4 carbon atoms, R_3 and R_4 each denote a hydrogen atom or a lower alkyl residue having 1 to 2 carbon atoms and n and m each represent an integer from 0 to 4, which is soluble in or dispersible in water.

(2) a polyamidoamine, which is dispersible in water, in a stoichiometry of 0.8 to 1.2 equivalents of amine per epoxide equivalent.

4,177,303
METHOD OF GALVANIZING A PORTION ONLY OF A FERROUS METAL ARTICLE

Robert H. Clipston, Hamilton; Emerson O. Hall, Burlington, and Hon-Hei F. Ng, Hamilton, all of Canada, assignors to Dominion Foundries and Steel, Limited, Hamilton, Canada

Continuation-in-part of Ser. No. 789,828, Apr. 22, 1977, abandoned. This application Jul. 13, 1978, Ser. No. 924,297
Int. Cl.² B05D *1/18, 1/38*
U.S. Cl. 427—259 **25 Claims**



1. A method of galvanizing a portion only of a ferrous metal article, including the steps of:

applying to the portion of the article that is not to be galvanized a suspension comprising a liquid suspending vehicle consisting of water and from 5 to 20% by weight of the suspension of the hydrated form of magnesium silicate known as talc suspended in the water and drying the suspension to form a dried coating on the said portion that will prevent the adhesion of molten zinc to the said coated portion,

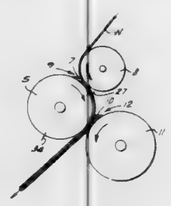
galvanizing the uncoated portion of the article by dipping in a bath of molten zinc, and

removng the coating from the article.

4,177,304
METHOD OF COATING BOTH SIDES OF A TRAVELLING WEB

Kenneth W. Berry, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Division of Ser. No. 778,506, Mar. 17, 1977, Pat. No. 4,108,110. This application Jan. 10, 1978, Ser. No. 868,396
Int. Cl.² B05D *1/18*
U.S. Cl. 427—434 R **6 Claims**



1. A method of puddle coating both sides of a travelling web, comprising:

forming a first puddle of coating material in generally upwardly directed trough at the upper side of a first nip of a first horizontal roll and a second horizontal roll;

forming a second puddle of coating material below said first nip in a generally upwardly directed trough at the upper side of a second nip formed by said second roll and a third roll;

running one side of a continuously travelling web in firm engagement directly with the perimeter of said first roll through said first puddle and said first nip and thereby coating the opposite side of said web in said first puddle while protecting said one side against the coating material of the first puddle by running of the one face in said engagement with the perimeter of said first roll;

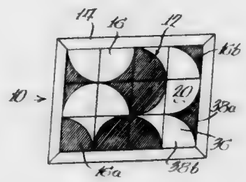
below said first nip running said coated opposite side of the web in direct engagement with the perimeter of said second roll and through said second puddle and said second nip and thereby exposing the uncoated side of the web to the coating material in said second puddle and maintaining the coated side of the web in said running engagement with said third roll and thereby protecting said coated side of the web from the coating material in said second puddle;

and preventing migration of coating material via the opposite ends of said second roll from either of said puddles to the other of said puddles.

4,177,305
WALL HANGING

David A. Feingold, and Susan R. Feingold, both of 2111 Glen Flora, Waukegan, Ill. 60085

Filed Aug. 7, 1978, Ser. No. 931,426
Int. Cl.² B44F *11/04*
U.S. Cl. 428—13 **22 Claims**



1. A wall hanging, comprising:

a selectively variable picture having a plurality of movable tile means positioned generally adjacent each other in a longitudinal and lateral array, said tile means having complementary configurations and being interchangeable;

each tile means having a single thin walled viewable picture surface facing generally forward with a peripheral edge and having a thin walled skirt extending generally rearwardly from said periphery edge, said thin walled skirt having a rearward edge and a rearward dimension defining the thickness of said tile means;

said viewable picture surface being generally planar and spanning a distance substantially greater than the thickness of said tile means and defining a geometric center;

at least one eccentric image positioned generally adjacent said viewable picture surface at a location geometrically offset and spaced from said geometric center;

each of said tile means being movable for selectively varying the position of said eccentric image to attain a different picture;

said thin walled skirt cooperating with said viewable picture surface for defining a rearwardly facing socket positioned generally rearwardly of said viewable picture surface, said socket having a minimum cross-sectional area slightly less than the maximum surface area of said viewable picture surface and having a lateral shape and configuration substantially similar to the shape and configuration of said viewable picture surface;

said thin walled skirt and said thin walled viewable surface having wall thicknesses substantially less than the minimum distance across said socket for minimizing the weight and amount of material needed to fabricate said tile means;

picture support means generally covered by and positioned rearwardly of said selectively variable picture for supporting said selectively variable picture on a wall, said picture support means having a generally planar backing surface positioned generally parallel to said viewable picture surfaces for supportingly engaging said rearward edges of said tile means and having a plurality of complementary configured pegs having a configuration generally complementary and similar to said tile means, said pegs extending forwardly from said backing surface generally towards said viewable picture surfaces and aligned in registration with said sockets for matingly engaging said tile means;

each of said pegs having a front surface and side wall means extending between and connecting said front surface to said backing surface, said side wall means engaging said skirt and extending forwardly a sufficient distance to position said front surface closely adjacent said viewable picture surface;

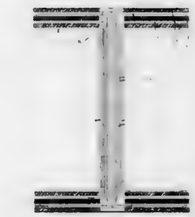
said front surface being generally planar and spanning a distance substantially greater than said forward distance of said side wall means, and said front surface being positioned generally parallel to and rearwardly of said viewable picture surface; and

frame means connected to and extending outwardly of said picture support means for decoratively surrounding and containing said selectively variable picture.

4,177,306
LAMINATED SECTIONAL GIRDER OF FIBER-REINFORCED MATERIALS

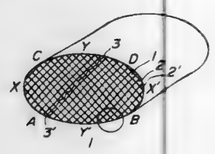
Ralf-Thilo Schulz, Putzbrunn; Klaus Brunsch, Weidach, and Ludwig Lemmer, Ottobrunn, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Fed. Rep. of Germany

Filed May 12, 1977, Ser. No. 796,414
Claims priority, application Fed. Rep. of Germany, May 19, 1976, 2622163
Int. Cl.² B32B *5/12, 7/00*
U.S. Cl. 428—107 **11 Claims**



1. In a longitudinal laminated construction girder consisting of at least one web portion and at least one flange portion, said web and flange portions extending transversely to each other, with each being formed of a plurality of layers, each of said layers consisting essentially of a fiber reinforced structure formed of thermosetting-resin-impregnated fibers, the improvement comprising: that both said web and flange portions are each structured to consist of at least three of said layers; that said layers include at least two connecting layers which extend through both said web and flange portions; that said connecting layers are constructed with crossing fiber applications which include fibers extending at an angle transversely to the longitudinal direction of said girder; and that said at least one flange portion includes at least one flange layer which extends exclusively through said flange portion and is located between said at least two connecting layers extending through said flange portion; said at least one flange layer being structured to include unidirectional fiber applications which extend parallel to said longitudinal direction of said girder.

4,177,307
THERMAL SHOCK RESISTANT CERAMIC HONEYCOMB STRUCTURES
Yukio Torii, Mons, Belgium, and Takao Nakamura, Nagoya, Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan
Filed Mar. 6, 1978, Ser. No. 883,948
Claims priority, application Japan, Mar. 12, 1977, 52-27173
Int. Cl.² B32B *3/12*
U.S. Cl. 428—116 **7 Claims**



1. Thermal shock resistant ceramic honeycomb structures in which the shape of a multiplicity of parallel channels extending therethrough is quadrilateral and the outer periphery shape of the vertical cross-section of said honeycomb is an ellipse having an X-axis along its long diameter and a Y-axis along its short diameter, the honeycomb having first and second groups of parallel partitions forming the quadrilateral channel, said first group of partitions being inclined at an angle of more than 10° against the X-axis, said second group of partitions being parallel to or inclined against the Y-axis.

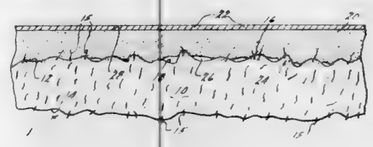
4,177,308
NON-COMBUSTIBLE HIGH TEMPERATURE ABRADABLE SEAL MATERIAL
David R. Beeler, Fairfield, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Aug. 10, 1978, Ser. No. 932,814
Int. Cl.² C04B *21/00*
U.S. Cl. 428—117 **11 Claims**

1. A sealant composition for jet engines, said composition being in the form of a syntactic foam and comprising a major amount of aluminum phosphate and a minor amount of silica or glass microballoons having a diameter of about 10 to 300 microns.

4,177,309
DRY TRANSFER MATERIALS
Philip Shadbolt, and Helen Ganszczyk, both of London, England, assignors to Letraset USA Inc., Bergenfield, N.J.
Filed Oct. 26, 1977, Ser. No. 845,608
Claims priority, application United Kingdom, Nov. 5, 1976, 46262/76
Int. Cl.² B32B *7/14*
U.S. Cl. 428—195 **13 Claims**

1. In a dry transfer material consisting essentially of a flexible light transmitting carrier sheet, a plurality of transferable indicia on the carrier sheet and a coating of adhesive substance on the indicia and overlapping on to the surface of the carrier sheet, the improvement wherein the adhesive substance contains dry transfer adhesive components and a detackifying wax containing polar groups prior to being deposited on said indicia and said adhesive is deposited on to said indicia and overlapping on to said carrier sheet from a solution or dispersion in at least one organic solvent the concentration of the wax and the nature of the indicia being such that on the deposition of the adhesive composition from the solution or dispersion in at least one organic solvent and drying down of the adhesive by the evaporation thereof an interaction occurs between the adhesive and the indicia whereby the surface tack of the adhesive over the indicia is greater than the surface tack of the adhesive on the carrier between the indicia.

4,177,310
METHOD OF METALLIZING PAPER
Robert W. Steeves, Nahant, Mass., assignor to King Seeley Thermos Company, Winchester, Mass.
Filed Jul. 27, 1978, Ser. No. 928,587
Int. Cl.² B05D *3/06*
U.S. Cl. 428—216 **19 Claims**



1. The process of metallizing paper comprising the steps of:
(A) coating a surface of a paper substrate with a solventless thin film consisting essentially of a radiation curable resin precursor;
(B) immediately contacting said film with electron radiation sufficient to cure said precursor before said precursor has penetrated into said paper substrate a distance sufficient to cause detrimental stiffening thereof; and
(C) metallizing the exposed surface of said film.

15. A metallized paper product comprising a paper substrate with a smooth continuous, cured, coherent resin film on one side thereof, said film having limited penetration into the paper substrate, being substantially entirely within the adjacent quarter of the paper cross-section thickness, and further comprising fibrous matter of the paper substrate intermixed in said resin coating up to 25 percent thereof, the outer surface of said resin being overcoated with metal of less than 1/100th thickness of the said resin film.

4,177,311
COMPOSITE FABRIC
John B. Smith, Thornhill; Peter W. Bell, Sanquhar; David S. Queen, Sanquhar, and John Mitchell, Sanquhar, all of England, assignors to Sidlaw Industries Limited, Dundee, Great Britain
Filed Nov. 29, 1978, Ser. No. 964,513
Claims priority, application United Kingdom, Nov. 30, 1977, 49947/77
Int. Cl.² B32B *7/00*
U.S. Cl. 428—246 **6 Claims**

1. A composite fabric comprising a layer of pile-forming material bonded to a substrate material by an interlayer of substantially air-free plastics material having a density in the range 0.9 to 1.5 gm/cc, wherein the substrate material is formed by deaerated plastics material having a weight in the range 0–6.5 kg/sq. meter (0–12 lbs/sq. yard) with a layer of fibrous material embedded therein.

4,177,312
MATTING ARTICLE
Alfred Rasen; Rolf Vollbrecht, and Klemens Schenesse, all of Obernburg, Fed. Rep. of Germany, assignors to Akzona Inc., Asheville, N.C.
Filed May 8, 1978, Ser. No. 903,552
Int. Cl.² B32B *7/00*
U.S. Cl. 428—284 **10 Claims**

1. A coherently self-bonded, low density matting article comprising:
(a) a primary matting layer consisting essentially of a plurality of continuous melt-spun synthetic polymer filaments of a diameter of about 0.1 to 1.5 mm. laid in overlapping rows of irregularly looped and intermingled filaments to form a peak and valley three-dimensional sheet structure undulating in the longitudinal and/or transverse directions of the matting, the individual filaments in said structure being self-bonded at random points of intersection to provide a transverse strength per unit of surface weight of at least 2 Nm/g, said primary layer having a thickness of about 5 to 70 mm and a surface weight per unit thickness of less than 50,000 g/m^3; and

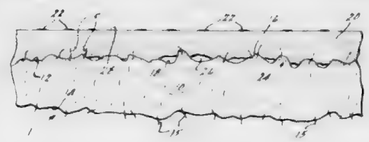


(b) a secondary footing layer consisting essentially of a substantially flat, thin nonwoven web of synthetic polymer filaments melt-spun as a separate surface sheet and then immediately applied onto one of the undulating faces of said primary matting layer while still tacky such that the freshly melt-spun surface filaments of the nonwoven web become bonded to part of the filaments of said primary matting layer at mutual points of intersection, said footing layer having a substantially lower porosity than said primary matting layer.

4,177,313
AMINE-MODIFIED LIGNOSULFONATE-EXTENDED PHENOL FORMALDEHYDE RESINS
Pierre C. Herault, Decatur, Ga., assignor to Georgia-Pacific Corporation, Portland, Oreg.
Filed Nov. 28, 1978, Ser. No. 964,291
Int. Cl.² C08L *97/00;* **C08H** *5/02*
U.S. Cl. 428—288 **15 Claims**

1. A resin binder composition comprising an aqueous solution of a phenol-formaldehyde resole resin and from about 40 to about 100% by weight based on phenol-formaldehyde resin solids of a water-soluble basic amine-modified lignosulfonate said modified lignosulfonate containing from about 2% to about 12% by weight of a water-soluble basic amine and from about 88 to about 98% by weight of a water-soluble lignosulfonate salt.

4,177,314
METHOD OF PRINTING PAPER
Robert W. Steeves, Nahant, Mass., assignor to King Seeley Thermos Company, Winchester, Mass.
Filed Oct. 25, 1978, Ser. No. 954,524
Int. Cl.² B05D *3/06*
U.S. Cl. 428—336 **14 Claims**



1. The process of printing a modified paper substrate comprising the steps of:
(A) coating a surface of a paper substrate with a thin film consisting essentially of a radiation curable resin precursor;
(B) immediately contacting said film with electron radiation sufficient to cure said precursor before said precursor has penetrated into said paper substrate a distance sufficient to cause detrimental stiffening thereof; and
(C) printing on the exposed surface of said film.

11. A printed paper product comprising a paper substrate with a smooth continuous, coherent resin film on one side thereof, said film having limited penetration into the paper substrate, being substantially entirely within the adjacent quarter of the paper cross-section thickness, and further comprising fibrous matter of the paper substrate intermixed in said resin film up to 25 percent thereof, at least portions of the outer surface of said resin film being overcoated with ink.

4,177,315
COATED POLYMERIC SUBSTRATES
Richard W. Ubersax, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 774,425, Mar. 4, 1977, abandoned. This application Jun. 16, 1978, Ser. No. 916,845
Int. Cl.² C08J *3/02;* **C08L** *83/04;* **B32B** *5/16*
U.S. Cl. 428—336 **4 Claims**

1. A polymeric film substrate coated to a thickness of about from 1 to 20 microns with a rapidly curing composition comprising
(a) about from 5 to 50 weight percent solids, the solids comprising about from 10 to 70 weight percent silica and about from 90 to 30 weight percent of a partially polymerized organic silanol of the general formula $RSi(OH)_3$, wherein R is selected from methyl and up to about 40% of a radical selected from the group consisting of vinyl, phenyl, γ-glycidoxypropyl, and γ-methacryloxypropyl, and
(b) about from 95 to 50 weight percent solvent, the solvent comprising about from 10 to 90 weight percent water and about from 90 to 10 weight percent lower aliphatic alcohol,
the coating composition having a pH of about from 6.2 to 6.5.

2. A coated article of claim 1 wherein the substrate consists essentially of polyethylene terephthalate.

4,177,316
IMPREGNATED CARBON BRUSH FOR ELECTRICAL MACHINERY
Winfried Diegelmann, Heuchelheim; Günter Schardt, Giessen; Jochen Klatt, Krofdorf-Gleiberg, and Heinz Grölz, Staufenberg, all of Fed. Rep. of Germany, assignors to Schunk & Ebe GmbH, Postfach, Fed. Rep. of Germany
Filed Aug. 25, 1977, Ser. No. 827,612
Int. Cl.² H01R *39/22;* **B05D** *5/12;* **H01R** *39/26*
U.S. Cl. 428—367 **6 Claims**

1. An impregnated carbon brush for electrical machinery for improved running properties and increased wear-resistance, said carbon brush having an impregnating medium selected from the group of a non-melting grease, a non-melting wax, and a non-flowing oil; said impregnating medium being obtained by thoroughly mixing a medium selected from a group of grease, wax and oil with montmorillonite flakes having surfaces coated with long-chain hydrocarbons, and thereby being converted to a non-melting or non-flowing condition.

4,177,317
STABILIZATION OF CHROMIUM DIOXIDE MAGNETIC PIGMENTS
Eduard Schoenafinger, Ludwigshafen; Paul Deigner, Weisenheim; Eberhard Koester; Manfred Ohlinger, both of Frankenthal; Dieter Schaefer; Werner Stumpfl, both of Ludwigshafen; Juergen Amort, Troisdorf; Claus-Dietrich Seiler, Rheinfelden; Heinz Nestler, Troisdorf, and Otto Ambros, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany
Continuation of Ser. No. 640,574, Dec. 15, 1975, abandoned. This application May 20, 1977, Ser. No. 801,162
Int. Cl.² H01F *10/02*
U.S. Cl. 428—405 **8 Claims**

1. A process for stabilizing a chromium dioxide magnetic pigment against the loss of its magnetic properties, wherein the chromium dioxide pigment in particle form, suspended in an

alcoholic, aqueous-alcoholic or aqueous medium, is treated with a solution in the said medium of a monomeric silane of the formula

$$R_nSi(OR')_{4-n}$$

where R is an organic radical of 1 to 18 carbon atoms, R' is an aliphatic organic radical of 1 to 8 carbon atoms and n is an integer from 1 to 3, the pH of the suspension being brought to from 2 to 6 or 7.5 to 9.5 and the silanes are hydrolyzed in the presence of the suspended chromium dioxide pigment, so that after isolating the chromium dioxide pigment from the alcoholic, aqueous-alcoholic or aqueous medium, the surfaces of the chromium dioxide particles bear hydrolyzed silane, and the treated chromium dioxide pigment is dried at from about 50° to 200° C.

4,177,318

SPECTROSCOPY

Ernald V. Williams, Llanelli, Wales, assignor to British Steel Corporation, London, England

Filed Jul. 25, 1977, Ser. No. 818,712

Claims priority, application United Kingdom, Aug. 2, 1976, 32120/76; Aug. 13, 1976, 33811/76

Int. Cl.[2] B32B *9/04;* **B05B** *5/12*

U.S. Cl. 428—408 **16 Claims**

1. A graphite electrode for use in spectrospopic analysis in which at least the region of the electrode intended for contact with the material to be analysed has a layer comprising the heat reaction product of graphite with a salt of a refractory metal selected from the group consisting of zirconium vanadium, molybdenum, and lanthanum and a salt of an alkali earth metal.

4,177,319

GLASS FOR THE PRODUCTION OF OPTICAL ELEMENTS WITH REFRACTIVE INDEX GRADIENTS

Walter Jahn, Ingelheim, Fed. Rep. of Germany, assignor to JENAer Glaswerk Schott & Gen., Mainz, Fed. Rep. of Germany

Filed Nov. 7, 1978, Ser. No. 958,376

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1977, 2749683

Int. Cl.[2] C03C *21/00, 3/04*

U.S. Cl. 428—410 **6 Claims**

1. An optical quality glass composition suitable for the production of optical elements with a refractive index gradient delta n of at least 100×10^{-4} by utilizing an ion exchange, consisting essentially of the following synthesis composition, in % by weight:

SiO_2	56–78
MgO	6–15
Li_2O	5–14
Na_2O	3–14
K_2O	0– 9

wherein the total of MgO plus Li_2O is 12–23.

4,177,320

ARTICLE COATED WITH FLUOROCARBON POLYMER

Tatsushiro Yoshimura, Takatsuki; Mutsusuke Namba, Settsu; Seisuke Suzue; Shigetake Tominaga, both of Ibaraki; Toshio Mizuno, Settsu, and Nariyoshi Hayashida, Kyoto, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Dec. 6, 1977, Ser. No. 858,063

Claims priority, application Japan, Dec. 10, 1976, 51/148989; Dec. 11, 1976, 51/148937

Int. Cl.[2] B32B *27/28, 27/18, 27/08*

U.S. Cl. 428—419 **8 Claims**

1. A coated article comprising:
a substrate;
an undercoat formed over said substrate and containing a polyarylene sulfide resin;
a primer coat formed over said undercoat and containing a binder and a fluorocarbon polymer; and a fluorocarbon polymer topcoat.

4,177,321

SINGLE CRYSTAL OF SEMICONDUCTIVE MATERIAL ON CRYSTAL OF INSULATING MATERIAL

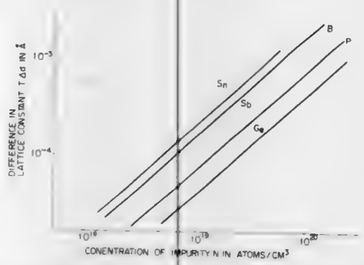
Jun-ichi Nishizawa, Sendai, Japan, assignor to Semiconductor Research Foundation, Japan

Continuation of Ser. No. 699,534, Jun. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 477,010, Jun. 6, 1974, abandoned. This application May 18, 1978, Ser. No. 907,290

Claims priority, application Japan, Jul. 25, 1972, 47-74483

Int. Cl.[2] H01L *21/20;* **B01J** *17/02*

U.S. Cl. 428—446 **9 Claims**



1. A grown crystal structure comprising: a spinel crystal having a lattice constant, a single crystal of semiconductive material having another lattice constant different from that of said spinel crystal and grown on said spinel crystal, said spinel crystal being selected from the group consisting of $MgO.nAl_2O_3$ where n is less than one or $MgO.Al_2O_3$ where the magnesium is present in stoichiometrically excessive amount, and means comprising at least a portion of said spinel crystal adjacent to said single crystal having a changed composition with respect to the remainder thereof for effectively reducing lattice strains developed in the grown crystal structure due to mismatch of the lattice constants between both said single and spinel crystals without adversely affecting the electrical characteristics of said single crystal of semiconductive material.

4,177,322

METHOD OF IMPROVING HIGH VOLTAGE INSULATING DEVICES

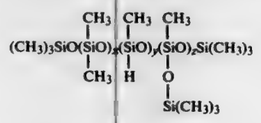
Gary R. Homan, and Chi-Long Lee, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 28, 1978, Ser. No. 901,053

Int. Cl.[2] B32B *9/04;* **H01B** *3/18, 3/46;* **B32B** *27/08*

U.S. Cl. 428—447 **17 Claims**

1. A method of improving an electrical insulating function of an outer surface of a solid electrical insulator wherein the improvement comprises coating the surface with a composition consisting essentially of of a general formula:



wherein x has an average value of at least 2; y and z each have an average value of 0 to 98; x plus y plus z is equal to a value of from 8 to 200 inclusive; y and z cannot be 0 simultaneously; when x, y, and z each have an average value greater than 0, a ratio of x to y to z is about 7 to 4 to 1; when y is 0 then the ratio of x to z is from 0.3/1 to 7/1 inclusive and x plus z has a value less than 100; and when z is 0 then the ratio of x to y is from 0.3/1 to 7/1 inclusive and x plus y has a value less than 100.

4,177,323

COATED METAL SHEET FOR USE IN PRODUCING A DRAWN AND IRONED CAN BODY

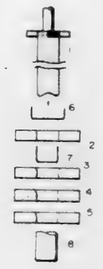
Tatsuro Obi, Tokyo; Teruo Koyama; Tadashi Tanaka, both of Yokahama, and Atsushi Hasegawa, Osaka, all of Japan, assignors to Nippon Steel Corporation and Sakuranomiya Chemical Co., Ltd., both of, Japan

Filed Dec. 27, 1978, Ser. No. 974,113

Claims priority, application Japan, Dec. 30, 1977, 52-160725

Int. Cl.[2] B32B *15/08*

U.S. Cl. 428—622 **9 Claims**



1. A coated metal sheet adapted for use as a drawn and ironed can body which comprises a metal sheet and a coating composition film completely cured on both of its surfaces or on one surface to be made the outer surface of a can body to be formed with dried film thickness of 2 to 10 μm, said coating composition comprising epoxy-phenolic resin containing (1) an acetal-type resin and (2) an olefin-type hydrocarbon having the chemical formula CnH_{2n} (n=31 to 38) admixed with $CnH_{2n}COOH$ having a molecular weight distribution of 1,000 to 5,000 which is added to the epoxy-phenolic resin in an amount of 0.5 to 2.0% by weight,

said epoxy-phenolic resin being prepared by condensing thermosetting type phenol resin with bisphenol-A-epoxy resin having mean molecular weight of 450 to 3700 at the weight ratio of 25:75 to 10:90,

said thermosetting-type phenol resin being prepared by condensing the mixture of meta-cresol and para-cresol at the weight ratio of 30:70 to 60:40 with formaldehyde in the presence of alkali catalyst.

4,177,324

HARD FACING OF METAL SUBSTRATES USING MATERIAL CONTAINING V, W, MO, C

Harry J. Brown, Lewiston, and Kuldip S. Chopra, Grand Island, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

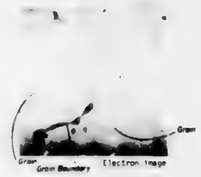
Filed Jun. 30, 1978, Ser. No. 920,827

Int. Cl.[2] B32B *15/16;* **C23C** *1/00*

U.S. Cl. 428—627 **2 Claims**

1. In a method for hard facing a surface of an iron or iron base alloy substrate by forming a bond between said surface and a hard-facing material, the improvement which comprises employing as hard-facing material solid particles consisting essentially of grains of vanadium carbide having in solid solution from about 10 to 50% by weight tungsten and about 1 to 4% by weight molybdenum and having about 1 to 4% by weight of binder metal between said grains, said binder metal consisting essentially of 90 to 99.98% nickel and 0.02 to 10% molybdenum.

2. A hard faced metal surface formed by providing molten iron or iron base alloy on a portion of an iron or iron base alloy metal substrate, applying to the molten metal a solid composition consisting essentially of grains of vanadium carbide having in solid solution from about 10 to 50% by weight tungsten and



about 1 to 4% by weight molybdenum and having about 1 to 4% by weight of binder metal between said grains, said binder metal consisting essentially of about 90 to 99.98% nickel and 0.02 to 10% molybdenum.

4,177,325

ALUMINIUM OR COPPER SUBSTRATE PANEL FOR SELECTIVE ABSORPTION OF SOLAR ENERGY

Marion L. Roberts; Max H. Sharpe, and Albert C. Krupnick, all of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 829,390, Aug. 31, 1977, Pat. No. 4,104,134. This application May 30, 1978, Ser. No. 910,793

Int. Cl.[2] B32B *15/20*

U.S. Cl. 428—629 **4 Claims**



1. A panel for selectively absorbing solar thermal energy comprising:
an aluminum substrate,
a layer of zinc carried on the substrate,
a layer of nickel on the zinc layer distal from the aluminum substrate, and
a deep blue, solar thermal energy absorbing layer of nickel oxide on the layer of nickel distal from the aluminum substrate, said nickel oxide layer having a thickness of about 400 to 1000 angstroms.

4,177,326

PROCESS FOR COATING STAINLESS STEEL WITH A LEAD-BASED ALLOY AND ARTICLE

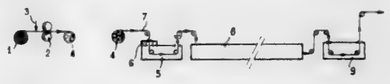
Bernard A. M. Windal, and Edmond Lobry, both of Solesmes, France, assignors to VALLOUREC Usines a Tubes de Lorraine-Escaut et Vallourec Reunies, Paris, France

Filed Dec. 16, 1977, Ser. No. 861,480

Claims priority, application France, Dec. 17, 1976, 76 38192

Int. Cl.[2] C23C *1/06*

U.S. Cl. 428—645 **8 Claims**



1. Process for manufacturing a strip of annealed stainless steel having a lead-based alloy coating, comprising
(a) mechanically preparing the surface of a stainless steel strip by cold rolling to remove oxide therefrom;

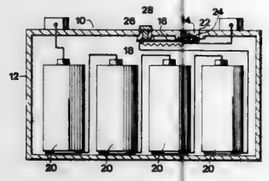
(b) pre-coating said strip in a lead-based alloy bath;
(c) heat treating the pre-coated strip by passing it through a second bath of the same alloy at an annealing temperature suifficient to render it deformable; and
(d) finally coating said strip by passing it through a third bath of the same alloy at a temperature lower than said annealing temperature.

4,177,327

METAL-AIR BATTERY HAVING ELECTRICALLY OPERATED AIR ACCESS VENT COVER

John P. Mathews, and Michael J. Smith, both of Mississauga, Canada, assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Nov. 20, 1978, Ser. No. 962,514
Int. Cl.[2] H01M *8/04*
U.S. Cl. 429—27 **10 Claims**



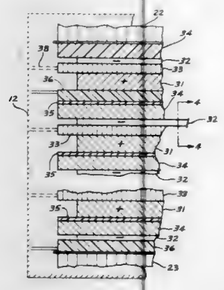
1. A battery case for a metal-air battery, said battery case having a vent and a vent cover therefor to permit gas communication to the interior of the battery case when said vent cover is open; said vent cover having an electrically operated actuator means and being movable upon the application of electrical power to said actuator means at least from a vent-closed to a vent-opened position; a source of electrical power for said electrically operated actuator means; and means for initiating the application of electrical power to said actuator means.

4,177,328

WALL WICK FOR NICKEL-HYDROGEN CELL

Howard H. Rogers, Culver City, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 19, 1978, Ser. No. 970,910
Int. Cl.[2] H01M *12/06*
U.S. Cl. 429—81 **3 Claims**



1. In an electrochemical cell having an electrode stack contained within the inside wall of a pressure vessel, the said electrode stack having at least a positive electrode, a negative electrode, electrolyte, and a separator, the improvement comprising:
a. a zirconium oxide based ceramic deposited on the said inside wall of the pressure vessel providing a wick for the said electrolyte; and
b. means for placing the said separator in capillary communication with the said ceramic wick whereby electrolyte is returned from the pressure vessel walls to the electrode stack.

4,177,329

ELECTROLYTE SALTS FOR NON AQUEOUS ELECTROCHEMICAL CELLS

Arabinda N. Dey, Needham; John S. Miller, Charlestown, both of Mass., and William L. Bowden, Nashua, N.H., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Nov. 2, 1978, Ser. No. 956,833
Int. Cl.[2] H01M *6/14*
U.S. Cl. 429—101 **9 Claims**

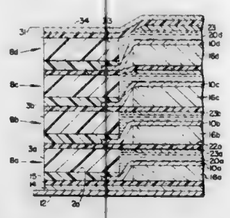
1. A non-aqueous electrochemical cell comprising an anode, comprised of one or more metals above hydrogen in the EMF series, a cathode depolarizer and a dissolved electrolyte salt characterized in that the electrolyte salt has the formula $M(ZX_4)_n$ wherein "M" is selected from the group consisting of alkali and alkaline earth metals, "Z" is selected from the group consisting of gallium, indium and thallium, "X" is selected from the group consisting of chlorine, bromine, iodine, fluorine and mixtures thereof, and "n" is 1 when "M" is an alkali metal and "n" is 2 when "M" is an alkaline earth metal.

4,177,330

LAMINAR BATTERIES AND METHODS OF MAKING THE SAME

Michael E. Gordon, Wayland, and Frank Stieger, Newton Highlands, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 852,919, Nov. 18, 1977, abandoned. This application Oct. 13, 1978, Ser. No. 951,122
Int. Cl.[2] H01M *6/46*
U.S. Cl. 429—152 **6 Claims**



1. A laminar battery comprising cells chemically isolated and electrically connected in series by conductive plastic intercell connectors and terminated by conductive plastic current collectors, and provided by liquid impervious seals formed by frames, one for each cell, having central openings to receive the wet cell components and placed between and sealed to confronting borders of the conductive plastic current collectors and intercell connectors, in which said frames each comprise at least first and second opposite surface layers essentially parallel to said conductive plastic intercell connectors and current collectors and formed of first and second different thermoplastic thermally activatable adhesive materials, said first layer being thermally activatable at a substantially lower temperature than said second layer.

4,177,331

SULFONE-CROSSLINKED POLYSTYRENE ION EXCHANGE RESIN AND PROCESS OF MANUFACTURE

David R. Amick, Chalfont, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Jul. 24, 1978, Ser. No. 927,224
Int. Cl.[2] C08G *75/20*; C08F *8/34*
U.S. Cl. 521—33 **4 Claims**

1. A process for producing sulfone-crosslinked ion exchange resin beads exhibiting high solids content when saturated with water which comprises reacting linear polystyrene beads with a sulfonating reagent mixture comprising either (1) a mixture of chlorosulfonic acid and sulfur trioxide or (2) a mixture of boron oxide or boric acid
and one or more reagents selected from sulfuric acid, chlorosulfonic acid and sulfur trioxide,
said sulfonating reagent mixture being used in excess of stoichiometric requirements.

4,177,332

1,1,1-TRIFLUORO-2-CHLOROETHANE AS BLOWING AGENT FOR POLYURETHANE FOAM

Karl-Heinz Mitschke, Odenthal; Hans Niederprüm, Monheim, and Manfred Kapps, Berg.-Gladb., all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 8, 1978, Ser. No. 932,056
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1977, 2738719
Int. Cl.[2] C08G *18/14*
U.S. Cl. 521—98 **4 Claims**

1. In the production of a foamed synthetic material by the reaction of starting materials which undergo a polymerization reaction to produce a high molecular weight synthetic material in the presence of a blowing agent or by foaming an unfoamed thermoplastic synthetic material by means of a blowing agent, the improvement which comprises employing 1,1,1-trifluoro-2-chloroethane as the blowing agent.

4,177,333

CATALYSTS FOR POLYIMIDE FOAMS FROM AROMATIC ISOCYANATES AND AROMATIC DIANHYDRIDES

Salvatore R. Riccitiello; Paul M. Sawko, both of San Jose, and Carlos A. Estrella, Santa Clara, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 24, 1978, Ser. No. 883,961
Int. Cl.[2] C08G *18/14, 18/30, 18/22, 18/24*
U.S. Cl. 521—124 **7 Claims**

1. A process for the preparation of polyimide foams comprising heating in the liquid phase and at a temperature within the range of about 190° C. to 300° C., a reaction mixture consisting essentially of an aromatic polyisocyanate with an aromatic polycarboxylic acid dianhydride, and a catalytic quantity of a metallic salt of octoic acid, the proportions of dianhydride and polyisocyanate ranging from about stoichiometry to a 10% weight excess of polyisocyanate.

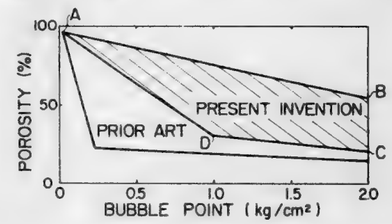
4,177,334

MICROPOROUS TUBES

Koichi Okita, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 12, 1977, Ser. No. 832,267
Claims priority, application Japan, Sep. 13, 1976, 51/110536
Int. Cl.[2] C08J *9/24*
U.S. Cl. 521—145 **5 Claims**

1. A microporous tube composed of a porous polytetrafluoroethylene resin comprising nodules linked to one another by fine filaments prepared by molding a polytetrafluoroethylene resin containing a liquid lubricating agent by a paste method to form a tube, removing said liquid lubricating agent, stretching by drawing said tube in a lengthwise direction using a die and a plug, and sintering at a temperature of about 327° C. or more,



said microporous tube (a) having a porosity and a bubble point in a range between the points A, B, C and D in FIG. 1 and defined in the following table:

	porosity	bubble point
A	96%	0.02 kg/cm^2
B	54%	2.0 kg/cm^2
C	20%	2.0 kg/cm^2
D	30%	1.0 kg/cm^2

and (b) having a ratio of wall thickness to inside diameter of about 0.1 or less.

4,177,335

PROCESS FOR PREPARING A POLYURETHANE FOAM FROM AN OXYALKYLATED PRODUCT

Arthur L. Austin, Southgate; William W. Levis, Jr., Wyandotte; Louis C. Pizzini, Trenton, and Robert J. Hartman, Southgate, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation of Ser. No. 824,279, Aug. 15, 1977, Pat. No. 4,105,597, which is a division of Ser. No. 590,332, Jun. 25, 1975, Pat. No. 4,097,399, and Ser. No. 590,333, Jun. 25, 1975, Pat. No. 4,052,345, which is a division of Ser. No. 425,524, Dec. 17, 1973, Pat. No. 3,957,922. This application Apr. 14, 1978, Ser. No. 896,496
The portion of the term of this patent subsequent to Oct. 4, 1994, has been disclaimed.
Int. Cl.[2] C08G *18/14*
U.S. Cl. 521—171 **2 Claims**

1. A process for preparing a polyurethane foam which comprises mixing and reacting
(1) providing a mixture containing
(a) a phenol, at least in an amount sufficient to form a complex with an aluminum or iron substance in the mixture;
(b) a non-phenolic active hydrogen compound having 2 to 8 active hydrogens per molecule and having an average molecular weight below about 10,000,
(c) a substance containing aluminum or iron which will form a complex with a phenol (a), and
(d) an organic acid anhydride, at least one of which components (a), (b) and (d) being halogenated,
(2) heating the mixture to a temperature in the range of from about 80° C. to about 250° C., and
(3) oxyalkylating the heated mixture by adding thereto sufficient alkylene oxide having from 2 to 12 carbon atoms to form an oxyalkylated polyol product, with 40 to about 60 parts of a polyarylpolyalkylene polyisocyanate having a functionality of about 2.2 to about 3.3 or of an isocyanate-terminated prepolymer derived from the reaction of a stoichiometric excess of said polyarylpolyalkylene polyisocyanate with said oxyalkylation polyol, 0.2 to about 2 parts of a wetting agent, and 5 to about 30 parts of a blowing agent; wherein the catalyst residues from the

production of polyol (A) are not removed prior to use of said polyol in said foam system.

4,177,336

PREPARATION OF POLYOLEFIN CONTAINING MULTIPLE OLEFINIC UNSATURATION AND CARBOXYLIC ACID GROUPS AND POLYOLEFIN SO PREPARED

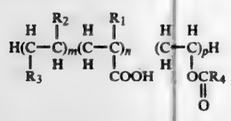
Manfred K. Seven, Long Valley, N.J., and Francis J. Olearczyk, deceased, late of Kenmore, N.Y. (by Jean R. Olearczyk, administratrix), assignors to Allied Chemical Corporation, Morristown, N.J., by said Manfred K. Seven

Filed Dec. 12, 1977, Ser. No. 859,906

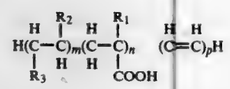
Int. Cl.[2] C08F *6/00, 210/02*

U.S. Cl. 525—325 **24 Claims**

1. A method of producing a polyolefin containing multiple olefinic unsaturation and carboxylic acid groups comprising reacting a terpolymer of the formula



having a number average molecular weight between about 1,000 and about 10,000 wherein m,n and p are integers with the ratio of n to m being on the average between about 0.002:1 and about 0.06:1 and the ratio of p to m being on the average between about 0.003:1 and about 0.065:1, R_1, R_2 and R_3 are each H, methyl or ethyl and R_4 is H or alkyl having 1–5 carbons, in the presence of water at an elevated reaction temperature for a time sufficient to remove substantially all ester groups and to form an unsaturated, carboxylated polyolefin of the formula



wherein m, n, p, R_1, R_2 and R_3 are as described above.

4,177,337

VULCANIZABLE RUBBER COMPOSITIONS AND VULCANIZED RUBBER PREPARED THEREFROM

Masao Onizawa, Ohmiya, Japan, assignor to Sanyo Trading Co., Ltd., Tokyo, Japan

Division of Ser. No. 743,211, Nov. 18, 1976, Pat. No. 4,146,689, which is a division of Ser. No. 625,874, Oct. 24, 1975. This application Feb. 16, 1978, Ser. No. 878,659

Claims priority, application Japan, Oct. 29, 1974, 49-124031; Oct. 2, 1975, 50-118242

Int. Cl.[2] C08F *8/00, 8/08, 8/26, 8/32*

U.S. Cl. 525—331 **12 Claims**

1. A vulcanizable composition comprising bromobutyl rubber, at least one amino acid selected from the group consisting of arginine, lysine, hydroxylysine, ornithine, cystine, asparagine, glutamine and citrulline, and at least one organic peroxide vulcanizing agent, with the proviso that said composition does not contain any zinc oxide or lead oxide.

4,177,338

SEMI-TELECHELIC OLEFINICALLY-UNSATURATED ORGANIC POLYMERS

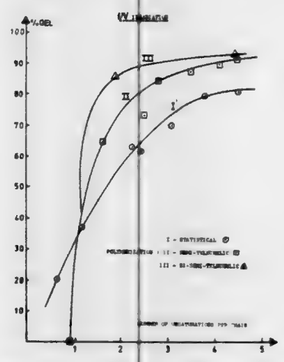
August Vrancken, Dworp, and Paul Dufour, Ruisbroek, both of Belgium, assignors to UCB, Societe Anonyme, Belgium

Filed Oct. 24, 1974, Ser. No. 517,822

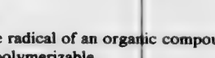
Claims priority, application United Kingdom, Oct. 26, 1973, 49938/73

Int. Cl.[2] C08F *8/14*

U.S. Cl. 526—211 **6 Claims**



1. An organic polymer compound having semi-telechelic olefinic unsaturation, of the formula:



(I)

in which

V is the radical of an organic compound containing at least one polymerizable



group and another group capable of reacting with the functional groups of organic compounds, the radicals of which compounds are represented by W and Y,

W is the radical of β-mercaptoethanol or 1-thioglycerol,

X is the radical of an organic compound containing a polymerizable



group,

Y is the radical of an organic compound containing a polymerizable



group and at least one other reactive group selected from hydroxyl, carboxyl, acid anhydride and epoxy groups,

y is 0 or a whole number of from 1 to 10,

x is the number of moles of X necessary to enable the chain $-(X)_x-(Y)_y-$ to have a molecular weight from 1000 to 10,000 and

H is the hydrogen atom detached from the chain transfer agent RSH, the radical RS of which is represented by W in the above formula, $(X)_x-(Y)_y$ being the radical polymerization product of the organic compounds whose radicals are designated X and Y, all of the radicals X and the radicals Y being distributed statistically along the polymer chain $-(X)_x-(Y)_y-$ in accordance with the polymerization kinetics.

4,177,339

SMOKING TOBACCO COMPOSITIONS

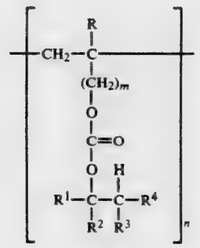
Thomas V. Van Auken, Richmond; Harvey J. Grubbs, Mechanicsville, and William R. Johnson, Jr., Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 739,291, Nov. 5, 1976, Pat. No. 4,092,988. This application Feb. 15, 1978, Ser. No. 877,978

Int. Cl.[2] C08F *118/00*

U.S. Cl. 526—314 **6 Claims**

1. A polymeric carbonate ester composition having a molecular weight in the range between about 500 and 2,000,000 and consisting essentially of recurring monomer units corresponding to the formula:



wherein R is a member selected from the group consisting of hydrogen and aliphatic, alicyclic and aromatic hydrocarbon radicals containing between 1 and about 10 carbon atoms, with the proviso that R is hydrogen when m is zero; R^1 is a member independently selected from the group consisting of unsaturated aliphatic radicals, and alicyclic and aromatic hydrocarbon radicals; R^2, R^3 and R^4 are members independently selected from the group consisting of hydrogen and aliphatic, alicyclic and aromatic hydrocarbon radicals; R^1 and R^3 when taken together with connecting elements form an alicyclic structure, and wherein the total number of carbon atoms in R^1, R^2, R^3 and R^4 collectively does not exceed about 20; m is an integer between 0 and about 8; and n is an integer between 2 and about 10,000.

4,177,340

MANUFACTURE OF HIGH-PRESSURE POLYETHYLENE

Klaus Böettcher; Heinrich G. Höerdt; Klaus Pfleger; Wieland Zacher, all of Wesseling, and Hans Gropper, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 30, 1977, Ser. No. 855,896

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1976, 2657475

Int. Cl.[2] C08F *210/02*

U.S. Cl. 526—329 **4 Claims**

1. In a process for the manufacture of an ethylene polymer by polymerizing ethylene in a polymerization zone at pressures of from 1,000 to 4,000 bars and at temperatures of from 100° to 450° C., with a mean residence time of from 30 to 120 seconds, by continuously passing a mixture of ethylene and oxygen, with or without a polymerization regulator, through a polymerization zone, the improvement which consists essentially of adding to the polymerization mixture from 0.01 to 0.5% by weight, based on ethylene, of an alkyl ester of an alkenemonocarboxylic acid of 3 or 4 carbon atoms, said alkyl moiety containing from 1 to 8 carbon atoms,

passing the polymerization mixture containing the alkenemonocarboxylic acid ester through a preheat zone, whereby ethylene polymerization is initiated at an average effective start temperature of less than 170° C.; and

passing the initiated polymerization mixture to the polymerization zone,

whereby the start temperature of the ethylene polymerization is lowered without changing the properties of the resultant polymer.

4,177,341

ADDITION OF SI-BONDED HYDROGEN TO AN ALIPHATIC MULTIPLE BOND

Gerhard Kreis, Münich; Peter August, Burghausen, and Manfred Wick, Schliersee, all of Fed. Rep. of Germany, assignors to Consortium Für Elektrochemische Industrie GmbH, Münich, Fed. Rep. of Germany

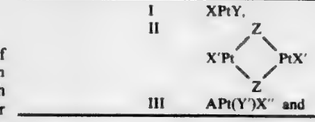
Filed May 24, 1978, Ser. No. 909,094

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1977, 2724822

Int. Cl.[2] C08G *77/06*

U.S. Cl. 528—15 **11 Claims**

1. An improved process for effecting the addition of silicon-bonded hydrogen atoms to compounds containing aliphatic multiple bonds in the presence of a platinum catalyst, the improvement which comprises contacting a compound containing at least one silicon-bonded hydrogen atom with a compound containing aliphatic carbon atoms linked by multiple bonds in the presence of a platinum catalyst selected from the group consisting of



mixtures thereof, in which A is halogen, X is a hydrocarbon radical having from 1 to 3 aliphatic double bonds which is bonded to the platinum atom via a PtC-sigma bond and a Pt-olefin-Pi-bond, X′ is a hydrocarbon radical substituted with an alkoxy or acyloxy group and has from 1 to 3 double bonds and is bonded to the platinum atom via a PtC-sigma bond and a Pt-olefin-Pi-bond, X″ is a hydrocarbon having an aliphatic double bond which is bonded to the platinum atom via a Pt-olefin-Pi-bond, Y is a chelated beta-diketonate ligand or arylcarboxylate ligand, Y′ is a beta-diketonate ligand and Z is a double link bridge ligand.

4,177,342

PROCESS FOR THE PREPARATION OF POLYISOCYANATES CONTAINING ALLOPHANATE GROUPS

Manfred Bock, Leverkusen; Josef Pedain; Wilhelm Slawyk, both of Cologne, and Klaus Konig, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 24, 1978, Ser. No. 909,239

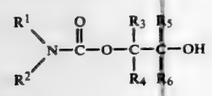
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1977, 2725318

Int. Cl.[2] C08G *18/32, 18/79, 18/80*

U.S. Cl. 528—45 **9 Claims**

1. A process for the preparation of allophanate polyisocyanates having at least three isocyanate groups by the reaction of hydroxyl compounds with excess quantities of organic polyisocyanates which are free from allophanate groups, character-

ized in that the hydroxyl compounds used contain compounds represented by the following formula



wherein

R^1 and R^2 are identical or different and represent hydrogen or hydroxyalkyl, alkyl or cycloalkyl groups wherein at least one of the groups R^1 and R^2 must be hydrogen or a hydroxy alkyl group, and

R_3, R_4, R_5 and R_6 are identical or different and represent hydrogen or alkyl or hydroxy alkyl groups or the groups R_3 and R_5 together with the two carbon atoms may form the basic structure of a cycloaliphatic ring.

4,177,343

PURIFICATION OF POLYMER SOLUTION

Calvin E. Pannell, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 19, 1977, Ser. No. 861,610

Int. Cl.[2] C08J *3/00;* **C08G** *63/74, 63/62*

U.S. Cl. 528—482 **8 Claims**

1. A method of removing organic contaminants from a non-aqueous polycarbonate polymer solution containing the same which comprises contacting said polymer solution with a strong acid cation exchange resin effective to remove said contaminants therefrom, and thereafter recovering a purified polymer solution.

4,177,344

ANHYDRO-SUGARS

Gerhard Baschang, Bettingen; Jaroslav Stanek, Birsfelden; Alberto Rossi, Oberwil, and Alex Sele, Muttenz, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

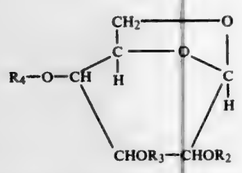
Filed Sep. 16, 1977, Ser. No. 833,795

Claims priority, application Switzerland, Sep. 29, 1976, 12299/76

Int. Cl.[2] C07H *3/10*

U.S. Cl. 536—4 **7 Claims**

1. 1,6-Anhydro-β-D-hexopyranose derivatives of the formula



(I)

wherein R_2 is hydrogen, methyl, benzoyl, benzoyl substituted by halogen, lower alkyl, lower alkoxy, hydroxy or lower alkanoyl, or naphthoyl, one of the two radicals R_3 and R_4 is lower alkyl, phenyl-methyl, phenyl-methyl substituted by halogen, lower alkyl, lower alkoxy, hydroxy or lower alkanoyloxy, or naphthyl-methyl and the other is lower alkyl, phenyl-methyl, phenyl-methyl substituted by halogen, lower alkyl, lowr alkoxy, hydroxy or lower alkanoyloxy, naphthyl-methyl, benzoyl, benzoyl substituted by halogen, lower alkyl, lowr alkoxy, hydroxy or lower alkanoyloxy, or naphthoyl and R_4 can also be hydrogen, with the proviso that the radicals R_3 and R_4 together contain at least 3 carbon atoms, and when R_4 is benzyl, R_3 contains at least 2 carbon atoms, and when one of the radicals R_3 and R_4 is benzoyl, benzoyl substituted as defined above or naphthoyl, R_2 is hydrogen.

4,177,345

PROCESS FOR PREPARING A SULFATE ESTER OF A POLYHYDROXY POLYMER

Richard G. Schweiger, 1324 Rimrock Dr., San Jose, Calif. 95120

Continuation of Ser. No. 786,209, Apr. 11, 1977, Pat. No. 4,143,226, which is a division of Ser. No. 669,483, Mar. 23, 1976, Pat. No. 4,035,569, which is a continuation of Ser. No. 487,196, Jul. 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 298,580, Oct. 18, 1972, abandoned, which is a continuation-in-part of Ser. No. 40,442, May 25, 1970, Pat. No. 3,702,843. This application Aug. 18, 1978, Ser. No. 934,818

The portion of the term of this patent subsequent to Nov. 14, 1989, has been disclaimed.

Int. Cl.[2] C08B *5/14*

U.S. Cl. 536—59 **8 Claims**

1. A process for preparing a polyhydroxy polymer product which is a polysaccharide or a polyvinyl alcohol that contains a generally uniform distribution of sulfate ester groups and, in addition, also contains ether groups, ester groups other than sulfate, or a mixture of ether groups and ester groups other than sulfate, said process comprising:

reacting a polyhydroxy polymer reactant with sulfur trioxide or a complex thereof at a temperature ranging from about 0° to about 25° C.;

said polyhydroxy polymer reactant being a polysaccharide or a polyvinyl alcohol that contains nitrite ester groups and also ether groups, ester groups other than nitrite, or a mixture of ether groups and ester groups other than nitrite;

said reaction of a polyhydroxy polymer reactant with sulfur trioxide or a complex thereof producing a reaction product which contains a mixture of nitrite and sulfate ester groups;

reacting said reaction product with a protic solvent to remove residual nitrite ester groups from said reaction product, and

then reacting the polymer with a base to neutralize or slightly alkalize the polymer and to obtain said sulfate ester in the form of its salt.

4,177,346

1,5-DISUBSTITUTED-2-PYRROLIDONES

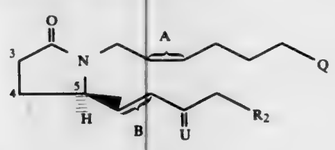
Albin J. Nelson, Westchester, N.Y., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 712,362, Aug. 6, 1976, abandoned. This application Mar. 13, 1978, Ser. No. 885,908

Int. Cl.[2] C07D *207/00, 403/06*

U.S. Cl. 542—427 **15 Claims**

1. A compound of the structure



wherein:

Q is selected from the group consisting of



tetrazol-5-yl and



A is a single or cis double bond;

B is a single or trans double bond;

U is H►|||OH HO►|||H or H〰OH,

R_2 is selected from the group consisting of α-thienyl, phenyl, phenoxy, monosubstituted phenyl and monosubstituted phenoxy, said substituents being selected from the group consisting of chloro, fluoro, phenyl, methoxy, trifluoromethyl and alkyl having from one to three carbon atoms;

R_3 is selected from the group consisting of hydrogen, alkyl having from one to five carbon atoms, phenyl and p-biphenyl;

R_4 is selected from the group consisting of



and $-SO_2R_5$, said R_5 being selected from the group consisting of phenyl and alkyl having from one to five carbon atoms;

or the alkali, alkaline earth and ammonium salts of those compounds having a carboxylate or tetrazol-5-yl group.

4,177,347

DISTILBENYL-OXDIAZOLES

Hans R. Meyer, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

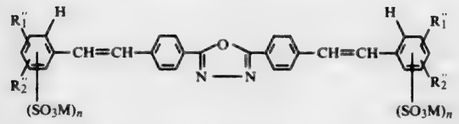
Continuation of Ser. No. 749,643, Dec. 10, 1976, abandoned, which is a continuation of Ser. No. 585,540, Jun. 10, 1975, abandoned. This application May 23, 1978, Ser. No. 908,600

Claims priority, application Switzerland, Jun. 12, 1974, 8031/74; Jun. 12, 1974, 8038/74

Int. Cl.[2] C07D *271/06*

U.S. Cl. 542—459 **11 Claims**

1. A distilbenyl-oxdiazole of the formula



wherein each of

R'_1 is identical and denotes methyl, ethyl, methoxy, chlorine, cyano, caboxyl or carbomethoxy and each of

R'_2 is identical and denotes hydrogen, chlorine, methyl or ethyl,

M denotes a hydrogen ion, alkali metal ion, alkaline earth metal ion, ammonium ion or amine salt ion and n denotes the numbers 1 or 2.

4,177,348

CARBOCYCLIC ANALOGS OF CYTOSINE NUCLEOSIDES

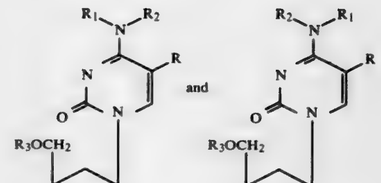
Y. Fulmer Shealy, Birmingham, and C. Allen O'Dell, Fairfield, both of Ala., assignors to United States Government, Washington, D.C.

Filed Dec. 13, 1977, Ser. No. 860,086

Int. Cl.[2] C07D *239/46, 498/04;* **A61K** *31/505*

U.S. Cl. 544—317 **14 Claims**

1. A compound having a formula selected from the group consisting of



and

wherein X and Y are hydrogen, hydroxy or benzolyoxy; R is hydrogen, lower alkyl or halogen; R_1 and R_2 are hydrogen or lower alkyl; and R_3 is hydrogen or acyl.

4,177,349

SUBSTITUTED 2,2'-BIPYRIDYL COMPOUNDS AND PROCESS FOR PREPARING SAME

Charles K. McGill, Indianapolis, Ind., assignor to Reilly Tar & Chemical Corporation, Indianapolis, Ind.

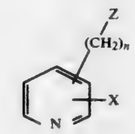
Filed Jul. 27, 1978, Ser. No. 928,396

Int. Cl.[2] C07D *213/22*

U.S. Cl. 546—255 **18 Claims**

1. A process for preparing a substituted 2,2'-bipyridyl compound, comprising the steps of:

(a) selecting a singly-substituted alkylpyridine of the formula



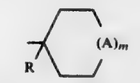
wherein:

(1) X is hydrogen or an alkyl group having from 1 to about 9 carbon atoms;

(2) Z is:

(i) a branched chain alkyl group having from 3 to about 20 carbon atoms connecting to $(CH_2)_n$ at a point of branching when n=0, 1, 2; or

(ii) a cyclic structure of the type



when n=0, 1, 2, wherein

(a) A is methylene, oxygen, or sulfur when m=0, 1; and

(b) R is hydrogen or an alkyl group having from 1 to about 4 carbon atoms; or

(iii) a phenyl group when n=1, 2, 3,; and

(3) the 2- or 6-position is occupied by hydrogen; and

(b) mixing a stoichiometric excess of the substituted pyridine with an amount of sodamide, said mixing being in a mole ratio of at least about 2:1;

(c) causing the resultant mixture to be at a temperature sufficiently high to cause substituted 2,2'-bipyridyl formation; and

(d) isolating the substituted 2,2'-bipyridyl formed during said causing.

4,177,350

IMIDAZOLE ETHYL OXYALKOXY DERIVATIVES AND THIO ANALOGUES THEREOF

Ludwig Zirngibl, and Kurt Thiele, both of Zofingen, Switzerland, assignors to Siegfried Aktiengesellschaft, Zofingen, Switzerland

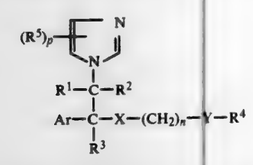
Filed Oct. 12, 1978, Ser. No. 950,825

Claims priority, application Switzerland, Oct. 13, 1977, 12528/77

Int. Cl.[2] **C07D** *233/60, 233/94, 401/12*

U.S. Cl. 546—278 **8 Claims**

1. A compound of the formula (1)



(1)

in which R^1, R^2 and R^3 are individually selected from the group consisting of hydrogen and lower alkyl; R^4 is selected from the group consisting of hydrogen; lower alkyl; C_4–C_8 cycloalkyl or a benzyl or phenyl group having at least one substituent selected from the group consisting of halogen, lower alkyl, lower alkoxy, lower alkylthio, phenyl, cyano, nitro and amino; and unsubstituted and halosubstituted pyridyl; R^5 is selected from the group consisting of nitro and lower alkyl; Ar is selected from the group consisting of unsubstituted and substituted phenyl having at least one substituent selected from the group consisting of halogen, lower alkyl and lower alkoxy; and unsubstituted and substituted benzyl having at least one substituent selected from the group consisting of substituents specified for R^4; X and Y are individually selected from the group consisting of oxygen and sulfur atoms; n is an integer of from 1 to 5 inclusive and p is selected from the group consisting of Zero and integers of from 1 to 3 inclusive provided that p does not exceed 1 where R^5 is nitro; and addition salts of said formula (1) compounds with pharmaceutically acceptable acids.

4,177,351

FLUORINATED HETEROCYCLIC SULFIDES

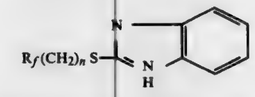
Sameeh S. Toukan, Phoenixville, and Murray Hauptschein, Glenside, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 396,649, Sep. 12, 1973, Pat. No. 3,933,819, which is a continuation-in-part of Ser. No. 171,325, Aug. 21, 1971, abandoned. This application Jun. 17, 1975, Ser. No. 587,794

Int. Cl.[2] **C07D** *235/04*

U.S. Cl. 548—325 **4 Claims**

1. A fluorinated alkyl sulfide represented by the structure



where R_f is selected from the group consisting of perfluoroalkyl, perfluoroisoalkyl and perfluoromonochloralkyl radicals having from 5 to 13 carbon atoms, and n is an integer of 2 or 3.

4,177,352

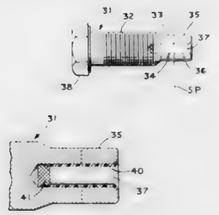
SHEAR BOLT ASSEMBLY FOR A LOAD LIMITING LINE SUPPORT FOR A POST INSULATOR

David R. Dunbar, Pavilion, N.Y., and Edward J. Balog, Sr., McKeesport, Pa., assignors to Interpace Corporation, Parsippany, N.J.

Filed May 25, 1978, Ser. No. 909,487

Int. Cl.[2] **F16B** *31/00;* **F16D** *9/00;* **H01B** *17/16, 17/38*

U.S. Cl. 174—1 **5 Claims**



1. A shear bolt assembly for joining two members with a given shear strength capability, said assembly comprising a bolt including a first portion adapted for being engaged by one of the members being joined with given shear capability, said bolt having an axial bore therein extending partially along the length of the bolt, a collar disposed adjacent said bolt and adapted for being engaged by the other of the members to be joined with given shear capability, said collar having an axial bore therein which is aligned with the bore in the bolt with said collar in abutting relation with said bolt along a plane constituting the shear plane of the bolt assembly, a shear pin extending in the axially aligned bores of the bolt and the collar, and adhesive means securing said shear pin in said collar and bolt.

4,177,353

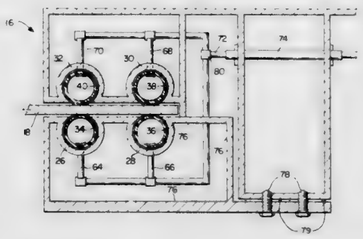
RFI SHIELDED DOORS WITH INFLATABLE GASKETS

Ray G. McCormack, St. Joseph, Ill., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 18, 1977, Ser. No. 778,911

Int. Cl.[2] **F16J** *15/46;* **H05K** *9/00*

U.S. Cl. 174—35 GC **2 Claims**



1. In combination, a shielded enclosure having a cooperating door and door frame; and

a gasket structure, comprising:

a flexible inflatable tube made from an electrically conductive elastomeric material and fixedly mounted about the entire periphery of the door frame such that it is between the door and the door frame when the door is closed; and

means for inflating said tube thereby causing said tube to make continuous electrical contact with both the door and the door frame when the door is closed.

4,177,354

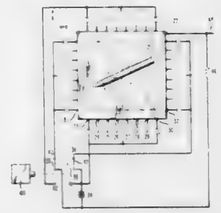
GRAPHIC COMMUNICATIONS APPARATUS

Max V. Mathews, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 17, 1978, Ser. No. 896,705

Int. Cl.[2] **G08C** *21/00*

U.S. Cl. 178—18 **9 Claims**



4. In combination in a system for providing electrical signals representative of the successive coordinate positions of a writing stylus and for providing a visual display of graphical information written by said stylus,

a transducer device adapted to be activated by a light-spot-emitting stylus, said device comprising

a photoconductive layer sandwiched between a transparent conductive layer and a resistive layer,

an output terminal electrically connected to said conductive layer,

multiple spaced-apart terminals electrically connected to said resistive layer along the periphery thereof,

and means connected to said spaced-apart terminals for successively applying x- and y-direction potentials to said resistive layer,

a display unit positioned in close proximity to said transducer device for providing a visual display of graphical information written by said stylus on said device,

and a processing unit connected to said output terminal for storing coordinate-position signals provided by said device and for applying said signals to said display unit.

4,177,355

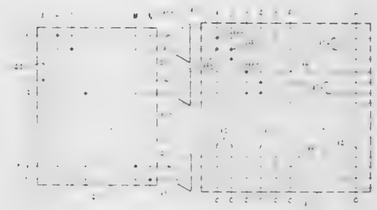
ARRAY DEVICE FOR DATA SCRAMBLING

Harold Fleisher, and Se J. Hong, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 24, 1975, Ser. No. 571,116

Int. Cl.[2] **H04K** *1/06*

U.S. Cl. 178—22 **5 Claims**



1. Apparatus for enciphering and deciphering a block of n data bits comprising;

a matrix of crossing input and output lines,

decoders each addressing a different group of the input lines,

grouping means for dividing the message to be enciphered or deciphered into m sets of n/m bits each and addressing each of the decoders with one set of bits,

said grouping means including a second matrix of crossing

input and output lines each of input lines being adapted to receive one of the n data bits and each output line being connected to one of the inputs of one of the decoders,

means at certain of the crossings of said second matrix to couple certain of the input lines to certain of the output lines to thereby generate the m sets,

substitution means for selectively connecting each group of input lines to at least m output lines at certain crossings of the input lines in the group with the m output lines to substitute coded digits for the digits in the original message to encode messages, and,

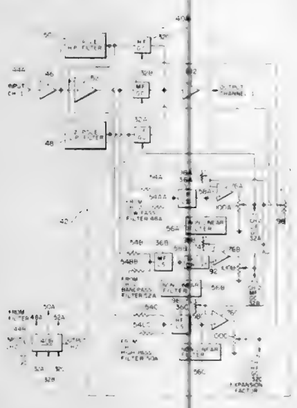
transposition means for changing the m output lines to which any group of input lines are connected to place digits in a different location in the encoded message than they were in the original message.

4,177,356

SIGNAL ENHANCEMENT SYSTEM

C. Rene Jaeger, South Lyndeboro, N.H., and Lawrence E. Blakely, Framingham, Mass., assignors to DBX Inc., Newton, Mass.

Filed Oct. 20, 1977, Ser. No. 843,949
Int. Cl.[2] H03G *3/00*; H04R *25/00*
U.S. Cl. 179—1 VL **12 Claims**



1. A system for enhancing the sound quality and dynamics of an audio signal having substantially all of its signal energy divided among a plurality of substantially discrete frequency bands, said system comprising;

an input terminal for receiving said audio signal;

an output terminal;

a plurality of separate signal paths between said input and output terminals for respectively and substantially mutually exclusively transmitting an information signal representative of the signal energy of the audio signal in a corresponding one of said frequency bands,

amplification means disposed in each of said signal paths for amplifying the corresponding information signal by a gain variable responsively to a control signal as to provide a signal output dynamically expanded with respect to said corresponding information signal;

a like plurality of level sensing means each connected between a corresponding one of said amplification means and a selected point in the respective signal path for sensing at said point the amplitudes of signals transmitted through the respective signal path and for providing responsively thereto said control signal as a logarithmic function of the amplitude of the sensed signals;

means for providing a signal to said output terminal as a function of the sum of said signal outputs of all of said amplification means; and

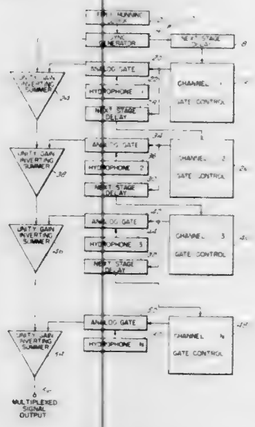
filtering means, coupled to the output of each of said level sensing means, for modifying said control signal nonlinearly with respect to the rate of change of the output of said level sensing means so as to allow relatively long smoothing constants to be applied to said control signal when the output of said level sensing means is a steady state or relatively slowly-varying signal, and so as to allow a relatively rapidly-varying signal at the output of said level sensing means to effect a relatively rapid change in said control signal.

4,177,357

SPATIALLY DISTRIBUTED ANALOG TIME DIVISION MULTIPLEXER

Gerald M. Mayer, East Lyme, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 3, 1978, Ser. No. 921,404
Int. Cl.[2] H04J *3/04*
U.S. Cl. 179—15 A **9 Claims**



1. An analog time division multiplexer system for transmitting analog signals from a first plurality of spatially distributed sensors of a multi-sensor array which comprises:

multiplexing means including a second plurality of channels, each member of said second plurality of channels corresponding to a respective member of said first plurality of spatially distributed sensors of said multi-sensor array, said multiplexing means combining an analog signal from each member of said first plurality of spatially distributed sensors with a DC level and with the analog signals from the preceding sensors of said first plurality of sensors to form a composite signal and inverting the polarity of the combination;

a free running clock providing an output thereof and having a time period longer than the time for sequentially sampling the outputs of various members of said first plurality of spatially distributed sensors;

a sync generator being triggered by the output of said free running clock, said sync generator producing an output thereof for use as a starting reference in said multiplexing means for a new sequence of multiplexed signals from said first plurality of spatially distributed sensors of said multi-sensor array;

transmission means for transmitting said composite signals to a remote receiving station; and

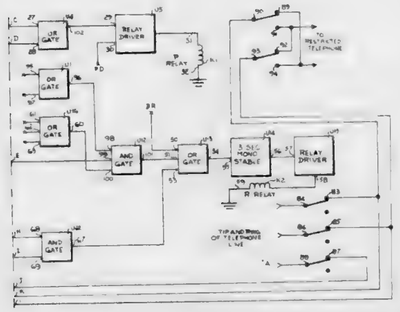
demultiplexing means including a third plurality of channels having each member thereof corresponding to a respective member of said first plurality of said spatially distributed sensors and a respective member of said second plurality of channels of said multiplexing means, said demultiplexing means decomposing said composite signal into the components thereof at said receiving station.

4,177,358

TONE DIAL TOLL RESTRICTOR

John W. Mason, Rte. 1, Box 153, Wirtz, Va. 24184

Continuation of Ser. No. 716,035, Sep. 9, 1976, abandoned, which is a continuation of Ser. No. 506,553, Sep. 16, 1974, abandoned. This application Jun. 21, 1978, Ser. No. 917,760
Int. Cl.[2] H04M *1/66*
U.S. Cl. 179—18 DA **6 Claims**



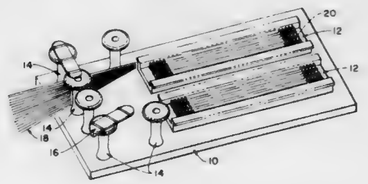
1. In a dual tone multi-frequency telephone system including a toll restrictor circuit, enabled by the initiation of a telephone call, for monitoring numbers dialed from a telephone connected to a telephone line and for disconnecting the telephone from the telephone line when a restricted number is dialed, the improvement comprising polarity-reversal means coupled to the telephone line for normally disabling the telephone dial by applying an original line voltage polarity to the telephone, and dial tone detector means, coupled between said polarity reversal means and the telephone line, and responsive to the presence of a dial tone for reversing the polarity of the telephone line connected to the telephone, enabling the telephone dial, and permitting dialed number signals to reach the connected telephone line.

4,177,359

POST WIRE GUIDE LATCHING MEANS

George Naranjo, Chicago, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 20, 1978, Ser. No. 953,337
Int. Cl.[2] H02G *1/00*
U.S. Cl. 179—98 **10 Claims**



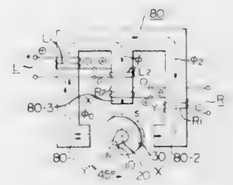
1. A post wire guide latching means adapted for use with a post wire guide, said post having an elongated tubular body for mounting on a support at one end of said body and terminating at the opposite end with a circumferentially disposed laterally extending flange means forming a head having a bore that extends longitudinally through said head into said body, said latching means including an elongated element for mounting on said head, said element including means for positioning said element relative to said bore and means for engaging the free edge of said flange whereby said element can be rotated relative to said head to overlie the head of an adjacently positioned post to thereby capture wires guided and positioned between said posts.

4,177,360

MOVING MAGNET TYPE PICKUP CARTRIDGE

Yasuhiro Fujimoto, and Masao Suzuki, both of Tokyo, Japan, assignors to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1977, Ser. No. 819,282
Claims priority, application Japan, Jul. 31, 1976, 51-91867; Jul. 31, 1976, 51-91868; Jun. 7, 1977, 52-67509
Int. Cl.[2] H04R *11/12*
U.S. Cl. 179—100.41 M **12 Claims**



1. A pickup cartridge of the moving magnet type, comprising

(a) a stationary yoke having at least three leg portions;

(b) an armature;

(c) means including a tiltably and oscillatably movable cantilever connected at one end with said armature for normally supporting said armature in a static position adjacent said yoke leg portions, said yoke leg portions being disposed in a plane normal to the axis of said cantilever when in the static position, a pair of said yoke leg portions comprising side leg portions arranged on left and right sides of said armature, respectively, the remaining yoke leg portions being arranged solely above said armature, whereby the area beneath said armature is open;

(d) a phonograph needle connected with the other end of said cantilever for tilting and oscillating the same;

(e) a pair of first coil means wound on said side leg portions, respectively, to provide channel signals in accordance with the inclination and oscillation of said armature based on oscillation applied to said phonograph needle; and

(f) a pair of second coil means electrically connected with said first coil means, respectively, said second coil means being wound on those leg portions of said yoke arranged between said yoke side leg portions in such a manner as to cancel the voltages induced in one yoke side leg portion when the cantilever is tilted in one direction from said static position;

(g) the end portions of said side leg portions adjacent said armature being disposed so that variation of magnetic flux, except that corresponding to inclination and oscillation of the armature based on oscillation applied to the phonograph needle, is cancelled magnetically.

4,177,361

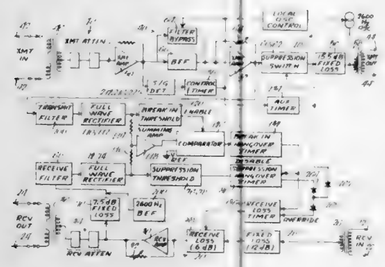
SIGNALING TONE TRANSPARENT ECHO SUPPRESSOR

Michael J. Birck, Hinsdale, Ill., assignor to Tellabs, Inc., Lisle, Ill.

Filed Dec. 14, 1977, Ser. No. 860,160
Int. Cl.[2] H04B *3/20*
U.S. Cl. 179—170.2 **24 Claims**

1. In an echo suppressor for telephone systems having separate transmit and receive channels on which signaling tone is at

least occasionally present, an attenuation pad for the receive channel; means coupled with the transmit channel and said attenuation pad for detecting the level of energy on the transmit channel and for controlling operation of said attenuation pad to insert and remove attenuation into and from the receive channel in accordance with the energy level being greater than or less than, respectively, selected levels; an attenuation pad for the transmit channel, means coupled with the receive channel and said transmit channel attenuation pad for detecting the level of energy on the receive channel and for controlling operation of said transmit channel attenuation pad to insert and remove attenuation into and from the transmit channel at a point subsequent to the point whereat the energy on the transmit channel is detected in accordance with the receive channel energy level being greater than or less than, respectively,



selected levels; means coupled with the transmit channel for removing signaling tone therefrom prior to said detecting means and said transmit channel attenuation pad, said removing means including signaling tone blocking means for the transmit channel, said blocking means having an active state in which signaling tone is removed from the transmit channel and an inactive state in which it is not; means for sensing the presence or absence of signaling tone on the transmit channel and for controlling operation of said blocking means to place the same in its active and inactive states, respectively, in accordance therewith; and means coupled with the transmit channel for generating signaling tone thereon subsequent to said transmit channel attenuation pad whenever said blockin, means is removing signaling tone, so that said echo suppressor does not interfere with signaling tone on the transmit channel a:: ' signaling tone does not affect operation of said detecting means.

4,177,362

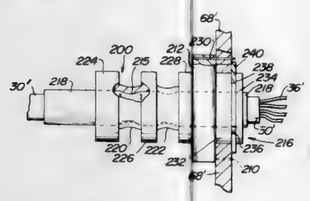
TAMPERPROOF HANDSET CONNECTOR ARRANGEMENT FOR RAILROAD APPLICATIONS

Charles A. Boenecke, 1 Capshire Dr., Cherry Hill, N.J. 08003

Continuation-in-part of Ser. No. 760,877, Jan. 21, 1977, Pat. No. 4,087,659. This application Apr. 13, 1978, Ser. No. 896,072

Int. Cl.[2] H04M *1/15*

U.S. Cl. 179—186 **2 Claims**



1. A tamperproof handset connector arrangement for installation in a railroad communication control having a housing provided with a front panel which has a hole and plural apertures spaced from the hole, the handset having a cable and a plurality of wires disposed within said cable for electrically connecting said control and handset, said connector arrangement comprising:

a connector having a flange, a swaged section disposed on one side of said flange, and a slotted section having an annular slot disposed on the other side of said flange,

said flange having a locating pin projecting therefrom on said slotted section side,

said connector having a passage extending therethrough,

said flange being substantially flush with the outer surface of said housing front panel and said slotted section extending through said panel hole into said housing,

said locating pin extending through one of said spaced apertures to prevent rotation of said connector,

a retainer disposed within said annular slot and frictionally secured to said slotted section to prevent displacement of said connector with respect to said front panel,

said handset cable passing through said connector passage into the interior of said housing.

4,177,363

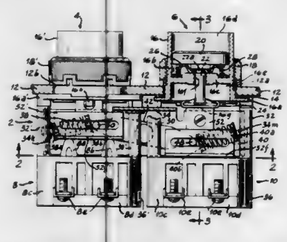
INTERLOCKING AND MAINTAINING ATTACHMENT FOR TWO STANDARD PUSHBUTTONS

John J. Keranen, Sussex, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 27, 1978, Ser. No. 881,797

Int. Cl.[2] H01H *9/00*; **G05G** *11/00*

U.S. Cl. 200—5 B **15 Claims**



1. An interlocking and maintaining attachment for two standard pushbutton devices of the type having a shaft-mounted pushbutton vertically reciprocable in a retaining ring with a standard push-plate secured to the lower end of the shaft and the pushbutton devices being mounted by their retaining rings in spaced apart relation on a common supporting member, comprising:

push-levers attached at their upper ends to respective push-plates on the pushbutton devices with their lower ends extending downwardly and having means for actuating driven units;

and a toggle mechanism including supporting means therefor mounted below said pushbutton devices comprising:

an elongated toggle lever pivotally mounted intermediate its ends on said supporting means;

toggle springs in compression between said supporting means and points on said toggle lever spaced on opposite sides of its pivot biasing said toggle lever in one or the opposite pivotal direction according to its angular state;

and means coupling said push-levers to said toggle lever at respective locations spaced on opposite sides of its pivot so that upon depression of one pushbutton, its push-lever drives the corresponding side of the toggle mechanism downwardly across its overcenter line of action whereupon said toggle mechanism snaps to its limit of downward motion carrying the corresponding push-lever and pushbutton with it while the other side of the toggle mechanism raises the other pushbutton, and said toggle mechanism thereafter maintains the pushbuttons in their respective down and up states.

4,177,364

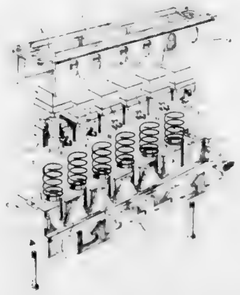
MULTIPLE PUSHBUTTON SWITCH

Robert L. Beecher, II, and Harold J. Hershey, both of Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 23, 1978, Ser. No. 889,497

Int. Cl.[2] H01H *9/26*

U.S. Cl. 200—5 B **6 Claims**



1. A multiple pushbutton switch of the type including one or more lockout members (70) and pushbutton actuators (20) having lockout engaging elements (80) attached thereto adapted to engage and displace the lockout members when one or more of the actuators is depressed, the interaction between the lockout engaging elements of the lockout members limiting the simultaneous depression of the actuators, characterized in that the lockout engaging elements comprise cams (86) rotatably oriented by adjustment among a plurality of positions, each cam in a first position of rotation oriented adjacent to a particular lockout member, being engageable with that lockout member when the associated actuator is depressed and each cam oriented in a second position of rotation not being engageable with the particular adjacent lockout member when the associated actuator is depressed.

4,177,365

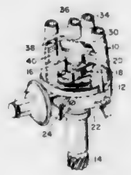
MOISTURE REDUCER FOR USE IN HEATED AND VENTED CONTAINER INCLUDING ELECTRICAL CONTACTS

Stanley J. Blackman, Brockton YMCA, Brockton, Mass. 02401

Continuation-in-part of Ser. No. 803,760, Jun. 6, 1977, abandoned, which is a continuation-in-part of Ser. No. 755,017, Dec. 28, 1976, abandoned. This application Jan. 25, 1978, Ser. No. 872,071

Int. Cl.[2] H01H *19/00*; **B65D** *81/26*; **C09K** *3/00*

U.S. Cl. 200—19 R **7 Claims**



1. The combination of an article of manufacture and a means of heating same, the article comprising a distributor for an internal combustion engine and a moldable, regenerative desiccant, the distributor including electric switch elements, a cap and a housing, the cap and housing engaged to each other defining a chamber and each having an internal surface, the cap and housing having an external environment outside the cap and housing, the electric switch elements in spaced relation to the desiccant, the chamber vented to the external environment, the desiccant cast in place totally within the chamber forming a solid structure and having a surface exposed to the chamber.

4,177,366

NOISE SUPPRESSION ELECTRODE ARRANGEMENT WITH A ROTOR OF DIELECTRIC MATERIAL

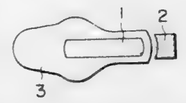
Kazuhiro Kozuka; Shin Yamamoto; Mikio Huruhashi, all of Nagoya; Katsutaro Iwaki, Chiryu, and Susumu Asari, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya, both of, Japan

Filed Jan. 4, 1978, Ser. No. 867,184

Claims priority, application Japan, Jan. 19, 1977, 52-5164

Int. Cl.[2] H01H *19/00*; **F02P** *7/00*; **H01H** *1/00*

U.S. Cl. 200—19 DR **5 Claims**



1. A noise suppression electrode arrangement for suppressing noise associated with an electrical discharge between a movable electrode mounted on a rotor and a stationary counterelectrode positioned in spaced relationship with respect to said rotor, said arrangement being characterized by:

the rotor including a turn table made of dielectric material; and

said electrode being mounted on the turn table such that as the electrode passes the counterelectrode during rotation of said rotor, the edge of said electrode nearest to the counterelectrode is located a distance of 0.7 to 3 mm from the edge of the turn table closest to the counterelectrode.

4,177,367

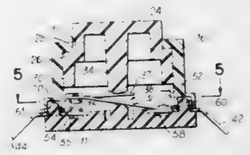
PUSH BUTTON SWITCH

Stephen A. Tirone, Boca Raton, and Ronald H. Arthur, Lauderhill, both of Fla., assignors to AMF Incorporated, White Plains, N.Y.

Filed Jul. 18, 1978, Ser. No. 925,675

Int. Cl.[2] H01H *9/00*

U.S. Cl. 200—159 A **5 Claims**



1. A push button switch comprising

a base of electrical insulating material,

a hollow cylindrical housing of electrical insulating material having an open bottom,

latching means extending from the bottom of said housing,

means in said base for releasably receiving said latching means for holding the housing in contact with the base, thereby to provide an enclosed region between the base and housing,

first and second substantially identical electrical terminals extending laterally from the interior to the exterior of said enclosed region at respective spaced locations about said housing.

first and second recesses in the top surface of said base proximate said spaced locations, said recesses being complementary in shape to the interior portions of said terminals for receiving respective ones of said terminal portions therein,

first and second projections extending upwardly from the surface of said base at the respective locations where the two terminals are located and in registration with the bottom edge of the housing,

an aperture in each of said terminals for receiving a respective one of said projections, thereby to locate said terminals on said base,

an elongated spring member of electrical conducting material having an aperture at one end in engagement with a respective one of said projections and in engagement with a respective one of said terminals,

said spring member extending inwardly within a said enclosed region and having its inner end overlaying but spaced from said first terminal,

first and second contacts respectively secured to said first terminal and said spring member and located to engage each other when the spring member is moved toward the first terminal,

one or more tabs extending upwardly from the end of said spring member that engages a respective projection,

first and second recesses in the bottom edge of said housing for receiving respective ones of said projections,

additional recesses in the bottom edge of the housing for receiving said one or more tabs and for providing clearance for said first end of the spring member,

actuator means on said housing member for engaging the spring member to move the second contact into engagement with the first contact,

said spring member urging the actuator away from the first terminal in the absence of a force being applied to the actuator.

4,177,368

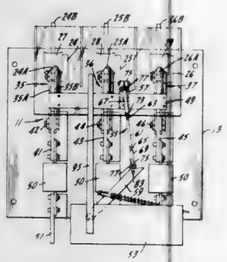
SWITCH OPERATING ROD ASSEMBLY

James A. Erickson, Crystal Lake, Ill., assignor to Boltswitch, Inc., Crystal Lake, Ill.

Filed Jul. 17, 1978, Ser. No. 924,943

Int. Cl.[2] H01H *3/02*

U.S. Cl. 200—332 **3 Claims**



1. In a high-current, low-voltage, load-break switch, of a kind comprising a fixed contact, a movable contact movable between a closed position in bolted pressure contact with the fixed contact and an open position displaced from the fixed contact, a switch-operator mechanism, including an operating lever, for rapidly opening and closing the switch by driving the movable contact between its closed position and its open position, and an electrically non-conductive operating rod assembly interconnecting the movable switch contact and the switch-operator mechanism, an improved operating rod assembly construction comprising:

a metal rod, threaded at its opposite ends;

two metal yokes, threaded onto the opposite ends of the metal rod to permit effective adjustment of the length of the operating rod assembly;

an insulator link, of molded high-strength dielectric material, pivotally mounted on one yoke at the end of that yoke opposite the rod to complete the operating rod assembly with a metal yoke at one end and the insulator link at the other;

and pivotal connecting means for pivotally connecting one end of the assembly to the movable switch contact and the other end to the operating lever of the switch-operator mechanism,

said metal rod being freely rotatable relative to one metal yoke and adaptable to be locked rotationally relative to the other metal yoke.

4,177,369

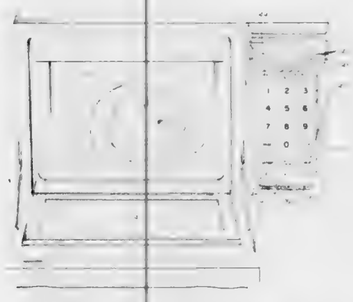
DIGITALLY PROGRAMMED MICROWAVE OVEN

Rex E. Fritts, Cedar Rapids, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

Continuation of Ser. No. 671,527, Mar. 29, 1976, abandoned. This application Jan. 26, 1978, Ser. No. 872,719

Int. Cl.[2] H05B *9/06*

U.S. Cl. 219—10.55 B **10 Claims**



1. A microwave heating system comprising:

means comprising a microwave generator energized by a power supply comprising a saturable transformer for supplying microwave energy to a multimode cavity having a movable closure member;

a control system for connecting a source of alternating current power to said power supply transformer at a first predetermined phase of said alternating current;

disconnecting said alternating current power from said transformer at a second predetermined phase of said alternating current power which is opposite in polarity to the polarity of said first phase; and

the clock frequency of said control system being substantially higher than the frequency of the power source.

4,177,370

VARIABLE COOKING MODE SELECTOR IN A MICROWAVE OVEN

Akira Otani, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 767,149, Feb. 9, 1977, abandoned. This application May 25, 1978, Ser. No. 909,569

Claims priority, application Japan, Feb. 13, 1976, 51/15353; Feb. 13, 1976, 51/15354

Int. Cl.[2] H05B *9/06*

U.S. Cl. 219—10.55 B **14 Claims**

1. A variable cooking mode selector for a microwave oven comprising:

a first supporting means disposed in a microwave oven housing;

a second supporting means movably mounted on the first supporting means;

a cam motor mounted on the second supporting means;

a cam plate fixed to a cam motor shaft of said cam motor, the cam plate having a periphery divided into plural sections of different radiuses, each of said sections providing a different repetition rate of energization of a magnetron employed in said microwave oven;

a switching means mounted on the first supporting means, said switching means functioning to energize a magnetron employed in the microwave oven;



an actuator lever associated with said switching means for closing or opening said switching means in response to the revolution of a selected section of said cam plate; and

control means fixed to said second supporting means for selecting the section of said cam plate which controls said actuator lever;

whereby a repetition rate of the magnetron energization is varied through the use of said control means to implement selected cooking modes.

4,177,371

WELDING MACHINE FOR WELDING PRE-WELD FLANGES AND SLIP-ON FLANGES ONTO PIPES

Helmut Honig, Netphen, Fed. Rep. of Germany, assignor to Deuzer Maschinenfabrik GmbH, Netphen, Fed. Rep. of Germany

Filed Apr. 14, 1977, Ser. No. 787,621

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1976, 2617061

Int. Cl.[2] B23K *31/00*

U.S. Cl. 219—59.1 **2 Claims**



1. A welding machine for welding preweld flanges and slip-on flanges onto pipes, which includes an upper welding station for welding a flange onto a pipe from the outside thereof, a second welding station for welding a flange onto a pipe from the inner side thereof, a stand common to both said upper welding station and said inner welding station and supporting said two welding stations as a unit, and fluid operable supporting means operable to engage about the central portion of a pipe to which a flange has to be welded and to lower such pipe from said upper welding station to said lower welding station and to lift said pipe from said lower welding station to said upper welding station, said fluid operable supporting means being connected to said stand.

4,177,372

METHOD AND APPARATUS FOR LASER ZONE MELTING

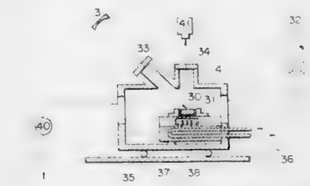
Nobuo Kotera, Kokubunji, Japan; Tetsu Oi, Waltham, Mass., and Takashi Nishida, Tokyo, Japan, assignors to Hitachi, Ltd., Japan

Filed May 24, 1977, Ser. No. 799,928

Claims priority, application Japan, May 26, 1976, 51-60012

Int. Cl.[2] B23K *9/00*

U.S. Cl. 219—121 L **20 Claims**



1. A laser zone melting method, wherein zone melting of a thin film is performed by irradiating with a laser beam and moving the laser beam relative to the thin film, in a moving direction, comprising the steps of (i) sufficiently elongating said laser beam in the direction substantially perpendicular to the moving direction of the melting zone so that the length of the beam, perpendicular to the moving direction of the melting zone, covers the width, in the direction perpendicular to said moving direction, of the thin film, and (ii) irradiating the thin film by the elongated laser beam while oscillatorily deflecting the elongated beam in a direction substantially perpendicular to the moving direction, with the peak-to-peak amplitude of the oscillation being approximately the width of the thin film in the direction perpendicular to the moving direction, and relatively moving the region irradiated by the laser beam from a first end to a second end of the thin film.

4,177,373

OSCILLATING ARC WELDING

Richard A. Roen, Edmonton, Canada, assignor to The Research Council of Alberta, Edmonton, Canada

Filed Apr. 10, 1978, Ser. No. 895,266

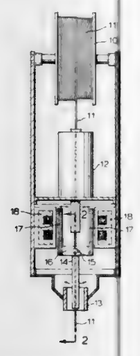
Claims priority, application United Kingdom, Aug. 3, 1977, 32626/77

Int. Cl.[2] B23K *9/02*

U.S. Cl. 219—125.12 **6 Claims**

1. In a process for making a weld in a gap between the walls of two pieces of metal to be welded together wherein a consumable electrode having a free end is moved through a welding torch and then into said gap, while, on the one hand said two pieces of metal and, on the other hand, said welding torch are moved relative to each other, thereby to move said welding torch along said gap or vice versa, sufficient potential is applied between said two pieces of metal and said consumable electrode to strike an arc therebetween which melts said consumable electrode and at least a part of said walls of said two pieces of metal, and said consumable electrode is oscillated back and forth across said gap, the improvement wherein the frequency of oscillation of said consumable electrode is at least 6 Hz, during the making of the weld said free end of said consumable electrode is maintained in said gap and at the ends of each half cycle of oscillation of said consumable electrode an impact force is applied to said consumable electrode to interrupt its movement towards the one wall of said metal pieces towards which said consumable electrode was moving before application of said impact force and immediately after the application of said impact force said consumable electrode

is moved away from said one wall and towards the opposite wall of said metal pieces, thereby causing molten metal at said



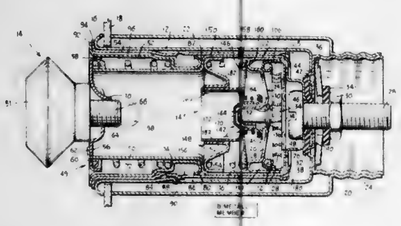
free end of said consumable electrode to be impelled against said one wall.

4,177,374

AUTOMATIC ELECTRIC CIGAR LIGHTER

Laurence G. Horwitt, New Haven, and Donald J. Mattis, Norwalk, both of Conn., assignors to Sun Chemical Corporation, New York, N.Y.

Filed Jan. 31, 1978, Ser. No. 873,771
Int. Cl.[2] F23Q *7/24*
U.S. Cl. 219—265 **27 Claims**



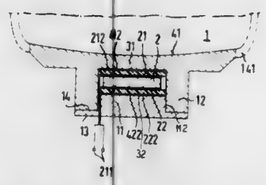
1. An automatic cigar lighter, comprising in combination:
(a) a holder device including a socket having two contacts forming part of a cigar lighter circuit,
(b) an ignitor plug receivable in the socket, said plug having a manually operable part,
(c) a heating element carried at the inner end of the plug,
(d) means for establishing a circuit from the holder device contacts through the heating element, said means including an electrical switch having cooperable parts carried by the ignitor plug,
(e) means for closing said switch to energize said heating element in response to actuation of said manually operable part, and
(f) means responsive to heating of said heating element, for opening said switch to de-energize the element, said means including a bimetallic member constituted solely of a bimetal sheet which is carried by said plug and is adapted to be connected in circuit with said heating element, said member having a circuit-opening position and a closed-circuit position, said sheet further having a bimetallic actuator portion which is free and clear of permanent attachment to said switch and to any other parts, said actuator portion being disposed for electrical contact with and for abutting engagement with one of the cooperable parts of said switch to effect said opening of the switch.

4,177,375

HEATING DEVICE HAVING AN OPTIMIZED HEATING ELEMENT OF PTC THERMISTOR MATERIAL

Hans Meixner, Haar, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 28, 1978, Ser. No. 946,634
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1977, 2743880
Int. Cl.[2] F27D *11/02*
U.S. Cl. 219—441 **10 Claims**



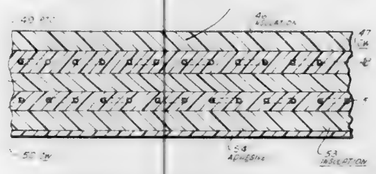
1. A heating device, comprising:
(a) a disc-shaped heating element having first and second major heat surfaces with electrodes thereon, the element being comprised of positive temperature coefficient (PTC) thermistor material;
(b) network voltage means electrically connected to said electrodes for operating the heating element;
(c) said PTC thermistor material having a cut-off control property at a desired cut-off temperature;
(d) the heating element having a thickness from 0.5 to 2 mm when the network voltage is 220 volts;
(e) a specific electrical impedance of the heating element, at Curie temperature and 2000 volt/cm being between $\rho c = 1 \times 10^3$ Ohm-cm and 6×10^3 Ohm-cm;
(f) the heating element having a specific heat output of greater than 50 watts per cm^2 of a cross-section of the disc-shaped element;
(g) the PTC thermistor material being selected to have a Curie temperature which is at least 50° K. higher than the cut-off temperature; and
(h) means for providing a substantially even dissipation of heat from the first and second major surfaces of the heating element.

4,177,376

LAYERED SELF-REGULATING HEATING ARTICLE

David A. Horsma, Palo Alto; Bernard J. Lyons, Atherton, and Robert Smith-Johannsen, Portola Valley, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 510,036, Sep. 27, 1974, abandoned. This application Aug. 4, 1975, Ser. No. 601,638
Int. Cl.[2] H05B *3/12, 3/38*
U.S. Cl. 219—553 **46 Claims**



1. A self-regulating electrical heating article adapted for connection to a source of electrical power comprising a first layer of material, said first layer exhibiting a positive temperature coefficient of resistance with an associated anomaly temperature T_s and having at least partially contiguous therewith a second layer of constant wattage material having an associated resistance, said article being connectable to an electric power input source whereby current flow is through at least a portion of said first layer and through at least a portion of said second layer, whereby there is both direct electrical and thermal coupling between said first and second layers, and whereby at a temperature which is the higher of the temperature at which the resistance of said first layer exceeds the resistance of said second layer or the anomaly temperature of said first layer, current flow predominantly follows the directionally shortest path through said first layer, said article having at least one electrical insulating layer contiguous with a surface of the first or of the second layer which is not adjacent to the other layer.

4,177,377

SEQUENCE CONTROL SYSTEM

Yoshikazu Kuze, No. 31-3, Higashi Magome 1-chome, Ota-ku, Japan

Filed Aug. 7, 1978, Ser. No. 931,552
Int. Cl.[2] G06K *7/14, 19/06*; H04B *1/06*
U.S. Cl. 235—419 **24 Claims**



1. A sequence control system comprising a transparent program sheet bearing a series of write clock marks and a plurality of data lines which are formed of opaque material and arranged in the longitudinal direction of said sheet,
a sheet reading device;
said sheet reading device comprising;
means for passing said sheet along a path,
a plurality of light-emitting elements disposed in the lateral direction at the entrance of said path, and
a plurality of light-receiving elements each of which is corresponding to each of said light-emitting elements and arranged to generate data when light from the corresponding light-emitting element is interrupted by said write clock marks and data lines of said sheet,
memory means for memorizing said data in synchronization with said write clock marks;
means for generating read clock pulse for reading said data;
means including a binary counter for actuating said memory means to cause it to generate output signals in accordance with said data memorized therein in synchronization with said read clock pulse, and
gate means for controlling said data and pulse.

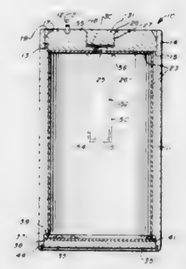
4,177,378

LONG-LIVED REFERENCE CELL SIMULATING THE α SCINTILLATION OF RADON-222

William M. Stevens, Loveland, Ohio, assignor to Randam Electronics, Inc., Cincinnati, Ohio

Filed Apr. 24, 1978, Ser. No. 899,329
Int. Cl.[2] G01D *18/00*
U.S. Cl. 250—252 **51 Claims**

1. A reference cell simulating the light spectrum of an alpha scintillation cell containing radon[222] for the purpose of calibrating electronic equipment detecting scintillations resulting from the radioactive decay of radon[222], said cell comprising:
(A) a normally closed gas-tight container formed at least partially from a substantially transparent gas-impermeable section of material;
(B) a luminescent material adhered to the inside of a first portion of said container, said luminescent material not adhering to the inside of a second portion of said container, said second portion including at least a part of said transparent section of material; and



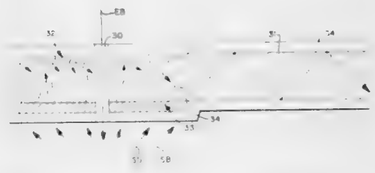
(C) supply means within said container for generating
(i) radon[222]; and
(ii) alpha particles, in an amount of less than about 2500 such particles per minute, in addition to those generated by said radon[222] and its decay products.

4,177,379

BACK-SCATTERED ELECTRON DETECTOR FOR USE IN AN ELECTRON MICROSCOPE OR ELECTRON BEAM EXPOSURE SYSTEM TO DETECT BACK-SCATTERED ELECTRONS

Yasuo Furukawa, Tokyo; Yoshiro Goto, Yokohama, and Takefumi Inagaki, Kawasaki, all of Japan, assignors to Fujitsu Limited, Japan

Filed Sep. 14, 1978, Ser. No. 942,455
Claims priority, application Japan, Sep. 14, 1977, 52-124112[U]
Int. Cl.[2] G01N *23/00*
U.S. Cl. 250—306 **12 Claims**



1. A back-scattered electron detector for use in an electron microscope or electron beam exposure system comprising:
a transparent plate having;
a scintillator part for emitting light outputs in accordance with electrons back-scattered from a specimen to be observed in an electron microscope or to be exposed with electrons in an electron beam exposure system, said scintillator part being provided with a hole through which a primary electron beam passes to the specimen and with gratings by which the emitted light outputs are reflected; and
a transmitting part for transmitting the emitted, scattered light outputs from the scintillator part;
metal-backing means on the surface of said transparent plate for increasing light reflecting efficiency thereof; and

convertor means connected to said transparent plate for converting the transmitted light outputs into corresponding electric signals.

4,177,380

METHOD AND APPARATUS FOR MAKING AND DEVELOPING IONOGRAPHIC IMAGES OF X-RAYED OBJECTS

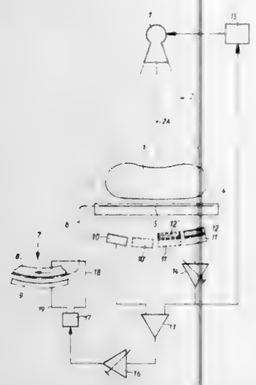
Rolf Eickel, and Alfred Rheude, both of Munich, Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 6, 1978, Ser. No. 867,494

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703426

Int. Cl.² G03G *13/00, 15/00*

U.S. Cl. 250—315.2 **18 Claims**



1. A method of making and processing latent images of X-rayed objects on dielectric receptor sheets which are confined in the interelectrode gap of an ionography imaging chamber during exposure to object-modulated X-rays including primary radiation and stray radiation, comprising the steps of exposing a receptor sheet to object-modulated X-rays whereby said stray radiation causes the formation of a first electrostatic charge pattern and the primary radiation causes the formation of a second charge pattern on the receptor sheet, said patterns together constituting the latent image; and neutralizing the first charge pattern, which corresponds to the action of said stray radiation, during processing of the receptor sheet.

4,177,381

GAS ANALYZER SAMPLE CELL

Edward A. McClatchie; Dean A. Watson, both of Berkeley, and Irvin G. Burough, Walnut Creek, all of Calif., assignors to Andros Incorporated, Berkeley, Calif.

Division of Ser. No. 749,836, Dec. 13, 1976, Pat. No. 4,103,174, which is a division of Ser. No. 509,838, Sep. 27, 1974, Pat. No. 4,013,260. This application Apr. 13, 1978, Ser. No. 895,937

Int. Cl.² G01J *1/00;* G01N *1/10, 21/24, 21/26*

U.S. Cl. 250—343 **2 Claims**

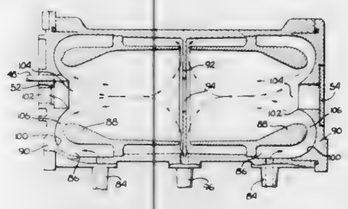
1. A sample cell for an infrared gas analyzer comprising:

an enclosure for a gas sample;

first and second windows in said enclosure, one of said windows being adjacent each end of said enclosure, said windows being substantially transparent to infrared radiation so as to define an infrared radiation path through said sample cell;

inlet means adjacent each end of the said enclosure for providing a gas sample to the interior of said cell adjacent each end thereof, outlet means between said inlet means for removing a gas sample from said cell,

flow control means adjacent each end of said enclosure for receiving a gas sample from the respective inlet means and establishing flows having substantial components toward said outlet means and having a substantial component in the radial inward direction, thereby creating a form of stagnation plug inwardly adjacent each of said windows,



and a central member extending transversely in the interior of said sample cell substantially midway between the ends thereof and having an opening accommodating the radiation path, said central member being spaced from said outlet means to allow removal of gas from both sides of said central member.

4,177,382

RADIOGRAPHY

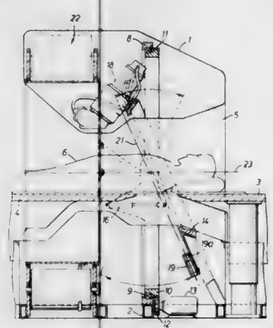
Godfrey N. Hounsfield, Newark, England, assignor to E M I Limited, Hayes, England

Continuation of Ser. No. 790,474, Apr. 25, 1977, abandoned. This application Oct. 3, 1978, Ser. No. 948,301

Claims priority, application United Kingdom, Apr. 28, 1976, 17204/76

Int. Cl.³ G03B *41/16*

U.S. Cl. 250—445 T **9 Claims**



1. Medical radiographic apparatus comprising means for defining a patient position, generating means for generating a substantially planar, fan-shaped distribution of X-radiation, means for mounting said generating means so that said radiation propagates through said patient position, detector means, including an array of detector devices disposed in an array extending across said distribution, for detecting radiation projected through said patient along a plurality of divergent beam paths in said distribution, rotating means causing said generating means and said detector means to rotate around said patient position about respective centers of rotation which are on a common axis so that said generating means projects said radiation through said patient position from a plurality of locations while rotating about its center of rotation and so that said detector means detects radiation emergent from the patient position along further groups of beam paths originating from respective ones of said locations while the detector means rotates about its center of rotation; means being provided to change the spacing between the respective centers of rotation of the generating means and the detector means, such means being synchronised in operation with said rotating means and causing said spacing to change during a number of rotations of said generating means and said detector means around said patient position; the radiation, during all of said rotations, traversing a common region in the vicinity of said axis.

4,177,383

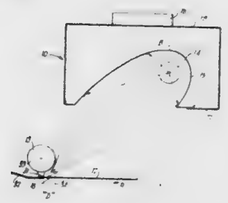
APPARATUS FOR TREATING A SHEET MATERIAL WITH RADIATION

Ronald E. Knight, Slough, England, assignor to Wallace Knight Limited, Slough, England

Filed May 4, 1978, Ser. No. 902,690

Int. Cl.² G01J *1/00;* A61K *27/02*

U.S. Cl. 250—492 R **7 Claims**



1. Apparatus for treating the surface of a sheet material with radiation comprising a lamp assembly, gripper means for pulling the sheet material by a leading margin along a path past the lamp assembly, the gripper means having a portion which is located on the same side of said path as said lamp assembly and which overlies a part of the surface to be treated and the lamp assembly being adapted to produce a beam of radiation having a main focus substantially on said path, the beam being generally downstream-directed and slanted at an acute angle relative to said path so that a substantial portion of said overlain surface part is exposed to focused radiation as the sheet material is moved along the path.

4,177,384

APPARATUS FOR PRODUCING ULTRAVIOLET RADIATION

Friedrich Wolff, Lindenring 17, D-6000 Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 716,253, Aug. 20, 1976, Pat. No. 4,095,113, and Ser. No. 716,254, Aug. 20, 1976, Pat. No. 4,106,083. This application Feb. 23, 1978, Ser. No. 880,567

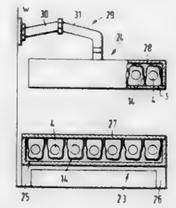
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1977, 2707920

The portion of the term of this patent subsequent to Jun. 13, 1995, has been disclaimed.

Int. Cl.² G01J *1/00*

U.S. Cl. 250—494 **15 Claims**

1. Apparatus for selective treatment by ultraviolet radiation, especially for treatment of skin diseases including psoriasis, comprising a plurality of closely adjacent parallel elongated sources of ultraviolet radiation each including a low-pressure mercury lamp having a layer of luminous material, said sources being arranged to emit a continuous spectrum whose intensity is higly pronounced in the region between approximately 300 and 330 nm and decreases pronouncedly at the wavelength of approximately 330 nm; and filter means arranged to absorb



radiation below approximately 295 nm, the transmissivity of said filter means increasing abruptly above 295 nm.

4,177,385

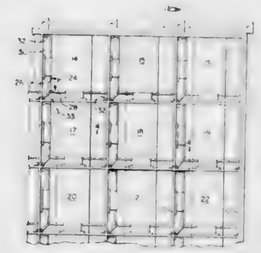
NUCLEAR FUEL STORAGE

Frank Bevilacqua, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 19, 1977, Ser. No. 834,634

Int. Cl.² G21F *5/00*

U.S. Cl. 250—507 **8 Claims**



1. A nuclear fuel storage apparatus for use in a water filled pool comprising: an egg crate structure of thermal neutron absorbing material, having vertically extending rectangular openings, adjacent openings having a common wall therebetween extending through a height generally equal to or exceeding the active length of the fuel to be stored; a plurality of inserts of neutron absorbing material, each adapted to slidably fit within a respective opening, said inserts each having a first plate parallel to one side of the openings and a second plate parallel to an adjacent side of the opening, said plates adjacently connected and having a length generally equal to or greater than the active length of the fuel to be stored; means for holding said inserts within the openings, with the first and second plates spaced a predetermined distance from the parallel sides of the opening; and means for supporting fuel to be stored at locations bounded by said plates and to sides of the respective opening.

4,177,386

METHOD AND APPARATUS FOR STORING NUCLEAR FUEL ASSEMBLIES IN MAXIMUM DENSITY RACKS

William J. Wachter, R.D. 4, English Rd., Wexford, Pa. 15090, and Thomas R. Robbins, 1528 Crofton Pkwy., Crofton, Md. 21114

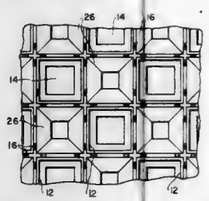
Filed May 26, 1978, Ser. No. 910,156

Int. Cl.² G21F *5/00*

U.S. Cl. 250—507 **7 Claims**

1. A storage rack for spent nuclear fuel assemblies for immersion in water, said rack comprising a plurality of identical

storage cells disposed adjacent each other in a regular array with adjacent cells connected together, cap members disposed on alternate cells and adapted to guide fuel assemblies into adjacent cells whereby the rack initially contains fuel assemblies in at least half of the storage cells, the remaining cells

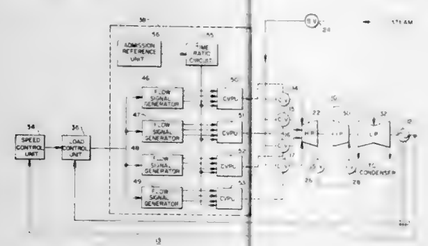


being filled with water, and at least some of said cap members being removable to permit fuel assemblies to be placed in additional cells in a final pattern determined by the actual level of reactivity of said fuel assemblies such that criticality is prevented.

4,177,387
METHOD AND APPARATUS FOR CONTROLLED-TEMPERATURE VALVE MODE TRANSFERS IN A STEAM TURBINE

Paul E. Malone, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 6, 1978, Ser. No. 867,572
Int. Cl.[2] H02P 9/04
U.S. Cl. 290—40 R **6 Claims**



1. In combination with a control system for a steam turbine having a plurality of valves arranged about nozzle arcs for admitting steam in a full arc mode and in a partial arc mode as determined by an admission reference factor AR and wherein said control system includes a flow reference signal indicative of turbine load, the improvement comprising a controller for transferring between modes so that steam flow remains substantially constant during transfer and temperature of a predetermined portion of the turbine varies substantially linearly with admission reference factor as it is varied between modes, said controller comprising:

means for generating said admission reference factor AR and for varying said factor during a mode transfer;

time ratio means for generating a multiplier (1−AR) in responsive to said admission reference factor;

a plurality of flow signal generators, there being one flow signal generator per valve, each said flow signal generator producing a full arc mode signal FA, a partial arc mode signal PA, and a reversing signal R, each said signal being a preselected function of said flow reference signal;

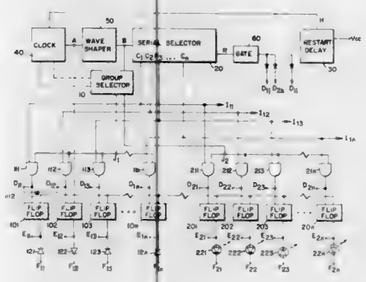
a plurality of signal conditioners for producing a plurality of combined flow signals according to the signal relationship FA+(R+PA) (1−AR), there being one signal conditioner and one combined flow signal per valve; and,

a plurality of lift signal generators for producing valve lift signals in response to said combined flow signals, there being one lift signal generator per valve.

4,177,388
PROGRAMMABLE CONTROL FOR LOAD MANAGEMENT

Mike I. Lingenfelter, State College, Pa., assignor to Louise D. Suhey, Pine Grove Mills, Pa.

Filed Jul. 10, 1978, Ser. No. 923,449
Int. Cl.[2] H02J 13/00
U.S. Cl. 307—38 **7 Claims**



1. A programmable control for load management of a plurality of electrical power loads, the programmable comprising:

(a) at least a first and a second group of load control means for controlling the power supplied to loads connected to pre-selected ones of the load control means,

(b) a group selector means for selecting which of the groups is functionally operative at any given instant in time,

(c) a serial selector means, commonly connected to each of the load control means in all of the groups, for serially selecting one of the load control means in each group for conduction for at least one period of the serial selector means,

(d) at least a first set of programming points, each point situated at an input to a load control means logically common with the output of the serial selector means,

(e) means selectively connecting at least two of the first set of programming points together for modifying the duration or order of a conduction state of at least one of the load control means, and

(f) means operative in the event of a power failure for delaying for a period of time the conduction on any of the load control means upon restoration of power.

4,177,389
POWER SUPPLY SYSTEM WITH TWO REGULATED POWER SUPPLY DEVICES CONNECTED IN PARALLEL AT AN OUTPUT

Heinrich Schott, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 28, 1977, Ser. No. 846,362
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1976, 2649087
Int. Cl.[2] G05F 1/64
U.S. Cl. 307—64 **9 Claims**

9. A power supply system comprising:

(a) two substantially similar regulated power supply devices having outputs connected in parallel;

(b) each power supply device having a switching means for regulating, current sensing means connected to the switching means, and a regulating control circuit means connected for controlling the switching means, said circuit control means comprising

(i) a voltage regulator means and a current regulator means having their respective outputs connected to control the switching means;

(ii) a discriminator means for comparing the load currents from the current sensing means in each power supply device;



(iii) a transfer switch means controlled by the discriminator means and connected to the voltage regulator and current regulator means for activating one of the voltage and current regulators and deactivating the other of the regulators in response to an output from the discriminator means.

4,177,390
A FIELD EFFECT TRANSISTOR LOGIC GATE HAVING DEPLETION MODE AND ENHANCEMENT MODE TRANSISTORS

Arthur M. Cappon, Boston, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 27, 1977, Ser. No. 864,292
Int. Cl.[2] H03K 19/08, 19/12, 19/36, 19/40
U.S. Cl. 307—205 **11 Claims**



1. A logic gate comprising:

(a) a first depletion mode field effect transistor having a gate electrode for coupling to a control signal source;

(b) a second depletion mode transistor;

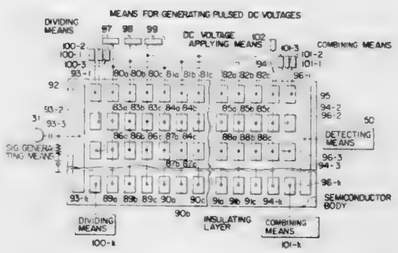
(c) an enhancement mode field effect transistor, such enhancement mode field effect transistor and second depletion mode transistor being serially connected together and being coupled to the first depletion mode transistor, one of such serially coupled transistors having a Schottky gate contact; and

(d) bias means coupled to the first and second depletion mode transistors for biasing the second depletion mode transistor and the enhancement mode field effect transistor with opposite states of conduction selectively in accordance with the control signal.

4,177,391
CHARGE TRANSFER SEMICONDUCTOR DEVICE

Hideo Sunami; Masaharu Kubo, both of Hachioji, and Iwao Takemoto, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 436,336, Jan. 24, 1974, abandoned. This application Jan. 16, 1976, Ser. No. 649,746
Claims priority, application Japan, Jan. 24, 1973, 48-9516
Int. Cl.[2] G11C 19/28; H01L 29/78
U.S. Cl. 307—221 D **21 Claims**



1. A charge transfer semiconductor device comprising:

a plurality of parallel-spaced rows of charge transfer elements, each of which includes

a semiconductor substrate along which charge carriers are to be transferred;

signal input means for introducing charge carriers at a first selected location in said substrate;

signal output means for producing an output signal representative of charge carriers which have been transferred thereto along said substrate, disposed at a second selected location in said substrate, spaced apart from said first selected location;

signal transfer means including a plurality of electrodes electrically insulated from said substrate, and sequentially disposed along the surface of said substrate between said first and second selected locations, for transferring charge carriers between said signal input means and said signal output means;

input gate means disposed between said first selected location and one end of said electrodes; and

storage means, disposed between said second location and the other end of the electrodes of said transfer means, for temporarily storing charge carriers which have been transferred beneath said plurality of electrodes prior to being delivered to said signal output means, each of said storage means being disposed in parallel spaced apart relationship with the other storage means, so that the plurality of storage means of said rows form a column of storage means perpendicular to said rows;

first means, connected to the signal input means of said charge transfer elements, for providing an input signal into the signal input means of the respective ones of said plurality of parallel-spaced rows of charge transfer elements;

a plurality of respective second means, each of which is connected to each respective input gate means of each charge transfer element, for selectively applying a respective voltage pulse to each respective input gate means, shifted in time with respect to the respective pulses applied to each other input gate means, whereby charge carriers are introduced into said substrate;

third means, connected to the signal transfer means of said charge transfer elements, for effecting the sequential transfer of introduced charge carriers along said substrate

beneath the signal transfer means of the respective ones of said plurality of charge transfer elements, said third means including a prescribed number of plural voltage transfer pulse generators for applying a prescribed number of voltage transfer pulses to the plurality of electrodes of each row, shifted in time with respect to one another, so that the voltage transfer pulse applied to a respective electrode of the plurality of electrodes of each row is shifted in time with respect to the voltage transfer pulses applied to adjacent electrodes of that particular row, and is applied in common to adjacent parallel electrodes of the other signal transfer means, said prescribed number of plural voltage transfer pulse generators being less than the number of parallel-spaced rows of charge transfer elements, and the frequency of said voltage transfer pulses being less than the frequency of the voltage pulses selectively applied by said second means; and

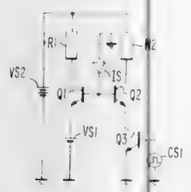
fourth means, connected to the signal output means of said charge transfer elements, for detecting said transferred charge carriers as an output signal.

4,177,392

CURRENT SWITCHING NETWORKS

Peter E. Haferl, Zurich, Switzerland, assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 757,375, Jan. 6, 1977, Pat. No. 4,081,721.
This application Oct. 7, 1977, Ser. No. 840,394
Claims priority, application United Kingdom, Feb. 4, 1976, 04406/76
Int. Cl.² H03K *17/00, 5/04*
U.S. Cl. 307—254 **13 Claims**



1. A current switching network comprising:

a constant current generator having first and second terminals between which current is supplied;

a first current amplifier having input and output and common connections, said first current amplifier being of a type exhibiting unilateral conduction from its input connection to its common connection through a unilaterally conductive input circuit therebetween and having its input connection clamped to its common connection during such unilateral conduction so their departure in potential does not exceed a predetermined value;

means for selectively connecting the input circuit of said first current amplifier for unilateral conduction between the first and second terminals of said constant current generator;

unilaterally conductive means connected between the first and second terminals of said constant current generator for selectively conducting that portion of the current supplied by said constant current generator as does not flow to the input circuit of said first current amplifier, said unilaterally conductive means being of a type conductive only when the potential thereacross exceeds a threshold value, which threshold value is chosen larger than said predetermined value plus any potential drop exhibited by said means for selectively connecting the input circuit of said current amplifier; and

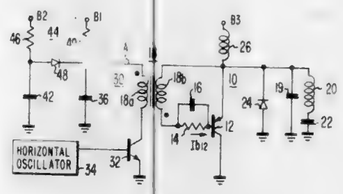
means connected between the common and output connections of said first current amplifier for extracting a first output current flowing in response to the selective connection of the input circuit of said first current amplifier between the first and second terminals of said constant current generator.

4,177,393

DRIVE CIRCUIT FOR A TELEVISION DEFLECTION OUTPUT TRANSISTOR

Gerhard Förster, Würenlos, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Dec. 20, 1977, Ser. No. 862,386
Claims priority, application United Kingdom, Dec. 20, 1976, 53174/76
Int. Cl.² H03K *17/00;* **H03B** *41/00*
U.S. Cl. 307—270 **9 Claims**



1. A drive circuit for a kinescope deflection output transistor, comprising:

drive transformer means including a secondary winding coupled with a base-emitter junction of the output transistor and also including a primary winding;

driver switch means serially coupled with said primary winding of said drive transformer means thereby forming a switched winding;

first energy storage means coupled to said switched winding;

a first source of energizing potential coupled to said first energy storage means for energy charging thereof;

second energy storage means;

unidirectional current conducting means coupled to said first and second energy storage means for providing energy flow therebetween;

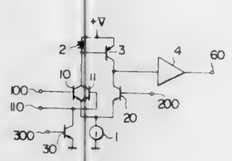
a second source of energizing potential coupled to said second energy storage means for energy charging thereof, said second source of potential having a magnitude substantially less than that of said first.

4,177,394

COMPARATOR CIRCUIT HAVING MULTI-FUNCTIONS

Wasao Takasugi, Higashiyamato, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 29, 1977, Ser. No. 828,672
Claims priority, application Japan, Sep. 1, 1976, 51-103645
Int. Cl.² H03K *5/20*
U.S. Cl. 307—357 **13 Claims**



1. A comparator circuit comprising:

first and second transistors having respective input electrodes for receiving first and second input signals, respectively;

a third transistor having an input electrode for receiving a third input signal to be compared with said first and second input signals;

input means connected to the respective input electrodes of said first, second and third transistors for supplying said first, second and third input signals;

a current source connected in common to said first output electrodes of said first, second and third transistors;

a first control means connected to the input electrode of said first transistor and responsive to a control signal for selectively rendering said first transistor non-conductive independent of said first input signal;

potential source means connected to second output electrodes of said first, second and third transistors; and

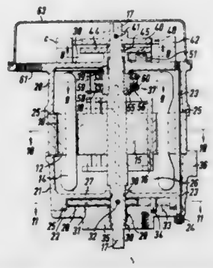
output means connected to the second output electrode of at least one of said first, second and third transistors.

4,177,395

ACTUATORS

Donald L. Hore, Bath, England, assignor to Rotork Limited, Bath, England

Filed Dec. 19, 1977, Ser. No. 862,092
Int. Cl.² H02K *33/00*
U.S. Cl. 310—39 **15 Claims**



1. An electrically operated quarter-turn actuator incorporating a single phase 2-pole dynamo-electric machine comprising a laminated stator having slots with three windings therein arranged to be energised to provide alternating or reversing flux, and a laminated rotor movable with respect to the stator and having a plurality of short-circuited continuous loops to which there are no external connections, wherein the rotor is coupled directly to the output shaft of the actuator, and the three stator windings are each connected with the power supply through a respective limit switch, the limit switches being cam operated from the output shaft, and the windings and switches being so arranged that the same one only of said windings is energised to complete the travel of the rotor in each direction of movement.

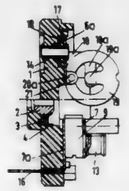
4,177,396

ELECTRIC MOTORS

Patrick Wang, Chai Wan, Hong Kong, assignor to Johnson Electric Industrial Manufactory Limited, Chai Wan, Hong Kong

Filed Nov. 1, 1977, Ser. No. 847,656
Claims priority, application France, Dec. 10, 1976, 76 37298
Int. Cl.² H02K *11/00*
U.S. Cl. 310—68 C **3 Claims**

1. An electric motor comprising a body, a stator and a rotor mounted within said body, at least the rotor having windings, a cover closing an axial end of said body and supporting two cages and two electrical input terminals, and two brushes each slidable in a respective one of said cages and engaging the rotor to supply current to the windings of the rotor, one of the electrical input terminals being directly connected to one of said cages and the other input terminal being connected to the other cage by way of a bimetal thermal switch, and wherein the bimetal is constituted by a bimetallic annulus having a central tab which is secured to a part of said other input terminal and having on its periphery a contact stud co-operating



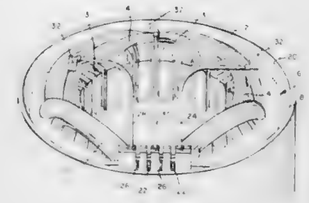
with a corresponding contact stud electrically connected to said other cage to interrupt the current supply to the rotor windings in response to a predetermined temperature being attained within said body.

4,177,397

ELECTRICAL CONNECTIONS FOR WINDINGS OF MOTOR STATORS

John F. Lill, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 17, 1978, Ser. No. 887,584
Int. Cl.² H02K *11/00*
U.S. Cl. 310—71 **7 Claims**



1. In an electric motor sub-assembly of the type comprising a hollow cylindrical motor housing, a stator disposed in said housing and coil windings on said stator, said stator having oppositely directed faces and an external circumferential surface, said circumferential surface having arcuate portions which are against internal surface portions of said housing, and having portions which are adjacent to said arcuate surface which are spaced from said internal surface of said housing, the improvement to said sub-assembly comprising:

a terminal housing mounted on one of said faces of said stator, said housing comprising an elongated block of insulating material having a terminal-receiving face and having terminal-receiving cavities extending into said terminal-receiving face, said housing extending across said face at a location adjacent to one of said arcuate portions,

integral retaining means extending from said housing, said retaining means comprising parallel spaced-apart legs extending from said housing and an integral strut extending between the ends of said legs, said legs extending across said adjacent portions of said circumferential surface on each side of said one arcuate portion, said strut extending across the other one of said faces whereby, said housing and retaining means are captured on said stator by said arcuate surface portions of said stator and said internal wall portion of said housing.

4,177,398

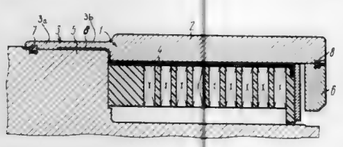
SHROUD FOR MOUNTING ROTOR END WINDING IN ELECTRIC MACHINE

Galina A. Zagorodnaya, Altaiskaya ulitsa, 20, kv. 5; Gurgen P. Vartanian, Budapeshtskaya ulitsa, 15, korpus 2, kv. 29; Garri M. Khutoretsky, Altaiskaya ulitsa, 20, kv. 5, and Vladimir M. Fridman, Grazhdansky prospekt, 13, korpus 1, kv. 170, all of Leningrad, U.S.S.R.

Continuation of Ser. No. 595,217, Jul. 11, 1975, abandoned. This application Feb. 24, 1977, Ser. No. 771,826

Int. Cl.[2] H02K *3/46*

U.S. Cl. 310—270 **4 Claims**



1. A shroud for attachment to an electrical machine rotor having an end winding cantilevered to an end portion of the rotor comprising: a rotor body; said shroud including a cylindrical shell having two axial portions of different thickness, one being a thickened portion, the other a thinned portion, said thickened portion starting immediately from the end of the rotor body and embracing the end winding to secure the latter from centrifugal forces, said thinned portion embracing the rotor body and including a first part adapted for an interference fit over said body to secure the shroud in radial direction; said thinned portion including a second part providing an annular gap at the edge of said rotor body between said thinned portion and said rotor body, said first part of said thinned portion which is adapted for the interference fit over said rotor body being separated from the thickened-portion, said second part of said thinned portion which provides said annular gap allowing for resilient radial displacement of the thickened portion relative to said rotor body without substantial reduction of the interference fit.

4,177,399

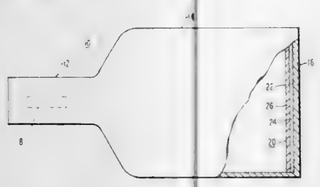
HIGH CONTRAST CATHODE RAY DISPLAY TUBE

Vincent J. Muccigrosso, Elmira; John L. Nivison, Elmira Heights, and Albert E. Oberg, Horseheads, all of N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 25, 1978, Ser. No. 909,416

Int. Cl.[2] H01J *29/20, 29/89*

U.S. Cl. 313—368 **1 Claim**



1. A cathode ray display tube with improved contrast for viewing the display in high ambient light levels wherein the tube includes a display faceplate portion with a display screen phosphor layer on the interior surface of the faceplate portion, the improvement wherein the tube faceplate portion is formed of a glass which is a green color filter glass of low relative transmissivity of at least 0.1 over the range of 532 to 558 μm, and the transmissivity of the color filter glass peaks at about 0.125 at about 545 μm, and the phosphor layer is terbium activated gadolinium oxysulfide which exhibits cathodoluminescent emission such that a high percentage of the total phosphor emission energy is concentrated between 540–550 μm and within the narrow range of wavelength for which the glass transmissivity peaks.

4,177,400

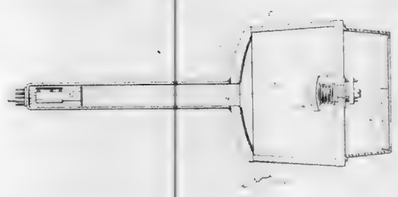
PROJECTION CATHODE RAY TUBE HAVING TARGET ANGULARLY AND LONGITUDINALLY ADJUSTABLE TO TUBE AXIS

George R. Hergenrother, Waltham, and Peter J. Sprague, Lenox, both of Mass., assignors to Advent Corporation, Cambridge, Mass.

Filed Mar. 27, 1978, Ser. No. 890,321

Int. Cl.[2] H01J *31/00, 29/24*

U.S. Cl. 313—477 R **10 Claims**



1. A projection cathode ray tube comprising the combination of

a sealed evacuated envelope comprising a tubular portion, a mirror portion sealed to one end of the tubular portion, the mirror portion having an inner concave mirror surface with a first aperture therein, an electron gun container portion sealed to the first aperture, a transparent face plate sealed to the other end of the tubular portion, the face plate having a second aperture therein, and a bellows having one end sealed to the second aperture and being closed at the other end thereof,

a target member within the envelope, attached to said other end of the bellows and having a surface with an electron beam sensitive coating thereon,

an electron gun within said electron gun container portion in position to direct a beam of electrons on to said coating, said mirror surface being located to reflect light between said coating and said face plate, and

means to adjust the target member position relative to the mirror portion including a shaft portion extending through the bellows and having an axis adjustably rotatable relative to said face plate, one end of the shaft portion being engaged with the target member and adapted to impart movements thereto longitudinally of the shaft portion and rotatably relative to said faceplate, a frame portion extending laterally from the other end of the shaft portion exteriorly of the envelope and having reference surface thereon each in engagement with the face plate, and means on the frame portion for independently adjusting the displacement between each of said reference surfaces and the target member.

4,177,401

LOW PRESSURE METAL VAPOR DISCHARGE LAMP WITH TUBULAR MEMBER AND MAGNETIC MEANS

Mikiya Yamane; Teruichi Tomura, both of Kunitachi, and Yoshio Watanabe, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 2, 1978, Ser. No. 902,058

Claims priority, application Japan, May 4, 1977, 52-50748

Int. Cl.[2] H01J *1/50, 61/10, 61/30, 61/42*

U.S. Cl. 313—485 **24 Claims**

1. A low pressure metal vapor discharge lamp comprising:

a discharge envelope including an outer bulb made of light-transmissive material and an inner tube disposed within said outer bulb, said inner tube having one open end and the other closed end;

an inert gas and metal filled in said envelope;

a cathode disposed interiorly of said inner tube;

an anode disposed exteriorly of said inner tube and interiorly of said outer bulb; and



magnetic field applying means disposed near the open end of said inner tube for applying a magnetic field near the open end.

4,177,402

MAGNETRON POLE PIECE ASSEMBLY

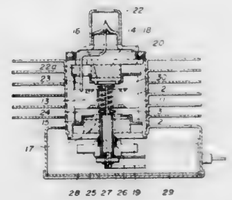
Yoshio Ishida, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 23, 1978, Ser. No. 880,587

Claims priority, application Japan, Jun. 24, 1977, 52-82497[U]

Int. Cl.[2] H01J *25/50*

U.S. Cl. 315—39.71 **6 Claims**



1. In a magnetron comprising an outer casing which includes an anode cylinder and yokes disposed at the both ends of said anode cylinder and is adapted to form a vacuum space, a plurality of vanes centripetally extending from the inner wall of said anode cylinder, a cathode structure disposed so as to form an interaction space between itself and said vanes, a holder located within said vacuum space which is firmly fixed on the inner wall of said anode cylinder and which has an opening formed in the center thereof, and a pole piece and a magnet disposed between said holder and one of said yokes, the improvement wherein through the opening formed at the center of said holder said pole piece is made to project into said interaction space and is metallically bonded to said holder at the periphery of said opening.

4,177,403

ELECTRONIC STARTER FOR IGNITING A DISCHARGE LAMP

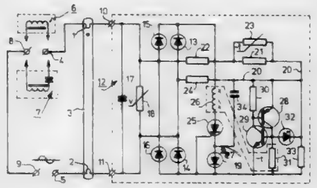
Michel Remery, Evreux, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 16, 1978, Ser. No. 870,026

Claims priority, application France, Jan. 31, 1977, 77 02585

Int. Cl.[2] H05B *41/16, 41/04*

U.S. Cl. 315—101 **19 Claims**



14. An electronic starter for igniting an electric discharge lamp comprising, a pair of input terminals for supplying an operating voltage to the electronic starter, a controlled semiconductor switch connected across said input terminals, said semiconductor switch including first and second electrodes that define a current control for the switch, a control circuit coupled between said first and second electrodes for controlling the operation of said semiconductor switch, said control circuit including a temperature-sensitive element, a voltage threshold element and an auxiliary switch having control electrode means, means coupling the auxiliary switch to at least one of said first and second electrodes of the semiconductor switch so as to control the operating condition of the semiconductor switch, means including said threshold element for coupling the control electrode means of the auxiliary switch to one of said input terminals so that the operating condition of the auxiliary switch is determined by the voltage level of said one input terminal, and means connecting the temperature-sensitive element to the control electrode means of the auxiliary switch thereby to effectively inhibit the operation of the auxiliary switch and thereby the operation of said semiconductor switch when the temperature of the temperature-sensitive element exceeds a given temperature level.

4,177,404

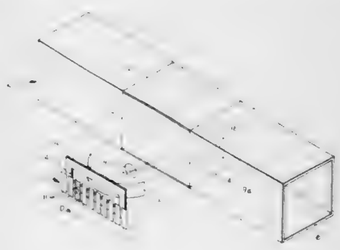
ARC DETECTOR FOR GLOW DISCHARGES

Ronald G. Eguchi, Long Beach, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Apr. 12, 1978, Ser. No. 895,727

Int. Cl.[2] H05B *41/36;* **H02H** *7/20*

U.S. Cl. 315—151 **14 Claims**

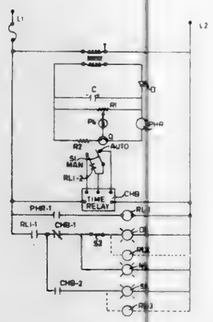


5. In an electric discharge device having a discharge volume with an anode and a cathode on opposite sides thereof, and having a high voltage impressed across said anode and cathode

for forming a stabilized glow in said discharge volume; means for preventing arcing across said volume, comprising:

a. photodetector means;
b. optical means presenting a complete transverse portion of said discharge volume to the field of view of said photodetector means;
c. electrical output circuit means operatively connected to said photodetector means for producing an electrical signal in response to the optical power reaching said photodetector means from the luminosity of an arc beginning to form in said discharge volume; and
d. means for cutting off the high voltage across said anode and cathode in response to said electrical signal.

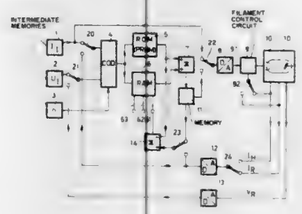
4,177,405
PHOTOCELL-CONTROLLED LIGHTING SYSTEM
Martial Chapdelaine, 2667, rue Prévert, Longueuil, Quebec, Canada (J4L 1T8)
Filed May 5, 1978, Ser. No. 903,167
Int. Cl.[2] H05B *37/02, 39/02*
U.S. Cl. 315—159 **7 Claims**



1. A photocell-controlled lighting system comprising:
(a) a first photocell-controlled relay operated by a photocell;
(b) at least one night or decorative light adapted to be connected to a power source;
(c) at least one spotlight also adapted for connection to said power source;
(d) a second relay adapted for connection to said power source and responsive to energization of said photocell-controlled relay for energizing said night or decorative light, and to de-energization of said photocell-controlled relay when the photocell is illuminated by the lights of an automobile entering the driveway of a house for switching off said night or decorative light; and
(e) a third time relay adapted for connection to said power source and operated by said second relay when the lights of the automobile are switched off for switching on said spotlight for a predetermined time interval.

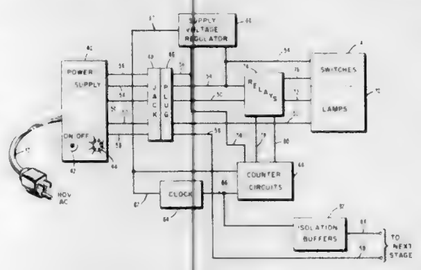
4,177,406
CIRCUIT FOR ADJUSTING TUBE ANODE CURRENT IN AN X-RAY GENERATOR
Bernd Hermeyer, Henstedt-Ulzburg, and Rudolf Ochmann, Hamburg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 25, 1978, Ser. No. 872,090
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703420
Int. Cl.[2] H05G *1/34*
U.S. Cl. 315—307 **6 Claims**

1. In a circuit for adjusting anode current in an X-ray generator of the type which includes coding means which function to form an address from values of anode current and tube voltage; addressable memory means which function to store filament current values associated with different combinations of anode current and tube voltages and to select and fetch these values in response to addresses formed by the coding means; and filament current adjusting means connected to receive the filament current values fetched from the memory means, which function to adjust a filament current in response to the values fetched; the improvement wherein:
the circuit further comprises
a buffer memory connected to store the filament current value fetched from the memory means;



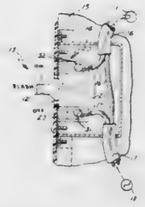
measuring means which function to measure the actual values of anode current and tube voltage during an X-ray exposure and which apply said measured values of anode current and tube voltage to the input of the coding means, whereby an address is formed from these measured values; and
means which function to store a filament current value from the buffer memory at a memory location in the memory means which is associated with the address formed from the measured values of anode current and tube voltage.

4,177,407
ELECTRONIC VOTIVE LIGHTS
Harold Goldstein, Westbury, and William T. Montren, Bayshore, both of N.Y., assignors to Control Electronics Co., Inc., Farmingdale, N.Y.
Filed Nov. 8, 1977, Ser. No. 849,650
Int. Cl.[2] H05B *37/00, 39/00, 41/00*
U.S. Cl. 315—312 **9 Claims**



1. An electronically controlled electric lamp assembly, comprising:
a plurality of relay means each having energizable coil portions for actuating control contact portions and power contact portions and each relay means being connected to the power source;
a plurality of switch means corresponding to said plurality of relay means, one being electrically connected between one of said plurality of relay means and said electric power source for actuatably energizing said relay coil portions thereby actuating said control contact portions for causing said coil portions to remain energized;
a plurality of electric lamps connected to corresponding power contact portions of said plurality of relay means, whereby upon said energization of said coil portions said power contact portions are actuated and corresponding lamps are energized; and
timing means electrically connected to said switch means and said coil portions of said relay means, whereby upon actuation of said switch, said timing means is activated for a predetermined period of time and upon the expiration of said predetermined period of time, said timing means lowers the current flow through said energized coil portions, thereby lowering the voltage drop across said energized coil portions and opening said control contact portions for deenergizing said coil portions and opening said power contact portions of said relay means for deenergizing a corresponding electric lamp.

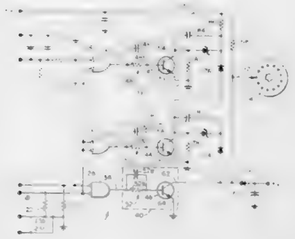
4,177,408
COMBINED SWITCH AND FLASHER
Robert D. Mason, 5501 Mick Ave., Kentwood, Mich. 49508
Filed Jun. 2, 1977, Ser. No. 802,883
Int. Cl.[2] H05B *37/02, 39/06, 41/04, 41/18*
U.S. Cl. 315—362 **9 Claims**



1. A switching apparatus connected to the existing two wires in a switch box, comprising
a housing to be accommodated within the switch box and having an open interior and a cover plate at one side of the open interior,
a base panel traversing the interior of the housing and confronting the sidewalls, a first face of the panel being spaced from the adjacent housing wall and cooperating therewith in defining an unobstructed pocket,
a flasher wafer in said pocket, and having electrical connection at its opposite faces, and
a mechanical switching mechanism within the housing and adjacent a second face of the base panel opposite the first face thereof and having circuit means connected in series with said flasher wafer.

4,177,409
VIDEO AMPLIFIER FOR DISPLAYING FOUR OR MORE VIDEO LEVELS ON A CATHODE RAY TUBE
Howard A. Chamberlin, Jr., Manchester, N.H., assignor to Hendrix Electronics Incorporated, Manchester, N.H.
Filed Feb. 13, 1978, Ser. No. 877,304
Int. Cl.[2] H01J *29/52*
U.S. Cl. 315—383 **8 Claims**

1. A video amplifier for generating at least four discrete output levels of video for a cathode ray tube display comprising
input decoding means for receiving at least two digital input lines and providing at least three output signal lines, said output lines uniquely representing the signal state of said input lines,
at least first, second, and third two-state switch elements, each switch element being associated with and responsive to a different one of said output signal lines, and each switch element providing, at respective first and second switch lines, a substantially short circuit, in response to a first state of said associated output signal line, and a substantially open circuit, in response to a second state of said associated output signal line,
means for providing a black video reference level to a video output line which, when applied to said cathode ray tube display, has sufficient potential to turn said cathode ray tube substantially off,
reference means associated with each switching element for connecting each first switch line to a common bright voltage reference level,
voltage determining means associated with each switching element for connecting each second switch line to said video output line, and
said input decoding means, said switching elements and said voltage determining means being connected to provide a priority switching system wherein



the video line is held at the bright voltage reference level when the first switch element is in a first state,
the video line is held at a normal voltage reference level when the second switch element is in said first state and the first switch element is in a second state,
the video line is maintained at a dim reference voltage when the third switch element only is in said first state,
the video line is maintained at said black video reference level when each switch element is in its second state, and
changes on said video line from one reference voltage level to another reference voltage level, in response to a change of digital input signal, are substantially monotonic,
whereby at least four voltage levels of video are obtained at the cathode ray tube display.

4,177,410
STRETCHABLE MATERIAL REWINDING MACHINE
Daniel J. Dowd, Williamsport, Pa., assignor to Westvaco Corporation, New York, N.Y.
Division of Ser. No. 750,469, Dec. 14, 1976, Pat. No. 4,103,840.
This application Jan. 6, 1978, Ser. No. 867,231
Int. Cl.[2] H02P *7/00*
U.S. Cl. 318—163 **6 Claims**



1. A stretchable material rewinding machine comprising a plurality of web guide rolls along a web route between a material supply reel and a rewind reel, a rotational power source,

and speed control means therefor, a first rotational power transmission link between said power source and said supply reel, a second rotational power transmission link between said power source and said rewind reel, the improvement comprising:

A. First and second web tension sensing means along said web route between said supply reel and said rewind reel for monitoring and tensile stress within said web and generating first and second signals proportional thereto;

B. First and second infinitely variable speed ratio change means in said first and second rotational power transmission links, respectively, for changing the rotational ratio between said power source and said supply and rewind rolls, respectively, in respective response to said first and second signals;

C. Accumulated rewind reel length counting means for monitoring the length of web accumulated on said rewind reel and generating a third signal proportional thereto;

D. First speed signal generation means for emitting a first speed signal to said speed control means while in receipt of said third signal for a first reel length interim; and,

E. Second speed signal generation means for emitting a second speed signal to said speed control means while in receipt of said third signal for a second reel length interim.

4,177,411

SPEED-AND-PHASE CONTROL CIRCUIT FOR A ROTARY MACHINE

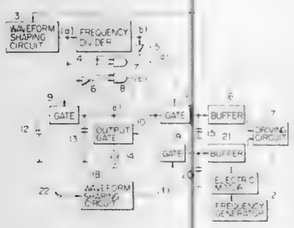
Saburo Takaoka, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 28, 1978, Ser. No. 929,053

Claims priority, application Japan, Jul. 28, 1977, 52-90569

Int. Cl.[2] H02D 5/06

U.S. Cl. 318—314 **5 Claims**



1. A speed-and-phase control circuit for a rotary machine, comprising:

a. frequency divider means responsive to an input signal whose frequency is proportional to the revolution number of said rotary machine for providing frequency division of said input signal and for providing said frequency-divided input signal as a first output signal;

b. logical circuit means responsive to said input signal and to said first output signal for providing in timed relationship a first timing pulse having a pulse width equal to a half period of said input signal, the rising edge of said first timing pulse being substantially coincident with the falling edge of said input signal, a second timing pulse having a pulse width equal to one period of said input signal, the rising edge of said second timing pulse being substantially coincident with the falling edge of said first timing pulse, and a third timing pulse having a pulse width equal to a half period of said input signal, the rising edge of said third timing pulse being substantially coincident with the falling edge of said second timing pulse;

c. charging circuit means for charging a first capacitor circuit to a predetermined voltage level in response to said first timing pulse;

d. discharge circuit means for discharging according to the constant current mode said first capacitor circuit in response to said second timing pulse;

e. first gate circuit means for transferring said charge present on said first capacitor circuit to a second capacitor circuit in response to said second timing pulse; and

f. second gate circuit means for transferring said charge present on said first capacitor circuit to a third capacitor circuit in response to a reference timing pulse having a reference phase, whereby the speed and phase of said rotary machine is selectively controlled in accordance with the voltages present on said second and third capacitor circuits.

4,177,412

CLOSED LOOP ROTATIONAL SPEED CONTROL SYSTEM HAVING MEANS FOR GENERATING A PNM SIGNAL FOR AN ELECTRIC MOTOR

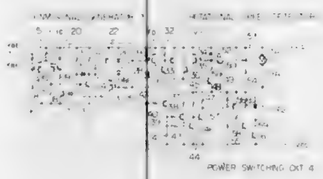
Hiroshi Minakuchi, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 14, 1977, Ser. No. 860,440

Claims priority, application Japan, Dec. 15, 1976, 51/151118

Int. Cl.[2] H02P 5/06

U.S. Cl. 318—341 **6 Claims**



1. A rotational speed control system for an electric motor comprising:

(a) a rotational speed detector for producing a DC voltage the magnitude of which varies in accordance with the rotational speed of the rotor of said electric motor;

(b) a PNM signal generator responsive to said rotational speed detector for producing a PNM signal comprising constant width pulses, the number of said pulses per a unit time varying in accordance with the magnitude of the DC voltage, said pulses being generated independently of rotational position of a shaft of said motor; and

(c) a power switching circuit responsive to said PNM signal generator and to said electric motor for switching the feed of electric power to said electric motor in accordance with the PNM signal, said power being removed from said motor during said constant width pulses.

4,177,413

BATTERY CHARGERS

Enzo Ascoli, Lausanne, Switzerland, assignor to The Gillette Company, Boston, Mass.

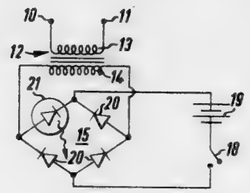
Filed Dec. 15, 1977, Ser. No. 861,044

Claims priority, application United Kingdom, Apr. 20, 1977, 16382/77

Int. Cl.[2] H02J 7/00; H02M 7/04

U.S. Cl. 320—2 **4 Claims**

1. A charging circuit for charging a low voltage battery from an AC supply, said charging circuit comprising a full wave bridge rectifier network having four legs, a pair of input terminals connected across one diagonal of said bridge for connection to a low voltage AC charging supply, a pair of output terminals connected across the other diagonal of said bridge for connection to a battery to be charged, three of said four legs including a rectifying element presenting a first voltage drop, and said fourth leg including a light emitting diode presenting a second voltage drop exceeding said first voltage drop, said light emitting diode serving both as a rectifying element excited only on alternate half cycles of said AC charging supply and to provide a visual indication of operation of said charging circuit.



4,177,414

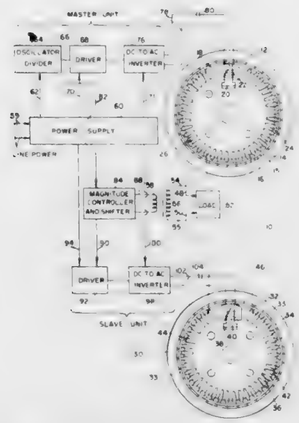
CONTROLLABLE VOLTAGE A.C. GENERATOR SYSTEM

John F. Roesel, Jr., Bradenton; Richard R. Ott, Sarasota, and Ronnie J. Barber, Bradenton, all of Fla., assignors to Precise Power Corporation, Bradenton, Fla.

Filed Dec. 21, 1977, Ser. No. 862,813

Int. Cl.[2] H02P 9/42

U.S. Cl. 322—28 **13 Claims**



1. A generator system for producing sine wave A.C. of a substantially constant selected frequency and of a substantially constant selected voltage, comprising a rotating master generator for generating a sine wave A.C. potential of a substantially constant selected frequency, at least one other rotating slave generator for generating sine wave A.C. of an identical frequency to that of the master generator, the A.C. potential output of the master generator being combined in series with that of the said other slave generator, electrical means for phase shifting of the A.C. potential output of the slave generator with respect to that of the master generator so that the combined A.C. potentials of both generators is a sine wave A.C. having the selected voltage.

7. In a voltage control system for combining in series the outputs of a master generator and at least one slave generator each producing sine wave A.C. potentials of an identical frequency, means for determining the peak voltage of the combined sine wave A.C. voltage output of the generators for a brief interval at one-quarter of a wave length after the zero point thereof, means for comparing such peak voltage with a selected voltage and for producing an electrical signal proportional to the difference therebetween, supplying such electrical difference signal to means for causing the phase of the sine wave A.C. potential output of the slave generator to be shifted by an amount proportional to said signal with respect to the sine wave A.C. potential output of the master generator, whereby the resultant combined series voltage is substantially the selected voltage.

4,177,415

VOLTAGE REGULATOR FOR USE WITH A POLYPHASE MAGNETO GENERATOR

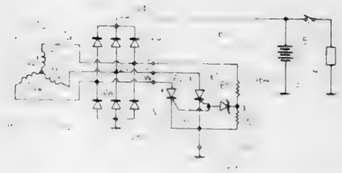
Hideki Yukawa, Susono, Japan, assignor to Kokusan Denki Co., Ltd., Numazu, Japan

Filed Apr. 19, 1978, Ser. No. 897,866

Claims priority, application Japan, Apr. 22, 1977, 52-50300

Int. Cl.[2] H02J 7/14; H02P 9/00

U.S. Cl. 322—28 **5 Claims**



1. A voltage regulator for use with a polyphase magneto generator and in combination with a rectifier circuit provided to rectify the output of the generator to charge a battery, said voltage regulator comprising:

at least two thyristors having the anodes respectively connected to the AC output terminals of the generator having phases adjacent to each other, having the cathodes connected to the negative output terminal of the rectifier circuit, and having the gates connected to each other, and

trigger means adapted to supply gate signals to the gates of said thyristors when the voltage of the output terminal having a phase in advance of the phases of the output terminals to which the anodes of said thyristors are connected exceeds a predetermined value,

whereby as the terminal voltage of the battery is excessive said thyristors are rendered conductive to short-circuit the output of the generator.

4,177,416

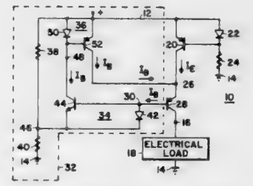
MONOLITHIC CURRENT SUPPLIES HAVING HIGH OUTPUT IMPEDANCES

William F. Davis, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 9, 1978, Ser. No. 885,064

Int. Cl.[2] G05F 1/56

U.S. Cl. 323—4 **12 Claims**



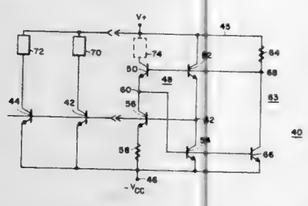
1. A high resistance current supply circuit for providing a current having a substantially constant magnitude, the high resistance current supply circuit having an output terminal for being coupled to an electrical load, the electrical load providing a voltage of variable magnitude to the output terminal, the high resistance current supply circuit including in combination:

power supply conductor means;
electron control means having input, output and control electrodes, said output electrode of said electron control means being coupled to the output terminal of the high resistance current supply circuit, said electron control means tending to provide an output current at said output electrode thereof and a control current at said control electrode thereof having magnitudes which undesirably tend to correspond to variations in the magnitude of the voltage provided by the electrical load at the output terminal;
circuit means coupling said input electrode of said electron control means to said power supply conductor means; and
feedback circuit means having input and output terminals, said input terminal being connected to said control electrode of said electron control means, said output terminal of said feedback means being connected to said input electrode of said electron control means, said feedback circuit means being responsive to said variations of the magnitude of said control current at said control electrode of said electron control means to provide a feedback current to said input electrode of said electron control means, said electron control means being responsive to said feedback current to substantially eliminate said undesirable variations in the magnitudes of said control current so that the magnitude of said output current provided at said output electrode of said electron control means remains substantially constant.

4,177,417
REFERENCE CIRCUIT FOR PROVIDING A PLURALITY OF REGULATED CURRENTS HAVING DESIRED TEMPERATURE CHARACTERISTICS

Paul M. Henry, Chandler, and William J. Lillis, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 2, 1978, Ser. No. 882,710
Int. Cl.[2] G05F *1/56*
U.S. Cl. 323—4 **11 Claims**

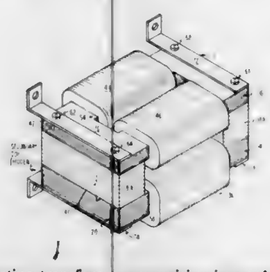


1. A circuit for providing a plurality of output currents of a regulated magnitude which have a predetermined temperature coefficient, including in combination:
reference cell means having resistive means and a plurality of bipolar transistors each having an emitter, a base and a collector, the base-to-emitter junctions of said plurality of transistors being connected serially in a loop with one another and with said resistive means such that the summation of the base-to-emitter voltages thereof develops a reference current in said resistive means, the magnitudes of the collector currents of said plurality of transistors being substantially equal to one another, and the base-to-emitter voltages of pairs of said plurality of transistors opposing each other around said loop, such that said reference current has a magnitude which is substantially proportional to the ratio of the emitter areas of at least a pair of said plurality of transistors and to the absolute temperature of said transistors;
a plurality of controlled current supply means connected to said emitter of one of said plurality of transistors so that said one of said plurality of transistors operates as an emitter-follower for enabling the plurality of output currents to be provided by said plurality of controlled current supply means, said emitter of said one of said plurality of transistors being further coupled to the collector of another one of said plurality of transistors; and
bias circuit means connected to said another one of said plurality of transistors for providing a bias voltage of a desired magnitude thereto and which enables said plurality of output currents to have the desired temperature coefficient.

4,177,418
FLUX CONTROLLED SHUNT REGULATED TRANSFORMER

Karl H. Brueckner; Charles A. Farel, both of Boulder, and Johnnie F. Irsik, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 4, 1977, Ser. No. 821,893
Int. Cl.[2] G05F *1/46;* **H01F** *27/24, 31/00*
U.S. Cl. 323—56 **8 Claims**



1. A regulating transformer comprising in combination:
a main "O" shaped core for supporting primary and secondary coils:
a shunt "O" shaped core for supporting at least one control coil; said shunt core being positioned in spaced juxtaposed alignment with the main core;
separate flux interconnecting means placed such that the magnetic flux from the main core travels at right angles to said flux interconnecting means for interconnecting the main core and the shunt core; said flux interconnecting means including a plurality of stacked I-shaped laminations placed such that the magnetic flux from the main core travels at right angles to the plurality of laminations and also being operable to mechanically couple the main and shunt cores;
fastening means, interconnecting the cores and flux interconnecting means, operable to give structural strength to said transformer; and
mounting means operable for mounting said transformer.

4,177,419
TEST APPARATUS FOR CHECKING THE RESPONSE OF PROTECTIVE RELAYS

Michael Fiorentzis, Wettingen, Switzerland, assignor to BBC Brown Boveri & Company Ltd., Baden, Switzerland

Continuation-in-part of Ser. No. 773,074, Feb. 28, 1977, abandoned. This application Dec. 4, 1978, Ser. No. 966,491
Claims priority, application Switzerland, Mar. 15, 1976, 3164/76
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—418 **8 Claims**

1. A test apparatus for checking of test objects, typically protective relays, especially voltage, current and frequency relays for protecting a generator of a power supply network, comprising:
a first circuit for producing and transforming the test magnitudes which are to be delivered to the test objects;
a second circuit for pre-programming the test magnitudes which are to be delivered to the test objects;

a signal and control device for controlling the course of the test;
a measuring device for measuring relay-response values;
said first circuit comprising a first test signal generating circuit for supplying a voltage relay and current relay with voltage test magnitudes and current test magnitudes, respectively;
said first test signal generating circuit comprising a test transformer having a secondary winding and a primary winding;
said first test signal generating circuit further comprising a static potentiometer connected in parallel with the secondary winding;
said static potentiometer comprising a combination of resistors and electronic switches connected in circuit with one another for delivering test magnitudes to the test objects in finely graduated values;



means for controlling said static potentiometer;
said first circuit further containing a second test signal generating circuit for supplying a frequency relay with frequency test magnitudes;
said second circuit for pre-programming the test magnitudes containing a test matrix for supplying information concerning the test magnitudes; and
said signal and control device being operatively connected with said test matrix and receiving said information therefrom and storing a predetermined test course-program and controlling the test course in accordance with said program.

4,177,420
MAJOR AND MINOR SHORT LEAKAGE DETECTOR

Charles W. Tripp, 15241 Oak Ridge Way, Los Gatos, Calif. 95030

Continuation-in-part of Ser. No. 851,593, Nov. 14, 1977, abandoned. This application May 8, 1978, Ser. No. 903,536
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—51 **27 Claims**

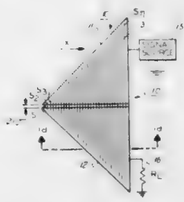


1. A short circuit detector for battery powered circuits such as those employed in vehicles or the like wherein one battery cable is connected to the circuit and the other is grounded, said tester being of the type connected in series with the battery and having a current lead for connection to one battery terminal from which the battery cable has been disconnected, a sensor lead for connection to the disconnected cable, current dissipating means connected for conducting high currents across said leads caused by a major short and signal means for audibly indicating the presence of said short by one tone; the improvement wherein said detector has a ground connection, said current dissipating means offering a resistance of less than one ohm to minor short currents as low as a few milliamperes, main switch means in series with said current dissipating means across said leads, voltage dropping trigger resistance means connected across said leads, trigger switch means connected to sense a voltage drop in said trigger resistance means and to one of said leads for turning said main switch means on in response to the current drawn through said trigger resistance means by a minor short current of less than one ampere thereby independently energizing the circuit under test, said signal means having a discriminator control circuit having means for sensing the amount of current flowing through said main switch means and said current dissipating means and connected to said signal means for turning the latter on, said signal means having means for producing a different tone from said one tone, for signalling said minor short when said main switch means is turned on and means for powering said signal means from said current lead.

4,177,421
CAPACITIVE TRANSDUCER

David D. Thornburg, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 27, 1978, Ser. No. 881,287
Int. Cl.[2] G01R *27/26*
U.S. Cl. 324—61 R **20 Claims**



1. A capacitive transducer comprising at least two plate electrodes aligned along a main axis in spaced juxtaposed relation, a substantially parallel array of segmented electrodes each of smaller dimensional width than said plate electrodes and aligned in a direction transverse to said main axis overly said plate electrodes but separated therefrom by dielectric means, said segmented electrodes capacitively coupled to said plate electrodes in an increasing capacitive and monotonic manner from one end of the transducer to the other along said main axis.

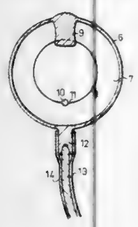
4,177,422
APPARATUS AND PROCESS FOR GENERATING AN IONIZED GAS OR PLASMA BY MICROWAVE ENERGY

Alain Deficis; Marie-Edith Gimonet, both of Ramonville Saint-Agne; Alain Priou, Castanet-Tolosan, and Christian Fournet-Fayas, Fenouillet, all of France, assignors to Agence Nationale de Valorisation de la Recherche (A.N.V.A.R.), Neuilly-sur-Seine, France

Filed Nov. 18, 1977, Ser. No. 852,748
Claims priority, application France, Nov. 19, 1976, 76 35308
Int. Cl.[2] G01R *21/04, 19/00*
U.S. Cl. 324—95 **16 Claims**

1. A device for the generation of an ionized gas for measurement of ultra-high frequency electromagnetic radiation comprising a sealed casing containing an ionizable gas, an oscillating circuit comprising an inductor connected across a capacitor in said casing, said inductor and capacitor being adapted to resonate at a predetermined resonance frequency F_o in the

ultra-high frequency range and to have a Q factor in a vacuum Q_o of greater than 1, in order to render said circuit capable of providing a firing voltage across said capacitor for ionizing said gas when said inductor receives electromagnetic radiation near the frequency F_o, optical conducting means having one



end attached to said casing near said capacitor, and means attached to the other end of said optical conducting means for analyzing light transmitted from said conductor and driving a signal representative of the power of the electromagnetic radiation.

4,177,423

BRIDGE CIRCUITS

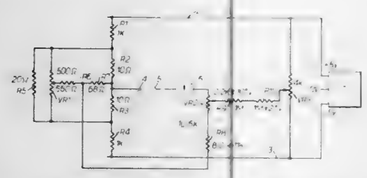
Roy C. Turner, Slough, and Philip J. Constable, Uxbridge, both of England, assignors to Drayton Controls (Engineering) Limited, West Drayton, England

Filed Jul. 6, 1977, Ser. No. 813,254

Claims priority, application United Kingdom, Jul. 7, 1976, 28322/76

Int. Cl.[2] **G01R** *17/06, 17/00, 27/02;* **G01K** *7/14*

U.S. Cl. 324—99 R **12 Claims**



1. A measuring bridge circuit comprising first and second standard resistance means in series between two bridge supply terminals, third and fourth series-connected resistance means including the track of a balancing potentiometer having a slider and connected in parallel with the series-connected first and second resistance means, fifth resistance means connected from the slider of the potentiometer by way of sixth resistance means to the junction of the first and second resistance means, the resistance of the fifth resistance means being high compared with the resistance of the sixth resistance means, a balance detector and means for connecting a voltage to be measured and the balance detector in series between the junction of the first and second resistance means and the junction of the fifth and sixth resistance means.

4,177,424

METHODS OF AND A CIRCUIT FOR MONITORING THE AMPLITUDE OF SINE WAVE-SHAPED SIGNALS

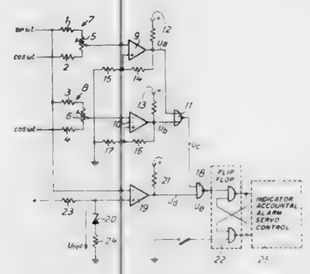
Siegfried Knittel, Naunheim, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed May 31, 1977, Ser. No. 801,909

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1976, 2624711

Int. Cl.[2] **G01R** *19/16, 19/00;* **H03K** *5/20*

U.S. Cl. 324—102 **7 Claims**



1. A method of monitoring the amplitude of one of a plurality of sine-wave shaped electrical signals in a predetermined time interval of the signal period wherein said plurality of sine-wave shaped signals is derived from scanning an object which is to be measured or controlled, said method comprising the steps of:

(a) comparing the voltage of the signal being monitored with the voltage of a reference signal to produce a first pulse;

(b) producing a second pulse determinative of said predetermined signal time interval by adding to said monitored signal at least one signal contained in said plurality of sine-wave shaped signals and phase shifted with respect to said monitored signal; and

(c) combining said first and second pulses in logic means to produce a signal for operating output means in response to said monitored signal.

4,177,425

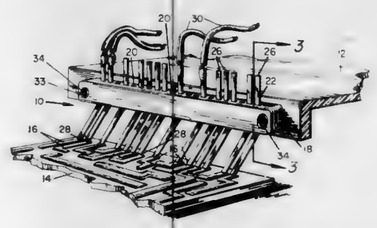
MULTIPLE CONTACT ELECTRICAL TEST PROBE ASSEMBLY

Seymour Lenz, P.O. Box 104, Altamonte Springs, Fla. 32701

Filed Sep. 6, 1977, Ser. No. 830,424

Int. Cl.[2] **G01R** *1/06, 31/02*

U.S. Cl. 324—158 P **11 Claims**



1. A multiple contact electrical test probe assembly for contacting and testing miniature electronic circuit devices lying in a first plane, said assembly comprising:

a support of an electrically non-conductive material, said support having a plurality of spaced holes extending through said support from one side of said support to an opposing side thereof all of said holes being substantially parallel and lying in a common plane which is substantially normal to said first plane;

a plurality of electrically conductive contact elements, each element dimensioned to a press fit within at least one of said holes and having a bend between the ends thereof to restrict sliding through the corresponding hole;

at least a first end of each said contact element adapted to sequentially engage a plurality of miniature electronic circuit devices for testing purposes;

each contact element having sufficient tensile strength to withstand said sequential testing of said circuit devices;

means for mounting said assembly in space relationship with said circuit device being tested;

wherein each said bend is positioned between said support and said circuit device being tested, and separates said corresponding contact element into two end portions, a first end portion including said first end and being longer than the second end portion which includes said second end; and wherein

both said first and second ends of each said contact element is adapted to sequentially engage a plurality of miniature electronic circuit devices for testing purposes, by sliding from the corresponding hole and reversal of the corresponding contact element.

4,177,426

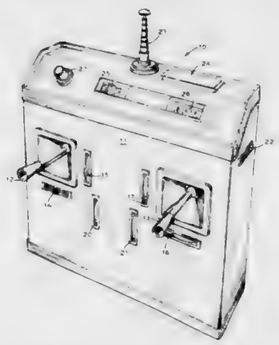
RADIO CONTROL SYSTEM WITH PLUGGABLE MODULES FOR CHANGING SYSTEM OPERATING FREQUENCY

Rudolph M. Gaishin, St. Joseph, and Garry C. Covert, Baroda, both of Mich., assignors to Heath Company, Benton Harbor, Mich.

Filed Oct. 30, 1975, Ser. No. 627,425

Int. Cl.[2] **H04B** *7/00*

U.S. Cl. 325—37 **19 Claims**



1. A radio control system for remote control of a mechanism comprising, in combination:

a radio transmitter including means mounted on a pluggable transmitter module to generate a radio signal at a first frequency and a modulation circuit to produce a modulation signal, said generating means and said modulation circuit being interconnected by a first disengageable plug and receptacle connection means to couple said modulation signal to said generating means which responds thereto by producing a modulated radio signal; and

a radio receiver including means mounted on a pluggable receiver module to receive and convert said modulated radio signal into a modulated signal at a second frequency, a demodulator responsive to signals at said second frequency to remove the modulation therefrom to control said mechanism, and a second disengageable plug and receptable connection means to interconnect said means to receive and convert with said demodulator, said transmitter and receiver modules cooperating to enable operation of said system at said first frequency when they are jointly plugged into said transmitter and receiver, respectively.

4,177,427

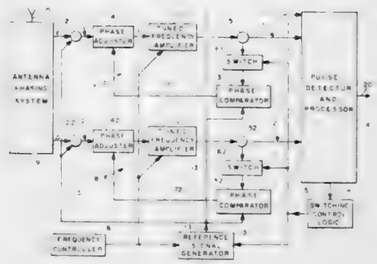
PHASE-NORMALIZED PARALLEL TUNED RECEIVER CHANNEL SYSTEM

Marvin W. Shores, Pomona, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Apr. 3, 1978, Ser. No. 892,527

Int. Cl.[2] **H03D** *3/00;* **H04B** *1/06*

U.S. Cl. 325—369 **3 Claims**



1. A system having a plurality of parallel tuned receiver channels, wherein a normalized phase relationship is maintained in the respective channels between amplified pulsed high frequency carrier signals having a given frequency, comprising

a plurality of parallel channels for receiving pulsed high frequency carrier signals from disparate sources, wherein each channel includes a tuned frequency amplifier for amplifying a given frequency component of a signal in the channel within a predetermined bandwidth;

a reference signal generator for generating a continuous wave reference signal having the given frequency; and

an individual phase control loop for each of the channels for locking the amplified signal in the channel to the phase of the reference signal, wherein each phase control loop includes

a first in-line circulator connected in the channel before the input of the tuned frequency amplifier for inserting the reference signal into the loop;

a phase comparator for comparing the phase of the reference signal components of the amplfied signal with the phase of the reference signal;

a phase adjuster controlled by the phase comparator and connected in the channel between the circular and the tuned frequency amplifier for adjusting the phase of the signal from the circulator in response to said phase comparison;

a second in-line circulator connected in the channel following the output of the amplifier; and

a switch connected to the second in-line circulator for providing the amplifier signal to the phase comparator;

wherein the system further comprises

a pulse detector and processor circuit for receiving the amplified signals from the plurality of channels and for detecting coherent pulsed signals in the received amplified signals; and

a switching control logic circuit connected to the signal detector and processor circuit, to the reference signal generator, and to each of the switches for enabling the reference signal generator to provide the reference signal, and for enabling the switches to provide the amplified signals in the plurality of channels to all of the respective channel phase comparators simultaneously during a predetermined interval in response to detection of a said

coherent pulsed signal by the pulse detector and processor circuit, thereby causing said phase adjustments in the separate channels to be made simultaneously to normalize the phase shift between the reference signal and the amplified signals in the plurality of channels.

4,177,428

CIRCUIT ARRANGEMENT FOR AMPLIFYING OSCILLATOR OSCILLATIONS AND CONVERTING SAME TO RECTANGULAR SIGNALS

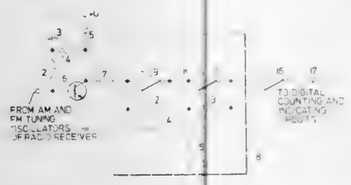
Otto Klank, Arpke, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltung-G.m.b.H., Frankfurt, Fed. Rep. of Germany

Filed Sep. 19, 1977, Ser. No. 834,448

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1977, 2641782

Int. Cl.[2] H04B *1/06*

U.S. Cl. 325—455 **9 Claims**



1. In a circuit arrangement for digitally indicating the frequency to which a radio receiver having both an AM tuning oscillator and an FM tuning oscillator is tuned, said circuit arrangement including means for coupling the output signals from said AM and FM oscillators to the input of a common broadband amplifier which has a bandwidth sufficiently broad so as to pass and amplify signal frequencies from both the AM and FM tuning oscillators and which converts the amplified output signals from said oscillators into rectangular signals, said coupling means sufficiently loosely coupling the output signals from said AM and said FM tuning oscillators to the common input of said broadband amplifier so that said tuning oscillators are not noticeably detuned by changes in capacitance of said broadband amplifier, and digital counting and indicating means for counting the frequency of said rectangular signals and for providing a digital indication of the frequency to which the particular tuning oscillator is tuned; the improvement wherein said common broadband amplifier comprises first and second inverters, each having a fast rise-time, which are each designed as an integrated circuit and which are connected in series with one another via a capac ance; and means for applying a respective bias voltage to the input of each of said inverters so that the operating point of each of said inverters lies on the steep portion of the curve indicating the relationship between the input voltage and the output voltage of the inverter, said means for applying a respective bias voltage including a resistive voltage divider connected from the output of said second inverter to a point of reference potential with said voltage divider having its tap connected with said input of said second inverter, which is connected behind said first inverter, to generate the biasing voltage for said second inverter.

4,177,429

SWITCHING ARRANGEMENT FOR COMBINATION VHF-UHF TUNERS

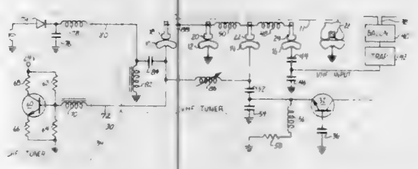
Alarico A. Valdettaro, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed Dec. 14, 1977, Ser. No. 860,485

Int. Cl.[2] H04B *1/06*

U.S. Cl. 325—459 **9 Claims**

1. A television tuner arrangement for receiving both VHF and UHF television signals, comprising a common VHF and UHF station selector shaft, detent means for establishing a plurality of equally spaced detent positions for said selector shaft, VHF tuner means for selecting different VHF stations in the VHF band in alternate detent positions of said selector shaft, UHF tuner means connected to said selector shaft and effective to receive any one of the seventy UHF stations in the detent positions between said alternate detent positions upon rotation of said selector shaft through a plurality of revolutions, said UHF tuner means including an IF output circuit and a transistor oscillator having a base and a collector, means for



continuously supplying a unidirectional supply potential to said collector, said VHF tuner means including a fixed stator member carrying a plurality of stator contacts, means carried by said selector shaft for supporting a plurality of tuning panels, means permanently connecting a first one of said stator contacts to said base and to said IF output circuit, means permanently connecting a second one of said stator contacts to ground, and means carried by each of said tuning panels for electrically connecting said first and second stator contacts together in said alternate detent positions of said selector shaft.

4,177,430

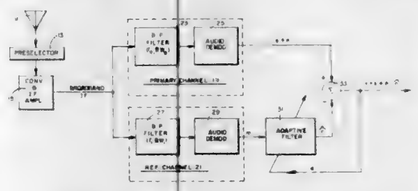
ADAPTIVE NOISE CANCELLING RECEIVER

James E. Paul, Anaheim, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 6, 1978, Ser. No. 884,093

Int. Cl.[2] H04B *1/12*

U.S. Cl. 325—475 **16 Claims**



1. An adaptive noise cancelling receiver comprising:

means responsive to received radio frequency signals for selectively developing a desired broadband frequency signal containing a desired signal;

a first frequency channel responsive to the broadband frequency signal for generating a first audio signal in a first band of frequencies containing the desired signal in the presence of a first broadband noise;

a second frequency channel responsive to the broadband frequency signal for generating a second audio signal in a second band of frequencies containing a second broadband noise which is correlated with the first broadband noise;

an adaptive filter responsive to the second broadband noise and to an output audio signal for adaptively developing an estimate of the first broadband noise; and

means for combining the estimate of the first broadband noise with the first audio signal to substantially cancel out the first and second broadband noises and develop the output audio signal, said output audio signal substantially containing only the desired signal.

4,177,431

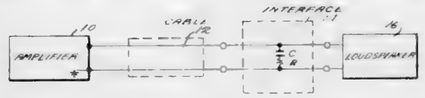
LOUDSPEAKER-CABLE INTERFACE

Matthew S. Polk, Jr., 34 E. Melrose Ave., Baltimore, Md. 21212

Filed Mar. 17, 1978, Ser. No. 887,740

Int. Cl.[2] H03F *1/26*

U.S. Cl. 330—149 **9 Claims**



1. In an audio reproduction system of the type including an amplifier, at least one remote speaker unit, and a cable of predetermined characteristic impedance electrically connecting said remote speaker unit to said amplifier, said system having a tendency to generate spurious higher than audio frequency signals and a tendency to reflect said signals within the cable, said reflected signals passing through said cable to said amplifier, the improvement wherein said system further comprises:

interface means, interposed at the end of said cable between said cable and said speaker, for terminating said cable with a predetermined impedance at said higher than audio frequencies to inhibit generation of said spurious higher than audio frequency reflected signals, said predetermined impedance including a resistive component on the order of said characteristic impedance and a capacitive component of low value at said higher than audio frequencies.

4,177,432

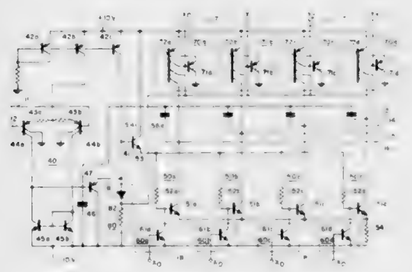
MULTI OUTPUT DIFFERENTIAL AMPLIFIER

Stephen W. Hobrecht, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 26, 1978, Ser. No. 919,160

Int. Cl.[2] H03F *3/45*; H03C *3/68*

U.S. Cl. 330—252 **9 Claims**



1. A multi-output differential amplifier integrated on a semiconductor substrate comprising:

input terminal means for simultaneously receiving a pair of analog voltages;

first transistor means connected to said input terminal means for generating an analog signal representative of any voltage difference between said pair;

a plurality of output terminal means;

a plurality of output transistors, each of said transistors having a base coupled to receive said analog signal and having a collector coupled to a respective one of said output terminal means;

a plurality of selectively activated current source means coupled respectively to the collectors of said output transistors for supplying current to selectable ones of said collectors in response to output selection signals; and

a plurality selectively activated current sinking means coupled respectively to the bases of said output transistors for sinking current from selectable ones of said bases in response to said output selection signals.

4,177,433

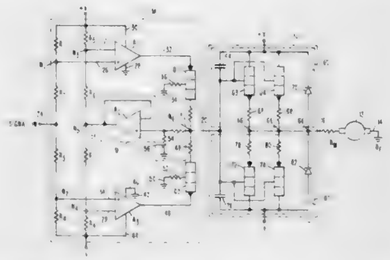
REEL MOTOR PREAMPLIFIER

Robert J. Christopher, Boulder, Colo., and Robert L. Schaaf, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 20, 1978, Ser. No. 962,278

Int. Cl.[2] H03F *3/20, 3/68*

U.S. Cl. 330—265 **6 Claims**



1. A bipolar amplifier circuit for supplying bipolar signals to a load, said amplifier circuit comprising in combination:

a preamplifier stage having an output terminal; and

a power amplifier stage having an input terminal connected in tandem with the output terminal of the preamplifier stage and an output terminal to supply a high voltage/-high current signal to the load;

said preamplifier stage including a first signal operational amplification means;

a second signal operational amplification means interconnected in parallel with the first signal amplification means;

a first signal dividing means interconnecting a first input of the first and second amplification means; said signal dividing means being operable for receiving a bipolar signal and providing a unipolar signal therefrom;

a pair of switching means one of each positioned in the output terminal of the first and second amplification means; each of said switching means being operable to regulate an electrical characteristic of the associated amplification means;

a second signal dividing means interconnecting a second input of the first and second amplification means and operating as a voltage divider to provide a unipolar signal to each of the first and second amplification means;

a gain controlled loop interconnecting the output of said switching means to the second signal dividing means to direct a portion of the bipolar output signal to said second signal dividing means to control the first and second amplification means such that the signal amplification of the activated amplification means is supported;

said power amplifier stage including a third signal amplification means;

a fourth signal amplification means connected in parallel, at a common node, with the third amplification means whereby each of the third and fourth signal amplification means are arranged in a parallel configuration to maximize signal amplification.

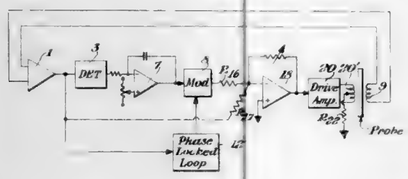
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4,177,434

CONSTANT AMPLITUDE CONTROL OF ELECTROMECHANICAL OSCILLATORS

Edward S. Ida, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 30, 1978, Ser. No. 910,849
Int. Cl.[2] G01N *11/16*; H03B *5/30, 3/02*
U.S. Cl. 331—27 5 Claims



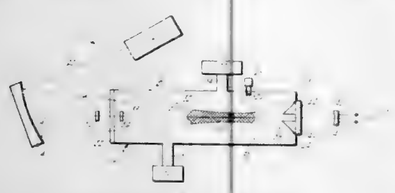
1. A method for maintaining the amplitude of an electromechanical oscillator mechanical output signal constant independent of its operating frequency, comprising the steps of:
generating a constant amplitude a-c signal in phase agreement with said output signal;
developing a d-c signal related to said output signal amplitude;
continuously integrating the difference in voltages between said d-c signal and a preselected setpoint voltage value to provide a control signal;
amplitude modulating said constant amplitude a-c signal with said control signal to provide a modulated a-c signal in phase with said output signal to maintain said oscillator in oscillation; and
maintaining the amplitude of said output signal in accordance with the algebraic sum of a linear negative feedback signal derived from said output signal and said modulated a-c signal, thereby to maintain said output signal amplitude constant.

4,177,435

OPTICALLY PUMPED LASER

Robert T. Brown, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 13, 1977, Ser. No. 841,866
Int. Cl.[2] H01S *3/097*
U.S. Cl. 331—94.5 G 26 Claims



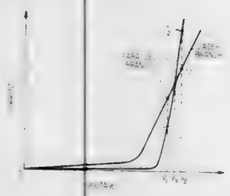
1. An electrical discharge laser comprising:
a source of pumping radiation for creating a population inversion in a gaseous gain medium;
a gain medium comprising at least one of the rare gases and at least one of the halide gases;
a cell for containment of the gain medium wherein the cell includes an input window substantially transmissive at the wavelength of the pumping radiation and an exit window which is substantially transmissive at the ultraviolet and visible wavelengths between 0.25 and 0.60 microns wherein the input window and exit window are positioned on a beam axis;
means for passing the gain medium through the cell;
ionization means for creating a low level of electron density in at least some of the gain medium in the cell;
means for concentrating the pumping radiation into a volume occupied by ionized gain medium to produce a diffuse electrical discharge;
an optical resonator positioned on and symmetrically about the beam axis having a first mirror with a first reflective surface and a second mirror with a second reflective surface wherein the diffuse electrical discharge is disposed therebetween;
means for shielding the first mirror, the second mirror and the exit window from the pumping radiation; and
means for coupling a beam of output radiation from the resonator.

4,177,436

CIRCUIT FOR CONTROLLING THE DIFFERENTIAL OUTPUT POWER OF A SEMICONDUCTOR LASER

Richard W. Dixon, Bernardsville, and Joseph F. Svacek, III, Jamesburg, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 5, 1977, Ser. No. 857,585
Int. Cl.[2] H01S *3/13*
U.S. Cl. 331—94.5 S 12 Claims



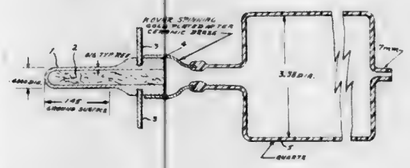
1. A circuit for controlling the output of a semiconductor laser comprising, in parallel with said laser, a circuit branch including a threshold device and having a current-voltage characteristic which intersects that of said laser at a cross-over voltage V_x such that, for voltages less than V_x the current through said laser exceeds that through said branch, whereas for voltages greater than V_x the current through said laser is less than the current through said branch.

4,177,437

HIGH POWER PRE-TR SWITCH

James F. McLaughlin, Severna Park, and Harry Goldie, Randallstown, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 20, 1978, Ser. No. 871,066
Int. Cl.[2] H01P *1/14*
U.S. Cl. 333—13 1 Claim



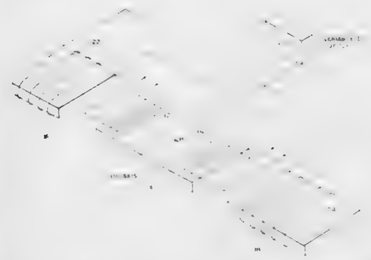
1. A high power pre-TR switch comprising
a machined, hot pressed boron nitride vial,
a reservoir vessel sealably connected thereto, said vial and said reservoir vessel defining a hermetically sealed enclosure,
a halogen in said vial, and heat sink means affixed to said vial.

4,177,438

SURFACE ACOUSTIC WAVE MODULATOR USING SINGLE CRYSTAL FILMS OF LITHIUM FERRITE

Carmine Vittoria, Bowie, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 18, 1978, Ser. No. 925,726
Int. Cl.[2] H03H *9/26, 9/30*; H03C *3/38*; H01L *41/12*
U.S. Cl. 333—152 8 Claims



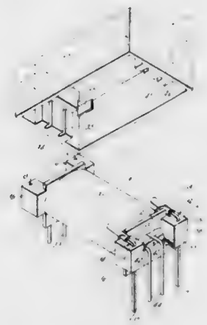
1. A continuously tunable SAW device comprising:
a slab of material comprising a unitary piece of magnetostrictive, insulating crystalline material having at least one flat surface;
input transducer means mounted on said flat surface of said slab of material for propagating an acoustic wave along said flat surface of said slab of material;
output transducer means mounted on the same flat surface of said slab of material as said input transducer and spaced therefrom for receiving said acoustic wave propagated by said input transducer; and
means for applying a variable dc magnetic field in the direction of and along the propagation path of said acoustic wave for varying the propagation time of said acoustic wave between said input and output transducer means.

4,177,439

REED RELAY AND METHOD OF ASSEMBLY

Philip N. Smith, Cincinnati, Ohio, assignor to Standex International Corporation, Andover, Mass.

Filed Feb. 27, 1978, Ser. No. 881,697
Int. Cl.[2] H01H *51/27, 11/00, 1/66*
U.S. Cl. 335—151 12 Claims



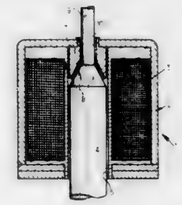
1. A reed relay comprising,
a hollow bobbin having a large opening at one end and a small opening at the other end, at least one switch enclosed in a glass envelope and having leads projecting from both ends, said switch being inserted into said bobbin with leads projecting through said openings,
said small opening including a transverse shoulder upon which said projecting lead rests,
said bobbin having a tab hinged across said large opening and adapted to swing up into position to provide a shoulder across said large opening upon which said projecting lead rests, said hinged tab thereby permitting a large opening for switch insertion while providing a lead supporting shoulder after said switch has been inserted into said bobbin,
and a housing for said bobbin.

4,177,440

MOVING-ARMATURE ELECTROMAGNETIC DEVICE

Didier Merlette, Mouy, France, assignor to Techniques Europeennes de Commutation (T.E.C.), Mouy, France

Filed Jul. 31, 1978, Ser. No. 929,359
Claims priority, application France, Aug. 5, 1977, 77 24241
Int. Cl.[2] H01F *7/12*
U.S. Cl. 335—247 6 Claims



1. A moving-armature electromagnetic device comprising: a moveable core; a seat portion engageable by an end of said core to close the magnetic flux lines when the device is energized, said seat portion and said end of said core having complementary tapered surfaces; and a non-magnetic anti-friction ring positioned between said core and said seat to reduce the frictional forces and the magnetic remanence forces between said core and said seat.

4,177,441

ELECTROMAGNETIC STRUCTURE FOR A VITAL RELAY

William J. Lichtenberger, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 5, 1978, Ser. No. 903,373
Int. Cl.[2] H01F *7/08*
U.S. Cl. 335—270 10 Claims



1. An electromagnetic device comprising, a U-shaped electromagnet, a spring biased armature, and a unitary metallic frame fixedly attached to said U-shaped electromagnet, said unitary metallic frame includes an apertured portion for accommodating the back side of said spring biased armature and establishing a floating hinge joint between said apertured portion and said back end of said spring biased armature, and said unitary metallic frame includes a fulcrum point about which

said spring biased armature teeters to urge the back end of said spring biased armature into close proximity of said U-shaped electromagnet to minimize the air gap when the said U-shaped electromagnet is deenergized.

4,177,442

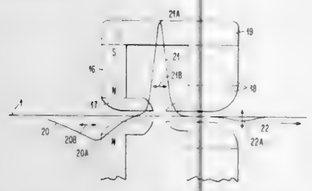
PRODUCTION OF MAGNETIC MEDIA

Geoffrey Bate, and Larry P. Dunn, both of Boulder County, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 609,113, Aug. 29, 1975, abandoned. This application Sep. 26, 1977, Ser. No. 836,823

Int. Cl.[2] H01F *10/02*

U.S. Cl. 335—284 **4 Claims**



1. In a method of orienting magnetic particles on a medium during relative movement of the medium with respect to a permanent magnet assembly, the improvement comprising:

providing said magnet assembly having first and second spaced sections defining a path therebetween, each section having a large pole and a small pole with a gap therebetween and a shunt interconnecting said poles, said poles flaring outwardly at their ends away from the gap, choosing the magnets of each section to have essentially the same magnetic remanence;

arranging the magnetic material in each section entirely on the side of the small pole to create a first unfocused magnetic field at the small pole along the path of travel of the medium, a second focused magnetic field at the gap greater in intensity and opposite in the direction from the first field along the path of travel of the medium, and a third magnetic field at said larger pole; and

providing antennae means on the section extending from the gap a distance at least equal to the length of the magnetic assembly said antennae means being longer than the permanent magnet alone and at one or more points being further removed from the medium than any magnetic pole to attenuate the intensity of the third field to an intensity less than that of the first field and in the same direction in the plane of the path of travel of the medium, and maintaining a minimal vertical field component normal to the plane of the path of travel no greater in magnitude than the third field by providing the magnetic material on both sides of the path of travel of the medium, and moving said media containing magnetic particles on said path through said first, second, and third fields successively, maintaining said path of travel essentially midway between said spaced sections,

whereby to align the particles on a plane on said media without a substantial subsequent disorienting field.

4,177,443

THERMAL RELAY AND ELECTRIC RANGE CONTROL UTILIZING THE SAME

Steven A. Willeke, Mansfield, Ohio, assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Mar. 31, 1978, Ser. No. 892,437

Int. Cl.[2] H01H *71/16, 71/22*

U.S. Cl. 337—101 **8 Claims**

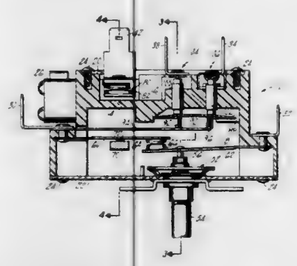
1. A thermal relay comprising:

a housing;

a thermally responsive snap disc situated in said housing;

an electrical heater mounted directly upon said thermally responsive snap disc;

temperature compensating means acting upon said thermally responsive snap disc through said electrical heater;



electrical contact means situated in said housing; and

contact operating means for mechanically coupling said snap disc and electrical contact means.

4,177,444

TIME LAG FUSE

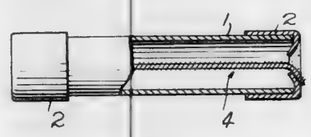
Minoru Taki, Yokohama, Japan, assignor to Fukada Works, Ltd., Tokyo, Japan

Filed Mar. 23, 1978, Ser. No. 889,505

Claims priority, application Japan, Aug. 8, 1977, 52-1051625[U]

Int. Cl.[2] H01H *85/04*

U.S. Cl. 337—163 **5 Claims**



1. A time lag fuse comprising a fuse barrel having a conductive cap attached at each end of the fuse barrel and a fuse element within said fuse barrel and connected between said caps, wherein said fuse element is comprised of a core cord of insulating fibers spirally bound by a melting element.

4,177,445

CONTACTLESS SWITCHING ELEMENT FOR ELECTRIC CURRENT

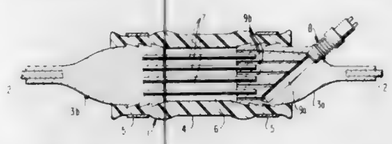
Helmut Buchner, Wendlingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,610

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1977, 2707956

Int. Cl.[2] H01H *37/72*

U.S. Cl. 338—34 **25 Claims**



1. A contactless switch for electric currents comprising:

(a) a switch body defining a hollow space;

(b) metal switch element means operable to be reversibly hydrogenated and dehydrogenated for rendering said switch element means electrically non-conductive and electrically conductive, respectively, said switch element means being positioned within said hollow space;

(c) hydrogen donor means in pressure-tight communication with said hollow space, said donor means containing a hydrogen donor metal that is operable to be dehydrogenated and hydrogenated in response to heating and cooling of said donor metal, respectively, and

(d) means for increasing and decreasing the temperature of said donor metal.

4,177,446

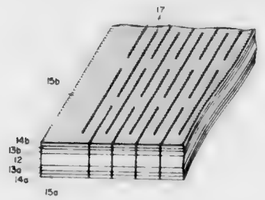
HEATING ELEMENTS COMPRISING CONDUCTIVE POLYMERS CAPABLE OF DIMENSIONAL CHANGE

Stephen H. Diaz, Los Altos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 638,440, Dec. 8, 1975, abandoned. This application Mar. 9, 1977, Ser. No. 775,882

Int. Cl.[2] H01C *3/06*

U.S. Cl. 338—212 **18 Claims**



1. A heating element which comprises:

(A) a laminar member composed of a material which comprises an organic polymer and electrically conductive particles dispersed in the polymer in amount sufficient to render the member electrically conductive; and

(B) a pair of laminar flexible electrodes which (i) are connected to opposite faces of said laminar member; (ii) are substantially coplanar with said laminar member; and (iii) are adapted to be connected to an external source of power to cause current to pass through said laminar member;

said laminar member and laminar electrodes having a plurality of apertures through the thickness thereof, the apertures being in parallel rows and being of elongated closed cross-section and overlapping one another to permit at least one of the dimensions of the element in the plane thereof to be changed by a change in the shape of the apertures.

4,177,447

DEVICE FOR DETECTING ERRORS IN A DIGITAL TRANSMISSION SYSTEM

Jean-Yves Jaouen, Lannion, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Mar. 1, 1978, Ser. No. 882,315

Claims priority, application France, Mar. 4, 1977, 77 06499

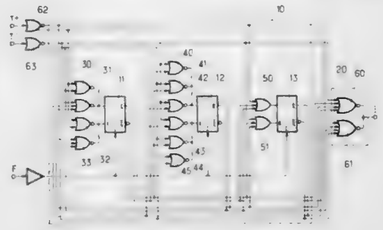
Int. Cl.[2] G06F *11/02*

U.S. Cl. 340—146.1 AB **15 Claims**

1. Apparatus for detecting errors in a digital transmission system of a type wherein the signal transmitted has a bounded digital running total which can assume any one of n distinct states, characterized by:

a synchronous up/down counter having an up-count input and a down-count input both of which are connected to receive said transmitted signal, said counter including K bi-stable multivibrators each of which has at least one input and first and second, complementary, outputs, each multivibrator having a logic arrangement associated with the at least one input thereto, said logic arrangement having a plurality of inputs connected to said up-count input, to said down-count input, and to selected ones of the first and second outputs of the remaining (K-1) multivibrators in the up/down counter; and

an end-decoder sensitive to any overflow of a lowest or highest count in said up/down counter, said decoder



including first and second logic circuits having inputs respectively connected to (a) said up-count input and the first outputs of said K bi-stable multivibrators, and (b) said down-count input and the second outputs of said K bi-stable multivibrators, and wherein:

K, the number of bistable multi-vibrators in said up/down counter, is an integer which satisfies the inequality:

$$2^{K-1} < n \leq 2^K.$$

4,177,448

CHARACTER RECOGNITION SYSTEM AND METHOD MULTI-BIT CURVE VECTOR PROCESSING

Robert K. Brayton, Briarcliff Manor, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 26, 1978, Ser. No. 919,535

Int. Cl.[2] G06K *9/00, 9/16*

U.S. Cl. 340—146.3 AE **10 Claims**



1. In an automatic character recognition system for identifying an unknown character wherein said unknown character is one of a class of a plurality of known characters, a scanning and training structure including:

means for storing a binary indicia a plurality of separate segments of character shapes, said separate segments being conformable to segments included within the shapes of said characters within said plurality of known characters, said binary encoded separate segments being referred to as canonic shapes and each being identified in said storage means by a binary encoded shape index number,

means for processing and manifesting a first known character from said character class in a digital matrix format of stored binary indicia,

means connected to said processing and manifesting means

for digitally scanning said stored first known character indicia using a first set of selected scan parameters, said selected scan parameters designating a specific start position, scan length, scan binary indicia transition and direction for said scanning function, said digital scanning function producing a first binary encoded path vector in the form of a multi-bit binary word including the starting coordinates of said scan and a plurality of further binary coordinates of said known character along the selected length of said scan,

means connected to said digital scanning and encoding means and to said binary indicia storing means for performing the complex inner product function of said binary encoded path vector and each of said stored canonic shapes to produce a plurality of complex numbers encoded in binary form, one for each complex inner product performed with each canonic shape, each of said binary encoded complex inner product numbers including a magnitude value representative of the similarity between said binary encoded path vector and each of said canonic shapes, and an angle value representative of the angular offset of the encoded path vector relative to each of said canonic shapes,

means connected to said complex inner product function means for determining the magnitude of each of said encoded complex inner product number and selecting the largest magnitude number and recording the shape index of the canonic shape which produced said largest magnitude complex inner product number,

means connected to said magnitude determining means for encoding at least said recorded shape index and said angle value within an N bit vector,

at least a first storage plane means including a separate storage column for each of different one of said characters in said class of a plurality of characters and 2^N storage rows for each different one of possible N bit vectors,

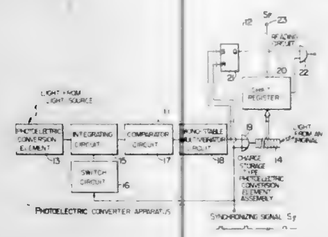
and means connected to said N bit vector encoding means and said first storage plane means of entering a first storage indicia into said at least first storage plane means at a discrete storage location corresponding to the column associated with said first known character and to the row associated with said encoded N bit vector associated with said recorded shape index and angle value.

4,177,449

PHOTOELECTRIC CONVERTER APPARATUS

Takatoshi Ikeda, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 24, 1978, Ser. No. 871,808
Claims priority, application Japan, Jan. 27, 1977, 52-8075
Int. Cl.[2] G06K *9/00*
U.S. Cl. 340—146.3 AG **16 Claims**



1. A photoelectric converter apparatus for reading information contained on an original information containing copy comprising:

a plurality of first photoelectric conversion elements disposed in an array for receiving light carrying image information to be read out of said original copy, said conversion elements each being of the charge storage type and adapted to store an amount of electric charge which is proportional to an intensity of said image information carrying light;

a second photoelectric conversion element for receiving light carrying luminance information of an external light source irradiating said original copy and for converting said luminance information carrying light into an electrical signal;

means for selectively transmitting a read-out signal to said first photoelectric conversion elements, said read-out signal transmitting means comprising a circuit for storing said electrical signal from said second photoelectric conversion element and means for producing said read-out signal when an output of said storing circuit reaches a predetermined reference level; and

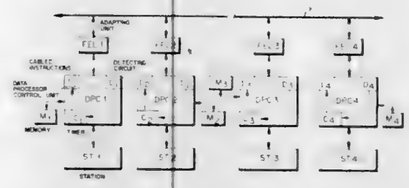
means for reading out electric charges stored in said first photoelectric conversion elements by an external first clock signal in response to said read-out signal.

4,177,450

PROCESS AND METHOD TO INITIATE A RECEIVING AND TRANSMITTING STATION LINKED BY A CONNECTING CHANNEL OF AN INFORMATION EXCHANGE SYSTEM CONSISTING OF SEVERAL TRANSMITTING AND RECEIVING STATIONS

Pierre Sarrand, Fresnes, France, assignor to Compagnie Internationale pour l'Informatique Cii - Honeywell Bull (Societe Anonyme), Paris, France

Filed Dec. 22, 1976, Ser. No. 753,494
Claims priority, application France, Dec. 31, 1975, 75 40365
Int. Cl.[2] H04Q *9/00*
U.S. Cl. 340—147 LP **7 Claims**



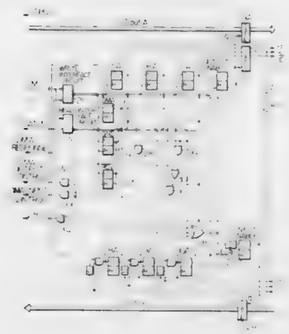
1. A method for initiating an exchange of information between a receiving and transmitting station of an information exchange system having several receiving and transmitting stations linked to one another by a connecting channel over which initiation information is transmitted toward one of the stations, each of the stations including a timing means, said method comprising the steps of detecting said initiation information transmitted by one of said stations during a first schedule to thereby couple the one station to said connecting channel and initiating a timing period of a given duration by setting each of the timing means to start counting from a common reference point; determining each of the timing means to have its unique time schedule toward which each timing means counts, if the one station is inoperative and fails to detect the initiation information, permitting another of the stations having a second time schedule greater than the first time schedule to detect the initiation information and to couple the other station to the connecting channel.

4,177,451

DATA COMMUNICATION SYSTEM

Taihei Yamaguchi, Yamato, Japan, assignor to Panafacom Limited, Japan

Continuation-in-part of Ser. No. 692,352, Jun. 3, 1976. This application May 16, 1978, Ser. No. 906,341
Claims priority, application Japan, Jun. 10, 1975, 50-69906
Int. Cl.[2] H04Q *9/00;* **H04L** *5/14;* **H04J** *3/06*
U.S. Cl. 340—147 R **7 Claims**



1. A data communication system for transmitting and receiving data information comprising:

at least first communication control unit which sends control signals as control command signals when said one communication control unit is used as a transmitting side and which sends said control signals as various response signals when said first communication control unit is used as a receiving side, and;

second communication control unit which receives said control signals as said control command signals when said second communication control unit is used as a receiving side, and which receives said control signals as said various response signals when said second communication control unit is used as a transmitting side;

a plurality of lines for said data information, and, different plurality of lines for said control signals, which connect said first communication control unit and said second communication control unit in said system each respective communication control unit including respective first means for defining said control signals in accordance with a first set of meanings, including use as an inquiry command, and end-of-transmission command, and a receive command when said each respective communication control unit is used as the transmitting side, and each respective communication control unit including respective second means for defining said control signals in accordance with a second set of meanings, including use as a negative acknowledge response, a reverse interruption response, and an acknowledge response when said each respective communication control unit is used as the receiving side,

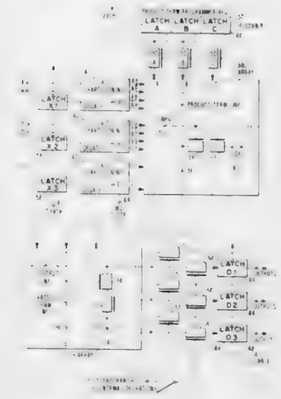
each respective communication control unit including respective logic circuit means, responsive to the use of said each respective communication control unit as a transmitting or receiving side and to said control signals, for determining which of said first and second sets of meanings to attach to said control signals.

4,177,452

ELECTRICALLY PROGRAMMABLE LOGIC ARRAY

Peruvemba S. Balasubramanian, Manassas, Va., and Stephen B. Greenspan, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,682
Int. Cl.[2] G11C *5/02, 11/40*
U.S. Cl. 340—166 R **7 Claims**



1. A memory circuit, comprising:

a transistor flip flop circuit having a first active device with its current path connected between a first node and a zero state voltage and a second active device with its current path connected between a second node and said zero state voltage, said first node connected to the control electrode of said second active device and said second node connected to the control electrode of said first active device, with said first device having an initial nonconductive state and said second device having an initial conductive state;

a blocking transistor device having its current path connected to said second node and its control electrode connected to said first node;

an array transistor device having its current path connected between the current path of said blocking transistor and a word line and its control electrode connected to a bit line;

a circuit path from said word line through the current paths of said array device, said blocking device, and said second active device representing a first stored information state, a second information state being represented by an open circuit due to said blocking device being nonconductive;

said conduction state of said blocking device being controlled by the voltage state of said first node;

said voltage state at said first node being selectably altered from said first state with said first active device nonconductive to a second state with said first active device conductive, by the transmission of a write voltage signal from said word line through the current paths of said array device and blocking device to said control electrode of said first active device turning it on and thus switching the flip-flop and turning said blocking device off.

4,177,453

DIGITAL REMOTE CONTROL SYSTEM WITH IMPROVED NOISE IMMUNITY

Johnny Collins, Oak Park, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Oct. 25, 1977, Ser. No. 845,191
Int. Cl.[2] H04Q *4/00*
U.S. Cl. 340—171 A **9 Claims**

1. In a remote control receiver for selectively enabling a plurality of functions, each function corresponding to transmit-

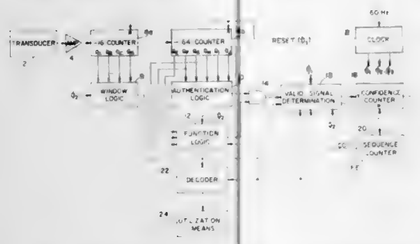
ted signals lying in a respective frequency band, the combination comprising:

means for defining a plurality of consecutive timing intervals;

means for repetitively deriving the frequency of a transmitted signal during each of said timing intervals;

means for identifying the condition wherein a derived frequency is within a restricted range of frequencies included within one of said frequency bands and centered about the frequency derived during the immediately preceding one of said timing intervals; and

means for enabling the function corresponding to said one frequency band in response to continued satisfaction of said condition for a predetermined number of successive ones of said timing intervals.



4,177,454

DIGITAL DISPLAY SYSTEM

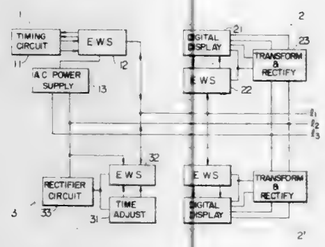
Yoshio Shinoda, Okazaki; Akira Kuno, Nagoya, and Toshinobu Kuroyama, Kasugai, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Jun. 2, 1978, Ser. No. 911,895

Claims priority, application Japan, Jun. 8, 1977, 52-67670

Int. Cl.[2] G04C *13/02*; G08B *5/00*

U.S. Cl. 340—309.4 **2 Claims**



1. A digital display system comprising;

a single transmission control unit including an A.C. power supply for generating an A.C. voltage of a fixed frequency, and a time-division multiplex signal conversion circuit for extracting a pulse signal of said fixed frequency from said A.C. voltage to produce a reference position signal indicative of the beginning of a one cycle period based on said pulse signal to address a section in said one cycle period and producing a time-division multiplex signal which bears a command pulse at a specified address in accordance with a selected display signal;

a single signal line over which said time-division multiplex signal is transmitted;

a pair of power lines over which said A.C. voltage is transmitted; and

a plurality of display units each operable to read out a pulse signal of said fixed frequency from said A.C. voltage transmitted over said pair of power lines and read out said command pulse from said time-division multiplex signal received through said signal line based on said pulse signal to display in digital form the information relating to said display signal.

4,177,455

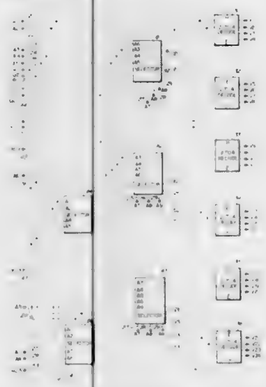
ELECTRICALLY CONFIGURABLE HIGH-LOW DECODER

Rolfe D. Armstrong, Escondido, and George B. Gillow, Bonita, both of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Jan. 9, 1978, Ser. No. 867,853

Int. Cl.[2] H03K *13/243*

U.S. Cl. 340—347 DD **16 Claims**



1. A selectively configurable decoder having at least a mode selection input, a plurality of address inputs, and a plurality of outputs, said selectively configurable decoder comprising in combination:

(a) a plurality of decoding means each having a plurality of decode inputs for decoding selectable combinations of signals applied to said decode inputs, each of said decoding means having an enable input and a plurality of outputs coupled to respective ones of said outputs of said selectively configurable decoder;

(b) first means responsive to said address inputs and said mode selection input for producing said selectable combinations of signals; and

(c) second means responsive to said mode selection input and said address inputs and coupled to said enable inputs of said plurality of decoding means for enabling a plurality of combinations of said plurality of decoding means in response to a plurality of combinations of binary logic levels applied to said mode selection input.

4,177,456

DECODER FOR VARIABLE-LENGTH CODES

Takahiko Fukinuki, Kokubunji, and Hiroshi Yoshigi, Hachioji, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 3, 1978, Ser. No. 874,938

Claims priority, application Japan, Feb. 10, 1977, 52/13925; Feb. 28, 1977, 52/20210; Feb. 28, 1977, 52/20211

Int. Cl.[2] H03K *13/243*

U.S. Cl. 340—347 DD **4 Claims**

1. A decoder for decoding variable-length codes comprising:

an input to which a variable length code is to be applied;

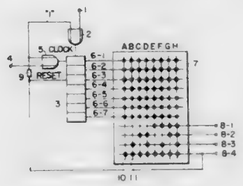
a shift register, coupled to said input, for receiving a variable length code applied thereto and storing said variable-length code;

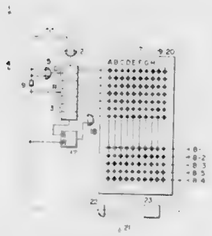
first means, coupled to the stages of said shift register, for converting the contents of said shift register into a fixed-length code as an output signal;

second means, coupled to said first means, for detecting the completion of the code conversion operation carried out by said first means;

third means, coupled to said second means, for causing said shift register to receive and store a prescribed code in response to said second means detecting said completion of the code conversion operation; and

fourth means, coupled to the last stage of said shift register, for storing a signal representative of overflow from said last stage of said shift register and applying said signal to said first means.





4,177,457

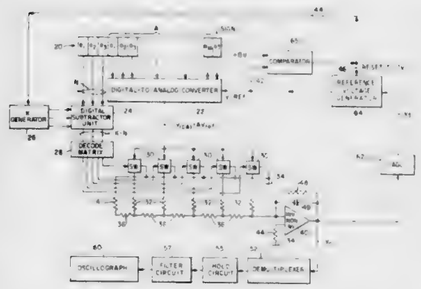
FLOATING POINT PLAYBACK SYSTEM

Donald L. Howlett, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,491

Int. Cl.[2] H03K *13/02*

U.S. Cl. 340—347 DA **10 Claims**



1. In a system wherein a wide dynamic amplitude range analog signal is digitized in floating point word form, said word being represented in digital signal form by the general algebraic form $Q=\pm AB^{-N}$ wherein Q represents the amplitude of the analog signal, A represents the mantissa, B indicates the radix of the number system used, N is the exponent, and wherein said word is represented by a first plurality of binary bits representing $\pm A$ and a second plurality of binary bits representing N, a system for recreating an analog signal from the floating point words comprising: first means for converting said bits representing A to an interim analog signal; second means for converting said bits representing N to a plurality of control signals; resistor network means for providing a signal which is a reduction of a signal applied to the resistor network means, said resistor network means including a first plurality of N number of resistor, having a first resistor and an Nth resistor, and all resistors in the first plurality of resistors have the same resistance value; a second plurality of N number of serially connected resistors having a first resistor and an Nth resistor, all resistors of the second plurality of resistors have the same resistance value, and connected so that each connection of two resistors of the second plurality of resistors is connected to one end of a corresponding resistor in the first plurality of resistors, and a first resistor connecting the Nth resistor of the second plurality of resistors to ground, where the first resistor has a resistance value that is one-seventh of the value of the resistance value of a resistor in the second plurality of resistors and a resistance value that is seven-eighths of the resistance value of a resistor in the first plurality of resistors; a plurality of switching means, each switching means being connected to the first and second converting means, to ground and to the unconnected end of a corresponding resistor of the first plurality of resistors for applying the interim analog signal to the corresponding resistor of the first plurality of resistors when a corresponding control signal is at one logic level and for connecting the corresponding resistor of the first plurality of resistor network means to ground when the corresponding control signal is at another logic level; and amplifier means connected to the unconnected end of the first resistor of the second plurality of resistors for amplifying the signal provided by the resistor network means to provide an amplified signal corresponding to the wide dynamic amplitude range analog signal.

4,177,458

DISPLAY PANEL AND DISPLAY ELEMENTS THEREFOR

Yoshimasa Wakatake, Tokyo, Japan, assignor to Nihon Advanced Products Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1978, Ser. No. 871,700

Claims priority, application Japan, Jan. 24, 1977, 52-6523

Int. Cl.[2] G06K *15/18*

U.S. Cl. 340—373 **7 Claims**



1. A display panel comprising:

a display surface structure;

a display switching unit; and

a drive unit;

in which, letting N vertical lines of arrangement spaced a predetermined distance from adjacent ones of them in a horizontal direction be represented by $a_1, a_2, \ldots a_N$, respectively, the display surface structure has M display elements $D_{i1}, D_{i2}, \ldots D_{iM}$ disposed on the vertical line a_i (i+1, 2, . . . N) at predetermined intervals in a vertical direction;

in which the display element D_{ij} (j+1, 2, . . . M) is formed with a block member having a shaft receiving hole extend-

ing in the horizontal direction, an outer periphery forming a plurality of display surfaces of different colors to form a plurality of corners around the shaft receiving hole, and a magnetic piece disposed in each of the corners except one of them, the display element D_{ij} being supported by a shaft loosely inserted into the shaft receiving hole in a manner to be rotatable about the shaft, the shaft receiving hole having such an inner peripheral configuration as to permit a selected one of the display surfaces to lie in a vertical plane in the state of the display element D_{ij} being supported by the shaft;

in which the display switching unit has a display control head E_i disposed to be movable along the vertical line a_i in the vertical direction, the display control head E_i having electromagnets less than the corners of the block member by one; and

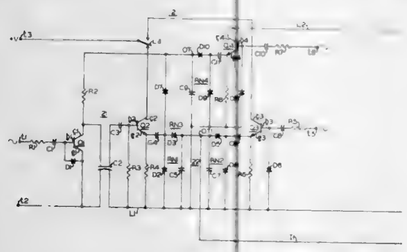
in which the drive unit has means for simultaneously moving down the display control heads E_1 to E_N and means for driving the electromagnets of the display control head E_i in synchronism with the movement of the display control head E_i.

4,177,459

FAIL-SAFE ACKNOWLEDGING CIRCUIT

John O. G. Darrow, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 24, 1977, Ser. No. 800,133
Int. Cl.² G08B 21/00
U.S. Cl. 340—519 **10 Claims**



1. A fail-safe electronic circuit arrangement which requires an acknowledgment after the reception of a more restrictive input signal in order to reestablish an output signal comprising, a plurality of latching means connectable to a separate one of a plurality of input signals having a predetermined order of more restrictive significance, one of a plurality of gating means cooperatively associated with a separate one of said plurality of latching means, and a multiple input gating means coupled to said plurality of latching and gating means for producing an output signal and conditioned upon the reception of a more restrictive input signal for causing the removal of the output signal.

4,177,460

TWO-WAY ALARM SAFETY APPARATUS

Walter W. Hoinski, Norristown, and John J. Simkanich, Yardley, both of Pa., assignors to Power Systems Development Corp., Wilmington, Del.

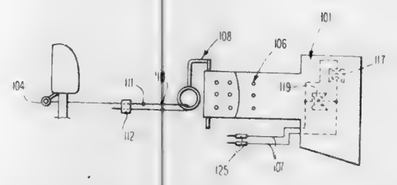
Filed Sep. 30, 1977, Ser. No. 838,136
Int. Cl.² G08B 21/00; B60R 27/00
U.S. Cl. 340—576 **10 Claims**

1. An alarm apparatus, capable of being worn by operators of motor vehicles and the like, to signal an undesirable position of one part of the body with respect to another or with respect to a fixed object, comprising:

means for providing an electrically produced signal;

an electrical power source capable of powering said electric signal means;

means responsive to an undesirable position of the body for electrically connecting said electric signal means to said electrical power source, said electrical connection means including two electric switches each being capable of individually electrically connecting said electric signal



means to said electrical power source, said switches being positioned to have two distinct planes of operation; and

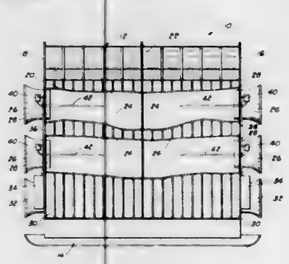
means for securing said electrical connection means to said body.

4,177,461

SMOKE ALARM DEVICE FOR A GRAIN DRYER

David A. Brown; Jan L. Norman, and Donald W. Whitson, all of Scott City, Kans., assignors to All Phase Electronics, Inc., Scott City, Kans.

Continuation-in-part of Ser. No. 684,718, May 10, 1976, abandoned. This application Jan. 23, 1978, Ser. No. 871,372
Int. Cl.² G08B 17/10
U.S. Cl. 340—628 **9 Claims**



1. A grain dryer alarm device attached to a housing of a grain dryer, the alarm device comprising:

a smoke detector housing disposed outside the dryer housing;

a smoke detector mounted inside said detector housing;

an elongated conduit having one end communicably connected to said smoke detector housing, said conduit attached to and extending through the dryer housing, the other end of said conduit disposed inside a hot air chamber of the dryer, said conduit receiving smoke therein and conducting the smoke to said smoke detector housing and said smoke detector when smoke occurs in the hot air chamber;
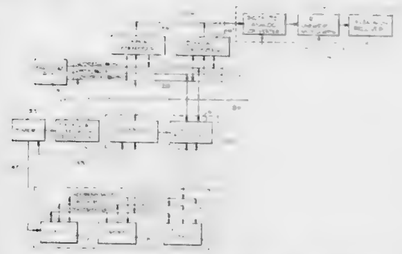
dryer signal means attached to the dryer and electrically connected to said smoke detector for signaling when smoke is detected in the dryer.

4,177,462

COMPUTER CONTROL OF TELEVISION RECEIVER DISPLAY

David H. Chung, Palo Alto, Calif., assignor to Umtech, Inc., Palo Alto, Calif.

Filed Dec. 30, 1976, Ser. No. 755,749
Int. Cl.² G06F 3/14
U.S. Cl. 340—703 **22 Claims**



1. A method of producing sequential frame displays of object images and background on a display surface area which is scanned by a scanning system to produce each of said frame displays, comprising the steps of:

storing at predetermined locations sets of information respectively defining a plurality of spatial display segments which individually at least partially define an object image associated therewith it may be desired be displayed at some location on said display area during one or more of said sequential frame displays;

tracking the scan by said scanning system which produces each of said frame displays;

responding to said step of tracking indicating that said scanning system is approaching a desired spatial location for a selected spatial segment in one of said frame displays by directing delivery to said scanning system at such time of control signals conforming to the stored information set defining said selected spatial display segment;

calculating for each of said frame displays the time-distance between spatial display segments which are to be sequentially displayed thereon; and

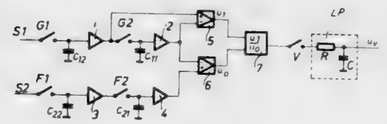
providing to said scanning system background control signals directing said scanning system to produce said background display between spatial display segments for said calculated time-distance.

4,177,463

METHOD AND DEVICE FOR MEASURING THE VELOCITY OF AN OBJECT RELATIVE TO A REFERENCE

Ingvar Andermo, Täby, Sweden, assignor to Stiftelsen Institutet for Mikrovågsteknik vid Tekniska Hogskolan I Stockholm, Stockholm, Sweden

Continuation of Ser. No. 688,334, May 20, 1976, abandoned, which is a continuation of Ser. No. 473,943, May 28, 1974, abandoned. This application Dec. 20, 1977, Ser. No. 862,609
Claims priority, application Sweden, Jun. 1, 1973, 7307801
Int. Cl.² G01S 9/44
U.S. Cl. 343—8 **19 Claims**



1. A method for measuring the velocity of an object relative to a reference surface by means of spaced receivers on the object, said receivers being positioned one after the other in the direction of the velocity component to be measured, comprising:

transmitting a signal to the reference surface which reflects the transmitted signal, the reflected signal being a spatial waveform function originating from the reflecting surface and which is defined by the nature of the surface of the reference;

receiving the reflected signals by said receivers and developing output signals in each receiver, the values of said output signals being a function of the position of the detecting area of the receiver relative to the reference surface;

sequentially sampling said receiver output signals at different scanning occasions;

storing the sampled values of the receiver output signal from a number of detecting areas at various positions relative to the object at a first scanning occasion, said stored sampled output signal values representing a sampled virtual image of the spatial waveform function;

interpolating the stored signal values by interpolation between said sample values of said sampled virtual image representing signal values at the first scanning occasion, to thereby develop an approximation of the spacial waveform function;

comparing values of the developed approximation of the spatial waveform function with corresponding values of a developed approximation of the spatial waveform function obtained at a later scanning occasion and generating a difference output which is the result of said comparing; and

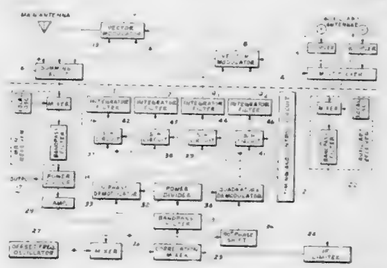
determining the displacement of the developed spatial waveform function relative to the object between said first and later scanning occasions, and generating a velocity signal that is a function of the quotient between said difference output and said approximation of the spatial waveform function and of the time elapsing between said first scanning occasion and said later scanning occasion, said velocity signal representing the velocity of the object relative to the reference surface.

4,177,464

MULTIPLEXING OF MULTIPLE LOOP SIDELOBE CANCELLERS

Raymond J. Masak, East Northport, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 13, 1978, Ser. No. 960,207
Int. Cl.² G01S 3/06
U.S. Cl. 343—100 LE **3 Claims**



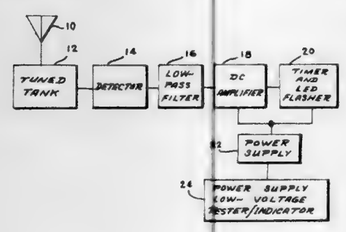
1. An improved sidelobe canceller in which cancellation of the undesired signals is performed at RF and the cancellation weights are determined from samples of correlated and demodulated signals, wherein the improvement comprises: a multiplexer communicating with each auxiliary antenna and capable of transmitting any one of the auxiliary antenna signals into a channel of signal processing upon command, and a timing and

control circuit connected to said multiplexer and a set of sample and hold circuits in the signal processing channel, where said timing and control circuit coordinates the multiplexer transmission of each antenna signal with a timed sampling by said sample and hold circuits for the corresponding auxiliary antenna.

4,177,465
NEAR-RANGE PERSONNEL BEACON LOCATOR APPARATUS

Donald O. Lundvall, I, Papillion; John P. Engels, and Robert R. Yesconis, both of Omaha, all of Nebr., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 6, 1978, Ser. No. 949,189
Int. Cl.[2] G01S *11/00*
U.S. Cl. 343—112 D **7 Claims**



1. A personnel beacon locator apparatus comprising in combination:

an antenna and tuned tank circuit to receive an RF signal, said RF signal being radiated by an accidently activated survival beacon,

a detector unit connected to said tuned tank circuit to detect said RF signal, said detector unit providing a detected RF output signal,

a low pass filter unit connected to said detector unit to filter said detected RF output signal, said low pass filter unit providing a filtered output signal,

an operational amplifier connected to said low pass filter unit to receive said filtered output signal, said operational amplifier having a variable gain, said operational amplifier amplifying said filtered output signal to provide a DC level, said DC level being proportional to the distance to said activated survival beacon,

a timer unit connected to said operational amplifier to receive said DC level, said timer unit having a variable duty cycle, said timer unit providing a pulsed output signal, said pulsed output signal having a variable pulse width, said pulse width varying in response to the level of said DC level, said pulsed output signal driving an LED indicator, said LED indicator blinking at a rate proportional to the diatance to said activated survival beacon, and,

a power supply unit connected to said operational amplifier and timer units to supply DC voltages thereto.

4,177,466
AUTO THEFT DETECTION SYSTEM

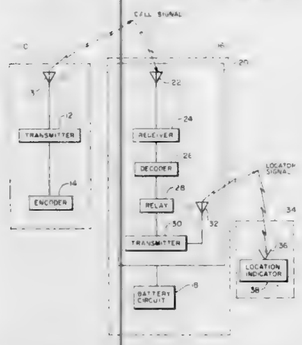
William R. Reagan, Medfield, Mass., assignor to Lo-Jack Corporation, Boston, Mass.

Filed Nov. 16, 1977, Ser. No. 851,835
Int. Cl.[2] G01S *11/00*
U.S. Cl. 343—112 TC **21 Claims**

2. A system for indicating the proximity of a stolen vehicle comprising:

at least one first transmitter means adapted to broadcast a call signal modulated with any selected one of a plurality of vehicle identification codes each assigned to a different one of a multitude of vehicles including said stolen vehicle;

a transceiver affixed to said stolen vehicle, said transceiver including first receiver means for receiving said call signal, second transmitter means adapted to broadcast a continuous locator signal, and circuit means coupled between said first receiver means and said second transmitter means for activating said second transmitter means only upon reception by said first receiver means of said call



signal modulated with said vehicle identification code assigned to said stolen vehicle;

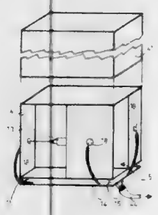
a plurality of second receiver means each adapted to receive and respond to said locator signal, said second receiver means being remote from said first transmitter means and separate from said stolen vehicle; and

means responsive to said second receiver means for providing an indication of at least the bearing or distance of said stolen vehicle relative to said second receiver.

4,177,467
WAVEGUIDE RECEIVING ANTENNA

Jean J. Vigneron, Saint-Germain les Arpajon, France, assignor to Regent Marine & Instrumentation, Inc., Buffalo, N.Y.

Filed Mar. 20, 1978, Ser. No. 887,925
Claims priority, application France, Mar. 24, 1977, 77 08700
Int. Cl.[2] G01S *3/28*
U.S. Cl. 343—119 **19 Claims**



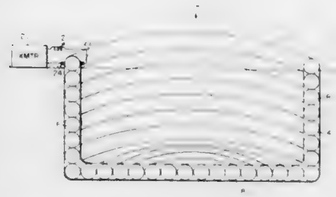
16. An antenna for short-range reception of a signal emitted by an emission source, of the type comprising a sector for locating said source, a microwave detecting element placed within said sector, wherein said antenna comprises at least two sectors which are independent of each other and each constituted by a waveguide having a single open face which is oriented in the intended direction of surveillance, said detecting element being disposed at right angles to and at the geometrical center of the supporting wall of the waveguide associated with said detecting element, the frequencies detected by said antenna being within the range of 10^9 Hz to 30×10^9 Hz, the signal delivered by the detecting element being processed

directly by signal processing means in order to permit a variation in range of said antenna.

4,177,468
INFLATABLE CAVITY-BACKED ANNULAR SLOT TRANSMITTING ANTENNA

Elwin W. Seeley, and Verne E. Hildebrand, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 5, 1978, Ser. No. 939,735
Int. Cl.[2] H01Q *1/34, 13/10*
U.S. Cl. 343—710 **10 Claims**



1. A floatable radio antenna capable of floating in a liquid with the radiating slot projecting above the surface, comprising:

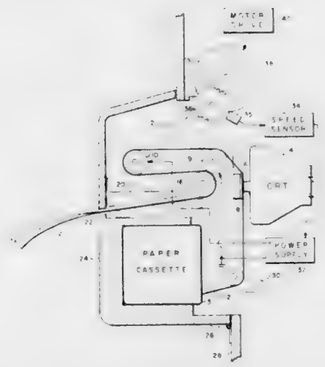
a cup shaped body having an inner conducting surface and an outer conducting surface,

said inner conducting surface being separated from said outer surface by buoyant insulating means with the lip of the cup shaped body forming the radiating slot.

4,177,469
RECORDER WITH ELECTRICALLY CONDUCTIVE PAPER

Dean M. Peterson, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 8, 1977, Ser. No. 858,785
Int. Cl.[2] G01D *9/42, 15/24*
U.S. Cl. 346—110 R **9 Claims**



1. A recorder for an electrically conductive recording medium comprising

a first electrically conductive roller arranged to support the recording medium at a first roller contact area,

a second electrically conductive roller arranged to support the recording medium, said first roller being spaced from said second roller,

a third roller arranged to urge the recording medium after passage of said medium over said second roller against said first roller on the side of said first roller opposite to said first roller contact area,

a power supply means for providing an output potential across a pair of output terminals,

first circuit means connecting one of said output terminals to said first roller,

second circuit means connecting the other one of said output terminals to said second roller, said power supply means producing a current flow to the recording medium to produce a developing of a recording thereon,

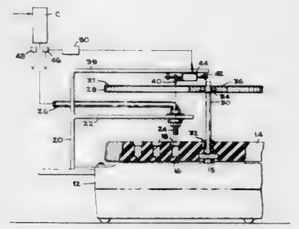
means for recording on the recording medium prior to its passage over said first roller on said first roller contact area, and

recording medium drive means arranged to drive the recording medium past said means for recording and over said first, second and third rollers.

4,177,470
DATA RECORDING APPARATUS

Emmett L. Durrum, Menlo Park, Calif., assignor to Eldex Laboratories, Incorporated, Menlo Park, Calif.

Division of Ser. No. 705,471, Jul. 15, 1976, Pat. No. 4,064,512.
This application Dec. 13, 1977, Ser. No. 860,232
Int. Cl.[2] G01D *15/16, 15/24*
U.S. Cl. 346—139 R **1 Claim**



1. Improved data recording apparatus for recording data the magnitude of which varies with time comprising a circular carrier having a central axis, means for supporting said carrier for rotation on said axis, inscribing means and carriage means for mounting said inscribing means above said carrier, means for moving said carriage means radially of said central axis in response to rotation of said carrier so as to cause said inscribing means to traverse a spiral path relative said carrier, drive means carried on said carriage means for rotatively driving said carrier, said drive means including a wheel driven at a preselected speed about a generally radially extending axis, said wheel having a periphery in driving contact with said carrier at a point in alignment with said inscribing means so that in response to rotation of said wheel and activation of said moving means said inscribing means travels on a spiral path on said carrier which spiral path has a linear time base, and means for activating said inscribing means to inscribe data indicia adjacent said path that is indicative of the magnitude of variations in the data so as to afford a quantitative indication of said data with reference to the linear time base.

4,177,471
CARRIAGE AND RACEWAY MECHANISM FOR AN INK JET PRINTER

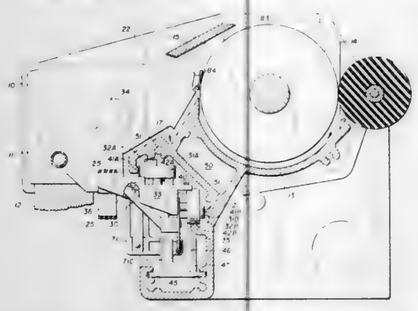
Charles S. Mitchell, Palo Alto, Calif., assignor to Silonics, Inc., Sunnyvale, Calif.

Filed Nov. 4, 1977, Ser. No. 848,615
Int. Cl.[2] G01D *15/18;* **B41J** *3/04, 19/00*
U.S. Cl. 346—140 R **9 Claims**

1. In a printer mechanism having a main frame, side plates at

either end of said main frame, a platen rotatably mounted to said side plates, a carriage assembly, a print head mounted to said assembly, the main frame being a single piece of uniform cross-section along its length between said side plates, comprising:

a raceway, engaging said carriage assembly whereby said assembly moves along said raceway,



a stiffening section in close proximity with said raceway,

a paper guide above said stiffening section,

guide points near said raceway whereby said raceway may be machined and said side plates positioned,

receptacle slots located below said raceway whereby a board bearing carriage assembly position indicators in placed.

4,177,472

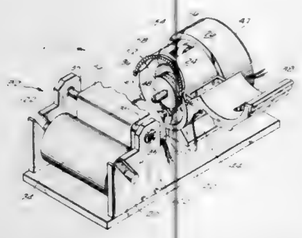
ROTARY ELECTRICAL PRINTER AND METHOD AUTOMATIC BLACKNESS CONTROL FOR ROTARY ELECTRICAL PRINTER

Olin B. King, Huntsville, Ala., assignor to SCI Systems, Inc., Huntsville, Ala.

Division of Ser. No. 611,785, Sep. 9, 1975, Pat. No. 4,100,551. This application Mar. 22, 1978, Ser. No. 888,967

Int. Cl.² G01D *15/08*; G03G *21/00*

U.S. Cl. 346—162 **4 Claims**



1. In a rotary electrical discharge printer including a rotor, at least one stylus on said rotor, means for rotating said rotor and moving said stylus relative to an electrical discharge-sensitive record member, discharge means for applying an electrical voltage to said stylus and creating an electrical discharge between said stylus and said record member at predetermined positions so as to form images on said record member, means for detecting the speed of movement of said rotor relative to said record member, and means for varying the voltage applied to said stylus approximately in direct proportion to said speed.

4,177,473

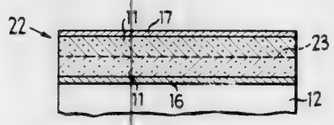
AMORPHOUS SEMICONDUCTOR MEMBER AND METHOD OF MAKING THE SAME

Stanford R. Ovshinsky, Bloomfield Hills, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed May 18, 1977, Ser. No. 797,929

Int. Cl.² H01L *45/00*

U.S. Cl. 357—2 **96 Claims**



1. An amorphous semiconductor member comprising a primarily lone-pair amorphous semiconductor material having orbitals formed in a solid amorphous host matrix having structural configurations which have local rather than long-range order and electronic configurations providing an energy gap and a large electrical activation energy, and a modifier material added to said amorphous host matrix and having orbitals which interact with the orbitals of the amorphous host matrix and form electronic states in the energy gap which modify substantially the electronic configurations of the amorphous host matrix for reducing substantially the electrical activation energy thereof and, hence, increasing substantially the electrical conductivity of the semiconductor member at room temperature and above, the amount of addition of the modifier material controlling the range of electrical conductivity.

4,177,474

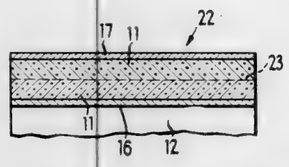
HIGH TEMPERATURE AMORPHOUS SEMICONDUCTOR MEMBER AND METHOD OF MAKING THE SAME

Stanford R. Ovshinsky, Bloomfield Hills, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 797,929, May 18, 1977. This application Oct. 12, 1977, Ser. No. 841,369

Int. Cl.² H01L *45/00*

U.S. Cl. 357—2 **73 Claims**



1. An amorphous semiconductor member comprising an amorphous semiconductor material including a composition of a plurality of elements, at least one of which is a low atomic weight element comprising boron, carbon, nitrogen or oxygen, formed in a solid amorphous host matrix having structural configurations which have local rather than long range order and electronic configurations providing an energy gap and an electrical activation energy, and a modifier material added to said amorphous host matrix and having orbitals which interact with the amorphous host matrix and form electronic states in the energy gap which modify substantially the electronic configurations of the amorphous host matrix at room temperature and above.

4,177,475

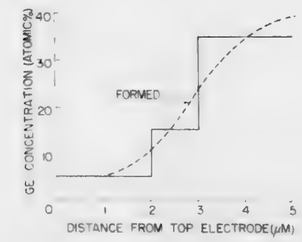
HIGH TEMPERATURE AMORPHOUS MEMORY DEVICE FOR AN ELECTRICALLY ALTERABLE READ-ONLY MEMORY

Scott H. Holmberg, Escondido, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 31, 1977, Ser. No. 847,068

Int. Cl.² H01L *45/00*

U.S. Cl. 357—2 **10 Claims**



1. An electrically alterable memory device comprising:

a positive electrode;

a negative electrode; and

a structure of memory material mounted in between said electrodes, which structure is constructed of first, second and third regions, said first region being adjacent to said positive electrode, said second region being between said first and third regions, said third region being adjacent said negative electrode and completely separating said second region from said negative electrode;

said second region being formed of a tellurium based chacogenide which has higher electrical resistance in its amorphous state and lower electrical resistance in its crystalline state and can be switched from one state to another upon application to said electrodes of an electrical signal of appropriate value;

said first region being formed of a material having a higher percentage of tellurium than said second region;

said third region being formed of a material having between 25 and 45 atomic percent of germanium, the remaining material being substantially tellurium.

4,177,476

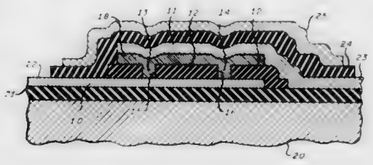
MULTIPLE WEAK-LINK SQUID WITH NON-SUPERCONDUCTIVE MATERIAL WEAK-LINKS

Harry Kroger, Sudbury, and Don W. Jillie, Jr., Arlington, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 5, 1978, Ser. No. 903,309

Int. Cl.² H01L *39/22*

U.S. Cl. 357—5 **28 Claims**



1. A SQUID comprising

first and second layers of superconductive material superposed with respect to each other,

insulator layer means to disposed between said superconductive layers, said insulator layer means having at least two holes therethrough and

non-superconductive material within said holes forming weak superconducting links between said first and second superconductive layers by the proximity effect induced by said first and second superconductive layers,

whereby a magnetic field applied to said SQUID causes control of the supercurrent flowing between said first and second superconductive layers through said weak links.

4,177,477

SEMICONDUCTOR SWITCHING DEVICE

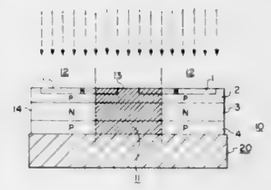
Shigeru Hokuyo, and Hiroshi Gamo, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 557,156, Mar. 10, 1975, abandoned. This application May 3, 1977, Ser. No. 793,242

Claims priority, application Japan, Mar. 11, 1974, 49 28739

Int. Cl.² H01L *29/74, 29/167*

U.S. Cl. 357—38 **7 Claims**



1. A semiconductor switching device comprising: a wafer of semiconductor material having two major opposed generally parallel surfaces, said wafer comprising four layers of opposite conductivity type disposed in PN junction forming relationships, an n-type emitter layer disposed adjacent to an upper one of the major surfaces, a p-type base layer disposed below the n-type emitter layer and having a region extending upwards through the n-type emitter layer to emerge at the upper major surface and share a portion of the upper major surface with the n-type emitter layer, an n-type base layer below the p-type base layer, a p-type emitter layer below the n-type base layer and extending downwards to the lower major surface, wherein a gate region of the device is defined at the upper major surface at a portion of the surface where the p-type base layer emerges, a metal doped region sufficiently doped with heavy metal atoms to define within said metal doped region stable charge recombination centers, wherein said metal doped region extends throughout an initial conduction region of the device which exhibits an operating temperature in use sufficiently elevated to anneal the semiconductor material comprising said wafer and which consists of the gate region and a portion of the n-type emitter layer immediately adjacent the gate region and the portions of said wafer laying thereunder and extending down to the lower major surface of said wafer, the remainder of said wafer being free of said heavy metal atoms, at least the portion of said wafer free of heavy metal atoms having radiation induced charge recombination centers throughout, and the concentration of radiation induced charge recombination centers in said initial conduction region being substantially less than outside of said initial conduction region.

4,177,478

AMPLIFYING GATE THYRISTOR WITH GATE TURN-OFF (G.T.O.)

Albert Sénés, L'Hay les Roses, France, assignor to Alsthom-Atlantique, Paris, France

Filed Jan. 4, 1978, Ser. No. 866,897

Claims priority, application France, Jan. 10, 1977, 77 00471

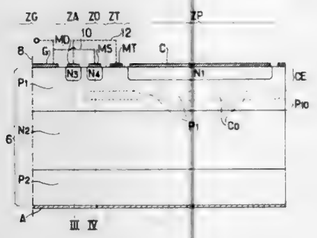
Int. Cl.² H01L *29/74*

U.S. Cl. 357—38 **3 Claims**

1. An amplifying gate thyristor with gate turn off, comprising a semiconductor monocrystalline wafer with two surfaces which are an anode surface and a cathode surface and which

are metallized, the surface of this wafer comprising five zones which succeed each other in the following order:

a gate zone;
a trigger amplification zone;
a turn off zone;
a trigger transmission zone;
and a main zone;
the wafer comprising in these five zones a stack of semiconductor layers and superimposed metallization in the following order starting from the anode surface;
an anode constituted by metallization;
a P type semiconductor injection layer;
an N type semiconductor blocking layer;
and a P type semiconductor base layer reaching in some places the cathode surface;
the wafer comprising; in the gate zone, a gate constituted by metallization deposited on the base layer; in the trigger amplification zone a trigger emitter separated from the gate and constituted by an N type semiconductor layer disposed on the base layer and coated with trigger emitter



metallization in the turn off zone, a shunt diode constituted by an N type semiconductor layer disposed on the base layer, this N layer being separated from the trigger emitter and coated with covering shunt diode metallization connected to the gate, in the trigger transmission zone, transmission metallization deposited on the base layer, separated from the shunt diode metallization and connected to the trigger emitter metallization; in the main zone, a main emitter constituted by an N type layer disposed on the base layer and coated with a cathode constituted by metallization separated from the transmission metallization; and a conduction layer situated in the thickness of the base layer and constituted by a P+ type semiconductor layer, in which the doping concentration is higher than that of the base layer, this conduction layer extending over the turn off zone, the trigger transmission zone and the main zone, forming in the main zone a buried grid whose gaps are occupied by the material of the base layer so as to allow the negative carriers to pass through these gaps from the main emitter to the blocking layer.

4,177,479

ELECTRICAL CIRCUIT WITH A HIGH-FREQUENCY THYRISTOR FIRED BY BLOCKING LEAKAGE CURRENT

Patrick DeBruyne, Siggenthal, and Roland Sittig, Umiken, both of Switzerland, assignors to BBC Brown Boveri & Company, Limited, Baden, Switzerland

Continuation of Ser. No. 713,484, Aug. 11, 1976, abandoned. This application Apr. 6, 1978, Ser. No. 894,033

Claims priority, application Switzerland, Sep. 9, 1975, 11695/75

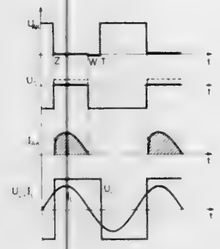
Int. Cl.[2] H01L *29/74*

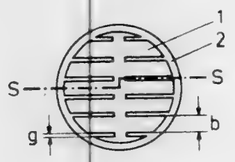
U.S. Cl. 357—38 **4 Claims**

1. A method of operating a thyristor circuit which includes a load and at least one thyristor in series connection with said load, using biasing means which subjects said thyristor to an alternating current having a frequency greater than 10 kHz and a voltage greater than 500 V, and a gate circuit for applying predetermined potentials to said thyristor to selectively fire said thyristor, comprising the steps of:

providing said at least one thyristor with an emitter zone and a gate in the form of an interdigitated emitter-gate structure, a control zone in contact with said gate, a base zone which is doped to a lesser extent than the control zone and an anode zone, said control zone being free from any short circuits to an electrode in contact with said emitter zone bridging the PN-junction between said control and said emitter zones, and said base zone consisting of first and second layers, said first layer being adjacent said control zone and doped to a lesser extent than said second layer;

connecting said biasing means across said emitter and anode zones of said at least one thyristor;





maintaining the electrical potential of said gate during the forward blocking state of the thyristor such that the PN-junction between the control zone and the contiguous emitter zone is polarized in the blocking direction, said biasing means generating a leakage current in said forward blocking state;

firing said thyristor during a positive load current period by means of said leakage current by setting the potential of said gate to a value between and including zero and the opposite of the potential of the gate during the forward blocking state; and

setting the potential of said gate again to the value of the forward blocking state after said alternating current turns to its negative load current period.

4,177,480

INTEGRATED CIRCUIT ARRANGEMENT WITH MEANS FOR AVOIDING UNDESIRABLE CAPACITIVE COUPLING BETWEEN LEADS

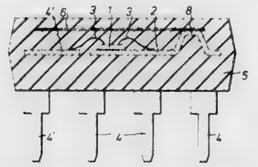
Kurt Hintzmann, Leingarten; Reinhold Kaiser, Heilbronn-Sontheim; Wolfgang Link; Willy Minner, both of Schwaigern; Dieter Mutz, Heilbronn-Frankenbach; Manfred Salomon, Leingarten, and Arnim Wingert, Heilbronn, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 728,878, Oct. 1, 1976, abandoned. This application Apr. 26, 1978, Ser. No. 900,647

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1975, 2543968

Int. Cl.[2] H01L *49/00, 25/04, 29/40*

U.S. Cl. 357—84 **22 Claims**



1. In an integrated circuit arrangement, particularly an amplifier, including a semiconductor body carrying an integrated circuit, said semiconductor body being embedded in a casing of insulating material together with flat supply lines which do not extend over a surface of said semiconductor body and which are connected to the contacts of said semiconductor body; the improvement wherein: an electrically conductive areal element, which extends only in a plane which is substantially parallel to the plane in which the parts of the flat supply lines embedded in the insulating material and associated with the connecting points of the semiconductor body are located, is present in said insulating material or on the surface of said insulating material casing only on the side of the surface of said semiconductor body on which the devices of the integrated circuit are located in the semiconductor body; the area of said electrically conductive areal element projected on to the plane of said flat supply lines extends from one supply line to another between which an undesirable capacitance coupling occurs which makes decoupling necessary; and means are provided for connecting said electrically conductive areal element to a reference potential.

4,177,481

MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS WITH CHROMINANCE CROSSTALK ELIMINATION

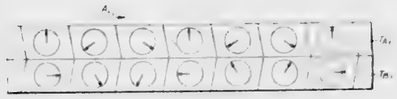
Kazuo Yamagiwa, and Masahiro Tada, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 11, 1977, Ser. No. 814,676

Claims priority, application Japan, Jul. 14, 1976, 51-83661[U]

Int. Cl.[2] H04N *5/79*

U.S. Cl. 358—8 **18 Claims**



1. In apparatus for recording periodic information signals comprised of first intervals and predetermined numbers of second intervals included in each of said first intervals and which are recorded in respective areas of successive parallel tracks on a record medium: the combination of means for providing said periodic information signals with a carrier having its phase selectively changed in one direction by a first amount $2\pi/N$ and in the opposite direction by a second amount $2\pi/M$, with N and M each being a whole number having an absolute value greater than 2 and which is positive to indicate a phase change in said one direction and negative to indicate a phase change in said opposite direction, and with N and M being selected to satisfy the equation $1/N-1/M=\frac{1}{2}$; and control means causing said first amount of phase change of the carrier for each of said second intervals of the information signals recorded in alternate ones of said parallel tracks and said second amount of phase change of the carrier for each of said second intervals of the information signals recorded in the remaining ones of said parallel tracks.

4,177,482

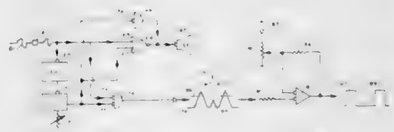
POPULATION AND PROFILE DATA OF BODIES IN A TRANSPARENT MASS

James W. Henry, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 790,792, Apr. 21, 1977, Pat. No. 4,121,247. This application Jun. 7, 1978, Ser. No. 913,401

Int. Cl.[2] H04N *7/18*

U.S. Cl. 358—93 **10 Claims**



1. Method of obtaining data of bodies contained within a transparent mass wherein said bodies and said mass have different indexes of refraction comprising

(a) moving a specimen of the mass containing said bodies into an optical viewing position wherein said specimen is intercepted by a columned beam of parallel light rays of a schlieren optical system whereby rays penetrating said mass are maintained in a columned state and rays penetrating said bodies are deviated from said columned beam of light to form an image of the profile of said bodies within said mass,

(b) detecting at least a portion of said deviated rays by a television camera, and converting the image into a video signal,

(c) electrically applying said video signal to the input of separator circuit means which is adapted to produce a control pulse on its output terminal of predetermined duration for each horizontal synchronization pulse contained in said video signal,

(d) electrically applying the video signal and the control pulse from the separator circuit means to separate input terminals of gate means adapted to pass said video signal through to its output terminal whenever said control pulse is applied to said second input terminal,

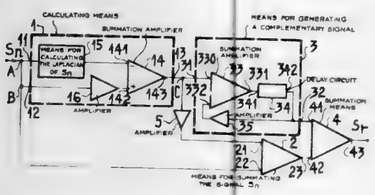
(e) electrically applying the output signal from said gate means to comparator means for converting all pulses of greater than a predetermined amplitude contained within said passed video signal into a digitized signal, and

(f) feeding the digitized signal into a digital computer whereby the signal is processed into said data.

4,177,483
PROCESS AND ARRANGEMENT FOR RECONSTITUTING THE THERMAL FLUX ABSORBED BY A PYROELECTRIC TARGET

Pierre Felix, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 10, 1978, Ser. No. 868,248
Claims priority, application France, Jan. 11, 1977, 77 00614
Int. Cl.[2] H04N *5/33*
U.S. Cl. 358—113 **9 Claims**



1. An arrangement for reconstituting the signal representing the thermal flux absorbed by the sensitive surface of a camera system using the pyroelectric effect, comprising means for periodically reading said sensitive surface by successive frames and delivering a signal Sn for reading a point of co-ordinates x,y during the reading thereof in the course of a frame of order n, comprising:

means for correcting the signal Sn comprising means (1) for calculating a first component representing the Laplacian of the signal Sn and means (2) for summating said signal Sn with said first component, said correcting means delivering a corrected signal at the output (23) of said summation means (2),

means (3) for generating a complementary signal connected to the output (13) of said calculating means (1) and comprising means for generating on the one hand a signal representing the temperature θ_{n-1} of the point of co-ordinates x, y during the reading of said point in the course of a frame of order n−1 and, on the other hand, a second component representing the Laplacian of said temperature,

means (4) for summating said complementary signal and the corrected signal and delivering the reconstitute signal.

4,177,484
LARGE SCREEN TELEVISION

Daniel Q. Boje, Palisades Park, N.J., assignor to Agar International Ltd., Englewood Cliffs, N.J.

Filed May 16, 1977, Ser. No. 797,464
Int. Cl.[2] H04N *5/64, 5/74*
U.S. Cl. 358—254 **10 Claims**



1. A large screen television system comprising:

a housing having a projection portion and a reflection portion interconnected at adjacent ends thereof to define a substantially L-shaped configuration;

said reflection portion including a top wall and a bottom wall interconnected by opposing side walls to define a horizontally extending compartment, said top and bottom walls diverging away from each other from a rear interconnecting junction line therebetween to provide a large front area defined by said top, bottom and side walls, said bottom wall having an opening therein;

said projection portion including a base wall with upwardly extending rear and front walls interconnected by side walls to define a vertically elongated container, said rear, front and side walls of said container being disposed around said bottom wall opening and being interconnected to said bottom wall of said reflection portion to provide communication between said container and said compartment;

support means positioned in said container on said base wall to receive a television set for retaining the television set in position with its screen facing upwardly towards said bottom wall opening, where a top portion of the screen is disposable adjacent to said rear wall of said container, and an opposite bottom portion of the screen is disposable adjacent to said front wall of said container;

said support means including adjustable yoke means for positioning about a periphery of the television set, and legs depending from said yoke means for support thereof;

a rear projection screen disposed across said large front area of said compartment, retaining means for securing said rear projection screen to said compartment;

reflective means disposed on an inside surface of said top wall of said compartment with said reflective means and said top wall being angularly positioned with respect to said rear projection screen for said reflective means to reflect an image from the television screen to said rear projection screen;

lens means disposed within said container for focusing a picture from the television screen through said bottom wall opening onto said reflective means so that a top portion of the picture is focused onto a top portion of said reflective means, and for projecting the image of the picture from said reflective means onto a rear surface of said rear projection screen to obtain an enlarged image of the picture received by the television set which can be viewed at a location in front of said rear projection screen; and

said lens means including a removable box-like member positionable on the television set to enclose the television screen, a tubular member connected to said box-like member and extending upwardly from said box-like member towards said reflective means, and a lens assembly adjustably fitting within said tubular member.

4,177,485
FACSIMILE APPARATUS

Lawrence D. Prehn, 30 Old Glebe Rd., Arlington, Va.

Filed Sep. 6, 1944, Ser. No. 552,858
Int. Cl.[2] H04N *1/44*
U.S. Cl. 358—259 **8 Claims**

1. In a facsimile apparatus, means for producing a stepped signal, the amplitudes of the steps being substantially dependent upon the photographic density of the subject and the durations of the steps being predetermined, a combining circuit and means for introducing the stepped signal thereto, means for introducing a coding signal to said combining circuit including a series of contacts and means for applying electrical potentials thereto, means for making successive circuits between the several contacts and the combining circuit, the durations of maintenance of the successive circuits being equal to the durations of the steps of the first mentioned signal, and



means for synchronizing the circuit making means with the first mentioned signal.

4,177,486
FACSIMILE DEVICE

Lawrence D. Prehn, OCSigO, 3C 340, The Pentagon, Washington 25, D.C. 20301

Filed Dec. 2, 1944, Ser. No. 566,382
Int. Cl.[2] H04N *1/44*
U.S. Cl. 358—259 **1 Claim**

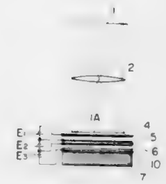


1. In a facsimile system, a distributor including an array of n electrical contacts, a source of potential therefor and a normally rotating brush for applying potential from said source to said contacts in sequence, a plurality of cryptographic rotors in cascade, aid cascade having n input and n output contacts, means for connecting said distributor contacts to said input contacts in pairs and means for connecting said output contacts together in groups to provide a sequence of n-x output signals from said cascade, a plurality of n-x switches each normally open and closable responsive to an electrical signal, each said switch being controlled by a separate one of said cascade output signals, a facsimile device including a drum carrying a subject to be transmitted and at least one dummy subject, a plurality of n-x scanning devices cooperating with said drum and the subjects carried thereby normally to derive n-x facsimile signals, an output line common to said switches, and means for connecting said scanning devices to said switches in pairs thereby to deliver to said output line signal segments from said scanning devices in a sequence determined by the output signals from said cascade of rotors.

4,177,487
FACSIMILE SCANNER

Mutsuo Takenouchi; Takashi Ozawa; Syoji Wako, and Satoru Itoh, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1978, Ser. No. 891,249
Claims priority, application Japan, Apr. 11, 1977, 52/40440; Apr. 26, 1977, 52/437311; Apr. 26, 1977, 52/47312
Int. Cl.[2] H04N *1/04*
U.S. Cl. 358—294 **16 Claims**



9. An electro-optical picture signal processing system comprising:

an electron emission plane arranged in one-dimension,

a grid electrode to control passing of the electrons emitted from the electron emission plane;

a number of secondary-electron multiplying devices, each of which has a cross section not larger than picture-element size and produces secondary-electrons in response to the incidence of photoelectrons from the electron emission plane,

an electric power source providing a voltage for accelerating secondary-electrons, and

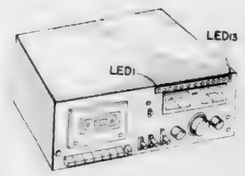
an anode consisting of a number of segments as large as a picture-element, for capturing multiplied secondary-electrons,

wherein at least one of the electron emission plane and the grid electrode is divided into a number of picture-element size segment which are one-dimensionally scanned to select from one end to the other, and further a voltage between the electron emission plane and the grid electrode at selected segment portion is controlled in accordance with a time sequential picture signal.

4,177,488
MAGNETIC RECORDING AND PLAYBACK MEANS WITH INDICATION OF TAPE REMAINING

Koichi Sakai, Otsu, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 17, 1978, Ser. No. 870,083
Claims priority, application Japan, Jan. 17, 1977, 52-4597[U]; Feb. 2, 1977, 52-11080; Feb. 3, 1977, 52-12222[U]
Int. Cl.[2] G11B *19/06, 27/14, 23/04*
U.S. Cl. 360—72.3 **7 Claims**



1. Magnetic recording and playback means employing tape cassette means in which electromagnetic tape is contained in a case, said recording and playback means comprising:

a supply reel stand for supporting a supply reel and rotatable to cause unwinding or winding of tape from or onto a supply reel on said supply reel stand;

a take-up reel stand for supporting a take-up reel and rotatable to cause winding or unwinding of tape onto or from a take-up reel on said take-up reel stand;
guide means for guiding said tape along a set path between said reel stands;
recording and playback means located near said path for effecting recording and playback of audio or video signals on or from the tape;
first pulse emission means operatively associated with one of said reel stands for emitting periodic pulses proportional to the rotation period of said one of said reel stands;
second pulse emission means separate from said first pulse emission means;
a ring counter connected to said pulse emission means and constituted by a plurality of cascade-connected flip-flops in which the stored content is shifted each time said counter receives an input of one pulse emitted by one of said pulse emission means and which are reset upon reception of a pulse emitted as output by the other of said pulse emission means; and
a plurality of display means disposed in a linear array, and each of which is connected with a corresponding flip-flop in said ring counter and is caused to light when the corresponding said flip-flop is set;
whereby said display means are caused to light in order starting from the display means connected to the flip-flop which is nearest the input terminals of said ring counter, and the number of said display means which is caused to light being proportional to the amount of tape unwound from said supply reel and wound onto said take-up reel, and the amount of tape remaining available for recording or playback is thereby indicated.

4,177,489

TAPE RUNNING MECHANISM PROVIDED WITH AUTOMATIC STOPPING DEVICE

Isao Hasegawa, Toda, Japan, assignor to Clarion Co. Ltd., Saitama, Japan

Filed Jul. 11, 1977, Ser. No. 814,616
Claims priority, application Japan, Jul. 9, 1976, 51-80867; Jul. 9, 1976, 51-80868; Jul. 9, 1976, 51-90452[U]; Jul. 12, 1976, 51-91685[U]; Aug. 9, 1976, 51-93947; Aug. 11, 1976, 51-94765; Aug. 13, 1976, 51-107584[U]
Int. Cl.² G11B *15/18, 21/22*
U.S. Cl. 360—74.2 **22 Claims**



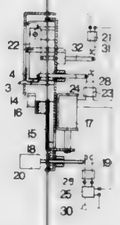
1. In a magnetic tape recorder having:
(a) a reel driving shaft (**61**) and
(b) a driving motor (**120**), an automatic stopping device comprising:
(i) a detection arm (**7**) mounted for pivoting about an axis parallel to the axis of said reel driving shaft,
(ii) means acting on said detection arm (**7**) for mechanically operating said arm (**7**) in response to the stopping of rotation of said reel driving shaft (**61**)
(iii) a push member (**180**) mounted for rotation about an axis parallel to the axis of the reel driving shaft (**61**)
(iv) a connecting lever (**181**) interconnecting said detection arm (**7**) and said push member (**180**) such that push member (**180**) is caused to move when said detection arm (**7**) moves
(v) a latch member (**186**) mounted for rotation about an axis parallel to the axis of the reel driving shaft (**61**) and including an engaging member (**189**) at an end thereof,
(vi) spring means acting between the push member (**180**) and the latch member (**186**) to urge the latch member (**186**) to rotate when said push member (**180**) is rotated,
(vii) a flywheel (**125**) coupled to said driving motor (**120**) for rotation by said motor,
(viii) a plurality of members (**128**) provided on said flywheel (**125**) and positioned to be abutted by said engaging member (**189**), and thereby prevent further rotation of the flywheel (**125**), when said latch member (**186**) is moved by said spring means as a result of movement of said push member (**180**) by said detection arm (**7**) detecting stoppage of rotation of said reel driving shaft (**61**).

4,177,490

SWITCHING DEVICE FOR CASSETTE TAPE RECORDERS

Werner Broghammer, Tennenbronn, Fed. Rep. of Germany, assignor to Dual Gebruder Steidenger, St. Georgen, Fed. Rep. of Germany

Filed Feb. 6, 1978, Ser. No. 875,558
Int. Cl.² G11B *21/22, 15/18*
U.S. Cl. 360—105 **2 Claims**



1. Cassette tape recorder for use with a tape cassette, which on its wide side has at least one opening, through which a winding mandrel is insertable for engagement in the core of the spool of the tape and which in one of its narrow sides has at least one opening in which a magnetic head can be inserted, comprising
winding mandrel means for operative engagement with the spool in the cassette,
a magnetic head,
feed means displaceably mounted in a plane perpendicular to the axis of said winding mandrel means for transferring said magnetic head into an operative position such that said magnetic head enters into the opening in a narrow side of the cassette, said magnetic head being secured on said feed means,
first spring means biasing said feed means in a direction against displacement thereof into said operative position,
a first control means for transferring said feed means into said operative position when said first control means is moved to an actuated position,
a locking means for locking said first control means in said actuated position when said first control means is moved into said actuated position,
a second control means having a direction of actuation corresponding to the movement of a person's hand during grabbing of an inserted cassette, said second control means being arranged directly contiguous to the inserted cassette such that the cassette only can be grabbed after said second control means has been moved in an actuated direction,
second spring means biasing said second control means in a direction against movement in said actuated direction,
said second control means being actuatable against said second spring means,
mounting means for mounting the cassette inserted in the cassette tape recorder, said mounting means being formed such that the inserted cassette can only be grabbed by hand for the purpose of removal by moving said second control means in said actuated direction,
means for transmitting a movement of said second control means to said locking means, whereby said locking means releases said first control means and said feed means is moved out of said operative position.

4,177,491

CLAMPING DEVICE FOR DISK-SHAPED MEMORY SHEETS

Emil Jahn, Pforzheim, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 16, 1978, Ser. No. 869,823
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1977, 2708798
Int. Cl.² G11B *5/82, 25/04*
U.S. Cl. 360—135 **5 Claims**

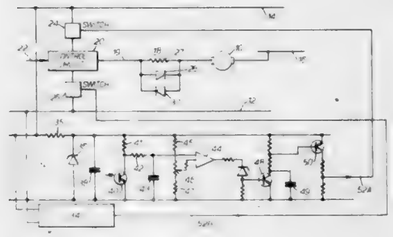
1. A centering and clamping device for disk-shaped memory sheets having circular holes in the center thereof, said device comprising: a frame having side walls; a frusto-conical member rotatable on one side wall; a cup-shaped member mounted on another side wall having a recess facing said frusto-conical member concentric therewith, said cup-shaped member having a rim around said recess, the diameter of said frusto-conical member growing smaller in the direction of said cup-shaped member, said frusto-conical member being movable in opposite directions through and out of a memory sheet hole into and out of said recess to center the memory sheet, said frusto-conical member having a shoulder to clamp the inner memory sheet edge against said rim of said member, said members being pivotally mounted about the same axis; power means for rotating said frusto-conical member in either direction about said axis to project said frusto-conical member into and withdraw the same from said recess, respectively, to first and second limiting stop positions, respectively; and motion means including a torque limiter for converting said rotary movements of said frusto-conical member to said axial movements thereof, respectively.

4,177,492

ELECTRICAL PROTECTION CIRCUITS

John Noddings, Coventry, and Michael D. Cox, Rugby, both of England, assignors to Associated Engineering Limited, England

Filed Jan. 16, 1978, Ser. No. 869,648
Claims priority, application United Kingdom, Feb. 8, 1977, 5069/77
Int. Cl.² H02H *3/08, 7/08*
U.S. Cl. 361—31 **6 Claims**



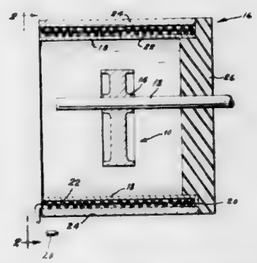
1. An overload protection circuit arrangement for protecting against overload an electric motor having a power supply circuit and a mechanical actuator driven by the motor, comprising
bi-polar electrically responsive energy-output means connected in circuit with said power supply circuit so as to be responsive to a motor overload current of either polarity therein and to produce a non-electrical energy output corresponding to either such overload current,
transducing means operatively associated with said electrically responsive energy output means so as to be responsive to each said non-electrical energy output thereof and to produce a corresponding electrical control signal,
control means connected to be responsive to each said control signal and associated with said power supply circuit for interrupting the corresponding overload current in the motor, and
timing means operative in response to either said control signal for holding the motor current interrupted for at least a predetermined time delay and then allowing its reconnection.

4,177,493

HIGH VOLTAGE ANTENNA PROTECTION SYSTEM

Emmanuel E. Bliamptis, Lexington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 29, 1977, Ser. No. 865,753
Int. Cl.² H02H *7/20*
U.S. Cl. 361—56 **5 Claims**



1. An apparatus for the protection of electrically charged

bodies against spurious overvoltages comprising a cup shaped housing; an electrically conductive shaft extending through one end of the housing, parallel to, but spaced away from the longitudinal axis of the housing; rotor means mounted on the shaft so that rotation of said rotor results in a progressively diminished air gap between the rotor and housing; means for connecting the shaft to an electrically charged body, and means for connecting the housing to ground.

4,177,494

CIRCUIT ARRANGEMENT FOR PRODUCING AN OPEN MAGNETIC FIELD

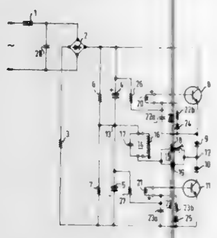
Rudy Tellert, Schweinfurt, Fed. Rep. of Germany, assignor to Sachs Systemtechnik GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Nov. 8, 1977, Ser. No. 849,666

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1976, 2651516

Int. Cl.[2] H02H 7/10; H02M 7/48

U.S. Cl. 361—152 **6 Claims**



1. In apparatus for producing a magnetic field for coupling to a load, said apparatus having at least a first and second amplifier element operating in phase opposition, and first oscillating circuit means connected to said first and second amplifier element for generating a first oscillating voltage having a predetermined fundamental frequency, said first oscillating circuit means comprising inductor means for producing said magnetic field, the improvement which comprises second oscillating circuit means connected to said first oscillating circuit means for furnishing a second oscillating voltage having a frequency corresponding to the third harmonic of said fundamental frequency, said second oscillating circuit means comprising a coil positioned relative to said load such that substantially no energy is transferred from said coil to said load.

4,177,495

VARIABLE ELECTRIC CAPACITOR

Maurice Perret, Avenches, Switzerland, assignor to Gesellschaft fur elektronische Rohren Comet Bern, Switzerland

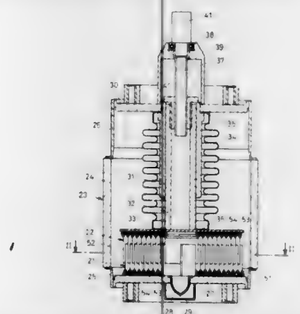
Filed Aug. 9, 1977, Ser. No. 823,323

Claims priority, application Switzerland, Aug. 25, 1976, 10748/76; Jun. 7, 1977, 6973/77

Int. Cl.[2] H01G 5/14

U.S. Cl. 361—279 **6 Claims**

1. An electric capacitor comprising two electrode units, each electrode unit having at least one capacitor plate arranged such that a plurality of capacitor plate portions with parallel mutually oppositely facing surfaces are provided, and a support for said at least one capacitor plate, said at least one capacitor plate having two oppositely positioned lateral edges, one of which is free and the other is fixedly secured to the support, a gap being defined between the oppositely facing surfaces of the capacitor plate portions, said gap being greater than the thickness of said at least one capacitor plate of the other electrode unit, the respective capacitor plate portions of the two electrode units being intermeshed and the mutually facing surfaces of the capacitor plate portions being parallel to a straight line along which one electrode unit is adjustable relative to the other for varying the extent of intermeshing of the capacitor plate portions of both electrode units, guiding means being provided at each electrode unit adjacent said support, said guiding means being arranged to engage the free lateral edge of said at least one capacitor plate of the other electrode unit for individually centering all capacitor plate portions of each electrode unit with respect to the capacitor plate portions



of the other electrode unit when the two electrode units are set to a maximum extent of intermeshing of their capacitor plate portions while in other settings of the electrode units the guiding means are out of engagement with said at least one capacitor plate of the other electrode unit, at least one body being connected to the support for said at least one capacitor plate of each electrode unit and including grooves having flanks which constitute said guiding means.

4,177,496

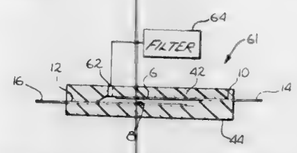
CAPACITIVE PRESSURE TRANSDUCER

Robert L. Bell, Chatsworth; Robert Willing, Anaheim, and Fred Kavli, Woodland Hills, all of Calif., assignors to Kavlico Corporation, Chatsworth, Calif.

Continuation of Ser. No. 666,188, Mar. 12, 1976, abandoned. This application Sep. 19, 1977, Ser. No. 834,498

Int. Cl.[2] H01G 7/00

U.S. Cl. 361—283 **10 Claims**



1. A capacitive pressure transducer comprising, in combination, a pair of essentially zero hysteresis nonconductive electrically insulative members, at least one of said electrically insulative members comprising an elastic diaphragm defining a substantially planar inner surface and having a continuous solid cross-section, the other of said electrically insulative members defining a substantially planar inner surface and having a substantially continuous solid cross-section, said electrically insulative members being disposed in vertically aligned, stacked relationship with marginal edge portions in overlying relationship and with said inner surfaces in spaced apart parallel relationship to define a gap, seal means comprising a fired glass frit having a thickness ranging from about 0.1 milinch to 20 milinch bonding said overlying edge portions together in sealed relationship having a predetermined spacing and fixing said electrically insulative members in a parallel relationship, said frit and insulative members being of substantially similar materials from the standpoint of coefficient of thermal expansion, a planar layer of conductive material secured on each of said inner surfaces, each of said layers of conductive material comprising a central conductive portion and a co-planar conductive path portion extending from said central portion for connection to external leads, said central conductive portions on said inner surfaces being disposed in vertically aligned, spaced apart parallel relationship to form a capacitor having a capacitance which varies according to the substantially transverse flexing of said elastic diaphragm toward the other member in response to pressure, with the gap being dimensioned between 0.1 milinches to 20 milinches and the diaphragm being constructed to enable said diaphragm to bottom out when a pressure in excess of a predetermined pressure is applied to the transducer so as to avoid damaging stress on said transducer.

4,177,497

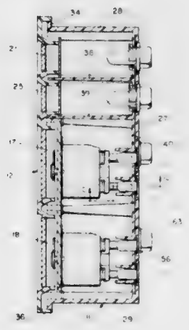
INSTRUMENT CLUSTER ASSEMBLY

Thomas J. McCook, Wilmette, and John F. Shragal, River Grove, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 690,636, May 27, 1976, abandoned, which is a continuation of Ser. No. 522,023, Nov. 8, 1974, abandoned. This application Dec. 29, 1977, Ser. No. 865,636

Int. Cl.[2] H02B 1/04

U.S. Cl. 361—331 **6 Claims**



1. An indicator assembly, comprising; housing means, a plurality of indicators mounted on said housing means, each of said indicators having electrical connectors, terminals in said housing means providing current to said indicators, a conductive standard circuit plate permanently carried by said housing means and providing electrical circuit paths for said indicators through said connectors from said terminals, said paths being provided by relatively narrow cut-out portions in said plate and conductor paths in said plate that are substantially wider than the cut-out portions, said housing means being constructed of plastic, said cut-out portions each having a small bridge portion of plate along their length, said housing means having a plurality of apertures therein, each positioned adjacent one of the bridge portions so that the bridge portions are visable from outside the housing and may be selectively removed to achieve different circuit patterns from a standard circuit plate, and said circuit paths being insert molded in said housing means.

4,177,498

CONTROL PANEL FOR VEHICLE ENTERTAINMENT SERVICE SYSTEMS

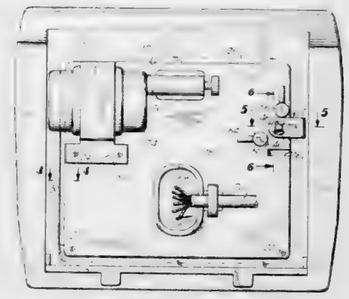
Harry Weitz, New Hyde Park, N.Y., assignor to Instrument Systems Corporation, Huntington, N.Y.

Filed Mar. 10, 1978, Ser. No. 885,419

Int. Cl.[2] H02B 1/04

U.S. Cl. 361—360 **13 Claims**

1. A control panel for mounting in an opening in a support defined on at least two sides by first and second rim portions, comprising frame means dimensioned for receipt in the opening and formed with a slot in one side thereof dimensioned for receipt of the first rim portion, said frame means being further formed with a projection on a side thereof positioned for engagement against the front surface of the second rim portion; circuit means carried by said frame means for performing a control function; bolt means threadably engaged to said frame means adjacent said projection and formed with a head portion accessable from the front of said control panel for the manual pivoting thereof between first and second positions; and dog



means fixed to said bolt means for displacement in response to the pivoting of said bolt means relative to said frame means between said first position at which said dog means engages against the rear surface of the second rim portion for retaining the second rim portion between said dog means and said projection, and said second position at which said dog means is displaced both axially and pivotably relative to the axis of said bolt means away from and out of registration with the second rim portion, whereby said control panel may be readily removed from the support when said dog means is in said second position.

4,177,499

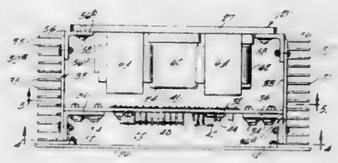
ELECTRONIC ASSEMBLY WITH HEAT SINK MEANS

Werner K. Volkmann, Media, Pa., assignor to Volkmann Electric Drives Corporation, Folcroft, Pa.

Filed Nov. 14, 1977, Ser. No. 850,911

Int. Cl.[2] H05K 7/20

U.S. Cl. 361—388 **5 Claims**



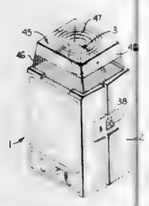
1. An electronic assembly consisting of at least a pair of modules interconnected by means permitting ease of assembly and disassembly, one of said modules comprising a pair of spaced heat sinks, a printed circuit board mounted by first bracket support means between said heat sinks, electronic components on the upper face of said printed circuit board including high heat generating elements supported by said first bracket support means along side edges of said printed circuit board in close proximity to said heat sinks, the other module including a base underlying said printed circuit board and mounting electronic components on a face thereof and second bracket means carried by said heat sinks and secured to said base, said heat sinks thereby forming side enclosures for said assembly.

4,177,500

POWER FAILURE LIGHT AND CIRCUIT THEREFOR

Thomas H. Nicholl, 1204 W. 27 St., Kansas City, Mo. 64108, and John J. Collins, Kansas City, Mo., assignors to Thomas H. Nicholl, Kansas City, Mo.

Filed Sep. 29, 1978, Ser. No. 947,261
Int. Cl.² F21V *19/04*
U.S. Cl. 362—20 **13 Claims**



1. In a power failure light including power supply means providing pulsating DC current during reception thereby of electrical power from a power receptacle having said power failure light connected thereto; a rechargeable battery; a light bulb for illumination by said battery upon interruption of said electrical power; and circuit means including diode means connecting said battery across said power supply means whereby said battery receives charging current therefrom and transistor means connecting said light bulb across said battery and effecting conduction of current from said battery through said bulb, illuminating same, upon said interruption of said power, said transistor means having a base-emitter junction, suitable forward bias of said junction effecting said illumination of said bulb; the improvement comprising:

(a) said junction being connected across said diode means, said diode means having a pulsed voltage thereacross during the occurrences of the DC pulses of said charging current, the voltage pulses appearing across said junction and biasing said transistor means into a non-conductive state thereby preventing said illumination of said bulb; and

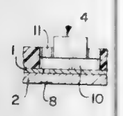
(b) timing means connected across junction and across said power supply means, said timing means maintaining the non-conductive state of said transistor means between the occurrences of said voltage pulses across said junction and providing suitable bias to said junction after said interruption of power to thereby effect said illumination of said bulb.

4,177,501

ILLUMINATED KEYBOARD

James H. Karlin, Fairport, N.Y., assignor to Harris Corporation, Cleveland, Ohio

Filed Nov. 15, 1977, Ser. No. 851,694
Int. Cl.² G01D *11/28*
U.S. Cl. 362—26 **23 Claims**



1. An illuminating arrangement comprising:

light-pipe means formed of a light transmitting material having front and rear surfaces,

a light source means for edge-lighting said light-pipe means, and

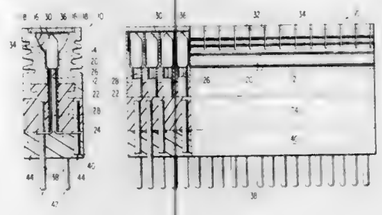
surface means for deflecting light from said light source through said front surface comprising roughened portions of said rear surface.

4,177,502

INCANDESCENT BAR DISPLAY MODULE

Benjamin E. Hiscock, S. Burlington, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Jul. 19, 1977, Ser. No. 817,457
Int. Cl.² F21S *2/00, 3/00;* F21V *11/00, 7/00*
U.S. Cl. 362—218 **7 Claims**



1. A display comprising a plurality of lighted segments aligned to form an incandescent bar display comprising,

a lamp block having a base portion provided with an aligned row of apertures, said base portion merging into concave sidewalls to form parabolic reflectors;

a plurality of incandescent lamps located in said aligned row of apertures

means defining barrier plates mounted in a series of cuts arranged throughout the length of said block to sectionalize the block into separate reflectors for each lamp,

cooling fins formed on outside of said lamp block to dissipate the heat generated by said incandescent lamps,

an insulating connector block formed on the side of said block opposite from said parabolic reflectors; and

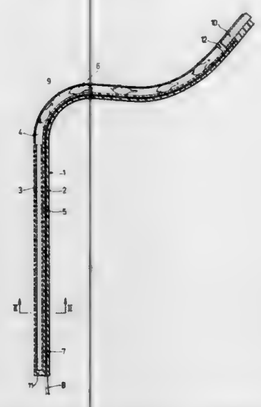
means for connecting said lamps to a suitable source of power.

4,177,503

DEVICE FOR LOCATING AND RETRIEVING METALLIC PARTS FROM DIFFICULT TO REACH AREAS

Jacques L. V. Anquetin, 7 rue de la Gouttiere, 78640 Neauphle le Chateau, France

Filed Nov. 3, 1978, Ser. No. 957,365
Claims priority, application France, Nov. 7, 1977, 77 33449
Int. Cl.² F21V *1/00*
U.S. Cl. 362—236 **4 Claims**



1. A device for locating and retrieving metallic parts from places which are difficult to reach comprising, a section made

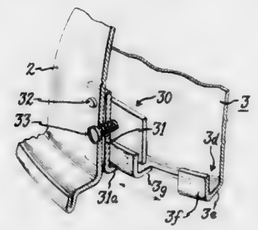
of transparent or translucent flexible plastic material and having a longitudinal cylindrical cavity enclosing along part of its length from one end of the section, a series of small electric bulbs distributed along the length of the section and energized from two longitudinal electrical conductors embedded in the section beside said cavity, and by conductors connecting the bulbs to the two longitudinal conductors, said cavity enclosing, in the remainder of the length of the section, a cylindrical tube of rigid plastic material whose outside diameter is approximately equal to that of the cavity, said cylindrical cavity encloses, at an end of the section remote from the tube, a permanent cylindrical magnet whose diameter is approximately the same as that of the cavity, at least one of the two longitudinal electrical conductors being bendable but sufficiently rigid to maintain in the portion of the section located between the rigid tube and the magnet any bends formed in this portion of the section.

4,177,504

LUMINAIRE REFLECTOR MOUNTING FOR ROTATION OF ASYMMETRIC REFLECTOR

Alfred J. Henderson, Jr., Chagrin Falls, Ohio, and Thomas A. Fletcher, Dana, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 4, 1977, Ser. No. 848,544
Int. Cl.² F21V *17/02*
U.S. Cl. 362—282 **5 Claims**



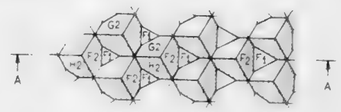
1. A luminaire comprising, in combination, a concave housing having a bottom opening, a concave reflector arranged within said housing and having a rim defining a bottom opening substantially coaxial with the bottom opening of said housing, the rim of said reflector being substantially channel-shaped and being formed with an annular flange projecting upwardly and spaced outwardly from the reflector, means for removably mounting a lamp in said reflector, said reflector being rotatably adjustable within said housing about the axis thereof, and a plurality of circumferentially spaced fastening means adjustably securing said reflector rim flange to said housing for holding said reflector in different rotational positions relative to said housing, whereby the light distribution from said reflector may be varied, each said fastening means including support means secured to and having a portion projecting radially inwardly from said housing for supporting said reflector, said reflector being formed in said rim thereof with circumferentially spaced, outwardly open recesses, said recesses being sufficiently large for passage therethrough of said radially projecting support portions when said reflector is removed from and inserted into said housing, each said fastening means including a clamp member adjustably attached to said housing for releasably clamping said reflector rim flange to said housing.

4,177,505

INDICATOR LIGHT WITH INCORPORATED CATADIOPTRIC ELEMENT FOR AUTOMOBILE

Pierre Carel, Le Petit Clamart, France, assignor to Cibie Projecteurs, Bobigny, France

Filed Dec. 19, 1977, Ser. No. 861,782
Claims priority, application France, Jan. 24, 1977, 77 01895
Int. Cl.² F21V *7/00*
U.S. Cl. 362—309 **5 Claims**



1. In an indicator light with a catadioptric element for automobiles comprising an exterior diffusing glass, a reflector having a longitudinal axis, a light source, and a transparent catadioptric element placed transversely with respect to said axis so as to intercept a part of the light beam reflected by the reflector, said catadioptric element having a substantially flat outer face and an inner face composed of a plurality of prisms, located in a useful illumination window zone, separated by flat surfaces parallel to the outer surface, said flat surfaces allowing the emission by light of an illuminating flow centered on the axis of said reflector;

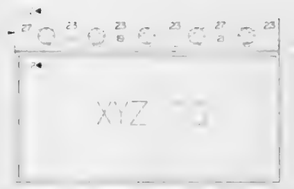
the improvement comprising said catadioptric prisms each presenting one facet defining with the outer surface of the catadioptric element a deflector prism which deviates light rays emitting a second illumination flow adjacent the first illuminating flow.

4,177,506

ILLUMINATED BAR FOR AN ADVERTISING SIGN

Jimmy W. Easterling, P.O. Box 1248, Clanton, Ala. 35045

Filed May 22, 1978, Ser. No. 908,201
Int. Cl.² F21S *1/12*
U.S. Cl. 362—414 **4 Claims**



1. An illuminated bar for use with an advertising sign, said bar comprising,

(a) an elongated housing having spaced apart upstanding side members,

(b) means mounting at least one electric lamp between said upstanding side members, and

(c) longitudinally spaced magnifying lenses carried by each said upstanding side member at opposite sides of said lamp with each of said lenses being opposite one of a plurality of longitudinally spaced openings in said side members in position to transmit and magnify light emitted at said opposite sides of said lamp.

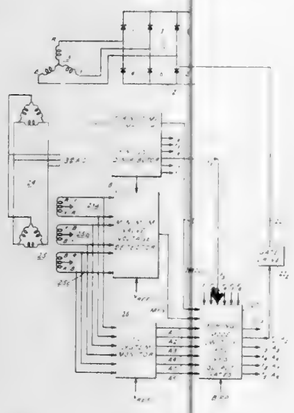
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4,177,507

METHOD AND CONTROL FOR MAINTAINING OPTIMUM PERFORMANCE OF HVDC POWER TRANSMISSION SYSTEMS AT RECTIFIER END DURING A. C. SYSTEM FAULT

Bernard D. Leete, Newtown Square, Pa., assignor to General Electric Company, Philsdelphia, Pa.

Filed Mar. 22, 1978, Ser. No. 889,157
Int. Cl.[2] H02M *7/155*
U.S. Cl. 363—51 **21 Claims**



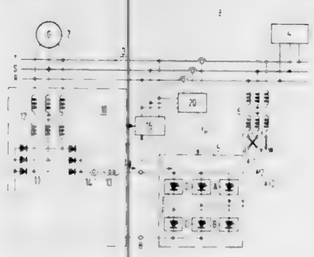
1. In an HVDC power converter comprising a plurality of valves connected in an HVDC bridge arrangement intermediate a multiphase alternating current system and at least one HVDC power conductor link together with gating circuit means for gating-on respective ones of said valves during selected intervals of the alternating current periods of the respective phases, the said gating circuit means including equidistant-spaced gate firing pulse generating means for supplying equidistant-spaced gating-on firing pulses to gate drive circuit means for the respective valves of the HVDC bridge power converter during normal operation of the converter in the presence of symmetrically-shaped A.C. system voltage waveforms; the improvement comprising firing mode switch means connected intermediate the equidistant-spaced gate firing pulse generating means and the gate drive means for the respective valves, A.C. system monitor means coupled to the A.C. system in parallel circuit relationship with the HVDC bridge for reducing and monitoring the voltage waveshapes of the A.C. system voltage for detecting the points at which the respective phase-to-phase voltages of the multiphase alternating current system pass through zero voltage value in a direction which will enable the respective associated HVDC valves for conduction and for deriving commutating voltage-indicating signals indicative of this occurrence, minimum valve voltage detector means coupled to the A.C. system in addition to the A.C. system monitor means for sensing that any of the A.C. system phase-to-phase voltages are below a predetermined minimum safe level required to assure safe operation of the HVDC power converter and deriving an output minimum valve voltage alarm signal under conditions where the minimum safe level has not been attained by the voltage across any one of the HVDC valves, and means for applying the output minimum valve voltage alarm signal to the firing mode switch means for controlling the operating thereof; said firing mode switch means including means for effectively removing the normal equidistant-spaced firing pulses from effective application to the gate drives of the respective HVDC valves and effectively coupling said commutating voltage-indicating signals for the respective phases to the gate drive means for the respective HVDC valves in the presence of a minimum valve voltage alarm signal for use as gating-on firing pulses for the HVDC valves under conditions where asymmetries occur in the A.C. system voltage waveforms due to transient disturbances affecting the system, said firing mode switch means further automatically decoupling said commutating voltage indicating signals from the gate drives for the HVDC valves upon termination of the minimum valve voltage alarm signal and reapplying the normal equidistant-spaced firing pulses thereto.

4,177,508

APPARATUS FOR BALANCING AN ASYMMETRICAL LOAD

Eberhard Schmid, Dormitz, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 21, 1978, Ser. No. 879,590
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1977, 2708305
Int. Cl.[2] H02J *3/26*
U.S. Cl. 363—78 **10 Claims**



1. Apparatus for use in balancing an asymmetrical load which is supplied from a three-phase network comprising:

a self commutating converter for generating a three-phase output current system on the a-c side and which is adapted to be connected on the a-c side with phases reversed to said network, said converter including controllable valves which are arranged in a bridge circuit and are adapted for forced quenching;

a d-c source connected to the d-c side of said converter and coupling thereto a constant d-c current corresponding to the maximum asymmetry power to be balanced;

a control device for controlling said converter such that the phase and amplitude of the fundamental of the three phase output current system thereof are dependent, respectively, on the phase and amplitude of the countercurrent system required for balancing, said control device including:

a first control means having a pulse program for firing and extinguishing the valves of said converter;

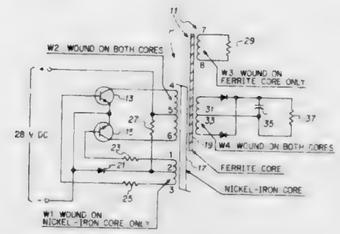
a second control means responsive to the a-c voltage and a-c current of said network for determining the phase and amplitude of said required countercurrent system and for controlling the pulse widths of the pulses of said program of said first control means to effect a change in the amplitude of the fundamental of said three phase output current system in dependence on said determined amplitude of said countercurrent system and for controlling the phase of the pulse program relative to the zero crossings of the a-c voltage of said network to effect a change in the phase of the fundamental of said three phase output current system in dependence on said determined phase of said countercurrent system.

4,177,509

SELF-EXCITED INVERTER WITH SUPPRESSED CURRENT SPIKES

Johannes Bullinga, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 26, 1978, Ser. No. 955,277
Int. Cl.[2] H02M *7/537*
U.S. Cl. 363—133 **14 Claims**



1. A free-running inverter comprising:

transformer means comprising (a) first and second magnetic cores, said first core requiring less magnetizing force than the second core to become saturated, (b) a primary first winding wound around both cores, (c) a secondary second winding wound around both cores, and (d) a feedback third winding wound around only said first core, and

switch means having on and off states for alternately connecting a DC voltage source to said first winding and then, in response to said first core saturation, disallowing said connection,

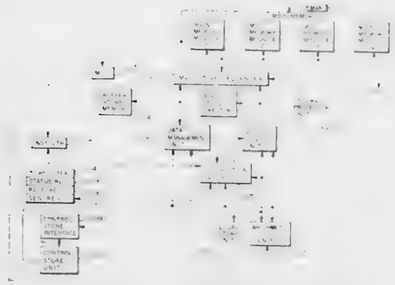
said third winding being connected for supplying to said switch means all the voltage or current necessary for driving said switch means between and during its on and off states.

4,177,510

PROTECTION OF DATA IN AN INFORMATION MULTIPROCESSING SYSTEM BY IMPLEMENTING A CONCEPT OF RINGS TO REPRESENT THE DIFFERENT LEVELS OF PRIVILEGES AMONG PROCESSES

Marc Appell, Paris; Georges Lepicard, Vaucresson; Philippe-Hubert de Rivet, Paris; John J. Bradley, Garches, all of France, and Benjamin S. Franklin, Cambridge, Mass., assignors to Compagnie Internationale pour l'Informatique, CII Honeywell Bull, Paris, France

Filed Dec. 2, 1974, Ser. No. 528,953
Claims priority, application France, Nov. 30, 1973, 73 42706
Int. Cl.[2] G06F *9/18, 9/20*
U.S. Cl. 364—200 **11 Claims**



1. In an automatic data processing apparatus for processing information, including a virtual memory having stored therein a plurality of different types of groups of information, each information group-type associated with an address space in said virtual memory bounded by a segment having adjustable bounds, said information being protected against unauthorized uses by a hierarchy of concentric ring levels (i.e. levels of privilege) wherein each group-type of information is associated with a predetermined ring number indicative of a level of privilege, said level of privilege decreasing as the associated ring number increases, an apparatus for generating a write-violation-exception signal comprising:

(a) first means for storing first information indicating the maximum ring number RD (i.e. minimum level of privilege) required to read invormation from said selected group;

(b) second means for storing second information indicating the maximum ring number WR (i.e. minimum level of privilege) required to write information into said selected group;

(c) third means for storing third information indicating the maximum ring number MAXR (i.e. minimum level of privilege) required to process information from said selected group;

(d) fourth means interconnecting said first, second and third means, for determining the maximum of the contents of said first, second and third means, whereby an effective address ring number EAR is generated;

(e) fifth means connected with said second means, for comparing the effective address ring number EAR with the write ring number WR; and,

(f) sixth means connected with said fifth means for generating a write-violation-exception signal when EAR is greater than WR.

4,177,511

PORT SELECT UNIT FOR A PROGRAMMABLE SERIAL-BIT MICROPROCESSOR

Vincent J. Taddei, West Chester, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sep. 4, 1974, Ser. No. 503,111
Int. Cl.[2] G06F *3/04*
U.S. Cl. 364—200 **4 Claims**



1. An apparatus for establishing communication paths between a plurality of peripheral devices and a serial-bit data processor, said processor including means for providing external interface control signals and serial peripheral designation information, each of said plurality of peripheral devices being enabled for communications with said processor responsive to said external interface control signals, comprising:

means for transforming said serial designation information from said processor to parallel information;

means connected to said transforming means for decoding said transformed designation information;

means connected to said plurality of peripheral devices and to said means for providing said external interface control signals and responsive to said decoding means for selectively gating said control signals to said plurality of pe-

ripheral devices in accordance with said decoded designation information, said means for selectively gating including;

a first matrix connected between said means for providing external interface signals and said plurality of peripheral devices and responsive to said decoding means for providing a given one of said external interface control signals to said one of said plurality of peripheral devices specified by said decoded designation information,

a second matrix connected between said means for providing external interface signals and said plurality of peripheral devices and responsive to said decoding means for providing a second given one of said external interface control signals to said one of said plurality of peripheral devices specified by said decoded designation information, and

a third matrix connected between said means for providing external interface signals and said plurality of peripheral devices and responsive to said decoding means for providing a third given one of said external interface control signals to said one of said plurality of peripheral devices specified by said decoded designation information, said communications path being enabled only when said one of said plurality of peripheral devices specified by said decoded designation information has received said given one, said second given one and said third given one of said external interface control signals; and

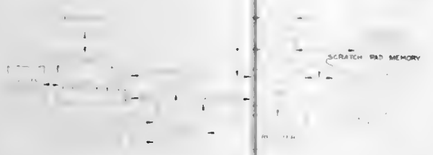
means responsive to said selectively gated control signals for enabling a communications path between said processor and one of said plurality of peripheral devices specified by said decoded designation information.

4,177,512

SOFT INPUT/OUTPUT AUTO POLL SYSTEM

Richard A. Moggia, Goleta, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 12, 1976, Ser. No. 666,413
Int. Cl.[2] G06F *3/04, 13/00*
U.S. Cl. 364—200 **3 Claims**



1. In a data processing system, means for providing automatic polling of a peripheral in response to digitally coded input/output descriptors comprising:

a system memory for storing a read-from-peripheral digitally coded input/output descriptor and a write-to-peripheral digitally coded input/output descriptor, each including a settable poll indication, said write-to-peripheral descriptor also including a linking address to said read-from-peripheral descriptor, and said read-from-peripheral descriptor also including a linking address to said write-to-peripheral descriptor, said write-to-peripheral descriptor additionally including poll message addresses of a plurality of poll messages stored in said memory, and further including a pointer address pointing to a particular one of said poll message addresses; and

input/output control means for controlling the transfer of data between said memory and said peripheral;

said input/output control means including means for fetching said write-to-peripheral descriptor from said memory and in response to the detection of a predetermined setting of the poll indication of the fetched write-to-peripheral descriptor causing the poll message pointed to by the pointer address to be transferred to said peripheral following which the pointer address is modified to point to another poll message;

said input/output control means also including means for automatically fetching said read-from-peripheral descriptor from said memory in response to the linking address of the fetched write-to-peripheral descriptor and for executing the fetched read-from-peripheral descriptor so as to provide for the transfer from said peripheral of a response to the poll message transferred thereto during execution of said write-to-peripheral descriptor;

said input/output control means additionally including means for automatically linking back from said read-from-peripheral descriptor to said write-to-peripheral descriptor using the linking address of said read-from-peripheral descriptor so as to provide for another execution of said write-to-peripheral descriptor, said linking back occurring in response to a predetermined setting of the poll indication of said read-from-peripheral descriptor and the receipt of a first predetermined type of response from said peripheral to the poll message transferred thereto during execution of the immediately preceding write-to-peripheral descriptor.

4,177,513

TASK HANDLING APPARATUS FOR A COMPUTER SYSTEM

Roy L. Hoffman, Pine Island; William G. Kempke, Rochester; John W. McCullough, Rochester; Frank G. Soltis, Rochester, and Richard T. Turner, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 8, 1977, Ser. No. 813,901
Int. Cl.[2] G06F *9/18*
U.S. Cl. 364—200 **9 Claims**

1. Task handling apparatus in a computer system having main storage interconnected with a central processing unit (CPU) and I/O units, where said CPU includes means for processing an active task dispatching element comprising:

a source of task dispatching elements, each having a priority indicator, said task dispatching elements including CPU and I/O task dispatching elements,

task queue register means selectively loadable to store said task dispatching elements,

means for loading said task queue register means with task dispatching elements in priority sequence from said source, where the highest priority task dispatching element is dispatchable as an active task and all other task dispatching elements are inactive dispatchable task dispatching elements,

task dispatching means for determining the highest priority task dispatching element in said task queue register means,

a source of task messages, each having a priority key,

intertask communication queue register means selectively loadable with task dispatching elements and with task messages,

intertask communication means comprising send means activatable by said active task dispatching element for loading messages from said source of messages in said intertask communication queue register means and for unloading task dispatching elements from said intertask communication queue register means and loading said unloaded task dispatching elements in priority sequence in said task queue register means, said send means activating said task dispatching means whenever said send means loads one or more task dispatching elements in said task queue register means, and receive means activatable by said active task dispatching element for unloading messages for said active task dispatching element from said intertask communication queue register means and in the absence of any message for said active task dispatching element for unloading said active task dispatching element from said task queue register means and loading it in priority sequence in said intertask communication queue register means, said receive means activating said task dispatching means whenever said receive means unloads said active task dispatching element from said task queue register means, and

task switching means having first means responsive to said task dispatching means having been activated in response to said send means loading said task queue register means with a task dispatching element and said task dispatching means having determined that said loaded task dispatching element has a priority higher than the priority of said active task dispatching element for making said active task dispatching element inactive dispatchable and said higher priority loaded task dispatching element an active task dispatching element and having second means responsive to said task dispatching means having been activated in response to said receive means unloading said active task dispatching element from said task queue register means for making the highest priority task dispatching element remaining in said task queue register means an active task dispatching element.

4,177,514

GRAPH ARCHITECTURE INFORMATION PROCESSING SYSTEM

Charle R. Rupp, Pittsfield, Mass., assignor to General Electric Company

Continuation of Ser. No. 741,421, Nov. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 707,721, Jul. 21, 1976, abandoned. This application Nov. 22, 1977, Ser. No. 853,880
Int. Cl.[2] G06F *15/16, 15/34*
U.S. Cl. 364—200 **18 Claims**



1. A distributive function information processing system made up of interconnected processing elements for use in combination with one or more input or output devices such as display devices, keyboards, printers, cathode ray tubes and data links, comprising:

a. a plurality of processing elements including:

(1) one or more data processors for receiving, transforming and transmitting data in response to control signals, and

(2) two or more control processors for generating and transmitting control signals for operating said system;

b. a plurality of control arcs interconnecting said processing elements into a system, each said control arc consisting of:

(1) control arc logic circuitry for generating and transmitting said control signals constituting a control arc transmitter,

(2) control arc logic circuitry for receiving and interpreting said control signals constituting a control arc receiver, and

(3) electrical connectors constituting control arc communication lines interconnecting said control arc transmitter and said control arc receiver into a control arc for conveying said control signals from transmitter to the receiver and for conveying responses to said control signals from receiver to transmitter whereby each control arc can pass said control signals in the direction from transmitter to receiver,

said control arc logic circuits being located in and forming a part of said processing elements with the two logic circuits of each control arc being located in a different processing element with control arc transmitters being located only in said control processors, with control arc receivers being located in either control processors or data processors and with at least one control processor containing a control arc receiver whereby each control arc interconnects two processing elements for interconnecting said processing elements into said system,

wherein the number of control arcs is equal to or greater than the total number of control and data processors, wherein said control arcs interconnecting two or more of the processing elements in a system describe a loop and wherein one said control processor includes, in addition to the control arc logic circuitry constituting a portion of one or more said control arcs, state defined control circuitry permitting said one control processor to assume, in turn, two or more different states to have state defined control whereby the control function performed by said one control processor depends in part on its state;

c. input and output data lines for connecting one or more processing elements with one or more said input or output devices wherein the network created by processing elements when interconnected by said control arcs defines a mathematical graph in the sense of graph mathematics over the processing elements and wherein said processing elements constitute the nodes of the graph; and

d. data path means for movement of data among said processing elements, said electrical connectors constituting control arc communication lines also constituting means for movement of data in the same direction as said control signals are moved thereby constituting a portion of said data path means;

whereby said system may accept data from said input device, operate and transform data using a control scheme based on graph theory mathematics and produce data usable by said output device.

4,177,515

INTERRUPT ADAPTER FOR DATA PROCESSING SYSTEMS

Alfred D. Jenkins, and Edward W. Schade, Jr., both of Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 23, 1977, Ser. No. 864,044
Int. Cl.[2] G06F *9/18*
U.S. Cl. 364—200 **5 Claims**

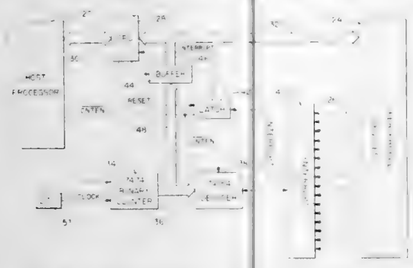
1. In a data processing system having a central processor and a plurality of data terminal devices each having a request line for signalling the central processor to request exchange of information comprising,

an interface device coupled to said central processor over a communication line;

a microprocessor located on said interface device;

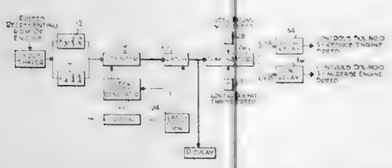
first gating means connected in series to each request line of said data terminal devices for outputting an exchange

request signal found on its associated request line when enabled;
means for generating timing pulses
binary counter means responsive to said timing pulses for generating a plurality of binary counts each representing the address of one of said remote terminal devices;
decoder means coupled to the output of said binary counter means to output a control signal in response to the generation of each of said binary counts, said decoded means coupled to each of said first gating means to output said control signal to the first gating means whose associated request line is connected to the terminal device having the address which generated the control signal for enabling



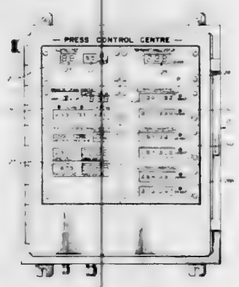
said first gating means to output an exchange request signal when there is a request signal on the request line;
storage means responsive to the outputting of said control signal to store the binary count generated by said counter means, said storing means connected to said microprocessor;
disabling means responsive to the outputting of said exchange request signal for disabling said counter means and operating said storing means to transfer the binary count stored therein to the microprocessor;
and means responsive to the transfer of the binary count to the microprocessor to initiate the transfer of information from the requesting terminal device to the microprocessor for storage therein.

4,177,516
ELECTRONIC DIGITAL GOVERNOR
Ralph I. Mason, Calgary, Canada, assignor to Shaw GMC Trucks Ltd., Calgary, Canada
Filed Jan. 16, 1978, Ser. No. 869,766
Claims priority, application Canada, Feb. 15, 1977, 271857
Int. Cl.[2] G06F *15/20*; F02D *31/00*
U.S. Cl. 364—431 **14 Claims**



1. An electronic digital governor for controlling the RPM of an engine comprising:
(a) clock generator means including a clear pulse generator and a latch pulse generator;
(b) a sensor for receiving a train of pulses whose number per unit time is proportional to the RPM of said engine;
(c) counting means connected to said sensor means for counting the number of pulses in said train of pulses, said count being carried out between consecutive clear pulses fed to said counter by said clear pulse generator;
(d) latch means connected to said counting means, for storing a count accumulated between consecutive clear pulses, said latch being controlled by latch pulses from said latch pulse generator, the time duration between consecutive clear pulses and consecutive latch pulses being the same and equal to a predetermined time period T;
(e) comparator means having a first input connected to said latch and a second input connected to a switch means which is manually controllable to enter an upper bound RPM value, wherein said comparator means compares said stored count with said upper bound RPM value and activates a relay if said stored value is greater than said upper bound RPM value; and
(f) an electromechanical device, controllable by said relay for controlling the RPM of said engine to reduce the RPM below said upper bound RPM value.

4,177,517
MONITORING DEVICE FOR POWER PRESSES
Klaus H. Mette, 2412 Cavendish Dr., Burlington, Ontario, and Andrew R. St. Denis, 3541 Rankin, Windsor, Ontario, both of Canada
Continuation-in-part of Ser. No. 703,226, Jul. 7, 1976, Pat. No. 4,057,713. This application Oct. 20, 1977, Ser. No. 844,130
Int. Cl.[2] G01C *1/00*; G01P *3/36*
U.S. Cl. 364—559 **7 Claims**



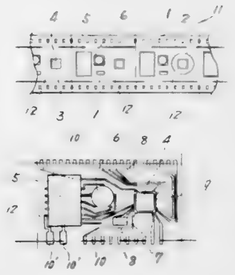
1. A monitoring device for use with a rotary drive shaft of machine tools, comprising a light emitting means and a photoelectric receiving means for producing a discrete electrical signal for each rotation of the driveshaft through a selected fractional part of one rotation of the shaft, a data process for receiving said electric signals and converting said signals to rotational positions of said shaft in degrees, a digital display adapted to indicate the output of said data processor in degrees of a circle and electronic switches adjustable in degrees indicative of the angular position of the drive shaft and being adapted to control operational functions associated with the machine tool at precise locations in each revolution of the shaft as indicated by the output of the data processor.

4,177,518
PROGRAMMABLE CALCULATOR INCLUDING SCROLLING ALPHANUMERIC DISPLAY MEANS
Emil E. Olander, Jr., Fort Collins; Rex L. James, Loveland; Ivar W. Larson, Loveland; Wayne F. Covington, Loveland; Jack M. Walden, Loveland; Robert E. Watson, Loveland; Francis J. Yockey, Loveland; Fred Wenninger, Jr., Loveland, and Homer C. Russell, Berthoud, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Division of Ser. No. 510,921, Sep. 30, 1974, Pat. No. 4,028,538, which is a division of Ser. No. 212,581, Dec. 27, 1971, Pat. No. 3,839,630. This application Jun. 1, 1977, Ser. No. 802,303
Int. Cl.[2] G06F *3/14*
U.S. Cl. 364—710 **4 Claims**



1. An electronic calculator comprising:
keyboard input means having a plurality of keys for entering one or more lines of alphameric information, including a display command, into the calculator, said keyboard input means including keys representative of every alphabetic character of a selected language, every numeric character from zero through nine, and a plurality of special characters;
memory means for storing each line of alphameric information as it is being entered into the calculator from said keyboard input means and for storing a program comprising a plurality of lines of alphameric information entered into the calculator, said memory means including a plurality of data storage registers for storing data;
processing means, coupled to said keyboard input means and memory means, for selectively processing a single line of alphameric information entered into the calculator and a program previously stored in said memory means to perform selected functions and to compute the results of selected algebraic expressions; and
display means, coupled to said processing means, for providing a visual indication of each line of alphameric information entered into the calculator and of the results of selected functions and algebraic expressions processed by said processing means, said display means being operative for visually displaying any selected one or more of the alphabetic, numeric, and special characters represented by the keys of said keyboard input means;
said processing means being responsive to a display command, including specification of one or more of said data storage registers, that is encountered during processing of a line of alphameric information stored in said memory means for causing the contents of the specified one or more data storage registers to be displayed by said display means without thereby altering the contents of those specified data storage registers.

4,177,519
ELECTRONIC CONTROL ASSEMBLY MOUNTED ON A FLEXIBLE CARRIER AND MANUFACTURE THEREOF
Takeshi Kasubuchi, Nara; Kaoru Ozawa, Yamatokoriyama, and Takeo Hara, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 709,518, Jul. 28, 1976, abandoned. This application Apr. 17, 1978, Ser. No. 897,116
Claims priority, application Japan, Jul. 28, 1975, 50-92302
Int. Cl.[2] H05K *3/30*
U.S. Cl. 364—712 **11 Claims**



1. An electronic network for interconnecting a display means, battery and key input means into an operative combination, comprising:
a flexible carrier film having physical characteristics on the order of 35 mm motion picture film; wiring patterns formed directly on the flexible carrier film;
a semiconductor chip mounted on the flexible carrier film through the use of multibonding technique;
a power supply circuit element mounted on the flexible carrier film;
connection lead means formed on both sides of the flexible carrier film;
said connection lead means on one side of flexible carrier film being for connection to a said display means external to said carrier film; and
said connection lead means on the remaining side of said flexible carrier film being for connection to at least a said key input means external to said carrier film.

4,177,520
CALCULATOR APPARATUS HAVING A SINGLE-STEP KEY FOR DISPLAYING AND EXECUTING PROGRAM STEPS AND DISPLAYING THE RESULT
Randall B. Neff, Menlo Park, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Aug. 14, 1975, Ser. No. 604,696
Int. Cl.[2] G06F *3/14*
U.S. Cl. 364—900 **9 Claims**

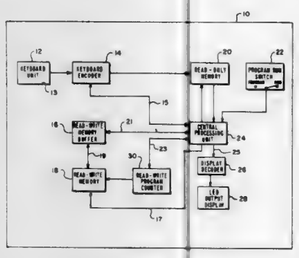
1. A programmable calculator for storing and executing a program having a plurality of program steps, said calculator comprising:

keyboard means having a keyboard unit with a plurality of keys for entering data and program steps including a single-step key for initiating single-step operations and having means for generating a signal indicative of said single-step key being depressed and for terminating the generation of said signal, the terminating being indicative of said single-step key being released from it depressed position;

storage means coupled to said keyboard means for receiving and storing entered program steps;

display means for displaying stored program steps, step numbers, and results of executions of said steps; and

processing means coupled to the keyboard means, to the



storage means, and to the display means for causing the display means to display a stored program step and step number responsive to said signal indicative of depression of the single-step key, and for executing the displayed step and for causing the display means to display the result of said execution in response to the absence of said signal indicative of release of the single-step key from its depressed position.

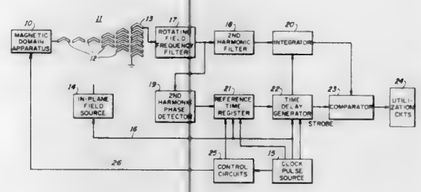
4,177,521

OUTPUT TIMING ARRANGEMENT FOR SINGLE-WALL MAGNETIC DOMAIN APPARATUS

Edwin M. Schaefer, III, North Aurora, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 27, 1978, Ser. No. 890,662
Int. Cl.² G11C *19/08*
U.S. Cl. 365—8 **7 Claims**

1. A readout timing arrangement for single-wall magnetic domain apparatus comprising magnetic media in which single-wall magnetic domains may be created and propagated, means for generating an in-plane magnetic rotating field for propagating said domains, and a domain detector array, characterized in that



a phase detection circuit is provided for detecting the second harmonic component of voltage signals generated at said detector array by said propagating field for generating phase angle signals and being further characterized in circuit means operated responsive to said phase angle signals for generating strobe signals for detecting domain-generated output signals at said detector array.

DESIGN PATENTS

GRANTED DEC. 4, 1979

ERRATA

For CLASS	See PATENT NO.
D09–071	253,561
D21–054	253,615

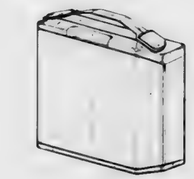
V 9 8 9 / 1 DE 4 7 9 JM

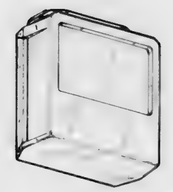
V 989 / 1 DE 4 79 UMI

DESIGNS

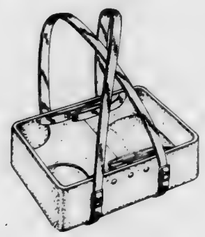
DECEMBER 4, 1979

253,556
CARRYING CASE FOR PARAMEDIC EQUIPMENT OR THE LIKE
Herbert F. D'Alo, Lakewood, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Feb. 10, 1978, Ser. No. 876,775
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—30





253,557
INFANT CARRIER
Debbie A. Thompson, 1439 Cerro Verde, San Jose, Calif. 95120
Filed Dec. 1, 1977, Ser. No. 856,607
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D3—31



253,558
INFANT CARRIER
Kathleen T. Carter, 4307 Fifth St., Riverside, Calif. 92501
Filed Dec. 27, 1977, Ser. No. 864,659
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D3—31

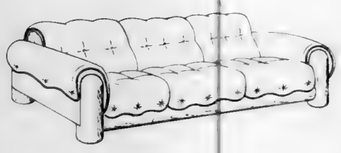




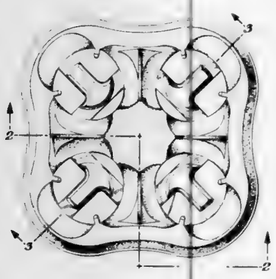
253,559
CHAIR
Morris F. Fisher, North Palm Beach, Fla., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed Oct. 11, 1977, Ser. No. 840,691
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57



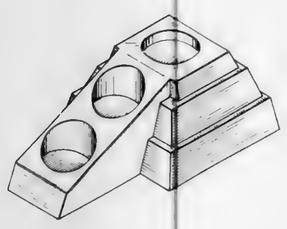
253,560
UPHOLSTERED SOFA
Lester Beall, Jr., High Point, N.C., assignor to The Bean Station Furniture Factory, Bean Station, Tenn.
Filed Nov. 29, 1977, Ser. No. 855,759
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



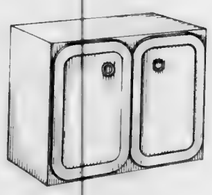
253,561
BEVERAGE TRAY
Henry R. Vigue, Waterville, Me., assignor to Keyes Fibre Company
Filed Mar. 25, 1977, Ser. No. 781,135
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—71



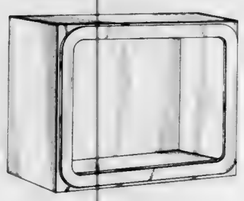
253,562
VERTICAL HEIGHT ADJUSTING STAND FOR A BED
Peter K. Evans, 420 LeJeune Rd., N., Miami, Fla. 33126
Filed Jun. 6, 1977, Ser. No. 804,109
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—85



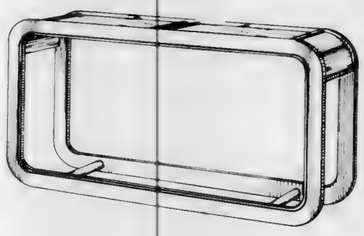
253,563
CABINET
Nicholas A. Ungaro, Louisville, Ky., assignor to Peters-Revington Corporation, Amsterdam, N.Y.
Filed Aug. 8, 1977, Ser. No. 822,484
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—127



253,564
CABINET
Nicholas A. Ungaro, Louisville, Ky., assignor to Peters-Revington Corporation, Amsterdam, N.Y.
Filed Aug. 10, 1977, Ser. No. 823,294
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—130



253,565
TABLE
Nicholas A. Ungaro, Louisville, Ky., assignor to Peters-Revington Corporation, Amsterdam, N.Y.
Filed Aug. 10, 1977, Ser. No. 823,291
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175



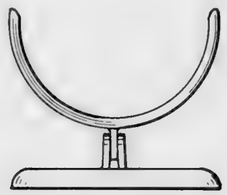
253,566
SPEAKER STAND
Larry K. Davis, 1701 S. Florence, Tulsa, Okla. 74104
Filed Oct. 28, 1977, Ser. No. 846,391
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—184



253,567
CABINET
Nicholas A. Ungaro, Louisville, Ky., assignor to Peters-Revington Corporation, Amsterdam, N.Y.
Filed Aug. 11, 1977, Ser. No. 823,814
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—189



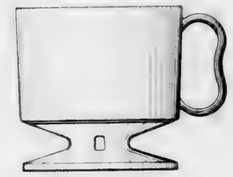
253,568
ARM REST
Anne M. Brink, 12561 Shelley Dr., Apt. 5, Garden Grove, Calif. 92640
Filed Oct. 4, 1977, Ser. No. 839,275
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



253,569
PUNCH BOWL OR THE LIKE
Alvin Gruber, 2215 Disston St., Philadelphia, Pa. 19149
Filed Aug. 24, 1977, Ser. No. 827,140
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—4



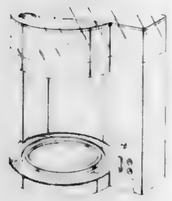
253,570
DRINKING CUP
James F. Pomroy, St. Paul, Minn., assignor to Plastics, Inc., St. Paul, Minn.
Filed Oct. 13, 1977, Ser. No. 841,690
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—9



253,571
DRINKING GLASS OR SIMILAR ARTICLE
Mark R. Schreibman, and James V. Park, both of 4325 Comanche Dr., #1, Boulder, Colo. 80303
Filed Nov. 7, 1977, Ser. No. 849,228
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—13



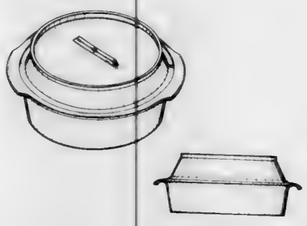
253,572
COFFEEMAKER
Joseph A. Rinaldi, Oradell, N.J., assignor to Rival Manufacturing Company, Kansas City, Mo.
Filed Jun. 24, 1977, Ser. No. 809,639
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—41



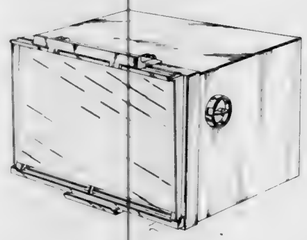
253,573
COMBINED LADLE AND COVERED GRAVY BOAT
William R. Edwards, Box 40, Rte. 2, California, Md. 20619
Filed Mar. 30, 1977, Ser. No. 782,838
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—65



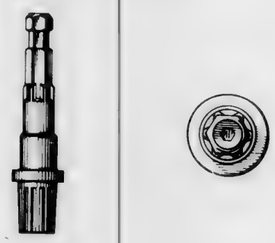
253,574
CASSEROLE WITH COVER SEPARATELY USABLE AS PIE PLATE OR THE LIKE
William M. Anderson, Jr., Lynnwood, Wash., assignor to AMG Industries, Inc., Seattle, Wash.
Filed Aug. 5, 1977, Ser. No. 821,982
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—97



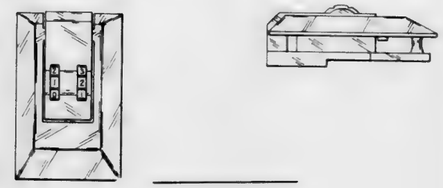
253,575
COOKING AND DEHYDRATING DEVICE
Robert J. Scott, Blue Springs, and Bill G. Mead, Raytown, both of Mo., assignors to Rival Manufacturing Company, Kansas City, Mo.
Filed Jun. 16, 1977, Ser. No. 807,043
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128



253,576
SHAFT COUPLING FOR GARDEN IMPLEMENTS AND THE LIKE
Dieter Raffler, and Franco Clivio, both of Ulm, Fed. Rep. of Germany, assignors to Gardena Kress & Kastner GmbH, Fed. Rep. of Germany
Filed Jun. 28, 1977, Ser. No. 810,826
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1977, MR771
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—1



253,577
LUGGAGE ZIPPER LOCK
Wallace E. Atkinson, Petersburg, Va., assignor to United States Luggage Corp.
Filed May 3, 1978, Ser. No. 902,770
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—338



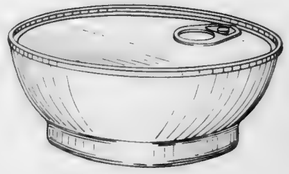
253,578
SPRING CLIP
Stephen E. D. Fournier, 74 Tremont St., Hartford, Conn. 06105
Filed Aug. 24, 1977, Ser. No. 827,388
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—395



253,579
COMBINED BOTTLE AND CAP
Irene Sinclair, London, England, assignor to Lever Brothers Company, New York, N.Y.
Filed Jul. 5, 1977, Ser. No. 813,110
Claims priority, application United Kingdom, Jan. 5, 1977, 978442/77
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—128



253,580
PACKAGING CONTAINER OR THE LIKE
Carmen T. Mascia, Clarendon Hills, Ill., assignor to The Continental Group, Inc., New York, N.Y.
Filed Aug. 15, 1977, Ser. No. 824,367
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—220



253,581
FOUR WAY CORNER LEVEL
Robert H. Vanderwerf, San Rafael, Calif., assignor to Vy-Dawn, Inc., San Rafael, Calif.
Filed Jun. 30, 1977, Ser. No. 811,538
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—69

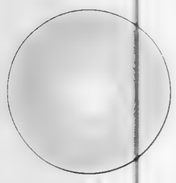


253,582
STUD MARKING GUIDE
Thomas M. Schwartz, 4 Garden St., Newburyport, Mass. 01950
Filed Mar. 22, 1977, Ser. No. 780,030
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—70

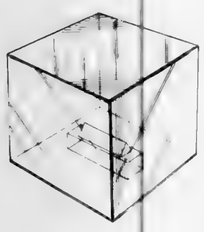


253,583
CHARM, MEDALLION OR SIMILAR ARTICLE
Charles E. Millican, 11742 Aldine Westfield, Houston, Tex. 77093
Filed Oct. 3, 1977, Ser. No. 838,940
Term of patent 3½ years
Int. Cl. D11—*01*
U.S. Cl. D11—101





253,584
DESK ORNAMENT
David E. Dorsen, 1506 Oakdale, Chicago, Ill. 60657
Filed Jul. 5, 1977, Ser. No. 813,106
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—131



253,585
PLAQUE
John V. Rawson, Jr., South Plainfield, N.J., assignor to The Brass Ones, Inc., Rocky Hill, N.J.
Filed Feb. 13, 1978, Ser. No. 877,425
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—140

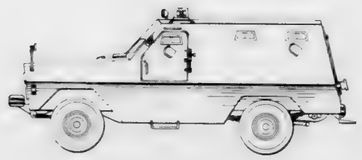




253,586
CONTAINER FOR GROWING EDIBLE SPROUTS FROM SEEDS
Machmud D. Rowe; Robert H. Hetherington, and Susan L. Johnson, all of Seattle, Wash., assignors to Bima Industries, Inc., Seattle, Wash.
Filed Apr. 14, 1978, Ser. No. 896,780
Term of patent 14 years
Int. Cl. D11—*02*; D9—*03*
U.S. Cl. D11—152



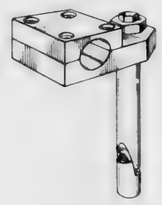
253,587
COMMANDO ARMORED TRANSPORTER
James M. Bemiss, St. Clair Shores, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.
Filed Apr. 27, 1978, Ser. No. 900,463
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—12



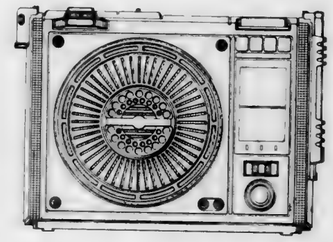
253,588
MOTORCYCLE
Koichiro Ban, Tachikawa; Tsunemi Kawashima, Tokyo, and Kunihiko Kobayashi, Tanashi, all of Japan, assignors to Yamaha Hatsukoki Kabushiki Kaisha, Shizuoka, Japan
Filed Mar. 2, 1978, Ser. No. 883,040
Claims priority, application Japan, Sep. 3, 1977, 52-35129
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—110



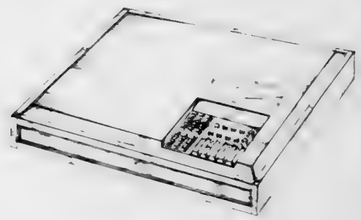
253,589
BICYCLE HANDLEBAR CLAMP
Gary R. Horton, 879 Tierra Alta, Moss Beach, Calif. 94018
Filed Sep. 16, 1977, Ser. No. 834,144
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—118



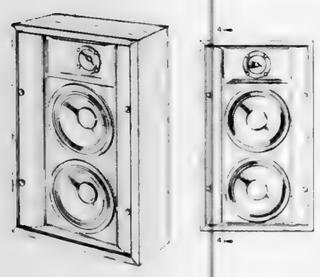
253,590
COMBINED CARTRIDGE PLAYER AND RADIO
Paul J. Klucznik, Manlius, N.Y., assignor to General Electric Company
Filed Jul. 7, 1977, Ser. No. 813,610
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—5



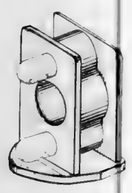
253,591
MICROPROCESSOR-CONTROLLED RADIAL TRACKING RECORD PLAYER
Robert G. Cheeseboro, 3650 Somerset Dr., Los Angeles, Calif. 90016
Filed Mar. 16, 1977, Ser. No. 778,056
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—14



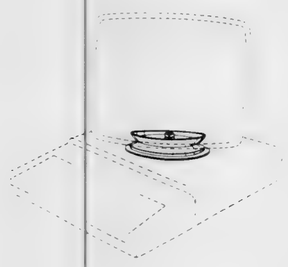
253,592
LOUDSPEAKER
Hideo Takei, Flushing, N.Y., assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 5, 1977, Ser. No. 813,129
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—34



253,593
LAMP CARTRIDGE FOR OPTICAL CHARACTER RECOGNITION READER
William R. Smith, Mountain View, and Anthony Sun, Los Altos, both of Calif., assignors to Caere Corporation, Mountain View, Calif.
Filed May 27, 1977, Ser. No. 801,293
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40



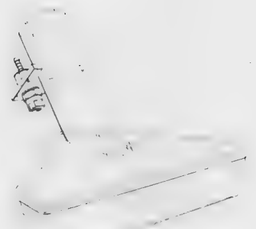
253,594
COMBINED TURN AND TILT BASE
Alan F. Antenbring, Broxbourne, England, assignor to International Standard Electric Corporation
Filed Jun. 13, 1977, Ser. No. 806,254
Term of patent 14 years
Int. Cl. D14—*02*; D6—*06*
U.S. Cl. D14—40



253,595
COMBINED RADIO AND PEN
Hoi T. Vong, 179/180 Connaught Rd. West, Cheung Ka Industrial Bldg., 19th Floor., Block A, West Point, Hong Kong, Hong Kong
Filed Jun. 15, 1977, Ser. No. 806,934
Claims priority, application United Kingdom, Dec. 20, 1976, 978328
Term of patent 14 years
Int. Cl. D14—*03*; D19—*06*
U.S. Cl. D14—69



253,596
SUCTION TOOL FOR A LIQUID DISPENSING VACUUM CLEANER
Jelle G. Nauta, R.R. #4, Stouffville, Ontario, Canada
Filed Oct. 5, 1977, Ser. No. 839,759
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—63

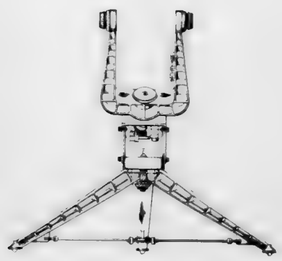


253,597
TEMPLE FOR SPECTACLES
Charles I. Solomon, Box 12495, San Antonio, Tex. 78215
Filed Aug. 22, 1977, Ser. No. 826,358
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—81



253,598
TELESCOPE MOUNT
Peter W. Bressler, Philadelphia, Pa., assignor to Edmund Scientific Company, Barrington, N.J.
Filed Sep. 2, 1977, Ser. No. 830,364
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—60



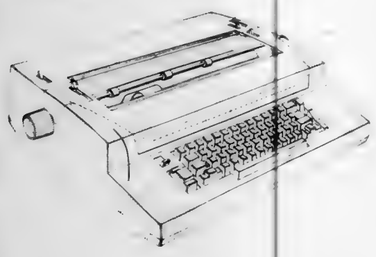


253,599
PAIR OF TEMPLE BARS FOR EYEGLASSES
John P. Bell, Jr., 110 Fairlane Dr., Rochester, N.Y. 14626
Filed May 23, 1978, Ser. No. 908,901
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—81



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253,600
TYPEWRITER
Allan L. McCroskery, Weston, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 2, 1977, Ser. No. 773,726
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—1



253,601
FINGER-PROTECTIVE CUTTING GUIDE
William J. Weber, Dix Hills; Jeffrey Herbst, Plainview, and Thomas Cullen, Levittown, all of N.Y., assignors to Weber & Stevens, Inc., Melville, N.Y.
Filed Oct. 17, 1977, Ser. No. 843,123
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—37



253,602
TOY GLIDER
Dewayne L. Evans, 3161 Belleview Rd., Toledo, Ohio 43606
Filed May 18, 1977, Ser. No. 798,230
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—89



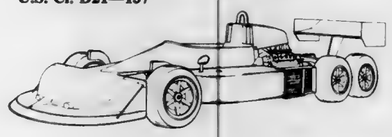
253,603
TOY PARACHUTE FRAME
Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.
Filed May 31, 1977, Ser. No. 801,630
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—91



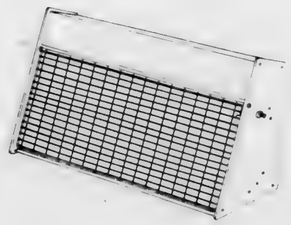
253,604
TOY PARACHUTE FRAME
Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.
Filed May 31, 1977, Ser. No. 802,285
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—91



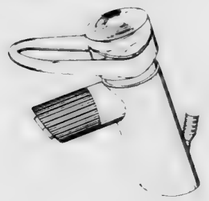
253,605
MODEL RACING CAR
Robert J. Herd, Milton Malsor, England, assignor to March Engineering Limited, Bicester, England
Filed Jun. 2, 1977, Ser. No. 802,829
Claims priority, application United Kingdom, Dec. 2, 1976, 978124/76
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—137



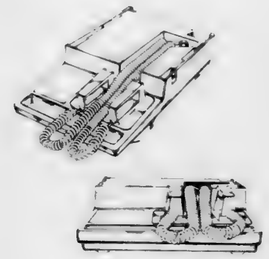
253,606
ELECTRIC INSECT EXTERMINATOR
Mordechai Yavnieli, Tel-Aviv, Israel, assignor to Amcor Ltd., Tel-Aviv, Israel
Filed Aug. 22, 1977, Ser. No. 826,776
Claims priority, application Israel, Mar. 1, 1977, 6680
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—19



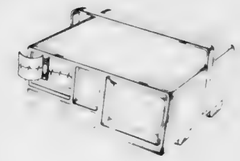
253,607
WATER FAUCET
Andreas Haug, Altensteig, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany
Filed Sep. 8, 1978, Ser. No. 941,331
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1978, MR 934 OB
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—23



253,608
PORTABLE DEFIBRILLATOR OR THE LIKE
David B. Smith, Mercer Island; Paul W. Jones, Bothell; John M. Moore, Redmond, and William C. Bruton, Seattle, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.
Filed Sep. 11, 1978, Ser. No. 942,748
Term of patent 14 years
Int. Cl. D24—*01, 02*
U.S. Cl. D24—8

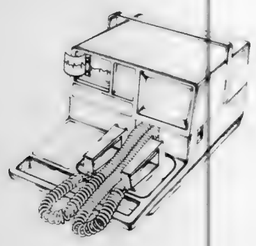


253,609
PORTABLE EKG MONITOR/EKG RECORDER OR THE LIKE
David B. Smith, Mercer Island; Paul W. Jones, Bothell, and James A. Benson, Bellevue, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.
Filed Sep. 11, 1978, Ser. No. 942,749
Term of patent 14 years
Int. Cl. D24—*01, 02*
U.S. Cl. D24—17





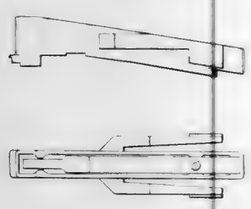
253,610
PORTABLE DEFIBRILLATOR/EKG MONITOR/EKG RECORDER OR THE LIKE
David B. Smith, Mercer Island; Paul W. Jones, Bothell; James A. Benson, Bellevue; John M. Moore, Redmond, and William C. Bruton, Seattle, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.
Filed Sep. 11, 1978, Ser. No. 942,750
Term of patent 14 years
Int. Cl. D24—*01, 02*
U.S. Cl. D24—17



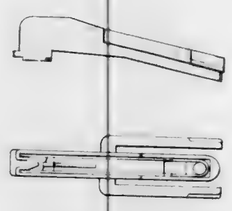
253,611
SURGICAL CLIP APPLIER
Robert K. Jarvik, Salt Lake City, Utah, and Stephen J. Jewusiak, Denville, N.J., assignors to Ethicon, Inc., Somerville, N.J.
Filed Oct. 31, 1977, Ser. No. 847,384
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26



253,612
SURGICAL CLIP CARTRIDGE
Robert K. Jarvik, Salt Lake City, Utah, and Robert W. Mericle, Bridgewater, N.J., assignors to Ethicon, Inc., Somerville, N.J.
Filed Oct. 31, 1977, Ser. No. 847,387
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—27



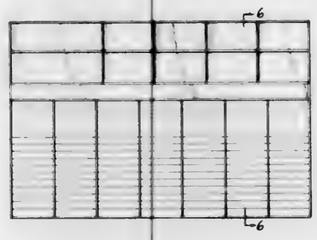
253,613
SURGICAL CLIP CARTRIDGE
Robert K. Jarvik, Salt Lake City, Utah, and Robert W. Mericle, Bridgewater, N.J., assignors to Ethicon, Inc., Somerville, N.J.
Filed Oct. 31, 1977, Ser. No. 847,388
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—27



253,614
DOOR EDGE DRAFT SHIELD
Bernard Corbin, P.O. Box 29663, Atlanta, Ga. 30359
Filed Jun. 13, 1977, Ser. No. 805,805
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



253,615
PLAYING CARD HOLDER
Walter R. Colwell, 2725 Via Arboleda, San Clemente, Calif. 92672
Filed Jun. 20, 1977, Ser. No. 807,980
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—54



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF DECEMBER, 1979

NOTE —Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-T-O Inc.: *See—*
Vorkapich, Theodore, 4,176,718, Cl. 169-39.000.
AB Bofors: *See—*
Albrektsson, Kjell A.; Eriksson, Bertil T.; Eriksson, Sven W.; Franzen, Hans A. E.; and Sandlin, Rolf H., 4,176,814, Cl. 244-3.150.
AB Volvo: *See—*
Otteblad, Sven I. A.; Brynielsson, Erner T. O.; Dovertie, Ralph G.; Franzen, Stig E. R.; and Brelen, Hans E. O., 4,176,728, Cl. 180-168.000.
Abbott, Sheldon J. Dental drill. 4,176,453, Cl. 433-82.000.
Ackley, Daniel: *See—*
Siu, Ting Y.; and Ackley, Daniel, 4,177,151, Cl. 252-8.600.
Acro Matic Inc.: *See—*
Terpening, George I., 4,176,665, Cl. 128-165.000.
Acurex Corporation: *See—*
Kennedy, William S., 4,177,083, Cl. 136-89.0CA.
Adams, Alphonso, to Adams, Helen H., a part interest. Template for supporting a door frame. 4,176,831, Cl. 269-17.000.
Adams, Clyde M., Jr. Method and apparatus for separation, refinement, extraction and/or concentration by liquation. 4,177,051, Cl. 62-532.000.
Adams, Helen H.: *See—*
Adams, Alphonso, 4,176,831, Cl. 269-17.000.
Adams, Richard L., to General Motors Corporation. Precoagulated PTFE-bound electrodes. 4,177,157, Cl. 252-182.100.
Adjemian, Alain: *See—*
Cohen, Joseph; and Adjemian, Alain, 4,177,242, Cl. 423-83.000.
Adult Care Products, Inc.: *See—*
Herring, Julian N., 4,176,667, Cl. 128-287.000.
Advent Corporation: *See—*
Hergenrother, George R.; and Sprague, Peter J., 4,177,400, Cl. 313-477.00R.
Ag Best Corporation: *See—*
Gilst, Carl V., 4,176,869, Cl. 292-304.000.
Agar International Ltd.: *See—*
Boje, Daniel Q., 4,177,484, Cl. 358-254.000.
Agence Nationale de Valorisation de la Recherche (A.N.V.A.R.): *See—*
Deficis, Alain; Gimonet, Marie-Edith; Priou, Alain; and Fournet-Fayas, Christian, 4,177,422, Cl. 324-95.000.
Agfa-Gevaert AG: *See—*
Weiss, Rudolf; Kiessling, Werner; and Wiedemann, Otto, 4,176,938, Cl. 354-275.000.
Agfa-Gevaert Aktiengesellschaft: *See—*
Eickel, Rolf; and Rheude, Alfred, 4,177,380, Cl. 250-315.200.
Knor, Bernhard; Payrhammer, Bernd; and Treiber, Helmut, 4,176,964, Cl. 356-444.000.
Lermann, Peter; and Fauth, Gunter, 4,176,934, Cl. 354-150.000.
Leuchter, Jurgen, 4,176,939, Cl. 354-307.000.
Payrhammer, Bernd, 4,176,944, Cl. 355-18.000.
Wagensonner, Eduard, 4,176,927, Cl. 354-21.000.
Agfa-Gevaert, N.V.: *See—*
De Brabandere, Luc A.; Borginon, Hendrik A.; Pattyn, Herman A.; and Pollet, Robert J., 4,177,071, Cl. 430-494.000.
Ahlen, Karl G.; Bergstrom, Per-Olof; and Supanich, Joseph, to S.R.M. Hydromekanik Aktiebolg. Control arrangement for variable power transmission. 4,176,564, Cl. 74-732.000.
Ahlschlager, Christ L.; Ahlschlager, Marvin L.; and Ahlschlager, Donald A. Firewood splitting device. 4,176,698, Cl. 144-193.00R.
Ahlschlager, Donald A.: *See—*
Ahlschlager, Christ L.; Ahlschlager, Marvin L.; and Ahlschlager, Donald A., 4,176,698, Cl. 144-193.00R.
Ahlschlager, Marvin L.: *See—*
Ahlschlager, Christ L.; Ahlschlager, Marvin L.; and Ahlschlager, Donald A., 4,176,698, Cl. 144-193.00R.
Aho, Leo E., to Sarvis Oy. Stackable crates. 4,176,747, Cl. 206-509.000.
Airco, Inc.: *See—*
Wittenrich, John H., 4,176,998, Cl. 414-433.000.
Aisin Seiki Kabushiki Kaisha: *See—*
Yamanaka, Minoru; and Ii, Akira, 4,177,224, Cl. 261-39.00A.
AIT Industries, Inc.: *See—*
Vulich, Yordan; and Loreto, Wilfredo P., 4,176,498, Cl. 51-101.0LG.
Aizawa, Hiroshi: *See—*
Kozuki, Susumu; Uchidoi, Masanori; Date, Nobuaki; Shimizu, Masami; Aizawa, Hiroshi; and Takishima, Yoshiyuki, 4,176,936, Cl. 354-38.000.
Ajax Hardware Corporation: *See—*
Gorton, Howard B., 4,176,890, Cl. 312-343.000.
Akai, Norio; Inoue, Nobumasa; and Ohtani, Kazuo. Device for preventing slipping of turntable out of shaft. 4,176,847, Cl. 274-39.00R.
Akkerboom, Piet J.; Lower, Geertruiida J.; and Timp, Willem J., to Gist-Brocades N.V. Process for the preparation of hydroxyphosphinylureidobenzylpenicillins. 4,177,189, Cl. 260-239.100.
Aktiebolaget Leo: *See—*
Fex, Hans, Hansen, Bertil; Holmberg, Krister; Hogberg, Bertil; and Konyves, Imre, 4,177,269, Cl. 424-243.000.
Akzona Inc.: *See—*
Franks, Neal E., 4,177,236, Cl. 264-187.000.
Rasen, Alfred; Vollbrecht, Rolf; and Schenesse, Klemens, 4,177,312, Cl. 428-284.000.
Smakman, Robert, 4,177,140, Cl. 210-37.00R.
van der Burg, Willem J., 4,177,275, Cl. 424-256.000.
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Albanese, Vincent M., to Nalco Chemical Company. Chemical treatment for improving electrostatic precipitation of dust particles in electrostatic precipitators. 4,177,043, Cl. 55-5.000.
Albrecht, Wolfgang: *See—*
Selden, Peter H.; Duerkop, Joachim; Albrecht, Wolfgang; and Weissenmayer, Heinz, 4,177,032, Cl. 425-468.000.
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Alfa Romeo S.p.A.: *See—*
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Alfranseder, Josef: *See—*
Rebsdat, Siegfried; Mayer, Sigmund; Alfranseder, Josef; and Riedl, Josef, 4,177,169, Cl. 252-476.000.
Alkema, Jan, to Koninklijke Adriaan Volker Baggermaatschappij B.V. Hopper vessel with discharge valve members adapted to selectively function as part of a discharge conduit. 4,176,885, Cl. 406-128.000.
All Phase Electronics, Inc.: *See—*
Brown, David A.; Norman, Jan L.; and Whitson, Donald W., 4,177,461, Cl. 340-628.000.
Allard, John J.; and Montz, James R., to AMF Incorporated. Automatic temperature controller with night setback and operating as a function of outside air. 4,176,785, Cl. 236-46.00R.
Allen D. Everitt Knitting Company: *See—*
Everitt, Allen D., 4,176,409, Cl. 2-173.000.
Allen, Dillis V. Electric transportation system. 4,176,609, Cl. 104-88.000.
Allen, Paul E., to Logic Devices, Inc. Fluid cooling of injection molded plastic articles. 4,177,238, Cl. 264-328.000.
Allenbaugh, George G., Jr., to Premier Industrial Corporation. Liquid particle deflector structure for discharge nozzles. 4,176,794, Cl. 239-498.000.
Allert, Anton; Weiss, Friedrich; and Schrape, Peter, to Daimler-Benz Aktiengesellschaft. Anti-skid protective cap especially of rubber, for actuating pedals of a motor vehicle. 4,176,562, Cl. 74-563.000.
Allied Chemical Corporation: *See—*
Seven, Manfred K.; and Olearczyk, Francis J., deceased (said Manfred K. Seven assors. to), 4,177,336, Cl. 525-325.000.
Alpers, Gunther; and Bentz, Helmut, to O&K Orenstein & Koppel Aktiengesellschaft. Endless track traveling mechanism. 4,176,887, Cl. 305-57.000.
Alsthom-Atlantique: *See—*
Danel, Francois, 4,177,226, Cl. 261-124.000.
Senes, Albert, 4,177,478, Cl. 357-38.000.
Altec Corporation: *See—*
Sinclair, Rex, 4,176,731, Cl. 181-192.000.
Aluminum Pechiney: *See—*
Cohen, Joseph; and Adjemian, Alain, 4,177,242, Cl. 423-83.000.
ALZA Corporation: *See—*
Michaels, Alan S.; and Guillod, Mark S., 4,177,256, Cl. 424-22.000.
Amana Refrigeration, Inc.: *See—*
Fritts, Rex E., 4,177,369, Cl. 219-10.55B.
Ambros, Otto: *See—*
Schoenafinger, Eduard; Deigner, Paul; Koester, Eberhard; Ohlinger, Manfred; Schaefer, Dieter; Stumpfl, Werner; Amort, Juergen; Seiler, Claus-Dietrich; Nestler, Heinz; and Ambros, Otto, 4,177,317, Cl. 428-405.000.
Ambrosini, Leonard R.; Juliano, Joseph O.; and Rarick, Charles H., to United States of America, Army. Electrically energized impact detonated projectile with safety device. 4,176,608, Cl. 102-216.000.
Amchem Products, Inc.: *See—*
Hall, Wilbur S., 4,177,180, Cl. 260-29.70H.

Amerace Corporation: *See—*
Obuch, Edward A., 4,176,904, Cl. 339-192.00R.

American Cyanamid Company: *See—*
Conrow, Ransom B.; and Bernstein, Seymour, 4,177,209, Cl. 260-506.000.

AMF Incorporated: *See—*
Allard, John J.; and Montz, James R., 4,176,785, Cl. 236-46.00R.
Fiore, Joseph V.; and Slanski, John M., 4,176,668, Cl. 131-17.00A.
Seiling, Samuel O., 4,177,030, Cl. 425-238.000.
Tirone, Stephen A.; and Arthur, Ronald H., 4,177,367, Cl. 200-159.00A.

Amick, David R., to Rohm and Haas Company. Sulfone-crosslinked polystyrene ion exchange resin and process of manufacture. 4,177,331, Cl. 521-33.000.

Amort, Juergen: *See—*
Schoenafinger, Eduard; Deigner, Paul; Koester, Eberhard; Ohlinger, Manfred; Schaefer, Dieter; Stumpfl, Werner; Amort, Juergen; Seiler, Claus-Dietrich; Nestler, Heinz; and Ambros, Otto, 4,177,317, Cl. 428-405.000.

AMP Incorporated: *See—*
Lill, John F., 4,177,397, Cl. 310-71.000.

Ampex Corporation: *See—*
Borzak, Robert A., 4,176,744, Cl. 206-303.000.

Amstad, John H., to Atlas Pacific Engineering Company. Live knife assembly. 4,176,594, Cl. 99-593.000.

Amtel, Inc.: *See—*
Reid, William R.; and Vitale, John, 4,176,615, Cl. 114-230.000.

Andermo, Ingvar, to Stiftelsen Institutet for Mikrovagsteknik vid Tekniska Hogskolan I Stockholm. Method and device for measuring the velocity of an object relative to a reference. 4,177,463, Cl. 343-8.000.

Anderson, Aelita, administrator: *See—*
Anderson, Harald, deceased; Anderson, Aelita, administrator; and Cozine, Michael S., administrator, 4,177,037, Cl. 8-149.000.

Anderson, Clay H.; and St. Jean, Gerard, to C. H. Anderson and Associates Ltd. Winch drum mounted directly on a worm gear drive unit. 4,176,827, Cl. 254-186.00R.

Anderson, Harald, deceased; Anderson, Aelita, administrator; and Cozine, Michael S., administrator. Method for multicolor dyeing of textile yarns. 4,177,037, Cl. 8-149.000.

Anderson, Harvey G.; and Pannaci, Karl E. Selvage strip lifting device. 4,176,430, Cl. 26-96.000.

Anderson, Rodney L., to Creative Tool Specialties, Inc. Universal panograph pattern. 4,176,585, Cl. 409-125.000.

Ando, Wataru; and Watanabe, Kazuo, to K. K. Pollution Preventing Research Laboratory. Method of producing N-formylamine. 4,177,121, Cl. 204-158.00R.

Andros Incorporated: *See—*
McClatchie, Edward A.; Watson, Dean A.; and Burough, Irvin G., 4,177,381, Cl. 250-343.000.

Angstrohm Precision, Inc.: *See—*
Solow, Benjamin, 4,176,445, Cl. 29-620.000.

Anquetin, Jacques L. V. Device for locating and retrieving metallic parts from difficult to reach areas. 4,177,503, Cl. 362-236.000.

Ansul Company, The: *See—*
Rasheed, Khalid; and Warkentin, James D., 4,177,270, Cl. 424-248.510.

Antenore, Ronald L.: *See—*
Capra, Nicholas G.; and Antenore, Ronald L., 4,176,764, Cl. 222-135.000.

Antipenko, Grigory I.: *See—*
Krupman, Leonid I.; Yaroslavtsev, Jury G.; Sochnev, Alexandr E.; Shamil, Jury P.; Khitrik, Abram I.; Antipenko, Grigory I.; Smetanin, Jury G.; Samsonov, Albert N.; Ljudkovsky, Vadim M.; Pokrass, Leonid M.; Kurdjukov, Anatoly A.; Ofengenden, Abram M.; and Zhitnik, Georgy G., 4,177,070, Cl. 75-257.000.

Antonucci, Ermen S.; Cadden, Duane L.; Regenbrecht, Albert; and Schwartz, Edward, to GTE Sylvania Incorporated. Salvage method for cathode ray tubes. 4,176,891, Cl. 316-2.000.

Antos, George J., to UOP Inc. Dehydrogenation process utilizing multimetallic catalytic composite. 4,177,218, Cl. 585-379.000.

Apparatebau Gauting GmbH: *See—*
Borberg, Hartmut, 4,176,672, Cl. 137-99.000.

Appell, Marc; Lepicard, Georges; de Rivet, Philippe-Hubert; Bradley, John J.; and Franklin, Benjamin S., to Compagnie Internationale pour l'Informatique, CII Honeywell Bull. Protection of data in an information multiprocessing system by implementing a concept of rings to represent the different levels of privileges among processes. 4,177,510, Cl. 364-200.000.

Arcamonte, Lucy M. Footwear constructed from a single piece of material. 4,176,475, Cl. 36-9.00R.

Arceneaux, Leonce, to DTL, Incorporated. Diamond drill bit. 4,176,723, Cl. 175-329.000.

Archer, Jean F., to Stas Societe Technique d'Accessoires Specialises. Lifting rings for chain slings. 4,176,874, Cl. 294-78.00A.

Archibald, John L.; and Jackson, John L., to John Wyeth & Brother Ltd. 1-[(3-Indolyl)-alkyl]-piperidyl ureas and hypotensive compositions. 4,177,279, Cl. 424-267.000.

Arhart, Richard J.; and Nersasian, Arthur, to Du Pont de Nemours, E. I., and Company. Press-curable fluoropolymer compositions and process. 4,177,223, Cl. 525-331.000.

Armco Steel Corporation: *See—*
Felton, Dale D.; and Jones, William R., 4,176,865, Cl. 285-373.000.

Armstrong, Rolfe D.; and Gillow, George B., to NCR Corporation. Electrically configurable high-low decoder. 4,177,455, Cl. 340-347.0DD.

Arndt, Friedrich; Kruger, Hans-Rudolf; and Rusch, Reinhart, to Schering Aktiengesellschaft. 1,2,3-Thiadiazole-5-carboxylic acid derivatives, herbicidal and growth regulating compositions containing the same and process for making same. 4,177,054, Cl. 71-90.000.

Arnold Engineering Company, The: *See—*
Bankson, Billye, 4,177,089, Cl. 148-31.550.

Artamonov, Viktor L.: *See—*
Paton, Boris E.; Medovar, Boris I.; Tsukanov, Georgy E.; Bogachenko, Alexei G.; Artamonov, Viktor L.; Timashov, Grigory A.; Shtanko, Jury P.; Marchenko, Alexandr M.; Fedorovsky, Boris B.; Kumysh, Ilya I.; Chepurnoi, Anatoly D.; Saenko, Vladimir Y.; and Semin-Vadov, Gennady M., 4,177,058, Cl. 75-10.00C.

Arthur, Ronald H.: *See—*
Tirone, Stephen A.; and Arthur, Ronald H., 4,177,367, Cl. 200-159.00A.

Arundale, Inc.: *See—*
Corkery, Gregory O., 4,176,816, Cl. 248-188.900.

Arvey Corporation: *See—*
Kooi, Edward, 4,176,746, Cl. 206-438.000.

Asahi-Dow Limited: *See—*
Tsurumi, Michio; Sakakiyama, Takashi; Tazaki, Kichiya; and Koyama, Masaoki, 4,177,181, Cl. 260-29.70H.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Inoue, Akio; Kobayashi, Tadahiro; and Iwasa, Toshio, 4,177,150, Cl. 210-500.00M.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Nakamura, Kazuo; and Jyojiki, Masao, 4,176,928, Cl. 354-25.000.

Asari, Susumu: *See—*
Kozuka, Kazuhiro; Yamamoto, Shin; Huruhashi, Mikio; Iwaki, Katsutaro; and Asari, Susumu, 4,177,366, Cl. 200-19.0DR.

Ascoli, Enzo, to Gillette Company, The. Battery chargers. 4,177,413, Cl. 320-2.000.

ASEA Aktiebolag: *See—*
Stenkvist, Sven-Einar; and Widell, Bjorn, 4,177,061, Cl. 75-11.000.

Ashby, Bruce A.: *See—*
Razzano, John S.; Petersen, Louis P.; and Ashby, Bruce A., 4,177,200, Cl. 260-448.20N.

Associated Engineering Limited: *See—*
Noddings, John; and Cox, Michael D., 4,177,492, Cl. 361-31.000.

Astra Lakemedel Aktiebolag: *See—*
Lindberg, Ulf H. A.; Ross, Svante B.; Thorberg, Seth O.; and Ogren, Sven O., 4,177,291, Cl. 424-330.000.

Atlantic Richfield Company: *See—*
Wilson, William N., 4,176,720, Cl. 166-293.000.

Atlas Pacific Engineering Company: *See—*
Amstad, John H., 4,176,594, Cl. 99-593.000.

ATO Chemie: *See—*
Boy, Aristide; Galy, Henri; Ivaldi, Raoul; and Passedroit, Hubert, 4,177,208, Cl. 260-504.00S.

Aubard, Gilbert G.: *See—*
Torossian, Dieran R.; Aubard, Gilbert G.; and Legeai, Jacky M., 4,177,268, Cl. 424-243.000.

Aude, Thomas C., to Bechtel International Corporation. Self cleaning manifold connection for slurry pump. 4,177,016, Cl. 417-53.000.

August, Peter: *See—*
Kreis, Gerhard; August, Peter; and Wick, Manfred, 4,177,341, Cl. 528-15.000.

Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., to BASF Wyandotte Corporation. Process for preparing a polyurethane foam from an oxyalkylated product. 4,177,335, Cl. 521-171.000.

Automated Donut Systems, Inc.: *See—*
Kochan, Kenneth, 4,176,590, Cl. 99-405.000.

Avco Corporation: *See—*
McClure, John W.; and Hudson, George S., 4,176,547, Cl. 73-136.00R.

Avon Industrial Polymers (Melksham) Limited: *See—*
Down, Clive L. C., 4,176,729, Cl. 180-127.000.

Awao, Takao: *See—*
Kobayashi, Mituki; Awao, Takao; Mizusaki, Yujiro; Sato, Kunio; Kato, Akio; and Mitushi, Hisao, 4,177,069, Cl. 75-213.000.

Ayerst McKenna & Harrison Ltd.: *See—*
Philipp, Adolf H.; and Jirkovsky, Ivo L., 4,177,284, Cl. 424-275.000.

Aziz, Edward D. Sit-up exercising device. 4,176,835, Cl. 272-93.000.

B. V. Etikettenfabriek Gebroeders Mogendorff: *See—*
l'Hoir, Paul A. L., 4,176,479, Cl. 40-2.00R.

Backus Devices, Incorporated: *See—*
Backus, Harold A., 4,176,651, Cl. 123-27.0GE.

Backus, Harold A., to Backus Devices, Incorporated. Engine combustion system. 4,176,651, Cl. 123-27.0GE.

Baika, Toyokazu: *See—*
Nakamura, Norihiko; Toyama, Noboru; and Baika, Toyokazu, 4,176,635, Cl. 123-119.00A.

Bailey, Daniel R. Mobile visual signalling device. 4,176,483, Cl. 40-467.000.

Bain-Smith, Timothy: *See—*
Spence-Bate, Harry A. H.; and Bain-Smith, Timothy, 4,176,947, Cl. 355-53.000.

Baird, Thomas E. Suds-making and applying kit for converting upright vacuum sweepers to rug shampooers. 4,176,421, Cl. 15-320.000.

Bake, Earl A.: *See—*
Clapper, Robert L.; Schoneweis, E. Frederick; Hankosky, Andrew; and Bake, Earl A., 4,176,981, Cl. 403-31.000.

Baker International Corporation: *See—*
Bigelow, Eugene H.; and Goldsmith, Burton J., 4,176,715, Cl. 166-138.000.
McCombs, Russell L.; and Motsinger, James V., 4,176,436, Cl. 29-240.000.

Baker, Irwin G., to Boeing Company, The. Midcabin door for blended wing aircraft. 4,176,812, Cl. 244-129.500.

Balakrishnan, Ramachandran; and Skinner, Geoffrey F., to Foster Wheeler Energy Corporation. Extraction of gold and silver. 4,177,068, Cl. 75-105.000.

Balasubramanian, Peruvemba S.; and Greenspan, Stephen B., to International Business Machines Corporation. Electrically programmable logic array. 4,177,452, Cl. 340-166.00R.

Baldwin, Roger A.: *See—*
Rhodes, Donald E.; Baldwin, Roger A.; and Davis, Robert E., 4,177,134, Cl. 208-177.000.

Ball, Glenn A.: *See—*
Grawey, Charles E.; Ball, Glenn A.; and Zook, Donald G., 4,177,027, Cl. 425-49.000.

Ballert Orthopedic Corp.: *See—*
Perser, Donald A.; and Roman, Donald A., 4,176,459, Cl. 33-174.00D.

Balog, Edward J., Sr.: *See—*
Dunbar, David R.; and Balog, Edward J., Sr., 4,177,352, Cl. 174-1.000.

Bando, Yasuo: *See—*
Umemura, Sumio; Ohdan, Kyoji; Sakai, Fumihiko; Bando, Yasuo; and Ikezawa, Harumi, 4,177,161, Cl. 252-435.000.

Baney, Ronald H.; and Harris, Len A., to Dow Corning Corporation. Organothiol-containing siloxane resins as adhesion promoters for siloxane resins. 4,177,175, Cl. 260-29.20M.

Bankson, Billye, to Arnold Engineering Company, The. Magnetic particles and compacts thereof. 4,177,089, Cl. 148-31.550.

Barabash, Martin J.: *See—*
Barker, Graham; and Barabash, Martin J., 4,177,259, Cl. 424-63.000.

Barber, Bernard H., to Davy-Loewy Limited. Splined articulated coupling. 4,176,540, Cl. 72-201.000.

Barber, Ronnie J.: *See—*
Roesel, John F., Jr.; Ott, Richard R.; and Barber, Ronnie J., 4,177,414, Cl. 322-28.000.

Bardonnet, Pierre; and Chamberaud, Jean-Rene, to Essilor International (Compagnie Generale d'Optique). Device for attaching on a spectacle lens a block for mounting on an edging or bevelling machine. 4,176,501, Cl. 51-277.000.

Barker, Graham; and Barabash, Martin J., to Witco Chemical Corporation. Waterproof makeup and method of preparing same. 4,177,259, Cl. 424-63.000.

Barnabe, Jean-Louis M., to Regie Nationale des Usines Renault. Electrochemical detector of the oxygen content of the exhaust gases of combustion engines. 4,177,125, Cl. 204-195.00S.

Barnes, William; Gerstenberg, Roy W.; Kropa, Gomer E.; and Le-Jeune, Roland A., to Leesona Corporation. Feed device for sheet granulator and method of feeding same. 4,176,796, Cl. 241-30.000.

Baron, Barnett. Brewing apparatus. 4,176,588, Cl. 99-323.000.

Barr, Dwight L.; Barr, Leslie A.; Swett, Benson P.; and Ray, Charles M., to Barr Industries, Inc. Camper top tent assembly. 4,176,873, Cl. 296-156.000.

Barr Industries, Inc.: *See—*
Barr, Dwight L.; Barr, Leslie A.; Swett, Benson P.; and Ray, Charles M., 4,176,873, Cl. 296-156.000.

Barr, Leslie A.: *See—*
Barr, Dwight L.; Barr, Leslie A.; Swett, Benson P.; and Ray, Charles M., 4,176,873, Cl. 296-156.000.

Barry, Louis T.: *See—*
von Dreusche, Charles F., Jr.; and Barry, Louis T., 4,176,611, Cl. 110-225.000.

Bartoov, Benjamin; Mayevsky, Abraham; Mendel, Shmuel; and Oren, Amiram, to SEM Israel Limited. Method and apparatus for measuring the motility of sperm cells. 4,176,953, Cl. 356-73.000.

Basarova, Gabriela: *See—*
Kubanek, Vladimir; Basarova, Gabriela; Kralicek, Jaroslav; Skach, Josef; Fencl, Zdenek; Budin, Jiri; Kondelikova, Jaroslava; and Sittler, Eduard, 4,177,295, Cl. 426-330.300.

Baschang, Gerhard; Stanek, Jaroslav; Rossi, Alberto; and Sele, Alex, to Ciba-Geigy Corporation. Anhydro-sugars. 4,177,344, Cl. 536-4.000.

BASF Aktiengesellschaft: *See—*
Boettcher, Klaus; Hoerdt, Heinrich G.; Pfleger, Klaus; Zacher, Wieland; and Gropper, Hans, 4,177,340, Cl. 526-329.000.
Schoenafinger, Eduard; Deigner, Paul; Koester, Eberhard; Ohlinger, Manfred; Schaefer, Dieter; Stumpfl, Werner; Amort, Juergen; Seiler, Claus-Dietrich; Nestler, Heinz; and Ambros, Otto, 4,177,317, Cl. 428-405.000.
Selden, Peter H.; Duerkop, Joachim; Albrecht, Wolfgang; and Weissenmayer, Heinz, 4,177,032, Cl. 425-468.000.

BASF Wyandotte Corporation: *See—*
Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,177,335, Cl. 521-171.000.
Schaaf, Robert L.; Kan, Peter T.; and Cenker, Moses, 4,177,205, Cl. 260-453.0AM.

Bassi, Aldo, to Alfa Romeo S.p.A. Fuel-intermittent-injection installation for internal-combustion engines. 4,176,627, Cl. 123-32.0EB.

Bassler, Hans: *See—*
Panknin, Walter; Finsterwalder, Kurt; Kannegiesser, Reinhard; and Bassler, Hans, 4,176,536, Cl. 72-91.000.

Batchelor, John F.: *See—*
Hodson, Harold F.; and Batchelor, John F., 4,177,257, Cl. 424-46.000.

Bate, Geoffrey; and Dunn, Larry P., to International Business Machines Corporation. Production of magnetic media. 4,177,442, Cl. 335-284.000.

Batson, William A., to Singer Company, The. Guard mechanism for radial saw. 4,176,571, Cl. 83-397.000.

Battelle Development Corporation: *See—*
Rosenberg, Harvey S.; and Grotta, Henry M., 4,177,245, Cl. 423-242.000.

Baum, Joseph W., Sr.; and Timothy, Dave A. Rotor assembly. 4,177,009, Cl. 416-45.000.

Baumann, James R.; Comer, Robert C.; and Yourczek, Jerome F., to Toro Company, The. Line feed mechanism for filament mower. 4,176,508, Cl. 56-12.700.

Baxter Travenol Laboratories, Inc.: *See—*
Winchell, David A., 4,176,755, Cl. 215-32.000.

Bayer Aktiengesellschaft: *See—*
Bock, Manfred; Pedain, Josef; Slawyk, Wilhelm; and Konig, Klaus, 4,177,342, Cl. 528-45.000.
Bossert, Friedrich; Wehinger, Egbert; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, 4,177,278, Cl. 424-266.000.
de Montigny, Armand; and Moretto, Hans-Heinrich, 4,177,201, Cl. 260-448.20E.
Mitschke, Karl-Heinz; Niederprum, Hans; and Kapps, Manfred, 4,177,332, Cl. 521-98.000.
Pieper, Christian; Sandhu, Surinder S.; Schummer, Gunter; and Feltgen, Karlheinz, 4,177,111, Cl. 203-14.000.
Scholl, Hans-Joachim; and Dieterich, Dieter, 4,177,206, Cl. 260-456.00P.
Seng, Florin; Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,177,055, Cl. 71-92.000.
Tacke, Peter; Neuray, Dieter; and Michael, Dietrich, 4,177,185, Cl. 260-38.000.
Traenckner, Hans-Joachim; Goossens, John; Kremer, Wolfgang; and Kronke, Heinz, 4,177,172, Cl. 260-15.000.

BBC Brown Boveri & Company: *See—*
DeBruyne, Patrick; and Sittig, Roland, 4,177,479, Cl. 357-38.000.

BBC Brown Boveri & Company Ltd.: *See—*
Fiorentzis, Michael, 4,177,419, Cl. 324-418.000.

Bean, James Richard: *See—*
Moore, Mary A., 4,177,266, Cl. 424-195.000.

Beane, Frank T. Special package and method. 4,176,748, Cl 206-525.000.

Beauvillain, Gerard M.: *See—*
Bouille, Remy A.; and Beauvillain, Gerard M., 4,176,954, Cl. 356-73.100.

Bechtel International Corporation: *See—*
Aude, Thomas C., 4,177,016, Cl. 417-53.000.

Beck, Gunther: *See—*
Seng, Florin; Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,177,055, Cl. 71-92.000.

Becker, Hubert: *See—*
Becker, Josef; Becker, Hubert; and Becker, Matthias, 4,176,811, Cl. 242-118.100.

Becker, Josef; Becker, Hubert; and Becker, Matthias. Conical yarn carrier. 4,176,811, Cl. 242-118.100.

Becker, Matthias: *See—*
Becker, Josef; Becker, Hubert; and Becker, Matthias, 4,176,811, Cl. 242-118.100.

Beckman Instruments, Inc.: *See—*
Way, Allan S.; and Reid, Taylor A., 4,176,958, Cl. 356-321.000.

Becton, Dickinson and Company: *See—*
Gellman, Barry N., 4,176,756, Cl. 215-274.000.

Beecham Group Limited: *See—*
Cassidy, Frederick; and Wootton, Gordon, 4,177,283, Cl. 424-274.000.
Khan, Karrar A.; and Cook, Brian, 4,177,254, Cl. 424-16.000.

Beecher, Robert L., II; and Hershey, Harold J., to Bell Telephone Laboratories, Incorporated. Multiple pushbutton switch. 4,177,364, Cl. 200-5.00B.

Beeghly, Bruce R., to Economy Engine Company, The. Pulse generating and distributing circuits for internal combustion engines or the like. 4,176,643, Cl. 123-146.50A.

Beeler, David R., to United States of America, Air Force. Non-combustible high temperature abradable seal material. 4,177,308, Cl. 428-117.000.

Been, Larry C. Apparatus and method for making bridgework. 4,176,706, Cl. 164-34.000.

Bekum Maschinenfabriken GmbH: *See—*
Gittner, Franz; Glaser, Arnaldo; and Kotke, Klaus D., 4,177,239, Cl. 264-530.000.

Bel Fuse Inc.: *See—*
Bernstein, Elliot, 4,176,902, Cl. 339-147.00P.

Bell, Joseph S.: *See—*
Jude, Dennis W.; and Bell, Joseph S., 4,176,691, Cl. 138-103.000.

Bell, Peter W.: *See—*
Smith, John B.; Bell, Peter W.; Queen, David S.; and Mitchell, John, 4,177,311, Cl. 428-246.000.

Bell, Robert L.; Willing, Robert; and Kavli, Fred, to Kavlico Corporation. Capacitive pressure transducer. 4,177,496, Cl. 361-283.000.

Bell Telephone Laboratories, Incorporated: *See—*
Beecher, Robert L., II; and Hershey, Harold J., 4,177,364, Cl. 200-5.00B.

Dixon, Richard W.; and Svacek, Joseph F., III, 4,177,436, Cl. 331-94.50S.
Marcatili, Enrique A. J.; and Marcuse, Dietrich, 4,176,911, Cl. 350-96.310.
Mathews, Max V., 4,177,354, Cl. 178-18.000.
Schaefer, Edwin M., III, 4,177,521, Cl. 365-8.000.
Wagner, Richard E., 4,176,908, Cl. 350-96.150.

Belles, Wayne S.: *See—*
Hunter, Don L.; and Belles, Wayne S., 4,177,057, Cl. 71-92.000.

Beloit Corporation: *See—*
Berry, Kenneth W., 4,177,304, Cl. 427-434.00R.
Brendemuehl, Roger C., 4,176,775, Cl. 226-7.000.

Bendig, Larry L.; Stowell, Donald E.; and Starks, Laura A., to Conoco, Inc. Production of low loose bulk density alumina. 4,177,251, Cl. 423-628.000.

Bendix Corporation, The: *See—*
Stauffer, Reuben L., 4,176,625, Cl. 123-32.0EH.

Bennett, Gregory B., to Sandoz, Inc. 6-(Substituted phenyl)-4,5-dihydro-pyridazin-3(2H)-ones. 4,177,273, Cl. 424-250.000.

Bentz, Helmut: *See—*
Alpers, Gunther; and Bentz, Helmut, 4,176,887, Cl. 305-57.000.

Berg, Verland V., to Berg, Verland V.; and Tracy, Raymond. Free standing fireplace. 4,176,652, Cl. 126-121.000.

Berggren, Kenneth S.: *See—*
Kubat, Josef; and Berggren, Kenneth S., 4,177,103, Cl. 156-500.000.

Bergman, Gunnar B.: *See—*
Goss, Wilbur H.; and Bergman, Gunnar B., 4,176,614, Cl. 114-125.000.

Bergstrom, Per-Olof: *See—*
Ahlen, Karl G.; Bergstrom, Per-Olof; and Supanich, Joseph, 4,176,564, Cl. 74-732.000.

Berkbigler, Kenneth A. Fuel metering rod position control. 4,177,225, Cl. 261-50.00A.

Berkoz, Belig: *See—*
Untch, Karl G.; Berkoz, Belig; and Unger, Stefan H., 4,177,280, Cl. 424-272.000.

Bernstein, Elliot, to Bel Fuse Inc. Method for fusing male plug at end of power line cord. 4,176,902, Cl. 339-147.00P.

Bernstein, Seymour: *See—*
Conrow, Ransom B.; and Bernstein, Seymour, 4,177,209, Cl. 260-506.000.

Berry, Kenneth W., to Beloit Corporation. Method of coating both sides of a travelling web. 4,177,304, Cl. 427-434.00R.

Bertil Wigemark AB: *See—*
Wigemark, Bertil V., 4,176,423, Cl. 16-125.000.

Bertolacini, Ralph J.: *See—*
Feinstein, Allen I.; Bertolacini, Ralph J.; and Kim, Dae K., 4,177,219, Cl. 585-489.000.

Bertrand, Jacques A.; and Marechal, Robert A., to Klippan France, S.A. Lock sensitivity adjustor. 4,176,810, Cl. 242-107.40B.

Betts, Edward E., to United States of America, Navy. Quick disconnect electrical connector having disassembly features for refurbishment. 4,176,899, Cl. 339-45.00M.

Bevilacqua, Frank, to Combustion Engineering, Inc. Nuclear fuel storage. 4,177,385, Cl. 250-507.000.

Bezvulyak, Anatoly S.; Gelfand, Ilya M.; Torchinsky, Efim M.; Pushkin, Sergei B.; Vedernikov, Rudolf K.; Kulachenkov, Gennady P.; Tkachuk, Petr F.; and Karyagin, Viktor F., to Vsesojuznynauchno-Issledovatelsky Institut Metlizno Promyshlennosti (Vniimetiz). Photoelectric pyrometer for measuring temperature of bodies of small cross-sectional dimensions which vary with respect to optical axis of pyrometer. 4,176,952, Cl. 356-47.000.

Biebricher, Christof; and Luce, Rudiger, to Max-Planck-Gesellschaft zur Forderung der Wissenschafen e.V. Method for the production of a vehicle substance which is capable of covalent bonding with biologically active matter. 4,177,038, Cl. 8-192.000.

Bielaczek, Herbert, to Brehm, Robert, a part interest. Method and apparatus for tapping groundwater. 4,176,716, Cl. 166-254.000.

Bielecki, Marek; Bogdanski, Andrzej; Buxakowski, Andrzej; Chudzinski, Janusz; Glogowski, Andrzej; Kopczynski, Marian; Krolikowski, Andrzej; Kryszewski, Jozef; Moczulski, Zdzislaw; Ochocki, Wlodzimierz; Pomorski, Aleksander; Rumatowski, Karol; Sawicki, Janusz; Szostakowski, Henryk; Warowny, Tadeusz; Wisniewski, Teofil; and Wozniak, Antoni, to Politechnika Poznanska; and Zaklady Przemyslu Metalowego. Diesel engine with electronic control. 4,176,624, Cl. 123-32.0EA.

Bietz, Rolf: *See—*
Lehmann, Hans-Juergen; Bietz, Rolf; and Wegner, Juergen, 4,177,294, Cl. 426-271.000.

Bigelow, Eugene H.; and Goldsmith, Burton J., to Baker International Corporation. High temperature well packer. 4,176,715, Cl. 166-138.000.

Bilal, Abdel-Latif: *See—*
Herrmann, Fritz; and Bilal, Abdel-Latif, 4,177,130, Cl. 204-299.00R.

Billings Energy Corporation: *See—*
Campbell, Barrie C., 4,177,118, Cl. 204-129.000.

Binder, Dieter: *See—*
Hromatka, Otto; Binder, Dieter; Pfister, Rudolf; and Zeller, Paul, 4,177,193, Cl. 549-64.000.

Bingham, Richard C., to Du Pont de Nemours, E. I., and Company. Organic pigments derived from benzocoumarin. 4,177,195, Cl. 260-343.210.

Binney & Smith Inc.: *See—*
Klara, Charles J.; Hohl, James H.; and Clymer, Wilbur L., 4,176,763, Cl. 221-93.000.

Bio-Energy Systems, Inc.: *See—*
Zinn, Michael F.; and Krulick, Steven E., 4,176,654, Cl. 126-448.000.

Biosonics International, Ltd.: *See—*
Hatter, Edward E.; Taylor, Richard H.; and McGunigle, Richard D., 4,176,454, Cl. 433-119.000.

Birck, Michael J., to Tellabs, Inc. Signaling tone transparent echo suppressor. 4,177,361, Cl. 179-170.200.

Birkmaier, Horst: *See—*
Severus, Harald; and Birkmaier, Horst, 4,177,299, Cl. 427-287.000.

Biro, Katalin: *See—*
Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szabolcs, 4,177,190, Cl. 260-239.500.

Bischoff, Erich; Dangel, Jurgen; Schussler, Hans; Ricker, Thomas; and Stein, Erich, to Licentia Patent-Verwaltung-G.m.b.H. Method for producing a semiconductor fixed value ROM. 4,176,442, Cl. 29-571.000.

Bishai, Wilson B.; and McCloskey, John H., to Middle East Software Corporation. Interactive video display and editing of text in the Arabic script. 4,176,974, Cl. 400-111.000.

Blackman, Stanley J. Moisture reducer for use in heated and vented container including electrical contacts. 4,177,365, Cl. 200-19.00R.

Blackwood, William A. Forklift attachment for highway vehicles. 4,177,001, Cl. 414-628.000.

Blaetz, Philip H., to Kraft, Inc. Dasher. 4,176,970, Cl. 366-280.000.

Blakely, Lawrence E.: *See—*
Jaeger, C. Rene; and Blakely, Lawrence E., 4,177,356, Cl. 179-1.0VL.

Blaskowski, Henry J., to Combustion Engineering, Inc. Fluidized bed boiler. 4,176,623, Cl. 122-367.0PF.

Bliamptis, Emmanuel E., to United States of America, Air Force. High voltage antenna protection system. 4,177,493, Cl. 361-56.000.

Blue, Emanuel M., to Chevron Research Company. Method for producing an attrition-resistant adsorbent for sulfur dioxide, the resulting composition and a process using same. 4,177,158, Cl. 252-189.000.

Bobo, Melvin: *See—*
Riedmiller, Charles F.; and Bobo, Melvin, 4,177,004, Cl. 415-116.000.

Bocckino, Harry G.: *See—*
Pepper, Terry W.; and Bocckino, Harry G., 4,177,067, Cl. 75-104.000.

Bochis, Richard J.; and Kulsa, Peter, to Meck & Co., Inc. Substituted imidazo [1,2-a] pyridines. 4,177,274, Cl. 424-256.000.

Bock, Manfred; Pedain, Josef; Slawyk, Wilhelm; and Konig, Klaus, to Bayer Aktiengesellschaft. Process for the preparation of polyisocyanates containing allophanate groups. 4,177,342, Cl. 528-45.000.

Bodendorfer, Roland, to TMC Corporation. Safety ski binding. 4,176,857, Cl. 280-613.000.

Bodenseewerk Perkin-Elmer & Co. GmbH: *See—*
Tomoff, Toma; and Tamm, Rolf G. A., 4,176,956, Cl. 356-312.000.

Boeing Company, The: *See—*
Baker, Irwin G., 4,176,812, Cl. 244-129.500.

Boenecke, Charles A. Tamperproof handset connector arrangement for railroad applications. 4,177,362, Cl. 179-186.000.

Boettcher, Klaus; Hoerdt, Heinrich G.; Pfleger, Klaus; Zacher, Wieland; and Gropper, Hans, to BASF Aktiengesellschaft. Manufacture of high-pressure polyethylene. 4,177,340, Cl. 526-329.000.

Bogachenko, Alexei G.: *See—*
Paton, Boris E.; Medovar, Boris I.; Tsukanov, Georgy E.; Bogachenko, Alexei G.; Artamonov, Viktor L.; Timashov, Grigory A.; Shtanko, Jury P.; Marchenko, Alexandr M.; Fedorovsky, Boris B.; Kumysh, Ilya I.; Chepurnoi, Anatoly D.; Saenko, Vladimir Y.; and Semin-Vadov, Gennady M., 4,177,058, Cl. 75-10.00C.

Bogdanski, Andrzej: *See—*
Bielecki, Marek; Bogdanski, Andrzej; Buxakowski, Andrzej; Chudzinski, Janusz; Glogowski, Andrzej; Kopczynski, Marian; Krolikowski, Andrzej; Kryszewski, Jozef; Moczulski, Zdzislaw; Ochocki, Wlodzimierz; Pomorski, Aleksander; Rumatowski, Karol; Sawicki, Janusz; Szostakowski, Henryk; Warowny, Tadeusz; Wisniewski, Teofil; and Wozniak, Antoni, 4,176,624, Cl. 123-32.0EA.

Bohen, Joseph M., to Pennwalt Corporation. Stabilizers for halogenated resins. 4,177,187, Cl. 260-45.75S.

Bohen, Joseph M., to Pennwalt Corporation. Process for preparing alkaline earth metal mercaptides. 4,177,198, Cl. 260-399.000.

Boje, Daniel Q., to Agar International Ltd. Large screen television. 4,177,484, Cl. 358-254.000.

Bolton-Emerson, Inc.: *See—*
Hutchins, Clement A., 4,176,570, Cl. 83-355.000.

Boltswitch, Inc.: *See—*
Erickson, James A., 4,177,368, Cl. 200-332.000.

Bommart, Patrick, to C. Delachaux. Setting arrangement for alignment and gap between two rail ends. 4,176,777, Cl. 228-5.100.

Bonhomme, Pierre: *See—*
Jay, Pierre; and Bonhomme, Pierre, 4,177,156, Cl. 252-66.000.

Borberg, Hartmut, to Apparatebau Gauting GmbH; and Ernst Muller KG. Mixing apparatus for a first liquid component with at least one additional component. 4,176,672, Cl. 137-99.000.

Borg-Warner Corporation: *See—*
Roberts, Richard W., 4,176,737, Cl. 192-82.00T.

Borginon, Hendrik A.: *See—*
De Brabandere, Luc A.; Borginon, Hendrik A.; Pattyn, Herman A.; and Pollet, Robert J., 4,177,071, Cl. 430-494.000.

Bornemann, Hans-Joachim, to Thyssen Industrie Aktiengesellschaft. Mixing apparatus. 4,176,966, Cl. 366-78.000.

Borzak, Robert A., to Ampex Corporation. Tape reel container. 4,176,744, Cl. 206-303.000.

Bossert, Friedrich; Wehinger, Egbert; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, to Bayer Aktiengesellschaft. 2-Alkyleneaminodihydropyridines compounds, their production and their medicinal use. 4,177,278, Cl. 424-266.000.

Bostick, Joseph: *See—*
Wilkinson, Elizabeth P., 4,176,773, Cl. 224-205.000.

Boswell, James W. Bicycle path transport system. 4,176,982, Cl. 404-34.000.

Boucher, Claude; and Boucher, Jacqueline. Agrarian stake. 4,176,494, Cl. 47-47.000.

Boucher, Jacqueline: *See—*
Boucher, Claude; and Boucher, Jacqueline, 4,176,494, Cl. 47-47.000.

Bouillie, Remy A.; and Beauvillain, Gerard M. Equipment for measuring the length of dielectric elements transmitting optical frequencies. 4,176,954, Cl. 356-73.100.

Bourdon, Claude G.: *See—*
Robert, Andre J.; Bourdon, Claude G.; Msika, Nessim C.; Chorlay, Etienne G.; and Euzenade, Jean-Louis, 4,176,951, Cl. 356-33.000.

Bourgoin, Bernard, to Centre Technique des Industries Mecaniques. Sprinkling device for grinding wheels. 4,176,500, Cl. 51-267.000.

Bouvaist, Jean-Marie A.; and Lacoste, Georges, to Societe pour le Forgeage et l'Estampage des Alliages Legers FORGEAL. Process for the thermal treatment and the quenching of forged articles. 4,177,086, Cl. 148-12.70A.

Bowden, William L.: *See—*
Dey, Arabinda N.; Miller, John S.; and Bowden, William L., 4,177,329, Cl. 429-101.000.

Bowes, Alan: *See—*
Scudder, Roy; and Bowes, Alan, 4,176,511, Cl. 56-330.000.

Boy, Aristide; Galy, Henri; Ivaldi, Raoul; and Passedroit, Hubert, to ATO Chemie. Process for preparing sulphonic acids and sulphonates. 4,177,208, Cl. 260-504.00S.

Bozung, Hans-Gunther; and Mendle, Hans, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (M.A.N.). Variable-throat spiral duct system for rotary stream-flow machines. 4,177,005, Cl. 415-128.000.

Bradley, John J.: *See—*
Appell, Marc; Lepicard, Georges; de Rivet, Philippe-Hubert; Bradley, John J.; and Franklin, Benjamin S., 4,177,510, Cl. 364-200.000.

Braukmann Armaturen AG: *See—*
Braukmann, Heinz W., 4,176,786, Cl. 236-99.00K.

Braukmann, Heinz W., to Braukmann Armaturen AG. Concealed thermostatic control valve. 4,176,786, Cl. 236-99.00K.

Braun Aktiengesellschaft: *See—*
Roth, Johann; and Schneider, Peter, 4,176,922, Cl. 352-27.000.

Bray, Geddes A., to Mather & Platt Limited. Heat sensitive release devices. 4,176,719, Cl. 169-39.000.

Brayton, Robert K., to International Business Machines Corporation. Character recognition system and method multi-bit curve vector processing. 4,177,448, Cl. 340-146.3AE.

Brehm, Robert: *See—*
Bielaczek, Herbert, 4,176,716, Cl. 166-254.000.

Breitenkam, Fred J.; and Landrith, James E., to Van Dyk Research Corporation. Malfunction display system for electrophotographic copying machines. 4,176,941, Cl. 355-14.00R.

Brelen, Hans E. O.: *See—*
Otteblad, Sven I. A.; Brynielsson, Erner T. O.; Dovertie, Ralph G.; Franzen, Stig E. R.; and Brelen, Hans E. O., 4,176,728, Cl. 180-168.000.

Brendemuehl, Roger C., to Beloit Corporation. Inhibiting noise in sheet spreaders. 4,176,775, Cl. 226-7.000.

Brennan, Michael P. J., to Chloride Silent Power Limited. Method for making an electrode. 4,176,447, Cl. 29-623.500.

Brewer, John C., to Garbalizer Corporation of America. Materials reduction structure. 4,176,800, Cl. 241-243.000.

Brewer, Marie-Louise. Calendar. 4,176,478, Cl. 40-107.000.

Bridgestone Tire Company Limited: *See—*
Nojima, Hiroshi; and Nishimura, Masahiro, 4,176,703, Cl. 152-209.00B.

Brinkmann, Heinz; and Spielhoff, Horst, to Hermann Berstorff Maschinenbau GmbH. Apparatus for the preparation of thermoplastic materials. 4,176,967, Cl. 366-83.000.

Bristol-Myers Company: *See—*
Granatek, Edmund S.; Ruva, Frank D.; and Grab, Frederick L., 4,177,199, Cl. 260-430.000.

British Gas Corporation: *See—*
Jude, Dennis W.; and Bell, Joseph S., 4,176,691, Cl. 138-103.000.
Wood, Andrew, 4,177,042, Cl. 48-87.000.

British Petroleum Company Limited, The: *See—*
Eyles, Martin K.; and Wagner, Graham L., 4,176,544, Cl. 73-61.200.

British Steel Corporation: *See—*
Williams, Ernald V., 4,177,318, Cl. 428-408.000.

Brittingham, William C. Bee frame caddy. 4,176,416, Cl. 6-12.00R.

Broadway, William W., to FMC Corporation. Pressure-sensitive temperature-responsive rotary valve for cryogenic temperatures. 4,176,820, Cl. 251-317.000.

Brock, James H. Quick disconnect trailer hitch. 4,176,853, Cl. 280-423.00R.

Broghammer, Werner, to Dual Gebruder Steidenger. Switching device for cassette tape recorders. 4,177,490, Cl. 360-105.000.

Bronz Engineering Company, Ltd., The: *See—*
Brown, Arthur N., 4,176,537, Cl. 72-98.000.

Brookhyser, Byron B., to Weyerhaeuser Company. Apparatus for aligning thin sheets at work station. 4,176,467, Cl. 34-236.000.

Brown, Arthur N., to Bronz Engineering Company, Ltd., The. Method of and means for straightening bars and tubes. 4,176,537, Cl. 72-98.000.

Brown, David A.; Norman, Jan L.; and Whitson, Donald W., to All Phase Electronics, Inc. Smoke alarm device for a grain dryer. 4,177,461, Cl. 340-628.000.

Brown, Fred A., III: *See—*
Hughes, Francis H.; Morton, Kenneth O.; LeMere, Roger; and Brown, Fred A., III, 4,176,832, Cl. 271-10.000.

Brown, Harry J.; and Chopra, Kuldip S., to Union Carbide Corporation. Hard facing of metal substrates using material containing V, W, Mo, C. 4,177,324, Cl. 428-627.000.

Brown, Robert T., to United Technologies Corporation. Optically pumped laser. 4,177,435, Cl. 331-94.50G.

Brown, Winthrop K.: *See—*
Nolte, David G.; and Brown, Winthrop K., 4,176,543, Cl. 73-40.50A.

Brueckner, Karl H.; Farel, Charles A.; and Irsik, Johnnie F., to International Business Machines Corporation. Flux controlled shunt regulated transformer. 4,177,418, Cl. 323-56.000.

Brunsch, Klaus: *See—*
Schulz, Ralf-Thilo; Brunsch, Klaus; and Lemmer, Ludwig, 4,177,306, Cl. 428-107.000.

Brynielsson, Erner T. O.: *See—*
Otteblad, Sven I. A.; Brynielsson, Erner T. O.; Dovertie, Ralph G.; Franzen, Stig E. R.; and Brelen, Hans E. O., 4,176,728, Cl. 180-168.000.

Buchner, Helmut, to Daimler-Benz Aktiengesellschaft. Contactless switching element for electric current. 4,177,445, Cl. 338-34.000.

Budin, Jiri: *See—*
Kubanek, Vladimir; Basarova, Gabriela; Kralicek, Jaroslav; Skach, Josef; Fencl, Zdenek; Budin, Jiri; Kondelikova, Jaroslava; and Sittler, Eduard, 4,177,295, Cl. 426-330.300.

Budzich, Tadeusz. Load responsive fluid control valves. 4,176,521, Cl. 60-445.000.

Bullinga, Johannes, to Rockwell International Corporation. Self-excited inverter with suppressed current spikes. 4,177,509, Cl. 363-133.000.

Bunker Ramo Corporation: *See—*
Cameron, John K., 4,176,897, Cl. 339-40.000.
Johnston, Samuel A., 4,176,557, Cl. 73-708.000.

Bunyan's Woodcutter Corp.: *See—*
Greeninger, Carroll D., 4,176,696, Cl. 144-3.00K.

Bureau de Recherches Geologiques et Mimeres: *See—*
Clin, Francois H.; Gony, Jean-Noel; and Proust, Francois O., 4,176,799, Cl. 241-74.000.

Burgess, Dennis A., to Burgess Industries, Inc. Microfiche exposer. 4,176,949, Cl. 355-104.000.

Burgess Industries, Inc.: *See—*
Burgess, Dennis A., 4,176,949, Cl. 355-104.000.

Burough, Irvin G.: *See—*
McClatchie, Edward A.; Watson, Dean A.; and Burough, Irvin G., 4,177,381, Cl. 250-343.000.

Burrill, Peter M.; and Rankin, Frank S., to Dow Corning Limited. Treatment of fibres. 4,177,176, Cl. 260-29.20M.

Burroughs Corporation: *See—*
Aldridge, Lionel D., 4,176,895, Cl. 339-17.0CF.
Holmberg, Scott H., 4,177,475, Cl. 357-2.000.
Moggia, Richard A., 4,177,512, Cl. 364-200.000.
Taddei, Vincent J., 4,177,511, Cl. 364-200.000.

Burroughs Wellcome Co.: *See—*
Hodson, Harold F.; and Batchelor, John F., 4,177,257, Cl. 424-46.000.

Busch, Dieter: *See—*
Stein, Manfred; and Busch, Dieter, 4,176,515, Cl. 58-19.00R.

Buschermohle, Gregor, to Keller Ofenbau GmbH. Tunnel kiln for firing ceramic ware. 4,177,035, Cl. 432-121.000.

Bush Boake Allen Limited: *See—*
Cookson, Richard C.; and Ferro, Lorenzo D., 4,177,170, Cl. 252-522.000.

Buxakowski, Andrzej: *See—*
Bielecki, Marek; Bogdanski, Andrzej; Buxakowski, Andrzej; Chudzinski, Janusz; Glogowski, Andrzej; Kopczynski, Marian; Krolikowski, Andrzej; Kryszewski, Jozef; Moczulski, Zdzislaw; Ochocki, Wlodzimierz; Pomorski, Aleksander; Rumatowski, Karol; Sawicki, Janusz; Szostakowski, Henryk; Warowny, Tadeusz; Wisniewski, Teofil; and Wozniak, Antoni, 4,176,624, Cl. 123-32.0EA.

C. Delachaux: *See—*
Bommart, Patrick, 4,176,777, Cl. 228-5.100.

C. H. Anderson and Associates Ltd.: *See—*
Anderson, Clay H.; and St. Jean, Gerard, 4,176,827, Cl. 254-186.00R.

C. Otto & Comp. G.m.b.H.: *See—*
Hahn, Ulrich; and Stumpe, Klaus, 4,177,139, Cl. 210-33.000.

Cable Caddy, Inc.: *See—*
Douglas, Homer C., 4,176,801, Cl. 242-54.00R.

Cadden, Duane L.: *See—*
Antonucci, Ermen S.; Cadden, Duane L.; Regenbrecht, Albert; and Schwartz, Edward, 4,176,891, Cl. 316-2.000.

Cairo, Anthony C.; Tillmann, Ditmar K.; and Insley, Gene I., to Robertshaw Controls Company. Plug in igniter unit and method of making the same. 4,176,903, Cl. 339-147.00R.

California R & D Center: *See*—
Sims, Anson; and Jones, Lawrence T., 4,176,492, Cl. 46-22.000.
Cameron, John K., to Bunker Ramo Corporation. EMI protected connector assembly. 4,176,897, Cl. 339-40.000.
Camirand, Wayne M.: *See*—
Popper, Karel; and Camirand, Wayne M., 4,177,146, Cl. 210-137.000.
Campbell, Barrie C., to Billings Energy Corporation. Process for electrolyzing water. 4,177,118, Cl. 204-129.000.
Campbell, Joseph M.; and Minyard, Larry J., to Teledyne Industries, Inc. System for encoding of bass and treble expression effects while recording from the keyboard of an electronic player piano. 4,176,578, Cl. 84-115.000.
Canadian Patents and Development Limited: *See*—
Thayer, William L.; Pageau, Lucien; and Sourirajan, Srinivasa, 4,177,031, Cl. 425-460.000.
Canevari, Roger: *See*—
Regnier, Gilbert; Canevari, Roger; Laubie, Michel; and Poignant, Jean-Claude, 4,177,272, Cl. 424-250.000.
Canon Kabushiki Kaisha: *See*—
Fujibayashi, Kazuo, 4,176,914, Cl. 350-214.000.
Ito, Fumio; Tsunekawa, Tokuichi; Taguchi, Tetsuya; and Harigaya, Isao, 4,176,929, Cl. 354-29.000.
Ito, Yuji, 4,176,920, Cl. 351-7.000.
Kozuki, Susumu; Uchidoi, Masanori; Date, Nobuaki; Shimizu, Masami; Aizawa, Hiroshi; and Takishima, Yoshiyuki, 4,176,936, Cl. 354-38.000.
Matsumoto, Kazuya; Kawamura, Naoto; and Minami, Setsuo, 4,176,907, Cl. 350-6.800.
Takahashi, Yuji, 4,176,834, Cl. 271-116.000.
Canron, Inc.: *See*—
von Beckmann, Helmuth, 4,176,456, Cl. 33-1.00Q.
Cappon, Arthur M., to Raytheon Company. A field effect transistor logic gate having depletion mode and enhancement mode transistors. 4,177,390, Cl. 307-205.000.
Capra, Nicholas G.; and Antenore, Ronald L., to James D. Pauls, Ltd. Mechanically operated mixing dispenser having a plurality of expansible chambers and a plurality of accumulating chambers. 4,176,764, Cl. 222-135.000.
Carel, Pierre, to Cibie Projecteurs. Indicator light with incorporated catadioptric element for automobile. 4,177,505, Cl. 362-309.000.
Carl Hurth Maschinen- und Zahnradfabrik: *See*—
Eichinger, Johann, 4,176,549, Cl. 73-162.000.
Carpenter, Frank M., to Neotec Corporation. Cam filter wheel. 4,176,916, Cl. 350-315.000.
Carr, Brian J., to Diamond Shamrock Corporation. Polyepoxide curing by polymercaptans catalyzed by dimethylamino alkyl ethers. 4,177,173, Cl. 260-18.0EP.
Carrera International Corporation: *See*—
Matthias, Jan H., 4,176,410, Cl. 2-436.000.
Matthias, Jan H., 4,176,921, Cl. 351-106.000.
Carrier Corporation: *See*—
Clark, William E.; and Herb, Carl C., 4,176,690, Cl. 137-8.000.
Carson, William W.: *See*—
Holtzapple, Mark T.; Wehe, Robert L.; Myer, Charles G.; and Carson, William W., 4,176,522, Cl. 60-459.000.
Cascade Corporation: *See*—
Weinert, Harry F.; McCart, Larry D.; and Weisgerber, David J., 4,177,000, Cl. 414-620.000.
Case, Richard W., to K-Shox, Inc. Shock absorber for oil well pumping unit. 4,176,714, Cl. 166-72.000.
Cassidy, Frederick; and Wootton, Gordon, to Beecham Group Limited. Aromatic prostaglandin analogues. 4,177,283, Cl. 424-274.000.
Castoe, John H. Apparatus for removing rocker arms. 4,176,435, Cl. 29-220.000.
Caterpillar Tractor Co.: *See*—
Grawey, Charles E.; Ball, Glenn A.; and Zook, Donald G., 4,177,027, Cl. 425-49.000.
Keffeler, Gary L., 4,176,457, Cl. 33-126.70R.
Cattaneo, Maurizio; and Masoero, Renzo, to Fiat Societa per Azioni. Automatically controlled irrigation system. 4,176,791, Cl. 239-76.000.
CECA S.A.: *See*—
Sarrut, Jean P., 4,177,152, Cl. 252-2.000.
Cecchin, Giuliano; Luciani, Luciano; and Griselli, Pier Luigi, to Montedison S.p.A. Catalytic components and catalysts for the polymerization of olefins. 4,177,160, Cl. 252-429.00B.
Cello Chemical Company: *See*—
Magid, David J., 4,176,420, Cl. 15-230.000.
Celloplast AB Norrkoeping: *See*—
Kubat, Josef; and Berggren, Kenneth S., 4,177,103, Cl. 156-500.000.
Cenker, Moses: *See*—
Schaaf, Robert L.; Kan, Peter T.; and Cenker, Moses, 4,177,205, Cl. 260-453.0AM.
Centre Technique des Industries Mecaniques: *See*—
Bourgoin, Bernard, 4,176,500, Cl. 51-267.000.
Ceskoslovenska akademie ved: *See*—
Sipek, Emil; and Simecek, Tomislav, 4,176,962, Cl. 356-400.000.
Chadwick, Alexander, to Chrysler Corporation. Fuel injection system and control valve for multi-cylinder engines. 4,176,822, Cl. 251-129.000.
Chadwick, Duane G., to Utah State University Foundation. Heat-powered water pump. 4,177,019, Cl. 417-379.000.
Chadwick, Duane G., to Utah State University Foundation. Heat-powered water pump. 4,177,020, Cl. 417-379.000.
Chadwick, Kenneth E.; Chia, E. Henry; and Powers, Frank M., to Southwire Company. Method for solution heat treatment of 6201 aluminum alloy. 4,177,085, Cl. 148-2.000.
Chakrabarti, Paritosh M., to GAF Corporation. Synthetic aqueous based metal working fluid compositions. 4,177,154, Cl. 252-32.500.
Chamberaud, Jean-Rene: *See*—
Bardonnet, Pierre; and Chamberaud, Jean-Rene, 4,176,501, Cl. 51-277.000.
Chamberlin, Howard A., Jr., to Hendrix Electronics Incorporated. Video amplifier for displaying four or more video levels on a cathode ray tube. 4,177,409, Cl. 315-383.000.
Chang, Clarence D.; and Lang, William H., to Mobil Oil Corporation. Methanation of synthesis gas. 4,177,202, Cl. 260-449.00R.
Chapdelaine, Martial. Photocell-controlled lighting system. 4,177,405, Cl. 315-159.000.
Chapman, Robert D.: *See*—
Euzarraga, Rosendo; Winkler, Robert J.; and Chapman, Robert D., 4,176,480, Cl. 40-155.000.
Charles, Herbert N., to Fram Corporation. Fan blade with bends forming general blade curvature. 4,177,012, Cl. 416-132.00A.
Chen, Robert H. K., to Ortho Pharmaceutical Corporation. Total synthesis of the utero-evacuant substance D,L-zoapatanol. 4,177,194, Cl. 260-333.000.
Chepurnoi, Anatoly D.: *See*—
Paton, Boris E.; Medovar, Boris I.; Tsukanov, Georgy E.; Bogachenko, Alexei G.; Artamonov, Viktor L.; Timashov, Grigory A.; Shtanko, Jury P.; Marchenko, Alexandr M.; Fedorovsky, Boris B.; Kumysh, Ilya I.; Chepurnoi, Anatoly D.; Saenko, Vladimir Y.; and Semin-Vadov, Gennady M., 4,177,058, Cl. 75-10.00C.
Cherrington, Martin D., to Reading and Bates Construction Co. System and method for installing production casings. 4,176,985, Cl. 405-184.000.
Chevron Research Company: *See*—
Blue, Emanuel M., 4,177,158, Cl. 252-189.000.
Lowe, Warren, 4,177,153, Cl. 252-32.70E.
Cheynet, Claudius. Device for covering warp yarn with covering yarns. 4,176,530, Cl. 66-203.000.
Chia, E. Henry: *See*—
Chadwick, Kenneth E.; Chia, E. Henry; and Powers, Frank M., 4,177,085, Cl. 148-2.000.
Chinchen, Godfrey C., to Imperial Chemical Industries Limited. Low temperature shift conversion process. 4,177,252, Cl. 423-656.000.
Chloride Silent Power Limited: *See*—
Brennan, Michael P. J., 4,176,447, Cl. 29-623.500.
Choay, Jean: *See*—
Lormeau, Jean-Claude; Choay, Jean; and Goulay, Jean, 4,177,262, Cl. 424-105.000.
Choay S.A.: *See*—
Lormeau, Jean-Claude; Choay, Jean; and Goulay, Jean, 4,177,262, Cl. 424-105.000.
Chopra, Kuldip S.: *See*—
Brown, Harry J.; and Chopra, Kuldip S., 4,177,324, Cl. 428-627.000.
Chorlay, Etienne G.: *See*—
Robert, Andre J.; Bourdon, Claude G.; Msika, Nessim C.; Chorlay, Etienne G.; and Euzenade, Jean-Louis, 4,176,951, Cl. 356-33.000.
Christoph, Dieter, to Schulz, Siegfried, a part interest. Spherical bearing seat cutter machine. 4,176,565, Cl. 82-12.000.
Christopher, Robert J.; and Schaaf, Robert L., to International Business Machines Corporation. Reel motor preamplifier. 4,177,433, Cl. 330-265.000.
Chrysler Corporation: *See*—
Chadwick, Alexander, 4,176,822, Cl. 251-129.000.
Chubb Industries Limited: *See*—
Markham, Michael H.; and Ruston, Rudolf S., 4,176,610, Cl. 109-59.00R.
Chudzinski, Janusz: *See*—
Bielecki, Marek; Bogdanski, Andrzej; Buxakowski, Andrzej; Chudzinski, Janusz; Glogowski, Andrzej; Kopczynski, Marian; Krolikowski, Andrzej; Kryszewski, Jozef; Moczulski, Zdzislaw; Ochocki, Wlodzimierz; Pomorski, Aleksander; Rumatowski, Karol; Sawicki, Janusz; Szostakowski, Henryk; Warowny, Tadeusz; Wisniewski, Teofil; and Wozniak, Antoni, 4,176,624, Cl. 123-32.0EA.
Chung, David H., to Umtech, Inc. Computer control of television receiver display. 4,177,462, Cl. 340-703.000.
Ciba-Geigy Corporation: *See*—
Baschang, Gerhard; Stanek, Jaroslav; Rossi, Alberto; and Sele, Alex, 4,177,344, Cl. 536-4.000.
Meyer, Hans R., 4,177,347, Cl. 542-459.000.
Mueller, Karl F.; and Good, William R., 4,177,056, Cl. 71-93.000.
Popplewell, Alan F., deceased; and Clark, David R., 4,177,155, Cl. 252-49.300.
Robertson, George H., 4,177,082, Cl. 106-309.000.
Rody, Jean; Greber, Gerd; and Muller, Helmut, 4,177,186, Cl. 260-45.80N.
Schmidt, Andreas, 4,177,213, Cl. 260-590.00R.
Weiss, Jonas, 4,177,302, Cl. 427-407.00C.
Cibie Projecteurs: *See*—
Carel, Pierre, 4,177,505, Cl. 362-309.000.
Citation Manufacturing Co., Inc.: *See*—
Heinrich, Elmer G., 4,176,793, Cl. 239-407.000.
Cities Service Company: *See*—
Gohlke, Arthur F., 4,177,288, Cl. 424-294.000.

Citizen Watch Co. Ltd.: *See*—
Yoshida, Makoto, 4,176,517, Cl. 58-23.00R.
Citrin, Paul S., to Indicon Inc. Fast responsive valve. 4,176,671, Cl. 137-1.000.
Cla-Val Co.: *See*—
Ensign, Harold W., 4,176,687, Cl. 137-625.650.
Clapper, Robert L.; Schoneweis, E. Frederick; Hankosky, Andrew; and Bake, Earl A., to Rockwell International Corporation. Device for coupling a pair of rods. 4,176,981, Cl. 403-31.000.
Clarion Co. Ltd.: *See*—
Hasegawa, Isao, 4,177,489, Cl. 360-74.200.
Clark, David R.: *See*—
Popplewell, Alan F., deceased; and Clark, David R., 4,177,155, Cl. 252-49.300.
Clark, William E.; and Herb, Carl C., to Carrier Corporation. Regulator for a damper assembly. 4,176,690, Cl. 137-8.000.
Clarke, George C. Variable speed drive. 4,176,560, Cl. 74-230.17A.
Clin, Francois H.; Gony, Jean-Noel; and Proust, Francois O., to Bureau de Recherches Geologiques et Minieres. Rotary screens. 4,176,799, Cl. 241-74.000.
Clipston, Robert H.; Hall, Emerson O.; and Ng, Hon-Hei F., to Dominion Foundries and Steel, Limited. Method of galvanizing a portion only of a ferrous metal article. 4,177,303, Cl. 427-259.000.
Cluett, Peabody & Co., Inc.: *See*—
Hughes, Francis H.; Morton, Kenneth O.; LeMere, Roger; and Brown, Fred A., III, 4,176,832, Cl. 271-10.000.
Clumpner, Joseph A., to Swiss Aluminium Ltd. Method for the degassing and filtration of molten metal. 4,177,065, Cl. 75-93.00E.
Clumpner, Joseph A., to Swiss Aluminium Ltd. Method and apparatus for the removal of impurities from molten metal. 4,177,066, Cl. 75-93.00E.
Clymer, Wilbur L.: *See*—
Klara, Charles J.; Hohl, James H.; and Clymer, Wilbur L., 4,176,763, Cl. 221-93.000.
Cohen, Joseph; and Adjemian, Alain, to Aluminum Pechiney. Method of obtaining pure alumina by acid attack on aluminous minerals containing other elements. 4,177,242, Cl. 423-83.000.
Cole, George A. Security gate post. 4,176,868, Cl. 292-258.000.
Cole, H. Ray. Lock device for dump trucks. 4,176,881, Cl. 298-22.00J.
Cole, James D., to F. D. Farnam Co. Apparatus for electrostatic fuel mixing. 4,176,637, Cl. 123-119.00E.
Colgate Palmolive Company: *See*—
Gaffar, Maria C. S.; and Gaffar, Abdul, 4,177,258, Cl. 424-52.000.
Collender, Robert B. Stereoscopic motion picture large scale scanning reproduction method and apparatus. 4,176,923, Cl. 352-58.000.
Collin, John, to Massey-Ferguson Services N.V. Hitch adaptor. 4,176,852, Cl. 280-415.00A.
Collins, John J.: *See*—
Nicholl, Thomas H.; and Collins, John J., 4,177,500, Cl. 362-20.000.
Collins, Johnny, to Zenith Radio Corporation. Digital remote control system with improved noise immunity. 4,177,453, Cl. 340-171.00A.
Colt Industries Operation Corp.: *See*—
McCabe, Ralph P., 4,176,633, Cl. 123-102.000.
Combustion Engineering, Inc.: *See*—
Bevilacqua, Frank, 4,177,385, Cl. 250-507.000.
Blaskowski, Henry J., 4,176,623, Cl. 122-367.0PF.
Comer, Robert C.: *See*—
Baumann, James R.; Comer, Robert C.; and Yourczek, Jerome F., 4,176,508, Cl. 56-12.700.
Cominco Ltd.: *See*—
Kerby, Robert C., 4,177,117, Cl. 204-114.000.
Commonwealth of Australia, The: *See*—
Kossoff, George; and Robinson, David E., 4,176,658, Cl. 128-660.000.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Jaouen, Jean-Yves, 4,177,447, Cl. 340-146.1AB.
Compagnie Internationale pour l'Informatique, CII Honeywell Bull: *See*—
Appell, Marc; Lepicard, Georges; de Rivet, Philippe-Hubert; Bradley, John J.; and Franklin, Benjamin S., 4,177,510, Cl. 364-200.000.
Compagnie Internationale pour l'Informatique Cii - Honeywell Bull (Societe Anonyme): *See*—
Sarrand, Pierre, 4,177,450, Cl. 340-147.0LP.
Concordia Fluidtechnik GmbH: *See*—
Stahle, Kurt, 4,176,686, Cl. 137-604.000.
Concrete Industries (Monier) Limited: *See*—
Day, Henry, 4,177,232, Cl. 264-133.000.
Condon, Michael E.: *See*—
Ondetti, Miguel A.; and Condon, Michael E., 4,177,277, Cl. 424-263.000.
Condon, Nancy J., to Shell Oil Company. Polymeric blend for automotive applications. 4,177,184, Cl. 260-32.60A.
Connor, Peter J., to Mosser Industries, Inc. Purged sliding gate valve. 4,176,673, Cl. 137-240.000.
Conoco, Inc.: *See*—
Bendig, Larry L.; Stowell, Donald E.; and Starks, Laura A., 4,177,251, Cl. 423-628.000.
Conrow, Ransom B.; and Bernstein, Seymour, to American Cyanamid Company. Ureylenebis(anionic substituted phenylene carbonyl)imino naphthalene sulfonic acids and naphthalene carboxylic acids and their salts. 4,177,209, Cl. 260-506.000.
Consortium Fur Elektrochemische Industrie GmbH: *See*—
Kreis, Gerhard; August, Peter; and Wick, Manfred, 4,177,341, Cl. 528-15.000.
Constable, Philip J.: *See*—
Turner, Roy C.; and Constable, Philip J., 4,177,423, Cl. 324-99.00R.
Consumers Glass Company Limited: *See*—
Mancini, Derek V., 4,176,507, Cl. 53-478.000.
Continental Group, Inc., The: *See*—
Roth, Donald J., 4,176,760, Cl. 220-359.000.
Control Electronics Co., Inc.: *See*—
Goldstein, Harold; and Montren, William T., 4,177,407, Cl. 315-312.000.
Cook, Brian: *See*—
Khan, Karrar A.; and Cook, Brian, 4,177,254, Cl. 424-16.000.
Cookson, Richard C.; and Ferro, Lorenzo D., to Bush Boake Allen Limited. 3,3,7,8-Tetramethyl-2-oxabicyclo-[4,4,0]-decane derivatives and their use in perfume compositions. 4,177,170, Cl. 252-522.000.
Cooper, Tallie B. Hammer device attachment. 4,176,541, Cl. 72-474.000.
Copal Company Limited: *See*—
Okabe, Katsuhiko, 4,176,599, Cl. 101-95.000.
Copeland, Thomas M.; Feinberg, Kenneth J.; and Vang, Alfred H. Plotting apparatus. 4,176,455, Cl. 33-1.00M.
Corcoran, Edward J., Jr. Coin actuated timer with audio output. 4,176,739, Cl. 194-9.00T.
Corkery, Gregory O., to Arundale, Inc. Process for improving impact resistance of rigid nylon articles and the articles produced therefrom. 4,176,816, Cl. 248-188.900.
Corno, Maria L.: *See*—
Doria, Gianfederico; Romeo, Ciriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, 4,177,276, Cl. 424-263.000.
Doria, Gianfederico; Romeo, Giriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, 4,177,286, Cl. 424-283.000.
Cosden Technology, Inc.: *See*—
Watson, James M., 4,177,110, Cl. 203-9.000.
Cousin Freres S.A.: *See*—
Cousin, Jacques V. L.; Decroix, Marcel E. R.; and Gouy, Hyppolite P., 4,176,735, Cl. 192-12.00D.
Cousin, Jacques V. L.; Decroix, Marcel E. R.; and Gouy, Hyppolite P., to Cousin Freres S.A. High-speed apparatus for off-winding thread. 4,176,735, Cl. 192-12.00D.
Covert, Garry C.: *See*—
Gaishin, Rudolph M.; and Covert, Garry C., 4,177,426, Cl. 325-37.000.
Covington, Wayne F.: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,177,518, Cl. 364-710.000.
Cox Foundry & Machine Co.: *See*—
Simmons, James W., Jr., 4,176,692, Cl. 139-21.000.
Cox, Howard W., to Mission Marketing Corporation of Arizona. Ventilating damper assembly. 4,176,587, Cl. 98-116.000.
Cox, Michael D.: *See*—
Noddings, John; and Cox, Michael D., 4,177,492, Cl. 361-31.000.
Coyle, Randy. Variable resistance exercising apparatus and method. 4,176,836, Cl. 272-120.000.
Cozine, Michael S., administrator: *See*—
Anderson, Harald, deceased; Anderson, Aelita, administrator; and Cozine, Michael S., administrator, 4,177,037, Cl. 8-149.000.
Cracraft, Julian L. Safety door holder. 4,176,870, Cl. 292-338.000.
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. [1-Oxo-2-thienyl-2-substituted-5-indanyloxy (or thio)]alkanoic acids and derivatives thereof. 4,177,285, Cl. 424-275.000.
Crane Co.: *See*—
Liberman, Richard, 4,176,675, Cl. 137-340.000.
Craven, Geoffrey F.: *See*—
Wallace, Walter M.; and Craven, Geoffrey F., 4,176,749, Cl. 209-457.000.
Creative Tool Specialties, Inc.: *See*—
Anderson, Rodney L., 4,176,585, Cl. 409-125.000.
Creusot-Loire: *See*—
Honnorat, Yves C.; Raisson, Gerard D.; and Morlet, Jean G., 4,177,026, Cl. 425-7.000.
Cromwell, John E.; Herbert, Nicholas; and Hyde, Glenn F., to Koppers Company, Inc. Method of making piston rings with chrome-filled grooves. 4,176,434, Cl. 29-156.630.
Crosby, Samuel C.: *See*—
Whitney, Thomas M.; and Crosby, Samuel C., 4,176,413, Cl. 4-300.000.
Crown Zellerbach: *See*—
Herschler, Robert J., 4,177,267, Cl. 424-238.000.
Crown Zellerbach Corporation: *See*—
Stoilberg, Ray H., 4,176,745, Cl. 206-423.000.
Cudby, Joseph W.; King, Christopher F.; and Syred, Nicholas, to USS Engineers and Consultants, Inc. Fluted,-stepped, pour nozzle. 4,176,769, Cl. 222-591.000.
Culbert, Robert M.; and Raber, Robert R., Jr., to Farr Company. Air filter assembly. 4,177,050, Cl. 55-499.000.
Cummins Engine Company, Inc.: *See*—
Perr, Julius P., 4,176,641, Cl. 123-140.0FG.
Cunneen, Charles: *See*—
Davidson, Thomas; and Cunneen, Charles, 4,176,815, Cl. 248-589.000.
Cuntze, Ulrich: *See*—
Kleber, Rolf; and Cuntze, Ulrich, 4,177,231, Cl. 264-130.000.

Cyphelly, Ivan J. Hydrostatic torque measuring device for rotating shafts. 4,176,548, Cl. 73-136.00D.
D. H. Baldwin & Company: *See*—
Munch, Walter, 4,176,575, Cl. 84-1.010.
Dai Nippon Toryo Co., Ltd.: *See*—
Hayashi, Masaaki; Tsuneta, Kazuyoshi; Takada, Hiroshi; Kenmotsu, Nobuhiro; and Sasaki, Hiroharu, 4,177,174, Cl. 260-18.0PN.
Daicel LTD.: *See*—
Kishi, Kazuo; Hayashi, Minoru; and Naganuma, Kazuo, 4,176,607, Cl. 102-49.300.
Daikin Kogyo Co., Ltd.: *See*—
Yoshimura, Tatsushiro; Namba, Mutsusuke; Suzue, Seisuke; Tominaga, Shigetake; Mizuno, Toshio; and Hayashida, Nariyoshi, 4,177,320, Cl. 428-419.000.
Daimler-Benz Aktiengesellschaft: *See*—
Allert, Anton; Weiss, Friedrich; and Schrape, Peter, 4,176,562, Cl. 74-563.000.
Buchner, Helmut, 4,177,445, Cl. 338-34.000.
Schulz, Manfred; and Kappler, Gudrun, 4,176,877, Cl. 296-208.000.
Dal Bianco, Alberto, to Montedison S.p.A. Tubular reactor for the high pressure polymerization of alpha-olefines. 4,177,240, Cl. 422-115.000.
Dale, Warren H., to Hercules Incorporated. Apparatus and method for automated injection of trees with a treating liquid. 4,176,495, Cl. 47-57.500.
Dalibor, Horst, to Hoechst Aktiengeselischaft. Process for the preparation of coatings composed of polyhydroxy compounds. 4,177,183, Cl. 260-31.40R.
Danel, Francois, to Alsthom-Atlantique. Device for injection of a gas in a liquid. 4,177,226, Cl. 261-124.000.
Dangel, Jurgen: *See*—
Bischoff, Erich; Dangel, Jurgen; Schussler, Hans; Ricker, Thomas; and Stein, Erich, 4,176,442, Cl. 29-571.000.
Daniher, Francis A.; and Oswald, Alexis A., to Exxon Research & Engineering Co. Pesticidal use of N-chlorocrotyl acyl compositions. 4,177,289, Cl. 424-300.000.
Dannelly, Clarence C., to Eastman Kodak Company. Rumen-stable pellets. 4,177,255, Cl. 424-21.000.
Danon, David, to Yeda Research & Development Co. Ltd. Water container. 4,176,772, Cl. 224-148.000.
Darrow, John O. G., to Westinghouse Air Brake Company. Fail-safe acknowledging circuit. 4,177,459, Cl. 340-519.000.
Das, Suryya K.; and Kania, Charles M., to PPG Industries, Inc. Thermosetting acrylic copolymer compositions. 4,177,178, Cl. 260-29.40A.
Date, Nobuaki: *See*—
Kozuki, Susumu; Uchidoi, Masanori; Date, Nobuaki; Shimizu, Masami; Aizawa, Hiroshi; and Takishima, Yoshiyuki, 4,176,936, Cl. 354-38.000.
Davidson, Daniel F., to United Kingdom Atomic Energy Authority. Electromagnetic pumps. 4,177,015, Cl. 417-50.000.
Davidson, Donald R., to Singer Company, The. Low tolerance rotary to linear transmission. 4,176,561, Cl. 74-424.80A.
Davidson, Thomas; and Cunneen, Charles, to F & S Manufacturing Corporation. Variable spring hanger assembly. 4,176,815, Cl. 248-589.000.
Davies, George E.; and Janata, Jiri, to Imperial Chemical Industries Limited. Magnetic particles for immunoassay. 4,177,253, Cl. 424-1.000.
Davis, Jack W.: *See*—
Eckbreth, Alan C.; and Davis, Jack W., 4,176,960, Cl. 356-338.000.
Davis, Robert E.: *See*—
Rhodes, Donald E.; Baldwin, Roger A.; and Davis, Robert E., 4,177,134, Cl. 208-177.000.
Davis, William F., to Motorola, Inc. Monolithic current supplies having high output impedances. 4,177,416, Cl. 323-4.000.
Davy-Loewy Limited: *See*—
Barber, Bernard H., 4,176,540, Cl. 72-201.000.
Day, Henry, to Concrete Industries (Monier) Limited. Coating uncured cementitious surfaces. 4,177,232, Cl. 264-133.000.
Day, Joseph G., to Johnson, Matthey & Co., Limited. Production of yttrium. 4,177,059, Cl. 75-10.00R.
DBX Inc.: *See*—
Jaeger, C. Rene; and Blakely, Lawrence E., 4,177,356, Cl. 179-1.0VL.
DeBoskey, Wentzle R.; and Sebrosky, Robert A., to International Business Machines Corporation. Metalloid filament wire matrix print head. 4,176,975, Cl. 400-124.000.
De Brabandere, Luc A.; Borginon, Hendrik A.; Pattyn, Herman A.; and Pollet, Robert J., to Agfa-Gevaert, N.V. Rapidly processable radiographic materials. 4,177,071, Cl. 430-494.000.
DeBruyne, Patrick; and Sittig, Roland, to BBC Brown Boveri & Company. Electrical circuit with a high-frequency thyristor fired by blocking leakage current. 4,177,479, Cl. 357-38.000.
DeColibus, Raymond L., to Du Pont de Nemours, E. I., and Company. Titanium dioxide pigment slurries to impart high gloss to water-based acrylic paint systems. 4,177,081, Cl. 106-300.000.
Decroix, Marcel E. R.: *See*—
Cousin, Jacques V. L.; Decroix, Marcel E. R.; and Gouy, Hyppolite P., 4,176,735, Cl. 192-12.00D.
Deere & Company: *See*—
Diehl, William K., 4,176,682, Cl. 137-533.110.
Shipinski, John H., 4,176,642, Cl. 123-140.00R.
Deficis, Alain; Gimonet, Marie-Edith; Priou, Alain; and Fournet-Fayas, Christian, to Agence Nationale de Valorisation de la Recherche (A.N.V.A.R.). Apparatus and process for generating an ionized gas or plasma by microwave energy. 4,177,422, Cl. 324-95.000.
Deigner, Paul: *See*—
Schoenafinger, Eduard; Deigner, Paul; Koester, Eberhard; Ohlinger, Manfred; Schaefer, Dieter; Stumpfl, Werner; Amort, Juergen; Seiler, Claus-Dietrich; Nestler, Heinz; and Ambros, Otto, 4,177,317, Cl. 428-405.000.
de Launay, Paul. Check valve. 4,176,680, Cl. 137-496.000.
Del Bo, Vittorio: *See*—
Iannuzzi, Giulio; deMartiis, Carlo C.; Del Bo, Vittorio; and Gandolfi, Luciano, 4,176,443, Cl. 29-589.000.
DeLuca, Raymond F., to Georgia-Pacific Corporation. Multiple wound roll dispenser for flexible sheet material. 4,176,569, Cl. 83-337.000.
DEMAG Aktiengesellschaft: *See*—
Elsner, Wolfgang; Kalter, Werner; Michel, Rolf; and Moslener, Jorn, 4,176,535, Cl. 72-10.000.
deMartiis, Carlo C.: *See*—
Iannuzzi, Giulio; deMartiis, Carlo C.; Del Bo, Vittorio; and Gandolfi, Luciano, 4,176,443, Cl. 29-589.000.
Demer, Joseph: *See*—
Mylrea, Kenneth C.; and Demer, Joseph, 4,176,660, Cl. 128-671.000.
de Montigny, Armand; and Moretto, Hans-Heinrich, to Bayer Aktiengesellschaft. Preparation of silicon-functional polyorganosiloxanes. 4,177,201, Cl. 260-448.20E.
Denney, Jon F. Combined clip and quick release key. 4,176,534, Cl. 70-408.000.
Denny, Patrick J.; Harrison, David L.; and Stacey, Martyn H., to Imperial Chemical Industries Limited. Catalyst bed for use in a catalytic flameless heater device. 4,177,168, Cl. 252-470.000.
DeNora, Oronzio; and Pellegri, Alberto, to Oronzio DeNora Implanti Elettrochimici S.p.A. Electrolytic cell with membrane and method of operation. 4,177,116, Cl. 204-98.000.
de Polo, Harry R. Garments formed of helically coiled pieces. 4,176,408, Cl. 2-69.000.
de Rivet, Philippe-Hubert: *See*—
Appell, Marc; Lepicard, Georges; de Rivet, Philippe-Hubert; Bradley, John J.; and Franklin, Benjamin S., 4,177,510, Cl. 364-200.000.
Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co. Ltd. Intrakeyboard coupling and transposition control for a keyboard musical instrument. 4,176,573, Cl. 84-1.010.
Deuzer Maschinenfabrik GmbH: *See*—
Honig, Helmut, 4,177,371, Cl. 219-59.100.
Devanney, Mary T. Numbers teaching aid. 4,176,472, Cl. 35-32.000.
DeWitt, Leslie, Jr. Aerodynamic throwing disc. 4,176,843, Cl. 273-106.00B.
Dey, Arabinda N.; Miller, John S.; and Bowden, William L., to P. R. Mallory & Co. Inc. Electrolyte salts for non aqueous electrochemical cells. 4,177,329, Cl. 429-101.000.
Diamond Shamrock Corporation: *See*—
Carr, Brian J., 4,177,173, Cl. 260-18.0EP.
Schwartz, Joel; and Fleming, Joseph P., 4,177,243, Cl. 423-167.000.
Diaz, Stephen H., to Raychem Corporation. Heating elements comprising conductive polymers capable of dimensional change. 4,177,446, Cl. 338-212.000.
Dickerson, Delbert J., to Dickerson, Donald R. Automatic shutoff liquid dispensing valve. 4,176,694, Cl. 141-95.000.
Dickerson, Donald R.: *See*—
Dickerson, Delbert J., 4,176,694, Cl. 141-95.000.
Dickerson, Evelyn C.; and Jones, Ronald B. Lounge with articulated side-by-side independently adjustable longitudinal sections. 4,176,415, Cl. 5-66.000.
Dickson, Eric W., to Glacier Metal Company Limited, The. Method and apparatus for reducing metal oxide. 4,177,063, Cl. 75-62.000.
Dideriksen, Erling T., to Interlego A.G. Rotatable element for toy building sets. 4,176,493, Cl. 46-23.000.
Diegelmann, Winfried; Schardt, Gunter; Klatt, Jochen; and Grolz, Heinz, to Schunk & Ebe GmbH. Impregnated carbon brush for electrical machinery. 4,177,316, Cl. 428-367.000.
Diehl, William K., to Deere & Company. Check valve ball stop clip. 4,176,682, Cl. 137-533.110.
Diemert, Paul M.: *See*—
Reed, Frank A., deceased; and Diemert, Paul M., executor, 4,176,987, Cl. 406-10.000.
Diemert, Paul M., executor: *See*—
Reed, Frank A., deceased; and Diemert, Paul M., executor, 4,176,987, Cl. 406-10.000.
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Dietze, Gunther; and Wicklmayr, Matthias, to Thera Gesellschaft fur Patentverwertung mbH. Pharmaceutical composition and method of stimulating blood circulation and wound healing. 4,177,261, Cl. 424-101.000.
Dill, Terry A., to Jefferson Industries Company, The. Pig confinement stall assembly. 4,176,621, Cl. 119-20.000.
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Doria, Gianfederico; Romeo, Giriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, to Farmitalia Carlo Erba, S.p.A. Substituted 2-vinyl-chromones and process for their preparation. 4,177,286, Cl. 424-283.000.
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Dotson, Ronald L.; and Lynch, Richard W., to Olin Corporation Electrochemical production of organic hypohalite compounds in an undivided cell. 4,177,115, Cl. 204-78.000.
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Dow Corning Limited: *See*—
Burrill, Peter M.; and Rankin, Frank S., 4,177,176, Cl. 260-29.20M.
Dow, Walter K. Novel windshield visor support and adapter. 4,176,875, Cl. 296-97.00K.
Dowd, Daniel J., to Westvaco Corporation. Stretchable material rewinding machine. 4,177,410, Cl. 318-163.000.
Down, Clive L. C., to Avon Industrial Polymers (Melksham) Limited. Attachment of hovercraft fingers. 4,176,729, Cl. 180-127.000.
Doyle, Charles E., Jr. Skewer. 4,176,592, Cl. 99-419.000.
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Eickel, Rolf; and Rheude, Alfred, to Agfa-Gevaert Aktiengesellschaft. Method and apparatus for making and developing ionographic images of X-rayed objects. 4,177,380, Cl. 250-315.200.
Eisenmann, Siegfried; and Harle, Hermann, to Furstlich Hohenzollernsche Huttenverwaltung Laucherthal. High-pressure rotary fluid-displacing machine. 4,177,025, Cl. 418-133.000.
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Franke, John M., to United States of America, National Aeronautics and Space Administration. Laser Doppler velocity simulator. 4,176,950, Cl. 356-28.000.

Franke, Walter. Internal combustion engine. 4,176,632, Cl. 123-75.00B.

Franklin, Benjamin S.: *See—*
Appell, Marc; Lepicard, Georges; de Rivet, Philippe-Hubert; Bradley, John J.; and Franklin, Benjamin S., 4,177,510, Cl. 364-200.000.

Franks, Neal E., to Akzona Inc. Process for producing regenerated cellulose containing cross linked sodium lignate or sodium lignosulfonate. 4,177,236, Cl. 264-187.000.

Franzen, Hans A. E.: *See—*
Albrektsson, Kjell A.; Eriksson, Bertil T.; Eriksson, Sven W.; Franzen, Hans A. E.; and Sandlin, Rolf H., 4,176,814, Cl. 244-3.150.

Franzen, Stig E. R.: *See—*
Otteblad, Sven I. A.; Brynielsson, Erner T. O.; Dovertie, Ralph G.; Franzen, Stig E. R.; and Brelen, Hans E. O., 4,176,728, Cl. 180-168.000.

Frazee, Ralph E., Jr.; and Smithgall, David H., Sr., to Western Electric Co., Inc. Methods and apparatus for improving the resolution of measured parameters. 4,176,961, Cl. 356-355.000.

Frazer, Robert E., to United States of America, National Aeronautics and Space Administration. Apparatus for endoscopic examination. 4,176,662, Cl. 128-6.000.

Frechet, Daniel: *See—*
Nedelec, Lucien; Frechet, Daniel; Dumont, Claude; and Hunt, Peter, 4,177,292, Cl. 424-330.000.

Freiter, Gerhard, to U.S. Philips Corporation. Actuating mechanism for a record changer with a stacking spindle. 4,176,846, Cl. 274-10.00S.

Freudlsperger, Hans: *See—*
Gansauge, Jost; Muschi, Johann; and Freudlsperger, Hans, 4,176,710, Cl. 165-104.00F.

Fridman, Vladimir M.: *See—*
Zagorodnaya, Galina A.; Vartanian, Gurgen P.; Khutoretsky, Garri M.; and Fridman, Vladimir M., 4,177,398, Cl. 310-270.000.

Fritts, Rex E., to Amana Refrigeration, Inc. Digitally programmed microwave oven. 4,177,369, Cl. 219-10.55B.

Fritz, Adolf: *See—*
Hellberg, Rainer; Steinke, Leo; and Fritz, Adolf, 4,176,644, Cl. 123-148.00E.

Frohbieter, Edwin H., to Whirlpool Corporation. Conveyor belt for ice dispenser. 4,176,528, Cl. 62-344.000.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Mori, Haruo, 4,176,636, Cl. 123-119.00A.

Fuji Kogyo Co., Ltd.: *See—*
Ohmura, Ryuichi, 4,176,488, Cl. 43-24.000.

Fuji Photo Film Co., Ltd.: *See—*
Ono, Yoshihiro; Harada, Shigeo; Mizobuchi, Yuzo; and Ikeda, Tomoaki, 4,177,072, Cl. 430-302.000.
Takahashi, Koji, 4,176,946, Cl. 355-38.000.

Fuji Xerox Co., Ltd.: *See—*
Takenouchi, Mutsuo; Ozawa, Takashi; Wako, Syoji; and Itoh, Satoru, 4,177,487, Cl. 358-294.000.

Fujibayashi, Kazuo, to Canon Kabushiki Kaisha. Compact retrofocus wide angle objective. 4,176,914, Cl. 350-214.000.

Fujimoto, Yasuhiro; and Suzuki, Masao, to Sansui Electric Co., Ltd. Moving magnet type pickup cartridge. 4,177,360, Cl. 179-100.41M.

Fujioka, Tomio: *See—*
Yonemitsu, Eiichi; Miyamori, Hiroshi; Nawata, Takanari; Fujioka, Tomio; Ito, Akira; and Kobayashi, Makoto, 4,177,247, Cl. 423-515.000.

Fujitsu Limited: *See—*
Furukawa, Yasuo; Goto, Yoshiro; and Inagaki, Takefumi, 4,177,379, Cl. 250-306.000.

Fukada Works, Ltd.: *See—*
Taki, Minoru, 4,177,444, Cl. 337-163.000.

Fukinuki, Takahiko; and Yoshigi, Hiroshi, to Hitachi, Ltd. Decoder for variable-length codes. 4,177,456, Cl. 340-347.0DD.

Fukuda, Hiroshi; and Matsuzaka, Haruo, to Matsu Kyu Kabushiki Kaisha. Contactless digital key switch. 4,176,782, Cl. 235-449.000.

Fukuda, Kenji: *See—*
Maeda, Yoshio; Matsumoto, Koichi; Fukuda, Kenji; and Shindo, Isao, 4,176,957, Cl. 356-319.000.

Funahashi, Osamu: *See—*
Mishima, Takao; Semba, Shoji; Ogata, Kiichi; and Funahashi, Osamu, 4,176,532, Cl. 68-19.000.

Furstlich Hohenzollernsche Huttenverwaltung Laucherthal: *See—*
Eisenmann, Siegfried; and Harle, Hermann, 4,177,025, Cl. 418-133.000.

Furukawa, Yasuo; Goto, Yoshiro; and Inagaki, Takefumi, to Fujitsu Limited. Back-scattered electron detector for use in an electron microscope or electron beam exposure system to detect back-scattered electrons. 4,177,379, Cl. 250-306.000.

G S & H Equipment Corporation: *See—*
Griner, Henry; Griner, Wade; Hyars, Claude; and Sweat, Tommy, 4,176,509, Cl. 56-27.500.
Griner, Henry; Griner, Wade; Hyars, Claude; and Sweat, Tommy, 4,176,510, Cl. 56-27.500.

GAF Corporation: *See—*
Chakrabarti, Paritosh M., 4,177,154, Cl. 252-32.500.

Gaffar, Abdul: *See—*
Gaffar, Maria C. S.; and Gaffar, Abdul, 4,177,258, Cl. 424-52.000.

Gaffar, Maria C. S.; and Gaffar, Abdul, to Colgate Palmolive Company. Dentifrice for dental remineralization. 4,177,258, Cl. 424-52.000.

Gagin, Lawrence V., to Johns-Manville Corporation. Glass composition for fiberization. 4,177,077, Cl. 106-50.000.

Gaishin, Rudolph M.; and Covert, Garry C., to Heath Company. Radio control system with pluggable modules for changing system operating frequency. 4,177,426, Cl. 325-37.000.

Gallegos, Manuel. Supporting bracket for musical instruments. 4,176,580, Cl. 84-327.000.

Galy, Henri: *See—*
Boy, Aristide; Galy, Henri; Ivaldi, Raoul; and Passedroit, Hubert, 4,177,208, Cl. 260-504.00S.

Gamo, Hiroshi: *See—*
Hokuyo, Shigeru; and Gamo, Hiroshi, 4,177,477, Cl. 357-38.000.

Gandolfi, Luciano: *See—*
Iannuzzi, Giulio; deMartiis, Carlo C.; Del Bo, Vittorio; and Gandolfi, Luciano, 4,176,443, Cl. 29-589.000.

Gansauge, Jost; Muschi, Johann; and Freudlsperger, Hans, to Wacker-Chemie GmbH. Fluidized bed reactor. 4,176,710, Cl. 165-104.00F.

Ganszczyk, Helen: *See—*
Shadbolt, Philip; and Ganszczyk, Helen, 4,177,309, Cl. 428-195.000.

Garavalia, Thomas A.: *See—*
Schlangen, Andrew J.; McClead, Jerry W.; and Garavalia, Thomas A., 4,177,007, Cl. 415-160.000.

Garbalizer Corporation of America: *See—*
Brewer, John C., 4,176,800, Cl. 241-243.000.

Gardner, James F., to Ingersoll-Rand Company. Variable eccentric device. 4,176,983, Cl. 404-117.000.

Garrett Corporation, The: *See—*
Nancarrow, James H., 4,177,006, Cl. 415-151.000.
Rousseau, Jean L. I., 4,176,523, Cl. 62-2.000.

Gartung, Clifford W., to Pleion Corporation. Modular storage unit assembly. 4,176,889, Cl. 312-195.000.

Gary, Fred J. Heat recovery device for use in return air duct of forced air furnace. 4,176,787, Cl. 237-55.000.

Gebel, Iosif D.; Zykov, Arkady A.; Nefedov, Askold I.; Parshikov, Viktor I.; and Khrolenko, Viktor F., to Spetsialnoe Knostruktorskoe Bjuro PO Proektirovaniju Shlifovalnogo Oborudovania. Device for measuring the deviation of object with nominally circular cross-section from the round shape. 4,176,461, Cl. 33-178.00D.

Gebruder Welger: *See—*
Sacht, Hans O., 4,176,596, Cl. 100-88.000.

Gelfand, Ilya M.: *See—*
Bezvulyak, Anatoly S.; Gelfand, Ilya M.; Torchinsky, Efim M.; Pushkin, Sergei B.; Vedernikov, Rudolf K.; Kulachenkov, Gennady P.; Tkachuk, Petr F.; and Karyagin, Viktor F., 4,176,952, Cl. 356-47.000.

Gellman, Barry N., to Becton, Dickinson and Company. Stopper lock for culture bottle. 4,176,756, Cl. 215-274.000.

Gene Fowler and Friends Inc.: *See—*
Fowler, Eugene W., 4,176,860, Cl. 283-34.000.

General Cable Corporation: *See—*
Olszewski, Jerzy A.; and Ramy, Towheed, 4,176,893, Cl. 339-14.00R.

Rubinstein, Solomon, 4,176,866, Cl. 285-421.000.
General Dynamics Corporation: *See—*
Feddersen, Phyllis A., 4,176,602, Cl. 430-308.000.
Shores, Marvin W., 4,177,427, Cl. 325-369.000.
General Electric Company: *See—*
Divins, Larry A.; and Short, Larry E., 4,177,241, Cl. 423-20.000.
Eskesen, John H.; and Leibowitz, Herman M., 4,177,011, Cl. 416-191.000.
Fiedler, Howard C., 4,177,091, Cl. 148-111.000.
Gray, David A.; and Sivertsen, Marvin L., 4,176,826, Cl. 254-175.000.
Henderson, Alfred J., Jr.; and Fletcher, Thomas A., 4,177,504, Cl. 362-282.000.
Leete, Bernard D., 4,177,507, Cl. 363-51.000.
Malone, Paul E., 4,177,387, Cl. 290-40.00R.
McCardle, Arthur, Jr., 4,176,792, Cl. 239-265.410.
Razzano, John S.; Petersen, Louis P.; and Ashby, Bruce A., 4,177,200, Cl. 260-448.20N.
Riedmiller, Charles F.; and Bobo, Melvin, 4,177,004, Cl. 415-116.000.
Rupp, Charle R., 4,177,514, Cl. 364-200.000.
Smith, Alfred H., Jr., 4,177,301, Cl. 427-401.000.
Stoner, Jesse A.; and Mills, Robert L., 4,176,693, Cl. 141-1.000.
General Motors Corporation: *See—*
Adams, Richard L., 4,177,157, Cl. 252-182.100.
General Staple Company, Inc.: *See—*
Zahn, Irwin; and Meyer, Heinrich F., 4,176,448, Cl. 29-626.000.
Georg Rost & Sohne: *See—*
Strangfeld, Reiner, 4,176,821, Cl. 251-38.000.
Georgia-Pacific Corporation: *See—*
DeLuca, Raymond F., 4,176,569, Cl. 83-337.000.
Herault, Pierre C., 4,177,313, Cl. 428-288.000.
Rivers, Morris R.; Osterman, Ralph G.; and Warmuth, George H., 4,177,048, Cl. 55-275.000.
Gerry, Martin E. Modulation ignition system. 4,176,647, Cl. 123-148.00E.
Gerschwitz, Walter: *See—*
Hoefer, Friedrich-Wilhelm; Gerschwitz, Walter; and Schwerin, Guenther, 4,176,685, Cl. 137-596.130.
Gerstenberg, Roy W.: *See—*
Barnes, William; Gerstenberg, Roy W.; Kropa, Gomer E.; and LeJeune, Roland A., 4,176,796, Cl. 241-30.000.
Gesellschaft fur elektronische Rohren Comet Bern: *See—*
Perret, Maurice, 4,177,495, Cl. 361-279.000.
Gewerkschaft Eisenhutte Westfalia: *See—*
Erwien, Helmut; and Karsten, Werner, 4,176,884, Cl. 299-14.000.
Ghosh, Amal K.: *See—*
Feng, Tom; and Ghosh, Amal K., 4,177,093, Cl. 148-174.000.
Gibson, Harry; and Jones, John W. D., to Smiths Industries Limited. Aircraft instruments. 4,176,546, Cl. 73-182.000.
Gikis, Benjamin J.: *See—*
Murray, Robert G.; and Gikis, Benjamin J., 4,176,465, Cl. 34-31.000.
Gillette Company, The: *See—*
Ascoli, Enzo, 4,177,413, Cl. 320-2.000.
Gillissie, Michael J. E., to Northern Telecom Limited. Container apparatus for handling semiconductor wafers. 4,176,751, Cl. 211-41.000.
Gillow, George B.: *See—*
Armstrong, Rolfe D.; and Gillow, George B., 4,177,455, Cl. 340-347.0DD.
Gilst, Carl V., to Ag Best Corporation. Gate latching apparatus for animal closure panels. 4,176,869, Cl. 292-304.000.
Gimonet, Marie-Edith: *See—*
Deficis, Alain; Gimonet, Marie-Edith; Priou, Alain; and Fournet-Fayas, Christian, 4,177,422, Cl. 324-95.000.
Gingo, Joseph M.: *See—*
Russell, C. Paul; Gingo, Joseph M.; and Drica-Minieris, Oswald A., 4,176,705, Cl. 152-359.000.
Giordano, Dennis R., to Safron Printing Company. Non-counterfeitable documents. 4,176,859, Cl. 283-8.00R.
Giraldi, Piernicola: *See—*
Doria, Gianfederico; Romeo, Ciriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, 4,177,276, Cl. 424-263.000.
Doria, Gianfederico; Romeo, Giriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, 4,177,286, Cl. 424-283.000.
Gist-Brocades N.V.: *See—*
Akkerboom, Piet J.; Lower, Geertruuda J.; and Timp, Willem J., 4,177,189, Cl. 260-239.100.
Gittner, Franz; Glaser, Arnaldo; and Kotke, Klaus D., to Bekum Maschinenfabriken GmbH. Blow molding method. 4,177,239, Cl. 264-530.000.
Glacier Metal Company Limited, The: *See—*
Dickson, Eric W., 4,177,063, Cl. 75-62.000.
Glaser, Arnaldo: *See—*
Gittner, Franz; Glaser, Arnaldo; and Kotke, Klaus D., 4,177,239, Cl. 264-530.000.
Glaser, Hans E. Binding for cross-country skis. 4,176,856, Cl. 280-611.000.
Gliatas, Themistocles H., to Ranco Incorporated. Butterfly valve. 4,176,823, Cl. 251-306.000.
Glick, Earl. Universal electrical outlet box and method of installing. 4,176,758, Cl. 220-3.300.
Global Marine, Inc.: *See—*
Wetmore, Sherman B.; McNary, James F.; and Person, Abraham, 4,176,722, Cl. 175-7.000.
Wetmore, Sherman B., 4,176,863, Cl. 285-18.000.
Glogowski, Andrzej: *See—*
Bielecki, Marek; Bogdanski, Andrzej; Buxakowski, Andrzej; Chudzinski, Janusz; Glogowski, Andrzej; Kopczynski, Marian; Krolikowski, Andrzej; Kryszewski, Jozef; Moczulski, Zdzislaw; Ochocki, Wlodzimierz; Pomorski, Aleksander; Rumatowski, Karol; Sawicki, Janusz; Szostakowski, Henryk; Warowny, Tadeusz; Wisniewski, Teofil; and Wozniak, Antoni, 4,176,624, Cl. 123-32.0EA.
Gobl, Horst, to Linde Aktiengesellschaft. Thermally insulated vessel especially for liquefied gases. 4,176,761, Cl. 220-438.000.
Godbey, Josiah J. Internal electrical interconnect coupler. 4,176,894, Cl. 339-15.000.
Goddard, Michael R.: *See—*
King, Colin M.; Goddard, Michael R.; and Murray, Dudley C., 4,176,606, Cl. 102-37.400.
Godfrey, Steven W., to Hunt Manufacturing Co. Hanging file support frame. 4,176,753, Cl. 211-182.000.
Goebel, Bert; and Perez, Leo. Hitting mitt. 4,176,407, Cl. 2-20.000.
Gohlke, Arthur F., to Cities Service Company. Composition for controlling fungi. 4,177,288, Cl. 424-294.000.
Goland, Yaacov, to Joy Manufacturing Company. Electrostatic precipitators. 4,177,047, Cl. 55-146.000.
Goldie, Harry: *See—*
McLaughlin, James F.; and Goldie, Harry, 4,177,437, Cl. 333-13.000.
Goldsmith, Burton J.: *See—*
Bigelow, Eugene H.; and Goldsmith, Burton J., 4,176,715, Cl. 166-138.000.
Goldstein, Harold; and Montren, William T., to Control Electronics Co., Inc. Electronic votive lights. 4,177,407, Cl. 315-312.000.
Goldsworthy, William B.; and Karlson, Harald E., to McDonnell Douglas Corporation. Apparatus for continuously fabricating three-dimensional filament reinforced foam insulation. 4,177,029, Cl. 425-112.000.
Gony, Jean-Noel: *See—*
Clin, Francois H.; Gony, Jean-Noel; and Proust, Francois O., 4,176,799, Cl. 241-74.000.
Good, William R.: *See—*
Mueller, Karl F.; and Good, William R., 4,177,056, Cl. 71-93.000.
Goodyear Tire & Rubber Company, The: *See—*
Russell, C. Paul; Gingo, Joseph M.; and Drica-Minieris, Oswald A., 4,176,705, Cl. 152-359.000.
Goossens, John: *See—*
Traenckner, Hans-Joachim; Goossens, John; Kremer, Wolfgang; and Kronke, Heinz, 4,177,172, Cl. 260-15.000.
Gordon, Michael E.; and Stieger, Frank, to Polaroid Corporation. Laminar batteries and methods of making the same. 4,177,330, Cl. 429-152.000.
Gorini, Robert F.; Johnson, Herbert; and Sillars, Frederick S., to USM Corporation. Method for stiffening flexible workpieces. 4,177,098, Cl. 156-80.000.
Gorton, Howard B., to Ajax Hardware Corporation. Drawer and support system. 4,176,890, Cl. 312-343.000.
Goss, Wilbur H.; and Bergman, Gunnar B., to SeaTek Corporation. Control force tank and method for stabilizing floating vessels. 4,176,614, Cl. 114-125.000.
Goto, Yoshiro: *See—*
Furukawa, Yasuo; Goto, Yoshiro; and Inagaki, Takefumi, 4,177,379, Cl. 250-306.000.
Gotoh, Isamu; Okamoto, Yoshinori; and Wakatsuki, Goroei, to Honda Giken Kogyo Kabushiki Kaisha. Engine starting device. 4,176,648, Cl. 123-179.00S.
Goulay, Jean: *See—*
Lormeau, Jean-Claude; Choay, Jean; and Goulay, Jean, 4,177,262, Cl. 424-105.000.
Gouy, Hyppolite P.: *See—*
Cousin, Jacques V. L.; Decroix, Marcel E. R.; and Gouy, Hyppolite P., 4,176,735, Cl. 192-12.00D.
Gover, Russell D., Sr. Boring tool. 4,176,990, Cl. 408-189.000.
Grab, Frederick L.: *See—*
Granatek, Edmund S.; Ruva, Frank D.; and Grab, Frederick L., 4,177,199, Cl. 260-430.000.
Granatek, Edmund S.; Ruva, Frank D.; and Grab, Frederick L., to Bristol-Myers Company. Silver salts of phosphanilic acid. 4,177,199, Cl. 260-430.000.
Granet, Jacques R., to Le Material Telephonique. Apparatus for regulating the passage and flow rate of a liquid. 4,177,018, Cl. 417-338.000.
Grawey, Charles E.; Ball, Glenn A.; and Zook, Donald G., to Caterpillar Tractor Co. Core portion for a tube tire. 4,177,027, Cl. 425-49.000.
Gray, David A.; and Sivertsen, Marvin L., to General Electric Company. Safety catch apparatus for a suspension system. 4,176,826, Cl. 254-175.000.
Greaves, Terence M.; and Summers, Robert D., to Rolls-Royce Limited. Cooled rotor blade for a gas turbine engine. 4,177,010, Cl. 416-97.00R.
Greber, Gerd: *See—*
Rody, Jean; Greber, Gerd; and Muller, Helmut, 4,177,186, Cl. 260-45.80N.
Greenhalgh, Peter F.: *See—*
Hildon, Anthony M.; and Greenhalgh, Peter F., 4,177,196, Cl. 260-348.250.

Greeninger, Carroll D., to Bunyan's Woodcutter Corp. Fireplace wood cutting machine. 4,176,696, Cl. 144-3.00K.
Greenspan, Stephen B.: *See—*
Balasubramanian, Peruvemba S.; and Greenspan, Stephen B., 4,177,452, Cl. 340-166.00R.
Gregory, Stephen A.; and Welzen, Joseph A. Stenotype tape marking attachment. 4,176,973, Cl. 400-91.000.
Griffin, Jacqulyn G. Batting baseball tee. 4,176,838, Cl. 273-26.00E.
Griggs, William K.; and Holland, Harry, to Tumbleweed Enterprises. Motorcycle canteen. 4,176,770, Cl. 224-30.00A.
Griner, Henry; Griner, Wade; Hyars, Claude; and Sweat, Tommy, to G S & H Equipment Corporation. Laterally adjustable tobacco combine. 4,176,509, Cl. 56-27.500.
Griner, Henry; Griner, Wade; Hyars, Claude; and Sweat, Tommy, to G S & H Equipment Corporation. Tobacco combine hydraulic motor system. 4,176,510, Cl. 56-27.500.
Griner, Wade: *See—*
Griner, Henry; Griner, Wade; Hyars, Claude; and Sweat, Tommy, 4,176,509, Cl. 56-27.500.
Griner, Henry; Griner, Wade; Hyars, Claude; and Sweat, Tommy, 4,176,510, Cl. 56-27.500.
Griselli, Pier Luigi: *See—*
Cecchin, Giuliano; Luciani, Luciano; and Griselli, Pier Luigi, 4,177,160, Cl. 252-429.00B.
Groen, Marinus B.: *See—*
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Grolz, Heinz: *See—*
Diegelmann, Winfried; Schardt, Gunter; Klatt, Jochen; and Grolz, Heinz, 4,177,316, Cl. 428-367.000.
Gropper, Hans: *See—*
Boettcher, Klaus; Hoerdt, Heinrich G.; Pfleger, Klaus; Zacher, Wieland; and Gropper, Hans, 4,177,340, Cl. 526-329.000.
Grotta, Henry M.: *See—*
Rosenberg, Harvey S.; and Grotta, Henry M., 4,177,245, Cl. 423-242.000.
Grubbs, Harvey J.: *See—*
Van Auken, Thomas V.; Grubbs, Harvey J.; and Johnson, William R., Jr., 4,177,339, Cl. 526-314.000.
GTE Laboratories Incorporated: *See—*
Kocher, Robert C.; and Piorkow, Alfred, 4,176,925, Cl. 354-1.000.
GTE Sylvania Canada Limited: *See—*
Nattel, William, 4,176,759, Cl. 220-3.940.
GTE Sylvania Incorporated: *See—*
Antonucci, Ermen S.; Cadden, Duane L.; Regenbrecht, Albert; and Schwartz, Edward, 4,176,891, Cl. 316-2.000.
Guaita, Cesare: *See—*
Siclari, Francesco; Rossi, Pietro P.; Guaita, Cesare; and L'Acqua, Vito, 4,177,214, Cl. 260-601.00R.
Guillod, Mark S.: *See—*
Michaels, Alan S.; and Guillod, Mark S., 4,177,256, Cl. 424-22.000.
Gustav Wiegard Maschinenfabrik: *See—*
Holter, Karl; and Wiegard, Gustav, 4,176,462, Cl. 33-182.000.
H. H. Robertson Company: *See—*
Ting, Raymond M. L., 4,176,503, Cl. 52-1.000.
Haake, Inc.: *See—*
Kromer, Heiner M.; and Ossman, John, 4,176,968, Cl. 366-97.000.
Hach Chemical Company: *See—*
Hach, Clifford C.; and Zemke, Wayne P., 4,177,148, Cl. 210-396.000.
Hach, Clifford C.; and Zemke, Wayne P., to Hach Chemical Company. Mechanical strainer. 4,177,148, Cl. 210-396.000.
Hachiya, Iwao: *See—*
Mochizuki, Keizo; and Hachiya, Iwao, 4,177,296, Cl. 426-632.000.
Haferl, Peter E., to RCA Corporation. Current switching networks. 4,177,392, Cl. 307-254.000.
Hafner, Otto P. Locking joint machine. 4,176,441, Cl. 29-566.100.
Hagiuda, Nobuyoshi; and Tanaka, Hiroaki, to Nippon Kogaku K.K. Shutter release mechanism for cinecamera. 4,176,924, Cl. 352-174.000.
Hagiwara, Hidehiko: *See—*
Imaki, Masakatu; Hagiwara, Hidehiko; and Usui, Seiji, 4,177,126, Cl. 204-195.00F.
Hahn, Ulrich; and Stumpe, Klaus, to C. Otto & Comp. G.m.b.H. Process for treating particles of adsorbent used to remove phenol from waste water. 4,177,139, Cl. 210-33.000.
Halbfoster, Christopher J., to Ecodyne Corporation. Mixture of oppositely charged filter aid material. 4,177,142, Cl. 210-75.000.
Hall, Emerson O.: *See—*
Clipston, Robert H.; Hall, Emerson O.; and Ng, Hon-Hei F., 4,177,303, Cl. 427-259.000.
Hall, Wilbur S., to Amchem Products, Inc. Composition comprising resin and pigment for autodeposition. 4,177,180, Cl. 260-29.70H.
Halliburton, Ronald D.: *See—*
Ryan, Allen L.; Jansons, Eric G.; Halliburton, Ronald D.; and Pearson, James H., 4,176,844, Cl. 273-121.00A.
Hamacher, Leonhard W.: *See—*
Young, Maurice A.; and Hamacher, Leonhard W., 4,176,513, Cl. 57-237.000.
Hammer, Jacob M.; and Neil, Clyde C., to RCA Corporation. Fiber-optic thermometer. 4,176,551, Cl. 73-339.00R.
Hammer, Jacob M., to RCA Corporation. Fiber-optic thermometer. 4,176,552, Cl. 73-339.00R.
Hancock, Charles J.: *See—*
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Hankosky, Andrew: *See—*
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Hansen, Bertil: *See—*
Fex, Hans; Hansen, Bertil; Holmberg, Krister; Hogberg, Bertil; and Konyves, Imre, 4,177,269, Cl. 424-243.000.
Hansen, Jorgen F., to Nordisk Insulinlaboratorium. Process for recovering purified albumin from blood plasma using PEG and caprylic acid. 4,177,188, Cl. 260-122.000.
Hara, Takeo: *See—*
Kasubuchi, Takeshi; Ozawa, Kaoru; and Hara, Takeo, 4,177,519, Cl. 364-712.000.
Harada, Shigeo: *See—*
Ono, Yoshihiro; Harada, Shigeo; Mizobuchi, Yuzo; and Ikeda, Tomoaki, 4,177,072, Cl. 430-302.000.
Harigaya, Isao: *See—*
Ito, Fumio; Tsunekawa, Tokuichi; Taguchi, Tetsuya; and Harigaya, Isao, 4,176,929, Cl. 354-29.000.
Harle, Hermann: *See—*
Eisenmann, Siegfried; and Harle, Hermann, 4,177,025, Cl. 418-133.000.
Harris Corporation: *See—*
Karlin, James H., 4,177,501, Cl. 362-26.000.
Harris, Len A.: *See—*
Baney, Ronald H.; and Harris, Len A., 4,177,175, Cl. 260-29.20M.
Harrison, David L.: *See—*
Denny, Patrick J.; Harrison, David L.; and Stacey, Martyn H., 4,177,168, Cl. 252-470.000.
Harsco Corporation: *See—*
Pack, Paul R., 4,177,062, Cl. 75-28.000.
Hartman & Braun AG.: *See—*
Fabinski, Walter; and Faulhaber, Reimar, 4,176,963, Cl. 356-418.000.
Hartman, Robert F.: *See—*
Linstromberg, William J.; and Hartman, Robert F. 4,176,527, Cl. 62-320.000.
Hartman, Robert J.: *See—*
Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,177,335, Cl. 521-171.000.
Harvey, Kenneth L.; and Dixon, Howard D., to United States of America, Air Force. Low shear mixing process for the manufacture of solid propellants. 4,177,227, Cl. 264-3.00R.
Hase, Yoshihiko: *See—*
Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; Yamamoto, Minoru; and Hase, Yoshihiko, 4,177,133, Cl. 208-50.000.
Hasebe, Mitsuo, to Ricoh Company, Ltd. Electrophotographic apparatus. 4,176,943, Cl. 355-14.00R.
Hasegawa, Atsushi: *See—*
Obi, Tatsuro; Koyama, Teruo; Tanaka, Tadashi; and Hasegawa, Atsushi, 4,177,323, Cl. 428-622.000.
Hasegawa, Isao, to Clarion Co. Ltd. Tape running mechanism provided with automatic stopping device. 4,177,489, Cl. 360-74.200.
Hasegawa, Kensuke: *See—*
Motoda, Kenro; and Hasegawa, Kensuke, 4,177,002, Cl. 414-751.000.
Haslett, John A., Jr., to Flo Dri Company. Compressed gas filter. 4,177,049, Cl. 55-483.000.
Hassell, Aarno A., to Rogers Corporation. Cushion insole. 4,176,476, Cl. 36-44.000.
Hata, Yukinori; Watanabe, Tsutomu; and Itoh, Fumio, to Oji Paper Co., Ltd. Photosensitive resin composition comprising cellulose ether aromatic carboxylic ester. 4,177,073, Cl. 430-188.000.
Hatada, Kenzo: *See—*
Kawakami, Hakuhei; Ishihara, Takeshi; and Hatada, Kenzo, 4,176,518, Cl. 58-38.00R.
Hatter, Edward E.; Taylor, Richard H.; and McGunigle, Richard D., to Biosonics International, Ltd. Ultrasonic tooth cleaner. 4,176,454, Cl. 433-119.000.
Hauptschein, Murray: *See—*
Toukan, Sameeh S.; and Hauptschein, Murray, 4,177,351, Cl. 548-325.000.
Havey, Ambrose S., III Multi-element casket. 4,176,431, Cl. 27-2.000.
Hayakawa, Mitsutaka: *See—*
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; Kuroha, Kenji; and Hayakawa, Mitsutaka, 4,176,965, Cl. 366-8.000.
Hayashi, Kiyoshi: *See—*
Nakamura, Soichi; and Hayashi, Kiyoshi, 4,176,913, Cl. 350-214.000.
Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; Yamamoto, Minoru; and Hase, Yoshihiko, to Maruzen Petrochemical Co., Ltd. Process for producing high-crystalline petroleum coke. 4,177,133, Cl. 208-50.000.
Hayashi, Masaaki; Tsuneta, Kazuyoshi; Takada, Hiroshi; Kenmotsu, Nobuhiro; and Sasaki, Hiroharu, to Dai Nippon Toryo Co., Ltd. Epoxy resin composition cured by reaction product of phenol carboxylic acids with polyamino compounds. 4,177,174, Cl. 260-18.0PN.
Hayashi, Minoru: *See—*
Kishi, Kazuo; Hayashi, Minoru; and Naganuma, Kazuo, 4,176,607, Cl. 102-49.300.
Hayashida, Nariyoshi. *See—*
Yoshimura, Tatsushiro; Namba, Mutsusuke; Suzue, Seisuke; Tominaga, Shigetake; Mizuno, Toshio; and Hayashida, Nariyoshi, 4,177,320, Cl. 428-419.000.
Hazan, Isidor, to Du Pont de Nemours, E. I., and Company. Process for electrodeposition of graft copolymer. 4,177,124, Cl. 204-181.00C.

Headley, Jack W.; Skow, Andrew M.; and Titiriga, Andrew, Jr., to Northrop Corporation. Shark nose for aircraft. 4,176,813, Cl. 244-130.000.

Heath Company: *See—*
Gaishin, Rudolph M.; and Covert, Garry C., 4,177,426, Cl. 325-37.000.

Heiba, El-Ahmadi I.; Kinney, Robert E.; and Stead, George E., to Mobil Oil Corporation. Succinimides of amino aromatic sulfonic acid salts. 4,177,192, Cl. 260-326.220.

Heilhecker, Joe K.: *See—*
Taft, Daniel G.; and Heilhecker, Joe K., 4,176,986, Cl. 405-211.000.

Heimlicher, Paul, to Maschinenfabrik WIFAG. Apparatus for adjusting printing press for changes in paper size. 4,176,833, Cl. 270-71.000.

Heinemann, Henning: *See—*
Liepmann, Hans; Hueschens, Rolf; Milkowski, Wolfgang; Zeugner, Horst; Heinemann, Henning; Wolf, Klaus-Ullrich; Hell, Insa; and Hempel, Reinhard, 4,177,287, Cl. 424-285.000.

Heinrich, Elmer G., to Citation Manufacturing Co., Inc. Electric clutch control. 4,176,793, Cl. 239-407.000.

Heise, Arend: *See—*
Bossert, Friedrich; Wehinger, Egbert; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, 4,177,278, Cl. 424-266.000.

Hell, Insa: *See—*
Liepmann, Hans; Hueschens, Rolf; Milkowski, Wolfgang; Zeugner, Horst; Heinemann, Henning; Wolf, Klaus-Ullrich; Hell, Insa; and Hempel, Reinhard, 4,177,287, Cl. 424-285.000.

Hellberg, Rainer; Steinke, Leo; and Fritz, Adolf, to Robert Bosch GmbH. Engine ignition system with variable spark internal duration. 4,176,644, Cl. 123-148.00E.

Hempel, Reinhard: *See—*
Liepmann, Hans; Hueschens, Rolf; Milkowski, Wolfgang; Zeugner, Horst; Heinemann, Henning; Wolf, Klaus-Ullrich; Hell, Insa; and Hempel, Reinhard, 4,177,287, Cl. 424-285.000.

Henderson, Alfred J., Jr.; and Fletcher, Thomas A., to General Electric Company. Luminaire reflector mounting for rotation of asymmetric reflector. 4,177,504, Cl. 362-282.000

Hendrix Electronics Incorporated: *See—*
Chamberlin, Howard A., Jr., 4,177,409, Cl. 315-383.000.

Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See—*
Lehmann, Hans-Juergen; Bietz, Rolf; and Wegner, Juergen, 4,177,294, Cl. 426-271.000.

Henri Muhlethaler S.A.: *See—*
Muhlethaler, Henri, 4,176,742, Cl. 206-98.000.

Henry, David W.: *See—*
Wu, Helen Y.; Smith, Thomas H.; and Henry, David W., 4,177,264, Cl. 424-180.000.

Henry, James W., to Eastman Kodak Company. Population and profile data of bodies in a transparent mass. 4,177,482, Cl. 358-93.000.

Henry, Paul M.; and Lillis, William J., to Motorola, Inc. Reference circuit for providing a plurality of regulated currents having desired temperature characteristics. 4,177,417, Cl. 323-4.000.

Herault, Pierre C., to Georgia-Pacific Corporation. Amine-modified lignosulfonate-extended phenol formaldehyde resins. 4,177,313, Cl. 428-288.000.

Herb, Carl C.: *See—*
Clark, William E.; and Herb, Carl C., 4,176,690, Cl. 137-8.000.

Herbert, Nicholas: *See—*
Cromwell, John E.; Herbert, Nicholas; and Hyde, Glenn F., 4,176,434, Cl. 29-156.630.

Hercules Incorporated: *See—*
Dale, Warren H., 4,176,495, Cl. 47-57.500.

Hergenrother, George R.; and Sprague, Peter J., to Advent Corporation. Projection cathode ray tube having target angularly and longitudinally adjustable to tube axis. 4,177,400, Cl. 313-477.00R.

Hermann Berstorff Maschinenbau GmbH: *See—*
Brinkmann, Heinz; and Spielhoff, Horst, 4,176,967, Cl. 366-83.000.

Hermeyer, Bernd; and Ochmann, Rudolf, to U.S. Philips Corporation. Circuit for adjusting tube anode current in an X-ray generator. 4,177,406, Cl. 315-307.000.

Herring, John L. Storage structure for artificial fly-type fishing lures. 4,176,491, Cl. 43-57.50R.

Herring, Julian N., to Adult Care Products, Inc. Disposable liquid absorbent pad and method. 4,176,667, Cl. 128-287.000.

Herrington, Daniel R.; and Schwerko, Albert P., to Standard Oil Company (Ohio), The. Hydrotreating process utilizing elemental sulfur for presulfiding the catalyst. 4,177,136, Cl. 208-215.000.

Herrmann, Fritz; and Bilal, Abdel-Latif. Apparatus for separating ions present as solutes. 4,177,130, Cl. 204-299.00R.

Herschler, Robert J., to Crown Zellerbach. Enhancing tissue penetration of physiologically active steroidal agents with DMSC. 4,177,267, Cl. 424-238.000.

Hershey, Harold J.: *See—*
Beecher, Robert L., II; and Hershey, Harold J., 4,177,364, Cl. 200-5.00B.

Hewlett, Anthony M., to National Research Development Corporation. Medical ventilation apparatus. 4,176,663, Cl. 128-204.260.

Hewlett-Packard Company: *See—*
Lau, Silvanus S.; Mayer, James W.; and Sigmon, Thomas W. (Thomas W. Sigmon, a part interest assors. to), 4,177,084, Cl. 148-1.500.
Neff, Randall B., 4,177,520, Cl. 364-900.000.
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,177,518, Cl. 364-710.000.

HFM Hohenloher Fahrzeuge- und Maschinenvertrieb GmbH: *See—*
Schaeff, Hans, 4,176,726, Cl. 180-15.000.

Hiatt, Sidney A.: *See—*
Wright, Ronald E.; Kennedy, Ronald J.; and Hiatt, Sidney A., 4,176,414, Cl. 5-13.000.

Hickey, Robert F.; and Owens, Roger W., to Ecolotrol, Inc. Excess-growth control system for fluidized-bed reactor. 4,177,144, Cl. 210-86.000.

Hildebrand, Verne E.: *See—*
Seeley, Elwin W.; and Hildebrand, Verne E., 4,177,468, Cl. 343-710.000.

Hildon, Anthony M.; and Greenhalgh, Peter F., to Interox Chemicals Limited. Epoxidation. 4,177,196, Cl. 260-348.250.

Hill, Gary L.: *See—*
Hill, Wayland W.; and Hill, Gary L., 4,176,854, Cl. 280-478.00R.

Hill, Wayland W.; and Hill, Gary L. Connection facilitating hitch. 4,176,854, Cl. 280-478.00R.

Hills, Ronald F.: *See—*
Lee, James A.; Madsen, Peter E.; and Hills, Ronald F., 4,177,087, Cl. 148-11.50R.

Hiltebrandt, Siegfried: *See—*
Schubert, Herbert; and Hiltebrandt, Siegfried, 4,176,661, Cl. 128-6.000.

Hines, Clyde K.; Long, Everett J.; and Muench, Elmer W., to Everett/Charles, Inc. Low insertion force connector. 4,176,900, Cl. 339-75.0MP.

Hintzmann, Kurt; Kaiser, Reinhold; Link, Wolfgang; Minner, Willy; Mutz, Dieter; Salomon, Manfred; and Wingert, Arnim, to Licentia Patent-Verwaltungs-G.m.b.H. Integrated circuit arrangement with means for avoiding undesirable capacitive coupling between leads. 4,177,480, Cl. 357-84.000.

Hirose, Takao: *See—*
Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; Takashima, Hiroaki; Kato, Osamu; and Nagi, Minoru, 4,177,132, Cl. 208-22.000.

Hiscock, Benjamin E., to Simmonds Precision Products, Inc. Incandescent bar display module. 4,177,502, Cl. 362-218.000.

Hitachi, Ltd.: *See—*
Fukinuki, Takahiko; and Yoshigi, Hiroshi, 4,177,456, Cl. 340-347.0DD.
Ikeda, Takatoshi, 4,177,449, Cl. 340-146.3AG.
Ishida, Yoshio, 4,177,402, Cl. 315-39.710.
Kotera, Nobuo; Oi, Tetsu; and Nishida, Takashi, 4,177,372, Cl. 219-121.00L.
Maeda, Yoshio; Matsumoto, Koichi; Fukuda, Kenji; and Shindo, Isao, 4,176,957, Cl. 356-319.000.
Mastuzaki, Harumi; Ebara, Katsuya; and Takahashi, Sankichi, 4,177,138, Cl. 210-22.00C.
Shigeta, Junji; Oi, Tetsu; Kotera, Nobuo; Nakashima, Muneyasu; and Miyamoto, Nobuo, 4,177,298, Cl. 427-85.000.
Sunami, Hideo; Kubo, Masaharu; and Takemoto, Iwao, 4,177,391, Cl. 307-221.00D.
Suzuki, Yoshihiro; Ura, Mitsuru; and Takahashi, Hiroshi, 4,177,114, Cl. 204-38.00B.
Takasugi, Wasao, 4,177,394, Cl. 307-357.000.
Yamane, Mikiya; Tomura, Teruichi; and Watanabe, Yoshio, 4,177,401, Cl. 313-485.000.

Hitachi Metals, Inc.: *See—*
Sawada, Takeshi; and Inoue, Takeshi, 4,176,539, Cl. 72-178.000.

Hitachi Plant Engineering & Construction Co., Ltd.: *See—*
Mastuzaki, Harumi; Ebara, Katsuya; and Takahashi, Sankichi, 4,177,138, Cl. 210-22.00C.

Hix, Harold A. Cementing tool and method of utilizing same. 4,176,717, Cl. 166-289.000.

Hobrecht, Stephen W., to National Semiconductor Corporation. Multi output differential amplifier. 4,177,432, Cl. 330-252.000.

Hodson, Harold F.; and Batchelor, John F., to Burroughs Wellcome Co. Cyclic sulphur compounds. 4,177,257, Cl. 424-46.000.

Hoechst Aktiengeselischaft: *See—*
Dalibor, Horst, 4,177,183, Cl. 260-31.40R.

Hoechst Aktiengesellschaft: *See—*
Kleber, Rolf; and Cuntze, Ulrich, 4,177,231, Cl. 264-130.000.
Rebsdat, Siegfried; Mayer, Sigmund; Alfranseder, Josef; and Riedl, Josef, 4,177,169, Cl. 252-476.000.
Scholz, Manfred; Strie, Lothar; and Stendenbach, Karl-Heinz, 4,176,437, Cl. 29-402.120.
Thummler, Ursus; Werner, Hugo; and Sander, Harry, 4,176,765, Cl. 222-218.000.

Hoefer, Friedrich-Wilhelm; Gerschwitz, Walter; and Schwerin, Guenther, to Robert Bosch GmbH. Valve arrangement for controlling the flow of hydraulic fluid to and from a user. 4,176,685, Cl. 137-596.130.

Hoerdt, Heinrich G.: *See—*
Boettcher, Klaus; Hoerdt, Heinrich G.; Pfleger, Klaus; Zacher, Wieland; and Gropper, Hans, 4,177,340, Cl. 526-329.000.

Hoffman, Alfred A., Jr.: *See—*
Irvin, Howard B.; Sherk, Fred T.; and Hoffman, Alfred A., Jr., 4,177,250, Cl. 423-573.00G.

Hoffman-La Roche Inc.: *See—*
Hromatka, Otto; Binder, Dieter; Pfister, Rudolf; and Zeller, Paul, 4,177,193, Cl. 549-64.000.

Hoffman, Roy L.; Kempke, William G.; McCullough, John W.; Soltis, Frank G.; and Turner, Richard T., to International Business Machines Corporation. Task handling apparatus for a computer system. 4,177,513, Cl. 364-200.000.

Hogberg, Bertil: *See—*
Fex, Hans; Hansen, Bertil; Holmberg, Krister; Hogberg, Bertil; and Konyves, Imre, 4,177,269, Cl. 424-243.000.

Hohl, James H.: *See—*
Klara, Charles J.; Hohl, James H.; and Clymer, Wilbur L., 4,176,763, Cl. 221-93.000.

Hoinski, Walter W.; and Simkanich, John J., to Power Systems Development Corp. Two-way alarm safety apparatus. 4,177,460, Cl. 340-576.000.

Hokuyo, Shigeru; and Gamo, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor switching device. 4,177,477, Cl. 357-38.000.

Holland, Harry: *See—*
Griggs, William K.; and Holland, Harry, 4,176,770, Cl. 224-30.00A.

Holman, William P. Geothermal home construction. 4,176,788, Cl. 237-81.000.

Holmberg, Krister: *See—*
Fex, Hans; Hansen, Bertil; Holmberg, Krister; Hogberg, Bertil; and Konyves, Imre, 4,177,269, Cl. 424-243.000.

Holmberg, Scott H., to Burroughs Corporation. High temperature amorphous memory device for an electrically alterable read-only memory. 4,177,475, Cl. 357-2.000.

Holmes, Robert G., to Ohio Agricultural Research and Development Center. Sorting system and apparatus. 4,176,750, Cl. 209-699.000.

Holter, Karl; and Wiegard, Gustav, to Mannesmann Aktiengesellschaft; and Gustav Wiegard Maschinenfabrik. Apparatus for inspecting the geometry of dual roller tracks for continuous castings. 4,176,462, Cl. 33-182.000.

Holtzapple, Mark: *See—*
Holtzapple, Mark T.; Wehe, Robert L.; Myer, Charles G.; and Carson, William W., 4,176,522, Cl. 60-459.000.

Holtzapple, Mark T.; Wehe, Robert L.; Myer, Charles G.; and Carson, William W., to Holtzapple, Mark. Torque monitor. 4,176,522, Cl. 60-459.000.

Holzhauser, Ronald C.; Zirngibl, Carl H.; and O'Brien, Vincent J., to Eastman Kodak Company. Sheet feeding apparatus for use with copier/duplicators or the like. 4,176,945, Cl. 355-23.000.

Homan, Gary R.; and Lee, Chi-Long, to Dow Corning Corporation. Method of improving high voltage insulating devices. 4,177,322, Cl. 428-447.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Gotoh, Isamu; Okamoto, Yoshinori; and Wakatsuki, Goroei, 4,176,648, Cl. 123-179.00S.

Honda Motor Co., Ltd.: *See—*
Siozawa, Nobuo; Kikuchi, Uhee; Kimura, Suguru; Todoroki, Nobuaki; Yasukawa, Jun-ichi; and Kamiyama, Satoru, 4,177,123, Cl. 204-181.00C.

Honeywell Inc.: *See—*
Peterson, Dean M., 4,177,469, Cl. 346-110.00R.

Hong, Se J.: *See—*
Fleisher, Harold; and Hong, Se J., 4,177,355, Cl. 178-22.000.

Honig, Helmut, to Deuzer Maschinenfabrik GmbH. Welding machine for welding pre-weld flanges and slip-on flanges onto pipes. 4,177,371, Cl. 219-59.100.

Honnorat, Yves C.; Raisson, Gerard D.; and Morlet, Jean G., to Creusot-Loire. Device for the manufacture of spherical metallic powder. 4,177,026, Cl. 425-7.000.

Hook, James M.: *See—*
Rickards, Michael A.; Ruhe, Richard K.; Meyerhoff, Leonard; and Hook, James M., 4,176,613, Cl. 114-67.00A

Hore, Donald L., to Rotork Limited. Actuators. 4,177,395, Cl. 310-39.000.

Horiba, Ltd.: *See—*
Imaki, Masakatu; Hagiwara, Hidehiko; and Usui, Seiji, 4,177,126, Cl. 204-195.00F.

Horowitz, Alexandre: *See—*
Kymmell, Georg R. W.; Horowitz, Alexandre; and van der Hoorn, Rudolf J. G. A., 4,176,538, Cl. 72-110.000.

Horsma, David A.; Lyons, Bernard J.; and Smith-Johannsen, Robert, to Raychem Corporation. Layered self-regulating heating article. 4,177,376, Cl. 219-553.000.

Horton, James B. Drive system for deep well pump. 4,176,520, Cl. 60-369.000.

Horwitt, Laurence G.; and Mattis, Donald J., to Sun Chemical Corporation. Automatic electric cigar lighter. 4,177,374, Cl. 219-265.000.

Hounsfield, Godfrey N., to E M I Limited. Radiography. 4,177,382, Cl. 250-445.00T.

Hovey, Thomas C. Gas scavenger system. 4,176,666, Cl. 128-205.240.

Howlett, Donald L., to Texaco Inc. Floating point playback system. 4,177,457, Cl. 340-347.0DA.

Hromatka, Otto; Binder, Dieter; Pfister, Rudolf; and Zeller, Paul, to Hoffman-La Roche Inc. Thienothiazine derivatives. 4,177,193, Cl. 549-64.000.

Hubert, Gustav, to Notifier Company. Triggering device for combustion detector. 4,176,618, Cl. 116-102.000.

Hudson, George S.: *See—*
McClure, John W.; and Hudson, George S., 4,176,547, Cl. 73-136.00R.

Hudson, James A., Jr.; Levandoski, Raymond A.; and Long, Allen K., to Western Electric Co. Inc. Method and apparatus for controlling the filling of a cable. 4,177,097, Cl. 156-48.000.

Hueschens, Rolf: *See—*
Liepmann, Hans; Hueschens, Rolf; Milkowski, Wolfgang; Zeugner, Horst; Heinemann, Henning; Wolf, Klaus-Ullrich; Hell, Insa; and Hempel, Reinhard, 4,177,287, Cl. 424-285.000.

Huesing, Juergen; and Lampe, Hans H., to International Business Machines Corporation. Apparatus for monitoring and checking processor operation sequences. 4,176,781, Cl. 235-304.000.

Huggins, Jack G. Weather proof sandwich panel floor attachment device. 4,176,504, Cl. 52-61.000.

Hughes, Francis H.; Morton, Kenneth O.; LeMere, Roger; and Brown, Fred A., III, to Cluett, Peabody & Co., Inc. Method and apparatus for handling, positioning and assembling fabric plies. 4,176,832, Cl. 271-10.000.

Hughes, George C., to Textron Inc. Relay pilot regulator. 4,176,677, Cl. 137-488.000.

Hungerbach, Paul, to Thyssen Schachtbau GmbH. Bulk-storage receptacle with helical chute. 4,176,997, Cl. 414-299.000.

Hunt Manufacturing Co.: *See—*
Godfrey, Steven W., 4,176,753, Cl. 211-182.000.

Hunt, Peter: *See—*
Nedelec, Lucien; Frechet, Daniel; Dumont, Claude; and Hunt, Peter, 4,177,292, Cl. 424-330.000.

Hunter, Don L.; and Belles, Wayne S., to United States Borax & Chemical Corporation. Herbicidal benzimidazoles. 4,177,057, Cl. 71-92.000.

Hunter, John P., Jr.: *See—*
Patterson, Thomas K.; Mitchell, William O.; Smith, Donald H.; and Hunter, John P., Jr., 4,176,566, Cl. 83-29.000.

Huruhashi, Mikio: *See—*
Kozuka, Kazuhiro; Yamamoto, Shin; Huruhashi, Mikio; Iwaki, Katsutaro; and Asari, Susumu, 4,177,366, Cl. 200-19.0DR.

Hutchins, Clement A., to Bolton-Emerson, Inc. Dicer with soft feed apparatus. 4,176,570, Cl. 83-355.000.

Hutchins, Ned M.: *See—*
Studebaker, Irving G.; and Hutchins, Ned M., 4,176,882, Cl. 299-2.000.

Hyars, Claude: *See—*
Griner, Henry; Griner, Wade; Hyars, Claude; and Sweat, Tommy, 4,176,509, Cl. 56-27.500.
Griner, Henry; Griner, Wade; Hyars, Claude; and Sweat, Tommy, 4,176,510, Cl. 56-27.500.

Hyde, Glenn F.: *See—*
Cromwell, John E.; Herbert, Nicholas; and Hyde, Glenn F., 4,176,434, Cl. 29-156.630.

Iannuzzi, Giulio; deMartiis, Carlo C.; Del Bo, Vittorio; and Gandolfi, Luciano, to SGS-ATES Componenti Elettronici S.p.A. Method of connecting semiconductor structure to external circuits. 4,176,443, Cl. 29-589.000.

Ichikawa, Kiyoshi: *See—*
Yamada, Shigeru; and Ichikawa, Kiyoshi, 4,176,577, Cl. 84-1.010.

Ichikawa, Toshiji; and Minoo, Osamu, to Terumo Corp. Polyvinyl chloride series resin medical product implements and method of manufacturing the same using siloxane oil additive. 4,177,182, Cl. 260-29.1SB.

Ida, Edward S., to Du Pont de Nemours, E. I., and Company. Constant amplitude control of electromechanical oscillators. 4,177,434, Cl. 331-27.000.

Ii, Akira: *See—*
Yamanaka, Minoru; and Ii, Akira, 4,177,224, Cl. 261-39.00A.

Ikeda, Takatoshi, to Hitachi, Ltd. Photoelectric converter apparatus. 4,177,449, Cl. 340-146.3AG.

Ikeda, Takeshi: *See—*
Ueno, Yoshio; Ikeda, Takeshi; and Isozaki, Masaru, 4,177,237, Cl. 264-296.000.

Ikeda, Tomoaki: *See—*
Ono, Yoshihiro; Harada, Shigeo; Mizobuchi, Yuzo; and Ikeda, Tomoaki, 4,177,072, Cl. 430-302.000.

Ikekawa, Tetsuro: *See—*
Sakakida, Koji; and Ikekawa, Tetsuro, 4,177,108, Cl. 435-74.000.

Ikezawa, Harumi: *See—*
Umemura, Sumio; Ohdan, Kyoji; Sakai, Fumihiko; Bando, Yasuo; and Ikezawa, Harumi, 4,177,161, Cl. 252-435.000.

Illinois Tool Works Inc.: *See—*
Naranjo, George, 4,177,359, Cl. 179-98.000.

Imaki, Masakatu; Hagiwara, Hidehiko; and Usui, Seiji, to Horiba, Ltd. Reference electrode. 4,177,126, Cl. 204-195.00F.

Imperial Chemical Industries Limited: *See—*
Chinchen, Godfrey C., 4,177,252, Cl. 423-656.000.
Davies, George E.; and Janata, Jiri, 4,177,253, Cl. 424-1.000.
Denny, Patrick J.; Harrison, David L.; and Stacey, Martyn H., 4,177,168, Cl. 252-470.000.

Imura, Toshinori, to Minolta Camera Kabushiki Kaisha. Camera with self-contained flash device. 4,176,930, Cl. 354-59.000.

Ina, Toshikazu: *See—*
Kawai, Hisasi; and Ina, Toshikazu, 4,176,629, Cl. 123-32.0EC.

Inagaki, Takefumi: *See—*
Furukawa, Yasuo; Goto, Yoshiro; and Inagaki, Takefumi, 4,177,379, Cl. 250-306.000.

Inauen Maschinen AG: *See—*
Landolt, Bruno, 4,176,506, Cl. 53-86.000.

Indicon Inc.: *See—*
Citrin, Paul S., 4,176,671, Cl. 137-1.000.

Industra Products, Inc.: *See—*
Walker, Robert G., 4,176,444, Cl. 29-596.000.

Industrial Sales & Marketing Corporation: *See—*
Rich, Brett, 4,176,789, Cl. 238-8.000.

Ingersoll-Rand Company: *See—*
Gardner, James F., 4,176,983, Cl. 404-117.000.

Ingram, James R., Jr.; and Kiesel, George A., to Recognition Equipment Incorporated. Gate device. 4,176,855, Cl. 235-480.000.

Inoue, Akio; Kobayashi, Tadahiro; and Iwasa, Toshio, to Asahi Kasei Kogyo Kabushiki Kaisha. Dried porous acrylonitrile polymer membrane, process for producing same and separators made therefrom. 4,177,150, Cl. 210-500.00M.

Inoue, Nobumasa: *See—*
Akai, Norio; Inoue, Nobumasa; and Ohtani, Kazuo, 4,176,847, Cl. 274-39.00R.

Inoue, Takeshi: *See—*
Sawada, Takeshi; and Inoue, Takeshi, 4,176,539, Cl. 72-178.000.

Insley, Gene I.: *See—*
Cairo, Anthony C.; Tillmann, Ditmar K.; and Insley, Gene I., 4,176,903, Cl. 339-147.00R.

Institut Elektrosvarki Imeni E.O. Patona Akademii Nauk Ukrainskoi SSR: *See—*
Paton, Boris E.; Medovar, Boris I.; Tsukanov, Georgy E.; Bogachenko, Alexei G.; Artamonov, Viktor L.; Timashov, Grigory A.; Shtanko, Jury P.; Marchenko, Alexandr M.; Fedorovsky, Boris B.; Kumysh, Ilya I.; Chepurnoi, Anatoly D.; Saenko, Vladimir Y.; and Semin-Vadov, Gennady M., 4,177,058, Cl. 75-10.00C.

Instrument Systems Corporation: *See—*
Weitz, Harry, 4,177,498, Cl. 361-360.000.

Interlego A.G.: *See—*
Dideriksen, Erling T., 4,176,493, Cl. 46-23.000.

International Business Machines Corporation: *See—*
Balasubramanian, Peruvemba S.; and Greenspan, Stephen B., 4,177,452, Cl. 340-166.00R.
Bate, Geoffrey; and Dunn, Larry P., 4,177,442, Cl. 335-284.000.
Brayton, Robert K., 4,177,448, Cl. 340-146.3AE.
Brueckner, Karl H.; Farel, Charles A.; and Irsik, Johnnie F., 4,177,418, Cl. 323-56.000.
Christopher, Robert J.; and Schaaf, Robert L., 4,177,433, Cl. 330-265.000.
DeBoskey, Wentzle R.; and Sebrosky, Robert A., 4,176,975, Cl. 400-124.000.
Fleisher, Harold; and Hong, Se J., 4,177,355, Cl. 178-22.000.
Hoffman, Roy L.; Kempke, William G.; McCullough, John W.; Soltis, Frank G.; and Turner, Richard T., 4,177,513, Cl. 364-200.000.
Huesing, Juergen; and Lampe, Hans H., 4,176,781, Cl. 235-304.000.

International Standard Electric Corporation: *See—*
Jahn, Emil, 4,177,491, Cl. 360-135.000.

Interox Chemicals Limited: *See—*
Hildon, Anthony M.; and Greenhalgh, Peter F., 4,177,196, Cl. 260-348.250.

Interpace Corporation: *See—*
Dunbar, David R.; and Balog, Edward J., Sr., 4,177,352, Cl. 174-1.000.

Inukai, Mitsuo: *See—*
Sasaki, Shiro; Yasumatsu, Jun; and Inukai, Mitsuo, 4,176,808, Cl. 242-107.100.

Irsik, Johnnie F.: *See—*
Brueckner, Karl H.; Farel, Charles A.; and Irsik, Johnnie F., 4,177,418, Cl. 323-56.000.

Irvin, Howard B.; Sherk, Fred T.; and Hoffman, Alfred A., Jr., to Phillips Petroleum Company. Method of removing acetylene and sulfur compounds from gases by absorption in dimethyl formamide. 4,177,250, Cl. 423-573.00G.

Ishida, Yoshio, to Hitachi, Ltd. Magnetron pole piece assembly. 4,177,402, Cl. 315-39.710.

Ishihara, Takeshi: *See—*
Kawakami, Hakuhei; Ishihara, Takeshi; and Hatada, Kenzo, 4,176,518, Cl. 58-38.00R.

Ishimaru, Hajime, to National Laboratory for High Energy Physics. Bakable multi-pins vacuum feedthrough. 4,176,901, Cl. 339-136.00M.

Isizuka, Hirosi: *See—*
Nakamura, Akio; and Isizuka, Hirosi, 4,177,141, Cl. 210-70.000.

Isley, John C. Tie down clamp for vehicle mounted camper housing. 4,176,830, Cl. 269-6.000.

Isozaki, Masaru: *See—*
Ueno, Yoshio; Ikeda, Takeshi; and Isozaki, Masaru, 4,177,237, Cl. 264-296.000.

Ito, Akira: *See—*
Yonemitsu, Eiichi; Miyamori, Hiroshi; Nawata, Takanari; Fujioka, Tomio; Ito, Akira; and Kobayashi, Makoto, 4,177,247, Cl. 423-515.000.

Ito, Fumio; Tsunekawa, Tokuichi; Taguchi, Tetsuya; and Harigaya, Isao, to Canon Kabushiki Kaisha. Exposure control device for a camera. 4,176,929, Cl. 354-29.000.

Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; Kuroha, Kenji; and Hayakawa, Mitsutaka, to Yasuro Ito; and Taisei Corporation. Method and apparatus for weighing aggregates. 4,176,965, Cl. 366-8.000.

Ito, Yuji, to Canon Kabushiki Kaisha. Ophthalmoscopic system with a wide angle objective lens. 4,176,920, Cl. 351-7.000.

Itoh, Fumio: *See—*
Hata, Yukinori; Watanabe, Tsutomu; and Itoh, Fumio, 4,177,073, Cl. 430-188.000.

Itoh, Satoru: *See—*
Takenouchi, Mutsuo; Ozawa, Takashi; Wako, Syoji; and Itoh, Satoru, 4,177,487, Cl. 358-294.000.

Itoki Kosakusho Co., Ltd.: *See—*
Oku, Nobuyuki, 4,176,996, Cl. 414-273.000.

ITT Industries, Inc.: *See—*
Quere, Eugene M.; and Le Rolland, Pierre M., 4,176,446, Cl. 29-622.000.

Ivaldi, Raoul: *See—*
Boy, Aristide; Galy, Henri; Ivaldi, Raoul; and Passedroit, Hubert, 4,177,208, Cl. 260-504.00S.

Iwaki, Katsutaro: *See—*
Kozuka, Kazuhiro; Yamamoto, Shin; Huruhashi, Mikio; Iwaki, Katsutaro; and Asari, Susumu, 4,177,366, Cl. 200-19.0DR.

Iwasa, Toshio: *See—*
Inoue, Akio; Kobayashi, Tadahiro; and Iwasa, Toshio, 4,177,150, Cl. 210-500.00M.

Jackson, John L.: *See—*
Archibald, John L.; and Jackson, John L., 4,177,279, Cl. 424-267.000.

Jackson, Martin A., to Sheldahl, Inc. Unwind stand-roll brake. 4,176,805, Cl. 242-75.460.

Jaeger, C. Rene; and Blakely, Lawrence E., to DBX Inc. Signal enhancement system. 4,177,356, Cl. 179-1.0VL.

Jahn, Emil, to International Standard Electric Corporation. Clamping device for disk-shaped memory sheets. 4,177,491, Cl. 360-135.000.

Jahn, Walter, to JENAer Glaswerk Schott & Gen. Glass for the production of optical elements with refractive index gradients. 4,177,319, Cl. 428-410.000.

James D. Pauls, Ltd.: *See—*
Capra, Nicholas G.; and Antenore, Ronald L., 4,176,764, Cl. 222-135.000.

James, Rex L.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,177,518, Cl. 364-710.000.

Janata, Jiri: *See—*
Davies, George E.; and Janata, Jiri, 4,177,253, Cl. 424-1.000.

Jankovics, Gabor: *See—*
Entzmann, Karl; Kalman, Gyorgy; Varga, Janos; Vecsei, Miklos; Jankovics, Gabor; and Kozicz, Laszlone, 4,177,052, Cl. 71-33.000.

Janoski, Edward J.; Mitchell, Richard E.; and Schneider, Abraham, to Suntech, Inc. Continuous process for conversion of dimethyldicyclopentadiene to endo-dimethyldicyclopentadiene, a missile fuel. 4,177,217, Cl. 585-253.000.

Jansons, Eric G.: *See—*
Ryan, Allen L.; Jansons, Eric G.; Halliburton, Ronald D.; and Pearson, James H., 4,176,844, Cl. 273-121.00A.

Jaouen, Jean-Yves, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Device for detecting errors in a digital transmission system. 4,177,447, Cl. 340-146.1AB.

Japan Atomic Energy Research Institute: *See—*
Kumakura, Minoru; Yoshida, Masaru; and Kaetsu, Isao, 4,177,107, Cl. 435-176.000.

Jarmann, Adolf. Tool for removing and inserting bolts in connecting rods. 4,176,439, Cl. 29-427.000.

Jay, Pierre; and Bonhomme, Pierre, to Rhone-Poulenc Industries. Dielectric compositions comprising mixtures of polychlorinated benzenes and alkylaromatic hydrocarbons. 4,177,156, Cl. 252-66.000.

Jefferson Industries Company, The: *See—*
Dill, Terry A., 4,176,621, Cl. 119-20.000.

Jeffrey, Lawrence W.; and Jeffrey, Robert D. Arm-wrestling apparatus. 4,176,837, Cl. 273-1.00R.

Jeffrey, Robert D.: *See—*
Jeffrey, Lawrence W.; and Jeffrey, Robert D., 4,176,837, Cl. 273-1.00R.

JENAer Glaswerk Schott & Gen.: *See—*
Jahn, Walter, 4,177,319, Cl. 428-410.000.

Jenkins, Alfred D.; and Schade, Edward W., Jr., to NCR Corporation. Interrupt adapter for data processing systems. 4,177,515, Cl. 364-200.000.

Jernqvist, Ake S., to Alfa-Laval AB. Process for removing oxygen from and adding carbon dioxide to a liquid water. 4,177,044, Cl. 55-48.000.

Jewett, Gary L.: *See—*
Vanderkooi, William N.; and Jewett, Gary L., 4,177,210, Cl. 260-561.00N.

Jillie, Don W., Jr.: *See—*
Kroger, Harry; and Jillie, Don W., Jr., 4,177,476, Cl. 357-5.000.

Jirkovsky, Ivo L.: *See—*
Philipp, Adolf H.; and Jirkovsky, Ivo L., 4,177,284, Cl. 424-275.000.

Joffe, Kenneth L., to Wynn Oil Company. Flushing of liquid circulation systems. 4,176,708, Cl. 165-95.000.

Johann Wolf Gesellschaft m.b.H. KG: *See—*
Wolf, Johann, 4,176,622, Cl. 119-28.000.

John Wyeth & Brother Ltd.: *See—*
Archibald, John L.; and Jackson, John L., 4,177,279, Cl. 424-267.000.

Johns-Manville Corporation: *See—*
Gagin, Lawrence V., 4,177,077, Cl. 106-50.000.

Johnson Electric Industrial Manufactory Limited: *See—*
Wang, Patrick, 4,177,396, Cl. 310-68.00C.

Johnson, Herbert: *See—*
Gorini, Robert F.; Johnson, Herbert; and Sillars, Frederick S., 4,177,098, Cl. 156-80.000.

Johnson & Johnson: *See—*
Walts, John M., 4,177,171, Cl. 252-541.000.

Johnson, Matthey & Co., Limited: *See—*
Day, Joseph G., 4,177,059, Cl. 75-10.00R.

Johnson, Robert D. Skateboard truck with independent wheel suspension. 4,176,850, Cl. 280-87.04A.

Johnson, Willard L. Stack-type heat exchanger. 4,176,709, Cl. 165-99.000.

Johnson, William R., Jr.: *See—*
Van Auken, Thomas V.; Grubbs, Harvey J.; and Johnson, William R., Jr., 4,177,339, Cl. 526-314.000.

Johnston, Samuel A., to Bunker Ramo Corporation. Pressure sensor. 4,176,557, Cl. 73-708.000.

Jones, John W. D.: *See—*
Gibson, Harry; and Jones, John W. D., 4,176,546, Cl. 73-182.000.

Jones, Lawrence T.: *See—*
Sims, Anson; and Jones, Lawrence T., 4,176,492, Cl. 46-22.000.

Jones, Richard E., to Robertshaw Controls Company. Retrofit igniter. 4,177,034, Cl. 431-264.000.

Jones, Ronald B.: *See—*
Dickerson, Evelyn C.; and Jones, Ronald B., 4,176,415, Cl. 5-66.000.

Jones, Willard H. Releasable holder for boxes. 4,176,817, Cl. 248-313.000.

Jones, William A.: *See—*
Murtha, Timothy P.; Jones, William A.; and Zuech, Ernest A., 4,177,164, Cl. 252-455.00Z.

Jones, William R.: *See—*
Felton, Dale D.; and Jones, William R., 4,176,865, Cl. 285-373.000.

Josephs, Richard M., to Sperry Rand Corporation. Magnetic bubble lattice device. 4,177,297, Cl. 427-38.000.

Jouveinal S.A.: *See—*
Torossian, Dieran R.; Aubard, Gilbert G.; and Legeai, Jacky M., 4,177,268, Cl. 424-243.000.

Joy Manufacturing Company: *See—*
Goland, Yaacov, 4,177,047, Cl. 55-146.000.

Jude, Dennis W.; and Bell, Joseph S., to British Gas Corporation Apparatus for arresting propagating fractures in pipelines. 4,176,691, Cl. 138-103.000.

Juliano, Joseph O.: *See—*
Ambrosini, Leonard R.; Juliano, Joseph O.; and Rarick, Charles H., 4,176,608, Cl. 102-216.000.

Julius Blum Gesellschaft m.b.H.: *See—*
Rock, Erich; and Mages, Bernhard, 4,176,422, Cl. 16-130.000.
Rock, Erich; and Mages, Bernhard, 4,176,424, Cl. 16-148.000.
Rock, Erich; and Mages, Bernhard, 4,176,496, Cl. 49-410.000.

Jundt, Werner; Sohner, Gerhard; Werner, Peter; and Roozenbeek, Herman, to Robert Bosch GmbH. Motor ignition system control circuit for maintaining energy storage in spark coil constant in wide speed range. 4,176,645, Cl. 123-148.00E.

Jyojiki, Masao: *See—*
Nakamura, Kazuo; and Jyojiki, Masao, 4,176,928, Cl. 354-25.000.

K. K. Pollution Preventing Research Laboratory: *See—*
Ando, Wataru; and Watanabe, Kazuo, 4,177,121, Cl. 204-158.00R.

K-Shox, Inc.: *See—*
Case, Richard W., 4,176,714, Cl. 166-72.000.

Kabushiki Kaisha Kawai Gakki Seisakusho: *See—*
Murakami, Keiji, 4,176,576, Cl. 84-1.010.
Nogimura, Tsunehisa, 4,176,574, Cl. 84-1.010.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Kanai, Seikichi; and Komiyama, Kunihiko, 4,176,628, Cl. 123-32.00A.

Kabushiki Kaisha Sato: *See—*
Sato, Yo, 4,176,600, Cl. 101-111.000.

Kabushiki Kaisha Sato Kenkyusho: *See—*
Sato, Yo, 4,176,603, Cl. 101-291.000.

Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho: *See—*
Sasaki, Shiro; Yasumatsu, Jun; and Inukai, Mitsuo, 4,176,808, Cl. 242-107.100.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Kozuka, Kazuhiro; Yamamoto, Shin; Huruhashi, Mikio; Iwaki, Katsutaro; and Asari, Susumu, 4,177,366, Cl. 200-19.0DR.

Kaetsu, Isao: *See—*
Kumakura, Minoru; Yoshida, Masaru; and Kaetsu, Isao, 4,177,107, Cl. 435-176.000.

Kaga, Hideharu: *See—*
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; Kuroha, Kenji; and Hayakawa, Mitsutaka, 4,176,965, Cl. 366-8.000.

Kaiser, Fay E., Jr., to U.S. Aviex Corp. Starter fluid for internal combustion engines. 4,177,040, Cl. 44-52.000.

Kaiser, Reinhold: *See—*
Hintzmann, Kurt; Kaiser, Reinhold; Link, Wolfgang; Minner, Willy; Mutz, Dieter; Salomon, Manfred; and Wingert, Arnim, 4,177,480, Cl. 357-84.000.

Kali-Chemie Pharma GmbH: *See—*
Liepmann, Hans; Hueschens, Rolf; Milkowski, Wolfgang; Zeugner, Horst; Heinemann, Henning; Wolf, Klaus-Ullrich; Hell, Insa; and Hempel, Reinhard, 4,177,287, Cl. 424-285.000.

Kalish, Stanley. Impregnated bandage. 4,176,664, Cl. 128-156.000.

Kalman, Gyorgy: *See—*
Entzmann, Karl; Kalman, Gyorgy; Varga, Janos; Vecsei, Miklos; Jankovics, Gabor; and Kozicz, Laszlone, 4,177,052, Cl. 71-33.000.

Kaltenbach & Voigt GmbH & Co.: *See—*
Lohn, Gerd, 4,177,024, Cl. 418-16.000.

Kalter, Werner: *See—*
Elsner, Wolfgang; Kalter, Werner, Michel, Rolf; and Moslener, Jorn, 4,176,535, Cl. 72-10.000.

Kamiya, Tamotsu; and Miyao, Shigeru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Pneumatic system for smoothing discharge pressure from air. 4,177,023, Cl. 417-540.000.

Kamiyama, Satoru: *See—*
Siozawa, Nobuo; Kikuchi, Uhee; Kimura, Suguru; Todoroki, Nobuaki; Yasukawa, Jun-ichi; and Kamiyama, Satoru, 4,177,123, Cl. 204-181.00C.

Kamiyama, Toshibumi; and Miyamoto, Kunito, to Matsushita Electric Industrial Co., Ltd. Frost detector. 4,176,524, Cl. 62-140.000.

Kamyr, Incorporated: *See—*
Laakso, Oliver A.; and Sherman, Michael I., 4,177,105, Cl. 162-237.000.

Kan, Peter T.: *See—*
Schaaf, Robert L.; Kan, Peter T.; and Cenker, Moses, 4,177,205, Cl. 260-453.0AM.

Kanai, Seikichi; and Komiyama, Kunihiko, to Kabushiki Kaisha Komatsu Seisakusho. Combustion chamber for an internal combustion engine of direct injection type. 4,176,628, Cl. 123-32.00A.

Kanai, Teijiro: *See—*
Yoshida, Akihiko; Koaki, Akira; Nakano, Takahumi; Miyake, Mitsunao; Kanai, Teijiro; and Misono, Izumi, 4,176,605, Cl. 101-451.000.

Kanao, Mitsuhiro. Internal combustion engine. 4,176,631, Cl. 123-73.0PP.

Kanebo, Ltd.: *See—*
Mishima, Takao; Semba, Shoji; Ogata, Kuchi; and Funahashi, Osamu, 4,176,532, Cl. 68-19.000.

Kania, Charles M.: *See—*
Das, Suryya K.; and Kania, Charles M., 4,177,178, Cl. 260-29.40A.

Kannegiesser, Reinhard: *See—*
Pankmin, Walter; Finsterwalder, Kurt; Kannegiesser, Reinhard; and Bassler, Hans, 4,176,536, Cl. 72-91.000.

Kappler, Gudrun: *See—*
Schulz, Manfred; and Kappler, Gudrun, 4,176,877, Cl. 296-208.000.

Kapps, Manfred: *See—*
Mitschke, Karl-Heinz; Niederprum, Hans; and Kapps, Manfred, 4,177,332, Cl. 521-98.000.

Karlin, James H., to Harris Corporation. Illuminated keyboard. 4,177,501, Cl. 362-26.000.

Karlovitz, Bela, to Toyota Motor Company, Ltd. Emission control 4,176,649, Cl. 123-191.0SP.

Karlson, Harald E.: *See—*
Goldsworthy, William B.; and Karlson, Harald E., 4,177,029, Cl. 425-112.000.

Karpati, Egon: *See—*
Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szabolcs, 4,177,190, Cl. 260-239.500.

Karsten, Werner: *See—*
Erwien, Helmut; and Karsten, Werner, 4,176,884, Cl. 299-34.000.

Karyagin, Viktor F.: *See—*
Bezvulyak, Anatoly S.; Gelfand, Ilya M.; Torchinsky, Efim M.; Pushkin, Sergei B.; Vedernikov, Rudolf K.; Kulachenkov, Gennady P.; Tkachuk, Petr F.; and Karyagin, Viktor F., 4,176,952, Cl. 356-47.000.

Kasahara, Shigekazu: *See—*
Kurihara, Kenji; Kasahara, Shigekazu; and Suzuki, Takashi, 4,177,179, Cl. 260-29.6NR.

Kassos, Thomas G. Aquarium-terrarium tank 4,176,620, Cl. 119-5.000.

Kasubuchi, Takeshi; Ozawa, Kaoru; and Hara, Takeo, to Sharp Kabushiki Kaisha. Electronic control assembly mounted on a flexible carrier and manufacture thereof. 4,177,519, Cl. 364-712.000.

Katakabe, Noboru; Yamaguchi, Isao; and Onishi, Masaru, to Matsushita Electric Industrial Co., Ltd. Electrophotographic color image producing apparatus. 4,176,940, Cl. 355-10.000.

Katkov, Jury V., to Moskovsky Automobilny Zavod imeni I.A. Likhacheva (Proizvodstvennoe Obiedinenie Zil). Piston stroke adjusting arrangement for disc-type friction clutches and brakes. 4,176,738, Cl. 192-111.00R.

Kato, Akio: *See—*
Kobayashi, Mituki; Awao, Takao; Mizusaki, Yujiro; Sato, Kunio; Kato, Akio; and Mitushi, Hisao, 4,177,069, Cl. 75-213.000.

Kato, Osamu: *See—*
Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; Takashima, Hiroaki; Kato, Osamu; and Nagi, Minoru, 4,177,132, Cl. 208-22.000.

Kato, Takashi: *See—*
Nakamura, Norihiko; Kato, Takashi; and Kobayashi, Tatsuo, 4,176,646, Cl. 123-148.00E.

Kavli, Fred: *See—*
Bell, Robert L.; Willing, Robert; and Kavli, Fred, 4,177,496, Cl. 361-283.000.

Kavlico Corporation: *See—*
Bell, Robert L.; Willing, Robert; and Kavli, Fred, 4,177,496, Cl. 361-283.000.

Kawai, Hisasi; and Ina, Toshikazu, to Nippon Soken, Inc. Electric control method for fuel injection and ignition timing. 4,176,629, Cl. 123-32.0EC.

Kawai Musical Instrument Mfg. Co. Ltd.: *See—*
Deutsch, Ralph, 4,176,573, Cl. 84-1.010.

Kawakami, Hakuhei; Ishihara, Takeshi; and Hatada, Kenzo, to Matsushita Electric Industrial Co., Ltd. Electronic clock having audible time indication. 4,176,518, Cl. 58-38.00R.

Kawamura, Naoto: *See—*
Matsumoto, Kazuya; Kawamura, Naoto; and Minami, Setsuo, 4,176,907, Cl. 350-6.800.

Kawase, Suminosuke, to Tokyo Kogaku Kikai Kabushiki Kaisha. Finder system for photographing apparatus. 4,176,937, Cl. 354-62.000.

Kaye, Morton. Opto-mechanical measuring system. 4,176,460, Cl. 33-174.00L.

Kazda, Stanislav: *See—*
Bossert, Friedrich; Wehinger, Egbert; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, 4,177,278, Cl. 424-266.000.

Kazmierowicz, Casimir W. Method and apparatus for obtaining the temperature profile of a kiln. 4,176,554, Cl. 73-341.000.

Keene, Wayne H.; Rudko, Robert I.; and Sonnenschein, Charles M., to Raytheon Company. High gain laser spectrometer. 4,176,959, Cl. 356-325.000.

Keffeler, Gary L., to Caterpillar Tractor Co. Combined dipstick breather tube. 4,176,457, Cl. 33-126.70R.

Keller Ofenbau GmbH: *See—*
Buschermohle, Gregor, 4,177,035, Cl. 432-121.000.

Kelso, Eileen E.: *See—*
Kelso, Richard C.; and Kelso, Eileen E., 4,176,684, Cl. 137-562.000.

Kelso, Richard C.; and Kelso, Eileen E. Splash down. 4,176,684, Cl. 137-562.000.

Kemp, Gibson D. Fluid mixer and comminuter. 4,176,797, Cl. 241-30.000.

Kempke, William G.: *See—*
Hoffman, Roy L.; Kempke, William G.; McCullough, John W.; Soltis, Frank G.; and Turner, Richard T., 4,177,513, Cl. 364-200.000.

Kendall Company, The: *See—*
Peterson, James J., 4,176,412, Cl. 4-144.100.

Kenmotsu, Nobuhiro: *See—*
Hayashi, Masaaki; Tsuneta, Kazuyoshi; Takada, Hiroshi; Kenmotsu, Nobuhiro; and Sasaki, Hirotharu, 4,177,174, Cl. 260-18.0PN.

Kennedy, Ronald J.: *See—*
Wright, Ronald E.; Kennedy, Ronald J.; and Hiatt, Sidney A., 4,176,414, Cl. 5-13.000.

Kennedy, William S., to Acurex Corporation. Photovoltaic concentrator. 4,177,083, Cl. 136-89.0CA.

Kep Enterprises: *See—*
Poggemiller, Erhard; and Sweet, Ralph, 4,176,721, Cl. 172-4.000.

Kephart, John W., Jr. Fluid operated rotor. 4,177,014, Cl. 416-197.00A.

Keranen, John J., to Eaton Corporation. Interlocking and maintaining attachment for two standard pushbuttons. 4,177,363, Cl. 200-5.00B.

Kerby, Robert C., to Cominco Ltd. Bipolar refining of lead. 4,177,117, Cl. 204-114.000.

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Rhodes, Donald E.; Baldwin, Roger A.; and Davis, Robert E., 4,177,134, Cl. 208-177.000.
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Kessler, Theodore P., to Timron, Inc. Machine for winding pile fabric on a reel. 4,176,803, Cl. 242-67.10R.

Khan, Karrar A.; and Cook, Brian, to Beecham Group Limited. Orally administrable pharmaceutical composition. 4,177,254, Cl. 424-16.000.

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Krupman, Leonid I.; Yaroslavtsev, Jury G.; Sochnev, Alexandr E.; Shamil, Jury P.; Khitrik, Abram I.; Antipenko, Grigory I.; Smetanin, Jury G.; Samsonov, Albert N.; Ljudkovsky, Vadim M.; Pokrass, Leonid M.; Kurdjukov, Anatoly A.; Ofengenden, Abram M.; and Zhitnik, Georgy G., 4,177,070, Cl. 75-257.000.

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Khutoretsky, Garri M.: *See—*
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Ingram, James R., Jr.; and Kiesel, George A., 4,176,855, Cl. 235-480.000.

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Weiss, Rudolf; Kiessling, Werner; and Wiedemann, Otto, 4,176,938, Cl. 354-275.000.

Kikuchi, Uhee: *See—*
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Kilcher-Chemie AG: *See—*
Prolss, Ludwig, 4,177,228, Cl. 264-24.000.

Kim, Dae K.: *See—*
Feinstein, Allen I.; Bertolacini, Ralph J.; and Kim, Dae K., 4,177,219, Cl. 585-489.000.

Kimura, Shigeru, to Nifco, Inc. Panel fastener. 4,176,428, Cl. 24-73.00P.

Kimura, Suguru: *See—*
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King, Christopher F.: *See—*
Cudby, Joseph W.; King, Christopher F.; and Syred, Nicholas, 4,176,769, Cl. 222-591.000.

King, Colin M.; Goddard, Michael R.; and Murray, Dudley C., to Pains-Wessex Limited. Pyrotechnic devices. 4,176,606, Cl. 102-37.400.

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Steeves, Robert W., 4,177,310, Cl. 428-216.000.
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Heiba, El-Ahmadi I.; Kinney, Robert E.; and Stead, George E., 4,177,192, Cl. 260-326.220.

Kirk, Clair F.; and Kirk, Samuel A. Hydraulic inertia centrifugal catalytic desalination device. 4,176,779, Cl. 233-32.000.

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Kirkwood, John M.: *See—*
Talbott, John W.; and Kirkwood, John M., 4,176,798, Cl. 241-39.000.

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Yamada, Seiji; Yoshiyama, Ichiro; and Kitaura, Mashio, 4,176,955, Cl. 356-222.000.

Klank, Otto, to Licentia Patent-Verwaltung-G.m.b.H. Circuit arrangement for amplifying oscillator oscillations and converting same to rectangular signals. 4,177,428, Cl. 325-455.000.

Kiara, Charles J.; Hohl, James H.; and Clymer, Wilbur L., to Binney & Smith Inc. Magazine for transferring rod-shaped articles. 4,176,763, Cl. 221-93.000.

Klatt, Jochen: *See—*
Diegelmann, Winfried; Schardt, Gunter; Klatt, Jochen; and Grolz, Heinz, 4,177,316, Cl. 428-367.000.

Kleber, Rolf; and Cuntze, Ulrich, to Hoechst Aktiengesellschaft. Process for improving the sliding properties of linear polyester material in spinning operations. 4,177,231, Cl. 264-130.000.

Klein, Schanzlin & Becker Aktiengesellschaft: *See—*
Florjancic, Dusan; and Matthias, Heinz-Bernd, 4,177,008, Cl. 415-206.000.

Klippan France, S.A.: *See—*
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Klocker, Otto: *See—*
Schamberg, Eckehard; Fock, Jurgen; Klocker, Otto; and Esselborn, Eberhard, 4,177,221, Cl. 525-244.000.

Knaggs, Edward A.: *See—*
Nussbaum, Marvin L.; and Knaggs, Edward A., 4,177,207, Cl. 260-504.00R.

Knight, Ronald E., to Wallace Knight Limited. Apparatus for treating a sheet material with radiation. 4,177,383, Cl. 250-492.00R.

Knittel, Siegfried, to Ernst Leitz Wetzlar GmbH. Methods of and a circuit for monitoring the amplitude of sine wave-shaped signals. 4,177,424, Cl. 324-102.000.

Knor, Bernhard; Payrhammer, Bernd; and Treiber, Helmut, to AGFA-Gevaert, A.G. Determination of extreme density values of a transported strip of photographic originals. 4,176,964, Cl. 356-444.000.

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Koaki, Akira: *See—*
Yoshida, Akihiko; Koaki, Akira; Nakano, Takahumi; Miyake, Mitsunao; Kanai, Teijiro; and Misono, Izumi, 4,176,605, Cl. 101-451.000.

Kobayashi, Makoto: *See—*
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Kobayashi, Nobuyuki: *See—*
Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; Yamamoto, Minoru; and Hase, Yoshihiko, 4,177,133, Cl. 208-50.000.

Kobayashi, Tadahiro: *See—*
Inoue, Akio; Kobayashi, Tadahiro; and Iwasa, Toshio, 4,177,150, Cl. 210-500.00M.

Kobayashi, Tatsuo: *See—*
Nakamura, Norihiko; Kato, Takashi; and Kobayashi, Tatsuo, 4,176,646, Cl. 123-148.00E.

Kochan, Kenneth, to Automated Donut Systems, Inc. Doughnut frying apparatus. 4,176,590, Cl. 99-405.000.

Kocher, Robert C.; and Piorkow, Alfred, to GTE Laboratories Incorporated. Laser scanner for photolithography of slotted mask color cathode ray tubes. 4,176,925, Cl. 354-1.000.

Kodama Taiwan Industrial Co., Ltd.: *See—*
Wang, Wan-Ching, 4,176,734, Cl. 190-49.000.

Kodama, Yukuo, to Nippon Electric Co., Ltd. Arrangement for putting an electronic timepiece right with minute indication advanced at first. 4,176,516, Cl. 58-23.00R.

Koester, Eberhard: *See—*
Schoenafinger, Eduard; Deigner, Paul; Koester, Eberhard; Ohlinger, Manfred; Schaefer, Dieter; Stumpfl, Werner; Amort, Juergen; Seiler, Claus-Dietrich; Nestler, Heinz; and Ambros, Otto, 4,177,317, Cl. 428-405.000.

Kokusan Denki Co., Ltd.: *See—*
Yukawa, Hideki, 4,177,415, Cl. 322-28.000.

Kolbel, Herbert; and Tillmetz, Klaus D., to Schering Aktiengesellschaft. Process for the production of hydrocarbons and oxygen-containing compounds and catalysts therefor. 4,177,203, Cl. 260-449.60R.

Komiyama, Kunihiko: *See—*
Kanai, Seikichi; and Komiyama, Kunihiko, 4,176,628, Cl. 123-32.00A.

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Kondelikova, Jaroslava: *See—*
Kubanek, Vladimir; Basarova, Gabriela; Kralicek, Jaroslav; Skach, Josef; Fencl, Zdenek; Budin, Jiri; Kondelikova, Jaroslava; and Sittler, Eduard, 4,177,295, Cl. 426-330.300.

Konig, Klaus: *See—*
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Koninklijke Adriaan Volker Baggermaatschappij B.V.: *See—*
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Leibinsohn, Saul H., 4,176,683, Cl. 137-559.000.

Konyves, Imre: *See—*
Fex, Hans; Hansen, Bertil; Holmberg, Krister; Hogberg, Bertil; and Konyves, Imre, 4,177,269, Cl. 424-243.000.

Kooi, Edward, to Arvey Corporation. Gusset pouch with integral seal support and method of making same. 4,176,746, Cl. 206-438.000.

Kopczynski, Marian: *See—*
Bielecki, Marek; Bogdanski, Andrzej; Buxakowski, Andrzej; Chudzinski, Janusz; Glogowski, Andrzej; Kopczynski, Marian; Krolikowski, Andrzej; Kryszewski, Jozef; Moczulski, Zdzislaw; Ochocki, Wlodzimierz; Pomorski, Aleksander; Rumatowski, Karol; Sawicki, Janusz; Szostakowski, Henryk; Warowny, Tadeusz; Wisniewski, Teofil; and Wozniak, Antoni, 4,176,624, Cl. 123-32.0EA.

Koppers Company, Inc.: *See—*
Cromwell, John E.; Herbert, Nicholas; and Hyde, Glenn F., 4,176,434, Cl. 29-156.630.

Kornhauser, Murray, to Safety Consultants. Energy absorbing bumper system. 4,176,858, Cl. 280-734.000.

Kossoff, George; and Robinson, David E., to Commonwealth of Australia, The. Ultrasonic echogram display. 4,176,658, Cl. 128-660.000.

Kotera, Nobuo; Oi, Tetsu; and Nishida, Takashi, to Hitachi, Ltd. Method and apparatus for laser zone melting. 4,177,372, Cl. 219-121.00L.

Kotera, Nobuo: *See—*
Shigeta, Junji; Oi, Tetsu; Kotera, Nobuo; Nakashima, Muneyasu; and Miyamoto, Nobuo, 4,177,298, Cl. 427-85.000.

Kotke, Klaus D.: *See—*
Gittner, Franz; Glaser, Arnaldo; and Kotke, Klaus D., 4,177,239, Cl. 264-530.000.

Koutsky, L. John, to Sears Manufacturing Company. Armrest structure. 4,176,878, Cl. 297-115.000.

Koyama, Masaoki: *See—*
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Koyama, Teruo: *See—*
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Kozicz, Laszlone: *See—*
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Kozuka, Kazuhiro; Yamamoto, Shin; Huruhashi, Mikio; Iwaki, Katsutaro; and Asari, Susumu, to Nippondenso Co., Ltd.; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Noise suppression electrode arrangement with a rotor of dielectric material. 4,177,366, Cl. 200-19.0DR.

Kozuki, Susumu; Uchidoi, Masanori; Date, Nobuaki; Shimizu, Masami; Aizawa, Hiroshi; and Takishima, Yoshiyuki, to Canon Kabushiki Kaisha. Motor drive unit for a camera. 4,176,936, Cl. 354-38.000.

Kraft, Inc.: *See—*
Blaetz, Philip H., 4,176,970, Cl. 366-280.000.

Kraftwerk Union Aktiengesellschaft: *See—*
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Krakauer, Merrill: *See—*
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Kralicek, Jaroslav: *See—*
Kubanek, Vladimir; Basarova, Gabriela; Kralicek, Jaroslav; Skach, Josef; Fencl, Zdenek; Budin, Jiri; Kondelikova, Jaroslava; and Sittler, Eduard, 4,177,295, Cl. 426-330.300.

Kreis, Gerhard; August, Peter; and Wick, Manfred, to Consortium Fur Elektrochemische Industrie GmbH. Addition of Si-bonded hydrogen to an aliphatic multiple bond. 4,177,341, Cl. 528-15.000.

Kremer, Wolfgang: *See—*
Traenckner, Hans-Joachim; Goossens, John; Kremer, Wolfgang; and Kronke, Heinz, 4,177,172, Cl. 260-15.000.

Krigas, Thomas: *See—*
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Kroger, Harry; and Jillie, Don W., Jr., to Sperry Rand Corporation. Multiple weak-link SQUID with non-superconductive material weak-links. 4,177,476, Cl. 357-5.000.

Krolikowski, Andrzej: *See—*
Bielecki, Marek; Bogdanski, Andrzej; Buxakowski, Andrzej; Chudzinski, Janusz; Glogowski, Andrzej; Kopczynski, Marian; Krolikowski, Andrzej; Kryszewski, Jozef; Moczulski, Zdzislaw; Ochocki, Wlodzimierz; Pomorski, Aleksander; Rumatowski, Karol; Sawicki, Janusz; Szostakowski, Henryk; Warowny, Tadeusz; Wisniewski, Teofil; and Wozniak, Antoni, 4,176,624, Cl. 123-32.0EA.

Kromer, Heiner M.; and Ossman, John, to Haake, Inc. Three sectioned mixer having individual thermal controls. 4,176,968, Cl. 366-97.000.

Kronke, Heinz: *See—*
Traenckner, Hans-Joachim; Goossens, John; Kremer, Wolfgang; and Kronke, Heinz, 4,177,172, Cl. 260-15.000.

Kronogard, Sven O., to United Turbine AB & Co., Kommanditbolag. Gas turbine having a ceramic rotor. 4,176,519, Cl. 60-39.16R.

Kroon, Simon G., to U.S. Philips Corporation. Method of treating a monocrystalline body utilizing a measuring member consisting of a monocrystalline layer and an adjoining substratum of different index of refraction. 4,177,094, Cl. 148-175.000.

Kropa, Gomer E.: *See—*
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Kruger, Hans-Rudolf: *See—*
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Krulick, Steven E.: *See—*
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Krupman, Leonid I.; Yaroslavtsev, Jury G.; Sochnev, Alexandr E.; Shamil, Jury P.; Khitrik, Abram I.; Antipenko, Grigory I.; Smetanin, Jury G.; Samsonov, Albert N.; Ljudkovsky, Vadim M.; Pokrass, Leonid M.; Kurdjukov, Anatoly A.; Ofengenden, Abram M.; and Zhitnik, Georgy G. Exothermic slag-forming mixture. 4,177,070, Cl. 75-257.000.

Krupnick, Albert C.: *See—*
Roberts, Marion L.; Sharpe, Max H.; and Krupnick, Albert C., 4,177,325, Cl. 428-629.000.

Kruse, Larry W., to Standard Oil Company. Aromatics extraction process. 4,177,137, Cl. 208-321.000

Kryszewski, Jozef: *See—*
Bielecki, Marek; Bogdanski, Andrzej; Buxakowski, Andrzej; Chudzinski, Janusz; Glogowski, Andrzej; Kopczynski, Marian; Krolikowski, Andrzej; Kryszewski, Jozef; Moczulski, Zdzislaw; Ochocki, Wlodzimierz; Pomorski, Aleksander; Rumatowski, Karol; Sawicki, Janusz; Szostakowski, Henryk; Warowny, Tadeusz; Wisniewski, Teofil; and Wozniak, Antoni, 4,176,624, Cl. 123-32.0EA.

Kubanek, Vladimir; Basarova, Gabriela; Kralicek, Jaroslav; Skach, Josef; Fencl, Zdenek; Budin, Jiri; Kondelikova, Jaroslava; and Sittler, Eduard, to Vysoka skola chemicko-technologicka. Method for stabilizing colloidal and taste qualities of beverages. 4,177,295, Cl. 426-330.300.

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Kubo, Masaharu: *See—*
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Kuhlapparate GmbH SIBIR: *See—*
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Kulachenkov, Gennady P.: *See—*
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Kulsa, Peter: *See—*
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Kumakura, Minoru; Yoshida, Masaru; and Kaetsu, Isao, to Japan Atomic Energy Research Institute. Process for producing composition containing insolubilized enzyme and/or insolubilized bacterial cells. 4,177,107, Cl. 435-176.000.

Kumysh, Ilya I.: *See—*
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Kuno, Akira: *See—*
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Kuo, Han C., to Olin Corporation. Plated metallic cathode. 4,177,129, Cl. 204-290.00R.

Kurandt, Hans-Friedrich, to Veba-Chemie Aktiengesellschaft. Method for the production of phosphoric acid with high contents of fertilizer-nutrients. 4,177,053, Cl. 71-36.000.

Kurdjukov, Anatoly A.: *See—*
Krupman, Leonid I.; Yaroslavtsev, Jury G.; Sochnev, Alexandr E.; Shamil, Jury P.; Khitrik, Abram I.; Antipenko, Grigory I.; Smetanin, Jury G.; Samsonov, Albert N.; Ljudkovsky, Vadim M.; Pokrass, Leonid M.; Kurdjukov, Anatoly A.; Ofengenden, Abram M.; and Zhitnik, Georgy G., 4,177,070, Cl. 75-257.000.

Kurihara, Kenji; Kasahara, Shigekazu; and Suzuki, Takashi, to Toyo Soda Manufacturing Co., Ltd. Aqueous cold setting paint. 4,177,179, Cl. 260-29.6NR.

Kuroha, Kenji: *See—*
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Kuroyama, Toshinobu: *See—*
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Kuze, Yoshikazu. Sequence control system. 4,177,377, Cl. 235-419.000.
Kwon, Nathan J. Reel assembly for controlling cord winding in kite flying. 4,176,806, Cl. 242-96.000.
Kwon, Nathan J. Kite-flying control reel. 4,176,807, Cl. 242-96.000.
Kymmell, Georg R. W.; Horowitz, Alexandre; and van der Hoorn, Rudolf J. G. A., to Volvo Car B.V. Method and apparatus for the forming of metal endless belts from blanks of tubular material. 4,176,538, Cl. 72-110.000.
L. Schuler GmbH: *See—*
Panknin, Walter; Finsterwalder, Kurt; Kannegiesser, Reinhard; and Bassler, Hans, 4,176,536, Cl. 72-91.000.
Laakso, Oliver A.; and Sherman, Michael L, to Kamyr, Incorporated. Apparatus for delignifying and bleaching cellulose pulp. 4,177,105, Cl. 162-237.000.
Labes, Mortimer M., to Temple University. Fluorescent liquid crystal display. 4,176,918, Cl. 350-346.000.
Laboratoire L. Lafon: *See—*
Lafon, Louis, 4,177,290, Cl. 424-324.000.
Lacoste, Georges: *See—*
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Siclari, Francesco; Rossi, Pietro P.; Guaita, Cesare; and L'Acqua, Vito, 4,177,214, Cl. 260-601.00R.
Lafon, Louis, to Laboratoire L. Lafon. Acetamide derivatives. 4,177,290, Cl. 424-324.000.
Lafuze, David S., to Dresser Industries, Inc. Rotary bearing seal for drill bits. 4,176,848, Cl. 277-92.000.
Lage, Frederick A. Device for conditioning expended shotshells. 4,176,583, Cl. 86-24.000.
Lampe, Hans H.: *See—*
Huesing, Juergen; and Lampe, Hans H., 4,176,781, Cl. 235-304.000.
Lancaster, John T. Apparatus for playing a simulated golf game. 4,176,845, Cl. 273-245.000.
Landolt, Bruno, to Inauen Maschinen AG. Vacuum packing machine with tiltable roller stacking plate. 4,176,506, Cl. 53-86.000.
Landrith, James E.: *See—*
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Lang, William H.: *See—*
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Lange, Gerhardt, to Messer Griesheim GmbH. Flame cutting arrangement. 4,176,828, Cl. 266-65.000.
Lanning, Michael E. Wrist support. 4,176,840, Cl. 273-54.00B.
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Lattmann, Werner; and Staheli, Paul, to Rieter Machine Works Ltd. Apparatus for separating opened fibre flocks from a transporting air stream. 4,176,988, Cl. 406-171.000.
Lau, Silvanus S.; Mayer, James W.; and Sigmon, Thomas W., to Hewlett-Packard Company, by Thomas W. Sigmon, a part interest. Method for producing a low defect layer of silicon-on-sapphire wafer. 4,177,084, Cl. 148-1.500.
Laubie, Michel: *See—*
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Lauria, Francesco: *See—*
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Lee, Chi-Long: *See—*
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Barnes, William; Gerstenberg, Roy W.; Kropa, Gomer E.; and LeJeune, Roland A., 4,176,796, Cl. 241-30.000.
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Leggett & Platt, Incorporated: *See—*
Wright, Ronald E.; Kennedy, Ronald J.; and Hiatt, Sidney A., 4,176,414, Cl. 5-13.000.
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Eskesen, John H.; and Leibowitz, Herman M., 4,177,011, Cl. 416-191.000.
Leitner, Kajetan. Chuck for gripping head of screw. 4,176,699, Cl. 145-52.000.
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LeMere, Roger: *See—*
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Shadbolt, Philip; and Ganszczyk, Helen, 4,177,309, Cl. 428-195.000.
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Luginbuhl, Pierre, to S I G Schweizerische Industrie-Gesellschaft. Apparatus for forming stacks of flat objects. 4,176,993, Cl. 414-106.000.
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M&T Chemicals Inc.: *See—*
Mansukhani, Ishwar R., 4,177,075, Cl. 106-30.000.
MacDonald, Malcolm D. Swimming pool cleaning device. 4,176,419, Cl. 15-1.700.
Mackal, Glenn H. Oral inflation valve. 4,176,681, Cl. 137-516.290.
MacKiernan, Stuart W., Jr. Blank check system. 4,176,861, Cl. 283-58.000.
Madsen, Peter E.: *See—*
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Maeda, Yoshio; Matsumoto, Koichi; Fukuda, Kenji; and Shindo, Isao, to Hitachi, Ltd. Method and apparatus for optically analyzing specimen by using two light beams. 4,176,957, Cl. 356-319.000.
Mageli, Orville L.; and Swarts, William A., to Pennwalt Corporation. Peroxy compounds. 4,177,204, Cl. 260-453.0RZ.
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Magid, David J., to Cello Chemical Company. Surface treating pad. 4,176,420, Cl. 15-230.000.
Malone, Paul E., to General Electric Company. Method and apparatus for controlled-temperature valve mode transfers in a steam turbine. 4,177,387, Cl. 290-40.00R.
Manara, Giovanni; Notari, Bruno; and Fattore, Vittorio, to Snamprogetti S.p.A. Catalyst for the preparation of dimethyl ether. 4,177,167, Cl. 252-455.00R.
Mancini, Derek V., to Consumers Glass Company Limited. Condiment packaging machine. 4,176,507, Cl. 53-478.000.
Manis, John R. Firearm barrels and projectiles. 4,176,487, Cl. 42-76.00R.
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Mansukhani, Ishwar R., to M&T Chemicals Inc. Jet printing ink containing ammonium formate electrolyte. 4,177,075, Cl. 106-30.000.
Marcatili, Enrique A. J.; and Marcuse, Dietrich, to Bell Telephone Laboratories, Incorporated. Graded index optical fiber. 4,176,911, Cl. 350-96.310.
Marchaix, Raymond; and Le Cun, Alain, to Regie Nationale des Usines Renault. Safety device for venting a fuel tank. 4,176,678, Cl. 137-493.000.
Marchello, John L. Bicycle seat. 4,176,880, Cl. 297-452.000.
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Marechal, Gilles A. G., to Societe d'Exploitation des Procedes Marechal SEPM. Electric plug and socket connectors with resilient end-pressure contacts and safety disc. 4,176,898, Cl. 339-41.000.
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Markham, Michael H.; and Ruston, Rudolf S., to Chubb Industries Limited. Safe deposit apparatus. 4,176,610, Cl. 109-59.00R.
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Martin, Barrie J., to Plessey Handel und Investments AG. Fuel injection system. 4,176,634, Cl. 123-119.0EE.
Marty, William B., Jr. Cockpit display simulator for electronic countermeasure training. 4,176,468, Cl. 35-10.400.
Maruzen Petrochemical Co., Ltd.: *See—*
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Maryland Cup Corporation: *See—*
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Masak, Raymond J., to United States of America, Air Force. Multiplexing of multiple loop sidelobe cancellers. 4,177,464, Cl. 343-100.0LE.
Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (M.A.N.): *See—*
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Maschinenfabrik WIFAG: *See—*
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Masoero, Renzo: *See—*
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Mason, John W. Tone dial toll restrictor. 4,177,358, Cl. 179-18.0DA.
Mason, Ralph I., to Shaw GMC Trucks Ltd. Electronic digital governor. 4,177,516, Cl. 364-431.000.
Mason, Robert D. Combined switch and flasher. 4,177,408, Cl. 315-362.000.
Massey-Ferguson Services N.V.: *See—*
Collin, John, 4,176,852, Cl. 280-415.00A.
Mastuzaki, Harumi; Ebara, Katsuya; and Takahashi, Sankichi, to Hitachi Plant Engineering & Construction Co., Ltd.; and Hitachi, Ltd. Dialysis method and apparatus therefor. 4,177,138, Cl. 210-22.00C.
Mather & Platt Limited: *See—*
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Mathews, John P.; and Smith, Michael J., to P. R. Mallory & Co. Inc. Metal-air battery having electrically operated air access vent cover. 4,177,327, Cl. 429-27.000.
Mathews, Max V., to Bell Telephone Laboratories, Incorporated. Graphic communications apparatus. 4,177,354, Cl. 178-18.000.

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Matsumoto, Kazuya; Kawamura, Naoto; and Minami, Setsuo, to Canon Kabushiki Kaisha. Scanning device. 4,176,907, Cl. 350-6.800.

Matsumoto, Koichi: *See—*
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Matsushita Electric Industrial Co., Ltd.: *See—*
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Matthias, Heinz-Bernd: *See—*
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Matthias, Jan H., to Carrera International Corporation. Sport goggle. 4,176,410, Cl. 2-436.000.

Matthias, Jan H., to Carrera International Corporation. Eyeglasses having removable lenses. 4,176,921, Cl. 351-106.000.

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Max-Planck-Gesellschaft zur Forderung der Wissenschafen e.V.: *See—*
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Mayer, Gerald M., to United States of America, Navy. Spatially distributed analog time division multiplexer. 4,177,357, Cl. 179-15.00A.

Mayer, James W.: *See—*
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Mazdiyasni, Khodabakhsh S., to United States of America, Air Force. Process for producing reaction sintered silicon nitride of increased density. 4,177,230, Cl. 264-60.000.

Mazoff, Joseph. Drill sharpener. 4,176,499, Cl. 51-124.00R.

McCabe, Ralph P., to Colt Industries Operation Corp. Governor apparatus and system. 4,176,633, Cl. 123-102.000.

McCandless, Harry E., to RCA Corporation. Method for establishing uniform cathode-to-grid spacing in an electron gun. 4,176,432, Cl. 29-25.160.

McCardle, Arthur, Jr., to General Electric Company. Variable area exhaust nozzle. 4,176,792, Cl. 239-265.410.

McCart, Larry D.: *See—*
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McClatchie, Edward A.; Watson, Dean A.; and Burough, Irvin G., to Andros Incorporated. Gas analyzer sample cell. 4,177,381, Cl. 250-343.000.

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McClure, Charles L., to Pro-Tech, Inc. Depth/flow monitoring instrumentation. 4,176,550, Cl. 73-302.000.

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McCombs, Russell L.; and Motsinger, James V., to Baker International Corporation. Method and apparatus for counting turns when making threaded joints. 4,176,436, Cl. 29-240.000.

McCook, Thomas J.; and Shragal, John F., to Stewart-Warner Corporation. Instrument cluster assembly. 4,177,497, Cl. 361-331.000.

McCormack, Ray G., to United States of America, Army. RFI shielded doors with inflatable gaskets. 4,177,353, Cl. 174-35.0GC.

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McGraw-Edison Company: *See—*
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McLaughlin, James F.; and Goldie, Harry, to United States of America, Air Force. High power pre-TR switch. 4,177,437, Cl. 333-13.000.

McMorrow, John J. Blood segment processor. 4,176,451, Cl. 30-124.000.

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Meck & Co., Inc.: *See—*
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Meixner, Hans, to Siemens Aktiengesellschaft. Heating device having an optimized heating element of PTC thermistor material. 4,177,375, Cl. 219-441.000.

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Mercer, James B. Therapeutic treatment for measles viral infection. 4,177,281, Cl. 424-273.00R.

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Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 4,177,285, Cl. 424-275.000.

Merker, Reuven; and Lucca, Salvatore, to Metalux Corporation. The. Method for obtaining bright zinc and cadmium electroplates using carboxamide additives. 4,177,131, Cl. 204-50.00Y.

Merlette, Didier, to Techniques Europeennes de Commutation (T.E.C.). Moving-armature electromagnetic device. 4,177,440, Cl. 335-247.000.

Messer Griesheim GmbH: *See—*
Lange, Gerhardt, 4,176,828, Cl. 266-65.000.

Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See—*
Schulz, Ralf-Thilo; Brunsch, Klaus; and Lemmer, Ludwig, 4,177,306, Cl. 428-107.000.

Metals & Plastics, Inc.: *See—*
Lowry, George W., 4,177,234, Cl. 264-140.000.

Metalux Corporation, The: *See—*
Merker, Reuven; and Lucca, Salvatore, 4,177,131, Cl. 204-50.00Y.

Mette, Klaus H.; and St. Denis, Andrew R. Monitoring device for power presses. 4,177,517, Cl. 364-559.000.

Mettler, Mark F.; Faust, Clifford C.; Loichinger, Brant A.; and Forrest, Walter T., to Union Carbide Corporation. Flexible tubular casing article. 4,176,700, Cl. 150-3.000.

Meyer, Hans R., to Ciba-Geigy Corporation. Distilbenyl-oxdiazoles. 4,177,347, Cl. 542-459.000.

Meyer, Heinrich F.: *See—*
Zahn, Irwin; and Meyer, Heinrich F., 4,176,448, Cl. 29-626.000.

Meyerhoff, Leonard: *See—*
Rickards, Michael A.; Ruhe, Richard K.; Meyerhoff, Leonard; and Hook, James M., 4,176,613, Cl. 114-67.00A.

Michael, Dietrich: *See—*
Tacke, Peter; Neuray, Dieter; and Michael, Dietrich, 4,177,185, Cl. 260-38.000.

Michaelis, Eduard, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Method of continuously casting a steel strand. 4,176,707, Cl. 164-89.000.

Michaels, Alan S.; and Guillod, Mark S., to ALZA Corporation. Osmotic bursting drug delivery device. 4,177,256, Cl. 424-22.000.

Michel, Gerd W.; and Fralick, Elizabeth A., to E. R. Squibb & Sons, Inc. Process for the purification of amphotericin B and A solubilizing media useful in that process. 4,177,265, Cl. 424-181.000.

Michel, Rolf: *See—*
Elsner, Wolfgang; Kalter, Werner; Michel, Rolf; and Moslener, Jorn, 4,176,535, Cl. 72-10.000.

Microdot Inc.: *See—*
Witte, Erwin C., 4,176,582, Cl. 85-61.000.

Middle East Software Corporation: *See—*
Bishai, Wilson B.; and McCloskey, John H., 4,176,974, Cl. 400-111.000.

Midway Mfg. Co.: *See—*
Ryan, Allen L.; Jansons, Eric G.; Halliburton, Ronald D.; and Pearson, James H., 4,176,844, Cl. 273-121.00A.

Milkowski, Wolfgang: *See—*
Liepmann, Hans; Huetschens, Rolf; Milkowski, Wolfgang; Zeugner, Horst; Heinemann, Henning; Wolf, Klaus-Ullrich; Hell, Insa; and Hempel, Reinhard, 4,177,287, Cl. 424-285.000.

Miller, Diane. Pneumatic biasing device for preventing air from entering a nursing bottle. 4,176,754, Cl. 215-11.00E.

Miller, John S.: *See—*
Dey, Arabinda N.; Miller, John S.; and Bowden, William L., 4,177,329, Cl. 429-101.000.

Mills, Robert L.: *See—*
Stoner, Jesse A.; and Mills, Robert L., 4,176,693, Cl. 141-1.000.

Minakuchi, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Closed loop rotational speed control system having means for generating a PNM signal for an electric motor. 4,177,412, Cl. 318-341.000.

Minami, Setsuo: *See—*
Matsumoto, Kazuya; Kawamura, Naoto; and Minami, Setsuo, 4,176,907, Cl. 350-6.800.

Minner, Willy: *See—*
Hintzmann, Kurt; Kaiser, Reinhold; Link, Wolfgang; Minner, Willy; Mutz, Dieter; Salomon, Manfred; and Wingert, Arnim, 4,177,480, Cl. 357-84.000.

Minnesota Mining & Manufacturing Company: *See—*
Welna, Walton W.; and Frank, Lowell C., 4,177,078, Cl. 106-67.000.

Minolta Camera Kabushiki Kaisha: *See—*
Imura, Toshinori, 4,176,930, Cl. 354-59.000.
Yamada, Seiji; Yoshiyama, Ichiro; and Kitaura, Mashio, 4,176,955, Cl. 356-222.000.

Minoo, Osamu: *See—*
Ichikawa, Toshiji; and Minoo, Osamu, 4,177,182, Cl. 260-29.1SB.

Minyard, Larry J.: *See—*
Campbell, Joseph M.; and Minyard, Larry J., 4,176,578, Cl. 84-115.000.

Mishima, Takao; Semba, Shoji; Ogata, Kiichi; and Funahashi, Osamu, to Kanebo, Ltd.; and Wakayama Iron Works, Ltd. Apparatus for continuously washing fabric with water. 4,176,532, Cl. 68-19.000.

Misono, Izumi: *See—*
Yoshida, Akihiko; Koaki, Akira; Nakano, Takahumi; Miyake, Mitsunao; Kanai, Teijiro; and Misono, Izumi, 4,176,605, Cl. 101-451.000.

Missimer, Dale J., to Polycold Systems, Inc. Refrigeration system having quick defrost and re-cool. 4,176,526, Cl. 62-278.000.

Mission Marketing Corporation of Arizona: *See—*
Cox, Howard W., 4,176,587, Cl. 98-116.000.

Mitchell, Charles S., to Silonics, Inc. Carriage and raceway mechanism for an ink jet printer. 4,177,471, Cl. 346-140.00R.

Mitchell, John: *See—*
Smith, John B.; Bell, Peter W.; Queen, David S.; and Mitchell, John, 4,177,311, Cl. 428-246.000.

Mitchell, Richard E.: *See—*
Janoski, Edward J.; Mitchell, Richard E.; and Schneider, Abraham, 4,177,217, Cl. 585-253.000.

Mitchell, William O.: *See—*
Patterson, Thomas K.; Mitchell, William O.; Smith, Donald H.; and Hunter, John P., Jr., 4,176,566, Cl. 83-29.000.

Mitschke, Karl-Heinz; Niederprum, Hans; and Kapps, Manfred, to Bayer Aktiengesellschaft. 1,1,1-Trifluoro-2-chloroethane as blowing agent for polyurethane foam. 4,177,332, Cl. 521-98.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Hokuyo, Shigeru; and Gamo, Hiroshi, 4,177,477, Cl. 357-38.000.

Mitsubishi Gas Chemical Company, Inc.: *See—*
Yonemitsu, Eiichi; Miyamori, Hiroshi; Nawata, Takanari; Fujioka, Tomio; Ito, Akira; and Kobayashi, Makoto, 4,177,247, Cl. 423-515.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Yoshida, Akihiko; Koaki, Akira; Nakano, Takahumi; Miyake, Mitsunao; Kanai, Teijiro; and Misono, Izumi, 4,176,605, Cl. 101-451.000.

Mitsubishi Plastics Industries Limited: *See—*
Ueno, Yoshio; Ikeda, Takeshi; and Isozaki, Masaru, 4,177,237, Cl. 264-296.000.

Mituishi, Hisao: *See—*
Kobayashi, Mituki; Awao, Takao; Mizusaki, Yujiro; Sato, Kunio; Kato, Akio; and Mituishi, Hisao, 4,177,069, Cl. 75-213.000.

Miyake, Mitsunao: *See—*
Yoshida, Akihiko; Koaki, Akira; Nakano, Takahumi; Miyake, Mitsunao; Kanai, Teijiro; and Misono, Izumi, 4,176,605, Cl. 101-451.000.

Miyamori, Hiroshi: *See—*
Yonemitsu, Eiichi; Miyamori, Hiroshi; Nawata, Takanari; Fujioka, Tomio; Ito, Akira; and Kobayashi, Makoto, 4,177,247, Cl. 423-515.000.

Miyamoto, Kunito: *See—*
Kamiyama, Toshibumi; and Miyamoto, Kunito, 4,176,524, Cl. 62-140.000.

Miyamoto, Nobuo: *See—*
Shigeta, Junji; Oi, Tetsu; Kotera, Nobuo; Nakashima, Muneyasu; and Miyamoto, Nobuo, 4,177,298, Cl. 427-85.000.

Miyao, Shigeru: *See—*
Kamiya, Tamotsu; and Miyao, Shigeru, 4,177,023, Cl. 417-540.000.

Mizobuchi, Yuzo: *See—*
Ono, Yoshihiro; Harada, Shigeo; Mizobuchi, Yuzo; and Ikeda, Tomoaki, 4,177,072, Cl. 430-302.000.

Mizuno, Toshio: *See—*
Yoshimura, Tatsushiro; Namba, Mutsusuke; Suzue, Seisuke; Tominaga, Shigetake; Mizuno, Toshio; and Hayashida, Nariyoshi, 4,177,320, Cl. 428-419.000.

Mizusaki, Yujiro: *See—*
Kobayashi, Mituki; Awao, Takao; Mizusaki, Yujiro; Sato, Kunio; Kato, Akio; and Mituishi, Hisao, 4,177,069, Cl. 75-213.000.

Mlekarensky prumysl, generalni reditelstvi: *See—*
Forman, Ladislav; Pech, Zdenek; and Vondruska, Vaclav, 4,177,293, Cl. 426-43.000.

Mobil Oil Corporation: *See—*
Chang, Clarence D.; and Lang, William H., 4,177,202, Cl. 260-449.00R.
Espenscheid, Wilton F., 4,177,079, Cl. 106-274.000.
Heiba, El-Ahmadi I.; Kinney, Robert E.; and Stead, George E., 4,177,192, Cl. 260-326.220.
Oleck, Stephen M.; and Sherry, Howard S., 4,177,163, Cl. 252-439.000.

Mochizuki, Keizo; and Hachiya, Iwao, to Meiji Seika Co., Ltd. Process for the preparation of peanut-curd. 4,177,296, Cl. 426-632.000.

Moczulski, Zdzislaw: *See—*
Bielecki, Marek; Bogdanski, Andrzej; Buxakowski, Andrzej; Chudzinski, Janusz; Glogowski, Andrzej; Kopczynski, Marian; Krolikowski, Andrzej; Kryszewski, Jozef; Moczulski, Zdzislaw; Ochocki, Wlodzimierz; Pomorski, Aleksander; Rumatowski, Karol; Sawicki, Janusz; Szostakowski, Henryk; Warowny, Tadeusz; Wisniewski, Teofil; and Wozniak, Antoni, 4,176,624, Cl. 123-32.0EA.

Moggia, Richard A., to Burroughs Corporation. Soft input/output auto poll system. 4,177,512, Cl. 364-200.000.

Montedison S.p.A.: *See—*
Cecchin, Giuliano; Luciani, Luciano; and Griselli, Pier Luigi, 4,177,160, Cl. 252-429.00B.
Dal Bianco, Alberto, 4,177,240, Cl. 422-115.000.

Montren, William T.: *See—*
Goldstein, Harold; and Montren, William T., 4,177,407, Cl. 315-312.000.

Montz, James R.: *See—*
Allard, John J.; and Montz, James R., 4,176,785, Cl. 236-46.00R.

Moore, Mary A., to Bean, James Richard. Pain relief composition and method of preparing same. 4,177,266, Cl. 424-195.000.

Moore, Wayne O. Method for production of precast manhole bases. 4,177,229, Cl. 264-40.500.

Moretto, Hans-Heinrich: *See—*
de Montigny, Armand; and Moretto, Hans-Heinrich, 4,177,201, Cl. 260-448.20E.

Mori, Haruo, to Fuji Jukogyo Kabushiki Kaisha. Internal combustion engine having exhaust emission control system. 4,176,636, Cl. 123-119.00A.

Mori, Ikuo, to Nippon Kogaku K.K. Wide angle lens. 4,176,915, Cl. 350-220.000.

Moriyama, Toshio. AC type dust collecting apparatus. 4,177,046, Cl. 55-123.000.

Morlet, Jean G.: *See—*
Honnorat, Yves C.; Raisson, Gerard D.; and Morlet, Jean G., 4,177,026, Cl. 425-7.000.

Morton, Kenneth O.: *See—*
Hughes, Francis H.; Morton, Kenneth O.; LeMere, Roger; and Brown, Fred A., III, 4,176,832, Cl. 271-10.000.

Moskovsky Automobilny Zavod imeni I.A. Likhacheva (Proizvodstvennoe Obiedinenie Zil): *See—*
Katkov, Jury V., 4,176,738, Cl. 192-111.00R.

Moslener, Jorn: *See—*
Elsner, Wolfgang; Kalter, Werner; Michel, Rolf; and Moslener, Jorn, 4,176,535, Cl. 72-10.000.

Mosser Industries, Inc.: *See—*
Connor, Peter J., 4,176,673, Cl. 137-240.000.

Motoda Denshi Kogyo Kabushiki Kaisha: *See—*
Motoda, Kenro; and Hasegawa, Kensuke, 4,177,002, Cl. 414-751.000.

Motoda, Kenro; and Hasegawa, Kensuke, to Motoda Denshi Kogyo Kabushiki Kaisha. Cooperative drive robot. 4,177,002, Cl. 414-751.000.

Motorola, Inc.: *See—*
Davis, William F., 4,177,416, Cl. 323-4.000.
Henry, Paul M.; and Lillis, William J., 4,177,417, Cl. 323-4.000.

Motsinger, James V.: *See—*
McCombs, Russell L.; and Motsinger, James V., 4,176,436, Cl. 29-240.000.

Msika, Nessim C.: *See—*
Robert, Andre J.; Bourdon, Claude G.; Msika, Nessim C.; Chorlay, Etienne G.; and Euzenade, Jean-Louis, 4,176,951, Cl. 356-33.000.

Muccigrosso, Vincent J.; Nivison, John L.; and Oberg, Albert E., to Westinghouse Electric Corp. High contrast cathode ray display tube. 4,177,399, Cl. 313-368.000.

Mueller, Karl F.; and Good, William R., to Ciba-Geigy Corporation. Water-insoluble hydrophilic copolymers used as carriers for medicaments and pesticides. 4,177,056, Cl. 71-93.000.

Muench, Elmer W.: *See—*
Hines, Clyde K.; Long, Everett J.; and Muench, Elmer W., 4,176,900, Cl. 339-75.0MP.

Muhlethaler, Henri, to Henri Muhlethaler S.A. Match carrier including frangible protrusions. 4,176,742, Cl. 206-98.000.

Muller, Helmut: *See—*
Rody, Jean; Greber, Gerd; and Muller, Helmut, 4,177,186, Cl. 260-45.80N.

Munch, Walter, to D. H. Baldwin & Company. Improved touch operated capacitance switch circuit for an electronic organ. 4,176,575, Cl. 84-1.010.

Murakami, Keiji, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument. 4,176,576, Cl. 84-1.010.

Muromoto Iron Works Co., Ltd.: *See—*
Muromoto, Wasaburo, deceased, 4,176,450, Cl. 30-92.000.

Muromoto, Osamu, executor: *See—*
Muromoto, Wasaburo, deceased, 4,176,450, Cl. 30-92.000.
Muromoto, Wasaburo, deceased (by Muromoto, Osamu, executor), to Muromoto Iron Works Co., Ltd. Cutter mainly for cutting synthetic resin articles. 4,176,450, Cl. 30-92.000.
Murray, Dudley C.: *See—*
King, Colin M.; Goddard, Michael R.; and Murray, Dudley C., 4,176,606, Cl. 102-37.400.
Murray, Robert G.; and Gikis, Benjamin J., to Natomas Company. Heat saving method for drying wet solids. 4,176,465, Cl. 34-31.000.
Murtha, Timothy P.; Jones, William A.; and Zuech, Ernest A., to Phillips Petroleum Company. Hydroalkylation composition and process for producing said composition. 4,177,164, Cl. 252-455.00Z.
Murtha, Timothy P.; and Zuech, Ernest A., to Phillips Petroleum Company. Hydroalkylation composition and process for producing said composition. 4,177,165, Cl. 252-455.00Z.
Murtha, Timothy P.; and Zuech, Ernest A., to Phillips Petroleum Company. Hydroalkylation composition and process for producing said composition. 4,177,166, Cl. 252-455.00Z.
Muschi, Johann: *See—*
Gansauge, Jost; Muschi, Johann; and Freudlsperger, Hans, 4,176,710, Cl. 165-104.00F.
Mushkin, Nicholas M. Speaker cabinet. 4,176,730, Cl. 181-148.000.
Mutz, Dieter: *See—*
Hintzmann, Kurt; Kaiser, Reinhold; Link, Wolfgang; Minner, Willy; Mutz, Dieter; Salomon, Manfred; and Wingert, Arnim, 4,177,480, Cl. 357-84.000.
Myer, Charles G.: *See—*
Holtzapple, Mark T.; Wehe, Robert L.; Myer, Charles G.; and Carson, William W., 4,176,522, Cl. 60-459.000.
Myers, Richard E., to Nalco Chemical Company. Elimination of strainer fouling in recirculating cooling water systems. 4,177,143, Cl. 210-82.000.
Mylrea, Kenneth C.; and Demer, Joseph, to University Patents, Inc. Disposable esophageal and tracheal multi-probes. 4,176,660, Cl. 128-671.000.
Nagai, Takanori: *See—*
Shinoda, Osamu; Okabayashi, Keiichi; and Nagai, Takanori, 4,176,639, Cl. 123-136.000.
Naganuma, Kazuo: *See—*
Kishi, Kazuo; Hayashi, Minoru; and Naganuma, Kazuo, 4,176,607, Cl. 102-49.300.
Nagi, Minoru: *See—*
Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; Takashima, Hiroaki; Kato, Osamu; and Nagi, Minoru, 4,177,132, Cl. 208-22.000.
Nagy, Ernest J., to Pullman Incorporated. Sliding door and threshold arrangement for a railway passenger car compartment. 4,176,497, Cl. 49-411.000.
Nakahata, Masaaki: *See—*
Tohyama, Takanori; and Nakahata, Masaaki, 4,177,109, Cl. 435-24.000.
Nakamura, Akio; and Isizuka, Hirosi. Filter medium, process for preparation thereof, filtering method and filtering apparatus. 4,177,141, Cl. 210-70.000.
Nakamura, Kazuo; and Jyojiki, Masao, to Asahi Kogaku Kogyo Kabushiki Kaisha. Focus detecting device. 4,176,928, Cl. 354-25.000.
Nakamura, Norihiko; Toyama, Noboru; and Baika, Toyokazu, to Toyota Jidosha Kabushiki Kogyo Kaisha. Exhaust gas recirculation system for an internal combustion engine. 4,176,635, Cl. 123-119.00A.
Nakamura, Norihiko; Kato, Takashi; and Kobayashi, Tatsuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of igniting in an internal combustion engine. 4,176,646, Cl. 123-148.00E.
Nakamura, Soichi; and Hayashi, Kiyoshi, to Nippon Kogaku K.K. Telephoto lens with large relative aperture. 4,176,913, Cl. 350-214.000.
Nakamura, Takao: *See—*
Torii, Yukio; and Nakamura, Takao, 4,177,307, Cl. 428-116.000.
Nakamura, Yasuo: *See—*
Suzuki, Masatosi; Soda, Kazuya; and Nakamura, Yasuo, 4,177,112, Cl. 204-1.00T.
Nakaniwa, Mikio: *See—*
Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; Yamamoto, Minoru; and Hase, Yoshihiko, 4,177,133, Cl. 208-50.000.
Nakano, Takahumi: *See—*
Yoshida, Akihiko; Koaki, Akira; Nakano, Takahumi; Miyake, Mitsunao; Kanai, Teijiro; and Misono, Izumi, 4,176,605, Cl. 101-451.000.
Nakashima, Muneyasu: *See—*
Shigeta, Junji; Oi, Tetsu; Kotera, Nobuo; Nakashima, Muneyasu; and Miyamoto, Nobuo, 4,177,298, Cl. 427-85.000.
Nalco Chemical Company: *See—*
Albanese, Vincent M., 4,177,043, Cl. 55-5.000.
Myers, Richard E., 4,177,143, Cl. 210-82.000.
Namba, Mutsusuke: *See—*
Yoshimura, Tatsushiro; Namba, Mutsusuke; Suzue, Seisuke; Tominaga, Shigetake; Mizuno, Toshio; and Hayashida, Nariyoshi, 4,177,320, Cl. 428-419.000.
Nancarrow, James H., to Garrett Corporation, The. Turbocharger control. 4,177,006, Cl. 415-151.000.
Naranjo, George, to Illinois Tool Works Inc. Post wire guide latching means. 4,177,359, Cl. 179-98.000.
National Gypsum Company: *See—*
Stiling, Rodney A., 4,176,972, Cl. 366-304.000.
National Laboratory for High Energy Physics: *See—*
Ishimaru, Hajime, 4,176,901, Cl. 339-136.00M.
National Research Development Corporation: *See—*
Hewlett, Anthony M., 4,176,663, Cl. 128-204.260.
Thursby, Graham J., 4,177,092, Cl. 148-113.000.
National Semiconductor Corporation: *See—*
Hobrecht, Stephen W., 4,177,432, Cl. 330-252.000.
Nelson, Carl T., 4,177,095, Cl. 148-175.000.
National Steel Corporation: *See—*
Sangster, William H., 4,176,994, Cl. 414-163.000.
Natomas Company: *See—*
Murray, Robert G.; and Gikis, Benjamin J., 4,176,465, Cl. 34-31.000.
Nattel, William, to GTE Sylvania Canada Limited. Electrical outlet box. 4,176,759, Cl. 220-3.940.
Nawata, Takanari: *See—*
Yonemitsu, Eiichi; Miyamori, Hiroshi; Nawata, Takanari; Fujioka, Tomio; Ito, Akira; and Kobayashi, Makoto, 4,177,247, Cl. 423-515.000.
NCR Corporation: *See—*
Armstrong, Rolfe D.; and Gillow, George B., 4,177,455, Cl. 340-347.0DD.
Jenkins, Alfred D.; and Schade, Edward W., Jr., 4,177,515, Cl. 364-200.000.
Sacher, Eric; and Trebelhorn, Thomas E., 4,176,780, Cl. 235-302.000.
Neal, Michael G.: *See—*
Ernster, Peter J.; Schaefer, George H.; and Neal, Michael G., 4,176,971, Cl. 366-298.000.
Nedelec, Lucien; Frechet, Daniel; Dumont, Claude; and Hunt, Peter, to Roussel Uclaf. Novel 5H-benzocyclohepten-7-amines. 4,177,292, Cl. 424-330.000.
Nefedov, Askold I.: *See—*
Gebel, Iosif D.; Zykov, Arkady A.; Nefedov, Askold I.; Parshikov, Viktor I.; and Khrolenko, Viktor F., 4,176,461, Cl. 33-178.00D.
Neff, Randall B., to Hewlett-Packard Company. Calculator apparatus having a single-step key for displaying and executing program steps and displaying the result. 4,177,520, Cl. 364-900.000.
Neidhardt, Manfred; and Rehfeld, Gerhard, to Dynamit Nobel Aktiengesellschaft. Method of manufacturing electrically fused corundum. 4,177,235, Cl. 264-140.000.
Neil, Clyde C.: *See—*
Hammer, Jacob M.; and Neil, Clyde C., 4,176,551, Cl. 73-339.00R.
Neiman S.A.: *See—*
Lipschutz, Paul, 4,176,867, Cl. 292-201.000.
Nelson, Albin J., to Pfizer Inc. 1,5-Disubstituted-2-pyrrolidones. 4,177,346, Cl. 542-427.000.
Nelson, Carl T., to National Semiconductor Corporation. Process for fabricating an integrated circuit subsurface zener diode utilizing conventional processing steps. 4,177,095, Cl. 148-175.000.
Nelson & Johnson Engineering: *See—*
Stevenson, Grant E., 4,176,597, Cl. 100-244.000.
Nemag, B.V.: *See—*
van Huuksloot, Leendert, 4,176,872, Cl. 294-70.000.
Nemoto, Tsuneo; and Toyoshima, Kiichiro, to Sony Corporation. Reel for tape. 4,176,804, Cl. 242-68.500.
Neotec Corporation: *See—*
Carpenter, Frank M., 4,176,916, Cl. 350-315.000.
Nersasian, Arthur: *See—*
Arhart, Richard J.; and Nersasian, Arthur, 4,177,223, Cl. 525-331.000.
Nestler, Heinz: *See—*
Schoenafinger, Eduard; Deigner, Paul; Koester, Eberhard; Ohlinger, Manfred; Schaefer, Dieter; Stumpfi, Werner; Amort, Juergen; Seiler, Claus-Dietrich; Nestler, Heinz; and Ambros, Otto, 4,177,317, Cl. 428-405.000.
Neuenschwander, Rudolf, to Scott Paper Company. Web forming apparatus employing intermediate web forming and spreading section. 4,176,426, Cl. 19-306.000.
Neuenschwander, Rudolf, to Scott Paper Company. Web forming apparatus employing spreading section. 4,176,427, Cl. 19-306.000.
Neumann, Fred F.: *See—*
Thomas, Rudy; and Neumann, Fred F., 4,176,809, Cl. 242-107.40A.
Neumann, Ullrich; and Rudolph, Kurt. Process for purge stream treatment in removal of sulfur dioxide. 4,177,244, Cl. 423-242.000.
Neuray, Dieter: *See—*
Tacke, Peter; Neuray, Dieter; and Michael, Dietrich, 4,177,185, Cl. 260-38.000.
Newsday, Inc.: *See—*
Targe, David M., 4,176,862, Cl. 283-64.000.
Ng, Hon-Hei F.: *See—*
Clipston, Robert H.; Hall, Emerson O.; and Ng, Hon-Hei F., 4,177,303, Cl. 427-259.000.
NGK Insulators, Ltd.: *See—*
Torii, Yukio; and Nakamura, Takao, 4,177,307, Cl. 428-116.000.
Nicholl, Thomas H.; and Collins, John J., to Nicholl, Thomas H. Power failure light and circuit therefor. 4,177,500, Cl. 362-20.000.
Nichols Engineering & Research Corp.: *See—*
von Dreusche, Charles F., Jr.; and Barry, Louis T., 4,176,611, Cl. 110-225.000.
Niedermeyer, Karl O. Through flow sump pump. 4,177,021, Cl. 417-424.000.
Niederprum, Hans: *See—*
Mitschke, Karl-Heinz; Niederprum, Hans; and Kapps, Manfred, 4,177,332, Cl. 521-98.000.

Nifco, Inc.: *See—*
Kimura, Shigeru, 4,176,428, Cl. 24-73.00P.
Nihon Advanced Products Kabushiki Kaisha: *See—*
Wakatake, Yoshimasa, 4,177,458, Cl. 340-373.000.
Nilsson, Erik G., to Swegea Maschinen AG. Band cutting apparatus. 4,176,568, Cl. 83-187.000.
Nippon Electric Co., Ltd.: *See—*
Kodama, Yukuo, 4,176,516, Cl. 58-23.00R.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Yamada, Shigeru; and Ichikawa, Kiyoshi, 4,176,577, Cl. 84-1.010.
Nippon Kogaku K.K.: *See—*
Hagiuda, Nobuyoshi; and Tanaka, Hiroaki, 4,176,924, Cl. 352-174.000.
Mori, Ikuo, 4,176,915, Cl. 350-220.000.
Nakamura, Soichi; and Hayashi, Kiyoshi, 4,176,913, Cl. 350-214.000.
Watanabe, Sakuji, 4,176,933, Cl. 354-127.000.
Nippon Oil Company, Ltd.: *See—*
Sato, Hisataka, 4,177,076, Cl. 106-32.000.
Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; Takashima, Hiroaki; Kato, Osamu; and Nagi, Minoru, 4,177,132, Cl. 208-22.000.
Nippon Soken, Inc.: *See—*
Kawai, Hisasi; and Ina, Toshikazu, 4,176,629, Cl. 123-32.0EC.
Noguchi, Masaaki; Tanaka, Yukiyasu; and Tanaka, Taro, 4,176,650, Cl. 123-198.00F.
Shinoda, Yoshio; Kuno, Akira; and Kuroyama, Toshinobu, 4,177,454, Cl. 340-309.400.
Nippon Steel Corporation: *See—*
Obi, Tatsuro; Koyama, Teruo; Tanaka, Tadashi; and Hasegawa, Atsushi, 4,177,323, Cl. 428-622.000.
Nippondenso Co., Ltd.: *See—*
Kozuka, Kazuhiro; Yamamoto, Shin; Huruhashi, Mikio; Iwaki, Katsutaro; and Asari, Susumu, 4,177,366, Cl. 200-19.0DR.
Norimatsu, Hideaki; and Sato, Yoshiaki, 4,176,626, Cl. 123-32.0EE.
Suzuki, Masatosi; Soda, Kazuya; and Nakamura, Yasuo, 4,177,112, Cl. 204-1.00T.
Nishida, Takashi: *See—*
Kotera, Nobuo; Oi, Tetsu; and Nishida, Takashi, 4,177,372, Cl. 219-121.00L.
Nishimura, Masahiro: *See—*
Nojima, Hiroshi; and Nishimura, Masahiro, 4,176,703, Cl. 152-209.00B.
Nishimura, Sanji: *See—*
Watanabe, Morio; and Nishimura, Sanji, 4,177,119, Cl. 204-151.000.
Nishizawa, Jun-ichi, to Semiconductor Research Foundation. Single crystal of semiconductive material on crystal of insulating material. 4,177,321, Cl. 428-446.000.
Nissan Motor Company, Limited: *See—*
Kitamura, Hidetoshi; and Sato, Jun, 4,176,638, Cl. 123-119.00A.
Nivison, John L.: *See—*
Muccigrosso, Vincent J.; Nivison, John L.; and Oberg, Albert E., 4,177,399, Cl. 313-368.000.
Noddings, John; and Cox, Michael D., to Associated Engineering Limited. Electrical protection circuits. 4,177,492, Cl. 361-31.000.
Noethe, Bjoern, to Siemens Aktiengesellschaft. Optical ribbon cables. 4,176,910, Cl. 350-96.230.
Nogimura, Tsunehisa, to Kabushiki Kaisha Kawai Gakki Seisakusho. Frequency divider for tone source apparatus for Arabian scale in electronic organ. 4,176,574, Cl. 84-1.010.
Noguchi, Masaaki; Tanaka, Yukiyasu; and Tanaka, Taro, to Nippon Soken, Inc. Method for operating a multi-cylinder jump-spark ignition engine and operation control system thereof. 4,176,650, Cl. 123-198.00F.
Nojima, Hiroshi; and Nishimura, Masahiro, to Bridgestone Tire Company Limited. Pneumatic tire having lug pattern. 4,176,703, Cl. 152-209.00B.
Nolte, David G.; and Brown, Winthrop K., to Texaco Inc. Sonic leak detector and method. 4,176,543, Cl. 73-40.50A.
Nordendale, Paul A. Wall safe lock. 4,176,533, Cl. 70-115.000.
Nordisk Insulinlaboratorium: *See—*
Hansen, Jorgen F., 4,177,188, Cl. 260-122.000.
Nordskog, Robert A. Self-propelled aircraft passenger elevator. 4,176,732, Cl. 187-9.00E.
Norimatsu, Hideaki; and Sato, Yoshiaki, to Nippondenso Co., Ltd. Air-fuel ratio feedback control system. 4,176,626, Cl. 123-32.0EE.
Norin, Ake: *See—*
Eriksson, Ake; and Norin, Ake, 4,176,657, Cl. 126-401.000.
Norman, Jan L.: *See—*
Brown, David A.; Norman, Jan L.; and Whitson, Donald W., 4,177,461, Cl. 340-628.000.
Northern Telecom Limited: *See—*
Gillissie, Michael J. E., 4,176,751, Cl. 211-41.000.
Northrop Corporation: *See—*
Eguchi, Ronald G., 4,177,404, Cl. 315-151.000.
Headley, Jack W.; Skow, Andrew M.; and Tiuriga, Andrew, Jr., 4,176,813, Cl. 244-130.000.
Nortn-Harty Colliery Engineering Limited: *See—*
Wallace, Walter M.; and Craven, Geoffrey F., 4,176,749, Cl. 209-457.000.
Notari, Bruno: *See—*
Manara, Giovanni; Notari, Bruno; and Fattore, Vittorio, 4,177,167, Cl. 252-455.00R.
Notifier Company: *See—*
Hubert, Gustav, 4,176,618, Cl. 116-102.000.
Nozaki, Kenzie, to Shell Oil Company. 1-Octen-7-yne production. 4,177,220, Cl. 585-505.000.
Nussbaum, Marvin L.; and Knaggs, Edward A., to Stepan Chemical Company. Petroleum sulfonates. 4,177,207, Cl. 260-504.00R.
N.V. Klippan S.A.: *See—*
Thomas, Rudy; and Neumann, Fred F., 4,176,809, Cl. 242-107.40A.
O&K Orenstein & Koppel Aktiengesellschaft: *See—*
Alpers, Gunther; and Bentz, Helmut, 4,176,887, Cl. 305-57.000.
Oberg, Albert E.: *See—*
Muccigrosso, Vincent J.; Nivison, John L.; and Oberg, Albert E., 4,177,399, Cl. 313-368.000.
Obi, Tatsuro; Koyama, Teruo; Tanaka, Tadashi; and Hasegawa, Atsushi, to Nippon Steel Corporation; and Sakuranomiya Chemical Co., Ltd. Coated metal sheet for use in producing a drawn and ironed can body. 4,177,323, Cl. 428-622.000.
O'Brien, Vincent J.: *See—*
Holzhauser, Ronald C.; Zirngibl, Carl H.; and O'Brien, Vincent J., 4,176,945, Cl. 355-23.000.
Obuch, Edward A., to Amerace Corporation. Electrical terminal. 4,176,904, Cl. 339-192.00R.
Occidental Oil Shale, Inc.: *See—*
Studebaker, Irving G.; and Hutchins, Ned M., 4,176,882, Cl. 299-2.000.
Ochmann, Rudolf: *See—*
Hermeyer, Bernd; and Ochmann, Rudolf, 4,177,406, Cl. 315-307.000.
Ochocki, Wlodzimierz: *See—*
Bielecki, Marek; Bogdanski, Andrzej; Buszkowski, Andrzej; Chudzinski, Janusz; Glogowski, Andrzej; Kopczynski, Marian; Krolikowski, Andrzej; Kryszewski, Jozef; Moczulski, Zdzislaw; Ochocki, Wlodzimierz; Pomorski, Aleksander; Rumatowski, Karol; Sawicki, Janusz; Szostakowski, Henryk; Warowny, Tadeusz; Wisniewski, Teofil; and Wozniak, Antoni, 4,176,624, Cl. 123-32.0EA.
Oddo, Luigi G. Electronic engine wear detector. 4,176,545, Cl. 73-64.000.
O'Dell, C. Allen: *See—*
Shealy, Y. Fulmer; and O'Dell, C. Allen, 4,177,348, Cl. 544-317.000.
Ofengenden, Abram M.: *See—*
Krupman, Leonid I.; Yaroslavtsev, Jury G.; Sochnev, Alexandr E.; Shamil, Jury P.; Khitrik, Abram I.; Antipenko, Grigory I.; Smetanin, Jury G.; Samsonov, Albert N.; Ljudkovsky, Vadim M.; Pokrass, Leonid M.; Kurdjukov, Anatoly A.; Ofengenden, Abram M.; and Zhitnik, Georgy G., 4,177,070, Cl. 75-257.000.
Ogata, Kiichi: *See—*
Mishima, Takao; Semba, Shoji; Ogata, Kiichi; and Funahashi, Osamu, 4,176,532, Cl. 68-19.000.
Ogren, Sven O.: *See—*
Lindberg, Ulf H. A.; Ross, Svante B.; Thorberg, Seth O.; and Ogren, Sven O., 4,177,291, Cl. 424-330.000.
Ohdan, Kyoji: *See—*
Umemura, Sumio; Ohdan, Kyoji; Sakai, Fumihiko; Bando, Yasuo; and Ikezawa, Harumi, 4,177,161, Cl. 252-435.000.
Ohio Agricultural Research and Development Center: *See—*
Holmes, Robert G., 4,176,750, Cl. 209-699.000.
Ohlinger, Manfred: *See—*
Schoenafinger, Eduard; Deigner, Paul; Koester, Eberhard; Ohlinger, Manfred; Schaefer, Dieter; Stumpfi, Werner; Amort, Juergen; Seiler, Claus-Dietrich; Nestler, Heinz; and Ambros, Otto, 4,177,317, Cl. 428-405.000.
Ohmura, Ryuichi, to Fuji Kogyo Co., Ltd. Line guide ring. 4,176,488, Cl. 43-24.000.
Ohtani, Kazuo: *See—*
Akai, Norio; Inoue, Nobumasa; and Ohtani, Kazuo, 4,176,847, Cl. 274-39.00R.
Oi, Tetsu: *See—*
Kotera, Nobuo; Oi, Tetsu; and Nishida, Takashi, 4,177,372, Cl. 219-121.00L.
Shigeta, Junji; Oi, Tetsu; Kotera, Nobuo; Nakashima, Muneyasu; and Miyamoto, Nobuo, 4,177,298, Cl. 427-85.000.
Oji Paper Co., Ltd.: *See—*
Hata, Yukinori; Watanabe, Tsutomu; and Itoh, Fumio, 4,177,073, Cl. 430-188.000.
Okabayashi, Keiichi: *See—*
Shinoda, Osamu; Okabayashi, Keiichi; and Nagai, Takanori, 4,176,639, Cl. 123-136.000.
Okabe, Katsuhiko, to Copal Company Limited. Device for intermittently driving printing rings in a printer. 4,176,599, Cl. 101-95.000.
Okamoto, Yoshinori: *See—*
Gotoh, Isamu; Okamoto, Yoshinori; and Wakatsuki, Goroei, 4,176,648, Cl. 123-179.00S.
Okazaki, Hiroshi. *See—*
Okumura, Tomisaburo; Okazaki, Hiroshi; and Tsuchitani, Akira, 4,177,096, Cl. 148-187.000.
Okita, Koichi, to Sumitomo Electric Industries, Ltd. Microporous tubes. 4,177,334, Cl. 521-145.000.
Oku, Nobuyuki, to Itoki Kosakusho Co., Ltd. Automatic positioning system for a carriage in a storage and retrieval system. 4,176,996, Cl. 414-273.000.
Okumura, Tomisaburo; Okazaki, Hiroshi; and Tsuchitani, Akira, to Matsushita Electronics Corporation. Method for manufacturing a semiconductor integrated circuit device. 4,177,096, Cl. 148-187.000.
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., to Hewlett-Packard

Company. Programmable calculator including scrolling alphanumeric display means. 4,177,518, Cl. 364-710.000.

Olearczyk, Francis J., deceased: *See—*
Seven, Manfred K.; and Olearczyk, Francis J., deceased, 4,177,336, Cl. 525-325.000.

Olearczyk, Jean R., administratrix: *See—*
Seven, Manfred K.; and Olearczyk, Francis J., deceased, 4,177,336, Cl. 525-325.000.

Oleck, Stephen M.; and Sherry, Howard S., to Mobil Oil Corporation. Supported catalyst for demetalation and desulfurization of hydrocarbon oils. 4,177,163, Cl. 252-439.000.

Olin Corporation: *See—*
Dotson, Ronald L.; and Lynch, Richard W., 4,177,115, Cl. 204-78.000.
Kuo, Han C., 4,177,129, Cl. 204-290.00R.

Olszewski, Jerzy A.; and Ramy, Towheed, to General Cable Corporation. Reliable sheath bonding connector and method of making. 4,176,893, Cl. 339-14.00R.

Olympus Optical Company Limited: *See—*
Tojo, Tsutomu, 4,176,912, Cl. 350-175.0ML.

Omron Tateisi Electronics Co.: *See—*
Takenaka, Kunio, 4,176,556, Cl. 73-362.0AR.
Yasutake, Akira, 4,176,917, Cl. 350-336.000.

Ondetti, Miguel A.; and Condon, Michael E., to E. R. Squibb & Sons, Inc. Method for alleviating hypertension. 4,177,277, Cl. 424-263.000.

O'Neal, Chester L.; and O'Neal, Danny C. Disposable toothbrush and dentifrice combination. 4,176,980, Cl. 401-162.000.

O'Neal, Danny C.: *See—*
O'Neal, Chester L.; and O'Neal, Danny C., 4,176,980, Cl. 401-162.000.

Onishi, Masaru: *See—*
Katakabe, Noboru; Yamaguchi, Isao; and Onishi, Masaru, 4,176,940, Cl. 355-10.000.

Onizawa, Masao, to Sanyo Trading Co., Ltd. Vulcanizable rubber compositions and vulcanized rubber prepared therefrom. 4,177,337, Cl. 525-331.000.

Ono, Yoshihiro; Harada, Shigeo; Mizobuchi, Yuzo; and Ikeda, Tomoaki, to Fuji Photo Film Co., Ltd. Process for preparing a lithographic printing plate with a thiourea wetting solution. 4,177,072, Cl. 430-302.000.

Orel, Jeannette V. Self-acting smoke sorbing device. 4,177,045, Cl. 55-102.000.

Oren, Amiram: *See—*
Bartoov, Benjamin; Mayevsky, Abraham; Mendel, Shmuel; and Oren, Amiram, 4,176,953, Cl. 356-73.000.

Oronzio DeNora Impianti Elettrochimici S.p.A.: *See—*
DeNora, Oronzio; and Pellegri, Alberto, 4,177,116, Cl. 204-98.000.

Ortho Pharmaceutical Corporation: *See—*
Chen, Robert H. K., 4,177,194, Cl. 260-333.000.

Osorio, Manuel M. Composition for and method of causing rainfall. 4,176,790, Cl. 239-2.00R.

Ossman, John: *See—*
Kromer, Heiner M.; and Ossman, John, 4,176,968, Cl. 366-97.000.

Osterman, Ralph G.: *See—*
Rivers, Morris R.; Osterman, Ralph G.; and Warmuth, George H., 4,177,048, Cl. 55-275.000.

O'Sullivan, Rita. Visual teaching aid for number concept. 4,176,474, Cl. 35-73.000.

Oswald, Alexis A.: *See—*
Daniher, Francis A.; and Oswald, Alexis A., 4,177,289, Cl. 424-300.000.

Otani, Akira, to Sharp Kabushiki Kaisha. Variable cooking mode selector in a microwave oven. 4,177,370, Cl. 219-10.55B.

Ott, Richard R.: *See—*
Roesel, John F., Jr.; Ott, Richard R.; and Barber, Ronnie J., 4,177,414, Cl. 322-28.000.

Otteblad, Sven I. A.; Brynielsson, Erner T. O.; Dovertie, Ralph G.; Franzen, Stig E. R.; and Brelen, Hans E. O., to AB Volvo. Combined automatic and manual guidance system. 4,176,728, Cl. 180-168.000.

Ovshinsky, Stanford R., to Energy Conversion Devices, Inc. Amorphous semiconductor member and method of making the same. 4,177,473, Cl. 357-2.000.

Ovshinsky, Stanford R., to Energy Conversion Devices, Inc. High temperature amorphous semiconductor member and method of making the same. 4,177,474, Cl. 357-2.000.

Owens, Malcolm P.: *See—*
Knox, Lee H.; Owens, Malcolm P.; and Ure, George R., 4,176,711, Cl. 165-105.000.
Knox, Lee H.; and Owens, Malcolm P., 4,176,712, Cl. 165-105.000.

Owens, Roger W.: *See—*
Hickey, Robert F.; and Owens, Roger W., 4,177,144, Cl. 210-86.000.

Oxford Industries, Inc.: *See—*
Patterson, Thomas K.; Mitchell, William O.; Smith, Donald H.; and Hunter, John P., Jr., 4,176,566, Cl. 83-29.000.

Ozawa, Kaoru: *See—*
Kasubuchi, Takeshi; Ozawa, Kaoru; and Hara, Takeo, 4,177,519, Cl. 364-712.000.

Ozawa, Takashi: *See—*
Takenouchi, Mutsuo; Ozawa, Takashi; Wako, Syoji; and Itoh, Satoru, 4,177,487, Cl. 358-294.000.

P. R. Mallory & Co. Inc.: *See—*
Dey, Arabinda N.; Miller, John S.; and Bowden, William L., 4,177,329, Cl. 429-101.000.
Mathews, John P.; and Smith, Michael J., 4,177,327, Cl. 429-27.000.

Pack, Paul R., to Harsco Corporation. Method for removing oil from mill scale and recovering metallic values therein. 4,177,062, Cl. 75-28.000.

Pageau, Lucien: *See—*
Thayer, William L.; Pageau, Lucien; and Sourirajan, Srinivasa, 4,177,031, Cl. 425-460.000.

Pagnozzi, Ernesto G.; and Pagnozzi, Vincenzo. Apparatus for drying timber. 4,176,466, Cl. 34-233.000.

Pagnozzi, Vincenzo: *See—*
Pagnozzi, Ernesto G.; and Pagnozzi, Vincenzo, 4,176,466, Cl. 34-233.000.

Pains-Wessex Limited: *See—*
King, Colin M.; Goddard, Michael R.; and Murray, Dudley C., 4,176,606, Cl. 102-37.400.

Pall Corporation: *See—*
Rosenberg, David J., 4,177,149, Cl. 210-436.000.

Panafacom Limited: *See—*
Yamaguchi, Taihei, 4,177,451, Cl. 340-147.00R.

Panknin, Walter; Finsterwalden, Kurt; Kannegiesser, Reinhard; and Bassler, Hans, to L. Schuler GmbH. Device for producing a bead on the circumference of a hollow cylinder. 4,176,536, Cl. 72-91.000.

Pannaci, Karl E.: *See—*
Anderson, Harvey G.; and Pannaci, Karl E., 4,176,430, Cl. 26-96.000.

Pannell, Calvin E., to Dow Chemical Company, The. Purification of polymer solution. 4,177,343, Cl. 528-482.000.

Parker, Robert H., to W. H. Brady Co. Apparatus for separating laminated layers. 4,177,104, Cl. 156-584.000.

Parshikov, Viktor I.: *See—*
Gebel, Iosif D.; Zykov, Arkady A.; Nefedov, Askold I.; Parshikov, Viktor I.; and Khrolenko, Viktor F., 4,176,461, Cl. 33-178.00D.

Passedroit, Hubert: *See—*
Boy, Aristide; Galy, Henri; Ivaldi, Raoul; and Passedroit, Hubert, 4,177,208, Cl. 260-504.00S.

Paton, Boris E.; Medovar, Boris I.; Tsukanov, Georgy E.; Bogachenko, Alexei G.; Artamonov, Viktor L.; Timashov, Grigory A.; Shtanko, Jury P.; Marchenko, Alexander M.; Fedorovsky, Boris B.; Kumysh, Ilya I.; Chepurnoi, Anatoly D.; Saenko, Vladimir Y.; and Semin-Vadov, Gennady M., to Institut Elektrosvarki Imeni E.O. Patona Akademii Nauk Ukrainskoi SSR. Method for producing a non-split metal workpiece formed as a cast hollow billet with a bottom part. 4,177,058, Cl. 75-10.00C.

Patterson, James; and Farrar, Peter G. G., to Rolls-Royce Limited. Compressor rotor stage. 4,177,013, Cl. 416-193.00A.

Patterson, Thomas K.; Mitchell, William O.; Smith, Donald H.; and Hunter, John P., Jr., to Oxford Industries, Inc. Creel loading and cutting system. 4,176,566, Cl. 83-29.000.

Pattyn, Herman A.: *See—*
De Brabandere, Luc A.; Borginon, Hendrik A.; Pattyn, Herman A.; and Pollet, Robert J., 4,177,071, Cl. 430-494.000.

Paul, James E., to Rockwell International Corporation. Adaptive noise cancelling receiver. 4,177,430, Cl. 325-475.000.

Payrhammer, Bernd, to AGFA-Gevaert, A.G. Correctly positioning successive originals of a photographic strip at a copying or severing station. 4,176,944, Cl. 355-18.000.

Payrhammer, Bernd: *See—*
Knor, Bernhard; Payrhammer, Bernd; and Treiber, Helmut, 4,176,964, Cl. 356-444.000.

Pearson, James H.: *See—*
Ryan, Allen L.; Jansons, Eric G.; Halliburton, Ronald D.; and Pearson, James H., 4,176,844, Cl. 273-121.00A.

Pech, Zdenek: *See—*
Forman, Ladislav; Pech, Zdenek; and Vondruska, Vaclav, 4,177,293, Cl. 426-43.000.

Pedain, Josef: *See—*
Bock, Manfred; Pedain, Josef; Slawyk, Wilhelm; and Konig, Klaus, 4,177,342, Cl. 528-45.000.

Pellegri, Alberto: *See—*
DeNora, Oronzio; and Pellegri, Alberto, 4,177,116, Cl. 204-98.000.

Pennington, Charles A. Device for scoring wood panels prior to sawing. 4,176,572, Cl. 83-862.000.

Pennington, William. Plastic sheet sealing process and apparatus. 4,177,100, Cl. 156-157.000.

Pennwalt Corporation: *See—*
Bohen, Joseph M., 4,177,187, Cl. 260-45.75S.
Bohen, Joseph M., 4,177,198, Cl. 260-399.000.
Mageli, Orville L.; and Swarts, William A., 4,177,204, Cl. 260-453.0RZ.
Toukan, Sameeh S.; and Hauptschein, Murray, 4,177,351, Cl. 548-325.000.

Pepper, Terry W.; and Bocckino, Harry G., to Texasgulf Inc. Recovery of silver, copper and zinc from partially roasted pyrite concentrate by ferric sulphate leaching. 4,177,067, Cl. 75-104.000.

Perez, Leo: *See—*
Goebel, Bert; and Perez, Leo, 4,176,407, Cl. 2-20.000.

Perin, Philippe, to Societe Fiat France, S.A. Devices for automatically coupling implements to self-propelled articles. 4,176,727, Cl. 180-53.00R.

Perr, Julius P., to Cummins Engine Company, Inc. Aneroid for a turbocharged engine. 4,176,661, Cl. 123-140.0FG.

Perret, Maurice, to Gesellschaft fur elektronische Rohren Comet Bern. Variable electric capacitor. 4,177,495, Cl. 361-279.000.

Perser, Donald A.; and Roman, Donald A., to Ballert Orthopedic Corp. Foot elevation measuring device. 4,176,459, Cl. 33-174.00D.

Person, Abraham: *See—*
Wetmore, Sherman B.; McNary, James F.; and Person, Abraham, 4,176,722, Cl. 175-7.000.

Petersen, Louis P.: *See—*
Razzano, John S.; Petersen, Louis P.; and Ashby, Bruce A., 4,177,200, Cl. 260-448.20N.

Peterson, Dean M., to Honeywell Inc. Recorder with electrically conductive paper. 4,177,469, Cl. 346-110.00R.

Peterson, James J., to Kendall Company, The. Urine collection device. 4,176,412, Cl. 4-144.100.

Peterson, Richard H. Circuit for simulating reverberation in electronic organs. 4,176,579, Cl. 84-1.240.

Pfister, Rudolf: *See—*
Hromatka, Otto; Binder, Dieter; Pfister, Rudolf; and Zeller, Paul, 4,177,193, Cl. 549-64.000.

Pfizer Inc.: *See—*
Nelson, Albin J., 4,177,346, Cl. 542-427.000.
Sarges, Reinhard, 4,177,282, Cl. 424-273.00R.

Pfleger, Klaus: *See—*
Boettcher, Klaus; Hoerdt, Heinrich G.; Pfleger, Klaus; Zacher, Wieland; and Gropper, Hans, 4,177,340, Cl. 526-329.000.

Philip Morris Incorporated: *See—*
Van Auken, Thomas V.; Grubbs, Harvey J.; and Johnson, William R., Jr., 4,177,339, Cl. 526-314.000.

Philipp, Adolf H.; and Jirkovsky, Ivo L., to Ayerst McKenna & Harrison Ltd. 2-Substituted-3-methyl-γ-pyrone tricyclic derivatives and process therefor. 4,177,284, Cl. 424-275.000.

Philips, Nicholas A. Hinged fishing lure. 4,176,490, Cl. 43-42.150.

Phillips Petroleum Company: *See—*
Irvin, Howard B.; Sherk, Fred T.; and Hoffman, Alfred A., Jr., 4,177,250, Cl. 423-573.00G.
McDaniel, Max P.; and Welch, Melvin B., 4,177,162, Cl. 252-439.000.
Murtha, Timothy P.; Jones, William A.; and Zuech, Ernest A., 4,177,164, Cl. 252-455.00Z.
Murtha, Timothy P.; and Zuech, Ernest A., 4,177,165, Cl. 252-455.00Z.
Murtha, Timothy P.; and Zuech, Ernest A., 4,177,166, Cl. 252-455.00Z.

Pieper, Christian; Sandhu, Surinder S.; Schummer, Gunter; and Feltgen, Karlheinz, to Bayer Aktiengesellschaft. Process for the recovery of dimethylacylamides. 4,177,111, Cl. 203-14.000.

Pierrel, Michel, to Pont-a-Mousson S.A. Process and installation for heat treating spheroidal or lamellar graphite cast iron pipes. 4,177,088, Cl. 148-15.000.

Pilipski, Mark. Low pressure alarm. 4,176,617, Cl. 116-70.000.

Pinkus, Alan E. Wrist support. 4,176,839, Cl. 273-29.00A.

Pioneer Electronic Corporation: *See—*
Takaoka, Saburo, 4,177,411, Cl. 318-314.000.

Piorkow, Alfred: *See—*
Kocher, Robert C.; and Piorkow, Alfred, 4,176,925, Cl. 354-1.000.

Pittman, Turner J. Inflatable enclosure and energy exchange system. 4,176,653, Cl. 126-428.000.

Pizzini, Louis C.: *See—*
Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,177,335, Cl. 521-171.000.

Pleion Corporation: *See—*
Gartung, Clifford W., 4,176,889, Cl. 312-195.000.

Plessey Handel und Investments AG: *See—*
Martin, Barrie J., 4,176,634, Cl. 123-119.0EE.
Wallace, Malcolm R., 4,177,033, Cl. 431-78.000.

Podesta, Armando. Gasket for closure caps for containers. 4,176,757, Cl. 215-341.000.

Poggemiller, Erhard; and Sweet, Ralph, to Kep Enterprises; and Sweet Manufacturing Ltd. Depth control for ground working agricultural implements. 4,176,721, Cl. 172-4.000.

Pohl, Louis; and Westerhoff, Heinz, to Pohl, Louis. Pipe string connection for high load operation. 4,176,864, Cl. 285-181.000.

Poignant, Jean-Claude: *See—*
Regnier, Gilbert; Canevari, Roger; Laubie, Michel; and Poignant, Jean-Claude, 4,177,272, Cl. 424-250.000.

Pokrass, Leonid M.: *See—*
Krupman, Leonid I.; Yaroslavtsev, Jury G.; Sochnev, Alexandr E.; Shamil, Jury P.; Khitrik, Abram I.; Antipenko, Grigory I.; Smetanin, Jury G.; Samsonov, Albert N.; Ljudkovsky, Vadim M.; Pokrass, Leonid M.; Kurdjukov, Anatoly A.; Ofengenden, Abram M.; and Zhitnik, Georgy G., 4,177,070, Cl. 75-257.000.

Polaroid Corporation: *See—*
Gordon, Michael E.; and Stieger, Frank, 4,177,330, Cl. 429-152.000.
Young, Warren H.; Drevitch, Nolan A.; and Rosati, Anthony G., 4,176,932, Cl. 354-126.000.

Politechnika Poznanska: *See—*
Bielecki, Marek; Bogdanski, Andrzej; Buxakowski, Andrzej; Chudzinski, Janusz; Glogowski, Andrzej; Kopczynski, Marian; Krolikowski, Andrzej; Kryszewski, Jozef; Moczulski, Zdzislaw; Ochocki, Wlodzimierz; Pomorski, Aleksander; Rumatowski, Karol; Sawicki, Janusz; Szostakowski, Henryk; Warowny, Tadeusz; Wisniewski, Teofil; and Wozniak, Antoni, 4,176,624, Cl. 123-32.0EA.

Polk, Matthew S., Jr. Loudspeaker-cable interface. 4,177,431, Cl. 330-149.000.

Pollet, Robert J.: *See—*
De Brabandere, Luc A.; Borginon, Hendrik A.; Pattyn, Herman A.; and Pollet, Robert J., 4,177,071, Cl. 430-494.000.

Polycold Systems, Inc.: *See—*
Missimer, Dale J., 4,176,526, Cl. 62-278.000.

Polymer Research, Inc.: *See—*
Wallace, Robert A.; and McCurdy, J. L., 4,176,969, Cl. 366-149.000.

Pomorski, Aleksander: *See—*
Bielecki, Marek; Bogdanski, Andrzej; Buxakowski, Andrzej; Chudzinski, Janusz; Glogowski, Andrzej; Kopczynski, Marian; Krolikowski, Andrzej; Kryszewski, Jozef; Moczulski, Zdzislaw; Ochocki, Wlodzimierz; Pomorski, Aleksander; Rumatowski, Karol; Sawicki, Janusz; Szostakowski, Henryk; Warowny, Tadeusz; Wisniewski, Teofil; and Wozniak, Antoni, 4,176,624, Cl. 123-32.0EA.

Pont-a-Mousson S.A.: *See—*
Pierrel, Michel, 4,177,088, Cl. 148-15.000.

Poppelsdorf, Fedor, to Union Carbide Corporation. Process for preparing bis(N,N-dialkylamino)alkyl ethers employing sulfur oxychloro-containing compounds. 4,177,212, Cl. 260-584.00R.

Popper, Karel; and Camirand, Wayne M. Methods and apparatus for continuously endowing liquid with mechanical energy by osmosis. 4,177,146, Cl. 210-137.000.

Popplewell, Alan F., deceased (by Popplewell, Margaret R., legal representative); and Clark, David R., to Ciba-Geigy Corporation. Additives for water-based functional fluids. 4,177,155, Cl. 252-49.300.

Popplewell, Margaret R., legal representative: *See—*
Popplewell, Alan F., deceased; and Clark, David R., 4,177,155, Cl. 252-49.300.

Post, Vernon L.: *See—*
Fosner, Emerson O.; and Post, Vernon L., 4,176,470, Cl. 35-22.00A.

Power, Douglas P. Cooking pan for baking pizza pies and like food products. 4,176,591, Cl. 99-430.000.

Power Systems Development Corp.: *See—*
Hornski, Walter W.; and Simkanich, John J., 4,177,460, Cl. 340-576.000.

Powers, Frank M.: *See—*
Chadwick, Kenneth E.; Chia, E. Henry; and Powers, Frank M., 4,177,085, Cl. 148-2.000.

PPG Industries, Inc.: *See—*
Das, Suryya K.; and Kania, Charles M., 4,177,178, Cl. 260-29.40A.
Radzwill, John, 4,177,099, Cl. 156-99.000.
Rahn, Henry W., 4,177,128, Cl. 204-243.00R.

Precise Power Corporation: *See—*
Roesel, John F., Jr.; Ott, Richard R.; and Barber, Ronnie J., 4,177,414, Cl. 322-28.000.

Precision Screen Machines, Inc.: *See—*
Szarka, Sandor, 4,176,601, Cl. 101-115.000.

Prehn, Lawrence D. Facsimile apparatus. 4,177,485, Cl. 358-259.000.

Prehn, Lawrence D. Facsimile device. 4,177,486, Cl. 358-259.000.

Premier Industrial Corporation: *See—*
Allenbaugh, George G., Jr., 4,176,794, Cl. 239-498.000.

Primus-Sievert AB: *See—*
Eriksson, Ake; and Norin, Ake, 4,176,657, Cl. 126-401.000.

Priou, Alain: *See—*
Deficis, Alain; Gimonet, Marie-Edith; Priou, Alain; and Fournet-Fayas, Christian, 4,177,422, Cl. 324-95.000.

Pro-Tech, Inc.: *See—*
McClure, Charles L., 4,176,550, Cl. 73-302.000.

Process Engineering, Inc.: *See—*
Schultz, Jeffrey A., 4,177,017, Cl. 417-231.000.

Prolss, Ludwig, to Kilcher-Chemie AG. Method of production of a micro-porous membrane for filtration plants. 4,177,228, Cl. 264-24.000.

Proskow, Stephen, to Du Pont de Nemours, E. I., and Company. Butadiene/acrylonitrile photosensitive, elastomeric polymer compositions for flexographic printing plates. 4,177,074, Cl. 430-286.000.

Proust, Francois O.: *See—*
Clin, Francois H.; Gony, Jean-Noel; and Proust, Francois O., 4,176,799, Cl. 241-74.000.

Prunier, Jean-Claude, to Souriau et Cie. Processes for preparing a connector end on a fiber bundle optical cable and cables thus obtained. 4,176,909, Cl. 350-96.200.

Pullman Incorporated: *See—*
Nagy, Ernest J., 4,176,497, Cl. 49-411.000.

Pushkin, Sergei B.: *See—*
Bezvulyak, Anatoly S.; Gelfand, Ilya M.; Torchinsky, Efim M.; Pushkin, Sergei B.; Vedernikov, Rudolf K.; Kulachenkov, Gennady P.; Tkachuk, Petr F.; and Karyagin, Viktor F., 4,176,952, Cl. 356-47.000.

Pyke, Thomas R.; and Salmond, Marion P., to Upjohn Company, The. Process for preparing 3aα-H-4α-[3'-propanol]-7aβ-methylhexahydro-1,5-indanedione hemiketal. 4,177,106, Cl. 435-125.000.

Quarz-Zeit AG: *See—*
Stein, Manfred; and Busch, Dieter, 4,176,515, Cl. 58-19.00R.

Queen, David S.: *See—*
Smith, John B.; Bell, Peter W.; Queen, David S.; and Mitchell, John, 4,177,311, Cl. 428-246.000.

Quere, Eugene M.; and Le Rolland, Pierre M., to ITT Industries, Inc. Assembly process of electrodes in an insulating material. 4,176,446, Cl. 29-622.000.

Quest Automation Limited: *See—*
Eadie, David W.; and Hancock, Charles J., 4,176,926, Cl. 354-4.000.

Raber, Robert R., Jr.: *See—*
Culbert, Robert M.; and Raber, Robert R., Jr., 4,177,050, Cl. 55-499.000.

Radzwill, John, to PPG Industries, Inc. Method of bonding polyurethane sheeting to acrylic or polyurethane sheeting in production of transparent windows. 4,177,099, Cl. 156-99.000.

Rae, Donald A. Book with removable three dimensional figurines. 4,176,473, Cl. 35-35.00E.
Rahn, Henry W., to PPG Industries, Inc. Cathode element for use in aluminum reduction cell. 4,177,128, Cl. 204-243.00R.
Raisson, Gerard D.: *See*—
Honnorat, Yves C.; Raisson, Gerard D.; and Morlet, Jean G., 4,177,026, Cl. 425-7.000.
Ramy, Towheed: *See*—
Olszewski, Jerzy A.; and Ramy, Towheed, 4,176,893, Cl. 339-14.00R.
Ranco Incorporated: *See*—
Gliatas, Themistocles H., 4,176,823, Cl. 251-306.000.
Randam Electronics, Inc.: *See*—
Stevens, William M., 4,177,378, Cl. 250-252.000.
Randolph, George J. J. Method and apparatus for the controlled drying of lumber and the like. 4,176,464, Cl. 34-16.500.
Rankin, Frank S.: *See*—
Burrill, Peter M.; and Rankin, Frank S., 4,177,176, Cl. 260-29.20M.
Rarick, Charles H.: *See*—
Ambrosini, Leonard R.; Juliano, Joseph O.; and Rarick, Charles H., 4,176,608, Cl. 102-216.000.
Rasen, Alfred; Vollbrecht, Rolf; and Schenesse, Klemens, to Akzona Inc. Matting article. 4,177,312, Cl. 428-284.000.
Rasheed, Khalid; and Warkentin, James D., to Ansul Company, The. Soil fungicidal (nitrogen heterocyclic)-substituted-1,3-benzodithiole-2-ones. 4,177,270, Cl. 424-248.510.
Raske, Walter O. A. Lever holding device for fuel dispensing nozzle assembly. 4,176,695, Cl. 141-96.000.
Rast, Howard E., Jr., to United States of America, Navy. Passive high-speed automatic shutter for imaging devices. 4,176,919, Cl. 350-354.000.
Ray, Charles M.: *See*—
Barr, Dwight L.; Barr, Leslie A.; Swett, Benson P.; and Ray, Charles M., 4,176,873, Cl. 296-156.000.
Raychem Corporation: *See*—
Diaz, Stephen H., 4,177,446, Cl. 338-212.000.
Horsma, David A.; Lyons, Bernard J.; and Smith-Johannsen, Robert, 4,177,376, Cl. 219-553.000.
Raytheon Company: *See*—
Cappon, Arthur M., 4,177,390, Cl. 307-205.000.
Keene, Wayne H.; Rudko, Robert I.; and Sonnenschein, Charles M., 4,176,959, Cl. 356-325.000.
Razzano, John S.; Petersen, Louis P.; and Ashby, Bruce A., to General Electric Company. Silyl phosphates as neutralizing agents for alkali metal hydroxides. 4,177,200, Cl. 260-448.20N.
RCA Corporation: *See*—
Forster, Gerhard, 4,177,393, Cl. 307-270.000.
Haferl, Peter E., 4,177,392, Cl. 307-254.000.
Hammer, Jacob M.; and Neil, Clyde C., 4,176,551, Cl. 73-339.00R.
Hammer, Jacob M., 4,176,552, Cl. 73-339.00R.
McCandless, Harry E., 4,176,432, Cl. 29-25.160.
Reading and Bates Construction Co.: *See*—
Cherrington, Martin D., 4,176,985, Cl. 405-184.000.
Reagan, William R., to Lo-Jack Corporation. Auto theft detection system. 4,177,466, Cl. 343-112.0TC.
Realty & Industrial Corporation: *See*—
Shepard, Francis H., Jr., 4,176,977, Cl. 400-320.000.
Rebsdat, Siegfried; Mayer, Sigmund; Alfranseder, Josef; and Riedl, Josef, to Hoechst Aktiengesellschaft. Process for improving the activity of used supported silver catalysts. 4,177,169, Cl. 252-476.000.
Recognition Equipment Incorporated: *See*—
Ingram, James R., Jr.; and Kiesel, George A., 4,176,855, Cl. 235-480.000.
Redding, Robert J. Analysis instruments, 4,176,542, Cl. 73-23.100.
Redington Inc.: *See*—
Vogel, Walter H., 4,176,741, Cl. 198-457.000.
Reed, Frank A., deceased; and by Diemert, Paul M., executor, to Diemert, Paul M. Fluent material handling apparatus. 4,176,987, Cl. 406-10.000.
Regenbrecht, Albert: *See*—
Antonucci, Ermen S.; Cadden, Duane L.; Regenbrecht, Albert; and Schwartz, Edward, 4,176,891, Cl. 316-2.000.
Regent Marine & Instrumentation, Inc.: *See*—
Vigneron, Jean J., 4,177,467, Cl. 343-119.000.
Regie Nationale des Usines Renault: *See*—
Barnabe, Jean-Louis M., 4,177,125, Cl. 204-195.00S.
Marchaix, Raymond; and Le Cun, Alain, 4,176,678, Cl. 137-493.000.
Regnier, Gilbert; Canevari, Roger; Laubie, Michel; and Poignant, Jean-Claude, to Science Union et Cie. Disubstituted piperazines. 4,177,272, Cl. 424-250.000.
Rehfeld, Gerhard: *See*—
Neidhardt, Manfred; and Rehfeld, Gerhard, 4,177,235, Cl. 264-140.000.
Rehrig, Houston. Plastic child seat back for cart. 4,176,849, Cl. 280-33.99B.
Reid, Taylor A.: *See*—
Way, Allan S.; and Reid, Taylor A., 4,176,958, Cl. 356-321.000.
Reid, William R.; and Vitale, John, to Amtel, Inc. Mooring attachment for single point mooring terminals. 4,176,615, Cl. 114-230.000.
Reilly Tar & Chemical Corporation: *See*—
McGill, Charles K., 4,177,349, Cl. 346-255.000.
Remberg, Axel; and Triesch, Willi, to Kraftwerk Union Aktiengesellschaft. Installation for centering the inner housing of a steam turbine. 4,177,003, Cl. 415-108.000.
Remery, Michel, to U.S. Philips Corporation. Electronic starter for igniting a discharge lamp. 4,177,403, Cl. 315-101.000.
Rengo Co., Ltd.: *See*—
Tokuno, Masateru, 4,177,102, Cl. 156-472.000.
Repetti, Pierre, to Systems and Technics S.A. Storing and feeding device for flat parts. 4,176,670, Cl. 133-4.00R.
Research Corporation: *See*—
Rosenberg, Barnett; VanCamp, Loretta; and Krigas, Thomas, 4,177,263, Cl. 424-131.000.
Research Council of Alberta, The: *See*—
Roen, Richard A., 4,177,373, Cl. 219-125.120.
Rheude, Alfred: *See*—
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Rhodes, Donald E.; Baldwin, Roger A.; and Davis, Robert E., to Kerr-McGee Corporation. Separation technique in a coal deashing process. 4,177,134, Cl. 208-177.000.
Rhodes, Donald E., to Kerr-McGee Corporation. Use of specific coal components to improve soluble coal product yield in a coal deashing process. 4,177,135, Cl. 208-177.000.
Rhone-Poulenc Industries: *See*—
Jay, Pierre; and Bonhomme, Pierre, 4,177,156, Cl. 252-66.000.
Riccitiello, Salvatore R.; Sawko, Paul M.; and Estrella, Carlos A., to United States of America, National Aeronautics and Space Administration. Catalysts for polyimide foams from aromatic isocyanates and aromatic dianhydrides. 4,177,333, Cl. 521-124.000.
Rich, Brett, to Industrial Sales & Marketing Corporation. Railroad grade crossing platform and an end capping device therefor. 4,176,789, Cl. 238-8.000.
Richard A. Shaw, Inc.: *See*—
Shaw, Richard A., 4,176,595, Cl. 99-638.000.
Richard, Wilfred T., to Stauffer Chemical Company. Production of sulfur dioxide from waste sulfuric acid. 4,177,248, Cl. 423-540.000.
Richard Wolf GmbH: *See*—
Schubert, Herbert; and Hiltebrandt, Siegfried, 4,176,661, Cl. 128-6.000.
Richards, Elmer A.; and Roberts, Carl D., to Eaton Corporation. Blocked change gear transmission and improved blocker and jaw clutch assembly therefor. 4,176,736, Cl. 192-53.00F.
Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szabolcs, 4,177,190, Cl. 260-239.500.
Rickards, Michael A.; Ruhe, Richard K.; Meyerhoff, Leonard; and Hook, James M., to Rohr Industries, Inc. Fixed geometry water jet inlet for a surface effect ship. 4,176,613, Cl. 114-67.00A.
Ricker, Thomas: *See*—
Bischoff, Erich; Dangel, Jurgen; Schussler, Hans; Ricker, Thomas; and Stein, Erich, 4,176,842, Cl. 29-571.000.
Ricoh Company, Ltd.: *See*—
Hasebe, Mitsuo, 4,176,943, Cl. 355-14.00R.
Tatsumi, Susumu; and Kuroishi, Shoji, 4,176,942, Cl. 355-14.00R.
Ridenour, Michael R., to Evans Products Company. Dual action control mechanism. 4,176,784, Cl. 236-86.000.
Riedl, Josef: *See*—
Rebsdat, Siegfried; Mayer, Sigmund; Alfranseder, Josef; and Riedl, Josef, 4,177,169, Cl. 252-476.000.
Riedmiller, Charles F.; and Bobo, Melvin, to General Electric Company. Combined turbine shroud and vane support structure. 4,177,004, Cl. 415-116.000.
Rieter Machine Works Ltd.: *See*—
Lattmann, Werner; and Staheli, Paul, 4,176,988, Cl. 406-171.000.
Schwengeler, Peter, 4,176,512, Cl. 57-88.000.
Stalder, Herbert, 4,176,518, Cl. 57-261.000.
Ringle, Gerald D. Wheel alignment gauge assembly and adapter therefor. 4,176,463, Cl. 33-203.180.
Ritter, John C. Paint can corner filler. 4,176,768, Cl. 222-564.000.
Rivers, Morris R.; Osterman, Ralph G.; and Warmuth, George H., to Georgia-Pacific Corporation. Bearing breather desiccant device. 4,177,048, Cl. 55-275.000.
Robbins, Thomas R.: *See*—
Wachter, William J.; and Robbins, Thomas R., 4,177,386, Cl. 250-507.000.
Robert, Andre J.; Bourdon, Claude G.; Msika, Nessim C.; Chorlay, Etienne G.; and Euzenade, Jean-Louis, to Etat Francais as represented by the Pelegue General pour l'Armement. Rotating birefringent ellipsometer and its application to photoelasticimetry. 4,176,951, Cl. 356-33.000.
Robert Bosch GmbH: *See*—
Hellberg, Rainer; Steinke, Leo; and Fritz, Adolf, 4,176,644, Cl. 123-148.00E.
Hoefer, Friedrich-Wilhelm; Gerschwitz, Walter; and Schwerin, Guenther, 4,176,685, Cl. 137-596.130.
Jundt, Werner; Sohner, Gerhard; Werner, Peter; and Roozenbeek, Herman, 4,176,645, Cl. 123-148.00E.
Schwerin, Gunther, 4,176,688, Cl. 137-630.130.
Ziegler, Karl, 4,176,776, Cl. 226-51.000.
Roberts, Carl D.: *See*—
Richards, Elmer A.; and Roberts, Carl D., 4,176,736, Cl. 192-53.00F.
Roberts, Durward T., Jr., to Firestone Tire & Rubber Company, The. Method for forming side-wall strip in a tube. 4,177,233, Cl. 264-134.000.
Roberts Filter Manufacturing Company: *See*—
Roberts, Robert L., 4,177,147, Cl. 210-151.000.
Roberts, Marion L.; Sharpe, Max H.; and Krupnick, Albert C., to United States of America, National Aeronautics and Space Administration. Aluminium or copper substrate panel for selective absorption of solar energy. 4,177,325, Cl. 428-629.000.
Roberts, Richard W., to Borg-Warner Corporation. Drive mechanism. 4,176,737, Cl. 192-82.00T.
Roberts, Robert L., to Roberts Filter Manufacturing Company. Biological treating systems. 4,177,147, Cl. 210-151.000.
Robertshaw Controls Company: *See*—
Cairo, Anthony C.; Tillmann, Ditmar K.; and Insley, Gene I., 4,176,903, Cl. 339-147.00R.
Jones, Richard E., 4,177,034, Cl. 431-264.000.
Robertson, George H., to Ciba-Geigy Corporation. Process for granulating pigment compositions. 4,177,082, Cl. 106-309.000.
Robins, Thomas L. Variable thrust controller for water jet propulsion system. 4,176,616, Cl. 115-14.000.
Robinson, David E.: *See*—
Kossoff, George; and Robinson, David E., 4,176,658, Cl. 128-660.000.
Rock, Erich; and Mages, Bernhard, to Julius Blum Gesellschaft m.b.H. Furniture hinge. 4,176,422, Cl. 16-130.000.
Rock, Erich; and Mages, Bernhard, to Julius Blum Gesellschaft m.b.H. Hinge casing. 4,176,424, Cl. 16-148.000.
Rock, Erich; and Mages, Bernhard, to Julius Blum Gesellschaft m.b.H. Guide rail assembly for sliding doors. 4,176,496, Cl. 49-410.000.
Rockwell International Corporation: *See*—
Bullinga, Johannes, 4,177,509, Cl. 363-133.000.
Clapper, Robert L.; Schoneweis, E. Frederick; Hankosky, Andrew; and Bake, Earl A., 4,176,981, Cl. 403-31.000.
Paul, James E., 4,177,430, Cl. 325-475.000.
Rodaway, Keith S., to Everest & Jennings, Inc. Wheelchair foot rest latch. 4,176,879, Cl. 297-429.000.
Rodgers, James W.: *See*—
Duggins, Richard W.; and Rodgers, James W., 4,176,452, Cl. 30-293.000.
Rodriguez, Manuel F. Faucet replacement valve stem assembly. 4,176,674, Cl. 137-315.000.
Rody, Jean; Greber, Gerd; and Muller, Helmut, to Ciba-Geigy Corporation. Stabilization of light-sensitive polymers. 4,177,186, Cl. 260-45.80N.
Roe, Thomas J. Marching guide. 4,176,471, Cl. 35-29.00R.
Roen, Richard A., to Research Council of Alberta, The. Oscillating arc welding. 4,177,373, Cl. 219-125.120.
Roesel, John F., Jr.; Ott, Richard R.; and Barber, Ronnie J., to Precise Power Corporation. Controllable voltage A.C. generator system. 4,177,414, Cl. 322-28.000.
Roger, Harry. Check valve. 4,176,679, Cl. 137-495.000.
Rogers Corporation: *See*—
Hassell, Aarno A., 4,176,476, Cl. 36-44.000.
Rogers, Howard H., to United States of America, Air Force. Wall wick for nickel-hydrogen cell. 4,177,328, Cl. 429-81.000.
Rogers, John W. Coil breakaway device. 4,176,774, Cl. 225-103.000.
Rohm and Haas Company: *See*—
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Rohr Industries, Inc.: *See*—
Rickards, Michael A.; Ruhe, Richard K.; Meyerhoff, Leonard; and Hook, James M., 4,176,613, Cl. 114-67.00A.
Rolfe, Peter. Catheter with measurement electrodes. 4,176,659, Cl. 128-635.000.
Rolls-Royce Limited: *See*—
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Perser, Donald A.; and Roman, Donald A., 4,176,459, Cl. 33-174.00D.
Romeo, Ciriaco: *See*—
Doria, Gianfederico; Romeo, Ciriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, 4,177,276, Cl. 424-263.000.
Romeo, Giriaco: *See*—
Doria, Gianfederico; Romeo, Giriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, 4,177,286, Cl. 424-283.000.
Roozenbeek, Herman: *See*—
Jundt, Werner; Sohner, Gerhard; Werner, Peter; and Roozenbeek, Herman, 4,176,645, Cl. 123-148.00E.
Rosati, Anthony G.: *See*—
Young, Warren H.; Drevitch, Nolan A.; and Rosati, Anthony G., 4,176,932, Cl. 354-126.000.
Rosenberg, Barnett; VanCamp, Loretta; and Krigas, Thomas, to Research Corporation. Anti-animal tumor method. 4,177,263, Cl. 424-131.000.
Rosenberg, David J., to Pall Corporation. Filter assembly for intravenous liquid administration apparatus. 4,177,149, Cl. 210-436.000.
Rosenberg, Harvey S.; and Grotta, Henry M., to Battelle Development Corporation. Scale suppression in lime and limestone scrubbers. 4,177,245, Cl. 423-242.000.
Ross, Joseph A.; and Stern, Howard K., to Solid Photography Inc. Numerically controlled milling with parabolic profile tools for surface smoothness. 4,176,992, Cl. 409-131.000.
Ross, Svante B.: *See*—
Lindberg, Ulf H. A.; Ross, Svante B.; Thorberg, Seth O.; and Ogren, Sven O., 4,177,291, Cl. 424-330.000.
Rossi, Alberto: *See*—
Baschang, Gerhard; Stanek, Jaroslav; Rossi, Alberto; and Sele, Alex, 4,177,344, Cl. 536-4.000.
Rossi, Pietro P.: *See*—
Siclari, Francesco; Rossi, Pietro P.; Guaita, Cesare; and L'Acqua, Vito, 4,177,214, Cl. 260-601.00R.
Roth, Donald J., to Continental Group, Inc., The. Easy opening container unit having a domed end panel. 4,176,760, Cl. 220-359.000.
Roth, Johann; and Schneider, Peter, to Braun Aktiengesellschaft. Microphone arrangement in a sound movie camera. 4,176,922, Cl. 352-27.000.
Roth, Peter F. Vessel pump. 4,177,022, Cl. 417-424.000.
Rotork Limited: *See*—
Hore, Donald L., 4,177,395, Cl. 310-39.000.
Rottensteiner, Hans, to Lindauer Dornier Gesellschaft mbH. Apparatus for cleaning clamping surfaces. 4,176,429, Cl. 26-93.000.
Rousseau, Jean L. I., to Garrett Corporation, The. Adsorption air conditioner. 4,176,523, Cl. 62-2.000.
Roussel Uclaf: *See*—
Nedelec, Lucien; Frechet, Daniel; Dumont, Claude; and Hunt, Peter, 4,177,292, Cl. 424-330.000.
Roxby, Edwin H. Load-lifting and centering device. 4,176,818, Cl. 248-354.00H.
Rubinstein, Solomon, to General Cable Corporation. Standardized gland assembly for cable connections. 4,176,866, Cl. 285-421.000.
Rudko, Robert I.: *See*—
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Rudle, Manfred: *See*—
Stoll, Kurt; and Rudle, Manfred, 4,176,586, Cl. 92-5.00R.
Rudolph, Kurt: *See*—
Neumann, Ullrich; and Rudolph, Kurt, 4,177,244, Cl. 423-242.000.
Ruff, Glen T. Rotary-tiller tine cleaning tool. 4,176,417, Cl. 7-161.000.
Ruhe, Richard K.: *See*—
Rickards, Michael A.; Ruhe, Richard K.; Meyerhoff, Leonard; and Hook, James M., 4,176,613, Cl. 114-67.00A.
Rumatowski, Karol: *See*—
Bielecki, Marek; Bogdanski, Andrzej; Buxakowski, Andrzej; Chudzinski, Janusz; Glogowski, Andrzej; Kopczynski, Marian; Krolikowski, Andrzej; Kryszewski, Jozef; Moczulski, Zdzislaw; Ochocki, Wlodzimierz; Pomorski, Aleksander; Rumatowski, Karol; Sawicki, Janusz; Szostakowski, Henryk; Warowny, Tadeusz; Wisniewski, Teofil; and Wozniak, Antoni, 4,176,624, Cl. 123-32.0EA.
Runge, Thomas M. Cardiac assist device employing electrically stimulated artificial muscle. 4,176,411, Cl. 3-1.700.
Rupp, Charle R., to General Electric Company. Graph architecture information processing system. 4,177,514, Cl. 364-200.000.
Rusch, Reinhart: *See*—
Arndt, Friedrich; Kruger, Hans-Rudolf; and Rusch, Reinhart, 4,177,054, Cl. 71-90.000.
Russell, C. Paul; Gingo, Joseph M.; and Drica-Mimieris, Oswald A., to Goodyear Tire & Rubber Company, The. Tire cord with a synthetic fiber core. 4,176,705, Cl. 152-359.000.
Russell, Homer C.: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,177,518, Cl. 364-710.000.
Ruston, Rudolf S.: *See*—
Markham, Michael H.; and Ruston, Rudolf S., 4,176,610, Cl. 109-59.00R.
Ruva, Frank D.: *See*—
Granatek, Edmund S.; Ruva, Frank D.; and Grab, Frederick L., 4,177,199, Cl. 260-430.000.
Ruzicka, Jan; Lorenz, Jindrich; Marek, Vladimir; and Tusl, Miroslav. Pencil sheath and composition therefor. 4,176,978, Cl. 401-96.000.
Ryan, Allen L.; Jansons, Eric G.; Halliburton, Ronald D.; and Pearson, James H., to Midway Mfg. Co. Multi-station pinball game. 4,176,844, Cl. 273-121.00A.
S I G Schweizerische Industrie-Gesellschaft: *See*—
Luginbuhl, Pierre, 4,176,993, Cl. 414-106.000.
S.R.M. Hydromekanik Aktiebolg: *See*—
Ahlen, Karl G.; Bergstrom, Per-Olof; and Supanich, Joseph, 4,176,564, Cl. 74-732.000.
Sacher, Eric; and Trebelhorn, Thomas E., to NCR Corporation. Method and apparatus for testing printed circuit boards. 4,176,780, Cl. 235-302.000.
Sachs Systemtechnik GmbH: *See*—
Tellert, Rudy, 4,177,494, Cl. 361-152.000
Sacht, Hans O., to Gebruder Welger. Machine for forming a round bale of fibrous agricultural material. 4,176,596, Cl. 100-88.000.
Saenko, Vladimir Y.: *See*—
Paton, Boris E.; Medovar, Boris I.; Tsukanov, Georgy E.; Bogachenko, Alexei G.; Artamonov, Viktor L.; Timashov, Grigory A.; Shtanko, Jury P.; Marchenko, Alexandr M.; Fedorovsky, Boris B.; Kumysh, Ilya I.; Chepurnoi, Anatoly D.; Saenko, Vladimir Y.; and Semin-Vadov, Gennady M., 4,177,058, Cl. 75-10.00C.
Safety Consultants: *See*—
Kornhauser, Murray, 4,176,858, Cl. 280-734.000.
Safron Printing Company: *See*—
Giordano, Dennis R., 4,176,859, Cl. 283-8.00R.
Saida, Yasushi. Ball-point pen. 4,176,979, Cl. 401-100.000.
St. Denis, Andrew R.: *See*—
Mette, Klaus H.; and St. Denis, Andrew R., 4,177,517, Cl. 364-559.000.

St. Jean, Gerard: *See—*
Anderson, Clay H.; and St. Jean, Gerard, 4,176,827, Cl. 254-186.00R.
Sakai, Fumihiko: *See—*
Umemura, Sumio; Ohdan, Kyoji; Sakai, Fumihiko; Bando, Yasuo; and Ikezawa, Harumi, 4,177,161, Cl. 252-435.000.
Sakai, Koichi, to Matsushita Electric Industrial Co., Ltd. Magnetic recording and playback means with indication of tape remaining. 4,177,488, Cl. 360-72.300.
Sakakida, Koji; and Ikekawa, Tetsuro. Process for producing emitanin. 4,177,108, Cl. 435-74.000.
Sakakiyama, Takashi: *See—*
Tsurumi, Michio; Sakakiyama, Takashi; Tazaki, Kichiya; and Koyama, Masaoki, 4,177,181, Cl. 260-29.70H.
Sakuma, Kouhei; Ukigai, Toshiyuki; Yamashita, Tatsuji; and Yamaki, Osamu, to Lion Yushi Kabushiki Kaisha. Dispersant for coal into oils. 4,177,039, Cl. 44-51.000.
Sakuranomiya Chemical Co., Ltd.: *See—*
Obi, Tatsuro; Koyama, Teruo; Tanaka, Tadashi; and Hasegawa, Atsushi, 4,177,323, Cl. 428-622.000.
Salmond, Marion P.: *See—*
Pyke, Thomas R.; and Salmond, Marion P., 4,177,106, Cl. 435-125.000.
Salomon, Manfred: *See—*
Hintzmann, Kurt; Kaiser, Reinhold; Link, Wolfgang; Minner, Willy; Mutz, Dieter; Salomon, Manfred; and Wingert, Arnim, 4,177,480, Cl. 357-84.000.
Samsonov, Albert N.: *See—*
Krupman, Leonid I.; Yaroslavtsev, Jury G.; Sochnev, Alexandr E.; Shamil, Jury P.; Khitrik, Abram I.; Antipenko, Grigory I.; Smetanin, Jury G.; Samsonov, Albert N.; Ljudkovsky, Vadim M.; Pokrass, Leonid M.; Kurdjukov, Anatoly A.; Ofengenden, Abram M.; and Zhitnik, Georgy G., 4,177,070, Cl. 75-257.000.
Sanchez Torres, Silvestre. Muffler made of manganese alloy. 4,177,090, Cl. 148-32.000.
Sander, Harry: *See—*
Thummler, Ursus; Werner, Hugo; and Sander, Harry, 4,176,765, Cl. 222-218.000.
Sandhu, Surinder S.: *See—*
Pieper, Christian; Sandhu, Surinder S.; Schummer, Gunter; and Feltgen, Karlheinz, 4,177,111, Cl. 203-14.000.
Sandlin, Rolf H.: *See—*
Albrektsson, Kjell A.; Eriksson, Bertil T.; Eriksson, Sven W.; Franzen, Hans A. E.; and Sandlin, Rolf H., 4,176,814, Cl. 244-3.150.
Sandoz, Inc.: *See—*
Bennett, Gregory B., 4,177,273, Cl. 424-250.000.
Sangster, William H., to National Steel Corporation. Coke oven charging apparatus. 4,176,994, Cl. 414-163.000.
Sansui Electric Co., Ltd.: *See—*
Fujimoto, Yasuhiro; and Suzuki, Masao, 4,177,360, Cl. 179-100.41M.
Sanyo Trading Co., Ltd.: *See—*
Onizawa, Masao, 4,177,337, Cl. 525-331.000.
Sarges, Reinhard, to Pfizer Inc. Hydantoin therapeutic agents. 4,177,282, Cl. 424-273.00R.
Sarkes Tarzian, Inc.: *See—*
Valdettaro, Alarico A., 4,177,429, Cl. 325-459.000.
Sarrand, Pierre, to Compagnie Internationale pour l'Informatique Cii - Honeywell Bull (Societe Anonyme). Process and method to initiate a receiving and transmitting station linked by a connecting channel of an information exchange system consisting of several transmitting and receiving stations. 4,177,450, Cl. 340-147.0LP.
Sarrut, Jean P., to CECA S.A.; and Le Carbone Lorraine. Method of extinguishing metal fires. 4,177,152, Cl. 252-2.000.
Sarvis Oy: *See—*
Aho, Leo E., 4,176,747, Cl. 206-509.000.
Sasaki, Hiroharu: *See—*
Hayashi, Masaaki; Tsuneta, Kazuyoshi; Takada, Hiroshi; Kenmotsu, Nobuhiro; and Sasaki, Hiroharu, 4,177,174, Cl. 260-18.0PN.
Sasaki, Shiro; Yasumatsu, Jun; and Inukai, Mitsuo, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho. Passenger restraining seat belt retractor. 4,176,808, Cl. 242-107.100.
Sasse, Klaus: *See—*
Seng, Florin; Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,177,055, Cl. 71-92.000.
Sato, Hisatake, to Nippon Oil Company, Ltd. Water or alcohol soluble printing ink composition. 4,177,076, Cl. 106-32.000.
Sato, Jun: *See—*
Kitamura, Hidetoshi; and Sato, Jun, 4,176,638, Cl. 123-119.00A.
Sato, Kozi, to Toyo Ink Manufacturing Co., Ltd. Photopolymerizable hydroxy-benzophenone derivative compounds and photocurable compositions. 4,177,122, Cl. 204-159.160.
Sato, Kunio: *See—*
Kobayashi, Mituki; Awao, Takao; Mizusaki, Yujiro; Sato, Kunio; Kato, Akio; and Mituishi, Hisao, 4,177,069, Cl. 75-213.000.
Sato, Yo, to Kabushiki Kaisha Sato. Type positioning mechanism for printing device. 4,176,600, Cl. 101-111.000.
Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Label strip inserting device. 4,176,603, Cl. 101-291.000.
Sato, Yoshiaki: *See—*
Norimatsu, Hideaki; and Sato, Yoshiaki, 4,176,626, Cl. 123-32.0EE.
Sauder Industries, Inc.: *See—*
Sauder, Robert A., 4,177,036, Cl. 432-247.000.
Sauder, Robert A., to Sauder Industries, Inc. High temperature industrial furnace. 4,177,036, Cl. 432-247.000.
Sawada, Takeshi; and Inoue, Takeshi, to Hitachi Metals, Inc. Cold-roll forming stand. 4,176,539, Cl. 72-178.000.
Sawicki, Janusz: *See—*
Bielecki, Marek; Bogdanski, Andrzej; Buxakowski, Andrzej; Chudzinski, Janusz; Glogowski, Andrzej; Kopczynski, Marian; Krolikowski, Andrzej; Kryszewski, Jozef; Moczulski, Zdzislaw; Ochocki, Wlodzimierz; Pomorski, Aleksander; Rumatowski, Karol; Sawicki, Janusz; Szostakowski, Henryk; Warowny, Tadeusz; Wisniewski, Teofil; and Wozniak, Antoni, 4,176,624, Cl. 123-32.0EA.
Sawko, Paul M.: *See—*
Riccitiello, Salvatore R.; Sawko, Paul M.; and Estrella, Carlos A., 4,177,333, Cl. 521-124.000.
Sawyer, Robert J. Picture frame assembly. 4,176,481, Cl. 40-156.000.
Sca Development Aktiebolag: *See—*
Wappling, Rune A., 4,176,619, Cl. 118-410.000.
Scalera, Frank T.; and Krakauer, Merrill. Drive system for rotary merchandise carriers. 4,176,762, Cl. 221-81.000.
Schaaf, Robert L.; Kan, Peter T.; and Cenker, Moses, to BASF Wyandotte Corporation. Process for the preparation of highly stable liquid carbodiimide-containing polyisocyanate compositions. 4,177,205, Cl. 260-453.0AM.
Schaaf, Robert L.: *See—*
Christopher, Robert J.; and Schaaf, Robert L., 4,177,433, Cl. 330-265.000.
Schade, Edward W., Jr.: *See—*
Jenkins, Alfred D.; and Schade, Edward W., Jr., 4,177,515, Cl. 364-200.000.
Schaefer, Dieter: *See—*
Schoenafinger, Eduard; Deigner, Paul; Koester, Eberhard; Ohlinger, Manfred; Schaefer, Dieter; Stumpfi, Werner; Amort, Juergen; Seiler, Claus-Dietrich; Nestler, Heinz; and Ambros, Otto, 4,177,317, Cl. 428-405.000.
Schaefer, Edwin M., III, to Bell Telephone Laboratories, Incorporated. Output timing arrangement for single-wall magnetic domain apparatus. 4,177,521, Cl. 365-8.000.
Schaefer, George H.: *See—*
Ernster, Peter J.; Schaefer, George H.; and Neal, Michael G., 4,176,971, Cl. 366-298.000.
Schaeff, Hans, to HFM Hohenloher Fahrzeuge- und Maschinenvertrieb GmbH. Amphibious vehicle. 4,176,726, Cl. 180-15.000.
Schamberg, Eckehard; Fock, Jurgen; Klocker, Otto; and Esselborn, Eberhard, to Th. Goldschmidt AG. Substrate-less, thermosetting synthetic resin foil. 4,177,221, Cl. 525-244.000.
Schardt, Gunter: *See—*
Diegelmann, Winfried; Schardt, Gunter; Klatt, Jochen; and Grolz, Heinz, 4,177,316, Cl. 428-367.000.
Schenesse, Klemens: *See—*
Rasen, Alfred; Vollbrecht, Rolf; and Schenesse, Klemens, 4,177,312, Cl. 428-284.000.
Schering Aktiengesellschaft: *See—*
Arndt, Friedrich; Kruger, Hans-Rudolf; and Rusch, Reinhart, 4,177,054, Cl. 71-90.000.
Kolbel, Herbert; and Tollmetz, Klaus D., 4,177,203, Cl. 260-449.60R.
Schlangen, Andrew J.; McClead, Jerry W.; and Garavalia, Thomas A., to Trane Company, The. Centrifugal blower control apparatus. 4,177,007, Cl. 415-160.000.
Schlossmann, Klaus: *See—*
Bossert, Friedrich; Wehinger, Egbert; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, 4,177,278, Cl. 424-266.000.
Schmid, Eberhard, to Siemens Aktiengesellschaft. Apparatus for balancing an asymmetrical load. 4,177,508, Cl. 363-78.000.
Schmidt, Andreas, to Ciba-Geigy Corporation. Process for benzylating ketones. 4,177,213, Cl. 260-590.00R.
Schmidt, Robert R.: *See—*
Seng, Florin; Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,177,055, Cl. 71-92.000.
Schneider, Abraham: *See—*
Janoski, Edward J.; Mitchell, Richard E.; and Schneider, Abraham, 4,177,217, Cl. 585-253.000.
Schneider, Peter: *See—*
Roth, Johann; and Schneider, Peter, 4,176,922, Cl. 352-27.000.
Schoenafinger, Eduard; Deigner, Paul; Koester, Eberhard; Ohlinger, Manfred; Schaefer, Dieter; Stumpfi, Werner; Amort, Juergen; Seiler, Claus-Dietrich; Nestler, Heinz; and Ambros, Otto, to BASF Aktiengesellschaft. Stabilization of chromium dioxide magnetic pigments. 4,177,317, Cl. 428-405.000.
Scholl, Hans-Joachim; and Dieterich, Dieter, to Bayer Aktiengesellschaft. Polyisocyanates containing sulphonic acid and phosphonate groups. 4,177,206, Cl. 260-456.00P.
Scholz, Manfred; Strie, Lothar; and Stendenbach, Karl-Heinz, to Hoechst Aktiengesellschaft. Method of repairing a defective coated workpiece. 4,176,437, Cl. 29-402.120.
Schoneweis, E. Frederick: *See—*
Clapper, Robert L.; Schoneweis, E. Frederick; Hankosky, Andrew; and Bake, Earl A., 4,176,981, Cl. 403-31.000.
Schott, Heinrich, to Siemens Aktiengesellschaft. Power supply system with two regulated power supply devices connected in parallel at an output. 4,177,389, Cl. 307-64.000.
Schrape, Peter: *See—*
Allert, Anton; Weiss, Friedrich; and Schrape, Peter, 4,176,562, Cl. 74-563.000.

Schubert, Herbert; and Hiltebrandt, Siegfried, to Richard Wolf GmbH. Photoendoscope having a distal electronic flash-tube guard. 4,176,661, Cl. 128-6.000.
Schuda, Felix J.: *See—*
Wright, Dave L.; Schuda, Felix J.; and Spranza, Joseph J., III, 4,176,892, Cl. 316-19.000.
Schultz, Jeffrey A., to Process Engineering, Inc. Pump system for cryogenic liquid delivery vehicles. 4,177,017, Cl. 417-231.000.
Schulz, Manfred; and Kappler, Gudrun, to Daimler-Benz Aktiengesellschaft. Water drainage spout, especially for hollow spaces in motor vehicle structures. 4,176,877, Cl. 296-208.000.
Schulz, Ralf-Thilo; Brunsch, Klaus; and Lemmer, Ludwig, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Laminated sectional girder of fiber-reinforced materials. 4,177,306, Cl. 428-107.000.
Schulz, Siegfried: *See—*
Christoph, Dieter, 4,176,565, Cl. 82-12.000.
Schumacher, Ernest W., to Virginia Chemicals Inc. Two-way filter-drier for heat pump systems. 4,177,145, Cl. 210-136.000.
Schummer, Gunter: *See—*
Pieper, Christian; Sandhu, Surinder S.; Schummer, Gunter; and Feltgen, Karlheinz, 4,177,111, Cl. 203-14.000.
Schunk & Ebe GmbH: *See—*
Diegelmann, Winfried; Schardt, Gunter; Klatt, Jochen; and Grolz, Heinz, 4,177,316, Cl. 428-367.000.
Schussler, Hans: *See—*
Bischoff, Erich; Dangel, Jurgen; Schussler, Hans; Ricker, Thomas; and Stein, Erich, 4,176,442, Cl. 29-571.000.
Schwartz, Edward: *See—*
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Schwartz, Joel; and Fleming, Joseph P., to Diamond Shamrock Corporation. Process for production of phosphate rock slurries having reduced water content and viscosity. 4,177,243, Cl. 423-167.000.
Schwebke, Donald D. Jack device for trailers. 4,176,825, Cl. 254-94.000.
Schweiger, Richard G. Process for preparing a sulfate ester of a polyhydroxy polymer. 4,177,345, Cl. 536-59.000.
Schwengeler, Peter, to Rieter Machine Works Ltd. Rotor braking apparatus at each spinning unit of an open-end spinning machine. 4,176,512, Cl. 57-88.000.
Schwerin, Guenther: *See—*
Hoefer, Friedrich-Wilhelm; Gerschwitz, Walter; and Schwerin, Guenther, 4,176,685, Cl. 137-596.130.
Schwerin, Gunther, to Robert Bosch GmbH. Check valve. 4,176,688, Cl. 137-630.130.
Schwerko, Albert P.: *See—*
Herrington, Daniel R.; and Schwerko, Albert P., 4,177,136, Cl. 208-215.000.
SCI Systems, Inc.: *See—*
King, Olin B., 4,177,472, Cl. 346-162.000.
Science Union et Cie: *See—*
Regnier, Gilbert; Canevari, Roger; Laubie, Michel; and Poignant, Jean-Claude, 4,177,272, Cl. 424-250.000.
Scott, Lawrence S. Apparatus for automatic inflation of diver flotation means. 4,176,418, Cl. 9-313.000.
Scott Paper Company: *See—*
Neuenschwander, Rudolf, 4,176,426, Cl. 19-306.000.
Neuenschwander, Rudolf, 4,176,427, Cl. 19-306.000.
Scudder, Roy; and Bowes, Alan, to FMC Corporation. Conveyor system for a harvester. 4,176,511, Cl. 56-330.000.
Sears Manufacturing Company: *See—*
Koutsky, L. John, 4,176,878, Cl. 297-115.000.
SeaTek Corporation: *See—*
Goss, Wilbur H.; and Bergman, Gunnar B., 4,176,614, Cl. 114-125.000.
Sebrosky, Robert A.: *See—*
DeBoskey, Wentzle R.; and Sebrosky, Robert A., 4,176,975, Cl. 400-124.000.
Seeley, Elwin W.; and Hildebrand, Verne E., to United States of America, Navy. Inflatable cavity-backed annular slot transmitting antenna. 4,177,468, Cl. 343-710.000.
Seiberling, Mildred Kelly: *See—*
Seiberling, Theophilus K., 4,176,702, Cl. 152-209.00R.
Seiberling, Theophilus K., to Seiberling, Mildred Kelly, a part interest. Tire treads and their manufacture. 4,176,702, Cl. 152-209.00R.
Seibt, Willie, to Sherritt Gordon Mines Limited. Method of electroforming sheets and self-stripping cathode. 4,177,113, Cl. 204-12.000.
Seidel, William C., to Du Pont de Nemours, E. I., and Company. Recovery of triarylboranes. 4,177,215, Cl. 260-606.50B.
Seiler, Claus-Dietrich: *See—*
Schoenafinger, Eduard; Deigner, Paul; Koester, Eberhard; Ohlinger, Manfred; Schaefer, Dieter; Stumpfi, Werner; Amort, Juergen; Seiler, Claus-Dietrich; Nestler, Heinz; and Ambros, Otto, 4,177,317, Cl. 428-405.000.
Seiling, Samuel O., to AMF Incorporated. Dough divider. 4,177,030, Cl. 425-238.000.
Selden, Peter H.; Duerkop, Joachim; Albrecht, Wolfgang; and Weissenmayer, Heinz, to BASF Aktiengesellschaft. Molding core for the manufacture of hollow bodies consisting of fiber-reinforced synthetic resin. 4,177,032, Cl. 425-468.000.
Sele, Alex: *See—*
Baschang, Gerhard; Stanek, Jaroslav; Rossi, Alberto; and Sele, Alex, 4,177,344, Cl. 536-4.000.
SEM Israel Limited: *See—*
Bartoov, Benjamin; Mayevsky, Abraham; Mendel, Shmuel; and Oren, Amiram, 4,176,953, Cl. 356-73.000.
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Mishima, Takao; Semba, Shoji; Ogata, Kiichi; and Funahashi, Osamu, 4,176,532, Cl. 68-19.000.
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Semin-Vadov, Gennady M.: *See—*
Paton, Boris E.; Medovar, Boris I.; Tsukanov, Georgy E.; Bogachenko, Alexei G.; Artamonov, Viktor L.; Timashov, Grigory A.; Shtanko, Jury P.; Marchenko, Alexandr M.; Fedorovsky, Boris B.; Kumysh, Ilya I.; Chepurnoi, Anatoly D.; Saenko, Vladimir Y.; and Semin-Vadov, Gennady M., 4,177,058, Cl. 75-10.00C.
Senes, Albert, to Alsthom-Atlantique. Amplifying gate thyristor with gate turn-off (G.T.O.). 4,177,478, Cl. 357-38.000.
Seng, Florin; Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. 1-Acyloxymethyl-4,5-dichloro-imidazole-2-carboxylic acid derivatives and their use as plant protection agents. 4,177,055, Cl. 71-92.000.
Seven, Manfred K.; and Olearczyk, Francis J., deceased (by Olearczyk, Jean R., administratrix), to Allied Chemical Corporation, by said Manfred K. Seven. Preparation of polyolefin containing multiple olefinic unsaturation and carboxylic acid groups and polyolefin so prepared. 4,177,336, Cl. 525-325.000.
Severo-Kavkazsky Gorno-Metallurgichesky Institut: *See—*
Yagupov, Alexandr V., 4,176,795, Cl. 241-21.000.
Severus, Harald; and Birkmaier, Horst, to Swiss Aluminium Ltd. Aluminum or aluminum alloy article and process. 4,177,299, Cl. 427-287.000.
Severus-Laubenfeld, Harald, to Swiss Aluminium Ltd. Device for the production of anodized material. 4,177,127, Cl. 204-207.000.
SGS-ATES Componenti Elettronici S.p.A.: *See—*
Iannuzzi, Giulio; deMartiis, Carlo C.; Del Bo, Vittorio; and Gandolfi, Luciano, 4,176,443, Cl. 29-589.000.
Shadbolt, Philip; and Ganszczyk, Helen, to Letraset USA Inc. Dry transfer materials. 4,177,309, Cl. 428-195.000.
Shamil, Jury P.: *See—*
Krupman, Leonid I.; Yaroslavtsev, Jury G.; Sochnev, Alexandr E.; Shamil, Jury P.; Khitrik, Abram I.; Antipenko, Grigory I.; Smetanin, Jury G.; Samsonov, Albert N.; Ljudkovsky, Vadim M.; Pokrass, Leonid M.; Kurdjukov, Anatoly A.; Ofengenden, Abram M.; and Zhitnik, Georgy G., 4,177,070, Cl. 75-257.000.
Sharp Kabushiki Kaisha: *See—*
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Sharpe, Max H.: *See—*
Roberts, Marion L.; Sharpe, Max H.; and Krupnick, Albert C., 4,177,325, Cl. 428-629.000.
Shaw GMC Trucks Ltd.: *See—*
Mason, Ralph I., 4,177,516, Cl. 364-431.000.
Shaw, Richard A., to Richard A. Shaw, Inc. Apparatus and method for coring cauliflower heads. 4,176,595, Cl. 99-638.000.
Shealy, Y. Fulmer; and O'Dell, C. Allen, to United States Government. Carbocyclic analogs of cytosine nucleosides. 4,177,348, Cl. 544-317.000.
Sheldahl, Inc.: *See—*
Jackson, Martin A., 4,176,805, Cl. 242-75.460.
Shell Oil Company: *See—*
Condon, Nancy J., 4,177,184, Cl. 260-32.60A.
Nozaki, Kenzie, 4,177,220, Cl. 585-505.000.
Shepard, Francis H., Jr., to Realty & Industrial Corporation. Proportional carrier control and moving mechanism for electric typewriter. 4,176,977, Cl. 400-320.000.
Sherk, Fred T.: *See—*
Irvin, Howard B.; Sherk, Fred T.; and Hoffman, Alfred A., Jr., 4,177,250, Cl. 423-573.00G.
Sherman, Michael I.: *See—*
Laakso, Oliver A.; and Sherman, Michael I., 4,177,105, Cl. 162-237.000.
Sherritt Gordon Mines Limited: *See—*
Seibt, Willie, 4,177,113, Cl. 204-12.000.
Sherry, Howard S.: *See—*
Oleck, Stephen M.; and Sherry, Howard S., 4,177,163, Cl. 252-439.000.
Shields, Santos, to Dresser Industries, Inc. Earth boring cutting element enhanced retention system. 4,176,725, Cl. 175-374.000.
Shigeta, Junji; Oi, Tetsu; Kotera, Nobuo; Nakashima, Muneyasu; and Miyamoto, Nobuo, to Hitachi, Ltd. Method for producing an InSb thin film element. 4,177,298, Cl. 427-85.000.
Shimizu, Masami: *See—*
Kozuki, Susumu; Uchidoi, Masanori; Date, Nobuaki; Shimizu, Masami; Aizawa, Hiroshi; and Takishima, Yoshiyuki, 4,176,936, Cl. 354-38.000.
Shindo, Isao: *See—*
Maeda, Yoshio; Matsumoto, Koichi; Fukuda, Kenji; and Shindo, Isao, 4,176,957, Cl. 356-319.000.
Shinoda, Osamu; Okabayashi, Keiichi; and Nagai, Takanori, to Toyota Jidosha Kogyo Kabushikikaisha. Evaporative emission system for improving engine starting characteristics. 4,176,639, Cl. 123-136.000.
Shinoda, Yoshio; Kuno, Akira; and Kuroyama, Toshinobu, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Digital display system. 4,177,454, Cl. 340-309.400.

Shinto Paint Co., Ltd.: *See—*
Siozawa, Nobuo; Kikuchi, Uhee; Kimura, Suguru; Todoroki, Nobuaki; Yasukawa, Jun-ichi; and Kamiyama, Satoru, 4,177,123, Cl. 204-181.00C.

Shipinski, John H., to Deere & Company. Diesel engine starting control. 4,176,642, Cl. 123-140.00R.

Shores, Marvin W., to General Dynamics Corporation. Phase-normalized parallel tuned receiver channel system. 4,177,427, Cl. 325-369.000.

Short, Larry E.: *See—*
Divins, Larry A.; and Short, Larry E., 4,177,241, Cl. 423-20.000.

Showa Denko K.K.: *See—*
Kobayashi, Mituki; Awao, Takao; Mizusaki, Yujiro; Sato, Kunio; Kato, Akio; and Mituishi, Hisao, 4,177,069, Cl. 75-213.000.

Shragal, John F.: *See—*
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Shtanko, Jury P.: *See—*
Paton, Boris E.; Medovar, Boris I.; Tsukanov, Georgy E.; Bogachenko, Alexei G.; Artamonov, Viktor L.; Timashov, Grigory A.; Shtanko, Jury P.; Marchenko, Alexandr M.; Fedorovsky, Boris B.; Kumysh, Ilya I.; Chepurnoi, Anatoly D.; Saenko, Vladimir Y.; and Semin-Vadov, Gennady M., 4,177,058, Cl. 75-10.00C.

Siclari, Francesco; Rossi, Pietro P.; Guaita, Cesare; and L'Acqua, Vito, to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Procedure for the preparation of saturated and unsaturated dialdehydes. 4,177,214, Cl. 260-601.00R.

Sidlaw Industries Limited: *See—*
Smith, John B.; Bell, Peter W.; Queen, David S.; and Mitchell, John, 4,177,311, Cl. 428-246.000.

Siegfried Aktiengesellschaft: *See—*
Zirngibl, Ludwig; and Thiele, Kurt, 4,177,350, Cl. 546-278.000.

Siemens Aktiengesellschaft: *See—*
Meixner, Hans, 4,177,375, Cl. 219-441.000.
Noethe, Bjoern, 4,176,910, Cl. 350-96.230.
Schmid, Eberhard, 4,177,508, Cl. 363-78.000.
Schott, Heinrich, 4,177,389, Cl. 307-64.000.

Sigmon, Thomas W.: *See—*
Lau, Silvanus S.; Mayer, James W.; and Sigmon, Thomas W., 4,177,084, Cl. 148-1.500.

Sillars, Frederick S.: *See—*
Gorini, Robert F.; Johnson, Herbert; and Sillars, Frederick S., 4,177,098, Cl. 156-80.000.

Silonics, Inc.: *See—*
Mitchell, Charles S., 4,177,471, Cl. 346-140.00R.

Simecek, Tomislav: *See—*
Sipek, Emil; and Simecek, Tomislav, 4,176,962, Cl. 356-400.000.

Simkanich, John J.: *See—*
Hoinski, Walter W.; and Simkanich, John J., 4,177,460, Cl. 340-576.000.

Simmonds Precision Products, Inc.: *See—*
Hiscock, Benjamin E., 4,177,502, Cl. 362-218.000.

Simmons, James W., Jr., to Cox Foundry & Machine Co. Rotating driving mechanism for imparting reciprocatory motion to a driven element. 4,176,692, Cl. 139-21.000.

Simonson, Robert C.; and Stroud, Ruben J. Child's bumper bike. 4,176,851, Cl. 280-259.000.

Sims, Anson; and Jones, Lawrence T., to California R & D Center. Magnetized toy with removable appendages. 4,176,492, Cl. 46-22.000.

Sinclair, Rex, to Altec Corporation. Two-section exponential acoustical horn. 4,176,731, Cl. 181-192.000.

Singer Company, The: *See—*
Batson, William A., 4,176,571, Cl. 83-397.000.
Davidson, Donald R., 4,176,561, Cl. 74-424.80A.

Singer, Roger M., to United Technologies Corporation. Catalytic dry powder material for fuel cell electrodes comprising fluorocarbon polymer and precatalyzed carbon. 4,177,159, Cl. 252-428.000.

Siozawa, Nobuo; Kikuchi, Uhee; Kimura, Suguru; Todoroki, Nobuaki; Yasukawa, Jun-ichi; and Kamiyama, Satoru, to Taikisha Ltd.; Honda Motor Co., Ltd.; and Shinto Paint Co., Ltd. Method for supplying binder into a coating bath and its apparatus. 4,177,123, Cl. 204-181.00C.

Sipek, Emil; and Simecek, Tomislav, to Ceskoslovenska akademie ved. Method for determining a straight line intersecting the axis of an optical radiation beam of a photoelectric levelling apparatus and arrangement for execution of this method. 4,176,962, Cl. 356-400.000.

Sittig, Roland: *See—*
DeBruyne, Patrick; and Sittig, Roland, 4,177,479, Cl. 357-38.000.

Sittler, Eduard: *See—*
Kubanek, Vladimir; Basarova, Gabriela; Kralicek, Jaroslav; Skach, Josef; Fencl, Zdenek; Budin, Jiri; Kondelikova, Jaroslava; and Sittler, Eduard, 4,177,295, Cl. 426-330.300.

Siu, Ting Y.; and Ackley, Daniel, to Tenneco Chemicals, Inc. Fabric-conditioning article for use in a clothes dryer. 4,177,151, Cl. 252-8.600.

Sivertsen, Marvin L.: *See—*
Gray, David A.; and Sivertsen, Marvin L., 4,176,826, Cl. 254-175.000.

Skach, Josef: *See—*
Kubanek, Vladimir; Basarova, Gabriela; Kralicek, Jaroslav; Skach, Josef; Fencl, Zdenek; Budin, Jiri; Kondelikova, Jaroslava; and Sittler, Eduard, 4,177,295, Cl. 426-330.300.

Skinner, Geoffrey F.: *See—*
Balakrishnan, Ramachandran; and Skinner, Geoffrey F., 4,177,068, Cl. 75-105.000.

Skinner, Robert T. J., to Lucas Industries, Limited. Fuel injection pumping apparatus. 4,176,640, Cl. 123-139.0AQ.

Skow, Andrew M.: *See—*
Headley, Jack W.; Skow, Andrew M.; and Titiriga, Andrew, Jr., 4,176,813, Cl. 244-130.000.

Slanski, John M.: *See—*
Fiore, Joseph V.; and Slanski, John M., 4,176,668, Cl. 131-17.00A.

Slawyk, Wilhelm: *See—*
Bock, Manfred; Pedain, Josef; Slawyk, Wilhelm; and Konig, Klaus, 4,177,342, Cl. 528-45.000.

Smakman, Robert, to Akzona Inc. Method for removing a weak acid from an aqueous solution. 4,177,140, Cl. 210-37.00R.

Smetanin, Jury G.: *See—*
Krupman, Leonid I.; Yaroslavtsev, Jury G.; Sochnev, Alexandr E.; Shamil, Jury P.; Khitrik, Abram I.; Antipenko, Grigory I.; Smetanin, Jury G.; Samsonov, Albert N.; Ljudkovsky, Vadim M.; Pokrass, Leonid M.; Kurdjukov, Anatoly A.; Ofengenden, Abram M.; and Zhitnik, Georgy G., 4,177,070, Cl. 75-257.000.

Smith, Alfred H., Jr., to General Electric Company. Primer compositions for adhering silicone compositions. 4,177,301, Cl. 427-401.000.

Smith, Donald H.: *See—*
Patterson, Thomas K.; Mitchell, William O.; Smith, Donald H.; and Hunter, John P., Jr., 4,176,566, Cl. 83-29.000.

Smith, George. Motorized lens ring adjustor for still camera lens. 4,176,935, Cl. 354-195.000.

Smith International, Inc.: *See—*
Vezirian, Edward, 4,176,724, Cl. 175-369.000.

Smith-Johannsen, Robert: *See—*
Horsma, David A.; Lyons, Bernard J.; and Smith-Johannsen, Robert, 4,177,376, Cl. 219-553.000.

Smith, John B.; Bell, Peter W.; Queen, David S.; and Mitchell, John, to Sidlaw Industries Limited. Composite fabric. 4,177,311, Cl. 428-246.000.

Smith, Michael J.: *See—*
Mathews, John P.; and Smith, Michael J., 4,177,327, Cl. 429-27.000.

Smith, Philip N., to Standex International Corporation. Reed relay and method of assembly. 4,177,439, Cl. 335-151.000.

Smith, Thomas H.: *See—*
Wu, Helen Y.; Smith, Thomas H.; and Henry, David W., 4,177,264, Cl. 424-180.000.

Smithgall, David H., Sr.: *See—*
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Smiths Industries Limited: *See—*
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Snamprogetti S.p.A.: *See—*
Manara, Giovanni; Notari, Bruno; and Fattore, Vittorio, 4,177,167, Cl. 252-455.00R.

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Sochnev, Alexandr E.: *See—*
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Societe d'Exploitation des Procedes Marechal SEPM: *See—*
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Societe Fiat France, S.A.: *See—*
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Societe pour le Forgeage et l'Estampage des Alliages Legers FORGEAL: *See—*
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Soda, Kazuya: *See—*
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Sohner, Gerhard: *See—*
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Solarco Corporation: *See—*
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Solex Research Corporation: *See—*
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Solid Photography Inc.: *See—*
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Solomon, Fred F.: *See—*
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Solow, Benjamin, to Angstrohm Precision, Inc. Metal foil resistor. 4,176,445, Cl. 29-620.000.

Soltis, Frank G.: *See—*
Hoffman, Roy L.; Kempke, William G.; McCullough, John W.; Soltis, Frank G.; and Turner, Richard T., 4,177,513, Cl. 364-200.000.

Sommer, Reinhold. Tennis racket. 4,176,841, Cl. 273-73.00H.

Sommers, Richard J., to FMC Corporation. Fish holding pan on traveling water screen and method of flushing same. 4,176,984, Cl. 405-81.000.

Sonnenschein, Charles M.: *See—*
Keene, Wayne H.; Rudko, Robert I.; and Sonnenschein, Charles M., 4,176,959, Cl. 356-325.000.

Sony Corporation: *See—*
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Yamagiwa, Kazuo; and Tada, Masahiro, 4,177,481, Cl. 358-8.000.

Sorensen, Norman L., to Wisco Corporation. Wind deflector. 4,176,876, Cl. 296-137.00J.

Souriau et Cie: *See—*
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Sourirajan, Srinivasa: *See—*
Thayer, William L.; Pageau, Lucien; and Sourirajan, Srinivasa, 4,177,031, Cl. 425-460.000.

Southwire Company: *See—*
Chadwick, Kenneth E.; Chia, E. Henry; and Powers, Frank M., 4,177,085, Cl. 148-2.000.

Spectra-Physics, Inc.: *See—*
Wright, Dave L.; Schuda, Felix J.; and Spranza, Joseph J., III, 4,176,892, Cl. 316-19.000.

Speer, Kenneth. Ceramic ferrule. 4,176,612, Cl. 110-323.000.

Spence-Bate, H. A. H.: *See—*
Spence-Bate, Harry A. H.; and Bain-Smith, Timothy, 4,176,947, Cl. 355-53.000.

Spence-Bate, Harry A. H.; and Bain-Smith, Timothy, to Spence-Bate, H. A. H. Step and repeat mechanism. 4,176,947, Cl. 355-53.000.

Spence-Bate, Harry A. H. Recording and copying camera. 4,176,948, Cl. 355-53.000.

Sperry Rand Corporation: *See—*
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Kroger, Harry; and Jillie, Don W., Jr., 4,177,476, Cl. 357-5.000.

Spetsialnoe Knostruktorskoe Bjuro PO Proektirovaniju Shlifovalnogo Oborudovania: *See—*
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Spielhoff, Horst: *See—*
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Sprague, Peter J.: *See—*
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Spranza, Joseph J., III: *See—*
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SRI International: *See—*
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Staff KG: *See—*
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Staheli, Paul: *See—*
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Stahle, Kurt, to Concordia Fluidtechnik GmbH. Flow control valve for liquids. 4,176,686, Cl. 137-604.000.

Stalder, Herbert, to Rieter Machine Works Ltd. Method of controlling the operating conditions of a ring spinning machine and apparatus for implementing the method. 4,176,514, Cl. 57-261.000.

Standard Oil Company: *See—*
Kruse, Larry W., 4,177,137, Cl. 208-321.000.

Standard Oil Company (Indiana): *See—*
Feinstein, Allen I.; Bertolacini, Ralph J.; and Kim, Dae K., 4,177,219, Cl. 585-489.000.

Standard Oil Company (Ohio), The: *See—*
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Standex International Corporation: *See—*
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Stanek, Jaroslav: *See—*
Baschang, Gerhard; Stanek, Jaroslav; Rossi, Alberto; and Sele, Alex, 4,177,344, Cl. 536-4.000.

Starks, Laura A.: *See—*
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Stas Societe Technique d'Accessoires Specialises: *See—*
Archer, Jean F., 4,176,874, Cl. 294-78.00A.

Stauffer Chemical Company: *See—*
Richard, Wilfred T., 4,177,248, Cl. 423-540.000.
Walsh, Edward N.; and Fearing, Ralph B., 4,177,300, Cl. 427-390.00D.

Stauffer, Reuben L., to Bendix Corporation, The. Pulse time addition circuit for electronic fuel injection systems. 4,176,625, Cl. 123-32.0EH.

Stead, George E.: *See—*
Heiba, El-Ahmadi I.; Kinney, Robert E.; and Stead, George E., 4,177,192, Cl. 260-326.220.

Steckel, Lester M. Ear tag. 4,176,482, Cl. 40-301.000.

Steeves, Robert W., to King Seeley Thermos Company. Method of metallizing paper. 4,177,310, Cl. 428-216.000.

Steeves, Robert W., to King Seeley Thermos Company. Method of printing paper. 4,177,314, Cl. 428-336.000.

Stein, Erich: *See—*
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Stein, Manfred; and Busch, Dieter, to Quarz-Zeit AG. Electronic clock, particularly a quartz clock. 4,176,515, Cl. 58-19.00R.

Steinke, Leo: *See—*
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Stendenbach, Karl-Heinz: *See—*
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Stenkvist, Sven-Einar; and Widell, Bjorn, to ASEA Aktiebolag. Method for making iron-chromium alloys. 4,177,061, Cl. 75-11.000.

Stepan Chemical Company: *See—*
Nussbaum, Marvin L.; and Knaggs, Edward A., 4,177,207, Cl. 260-504.00R.

Stern, Howard K.: *See—*
Ross, Joseph A.; and Stern, Howard K., 4,176,992, Cl. 409-131.000.

Stevens, William M., to Randam Electronics, Inc. Long-lived reference cell simulating the α scintillation of radon-222. 4,177,378, Cl. 250-252.000.

Stevenson, Grant E., to Nelson & Johnson Engineering. Manual compactor. 4,176,597, Cl. 100-244.000.

Stewart-Warner Corporation: *See—*
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Stieger, Frank: *See—*
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Stierlin, Hans; and Ferguson, John R., to Kuhlapparate GmbH SIBIR. Absorption refrigerating unit. 4,176,529, Cl. 62-490.000.

Stiftelsen Institutet for Mikrovagsteknik vid Tekniska Hogskolan I Stockholm: *See—*
Andermo, Ingvar, 4,177,463, Cl. 343-8.000.

Stiling, Rodney A., to National Gypsum Company. Coaxial pump mixer. 4,176,972, Cl. 366-304.000.

Stoddard, Xerxes T.; Vaseen, Vesper A.; and Terry, Ruel C. Wet oxidation of materials. 4,177,246, Cl. 423-437.000.

Stoddard, Xerxes T.; Vaseen, Vesper A.; and Terry, Ruel C. Wet oxidation of sulphur and the capture of generated heat. 4,177,249, Cl. 423-522.000.

Stoepel, Kurt: *See—*
Bossert, Friedrich; Wehinger, Egbert; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, 4,177,278, Cl. 424-266.000.

Stoll, Kurt; and Rudle, Manfred. Piston and cylinder device. 4,176,586, Cl. 92-5.00R.

Stollberg, Ray H., to Crown Zellerbach Corporation. Shipping container. 4,176,745, Cl. 206-423.000.

Stoner, Jesse A.; and Mills, Robert L., to General Electric Company. Apparatus and method of operating. 4,176,693, Cl. 141-1.000.

Stover, Donald E. Fireplace tongs. 4,176,871, Cl. 294-10.000.

Stowell, Donald E.: *See—*
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Strangfeld, Reiner, to Georg Rost & Sohne. Pilot-operated valve assembly. 4,176,821, Cl. 251-38.000.

Strauser, John W. Machine for making wooden bee box components. 4,176,697, Cl. 144-7.000.

Strie, Lothar: *See—*
Scholz, Manfred; Strie, Lothar; and Stendenbach, Karl-Heinz, 4,176,437, Cl. 29-402.120.

Stroud, Ruben J.: *See—*
Simonson, Robert C.; and Stroud, Ruben J., 4,176,851, Cl. 280-259.000.

Stuck, Robert M., to Marshall Air Systems, Inc. Cooking apparatus. 4,176,589, Cl. 99-386.000.

Studebaker, Irving G.; and Hutchins, Ned M., to Occidental Oil Shale, Inc. In situ oil shale retorts with gas barriers for maximizing product recovery. 4,176,882, Cl. 299-2.000.

Stumpe, Klaus: *See—*
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Stumpfi, Werner: *See—*
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Stuyvenberg, Bernard R. Audio amplitude-responsive lighting display. 4,176,581, Cl. 84-464.00R.

Suhey, Louise D.: *See—*
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Sumitomo Electric Industries, Ltd.: *See—*
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Summers, Robert D.: *See—*
Greaves, Terence M.; and Summers, Robert D., 4,177,010, Cl. 416-97.00R.

Sun Chemical Corporation: *See—*
Horwitt, Laurence G.; and Mattis, Donald J., 4,177,374, Cl. 219-265.000.

Sun, Kwok K., to Upjohn Company, The. Process for the preparation of bis(aminophenyl)alkanes. 4,177,211, Cl. 260-570.00D.

Sunami, Hideo; Kubo, Masaharu; and Takemoto, Iwao, to Hitachi, Ltd. Charge transfer semiconductor device. 4,177,391, Cl. 307-221.00D.

Sunbeam Corporation: *See—*
Ernster, Peter J.; Schaefer, George H.; and Neal, Michael G., 4,176,971, Cl. 366-298.000.

Sundstrand Corporation: *See—*
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Sung, Rodney L.; and Von Allmen, Ronald W., to Texaco Inc. Carburetor detergents. 4,177,041, Cl. 44-71.000.

Suntech, Inc.: *See—*
Janoski, Edward J.; Mitchell, Richard E.; and Schneider, Abraham, 4,177,217, Cl. 585-253.000.
Thompson, Robert M., 4,177,222, Cl. 525-432.000.

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Supanich, Joseph: *See*—
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Suzue, Seisuke: *See*—
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Suzuki, Masao: *See*—
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Suzuki, Masatosi; Soda, Kazuya; and Nakamura, Yasuo, to Nippondenso Co., Ltd. Oxygen concentration detector and method of use thereof. 4,177,112, Cl. 204-1.00T.

Suzuki, Takashi: *See*—
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Suzuki, Yoshihiro; Ura, Mitsuru; and Takahashi, Hiroshi, to Hitachi, Ltd. Silver-electroplating process. 4,177,114, Cl. 204-38.00B.

Svacek, Joseph F., III: *See*—
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Swarts, William A.: *See*—
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Swartzon, Jackob: *See*—
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Sweet, Ralph: *See*—
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Swiss Aluminium Ltd.: *See*—
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Clumpner, Joseph A., 4,177,066, Cl. 75-93.00E.
Severus, Harald; and Birkmaier, Horst, 4,177,299, Cl. 427-287.000.
Severus-Laubenfeld, Harald, 4,177,127, Cl. 204-207.000.

Syntex (U.S.A.) Inc.: *See*—
Untch, Karl G.; Berkoz, Belig; and Unger, Stefan H., 4,177,280, Cl. 424-272.000.

Syred, Nicholas: *See*—
Cudby, Joseph W.; King, Christopher F.; and Syred, Nicholas, 4,176,769, Cl. 222-591.000.

Systems and Technics S.A.: *See*—
Repetti, Pierre, 4,176,670, Cl. 133-4.00R.

Szarka, Sandor, to Precision Screen Machines, Inc. Automated towel transfer printing, feeding, drying and folding apparatus. 4,176,601, Cl. 101-115.000.

Szeberenyi, Szabolcs: *See*—
Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szabolcs, 4,177,190, Cl. 260-239.500.

Szostakowski, Henryk: *See*—
Bielecki, Marek; Bogdanski, Andrzej; Buxakowski, Andrzej; Chudzinski, Janusz; Glogowski, Andrzej; Kopczynski, Marian; Krolikowski, Andrzej; Kryszewski, Jozef; Moczulski, Zdzislaw; Ochocki, Wlodzimierz; Pomorski, Aleksander; Rumatowski, Karol; Sawicki, Janusz; Szostakowski, Henryk; Warowny, Tadeusz; Wisniewski, Teofil; and Wozniak, Antoni, 4,176,624, Cl. 123-32.0EA.

Szporny, Laszlo: *See*—
Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szabolcs, 4,177,190, Cl. 260-239.500.

Taber, Russell E. Rack and golf cart. 4,176,752, Cl. 211-120.000.

Tacke, Peter; Neuray, Dieter; and Michael, Dietrich, to Bayer Aktiengesellschaft. Flameproof polyamide moulding composition. 4,177,185, Cl. 260-38.000.

Tada, Masahiro: *See*—
Yamagiwa, Kazuo; and Tada, Masahiro, 4,177,481, Cl. 358-8.000.

Taddei, Vincent J., to Burroughs Corporation. Port select unit for a programmable serial-bit microprocessor. 4,177,511, Cl. 364-200.000.

Taft, Daniel G.; and Heilhecker, Joe K., to Exxon Production Research Company. Subsea riser and flotation means therefor. 4,176,986, Cl. 405-211.000.

Taguchi, Tetsuya: *See*—
Ito, Fumio; Tsunekawa, Tokuichi; Taguchi, Tetsuya; and Harigaya, Isao, 4,176,929, Cl. 354-29.000.

Taikisha Ltd.: *See*—
Siozawa, Nobuo; Kikuchi, Uhee; Kimura, Suguru; Todoroki, Nobuaki; Yasukawa, Jun-ichi; and Kamiyama, Satoru, 4,177,123, Cl. 204-181.00C.

Taisei Corporation: *See*—
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; Kuroha, Kenji; and Hayakawa, Mitsutaka, 4,176,965, Cl. 366-8.000.

Takada, Hiroshi: *See*—
Hayashi, Masaaki; Tsuneta, Kazuyoshi; Takada, Hiroshi; Kenmotsu, Nobuhiro; and Sasaki, Hiroharu, 4,177,174, Cl. 260-18.0PN.

Takahashi, Hiroshi: *See*—
Suzuki, Yoshihiro; Ura, Mitsuru; and Takahashi, Hiroshi, 4,177,114, Cl. 204-38.00B.

Takahashi, Koji, to Fuji Photo Film Co., Ltd. Color printer and method of controlling exposure time therefor. 4,176,946, Cl. 355-38.000.

Takahashi, Sankichi: *See*—
Mastuzaki, Harumi; Ebara, Katsuya; and Takahashi, Sankichi, 4,177,138, Cl. 210-22.00C.

Takahashi, Yuji, to Canon Kabushiki Kaisha. Sheet transfer device. 4,176,834, Cl. 271-116.000.

Takaoka, Saburo, to Pioneer Electronic Corporation. Speed-and-phase control circuit for a rotary machine. 4,177,411, Cl. 318-314.000.

Takashima, Hiroaki: *See*—
Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; Takashima, Hiroaki; Kato, Osamu; and Nagi, Minoru, 4,177,132, Cl. 208-22.000.

Takasugi, Wasao, to Hitachi, Ltd. Comparator circuit having multifunctions. 4,177,394, Cl. 307-357.000.

Takemoto, Iwao: *See*—
Sunami, Hideo; Kubo, Masaharu; and Takemoto, Iwao, 4,177,391, Cl. 307-221.00D.

Takenaka, Kunio, to Omron Tateisi Electronics Co. Electronic thermometer. 4,176,556, Cl. 73-362.0AR.

Takenouchi, Mutsuo; Ozawa, Takashi; Wako, Syoji; and Itoh, Satoru, to Fuji Xerox Co., Ltd. Facsimile scanner. 4,177,487, Cl. 358-294.000.

Taki, Minoru, to Fukada Works, Ltd. Time lag fuse. 4,177,444, Cl. 337-163.000.

Takishima, Yoshiyuki: *See*—
Kozuki, Susumu; Uchidoi, Masanori; Date, Nobuaki; Shimizu, Masami; Aizawa, Hiroshi; and Takishima, Yoshiyuki, 4,176,936, Cl. 354-38.000.

Talbott, John W.; and Kirkwood, John M., to Washington State University Research Foundation, Inc. Method and apparatus for induction and dispersion of particles in an airstream. 4,176,798, Cl. 241-39.000.

Tamm, Rolf G. A.: *See*—
Tomoff, Toma; and Tamm, Rolf G. A., 4,176,956, Cl. 356-312.000.

Tanaka, Hiroaki: *See*—
Hagiuda, Nobuyoshi; and Tanaka, Hiroaki, 4,176,924, Cl. 352-174.000.

Tanaka, Tadashi: *See*—
Obi, Tatsuro; Koyama, Teruo; Tanaka, Tadashi; and Hasegawa, Atsushi, 4,177,323, Cl. 428-622.000.

Tanaka, Taro: *See*—
Noguchi, Masaaki; Tanaka, Yukiyasu; and Tanaka, Taro, 4,176,650, Cl. 123-198.00F.

Tanaka, Yukiyasu: *See*—
Noguchi, Masaaki; Tanaka, Yukiyasu; and Tanaka, Taro, 4,176,650, Cl. 123-198.00F.

Targe, David M., to Newsday, Inc. Read-away flap. 4,176,862, Cl. 283-64.000.

Tatsumi, Susumu; and Kuroishi, Shoji, to Ricoh Company, Ltd. Electrophotographic copying apparatus. 4,176,942, Cl. 355-14.00R.

Taube, Andris: *See*—
Taube, John; and Taube, Andris, 4,176,931, Cl. 354-79.000.

Taube, John; and Taube, Andris. Camera to microscope adapter system with peripheral image averaging means for exposure control. 4,176,931, Cl. 354-79.000.

Taylor, Richard H.: *See*—
Hatter, Edward E.; Taylor, Richard H.; and McGunigle, Richard D., 4,176,454, Cl. 433-119.000.

Tazaki, Kichiya: *See*—
Tsurumi, Michio; Sakakiyama, Takashi; Tazaki, Kichiya; and Koyama, Masaoki, 4,177,181, Cl. 260-29.70H.

Techniques Europeennes de Commutation (T.E.C.): *See*—
Merlette, Didier, 4,177,440, Cl. 335-247.000.

Teledyne Industries, Inc.: *See*—
Campbell, Joseph M.; and Minyard, Larry J., 4,176,578, Cl. 84-115.000.

Tellabs, Inc.: *See*—
Birck, Michael J., 4,177,361, Cl. 179-170.200.

Tellert, Rudy, to Sachs Systemtechnik GmbH. Circuit arrangement for producing an open magnetic field. 4,177,494, Cl. 361-152.000.

Temple University: *See*—
Labes, Mortimer M., 4,176,918, Cl. 350-346.000.

Tenneco Chemicals, Inc.: *See*—
Siu, Ting Y.; and Ackley, Daniel, 4,177,151, Cl. 252-8.600.

Teramachi, Hiroshi. Limited sliding ball spline assembly. 4,176,888, Cl. 308-6.00R.

Terpening, George I., to Acro Matic Inc. Stocking knee brace. 4,176,665, Cl. 128-165.000.

Terris, James M. Directional sign. 4,176,484, Cl. 40-584.000.

Terris, James M. Directional sign. 4,176,485, Cl. 40-584.000.

Terry, Ruel C.: *See*—
Stoddard, Xerxes T.; Vaseen, Vesper A.; and Terry, Ruel C., 4,177,246, Cl. 423-437.000.
Stoddard, Xerxes T.; Vaseen, Vesper A.; and Terry, Ruel C., 4,177,249, Cl. 423-522.000.

Terumo Corp.: *See*—
Ichikawa, Toshiji; and Minoo, Osamu, 4,177,182, Cl. 260-29.1SB.

Terzian, Rouben T., to Marvin Glass & Assoc. Cooking device. 4,176,593, Cl. 99-422.000.

Tetronics Research & Development Company Limited: *See*—
Tylko, Jozef K., 4,177,060, Cl. 75-10.00R.

Texaco Inc.: *See*—
Howlett, Donald L., 4,177,457, Cl. 340-347.0DA.

Nolte, David G.; and Brown, Winthrop K., 4,176,543, Cl. 73-40.50A.
Sung, Rodney L.; and Von Allmen, Ronald W., 4,177,041, Cl. 44-71.000.

Texasgulf Inc.: *See*—
Pepper, Terry W.; and Bocckino, Harry G., 4,177,067, Cl. 75-104.000.

Textron Inc.: *See*—
Hughes, George C., 4,176,677, Cl. 137-488.000.

Th. Goldschmidt AG: *See*—
Schamberg, Eckehard; Fock, Jurgen; Klocker, Otto; and Esselborn, Eberhard, 4,177,221, Cl. 525-244.000.

Thayer, William L.; Pageau, Lucien; and Sourirajan, Srinivasa, to Canadian Patents and Development Limited. Apparatus for casting tubular, polymeric membranes for reverse osmosis and ultrafiltration. 4,177,031, Cl. 425-460.000.

Thera Gesellschaft fur Patentverwertung mbH: *See*—
Dietze, Gunther; and Wicklmayr, Matthias, 4,177,261, Cl. 424-101.000.

Thiele, Kurt: *See*—
Zirngibl, Ludwig; and Thiele, Kurt, 4,177,350, Cl. 546-278.000.

Thomas, Frank S., Jr., deceased; and by Thomas, Phyllis, executrix. Slide locking mechanism for magazine-fed firearms. 4,176,584, Cl. 89-138.000.

Thomas, Phyllis, executrix: *See*—
Thomas, Frank S., Jr., deceased; and Thomas, Phyllis, executrix, 4,176,584, Cl. 89-138.000.

Thomas, Rudy; and Neumann, Fred F., to N.V. Klippan S.A. Acceleration-sensitive device. 4,176,809, Cl. 242-107.40A.

Thompson, Robert M., to Suntech, Inc. Block copolymer of poly(dioxa-amide) and polyamide. 4,177,222, Cl. 525-432.000.

Thomson-CSF: *See*—
Felix, Pierre, 4,177,483, Cl. 358-113.000.

Thorberg, Seth O.: *See*—
Lindberg, Ulf H. A.; Ross, Svante B.; Thorberg, Seth O.; and Ogren, Sven O., 4,177,291, Cl. 424-330.000.

Thorley, Graham R., to Transportation, Design & Technology, Inc. Wheelchair lift. 4,176,999, Cl. 414-540.000.

Thornburg, David D., to Xerox Corporation. Capacitive transducer. 4,177,421, Cl. 324-61.00R.

Thorpe, Walter H. Emergency traction device. 4,176,704, Cl. 152-225.00C.

Thummler, Ursus; Werner, Hugo; and Sander, Harry, to Hoechst Aktiengesellschaft. Self-cleaning bucket wheel lock. 4,176,765, Cl. 222-218.000.

Thursby, Graham J., to National Research Development Corporation. Diffusing an element into a metal. 4,177,092, Cl. 148-113.000.

Thyssen Industrie Aktiengesellschaft: *See*—
Bornemann, Hans-Joachim, 4,176,966, Cl. 366-78.000.

Thyssen Schachtbau GmbH: *See*—
Hungerbach, Paul, 4,176,997, Cl. 414-299.000.

Tibolla, Marcello: *See*—
Doria, Gianfederico; Romeo, Ciriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, 4,177,276, Cl. 424-263.000.
Doria, Gianfederico; Romeo, Giriaco; Lauria, Francesco; Corno, Maria L.; Giraldi, Piernicola; and Tibolla, Marcello, 4,177,286, Cl. 424-283.000.

Tillmann, Ditmar K.: *See*—
Cairo, Anthony C.; Tillmann, Ditmar K.; and Insley, Gene I., 4,176,903, Cl. 339-147.00R.

Tillmetz, Klaus D.: *See*—
Kolbel, Herbert; and Tillmetz, Klaus D., 4,177,203, Cl. 260-449.60R.

Timashov, Grigory A.: *See*—
Paton, Boris E.; Medovar, Boris I.; Tsukanov, Georgy E.; Bogachenko, Alexei G.; Artamonov, Viktor L.; Timashov, Grigory A.; Shtanko, Jury P.; Marchenko, Alexandr M.; Fedorovsky, Boris B.; Kumysh, Ilya I.; Chepurnoi, Anatoly D.; Saenko, Vladimir Y.; and Semin-Vadov, Gennady M., 4,177,058, Cl. 75-10.00C.

Timco, Gary G. Wave simulator. 4,176,469, Cl. 35-19.00R.

Timothy, Dave A.: *See*—
Baum, Joseph W., Sr.; and Timothy, Dave A., 4,177,009, Cl. 416-45.000.

Timp, Willem J.: *See*—
Akkerboom, Piet J.; Lower, Geertruiida J.; and Timp, Willem J., 4,177,189, Cl. 260-239.100.

Timron, Inc.: *See*—
Kessler, Theodore P., 4,176,803, Cl. 242-67.10R.

Ting, Raymond M. L., to H. H. Robertson Company. Controlled release wall structure. 4,176,503, Cl. 52-1.000.

Tirone, Stephen A.; and Arthur, Ronald H., to AMF Incorporated. Push button switch. 4,177,367, Cl. 200-159.00A.

Titiriga, Andrew, Jr.: *See*—
Headley, Jack W.; Skow, Andrew M.; and Titiriga, Andrew, Jr., 4,176,813, Cl. 244-130.000.

Tkachuk, Petr F.: *See*—
Bezvulyak, Anatoly S.; Gelfand, Ilya M.; Torchinsky, Efim M.; Pushkin, Sergei B.; Vedernikov, Rudolf K.; Kulachenkov, Gennady P.; Tkachuk, Petr F.; and Karyagin, Viktor F., 4,176,952, Cl. 356-47.000.

TMC Corporation: *See*—
Bodendorfer, Roland, 4,176,857, Cl. 280-613.000.

Todoroki, Nobuaki: *See*—
Siozawa, Nobuo; Kikuchi, Uhee; Kimura, Suguru; Todoroki, Nobuaki; Yasukawa, Jun-ichi; and Kamiyama, Satoru, 4,177,123, Cl. 204-181.00C.

Tohyama, Takanori; and Nakahata, Masaaki, to Wako Pure Chemical Industries, Ltd. γ-glutamyl-p-aminoanilide derivatives for measuring activity of γ-glutamyl transpeptidase. 4,177,109, Cl. 435-24.000.

Tojo, Tsutomu, to Olympus Optical Company Limited. Microscope objective lens system. 4,176,912, Cl. 350-175.0ML.

Tokuno, Masateru, to Rengo Co., Ltd. Single facer for manufacturing single-faced corrugated board. 4,177,102, Cl. 156-472.000.

Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Kawase, Suminosuke, 4,176,937, Cl. 354-62.000.

Tominaga, Shigetake: *See*—
Yoshimura, Tatsushiro; Namba, Mutsusuke; Suzue, Seisuke; Tominaga, Shigetake; Mizuno, Toshio; and Hayashida, Nariyoshi, 4,177,320, Cl. 428-419.000.

Tomoff, Toma; and Tamm, Rolf G. A., to Bodenseewerk Perkin-Elmer & Co. GmbH. Sample tube mounting structure for flameless atomic absorption spectroscopy. 4,176,956, Cl. 356-312.000.

Tomura, Teruichi: *See*—
Yamane, Mikiya; Tomura, Teruichi; and Watanabe, Yoshio, 4,177,401, Cl. 313-485.000.

Torchinsky, Efim M.: *See*—
Bezvulyak, Anatoly S.; Gelfand, Ilya M.; Torchinsky, Efim M.; Pushkin, Sergei B.; Vedernikov, Rudolf K.; Kulachenkov, Gennady P.; Tkachuk, Petr F.; and Karyagin, Viktor F., 4,176,952, Cl. 356-47.000.

Torii, Yukio; and Nakamura, Takao, to NGK Insulators, Ltd. Thermal shock resistant ceramic honeycomb structures. 4,177,307, Cl. 428-116.000.

Toro Company, The: *See*—
Baumann, James R.; Comer, Robert C.; and Yourczek, Jerome F., 4,176,508, Cl. 56-12.700.

Torossian, Dieran R.; Aubard, Gilbert G.; and Legeai, Jacky M., to Jouveinal S.A. Method of alleviating inflammation by administration of dexamethasone derivatives. 4,177,268, Cl. 424-243.000.

Toukan, Sameeh S.; and Hauptschein, Murray, to Pennwalt Corporation. Fluorinated heterocyclic sulfides. 4,177,351, Cl. 548-325.000.

Towart, Robertson: *See*—
Bossert, Friedrich; Wehinger, Egbert; Heise, Arend; Kazda, Stanislav; Stoepel, Kurt; Towart, Robertson; Vater, Wulf; and Schlossmann, Klaus, 4,177,278, Cl. 424-266.000.

Townsend, Loren R. Means for converting a water drive center pivot irrigation system to air drive. 4,176,676, Cl. 137-344.000.

Toyama, Noboru: *See*—
Nakamura, Norihiko; Toyama, Noboru; and Baika, Toyokazu, 4,176,635, Cl. 123-119.00A.

Toyo Ink Manufacturing Co., Ltd.: *See*—
Sato, Kozi, 4,177,122, Cl. 204-159.160.
Yoshida, Akihiko; Koaki, Akira; Nakano, Takahumi; Miyake, Mitsunao; Kanai, Teijiro; and Misono, Izumi, 4,176,605, Cl. 101-451.000.

Toyo Soda Manufacturing Co., Ltd.: *See*—
Kurihara, Kenji; Kasahara, Shigekazu; and Suzuki, Takashi, 4,177,179, Cl. 260-29.6NR.

Toyoshima, Kiichiro: *See*—
Nemoto, Tsuneo; and Toyoshima, Kiichiro, 4,176,804, Cl. 242-68.500.

Toyota Jidosha Kabushiki Kogyo Kaisha: *See*—
Nakamura, Norihiko; Toyama, Noboru; and Baika, Toyokazu, 4,176,635, Cl. 123-119.00A.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Kamiya, Tamotsu; and Miyao, Shigeru, 4,177,023, Cl. 417-540.000.
Nakamura, Norihiko; Kato, Takashi; and Kobayashi, Tatsuo, 4,176,646, Cl. 123-148.00E.
Sasaki, Shiro; Yasumatsu, Jun; and Inukai, Mitsuo, 4,176,808, Cl. 242-107.100.
Shinoda, Yoshio; Kuno, Akira; and Kuroyama, Toshinobu, 4,177,454, Cl. 340-309.400.
Yamanaka, Minoru; and Ii, Akira, 4,177,224, Cl. 261-39.00A.

Toyota Jidosha Kogyo Kabushikikaisha: *See*—
Shinoda, Osamu; Okabayashi, Keiichi; and Nagai, Takanori, 4,176,639, Cl. 123-136.000.

Toyota Motor Company, Ltd.: *See*—
Karlovitz, Bela, 4,176,649, Cl. 123-191.0SP.

Tracy, Raymond: *See*—
Berg, Verland V., 4,176,652, Cl. 126-121.000.

Traenckner, Hans-Joachim; Goossens, John; Kremer, Wolfgang; and Kronke, Heinz, to Bayer Aktiengesellschaft. Aqueous nitrocellulose/alkyd resin dispersion. 4,177,172, Cl. 260-15.000.

Trane Company, The: *See*—
Schlangen, Andrew J.; McClead, Jerry W.; and Garavalia, Thomas A., 4,177,007, Cl. 415-160.000.

Transportation, Design & Technology, Inc.: *See*—
Thorley, Graham R., 4,176,999, Cl. 414-540.000.

Trayco, Inc.: *See*—
Whitney, Thomas M.; and Crosby, Samuel C., 4,176,413, Cl. 4-300.000.

Trebelhorn, Thomas E.: *See*—
Sacher, Eric; and Trebelhorn, Thomas E., 4,176,780, Cl. 235-302.000.

Treiber, Helmut: *See*—
Knor, Bernhard; Payrhammer, Bernd; and Treiber, Helmut, 4,176,964, Cl. 356-444.000.

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Triesch, Willi: *See—*
Remberg, Axel; and Triesch, Willi, 4,177,003, Cl. 415-108.000.
Tripp, Charles W. Major and minor short leakage detector. 4,177,420, Cl. 324-51.000.
Triumph Werke Nurnberg A.G.: *See—*
Lendl, Josef, 4,176,976, Cl. 400-124.000.
Trutzschler GmbH & Co. KG: *See—*
Trutzschler, Hermann, 4,176,425, Cl. 19-81.000.
Trutzschler, Hermann, to Trutzschler GmbH & Co. KG. Device for supporting textile fiber bales during bale breaking. 4,176,425, Cl. 19-81.000.
Tsuchitani, Akira: *See—*
Okumura, Tomisaburo; Okazaki, Hiroshi; and Tsuchitani, Akira, 4,177,096, Cl. 148-187.000.
Tsukanov, Georgy E.: *See—*
Paton, Boris E.; Medovar, Boris I.; Tsukanov, Georgy E.; Bogachenko, Alexei G.; Artamonov, Viktor L.; Timashov, Grigory A.; Shtanko, Jury P.; Marchenko, Alexandr M.; Fedorovsky, Boris B.; Kumysh, Ilya I.; Chepurnoi, Anatoly D.; Saenko, Vladimir Y.; and Semin-Vadov, Gennady M., 4,177,058, Cl. 75-10.00C.
Tsunekawa, Tokuichi: *See—*
Ito, Fumio; Tsunekawa, Tokuichi; Taguchi, Tetsuya; and Harigaya, Isao, 4,176,929, Cl. 354-29.000
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Hayashi, Masaaki; Tsuneta, Kazuyoshi; Takada, Hiroshi; Kenmotsu, Nobuhiro; and Sasaki, Hiroharu, 4,177,174, Cl. 260-18.0PN.
Tsurumi, Michio; Sakakiyama, Takashi; Tazaki, Kichiya; and Koyama, Masaoki, to Asahi-Dow Limited. Flame-retardant adhesive compositions. 4,177,181, Cl. 260-29.70H.
Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szabolcs, to Richter Gedeon Vegyeszeti Gyar Rt. Diamino-androstanes and a process for the preparation of the said compounds. 4,177,190, Cl. 260-239.500.
Tucker, James M.; Dougan, Roger W.; and Swartzon, Jacob, to Wylain, Inc. Combined environmental and refrigeration system. 4,176,525, Cl. 62-238.00R.
Tumbleweed Enterprises: *See—*
Griggs, William K.; and Holland, Harry, 4,176,770, Cl. 224-30.00A.
Turner, Richard T.: *See—*
Hoffman, Roy L.; Kempke, William G.; McCullough, John W.; Soltis, Frank G.; and Turner, Richard T., 4,177,513, Cl. 364-200.000.
Turner, Roy C.; and Constable, Philip J., to Drayton Controls (Engineering) Limited. Bridge circuits. 4,177,423, Cl. 324-99.00R.
Tusl, Miroslav: *See—*
Ruzicka, Jan; Lorenz, Jindrich; Marek, Vladimir; and Tusl, Miroslav, 4,176,978, Cl. 401-96.000.
Twickler, Robert G., to Sundstrand Corporation. Combination no-back brake and torque limiter assembly. 4,176,733, Cl. 188-134.000.
Tylko, Jozef K., to Tetronics Research & Development Company Limited. Reduction of stable oxides. 4,177,060, Cl. 75-10.00R.
Tzu-Yen, Hsieh. Automatically stamping mailbox. 4,176,740, Cl. 194-9.00R.
Ube Industries, Ltd.: *See—*
Umemura, Sumio; Ohdan, Kyoji; Sakai, Fumihiko; Bando, Yasuo; and Ikezawa, Harumi, 4,177,161, Cl. 252-435.000.
Ubersax, Richard W., to Du Pont de Nemours, E. I., and Company. Coated Polymeric substrates. 4,177,315, Cl. 428-336.000.
UCB, Societe Anonyme: *See—*
Vrancken, August; and Dufour, Paul, 4,177,338, Cl. 526-211.000.
Uchidoi, Masanori: *See—*
Kozuki, Susumu; Uchidoi, Masanori; Date, Nobuaki; Shimizu, Masami; Aizawa, Hiroshi; and Takishima, Yoshiyuki, 4,176,936, Cl. 354-38.000.
Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; Takashima, Hiroaki; Kato, Osamu; and Nagi, Minoru, to Nippon Oil Company, Ltd. Process for the continuous production of petroleum-derived pitch. 4,177,132, Cl. 208-22.000.
Ueno, Yoshio; Ikeda, Takeshi; and Isozaki, Masaru, to Mitsubishi Plastics Industries Limited. Method of molding socket of plastic resin tube. 4,177,237, Cl. 264-296.000.
Ugelstad, John: *See—*
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Ukigai, Toshiyuki: *See—*
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Umemura, Sumio; Ohdan, Kyoji; Sakai, Fumihiko; Bando, Yasuo; and Ikezawa, Harumi, to Ube Industries, Ltd. Catalytic oxidative process for producing maleic anhydride. 4,177,161, Cl. 252-435.000.
Umtech, Inc.: *See—*
Chung, David H., 4,177,462, Cl. 340-703.000.
Unger, Stefan H.: *See—*
Untch, Karl G.; Berkoz, Belig; and Unger, Stefan H., 4,177,280, Cl. 424-272.000.
Unicler: *See—*
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Wade, Peter C.; Vogt, B. Richard; and Kissick, Thomas P., to E. R. Squibb & Sons, Inc. 2-Alkyl-3-(substituted hydrazino)benzisothiazolines. 4,177,191, Cl. 548-212.000.
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Wagner, Richard E., to Bell Telephone Laboratories, Incorporated. Devices for monitoring, switching, attenuating or distributing light. 4,176,908, Cl. 350-96.150.
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Warden, A. Jack. Method for producing integrally sealed billets from scrap metal without fully remelting the metal. 4,176,438, Cl. 29-403.100.

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Wetmore, Sherman B.; McNary, James F.; and Person, Abraham, to Global Marine, Inc. Marine riser system with dual purpose lift and heave compensator mechanism. 4,176,722, Cl. 175-7.000.

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Wetterhorn, Richard H., to Dresser Industries, Inc. Pressure gauge casing-to-socket construction. 4,176,558, Cl. 73-741.000.

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Sinclair, Irene, 253,579, Cl. D9-128.000.
March Engineering Limited: *See—*
Herd, Robert J., 253,605, Cl. D21-137.000.
Mascia, Carmen T., to Continental Group, Inc., The. Packaging container or the like. 253,580, 12-4-79, Cl. D9-220.000.
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Takei, Hideo, 253,592, Cl. D14-34.000.
McCroskery, Allan L., to International Business Machines Corporation. Typewriter. 253,600, 12-4-79, Cl. D18-1.000.
Mead, Bill G.: *See—*
Scott, Robert J.; and Mead, Bill G., 253,575, Cl. D7-128.000.
Mericle, Robert W.: *See—*
Jarvik, Robert K.; and Mericle, Robert W., 253,612, Cl. D24-27.000.
Jarvik, Robert K.; and Mericle, Robert W., 253,613, Cl. D24-27.000.
Millican, Charles E. Charm, medallion or similar article. 253,583, 12-4-79, Cl. D11-101.000.
Moore, John M.: *See—*
Smith, David B.; Jones, Paul W.; Moore, John M.; and Bruton, William C., 253,608, Cl. D24-8.000.
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Park, James V.: *See—*
Schreibman, Mark R.; and Park, James V., 253,571, Cl. D7-13.000.
Peters-Revington Corporation: *See—*
Ungaro, Nicholas A., 253,563, Cl. D6-127.000.
Ungaro, Nicholas A., 253,564, Cl. D6-130.000.
Ungaro, Nicholas A., 253,565, Cl. D6-175.000.
Ungaro, Nicholas A., 253,567, Cl. D6-189.000.
Physio-Control Corporation: *See—*
Smith, David B.; Jones, Paul W.; Moore, John M.; and Bruton, William C., 253,608, Cl. D24-8.000.
Smith, David B.; Jones, Paul W.; and Benson, James A., 253,609, Cl. D24-17.000.
Smith, David B.; Jones, Paul W.; Benson, James A.; Moore, John M.; and Bruton, William C., 253,610, Cl. D24-17.000.
Plastics, Inc.: *See—*
Pomroy, James F., 253,570, Cl. D7-9.000.
Pomroy, James F., to Plastics, Inc. Drinking cup. 253,570, 12-4-79, Cl. D7-9.000.
Raffler, Dieter; and Clivio, Franco, to Gardena Kress & Kastner GmbH. Shaft coupling for garden implements and the like. 253,576, 12-4-79, Cl. D8-1.000.
Rawson, John V., Jr., to Brass Ones, Inc., The. Plaque. 253,585, 12-4-79, Cl. D11-140.000.
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Kupperman, Sam; and Kupperman, Dennis, 253,603, Cl. D21-91.000.
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Rinaldi, Joseph A., to Rival Manufacturing Company. Coffeemaker. 253,572, 12-4-79, Cl. D7-41.000.
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Scott, Robert J.; and Mead, Bill G., 253,575, Cl. D7-128.000.
Rowe, Machmud D.; Hetherington, Robert H.; and Johnson, Susan L., to Bima Industries, Inc. Container for growing edible sprouts from seeds. 253,586, 12-4-79, Cl. D11-152.000.
Schreibman, Mark R.; and Park, James V. Drinking glass or similar article. 253,571, 12-4-79, Cl. D7-13.000.
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Smith, William R.; and Sun, Anthony, to Caere Corporation. Lamp cartridge for optical character recognition reader. 253,593, 12-4-79, Cl. D14-40.000.
Solomon, Charles I. Temple for spectacles. 253,597, 12-4-79, Cl. D16-81.000.
Sun, Anthony: *See—*
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Takei, Hideo, to Matsushita Electric Industrial Co., Ltd. Loudspeaker. 253,592, 12-4-79, Cl. D14-34.000.
Thompson, Debbie A. Infant carrier. 253,557, 12-4-79, Cl. D3-31.000.
Ungaro, Nicholas A., to Peters-Revington Corporation. Cabinet. 253,563, 12-4-79, Cl. D6-127.000.
Ungaro, Nicholas A., to Peters-Revington Corporation. Cabinet. 253,564, 12-4-79, Cl. D6-130.000.
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United States Luggage Corp.: *See—*
Atkinson, Wallace E., 253,577, Cl. D8-338.000.
Vanderwerf, Robert H., to Vy-Dawn, Inc. Four way corner level. 253,581, 12-4-79, Cl. D10-69.000.
Vigue, Henry R., to Keyes Fibre Company. Beverage tray. 253,561, 12-4-79, Cl. D7-71.000.
Vong, Hoi T. Combined radio and pen. 253,595, 12-4-79, Cl. D14-69.000.
Vy-Dawn, Inc.: *See—*
Vanderwerf, Robert H., 253,581, Cl. D10-69.000.
Weber & Stevens, Inc.: *See—*
Weber, William J.; Herbst, Jeffrey; and Cullen, Thomas, 253,601, Cl. D19-37.000.
Weber, William J.; Herbst, Jeffrey; and Cullen, Thomas, to Weber & Stevens, Inc. Finger-protective cutting guide. 253,601, 12-4-79, Cl. D19-37.000.
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Ban, Koichiro; Kawashima, Tsunemi; and Kobayashi, Kunihiko, 253,588, Cl. D12-110.000.
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ISSUED DECEMBER 4, 1979

NOTE.—First number, class; second number, subclass; third number, patent number

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	31	253,557		191	253,568		338	253,577	D12—	12	253,587	D16—	60	253,598	D22—	19	253,606
		253,558	D7—	4	253,569		395	253,578		110	253,588		81	253,597	D23—	23	253,607
D6—	57	253,559		9	253,570	D9—	128	253,579		118	253,589			253,599	D24—	8	253,608
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	127	253,563		65	253,573		70	253,582		34	253,592	D21—	54	253,615		26	253,611
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	175	253,565		97	253,574		131	253,584			253,594		91	253,603			253,613
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	4,176,454		4,176,572		4,177,095		4,177,195		4,176,767		4,177,036
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05 :	4,176,417		4,176,969	09 :	4,176,460		4,176,457		4,176,980		4,177,365
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	4,176,674		4,176,441		4,176,448		4,176,819		4,176,673		4,176,797
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	4,176,709		4,176,504		4,176,453		4,176,995		4,176,858		4,176,848
	4,176,736		4,176,551		4,176,474		4,177,241		4,176,918		4,176,855
	4,176,768		4,176,552		4,176,483	39 :	4,176,438		4,176,981		4,176,894
	4,176,822		4,176,561		4,176,486		4,176,472		4,176,984		4,176,986
	4,176,876		4,176,601		4,176,555		4,176,521		4,177,014		4,177,079
	4,176,880		4,176,611		4,176,654		4,176,643		4,177,099		4,177,110
	4,176,903		4,176,617		4,176,690		4,176,702		4,177,128		4,177,145
	4,176,982		4,176,655		4,176,693		4,176,705		4,177,147		4,177,184
	4,177,028		4,176,656		4,176,815		4,176,718		4,177,177		4,177,220
	4,177,040		4,176,681		4,176,832		4,176,750		4,177,178		4,177,248
	4,177,106		4,176,746		4,176,859		4,176,758		4,177,180		4,177,270
	4,177,157		4,176,756		4,176,862		4,176,774		4,177,187		4,177,457
	4,177,175		4,176,762		4,176,891		4,176,792		4,177,198	49 :	4,176,800
	4,177,205		4,176,764		4,176,902		4,176,794		4,177,217		4,176,853
	4,177,210		4,176,803		4,176,945		4,176,823		4,177,285		4,177,019
	4,177,263		4,176,836		4,176,968		4,176,840		4,177,297		4,177,020
	4,177,289		4,176,866		4,176,972		4,176,871		4,177,331		4,177,118
	4,177,322		4,176,893		4,176,991		4,177,004		4,177,351		4,177,227
	4,177,335		4,176,904		4,176,992		4,177,051		4,177,386	50 :	4,176,590
	4,177,408		4,176,908		4,176,998		4,177,082		4,177,388		4,177,502
	4,177,426		4,176,911		4,177,011		4,177,136		4,177,397	51 :	4,176,625
	4,177,473		4,176,941		4,177,041		4,177,137		4,177,410		4,176,868
	4,177,474		4,176,961		4,177,056		4,177,230		4,177,441		4,176,950
27 :	4,176,471		4,176,977		4,177,064		4,177,233		4,177,459		4,177,030
	4,176,508		4,176,983		4,177,091		4,177,245		4,177,460		4,177,339
	4,176,522		4,177,037		4,177,105		4,177,308		4,177,499		4,177,358
	4,176,559		4,177,093		4,177,149		4,177,378		4,177,507		4,177,452
	4,176,604		4,177,124		4,177,199		4,177,439		4,177,511		4,177,485
	4,176,698		4,177,131		4,177,200		4,177,443	44 :	4,176,805	53 :	4,176,467
	4,176,949		4,177,142		4,177,204		4,177,504	45 :	4,176,455		4,176,470
	4,177,078		4,177,151		4,177,209		4,177,515		4,176,456		4,176,697
	4,177,513		4,177,154		4,177,236	40 :	4,176,714		4,176,571		4,176,812
28 :	4,176,495		4,177,163		4,177,300		4,177,134		4,176,589		4,177,048
29 :	4,176,414		4,177,171		4,177,301		4,177,135		4,176,667		4,177,267
	4,176,591		4,177,191		4,177,302		4,177,162	47 :	4,176,578	54 :	4,177,212
	4,176,816		4,177,192		4,177,324		4,177,164		4,176,809		4,177,315
	4,176,881		4,177,194		4,177,346		4,177,165		4,177,081	55 :	4,176,409
	4,176,906		4,177,202		4,177,352		4,177,166		4,177,115		4,176,557
	4,177,065		4,177,243		4,177,355		4,177,250		4,177,129		4,176,755
	4,177,066		4,177,258		4,177,387		4,177,251		4,177,255		4,176,775
	4,177,225		4,177,259		4,177,399	41 :	4,176,464		4,177,482		4,176,785
31 :	4,176,482		4,177,265		4,177,407		4,176,696	48 :	4,176,411		4,176,826
	4,176,676		4,177,273		4,177,448		4,177,000		4,176,436		4,176,971
	4,176,743		4,177,274		4,177,464	42 :	4,176,420		4,176,478		4,177,007
	4,176,788		4,177,277		4,177,498		4,176,426		4,176,499		4,177,075
	4,177,465		4,177,336		4,177,501		4,176,427		4,176,520		4,177,104
32 :	4,176,730		4,177,354	37 :	4,176,415		4,176,473		4,176,525		4,177,304
	4,177,080		4,177,362		4,176,452		4,176,503		4,176,695		4,177,363
33 :	4,177,017		4,177,436		4,176,484		4,176,543		4,176,706	56 :	4,176,779
	4,177,356		4,177,484		4,176,485		4,176,550				

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06 :	253,557	09 :	253,578		253,604	27 :	253,570	37 :	253,560		253,612
	253,558		253,600	21 :	253,563	29 :	253,575	39 :	253,602		253,613
	253,568	12 :	253,559		253,564	34 :	253,572	40 :	253,566	51 :	253,577
	253,581		253,562		253,565		253,585	42 :	253,569	53 :	253,574
	253,589	13 :	253,614		253,567	36 :	253,590		253,598		253,586
	253,591	17 :	253,556	23 :	253,561		253,592	48 :	253,583		253,608
	253,593		253,580	24 :	253,573		253,599		253,597		253,609
	253,615		253,584	25 :	253,582						
08 :	253,571		253,603	26 :	253,587		253,601	49 :	253,611		253,610

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

06 :	T989,001		T989,002		T989,003		T989,004	34 :	T989,005		

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December 11, 1979 Volume 989 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

July 3, 1979.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

Department of the Treasury
United States Customs Service

(TMK-2-R:E:E)

NOTICE OF APPLICATION FOR RECORDATION OF TRADE NAME

XYLOGICS, INC.

Application has been filed pursuant to section 133.12 Customs Regulations (10 CFR 133.12), for recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124) of the trade name XYLOGICS, INC. used by Xylogics, Inc., a corporation organized under the laws of the State of Massachusetts, located at 42 Third Avenue, Burlington, Massachusetts 01803.

The application states that the trade name is applied to electronic data processing equipment, including central processing units, memory devices, controllers, interfaces and tape drives, disc drives, terminals and other peripheral input and output equipment; and computer programs in printed form and in the form of magnetic tapes, magnetic discs and read-only semiconductor memories manufactured in England and the United States. Zylogics International, Ltd., Lyton House, Mill Lane, Gerrards Cross, Bucks SL98AY, Great Britain is authorized to use the trade name.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Any such submission should be addressed to the Commissioner of Customs, Washington, D.C. 20229, in time to be received not later than 30 days from the date of publication of this notice in the Federal Register.

Notice of the action taken on the application for recordation of the trade name will be published in the FEDERAL REGISTER.

Dated: Nov. 5, 1979.

DONALD W. LEWIS,
Director, Office of Regulations and Rulings.

Erratum

In the notice of Reissue Applications Filed which appears in the Official Gazette September 18, 1979, the entry for Patent No. 4,094,801 on page 18 in the Patent Section, 986 OG 18, and on page 14 in the Trademark Section, 986 TMOG 14, is incorrect and should read as follows:

4,094,801. Re. S.N. 048,418. Filed June 14, 1979. Cl. 252/33: MAGNESIUM-CONTAINING COMPLEXES, METHOD FOR THEIR PREPARATION, AND COMPOSITIONS CONTAINING THE SAME, John Wesley Forsberg, Owner of Record: *The Lubrizol Corporation, Wickliffe, Ohio.* Attorney or Agent: James W. Adams, Jr. et al., Ex. Gp.: 116.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

Re. 29,083, Re. S.N. 063,356, Filed Aug. 3, 1979, Cl. 239/224, ATOMIZER WHEEL FOR THE ATOMIZATION OF SUSPENSIONS OF HARD-WEARING MATERIALS, Kaj Nielsen, Owner of Record: *Aktieselskabet Niro Atomizer, Soborg, Denmark,* Attorney or Agent: Davidson C. Miller, et al., Ex. Gp.: 313

Re. 29,498, Re. S.N. 073,485, Filed Sep. 7, 1979, Cl. 435/14, PROCESS FOR THE ENZYMATIC DETERMINATION OF GLUCOSE WITH A GLUCOSE-OXYDAZED PEROXIDAZED ENZYME SYSTEM, Franco Meiattini, Owner of Record: *Instituto Sieroterapico E Vaccinogeno Toscano SCLAVO S.P.A., Siena, Italy,* Attorney or Agent: George B. Finnegan Jr., et al., Ex. Gp.: 172

3,268,351, Re. S.N. 066,887, Filed Aug. 16, 1979, Cl. 427/444, XEROGRAPHIC FIXING METHOD AND APPARATUS, Warren G. Van Dorn, Owner of Record: *Xerox Corporation, Rochester, N.Y.,* Attorney or Agent: Harvey M. Brownrout, Ex. Gp.: 162

3,291,466, Re. S.N. 066,885, Filed Aug. 16, 1979, Cl. 432/60, XEROGRAPHIC FIXING DEVICE, Gilbert A. Aser, et al., Owner of Record: *Xerox Corporation, Rochester, N.Y.,* Attorney or Agent: Harvey M. Brownrout, et al., Ex. Gp.: 344

3,341,101, Re. S.N. 065,682, Filed Aug. 10, 1979, Cl. 227/8, POWER-ACTUATED TOOL, David F. Butler, et al., Owner of Record: *Olin Mathieson Chemical Corporation, New Haven, Conn.,* Attorney or Agent: Paul J. Lerner, et al., Ex. Gp.: 322

3,720,979, Re. S.N. 070,869, Filed Aug. 29, 1979, Cl. 16/150, BIASED HINGES, Alois A. Krawagna, Owner of Record: *Westhem Corporation Limited, Toronto, Ontario, Canada,* Attorney or Agent: David S. Kane, et al., Ex. Gp.: 353

3,745,792, Re. S.N. 066,882, Filed Aug. 16, 1979, Cl. 66/85 A, WICKING APPARATUS, Raghulinga R. Thettu, Owner of Record: *Xerox Corporation, Stamford, Conn.,* Attorney or Agent: Harvey M. Brownrout, et al., Ex. Gp.: 353

3,839,444, Re. S.N. 075,367, Filed Sep. 14, 1979, Cl. 260/55 AR, HALOPHENOXY BENZAMIDE HERBICIDES, Robert J. Theissen, Owner of Record: *Mobil Oil Corporation, New York, N.Y.,* Attorney or Agent: Charles A. Huggett, et al., Ex. Gp.: 117

3,845,833, Re. S.N. 072,380, Filed Sep. 4, 1979, Cl. 280/218, TRACTOR SUSPENSION, William A. Bice, Owner of Record: *Clark Equipment Company, Buchanan, Mich.,* Attorney or Agent: Kenneth C. Witt, Ex. Gp.: 316

3,906,916, Re. S.N. 072,501, Filed Sep. 4, 1979, Cl. 123/139 AP, FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES, Helmut Laufer, Owner of Record: *Robert Bosch G.m.b.H., Stuttgart, Germany,* Attorney or Agent: Edwin E. Greigg, et al., Ex. Gp.: 342

3,907,135, Re. S.N. 050,525, Filed Jun. 21, 1979, Cl. 414/528, APPARATUS FOR PLANTING SUGAR CANE RELATING TO THE ORIENTATION OF ELONGATED ELEMENTS, Peter Populin, et al., Owner of Record: *Peter Populin and Louis Populin, Home Hill, North Queensland, Australia,* Attorney or Agent: John C. Holman, et al., Ex. Gp.: 314

3,942,624, Re. S.N. 074,574, Filed Sep. 17, 1979, Cl. 198/502, CANTILEVERED BELTED BAG LOADING APPARATUS, Vytautas Kupcikevicius, Owner of Record: *Union Carbide Corp., New York, N.Y.,* Attorney or Agent: Michael O. Warnecke, et al., Ex. Gp.: 313

3,996,006, Re. S.N. 044,403, Filed Jun. 1, 1979, Cl. 422/50, SPECIMEN TEST SLIDE, Joseph F. Pagano, Owner of Record: *Smithkline Corporation, Philadelphia, Pa.,* Attorney or Agent: Marcus B. Finnegan, et al., Ex. Gp.: 177

4,012,343, Re. S.N. 072,728, Filed Sep. 4, 1979, Cl. 260/28.5, CROSSLINKED OLEFIN POLYMER HAVING IMPROVED FLAME RETARDANCE, Charles F. Raley, Jr., Owner of Record: *The Dow Chemical Company, Midland, Mich.,* Attorney or Agent: R. G. Waterman, et al., Ex. Gp.: 141

4,013,023, Re. S.N. 066,701, Filed Aug. 15, 1979, Cl. 110/8 A, INCINERATION METHOD AND SYSTEM, Luis A. Lombana, et al., Owner of Record: *Envirotech Corporation, Menlo Park, Calif.,* Attorney or Agent: John J. Morrisey, et al., Ex. Gp.: 344

4,037,961, Re. S.N. 045,420, Filed Jun. 4, 1979, Cl. 356/318, SYSTEM AND APPARATUS FOR CONTOUR PLOTTING THE TOTAL LUMINESCENCE SPECTRUM OF A SAMPLE, James H. Macemon, Owner of Record: *Baxter Travenol Lab., Deerfield, Ill.,* Attorney or Agent: Henry W. Collins, Ex. Gp.: 257

4,046,418, Re. S.N. 072,641, Filed Sep. 5, 1979, Cl. 297/118, WHEELCHAIRS, Royal Smith, et al., Owner of Record: *Inventors,* Attorney or Agent: Rupert J. Brady, et al., Ex. Gp.: 355

4,046,690, Re. S.N. 073,031, Filed Sep. 6, 1979, Cl. 210/75, FILTERING COAL-DERIVED OIL THROUGH A FILTER MEDIA PRECOATED WITH PARTICLES PARTIALLY SOLUBILIZED BY SAID OIL, Billy R. Rodgers, et al., Owner of Record: *U.S. Energy Research and Development Administration, Washington, D.C.,* Attorney or Agent: Allen H. Uzzell, et al., Ex. Gp.: 176

4,046,739, Re. S.N. 073,628, Filed Sep. 10, 1979, Cl. 528/272, PROCESS FOR REDUCING THE PROCESSING TIME IN THE PRODUCTION OF POLYESTERS, Joseph Lacona, Owner of Record: *Koppers Company, Inc., Pittsburgh, Pa.,* Attorney or Agent: Donald M. Mackay, et al., Ex. Gp.: 144

4,047,187, Re. S.N. 072,666, Filed Sep. 5, 1979, Cl. 354/23 D, SYSTEM FOR EXPOSURE MEASUREMENT AND/OR FOCUS DETECTION BY MEANS OF IMAGE SENSER, Yukio Mashimo, et al., Owner of Record: *Canon Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: David Loren, et al., Ex. Gp.: 211

4,051,912, Re. S.N. 049,968, Filed Jun. 19, 1979, Cl. 175/410, PERCUSSION DRILL BIT, Kenneth M. White, Owner of Record: *Inventor,* Attorney or Agent: John E. Lind, Ex. Gp.: 354

4,073,269, Re. S.N. 075,066, Filed Sep. 12, 1979, Cl. 123/32 EE, FUEL INJECTION SYSTEM, Herro Herth, et al., Owner of Record: *Robert Bosch G.m.b.H., Stuttgart, Germany,* Attorney or Agent: Edwin E. Greigg, et al., Ex. Gp.: 342

4,080,840, Re. S.N. 072,061, Filed Sep. 4, 1979, Cl. 74/61, VIBRATOR DEVICE, Spencer A. Stone, Owner of Record: *The Deister Concentrator Co., Inc., Fort Wayne, Ind.,* Attorney or Agent: George A. Gust, et al., Ex. Gp.: 352

4,087,203, Re. S.N. 062,851, Filed Aug. 1, 1979, Cl. 416/141, CROSS BEAM ROTOR, Donald L. Ferris, et al., Owner of Record: *United Technologies Corporation, Hartford, Conn.,* Attorney or Agent: Vernon F. Hauschild, Ex. Gp.: 343

4,105,603, Re. S.N. 071,559, Filed Aug. 31, 1979, Cl. 260/8, PEPTIDES WHICH EFFECT RELEASE OF HORMONES, Wylie W. Vale, Jr., et al., Owner of Record: *The Salk Institute for Biological Studies, San Diego, Calif.,* Attorney or Agent: William E. Anderson, et al., Ex. Gp.: 143

4,107,307, Re. S.N. 064,672, Filed Aug. 8, 1979, Cl. 424/249, IMIDAZO (1,5-D)-AS-TRIAZINE-4(3H)-ONES AND THIONES, Rolf Paul, et al., Owner of Record: *American Cyanamid Company, Stamford, Conn.,* Attorney or Agent: Edward A. Conroy, Jr., Ex. Gp.: 125

4,116,316, Re. S.N. 064,225, Filed Aug. 6, 1979, Cl. 192/58 A, FLUID COUPLING DEVICE AND BIMETAL COIL, Kenneth R. Streeter, Owner of Record: *Eaton Corporation, Cleveland, Ohio,* Attorney or Agent: Robert J. McCloskey, et al., Ex. Gp.: 352

4,118,619, Re. S.N. 071,334, Filed Aug. 30, 1979, Cl. 219/121 L, ROTARY BEAM CHOPPER AND SCANNING SYSTEM, Colin Shaw McArthur, et al., Owner of Record: *R. J. Reynolds Tobacco Company, Winston Salem, N.C.,* Attorney or Agent: Grover M. Myers, et al., Ex. Gp.: 213

4,127,632, Re. S.N. 074,414, Filed Sep. 11, 1979, Cl. 264/334, METHOD OF PRODUCING UNDERCUT TUBULAR PLASTIC ARTICLES, Anton Anger, Owner of Record: *Anton Anger Maschinenbau GmbH, Linz, Austria,* Attorney or Agent: David S. Kane, et al., Ex. Gp.: 147

4,129,575, Re. S.N. 068,011, Filed Aug. 20, 1979, Cl. 260/343.21, 8-METHOXYPSORALEN, Louis J. Glunz, et al., Owner of Record: *Thomas C. Elder, Inc., Hamilton, Ind.,* Attorney or Agent: Gordon W. Hueschen, Ex. Gp.: 121

4,129,576, Re. S.N. 068,012, Filed Aug. 20, 1979, Cl. 260/343.21, PROCESS FOR MAKING OMEGA-CHLORO-2,3,4-TRIHYDROXYACETOPHENONE, Louis J. Glunz, et al., Owner of Record: *Thomas C. Elder, Inc., Hamilton, Ind.,* Attorney or Agent: Gordon W. Hueschen, Ex. Gp.: 121

4,131,815, Re. S.N. 063,976, Filed Aug. 6, 1979, Cl. 310/323, SOLID PIEZOELECTRIC SAND DETECTION PROBES, Paul A. Boatright, Owner of Record: *Oceanography International Corporation, College Station, Tex.,* Attorney or Agent: D. Carl Richards, et al., Ex. Gp.: 212

4,138,352, Re. S.N. 068,293, Filed Aug. 20, 1979, Cl. 252/135, DETERGENT COMPOSITIONS WITH ANTISOIL AND ANTIREDEPOSITION PROPERTIES, Arthur S. Teot, et al., Owner of Record: *The Dow Chemical Co., Midland, Mich.,* Attorney or Agent: Richard G. Waterman, et al., Ex. Gp.: 166

4,145,084, Re. S.N. 067,838, Filed Aug. 20, 1979, Cl. 297/418, MINIATURE WICKER FURNITURE AND METHOD OF ASSEMBLING SAME, Joan M. Capper, Owner of Record: *Inventor*, Attorney or Agent: Robert B. Kennedy, Ex. Gp.: 355

4,150,897, Re. S.N. 076,092, Filed Sep. 17, 1979, Cl. 356/152, WHEEL MOUNTED VEHICLE WHEEL ALIGNER, Thomas E. Roberts Jr., et al., Owner of Record: *FMC Corporation, San Jose, Calif.*, Attorney or Agent: Robert S. Kelly, Ex. Gp.: 257

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PATENT NOTICES

Certificates of Correction for the Week of Dec. 11, 1979

3,870,112	4,129,377	4,154,710	4,164,370
3,926,891	4,129,509	4,155,138	4,164,510
4,014,825	4,131,499	4,156,379	4,164,666
4,024,742	4,131,550	4,157,399	4,164,765
4,026,848	4,132,498	4,157,581	4,165,149
4,037,049	4,133,465	4,157,694	4,165,378
4,055,733	4,135,179	4,157,778	4,165,391
4,062,864	4,137,215	4,157,975	4,165,790
4,064,160	4,137,809	4,157,984	4,165,888
4,073,141	4,137,922	4,158,150	4,166,721
4,081,458	4,139,372	4,158,195	4,166,796
4,083,151	4,139,491	4,158,828	4,167,066
4,084,230	4,139,847	4,158,844	4,167,291
4,086,230	4,140,470	4,159,339	4,167,614
4,094,816	4,140,473	4,159,354	4,167,653
4,097,062	4,140,830	4,159,395	4,167,681
4,103,002	4,140,915	4,159,399	4,167,724
4,107,897	4,141,739	4,159,682	4,167,977
4,109,316	4,142,251	4,159,933	4,168,410
4,109,885	4,142,264	4,161,030	4,168,566
4,109,934	4,144,560	4,161,577	4,168,665
4,110,045	4,145,599	4,161,598	4,168,697
4,111,836	4,146,910	4,161,953	4,168,723
4,112,425	4,147,851	4,162,003	4,168,776
4,114,588	4,148,215	4,162,229	4,169,050
4,115,232	4,148,364	4,163,067	4,169,137
4,115,589	4,149,232	4,163,069	4,169,287
4,116,922	4,149,911	4,163,079	4,169,738
4,117,230	4,150,062	4,163,108	4,169,758
4,118,765	4,151,499	4,163,280	4,169,776
4,122,281	4,152,552	4,163,317	4,169,928
4,122,643	4,152,922	4,163,739	4,169,941
4,123,387	4,153,354	4,163,842	4,169,942
4,128,308	4,154,131	4,164,304	4,170,261

Disclaimers

3,801,857.—*David Warren Luz*, Indianapolis, Ind. TELEVISION DEFLECTION CIRCUIT WITH TRANSFORMERLESS COUPLING BETWEEN THE DRIVER AND OUTPUT STAGE. Patent dated Apr. 2, 1974. Disclaimer filed Oct. 12, 1979, by the assignee, *RCA Corporation*.

Hereby enters this disclaimer to claims 1–3 of said patent.

4,016,369.—*Thomas Josef Pedersen*, Lincroft, N.J. ADDRESSING ARRANGEMENTS FOR COMMUNICATIONS NETWORKS. Patent dated Apr. 5, 1977. Disclaimer filed Oct. 10, 1979, by the assignee, *Bell Telephone Laboratories, Incorporated*.

Hereby enters this disclaimer to claim 1 of said patent.

4,161,634.—*Jules A. Bellisio*, Wall Township, Monmouth County, N.J. COUNT-DOWN ADDRESSING SYSTEM. Patent dated July 17, 1979. Disclaimer filed Oct. 9, 1979, by the assignee, *Bell Telephone Laboratories, Incorporated*.

Hereby enters this disclaimer to claims 1–5 of said patent.

4,162,259.—*Welf von Daehne, Rungsted Kyst*, and *Poul R. Rasmussen*, Frederikssund, Denmark. FUSIDIC ACID DERIVATIVES. Patent dated July 24, 1979. Disclaimer filed Oct. 15, 1979, by the assignee, *Leo Pharmaceutical Products Ltd.*

The term of this patent subsequent to July 11, 1995, is hereby disclaimed.

4,164,755.—*Yasushi Matsumoto*, Narashino, Japan. VIDEO DISC APPARATUS. Patent dated Aug. 14, 1979. Disclaimer filed Oct. 12, 1979, by the assignee, *RCA Corporation*.

Hereby enters this disclaimer to claims 1, 2, 3, 6, 7, 8, 9 and 12 of said patent.

Erratum

In the notice of Certificates of Correction appearing in 986 OG 30, dated Sept. 25, 1979, Patent No. 3,822,716 should be corrected to read—3,882,716—.

Set XII of Addenda to the Classification Definitions

The definitions of the classes listed below were modified by addenda as part of Classification Orders issued between April 1, 1979 and June 30, 1979. All of these addenda have been consolidated into Set XII of "Addenda to the Classification Definitions."

Class	Class	Class	Class	Class
2	83	177	252	343
5	85	178	254	346
8	90	179	258	350
9	92	181	260	351
10	98	182	264	352
12	99	184	266	353
15	100	186	267	354
16	104	188	269	355
19	106	192	271	356
23	108	193	272	358
24	110	194	274	360
28	112	196	279	361
29	114	198	280	362
30	116	201	291	364
32	118	202	297	365
33	119	203	302	366
34	122	204	307	401
35	125	206	310	403
37	126	208	312	406
43	128	209	313	407
44	133	210	315	408
46	134	219	318	409
47	137	221	320	414
48	138	222	322	415
49	139	223	323	417
51	140	226	324	422
52	141	231	325	423
53	142	233	328	424
55	144	235	329	425
56	148	239	330	426
60	149	241	331	427
62	156	242	332	428
65	160	243	333	432
69	164	244	334	585
72	165	246	335	
73	173	248	336	
74	174	249	337	
76	175	250	339	
82	176	251	340	

The following newly established classes issued between April and June, 1979: Classes 406, 409, and 585.

ALFRED C. MARMOR,
Administrator for Documentation,
October 22, 1979.

July–September 1979 Classification Orders

The reclassifications covered by the following classification changes became effective between July and September 1979.

Classification Order 692, effective July 17, 1979:

	Class	*Subclasses*
Abolished	195	All.
Established	(New) 435	1–317; Cross-reference art collections: 800–820; 822–948.

Classification Order 693, effective July 19, 1979:		
Established	220	902.
Classification Order 694, effective July 20, 1979:		
Abolished	289	18.
Established	289	16.5; 18.1.
Classification Order 695, effective July 20, 1979:		
Abolished	423	21.
Established	423	21.1; 21.5.
Classification Order 696, effective August 6, 1979:		
Abolished	180	1; 115; 3–6; 25–35; 42–52; 64; 66; 67; 82; 91–114; unnumbered subclass following subclass 90.
	280	11.11.
Established	180	89.2; 164–313; Cross-reference art collections; 900–903.
	280	11.115.
Position change	180	90.6.
Title changes	180	9.44; 153; 79.3.
Classification Order 697, effective August 8, 1979:		
Abolished	260	823–901.
	526	1–58.
	528	11; 46; 47; 130–136; 177; 178; 197; 213; 221; 231; 273; 311; 333; 334; 404.
Established	(New) 525	1–6; 10–324; 326–540. Cross-reference art collections: 901–941.
Classification Order 698, effective August 16, 1979:		
Abolished	544	58.
Established	544	58.1; 58.2; 58.4–58.7.
Classification Order 699, effective August 16, 1979:		
Abolished	126	270; 271.
Established	126	415–452; Cross-reference art collections: 900; 901.
Classification Order 700, effective August 23, 1979:		
Abolished	264	210; 288–290.
Established	264	210.1–210.8; 235.6; 235.8; 288.4; 288.8; 289.3; 289.6; 290.2; 290.5; 290.7.
Classification Order 701, effective August 31, 1979:		
Abolished	260	327–329; 329.2; 329.3; 330.5; 331; 332; 332.1–332.3; 332.5; 332.8.
Established	260	330; 330.3.
	(New) 540	1–90.
Classification Order 702, effective September 24, 1979:		
Abolished	260	208–308.
Established	260	245.1–245.7.
	548	100–269.
Title changes	548	301; 310–312; 314; 319–322; 329; 330; 333; 337; 339; 341; 351; 352; 365; 367; 372; 375–378.
Classification Order 703, effective September 26, 1979:		
Abolished	340	1-15; 15.5; 16–18; 558–560.
Established	340	850–861.
	(New) 367	1–191; Cross-reference art collections: 900–912.
Title change (if applicable).	340	566.

ALFRED C. MARMOR,
Administrator for Documentation,
October 22, 1979.

Patents Available for Licensing or Sale

3,711,837. HEADLINE COUNTING AND PRINTING DESIGN DEVICE. C. Claborne Carter, Suite 513, Nashville City Bank Bldg., Nashville, Tenn. 37201.

4,143,761. SAFETY MATCH BOOK. Francis P. Brand, 11 Curley St., Long Beach, N.Y. 11561.

Application for license may be addressed to: Division Patent Counsel, Switchgear & Distribution Transformer Division, General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa. 19142.

4,156,225. ELECTRIC FUSE WITH INDICATING MEANS.

4,158,911. METHOD OF MANUFACTURING A VACUUM-TYPE CIRCUIT INTERRUPTER.

Application for license under these patents may be addressed to: Patent Counsel, Ordnance Systems Department, General Electric Company, 100 Plastics Ave., Pittsfield, Mass. 01201.

4,036,344. MULTIPLE-PLATE CLUTCH.

4,079,687. TORPEDO TARGET ACQUISITION.

4,169,391. VARIABLE SPEED TRANSMISSION. Abram Schonberger. Correspondence to: Mr. Hugo V. Goodyear, 221 Alder Way, Brandon, Fla. 33511.

4,042,325. METHOD OF KILLING MICROORGANISMS IN THE INSIDE OF A CONTAINER UTILIZING A PLASMA INITIATED BY A FOCUSED LASER BEAM AND SUSTAINED BY AN ELECTROMAGNETIC FIELD. Eli Lilly and Company, 307 East McCarty St., Indianapolis, Ind. 46206.

Applications for license may be addressed to Manager, Patent Administration and Licensing, Electric Power Research Institute, P.O. Box 10412, Palo Alto, Calif. 94303.

4,123,566. NA/S CELL REACTANT CONTAINER WITH METAL ALUMINIDE COATING.

4,142,576. HEAT PUMP SYSTEM WITH IMPROVED HEAT TRANSFER.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, Vice President, Licensing, 30 Rockefeller Plaza, New York, N.Y. 10020.

4,166,918. METHOD OF REMOVING THE EFFECTS OF ELECTRICAL SHORTS AND SHUNTS CREATED DURING THE FABRICATION PROCESS OF A SOLAR CELL.

4,166,919. AMORPHOUS SILICON SOLAR CELL ALLOWING INFRARED TRANSMISSION.

4,166,964. INVERTING BUFFER CIRCUIT.

4,166,965. THRESHOLD GATE.

4,167,015. CERMET LAYER FOR AMORPHOUS SILICON SOLAR CELLS.

4,167,020. SUPPRESSION OF LUMINANCE SIGNAL CONTAMINATION OF CHROMINANCE SIGNALS IN A VIDEO SIGNAL PROCESSING SYSTEM.

4,167,021. SUPPRESSION OF CHROMINANCE SIGNAL CONTAMINATION OF THE LUMINANCE SIGNAL IN A VIDEO SIGNAL PROCESSING SYSTEM.

4,167,022. SETUP CONTROL UNIT FOR TELEVISION CAMERAS.

4,167,023. ROTATING HEAD RECORDER WITH DIFFERENT RECORDING AND PLAYBACK SPEEDS.

4,167,025. AUTOMATIC PEAK BEAM CURRENT LIMITER.

4,167,681. MICROWAVE POWER LIMITER COMPRISING A DUAL-GATE FET.

4,167,690. CATHODE AND METHOD OF OPERATING THE SAME.

4,167,744. ELECTROLUMINESCENT SEMICONDUCTOR DEVICE HAVING OPTICAL FIBER WINDOW.

4,167,749. NOISE REDUCTION APPARATUS.

4,168,256. PVC MOLDING COMPOSITION.

4,168,330. METHOD OF DEPOSITING A SILICON OXIDE LAYER.

4,168,432. METHOD OF TESTING RADIATION HARDNESS OF A SEMICONDUCTOR DEVICE.

4,168,476. AC VOLTAGE REGULATOR.

4,168,506. FILM GUIDE FOR OPTICAL SCANNERS.

4,168,628. PULSE-ECHO ULTRASONIC-IMAGING DISPLAY SYSTEM HAVING TIME-VARIED EFFECTIVE APERTURE.

4,169,241. OVERVOLTAGE PROTECTED DE-BOOST REGULATOR.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, Vice President, Licensing, 30 Rockefeller Plaza, New York, N.Y. 10020.

4,163,677. SCHOTTKY BARRIER AMORPHOUS SILICON SOLAR CELL WITH THIN DOPED REGION ADJACENT METAL SCHOTTKY BARRIER.

4,163,926. SWITCHING REGULATOR FOR A TELEVISION APPARATUS.

4,163,961. ROTARY JOINT.

4,163,974. ANTENNA FEED SYSTEM.

4,164,681. IMAGE DISPLAY DEVICE WITH ION FEEDBACK CONTROL AND METHOD OF OPERATING THE SAME.

4,164,687. TELEVISION KINESCOPE PROTECTION CIRCUIT.

4,164,711. TUNING SYSTEM INCLUDING A MEMORY FOR STORING TUNING INFORMATION WITH USER CONTROLS ARRANGED TO FACILITATE ITS PROGRAMMING.

4,164,739. REDUCTION OF TARGET SHIFT IN COORDINATE CONVERTER.

4,164,755. VIDEO DISC PICKUP APPARATUS.

4,164,756. DISC RECORD GROOVE SKIPPER.

4,164,782. LOCKING MECHANISM FOR RECORD PACKAGE.

4,165,227. STEM-SEALING METHOD FOR ASSEMBLING ELECTRON TUBES INCLUDING IMPROVED CULLET COLLECTION.

4,165,396. METHOD FOR SALVAGING THE LIGHT-ABSORBING MATRIX AND SUPPORT OF A LUMINESCENT SCREEN.

4,165,459. TIME INTERVAL MEASUREMENT.

4,165,560. METHOD FOR MANUFACTURING A DIAMOND STYLUS FOR VIDEO DISC PLAYERS.

4,166,233. PHOSPHOR SCREEN FOR FLAT PANEL COLOR DISPLAY.

4,166,281. VIDEO IMAGE HIGHLIGHT SUPPRESSION CIRCUIT WITH DELAYED COMPENSATION.

Applications for licenses should be addressed to: Division Patent Counsel Space Division General Electric Company, P.O. Box 8555, Philadelphia, Pa. 19101.

4,139,024. THERMAL INSULATION STRUCTURE.

4,150,568. APPARATUS AND METHOD FOR DOWN HOLE VIBRATION SPECTRUM ANALYSIS.

Application for license may be addressed to the General Electric Company, Division Patent Counsel, Housewares and Audio Business Division, 1285 Boston Ave., Bridgeport, Conn. 06602.

4,155,349. A VARIABLE INTENSITY WHISTLE.

Applications for license may be addressed to the Manager-Technology Marketing Operation General Electric Company, 120 Erie Blvd., Schenectady, N.Y. 12305.

3,410,553. ORTHOPEDIC SUPPORTIVE FRAME.

3,813,316. MICROORGANISMS HAVING MULTIPLE COMPATIBLE DEGRADATIVE ENERGY-GENERATING PLASMIDS AND PREPARATION THEREOF.

3,923,603. DISCRETE PLASMID CONSTRUCTION FROM CHROMOSOMAL GENES IN PSEUDOMONAS.

3,928,220. PREPARATION OF HYDROCARBON-DISPERSIBLE MAGNETIC MICROSPHEROIDS IN POWDERED FORM.

3,959,720. VOLTAGE CONTROL SYSTEM FOR HIGH FREQUENCY LINK CYCLOCONVERTER.

4,004,881. APPARATUS FOR GENERATING CARRIER GAS-TEST SPECIMEN VAPOR MIXTURES FOR DELIVERY INTO A GAS CHROMATOGRAPH.

4,011,378. AROMATIZED POLYACETYLENES.

4,020,265. POLYACETYLENE TETRAPOLYMERS.

4,024,046. METHOD FOR MAKING POLYIMIDE COATED CONDUCTORAS IN A CONTINUOUS MANNER AND PRODUCTS MADE THEREBY.

Kulite Semiconductor Products, Inc. offers to grant non-exclusive licenses on reasonable terms and conditions under the following patents.

Inquiries respecting licenses under these patents should be addressed to: Arthur L. Plevy, Patent Counsel, P.O. Box 38, 281 Summerhill Road, East Brunswick, N.J. 08816.

3,654,579. ELECTROMECHANICAL TRANSDUCERS AND HOUSINGS.

3,706,953. PARTICLE IMPACT PROTECTORS AND ASSEMBLIES THEREOF FOR PRESSURE SENSING TRANSDUCERS HAVING DIAPHRAGMS.

3,748,571. PRESSURE SENSITIVE TRANSDUCERS EMPLOYING CAPACITIVE AND RESISTIVE VARIATIONS.

3,753,196. TRANSDUCERS EMPLOYING INTEGRAL PROTECTIVE COATINGS AND SUPPORTS.

3,800,264. HIGH TEMPERATURE TRANSDUCERS AND HOUSING INCLUDING FABRICATION METHODS.

3,739,315. SEMICONDUCTOR TRANSDUCERS HAVING H SHAPED CROSS-SECTIONAL CONFIGURATIONS.

3,819,431. METHOD OF MAKING TRANSDUCERS EMPLOYING INTEGRAL PROTECTIVE COATINGS AND SUPPORTS.

3,868,719. THIN RIBBON-LIKE GLASS BACKED TRANSDUCERS.

3,873,956. INTEGRATED TRANSDUCER ASSEMBLIES.

3,900,811. ECONOMICAL PRESSURE TRANSDUCER ASSEMBLIES, METHODS OF FABRICATING AND MOUNTING THE SAME.

3,924,322. ECONOMICAL PRESSURE TRANSDUCER ASSEMBLIES, METHODS OF FABRICATING AND MOUNTING THE SAME.

3,930,412. ELECTRICALLY SCANNED PRESSURE TRANSDUCER CONFIGURATIONS.

3,930,823. HIGH TEMPERATURE TRANSDUCERS AND HOUSING INCLUDING FABRICATION METHODS.

3,935,634. METHODS OF FABRICATING INTEGRATED TRANSDUCER ASSEMBLIES.

3,951,707. METHOD FOR FABRICATING GLASS-BACKED TRANSDUCERS AND GLASS-BACKED STRUCTURES.

3,970,982. BEAM TYPE TRANSDUCERS EMPLOYING ACCURATE, INTEGRAL FORCE LIMITING.

3,993,150. ECONOMICAL WEIGHING APPARATUS EMPLOYING A CANTILEVER BEAM STRUCTURE.

3,995,247. TRANSDUCERS EMPLOYING GAP-BRIDGING SHIM MEMBERS.

4,016,644. METHODS OF FABRICATING LOW PRESSURE SILICON TRANSDUCERS.

4,025,942. LOW PRESSURE TRANSDUCERS EMPLOYING LARGE SILICON DIAPHRAGMS HAVING NON-CRITICAL ELECTRICAL PROPERTIES.

4,040,172. METHOD OF MANUFACTURING INTEGRAL TRANSDUCER ASSEMBLIES EMPLOYING BUILT-IN PRESSURE LIMITING.

4,041,289. DIGITAL SCALE OR WEIGHING APPARATUS.

4,051,451. BEAM TYPE TRANSDUCERS EMPLOYING DUAL DIRECTION FORCE LIMITING MEANS.

4,115,767. APPARATUS FOR CONVERTING AN ANALOG SIGNAL INTO DIGITAL FORM PARTICULARLY ADAPTED FOR USE IN DIGITAL COUNTER DISPLAYS.

National Technical Information Service

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Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS P. CAMPION,
Patent Program Coordinator, National
Technical Information Service.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 6–008,720. Pod Assembly. Filed Feb. 2, 1979.

Patent application 6–015,092. Seawater Battery. Filed Feb. 26, 1979.

Patent application 6–015,269. LCD Controller. Filed Feb. 26, 1979.

Patent application 6–015,828. Sonobuoy Launcher System. Filed Feb. 28, 1979.

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Patent application 6–020,902. Synthesized Sinusoid Generator. Filed Mar. 16, 1979.

Patent application 6–024,827. Flexible Piezoelectric Composite Transducers. Filed Mar. 28, 1979.

Patent application 6–030,187. Method and Apparatus for Fabricating a Wideband Whip Antenna. Filed Apr. 16, 1979.

Patent application 6–036,911. Printed Circuit Waveguide to Microstrip Transition. Filed May 7, 1979.

Patent application 6–038,379. Programmable D.C. Motor Servo System. Filed May 11, 1979.

Patent application 6–039,920. Air-Curtain Incinerator for Energetic Materials. Filed May 17, 1979.

Patent application 6–040,251. Adaptive Detector. Filed May 18, 1979.

Patent application 6–042,165. Ion Drag Pumped Heat Pipe. Filed May 26, 1979.

Patent application 6–047,187. Differential Sample and Hold Circuit. Filed June 8, 1979.

Patent application 6–047,459. Acceleration Cueing Simulation Device. Filed June 11, 1979.

Patent application 6–049,693. Stray Light Eliminator in a Scatterometer. Filed June 7, 1979.

Patent application 6–050,946. Charge Coupled Device Signal Output Summing Circuit. Filed June 21, 1979.

Patent application 6–052,298. Wideband Polarization-Transforming Electromagnetic Mirror. Filed June 26, 1979.

Patent application 6–052,368. Protective Communications Helmet. Filed June 27, 1979.

Patent application 6–052,649. Liquid Crystal Fiber Optics Large Screen Display Panel. Filed June 27, 1979.

Patent application 6–054,078. Rat-Race Mixer With Improved Intermediate Frequency Extractor. Filed July 2, 1979.

Patent application 6–055,100. Magneto-Optic Bias of Ring Laser. Filed July 5, 1979.

Patent application 6–056,655. Excimer-Pumped Four Level Blue-Green Solid State Laser. Filed July 11, 1979.

Patent 4,144,534. Battlefield IFF System. Filed May 1, 1975. Patented Mar. 13, 1979. Not available NTIS.

Patent 4,147,929. Optical Photoemissive Detector and Photomultiplier. Filed Aug. 31, 1977. Patented Apr. 3, 1979. Not available NTIS.

Patent 4,147,942. Fast Recovery One-Shot. Filed July 1, 1977. Patented Apr. 3, 1979. Not available NTIS.

Patent 4,151,893. Wing in Ground Effect Vehicle. Filed Sept. 8, 1977. Patented May 1, 1979. Not available NTIS.

Patent 4,153,962. Undersea Tether/Termination Assembly. Filed Dec. 27, 1977. Patented May 15, 1979. Not available NTIS.

Patent 4,155,653. Smoke-Measuring Transducer. Filed Oct. 14, 1977. Patented May 22, 1979. Not available NTIS.

Patent 4,155,981. Rectangular Cell Honeycomb Chemical Converter-Heat Exchanger. Filed Feb. 9, 1978. Patented May 22, 1979. Not available NTIS.

Patent 4,156,869. Conducting Cable. Filed June 20, 1977. Patented May 29, 1979. Not available NTIS.

Patent 4,157,863. Acousto-Optic Modulator. Filed Apr. 6, 1978. Patented June 12, 1979. Not available NTIS.

Patent 4,157,926. Method of Fabricating a High Electrical Frequency Infrared Detector by Vacuum Deposition. Filed June 22, 1973. Patented June 12, 1979. Not available NTIS.

Patent 4,158,207. Iron-Doped Indium Phosphide Semiconductor Laser. Filed Mar. 27, 1978. Patented June 12, 1979. Not available NTIS.

Patent 4,158,649. Polymeric Membranes Which Contain Polyphenylquinoxalines and Which Are Useful as Battery Separators. Filed Oct. 17, 1977. Patented June 19, 1979. Not available NTIS.

Patent 4,158,781. Transmit Receive Solid State Switch for Electroacoustic Transducers. Filed Jan. 30, 1978. Patented June 19, 1979. Not available NTIS.

Patent 4,160,175. Differential Threshold Detector. Filed Jan. 12, 1978. Patented July 3, 1979. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters NASA—
Code GP–2, Washington, D.C. 20546

Patent application 6–041,143. Massively Parallel Processor Computer. Filed May 21, 1979.

Patent application 6–041,164. Buck/Boost Regulator. Filed May 21, 1979.

Patent application 6–051,270. Multiple Band Circularly Polarized Antenna. Filed June 22, 1979.

Patent application 6–051,271. Decommutator Patchboard Verifier. Filed June 22, 1979.

Patent application 6–051,274. Automatic Flowmeter Calibration System. Filed June 22, 1979.

Patent application 6–053,652. Power Converter. Filed June 29, 1979.

Patent 4,154,228. Apparatus and Method of Inserting a Microelectrode in Body Tissue or the Like Using Vibration Means. Filed Aug. 6, 1976. Patented May 15, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 6–019,806. Serial Phase Shift Beamformer Using Charge Transfer Devices. Filed Mar. 12, 1979.

Patent application 6–038,761. Propellant Binder Manufacture Without a Transient Volatile Pre-Solution Step. Filed May 14, 1979.

Patent application 6–039,059. Thiols of Solid Propellant Modifiers. Filed May 14, 1979.

Patent application 6–050,578. Thermal Signature Targets. Filed June 21, 1979.

Patent application 725,606. Pyrotechnic Smoke Composition. Filed Sept. 22, 1976.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626–7555 Ext. 274
	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

V 9 8 9 / 2 DEC 11 79 (IM)

V 989 2 DEC 11 1979 UMI

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 3, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-1-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.; Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	11-13-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	2-5-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	5-30-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	4-13-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy; Rocket Fuels.	5-19-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-5-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-31-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-1-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	12-12-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-17-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	10-13-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	11-30-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-4-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	7-10-78

Expiration of patents: The patents within the range of numbers indicated below expire during November 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,061,833 to 3,066,301, inclusive
Plant Patents..... Numbers 2,189 to 2,197, inclusive

REISSUES

DECEMBER 11, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,162

METHOD AND DEVICE FOR TRANSFERRING FRESH BOBBINS FROM A BOBBIN SUPPLY DEVICE TO A CONVEYOR BELT OF A TEXTILE MACHINE

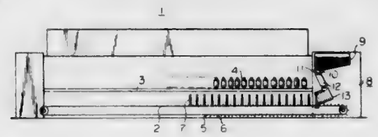
Ikuo Komura, Toyota; Hideo Tamai, Kariya; Takayuki Morita, Obu, and Masanao Kobayakawa, Anjyo, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Original No. 3,938,308, dated Feb. 17, 1976, Ser. No. 534,723, Dec. 20, 1974. Application for reissue Apr. 6, 1977, Ser. No. 785,187

Claims priority, application Japan, Dec. 26, 1973, 49-2498[U]

Int. Cl.[2] D01H *9/18*

U.S. Cl. 57—266 **6 Claims**



6. In a textile machine, a method for transferring fresh bobbins from a bobbin supply device to supporting pegs mounted on a conveyor belt, comprising positioning a plurality of substantially parallel fresh bobbins on an incline supporting plane and an additional fresh bobbin on a horizontal supporting plane connected to said inclined supporting plane and formed adjacently above said conveyor belt, resiliently preventing free escape of said fresh bobbin on said horizontal supporting plane from said horizontal supporting plane, moving each of said pegs to a bottom bore of said fresh bobbin along a horizontal passage to said supporting plane, inserting one of said pegs into said bottom bore of said fresh bobbin positioned on said horizontal supporting plane, urging said fresh bobbin toward the outside of said supporting plane by horizontal displacement of said peg, discharging said fresh bobbin from said supporting plane while overcoming said resilient prevention of free escape of said fresh bobbin, and thereafter moving a new fresh bobbin by gravity down said incline supporting plane to said horizontal supporting plane.

Re. 30,163

CARTON

Melvin H. Meyer, Maywood, and Gerald G. Weitzel, Oaklawn, both of Ill., assignors to Stone Container Corporation, Chicago, Ill.

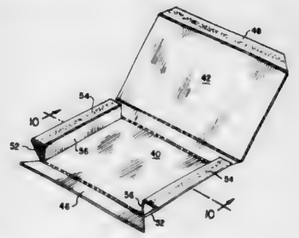
Original No. 3,985,230, dated Oct. 12, 1976, Ser. No. 598,712, Jul. 24, 1975. Application for reissue Apr. 20, 1978, Ser. No. 898,327

Int. Cl.[2] B65D *85/30, 85/54*

U.S. Cl. 206—424 **12 Claims**

12. A cushioned shipping folder formed from a unitary blank of foldable paperboard or the like, comprising:

first and second major parallel walls and first and second minor parallel walls foldably interconnected to form a tubular structure, said first and second major parallel walls being rectangular in shape, said first major wall being [greater] *lesser* in length than said second major wall; a closure and protecting structure for each end of said tubular structure including first and second flaps foldably connected to each other along a straight fold line extending the entire length of said first and second flaps, said first and second flaps being rectangular in shape and coextensive in length with each other and with the width or shorter dimensions of said first major wall, said first flap being foldably connected to said first major parallel wall along a straight fold line extending along the entire width or shorter dimension of said first major wall, [at least a portion of said first flap being folded obliquely with respect to said first major wall, said second flap being folded to a position generally perpendicular to said first major wall, said first flap portion, said second flap and a portion of said first major wall forming a uniformly shaped air cushion extending across the entire width of said first major wall,] said closure and protecting structure further comprising an additional fold line being formed in said first [inner] flap thereby dividing said first [inner] flap



into a first and second section, said first [inner] flap first section being folded obliquely with respect to said first major wall, said first [inner] flap second section being folded to a position in facing relationship with said section major wall, *said second flap being folded to a position generally perpendicular to said first major wall, said first flap first and second sections and said second flap forming a uniformly shaped air cushion extending across the entire width of said first major wall,* the fold line between said first [inner] flap first and second section being engageable with the end edge of said second major wall.

Re. 30,164

EXPOSURE SYSTEM FOR ELECTROPHOTOGRAPHIC COPYING APPARATUS

Rudolf Eppe, Taufkirchen; Gunther Schnall, Eching; Gunter Abbe, Gilching, and Rudiger Ettelbruck, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Original No. 3,977,781, dated Aug. 31, 1976, Ser. No. 475,150, May 31, 1974. Application for reissue Feb. 17, 1978, Ser. No. 878,745

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1973, 2328463

Int. Cl.[2] G03B *27/32*

U.S. Cl. 355—69 **16 Claims**

1. Apparatus for transferring images of stationary originals onto a light receiving surface, comprising, in combination, means for moving said surface in a predetermined direction along a first path; a stationary holder for said originals, said holder being spaced apart from said path and being arranged to support an original in a position in which one side of said original on said holder faces said path; flash means for illuminating said one side of said original for a predetermined short illuminating interval; a lens element disposed between said holder and said path; and means for moving said lens element in said predetermined direction along a second path parallel to said first path during said short illuminating interval, so that said lens element images all of said one side of that said original onto said light receiving surface.

Re. 30,165

ELECTRIC DISCHARGE LAMP

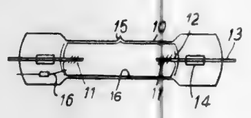
David R. Mason; Susan M. Cole, both of Runcorn; Maurice A. Cayless, and David O. Wharmby, both of London, all of England, assignors to Thorn Lighting Limited, London, England

Original No. 3,900,754, dated Aug. 19, 1975, Ser. No. 434,382, Jan. 18, 1974. Application for reissue Aug. 19, 1977, Ser. No. 826,237

Claims priority, application United Kingdom, Jun. 19, 1973, 2953/73

Int. Cl.[2] H01J *61/30*

U.S. Cl. 313—221 9 Claims



1. An electrical discharge lamp comprising: an arc tube; components including a pair of spaced electrodes in said arc tube and respective conductive leads or supports for said electrodes; a gaseous fill in said tube; and a transparent, defect-free, solution-deposited protective coating of a vitreous compound selected from metal phosphates and arsenates *which is inert to the gaseous fill in the tube* on at least the [internal surface] *surfaces internally* of the arc tube [and th exposed surfaces of said leads or supports] which [tend to react with] *are reactive to* said *gaseous* fill [during operation of the lamp].

Re. 30,166

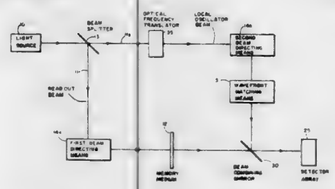
HETERODYNE READOUT HOLOGRAPHIC MEMORY

Tzuo-Chang Lee, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Original No. 3,698,010, dated Oct. 10, 1972, Ser. No. 181,803, Sep. 20, 1971. Application for reissue Oct. 9, 1974, Ser. No. 513,447

Int. Cl.[2] G11C *11/02;* G03H *1/30, 1/22*

U.S. Cl. 365—122 27 Claims



19. A system for reading out a bit pattern stored in a hologram, the system comprising:

means for directing a first beam to the hologram, a portion of the first beam being diffracted by the hologram to form a reconstructed image of the bit pattern;

means for superimposing a second beam with the diffracted portion of the first beam, the second beam differing from the first beam such that a beat frequency is produced when the first and second beams are superimposed; and

means for detecting a beat frequency signal produced by the superimposed first and second beams for each bit of the bit pattern.

PATENTS

GRANTED DEC. 11, 1979

ERRATA

For CLASS	See PATENT NO.
433–174	4,177,562
433–228	4,177,563
433–082	4,177,564
433–075	4,177,565
024–176	4,177,623
242–217	4,177,655
166–263	4,177,752
137–599	4,177,840
220–270	4,177,929
220–284	4,177,930
220–288	4,177,931
220–307	4,177,932
220–307	4,177,933
220–319	4,177,934
220–417	4,177,935
220–441	4,177,936
222–063	4,177,937
222–080	4,177,938
222–153	4,177,939
222–636	4,177,940
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222–198	4,177,942
222–591	4,177,943
430–049	4,178,179
430–417	4,178,180
430–524	4,178,181
430–222	4,178,182
430–553	4,178,183
430–503	4,178,184
430–569	4,178,185
435–241	4,178,209
435–047	4,178,210
435–144	4,178,211
435–032	4,178,212
435–126	4,178,213
435–252	4,178,214
548–251	4,178,288
549–022	4,178,290
549–039	4,178,291
585–357	4,178,317
525–077	4,178,318

V 9 8 9 / 2 D E 1 1 7 9 UMI

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DEC 11 79
UMI

525–188	4,178,319
525–188	4,178,320
525–188	4,178,321
525–188	4,178,322
525–188	4,178,323
525–188	4,178,324
525–157	4,178,325
525–176	4,178,326
525–169	4,178,327
525–098	4,178,328
525–077	4,178,329
525–003	4,178,330
525–398	4,178,429
178–018	4,178,481
250–338	4,178,522
350–006.6	4,178,561
343–756	4,178,574
343–781 R	4,178,576
367–159	4,178,577
367–139	4,178,578
346–163	4,178,583
346–140 R	4,178,595

PATENTS

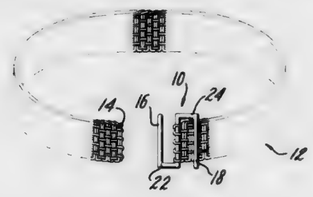
GRANTED DECEMBER 11, 1979

GENERAL AND MECHANICAL

4,177,522
SURVIVAL BELT

Parker K. Auburn, 95 Dwight Pl., Englewood, N.J. 07631

Filed Nov. 25, 1977, Ser. No. 854,889
Int. Cl.[2] A41F 9/00
U.S. Cl. 2—338 11 Claims



1. A belt, which may be quickly converted into a single length of cord having sufficient strength for supporting the weight of a person, comprising:

a buckle having at least one cross piece;

a web woven from a single length of cord formed into approximately 3–10 loops approximately 2–4 feet long, each loop passing over said cross piece, said loops forming a plurality of warp strands;

the bight of said cord, remaining after formation of said loops, being woven in weft loops through said warp strands as pairs of weft strands, each succeeding weft loop passing through the end of the previous weft loop;

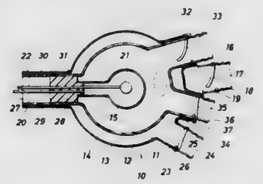
the end of the cord in the last weft loop being passed through the penultimate weft loop and then woven back through the warp to releasably lock the weave;

whereby the end of the cord may be pulled out of the warp and through the penultimate loop to unlock the weave which can then be quickly unwoven by pulling on the cord to convert the belt into a long single length of survival line.

4,177,523
ARTIFICIAL HEART

Arnold J. Lande, 2145 Stanmore Dr., Houston, Tex. 77019

Filed Mar. 15, 1978, Ser. No. 886,824
Int. Cl.[2] A61F 1/24; A61M 1/03
U.S. Cl. 3—1.7 6 Claims



1. A blood pumping apparatus for use as an artificial heart comprising;

(a) a 1st pumping chamber having expandable walls and having an inlet for receiving blood and an outlet for discharging blood;

(b) a 2nd pumping chamber positioned within said 1st pumping chamber having expandable walls and having an inlet for receiving blood and an outlet for discharging blood; and

(c) an inflatable blood displacement means having expandable walls positioned within said 2nd pumping chamber for periodic inflation and deflation to discharge and receive blood in said 2nd pumping chamber and for periodic expansion and contraction of said 2nd pumping chamber walls for discharging and receiving blood in said 1st pumping chamber.

4,177,524
MEDICAL SECUREMENT ELEMENT WITH ABRASIVE GRAINS ON THREAD SURFACE

Helmut Grell, Aalen, and Heinz Scharbach, Plankstadt, both of Fed. Rep. of Germany, assignors to Pfaudler-Werke A.G., Schwetzingen, Fed. Rep. of Germany

Filed May 10, 1977, Ser. No. 795,658
Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621384
Int. Cl.[2] A61F 1/24
U.S. Cl. 3—1.9 11 Claims

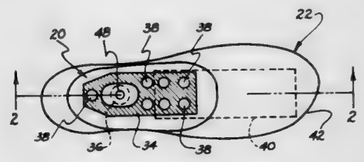


1. A medical securement element for engagement with a counterthread in a bone, comprising a self-tapping screw thread with biocompatible abrasive grains at the surface of the thread.

4,177,525
REINFORCED ARTIFICIAL FOOT AND METHOD OF MAKING

Charles J. Arbogast, and Robert E. Arbogast, both of Mount Sterling, Ohio, assignors to Ohio Willow Wood Co., Inc., Mount Sterling, Ohio

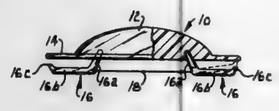
Filed Nov. 9, 1977, Ser. No. 849,763
Int. Cl.[2] A61F 1/08
U.S. Cl. 3—7 15 Claims



1. An artifical foot comprising, in combination, a rigid keel portion comprising a porous plastic material disposed in the ankle region and having a flat top portion, a relatively flat, downwardly sloping bottom portion integrally formed with a curved instep portion and rounded toe and rear portions, said plastic material being molded in surrounding relationship to a metallic insert securely imbedded within said plastic material and including a vertical extending bolt receiver portion adapted to receive a fastener means and a flat elongate strip

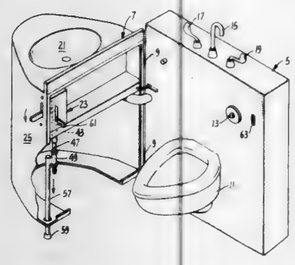
portion joined to said receiver portion, said strip portion disposed in the lower portion of said keel in generally parallel extending relationship to said sloping bottom portion thereof; and a flexible porous, plastic covering molded in surrounding and bonded relationship to said keel portion and having the general configuration of the human foot.

4,177,526
SECURING DEVICE FOR AN INTRAOCULAR LENS
John C. Kuppinger, deceased, late of Harlingen, Tex., and by Charlotte W. Kuppinger, executrix, 1515 N. Ed Carey Dr., Harlingen, Tex. 78550
Filed Jul. 22, 1977, Ser. No. 818,003
Int. Cl.[2] A61F *1/16, 1/24*
U.S. Cl. 3—13 **4 Claims**



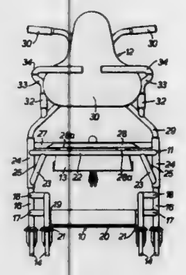
1. An intraocular lens structure comprising:
a lens adapted to be implanted in the pupillary region of the eye adjacent the iris;
a plurality of resilient L-shaped arms on one face of the lens with one end of one leg of each arm anchored in the lens and the other leg extending outwardly toward the periphery of the lens and terminating in a free end; and
a frangible tension member connecting said arms and of a length such that the arms are held in a position such that the free ends are spaced away from the confronting surface of the lens, said frangible member constructed in a manner to be capable of being severed by a laser beam whereby to release the arms to effect pinching of the iris between the lens surface and said free ends.

4,177,527
LATCH ON MASQUERADER UNIT
Richard E. Uhlig, Burlingame, Calif., assignor to Aluminum Plumbing Fixture Corp., South San Francisco, Calif.
Filed Nov. 15, 1978, Ser. No. 960,968
Int. Cl.[2] A47K *1/00*
U.S. Cl. 4—3 **2 Claims**



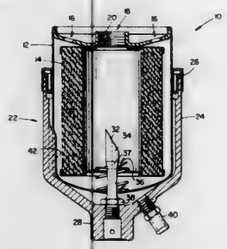
1. In a combination wash basin and toilet fixture wherein the toilet bowl is mounted on a fixed frame and the wash basin is mounted on a swinging frame by means of hinges whereby the wash basin can be swung to a first position flush with the main frame to enable one to use the wash basin and can be swung to a second position away from the main frame to enable one to use the toilet, the improvement comprising a latch mechanism, said latch mechanism having a downwardly extending arm with an operating handle connected thereto and having a spring means to normally bias said arm in a down position whereby upon release of said operating handle, said arm will move downwardly and engage the floor, stabilizing the wash basin in the second position.

4,177,528
SANITARY CHAIRS
David R. James, Covertside, Hasfield, Gloucester, England
Filed Jan. 13, 1976, Ser. No. 648,775
Claims priority, application United Kingdom, Jan. 21, 1975, 2538/75
Int. Cl.[2] A47K *11/04*; B60N *1/06*; B60R *21/10*
U.S. Cl. 4—134 **7 Claims**



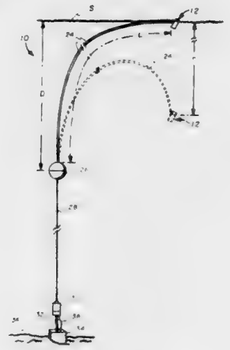
1. A sanitary or commode chair having an apertured seat and two side support arms each of which comprises a main side portion arranged to extend alongside, and an inturned end portion arranged to extend in front of, a person seated in the chair, and means movably mounting the end arm portions on the main side portions for opening movement relative to the side portions of the arms whereby to allow front entry and exit of the user with the side portions in the normal side-support position.

4,177,529
FILTER WRENCH
William J. Sikula, Jr., Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.
Filed Aug. 18, 1978, Ser. No. 934,901
Int. Cl.[2] B25F *1/00*
U.S. Cl. 7—100 **14 Claims**



1. A filter wrench for draining and removing a fluid filter having an outer canister and an inner filter element from a filter utilizing device, comprising: a housing having a closed bottom and an open top sized to encircle and engage said fluid filter, said housing having gripping means provided on the inside thereof for gripping portions of said outer canister when said housing engages said fluid filter, and said housing having rotating means provided thereon for rotating said housing for removal of said fluid filter; punch means secured to said housing extending from the bottom thereof for puncturing said outer canister when said housing engages said fluid filter, said punch means having outer passage means provided therein for allowing the passage of fluid from said outer canister into said housing; and outlet means provided in said housing at the bottom thereof for allowing the drain of fluid therefrom.

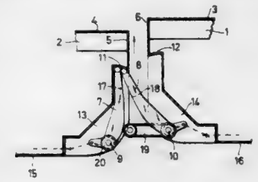
4,177,530
BUOY SYSTEM FOR VERTICAL OCEAN PROFILING
Richard C. Swenson, Carriere, Miss., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed May 15, 1978, Ser. No. 905,712
Int. Cl.[2] B63B *21/52*
U.S. Cl. 9—8 R **8 Claims**



1. A buoy system for obtaining a vertical profile of oceanic conditions between a predetermined depth d and the ocean surface, said system comprising, in combination:
an instrumentation vehicle that is operable to be cycled between a predetermined negative buoyancy condition and a predetermined positive buoyancy condition;
flexible tether means having a length L in excess of said predetermined depth and being characterized by a predetermined positive buoyancy factor per unit of length, whereby said tether means has a total positive buoyancy that is greater than said predetermined negative buoyancy condition and is distributed along said length of said tether means;
said tether means having one end fixed at depth D approximating said predetermined depth d and having its other end connected to said vehicle, whereby when said vehicle is in said positive buoyancy condition, it will float at said surface and when in said negative buoyancy condition will sink until the negative buoyancy condition is balanced at said predetermined depth d by an equal positive buoyant force imposed by the portion of said tether means being drawn downwardly by said vehicle, at which depth said vehicle will hover until cycled to said positive buoyancy condition for ascent to said surface.

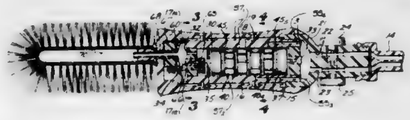
4,177,531
DEVICE FOR ADJUSTING AND COUPLING AMPHIBIOUS VEHICLES
Eberhard Illgner, Nieder-Olm, Fed. Rep. of Germany, assignor to Magirus-Deutz AG, Ulm, Fed. Rep. of Germany
Filed Sep. 20, 1978, Ser. No. 945,201
Int. Cl.[2] E01D *21/00*
U.S. Cl. 14—27 **7 Claims**

1. An arrangement for adjusting adjacent differently immersed amphibious floating bodies to a common coupling height, which includes: a first amphibious floating body, a second amphibious floating body, each of said floating bodies having at least one wall thereof provided with a supporting arm pivotally connected thereto, and also having an abutment surface adapted to receive therebelow the supporting arm of the pertaining floating body and also the supporting arm of the other floating body to be connected thereto, each supporting arm pertaining to the respective less immersed floating body



being adapted to be pivoted below the abutment of the respective deeper immersed floating body and to be locked therebelow to thereby lift said deeper immersed floating bodies so as to align the surfaces of said floating bodies while interconnecting said last mentioned floationg bodies.

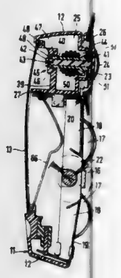
4,177,532
ROTARY BRUSH
Shinsuke Azuma, 6020 Lindley Ave., Encino, Calif. 91316
Filed Oct. 2, 1978, Ser. No. 947,470
Int. Cl.[2] A46B *13/06*
U.S. Cl. 15—24 **3 Claims**



1. A rotary brush device adapted to be attached to a home water outlet comprising:
a hollow substantially tubular handle structure;
a substantially tubular inner casing received on the interior of said handle structure, said casing including a plurality of stand offs formed on the exterior peripheral surface thereof for separating said casing from said handle;
valve means attached to one end of said handle structure and connected to said outlet;
an end cap deployed between said handle structure, said casing and said valve means for defining a first cavity communicating between said casing and said valve means, a second cavity being defined between said casing and said handle structure and a third cylindrical cavity being formed on the interior of said casing, said casing including a plurality of longitudinal bores extending from said first cavity into the wall thereof each terminating in a tangential port directed into said third cavity at selected axial locations;
a plurality of pelton wheels mounted for common rotation on a central shaft and deployed on the interior of said third cavity in alignment with corresponding ones of said ports;
a plurality of separators interposed between said pelton wheels in said third cavity;
a plurality of windows formed in said casing in corresponding alignment with said pelton wheels, said windows communicating between said second and third cavities for permitting the outward escape of fluid from said wheels into said second cavity;
a nozzle closing off the other end of said handle structure and communicating with said second cavity;
a sleeve rotatably mounted on the exterior of said nozzle;
a driven gear attached to said sleeve;
gearing means disposed in said nozzle and engaged between said driven gear and said shaft; and

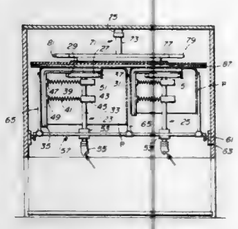
a brush attachable to said sleeve.

4,177,533
CLEANING DEVICE
Johannes Liebscher, Nassau, and Rolf G. Schülein, Singhofen, both of Fed. Rep. of Germany, assignors to Leifheit International Guenter Leifheit GmbH, Nassau, Fed. Rep. of Germany
Filed Dec. 4, 1975, Ser. No. 637,856
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1974, 2457414
Int. Cl.² A47L *11/33*
U.S. Cl. 15—42 **13 Claims**



1. In a cleaning device including a housing adapted for movement in two opposite directions over a one cleaning body having an upwardly directed shaft and a ring of radially downwardly directed bristles; a pair of vertically spaced bearings provided in said housing for rotatably supporting said shaft, one of said bearings defining an elongated opening the major axis of which is oriented in the direction of movement of said housing to permit the pivoting of said shaft about a pivot point defined by the other bearing and thus, in response to a change in the direction of movement of said housing, alternately tilting one of two opposite positions of said ring of bristles into engagement with said surface; and driving means for imparting rotary movement to said shaft in a direction dependent on the direction of movement of said housing.

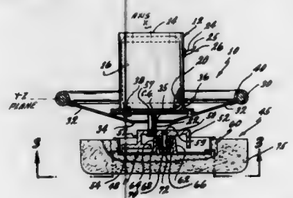
4,177,534
WASHING MACHINE FOR CLEANING COOKING POTS OR SIMILAR ARTICLES
Joseph C. Lanzisera, 43 Jackson Ave., Bayville, Long Island, N.Y. 11709
Continuation-in-part of Ser. No. 675,923, Apr. 12, 1976, Pat. No. 4,069,533. This application Nov. 28, 1977, Ser. No. 855,202
Int. Cl.² A46B *13/06*
U.S. Cl. 15—56 **6 Claims**



1. Apparatus for cleaning a cooking pot comprising an upwardly extending washer-scrubber unit for washing and scrubbing the inside surface of said cooking pot, said upwardly extending washer-scrubber unit comprising:

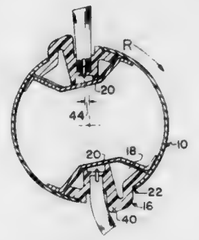
(a) a rotably mounted vertical pipe,
(b) scrubbing means fixedly mounted on said vertical pipe and adapted to support said cooking pot when said cooking pot is placed thereon in an inverted position and contact the inside of said cooking pot,
(c) a first horizontal pipe, having angled end nozzles, fixedly attached to said vertical pipe, the interiors of the two pipes being in communication, said first horizontal pipe being positioned on said vertical pipe so as to be below the cooking pot when the cooking pot is mounted on the scrubbing means,
(d) a second horizontal pipe having spray end nozzles, fixedly attached to said vertical pipe, the interiors of the two pipes being in communication, said second horizontal pipe being positioned on said vertical pipe so as to be inside said cooking pot when said cooking pot is mounted on said scrubbing means, and
(e) means for supplying fluid under pressure to said interior of the vertical pipe,
(f) whereby said fluid emerging from the nozzles of the first pipe will produce rotational movement of the vertical pipe and the fluid emerging from the nozzles of the second pipe will spray wash the inside of the cooking pot.

4,177,535
POLISHING APPARATUS
Bernie R. Cole, 2930 Adams, San Diego, Calif. 92116
Filed Aug. 2, 1978, Ser. No. 930,532
Int. Cl.² A47L *11/12*
U.S. Cl. 15—97 R **3 Claims**



1. A portable apparatus for polishing and the like comprising:
an electrical motor having a longitudinal axis, said electric motor having a housing, said housing comprising a top wall and sidewalls, said electric motor having a shaft extending from the bottom of said motor housing:
handle grip means secured to said electrical motor housing, said handle grip means being in the form of a steering wheel with at least two spoke arms whose inner ends are secured to said motor housing, said handle grip means being in a horizontal plane substantially perpendicular to the longitudinal axis of said electric motor, the plane in which said handle grip means is located being oriented between a plane drawn parallel to the top wall of said motor housing and a plane drawn parallel to the bottom of the side walls of said motor housing,
the center of gravity of said apparatus being in a plane perpendicular to the longitudinal axis of said electric motor that is below said horizontal plane passing through said handle grip means thereby causing said polishing apparatus to automatically right itself any time a tipping force is removed;
a polishing wheel assembly detachably secured to the lower end of said electric motor shaft, said polishing wheel assembly being oriented to rotate in a plane substantially perpendicular to the longitudinal axis of said electric motor shaft, said polishing wheel assembly an eccentric orbital member and a polishing wheel;
said eccentric orbital member comprising:
an elongated plate having a first threaded bore located perpendicular to the bottom surface of said plate, said first threaded bore being substantially symmetrically centered on said plate, a pair of legs depend downwardly from the opposite ends of said elongated plate, a foot of substantial mass is formed on the bottom of one of said legs, said foot being formed substantially perpendicular to said leg and being in the shape of a half moon, and a second threaded bore located perpendicular to the top surface of said plate but being located eccentrically with respect to the center of said plate, said motor shaft being threadably received in said second threaded bore;
said polishing wheel having a hub at its center with counter sunk recesses in its opposite lateral sides, a ball bearing assembly is received in the top recess, the center of said hub also has an aperture that connects with the top and bottom recesses, a bolt having a smooth shank portion passes through said aperture with its head being captured in the bottom recess, said smooth shank portion is also journaled within said ball bearing assembly with a threaded tip portion on said bolt being threadably received in said first threaded bore on the bottom of said elongated plate.

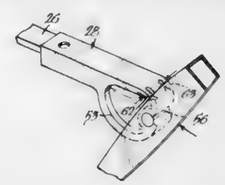
4,177,536
KINETIC BRUSH AGITATOR WITH BACK UP BEATER BAR
Joseph A. Powers, Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Dec. 6, 1978, Ser. No. 966,804
Claims priority, application United Kingdom, May 12, 1978, 19275/78
Int. Cl.² A46B *7/10*; A47L *5/00*
U.S. Cl. 15—182 **2 Claims**



1. A suction cleaner agitator having a generally cylindrical body and a beater bar, disposed closely adjacent to a brush having a free length; said beater bar being disposed so as to provide backup for said brush during cleaning rotation and being shorter than said brush; said beater bar having a curved shoulder facing said brush and adjacent the periphery of said beater bar; said shoulder being located at between one quarter and three quarters of the free length of said brush; said brush bending over said shoulder during agitation; said shoulder having a radius of less than one quarter of the free length of said brush; said brush extending from said agitator body in a trailing relationship, with the centerline of the brush offset from the center of the agitator body in the direction of the beater bar, rearwardly relative to the direction of rotation of the agitator body.

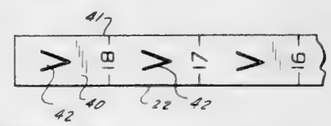
4,177,537
ARM TO BLADE CONNECTOR
Gary W. Roadarmel, Michigan City, Ind., assignor to The Anderson Company of Indiana, Gary, Ind.
Filed Nov. 27, 1978, Ser. No. 963,988
Int. Cl.² B60S *1/40*
U.S. Cl. 15—250.32 **10 Claims**

1. A connector for connecting a windshield wiper arm to a blade, said connector having a blade-receiving part, said blade-receiving part having a slot formed therein along an axis transverse to the longitudinal axis of the connector, a latch means formed on said body portion in spaced relation to said body portion, said latch means being urged toward said body portion an amount sufficient to fit the latch means inside the spaced side walls of an opening in said blade, whereby the connector is moved transverse to the longitudinal axis of the



blade until the latch means are disposed between the side walls and the slot in the connector passes over the cross pin to seat the cross pin in said slot, and whereby pivoting the connector about the axis of the cross pin permits the latch means to snap out of the opening in the blade, said latch means engaging the top edges of the opening in the blade whenever the connector is pivoted excessively with respect to the blade.

4,177,538
WINDSHIELD WIPER ELEMENT
William M. Blaiklock, Dundas, and Brian A. Fisher, Burlington, both of Canada, assignors to Tridon Limited, Burlington, Canada
Filed Jul. 27, 1978, Ser. No. 928,460
Int. Cl.² B60S *1/38*
U.S. Cl. 15—250.39 **10 Claims**

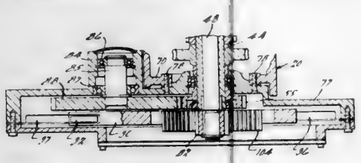


8. A windshield wiper element comprising an elongated backing strip having a slot formed therein and a squeegee element having a head received in said slot, said backing strip having a plurality of breakage indications provided thereon at predetermined spaced locations corresponding to predetermined windshield wiper lengths and means on the backing strip located at least between each of said breakage indications for engaging said head strip of the squeegee to resist longitudinal removal of the squeegee from the backing strip; said means comprising a plurality of integral tabs formed in said backing strip and respectively located between each of said indications and depressed into said channel for engagement with said head strip.

4,177,539
OSCILLATING SOOT BLOWER MECHANISM
Larry M. Elting, 712 Madison Ave., Lancaster, Ohio 43130
Filed Sep. 26, 1978, Ser. No. 945,854
Int. Cl.² F23J *3/02*
U.S. Cl. 15—316 R **4 Claims**

1. In a long travel soot blower or the like having a supporting beam, a carriage adapted to travel along the beam and including a housing forming an enclosure for the carriage, a lance secured to the carriage to travel therewith but rotatable about its longitudinal axis, longitudinal rack means carried by the beam, a motor operatively interconnected with the carriage, walking pinion means carried by the carriage and rotatable to drive the carriage and lance along the beam, and transmission means for rotating the walking pinion means and for

oscillating the lance about its longitudinal axis characterized by a pair of interfitted independently rotatable shafts journaled in but projecting at their outer ends outside said housing of the carriage, the radially outer of said shafts being drivable by the motor and having gear means thereon within the carriage housing for driving said walking pinion means to actuate the carriage along the beam, a yoke driving gear on the projecting outer end of said radially outer shaft, the outer end of the radially inner shaft extending beyond the outer end of the



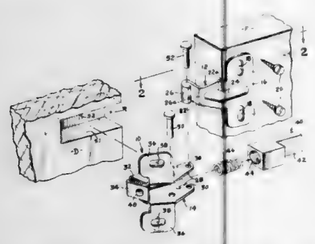
radially outer shaft, an inner end of said radially inner shaft having a rotary driving connection to the lance within the carriage housing, a yoke driven gear on the outer end of the radially inner shaft, an accessory housing secured to the outside of the carriage housing and enclosing said two last-mentioned gears, and yoke means in said accessory housing actuatable by the yoke driving gear for oscillating the yoke driven gear and the radially inner shaft to oscillate the lance about its longitudinal axis.

4,177,540

SELF-CLOSING CONCEALED HINGE

Howard B. Gorton, San Gabriel, Calif., assignor to Ajax Hardware Corporation, City of Industry, Calif.

Filed Feb. 10, 1978, Ser. No. 876,616
Int. Cl.[2] E05D *11/08*; E05F *1/12*
U.S. Cl. 16—142 **8 Claims**



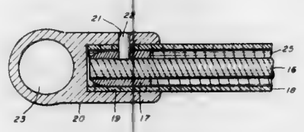
1. A compact hinge assembly comprising door and frame wings mountable on said door and said frame, respectively, one of the wings having a housing including a pair of closely spaced parallel ear plates joined by a connecting bight and adapted to be concealed in a narrow elongate recess in the door, the ear plates having laterally extending securing plates, the other of the wings having a knuckle having an engageable ridge and disposed inbetween the ear plates and an arm connected to the knuckle at one end and having second securing plates at the opposite end, the arm fitting between the ear plates, a hinge pin pivotally interconnecting said knuckle and ear plates for relative swinging of said wings about a fixed axis defined by the axis of said hinge pin, a pressure element disposed in snug sliding relation between the ear plates, spring means biasing the pressure element substantially radially toward said hinge pin in all positions of said wings, and retaining means on the housing and engaging the remote side of the pressure element from the connecting bight to hold the pressure element against the connecting bight, whereby adjacent the closed position of the door the pressure element engages the ridge to urge the door to closed position.

4,177,541

BICYCLE CABLE

Raymond N. Seakan, Randolph, Mass., assignor to Acro-Fab Industries, Inc., Stoughton, Mass.

Filed Jul. 20, 1978, Ser. No. 926,310
Int. Cl.[2] A44B *21/00*; F16G *11/00*
U.S. Cl. 24—73 A **4 Claims**



1. In a cable assembly for locking cycles and the like having
an inner flexible steel cable,
an outer steel flexible sheath coaxial with said cable,
in combination, an inner fitting having an outer diameter less than the inner diameter of said sheath, means permanently securing said inner fitting to said cable,
an end fitting having a cylindrical recess shaped and sized to receive an end of said sheath and
a pin extending into and permanently interengaging said sheath and said end and inner fittings.

4,177,542

HANDHOLD INSERT FOR A TWISTED ROPE

James H. Denney, Temple Terrace, Fla., assignor to Vector Engineering Corporation, Temple Terrace, Fla.

Filed Jun. 8, 1978, Ser. No. 913,675
Int. Cl.[2] F16G *11/00*
U.S. Cl. 24—115 R **11 Claims**



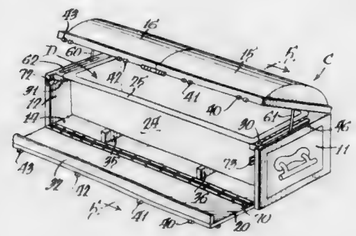
1. A handhold of the type primarily intended for use in combination with a twisted rope, said handhold comprising: a substantially elongate body means comprising a central shaft and oppositely disposed flange means extending radially from each end of said shaft, whereby said central shaft defines a relieved portion of said body means; and a plurality of groove means comprising a plurality of notches formed in each of said flange means and being axially aligned with a corresponding one of said notches in the other of said flange means, the number of said plurality of said groove means being at least equal to the number of strands forming the twisted rope, whereby said handhold may be inserted between the separated strands of the rope such that each strand will seat in at least two of said notches to secure said handhold within the rope.

4,177,543

DISPLAY CASKET

Manfred E. Angermann, Rte. 5, Box 465 Geneva Oaks Rd., Lake Geneva, Wis. 53147

Filed Jun. 26, 1978, Ser. No. 919,232
Int. Cl.[2] A61G *17/00*
U.S. Cl. 27—35 **9 Claims**



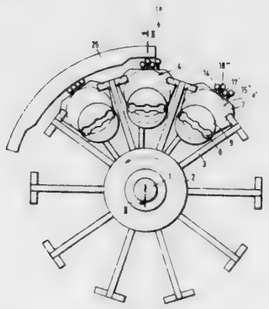
1. A display casket for removably holding a body display container having a continuous lateral flange around its upper periphery comprising, a casing with front, rear and side walls, a bottom and a lid to have the appearance of a conventional casket, each of said walls having an upper surface to engage under said lateral flange for support of the display container, first hinge means with a removable hinge pin pivotally mounting said lid to the rear wall, second hinge means interconnecting said casing and the lower edge of the rear wall for downward pivoting of the rear wall, releasable latch means for holding the rear wall in upright position, and pivot means acting between said front wall and the lid to enable reverse inclination of the lid for insertion and removal of a body display container through an opening provided by downward pivoting of the rear wall.

4,177,544

METHOD OF AND APPARATUS FOR MAKING TAMPONS

Gerd Bischkopf, Kottenheim; Herbert Gawarecki, Haltern-Flaesheim, and Gerhard Cremer, Mayen, all of Fed. Rep. of Germany, assignors to Biloma GmbH Spezialmaschinenfabrik, Mayen, Fed. Rep. of Germany

Filed Feb. 28, 1977, Ser. No. 772,632
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1976, 2607975
Int. Cl.[2] A61F *13/20*
U.S. Cl. 28—119 **23 Claims**



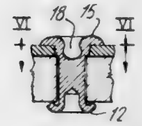
1. A method of making tampons from a strip of pressable material, said method comprising the steps of:
(a) continuously orbiting a succession of angularly spaced treatment stations about an axis in a predetermined rotational sense, whereby each of said stations trails on a circular path the station immediately downstream and leads the station immediately upstream;
(b) continuously withdrawing said strip of pressable material from a supply and feeding said strip in a direction substantially tangential to said circular path, and during each orbit of said stations:
(c) gripping the end of said strip at a first one of said stations and pulling said strip from said supply as said first station orbits;
(d) thereafter gripping said strip between said end and said supply at a second station immediately trailing said first station;
(e) thereafter severing the gripped strip at said second station and releasing the severed strip portion only at said first station, whereby a new end of said strip is formed at said second station;
(f) thereafter winding said severed portion at said second station up into a tampon blank;
(g) thereafter pressing said tampon blank at said second station into a finished tampon; and
(h) thereafter discharging said finished tampon from said second station.

4,177,545

FASTENING METHOD AND PRODUCT

Martin R. Lambertz, New Hamburg, Canada, assignor to The Stanley Works, Limited, Ontario, Canada

Filed Dec. 28, 1976, Ser. No. 755,057
Claims priority, application Canada, Dec. 30, 1975, 242770
Int. Cl.[2] B21D *53/40*; B21K *13/02*; B23P *11/00*; B21D *39/03*
U.S. Cl. 29—11 **6 Claims**



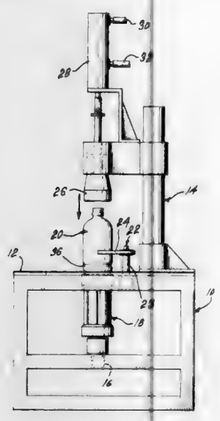
1. A method of reducing squeak in a hinge assembly of the type in which a pair of hinge members are pivotally interconnected by a headed rivet passing through axially aligned holes therein comprising:
(a) providing a first hinge member having a noncircular hole therethrough and a second hinge member having a circular hole therethrough;
(b) providing a rivet having (i) a head and a stem portion, said stem portion having a constant external diameter throughout its entire length, (ii) an axial bore through the head and extending into the stem to provide a longitudinal substantially circular tubular portion corresponding in length substantially to the thickness of said first hinge member, and a solid stem portion contiguous with said tubular portion and extending therefrom;
(c) axially aligning said noncircular and said circular holes;
(d) inserting said stem portion through said aligned noncircular and circular holes in said respective hinge members so that the head of said rivet abuts said first hinge member and said solid stem portion projects into said circular hole in said second hinge member; and
(e) applying a compressive force to the ends of said rivet sufficient only to upset and radially expand said tubular portion to a shape substantially conforming to said noncircular hole, thereby preventing rotational movement of said rivet relative to said first hinge member while permitting movement of said second hinge member relative to said first hinge member and said rivet and thus produce a substantially squeak free hinge assembly.

4,177,546

APPARATUS FOR INSERTING A RESILIENT BAND ON A CONTAINER

Wolfgang Geisinger, 180 rue Paradis, Rosemere, Quebec, Canada

Filed Feb. 23, 1978, Ser. No. 880,639
Claims priority, application Canada, Aug. 22, 1977, 285194
Int. Cl.[2] B23P *19/02*
U.S. Cl. 29—235 9 Claims



1. Apparatus for inserting a resilient band on a container adjacent one end thereof, comprising: an outer cylindrical member having a top wall for receiving thereon said band to be inserted, said member having a side wall provided with a series of circumferentially spaced slits extending from said top wall to a location therebeneath on said side wall to define a series of fingers pivotable about their lower portions; plunger means slidably mounted coaxially within said cylindrical member and in contacting engagement with said fingers, said plunger means having a top wall for receiving said one end of said container thereon; said plunger means being actuable to move downwardly within said member to thereby cause outward pivotal movement of said fingers whereby said band on said top wall of said cylindrical member is caused to slide on said container into a predetermined position thereon, said outward pivotal movement of said fingers being such that contact of said fingers with said container is prevented as sais band slides on said container into said predetermined position.

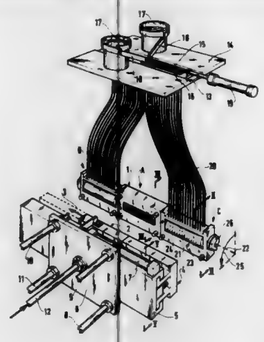
4,177,547

METHOD OF MANUFACTURING CABLE CLIPS AND DEVICE FOR APPLYING THE METHOD

René Aubert, Pont A Mousson, France, assignor to Societe d'Usinage des Tubes pour l'Electricite S.U.T.E., Pont A Mousson, France

Filed Feb. 23, 1978, Ser. No. 880,521
Claims priority, application France, Feb. 25, 1977, 77 05624
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—432 23 Claims

1. A method of automatic manufacture of clips for supporting tubes or electric cables on a surface, said clips having substantially the shape of a hook and being assembled with a fixing member for fixing the clip to the surface; the method comprising successively: at a first station, an injection phase in a mould defined by a fixed half-mould and a movable half-mould; a transfer phase at a second station during which the movable half-mould is transferred, carrying the moulded clips with it; a fixing member insertion phase for said clips at said second station; and an ejection phase of the assembled clips and



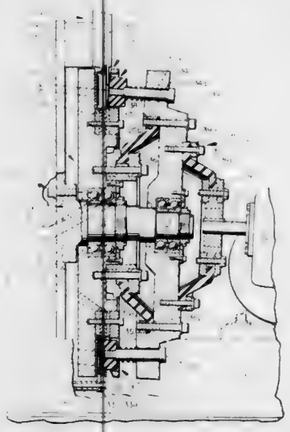
wherein; the cycle of the phases resume after return of the movable half-mould to said first station.

4,177,548

METHOD AND DEVICE FOR ASSEMBLING COAXIALLY INTERFITTING PARTS

Jon R. Yarick, Walbridge, Ohio, and Nelson J. Franks, Lambertville, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed May 16, 1978, Ser. No. 906,496
Int. Cl.[2] B23P *11/02, 19/02;* B21D *51/46*
U.S. Cl. 29—453 21 Claims



1. A method of assembling a pre-shaped pair of coaxially mating parts shaped to interfit in assembled relationship one within the other and comprising the steps of:

arranging said pair of mating parts in unassembled positionally oriented relationship with the corresponding interfitting portions thereof respectively disposed in adjacent confronting relationship;

rotating said pair of mating parts while in such positionally oriented relationship in a first arcuate path lying in a plane disposed transversely to the axis of coaxial alignment of said mating parts;

concurrently rotating an axially elongated assembly member in rotational synchronization and in endwise confronting relationship with said mating parts, but in a second arcuate path deployed in adjacent oblique planar relationship with

the plane of said first arcuate path and with the elongate axis of said assembly member positioned transversely to said second orbital path and in endwise alignment with said mating parts; and

correlating the oblique planar relationship and relative interspacing of said first and second arcuate paths to cause said assembly member to uniformly advance and retreat relative to said first arcuate path and during such advance to forcefully urge said mating parts into assembled interfitting relationship with one another.

8. A rotary assembly device for assembling a pre-shaped pair of coaxially mating parts shaped to interfit in assembled relationship one within the other and comprising:

means for carrying said pair of mating parts in unassembled positionally oriented relationship with interfitting portions thereof respectively disposed in adjacent confronting relationship while concurrently rotating said mating parts in a first arcuate path lying in a plane disposed transversely to the axis of coaxial alignment of said mating parts;

an axially elongated assembly member;

means for carrying said assembly member and concurrently rotating the same in a second arcuate path adjacently interspaced from said first arcuate path and lying in a plane deployed in adjacent oblique planar relationship relative to the plane of said first arcuate path, said last-mentioned means being operative to rotate said assembly member in rotational synchronization with the mating parts carried by the first-mentioned means and being adapted to carry said assembly member with the elongate axis thereof positioned transversely to said second arcuate path and in endwise alignment with said mating parts; and

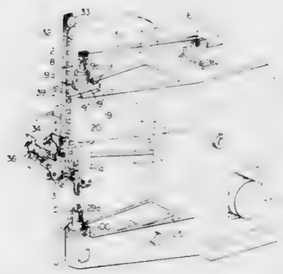
the oblique planar relationship and interspacing of first and second arcuate paths being correlated to cause said assembly member to uniformly advance and retreat relative to said mating parts and during such advance to forcefully urge said mating parts into assembled interfitting relationship with one another.

4,177,549

MACHINE FOR MOUNTING ELECTRICAL COMPONENTS ONTO PRINTED-CIRCUIT BOARDS

Kazuhiro Mori; Yoshihiko Misawa, and Kiyoshi Mayahara, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

Filed Mar. 17, 1978, Ser. No. 887,814
Claims priority, application Japan, Mar. 22, 1977, 52-31712
Int. Cl.[2] B23P *23/00;* B23Q *41/02*
U.S. Cl. 29—564.2 5 Claims



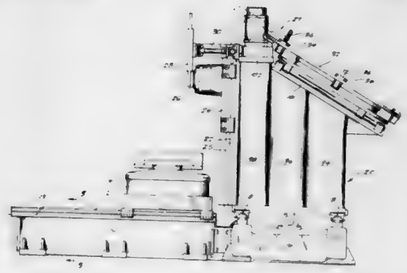
1. Apparatus for inserting the connecting wires of successively arranged electrical circuit component parts on a feeding tape into matching holes of a circuit board, said connecting wires extending in a same direction from said feeder tape, comprising: a mounting bracket rotatable about an axis along which the connecting wires are inserted into said matching holes; means for fixing said bracket in an arbitrary position with respect to said axis; means mounted on said bracket for intermittently advancing said feeder tape; a cutter mounted on said bracket and operable to successively cut off the connecting wires of each of said component parts in response to each intermittent advancement of said feeder tape; an insertion head operable to reciprocate along said axis and rotatable with said mounting bracket to take up said arbitrary position and including a first gripper operable to rotate, during the time when said insertion head is moved downward, from a first position in which the gripper holds the cutoff component part to a second position in which the connecting wires of the held component part are substantially oriented toward said matching holes; and a second gripper disposed below said insertion head and operable to reciprocate along said axis in directions opposite to the directions of movement of said insertion head for holding the connecting wires that extend through the matching holes to give a bend thereto.

4,177,550

MACHINE TOOL WITH HOLLOW STRUCTURAL STEEL MEMBERS

Charles B. Sipek, Hales Corners; Richard Johnstone, Brookfield, and Russell B. Clegg, Milwaukee, all of Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Filed Feb. 1, 1978, Ser. No. 874,327
Int. Cl.[2] B23B *37/00;* B23C *1/00*
U.S. Cl. 29—568 6 Claims



1. In a machine tool having a bed and having a member slidably mounted on said bed for movement along a horizontal axis, the improvement wherein said bed comprises a plurality of structural steel tubes;

all of said tubes being substantially rectangular in cross-sectional shape and extending in a parallel relationship, at least one flat longitudinal face of each of said tubes being in abutment and connected with an adjecent tube,

means connecting the ends of all of said tubes together to form a unitary structure; and,

a pair of ways attached to said tubes for slidably supporting said member.

4,177,551

METHOD OF WELDING A ARC BATTERY INTERCELL CONNECTOR

George S. Johnson, Anderson, and Robey C. Reff, Muncie, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 21, 1978, Ser. No. 944,257
Int. Cl.[2] H01M *2/24;* B23P *9/16*
U.S. Cl. 29—623.1 1 Claim

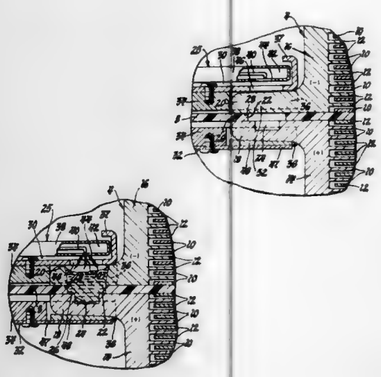
1. The process of assembling a multicell, lead-acid storage battery comprising the steps of:

forming a case having a plurality of partitions subdividing the case into a plurality of individual cell compartments, said partitions having apertures therein adapted to receive

battery intercell connectors for electrically series interconnecting the several cells of the battery;

assembling a cell group for each of said compartments, said group comprising a stack of alternating positive and negative plates, a positive plate strap electrically joining the positive plates together, a negative plate strap electrically joining the negative plates together and upstanding lugs on said plate straps, wherein pairs of said lugs are adapted by fusion to electrically join the plate straps of adjacent groups through the apertures in the partitions and wherein one lug member of each lug pair has a substantially flat face on its partition-abutting side and the other lug member of each pair has a cavity formed in its partition-abutting side;

inserting said groups in said cell compartments such that the lugs of each pair overlie said aperture on opposite sides of said partition and so as to have said cavity in substantial axial alignment with said aperture;



orienting said case such that said other lug member lies beneath said one lug member and the partition positioned therebetween;

applying the arc of an inert-gas-shielded, nonconsumable-electrode, arc welding torch to the backside of said one lug member such as to fuse through substantially only the center of said lug member and to cause the melt therefrom to flow by gravity through said aperture into said cavity in sufficient quantity to substantially fill said cavity and said aperture;

inverting said previously oriented case and applying the arc of an inert-gas-shielded, nonconsumable-electrode, arc welding torch to the backside of said other lug member such as to fuse through substantially only the center thereof and weld it to the one lug material filling the cavity; and

squeezing the lugs together to form a substantially fluid-tight intercell connector through said aperture.

4,177,552

METHOD OF MAKING LAMINAR BATTERIES

Michael E. Gordon, Wayland, and Frank Stieger, Newton Highland, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 852,919, Nov. 18, 1977, abandoned. This application Jun. 26, 1978, Ser. No. 918,780

Int. Cl.[2] H01M *6/00, 6/46*

U.S. Cl. 29—623.4 **2 Claims**

1. In the process of making a laminar battery, the steps of extruding a slurry electrode onto a central region of the surface of a conductive plastic substrate, adhering a separator to a first side of a laminated frame of larger area than the separator and formed with a central opening adapted to register with and receive said electrode with the separator extending over said opening and beyond the border of said opening and the frame having border portions extending beyond the border of the separator, said frame being a laminate of two heat activatable thermoplastic adhesive materials, a first of said materials on said first side of the frame being adhesively activatable at a first temperature below the temperature at which a second of said materials is adhesively activatable under the same conditions of



applied pressure and duration of heating, said separator being adhered to said first side of said frame by heat and pressure for a time sufficient to activate said first material but not said second material, placing said frame and said separator adhered thereto over said electrode and conductive plastic substrate with said electrode within said opening and said separator in registry and in contact with said electrode and extending beyond the borders of said electrode and said first side of said frame being in contact with said conductive plastic substrate beyond the borders of said separator, and adhering said frame to said conductive plastic by the application of heat and pressure for a time sufficient to activate said first material but not said second material.

4,177,553

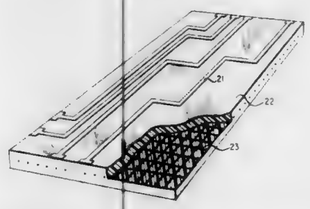
REINFORCED FLEXIBLE PRINTED WIRING BOARD

Theodore H. Klein, Livingston, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 701,591, Jul. 1, 1976, Pat. No. 4,103,102. This application Feb. 27, 1978, Ser. No. 881,706

Int. Cl.[2] H05K *3/10*

U.S. Cl. 29—625 **7 Claims**



1. A method of forming a reinforced flexible printed wiring board comprising:

(a) coating a continuous glass fiber with a lubricant;

(b) twisting relatively at least one continuous glass fiber about at least one continuous polyester fiber with a periodicity between 0.1 and 10 twists per inch, to form a yarn;

(c) weaving the yarn into a fabric;

(d) removing between 5 and 75 percent of the lubricant from the yarn at temperatures less than 300 degrees F.;

(e) impregnating the fabric with a flexible resin;

(f) curing at least partially the flexible resin; and

(g) defining a metallic circuit on the resin impregnated fabric, whereby, a flexible printed wiring board with peel strength greater than three pounds per inch of conductor width, insulation resistance greater than 1×10^9 ohms, propagation tear strength greater than 0.5 pounds and dimensional stability greater than 2 mils per inch is fabricated.

4,177,554

ASSEMBLING LEADS TO A SUBSTRATE

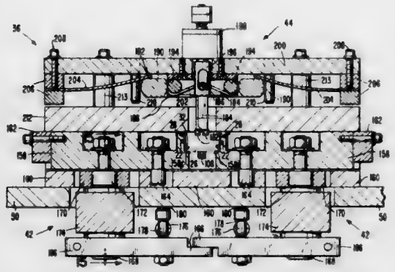
Ernest E. Deveres, Lowell; Paul J. Ouellette, Amesbury, and Joseph F. Pollitt, Bradford, all of Mass., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Apr. 26, 1978, Ser. No. 900,220

Int. Cl.[2] H05K *3/32*

U.S. Cl. 29—626 **19 Claims**





1. A method of assembling leads to a substrate wherein the leads project in spaced parallel relationship from a continuous support rail, which comprises:

supporting the substrate in a lead-substrate assembling position;

simultaneously feeding a pair of independent support rails along essentially parallel paths to locate leads on the support rails on opposite sides of the lead-substrate assembling position;

engaging outer portions of the leads in the lead-substrate assembling position and moving the leads in opposite directions toward a substrate in the lead-substrate assembling position to assemble the leads to respective opposite sides of the substrate simultaneously;

engaging inner portions of the leads in the lead-substrate assembling position simultaneously with the engaging of the outer portions of the leads, to retain terminal-engaging portions of the leads in alignment with respective terminals on the substrate as the leads are assembled to the substrate; and

cutting the support rails to sever the leads in the lead-substrate assembling position from the remaining leads on the support rails.

3. Apparatus for assembling leads to a substrate wherein the leads project in parallel relationship from respective independent support members, which comprises:

means for supporting the substrate in a lead-substrate assembling position;

first and second lead-engaging means engageable with outer portions of respective ones of the leads for moving the leads toward the substrate in the lead-substrate assembling position to assemble the leads to respective opposite sides of the substrate simultaneously;

first moving means for moving the first and second lead-engaging means from retracted positions into advanced positions in which the first and second lead-engaging means assemble the leads to the substrate in the lead-substrate assembling position;

first and second lead-alignment retaining means engageable with inner portions of respective ones of the leads to clamp the leads to the first and second lead-engaging means, respectively, for retaining terminal-engaging portions of the leads in alignment with respective terminals on the substrate in the lead-substrate assembling position as the first and second lead-engaging means assemble the leads to the substrate;

second moving means for moving the first and second lead-alignment retaining means from retracted positions into advanced positions in which the lead-alignment retaining means engage the inner portions of respective ones of the leads, the second moving means including means for urging the first and second lead-alignment retaining means into engagement with the inner portions of the leads and permitting inward movement of the lead-alignment retaining means in response to movement of the leads by the first and second lead-engaging means into assembled relationship with the substrate in the lead-substrate assembling position; and

first and second return means for returning the first and second lead-engaging means, and the first and second lead-alignment retaining means, respectively, to their retracted positions.

4,177,555

WIRE-WRAPPING TOOL FOR NON-STRIPPED WIRE

David Weltman, Pleasantville, and Thomas Rivera, New York, both of N.Y., assignors to O.K. Machine and Tool Corp., New York, N.Y.

Filed Jul. 3, 1978, Ser. No. 921,436

Int. Cl.[2] B21F *15/04;* **H01R** *11/08*

U.S. Cl. 29—751 **11 Claims**



2. A novel wrapping bit configuration for wire-wrapping a non-stripped and non-slitted insulated wire around a terminal, comprising an elongated shaft having adjacent terminal-receiving and wire-supplying passageways terminating in adjacent holes at a bit face surface at a forward end of the shaft, and forwardly-projecting parallel wall portions on the bit face surrounding the terminal-receiving hole, said forwardly-projecting parallel wall portions forming a channel having a depth at least equal to twice the overall diameter of the insulated wire and with the parallel walls spaced apart by an amount approximately equal to the sum of the terminal corner-to-corner dimension, the wire core diameter, and the wire insulation wall thickness, said channel being tilted with respect to a line perpendicular to the terminal-receiving and wire-exiting holes at an angle of approximately 20°–35° in the direction opposite to bit rotation during use, whereby upon rotation of the shaft the bit face crushes an insulated wire as it exits from the wire-supplying hole and is wrapped around a terminal located in the terminal-receiving hole causing the insulation adjacent the terminal corners to be pierced baring the wire core and causing the bared wire core to form a good electrical connection to the terminal.

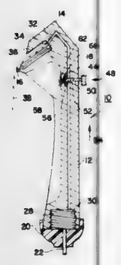
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4,177,556

WATER DISPENSING RAZOR

Ralph Galli, Jr., 191 Bay 32nd St., Brooklyn, N.Y. 11214

Filed Mar. 27, 1978, Ser. No. 890,458
Int. Cl.[2] B26B *21/40*
U.S. Cl. 30—41 **3 Claims**



1. A liquid dispensing razor comprising:
(a) an elongated handle;
(b) a shaving head at one end of said handle, said handle having a longitudinal passageway therethrough and an opening at the other end thereof for connection to a source of liquid, a razor blade, said head further including a supporting surface for receiving and supporting said razor blade thereon, said razor blade having opposed lateral first and second surfaces and a pair of opposed marginal edges, one of said marginal edges being sharpened along the length thereof, said first lateral surface being disposed in touching engagement with said supporting surface, said handle having a laterally extending slotted opening disposed over said second lateral surface of said blade and adjacent the other of said marginal edges of said blade, said slotted opening communicating with said longitudinal passageway for directing said liquid across only said second lateral surface of said blade, said first lateral surface being located intermediate said second lateral surface and said other end of said handle, said slotted opening being substantially equal in length to the length of said other marginal edge of said blade, a valve, said valve being installed on said handle at a location intermediate the ends of said handle, said valve having an operating lever, said operating lever being located outwardly from said handle adjacent said location, means to bias said valve into a closed condition preventing the flow of said liquid through said passageway, whereby the momentary manual operation of said operation of said operating lever allows said liquid to flow through said passageway and over substatially all of said second lateral surface of said blade and over said one marginal edge of said blade.

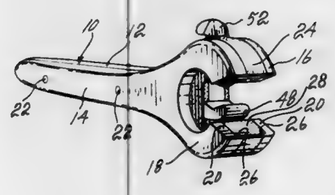
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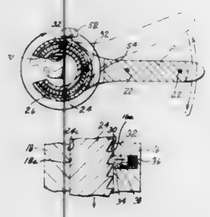
TUBE CUTTER WITH A RATCHET HANDLE

Aurèle Courty, 471 Sainte-Madeleine St., Montreal, Quebec, Canada H3K 2K8

Continuation-in-part of Ser. No. 869,346, Jan. 13, 1978.
Filed Aug. 31, 1978, Ser. No. 938,537
Int. Cl.[2] B23D *21/06*
U.S. Cl. 30—102 **3 Claims**

1. A tube cutter comprising:
(a) an elongated handle formed in two longitudinal symmetrical half portions secured together and having a C-shaped head at one end also formed in two symmetrical half portions spacedly facing each other, each head half portion being integral with one handle half portion, said C-shaped head defining a lateral opening through which a tube can be inserted, each head half portion having an inner radial side face and a peripheral shoulder projecting from said inner radial side face and directed towards the shoulder of the other head half portion;
(b) a C-shaped body rotatably mounted between the two head half portions and defining a lateral opening of substantially the same width as the lateral opening of the C-shaped head, said body having a peripheral outer face exposed between the shoulders of the two head half portions and radial external side faces in sliding contact with the respective inner radial side faces of said head half portions whereby said C-shaped body can rotate with respect to said elongated handle about an axis transverse to said C-shaped body, the latter being rotatably guided by said peripheral shoulders of said head half portions;
(c) pawl and ratchet means entirely located at one of the radial body side faces and at the contacting inner radial side face of the corresponding head half portion, said pawl and ratchet means being arranged concentric with the rotational axis of said C-shaped head and allowing free rotation of said C-shaped head with respect to said elongated handle in one direction only; and





(d) a tube cutter assembly mounted on said body, a tube abutment member slidably mounted in said body for radial movement towards and away from the cutter member and in a direction transverse to said lateral opening, and control means mounted on said body projecting outwardly from the exposed peripheral outer face of said body to move said abutment member towards said cutter member to press a tube between the two members, said two members having a spacing therebetween in register with the lateral openings of said body and said head, whereby a pipe can be inserted through the registering openings in said body and in said head and between said two members, and said cutter member pressed against said tube whereby back-and-forth rotation of said handle causes rotation of said body and cutter member through said pawl and ratchet means to cut the tube, and wherein said handle half portions define a through opening adjacent said body for the free passage of said externally projecting control means during rotation of said body relative to said handle.

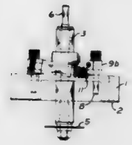
4,177,558

INTERNAL CUTTER FOR TRIMMING PLASTIC PIPE

Thomas G. Brown, Erie, Pa., assignor to Reed Manufacturing Company, Erie, Pa.

Filed Mar. 3, 1978, Ser. No. 883,239
Int. Cl.[2] B23D *21/06*
U.S. Cl. 30—103 **3 Claims**





1. A cutter for trimming roughed in plastic pipe to a predetermined level relative to the surface of a floor or wall through which the pipe extends, comprising a housing surrounding the pipe to be trimmed, means riding in load carrying relation to said surface for supporting the housing for movement over said surface and for rotation around said pipe, a circular saw jounaled in the housing on an axis perpendicular to said surface, said saw being vertically adjustable along said axis to select the level of the saw relative to said surface, guide members forming with the saw the locus of a circle, means for retracting said guide members radially inward toward the saw to reduce the diameter of said circle so the saw and guide members may be telescoped within said pipe and means for extending said guide members radially outward away from the saw to increase the diameter of said circle and force the saw through said pipe, said guide members riding on the internal surface of said pipe and guiding the saw as the housing while supported on said surface by its supporting means is rotated about said pipe to cut off the projecting end of said pipe.

4,177,559

INTERNAL PIPE CUTTER

Charles E. Anderson, Minneapolis, Minn., assignor to Cherne Industries, Inc., Edina, Minn.

Filed Feb. 24, 1978, Ser. No. 881,064
Int. Cl.[2] B23D *21/06*
U.S. Cl. 30—105 **8 Claims**



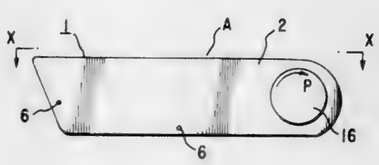
1. An internal pipe cutter for cutting a pipe having a predetermined thickness, which comprises:
(a) a rotatable mandrel;
(b) a cutting drum and guide drum carried on the mandrel and adjustably mounted relative to one another such that the longitudinal spacing therebetween can be varied;
(c) the guide drum having means for controlling the depth at which the cutting drum is positioned in the pipe; and
(d) the cutting drum having a cutter which is projected radially outwardly by centrifugal force as the mandrel is rotated to cut the pipe, wherein the cutter comprises a slider block slidably received in the cutting drum and carrying a cutting blade therein, the cutting blade being radially adjustable relative to the slider block, wherein the slider block has a slot which loosely receives the cutting blade therein and a set screw which bears against the cutting blade to hold the cutting blade in an adjusted radial position relative to the slider block; and wherein the cutting drum has an elongated radial slot through which the set screw extends, the outward movement of the slider block being limited by engagement of the set screw with a radially outer end of the cutting drum slot, wherein the outer end of the cutting blade slot is positioned relative to the screw and the cutting blade is positioned relative to the slider block such that the cutting blade cuts through the predetermined thickness of the pipe substantially simulataneously with the engagment of the set screw with the outer end of the cutting drum slot to prevent the cutter from being projected outwardly past the pipe after the pipe has been cut.

4,177,560

SAFETY KNIFE

Hiroshi Sakurai, 7-2 Inago-cho, Seki-shi, Gifu, Japan

Filed Aug. 8, 1978, Ser. No. 931,881
Claims priority, application Japan, Oct. 22, 1977, 52/142660[U]
Int. Cl.[2] B26B *1/04*
U.S. Cl. 30—160 **2 Claims**



1. A safety knife comprising a pair of side plates, a blade, an interplate and a pin, wherein said blade has a locking slot at a top and another locking slot at a bottom thereof, a rack insertion hole and an opening in which a shaft pin provided with gear is fixed, said rack insertion hole having such a size and being provided in such a portion of said blade that a rack can travel smoothly therethrough engaging with the gear provided around said shaft pin, and
said interplate has a spring portion and a locking clay at the end of said spring portion, said locking claw being to interact with said locking slots.

4,177,561

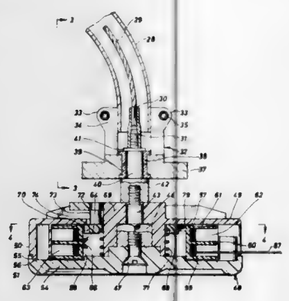
ROTARY CUTTING ASSEMBLY

George C. Ballas, Houston, Tex., assignor to Weed Eater, Inc., Houston, Tex.

Division of Ser. No. 706,623, Jul. 19, 1976, abandoned. This application May 31, 1977, Ser. No. 801,536
Int. Cl.[2] A01G *3/06*
U.S. Cl. 30—276 **20 Claims**

1. Apparatus for cutting vegetation and the like, comprising a housing rotatable in a cutting plane about an axis and having at least one internal compartment and at least two peripheral apertures communicating with said compartment and each being defined at least partially by a curvilinear wall portion of said housing,

a spool-like member removably insertable in said housing, said spool-like member including a wall member extending generally perpendicularly to said cutting plane and at least three flange elements extending outwardly from said wall member in planes substantially parallel to said cutting plane, each flange element being spaced from the other along said axis and defining with said wall member a pair of storage compartments,



a flexible line member having a coiled portion stored in each said storage compartments and having a non-coiled portion extending from each said storage compartments through one of said peripheral apertures and outwardly of the periphery of said housing for travel in said cutting plane, and

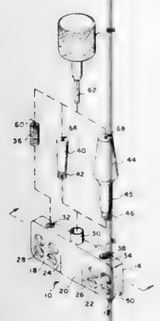
a pair of metallic bearing elements each being disposed within one of said peripheral apertures and each being in abutting engagement with the curvilinear wall portion of the housing defining the aperture.

4,177,562

DENTAL IMPLANT AND METHOD OF INSERTING THE SAME

Alvin L. Miller, Creek Rd., Mount Holly, N.J. 08060, and Anthony J. Viscido, 7015 Keene Mill Rd., Springfield, Va. 22150

Filed May 2, 1977, Ser. No. 792,522
Int. Cl.[2] A61C *8/00*
U.S. Cl. 433—174 **12 Claims**



1. A dental implant comprising:

a body member, said body member having a top and having side by side first and second body portions attached to each other;

said first portion including spaced apart and substantially parallel side walls and means accessible from the top of said implant for moving at least part of said side walls outwardly away from each other; and

said second portion including a substantially vertically extending hollow bore therein, said bore being open at the top of said implant and including screw threads adjacent the lower portion thereof.

4,177,563

DENTAL FILLING MATERIAL

Robert Schmitz-Josten, Cologne; Manfred Borgardt, Wuppertal; Hans-Hermann Schulz, Leichlingen; Michael Walkowiak, Cologne; Bernhard Leusner, Leverkusen, and Carlhans Süling, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 19, 1978, Ser. No. 907,639
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1977, 2728764
Int. Cl.[2] C08K *3/22, 3/34, 3/36*
U.S. Cl. 433—228 **12 Claims**

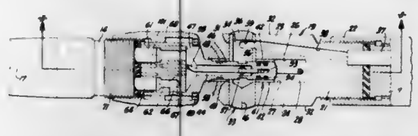
1. A formulated dental filling material comprising a polymerizable organic plastics material containing inorganic fillers, which filling material comprises at least two pastes in intimate admixture with one another in a paste/paste system in which hardening is initiated by means of a peroxidic initiator and an accelerator, wherein said at least two pastes contain different inorganic fillers with different chemical constitutions such that one of said at least two pastes contains filler with a substantially higher proportion of elements with high atomic number than does the other of said at least two pastes.

4,177,564

DENTAL HANDPIECE CONNECTOR

Lloyd P. Flatland, 15 Quisisana Dr., Kentfield, Calif. 94904

Filed Mar. 20, 1978, Ser. No. 887,864
Int. Cl.[2] A61C *1/10*
U.S. Cl. 433—82 **7 Claims**



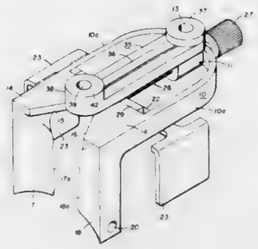
1. A dental handpiece connector for use with a dental air tube having a first connector thereon and with a dental handpiece having a second connector thereon, comprising a body having a first base adapted to engage said first connector and having a tine, means defining a cross bore in said tine, means in said body defining an air passage extending from said base to said cross bore, a disc adapted to be received against said tine, means defining an axial passage in said disc adapted to align with said cross bore, means defining a radial passage in said disc intersecting said axial passage, a pin having a pin chamber and arranged to confine said disc to rotation relative to said tine, means defining a first opening between the interior of said pin chamber and said air passage, a stem adapted to be received in said radial passage and having a second base adapted to engage said second connector, means defining a stem passageway in said stem, means defining a second opening between said stem passageway and said pin chamber, and means for confining said stem to rotation in said radial passage relative to said disc.

4,177,565

PROXIMAL BOX JIG

John M. Heasley, 307 - 22nd St., NE., Cedar Rapids, Iowa 52402

Filed Aug. 7, 1978, Ser. No. 931,509
Int. Cl.[2] A61C *3/00*
U.S. Cl. 433—75 **10 Claims**



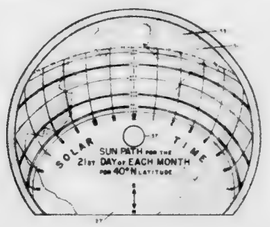
1. A jig for the cutting of proximal boxes in dentistry comprising: a guide table having a pair of spaced interproximal retentive arms extending in one transverse direction from the guide table, the retentive arms having opposed embrasure portions effective to engage the opposite embrasure areas between adjacent teeth, the spacing between the retentive arms being variable in order for the embrasure portion to clampingly engage said embrasure areas in order to support the guide table in overlying relation to a tooth to be provided with a proximal box, the guide table having spaced opposed buccal and lingual wall guide surfaces disposed transversely of the guide table; and a paralleling member mounted to the guide table for paralleling movement over the guide table in a plurality of directions, the paralleling member including dental burr holding means adapted to receive and dispose a dental burr transversely of the guide table for movement between the buccal and lingual wall guide surfaces during said movement of the paralleling member in order to determine the location of the buccal and lingual walls of a proximal box.

4,177,566

INSOLATION SURVEY DEVICE

Bernard M. Haines, Box 914, Glenwood Springs, Colo. 81601

Filed Dec. 21, 1977, Ser. No. 862,778
Int. Cl.[2] G01C *1/00*
U.S. Cl. 33—1 DD **12 Claims**



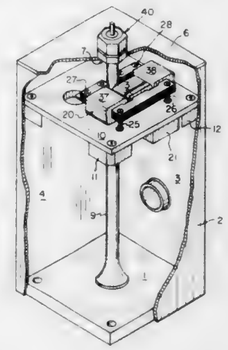
1. An insolation survey device for forming visual representation of the quantity of direct, time-varying exposure of a preselected location to solar radiation comprising means reflecting said radiation for forming a visible, reflected pattern corresponding to said areas of direct radiation, calibrated display sheet means for forming a composite visual image of said calibrations with said visual reflected patterns; direction indicating means for said display sheet and means for leveling said display sheet with respect to the horizontal.

4,177,567

TRACER HEAD

Walter S. Limbach, 2nd, Eighty-four; Jon R. Swoager, and James M. Swoager, both of Imperial, all of Pa., assignors to Automation Equipment Inc., Pittsburgh, Pa.

Continuation of Ser. No. 762,523, Jan. 26, 1977, abandoned. This application Dec. 1, 1978, Ser. No. 965,399
Int. Cl.[2] B43L *13/10;* **H01F** *21/06*
U.S. Cl. 33—23 K **3 Claims**



1. A tracer head comprising a base, a stylus mounted to the base and extending away therefrom for engagement with the edge of a template, means for detecting deflection of the unfastened end of the stylus,

the improvement comprising:

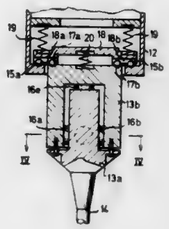
said stylus being an elongate solid cylindrical rod having near its base an integral flared skirt having a smooth and consistent tangency with the cylindrical wall of the stylus, the ratio of the diameter of the base of the skirt to the diameter of the rod being between 4:1 and 1.5:1 and the ratio of the diameter of the base to the axial distance between the base and the point of tangency being between 1:0.75 and 1:2, so that the skirt comprises an integral 360 degree restoring spring for returning the rod after deflection to its null position.

4,177,568

MEASUREMENT HEAD

Walter Werner, Königsbronn; Klaus Herzog, Oberkochen, and Franz Szenger, Königsbronn, all of Fed. Rep. of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Mar. 16, 1978, Ser. No. 887,241
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1977, 2712181
Int. Cl.[2] G01B *7/02*
U.S. Cl. 33—174 L **24 Claims**

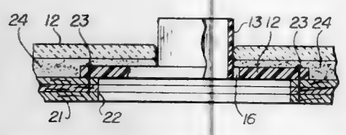


1. A measurement head for determining the coordinates in

space of any points of a workpiece moved relative to the measurement head, comprising a mounting part and a movable part, said mounting part being adapted to be fixedly mounted and having means establishing a fixed reference plane of probe support, whereby a fixed reference axis is also established normal to said plane, said movable part having a probe axis which in a position of rest is aligned with said fixed reference axis, coupling means tiltably and yieldably supporting said movable part with respect to said mounting part and permitting said movable part and its probe axis to tilt with respect to said fixed reference axis, said coupling means including loading means axially operative to normally urge said movable part into said position of rest wherein said movable part is in a precise position in space with respect to said mounting part, said movable part consisting of a base member and a probe member connected to each other via one or more measuring elements which are highly sensitive to tension and compression, said base member being the means whereby said movable part is tiltably and yieldably supported.

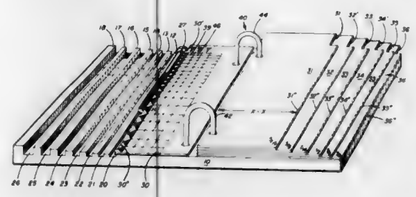
23. Measurement-head structure for mounting a work-contacting probe in a machine for ascertaining coordinate data pertaining to selected surface points on a workpiece, said structure comprising a base member adapted for fixed mounting to a probe-supporting part of the machine and having means establishing a fixed reference plane of probe support, whereby a fixed reference axis is also established normal to said plane, coupling means including a tiltable and yieldable member supported by and with respect to said base member and having an at-rest position determined by said reference plane of probe support, means acting in the direction of said axis and normally loading said coupling member into a precise position and orientation in space with respect to said base member, a work-contactable probe member coupled to said coupling member, said probe member being in alignment with said axis when said structure is in at-rest condition, said probe member extending for probe-to-work contact at axial offset from said plane, and strain-gage means carried by said coupling member and producing an electrical output signal in response to a stress change in said coupling member, whereby said strain-gage means is instrumental in determining precisely such initial workpiece contact by said probe member as to cause a stress change in said coupling member.

4,177,569
TEMPLATE FOR LOCATING HOLES FOR FAUCET AND BASIN IN VANITY-TYPE SINK COUNTERS
John G. Greer, 1028 Alameda, Redwood City, Calif. 90261
Filed Apr. 6, 1978, Ser. No. 894,185
Int. Cl.[2] G01B *1/00*
U.S. Cl. 33—174 G **8 Claims**



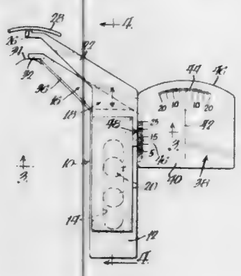
1. A template for use in combination with a sink counter to lay tile on said sink counter or vanity surrounding a first hole in the counter vanity through which a faucet is subsequently to be installed, said template further being used to aid the tile setter in locating the tile and insuring that said first hole is not obstructed by cement and/or tile, said template comprising, a base larger than said first hole and having means associated therewith for permanently securing said base to said counter approximately concentric with said first hole, a cylinder, and means at least temporarily securing said cylinder to said base upstanding from the surface of said base opposite said counter, said base being formed with a second hole substantially smaller than said first hole and approximately concentric with said cylinder.

4,177,570
APPARATUS FOR GAUGING AND PRICING FASTENERS
Allan R. Hewitt, 17 S. Church St., DuBois, Pa. 15801
Filed Apr. 10, 1978, Ser. No. 894,904
Int. Cl.[2] G01B *5/02*
U.S. Cl. 33—174 R **8 Claims**



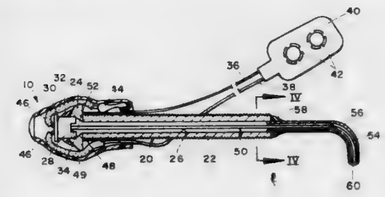
1. Apparatus for gauging and pricing fastening devices, said apparatus comprising:
- a base member that includes an array of elevated portions forming therebetween an array of parallel channels, each of said channels corresponding to a predetermined fastener gauge such that said parallel channels gauge a fastener disposed in one of said parallel channels;
- a plurality of indexing pages that respectively cooperate with a single corresponding parallel channel of said base member to measure the axial length of a fastener disposed in the corresponding parallel channel; and
- means for binding said indexing pages to said base member such that said indexing pages can be selectively turned between first and second positions that oppose said base portion on opposite sides of said binding means, the major exposed surface of indexing pages in one of said positions displaying the price of the fastener in accordance with the measured length.

4,177,571
OPHTHALMIC DEVICE FOR MEASURING VERTEX DISTANCE AND PANTOSCOPIC TILT ANGLE
Gary L. Renier, 3726 Fairway Rd., Fargo, N. Dak. 58102
Filed May 22, 1978, Ser. No. 908,127
Int. Cl.[2] A61B *3/10*
U.S. Cl. 33—200 **5 Claims**



1. An ophthalmic measuring device for determining the vertex distance between the optical centers of the anterior surfaceof the closed eyelid and the posterior spectacle surface of a trial lens mounted in a frame, which device is comprised of a generally planar member having a body portion, a measuring arm connected to said body portion, a second measuring arm, one of said arms including an eyelid contacting tip for engaging the optical center of the closed eyelid, said eyelid contacting tip being flattened and widened in the plane perpendicular to the general plane of said device and the other of said arms including a rounded trial lens contacting tip for engaging the optical center of the posterior spectacle surface, means slidably connecting said measuring arms and permitting relative movement therebetween, said arms being disposed at an obtuse angle relative to said body portion, and a measuring scale and indicating means placed, one with respect to each of said arms, whereby the vertex distance may be read directly from said scale and indicating means when said arms are moved to contact the optical centers of the anterior surface of the closed eyelid and the posterior lens surface, respectively.

4,177,572
LIGHTED SIGHT PIN FOR ARCHERY BOWS
Ted E. Hindes, 7822 Myers Lake Ave., Rockford, Mich. 49341
Filed Jun. 28, 1978, Ser. No. 919,979
Int. Cl.[2] F41G *1/46, 1/34*
U.S. Cl. 33—265 **18 Claims**



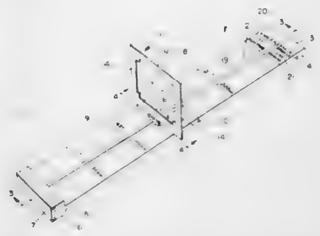
1. A lighted sight pin for use with archery bows comprising a rigid shaft; holding means at one end of said shaft for holding a light source; said shaft and holding means including a continuous passageway extending therethrough; a light source secured at one end of said passageway at least partially within said holding means; voltage applying means connected to said light source for applying an electrical voltage thereto; light-transmitting means extending from said light source, through said passageway and beyond the other end of said rigid shaft for transmitting light from said light source to the end of said light-transmitting means to provide a lighted sight at said end of said light-transmitting means; encapsulating means for covering and protecting said holding means, said light source and portions of said voltage-applying means and shaft; said light source being a light-emitting diode received in an enlarged portion of said passageway in said holding means; said light-emitting diode including a recess aligned with said passageway; said light-transmitting means having one end extending into said recess, a generally rectilinear portion, and an opposite end extending beyond the end of said rigid shaft, said opposite end extending at a right angle to said generally rectilinear portion.

5. A lighted sight pin for use with archery bows comprising a rigid shaft; holding means at one end of said shaft for holding a light source; said shaft and holding means including a continuous passageway extending therethrough; a light source secured at one end of said passageway at least partially within said holding means; voltage applying means connected to said light source for applying an electrical voltage thereto; light-transmitting means extending from said light source, through said passageway and beyond the other end of said rigid shaft for transmitting light from said light source to the end of said light-transmitting means to provide a lighted sight at said end of said light-transmitting means; encapsulating means for covering and protecting said holding means, said light source and portions of said voltage-applying means and shaft; said rigid shaft being threaded on its exterior for securement to a sight-supporting member.

15. A light sight pin for use with archery bows comprising a rigid shaft; holding means at one end of said shaft for holding a light source; said shaft and holding means including a continuous passageway extending therethrough; a light source secured at one end of said passageway at least partially within said holding means; voltage applying means connected to said light source for applying an electrical voltage thereto; light-transmitting means extending from said light source, through said passageway and beyond the other end of said rigid shaft for transmitting light from said light source to the end of said light-transmitting means to provide a lighted sight at said end of said light-transmitting means; encapsulating means for covering and protecting said holding means, said light source and portions of said voltage-applying means and shaft; and a protective tube around said shaft adjacent said holding means to protect said voltage applying means therearound from abrasion.

17. A lighted sight pin for use with archery bows comprising a rigid shaft; holding means at one end of said shaft for holding a light source; said shaft and holding means including a continuous passageway extending therethrough; a light source secured at one end of said passageway at least partially within said holding means; voltage applying means connected to said light source for applying an electrical voltage thereto; light-transmitting means extending from said light source, through said passageway and beyond the other end of said rigid shaft for transmitting light from said light source to the end of said light-transmitting means to provide a lighted sight at said end of said light-transmitting means; encapsulating means for covering and protecting said holding means, said light source and portions of said voltage-applying means and shaft; and a rigid, hollow member extending from said other end of said rigid shaft and having a cross-sectional area smaller than that of said rigid shaft; said light-transmitting means extending through said smaller, hollow member to the free end of said smaller, hollow member whereby said light-transmitting means is protected along its entire length by said rigid shaft and smaller, hollow member with said free end of said smaller, hollow member and the protected light-transmitting means providing a small, lighted sighting tip enabling proper aiming and accuracy while shooting using the sight pin.

4,177,573
VARIABLE ANGLE APERTURE CARD
James D. Boston, III, 565 Chantilly Dr., Sierra Vista, Ariz. 85635
Filed Jun. 7, 1978, Ser. No. 913,460
Int. Cl.[2] G01C *3/00*
U.S. Cl. 33—277 **5 Claims**



1. In a variable angle aperture card for framing a scene to be photographed and determining the best camera equipment required and selection of lens to isolate that view, an elongated flat bar, said bar being divided into at least two sections, said sections being hinged together for folding, an elongated central slot in said bar extending generally end to end thereof, a rectangular viewing aperture card having fixed horizontal and vertical frame members forming a fixed viewing aperture correlating in size to that of available standard photographic print sizes, slide means arranged for sliding movement lengthwise of said slot, said card being hingedly mounted on said slide means and being foldable relative thereto, degree of acceptance and equivalent lens focal length scales removably and longitudinally affixed to the upper face of said bar on

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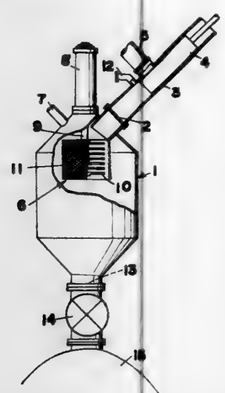
either side of said slot, whereby a photographer may view therethrough to frame the scene and determine from said scales the angle of view for different camera formats and the lens to best photograph the view from the position at which the framing was made.

4,177,574

METHOD AND APPARATUS FOR GRANULATING HYDRATED MATERIALS INCLUDING FOOD STUFFS

Masakazu Kobayashi, Tokyo, and Koh Harashima, Kawaguchi, both of Japan, assignors to Kanesa Miso Kabushiki-Kaisha, Tokyo, Japan

Filed Mar. 13, 1978, Ser. No. 885,796
Claims priority, application Japan, Mar. 12, 1977, 52/27496
Int. Cl.[2] F26B 7/00
U.S. Cl. 34—12 **4 Claims**



1. A method of granulating hydrated materials including food stuffs which comprises;
processing said materials to a paste-like phase having an intermediate moisture content which is higher than the plastic limit of said processed materials, and which falls in the range of approximately 12–40% on a dry basis,
extruding said materials through perforations to form them into strips,
feeding the extruded strips into a vacuum chamber which is kept under a pressure lower than 4 Torr to 0.1 Torr, thereby hardening the extruded strips by means of rapid cooling of the extruded strips and reduction of the moisture content thereof by vacuum evaporation of said moisture content, and
converting the strips to granules of a desired size by subjecting said strips to mechanical shearing forces under a vacuum.

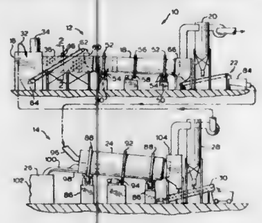
4,177,575

ORGANIC MATERIAL TREATMENT PROCESS

Alfred W. Brooks, St. Thomas, Canada, assignor to Cannon Limited, Hamilton, Bermuda

Division of Ser. No. 834,735, Sep. 19, 1977, Pat. No. 4,137,029.
This application Oct. 30, 1978, Ser. No. 956,139
Int. Cl.[2] F26B 3/04
U.S. Cl. 34—13 **16 Claims**

1. A method of drying and pelletizing organic material such as sewage, the method comprising: introducing the organic material into a rotating louvred drying drum having longitudinal, circumferentially spaced-apart, radially inwardly disposted louvres, said drum having an input section, an output section and a central pelletizing section formed by adjacent portions of the input and output sections; passing heated air through the louvred drying drum input section louvres to dry the material, said air being at a temperature between 500° and 800° F. and at a velocity through the drum between 200 and 400 feet per minute; passing cooling air through the louvred drying drum output section louvres to cool the material; and



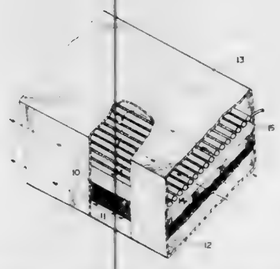
interrupting the flow of heated air and cooling air through the louvres in the pelletizing section by closing the louvres to form a cylindrical rolling surface in the pelletizing section, whereby the organic material is rolled in the pelletizing section to form pellets.

4,177,576

METHOD AND APPARATUS FOR CONDITIONING MATERIAL UTILIZING AIRFLOW CONTROL MEANS

John D. Psaras, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Division of Ser. No. 705,739, Jul. 15, 1976, Pat. No. 4,091,824.
This application Feb. 13, 1978, Ser. No. 877,154
Int. Cl.[2] F26B 3/04
U.S. Cl. 34—33 **17 Claims**



17. A method of conditioning material comprising:
transporting the material on a conveyor along a path, and
directing a stream of conditioned gas at the material through a honeycomb structure coextensive with said conveyor to spread the gas stream evenly across the surface of the conveyor for uniform conditioning of the material.

4,177,577

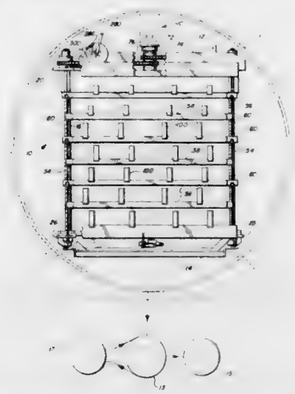
SHELF ARRANGEMENT FOR FREEZE DRYING APPARATUS

Harry L. Bird, Red Hook, N.Y., assignor to The Virtis Company, Inc., Gardiner, N.Y.

Filed May 16, 1978, Ser. No. 906,678
Int. Cl.[2] F26B 13/30
U.S. Cl. 34—92 **7 Claims**

3. In an apparatus having a mechanism to be rotatably driven, an improved driving means comprising:
a base plate;
a motor means mounted on the base plate having an output shaft positioned essentially perpendicular to said base plate;

means for mounting said base plate on the apparatus so that said base plate can pivot about said output shaft;
adjustable limit means mounted adjacent said base plate for limiting the pivoting of said base plate, said limit means including adjustable torque sensing means that senses the torque exerted by said output shaft and causes said motor to cease operation when a predetermined torque is sensed.



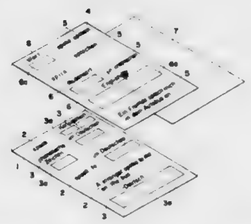
damping means connected to said base plate for absorbing transient forces, the capacity of said damping means to absorb transient forces being directly related to the magnitude of such transient forces, thereby preventing said base plate from being rapidly pivoted in response to transient forces.

4,177,578

MULTI-PAGE PROBLEM AND ANSWER WORKBOOK

Takeshi Yamamoto, Fujinodai-Danchi 1-20-106, Honmachida 3486, Machida-shi, Tokyo, Japan

Filed Dec. 30, 1977, Ser. No. 866,399
Claims priority, application Japan, Mar. 2, 1977, 52/23876[U]
Int. Cl.[2] G09B 3/02
U.S. Cl. 35—9 R **6 Claims**



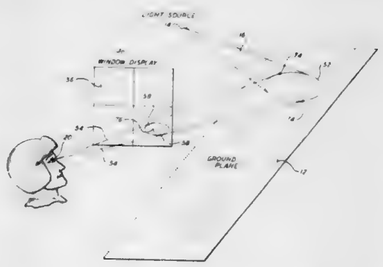
1. A multi-page problem and answer workbook comprising:
a first page having thereon a problem section setting forth a problem to be answered and an adjacent expected answer guide section on which a student may place an expected answer to said problem;
a transparent second page superimposable over said first page, said second page having thereon an answer section setting forth the correct answer to said problem of said problem section on said first page and an adjacent expected problem guide section on which the student may place an expected problem which is correctly answered by said correct answer;
said answer section and said expected problem guide section being positioned on said second page such that when said second page is superimposed over said first page said answer section and said expected problem guide section respectively overlie said expected answer guide section and said problem section of said first page and;
an opaque sheet means, selectively insertable between said first and second pages, for preventing said problem section and said expected answer in said expected answer guide section on said first page from being visible through said second page when said second page is superimposed over said first page;
whereby said expected answer guide section of said first page comprises means for allowing the student to insert an expected answer to said problem of said problem section by using said first page only, said expected problem guide section of said second page comprises means for allowing the student to insert an expected problem which is answered by said correct answer of said answer section by using said second page only, and said correct answer of said answer section may be compared with said expected answer inserted in said expected answer guide section and said problem in said problem section may be compared with said expected problem inserted into said expected problem guide section when said second page is superimposed over said first page.

4,177,579

SIMULATION TECHNIQUE FOR GENERATING A VISUAL REPRESENTATION OF AN ILLUMINATED AREA

David L. Peters, Whitney Point; Arthur P. Schnitzer, Vestal; John R. Trzeciak, Binghamton, and Brain J. Woycechowsky, Vestal, all of N.Y., assignors to The Singer Company, Binghamton, N.Y.

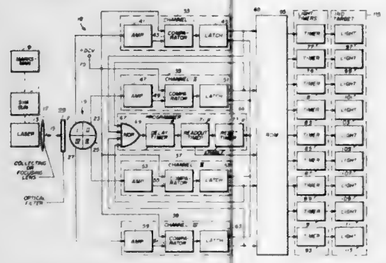
Filed Mar. 24, 1978, Ser. No. 889,683
Int. Cl.[2] G09B 9/08
U.S. Cl. 35—12 N **14 Claims**



1. Apparatus for providing on a viewing surface of a raster scan television display a simulated view from an eyepoint of a changeable illuminated area located on a plane surface where the source of illumination is a cone of light, whose orientation can be varied, whose apex can be located at any distance from said eyepoint and said plane surface, and whose conical surface intersects said plane surface comprising:
a. means for generating first signals representative of changeable relative geometrical relationships between locations and orientations of said plane surface, said eyepoint, and said cone of light;
b. means for generating second signals representative of the position on said viewing surface of a line of sight from said eyepoint through said viewing surface to a plane surface intersection point;
c. a signal processor receiving and combining said first and second signals such that a third signal is generated representative of the location of the line of sight plane surface intersection point relative to a conic section generated by the intersection of the cone of light with the plane surface;

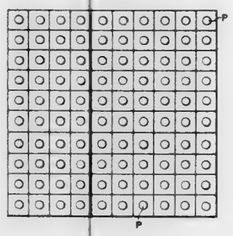
d. a signal comparator responsive to said third signal which determines whether said plane surface intersection point lies within, on, or outside said conic section; and
e. a video processor responsive to said signal comparator for modulation of said raster scan display, whereby the video modulation creates an illuminated area on the viewing surface corresponding to the plane surface intersection point when said point lies within or on the said conic section.

4,177,580
LASER MARKSMANSHIP TARGET
Albert H. Marshall, Maitland, and George A. Siragusa, Winter Park, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jan. 23, 1978, Ser. No. 871,265
Int. Cl.[2] F41G *3/26*; F41J *5/08*
U.S. Cl. 35—25 **19 Claims**



1. A target system for indicating the general area of a radiant energy hit thereon, comprising in combination:
a target having a predetermined indicia mounted thereon;
a plurality of predetermined indicator means mounted on said target, with one thereof mounted at the center of said target, and with the remainder thereof mounted uniformly around the perimeter of said target;
a quartet of sensors, each of which is adapted for producing an electrical signal in response to receiving said radiant energy, and all of which are relatively disposed in a quadrant pattern, the pattern of which is disposed a predetermined distance from said predetermined indicator means mounted at the center of said target;
a quartet of data processing channels effectively connected to the outputs of said quartet of sensors for producing predetermined signals at the data outputs thereof in response to said electrical signals, respectively;
a predetermined programmed read only memory having a quartet of data inputs, an enable input, and a plurality of outputs, with the quartet of data inputs thereof respectively connected to the data outputs of said quartet of data processing channels, and with the plurality of outputs thereof effectively connected to the inputs of said plurality of predetermined indicator means;
a NOR gate, having a quartet of inputs effectively connected to the outputs of said quartet of data processing channels and an output;
an adjustable delay timer connected to the output of said NOR gate;
an adjustable readout timer having a data input, a data output, and an enable output, with the data input connected to the output of said adjustable timer, and the enable output connected to the enable input of said predetermined programmed read only memory for timely enabling said read only memory, so as to effect the reading out of the data stored in said read only memory, thereby effecting the activation of said plurality of predetermined indicator means in correspondence therewith; and
an adjustable reset timer having an input connected to the output of said adjustable readout timer, and an output effectively connected to the reset inputs of said quartet of data processing channels for timely resetting said data processing channels.

4,177,581
DEVICE FOR TEACHING CONCEPTS OF NUMBERS AND MATHEMATICAL PRINCIPLES
Hazel Walker, The Retreat, 107, Heslington Rd., York, England
Filed Aug. 8, 1977, Ser. No. 822,662
Int. Cl.[2] G09B *19/02, 1/10*
U.S. Cl. 35—31 D **8 Claims**



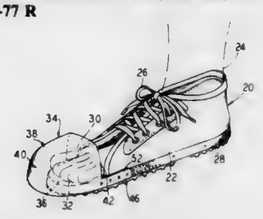
1. A device for teaching concepts of numbers and mathematical principles comprising a base component having a surface visibly divided by lines into a hundred identical unit squares in ten by ten format, and a series of number elements having denominations 1,2,3,4,5,6,7,8,9,10,20,30,40,50,60,70,80 and 90, each of said number elements being dimensioned so that it is adapted to cover as many unit squares on said base component as is represented by that number element, each of said number elements being marked with the number it represents but being free of any line markings indicating the number it represents, and at least some of said number elements being sufficiently transparent to allow said marked unit squares on said base to be visible through said number element when said number elements are placed on said base component, whereby when one of said transparent number elements, other than the element representing the number 1, is on said base component, it is visibly divided into the number of unit squares equal to the number it represents, but when said one transparent element is off said base component, it is not so divided.

4,177,582
SOLE FOR SHOES AND PROCESS FOR THE PRODUCTION THEREOF
Johann Ehrlich, Jr., Schulgasse 3, Krems/Weinzierl, Austria (A-3500)
Filed Jul. 27, 1977, Ser. No. 819,684
Claims priority, application Austria, Jul. 20, 1976, 5336/76
Int. Cl.[2] A43B *13/08*
U.S. Cl. 36—33 **9 Claims**



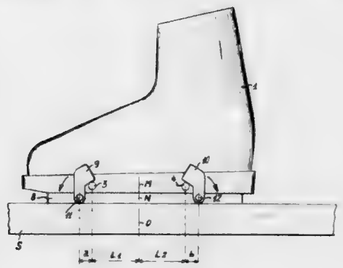
1. A sole construction for shoes comprising separate forward and rearward parts constructed entirely of wood, a flexible intermediate part interconnecting said forward and rearward parts, said intermediate part extending across said sole and being located adjacent the area adapted to be engaged by the ball of a wearer's foot, said intermediate part consisting of foamed polyurethane, containing polyisocyanate, chemically bonded to said wooden parts, said chemical bond forming the sole interconnection between said intermediate part and said forward and rearward parts.

4,177,583
ORTHOPEDIC SHOE WITH FOREFOOT PROTECTIVE GUARD
Andrew W. Chapman, 5711 Woodland Dr., Western Springs, Ill. 60558
Filed Apr. 13, 1978, Ser. No. 895,959
Int. Cl.[2] A43C *13/14*; A43B *7/00*
U.S. Cl. 36—77 R **10 Claims**



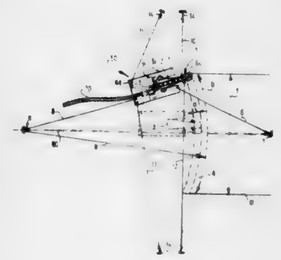
1. An orthopedic shoe for postoperative wear having a generally rigid sole and a light weight upper portion with an open front for the forefoot of a patient to extend therethrough wherein the improvement comprises:
a semi-rigid protective guard for the forefoot including:
a domical cover member having a vaulted forward portion and a pair of side portions defining a hollow safety zone which is adapted to extend about and to overlie the distal portion of a patient's foot in fixed, spaced relationship thereto,
a generally horizontal abutment means comprising an abutting end surface, depending from said forward portion and extending rearwardly therefrom into abutting engagement with a forward contoured surface of said rigid sole, and
a mounting means extending rearwardly of said cover member for securing said protective guard to said orthopedic shoe in said fixed, spaced relationship relative to the distal portion of said patient's foot.

4,177,584
SKI BOOT AND BINDING ASSEMBLY
Jean J. A. Beyl, 10, Bd Victor-Hugo, 58000 Nevers, France
Filed Mar. 22, 1978, Ser. No. 889,001
Claims priority, application France, Mar. 28, 1977, 77 09159
Int. Cl.[2] A43B *5/04*; B62B *0/00*
U.S. Cl. 36—117 **7 Claims**



1. A ski-boot and ski-binding assembly for use with skis provided with a mounting mark, comprising in combination, transversely extending anchoring means carried by said ski boot, said means having a pair of projecting engaging surfaces on either side of the boot, longitudinally spaced on either side of the substantially longitudinal center of the boot, a casing mounted on said ski intermediate the boot and ski, said casing bearing a reference mark adapted to be aligned with a mounting mark on said ski, and a pair of retaining members on each side of said casing fixedly longitudinally spaced on each side of said reference mark and adapted releasably to engage the longitudinally spaced projecting surfaces of said anchoring means, whereby the center of said ski boot is aligned with the mounting mark on said ski.

4,177,585
METHOD AND APPARATUS FOR DREDGING
Jan de Koning, Amsterdam; Jan Steyn, Nieuw-Vennep, both of Netherlands, assignors to Ballast-Nedam Groep N.V., Amsterdamse Ballast Bagger en Grond (Amsterdam Ballast Dredging) B.V., Amstelveen and Scheepswerf en Machinefabriek "De Liesbosch" B.V., Nieuwegein, both of Netherlands
Filed Feb. 8, 1978, Ser. No. 876,173
Int. Cl.[2] E02F *3/90*
U.S. Cl. 37—67 **10 Claims**



1. The method of dredging which comprises the steps of:
(a) moving a floating body laterally, while dredging material with a dredging head carried by the body, by anchoring side ropes at points laterally spaced from and on opposite sides of said body and hauling in one of said side ropes while paying out the other, whereby the dredger head traverses a dredging path;
(b) locating said body longitudinally during step (a) by a longitudinal rope connected with the rear of the body and anchored at a point spaced rearwardly from the body and by at least one further longitudinal rope connected with the bow of the body and anchored at a point spaced forwardly from the body, and applying tension to said longitudinal ropes; and
(c) controlling said dredging path to follow a predetermined path by sensing the tension in one of said longitudinal ropes and maintaining the sensed tension at a predetermined value during the lateral movement of the body in step (b).

4,177,586
YELLOWING RESISTANT LABEL COMPRISING A POROUS POLYAMIDE LAYER CONTAINING A PLASTICIZER
Shigeru Ogawa, Kyoto; Kenzi Uemura, Kameoka, and Masao Tanida, Kyoto, all of Japan, assignors to Dynic Corporation, Kyoto, Japan
Filed Aug. 31, 1977, Ser. No. 829,212
Claims priority, application Japan, Jun. 3, 1977, 52-65902
Int. Cl.[2] B05D *1/36*; B32B *5/24, 5/28, 31/24*
U.S. Cl. 40—2 R **8 Claims**

1. A label which is resistant to rubber-induced yellowing which comprises a fabric base containing a porous nylon resin layer formed on the surface thereof, said porous nylon resin layer being prepared by dissolving a nylon resin in a solution of

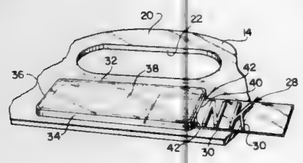
calcium chloride in methanol and adding thereto 7.5 to 17.5 PHR of a plasticizer selected from the group consisting of a carboxylic acid ester plasticizer and a sulfonamide plasticizer and dipping the nylon coated fabric base into water to leach out the methanol and calcium chloride to form said porous layer and drying the resultant composite.

4,177,587

NAME PLATE ASSEMBLY FOR TOTE BAG AND THE LIKE

Mac Dorsen, Scarsdale, and Philip A. Saltzman, Brooklyn, both of N.Y., assignors to Stupell Industries, Inc., Providence, R.I.

Filed Jul. 27, 1977, Ser. No. 819,682
Int. Cl.[2] G09F *3/20*
U.S. Cl. 40—16 **3 Claims**



1. An article having identifying indicia thereon, said article including means for releasably receiving an elongated generally thin material strip, said strip having a front face adapted for the receipt of marking indicia adhered thereto, said receiving means in turn attached to said article whereby a plurality of material strips may be alternatively received by said receiving means so as to modify the indicia of said article, said receiving means adapted to contact said strip at least at two longitudinally spaced locations thereof, said marking indicia positioned on said strip between said locations, said article receiving means comprising a substantially enclosed substantially rigid pocket outwardly projecting from said article, one side thereof open for receipt of said strip therein for underlying relationship with the outer face of said pocket, said outer face at least translucent so that at least the indicia on said strip is visible therethrough, said strip being flexible and having its opposed ends normally upwardly curled, said pocket having a top wall, a bottom wall, and a side wall, said walls outwardly extending from said article and connected to said outer face so as to space said outer face from said article, an (said) open side opposed to and longitudinally spaced from said side wall and defining a narrow slot for receipt of said strip said slot having a bottom portion adjacent said article, said slot being of sufficient width at said bottom portion for the uninterrupted receipt of said strip but narrower than the width of said strip at upper portions thereof whereby said normally upwardly bent portions of said strip end proximal said slot (will) abut said upper portions thereof so as to retain said strip within said pocket, said slot upper portions being formed by a pair of opposed bosses inwardly extending into said slot from top and bottom walls of said pocket.

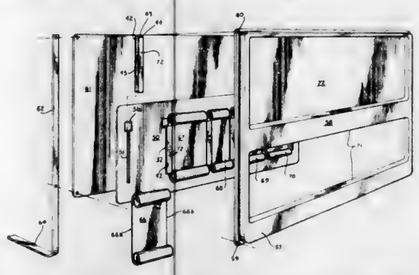
4,177,588

INDICATING DEVICE

James L. Gebhardt, Roswell, and Carlos L. Sanders, Atlanta, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Apr. 24, 1978, Ser. No. 899,360
Int. Cl.[2] G09F *11/21*
U.S. Cl. 40—16.4 **11 Claims**

1. An indicating device comprising a substantially flat base plate, an elongated slot formed in said base plate, a semirigid elongated rib having a central axial strut and a pair of parallel elongated rib mounting grooves formed in said rib, the length of said rib being substantially equal to the length of said slot, said grooves being disposed on opposite sides of said strut, said strut being of a width somewhat less than the width of said slot, and the width of said grooves being somewhat greater than the



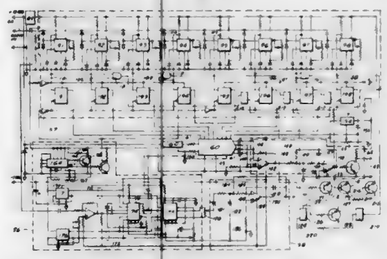
thickness of said base plate whereby said rib is slidable longitudinally in said slot with the edges thereof disposed in said grooves.

4,177,589

THREE-DIMENSIONAL ANIMATED FACIAL CONTROL

Alvaro J. Villa, Northridge, Calif., assignor to Walt Disney Productions, Burbank, Calif.

Filed Oct. 11, 1977, Ser. No. 841,002
Int. Cl.[2] G09F *27/00*
U.S. Cl. 40—457 **13 Claims**



1. An artifically animated figure comprising:
a replica of a face having three-dimensional facial features formed of a flexible material and having remotely actuable concealed means for manipulating the jaw, concealed means for rounding the mouth, concealed means for stretching the mouth and concealed means for drawing the lower lip inward relative to the upper lip, and
audio transducing means for generating an electrical signal of variable frequency components proportional to the frequency components of an audible input and coupled to said concealed means for actuating selected combinations of said concealed means as controlled by said electrical signal to produce animated movements of said facial features corresponding to facial movements of an individual originating said audio input.

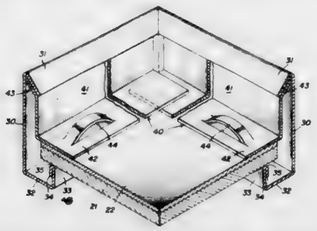
4,177,590

PICTURE FRAME ASSEMBLY

Lawrence P. Tushner, and Walter J. Krol, both of Chicago, Ill., assignors to Intercraft Industries Corporation, Chicago, Ill.

Filed Sep. 11, 1978, Ser. No. 941,002
Int. Cl.[2] G09F *1/12*
U.S. Cl. 40—156 **15 Claims**

1. A frame assembly for displaying a picture or the like and comprising a frame having a pair of end frame members and a pair of side frame members, each of said frame members including an outside wall having a rear and a front, a rear wall on the rear of said outside wall and being inclined inwardly and forwardly therefrom, a front lip on the front of said outside wall and extending inwardly therefrom, and an inside wall on the inside of said front lip and extending rearwardly therefrom, the rear of said inside wall being located forwardly of the front of said rear wall and defining a ledge for means including the picture; and at least two retaining strips respectively associated with two of said frame members, each of said retaining strips including a side wall having a front and a rear, a flange on the



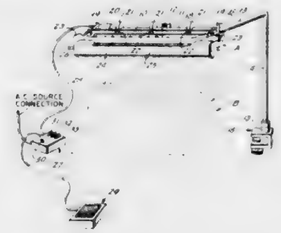
front of said side wall and extending inwardly therefrom, and a tongue on the rear of said side wall and being inclined outwardly and rearwardly therefrom, each of said retaining strips being applied by inserting its tongue in the space between the associated outside and rear walls and then pushing said retaining strip toward the associated outside wall until the associated flange rests on the rear of the means.

4,177,591

COPY HOLDER

John J. Thompson; Paul D. Gorman, both of New York, N.Y., and Patrick Dowd, Paramus, N.J., assignors to Pres-To-Line Corporation of America, New York, N.Y.

Filed Feb. 28, 1978, Ser. No. 882,161
Int. Cl.[2] B41J *11/36*
U.S. Cl. 40—343 **11 Claims**
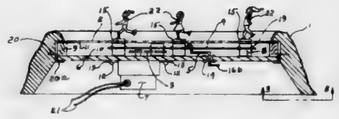


1. In a data-sheet handling copy holder for use as an adjunct to a typewriter or other operator-indexed data machine, the copy holder comprising a copy holder head, a platen having a shaft journaled in said head, pressure means carried by said head for coacting with the platen to hold a data sheet therebetween, and drive means for periodically incrementally advancing the angular position of said platen shaft, said drive means comprising a positive-displacement pulse-operated motor having an output shaft coupled to said platen shaft and producing an incremental angular output-shaft advance which is directly proportional to the time duration of an input control-pulse signal, and control means for said motor, said control means comprising pulse-generator means operatively connected to said motor for supplying a control-pulse signal of predetermined duration, the improvement wherein said control means includes selector-switch means providing a selected one of first and second selectively available control inputs to said pulse-generator means and respectively determining first and second control-pulse signal outputs of predetermined first and second time duration, and push-button means operative upon said generator means for initiating the production of a pulse of thus-selected duration.

4,177,592

MINIATURE ANIMATED DISPLAY

Mildred R. Ruck, Bethel Park, Pa., assignor to Ruck Engineering, Inc., Bethel Park, Pa.

Filed Oct. 26, 1977, Ser. No. 845,616
Int. Cl.[2] G09F *19/00*
U.S. Cl. 40—426 **10 Claims**



1. An animated display comprising:
a base;
a rigid member disposed within said base;
a first arm rotatably connected at one end to said rigid member;
a second arm, one end of said second arm rotatably connected to said rigid member and the other end of said second arm rotatably connected to said base;
rotating means for rotating said first arm fixed to one end of said first arm;
at least one plate magnet fixed to said rigid member such that at least a portion of said plate magnets extends above said rigid member;
a plate attached to said base above said plate magnets;
at least one animated figure;
at least one animated figure on the plate and above a plate magnet; said animated figure having a magnet attached to it such that when each of said figure magnets is placed on said plate in proximity to each of said plate magnets and said rotating means rotates said first arm, said figure magnets will become magnetically coupled to said plate magnets through said plate and said figures will be moved across said plate.

4,177,593

DEVICE HAVING INDICIA ANNOUNCING AN EVENT

James E. Lockey, 4912 Upton Ave. S., Minneapolis, Minn. 55410

Filed Feb. 1, 1978, Ser. No. 874,341
Int. Cl.[2] G09F *3/00, 23/06*
U.S. Cl. 40—488 **5 Claims**



1. A device for announcing an event comprising in combination:
(a) an edible item having letter indicia thereon which includes as part of the indicia the letters "SHE,"
(b) a walled sleeve having an opening in the wall thereof of a size which when positioned on the item exposes only the letters "SHE" of the indicia,
(c) said sleeve having complementary indicia adjacent said opening whereby the only indicia appearing relative to the item is the complementary indicia and the letters "SHE."

4,177,594

FISHING ROD ATTACHMENT

Chin K. Kim, Chicago, Ill., assignor to Bong K. Kim, Melrose Park, Ill., a part interest

Filed Mar. 16, 1978, Ser. No. 887,154
Int. Cl.[2] A01K *97/00*
U.S. Cl. 43—15 **8 Claims**

1. In a fishing device adapted to be attached to a fishing rod

having a fishing line connected at one end to the rod and at the other end to a fishhook, the combination comprising: an outer elongated member adapted to be attached toa fishing rod in parallel disposition thereto; an inner member movably mounted within said outer member; hook means mounted on said inner member and adapted to be attached releasably to the fishing line; main spring means for urging resiliently said members to an initial position; latching means for fixing releasably said members in a set position against the force of said main spring means and for freeing the two members relative to one another in response to a force applied to said hook means via the fishing line so that said members return abruptly under the



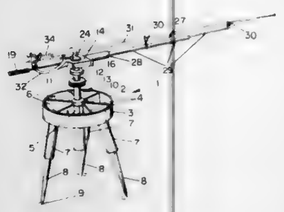
force of said main spring means to their initial position, thereby jerking on the fishing line to set the fishhook in place to catch a fish; wherein said hook means includes a tubular member having a backwardly inclined slot therein and having a spring loaded hook mounted on a block slidably mounted therein for receiving loosely an intermediate portion of the fishing line extending into the interior of said tubular member within said slot, push rod means for moving slidably said block to move said hook to a position out of alignment with said slot to enable the intermediate portion of the fishing line to be inserted into said slot and subsequently thereto when the force is applied to the line, to release the line from the fishing device.

4,177,595

PORTABLE FISHING ROD HOLDER AND STAND

Pyong H. Chon, 921 Citron - #2, Anaheim, Calif. 92805

Filed Jun. 27, 1978, Ser. No. 919,673
Int. Cl.[2] A01K *97/10*
U.S. Cl. 43—21.2 **9 Claims**



1. A fishing rod holder and stand for supporting in fishing position a fishing rod and reel comprising a circular tray with an upstanding side wall and a plurality of open compartments therein, removable spaced legs depending from said tray, a centrally disposed tubular hub in said tray having an upright tubular post removable therein, an inner post member sleeved within said post, adjusting means on said tubular post for preventing relative movement therebetween, a flat generally horizontal reel supporting plate formed with downwardly depending ring means, and circular boss means on said inner post member interfitting in said ring means, handle rod means projecting from said ring means for relatively and tiltably adjusting said ring and boss means, an elongated supporting pole mounted in and projecting forwardly from said flat plate, a rearwardly and upwardly extending U-shaped bracket means on said plate for receiving and supporting the handle end of a fishing rod, and spaced brackets on said elongated supporting pole for receiving and supporting the forward end of the fishing rod whereby the latter is supported in fishing position with the reel thereof supported by said reel supporting plate.

4,177,596

APPENDAGE FOR A FISHHOOK

John P. Dillow, 1906 Springbranch, Arlington, Tex.

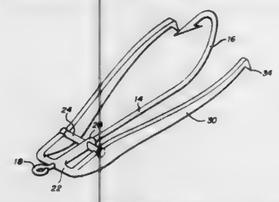
Filed Feb. 21, 1978, Ser. No. 879,243
Int. Cl.[2] A01K *83/02*
U.S. Cl. 43—36 **21 Claims**

18. An appendage for combination with a fishhook, said fishhook having an elongated shank with a bight at one end and an eye at its other end, comprising:

(a) an anchor member rigidly attached to the shank near the eye thereof;

(b) a pair of independently operable torsion members extending radially outwardly from the anchor member, with said torsion members lying on opposite sides of the shank and in a plane which is approximately perpendicular to the plane formed by the shank and the bight, and said plane being approximately transverse to the longitudinal axis of the shank;

(c) a cantilevered arm permanently connected to the distal end of each of the torsion members, and each arm having a relaxed position in which it forms a substantial angle with respect to the hook's shank at such time as its associated torsion member is relaxed, and each of said arms having a cocked position in which it is much closer to the



shank than in its relaxed position, with the cocked position of each arm being established by imparting torsion to its associated torsion member; and

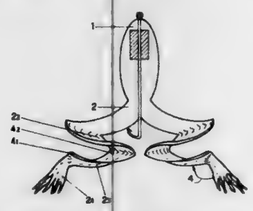
(d) means for temporarily holding individual ones of the two cantilevered arms in a cocked position, with said means including an element which is singularly associated with each one of the cantilevered arms, with each element being rigidly fixed to the shank at a position intermediate the torsion member and the bight of the hook, and said holding means being responsive to movement of a cantilevered arm within a fish's mouth for releasing said arm such that the potential energy in a torsion member may be recovered and an associated arm returned to its relaxed position, whereby the fish will have more difficulty in dislodging a hook with relaxed arms than it had in swallowing a hook with cocked arms.

4,177,597

FISHING LURE SIMULATING LIFELIKE MOVEMENT

Robert C. Thomassin, 20, rue Pasteur, Fontenay sous Bois, France

Filed Apr. 21, 1977, Ser. No. 789,692
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.3 **5 Claims**



1. A fishing lure capable of simulating the lifelike swimming motion of aquatic animals comprising:

a main body portion having an axis of symmetry;

at least two movable members formed of flexible, resilient material and projecting from said body;

each of said members comprising at least three rectilinear shaped segments, each of which has a width greater than its thickness, and all of the segments of each member being oriented so that in the initial non-swimming position of th lure, the segments all lie with their widths in the same plane and form angles with one another,

a first segment of each said member connected at one end to said body and extending at an acute angle away from a rearward extension of the axis of symmetry of said body,

a second segment of each said member connected at its one end to the other end of said first segment and extending towards the said rearward extension of the axis of symmetry at an acute angle with respect to said rearward extension;

a third segment of each said member connected to the other end of said second segment and extending forward toward said body in a direction substantially parallel with the said rearward extension of the axis of symmetry; and

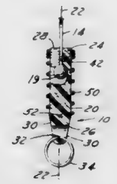
said members, when the lure is placed in a body of water and subjected to the pull of a fishing line to which the lure is attached, exhibiting lifelike swimming motion of aquatic animals due to the action of a continuous stream of water caused by the pull of the lure through the water whereby the segments of each member resiliently deviate from their initial angled positions, thereby changing the angle between each segment and the relative position of the plane of each segment.

4,177,598

FISHING LURE HOOK UP SWIVEL

Kenneth A. Jolley, 9318 A Maryland St., Wurtsmith AFB, Mich. 48753

Filed Apr. 27, 1978, Ser. No. 900,341
Int. Cl.[2] A01K *91/04*
U.S. Cl. 43—42.49 **11 Claims**



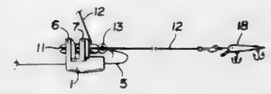
1. A hook up swivel for coupling a ball-like element provided on one end of a fish line to a fish lure whereby the lure can rotate relative to the line, said hook up swivel comprising an elongated generally solid body which is of generally cylindrical configuration, said body having an axis and a pair of end portions, said body being made from a hard plastic material, said body having adjacent one end portion a generally flat surface through which said axis extends and which is perpendicular thereto, the other of said end portions having opposing flat tapered surface areas on opposite sides of said axis, an outwardly opening ball recess in said body which is spaced from said flat surface and intersects said axis, a bore provided in said body which extends from said flat surface along said axis to said recess, a slot in said body intersecting said bore throughout its length and also extending from said flat surface to said recess, said ball recess forming a receiver for the ball-like element and said slot forming an entrance to said bore for the fish line, an aperture extending through said body and said flat tapered surface areas, a ring-like element extending through said aperture and to which the fish lure is adapted to be attached, and closure means carried by said body and adapted for retaining the ball-like element and line in said recess and bore respectively to permit the fish lure to rotate relative to the line, said closure means being in the form of a retractable coil spring which is sleeved over said body and overlies said recess and said slot, said coil spring having one end anchored to said body, said spring being adapted to retain the ball-like element and the line in said recess and said bore respectively.

4,177,599

DOWNRIGGER RELEASE DEVICE

Alfred Pettersen, 345 Foul Bay Rd., Victoria, British Columbia, Canada

Filed Feb. 15, 1978, Ser. No. 878,185
Int. Cl.[2] A01K *91/00*
U.S. Cl. 43—43.12 **2 Claims**



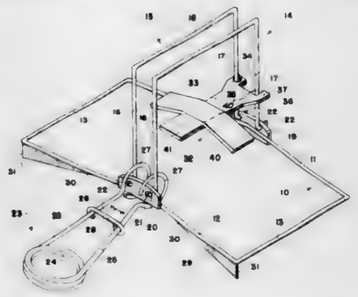
1. A downrigger release device for use in deep water fishing with a downrigger line comprising an elongated body, a passage in said body for fixedly receiving a connecting line for connecting one end of the body to the downrigger line; a first arm extending outwardly from one side of the body; an aperture in said arm, the longitudinal axis of said aperture being substantially parallel to the longitudinal axis of the body; a pin releasably insertable into said aperture; a slot in one end of said pin for receiving a fishing line, whereby the fishing line is retained in said arm when the pin is inserted into said aperture, the fishing line being releasable from the body when force is applied to the fishing line; and connector means on the other end of said pin for attaching the pin to the connecting line and to the other end of said body, whereby the body, connecting line and pin form a single unit connected to the downrigger line.

4,177,600

ANIMAL TRAP

Reino Torkko, P.O. Box 478, Longlac, Canada (P0T 2A0)

Filed Jan. 16, 1978, Ser. No. 869,607
Int. Cl.[2] A01M *23/30, 23/26*
U.S. Cl. 43—82 **6 Claims**



1. An animal trap comprising in combination a lower jaw assembly, an upper jaw assembly pivoted to said lower jaw assembly and movable from a set position substantially perpendicular to said lower jaw assembly, to a sprung position substantially superimposed upon said lower jaw assembly and vice versa, spring means operatively connected between said upper and lower jaw assemblies normally urging said upper jaw assembly towards the sprung position, and a trigger assembly for said upper jaw assembly, said trigger assembly maintaining said upper jaw assembly in the set position against the pressure of said spring means, when in the set position, and releasing said upper jaw assembly to the sprung position when disengaged from said upper jaw assembly, said upper jaw assembly including a pair of upper jaws each having lower ends and pivoted by said lower ends thereof substantially centrally of

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said lower jaw assembly and lying in substantially spaced and parallel relationship when in said set position, each of said upper jaws comprising an open rectangular frame, each of said open rectangular frames constituting said upper jaws including a pair of spaced and parallel side members including outer ends and a transversely extending end member extending between the outer ends of said side members, said trigger assembly including a main, substantially rectangular, member loosely pivoted at one longitudinal side thereof and adjacent one end thereof, to one of said side members of one of said open frames, a lug formed on said one end of said main member of said trigger assembly on the other longitudinal side member thereof and detachably engaging with the corresponding one side member of the other of said open frames when in the set position, and a trigger plate extending downwardly at right angles from said one end of said main member and engaging the corresponding one side members of said rectangular frames, and a secondary member extending from each side of said main member of said trigger assembly intermediate the ends thereof and substantially at right angles thereto, said spring means urging said corresponding side member into detachable locking engagement with said lug.

4,177,601

FLOATED BAG TRAP

Roger H. Morton, 314 Sand Dune La., Holden Beach, Brunswick County, N.C. 28462

Filed Feb. 21, 1978, Ser. No. 879,249
Int. Cl.[2] A01K 69/06
U.S. Cl. 43—102 **2 Claims**



1. A trap for fish, crabs and the like, characterized by a substantial portion thereof being flexible and collapsible for increasing capacity while facilitating storage and handling comprising:

(a) a substantially rigid base adapted to rest on an underwater floor, said base defining a compartment;

(b) buoyant flexible enclosure means secured to said base and communicatively cooperating with the compartment defined by said base when under water to form an enclosure of substantially greater volume than said compartment, said buoyant flexible enclosure means comprising a net and buoyancy means secured to said net;

(c) bait holding means carried by said base and disposed within the compartment thereof;

(d) entry means in said enclosure for entrance of fish, crabs and the like and comprising a muzzle carried by said base and a hole in said net communicatively cooperating with said muzzle; and

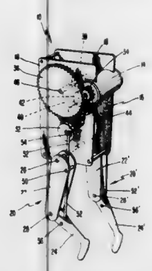
(e) trap location and retrieval means attached to said enclosure whereby the trap may be left under water and later retrieved.

4,177,602

AUTOMATED MECHANISM FOR IMPARTING MOVEMENT TO LIMBS OF A MECHANICAL TOY

Eun S. Choi, 315-503, Jamsil-3-dong, Gangnam-ku, Seoul, Rep. of Korea

Filed Jul. 26, 1978, Ser. No. 928,285
Int. Cl.[2] A63H 11/00
U.S. Cl. 46—150 **7 Claims**



1. An automated mechanism for imparting life-like movement to limbs of a mechanical toy comprising:

(a) a motor;

(b) a gearbox;

(c) cam means rotatably mounted to the gearbox;

(d) gear mechanism rotatably mounted to the gearbox and operatively connected to the motor and cam means for rotatably moving the cam means in response to activation of the motor;

(e) at least a pair of limbs, each limb having a first member pivotally mounted to form joints at one end to the gearbox and at the other end to an opposing end of a second member;

(f) first and second fulcrum pins mounted at the said one end of each first limb member adjacent the gearbox and forming a space between said fulcrum pins;

(g) a connecting rod for each limb to impart movement thereto in response to rotation of the cam means, the rod having one end pivotally connected to the cam means and the other end to the second member at a distance from the joint formed with the first member, and wherein each rod is positioned for movement within the space formed between the first and second fulcum pins, the pins acting as fulcrums for the rod to transfer a predetermined movement to the second member when the rod engages the pins.

4,177,603

PLANT DESTRUCTION USING ELECTRICITY

Willis G. Dykes, Vicksburg, Miss., assignor to Lasco, Inc., Vicksburg, Miss.

Filed Dec. 8, 1977, Ser. No. 859,110
Int. Cl.[2] A01M 21/00
U.S. Cl. 47—1.3 **28 Claims**

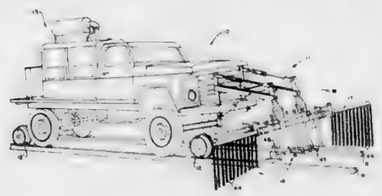
1. A machine for destroying plant growth around and between a pair of railroad tracks, said machine comprising:

a vehicle having at least two sets of two wheels adapted to ride on said tracks, the wheels of each set electrically isolated from each other,

a source of high-voltage electricity mounted on and movable with said vehicle,

means for connecting said high-voltage source of electricity to ground, said means comprising one wheel of at least one of said wheel sets,

means for destroying plants around and between the railroad tracks, said means including a generally horizontally disposed rod mounted on said vehicle, plant contacting means operatively connected to said rod, and means for operatively electrically connecting said plant contacting means to said high voltage source of electricity, said plant contacting means for transferring electricity from said



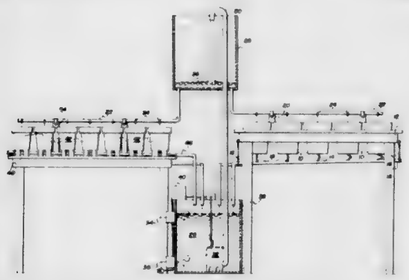
high voltage source to ground through plants contacted thereby.

4,177,604

DRIP-ACTION HYDROPONIC GARDEN

David L. Friesen, 3667 35th St., San Diego, Calif. 92104

Filed Nov. 11, 1977, Ser. No. 850,779
Int. Cl.[2] A01G 31/00; B67D 5/08
U.S. Cl. 47—62 **2 Claims**



1. A hydroponic gardening system comprising:

(a) a plurality of plant pots, each having a central drain hole in the bottom thereof and being capable of holding root-engaging solids;

(b) said pots each having a fluid receiving port and a drain nipple projecting from the bottom thereof; said drain nipple end comprising a stub pipe having an orthogonally related collar on one end thereof, said pipe being inserted through the hole in said pot from the inside such that said collar seals same;

(c) a drip line operative to drip hydroponic liquid in said ports;

(d) a drain pipe having a plurality of openings to receive said drain nipples from said pots; and

(e) means to deliver liquid received by said drain pipe to said drip line.

4,177,605

DEVICE FOR DRIVING PANELS IN CONVEYANCE, ESPECIALLY HORIZONTALLY-SLIDING WINDOWS IN AN AUTOMOBILE

Robert Cherbourg, Rueil Entree Rnur; Jean-Pierre Falluel, Pierrelaye Entree Raur, and Michel Ménard, Beynes Entree Rnur, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Feb. 22, 1978, Ser. No. 880,177
Claims priority, application France, Feb. 22, 1977, 77 05013
Int. Cl.[2] E05C 7/06
U.S. Cl. 49—98 **7 Claims**

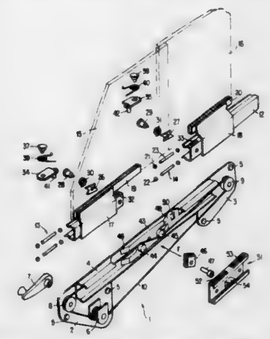
1. A device for driving sliding panels in a plane comprising: a pair of movable panels;

a fixed slide bar;

a carriage slidably disposed on the fixed slide bar;

a motor slide bar connected to the carriage and capable of sliding with the carriage on the slide bar;

a pair of supporrt slide bars slidably disposed on the fixed slide bar, each support bar having a latch selectively



engageable by said motor slide bar and independently supporting one of the panels for back and forth movement; and

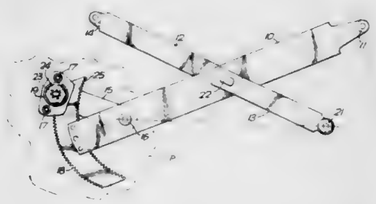
crank means for driving the carriage to cause engagement of the motor slide bar with a latch of one of the support slide bars to drive the panel supported by the one of the support slide bars.

4,177,606

REGULATOR ASSEMBLIES

Philip S. Jeavons, and Sidney E. Fisher, both of Birmingham, England, assignors to Wilmot-Breeden Limited, Birmingham, England

Filed Aug. 31, 1977, Ser. No. 829,580
Claims priority, application United Kingdom, Aug. 31, 1976, 36041/76
Int. Cl.[2] E05F 11/44
U.S. Cl. 49—351 **4 Claims**



1. A vehicle window regulator assembly comprising two pivotally interconnected lifting arms acting between a window and a door panel of the vehicle in the manner of a scissors linkage, a panel plate attached to the door panel by a plurality of spaced fasteners one of which provides a pivotal interconnection between the panel plate and one of the lifting arms, a toothed segment carried by an end portion of said one lifting arm, which end portion is sandwiched between the panel plate and the door panel, and a pinion carried by the panel plate in mesh with the teeth of said segment whereby rotation of the pinion serves to effect pivotal movement of said lifting arm relative to the panel plate and thus, in use, opening or closing movement of the window.

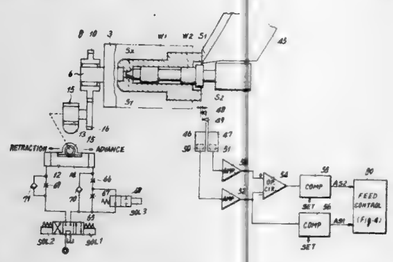
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4,177,607

END SURFACE MACHINING APPARATUS FOR A MATCHING WORKPIECE

Kikujiro Toda, Chita, Japan, assignor to Toyoda-Koki Kabushiki-Kaisha, Aichi, Japan

Filed Feb. 1, 1978, Ser. No. 874,250
Claims priority, application Japan, Feb. 28, 1977, 52/21095
Int. Cl.² B24B *49/04*
U.S. Cl. 51—165 R **6 Claims**



1. An apparatus for machining an end surface of a first workpiece in a state that a second workpiece is inserted into said first workpiece and is axially positioned relative thereto with an engagement surface thereof being seated on a seat surface of said first workpiece, comprising:

a support member;

a work spindle rotatably carried on said support member for supporting said first and second workpieces;

a tool support for carrying a tool;

feed means for relatively moving said support member and said tool support toward and away from each other in an axial direction of said work spindle;

a first in-process gauge having a feeler engageable with said end surface to be machined of said first workpiece on said work spindle;

a second in-process gauge having a feeler engageable with a reference surface of said second workpiece on said work spindle, said reference surface being spaced from said engagement surface in said axial direction of said work spindle;

feed control means responsive to respective measurement output signals from said first and second in-process gauges for calculating the size difference of said end surface in process relative to said reference surface and for controlling said feed means upon the coincidence of said size difference with a set value being present therein;

a chuck provided on one end of said work spindle for clamping only said first workpiece on said work spindle;

contact establishing means for establishing a close contact of said engagement surface of said second workpiece with said seat surface of said first workpiece during measurement by said first and second in-process gauges, said chuck being operable independently of said contact establishing means for ensuring reliable clamping of said first workpiece.

4,177,608

FINISHING APPARATUS EMBODYING IMPROVED SEAL AND METHOD

Gunther W. Balz, Kalamazoo, Mich., assignor to Roto-Finish Company, Inc., Kalamazoo, Mich.

Filed Jan. 16, 1978, Ser. No. 869,469
Int. Cl.² B24B *31/00*
U.S. Cl. 51—163.2 **26 Claims**

1. Apparatus for finishing parts or workpieces by attrition with loose, comminuted, granular, or particulate solid finishing material comprising relatively large finishing chips in the presence of a liquid vehicle, which includes:

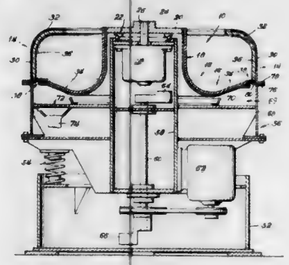
a finishing chamber having a containing surface comprising an outer upstanding wall and a bottom, said upstanding wall and said bottom being symmetrically arranged about a common axis and being relatively rotatable about said axis in order to impart motion to the contents of said chamber for finishing of said parts, and means for causing such relative motion,

characterized in that

said wall and said bottom have closely-spaced apposed surfaces and a resilient seal having corresponding apposed elements therebetween,

the apposed elements of said seal being in closely-spaced or touching relationship and

the surface of at least one of said apposed seal elements being irregular, thereby providing communication between said chamber and the exterior,



said irregular surface being adapted to impart a swirling or turbulent motion to the liquid vehicle passing through the seal by means of said surface irregularities, thereby retarding the rate of outflow of liquid vehicle from the finishing chamber so as to enable better cooling and cleansing of the finishing reaction mass during retention of the liquid vehicle within said finishing chamber, and better cooling and lubrication of the said sealing surfaces during travel of the liquid vehicle to the exterior upon being subjected to a sufficient liquid pressure head; and

said spacing and irregularities being of a size sufficient to permit flow from the interior to the exterior of said finishing chamber of liquid vehicle therein, including "fines" which may be entrained therein, when placed under a head of liquid pressure developed by means of said relative rotation of said upstanding wall and said bottom with respect to each other, but insufficient to permit passage to the exterior of said workpieces and finishing chips.

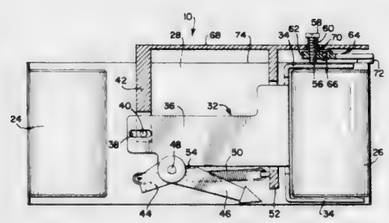
4,177,609

AUTOMATIC BELT CENTERING DEVICE

Stephanus J. Rameckers, Terheijden; Peter Wanninkhop, Breda, and Antonie J. Moolenaar, Dorst, all of Netherlands, assignors to Skil Corporation, Chicago, Ill.

Filed Jul. 12, 1978, Ser. No. 924,049
Int. Cl.² B24B *23/06*
U.S. Cl. 51—170 EB **10 Claims**

1. In an apparatus including spaced apart rolls, an adjustable mounting means for at least one roll, an endless belt positioned on the rolls, and drive means for the rolls and belt, the improvement comprising means for maintaining the belt in alignment relative to said rolls, the alignment means including a belt edge engaging means defining an engaging surface for engaging one belt edge, resilient means connected to said mounting means for applying a force tending to drive the mounting means in one direction, a support for said engaging means, and means operatively connecting said support and said mounting means whereby the force applied by said resilient means is transmitted to said support and associated engaging means, said resilient means thereby applying pressure to said engaging means to hold the engaging surface against said one belt edge as the belt is moved by the drive means, said engaging means therefor following variations in the belt edge position, and the position of said mounting means therefor being adjusted in response to said variations to compensate for the variations.

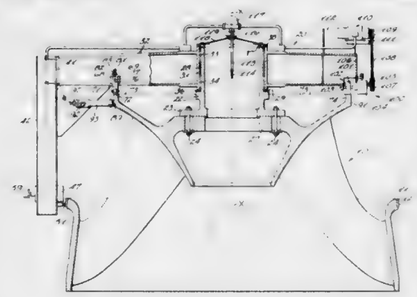


4,177,610

APPARATUS FOR MACHINING LARGE HEAVY WORKPIECES IN SITUS

Kalman Farkas, Dover, and Gary A. Krebs, Mt. Wolf, both of Pa., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 11, 1978, Ser. No. 904,766
Int. Cl.² B24B *19/00*
U.S. Cl. 51—241 S **4 Claims**



1. An apparatus for removing material from a metallic workpiece in which the workpiece is utilized as the support for the apparatus, said workpiece having

an axial bore and provided with a circular first portion and a circular second portion having an axial end surface and a circumferential side edge;

a bearing shaft having an axial bore secured to the workpiece with its axis coinciding with the axis of the workpiece;

a tool support beam having a hub from which first and second ends of said beam extend in opposite directions, said hub being provided with an axial bore which is adapted to be received by said bearing shaft in coaxial relationship;

a tool column secured to the said first extending end of said tool beam in depending relationship;

tool positioning means carried by the depending end of said tool column, said positioning means being movable in at least two mutually transverse paths of travel;

tool means carried by said tool positioning means for engagement with a portion of the workpiece from which metal is to be removed;

power drive means including a driving wheel carried on the second end of said tool support beam in position to engage on the axial end surface of the second portion of said workpiece to effect rotation of said tool support beam and thereby bodily movement of said tool means to effect the desired metal removing operation by said tool means on said workpiece;

an electric motor operably carried by said tool support beam; and,

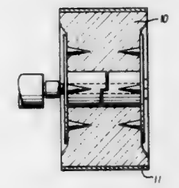
transmission drive means interconnecting said electric motor and said drive wheel to effect rotation of said drive wheel for rotating said tool support beam.

4,177,611

SANDING AND BUFFING ATTACHMENT FOR POWER TOOLS

Derrick Carr-Rollett, 28 Abbots Way, Auckland, New Zealand

Filed May 24, 1978, Ser. No. 909,052
Int. Cl.² B24D *9/00*
U.S. Cl. 51—376 **2 Claims**



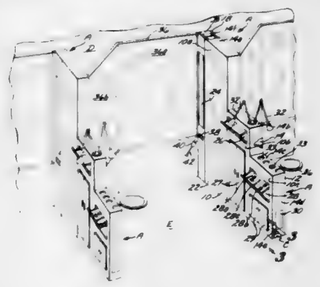
1. A sanding or buffing attachment for power tools including a section of resilient material having a circumferential surface, opposed inner and outer surfaces and a bore extending through said resilient material from said inner to said outer surface, abrasive or buffing material on said circumferential surface of said resilient material and a securing plate on each of said inner and outer surfaces of said resilient material, said securing plates each having a spindle section integral with the respective plate, said spindle sections extending into said bore in said resilient material, said spindle sections having stepped ends interengaging within said bore and said spindle sections further having aligned bores formed therethrough for accepting attachment means to engage the sanding or buffing attachment with a power tool chuck and said securing plates further having inwardly extending securing means engaging the resilient material and holding the plates and resilient material in position.

4,177,612

BEAUTY OPERATOR WALL STRUCTURE

Joe I. Tochihara, 4586 Everest Cir., Cypress, Calif. 90630

Filed Jul. 17, 1978, Ser. No. 925,221
Int. Cl.² E04H *3/00*
U.S. Cl. 52—28 **1 Claim**



1. In combination with a building that includes a floor and a plurality of walls extending upwardly therefrom in which the

business of a beauty salon is conducted, a plurality of longitudinally spaced vertical structural members secured to at least one of said walls and a plurality of longitudinally spaced horizontal structural members secured to said floor and lying in the same vertical plane as said vertical structural members, a plurality of pairs of prefabricated wall structures that removably engage a pair of said vertical and horizontal structual members to be supported thereby in vertical positions and normal to the one of said walls most adjacent thereto, said pair of wall structures when so disposed defining a space therebetween in which a chair for the support of a patron during the time that work is being performed on said patron by a beauty operator, each of said wall structures including:

a. first and second laterally spaced, parallel side walls, each of said side walls defining first, second and third rectangular panels of decreasing height;

b. a hollow frame assembly disposed between said first and second side walls and rigidly secured thereto, said frame assembly defining first, second and third horizontal surfaces that are flush with the upper horizontal surfaces of said first, second and third panels, a forward vertical surface flush with forward vertical edges of said first and second side wall, a horizontal portion upwardly disposed from lower horizontal edges of said first, second, and third vertical rectangular panels and cooperating therewith to define a horizontal recess that removably engages said horizontal recess that removably engages said horizontal structual member, and a vertical portion inwardly disposed from the free vertical edges of said first rectangular panels and cooperating therewith to define a vertical recess in which said vertical structual member is disposed;

c. first means for removably securing said wall structure to said vertical and horizontal structural members when the latter are disposed within said vertical and horizontal recesses, said first means cooperating with said vertical and horizontal structural members to maintain said wall structure at a fixed position relative to said floor and said wall most adjacent said wall structure;

d. a first mirror secured to said first rectangular panel of said first side wall;

e. electrically energized light means secured to said first rectangular end of said first side wall and adjacently disposed to said mirror;

f. a second mirror that extends between said pair of wall structures and is adjacently disposed to said wall of said building most adjacent said pair of wall structures;

g. first movable drawer means in said second panel of said first side wall for removably holding accessories of said beauty operator;

h. second movable drawer means in said third panel of said first side wall for removably holding an electrically operated hair dryer and hair curling irons;

i. third movable drawer means in said wall structure for receiving soiled linens;

j. a plurality of spaced receptacles that extend downwardly from said third horizontal surface that serve as wells to removably support bottles of liquid used by said beauty operator;

k. a plurality of electric outlets supported in spaced relationship on said wall structure; and

l. an electric circuit for supplying electric power to said light means and said outlets.

4,177,613

UNITIZED ROOF AND CEILING SUBASSEMBLY

Joseph A. Czeiner, 2594 West End Rd., West Palm Beach, Fla. 33406

Continuation-in-part of Ser. No. 174,060, Aug. 23, 1971, abandoned. This application Apr. 11, 1974, Ser. No. 460,088

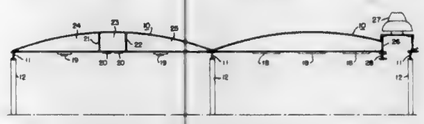
Int. Cl.[2] E04B *1/32*

U.S. Cl. 52—86 **7 Claims**

1. A unitized and prefabricated prestressed combination roof and ceiling assembly adapted to be supported, in situs, between supporting members comprising:

a first relatively thin continuous flat sheet of uniplanar rigid material of a predetermined width and of length at least equal to the spacing between supporting members,

a second initially and essentially flat sheet of uniplanar rigid material of width substantially equal to the first sheet and of length in excess of the first sheet and having its longitudinal axis aligned with the longitudinal axis of the first



sheet, said second sheet being bowed by pre-stressed compression into a shallow arc of chord length equal to the length of the first sheet, and

fastening means interconnecting together the ends of the first and second sheets to form a prefabricated and unitized assembly and to maintain the second sheet in compression forming an arched and prestressed roof deck and the first sheet in tension forming the ceiling of a structure when the assembly is in position between the supporting members.

4,177,614

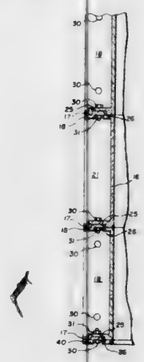
SWIMMING POOL WALL OF RESIN PANELS

George F. Arp, Fairport, N.Y., assignor to Heldor Associates, Inc., Clifton, N.J.

Filed May 15, 1978, Ser. No. 905,640

Int. Cl.[2] E04H *3/18*

U.S. Cl. 52—247 **9 Claims**



1. A swimming pool wall formed of a plurality of interconnected panels of resin material, each of said panels having an inward facing wall and a flange extending outward from said inward facing wall along top, bottom, and end edges of said panels, and said pool wall comprising:

a. each of said panels extending longitudinally of said pool wall for a substantial distance and extending upward for only a portion of the height of said pool wall with said pool wall being formed of at least three tiers of said panels;

b. said flanges at said bottom and top edges of said panels being formed with mating tongues and grooves extending along the length of each of said panels to interlock said tiers of said panels;

c. means for connecting together said flanges at said bottom and top edges between said tiers of said panels to hold said tongues and grooves together in said interlock;

d. means for connecting together said flanges at said end edges of longitudinally adjacent ones of said panels, so that end edge joints between said panels in one of said tiers are arranged in a central region of one of said panels in an adjacent tier;

e. means for fitting into tongue and groove relationship with the lowermost of said bottom edge flanges and extending across said end edge joints of the lowermost one of said tiers; and

f. each of said panels having a predetermined shape so that said substantial longitudinal extent of said panels in said interlocked tiers cooperates to conform each of said panels accurately to a predetermined configuration of said pool wall.

4,177,615

FASTENING DEVICE FOR ROOF PANEL JOINTS

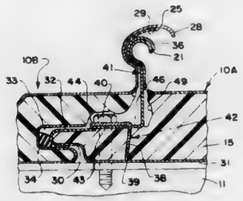
John W. Anderson, Bradford Woods, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Aug. 9, 1978, Ser. No. 932,333

Claims priority, application Spain, Aug. 27, 1977, 230.787[U]

Int. Cl.[2] E04B *7/00;* **E04C** *1/30;* **E04D** *3/362, 3/364*

U.S. Cl. 52—478 **9 Claims**



1. A joint between adjacent first and second roof panels, wherein each panel includes inner and outer skins which are laterally offset relative to each other, and an insulating core which connects the outer skin in shear-transferring relation to the inner skin, and wherein the insulating core of the first panel provides an upwardly presented exposed core surface between corresponding longitudinal edges of the outer and inner skins, said joint comprising interfitted connectors formed along upper edges of upstanding sidewalls of the outer skins and positively connecting said first roof panel to said second roof panel; a fastening device having an upper end confined within said interfitted connectors, a base extending laterally of said upper end overlying said exposed core surface, and a flange extending downwardly through said insulating core and presenting a lower end adjacent to said inner skin; and a fastener extending through said base, said insulating core and said inner skin securing said adjacent roof panels to a structural member.

4,177,616

INSULATED FURNACE STRUCTURE

Albert J. Lampert, 605 Avenue Teresa, San Clemente, Calif. 92676

Continuation-in-part of Ser. No. 777,059, Mar. 14, 1977, Pat. No. 4,083,155. This application Sep. 14, 1977, Ser. No. 833,176

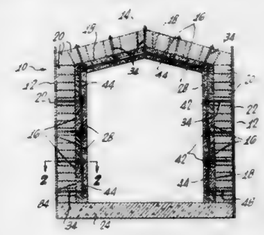
Int. Cl.[2] E04B *1/80*

U.S. Cl. 52—509 **8 Claims**

1. A thermal enclosure for use as a furnace comprising:

a plurality of structural walls of refractory brick;

a plurality of discrete, non-structural, soft, pliant pads arranged adjacent to each other according to a predetermined pattern to form a continuous insulating layer over the interior surface of said walls, each of said pads being formed throughout by a pliant, low density material made of a single, undivided and uninterrupted mass of randomly interwoven ceramic fibers, and each of said pads having mutually interlocking V-shaped ends; and



hanger means projecting inwardly from said walls for maintaining said pads in an overlying relationship with respect to said walls.

4,177,617

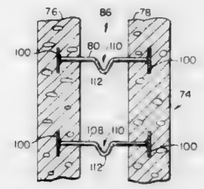
THERMAL BLOCK

Anthony DeLuca, and Josephine DeLuca, both of 8900 W. Sample Rd. #107, Coral Springs, Fla. 33065

Continuation-in-part of Ser. No. 801,093, May 27, 1977, abandoned. This application Nov. 7, 1977, Ser. No. 849,105

Int. Cl.[2] E04B *2/28*

U.S. Cl. 52—562 **9 Claims**



1. A building wall comprising:

a block, said block having a lateral surface,

a plate, said plate disposed secured within said block, said lateral surface having an opening therein communicating with said plate,

at least one rod, a portion of the length of said at least one rod having means for causing water condensate to concentrate at a point along the length of said at least one rod, located outwardly from said lateral surface when said at least one rod is disposed secured to said plate, means to secure one end of said at least one rod to said plate having said one end of said at least one rod disposed passing through said opening in said lateral surface,

a pair of washer like elements, said pair of washer like elements being disposed at said one end of said at least one rod, another pair of washers, said another pair of washers disposed at the other end of said at least one rod, said pair of washers and said another pair of washers disposed in spaced-apart relationship secured to said at least one rod and extending radially outwardly therefrom.

4,177,618

METHOD AND APPARATUS FOR INSTALLING INSULATION

John V. Felter, P.O. Box 7464, Houston, Tex. 77008

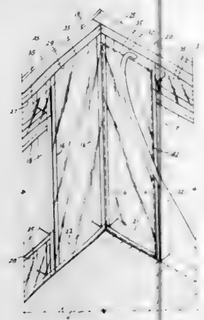
Filed Feb. 6, 1978, Ser. No. 875,410

Int. Cl.[2] E04B *1/74*

U.S. Cl. 52—743 **10 Claims**

1. Method for installing loose insulation in a space enclosed vertically therearound except at one side and enclosed at its

bottom, comprising covering said one side of said space with a sheet of plastic film to support insulation in said space and to form a vapor barrier, said plastic film being temporarily supported by a movable flat shield plate held against said plastic



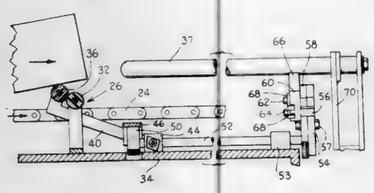
film at the outer side thereof and extending completely across at least one transverse dimension of said space, and delivering loose insulation into said space behind said sheet of plastic film, and leaving said sheet of plastic film in place to provide a permanent vapor barrier at one side of said insulation.

4,177,619

CASE INDEXING APPARATUS

Thomas P. Hartness, 305 Bridgewater Dr., and Robert G. Hartness, 203 Wilmington Rd., both of Greenville, S.C. 29615

Filed Oct. 6, 1977, Ser. No. 839,798
Int. Cl.[2] B65B *3/06, 21/16*
U.S. Cl. 53—250 **3 Claims**



1. An apparatus for indexing an empty case into an article loading machine from a conveyor feeding a continuous line of empty cases positioned adjacent one side of said article loading machine, said article loading machine including an elevator platform which raises an empty case to a loading position wherein said articles are deposited therein, said apparatus comprising:

rake means for shifting said first empty case from a first position on said conveyor onto said elevator platform including,

a rake,

a fluid operated cylinder connected to said rake,

means for activating said fluid operated cylinder connected to said rake upon a case being shifted into said first position causing said rake to shift said case onto said platform,

cam means engaging the next following case carried on said conveyor preventing said next following case from being shifted forward while said first empty case is being shifted onto said elevator platform,

means deactivating said cam means allowing said next following case to be shifted by said conveyor to said first position after said first empty case has been shifted onto said elevator,

said cam means including,

(i) an abutment carried in the path of said empty cases for engaging a front end of said next following case preventing said case from being shifted forward on said conveyor,

said means for deactivating said cam means includes,

(i) a post,

(ii) means for selectively raising said post to engage the bottom of said next following case adjacent a front end thereof for lifting said front end above said abutment, and

said means for selectively raising said post including,

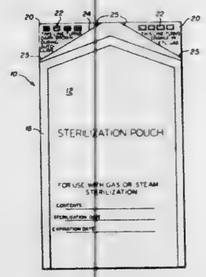
(i) a rotatable cam means engaging said post for raising said post upon being rotated lifting said front end of said next following case above said abutment.

4,177,620

METHOD OF FORMING A STERILIZABLE PACKAGE WITH TEAR-OFF INDICATORS

William P. Daly, White Plains, N.Y.; Robert P. Lewis, Oceanport, and Oliver L. Pouliot, Oradell, both of N.J., assignors to Faser Industries, Saddle Brook, N.J.

Division of Ser. No. 780,899, Mar. 23, 1977, Pat. No. 4,121,714.
This application May 10, 1978, Ser. No. 904,671
Int. Cl.[2] B65B *55/02*
U.S. Cl. 53—425 **2 Claims**



1. Method for sterilizing which comprises providing an open-ended package made of a plastic member heat sealed to a paper member, the paper member having a portion extending beyond the area to be enclosed by the heat seal when completed, said portion bearing indicia that changes color upon sterilization, inserting the item to be sterilized into the open-ended package, separating the indicia bearing portion from the package and inserting said separated portion into the package with the indicia visible through the plastic member, heat sealing the open end of the package and subjecting the sealed package to sterilization.

4,177,621

AUTOMATIC FRUIT BAGGING

Harry C. Powell, Jr., Faber, Va., assignor to Powell Machinery, Inc., Faber, Va.

Filed May 11, 1978, Ser. No. 905,173
Int. Cl.[2] B65B *1/32*
U.S. Cl. 53—468 **41 Claims**

1. A method of bagging bruisable discrete articles utilizing a weighing mechanism, comprising the steps of

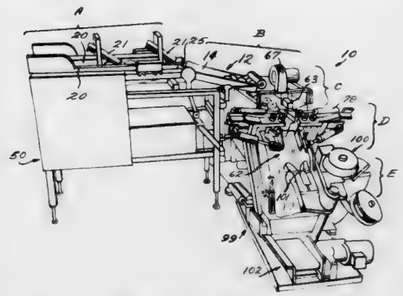
(a) feeding the articles single file to the weighing mechanism,

(b) terminating feeding of the articles to the weighing mechanism just short of a predetermined desired weight of articles,

(c) allowing the weighing mechanism to reach equilibrium and then weighing the articles in the weighing mechanism and comparing the weight of articles to the predetermined desired weight,

(d) if the weight is equal to or greater than the predetermined desired weight, emptying the weighing mechanism,

(e) if the weight is less than the predetermined desired weight, reinstituting feeding until another single article is fed to the weighing mechanism, and



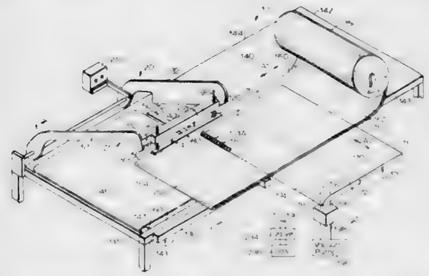
(f) terminating feeding to the weighing mechanism after the single another article is fed, and then repeating steps (c) and (e) until the conditions in step (d) are met.

4,177,622

BAG SEALING APPARATUS WITH BAG EVACUATION MEANS

Martin Siegel, Englewood Cliffs; Eugene Millevoi, Fort Lee, and Boleslaw L. Budzyn, Passaic, all of N.J., assignors to Weldotron Corporation, Piscataway, N.J.

Filed Jun. 7, 1978, Ser. No. 913,522
Int. Cl.[2] B65B *31/04*
U.S. Cl. 53—511 **11 Claims**



1. Apparatus for forming a packaged product comprising

a supply of bag-forming film,

first means for forming an open-ended bag from said film,

second means coupled to the open end of said bag for evacuating said bag,

third means for sealing the open end of said bag,

said second means comprising a chamber disposed across the open end of said bag and having a front end which faces the inside of said bag, said front end including an apertured portion and an adjacent unapertured portion, and

fourth means blocking a portion of said apertured portion.

4,177,623

STIRRUP STRAP FASTENER

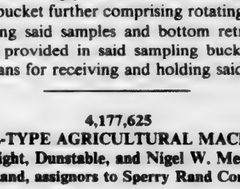
Wayne W. Perry, 10641 W. 104th Pl., Broomfield, Colo. 80020

Filed Mar. 20, 1978, Ser. No. 888,369
Int. Cl.[2] A44B *11/22*
U.S. Cl. 24—176 **4 Claims**

1. Fastener means releasably joining straps together comprising:

a metal plate having a pair of spaced bends to produce spaced apart, parallel, planar land areas offset from each other at least the thickness of the straps and spaced apart by a sloped land between the spaced lands, a first of said parallel areas having a plurality of holes for permanently securing said plate to strap means;

a pair of spaced apart prongs extending outwardly from the second said planar land area directed away from said first land area with said holes, and said prongs being offset



from said second adjacent land area by neck portions of a length of the general thickness of a strap to be fastened, and outer planar ends of said prongs being generally parallel to said second land area; and

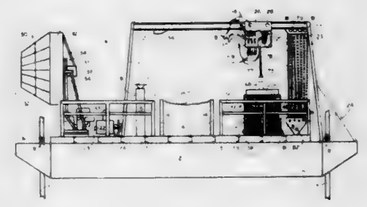
a land extension parallel with and extending from said second land area between said spaced apart prongs, and extending beyond said neck portions and of a length substantially less than said prongs.

4,177,624

AQUATIC PLANT SAMPLER

Thomas G. Kelpin, 8877 Bayonne Dr., Shreveport, La. 71108

Filed Oct. 6, 1977, Ser. No. 840,095
Int. Cl.[2] A01D *44/00*
U.S. Cl. 56—9 **20 Claims**



1. An aquatic plant sampler comprising:

(a) an aquatic craft; and

(b) a sampling bucket carried by said aquatic craft for lowering into the water of a water body floating said aquatic craft and collecting plant and water bottom samples, said sampling bucket further comprising rotating cutter means for isolating said samples and bottom retracting means internally provided in said sampling bucket above said cutter means for receiving and holding said samples.

4,177,625

PULL-TYPE AGRICULTURAL MACHINE

Andrew C. Knight, Dunstable, and Nigel W. Meek, Aylesbury, both of England, assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 27, 1978, Ser. No. 890,091
Claims priority, application United Kingdom, Apr. 5, 1977, 14224/77
Int. Cl.[2] A01D *35/264*
U.S. Cl. 56—13.6 **9 Claims**

6. A harvesting machine comprising:

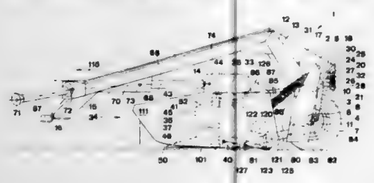
a mobile frame adapted for movement across the field, said

V 9 8 9 / 2 D E 1 1 7 9 UMI

frame having an upper transverse beam and legs projecting downwardly from the respective ends of said upper beam;

a crop harvesting header movably affixed forward of said frame, said header including a plurality of drum type cutter means for severing the crop from the ground and an elongated rotary crop conditioning means rearward of said drum type cutter means for conditioning the severed crop;

a header suspension means for floatingly supporting said header from said frame, said suspension means including a spring-like means disposed between said header and said frame for floatingly supporting said header and upper and lower link means for pivotably interconnecting said header and said frame, said lower link means being pivotally connected to the respective legs of said frame;



an arched drawbar pivotally attached to said frame and being pivotable over said header to move said machine between an operative position and a transport position;

lifting means operable with said lower link means for moving said frame relative to the ground and said header relative to said frame such that the distance between the header and the ground when the header is in the raised transport position is greater than the distance between the header and arched drawbar when the header is in the lowered operative position; and

drive means for rotating said drum type cutter means and said conditioning means, said drive means including a power input means for receiving rotary driving power from a prime mover, said power input means being rotatably journalled in and supported by said arched drawbar such that said power input means is at least partially substantially horizontal.

4,177,626

CROP GATHERING APPARATUS

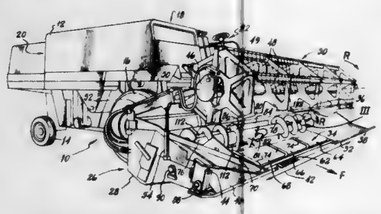
James B. McNaught, St. Germain-en-Laye, France, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Apr. 17, 1978, Ser. No. 896,667

Claims priority, application United Kingdom, Apr. 21, 1977, 16714/77; May 11, 1977, 19694/77

Int. Cl.[2] A01D *45/00*

U.S. Cl. 56—14.5 **4 Claims**



1. A combine harvester crop gathering table including an upper rear table support beam, a table floor the upper surface of which forms an auger trough, a rear wall connected to the table support beam and to the table floor, an end wall at each end of the table secured to the upper rear table support beam the table floor and the rear wall, a cutterbar assembly mounted on the forward portion of the crop gathering table and extending from one end wall to the other end wall, a crop outlet opening in the rear wall, and an auger **36** rotatably journaled on the two end walls for receiving crop material, for conveying crop material along the auger trough and for conveying crop material through the crop outlet opening in the rear wall of the table, said auger including a hollow auger shaft with a center axis of rotation, auger flighting attached to the outer surface of the hollow auger shaft on each end of said hollow auger shaft for conveying crop material from the adjacent end wall to the crop outlet opening, and a plurality of crop feeding plates attached to the hollow auger shaft generally parallel to the center axis of rotation of the hollow auger shaft and extending outwardly from the axis of rotation of the hollow auger shaft a distance substantially less than the outer free edges of the auger flighting to pull crop material into the auger trough without impeding movement along the auger trough toward the crop outlet opening.

4,177,627

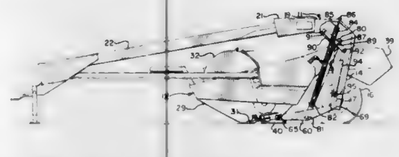
HEADER SUSPENSION

George B. Cicci, Burr Ridge, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Jun. 12, 1978, Ser. No. 914,321

Int. Cl.[2] A01D *47/00*

U.S. Cl. 56—15.8 **13 Claims**



1. A mobile crop harvester comprising:

a wheel supported main frame;

a laterally elongated crop harvesting header having a crop cutting apparatus disposed adjacent the forward edge thereof, a crop conveying means for moving the crops from the cutting apparatus rearwardly, and ground engaging means for gaging the height of the cutting apparatus from the ground;

a linkage means for attaching said header to said carrying frame in a four bar nonplanar linkage to provide vertical swinging movements of said header between operating positions with said ground engaging means engaging the ground and a transport position with said ground engaging means raised, said linkage means being so disposed and of such relative lengths that when said header is in the operating position, the instant center of movement of said header relative to said frame is rearward of said header but relatively closely adjacent to said harvester and upon movement of said header toward said transport position, said instant center moves rearwardly toward infinity.

4,177,628

HILLSIDE ATTACHMENT FOR COMBINES

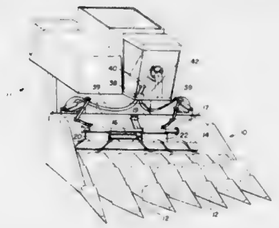
Harold H. Brandt, Garnavillo, Iowa 52049

Filed Dec. 27, 1977, Ser. No. 864,199

Int. Cl.[2] A01D *35/28*

U.S. Cl. 56—209 **10 Claims**

1. For use in a harvesting machine or combine having a grain gathering and harvesting unit, a threshing unit rearwardly of said harvesting unit, and feeding means for transporting the grain collected by the harvesting unit to the threshing unit through a grain intake opening, control means for more evenly distributing the grain collected by the harvesting unit when said combine operates on a side hill, said control means comprising regulating means located between said harvesting unit and said threshing unit to selectively direct a greater amount of



grain discharged from the harvesting unit through said intake opening to a selected side of said threshing unit.

4,177,629

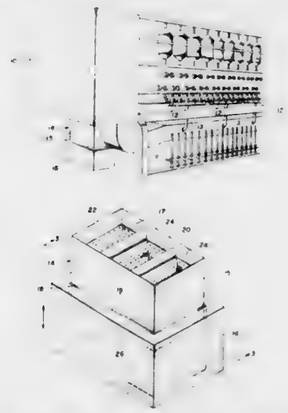
TUNABLE NOISE SUPPRESSION SYSTEM FOR SPINNING MACHINE FIBER COLLECTOR UNITS

Harry R. Kennedy, Greer, S.C., assignor to Seabrook, Inc., Anderson, S.C.

Filed Jun. 23, 1978, Ser. No. 918,573

Int. Cl.[2] D01H *11/00*; **G10K** *11/02*

U.S. Cl. 57—1 R **7 Claims**



1. In a textile machine of the class having a pneumatic loose fiber collection system including a loose fiber collection box having an exhaust outlet, the combination with said loose fiber collection box of an exhaust noise suppression device mounted in communication with said exhaust outlet and including at least a pair of interfitting sections which are adjustable one relative to the other so that said device can be tuned to suppress predominant noise frequencies, said interfitting sections being sleeve-like and being telescopically engaged, a resilient gasket disposed between said telescoping sections of the device to form an air seal therebetween and to also form a frictional connection between said sections whereby they will remain in selected adjusted positions, and each of said telescoping sleeve-like sections being double-walled with the inner wall thereof perforated, and acoustical insulating material filling the spaces of said sections between their inner and outer walls.

4,177,630

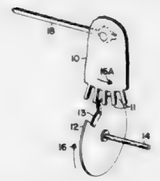
SWEEP SECONDS TO JUMP SECONDS CONVERSION FOR CLOCKS

Frank H. Marz, Delavan, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Oct. 25, 1977, Ser. No. 845,018

Int. Cl.[2] G04B *13/00*

U.S. Cl. 58—7 **12 Claims**



1. In a timing mechanism for a clock, a jump seconds indicator comprising an impulse wheel having a plurality of teeth, and drive means coupled to said impulse wheel for advancing said impulse wheel, said drive means comprising a conversion wheel having means located thereon for advancing said impulse wheel by both indexing one tooth of said plurality of teeth by contact therewith and engaging the next adjacent tooth of said plurality of teeth prior to indexing it, and means for substantially uniformly and unidirectionally rotating said conversion wheel.

4,177,631

SMALL-SIZED QUARTZ CRYSTAL WRISTWATCH

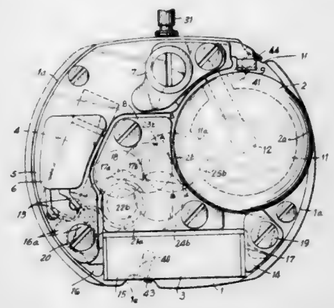
Haruyoshi Yamada, and Kenichi Ushikoshi, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Apr. 25, 1977, Ser. No. 790,723

Claims priority, application Japan, Apr. 26, 1976, 51-47031

Int. Cl.[2] G04B *13/02, 19/02*; **G04C** *3/00*

U.S. Cl. 58—23 BA **20 Claims**



1. An electronic wristwatch comprising support means, a battery means disposed on said support means, quartz crystal oscillator means, said quartz crystal oscillator means including a quartz crystal vibrator, said quartz crystal vibrator being formed by photo-etching, and a cylindrical case, said quartz crystal vibrator being disposed in said cylindrical case, said quartz crystal oscillator means being disposed on said support means and coupled to said battery means for producing a high frequency time standard signal, divider means disposed on said support means and coupled to said oscillator means for dividing a high frequency time standard signal produced by said oscillator means and in response thereto producing a low frequency timekeeping signal, and electro-mechanical transducer means disposed on said support means for receiving said

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low frequency timekeeping signal and in response thereto being continuously incrementally rotated, a center wheel rotatably disposed on said supporting means, and a gear train disposed intermediate said electro-mechanical transducer means and said center wheel for transmitting to said center wheel a predetermined amount of rotation in response to each incremental rotation of said electro-mechanical transducer means, said support means including a support plate constructed and arranged to position said battery so that the periphery thereof is disposed proximate to said center wheel, so that said battery means is disposed in overlapping relationship with said center wheel in plan view, and is further constructed and arranged to position said gear train out of overlapping relationship with said battery means in plan view, said support plate being further adapted to position said gear train on the opposite side of an imaginary line from said battery means, said imaginary line intersecting said center wheel at a position substantially tangent to said battery means, and a stem disposed on said support means, the axial direction of said stem being disposed in substantial alignment with a further imaginary line intersecting said center wheel, said further imaginary line being disposed at a position substantially tangent to said battery means.

4,177,632

ELECTRONIC WATCH

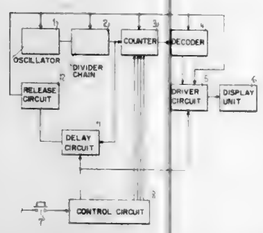
Jean-Jacques Bürki, St. Blaise; Hans G. Dill, and Kurt Hübner, both of Neuchatel, all of Switzerland, assignors to Ebauches Electroniques S.A., Marin, Switzerland

Filed Jul. 8, 1977, Ser. No. 814,107

Claims priority, application Switzerland, Jul. 16, 1976, 9126/76

Int. Cl.² G04C *3/00*

U.S. Cl. 58—23 BA **5 Claims**



1. An electronic watch adapted to be powered by at least one feeding battery and having an oscillator circuit, a frequency divider chain connected to said oscillator circuit, counter means connected to an output of said frequency divider chain for selecting a desired one function of at least two functions of said watch, decoder means connected to an output of said counter for decoding the output signal therefrom; a display means, and an interface means connected between said display means and said decoder means for the control of said display means; said watch further comprising

a delay circuit connected to the output of said frequency divider chain for producing a time delay T_o;

a logic circuit connected to said delay circuit and having at least three serial, shiftable stages, each stage having an output corresponding to a possible function of said watch, one of said stages corresponding to a stocking condition;

and a control means for controlling the sequential shifting between said logic circuit stages and thus for controlling the function to be displayed by said display means;

said delay circuit being activated and said display means being visably deactivated by the logic circuit so as to indicate immediately that the logic circuit is in said stocking condition when first placed therein such that the output of said delay circuit remains unchanged until the end of said time T_o and the time counting is not lost when if before the end of said time delay T_o said logic circuit is switched out of the stocking position, such as when during the selection of the functions of said watch said logic circuit is shifted from one condition to another through the intermediate stocking condition, and such that at the end of said time delay T_o, said delay circuit is capable of at least indirectly disabling at least part of the circuits of said watch to put said watch into said stocking condition which is a state of reduced energy consumption in which said logic circuit can still be fed by the battery so that upon further activation of said control means said logic circuit can be switched out of said stocking condition.

4,177,633

TIME CORRECTING MEANS FOR A DIGITAL ELECTRONIC WATCH

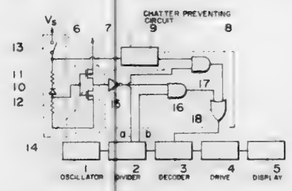
Masao Miyamoto, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Jul. 3, 1978, Ser. No. 921,234

Claims priority, application Japan, Jul. 20, 1977, 52-87108

Int. Cl.² G04C *3/00;* **G04B** *27/00;* **H01L** *29/84*

U.S. Cl. 58—23 R **6 Claims**



1. Time correcting means for a digital electronic watch of the type having a decoder circuit for effecting time correction in response to correcting pulse trains applied thereto when the watch is placed in its time correcting mode, said time correcting means comprising:

switching means including a distortion semiconductor having a resistive characteristic which varies in response to pressure applied thereto; a resistor connected in series with said distortion semiconductor; voltage level detecting means to detect the voltage level across said resistor; and a signal selective circuit coacting with said voltage level detecting means to selectively transfer correcting pulse trains of different frequencies to said decoder circuit for changing the time correcting speed in response to pressure applied to said distortion semiconductor.

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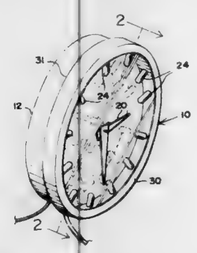
MULTI-REFLECTION CLOCK

Miguel Calienes, 8370 SW. 39th St., Miami, Fla. 33155

Filed Sep. 20, 1977, Ser. No. 834,846

Int. Cl.² G04B *19/30, 19/06*

U.S. Cl. 58—50 R **2 Claims**



1. A multi-reflection clock comprising a housing, a one way mirror mounted in said housing, said mirror having a reflecting surface positioned on the rear surface thereof, clock means mounted on said mirror and having minute and hour hands positioned before said front surface of said mirror, a two way mirror mounted on said housing adjacent to and in spaced relation to said front surface of said one way mirror, said one way mirror being convex in shape facing in the direction of said two way mirror and light producing means mounted on said housing whereby substantially innumerable images representing the numerals of a clock are reflected between said mirrors and an observer viewing said clock will see said images symmetrically disposed about said clock, in arcuate alignment and converging together in the direction of the rear of said clock.

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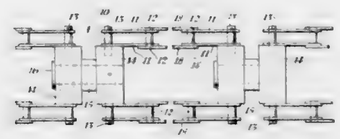
SWIVEL LINK FOR A DUAL CHAIN CONVEYOR

Frank Klimezky, 3581 S. Ocean Blvd., South Palm Beach, Fla. 33460

Filed Sep. 5, 1978, Ser. No. 939,673

Int. Cl.² F16G *13/06;* **B65G** *17/00*

U.S. Cl. 59—78 **1 Claim**



1. In a dual chain conveyor of the endless type having a plurality of predetermined lengths of first chains and second chains mounted in laterally and axial alignment relationship and each of said lengths having leading and tailing ends; an adaptor comprising

a first rigid body mounted between leading ends of each of said plurality of lengths of said first and second chains;

a second rigid body mounted between the trailing ends of each of said plurality of lengths of said first and second chains;

a swivel pin connecting each said first and second body of adjacent chain lengths allowing relative rotational movement between said first and second body, and a spacer positioned between each said first and second body mounted on said swivel pin whereby predetermined lengths of said dual chain may be rotated perpendicular to the direction of movement of said chain.

4,177,636

CENTRIFUGAL FLUIDIZED BED COMBUSTOR

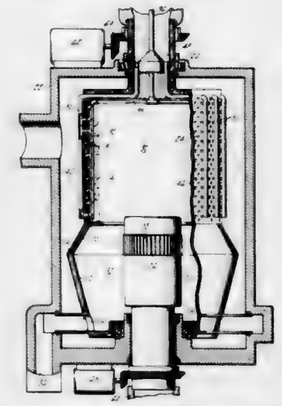
John J. Horgan, Wethersfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 15, 1977, Ser. No. 861,035

Int. Cl.² F02C *3/26;* **F23D** *19/00*

U.S. Cl. 60—39.35 **12 Claims**

1. A coal-fired combustor having a rotary drum supported vertically with respect to the earth's horizon having a cylindrically shaped wall defining a combustion chamber, means for fluidizing the coal to form a fluidized coal bed adjacent the inner surface of said cylindrically shaped wall and surrounding said combustion chamber, means including openings in the cylindrically shaped wall for admitting coal internally of said cylinder through the outer surface of said cylindrically shaped wall so that said coal is admitted therein radially and is directed toward the axis of rotation of said drum, air admitted internally through openings in said cylindrically shaped wall flowing toward said axis of rotation effectuating the fluidizing of the bed and means communicating with said combustion chamber for leading products of combustion out of said combustion chamber, said bed having sulphur absorbing material, and means for imparting rotary motion to said drum at a speed for forming said fluidized bed so that said coal passes through said bed in the process of combustion and the sulphur constituent of the coal is absorbed by the sulphur absorbing material in said bed.



4,177,637

INLET FOR ANNULAR GAS TURBINE COMBUSTOR

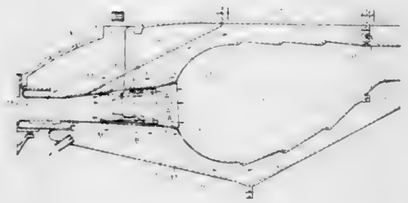
George Pask, Stanton-by-Bridge, England, assignor to Rolls-Royce Limited, London, England

Filed Dec. 19, 1977, Ser. No. 862,193

Claims priority, application United Kingdom, Dec. 23, 1976, 53950/76

Int. Cl.² F02C *3/06, 3/08*

U.S. Cl. 60—39.36 **6 Claims**



1. Combustion equipment for receiving compressed air from a compressor of a gas turbine engine, said combustion equipment comprising:

an annular flame tube defined by radially spaced walls and an upstream end plate having a plurality or circumferentially spaced apertures;

a plurality of pots, each being arranged in one of said apertures and projecting therefrom in an upstream direction from said flame tube;

radially spaced walls defining an annular diffusing passageway for receiving all compressed air from the compressor of the gas turbine engine, said annular diffusing passageway extending in a downstream direction and terminating adjacent to upstream ends of said pots;

a plurality of circumferentially spaced tubular ducts within the annular diffusing passageway, there being one of said tubular ducts for each of said pots, each of said tubular ducts being contiguous with at least a part of the spaced walls of said annular diffusing passageway, said tubular ducts extending from a position intermediate the ends of said annular diffusing passageway downstream to a position contacting an upstream end of one of said pots;

and a fuel burner positioned in each of said tubular ducts

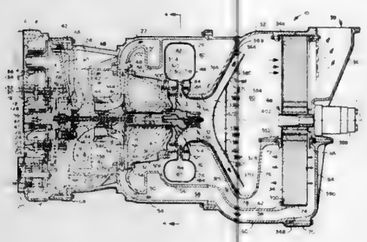
whereby some of the compressed air delivered to said annular diffusing passageway flows through said tubular ducts into said pots and said flame tube together with fuel from said fuel burner while the remaining compressed air delivered to said annular diffusing passageway flows between adjacent circumferentially spaced tubular ducts and from the downstream end of said diffusing passageway over the upstream end plate of said flame tube.

4,177,638

SINGLE SHAFT GAS TURBINE ENGINE WITH RADIAL EXHAUST DIFFUSER

Homer J. Wood, Sherman Oaks, Calif., assignor to Deere & Company, Moline, Ill.

Filed Jun. 24, 1975, Ser. No. 589,909
Int. Cl.[2] F02C *7/10*
U.S. Cl. 60—39.51 H **6 Claims**



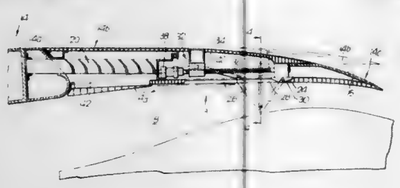
1. A gas turbine engine comprising a compressor mounted for rotation about a central axis; a single stage radial inflow turbine mounted axially forward of the compressor for rotation about the central axis, the turbine engine being coupled to drive the compressor and being arranged to discharge exhaust gases in an axially forward direction; a disk regenerator which is mounted axially forward of the turbine in line with the central axis and which is coupled to pass high pressure gases therethrough in one direction and exhaust gases therethrough in an opposite direction; and a radial exhaust diffuser disposed between the turbine and the regenerator, the exhaust diffuser being coupled to receive exhaust gases from the turbine and discharge the exhaust gases to the regenerator.

4,177,639

THRUST REVERSER FOR A FLUID FLOW PROPULSION ENGINE

Maurice I. Taylor, Allestree, England, assignor to Rolls-Royce Limited, London, England

Filed Apr. 12, 1978, Ser. No. 896,021
Claims priority, application United Kingdom, Jun. 5, 1977, 19009/77
Int. Cl.[2] F02K *1/20*
U.S. Cl. 60—226 A **3 Claims**



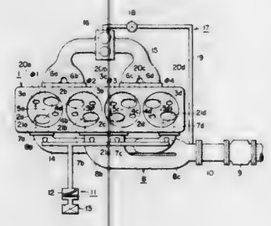
1. A gas turbine ducted fan propulsion engine including a core gas generator, a stage of fan blades mounted coaxially with and upstream of said core gas generator so as to be rotated thereby, a fan cowl surrounding said fan blades and forming with the core gas generator, a fan duct through which air acted upon by said fan blades passes to an exhaust nozzle, said fan cowl comprising a fixed upstream portion, a fixed downstream portion axially spaced therefrom to form a passage therebetween, a translatable intermediate portion which in a cruise position, closes said passage at its outer end with respect to the fan duct and a translatable cylinder which in said cruise positon, closes said passage at its inner end, a plurality of blocker flaps peripherally of and nested within the inner surface of the fixed downstream portion and movably connected thereto by their upstream ends, for simultaneous translation axially of the duct and pivoting thereacross, said intermediate portion, cylinder and blocker flaps being interconnected via means adapted to also bring about simultaneous translation and pivoting of said respective intermediate portion, cylinder and blocker flaps, such that on said translation being achieved, said cylinder covers recesses left by said blocker flaps.

4,177,640

INTERNAL COMBUSTION ENGINE SYSTEM

Hiroshi Kuroda, Tokyo; Yasuo Nakajima, Yokosuka, and Yoshimasa Hayashi, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 4, 1977, Ser. No. 793,492
Claims priority, application Japan, May 7, 1976, 51/58134[U]
Int. Cl.[2] F02M *25/06;* **F02B** *75/18*
U.S. Cl. 60—274 **17 Claims**



16. A method of operating a multi cylinder internal combustion engine of the in-line type which is equipped with a cross-flow type cylinder head comprising the steps of:

preparing a combustible charge containing air, EGR gas and a hydrocarbon fuel which has an air:fuel ratio in the range of 13:1 to 16:1 and contains EGR gas recirculated at a rate of up to 40%;

feeding said charge through an induction manifold which is arranged to have the minimum possible overall length by arranging the inlet ports of the most outboard cylinders, inboard of the corresponding exhaust ports;

introducing the charge through inlet ports into simply configured combustion chambers so that the charge swirls within the combustion chambers;

igniting the charge by using two symmetrically disposed, diametrically opposed, synchronously sparked spark plugs projected through the cylinder head so that the spark gaps thereof are spaced by a distance L defined as follows,

$L = (0.45 \text{ to } 0.67)D$ where D is the diameter of the cylinders;

discharging the combustion products resulting from said ignition through individual exhaust ports;

mixing secondary air with the combustion products in the exhaust ports;

supplying said secondary air via a reed valve operated by the pulsations of the combustion products in the exhaust ports;

recirculating a portion of the combustion products to the induction manifold for the preparation of the combustible mixture; and

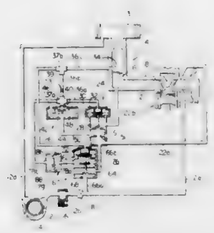
oxidizing the HC and CO in the remaining unrecirculated combustion products via the secondary air mixed therewith in an oxidizing type catalytic converter.

4,177,641

APPARATUS FOR CLEANING EXHAUST GAS FOR AN INTERNAL COMBUSTION ENGINE

Nobuaki Wakita, and Eiji Hashimoto, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 30, 1978, Ser. No. 910,097
Claims priority, application Japan, Mar. 7, 1978, 53/024990
Int. Cl.[2] F02B *75/10;* **F01N** *3/10*
U.S. Cl. 60—278 **2 Claims**



1. An apparatus for cleaning exhaust gas of an internal combustion engine, comprising:

exhaust gas recirculation passageway means adapted for connecting an exhaust system of the engine with an intake system of the engine for introducing a part of the exhaust gas in the exhaust system into the intake system;

first valve means for controlling pressure of recirculated exhaust gas in said exhaust gas recirculation passageway means so that said pressure is maintained at a predetermined pressure which is close to the atmospheric air pressure;

air pump means for generating a flow of air;

secondary air introduction passageway means connecting said air pump means with said exhaust system for introducing secondary air into said exhaust system;

by-pass passageway means connecting said secondary air introduction passageway means with said exhaust gas recirculation passageway means for diverting a part of said secondary air in said secondary air introduction passageway means into said exhaust gas recirculation passageway means;

second valve means for controlling the amount of said diverted air; and

vacuum control means for controlling the opening of said second valve means in accordance with opening of a throttle valve and for controlling the opening of said second valve means so that a large amount of diverted air is passed through said second valve means for a predetermined period after said throttle valve is opened from a closed position.

4,177,642

DIVERTER VALVE FOR EXHAUST SYSTEM OF INTERNAL COMBUSTION ENGINE

Leo T. Klimazewski, St. Louis, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 23, 1977, Ser. No. 864,054
Int. Cl.[2] F01N *3/15*
U.S. Cl. 60—290 **11 Claims**

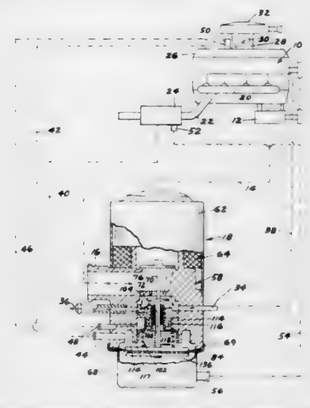
1. An air control valve for use on an internal combustion system having an exhaust manifold and an exhaust pipe extending from the exhaust manifold with a catalytic converter in the exhaust pipe, and an air pump for supplying air to the exhaust system, said air control valve comprising:

a valve body having a central bore forming an air chamber, an air inlet extending to the air chamber, and at least a pair of air outlets leading from the air chamber, one of said air outlets being connected to the exhaust system upstream of the catalytic converter and the other outlet being connected to the catalytic converter;

valve means positioned in the chamber between the outlets and shifting alternately between open and closed positions of the outlets, the inlet being in fluid communication with one outlet when the valve means is in one position and in fluid communication with the other outlet when the valve means is in another position;

a valve stem positioned in said air chamber having said valve means mounted thereon;

a main diaphragm assembly on the valve body and connected to an end of the valve stem, spring biasing means to urge the diaphragm assembly and the valve means to a position for supplying air to the exhaust system, a vacuum chamber for said valve means, a vacuum line extending from the intake manifold of the internal combustion engine to the vacuum chamber, and temperature responsive means operatively connected to said vacuum line to permit the exertion of a vacuum against the valve means during cold engine operation to permit movement of the valve means to a position for the supply of air to the exhaust system upstream of the catalytic converter, said temperature responsive means being operable to interrupt the exertion of a vacuum against the valve means through said vacuum line during warm engine operation to permit movement of the valve means to a position for the supply of air to the catalytic converter.



4,177,643

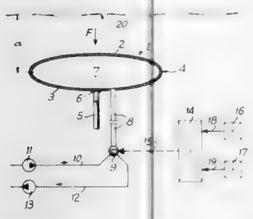
METHOD FOR COLLECTING ENERGY FROM SWELL AND PLANT FOR CARRYING OUT SAID METHOD

Michel Lorphelin, 5 rue Denis-Poisson, 75017 Paris, France

Filed Oct. 27, 1977, Ser. No. 846,123
Claims priority, application France, Nov. 2, 1976, 76 33012
Int. Cl.[2] F03B *13/12*
U.S. Cl. 60—496 **20 Claims**

1. A method of collecting energy from a swell in a fluid medium using a mobile float which is displaceable in response to movements of the swell, comprising the steps of submerging the float in a fluid medium at a predetermined depth, said predetermined depth being selected such that, in the absence of movement of the fluid medium, the upwardly and downwardly

directed forces acting on the float counterbalance each other so that the float is in equilibrium at such predetermined depth,



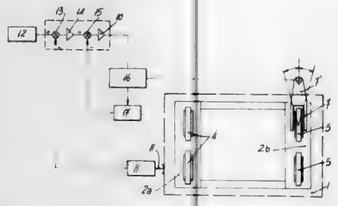
and adjusting the buoyancy of the float so as to maintain it in equilibrium.

4,177,644

APPARATUS FOR CONTROLLING AND TAKING UP AXIAL DISPLACEMENT IN MACHININGS ON LARGE DIAMETER CYLINDERS

Cesare Panzeri, Macherio, Italy, assignor to Breda Termomeccanica S.p.A., Milan, Italy

Filed Feb. 14, 1978, Ser. No. 877,733
Claims priority, application Italy, Feb. 15, 1977, 20302 A/77
Int. Cl.[2] F01B *23/00*
U.S. Cl. 60—721 **9 Claims**



1. An apparatus for controlling and taking up the axial displacement of large rotating cylinders, wherein the cylinder rests on a pair of end bearings, of which one bearing is provided with driven rollers, while the other is provided with idle rollers, of which one is a guide roller carried by a bearing orientable about a vertical axis, comprising a first transducer for sensing the axial cylinder displacement, the output of which is connected to an input of a first device and compared with a reference signal supplied to another input to said first device, the output of the latter being operatively connected through an amplifier to an input of a second comparing device, a second input of which is connected to the output of a second displacement transducer for the bearing of the guide roller, the output of said second comparing device being supplied to a servoactuator mechanically connected to the orientable bearing of said guide roller.

4,177,645

PROCESS FOR ISOLATING DINITROGEN MONOXIDE

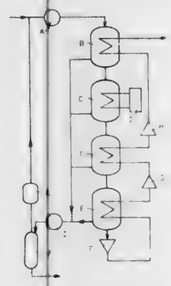
Hans-Helmut Schwarz, Krefeld, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 10, 1978, Ser. No. 923,507
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1977, 2732267
Int. Cl.[2] F25J *3/06*
U.S. Cl. 62—23 **4 Claims**

1. A process for isolating dinitrogen monoxide from oxidation off-gases formed by the oxidation of a cycloalkanol or a cycloalkanone using nitric acid which off-gases contain dinitrogen monoxide in admixture with nitrogen oxide, nitrogen dioxide, nitrogen, oxygen, carbon-dioxide and/or stream which comprises:

A. Drying the oxidation off-gas;

B. Compressing the resultant off-gas from which water has been removed to a pressure in the range of 15 to 300 bars and cooling the same to a temperature in the range of 0° to −88° C.;



C. Removing the liquid phase obtained as a result of said compression and cooling; and

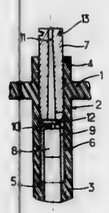
D. Cooling the resultant gas phase by expansion and passing the same in indirect heat exchange with off-gas which has been prepurified by removal of water content thereof.

4,177,646

LIQUEFIED GAS APPARATUS

Laurent J. Guadagnin; Claude R. Grossiord; John A. Jensen, all of Annecy, France; Antoine Kawam, Washington, D.C.; Jacques M. Mouchet, Annecy-le-Vieux, and Michel E. Royer, la Balme de Sillingy, both of France, assignors to S. T. Dupont, Paris, France

Filed Nov. 17, 1977, Ser. No. 852,415
Claims priority, application France, Nov. 19, 1976, 76 35039
Int. Cl.[2] F17C *7/00*
U.S. Cl. 62—52 **14 Claims**



1. A liquefied gas apparatus comprising a vaporizer-pressure reducer ensuring both transition into the gaseous state of gas stored in the liquid state and control of the flow of the gas discharged therefrom, all solid portins of said apparatus with which said vaporizer-pressure reducer is in contact having a thermal conductivity in the range 0.3 to 5 kcal/m/h/°C.

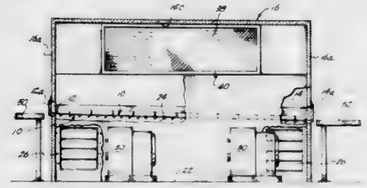
4,177,647

AIR SLIDE FREEZER SYSTEM

Milan R. Overbye, Bellevue, Wash., assignor to Lewis Refrigeration Co., Redmond, Wash.

Filed Oct. 6, 1977, Ser. No. 840,011
Int. Cl.[2] F25D *13/06*
U.S. Cl. 62—63 **14 Claims**

1. A system for freezing of comestibles prepackaged in substantially flat bottom storage containers, said system comprising conveyor deck means including an elongated substantially flat stationary conveyance surface extending longitudinally from a container input location to a container output location and adapted to support thereon a plurality of such containers distributed over its length between said locations, said conveyance surface having a plurality of air discharge apertures therein distributed over its length at locations to underlie said containers, air freezer means including heat exchange means, blower means and associated closed air recirculation means cooperable to freeze and pressurize and to recirculate the pressurized freezing air continuingly in a path that includes plenum space beneath said surface wherein the air is pressurized for upward flow through said discharge apertures and collecting space overlying said surface for return of air to the suction side of said blower means, thereby to form and



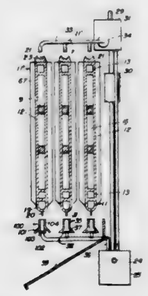
maintain beneath each container a bearing film of freezing air flowing outwardly from between said conveyance surface and the bottom of each container, the film air pressure being effective to elevate said containers slightly above said surface to permit substantially frictionless advancement of the containers over said surface, and the film airflow velocity relative to each container being effective to transfer heat rapidly from the containers and thereby from the comestibles therein, and means to effect substantially concurrent progressive advancement of said film-borne containers in the direction from said input location to said output location at a controlled average rate substantially negligible in relation to said film air flow velocity, whereby rate of heat removal from the comestibles is substantially independent of such advancement rate including variations therein.

4,177,648

FREEZING APPARATUS AND METHOD

Robert S. Ohling, San Jose, Calif., assignor to Acoolco Corporation, Watsonville, Calif.

Division of Ser. No. 583,196, Jun. 2, 1975, Pat. No. 4,107,943.
This application Mar. 30, 1978, Ser. No. 891,597
Int. Cl.[2] F25C *5/10*
U.S. Cl. 62—73 **10 Claims**



1. A method of freezing a liquid comprising the steps of (a) establishing a freezing zone,

(b) delivering the liquid to the freezing zone so that the liquid runs across the freezing zone,

(c) collecting the unfrozen liquid running off the freezing zone so that it is returned to the freezing zone,

(d) stopping the delivery of liquid when a sheet of frozen liquid of predetermined thickness is on the freezing zone,

(e) continuing the freezing step to harden the sheet of frozen liquid,

(f) initially heating the periphery of the freezing zone in order to thaw the bond between the freezing zone and the sheet around the periphery of the sheet,

(g) then heating the freezing zone through out in order to harvest the sheet of frozen liquid by thawing the remainder of the bond between the freezing zone and the sheet, and

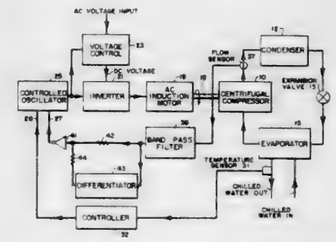
(h) gravity dropping the sheet from the freezing zone into a fragmenting zone where the sheet is broken into fragments.

4,177,649

SURGE SUPPRESSION APPARATUS FOR COMPRESSOR-DRIVEN SYSTEM

Harry J. Venema, Wheaton, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 1, 1977, Ser. No. 847,635
Int. Cl.[2] F25B *1/00*
U.S. Cl. 62—209 **12 Claims**



1. A control system for dynamically controlling surge in a compressor-driven system wherein gas flows through a containment circuit including an adjustable capacity compressor, the discharge pressure of the gas at the compressor outlet varying as a function of the gas flow rate, comprising:

means for adjusting the capacity of the compressor to select the steady state operating point on the discharge pressure versus flow rate characteristic curve;

sensing means for sensing a predetermined parameter which is subject to substantial variations if surging occurs;

means, responsive to said sensing means, for developing a feedback signal which is a function of said predetermined parameter; and

regulating means responsive to said feedback signal for dynamically varying the capacity of the compressor to vary the instantaneous operating point alternately back and forth around the steady state operating point and to effect a negative slope to the portion of the pressure-flow curve over which the instantaneous operating point dynamically varies, thereby preventing surge and stabilizing the operation of the compressor-driven system.

4,177,650

CRYOGENIC COOLING APPARATUS

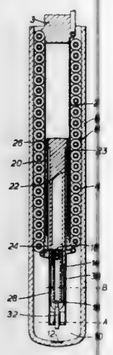
David N. Campbell, Alcester, England, assignor to The Hymatic Engineering Company Limited, Worcestershire, England

Filed Jan. 13, 1978, Ser. No. 869,230

Claims priority, application United Kingdom, Jan. 13, 1977, 1336/77

Int. Cl.² F25B 41/04

U.S. Cl. 62—222 **7 Claims**



1. Cryogenic cooling apparatus of the type including a generally tubular heat exchanger having a warm end and a cold end and affording two paths, through one of which refrigerant gas flows from a supply under pressure to an expansion nozzle for producing cooling by means of the Joule Thomson effect in a liquefying chamber in said apparatus while the low pressure gas returns through said other path to cool the incoming refrigerant, said cryogenic cooling apparatus including a valve member cooperating with said nozzle to vary the effective area of said nozzle for automatically controlling the flow of said refrigerant, said valve being connected to an expander wherein said valve is actuated by the expansion of said expander, said expansion being caused by the temperature of said expander, said expander being of elongate form and having an anchored end, said anchored end supported by said cold end of said heat exchanger but thermally insulated from said cold end of said heat exchanger by a path of low thermal conductivity, said expander extending away from said warm end of said heat exchanger to terminate in a free end which actuates said valve, said expander having a warm end portion of high thermal conductivity extending from its anchored end to a region between said nozzle and said heat exchanger, said region being out of the direct line of spray of refrigerant from said nozzle, said expander also having a cold end portion of lower thermal conductivity extending from said region to the vicinity of said valve.

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APPARATUS AND METHOD OF HEATING AND COOLING

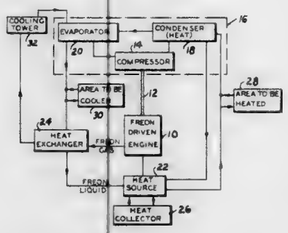
Lorrell C. McFarland, 417 E. 12, Claremore, Okla. 74017

Filed Dec. 28, 1977, Ser. No. 865,266

Int. Cl.² F25B 27/00

U.S. Cl. 62—238 **4 Claims**

1. The method of utilizing the normally wasted heat of an air conditioning system, comprising: providing an air conditioner unit having a compressor, a condenser and an evaporator; drivably connecting a liquid hydrocarbon operated engine with said
compressor; connecting a primary heat source with said engine; conveying the heat exhausted by said condenser to the primary
heat source; connecting said evaporator with a heat exchanger; interposing an area to be cooled between the evaporator and the
heat exchanger; passing the heated liquid hydrocarbon exhausted by said engine
through said heat exchanger; and, returning the cooled liquid hydrocarbon to said engine.



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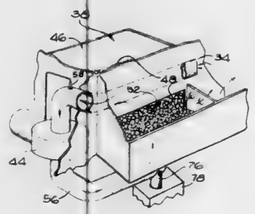
REFRIGERATION SYSTEM

Lawrence C. Volk, 10001 Beech St., Fontana, Calif. 92335

Continuation-in-part of Ser. No. 717,101, Aug. 24, 1976, abandoned. This application Jan. 3, 1978, Ser. No. 866,221

Int. Cl.² B60H 3/04

U.S. Cl. 62—239 **3 Claims**



1. In combination, a refrigeration system and a catering truck comprising:
a reservoir for ice cubes;
a food compartment for storing food under refrigeration having a cooling section adjacent thereto;
means for gravity feeding ice from said reservoir to said cooling section through an aperture interconnection;
a blower for directing air through an intake pipe to said cooling section and then circulating cooled air from said cooling section through said food compartment; and
an exhaust pipe interconnecting said food compartment and said blower for recirculating air in said food compartment to said blower drain means for removing ice melt from the cooling section.

4,177,653

SLUSH FILTRATION METHOD

Donald A. Hickson, Benicia, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 20, 1978, Ser. No. 953,293

Int. Cl.² F25D 3/12; B01D 37/00

U.S. Cl. 62—534 **4 Claims**

1. A process for separating colloidal zeolite particles from a liquid dispersion of the particles, which comprises: cooling the liquid dispersion of the particles to form a slush; allowing the slush to melt; and filtering the colloidal particles from the melting slush during the course of melting.

4,177,654

TRANSMISSION SHAFT

Erich Aucktor, Offenbach am Main, Fed. Rep. of Germany, assignor to Löhr & Bromkamp G.m.b.H., Offenbach am Main, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 843,111

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1976, 2648569

Int. Cl.² F16D 3/02

U.S. Cl. 64—21 **1 Claim**



1. A machine drive transmission shaft having a variable length adjustment comprising a pair of synchronous speed torque coupling joints each rotatable about an axis with said joints disposed in spaced relation and with the axes thereof disposed in general alignment, an axially elongated telescopic shaft extending between and in general axial alignment with and interconnecting said coupling joints, each of said coupling joints comprises an inner joint member having an outer surface encircling the axis of said inner joint member and with a plurality of axially extending circumferentially spaced rectilinear grooves formed therein, a hollow outer joint member enclosing said inner joint member and having an inner surface encircling the axis of said outer joint member and spaced outwardly from the outer surface of said inner joint member, the inner surface of said outer joint member having a plurality of axially extending circumferentially spaced rectilinear grooves formed therein, a plurality of balls each slidably seated in a different one of the grooves in said inner joint member and in an oppositely disposed groove in said outer joint member for transmitting torque between said inner and outer joint members, said inner and outer joint members in each said coupling joint being axially slidable relative to one another, said telescopic shaft comprising a spindle connected to each said inner joint member and extending therefrom in the axial direction of said telescopic shaft toward the other said spindle, a first shaft member attached to and extending axially from one of said spindles and a hollow second shaft member attached to and extending axially from the other one of said spindles, said first shaft member extending into said hollow second shaft member in closely fitting sliding relation so that the overall length of the transmission shaft can be varied, the outer surface of said first shaft member and the inner surface of said second shaft member having complementary non-circular interfitting cross sections so that torque can be transmitted therebetween, and a cage positioned between the inner surface of said outer joint member and the outer surface of said inner joint member and encircling said inner joint member, said cage having a plurality of circumferentially spaced openings therein for each of said balls.

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Patent Not Issued For This Number

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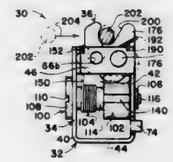
CABINET LOCK

Edwin W. Davis, Medina, Ohio, assignor to The Eastern Company, Cleveland, Ohio

Filed Mar. 2, 1978, Ser. No. 882,660

Int. Cl.² E05B 65/44; E05C 3/02

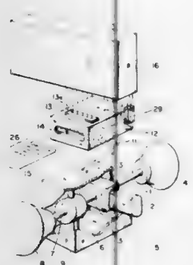
U.S. Cl. 70—84 **30 Claims**



1. A cabinet lock, comprising:
(a) a one-piece housing having front and back walls extending in spaced, substantially parallel planes, the front and back walls having overlying first and second ends, the front and back walls being interconnected near their first ends by an end wall, and being interconnected near their second ends by a pair of side walls, the side walls extending in spaced parallel planes which substantially orthogonally intersect the planes of the front and back walls, the front and back walls having a first set of aligned holes formed therethrough, the side walls having a second set of aligned holes formed therethrough;
(b) actuator means extending into the first set of holes and being supported by the front and back walls;
(c) rotary latch bolt means extending into the second set of holes and being supported by the side walls;
(d) the actuator means including:
(i) a cam member mounted for movement between locked and unlocked positions; and,
(ii) first biasing means biasing the cam member toward its locked position;
(e) the rotary latch bolt means including:

(i) a latch bolt member mounted for rotary movement about the axis of the second set of holes between latched and unlatched positions; and,
(ii) second biasing means biasing the latch bolt member toward its unlatched position;
(f) the cam member and the latch bolt member having interengaging surface means formed thereon for:
(i) permitting the cam member to move, under the influence of the first biasing means, to its locked position when the latch bolt member is moved, in opposition to the action of the second biasing means, from its unlatched position to its latched position; and
(ii) retaining the latch bolt member in its latched position until the cam member is moved, in opposition to the action of the first biasing means, to its unlocked position.

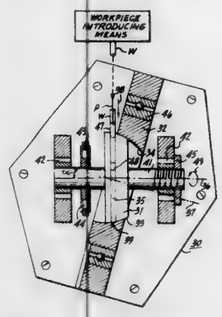
4,177,657
ELECTRONIC LOCK SYSTEM
Kemal Aydin, Little Falls, N.J., assignor to Kadex, Inc., New York, N.Y.
Continuation of Ser. No. 667,105, Apr. 16, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 849,163
Int. Cl.[2] E05B 49/02
U.S. Cl. 70—278 **5 Claims**



1. A locking system comprising a key having first and second coded data thereon, a lock having a bolt operating mechanism, a memory, means for sensing data on said key, means responsive to sensed first data that corresponds to data stored in said memory connected to operate said bolt operating mechanism, and means responsive to sensed second data for changing the data in said memory to correspond to said second data, said lock comprising a slot for receiving said key, and switch means responsive to full insertion of said key in said slot and coupled to enable said sensing means, said sensing means sensing coded data on said key as said key is withdrawn from said slot.

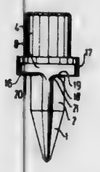
4,177,658
METHODS AND APPARATUS FOR CONTINUOUS EXTRUSION
Nazeer Ahmed, Tumkur, India, and Francis J. Fuchs, Jr., Princeton Junction, N.J., assignors to Western Electric Co., Inc., New York, N.Y.
Filed Jun. 8, 1978, Ser. No. 913,761
Int. Cl.[2] B21B 27/00, 45/02; B21C 23/32
U.S. Cl. 72—60 **10 Claims**

1. A method of continuously deforming an elongated workpiece of indefinite length to produce an elongated product of indefinite length, the method comprising the steps of:
(a) introducing the elongated workpiece into a first portion of an annular groove in one of two mating surfaces, the two mating surfaces being an outer surface of an inner toroid and an inner surface of an outer toroid, the inner and outer toroids having respective axes which intersect at such an angle that a second portion of the annular groove is covered by the mating surface which does not include the annular groove while said first portion of the annular groove is not covered by said mating surface which does not include the annular groove;
(b) rotating the inner and outer toroids simultaneously about



their respective axes, in such direction of rotation that the elongated workpiece is advanced from said first portion of the annular groove into said second portion of the annular groove, and then into a deforming agency as the advancing, elongated workpiece again approaches said first portion of the annular groove; and
(c) so deforming the elongated workpiece within the deforming agency as to produce an elongated product of indefinite length.

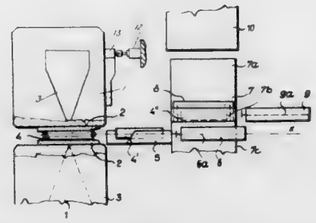
4,177,659
ROTATABLE PIERCING TOOLS FOR FORMING HOLES SURROUNDED EACH BY A BOSS IN METAL PLATES OR THE WALL OF METAL TUBES
Johannes A. van Geffen, Apeldoorn, Netherlands, assignor to Technisch Handels- en Adviesbureau van Geffen B.V., Apeldoorn, Netherlands
Filed Jan. 24, 1978, Ser. No. 871,975
Claims priority, application Netherlands, Jan. 27, 1977, 7700872
Int. Cl.[2] B21D 28/36
U.S. Cl. 72—71 **6 Claims**



1. A piercing tool comprising an elongate body having a shank portion at one end adapted to be gripped and rotated by a power tool, said tool having a tapered tip at that end opposite said shank portion, an intermediate portion joining said tip, and a third portion joining said intermediate portion to said shank portion, said tip and intermediate portion being of polygonal cross section presenting a plurality of side faces and longitudinally extending corners joining adjacent side faces, the corners of said intermediate portion extending parallel to the axis of said body and being disposed at the same radial spacing therefrom, the corners of said tip forming extensions of the corners of said intermediate portion whereby the tool may pierce a thin

walled metal member and thereafter form, by frictional heat and pressure, an expanded hole through the metal member which is surrounded by a boss of substantially greater height than the thickness of the metal member and which projects from opposite sides of the members;
said third portion being of cylindrical form having a diameter greater than that of said boss to define a bottom face whereby the third portion overhangs said intermediate portion; and
means only at the juncture of at least some of said corners of the intermediate portion and said bottom face of said third portion for bevelling the inside of said boss.

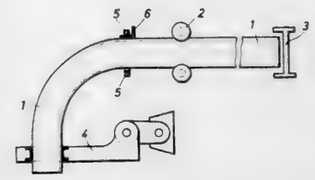
4,177,660
APPARATUS FOR FEEDING WORKPIECES FOR CROSS WEDGE ROLLING
Jan Kovar, Ricmanice, and Jan Drkal, Brno, both of Czechoslovakia, assignors to Vyzkumny ustav tvarecich stroju a technologie tvareni, Brno, Czechoslovakia
Filed Mar. 24, 1978, Ser. No. 890,023
Int. Cl.[2] B21H 9/00
U.S. Cl. 72—108 **6 Claims**



1. In cross wedge rolling apparatus including a cross wedge rolling mill stand having opposed rolls, the improved mechanism for feeding workpieces to the rolling mill stand, comprising a stand-by trough disposed substantially on the axis of cross rolling, an auxiliry trough above the axis of cross rolling, a supply chute above the auxiliary trough for supplying workpieces to be rolled to said auxiliary trough, the supply chute terminating at the auxiliary trough, a first power cylinder for shifting a workpiece in the auxiliary trough to the stand-by trough, a second power cylinder for shifting a workpiece in the stand-by trough to a position between the opposed rolls of the mill stand, and means selectively to discharge a workpiece from the auxiliary trough before it is fed to the stand-by trough.

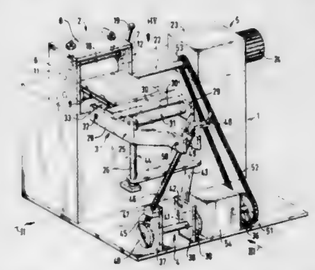
4,177,661
METHOD AND APPARATUS FOR BENDING LARGE PIPES
Kurt Schwarzbach, Düsseldorf; Horst Koehler, Haan, and Franz Müller, Duisburg, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany
Filed Dec. 7, 1976, Ser. No. 748,216
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1975, 2555326
Int. Cl.[2] B21D 7/024, 7/16
U.S. Cl. 72—128 **4 Claims**

1. Apparatus for bending large pipes including:
(a) a guidance device for guiding a pipe to be bent;
(b) a pressure element for pushing the pipe through said guidance device;
(c) a heat source placed downstream from the guidance device in a direction of movement of the pipe for inductively heating the pipe, said heating source being of annular shape;
(d) a turning lever for receiving and holding the free end of the pipe during bending, the improvement comprising:
(e) a screen disposed between said heating source and said guidance device but not mounted on the pipe, said screen being movable in the direction of the axis of the pipe to be bent and being disposed between the wall of the pipe and said annular heat source opposite to the location of the turning axis of the lever about which the pipe is being



bent, said screen being shaped to cover less than the full circumference of the pipe but at least approximately one third of the circumference of the pipe and having maximum thickness adjacent to a line of largest curvature of the bending and turning, and tapering down adjacent to sides of the pipe undergoing medium curving upon bending, said screen being stationary relative to the pipe during bending by operation of turning of the lever.

4,177,662
MACHINE FOR THE MANUFACTURE OF AXIALLY PRESTRESSED COILS FROM STRIP
Günter Weinmann, Robert-Schumann-Str. 5, D-6053 Obertshausen, and Heinz Vogel, Waldstrasse 13, D-6239 Diedenbergen, both of Fed. Rep. of Germany
Filed Jan. 3, 1978, Ser. No. 866,519
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1977, 2700033
Int. Cl.[2] B21F 3/02, 3/10; B21D 11/06
U.S. Cl. 72—138 **15 Claims**

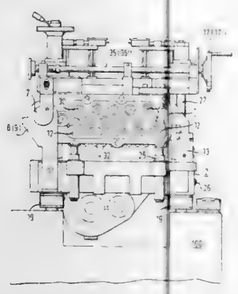


1. A machine for the manufacture, from a strip, of an axially prestressed coil for covering of machine parts, comprising a feed roller pair for feeding the strip by use of an associated feed drive mechanism, an adjusting device for adjusting one of said feed rollers to thereby change the gap between the two feed rollers, the feed rollers being movable against one another by a pressing device, a bending roller which is arranged in front of the feed roller pair, a bearing member for supporting one of the bending roller and the feed roller pair for pivotal movement by means of a swivel drive mechanism about an axis which extends perpendicularly to the plane of the strip which exits from the feed rollers and a shifting drive mechanism for shifting one of the bending roller and the feed rollers transversely to their axis and the feed drive mechanism, the swivel drive mechanism and the shifting drive mechanism being interconnected.

4,177,663
PIVOTABLE ROLLER FRAME ASSEMBLY FOR A MATERIAL STRAIGHTENING MACHINE

Horst Zerhoch, Sinzheim, Fed. Rep. of Germany, assignor to Horst Zerhoch-Vorrinchtungs und Machinenbau GmbH & Co. KG, Sinzheim, Fed. Rep. of Germany

Filed Feb. 6, 1978, Ser. No. 875,528
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1977, 2704674
Int. Cl.[2] B21D *1/02*
U.S. Cl. 72—165 3 Claims

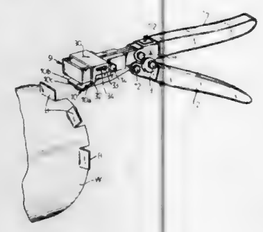


1. A straightening machine for straightening flat and sheet materials flowing therethrough comprising:
an upper and a lower roller frame each having a pair of spaced mounting bars supporting a plurality of positively driven straightening rollers arranged traversely to the direction of material flow, the straightening rollers of said upper frame being staggered in relation to the straightening rollers of said lower frame;
means for pivotably coupling said upper roller frame to said lower roller frame, said means allowing said upper roller frame to pivot with respect to said lower roller frame about an axis which is parallel to the axes of said straightening rollers;
a first drive transmission attached to said upper roller frame for driving said straightening rollers of said upper frame;
a second drive transmission attached to said lower roller frame for driving said straightening rollers of said lower frame; and,
a universal joint connecting shaft having an axis in said pivotal axis drivingly connecting said first and second drive transmissions.

4,177,664
COMBINED BLANK FORMING AND BENDING TOOL

Howard P. Spors, 2162 S. 31th St., Milwaukee, Wis. 53215

Filed Jun. 13, 1978, Ser. No. 915,271
Int. Cl.[2] B21D *31/02*
U.S. Cl. 72—326 7 Claims

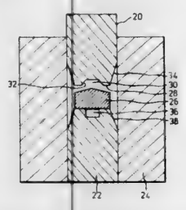


1. A partial blank cutting and bending tool for sheet metal or the like and comprising, a pair of handles, a cutting female member and a cutting male member comprising a plate, said male member having connection means with said handles for being swung by said handles between workpiece cutting and workpiece releasing positions, said female member having a pair of spaced apart cutting edges and also having a connecting intermediate non-cutting edge between said pair of cutting edges, said male member having cutting edges and swingable between and in cutting cooperation with said cutting edges of said female member, said male member also having an intervening non-cutting edge between its cutting edges, said intervening edge being spaced a distance from said intermediate edge of said female member when said cutting members are urged together; the opposed cutting edges of said members cooperating to cut a pair of slits in the workpiece to define a partially cut blank, said connection means between said handles and said male and female members being positioned to cause said male intervening edge to swing past said female intermediate edge a distance spaced apart to thereby bend said blank between said connecting intermediate non-cutting edge and said intervening non-cutting edge and to a substantial right angle from its original position with said workpiece by movement between said cutting members, whereby a blank is partially cut and simultaneously bent from said workpiece.

4,177,665
COLD FLOW FORMING

Heinz P. Schurmann, 421 Abington Ave., Mississauga, Canada (L5A 1L6)

Filed Apr. 3, 1978, Ser. No. 892,541
Int. Cl.[2] B21D *22/06*
U.S. Cl. 72—359 14 Claims

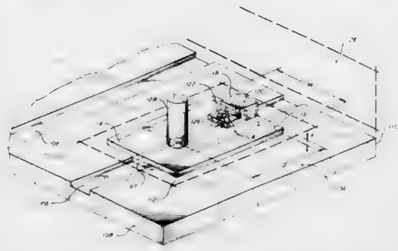


1. A process for producing cold flow formed items from slugs, the process comprising the steps:
providing a slug to be cold flow formed;
providing first and second dies aligned for relative movement axially towards and away from one another, the dies having respective opposed first and second faces and the first face defining a cavity having portions including generally axial walls, and the first die having a peripheral chamfer extending axially away from the first face;
providing a sleeve containing the first and second dies to combine with outer parts of the second face and the peripheral chamfer to define an annular space;
placing the slug between said dies inside the sleeve;
causing said relative movement between the dies to create an impact between the slug and the dies;
causing said relative movement to continue so that the slug is caused to cold flow into contact with said generally axial walls and also into the annular space so that destructive forces applied to the axial walls are countered by forces applied to the chamfer thereby stabilizing the material of the first die between the axial walls and the chamfer.

4,177,666
METHOD AND APPARATUS FOR SAFELY FEEDING A MACHINE MANUALLY

Edward F. Du Bois, and Arthur L. Papastrat, both of Binghamton, N.Y., assignors to The Singer Company, Binghamton, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,145
Int. Cl.[2] B21D *43/04, 5/02, 55/00*
U.S. Cl. 72—420 7 Claims



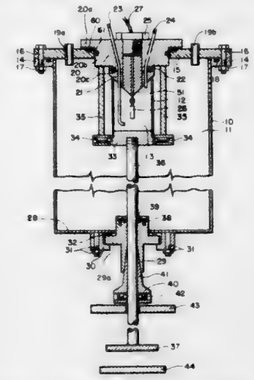
1. A press brake safety apparatus for safely inserting sheet material into the point of operation of a press brake having a danger zone, comprising:
(a) a surface plate for supporting the sheet material to be inserted into the press brake;
(b) a pusher, comprising:
(1) a pusher body for sliding along said surface plate, having a first pusher surface with a thickness of the order of the thickness of the sheet material being inserted, for abutment against the sheet material,
(2) a vertical surface element having a second pusher surface of substantially greater thickness than said first pusher surface, adjustably mounted on said pusher body and movable between a first position in which said second pusher surface coincides with said first pusher surface to form a composite pusher surface, and a second position in which said second pusher surface is recessed from said first pusher surface, and
(3) a handle, integral with said pusher body and located a sufficient distance from said first pusher surface such that the hand of the operator holding said handle will not enter the danger zone while using said pusher; and
(c) keying means interrelating said pusher and said surface plate and situated such that a predetermined pusher travel path is maintained relative to said surface plate.

4,177,667
QUICK RESPONSE HUMIDITY CHAMBER

Steven R. Rolf, Sundance, Wyo.; James L. DeVries, Sioux Falls, and T. Ashworth, Rapid City, both of S. Dak., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 3, 1978, Ser. No. 882,849
Int. Cl.[2] G01N *25/56*
U.S. Cl. 73—1 G 6 Claims

1. A system for testing the response of sensors to fluid characteristics comprising,
a first enclosure for retaining a first volume of fluid having a predetermined physical characteristic at a fixed value, said first enclosure having a circular opening at one end,
means positioned within said first enclosure for measuring the value of said characteristic,
a second enclosure for retaining a second volume of fluid having the same physical characteristic as said first volume but fixed at a different value, said first enclosure being positioned within said second enclosure,
a conical surface projecting within said circular opening of said first enclosure to seal said first enclosure within said second enclosure, and
means for causing the exchange of fluid between said volumes so that said means for measuring is subjected to the
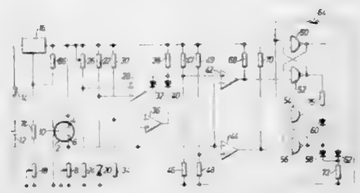


characteristic value of said second volume to provide a measurement of that value prior to fluid equilibration.

4,177,668
APPARATUS FOR DETERMINING THE ALCOHOLIC CONTENT IN THE BLOOD

Lars-Erik Holmberg, Box 184, S-201 21 Malmö, Sweden

Filed May 2, 1978, Ser. No. 902,050
Claims priority, application Sweden, May 4, 1977, 7705196
Int. Cl.[2] G01N *27/04*
U.S. Cl. 73—23 14 Claims



1. An apparatus for determing the alcoholic content in blood, comprising a sensor disposed to produce a signal in response to the alcoholic content of exhaled air to which it is exposed from a test person, and at least two comparator devices for comparing said output signal with at least two preset reference values, a logic circuitry of TTL elements connected to the output of the comparator devices is arranged to actuate at least one light emitting diode of a plurality of light emitting diodes, said actuated light emitting diode being determined by the result of said comparison for indicating the alcoholic content, said logic circuitry comprising two SR flip-flops with inverted inputs, each of said flip-flops being composed of two NAND gates which are connected to three light emitting diodes in such a manner that a first light emitting diode is actuated when the output signal from the sensor is below the first reference value, the first light emitting diode is extinguished and the second light emitting diode is ignited when the output signal is between the first and second reference value, and the third light emitting diode is ignited and the second is extinguished when the output signal exceeds the second reference value.

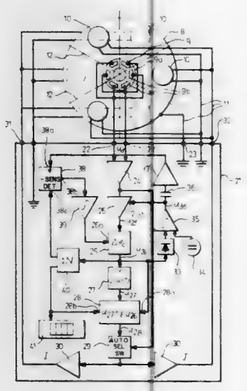
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4,177,669

DEVICE FOR MEASURING THE DENSITY OF A FLUID

Alfred Wenger, Langenbruck, Switzerland, assignor to Institut Straumann AG, Switzerland

Filed Jul. 18, 1978, Ser. No. 925,751
Claims priority, application Switzerland, Jul. 27, 1977, 9278/77
Int. Cl.² G01N 9/00
U.S. Cl. 73—32 A 10 Claims



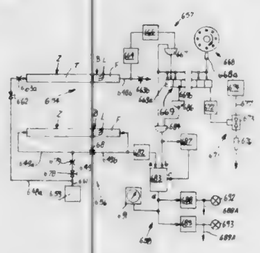
1. In a device for measuring the density of a liquid or gaseous medium, of the type including a support operable to hold an oscillation body, to be introduced into the medium, in a position permitting its oscillation, at least one oscillation detector operable to produce, during operation of the device, an electric detector signal in dependence on the oscillation of the oscillating body, at least one oscillation generator operable to excite the oscillating body, and an electronic circuitry component connected to the oscillation detector and the oscillation generator and including one of a period meter and a frequency meter, for determining one of the period and frequency of oscillation, and at least one phase shifter operable to supply the oscillation generator with an electric excitation signal shifted in phase, through a phase angle, relative to the detector signal produced by the oscillation detector: the improvement comprising, in combination, said electronic circuitry component comprising means operable to vary both the phase angle, between the detector signal and the excitation signal, and the oscillation frequency at least approximately periodically within an interval at a frequency which is less than the oscillation frequency of the oscillating body; and control elements operable to control the phase and frequency position of such interval as a function of the variation of the ratio of the detector signal to the excitation signal, and of the relation, within such interval, of the variations of the detector signal, the excitation signal, and the phase angle between the detector and excitation signals.

4,177,670

METHOD AND APPARATUS FOR MULTIPLE TESTING OF WRAPPERS OF CIGARETTES FOR POROSITY

Uwe Heitmann, Schwarzenbek; Heinz-Christen Lorenzen, Hamburg; Günter Wahle, Reinbek, and Rolf Dahlgrün, Schwarzenbek, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 859,950, Dec. 12, 1977, abandoned, which is a continuation-in-part of Ser. No. 840,562, Oct. 11, 1977, abandoned. This application Mar. 6, 1978, Ser. No. 883,370
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1976, 2653735
Int. Cl.² G01N 15/08
U.S. Cl. 73—38 45 Claims



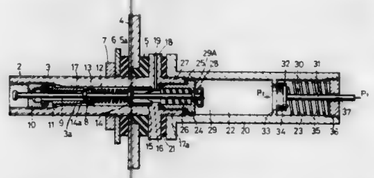
1. A method of testing wrappers of rod-shaped articles which constitute or form part of smokers' products, comprising the steps of measuring the permeability of at least the major portion of the wrapper of each of a series of successive articles; comparing the measured permeability with a predetermined value denoting the maximum permissible permeability of such portions of wrappers; measuring the permeability of predetermined portions of the wrappers of said series of articles, each of said measuring steps including establishing a pressure differential between the interior and the exterior of the respective wrappers; moving the articles of said series sideways along a predetermined path in the course of said measuring steps; generating signals denoting the permeability of said predetermined wrapper portions; and comparing said signals with a signal denoting the minimum acceptable permeability of said predetermined wrapper portions.

4,177,671

APPARATUS FOR SENSING AIR-PRESSURE DROP IN A TIRE

Isao Ichihara; Yasuo Oguni, and Harunori Shiratori, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Continuation-in-part of Ser. No. 780,822, Mar. 24, 1977, abandoned. This application Aug. 3, 1978, Ser. No. 930,649
Claims priority, application Japan, Mar. 25, 1976, 51-34005
Int. Cl.² B60C 23/04
U.S. Cl. 73—146.5 6 Claims



1. An apparatus for sensing air-pressure drop in an automobile tire, adapted for connection with an ordinary air valve having a cylindrical valve body mounted to a tire rim and projecting into the tire at one end to define a valve port, a valve member provided in said valve body designed to open and close a first air passage in said valve body, a second air passageway connected to said first passageway having an exit port on the interior of said tire, said valve port being connected with said first air passageway, a first valve rod axially movable for moving said valve member in one direction to open said first air passageway so that air flows from said first passageway into said second passageway and from there into said tire and a spring urging said valve member in another direction to close said first air passageway, said apparatus comprising:

a cylindrical housing mountable to said one end of said valve body;

a differential pressure sensor dividing the interior of said housing into a first chamber having an air inlet located between said first and second air passageways such that a portion of the air exiting from said first passageway passes through said inlet without passing through said second passageway and a second chamber connected with the interior of the tire, said sensor being normally maintained at a predetermined position by virtue of an equilibrium in air pressure between said first chamber and said interior of the tire and displaceable upon breakage of said equilibrium resulting from pressure drop in said tire to provide an indication of said air pressure drop;

a normally closed valve provided at said air inlet adapted to open for air connecting said first chamber with said first passageway in response to the opening of said first air passageway; and

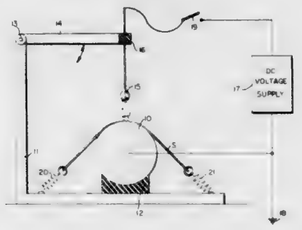
means provided in said second chamber for returning said sensor to said pedetermined position when said air pressure of said tire is raised to a level substantially equal to that of said first chamber.

4,177,672

WHISKERING TEST APPARATUS

Doulgas W. Donigian, Catonsville, Md., assignor to Westvaco Corporation, New York, N.Y.

Filed Apr. 6, 1978, Ser. No. 894,106
Int. Cl.² G01N 13/00
U.S. Cl. 73—150 R 1 Claim



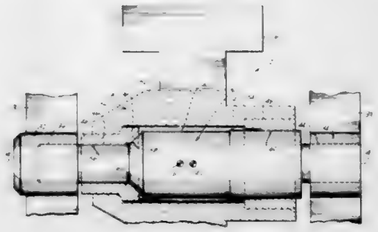
1. An apparatus for producing the whiskers associated with an electroassisted gravure printing process under static conditions without employing the dynamic printing conditions of an electroassisted gravure printing process comprising, a frame element, a conductive, grounded backing member mounted on said frame element, means for insulating said grounded backing member from said frame element, a pivotally adjustable arm member mounted on said frame element, a printing stylus connected to said arm member and arranged to lie normally in spaced relation from said backing plate, means for insulating said printing stylus from said arm member, and a DC power supply connected to said printing stylus, said power source being adapted to produce an electric field between said backing member and printing stylus after a drop of ink placed on said stylus is transferred to a printing substrate which is releasably attached in fixed relation on said backing member.

4,177,673

ANEMOMETER

Rudolph E. Krueger, 1201 Dolphin Ter., Corona Del Mar, Calif. 92625

Filed Jun. 8, 1978, Ser. No. 913,523
Int. Cl.² G01W 1/00
U.S. Cl. 73—189 31 Claims



1. In an anemometer having a rotor assembly mounted on a rotor support shaft for rotation about an axis of the shaft, the rotor assembly having blade means for catching fluid flow against it for causing the rotor assembly to rotate about its axis at a speed which is converted into a signal proportional to fluid flow rate across the rotor assembly, an improved bearing arrangement for mounting the rotor assembly for rotation about the rotor support shaft, the improvement wherein the rotor assembly includes front and rear bearings secured to corresponding axially spaced apart front and rear portions of the rotor support shaft, the rotor support shaft having a front portion having a tapered surface which tapers wider toward a rear portion of the rotor support shaft, the front bearing having a tapered surface which tapers wider toward the rear portion of the rotor support shaft and bears against the tapered surface of the rotor support shaft, at least a portion of the cooperating tapered surfaces of the front bearing and the rotor support shaft being located upstream of the center of gravity and the aerodynamic center of the rotor assembly for supporting upstream of the center of gravity and the aerodynamic center both radial and thrust loads acting on the rotor assembly from fluid flowing axially from front to rear along the rotor support shaft.

4,177,674

SPREADER APPLICATION RATE MONITORING DEVICE

Leonald W. Friedenberg, and James A. Baker, both of Edmonton, Canada, assignors to Baker Engineering Enterprises Ltd., Edmonton, Canada

Filed Apr. 24, 1978, Ser. No. 899,541
Int. Cl.² B05B 12/00; G01F 15/06
U.S. Cl. 73—198 3 Claims

1. Apparatus for monitoring the volume of fluent material applied per unit area by mobile application equipment, including a storage tank (100), dispensing means (111), and conduit means connecting the tank with the dispensing means, comprising

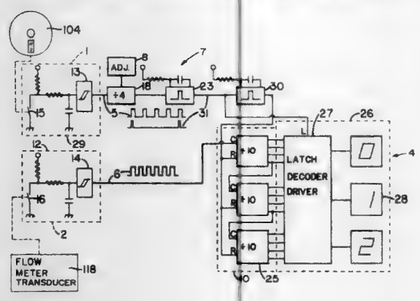
(a) first measuring means (1) operatively connected with the mobile application equipment for generating an area electrical pulse signal (5) having a frequency proportional to the rate at which a unit of area is traversed by the application equipment;

(b) second measuring means (2) including flow measuring means (110; 118) operatively connected in the conduit means for generating a volume electrical pulse signal having a frequency proportional to the rate at which a unit of volume of the material is applied by the application equipment;

(c) electrical circuit means including frequency multiplying means (7) and calibration adjustment means (8) for multi-

plying at least one of said area and volume pulse signals by a calibration factor that is determined from the size of at least one of the units of area and volume;

(d) pulse counting means (10) for accumulating pulses derived from said frequency multiplying means which are a function of the volume electrical pulse signal (6) for a



period of time which is a function of the area electrical pulse signal (5); and

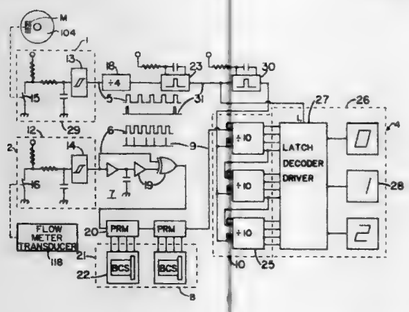
(e) display means (4) connected with said pulse counting means for indicating the number of pulses accumulated in said pulse counting means, whereby the resultant accumulated pulse value is proportional to the volume of material applied per unit area.

4,177,675

SPREADER APPLICATION RATE MONITORING DEVICE

Leonald W. Friedenberg, and James A. Baker, both of Edmonton, Canada, assignors to Baker Engineering Enterprises Ltd., Edmonton, Canada

Filed Apr. 24, 1978, Ser. No. 899,542
Int. Cl.² B05B *12/00*; G01F *15/06*
U.S. Cl. 73—198 **3 Claims**



1. Apparatus for monitoring the volume of fluent material applied per unit area by mobile application equipment, including a storage tank (100), dispensing means (111), and conduit means connecting the tank with the dispensing means, comprising

(a) first measuring means (1) operatively connected with the mobile application equipment for generating an area electrical pulse signal (5) having a frequency proportional to the rate at which a unit of area is traversed by the application equipment;

(b) second measuring means (2) including flow measuring means (110; 118) operatively connected in the conduit means for generating a volume electrical pulse signal having a frequency proportional to the rate at which a unit of volume of the material is applied by the application equipment;

(c) electrical circuit means including frequency multiplying means (7) and calibration adjustment means (8) for multiplying said volume electrical pulse signal by a calibration factor that is determined from the size of the unit of volume;

(d) pulse counting means (10) for accumulating pulses derived from said frequency multiplying means which are a function of the volume electrical pulse signal (6) for a period of time determined by said first measuring means and corresponding to the time required by said application equipment to cover a unit of area; and

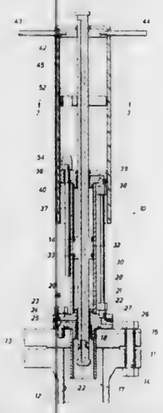
(e) display means (4) connected with said pulse counting means for indicating the number of pulses accumulated in said pulse counting means, whereby the resultant accumulated pulse value is proportional to the volume of material applied per unit area.

4,177,676

SENSOR POSITIONING APPARATUS

Robert H. Welker, P.O. Box 1228, Bellaire, Tex. 77401

Filed May 25, 1978, Ser. No. 909,452
Int. Cl.² G01F *15/18*
U.S. Cl. 73—198 **7 Claims**



1. An apparatus for mounting a sensor means for insertion into and removal from a pipeline against the pressure acting in the pipeline which apparatus is adapted to function at a tee on the pipeline and which comprises:

(a) an elongate cylinder adapted to be positioned approximately perpendicular to the axis of a pipeline;

(b) a piston slidably positioned in said cylinder;

(c) means for mounting said cylinder to said tee in the pipe;

(d) a piston rod connected to said piston and extending from said cylinder through the tee and into the pipeline on reciprocation by said piston;

(e) wherein said piston rod is adapted to support a sensor means at one end thereof which end is inserted into and removed from the pipe by operation of said piston moving in said cylinder; and

(f) wherein said mounting means includes

(1) a first flange plate constructed in accordance with industry standards and adapted to be mated against a coacting flange on the tee connected to the pipeline and wherein said first flange plate is axially open to receive said piston rod therethrough;

(2) a base plate adapted to be joined and sealed against said first flange plate on the top side thereof and further adapted to sealingly support said cylinder;

(3) seal means extending around said piston rod to prevent leakage of fluid from the pipe; and

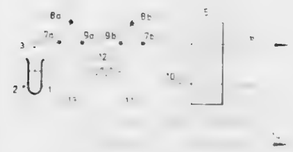
(4) means for securing said base plate relative to said first flange plate.

4,177,677

SAMPLE SUPPLY TO AUTOMATIC ANALYZERS

Jaromir Ruzicka, Naerum, and Elo H. Hansen, Lyngby, both of Fed. Rep. of Germany, assignors to Bifok AB, Sollentuna, Sweden

Filed Sep. 12, 1977, Ser. No. 832,741
Claims priority, application Sweden, Sep. 13, 1976, 7610110
Int. Cl.² G01N *1/18*
U.S. Cl. 73—422 GC **4 Claims**



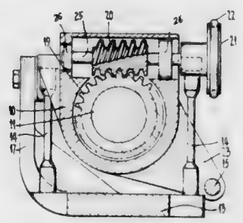
1. A method of supplying samples to a continuously flowing, non-segmented, unobstructed carrier solution for automatic analysis, comprising the steps of connecting a sampling conduit having a predetermined volume to a liquid sample supply and causing the liquid sample to occupy and fill said sampling conduit and thereby form a well-defined plug of known volume while said sampling conduit is disconnected from said flowing carrier solution, and automatically alternately disconnecting said sampling conduit from said supply while connecting said sampling conduit in a path of the flowing carrier solution which includes a shunt conduit having a much greater flow resistance than and parallel to said sampling conduit, and causing said carrier solution to flow through said sampling conduit and deliver said well-defined plug of sample to said path of flowing carrier solution.

4,177,678

DRIVE FOR BALANCING MACHINES

Gerhart W. Harant, Blackburn, Australia, assignor to Repco Limited, Australia

Filed May 30, 1978, Ser. No. 911,043
Claims priority, application Australia, Jun. 7, 1977, PD0375
Int. Cl.² G01M *1/16*
U.S. Cl. 73—460 **4 Claims**



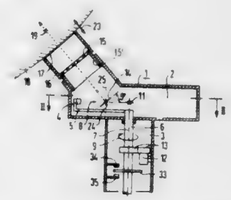
1. An apparatus for rotating a workpiece to be balanced in a balancing machine of the kind having a spindle for supporting said workpiece for rotation, said spindle being rotatably supported on a spindle mounting frame arranged to enable out of balance forces to be resolved into a single direction and measured, said single direction being at right angles to the axis of said spindle, wherein said apparatus comprises a speed reduction means mounted on said frame to transmit drive to said spindle, said speed reduction means rotating at a speed significantly greater than the rotational speed of said spindle and including an input shaft arranged at substantially a right angle to said spindle axis, said speed reduction means being driven by drive means from a drive motor mounted away from said frame, said drive motor having its shaft axis parallel to said input shaft such that any cyclical force changes occurring in said drive means and spuriously reacted into said direction occur at a frequency substantially different to the frequency of signals resulting from out of balance forces in said workpiece.

4,177,679

ULTRASONIC APPLICATOR FOR ULTRASONIC SCANNING OF BODIES AND METHOD OF USING THE SAME

Richard E. Soldner, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 10, 1976, Ser. No. 694,835
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1975, 2529155
Int. Cl.² A61B *10/00*
U.S. Cl. 73—625 **7 Claims**



4. The method of scanning internal body regions accessible through narrow acoustic apertures, which comprises: sequentially directing ultrasonic beams along converging incident beam paths intercepted by a reflective surface, and disposing the reflective surface at such an angular relationship to the incident beam paths as to produce respective sequentially active reflected beams which converge interiorly of a body surface substantially at a narrow acoustic aperture within the body and such that the successive sequentially active reflected beams extend through the acoustic aperture and then diverge along successive scan lines forming a sector scanning configuration within an internal body region beyond the acoustic aperture, and predominantly utilizing ultrasonic echo signals produced in the sector scanning configuration beyond the point of convergence so as to predominantly provide an ultrasonic echo sectional view of the internal body region beyond such acoustic aperture.

4,177,680

DUAL PRESSURE SENSOR

Dennis C. Coleman, Delavan, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Oct. 14, 1977, Ser. No. 842,189
Int. Cl.² G01L *9/12*
U.S. Cl. 73—718 **18 Claims**

1. A variable capacitance dual pressure sensor comprising:

an enclosure;

a substrate of dielectric material within said enclosure having a first major surface and a second major surface;

a first electrode affixed to a portion of said first major surface;

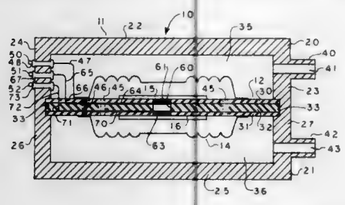
a second electrode affixed to a portion of said second major surface and electrically isolated from said first electrode;

a first flexible electrode mounted in sealed relation to said first major surface of said substrate and spaced from said

V 9 8 9 / 2 DE 11 79 UMI

first electrode forming therewith the plates of a first capacitor, with said second fixed electrode being isolated from any capacitance variances caused by said first flexible electrode;

a second flexible electrode mounted in sealed relation to said second major surface of said substrate and spaced from said second electrode forming therewith the plates of a second capacitor, said first and second flexible electrodes being movable independently of each other and electrically coupled together forming a common connection, and with said first fixed electrode being isolated from any capacitance variances caused by said second flexible electrode;



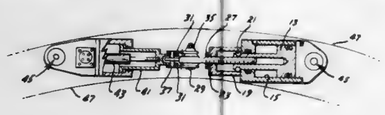
said substrate being sealably mounted within said enclosure forming therewith a first chamber external to said first flexible electrode and a second chamber external to said second flexible electrode and sealed from said first chamber; and means to communicate a variable pressure to at least one of the Chambers.

4,177,681

APPARATUS FOR ADJUSTING AND LOCKING A LINEAR ACTUATOR

Thomas B. Wess, Cincinnati, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 6, 1978, Ser. No. 893,868
Int. Cl.[2] F16H *21/44, 21/54, 25/18*
U.S. Cl. 74—110 **3 Claims**



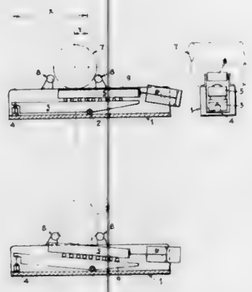
1. A linear actuator for actuation of a turbine nozzle and the like having infinite stroke adjustment and lockable at any position of its designated stroke, said actuator comprising a cylindrical actuator body, an actuator piston disposed within said actuator body for sliding movement therein, an actuator rod having a threaded portion thereon threadably attached to said actuator piston and extending outwardly therefrom, the extending portion of said actuator rod being adjustable in length, an actuator retract stop threadably attached to said actuator rod for limiting the travel of said actuator piston within said actuator body, means for locking said actuator rod in position in said actuator piston to prevent relative movement therebetween, means for locking said actuator retractor stop in position against said actuator body, load clevis attachments having openings therein in alignment with openings in said actuator rod, a shoulder bolt positioned through the aligned openings in said actuator rod and said clevis attachments, and a load piston pivotably attached to said actuator rod for linear movement therewith, whereby the load piston which is locked in position serves to control an electrical feedback precalibrated to give a known signal proportional to its stroke thereby indicating the position of the load.

4,177,682

MECHANISM AND A METHOD FOR THE SUPPORT AND STEPWISE ROTATION OF A MEMBER

Peter G. Blackman, 14 Charlesfield Rd., Rugby, Warwickshire, England, assignor to Peter George Blackman, Rugby and Associated Electrical Industries Limited, London, both of, England

Filed Oct. 11, 1977, Ser. No. 840,900
Int. Cl.[2] F16H *27/02*
U.S. Cl. 74—128 **13 Claims**



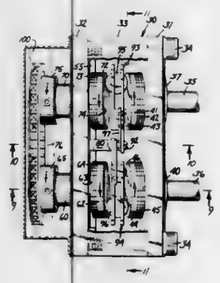
1. A mechanism for the support and stepwise rotation of a rotary member, comprising primary support means defining a stable position of said rotary member and secondary support means for lifting said rotary member off the primary support means, moving linearly a predetermined distance in a direction to allow said rotary member to roll on said secondary support means, and lowering said rotary member onto said primary support means in said stable position, the rotation of said rotary member corresponding to said predetermined distance.

4,177,683

POWER TRANSMISSION MECHANISM

Darcy C. Moses, Rush City, Minn., assignor to Darmo Corporation, Thief River Falls, Minn.

Filed Sep. 19, 1977, Ser. No. 834,279
Int. Cl.[2] F16H *13/02, 13/04*
U.S. Cl. 74—200 **17 Claims**



1. A variable ratio power transmission mechanism comprising, in combination:

a driving member rotatable about a first axis and having a flat surface perpendicular to said first axis;

a driven member rotatable about a second axis and having a flat surface perpendicular to said second axis;

mounting means positioning said member in spaced apposition so that said surfaces define planes intersecting at an acute dihedral angle, said mounting means including ratio varying means for causing relative motion between said members in a direction aligned with the vertex of said dihedral angle;

rolling means making contact with said surfaces along circles concentric with said axes;

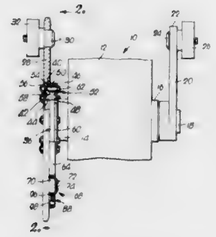
and means resiliently urging said rolling means toward the vertex of said dihedral angle.

4,177,684

ANGULARLY ADJUSTABLE MOUNTING FOR SPROCKET WHEELS AND THE LIKE

Allen A. White, Peabody, and Thomas W. Ankenman, Hesston, both of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Aug. 10, 1977, Ser. No. 823,230
Int. Cl.[2] F16H *13/10*
U.S. Cl. 74—212 **9 Claims**



1. Power transmitting mechanism including:

a shaft rotatable about its longitudinal axis;

a rotary member; and

apparatus securing said member to the shaft in a certain angular relationship for rotation with the shaft about said axis while the member and said shaft remain held in said certain angular relationship,

said apparatus permitting selective angular adjustment of the member relative to the shaft in the plane of rotation of the member to a new angular relationship with the shaft upon temporary termination of said shaft rotation,

said apparatus including first structure movable with the shaft during said relative adjustment, second structure movable with said member during said relative adjustment, and operating means between said structures for moving the latter relative to one another to effect said adjustment,

said operating means including a pair of relatively shiftable components having interacting cam surfaces, said components being disposed to impart adjusting force to said first structure when they are relatively shifted in one direction and to relieve adjusting force from said first structure when they are relatively shifted in the opposite direction,

said operating means further including a second pair of relatively shiftable components having interacting cam surfaces, said second pair of components cooperating with said first mentioned pair of components to confine said first structure therebetween whereby relative shifting of the respective components of the two pairs may be used to effect said adjusting movement of said first structure.

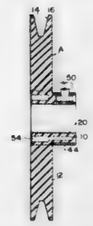
4,177,685

PULLEY

Warren H. DeLancey, 1580 Prospect Ave., Elyria, Ohio 44035

Filed Feb. 13, 1978, Ser. No. 877,018
Int. Cl.[2] F16H *55/48*
U.S. Cl. 74—230.7 **12 Claims**

4. A pulley comprising a disk-like body part with a V-belt groove in its periphery or rim and a hub part extending from at least one side of said body part and having at least one external non-circular recess therein, said hub part having a shaft receiving aperture therein concentric with the V-groove in said body part and an aperture extending from the bottom of said recess or recesses to said shaft receiving aperture, non-circular nuts in the non-circular aperture or apertures in said hub part, and a ring or band member encircling said hub part and having an aperture or apertures therein aligned with the threaded aperture or apertures in the nut or nuts, said body and hub parts being made of a plastic and having at least the sides of the V-belt groove reinforced with glass beads or spheres for reducing pulley and belt wear.

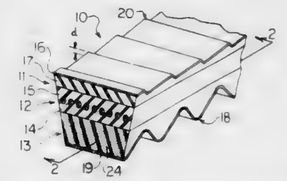


4,177,686

ENDLESS POWER TRANSMISSION BELT

Richard J. Jacob, Dayton, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Filed Jun. 15, 1978, Ser. No. 916,026
Int. Cl.[2] G01F *1/06*
U.S. Cl. 74—231 CB **26 Claims**



1. An endless power transmission belt comprising an inner compression section, an outer tension section and a load-carrying section positioned therebetween, said tension section comprising a plurality of corrugations transverse to the endless path of said belt, said corrugations having a sawtooth shape when viewed from a side of said belt.

4,177,687

V-BELT

Paul E. Russ, Sr., Littleton, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Aug. 16, 1978, Ser. No. 934,122
Int. Cl.[2] F16G *5/20*
U.S. Cl. 74—231 C **18 Claims**

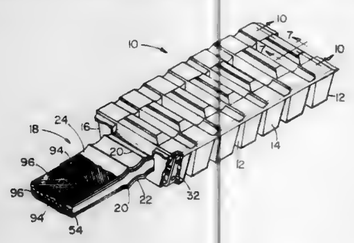
1. A power transmission belt comprising:

a generally flat belt type load carrying section;

a series of spaced blocks transversely positioned and attached to the load carrying section, the blocks molded of a polymeric material and having opposing V-type sides which define frictional driving surface areas; and

a reinforcement for, and of which a portion is embedded in each block, each reinforcement including upper and lower beam members positioned transversely and at opposing radial sides to the load carrying section, and diagonal side members attached to the beam members and embedded in

the blocks with a side member juxtaposed and lending support to each frictional driving surface, each reinforcement arranged so as to substantially surround and transversely support the load carrying section.

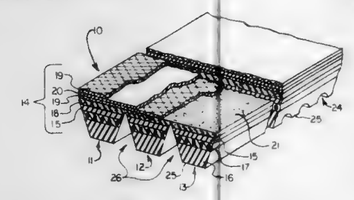


4,177,688

ENDLESS POWER TRANSMISSION BELT AND METHOD FOR MAKING SAME

Anderson W. Howerton, Nixa; Darrell L. Klein, and James R. Thomas, both of Springfield, all of Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Feb. 8, 1978, Ser. No. 875,980
Int. Cl.² F16G 5/06, 5/22
U.S. Cl. 74—233 **11 Claims**



1. An endless power transmission belt comprising a plurality of longitudinally extending, laterally spaced belt elements, each of said belt elements being of trapezoidal cross-section and having an inner compression section, a load-carrying section and an outer tension section, and a tie band interconnecting the radially outer surfaces of said belt elements, said tie band comprising a plurality of cooperating layers, one of said layers being bonded to said radially outer surfaces of said belt elements and comprising an elastomeric matrix having a plurality of discrete elongated fibers homogeneously dispersed therethrough and oriented at an angle of about 90° to the the endless path of said belt, and another of said layers comprising a fabric layer, wherein said spaced belt elements define grooves extending outwardly from the inner surface of said belt through said compression section, load-carrying section and tension section into said elastomeric matrix of said tie band, said grooves terminating short of and spaced from said fabric layer.

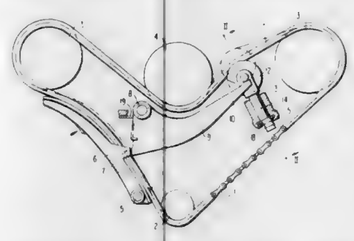
4,177,689

CHAIN DRIVE, ESPECIALLY FOR THE CONTROL DRIVE OF INTERNAL COMBUSTION ENGINES

Karl Zeilinger, Berglen-Hosslinswart, and Reiner Bachschmid, Stetten-Rommelshausen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 5, 1977, Ser. No. 857,693
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1976, 2655102
Int. Cl.² F16H 7/08, 7/12
U.S. Cl. 74—242.8 **16 Claims**

1. A timing control chain drive of an internal combustion engine which includes one driving chain wheel and at least two driven chain wheels with a drive chain passing around the driving and driven chain wheels, and a first chain tensioning means engaging at a non-loaded section of the drive chain, characterized in that a further chain tensioning means is provided which engages at another section of the drive chain, and in that means are provided for operatively connecting the first and further chain tensioning means whereby a tensioning movement of the further tensioning means is derived from the first tensioning means.

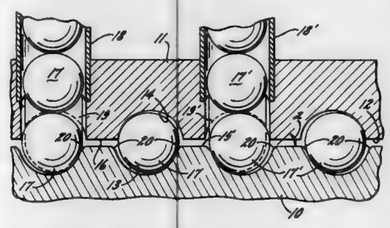


4,177,690

BALL SCREW AND NUT

Hubert E. Klinkenberg, Rochester, Mich., assignor to Beaver Precision Products, Inc., Beloit, Wis.

Filed Feb. 22, 1978, Ser. No. 880,088
Int. Cl.² F16H 1/18
U.S. Cl. 74—424.8 R **3 Claims**



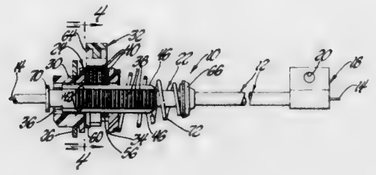
1. In a helical ball screw and nut mechanism, the combination of, a screw having an external helical ball groove of generally semi-circular cross-section, lands formed on said screw and separating adjacent convolutions of said groove, a nut telescoped on said screw and having an internal helical ball groove registering with the groove in said screw to define a ball path, said nut having a return passage having two ends each communicating with said path, the ends of said passage being spaced axially from each other whereby the passage and the portion of the path between said ends define a closed circuit with the path forming the active portion of the circuit and the passage forming the inactive portion, a plurality of balls disposed in and filling said circuit and the nut and screw being preloaded whereby the balls in said active portion bear against one side wall of the generally semi-circular cross section of the groove in said screw and against the opposite side wall of the groove in said nut, and inclined surfaces between the tops of said lands and the side walls of the groove in said screw to unload said balls as the balls travel into and out of said active portion of said circuit, said surfaces being inclined relative to the axis of said screw at an acute angle in the range of 30 to 60 degrees.

4,177,691

MOTION TRANSMITTING REMOTE CONTROL ASSEMBLY

F. Lawrence Fillmore, Birmingham, Mich., assignor to Teleflex Incorporated, Limerick, Pa.

Filed Mar. 6, 1978, Ser. No. 883,458
Int. Cl.² F16C 1/10
U.S. Cl. 74—501 P **16 Claims**



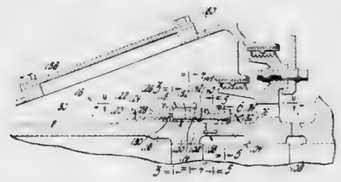
1. A motion transmitting remote control assembly comprising; a conduit, a core element movably supported by said conduit with the ends thereof extending from the ends of said conduit, a fitting adjacent a first end of said conduit for attaching said conduit to a support structure, adjustment means attached to said conduit adjacent the second end thereof, support means adapted for attachment to a support structure, locking means supported by said support means for movement between engaged and disengaged positions for allowing relative movement between said adjustment means and said support means in a direcion longitudinally of said conduit when in said disengaged position and for preventing said relative movement when in said engaged position, said adjustment means having a plurality of straight irregularities disposed therealong and extending transversely to the longitudinal axis of said conduit, said locking means having a plurality of straight irregularities of coacting with said irregularities on said adjustment means when in said engaging position, said adjustment means comprising an elongated member having oppositely facing parrallel sides, said irregularities being disposed in side by side relationship along said sides, and guide means defined by a passageway extending through said support means with said elongated member disposed therein for guiding the movement of said elongated member relative to said support means while preventing rotation of said elongated member relative to said support means.

4,177,692

SHAFT BALANCING

John A. Irwin, Greenwood, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1977, Ser. No. 854,759
Int. Cl.² F16F 15/22
U.S. Cl. 74—573R **1 Claim**



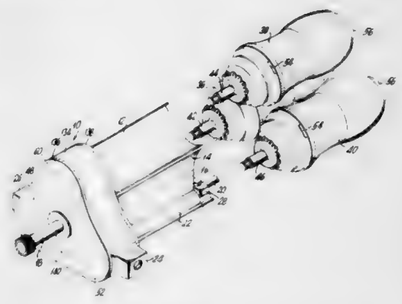
1. A gas turbine engine rotor shaft balancing assembly comprising: a shaft having first and second segments each having an outer peripheral surface thereon spaced from one another, a coupling joining said shaft segments, one of said shaft segments including a plurality of external splines at one end thereof, a first balance ring having a first precise unbalance located thereon, said first balance ring having a first smooth inner bore at one end thereof supportably received on the peripheral surface of the other of said shaft segments and internal splines at the opposite end thereof and for axial adjustment into and out of interlocked engagement with said external splines, a second balance ring having a second smooth inner bore throughout its axial length slidably supported on the peripheral surface of the other of said shaft segments and having a second precise unbalance thereon, coacting serration means on said first and second balance rings for axially joining and separating said first and second balance rings for rotatable adjustment relative to one another to circumferentially locate said first and second unbalances at a relatively fixed rotatable joined position therebetween, said first and second balance rings when in their joined position having their smooth inner bores rotatable on said other of said shaft segments when said first balance ring is out of interlocked engagement with said external splines thereby to circumferentially position said relatively fixed joined first and second balance rings with respect to said shaft for correcting shaft unbalance, means for shifting said first and second balance rings axially on said shaft when said relatively fixed first and second precise unbalances are rotatably adjusted with respect to the shaft to balance said shaft, a housing surrounding said shaft and said first and second balance rings thereon accessible from exteriorly of said engine and including an access port therein overlying said shaft and said first and second balance rings thereon, a removable panel on said housing covering said access port to prevent the entrance of foreign matter interiorly of said housing, said panel being removable whereby said first and second balance rings can be adjusted both axially and rotatably both with respect to one another and with respect to said shaft to produce in situ balancing of the shaft without disassembly from an axially fixed running location within a gas turbine engine.

4,177,693

DRIVE SYSTEM

Theodore Ivanko, Fairfield, and Michael S. Saboe, Trumbull, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Jun. 22, 1978, Ser. No. 917,981
Int. Cl.² F16H 1/28
U.S. Cl. 74—661 **10 Claims**



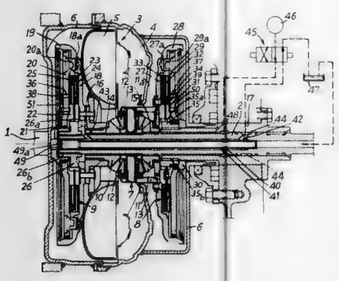
1. A drive system comprising:
three engines each ofwhich has separate drive means;
a unitary "y" shaped firewall to separate the engines from each other;
a gear box to which said engines are mounted with their drive means operatively connected to gear means within said gear box, said firewall being also supported by said gear box to maintain the separation of the engines up to the face of said gear box, said gear box having idler gears operatively connecting the drive means of the three engines to an output drive train of said gear box.

4,177,694

TRANSMISSION MECHANISM WITH HYDROKINETIC COUPLING DEVICE AND REVERSING DEVICE

Henri G. Lachaize, Fontenay-aux-Roses, France, assignor to Société Anonyme Automobiles Citroen, Paris, France

Filed Sep. 6, 1977, Ser. No. 830,995
Claims priority, application France, Sep. 9, 1976, 76 27171
Int. Cl.[2] F16H 3/44
U.S. Cl. 74—732 **7 Claims**



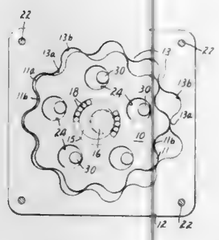
1. A transmission mechanism, more particularly for an automobile, disposed between a driving shaft and a driven shaft comprising in a fixed support structure, a hydrokinetic device for coupling said driving and driven shafts, said device including a closed enclosure provided with a driving wheel therein remote from said driving shaft, said enclosure being rigidly locked with said driving shaft and fluid-filled, a driven wheel located within said enclosure adjacent of said driving wheel and which can be coupled to an end of said driven shaft located in said enclosure and in axial alignment with said driving shaft by means of a reversing device comprising a planetary gear set of bevel gears located substantially at the center of the enclosure and the driving gear of which is keyed to said driven wheel, the driven gear of which is keyed on said driven shaft, said driving gears meshing with at least one planet wheel carried by a planet wheel holder which is freely rotatable with respect to the driven shaft, the coupling of said driving wheel and said driven shaft being controlled by hydraulically controlled coupling means located in said enclosure between said driving gear and said driven shaft and between said planet wheel holder and a part of said fixed support structure.

4,177,695

ROTARY SPEED CHANGER

Leslie H. Grove, 707 E. Hoyt Ave., St. Paul, Minn. 55106

Continuation-in-part of Ser. No. 583,595, Jun. 4, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 763,919
Int. Cl.[2] F16H 1/28
U.S. Cl. 74—80.4 **11 Claims**



1. An efficient, economical rotary speed changer comprising a housing containing

(a) a 2-element internal gear set, the inner element having n external teeth and the outer element having n+1 internal teeth, all of which are in substantial contact with the facing external teeth,

(b) a crankshaft journalled in the housing coaxially with said outer element and having an eccentric journalled in an opening on the axis of the inner element,

(c) the inner element having m cylindrical cycloid holes or pins centered on and equally spaced along a circle centered on its axis, n and m each being integers, n being at least three,

(d) a plate having a cylindrical cycloid pin or hole mating with each hole or pin of the inner element, the diameter of each cycloid hole exceeding the diameter of the mating pin plus twice the eccentricity of the crankshaft-eccentric,

(e) the ratio of the root diameter of the inner element to the eccentricity being at least 9 to 1, and

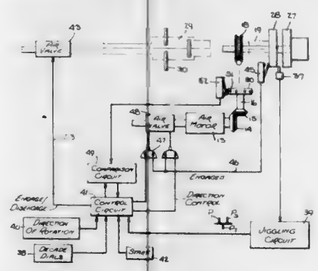
(f) one of said plate and outer element being fixed to the housing and the other free to rotate at a reduced speed relative to that at which the crankshaft rotates.

4,177,696

ANGULAR INDEXING MECHANISM FOR ORIENTING WORKPIECE

Lester I. Moss, Hackensack, N.J., assignor to Mosstype Corporation, Waldwick, N.J.

Filed Jan. 22, 1976, Ser. No. 651,535
Int. Cl.[2] B23Q 17/18
U.S. Cl. 74—826 **10 Claims**



1. In a mechanism provided with a multiple-tooth face gear coupling pair wherein the first gear in the pair is arranged to be rotatable and the second gear to be non-rotatable, reversible motor means being associated with said first gear to cause it to assume a desired angular position, the second gear being axially retractable and advanceable with respect to the first gear whereby when the second gear is retracted, the first gear is free to rotate, and when the second gear is advanced into meshing relationship with the first gear, the position of the first gear is locked against rotation, a system for bringing about a condition of full intermeshing engagement between the face gears, said system comprising:

(A) means operatively coupled to said second gear to sense a point in the advance thereof at which the second gear is a few mils somewhat shy of full engagement with the first gear to produce a control signal; and

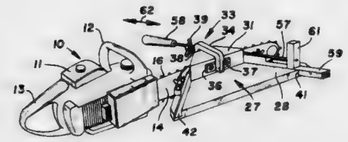
(B) means responsive to said control signal to initiate a jiggling action in each phase of which the motor means for the first gear is momentarily reversed in direction to slightly turn the first gear to permit an incremental advance of the second gear to a point still closer to full engagement, said jiggling action continuing until a condition of full engagement is attained.

4,177,697

APPARATUS FOR SHARPENING A CHAIN SAW

Edward C. McDunn, Barnesville, Minn. 56514

Filed Dec. 2, 1977, Ser. No. 856,999
Int. Cl.[2] B23D 63/16
U.S. Cl. 76—25 A **28 Claims**



1. An apparatus for sharpening the cutting teeth of a chain saw having a blade and a chain movably mounted on the blade, said chain having teeth operable to cut material, as wood, each tooth having a forward cutting edge, comprising: a base, means mounted on the base operable to hold the base on the blade, a rod file having a forward end and a handle end, an elongated non-rotatable slide, means connecting the forward end of the file to the slide, said handle end of the file being free to be moved in a direction whereby the file can be moved into engagement with the forward cutting edge of a tooth, said base having linear surfaces forming at least one linear groove providing guide means for accommodating the slide for movement along the linear path of said groove, said slide having linear external surfaces located in sliding engagement with surfaces of the base forming the groove therein whereby the slide and file can be moved in opposite directions along said linear path, said guide means locating the slide at an angle relative to the side of the blade to position the rod file at an angle relative to the forward cutting edge of a tooth of the chain, and holding means mounted on the base engageable with said tooth of the chain to hold the tooth in a fixed position and to align the file with the forward cutting edge of said tooth, said holding means extended in the general longitudinal direction of the file means and having a portion engageable with the side of the tooth that is to be sharpened whereby the rod file can be moved along said linear path to sharpen the forward cutting edge of said tooth.

4,177,698

FINGER FIT IMPLEMENT

Lillian L. Greneker, 321 E. 69th St., Apt. 1E, New York, N.Y. 10021

Filed Mar. 24, 1978, Ser. No. 889,735
Int. Cl.[2] B25B 9/00
U.S. Cl. 81—1 R **7 Claims**



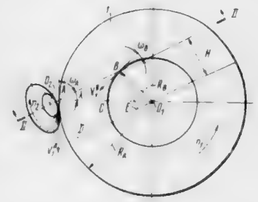
1. A finger fit implement comprising a shaped hollow member, one end of which forming an opening to accomodate the entry of a finger, and having an interior shape including a top portion generally parallel to the axis of said member and a lower portion off centered and tapered with respect to said axis of said member and joining said top portion forming a closed end of said member; an external fitting means for accomodating an element for manipulation by said finger, said fitting means positioned in axial alignment with said top portion of said opening and secured to said member at the point where said top portion and said tapered lower portion join, said fitting including a bevelled inner surface generally parallel to said tapered lower portion of said member providing a conforming fit on said finger thus increasing manipulability and fit, a plurality of rigid segments positioned at circumferentially spaced positions about said hollow shaped member, said segments digitally engageable for manipulation support of said member, and providing the area of said implement about the central portion of the finger of relatively thin material so as to be transmissive of pressure and thereby provide an area for increased touch sensitivity.

4,177,699

METHOD OF MACHINING END FACES

Stanislav A. Dovnar, ulitsa Koltsova, 18/1, kv. 79; Valery A. Sidorenko, Leninsky prospekt, 14, kv. 3; Evgeny I. Morgunsky, ulitsa Malaya, 15, kv. 1, and Nikolai V. Vishnev, ulitsa Karastoyanovoi, 23, kv. 82, all of Minsk, U.S.S.R.

Filed Jun. 21, 1978, Ser. No. 917,579
Int. Cl.[2] B23B 3/00; B23C 1/00
U.S. Cl. 82—1 C **1 Claim**



1. A method of machining end faces with rotary tools comprising the steps of:

imparting to the workpiece a rotary motion;

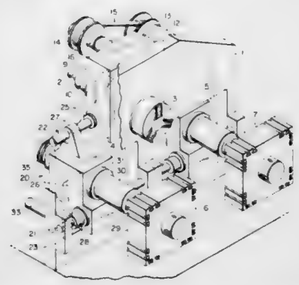
imparting to the tool a straight motion at an angle 20°–75° to the radius of the workpiece.

4,177,700

TURNING MACHINE TOOL

Eberhard van der Horst, Erkelenz, Fed. Rep. of Germany, assignor to A. Monforts, Monchengladbach, Fed. Rep. of Germany

Filed Apr. 26, 1978, Ser. No. 900,111
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1977, 2718479
Int. Cl.[2] B23B 3/00, 3/34
U.S. Cl. 82—2 R **14 Claims**



1. Turning machine tool comprising a workpiece spindle, a cantilevered longitudinal guide adjacent said workpiece spindle and movable parallel to the rotary axis thereof, at least one tool support mounted on the free end of said cantilevered longitudinal guide and being movable in a horizontal plane

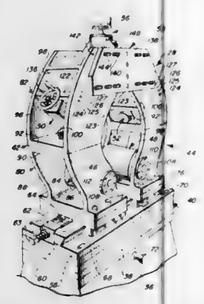
perpendicularly to said rotary axis of said workpiece spindle within a work space for the turning machine tool, guide means for said cantilevered longitudinal guide, and a round guide system comprising two transverse guides movable perpendicularly to said rotary axis of said workpiece spindle, said cantilevered longitudinal guide being supported outside said work space through the intermediary of said guide means in said round guide system.

4,177,701

STEADY REST FOR USE IN APPARATUS FOR SUPPORTING AND PRECISION-TURNING OF LARGE ROTARY DEVICES

Siegfried Schulz, Rolling Meadows, Ill., assignor to Dieter Christoph, Streamwood, Ill., a part interest

Filed Sep. 5, 1978, Ser. No. 939,322
Int. Cl.² B23B *15/00, 3/00, 5/28*
U.S. Cl. 82—39 **23 Claims**



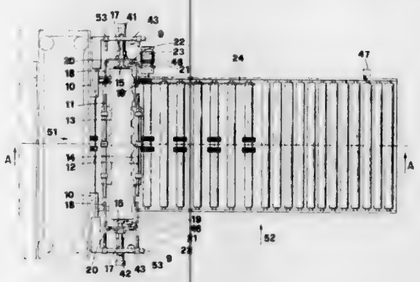
23. In an apparatus for supporting and turning a large rotatable work piece, said apparatus having a base, a cutter support mounted on the base for holding a cutter in position adjacent to the work piece, the improvement comprising: a pair of steady rests mounted on said base for rotatably supporting the work piece; each of said steady rests including; a pedestal having a tower mounted on the base; fasteners releasably securing the tower to the base; a plurality of adjustment plates mounted on the pedestal; a jaw support mounted on the adjustment plates, said jaw support including a pedestal plate, a lead screw rotatably mounted on the pedestal plate, a pair of pivot nuts threaded on the lead screw, and a jaw base connected to each of the pivot nuts and movable therewith; a C-shaped jaw mounted on each jaw base, each C-shaped jaw positioned in a substantially upright attitude with the open side of each jaw facing the other jaw to form a work piece opening therebetween for receiving the work piece, each of the C-shaped jaws having an upper jaw and a lower jaw, each lower jaw having a base plate connected to the jaw base, a pair of roller plates fixed to the base plate, and a connector plate forming the upper end of the lower jaw fixed to the roller plates, a plurality of removable extension plates secured to the connector plate of the lower jaw for determining the size of the C-shaped jaw, said upper jaw having an upper jaw connector plate connected to the extension plates, a pair of side plates fixed to the connector plate, and an upper plate fixed to the side plates adjacent to the upper end of the upper jaw; a removable jaw bridge connecting the upper jaws to complete a circle around a work piece in cooperation with the C-shaped jaws and the jaw support; a support roller mounted in each lower jaw between the roller plates and being adpated to rotatably engage the work piece; a brake mounted in each upper jaw, each brake including a brake plate pivotedly mounted between the side plates of the respective upper jaw for angularly positioning the brake, a brake housing secured to the brake plate, a brake screw rotatably mounted in the brake housing, a brake nut threadedly engaging the brake screw and a brake pad mounted on the brake nut for engagement with the work piece; and a shaft stabilizer mounted on the removable jaw bridge, said shaft stabilizer including a stabilizer roller being vertically adjustable for engagement with the work piece to hold the work piece in engagement with the support rollers supporting the work piece.

4,177,702

DEVICE FOR AUTOMATICALLY FORMING PILES OUT OF STRIPS EXITING FROM A MACHINE ON WHICH THE SAID STRIPS ARE PRODUCED

Luigi Pazzaglia, Bologna, Italy, assignor to Officine Cevolani S.p.A., Bologna, Italy

Filed Jun. 1, 1978, Ser. No. 911,392
Claims priority, application Italy, Jun. 21, 1977, 3479 A/77
Int. Cl.² B65G *57/06*; B21D *43/22*
U.S. Cl. 83—79 **7 Claims**



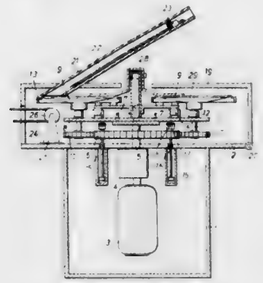
1. Device for automatically forming piles out of strips exiting from a machine on which the said strips are produced, the latter being, a machine of the type that comprises a horizontal table for supporting a sheet to be divided up into strips that is being fed to a cutting device for shearing the said strips perpendicularly to the infeed direction of the said sheet, essential features of the device in question being that it comprises in conjunction: two rods placed downstream of the said cutting device, perpendicualrly to the direction in which the said strips exiting therefrom move forwad, these being parallel one to the other, and supported, through two brackets placed roughly at the extremities of the said rods, by the bed of the said machine, the said rods, each rotatable around its own axis, being movable with respect to one another to suit the width of the sheared strips, each of the said rods being provided with at least one first support member, in an almost central position, provided to sustain the pack of strips in a roughly horizontal position exiting from the aforementioned cutting device resting on one another, the said brackets each being provided with a limit member defining a vertical wall extending below the said rods, on a plane parallel to the direction in which the said strips move forward, the said limit members being provided for the purpose of restraining and guiding the said strips, it being possible to position the said brackets with respect to one another to suit the length of the sheared strip, each of the said limit members being provided with second support members, in the region of the plane defined by the said first support members, on which the said strips can rest in packs and be sustained jointly with the said first support members; means for operating the said rods and for rotating them in opposite directions between two extreme positions, that is to say, the support position and the release position for the pack of strips resting on the said support members, the said operating means being actuated to suit a predetermined number of strips exiting from the said cutting device; a driven endless conveyor placed downstream of the machine, beneath the said rods, movable in a direction parallel to and in harmony with that in which the strips exiting from the cutting device move forward, this designed to accept in succession the packs of strips dropping out of the said rods, until a vertical pile of strips has been formed and to then carry the said pile towards a discharge station; first sensor means placed between the said rods and the said conveyor, to detect when a height pre-established for the pile of strips has been reached, and to consequently cause the said cutting device to cease operating and the said conveyor to subsequently be actuated; and second sensor means placed at the side of the said conveyor, to detect that the said conveyor has undergone in the aforementioned direction a displacement at least equal to the width of the pile and to cause, in consequence, the endless conveyor to halt and the said cutting device to resume operation.

4,177,703

SLICING MACHINE FOR SALMON

Adolf J. J. F. Cavier, Flerrentwiete 49a, 2000 Hamburg 56, and Rudolf Maass, Bahrenfelder Chaussee 73, 2000 Hamburg 50, both of Fed. Rep. of Germany

Filed Apr. 17, 1978, Ser. No. 897,749
Int. Cl.² B26D *4/38*
U.S. Cl. 83—356.3 **5 Claims**



1. A salmon slicing machine comprising a frame, a stationary sun gear and a rotatable shaft mounted on said frame, a stop plate and circular supporting parts having circular grooves mounted for rotation on said rotatable shaft, circular knives positioned under said circular supporting parts and mounted for horizontally rotating and orbiting around said stationary sun gear, means to adjust said stop plate relative to said circular knives and a feeding means for the material to be sliced inclined at an acute angle to the plane of rotation of the knives.

4,177,704

PORTABLE SAW MILL

Rae Randle, Breynat, Canada (T0A 0P0)

Filed Nov. 28, 1977, Ser. No. 855,348
Claims priority, application Canada, Nov. 26, 1976, 266697
Int. Cl.² B27B *7/04*
U.S. Cl. 83—435.1 **9 Claims**

1. A portable saw mill for cutting logs into small dimension lumber, comprising, in combination:

(a) a rigid frame providing a lower base;

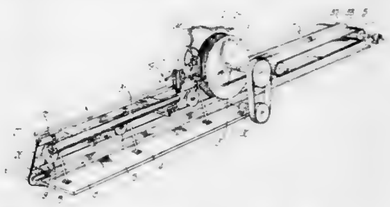
(b) a longitudinally extending rigid rail mounted on said base;

(c) a carriage reciprocally mounted on said rail, said carriage having an upper surface for supporting a log to be cut;

(d) a pair of arbors mounted on said base for rotation about parallel axes normal to said horizontal rail and each having a circular saw blade mounted thereon for cutting a log carried by the movable carriage;

(e) means for moving said saw blades towards and away from each other to vary the spacing therebetween, and having a selected minimum spacing slightly larger than the width of the movable carriage, whereby the carriage can pass between the saw blades during cutting of a log carried thereby;

(f) log hold down means mounted on said carriage clampingly to press the log onto the log supporting upper surface thereof and dimensioned to pass between said saw blades during reciprocal movement of the carriage; and



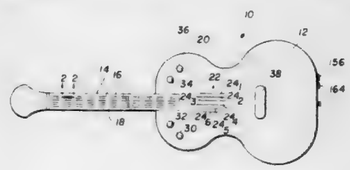
(g) guide means for guiding the carriage during reciprocal movement thereof along the rail, said guide means engaging the carriage at a position below the log supporting surface thereof; said combination providing a lightweight, rigid portable saw mill having no supporting structure located in a plane above the movable carriage so as to permit unobstructed viewing of a log during cutting.

4,177,705

STRINGLESS ELECTRONIC MUSICAL INSTRUMENT

Fred J. Evangelista, 14 Linda La., Severna Park, Md. 21146

Filed Dec. 28, 1978, Ser. No. 973,801
Int. Cl.² G10H *1/00, 1/02*
U.S. Cl. 84—1.16 **14 Claims**



1. In an electronic musical instrument for simulating a stringed instrument having a body portion adapted to carry tone generating means and a neck portion adapted to carry a finger-board assembly coupled to said tone generator means and being operable to vary the tonal output thereof, the improvement comprising:

tone generator means including an electrical oscillator circuit for each fundamental frequency desired to be simulated and including switch operated circuit means operable from said fingerboard assembly for selectively changing the tonal output frequency of said oscillator circuit;

a respective output amplifier circuit coupled to said oscillator circuit and being energized in accordance with the operative state of a player actuated switch device; and

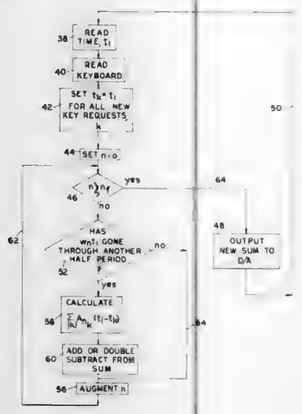
said player actuated switch device consisting of a relatively thin flexible blade-type switch actuator member mounted on edge in a substantially upright position on the outer surface of said body portion adjacent said fingerboard assembly, being adapted thereby to be deflected bi-directionally transverse to said upright position when strummed, struck, picked or plucked or bowed by a player, and at least one pair of electrical switch contacts located on each side of said actuator element, wherein deflection of said actuator element in either direction operates one of said pair of switch contacts to energize said output amplifier circuit.

4,177,706

DIGITAL REAL TIME MUSIC SYNTHESIZER

Alan J. Greenberger, #8 Hart Ave., Hopewell, N.J. 08525

Continuation-in-part of Ser. No. 721,447, Sep. 8, 1976, abandoned. This application Jul. 7, 1978, Ser. No. 922,803
Int. Cl.[2] G10H *1/06, 5/10*
U.S. Cl. 84—1.01 **11 Claims**



1. A musical synthesizer wherein musical waveshapes are synthesized comprising:

first memory means for storing a set of transient envelope waveshapes and a set of harmonic frequencies constituting said musical waveshapes;

means coupled to said first memory means for comparing and digitally approximating said musical waveshapes by the summing of square wave signals into digitalized waveform approximations of said musical waveshapes;

selecting means coupled to said first memory means a plurality of each of said selecting means controlling the initiation of one of said musical waveshapes; and

means coupled to said selecting means and said first memory means for non-periodically computing said musical waveshapes dependent upon the state of any of said selecting means, said computing means including signal information derived from the state of said selecting means.

4,177,707

ELECTRONIC MUSIC SYNTHESIZER

Gary R. Boucher, 11831 S. Willow Cir., Houston, Tex. 77071

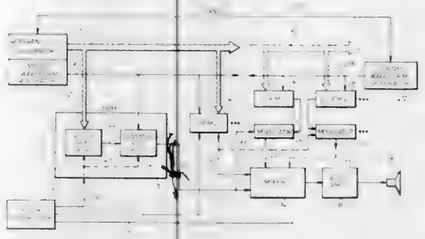
Continuation-in-part of Ser. No. 601,509, Aug. 4, 1975, abandoned. This application May 2, 1977, Ser. No. 793,126
Int. Cl.[2] G10H *1/00*
U.S. Cl. 84—1.01 **25 Claims**

1. An electronic sound synthesizer for generating a selected signal waveform at a desired audio frequency F2, comprising:

(a) a signal generator for generating a periodic signal at a relatively higher frequency F1 than the audio frequency F2 and having a waveshape similar to that of said desired signal waveform;

(b) a sampling circuit for repetitively sampling said periodic signal to thereby provide a series of samples, successive ones of the samples being produced by sampling said periodic signal at a rate of approximately once per a given cycle at instantaneous points in the cycle which are progressively displaced from the previously sampled points;

(c) a storage mechanism for storing said samples; and



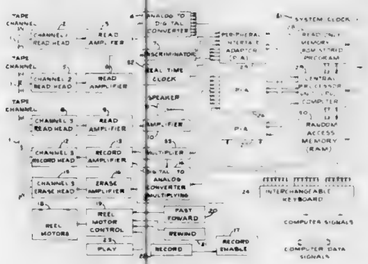
(d) means for sequentially recombining each of said samples to thereby produce said selected waveform at the desired audio frequency F2.

4,177,708

COMBINED COMPUTER AND RECORDER FOR MUSICAL SOUND REPRODUCTION

Rochelle Pinz, 2100 Atlantic Blvd., Atlantic Beach, N.Y. 11509, and Gordon Silverman, New York, N.Y., assignors to Rochelle Pinz, Atlantic Beach, N.Y.

Filed Jun. 17, 1977, Ser. No. 807,733
Int. Cl.[2] G10H *3/04*
U.S. Cl. 84—1.28 **6 Claims**



1. A device for storing samples of musical tones and reproducing and recording sustained tones, chords and melodies, said device comprising:

first recording means including a multiplicity of samples of tones produced by some musical instrument previously recorded on said first recording means,

first conversion means for the conversion of said multiplicity of samples of tones from said first recording means into electrical signals,

amplification means for the amplification of said electrical signals,

a second conversion means for the conversion of said amplified electrical signals into a multiplicity of pulse signals whose states are equivalent to said tone samples,

a second recording means which includes a multiplicity of address and reset signals in correspondence with said multiplicity of tone samples on said first recording means,

a third conversion means for the conversion of said address and reset signals into electrical address and reset signals,

a second amplification means for the amplification of said electrical and reset signals,

discriminator means for the separation of said electrical address and reset signals into a distinct address signal and a distinct reset signal,

keyboard means adapted to produce signals which determine which of said tone samples should be used to produce a sustained tone or tones,

read only memory means which stores the sequence of operations by which said device accepts signals from said keyboard and accepts said samples of tones and produces a sustained sequence of tone or tones,

random access memory means which stores said pulse signals from said second conversion means and which stores signals from said keyboard means,

central processor means for receiving signals from said read only memory means and producing control signals for the reproduction of said sustained tone or tones,

system clock means which includes time signals to determine when said control signals from said control processor means are to be produced,

a fourth conversion means for the conversion of a second multiplicity of pulse signals initiated by said central processor means, said second multiplicity of pulse signals being representative of the time course of a note or notes into a continuous electrical signal equivalent to the state of said second multiplicity of pulse signals,

a third amplification means which amplifies said continuous signal representative of the time course of a note or notes,

a fifth conversion means for the conversion of said continuous signal representative of the time course of a note or notes into a magnetic signal equivalent to said continuous electrical signal,

multiplier means for the adjustment of the magnitude of said continuous electrical signal being produced by said fifth conversion means,

a third recording means to store said magnetic signal,

a fourth amplification means for the amplification of signals from said fifth conversion means,

audio means for the reproduction of the signal produced by said fourth amplification means,

erasure means to produce an electrical erase signal to convert signals on said third recording means to a form which will not induce response in said first conversion means,

a sixth conversion means to convert said electrical erase signal to a magnetic signal representative of said electrical erase signal,

reel motor means for the forward and backward movement of said recording means, said second recording means and said third recording means,

fast forward control means to initiate forward movement of said reel motor means,

rewind control means to initiate backward movement of said reel motor means, and

record means whereby amplification is initiated by said third amplification means and whereby electrical erase signal is initiated by said erasure means.

4,177,709

MOUNTING FOR TWO PAIRS OF CYMBALS

Michael E. Adams, 6409 N. Newgard, Chicago, Ill. 60626

Continuation-in-part of Ser. No. 924,998, Jul. 17, 1978. This application Sep. 29, 1978, Ser. No. 946,740
Int. Cl.[2] G10D *13/06*
U.S. Cl. 84—422 R **25 Claims**

1. A percussion musical instrument comprising:

a telescoping stand;

a frame removably mounted to said stand and movable therewith;

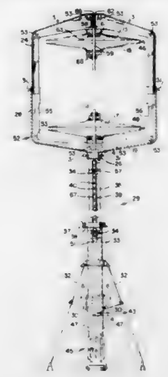
a spring-biased first rod disposed within said stand and movable therein;

a pair of lower twin cymbals spaced apart in a facing relationship one above the other along said first rod within said frame, the lower one of said lower twin cymbals being fixed to said frame, and the upper one of said lower twin cymbals being adjustably fixed to said first rod and movable therewith;

a second rod disposed at the top of said frame and movable therein;

a pair of upper twin cymbals spaced apart in a facing relationship one above the other along said second rod within said frame, the upper one of said upper twin cymbals being fixed to said frame, and the lower one of said upper twin cymbals being adjustably fixed to said second rod and movable therewith;

connecting means connecting said first rod to said second rod for unitary movement thereof; and,



pedal means attaching to said first rod for moving said first rod up and down within said stand, said connecting means moving said second rod in unison with said first rod, whereby the upper one of said lower twin cymbals and the lower one of said upper twin cymbals move in unison with the operation of said pedal means.

4,177,710

BLIND FASTENER

Josip Matuschek, Newport Beach, and Rene A. Chister, Costa Mesa, both of Calif., assignors to Townsend Textron, Santa Ana, Calif.

Continuation-in-part of Ser. No. 807,366, Jun. 17, 1977, abandoned. This application Jul. 29, 1977, Ser. No. 820,156
Int. Cl.[2] F16B *13/04*
U.S. Cl. 85—70 **2 Claims**



1. A fastener for firmly securing together workpieces of composite thickness ranging from a predetermined minimum to a predetermined maximum comprising in combination,

a tubular sleeve having a head at one end and adapted to extend through aligned openings in said workpieces with said head abutting one of said workpieces, and

a mandril having a cylindrical body within said tubular sleeve and formed with a head on said body in engagement with the other end of said sleeve,

said tubular sleeve being formed with a uniform outside diameter throughout its length and with a uniform fixed inside diameter from said head to approximately the point on said sleeve of said predetermined minimum composite workpiece thickness, said inside diameter increasing at a

uniform rate from said point to said other end of said sleeve,

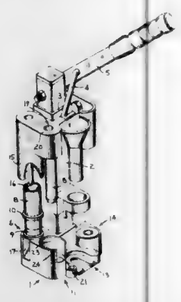
said mandril body being formed with a cylindrical outside surface substantially complemental of the inside surface of said sleeve to prevent inward collapsing movement of all portions of said sleeve upon application of longitudinal compressive force thereto.

4,177,711

SHOTGUN SHELL LOADING

Richard J. Lee, Highway "U", Hartford, Wis. 53027

Filed Aug. 28, 1978, Ser. No. 937,083
Int. Cl.[2] F42B *33/10*
U.S. Cl. 86—38 **5 Claims**



1. In a device for loading a shotgun shell having a head thereon, the combination comprising:

(a) a base defining first and second stations for supportingly receiving a shell,

(b) vertically movable ram means disposed above said first station for removing an old primer from said shell and applying a sizing ring to the shell head,

(c) a supporting surface at said second station,

(d) a vertically movable priming post disposed above said supporting surface, said post having an exposed top end,

(e) a vertical passage disposed in said post and extending from said exposed top end to the lower post end so that a new primer may be dropped by gravity therethrough onto said supporting surface,

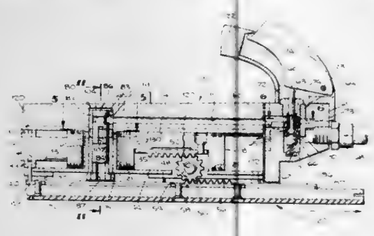
(f) and means to move said post downwardly toward said surface to drive the shell onto said new primer.

4,177,712

AIR DRIVEN TOOL WITH DOUBLE-ENDED ALIGNED PISTONS OPPOSITELY DRIVEN

Albert M. Herzig, 700 N. Rexford Dr., Beverly Hills, Calif. 90210

Filed Mar. 10, 1978, Ser. No. 885,177
Int. Cl.[2] F01L *33/04;* **F01B** *9/00, 7/02, 7/16*
U.S. Cl. 91—179 **12 Claims**



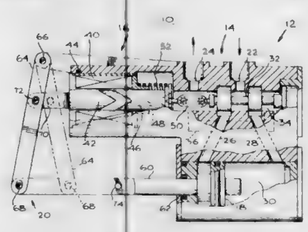
12. A pneumatic motor including a pair of tandemly mounted reciprocating pistons and a reciprocating carrier connected directly to one of the pistons for direct drive thereof in the same direction as said one piston, means including a rack and pinion connection between the other piston and the carrier, a source of fluid pressure and valve means for alternately supplying and exhausting fluid pressure to opposite ends of the pistons for driving them, channel means communicating with the said valve means for delivering fluid pressure, alternately to respective first ends of the pistons and then to respective second ends of the pistons and for exhausting fluid alternately from respective first ends of the pistons and from respective second ends of the pistons.

4,177,713

ELECTROHYDRAULIC PROPORTIONAL ACTUATOR APPARATUS

Leon D. Lewis, Palos Verdes; Wilfried Wiher, Redondo Beach, and Warde L. Parker, Rancho Palos Verdes, all of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 576,611, May 12, 1975, Pat. No. 4,044,652.
This application Jul. 18, 1977, Ser. No. 816,774
Int. Cl.[2] F15B *9/10*
U.S. Cl. 91—375 R **30 Claims**



1. Electrohydraulic proportional actuator apparatus comprising:

a rotary valve and rotary hydraulic actuator mounted and interconnected within a housing, the valve having a torque signal input shaft including a hollow portion defining a longitudinally extending first fluid passage and a sleeve member surrounding the shaft hollow portion and spaced from the shaft outer surface by spacing means to define a longitudinally extending, circumferential second fluid passage, the actuator having an output shaft coupled to a motive member, the spacing means comprising a pair of tubular spacers at opposite ends of the second fluid passage;

means for coupling the valve to a supply of pressurized fluid, the valve being movable relative to the motive member between a null position and respective flow positions for applying pressurized fluid via one of said first and second passages selectively to one side or the other of the motive member;

a transducer coupled to drive the valve to a selected flow position corresponding to an electrical signal applied to the transducer; and

means response to the movement of the motive member for restoring the valve to its null position upon the motive member reaching a position corresponding to the electrical signal applied to the transducer.

4,177,714

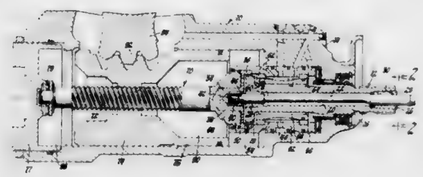
TORSION BAR FOR POWER STEERING GEAR

Floyd A. Schluckebier, Vassar, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 25, 1977, Ser. No. 844,624
Int. Cl.[2] F15B *9/10*
U.S. Cl. 91—375 A **2 Claims**

1. A power steering gear comprising a housing, a stub shaft

forming first rotatable means mounted for turning movement in said housing, an output operatively mounted for turning movement in said housing and extending outwardly therefrom, hydraulically powered actuator means operatively mounted in said housing for moving said output, said actuator means having gear means drivingly connected to said output so that said output moves in response to movement of said actuator means, valve means in said housing operatively connected to a source of pressurized hydraulic fluid selectively movable to effect the hydraulic powered movement of said actuator means and said output, said valve means comprising a valve body member and a spool member, threaded means forming second rotatable means operatively connecting said actuator means to said valve body member and said stub shaft for mechanically moving said actuator means in said housing, torsion bar means having a cylindrical end portion extending into said stub shaft providing a centering spring interconnection between said valve body and spool members, and first fastener means formed by a resilient and tapered thin-walled sleeve having a longitudinal slot extending through the wall thereof, said sleeve being operatively disposed around said cylindrical end of said torsion bar means for securing said cylindrical end to one of said rotatable means, second fastener means including a deformable locking sleeve operatively securing the other end of said torsion bar to the other of said rotatable means to permit winding of said torsion bar and the relative turning of said valve members in response to rotation of said stub shaft for the hydraulic powered movement of said actuator means and said output.



4,177,715

METHOD OF MAKING PARTITIONED TRAY

George L. Meyers, Menasha, Wis., assignor to American Can Company, Greenwich, Conn.

Division of Ser. No. 796,220, May 12, 1977, Pat. No. 4,081,125.
This application Jan. 20, 1978, Ser. No. 870,989
Int. Cl.[2] B31B *17/00*
U.S. Cl. 93—37 R **2 Claims**



1. The method of making a paperboard tray, comprising the steps of:

(a) feeding a first paperboard web from a roll;

(b) feeding a second narrower paperboard web over said first web;

(c) adhering said webs in mated relation at selected areas; and

(d) cutting and scoring said mated webs to form said first web into,

(1) a rectangular bottom panel defined by a pair of side score lines and a pair of primary end score lines,

(2) a pair of end walls hingedly connected to said bottom panel along said primary end score lines,

(3) a pair of side walls hingedly connected to said bottom panel respectivley along said pair of side score lines, and

(4) four corner tabs for connecting said end walls and said side walls together to form a tray body,

and to form said second web into,

(5) a divider panel having a main portion overlaying and coterminous with said bottom panel and having a pair of end portions respectively overlaying said end walls and being hingedly connected to said main portion along a pair of secondary side score lines which respectively overlay said pair of primary end score lines,

(6) an attachment section defined in the main portion of said divider panel by said pair of secondary end score lines and a fold line, said attachment section being adhered to said bottom panel,

(7) a partition section in the main portion of said first divider panel hingedly connected to said attachment section along said fold line, and

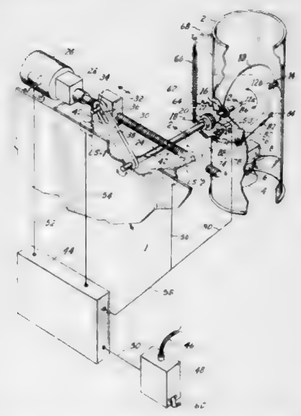
(8) substantially triangular web sections and end glue sections defined in the end portions of said first divider panel by a pair of biased fold lines, said end glue sections being adhered to said end walls.

4,177,716

AUTOMATIC ENERGY SAVER AND FIRE DAMPER FOR EXHAUST SYSTEMS

Gerald J. Bowe, 3348 Morgan Ave., Eau Claire, Wis. 54701, and Thadeus Skuba, Osseo, Wis., assignors to Gerald J. Bowe, Eau Claire, Wis.

Filed Feb. 21, 1978, Ser. No. 879,735
Int. Cl.[2] F23J *11/00*
U.S. Cl. 98—115 SB **10 Claims**



1. Exhaust apparatus for a spray booth comprising:

an exhaust duct adapted to receive and discharge exhaust air from a spray booth;

a damper mounted in said exhaust duct for movement between open and closed positions therein;

a reversible motor for imparting movement to said damper in opposite directions between said open and closed positions;

power transmitting means drivingly connected between said motor and said damper;

a first limit switch operative in response to the movement of said damper to said closed position to stop said motor;

a second limit switch operative in response to the movement of said damper to said open position to stop said motor; and

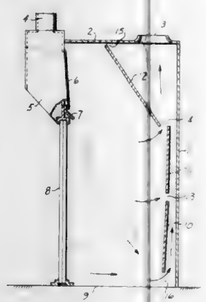
switch means connected to said motor and movable to a first position in response to the termination of spraying opera-

tion to actuate said motor for movement in one direction to close said damper and movable to a second position in response to the commencement of spraying operation to actuate said motor for movement in the opposite direction to open said damper.

4,177,717
BAFFLE SYSTEM FOR FUME HOOD

Harry N. Grow, Two Rivers, and Jon A. Zboralski, Manitowoc, both of Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 27, 1978, Ser. No. 928,462
Int. Cl.[2] F23J *11/00*
U.S. Cl. 98—115 LH **20 Claims**

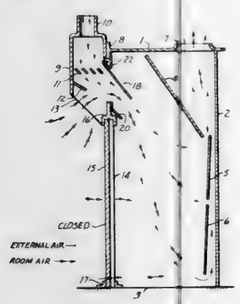


1. A fume hood including a housing that has a wall with an adjacent baffle system for directing fumes to an exhaust wherein the improvement comprises: at least three baffles which include a lower baffle, an intermediate baffle, and an upper baffle spaced from each other for gas flow through openings between the three panels; and the lower baffle has a bottom edge spaced from the wall to provide a bottom gas inlet to the three baffle system.

4,177,718
FUME HOOD

Harry N. Grow, Two Rivers, and Jon A. Zboralski, Manitowoc, both of Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 27, 1978, Ser. No. 928,463
Int. Cl.[2] F23J *11/00*
U.S. Cl. 98—115 LH **14 Claims**

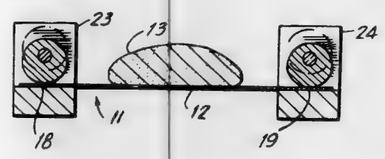


1. A fume hood with an inlet for external air and an openable sash for operator access to an interior of the hood, wherein the improvement comprises: an air supply actuated valve means in flow communication with the hood for directing an air supply through a sash opening in the hood when the sash is open, and for directing an air supply around the sash into the hood when the sash is closed.

4,177,719
COOKING PROCESS AND APPARATUS

Rodolfo R. Balaguer, 2607 Grace Dr., Harbor Beach, Fort Lauderdale, Fla. 33316

Continuation-in-part of Ser. No. 536,105, Dec. 24, 1974, abandoned. This application Nov. 28, 1975, Ser. No. 635,055
Int. Cl.[2] H05B *7/06*
U.S. Cl. 99—358 **6 Claims**



1. A food cooking apparatus which comprises:
(a) a frame;
(b) an electrically conductive sheet having thickness in the range of 0.0005 to 0.125 inches;
(c) two parallel elongated electrically conductive clamps mounted on said frame for clamping respective opposite ends of said sheet to support said sheet between said clamps and make electrical contact to the ends of said sheet, each clamp comprising a first member having a horizontally disposed longitudinal upper surface and a longitudinal substantially cylindrical second member rotatably mounted above and substantially parallel to the upper surface of said first member by means of bearings adjacent each end of said second member, said second member being resiliently bowed between said bearings and being rotatable between a first position in which the substantially cylindrical side surface of said second member is bowed upward away from and does not contact the upper surface of said first member and an end of said sheet can be inserted or removed from between the upper surface of said first member and said second member, and a second position in which the end of the sheet is clamped between and in direct contact with the upper surface of said first member and the cylindrical side surface of said second member and the bow in the second member is at least partially straightened out against the clamped end of the sheet and the upper surface of the first member therebelow to apply substantially uniform pressure to the sheet along the length of the clamp; and
(d) electric current supply means mounted on said frame and electrically connected to said clamps for supplying current to said clamps so that the current flows through the sheet from one clamp to the other in an amount sufficient to cook a food article disposed on said sheet between said clamps.

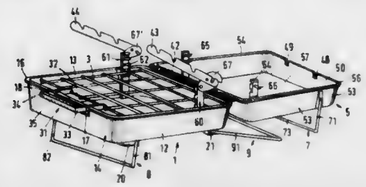
4,177,720
PORTABLE GRILLING DEVICE

Klaus Schmidt, Ritterhude, Fed. Rep. of Germany, assignor to EWG Import u. Export GmbH & Co. Handelskommanditgesellschaft, Bremen, Fed. Rep. of Germany

Filed Apr. 13, 1978, Ser. No. 896,153
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1978, 2800857
Int. Cl.[2] A47J *37/04, 37/07*
U.S. Cl. 99—419 **9 Claims**

1. A portable grill device comprising
first and second bowls hingedly connected to move between

an overlying closure position, a generally right angular use position, and a generally horizontal use position,
latch means partially carried by said first bowl and partially carried by said second bowl for releasably maintaining said first and second bowls in said right angular use position and for allowing said first and second bowls to open into said generally horizontal use position, said latch means being positioned adjacent the hinge edge of each of said first and second bowls,

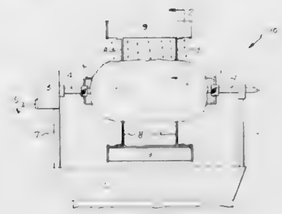


at least one spit holder arm connected with said latch means, said spit holder arm and said latch means cooperating to locate said spit holder arm at an elevated position above said first bowl where said arm is directed toward that first bowl edge opposite to that first bowl's hinge edge, said cooperation being effected when said first and second bowls are in said right angular use position, and
a spit located in supportive relation with said spit holder arm.

4,177,721
BARBECUE ROTISSERIE BASTER

Walden K. Redhead, 3831 E. McGilvra St., Seattle, Wash. 98112

Filed Feb. 1, 1978, Ser. No. 874,322
Int. Cl.[2] A47J *37/04*
U.S. Cl. 99—345 **5 Claims**

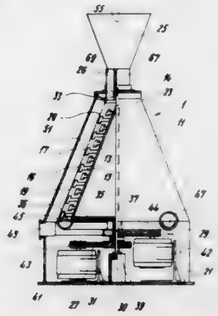


1. A barbecue rotisserie baster comprising in combination: a basting cartridge tube filled with basting sauce provided with control means for dispensing the sauce defined by a plurality of holes disposed substantially linearly longitudinally on said tube, leg elements having hooked end portions remote from said cartridge tube adapted to be inserted in an object to be basted, and means to fasten said leg elements to said cartridge tube comprising a loop section of suitable dimension to overlie said cartridge tube when said cartridge tube is slidably disposed therein and is provided with a screw means to constrain the cartridge within this loop, said loop is fastened to said leg elements.

4,177,722
APPARATUS FOR THE CONTINUOUS SEPARATION OF THE FLESH OF FRUIT FROM THE PITS AND SKINS, ESPECIALLY OF THE PULP OF GRAPES FROM THEIR SEEDS AND SKINS

George C. van Olphen, Tucson, Ariz., assignor to Westfalia Separator Aktiengesellschaft, Oelde Westfalen, Fed. Rep. of Germany

Filed Jan. 5, 1978, Ser. No. 867,211
Int. Cl.[2] A23N *4/10, 7/00*
U.S. Cl. 99—540 **14 Claims**

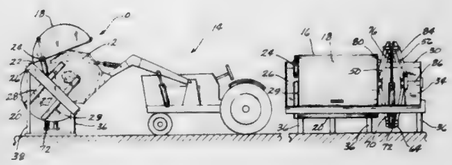


1. In apparatus suitable for continuous separation of the flesh of fruit from its pits and skin comprising a rotor, a screen concentrically disposed opposite the rotor, the rotor having radial arms provided with hammer heads for working of the fruit for passage of the flesh through the screen and collection of the pits and skins on the screen, the improvement which comprises, the screen being rotatably mounted, drive means for the rotor and the screen for driving the rotor and screen at circumferential speeds differing by at least 10%, the hammer heads having striking surfaces inclined so as to form an acute angle with the axis of rotation in the radial projection of the striking surfaces onto the axis, and the rotor and screen being conical and disposed in nested relation.

4,177,723
COMPACTOR DEVICE FOR LARGE ROUND BALES

Wesley F. Buchele, Ames; Dennis L. Jeffries, Waterloo; Ricky D. Madson, Ames; Timothy J. Mattson, Waterloo; Gregory E. Sparks, Waterloo; Raymond D. Thompson, Waterloo, and Howard T. Uehle, Waterloo, all of Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Feb. 8, 1978, Ser. No. 876,055
Int. Cl.[2] B65B *13/20;* B30B *9/30*
U.S. Cl. 100—8 **4 Claims**



1. A compactor device for large round bales, comprising,
a bale compartment having first and second opposite ends and being adapted to receive a bale to be compacted, said first end being fixed to resist movement of the bale during compaction,
a plunger means slidably mounted within said bale compartment for movement towards and away from said first end,

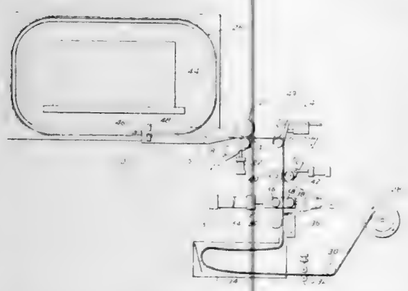
said plunger means having a periphery adapted to substantially conform to the shape of said compartment,
a frame means secured to said second end of said bale compartment,
a double toggle means having two pairs of arms pivotally secured together and being adapted for expansion and contraction in a direction towards and away from, respectively, said first end of said bale compartment, said double toggle means having first and second opposite sides with said first side fixedly secured to said frame means and said second side secured to said plunger means for movement therewith, said second side being secured to said plunger means at a position generally centrally of the periphery thereof,
power means connected to said double toggle means for expanding and contracting said double toggle means,
a first stabilizer arm pivotally connected at one end to said double toggle means and pivotally connected at the other end to said frame means, and
a second stabilizer arm pivotally connected at one end to said double toggle means and pivotally connected at the other end to said plunger means at a position spaced between said periphery and the securement to said second side of the double toggle means,
said first and second stabilizer arms being disposed in parallel relation to one pair of said arms of said double toggle means to maintain said plunger means in a constant attitude while said double means is being expanded to compact a bale within said bale compartment.

4,177,724

STRAP TENSIONING DEVICE

Eric A. Johnson, III, Crawfordsville; Melvin E. Moore, Rockville, and Tom A. Budd, Crawfordsville, all of Ind., assignors to Keystone Consolidated Industries, Inc., Peoria, Ill.

Filed Jun. 5, 1978, Ser. No. 912,512
Int. Cl.[2] B65B *13/22*
U.S. Cl. 100—26 **4 Claims**



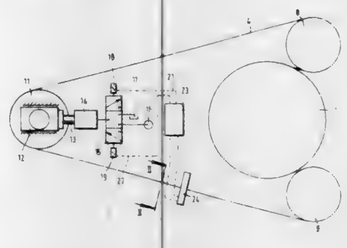
1. In a package strapping machine an improved means for tightening the strap extending from a strap supply about a package to be strapped, comprising, in combination:
feed roller means for feeding the strap about a closed loop to encircle a package to be strapped,
means for gripping the lead end of the strap after it has been fed around the closed loop,
retract roller means for retracting excess strap from the closed loop after the gripping means has gripped the lead strap end so as to tighten the strap about the package,
a linearly reciprocating tension means positioned outside of the path of the strap between said feed means and said retract means and relatively farther from said closed loop than either the feed means or the retract means in relation to the direction of strap feed, said tension means positioned to extend in a direction approximately normal to the free running strand of strap passing through the tension means; and
a secondary gripper means between the linearly reciprocating tension means and the strap supply adapted to grip the strap prior to operation of the linearly reciprocating tension means whereby, when the linearly reciprocating tension means extends to place a final tension in the strap about the package, the amount of strap take-up by the tension means is substantially greater than the linear extension of the tension means thus minimizing the required extension of the tension means and reducing the room necessary within the machine to accommodate the tension means.

4,177,725

METHOD OF AND APPARATUS FOR RECTIFYING DISTORTION IN AN ENDLESS PRESSING BAND

Rolf Gersbeck, Ronnenberg, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hannover Kleefeld, Fed. Rep. of Germany

Filed Oct. 4, 1978, Ser. No. 948,493
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1977, 2744919
Int. Cl.[2] B29C *3/00;* **B29H** *5/00;* **B30B** *15/28, 15/14*
U.S. Cl. 100—38 **2 Claims**



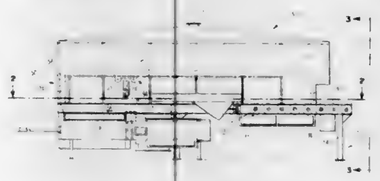
1. A method of rectifying distortion in an endless pressing band, which said pressing comprises a layer of rubber with a steel-wire fabric connected thereto, wound around a heating drum, two associated guide rollers and a hitch roller, comprising the steps of monitoring the relative positions of the opposite ends of one weft wire of said steel-wire fabric and, in the event of a deviation out of position of the two ends of that said weft wire in relation to one another, moving the axis of said hitch roller to adjust its inclination to the axis of said heating drum while retaining the axes of said hitch roller and of said heating drum in a common plane.

4,177,726

AUTOMATIC BAG OPENER

Gerald W. Kinard, Hillsboro, Tex., assignor to Certain-teed Corporation, Valley Forge, Pa.

Filed Jan. 12, 1977, Ser. No. 758,769
Int. Cl.[2] B65G *65/04;* **B30B** *1/00*
U.S. Cl. 100—214 **7 Claims**



1. An apparatus for automatically opening a bag comprising:

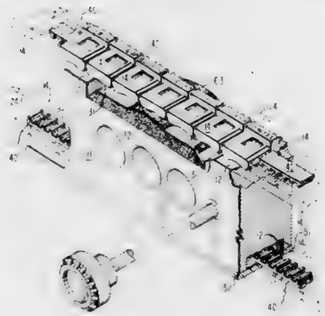
(a) a frame,
(b) a conveyor for transporting the bag into the apparatus,
(c) means operably associated with the conveyor for automatically removing the bag from said conveyor and for supporting and maintaining stationary said bag when said bag has reached a predetermined position on said conveyor, wherein said removing and supporting means comprises a first table operably associated with said conveyor for removing, supporting and maintaining stationary bags from said conveyor, and a second table positioned adjacent and rectilinearly aligned with the first table, and means for moving said bag from said first table to said second table,
(d) means operably associated with the removing and supporting means for cutting the bag, wherein said cutting means comprises at least one cutting wheel pivotally mounted to the apparatus and adapted to contact said bag when said bag is on said second table, and
(e) means operably associated with both said removing and supporting means and the cutting means for automatically gripping and moving said bag into and through said cutting means and automatically releasing said bag after said bag has moved through said cutting means.

4,177,727

LINE PRINTER CHARACTER CHAIN LUBRICATING DEVICE

Theodore M. Cooke, Altamonte Springs, Fla.; Lawrence T. Carian, Clawson, and Gunther R. Goetzinger, Detroit, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 1, 1978, Ser. No. 901,290
Int. Cl.[2] F16N *7/12;* **B41J** *1/20*
U.S. Cl. 101—93.14 **4 Claims**



1. In a line printer character chain mechanism having a hard, support surface about which a printer character chain is rotated, a lubricating device for providing an accurate amount of lubricant between the character chain and the hard support surface, the lubricating device being located in a depression in the hard support surface and comprising a piece of flexible, microporous, polymeric material that is impregnated with a liquid lubricant nonreactive to the polymeric material has at least one depression formed therein that serves as a charging reservoir for the liquid and has a smooth convex arcuate surface for contacting the character chain, and means for semipermanently mounting the polymeric material in the depression in the support surface to provide at least a portion of the polymeric material in contact with the character chain as it passes thereby in rotation such that the polymeric material will maintain a desired amount of lubricant between the support surface and the side of the character chain normally in contact therewith.

4,177,728

METHOD FOR PRODUCING DUPLICATING STENCILS

Peter Koreska, Vienna, Austria, assignor to W. Koreska GmbH, Vienna, Austria

Filed Apr. 18, 1975, Ser. No. 569,360
Claims priority, application Austria, Apr. 26, 1974, 3462/74
Int. Cl.[2] B41N *1/24;* **B41C** *1/14*
U.S. Cl. 101—128.2 **4 Claims**

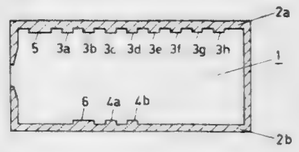
1. A method for producing a reusable, marked duplicating stencil of an original of an image having light and dark portions, comprising the steps of:
preparing a structure including an ink-permeable sheet composed of a plastic material having two major surfaces, and a first layer including a binding material and disposed on at least a portion of one of said major surfaces, said binding material including particles of a semiconductor,
establishing an electrostatic charge distribution on said first layer in correspondence to said image;
applying a toner to the electrostatically charged portions of said first layer;
subsequently, applying a second layer consisting essentially of a hot-seal adhesive to at least a portion of said first layer;
applying a third layer consisting essentially of a material substantially transparent to infra-red light to said second layer;
thereafter, subjecting said second layer to sufficient infra-red light to heat up the parts of said second layer corresponding to the dark portions of said image so that the heated parts, upon cooling, become adhered to said first layer; and
thereafter removing said second and third layers to obtain said stencil.

4,177,729

METHOD FOR THE PRODUCTION MARKING OF LIQUID DISPLAYS

Erwin Büchel, Ennetbaden; Ruurd de Fluiter, Zurich; Peter J. Wild, Wettingen, and Jörg Wullschleger, Mulligen, all of Switzerland, assignors to BBC Brown Boveri & Company, Limited, Baden, Switzerland

Filed Aug. 31, 1977, Ser. No. 829,482
Claims priority, application Switzerland, Nov. 24, 1976, 14746/76
Int. Cl.[2] B41F *15/34*
U.S. Cl. 101—129 **24 Claims**



1. A method for the production marking of a liquid crystal display having a closure bar, said closure bar surrounding the area in which the liquid crystal is to be displayed and sealing said liquid crystal in said display, comprising:
providing a printing screen whose geometry includes said closure bar, wherein at least one sequence of projections which form a code projects from said closure bar; and
print forming said closure bar by use of said screen wherein the geometry of each of said sequence of projections simultaneously forms a portion of the geometry of said closure bar thereby coding said closure bar.

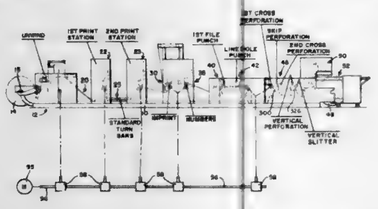
V 9 8 9 2 DEC 11 1979 UMI

4,177,730

METHOD AND APPARATUS FOR WEB PRINTING

Louis Schriber; Robert E. Stephens, and John F. Blaha, all of Dayton, Ohio, assignors to Harris Corporation, Melbourne, Fla.

Filed Nov. 4, 1976, Ser. No. 738,751
Int. Cl.[2] B41F 5/08, 13/14, 29/00
U.S. Cl. 101—248 9 Claims



1. A method of makeready for a press having an unwind apparatus for supporting a rolled web of material and a plurality of rotatable members in spaced alignment defining a path for the web and arranged to perform operations on said web such as printing, perforating, numbering, punching or slitting, said members being rotatable in synchronism and being adjustable laterally and/or circumferentially with respect to the web path;

comprising the steps of

establishing a reference position in the unwind apparatus for the rolled web,

establishing separate side reference positions for each of said rotatable members having a lateral adjustment with respect to the unwind reference position, establishing a circumferential reference position for each of said rotatable members with respect to each other,

providing side measuring and circumferential measuring scale devices associated with each of the adjustable rotatable members to indicate lateral displacement and rotary displacement of the corresponding rotatable member from the reference positions,

establishing a coordinate layout system having reference marks corresponding to the reference positions and having scales in dimensions corresponding to said scale devices,

preparing a chart of dimensional settings using a representation of the desired product in conjunction with the layout system whereby measurements are provided for lateral and circumferential adjustment of the adjustable rotatable members using their respective scale devices, and the settings for the rotatable members can be accomplished with precision to minimize their adjustment once the web is threaded through the press and a run is started.

4,177,731

PRINTER SYSTEM RIBBON DRIVE HAVING CONSTANT RIBBON SPEED AND TENSION

Robert A. Kleist, Anaheim, and Jerry Matula, Culver City, both of Calif., assignors to Printronix, Inc., Irvine, Calif.

Continuation of Ser. No. 708,364, Jul. 26, 1976, abandoned. This application Mar. 23, 1978, Ser. No. 889,290
Int. Cl.[2] B41J 33/14
U.S. Cl. 101—336 18 Claims

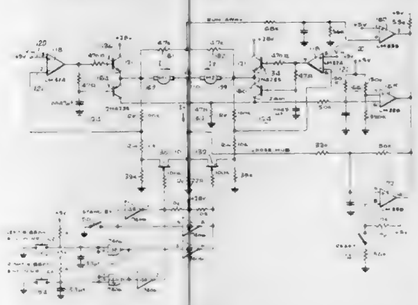
1. A system for driving an elongated web member comprising the combination of:

a pair of rotatable reel members;

an elongated web member extending between and having the opposite ends thereof wound on opposite ones of the pair of rotatable reel members;

a pair of direct current permanent magnet motors, each coupled to a different one of the pair of rotatable reel members; and

circuit means coupled to the pair of motors, the circuit means being operative to energize the motors so as to maintain a substantially constant tension on the web member and including common junction means coupled to each of the pair of motors, means coupled to one of the pair of motors operating as a web member takeup motor for providing a current therethrough and a resulting voltage drop thereacross, means responsive to the voltage drop across said one of the pair of motors for providing a current through the other one of the pair of motors operating as a web member supply motor and into the common junction means and being of sufficient value to maintain the voltage drop across said one of the pair of motors



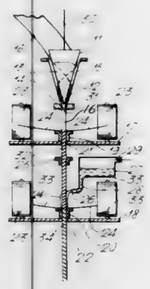
substantially constant, the other one of the pair of motors being operated in response to the voltage drop across said one of the pair of motors, a common current path coupled to each of the pair of motors via the common junction means, a first source of constant voltage coupled to said one of the pair of motors, a second source of constant voltage, differential amplifier means having an output coupled to the other one of the pair of motors and a pair of inputs, one input of which is coupled to the second source of constant voltage, and a feedback circuit coupled between the common current path and the other one of the pair of inputs of the differential amplifier means.

4,177,732

EXPLOSIVE FUSE-CORD

Daniel Steele, Stevenston, Scotland, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 17, 1977, Ser. No. 843,057
Claims priority, application United Kingdom, Nov. 8, 1976, 46361/76
Int. Cl.[3] C06C 5/04
U.S. Cl. 102—27 R 21 Claims



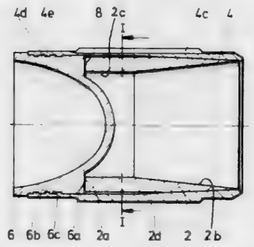
1. An explosive fusecord comprising a core of explosive material surrounded by at least two layers of textile wrapping material, two adjacent wrapping layers being bonded together by an intermediate layer of waterproof hot-melt adhesive material which is a blend of thermoplastic polymeric film-forming material and a tackifying resin.

4,177,733

SPIN STABILIZED PROJECTILE ASSEMBLY

Rudolf Romer, Kaarst; Manfred Moll, Dusseldorf, and Christian Jaeneke, Aachen, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH., Dusseldorf, Fed. Rep. of Germany

Filed Sep. 19, 1977, Ser. No. 834,496
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1976, 2642222
Int. Cl.[2] F42B 13/02
U.S. Cl. 102—93 7 Claims



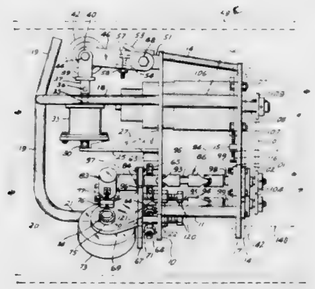
1. A spin stabilized projectile assembly, comprising an annular projectile, a sabot, the projectile having a shoulder at the rear end which bears against the sabot, a barrel guide ring connecting the projectile and the sabot, said sabot having a diameter substantially equal to that of the projectile, the barrel guide ring extending around and over the projectile and a cylindrical part of the sabot, the guide ring being secured to the sabot against relative movement therebetween in a longitudinal direction but being rotatable with respect to the sabot.

4,177,734

DRIVE UNIT FOR INTERNAL PIPE LINE EQUIPMENT

Gary S. Rhoden, Houston, Tex., assignor to Midcon Pipeline Equipment Co., Houston, Tex.

Filed Oct. 3, 1977, Ser. No. 838,860
Int. Cl.[2] B61B 13/10
U.S. Cl. 104—138 G 15 Claims



1. Drive unit for propelling internal pipeline equipment through pipelines, comprising at least one wheel means disposed to roll along the length of the interior wall of a pipe into which said drive unit is inserted, each said wheel means being rotatable about a wheel axis transverse to the pipe axis, support means supporting each said wheel means within said pipe and adapted for movement lengthwise of said pipe, rotative drive motor means having an axial length longer than can be accommodated transversely within said pipe with said drive motor means disposed parallel to each said wheel axis to drive said wheel means, said rotative drive motor means being supported by said support means with its axis disposed parallel to said pipe axis and perpendicular to each said wheel axis to be accommodated within said pipe, and drive transmission means associated with each said wheel means adapted to transmit rotational energy from said drive motor means to said wheel means perpendicularly disposed thereto to drive said wheel means; said drive motor means having a chain sprocket carried on an axial drive shaft thereof, each said wheel means having a chain sprocket parallel thereto and rotatable therewith, each said drive transmission means having a first chain sprocket aligned with said drive motor means chain sprocket and having a second chain sprocket aligned with the associated wheel means chain sprocket, a first drive chain engaged around said drive motor chain sprocket and each said first chain sprockets, and a second drive chain engaged around said second chain sprocket of each said drive transmission means and the associated wheel means chain sprocket, each said wheel means being mounted on a wheel support plate pivotably supported by said support means for movement about an axis radial with respect to a pipe in which said drive unit is disposed, and adjustment means carried by said support means for adjustably fixing the rotational position of each wheel support plate with relation to the radial axis whereby the camber of each wheel means may be adjusted.

3. Drive unit for propelling internal pipeline equipment through pipelines, comprising at least one wheel means disposed to roll along the length of the interior wall of a pipe into which said drive unit is inserted, each said wheel means being rotatable about a wheel axis transverse to the pipe axis, support means supporting each said wheel means within said pipe and adapted for movement lengthwise of said pipe, rotative drive motor means having an axial length longer than can be accommodated transversely within said pipe with said drive motor means disposed parallel to each said wheel axis to drive said wheel means, said rotative drive motor means being supported by said support means angularly to each said wheel axis to be accommodated within said pipe, and drive transmission means associated with each said wheel means adapted to transmit rotational energy from said drive motor means to said wheel means angularly disposed thereto to drive said wheel means, support means comprising spaced first and second parallel plates each disposed transversely of the axis of a pipe within which the drive unit is disposed, means interconnecting said first and second plates, said first plate being adapted for connection to internal pipeline equipment to be propelled through the pipe, said drive motor means being supported by said first plate and extending through an opening through said second plate, said wheel means being supported by said second plate, said drive transmission means each being supported by said first plate and extending through an opening through said second plate to be connected to a said wheel means.

4,177,735

CAR IMPACT CUSHIONING AND COUPLER CENTERING ARRANGEMENT FOR RAILROAD TRACK BUMPING POSTS

Carl N. Rydin, 4S556 River Rd., Naperville, Ill. 60540

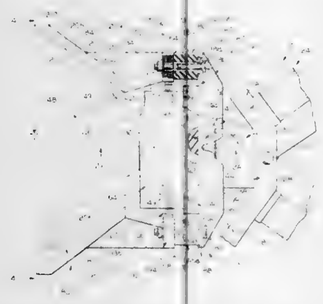
Filed May 1, 1978, Ser. No. 901,497
Int. Cl.[2] B61K 7/18
U.S. Cl. 104—254 11 Claims

1. A shock absorbing attachment for railroad track bumping posts of the type including a vertically disposed striking plate fixedly mounted above the track at the level of the car center line of draft adjacent the end of the track right of way for engagement by the car coupler, said attachment comprising:

a bearing plate having a forward side and a rearward side,

means for mounting said bearing plate on the striking plate with the bearing plate forward side facing the track right

of way and with said bearing plate extending crosswise of the track and being vertically disposed,
said bearing plate forward side defining a seat,
a body formed from resiliently compressible material and being of generally parallelepiped configuration defining a rear side seated on said bearing plate seat and a front side facing oppositely of said rear side,
said body being formed to define a cross bore therethrough that parallels said front and rear sides of said body,
a leaf spring positioned in said body bore and proportioned lengthwise thereto to have its ends extend externally of said body bore on either side of said body,
said leaf spring having a rectangular transverse cross-sectional configuration and being disposed to have the long sides of its said configuration in substantial parallelism with said bearing plate and proportioned such that said leaf spring engages the upper and lower portions of said body bore,
said leaf spring ends each having interposed between same and said bearing plate a compression spring assembly,



said compression spring assemblies each comprising:
a center rod anchored between the respective leaf spring ends and said bearing plate and an annular compression spring through which the respective center rods extend,
said center rods being disposed in substantial parallelism and projecting forwardly of said bearing plate bearing seat on either side of same,
said center rods being connected to said bearing plate for swinging movement of their forward ends toward each other under the impact of a car coupler against the front side of said body to compress said body against said bearing seat with said leaf spring adjacent the mid length of same being deflected toward said bearing plate under such impact,
whereby said body and said leaf spring act in combination to cushion said impact with said center rod forward portions swinging toward each other to compress said compression spring assemblies for supplementing the resistance of said body and said leaf spring to said impact.

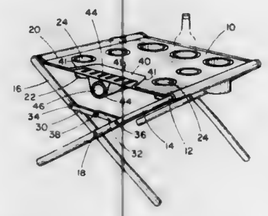
4,177,736
MECHANICALLY AND WELDINGLY SECURED BRACKET
Phillip G. Przybylinski, Schererville; Babgaunda A. Patil, Hammond, both of Ind., and George S. McNally, South Holland, Ill., assignors to Pullman Incorporated, Chicago, Ill.
Filed Nov. 28, 1977, Ser. No. 855,518
Int. Cl.[2] **B61D** *17/16, 39/00;* **E04B** *7/16;* **E04D** *13/14*
U.S. Cl. 105—377 **7 Claims**

1. In a railway hopper car having sides, ends and a roof including coaming defining a hatch opening;
said coaming having a pair of longitudinally extending side walls and a pair of transversely extending end walls intersecting to define corners;
end closure sections abutting each of the transversely extending end walls, the improvement comprising:
a reinforcing member at each corner connecting the coaming to the end closure section;
said reinforcing member including inner, intermediate and outer end portions; and
said reinforcing member having mechanical securement means attaching the inner end portion to the coaming; and



said reinforcing member having a rigid securement comprising weld means spaced from said mechanical securement attaching the intermediate portion to the coaming and attaching the outer end portion to the end closure section thereby mitigating stress concentrations leading to fracturing of the coaming during operation of the railway car.

4,177,737
FOLDABLE CONVERTIBLE STOOL-TABLE-BAR
Harold Brickman, 2911 W. Catalpa, Chicago, Ill. 60625
Filed Jul. 14, 1977, Ser. No. 815,717
Int. Cl.[2] **A47B** *85/00*
U.S. Cl. 108—11 **6 Claims**

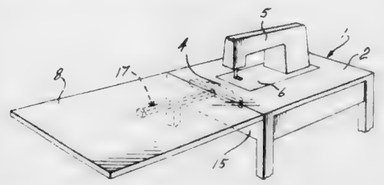


1. A foldable stool-table-bar comprising a pair of U-shaped members each of which is formed of a pair of laterally spaced apart legs joined at their upper edges by an elongated cross brace member, means pivotally mounting the leg of one member to the corresponding leg of the other intermediate their ends for rocking movement between open and collapsed position, a flexible fabric one edge of which is joined to one cross brace member while the other edge is joined to the other cross brace member to extend continuously between the cross brace members, openings in the fabric having a shape and dimension corresponding to cups, saucers, glasses, bottles or dishes, for enabling a base portion thereof to extend therethrough, and flexible pockets extending downwardly from said openings for a distance beyond the fabric but less than the length of the cups, saucers, glasses, bottles or dishes inserted therein.

4,177,738
FURNITURE WITH OPENING FLAP AND SUPPORT THEREFOR
Rejean Lacasse, 167 St. Francois St., Saint-Pie de Bagot, Canada (J0H 1W0)
Filed Jan. 23, 1978, Ser. No. 871,206
Int. Cl.[2] **A47B** *1/04, 81/00*
U.S. Cl. 108—78 **1 Claim**

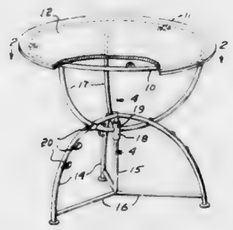
1. In a piece of furniture or the like, the combination comprising a furniture body including a top panel member and a

side wall having an aperture therethrough underneath and adjacent said top panel member, a flap having one edge pivoted to said top panel member to an open flat position outwardly extending edgewise from said top panel member and from said side wall, a flap supporting assembly consisting of a reinforcing bracket member secured against the bottom of said top panel member, said reinforcing bracket constituting an elongated member longitudinally extending lengthwise of said side wall and having a C-shaped transverse profile including a top portion secured against the bottom of said top panel member, a first side portion secured against the inner side of said side wall, and spaced from a second inwardly located side portion, a slideway member fixedly secured between said first and said second side portions, and defining a slideway passage which is non circular and which extends substantially parallel



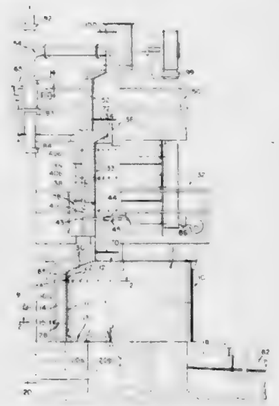
to said top panel member adjacent the bottom face of the latter and in register with said side wall aperture, and a supporting arm of non circular cross-section slidable endwise through said slideway member and said first and second side portions, said reinforcing bracket and said slideway member being located centrally of said side wall and said supporting arm is perpendicular to said side wall and includes an outer longer straight portion and an inner shorter straight portion bent at an obtuse angle relative to each other, whereby said longer straight portion is upwardly inclined when said arm is in extended position and said shorter straight portion engages said slideway passage, and said longer straight ortion engages said slideway passage and is substantially parallel to said top panel member when said arm is in retracted position, said shorter straight portion being then upwardly inclined.

4,177,739
VERTICALLY ADJUSTABLE TABLE
Richard D. Phelps, Lakeside, Conn., assignor to Back Bay Company, Inc., Wellesley Hills, Mass.
Filed Sep. 5, 1978, Ser. No. 939,273
Int. Cl.[2] **A47B** *9/00*
U.S. Cl. 108—144 **9 Claims**



1. A table comprising an upper section including a top, depending and inwardly disposed supports connected thereto, and a central, vertical sleeve to which the inner ends of the supports are secured, and lower supporting section including legs, each extending upwardly and inwardly between two supports, a central pivot of substantial length extending downwardly through said sleeve, the inner ends of said legs secured to the upper end of said pivot, and means to enable at least two different table heights to be established, said means including leg-mounted, laterally exposed and vertically spaced support holders, each holder engageable by a support when the upper section is held in an appropriate vertical position relative thereto and turned into a position in which that support is seated thereon by gravity.

4,177,740
APPARATUS FOR GENERATING HEAT FROM WASTE FUEL
Frank H. Lamb; Malcolm D. Lefcort, both of Vancouver, and Petr Rada, North Vancouver, all of Canada, assignors to Enterprises International, Inc., Aberdeen, Wash.
Filed Mar. 10, 1978, Ser. No. 885,377
Int. Cl.[2] **F23G** *5/12*
U.S. Cl. 110—213 **13 Claims**



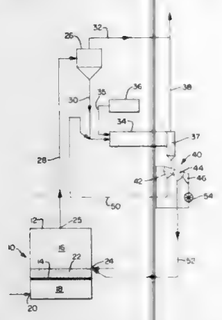
1. A waste wood fuel burner comprising:
a primary combustion chamber having an outlet, an inlet and a side wall,
means at the inlet for supporting a pile of fuel,
means for feeding the pile,
means for guiding underfire air through said pile,
a secondary combustion chamber having an inlet, an outlet and a side wall,
means between the primary combustion chamber outlet and the secondary combustion chamber inlet for impeding movement of unburned particulate matter out of said primary combustion chamber but allowing free passage of volatile gases,
means introducing swirl air into said primary combustion chamber,
means for introducing secondary combustion air into said secondary combustion chambers, and
control means for limiting the swirl air to an amount when combined with said underfire air results in less than stoichiometric combustion in said primary combustion chamber, and for increasing secondary combustion air in said secondary combustion chamber for assuring more than stoichiometric combustion in said secondary combustion chamber.

4,177,741

SYSTEM AND METHOD FOR IMPROVING THE REACTION EFFICIENCY OF A FLUIDIZED BED

Robert D. Stewart, Verona, and Robert L. Gamble, Wayne, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jun. 19, 1978, Ser. No. 916,997
Int. Cl.² F23D 1/00; F23B 7/00
U.S. Cl. 110—263 6 Claims



1. A system for improving the reaction efficiency of a fluidized bed combustor or reactor, comprising a housing, a perforated plate disposed in said housing and defining a chamber in said housing, means to introduce particulate material containing fuel into said chamber where it accumulates on said plate, means to pass a gas upwardly through a portion of the perforations in said plate and into said chamber to fluidize said particulate material, promote the combustion of said fuel material, and entrain the relative fine particulate material, outlet means formed in the upper portion of said housing for permitting said gas and entrained particulate material to discharge from said housing along with the gaseous products of combustion, means for separating said entrained particulate material from said gas, means disposed externally of said housing for receiving said particulate material from said separating means and for agglomerating same and means for passing the agglomerated particulate material back into said chamber.

4. A method for improving the reaction efficiency of a fluidized bed combustor or reactor, comprising the steps of passing a gas upwardly through a particulate material containing fuel disposed in a chamber to fluidize said particulate material, promote the combustion of said fuel material and entrain the relative fine particulate material, permitting said gas and entrained particulate material to discharge from said housing along with the gaseous products of combustion, separating said entrained particulate material from said gas, agglomerating said particulate material externally of said housing, and passing the agglomerated particulate material back into said chamber.

4,177,742

INCINERATOR FOR BURNING WASTE AND A METHOD OF UTILIZING SAME

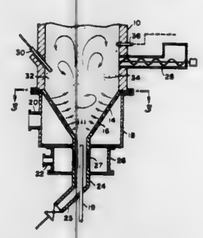
Toshio Uemura; Yoshiki Watanabe; Yoji Masumoto; Tomihisa Ishikawa; Noboru Kajimoto, all of Kure, and Shin Kawada, Tokyo, all of Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1978, Ser. No. 893,261
Int. Cl.² F23G 7/00
U.S. Cl. 110—346 6 Claims

1. A process for burning waste in an incinerator of the type including a hollow body having an open upper end forming an outlet and an open lower end, a bottom plate closing the lower end, a central opening provided in the bottom plate for introducing pressurized oxidizing gas into the hollow body, a plurality of circumferentially disposed openings provided in the bottom plate for introducing pressurized oxidizing gas into the hollow body, an oxidizing gas feeding means for supplying gas to the central opening and circumferentially disposed openings, heat transfer medium particles provided in the hollow body and a means for feeding waste into the hollow body comprising the steps of:

forming a swirling blast fluidized bed of heat transfer medium particles above said bottom plate by blowing oxidizing gas through said central and circumferentially disposed openings in upwardly vertical and horizontally circumferential directions;

introducing waste into said fluidized bed;



burning said waste in said fluidized bed at between 500° C. and 1000° C.;

retaining any resulting combustion gas from said burning in a free space above said fluidized bed for a sufficient period of time required for combustion of any unburned components contained in said combustion gas;

discharging said combustion gas from said outlet; and

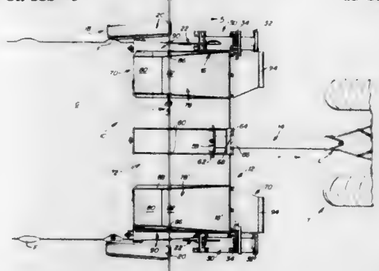
blowing cooling air into said outlet to maintain the temperature of the combustion gas discharged through said outlet in a range from 350° C. to 670° C.

4,177,743

SEEDLING TRANSPLANTER

Herschel L. Webster, Rte. 1, Cleveland, Ga. 30528

Filed Mar. 20, 1978, Ser. No. 888,131
Int. Cl.³ A01C 11/02
U.S. Cl. 111—3 12 Claims



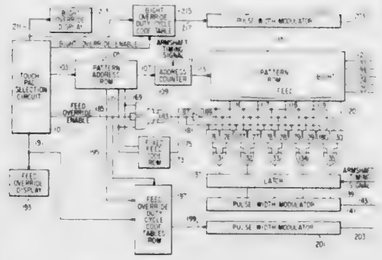
1. A seedling transplanter including frame means, ground-engageable wheel means journaled from said frame means for rolling support of said frame means from a ground surface and movement of said frame means over the ground surface along a first path in a predetermined orientation relative to said frame means, said wheel means including a plurality of journaled wheels, at least one of said wheels being angularly positioned relative to said path, a substantially planar coulter disk journaled from said frame for rotation about an axis disposed at substantially right angles relative to said path and positioned ahead of said one wheel in the direction of intended movement of said frame means along said path, said coulter disk being disposed at an elevation to knife through the upper layer of said ground along a second path paralleling the first path and spaced slightly to the side of the track of said one wheel toward which the rear portion of said one wheel is angled, said coulter disk including a generally radially extending wave therein defined by successive reversely curving peripheral portions of said disk, said wave projecting outwardly from the plane of the remainder of the disk toward the side of said second path on which said one wheel is disposed.

4,177,744

DIGITAL OVERRIDE CONTROL OF BIGHT AND FEED IN A SEWING MACHINE

John W. Wurst, Dover, and William H. Dunn, Branchville, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Jul. 28, 1978, Ser. No. 928,940
Int. Cl.² D05B 3/02
U.S. Cl. 112—158 E 5 Claims



1. In a sewing machine having stitch forming instrumentalities positionally controlled over a predetermined range between stitches to produce a pattern of feed and bight controlled stitches, static memory means for storing pattern stitch information, means operating in timed relation with said sewing machine for recovering selected pattern stitch information from said static memory means, separate actuating means responsive to said pattern stitch information for influencing the feed and bight motions respectively to produce a pattern of stitches corresponding to the selected pattern stitch information, and controllable alteration means effective to alter the operation of at least one of said feed and bight actuating means to an amount of motion proportional to that dictated by said pattern stitch information, the improvement comprising:

override memory means for storing actuating means motion alteration values in addressable memory locations;

operator controlled means for providing an address signal corresponding to a desired alteration value;

means utilizing said address signal for retrieving from said override memory means said desired alteration value; and

converting means for converting said desired alteration value into a control signal for rendering effective said alteration means to proportionally alter the size of the selected pattern produced by said sewing machine.

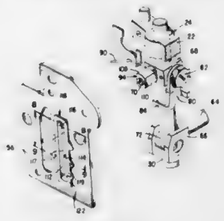
4,177,745

NEEDLE BAR GUIDE FOR A SEWING MACHINE

Kenneth D. Adams, Madison, and Robert B. Brauch, Wayne, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Jun. 7, 1978, Ser. No. 913,424
Int. Cl.² D05B 69/02
U.S. Cl. 112—221 4 Claims

1. In a skip-stitch type sewing machine, the combination including a needle bar, a latch carrier secured to the needle bar, cranking means attachable to and detachable from the latch carrier for reciprocating the carrier and needle bar when connected thereto, a plastic toe affixed to the latch carrier, and a fixed head end mounting plate including a molded plastic guide with an elongated slot having opposite planar sides, said plastic guide including marginal flanges extending therearound which contact opposite sides of the plate and prevent movement of the guide in a direction perpendicular to the plate, the toe having opposite flat sides which engage the opposite planar sides of the slot to angularly orient the latch carrier and to define the path of the latch carrier during reciprocation of the



latch carrier by the cranking means, the toe and guide being of dissimilar compositions and the molded plastic guide being of a softer material than the toe.

4,177,746

METHOD OF FORMING A CONTAINER

Harry W. Lee, Jr.; Joseph W. Wallace, and James M. Woolard, all of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Division of Ser. No. 774,475, Mar. 4, 1978, which is a continuation-in-part of Ser. No. 709,903, Jul. 29, 1976, abandoned. This application Sep. 21, 1978, Ser. No. 944,261
Int. Cl.² B21D 51/26
U.S. Cl. 113—120 H 6 Claims



1. In a method of making a container having a cylindrical side wall and a bottom-closing portion closing one end thereof, the improvement comprising forming a frustoconical portion having one thereof directly attached to said side wall, forming a first semi-torroidal portion having one end thereof directly attached to the other end of said frustoconical portion, forming a second semi-torroidal portion having one end thereof directly attached to the other end of said first semi-torroidal portion and directly attaching the other end of said second semi-torroidal portion to said bottom-closing portion.

4,177,747

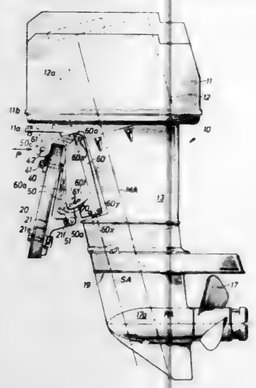
OUTBOARD MOTOR BRACKET ASSEMBLY

Heinz Pichl, Upsala, Sweden, assignor to Ab Volvo Penta, Gothenburg, Sweden

Filed Aug. 23, 1977, Ser. No. 827,005
Claims priority, application Sweden, Aug. 27, 1976, 7609500
Int. Cl.² B63H 21/26
U.S. Cl. 115—41 HT 24 Claims

1. A bracket assembly for trimmably and tiltably attaching a drive leg to the transom of a boat, a first part of the bracket assembly being attached to said transom and swingable about an essentially horizontal lateral axis and the drive leg itself being steerably attached to a second part of the bracket assembly, said second part being displaceable relative to said first part and co-operating therewith, characterized in that a device for the adjustment of the trim position of said drive leg is connected between said transom and said first part, said second part is pivotable about an essentially horizontal tilt pin and a second device for the adjustment of the trim position of the leg

is connected between said first and second parts, the axis of said tilt pin being coincident with said lateral axis, said second part is arranged for being tilted-up about said tilt pin relative to said first part up to the extreme tilt-up position of said drive leg and for returning into the operating trim position adjusted by



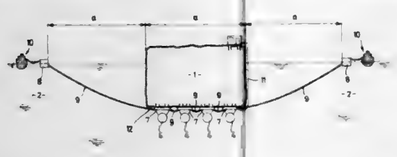
said second trimming device, said drive leg is attached to said second part for rotation about a steering axis but fixedly with respect to relative movement about said tilt pin, so that said drive leg takes part in all tilt movements of said second part about said essentially horizontal pivot axis.

4,177,748

DEVICE FOR ATTACHING PROPULSION UNITS TO A TABULAR ICEBERG

Georges L. Mougin, Paris, France, assignor to ITI Limited, Paris, France

Filed Mar. 8, 1978, Ser. No. 884,405
Claims priority, application France, Mar. 8, 1977, 77 06704
Int. Cl.[2] B63H *23/32*
U.S. Cl. 115—76 **10 Claims**



1. A device for attaching underwater propulsion units to the substantially horizontal lower surface of a tabular iceberg, the device comprising a flat flotation unit incorporating buoyancy chambers, the lower portion of the flotation unit being adapted to be attached to a propulsion unit, and the upper portion of the flotation unit having a plurality of upstanding support members for embedding in the lower surface of the iceberg, the support members including heating means and being in the form of hollow right prisms with walls which are grooved to facilitate the escape of iceberg melt water during embedding and which have openings in the vicinity of their connection to the flotation unit to enable seawater to escape from the hollow interior of the support members during embedding.

10. The method of recovering a propulsion device attached to a lower surface of an iceberg comprising the steps of

(a) heating a support member attaching the propulsion device to said iceberg to partially melt the ice thereof and release the support member therefrom; and

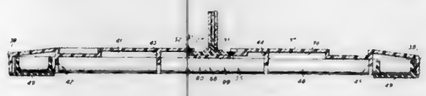
(b) filling a flotation unit of the device with water to exercise an Archimedean downthrust on said support member and carry said device away from said iceberg.

4,177,749

DEMOUNTABLE TWO-COMPONENT ROADWAY SIGNAL ASSEMBLY

Henry Lindner, Elgin, Ill., assignor to Beatrice Foods Co., Elgin, Ill.

Filed Dec. 15, 1978, Ser. No. 969,708
Int. Cl.[2] E01F *9/10*; G02B *5/12*
U.S. Cl. 116—63 T **11 Claims**



1. A portable wind-resistant, demountable collapsible signal assembly comprising

(A) an elongated base construction,

(B) a sign assembly having a bottom portion with a bottom side,

(C) said sign assembly further having a disc member disposed in a spaced, parallel relationship to said bottom side, and having disc connecting means mounting said disc member to a mid-region of said bottom side, said disc member having edge discontinuities defined in selected circumferential edge portions thereof, said edge discontinuities including a first slot and a second slot spaced circumferentially approximately 90° from said first slot, said disc member having upper and lower surface portions,

(D) said sign assembly further including a pair of flattened leg members which downwardly extend from said bottom side, and leg connecting means mounting said pair of leg members to said bottom side with each one of said leg members being generally in the region of a different opposed end region of said base portion,

(E) said base construction comprising

(1) a housing having a platform plate with integral, inturned side and end flanges which together with said platform plate define a chamber,

(2) ballast means disposed in said chamber, including ballast retaining means therefor,

(3) said platform plate having a depression defined in an upper mid portion thereof, with opposed recesses having overhanging lip portions along side edge portions of said depression the interrelationship between said recesses, said lip portions, and said depression being such that its disc member is positionable in said depression with circumferential edge portions thereof being in sliding retained engagement with said recesses and said lip portions and further being axially pivotable relative thereto,

(4) said platform plate further having boss means depending from the under surface of said platform plate in the region of said depression for locating and limiting lateral movements of said disc member relative to said platform plate when said disc member is so positioned in said depression,

(5) said platform plate still further having defined therein an elongated, resilient locking finger which is integral with said platform plate at a root end thereof, and which is separated from said platform plate along the opposed sides and at the forward end thereof, said resilient locking finger being adapted for flexural movements normally relative to said platform plate said root end being located in longitudinally spaced relationship to one side of said depression, and said forward end being located in an adjacent relationship to said depression,

(F) the interrelationship between said locking finger, said disc member, and the associated components as defined above is such that, when said disc member is so positioned in said depression,

(1) said disc member is pivotable in said depression when said locking finger is depressed at least sufficiently to permit said forward end thereof to slidably engage the lower surface of said disc member,

(2) said disc member is locked against pivotal and other movements relative to said base construction when said bottom portion extends generally across said base construction, said forward end engages said first slot, and said locking finger is in a relaxed configuration,

(3) said disc member is yieldingly biased against pivotal and other movements relative to said base construction when said bottom portion extends generally parallelly along said base construction, said forward end engages said second slot and said locking finger is in a relaxed configuration, and

(G) the interrelationship between said locking finger, said disc member, said platform plate, and the associated components as defined above is such that

(1) when said disc member is so positioned in said depression, and said locking finger is raised at least sufficiently to permit said forward end thereof to slidably engage the upper surface of said disc member, said disc member is pivotable in said depression,

(2) said disc member is orientable relative to said platform plate by pivoting same in said depression with said locking finger so raised into a position where said boss means along one hemicircular circumferential region thereof are aligned with edge discontinuities in said disc member,

(3) when so positioned, said disc member is translatable laterally relative to said depression to an extent sufficient to permit said disc member to be tiltable relative to said base construction and removable from said recesses and said overhanging lip portions and said base construction, and

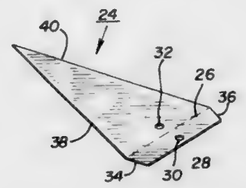
(4) said disc member, when separated from said base construction, is engagable therewith by so orienting said disc member relative to said platform plate with said locking finger so raised.

4,177,750

PENNANT AND METHOD OF MAKING A PENNANT

Ted Scarlet, 101 Lilac St., Bergenfield, N.J. 07621

Filed Sep. 14, 1977, Ser. No. 833,306
Int. Cl.[2] G09F *17/00*
U.S. Cl. 116—173 **4 Claims**



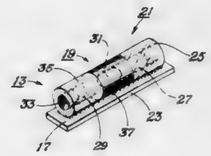
1. An improved pennant made of man-made fiber and having at least one side printed to depict scenes, names, insignias and combinations thereof and the like, the pennant being precision cut from a larger piece of fabric to provide the desired outer configuration, the pennant printed from a transfer member of paper and the like which is printed on one face with and by offset printing using and applying to one face of the transfer member a color sequence of special dye dispersal inks printed as a mirror reproduction of the to be depicted representation, said transfer member cut to provide at least one edge which is accurately positioned with relation to the depicted representation the pennant including (a) a pennant of material of man-made fiber sheet material, the sheet being die cut to provide a precise guide edge along at least one edge of the sheet of material and to provide two ends, one longer than the other; (b) a printed design applied to the face of the pennant, this design applied when and as the printed face of the transfer member is placed in a selected position adjacent to and on the face of the pennant material after which with an application of determined pressure and a heating of about sixteen seconds at one hundred eighty degrees centigrade a transfer design from the transfer paper to the pennant material is achieved; (c) an additional lip portion formed on the long end of the pennant, this lip portion foldable at a perforated line formed at selected distance from and parallel to the end of the pennant, the securing of the lip to form a tunnel being a single pass of a sewing machine; (d) a pair of small holes of like size formed before securing the lip in the pennant material, the holes laying on a common line normal to the perforated line with one on each side of the perforated line and at an equal distance therefrom so that when the lip is secured the holes are substantially in coincidence, and providing means for mounting and supporting the pennant on a pin, nail and the like, and (e) a tunnel formed by securing said lip in a fold-over condition to the pennant material after removal of the transfer paper from the face of the pennant, said tunnel providing a mounting of a stick, rod and the like, the ends of the material being cut so as to not protrude beyond the sides of the pennant after the fold-over and tunnel have been formed.

4,177,751

METHOD OF FORMING A DEVICE FOR SHOWING RECEIPT OF PREDETERMINED SHOCK

Ulyss R. Rubey, Lewisville, Tex., assignor to Detectors, Inc., Graham, Tex.

Division of Ser. No. 788,008, Apr. 15, 1977, Pat. No. 4,125,085.
This application Jun. 7, 1978, Ser. No. 913,479
Int. Cl.[2] G01P *15/04*
U.S. Cl. 116—201 **3 Claims**



1. A method of forming a shock detection device for detecting and notifying an observer that a predetermined acceleration has been received by an article being monitored comprising the steps of:

A. forming a measuring means for measuring if said predetermined acceleration has been received by constraining a liquid into the form of a deformable reservoir that will deform responsive to acceleration and return to its original shape when the acceleration ceases if the acceleration is below the predetermined acceleration; containing a gas adjacent said deformable reservoir of liquid and in contact with at least one side thereof so as to define an interfacial barrier therebetween having a predetermined interfacial tension, the size of the liquid reservoir and the interfacial tension being chosen such that said predetermined acceleration effects rupture of said interfacial barrier such that at least a droplet of said liquid breaks away from said liquid reservoir; sealingly containing said reservoir of liquid and said gas within a structure;

B. forming an indicator means and connecting said indicator means with said measuring means for indicating that said predetermined acceleration has been effected; said indicator means being formed by providing a visual means disposed adjacent said interfacial barrier for indicating when said interfacial barrier has been ruptured and

C. connecting said measuring means and said indicator means with an attachment means for attaching said device

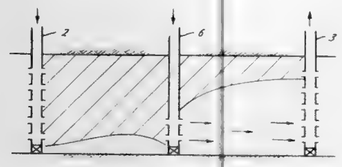
to the article for monitoring if said predetermined acceleration has been received.

4,177,752

HIGH VERTICAL CONFORMANCE STEAM DRIVE OIL RECOVERY METHOD

Alfred Brown, Houston, Tex.; Brian L. Reynolds, Cookeville, Tenn., and Wilbur L. Hall, Bellaire, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 24, 1978, Ser. No. 936,438
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—263 **14 Claims**



1. A method of recovering viscous oil from a subterranean, viscous oil containing formation, said formation being penetrated by at least three wells, one injection well and one production well, both of said injection and production wells being in fluid communication with a substantial portion of the vertical thickness of the formation, and an infill well located within the recovery zone defined by the injection well and production well and in fluid communication with only the lower 50 percent or less of the formation, comprising:

(a) injecting a thermal oil recovery fluid comprising steam into the formation via the injection well and recovering fluid including oil from the formation by the production well until the fluid being recovered from the production well comprises a predetermined amount of steam or water;

(b) thereafter recovering fluids including oil from the formation by the infill well and continuing injecting said thermal oil recovery fluid into said injection well until the fluid being recovered comprises a predetermined fraction of steam or water;

(c) thereafter injecting hot water into the infill well and recovering fluids from the formation by means of the production well until the percentage of water in the fluids being recovered reaches a predetermined value; and thereafter

(d) injecting steam into the infill well;

(e) injecting an aqueous fluid into the injection well simultaneously with steps (c) and (d) at a rate sufficient to maintain a positive pressure gradient from the injection well to the infill well; and

(f) recovering fluids from the formation via the production well until the fluids being recovered comprise at least 80 percent water.

4,177,753

WETTING STATION, ROTATING CONVEYOR STATION, SELF CLEANING CONVEYOR UNIT, AND CONVEYOR SYSTEM USING SAME

Ronald D. Bourgeois, 38 Ellison Pk., Waltham, Mass. 02154

Filed Jul. 25, 1977, Ser. No. 818,318
Int. Cl.[2] A23G *3/20*; B05C *3/10, 19/00*
U.S. Cl. 118—16 **1 Claim**

1. A conveyor system comprising:

a wetting station including a container adapted for holding a wetting agent;

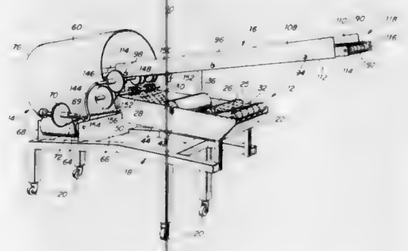
a slack conveyor belt having at least its transfer path portion extending through said container and at least a part of that portion dipping below the level of the wetting agent;

a ballast roller, at least partially submerged in the wetting agent and bearing on the part of the transfer path portion of the conveyor belt which dips into the wetting agent, for compelling conveyed objects to pass submerged in the wetting agent between the ballast roller and conveyor belt, said ballast roller being continuously vertically moveable relative to the transfer path portion of said conveyor belt for accommodating variations in the thickness of conveyed objects;

a rotating conveyor station including a hollow drum open at only one end for receiving objects conveyed from said wetting station;

means for rotating said drum about an inclined, longitudinal axis with its open end being the higher end;

a plurality of individual pick-up pins extending generally, radially inwardly from the inner surface of said drum for picking up items accumulated with the coating agent in the lower position in said drum and carrying them to the upper position in the drum for release onto a self-cleaning



conveyor unit including a support structure including a bottom member and two side members;

a plurality of roller means supported by said support structure; and

a perforate conveyor belt driven on said roller means and extending in its return path along said bottom member for a substantial portion of the length of said bottom member for sweeping particles dropped from the transported objects and accumulating on said bottom member back in the direction from the terminus toward the origin of the conveyor belt for return to said drum; said side members extending substantially beyond said bottom member toward the origin of said conveyor belt; said support structure being tilted with the terminus set higher than the origin of the conveyor belt; and a shaker member extending from said side members beyond said bottom member for jarring said belt to shake loose particles from said belt and conveyed objects.

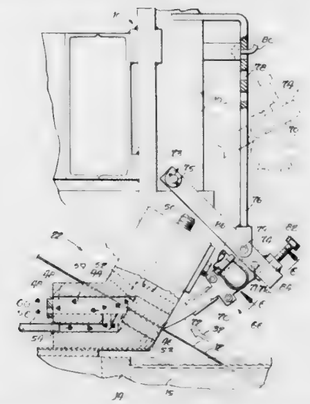
4,177,754

APPARATUS FOR OBTAINING BRIGHT FINISH GALVANIZING COATING ON WIRE

William L. James, and Alex P. Wonso, both of Homewood, Ill., assignors to Fennell Corporation, Harvey, Ill.

Filed May 30, 1978, Ser. No. 910,185
Int. Cl.[2] C23C *1/02*
U.S. Cl. 118—47 **5 Claims**

1. Apparatus for obtaining a bright finish on zinc galvanized wire comprising: water quenching bath means for quenching the wire while the zinc coating is still in a molten condition, said water quenching means being mounted for receiving said wire following its passage through a molten zinc bath, burner means interposed between the water quenching means and the molten zinc bath and directed at the wire for maintaining the zinc coating on the wire in a molten condition until the wire enters the water quenching means, and means interposed between said water quenching means and said burner means for



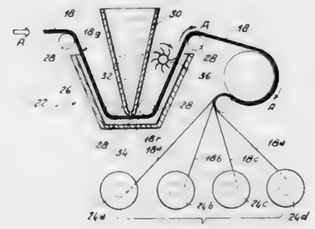
substantially preventing water from the quenching means from leaking into the zinc bath.

4,177,755

APPARATUS FOR DUSTING AN ELASTOMERIC SURFACE

Deregibus Alfio, Padua, Italy, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 13, 1977, Ser. No. 841,786
Claims priority, application Italy, Apr. 5, 1977, 23159 A/77
Int. Cl.[2] B05C *5/00, 11/02*
U.S. Cl. 118—118 **2 Claims**



1. Apparatus, for the application of a film of zinc stearate powder onto tape incorporating textile material and having a layer of vulcanizable elastomer exposed at one face of the tape, comprising:

(i) first and second roller means about which said tape may be entrained with the elastomer face thereof contacting said roller means, the roller means being spaced and positioned such that a portion of said tape between the roller means is substantially horizontal and has the elastomer face exposed upwardly; p1 (ii) a feedbox, to contain zinc stearate powder, having at its lower part at least one slit positioned transversely of the tape and extending for the entire width of the tape for the emergence of the zinc stearate powder, said feedbox being disposed with its lower part positioned between said first and second roller means and closely spaced above said substantially horizontal portion of said tape, for even distribution of zinc stearate dust onto said tape portion;

(iii) third roller means, at a level above that of the first and second roller means, about which said tape may be entrained such that a further portion of said tape, downstream of said substantially horizontal portion thereof and between said second and third roller means, is inclined upwardly, and

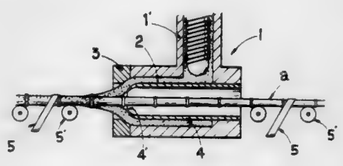
(iv) brush means disposed to contact the stearate-dusted face of said further tape portion between said second and third roller means, for the removal from said further tape portion of any excess stearate dust thereon.

4,177,756

SURFACE COATING DEVICE OF BAMBOOS

Syozo Shigematsu, 9-9,4-chome, Habikigaoka, Habikino, Osaka-fu, Japan

Filed Jul. 12, 1977, Ser. No. 814,913
Claims priority, application Japan, Aug. 3, 1976, 51-103590[U]
Int. Cl.[2] B05C *3/10*
U.S. Cl. 118—404 **2 Claims**



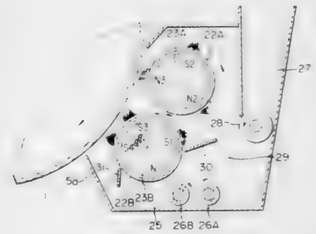
1. A device for the coating of bamboos with synthetic resin comprising a die, a synthetic resin chamber communicating with said die, a push mechanism for said synthetic resin, a nozzle tube having an opening wide enough for passage therethrough of bamboo whose outside diameter varies constantly due to knots, centrally located and affixed within said chamber, said tube having a downwardly curved end portion forming an outlet located and within the opening of said die over which end portion say synthetic resin flows onto said bamboo without filling said die opening, a feeding mechanism positioned in front of said device and a feeding mechanism positioned in back of said device, each of said mechanisms comprising a belt and roller combination for moving the bamboo at a fixed speed while giving it a constant rotation.

4,177,757

MAGNETIC BRUSH DEVELOPING DEVICE FOR DEVELOPING ELECTROSTATIC LATENT IMAGES

Syuzi Murakawa; Toshirou Kasamura, and Yujiro Ando, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

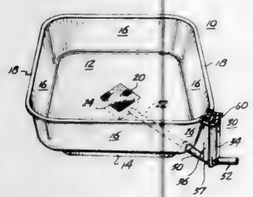
Filed Dec. 22, 1977, Ser. No. 863,438
Claims priority, application Japan, Jan. 7, 1977, 52-585
Int. Cl.[2] G03G *13/09*
U.S. Cl. 118—658 **15 Claims**



1. A device for developing latent images carried on a movable surface, comprising:

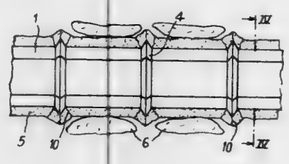
a container for containing developer therein;
first magnetic means supported in said container for producing a first magnet field, said first magnetic means having a single magnetic pole disposed at a developing position opposed to the surface to be developed;
a first non-magnetic member interposed between the surface to be developed and said first magnetic means, said first non-magnetic member being movable relative to said first magnetic means in the same direction as the movable surface to be developed at the developing position;
a second magnetic means supported in said container in spaced relation to said first magnetic means for producing a second magnetic field, said second magnetic means having adjacent magnetic poles of identical polarity disposed at the developing position;
a second non-magnetic member interposed between the surface to be developed and said second magnetic means, said second non-magnetic member being movable relative to said second magnetic means in the same direction as the movable surface to be developed at the developing position, said adjacent poles of identical polarity being effective to produce repelling fields therebetween which repel developer from the surface of the second non-magnetic member at the developing position, said first and second magnetic means being arranged to provide downward or horizontal passage of developer through the repelling fields and said second non-magnetic member being disposed downstream of said first non-magnetic member with respect to the movement direction of the surface to be developed; and
means for applying developer from said container only to said first non-magnetic member for development of a latent image on the movable surface, the developer then being transported from said first non-magnetic member to the second non-magnetic member to further develop the latent image by another application of developer.

4,177,758
REARING APPARATUS FOR FISH FRY
Dale E. Young, II, Rte. 4, Box 4915-Z, Juneau, Ak. 99803; David K. Elie, 13551 35th Ave. NE., Seattle, Wash. 98125, and Peter K. Schoening, 5807 NE. 151st Ave., Bothell, Wash. 98011
Filed Jan. 30, 1978, Ser. No. 873,203
Int. Cl.[2] A01K *61/00*
U.S. Cl. 119—3 **7 Claims**



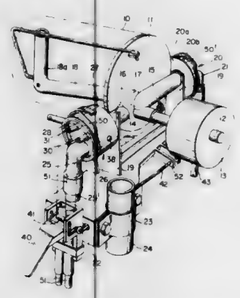
1. Rearing apparatus for fish frys comprising:
a rectangular tank having a discharge outlet basin in the bottom;
foraminous means screening said basis;
a first conduit extending from said outlet basin to beneath a tank corner;
a second conduit having its axis disposed at an obtuse angle to the axis of said first conduit;
a smoothly curved transitional conduit connecting between said first and second conduits whereby to form a continuous stress-relieving passage for fish fry;
wall means connected with and rising above said transitional conduit and being in flow communication with said stress-relieving passage and forming an upright weir chamber; and
means forming a vertically movable weir in said chamber normally blocking said passage to such a degree as to govern the water depth in said tank.

4,177,759
APPARATUS AND METHOD FOR COLLECTING OYSTERS
Guy Mahéo, Lezardrieux, France, assignor to Societe Civile G. M. Maheo - Conseil, Lezardrieux, France
Filed Aug. 8, 1977, Ser. No. 822,992
Claims priority, application France, Aug. 11, 1976, 76 24510
Int. Cl.[2] A01K *61/00*
U.S. Cl. 119—4 **7 Claims**



1. A frame with a series of parallel bars attached, which forms a grill for collecting oysters, wherein the improvement comprises a series of ribs, encircling at least some of said bars, said ribs being spaced slightly greater than the length of one oyster apart and rising above said bars; a lime coating formed over said bars and said ribs, the height of said ribs being substantially less than the thickness of said lime coating which is formed on said bars.

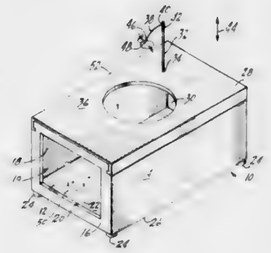
4,177,760
LIQUID FLOW SENSING DEVICE
Paul Slater, Palmerston North, New Zealand, assignor to Delta Plastics Limited, Palmerston North, New Zealand
Filed Feb. 10, 1978, Ser. No. 876,524
Claims priority, application New Zealand, Feb. 11, 1977, 183315
Int. Cl.[2] A01J *7/00*
U.S. Cl. 119—14.08 **20 Claims**



1. A valve unit for a liquid flow sensing device of the type having a control means which is movable between first and second positions when the flow rate is respectively low and high but biassed to the said first position, said valve unit comprising:
a fluid inlet;
a fluid outlet;

a first section movable in response to movement of said control means;
a second section;
a fluid flow passage connecting said inlet and outlet;
first and second ports;
a third section which is movable independently of said first and second sections and has means for disconnecting said flow passage from said inlet and outlet;
means for connecting said first and second ports together; and
means for coupling said third section to said first section such that as said control means moves from said second position to said first position it moves both the first and third sections relatively to said second section so that the flow passage is disconnected from said inlet and outlet and said first and second ports are connected by said port connecting means.

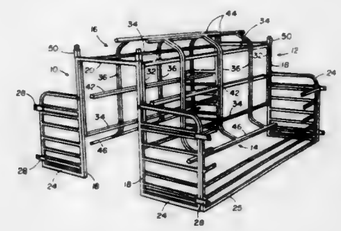
4,177,761
PET PLAY HOUSE
Louis Bellocchi, Jr., 60 Newport Rd., Island Park, N.Y. 11558
Filed Sep. 30, 1977, Ser. No. 838,100
Int. Cl.[2] A01K *1/02*
U.S. Cl. 119—19 **8 Claims**



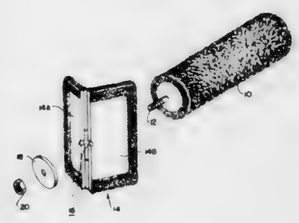
1. A pet play house apparatus comprising a plurality of walls, a base, said walls fixedly secured to said base, said walls defining an open-mouth portion opposite and above said base, a unitary opening in said walls whereby a pet may pass there through into the enclosure formed by said walls and said base, a lid, means to slidably engage said lid with said walls whereby said lid may be disposed entirely covering said open-mouth portion, said lid having an access opening therein, said access opening being smaller than said open-mouth portion, a dowel, one end of said dowel fixably secured to an exterior lateral surface of said lid, the other end of said dowel extending upwardly from said lid, a wire-like element, means to slidably frictionally engage one end of said wire-like element at selected locations along the length of said dowel, a toy, said toy carried by the free end of said wire-like element, said toy being located adjacent said opening in said lid.

4,177,762
FARROWING CRATE
Norbert R. Borcherding, Box 128, Garnavillo, Iowa 52049
Filed May 30, 1978, Ser. No. 910,199
Int. Cl.[2] A01K *1/02*
U.S. Cl. 119—20 **6 Claims**

1. A farrowing crate for sows and the like, said crate comprising spaced-apart front and rear panels, side panels combined with said front and rear panels to form a generally rectangular enclosure, each of said side panels having a central portion and an upper portion extending inwardly from the central portion and a lower portion extending outwardly from the central portion in a direction opposite to the upper portion, the central portion of each said side panels being pivotally joined to the front and rear panels for pivotal movement of the side panel about a substantially horizontal axis, the perpendicular distance from the plane of the central portion of each side panel to the outer edge of the upper portion being greater than the perpendicular distance from the plane of the central portion to the outer edge of the lower portion when said side panel is positioned with the upper portion at the top, and means for maintaining each side panel in a selected position with the upper portion positioned either above the central portion or below the central portion so that the width of the enclosure can be varied.



4,177,763
CAT SCRATCHING POST ASSEMBLY
Weldon R. Cook, 30700 Manzano Dr., Malibu, Calif. 90265
Filed Apr. 17, 1978, Ser. No. 896,892
Int. Cl.[2] A01K *15/00*
U.S. Cl. 119—29 **4 Claims**



1. A scratching post assembly for cats, and other household pets, comprising: an elongated post; carpeting material covering said post; a stud protruding downwardly from the lower end of said post; a two-piece base comprising a first planar section and a second planar section having edges adjacent to

one another; carpeting material covering said base and causing the adjacent edges of said first and second planar sections to be hinged to one another so as to permit the base to be closed to a first position in which the first and second sections are folded against one another, and to be opened to a second position in which the first and second sections are in co-planar relationship with respect to one another, said first and second sections defining a hole on the hinge line for receiving said stud; and fastening means engaging said stud on the opposite side of the base from the post to secure the post in an upright position on the base and to cause the post to hold the first and second sections of the base in their co-planar relationship.

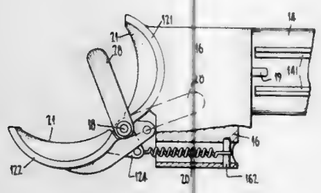
4,177,764

ANIMAL LEG CLAMP APPARATUS

William R. C. Geary, F.4/18 Kensington Rd., South Yarra, Victoria, Australia (3141)

Filed Jul. 11, 1977, Ser. No. 814,799
Int. Cl.[2] A61D *3/00*
U.S. Cl. 119—103 **8 Claims**

1. Animal leg clamp apparatus comprising, a carrier, a fixed clamp member associated with said carrier, a coacting clamp member pivotally connected to said fixed clamp member for movement towards and from said fixed clamp member to close and open the clamp respectively, at least one return spring connecting said carrier to said coacting clamp member for normally maintaining said coacting clamp member in its open position, a hydraulic cylinder fixed relative to said carrier and which in use is connected to a fluid reservoir, a slidable plunger in the cylinder, and means for transmitting motion



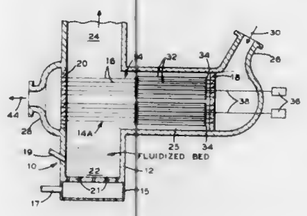
from the plunger to the coacting clamp member thereby to close the clamp in opposition to the return spring, and wherein, as said coacting clamp member closely approaches its fully open position, the line of action of said means for transmitting motion thereto passes over the pivotal axis thereof, thereby to lock said coacting clamp member in its open position, and actuating means operatively connected to the coacting clamp member for imparting initial closing movement to the coacting clamp member, thereby to permit the clamp to be re-closed by the plunger.

4,177,765

OUTPUT CONTROL FOR FLUIDIZED BED BOILERS

Allen E. Wehrmeister, Lynchburg, Va., assignor to The Babcock & Wilcox Co., New York, N.Y.

Filed Aug. 14, 1978, Ser. No. 933,299
Int. Cl.[2] F22B *1/02*; F23D *19/02*
U.S. Cl. 122—4 D **8 Claims**



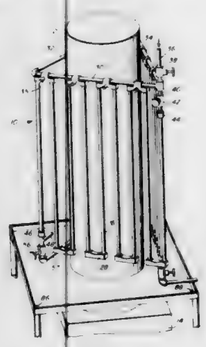
1. In combination with a vapor generator having a combustion chamber fired by a fluidized bed of granular material, a multiplicity of heat exchanger tubes arranged within the generator to form at least one tube bank for heating fluids flowing therethrough, a heat shielding apparatus which comprises a plurality of slidable insulating sleeves, the sleeves circumscribing a portion of the length of the tubes, and means for supporting and sliding the sleeves over the exposed portion of the tubes to vary the amount of tubular surface area exposed to the heat generated within the chamber.

4,177,766

HEAT RECOVERY SYSTEM FOR FURNACES AND THE LIKE

Edward S. Richter, 1591 SW. 65th Ter., Boca Raton, Fla. 33432

Filed Jun. 2, 1978, Ser. No. 911,715
Int. Cl.[2] F22B *1/02*; F22D *1/00*
U.S. Cl. 122—20 B **5 Claims**



1. A system for recovering heat from the stack of a furnace or the like, comprising

(a) a plurality of straight, rigid support pipes connected in end-to-end relation to define a closed geometric figure mountable horizontally about the exterior of said stack with each of said pipes extending in close relation to said stack,

(b) a plurality of parallel pipe lengths forming a section depending from each support pipe, said pipe lengths being connected at alternating ends to define a plurality of co-planar reversing bends in each section of pipe lengths,

(c) valve means connected to the first and last lengths of pipe in each section for selectively opening and closing a flow path through said section,

(d) means connecting said system to a water supply source whereby water flowing through said system will be heated by the heat from said stack, and

(e) an insulated housing substantially enclosing said system.

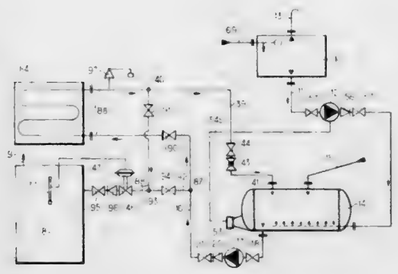
4,177,767

METHOD AND DEVICE FOR FEEDING A SYSTEM OF GENERATION AND DISTRIBUTION OF VAPOR CONDENSABLE INTO MAKE-UP LIQUID

Pierre E. Regamey, 35 Le Calabert, Ecully, France (69130)

Filed Nov. 12, 1976, Ser. No. 741,339
Claims priority, application France, Nov. 13, 1975, 75 34705; Sep. 13, 1976, 76 27510; Sep. 13, 1976, 76 27511
Int. Cl.[2] F22D *5/30*
U.S. Cl. 122—456 **42 Claims**

1. A closed loop system having at least one vapor producing evaporating boiler, at least one vapor utilizing condenser, and at least one condensate recovery collector, an improved automatic and continuous method of recovering and distributing condensate within such system and of introducing fresh liquid into the system, wherein said condensate and liquid is binary consisting of vapor and a liquid phase (condensates) and is at pressures and temperatures approximately constant everywhere and identically equal (disregarding the local flow-pressure losses) in the system between a point of supply of vapor to and across the vapor utilizing condenser and a point of delivery of the condensates to the said condensate collector, with



recovery of at least the most part of the condensates by natural return-flow to the collector tank, the said method consisting in replenishing the boiler from two sources of make-up liquid constituted respectively, on the one hand, by a supply of external input feed-liquid and on the other hand, by the recovered condensates, and of providing a supply flow-rate which may be controlled automatically according to the instant sensed level of liquid in the collector tank within a defined range of controlled values between two limits, viz. an upper or feed shut-down limit and a lower or maximum feed flow-rate limit, and of providing introduction of the make-up liquid from the collector tank directly into the boiler by forced circulation, according to the instant sensed level of liquid in the boiler within a defined range of controlled values between two limits, viz. an upper or feed shut-down limit and a lower or maximum flow rate limit, and where the reintroduction is continuous and depends only on the actually detected physical presence of the condensates and the interlocked follow-up relationship with the sensed level of liquid in the boiler.

4,177,768

FUEL COMPOSITIONS

Bryan T. Davis, West Bloomfield, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Jan. 19, 1979, Ser. No. 4,716
Int. Cl.[2] C10L *1/18*
U.S. Cl. 123—1 A **39 Claims**

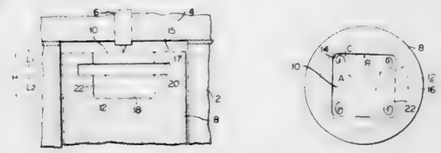
1. As a new composition of matter, an anti-wear compression ignition fuel for use in diesel engines comprising (1) a monohydroxy alkanol having from 1 to 5 carbon atoms, (2) an ignition accelerator, and (3) a wear inhibiting amount of a dimerized unsaturated fatty acid and an ester of a phosphorus acid.

4,177,769

COMBUSTION CHAMBER FOR AN INTERNAL COMBUSTION ENGINE OF DIRECT INJECTION TYPE

Masaru Okada, and Seikichi Kanai, both of Oyama, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 18, 1977, Ser. No. 843,229
Claims priority, application Japan, Oct. 18, 1976, 51/138872
Int. Cl.[2] F02B *23/06*
U.S. Cl. 123—30 D **3 Claims**



1. In an internal combustion engine of the direct injection type including combustion chambers each defined by a cylinder head, a cylinder liner and a piston head having a wall defining a cavity therein, means for producing air swirl in said cavity, and fuel injection means each having a plurality of fuel injection nozzles, said fuel injection means being mounted substantially at the central part of said cavity, said nozzles being arranged to inject jets of fuel into said cavity radially against said cavity wall, the improvement wherein said cavity wall is constructed to define a generally equilateral polygonal cavity formed in said piston head and a generally concentric circular shaped cavity formed in the generally intermediate part of the depth of said equilateral polygonal cavity.

4,177,770

COMPENSATION OF SENSOR VOLTAGE FOR REFERENCE POTENTIAL VARIATION

Robert L. Anderson, Saline, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 7, 1978, Ser. No. 940,421
Int. Cl.[2] F02B *3/08*; F01N *3/08*
U.S. Cl. 123—32 EE **10 Claims**

1. An improved electrical system of the type which comprises:

(a) a source of electrical energy having a source reference terminal and an other terminal across which terminals is developed a potential difference or EMF usable as a supply voltage for said electrical system;

(b) means for generating a sensor signal voltage, said means

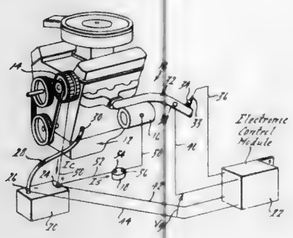
having first and second terminals across which said sensor voltage is generated;

(c) an electronic circuit adapted to respond to said sensor signal voltage, said electronic circuit using the potential at said source reference terminal as the reference potential for said electronic circuit;

(d) conductive means for coupling said second terminal of said signal generating means to said source reference terminal; and

(e) means for causing currents of varying character to flow through said conductive means;

wherein the improvement comprises:



(f) means for generating a compensated sensor signal voltage, said compensated sensor signal voltage being equal or proportional to said sensor signal voltage as it appears across said first and second terminals, said compensated sensor signal voltage being referenced to the potential of said source reference terminal and being compensated, as compared to the voltage between said first terminal of said signal generating means and said source reference terminal, for varying potential differences appearing across said conductive means as a result of said currents of varying character flowing therethrough.

4,177,771

ROTARY ENGINES WITH FREE RECIPROCATING-ROTATING PISTONS AND JET THRUST DRIVE

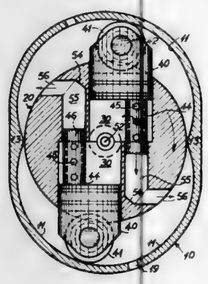
Ata Nutku, Dumen Sokak 5/1-D.12, Gumussuyu, Istanbul, Turkey

Filed Jan. 19, 1977, Ser. No. 760,692

Claims priority, application Turkey, Aug. 12, 1976, 72355

Int. Cl.² F02B 57/04

U.S. Cl. 123—43 C **28 Claims**



1. A rotary engine comprising a stator casing containing a rotor, said rotor having at least one cylinder cavity therein containing a reciprocating piston that has an outer end with means engaging a wall of said casing and that has an inner end provided with an eccentric tail-rod that reciprocates in a well and prevents rotation of the piston, the configuration of said casing and said rotor being correlated so that said piston moves in and out of said rotor as the rotor turns with said piston in contact with said casing wall, means for admitting a working fluid to said cylinder cavity for urging said piston out of said rotor, and means for exhausting said fluid from said cylinder cavity as a jet from the periphery of said rotor, whereby said rotor is driven by the exhausting of said fluid from said cylinder cavity and by the reactive forces of the casing wall upon said piston.

4,177,772

METHOD OF OPERATING A FOUR-STROKE INTERNAL COMBUSTION ENGINE AND INTERNAL COMBUSTION ENGINE FOR CARRYING OUT THIS METHOD

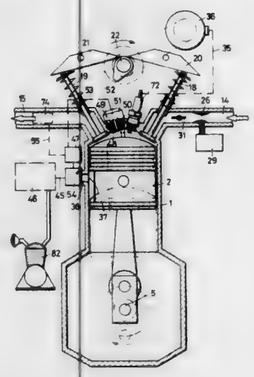
Walter Franke, Hittfelder Kirchweg 22, 2105 Seevetal 3, Fed. Rep. of Germany

Filed Dec. 28, 1976, Ser. No. 755,007

Claims priority, application Fed. Rep. of Germany, Jan. 2, 1976, 2600014

Int. Cl.² F02B 75/10

U.S. Cl. 123—75 B **14 Claims**



1. An internal combustion engine comprising: cylinder means; piston means operably reciprocable within said cylinder means; inlet means for introducing a combustible fuel-air mixture into said cylinder means; ignition means for igniting said mixture; exhaust means for removing combustion gases from said cylinder means; aperture means defined to extend in flow communication with said cylinder means; source means for supplying an additional fluid into said cylinder means through said aperture means; valve means interposed between said source means and said aperture means for controlling the flow of said additional fluid therebetween; sensing means for sensing combustion pressure within said cylinder means; valve control means responsive to said sensing means for controlling operation of said valve means in accordance with the sensed value of combustion pressure within said cylinder means; means for sensing the composition of said combustion gases in said exhaust means; and further valve control means responsive to said composition sensing means for controlling jointly with said valve control means operation of said valve means in response to sensed composition of said combustion gases.

4,177,773

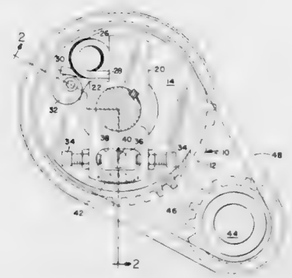
DAMPED AUTOMATIC VARIABLE VALVE TIMING DEVICE FOR INTERNAL COMBUSTION ENGINES

John R. Cribbs, 6034 Soledad Mountain Rd., La Jolla, Calif. 92037

Filed Dec. 27, 1977, Ser. No. 864,664

Int. Cl.² F01L 1/34

U.S. Cl. 123—90.15 **4 Claims**



1. An automatic variable cam drive for internal combustion engines having a crankshaft and a camshaft, said cam drive comprising:

a face plate fixed to a camshaft;

a sprocket mounted for limited rotation on said face plate axially of said camshaft and positively driven in one direction by a crankshaft;

a resilient drive coupling operatively mounted on and between said face plate and sprocket and producing a bias in said face plate and camshaft to turn with said sprocket in said direction, whereby gas load reaction to high crankshaft rpm overcomes said bias and said face plate and camshaft have a relative shifting movement to a rotationally retarded position to give a like retarded valve timing; and spring means operatively positioned between said face plate and the positively driven sprocket to dampen and smooth out said shifting movement.

4,177,774

CONTROL VALVES

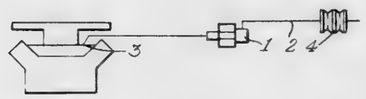
John H. Moshal, Westville, South Africa, assignor to Control Logic (Proprietary) Limited, Durban, South Africa

Filed Jun. 21, 1976, Ser. No. 698,408

Claims priority, application South Africa, Jun. 25, 1975, 75/4076

Int. Cl.² F02D 11/10, 28/00, 31/00

U.S. Cl. 123—102 **4 Claims**



1. A solenoid operated valve for a vehicle engine control system comprising:

a hollow body of non-magnetic material having an inlet and a first outlet axially aligned with each other;

valve seats provided at said inlet and first outlet;

a hollow piston of magnetic material having a head at each end and slidable in said body between positions where said heads respectively communicate with said valve seats to close the inlet or first outlet from communicating with the interior of said body;

ports provided in said piston wall which are in communication with a normally open second outlet provided in said hollow body, said second outlet being fluidly coupled with said inlet and first outlet, the fluid flow passing between said inlet and second outlet and between said first and second outlets being adjustably varied in dependence on the position of said hollow piston, the fluid flow path between said second outlet and said inlet being configured to provide a considerable constriction to fluid flow; and,

a solenoid coil for controlling the position of said piston,

said inlet port being open to ambient air, said first outlet being connectable with a vacuum line of said engine, and said second outlet being connectable with a vacuum operated servo mechanism provided on said engine.

4,177,775

FUEL INJECTION PUMP

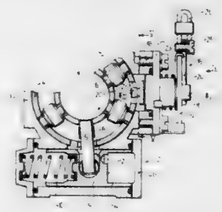
Gerald Höfer, Flacht; Karl Konrath, Ludwigsburg; Manfred Schwarz, Gerlingen, and Willi Müller, Sulz, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 16, 1978, Ser. No. 916,171

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1977, 2729807

Int. Cl.² F02M 39/00; F04B 19/02

U.S. Cl. 123—139 AP **14 Claims**



1. A fuel injection pump for internal combustion engines provided with a cam drive mechanism arranged to actuate at least one pump piston, said cam drive mechanism comprising a ring stationarily mounted in the pump housing and being rotatable by means of a device operating in dependence on the speed, and adpated to adjust the onset of injection, comprising a stop means arranged to limit the twisting angle (α) of said ring and further being adjustable by way of another device which engages into at least one corresponding recess of said ring.

4,177,776

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Noriaki Kawai, Okazaki; Hisaji Okamoto, Aichi; Yosiaki Takeda, Nagoya; Fukuzi Sano, Kariya; Akio Kakiuchi, Nagoya; Masami Manabe, Kariya; Takashi Nomura, Kariya, and Sigeya Abe, Kariya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Nippondenso Kabushiki Kaisha, Kariya, both of, Japan

Division of Ser. No. 635,069, Nov. 25, 1975, Pat. No. 4,068,633, which is a division of Ser. No. 386,874, Aug. 9, 1973, Pat. No. 3,930,474, which is a continuation of Ser. No. 116,343, Feb. 18, 1971, abandoned. This application Oct. 5, 1977, Ser. No. 839,557

Claims priority, application Japan, Feb. 27, 1970, 45-17189; Mar. 30, 1970, 45-30471[U]; Apr. 9, 1970, 45-34366[U]; Apr. 9, 1970, 45-34367[U]

Int. Cl.² F02P 5/04

U.S. Cl. 123—117 A **14 Claims**

1. An ignition system for an spark-ignition type internal combustion engine comprising an ignition device capable of performing the spark timing control function, and a temperature detecting element for detecting the temperature having an effect on the engine torque efficiency, whereby said ignition

V 9 8 9 1 2 D E 1 1 7 9 UMI

device is operated so that the spark timing under a low temperature condition is advanced as compared to that used under a high temperature condition according to the temperature detected by said temperature detecting element,

wherein said ignition device comprises a housing for said ignition device; and

a vacuum spark advance mechanism secured to said housing,

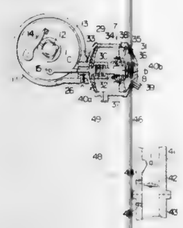
said vacuum spark advance mechanism including first, second and third diaphragms disposed within a single casing,

a first control rod secured at one end thereof to said first diaphragm,

a second control rod secured at one end thereof to said second and third diaphragms,

said one end of said first control rod and the other end of said second control rod being slidably interconnected by way of a compression spring disposed therebetween,

a first vacuum chamber defined between said first diaphragm and said second diaphragm,



an air chamber defined between said second diaphragm and said third diaphragm, and

a second vacuum chamber defined between said third diaphragm and said casing,

the other end of said first control rod being connected to the movable breaker plate,

said first vacuum chamber being communicated through a temperature change-over valve with a first vacuum intake port disposed in an inlet pipe downstream of a carburetor throttle valve,

said second vacuum chamber being directly communicated with a second vacuum intake port disposed slightly upstream of the fully closed position of said carburetor throttle valve, whereby said temperature change-over valve exposes said first vacuum chamber to the atmosphere when the engine temperature is high, and said temperature change-over valve communicates said vacuum chamber to said first vacuum intake port when the engine temperature is low.

4,177,777

EXHAUST GAS RECIRCULATION CONTROL SYSTEM

Kimiomi Maruyama, Yokohama; Yoshitaka Hata, Fujisawa, and Akihiro Ohnishi, Koshigaya, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Aug. 12, 1977, Ser. No. 824,316

Claims priority, application Japan, Aug. 23, 1976, 51-100435

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **5 Claims**

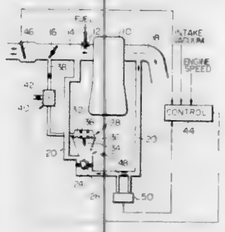
1. A system for controlling the flow of exhaust gas recirculated from an exhaust passage of an internal combustion engine to an induction passage of the engine through an exhaust recirculation passage, the system comprising:

a flow control valve to vary an effective cross-sectional area of the exhaust recirculation passage;

a first flow sensing means for sensing the volume flow rate of air in the induction passage and producing a first electrical signal representing the sensed flow rate;

a second flow sensing means for sensing the volume flow rate of exhaust gas in the recirculation passage and producing a second electrical signal representing the sensed flow rate;

a control means for producing a third electrical signal representing a deviation of the ratio of the volume flow rate of



exhaust gas represented by said second electrical signal to the volume flow rate of air represented by said first electrical signal from a preset ratio; and

an actuator means for operating said control valve in response to said third electrical signal.

4,177,778

CARBURETORS WITH HEATING DEVICE

Takashi Naitou, Kariya; Masaharu Sumiyoshi; Osamu Ito, both of Toyota; Nobuhito Hobo, Inuyama, and Yutaka Suzuki, Nishio, all of Japan, assignors to Nippondenso Co., Ltd. and Toyota Jidosha Kobyo Kabushiki Kaisha, both of Aichi, Japan

Filed Jul. 21, 1977, Ser. No. 817,706

Claims priority, application Japan, Jul. 29, 1976, 51/90602; Nov. 29, 1976, 51/143891; May 6, 1977, 52/52317

Int. Cl.[2] F02M *31/00*

U.S. Cl. 123—122 F **9 Claims**



1. In combination with a carburetor having an induction passage with a venturi and a throttle valve therein, fuel passage means for supplying liquid fuel from a fuel chamber into said induction passage, and air passage means for inducing the air from an upstream portion of the venturi into the fuel passage means: a heating device comprising a plurality of honeycomb heater elements coaxially disposed within one of said fuel and air passage means through a cylindrical insulator to heat the fluid passing therethrough, each of said honeycomb heater elements being made of a ceramic composition having a positive temperature coefficient of resistance and being provided at the opposite ends thereof with a pair of electrodes which are connected in parallel with each other and also connected with an electric power source, whereby the liquid fuel or air is heated by said heating device when the temperature of liquid or air is lower than a critical temperature defined by the ceramic composition of said respective honeycomb heater elements.

4,177,779

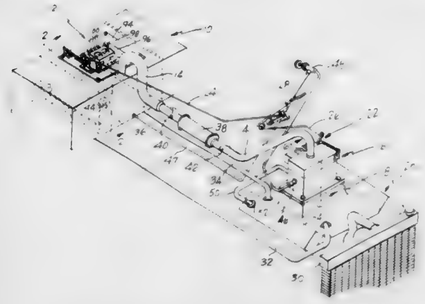
FUEL ECONOMY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Thomas H. W. W. P. Ogle, 9028 Mt. Delano, El Paso, Tex. 79924

Filed Jul. 20, 1977, Ser. No. 817,243

Int. Cl.[2] F02M *31/00*

U.S. Cl. 123—133 **32 Claims**



1. A fuel vapor system for an internal combustion engine having an intake manifold, which comprises:

(a) tank means for containing fuel vapor;

(b) vapor equalizer means mounted on and in fluid communication with said intake manifold of said engine;

(c) vapor conduit means connecting said tank means to said vapor equalizer means for delivering fuel vapor from the former to the latter;

(d) said vapor equalizer means having first valve means connected thereto for controlling the admission of air to said vapor equalizer means;

(e) said tank means having second valve means connected thereto for controlling the admission of air to said tank means; and

(f) throttle means for controlling said first and second valve means so that the opening of said first valve means precedes and exceeds the opening of said second valve means.

4,177,780

DEVICE FOR INCREASING THE UNIFORMITY OF THE AIR-FUEL MIXTURE IN INTERNAL COMBUSTION ENGINES

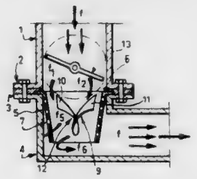
Albert Pellerin, 35 rue Lambrechts, 92400 Courbevoie, France

Filed Nov. 16, 1977, Ser. No. 851,971

Claims priority, application France, Nov. 16, 1976, 76 34414

Int. Cl.[2] F02M *29/00*

U.S. Cl. 123—141 **2 Claims**



1. In a device for internal combustion engines for increasing the uniformity of the air-fuel mixture, comprising a frusto-conical element formed by a perforated lateral wall having a collar at its major opening, the collar being adapted to fit between the carburetor flange and the manifold flange of an internal combustion engine whereas the apex of the truncated cone extends into the manifold inlet of said engine; the improvement comprising a single additional internal component in the form of a plate shaped and curved to form a spiral so as to produce turbulence and send the mixture against the walls of the truncated cone, the spiral being disposed within the truncated cone and end portions of the spiral being secured to the truncated cone and the mid-portion of the spiral between said end portions extending into the truncated cone more closely adjacent said apex and said end portions being disposed more closely adjacent said major opening of said truncated cone.

4,177,781

ELECTROMECHANICAL ENGINE TIMING DEVICE

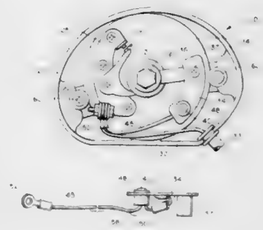
Ronald L. Marchelletta, and Charles W. Wheeler, both of Thousand Oaks, Calif., assignors to Moto-Tronics, Pacific Palisades, Calif.

Continuation of Ser. No. 604,678, Aug. 14, 1975, abandoned.

This application Nov. 11, 1977, Ser. No. 850,573

Int. Cl.[2] F02P *17/00*

U.S. Cl. 123—146.5 A **3 Claims**



1. An electromechanical engine timing device comprising:

an arcuate bracket formed to fit internally in an ignition system distributor having one or more breaker points;

at least one light-emitting diode securely mounted in a hole in said bracket;

current-limiting means connected between one side of said light-emitting diode and said bracket whereby when said bracket is secured in the distributor the plate acts as the ground terminal;

protective insulating means encapsulating the rear portion of said light-emitting diode and said current-limiting means; and

connecting means connecting the other side of said light-emitting diode in parallel with said breaker points whereby said light-emitting diode continuously indicates the opening and closing of said breaker points.

4,177,782

IGNITION SYSTEM PROVIDING SPARKS FOR TWO IGNITION PLUGS IN EACH CYLINDER FROM A SINGLE IGNITION COIL

Takashi Yoshinari, and Terumi Ookado, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 31, 1977, Ser. No. 846,891

Claims priority, application Japan, Nov. 1, 1976, 51/130493

Int. Cl.[2] F02P *3/02;* **H05B** *41/02*

U.S. Cl. 123—148 C **7 Claims**

1. An ignition system for an internal combustion engine having at least one cylinder, comprising:

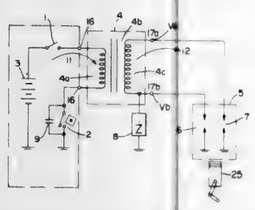
an ignition coil having a primary winding and a secondary winding, said secondary winding having two output terminals;

an ignition control circuit for applying a charging current to the primary winding of the ignition coil and for interrupting said charging current;

two ignition plugs provided for each cylinder of the engine, each said ignition plug having at least one gap formed by two spaced apart electrodes,

first connecting means for connecting one of the spaced apart electrodes of each gap of the two plugs to ground;

second connecting means for connecting the other spaced apart electrode of one of the two plugs to one output terminal of the secondary winding of the ignition coil;



third connecting means for connecting the other spaced apart electrode of the other of the two plugs to the other output terminal of the secondary winding of the ignition coil; and

impedance means provided between only one of the output terminals of the secondary winding of the ignition coil and ground.

4,177,783

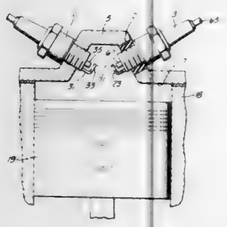
DUAL SPARK PLUG IGNITION SYSTEM

Osvaldo Palomeque, 4116 ½ N. Peck Rd., Apt. C, El Monte, Calif. 91732

Filed Nov. 3, 1978, Ser. No. 957,535

Int. Cl.² F02P *1/00*

U.S. Cl. 123—148 C **9 Claims**



1. An ignition system for an internal combustion engine for reducing the amount of air pollutants in the exhaust gases thereof, comprising:

(a) a first spark plug having central and side electrodes and being mounted upon a cylinder of said engine and electrically grounded to said cylinder; and

(b) a second spark plug having central and side electrodes and being mounted upon said cylinder and electrically insulated therefrom, said first and second spark plugs being separated by an air gap and angularly disposed with respect to each other and being operatively connected to electrical distributor means which causes an electric spark to jump said air gap between said first and second spark plugs.

4,177,784

ENGINE STARTING DEVICE

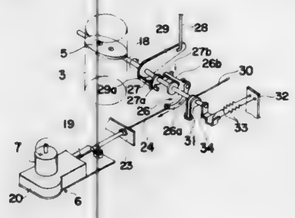
Yasuo Tatsutomi; Hideo Shiraishi, and Takashi Hamamoto, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Dec. 16, 1977, Ser. No. 861,446

Claims priority, application Japan, Dec. 21, 1976, 51/172023[U]

Int. Cl.² F02N *17/00*; F02C *33/04*

U.S. Cl. 123—179 G **4 Claims**



1. In an internal combustion engine having a rotatable throttle valve positioning shaft, a carburetor system including an openable and closable throttle valve fixedly mounted on said throttle valve positioning shaft, a main throttle valve control means connected to said throttle valve positioning shaft and externally actuable to turn said throttle valve positioning shaft in a first direction for causing said throttle valve to open, a throttle valve return means exerting a constant force on said throttle valve positioning shaft to turn said throttle valve shaft in a second direction for causing said throttle valve to close, a cranking motor, and a cranking motor power supply circuit including a starter switch which is closable by external action to close said cranking motor power supply circuit, an engine starting device, comprising:

subsidiary throttle valve control means including a first lever means rotatably mounted on said throttle valve positioning shaft, and a second lever means which is fixedly mounted on said throttle valve positioning shaft and is engaged by said first lever means for being moved thereby in said first direction, and which under the force of said throttle valve return means transmitted through said throttle valve positioning shaft is rotatable in said second direction for simultaneously rotating said first lever means in said second direction;

drive means connected to said first lever means for actuating said subsidiary throttle valve control means for rotating said throttle valve positioning shaft in said first direction;

a drive means power supply circuit which connected in parallel to said cranking motor power supply circuit and being closable to energize said drive means and having a normally open thermo-switch therein which is closable to close said drive means power supply circuit; and

temperature detection means connected to said thermos-witch for detecting the temperature in at least one portion of said engine and causing said switch to close when the temperature in said portion of said engine exceeds a certain set value.

4,177,785

DIESEL ENGINE GLOW PLUG ENERGIZATION CONTROL DEVICE

Arthur R. Sundeen, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 846,917, Oct. 31, 1977, abandoned. This application May 12, 1978, Ser. No. 905,335

Int. Cl.² F02N *17/00*

U.S. Cl. 123—179 H **8 Claims**

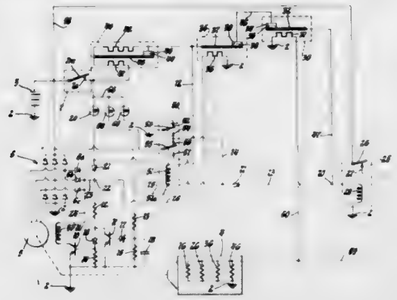
1. In combination:

a Diesel engine having at least one glow plug having a resistance element heatable to a mixture-igniting temperature range of the order of 900° C. to facilitate engine starting under cold conditions, the glow plug being characterized by decreased temperature rise per unit of heating power while the temperature thereof is within said mixture-igniting temperature range and the engine being capable of starting without significant glow plug action at a predetermined self-igniting temperature of the order of 80° C.;

a thermostatic switch adapted to complete an electric circuit when below said self-igniting temperature and to interrupt the circuit when above said self-igniting temperature;

means to energize said glow plug when said switch completes the electric circuit and to deenergize said glow plug when said switch interrupts the electric circuit;

resistive heater means energized when said glow plug is



energized to heat said switch in accordance with current flow supplied said heater means at a rate such that at a predetermined low engine starting temperature of the order of −18° C. said glow plug reaches said mixture-igniting temperature range at the time said switch reaches said self-igniting temperature; and

means communicating the engine temperature to said thermostatic switch independently of the said last means so that said switch partakes of the engine temperature and interrupts said circuit in the absence of heating by said last means when the engine temperature is at or above said self-igniting temperature,

said combination being so constructed and arranged that over a substantial engine temperature range between said predetermined low engine starting temperature and said self-igniting temperature said glow plug is heated above the temperature required to assist engine start.

4,177,786

LUBRICANT FEEDING MEANS

Wulf Leitermann, Bad Wimpfen, and Rolf Lechler, Neckarsulm, both of Fed. Rep. of Germany, assignors to Audi Nsu Auto Union Aktiengesellschaft, Fed. Rep. of Germany

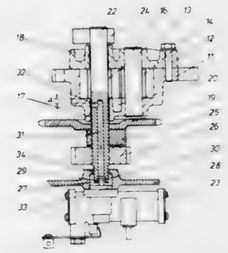
Continuation of Ser. No. 637,990, Dec. 5, 1975, abandoned. This application Jun. 8, 1978, Ser. No. 913,600

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1974, 2458086

Int. Cl.² F01M *1/00*

U.S. Cl. 123—196 R **7 Claims**

1. A lubricant system which includes in combination a metering pump and means for providing filtered lubricant to the metering pump, said means comprising at least one shaft, a bearing surface for the shaft mounted in journal bearing, a means for forcing a lubricant through the gap between the bearing surface and shaft so that particles larger than the size of said gap will be unable to pass through, and a passage for



conveying the lubricant forced through said gap to the metering pump.

4,177,787

DETERIORATED CONDITION DETECTING APPARATUS FOR AN OXYGEN SENSOR

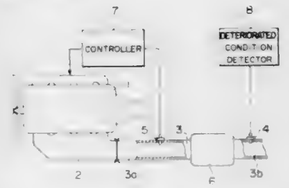
Tadashi Hattori, Okazaki; Hiroaki Yamaguchi, Aichi, and Takamichi Nakase, Gamagori, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jul. 14, 1977, Ser. No. 815,832

Claims priority, application Japan, Aug. 8, 1976, 51-94120

Int. Cl.² F02B *75/10, 77/08*

U.S. Cl. 123—198 D **6 Claims**



1. In combination with an engine control system having a catalytic converter mounted in an exhaust passage of the engine, an oxygen sensor mounted upstream of said converter for generating an output signal the signal level of which changes when oxygen concentration present upstream of said converter in said exhaust passage changes across a value corresponding to a stoichiometric ratio of air-fuel mixture supplied to said engine, and a controller connected to said oxygen sensor for feeding back said output signal thereby controlling the oxygen concentration in said exhaust passage towards said value, a sensor deteriorated condition detecting apparatus comprising:

a reference oxygen sensor mounted in said exhaust passage downstream of said catalytic converter and adapted to be correctly responsive to the oxygen concentration present downstream of said converter in said exhaust passage for generating a reference output signal in the same manner as said oxygen sensor connected to said controller;

first comparing means connected to said reference oxygen sensor for generating a first comparison signal which alternately changes between predetermined constant high and low levels in response to changes of said reference output signal;

first integrating means connected to said first comparing means for generating a first integration signal which changes proportionally to the duty factor of said first comparison signal;

second comparing means connected to said first integrating means for generating a second comparison signal when

said first integration signal becomes higher and lower than predetermined upper and lower limits respectively; and

warning means connected to said second comparing means for warning at least of the deteriorated condition of said oxygen sensor connected to said controller in response to said second comparison signal.

4,177,788

DIESEL ENGINE FUEL CONTROL APPARATUS

Yoshiyuki Morita, Kariya; Masami Itou, Toyota; Shigeyoshi Nomura, Aichi, and Masahiro Ueda, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kairya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Aug. 21, 1978, Ser. No. 935,723
Claims priority, application Japan, Jan. 11, 1978, 53-2256
Int. Cl.[2] F02D *31/00, 1/00*
U.S. Cl. 123—97 B **4 Claims**



1. A diesel engine fuel control apparatus comprising:

a key switch having operational positions including at least a start position for starting a diesel engine, an operation position for continuously running the engine and an interruption position for stopping the engine, said key switch having a start position terminal, an operation position terminal and an interruption position terminal which are selectively connected to one terminal of a vehicle-mounted power supply depending on said key switch being at said start position, said operation position or said interruption position;

an injection pump for controlling the amount of fuel supplied to said diesel engine;

an electrical actuator for driving a control lever means of said injection pump to control the amount of fuel supplied to said diesel engine;

a control unit for controlling the energization of said electrical actuator to increase or decrease the amount of fuel supplied to said diesel engine from said injection pump in accordance with the operational position of said key switch, said control unit including;

a position sensing switching means for sensing the position of said control lever means of said injection pump;

a switchover means adapted to be turned on and off by signals from the start position terminal and the operation position terminal of said key switch, said switchover means being connected to said position sensing switching means and said electrical actuator to drive said electrical actuator to a predetermined position in response to a control signal from said key switch;

a brake responsive switching means for forcibly controlling said switchover means irrespective of the control signal from said operation position terminal of said key switch when an exhaust brake is applied to said diesel engine, for substantially blocking the supply of fuel to said diesel engine from said injection pump;

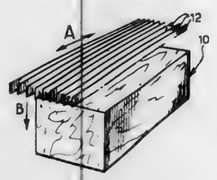
whereby the operation of said injection pump is controlled by said key switch and an excessive amount of supply of fuel is prevented when the exhaust brake is applied.

4,177,789

METHOD FOR THE PRODUCTION OF SLABS OF MARBLE OR SIMILAR STONY MATERIAL

Giuseppe Marocco, Corso Galileo Ferraris 18, Turin, Italy

Filed Aug. 1, 1978, Ser. No. 930,118
Claims priority, application Italy, Aug. 3, 1977, 68796 A/77
Int. Cl.[2] B28D *1/00*
U.S. Cl. 125—1 **30 Claims**



1. Method for the manufacture of slabs by sawing a block of marble, granite or like material by means of a multiple-blade frame, the said method comprising the following steps:

(a) subjecting a monolithic block to a first sawing operation by means of a multiple saw frame to form a series of preliminary slabs parallel to each other,

(b) keeping the preliminary slabs joined together at least at one of their edges to maintain them in fixed relative positions, said preliminary slabs being separated by clefts made by the first sawing operation;

(c) introducing spacer material into the clefts, thus producing a composite block formed by the preliminary slabs and said spacer material, and

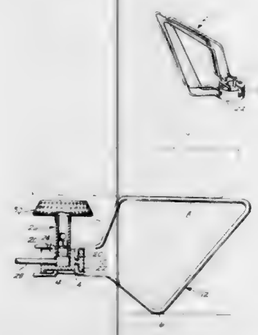
(d) subjecting the said composite block to a second sawing operation along intermediate planes of the preliminary slabs, so as to sub-divide each preliminary slab into two final slabs.

4,177,790

POCKET CAMP STOVE

Iwamoto Zenzaburo, Yokohama, Japan, assignor to International Business Development Co., Bellevue, Wash.

Division of Ser. No. 704,119, Jul. 12, 1976, Pat. No. 4,092,974.
This application Dec. 19, 1977, Ser. No. 861,863
Int. Cl.[2] F24C *5/20*
U.S. Cl. 126—38 **4 Claims**



1. A knock-down portable gas stove comprising:

a burner support hub member including a vertical socket;

a plurality of leg members, each of which is pivotally connected to the hub member for pivotal movement about a vertical axis between a use position wherein each of the legs extends radially outwardly from the hub member and a stowage position wherein each of the leg members are disposed substantially against the other leg members in a relatively flat, juxtaposed relationship;

each of the leg members including a lower foot portion restable on a support surface and an upper pan support portion;

a gas burner unit insertable into the socket in the support hub member and including a burner head positioned above the hub member at a level below the level of the pan supporting portions of the leg members; and

a gas supply conduit having an outlet end connected to the burner unit and an inlet end adapted to receive gaseous fuel from a remote, volumetrically regulated source of gaseous fuel under pressure;

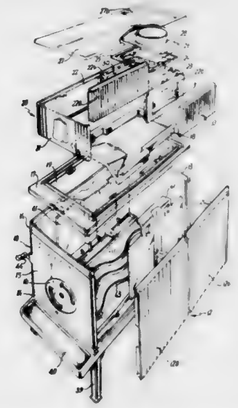
whereby said knock-down portable gas stove can be disassembled for easy, compact stowage in a relatively flat configuration by removing the burner unit from the socket in the hub member, by folding the leg members relatively together, and by placing the burner unit and the gas supply conduit adjacent the folded leg members and the hub member.

4,177,791

WOOD-BURNING STOVES

Nicholas G. Marchant, Newbury, England, assignor to Waterford Ironfounders Limited, Bilberry, Ireland

Filed Jan. 17, 1978, Ser. No. 870,062
Claims priority, application United Kingdom, Sep. 6, 1977, 37083/77
Int. Cl.[2] F24B *3/00;* **F24C** *1/14*
U.S. Cl. 126—65 **6 Claims**



1. A wood-burning stove comprising a combustion chamber defined by a base panel, side panels, rear panel, a front frame, a fire door and ventilator on the front frame, a top frame, and a horizontally disposed baffle plate occupying the rearward region of the top frame to leave an opening forward of said baffle plate for the escape of gases upwardly from the combustion chamber; the stove also comprising a flue chamber above the combustion chamber to accept gases therefrom, said flue chamber being defined by said baffle plate, a front panel, side panels, a rear frame defining a rear flue opening, an upper frame defining an upper flue opening, a liftable and movable hob panel apertured in the region of said upper flue opening, a removable flue outlet collar in one of said flue openings and a removable blanking plate in the other of said openings so that, when said flue outlet collar is in the top flue opening frame, the hob can be lifted and moved independently of the collar to give access for cleaning.

4,177,792

DRILLING RIG HEATER

Clyde E. Finch, Jr., 601 Glendale, Alice, Tex. 78332

Filed Mar. 20, 1978, Ser. No. 890,619
Int. Cl.[2] F24C *5/00;* **F23D** *5/02*
U.S. Cl. 126—93 **7 Claims**



1. A heater including:

a. a substantially closed first housing forming a fuel and fire reservoir;

b. a first elongated hollow member mounted on top of said first housing with its lower end communicating with said first housing and extending upwardly therefrom;

c. a second housing mounted on top of said first housing, therebeing port means communicating said first and second housing and port means communicating said second housing and said first elongated member;

d. a second elongated hollow member mounted on said second housing and extending upwardly therefrom;

e. said second hollow member having an upper end for communicating air to the interior of said second hollow member, and said second hollow member having its lower end communicating with said second housing for communicating air to said second housing and to said first elongated hollow member;

f. valve means in said first elongated hollow member for controlling communication therethrough; and

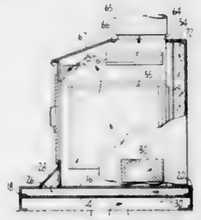
g. valve means in said second elongated hollow member for closing off the air supply to said first hollow member and the fuel and fire reservoir.

4,177,793

FREESTANDING FIREPLACE STOVE WITH HEATED AIR CIRCULATION

William R. Johnson, Santa Cruz, Calif., assignor to Chinook Manufacturing Co., Santa Cruz, Calif.

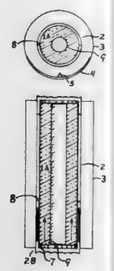
Filed Sep. 9, 1977, Ser. No. 831,775
Int. Cl.[2] F24B *7/00*
U.S. Cl. 126—121 **1 Claim**



1. A freestanding air circulating fireplace stove comprising, in combination:

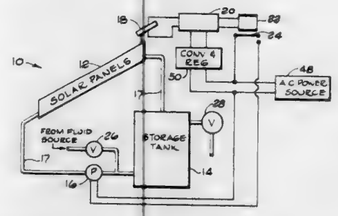
a. an all metal uninsulated firebox having two side walls, a back wall and a top wall defining a combustion chamber having an open front,
b. an outer shell completely surrounding said firebox and spaced therefrom to form plenum chambers between the sides, back and top of the firebox, said shell having a back wall including an insulation chamber, and insulation in said chamber so the fireplace stove can be mounted directly against a wall, and doors hingeably mounted thereon covering said firebox open front, said outer shell top being releasably connected to said firebox,
c. a base for said firebox and outer shell, said base extending forwardly of the open front of said firebox and having a passage for combustion air from the base to the open front of the firebox, said passage having an air opening located in front of said hingeably mounted doors, said air opening forming the only passage for air into said firebox from said passage, said firebox having a plurality of openings mating with said air passage opening for receiving air therefrom,
d. a flue for the exhaust of combustion products, said flue being in communication with the top wall of the firebox,
e. a separate air inlet opening in said outer shell for admitting secondary air into the plenum between the outer shell and the sides, back and top of the firebox,
f. exhaust air outlets in the outer shell
g. an electric fan for circulating secondary air through said separate inlet opening, plenum and exhaust outlets,
h. a plurality of Z-shaped stiffeners on said firebox sides and back,
i. a pair of shields each mounted on one of said firebox sides by said stiffeners and spaced from said firebox sides to define air flow channels along said firebox sides, said shields extending only part of the way along said firebox sides to define entrance and exit areas near the top and bottom of said firebox sides respectively so that air from said separate inlet opening flows into said air flow channels to contact said firebox sides, and
j. a plurality of channel defining means mounted on top of said firebox to receive air from said air flow channels and guide that air along the top of said firebox, said top mounted channel defining means being disposed essentially perpendicularly with respect to said firebox side channels.

4,177,794
EVACUATED-TUBE SOLAR COLLECTOR
Harry E. Novinger, 4961 S. Chester St., Englewood, Colo. 80111
Filed May 5, 1978, Ser. No. 903,068
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—443 **12 Claims**



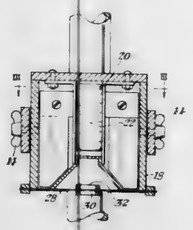
1. In an elongated tube-evacuated solar collector: a collector inner tube and a collector outer tube, the inner tube disposed within the outer tube, both tubes transparent and sealed for evacuation of air in the common space between their walls; a natural dark substantially black mineral wool fibrous absorber with spaces for fluid between its fibers disposed in proximity to substantially all the inner surface of the wall of the inner tube; duct means for venting a fluid transfer agent into the collector, through the absorber and out of the collector; the duct means includes absorber duct means formed by absorber fiber arrangement for venting the transfer agent through the absorber substantially parallel to its axis; and reflector means to re-direct radiation entering the lower evacuated area back to the absorber.

4,177,795
TRIGGERING DEVICE RESPONSIVE TO ENERGY FLOW AND CONTROLLED SOLAR HEATING SYSTEM INCORPORATING THE DEVICE
Robert T. Schultz, 1021 Cliff Dr., Santa Barbara, Calif. 93109
Filed Aug. 11, 1977, Ser. No. 823,572
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **38 Claims**



1. A system for controlled solar heating of a fluid, comprising:
(A) a panel for collecting solar energy and transferring said energy to the fluid;
(B) means for circulating the fluid through said panel to receive said energy;
(C) means responsive to the rate of flow of solar energy through an area in the vicinity of said panel for providing a control signal;
(D) means for switching on and off said circulation of said fluid through said panel in response to said control signal.

4,177,796
MAGNETIC THERMAL VIBRATIONAL DEVICE FOR THE TREATMENT OF ARTHRITIS AND THE LIKE
Jose J. Franco-Vila, 730 E. 6th Pl., Hialeah, Fla. 33010
Filed Aug. 22, 1977, Ser. No. 826,410
Int. Cl.[2] A61N *1/42;* **A61H** *23/00*
U.S. Cl. 128—1.5 **3 Claims**



1. A therapeutic device for treating arthritis, rheumatism, or other similarly related bone joint diseases, comprising:
an electromagnet, including a coil, said electromagnet having shaped, spaced apart end faces providing a concentrated field of magnetic energy;
an AC power source connected to said electromagnet for alternately magnetizing said coil;

an elastic supporting band positioned across said spaced apart end faces of said electromagnet;
at least one permanent magnet connected to said elastic supporting band, suspended between the electromagnet end faces, said suspended permanent magnet having its magnetic axis oriented perpendicular to the magnetic field of said electromagnet;
said electromagnet including steel plates coupled together to produce hysterisis;
a housing enclosing said electromagnet for entrapping heat within said housing; and
said elastic supporting band connected at opposite ends to said housing forming a resilient closure for said housing whereby said resilient closure may contact the skin of a patient to produce thermal vibrational effects while an alternating magnetic field is simultaneously disposed therethrough.

4,177,797
ROTARY BIOPSY DEVICE AND METHOD OF USING SAME
Shelby M. Baylis, 6800 Hubbard Rd., Clarkston, Mich. 48016, and Jorge S. Szauer, Pontiac, Mich., assignors to Shelby M. Baylis, Clarkston, Mich.
Filed Mar. 4, 1977, Ser. No. 774,408
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—2 B **11 Claims**

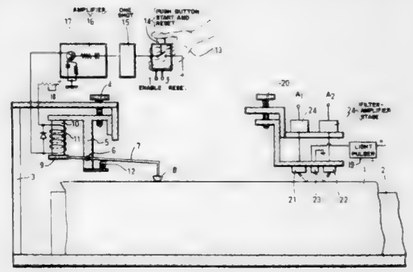


1. A device for extracting biopsy samples and the like, comprising:
an elongated needle member having distal and proximal ends, said distal end having a sharp conical point for penetration of the body tissue;
said needle member having disposed along at least a portion of the length thereof body tissue helical cutting means;
a hollow cylindrical cutting tube of substantially uniform diameter having distal and proximal ends, said distal end having a truncated conical cutting edge;
said tube being substantially tightly slidably received over said needle member having said helical cutting means disposed thereon, after said needle member has penetrated into the body tissue;
said distal truncated conical cutting edge of said tube projecting beyond said distal sharp conical point of said needle member in the body tissue when said tube is disposed over said needle member in an operative position; and
said needle member and said tube being withdrawn substantially simultaneously from the body with the tissue sample being collected interiorly of said tube

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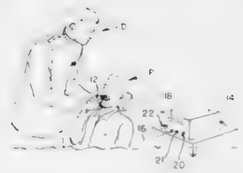
4,177,798
APPARATUS FOR MEASURING THE MECHANICAL CHARACTERISTICS OF A MATERIAL SUCH AS LIVING SKIN
Jean-Luc Lévêque, Montfermeil, and Gilbert Gras, Aulnay Sous Bois, both of France, assignors to L'Oreal, Paris, France
Filed Jul. 7, 1977, Ser. No. 813,458
Claims priority, application France, Jul. 20, 1976, 76 22089
Int. Cl.[2] A61B *5/10*
U.S. Cl. 128—774 **15 Claims**

1. Apparatus for measuring certain mechanical characteristics of a material capable of transmitting a vibration, and which can be the skin of a living subject, said apparatus comprising, emitter means for generating a disturbance in the material, and receiver means spaced from said emitter means by a certain distance, the receiver means comprising at least one luminous source associated with two photosensitive receiving cells isolated one from the other, characterized by the fact that the luminous source sends radiation to the surface of the material under test, the photocells receiving the said radiation after reflection from the surface of the material under test, and



circuit means connected to said photocells for registering characteristics of said material in response to the reflected radiation received by said photocells.

4,177,799
DENTAL PULP TESTER
Carl J. Masreliez, 3301 - 181st Pl. NE., Redmond, Wash. 98052
Filed Jul. 25, 1977, Ser. No. 818,737
Int. Cl.[2] A61B *5/05*
U.S. Cl. 128—741 **25 Claims**



1. A system for testing the dental pulp of a tooth, comprising:
a probe having a first electrode adapted to directly contact said tooth;
a second electrode adapted for indirect electrical contact with said tooth;
contact detection means for determining when said first electrode is in contact with said tooth and for generating an initiate signal in response thereto; and
electrical stimulus means connected to said probe for producing an electrical stimulus between said first and second electrodes having an intensity which increases responsive to said initiate signal, said electrical stimulus means further including initializing means for resetting the intensity of said electrical stimulus to a predetermined value responsive to termination of said initiate signal for longer than a predetermined period such that the intensity of said electrical stimulus is initialized to a preset value by removal of said first electrode from said tooth for longer than said predetermined period.

4,177,800
IMPLANTABLE BIOTELEMETRY TRANSMITTER AND METHOD OF USING SAME
Carl C. Enger, 12700 Lake Ave., Lakewood, Ohio 44107
Filed Apr. 10, 1978, Ser. No. 894,811
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—2.1 A **9 Claims**

1. A telemetry transmitter adapted to be implanted in a

living body, the transmitter comprising transducer means adapted to be mechanically moved by a pulsating portion of the living body to provide electrical power output; pulse-generating means coupled to said transducer means and responsive to its electrical power output for producing short pulses of predetermined width; radio transmitting means coupled to said pulse-generating means and responsive to the short



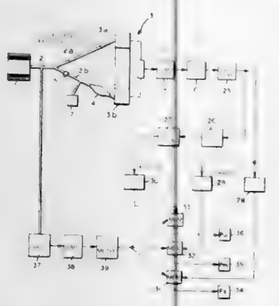
pulses for generating successive spaced radio carrier frequency signal bursts of substantially said predetermined width and modulation means adapted to respond to a signal representing at least one body function for independently modulating said transmitting means, whereby the transmitter transmits during ON times determined by the given width of the pulses and the bursts carry modulation representing the at least one body function.

4,177,801

PROCESS AND APPARATUS FOR THE NON-INTRUSIVE MEASUREMENT OF CIRCULATORY PARAMETERS

Henri Grangirard, Villeurbanne, and Pierre F. Serres, Sainte-Foy-les-Lyon, both of France, assignors to Dubernard Hospital, S.A., Bordeaux, France

Filed Jul. 18, 1977, Ser. No. 816,659
Claims priority, application France, Jul. 30, 1976, 76 24233
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—681 **14 Claims**



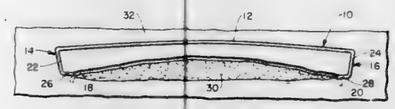
1. A process for the periodical and automatic determination and indication of the systolic and mean pressures of a subject comprising the steps of applying a counter-pressure by a pressure applying means to a part of the body of the subject, varying the counter-pressure from a pressure above the systolic pressure of the subject to a pressure below the diastolic pressure of the subject, converting the shock wave produced by intra-arterial phenomena to an electrical signal by means of an electronic differential pressure gauge having at least one pole thereof coupled to the counter-pressure-applying means so that the intra-arterial phenomena producing variations in the counter-pressure excercised by the counter-pressure applying means are picked up by the electronic differential pressure gauge and converted to an electrical signal having a value which is continuous and proportional to the intra-arterial phenomena, sensing the instantaneous absolute counter-pressure excercised by the counter-pressure-applying means in a continuous manner and converting the instantaneous absolute counter-pressure to a second electrical signal by means of an electronic absolute pressure gauge connected to said pressure-applying means, the second electrical signal being supplied in a continuous manner and having an amplitude which is proportional to the amplitude of the pressure received, obtaining and indicating at the two points characterizing the curve of variation of the value of the electrical signal issuing from the electronic differential pressure gauge as a function of the counter-pressure excercised by the counter-pressure-applying means the two values of the counter-pressure excercised by the counter-pressure applying means which correspond to said two points and which indicate the systolic and mean pressures, wherein the step of obtaining and indicating the data at the two points characterizing the curve of variation of the value of the electrical signal which correspond to the systolic pressure and mean pressure, respectively, includes the step of integrating to "staircase-form" signals of the electrical signal issuing from the electronic differential pressure gauge, the amplitude of the graduations of the "staircase-form" signals being proportional to the difference between the amplitudes of said electrical signal at two successive samples, differentiating said "staircase-form" signals with respect to time in order to give a series of positive electric impulses and a series of negative electric impulses, comparing said impulses with two previously programmed amplitude thresholds in order to identify the two impulses corresponding to said two points, and enabling an electronic member unit to read said second electrical signal representative of said absolute pressure when said impulses have a predetermined relationship to said threshold to thereby determine the systolic and mean pressures.

4,177,802

SELF RETAINING SKIN RETRACTOR

Noboru Ogami, 34 Gartley Pl., Honolulu, Hi. 96817

Filed Dec. 21, 1977, Ser. No. 862,811
Int. Cl.[2] A61B *17/04*
U.S. Cl. 128—20 **5 Claims**



1. A skin retractor for use during suturing of an incision comprising:

an elongated narrow body having a first end and a second end;

a first connecting end attached to said first end, said first connecting end including a first member extending substantially at a right angle from said body a second member extending substantially at a right angle from said first member;

a second connecting end attached to said second end, said second connecting end including a third member extending substantially at a right angle from said body and a fourth member extending substantially at a right angle from said third member;

said first end and said second end to be located at opposite ends of the surgical incision causing slight stretching of the incision resulting in the incision side walls being stretched but to maintain accurate apposition of the incision side walls to facilitate satisfactory closing of the incision and subsequently the most desirable incision scar in appearance;

a fifth member connected to and extending substantially at a right angle from said second member, said fifth member being positioned substantially perpendicular to said body;

a sixth member extending from and being connected to at substantially a right angle from said fourth member, said sixth member being positioned substantially parallel to said fifth member; and

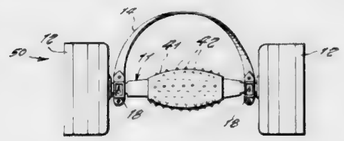
a seventh member connected to and extending angularly outwardly from said fifth member, an eighth member connected to and extending angularly outwardly from said sixth member, in respect to said body the said seventh and eighth members extend in substantially the same direction.

4,177,803

FOOT EXERCISER

Bertha Papistas-Scherer, c/o George Spector, 3615 Woolworth Building, 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Aug. 29, 1977, Ser. No. 828,868
Int. Cl.[2] A61H *1/02*
U.S. Cl. 128—25 B **4 Claims**



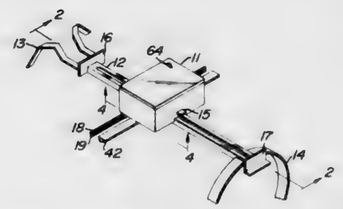
1. A foot exerciser comprising in combination a roller and a strap for securing a person's foot thereupon, said roller comprising a member made of hard material, and including a wheel at each end interconnected by a portion therebetween, and said strap comprising a flexible member looped at each end around said portion and each secured therearound by a buckle.

4,177,804

AUTOMATIC MASSAGING DEVICE

Fred Weingarten, 507 Country Club Dr., Cherry Hill, N.J. 08003

Continuation of Ser. No. 772,771, Feb. 28, 1977, abandoned. This application Jul. 12, 1978, Ser. No. 923,977
Int. Cl.[2] A61H *7/00*
U.S. Cl. 128—52 **13 Claims**



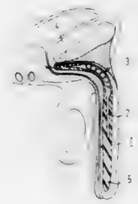
1. An automatic back massaging device, adapted to travel up and down the back of the user, comprising at least one massaging element which engages the back of the user for a combined massaging effect and drive means, means for shoulder and hip engagement, with track structure in between, a housing slidably mounted on said track, said massaging element mounted in said housing, a reversable motor mounted in said housing to drive said device, and automatic switching means adapted to reverse the direction of said device.

4,177,805

PENILE IMPLANTATION PROSTHESIS

Theodor Tudoriu, Munich, Fed. Rep. of Germany, assignor to Peter Falge, Fed. Rep. of Germany, a part interest

Filed Nov. 23, 1977, Ser. No. 854,476
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1977, 2736443
Int. Cl.[2] A61F *5/42*
U.S. Cl. 128—79 **11 Claims**



1. A penile implantation prosthesis comprising

an elongated encasing body formed from a physiologically inert and pliable material, and

a stiffening bar completely embedded in said body and extending from the proximal end of said body to a location spaced from the distal end thereof, said stiffening bar being formed from a material more resistant to bending than said body,

said body being dimensioned so that it can be surgically inserted into the corpora cavernosa of a penis with the proximal end anchored near the rami of the pubis and the distal end in approximately the geometric center of the glans penis,

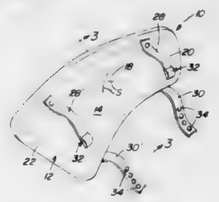
said stiffening bar including a joint portion which is bendable from a substantially straight configuration to a curved configuration in only one direction, said joint portion being located in said body so that, upon implantation, said joint portion resides along the transition area between the rami of the pubis and the base of the penis shaft.

4,177,806

KNEE PILLOW

Teaford A. Griffin, 105 Shearwater Dr., Ocean Springs, Miss. 39564

Filed Nov. 9, 1977, Ser. No. 850,281
Int. Cl.[2] A61F *5/30*
U.S. Cl. 128—132 R **1 Claim**



1. A pillow for placement between the knees and adjacent upper and lower leg portions of a person lying on his or her side and having their legs disposed in superposed relation, said pillow comprising an elongated resilient pad of greater length than width and of greater width than thickness, approximate longitudinal and transverse midportions of the opposite sides of said pad defining shallow concave recesses opening outwardly from opposite sides of the pad and registered with each other in the direction in which said thickness is measured, said recesses being adapted to seatingly receive the adjacent portions of said person's knees therein with the adjacent knee portions

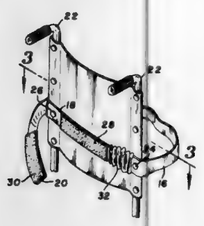
seated in the recesses serving to prevent shifting of the pillow from between the knees and also shifting of the knees from superposed vertically registered positions, the longitudinal extent of said pillow being sufficiently greater than said width to enable the opposite end portions of said elongated pillow to be received between and utilized in maintaining the adjacent upper leg portions and the adjacent lower leg portions of said person comfortably spaced apart, each of said end portions including strap means for adjustable securement about the upper and lower leg portions of one of said legs, said pillow being longitudinally bowed in a plane disposed normal to the direction in which said thickness is measured.

4,177,807

RESTRAINING BELT FOR PATIENTS IN WHEELCHAIRS, STRETCHERS OR THE LIKE

John J. Ocel; Thomas Ocel, and Donald J. Ocel, all of Minneapolis, Minn., assignors to Ocelco, Inc., Minneapolis, Minn.

Filed May 4, 1978, Ser. No. 902,832
Int. Cl.² A61F *13/00*
U.S. Cl. 128—133 **3 Claims**



1. A restraining strap for securing a patient to a patient-transporting device, comprising:
(a) a unitary, woven, flexible strap having first and second end portions of predetermined lengths;
(b) Velcro-type fastening means attached to the inner and outer surfaces of said strap along said first and second end portions, respectively; and
(c) a collapsible, tubular fabric sleeve surrounding said first end portion of said strap and having one end thereof attached to said strap at a point intermediate said first and second end portions and extending a predetermined distance toward the terminus of said first end portion.

4,177,808

ANTI-BUBBLE SAFETY VALVE FOR A LIQUID-CIRCUIT

Edouard Malbec, Logis de Chalonne, Le Gond Pontouvre, France (16160)

Filed Sep. 19, 1977, Ser. No. 834,545
Int. Cl.² A61M *05/00*
U.S. Cl. 128—214 R **3 Claims**



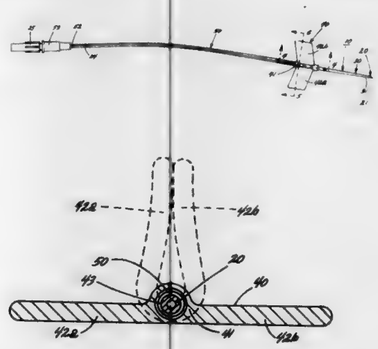
1. An anti-bubble safety device for a low pressure liquid circuit and especially for medical perfusion, comprising a bag including a flexible wall and forming a chamber for the admission of liquid; a valve comprising a diaphragm forming a part of said flexible wall; a seating for said diaphragm formed by a plate having a peripheral edge to which is bonded said diaphragm, said diaphragm and seating forming an interface and comprising at least one liquid circulation passageway through the plate from the interior of the bag to the interface; and an outlet duct extending through said plate which is in laterally spaced relation with said at least one liquid circulation passageway so as to impose a laminar flow of the liquid in the interface between said passageway and said outlet duct, said outlet duct being adapted to be connected to an outlet pipe extending outwardly of the bag and said bag being provided with a passageway to the surrounding atmosphere.

4,177,809

INTRAVENOUS CATHETER APPARATUS AND METHOD

Harvey R. Moorehead, Salt Lake City, Utah, assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 15, 1977, Ser. No. 833,628
Int. Cl.² A61M *5/00*
U.S. Cl. 128—214.4 **13 Claims**



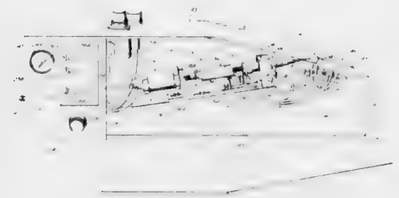
1. An intravenous catheter apparatus comprising an intravenous catheter tube, a manually guidable circumferentially deformable elastomeric bore-defining tubular inserter integral with, and in axial alignment with, the catheter tube for use with a patient, and a needle concentric within the catheter tube and inserter and extending through at least part of the bore of the inserter to beyond the distal end of the catheter tube, the bore of the inserter being in open communication with the catheter tube lumen, the catheter tube and inserter being unitarily joined and adapted to be advanced or retracted as a unit axially in sliding relation along the needle, the inserter comprising opposed laterally extending wings adapted to be manually compressed together from an at-rest position to a needle control position, the bore of the inserter being sufficiently large to permit retraction of the needle from the catheter tube and the inserter when the inserter is at rest, and when the inserter wings are compressed to the needle control position being sufficiently constricted to enable the inserter to grip the needle firmly to permit inserter-forced injection of the distal end of the needle into the body of a patient.

4,177,810

PNEUMATIC INJECTION APPARATUS

Albert J. Gourlandt, Gambais, France, assignor to Damon Corporation, Needham Heights, Mass.

Filed Feb. 24, 1978, Ser. No. 881,033
Claims priority, application France, Dec. 23, 1977, 77 39085
Int. Cl.² A61M *5/00*
U.S. Cl. 128—218 A **11 Claims**



1. An automatic injection apparatus comprising
a fluid actuated drive cylinder having a driven rod extending from one end thereof, said rod translating along a longitudinal axis of said cylinder upon actuation of said cylinder,
a syringe displacement means connected to said rod for movement along the longitudinal axis of the displacement means,
an injection syringe connected to said displacement means and having
a syringe body slidably mounted within a syringe support, and being provided with a lateral injection-liquid supply tubulure,
a syringe piston slidably mounted within the syringe body, and
an injection needle rigidly secured to the syringe body,
fluid logic circuitry including a pneumatic switching means for switchably connecting a system fluid input to said drive cylinder for repetitively driving and releasing said cylinder,
said switching means including at least a start switching means and said cylinder being urged from a withdrawal state to an injection state in response to actuation of said start switching means,
retention means for immobilizing a part of an animal to be treated, said start switching means being housed in said retention means, and said retention means being releasably secured to a top panel surface of said apparatus,
said start switching means being normally in a ready state and being actuated to a start state when said animal part is placed in position at said retention means, and
a release manifold mechanism for connecting said start switching means to other portions of said fluid logic circuitry,
whereby said retention means can be quickly disconnected both mechanically and pneumatically from the rest of said apparatus.

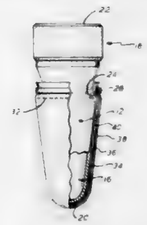
4,177,811

THERAPEUTIC APPLICATOR AND CLEANSING DEVICE

Marcial Alvarez, 225 E. Jersey St., Elizabeth, N.J. 07206

Continuation-in-part of Ser. No. 744,403, Nov. 23, 1976, abandoned. This application Sep. 14, 1977, Ser. No. 833,070
Int. Cl.² A61M *35/00*; B08B *1/00*
U.S. Cl. 128—261 **13 Claims**

1. A cleansing and applicator device for treatment of the perineal area of the human anatomy, comprising in combination:
a generally conically shaped applicator body, said body generally tapering from the base to the apex thereof;
a flexible and compressible covering structure for effecting said cleansing being fitted about and thereby enclosing at least the portion of the said body including said apex; said structure being a composite of overlying layers of material, at least one said layer being moisture-absorbent and another said layer being liquid impervious, the layers of said composite being readily detachable from said structure and thereby from said applicator body by a user of



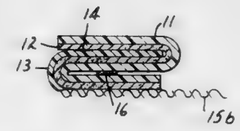
said device to effect disposal of said layers after use thereof; and
means removably securing said covering structure to said applicator body, whereby said covering structure may be replaced following use of the layers thereof.

4,177,812

TAPE STRUCTURE AND GARMENT CLOSURE MADE THEREWITH

Robert C. Brown, Falcon Heights, Minn., and Lyle H. Mickschl, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 20, 1973, Ser. No. 389,877
Int. Cl.² A61F *13/16*
U.S. Cl. 128—284 **5 Claims**



1. In a disposable diaper having a top sheet, a backing sheet and an absorbent core interposed therebetween, a means for providing self-stored protective access to a portion of the adhesive surface of a diaper tape fastener comprising, a pressure-sensitive tape fastener having an upper surface and a lower surface, said lower surface being divided widthwise into two end segments at least one of which is adhesively treated and a middle segment containing a release agent, one of said segments being a fixed end segment which is secured to said backsheet, the other of said end segments being a releasable end segment; said fastener being folded in manner such that said releasable end segment and said middle segment are superimposed over said fixed end segment with the lower surface of said releasable end segment being in contacting relation and releasably secured to the lower surface of said middle segment.

4,177,813

VESSEL OCCLUDER

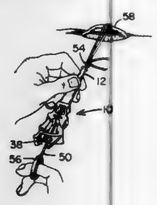
Curtis H Miller, Burnsville; Robert A. Arp, Eden Prairie, both of Minn., and Howard F. Carpenter, South Easton, Mass., assignors to Med General, Inc., Minneapolis, Minn.

Filed Jan. 9, 1978, Ser. No. 868,032
Int. Cl.² A61B *17/12*
U.S. Cl. 128—326 **9 Claims**

1. A vessel occluder comprising:
(a) an elongated tubular sheath having proximal and distal ends;
(b) a clamp member having a tubular base portion adapted to

be fitted into said proximal end of said tubular sheath and having integrally formed resilient bifurcated fingers extending from said base portion, one of said fingers terminating in an integrally formed, transversely extending clasp segment having an aperture therethrough, said clasp segment being adapted to engage the other of said fingers for releasably pinching said fingers together; and

(c) an elongated retractor adapted to extend through said aperture in said clasp segment, said tubular base portion



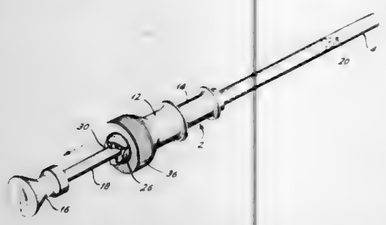
and the lumen of said sheath and beyond both ends thereof, said retractor having a handle at its proximal end and a hook at its distal end adapted to snare the ends of a cord or the like looped about a body vessel and draw said ends through the lumen of the sheath, between said bifurcated fingers and through said aperture in said clasp segment, the arrangement being such that when said clasp segment engages the other of said fingers, said cord is restrained from axial movement with respect to said sheath.

4,177,814

SELF-SEALING CANNULA

William R. Knepshield, Malvern; Jerry Polizzi, Morrisville, and Allen H. Okamoto, Ambler, all of Pa., assignors to KLI, Incorporated, Newtown, Pa.

Filed Jan. 18, 1978, Ser. No. 870,478
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—348 **12 Claims**



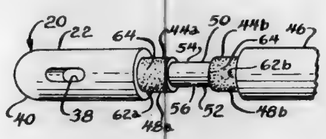
1. A self sealing cannula for insufflatory surgical procedures wherein an operative body cavity is maintained under gas pressure during said surgical procedure, said cannula comprising an elongated sleeve having a cannula passage constructed for receiving surgical instruments therethrough and for penetrating into said operative body cavity to facilitate insertion and withdrawal of a surgical instrument while retaining said cannula in situ and while retaining gas pressure in said body cavity notwithstanding withdrawal of said surgical instrument, said cannula having a valve seat coaxially disposed about the cannula passage through which said surgical instrument is adapted to extend, an elastomeric valve positioned against the valve seat in a position to block said passage, said elastomeric valve having a slotted portion positioned along said cannula passage in a position to be penetrated by said surgical instrument upon insertion thereof, and having sufficient elasticity to yield to permit such insertion, and compression means carried by said cannula and positioned to apply inwardly directed pressure to said elastomeric valve to compress the elastomeric valve inwardly toward said slotted portion thereof for sealing the cannula passage against outward flow of said pressurized gas therethrough after withdrawal of said surgical instrument from said cannula passage.

4,177,815

CATHETER BALLOON STRUCTURE

Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Feb. 1, 1978, Ser. No. 874,072
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—349 B **5 Claims**



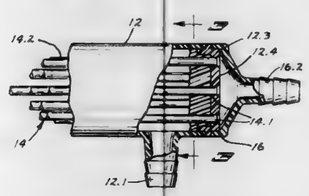
1. A catheter comprising, an elongated shaft having an inflation lumen extending along the shaft, a pair of spaced annular ledges recessed from an outer surface of the shaft circumferentially around the shaft and defining spaced recessed bonding surfaces extending circumferentially around the shaft, and an annular section of the shaft extending between said ledges and recessed from said bonding surfaces circumferentially around the shaft, with said shaft section defining an inner part of a cavity communicating with the inflation lumen intermediate said ledges, said catheter having an annular sleeve of elastic material having a thickness approximately equal to the distance between said bonding surfaces and the outer shaft surface adjacent said ledges, with said sleeve having a length approximately equal to the distance between remote ends of said ledges, and said catheter having means for uniformly bonding opposed ends of said sleeve to said bonding surfaces circumferentially around the ledges.

4,177,816

HEAT EXCHANGER FOR BLOOD

William L. Torgeson, Edina, Minn., assignor to Sci-Med Life Systems, Inc., Minneapolis, Minn.

Filed Mar. 27, 1978, Ser. No. 890,077
Int. Cl.[2] A61F *7/00*
U.S. Cl. 128—400 **12 Claims**



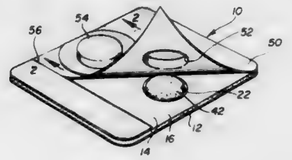
1. A disposable heat exchanger for controlling the temperature of blood, comprising a plurality of generally parallel tubes having smooth inner walls, inlet and outlet means for supplying blood to and for collecting blood from the tubes, a jacket about the tubes having inlet and outlet means enabling the flow of a heat exchange medium through the jacket and in heat exchange proximity with the tubes, the tubes being characterized by including elongated inserts therein, each insert having periodic reverse bends providing the insert with a serpentine configuration, outer surfaces of the bends being in heat-exchange contact with inner walls of the tubes, the tubes with inserts being of sufficient number, length and flow area to enable gentle, laminar blood flow through the tubes at 37° C. at a rate of up to about 5 liters per minute.

4,177,817

DUAL TERMINAL TRANSCUTANEOUS ELECTRODE

Albert J. Bevilacqua, Downers Grove, Ill., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Feb. 1, 1978, Ser. No. 874,233
Int. Cl.[2] A61N *1/04*
U.S. Cl. 128—802 **4 Claims**



1. A dual terminal electrode construction for the transcutaneous application of current to a patient, such as might be employed in the electrical stimulation of nerves, said electrode comprising a pair of spaced terminal arrangements and a base member upon which said terminal arrangements are provided, said base member comprising a section of nonconductive foam material having an adhesively coated surface for affixing the electrode in engagement with the skin of a patient above the nerve to be stimulated, and a pair of spaced through apertures, a terminal arrangement associated with each said aperture and engaged with the surface of said base member opposite said adhesively coated surface, each said terminal arrangement including, a section of non-porous, adhesively coated material of substantially less area than the base member, and affixed to the base member surface opposite said adhesively coated surface in overlying relation to the associated aperture, said sections of non-porous material serving to define with said apertures, two closed bottom reservoir chambers which open to said adhesively coated surface, with said sections of non-porous material providing the bottom walls for each said reservoir chambers, a terminal member carried by each said section of non-porous material and including a surface portion in said chamber that is sized with respect to said chamber to provide an exposed portion of the adhesively coated surface of said section of non-porous material, an open cell pad disposed in each said chamber in overlying contact with the terminal member, and affixed to the exposed portion of said adhesively coated surface of the section of non-porous material defining the bottom wall of said chamber, said base member being of a thickness to provide reservoir chambers of sufficient depth to accommodate a desired quantity of electrolytic gel which impregnates said pads, and said reservoir chambers being spaced apart a distance sufficient to provide a barrier segment separating one chamber from the other chamber, said barrier segment being of sufficient width at its narrowest point such that upon the mounting of said electrode to the skin of a patient, the respective chambers and the electrolytic gel associated with said chambers are isolated electrically each from the other by said barrier segment, such that upon the application of current across said terminal elements, said current will pass through the skin of the patient.

4,177,818

SELF ATTACHABLE SMALL-TOOTHED ELECTRODE AND A FORCEPS FOR MANEUVERING IT

Francisco L. De Pedro, Segurola 1431, 2nd Floor, Apt. "H", 1638 Vicente Lopez, Argentina

Filed Dec. 5, 1977, Ser. No. 857,845
Claims priority, application Argentina, Dec. 2, 1976, 265699
Int. Cl.[2] A61N *1/04*
U.S. Cl. 128—418 **1 Claim**



1. The combination of an electrode carrying member which is adapted to be inserted with hooks into the cardiac muscle and specially shaped forceps to assist in such insertion wherein the improvement comprises:

(a) a substantially parallepipedic elastic body having first and second large planar faces and two parallel long sides and two parallel short sides;

(b) a conductor attached to the first one of the said large faces;

(c) four small inwardly curved teeth attached to the second large face close to the corners thereof;

(d) each tooth having a sharpened thin point;

(e) the teeth next to each of the long sides being arranged in a straight line running parallel to said long sides with the points of opposing pairs of teeth directed towards each other and said opposing pairs of teeth forming an arc of a circle separated by a gap;

(f) a thin electrode point connected to the conductor projecting from the center of the second large face midway between said opposing pairs of teeth;

(g) a stub projecting from each of the short parallel sides of the elastic body;

(h) receptacles at the free ends of said forceps receiving said stubs to permit articulation between the elastic body and said forceps; the arrangement being such that prior to insertion of the electrode the said stubs are placed in said receptacles formed at the ends of the forceps and on manually closing the forceps, the elastic body is bent back on itself until the curved teeth are substantially parallel one with the other and parallel to the electrode point so as to permit their being driven into the heart muscle without tearing the muscle and on releasing the forceps, the elastic body is allowed to resume its original shape causing the curved teeth to be further embedded in the heart muscle with minimum damage to the tissue.

4,177,819

MUSCLE STIMULATING APPARATUS

Harvey I. Kofsky, 3250 Ellendale Ave., Apt. 408, Montreal, Quebec, Canada (H3S 1W4), and Arthur Levine, 5718 Rand Ave., Montreal, Quebec, Canada (H4W 2H7)

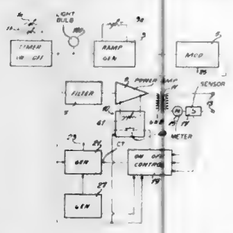
Filed Mar. 30, 1978, Ser. No. 891,817
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—422 **3 Claims**

1. Electronic apparatus for stimulating the muscles of a patient, comprising:

electrodes disposed, in operation, on the skin surface of the patient in the vicinity of the muscles to be stimulated;

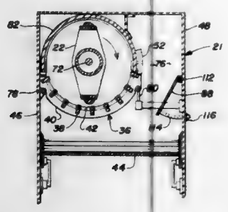
a first generator having an output frequency of 2000 to 3000 Hz;

means for turning said first generator on for a predetermined time period separated by predetermined intervals;
means for gradually increasing the amplitude of said first generator output from zero at the onset of each time period, and for gradually decreasing said amplitude to zero at the end of each time period;
said first generator having a START/STOP terminal;
a second generator, having an output frequency of 40 to 60



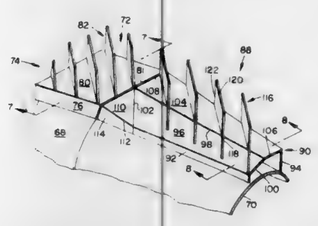
Hz, connected to said START/STOP terminal to start and stop said first generator at a rate of 40 to 60 times per second;
whereby to produce, in each of said time periods, 40 to 60 bursts per second of a 2000 to 3000 Hz signal;
filter means receiving said 40 to 60 burst per second of said 2000 to 3000 Hz signal to produce 40 to 60 bursts per second of a low distortion 2000 to 3000 Hz sine wave; and
means connecting said sine wave to said electrodes.

4,177,820
COMBINE WITH OFFSET ROTOR
Edward W. Rowland-Hill, Lancaster, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.
Filed Apr. 7, 1978, Ser. No. 894,323
Int. Cl.[2] A01F *12/20*
U.S. Cl. 130—27 T **4 Claims**



1. A combine for cutting and threshing agricultural products comprising in combination, a mobile frame, a threshing compartment extending longitudinally upon said frame and having an inlet at one end to receive products to be threshed and discharge means at the other end through which waste material is discharged, a single threshing rotor extending longitudinally within said threshing compartment and rotatably supported by axially aligned bearings offset laterally a predetermined distance from the central axis of said compartment to provide a side space laterally between the peripheral path of said rotor and one side of said compartment, a concave supported by said frame longitudinally beneath said rotor and extending segmentally adjacent the lower portion of the peripheral path of said rotor, a separation grate extending coaxially beyond the inner end of said concave and having an upper portion extending upwardly above the corresponding edge of said concave on the side adjacent said space, means extending transversely between the opposite sides of said threshing compartment below said concave to receive threshed material, means to rotate said rotor in a direction to direct the threshed product toward and into said side space in said compartment, a deflector supported at said one side of said compartment and extending downward and inward from one edge adjacent said one side of said compartment and operable to deflect threshed material discharged through said separation grate and concave into said space downward and inward toward the longitudinal center of said material receiving means, and means adjustably supporting the lower edge of said deflector at desired distances toward and from said one side of said compartment to vary the inclination of said deflector to effect substantially evenly desired distribution of said material across said receiving means, whereby substantially even distribution of threshed material occurs on said receiving means between opposite sides thereof.

4,177,821
FEED ROTOR FOR AN AXIAL FLOW ROTARY COMBINE
Rolf W. Peiler, East Moline, and Ronald E. Rohren, Moline, both of Ill., assignors to Deere & Company, Moline, Ill.
Filed May 1, 1978, Ser. No. 901,325
Int. Cl.[2] A01F *12/22*
U.S. Cl. 130—27 T **25 Claims**

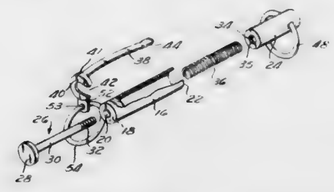


1. In an axial flow rotary separator for treating agricultural crops in which a rotor rotates within a housing and in which crop material is introduced into an annular space between rotor and housing, rotor and housing cooperating as the rotor rotates to treat the crop material and propel it downstream in a generally spiral path, said separator including a threshing section, an improved separator feed section upstream of the threshing section, comprising:
an infeed housing having a wall including a crop receiving opening and a plurality of helically disposed lead members carried internally by the housing wall; and
a rotor feed portion having a frame, supported for rotation and axially extending in the housing and including a plurality of raised approximately axially extending feed bars carried by the frame, circumferentially spaced and defining between them crop receiving spaces and each having an axially elongated ramp-like surface including, with respect to rotor rotation, leading and trailing portions, said trailing portion being at a greater radial distance from the rotor axis than the leading portion so that crop material introduced to the feed section through the crop receiving opening and entering the crop receiving spaces is engaged by the feed bars and propelled circumferentially, inertia of the material and friction between it and the housing causing relative circumferential motion, the material riding up the ramp and being urged radially outwards and dispersed and forming an attenuated annular mat while engagement by the helical lead members deflects the crop material downstream towards the threshing section.

4,177,822
TOBACCO COMPOSITION
Herman G. Bryant, Jr., Bahama; Vello Norman, Raleigh, and Thomas B. Williams, Durham, all of N.C., assignors to Liggett Group Inc., Durham, N.C.
Continuation-in-part of Ser. No. 548,983, Feb. 11, 1975, abandoned, which is a continuation of Ser. No. 344,589, Mar. 26, 1973, abandoned. This application Jan. 27, 1977, Ser. No. 763,267
Int. Cl.[2] A24B *15/02*
U.S. Cl. 131—17 R **9 Claims**

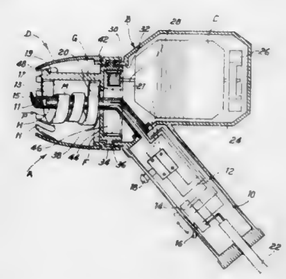
1. A smoking composition comprising tobacco and a water soluble chloride salt of palladium, said salt being decomposable into metallic palladium and associated with said tobacco in said composition in amounts of from about 0.001 to about 0.10 percent by weight, calculated as palladium metal, of said tobacco.

4,177,823
COMBINATION KEY RING
Michael Glasser, 5444 Sepulveda #221, Van Nuys, Calif. 91401
Filed Oct. 6, 1977, Ser. No. 839,827
Int. Cl.[2] A24F *9/02, 9/04*
U.S. Cl. 131—184 R **6 Claims**



1. In combination:
An elongated body being substantially hollow having a first end with an opening therein and a second end being substantially closed with a relatively smaller center opening therein, whereby the substantially closed end defining an inner ridge with said body near the second end thereof;
an elongated pin having a first end adapted to be disposed within the center opening in the second end of said body and a second end disposed from center opening outside of said body;
a substantially flat portion being coupled to the second end of said elongated pin and adapted to be disposed outside of the second end of said body;
an inner core member being adapted to be slidably inserted within the first end of said body and coupled to the first end of said elongated pin;
biasing means disposed between the inner ridge in said body and said core member for urging said core member and said elongated pin away from said body and for maintaining said flat portion on said pin against the second end of said body whereby pressure exerted against said core member forces said flat portion on said pin away from said body and defines a space therebetween;
an end clip having a relatively thin, flat member with a slot therein adapted to be placed between said flat portion and the first end of said body whereby said pin is fitted into said slot; and
an elongated flat member coupled to said thin, flat member at a right angle thereto, whereby said end clip can be removed when said core member is depressed into said body.

4,177,824
DEVICE FOR AUTOMATIC HAIR CURLING
Vittorio Gnaga, Via Boccaccio 4, Milan, Italy
Filed Dec. 7, 1977, Ser. No. 858,377
Claims priority, application Italy, Dec. 20, 1976, 30639 A/76
Int. Cl.[2] A45D *2/12*
U.S. Cl. 132—34 R **9 Claims**

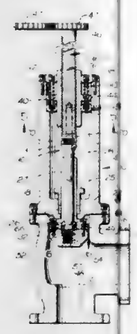


1. A device for automatically curling hair, said device comprising:
a dome-shaped housing having an inlet opening and a longitudinal axis;
a fixed rod immovably positioned coaxially within said housing;
heating means immovably positioned within said fixed rod;
a driving rod positioned within said housing at a position spaced radially outwardly from said fixed rod;
a spiral-shaped tape-like member positioned within said housing and eccentrically about said fixed rod, said spiral-shaped member having at least one end fixed to said driving rod; and
driving means, operatively connected to said driving rod, for moving said driving rod in a path coaxially about said fixed rod, and for thus rotating said spiral-shaped member eccentrically about said fixed rod, thereby creating a suction through said inlet opening, such that the combined action of said rotating spiral-shaped member and said suction operates to wind a lock of hair, introduced into said housing through said inlet opening, around said fixed rod.

4,177,825
SELF-GRINDING VALVE MECHANISM
Millard B. Crawford, Baton Rouge, La., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.
Filed Dec. 5, 1977, Ser. No. 857,644
Int. Cl.[2] B24B *15/02*
U.S. Cl. 137—243.2 **8 Claims**

1. In a self-grinding valve mechanism of the type described, the combination of a valve body provided with a valve seat, a valve disc adapted to contact said valve seat upon the closing of the valve mechanism said valve disc being operative during selective contact with the said valve seat to effect a grinding of said seat, means including a valve stem assembly for operating said valve disc to open and close the valve mechanism and to selectively grind said valve seat, means for rotating said valve stem assembly and displacing said valve stem assembly relative to said valve seat, means for floatingly coupling said valve stem assembly to said valve disc to effect a controlled rotation of the valve disc during the grinding of the valve seat including cooperating key and keyway means and means for activating said coupling means including means biasing said key means in the keyway means said biasing means being loaded upon the valve disc engaging said valve seat, whereby upon activation of said coupling means a simultaneous rotation of the valve stem assembly and disc will take place and a grinding of the

valve seat effected and wherein said valve stem assembly is segmented and the cooperating opposed portions thereof are provided with coupling lugs selectively spaced with respect to



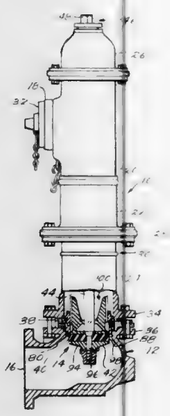
each other so as to provide a delayed coupling and linear displacement of the valve stem segments and relieving the force of said biasing means prior to rotation of the valve disc upon the initial rotation of one of said valve stem segments.

4,177,826

FIRE HYDRANT WITH IMPROVED SHOE AND VALVE

Lawrence F. Luckenbill, Decatur, Ill., assignor to Mueller Co., Decatur, Ill.

Filed Jan. 26, 1977, Ser. No. 762,511
Int. Cl.[2] E03B *9/08*
U.S. Cl. 137—307 **22 Claims**



1. A fire hydrant comprising:

a barrel closed at its upper end and open at its lower end, said barrel having at least one outlet nozzle adjacent its upper end;

an elbow shaped hydrant shoe having one end with an upwardly opening mouth, said one end being attached to the lower end of said barrel, and another end with an inlet opening lying in a plane substantially 90° to a plane of the upwardly opening mouth, said other end being arranged to be attached to a water main;

a downwardly facing valve seat ring positioned in the one end of said shoe adjacent the upwardly opening mouth;

a valve element arranged to seat on said valve seat ring;

a reciprocating valve stem extending from said valve element upwardly within said barrel; and

operating means connected to said valve stem and extending out of the closed end of said barrel,

the improvement in interior configuration of said shoe and in exterior configuration of said valve element for minimizing flow loss of the hydrant between the inlet opening of said shoe and the outlet nozzle of said barrel, said improvement comprising said shoe having a cylindrical inlet passage extending from said inlet opening and a cylindrical outlet passage extending from said upwardly opening mouth, a part spherical chamber communicating with said cylindrical inlet passage and said cylindrical outlet passage, said part spherical chamber having a spherical center positioned above the axis of said cylindrical inlet passage and on the axis of said cylindrical outlet passage, a diverging transitional surface of rotation having a generally part frusto-conical shape with an axis generally parallel to the axis of said cylindrical inlet passage and said diverging transitional surface of rotation extending from a plane perpendicular to the cylindrical inlet passage and smoothly merging with said part spherical chamber at a tangential intersection with the same, a converging transitional surface of rotation having a generally part frusto-conical shape with an axis generally parallel to the axis of said cylindrical outlet passage, said converging transitional surface of rotation extending smoothly from a tangential intersection with said part spherical chamber to a plane extending perpendicularly to an axis of said cylindrical outlet passage, said converging transitional surface merging smoothly with said diverging transitional surface, and said valve element having on its upper surface thereof a generally conically shaped converging surface of rotation extending from substantially a maximum diameter of said valve element substantially to said valve stem, said generally converging surface of rotation of said valve element defining with said converging transitional surface of rotation and a portion of said diverging surface of rotation of said shoe when said valve element is open an annular passage for uniform flow fluid through said shoe and into said barrel, said annular passage varying in radial section from a diverging radial section at a midpoint of said converging transitional surface of rotation of said shoe to a converging radial section at a midpoint of said diverging transitional surface of rotation of said shoe.

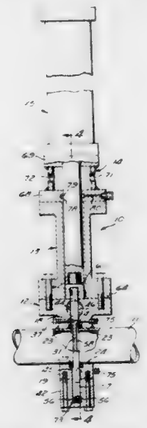
4,177,827

PIPE PLUGGING DEVICE

Joseph B. Smith, Berea; Edward B. Smith, Cleveland Heights; Gregory D. Schroeder, and William B. Smith, both of Berea, all of Ohio, assignors to The Pipe Line Development Co., Cleveland, Ohio

Filed Oct. 5, 1977, Ser. No. 839,608
Int. Cl.[2] F16K *43/00*
U.S. Cl. 137—318 **18 Claims**

1. Apparatus for controlling flow through a pipeline or other conduit carrying fluid, comprising a fluidtight housing adapted to be secured around the exterior of a pipeline in a location intermediate its ends, said housing including walls defining a cavity around said pipeline, a shear adapted to operate in said cavity, a shear driving means supported on said housing and connected to said shear for driving said shear transversely through the pipeline, and shear actuator means for moving a shearing surface associated with said shear formed by a face of said shear transverse to an axis parallel to the pipeline axially into engagement with a sealing surface formed in the interior of the housing opposite said actuator means, said sealing surface encircling the interior of the pipeline concentric with and transverse to the pipeline whereby said shear is effective to terminate flow though the pipeline, said housing walls including a wall generally transverse to said pipeline and opposing said encircling sealing surface, said actuator means being carried on said transverse wall of said housing, said actuator means being operable independently of the operation of said shear driving actuator.

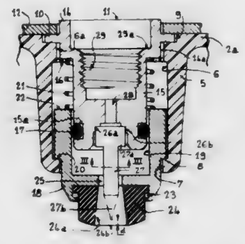


4,177,828

TAPPING OF GAS FROM A CARTRIDGE

Marcel Vache, Sainte-Foy-Les-Lyon, France, assignor to Application des Gaz, Paris, France

Filed Mar. 6, 1978, Ser. No. 883,962
Claims priority, application France, Mar. 8, 1978, 78 07739
Int. Cl.[2] F16K *43/00*; B67B *7/24*
U.S. Cl. 137—318 **11 Claims**



1. A tapping device for use in a gas appliance for tapping gas from a puncturable and disposable gas cartridge, comprising:

a body having an axially elongated outer surface, having an appliance receiving socket at one end and having an axial channel extending from the socket through the body;

a perforating needle fixed to the body in alignment with the axial channel and extending beyond the other end of the body and operative to puncture a cartridge when the body is moved axially to drive the needle thereinto;

a ring surrounding the body with a functional clearance enabling axial sliding of said ring over and outside said body;

spring means operative between the ring and the body to resiliently urge the ring toward said other end of the body; and

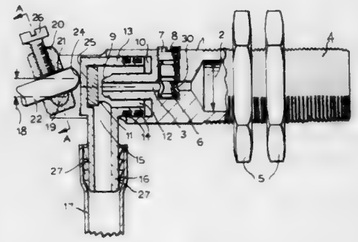
annular sealing means carried by the ring, the sealing means surrounding the perforating needle and being normally urged by the spring means beyond the needle, the sealing means being operative to seal against the cartridge under the pressure of the spring means when the perforating needle is driven into the cartridge.

4,177,829

FLOAT CONTROLLED VALVES

David Friedman, 91 Frere Rd., Judith's Paarl, Johannesburg 2001, South Africa

Filed Apr. 13, 1977, Ser. No. 787,297
Claims priority, application South Africa, May 10, 1976, 76/2758; Jun. 7, 1976, 76/3361; Aug. 10, 1976, 76/4784; Nov. 25, 1976, 76/7064; Feb. 23, 1977, 77/1067
Int. Cl. F16k *31/26*
U.S. Cl. 137—426 **3 Claims**



1. A float controlled valve including a float, a first body having a passage passing through it, means at the outlet end of the passage defining a valve seat, a cooperating second body having a loose closure element, the first body and second body being telescopically engageable with and movable relative to each other whilst being in sealing contact to define a chamber including the valve seat and the closure member, an outlet from said chamber being provided in the second body, and means for moving the second body and closure element telescopically relative to the first body and valve seat to cause closing of the valve, the means for moving the second body comprising a pivotal mounting fixed to the first body and adapted to mount the float, said closure element being free to move onto the valve seat in the event there is a reverse pressure gradient between said outlet and said passage, the pivotal mounting comprising a pivotally mounted member which is perforated by at least three mutually orthogonally oriented and intersecting holes, a pivot pin disposed in a first one of the holes, a float arm associated with the float and disposed in a second one of the holes and a threaded member disposed in the third one of the holes, the pivot pin having a recessed area with which the float arm is in contact, the threaded member acting to lock the float arm in an axially adjusted position in the second hole and to lock the pivot pin in position in the first hole by reason of contact of the float arm with the pivot pin, the second hole being eccentric with respect to the first hole, the float arm projecting from the pivotally mounted member and located for engagement with the second body to urge it toward a closed condition as the pivotally mounted member is rotated by rising of the float.

4,177,830

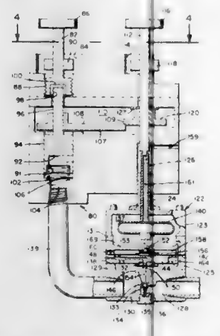
VALVE ASSEMBLY PERMITTING INDEPENDENT PEAK FLOW AND DECAY RATE CONTROL OF PERIODIC GAS FLOWS

Ramon J. Munson, Rialto, Calif., assignor to Bourns, Inc., Riverside, Calif.

Filed Dec. 21, 1976, Ser. No. 752,945
Int. Cl.[2] F16K *31/12*; A62B *7/00*
U.S. Cl. 137—501 **10 Claims**

1. Apparatus for controlling the peak flow rates and decay rates of periodic gas flows through a conduit, the peak flow rates being characterized by an initial minimum pressure followed by a progressively increasing pressure, comprising:

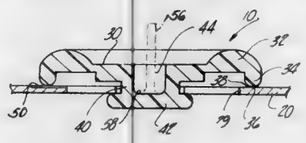
a housing for retaining elements of said apparatus;
an adjustable peak flow valve in said housing having an adjustable orifice for restricting the flow of gas through said conduit, said adjustable peak flow valve comprising
a cylindrical aperture in said housing for retaining the elements;
a hollow cylindrical member slideably situated within said aperture;
an axially extending shaft formed integrally with one end of said hollow cylindrical member;
an annular step forming an axial shelf at the other end of said hollow cylindrical member;
a first port formed in a side wall of said hollow, cylindrical member;
a second port, capable of alignment with said first port, formed in said housing;
means to adjust said hollow, cylindrical member axially and rotatably to vary alignment of said first and said second ports; adjustment of said alignment of said ports forming said adjustable orifice;—and—adjustment of said adjustable orifice controlling peak flow through said conduit



an adjustable decay rate valve in said housing having a regulator controlled by means of adjustments made to said adjustable decay rate valve, said regulator having means for receiving a supply of gas under pressure from an inlet port, said regulator means including means for sensing pressure at said peak flow valve, means for regulating said gas in response to the pressure at said peak flow valve adjustable orifice, and conduit means for supplying the regulated gas to said adjustable peak flow valve;
means responsive to the adjustment of said adjustable peak flow valve for effecting adjustment of said adjustable decay rate valve;
whereby said responsive adjustment means is responsive to adjustment of said adjustable decay rate valve for effecting the adjustment of said peak flow valve so as to automatically adjust the size of said orifice by an amount sufficient to substantially compensate for changes in the peak flow rate resulting from the adjustment of said adjustable decay rate valve.

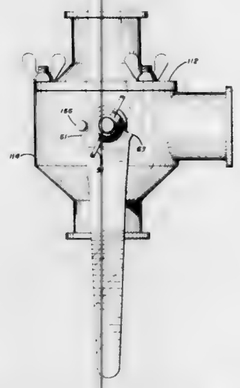
4,177,831
FLEXIBLE TIME DELAY VALVE
Benjamin C. Benjamin, Flint, Mich., assignor to Schmelzer Corporation, Durand, Mich.
Filed Aug. 25, 1977, Ser. No. 827,456
Int. Cl.[2] F16K *15/14*
U.S. Cl. 137—513.5 **2 Claims**

1. A time delay valve for controlling fluid communication through an opening in a wall and allowing communication from one side of said wall to the other but restricting flow in the opposite direction, the combination comprising; a body of resilient material having a disc shaped head adapted to be disposed at one side of said wall, said opening have a central portion and diametrically opposed elongated portions extending radially from said central portion, said head being larger in diameter than said opening and disposed in engagement with said wall to close said opening, a central stem protruding through said central portion of said opening and permitting fluid passage through said elongated portions of said opening, a disc shaped stop portion forming part of said stem and having a continuous annular portion larger than said central portion of said opening and requiring deflection upon insertion of said valve in said opening, said stem having an axially extending recess closed at one end by said stop portion, said valve being insertable in said opening upon the application of force in said recess and on said stem to push said valve through said opening



from one side of said wall, said recess and said elongated portions accommodating displaced material of said valve during its insertion in said wall, said head having an annular bead formed at the circumferential edge of said head to form a sealing surface, said sealing surface having a semi-circular cross section forming a relatively narrow sealing surface and being engageable with a complementary flat sealing surface on said wall, a metering groove in said wall extending radially from said opening beyond said bead, said head being flexible and movable out of engagement with said wall surface to permit fluid flow in one direction through said opening and being engageable with said wall to limit fluid flow through said metering groove and said opening in the opposite direction.

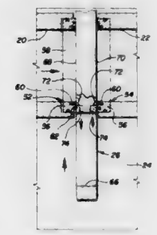
4,177,832
INLINE BALL VALVE
Lewis H. Price, State College, Pa., assignor to Lee Industries, Inc., Philipsburg, Pa.
Filed Jul. 11, 1977, Ser. No. 814,681
Int. Cl.[2] F16K *5/06*
U.S. Cl. 137—625.47 **7 Claims**



1. A three way ball valve comprising:
a valve body having a pair of axially aligned ports and a third port extending perpendicular to the pair of axially aligned ports;

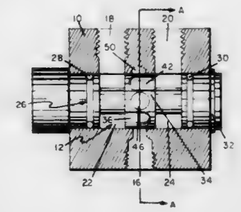
a ball, with a passage having three openings formed therein, positionable with respect to the valve body so that the three openings are aligned with the three ports;
a cage formed of a plastic material, confined in the valve body around the ball with openings aligned with the ports in the valve body and being in high pressure contact with the ball in an area proximate to the pair of axially aligned ports;
an operating stem for the ball extending radially therefrom through a radial opening in the cage and through a corresponding radial opening in the valve body;
a handle connected to said operating stem exteriorally of said valve body for rotating said operating stem to position said ball, said handle having a pair of spaced projections with oppositely arranged engaging surfaces; and,
stop means comprising at least one upstanding element, disposed on the exterior of said valve body for contacting said engaging surfaces of said projections on said handle to limit rotation of said handle;
said handle being formed so that when said stop means is positioned between the closest adjacent engaging surfaces of said projections, rotation is limited to 90°, and when said stop means is positioned between the other of said engaging surfaces of said projections, rotation is limited to 180°.

4,177,833
VALVES HAVING A PRESSURE EQUALIZER ACROSS DUAL FACE SEALS
Bertram L. Morrison, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.
Filed Jul. 14, 1978, Ser. No. 924,775
Int. Cl.[2] F16K *11/07*
U.S. Cl. 137—625.12 **10 Claims**



1. A valve structure comprising:
a valve body having a flow passage therethrough and a valve chamber therein intersecting the flow passage, a valve member mounted within the valve body for movement between open and closed positions and having a main bore therethrough adapted to align with the flow passage in the open position;
an annular upstream seat assembly on one side of the valve member about the inlet to the valve chamber and an annular downstream seat assembly on the other side of the valve member about the outlet from the valve chamber, said seat assemblies each having a pair of spaced concentric face seals adapted to engage against the exterior sealing surfaces of the valve member;
said valve member having at least a pair of cooperating auxiliary pressure relieving passageways adjacent opposite ends of the bore extending from the bore through the valve member to the exterior sealing surface thereof adjacent the leading side of the valve member as the valve member is moved from closed position to open position, one of the auxiliary passageways being an upstream auxiliary passageway positioned adjacent the upstream seat assembly and the other auxiliary passageway being a downstream auxiliary passageway positioned adjacent the downstream seat assembly in the closed position of the valve member;
said valve member during initial movement from closed position to open position temporarily positioning the auxiliary passageways between the concentric face seals of the respective associated adjacent seat assemblies permitting fluid to pass from the inlet by leaking past the inner face seal of said upstream seat assembly through the upstream auxiliary passageway into the bore, and then passing from the bore into the downstream auxiliary passageway and leaking past the inner face seal of said downstream seat assembly into the outlet;
said auxiliary passageways and said face seals being effective to reduce the overall pressure differential between the upstream and downstream seat assemblies when said valve member is initially moved from the closed position.

4,177,834
ROTARY FOUR WAY TANDEM CENTER VALVE
Roland W. Bonney, R.F.D. 1, Box 65, Kennebunkport, Me. 04046
Filed Feb. 5, 1979, Ser. No. 9,485
Int. Cl.[2] F16K *11/07*
U.S. Cl. 137—625.23 **3 Claims**



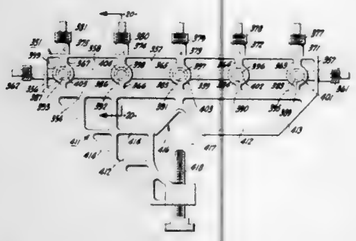
1. A rotary four way tandem center valve comprising:
a valve housing;
a cylindrical bore defined in said valve housing;
an inlet port defined in said valve housing communicating into said cylindrical bore adapted to allow the entrance of hydraulic fluid into said cylindrical bore;
an outlet port defined in said valve housing communicating into said cylindrical bore adapted to allow the escape of hydraulic fluid from said cylindrical bore;
a first and second operation port defined in said valve housing, each communicating into said cylindrical bore;
a spool member rotatably positioned within said cylindrical bore;
a spool projection member extending around and projecting from said spool member, adapted so that its outer periphery contacts said valve housing within said cylindrical bore;
a first and second pressure chamber defined within said cylindrical bore, one on each side of said central spool projection member into which said first and second operation ports communicate respectively;
a first and second axial groove defined opposite one another on the periphery of said central spool projection member, each extending toward and communicating with said first pressure chamber;
a third and fourth axial groove defined on the periphery of said central spool projection member, each positioned opposite one another, each extending toward and communicating with said second pressure chamber, said first, second, third, and fourth grooves adapted such that when said first groove is aligned with said inlet port, said third groove is aligned with said outlet port and when said second groove is aligned with said outlet port, said third groove is aligned with said inlet port; and
a first and second channel intersecting one another defined

within said central spool projection member, adapted such that when said first channel is rotated to be in communication with said inlet port, said second channel is in communication with said outlet port.

4,177,835
PLASTIC MANIFOLD ASSEMBLY

Hyman W. Paley, 20 Broadmoor Dr., San Francisco, Calif. 94132

Continuation of Ser. No. 579,906, May 22, 1975, abandoned, and a continuation-in-part of Ser. No. 538,936, Jan. 6, 1975, abandoned. This application Sep. 29, 1976, Ser. No. 727,791
Int. Cl.[2] E03B *7/07*
U.S. Cl. 137—883 **10 Claims**

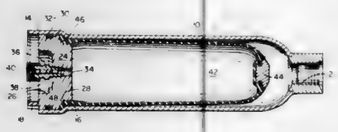


1. In a manifold assembly: a generally rectangular body fabricated of molded plastic including a generally planar top wall, end and side walls extending from the top wall, a longitudinal rib adjoining the top wall and extending between the end walls in a direction generally parallel to the side walls, a plurality of lateral ribs extending between the side walls, axially extending flow passageways formed in ribs, the passageway in the longitudinal rib intersecting the passageways in the lateral ribs, valve bores formed in the body at the intersections of the passageways extending in a direction normal to the passageways, and valve members rotatively mounted in the bores having passageways adapted for selective alighment with the intersecting passageways for controlling communication between the same.

4,177,836
DISPOSABLE PRESSURE VESSEL

James E. Thompson, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 23, 1978, Ser. No. 953,692
Int. Cl.[2] F16L *55/04*
U.S. Cl. 138—30 **4 Claims**

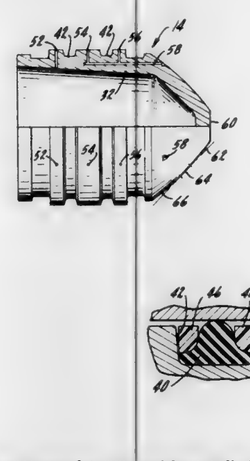


1. A pressure vessel comprising: a cylindrical cap member having an axially extending through hole provided therein, said cylindrical cap member having an exteriorly disposed annular shoulder provided therein around the periphery thereof; a normally closed gas valve disposed in blocking position in said through hole operable to allow bidirectional flow of gas through said through hole; a generally cylindrical bladder of a resilient deformable material having a closed end and an open end, said open end having an annular flared portion bonded to said exteriorly disposed annular shoulder of said cylindrical cap member which blocks said open end of said generally cylindrical bladder; and a rigidly cylindrical housing having a closed end and an open end, said closed end having a port provided therein and said open end having an interiorly disposed annular shoulder portion provided therein around the periphery thereof, said housing sized to contain said generally cylindrical bladder and said cylindrical cap member therein with said annular flared portion of said generally cylindrical bladder abutting said interiorly disposed annular shoulder portion of said cylindrical housing and with said cylindrical cap member blocking said open end to enclose said generally cylindrical bladder in said cylindrical housing, said interiorly disposed annular shoulder portion of said cylindrical housing including at least one interiorly offset lanced portion positioned to hold said cylindrical cap member in juxtaposition compressing said flared portion of said generally cylindrical bladder between said interiorly disposed annular shoulder of said cylindrical housing and said exteriorly disposed annular shoulder of said cylindrical cap member.

4,177,837
ACCUMULATOR

Earl E. Frank, Tallman, N.Y., and Bing S. Yee, Paramus, N.J., assignors to Abex Corporation, New York, N.Y.

Filed May 19, 1977, Ser. No. 798,319
Int. Cl.[2] F16L *55/04*
U.S. Cl. 138—31 **3 Claims**

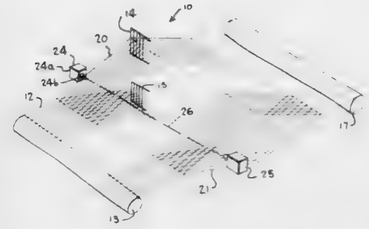


1. In an accumulator comprising a cylinder having a delivery port at one end for delivering hydraulic fluid under pressure and having an opening at the opposite end enabling a pressurizing gas to be admitted to the cylinder, a piston having a cylindrical side wall complementally fitting the inside diameter of the cylinder and having an end wall, facing the delivery port, comprising two spherical zones having substantially the same radius separated by a chordal surface having no radius surface, and the cylinder having a concave end wall, at the delivery end of the cylinder, with a slope substantially complemental to said chordal surface and constituting complemental stop for said surface of the piston, said spherical zones serving to sweep dirt past said concave end wall and out the delivery port.

4,177,838
STOP MOTION SYSTEM FOR HIGH SPEED LOOMS AND THE LIKE

Marlin Van Wilson, Barboursville, Va.; Larry C. Nickell, Lewisburg, and John L. McCormack, Fairlea, both of W. Va., assignors to Appalachian Electronic Instruments, Inc., Ronceverte, W. Va.

Filed Apr. 6, 1978, Ser. No. 893,931
Int. Cl.[2] D03D *51/28;* **G01N** *21/28*
U.S. Cl. 139—353 **22 Claims**



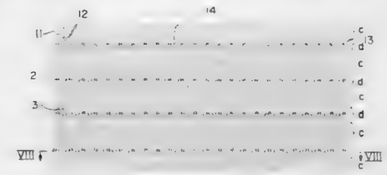
1. Automatic loom stopping apparatus to be associated with a loom wherein warp yarns are shedded periodically to open shed condition during weaving for detecting yarn defects arising from warp yarn breakage or improper shedding and actuate loom stop motion means of the loom upon occurrence of such yarn defects, comprising monitor light beam forming means including light beam emitter and detector means positioned adjacent the warp yarn path from the supply end to the weaving zone of the loom to direct the monitor light beam through the open shed along a substantially horizontal transverse light path generally perpendicular to the warp yarns, the detector means providing a detector defect signal when any portion of a warp yarn or broken end interrupts the monitor light beam, signal processing means including amplifier means for producing a processed defect signal responsive to said detector defect signal, timing pulse forming means including rotation sensing means monitoring rotation of a drive shaft of the loom for producing timing pulses indicating a predetermined phase time in the cycle of operation of the loom, a gate control pulse generator for producing short duration window pulses responsive to said timing pulses to indicate times when the shed is in predetermined open condition, a first gate circuit receiving said processed defect signals and said window pulses for producing a first gated defect signal when said yarn defects occur during the open shed periods signified by the window pulses, start-up delay signal means responsive to said timing pulses for producing a gate enable signal commencing at a delay time following loom start-up when the timing pulses occur at a predetermined frequency, a second gate circuit responsive to concurrence of said gate enable signals and said first gated defect signals to produce output stop signals, and stop relay means activated by said output stop signals to stop the loom.

4,177,839
WEBBING FOR SEAT BELT

Kouichi Kikuchi, Haibara, Japan, assignor to NSK-Warner K.K. and Kikuchi Kogyo K. K., both of Tokyo, Japan

Division of Ser. No. 781,433, Mar. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 652,771, Jan. 27, 1976, abandoned. This application Jun. 21, 1978, Ser. No. 917,587
Int. Cl.[2] D03D *15/00*
U.S. Cl. 139—419 **1 Claim**

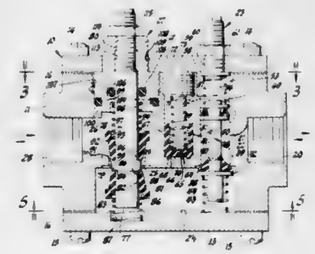
1. An energy-absorbing webbing for seat belts comprising wefts of high extensibility, first warps of high extensibility, second warps which are thin as compared with the first warps and have low extensibility, the second warps being interwoven in the webbing in widthwise spaced relationship, and third warps selected from threads of low and medium extensibility and interwoven in the webbing, the third warps being undulated in the widthwise direction of the webbing to form with the second warps a Leno weave construction.



4,177,840
PRESSURE REGULATION AND FLOW CONTROL VALVE WITH COMBINATION NEEDLE AND CHECK VALVES

James A. Neff, Bloomfield Township, Oakland County, and Richard A. Fagerlie, Union Lake, both of Mich., assignors to MAC Valves, Inc., Wixom, Mich.

Filed Dec. 29, 1977, Ser. No. 865,390
Int. Cl.[2] F15B *11/04, 13/042*
U.S. Cl. 137—599 **15 Claims**



1. In a combination pressure regulating and flow control air valve for controlling fluid flow through a fluid flow circuit which includes a fluid controlled apparatus, the combination comprising:

(a) a valve body and cover means having an upstream pressurized fluid supply port for connection to a source of pressurized fluid, and a downstream working port for connection to the fluid controlled apparatus in said fluid flow circuit, and a fluid flow passage interconnecting said ports;

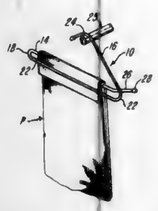
(b) an adjustable pressure regulator valve means operatively mounted in said fluid flow passage to provide a regulated downstream pressure at the downstream working port when fluid is flowing from the source of pressurized fluid into the upstream port and to the downstream port;

(c) a check valve means operatively mounted in said fluid flow passage in parallel with the pressure regulator valve means and operative to force the flow of fluid through said pressure regulator valve means when fluid is flowing through said fluid flow passage from said upstream port to said downstream port, and allow flow past said pressure regulator valve means and reduce pressure in said fluid flow passage to allow the pressure regulator valve to open when fluid is exhausted from said downstream port and through said fluid flow passage and out the upstream pressure port; and,

(d) an adjustable, double acting, fluid flow control valve means operatively mounted in said fluid flow passage downstream from said adjustable pressure regulator valve

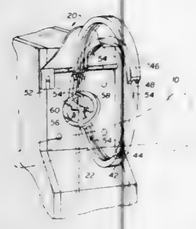
means, and in series with said check valve means to provide a selective metering action to the flow of fluid through said fluid flow passage from either port to the other port.

4,177,841
HANGER FOR SUPPORTING PANTS AND THE LIKE AND METHOD OF PRODUCTION
Alan F. Meckstroth, 2357 Shelterwood Dr., Dayton, Ohio 45409
Continuation of Ser. No. 829,231, Aug. 31, 1977, Pat. No. 4,120,433. This application Oct. 11, 1978, Ser. No. 950,370
Int. Cl.[2] B21F *45/02*
U.S. Cl. 140—81.5 **6 Claims**



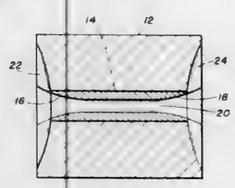
1. A method of producing a hanger for supporting pants from a clothes rod, comprising the steps of forming a generally horizontal elongated first support member, forming a generally horizontal elongated second support member integrally connected to the first support member and disposed thereabove in generally parallel spaced relation, forming a third support member integrally connected to the first support member and projecting above the second support member, providing the third support member with means for releasably connecting the third support member to a clothes rod with the first and second support members depending from the third support member, supporting the second support member in a cantilever manner between the first and third support members and with a free end portion, positioning the free end portion for guiding the free end portion and the second support member on one side of inverted vertical pants and the first and third support members on the other side of the pants when said hanger is inverted and slid laterally onto the pants, and maintaining the vertical spacing between the first and second support members sufficiently to avoid clamping the pants therebetween when the inverted hanger is slid laterally onto the pants to facilitate convenient and quick attachment of the hanger to the pants.

4,177,842
TYING MACHINE
Gerald G. Dilley, Portland, Oreg., assignor to Peters Equipment Corporation, College Point, N.Y.
Filed Jan. 25, 1978, Ser. No. 872,013
Int. Cl.[2] B21F *7/00, 15/04*
U.S. Cl. 140—93.6 **4 Claims**



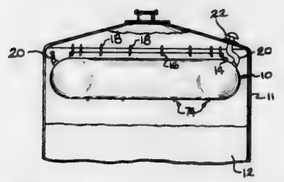
1. An improved pair of wire-engaging clamps for a wire twisting machine of the type wherein a wire length is urged through movement into encircling relation about a product and the opposite ends of said wire length are then clamped and said clamped wire ends then rotated so as to produce twists in the portions of said wire lengths adjacent said ends for tying said wire lengths about said product, said pair of clamps comprising a cylindrical body journalled for rotation and having a wire-clamping station formed on one end thereof, a pair of circumferentially spaced wire-holding surfaces operatively arranged on said body in clearance positions of a prescribed initial distance from said cylindrical body wire-clamping end so as to allow the positioning in said clearances of said wire length ends preparatory to the clamping thereof against said wire-holding surfaces, a pair of clamping rods respectively disposed in cooperating clamping relation to said wire-holding surfaces each operatively arranged for axial movement in said body through a clamping stroke of a selected distance beyond that of said prescribed initial distance required in said movement of each said clamping rod from a starting clearance position into pressing engagement against one of said wire length ends, and two pressure air cylinders and cooperating piston rods disposed therein operationally connected to actuate each said clamping rod through said clamping stroke for said prescribed distance and whatever portion of said selected distance therebeyond that is necessary for establishing said pressing engagement of each of said clamp against said wire length end, said pressure air cylinders being operationally arranged in pushing contact against the end of said clamping rods remote from said opposite ends thereof having said pressing engagement against said wire length ends and exerting a bias provided by said pressure air effective to cause unimpeded movement of said rods from starting clearance positions thereof to terminating positions as determined by the contact of said rods against said cooperating wire length ends, whereby each said rod moves through said clamping stroke, which is adjustably enlarged, in response to said pressure air until firmly against said wire length end positioned in front of said wire-holding surface despite increases in the distance actually required to be traversed during succeeding clamping strokes.

4,177,843
WIRE STRAIGHTENER DIE
Douglas R. Sarver, 810 Karen Dr., Kingsville, Md. 21087
Filed May 8, 1978, Ser. No. 903,713
Int. Cl.[2] B21F *1/02*
U.S. Cl. 140—147 **7 Claims**



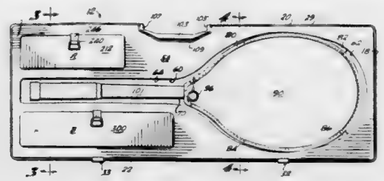
1. A wire straightener die consisting of a single structure and comprised of:
a metal body; and
a hardened core therethrough, said core being centrally located in said metal body, said core having a passageway therethrough, said passageway having a central straight portion with each end thereof continuing into an ever widening bell-shaped flare to the respective end of said hardened core, said hardened core being of a lesser length than said metal body, said metal body beyond the respective ends of said hardened core being flared to communicate said passageway with the exterior of said metal body.

4,177,844
SILO BREATHER BAG
Ralph L. Kuss, and Jerry J. Hickle, both of Findlay, Ohio, assignors to Kuss Corporation, Findlay, Ohio
Filed Sep. 25, 1978, Ser. No. 945,226
Int. Cl.[2] A45C *9/00*; B65B *3/00*; B65D *25/02*
U.S. Cl. 150—1 **11 Claims**



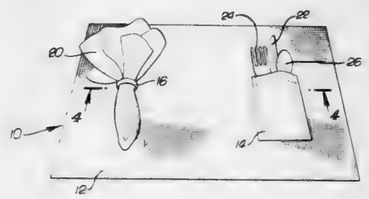
1. A bag adaptable for use in sealed structures to maintain pressure equilibrium comprising, in flat preassembly configuration, two generally semi-circular panels, both of said panels having a generally semi-circular edge with truncated end edges intersecting a notched chordal edge and said truncated end edges intersecting at an acute angle, a third panel having a generally hour-glass shape with two opposed generally arcuate edges, terminal portions of each of said arcuate edges defining one edge of an acute angle projection, the other edge of each of said acute angle projections intersecting one edge of an irregular flap at an acute angle, each of said irregular flaps defining one edge of an inwardly directed notch having edges of unequal length, whereby in assembled configuration, said semi-circular and truncated edges of one of said semi-circular panels are sealed to corresponding edges of said other of said semi-circular panels, said arcuate edges of said hour-glass-like panel are sealed to said chordal edges of said semi-circular panels and said projection, notch and flap edges are sealed to adjacent corresponding edges.

4,177,845
RACQUET DISPLAY CASE
Franklin S. Intengan, 66 W. 81st. St. Apt. W-122, Hialeah, Fla. 33014
Continuation-in-part of Ser. No. 851,143, Nov. 14, 1977, abandoned. This application Apr. 6, 1978, Ser. No. 894,036
Int. Cl.[2] A45C *11/00*
U.S. Cl. 150—52 G **15 Claims**



1. A racquet case for carrying, displaying and storing a racquet of a predetermined overall length, the racquet having a handle of a predetermined cross sectional area and a head end of a predetermined thickness and span, said case comprising:
a rigid frame defining a center opening, the rigid frame including an upper and lower run in spaced parallel relation and of a length substantially equal to but slightly greater than that of the overall length of the racquet, and said frame including a first and second end run in spaced parallel relation with respect to one another and extending between said upper and lower runs, and said upper and lower runs being spaced from one another a distance substantially equal to, but slightly greater than the span of the head end of the racquet, and
each of said runs having an outer and an inner surface and spaced side surfaces extending from the outer surface and said side surfaces of each run being equispaced from one another defining a medial main plane of symmetry of said frame,
means for holding the racquet in confining relation to the center opening extending from the frame to hold the racquet between the runs with the main plane of the racquet oriented generally coincident with the plane of symmetry, with the handle generally parallel to the upper and lower runs, and the head end adjacent the second end run, and
compartment means including access means for opening and closing said compartment means carried by the frame and extending along the racquet handle.

4,177,846
ROLL-UP PLACE MAT
Jean Rountree, 851 N. Michigan Ave., Pasadena, Calif. 91104
Filed Oct. 16, 1978, Ser. No. 951,639
Int. Cl.[2] A45F *5/04*
U.S. Cl. 150—52 C **4 Claims**



1. A roll-up place mat having means for holding a napkin in place and dining flatware in place, while rolled up, comprising:
a flexible rectangular top sheet member having an attached pocket member to receive dining flatware, and an attached ring member to receive a napkin, said top sheet member being superimposed on a lining sheet member of equal size, said sheet member and said lining member having their respecti e edges connected together and wherein the outer surface of said lining member has an attached tying member to tie and maintain said roll-up place mat in a rolled up position while containing a napkin in place and dining flatware in place.

4,177,847
SLIP-ON GUITAR COVER
Stanley G. Spindler, 1926 Farmbrook, Troy, Mich. 48098
Filed Feb. 5, 1979, Ser. No. 9,609
Int. Cl.[2] G10G *7/00*
U.S. Cl. 150—52 R **7 Claims**



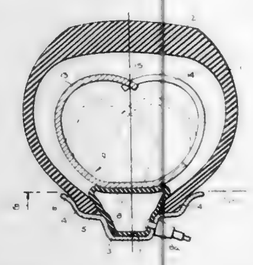
1. A slip-on cover for protecting the sound box of an electric guitar having a neck, a bridge portion and a plurality of control buttons, said cover comprising: a front sheet, a side sheet and a back sheet, each comprising a soft absorbant cloth material

and each of said front, side and back sheets being sewn together at adjacent perimeter edge portions; said front sheet having a generally U-shaped recess therein adapted to align with said bridge portion, said front sheet further having an elongated first slit extending from the closed end of said recess, and having fastening means for connecting opposing sides of said slit proximate to said recess, and wherein said front sheet has a plurality of second slits therein adapted to receive said control buttons, the longitudinal axis of said second slits being aligned at about a 30 degree angle from the longitudinal axis of said guitar cover.

4,177,848
RUN - FLAT TIRE

Sjirk Van der Burg, Embourg, Belgium, assignor to Uniroyal Aktiengesellschaft, Aachen, Fed. Rep. of Germany

Filed Sep. 9, 1977, Ser. No. 831,829
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1976, 2653658
Int. Cl.[2] B60C *17/04*
U.S. Cl. 152—158 **15 Claims**



10. In a pneumatic, tired wheel having a tubeless inflatable tire mounted on the rim of the wheel and having an inner tire surface, the improvement comprising a toroidal support device to enable the tired wheel to travel in a flat state, said support device comprising:

an inflatable, toroidal inner tube located in a well of the rim and having sidewall portions directly engageable with the tire beads to elastically clamp the tire beads against the rim flanges, said tube radially extending outwardly from the well of the rim to or slightly beyond the radially outer edges of the rim flanges, the radially outward portion of said tube having a radially external outer circumferential area, said tube being inflatable independently of the tire; and

a separate noninflatable toroidal support element having sidewall portions that are discontinuous with corresponding sidewall portions of said inner tube, said support element being mounted on the radially extending outer circumferential area of said inner tube and being normally free from contact with said tire beads when the tire is in an inflated state, said support element having a radially internal circumferential wall section impervious to puncture, lying adjacent the radially external circumferential area of the inner tube and having an outer surface area spaced from the inner surface area of the tire when the tire is in its inflated state so that under normal travel conditions the support element does not contact the inner surface area of the tire,

and wherein the radially internal, circumferential wall section of the toroidal support element consists of a material or is reinforced with a material that is not extensible in the circumferential direction,

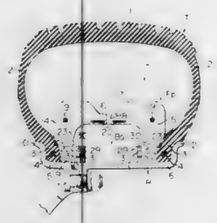
and the radially internal, circumferential wall section has sufficient axial width such that, upon a pressure drop in the tire, said wall section can completely cover and protect the radially external circumferential area of the inner tube,

and wherein the support element is circular in cross section.

4,177,849
SAFETY WHEEL

Isao Osada, Izumi, and Shoichi Sano, Tokorozawa, both of Japan, assignors to Ohtsu Tire & Rubber Co., Ltd., Izumiotsu and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jul. 6, 1978, Ser. No. 922,506
Claims priority, application Japan, Jul. 7, 1977, 52-81208; Jul. 7, 1977, 52-81210; Jul. 7, 1977, 52-81211
Int. Cl.[2] B60C *17/04*
U.S. Cl. 152—158 **12 Claims**

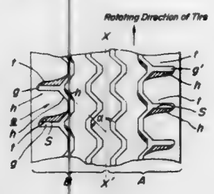


1. A safety wheel for vehicle use of the type including a split rim (R) comprised of at least two rim sections arranged axially adjacent to each other, a tubeless tire (T) mounted on said split rim, and a flat protector (Fp) arranged in the air chamber defined in said tubeless tire by said split rim for bearing engagement with the tread portion of said tubeless tire when the air sealed in the latter is lost, said flat protector being fitted around the inner periphery thereof to the rim base portion of said split rim and supported at the opposite sides by the respective bead portions of said tubeless tire, said safety wheel being characterized in that said flat protector takes the form of an annular elastic member of substantially H-shaped radial cross section having an annular recess (**17**) formed in the middle of the outer peripheral surface thereof, including a pair of spaced opposite annular side wall portions (**14**, **15**) and an annular bridging wall portion (**16**) which extends between those sections of said opposite side wall portions lying slightly radially inside of the outer peripheral surfaces thereof to integrally interconnect said opposite side wall portions.

4,177,850
LARGE-SIZED PNEUMATIC RADIAL TIRE

Hiroshi Ogawa, Kodaira; Shigeta Aoki, Higashi-Murayama, and Tatsuo Arai, Fuchu, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Aug. 18, 1977, Ser. No. 825,732
Claims priority, application Japan, Aug. 31, 1976, 51/103827
Int. Cl.[2] B60C *11/04, 11/06*
U.S. Cl. 152—209 R **8 Claims**



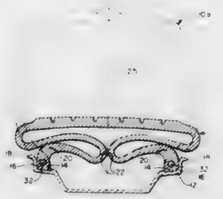
1. A large-sized pneumatic radial tire comprising a tread including grooves having alternately directed inclined portions

at an angle of 30°–90° with respect to the circumferential direction of the tire, a belt composed of a plurality of rubberized layers each containing steel cords, and a carcass of a substantially radial construction; said tread including two half regions divided with respect to a crown center, one of said regions being a region in a direction of plysteer which is produced due to the tire construction and to the ground contact reaction force acting on said steel cord of at least one rubberized layer disposed near said tread and which acts upon the tire, and the other region being a region opposite to the direction of plysteer; characterized by only providing reinforcements on the kicking-out sides of the walls of said inclined portions of said grooves in said region opposite to the direction of plysteer.

4,177,851
FOLDABLE SPARE TIRE

Michael L. Gill, Akron, and William M. Hopkins, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 666,852, Mar. 15, 1976, abandoned. This application Jan. 16, 1978, Ser. No. 869,883
Int. Cl.[2] B60C *5/00*
U.S. Cl. 152—353 R **4 Claims**

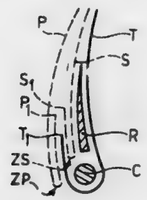


1. An inflatable tire having a tread, sidewalls, and beads, said tread having, when the tire is deflated, a diameter materially smaller than when it is inflated, said tire comprising an endless inextensible bead core in each of said beads, at least one ply of reinforcing cords extending to and between said bead cores, and means reducing the parasitic stress in each bead core comprising an annular ply positioning element disposed in concentric surrounding coplanar relation about each bead core and axially inward of the or each said ply in the respectively associated bead, the or each ply in the bead region being extended from the bead core outwardly of the mid-plane of the bead core, in the deflated state of the tire.

4,177,852
STRUCTURE OF PNEUMATIC TIRE COVERS

Claudio Merli, Cormano, and Carlo Francia, Monza, both of Italy, assignors to Euteco S.p.A., Milan, Italy

Filed Oct. 18, 1977, Ser. No. 843,106
Claims priority, application Italy, Oct. 19, 1976, 28523 A/76
Int. Cl.[2] B60C *9/02*
U.S. Cl. 152—354 R **2 Claims**



1. A pneumatic tire cover of the type comprising a peripheral reinforcement formed by two or more layers of plies whose threads are arranged in a predominantly longitudinal direction and a carcass formed by two reinforcements, each having a specific function wherein:

the inner structure is formed by at least one radial ply formed by threads (cords) of aromatic polyamide and said threads lie in radial planes, or they form small angles with said planes;

the outer structure is formed by at least two plies with threads (cords) of a material different from that of the inner structure, the said material having elongation values from 2 to 5 times greater than those of the aromatic polyamide for loads proportional to the breaking load, said threads being furthermore arranged in alternately crossed directions from one ply to another, so as to form angles from 7° to 35° with the radial planes and equivalent angles from 14° to 70° between successive plies;

the inner structure being furthermore able to bear on its own the inflation pressure, the outer structure being able to limit the lateral flexures of the tire by opposing the forces directed along the axis of rotation; and

wherein the ply or plies of the inner structure are anchored to the bead wire by a folded back edge flap or flaps and the plies of the outer structure are not anchored to said bead wire and are folded back upon themselves adjacent their free edges so as to form ribs, these ribs being at least in part, located in the space between the ply or plies of the inner structure and the folded back edge flap or flaps.

2. A pneumatic tire cover of the type comprising a peripheral reinforcement formed by two or more layers of plies whose threads are arranged in a predominantly longitudinal direction and a carcass formed by two reinforcements, each having a specific function wherein:

the inner structure is formed by at least one radial ply formed by threads (cords) of aromatic polyamide and said threads lie in radial planes, or they form small angles with said planes;

the outer structure is formed by at least two plies with threads (cords) of a material different from that of the inner structure, the said material having elongation values from 2 to 5 times greater than those of the aromatic polyamide for loads proporational to the breaking load, said threads being furthermore arranged in alternately crossed directions from one ply to another, so as to form angles from 7° to 35° with the radial planes and equivalent angles from 14° to 70° between successive plies;

the inner structure being furthermore able to bear on its own the inflation pressure, the outer structure being able to limit the lateral flexures of the tire by opposing the forces directed along the axis of rotation; and

wherein the ply or plies of the inner structure are anchored to the bead wire and the plies of the outer structure are not anchored to the bead wire and are folded back upon themselves adjacent their free edges so as to form ribs, these ribs being at least in part located outside the space between the ply or plies of the inner structure and the folded back edge flap or flaps.

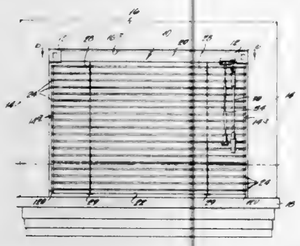
4,177,853
VENETIAN BLIND ASSEMBLY AND MOUNTING MEANS THEREFOR

Samuel J. Anderson, and James M. Anderson, both of Swarthmore, Pa., assignors to International Blind Company, Chester, Pa.

Filed May 19, 1977, Ser. No. 798,649
Int. Cl.[2] E06B *9/30*
U.S. Cl. 160—168 R **8 Claims**

1. A bracket for mounting the head rail of a venetian blind to a support surface of a window opening or the like comprising a generally box-like member having an open end to receive the outer terminal end of the head rail including a base panel confronting one end of the head rail and a front panel actuat-

able between an open position permitting insertion of said one end of the head rail and a closed position confining the said one end of the head rail, means mounting the said front panel for movement about multiple pivot points and means to latch said front panel in a closed position, said multiple pivot points



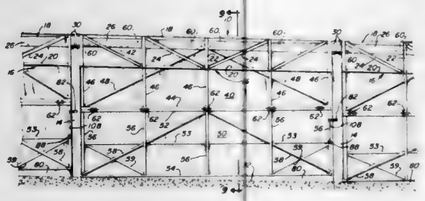
permitting pivotal and translatory movement of said front panel relative to said base, said translatory movement being the direction of securing said latch means and wherein the load on the front panel from said head rail acts in a direction perpendicular to said latching direction.

4,177,854

DOOR MOUNTING, OPENING AND LOCKING APPARATUS FOR BUILDINGS CONFORMING TO SLOPING TERRAIN

Wilfred H. DeVore, Box 75A Star Rt., Littleton, Colo. 80120

Filed Dec. 10, 1976, Ser. No. 749,469
Int. Cl.[2] E05D *15/26*
U.S. Cl. 160—207 **8 Claims**



1. Door apparatus adapted for use in a building that is constructed with a floor and an overhead structure, both of which slope from the horizontal, comprising:

two structural columns extending upwardly from said floor in parallel, spaced apart, relation to each other, said columns being oriented vertically but not perpendicular to the floor and defining a door space between them and each having on its upper extremity a flat bearing plate;

a header truss supported at each end over the door space by said columns above and substantially parallel to the sloping floor of a building and spanning the door space, said truss including an upper member and a lower member in parallel, spaced-apart relation to each other, both of said upper and lower members being oriented parallel to said floor and on a slope away from horizontal, a plurality of intermediate structural brace members attached between said upper and lower members, and bracket means at each end of said truss connected to and extending downwardly from said upper member of said truss and mounted on said bearing plate on the upper end of said column for supporting said truss over said column and adapted to conform to the angle between the upper member of said truss and said column when a load is applied thereto;

a flat elongated rectilinear face mounting plate rigidly attached to said truss on said intermediate brace members between and substantially parallel to said upper and lower members but not extended over the entire span of said truss, the width of said mounting plate being sufficiently large such that all points of a straight horizontal line lay on said plate; and

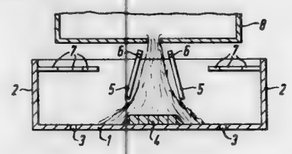
hanger means attached to said mounting plate along said straight, horizontal line and adapted for suspending a door in said door space.

4,177,855

TUNDISH AND METHOD OF POURING MOLTEN METAL THEREWITH

Jean L. Duchateau, Jouy-en-Josas, and Bernard E. Sautiere, Sedan, both of France, assignors to Foseco Trading A.G., Chur., Switzerland

Filed Mar. 28, 1978, Ser. No. 891,271
Claims priority, application United Kingdom, Mar. 28, 1977, 13002/77; Sep. 2, 1977, 36753/77
Int. Cl.[2] B22D *11/10*
U.S. Cl. 164—82 **26 Claims**



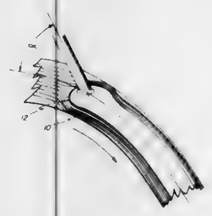
1. A method of pouring molten metal comprising providing an intermediate vessel with at least one nozzle disposed in pouring relationship to another vessel, positioning in the intermediate vessel pivotally mounted at an upper edge or in a wall portion thereof, two refractory heat-insulating slabs in spaced apart relation and extending downwardly into the intermediate vessel, pouring the molten metal from a ladle into the space between the slabs so that the slabs contain splash of the metal on initial pouring, and continuing pouring in such a manner that the slabs are raised by the molten metal to a generally horizontal position on top of the molten metal in the intermediate vessel.

4,177,856

CRITICAL GAS BOUNDARY LAYER REYNOLDS NUMBER FOR ENHANCED PROCESSING OF WIDE GLASSY ALLOY RIBBONS

Howard H. Liebermann, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 28, 1978, Ser. No. 937,113
The portion of the term of this patent subsequent to Mar. 20, 1996, has been disclaimed.
Int. Cl.[2] B22D *11/06, 11/16*
U.S. Cl. 164—87 **3 Claims**



1. A method for producing wide glassy alloy ribbons including the process steps of

(a) casting a melt of a glassy metal alloy onto a surface wheel having a wheel diameter D and at a predetermined impingement angle αtherewith;

(b) adjusting the substrate wheel speed S and the melt jet velocity to form a melt puddle of width w on the substrate wheel surface;

(c) adjusting the prevalent ambient atmospheric pressure to a predetermined value,

(d) producing a glassy alloy ribbon from the melt puddle, and

(e) maintaining the Reynolds number Re for the gas boundary layer flow about the melt puddle at less than a critical value Re^{crit} of about 2000±100 whereby the Reynolds number Re is expressed by the following formula

$$Re = K(1-\cos\alpha)DSwP[M/\eta]$$

wherein

Re=Reynolds number

K=constant which takes into consideration all conversion factors to obtain dimensional consistency

α=impingement angle between the melt jet and the tangent to the substrate surface at the impingement point

D=substrate wheel diameter

S=substrate wheel speed

w=ribbon or puddle width

P=ambient atmospheric pressure under which casting is conducted

M=molecular weight of ambient gas in which casting is conducted

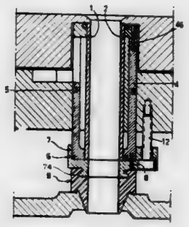
η=viscosity (20° C.) of ambient gas in which casting is conducted.

4,177,857

BLOW NOZZLE, NOTABLY FOR FOUNDRY CORES

Jacques Chamdru, Le Mesnil St. Denis, France, assignor to Regie Nationale des Usines Renault, Zola, France

Filed Sep. 6, 1977, Ser. No. 830,795
Claims priority, application France, Sep. 13, 1976, 76 27461
Int. Cl.[2] B22C *15/24*
U.S. Cl. 164—200 **7 Claims**



1. In a blow nozzle intended for foundry use according to the so-called hot-box process in the manufacture of sand molds and cores having a central replaceable barrel member which can be of different lengths and a surrounding sleeve means to provide cooling fluid in contact with said barrel member, the improvement wherein

said surrounding sleeve means comprises a female sleeve provided with diametrally opposite slots and a male sleeve in sliding relation to said female sleeve provided with diametrally opposite slots, and further comprising

index means to maintain the slots formed in said sleeves in mutual alignment, and

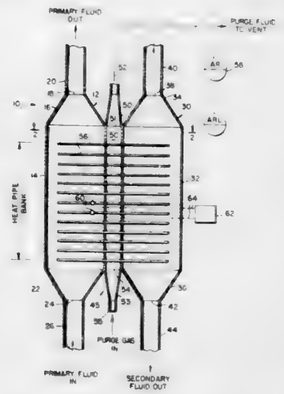
tip holder means to secure said sleeves to a hot-box filling tray, said tip holder means having a resiliently fitting plastic tip whereby the length of the nozzle can be adjusted by using barrels having different lengths.

4,177,858

HEAT EXCHANGER

Ernest L. Daman, Westfield, and Robert A. McCallister, Mountain Lakes, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Aug. 22, 1977, Ser. No. 826,602
Int. Cl.[2] F28D *15/00;* **F28F** *11/00*
U.S. Cl. 165—11 **8 Claims**



1. A heat exchanger comprising; a first fluid chamber for maintaining flow of a primary fluid; a second fluid chamber for maintaining flow of a secondary fluid, said second chamber spaced apart from said first chamber; a heat pipe including a cylindrical member closed at the ends thereof to contain a working fluid therein, said heat pipe extending in said first chamber and second chamber and having a portion between said chambers; a third fluid chamber for maintaining flow of a purged fluid, said portion of said heat pipe positioned within said third chamber, said chamber including side walls, a top closure, a bottom closure, inlet means for introducing said third fluid and outlet means for removing said third fluid; means for detecting leakage of said primary or said secondary fluid into said heat pipe and leakage of said working fluid from said heat pipe; and means for detecting primary or secondary fluid in said third chamber, whereby primary or secondary fluid leaking from said first and second chambers into said third chamber which is carried in said purged fluid is detected.

4,177,859

AIR CONDENSER

Maurizio Gatti, Sesto San Giovanni; Sergio Tavano, and Basilio Checcacci, both of San Donato Milanese, all of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Filed Apr. 6, 1978, Ser. No. 894,140
Claims priority, application Italy, Apr. 26, 1977, 22805 A/77
Int. Cl.[2] F28B *9/08*
U.S. Cl. 165—11 **5 Claims**

1. An air condenser comprising:

finned tube bundles positioned at a slope relative to the horizontal plane, wherein the tubes are arranged in rows and are divided into two zones,

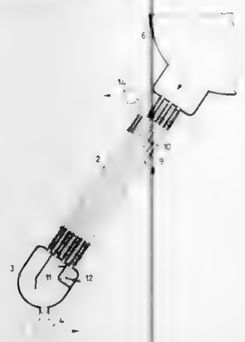
an inlet manifold connected to one end of the tubes in said first zone for feeding vapor thereinto,

a collection header connected to the tubes of both zones at the other ends thereof for collecting condensate from said tubes and for feeding residual vapors from said tubes of said first zone into each of the tubes of said second zone,

collection means connected to the one end of each tube of said second zone for collecting residual vapors from each of said tubes in said second zone,

said tubes of each of said zones being adapted to be swept by

cooling air such that the air first strikes the tubes of said first zone and then each of said tubes of said second zone, and wherein the outermost tube of said first zone is adapted to be initially struck by said cooling air so that vapor in said first tube of said first zone is almost completely condensed,



an inspection well within said collection header open to said header and said first tube of said first zone for receiving condensate therefrom prior to such condensate entering said collection header, and

a sensor extending into said inspection well for checking the temperature of the condensate therein to prevent the condensate from reaching freezing or solidifying temperatures.

4,177,860

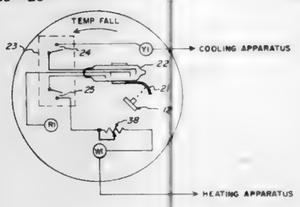
HEATING AND COOLING THERMOSTAT WITH CHANGEOVER SWITCHING OPERATED UPON CONTROL POINT ADJUSTMENT

Vern C. Johnson, Minneapolis; Virgil K. McCormick, Wayzata, and John M. Whitney, Bloomington, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 712,119, Aug. 5, 1976, abandoned. This application Feb. 15, 1978, Ser. No. 878,053

Int. Cl.[2] F25B *29/00;* **H01H** *37/52, 37/12*

U.S. Cl. 165—26 **14 Claims**



1. In a thermostat adapted for controlling heating and cooling apparatus to maintain a predetermined temperature in a space, comprising,

a base member,

space temperature responsive switch means attached to said base member,

first switch means on said base member adapted to connect said temperature responsive switch means to control the heating apparatus,

second switch means on said base member adapted to connect said temperature responsive switch to control the cooling apparatus,

single member temperature control point adjustment means mounted on said base member having a first and a second range of temperature adjustments,

first mechanical means connecting said single adjustment means to said temperature responsive switch to select a predetermined control temperature to be maintained in the space when said adjustment means is in either said first or said second range of temperature adjustments, and

further mechanical means connecting said single adjustment means to said first switch means whereby said space temperature responsive switch means is adapted to control the heating apparatus to maintain a predetermined space temperature of said first range when said single adjustment means is in said first range of temperature adjustments,

said further mechanical means connecting said single adjustment means to said second switch means whereby said space temperature responsive switch means is adapted to control the cooling apparatus to maintain a predetermined space temperature of said second range when said single adjustment means is in said second range of temperature adjustments.

4,177,861

RECUPERATOR STRUCTURE

Norman F. Costello; Homer D. Huggins, and Stephen S. T. Kao, all of Racine, Wis., assignors to Modine Manufacturing Company, Racine, Wis.

Filed Nov. 7, 1977, Ser. No. 848,813

Int. Cl.[2] F27D *13/00*

U.S. Cl. 165—101 **3 Claims**



1. Recuperator structure for recovering heat values from a hot gas stream comprising exhaust gases from a combustion burner, comprising: an exhaust gas conduit from said burner; a combustion air conduit to said burner; a heat exchanger having exhaust gas passages in heat transfer relationship with combustion air passages for transferring heat from the exhaust gas to said combustion air; temperature control means for selectively restricting the volumetric flow of at least one of said combustion air and said exhaust gases through the heat exchanger for controlling the temperature in said heat exchanger; means for arranging said heat exchanger exhaust gas passages and combustion air passages in a plurality of modules of the heat exchanger with all modules being positioned in separate passages each controlled by a separate flow control damper; and force yieldable heat insulation means separating each said module from adjacent modules for compensating for thermal dimensional changes and for sealing the gases in the adjacent modules from each other.

4,177,862

SPRINKLER ARRANGEMENTS

Geddes A. Bray, Manchester, England, assignor to Mather & Platt Limited, Manchester, England

Filed Mar. 29, 1978, Ser. No. 891,357

Claims priority, application United Kingdom, Jun. 15, 1977, 24904/77

Int. Cl.[2] A62C *35/00, 37/10*

U.S. Cl. 169—17 **6 Claims**

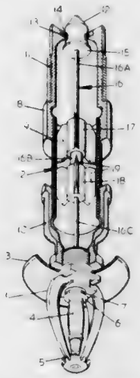
1. A sprinkler arrangement, comprising:

(a) a sprinkler head operable on attainment of a predetermined temperature;

(b) at least two interconnected pipe sections comprising a length of connection pipework to one end of which pipework the sprinkler head is attached and the other end of which defines a valve seat and is adapted for attachment to a main pipework system, and which pipe sections are relatively adjustable to vary the length of the connection pipework;

(c) an inert plug of resilient material which is located in the valve seat and which is substantially cylindrical in shape so that it can form a fluid-tight seal with the valve seat when located therein anywhere along its cylindrical length; and

(d) a strut in the form of a rod located along the length of the connection pipework between the inert plug and the



sprinkler head to maintain the plug in a sealing relationship with the valve seat anywhere along the cylindrical length of the latter whereby the sprinkler head is not overloaded by the force of the strut pressing thereon;

attainment of said predetermined temperature causing operation of the sprinkler head permitting movement of the strut and thereby movement of the inert plug out of the valve seat to allow a flow of extinguishant into and through the connection pipework to the sprinkler head when the arrangement is attached to the main pipework system.

4,177,863

SAFETY LIQUID DISPENSER

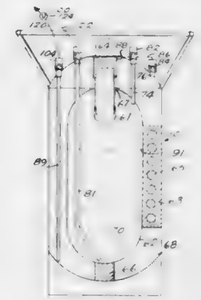
Sydney Simon, 936 Oranmore St., Pittsburgh, Pa. 15201

Continuation-in-part of Ser. No. 661,754, Feb. 26, 1976, Pat. No. 4,019,583, which is a continuation-in-part of Ser. No. 624,161, Oct. 20, 1975, Pat. No. 4,019,649, which is a continuation-in-part of Ser. No. 550,889, Feb. 19, 1975, Pat. No. 4,000,726. This application Mar. 24, 1977, Ser. No. 780,801

Int. Cl.[2] A62C *35/12*

U.S. Cl. 169—62 **16 Claims**

1. An inflammable fluid safety tank comprising a double walled tank body, a sleeve means secured to the outer wall structure and inner wall structure of said double walled tank body, said inner wall structure of said tank body forming an intermediate enclosed container, a plurality of support plate members connected to and spacing said outer wall structure from said inner wall structure, the outer wall structure of said double walled tank body being provided with a circular handle, said handle being supported above the tank body by a plurality of mounts, the diameter of said circular handle being greater than the outside diameter of the tank body, fluid transfer means mounted to said outer tank surface and communicating with an outer chamber defined by the inner surface of the tank body's outer wall and the outer wall of the intermediate enclosed container, a second fluid transfer means mounted to said tank body and communicating with said intermediate enclosed container, a pressurized gas container assembly including a pressurized gas container removably mounted to said sleeve means and positioned within said intermediate enclosed container, said gas container assembly comprising means for selectively connecting said gas container for communication with at least one of said fluid transfer means to discharge pressurized gas into said intermediate enclosed container and outer chamber, a first material contained in said intermediate



enclosed container and a second material contained in said outer chamber and discharge means mounted to said tank body adapted to selectively discharge pressurized material from either the intermediate enclosed container or the outer chamber.

4,177,864

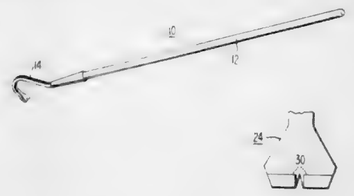
GARDEN CROOK

Edlo Donnini, 17 Wayne Ave., Jeannette, Pa. 15674

Continuation of Ser. No. 720,760, Sep. 7, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 849,328

Int. Cl.[2] A01B *1/08*

U.S. Cl. 172—371 **8 Claims**



1. A garden tool comprising an elongated handle defining a longitudinal axis; and a unitary steel member attached to one end of said elongated handle which comprises:

a longitudinally extending first straight portion for engaging one end of said elongated handle and defining a longitudinal axis coincident with said longitudinal axis of said handle;

a second straight portion extending from said first straight portion at an angle of approximately 40°;

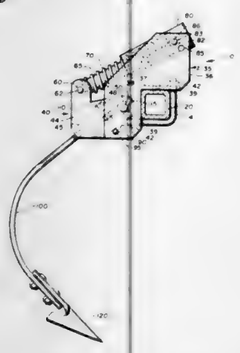
a partial circular portion, having a rectangular cross section, extending from said second straight portion, to a position past the axis defined by the longitudinally extending first straight portion;

a free end portion formed past the longitudinal axis defined by said first straight portion extending from said partial circular portion having a flat planar surface which terminates in a free end having a straight edge, said partial circular portion having a minimum outer curvature of a radius, from a point in line with the longitudinal axis of said elongated handle, greater than twice the width of the widest portion of said flat planar surface;

said flat planar surface merging continuously into a side of

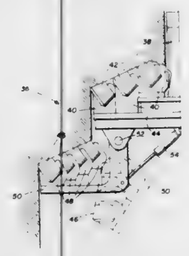
said partial circular portion and being disposed in a plane approximately perpendicular to the longitudinal axis of said elongated handle;
said flat planar surface having a width less than four times the width of the side of said partial circular portion into which it merges;
said unitary steel member being forged from a spring steel member having a rectangular cross-sectional area;
said flat planar surface tapering in width to said free end from said widest part and also tapering in width from said widest part to said partial circular portion; and
the width of said widest part of said flat planar surface being less than two inches.

4,177,865
CULTIVATOR TOOL SHANK ASSEMBLY
Howard L. Lewison, Hutchinson, Minn., assignor to Dynamics Corporation of America, Greenwich, Conn.
Filed Apr. 7, 1978, Ser. No. 894,361
Int. Cl.[2] A01B *35/24*
U.S. Cl. 172—705 **7 Claims**



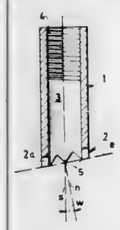
1. A cultivating shank assembly comprising, a tool shank adapted to have a cultivating tool mounted on one end of the same, a mounting frame for said assembly including a mounting portion and a tool shank support portion, said mounting portion of the mounting frame being formed of a pair of spaced plate members said mounting frame portion being adapted to be mounted on a transversely extending frame bar of a cultivator with the mounting frame portion extending forward and above the cultivating frame bar at one end and to the rear of the transversely extending frame bar at the other end, said tool shank portion having the tool shank mounted thereon, means included in the tool shank portion for pivotally mounting one end of the tool shank portion on the mounting portion of the mounting frame, a pressure rod pivotally attached to the other end of the tool shank portion, a compression bias spring positioned around the pressure rod with one end bearing against the tool shank portion, a cylindrical spring retainer encircling the spring at the other end, said spring retainer being pivotally mounted at the forward end of the mounting frame portion between the plate members, said pressure rod terminating within said cylindrical spring retainer said cylindrical spring retainer being comprised of a cylindrical member having a diametrical dimension such as to fit around the spring and the cylindrical member forming the pressure rod, and including a journal member positioned in one end of the cylindrical spring retainer against which the other end of the spring abuts with the journal member being retained in the plate members of the mounting frame portion by means of a pin positioned through a pair of apertures therein.

4,177,866
SYSTEM FOR BORING RAISES HAVING PORTIONS OF DIFFERENT DIAMETERS
Howard E. Mitchell, Duncanville, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed May 30, 1978, Ser. No. 910,725
Int. Cl.[2] E21C *23/00*
U.S. Cl. 175—53 **7 Claims**



1. A method of raise drilling by enlarging a pilot hole extending between an upper level of a mine and a lower level of a mine into a large diameter hole extending between said upper level and said lower level, comprising the steps of:
boring said pilot hole between said upper level and said lower level;
positioning a raise drilling machine at said upper level of a mine;
rotating and drawing a raise head along said pilot hole from said lower level to said upper level to enlarge the pilot hole to form said large diameter hole by disintegrating the formations surrounding the pilot hole, said raise head having a primary section for disintegrating the formations surrounding the pilot hole out to a first radial distance from the pilot hole and a secondary stage; and
expanding said raise head during the rotating and drawing step to position said secondary stage at a second and greater radial distance from the pilot hole.

4,177,867
SELF-DRILLING DOWEL WITH AN INCLINED ROLLING HEAD
Josef Entner, Frastanz, Austria, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein
Filed Dec. 29, 1977, Ser. No. 862,489
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658290
Int. Cl.[2] F16B *13/00*
U.S. Cl. 175—400 **1 Claim**



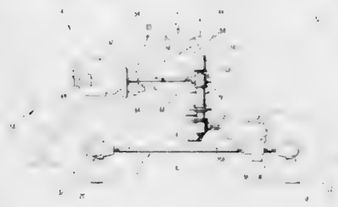
1. A self-drilling dowel for use in drilling a borehole in a hard receiving material such as concrete, rock and the like comprising an axially elongated tubular-shaped member, a drilling head at one end of said member, said drilling head having a plurality of cutting teeth with each of said teeth having a tip, said tubular-shaped member has an inner wall surface and an outer wall surface wherein the improvement comprises that the tips of said teeth extend from the inner wall surface to the outer wall surface of said tubular-shaped member, and the tips of each said teeth are located in a single plane and a line perpendicular to the plane and intersecting the axis of said tubular-shaped member forms an angle in the range of 4° to 9° with the axis.

4,177,868
WEIGHT-MEASURING AND DISPLAY DEVICE
Louis H. Sanders; Kenneth L. Watkins, and Galt S. Bowen, all of Albuquerque, N. Mex., assignors to Bio-Dynamics Inc., Indianapolis, Ind.
Filed Jan. 30, 1978, Ser. No. 873,530
Int. Cl.[2] G01G *3/14, 19/44*
U.S. Cl. 177—211 **27 Claims**



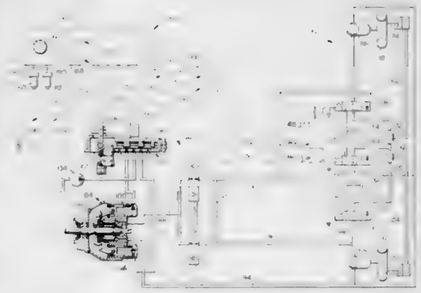
1. A rigid structure for supporting a load positioned thereon which comprises:
a top plate;
a bottom plate positioned beneath and spaced apart from said top plate;
a plurality of deflection beams arranged between said top and said bottom plates and supported by said bottom plate;
means for transmitting a force to each of said plurality of said deflection beams to produce deflection therein, said forces resulting from a load positioned on said top plate;
means for sensing a strain present within each of said plurality of deflection beams, said sensing means providing a measurable indication proportional to said load; and
each one of said plurality of deflection beams having a strain sensing area with a transverse cross-sectional area which decreases as a function of increased longitudinal distance from said force thereby producing a near constant strain throughout said strain sensing area in response to said force, said sensing means being positioned on said strain sensing areas.

4,177,869
SWIVEL JOINT FOR A VEHICLE
Wesley I. Crabiel, Galion, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Apr. 21, 1978, Ser. No. 898,679
Int. Cl.[2] B62D *27/00*
U.S. Cl. 180—6.58 **10 Claims**



1. In a vehicle of the type comprising a mobile carrier, a pedestal mounted thereon for rotation about a vertical axis, and a swivel joint connected between said pedestal and said carrier and through which energy is transmitted, the improvement wherein said swivel joint comprises:
a stationary sleeve mounted on said carrier along said vertical axis;
a rotary sleeve mounted coaxially around the exterior of said stationary sleeve;
said stationary sleeve including a fluid passage extending parallel to said axis for transmitting pressurized fluid;
said rotary sleeve including a fluid port;
one of said sleeves including an annular channel communicating said fluid port with said passage during rotation of said pedestal;
an upper gear box mounted at an upper end of said rotary sleeve for rotation therewith,
a lower gear box mounted at a lower end of said stationary sleeve;
a hollow vertical shaft extending coaxially through said stationary and rotary sleeves for transmitting mechanical energy;
upper gear means in said upper gear box for connecting said shaft to rotary means on said pedestal, and
lower gear means in said lower gear box for connecting said shaft to rotary means on said carrier;
electrical connector means mounted adjacent one end of said shaft for rotation relative thereto, said connector means being connectable to electrical conductors said shaft including an open upper end and an open bottom end for receiving electrical conductors to conduct electrical energy between said pedestal and carrier.

4,177,870
HYDROSTATIC FRONT WHEEL DRIVE SYSTEM
John I. Henn, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.
Filed May 30, 1978, Ser. No. 910,645
Int. Cl.[2] B60K *25/04*
U.S. Cl. 180—243 **9 Claims**



8. In combination with a vehicle including a reversible main traction drive transmission connected to drive main traction drive wheels, and first and second auxiliary traction wheels, an auxiliary traction drive system, comprising: a reversible variable displacement pump including a direction and displacement controller; first and second hydraulic motors connected in parallel with each other in a closed loop hydraulic circuit connecting the pump to the motors; first and second drive connection means respectively connecting the first and second motors to the first and second auxiliary traction wheels; said closed loop hydraulic circuit comprising a flow divider-combiner valve, a first conduit connected between a first port of the pump and the divider-combiner valve, second and third conduits connected between the divider-combiner valve and respective first ports of the motors; and a fourth conduit connecting respective second ports of the motors to a second port

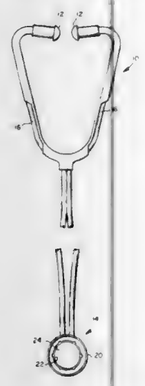
of the pump; and a restricted passage connected between the second and third conduits, whereby, after the vehicle completes negotiating a turn, the restricted passage permits flow therethrough to equalize the pressure in the second and third lines to re-center the flow divider-combiner valve.

4,177,871

TOY STETHOSCOPE

W. Porter Clanton, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Dec. 15, 1977, Ser. No. 860,696
Int. Cl.[2] A61B *7/02*; H04R *25/00*
U.S. Cl. 181—131 **5 Claims**



1. A toy stethoscope for conducting sound comprising:
a pair of flexible sound conducting tubes;
an ear piece connected to one end portion of each of said tubes; and
a soft pliable housing secured to the opposite end portions of said tubes, said housing having a substantially blind bore extending from one end thereof in which the blind end of said bore has at least one opening communicating with the open ends of said opposite end portions of said tubes, said housing further having a pad or block of soft sound damper material mounted within said blind bore and overlying said opening in said blind end for damping the sound conducted through said blind bore and said tubes to said ear pieces.

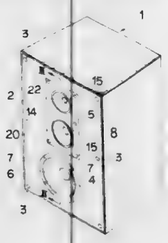
4,177,872

SPEAKER SYSTEM

Shinichi Watanabe, Matsudo; Shigeru Okazaki, Tokyo, and Mamoru Osata, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 28, 1978, Ser. No. 882,260
Claims priority, application Japan, Mar. 11, 1977, 52-29404[U]
Int. Cl.[2] H05K *5/00*; G10K *13/00*
U.S. Cl. 181—144 **2 Claims**

1. A speaker system comprising a cabinet;
a baffle board mounted in front of said cabinet and having first and second openings;
a woofer mounted on said baffle board so as to cover said first opening;
a sub-baffle board mounted on said baffle board so as to cover said second opening, said sub-baffle board having two openings, said sub-baffle board including a metal board and a damping plate laminated on said metal board;
a medium range speaker mounted on said sub-baffle board through said damping plate so as to cover one of said openings in said sub-baffle board; and



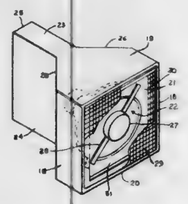
a tweeter mounted on said sub-baffle board through the medium of said damping plate so as to cover the other of said openings in said sub-baffle board.

4,177,873

LOUDSPEAKER EQUIPMENT

Warren Ripple, 2839 Sterling La., Sarasota, Fla. 33581

Continuation of Ser. No. 615,364, Sep. 22, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 790,485
The portion of the term of this patent subsequent to May 13, 1992, has been disclaimed.
Int. Cl.[2] H04R *1/28*; G10K *13/00*
U.S. Cl. 181—148 **7 Claims**



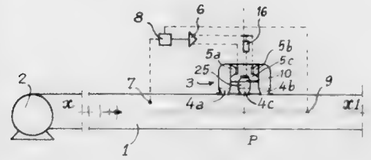
1. Loudspeaker equipment comprising a speaker and a speaker enclosure, the enclosure having enclosure walls defining a speaker chamber having front and rear intercommunicating portions, the front portion having a front wall with an opening therein and with the speaker mounted thereon and exposed through the opening, the side walls of the front portion defining a generally rectangular cavity of greater dimensions in directions paralleling the front wall than the dimension of said cavity perpendicular to the front wall, and the rear portion having walls defining a generally rectangular cavity a first transverse dimension of which is the same as the corresponding dimension of the front cavity and the second transverse dimension of which is substantially smaller than the corresponding dimension of the front cavity, the enclosure walls being at least in large part formed of sheet material of thickness of the order of 1/16" to ¼" and the speaker enclosure being substantially completely imperforate except for the speaker opening, thereby providing loudspeaker equipment in which the walls of the speaker enclosure extensively participate in the sound generation.

4,177,874

ACTIVE ACOUSTIC SOUND ABSORBER DEVICE

Theophile A. Angelini; Bernard J. P. Nayrole; Maurice J. Jessel; Georges Canevet; Gerard A. Mangiante, and Bernard Carbone, all of Marseilles, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Mar. 29, 1978, Ser. No. 891,340
Claims priority, application France, Apr. 1, 1977, 77 10497
Int. Cl.[2] F01N *1/06*
U.S. Cl. 181—206 **9 Claims**



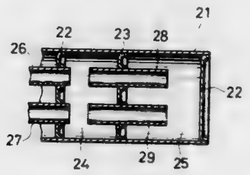
1. An active acoustic absorber device for absorbing sounds emitted by an emitter source and which propogate therefrom along a pipe having a longitudinal axis, comprising an acoustic tripole including two auxiliary sources which constitute a dipole and a third auxiliary source which constitutes a unipole; a single acoustic enclosure placed outside said pipe comprising a housing having the general form of a U including a chamber having a plane of symmetry transverse to said chamber and perpendicular to the longitudinal axis of said pipe, two lateral channels parallel to said plane and symmetrical with respect to said transverse plane of symmetry, each lateral channel having an open end which opens out into said pipe, and a median channel which is parallel to said transverse plane of symmetry and symmetrically located with respect thereto, said median channel having an open end which opens out into said pipe; said two auxiliary sources which constitute the dipole being located across said chamber, symmetrically with respect to said transverse plane of symmetry and said auxiliary source which constitutes the unipole being located in said median channel, symmetrically with respect to said transverse plane of symmetry.

4,177,875

MUFFLER FOR INTERNAL COMBUSTION ENGINE

Takao Kurobe; Katsuziro Tachikawa; Tetsuo Kato, and Yoshinobu Imatoku, all of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha; Kabushiki Kaisha Sango and Futaba Sangyo Kabushiki Kaisha, all of Aichi, Japan

Filed Jan. 4, 1978, Ser. No. 866,828
Claims priority, application Japan, Aug. 15, 1977, 52/97020
Int. Cl.[2] F01N *1/08*
U.S. Cl. 181—265 **2 Claims**



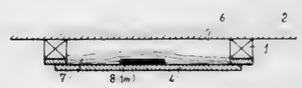
1. A muffler assembly for an internal combustion engine comprising: a generally cylindrical casing having a pair of end plates closing the interior of said casing and a central axis extending longitudinally thereof; a baffle plate located intermediate said end plates and extending across the interior of said casing in a plane generally perpendicular to said central axis; a front chamber defined between one of said end plates and said baffle plate; a tuning chamber defined between the other of said end plates and said baffle plate; an exhaust gas inlet extending through said one end plate in a direction generally parallel to said central axis, said inlet pipe being in direct flow communication between the exterior of said casing and said front chamber to deliver exhaust gases into said front chamber; an exhaust gas outlet pipe extending through said one end plate through which said inlet pipe extends in a direction parallel to said inlet pipe, said outlet pipe being in direct flow communication between said front chamber and the exterior of said casing to discharge exhaust gases from said front chamber; first tuning means consisting essentially of a tuning tube extending through said baffle plate in direct flow communication between said front chamber and said tuning chamber, said tuning tube being in direct coaxial alignment with said inlet pipe across said front chamber and extending generally parallel to said central axis; and second tuning means defining a gas flow path extending through said baffle plate between said tuning chamber and said front chamber, and gas flow path being in direct coaxial alignment with said outlet pipe across said front chamber.

4,177,876

PREFABRICATED ELEMENT TO FORM A DOUBLE SOUND INSULATION AND ABSORPTION WALL OF A DWELLING

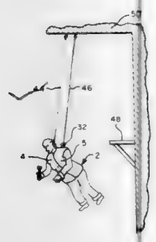
Jean Pujolle, Paris, France, assignor to Telediffusion de France, Paris, France

Filed Jul. 25, 1977, Ser. No. 818,717
Claims priority, application France, Sep. 10, 1976, 76 27280
Int. Cl.[2] E04B *1/82*
U.S. Cl. 181—284 **4 Claims**



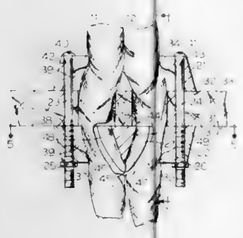
1. A sound absorbing and sound insulating structure wherein a single wall of a room having an annoying natural resonant frequency is covered with a plurality of prefabricated structures, each prefabricated structure comprising:
a four sided frame having parallel cross members for attachment to the wall, said cross members each having a height d to space a flexible panel member attached to said frame by said distance d from said wall;
a flexible panel member adhesively secured to said cross member at said distance d from said wall having a surface mass much smaller than the surface mass of said wall;
an additional surface mass adjustment element fixed to the side of said panel member which is inside the air space between the panel member and said wall; said additional adjustment element serving as the sole means for adjusting the surface mass of the structure so that the resonant frequency of the panel supporting said additional element is equal to a natural resonant frequency of said room after installation;
an elastic adhesive bonding said flexible panel member to said cross member;
the flexible panel members being of at least two different resonant frequencies due to differences in their surface mass, these differences taking into account the masses of the additional elements whereby each prefabricated structure and adjacent panel member on a wall has a different resonant frequency to provide an array of at least two flexible panel assemblies at a common distance d from the wall.

4,177,877
SAFETY VEST
Albert A. Gallinati, 820 E. McKinley St., Mundelein, Ill. 60060
Filed Feb. 21, 1978, Ser. No. 879,783
Int. Cl.[2] A62B *35/00*
U.S. Cl. 182—3 **10 Claims**



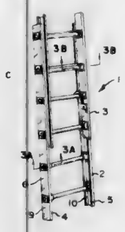
1. A safety garment having an inner and an outer shell, and a yieldable and slidable strap assembly within the shells including front and rear portions adapted to pass behind the user's back and chest respectively, and a circumferentially extending belt section adapted to extend about the waist of the user, said front and rear portions having lower ends overlapping the belt section, means connecting said lower ends of the strap portions to adjacent portions of the belt section, said front and rear portions having upper ends joined to form loops, tether means connected to the loops, and means foreshortening the effective lengths of said rear portions of the strap assembly and disposed in an area of the garment on the back side thereof intermediate said belt section and the upper portion of the garment and abuttable with each other upon tensioning said belt assembly through said loops.

4,177,878
ROPE LADDER
Robert M. Salvarezza, 110 Braemar Dr., Hillsborough, Calif. 94010
Continuation-in-part of Ser. No. 901,785, May 1, 1978. This application Aug. 14, 1978, Ser. No. 933,645
Int. Cl.[2] E06C *1/56, 7/50*
U.S. Cl. 182—199 **12 Claims**



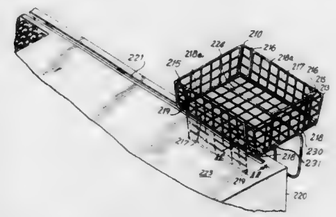
1. A rope ladder, including in combination:
(a) a series of ladder steps, each with an upper surface and a lower surface, two longitudinal edges and two end edges, each step having two spaced-apart pairs of vertical through openings, one pair spaced in from each said transverse edge, the openings in each pair being spaced apart from each other,
(b) two spaced-apart pairs of ropes, each rope passing through one said through opening of each said step,
(c) two pairs of wedge collars for each said step, one pair at each end of said step with an upper said wedge collar above its step and a lower said wedge collar below its step, each said wedge collar having a step-engaging end and a distal end and a single elongated through opening through which one pair of ropes pass and which at said step-engaging end is at least as wide as the overall distance between and including said step's through openings, said elongated through opening of at least said lower wedge collar curving inwardly from said step-engaging end to a narrower portion of said elongated opening at the distal end that is barely wide enough for the two ropes to pass therethrough,
said pair of wedge collars having an elongated pair of vertical bolt passages through them,
(d) a wedge heart in between said ropes of each pair of ropes and in each said elongated through opening of said lower wedge collar, said wedge heart having an upper surface in engagement with said lower surface of said step and tapering downwardly to an apex at its lower end and providing two rope-engaging side surfaces ending at said apex, which at said upper surface are spaced apart a distance identical to the distance between said step's through openings, so that these rope-engaging surfaces, when said wedge heart is fully wedged to place, lock their pair of ropes in place and prevent relative movement between them and said lower wedge collar and wedge heart, and
(e) a pair of bolts, each with a nut, for each pair of wedge collars, to wedge said wedge heart and lock said ropes in fixed position relative to said wedge heart and said pair of wedge collars and therefore to the step between the wedge collars.

4,177,879
LADDER AND METHOD OF CONSTRUCTION THEREFOR
William H. Frank, Louisville, Ky., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Jul. 25, 1977, Ser. No. 818,590
Int. Cl.[2] E06C *7/08, 7/50*
U.S. Cl. 182—220 **5 Claims**



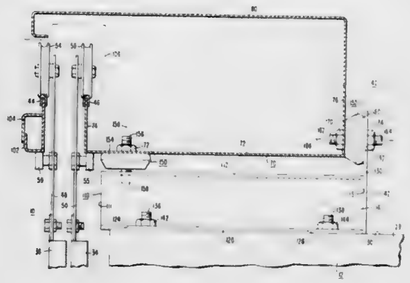
1. In a ladder having two elongated side rails each with a web, said web having two broad surfaces with spaced holes, said spaced holes including a large, central rung receiving hole in it, and smaller holes spaced outwardly from said central hole, and rungs supported by and extending between the webs of said side rails at spaced locations, the improvement comprising a rung bracket molded in place on said web having on one side of said web a hollow, rung receiving boss and a base part, and on another side of said web, a pad part, said pad and base parts covering all of said small holes, and tying members integral with the base and pad parts connecting said parts and extending through said holes in said web, said tying members of said bracket extending through all of said smaller holes and defining ribs extending from said base part to said boss, individual ones of said ribs being at least in part congruent with individual ones of said smaller holes so that said bracket is moldable in place on said web from a single side of said web.

4,177,880
COMBINATION SUPERMARKET COUNTER AND CART THEREFOR
Stanley Joseloff, 185 S. Atlantic Ave., Cocoa Beach, Fla. 32931
Division of Ser. No. 836,031, Sep. 23, 1977, Pat. No. 4,114,727. This application Aug. 7, 1978, Ser. No. 939,635
Int. Cl.[2] A47F *9/02*
U.S. Cl. 186—1 R **3 Claims**



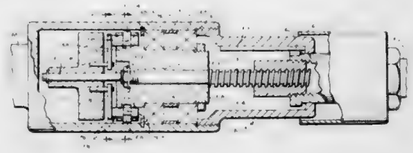
1. In combination, an improved check-out counter and shopping cart cooperating therewith; said counter construction including an upper surface having an elongated slot therein, extending between upstream and downstream areas adjacent a longitudinal edge thereof; said cart including a wheeled frame element and a basket element supported by said frame element and including front, rear, and a pair of side walls; at least one of said side walls having a portion thereof arranged for substantially vertical sliding movement between open and closed positions; said cart being selectively positioned with said basket element overlying said upper surface of said counter, wherein said slidably mounted portion of said side wall in open position penetrates said slot for horizontal sliding movement therein.

4,177,881
ELEVATOR SYSTEM
George A. Kappenhagen, Mechanicsburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Division of Ser. No. 833,626, Sep. 15, 1977, Pat. No. 4,149,615. This application May 30, 1978, Ser. No. 910,812
Int. Cl.[2] B66B *13/08*
U.S. Cl. 187—56 **1 Claim**



1. An elevator system, comprising:
an elevator car having front and top portions, with the front portion defining an entranceway,
door operator means having an elongated base frame member, said base frame member having first and second ends and a front portion,
means mounting said door operator means on the top portion of said elevator car, with the front portion of the base frame member being adjacent to the front portion of the elevator car,
said front portion of the base frame member including a first hanger roller track which overhangs the front portion of the elevator car,
a second hanger roller track, said second hanger roller track being an elongated, tubular structure having first and second ends and an upstanding leg portion which extends in a direction between its ends to define the hanger roller track,
mounting means mounting said second hanger roller track to said base frame member in horizontally spaced relation relative to said first hanger roller track, with the space between them having a predetermined length dimension along the front portion of the elevator car which is accessible from above,
first and second hanger plates each having hanger rollers mounted thereon, said first and second hanger plates being disposed between said spaced first and second hanger roller tracks, with their associated hanger rollers engaging the first and second hanger roller tracks, respectively,
first and second door panels for the entranceway of said elevator car,
means fastening said first and second door panels to said first and second hanger plates, respectively,
and means connecting said door operator means to said first and second hanger plates,
said tubular structure of the second hanger roller track, and said mounting means therefor, supporting the associated hanger plate and door panel such that the predetermined space between the first and second hanger roller tracks which is accessible from above is free of mounting means for a dimension sufficient to enable the first and second hanger plates and associated door panels to be removed from the hanger roller tracks from above.

4,177,882
MECHANICAL SNUBBING DEVICE WITH INERTIA ACTUATED BRAKING MEANS
Terrence P. Dowell, Van Nuys, and Edwin L. Banks, Jr., Lakeview Ter., both of Calif., assignors to Barry Wright Corporation, Watertown, Mass.
Filed Mar. 7, 1977, Ser. No. 775,260
Claims priority, application United Kingdom, Apr. 8, 1976, 14312/76
Int. Cl.[2] F16F *7/10*
U.S. Cl. 188—1 B **9 Claims**



1. In a snubber, first and second concentrically arranged parts slidingly interengaged for relative movement with a portion of one part extending into the other, a nut fixed to one part, a driver rotatably mounted within the other part and a screw fixed at one end to the driver and rotatably engaged at its other end within the nut, a braking surface on the other part concentric with the axis of the screw, brake shoes mounted to the driver within and concentric to the braking surface having portions for engaging the braking surface, said driver being driven in rotation by the screw, an inertia mass positioned about the screw for free rotation, said brake shoes being supported by the driver for sliding radial motion and being rotated by the driver, a plurality of levers pivotally supported by the driver and coupled to said inertia mass, said levers including cam means having cam portions supported for rotation by said driver, slidingly engaged with the ends of the brake shoes, each camming portion including means for rotating the brake shoes about a portion of the heel end of another of the cam portions

and a slot in the driver within which the brake shoes are confined for sliding motion.

4,177,883

DISCS FOR DISC BRAKES

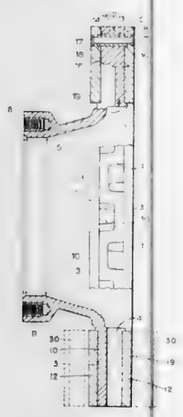
Hugh G. Margetts, Leamington Spa, England, assignor to Girling Limited, Birmingham, England

Filed Nov. 30, 1977, Ser. No. 856,205

Claims priority, application United Kingdom, Dec. 11, 1976, 51786/76

Int. Cl.[2] F16D *65/12*

U.S. Cl. 188—218 XL **7 Claims**



1. A disc for a disc brake comprising a driving component for connection to a rotatable member to be braked, said driving component comprising a cast mounting having flat opposite discontinuous abutment faces, annular braking members carried from said abutment faces, each of said braking members comprising a flat ring having a first face for direct intimate contact over a substantial area with a respective one of said abutment faces and a second opposite face for engagement by at least one friction member, and angularly spaced rivets additional to and separate from said annular members and said mounting for clamping said annular members against said abutment faces to maintain said direct intimate contact therebetween, wherein said angularly spaced rivets are circular in section and have heads, recessed openings are provided in said second faces of said annular members for receiving said heads, and openings are provided in portions of said driving component through which said rivets project, and wherein roll pins pass through said openings in said driving component and have opposite ends which are received in recesses in said first faces of said annular members, said roll pins having plain cylindrical bores through which said rivets project.

4,177,884

DAMPING MECHANISMS

William P. Vinten, Hartest, England, assignor to W. Vinten Limited, Suffolk, England

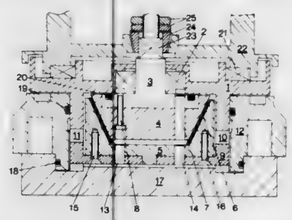
Filed Jun. 2, 1978, Ser. No. 911,875

Claims priority, application United Kingdom, Sep. 8, 1977, 37485/77

Int. Cl.[2] F16F *15/20*

U.S. Cl. 188—290 **6 Claims**

1. A damping mechanism comprising at least a pair of mateable surfaces, one of said surfaces being substantially resistive to lubricants, the other of said surfaces being substantially absorbent of lubricants, said surfaces being in engagement, and means for varying the pressure of one of said surfaces on the other of said surfaces to vary the degree of drag so that when said two surfaces are moved in the same plane relative to each



other the degree of damping is proportional to the relative velocity of said two surfaces up to a whip pan velocity.

4,177,885

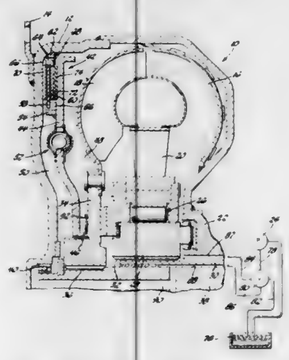
TORQUE CONVERTER AND LOCK-UP CLUTCH

Phillip J. Ross, Brownsburg, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 13, 1978, Ser. No. 951,090

Int. Cl.[2] F16D *47/06*

U.S. Cl. 192—3.3 **2 Claims**



1. A torque converter and multiple disc lock-up clutch assembly wherein engagement and disengagement of the clutch is controlled by fluid flow reversal through the torque converter, said assembly comprising; an input shell; a first annular splined member secured to the inner surface of said input shell; a clutch plate piston drivingly connected to the turbine of said torque converter; a clutch apply chamber formed by said turbine and said clutch plate piston; a second annular splined member secured to said clutch plate piston and being substantially concentric with and having lesser outer diameter than the inner diameter of said first annular splined member; a pair of annular clutch discs having splined outer diameters meshing with said first annular splined member; an annular clutch friction disc having a splined inner diameter meshing with said second annular splined member and being disposed intermediate and in controllable friction drive relation with said pair of annular clutch discs; an annular friction surface secured to said clutch plate piston adjacent to and in controlled friction drive relation with one of said pair of annular clutch discs and axially spaced from said annular clutch friction disc by said one annular clutch disc; and means for supplying fluid to said clutch apply chamber so that the clutch plate piston can be pressurized to enforce a friction drive in the clutch assembly between said annular clutch discs and said annular clutch friction disc and said annular friction surface.

4,177,886

PARKING BRAKE MECHANISM FOR MOTOR VEHICLE EQUIPPED WITH POWER TRANSMISSION WITH TORQUE CONVERTER

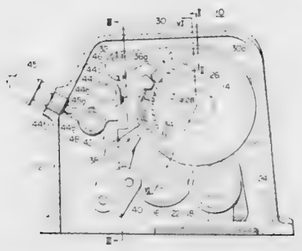
Kazuyoshi Hiraiwa, Ome, and Kotei Takahashi, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 26, 1977, Ser. No. 819,167

Claims priority, application Japan, Jul. 27, 1976, 51-89473

Int. Cl.[2] B60K *29/02*

U.S. Cl. 192—4 A **11 Claims**



1. A parking brake mechanism for a motor vehicle transmission having a transmission output shaft, a hub fixedly mounted on said output shaft, and an output shaft gear rotatable about said output shaft, said mechanism comprising:

a coupling sleeve coaxially slidably mounted around said hub and engageable with both said hub and said output shaft gear to provide secure connection between said output shaft gear and said output shaft, said sleeve being formed at its periphery with a plurality of external teeth having gaps therebetween;

a brake pawl mounted to rotate about an axis parallel with the axis of said output shaft, said brake pawl carrying a tooth which engages with one of the gaps formed between adjacent teeth of said sleeve when said brake pawl is biased to swing toward said coupling sleeve; and

a parking cam for urging said brake pawl to swing toward the teeth of said coupling sleeve, said parking cam biasing said brake pawl into engagement with the teeth of said coupling sleeve when said vehicle transmission is shifted into a parking position.

4,177,887

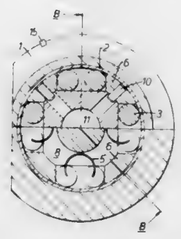
REVERSE SELF-LOCKING DEVICE

Harry Kellett, Dalton-in-Furness, and Harold L. Searle, Barrow-in-Furness, both of England, assignors to Vickers Limited, London, England

Filed Aug. 15, 1977, Ser. No. 824,604

Int. Cl.[2] F16D *67/00*

U.S. Cl. 192—8 R **3 Claims**



1. A drive transmitting device for use with a gun, which device may be preset and which will subsequently become locked if sudden or gradual rotation forces are applied, said device comprising:

a first member;

a second member, at least part of said first member being inside said second member;

means interposed between said first and second members whereby rotation of one of said members in either direction about a first axis of rotation causes rotation of said other member about said axis in the same direction as said one member, and whereby rotation of said one member about said first axis from its preset position as a result of rotation of said other member in either direction about said first axis is prevented, said means including a cylindrical housing coaxial with said first axis and extending around said second member, a plurality of rollers each having an axis of rotation spaced from said first axis and being arranged in respective pairs around said first axis, the number of pairs of rollers being more than two, spring means biasing the rollers of each pair of rollers away from each other, said spring means engaging with each of said rollers as close as possible to their axes of rotation and allowing free rolling movement of each of said rollers, said spring means comprising a separate spring for each said pair of rollers, each spring comprising a U-shaped resilient body extending radially inwardly from a respective pair of said rollers and having end portions which extend axially into central bores of said respective pair of rollers, wedging surfaces for said rollers defined by a flat outer surface on said first member for each respective pair of rollers and an internal cylindrical surface of said housing, said rollers cooperating with said wedging surfaces to prevent rotation of said one member from its preset position about said first axis as a result of rotation of said other member in either direction about said first axis, the forces required to restrain rotation of said one member being shared substantially equally between respective rollers of each of said pairs.

4,177,888

FRICTION CLUTCH PLATE WITH TWO CONCENTRIC HUBS FOR DAMPING

David R. Arrowsmith, Leamington Spa, England, assignor to Automotive Products Limited, Warwickshire, England

Filed Dec. 12, 1977, Ser. No. 859,853

Claims priority, application United Kingdom, Jan. 4, 1977, 00014/77

Int. Cl.[2] F16D *3/14*

U.S. Cl. 192—106.2 **18 Claims**



1. A friction clutch driven plate comprising:

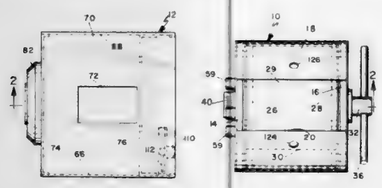
a first hub member;

a second hub member concentric with the first hub member and capable of limited angular movement about the hub axis relative to the first hub member;

a friction facing carrier mounted on the second hub member

by means allowing restrained limited angular movement about the hub axis relative to the second hub member;
springs seatings located on the first hub member and the carrier such that the first hub member seatings and the carrier seatings lie in a common radial plane;
and springs acting between the first hub member seatings and the carrier seatings so as to restrain the relative movement between the first hub member and second hub members.

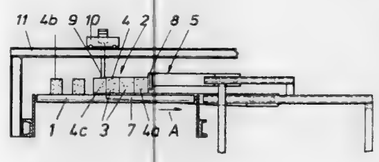
4,177,889
MONEY BOX AND VAULT
Ralph D. Adams, Escondido, and James K. Wyckoff, San Diego, both of Calif., assignors to Cubic Western Data, San Diego, Calif.
Filed Jan. 19, 1978, Ser. No. 870,715
Int. Cl.[2] G07B *15/00*
U.S. Cl. 194—1 B **12 Claims**



1. A coin box assembly for use in combination with a coin operated machine, said box comprising:
an outer cylindrical housing having co-axial bores formed in the end walls thereof and a coin opening in the side wall thereof;
an inner cylindrical housing mounted within said outer housing and having co-axial journal means journaled within said co-axial bores for relative rotation therein and a coin opening in the side wall thereof for alignment with said opening in said outer housing for the passage of coins therethrough;
lock means for locking said inner and outer housings into a locked position against relative rotation with said openings out in alignment, said lock means comprises a plurality of bores formed in adjacent walls of said inner and said outer housing, and spring biased pin means disposed in said bores and normally extending between and locking said walls against relative rotation,
a vault housing having a chamber for receiving said box, and
means in said chamber for simultaneously locking said box in said chamber and unlocking said inner and said outer cylindrical housings for permitting relative rotation therebetween for alignment of said coin openings.

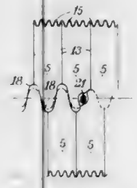
4,177,890
DEVICE FOR THE FORMATION OF SEPARATED ROWS OF GREEN BRICKS
Horst Steingrover, Ibbenbueren, Fed. Rep. of Germany, assignor to C. Keller GmbH u. Co. KG, Fed. Rep. of Germany
Filed Apr. 20, 1978, Ser. No. 898,244
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1977, 2730428
Int. Cl.[2] B65G *47/30*
U.S. Cl. 198—434 **3 Claims**

1. Apparatus for separating green bricks of the type which tend to stick together when abutting one another, said green bricks being arranged in a compact array of abutting crossrows, comprising a base receiving the separated green bricks, a lifting means operable to hold the compact array above said base and to be moved laterally relative to said base as leading crossrows are sequentially deposited from the lifting means onto the base, and separating means disposed over said base, said separating means comprising a separating member movable upwardly and downwardly, said separating member being movable downwardly toward the compact array of green bricks to engage the leading crossrow to thereby hold the engaged leading crossrow on said base as the remainder of the



compact array of abutting crossrows moves laterally away from the held leading crossrow, thereby separating the held individual row from the remainder of the green bricks in the compact array.

4,177,891
CONVEYOR BELT DEFORMABLE IN SPACE
Gilbert Delfosse, Avrille, France, assignor to Braud, Société Anonyme, Angers, France
Filed Aug. 2, 1978, Ser. No. 930,401
Claims priority, application France, Aug. 12, 1977, 77 24846
Int. Cl.[2] B65G *17/36*; A01D *61/00*
U.S. Cl. 198—570 **4 Claims**

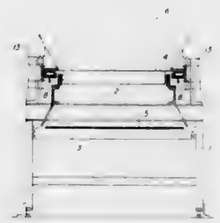


1. An assembly of conveying elements comprising two adjacent and synchronized bands each having a first end wall imbricated in those of the other band so as to constitute a double width conveyor capable of clearing obstacles inserted between the two bands; said bands being flexible and corrugated to form therein a series of alternating hollow portions and projecting portions, each of said bands being secured at spaced intervals to a longitudinally non-extensible traction member capable of being put out of shape in at least one direction perpendicular to its length, wherein the hollow portions of each band form a series of bucketlike elements which are closed along a first edge of each band by said first end walls, said first end walls having substantially identical dimensions and shape.

4,177,892
CONVEYOR COMPRISING A DRIVEN FLEXIBLE BELT FOR STEPWISE ADVANCING MOULDS
Emil Jespersen, Glostrup, and Vagn Mogensen, Gentofte, both of Denmark, assignors to Dansk Industri Syndikat AS, Herlev, Denmark
Filed Jun. 7, 1977, Ser. No. 804,367
Claims priority, application Denmark, Sep. 24, 1976, 4327/76
Int. Cl.[2] B65G *23/38*
U.S. Cl. 198—832 **2 Claims**

1. A conveyor for the stepwise advance of a plurality of casting moulds including a plurality of aligned closely juxtaposed mould parts having pouring cavities at joint faces between successive mould parts, comprising a frame, a flexible mould supporting belt carried by said frame so as to be mov-

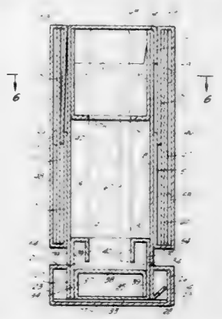
able in its longitudinal direction, and a driving mechanism to impart a stepwise longitudinal movement to said belt, said driving mechanism including a pair of elongate and substantially nonextensible coupling parts extending reciprocably along the opposite side edges of said belt and each comprising means selectively to clamp the respective coupling parts to the respective side edge portions of the belt over a substantial length thereof, and to release the coupling parts from said side edge portions, said coupling parts including, longitudinally extending parallel brackets disposed along corresponding portions of opposite sides of said frame, two sets of rollers rotatably supported by each said bracket with the axes of each set coplanar with each other and also the corresponding set on the other said bracket, the planes of said sets of rollers respectively being above and below the plane of said belt, a web plate movably mounted between said sets of rollers on each bracket



for reciprocation longitudinally of said belt, a first flange rail rigidly supported by each web plate and extending in parallel overlying relation with the adjacent longitudinal edge portion of said belt, a second flange rail rigidly supported by each web plate parallel with said first flange rail and belt and underlying the adjacent longitudinal edge portion of said belt the surface of one of said flange rails adjacent said belt being substantially level with the adjacent surface of said belt, an expansible means carried by said other flange rail between said rail and the adjacent surface of said belt and extending longitudinally of said rail, and a clamping rail carried by said expansible means for movement into and from engagement with the adjacent surface of said belt according to the expansion of said expansible means, whereby said belt is firmly clamped along its opposite edges uniformly along the full length of said clamping rails to retain said belt in a firm, flat condition as the belt with the moulds thereon is advanced by said clamping rails.

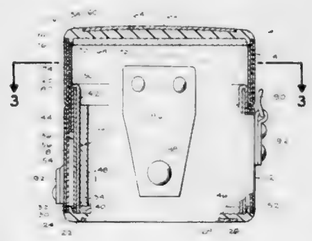
4,177,893
MERCHANDISE CONTAINER
William F. Kornfeld, 34 Shepherd La., Roslyn Heights, N.Y. 11577
Filed Nov. 27, 1978, Ser. No. 964,114
Int. Cl.[2] B65D *5/50*
U.S. Cl. 206—45.14 **8 Claims**

1. A merchandise container, comprising:
(a) a box-like base formed of a single piece of paperboard, the top wall of said base having an opening,
(b) a box-like insert, formed of a single piece of paperboard, within the opening in said base top wall, said insert projecting above said base top wall and having dimensions in a horizontal plane smaller than the corresponding dimensions of said base, so that said base and insert together have a stepped configuration, and said insert having an opening in its top wall for accommodating an article of merchandise,
(c) a double walled shell formed of a single piece of paperboard, at least one end of said shell being open, and
(d) a liner, formed of a single piece of paperboard, within said shell, said liner projecting downwardly beneath the bottom edge of said shell and sized and shaped to fit



snugly around the portion of said insert projecting above said base.

4,177,894
LENS CASE
Steven D. Petersen, 5316 Lewis Rd., Agoura, Calif. 91301
Filed Jul. 11, 1978, Ser. No. 923,705
Int. Cl.[2] B65D *85/38*
U.S. Cl. 206—316 **11 Claims**

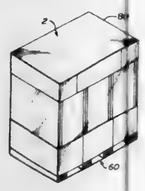


1. A lens case comprising:
a pair of tubular body members, each having a first open end, and an opposite end closed by an end-encompassing member attached thereto, said body members being coaxially disposed when said case is closed;
padding material disposed within said body members and against said end members;
hinge means connecting said body members; and
latch means affixed to one said body member and releasably attached to the other.

4,177,895
MOISTURE STABILIZED PACKAGE
Marcus H. Shelton, 613 Morrell, Baytown, Tex. 77520
Division of Ser. No. 487,895, Jul. 12, 1974, Pat. No. 4,095,692.
This application May 23, 1978, Ser. No. 908,870
The portion of the term of this patent subsequent to Jun. 20, 1995, has been disclaimed.
Int. Cl.[2] B65D *19/02*
U.S. Cl. 206—386 **12 Claims**

1. An improved-strength-retaining moisture-stabilized package comprising in combination a container prepared from corrugated standard paperboard having peaks and flutes said container having four side walls, a closed bottom and an open top with a polymeric covering encompassing said four walled exterior surfaces and the exterior of said bottom portion of said container, and a water vapor permeable cover for covering

said top open portion of said container said cover being prepared from standard paperboard having high porosity whereby said cover permits water vapor to be displaced up-



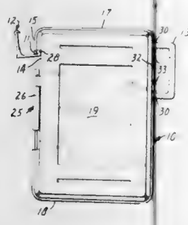
wardly from the interior of said container to pass through said cover and said polymeric covering prevents air currents from passing through the interior of said container, thereby resulting in a moisture-constant state within the interior of said package.

4,177,896

RECESSED HOOK AND HANDLE FOR A PLASTIC BOX

Mark W. Weavers, Little Canada, and Anthony W. Konkler, Lakeland, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 14, 1978, Ser. No. 896,586
Int. Cl.² B65D *85/67, 23/10*
U.S. Cl. 206—387 **4 Claims**



1. In a plastic box adapted for storage and shipment of a tape cassette, said box having rectangularly disposed first and second edge walls, first and second end walls, and opposed side walls, the improvement wherein said box has:

a recess opening through said side walls and said first edge wall adjacent said first end wall;

a hook portion projecting over a portion of said recess toward said second end wall so that the hook can be engaged with a horizontal member by passing the hook transversely over the horizontal member with the horizontal member being received in a position extending through said recess;

a handle portion adapted for manual engagement and integrally formed with said second edge wall adjacent said first end wall, said handle portion being thin and flexible at its juncture with said second edge wall to afford movement of said handle portion between a carrying position projecting from said second edge wall, and a storage position with said handle member generally parallel with said second edge wall;

a recess adapted to receive said handle member in its storage position; and

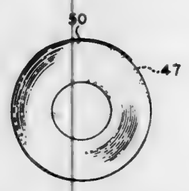
means for releasably retaining said handle portion in its storage position.

4,177,897

WOUND ROLL OF FIBROUS MATERIAL

Terrell A. Cole, 2820 Sherwood Dr., San Bruno, Calif. 94066

Division of Ser. No. 700,012, Jun. 25, 1976, Pat. No. 4,097,983.
This application May 11, 1978, Ser. No. 904,975
Int. Cl.² B65D *85/67*
U.S. Cl. 206—389 **1 Claim**



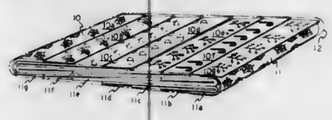
1. A length of single ply fibrous material such as label ribbon and the like wound into a coreless roll comprising: a fibrous ribbon wound into a multiplicity of contiguous, radially successive, concentric layers forming a roll of an annular configuration consisting of a plurality of inner layers disposed near the center of the roll and a plurality of outer layers disposed near the periphery of the roll, first locking means for establishing an interlocking relationship between the inner layers of the roll, and a second locking means for establishing an interlocking relationship between the outer layers of the roll, each of said locking means comprising a plurality of punctures and a plurality of burrs, each puncture of said plurality of punctures being formed in a layer of a plurality of radially successive layers of the roll and disposed in registry with adjacent punctures, and each burr of said plurality of burrs being integrally related to and projected from a layer of said plurality of radially successive layers of the roll and received in an interlocking relationship with a plurality of said punctures.

4,177,898

GIFT WRAP PACKAGE

Robert J. Humphrey, Bennington, Vt., assignor to Avco Corporation, Greenwich, Conn.

Filed Aug. 28, 1978, Ser. No. 937,651
Int. Cl.² B65D *69/00*
U.S. Cl. 206—494 **3 Claims**



1. In a gift wrap package having first and second identical nests of a plurality of folds of gift wrap sheets, each fold comprising at least two sheets of gift wrap, the sides of the sheets in each of said folds being aligned widthwise, said folds being folded on at least one Y axis parallel to the sides, the improvement comprising:

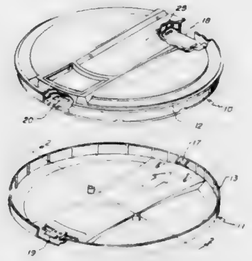
the ends of said sheets in each fold being misaligned lengthwise so that an end portion of each sheet in each fold is visible, each of said folds being folded on an X axis transverse to the sides to provide a front panel and a rear panel, whereby a portion of each sheet of said fold is visible within said front panel, said folds being nested within one another with the Y axis of all the folds being aligned, the front panel of the innermost folds being longer than the front panels of the outermost folds, whereby all of said end portions of said front panels are visible.

4,177,899

DISC MEMORY MODULE WITH STACKABLE DUST SHIELD

Paul N. Green, and James A. Duff, both of Omaha, Nebr., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Sep. 5, 1978, Ser. No. 939,514
Int. Cl.² B65D *55/00*
U.S. Cl. 206—509 **1 Claim**



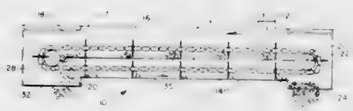
1. A dust shield to be detached and attached to a disk memory module of the type having a permanent housing having an aperture permitting access to the disk within by a drive unit, and a dust shield mating surface encircling the aperture, said dust shield having a mating surface mating with the permanent housing mating surface when attached to the module, wherein the improvement comprises a stacking surface on the dust shield similar to the mating surface on the permanent housing and spaced from the mating surface of the dust shield, and including a ridge extending around at least a substantial percentage of the periphery of the dust shield and dimensioned so as to mate with the mating surface of a similar dust shield, whereby a plurality of dust shields may be nestingly stacked with each other by the mating of the ridge with the dust shield mating surface.

4,177,900

GRAIN SCALPING AND CLEANING APPARATUS AND METHOD

Eldon R. Kluthe, Cairo, Nebr. 68824

Filed Jul. 31, 1978, Ser. No. 929,481
Int. Cl.² B07B *1/04*
U.S. Cl. 209—247 **27 Claims**



1. A method of scalping and cleaning grain wherein a rough grain product is processed into an intermediate grain product and then into a finished grain product, said rough grain product being comprised of a multitude of grain particles, a multitude of large impurities and a multitude of small impurities, said large impurities being of a larger diameter than said grain particles and said grain particles being of a larger diameter than said small impurities, said intermediate grain product being comprised of said grain particles and said small impurities, and said finished grain product being comprised of said grain particles, comprising the steps of:

(a) placing said rough grain product on an overs screen having a multitude of first openings, said first openings having a diameter which is larger than said grain particles and said small impurities, but smaller than said large impurities;

(B) moving said rough grain product relative to said overs screen by the use of a grain movement means, said grain movement means including a driving means driveably connected to a first end and a second end and grain movement members driveably connected to said first end and said second end, each of said grain movement members comprising an elongate flat paddle having a first elongate edge and a second elongate edge opposite said first elongate edge, said first elongate edge including a plurality of notches, said notched paddles consisting of a number of first notched paddles and a complimentary number of second notched paddles, said notches of said first notched paddles not being aligned with said notches of said second notched paddles, said first notched paddles and said second notched paddles being driveably connected to said first end and said second end in an alternating manner so that said first notched paddles pass over said overs screen immediately in front of and immediately behind said second notched paddles and said second notched paddles pass over said overs screen immediately in front of and immediately behind said first notched paddles;

(c) allowing said grain particles and said small impurities to fall through said first openings of said overs screen and fall against an unders screen having a multitude of openings of a smaller diameter than said grain particles but of a larger diameter than said small impurities;

(d) moving said small impurities and said grain particles, comprising said intermediate grain product relative to said unders screen by the use of said second elongate edges of said first and second notch paddles, said elongate edges being solid straight edges;

(e) allowing said small impurities to fall through said unders screen;

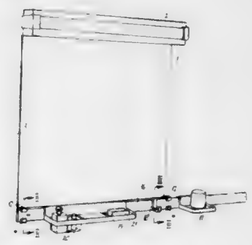
(f) removing said grain particles comprising a finished grain product through a finished grain product discharge means.

4,177,901

BATHROOM WALL FIXTURE

Didier Deconinck, Seyssins, France, assignor to Allibert Exploitation, Grenoble, France

Filed Apr. 18, 1978, Ser. No. 897,423
Claims priority, application France, Apr. 19, 1977, 77 12642
Int. Cl.² F16M *13/00*
U.S. Cl. 211—105.1 **10 Claims**



1. A bathroom wall fixture comprising:

a mirror;

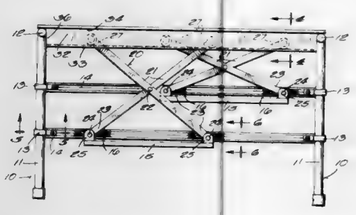
a pair of like supports each having a seat engaging and supporting said mirror;

a generally horizontally extending bar carried on said supports and horizontally and longitudinally displaceable thereon with respect to said mirror;

means on each of said supports tightenable for securing same to said bar and thereby fixedly positioning said bar relative to said mirror; and

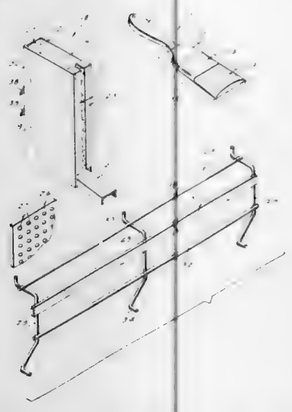
at least one shelf acccessory supported on and horizontally slidable along said bar.

4,177,902
DISPLAY UNIT
Ronald R. Winn, 430 Ridge Ave., Galesville, Wis. 54630
Filed May 2, 1978, Ser. No. 902,025
Int. Cl.² A44F 5/10
U.S. Cl. 211—162 **4 Claims**



1. In an article display rack having a top, bottom, front, back, and left and right sides, a plurality of vertical bottom channels extending from left to right and slidable from front to back, a plurality of panels one above each channel slidable from left to right, a pair of front to back arms spaced or placed at the left side and the right side respectively of said channels, each said track being provided at each end with a clamping member to secure it to said fore and aft rod in any fore and aft adjusted position, an upper track comprising a vertically opening channel for each said panel, each panel being provided at its bottom with a plurality of wheels immediately adjacent the plane of the panel at the bottom only, and each said panel being provided with a scissors linkage at the top, each arm of the scissors linkage having a pivotal attachment to the panel at one end, a pivotal attachment to the other arm of the scissors at its center, and a panel aligning roller at its rearmost end, and the channel for each said roller having a depending flange to trap the roller in the track.

4,177,903
PAINT BRUSH MERCHANDISING DISPLAY
Stanley Edelson, Searingtown, and Samuel Feinberg, Long Beach, both of N.Y., assignors to Amsterdam Brush Company, Amsterdam, N.Y.
Filed Dec. 21, 1977, Ser. No. 862,793
Int. Cl.² A47F 7/00
U.S. Cl. 211—49 D **6 Claims**



1. A modular merchandising display for paint brushes having a variety of sizes, the display comprising:

I. at least several modules all of which are identical to each other, each module being adapted to hold a stack of paint brushes and including:

(a) two vertical side walls permanently joined together at a fixed horizontal spacing, the spacing being larger than the width of the handles of a variety of sizes of paint brushes but smaller than the width of the bristle portions of the variety of sizes of paint brushes,

(b) a bottom wall, between said side walls near the lower edges of the latter, for supporting the lowermost paint brush in a stack between said side walls, said bottom wall extending forwardly beyond the front edges of said side walls and being inclined downwardly from back to front,

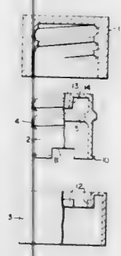
(c) a strip of resilient material carried by each side wall along its front edge, said strips projecting toward each other and being spaced apart a distance smaller than the width of a paint brush handle so that they frictionally grip between them the handles of a stack of paint brushes between said walls, the compressability of said strips permitting each paint brush handle to move outwardly between the strips when a paint brush is removed from the module,

II. a horizontally elongated support having a length many times the width of one of said modules, and

III. mounting means carried by each of said modules and projecting beyond the external contours of its respective module for securing the module to said support at any point along the length of said support,

whereby said modules may be mounted with any desired spacing between them.

4,177,904
SEAL ASSEMBLY FOR BOTTLES OR FLASKS
Antonio Puig Planas, No. 7 Juan Sebastian Bach St., Barcelona, Spain
Filed Jul. 24, 1978, Ser. No. 927,041
Claims priority, application Spain, Oct. 10, 1977, 231.303
Int. Cl.² B65D 41/08
U.S. Cl. 215—12 R **9 Claims**



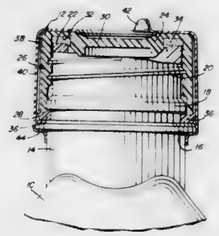
1. A seal assembly for bottles or flasks, said seal assembly comprising:

a neck member having a generally elongated hollow configuration adapted to non-rotatably fit about the exterior of a bottle or flask, said neck member having an upper end and an integral radially inwardly and longitudinally downwardly extending wall, said wall having at least one inwardly extending projection;

a generally hollow cylindrical intermediate member including means cooperating with said neck member to prevent relative rotation therebetween, said intermediate member having on the interior thereof means cooperable with a neck of the bottle or flask to prevent relative longitudinal movement therebetween, said intermediate member having an upper end having therein a dispensing opening adapted to align and cooperate with an opening in the neck of the bottle or flask to dispense product therefrom; and

a stopper member having a closed upper end and an open lower end, said stopper member having means cooperating with said intermediate member for removably attaching said stopper member to said intermediate member such that said closed upper end of said stopper member blocks said dispensing opening of said intermediate member.

4,177,905
CLOSURE SYSTEM FOR CONTAINERS
David A. Winchell, Twin Lakes, Wis., and Thomas A. Fowles, McHenry, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Jun. 5, 1978, Ser. No. 912,670
Int. Cl.² B65D 41/54
U.S. Cl. 215—246 **20 Claims**



1. A closure system for a container having a neck with a cap support flange extending radially outwardly from the neck, the top of the neck comprising a pour lip, the neck having threads above the support flange for engaging cooperating threads carried by a closure cap, the improvement comprising, in combination:

a closure cap comprising a top portion and an annular skirt depending downwardly therefrom;

said closure cap carrying threads adapted to cooperate with the container neck threads to enable axial travel of the cap with respect to the container neck when the cap is rotated with respect to the container neck;

a substantially circular central member depending downwardly from said closure cap top portion, the outer diameter of said central member being smaller than the internal diameter of the pour lip;

a first resilient gasket tightly encircling said central member and being positioned for vertical compression by the pour lip; and

a second resilient gasket tightly encircling said neck and overlying said cap support flange, said second resilient gasket being located to directly underlie the bottom of said annular skirt whereby downward axial movement of the cap with respect to the container neck will provide a vertical compressive force against said second resilient gasket by said cap skirt.

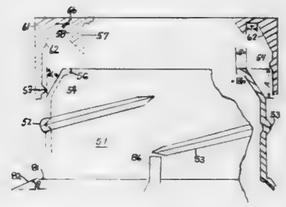
4,177,906
BLOW MOLDED PLASTIC BOTTLE AND PLASTIC CAP
Leo Von Hagel, North Massapequa, N.Y., assignor to Maxcap Inc., New York, N.Y.
Filed May 31, 1978, Ser. No. 911,277
Int. Cl.² B65D 55/02
U.S. Cl. 215—252 **38 Claims**

1. A combination of a blow molded plastic bottle and a plastic cap, comprising

(a) a bottle neck having a mouth, an external screw thread below said mouth and an inwardly directed portion at said mouth,

(b) said plastic cap adapted to be screwed onto said neck to cover said mouth and having an upper wall, a side wall with an internal thread corresponding to said external thread, and a downwardly directed circular plug for engaging said inwardly directed portion when said cap is screwed onto said neck and to form an anti-leak seal with said inwardly directed portion,

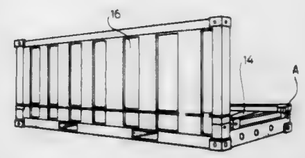
(c) cooperating antitamper means on said cap and bottle and including a permanently deformable element, said antitamper means permitting said cap to be rotated in one direction to screw said cap onto said neck to bring said plug into sealing relation to said mouth and then preventing rotation in an unscrewing direction unless said element is visibly deformed.



said inwardly directed portion having an inner surface and an outer surface, said inner and outer surface each extending upwardly and inwardly above said threads at an angle of at least about 30° to the horizontal,

said plug having a circular outer surface for engaging said mouth, said outer surface of said plug being tapered to increase in diameter upwardly and to exert an outward force on said mouth and a corresponding inward force on said plug outer surface when said cap is screwed onto said neck.

4,177,907
SHIPPING CONTAINER
Ettore Funaioli, Bologna; Alfio Rossetti, Busto Arsizio, and Pier C. Landini, Castellanza, all of Italy, assignors to Euteco S.p.A., Milan, Italy
Filed Sep. 29, 1978, Ser. No. 947,316
Claims priority, application Italy, Sep. 30, 1977, 28134 A/77
Int. Cl.² B65D 7/26
U.S. Cl. 220—1.5 **2 Claims**



1. A rigid collapsible container of parallelepipedic form, having a rectangular base wall, a roof, a pair of side walls and a pair of end walls, comprising:

the said rectangular base having a peripheral strengthening frame and provided at each of its four angles with a basic upright section terminating at its upper end with a rest surface on which, when the container is erected, an extension upright carried by the corresponding side walls come to rest in vertical alignement;

the two end walls hinged to opposite vertical edges of one of the side walls;

the said roof hinged at one of its longitudinal edges to the said one of the side walls by hinges carried by a longitudinal listel rigid with the said one of the side walls and

forming with the latter an angle of 90°, the width of said listel being not less than the thickness of the end walls, the roof also disengageably coupled in erected condition of the container to the other side wall, by means of a longitudinal listel rigid with said other side wall and forming with the latter an angle of 90°;

the side wall hingeably carrying the end walls and the roof being hinged to the base at a height less than that of the hinge of the said other side wall, the difference in height being not less than the thickness of the upright;

the structural relationship of the walls and roof of the container providing systematic container collapsing means wherein folding down of the erected container is only possible by the following successive operations:

folding of the end walls inwardly onto the side wall to which they are hinged,

folding the roof downwardly onto said folded end walls,

folding downwardly onto the base wall the said side wall together with the end walls and with the roof folded onto the side wall itself,

folding the other side wall downwardly onto the first one, all the folding movements involving a rotation of 90° and being carried out towards the inside of the container.

4,177,908

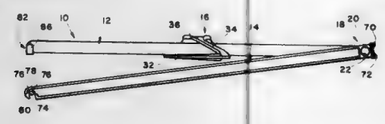
LOCKING PARALLEL BAR HANGER

John H. Batts, and Judd F. Garrison, both of Grand Rapids, Mich., assignors to John Thomas Batts, Inc, Zeeland, Mich.

Continuation-in-part of Ser. No. 773,536, Mar. 2, 1977, abandoned. This application Mar. 27, 1978, Ser. No. 890,031

Int. Cl.[2] A47J *51/14*

U.S. Cl. 223—96 **29 Claims**



1. A hanger for suspending slacks, pants and the like comprising:

an elongated, lower bar;

an elongated, upper bar positioned above and spaced from said lower bar;

hinge means for detachably and hingedly joining said upper bar to said lower bar adjacent one of the ends of each of said bars, said hinge means permitting pivotal movement of said upper bar from a first, closed position above and parallel with said lower bar to a second, open position in a vertical plane angled with respect to the vertical plane of said lower bar and permitting said bars to be detached from each other;

support means joined to said lower bar intermediate the ends thereof for hanging said hanger; and

latching means a part of said lower bar and said upper bar for latching said upper bar to said lower bar when in the first, closed position.

4,177,909

CONVERTIBLE PURSE

Lois O. Haskell, 4550 Warwick Blvd., Kansas City, Mo. 64111

Filed Oct. 17, 1977, Ser. No. 842,574

Int. Cl.[2] A45F *3/04*

U.S. Cl. 224—153 **2 Claims**

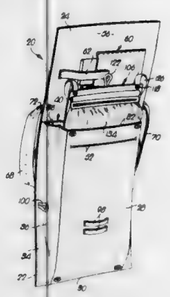
1. A convertible purse comprising:

a basic purse having at least one strap thereon and carryable in the form of a knapsack or a shoulder bag;

a main panel and a sheet of material secured thereto and cooperating therewith to define therebetween a major compartment presented by said basic purse, said main panel including a flap at its normally uppermost end, said main panel having a folding area extending transversely thereof, said basic purse being foldable along said area when the major compartment is empty, into overlapping relationship to present a hand carryable purse, there being a plurality of additional storage areas smaller than the major compartment formed in said basic purse, strap means on said flap fastenable to said sheet of material to close said major compartment when in the unfolded condition, and fastenable to the main panel to close said major compartment when in the folded condition;

a handbag adapted to be carried within said major compartment;

a clutch purse adapted to be carried by said handbag within said major compartment, said handbag and clutch purse being removable from said compartment and separable from one another for independent use;



at least one cosmetic pouch carried by said handbag and receivable within said major compartment together with the handbag;

said handbag having an open condition and a closed condition, the clutch purse and cosmetic pouch being carried by the handbag in its open condition, the handbag, clutch purse and cosmetic pouch being collectively receivable within said major compartment when the handbag is in its open condition, the handbag being independently usable as such when removed from the major compartment and placed in its closed condition; and

means on the handbag for supporting the same in an open condition when removed from the major compartment whereby to carry said cosmetic pouch in a position of access.

4,177,910

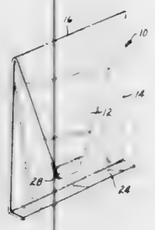
SHELL BOX HOLDING CLIP

William A. Gangi, 581 N. Hazel, St. Paul, Minn. 55119

Filed Apr. 27, 1978, Ser. No. 900,793

Int. Cl.[2] F42B *39/00*

U.S. Cl. 224—252 **6 Claims**



1. A shell box holding clip adapted to attach a standard box of shotgun shells to a shooter's belt or clothes and support the shells in a readily accessible position, wherein said clip comprises a planar outer portion adapted to extend full height along the wall of the box, an adjacent generally planar inner portion, joining means for joining adjacent ends of said inner and outer portions with said portions in face-to-face relationship and for resiliently biasing said inner and outer portions toward each other, a ledge portion at the end of the outer portion opposite its end joined to the inner portion which ledge portion projects from the side of the outer portion at which the inner portion is located and is adapted to engage the bottom surface of the box of shells, and means attached to said outer portion on its side opposite said ledge portion adapted for engagement with a shooter's belt or clothes; said inner portion extends the majority of the distance from said adjacent ends to said ledge portion; said joining means affords resilient separation and sliding of said inner and outer portions along opposite sides of one wall of the box with the ledge portion moved along its outer surface until the ledge portion moves along and is held adjacent the bottom surface of the box by the inner portion and the biasing of said joining means; and said inner portion has a part with a width generally the same as that of a said box located within a distance from said ledge portion equal to the height dimension of a said box to restrict movement of a said box with which the clip is engaged along said ledge portion transverse of said inner portion.

4,177,911

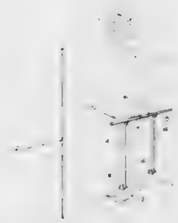
PANEL CARRIER

Edward O. Griffin, 54 Fort St., Presque Isle, Me. 04769

Filed Mar. 31, 1978, Ser. No. 892,021

Int. Cl.[2] B65G *7/12*

U.S. Cl. 224—45 P **1 Claim**



1. A device facilitating the carrying by one man of a large flat building panel comprising

a metal frame, said frame having

a pair of spaced apart vertical legs,

a panel supporting foot at the bottom of each leg and extending toward the user when the device is in use,

each foot having an upwardly extending lip at its end,

an elongated longitudinally extending handle interconnecting the legs at their upper ends and extending longitudinally beyond such upper ends,

said legs and feet being adapted to support the panel between them and the user of the device with a width of the panel tucked under one of the user's arms,

said legs near their upper ends being bent outwardly away from the load to offset the handle from the panel and provide space for the user's hand, and

said legs extending upwardly to locate said handle in the vicinity of the vertical location of the center of gravity of the panel and being spaced longitudinally apart to stabilize the same against tipping,

the portions of said handle which extend beyond the tops of the legs providing a convenient means for grasping the device and pushing it into place from one lifted end of the panel and the length of the handle permitting the user to shift his hand longitudinally along the handle to align the hand with the center of gravity of the panel so that the panel will be stable when carried.

4,177,912

APPARATUS FOR PLANETARY FEEDING OF ELECTRODE WIRE

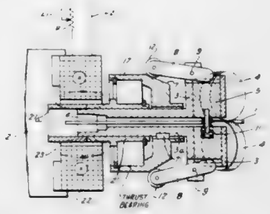
David A. Samokovliski; Angel S. Angelov; Georgi N. Nachev; Peter D. Petrov; Alfred E. Nemechek, and Iliyana I. Vajarova, all of Sofia, Bulgaria, assignors to CUV "Progress", Sofia, Bulgaria

Filed Nov. 25, 1977, Ser. No. 854,536

Claims priority, application Bulgaria, Nov. 24, 1976, 34752

Int. Cl.[2] B65H *17/22*

U.S. Cl. 226—176 **16 Claims**



1. An apparatus for the planetary feeding of electrode wire, comprising a housing, means for mounting the housing for rotation about its axis, opposed canted rolls mounted on the housing on opposite sides of the axis of the housing for engaging and feeding electrode wire along the axis of the housing, means movable relative to the housing for adjusting the force with which the rolls engage the electrode wire, means for rotating the housing about its axis, and means including an electromagnetic coil and an element variably responsive to variations in the magnetic field produced by the energization of the coil for moving the adjusting means to adjust the force with which the rolls engage the electrode wire.

4,177,913

AUTOMATIC PIPE WELDING APPARATUS

Taro Iwamoto, and Shimon Ando, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 15, 1978, Ser. No. 877,861

Claims priority, application Japan, Mar. 1, 1977, 52-22339

Int. Cl.[2] B23K *37/02*

U.S. Cl. 228—9 **19 Claims**



1. An automatic pipe welding apparatus, comprising:

an annular base member adapted to be disposed in concentric relation to a pipe, and including a semicircular first section, a quadrant circular second section and a quadrant circular third section, said second and third sections having one respective circumferential end pivotably connected to a respective circumferential end of said first

section, and their other circumferential end separably and lockably connected to one another;

at least three circumferentially spaced clamping means disposed on the inner periphery of said annular base member and operable to clamp the pipe for fixing said annular base member with respect to the pipe;

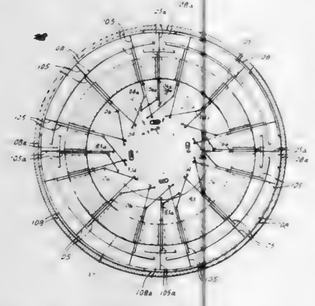
said annular base member having openings therein corresponding in number to the number of said clamping means and disposed at positions corresponding to those where said clamping means are located, a respective clamping means being moveable through a respective opening, said annular base member further having on the outer periphery thereof an annular concentric groove;

interlocking means for interlocking said at least three clamping means for joint movement to secure them to the pipe;

said interlocking means including a ring gear slidably received in said annular groove, said ring gear being divided into three sections at the locations corresponding to those where said first, second and third sections of said annular base member are connected to each other, said three sections of said ring gear being connected to each other so that said ring gear is openable as said annular base member is opened; pinions corresponding in number to the number of said clamping means with one pinion associated with each of said clamping means, said pinions being in mesh with said ring gear; and eccentric cam connected to each of said pinions, each of said cams being actuated through the connected pinion by said ring gear to urge the associated one of said clamping means against the pipe; and

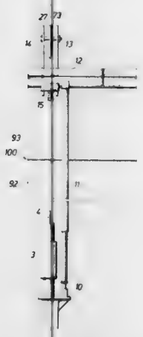
a carriage having a welding unit mounted thereon and being supported for circumferential movement on the outer periphery of said annular base member.

4,177,914
ROTARY INTERNAL PIPE CLAMP APPARATUS
Edward A. Clavin, Houston, Tex., assignor to Midcon Pipeline Equipment Co., Houston, Tex.
Filed Feb. 6, 1978, Ser. No. 875,289
Int. Cl.[2] B23K *37/04*
U.S. Cl. 228—49 B **35 Claims**



1. Welding clamp apparatus, comprising first and second axially spaced clamp assemblies each comprising plural circularly spaced clamps, each said clamp comprising a radially disposed element radially movable by toggle means having its outer end pivotally connected to said radially disposed element and having its inner end pivotally connected to one of first and second hub means each adapted to be driven in rotation about said axis, separate means for driving each said hub means in rotation about said axis in either direction to separately expand or retract each said clamp assembly.

4,177,915
METHOD FOR MANUFACTURING LARGE TANKS
Carl H. T. Blankenburg, Trosa, Sweden, assignor to Wikstrom International AB, Stockholm, Sweden
Filed Jun. 19, 1978, Ser. No. 916,495
Int. Cl.[2] B23K *31/02*
U.S. Cl. 228—184 **11 Claims**



1. In a method of manufacturing large tanks according to the "from the top and down" principle, whereby the roof of the tank is manufactured first at ground level, and successive plate sweeps, each having lugs mounted thereon, are attached one below the other, the completed part of the tank being raised in stages and a new plate sweep being fixed under the plate sweep immediately above it so that the tank grows from below, the improvement comprising:

mounting a plurality of lifting units around a plate sweep:

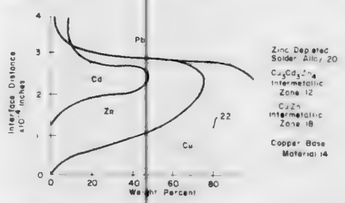
engaging said lifting units with lugs of said plate sweep to raise the finished part of the tank:

placing another plate sweep under the raised part of the tank:

mounting a welding machine guide rail to said lugs of one of said raised plate sweeps: and

welding a seam between two of said plate sweeps with a welding machine guided on said guide rail.

4,177,916
SOLDERING METHOD AND SOLDER JOINT
Michael C. Denlinger, Anaheim; Robert W. Korb, Fountain Valley, and Vernon F. Lardenoit, Diamond Bar, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Division of Ser. No. 858,491, Dec. 8, 1977, abandoned. This application Jun. 5, 1978, Ser. No. 912,894
Int. Cl.[2] B23K *1/02, 35/26*
U.S. Cl. 228—231 **7 Claims**



1. The method of joining a metal part to a cooper base by soldering comprising:

placing a melted solder alloy consisting essentially of zinc substantially within the range of 0.5 to 1.0 weight percent, cadmium substantially within the range of 8 to 17 weight percent and lead as a balance constituent between a metal part and a copper base material and permitting it to solidify to form a copper-zinc intermetallic layer at the juncture of the solder alloy layer and the copper base material; and

exposing the soldered copper base material with its solder layer and attached metal part to about 200° C. for at least one hour to at least partially convert the copper-zinc intermetallic layer to a copper-cadmium-zinc ternary interface layer.

7. A solder joint made in accordance with the method of claim **1**.

4,177,917
CONTAINER COVER WITH INTERLOCKING FLAP CONFIGURATION
George P. Webinger, Minneapolis, Minn., assignor to Champion International Corporation, Stamford, Conn.
Filed Oct. 2, 1978, Ser. No. 947,899
Int. Cl.[2] B65D *5/22*
U.S. Cl. 229—34 HW **9 Claims**



1. A container cover with straight outer side walls and having an interior, interlocking, flap configuration to adapt said cover to a taper-sided package tray, said cover comprising:

a. a center portion having vertical outer side walls equal in number to the slanted side walls of said package tray,

b. a plurality of inner wall flaps each integrally formed with and hingedly attached along one edge thereof to a corresponding selected one of said vertical outer side walls, and

c. means integrally formed with said flaps for interlocking adjacent pairs of said flaps whereby when said flaps are folded inwardly into said cover, resilient, slanted inner walls are formed to match and grasp the slanted sides of said package tray thereby centering said tray within said cover and maintaining said tray in its tapered configuration.

4,177,918
CARTON
Robert W. Lane, Park Hills, Ky., assignor to The C. W. Zumbiel Company, Cincinnati, Ohio
Filed Sep. 5, 1978, Ser. No. 939,327
Int. Cl.[2] B65D *5/10, 5/06, 5/28*
U.S. Cl. 229—39 B **12 Claims**

1. An improved carton for use in packaging an elongated fragile article, said carton comprising

multiple sidewalls connected one to the other,

a stop rib fixed to two opposed sidewalls at opposite ends of said stop rib, said stop rib being located at one end of said carton, and said stop rib being adapted to receive one end of said article in seated relation thereagainst for retaining said article in spaced relation from the one end of said carton,

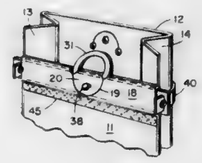
a cushion flap hingedly connected at one side edge to one of those sidewalls to which said stop rib is fixed and unconnected at the other side edge to the other of those sidewalls to which said stop rib is fixed, and

at least one breakaway nick connecting said stop rib and said cushion flap in planar relation when said carton is erected prior to insertion of said article therein, said cushion flap being broken away from connected relation with said stop rib as said article is inserted into the open end of the erected but unfilled carton, said cushion flap being swingable on a hinge line to accommodate insertion of said



article in said carton, and said broken away cushion flap cooperating with said article to bias said article against at least two sidewalls of said carton for retaining said article in spaced relation from at least one other sidewall of said carton.

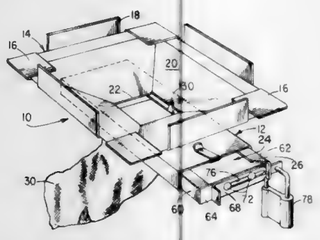
4,177,919
DISPOSABLE, RESEALABLE CONTAINER
Ricardo H. Soto, Apartado 91711, Bogota, Colombia
Continuation-in-part of Ser. No. 794,005, May 5, 1977, Pat. No. 4,102,487. This application Oct. 11, 1977, Ser. No. 840,628
The portion of the term of this patent subsequent to Jul. 25, 1995, has been disclaimed.
Int. Cl.[2] B65D *33/02, 33/06, 33/16*
U.S. Cl. 229—54 R **13 Claims**



1. A sealable container comprising a bag having generally flat first and second panels and first and second pleated sides joining said panels together and cooperating therewith to define an open mouth, the upper portion of said first panel having its side edges separated from said pleated sides to define a foldable flap; an elongated, generally flat carrier providing a handle and held by said first panel and having an upper edge spaced from said mouth beneath said flap, said flap being folded against said edge and securing said carrier to said bag; means for attaching said folded flap to one of said carrier and first panel, whereby said carrier provides support to said bag and its contents when the bag is open; and lock means on said carrier for securing the upper portions of said pleats and said second panel to said carrier after they have been closed and folded over said upper edge of said carrier.

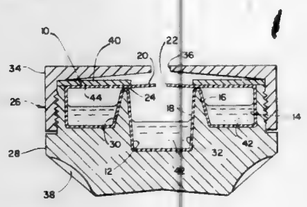
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4,177,920
SELF-LOCKING COIN RECEPTACLE AND COVER THEREFOR
August M. Sciortino, 1919A Pickwick La., Glenview, Ill. 60025
Filed Jan. 12, 1978, Ser. No. 868,876
Int. Cl.[2] G07B *15/00*
U.S. Cl. 232—16 **23 Claims**



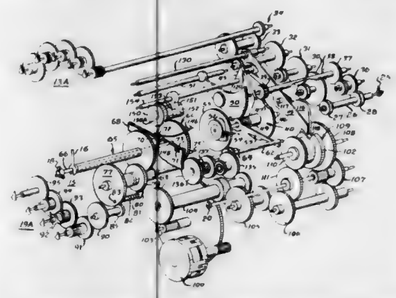
1. A cover assembly adapted to be locked onto a coin-receptacle capable of being inserted into a preformed recess of a coin-controlled machine of the type that has an interior coin chute having a delivery end opening to the recess; comprising, a top wall having a window adapted to be aligned with the coin chute when the cover is engaged on the coin receptacle and together therewith installed within the recess, slide means seated for slidable movement beneath the top wall to cover and uncover the window, first spring means secured to the cover and to said slide means for biasing the slide means to a condition whereat the window is covered and spring catch means coupled between the slide means and said cover operable between a first condition permitting movement of said slide means against the bias of said first spring means and a second condition whereat to prevent movement of said slide means against said spring bias and detent means within said cover and operable with the movement of said slide means, said detent means being disposed normally away from said window, said slide means operable to drive said detent means positively into said window when said slide means is manipulated against the bias of said first spring means partially or fully to uncover said window, whereby withdrawal of said coin-receptacle from said recess is prevented except when the window is fully covered.

4,177,921
ONE PIECE CHYLOMICRON ROTOR LINER
Steven T. Nielsen, Sunnyvale, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.
Filed Sep. 29, 1977, Ser. No. 837,659
Int. Cl.[2] B04B *1/00*
U.S. Cl. 233—20 R **3 Claims**



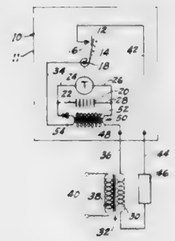
1. A multicompartment rotor liner for receipt of a fluid mixture and for use in a centrifuge rotor, said liner comprising:
a lower portion having a generally cylindrical central chamber and an annular chamber surrounding said central chamber, said central and annular chambers being separated by a double wall, said annular chamber receiving one constituent of said mixture during centrifugation and said central chamber receiving another constituent of said mixture during centrifugation; and
a cover integrally formed with said lower portion and having a central access aperture, the top of said double wall establishing the upper limit of said central chamber, said cover when in engagement with said top of said double wall defining the vertical extent of the top of said central chamber to prevent the establishment of a cavity in said central chamber above said top of said double wall, so that none of said another constituent will accumulate above said top of said double wall when said liner is in said rotor and subjected to centrifugation to eliminate inadvertent introduction of said another constituent into said annular chamber when a pipette is inserted through said central access aperture to said annular chamber.

4,177,922
MOTOR DRIVEN RESET MECHANISM FOR CUMULATIVE DEMAND REGISTER
David G. Hart, Clemson, and Norman B. Venaas, Seneca, both of S.C., assignors to Sangamo Weston, Inc., Atlanta, Ga.
Filed Sep. 8, 1977, Ser. No. 833,175
Int. Cl.[2] G06C *15/42;* **G01R** *11/02*
U.S. Cl. 235—144 MA **10 Claims**



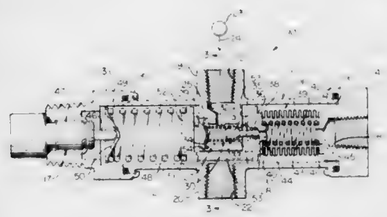
1. In an electrical power meter, the combination of a period maximum demand register comprising a dial including an indicating hand; first gear means including pusher gear means rotatable in a recording direction and a reset direction, said first gear means operably connected to advance and reset said period maximum demand register when said pusher gear means is rotated in said recording and reset directions respectively, the angular displacement of said pusher gear means being representative of maximum demand in a predetermined period; second gear means responsive to an input drive for driving said pusher gear in said recording direction; reset means for periodically resetting said pusher arm means to a reset position; and a cumulative demand register; reset drive means; means including a reset gear having first and second axially displaced positions; said reset gear further including hold-out pin means extending from one surface thereof; a fixed plate adjacent said one surface of said reset gear and defining stowage slot means adapted to receive said hold-out pin means when said reset gear is in said first axial position, said hold-out pin means riding on said plate when said reset gear is in said second axial position; reset spring means for biasing said reset gear when said pin means is received in said stowage slot means for urging said pin means against one edge of said stowage slot means to define the zero reset position of said reset gear; manual reset means for moving said reset gear to said second axial position, said reset gear engaging said reset drive means in said second axial position and adapted to engage said pusher gear to drive the same in the reset direction; and third gear means including unidirectional drive means responsive only to the turning of said reset gear in said reset direction to advance said cumulative demand register by an amount representative of the angular displacement of said pusher gear from its initial position, said reset drive means being further operative to reset said period maximum demand register when said pusher gear means is driven in the reset direction.

4,177,923
BATTERY OPERATED THERMOSTAT TIMER WITH BATTERY CHARGING CIRCUITS
Robert C. Krump, Waterloo, Ill., assignor to Emerson Electric Co., St. Louis, Mo.
Continuation of Ser. No. 800,508, May 25, 1977, abandoned.
This application Aug. 14, 1978, Ser. No. 933,217
Int. Cl.[2] H02J *7/00;* **F23N** *5/20*
U.S. Cl. 236—46 R **4 Claims**



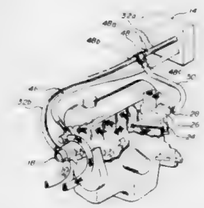
1. In a timer controlled space thermostat for switching a circuit connecting remote space conditioning apparatus with a remote A.C. power source, electrically operated timer means for periodically changing the temperature set point of said thermostat, a rechargeable battery for operation of said timer means, charging means for said battery comprising a transformer having a primary winding in said circuit and a secondary winding connected across said battery, current rectifying means connected in series with said secondary winding and said windings being so connected as to be only energized when the thermostat is closed.

4,177,924
CONDITION RESPONSIVE VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME
Harold G. Brakebill, Concord, and Edwin M. Dexter, Knoxville, both of Tenn., assignors to Robertshaw Controls Company, Richmond, Va.
Filed Nov. 23, 1977, Ser. No. 854,423
Int. Cl.[2] G05D *23/02*
U.S. Cl. 236—86 **20 Claims**



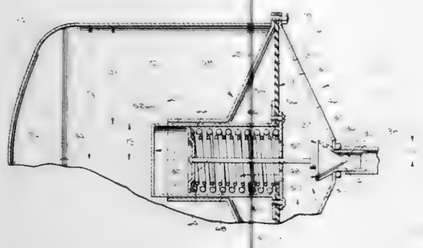
1. In a condition responsive valve construction for varying the output pressure of said valve construction in relation to a movable part of a condition responsive means of said valve construction that is moved in relation to the condition sensed thereby, said valve construction having a housing means provided with an inlet to be interconnected to a fluid pressure source and an outlet separated from said inlet by main valve means and being adapted to be interconnected to vent by vent valve means, said valve means being controlled by said condition resonsive means, said vent valve means comprising a movable vent valve member and a movable vent valve seat adapted to be opened and closed by said vent valve member, the improvement comprising biasing means operatively interconnecting said movable part of said condition responsive means to said vent valve seat of said vent valve means to urge the same to an open condition relative to said vent valve member by a force that is changeable by the condition sensed by said condition responsive means.

4,177,925
HEATER ADAPTER FOR IMPROVED AUTOMOBILE HEATER PERFORMANCE
Lloyd W. Ashling, 10101 Lyndale Ave. South, #212, Bloomington, Minn. 55420
Filed Jun. 19, 1978, Ser. No. 916,746
Int. Cl.[2] B60H *1/02*
U.S. Cl. 237—12.3 B **4 Claims**



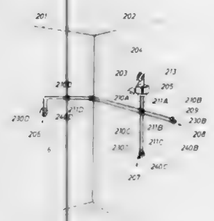
1. A method of improving heater performance of an automotive vehicle of the type having:
an internal combustion engine;
internal coolant passages in the engine and having a first coolant outlet and a coolant inlet,
an intake manifold mounted on the engine and communicating with the internal coolant passages and having a second coolant outlet;
a vehicle mounted radiator having an inlet and an outlet, the radiator inlet being connected to the first coolant outlet, a coolant pump connected between the radiator outlet and the coolant inlet of said engine to circulate liquid engine coolant through the engine between the coolant inlet and the first and second coolant outlets;
a vehicle mounted heater core having an inlet and an outlet, a first conduit connecting the heater core outlet to the coolant pump inlet, a second conduit normally causing the heater core inlet to receive coolant from the second coolant outlet;
a thermostatic valve connected to the engine and adjusted to control coolant flow from the first coolant outlet, the thermostatic valve being closed at temperatures below a predetermined value to prevent coolant flow through the radiator and opening in response to temperatures above the predetermined value to permit a controlled flow of coolant through the radiator;
the method comprising:
connecting a detachable fitting to the first coolant outlet with an auxiliary outlet between the first coolant outlet and the thermostatic valve,
and providing a fluid connection directly from the auxiliary outlet of said fitting to the heating core inlet independently of the second conduit so that heated fluid from the engine is supplied directly to the heater core rather than merely through the intake manifold.

4,177,926
WATER ACCUMULATOR-DISTRIBUTOR FOR AGRICULTURAL SPRINKLER
Edwin J. Hunter, Rancho Santa Fe, Calif., assignor to The Toro Company, Riverside, Calif.
Filed Mar. 30, 1978, Ser. No. 891,825
Int. Cl.[2] B05B *1/08*
U.S. Cl. 239—99 **22 Claims**



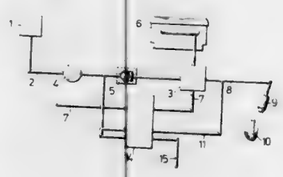
1. An improved water accumulator-distributor for an agricultural sprinkler comprising:
(a) a hollow closed body having an inlet adapted for connection to a source of fluid under pressure and an outlet opening including a valve seat;
(b) a flexible diaphragm disposed within said body to divide said body into two chambers, said inlet and said outlet opening being in communication with one of said two chambers, the other of said two chambers being filled with compressed gas at a pressure less than the minimum pressure of said fluid under pressure;
(c) a valve member adapted for sealed mating with said valve seat to close said outlet opening to prevent fluid from exiting said one of said two chambers to said outlet opening, said member being movable between a first position where said valve seat is closed thereby and a second position where said valve seat is open for the passage of fluid therethrough to exit said body through said outlet opening;
(d) first bias means carried by said flexible diaphragm for increasingly urging said valve member towards said second position as said flexible diaphragm is flexed by an increasing volume of fluid under pressure being introduced into said one of said two chambers through said inlet, said first bias means being adapted to produce a maximum bias force insufficient to lift said valve member from said valve seat against the differential pressure of said fluid in said one chamber when said valve member is in said first position and sufficient to move said valve member completely from said first position to said second position when said differential pressure is removed therefrom; and,
(e) means carried by said flexible diaphragm for lifting said valve member from said valve seat an amount sufficient to remove the differential pressure therefrom when said diaphragm reaches its desired point of maximum flexure from the passage of fluid under pressure into said one of said two chambers whereby said valve member is moved to said second position by said first bias means to allow the water accumulated in said one chamber to be expulsed through said outlet opening.

4,177,927
APPARATUS FOR SHAPING AND POSITIONING FLUID DISPERSAL PATTERNS
Thomas R. Simmons, 3510 Lobit, Dickinson, Tex. 77027
Filed Dec. 14, 1977, Ser. No. 860,394
Int. Cl.[2] B05B *1/08;* **A47K** *3/00, 3/22*
U.S. Cl. 239—101 **4 Claims**



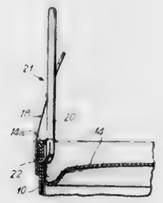
1. A fluid dispersal system for discharging an oscillating fan-like stream of liquid, comprising
a pair of conduits aligned in a plane and interconnected to receive and carry a flow of liquid,
nozzle means interconnected with said conduits for discharging said liquid as a fan-like stream positioned substantially perpendicular to said plane, said nozzle means includes a deflector means therein for forming said fan-like stream, said control means causes the stream to sweep between preselected limits of oscillating travel with said plane, said nozzle means further comprises a tubular conduit member formed into a substantially U-shaped configuration including a pair of legs lying in the same plane and joined by an arcuate portion, said arcuate portion having first and second exterior surfaces spaced opposite one another, an aperture in said first surface of substantially wedge shape when viewed in a direction perpendicular to said plane and of a shape substantially that of a sector of a circle when viewed in a direction parallel to said plane, said deflector means being formed by said second surface having a crimp therein extending substantially perpendicular to said plane, and
control means interconnected with said conduits for oscillating said fan-like stream in parallel alignment with said plane and at a predetermined rate of approximately 0.5 seconds.

4,177,928
DEVICE FOR CLEANING WINDSHIELDS, HEADLAMP LENSES, REAR VIEW MIRRORS, REFLECTOR MEANS OR THE LIKE OF A VEHICLE
Lars A. Bergkvist, Gottne, 890 26 Moliden, Sweden
Filed Feb. 23, 1976, Ser. No. 660,677
Claims priority, application Sweden, Feb. 24, 1975, 7502058
Int. Cl.[2] B05B *1/24*
U.S. Cl. 239—129 **8 Claims**



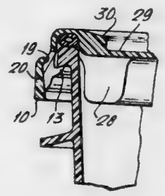
1. A system to be installed in vehicles for cleaning windshields, headlamp lenses, rear view mirrors, reflector means or the like of the vehicle, comprising: liquid container means; a steam generator having heating means adapted to be connected to an energy source in the vehicle; conduit means, including pump means having at least one pump connected between the liquid container means and said steam generator for advancing liquid in the conduit means from the container means, and said conduit means including a check valve downstream of said pump to prevent return flow of liquid from the steam generator to the container means; outlet conduit means connected to said steam generator for passing steam from the steam generator to the vehicle parts to be cleaned; shunt conduit means from said first mentioned conduit means by-passing said steam generator and having a connection to the outlet conduit means so that steam from the generator meets and intermixes with liquid from the shunt conduit and advances the mixture to the vehicle part or parts to be cleaned.

4,177,929
FLIP-TOP CAN CONSTRUCTION
John C. Murray, R.D. #1, Broad Top, Pa. 16621
Filed Nov. 2, 1978, Ser. No. 956,949
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—270 **5 Claims**



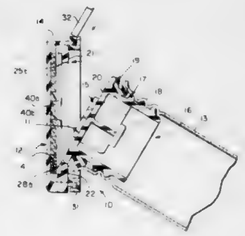
1. A can for containing a liquid comprising a cylindrical main body portion, a lid portion including a removable lid segment and an upstanding lip surrounding said lid portion and means provided for securing said segment to said lip after its removal from said lid portion, said lid portion being generally circular with a diameter and a center and said means comprising an opening defined by said lip, said segment extending through said opening after its removal.

4,177,930
CLOSURE HAVING OPENING MEANS
Victor E. Crisci, Wellsburg, W. Va., assignor to Polysar Resins, Inc., Leominster, Mass.
Filed May 30, 1978, Ser. No. 910,527
Int. Cl.[2] B65D *43/26*
U.S. Cl. 220—284 **10 Claims**



1. A closure for a container comprising:
(a) a cover portion; and
(b) a continuous rim flange extending around the cover portion;
(c) the rim flange extending downwardly from a base end to a free end and having:
(i) a circumferentially discontinuous and radially inwardly projecting locking bead for locking engagement with a container;
(ii) a plurality of circumferentially spaced-apart access regions disposed between the base end of the flange and the locking bead and in circumferential positions between adjacent discontinuous sections of the locking bead to enable a closure removal tool to be inserted downwardly through each access region and between adjacent discontinuous sections of the bead; and
(iii) a plurality of rim stiffening protrusions which project from the outer surface of the flange in at least said circumferential positions between the discontinuous sections of the bead and which overlie the circumferential line of the locking bead to resist bending of the flange circumferentially in said circumferential positions upon prising of the free end of the rim flange radially outwards by the closure removal tool inserted downwardly through the access regions and to assist bending outwards of the flange circumferentially at each side of said access regions to promote radial outward movement of the locking bead.

4,177,931
BREAKAWAY GAS CAP
John H. Evans, Connersville, Ind., assignor to Stant Manufacturing Company, Inc., Connersville, Ind.
Filed Oct. 4, 1978, Ser. No. 948,424
Int. Cl.[2] B65D *41/04, 41/32*
U.S. Cl. 220—288 **12 Claims**

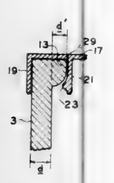


1. A cap for an automobile fuel fill neck, comprising an inner portion having a central portion adapted to close and seal the neck and having peripheral portions, an outer portion carried by said peripheral portions and providing a hand engaging surface to be used to insert and remove the central portion from the neck, said inner portion including a frangible section defined between the central portion and the peripheral portions to enhance breakage of the gas cap without affecting the closure and sealing of the neck.

4,177,932
THERMOPLASTIC CONTAINER FOR STORING AND DISPENSING SOLID PARTICULATE MATERIAL
Bruce T. Cleevely, Pittsburgh, Pa., assignor to The C. F. Sauer Company, Richmond, Va.
Filed Mar. 6, 1979, Ser. No. 18,062
Int. Cl.[2] B65D *39/00*
U.S. Cl. 220—307 **6 Claims**

1. In a thermoplastic container for storing and dispensing solid particulate material, the container comprising a body portion having side and end walls, a closed bottom end and an open mouth, and a friction fit dispensing cap having a downwardly extending outer wall and spaced downwardly extending locking flange carrying locking ribs thereon, the improvement wherein:
said body portion is of unitary, seamless, thermoplastic construction having adjacent the open mouth thereof inwardly extending locking and sealing beads, the locking

portion of said beads being along the walls of said body portion and having a thickness sufficient to frictionally lock the cap onto said body portion through contact with



the upperside of ribs of said cap, and the sealing portion of said beads being at the juncture of adjacent walls of said body portion and having a thickness less than that of the locking portion of said beads.

4,177,933

CONTAINER AND CLOSURE THEREFORE

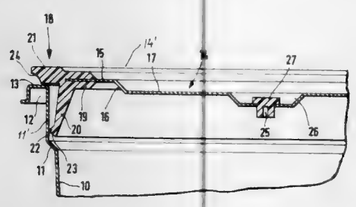
Gunter Lumpp, Reutlingen, Fed. Rep. of Germany, assignor to Rieber Werke Heinrich Rieber KG, Reutlingen, Fed. Rep. of Germany

Filed Sep. 21, 1978, Ser. No. 944,377

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1977, 7731724[U]

Int. Cl.² B65D *39/00*

U.S. Cl. 220—307 **9 Claims**



1. A container, comprising a container body provided with a neck portion forming an opening; and a removable lid operative for firmly closing said opening and including a cap body adapted to substantially cover said opening of the container when the latter is in assembly with the lid, an outer elastomeric rim circumferentially and outwardly projecting from said cap body and comprising a lower annular portion extending substantially normal to the elongation of said cap body and adapted to firmly engage the inner wall of the neck portion of the container when the latter is in assembly with the lid, said lower portion being provided with a free end opposite said cap body and having a bulge extending outwardly from said free end and formed with an inclined surface, said rim further comprising an upper portion so spaced from said lower portion as to engage the outer upper surface of the neck portion when said lower portion is inserted all the way in said opening, thus preventing further penetration of the lid inside the opening of the container and ensuring firm closing of the container, said upper portion of the rim being provided on an inner side thereof with a shoulder part defining a space between the upper outer surface of said neck portion and the inner side of said shoulder part, so as to define a gripping surface on said upper portion operative to be gripped when said lid is to be withdrawn from said opening.

4,177,934

CONTAINER AND LID

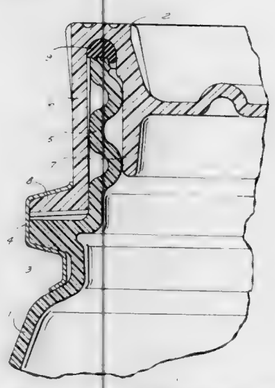
Theo Hammes, Cologne, and Alois Hoff, Brühl, both of Fed. Rep. of Germany, assignors to Mauser Kommandit-Gesellschaft, Brühl, Fed. Rep. of Germany

Continuation of Ser. No. 701,870, Jul. 1, 1976, abandoned. This application Jun. 7, 1978, Ser. No. 913,032

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1975, 2544491

Int. Cl.² B65D *45/32, 43/06, 7/42*

U.S. Cl. 220—319 **6 Claims**



1. A container, comprising in combination a container body including an upper wall portion having a predetermined thickness and comprising an upwardly converging section and a substantially upright section above the converging section and with which the converging section is unitarily integrated; a neck portion axially spaced from said upper wall portion and having substantially said predetermined wall thickness; a first radially outwardly extending flange unitarily integrated with the substantially upright section of said upper wall portion of said container and with said neck portion, said first flange having an upper surface and an axial thickness which is equal to substantially twice the thickness of said predetermined thickness; a lid comprising an external wall surrounding said neck portion and which includes a second radially outwardly extending flange having a lower surface abutting against the upper surface of said first flange, said external wall being circumferentially complete so as to insure a uniform distribution of load applied to said wall and resulting from forces acting axially upon said container; and an annular connecting element operative for urging said first and second flanges together into alignment in the axial direction of the container and for uniformly clasping the flanges to thereby eliminate undesirable local deformation of said element due to the same forces and thus to insure permanent sealing closure of the container by said lid.

4,177,935

LINED BULK CONTAINER AND METHOD OF FORMING SAME

Michael J. Centanni, New Orleans, La., assignor to The Continental Group, Inc., New York, N.Y.

Filed Apr. 7, 1978, Ser. No. 894,542

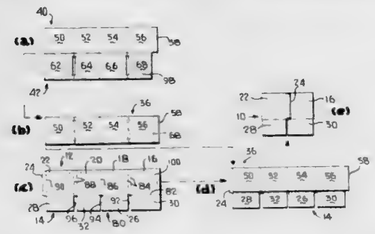
Int. Cl.² B65D *5/56;* **B31B** *49/02*

U.S. Cl. 220—417 **9 Claims**

1. A method of forming a knocked-down double lined box, said method comprising in a continuous flow providing a liner blank including first and second liner portions joined along a longitudinal fold line and wherein the first and second liner portions are divided into panels by longitudinally spaced transverse fold lines aligned in the two liner portions, there being

formed slots along at least two of the furthest longitudinally remote ones of said longitudinally spaced transverse fold lines of said second liner portion, folding said liner blank along the longitudinal fold and adhesively bonding together the two liner portions, providing a flat box blank having a body portion with transverse fold lines of the same general longitudinal spacing as in the liner portions, positioning the folded and bonded liner blank relative to the box blank body portion and bonding the one of the liner portions to the box blank body portion, and then folding the assembled box blank and liner blank as a unit along the two longitudinally remote transverse fold lines to form the knocked-down double lined box.

7. A knocked-down liner box, said box comprising a generally rectangular box blank including an elongated body portion divided into a plurality of panels by longitudinally spaced transverse fold lines, a generally rectangular liner blank including first and second elongated liner portions integrally joined along a longitudinal fold line and disposed in relative overlying relation, said first and second liner portions being adhesively



bonded together, said liner portions having aligned transverse fold lines longitudinally spaced in accordance with the longitudinal spacing of said box blank fold lines, said second liner portion being adhesively bonded to said box blank body portion, said transverse fold lines including at least two of which are longitudinally remote transverse fold lines remote from the center of said liner blank defining outer panels and other fold lines defining inner panels, the assembled box blank and liner blank outer panels being folded into relatively overlying relation with respect to said inner panels of said box blank and liner panels, said second liner portions having transverse slots along said longitudinally remote transverse fold lines receiving aligned material of said folded first liner portion, said slots being of a selected length which assures square folding of said outer panels relative to said inner panels, said slots each forming a portion of a respective longitudinally remote transverse fold line and having opposite ends terminating remote from an adjacent end of a respective longitudinally remote transverse fold line.

4,177,936

VARIABLE FLUTE CONTAINER

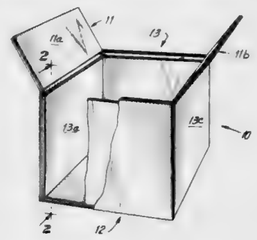
Mack L. Ford, Jr., Westerville, and William W. McFarland, Wooster, both of Ohio, assignors to International Paper Company, New York, N.Y.

Continuation of Ser. No. 803,970, Jun. 6, 1977, abandoned. This application Sep. 20, 1978, Ser. No. 943,772

Int. Cl.² B32B *3/28;* **B65D** *25/14*

U.S. Cl. 220—441 **2 Claims**

1. In a corrugated container comprising a top portion, a bottom portion and a main body therebetween, the top portion, bottom portion and main body consisting of in combination at least one integral material layer and an integral double face liner, each material layer consisting of a single face liner and a fluting medium, the fluting medium having one free side and the other side thereof being attached to one side of the single face liner, each material layer being attached to the next of the material layers in sequence such that the other side of the single face liner of the next material layer is attached to the free side of the fluting medium of the previous material layer in sequence, and the double face liner being attached to the free side of the fluting medium of the final of the material layers in sequence, the improvement comprising at least one contiguous reinforcing layer on the main body between the last material layer in sequence thereof and the double face liner whereby the main body is reinforced as compared to the top and bottom portions, each reinforcing layer consisting of a single face liner and a fluting medium, the fluting medium having one free side



and the other side being attached to one side of the single face liner, the first of the reinforcing layers being attached to the main body such that the other side of the single face liner of the reinforcing layer is attached to the free side of the fluting material of the last material layer in sequence and the other of the reinforcing layers being attached in similar sequence to the first of the reinforcing layers, the double face liner being attached to the fluting medium of the final of the reinforcing layers in sequence.

4,177,937

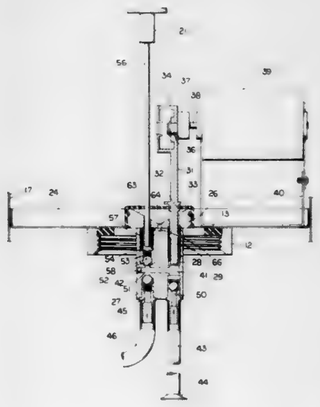
CONSTANT PRESSURE SPRAYING APPARATUS

Robert E. Stevens, and Albert L. Schlensker, both of Westfield, Ind., assignors to Curtis Dyna Products Corporation, Westfield, Ind.

Filed May 11, 1978, Ser. No. 904,768

Int. Cl.² F04B *49/08, 49/06*

U.S. Cl. 222—63 **5 Claims**



1. A constant pressure pumping assembly adapted to be mounted on one wall of a tank containing a liquid to be pumped from the tank, said assembly comprising a base plate, a flow control body extending from one face of said base plate into said tank, a pump piston extending into a piston bore in said control body, an electric motor and a pump discharge

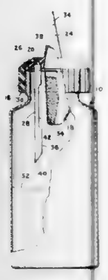
pressure responsive switch controlling the motor both mounted on said base plate, motion transmission means between said motor and piston whereby when said motor is energized said piston is reciprocated in said bore to provide a positive displacement pump, check valve controlled suction and discharge passages in said control body communicating with the space adjacent the working face of the piston, a by-pass passage communicating with said space and with the interior of the tank, a priming member for blocking said by-pass passage when in operating position and opening said by-pass passage when in priming position, a closure member for said flow control body overlying said body and extending from the other face of said base plate, the outer surface of the closure member having a concave configuration with a drain aperture at its lowermost point, said piston bore intersecting said concave surface whereby fluid leakage past said piston is directed by said concave surface into said drain aperture.

4,177,938

CONTAINER WITH MIXING CARTRIDGE

Guido J. Brina, 9 Club Cir., Monmouth Beach, N.J. 07750

Filed Jun. 30, 1977, Ser. No. 811,587
Int. Cl.² B65D *25/08*
U.S. Cl. 222—80 **6 Claims**



1. A container for storing separate components and for mixing said components comprising:

a vessel having a mouth;

a cap adapted to engage the mouth of said vessel;

a sealed cartridge disposed in the mouth of said vessel, said sealed cartridge asymmetrically formed to partially fill the mouth of said vessel to leave a passage therein for the flow of liquids therethrough; and having an upper and lower surface

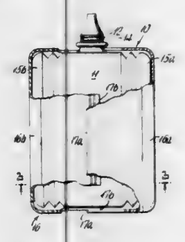
a piercing member connected to said cap of said vessel, disposed asymetrically on said cap to extend through the passage in said mouth of said vessel when said cartridge member and said cap are aligned in a first relative position, and to extend through upper and lower surfaces of said cartridge member when said cartridge member and said cap are aligned in a second relative position, so that the contents of said vessel can pass through said passage left in the mouth of said vessel without piercing the cartridge when said piercing member is in said first position, and the contents of said cartridge will be passed through the hole produced by said piercing member upon the positioning of said piercing member through said cartridge.

4,177,939

SQUEEZE BOTTLE

Ralph H. Thomas, Clark, N.J., assignor to Bristol-Myers Company, New York, N.Y.

Filed Jul. 22, 1977, Ser. No. 817,958
Int. Cl.² B65D *1/32*
U.S. Cl. 222—153 **3 Claims**



1. A squeeze bottle comprising a container having a neck portion containing a spray unit and bellowed side walls

(a) said bellowed side walls being adapted to be compressed inwardly to apply pressure to the contents of said container and to return to their normal position when the pressure is released;

(b) shroud means encompassing at least a portion of each of said bellowed side walls, said shroud means comprising a pair of sections each having free inner margins disposed in overlapping relationship with respect to each other, each of said shroud sections being adapted to move inwardly when compressed and to apply pressure to said side bellowed walls; and

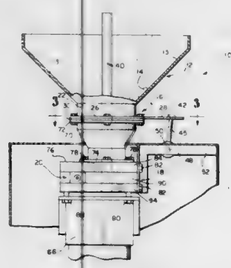
(c) the overlapping portions of said shroud sections having bead and groove means disposed in mating relationship, said mating relationship being adapted to be released by a predetermined pressure applied inwardly to said shroud sections.

4,177,940

FLOCK FIBER FEEDING APPARATUS HAVING A PLURALITY OF IMPELLERS AND A VENTURI FLOW TUBE

John P. McHugh, Lexington, Ky., assignor to Solar Suede Corporation, Lexington, Ky.

Filed Apr. 1, 1977, Ser. No. 783,801
Int. Cl.² B67D *5/54*
U.S. Cl. 222—636 **10 Claims**



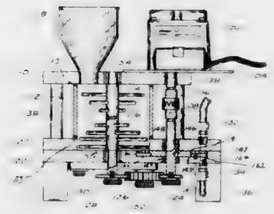
1. Flock fiber feeding apparatus comprising a fiber-receiving hopper having a downwardly open discharge passage; means for urging flock fibers downwardly through the discharge passage; a pump mounted below the discharge passage and having a pump chamber in communication with the discharge passage, said pump having a pump throat in communication with the pump chamber; a shaft extending substantially vertical within the hopper and within the pump chamber of said pump; an impeller mounted on said shaft within the pump chamber; a motor connected to said shaft for drivingly rotating said shaft so that said impeller sweeps flock fibers into the inlet end of the pump throat; and a venturi flow tube at an angle to and in communication with the outlet end of the pump throat so that flock fibers are drawn by suction out of the throat and into the flow tube when an air stream is passed through said flow tube for entrainment of the fibers with the air stream, said pump throat extending transversely to the shaft.

4,177,941

METERING DEVICE

Basil K. J. Leong, Portage, Mich., assignor to International Research and Development Corporation, Mattawan, Mich.

Filed Nov. 2, 1977, Ser. No. 847,774
Int. Cl.² G01F *11/24*
U.S. Cl. 222—636 **16 Claims**



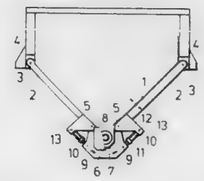
1. In a metering device for metering a powdered material which is capable of handling both free-flowing powders and non free-flowing powders, which device comprises a mixing chamber having a rotary-driven stirring means therein, and rotary-driven metering means for removing measured portions of powdered material from said mixing chamber, the combination therewith of a motor which is connected to drive one of said stirring means and said metering means directly, and the other indirectly, in which said stirring means and said metering means are connected together by a power-transfer means adapted to maintain a predetermined rate of rotation of one of said means with respect to the other, said power-transfer means being adjustable so that the said predetermined rate of rotation can be altered, and in which said power-transfer means comprises a gear train having a changeable gear ratio.

4,177,942

SILO DISCHARGING MEANS

Seppo Häkkinen; Niilo Nyman; Ossi Kilpeläinen; Ilmari Paakkinen, all of Savonlinna; Kari Rautapaa, Punkasalmi, and Seppo Rasimus, Savonlinna, all of Finland, assignors to Enso-Gutzeit Osakeyhtiö, Helsinki, Finland

Filed Mar. 17, 1978, Ser. No. 887,839
Claims priority, application Finland, Mar. 30, 1977, 770986
Int. Cl.² B65G *3/12*
U.S. Cl. 222—198 **7 Claims**



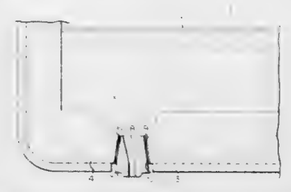
1. Improvement in discharging means for a silo comprising side walls including upright supports, and a pair of bottom plates arranged in a V-shaped configuration with said bottom plates extending downwardly from said side walls and inwardly toward one another in the downward direction, said bottom plates each having an upper margin and a lower margin, the lower margin of said bottom plates being spaced apart and forming therebetween a discharge aperture through which goods can be discharged from said silo, and actuating means connected to said bottom plates for moving said bottom plates in a reciprocating manner, wherein the improvement comprises that each said bottom plate is pivotally connected at the upper margin thereof to said side walls, connecting means pivotally connected to each of the lower margins of said bottom plates, said actuating means pivotally connected to said connecting means at locations spaced from the pivotal connection of said connecting means to said bottom plates, the pivotal connections of said connecting means to said bottom plates and to said actuating means forms a quadrangle linkage, and said actuating means arranged for moving the bottom margins of said bottom plates in a reciprocating manner so that said bottom plates pivot about the connections thereof to said side walls.

4,177,943

REFRACTORY RELEASING AGENT

Hiroyuki Suzuki, Tokyo, Japan, assignor to Daishin Kako Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1977, Ser. No. 813,873
Int. Cl.² B22D *41/02, 41/08*
U.S. Cl. 222—591 **4 Claims**



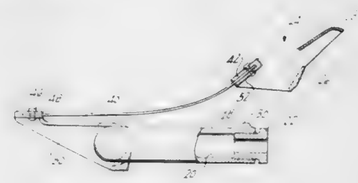
1. A ladle having a nozzle-receiving bore, wherein said bore is coated with the releasing agent comprising graphite powder in an amount sufficient for imparting lubricity to the releasing agent, water and at least one kind of water-soluble and gelatinizable polysaccharide dissolved in the water in an amount sufficient for gelatinizing the releasing agent so as to impart coating capability and adhesiveness to the receiving agent and wherein a refractory nozzle is inserted into said nozzle-receiving bore so as to be in contact with said releasing agent.

4,177,944

ROTARY IRRIGATION SPRINKLER

William J. Wichman, Glendora, Calif., assignor to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.

Filed Aug. 16, 1978, Ser. No. 933,987
Int. Cl.² B05B *3/14*
U.S. Cl. 239—230 **10 Claims**



1. A rotary irrigation sprinkler comprising:

V 9 8 9 2 2 DEC 11 79 UMI

a body member mounted for rotation about a substantially vertical axis;

means for periodically impacting said body member thereby imparting to said body member an increment of rotational movement about said vertical axis, said means deriving said rotational movement from a stream of water ejected from said sprinkler;

said means for impacting being supported on a first end of a flexible arm of inherent resiliency; and

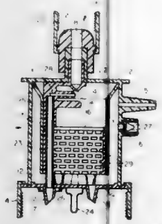
a second opposite end of said flexible arm means being secured to said body member.

4,177,945

HUMIDIFIER UNIT

Charles M. Schwartz, Columbus, Ohio, and Eugene J. Meierhoefer, Hackettstown, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 6, 1978, Ser. No. 883,609
Int. Cl.² A61M *11/02*; B05B *7/30*
U.S. Cl. 239—338 **13 Claims**



1. A unit for producing an entrained liquid aerosol in a pressurized gas stream comprising a vacuum-tight bottle for supplying the liquid and an adapter head for coupling the liquid pressurized gas stream,

(A) wherein the bottle comprises

(i) reservoir means for the liquid including a breachable seal,

(ii) connecting means including a breachable seal for communicating with the liquid in the reservoir means and supplying the liquid through a liquid passage to the adapter head, and

(B) wherein the adapter head comprises

(iii) housing means having an inlet opening for pressurized gas, an exit opening for aerosol laden pressurized gas and first and second breaching cannulae below the inlet and exit openings and on the lower extreme of the housing means,

the first cannula breaching the breachable seal of the connecting means for communicating with the liquid so as to be in liquid communication with the reservoir means, the second cannula breaching the breachable seal on the reservoir means so as to be in communication with the reservoir means for returning excess liquid from the housing means to the reservoir means,

(iv) means forming a vacuum-tight seal between the first cannula and the connecting means for communicating with the liquid in the reservoir,

(v) venturi means fixed within the housing means including a venturi channel and a perpendicular liquid passage operatively associated with the venturi channel and downstream thereof so that the pressure drop of gas passing through the venturi channel causes liquid droplets from the liquid passage to be inspired therein,

(vi) means for connecting the venturi channel with the pressurized gas stream, and

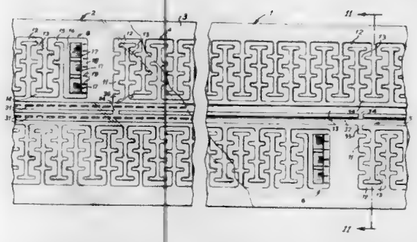
(vii) means forming a vacuum-tight connection between the liquid passage and the first cannula whereby the liquid passage is in liquid communication with the reservoir means.

4,177,946

INTEGRAL DRIP IRRIGATION SYSTEM

Jaime Sahagun-Barragan, Calle del Teco 287, Zamora, Mich., Mexico

Filed Mar. 23, 1978, Ser. No. 889,398
Claims priority, application Mexico, Apr. 11, 1977, 168682
Int. Cl.² B05B *15/00*
U.S. Cl. 239—533.1 **11 Claims**



1. An integral drip irrigation system of the type comprising an elongated laminate forming an integral part of a piping for carrying irrigation liquid and constituted by a flexible plastic sheet, thermally deformed to provide a plurality of cavities therein and a flat flexible plastic sheet adhered to said deformed sheet at the most prominent areas thereof to complete passages and chambers with said cavities, said passages and chambers comprising at least one elongated winding passage running along the laminate; at least one irrigation liquid admission zone capable of receiving said liquid from said pipe and feed it to said at least one winding passage through one end thereof; at least one discharge zone capable of receiving the irrigation liquid delivered through the opposite end of said at least one winding passage and controlledly discharging it outwardly of the laminate; and emitter opening provided on one of the faces of the laminate at said at least one discharge zone; an integrated filtration system for the irrigation liquid which comprises at least a thin slit for retaining solids, provided in said laminate at the face opposite the face containing said discharge opening and coincident with said at least one admission zone; and an integrated pressure compensating system comprising a non-supported area of said flat sheet, spanning at least one discharge zone, so that when the pressure in the pipe increases the non-supported area of said flat sheet acts as a compensating diaphragm by controlledly narrowing the cross sectional area of said at least one discharge zone in proportion to the increase of the pressure in the piping for carrying the irrigation liquid.

4,177,947

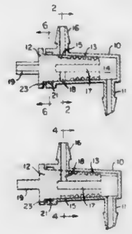
IRRIGATION DEVICE

Stanley W. O. Menzel, Santee, Calif., assignor to Reed Irrigation Systems Pty. Ltd., Elizabeth, Australia

Filed Oct. 13, 1978, Ser. No. 951,111
Int. Cl.² B05B *15/00*
U.S. Cl. 239—542 **5 Claims**

1. An irrigation device with variable flow control comprising,

a hollow body closed at one end and open at the other end and having a first nipple and a second nipple spaced from each other along said hollow body, and within the body a rotatable key having a periphery which closely fits the hollow of the body and is inserted into the body from said other end and said key having an inner end terminating adjacent the closed end of the said hollow body to leave a space at said closed end of the body with which a passage in the first nipple communicates, the key having a channel formed therein which extends from said space to the periphery of the key remote from the said inner end and in one rotational position of the key communicates with a passage in said second nipple, the key having a peripheral helical groove which communicates at one end with the



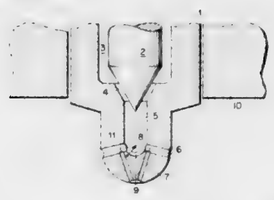
said space and at the other end with a channel which communicates with said passage of said second nipple when the key is in another rotational position, and means to removably hold the key in said body.

4,177,948

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES WITH INTERNAL MIXING

Wolfgang Schaffitz, Munich, Fed. Rep. of Germany, and Eugen W. Huber, deceased, late of Munich, Fed. Rep. of Germany (by Gerda A. O. Huber-Pfitzold, Anke H. L. Huber, Christina G. E. Huber, heirs), assignors to Institut für Motorenbau Professor Huber Eingetragener Verein, Munich, Fed. Rep. of Germany

Filed Mar. 16, 1977, Ser. No. 778,211
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1976, 2610927
Int. Cl.² B05B *1/30*
U.S. Cl. 239—533.3 **3 Claims**



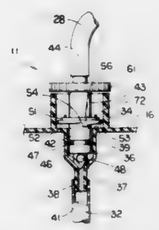
1. A fuel injection nozzle for internal combustion engines with internal mixing, in which the fuel flows through an injection hole bore having an inlet and an outlet end to the combustion chamber under a high pressure upstream of the inlet end of said injection hole bore, and in which a constriction of the flow cross section of the fuel occurs in the injection hole bore in a region downstream from and adjacent to the inlet end of said injection hole bore due to a reduction of static pressure in said region, the flow cross section of the injection hole bore remaining the same as the flow of fuel through said nozzle is varied, characterized in that a communicating bore connecting the combustion chamber and the injection hole bore is formed to communicate with said region of said injection hole bore to convey gas from the combustion chamber into a space of relative sub-pressure surrounding the flowing fuel in said region.

4,177,949

FOG GENERATING APPARATUS

Russell R. Curtis, Indianapolis, and Albert L. Schlensker, Westfield, both of Ind., assignors to Curtis Dyna Products Corporation, Westfield, Ind.

Filed May 19, 1978, Ser. No. 907,882
Int. Cl.² B05B *1/30*
U.S. Cl. 239—582 **4 Claims**



1. An adjustable metering valve for a fog generating apparatus of the type in which an electric motor-driven fan provides aspirating air movement drawing liquid at a relatively low flow rate from an adjacent liquid reservoir and delivering it to an atomizing means, said adjustable metering valve being adapted to control the flow of liquid from said reservoir to said atomizing means, said metering valve comprising a valve body having a central longitudinal bore with an inlet aperture at one end, a valve seat formed in said body adjacent the intake end of said bore and an annular transverse shoulder formed in said body encircling said bore and spaced from said inlet aperture, a hollow valve stem received within said bore and extending beyond said housing at one of its ends and cooperating with said valve seat at its other end, a transverse passage in said valve stem upstream of said valve seat and communicating with the interior of the valve stem, an annular flange on said valve stem adjacent said shoulder, cooperating cam elements on said shoulder and said stem flange comprising two camming surfaces each extending for approximately 180° of the flange surface and varying uniformly from a minimum to a maximum thickness in said approximate 180° extension, and two diametrically opposite abutments each engaging one of said cam surfaces, said cam elements being operative to axially displace said valve stem with relation to said valve seat between full closed and full open positions upon approximately 180° of rotation of said stem, and a member carried by the portion of said stem exterior of the housing for facilitating manual adjusting rotation of said stem within the housing.

4,177,950

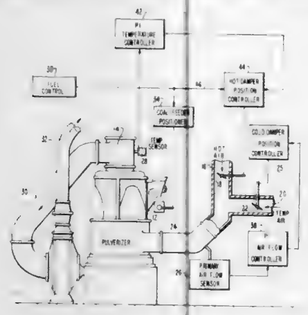
CONTROL FOR A POWER PLANT COAL MILL PULVERIZER HAVING FEEDFORWARD DAMPER POSITIONING

William J. Smith, Verona, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 16, 1978, Ser. No. 878,614
Int. Cl.² B02C *25/00*
U.S. Cl. 241—33 **4 Claims**

1. A control for an electric power plant pulverizer mill having a variable speed feeder and hot and cold air ducts supplying primary air flow through said pulverizer under the control of respective hot and cold air dampers, said control comprising means for sensing the temperature of the mill outlet flow, means for sensing the primary air flow, means for generating a feeder speed demand, means for operating the feeder in accordance with the feeder speed demand, means for positioning the hot damper in accordance with a hot damper position demand, means for positioning the cold damper in accordance with a cold damper position demand, means for generating the damper position demands in response to said flow and tempera-

ture sensing means to control total primary air flow in accordance with a predetermined function and to control the mill outlet temperature in accordance with another predetermined

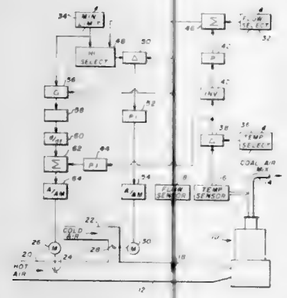


function, and means for applying the feeder speed demand to said damper position demand generating means to produce anticipatory movement of at least one of the dampers in response to feeder speed demand changes.

4,177,951
PULVERIZER AIR FLOW AND TEMPERATURE CONTROL

John A. Makuch, Granby, Conn., assignor to Combustion Engineering Inc., Windsor, Conn.

Filed Jun. 28, 1978, Ser. No. 919,756
Int. Cl.[2] B02C *25/00*
U.S. Cl. 241—35 **10 Claims**



1. A method for controlling the quantities of at least two constituents of a fluid mixture delivered to a mixing point in response to measured parameters of the mixture comprising the steps of:

selecting normal values for first and second parameters of the mixture;

selecting a desired minimum value for the mixture second parameter;

measuring the actual value of the mixture first parameter;

comparing the measured and selected normal values of the mixture first parameter;

adjusting the flow of the first constituent to compensate for any difference between the measured actual and selected normal values of the mixture first parameter when the mixture second parameter is above the selected desired minimum value;

modifying the selected value of the mixture second parameter as a function of any difference between the measured actual and selected normal values of the mixture first parameter;

measuring the actual value of the mixture second parameter;

comparing the measured and modified selected values of the mixture second parameter;

adjusting the flow of the second constituent to compensate for any difference between the measured actual and modified selected values of the mixture second parameter when the second parameter is above the selected desired minimum value;

adjusting the flow of the first constituent as a function of the rate of change of the second parameter when the second parameter is below the selected desired minimum value;

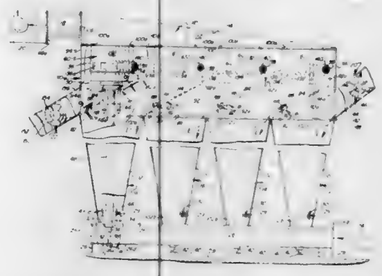
comparing the measured and actual selected desired minimum values of the mixture second parameter when the second parameter is below the desired minimum; and

adjusting the flow rate of the second constituent to compensate for any difference between the measured actual and selected minimum values when the flow rate is below the selected minimum value.

4,177,952
IMPACT SCRUBBER

Leslie D. Rikker, Oak Forest, Ill., assignor to National Engineering Company, Chicago, Ill.

Filed Apr. 24, 1978, Ser. No. 899,226
Int. Cl.[2] B02C *23/18*
U.S. Cl. 241—40 **32 Claims**



1. An impact scrubber for removing coating materials from the surfaces of particulate matter such as spent foundry sand and the like, said scrubber including one or more scrubber cells comprising:

a lift tube open adjacent upper and lower ends for containing a high velocity fluidized stream of said matter;

fluid injector means adjacent said lower end of said lift tube for moving said matter into said lift tube forming an upwardly flowing fluidized stream therein;

adjustable inlet valve means adjacent said fluid injector means for regulating the flow of said matter into said lower end of said lift tube;

target means spaced above the upper end of said lift tube providing an impact area for receiving the impact of said fluidized stream of matter and divering said matter and said coating materials removed therefrom in a generally downwardly extending annular curtain concentrically around said lift tube;

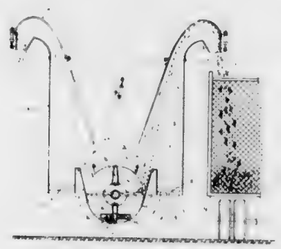
means for directing a secondary fluid flow outwardly of said lift tube at a level below and adjacent the open upper end for angularly intercepting said curtain of flowing matter and coating material and separating said coating materials away from said particulate matter; and

means for exhausting said separated coating materials along with said primary and secondary fluid separately away from said particulate matter.

4,177,953
CHOPPING-RAISING-CLEANING ASSEMBLY FOR SUGAR CANE HARVESTING MACHINES

Luiz Antonio C. Ribeiro Pinto, Ribeirão Preto, Brazil, assignor to Santal Equipamentos S. A. Comercio E. Industria, Sao Paulo, Brazil

Filed Mar. 29, 1978, Ser. No. 891,282
Claims priority, application Brazil, Aug. 26, 1977, 17705738; Nov. 30, 1977, 17707999
Int. Cl.[2] B02C *13/288*
U.S. Cl. 241—58 **25 Claims**



1. Chopping-raising-cleaning assembly for sugar cane harvesting machines of the cutting, chopping, cleaning and loading type, comprising a cylinder having an internal surface and provided with a central, longitudinal, horizontal, rotatably driven shaft, at least one radial fin having an external edge mounted on said shaft, at least the external edge thereof abutting the internal surface of the cylinder, said cylinder formed with an entrance opening substantially no higher than the level of the shaft to allow cane billets pre-cut by a suitable chopping mechanism, to be fed transversely to said shaft, said cylinder also formed with a tangential outlet opening for the billets and arranged to allow the billets fed to the cylinder to be launched outside the cylinder by the action of the fins in a generally vertical path, a billet discharge duct in communication with said tangential outlet opening to receive the discharged billets, said duct being bent upward and to one of the sides of the housing generally parallel to said central shaft, means mounting said duct for rotation of about 180° around a vertical axis passing through the center of said outlet opening, said duct formed adjacent its base with two opposed openings, fan means mounted externally of said duct for providing a forced transversal air stream through said opposed openings.

4,177,954
HAMMER-ROLL RECYCLING PLANT

Arlen J. Ostreng, Rte. 3, Robill Ct., Box 627, LaCrosse, Wis. 54601

Continuation-in-part of Ser. No. 771,013, Mar. 8, 1977, abandoned. This application Jan. 17, 1978, Ser. No. 870,064
Int. Cl.[2] B02C *13/28*
U.S. Cl. 241—167 **8 Claims**

1. An apparatus for crushing reinforced concrete and the like comprising:

a housing;

a rotor rotatably mounted within said housing and having an axis of rotation;

means for rotating said rotor;

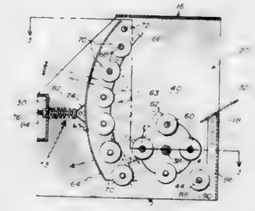
a plurality of hammer cylinders;

means for rotatably mounting said hammer cylinders to said rotor so that no translational movement of the cylinder relative to the rotor is permitted;

said mounting means comprising a plurality of shafts fixed to said rotor assembly, each of said shafts having a longitudinal axis parallel to the axis of rotation of said rotor, said plurality of shafts being substantially equidistantly spaced circumferentially about said rotor;

each of said hammer cylinders having a length at least as great as its diameter;

a breaker bar assembly mounted to said housing a predetermined distance from said rotor and said hammer cylinders;

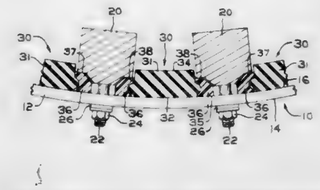


said hammer cylinders being rotatably mounted on said shafts with a sliding fit allowing only rotational movement of said hammer cylinders relative to said rotor.

4,177,955
MILL WEAR MEMBER

Larry G. Miller, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 2, 1978, Ser. No. 911,856
Int. Cl.[2] B02C *17/22*
U.S. Cl. 241—183 **4 Claims**



1. In a liner member for use in rotary drum type mills having spaced lifter bars at interior surface areas of the mill, which liner member is adapted for disposition between a selected pair of said lifter bars and comprises a resilient portion of vulcanized elastomeric material having a widthwise dimension substantially corresponding to the spacing between said selected pair of lifter bars, the improvement wherein said liner member further comprises a rigid plastic portion bonded along each longitudinal margin of said resilient portion.

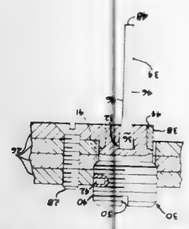
4,177,956
COMMINUTION MACHINE WITH PULVERIZING BLADE ASSEMBLY

William E. Fawcett, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Mar. 27, 1978, Ser. No. 890,530
Int. Cl.[2] B02C *13/28*
U.S. Cl. 241—188 A **7 Claims**

1. A blade assembly for pulverizing machines comprising: plug means having a slotted portion formed therein, blade means with one end disposed in said slot and another end extending away from said plug, shrinkable collar means for holding said blade and said plug in assembled relation, said walls of said slotted portion tapering outwardly from one another as they extend into said plug, said one end of said blade having sides that taper outwardly from one another as they

extend into said plug, said tapering sides and walls forming cooperating elements of abutment means so as to urge said one



end of said blade into firm engagement with the bottom of said slotted portion of said plug.

4,177,957

APPARATUS FOR CLAMPING A THREAD

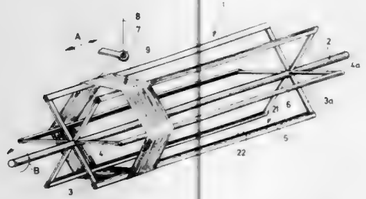
Florian Lucke, Mengen, Fed. Rep. of Germany, assignor to Lucke Apparate-Bau Gesellschaft mit beschraenkter Haftung, Mengen, Fed. Rep. of Germany

Filed Aug. 29, 1978, Ser. No. 937,888

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1977, 2739535

Int. Cl.[2] **B65H** *54/56, 49/30*

U.S. Cl. 242—53 **6 Claims**



1. Apparatus for clamping a thread in a reeling machine, comprising a reeling cage which is rotatably mounted on a machine frame and comprises bars extending parallel to the axis of rotation thereof, and a thread laying device which is displaceable on the machine frame for laying of an incoming thread on the bars of the reeling cage, a strip-like first brush for clamping a thread between its bristles provided on at least one bar of the reeling cage and extending in the longitudinal direction thereof, a thread receiver which is displaceable between retracted and advanced positions on the machine frame transversely to the axis of rotation of the reeling cage, a second strip-like brush supported by the thread receiver for clamping the thread between the thread laying device and the reeling cage when the thread receiver is displaced to its advanced position, and an arm pivotally mounted on the thread receiver for pulling out a certain thread length between the second brush and the thread laying device when the thread receiver is displaced to its advanced position, which thread length, after the thread has been severed between the second brush and the laying device, the reeled thread has been removed and the thread receiver has been displaced to its retracted position, hangs in the path of the first brush and is clampable by the latter.

4,177,958

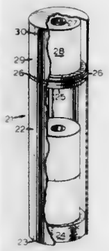
TOILET PAPER SERVICE PEDESTAL

Judith A. Poole, 746-8th Ave. S., S. Saint Paul, Minn. 55075

Filed Jun. 15, 1978, Ser. No. 915,928

Int. Cl.[2] **A47K** *10/22, 10/32*

U.S. Cl. 242—55.42 **2 Claims**



2. A toilet paper service pedestal comprising a hollow elongate body standing vertically on a base end in contact with the floor and being free to be moved laterally on the floor, a dense mass in the base end to stabilize the pedestal against toppling over, with a removable platform on the head end of the pedestal with a vertical spindle on the platform to hold a roll of toilet paper for dispensing short lengths of paper and with access through the removable platform for introducing and removing rolls of toilet paper to and from the hollow body.

4,177,959

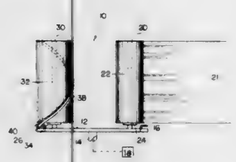
FLYING SPLICE APPARATUS AND PROCESS

William G. Lancaster, 5101 Upper River Rd., and Patrick R. Lancaster, III, 2606 N. Osage, both of Louisville, Ky. 40200

Filed Oct. 2, 1978, Ser. No. 947,828

Int. Cl.[2] **B65H** *19/18*

U.S. Cl. 242—58.2 **17 Claims**



1. An apparatus for effecting a flying splice of vertically positioned rolls of plastic film comprising a reel, means connected to said reel to rotate said reel, a plurality of roll supporting members mounted to said reel, at least one guide member mounted to said apparatus, a roll of plastic film mounted on each of said roll support members, at least one of said rolls being provided with an adhesive strip extending angularly across the surface of the leading edge of the film web with mounting means mounted to said angularly oriented adhesive strip, said mounting means being moveably mounted on one of said guide members, said reel when rotated bringing film dispensed from a lead roll into contact with the adhesive strip on the leading edge of another roll so that the leading edge of the film of the roll is carried off of the roll and said mounting means is carried off of said guide member.

10. A roll of plastic film adapted for use on vertically positioned rolls for effecting a flying splice comprising a roll of plastic film, the leading edge of said plastic film being cut diagonally, an adhesive strip fastened along the edge of the diagonally cut film and tubular means mounted to said adhesive strip at the leading corner of said diagonally cut leading edge, said tubular means being spaced from said roll of film and oriented parallel to the bottom edge of said roll of film to receive a guide member.

4,177,960

AUTOMATIC PAPER SPLICING CONTROL DEVICE

Hiroshi Nakagawa, Yokohama, Japan, assignor to Tokyo Kikai Seisakusho Ltd., Tokyo, Japan

Filed Dec. 5, 1977, Ser. No. 857,136

Claims priority, application Japan, Dec. 30, 1976, 51-159250

Int. Cl.[2] **B65H** *19/14;* **B32B** *31/00;* **B65H** *19/08*

U.S. Cl. 242—58.3 **5 Claims**



1. An automatic paper splicing control device for splicing the adhesive portion of a rotating roll paper with a travelling paper, comprising a depressing means for depressing the travelling paper against the roll paper and onto the part thereof having the adhesive and requiring a time T from its start of operation for causing the travelling paper to contact with the roll paper, pulse generating means for generating pulse signals having a frequency proportional to the revolutions of the roll paper, detecting means for detecting a predetermined position of the adhesive, counting means for counting the number of pulses generated by the pulse generating means during a time T and prior to the start of operation, and control means for modifying the time of occurrence of the start of operation of the depressing means in accordance with the contents counted by the counter during the time T, said detecting means being disposed at a position angularly separated from the position where the roll paper and travelling paper are spliced and in a direction opposite to the rotation of the roll paper, said angular separation corresponding to a maximum number of pulses generated during a time T by a roll paper of minimum diameter and maximum speed which is to be used, whereby the start of operation is delayed from said detecting means position.

4,177,961

EXTENSION CORD HOLDER

Manfred Gruenewald, Woodside, N.Y., assignor to Excel Plastic Products, Inc., Jersey City, N.J.

Filed Jun. 23, 1978, Ser. No. 918,642

Int. Cl.[2] **B65H** *75/36*

U.S. Cl. 242—85.1 **8 Claims**



1. An integrally molded Extension Cord Holder comprising;

a. spaced side members,

b. a substantially unitary elongated center section connecting said side members to each other having a length shorter than the side members to form spaced cord receiving recesses between the side members respectively at opposite ends of the Extension Cord Holder,

c. a handle connected to one of said side members, and

d. at least one locking recess formed by said handle.

4,177,962

WINDING-IN DEVICE FOR VEHICLE SAFETY BELTS

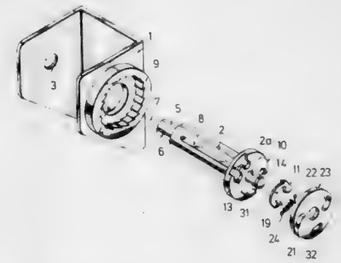
Eckhard Hildebrandt, 31 Bardseyring, 2359 Kisdorf, Fed. Rep. of Germany

Filed May 17, 1978, Ser. No. 907,021

Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722744

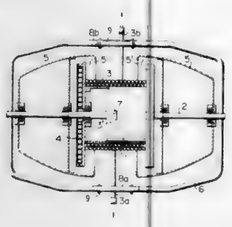
Int. Cl.[2] **A62B** *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 B **9 Claims**



1. In a winding-in device for safety belts of motor vehicles, the device being of the type including a housing provided with a ring of teeth, a shaft having a flange, rotatably mounted in said housing for receiving a safety belt, a locking pawl pivotably mounted on said flange for engagement with said ring of teeth, an inertia body rotatable on and with said shaft, spring means for connecting said inertia body to said shaft, said inertia body, when a predetermined limiting level of acceleration of the shaft is exceeded, lags behind the rotary movement of said shaft in opposition to the effect of said spring means, so as to bring the locking pawl into engagement with said ring of teeth, the improvement which comprises, said inertia body having an actuating slot forming a cam track therein, and said locking pawl having first and second end regions connected by a web and being inset in said flange, the first end region being provided with a mounting head in the form of a part-disc, which disc is held against radial movement by a bearing space of a part-circular configuration forming part of a recess, said disc forming, in conjunction with said bearing space, a pivot mounting for connecting said locking pawl to said flange, one end of said bearing space continuing into a radial or substantially radial abutment face which forms a buttress for said locking pawl when the latter is in the locking position, said buttress being deformable under excessive loads, the second end region, which is opposite to said first end region, carrying an actuating pin, parallel to the axis of the device, which engages in said actuating slot in said inertia body, said actuating slot following a path along an arc of a circle eccentric to said inertia body.

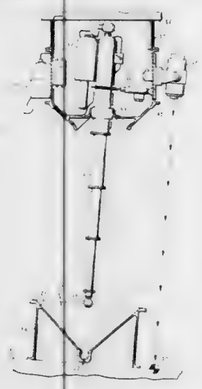
4,177,963
CORD WINDING APPARATUS
Katsuhiko Takahashi, Tokorozawa; Masakazu Iikura, Tokyo, and Hachiro Doi, Minamisaitama, all of Japan, assignors to Fuso Keigokin Co., Ltd., Tokyo, Japan
Filed Jun. 28, 1978, Ser. No. 919,842
Claims priority, application Japan, Sep. 26, 1977, 52-115888
Int. Cl.² B65H *75/48*
U.S. Cl. 242—107.11 **5 Claims**



1. A cord winding apparatus for use in connecting an electro-motive apparatus to a power source comprising:
a shaft;
a winding drum rotatably mounted on the sahft;
a cord folded into two pieces and connected to the drum at the cord folding point, said cord being wound around the drum such that the two folded cord pieces are wound from the same direction around the drum;
spring means connected to the shaft and the drum for stretching the folded cord pieces between the electro-motive apparatus and the power source and for rewinding the two folded cord pieces;
a fixed arm rigidly connected to said shaft for preventing rotating movement of said shaft; and
a pair of wheels flanking the sides of the winding drum so as to support said winding drum and which are mounted on said shaft so as to rotate independently of said winding drum, said wheels sandwiching the winding drum between the two wheels and each wheel having a substantially cup-like shape so as to stablize said cord winding apparatus.

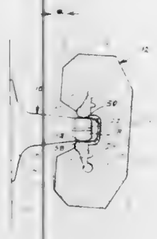
4,177,964
DOCKING SYSTEM FOR SPACE STRUCTURES
Edward J. Hujsak, La Jolla, and LeRoy E. Siden, San Diego, both of Calif., assignors to General Dynamics Corporation, San Diego, Calif.
Filed Sep. 8, 1978, Ser. No. 940,538
Int. Cl.² B64G *1/00*
U.S. Cl. 244—161 **8 Claims**

1. A system for joining large structures in space which comprises:
a concave generally conical receiving means on one structure;
a rounded socket at the apex of said conical receiving means;
a convex generally conical extending means on a second structure;
an extendable and retractable boom extending out from the apex area of said convex means;
said boom being movable about a spherical bearing at the point where said boom passes through said convex means;
means for guiding the end of said boom towards said socket as said structures approach each other;
means for locking said boom end in said socket upon entry of said end thereinto;
means for retracting said boom whereby said structures are drawn toward each other and said concave and convex means are brought into engagement; and



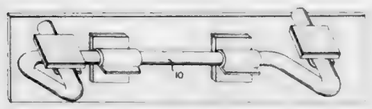
latch means for holding said convex and concave means in engagement.

4,177,965
SOAP BAR AND HOLDER
Henry Blaszkowski, P.O. Box 114, Southfield, Mich. 48075
Continuation of Ser. No. 718,183, Aug. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 585,706, Jun. 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 392,817, Aug. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 274,641, Jul. 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 93,000, Nov. 27, 1970, abandoned. This application Jun. 12, 1978, Ser. No. 914,859
Int. Cl.² C11D *17/04*
U.S. Cl. 248—359 **10 Claims**



1. In combination, a soap bar having a pair of opposed faces spaced apart a distance substantially less than the lateral extent of said faces, an insert formed of a water insoluable material embedded in said soap bar and firmly bonded thereto at the interfaces of the soap bar and the insert, said soap bar having a socket therein of generally circular cross section extending from said insert to one of said opposed faces, said insert having a lateral dimension greater than the diameter of the inner end of said socket and being oriented in the soap bar so that it is spaced inwardly from both of said opposed faces and so that its lateral dimension lies in a plane generally parallel to the lateral dimension of the soap bar, said insert having a cavity therein of circular cross section, the axis of which is perpendicular to the plane of the lateral dimension of the soap bar, said insert having an end wall at the axially inner end of the cavity and having a circular opening axially opposite said end wall which is concentric with the axis of the cavity, said opening providing a passageway between the inner end of the socket and the cavity, said opening being concentric with the axis of the socket and having a diameter smaller than the lateral dimension of the socket at the inner end thereof so that the line of junction between the inner end of the socket and the insert is spaced radially outwardly of said opening and radially inwardly of the periphery of the insert, the axial dimension of said insert between said line of junction and the interface between said end wall and the soap bar being less than the lateral dimension of the insert, and a holder for the soap bar having a base adapted to be affixed to a support surface and having a shank fixed to and extending from said base so that the shank extends generally perpendicular to the support surface on which the base is affixed, said shank having a head at the free end thereof, said head being sized for removable insertion into said cavity through said opening, said head having an axial dimension corresponding generally to the axial dimension of the cavity from said opening to said end wall, the axial dimension of the portion of the shank extending from said base to said head being substantially greater than said axial dimension of said head to provide ample clearance for enabling the user to wrap his fingers around the soap bar and rub them across said one face when said head is inserted into said cavity, the outer periphery of said head defining a generally cylindrical bearing surface concentric with the axis of said shank, said cavity defining a generally cylindrical bearing surface concentric with the axis of said opening and extending between said end wall and said opening, the diameters of said bearing surfaces being dimensionally related at axially spaced sections thereof so that, when the head is fully inserted into said cavity, the bearing surfaces interengage such that the soap bar is substantially incapable of being tilted relative to the shank of the holder and, when the head is less than fully inserted into said cavity, the soap bar is loosely and tiltably retained on the holder.

4,177,966
MIRROR ASSEMBLY USING MIRROR, CLAMPS AND STANDOFF AXLES
Edgar Astrove, 35 Stratton Rd., Scarsdale, N.Y. 10583
Filed Jun. 5, 1978, Ser. No. 912,336
Int. Cl.² A47G *1/17*
U.S. Cl. 248—467 **6 Claims**



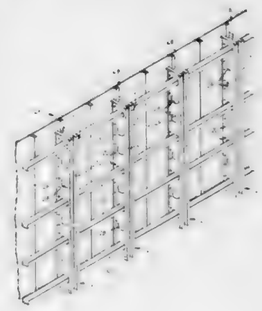
1. A mirror assembly characterized by:
(a) an elongated mirror having a viewing surface and a back surface;
(b) first and second mirror clamps attachable to the back surface of said mirror;
(c) first and second windscreen clamps attachable to a mounting surface such as the inside of a windscreen; and
(d) a set of standoff axles including first and second axle portions alignable to a single axis and having a multiplicity of bends forming first and second standoff portions essentially normal to the first and second axle portions respectively, and first and second hanger portions each lying within a plane nominally normal to the planes formed by first axle portion and first standoff portion and by second axle portion and second standoff portion;
said first mirror clamp and said second mirror clamp clamping by a physical force said first and second axle portions permitting rotational movement of said mirror upon application of rotational force, and said first and second windscreen clamps clamping by a physical force said first and second hanger portions.

4,177,967
GUIDANCE ARM FOR TRIPOD APPARATUS
L. Mark Marchus, 123 NW. 2nd St., Ste. 209, Portland, Oreg. 97209
Filed Oct. 31, 1977, Ser. No. 847,401
Int. Cl.² F16M *11/04*
U.S. Cl. 248—178 **13 Claims**



1. Apparatus for controlling a universal movement head of support means as a result of movement of an individual using the support means, said support means for substantially stably supporting the universal movement head and any device such as a camera attached thereto independently of the individual using the support means, comprising in combination:
control means for controlling movement of the movement head independently of hand movement of the individual, said control means comprising an arm grip structure having a generally planar contact portion extending generally parallelly between the upper torso and the upper arm of the individual, the contact portion defining an arm contact area of sufficient size to firmly retain the contact portion parallel with and against the upper torso with only upper arm pressure thereagainst; and
connection means for operatively connecting said control means to the movement head and adapted for positioning said control means with respect to said movement head to maintain continuous contact of said control means with a portion of the upper torso during movement of the individual using said apparatus.

4,177,968
CONCRETE FORMWORK SOLDIER
David Chapman, Bradford on Avon, England, assignor to Acrow (Engineers) Limited, London, England
Filed Aug. 29, 1977, Ser. No. 828,630
Int. Cl.² E04G *17/04*; E04C *3/30*
U.S. Cl. 249—211 **6 Claims**



1. A concrete formwork soldier for use with concrete formwork, said soldier comprising
two elongated members positioned parallel one to the other,

each of said members having a generally U-shaped cross-sectional configuration, said members being positioned in back-to-back relation with side flanges of said members extending away one from another, and said members being positioned to establish a space between backs of said members, and

a plurality of connecting members positioned between the backs of said elongated members within said space, each connecting member being connected to the backs of both of said elongated members for restraining said members in spaced, back-to-back relation, said connecting members themselves being located in spaced relation one from the other from one end of said elongated members to the other,

opposite ends of said connecting members cooperating with the backs of said elongated members to define two separate channels extending the length of said soldier from one end to the other end for use in connecting said soldier to concrete formwork, said channels being located opposite one another and separated by said connecting members, each of said channels being located inwardly of the side flanges of said members within said space established between backs of said members.

4,177,969

FLOW CONTROL DEVICE

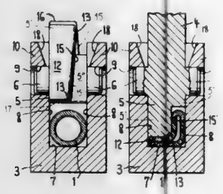
Paul Sieber-Müller, Ebenen, 3703 Aeschi b. Spiez, Berne, Switzerland

Filed May 3, 1977, Ser. No. 793,140

Claims priority, application Switzerland, May 3, 1976, 5424/76

Int. Cl.[2] F16K 7/06

U.S. Cl. 251—9 **5 Claims**



1. A flow control device for controlling the rate of flow of fluid passing through flexible tubing, comprising: a body member comprising a flat bottom and two substantially parallel spaced flat side walls defining a channel for receiving a flexible tubing, said side walls having a pair of axially aligned bearings respectively, a lever including at one end a semi-circular clamping disk for collapsing the tubing, and pivot means supporting said one end portion of said lever in said bearings for pivotal operation of said disk for clamping and selectively collapsing the tubing in said channel to regulate flow therethrough, said semi-circular clamping disk including a substantially semi-circular body of a width less than the spacing between said channel side walls, and a hub portion on at least one side of said semi-circular body and jointly therewith equaling the spacing between said side walls to snugly fit said lever one end portion within said channel body, said semi-circular body having a semi-circular perpheral press surface concentric with said pivot means and being spaced from said channel bottom wall, when in facing relation, a distance substantially equal to the double thickness of the tube wall to collapse and close the horizontal branch of an L-shaped collapsed tube, one generally radial side wall of said semi-circular body being spaced by said hub from the adjacent channel side wall a distance substantially equal to the double thickness of the tube wall and having a configuration to progressively collapse and close the vertical branch of an L-shaped collapsed tube.

4,177,970

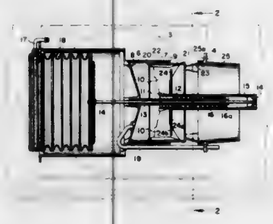
VALVE ASSEMBLY FOR USE IN AN AIR DISTRIBUTION SYSTEM

Harry K. Ring Jr., La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed May 12, 1978, Ser. No. 905,311

Int. Cl.[2] F16K 31/126

U.S. Cl. 251—61.3 **6 Claims**



1. A valve assembly for use in an air distribution system comprising

a. a plenum chamber having an inlet opening and an outlet;

b. conduit means for admitting air to said plenum chamber through said inlet opening and including a generally cylindrical sleeve having at least a portion thereof disposed within said plenum chamber, said portion including aperture means passing radially therethrough for providing communication between the interior of said sleeve and the interior of said plenum chamber;

c. a closure member disposed at the end portion of said sleeve downstream from said aperture means for blocking axial air flow;

d. a generally cylindrical valve member disposed within said sleeve and including an axially extending portion disposed adjacent but slightly spaced from the inner pheripheryof said sleeve, said valve member further including passage means extending between its axial ends for providing communication therebetween to thereby substantially balance the axial pressure forces to which it is subjected;

e. mounting means for supporting said valve member for axial movement between a first position substantially coextensive with said aperture means, thereby blocking flow therethrough; and a second position substantially non-coextensive with said aperture means for permitting flow therethrough; and valve member when in positions intermediate said first and second positions permitting a small amount of air flow through said passage means, between the axially extending portion of said valve member and the inner periphery of said sleeve, and through said aperture means; whereby an axial force is imposed upon said valve member in a direction urging same toward said first position;

f. force balancing means connected to said valve member to counteract said axial force, said force balancing means comprising

i. a generally planar member disposed within said passage means so as to restrict said small amount of air flow therethrough ,whereby a relatively low pressure area is created downstream of said valve member; and

ii. said generally planar member being connected to said valve member and including a first generally planar surface defining a first axially projected area subjected to the relatively high pressure area upstream from said valve member and a second opposite generally planar surface defining a second axially projected area subjected to the relatively low pressure area downstream from said valve member ,whereby a force is imposed on said valve member in a direction urging same toward said second position to thereby at least partially counteract said axial force; and

g. actuator means drivingly connected to said valve member

for selectively positioning same between said first and second positions.

6. The valve assembly of claim **1** wherein said actuator means include

a. diaphragm means disposed adjacent said closure member for receiving a control air pressure signal derived from air pressure present in said air distribution system; and

b. means connecting said diaphragm means to said valve member whereby said valve member may be selectively positioned between said first and second positions.

4,177,971

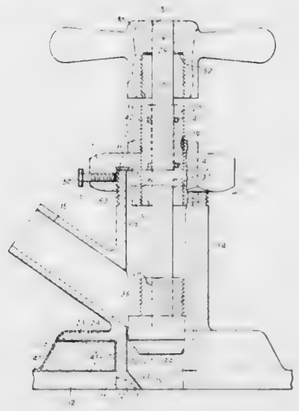
SEA COCK VALVE

Leslie E. Landamore, Salhouse, England, assignor to Pilgrim Engineering Developments Limited, London, England

Filed May 18, 1977, Ser. No. 798,109

Int. Cl. F16k 31/50

U.S. Cl. 251—215 **8 Claims**



1. A valve comprising:

a hollow valve body;

a valve opening in said valve body;

a valve seat in the said valve body around said valve opening;

closure means closing the valve body at the end opposite the valve opening;

a spindle opening in said closure means;

a valve member movable towards and away from said valve seat to open and close said valve;

a spindle carrying said valve member and extending through the said spindle opening;

first screw-threaded means on the closure means of the valve body to the outside of said valve body;

second screw-threaded means fixed on the spindle outside said valve body and adapted for mating with said first screw-threaded means on said closure means of the valve body to hold said valve member against said valve seat;

third screw-threaded means on the closure means of the valve body, to the inside of said valve body;

fourth screw-threaded means on said spindle inside said valve body and adapted for mating with said third screw-threaded means on said closure means of the valve body to the inside of the valve body for holding said valve member away from said valve seat, said spindle being slidable axially in said spindle opening between the position in which the first and second screw-threaded means engage and the position in which said third and fourth screw-threaded means engage; and

sealing surfaces carried on the closure means and on the said spindle which engage when the said third and fourth screw-threaded means engage to form a seal around the spindle opening.

4,177,972

COCKS HAVING ROTATING MANIPULATION SPINDLES

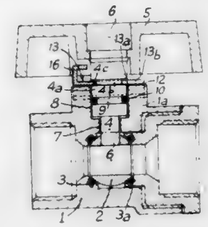
Andre' Legris, St-Maur, France, assignor to Societe Legris France S.A., Ozoir-La-Ferriere, France

Filed Dec. 2, 1976, Ser. No. 747,042

Claims priority, application France, Dec. 18, 1975, 75 38893

Int. Cl.[2] F16K 51/00

U.S. Cl. 251—288 **14 Claims**



1. A cock comprising a body, a spherical shut-off member rotatably mounted in the body, a spindle connecting said shut-off member to an external manipulation member, the body having a planar support surface, a locking member bearing against said planar support surface, said locking member having a notch which engages in a neck of the spindle, the shoulder of which is flush with the level of said planar surface, the surface of said locking member bearing against said planar surface of the body, said planar support surface of the body having two flanges which engage with the edges of the locking member, the locking member of the spindle is formed by a planar plate which extends across the entire diameter of said body, said planar plate having two turned down parallel edges which form two grooves into which there engage said flanges provided on the body of the cock to either side of planar support surface, and wherein the manipulation spindle comprises a circular neck wherein there are engaged the edges of the notch of the locking member, one of the surfaces of the neck forming the bearing shoulder.

4,177,973

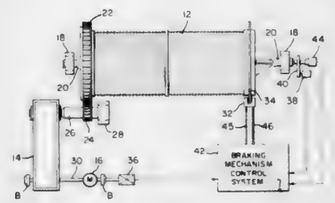
CABLE DRUM SAFETY BRAKE

Gregory C. Miller, Federal Way; Henry R. Albrecht, Seattle; C. William Clarke, Seattle, and Paul L. Longthorpe, Seattle, all of Wash., assignors to Ederer Incorporated, Seattle, Wash.

Filed Mar. 6, 1978, Ser. No. 883,539

Int. Cl.[2] B66D 1/48

U.S. Cl. 254—173 R **8 Claims**



1. A safety system for preventing rotation of a cable drum in response to failure or overload condition of a drive train hav-

ing a speed reduction ratio, said cable drum being driven by a prime mover through said drive train, said safety system, comprising:

sensing means having an output for measuring the rotation of said prime mover with respect to the rotation of said cable drum;

braking means for preventing rotation of said cable drum responsive to a drive train failure or overload indication; and

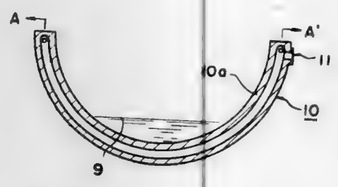
detection means receiving the output of said sensing means for generating said drive train failure or overload indication when said condition occurs when the rotation of said prime mover relative to the rotation of said cable drum deviates from a predetermined relationship which corresponds to the speed reduction ratio of said drive train.

4,177,974

MOLTEN SLAG RUNNER FOR BLAST-FURNACE PLANT

Masaaki Higuchi; Genji Nakatani; Haruo Ito; Masamichi Matsuda, all of Fukuyama, and Yoshinori Suetake, Kasaoka, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 10, 1978, Ser. No. 932,503
Claims priority, application Japan, Aug. 17, 1977, 52-97825
Int. Cl.[2] C21B *7/14*
U.S. Cl. 266—196 **4 Claims**



1. In a molten slag runner for conducting a stream of molten slag from a blast furnace to another place, the improvement wherein:

(a) at least part of said runner is composed of a plurality of trough elements arranged in series and subjected to forced cooling;

(b) each of said trough elements comprises a hollow body made of copper or copper alloy; and

(c) said hollow body comprises a plurality of partition walls alternately arranged parallel to one another to define throughout a space within said hollow body a series of zigzag passages disposed to flow a cooling medium without stagnation, wherein the spacing of said partition walls in the lower portion of said trough element is smaller than that of said partition walls in the upper portion of said trough element and inlet port means and exhaust port means connecting the ends of said series of passages to external cooling medium supply and exhaust pipe means.

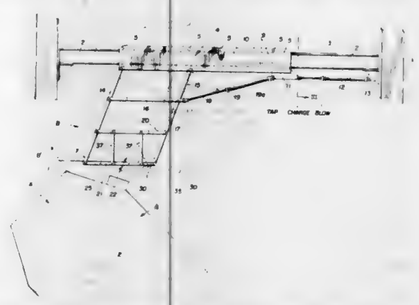
4,177,975

EXHAUST HOOD APPARATUS WITH TILTING FURNACE

Leo J. Meyers, and Louis A. Grant, both of Pittsburgh, Pa., assignors to Louis A. Grant, Inc., Pittsburgh, Pa.

Filed Jun. 14, 1978, Ser. No. 915,511
Int. Cl.[2] C21B *7/22*
U.S. Cl. 266—158 **12 Claims**

10. In the combination of a furnace having an open top for the discharge of gases and an exhaust hood with an open lower end spaced above the top of the furnace to receive exhaust gases from the furnace, the furnace being arranged to tilt from an upright position where the open top of the furnace is substantially centered under the open bottom of the hood to the right and to the left of the centered position, the open lower end of the hood being of an area to collect gases emerging from the top of the furnace when it is in the upright position or tilted to its full limit to one side or the other of the upright position, the improvement comprising an apparatus having a panel unit which will cover most of the bottom opening of the hood except that area which is over the right end of the furnace when the furnace is tilted to the right and all except the left side of the hood opening when the furnace is tilted to the left, said apparatus comprising a frame positioned above the lower



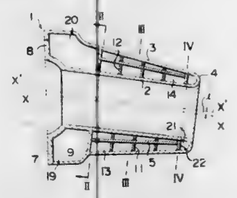
end of the hood from which said panel is suspended, a selectively operated first means for shifting the frame and panel horizontally relative to the hood, and a second selectively operated means for moving the panel in a vertical arc from a starting position at one side of the hood to a position below the level of the hood and then upwardly against the open end of the hood to cover the area of the opening selected by the operation of said first means, and returning it to the starting position, said second operating means serving to hold the panel at one side of the hood when the furnace is centered under the hood.

4,177,976

TUYERE FOR A MELTING FURNACE

Hiroshi Obata; Takehisa Hasegawa; Hideto Watanabe, all of Kurashiki; Kiyohiro Ikegawa, Nara, and Toshiyuki Ashida, Matsubara, all of Japan, assignors to Kawasaki Steel Corporation, Kobe and Kurimoto Iron Works, Ltd., Osaka, both of, Japan

Filed Jul. 13, 1978, Ser. No. 924,383
Int. Cl.[2] C21B *7/16*
U.S. Cl. 266—266 **3 Claims**



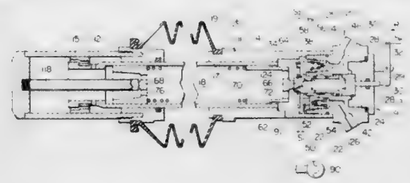
1. A tuyere for a melting furnace, which comprises inner and outer walls forming a water cooling space therebetween; a cylindrical intermediate wall dividing said water cooling space into an inner water cooling chamber and an outer water cooling chamber, whereby the cooling water is introduced into the outer water cooling chamber from the outside of the furnace, circulated into the inner water cooling chamber from the inner end portion at the furnace side of the outer water cooling chamber and discharged from the outer end portion of the inner water cooling chamber; a guide wall disposed at least in the outer water cooling chamber so as to form a helical passage for the cooling water; said cylindrical intermediate wall having a circular cross-section and the central longitudinal axis thereof being offset from said inner and outer walls toward the side of said outer wall which is subjected to a relatively high heat load, whereby the space between a portion of the outer surface of said intermediate wall and the inner surface of said outer wall at the high heat load side of said outer wall is narrower than the space between these surfaces at other portions of said helical passage, and the cross-sectional area of said helical passage at said high heat load side is smaller than the cross-sectional areas of said other portions of said helical passage.

4,177,977

HYDROPNEUMATIC SUSPENSION UNIT WITH A LEVEL SELECTOR MECHANISM

Tomoyoshi Sekiguchi, Atsugi, and Masayuki Fujii, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Feb. 16, 1978, Ser. No. 878,425
Claims priority, application Japan, Feb. 17, 1977, 52/16589
Int. Cl.[2] F16F *9/06, 9/44, 9/50*
U.S. Cl. 267—64 R **8 Claims**



1. A hydropneumatic suspension unit for a wheeled vehicle, comprising

first and second bodies which are connected to each other movably relative to each other and which define therebetween a first chamber,

a gas spring communicating with said first chamber,

inlet passage means communicating with said first chamber,

outlet passage means communicating with said first chamber,

an inlet valve for normally closing said inlet passage means and for opening said inlet passage means for causing supply of pressurized hydraulic fluid into said first chamber,

an outlet valve for normally closing said outlet passage means and for opening said outlet passage means for causing exhaust of hydraulic fluid from said first chamber,

first and second pistons which each are slidably fitted in said second body and which face each other and which define therebetween a second chamber;

said valves being movable relative to said pistons,

orifice means defining a restricted passage providing communication between said first and second chambers,

first biasing means for urging said first and second pistons in opposite first and second directions,

second biasing means for urging said first piston in said second direction,

a valve actuator connected to said first piston for causing said inlet valve to open said inlet passage means in response to movement of said first piston in said second direction in excess of a predetermined distance and for causing said outlet valve to open said outlet passage means in response to movement of said first piston in said first direction in excess of a predetermined distance, and

operating means for normally preventing said second piston from being moved in said second direction integrally with said first piston by said second biasing means and for, when it is desired to lengthen said suspension unit, allowing said second biasing means to move said first and second pistons in said second direction and for, when it is desired to shorten said suspension unit, moving said first and second pistons in said first direction.

4,177,978

UNIVERSAL SHOP STAND WITH BREAKDOWN FEATURE

Arthur J. Warsaw, 131 E. Main St., Colfax, Ill. 61728

Filed Apr. 3, 1978, Ser. No. 892,994
Int. Cl.[2] B66F *5/04*
U.S. Cl. 269—17 **9 Claims**



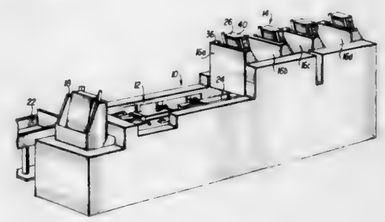
1. A shop stand comprising: first and second elongated side rails; first and second end frame means,each frame means including upright guide means and an extension received in said guide means for sliding adjustment in a vertical direction; means for locking each of said extensions to its associated guide means in an adjusted vertical position, said guide means of each end frame means being independently adjustable; first and second releasable clamp means for securing said first end frame means to said rails at an adjusted axial position, said clamp means being slidable along said rails in a loosened position; third and fourth releasable clamp means for mounting said second end frame means to an adjusted axial position on said rails; said third and fourth releasable clamp means mounted to said guide means of said second end frame means at a vertically offset position relative to a horizontal center line thereof, whereby said second end frame means may be mounted either in a relatively high or a low position in respect of said side rails using said third and fourth clamp means; said extension of said second end frame means being telescopically received in either end of said guide means therefor and being independently adjustable relative to said guide means whether said guide means is mounted in said high or low positions; and wheel support means carried by each of said clamp means.

4,177,979

SIGNATURE GATHERING MACHINE

Winston A. Orsinger, Nazareth, and George Fallos, Easton, both of Pa., assignors to Bell & Howell Company, Phillipsburg, N.J.

Filed Feb. 23, 1978, Ser. No. 880,525
Int. Cl.[2] B65H *39/045*
U.S. Cl. 270—54 **10 Claims**



1. A signature gatherer machine comprising:

a plurality of spaced hoppers arranged in a line, each hopper containing a stack of signatures;

a frame on which said hoppers are mounted,

a signature conveyor having a plurality of spaced pockets positioned parallel to said line of hoppers;

each of said hoppers including a dispensing means for repetitively engaging a signature from its stack of signatures, separating said signature from other signatures in said stack, and delivering said signature to one of said pockets on said signature conveyer;

said frame including hopper-mounting means for mounting said hoppers on said frame at any of a plurality of overlapping positions which are offset from adjacent positions along said frame by a distance which is significantly less than the widths of said hoppers and for selectively allowing independent relative movement of said hoppers along said frame to all said overlapping positions for adjusting the overall operation of said signature gatherer machine;

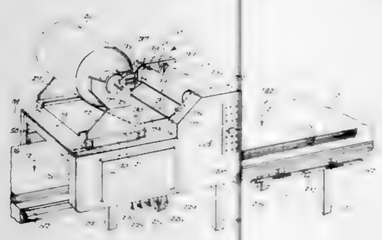
a power source and a variable-length linkage means for providing power to said hoppers at all said overlapping positions, said variable-length linkage means having an adjustable variable effective length from said power source to each of said respective hoppers for providing power from said power source to each of said hoppers at all said overlapping positions to which said hoppers are movable.

4,177,980

CLOTH-LAYING MACHINE

Albert Melega, Malverne, N.Y., assignor to Cutting Room Appliances Corporation, Hicksville, N.Y.

Filed May 23, 1977, Ser. No. 799,136
Int. Cl.[2] B65H *29/46*
U.S. Cl. 270—31 **10 Claims**



1. A cloth-laying machine comprising first and second side frame members, cross frame means for joining said first and second side frame members, a plurality of driven wheels mounted on said first and second side frame members, drive means including motor means for positively driving each of said driven wheels, guide wheel means mounted relative to one of said side frame members for running on a track member, and switch means mounted proximate said guide wheel means for deenergizing said motor means in the event said guide wheel means moves a predetermined vertical amount relative to said one of said side frame members.

4. A cloth-laying machine comprising first and second side frame members, cross frame means for joining said first and second side frame members, a plurality of driven wheels mounted on said first and second side frame members, drive means including motor means for positively driving each of said driven wheels, guide wheel means mounted relative to one of said side frame members for running on a track member, a pair of driven load-bearing wheels mounted on each of said first and second side frame members, and spring means for biasing said guide wheel means toward said track member.

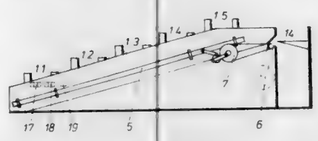
10. A cloth-laying machine comprising a frame, a plurality of wheel means for moving said frame on a cloth-laying table, motor means for driving said wheel means, brake means for stopping said machine, first means for actuating said brake means during normal operation, second means for actuating said brake means in the event said first means fail to function, guide wheel means for engaging a track, and switch means actuatable by said guide wheel means for stopping said machine in the event said guide wheel means moves a predetermined vertical amount relative to said frame.

4,177,981

COLLATING METHOD AND MACHINE

Michael Maul, Schwabach near Nürnberg, Fed. Rep. of Germany, assignor to Maul Lochkartenkeräte GmbH, Schwabach, Fed. Rep. of Germany

Filed Apr. 7, 1978, Ser. No. 894,334
Int. Cl.[2] B65H *39/055*
U.S. Cl. 270—58 **6 Claims**



1. A collating method, the method being of the type in which M groups of copies are received for collation, the M groups being in a predetermined sequence, each of the M groups consisting of N copies, the N copies within each individual group being the same, the copies in different ones of the M groups being different, the method being of the type wherein the M groups of N copies each are to be converted into N sets, each set containing M copies, the M copies within each individual set each coming from a different respective one of the M groups and being arranged in the set in said predetermined sequence,

the method comprising

subjecting a number M of groups of N copies per group to plural successive collating operations,

each of the collating operations being performed by laying all the copies of the M groups of N copies per group into a number of infeed bins lower than the number M, then in a cyclical sequence transferring individual copies from successive ones of the infeed bins to an outfeed bin until all of the copies of the M groups of N copies per group have been transferred from the infeed bins to the outfeed bin,

all of the copies of the M groups of N copies per group accordingly participating in each one of the plural successive collating operations, and each individual copy in the total number of copies in the M groups of N copies per group accordingly passing from an infeed bin to the outfeed bin once per collating operation and therefore a plurality of times during the performance of the plural successive collating operations,

the second and any subsequent collating operation being each performed by taking the copies stacked in the outfeed bin and reintroducing them into infeed bins for performance of another collating operation,

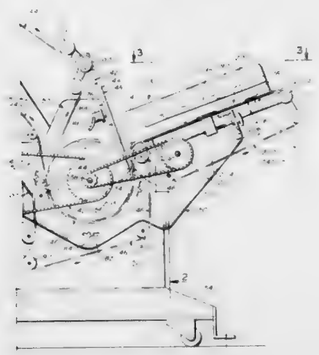
the number of successive collating operations performed being such that upon completion of the last of the plural collating operations the outfeed bin has received the desired N sets of M copies each with the M copies in each of the N sets being in said predetermined sequence within the respective set.

4,177,982

SHEET FEEDERS

Elmer Bewersdorf, Downers Grove; James F. Cosgrove, Western Springs; Thomas R. Flavin, Mokena; Edward Gallagher, Oak Lawn; William B. McCain, Hinsdale; Ronald W. Weller, Oak Lawn, and Lawrence J. Werstler, Evergreen Park, all of Ill., assignors to McCain Manufacturing Corporation, Chicago, Ill.

Filed Feb. 24, 1977, Ser. No. 771,657
Int. Cl.[2] B65H *5/22*
U.S. Cl. 271—5 **32 Claims**



1. A machine for loading a hopper with sheets while concurrently riffling the sheets, comprising:

(A) a supply station having a support means on which the sheets are to be first stacked on edge, substantially in a front-to-rear horizontal stack;

(B) a stop plate at the front of said support means and cooperating therewith to define a downwardly opening feed gate into which the sheets are to be fed, said plate having a manifold thereon adapted to be connected to a source of vacuum;

(C) a sheet stripper means of endless belt form positioned to traverse said manifold while engaging the leading sheet of the stack, said stripper means having repeating spaced rows of openings therein which, by the motion of the stripper, are successively valved and unvalved to the source of suction as they traverse said manifold, whereby the stripper is effective to extract the leading sheets of the stack successively by a suction grip and advance them one by one into said gate in overlapping relation;

(D) riffle feed belts positioned at the gate to capture the extracted sheets, said feed belts being supported and guided to form a first bend around which the overlapped sheets are fed; and

(E) transfer means to transfer the overlapped sheets from said bend to the hopper.

4,177,983

DEVICE FOR PICKING UP, DEPOSITING AND TRANSPORTING THIN METAL FOILS BY MEANS OF A VACUUM LIFTING DEVICE

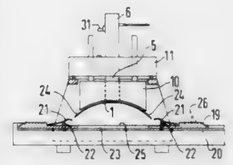
Manfred Wossler, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 21, 1977, Ser. No. 863,042
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1976, 2659421
Int. Cl.[2] B65H *5/10*
U.S. Cl. 271—268 **10 Claims**

10. A system for picking up, depositing, and transporting thin foils to a foil processing station, comprising:

(a) a foil receiving station comprising a planar surface with a foil to be picked up resting thereon;

(b) a vertically movable vacuum lifting device means for positioning over a central region of the foil to be picked up and for suspension of the foil from said central region by suction, edges of the thin suspended foil bending downwardly in curved fashion by gravitational attraction, said



vacuum lifting device means including a separately movable curving means for causing additional downward curving of the suspended foil; and

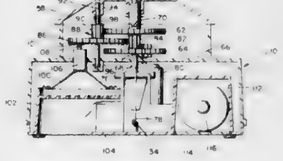
(c) traverse means for moving the device means and suspended foil from the receiving station to a foil depositing station, said foil depositing station comprising means for supporting the foil in a flat position when the vacuum lifting device releases the foil.

4,177,984

CAPTIVE FLYING TOY AIRPLANE HAVING SIMULATED MOTOR SOUNDS

Raymond J. Douglas, Carson; Ference Fekete, Huntington Beach; Derek J. Gay, Rancho Palos Verdes; Gary L. Hunter, Fountain Valley, and Nicol S. Wilson, Redondo Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Feb. 17, 1978, Ser. No. 878,853
Int. Cl.[2] A63H *17/34, 27/04*
U.S. Cl. 272—31 A **4 Claims**



1. A captive flying toy comprising:

a pylon having a turntable configured for rotation about a first axis;

a boom member having first and second ends;

means coupling said boom member to said turntable for pivoting about a second axis generally transverse to said first axis;

a toy member secured to one of said first and second ends of said boom member;

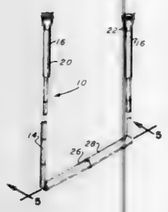
a counterweight member secured to the other of said first and second ends of said boom member;

a rod member extending through said turntable, one end of said rod member engaging said boom member;

electrically operated drive means for rotating said turntable, said drive means including at least one gear member coupled for rotation about said rod member and another gear member in said drive means, said another gear member having a circumferential ratchet surface;

a sound cone mounted within said pylon and having the apex portion thereof engaging said ratchet surface for emitting a sound having a frequency proportional to the speed of rotation of said another gear member;
a bell crank member engaging the other end of said rod member for displacing said rod member axially for pivoting said boom member against the force of said counterweight; and
a control member coupled to said bell crank member for pivoting the same.

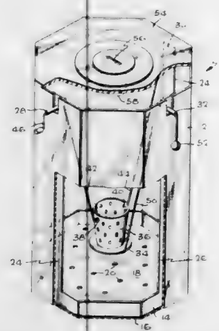
4,177,985
JUMP ROPE WITH VARIABLE WEIGHTING AND ROPE CONFIGURATION
Richard S. Hlasnicek, and Jean F. Hlasnicek, both of Jamestown Star Rte., Boulder Heights, Colo. 80302
Filed Oct. 3, 1977, Ser. No. 838,917
Int. Cl.² A63B *5/20*
U.S. Cl. 272—75 **7 Claims**



1. An improved jump rope of the kind having a flexible core extending continuously between handles on each of the opposite ends of the rope to form the body thereof, and having a plurality of elongated tubular segments slidable over the core between the handles, the segments having substantially similar inner diameters for non-telescoping adjacent positioning along the length of the core, wherein the improvement comprises:
(a) each of said handles having an outer diameter larger than that of the tubular segments; and
(b) first and second sleeves, one slidably mounted on each of said handles and covering a substantial portion of the handle for hand engagement with each said handle means on the outer end thereof to prevent the associated sleeve sliding off the outer end thereof, each sleeve having an inner diameter larger than the outer diameter of the handle for permitting the sleeves to be selectively slidable onto the body of the jump rope to positions near the center thereof over said tubular segments for centrally weighting the body of the rope, the length of each sleeve being greater than the length of each elongated segment for holding the segments in alignment through a portion of the body longer than the length of an individual segment.

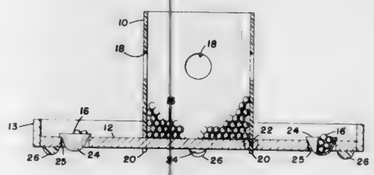
4,177,986
COIN DROP GAME
Gene E. Campbell, 327 Stepney St., Inglewood, Calif. 90305
Filed Jun. 28, 1977, Ser. No. 810,897
Int. Cl.² A63F *9/00*
U.S. Cl. 273—1 L **5 Claims**

1. A game of the class described comprising a container, said container having a coin receiving opening at one end, a coin receiving basket adjustably mounted inside the container, means connected to the coin receiving basket and controlled from outside the container for adjusting the position of the coin receiving basket in the container so that when a coin is inserted in the container the basket can be moved to catch the coin as it falls through the container, said container filled with liquid, the viscosity of the liquid selected to slow the movement of the coin falling through the container by a predetermined amount, said container including aiming means mounted at the upper



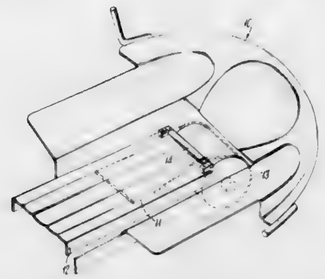
end of the container to control the dispersion of coins dropped through the coin receiving opening.

4,177,987
MARBLE GAME WITH SCOOP AND CUPS
Warren B. Zimmerman, 5 Vernon Hill Ct., Baltimore, Md. 21228
Filed Apr. 10, 1978, Ser. No. 894,765
Int. Cl.² A63F *7/00*
U.S. Cl. 273—1 R **6 Claims**



1. In a game of entertainment and skill for competition, coordination, and dexterity, having a game apparatus, removably associated game objects, and player units, which comprise:
a game apparatus structure;
a plurality of game scoring objects placed within said game apparatus structure;
a plurality of player manipulation devices to extract said game scoring object from said game apparatus structure,
a platform having a peripheral barrier encircling said platform and attached thereto by suitable means;
an open-ended container of more than two sides for said game scoring objects, centrally located on and removably attached to said platform on one of open ends of said container, and having an access aperture centrally located in each side thereof;
a plurality of cup-like containers removably located and set in apertures in said platform, one each in said platform opposite each side of said open ended container, for holding extracted game scoring objects from said open-ended container; and
a plurality of rubber-like legs on the bottom surface of said platform and attached thereto by suitable means, said rubber-like legs providing clearance for said cup-like containers extending through platform, and further preventing movement of said game apparatus structure during play of game.

4,177,988
PIN ORIENTATOR
Thomas M. Camilleri, 277 Avenue W, Brooklyn, N.Y. 11223
Continuation-in-part of Ser. No. 781,571, Mar. 28, 1977, abandoned. This application Dec. 14, 1977, Ser. No. 860,578
Int. Cl.² A63D *5/09*
U.S. Cl. 273—43 D **9 Claims**



1. In an automatic pinspotter bowling machine having an orientating pan from which the pins slide onto a distributor belt having the top run thereof supported throughout a major portion of its length by a belt runner, the improvement comprising an orientator having means adapted to contact and raise the bottom of the top run of the distributor belt above the plane of the belt runner to maintain the distributor belt closer than otherwise to the orientating pan.

4,177,989
HOLLOW BAT AND METHOD OF MAKING
James L. Easton, Los Angeles, and Gary W. Filice, Thousand Oaks, both of Calif., assignors to James D. Easton, Inc., Van Nuys, Calif.
Filed Nov. 28, 1977, Ser. No. 855,320
Int. Cl.² A63B *59/06*
U.S. Cl. 273—72 A **2 Claims**



1. A ball bat comprising:
a bat body having a generally cylindrical hollow handle portion open at one end and having an enlarged section therein adjacent the open end, the enlarged section having a circumference which, progressing along the axis of the cylindrical handle portion, first enlarges from the circumference of the remainder of the handle portion and then reduces to a circumference generally equivalent to the circumference of the remainder of the handle portion;
a hollow end knob having an interior cavity of transverse cross-section substantially larger than that of the handle portion of the bat body, the cavity having at one end an opening adapted to fit closely over the handle portion and being closed at the other end by a transverse wall;
the end knob being positioned over the enlarged section of the handle portion of the bat body with the end of the body abutting the transverse wall of the knob and the cavity opening encompassing the handle portion adjacent the enlarged section and pressing tightly thereagainst to provide a mechanical joint which resists both longitudinal and circumferential movement of the knob relative to the bat body.

4,177,990
RACKET FRAME
Takao Kajiwara, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan
Filed Sep. 28, 1977, Ser. No. 837,541
Claims priority, application Japan, Oct. 4, 1976, 51/119226
Int. Cl.² A63B *49/10*
U.S. Cl. 273—73 C **14 Claims**

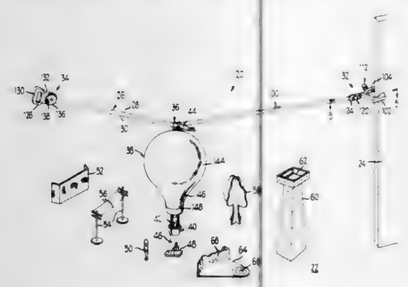


1. An improved racket frame comprising
a discontinuous core extending continuously around said racket frame and made up of a plurality of foamed resin core pieces longitudinally aligned in end-to-end abutting relationship, and
a fiber reinforced plastic envelope, with numerous fibers embedded therein, wholly covering said discontinuous core.

4,177,991
AMUSEMENT APPARATUS
Burton C. Meyer, Downers Grove, and Palmer J. Schoenfield, Lake Forest, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Jan. 31, 1978, Ser. No. 873,790
Int. Cl.² A63H *27/10*
U.S. Cl. 273—95 B **14 Claims**

1. An amusement apparatus comprising:
an endless loop of elongated flexible cord including an upper run and a lower run;
pulley means adjacent one end of said loop adapted to be detachably connected to an object for permitting movement of the cord of said runs toward and away from said object;
hand held movable control pulley means adjacent an opposite end of said loop including rotatable means for moving the cord of said runs toward and away from said object;
trolley means supported from said endless loop connected

for movement along with the cord of one of said runs to move between said object and said control pulley means;
an aerial toy releasably supported from said trolley means and stop means on one of said runs engageable to release said toy from said trolley; and
support means carried by said trolley means including a



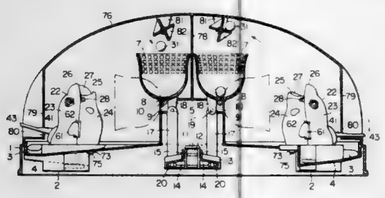
support for holding a portion of said aerial toy in position ready for release, resilient biasing means for propelling said aerial toy outwardly away from said support when released and trigger means for retaining said aerial toy in said ready position and operable to release said aerial toy to be propelled outwardly by said biasing means when said trigger means engages said stop means.

4,177,992

BALL FLING-OUT STRUCTURE WITH PIVOTING GOALS

Masatoshi Todokoro, 2-33, Koganehara 2-chome, Matsudo-City, Chiba-Prefecture, Japan

Filed May 15, 1978, Ser. No. 905,657
Claims priority, application Japan, Feb. 4, 1978, 53-13235[U]
Int. Cl.[2] A63B *63/04*; A63F *7/00*
U.S. Cl. 273—101 **2 Claims**



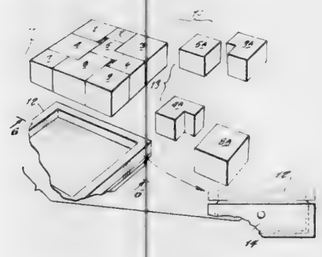
1. A game board arrangement wherein balls disposed towards the outer periphery of a game board are flung out of an animated head into a basket centrally located on the game board, comprising in combination:
(a) a base board (1) with a board center and board ends, recessions (2) extending from said board ends towards said board center and channels (3) for rolling balls into a part of said recession positioned closer to said board center;
(b) a plurality of basket-like ball-receiving goal structures (7) pivotally mounted in the center of the base board (1) so that said structures can freely turn from a horizontal to a vertical and from a vertical to a horizontal position;
(c) a lever (11) connected to said goal structures so that said structures may be turned from the vertical to the horizontal position by the operation of said lever;
(d) ball fling-out structures (22) disposed towards the periphery of the base board, each of said ball fling-out structures (22) being shaped like an animal or fish with a ball fling-out mouth-like opening (25) having a cover (27) at the top of each of said ball fling-out structures such that the fling-out opening (25) is opened and closed by said cover (27), a ball fling-out member positioned in each of said recessions (2);
(e) a track (29) provided in each of said ball fling-out structures for guiding the flung-out ball so that a ball (31) will be flung out from said opening (25) towards the goal structure;
(f) a lever (41) extending below said track for actuating said ball-fling member (34), control bars connected between said lever and said cover for moving said cover from its closed position to its open position when the ball fling-out member (34) is actuated by said lever (41), channels provided at the ends of the base board for guiding the balls from the board surface towards each of said ball fling-out members (34);
(f) a transparent dome covering the entirety of the upper side of the board; and,
(g) a vane wheel (82) mounted to said dome over said goal structure (7) so that a ball (31) flung out from said fling-out structures (22) can hit said vane wheel and drop into said goal structure (7).

4,177,993

VARIABLE BLOCK PUZZLE AND CONTAINER

Bruce R. Crosby, 8650 Pitner #180, Houston, Tex. 77080, and George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Aug. 29, 1977, Ser. No. 828,869
Int. Cl.[2] A63F *9/10*
U.S. Cl. 273—160 **2 Claims**



1. A puzzle comprising a plurality of blocks with interfitting and abutting surfaces which when properly assembled form a rectangularly shaped assembly of predetermined dimension in combination with a container having a cavity of rectangular contour adapted to snugly receive the assembly thereon in further combination with means for varying the shapes of some of said blocks forming sub assemblies adapted to replace specific sub assemblies of said blocks to obtain the same said assembly of predetermined dimensions, wherein said container includes a compartment underlying said cavity for storing all of said blocks thereon, wherein, said means comprises additional blocks which replace certain blocks of different shape of the assembly, said additional blocks forming subassemblies similar to the replaced subassemblies.

4,177,994

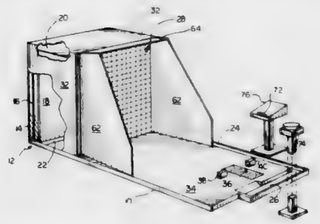
GOLF GAME AND PRACTICE APPARATUS

Everet F. Lindquist, Iowa City, Iowa, assignor to University of Iowa Research Foundation, Iowa City, Iowa

Filed Dec. 20, 1976, Ser. No. 752,022
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—176 FA **10 Claims**

1. An apparatus for predicating the flight and measuring the direction of a golf ball or the like hit by a player from an initial position in a player station by measuring the critical dimensions

of the initial segment of the trajectory, said apparatus comprising a penetrable grid through which said ball travels, said grid having a first group of a plurality of spaced-apart electrical conducting wires positioned in the same first plane, a first supporting structure to which said wires are affixed, a second group of a plurality of spaced-apart electrical conducting wires positioned on said grid in the same second plane, a second supporting structure to which said wires are affixed, said first and second supporting structures being relatively positioned so that one of said planes is located closer to the player station than the other of said planes with the wires in said first plane extending transversely to the wires in said second plane, said first and second planes being spaced-apart so that the wires in



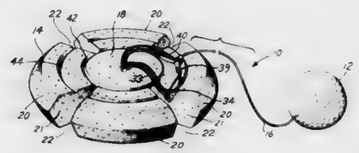
one plane do not normally contact the wires in the other plane, means for securing the wires in each of said planes to their respective supporting structures so as to provide for limited movement of the wires without permanent deformation thereof within the range of limited movement, said limited movement being sufficient to permit the wires in each plane to separate and allow a ball to pass through the grid, the spacing of said first and second planes being within the range of said limited movement of said wires to provide for contact of a wire in the plane closer to the player station with a wire in the other plane when struck by a ball, and electrical detecting means to detect the point of contact of the first pair of wires one in each of said planes when a ball hit from said player station passes through said grid.

4,177,995

GOLF PRACTICE DEVICE

Charles C. Surland, 12538 Parkvilla Ave., Baton Rouge, La. 70816

Continuation-in-part of Ser. No. 822,382, Aug. 5, 1977, abandoned. This application Nov. 6, 1978, Ser. No. 958,043
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—199 A **7 Claims**



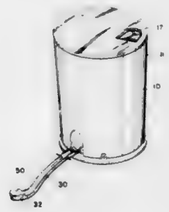
1. A golf practice device, comprising, in combination:
(a) a golf ball;
(b) a substantially planar drag member, said planar drag member being formed of a flexible material providing a self-sustaining form and having a central portion and a plurality of radial segments extending outward from said central portion, said segments defining means for accommodating and channeling an air-flow transverse to said planar drag member and for causing said planar drag member to deform in a substantially conical shape in response to an air flow transverse to said planar drag member;
(c) means for attaching said planar drag member to said golf ball, said attaching means comprising a flexible elongated member attached centrally to a first, planar surface of said planar drag member and extending from said planar surface in a direction transverse to said planar member, said planar member being pulled behind said golf ball by said attaching means to define means for presenting immediately upon movement of said ball a surface area which resists air movement substantially transverse to the flight trajectory of said golf ball; and
(d) said planar member, said attaching means and said golf ball cooperating to define means for varying said surface area inversely with the speed of movement of said golf practice device through the air.

4,177,996

AUTOMATIC GOLF BALL TEEING APPARATUS

Tommy J. C. Chang, No. 12, Lane 181 Pin Chiang St., Taipei, Taiwan

Filed May 15, 1978, Ser. No. 905,873
Int. Cl.[2] A63B *57/00*
U.S. Cl. 273—201 **3 Claims**



1. A device for storage and individual dispensing of golf balls, comprising:
A housing, said housing having a vertical spiral track positioned therein, said track having ball entrance and exit ends; an inclined fixed chute, said fixed chute being attached to said housing and positioned at said exit end of said spiral track for receiving golf balls therefrom; an inclined pivot chute, said pivot chute being attached to said housing by pivot means so as to swing in a substantially horizontal plane and for receiving balls from said fixed chute; escapement means attached to said fixed chute to block the path of a golf ball otherwise freely rolling on said fixed chute, said escapement means being linked to said pivot chute to permit one golf ball on said fixed chute to freely roll off said fixed chute and onto said pivot chute and to permit another ball from said spiral track to roll onto said fixed chute, said one ball and said another ball being respectively simultaneusly released from and retained onto said fixed chute in response to said pivot chute being swung about said pivot means; said pivot chute having means at its lower end for retaining a golf ball in position to be hit by a player.

4,177,997

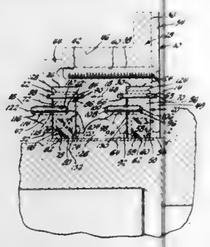
FLOATING SEAL

John N. Cartwright, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 8, 1978, Ser. No. 967,783
Int. Cl.[2] F16J *15/54, 15/40*
U.S. Cl. 277—27 **4 Claims**

1. A floating ring seal assembly for accommodating eccentric shaft motions in a high speed rotary device comprising a seal housing having spaced internal side walls defining an annular opening, an axial bore extending through said housing for receiving an axial extension of a drive shaft for a rotary machine and including a seal surface thereon, a seal carriage located in said annular opening, a wear seal element supported

by said seal carriage and having a radially inwardly located surface thereon in engagement with the seal surface of said shaft, means to support said carriage against rotation with respect to said seal housing and including means to permit floating radial movement of said carriage within said opening, spacer means to accommodate axial thrust on said seal carriage produced by the fluid pressure force thereon, said means being configured to maintain a minimal gap between said seal carriage and one of said internal walls of said seal housing to control leakage of pressure around said seal element to a low



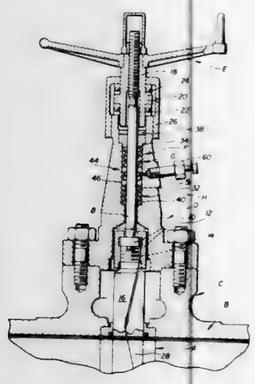
pressure return region whereby the minimum gap is maintained during periods of operation with substantial high pressure produced side thrust on said seal carriage thereby permitting free radial adjustment of said seal carriage during rotation of the shaft within the bore without contact between said carriage and the one of said internal walls to prevent frictional forces causing resistance to radial motion of said carriage within said openings thereby to assure reduced loading of the seal wear face against the seal surface of the shaft during all phases of operation thereof.

4,177,998

PACKING GLAND ASSEMBLY

Anthony A. Laitkep, Wharton; Danny S. Meyer, Richmond, and Willard J. Sitton, Houston, all of Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Aug. 25, 1978, Ser. No. 937,683
Int. Cl.[2] F16J *15/40*
U.S. Cl. 277—59 **2 Claims**



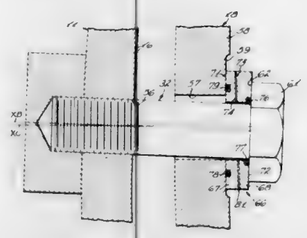
1. A packing assembly for a valve stem or shaft extending through a packing chamber having packing stops at the ends thereof, comprising outer and inner telescoping expander ring members received about the shaft or stem and fitting slidably in an intermediate part of the chamber, a plurality of V-type seal rings on opposite sides of said expander rings, an internal annular shoulder in said outer member, abutting the adjacent end of said inner ring in the collapsed positions of said expander rings, a collar at the opposite end of said inner member overlying the adjacent end of said outer member and spaced therefrom in said collapsed positions, a plurality of radial holes in said inner member adjacent said shoulder, an annular recess in the inner wall of said inner member intersecting said radial holes, and a fitting for plastic sealing material communicating with said radial holes and said recess for injection of sealing material between said expander rings to thereby separate the same and radially expand said seal rings and also to inject said seal material through said holes and recess inside and about said expander rings as secondary seal means.

4,177,999

INFINITELY ADJUSTABLE BEARING SEAL FOR NON-PARALLEL SURFACES

Harry M. Raber, York, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sep. 11, 1978, Ser. No. 941,085
Int. Cl.[2] F16J *15/06;* **F16B** *43/02*
U.S. Cl. 277—112 **5 Claims**



1. Apparatus for sealing the opening in a first member which is to be secured to a second member by a fastener having a bearing surface which is not parallel to the bearing surface of the first member with which it must engage;

an infinitely adjustable wedge seal means surrounding the fastener and interposed between the bearing surface of the fastener and the bearing surface of the first member;

whereby the infinitely adjustable wedge seal means can be adjusted to provide full bearing with which the bearing surface of the fastener can fully engage with and thereby seal the opening between said adjustable wedge seal means and the fastener.

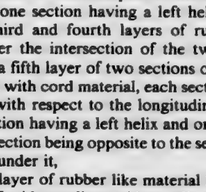
4,178,000

SEALING PROVIDED BETWEEN THE WALLS OF A COOLED CONTINUOUS MOULD AND THE HEAD OF A STARTER BAR

Gottfried Kuttner, Linz, Austria, assignor to Vereinigte Österreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Mar. 6, 1978, Ser. No. 884,001
Claims priority, application Austria, Mar. 25, 1977, 2099/77
Int. Cl.[2] B22D *11/08;* **F16J** *15/18*
U.S. Cl. 277—138 **31 Claims**

1. A sealing arrangement to be used in a continuous casting plant of the type including a cooled continuous mould, said cooled continuous mould having walls and accommodating a starter bar having a starter bar head, said sealing arrangement being provided between said walls of said cooled continuous mould and said starter bar head, wherein the improvement is characterized in that said sealing arrangement comprises an elastic seal, said starter bar head having an annular peripheral recess, said elastic seal being inserted in said annular peripheral recess and being dimensioned so as to close off said recess, said



seal also extending completely about the starter bar head periphery.

4,178,001

PIPE COUPLING

John M. Stanley, Milledgeville, and Bernard A. Greene, Gray, both of Ga., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Sep. 5, 1978, Ser. No. 939,187
Int. Cl.[2] F16J *15/32*
U.S. Cl. 277—152 **2 Claims**

1. A cylindrical pipe coupling including, an inner layer of rubber like material, a second layer of two sections of rubber like material reinforced with cord material, each section laid at an angle of about 65° with respect to the longitudinal axis of the coupling, one section having a left helix and the other a right helix, third and fourth layers of rubber like material positioned over the intersection of the two sections of said second layer, a fifth layer of two sections of rubber like material reinforced with cord material, each section laid at an angle of about 65° with respect to the longitudinal axis of the coupling, one section having a left helix and one a right helix, the helix of each section being opposite to the section of the second layer located under it,

and a sixth layer of rubber like material located as an outer surface of said coupling, said coupling adapted to permit the insertion of a first pipe into one end thereof, said coupling further including a first annular insert located near the opposite end of the coupling, said first insert being comprised of a ridge shaped lip of rubber-like material affixed to or integral with the inner surface of said inner layer, said first insert defining an opening of a smaller diameter than said inner layer and being adapted to permit the insertion of a portion of a second pipe into said coupling,

and a second annular insert located inwardly from said end of the coupling, said second insert comprising an inwardly protruding gasket shaped rubber like material affixed or integral with the inner surface of said inner layer, said second insert defining an angle of approximately 45° with

said inner surface and defining an opening of a diameter less than the opening defined by said first insert,

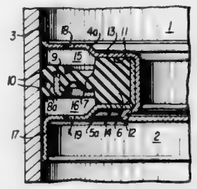
said first and said second inserts being adapted to permit the insertion of a portion of a second pipe into said coupling, thereby effectively sealing said first pipe with said second pipe.

4,178,002

SEPARATING PISTON FOR HYDROPNEUMATIC ONE-TUBE VIBRATION DAMPER

Ernst Kayser, Birkenau, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

Filed Mar. 2, 1976, Ser. No. 663,166
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1975, 2514056
Int. Cl.[2] F16J *15/20;* **B61F** *15/22*
U.S. Cl. 277—212 **11 Claims**



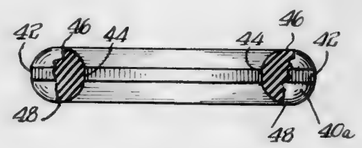
1. In a hydropneumatic one-tube vibration damper comprising a cylinder, a piston displaceably disposed within said cylinder, an annular elastomeric sealing element disposed about said piston and freely movable therewith and subdividing said cylinder into two separated fluid-tight chambers so that there will be no leakage between a hydraulic fluid in one of said chambers and pneumatic fluid in the other of said chambers, the improvement wherein said sealing element comprises an inner portion clamped by said piston, an outer portion in sliding contact with said cylinder and an intermediate flexible web portion connecting the inner and outer portions and flexing in response to small displacements of the piston to effect a small displacement of the piston without sliding displacement of said outer sealing element portion relative to said cylinder and wherein the outer portion of said sealing element is approximately semicircular in cross-section where it abuts the cylinder wall.

4,178,003

O-RING AND APPARATUS AND METHOD OF MANUFACTURE

Carroll D. Hobson, Goshen, Ind., assignor to Goshen Rubber Co., Inc., Goshen, Ind.

Filed Mar. 11, 1977, Ser. No. 776,730
Int. Cl.[2] F16J *15/54*
U.S. Cl. 277—237 R **6 Claims**



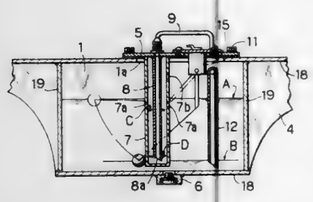
1. An O-ring comprising a molded resilient body annularly disposed about an axis, said body prior to use being generally round in radial cross-section and being provided with a molded

annular flattened area axially extending along one peripheral surface.

4,178,004
SPARE FUEL TANK FOR VEHICLE USE

Akibumi Shinoda, Handa, and Masahiko Shimizu, Ohbu, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Nov. 18, 1977, Ser. No. 853,231
Claims priority, application Japan, Nov. 20, 1976, 51-155942[U]; Oct. 12, 1977, 52-136655[U]
Int. Cl.² B60K *15/06*
U.S. Cl. 280—5 A **7 Claims**

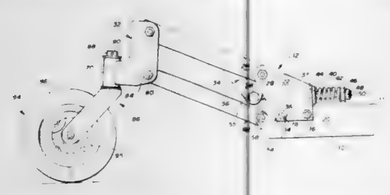


1. A spare fuel tank for a main fuel tank having a fuel inlet and provided with a top wall having an opening therein and a cover plate for covering said opening, said spare tank comprising a vertically elongated container with a bottom, extending vertically inside said main fuel tank and being fixed to said cover plate, said spare fuel tank being of size passable through said opening as a prefabricated entirety;
- at least one spare tank fuel inlet opening for natural flow-in of fuel at the time of fuel supplying to said main fuel tank formed at a position slightly lower than the normal full level of the fuel in said main fuel tank;
- a spare-fuel suction pipe inserted into said spare tank such that the lower end thereof almost reaches the bottom of said spare fuel tank; and
- fastening means for securely and detachably attaching said spare fuel tank and said spare-fuel suction pipe oil-tightly to said main fuel tank via said cover plate.

4,178,005
WHEEL MOUNTING ASSEMBLY

Frank N. Kent, Jr., Fayetteville, W. Va., assignor to Austin Industries, Inc., Dallas, Tex.

Filed Mar. 9, 1978, Ser. No. 884,822
Int. Cl.² B62D *61/12*
U.S. Cl. 280—43.18 **6 Claims**

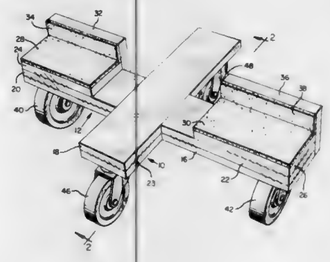


3. A casterwheel assembly for a towed implement which assembly will mount a casterwheel and comprises:
- a caster bracket for pivotally supporting the casterwheel;
- a height adjusting arm linking said caster bracket to said implement, one end of said arm being pivotally mounted to said implement and the other end of said arm being pivotally mounted to said caster bracket;
- a control arm also linking said caster bracket to said implement, one end of said control arm being pivotally mounted to said caster bracket and the other end of said control arm being pivotally mounted to said implement, said control arm and said height adjusting arm being disposed in substantially parallel relation to form a pantographic linkage between said implement and said caster bracket; and
- adjustment means affixed at one end to said height adjusting arm, and being adjustable relative to said implement, the adjustment of said means capable of changing the position of said implement with respect to the terrain by pivoting said height adjustment arm about the rear of said implement thereby changing the position of the implement relative to the casterwheel.

4,178,006
FURNITURE DOLLY

Richard E. Johnson, 3509 River Rd., Eugene, Oreg. 97404

Filed Feb. 21, 1978, Ser. No. 879,239
Int. Cl.² B62B *5/00*
U.S. Cl. 280—79.1 A **10 Claims**

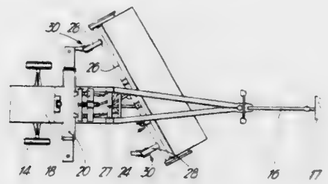


1. A furniture dolly comprising:
- a frame and four swivel casters secured in supporting relation to said frame adapting the same to traverse a substantially horizontal surface,
- said four swivel casters including spaced first and second side casters located toward first and second lateral sides of said frame, a third caster rearward of a line between said first and second casters, and a fourth caster forward of a line between said first and second casters, wherein said third and fourth casters are mounted on said frame to contact said horizontal surface in the alternative adapting said frame to rock about said first and second casters to a position where either said third caster or said fourth caster supports said frame upon the horizontal surface,
- said frame having a laterally extending furniture receiving ledge comprising a substantially horizontal shelf above the level of said first and second casters and extending in a direction approximately parallel to said line between said first and second casters, said substantially horizontal shelf being forward of said third caster and rearward of said fourth caster and being narrow compared to the distance between said third and fourth casters, said shelf being provided proximate its forward edge toward said fourth caster with an upstanding backrest completing a furniture holding configuration with said shelf that is approximately L-shaped in cross section against which said furniture may be placed, adapting movement of said furniture to produce rotation of said ledge about an axis between said first and second casters to place either said third caster or fourth caster in a bracing position relative to furniture moved on said dolly.

4,178,007
HYDRAULIC ANTI-SHIMMY DEVICE FOR CASTER WHEELS

Jacques Martineau, Laval, Canada, assignor to Caelter Enterprises, Ltd., Montreal, Canada

Filed Mar. 20, 1978, Ser. No. 890,646
Claims priority, application Canada, Sep. 23, 1977, 287415
Int. Cl.² B60B *33/00*
U.S. Cl. 280—80 R **5 Claims**

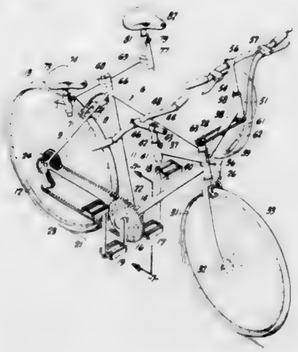


1. A caster wheel supporting arrangement comprising:
- a chassis member carrying bearing means having a generally vertical axis,
- a rotatable assembly including a caster wheel bracket held by said bearing means,
- a rotary hydraulic pump carried by the chassis member and having a rotor connected for rotation by the rotatable assembly, said pump having two ports and being such that at any position of the rotor the pump can move hydraulic fluid from one port to the other or vice versa depending on the direction of rotation of the rotor, and
- a hydraulic circuit connecting the ports of the pump and including a pressure sensitive flow resisting device of the type which opens to increase the flow area therethrough dependent on the pressure difference between said ports.

4,178,008
SIDE BY SIDE BICYCLE

Robert C. Barrett, 1511 Walnut St., Berkeley, Calif. 94709

Filed Sep. 21, 1977, Ser. No. 835,305
Int. Cl.² B62M *1/00*
U.S. Cl. 280—231 **6 Claims**

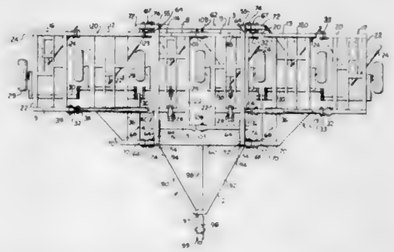


1. A side by side bicycle comprising:
- a frame having a rear fork thereon and a rear wheel rotatably supported by said rear fork;
- a front fork journalled on said frame on a generally upright axis and rotatably supporting a front wheel;
- a yoke on said frame adjacent said front fork and having first and second yoke bars of predetermined length laterally extending from opposite sides thereof;
- a first set of laterally extending handle bars rotatably mounted on the outer end of said first yoke bar and being drivingly connected to said front fork, each handle bar of said first set extending more than said predetermined length from said outer end of said first yoke bar;
- a second set of laterally extending handle bars fixedly but adjustably mounted on the outer end of said second yoke bar, each handle bar of said second set extending more than said predetermined length from said outer end of said second yoke bar;
- a pair of laterally spaced seats adjustably mounted on said frame on opposite sides thereof;
- drive means for said rear wheel and including a pair of cranked pedals on each side of said frame; and
- means for offsetting said first set and said second set of handle bars relative to each other in at least one of the vertical and fore and aft directions whereby said handle bars of said sets are in non-interfering paths and the arms of a pair of riders will overlap without interference and thereby permit positioning said riders in close proximity to said frame.

4,178,009
MULTI-SECTION IMPLEMENT AND DRAFTING STRUCTURE THEREFOR

Richard A. Worick, Beloit, Kans., assignor to Sunflower Manufacturing Company, Inc., Beloit, Kans.

Filed Mar. 29, 1978, Ser. No. 891,461
Int. Cl.² B60D *1/14*
U.S. Cl. 280—411 A **10 Claims**



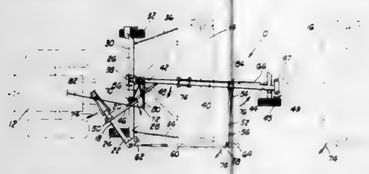
1. For use with a multi-section implement having a plurality of interconnected tool-carrying sections each having front and rear beams and arranged abreast to a line of draft and including at least one center section and adjoining wing sections connected by intersection hinges to said center section for flexing over ground contours and folding said wing sections relative to said center section and generally transverse to the line of draft, a drafting structure comprising:
- (a) a rigid frame of spaced draft beams each having front and rear ends and at least one spreader beam extended transversely to said draft beams and connected thereto near said rear ends;
- (b) said draft beams extending generally over said center section with said draft beams aligned generally longitudinally to the line of draft and having hinge means swingably mounting said frame to said wing sections for folding thereof at least near said rear ends of said draft beams and spanning said intersection hinges for resisting inward gathering forces causing arching of said center section with respect to said wing sections; and
- (c) hitch means for connecting said draft beams to a drawing vehicle.

4,178,010

IMPLEMENT HITCH ASSEMBLY

Jerome J. Gerber, Murdock, Kans. 67111

Filed Jul. 13, 1978, Ser. No. 924,243
Int. Cl.² B60D *1/00*
U.S. Cl. 280—412 **9 Claims**



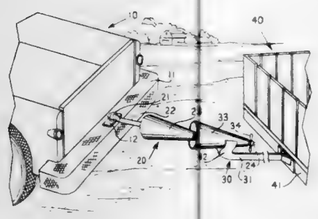
1. An implement hitch assembly attached to the rear of a self-propelled pulling vehicle, the assembly towing a front implement and a rear implement in a tandem position when traveling on a roadway, the assembly towing the front implement in a side-by-side position with the rear implement when in the field, the assembly comprising:
- a hitch bar having a first end portion adapted for pivot attachment to the pulling vehicle and a second end portion mounted on a hitch wheel;
- a draw bar laterally disposed to the direction of travel, said draw bar having a first end portion pivotally attached to the second end portion of said hitch bar and a second end portion mounted on a draw bar wheel, the front implement pivotally attached to said draw bar;
- a side bar having a first end portion pivotally attached to said draw bar and a second end portion mounted on a side bar wheel, the rear implement pivotally attached to said side bar;
- a pivot arm having a first end portion pivotally attached to said side bar and a second end portion pivotally attached to the first end portion of said hitch bar;
- a first swing arm having a first end portion pivotally attached to said side bar and a second end portion;
- a second swing arm having a first end portion pivotally attached to the second end portion of said first swing arm and a second end portion attached to the second end portion of said hitch bar;
- a rear latch bracket mounted on the second end portion of said first swing arm and the first end portion of said second swing arm and releasably engaging a rear latch pivotally attached to the second end portion of said side bar; and
- a front latch bracket mounted on said pivot arm and releasably engaging a front latch pivotally attached to said draw bar.

4,178,011

TAPERED FIT COUPLING METHOD AND APPARATUS

John G. Kirsch, 2600 Old Ranch Rd., Carson City, Nev. 89701

Filed Feb. 22, 1977, Ser. No. 770,566
Int. Cl.² B60D *1/14*
U.S. Cl. 280—477 **4 Claims**



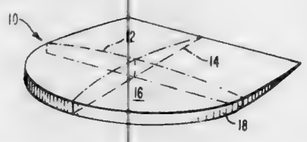
1. Apparatus for coupling a load to a power unit comprising: (1) A first tapered element containing a drift pin slot connected to the power unit; (2) A second tapered element containing a drift pin slot, partially alignable with the drift pin slot in the first tapered element so that a drift pin may be inserted through the two partially aligning drift pin slots for purpose of separating the two tapered elements when they are in contact with one another, connected to the load; (3) A misaligning pilot shaft between the two tapered elements; and (4) Means upon the misaligning shaft to draw the two tapered elements into intimate and rigid contact.

4,178,012

SKI WITH THREE-DIMENSIONAL RUNNING SURFACE

Walter, Roth, Sondermoning, and Hans Woitschätzke, Grünwald, both of Fed. Rep. of Germany assignors to Trak Incorporated, Ward Hill, Mass.

Filed Dec. 2, 1977, Ser. No. 856,777
Int. Cl.² A63C *5/04*
U.S. Cl. 280—609 **21 Claims**



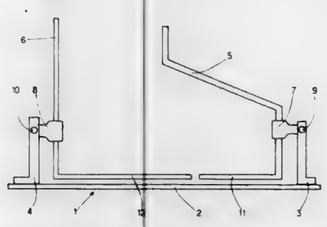
1. A gliding device particularly adapted for gliding over snow having a front end and a rear end and a three-dimensional bottom running surface, which surface comprises a plurality of protuberances which are inclined with respect to the bottom plane of the running surface and rise towards the rear end of the device to prevent backward movement of the device in use, said protuberances especially being scale-like and characterized in that the surface of said protuberances is convexly curved in both longitudinal and in transverse directions of the running surface to provide for improved forward gliding properties of the device and wherein the boundary line of said protuberances, which faces the front end of the device, lies substantially in the bottom plane of the running surface of the device.

4,178,013

FIXING DEVICE FOR SECURING NON-RIGID SHOES ON SKIS

Jean R. Bataille, 20, rue du Commandant René Mouchette, Paris, France

Filed Feb. 23, 1977, Ser. No. 771,250
Claims priority, application France, Feb. 25, 1976, 76 05252; Feb. 14, 1977, 77 04133
Int. Cl.² A63C *9/086*
U.S. Cl. 280—618 **7 Claims**



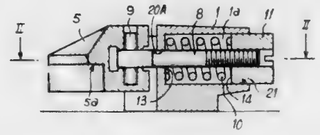
1. A device for securing a skier's foot to a ski, said ski having a binding mounted thereto, the device comprising:
- a base member detachably connectible to the ski binding;
- framework means mounted to the base member, the framework means being adapted to receive a skier's foot within the framework;
- expandable chock means mounted to the interior of the framework to engage and clamp the skier's foot;
- pump means carried by the framework and in communication with the chock means to supply the chock means with a fluid medium to expand the chock means;
- said pump means being located within the framework to be operative by motions and forces of the skier's foot on the pump means; and
- valve means interposed between the pump means and the chock means to control the pressure applied to the chock means by the pump means.

4,178,014

BINDING WITH VERTICAL PIVOT AXES

Georges P. J. Salomon, Annecy, France, assignor to S.A. des Etablissements Francois Salomon & Fils, Annecy, France

Division of Ser. No. 747,526, Dec. 6, 1976, abandoned. This application Oct. 18, 1978, Ser. No. 953,277
Claims priority, application France, Dec. 11, 1975, 75 37908
Int. Cl.² A63C *9/085*
U.S. Cl. 280—629 **7 Claims**



1. A safety binding for a ski having a longitudinal plane of symmetry and comprising a one-piece jaw having a rear end in which can be engaged and maintained one end of the sole of a ski boot, a casing integrally extending from said jaw frontwardly, support means connectible to said ski and providing two lateral support lines disposed respectively on either side of the longitudinal plane of symmetry of the ski, said jaw and casing defining a bore, said jaw having a transverse face, said support means comprising a support body engaged in said bore and having a transverse face opposed to the transverse face of the jaw, one of said transverse faces including projections and the other transverse face having recesses receiving said projections and defining said support lines while permitting relative movement between said jaw and said support body, and means in said bore resiliently acting on said jaw to urge said projections into said recesses such that the jaw can pivot on either line of support, the lines of support viewed along the longitudinal axis of the ski converging towards a point disposed above the ski in order that in one direction of lateral movement of the jaw, the jaw will pivot about one line of support and in the other direction of lateral movement of the jaw, the jaw will pivot about the other line of support.

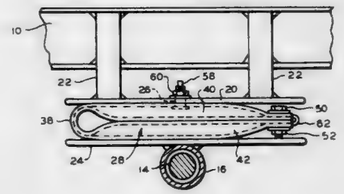
4,178,015

INFLATED VEHICLE SPRING AND LIFT

Henry H. Merriman, Jackson, and William J. White, Clark Lake, both of Mich., assignors to Merriman Products, Inc., Jackson, Mich.

Filed Dec. 12, 1977, Ser. No. 859,819
Int. Cl.² B60G *11/26*
U.S. Cl. 280—711 **6 Claims**

1. An inflatable air spring for vehicles having a frame mounted spring bracket and an axle mounted spring bracket comprising, in combination, a single collapsible elastomeric flexible wall tube radially expandable between inflatable and deflated conditions for location between the vehicle spring brackets and having first and second ends, said tube being folded over upon itself lengthwise defining upper and lower chamber portions and said ends being disposed adjacent each other in vertical juxtaposition, clamping means disposed above and below said tube ends closing said ends in air-tight relationship defining a pair of substantially horizontal linear seal joints, a conduit establishing communication between said tube upper



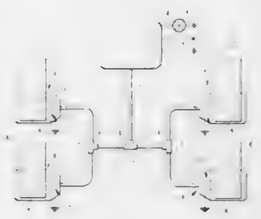
and lower chamber portions, said conduit extending into both of said seal joints, and an air valve communicating with one of said tube chamber portions.

4,178,016

TRIGGERING INSTALLATION FOR A PASSENGER PROTECTION DEVICE IN A VEHICLE

Rudolf Andres, Sindelfingen, and Heinz W. Knoll, Aidlingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 30, 1977, Ser. No. 811,723
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1976, 2631190
Int. Cl.² B60R *21/08*
U.S. Cl. 280—734 **18 Claims**



1. A triggering system for a motor vehicle passenger protection means activated by an energy source means, the triggering system comprising a sensor-controlled means including an igniter means, said sensor-controlled means supplying a triggering pulse to the igniter means in the presence of predetermined criteria, wherein the improvement comprises means for accommodating the igniter means so as to shield the igniter means from external influences, a transmission path means between the igniter means and the energy source means, the transmission path means including at least one high burning velocity fuse cord means arranged between the igniter means and the energy source means, and means for continuously testing the operating readiness of the transmission path means including an electrical line carried along with the fuse cord means.

4,178,017

SAFETY BAG INFLATION APPARATUS WITH EXTENDIBLE GUARD MEMBER AGAINST CONTACT OF BAG WITH HEATED GAS GENERATOR

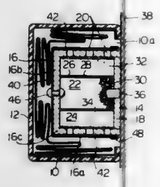
Takashi Ishi, Sayama; Takuzi Murakami, Tokorozawa; Masayoshi Kato, Shiki, and Tadahiko Nagaoka, Tokorozawa, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Division of Ser. No. 621,603, Oct. 10, 1975, Pat. No. 4,068,862. This application Sep. 7, 1977, Ser. No. 831,239

Claims priority, application Japan, Nov. 20, 1974, 49-133866; Apr. 30, 1975, 50-59155; May 24, 1975, 50-69884

Int. Cl.² B60R *21/08*

U.S. Cl. 280—740 **8 Claims**



1. A safety apparatus comprising:

a gas generator including a housing with a plurality of gas outlets formed in a wall thereof, a combustible gas-generating composition disposed in said housing, and a heat-absorbing material disposed in said housing between said gas-generating composition and said outlets;

an inflatable bag folded and arranged such that said housing extends into said bag, the mouth of said bag in a fixed position with respect to said housing, so that said bag is inflated when a gas is discharged from said outlets; and

a guard member of a metal which has a first portion and a petal-like second portion bounded by an imaginary line drawn substantially parallel to the outer surface of said wall of said housing and is entirely interposed between said inflatable bag and said wall, said first portion being kept permanently in a fixed position relative to said wall of said housing, said second portion assuming an initial position so as to cover at least a part of said gas outlets until discharge of said gas from said gas outlets and being unfoldable along said imaginary line such that said second portion assumes another position more distant from said wall than said initial position when said gas is discharged from said gas outlets and remains at said another position after completion of the discharge of said gas from said gas generator.

4,178,018

CONTINUOUS STATIONERY ASSEMBLIES

Per W. Halse, Oslo, Norway, assignor to Moore Business Forms, Inc., Grand Island, N.Y.

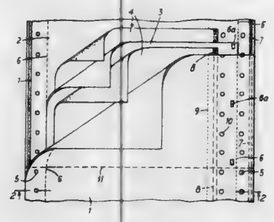
Filed Oct. 4, 1977, Ser. No. 839,263

Claims priority, application United Kingdom, Oct. 5, 1976, 41237/76

Int. Cl.² B41L *1/20*

U.S. Cl. 282—11.5 A **5 Claims**

1. A series-connected business form adapted to be fed through the printing means of a business machine, comprising, a pair of superimposed continuous outer webs having aligned opposed marginal edges, said webs having marginal feed strips including spaced feed holes extending along said marginal edges, said webs being directly connected together along longitudinal first connecting means lying adjacent said feed holes of said feed strips and extending along said marginal edges, a first continuous intermediate web disposed between said outer webs, said intermediate web having opposed side edges spaced inwardly of said marginal edges and of said feed holes, first lines of weakening provided in said outer webs adjacent one of said side edges, a second line of weakening provided in each of said webs inwardly of the other of said side edges, second connecting means lying between said second line of weakening and said other side edge for connecting said intermediate web to one of said outer webs, and said webs having spaced transverse lines of weakening in superimposed relationship for separating the form into individual units, whereby the form may be folded along said transverse lines



before being fed through the printing means with said webs in predetermined alignment with one another, and may be refolded along said transverse lines after leaving the printing means with said webs being substantially maintained in said alignment, and whereby said webs of each said unit may be separated from one another along said first and second lines of weakening.

4,178,019

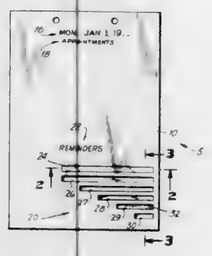
DATE REMINDER CALENDAR

Milton Gedzelman, 80 Beekman St., New York, N.Y. 10038

Filed Apr. 28, 1978, Ser. No. 900,874

Int. Cl.² B42D *5/04*

U.S. Cl. 283—2 **12 Claims**



1. A date reminder calendar comprising a plurality of stacked sheets each representing a different date, said sheets being arranged in a plurality of like groups of sheets with each group representing a predetermined time period, at least one of the sheets of each group being provided with a marking area adapted to be marked in a manner readily distinguishable from similar areas which have not been marked, a number of sheets equal up to the number of sheets in a group being disposed above said marking area and being provided with openings generally aligned with each other and being successively larger the closer to said marking area, whereby each marking area becomes larger and more prominent with the removal of each successive sheet to thereby increasingly signify the imminency of the date and the reminder associated with said marked area.

4,178,020

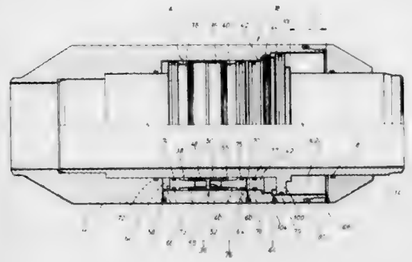
LOCKING SLIP JOINT AND METHOD OF USE

Emil E. Dopyera, Houston, Tex., assignor to Big-Inch Marine Systems, Inc., Houston, Tex.

Filed Dec. 15, 1977, Ser. No. 860,706

Int. Cl.² F16L *55/00, 17/02*

U.S. Cl. 285—18 **11 Claims**



1. A locking slip joint for connecting first and second tubular members comprising:

an outer sleeve having one end for connecting to a first tubular member;

an inner sleeve having one end for connecting to a second tubular member and having its other end disposed within said outer sleeve, said outer and inner sleeves providing a common central passage therethrough;

said outer sleeve having a precisely formed annular surface on its inside diameter and said inner sleeve having a precisely formed annular surface on its outside diameter, said annular surfaces being opposed in a spaced-apart relationship to define an annulus and being formed from deformable metal adapted to receive a continuous annular tooth by embedment;

seal means disposed within said annulus and comprising:

a ring member encircling said inner sleeve and including inner and outer joined arms defining therebetween a tapered annular recess adapted to forcibly receive a mating member for deforming the inner arm inwardly into engagement with said inner sleeve and deforming the outer arm outwardly into engagement with the outer sleeve, the engaging surface of each arm including at least one continuous annular tooth for embedding into the respective sleeves to form metal-to-metal seals;

a mating member having a tapered portion for mating with said recess of said ring member; and

means for forcing said mating member into said recess to effect deformation of said ring member and embedment of the annular teeth into the sleeves.

4,178,021

LEAK-TIGHT COUPLING DEVICE

Fernand Lauro, Grenoble, and Roland Podevin, Saint Ismier, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

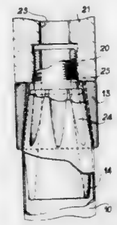
Filed Apr. 21, 1978, Ser. No. 898,981

Claims priority, application France, May 5, 1977, 77 13699

Int. Cl.² F16L *33/22*

U.S. Cl. 285—255 **7 Claims**

1. A device for providing a leak-tight coupling between a flexible tube and a rigid coupling connector having two coaxial components adapted to fit one inside the other, the first component being mounted within and covered by the flexible tube and the second component being mounted externally around the flexible tube in such a manner that the end portion of said tube is clamped between said two components, wherein one of said first and second components of the coupling connector has a frusto-conical tube-engaging surface with concave, longitudinally extending grooves formed therein and the other component has a complimentary frusto-conical tube engaging surface with convex longitudinally extending ribs formed



thereon, said ribs and grooves being adapted to cooperate with each other at the time of inter-engagement of said components so as to imprison said end portion of the tube.

4,178,022

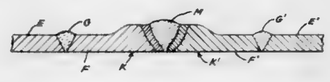
WELDED AUSTENITIC STEEL PIPE ASSEMBLY

Rodney E. Hanneman, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 12, 1977, Ser. No. 816,338

Int. Cl.² B23K *28/02*

U.S. Cl. 285—286 **3 Claims**



1. A butt-welded austenitic stainless steel pipe assembly having special utility in a boiling water reactor by virtue of having substantially the stress corrosion cracking resistance of the components of the assembly prior to welding comprising a plurality of pipe lengths, spool pieces of substantially the same inside diameter as the pipe lengths joined coaxially to the ends of each pipe length by solution-annealed butt-welds and butt-welded to opposed spool pieces of adjacent pipe lengths, said spool pieces each having an end portion of substantially the same wall thickness as the pipe lengths and having another portion of substantially greater wall thickness terminating in a frustroconical surface at the open end of the spool piece to provide in cooperation with an abutting spool piece an annular recess substantially filled with weld metal, and said spool pieces each having a weld heat affected zone extending from the frustroconical surface and terminating axially within the said greater wall thickness portion of the spool piece.

4,178,023

COUPLINGS FOR TUBES

John D. Guest, "Iona", Cannon Hill Way, Bray, Maidenhead, Berkshire, England

Filed Feb. 6, 1978, Ser. No. 875,713

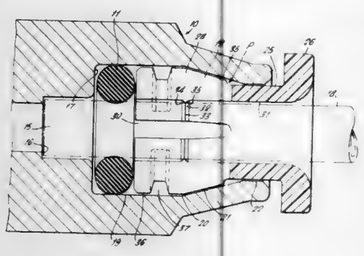
Claims priority, application United Kingdom, Feb. 9, 1977, 5415/77; Jul. 26, 1977, 31398/77

Int. Cl.² F16L *17/00*

U.S. Cl. 285—323 **15 Claims**

1. A tube coupling for gripping a tube comprising a body member with a bore, said bore having an internal surface tapering to a narrower diameter in a direction towards an open end of the bore in said body member, a collet in said bore having a circumferentially continuous annular portion and resilient arms extending from said annular portion inwardly in the axial direction from the open end of the bore, said collet having external cam surfaces on said arms arranged to co-oper-

ate with said internal surface of said body member, said cam surfaces on the collet arms extending only part of the way along the length of the arms from the root end thereof where the arms join together such that the tapered internal surface on the body member engages only a part of the length of said arms adjacent the root end thereof so that the collet arms are forced radially inwardly by flexure about the root end when the collet

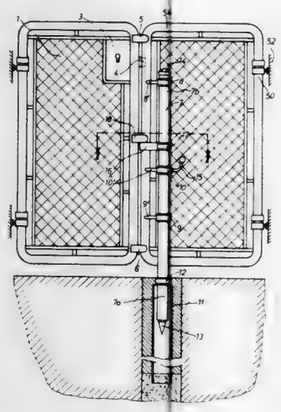


is moved axially towards the open end of the bore, the collet arms furthermore have an inwardly extending projection at a position along the length of each arm intermediate the ends thereof for engaging and gripping a tube in the collet, radially inwardly facing surfaces on the arms extending beyond the projection inwardly of the bore and being adapted to bear against the tube when the arms are forced inwardly to spread the gripping force along a large surface area of the tube.

4,178,024
ROD LOCK FOR DOORS OR GATES HAVING TWO WINGS

Remigius Wagner, Schulhausstrass 12, Wetzikon, Switzerland

Filed Jun. 26, 1978, Ser. No. 919,362
Claims priority, application Switzerland, May 7, 1977, 8299/77; Jul. 5, 1977, 8299/77
Int. Cl.² E05C 5/02
U.S. Cl. 292—57 **10 Claims**

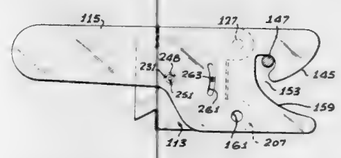


1. A rod locking arrangement for doors or gates having two wings, comprising:
- a locking rod capable of being mounted at one wing for vertical displacement;
- said locking rod being movable into a closed position where it engages with a floor recess;
- at least one stop member provided at the other wing against which bears the wing having the locking rod;
- a door lock effective between both of the wings;
- at least two guide rings for guiding the locking rod for vertical movement and for rotational movement about its lengthwise axis;
- a locking element mounted at the locking rod and pivotable together with said locking rod;
- said locking element engaging between both of the wings bearing against one another in the closed position thereof; and
- a retarding element for preventing lifting of the locking element and thus the locking rod.

4,178,025
NARROW CLEARANCE GATE LATCH

Milton Robins, Marina Del Rey, Calif., assignor to PTI - Dolco, Los Angeles, Calif.

Continuation-in-part of Ser. No. 754,326, Dec. 27, 1976, abandoned. This application Jun. 10, 1977, Ser. No. 805,464
Int. Cl.² E05C 3/04
U.S. Cl. 292—117 **13 Claims**

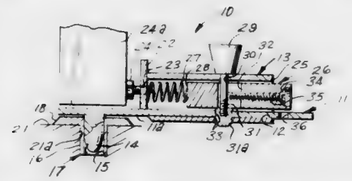


1. A latching mechanism for selectively preventing relative movement between two otherwise relatively movable structures comprising
- bar means suitable for fixed mounting on a first movable structure;
- a plate means suitable for pivotal mounting on a second relatively movable structure and having
  - a first cam surface on a leading edge thereof,
  - a nose section adjacent one end of said first cam surface,
  - a bar-receiving notch opening adjacent said nose section and having
  - a second cam surface on a portion of the periphery of said notch relatively distal from said nose section,
  - a third cam surface on a portion of the periphery of said notch adjacent said nose section,
  - a bar holding surface on the periphery of said notch intermediate said second and third cam surfaces;
- means for pivotally mounting said plate means to a relatively movable structure including
  - anchor plate means including
    - means for fixedly locating and mounting said anchor plate means on such a relatively movable structure and
    - means for attaching said plate means to said anchor plate means for relative pivotal movement therebetween, for retaining said plate means and said anchor plate means in a parallel relationship, and for holding said plate means and said anchor plate means in place relative to a relatively movable structure comprising
    - an aperture of predetermined first diameter in said anchor plate means,
    - an aperture of predetermined second diameter in said plate means, said first and second diameters being unequal,
    - bearing means having an outer diameter which is larger than the diameter of one of said apertures and smaller than the diameter of the other of said apertures and a greater axial length than the thickness of the one of said plate means and said anchor plate means having the larger of said apertures, said bearing means being seatable within the larger of said apertures, and
    - fastening means extending through said bearing means and the smaller one of said apertures and including means thereon, having a nominal diameter greater than that of the larger of said apertures, for preventing relative movement between the plates in a direction parallel to the axis of said fastening means.

4,178,026
SECURITY DOOR LOCK

William A. Sinkhorn, 2249 N. Medina Line Rd., Akron, Ohio 44313

Filed Mar. 1, 1978, Ser. No. 882,451
Int. Cl.² E05C 1/04
U.S. Cl. 292—295 **9 Claims**



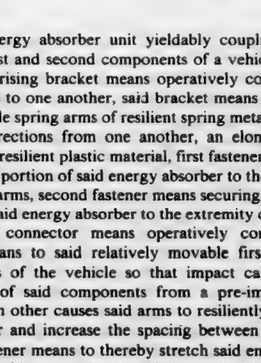
1. In combination with a door frame, a door mounted on said door frame and movable between an open and a closed position, a security door lock, said security door lock comprising: a lock housing, a slidable lock plate received in said lock housing, a pin presented from said lock plate, means in said door frame to receive said pin against lateral movement, said pin being insertable in said means only when the door is in the open position, a locking pin received in said lock housing and selectively engaging said lock plate for rendering said lock plate secure to said lock housing and thereby securing the door in its closed position against an intruder, a push-bar slidably received in said lock housing and manually movable between at least a first and a second position, said push bar engaging said locking pin and maintaining it in engagement with said lock plate when said push bar is disposed in said first position, said push bar disengaging from said locking pin to permit withdrawal of said locking pin from said lock plate when said push bar is disposed in said second position, spring means biasing said push bar toward said first position, and a knob external of said lock housing for lifting and lowering said locking pin.

4,178,027
DOOR LOCK GUARD

Marcel Charron, 44 Church St., East Hartford, Conn. 06108

Filed Jul. 31, 1978, Ser. No. 929,444
Int. Cl.² E05B 17/00
U.S. Cl. 292—346 **8 Claims**

1. A guard plate for use in a door lock guard, for use with locks of the type having a strike plate attached to a doorjamb and a latchbolt plate attached to a door, the guard plate comprising:
- a support plate which is capable of being attached to a doorjamb or a door, the support plate including a cutout providing for protrusion of the strike plate or the latchbolt plate, said support plate defining two oppositely disposed edges;
- a first flange extending from one edge of said support plate in a direction angled with respect to said plate said flange terminating in tongue which extends in generally parallel relation to the support plate; and
- a second flange extending from said second edge of the support plate, said second flange including an aperture,



said flanges extending in opposite directions with respect to each other.

4,178,028
ENERGY ABSORBING MOUNTING FOR VEHICLE BUMPER

Loren E. Lura, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 1, 1977, Ser. No. 856,592
Int. Cl.² B60R 19/00
U.S. Cl. 293—135 **3 Claims**



1. An energy absorber unit yieldably coupling relatively movable first and second components of a vehicle to one another comprising bracket means operatively connecting said components to one another, said bracket means having a pair of deflectable spring arms of resilient spring metal diverging in opposite directions from one another, an elongated energy absorber of resilient plastic material, first fastener means securing one end portion of said energy absorber to the extremity of one of said arms, second fastener means securing the other end portion of said energy absorber to the extremity of the other of said arms, connector means operatively connecting said bracket means to said relatively movable first and second components of the vehicle so that impact causing relative movement of said components from a pre-impact position toward each other causes said arms to resiliently deflect from one another and increase the spacing between said first and second fastener means to thereby stretch said energy absorber and so that said energy absorber dissipates the kinetic energy of said components as said components are relatively moved, said plastic energy absorber having a recovery rate lower than the recovery rate of said spring arms to permit said spring arms to return said components to said pre-impact position without added recovery force from said energy absorber.

V 9 8 9 1 2 DEC 11 1979 UMI

4,178,029

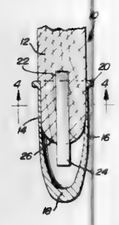
FERROUS OBJECT RETRIEVER

LeRoy A. LaPan, 1913 24th St., Bay City, Mich. 48706

Filed Feb. 22, 1978, Ser. No. 880,325

Int. Cl.² B66C *1/04*

U.S. Cl. 294—65.5 **2 Claims**



1. A tool especially designed to be used in a kitchen for retrieving ferrous objects, said tool comprising an elongated wooden handle including opposite ends, one of said ends including a diametrically reduced end portion having an endwise outwardly opening blind bore formed therein, an elongated permanent magnet having one end seated and secured in said bore with the other end of the magnet projecting endwise outwardly of said end portion, a hollow end cap removably engaged over said end portion and loosely enclosing the exposed end of said permanent magnet therein, the other end of said handle being of substantially the same cross-sectional shape and size as said end portion of said handle and said cap, when removed from said one end portion of said handle, may be removably snugly telescopingly engaged over the other end of said handle and comprise a handgrip for the last mentioned end of said handle.

4,178,030

GRAPPLE OR GRAB-BUCKET SAFETY MECHANISM

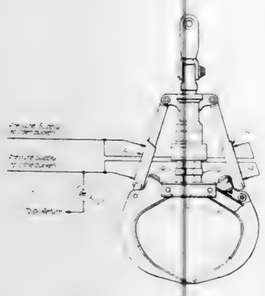
Hans Dolinsek, Stuttgart, Fed. Rep. of Germany, assignor to Firma Johannes Fuchs, Ditzingen, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,324

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1977, 2718434

Int. Cl.² B66C *3/16*

U.S. Cl. 294—70 **4 Claims**



4. In a grapple or the like excavating device for use as a working attachment for a crane, excavator or the like, said grapple comprising at least two pivoted buckets with at least one selectively operable double-acting hydraulic cylinder for bucket actuation from open to closed position and from closed to open position, the normal bucket-open position being limited by energy-absorbing buffer means, the improvement in which said buffer means includes a yieldably displaceable abutment having an energy-absorbing stroke of such extent that only a portion of said stroke is used in arresting bucket-opening movement in the presence of a bucket-opening actuation by said cylinder, whereby a portion of said stroke remains in which to absorb such mechanical shock in the bucket-opening direction as may be encountered by a bucket while in its normal bucket-open position, and pressure-relief valve means connected to that end of said cylinder which receives pressure fluid for actuation in the bucket-closing direction.

4,178,031

LIFTING GEAR FOR FILLED SACKS

Fritz Achelpohl, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Feb. 1, 1978, Ser. No. 874,155

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1977, 2704732

Int. Cl.² B66C *1/58*

U.S. Cl. 294—82 R **3 Claims**



1. An annular supporting frame for lifting a filled sack, comprising a pair of clamping bars about which the gathered and flattened end of the sack is slung, characterised in that the supporting frame comprises a triangular lug (3, 5, 6) about the clamping bar (3) of which that is opposite the supporting angle (7) for suspending from the hook (8) of a crane there is placed that end (1) of the sack which is folded onto itself to form a loop (4) through which a second clamping bar (9) is pushed which has a flanged end piece (10) by which it is supported on a limb (6) of the lug connecting the clamping bar (3) to the supporting angle (7).

4,178,032

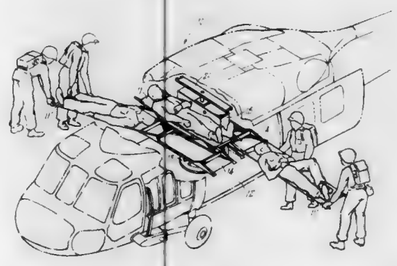
APPARATUS FOR SYNCHRONOUSLY ELEVATING AND LOWERING AIR-AMBULANCE LITTER WITH CRASH ATTENUATION CAPABILITY

Horace T. Hone, Trumbull, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 1, 1978, Ser. No. 901,881

Int. Cl.² B60P *3/26*; B64D *11/00*

U.S. Cl. 296—19 **9 Claims**



1. Litter elevating and lowering apparatus adapted for use in an air-ambulance comprising:

(A) a pulley-cable defining a continuous cable having two selectively spaced vertical oriented portions and two crossed portions connecting the vertical portions so that motion of the cable over the pulleys will cause the vertical portions to move vertically upwardly and downwardly synchronously,

(B) litter support means connected to said cable vertical portions to provide level support for a patient bearing litter and for synchronous vertical litter motion with said cable vertical portions,

(C) means to cause said continuous cable to move over said pulleys to cause said litter support means to be either elevated or lowered synchronously,

(D) locking means to lock said cable against motion with said litter support means in a selected position of elevation and,

(E) crash attenuating means operatively associated with said continuous cable to permit said cable side portions and hence said litter support means to move gently a selected vertical distance in response to a preselected G-level load imposed thereon by a down-crash or other force to thereby attenuate the force and spare the patient the full impact of the down-crash load and prevent cable rupture as a result thereof.

4,178,033

MOTORCYCLE COVERING

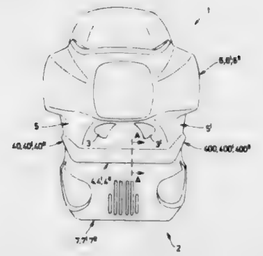
Hans-Albrecht Muth, Hechendorf, and Hans-Günther v. d. Marwitz, Münich, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed May 24, 1977, Ser. No. 799,951

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1976, 2624850

Int. Cl.² B62J *17/04*

U.S. Cl. 296—78.1 **4 Claims**



1. A covering for a motorcycle which covers essentially the frontal area of the motorcycle from the handlebar down to the drive means as well as lateral areas of the motorcycle, and which consists essentially of an upper part and a lower part connected together in the area of a spoiler means formed integrally with the upper part and wherein the covering forms a fairing and the upper part, for purposes of forming the spoiler means, is constructed in its lower edge area projecting obliquely outwardly and downwardly from the motorcycle, characterized in that a connecting flange for the lower part is arranged at the spoiler means along the inner side thereof.

4,178,034

VEHICLE INSECT PROTECTION APPARATUS

Theodor H. Mittendorf, P.O. Box 1138, Mount Dora, Fla. 32757

Filed Jan. 30, 1978, Ser. No. 873,211

Int. Cl.² B60K *11/02*

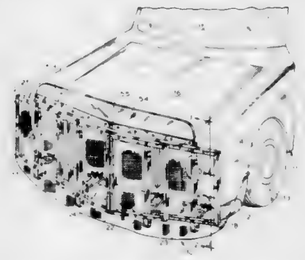
U.S. Cl. 296—91 **3 Claims**

1. An insect protection apparatus for moving vehicles comprising in combination:

frame means having a plurality of elongated rigid frame members;

a screen attached to said rigid frame members;

bumper attaching means for attaching said frame members to a bumper of a vehicle for holding a screen in front of said vehicle, said bumper attaching means having a pair of brackets having hook shaped end portions on one end thereof, each said bracket being adapted to hook onto a vehicle bumper and attached with bolts to a plurality of said rigid frame members for supporting said frame mem-



bers in an upright position on a vehicle bumper, and a plurality of bumper engaging brace members for engaging a bumper to prevent said elongated rigid frame members from shifting on said bumper; and

said bumper engaging brace members being covered with a resilient material adapted to frictionally engage said bumper when said rigid frame members are attached to said bumper, said bumper engaging brace members each being attached between two elongated rigid frame members, thereby bracing said frame members to each other and against a bumper.

4,178,035

SUN VISOR FOR MOTOR VEHICLES

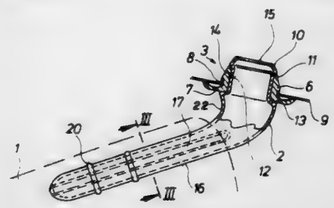
Kurt Cziptschirsch, Wuppertal, Fed. Rep. of Germany, assignor to Gebr. Happich GmbH, Fed. Rep. of Germany

Filed Oct. 14, 1977, Ser. No. 842,317

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1976, 2653988

Int. Cl.² B60J *3/00*

U.S. Cl. 296—97 K **18 Claims**



1. A sun visor for use in a motor vehicle, or the like, comprising:

a visor body shaped to serve as a visor;

a bearing housing adapted for mounting to the body of the vehicle, or the like; said bearing housing comprising a rotationally symmetric plug body having a plug opening extending into it; and

a bearing axle comprising: a first leg having bearing means thereon for enabling connection of said axle with said visor body and for enabling pivoting of said visor body around said axle first leg; said bearing axle also being pluggable into said bearing housing plug opening;

said plug body being generally in the form of a rosette in-

cluding a forwardly extending plug pin and a flange at the rear of said plug pin; said plug pin tapering conically narrower to the end thereof away from said flange;

a transition between said plug pin and said flange, said transition being annular and narrowed in diameter as compared with said plug pin at said transition, thereby to define a groove type undercut at said transition,

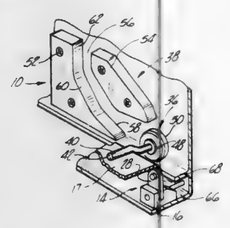
said plug body plug opening extending through said flange and said transition into said plug pin.

4,178,036

POSITIVE LOCK MECHANISM FOR VEHICULAR SLIDING ROOF PANELS

Milton C. Kalitz, Allen Park, Mich., assignor to American Sunroof Corporation, Southgate, Mich.

Filed Oct. 17, 1977, Ser. No. 842,556
Int. Cl.[2] B60J *7/18*
U.S. Cl. 296—137 B **19 Claims**



1. A locking action device for preventing movement of an automotive sliding roof panel, comprising:

(a) means for following the path of travel of the panel and connected thereto,

(b) a guiding surface interposed the path of travel of the following means, the following means engaging the guiding surface, the guiding surface defining the path of travel of the following means upon engagement therewith, and

wherein the following means is retained in position by the guiding surface to prevent dislodgment of the roof panel when the panel is positioned to close an opening in the roof.

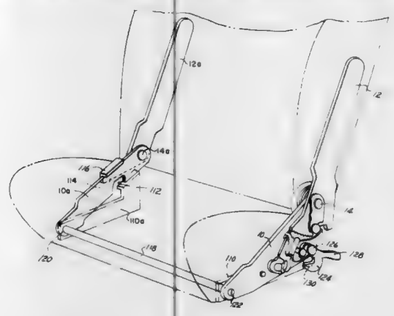
4,178,037

SEAT RECLINER ASSEMBLY

Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 730,228, Oct. 6, 1976, abandoned, Ser. No. 651,716, Jan. 23, 1976, abandoned, and Ser. No. 552,974, Feb. 26, 1975, Pat. No. 3,973,288. This application May 30, 1978, Ser. No. 910,296
Int. Cl.[2] A47C *1/00, 1/026*
U.S. Cl. 297—326 **3 Claims**

1. A reclining vehicle seat and seat back supporting construction for supporting a seat back for pivotal movement relative to a vehicle seat, and for supporting the seat and seat back for simultaneous forwardly and upwardly pivotal movement to provide access to a space in rear of the seat, said construction comprising a pair of generally similar assemblies spaced apart laterally of the vehicle, each assembly consisting essentially of three flat elongated members shaped to provide for fabrication from flat stock by cutting and bending, said members for each assembly comprising an elongated flat base support member extending longitudinally of the vehicle and having its width dimension occupying a vertical plane, an elongated flat seat support member pivoted at its forward end to the forward end of said base support member, said seat support member having its width dimension occupying a vertical plane and having a flat side of its forward end in mutually supporting side-by-side sliding contact with a flat side of the forward end of said base support member, and an elongated flat seat back support member pivoted at one end to the rear end of said seat support member and movable relative thereto between a generally upright position and a rearwardly inclined reclining position, said seat back support member having its width dimension occupying a vertical plane and having a flat side of its said one end in mutually supporting side-by-side sliding contact with a flat side of the rear end of said seat support member, latch means for latching said seat back support member to said seat support member in a selectd one of a plurality of positions between upright and reclining position, said seat support members being separate, independent, and spaced apart, a torque-transmitting member extending transversely between said assemblies and rigidly connected at its ends to the forward ends of said seat support members, said



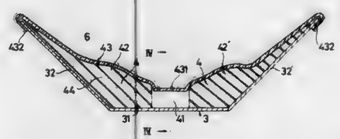
torque-transmitting member being pivotally connected adjacent its ends to both of said base support members and constituting the sole connection between said assemblies to ensure simultaneous equal tilting of both of said seat support members as the entire seat construction is tilted forwardly and upwardly to provide access to the space in rear of the seat construction, and rigid abutment means acting between one of said seat support members and the seat back support member pivoted thereto and engageable when said seat back support member is in upright position whereby force applied in a forward direction to the top of the seat back mounted on said seat back support member causes unitary forward and upward tilting of the entire seat construction about the pivot connections at the forward ends of said base support members.

4,178,038

HEADREST OF TREATMENT TABLE

Akio Yada, Uji, and Naonobu Tsukada, Joyo, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Mar. 14, 1978, Ser. No. 886,408
Claims priority, application Japan, Mar. 15, 1977, 52/31702[U]
Int. Cl.[2] A47C *1/10*
U.S. Cl. 297—391 **4 Claims**



1. A headrest for a medical treatment table comprising:

a rigid headrest base, said base comprising:

a flat bottom plate;

at least two side pieces extending upwardly in an inverted-bell shape from both sides of said flat plate;

an end area of said flat bottom plate gently curved rearwardly; and

an end area of said side pieces gently curved rearwardly adjacent said end area of said flat bottom plate;

a cushion member coupled to said rigid headrest base; and

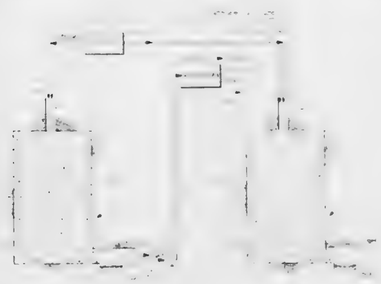
an extensible surface cover separate from said cushion member and detachably coupled to said rigid headrest base by U-shaped base attachment members integrally formed in said surface cover for covering said cushion member whereby said surface cover may be easily replaced when it becomes soiled.

4,178,039

WATER TREATMENT AND HEATING IN SPENT SHALE OIL RETORT

Robert S. Burton, III, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jan. 30, 1978, Ser. No. 873,667
Int. Cl.[2] E21C *41/10*
U.S. Cl. 299—2 **11 Claims**



1. A method for processing oil shale in an in situ oil shale retort in a subterranean formation containing oil shale comprising the steps of:

excavating a first portion of formation to form at least one void within the boundaries of an in situ oil shale retort site;

explosively expanding a second portion of formation within the boundaries of the in situ oil shale retort site towards such a void to form a fragmented permeable mass of formation particles containing oil shale in such an in situ oil shale retort;

retorting the particles containing oil shale in the fragmented mass to produce an in situ fragmented permeable mass of particles containing treated oil shale in a spent in situ retort;

introducing water containing undissolved impurities into an upper portion of the spent in situ retort; and

withdrawing water from a lower portion of the spent retort having a concentration of undissolved impurities lower than the concentration of undissolved impurities in the introduced water.

6. A method for processing oil shale in an in situ oil shale retort in a subterranean formation containing oil shale comprising the steps of:

excavating a first portion of formation to form at least one void within the boundaries of an in situ oil shale retort site;

explosively expanding a second portion of formation within the boundaries of the in situ oil shale retort site towards such a void to form a fragmented permeable mass of formation particles containing oil shale in such an in situ oil shale retort;

retorting the particles containing oil shale in the fragmented mass to produce an in situ fragmented permeable mass of particles containing treated oil shale in a spent in situ retort;

introducing water into the spent in situ retort, at least a portion of the fragmented mass in the spent retort being at a sufficient temperature to generate steam; and

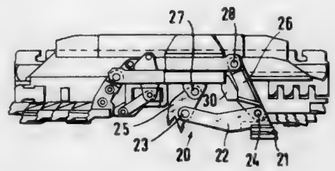
withdrawing steam from the spent in situ retort.

4,178,040

MOVABLE MINING PLANER WITH DIRECTION RESPONSIVE ADJUSTABLE CUTTER DEPTH

Gerhard Merten, Lunen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Feb. 15, 1978, Ser. No. 877,969
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1977, 2707724
Int. Cl.[2] E21C *27/32*
U.S. Cl. 299—34 **16 Claims**



1. A mineral mining plough for winning material in a mineral mining working, the plough being movable to and fro alongside a conveyor, said plough comprising: a plough body, first cutter means on said plough body for winning material lying in a first height range, second cutter means on said plough body for winning material lying in a second height range, said first and second cutter means each consisting of two sets of cutters arranged respectively on opposite sides of said plough body, one of the sets of cutters of said first cutter means being pivotally mounted on said plough body for movement independently of the other set of cutters of said first cutter means, and means for coacting with the mineral face during movement of the plough in one direction to urge the one set of cutters of said first cutter means to a depth of cut greater than that of the remaining sets of cutters on said plough body, and for coacting with the mineral face during movement of the plough in the opposite direction for retracting the said one set of cutters from the mineral face.

4,178,041

WHEEL ATTACHED BALANCING DEVICE

Kim E. Rush, Irvine, Calif., assignor to Khartli, Inc., Danville, Calif.

Filed Aug. 23, 1978, Ser. No. 935,885
Int. Cl.[2] B60B *7/00;* F16F *15/10*
U.S. Cl. 301—5 BA **10 Claims**

1. A wheel attachable balancing device comprising in combination,

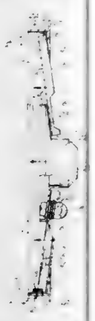
radially expansible means for disposition proximate a circular portion of a wheel and radially displaceable during wheel rotation into engagement with said circular portion,

a hub,

hub support structure carried by said expansible means and locating said hub in coaxial offset relationship with said expansible means,

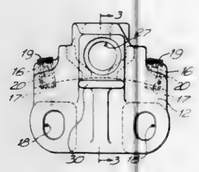
the entire body of said hub being axially displaceable during wheel rotation by centrifugal force acting on said support

structure, said support structure biasing said radially expansible means during wheel rotation into contact with



the circular portion of the rim to counteract vibratory wheel motion.

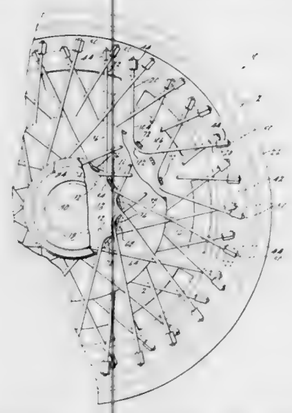
4,178,042
VARIABLE-TRACK WHEELS
Alec Sykes, Huddersfield, England, assignor to David Brown Tractors Limited, Huddersfield, England
Filed Nov. 24, 1978, Ser. No. 963,485
Claims priority, application United Kingdom, Dec. 10, 1977, 51505/77
Int. Cl.[2] B60B *23/12*
U.S. Cl. 301—9 TV **8 Claims**



1. A bracket secureable to a hub having a cylindrical periphery, for connecting the hub to a helical rail secured to the rim of a power-adjustable variable-track wheel, and including a groove in which the rail is slideable and in which a block can be housed so as to be moveable into and out of clamping engagement with the rail by the rotation of an eccentric pin which can be journalled in a bore formed in the bracket and intersecting the groove, wherein at least one screw-threaded hole is provided in the bracket and a screw can be disposed in the hole so as to be capable of abutting against the cylindrical periphery of the hub to enable the position of the bracket radially of the hub to be adjusted prior to securing the bracket to the hub.

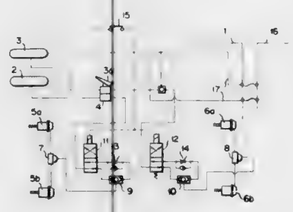
4,178,043
SIMULATED WIRE WHEEL TRIM FOR AUTOMOTIVE WHEELS
Hans R. Beisch, Amherstburg, Canada; Frederick A. Apczynski, Livonia, and James E. Gillespie, Westland, both of Mich., assignors to Norris Industries, Inc., Ypsilanti, Mich.
Continuation-in-part of Ser. No. 708,439, Jul. 26, 1976, abandoned. This application Jul. 21, 1977, Ser. No. 817,628
Int. Cl.[2] B60B *7/00*
U.S. Cl. 301—37 SS **25 Claims**

1. A simulated wire wheel cover comprising:
a center hub member;
a circular base member of a diameter greater than said hub member engaging one end of said hub member;
a cap member engaging another end of said center hub member;
a first plurality of spoke members extending radially outward from between said center hub member and said base member;
a second plurality of spoke members extending radially outward from between said center hub member and said cap member, said first plurality of spoke members and said



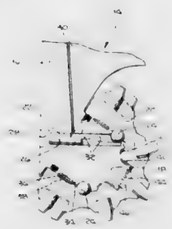
second plurality of spoke members each having radially outer ends engaging portions of said base member;
retention means secured to a peripheral edge of said base member and operative to retain said wheel trim on a vehicle wheel; and
a plurality of fasteners, each of said fasteners extending between and engaging said base member and said cap member so as to clamp said first plurality of spoke members between said hub member and said base member and said second plurality of spoke members between said hub member and said cap member.

4,178,044
BRAKE MECHANISM FOR TRACTORS
Yuzuru Itoh; Masaaki Ichimura, both of Kawasaki, and Masaru Uenoyama, Ayase, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed Jul. 13, 1978, Ser. No. 924,374
Claims priority, application Japan, Jul. 15, 1977, 52/93436
Int. Cl.[2] B60T *15/46*
U.S. Cl. 303—47 **4 Claims**



1. A brake mechanism for a tractor comprising an air tank containing compressed air therein, brake valve means connected to said air tank, a brake pedal operatively connected to said brake valve, a pair of selector valve means connected to said brake valve means, each of said selector valve means having two positions, a pair of throttle valve means each being connected to one of the outlet ports of said one of the selector valve means, respectively, a pair of double check valve means each being connected to another outlet port of one of said selector valve means at one end thereof, the other end of which being connected to one of said throttle valve means, respectively, two pairs of brake chambers each being connected to one of said double check valve means, respectively, and switch means connected to said selector valve means for changing over the positions thereof.

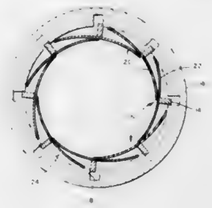
4,178,045
ABRASION RESISTANT BEARING SEAL
William J. Neilson, Whittier, Calif., assignor to Smith International, Inc., Newport Beach, Calif.
Filed May 5, 1978, Ser. No. 903,186
Int. Cl.[2] F16C *19/00*
U.S. Cl. 308—8.2 **12 Claims**



1. An earth boring tool for use in a down-hole environment of abrasive particles comprising:
a rotary tool body,
a journal carried by said body and having a friction bearing surface of revolution,
a cutter rotatable on said journal with a clearance fit providing radial movement relative to said journal with predetermined radial limits, the cutter defining, with said journal, a lubricant space provided by the clearance fit,
one of said journal and cutter having a circumferential seal gland comprising a groove with side walls and a bottom,
said gland being located adjacent an axial limit of the cylindrical friction bearing surface of said journal,
and resilient, radially expansible, axially immutable sealing ring means in said gland in sealing contact with a side wall thereof radially within the predetermined limits and having a circumferential surface in sealing contact with one of said journal and cutter,
said sealing ring means comprising at least one ring having a greater radial cross-section than axial, with a side wall surface, most of which is in sealing contact with a side wall of said groove,
the radial limit of movement of said sealing ring means while in sealing contact with said side wall being at least as great as the radial limit of clearance movement of said cutter.

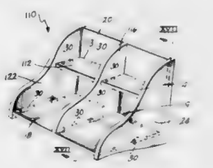
4,178,046
FOIL BEARING
Alexander Silver, Tarzana, and James R. Wenban, Redondo Beach, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.
Filed May 24, 1976, Ser. No. 689,619
Int. Cl.[2] F16C *17/00*
U.S. Cl. 308—9 **60 Claims**

11. In combination:
a pair of members arranged for relative rotation with respect to one another, one of said pair of members being adapted to rotatively support the other; and
a plurality of compliant, overlapping bearing foils operably disposed between said pair of relatively rotatable members, each of said plurality of foils having a first free end



adjacent one of said pair of relatively rotatable members, a second free end extending between said pair of members and overlapping the first free end of an adjacent foil, and means intermediate said first and second ends for mounting each of said foils on said one of said pair of relatively rotatable members.

4,178,047
FURNITURE UNITS WITH CONCEALED FASTENERS AND METHOD THEREFOR
Montgomery J. Welch, East Grand Rapids, Mich., assignor to Modular Systems, Inc., Fruitport, Mich.
Filed Aug. 17, 1977, Ser. No. 825,206
Int. Cl.[2] F16B *12/00*; **A47B** *43/00*
U.S. Cl. 312—140 **28 Claims**



1. A furniture unit having no visible fasteners of fastener openings after assembly and panels with side and edge surfaces secured together at joints lying in at least three mutually perpendicular planes, said unit comprising a first panel joined to spaced second and third panels which are parallel to one another but perpendicular to said first panel; said second and third panels in turn being joined to spaced side surface portions of a fourth panel which are parallel and face in the same direction, said fourth panel being perpendicular to all said first, second and third panels; said first and fourth panels being directly and separately secured only to surfaces of said second and third panels without direct attachment to one another; at least said second and third panels being secured to said first panel and thereafter joined as a subunit to said fourth panel; said first and fourth panels being joined to said second and third panels respectively by recessed fastening means for securing said panels together, each joint between said first and said second and third panels and said fourth and said second and third panels having a first portion of said recessed fastening means secured to one panel and receiving a second portion thereof which is secured to an opposite panel; at least one of the abutting joint surfaces at each of the joints being a panel edge surface and including a recessed pocket which opens only to its edge surface and not to another surface of the respective panel; one of said first and second portions of said recessed fastening means being secured to the bottom surface of each of said recessed pockets, the other of said first and second por-

tions being secured to the panel side surface opposite each of said recessed pockets; none of said first and second portions of said recessed fasteners, nor any part of said recessed pockets being visible after assembly of said panels such that said pockets and fasteners are completely covered and hidden by portions of said panels when said first and second fastener portions are engaged and said panels are joined.

4,178,048

CURVED GUIDE FOR PATERNOSTER-TYPE DOCUMENT CARRIERS

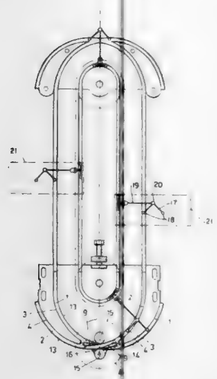
Herbert Zippel, Altdorf, Fed. Rep. of Germany, assignor to Herbert Zippel Gmbh & Co. KG, Nuremberg, Fed. Rep. of Germany

Filed Mar. 15, 1978, Ser. No. 886,936

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1977, 2717319

Int. Cl.[2] **A47B** *49/00*

U.S. Cl. 312—267 **5 Claims**



1. A curved guide for paternoster-type document carriers of the type wherein each carrier is connected by a support arm rotatably articulated on each front side to an endlessly moving chain, said carrier being conducted by means of a bent lever attached to each front side of each carrier in an inverted V-shaped position with the aid of guide rollers provided at the lever ends and running in slotted guideways which intersect at the two deflection points wherein the improvement comprises a pair of pivotally mounted and automatically settable point levers at the guideway intersection, said levers closing the respective entrance and exit of one slotted guideway from the other slotted guideway, the sides of said levers forming a continuous slotted guideway bridging the entrance and exit of said other slotted guideway substantially without a break and means for coupling said point levers, wherein said coupling means comprises a non-rotatable chain sprocket at each point lever and an endless chain intermeshing said chain sprockets.

4,178,049

SHELF BOX WITH DUAL PIVOTING STOP MECHANISM

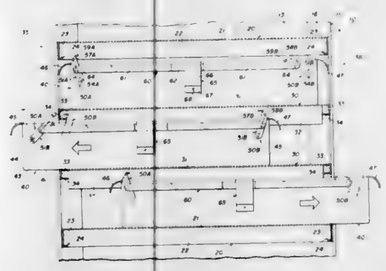
Ricky F. Loo, Batavia, Ill., assignor to Lyon Metal Products, Incorporated, Aurora, Ill.

Filed Jul. 10, 1978, Ser. No. 923,323

Int. Cl.[2] **A47B** *88/16*

U.S. Cl. 312—286 **14 Claims**

1. A shelf box for use at either side of a shelf rack which is open at opposite sides thereof and includes a plurality of parallel spaced-apart shelves each having two retaining portions extending downwardly therefrom along the entire length thereof, said shelf box comprising an open-top receptacle having opposed ends and being adapted for slidable disposition between adjacent ones of the associated shelves from either side thereof anywhere along the length thereof and dimensioned longitudinally to extend substantially from one side to the other side of the associated rack, with no portion of said receptacle extending above the retaining portions of the overlying shelf, a first stop member mounted on said receptacle adjacent to a first one of said ends for movement between a stop position extending upwardly above the top of said receptacle and engageable with the retaining portions of one of the adjacent shelves and a release position non-engageable with the retaining portions of the shelves, a second stop member mounted on said receptacle adjacent to a second one of said ends for movement between a stop position extending upwardly above the top of said receptacle and engageable with the retaining portions of one of the adjacent shelves and a



release position non-engageable with the retaining portions of the shelves, each of said stop members in the release position thereof accommodating withdrawal of the adjacent end of said receptacle from the associated rack, each of said stop members in the stop position thereof being engageable with one of the associated retaining portions for movement of said stop member to the release position thereof to accommodate withdrawal of the adjacent end of said receptacle from the associated rack and being engageable with the other of the associated retaining portions for limiting withdrawal of the opposite end of said receptacle from the associated rack, and control means for effecting movement of each of said stop members from the release position to the stop position thereof, whereby said shelf box may be opened from either side of the rack while preventing inadvertent complete removal of the shelf box from the rack.

4,178,050

MANUFACTURE OF HALOGEN CYCLE INCANDESCENT LAMPS

Rolf Kiesel, Königsbronn; Gerhard Maier, Herbrechtingen, and Helmut Grahmann, Friedberg, all of Fed. Rep. of Germany, assignors to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 755,189, Dec. 29, 1976, abandoned. This application Jan. 16, 1978, Ser. No. 869,494

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1977, 2601576

Int. Cl.[2] **H01J** *9/18;* **C03C** *27/02*

U.S. Cl. 316—19 **8 Claims**

1. Method of manufacturing a halogen cycle incandescent lamp having a bulb of hard glass and lead-in wires passing thereinto through a pinch seal comprising, in accordance with the invention, the steps of

providing a length of hard glass tubing (**1**);

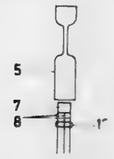
clamping the ends of the hard glass tubing length in clamps (**2**), heating the tubing intermediate the clamps and drawing apart the hard glass tubing to shape a bulb (**5**) with a rounded-off bowl (**6**) and an integrally formed exhaust tube (**4**);

providing a mount comprising one or more individually connectible filaments (**7**) and two or more lead-in wires (**8**);

said mount with the wires being introduced into the bulb (**5**) with the lead-in wires extending through the open portion of the tubing forming the bulb at the end remote from the exhaust tube;

heating a portion of the bulb through which the mount has been introduced and containing a quantity of about two or more grams of glass substantially uniformly about its circumference to a working temperature at which the glass will soften to a viscosity of approximately 10^{+4} poise, said temperature being sufficient to render the glass plastic but below the temperature at which the glass will wet the lead-in wires;

pinching the heated glass to surround the lead-in wires mechanically in close engagement to form an initial mechanical connection between the mount and said wires and the



thus pinched bulb and to provide a preliminary pinch portion;

withdrawing the pinch tool from the pinched region;

heating the thus pinched region by heating at least those portions of the pinched glass which are immediately adjacent the wires to liquefaction temperature and fusion with the wires to effect wetting of the glass immediately adjacent the wire and intimate merger of the surface of the wire with the glass to form a vacuum tight fusion seal;

then, after the vacuum tight fusion seal is obtained, mold pinching the initially pinched and reheated, fused region in a pinched-mold to mold the pinch region to a desired external shape which is to be retained after the lamp has been made to re-fashion the external shape of the lamp after the heating-to-fusion step; and

finishing the lamp by filling the lamp with an inert gas through the exhaust tube (**4**) and tipping off the exhaust tube.

4,178,051

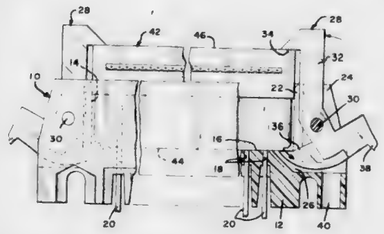
LATCH/EJECT PIN HEADER

Timothy L. Kocher, and Benny M. Bennett, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 21, 1978, Ser. No. 917,762

Int. Cl.[2] **H01R** *13/62*

U.S. Cl. 339—45 M **8 Claims**



1. A latch/eject pin header comprising:

an elongated housing defining an elongated cavity adapted to receive a mating connector therein;

a plurality of terminal pins fixedly mounted in said cavity;

latch/eject means at each end of said housing, said latch/eject means having a latch arm portion adapted to latchingly engage said connector mated in said header, an eject portion extending into said cavity to engage a mating face of said connector, an actuation portion adapted to impart a rotary motion to said latch/eject means upon squeezing together of the actuating portions at the opposite ends of said housing, and pivot pin means passing through an intermediate section of said latch arm portion rotatably mounting said latch/eject means in said housing, said eject portion and said actuation portion extending in substantially opposite directions to one side of said pivot pin, and substantially normal to said latch arm portion on the opposite side of said pivot pin,

whereby insertion of said mating connector into said housing brings the connector into driving engagement with said eject portion causing rotation of said latch arm portions into latching engagement with said connector and squeezing together of said actuation portions causes reverse rotation freeing said latch arm portions from said connector and driving said eject portion against said connector to remove it from said housing.

4,178,052

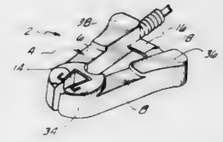
MEDICAL TERMINAL CLIP MEMBER FOR ATTACHMENT TO PATIENT ELECTRODES

Roger A. Ekbom, Newport Beach, and Sidney Friedlander, Encino, both of Calif., assignors to Tronomed, Inc., Costa Mesa, Calif.

Filed Oct. 13, 1977, Ser. No. 841,810

Int. Cl.[2] **H01R** *11/22*

U.S. Cl. 339—61 R **11 Claims**



1. A medical terminal clip member for attachment to electrodes connected to a patient comprising;

a body member made out of a relatively soft plastic material having a longitudinal axis and a pair of laterally spaced leg members extending in an approximately longitudinal direction and pivotally connected for relative movement, the spaced leg members forming a variably spaced electrode receptacle on one side of the pivotal connection;

conductive means supported by the body member and strengthening each laterally spaced leg member and further electrically connected to the electrode receptacle includes an approximately U-shaped receptacle and a pair of side members connected to and extending respectively from each end of the receptacle, each side member including a flange, and

a flexible shield member having a greater width along the longitudinal axis than its thickness traverse to the longitudinal axis is formed from the plastic material, the shield member further has a recessed central crease extending along the longitudinal direction so as to form an approximately shallow V-shape in a plane traverse to the longitudinal axis whereby either side of the flexible shield member pivots about the crease and come closer together when the respective leg members are depressed to open the electrical receptacle cavity, the flexible shield closes longitudinal access to the space between the leg members

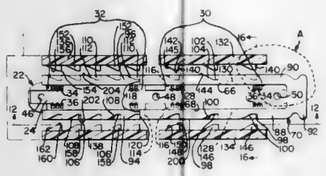
to prevent dislocation of the terminal clip member from the electrode by catching onto an exterior object.

4,178,053

ZERO-INSERTION FORCE ELECTRICAL CONNECTOR

Ralph C. Eifort, Wichita, Kans., assignor to NCR Corporation, Dayton, Ohio

Filed Feb. 13, 1978, Ser. No. 877,432
Int. Cl.² H01R *13/54*
U.S. Cl. 339—75 MP **7 Claims**



1. A substantial zero-insertion force, electrical connector comprising:

a member having a slot therein to receive a complementary member;

first and second groups of contacts located in said member to engage said complementary member; and

actuating means including an actuating member for sequentially moving the contacts of said first and second groups between first and second positions whereby said actuating member, when moved in a first direction, is effective to move the contacts of said first group to said second position and whereby further movement of said actuating member in said first direction is effective to move the contacts of said second group to said second position to enable said complementary member to be inserted in said slot with substantial zero-insertion force;

said actuating means further comprising first and second pairs of retractor means operatively connected with said first and second groups of contacts, respectively, and further comprising means interconnecting said first and second pairs of retractor means with said actuating member, said actuating member having first and second portions associated respectively with said first and second groups of contacts for sequentially moving the contacts of said first and second groups from said first position to said second position as said actuating member is moved in said first direction;

said first portions of said actuating member having first abutment areas thereon and said second portions of said actuating member having second abutment areas thereon, which said first and second abutment areas are arranged on said actuating member to coact with each other to enable said second group of contacts to be moved to said second position after said first group of contacts is moved to said second position as said actuating member is moved in said first direction.

4,178,054

PLUG TERMINATION FOR COAXIAL CABLE

Ronald C. Laudig, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 22, 1977, Ser. No. 826,801
Int. Cl.² H01R *11/08, 17/08*
U.S. Cl. 339—95 R **1 Claim**

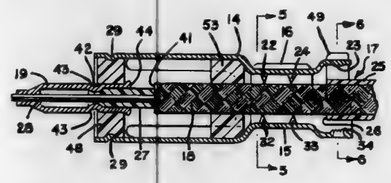
1. In a plug type connector body having an inner center contact connected to a center conductor of a coaxial cable and an outer one-piece connector shell connected to the conductive sheath of the cable and separated from the center contact and center conductor by dielectric material, the improvement comprising:

said shell being partially divided into first means and first and second split barrel sections;

said first means being deflectable resiliently in a direction radially of said cable for an internal frictional fit upon making a plug-in electrical connection with said plug type connector body.

said first split barrel section compressibly encircling and engaging said conductive sheath;

said second split barrel section compressibly encircling an outer jacket of said coaxial cable which covers said conductive sheath;



said shell including second means integral with a first end of said shell and extending towards said first and said second split barrel sections and being compressibly encircled and engaged by each of said split barrel sections;

said second means including an integral projecting lance internally of said encircling first split barrel section and penetrating into said sheath;

said second means including a second integral projecting lance internally of said encircling second split barrel section and penetrating into said jacket; and

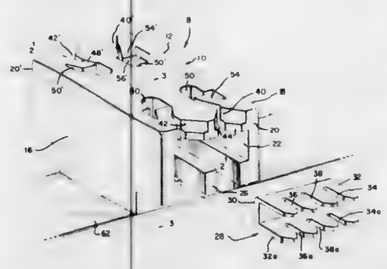
said first and second split barrel sections including projecting lances which penetrate into said sheath and said jacket, respectively.

4,178,055

CONNECTING DEVICE FOR CONNECTING PAIRS OF WIRES

James E. Fleischhacker, Winston-Salem, N.C., and Henry G. Wasserlein, Jr., Seminole, Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 576,831, May 12, 1975, abandoned. This application Dec. 21, 1976, Ser. No. 753,069
Int. Cl.² H01R *9/08*
U.S. Cl. 339—98 **3 Claims**



1. A connector for connecting the corresponding wires of two pairs of wires to each other in separate electrical connections comprising:

an insulating housing, said housing having oppositely directed wire-receiving open ends and having front and back wall means, and sidewalls extending between said ends, an internal barrier wall, said barrier wall being located between said open ends and extending from said front wall to said back wall, said barrier wall defining pockets in said housing which extend inwardly from said open ends to said barrier wall,

each of said pockets having an electrical connecting means therein, each of said connecting means being receptive to at least two wires upon locating said wires adjacent to said open ends with the axes of said wires extending substantially normally of said front and back wall means and thereafter moving said wires laterally of their axes and into said wire-receiving open ends, each of said pockets having wire holding means therein disposed between said electrical connector means and said back wall,

said front and back wall means extending past said connecting means in each of said pockets, said front wall means having wire admitting slot means extending partially thereacross from each of said wire-receiving ends towards said barrier wall whereby, upon locating the corresponding wires of said pairs adjacent to each end said connector and besides said wire-receiving open ends with portions of said wires extending substantially normally of said front wall means, upon moving said wires laterally of their axes towards, and into, said wire-receiving ends, and trimming said wires in the plane of said back wall means, portions of said wires move through said wire admitting slot means and into said pockets and are received by said electrical connecting means thereby electrically to connect said corresponding wires to each other.

4,178,056

ELECTRIC PLUG WITH NOVEL CABLE SECURING MEANS

Hop Lee, 2455-24th Ave., San Francisco, Calif. 94116

Filed Jun. 15, 1978, Ser. No. 915,927
Int. Cl.² H01R *13/58*
U.S. Cl. 339—103 R **1 Claim**

1. In an electric plug:

(a) a cable holding member having a longitudinal bore for receiving a cable carrying a plurality of wires;

(b) a cable gripping member positioned in a recess which opens into the bore in said cable holding member, said gripping member having a tongue extending through an opening in said cable holding member;

(c) adjustable means on said cable gripping member for forcing a pronged portion thereof into gripping engagement with the cable;

(d) a metal sleeve enclosing a portion of said cable holding member and having an opening for receiving said tongue;

(e) a spacing member receivable in the recess in the cable holding member and positioned between said cable gripping member and the interior of said sleeve;

(f) said adjustable means including a bolt whose head extends through an opening in said sleeve and having a nut-carrying head secured to a nut-carrying member, the other end of said bolt bearing against said pronged portion and the bolt shank received in said nut; and

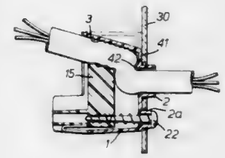
(g) whereby a rotation of said bolt in said nut will move the nut-carrying member into binding engagement with said spacing member and will force said pronged portion against the cable for anchoring it in the cable holding member.

4,178,057

CLIP FOR FIXING AN ELECTRIC CABLE TO A SUPPORT STRUCTURE

Mathew McCormick, East Didsbury, England, assignor to Bowthorpe-Hellermann Limited, Crawley, England

Filed Dec. 2, 1977, Ser. No. 856,965
Claims priority, application United Kingdom, Dec. 8, 1976, 51280/76
Int. Cl.² H01R *13/58*
U.S. Cl. 339—103 M **6 Claims**



1. A clip for securing one end of a multi-conductor electric cable to a support panel, comprising

(a) a generally trapezoidal hollow body member the larger forward end of which contains a recess defining a chamber, the upper and lower walls of said chamber diverging outwardly from the rear wall of said chamber toward the forward end of said body member, (1) said body member rear wall containing a pair of openings surrounded by outwardly extending cylindrical collar portions, respectively, said collar portions being adapted to be received by corresponding openings contained in said support panel;

(2) said body member also including adjacent its forward end a pair of laterally outwardly extending projecting portions;

(b) a closure member adapted for insertion within, and having external walls corresponding with the walls of, said recess chamber, said closure member including a bore arranged colinearly with a first one of said rear wall openings;

(c) a pair of electrical terminals mounted on the forward portions of said projecting portions, respectively, said terminals being so arranged that when a cable is inserted into the recess through the other one of said openings, the cable conductors extend forwardly from the recess for connection with said terminals, respectively; and

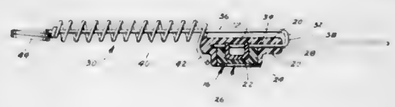
(d) screw means extending through said first opening and into said bore for drawing said closure member into said recess, thereby to clamp said cable between corresponding wall surfaces of said closure member and the recess chamber wall, said screw means including a head portion having a greater diameter than said first opening, whereby upon tightening said screw means, said head portion flattens the extension defined by said collar portion associated with said first opening to connect the clip with said support panel.

4,178,058

TEST PROBE FOR TELEPHONE WIRE CONNECTOR

John H. Swenson, Big Lake, Minn. 55309

Filed Jun. 8, 1978, Ser. No. 913,581
Int. Cl.² H01R *13/38, 13/54*
U.S. Cl. 339—108 TP **1 Claim**



1. An electrical test probe for use with two parallel, spaced-apart, electrically spliced together, insulated electrical lines

having the spliced portion encapsulated in a splice body of insulating material, the splice body being provided with an opening from an electrically conducting portion of said splice within the body to position outside the body between the two electrical lines; said probe including:

A. a single, integral, hook-shape rod of electrically conducting material, said rod having:
(1) a short finger,
(2) a long finger,
(3) an intermediate finger portion electrically connecting a first end of each of the long and short fingers to each other to be in parallel, spaced-apart, adjacent physical relationship to each other, and
(4) a handle member situated at a second end of said long finger,

said rod being of size and configuration to cause a second end of said short finger to contact said electrically conducting portion of the splice when the short finger is inserted into the opening in the splice body between the two electrical lines and the long finger is situated in adjacent, parallel relationship to the splice body; and

B. a compression coil spring surrounding said long finger, said spring having an integral splice body retaining arm extending outwardly from an end of said spring opposite said rod handle, said spring and retaining arm bearing on said handle and on said splice body to firmly hold said second end of said short finger in contact with an electrically conducting portion of the splice within the splice body.

4,178,059

ALUMINUM BASE FOR ELECTRIC LAMPS HAVING A PLASTIC COATING FOR IMPROVED CORROSION RESISTANCE

Stanley F. Bubar, Chagrin Falls, and David L. Jennings, Reminderville, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 9, 1978, Ser. No. 932,228
Int. Cl.[2] H01R *3/02*
U.S. Cl. 339—115 R **7 Claims**



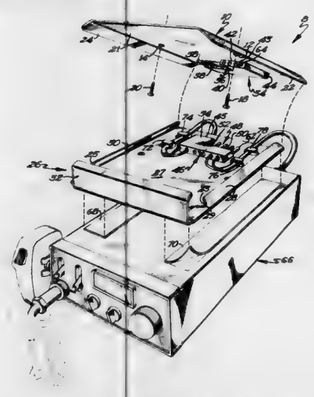
1. A screw base for an electric lamp of the kind comprising a threaded metal shell and a center contact mounted on an insulator uniting it to the shell, said shell being of aluminum coated externally with a thin self-adherent layer of soft protective plastic material having lubricative properties and a coefficient of friction less than 0.1, said layer being penetrable at points of maximum contact pressure when screwed into a socket in order to provide circuit continuity, said layer otherwise remaining in place to provide protection against corrosion of the aluminum and serving as a lubricant for easy lamp removal from the socket.

4,178,060

MOUNT FOR A COMMUNICATION DEVICE OR THE LIKE

James G. Coffey, 2516 Lee Ave. No., Minneapolis, Minn. 55418

Filed Mar. 30, 1978, Ser. No. 891,514
Int. Cl.[2] H01R *9/16;* **H02B** *1/02*
U.S. Cl. 339—125 R **3 Claims**



1. A mount for a C.B. radio and the like having an upper plate and a lower plate slidably mounted thereon, said upper plate having a first terminal block and said lower plate having a second terminal block for mating engagement with said first terminal block, each of said terminal blocks having a male and female connector for interconnection when said terminal blocks are mated, each of said blocks having a hole in which each of said connectors is positioned, each of said male and female connectors having a pair of oppositely disposed barbs extending therefrom and a pair of oppositely disposed flanges spaced from said barbs and extending from said connector, the improvement in said terminal block, said improvement including

(a) said terminal block having means adjacent each of said holes for engagement with said barbs of each of said connectors and simultaneously with said flanges when said connectors are inserted in said holes.

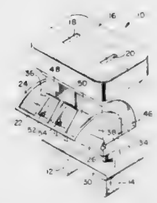
4,178,061

FUSED ELECTRICAL PLUG

Joseph M. Ahroni, 1631 16th Ave., Apt. 413, Seattle, Wash. 98122

Filed Feb. 15, 1977, Ser. No. 768,771
Int. Cl.[2] H01H *85/12, 85/22;* **H01R** *13/68*
U.S. Cl. 339—147 P **38 Claims**

1. In a fused electrical plug having a plug body formed with a pair of fuse recesses, a pair of electrical conductors entering said body and terminating in respective contact members in said fuse recesses, a pair of parallel conductor prongs projecting through the forward end of said plug body for insertion into a socket, a pair of removable electrical fuses positioned in said fuse recesses and connecting each of said contact members to a respective said conductor prong, the improvement comprising access door means on the plug body movable independently of said fuses between an open position allowing said fuses to be removed from said recesses and a closed position preventing access to said fuses, access door securing means including a locking plate having a pair of prong receiving slots allowing said plate to slide along said prongs to a locking position wherein said plate abuts the forward end of said plug body, and access door locking means operatively associated with said locking plate for maintaining said access door in its



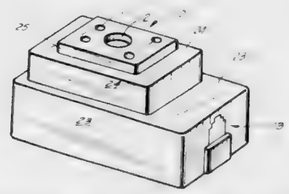
closed position when said locking plate is in its locking position, thereby preventing access to said fuses when said prongs are inserted in said socket.

4,178,062

MODULAR TELEPHONE CONNECTING BOX

Edward Abbo, 24 Woodhaven Dr., New City, N.Y. 10956

Filed Jul. 28, 1978, Ser. No. 928,886
Int. Cl.[2] H01R *33/76*
U.S. Cl. 339—154 A **5 Claims**



1. A modular telephone connecting box, comprising a housing having a top surface, side walls and an open bottom; a first telephone connecting receptacle provided inside said housing in operative proximity to the top portion thereof and having a plurality of contact passages passing through said top surface; a second telephone connecting receptacle mounted inside said housing in operative proximity to one side wall thereof and having a plurality of contacts, said one side wall defining an opening opposite to said second receptacle for receiving a telephone plug matching said second receptacle; a contact plate secured inside said housing opposite to said first receptacle and parallel to said top surface; a plurality of bolt nuts embedded in said contact plate and being electrically connected to corresponding contact passages of said first receptacle, said contacts of said second receptacle being connected to said bolt nuts, respectively; and a plurality of contacting elements projecting toward said open bottom and each being screwable into an assigned bolt nut.

4,178,063

REJECTION TYPE FUSE CLIP ASSEMBLY

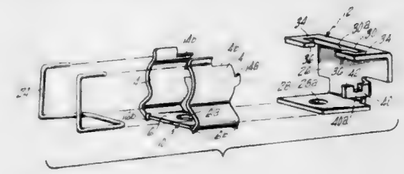
Howard Reynolds, New Britain, Conn., assignor to General Electric Company, New York, N.Y.

Filed Apr. 28, 1978, Ser. No. 901,366
Int. Cl.[2] H01K *13/16*
U.S. Cl. 339—259 F **2 Claims**

1. A fuse clip assembly capable of accepting only cartridge fuse terminal ferrules keyed with an annular groove, said assembly comprising, in combination:

A. a fuse clip having a pair of spaced, generally parallel, flexible clamping arms upstanding from an intermediate base, said clamping arms defining therebetween a pocket for accommodating the terminal ferrule of a cartridge fuse;

B. a rejection member having
(1) an upright body arranged transversely of said pocket to the rear of said clip,
(2) a shoulder bent over from the top of said body for horizontal extension toward said clip and terminating in an end stop edge for locating the longitudinal position of a grooved fuse terminal ferrule in said pocket,
(3) a foot extending from the lower end of said body into overlapping relation with said clip base,
(4) a pair of rejector arms extending from said shoulder at each side of said end stop edge for disposition immediately above said pocket,
(5) an interference element carried at the end of each said rejector arm, said interference elements cooperating to



obstruct the downward insertion into said pocket of a fuse terminal ferrule lacking the annular groove,
(6) the upper rear corners of said clamping arms being relieved to avoid interference with the extensions of said rejector arm pair and the interference elements borne thereby,
(7) an additional rejector arm extending from a lower portion of said body for disposition between said clamping arms generally beneath said pocket, and
(8) an additional interference element carried by said additional rejector arm for upward extension into said pocket, said additional interference element obstructing endwise insertion of a fuse terminal ferrule from below the level of said interference elements carried by said rejector arm pair; and

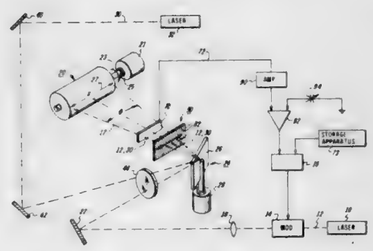
C. an essential non-removable fastener clamping said rejection member foot to said fuse clip base and the latter in electrical connection with a conductive terminal strap.

4,178,064

REAL TIME GRATING CLOCK FOR GALVANOMETER SCANNERS IN LASER SCANNING SYSTEMS

Peter Mrdjen, Mountain View, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 27, 1978, Ser. No. 900,460
Int. Cl.[2] G02B *27/17*
U.S. Cl. 350—6.6 **8 Claims**



1. Reproduction apparatus comprising:

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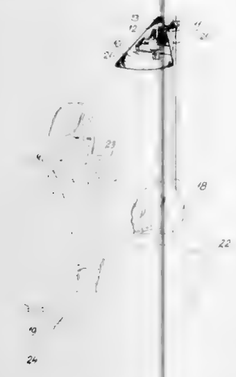
first laser means for generating a writing light beam,
means for modulating said light beam,
a medium sensitive to said light beam and to modulations thereof,
galvanometer means having a sinusoidal displacement characteristic for causing said light beam to scan the sensitive medium at a predetermined scanning rate, said galvanometer means oscillating in a resonant mode, and
means for controlling the modulation of the beam with respect to said scanning rate comprising second laser means for generating a timing light beam, said galvanometer means causing the timing beam to scan a timing means in synchronism with the writing beam, and means responsive to transmission of said timing light beam through the timing means and adapted to release timing signals in response thereto, said timing signals being coupled to said modulating means whereby said modulated light beam is reproduced on said sensitive medium in a manner whereby the nonlinear scan of said galvanometer means is compensated.

4,178,065

SPHERICALLY SHAPED TRIANGULAR MIRROR DEVICE

Nils G. Åkerlund, Rönnbergagatan 32, S-72346 Vesteras, Sweden

Filed May 1, 1978, Ser. No. 901,490
Int. Cl.[2] G02B *7/18*
U.S. Cl. 350—295 **2 Claims**



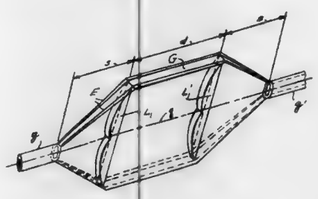
1. A mirror device, comprising:
a spherically shaped disc of triangular shape having rounded corner portions and having an outwardly curved surface which acts as a mirror;
a carrying member rigidly attachable to the spherically shaped disc, the carrying member being attachable to a support member and being hingedly settable in different positions so that the disc is settable in several inclined positions relative to the support member, the carrying member including two elongated and rigid plates gripping around two opposite surfaces of the disc, at first end portions thereof said plates being provided with support washers of resilient material arranged for abutment against the opposite surfaces of the disc, and at second end portions thereof the plates being provided with holes, whereby one end portion of an elongated flexible rod is attachable to said plates, and at the second end portion thereof the rod is fixedly attached to an attaching member which is fixedly attachable to the support member.

4,178,066

RAY-PATH EQUALIZER FOR SIGNAL-TRANSMISSION SYSTEM USING MULTIMODE LIGHT GUIDES

Pietro Di Vita, Torino, Italy, assignor to CSELT Centro Studi e Laboratori Telecomunicazzioni S.p.A., Torino, Italy

Continuation-in-part of Ser. No. 779,821, Mar. 21, 1977, Pat. No. 4,128,302, and a continuation-in-part of Ser. No. 793,420, May 3, 1977, Pat. No. 4,136,639. This application Jul. 15, 1977, Ser. No. 816,209
Claims priority, application Italy, Jul. 16, 1976, 68784 A/76
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.18 **8 Claims**



1. In an optical signal-transmitting system, in combination:
two aligned light guides with confronting ends respectively emitting and collecting bundles of light rays whose limiting rays include a critical angle Θ_M, of a magnitude for which $\Theta_M \approx \tan \Theta_M$, with a common axial line of said light guides in at least one longitudinal plane of symmetry thereof; and
an equalizer between said light guides comprising two identical transparent elements spaced apart from each other by a distance d and from the light-guide ends proximal to them by a equal distances s, each of said elements refracting rays from the proximal light-guide end, incident at an angle Θ within said plane of symmetry, toward the remote light-guide end along paths intersecting said axial line at points whose distance x from the center of the respective element is given substantially by

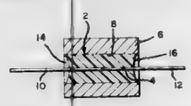
$$\frac{1}{x} = \frac{1}{d} \cdot \left[1 \pm \sqrt{\left(\frac{s \cdot \Theta_M}{r} \right)^2 - 1} \right].$$

4,178,067

SPLICING OPTIC WAVEGUIDES BY SHRINKABLE MEANS

Tore R. Johnson, Harrisburg; Emerson M. Reyner, II, Palmyra, and Roman S. Slysh, Hershey, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 19, 1978, Ser. No. 870,558
Int. Cl.[2] G02B *5/14*; F16L *25/00*; B65H *69/02*
U.S. Cl. 350—96.21 **3 Claims**



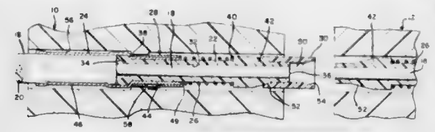
1. An optic waveguide splice, comprising:
an outer, dimensionally stable sleeve containing a mass of dimensionally unstable material;
a pair of optical waveguides received into opposite ends of a reduced diameter bore extending axially through said mass and having an initial diameter sufficient to receive freely the ends of said waveguides therein;
said mass adapted for axial shrinkage and radial volumetric expansion against said stable sleeve and inwardly in compression against said waveguides to move the ends thereof into adjacent colinear axial alignment.

4,178,068

FIBER OPTIC CABLE TERMINATION MEANS

Charles D. Hoover, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 14, 1977, Ser. No. 851,339
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.21 **6 Claims**



1. A preassembled optic cable connector which is spring loaded and self-latching upon insertion thereof within a housing provided with a cavity for mounting said connector, comprising:
a unitary ferrule having a concentric bore in which is mounted a light transmitting core of an optic cable with a polished end of said core at a mating forward end of said ferrule,
a rearward end of said ferrule being joined to said optic cable by a crimp sleeve encircling and radially gripping both said ferrule rearward end and said optic cable,
said crimp sleeve having a projecting shoulder to limit forward movement of said ferrule and said cable in a connector housing cavity,
a retention sleeve slideably mounted over said crimp sleeve and having means projecting therefrom to limit rearward movement of said retention sleeve in a connector housing,
said means being capable of deflection in response to forward movement of said retention sleeve in a housing cavity,
said crimp sleeve shoulder being engagable against a rearward end of said retention sleeve to limit forward movement of said ferrule and said cable relative to said retention sleeve, and
a helically coiled spring freely encircling said ferrule and having a forward end engagable against a projecting shoulder portion of said ferrule,
a rearward end of said spring being engagable against a forward end of said retention sleeve with the coils of said spring being resiliently compressed by movement of said ferrule and said cable rearwardly relative to said retention sleeve.

4,178,069

PROCESS FOR PREPARING AN OPTICAL ELEMENT FOR INCORPORATION INTO OPTICAL TRANSMISSION MEANS

Axel Andersen, Gentofte; Poul U. Knudsen, Hellerup, and Knud B. Jensen, Skodsborg, all of Denmark, assignors to Aktieselskabet Nordiske Kabel-Traadfabriker, Copenhagen, Denmark

Filed Nov. 4, 1977, Ser. No. 848,696
Claims priority, application Denmark, Nov. 9, 1976, 5050/76
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.23 **17 Claims**



14. An optical transmission means comprising an optical element placed in a tubular jacket, said element comprising an optical fiber provided with a tight-fitting coating, and to which element is imparted such a permanent preshape that when placed in the tubular jacket the element has a marked tendency to assume by itself a curve shape with a radius of curvature sufficiently big to avoid a substantial increase of the loss at light transmission, said permanent preshape being brought about by establishing in the coating elastic tensions which vary over the cross-sectional area of the element.

4,178,070

BICYCLE SAFETY DEVICE

Robert W. Thibodeau, Sr., 17 Gendron La., Kennebunk, Me. 04043

Filed Jun. 25, 1976, Ser. No. 699,940
Int. Cl.[2] G02B *5/12*
U.S. Cl. 350—99 **6 Claims**



1. A bicycle safety device comprising a pair of reflector assemblies mounted at substantially diametrically opposed positions on a wheel; each said assembly being mounted near the periphery of the wheel; each reflector assembly being characterized as having a reflector surface facing rearwardly and a reflector surface facing forwardly; each said reflector surface extending outwardly on both sides of the wheel; the rearward and forward facing reflector surfaces of each assembly being of different and contrasting colors with both rearward facing reflectors being of one color and both forward facing reflectors being of the different and contrasting color; said device being so characterized that when said wheel spins, a flashing effect is observed when there is incident light from the rear or front as a result of the reflection of rapidly alternating contrasting colors; said device being further characterized in that the flashing effect is clearly visible even when illumination of the reflective surfaces is low so as to provide a visible signal from the headlights of an automobile at a great distance.

4,178,071

MAGNIFYING CYLINDER FOR INSULIN SYRINGE

Burma B. Asbell, 1114 NE. 8th Ave., Gainesville, Fla. 32601

Filed Oct. 26, 1977, Ser. No. 845,484
Int. Cl.[2] G02B *27/02*
U.S. Cl. 350—116 **9 Claims**

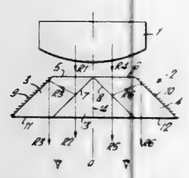
1. A magnifying cylinder for a syringe-like housing having a medicament receiving and a finger gripping flange-like portion at one end thereof comprising an elongated tubular body portion, said elongated tubular body portion having a slit disposed extending along the length thereof parallel to the longitudinal axis of the passageway therein and communicating with the entire length of said passageway, said body portion having a transparent portion, said transparent portion configured so as to provide magnification when viewed therethrough into and along the length of said passageway, a movable lens, a pair of straps, said pair of straps secured to said movable lens, said pair

of straps and said movable lens configured to be slideably frictionally engaged along the exterior surface of said body portion, an indicia line, said indicia line carried by said movable lens, said indicia line extending transverse to said longitudinal axis of said body portion when said movable lens is slideably engaged thereon, means to locate one end of said body portion touching said finger gripping portion when substantially the entire interior surface of said body portion defining said passageway is disposed frictionally, clampingly engaged



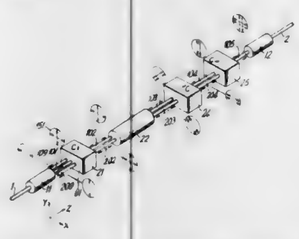
on the exterior surface of said housing, said body portion substantially extended along the entire length and girth of said housing, said body portion being slideable on said exterior surface of said housing, whereby the entire length of said passageway is magnified when viewed through said body portion and a portion of said passageway is magnified to a greater extent than the magnification of the remaining portion of said passageway when viewed through said movable lens and when said movable lens is carried by said body portion and said body portion is carried by said housing.

4,178,072
OPTICAL SYSTEMS
Philip J. Rogers, Meliden, Wales, assignor to Pilkington P. E. Limited, Merseyside, England
Continuation-in-part of Ser. No. 687,876, May 19, 1976, abandoned. This application Nov. 29, 1977, Ser. No. 855,628
Claims priority, application United Kingdom, Jun. 7, 1975, 24654/75; Dec. 2, 1976, 50242/76
Int. Cl.[2] G02B *27/02*
U.S. Cl. 350—145 **45 Claims**



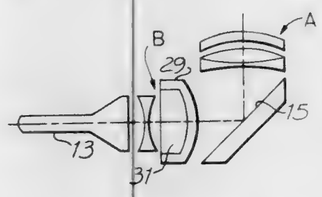
1. Optical apparatus for biocular viewing comprising a collimating magnifier lens for producing a magnified image of an object to be viewed and having an optical axis, and means positioned to receive light from the lens and providing a pair of partially transmitting/partially reflecting interfaces between solid parts, the interfaces being disposed respectively on opposite sides of and inclined relative to the optical axis so as to converge in a direction towards the lens, and further providing a pair of reflecting faces located respectively on opposite sides of the optical axis and each positioned further from the optical axis than the partially transmitting/partially reflecting interfaces on that side, each said reflecting face being parallel to the partially transmitting/partially reflecting interface on the same side of the optical axis and disposed so as to reflect rays of light received from the lens via the partially transmitting/partially reflecting interface towards an observer in parallel relationship with rays of light received from the lens and travelling from the partially transmitting/partially reflecting interface towards the observer thereby to provide on each side of the optical axis plural light paths by which said image can be viewed.

4,178,073
OPTICAL ISOLATOR
Teiji Uchida, and Atsufumi Ueki, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan
Filed May 31, 1978, Ser. No. 911,116
Claims priority, application Japan, May 31, 1977, 52/64315
Int. Cl.[2] G02F *1/09*
U.S. Cl. 350—151 **11 Claims**



1. An optical isolator comprising, a first means of polarization for dividing an incident light beam into two linearly polarized light beams having their directions of polarization perpendicular to each other, a non-reversible rotation element for rotating each of said linearly polarized light beams to form two rotated linearly polarized light beams, a polarization converting means and a second means of polarization which is responsive to said polarization connecting means for synthesizing said two rotated linearly polarized light beams.

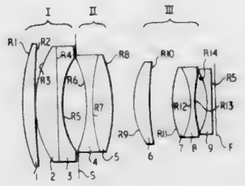
4,178,074
HEAD-UP DISPLAYS
Fritz P. Heller, Bromley, England, assignor to Elliott Brothers (London) Limited, Chelmsford, England
Filed Mar. 16, 1978, Ser. No. 887,071
Claims priority, application United Kingdom, Mar. 28, 1977, 12926/77
Int. Cl.[2] G02B *27/14*
U.S. Cl. 350—171 **5 Claims**



1. An optical projector for the display unit of a head-up display system comprising:
(A) a first optical display surface;
(B) a first collimating optical system for light from said first display surface, the said first optical display system being of the Petzval type and including
(i) a first lens group and
(ii) a second lens group,
(iii) said first lens group being closer to the first display surface than the second lens group,

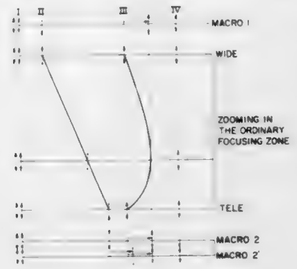
(C) the first lens group including a lens having a optically flat peripheral surface,
(i) said lens having a first surface proximal to said first display surface and
(ii) a second surface distal to said first display surface,
(iii) said first and second lens surfaces being transverse to the optical axis of the first lens group,
(iv) said distal lens surfaces being curved, and
(D) an interior flat dichroic film which is transmissive to light from said first display surface and which extends at an angle to the optical axis of the first lens group from said second surface to and reaches said first surface;
(E) a second optical display surface laterally displaced with respect to the said lens and parallel to the said flat peripheral surface, and
(F) between the second display surface and said flat peripheral surface, an optical arrangement which, with the curved distal surface of said lens and those optical elements down stream from the said lens, forms a collimating optical system for light from the second display surface reflected by the dichroic film.

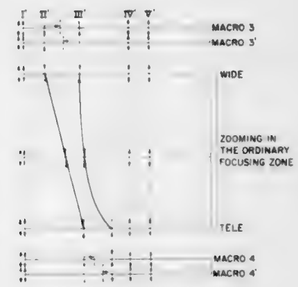
4,178,075
LENSES WITH DISTORTION
Philip J. Rogers, Clwyd, Wales, assignor to Pilkington P. E. Limited, St. Helens, England
Filed Feb. 1, 1978, Ser. No. 874,311
Claims priority, application United Kingdom, Feb. 10, 1977, 5649/77
Int. Cl.[2] G02B *9/60, 9/62*
U.S. Cl. 350—175 FS **20 Claims**



1. An objective lens which introduces barrel distortion at the edges of its field of view, the lens comprising a front part of positive power consisting of at least one positive lens element, a middle part of negative power consisting of at least two lens elements, one of which is of negative power and of a dispersive material and the other of which is of positive power but less powerful and of a less dispersive material than the negative power element, a back part of positive power and consisting of at least two components of positive power and with front convex surfaces, at least one of the components being a doublet which corrects residual lateral chromatic aberration, and a field-flattening element of negative power, wherein the middle part of negative power corrects residual spherical aberration of the front and back positive parts and lowers the residual Petzval sum which is further reduced by the negative field-flattening element, and wherein the front convex surfaces of the components of the back part of positive power contribute to barrel distortion.

4,178,076
MACRO ZOOM LENS
Sadahiko Tsuji, Yokohama, and Yujiro Agari, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 857,692, Dec. 5, 1977, Pat. No. 4,113,355, which is a continuation of Ser. No. 585,654, Jun. 10, 1975, abandoned. This application May 5, 1978, Ser. No. 903,174
Claims priority, application Japan, Jun. 17, 1974, 49-68883
Int. Cl.[2] G02B *15/18*
U.S. Cl. 350—184 **6 Claims**





1. A macro zoom lens capable of making close-up photography, at the edge of the wide and tele-side of the zooming zone, comprising:
focusing means, zooming means, and fixed image forming means arranged in the written order from an object side, said focusing means for focusing at an ordinary photographing distance, said zooming means including a first movable member and a second movable member, said fixed image forming means for focusing a light flux from said zooming means on a film;
at least one of said first movable member and second movable member being movable at the time of close-up photography;
said first and second movable members being within a zooming space during close-up photography in which said first and second movable members move at the time of zooming;
said first and second movable members being positioned at a position in said zooming space at the time of a close-up photograph from the wide edge and being positioned at a different position in said zooming space at the time of close-up photography from the tele-edge;
wherein the distance between said focusing means and the image forming means being substantially constant both at the time of close-up photography and at the time of photography at an ordinary distance,

the distance (e_1) between the focusing means and the first movable member,
the distance (e_2) between the first movable member and the second movable member, and
the distance (e_3) between the second movable member and the image forming means satisfy the following conditions:

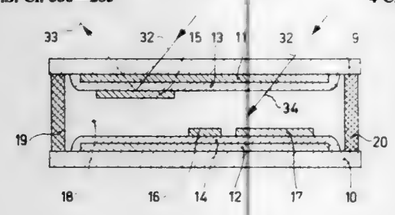
e_1 min $\leqq e_1$ macro

e_2 min $\leqq e_2$ macro

e_3 min $\leqq e_3$ macro

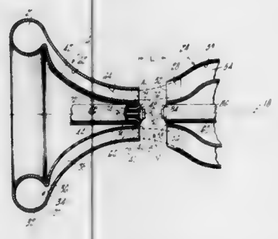
in which, e_1 min, e_2 min and e_3 min signify a minimum value of the distance e_1, e_2, e_3 respectively in the zooming state in an ordinary focusing zone, and e_1 macro, e_2 macro and e_3 macro signify a distance e_1, e_2 and e_3 respectively at the time of the close-up photography and wherein said focusing means is a focusing lens having positive refraction, said first movable member is a variator lens having negative refraction, said second movable member is a compensator lens having negative refraction and the image forming means is a basic lens having positive refraction.

4,178,077
ELECTROSTATICALLY CONTROLLED PICTURE DISPLAY DEVICE
Ties S. Te Velde, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 18, 1976, Ser. No. 715,429
Claims priority, application Netherlands, Aug. 27, 1975, 7510103
Int. Cl.[2] G05D *25/00*
U.S. Cl. 350—285 **4 Claims**



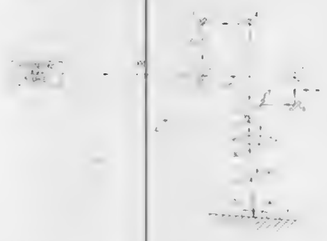
1. A passive picture display device which comprises: a plurality of display elements for controlling the reflection or the transmission of light, each display element comprising a first electrode, a second electrode and a third electrode, said third electrode being movable between said first and the second electrodes by electrostatic force, said device further including first and second supporting plates disposed in parallel spaced relationship with at least portions of said first and second supporting plates facing each other, said first supporting plate being transparent, said first and said second electrode of each display element being disposed respectively on facing surfaces of said first and second supporting plates, and said third electrode of each display element being movably disposed between said first and second supporting plates, said first electrode on the said first supporting plate being transparent and the space between said supporting plates being filled with an opaque liquid the color of which contrasts with the color of the side of said third electrodes facing said first supporting plate, said third electrode being provided with a pattern of light transmitting areas and the electrode on one of said supporting plates comprising a pattern of differently colored areas which are disposed in registered relationship with said light transmitting areas of said third electrodes.

4,178,078
AERODYNAMIC WINDOW
George F. Hausmann, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed Sep. 19, 1978, Ser. No. 944,055
Int. Cl.[2] G02B *5/00*
U.S. Cl. 350—319 **18 Claims**



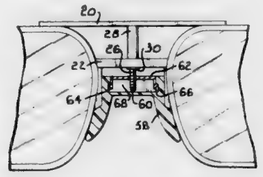
1. An apparatus adapted for providing an aerodynamic window capable of enveloping annularly a cavity therein to maintain a gas within the cavity at a desired pressure comprising:
a truncated injector, having an annular configuration symmetrically disposed about a center line axis, adapted for expanding a first gas to supersonic velocity to provide a flow of first gas through a flow path having a cylindrical configuration with an annular cross section;
an annular collector, disposed symmetrically about the center line axis in a spaced apart relationship with the truncated injector, having an annular collection duct in flow alignment with the truncated injector and the flow path wherein the annular collector cooperates with the annular injector and the flow path to define a cavity therebetween; and
means for providing a flow of second gas into the cavity, said means adapted for maintaining the second gas within the cavity at a desired pressure level while said first gas flows through the flow path to form an aerodynamic window annularly enveloping the cavity.

4,178,079
SUB-PICOSECOND OPTICAL GATING BY DEGENERATE FOUR-WAVE MIXING
Gary C. Bjorklund, West Windsor; David M. Bloom, Holmdel, and Paul F. Liao, Fair Haven, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed May 23, 1978, Ser. No. 908,780
Int. Cl.[2] H03F *7/00*
U.S. Cl. 350—353 **18 Claims**



1. An optical gate for producing an output beam in response to two input beams, one of said two input beams having information to be gated, and the other one of said two input beams having gating pulses at the instants when gating is to be performed, said gating pulses having a width which is less than or equal to a picosecond, said optical gate comprising,
a medium having a reflecting surface on one side thereof and a third order nonlinearity in susceptibility,
means for directing and focusing said two input beams to intersect at the interface between said medium and said reflecting surface, said reflecting surface being oriented such that said input beam having gating pulses impinges thereon at substantially a right angle and said input beam having information to be gated impinges thereon at an angle other than a right angle, and
means positioned in the path of the other one of said input beams to separate an output beam that is generated within said medium.

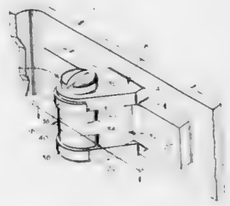
4,178,080
ADJUSTABLE NOSE PIECE ASSEMBLY FOR EYEGLASSES
Eugene E. Elder, 121 Belmont, Hebron, Nebr. 68370
Filed Aug. 30, 1977, Ser. No. 828,988
Int. Cl.[2] G02C *5/12, 5/04, 1/00*
U.S. Cl. 351—137 **6 Claims**



1. A nose piece assembly for use in combination with an eyeglasses frame having a first eyeglass lens and a second eyeglass lens secured to each other by means of a rigid cross piece, said nose piece assembly comprising:
a nose piece for supporting said eyeglasses frame upon the nose, said nose piece having an arched bridge portion with an internally threaded aperture defined in the upper surface thereof and a pair of coplanar leg portions arranged such that one leg portion extends outward from the bottom surface of said bridge portion at each end thereof;
a single continuous mounting channel defined in said cross piece;
a threaded mounting pin having a threaded end portion, said mounting pin being arranged to pass through said mounting channel such that said pin is freely rotatable therein and to threadably engage the internally threaded aperture in said nose piece so that said nose piece is threadably movable along the threaded end portion of said mounting pin; and
guideway means for aligning and securing said nose piece in place with respect to said eyeglasses frame.

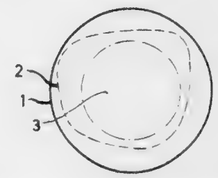
4,178,081
SPECTACLES HINGE
Richard T. Metcalfe, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Jun. 10, 1977, Ser. No. 805,268
Int. Cl.[2] G02C *5/22, 5/14*
U.S. Cl. 351—153 **9 Claims**

6. A spectacles frame hinge half comprising:
a main supporting body including the integral structure of a plate for securing the hinge half to a spectacles frame and an ear extending laterally from each of two opposite edges of said plate adjacent one end thereof, said ears providing barrel leaves of said hinge half and being coaxially apertured for receiving a hinge screw;
an insert between said ears of said main body, said insert including a portion covering each of facing surfaces of said two ears with space therebetween for receiving a number of barrel leaves of a separate second hinge half, said insert including an integral additional ear between said surface covering portions, said additional ear providing a third barrel leaf of said first mentioned hinge half; and



means on each of said surface covering portions of said insert for preventing its accidental displacement from said main supporting body.

4,178,082
HARDENED CIRCULAR SPECTACLE-LENS ELEMENT AND METHOD OF MAKING THE SAME
Bernhard Gänswein; Erwin J. Daniels, both of Aalen; Herman Schürle, Oberkochen, all of Fed. Rep. of Germany, and Klaus Grosskopf, Petersburg, Va., assignors to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany
Filed Dec. 1, 1977, Ser. No. 856,538
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1976, 2657459
Int. Cl.[2] G02C *7/02;* **C03C** *15/00;* **B24B** *1/00*
U.S. Cl. 351—159 **11 Claims**

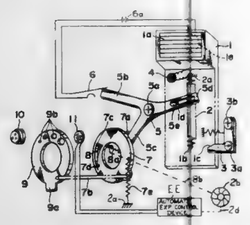


1. A hardened lens blank adapted for later edging to the profile needed for mounting in a selected one of a variety of spectacle frames, said blank being circular and having optically finished front and back surfaces, both of said surfaces being locally hardened in opposed central regions to the exclusion of opposed surrounding annular regions, said outer regions being of such effective radial extent as to include the requisite profile for each of the different spectacle frames within said variety.

4,178,083
CAMERA CONTAINING A MOVABLE AUTOMATIC DIMMER STROBO
Yaichi Iijima, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Filed Nov. 2, 1978, Ser. No. 956,974
Claims priority, application Japan, Dec. 26, 1975, 50-176660[U]
Int. Cl.[2] G03B *7/00, 15/03*
U.S. Cl. 354—41 **11 Claims**

1. In a camera:
an adjustable iris;
an automatic dimmer strobo selectively movable with re-

spect to said camera between an ordinary photographing position and a flash photographing position;
an adjustable film sensitivity changing ring;
and means responsive to strobo position for transmitting film sensitivity information from said film sensitivity changing ring to said iris when said strobo is in either position, said means comprising:

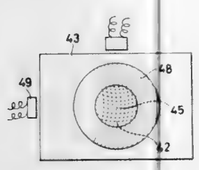


means including an automatic exposure device responsive to the position of said film sensitivity changing ring to adjust said iris when said strobo is in said ordinary photographing position;
and mechanical means connected between said film sensitivity changing ring and said iris to mechanically adjust said iris when said strobo is in said flash photographing position to a predetermined position determined by the film sensitivity information.

4,178,084
DEVICE FOR MEASURING LIGHT INCIDENT ON AN IMAGE FORMING OPTICAL SYSTEM

Kazuya Matsumoto, Yokohama; Susumu Matsumura; Aiichiro Koyama, both of Kawasaki; Youichi Okuno, Yokohama; Tokuichi Tsunikawa, Yokohama, and Tadashi Ito, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 691,628, Jun. 1, 1976, Pat. No. 4,103,153.
This application Jan. 16, 1978, Ser. No. 869,447
Claims priority, application Japan, Jun. 6, 1975, 50-68765; Jun. 6, 1975, 50-68766; Jun. 6, 1975, 50-68767; Jun. 6, 1975, 50-68768; Jun. 6, 1975, 50-68769; Jun. 6, 1975, 50-68770; Jun. 6, 1975, 50-68771; Jun. 6, 1975, 50-68772; Jun. 6, 1975, 50-68773; Jun. 6, 1975, 50-68774; Jun. 6, 1975, 50-68775; Jun. 6, 1975, 50-68776; Jun. 6, 1975, 50-68777; Jun. 6, 1975, 50-68778; Jun. 6, 1975, 50-68779; Jun. 6, 1975, 50-68780; Jun. 6, 1975, 50-68781; Jun. 6, 1975, 50-68782; Jun. 6, 1975, 50-68783
Int. Cl.[2] G03B *7/00, 19/12*
U.S. Cl. 354—59 **17 Claims**

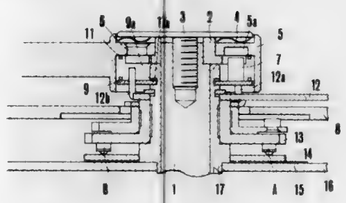


1. A camera, comprising:
an objective lens forming an optical path;
exposure controlling means for controlling exposure;
a finder optical system forming a second optical path;
a plurality of diffraction lattice elements, each of which having predetermined size and arranged in one of the optical paths and substantially overlapping each other at least partially with respect to an image forming light entering these areas; and
photo detecting means for detecting diffraction light from said diffraction lattice elements.

4,178,085
PHOTOGRAPHIC CAMERA WITH A RELEASE LOCKING DEVICE

Masayuki Suzuki, Kawasaki; Tadashi Ito, Yokohama; Masayoshi Yamamichi, Kawasaki, and Hiroyasu Murakami, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1977, Ser. No. 780,018
Claims priority, application Japan, Mar. 31, 1976, 51/35739
Int. Cl.[2] G03B *7/08, 17/38*
U.S. Cl. 354—60 R **3 Claims**

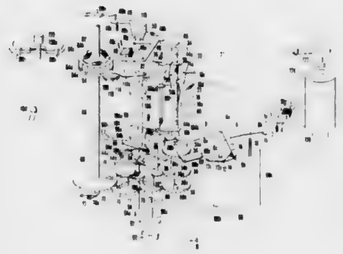


1. In a camera of a type having a power source, a shutter, a shutter releasebutton coupled to the shutter, first and second switches, an electromagnetic shutter release device which initiates shutter operation and is connected to the power source through the first switch which closes in response to depression of a shutter release button, a photometric circuit which is connected to the power source through the second switch, a photographic information display circuit which displays an output of the photometric circuit, and a wind-up lever with a preparatory angle between its initial stowed position and its advancing position, a releasable locking device comprising:
a release lock switch connected between the power source and the first and second switches for disabling said electromagnetic release device and said photometric circuit as well as said photographing information display circuits when the release lock switch is off;
an operation member concentrically rotatable relative to said wind-up lever for opening and closing said release lock switch in dependence upon the rotary position of the operation member;
connecting means rotatable by said operation member and engagable with the lever when the operation member has opened the release lock switch, said connecting means when engaging the lever being shifted during rotation of the lever from the stowed to the advancing position between a position in which it engages said wind-up lever and another position in which it is disengaged from the wind-up lever,
said operation member being moved by movement of said connecting means to the other position when said connecting means engages the lever to close said release lock switch and effect release from a locked condition.

4,178,086
CAMERA WITH A DEVICE FOR PROTECTING FILM AGAINST FOGGING

Nobuaki Date; Hiroshi Aizawa, both of Kawasaki; Masanori Uchidoi, Yokohama; Masami Shimizu, Tokyo, and Yoshiyuki Takishima, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1978, Ser. No. 892,421
Claims priority, application Japan, Apr. 8, 1977, 52-40013
Int. Cl.[2] G03B *19/12, 1/18, 9/08*
U.S. Cl. 354—152 **26 Claims**

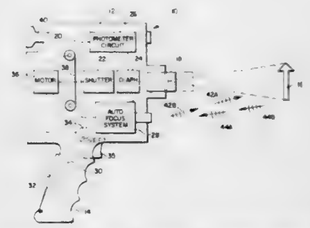


1. A safety device for a camera comprising:
(a) a camera body having a shutter including a front curtain and a rear curtain for controlling the amount of exposure of a film;
(b) shutter time control means for producing a shutter rear curtain closing signal to control the time of closure of the shutter based on a set shutter time or a computed shutter time;
(c) shutter rear curtain holding and releasing means having an electromagnetic device whose energization is controlled by said shutter rear curtain closing signal, for holding or releasing said shutter rear curtain in response to an attracting or releasing operation of said electromagnetic device;
(d) shutter rear curtain movement detecting means for detecting whether said shutter rear curtain runs down to produce a detection signal when said rear shutter curtain runs down;
(e) film winding means for winding the film and having an operating member accessible from outside the camera and a film take-up reel on which the film is wound, said take-up reel being connected to be driven by operation of said operating member;
(f) hindering means for hindering film winding operation and having a detent member engageable with said film winding means and said shutter rear curtain movement detecting means, and arranged so that when said shutter is cocked said detent member engages said film winding means to hinder the film winding up operation and when said shutter rear curtain movement detecting means produces said detection signal, said film winding means is disengaged from said detent member; and
(g) film winding detention release means having an operating member accessible from the outside of the camera for actuating said shutter rear curtain holding and releasing means, so that said rear curtain is released from the held position by operation of said operating member and said film winding means is released from said detent member by the detection signal of said shutter rear curtain movement detecting means.

4,178,087
AUTOFOCUS MOVIE CAMERA HAVING FOCUS CORRECTION MEANS

Edwin K. Shenk, Westford, and Shirley Y. Tam, Arlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 2, 1978, Ser. No. 947,774
Int. Cl.[2] G03B *3/10*
U.S. Cl. 354—195 **12 Claims**



1. In an autofocusing camera having a displaceable lens,
means for determining subject distance,
control means energizeable for displacing said lens to a location selected in accordance with said distance determining means to thereby focus an image of the subject on the camera focal plane,
said control means including encoder means responsive to lens displacement for producing a plurality of discrete signals, each representative of displacement of said lens to within a respective positional zone of said lens, and
said control means including means for terminating displacement of said lens when a predetermined signal is produced corresponding to location of said lens within a positional zone selected in accordance with said distance determining means, the improvement comprising:
that said displacement terminating means includes means responsive to said predetermined signal for terminating displacement of said lens following production of said predetermined signal at a lens location one-third to one-half the width of said positional zone whereby said lens is arrested close to the center of said positional zone regardless of the direction of lens travel into said positional zone.

4,178,088
PHOTOGRAPHIC PROCESSOR

Herbert D. Harding, 7900 Viscount St., El Paso, Tex. 79926

Filed Jul. 3, 1978, Ser. No. 921,332
Int. Cl.[2] G03D *3/02*
U.S. Cl. 354—308 **9 Claims**



1. Apparatus for processing photographic film comprising a box open at the top for holding processing equipment, the box having front and back walls, a removable cover mounted on the open top, the cover having front and rear walls spaced substantially farther apart than the front and back walls of the box, the cover including a wide shelf portion extending hori-

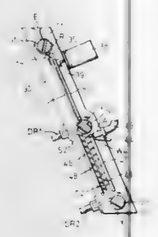
zontally from an inner margin at the front wall of the box to the front wall of the cover to close off the gap resulting from the wider spacing of the front and rear walls of the cover relative to the front and back walls of the box, the cover having an inner light-tight partition extending between the inner margin of the shelf and the top of the cover to form an outer compartment, with the shelf forming the bottom wall of the outer compartment, a door in the partition hinged at the top to permit the door to swing open inwardly and up against the top of the cover and to drop under the action of gravity to a closed position, the front of the cover having a pair of openings for access to the outer compartment, a pair of short flexible sleeves secured to the cover around the respective access openings, each sleeve forming a cuff adapted to fit the wrist of a user when the hands are inserted through the sleeves and into the outer compartment, the outer compartment and shelf forming a light-tight work area when the user's hands are inserted through the sleeves, in which light-sensitive film can be unloaded from its container, the partition and the door when closed forming a light-tight barrier between the outer compartment and the interior of the box so as to allow the hands to be safely removed from the sleeves after the film is transferred through the door to the processing equipment in the box.

4,178,089

PHOTOGRAPHIC DEVELOPER

Harry A. H. Spence-Bate, 1 Cheam Pl., Morley, Western Australia, Australia (6062)

Filed Dec. 29, 1977, Ser. No. 865,595
Claims priority, application United Kingdom, Dec. 30, 1976, 54345/76; Mar. 23, 1977, 12278/77; Apr. 19, 1977, 16273/77
Int. Cl.[2] G03D *3/04*
U.S. Cl. 354—319 **8 Claims**



1. A photographic developer comprising in combination:
a first film receiving chamber,
a second film receiving chamber in intercommunication with said first chamber,
a fluid seal separating said chambers,
a first chamber inlet seal,
a second chamber outlet seal,
wherein at least one of said seals comprises a rotatable gate formed as a cylinder with a longitudinal cut away section forming a passage through which film may be passed and wherein said chambers have fluid inlets for feeding fluids therethrough.

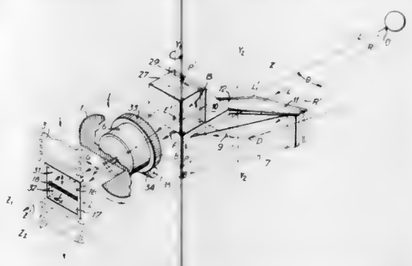
4,178,090

3-DIMENSIONAL CAMERA DEVICE

Alvin M. Marks, 166-35 9th Ave., Whitestone, and Mortimer Marks, 166-25 Cryders La., Beechhurst, both of N.Y. 11357

Continuation-in-part of Ser. No. 516,676, Oct. 21, 1974, Pat. No. 3,990,087. This application Jun. 30, 1977, Ser. No. 811,543
Int. Cl.[2] G03B *35/08*
U.S. Cl. 354—117 **28 Claims**

1. In a 3-dimensional camera device for photographing an object space in 3 dimensions from a first and a second position separated by an interocular distance, first and second light ray bundles from said object space to said first and second positions, a monocular lens, a first optical axis and a second optical axis through said lens, a film gate, a film frame at said film gate, a first position first horizontal deflector, and a first position second horizontal deflector, to deflect the said first light ray bundle from the said first position to along said first optical axis, a second position first vertical deflector and a second position second vertical deflector to deflect the second light ray bundle from said second position to along said second optical axis, a dark bar dividing said film gate into a first area coinciding with the plane of the image of the object space carried by the first light ray bundle and a second area coinciding with the plane of the image of the object space carried by the second light ray bundle, said first area and said second



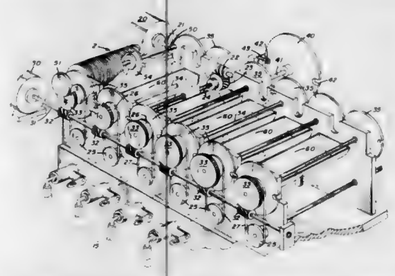
areas being adjacent at the said film gate, said first optical axis passing through center of said first area and the optical center of said lens, and said second optical axis passing through the center of the said second area and the optical center of said lens, means located along said first and second light ray bundles, said means and said dark bar mask defining and separating the said first and second light ray bundles at the first and second areas of said film gate, said first light ray bundle being transmitted only to said first area, and said second light ray bundle being transmitted only to said second area, and in which at least one of said horizontal deflectors is rotable, the said second horizontal deflector having a transparent diagonal upper half plane and a specular reflecting lower half plane.

4,178,091

HORIZONTAL FILM PROCESSING APPARATUS

Victor C. Solomon, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 774,718, Mar. 7, 1977, abandoned. This application Mar. 6, 1978, Ser. No. 883,756
Int. Cl.[2] G03D *3/02, 3/08*
U.S. Cl. 354—322 **24 Claims**



1. Apparatus for processing in a photographic processing solution a plurality of similar, disc-shaped film elements supported on a shaft passing through central sections of the elements; each such element having a peripheral edge and including an annular imaging area extending radially inwardly for a

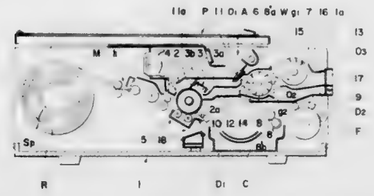
predetermined distance from the edge to the central section; said apparatus comprising:
a housing having a chamber for processing solution, said chamber having an elongate transversely concave bottom surface and adapted to be filled with the processing solution to a depth not substantially exceeding said radial distance;
means for supporting the shaft relative to said housing with the shaft extending in the direction of elongation of said bottom surface and with the edges of the film elements in close proximity to said bottom surface, whereby only the annular area of each film element is contacted by the processing solution; and
means for rotating the elements on the longitudinal axis of the shaft to move the annular area of each element through the processing solution.

4,178,092

ELECTROPHOTOGRAPHIC COPYING APPARATUS WITH GAS EVACUATING MEANS

Shunji Yamamoto, Shinshiro; Koji Imaizumi, and Takashi Hikosaka, both of Aichi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 631,463, Nov. 12, 1975, abandoned. This application Jul. 11, 1977, Ser. No. 814,831
Int. Cl.[2] G03G *15/00;* **F23J** *11/00*
U.S. Cl. 355—3 R **4 Claims**



1. An electrophotographic copying apparatus which comprises a rotatable photoreceptor member having a photoconductive surface for repeated formation of an electrostatic latent image of an original thereon, means disposed around said photoreceptor member and including corona charger means for uniformly charging said surface, exposure means for exposing said charged surface to image light of the original through an optical assembly including an illuminating light source so as to form the electrostatic latent image of the original thereon, and means for eliminating harmful gases generated by said corona charger means disposed within the copying apparatus, said means having suction means for drawing away said harmful gases adjacent to the corona charger means and said surface, said suction means including first duct means having one opening adjacent to said corona charger means, and suction fan means connected with said first duct means for generating air flow in the first duct means for drawing said harmful gases generated within said corona charger means through said opening of the first duct means and toward said suction fan, and means for supplying fresh air free from harmful gases toward said photoconductive surface opposed to said corona charger means, said fresh air supplying means including second duct means, one end of the second duct means being adjacent to said photoconductive surface opposed to said corona charger means.

4,178,093

OPTOMECHANICAL SCANNING APPARATUS FOR COPYING MACHINE

Nobuyuki Yanagawa, and Yasuhiro Tabata, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 28, 1977, Ser. No. 855,144
Claims priority, application Japan, Nov. 27, 1976, 51-142421; Nov. 27, 1976, 51-142422
Int. Cl.[2] G03B *27/00;* **G03G** *15/28;* **G03B** *27/54;* **G03G** *15/32*
U.S. Cl. 355—8 **14 Claims**



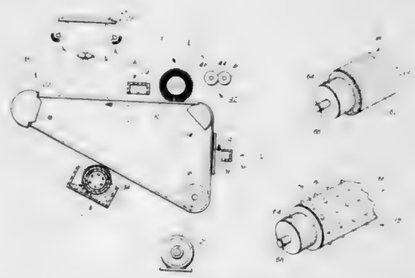
1. In an electrostatic copying machine including a rotary photoconductive drum, the combination comprising:
a horizontal platen translatable through a first exposure position;
a sheet document feed means provided at a second exposure position, the second exposure position being located below the first exposure position on a circle concentric with the drum, the document feed means being located below the platen;
first optical focussing means provided between the platen and the drum for focussing a light image from the first exposure position onto the drum; and
second optical focussing means provided between the sheet feed means and the drum for focussing a light image from the second expsoure position onto the drum circumferentially spaced from the light image focussed on the drum by the first optical focussing means.

4,178,094

BELT SUPPORT AND STEERING MODULE

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 1, 1978, Ser. No. 939,158
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—16 **16 Claims**



1. An apparatus for controlling the lateral movement of a belt arranged to move in a pre-determined path, including:
means for moving the belt in the pre-determined path, said

moving means having a readily deformable surface in contact with the belt;

means for supporting the belt and opposing the lateral movement of the belt from the pre-determined path, said supporting means causing the belt to distort the surface of said moving means so that the belt returns to the predetermined path; and

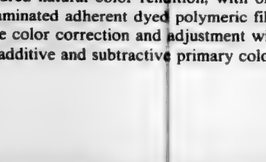
means for supplying a pressurized fluid between said supporting means and the belt to at least partially support the belt and reduce friction between the belt and said supporting means.

4,178,095

ABNORMALLY LOW REFLECTANCE PHOTOCONDUCTOR SENSING SYSTEM

James R. Champion, Longmont, and Steven D. Seigal, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 10, 1978, Ser. No. 894,957
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—14 R **3 Claims**



3. Copier control apparatus comprising:

a photoconductor;

means operable to establish a discharged test area and a charged test area, both test areas within the area of said photoconductor normally used for document reproduction;

a developer operable to present toner to said charged test area to thereby normally tone said charged test area;

light reflectance sensing means operable to compare light reflected from said discharged test area to that reflected from said charged test area, to thereby provide an output signal indicative of the quality of the test area; and

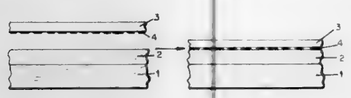
means including said light reflectance means operable to sense abnormally low light reflectance from said discharged area, to thereby provide an output signal indicative of abnormally dark photoconductor.

4,178,096

HIGH FIDELITY COLOR PRINTS

John F. Lontz, Wilmington, Del., assignor to John F. Lontz Associates, Inc., Wilmington, Del.

Filed Apr. 10, 1978, Ser. No. 887,436
Int. Cl.[2] G03B *27/32, 27/52*
U.S. Cl. 355—32 **4 Claims**



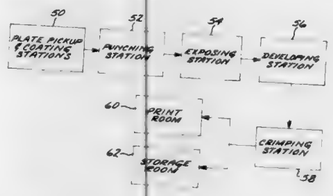
1. A high fidelity color corrected and adjusted print comprising a base reproduction initially deficient or rendered excessive in one or more measured spectral colors, as compared to their measured natural color rendition, with one or more overlays of laminated adherent dyed polymeric films serving to provide the color correction and adjustment with selected intensities of additive and subtractive primary colors.

4,178,097

AUTOMATIC LITHOGRAPHIC PLATE PROCESSOR

George M. Sara, Garden Grove, Calif., assignor to Beach Manufacturing Corporation, Huntington Beach, Calif.

Filed Sep. 6, 1977, Ser. No. 830,820
Int. Cl.[2] G03B *27/30*
U.S. Cl. 355—100 **19 Claims**



1. A method of automatically producing finished lithographic plates from a supply of blank plates and a supply of negatives, comprising the steps of:

picking up a blank plate from said supply of blank plates in a pickup station and placing said plate on a coating conveyor to a coating station;

coating the underside of said blank plate with a photosensitive fluid in said coating station and then inverting said plate and placing it on a first stage drying conveyor;

drying said fluid on said plate in a two-stage drying station by passing said plate through a heated air baffle in a first direction on said first stage drying conveyor on a first level and then moving said plate to a second lower level and placing it on a second stage drying conveyor moving in a second direction opposite to said first direction through said heated air baffle and thereafter conveying said plate to a punching station;

punching at least one indexing hole along the edges of said plate in said punching station by, first, positioning said plate for registration with at least one negative carried by a registration carrier and vacuum locking said plate to said registration carrier, punching said indexing hole and then transporting said registration carrier to an exposing station;

exposing said plate to said negative in said exposing station by transferring said plate to a vacuum locked exposure bed, transferring said negative to a vacuum locked negative carrier, transporting said registration carrier back to said punching station, vacuum locking said plate with said negative, exposing said plate, disengaging said negative from said exposed plate and placing said plate on a developing conveyor to a developing station;

developing said exposed plate in said developing station and placing said developed plate on a crimping conveyor to a crimping station; and

crimping said edges of said plate having said indexing holes in said crimping station by positioning said plate on a crimping bed, vacuum locking said plate on said crimping bed, crimping said edges of said plate, releasing said vacuum lock on said plate and conveying said finished plate to an exit station.

4,178,098

RANGE DETECTING METHOD AND APPARATUS

Noriyuki Asano, Kawasaki; Yukichi Niwa, Yokohama; Mitsutoshi Owada, Yokohama; Takaaki Yamagata, Yokohama, and Shin Tsuda, Kawagoe, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 5, 1978, Ser. No. 867,343
Claims priority, application Japan, Jan. 6, 1977, 52-506
Int. Cl.[2] G01C *3/00;* G03B *7/08*
U.S. Cl. 356—1 **23 Claims**

1. A method of detecting a range of an object comprising the steps of:

(A) deriving first and second images of the object along different sightlines;

(B) electrically sensing the first and second images to produce electrical analog data for each image element of the first and second images;

(C) storing the analog data of the first image on a first set of a plurality of N successive elements;

(D) successively correlating the analog data of said second image on each of a plurality of different sets of N successive elements with the analog data of said first image on the N successive elements, said correlating step including successively storing, on one set by set basis, the analog data on each of said plurality of sets of the N successive elements of the second image;



(E) successively storing the location, of each of the plurality of sets of the N successive elements of the second image whose analog data is correlated with the analog data on the N successive elements of the first image;

(F) detecting, through said correlation step, a set of the N successive elements of the second image which can be regarded as being in substantial coincidence with the N successive elements of the first image; and

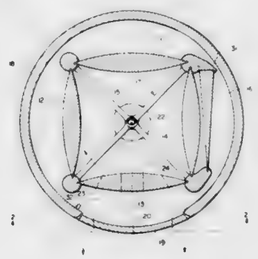
(G) determining the range of the object on the basis of the location of the stored data with respect to the location of the second image, of the set of the N successive elements of the second image which has been regarded as being in substantial coincidence with the N successive elements of the first image.

4,178,099

SCANNING OPTICAL SPECTRAL ANALYZER

Lowell F. Williams, West Caldwell, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 31, 1977, Ser. No. 846,646
Int. Cl.[2] G01N *21/00;* G01J *3/06*
U.S. Cl. 356—73 **7 Claims**



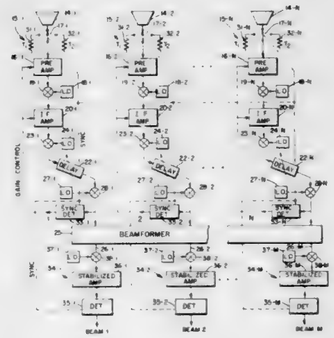
1. Apparatus for scanning a relatively wide field of view and enabling spectral information from a point source of optical radiation in the field to be derived comprising detector means for detecting the radiation; means having a relatively narrow instantaneous field of view for optically scanning the wide field of view to sequentially direct radiation from successively scanned portions of the wide field of view onto the detector means; optical dispersion means for dispersing the radiation; a first optical path for the radiation including the dispersion means, the scanning means and the detector means; and a second optical path for the radiation including the scanning means and the detector means; the dispersion means and the scanning means of said first path causing a convolution of spectral energy from the source on the detector means displaced in time from the spectral energy directed onto the detector through the second optical path during a scan of a wavelength of radiation from the source.

4,178,100

DISTRIBUTED-SWITCH DICKE RADIOMETERS

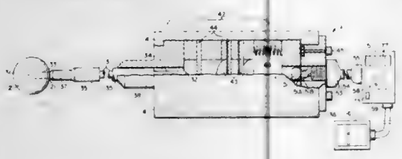
Robert A. Frosch, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Curt A. Levis, Columbus, Ohio

Filed Mar. 29, 1978, Ser. No. 891,356
Int. Cl.[2] G01J *1/56;* H04B *17/00*
U.S. Cl. 356—216 **26 Claims**



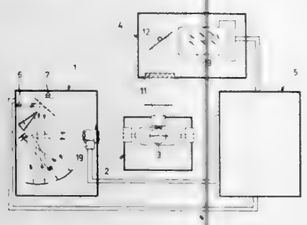
1. A radiometer for deriving high spatial resolution information from terrestrial, atmospheric or outer space regions, comprising an array of N elements for transducing electromagnetic energy into electric signals, all of said elements being simultaneously illuminated by electromagnetic energy from the region, N substantially identical, parallel processing channels, the ith one of said channels being provided for the ith one of said elements, where i is every integer from 1 to N, the ith channel including a variable gain device responsive to the signal transduced by the ith element and means for controlling the gain of the channel as a function of the channel output signal while at least one calibrated noise radiator is connected to the channel input, whereby the ith channel derives an output signal that is a replica of the amplitude and phase of radiation incident on the ith element, means for combining the output signals simultaneously derived from the N channels while each of the elements is simultaneously responsive to the radiation from the region so that the combining means derives a further signal that is a replica of the energy radiated from the region and a vector sum of the energy illuminating all of the elements from the region.

4,178,101
SCALAR IRRADIANCE METER
Charles R. Booth, 4648 Milton St., San Diego, Calif. 92110
Filed Mar. 16, 1977, Ser. No. 778,028
Int. Cl.² G01J *1/42*; G02B *5/14*
U.S. Cl. 356—221 **11 Claims**



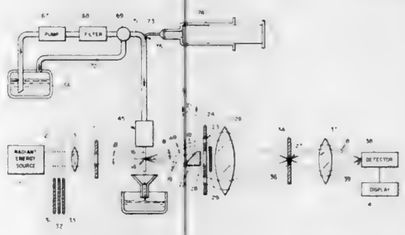
1. An apparatus for measuring the incident flux of scalar irradiance over a 4π solid angle which comprises:
(a) means for collecting omnidirectional scalar irradiance, said collecting means comprising a solid, spherical structure;
(b) means for converting the incident flux of said scalar irradiance into an electrical signal;
(c) means for adjusting the spectral response of the apparatus to obtain a spectral response that will allow said apparatus to measure scalar irradiance in predetermined radiometric or photometric units;
(d) means for conducting said scalar irradiance from substantially the geometrical center of said collecting means to said adjusting means;
(e) means for conditioning said electrical signal for its display; and
(f) means for displaying said electrical signal.

4,178,102
PROCESS AND APPARATUS FOR MEASURING THE CONCENTRATION OF A MOLECULE OF SELECTIVE SPECTRUM IN A SAMPLE SUBSTANCE
Clemente C. Riccardi; Sergio Meda, and Luciano Cigognini, all of Milan, Italy, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Sep. 20, 1977, Ser. No. 834,956
Int. Cl.² G01J *3/30*, *3/30*
U.S. Cl. 356—307 **8 Claims**



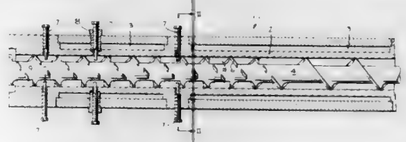
1. A process for measuring the concentration of a molecule of selective spectrum in a sample substance, comprising subjecting the sample substance to a first monochromatic excitation light of wavelength lying within the absorption spectrum of the molecule under measurement, filtering and collecting a first light emission from the sample substance at a wavelength lying within the emission spectrum of the molecule, and determining the intensity of the monochromatic light collected, and further comprising subsequently subjecting the sample substance to a second monochromatic excitation light of a wavelength close to that of the first monochromatic light but outside the absorption and emission spectra of the molecule, filtering and collecting a corresponding second light emission from the sample substance at the same wavelength as the first, then determining the new intensity of collected light and subtracting this from the first to give a useful monochromatic light signal free from spurious signals due to diffused light or to spurious fluorescent or phosphorescent light due to traces of other molecules in the sample substance.

4,178,103
LIGHT SCATTERING PHOTOMETER AND SAMPLE HANDLING SYSTEM THEREFOR
Richard W. Wallace, Los Altos, Calif., assignor to Chromatix, Inc., Mountain View, Calif.
Filed Mar. 28, 1977, Ser. No. 781,740
Int. Cl.² G01N *15/02*
U.S. Cl. 356—336 **10 Claims**



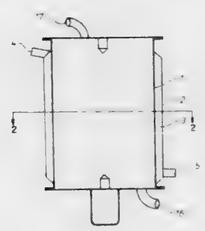
1. A light scattering photometer for measuring radiant power scattered by particles dispersed in a liquid comprising means forming a thin, flat curtain of said liquid having substantially parallel spaced unsupported surfaces, means for radiating a small sample volume of the liquid curtain with a beam of radiant power directed substantially perpendicularly through the curtain from one surface to the other and means for detecting the radiant power scattered by particles in said sample volume.

4,178,104
METHOD AND APPARATUS FOR MIXING VISCOUS MATERIALS
Hans G. L. Menges, Laurensberg b. Aachen; Engelbert G. Harms, Vaalserquartier b. Aachen, and Rainer Hegele, Ehningen, all of Fed. Rep. of Germany, assignors to Uniroyal, AG, Aachen, Fed. Rep. of Germany
Continuation of Ser. No. 641,790, Dec. 18, 1975, abandoned, which is a continuation of Ser. No. 379,537, Jul. 16, 1973, abandoned. This application Jan. 30, 1978, Ser. No. 873,316
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1972, 2235784
Int. Cl.² B29B *1/06*
U.S. Cl. 366—80 **18 Claims**



1. A single screw extruder for mixing and homogenizing viscous materials comprising a screw conveyor for rotation inside a housing, said screw conveyor being an integral member having at least one substantially continuous thread flight of a constant pitch extending helically in the same direction along the longitudinal length of the conveyor for providing a substantially continuous forward feed path of stock material throught the extruder, said flight providing in the feed path direction a first zone for stock material input subsequently followed by a second zone for stock material mixing and homogenizing; the thread in the first zone having uninterrupted lands and the thread in the second zone having spaces between adjacent lands of the screw thread and interrupting gaps in the lands of the screw thread, obstacle means projecting into at least one of said spaces and gaps for penetrating the stock material as the screw conveyor is substantially limited to rotational movement during the forward feed to create vortexing in the material; there being at least one full revolution of the screw thread between axially adjacent obstacle means, and means for adjusting said obstacle means to achieve desired depths of projection thereof relative to the respective gaps and spaces to accommodate different material to be mixed or different mixing conditions and creating local vortexing in the material during the forward feed thereof, each vortex location and degree of vortexing thereat being determined by the adjusted depth of the respective obstacle means.

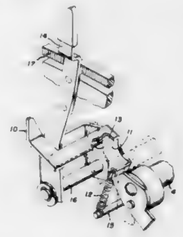
4,178,105
APPARATUS FOR CONTROLLING THE TEMPERATURE OF FLOWABLE CHOCOLATE MATERIALS
Helmut Sollich, Kalletal, Fed. Rep. of Germany, assignor to Sollich KG Spezialmaschinenfabrik, Bad Salzuflen, Fed. Rep. of Germany
Filed May 30, 1978, Ser. No. 910,852
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725183
Int. Cl.² B01F *7/16*; A23C *3/04*
U.S. Cl. 366—312 **6 Claims**



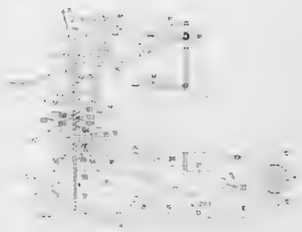
1. An arrangement for treating chocolate material comprising, a cylindrical container for axially conveying the chocolate material therethrough, a rotationally symmetrical cylindrical rotor mounted in said container with its axis extending parallel to the longitudinal axis of the container but mounted eccentrically relative thereto, said rotor including obliquely, outwardly-directed slots along its periphery extending substantially along its entire length, with bar wiper members arranged in said slots and extending along substantially the entire length thereof, said bar wiper members having sharpened outer edges, means for supporting said bar wiper members with their sharpened outer edges forcibly bearing against the inner wall of the cylindrical container including springs arranged between the bar wiper members and the slots in the rotor, and said cylindrical container having an inlet for chocolate material at one end in the region of the maximum distance between the rotor and the cylindrical container, and an outlet for chocolate material at its other end in the region of the mimimum distance between the rotor and the cylindrical container.

4,178,106
PRINT GAP ADJUST MECHANISM FOR PRINTERS
Werner H. Mailer, and Charles E. Milliser, both of Waynesboro, Va., assignors to General Electric Company, Waynesboro, Va.
Filed Nov. 25, 1977, Ser. No. 855,007
Int. Cl.² B41J *3/04*
U.S. Cl. 400—57 **6 Claims**

1. In a printer wherein it is desired to move the print head away from a predetermined gap spacing with respect to a print surface for servicing and for resetting the print head to said predetermined gap spacing comprising, means for moving said print head away from said surface comprising a lever for rotating said print head eccentrically about an axis, said means for resetting said print head comprising a movable arm pivoted for movement in fixed distance increments about a pivot point, a cam follower provided on one of said arm and lever, said other of said arm and lever comprising a cam face for mating with said cam follower, the cam face and its location with respect to the center of said axis being dimensioned such that moving the movable arm through successive increments of distance causes the print head to be moved correspondingly fixed distance increments of distance with respect to said surface.



4,178,107
TYPING DEVICE
Giampaolo Guerrini, Ivrea, and Dario Bisone, Montalto Dora, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Continuation of Ser. No. 709,126, Jul. 27, 1976, abandoned, which is a division of Ser. No. 475,122, May 31, 1974, Pat. No. 3,983,985. This application May 3, 1977, Ser. No. 793,391
Claims priority, application Italy, Jun. 19, 1973, 68815 A/73
The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.
Int. Cl.² B41J *1/30*
U.S. Cl. 400—144.2 **9 Claims**



1. A typing device comprising:
a sheet-carrying platen defining a printing line and a typing point;
a character-bearing disk comprising a plurality of laminae each carrying a type character and terminating in a free end on the periphery of said disk;
means defining a gap in the outermost periphery of said disk;
input means for serially entering characters to be printed;
type character selecting means responsive to a character entered by said input means for rotating said disk and arresting the same so as to align a selected one of said laminae in front of said typing point, such rotation of said disk beginning from a rest variable position defined by the

position reached by said disk upon printing the next preceding selected character;

striking means for impacting the selected lamina to type the selected character, said selecting means maintaining said selected lamina in front of said striking means after the impacting thereof; and

means responsive to the absence of entered characters in said input means within a predetermined period of time after the entering of the last preceding entered character for rotating said disk from its last position wherein the last selected lamina is in front of said striking means to a position wherein said gap is aligned with said typing point, whereby the last typed characters can be seen through said gap.

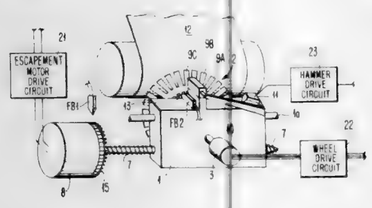
5. A typing device comprising a selector shaft, a character-bearing disk constructed of flexible plastics material and means for removably fixing said disk to said selector shaft, said selector shaft having a shaft axis, a conical end and flange means, extending radially outwardly a predetermined radial distance from said shaft axis and defining a rotation plane perpendicular to said shaft axis, wherein the character-bearing disk includes a plurality of laminae, a central part and a conical seat, cooperative, respectively, with said flange means and said conical end for aligning said laminae in a plane parallel to said rotation plane, wherein said shaft and said disk each comprises attachment portions radially spaced from said shaft axis a distance less than said predetermined radial distance; and wherein said fixing means comprise a hooked element engageable with the attachment portions at said shaft and said disk for fixing the disk to the selector shaft by making said central part adhere to said flange means and said conical seat adhere to said conical end taking up any possible play therebetween, said hooked element being releasable from said attachment portions for the removing of said disk from said selector shaft.

4,178,108

APPARATUS FOR SPACE SYNCHRONIZING CARRIER AND ROTATABLE PRINT DISK POSITIONS IN ON-THE-FLY PRINTING

Milburn H. Kane, Round Rock, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 26, 1978, Ser. No. 918,998
Int. Cl.² B41J *1/26*
U.S. Cl. 400—144.2 **11 Claims**



1. A printing apparatus for on-the-fly printing comprising in combination:

carrier means movable at a variable velocity from a first print position past a second print position on a printing medium,

printing means comprising a plurality of movable characters, each engagable with said printing medium,

character selection means for moving said characters over a variable distance, during the movement of said carrier means, from a first selected character coincident with said carrier at said first print position to a second selected character coincident with said carrier at said second print position,

means for urging said characters into engagement with said printing medium, and

printing control means for controlling the movement of said carrier means and selection means into said coincidence at said second printing position and for actuating said urging means when said coincidence occurs,

said control means including

means for detecting a coincidence failure at said second print position,

means responsive to a detected coincidence failure for reversing the movement of said carrier torward said first print position while permitting the continued movement of said selection means toward said second selected character,

means for reinitiating the forward movement of said carrier toward said second print position and

means for retaining the selection means at the second selected character until the arrival of the reinitiated carrier at said second print position,

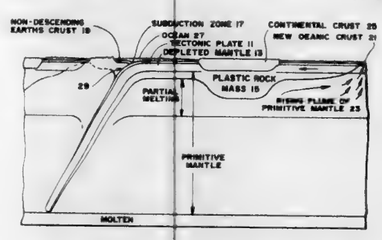
whereby said coincidence and actuation will occur if the selection means has reached said second character by the time the reinitiated carrier has reached the second print position.

4,178,109

METHOD FOR THE DISPOSAL OF NUCLEAR OR TOXIC WASTE MATERIALS

Robert A. Krutenat, Rte. 1, Box 471, Chimacum, Wash. 98325

Filed Oct. 11, 1977, Ser. No. 840,688
Int. Cl.² E21F *17/16*; G21F *9/36*
U.S. Cl. 405—128 **11 Claims**



1. The method of disposing of nuclear waste material wherein the earth has several subduction zones and includes a tetonic plate at each of these subduction zones that descends, adjacent a non-descending earth crust, into the central region of the earth comprising the steps of:

(a) drilling at least one borehole into said tectonic plate adjacent the non-descending earth crust;

(b) positioning said nuclear waste material in said bore hole; and

(c) sealing the nuclear waste material in said borehole; whereby

(d) said tectonic plate and said at least one borehole containing said nuclear waste material descend into the central region of the earth.

4,178,110

LINER FOR LARGE DIAMETER BOREHOLE

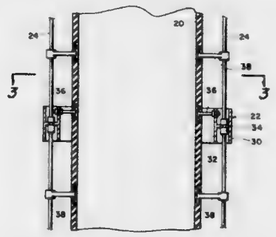
James H. Cobbs, 5144 S. New Haven, Tulsa, Okla. 74135

Filed Oct. 3, 1977, Ser. No. 838,745
Int. Cl.² E02D *5/00*
U.S. Cl. 405—133 **5 Claims**

1. A liner of low flexural rigidity adapted to be grouted into a borehole drilled in the earth comprising:

a thin-walled cylinder of selected diameter, less than that of said borehole, so that when said cylinder is inserted into said borehole an annular space will be provided between said cylinder and the wall of said borehole for receiving grout therein; and

at least one support ring surrounding said cylinder attached to said cylinder by means of a plurality of circumferentially spaced keys, each key having its inner ends attached



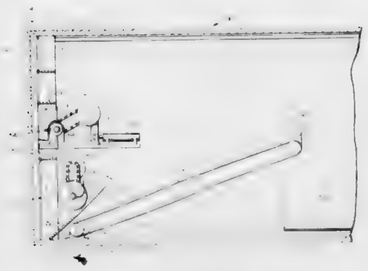
to said cylinder and its outer ends attached to said support ring.

4,178,111

APPARATUS FOR THE EXCAVATION OF SUBTERRANEAN TUNNELS

Fernand Plourde, 111 Westwood Ave., Plainville, Conn. 06062, and Maurice Plourde, 45 Wakeley Rd., Newington, Conn. 06111

Filed Aug. 30, 1978, Ser. No. 938,114
Int. Cl.² E21D *9/06*
U.S. Cl. 405—142 **10 Claims**



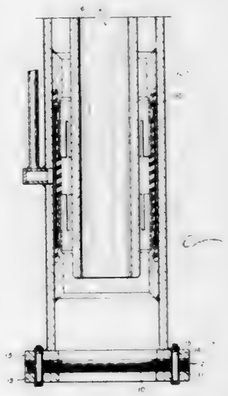
1. In apparatus for the excavation of subterranean tunnels, the combination of a hollow cylindrical shield adapted to be axially forced through the subterranean material and having a circular cutting edge at a leading end portion, an inclined baffle and guide member extending across a lower portion of the shield internally and rearwardly of its cutting edge, the inclination of the member being rearwardly and upwardly with respect to a lower portion of the cutting edge and the lower edge of the member being arcuate to substantially fit the internal parti-circular contour of the shield, and the baffle and guide member having an opening spaced upwardly and rearwardly from its lower edge and approximately intermediate its ends, an auger-like member rotatable about a substantially horizontal axis and disposed internally across the shield rearwardly of its cutting edge and above said baffle and guide member and adjacent the opening in the member, said auger-like member having first and second similar but opposite sections extending on horizontally opposite sides of said baffle opening and with oppositely directed flutes, power means for rotating said auger-like member whereby to cause the member to transport and to direct subterranean material dislodged by said cutting edge horizontally inwardly in opposite directions for downward discharge through said baffle and guide member opening and for further transport and removal rearwardly beneath the baffle and guide member from the interior of the shield.

4,178,112

PLAT-GARD LEG CLOSURE

Lloyd C. Knox, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jun. 12, 1978, Ser. No. 914,467
Int. Cl.² E02D *5/52*
U.S. Cl. 405—227 **8 Claims**



1. In combination, a diaphragm and annular diaphragm retaining means retaining said diaphragm therein, for closing the bore of a tubular support member of a marine platform or similar structure,

said diaphragm comprising:

circular elastomeric flexible member means having a peripheral portion and an inner portion, the upper and lower exterior surfaces of the peripheral portion being substantially parallel to the upper and lower exterior surfaces of the inner portion; the cross-sectional thickness of said circular elastomeric flexible member means being substantially less in comparison than the diameter of said circular elastomeric flexible member means whereby the shape of said circular elastomeric flexible member means substantially comprises a disk;

a plurality of annular reinforcing member means located in the peripheral portion of said circular elastomeric flexible member means, each annular reinforcing member means of said plurality having a substantially rectangular cross-sectional shape with the cross-sectional thickness thereof being substantially less in comparison than the cross-sectional width thereof thereby forming a thin cross-sectional shape and each annular reinforcing member means of said plurality being disposed in the peripheral portion of said circular elastomeric flexible member means having the cross-sectional width thereof in substantially parallel relationship to the cross-sectional width of an adjacent annular reinforcing member means of said plurality and being disposed in substantially parallel relationship to the upper and lower exterior surfaces of the peripheral portion of said circular elastomeric flexible member means; and

reinforcing means having a peripheral portion and an inner portion disposed within said flexible member means, said reinforcing means comprising a plurality of layers of fabric, each layer of fabric of said plurality having the peripheral portion thereof secured to the cross-sectional width of at least one of said annular reinforcing member means whereby each layer of fabric of said plurality is disposed within said circular elastomeric flexible member means in substantially parallel relationship with respect to an adjacent layer of fabric of said plurality; and

said annular diaphragm retaining means comprising:

a pair of annular plate means releasably secured to each other by a plurality of fastening means extending through

the pair of annular reinforcing member means, and through the peripheral portion of said reinforcing means, said annular diaphragm retaining means having one of the pair of annular plate means secured to the bottom of said tubular support member of a marine platform or similar structure thereby closing the bore of said tubular support member by said diaphragm and said diaphragm retaining means being installed thereon whereby the upper and lower surfaces of the peripheral portion of said circular elastomeric flexible member means sealingly engage such annular plate means of the pair of annular plate means throughout substantially one surface thereof by abutting the peripheral portion of said circular elastomeric flexible member means, the removal of the peripheral portion of said reinforcing means from the peripheral portion of said circular elastomeric flexible member means being prevented by the plurality of annular reinforcing member means secured thereto in substantially parallel relationship and the removal of the plurality of annular reinforcing member means from the peripheral portion of said circular elastomeric flexible member means being prevented by the plurality of fastening means extending therethrough.

4,178,113

BUFFER STORAGE APPARATUS FOR SEMICONDUCTOR WAFER PROCESSING

Robert I. Beaver, II, Menlo Park; Michael J. Adams, San Jose; George L. Prodanovich, Campbell; Paul F. Key, San Martin; Don O. Rawlings, San Jose; P. Santhanam, Sunnyvale, and Susan L. Hunt, Milpitas, all of Calif., assignors to Macronetics, Inc., Sunnyvale, Calif.

Filed Dec. 5, 1977, Ser. No. 857,427
Int. Cl.² B65G *51/02*
U.S. Cl. 406—10 **23 Claims**



1. In a semiconductor wafer processing system having a plurality of processing stations spaced along a conveyor structure and in which the various processing stations may process wafers at different rates and in which each said processing station provides signals indicating its availability or unavailability for processing a wafer, buffer storage apparatus cooperating with three such processing stations, said buffer storage apparatus comprising

a first buffer storage station positioned along said conveyor structure between a first and a second said processing stations and a second buffer storage station positioned along said conveyor structure between said second processing station and a third processing station,

said first buffer storage station comprising

first means for receiving and temporarily holding a first wafer group comprising a predetermined number of said wafers received from said first processing station and then supplying wafers from said first wafer group to said second processing station and thence to said second buffer storage station, and

means for conveying a wafer received at said first buffer storage station to said first holding means and from said first holding means toward said second processing station; and

second means for temporarily holding any additional wafers received from said first processing station during the time that said first receiving and holding means is holding or supplying to said second processing station wafers from said first wafer group; and

said second buffer station comprising

means for conveying a wafer received from said second processing station through said second buffer station to said third processing station if said third processing station is available for receiving said wafer, and

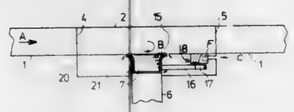
means for receiving and temporarily holding said wafer received from said second processing station if said third processing station is unavailable for receiving said wafer and then subsequently supplying said held wafer to said third processing station when said third processing station is available.

4,178,114

APPARATUS FOR DIVIDING A FLOCK-LADEN AIR STREAM IN PNEUMATIC TRANSPORTING SYSTEMS FOR SPINNING MACHINES

Robert Amann; Werner Lattmann, both of Ohringen, and Rudolf Wildbolz, Winterthur, all of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed May 1, 1978, Ser. No. 901,485
Claims priority, application Switzerland, Apr. 29, 1977, 5336/77
Int. Cl.² B65G *53/40*
U.S. Cl. 406—155 **21 Claims**



1. In combination

a transport duct for transporting a flock-laden air stream,

at least one branch duct connected to said transport duct to receive a part-flow of a flock-laden air stream passing through said transport duct, said branch duct being connected to said transport duct on a predetermined axis disposed in the direction of the part-flow air stream; and

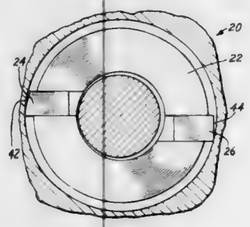
means rotatably mounted on said axis for directing the part-flow from said transport duct through said branch duct.

4,178,115

VALVE SEAT RING INSTALLATION TOOL

James L. Pool, Clarinda, Iowa, assignor to Lisle Corporation, Clarinda, Iowa

Filed Mar. 30, 1978, Ser. No. 891,693
Int. Cl.² B23C *1/20*
U.S. Cl. 408—82 **8 Claims**



1. A rotatable tool for reaming a counterbore in a workpiece having a bore with a sidewall and a bottom defined therein, said tool being of the type guided by a pilot member secured axially in said bore, said tool comprising, in combination:

a rotatable blade holder having an annular opening, the diameter of the annular opening being substantially equal to the diameter of said pilot member, and an axis defining an axial direction and radial distances, said axial direction being parallel to said axis and said radial distances being measured perpendicularly from said axis, said blade holder being annular about said axis;

a plurality of cutter blades mounted on said blade holder, one of said cutter blades having an axially extending cutting edge at a pre-selected radial distance from said axis, the remainder of said cutter blades each having a non-cutting axial edge at a radial distance less than said pre-selected radial distance, each of said cutter blades also having a radially extending cutting edge, said radially extending cutting edges being substantially equal to each other in length, and aligned in a single radial plane perpendicular to said axis;

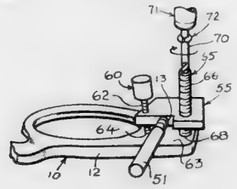
whereby only said one cutter blade with said axially extending cutting edge reams the sidewall of the bore of said workpiece while all cutter blades ream the bottom of the bore, so that said counterbore is reamed rapidly and not enlarged in radius beyond said pre-selected radial distance due to vibration or wear of the mounting of the blade holder on said pilot member.

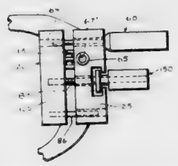
4,178,116

SPECTACLE FRAME WITH ANGULARLY ADJUSTABLE TEMPLES AND MEANS FOR MANUFACTURING AND ASSEMBLING SAME

Harry J. Lazarus, 36 Knox La., Englishtown, N.J. 07726

Division of Ser. No. 710,788, Aug. 2, 1976, Pat. No. 4,105,305. This application May 9, 1977, Ser. No. 795,029
Int. Cl.² B23B *47/28, 49/02*
U.S. Cl. 408—108 **33 Claims**





25. A template device for facilitating the drilling of a bore by a drill disposed at a selective angle and position relative to an end piece of an eyeglass frame having a temple piece and a hinge thereon oriented relative to said end piece, comprising a plate having a plate bore therethrough with a plate bore axis oriented at a selected axis angle in respect to said plate, a tube having a drill receiving bore therethrough disposed in the plate bore with an end for the exit of the drill which is adapted to extend outwardly from the plate into engagement with the frame, adjustment means for adjusting said tube in the plate bore so as to position it so that the end is engageable against the frame, and clamping means associated with said plate for clamping said plate to said frame to position said plate relative to said hinge.

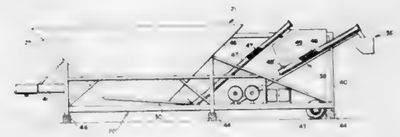
33. A template device for facilitating the drilling of a bore into a surface of a frame of an eyeglass which includes a hinge projecting therefrom, comprising a clamp member engageable with the hinge on said eyeglass frame and having first and second plate portions engageable with said hinge, at least one hollow drill tube extending through said first plate portion, adjustment means for adjusting said drill tube relative to said first plate portion to permit it to move to a position in which it bears against the frame to be drilled, said drill tube having a bore therethrough for the passage of a drill so that the drill is guided right up to the frame surface at which it is to be drilled, and a stabilizer threaded into said first plate portion and being adjustably threaded to bear against said second plate portion for positioning said first and second plates relative to the hinge and for clamping it in an adjusted position.

4,178,117

MOBILE SIDE-BY-SIDE BATCHING PLANT

Richard K. Brugler, Warren, Ohio, assignor to Heltzel Company, Warren, Ohio

Filed Feb. 2, 1978, Ser. No. 874,620
Int. Cl.² B65G *67/08*
U.S. Cl. 414—21 **3 Claims**



1. A mobile side-by-side pre-erected batching plant having transport wheels at one end thereof for the proportioning of materials for the production of concrete, whereby said pre-erected batching plant at the job site requires only blocking and leveling of the main frame to position the structure for the discharge of aggregates and cement at a truck charging elevation, said plant comprising a longitudinally substantially rectangular supporting main frame; a substantially rectangular unitary receptacle fixedly mounted thereon and provided with separating partitions therein, said partitions comprising a longitudinal wall dividing the receptacle substantially in half and a plurality of transverse walls extending substantially perpendicularly from said longitudinal wall to a wall of said receptacle on one side thereof, thereby providing a plurality of aggregate receiving bins in one-half of said receptacle and a cement receiving bin in other half; means controlling the discharge of material from each of said bins, said means being disposed adjacent the lower portion of each bin; aggregate weighing means positioned beneath said means for controlling the discharge of material from each of said bins, a first longitudinally extending transport conveyor means mounted on said weighing means and disposed in receiving relation to said aggregate weighing means, a second longitudinally extending transport conveyor means pre-erected to receive aggregates from said first longitudinally extending transport conveyor means and to discharge aggregates at said truck charging elevation; and a first longitudinally extending cement transport conveyor means mounted in an inclined pre-erected condition to receive cement from said cement bin at its lower end, cement weighing means positioned to receive cement from said first cement conveyor and a second longitudinally extending cement conveyor transport means receiving cement from said cement weighing means to discharge cement at said truck charging elevation.

4,178,118

BUNDLE SQUARING MACHINE

Peter E. Bailey, 96 Broadwater Dr., Saratoga, Australia

Filed Dec. 7, 1977, Ser. No. 858,239
Claims priority, application Australia, Dec. 14, 1976, 8486/76
Int. Cl.² B65G *47/26*
U.S. Cl. 414—28 **10 Claims**

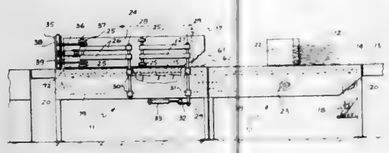
1. A bundle squaring machine comprising:

(a) a horizontally disposed conveyor system for conveying a bundle of articles in a longitudinal direction into and from a squaring zone of the machine,

(b) a pair of parallel spaced-apart vertically disposed side

squaring arms located above the conveyor system, the squaring arms being actuable to move toward one another in a lateral direction, whilst maintaining their parallel relationship, to co-act against a bundle of articles when located therebetween, and the squaring arms defining side borders of the squaring zone,

(c) pusher means normally located in a retracted position below the level of the conveyor system intermediate the squaring arms, the pusher means being actuable to project upwardly above the level of the conveyor system and then to move in the longitudinal direction of the machine to push against a trailing end of a bundle of articles when located within the squaring zone,



(d) vertically disposed rollers pivotably mounted one to each of the squaring arms at the leading end thereof, the rollers being spring biased to normally locate within side borders of the squaring zone to engage with a leading end of a bundle of articles when located within the squaring zone and when pushed longitudinally forward by the pusher means,

(e) means actuable to cause the vertically disposed rollers to pivot away from their normal position and to a position outside of the side borders of the squaring zone following a period of contact between the vertically disposed rollers and a bundle when located within the squaring zone, and,

(f) means actuable to halt movement of the conveyor system during actuation of the squaring arms and the pusher means.

4,178,119

ARRANGEMENT FOR TURNING, MULTIPLE STACKING AND ALIGNING A PAPER STACK

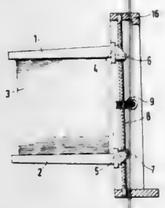
Gerhard Busch, Heidenkampsweg 48, 2000 Hamburg 1, Fed. Rep. of Germany

Filed Oct. 13, 1977, Ser. No. 841,651

Claims priority, application Fed. Rep. of Germany, May 18, 1977, 7715854[U]; May 25, 1977, 2723496

Int. Cl.² B65H *31/40*

U.S. Cl. 414—28 **9 Claims**



1. A device for turning and multiple placing on top of each other and for the alignment of paper stacks which are located on the rear contact plate of a turning stacker in a position preferably turned by 90°, comprising: fork-shaped members placed between individual paper stacks and being adjusted at a carrying plate of the stacker; means for venting the entire surface of the rear contact plate of the turning stacker by uniform air discharge after a paper stack has been turned substantially 90°; said paper stack being loosened and aligned by forming an air cushion under the stack and being thereafter turned to a final position; said fork-shaped members having carrying plates or carrying forks for holding the stack to be turned therebetween and have one yoke each; a left- and right-hand spindle; spindle nuts on said spindle and connected to said yoke; said rear contact plate having air discharge openings; an air channel underneath said rear contact plate and having means for air deflection and uniform air distribution underneath said air discharge openings; said air channel having narrow sides with walls displaceable relative to each other.

4,178,120

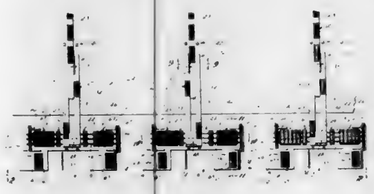
APPARATUS FOR TRANSFERRING ELONGATED ARTICLES FROM A SINGLE FILE SUPPLY INTO PRODUCT BUCKETS OF A CARTONER

Robert J. Weichhand, Ft. Mitchell, Ky., assignor to R. A. Jones & Co. Inc., Covington, Ky.

Filed Sep. 1, 1977, Ser. No. 829,589

Int. Cl.² B65G *57/08*

U.S. Cl. 414—41 **12 Claims**



1. Apparatus for transferring elongated packages into product buckets on a conveyor comprising,

means for feeding packages toward said product bucket conveyor in a direction perpendicular to said conveyor,

two accumulator conveyors running parallel to said product bucket conveyor and in opposite directions, said accumulator conveyors having their upstream ends adjacent one another and adjacent said package feeding means,

a diverter for pushing packages transversely to the length of the packages from said feeding means alternately onto respective accumulator conveyors,

means for pushing packages longitudinally to the length of the packages from said accumulator conveyors onto a dead plate overlying said product bucket conveyor,

and means for sweeping said packages transversely to the length of the packages off said dead plate into product buckets.

4,178,121

REPETITIVE-CYCLE OBJECT HANDLING APPARATUS

Leonard H. Taylor, High Wycombe, England, assignor to Perkin-Elmer Limited, Beaconsfield, Great Britain

Continuation of Ser. No. 776,941, Mar. 14, 1977, abandoned. This application Sep. 22, 1978, Ser. No. 944,817

Int. Cl.² B65G *57/00*

U.S. Cl. 414—104 **15 Claims**

1. Repetitive-cycle object handling apparatus comprising, in combination:

(a) a feed station for accommodating a stack of slab-like objects of regular geometry, means for subjecting said stack to a feed force acting in the longitudinal direction of said stack;

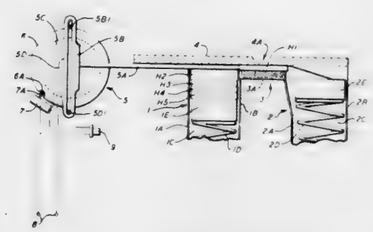
(b) a utilization station where objects fed seriatim from the feed station may be made to dwell before being moved on;

(c) a storage station for stacking one object at a time after the object has dwelled at the utilization station for a predetermined time interval;

(d) object transfer means for sliding out a leading object from said stack at the feed station to the utilization station and, at the end of said predetermined time interval, to move said object on to the storage station;

(e) an object stacking ramp for guiding an object leaving the utilization station toward a stacking attitude at the storage station under the action of said object transfer means;

(f) means for subjecting the stack of objects in said storage station to a bias force substantially in the longitudinal direction of the stack; and



(g) object fulcrum means disposed downstream of the centerline of the storage station stack and downstream of said object stacking ramp for enabling an object to be swung there-around to said stacking attitude under the action of said bias force after said bias force has first been overcome by said transfer means and a predetermined short portion of the object has progressed beyond said fulcrum.

4,178,122

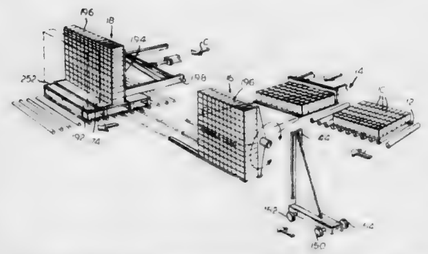
METHOD AND APPARATUS FOR CUBING BRICK

Daniel P. Abrahamson, 3030 N. 56th Dr., Phoenix, Ariz. 85031

Filed Mar. 29, 1978, Ser. No. 891,321

Int. Cl.² B65G *57/08*

U.S. Cl. 414—110 **9 Claims**



1. In a method for cubing elongated brick which have a flat end, and which are standing on their flat ends with their respective length dimensions oriented uprightly, the steps comprising simultaneously introducing a plurality of said brick into a cradle means in a close-packed relationship with their respective length dimensions generally parallel to one another and oriented uprightly, aligning one flat end of each of said brick in a horizontal plane in said cradle such that said flat ends of said brick occupy a common plane, tilting said cradle means to reorient the length dimension of said brick to a substantially horizontal position, ejecting said reoriented brick from said cradle as a stack unit and in a direction of movement generally parallel to the common plane occupied by said flat ends of said brick, applying a yieldable restraint against at least the upper ones of said brick in the leading edge of said stack as said stack is moved out of said cradle, positioning a pallet under said ejected stack of brick, substantially simultaneously contacting said flat ends of the bricks in said ejected stack and applying a force thereagainst which is sufficient to change the direction of movement of said stack of brick by about ninety degrees, and moving said stack of brick on to said pallet.

4,178,123

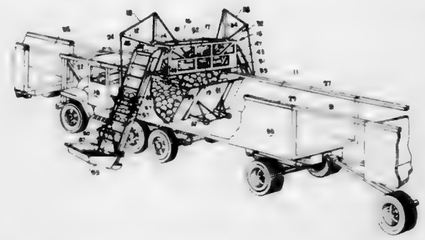
TRAILER BOX LOADER SYSTEM

Robert B. Loeffler, 1026 Adams St., Los Banos, Calif. 93635

Filed Dec. 12, 1977, Ser. No. 859,293

Int. Cl.² B65G *67/04*

U.S. Cl. 414—523 **9 Claims**



1. A loader system for agricultural trailer boxes or the like comprising,

a trailer box having opposed panels along the length thereof, said panels having beams atop for supporting loads thereon,

a carriage having a frame extending across the width of a trailer box and with opposed wheels connected thereto, positioned for carriage travel on said beams, and

at least one conveyor means having top and bottom portions for lifting agricultural goods over one of the beams atop said panels and transferring said goods into said trailer box, said top portion of said conveyor means upwardly supported from said carriage and extending transverse to the length of the panels of the trailer box and angularly downward from the carriage with the conveyor bottom portion clearing ground level, and

an angularly adjustable bin connected in ground clearance relationship to the bottom portion of said conveyor means, said bin adapted to feed said agricultural goods to said conveyor means.

4,178,124

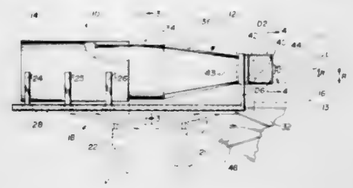
TURBINE APPARATUS

Alexander Puskas, 718 S. Trenton Ave., Pittsburgh, Pa. 15221

Filed Apr. 17, 1978, Ser. No. 896,930

Int. Cl.² F03D *1/04*

U.S. Cl. 415—2 **19 Claims**



1. Turbine apparatus adapted for disposition in a fluid stream to convert the kinetic energy of the fluid flow to mechanical rotation energy comprising:

fluid stream gathering means mounted on a framework for intercepting a portion of the fluid flow in the fluid stream, said gathering means having an inlet port and an exhaust port;

turbine means including a turbine housing rotatably mounted on said frame adjacent to said exhaust port for

rotatably responsing to the portion of the fluid flow intercepted by the inlet port; and

a plurality of passages within said turbine means extending substantially longitudinally along said turbine means and bending about the longitudinal axis of the turbine housing, each of said passages having an inlet at one face of the turbine housing adjacent to the exhaust port and having an outlet at the periphery of the turbine housing, each said passage tapering axially and radially towards the said periphery to emit a fluid jet tangential to the periphery of the turbine housing at about a right angle to the longitudinal axis of the turbine housing.

4,178,125

BUCKET-LESS TURBINE WHEEL

Hector A. Dauvergne, P.O. Box 884, San Leandro, Calif. 94577

Filed Oct. 19, 1977, Ser. No. 843,517
Int. Cl.[2] F01B *1/18*
U.S. Cl. 415—80 **18 Claims**



1. A turbine wheel for use in a turbine comprising:

a flat disk having a hollowed concentric central portion on one side of said disk, an annular rim portion, said rim portion having an inner margin at an interface with the hollowed portion and an outer periphery displaced from said inner margin, and a plurality of nozzles symmetrically spaced around said rim portion said nozzles each comprising a passage through said rim portion from said inner margin to said periphery, said nozzles terminating at said periphery in a portion of said passage directed at an acute angle from a tangent to the periphery of said rim portion, wherein said nozzles each comprise a replaceable inset, said rim portion having a cutout in which said inset is installed.

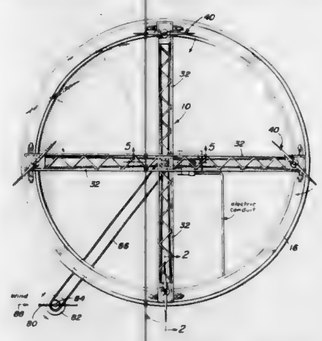
4,178,126

WIND DRIVEN POWER GENERATOR

Gehres D. Weed, Edmonton, Canada, assignor to Altarctic Engineering & Construction Ltd., Edmonton, Canada, a part interest

Filed Sep. 7, 1977, Ser. No. 831,347
Int. Cl.[2] F03D *7/06*
U.S. Cl. 416—17 **5 Claims**

1. A rotary power generator for disposition in a fluid flow path and to be driven thereby, said generator including a base, a rotor journaled from said base for rotation about a first axis for disposition transverse to said path, said rotor including a plurality of mounting portions spaced radially outwardly from and circumferentially about said axis and including a plurality of vane assemblies rotatably mounted, therefrom for angular displacement about axes generally paralleling said axis, vane assembly displacement control means operatively connected between said base and said vane assemblies for angularly displacing said vane assemblies relative to said mounting portions 180 degrees each 360 degrees of angular displacement of said rotor and in directions opposite to the direction of angular displacement of said rotor, upon rotation thereof, said vane assemblies being variously optimumly angularly positioned relative to said mounting portions and each other\to effect substantially maximum thrust therefrom on said rotor as a result of fluid flow thereagainst in one radial direction, said vane assembly displacement control means including angularly displaceable fluid flow sensing means operative to sense angular changes in the radial direction of fluid flow toward said axis to accordingly simultaneously variously angularly position said vane assemblies about their axes of rotation relative to said mounting portions, whereby said vane assemblies are maintained in said optimum position, said control means further including angularly displaceable operator means drivingly connected to said vane assemblies for angularly displacing the vane assemblies in response to angular displacement of said operator, reversible motor means drivingly connected to said operator means selectively reversely angularly displacing said



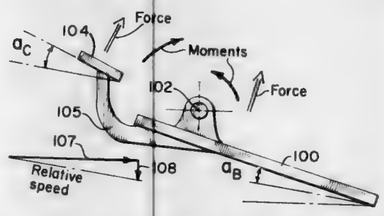
operator means, first and second support structures angularly displaceable with said operator and fluid flow sensing means, respectively, and motor operation controlling switch means and switch actuating means carried by said structures and operatively associated with each other and said motor means for driving said operator means to an angular position corresponding, at least generally, to an angular positional change of said fluid flow sensing means as a result of a change in said radial direction, one of said support structures being angularly displaceable relative to the corresponding angularly displaceable means, and key means operative to releasably key said one support structure in predetermined angular position relative to the corresponding angularly displaceable means.

4,178,127

VARIABLE PITCH IMPELLER

Zoltan P. Zahorecz, 1424 Oakcrest Ave., S. Pasadena, Calif. 91030

Filed Aug. 27, 1975, Ser. No. 585,339
Int. Cl.[2] B63H *3/00*; F03D *7/04*
U.S. Cl. 416—23 **12 Claims**



1. A mechanism for adjusting the lift angle of a lift surface relative to a fluid medium, dependent upon the relative velocity between the lift surface and the fluid medium, comprising:

a base;

means pivotally coupling the lift surface to said base along a selected axis, the lift center of the lift surface being spaced apart from the pivot axis;

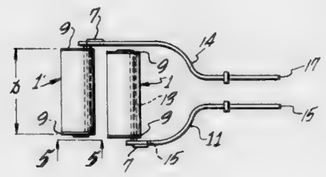
and a control surface fixedly coupled to said lift surface and extending therefrom to provide a control lift center at a different radial position than the lift center of the lift surface from the pivot axis, the lift components of the control surface and the lift surface acting in response to the fluid medium to provide opposite pivot moments on the lift surface about the pivot axis, such that the angle of the lift surface relative to the fluid medium stabilizes at a position dependent upon the relative velocity of the fluid medium, wherein the angle of the control surface relative to the lift surface is selected to provide a tapering off of the gradient of the lift component from the control surface at a predetermined relationship of relative fluid velocity and lift angle at which the opposite pivot moments cancel, such that the angle of the lift surface is varied automatically with relative fluid velocity but is stable at such velocity.

4,178,128

METHOD OF AND DEVICE FOR PROPULSION

Calvin A. Gongwer, Glendora, Calif., assignor to Innerspace Corporation, Glendale, Calif.

Filed May 10, 1977, Ser. No. 795,384
Int. Cl.[2] A63C *31/10*
U.S. Cl. 416—72 **10 Claims**



1. A propulsion device comprising:

a forward foil means and a rearward foil means in nested relationship for alternate transverse reciprocal and alternate pivotal movement in opposed direction about substantially parallel pivot axes;

said forward and rearward foil means axes being substantially parallel to the leading edges of said forward and rearward foil means; and

said axes of said forward and rearward foil means about which said forward and rearward foil means pivot being positioned a distance of less than about one-quarter of the chord length from the leading edge of said forward and rearward foils means;

whereby the wake of the forward foil means increases the resultant velocity component and the forward thrust produced by said rearward foil means and the action of the rearward foil means increases the resultant velocity component and the forward thrust means produced by said forward foil means.

4,178,129

GAS TURBINE ENGINE COOLING SYSTEM

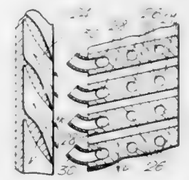
John Jenkinson, Bristol, England, assignor to Rolls-Royce Limited, London, England

Filed Feb. 3, 1978, Ser. No. 874,741
Claims priority, application United Kingdom, Feb. 18, 1977, 6860/77
Int. Cl.[2] F01D *5/18*
U.S. Cl. 416—95 **7 Claims**

1. A cooling system for a turbine of a gas turbine engine, said system comprising a turbine rotor with blades extending therefrom:

a plurality of circumferentially closely spaced pre-swirl nozzles defining a substantially continuous annular outlet flow area through which flows, in operation, a cooling fluid; and

a plurality of circumferentially spaced pitot receivers projecting from the blades of the turbine in a direction towards the pre-swirl nozzles and terminating at their free



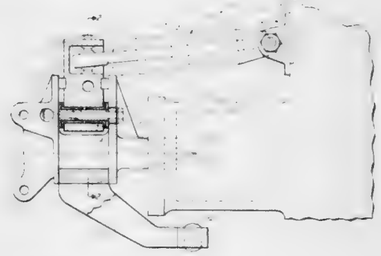
open inlet ends in closely spaced relation to the nozzles with the ends being substantially perpendicular to the relative approach vector of the fluid from the nozzles, the pitot receivers being sized and positioned to collect a portion only of the pre-swirled cooling fluid from the nozzles and to direct it to a portion only of the interior of each of the blades of the turbine.

4,178,130

HELICOPTER ROTOR HAVING LEAD-LAG DAMPER OPERABLE WITH PITCH AND FLAP DECOUPLING

Donald L. Ferris, Newtown, and William L. Noehren, Huntington, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 674,192, Apr. 6, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 849,064
Int. Cl.[2] B64C *27/38*
U.S. Cl. 416—107 **8 Claims**

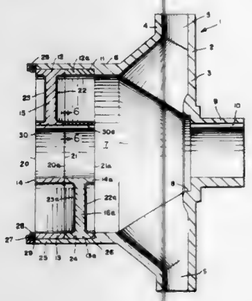


1. A helicopter rotor including:

1. a hub mounted for rotation about an axis of rotation,
2. at least one helicopter blade projecting from said hub and having an inboard end adjacent the hub and an outboard end away from the hub,
3. means supporting said blade inboard end from said hub so that said blade will rotate with said hub about said axis of rotation and so that said blade is capable of universal motion with respect to said hub about intersecting lead-lag and flapping axes, and for pitch change motion with respect to said hub about a pitch change axis intersecting said lead-lag and flapping axes,
4. a lead-lag damper supported from said hub so as to be movable in pivot motion in a trajectory lying substantially in a selected plane with respect to said hub,
5. link means extending between said lead-lag damper and said blade,
6. a universal connection connecting said link means to said lead-lag damper, and
7. means pivotally connecting said link means to said blades

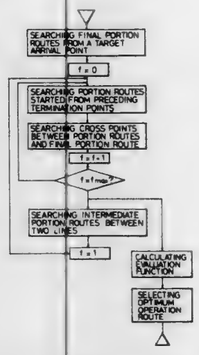
for pivot motion therebetween about a pivot axis offset from at least one of said pitch change and flapping axes.

4,178,131
CENTRIFUGAL IMPELLERS
Leonard J. Sieghartner, Coal Valley, Ill., assignor to Roy E. Roth Company, Rock Island, Ill.
Filed Aug. 7, 1978, Ser. No. 931,481
Int. Cl.[2] F04D *13/12, 24/18*
U.S. Cl. 416—175 **6 Claims**



1. In a centrifugal impeller for use in a centrifugal-turbine pump capable of pumping liquids at or near the boiling point thereof with suction heads not greater than about one foot, the impeller including a housing having a front, elongated entrance portion through which such liquid enters said housing, and a rear discharge portion from which liquid entering said housing through said discharge portion is discharged from said housing during operation of said pump, and said pump including drive means including a drive shaft mounted in said housing and operatively connected thereto for rotating the latter, the combination of:
   a. vane means removably mounted in said entrance portion for rotation therewith for feeding such liquid through said entrance portion to said discharge portion during such rotation of said housing with said drive shaft,
   b. said vane means comprising
      (1) a vane insert comprising
         (a) an outer annular flange,
         (b) an annular hub disposed inside said flange in substantially concentric relation thereto, and
         (c) a plurality of vanes extending between said flange and hub in annularly spaced relation to each other,
   c. said vane insert being mounted in said entrance portion for rotation therewith, with
      (1) the outer peripheral surface of said flange being disposed in closely adjacent relation to the inner surface of said entrance portion, and
      (2) said hub being mounted on and secured to said drive shaft for rotation with said drive shaft and said housing during operation of said pump,
   d. said flange having
      (1) a front face through which such liquid enters in entering into said entrance portion, and
      (2) a rear face through which said liquid exits in flowing through said entrance portion to said discharge portion, and
   e. each of said vanes having a front face,
      (1) facing in the direction of rotation of said impeller insert when the latter is so rotating with said drive shaft, and
      (2) disposed at a rearwardly opening obtuse angle to said front face of said flange.

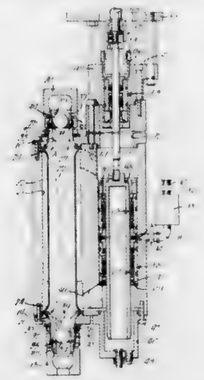
4,178,132
METHOD AND DEVICE FOR CONTROLLING THE NUMBER OF PUMPS TO BE OPERATED
Atsuko Shiraishi, Kokubunji, and Makoto Shioya, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan
Filed Dec. 20, 1976, Ser. No. 751,988
Claims priority, application Japan, Dec. 24, 1975, 50/153315
Int. Cl.[2] F04B *49/06*
U.S. Cl. 417—5 **20 Claims**



1. A method for controlling the number of pumps to be operated in a multi-pump fluid supply system including a pond or reservoir comprising the steps of:
   generating a first characteristic line relating to the cumulative values of predicted load flow rates with time and a second line relating to the sum of the cumulative values of predicted load flow rates and the capacity of the pond or reservoir with time;
   plotting possible pump operation routes passing through the region between the first and second lines so that the gradient of the route portion of each pump operation route is changed when the route portion reaches one of the first and second lines, until the number of gradient changing points of said pump operation route reaches a predetermined value;
   calculating the value of an evaluation function for every pump operation route which has been plotted;
   selecting the optimum pump operation route having a most suitable evaluation function; and
   controlling the number of pumps to be operated in response to the selected optimum pump operation route.

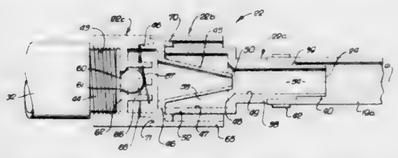
4,178,133
DOUBLE-ACTING FLEXIBLE TUBE PUMP
Waldemar Rawicki, Chicago, Ill., assignor to Binks Manufacturing Company, Franklin Park, Ill.
Filed Apr. 14, 1977, Ser. No. 787,358
Int. Cl.[2] F04B *21/00, 35/02, 43/10;* **F16J** *15/44*
U.S. Cl. 417—63 **2 Claims**

1. In a flexible tube pump, a pair of substantially identical pump cylinders each having inlet and outlet openings and a flexible tube in each said cylinder connected at its ends to the inlet and outlet openings thereof; each said connection comprising a frusto-conical recess in the cylinder wall, a hollow stem extending through said opening and having an enlarged frusto-conical head portion complementary to and juxtaposed to said recess comformably receiving the end of the tube, means for drawing said head portion toward and into said recess for compressing the end of the tube between said frusto-conical surfaces, and means on said stem for maintaining a clamping pressure on the tube end; a single control cylinder communicating adjacent one end thereof with one of said pump cylinders exteriorly of the respective tube and adjacent the other end thereof with the other pump cylinder exteriorly of the respective tube; and a single piston reciprocable in said control cylinder; the improvement comprising two spaced apart seals mounted in said control cylinder and sealingly engaging said reciprocable piston intermediate the two ends of said control cylinder; liquid having a visually detectable coloring; said liquid filling the pump cylinders exteriorly of said tubes and the control cylinder to opposite sides of said two seals; a piston rod connected to and extended from only one end of said piston and extending through only one end of said control cylinder for reciprocating said piston and displacing said liquid and thereby alternately and cyclically contracting



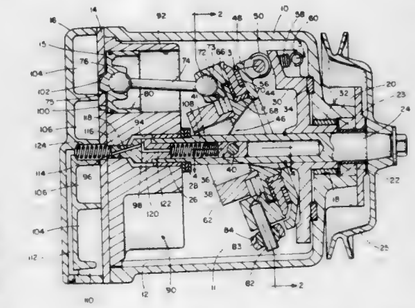
and expanding said tubes to perform a pumping function; the end of said piston opposite said piston rod being unobstructed, hollow and having a larger effective piston area than the other end of said piston, said piston being of relatively large diameter in relation to the diameter of the piston rod for minimizing the differential between the effective areas of the two ends of the piston and thus the liquid displacement thereof; and a sight glass in communication with said control cylinder in the space therein between said two seals, whereby the liquid leaking past either seal, itself, gives a signal when it is detected in said sight glass and before it passes the other seal so that damage to said tubes is averted.

4,178,134
ENGINE COOLANT SYSTEM FLUSH ATTACHMENT FOR COOLANT HOSE
John A. Babish, Glendora; Larry K. Arnot, Duarte, and Douglas C. Appel, Glendora, all of Calif., assignors to Wynn Oil Company, Fullerton, Calif.
Filed Jan. 6, 1978, Ser. No. 867,527
Int. Cl.[2] F01P *11/06*
U.S. Cl. 417—181 **13 Claims**



1. In combination with an engine cooling fluid duct,
   (a) body means having an outlet portion coupled to an end of the duct,
   (b) the body means having an inlet portion to receive pressurized fluid from a flush fluid source line for flow into the duct,
   (c) aspirating means including a forwardly tapering duct portion associated with said body means to aspirate air into the pressurized fluid flow into the duct,
   (d) check valve means associated with said body means to pass the pressurized flow generally forwardly in the body to the duct and to block reverse flow from the duct into the source line, and
   (e) pressure release means associated with said body means and spaced generally outwardly of said duct portion to release excessive pressure in the duct at a predetermined pressure level,
   (f) said check valve means located generally in alignment with, and directly rearwardly of the forwardly tapering duct portion.

4,178,135
VARIABLE CAPACITY COMPRESSOR
Richard W. Roberts, Lombard, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Dec. 16, 1977, Ser. No. 861,386
Int. Cl.[2] F04B *1/14*
U.S. Cl. 417—222 **6 Claims**

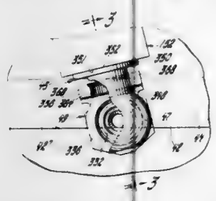


1. A compressor comprising: means defining a plurality of gas working spaces each having a piston cooperating with suction and discharge ports to compress a compressible fluid therein; a drive shaft; a cam mechanism driven by said drive shaft; a swash plate driven by said cam mechanism in a nutating path about the drive shaft axis; means operably connected between said swash plate and the individual pistons to impart reciprocating drive to said pistons; means for supporting said swash plate and said cam mechanism for pivotal movement with respect to the axis of said drive shaft, the pivot point lying along said drive shaft axis; a cam follower associated with said cam mechanism, said cam follower including a roller, and an axially fixed cam surface cooperating with said roller, said roller engaging said axially fixed cam surface to shift the pivot point of said swash plate along said drive shaft axis to vary the stroke.

4,178,136
GUIDE SHOE MEMBERS FOR WOBBLE PLATE COMPRESSOR
Earl Reid, Dayton, and Carl A. Copp, Jr., Vandalia, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Jun. 2, 1978, Ser. No. 911,818
Int. Cl.[2] F04B *1/14*
U.S. Cl. 417—269 **1 Claim**

1. In a compressor having a housing, a cylinder block disposed in one end of said housing forming longitudinally aligned cylinder bores receiving pistons therein, a working chamber defined between said block and one wall of said housing, a drive shaft rotatably supported in said working chamber, an annular wobble plate operated in response to

rotation of said drive shaft and drivingly connected to said pistons at locations therearound spaced radially from said drive shaft to reciprocate said pistons, means for translating the movement of said wobble plate into reciprocation of the pistons, said housing having a longitudinally extending guide slot formed therein in a common plane with said drive shaft and defining opposed substantially parallel plane bearing faces of predetermined depth, at least one of the driving connections of said wobble plate to its respective piston being spaced transversely from said common plane and said bearing faces whereby during movement of said wobble plate a driving force occurs at said one driving connection which is offset from said common plane, said wobble plate supporting a radially extending cylindrical rod portion formed with a ball on its outer end, said ball positioned for longitudinal and arcuate travel in said slot as a result of said wobble plate movement and tending toward travel lateral to said slot as a result of said offset force, and a pair of spaced guide shoe members positioned in said slot on opposite sides of said ball, said shoe members having concave recesses on opposing surfaces thereof facing each other for receiving and retaining said ball therebetween, said shoe members each having an outer bearing surface in bearing contact with its associated slot bearing face, the improvement wherein said shoe members have collar portions integrally formed in opposed relation on their radially inner ends and extending in a common plane normal to the axis of said rod portion, said collar portions forming outer surfaces as inward extensions of their associated shoe member outer bearing surfaces, wherein the total outer surface of each said shoe member is comprised of the collar portion outer surface and the shoe member outer surface, said total outer surface having a predetermined dimension along said rod portion greater than the predetermined depth of the associated slot bearing face, said collar portions having opposed inner surfaces each formed as a cylindrical surface portion positioned in conforming bearing contact with said rod portion, each said cylindrical surface portion extending through a predetermined arc less than a one-half circle to form a pair of shoulder portions, each shoulder portion of each pair of shoulder portions being located in opposed sufficiently spaced relation with the respective shoulder portion of the other pair so that a predetermined clearance is provided between the shoulder portions of each shoe member during longitudinal movement of the shoe members in said slot and during any limited pivotal movement of the shoe members about the axis of said rod portion, thereby to compensate for the travel of said ball longitudinally, arcuately and laterally in said slot, and whereby the travel of said ball to predetermined angular locations in said slot moves a portion of the outer bearing surface of each shoe member into a non-bearing relation with the bearing faces of said slot, said outer surface of each collar portion of said shoe member then moving into bearing relation with its slot bearing face to compensate for such non-bearing relation by replacing that portion of each shoe member outer bearing surface that is in non-bearing relation with another portion of said shoe member outer bearing surfaces thereby to insure substantially constant bearing contact areas between each said shoe member and its associated bearing face of the guide slot, and whereby cooperation between said rod portion and said cylindrical surface portions prevent the outer surface of either shoe member from being canted into a non-parallel orientation with respect to each other bearing face to thereby minimize undesirable wear of the bearing faces by reason of gouging thereof by said shoe members.



4,178,137

PRESSURE REGULATOR FOR A FLUID PUMP

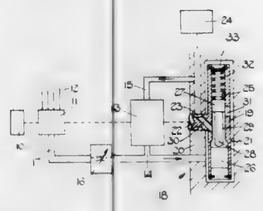
Colin P. Brotherston, Banstead, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 22, 1977, Ser. No. 863,316

Claims priority, application United Kingdom, Jan. 4, 1977, 00104/77

Int. Cl.[2] **F04B** *49/08*

U.S. Cl. 417—294 **5 Claims**



1. A centrifugal pressure regulator for controlling the output pressure of a fluid pump associated with said regulator, comprising: a body rotatable within a cavity, the speed of rotation of said body about its axis of rotation determining the output pressure of the pump, a bore extending diametrically within the body, one end portion of said bore being of larger diameter than the other end portion, a first piston slidable in said one end portion of the bore, a second piston slidable in the other end portion of the bore, abutment means extending between the two pistons and defining therebetween and the wall of the bore a spill chamber, said pistons being subjected at their outer ends to the pressure in said cavity and having their combined mass, together with the mass of the abutment means offset relative to the axis of rotation of the body in the direction of the larger piston, a spill port in the wall of said bore, said spill port placing said cavity and spill chamber in communication with each other, the size of said spill port being controlled by said second piston, resilient means biasing said piston in the direction to reduce the size of said spill port, an outlet communicating with said spill chamber for fuel which has flowed through said spill port, an inlet to said cavity and which in use is connected to the outlet of the pump, and means for restricting the rate of movement of the pistons with variation of speed and/or output pressure.

4,178,138

CARTRIDGE FOR PERISTALTIC PUMP

Frank Iles, "Loscombe", Four Lanes, Redruth, Cornwall, TR16 6LP England

Filed Apr. 26, 1977, Ser. No. 790,892

Claims priority, application United Kingdom, May 5, 1976, 18471/76

Int. Cl.[2] **F04B** *43/08, 43/12, 45/06*

U.S. Cl. 417—360 **4 Claims**

1. A peristaltic pump comprising

body means having a chamber with an open mouth;

a rotary member mounted in said body means for rotation in said chamber; and

a cartridge adapted to be releasably mounted in said chamber through said open mouth, said cartridge comprising

a housing with a bore for receiving said rotary member when said cartridge is mounted in said chamber,

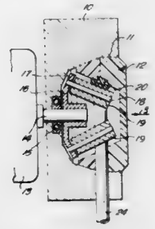
a tube with a flexible wall extending through said housing, said tube having a convolution with at least a part thereof encircling said bore,

a rib integrally mounted on said tube and extending along the longitudinal extent thereof, said rib narrowing in cross section to a neck adjacent said tube, and

a recess formed in said housing and encircling said bore, said recess having a width similar to that of said neck to entrap the rib therein and thereby hold said tube in said bore;

said rotary member being rotatable about the axis of the bore and having at least one eccentrically mounted element thereon for engaging and pressing the wall of the tube; and clamping means for releasably holding said cartridge in said chamber, said clamping means including

openings on opposite sides of the encircling wall of said chamber,



a pair of pins extending through said body means with one pin on each side of said body means;

resilient biasing means for resiliently biasing said pins so that the side portions thereof project into said chamber through said openings;

a groove on the outer surface of said cartridge adapted to receive the side portions of said pins, and

releasable locking means for holding said pins in said opening to hold said cartridge in place when located in said chamber;

whereby, upon rotation of said rotary member when said cartridge is in said chamber, said rotary member traverses said convolution and, by depressing said tube, causes fluid in said tube to flow.

4,178,139

CISTERN PUMPING PLANT

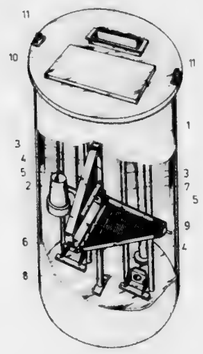
Rauno Seppänen, Kerava; Hannu Sarvanne, and Sixten Jakobsson, both of Vantaa, all of Finland, assignors to Oy E. Sarlin AB, Helsinki, Finland

Filed Feb. 10, 1978, Ser. No. 876,830

Claims priority, application Finland, Feb. 14, 1977, 770478

Int. Cl.[2] **E02D** *29/12*

U.S. Cl. 417—360 **5 Claims**



1. A cistern pumping plant comprising at least one pump within a cistern having a vertical wall; a plurality of guides; a servicing platform, said guides located between said platform and the wall and extending from a lower portion of said cistern below said platform to an upper portion of said cistern above said platform, said pump being liftable for maintenance and repairs along said guides up onto said servicing platform inside said cistern; said servicing platform comprising a plate hinged to the cistern and being turnable from a horizontal position, whereby a pump that is in need of being serviced being liftable directly into position above the servicing platform that has been turned to its open position whereupon the servicing platform is turned to its horizontal position and the pump is lowered to rest thereupon.

4,178,140

COMPRESSOR WITH RECIPROCATING PISTON PARTICULARLY FOR SMALL REFRIGERATORS

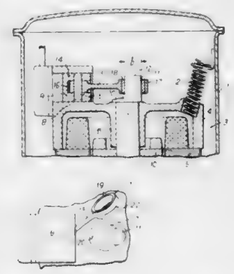
Hans J. Tankred, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 774,890, Mar. 7, 1977, abandoned. This application Aug. 30, 1978, Ser. No. 938,258

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1976, 2609653

Int. Cl.[2] **F04B** *17/00, 35/04;* **B23P** *15/10*

U.S. Cl. 417—415 **1 Claim**



1. A compressor assembly comprising a sealed housing, an electric motor having a casing and being resiliently mounted in said housing, said motor having a vertically disposed shaft, an offset crankpin attached to the upper end of said shaft, a cylinder member having a cylindrically shaped chamber attached to the upper side of said motor casing, a piston slidably mounted in said chamber, said chamber having a diameter larger than the axial length of said crankpin, a connecting rod having a shaft portion with the piston end thereof pivotally connected through cylindrically shaped pin means to said piston and crank end thereof connected in relatively rotatable relation to said crankpin, said connecting rod crank end being a generally annularly shaped ring with annular surfaces on opposite sides thereof and having a bore larger than the diameter of said crankpin, a sleeve between said connecting rod ring and said crankpin, one of said crank end annular surfaces having a recess for facilitating assembly which is displaced 90 degrees from the front between said ring and said shaft portion and which has a width at least equal to the diameter of said crankpin.

4,178,141

FUEL INJECTION PUMP FOR AIR-COMPRESSING INJECTION INTERNAL COMBUSTION ENGINES

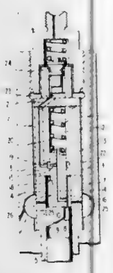
Heinz Scheying, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 12, 1977, Ser. No. 841,292

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 2647788

Int. Cl.[2] **F04B** *7/04*

U.S. Cl. 417—498 **16 Claims**



1. A fuel injection pump for internal combustion engines, the injection pump comprising control slide valve means longitudinally displaceably guided in a pump housing part, a displaceable pump piston means for opening and closing a fuel control bore communicating with a pump working space means and for displacing the control slide valve means, spring means for biasing the control slide valve means, said control slide valve means including first bore means for temporarily connecting the pump working space means with a pump pressure space means, the control slide valve means and the pump piston means being arranged substantially coaxially to each other in a pump cylinder means, characterized in that the control slide valve means rests on the pump means, second bore means provided in the pump housing part in which the control slide valve means is longitudinally displaceably guided for communicating the first bore means with the pump pressure space means in dependence upon a positioning of the control slide valve means, the control slide valve means further including a recess means disposed essentially in a lower half of the control slide valve means for communicating the pump working space means with the second bore means in dependence upon a positioning of the control slide valve means, the recess means extend in a direction of displacement of the control slide valve means and terminates in a surface which is slightly inclined in a direction toward an outer circumference of the control slide valve means, whereby, upon a longitudinal displacement of the control slide valve means by the pump piston means, the working pressure space means is in communication with the pump working space means alternately by either the first bore means or the recess means.

4,178,142

DOUBLE-CYLINDER PUMP ESPECIALLY FOR CONVEYING CEMENT

Friedrich Schwing, Herne, Fed. Rep. of Germany, assignor to Friedrich Wilh. Schwing GmbH, Herne, Fed. Rep. of Germany

Filed Jul. 21, 1977, Ser. No. 817,667

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1976, 2632816

Int. Cl.[2] **F04B** *15/02*

U.S. Cl. 417—516 **9 Claims**

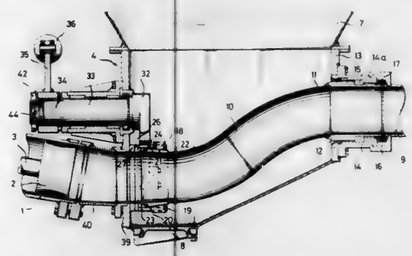
1. A double cylinder pump for a viscous, abrasive material comprising:

frame means having a pair of material conveyor cylinders providing a pair of delivery openings surrounded by a spectacle shaped plate;

a driven distribution pipe having an end swivellingly movable between said two openings for receiving the discharge of said cylinders;

a wearing ring carried by said distribution pipe adjacent its end for contacting said spectacle shaped plate throughout the swivelling movement of said pipe; and

a pressure device anchored in said frame means and coupled



to said wearing ring for forcing said wearing ring into contact with said spectacle shaped plate, said wearing ring being relatively movable with respect to said pressure device and said pipe responsive to the contact with said spectacle shaped plate to obtain sealing abutment between said ring and plate and for accommodating wear to said ring and plate from the viscous, abrasive material.

4,178,143

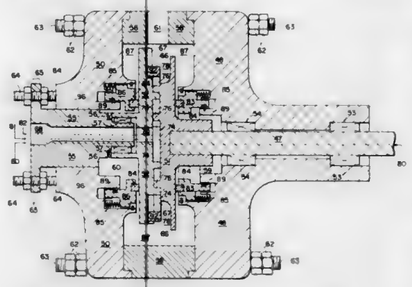
RELATIVE ORBITING MOTION BY SYNCHRONOOUSLY ROTATING SCROLL IMPELLERS

William G. Thelen, Onondaga, Mich., and Thomas W. Bein, Annapolis, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 30, 1978, Ser. No. 891,963

Int. Cl.[2] **F01C** *1/02, 21/14;* **F04C** *1/02, 15/02*

U.S. Cl. 418—19 **1 Claim**



1. A positive displacement fluid pump comprising:

a casing;

a pair of facing scroll vane impellers in operative meshed relationship rotatably mounted within the casing on parallel offset axes;

one port through the casing terminating between the impellers near their axes of rotation and another port through the casing located radially of the impellers;

means for rotating one of the impellers;

ring means outwardly surrounding the scroll vanes and slidably engaging facing portions of each impeller for transmitting rotary motion from said one impeller to the other impeller while permitting relative orbital motion therebetween whereby fluid is caused to flow between the scroll vanes and through the ports; and

means for adjusting the distance between the impeller axes for controlling pump output.

4,178,144

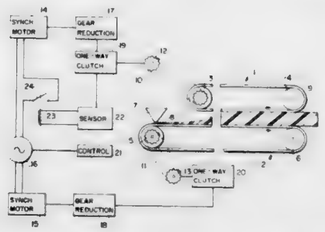
MOLDING CONVEYOR DRIVE

Charles P. Tabler, Hamilton, Ohio, assignor to Kornylak Corporation, Hamilton, Ohio

Filed Sep. 22, 1977, Ser. No. 835,780

Int. Cl.[2] **B29C** *15/00;* **B29D** *27/00*

U.S. Cl. 425—150 **13 Claims**



1. Apparatus for molding non-rigid material into rigid indefinite length product employing a top endless molding belt conveyor and an opposed bottom endless molding belt conveyor, forming therebetween opposed endless molding surfaces, and means to drive both belts so that upon start-up when only non-rigid material is between the belts the belts may be driven at substantially the same speed, wherein the improvement is in means to prevent shearing forces from distorting the product through inherent small differences in conveyor speed, comprising: mechanical coupling means between said drive means and only one of said conveyors for normally transferring driving power from said drive means to said one conveyor only; and means for disconnecting said mechanical coupling means when the other of said conveyors is being driven at a speed greater than said one conveyor so that said other conveyor may drive said one conveyor through the rigid product at a common speed.

4,178,145

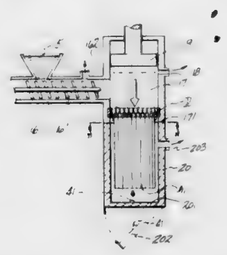
EXTRUSION DIE FOR CERAMIC HONEYCOMB STRUCTURES

Shoichi Hamamoto, and Masaaki Hiwatashi, both of Kyoto, Japan, assignors to Kyoto Ceramic Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 679,975, Apr. 26, 1976, abandoned. This application Dec. 13, 1977, Ser. No. 860,053

Int. Cl.[2] **B29F** *3/04*

U.S. Cl. 425—199 **20 Claims**



1. An extruder comprising:

an extrusion die of the type having an inlet and outlet face for forming honeycomb structures from extrudible material, said extrusion die comprising:

a plurality of intersecting discharge slots forming appropriately arranged core pins, said slots being of a predetermined width and formed in said die to a predetermined depth in a direction from the outlet face of said die towards the inlet face; and

a plurality of mutually independent feed passageways formed in a direction from the inlet face of said die towards the outlet face and communicating with said discharge slots, said feed passageways being placed midway on a side of said core pins, said passageways furtner having a cross sectional area larger than the total cross sectional area of the discharge slots which are feed by said feed passageways; and

a bucket having an open upper and a closed lower end coupled to the outlet face of said extrusion die, said bucket further being provided with an evacuation outlet whereby the bucket is evacuated to facilitate the initial drying of said honeycomb structure for maintaining the structural integrity of the honeycomb structure.

4,178,146

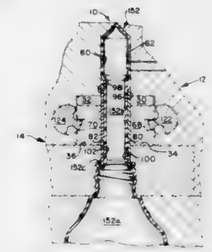
MOLD HAVING CUTTER MEANS

John P. Kinsley, Hanover Park, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Sep. 22, 1975, Ser. No. 615,272

Int. Cl.[2] **B29F** *5/00;* **B29D** *23/03*

U.S. Cl. 425—289 **10 Claims**



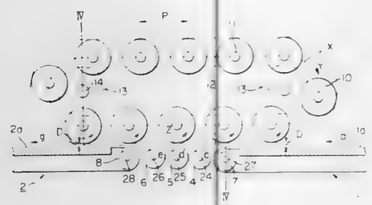
1. In a mold for forming a hollow article about a central axis of the mold, the article having a body portion, an extension portion, and a transverse shoulder joining the body portion and the extension portion, the mold having a first mold portion defining a cavity for forming the body portion and transverse shoulder of a hollow article, and a second mold portion defining a cavity extension communicating with the cavity for forming the extension portion of a hollow article, the mold comprising a pair of partible mold members cooperating to provide the first and second mold portions, a cutter means, and actuating means for moving the cutter means axially relative to the first mold portion and into cutting relation with the transverse shoulder of a formed hollow article to sever the extension portion thereof from the body portion thereof while the formed hollow article is in the mold, the improvement comprising the features that the second mold portion is axially immovable relative to the first mold portion, and the cutter means is axially movable relative to the second mold portion, whereby the cutter means is movable into said cutting relation without effecting substantial axial movement of a formed hollow article relative to the mold.

4,178,147

STRETCHER OF DOUGH FOR CAKES, BREAD AND THE LIKE

Torahiko Hayashi, 2-3 Nozawa-machi, Utsunomiya-shi, Tochigi-ken, Japan

Filed Jan. 25, 1977, Ser. No. 762,319
Claims priority, application Japan, Jan. 27, 1976, 51-7648
The portion of the term of this patent subsequent to Aug. 10, 1993, has been disclaimed.
Int. Cl.[2] A21C *3/02*
U.S. Cl. 425—372 **6 Claims**



1. An apparatus for continuously stretching dough for cakes, bread or the like, comprising:

(a) a plurality of rotatable stretching rollers movable in unison about an endless roller path having a lower straight portion;

(b) means spaced below said lower straight portion fr transporting dough into engagement with those of said stretching rollers moving along said lower straight portion, said transport means including an intake conveyor belt having a portion facing said lower straight portion and at least one rotatable transport roller facing said lower straight portion and disposed in series relation downstream of said intake conveyor belt;

(c) means operatively associated with said intake conveyor belt and each transport roller for driving them at respective speeds, said speeds being progressively faster in the downstream direction of dough transport; and

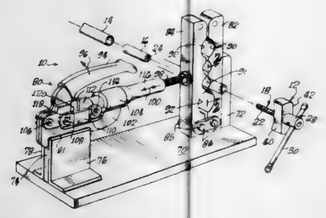
(d) means operatively associated with said stretching rollers for moving them along said lower straight portion in the same direction as the dough transport and at a linear speed faster than the peripheral speed of any transport roller.

4,178,148

TOOL FOR FLARING PIPE END PORTIONS

Robert E. Bunch, 2754 Arrow Hwy., Sp#22, LaVerne, Calif. 91750

Filed Aug. 22, 1978, Ser. No. 935,894
Int. Cl.[2] B29C *17/02*
U.S. Cl. 425—393 **17 Claims**



1. Tool apparatus for flaring the end portion of a plastic pipe and the like, comprising:

a flaring head having a circular forming recess confronting and adapted to receive the pipe end portion and having a cam edge portion adjacent to the forming recess to engage and deform the pipe end portion,

mandrel means threadedly connected with the flaring head for movement of the flaring head toward the mandrel means in a forming directions, and

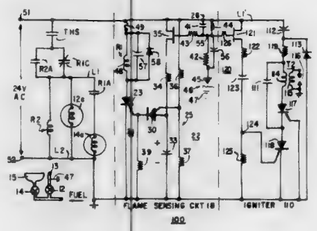
means mounting the mandrel means and the pipe end portion in clamped relation to prevent relative movement therebetween.

4,178,149

FUEL IGNITION CONTROL SYSTEM

Russell B. Matthews, Goshen, Ind., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Filed Apr. 25, 1977, Ser. No. 790,408
Int. Cl.[2] F23Q *9/14*
U.S. Cl. 431—46 **23 Claims**



1. In a fuel ignition control system including valve means having a pilot valve operable to supply fuel to a pilot outlet for ignition by sparks provided by an igniter means to establish a pilot flame, and a main valve operable to supply fuel to a main burner for ignition by the pilot flame, a control arrangement comprising activate means operable to extend a cyclical AC signal to said control arrangement and for energizing said pilot valve, and flame sensing means including first switching means operable when enabled to energize said main valve, control means including second switching means operable when enabled to effect the enabling of said first switching means, circuit means including capacitor means which is charged by said AC signal to provide a signal for enabling said second switching means, sensor means including energy storage means for permitting said sensor means to provide a control output whenever a pilot flame is provided, and enabling means responsive to said sensor means to be operable in the absence of said control output to control the charging of said capacitor means for preventing the enabling of said second switching means in the absence of a flame, said enabling means being operable when said control output is provided to permit said capacitor means to charge during alternate half cycles of said AC signal when a flame is established, to provide said enabling signal for said second switching means during one of said alternate half cycles.

4,178,150

PROCESS AND INSTALLATION FOR DRYING AND HEATING COAL

Claus Flockenhaus; Horst Fach, both of Essen; Günter Gabriel, Wattenscheid; Manfred Galow, Essen, and Joachim Meckel, Heiligenhaus, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Dec. 23, 1977, Ser. No. 863,795
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1976, 2659335
Int. Cl.[2] F27B *15/00*
U.S. Cl. 432—14 **9 Claims**

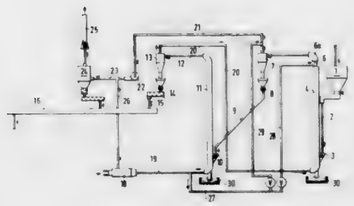
1. A process for subjecting coal to a drying and subsequent heating step,

said process comprising passing the feed coal through a flow-through drying zone while in contact with a heat carrier gas,

then separating the coal from the exhaust gas and discharging the latter into the atmosphere,

passing the dried coal thereupon into and through a flow-through heating zone where the coal is heated to a temperature in excess of 150° C. while in contact with a heat carrier gas,

separating the hot coal from the exhaust gas of the heating zone



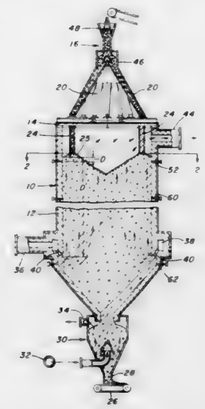
recovering the coal while passing the separated exhaust gas from the heating zone into said drying zone, a portion of the hot gas generated in a combustion zone being branched off to be passed into the exhaust gas from the drying zone at the place where the said exhaust gas leaves said drying zone or at the place where said exhaust gas is subsequently separated from the dried coal or being passed into the exhaust gas from the drying zone at both of these places so as to prevent the temperature of the exhaust gas from sinking to or below the sulfuric acid or water vapor dewpoint.

4,178,151

APPARATUS FOR MONITORING THE FEEDING OF PARTICULATE MATERIALS TO A PACKED BED FURNACE

Allan C. Huestis, Georgetown, S.C., assignor to Midrex Corporation, Charlotte, N.C.

Filed Mar. 2, 1978, Ser. No. 883,435
Int. Cl.[2] F27B *1/00, 1/10*
U.S. Cl. 432—1 **10 Claims**



9. A method of detecting a blocked feed tube in a generally vertical direct reduction furnace in which said furnace has a plurality of feed tubes for charging particulate metal oxide material into the top of said furnace to establish a particulate metal oxide burden therein, means for removing metallized particles from the bottom thereof to establish a continuous gravitational flow of the burden through said furnace, and means for establishing a counter-current flow of hot reducing gas through said burden, said method comprising:

(a) continuously monitoring the temperature of the burden in the region of each feed tube:

(b) continuously comparing the temperatures so monitored; and

(c) whereby a significant temperature change indicates that the feed tube has become blocked.

4,178,152

CELL FRAGILITY TESTING METHOD AND APPLIANCE THEREFOR

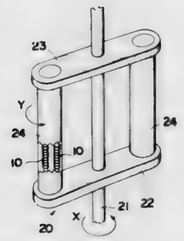
Yoshiaki Nunogaki, Nagaokakyo, Japan, assignor to Sanki Engineering Ltd., Japan

Filed Feb. 22, 1978, Ser. No. 880,159

Claims priority, application Japan, Feb. 24, 1977, 52-19611; Feb. 24, 1977, 52-19612; Feb. 24, 1977, 52-19613

Int. Cl.[2] **G01N** *33/16*

U.S. Cl. 23—230 B **5 Claims**



1. A coil column for use in a coil planet centrifuge for developing a hematologic pattern of blood, which comprises:

an elongated tube;

a support rod around which said elongated tube is helically wound, the opposed ends of said tube being retained in position at corresponding end portions of the support rod;

retainers one for each end of the support rod for retaining the opposed ends of said tube at said corresponding end portions of the support rod; and

an aqueous solution of a salt filled in the hollow of said tube and having a concentration gradient over the substantially entire length of said tube, said salt being selected from the group consisting of NaCl, NaBr, KCl, and KBr, and said solution being mixed with a viscosity modifier which is selected from the group consisting of monosaccharides, oligosaccharides, neutral polysaccharides, electrolytic polysaccharides, water-soluble proteins, synthetic water-soluble polymers, semisynthetic water-soluble polymers and glycerol.

4,178,153

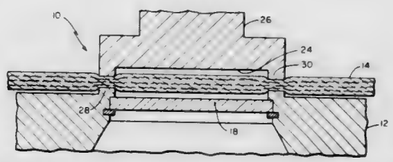
METHOD AND APPARATUS FOR CHEMICAL SPOT TEST ANALYSIS

Lester A. Sodickson, Newton, Mass., assignor to Damon Corporation, Needham Heights, Mass.

Filed Nov. 21, 1977, Ser. No. 853,435

Int. Cl.[2] **G01N** *33/16, 21/24*

U.S. Cl. 23—230 R **27 Claims**



1. In the constituent analysis of sample material on a porous medium by reaction in liquid state with reagent to produce a constituent-manifesting reaction product, and in which the reaction product is produced at the analysis site with only an optically-thin concentration, the analysis site is illuminated with incident electromagnetic radiation, and electromagnetic radiation resultant from the incident radiation and responsive to the concentration of the reaction product is sensed from a field of view within the analysis site, the improvement comprising the further successive steps of

A. pretreating the medium to bear at least one reagent in a dry state, and

B. introducing liquid to the reaction site for initiating the reaction which produces the reaction product, said introduction delivering the liquid centrally on the site and at a selected controlled rate substantially corresponding to the rate at which the liquid delivered to the central site portion enters the medium and is absorbed therein outward from the central location.

4,178,154

LIGHT SYNTHETIC FUEL

Henri Rothlisberger, 32 Blvd. Edouard VII, Beaulieu sur Mer, France

Filed Feb. 4, 1976, Ser. No. 655,229

Claims priority, application France, Feb. 5, 1975, 75 04397

Int. Cl.[2] **C10L** *1/02*

U.S. Cl. 44—53 **1 Claim**

1. A method of manufacturing a light fuel for internal combustion engines comprising the steps of crushing and composting a cellulose to separate the lignin therefrom, subjecting said lignin-free cellulose to acid hydrolysis to form a glucose, mixing said glucose with a basic medium and fermenting said mixture at a pressure on the order of 30 to 50 atms., and a temperature on the order of 75° to 90° C. to form isopropyl alcohol, converting said isopropyl alcohol to isopropyl ether, combining said isopropyl ether with a minor amount of a isooctane and subjecting said combination to a cobalt catalyst, selected from the group consisting of cobalt aluminate or/and cobalt acetate, said catalysis being carried out at about 500° C. at a pressure of about 50 atms. and an inert atmosphere for about 10 to 20 seconds.

4,178,155

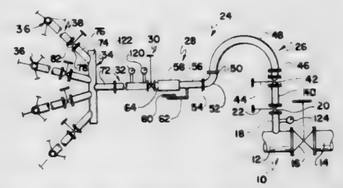
PIPELINE BLOW DOWN TECHNIQUE

Bernie B. Smith, Jr., P.O. Box 10251, Corpus Christi, Tex. 78410

Filed Jan. 9, 1978, Ser. No. 868,218

Int. Cl.[2] **F17D** *3/00*

U.S. Cl. 48—191 **10 Claims**



8. An installation for blowing down a high pressure pipeline having a block valve for controlling flow through the pipeline and a blow down valve adjacent the block valve, comprising

a pipe section for connection to the blow down valve having means for accommodating movement of the pipe section due to thermal expansion and contraction;

a throttling valve for creating a pressure drop downstream thereof;

means for heating material inside the pipe section; and

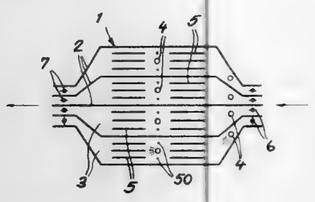
means connected to the pipe section for burning substantially all of the material emitting therefrom.

4,178,156

PROCESS AND APPARATUS FOR THE COLLECTION OF HIGH-RESISTANCE DUST

Koji Tashiro, Miki, and Yoichi Matsumoto, Takasago, both of Japan, assignors to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 1, 1977, Ser. No. 812,430
Claims priority, application Japan, Jul. 5, 1976, 51-79079
Int. Cl.² B03C *3/08*
U.S. Cl. 55—5 **9 Claims**



1. A process for collecting high-resistance dust from a gas stream entraining same in an electrostatic precipitator having dust-collecting electrodes and discharge electrodes, said process comprising the steps of:

(a) interrupting the flow of said gas stream through a part of the flow cross section of said electrostatic precipitator by closing off said part of said flow cross section between opposite ends thereof;

(b) electrically de-energizing the electrodes selectively of said part of the flow cross section of said electrostatic precipitator;

(c) discharging dust from the dust-collecting electrodes of said part of said electrostatic precipitator selectively by rapping the dust-collecting electrodes of said part while they are de-energized;

(d) spraying a conductivity-increasing substance into said part of said flow cross section between the closed-off ends thereof while the electrodes of said part are denergized;

(e) re-energizing the electrodes of said part of said electrostatic precipitator, thereby attracting said conductivity-increasing substance at least in part to said dust-collecting electrodes of the closed-off part whereby said substance adheres to said dust-collecting electrodes in said part of said electrostatic precipitator; and

(f) readmitting said stream of gas to said part of said electrostatic precipitator to effect removal of dust from the readmitted gas stream, the removal of dust from the gas stream continuing in the balance of the flow cross section during steps (a) to (e).

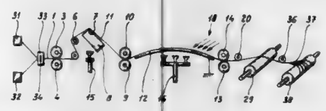
4,178,157

METHOD FOR MANUFACTURING A FILTER OF ELECTRICALLY CHARGED ELECTRET FIBER MATERIAL AND ELECTRET FILTERS OBTAINED ACCORDING TO SAID METHOD

Jan van Turnhout, Pijnacker, and Johannes C. Rieke, Delft, both of Netherlands, assignors to N. V. Verto, Rotterdam, Netherlands

Filed Dec. 21, 1977, Ser. No. 862,768
Claims priority, application Netherlands, Dec. 23, 1976, 7614376
Int. Cl.² B03C *3/00*; B29C *24/00*
U.S. Cl. 55—155 **6 Claims**

1. A method for manufacturing a filter of electrically charged electret fiber material, consisting of a high-molecular weight, non-polar polymeric substance, comprising the steps of: continuously supplying a foil of said substance, drawing, charging and fibrillating of the foil and the processing of the thus obtained filter material into a filter, selecting the foil and/or the type of drawing to manufacture spontaneously crimpable fiber material, winding said material in uncrimped



condition to a fibrous package and subsequently effecting crimping to interlock the fibers of said fibrous package.

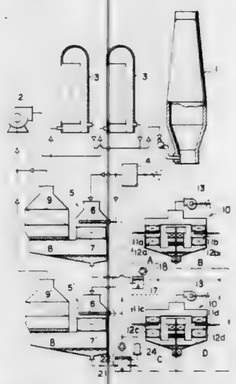
6. A filter produced by the method according to claim 1.

4,178,158

APPARATUS FOR WET PROCESS DEHYDRATION OF AIR TO BE SUPPLIED TO BLAST FURNACE

Toru Yoshida, Hachioji; Kameo Hosoi, Warabi; Takehisa Tanaka, Yokohama; Seiji Hirai, and Masakazu Nakauji, both of Sakai, all of Japan, assignors to Takasago Thermal Engineering Co., Ltd. and Nippon Steel Corporation, both of Tokyo, Japan

Filed May 30, 1978, Ser. No. 910,470
Claims priority, application Japan, Jun. 3, 1977, 52-64663; Jun. 3, 1977, 52-64665
Int. Cl.² B01D *53/14, 47/14*
U.S. Cl. 55—160 **9 Claims**



1. An apparatus for continuous dehydration of atmospheric air to be supplied by a blower to a blast furnace comprising a dehydration assembly provided with at least one dehydration means for contacting a stream of intake atmospheric air with regenerative hygroscopic liquid so as to reduce the moisture content of the air, a regeneration assembly provided with at least one regeneration means for contacting at least a part of the hygroscopic liquid which has been used in the dehydration assembly with another stream of intake atmospheric air under heating by a fluid heating medium so as to regenerate said part of the hygroscopic liquid, piping means for circulating through the or each said dehydration means the so regenerated hygroscopic liquid together with any remainder of the hygroscopic liquid which has been used in the dehydration assembly, and a duct for passing the dehydrated air coming from the dehydration assembly to the input side of said blower, characterized in that

(a) a cylinder is provided through which at least a part of the hygroscopic liquid flowing through said piping means is caused to flow so as to provide a liquid head of a predetermined height;

(b) means for continuously detecting the concentration of the hygroscopic liquid flowing through said cylinder is provided;

(c) said regeneration assembly is of such a size that it can handle the maximum regeneration load expected throughout the year, and is divided into a plurality of regeneration units, each regeneration unit being provided with the regeneration means for its own, means for controlling the flow rate of the fluid heating medium introduced into said regeneration means in accordance with a signal from said means for detecting the concentration of the hygroscopic liquid, and means for controlling the flow rate of the hygroscopic liquid introduced into said regeneration means directly or indirectly in accordance with a signal from said means for detecting the concentration of the hygroscopic liquid, whereby each unit is controllably operable independently of other units; and

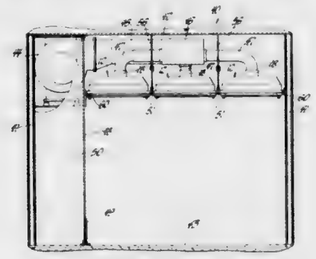
(d) each regeneration unit is further provided with at least one heat exchanger for transferring sensible heat of at least one fluid, of the regenerated hygroscopic liquid, fluid heating medium and air, leaving the regeneration means of said unit to at least one fluid, of the hygroscopic liquid to be regenerated and intake atmospheric air, introduced into said unit.

4,178,159

CLEAN ROOM FILTER ASSEMBLY

Ronald D. Fecteau, 14203 Huff, Warren, Mich. 48091

Filed Sep. 21, 1977, Ser. No. 835,154
Int. Cl.² B01D *50/00*
U.S. Cl. 55—385 A **10 Claims**



7. A clean room filter assembly comprising:

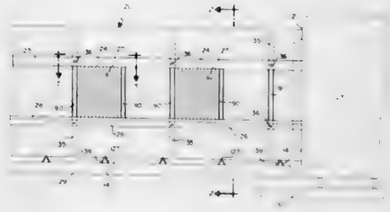
a filter housing including walls defining a plenum chamber and a filter-receiving recess located below said plenum chamber, an inwardly-directed V-shaped bend formed at the intersection between the plenum chamber walls and the recess walls, said V-shaped bend being located inside said recess walls; a filter unit including a body of filter media, a rectangular frame surrounding said filter media, and a first layer of sealing material located on the upper peripheral edge of said filter frame; a removable retainer member for engaging the lower peripheral edge of said filter frame to retain said filter unit in said recess; a second layer of sealing material located between said retainer member and the lower peripheral edge of said filter frame which overlaps said lower peripheral edge of said filter frame and said filter housing walls; each of said recess walls of said filter housing including an outwardly directed flange at the lower edge thereof; and fastening means for detachably connecting said retainer member to said flanges of said filter housing and for forcing said retainer member against said filter unit to compress said first layer of sealing material between said V-shaped bend and the upper peripheral edge of said filter frame and to compress said second layer of sealing material between said retainer member and said lower peripheral edge of said filter frame.

4,178,160

HUMIDIFIER DUCT SYSTEM

Michael Rahman, Winston-Salem, N.C., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Apr. 25, 1978, Ser. No. 900,034
Int. Cl.² B01D *45/00*
U.S. Cl. 55—436 **4 Claims**



1. An eliminator sheet assembly for mounting at an outlet of a duct in a system for distributing humidified air, said assembly comprising:

(a) a housing having a top, a bottom, two upright sidewalls, an inlet end for admitting a flow of humidified air which includes entrained droplets, and an aperture end for discharging this humidified air after removal of a limited part of the entrained droplets, said aperture end being opposite said inlet end;

(b) a plurality of eliminator sheets mounted in parallel in said housing, said eliminator sheets of said plurality being horizontally spaced from one another and being disposed uprightly and generally parallel to the direction of flow of the humidified air from said inlet end to said aperture end, said plurality of sheets forming a bundle having tortuous slow paths between said sheets to channel and act on the humidified air passing through said bundle to remove a limited part of the entrained droplets and to determine the direction of flow of air discharging from said aperture end;

(c) two pairs of spacing members for securing said plurality of eliminator sheets in said housing, a first pair of said spacing members being mounted to extend side-to-side across said inlet end, one member of said first pair being mounted adjacent said top of said housing and the other member of said first pair being mounted adjacent said bottom of said housing, each member of said first pair having recesses equally-spaced therealong for engagement with said eliminator sheets, each one of said recesses of said first pair of spacing members engaging a corresponding one of said eliminator sheets, and a second pair of said spacing members being mounted to extend side-to-side across said aperture end, one member of said second pair being mounted adjacent said top of said housing and the other member of said second pair being mounted adjacent said bottom of said housing, each member of said second pair having recesses equally-spaced therealong for engagement with said eliminator sheets, each one of said recesses of said second pair of spacing members engaging a corresponding one of said eliminator sheets, each eliminator sheet thereby being engaged by a recess on each of said spacing members; and

(d) means for selectively securing one of said pairs of spacing members to said housing at a plurality of lateral positions on said housing, whereby the position of said eliminator sheets relative to said aperture end of said housing is adjustable so that the direction of flow of humidified air from said aperture end can be changed.

4,178,161

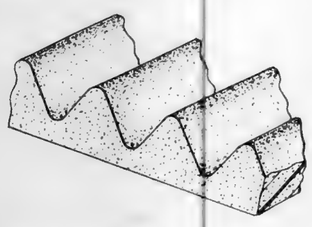
MANUFACTURE OF RIGIDIZED CONVOLUTED FOAM FROM FLEXIBLE POLYURETHANE FOAM AND RESULTANT PRODUCT

Bernard Rudner, Ridgewood; David Reich, Paramus, both of N.J., and Edward Galica, Hialeah, Fla., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Continuation of Ser. No. 740,952, Nov. 11, 1976, abandoned. This application Jul. 26, 1978, Ser. No. 928,225

Int. Cl.[2] **B01D** *39/16;* **B29C** *17/00*

U.S. Cl. 55—524 **24 Claims**



1. A process for the manufacture of a convoluted polyurethane foam self-standing filter which comprises the steps of: (a) passing a sheet of air-permeable flexible polyurethane foam that is capable of being impregnated with a thermosetting resin, said sheet having a thickness of from about 1¼ inches to about 8 inches, through a convoluting machine whereby two unnested sheets of convoluted foam are provided, each of said sheets being convoluted on only one side; (b) nesting said two unnested sheets of convoluted foam; (c) impregnating one of said nested sheets, by means of immersion, reverse-roll coating, or gravure roll coating, from the flat surface of the sheet almost to the closest valley surface of the sheet with a thermosetting melamine, urea, or benzoguanamine resin, and a cross-linker, the combined dry weight of said thermosetting resin and said cross-linker after reaction being from about 10 percent to about 300 percent of the dry weight of said polyurethane foam and being an amount to not appreciably impair said foam permeability and to increase the rigidity of said polyurethane foam sufficiently that said unnested sheet will be self-standing; (d) reacting said thermosetting resin and said cross-linker without separating said nested sheets; (e) repeating steps (c) and (d) on the other of said nested sheets; and, (f) separating said nested sheets, thereby providing convoluted polyurethane foam which is rigid enough to be self-standing.

12. The product of the process of claim 1.

4,178,162

BUSHING FOR APPARATUS FOR SPINNING GLASS FIBERS

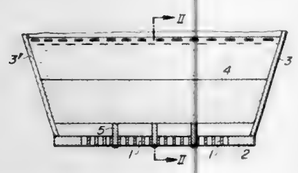
Hiroaki Shono; Shinzo Ishikawa; Isao Wakasa, and Miyako Adachi, all of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Continuation of Ser. No. 810,284, Jun. 27, 1977, abandoned. This application Nov. 22, 1978, Ser. No. 963,145

Claims priority, application Japan, Jul. 7, 1976, 51-80724

Int. Cl.[2] **C03B** *37/02*

U.S. Cl. 65—1 **8 Claims**



1. A bushing for a glass fiber spinning apparatus, having at its bottom an orifice plate provided with a great number of orifices consisting of plain holes arranged so densely that molten glass cones associated with the respective orifices tend to join, so as to cause a flooding condition at the downside of said orifice plate, said bushing further comprising at least one beam member disposed in said bushing and connected at both ends to the opposing walls of said bushing, each such beam member extending in parallel with and spaced from said orifice plate, and at least one rod member affixed at one end to one such beam member and affixed at the other end to said orifice plate, each such rod member extending substantially perpendicularly to said orifice plate, each such rod member having a diameter substantially equal to the diameter of one of said plain holes.

4,178,163

METHOD FOR THE MANUFACTURE OF FOAMED GLASS

Claus Wüstefeld, Panoramaweg 17, D 7035 Waldenbuch, Fed. Rep. of Germany

Continuation of Ser. No. 692,571, Jun. 2, 1976, abandoned. This application Jan. 16, 1978, Ser. No. 869,950

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1975, 2524981; Aug. 5, 1975, 2534874; Feb. 14, 1976, 2606049; May 15, 1976, 2621688

Int. Cl.[2] **C03B** *19/08*

U.S. Cl. 65—22 **20 Claims**

1. In a method for the manufacture of foamed glass, the improvement comprising the steps of:

providing a mixture of a finely divided glass and a bonding agent in a weight ratio of glass to bonding agent of 100 parts glass to 5–10 parts bonding agent, the bonding agent being an agent selected from the group of (1) the aqueous solutions of the oxygen acids of beryllium, boron, aluminum, silicon, germanium, arsenic, antimony, tellurium, polonium, astatine and phosphorus, and (2) the aqueous solutions of the salts formed by said oxygen acids neutralized with basic oxides, or basic hydroxides of beryllium, boron, aluminum, silicon, germanium, arsenic, antimony, tellurium, polonium, astatine and of the transition metals having a variable oxidation number;

drying the mixture at a temperature from 20° to 600° C. to thereby transform the bonding agent into a gel having water bound thereto; and

heating the dried mixture to a temperature from 800° to 1,000° C. to thereby melt the mixture and release the bound water from the gel, the released water forming a vaporous cellulating agent which effects the foaming of the molten glass, whereby the molten glass is foamed.

4,178,164

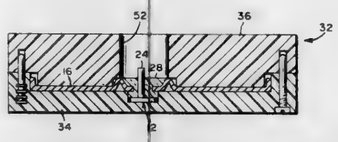
METHOD FOR MAKING A GLASS-TO-METAL SEAL FOR ELECTRO CHEMICAL CELLS

John J. Decker, and Donald J. Kantner, both of Emporium, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Division of Ser. No. 905,090, May 11, 1978. This application Oct. 20, 1978, Ser. No. 955,090

Int. Cl.[2] **C03C** *27/02*

U.S. Cl. 65—59 R **2 Claims**



1. In the method of forming a glass-to-metal seal for electrochemical cell terminals the steps comprising: placing in a carbon female mold half a metal terminal pin which is substantially tack shaped with its head fitted into a depression in said female mold; placing an apertured metal plate in a suitable depression in said female mold half, said apertured metal plate having a relief ring formed therein surrounding said aperture and spaced therefrom so that the area of said metal plate adjacent said aperture is planar, said planar area being spaced from said tack head and with the upright portion of said tack projecting through said aperture; placing a male mold half on said plate, said male mold half containing a bore of a size to conform to the diameter of said relief ring and being aligned therewith; placing in said bore a sealing material collect containing a central hole to receive said upright portion of said tack; placing a piston in said bore; and heating said mold and contained parts while applying a force to said piston to cause said sealing material to flow about said upright portion of said tack, through said aperture and to fill the space between said planar area and said head and to bond to said head.

4,178,165

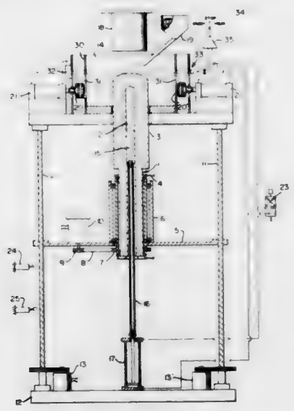
APPARATUS FOR MANUFACTURING HOLLOW AND SOLID INGOTS

Lothar Jung, 31 Lurline Dr., Millington, N.J. 07946

Division of Ser. No. 703,919, Jul. 9, 1976, Pat. No. 4,102,663. This application Jan. 10, 1978, Ser. No. 868,433

Int. Cl.[2] **C03B** *23/20, 19/06;* **B23K** *9/00*

U.S. Cl. 65—144 **7 Claims**



1. An apparatus suitable for the production of a cylindrical ingot from a melt of an ingot material, comprising:

(a) a heating chamber defined by vertical wall means;

(b) a support, vertically movable through said heating chamber, for holding the ingot in a vertical position, said support having an upper surface for deposition of the melt;

(c) a heat source for said heating chamber, said heat source being vertically positioned above said movable support;

(d) means for feeding the ingot material into the heating chamber, initially onto the upper surface of the support and subsequently onto the upper surface of the ingot as the ingot is formed; and

(e) at least one forming tool for shaping the melt to form the vertical cylindrical surface of the ingot, said forming tool being mounted for reciprocating movement in a horizontal plane, through openings in said vertical wall means and into and out of contact with the melt.

4,178,166

4,5-DICHLORO-IMIDAZOLE DERIVATIVES AND THEIR USE AS PLANT PROTECTION AGENTS

Klaus Sasse, Berg. Gladbach; Gunther Beck; Ludwig Eue, both of Leverkusen, and Robert R. Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

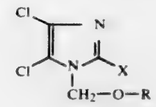
Filed Sep. 21, 1977, Ser. No. 835,095

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1976, 2646144

Int. Cl.[2] **C07D** *233/68;* **A01N** *9/22*

U.S. Cl. 71—92 **17 Claims**

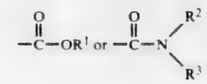
1. A 4,5-dichloro-imidazole derivative of the formula



(I)

in which

X represents a



in which

R^1 represents straight or branched alkyl with 1 to 6 carbon atoms or straight or branched alkenyl or alkynyl, each with up to 6 carbon atoms, which radicals can be carrying one or more substituents selected from halogen, alkoxy with 1 to 6 carbon atoms and alkylmercapto with 1 to 6 carbon atoms,

R^2 represents hydrogen, alkyl with 1 to 8 carbon atoms, alkenyl with up to 8 carbon atoms or the formyl group,

R^3 represents hydrogen, alkyl with 1 to 8 carbon atoms or alkenyl or alkynyl each with up to 8 carbon atoms, it being possible for each of these alkyl, alkenyl and alkynyl radicals to carry one or more substituents selected from alkoxy with 1 to 4 carbon atoms and alkylmercapto with 1 to 4 carbon atoms, or

R^2 and R^3 conjointly with the adjoining nitrogen atom form a heterocyclic ring selected from pyrrolidinyl, piperidinyl and hexamethyleneimidinyl; and

R represents alkyl with 1 to 12 carbon atoms or alkenyl or alkynyl each with up to 12 carbon atoms, it being possible for each of these alkyl, alkenyl and alkynyl radicals to carry one or more substituents selected from halogen, alkoxy with 1 to 6 carbon atoms, and alkylmercapto with 1 to 6 carbon atoms.

4,178,167

HERBICIDAL N-(HALOACETYL)-N-(N'-METHYLENEPYRROLIDONYL)-2-ALKOXYANILINES USEFUL AS HERBICIDES

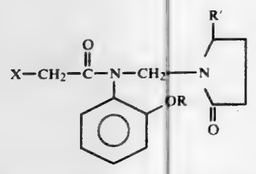
Louis Schneider, Elizabeth, and David E. Graham, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 807,066, Jun. 16, 1977, abandoned. This application Mar. 31, 1978, Ser. No. 892,146

Int. Cl.[2] **A01N** *9/22*

U.S. Cl. 71—95 **1 Claim**

1. A method of controlling grassy weeds which consists essentially of applying thereto a herbicidally effective amount of N-haloacetyl-N-(N'-methylenepyrrolidonyl)-2-alkoxyaniline compounds of the formula:



where R is alkyl of 1-6 carbon atoms, R′ is hydrogen or lower alkyl of 1-3 carbon atoms, and X is chloro, bromo or iodo.

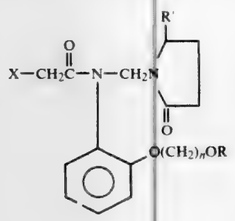
4,178,168

HERBICIDAL N-(HALOACETYL)-N-(N-METHYLENE PYRROLIDONYL)-2-OXYALKYLENEOXYALKYLANILINES

Louis Schneider, Elizabeth, and David E. Graham, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Jul. 27, 1978, Ser. No. 928,569
Int. Cl.[2] C07D 207/26; A01N 9/22
U.S. Cl. 71—95 **6 Claims**

1. Herbicidal N-(haloacetyl)-N-(N′-methylene-pyrrolidonyl)-2-oxyalkyleneoxyalkylaniline compounds having the formula:



where
n is 1-3,
R is alkyl of 1-3 carbon atoms,
R′ is hydrogen or alkyl of 1-3 carbon atoms, and,
X is chloro or bromo.

6. A herbicidal composition of matter comprising:
a. a herbicidally effective amount of a compound of claim 1; and
b. an inert carrier.

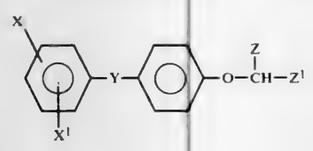
4,178,169

DIPHENYL SULFIDE, SULFOXIDE AND SULFONE PLANT GROWTH REGULATORS

Robert H. Meisinger, Glen Ellyn, Ill., and Pyung K. Yu, Miami, Fla., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed May 12, 1978, Ser. No. 905,314
Int. Cl.[2] A01N 5/00
U.S. Cl. 71—98 **15 Claims**

1. A method for regulating plant growth which comprises applying to a plant, to plant seeds, or to the locus of a plant an effective amount of a compound of the formula



wherein
X is a hydrogen atom, a halogen atom, a trifluoromethyl group, or a nitro group,
X[1] is a hydrogen atom, a halogen atom, a trifluoromethyl group, a cyano group, a carbamoyl group, a methyl group, a methoxy group, a (C_1-C_4 alkoxy carbonyl group, a methylcarbonyl group, a methanesulfonyl group, or an amino group,
Y is a group of the formula —S—, —SO—, or —SO_2,
Z is a hydrogen atom or a (C_1-C_4)alkyl group, and
Z[1] is a carboxy group, or an agronomically acceptable salt thereof, a cyano group, or a group of the formula —COR, wherein
R is a (C_1-C_{12})alkoxy group, a (C_7-C_{12})aralkoxy group, a (C_1-C_6)alkoxy (C_1-C_4)alkoxy group, a (C_3-C_5)alkenoxy group, an amino group, a (C_1-C_4)alkylamino group, or a di(C_1-C_4)alkylamino group.

4,178,170

PROCESS FOR THE PRODUCTION OF CARBURIZED SPONGE IRON BRIQUETTES

Italo Iacotti, and Edoardo Pasero, both of Rome, Italy, assignors to Istituto di Ricerca Finsider per la Riduzione Diretta S.p.A., Rome, Italy

Continuation of Ser. No. 818,834, Jul. 25, 1977, abandoned. This application Jun. 7, 1978, Ser. No. 914,906
Claims priority, application Italy, Aug. 4, 1976, 818834 A/76
Int. Cl.[2] C21C 5/52
U.S. Cl. 75—3 **3 Claims**

1. A process for the production of carburized iron sponge briquettes for use in electric furnaces, comprising reducing powdered iron ore with the action of a reducing gas in a plurality of fluidized beds by passing the iron ore from bed to bed, removing the reduced powdered iron ore from the last bed, intimately admixing the reduced powdered iron ore from the last bed at a temperature between 600° and 700° C. with a solid material containing carbon and having a grain size not more than 1 mm. and a low content of ash, volatile materials and sulfur, in an inert atmosphere, and then briquetting the intimately admixed material.

4,178,171

MANUFACTURE OF ACICULAR FERROMAGNETIC IRON PARTICLES

Werner Steck, Mutterstadt; Rudolf Brodt, Weinheim; Wilhelm Sarnecki, Limburgerhof; Helmut Jakusch, Frankenthal; Manfred Ohlinger, Frankenthal, and Eberhard Koester, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 20, 1978, Ser. No. 888,508
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714588
Int. Cl.[2] B22F 9/00
U.S. Cl. 75—0.5 AA **5 Claims**

1. A process for the manufacture of acicular ferromagnetic iron particles, which process comprises reducing an acicular iron(III) oxide hydroxide which carries on the surface of its particles a compound of calcium, strontium or barium and a monobasic, dibasic or tribasic aliphatic carboxylic acid of up to 6 carbon atoms or a chelate of calcium, strontium or barium and an organic compound containing at least two groups capable of chelating a calcium, strontium or barium cation, the reduction being carried out with hydrogen at from 275° to 380° C. and the acicular iron(III) oxide hydroxide having a length-to-width ratio of at least 15:1 and consisting of at least 70% by weight of lepidocrocite.

4,178,172

PROCESS FOR THE PRODUCTION OF EXTRA FINE COBALT POWDER

Heikki A. Tiitinen, Ulvila; Jussi K. Rastas, Pori; Matti J. Hamalainen, Kokkola, and Tom O. Niemi, Oja, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Jul. 3, 1978, Ser. No. 921,365
Claims priority, application Finland, Jul. 15, 1977, 2209/77
Int. Cl.[2] C22B 23/02
U.S. Cl. 75—0.5 BA **8 Claims**

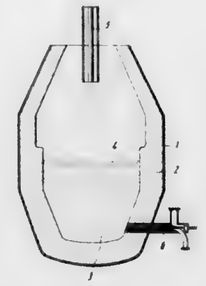
1. A process for the production of extra fine cobalt powder, comprising pyrolysing a cobalt(III)hexammine salt directly into its oxide, and then reducing the oxide to extra fine cobalt powder.

4,178,173

PROCESS FOR PRODUCING STAINLESS STEELS

Helmut Gorges; Heinrich Brod; Wilfried Pulvermacher, all of Bochum; Wolfgang Rübens, Witten-Stockum, and Otto Fischer, Bochum, all of Fed. Rep. of Germany, assignors to Fried. Krupp Hüttenwerke Aktiengesellschaft, Bochum, Fed. Rep. of Germany

Filed Aug. 10, 1978, Ser. No. 932,598
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1977, 2737832
Int. Cl.[2] C21C 5/32, 5/34
U.S. Cl. 75—60 **2 Claims**



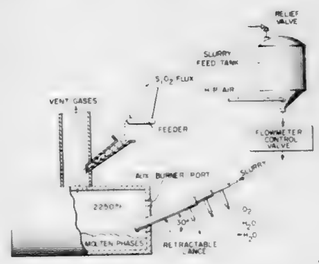
1. In a process for producing stainless steel of very low carbon content from a steel melt containing chromium or chromium nickel having a higher carbon content in a converter which has at least one blast nozzle below the molten steel bath level and at least one blast lance above the bath level wherein:
A. In a first refining phase oxygen is supplied to the steel melt through said blast lance and inert gas is supplied through said blast nozzle; and
B. In a succeeding refining phase oxygen in admixture with inert gas is supplied to said bath through said blast nozzle and the proportion of oxygen supplied is reduced in relationship to the proportion of inert gas
with the decreasing carbon content in the molten steel, the improvement permitting a decrease in the amount of inert gas supplied during said first refining phase without significantly increasing the refining time, which improvement comprises employing as at least one of said nozzles one having an axially movable bar within the passageway of said nozzle, said bar being:
1. Extended through said nozzle passageway to the mouth of said nozzle during said first refining phase; and
2. Said bar being withdrawn from said mouth during the successive refining phase, whereby the amount of gas passing through said nozzle during said first refining phase is reduced and the amount of gas passing through said nozzle during the successive refining phase is increased.

4,178,174

DIRECT PRODUCTION OF COPPER METAL

Charles Arentzen, Tucson, Ariz., assignor to The Anaconda Company, Denver, Colo.

Continuation-in-part of Ser. No. 827,359, Aug. 24, 1977, Pat. No. 4,148,630. This application Dec. 19, 1978, Ser. No. 971,084
Int. Cl.[2] C22B 15/00
U.S. Cl. 75—74 **5 Claims**



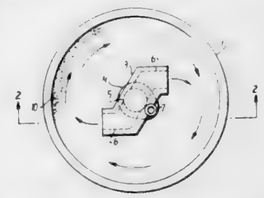
1. A process for the direct production of copper metal by directing an aqueous slurry of cupriferous material into a molten bath of cupriferous material at a temperature of about 2100° F. to 2400° F., wherein neither the cupriferous material of the slurry nor the cupriferous bath contain sufficient sulfides to maintain the bath temperature by oxidation of the sulfides, which comprises:
(a) incorporating in the slurry of cupriferous material a carbonaceous fuel;
(b) injecting oxygen-containing gas and the fuel-containing cupriferous slurry into the molten bath in the form of a high-velocity stream of the gas and slurry directed at the surface of the bath at an angle of from about 20° to 40° from the horizontal; and
(c) separately withdrawing the resulting slag and metallic copper from the bath, the proportion of slurry and volume of oxygen injected being adjusted with respect to the energy supplied by the fuel to establish and maintain operation at a temperature range of from about 2100° to 2400° F.

4,178,175

METHOD FOR AGITATING A BATH OF MELTED METAL FOR TREATING THE SAME

Kiichi Narita, Kobe; Takasuke Mori, Ashiya, and Takamichi Ito, Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Continuation of Ser. No. 368,283, Jun. 8, 1973, abandoned. This application Mar. 31, 1978, Ser. No. 892,417
Int. Cl.[2] C21C 7/00
U.S. Cl. 75—93 E **1 Claim**



1. A method of agitating a bath of melted metal for treating the same by defining a columnar body of the melted metal in said bath being hydrostatically communicated with said bath at the lower end portion thereof, mixing a gas with said columnar body to cause said body to have a reduced apparent specific

gravity as compared with the remaining body of said bath, and pouring melted metal forming the uppermost region of said columnar body onto the free surface of said bath from the upper side thereof, characterized by changing continuously the position from which said melted metal is poured on said free surface of said bath by relatively moving the flow of said melted metal with respect to said free surface and wherein said melted metal forming the upper-most region of said columnar body is poured into said bath at a location radially removed from the longitudinal axis of said columnar body and in a direction tangent to a circle defining said radially removed location so as to generate a reaction force including a component exerting a rotating moment to said columnar body.

4,178,176

RECOVERY OF IRON AND TITANIUM METAL VALUES

William K. Tolley, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 19, 1978, Ser. No. 925,901
Int. Cl.[2] C21B *15/00;* **C01G** *23/04*
U.S. Cl. 75—101 R **9 Claims**

1. A process for the recovery of iron values and titanium values from ilmenite which comprises the steps of:
(a) crushing said ilmenite;
(b) subjecting said crushed ilmenite to a reductive roast at a temperature of from about 600° to about 1000° C. in the presence of hydrogen, carbon monoxide, or a mixture of carbon monoxide and hydrogen;
(c) leaching the resultant reduced ilmenite with a leach solution comprising hydrogen chloride to form iron chlorides and titanium chlorides;
(d) removing insoluble gangue;
(e) cooling the soluble metal chlorides sufficiently to crystallize the iron chloride;
(f) separating the solid iron halide from the soluble titanium chloride;
(g) reducing a major portion of said iron chloride to form metallic iron hydrogen chloride, and recovering the metallic iron;
(h) oxidizing the other portion of said iron chloride to form ferric oxide;
(i) contacting said soluble titanium chloride with said ferric oxide to precipitate solid titanium dioxide; and
(j) separating and recovering said titanium dioxide.

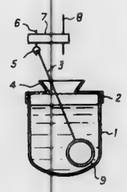
4,178,177

STIRRING MEANS TO MAKE MAGNESIUM ALLOYS

Peter Roebuck, and James H. T. Petch, both of Manchester, England, assignors to Magnesium Elektron Limited, Manchester, England

Filed Oct. 13, 1977, Ser. No. 842,014
Claims priority, application United Kingdom, Oct. 13, 1976, 42562/76
Int. Cl.[2] C22C *23/00, 1/02*
U.S. Cl. 75—135 **9 Claims**

1. A method of stirring a fluid mass of molten metal contained in a circular curved bottom vessel comprising the steps of
rotating a curved loop-shaped paddle in the fluid about a substantially center axis of the loop,
simultaneously rotating said loop-shaped paddle in an orbit around a fixed axis causing said center axis of the loop to orbitally rotate about said fixed axis,



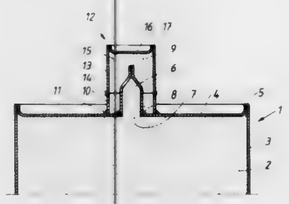
passing said loop close to substantially the whole of the curved bottom of the vessel and traversing substantially all the fluid mass with said curved loop by the combination rotation about said center and fixed axes.

4,178,178

METHOD OF SEALING HOT ISOSTATIC CONTAINERS

Tore Garvare, and Sven-Erik Isaksson, both of Robertsfors, Sweden, assignors to ASEA AB, Vasteras, Sweden

Filed Dec. 1, 1977, Ser. No. 856,535
Claims priority, application Sweden, Dec. 1, 1976, 7613445
Int. Cl.[2] B22F *3/00, 3/16*
U.S. Cl. 75—226 **5 Claims**



1. In a method for manufacturing solid bodies by preforming a quantity of powder and enclosing the powder preform thus produced in a casing provided with an evacuation nozzle, preheating the powder preform and degassing the same by evacuating said casing through said nozzle, and then isostatically hot pressing the powder preform by subjecting the same simultaneously to an elevated all encompassing gas pressure and a high temperature whereby the powder preform is sintered and compressed to produce a high density solid body, the improvement comprising conducting, after said degassing step and prior to said hot pressing stel, the steps of:
sealing said nozzle;
partially surrounding said sealed nozzle with a hood element so as to define a space between said nozzle and said hood element;
filling the space with a filling material and
closing the hood element about the nozzle to yield a gas-tight hood.

4,178,179

ELECTROPHOTOGRAPHIC MASTER CONVERSION SOLUTION

David A. Wheatland, Brunswick, Me., assignor to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 743,592, Nov. 22, 1976, abandoned, which is a continuation of Ser. No. 600,226, Jul. 30, 1975, Pat. No. 4,007,126. This application Jun. 1, 1978, Ser. No. 911,453
Int. Cl.[2] G03C *5/40;* **G03F** *7/02*
U.S. Cl. 430—49 **7 Claims**

1. A method of converting electrophotographic master plates having a zinc oxide containing coating by enhancing the hydrophilic properties of non-imaged portions of the electrophotographic master plate; comprising contacting the master plate with an acidic, aqueous conversion solution consisting essentially of phosphate ions and an active amount of a compound capable of forming an insoluble hydrophilic chelate with zinc ions in the presence of phosphate ions, said compound selected from the group consisting of triethylenetetramine and ethylenediamine.

4,178,180

COPPER PHYSICAL DEVELOPMENT USING HETEROCYCLIC LIGAND COPPER (I) COMPLEXES

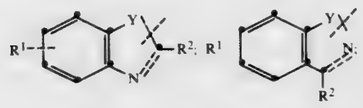
Richard S. Vinal, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

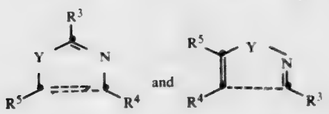
Division of Ser. No. 833,622, Sep. 15, 1977. This application Dec. 8, 1978, Ser. No. 967,559
Int. Cl.[2] G03C *5/24*
U.S. Cl. 430—417 **14 Claims**

1. A physical developer formulation comprising:
(a) a solvent;
(b) a copper(I) complex represented by the formula

$$L(CuX)_m$$

wherein L is a monodentate or bidentate heterocyclic ligand selected from the group consisting of:





wherein Y is oxygen or sulfur; R^1 is alkyl having from 1 to 20 carbon atoms or aryl having from 6 to 20 carbon atoms; R^2 through R^5 are independently selected from the group consisting of hydrogen, alkyl having from 1 to 20 carbon atoms, and aryl having from 6 to 20 carbon atoms; with the proviso that at least one of R^3 through $R^5$is hydrogen;
X is an anion; and
m is the integer of 1 or 2; and
(c) an organic ligand for copper(II).

4,178,181

INTERFERENCE FILM PHOTOGRAPHY

George M. Sawyer, 3435 W. 110th St., Inglewood, Calif. 90303

Continuation of Ser. No. 544,275, Apr. 21, 1966, abandoned. This application Sep. 14, 1970, Ser. No. 72,197
Int. Cl.[2] G03C *1/76, 7/00*
U.S. Cl. 96—67 **2 Claims**

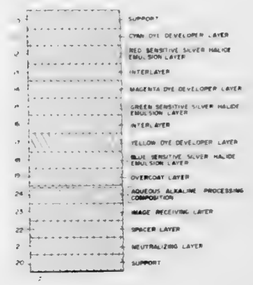
1. A photo-sensitive element comprising a transparent base, a silver halide emulsion layer and a reflecting layer thereover said reflecting layer comprising indium or gallium.

4,178,182

COLOR DIFFUSION-TRANSFER PHOTOGRAPHIC ELEMENT

Motohiko Tsubota; Shinji Sakaguchi, and Nobuo Tsuji, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd, Kanagawa, Japan and National Patent Development Corporation, New York, N.Y.

Filed Aug. 23, 1974, Ser. No. 500,016
Claims priority, application Japan, Aug. 24, 1973, 48-94330
Int. Cl.[2] G03C *1/40, 1/76, 7/00, 5/54*
U.S. Cl. 96—73 **37 Claims**



1. In a color diffusion transfer photographic product comprising a support carrying at least two dye image-forming units, each comprising a selectively sensitized silver halide emulsion layer associated therewith a dye image forming material capable of forming a diffusible dye contained in either said silver halide emulsion layer or a contiguous layer, an interlayer between said two dye image-forming units and an overcoat layer on the dye image-forming unit furthest from said support, the improvement in which at least one selected from the group consisting of said interlayer and said overcoat layer comprises a polymer of a monoacrylate or monomethacrylate of an aliphatic polyhydric alcohol.

4,178,183

THIAZOLYL COUPLER COMPOSITIONS AND PHOTOGRAPHIC ELEMENTS SUITED TO FORMING INTEGRAL SOUND TRACKS

Samuel J. Ciurca, Jr., Rochester; Robert G. Cameron, Spencerport, and Edward J. Walsh, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 27, 1978, Ser. No. 928,621
Int. Cl.[2] G03C *1/76, 7/24*
U.S. Cl. 430—553 **19 Claims**

10. A photographic element adapted to form a multicolor photographic image and an integral infrared absorbing dye sound track capable of producing a maximum density in excess of 1 throughout the spectral region of from 750 to 850 nm comprising

a transparent film support,

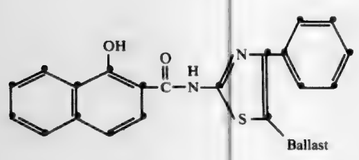
a first layer unit coated on said film support comprising a gelatino-silver halide emulsion layer having a peak sensitivity to a portion of the spectrum within the blue region at a wavelength shorter than 470 nm and containing a yellow dye-forming coupler,

a second layer unit coated over said first layer unit comprising a gelatino-silver halide emulsion layer having a peak sensitivity to the red portion of the spectrum and containing a cyan dye-forming coupler,

a third layer unit coated over said second layer unit comprising a gelatino-silver halide emulsion layer having a peak sensitivity to the green portion of the spectrum and containing a magenta dye-forming coupler, and

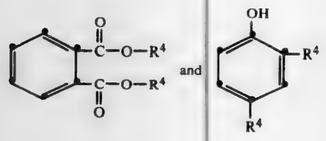
a fourth layer unit coated over said third layer unit comprising a gelatino-silver halide emulsion layer having a peak sensitivity within the 470 to 500 nm region of the spectrum and containing coupler solvent particles comprised of a combination, capable of permitting the formation of a microcrystalline dye, of

an infrared absorbing dye-forming coupler in a concentration of from 0.65 to 1.05 grams per square meter of the formula



wherein Ballast is a straight-chain alkyl group of from 10 to 20 carbon atoms and

a coupler solvent chosen from the group consisting of



wherein R^4 is alkyl of from 1 to 6 carbon atoms, said coupler and said coupler solvent being present in said particles in a ratio of from 4:1 to 1:1.

4,178,184

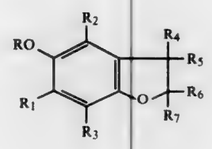
COLOR PHOTOGRAPHIC MATERIALS CONTAINING DYE-FADING INHIBITORS

Masahiko Taguchi; Katsuo Mogaki, and Syun Takada, all of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

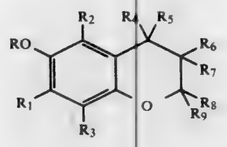
Filed Oct. 18, 1977, Ser. No. 843,261
Claims priority, application Japan, Oct. 23, 1976, 51-127427
Int. Cl.[2] G03C *1/76, 1/06, 1/40*
U.S. Cl. 430—503 **9 Claims**

1. A color photosensitive material comprising a support and a silver halide photosensitive layer, said material containing a first compound represented by formulas (Ia), (Ib), or (c) in combination with a second compound represented by formula (II)

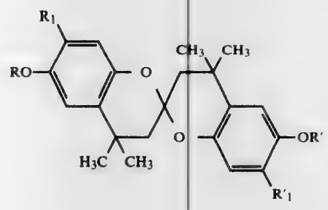
Formula (Ia)



Formula (Ib)



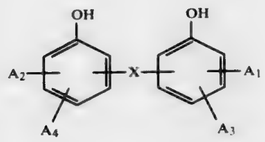
Formula (Ic)



wherein R, R′ and R'_1, individually represent an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group, or a heterocyclic ring; and R_4, R_5, R_6, R_7, R_8 and R_9 individually represent hydrogen, an alkyl group, an alkoxy group, an alkylthio group, an alkenyl group, an alkenyloxy group, an aryl group, an aryloxy group, an amino group or a heterocyclic

group selected from piperadine, morpholine, imidazoline, thiazoline, pyridine, pyrimidine, and triazine; provided that R_8 and R_9 can cooperatively be cyclized to form a cyclohexane ring which may be substituted with alkyl;

Formula (II)



wherein A_1, A_2, A_3 and A_4 are individually alkyl having 1–18 carbon atoms, the total number of carbon atoms of A_1, A_2, A_3 and A_4 being not more than 32; and X is a simple bond, oxygen, sulfur, or



in which A_5 is hydrogen or alkyl having 1–10 carbon atoms and n is an integer of 1–3.

4,178,185

Patent Not Issued For This Number

4,178,186

RESIN FOR COATINGS

Seimei Yasui, Ibaraki, and Minoru Hino, Toyonaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 5, 1976, Ser. No. 655,530
Claims priority, application Japan, Feb. 7, 1975, 50/16634
Int. Cl.[2] C09D *11/02;* **C08F** *8/46*
U.S. Cl. 106—20 **12 Claims**

1. A resin for coatings comprising a modified polymer consisting of an adduct of at least one liquid conjugated diolefinic polymer having a number average molecular weight of 150 to 3,000, a viscosity of 2 to 5,000 cps at 30° C., and at least 50% of cis-1,4 structure with at least one α,β-unsaturated dicarboxylic acid or anhydride thereof, wherein the carboxyl group or the carboxylic anhydride group is imidated by reacting with at least one primary amine having 1 to 27 carbon atoms and thereby the total amine value of the resulting modified polymer is made not more than 3.

4,178,187

MIXED OXIDE COMPOUND $NDALO_3$ FOR CASTING ADVANCED SUPERALLOY MATERIALS

Irvin C. Huseby, Schenectady, and Frederic J. Klug, Amsterdam, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 775,758, Mar. 9, 1977, Pat. No. 4,108,676. This application Jan. 5, 1978, Ser. No. 867,191
Int. Cl.[2] B28B *7/34;* **C04B** *35/44, 35/50;* **C01F** *17/00*
U.S. Cl. 106—38.9 **2 Claims**

1. A sintered ceramic core suitable for use in the casting and directional solidification of advanced superalloy materials consisting essentially of

a mixed oxide compound material $NdAlO_3$,

having a porosity content which is from about 10 percent by volume to about 70 percent by volume, at least 10 percent of the porosity content is interconnected, and

the $NdAlO_3$ mixed oxide compound material is leachable in a molten salt bath which is one selected from the group consisting of M_3AlF_6, M_3AlF_6+MF, $M_3AlF_6+M'F_2$ and M_3AlF_6+MCl wherein

M is Li, Na or K, and

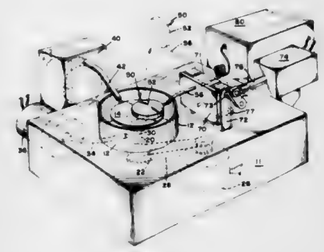
M′ is Mg, Ca, Ba or Sr.

4,178,188

METHOD FOR CLEANING WORKPIECES BY ULTRASONIC ENERGY

Jean G. M. Dussault, Naugatuck; Robert A. Geckle, Newtown, and William L. Puskas, Trumbull, all of Conn., assignors to Branson Ultrasonics Corporation, New Canaan, Conn.

Continuation of Ser. No. 833,024, Sep. 14, 1977, abandoned, which is a division of Ser. No. 735,601, Oct. 26, 1976, Pat. No. 4,064,885. This application Aug. 7, 1978, Ser. No. 931,461
Int. Cl.[2] B08B *3/12*
U.S. Cl. 134—1 **11 Claims**



1. The method of cleaning a workpiece comprising the steps of:

disposing a workpiece on a support in a manner for providing an exposed side of the workpiece;

rotating said support to cause the workpiece to undergo rotation about an axis intersecting said exposed side at a substantially perpendicular angle;

disposing an electroacoustic transducer spaced from the exposed side of the workpiece to form a gap between the transducer and the exposed side;

flooding the exposed side of the workpiece with a film of solvent flowing across the exposed side through the gap between the transducer and the exposed side;

applying ultrasonic energy emitted by the transducer to the flowing film of solvent to cause cavitation therein for effecting cleaning of the exposed side of the workpiece while the workpiece undergoes rotation;

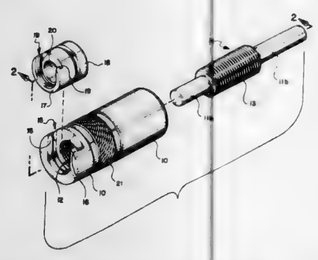
ceasing flooding of the exposed side of the workpiece, and subsequently rotating the support at a rotational speed sufficient to effect solvent removal from the exposed side by centrifugal force.

4,178,189

APPARATUS AND METHOD FOR CLEANING AND POLISHING CARTRIDGE CASES

Angelo J. Mancini, P.O. Box 545, and Ronald W. Galloway, Rte. 1, both of Afton, Wyo. 83110

Filed Jun. 12, 1978, Ser. No. 914,206
Int. Cl.[2] B08B *7/00*
U.S. Cl. 134—6 **5 Claims**



1. (Amended) A tool for mounting a cartridge case to a drill chuck for rotating the cartridge case about its longitudinal axis, said tool comprising:

a universal shellholder;

a body member having a bore extending axially from one end thereof to the other, with at least a portion of the bore being internally threaded;

an undercut slot at one end of said body member extending from the periphery of the body member radially inwardly to said bore, said slot being adapted to receive the flanged end of said universal shellholder in sliding movement from the periphery of the body member towards the bore, so that the central opening through said shellholder is in substantial axial alignment with said bore; and

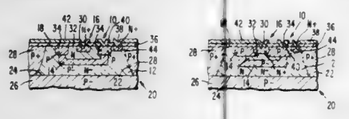
a shaft which has external threads along at least a portion of the longitudinal surface thereof, with the threaded portion of the shaft being adapted to engage the threads of the bore in said body member, said shaft having a sufficient longitudinal dimension to extend through the bore in said body member from said one end to and beyond the other end thereof so as to project outwardly from said other end in axial alignment with said bore, where when the rim end of a cartridge case is engaged in said shellholder and when said shaft is advanced toward said one end of said body member, the lead end of said shaft extends through the opening in said shellholder and contacts the end of the cartridge case, thereby binding the body member, shaft, shellholder, and cartridge case in locked engagement as a rigid unit, with the portion of the shaft projecting from the body member being adapted for engagement with a drill chuck.

4,178,190

METHOD OF MAKING A BIPOLAR TRANSISTOR WITH HIGH-LOW EMITTER IMPURITY CONCENTRATION

Murray A. Polinsky, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 799,722, May 23, 1977, Pat. No. 4,136,353, which is a continuation-in-part of Ser. No. 591,955, Jun. 30, 1975, abandoned. This application Oct. 10, 1978, Ser. No. 950,068
Int. Cl.[2] H01L *29/72, 29/02, 21/00*
U.S. Cl. 148—1.5 **7 Claims**



1. In a method of making a semiconductor device including forming a collector region of one type conductivity, forming a base region of the opposite type conductivity adjacent to said collector region, and forming an emitter region adjacent to said base region away from said collector region and of said one type conductivity, said emitter region having a depth greater than about 0.5 micrometers and having a relatively high-impurity-concentration portion separated from said base region by a significantly lower-impurity-concentration portion disposed therebetween, said portions of said emitter region being separated from each other by a high-low junction characterized by a point of inflection in the profile of the logarithm of the impurity-concentration vs. depth, the emitter doping concentration at said point of inflection being less than 2×10^{18} atoms per cubic centimeter, said high-low junction being sufficient in depth to be effective, during operation of said device, as a barrier to reflect minority carriers from said base region, the improvement in said method comprising the step of:

forming a graded impurity concentration in said low-impurity-concentration portion of said emitter region with the lowest-impurity-concentration section thereof being disposed adjacent said base region.

4,178,191

PROCESS OF MAKING A PLANAR MOS SILICON-ON-INSULATING SUBSTRATE DEVICE

Doris W. Flatley, Belle Mead, N.J., assignor to RCA Corp., New York, N.Y.

Filed Aug. 10, 1978, Ser. No. 932,626
Int. Cl.[2] H01L *21/225, 21/263, 11/00*
U.S. Cl. 148—1.5 **8 Claims**



1. In a process of making a planar silicon-on-insulating-substrate device which process includes the steps of forming an etch resistant, oxygen impermeable masking coating on discrete areas of the surface of a layer of silicon on an insulating substrate, and etching the unmasked portions of said silicon layer down to a depth about one-half the thickness of said silicon layer, the improvement comprising:

without removing said masking coating, introducing stabilizing impurities into the surface of the unmasked portions of the silicon layer, and

thereafter thermally oxidizing only the unmasked portions of the silicon layer to convert it to stabilized silicon dioxide in surrounding relation to the remaining masked portions of the silicon layer.

4,178,192

PROMOTION OF SURFACE FILM STABILITY DURING INITIATION OF THERMAL MIGRATION

Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 13, 1978, Ser. No. 941,924
Int. Cl.[2] H01L *21/225*
U.S. Cl. 148—1.5 **9 Claims**

1. In the method of moving a melt of metal-rich semiconductor material through a solid body of semiconductor material by thermal gradient zone melting processing comprising the steps of

a. selecting a body of single crystal semiconductor material so that the body has a first type conductivity, a selected resistivity, and at least one major surface having a preferred planar crystal structure orientation which is one selected from the group consisting of (100), (110) and (111), the vertical axis of the body being substantially aligned with a first axis of the crystal structure;

b. depositing a layer of metal having the preferred planar crystal structure orientation of one or more physical configurations on the selected surface of the body of semiconductor material;

c. heating the body and the metal deposit to a temperature sufficient to form a melt of metal-rich material on the surface of the body;

d. establishing a unidirectional temperature gradient along substantially the vertical axis of the body and the first axis of the crystal structure; and

e. migrating the metal-rich melt though the body along the unidirectional temperature gradient to divide the body into a plurality of regions of first type conductivity and to form at least one array of regions of recrystallized material of the body having solid solubility of the vapor deposited metal therein, the metal including at least one impurity material therein to impart at least one predetermined electrical characteristic thereto;

the improvement in the method of processing which includes

incorporating a wetting agent in the deposited layer of metal to enhance the wettability of the deposited layer with respect to a layer of the oxide of the semiconductor material on the surface of the body on which the metal is deposited and to promote initiation of thermal migration of a melt of the metal of the layer through the body by thermal gradient zone melting processing.

4,178,193

METHOD OF IMPROVING CORROSION RESISTANCE WITH COATING BY FRICTION

Jerome J. Kanter, 12300 Hobart Ave., Palos Park, Ill. 60464

Continuation-in-part of Ser. No. 558,800, Mar. 17, 1975, abandoned. This application May 25, 1977, Ser. No. 800,517
Int. Cl.[2] C23C *17/00*
U.S. Cl. 148—6 **1 Claim**

1. The method of coating a titanium article to improve the corrosion resistance of said titanium article comprising the steps of:

providing a titanium article; and

frictionally applying solid silicon to at least a portion of the surface of said titanium article to form a corrosion resistant coating on the treated portion of said titanium article.

4,178,194

ELECTROLYTIC PICKLING OF SILICON ELECTRICAL STEEL SHEET

Nazzareno Azzerri, via Catullo No. 57, Pomezia (Roma), and Roberto Bruno, via Cassia 1041, Roma, both of Italy

Filed Dec. 18, 1978, Ser. No. 970,109
Claims priority, application Italy, Dec. 16, 1977, 52249 A/77
Int. Cl.[2] H01F *1/04;* **B23P** *1/00*
U.S. Cl. 148—111 **5 Claims**

1. In a process for the production of silicon electrical steel sheet comprising in sequence the steps of hot rolling a strip of the steel; subjecting the strip to electrolytic pickling in a neutral aqueous medium, with the strip assuming a cathodic and anodic function; subjecting the strip thus pickled to heat treatment; cold rolling the strip; coating the strip with an annealing separator; annealing the strip; and subjecting the strip to final heat treatment; the improvement comprising, during the anodic phase of said electrolytic pickling, imposing on the strip a potential less than +1 V with respect to the standard hydrogen electrode.

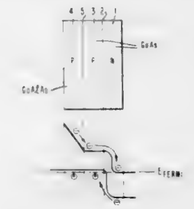
4,178,195

SEMICONDUCTOR STRUCTURE

Harold J. Hovel, Katonah, and Jerry M. Woodall, Mt. Kisco, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 744,012, Nov. 22, 1976, Pat. No. 4,122,476. This application Jun. 22, 1978, Ser. No. 918,114
Int. Cl.[2] H01L *21/208*
U.S. Cl. 148—171 **10 Claims**

1. The process of fabrication of a semiconductor structure having epitaxially contiguous regions of first and second semiconductor materials comprising in combination, the steps of contacting a substrate of a first semiconductor material with a melt of a second semiconductor material having the characteristics that the melt is undersaturated at the contacting temperature and that it becomes supersaturated as a result of the presence of said first semiconductor material dissolved into said melt, and separating said substrate and said melt.

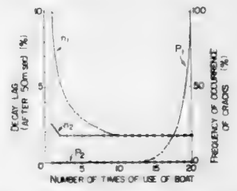


4,178,196

METHOD FOR MANUFACTURING AN IMAGE PICKUP TUBE TARGET

Yasuhiko Nonaka, Mobara, Japan, assignor to Hitachi, Ltd., Japan

Filed May 22, 1978, Ser. No. 908,286
Claims priority, application Japan, Jul. 1, 1977, 52-77916
Int. Cl.[2] H01L *27/14, 21/06*
U.S. Cl. 148—174 **1 Claim**



1. A method for manufacturing an image pickup tube target having a transparent substrate, a transparent conductive film, an N-type conductive film a Se-As-Te P-type photoconductive film and a porous Sb_2S_3 film formed in sequence one on the other, in which, in evaporating said porous Sb_2S_3 film in a low pressure inert gas, the amount of pre-evaporation of Sb_2S_3 is decreased as the number of times of repetitive use of an evaporation boat increases in which Sb_2S_3 is placed for evaporation, whereby the Sb_2S_3 film having a given porosity is formed.

4,178,197

FORMATION OF EPITAXIAL TUNNELS UTILIZING ORIENTED GROWTH TECHNIQUES

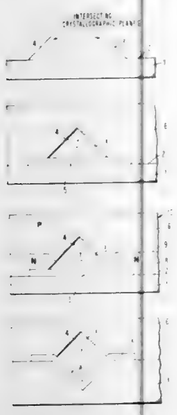
John C. Marinace, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 5, 1979, Ser. No. 17,230
Int. Cl.[2] H01L *21/20, 21/467, 21/76*
U.S. Cl. 148—175 **4 Claims**

1. The process of providing epitaxial tunnels in monocrystalline structures comprising the steps of:

providing a crystalline substrate having a surface thereof with a crystallographic orientation such that there are two

preferential growth crystallographic planes that intersect said substrate surface and intersect each other;



providing a void delineating resist pattern on said substrate and epitaxially growing a crystal of said material along said planes until intersection has taken place.

4,178,198

METHOD AND APPARATUS FOR TREADING TIRES

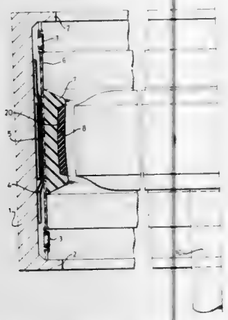
Jan H. F. Kent, St. Martin, Channel Islands, assignor to Kentredder Limited, St. Saviour, Channel Islands

Filed Jan. 31, 1978, Ser. No. 873,864

Claims priority, application United Kingdom, Feb. 7, 1977, 4891/77; Sep. 13, 1977, 38121/77

Int. Cl.[2] B29H *5/02, 5/30*

U.S. Cl. 156—96 **20 Claims**



1. A method of applying a tread band to a tyre carcass comprising the steps of

(a) providing a pre-vulcanised tread band and a continuous annular resilient tread band holder

(b) locating said tread band, whose inner periphery is greater than the outer periphery of a tyre carcass to be treaded, on the inner surface of said tread band holder, said tread band holder being of an adjustable diameter due to its resilient construction,

(c) positioning a tyre carcass adjacent said tread band so that their mid-circumferential planes coincide,

(d) urging the tread band into contact with the tyre carcass by reducing the diameter of the tread band holder, thereby shortening the outer periphery of the tread band and causing a generally uniform circumferential compressive stress to be set up in the tread band, the compressive stress being maintained while the band is bonded to the carcass so that, in the final assembly of tyre carcass and tread band, the outer periphery of the tread band is under compressive stress.

4,178,199

NOISE REDUCTION IN PNEUMATIC TIRES

Seymour A. Lippman, Huntington Woods; Gary P. Stokes, Westland, and Charles M. Chupa, Dearborn Heights, all of Mich., assignors to Uniroyal, Inc., New York, N.Y.

Continuation of Ser. No. 839,235, Oct. 4, 1977, abandoned, which is a continuation of Ser. No. 673,313, Apr. 5, 1976, abandoned. This application Aug. 28, 1978, Ser. No. 937,366

Int. Cl.[2] B29H *5/02*

U.S. Cl. 156—110 R **2 Claims**



1. A method of making a pneumatic tire to minimize noise generated by such tire during operation in a preferred speed range comprising the steps of:

(a) determining the resonant frequencies of a specimen tire;

(b) determining, for a plurality of tread pitch sequences, each of which includes a plurality of lugs, the excitation peak frequencies of each such tread pitch sequence, the excitation peak frequencies of each such tread pitch sequence being the frequencies of the strongest excitations which that tread pitch sequence would create upon operation of a tire in the preferred speed range with that tread pitch sequence applied thereto;

(c) comparing the excitation peak frequencies of each such tread pitch sequence with the resonant frequencies of the specimen tire, to determine the degree of coincidence between the excitation peak frequencies of each such tread pitch sequence and the resonant frequencies of the specimen tire;

(d) selecting the tread pitch sequence for which said degree of coincidence is the lowest; and

(e) applying the tread pitch sequence so selected to the tire being made.

4,178,200

PRESSURE ROLL FOR JACKETING STEEL PIPES WITH THERMOPLASTIC STRIP

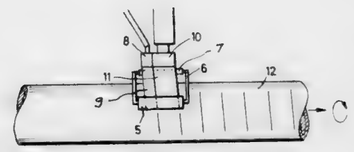
Karl-Heinz Hakert, Mülheim, and Walter Quitmann, Angermund, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 9, 1978, Ser. No. 884,969

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1977, 2710705

Int. Cl.[2] B65H *81/00;* **B21B** *31/08*

U.S. Cl. 156—187 **6 Claims**



1. Pressure roller for forcing a thermoplastic ribbon, strip or the like onto the surface of a rotating and axially moving steel pipe, comprising:

a shaft;

a cylindrical core on the shaft, made of sillicone rubber: and

a jacket on the core, made also of silicone rubber but being softer than the core.

4,178,201

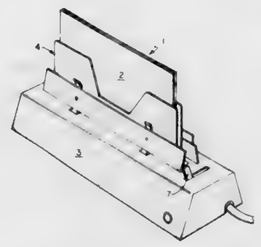
CARRIER FOR HOLDING SHEETS OF MATERIAL FOR USE WITH A THERMAL BINDING MACHINE

John J. Power, Westbury, N.Y.; Raymond H. Van Wagener, Darien, Conn., and Ernest M. Raasch, Fort Lee, N.J., assignors to Swingline, Inc., Long Island City, N.Y.

Filed Apr. 27, 1976, Ser. No. 680,686

Int. Cl.[2] B32B *35/00;* **C09J** *5/00*

U.S. Cl. 156—499 **15 Claims**



1. A carrier for supporting sheets to be bound along one edge of said sheets, said carrier having two side portions and a bottom portion:

(a) said side portions cooperating with said bottom portion for supporting the edges of the sheets being bound proximate the bottom portion and between the side portion;

(b) said bottom portion having an inner surface for supporting glue material placed thereagainst and used in binding the sheets together;

(c) said bottom portion also having an outer surface defined by a material for withstanding the heat when placed adjacent a heat source sufficient to melt the glue material proximate the inner surface; and

(d) said inner surface including a material for withstanding the heat transferred from the outer surface and having the characteristic of allowing the melted glue after cooling to be withdrawn from the inner surface in bound disposition with the sheets.

4,178,202

METHOD AND APPARATUS FOR FACILITATING THE DISPOSAL OF CUTTING LIQUID

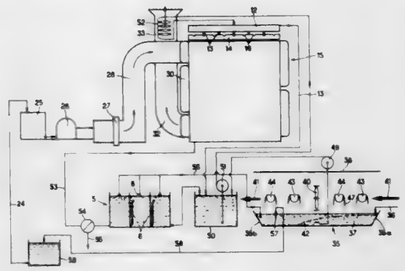
Georges Thomas, Fontenay le Comte, and Henri Nicol, Garancieres, both of France, assignors to SKF Compagnie d'Applications Mechaniques, Clamart, France

Filed Apr. 27, 1977, Ser. No. 791,252

Claims priority, application France, Apr. 28, 1976, 76 12579; Apr. 21, 1977, 77 12100

Int. Cl.[2] B01D *1/14*

U.S. Cl. 159—15 **8 Claims**



1. A method for the disposal of waste cutting liquid consisting essentially of an emulsion of partly soluble oils and water, said method comprising the steps of:

preliminary evaporating a part of water from said liquid in a shallow storage vessel defining a large free surface of said liquid in direct contact with air at ambient temperature,

permitting said liquid to settle for removal of insoluble oils from said liquid by decantation,

removing said insoluble oils from the surface of said settled liquid and delivering them to a treating device for separating the solid residues and tars from the combustible products,

flowing said liquid from the bottom of said settled liquid to the top of an evaporation tower,

causing said liquid to flow through the eavporation tower in a thin trickling stream submitted to a transverse current of hot air maintained at a temperature which will not evaporate the most volatile oily constituents of said liquid, said liquid remaining at a temperature below the evaporation temperature of the most volatile oily constituents thereof, whereby said air is only charged with water vapor and may be directly discharged to the atmosphere,

delivering the liquid collected at the bottom of the evaporating tower to said treating device for separating the solid residues and tars from the combustible products,

burning said combustible products,

and producing said current of hot air from heat produced from burning said combustible products.

4,178,203

METHOD OF INCREASING THE STRENGTH OF WET GLASS FIBER MATS MADE BY THE WET-LAID PROCESS

Paritosh M. Chakrabarti, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Jan. 24, 1978, Ser. No. 872,002

Int. Cl.[2] D21H *5/18*

U.S. Cl. 162—156 **13 Claims**

1. In the manufacture of glass fiber mat products by the wet-laid process at a high rate of production wherein an aqueous dispersion of glass fibers which contains a surfactant dis-

persant is formed from bundles of glass fibers of about ¼ to 3 inches in length and tertiary amine oxide or cationic quaternary ammonium dispersant compound at a concentration of about 5–500 ppm and at a fiber consistency of about 0.001 to 3%, which dispersion is passed through a matforming screen to form a freshly-prepared wet-mat of said fibers, the improvement which comprises:

applying to said freshly-prepared wet-mat an anionic surfactant selected from the group consisting of (1) an anionic surfactant having at least (a) a hydrophobic segment containing from 8 to 30 carbon atoms selected from the groups consisting of alkyl, aryl, alkylaryl, substituted alkyl, and substituted alkenyl groups, said groups being straight or branched chain, saturated or unsaturated, and (b) an anionic segment selected from the groups consisting of carboxy, sulfate ester, phosphate ester, sulfonic acid and phosphonic acid, or (2) a soap selected from sodium, potassium, ammonium and alkylolammonium salts of higher C_{10}–C_{20} fatty acids,

thereby to improve the wet-strength properties of said freshly-prepared wet-mat so that it can be readily handled and transferred during other steps in said process, into a finished glass fiber mat product.

4,178,204

WET-STRENGTH OF WET GLASS FIBER MATS BY TREATMENT WITH ANIONIC POLYELECTROLYTES

Paritosh M. Chakrabarti, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

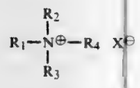
Filed Jan. 24, 1978, Ser. No. 872,000

The portion of the term of this patent subsequent to Dec. 11, 1996, has been disclaimed.

Int. Cl.² D21H *5/18*

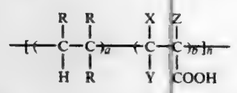
U.S. Cl. 162—156 **20 Claims**

1. In the manufacture of glass fiber mat products by the wet-laid process at a high rate of production wherein an aqueous dispersion of individual glass fibers is formed from bundles of glass fibers of about ¼ to 3 inches in length and an amine oxide dispersant or cationic quaternary ammonium dispersant compound having the formula:



where R_1, R_2, R_3 and R_4 are selected from the group consisting of aliphatic and aromatic hydrocarbon radicals, straight chain or branched, or two or more form a cyclic group, saturated or unsaturated, substituted or unsubstituted, at least two of said radicals containing at least 10 carbon atoms each, being the same or different, the sum of the carbon atoms in R_1, R_2, R_3 and R_4 being at least 22 and less than about 48, and X is an anion at a concentration of about 5–500 ppm and at a fiber consistency of about 0.001 to 3%, which dispersion is passed through a mat-forming screen to form a freshly-prepared wet-mat of said fibers, the improvement which comprises:

applying to said freshly-prepared wet mat an anionic polyelectrolyte having the structural formula:



wherein each R can be the same or different and is selected from the group consisting of hydrogen, lower alkoxy, hydroxy, lower alkylcarbonyloxy, hydroxy lower alkyl, lower alkyl, phenyl, carboxy, lower alkoxycarbonyl, lower alkylcarbonyloxy lower alkyl, amido and carbamyl, with the proviso that only one R can be lower alkyl or phenyl; wherein X, Y and Z can be the same or different and are each selected from the group consisting of hydrogen, lower alkyl, carboxy, lower alkoxycarbonyl, with the proviso that at least one of X, Y and Z be selected from the group consisting of carboxy and lower alkoxycarbonyl, and, when X and Y are each lower alkoxycarbonyl, Z is carboxy or lower alkoxycarbonyl, with the further proviso that only one of X, Y and Z can be lower alkyl; a is 0 to less than 1 and a+b=1; and n is a whole integer which ranges from about 5 to about 10,000

thereby to improve the wet-strength properties of said freshly-prepared wet-mat so that it can be readily handled and transferred during other steps in said process, including the drying and binder application units of the production line for said process, into a finished glass fiber mat product.

4,178,205

HIGH STRENGTH NON-WOVEN FIBROUS MATERIAL

Ritchie A. Wessling; William A. Foster, both of Midland, and Dale M. Pickelman, Auburn, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 17, 1977, Ser. No. 825,319

Int. Cl.² D21H *3/38*

U.S. Cl. 162—168 R **11 Claims**

1. A method for preparing non-woven fibrous web comprising:

(a) mixing an aqueous slurry of a negatively charged, water-insoluble, natural or synthetic fiber or a blend of such fibers with a structured particle latex having particles consisting of a non-ionic organic polymer core encapsulated by a thin polymer layer having bound charges of pH independent cationic groups, said charges being present in an amount of from about 0.15 milliequivalent to about 0.6 milliequivalent per gram of polymer in the latex; the non-ionic polymer core having a glass transition temperature of from about −80° C. to about 100° C.; the amount of said latex being not greater than the amount required to cause charge reversal on the fiber;

(b) draining water from the aqueous suspension to form a wet web;

(c) wet pressing the web; and

(d) heating the wet web; whereby there is formed a non-woven fibrous web having polymer uniformly distributed and bonded to the fiber.

4,178,206

METHOD OF FORMING GLASS FIBER DISPERSIONS WITH CATIONIC QUATERNARY AMMONIUM SURFACTANTS HAVING AT LEAST TWO LONG CHAIN GROUPS

Paritosh M. Chakrabarti, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

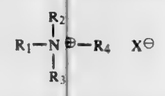
Filed Feb. 10, 1978, Ser. No. 876,651

Int. Cl.² D21H *5/18*

U.S. Cl. 162—156 **20 Claims**

1. In the manufacture of uniform glass mats at a high rate of production by the wet-laid process, the improved method which comprises

forming an aqueous dispersion of glass fibers by mixing bundles of said fibers of about ¼ to 3 inches in length in an aqueous medium at a fiber consistency of about 0.001 to 3.0% with about 5–500 ppm of a cationic quaternary ammonium surfactant compound having the formula:



where R_1, R_2, R_3 and R_4 are selected from the group consisting of aliphatic and aromatic hydrocarbon radicals, straight chain or branched, or two or more form a cyclic

group, saturated or unsaturated, substituted or unsubstituted, at least two of said radicals containing at least 10 carbon atoms each, being the same or different, the sum of the carbon atoms in R_1, R_2, R_3 and R_4 being at least 22 and less than about 48, and X is an anion thereby to substantially disperse said bundles into individual fibers within the aqueous medium, and,

passing said dispersion through a mat-forming screen to form the desired uniform glass fiber mat.

4,178,207

APPARATUS FOR PRODUCTION OF COMBUSTIBLE AMMUNITION CONTAINERS

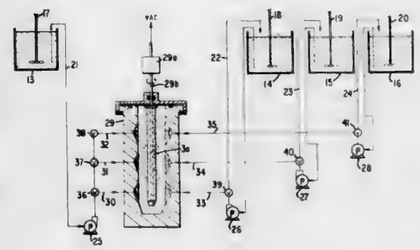
Wilhelm Oversohl, Koblenz-Karthause, Fed. Rep. of Germany, assignor to Wasag Chemie AG, Munchen-Unterfohring, Fed. Rep. of Germany

Division of Ser. No. 755,653, Dec. 30, 1976, Pat. No. 4,068,589. This application Sep. 15, 1977, Ser. No. 833,567

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1974, 2428632

Int. Cl.² D21J *7/00*

U.S. Cl. 162—384 **5 Claims**



1. Apparatus for the production of combustible munition containers which are non-uniform in composition axially but which are .niform in composition transaxially, which comprises a normally vertical, hollow, water-permeable but fiber-impermeable form having a circular cross section; controllable means for rotating said form axially; controllable means for maintaining the interior of said form under partial vaccum; controllable means connected to a suspension supply means for contacting one axial zone of said form with an aqueous suspension of a mixture of fibrous propellant material, cellulose papermaking fibers and binder material therefor; controllable means connected to additional suspension supply means for contacting at least an adjoining axial zone of said form with an additional suspension of said materials in a different ratio; and controllable means for removing liquid from the interior of said form.

4,178,208

SELF LOCKING DRIVE SYSTEM FOR ROTATING PLUG OF A NUCLEAR REACTOR

James E. Brubaker, Pittsburgh, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 23, 1978, Ser. No. 880,679

Int. Cl.² G21C *19/20;* **F16H** *1/16;* **B66C** *17/08*

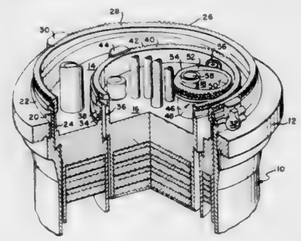
U.S. Cl. 176—30 **4 Claims**

1. A self locking drive system for rotating a refueling plug eccentrically mounted on the head of a large fast nuclear reactor, said refueling plug having a bull gear mounted on the edge thereof comprising:

a self locking double enveloping worm gear set consisting of a worm intermeshed with a matching worm gear,

a pair of matched idler gears both intermeshing with said bull gear,

a pinion gear intermeshing with both of said idler gears, said pinion gear and said worm gear being mounted for rotation on the same shaft



whereby said self locking double enveloping worm gear set prevents unwanted rotation of the refueling plugs as the result of seismic forces caused by an earthquake.

4,178,209

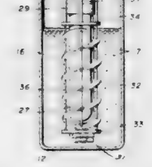
CONTINUOUS CELL CULTURE METHOD AND APPARATUS

William R. Tolbert, Manchester; Joseph Feder, University City, and Richard C. Kimes, Creve Coeur, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 850,987, Nov. 14, 1977. This application Mar. 6, 1978, Ser. No. 884,076

Int. Cl.² C12K *9/00*

U.S. Cl. 435—241 **5 Claims**



1. Apparatus for the continuous suspension culturing of cells comprising

(A) a hollow flask having an opening at the top,

(B) a stationary, hollow shaft means positioned within said flask, in fluid communication with said top opening of said flask and supported downwardly therefrom without any lower bearing,

(C) a stationary filter unit supported downwardly from said shaft means without any lower bearing and without any moving seals between the filter unit and any filter support means which could contact the cell suspension, said filter having

(1) a fluid collection cavity in direct fluid communication with the interior of said shaft means and the top of said flask, and

(2) a porous peripheral surface having a pore size smaller than the cells to be cultured or the carrier particles upon which said cells are attached but sufficiently large to permit permeation of fluid into said fluid collection cavity, and

(D) a rotatable agitator means concentrically disposed about

said filter unit for rotation by suspension from sleeve bearing means having low-friction engagement with said hollow shaft means.

5. In the method of continuous cell culture comprising growing animal cells in an agitated liquid suspension of nutrient culture medium containing amino acids, mineral salts, vitamins and carbohydrates and periodically removing filtered liquid from the cells, the improvement comprising carrying out the agitation and filtering without any moving bearing or seal surfaces contacting said cells which could cause cell disruption and with agitator means concentrically disposed about the filter for rotation to substantially prevent any clogging of said filter with cell debris.

4,178,210

ACCELLULAR SYNTHESIS OF CEPHALOSPORINS

Arnold L. Demain, Wellesley, Mass., and Masanobu Kohsaka, Osaka, Japan, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 775,156, Mar. 7, 1977, abandoned. This application Mar. 17, 1978, Ser. No. 880,036

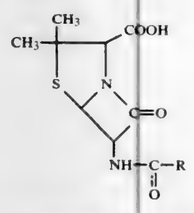
Int. Cl.[2] C12D *9/00*

U.S. Cl. 435—47 **10 Claims**

1. A process for producing a cephalosporin antibiotic, said process comprising the steps of:

providing a cell-free extract of *Cephalosporium acremonium;*

providing a source of starting material comprising a substance having the formula:



wherein R is a hydrocarbon containing 1–4 carbon atoms terminally substituted with a radical selected from the group consisting of carboxy, amino, and combinations thereof;

contacting the extract and the starting material in a reaction zone while promoting oxygen transfer;

providing ATP as an energy source to said reaction zone; and

allowing a component of the extract to react with said precursor for a sufficient amount of time to produce a cephalosporin antibiotic.

4,178,211

PROCESS FOR PRODUCING CITRIC ACID

Richard I. Leavitt, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 773,976, Mar. 3, 1977, abandoned. This application May 30, 1978, Ser. No. 910,359

Int. Cl.[2] C12D *1/04*

U.S. Cl. 195—30 **8 Claims**

1. A process for producing citric acid which comprises aerobically fermenting a mixed carbon source nutrient medium in a submerged culture of *Candida lipolytica,* ATCC-20510, said process being further characterized in that said mixed carbon source is a mixture of a carbohydrate and acetic acid or salt thereof with the fermentation liquor having an initial concentration of from about 1 to about 5 percent by weight of said acetic acid or salt thereof and, as a fermentation initiator, from 0.5 to about 2.5 percent by weight of said carbohydrate with no further addition of said carbohydrate to the fermentation mixture and a total of from about 5 to about 20 percent by weight of said acetic acid or salt thereof being added over the total fermentation period of from about 1 to about 15 days whereby said process produces a weight ratio of citric to isocitric acid of at least 4:1, respectively.

4,178,212

STABILIZED THYMIDINE PHOSPHORYLASE FORMULATION

Thomas A. Krenitsky, Chapel Hill, and Stanley R. M. Bushby, Durham, both of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 652,770, Jan. 27, 1976, Pat. No. 4,097,337. This application Mar. 27, 1978, Ser. No. 890,781

Claims priority, application United Kingdom, Jan. 27, 1975, 3445/75

Int. Cl.[2] C07G *7/026*

U.S. Cl. 435—32 **3 Claims**

1. A stabilized thymidine phosphorylase formulation comprising thymidine phosphorylase of bacterial origin in phosphate buffer containing ammonium sulfate, said formulation containing at least 5 mg of protein per ml.

4,178,213

FERMENTATION PROCESS FOR THE PRODUCTION OF (+)-2-(5β-N-BUTYL-4β-HYDROXY-2-OXO-TETRAHYDROFURAN-3β-YL)-2α-METHYLACETIC ACID

David C. Aldridge; Roger Bowling, and John C. Swait, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

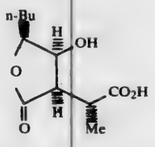
Filed Dec. 27, 1977, Ser. No. 864,473

Claims priority, application United Kingdom, Jan. 13, 1977, 1310/77; Mar. 14, 1977, 10622/77

Int. Cl.[2] C12D *13/00*

U.S. Cl. 435—126 **12 Claims**

1. A fermentation process for the production of (+)-2-(5β-n-butyl-4β-hydroxy-2-oxo-tetrahydrofuran-3β-yl)-2α-methylacetic acid having the formula:



I

which comprises cultivating a dihydrocanadensolide yielding strain of a species of the genus Penicillium or of the genus Aspergillus, in an aqueous nutrient medium containing a source of assimilable carbon and a source of assimilable nitrogen, isolating the compound of formula I by extracting the culture filtrate at a pH from 3.8–5.0 with a substantially water immiscible organic solvent, and evaporating the extract to dryness.

4,178,214

CULTURE MEDIUM FOR CULTIVATION OF FODDER YEASTS

Zinaida P. Shishkova, ulitsa Struktoru, 4a, kv. 21; Arvid Y. Kalninsh, ulitsa Sverdlova, 8, kv. 3; Juris P. Gailitis, ulitsa Bikernieku, 37, kv. 26; Uldis Y. Shmit, ulitsa Lenina, 118, kv. 21; Nikolai A. Vedernikov, ulitsa Aptiekas, 8, kv. 66; Valter P. Krastinsh, ulitsa Sabiles, 11, kv. 12, all of Riga; Damir A. Kalinkin, ulitsa Volodarskogo, 130, kv. 109, Bobruisk; Viktor R. Vaax, ulitsa Minskaya, 113, kv. 70, Bobruisk; Maria A. Zinina, ulitsa Minskaya, 101, kv. 61, Bobruisk; Vasily D. Belyaev, Sivtsev Vrazhek pereulok, 33, kv. 5, Moscow; Nikolai S. Maximenko, ulitsa Verkhnepervomaiskaya, 59/35, korpus 2, kv. 81, Moscow, and Yakov V. Epshtein, 11 Parkovaya ulitsa, 19/21, kv. 126, Moscow, all of U.S.S.R.

Filed Sep. 8, 1977, Ser. No. 831,602

Int. Cl.[2] A23K *1/00;* **A23J** *1/18;* **C12K** *1/00;* **C12C** *11/08*

U.S. Cl. 435—252 **5 Claims**

1. A liquid culture medium for cultivation of fodder yeasts which provide a source of proteins, vitamins and minerals in the diet of animals and birds, said liquid culture medium containing the following components in % by weight:

hydrolysate of ligneous wastes other than peat with pH=4.0–4.4: 48–97

peat hydrolysate obtained by hydrolysis of peat with sulphuric acid and having a pH=4.0–4.4: 0.1–50

nitrogen from a source other than said hydrolysates: 0.02–0.08

phosphorus measured as P_2O_5 from a source other than said hydrolysates: 0.03–0.12

potassium from a source other than said hydrolysates: 0.016–0.064

water: the balance.

4,178,215

METHOD OF MANUFACTURING BLAST FURNACE COKE

Yoshio Kiritani, Osaka; Michio Tsuyuguchi, Wakayama; Tetsuo Ibaragi, Wakayama; Katsuhiro Yano, Wakayama; Yoshihiko Sunami, and Kunihiko Nishioka, both of Amagasaki, all of Japan, assignors to Sumitomo Metal Industries Limited, Osaka and Sumikin Coke Company Limited, Wakayama, both of, Japan

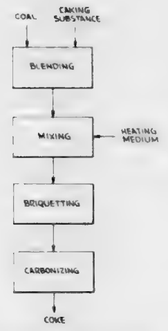
Filed Sep. 29, 1976, Ser. No. 728,009

Claims priority, application Japan, Jun. 30, 1976, 51-78088

The portion of the term of this patent subsequent to Feb. 14, 1995, has been disclaimed.

Int. Cl.[2] C10B *53/08, 57/00, 45/00*

U.S. Cl. 201—6 **15 Claims**



1. A method of manufacturing blast furnace coke comprising the steps of blending coals used for the production of coke with a caking substance to yield a mixture, powerfully mixing the mixture obtained for a time of one to five minutes with a mixer capable of applying mixing energy of more than 0.02 KW/kg while passing a heating medium through the mixture, briquetting the mixture obtained in said mixing step and producing coke by carbonizing the briquette obtained.

4,178,216

PROCESS FOR BIPOLAR ELECTRODE SUPPORT STRUCTURES

George F. Nordblom, Yardley, Pa.; Pierre P. Turillon, Ramsey, N.J.; Ernest L. Huston, Suffern, and Stephan L. Keresztes, Warwick both of N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 878,268, Feb. 16, 1978, Pat. No. 4,124,746. This application Aug. 3, 1978, Ser. No. 930,554

Int. Cl.[2] H01M *10/44*

U.S. Cl. 204—2.1 **27 Claims**

1. A process for producing a sheet like article of manufacture adapted for use as a bipolar electrode support structure for a lead-acid battery, the process comprising:

forming a continuous, porous matrix in the configuration of said article, said matrix being constituted of a metal selected from titanium, tantalum, niobium and zirconium, or of an alloy of said metal which alloy exhibits valve metal-like electrical characteristics;

mechanically deforming a rim-portion of said matrix thereby decreasing the pore dimensions at least adjacent a preselected portion of a surface of said matrix, thereby inhibiting lead infiltration into said preselected portion of matrix surface during the next step of the process;

infiltrating said matrix with lead or lead alloy such that pores which communicate with the remainder of said surface are filled to a depth exceeding a first predetermined depth from said surface; and

electrochemically oxidizing said lead or lead alloy so as to ensure that said pores which communicate with said remainder of said surface are filled with lead dioxide to a depth which exceeds a second predetermined depth from said surface, but is less than said first predetermined depth.

4,178,217

ZINC ELECTROPLATING BATH

Klaus Glaser, Mutterstadt; Werner Streit, Bobenheim; Rolf Fikentscher, Ludwigshafen, and Guenther Gotsmann, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 30, 1978, Ser. No. 937,912

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1977, 2740592

Int. Cl.[2] C25D *3/22, 3/24*

U.S. Cl. 204—55 Y **3 Claims**

1. In an aqueous zinc electroplating bath which is used to produce very bright zinc coatings and which is acid or alkaline or contains alkali metal cyanide, and comprises a polyalkylene-polyamine as the brightener, the improvement wherein the brightener used is a compound prepared by alkylating a polyalkylenepolyamine of the formula

$$H_2N-(CH_2)_n-NH]_xH,$$

in which n denotes 2 to 4 and x 5 to 120, at the nitrogen by alkyl radicals of 1 to 4 carbon atoms and additionally alkylating the polyalkylene polyamine by alkyl radicals containing sulfo groups, the amount of the alkyl radicals containing sulfo groups to be introduced into the polyalkylene polyamine molecule being from 0.01 to 1.99 moles per equivalent of basic

nitrogen, and the ratio of alkyl groups to alkyl radicals containing sulfo groups being from 1:30 to 30:1.

4,178,218

CATION EXCHANGE MEMBRANE AND USE THEREOF IN THE ELECTROLYSIS OF SODIUM CHLORIDE

Maomi Seko, Tokyo, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 836,417, Sep. 26, 1977, which is a continuation-in-part of Ser. No. 745,196, Nov. 26, 1976, abandoned, which is a continuation of Ser. No. 556,288, Mar. 7, 1975, abandoned. This application Nov. 9, 1978, Ser. No. 959,312
Claims priority, application Japan, Mar. 7, 1974, 49-25718
Int. Cl.² C25B *1/16, 1/28, 9/00, 13/08*
U.S. Cl. 204—98 **54 Claims**

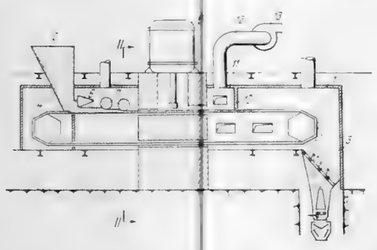
1. A process for the electrolysis of an aqueous sodium chloride solution which comprises passing an electric current through said solution in an electrolytic cell separated into an anode chamber and a cathode chamber by a cation exchange membrane consisting essentially of a fluorocarbon polymer containing pendant carboxylic acid and sulfonic acid groups, the total ion exchange capacity of sulfonic and carboxylic acid groups being from 0.5 to 4.0 milliequivalents per gram of dry resin, the ratio of carboxylic acid groups to sulfonic acid groups being in the range of from 1:100 to 100:1.

4,178,219

METHOD FOR PRODUCING MINERAL BINDER

Iosif G. Abramson, Varshavskaya ulitsa, 22, kv. 16; Boris V. Volkonsky, ploschad Chernyshevskogo, 7, kv. 7; Vasily A. Glukhikh, Belgradskaya ulitsa, 10, korpus 1, kv. 5; Solomon I. Danjushevsky, ploschad Chernyshevskogo, 7, kv. 79; Georgy B. Egorov, Grazhdansky prospekt, 90, korpus 2, kv. 103; Raisa A. Zozulya, 9 linia, 76, kv. 7; Alexei I. Natnenkov, Metallostroi, ulitsa Polevaya, 22, kv. 31; Jury V. Nikiforov, Zanevsky prospekt, 30, kv. 23; Rafail M. Nudelman, Nevsky prospekt, 61, kv. 1; Alexandr M. Khomyakov, Ivanovskaya ulitsa, 18, kv. 15; Boris M. Bresler, Lermontovsky prospekt, 8/10a, kv. 30; Igor A. Prudnikov, ulitsa Dimitrova, 4, korpus 1, kv. 221; Janetta M. Tseitlin, prospekt Veteranov, 40, kv. 10; Zalman L. Axelrod, Svetlanovsky prospekt, 117, kv. 168; Anatoly M. Zharnitsky, ploschad Chernyshevskogo, 7, kv. 46; Jury A. Makeev, Kuznetsovskaya ulitsa, 10, kv. 248; Ivan F. Malyshev, Kustarny pereulok, 8, kv. 4; Mikhail P. Svinin, Metallostroi Polevaya ulitsa, 25, kv. 25, all of Leningrad, U.S.S.R., Evgeny G. Komar, deceased, late of Leningrad, U.S.S.R., by Khaya S. Boguslavskaya, administrator, Kuznetsovskaya ulitsa, 36, kv. 26, Leningrad, U.S.S.R., by Olga E. Komar, administrator, Grazhdanskaya ulitsa, 16, kv. 11, Pushkin, U.S.S.R., and by Alexandr E. Komar, administrator, Kuznetsovskaya ulitsa, 36, kv. 26, Leningrad, U.S.S.R.

Continuation of Ser. No. 561,075, Mar. 24, 1975, abandoned. This application Apr. 30, 1976, Ser. No. 681,894
Int. Cl.² B01J *1/10*
U.S. Cl. 204—157.1 H **2 Claims**



1. A method of producing a mineral binder comprising the steps of: forming a layer of a Portland cement raw stock mixture having a uniform thickness heating the stock mixture to a temperature not over 600° C., and exposing the layer of stock mixture to ionizing radiation with the power of absorbed dose of at least 1 Mrads/s by moving the layer past an ionizing radiation source, the speed of movement being sufficient to thoroughly irradiate the stock mixture to produce a Portland cement clinker.

4,178,220

UNIFORMLY IRRADIATED POLYMER FILM

Stephen L. Fowler, Taylors, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Apr. 4, 1977, Ser. No. 784,184
Int. Cl.² C08F *8/00*
U.S. Cl. 204—159.14 **8 Claims**

1. A film of electron irradiated polymer with a substantially uniform electron irradiation dosage across the entire width thereof, said film having an electron dosage variation of less than plus or minus 15 percent of the mean dosage and having been produced by passing a film through an electron irradiation zone having disposed therein adjacent the film edges deflection blocks for deflecting electrons toward a deflection bottom for further deflecting said electrons toward the bottom edges of the film being irradiated.

4,178,221

PROCESS FOR THE PREPARATION OF WATER-SOLUBLE ACRYLIC POLYMERS BY PHOTOPOLYMERIZATION

Jean Boutin, Saint-Priest, and Jean Neel, Lyons, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Apr. 11, 1977, Ser. No. 786,659
Claims priority, application France, Apr. 14, 1976, 76 11634
Int. Cl.² C08F *2/46, 4/00*
U.S. Cl. 204—159.23 **29 Claims**

1. A method for the preparation of water-soluble acrylic polymers comprising:
(a) continuously depositing on a support a thin layer of an aqueous solution comprising acrylic monomer and a photopolymerization initiator, said solution being substantially free of dissolved oxygen;
(b) subjecting the thin liquid layer on the support to a first radiation stage comprising exposure to radiation of wavelengths between about 300 and 450 mμ and of average power between about 20 and 300 watt/m^2 for approximately 1 to 20 minutes in a gaseous atmosphere substantially free of oxygen while cooling said support to remove the heat of reaction;
(c) maintaining the cooled support in said oxygen free atmosphere while subjecting same to a second radiation stage comprising exposure to radiation of wavelengths between about 300 and 450 mμ and of average power between about 300 and 2000 watt/m^2 for approximately 1 to 20 minutes; and
(d) detaching the resultant partially solidified layer from the support.

4,178,222

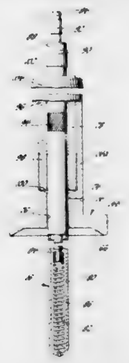
SOLID ELECTROLYTE OXYGEN SENSOR WITH ELECTRICALLY ISOLATED HEATER

Michael P. Murphy, and Raymond D. Willis, both of Flint, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 3, 1978, Ser. No. 892,642
Int. Cl.² G01N *27/46*
U.S. Cl. 204—195 S **6 Claims**

1. In a galvanic exhaust gas sensor having a solid electrolyte member, a subassembly comprising a heater and an outwardly flanged terminal tube for said electrolyte member, an inwardly flanged tubular metal shell surrounding said electrolyte member and heater-terminal tube subassembly, and means coacting with said flanges for holding said member, subassembly and

shell in a fixed predetermined relationship, the improvement wherein said heater-terminal tube subassembly includes at least one ceramic sleeve coaxially disposed within the terminal tube and extending along a substantial length thereof, an elongated heater disposed within the ceramic sleeve, and a vitreous material bonding said heater, sleeve and terminal tube together as a subassembly in predetermined disposition with respect to said electrolyte member, whereby said vitreous material supports said heater on said terminal tube, said ceramic sleeve aligns said heater within said terminal tube, and the heater and terminal tube are thermally separated and electrically isolated.



4,178,223

ELECTRICAL OXYGEN PROBE

Minoru Ohashi; Youichi Ishikawa; Makoto Shouda, and Tamon Watabe, all of Tokyo, Japan, assignors to Oriental Yeast Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 815,278, Jul. 13, 1977, abandoned. This application May 4, 1978, Ser. No. 902,840
Int. Cl.² G01N *27/46*
U.S. Cl. 204—195 P **7 Claims**



1. An electrical oxygen probe in a galvanic membrane probe which comprises a cathode, an anode, an oxygen permeable membrane, an electrolyte and an electrolytic cell wherein:
(i) said electrolytic cell is a metal tube, at the top of which an internal screw thread and an internal flange below the said thread are provided, in the center of which an external screw thread is provided, an external flange above the said thread and a vent hole below the said external thread for the adjustment of inner and outer pressures are provided, at the bottom of which an external screw thread is provided;
(ii) a metal which constitutes the anode is lined on the internal wall of the said electrolytic cell from the bottom to a suitable height;
(iii) the said cathode is comprised of a metal disposed at one end of a glass tube and a lead wire connected at one end to the cathode metal and extending through the glass tube at the other end;
(iv) the said oxygen permeable membrane is sticked on the bottom of the electrolytic cell by clamping with a O-ring, a washer and a cap having several grooves to eliminate foam, wherein the said membrane contacts with the surface of the said cathode;
(v) the said glass tube is kept in the center of the said electrolytic cell by clamping the upper parts of the said glass tube with O-rings which are compressed between a plug and said internal flange; and
(vi) the said electrolytic cell contains an electrolyte and in the center of which a protection cover is screwed to the said cell and is compressed to a O-ring and the said external flange.

4,178,224

APPARATUS FOR GENERATION AND CONTROL OF DOPANT AND REACTIVE GASES

Vernon R. Porter, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 19, 1978, Ser. No. 870,912
Int. Cl.² C25B *9/00, 15/08*
U.S. Cl. 204—237 **10 Claims**



1. An electrochemical generator for the electrolytic generation of arsine comprising:
a cylindrical member open at one end thereof; said cylindrical member also comprising copper or silver as the cathode of said generator;
an anode comprising a platinum group metal suspended in the center of said cylindrical member;
a cylindrical barrier concentric with said cylindrical member and surrounding said anode, said cylindrical membrane separating said cylindrical member into an annular region and a central region, said cylindrical barrier having impermeability to the gases from said anode and said cathode;
a cover sealing said open end of said cylindrical member, said cover isolating said annular region from said center region;
a first port in said cover for passing gas from said annular region; and
a second port in said cover for passing gas from said center region.

4,178,225

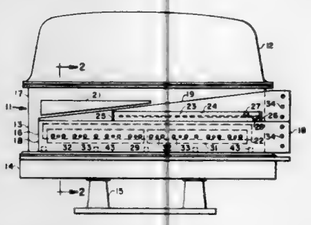
CATHODE BUSBAR STRUCTURE

Walter W. Ruthel, Grand Island, and Leo G. Evans, Tonawanda, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation of Ser. No. 590,799, Jun. 26, 1975, abandoned, which is a continuation-in-part of Ser. No. 430,428, Jan. 3, 1974, abandoned. This application Nov. 14, 1977, Ser. No. 852,401

Int. Cl.[2] C25B *9/04*

U.S. Cl. 204—279 **4 Claims**



1. A cathode busbar structure for an electrolytic cell having a high current capacity comprising

(a) a conductive cathode walled enclosure;

(b) at least one lead-in busbar, a side portion of said lead-in busbar extending outward of said cathode walled enclosure and adapted for electrical jumpering connection, said lead-in busbar being parallel to but not in physical contact with said cathode walled enclosure and adapted for electrical inter-cell connection along the lengthwise portion thereof;

(c) a plurality of busbar elements, physically contacting said cathode walled enclosure, electrically connected to said lead-in busbar, one element of the plurality of busbar elements of a tapered configuration having the larger end portion extending outward of said cathode walled enclosure adapted for electrical jumpering connection, said tapered busbar element being thicker than the remaining busbar elements, and said plurality of busbar elements combining to form an essentially rectangular electrical contact area on the cathode walled enclosure.

4,178,226

COMPATIBLE MIXTURES OF COAL LIQUIDS AND PETROLEUM BASED FUELS

Albert V. Cabal, Woodbury; Joseph G. Bendoraitis, Pitman; Robert B. Callen, West Deptford; Robert T. Pavlica, Princeton, all of N.J., and Sterling E. Voltz, Media, Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Apr. 15, 1977, Ser. No. 787,803

Int. Cl.[2] C10L *1/04*

U.S. Cl. 208—15 **5 Claims**

1. Compatible mixtures of coal liquids and petroleum based fuels boiling above about 250° F. and having at least about 10 weight percent of each of the components wherein said coal liquid is prepared by processing with solvent in the presence of hydrogen as a hydrogen donor solvent or as hydrogen gas and is free of the 950° F.+ fraction as a result of hydroprocessing, deasphalting or distillation.

4,178,227

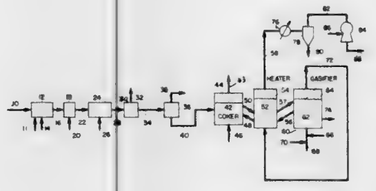
COMBINATION HYDROCONVERSION, FLUID COKING AND GASIFICATION

William J. Metrailer; Roby Bearden, Jr., and Clyde L. Aldridge, all of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 889,744, Mar. 24, 1978. This application Jun. 7, 1978, Ser. No. 913,394

Int. Cl.[2] C10G *37/00*

U.S. Cl. 208—50 **21 Claims**



1. A process for upgrading a carbonaceous chargestock, which comprises:

(a) adding to said carbonaceous chargestock an oil soluble metal compound of a metal selected from the group consisting of Groups IVB, VB, VIB, VIIB and VIII of the Periodic Table of Elements and mixtures thereof;

(b) converting said oil soluble metal compound to a solid catalyst within said chargestock in the presence of a hydrogen-containing gas by heating said chargestock to an elevated temperature;

(c) reacting the chargestock containing said catalyst with hydrogen under hydroconversion conditions, in a hydroconversion zone to produce an upgraded hydrocarbonaceous oil product;

(d) separating a heavy oil fraction from said hydrocarbonaceous oil product;

(e) contacting at least a portion of said heavy oil fraction with a bed of fluidized solids maintained in a fluid coking zone under fluid coking conditions to form coke, said coke depositing on said fluidized solids;

(f) introducing a portion of said solids with a coke deposit thereon into a heating zone operated at a temperature greater than said coking zone temperature to heat said portion of solids;

(g) recycling a first portion of heated solids from said heating zone to said coking zone;

(h) introducing a second portion of said heated solids to a fluid bed gasification zone maintained at a temperature greater than the temperature of said heating zone;

(i) reacting said second portion of heated solids in said gasification zone with steam and a molecular oxygen-containing gas to produce a hot gaseous stream containing hydrogen;

(j) introducing said hot gaseous stream containing hydrogen and entrained solids into said heating zone;

(k) recovering from said heating zone the resulting cooled gaseous stream containing hydrogen and entrained solid carbonaceous fines;

(l) separating at least a portion of said solid carbonaceous fines from said cooled gaseous stream, said separated fines having an average particle size of less than 10 microns in diameter, and

(m) recycling at least a portion of said separated fines to such chargestock of step (a).

4,178,228

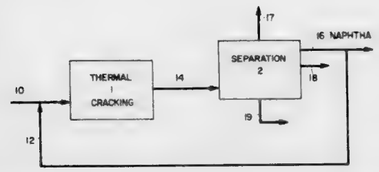
THERMAL CRACKING OF GAS OIL TO MIDDLE DISTILLATE

Bong H. Chang, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 7, 1978, Ser. No. 913,307

Int. Cl.[2] C10G *9/46, 37/02*

U.S. Cl. 208—72 **17 Claims**



15. A two-stage process for the thermal cracking of a hydrocarbonaceous feedstock which comprises:

(a) treating a heavy hydrocarbonaceous oil comprising residual components in a first thermal cracking zone at thermal cracking conditions including a temperature ranging from about 700° to 1100° F. and a pressure ranging from about 50 to about 1500 psig to produce a first thermally cracked product;

(b) separating from said first thermally cracked product a gas oil fraction;

(c) passing at least a portion of said separated gas oil fraction to a second thermal cracking zone;

(d) treating said portion of said separated gas oil in said second thermal cracking zone at thermal cracking conditions including a temperature ranging from about 700° to 1100° F. and a pressure ranging from about 50 to about 1500 psig in the presence of an added olefin-containing naphtha, said naphtha containing at least about 10 volume % olefins and less than about 30 volume % aromatics.

4,178,229

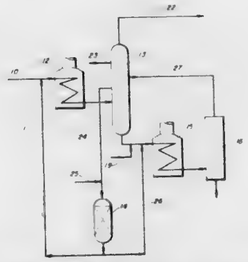
PROCESS FOR PRODUCING PREMIUM COKE FROM VACUUM RESIDUUM

James R. McConaghy; Paul C. Poynor, and John R. Friday, all of Ponca City, Okla., assignors to Conoco, Inc., Ponca City, Okla.

Filed May 22, 1978, Ser. No. 908,333

Int. Cl.[2] C10G *13/24, 37/02*

U.S. Cl. 208—50 **5 Claims**



1. A process for producing premium coke comprising:

(a) subjecting a heavy liquid hydrocarbonaceous material having an initial boiling point above 340° C. to a hydrogen donor diluent cracking operation;

(b) separating a pitch fraction including substantially all of the 510° C.+ material from the effluent of the hydrogen donor diluent cracking operation, said pitch fraction including part of the gas oil fraction from said effluent;

(c) passing at least part of the remainder of the gas oil fraction from said effluent to a hydrotreating step to produce a hydrotreated gas oil fraction;

(d) utilizing a first part of the hydrotreated gas oil fraction as donor diluent in said hydrogen donor diluent cracking operation;

(e) combining said pitch fraction and a second part of the hydrotreated gas oil fraction to provide a coker feedstock in which the total amount of material boiling above 510° C. in said coker feedstock is not more than 30 volume percent; and

(f) introducing said coker feedstock to a delayed premium coking operation whereby premium delayed coke is produced.

4,178,230

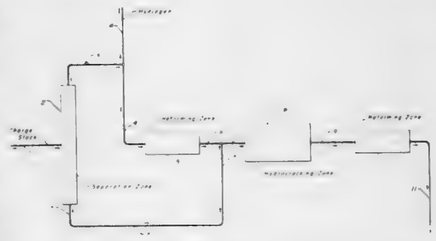
PROCESS FOR THE SIMULTANEOUS PRODUCTION OF AROMATIC HYDROCARBONS AND ISOBUTANE

James A. Johnson, Clarendon Hills, and Raouf G. Touma, Des Plaines, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed May 22, 1978, Ser. No. 908,300

Int. Cl.[2] C10G *37/10;* **C07C** *9/12*

U.S. Cl. 208—66 **8 Claims**



1. A process for the simultaneous production of an aromatic concentrate and an isobutane concentrate from a hydrocarbon charge stock boiling below about 500° F., and containing from about 14 to about 65 volume % naphthene hydrocarbon components which comprises the steps of:

(a) separating said charge stock into two fractions in a separation zone to provide a first fraction processing an end boiling point in the range of about 300° F. to about 400° F., and a second fraction having an initial boiling point in the range of 300° F. to 400° F. and an end boiling point not greater than 410° F.;

(b) reacting said first fraction, with hydrogen, in a first reforming reaction zone, in contact with a first catalytic composite comprising platinum and alumina at a temperature in the range of about 800° F. to about 1100° F. and a pressure of from about 100 to about 400 psig, said temperature and pressure selected to convert from about 25 volume % to about 90 volume % of said about 14 volume % to about 65 volume % naphthene hydrocarbon components to aromatic hydrocarbons within the first reforming zone effluent stream;

(c) admixing said first reforming zone effluent stream, without intermediate separation of the same to remove C_4^- light ends therefrom, with said second fraction processing an end boiling point of not greater than 410° F., in a hydrocracking reaction zone to hydrocrack both of said fractions, in contact with a second catalytic composite comprising a Group VIII noble metal component and a zeolitic aluminosilicate carrier material at a temperature in the range of about 350° F. to about 800° F. and a pressure from about 100 to about 400 psig, to produce a hydrocracking reaction zone effluent;

(d) reacting said hydrocracking reaction zone effluent, without intermediate separation of the same to remove C_4^- light ends therefrom, in a second reforming reaction zone

in contact with a third catalytic composite comprising platinum and alumina, at a temperature in the range of about 800° F. to about 1100° F. and a pressure of from about 100 to about 400 psig to produce a second reforming reaction zone effluent stream; and

(e) recovering said isobutane concentrate from said second reforming reaction zone effluent stream.

4,178,231

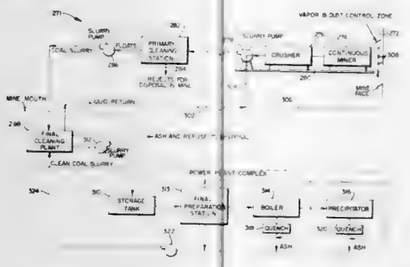
METHOD AND APPARATUS FOR COAL SEPARATION USING FLUORINATED HYDROCARBONS

Clay D. Smith, and Douglas V. Keller, Jr., both of Lafayette, N.Y., assignors to Otisca Industries, Ltd., Lafayette, N.Y.

Division of Ser. No. 561,168, Mar. 24, 1975, which is a continuation-in-part of Ser. No. 423,577, Jan. 14, 1974, abandoned. This application Jul. 31, 1978, Ser. No. 929,805

Int. Cl.² B03B *5/44, 9/00*

U.S. Cl. 209—3 **31 Claims**



1. A coal handling and utilization process which comprises the steps of: effecting a gravity separation of coal with a parting liquid; recovering the parting liquid from the separated coal and from the foreign material from which the coal is separated; burning said coal; mixing parting liquid as aforesaid with ash generated in the combustion of the coal to form a slurry; effecting a flow of the slurry to the means in which the recovery of the parting liquid from the foreign material was effected; and effecting a separation of the parting liquid associated therewith from said ash in said last-mentioned means.

4,178,232

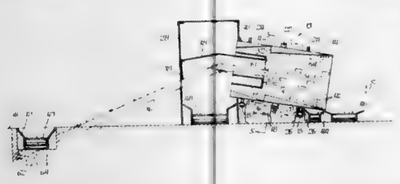
APPARATUS FOR SEPARATING SOLID MATERIALS

Anthony R. Nollet, Wilmington, Del., assignor to Cargill, Incorporated, Minneapolis, Minn.

Division of Ser. No. 669,831, Mar. 24, 1976, Pat. No. 4,070,202. This application Aug. 22, 1977, Ser. No. 826,645

Int. Cl.² B03B *9/06*

U.S. Cl. 209—3 **15 Claims**



1. An air drum processor for separating previously unprocessed refuse into a low bulk density substantially combustible light fraction of at least 50 percent by weight of the refuse and a high bulk density substantially incombustible heavy fraction comprising: a rotatable drum having its axis of rotation inclined at a predetermined angle to the horizontal and being open at at least one end; means for rotating said drum about its axis; conveyor means having a free end extending into said drum for charging the refuse directly into a rotating portion of said drum at a position intermediate the ends thereof while said drum is rotating; means for lifting and dropping the refuse within said drum during rotation thereof to expose the refuse materials to air separation; means for causing a stream of air to flow axially through said drum at a predetermined velocity to separate the charged refuse materials by virtue of their area to mass ratio and aerodynamic shape as the light fraction at the upper end of said drum, said drum having a length from the materials charging position in said drum to the lower end thereof adequate to provide for the heavy fraction materials in said refuse to undergo a sufficient number of lifting and dropping actions during their travel to the lower end of said drum for discharge as the heavy fraction to effect disentanglement of light fraction materials from the heavy fraction materials; and means covering said free end of said conveyor means and turnable about said free end of said conveyor means to drop material collecting thereon to prevent clogging of the drum by material stagnating in said drum at said free end of said conveyor.

4,178,233

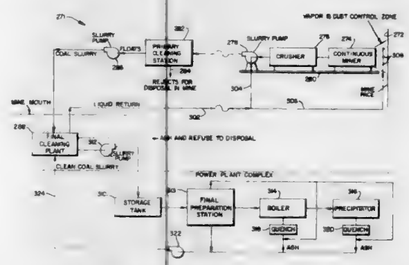
FLUORINATED HYDROCARBONS IN COAL MINING AND BENEFICIATION

Clay D. Smith, and Douglas V. Keller, Jr., both of Lafayette, N.Y., assignors to Otisca Industries, Ltd., Lafayette, N.Y.

Division of Ser. No. 561,168, Mar. 24, 1975, which is a continuation-in-part of Ser. No. 423,577, Jan. 14, 1974, abandoned. This application Jul. 31, 1978, Ser. No. 929,804

Int. Cl.² B03B *5/44, 9/00*

U.S. Cl. 209—3 **34 Claims**



1. A coal handling and processing method which includes the steps of mining the coal; forming a slurry of said coal with a carrier liquid which comprises a non-toxic, non-corrosive, non-flammable flourine-containing derivative of methane or ethane which has low viscosity and surface tension and is chemically inert under process conditions; conveying said slurry to a cleaning station; separating foreign material from the coal at said cleaning station by gravity separation in a parting liquid which is a flourine-containing derivative as aforesaid; forming a slurry of the separated coal in the parting liquid as a carrier; and conveying said slurry to a terminus.

4,178,234

ROTATING CYCLONE CENTRIFUGE APPARATUS

Roy A. Bobo, 2000 N. Loop West, Houston, Tex. 77018

Filed Jul. 20, 1978, Ser. No. 926,441

Int. Cl.² B04C *5/107, 5/13*

U.S. Cl. 209—211 **10 Claims**

1. A rotating cyclone apparatus for separating heavy solid phases from light solid phases in a liquid, comprising:

an elongate centrifuge housing with a separation chamber and having an axial inlet for liquid feed into the housing and a heavy phase outlet discharge through the side wall of the housing and a light phase outlet substantially in the central portion of the housing, with both of said outlets being at the opposite end portion of said separation chamber from said inlet;

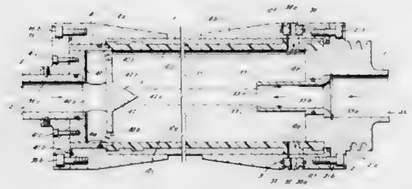
means for introducing air into said housing at the light phase outlet in a direction opposite to the direction of the discharge of the light phase to form an air core in the light phase discharge at substantially the central portion of the housing;

means for rotating said housing for creating a forced vortex;

an accelerator mounted at the inlet end of said housing for rotation with said housing and for imparting a helical flow to the inlet liquid combining the forced vortex and a free vortex at a velocity in excess of the velocity of rotation of said housing;

a rotatable re-entrant discharge tube extending into said separation chamber at substantially the central portion thereof and forming a part of the light phase outlet from said separation chamber at the opposite end of said chamber from said inlet; and

said re-entrant discharge tube extending into said separation chamber with its inlet opening inwardly of said heavy phase outlet discharge to inhibit a by-pass of the separated heavy phase outwardly with the light phase discharge.



4,178,235

FLOTATION RECOVERY OF PYROCHLORE

James A. Wilson, 13 Hilltop Rd., Port Washington, N.Y. 11050

Filed Jun. 30, 1978, Ser. No. 921,116

Int. Cl.² B03D *1/02*

U.S. Cl. 209—166 **3 Claims**

1. A process of froth flotation which includes agitating and aerating a pulp consisting of substantially liberated pyrochlore and associated minerals while suspended in a water solution of 5-hydroxyquinoline and collecting a rougher pyrochlore concentrate in a froth overflow and a rougher tailing in a pulp underflow.

4,178,236

MOBILE APPARATUS FOR RECEIVING AND CONVEYING FERROUS RAIL FASTENING ELEMENTS

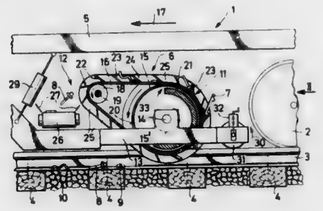
Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Apr. 20, 1978, Ser. No. 898,143

Claims priority, application Austria, Aug. 29, 1977, 6237/77

Int. Cl.² B03C *1/12*

U.S. Cl. 209—215 **9 Claims**



1. A mobile apparatus for receiving and conveying ferrous rail fastening elements disposed on the surface of a ballast bed, which comprises

(a) a carriage mounted for mobility in an operating direction on two rails of a track resting on the ballast bed,

(b) a carrier frame mounted vertically adjustably on the carriage,

(c) magnetic drums mounted on the carrier frame, the magnetic drums being associated with at least one of the rails and extending laterally thereof at both sides of the rail,

(1) each of the magnetic drums including a drive for rotation of the drum about an axis extending transversely to the track,

(d) an endless conveyor band trained about each of the magnetic drums, the conveyor band having

(1) entrainment elements for the rail fastening elements, and

(e) a conveyor band arrangement mounted on the carriage and associated with the magnetic drums rearwardly thereof in the operating direction.

4,178,237

MOBILE APPARATUS FOR RECEIVING AND CONVEYING FERROUS RAIL FASTENING ELEMENTS

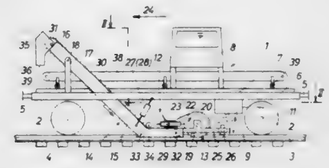
Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Apr. 20, 1978, Ser. No. 898,144

Claims priority, application Austria, Apr. 22, 1977, 2861/77

Int. Cl.² B03C *1/12*

U.S. Cl. 209—215 **8 Claims**



1. A mobile apparatus for receiving and conveying ferrous rail fastening elements disposed on the surface of a ballast bed, which comprises

(a) a carriage mounted for mobility in an operating direction on two rails of a track resting on the ballast bed, the carriage including

(1) a frame,

(b) a vertically adjustable carrier frame having two ends,

(1) rollers supporting one of the carrier frame ends for movement along the track rails and

(2) support means supporting the other carrier frame end on the carriage frame,

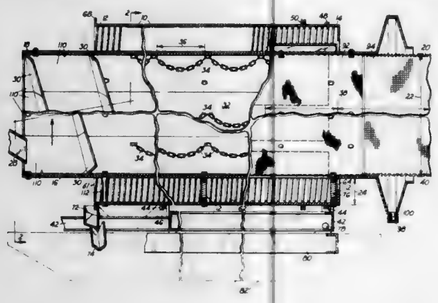
(c) magnetic drum means mounted on the one carrier frame end, the magnetic drum means being associated with at least one of the rails and extending laterally thereof at both sides of the rail,

(1) the magnetic drum means including a drive for rotation of the drum means about an axis extending transversely to the track and,

(d) a conveyor band arrangement mounted on the carrier frame, the conveyor band arrangement having a receiving end associated with the magnetic drum means and rearward thereof in the operating direction.

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4,178,238
APPARATUS FOR PROCESSING LOW-GRADE AGGREGATE ORE
Loyd F. Harris, 118 N. Cole St., Molalla, Oreg. 97038
Filed Jan. 25, 1977, Ser. No. 762,255
Int. Cl.[2] B07B *1/18, 1/24*
U.S. Cl. 209—270 **4 Claims**



1. An apparatus for separating a metal-bearing aggregate ore being supplied thereto into first particles having a predetermined range of cross sections and second particles having cross sections greater than those of said first particles and for thereafter classifying said first particles into concentrates having a predetermined range of densities and tailings having densities less than those of said concentrates so as to maintain said concentrates within said predetermined density range substantially independently of changes in the particular characteristics of aggregate ore being processed therein, said apparatus comprising:

(a) an elongate inner chamber having upper and lower ends, an inlet proximate said upper end thereof for permitting the introduction of said aggregate ore thereto and selection means for selecting said first particles from said aggregate ore including passage means for permitting said first particles to pass from said inner chamber;

(b) an elongate outer chamber housing said inner chamber and having upper and lower ends and an inner configuration sufficiently greater than the outer configuration of said inner chamber so as to define a working space therebetween, said outer chamber being disposed relative to said inner chamber such that said first particles passing from said inner chamber enter into said working space;

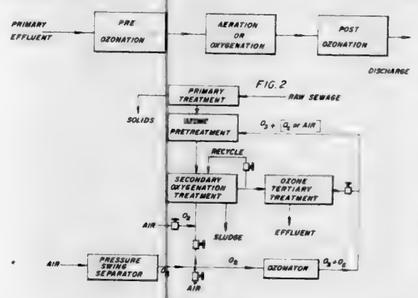
(c) movement means mounted on the inner surface of said outer chamber for urging said first particles passing into said working space in a first direction toward said upper end of said outer chamber;

(d) compaction means for compacting said first particles upon said movement means into density layers with said concentrates moving to the lowermost layers;

(e) shaving means for directing a liquid flow through said outer chamber directly over the surfaces of said movement means in a second direction opposite to said first direction toward said lower end of said outer chamber, said shaving means applying sufficient hydraulic separative force to said first particles upon said movement means so as to agitate same sufficiently to remove said tailings therefrom and to move said tailings in said second direction; and

(f) said shaving means including a helical riffle, said riffle being comprised of a plurality of elongate ribs radially spaced about the inner surface of said outer chamber and helically spaced from each other by a predetermined distance, said helical spacing decreasing from a lower end of said outer chamber toward an upper end thereof, said elongate ribs protruding from the inner surface of said outer chamber and extending helically from said lower end to said upper end thereof, and wherein the protrusion of said ribs decreases from a first height proximate said lower end to a second height proximate said upper end so as to urge said first particles thereon in said first direction when said inner and outer chambers are rotated, create turbulence in said liquid flow and present a plurality of partial dams therefor.

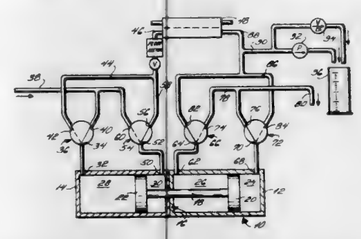
4,178,239
BIOLOGICAL INTERMEDIATE SEWAGE TREATMENT WITH OZONE PRETREATMENT
Frank E. Lowther, Severna Park, Md., assignor to Union Carbide Corporation, New York, N.Y.
Filed Nov. 13, 1974, Ser. No. 523,223
Int. Cl.[2] C02B *1/38;* **C02C** *1/06*
U.S. Cl. 210—15 **2 Claims**



1. In a process for secondary treatment of aqueous sewage containing biodegradable materials and non-biodegradable materials wherein the sewage is contacted with an O_2-containing gas in the presence of aerobic microorganisms, the improvement which comprises:

Contacting the sewage with an ozone-containing gas to pretreat the sewage by converting a substantial amount of the non-biodegradable material to biodegradable material.

4,178,240
FLUID HANDLING SYSTEM
Harry E. Pinkerton, Bridle Path La., Mill Neck, N.Y. 11765
Filed May 17, 1976, Ser. No. 686,856
Int. Cl.[2] B01D *31/00, 13/00*
U.S. Cl. 210—22 A **16 Claims**



16. A hemodialysis procedure utilizing a hydraulic system comprising a first and a second receptacle, and partition means in each receptacle dividing the receptacles into first and second chambers which procedure comprises connecting a patient to the blood side of a dialysis cell having blood and dialysate solution sides, reciprocating said partition means in said receptacles to cause, during reciprocation of said partition means, equal volumes of each first chamber to be swept by said partition means and equal volumes of each second chamber to be swept by said partition means, admitting a dialysate solution alternately to each chamber of said first receptacle as it expands, transferring said solution through the dialysate side of the dialysis cell from each said chamber of said first receptacle as it contracts, alternately to an expanding chamber of equal volume in said second receptacle whereby blood wastes migrate across the membrane from the blood side to the dialysate side of said cell, providing an outlet from said circuit whereby the egress of liquid from the circuit in direct volumetric relationship to the quantity of blood wastes crossing said membrane will occur through said outlet, and measuring that egress.

4,178,241
METHOD OF REMOVING UREA AND/OR CREATININE
Thomas E. Sullivan, 9401 Persimmon Tree Rd., Potomac, Md. 20845, and Oscar L. Wright, 11 Kathy La., Monroe, La. 71203
Filed Sep. 20, 1978, Ser. No. 944,130
Int. Cl.[2] B01D *15/04*
U.S. Cl. 210—24 **1 Claim**

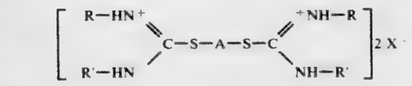
1. The method of removing urea and/or creatinine of biological origin from aqueous solutions containing the same, which method comprises contacting such aqueous solutions with a polymer selected from the group consisting of

(a) p-Mercapto polystyrene
(b) p-Mercaptoacetic polystyrene
(c) Dinitro-p-mercaptoacetic polystyrene
(d) p-Nitro polystyrene, and
(e) p-Amino polystyrene,

said polymer adsorbing at least some of the urea and/or creatinine from the aqueous solution.

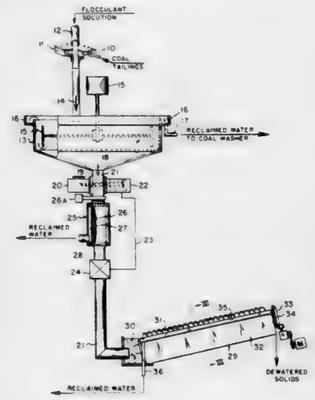
4,178,242
METHOD FOR THE PURIFICATION OF SEWAGE WATERS WHICH CONTAIN ORGANIC COMPOUNDS OF AN ANIONIC CHARACTER
Raffaello Fusco, Milan, Italy, assignor to Anic S.p.A., Palermo, Italy
Continuation of Ser. No. 734,189, Oct. 20, 1976, abandoned.
This application Aug. 21, 1978, Ser. No. 935,098
Claims priority, application Italy, Nov. 11, 1975, 29190 A/75
Int. Cl.[2] C02B *1/20*
U.S. Cl. 210—54 **1 Claim**

1. A method for the purification of sewage waters containing anionic organic compounds comprising the steps of adding to said water compounds having the general formula:



wherein R and R′ are hydrogen atoms or to lower alkyl groups (C_1–C_3), or R is an alkyl group, a cycloalkyl group, an aralkyl group or an aryl group and R′ a hydrogen atom, A is the residue of an aliphatic linear or branched hydrocarbon, or of an arylaliphatic hydrocarbon, or a residue derived from an aliphatic or mixed aliphatic-aromatic ether or thioether, X^- is an anion such as Cl^-, Br^-, OSO_4H^-, $CH_3SO_3^-$, or $ARSO_3^-$; precipitating said anionic organic compounds from said waters as saline derivatives and separating said waters from the precipitate.

4,178,243
METHOD AND APPARATUS FOR CONTROLLED DEWATERIZING OF COAL TREATMENT UNDERFLOW
Leonard Messer, Pittsburgh, Pa., assignor to American Minechem Corporation, Coraopolis, Pa.
Continuation of Ser. No. 630,214, Nov. 10, 1975, abandoned.
This application Mar. 15, 1978, Ser. No. 886,709
Int. Cl.[2] B01D *21/01;* **C02B** *1/20*
U.S. Cl. 210—54 **7 Claims**



1. A method of dewaterizing an aqueous slurry of fine solid particles comprising the steps of:

A. adding a flocculent lyophobic to water and lyophilic to fine solid particles to an aqueous slurry of fine solid particles to form a mixture;

B. charging said mixture to a thickener to separate water from said mixture by settling flocculated solids having a solids content of at least 35 percent;

C. impinging a radiation beam on the flocculated solids transverse the direction of travel of said solids adjacent discharge means from the thickener;

D. detecting with a detector means the impinged radiation to measure the density of the flocculated solids on which the radiation beam impinges and producing from the detector means an electrical signal proportional thereto;

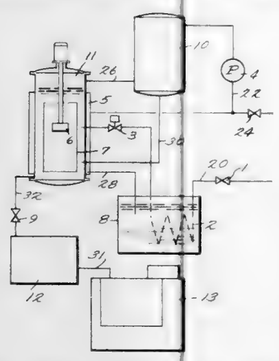
E. automatically regulating and controlling the rate of discharge of the flocculated solids from the thickener with a servovalve positioned in the conduit for discharging said flocculated solids from the thickener, said servovalve being responsive to the electrical signal produced by the detector means; and

F. passing the flocculated solids discharged from the thickener through a foraminal conduit section while vibrating said flocculated solids to remove water therefrom.

4,178,244
PROCESS FOR REMOVAL OF HARDENING AND GALVANIZING WASTE WATER
Helmut Kunst, Hanau, and Georg Wahl, Bergen-Enkheim, both of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany
Filed Jul. 19, 1977, Ser. No. 817,013
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1976, 2633772
Int. Cl.[2] C02C *5/00*
U.S. Cl. 210—71 **8 Claims**

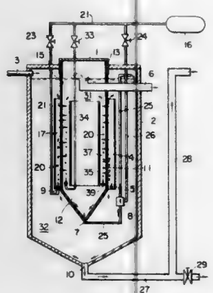
1. In a process for the elimination of toxic cyanide, nitrite, barium compound or heavy metal ions from waste water from a salt bath hardening or galvanizing operation by evaporation

of the toxic material containing waste water and complete detoxification of the evaporated concentrate in a salt bath, said waste water having a salt concentration below 300 g/l, the improvement comprising first evaporating the waste water to a salt concentration of 300 to 500 g/l and then supplying the



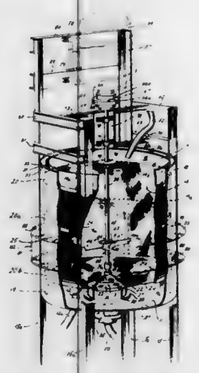
concentrated solution to a molten salt bath having a temperature of 300° to 600° C. consisting of 60–90 weight % alkali metal hydroxide, 5–20 weight % alkali metal nitrate and 5–20 weight % alkali metal sulfate to completely detoxify said evaporated concentrate.

4,178,245
FILTRATION METHOD
Azuma Nakaoka, and Sankichi Takahashi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 11, 1974, Ser. No. 514,129
Claims priority, application Japan, Oct. 12, 1973, 48-113950
Int. Cl.[2] B01D *23/24*
U.S. Cl. 210—81 **3 Claims**



1. A method of filtering sewage having suspended solids therein, comprising the steps of: passing the sewage through stationary filter material to generally maintain the solids on one side of said filter material and produce filtered water on the opposite side of the filter material; simultaneously passing a stream of gas bubbles along substantially the entire one side of the filter material for causing fluid pressure changes in the sewage around the filter material, and thereby vibrating the filter material continuously as a result of such pressure changes to dislodge the solids from the filter material and prevent clogging of the filter material; positively confining the stream of gas bubbles to flow along and closely adjacent substantially the entire surface of the one side of the filter material, for producing the vibration of the filter material, by means of a shelter member maintained at a fixed close spacing from the one side of said filter material.

4,178,246
SEPARATOR FOR DISCRETE SOLIDS FROM LIQUIDS
Max Klein, 257 Riveredge Rd., Tinton Falls, N.J. 07724
Filed May 31, 1977, Ser. No. 802,252
Int. Cl.[2] B01D *23/26*
U.S. Cl. 210—82 **17 Claims**



17. A method of concentrating and/or separating discrete pieces of solids such as granules, pellets and particles from a suspension, slurry or mixture of them in a liquid medium, which mixture contains a comparatively smaller amount of a substance that provokes blinding of the separation screen of certain filtering means tried for separating said solid pieces from said liquid medium, which method comprises

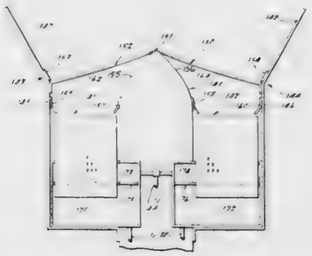
(a) feeding the aforesaid mixture into a basket-shaped first zone having a vertical cylindrical foraminous bounding surface and a bottom integral with it, said first zone being fixedly positioned coaxially within and (i) radially inwardly spaced away from a vertical cylindrical liquid-tight enclosing surface bounding an open-topped second zone bounded at its bottom by a liquid-tight surface integral with said vertical enclosing surface, and (ii) with the bottom of said first zone being upwardly spaced away from the bottom boundary of said second zone, thereby providing a cup-like portion of said second zone with the vertical annular portion between the vertical boundaries of the first and second zones and the bottom of said second zone being continuous with its annular portion located between the respective bottom portions of said two zones,

(b) while said mixture is accumulating in said first zone and filtrate from the mixture is accumulating in said vertical annular portion, exerting on the mixture circularly applied continuous pressure by a pair of diametrically opposed, rectangularly-shaped pressure-imparting means rigidly carried on a rotating shaft extending vertically coaxially in the basket-shaped zone and for at least the entire height thereof and said pressure imparting means from a level about midway of the lower half of that zone's height extending outwardly from the shaft to an extent of from about one-third to about two-thirds of the radius of that zone, thereby to develop and maintain in said mixture substantially cylindrically laminar movement as it is filling up said first zone and at the same time thereby permitting filtrate from said mixture to pass through said foraminous bounding wall and to accumulate in said second zone to a level therein at least equal to that of the final level of the mixture accumulating in said first zone, and

(c) continuing the feeding of said mixture into said first zone, while said circularly applied pressure is continued to develop and maintain in the top part of the mixture at least a shallow vortex and with substantially no turbulent agitation and to maintain in said mixture the aforesaid movement, at a rate to maintain the level of filtrate in said second zone at the same as that of the mixture in the first zone while at the same time allowing filtrate to leave from the bottom of said second zone at a rate to allow the filtrate accumulated in the second zone and the mixture accumulated in the first zone to remain at the same level, and

(d) allowing the feeding in of the mixture, the withdrawal of filtrate, application of circularly-acting pressure on the mixture, and maintenance of the described even level in both zones to continue until the maximum possible accumulation of concentrated solids is attained in the first zone (i) when the operation is conducted on a batch basis during the foregoing steps, and (ii) likewise when the operation is conducted on a continuous basis by withdrawing concentrated solids from the bottom of the first zone under conditions avoiding their admixture with the filtrate being discharged during the operation and with the concentrated solids withdrawal, filtrate withdrawal, and mixture feeding conducted each at its respective rate to enable maintaining the level of filtrate in the second zone at least equal to that of the mixture accumulated in the first zone.

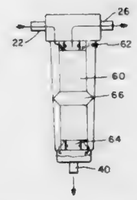
4,178,247
OIL SPILL RETRIEVAL SYSTEM
John J. Janson, Livonia, Mich., assignor to Jan-Bar Retrieval Corporation, Livonia, Mich.
Continuation-in-part of Ser. No. 802,026, May 31, 1977, Pat. No. 4,105,554. This application Aug. 2, 1978, Ser. No. 930,411
Int. Cl.[2] E02B *15/04*
U.S. Cl. 210—96.1 **36 Claims**



1. An oil retrieval system for retrieving oil spills and the like from bodies of water such as seas, lakes or the like and being operable from a boat, said system comprising: collecting means operatively connected with the boat for collecting the oil from the surface of the water, said collecting means collecting a mixture of oil and water, receiving tank means located on the boat for receiving the mixture of oil and water, separating means operatively connected with said receiving tank means for separating the oil and water, storage means for receiving and holding the separated oil, discharge means for discharging the water back to the body of water, monitor means for analyzing the water to be discharged and providing a first signal when the quantity of oil in the water is at a preselected low level and a second signal when the quantity of oil in the water is above said low level, said discharge means operable for discharging the water in response to said first signal and response to said second signal for transmitting the water to said separating means for an additional cycle, screen means including a screen structure located in front of said collecting means to block out debris from said collecting means, said screen means further comprising guide means for providing a funnel like construction for guiding the fluid into an area in front of and along said one side of said boat in relative proximity therewith and to said screen structure, said guide means having at least one gate and with said screen structure defining a V-shape and cooperating with said one gate for directing debris thereto whereby debris can be exited.

36. An oil retrieval system for retrieving oil spills and the like from bodies of water such as seas, lakes or the like and being operable from a boat, said system comprising: collecting means operatively connected with the boat for collecting the oil from the surface of the water, said collecting means collecting a mixture of oil and water, receiving tank means located on the boat for receiving the mixture of oil and water, separating means operatively connected with said receiving tank means for separating the oil and water, storage means for receiving and holding the separated oil, discharge means for discharging the water back to the body of water, monitor means for analyzing the water to be discharged and providing a first signal when the quantity of oil in the water is at a preselected low level and a second signal when the quantity of oil in the water is above said low level, said discharge means operable for discharging the water in response to said first signal and response to said second signal for transmitting the water to said separating means for an additional cycle, said boat being of a single hull construction with said collecting means comprising a first collecting unit located on one side of said boat and a second collecting unit located on the side of said boat opposite the side on which said first collecting unit is located, said first and second collecting units operable independently of each other for transmitting the mixture of oil and water to said receiving tank means.

4,178,248
NON-CLOGGING MICROPOROUS FILTER WITH CROSS FLOW OPERATION
Mark C. Porter, Pleasanton, and Wayne P. Olson, San Ramon, both of Calif., assignors to Nuclepore Corporation, Pleasanton, Calif.
Filed Nov. 1, 1977, Ser. No. 847,584
Int. Cl.[2] B01D *27/06*
U.S. Cl. 210—167 **3 Claims**



1. In a liquid filter, a filter cartridge, a shell for containing said filter cartridge, said cartridge having a set of inner and outer edges on opposite sides thereof defining together with said shell an inlet side for accepting material to be filtered and an outlet side opposite thereof for delivering a filtrate, said cartridge being constructed in a cylindrical pleated form in which the filter material is folded back and forth to define said set of inner and outer edges on opposite sides of the cartridge, the folds of said pleated form defining an inner boundary and an outer boundary for said filter located on concentric cylindrical boundaries, first port means forming an inlet port through said shell to the exterior of said inlet side of said cartridge, second port means forming a filtrate outlet on the other side of said filter cartridge and through said shell, third port means forming a bypass outlet through said shell on the inlet side of said cartridge and at a location remote from said first port means, a cylindrical sleeve surrounding a portion of the length of said cartridge in close fitting proximity to its outer boundary and leaving access rings at each end thereof, and means for preventing flow of liquid between said first inlet port and said third bypass port except between said sleeve and said

V 9892 DEC 11 79 UMI

filter cartridge, means for withdrawing a percentage of inlet liquid from said third port, means forming said bypass outlet to create a flow of liquid tangential to the folds of said filter cartridge on said inlet side, said first port means and third port means are disposed at remote locations so that filterable material passing from the first port means to the third port means flows solely between said inner outer filter cartridge boundaries and along the folds tangentially thereto.

4,178,249

MODULAR CONTAINER

Craig A. Councill, P.O. Box 777-H Rte. 1, Stevensville, Md. 21666

Filed Jun. 13, 1977, Ser. No. 805,866
Int. Cl.² B01D *27/02, 15/04*
U.S. Cl. 210—281 **19 Claims**



1. A modular container for maintaining ion-exchange particulate material within a chamber through which contaminated liquid passes, comprising:

(a) housing means having a contaminated liquid inlet and a liquid outlet, said housing means having a predetermined wall thickness;

(b) a pair of containment disks mounted within said housing means, each of said containment disks forming a plurality of rows of alternately undulating elements having a tortuous liquid flow path therethrough, said undulating elements being contoured to form a flow impingement surface in the direction of flow of said liquid throughout a cross-sectional flow area of said liquid, said containment disks and said housing means forming said chamber containing said ion-exchange particulate material, said undulating elements providing said tortuous liquid flow path and dispersal of said contaminated liquid in a transverse direction when taken with respect to said liquid flow prior to impingement; and,

(c) means for positionally mounting said containment disks within said housing means.

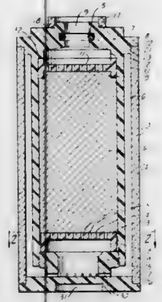
4,178,250

FILTER-PURIFIER CARTRIDGE HAVING MANUALLY SEPARABLE ELEMENTS

Isadore Turetsky, 23940 Welby Way, Canoga Park, Calif. 91307

Continuation-in-part of Ser. No. 910,029, May 26, 1978, abandoned. This application Jan. 10, 1979, Ser. No. 2,547
Int. Cl.² B01D *27/08*
U.S. Cl. 210—315 **5 Claims**

1. A filter-purifier cartridge for liquids having manually separable elements adapted to be inserted in a filter apparatus, comprising: a pervious tubular filter element adapted for radial flow therethrough, a manually separable hollow cylindrical purifier element having inlet and outlet means for flow of fluid therethrough, and containing a purifying medium confined between two foraminous members within the hollow core of said purifier element; said purifier element having a top wall, a concentric discharge passage through said top wall, said passage communicating with the fluid stream within said purifier element; a stepped flange located at the upper end section of the purifier element, said purifier element inserted into the hollow core of said tubular filter element, one end of said tubular filter being sealed and radially spaced from the main



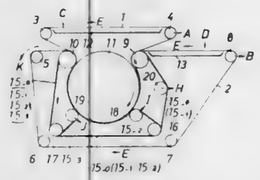
body of said purifier element by means of said stepped flange at the upper end section of said purifier element, thereby forming an intermediate annular channel; the remaining exposed end of said filter element being sealed and maintained in spaced relationship with said purifier element by means of a manually separable cartridge end closure which is aligned and joined to the lower end section of said purifier element, said end closure having a hollow core and a series of radial passages communicating with said hollow core; the annular channel communicating with the fluid stream within said purifier element by means of said radial passages and the hollow core within said end closure.

4,178,251

APPARATUS FOR DEHYDRATION OF SLUDGE

Akitoshi Iwatani, Marugame, Japan, assignor to Ishigaki Kiko Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1978, Ser. No. 935,696
Claims priority, application Japan, Dec. 20, 1977, 52-153719
Int. Cl.² B01D *33/04*
U.S. Cl. 210—350 **13 Claims**



1. In an apparatus for dehydrating sludge wherein at least one of the two endless belts, each trained around a plurality of rolls, is of water permeable filter medium, sludge feeding means is provided at the beginning of a path of travel of said two endless belts which are caused to run along said path of travel in contiguous relation with each other, said sludge feeding means being adapted to permit sludge to be carried between said two endless belts, and a drum supported in suitable bearings and a pressure belt trained around a plurality of rolls are provided to press said two endless belts in cooperation with

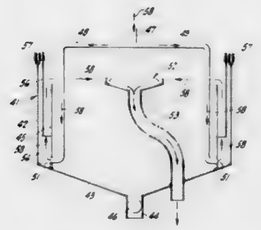
one another in their path of travel around the drum, said drum being in immediate contact with one of said two endless belts, said pressure belt being in immediate contact with the other of said two endless belts, the improvement comprising: said pressure belt being composed of a multiplicity of belt strips arranged in spaced relationship perpendicular to the movement of said two endless belts such that said belt strips do not overlap, said multiple belt strips being positioned along the path of the travel of said two endless belts and in contiguous relation therewith so as to cover any suitable number of stages into which said path of travel is divided.

4,178,252

DEVICE FOR SEPARATING PARTICLES FROM A FLUID SUSPENSION AND METHOD FOR SO DOING

Ray B. Krone, 645 Coolidge Street, Davis, Calif. 95616

Filed Aug. 31, 1978, Ser. No. 938,391
Int. Cl.² B01D *21/02*
U.S. Cl. 210—521 **1 Claim**



1. A device for separating particles from a fluid suspension comprising a container having an upright, circular-cylindrical, stationary outer wall with a free upper edge; a conical bottom plate at its peripheral edge united with the bottom edge of said outer wall; an upright, circular-cylindrical stationary inner plate disposed within said outer wall and extending to a predetermined height to leave an annular space therebetween; means for holding the lower edge of said inner plate continuously fastened to the edge of said bottom plate; means including orifices in the lower portion of said inner plate for discharging material into said annular space for upward flow therein; an intermediate plate of circular-cylindrical form disposed in said annular space between said outer wall and said inner plate; rollers on said intermediate plate engaging and movable on said upper edge of said outer wall; a weir substantially centered in the space enclosed by said inner plate and disposed at about said predetermined height; and a discharge pipe joined to and communicating with the interior of said weir and extending downwardly through said bottom plate, said inner plate being movable relative to said outer wall with a substantially constant normal distance between said inner plate and said outer wall.

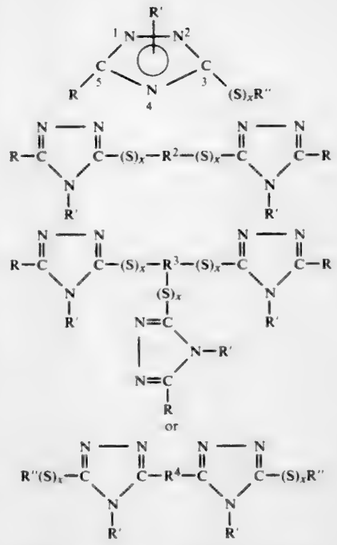
4,178,253

CORROSION INHIBITED LUBRICANT COMPOSITIONS

Peter I. Lee, Prestwood, and Brian Holt, Stretford, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 3, 1978, Ser. No. 892,711
Claims priority, application United Kingdom, Apr. 5, 1977, 14357/77
Int. Cl.² C10M *1/38*
U.S. Cl. 252—47 **6 Claims**

1. A lubricant composition comprising a major proportion of an oil of lubricating viscosity and from 0.001 to 10% by weight, based on the total composition, of a compound of the formula

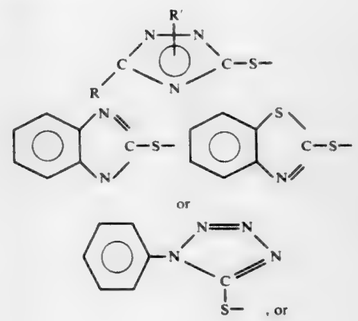


wherein X is an integer from 1 to 25; R, R′ and R″ are the same or different and each is hydrogen, a straight- or branched-chain alkyl having 1 to 20 carbon atoms; or said alkyl substituted by one or more halogen atoms or alkoxy groups having 1 to 12 carbon atoms; a straight- or branched-chain alkenyl having 2 to 12 carbon atoms; a straight- or branched-chain alkynyl having 2 to 12 carbon atoms; cycloalkyl having 3 to 12 carbon atoms; aryl having 6 to 10 carbon atoms; aralkenyl having 8 to 12 carbon atoms; aralkynyl having 8 to 12 carbon atoms; aralkyl having 7 to 20 carbon atoms; piperidyl, pyridyl; furyl; or said cycloalkyl, aryl, aralkenyl, aralkynyl, aralkyl, piperidyl, pyridyl or furyl substituted by one or more straight or branched alkyl having from 1 to 12 carbon atoms which alkyl groups may be substituted by halogen atoms, by alkoxy having 1 to 12 carbon atoms, by alkylthio having 1 to 18 carbon atoms, by alkylamino having 1 to 24 carbon atoms, by dialkylamino having 1 to 24 carbon atoms, by hydroxy, by cyano or by mixtures of said substituents; or

R is the group—$(S)_xR''$;

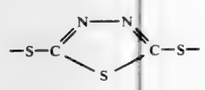
or when R and R′ are different from R″,

(a) R″ can be

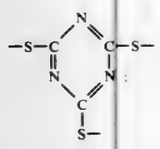


(b) R″ is the ammonium cation or a quaternary ammonium cation having 2 to 22 carbon atoms;

R^2 is

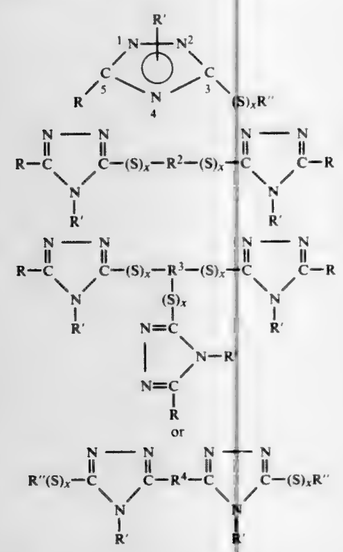


R^3 is



or R^2 and R^4 are alkylene having 1 to 12 carbon atoms; cycloalkylene having 5 to 12 carbon atoms, arylene having 6 to 10 carbon atoms, furandiyl or thiophenediyl.

5. A compound having the formula

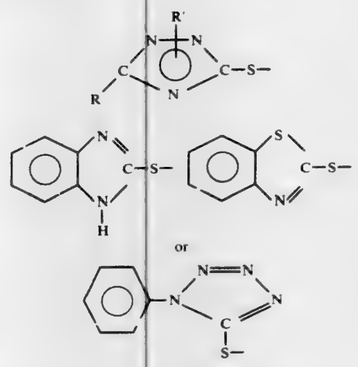


wherein x is an integer from 2 to 25; R, R′ and R″ are the same or different and each is hydrogen, a straight- or branched-chain alkyl having 1 to 20 carbon atoms; or said alkyl substituted by one or more halogen atoms or alkoxy groups having 1 to 12 carbon atoms; a straight- or branched-chain alkenyl having 2 to 12 carbon atoms; a straight- or branched-chain alkynyl having 2 to 12 carbon atoms; cycloalkyl having 3 to 12 carbon atoms; aryl having 6 to 10 carbon atoms; aralkenyl having 6 to 12 carbon atoms; aralkynyl having 8 to 12 carbon atoms; aralkyl having 7 to 20 carbon atoms; piperidyl, pyridyl; furyl; or said cycloalkyl, aryl, aralkenyl, aralkynyl, aralkyl, piperidyl, pyridyl or furyl substituted by one or more straight or branched alkyl having from 1 to 12 carbon atoms which alkyl groups may be substituted by halogen atoms, by alkoxy having 1 to 12 carbon atoms, by alkylthio having 1 to 18 carbon atoms, by alkylamino having 1 to 24 carbon atoms, by dialkylamino having 1 to 24 carbon atoms, by hydroxy, by cyano or by mixtures of said substituents; or

R is the group—$(S)_xR''$;

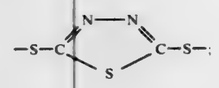
or when R and R′ are different from R″,

(a) R″ can be

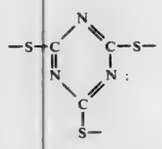


(b) R″ is the ammonium cation or a quaternary ammonium cation having 2 to 22 carbon atoms;

R^2 is



R^3 is



or R^2 and R^4 are alkylene having 1 to 12 carbon atoms; cycloalkylene having 5 to 12 carbon atoms, arylene having 6 to 10 carbon atoms, furandiyl or thiophenediyl.

4,178,254

FABRIC CARE COMPOSITIONS CONTAINING SMECTITE CLAY AND STARCH

John W. Leikhim, Cincinnati, and Sharon J. Mitchell, Forest Park, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 13, 1978, Ser. No. 885,933
Int. Cl.[2] D06M *13/00*
U.S. Cl. 252—8.6 **10 Claims**

1. A fabric care composition comprising:

(a) from about 0.5% to about 75% of a smectite clay selected from the group consisting of alkali metal and alkaline earth metal montmorillonites, saponites, hectorites and mixtures thereof having an ion exchange capacity of at least about 50 meq. per 100 grams;

(b) from about 1% to about 90% of a gelatinized vegetable starch; and

(c) from 0% to about 98% water.

4,178,255

DETERGENT COMPOSITIONS

Joseph F. Stima, Edison; Ronald S. Schreiber, Highland Park, and Annie S. Giordano, Piscataway, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed May 15, 1978, Ser. No. 905,718
Int. Cl.[2] D06M *13/50*
U.S. Cl. 252—8.8 **12 Claims**

1. A detergent composition comprising a surface active detergent and metakaolin, the ratio of metakaolin to surface active detergent being at least about 0.8:1.

4,178,256

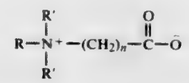
COMPOSITIONS FOR SOURING AND SOFTENING LAUNDERED TEXTILE MATERIALS, METHOD OF PREPARING THE SAME, AND STOCK SOLUTIONS PREPARED THEREFROM

John D. Ciko, Allen Park; John J. Cramer, and Geoffrey A. Jamieson, both of Wyandotte, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 545,382, Jan. 30, 1975, Pat. No. 4,053,423.
This application May 26, 1977, Ser. No. 800,796
Int. Cl.[2] D06M *13/38, 13/40*
U.S. Cl. 252—8.75 **18 Claims**

1. A stable homogeneous liquid composition for souring laundered textile materials and imparting softness thereto consisting essentially of

I. About 0.5–25% by weight of a softening agent for textile materials, the softening agent being a fatty amphoteric compound corresponding to the structural formula



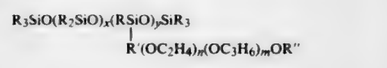
wherein R is selected from the group consisting of monovalent alkyl radicals and sulfonated monovalent alkyl radicals containing about 8–22 carbon atoms, R′ is selected from the group consisting of monovalent alkyl radicals and sulfonated monovalent alkyl radicals containing about 1–3 carbon atoms, and n is about 1–6, the said amphoteric compounds having non-acidic isoelectric ranges;

II. About 3–50% by weight of orthophosphoric acid as an acidic souring agent for laundered textile materials; and

III. About 25–96.5% by weight of water;

the said ingredients I, II and III being present in amounts whereby a stable homogeneous liquid composition is produced.

(C) from about 2 to about 6 parts by weight of an organopolysiloxane-polyoxyalkylene copolymer fluid having the average formula:



wherein R represents a monovalent hydrocarbon radical having from 1 to 10 carbon atoms, R′ represents a divalent alkylene radical having from 2 to 18 carbon atoms, R″ represents a monovalent hydrocarbon radical having from 1 to 6 carbon atoms, x has a value of 1 to 300, y has a value of 1 to 25, n has a value of 3 to 50, and m has a value of 3 to 50, with the proviso that at least 10 percent by weight of the polyoxyalkylene chain consists of oxypropylene units, and wherein said siloxane copolymer has an average molecular weight of about 600 to about 100,000,

(D) from about 7 to about 15 parts by weight of a trihydrocarbonsiloxy end-blocked dihydrocarbon siloxane fluid having a viscosity at about 25° C. of from about 200 to about 100,000 centistokes,

(E) from about 0.10 to about 0.35 parts by weight of a nonionic organo substituted cellulosic viscosity controller,

(F) from about 0.10 to about 0.45 parts by weight of an organic anti-bacterial agent, and

(G) from about 0.35 to about 1.2 parts by weight of the aqueous reaction product of an admixture consisting of (i) from about 0.10 to about 0.20 parts by weight of an organosubstituted benzoic acid, (ii) from about 0.15 to about 0.2 parts by weight of an organic amine, and (iii) from about 0.10 to about 0.80 parts by weight of water.

4,178,257

TIRE BAND PLY LUBRICANT POWDER

Daniel D. Berry, Bedford Hills, and Richard V. Girardi, Mahopac, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 6, 1978, Ser. No. 883,821
Int. Cl.[2] C10M *3/44, 7/48, 3/04, 7/02*
U.S. Cl. 252—21 **18 Claims**

1. A water soluble tire band ply lubricant powder consisting of, based upon 100 parts by weight of said powder, (A) from about 63 to about 85.45 parts by weight of an inorganic filler selected from the class consisting of mica particles and a mixture of mica and talc particles, said mixture containing up to 10 parts by weight of talc particles the remainder being mica particles, and containing adsorbed on the surface of said filler,

(B) from about 5 to about 14 parts by weight of a water soluble polyoxyalkylene glycol,

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4,178,258

LUBRICATING OIL COMPOSITION

Andrew G. Papay, Manchester, and Edward F. Zaweski, St. Louis, both of Mo., assignors to Edwin Cooper, Inc., St. Louis, Mo.

Filed May 18, 1978, Ser. No. 907,159
Int. Cl.[2] C10M *1/48, 1/38*
U.S. Cl. 252—32.7 E **13 Claims**

1. A lubricating oil composition suitable for use in the crankcase of an internal combustion engine, said composition comprising a major amount of mineral oil and a minor wear and friction reducing amount of an oil soluble molybdenum bis(-dialkyldithiocarbamate).

4,178,259

DISPERSANT MANNICH BASE COMPOSITIONS

John M. King, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 1, 1978, Ser. No. 901,919
Int. Cl.[2] C10M *1/54*
U.S. Cl. 252—42.7 **8 Claims**

1. A lubricating oil additive selected from a Mannich base condensation product and the alkaline earth metal salts thereof, said Mannich base being prepared by condensing formaldehyde and a polyamine with a sulfur-containing phenolic mixture consisting of (1) from 5 to 40% of a sulfurized alkylphenol and (2) from 95 to 60% of phenol alkylated with polyisobutene of 16 to 128 carbon atoms or a mixture of said phenol alkylated with polyisobutene and phenol alkylated with a propylene tetramer.

2. The calcium salt of said Mannich condensation product of claim 1 wherein said polyisobutene contains 32 to 100 carbon atoms.

4,178,260

ESTER BASED METAL WORKING LUBRICANTS

Brian A. Cook, Abingdon, and Thomas W. Brown, Didcot, both of England, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 626,662, Oct. 29, 1975, abandoned. This application Jul. 12, 1977, Ser. No. 814,857

Claims priority, application United Kingdom, Oct. 31, 1974, 47154/74

Int. Cl.[2] C10M *1/10*

U.S. Cl. 252—49.8 **9 Claims**

1. A lubricating oil composition comprising a mixture of (i) at least one pentaerythritol tetraester of at least one C_{16} to C_{20} aliphatic open-chain monocarboxylic acid, and (ii) at least one oil-compatible phosphorus compound selected from the group consisting of phosphoric acids, phosphorous acids, and alkyl acid phosphates in which the, or each, alkyl radical contains 1 to 4 carbon atoms; said compound or compounds (ii) being present in total amount of from 0.01 to 0.5 wt.% (calculated as phosphorus) based on the total weight of (i).

3. A composition as claimed in claim 1, wherein the pentaerythritol tetraester is pentaerythritol tetraoleate.

4. A composition as claimed in claim 1, wherein the said constituent (ii) is selected from phosphoric acids and said alkyl phosphates.

5. A composition as claimed in claim 4, wherein constituent (ii) is orthophosphoric acid.

7. A water-emulsifiable lubricating oil composition comprising the composition as defined in claim 1, a conventional emulsifier and a conventional mineral oil.

4,178,261

CARBOXYLIC ACID ESTERS AND THEIR USE AS A BASE LUBRICATING OIL

Rolf Dhein, and Karl-Heinz Hentschel, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

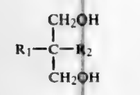
Filed Mar. 22, 1978, Ser. No. 889,118

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1977, 2713440

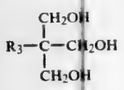
Int. Cl.[2] C10M *1/26;* **C11C** *3/06*

U.S. Cl. 252—57 **6 Claims**

1. A carboxylic acid ester preparable by completely or partially esterifying an acid component with a polyhydric alcohol component, said acid component comprising 6-cyclohexylhexanoic acid and up to 75 mol % based on the total acid component of an aliphatic monocarboxylic acid having 4 to 20 carbon atoms and said polyhydric alcohol having at least one member selected from the group consisting of glycerol, dipentaerythritol, a compound of the formula



wherein R_1 and R_2 are the same or different and are hydrogen or alkyl having 1 to 5 carbon atoms and a compound of the formula



wherein R_3 is alkyl having 1 to 6 carbon atoms or hydroxymethyl.

4,178,262

SPOTTING-AGENT COMPOSITION

John W. Compton, Taylor, and Stephen E. Eisenstein, Southfield, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 780,557, Mar. 23, 1977, Pat. No. 4,093,418. This application Aug. 22, 1977, Ser. No. 826,512

Int. Cl.[2] C11D *7/50*

U.S. Cl. 252—162 **4 Claims**

1. A spotting-agent composition for use in laundering garments which consists essentially of a solution of (1) about 10 weight percent or more of nonionic surfactant produced by reacting a mixture of fatty alcohols containing 10 to 18 carbon atoms (with the proviso that the proportion of such alcohols which is attributable to alcohols containing 17 or more carbon atoms is limited to about 20 percent by weight) with mixed lower-alkylene oxides selected from the group consisting of ethylene oxide and propylene oxide to such an extent as to have the mixed oxides comprise about 57 to 68 weight percent of the total fatty alcohols plus alkylene oxides used, with the proportion of ethylene oxide in the mixed oxides used being about 50 to 70%, in (2) an isoparaffinic solvent made of a mixture of isoparaffins containing an average of about 11 to 14 carbon atoms.

4,178,263

ORGANIC PEROXIDE COMPOSITIONS

Duane B. Priddy, Coleman, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 758,282, Jan. 10, 1977, abandoned. This application Oct. 31, 1977, Ser. No. 846,746

Int. Cl.[2] C11D *3/39;* **C07C** *179/06*

U.S. Cl. 252—186 **3 Claims**

1. An organic peroxide composition having reduced shock-sensitivity, the composition being consisting essentially of (a) a shock-sensitive organic peroxide and (b) an olefinically unsaturated monomer, the olefinically unsaturated monomer which does not homopolymerize, (a) being present in a proportion of 10 to 90 parts of weight and (b) being present in a proportion of 90 to 10 parts by weight per 100 parts by weight of (a) plus (b).

4,178,264

AIR TREATING GEL COMPOSITION

Allan L. Streit, Hackensack, N.J., and Edward Sansanelli, Rio De Janiero, Brazil, assignors to Airwick Industries, Inc., Carlstadt, N.J.

Filed Jan. 31, 1978, Ser. No. 873,827

Int. Cl.[2] B01J *13/00;* **A61K** *7/46;* **A61L** *13/04*

U.S. Cl. 252—316 **7 Claims**

1. A thermally stable gel composition comprising in an aqueous system from about 1.5–15%, by weight, of carrageenan and a stearate salt selected rom the group consisting of sodium, potassium and alkanolamine stearates, said carrageenan and stearate being present in a weight ratio of 0.3:1 to 5:1; from about 0.5–6.0%, by weight, of a volatile active agent; from about 1 to 20%, by weight, of a component for enhancing stearate solubility selected from the group consisting of glycols and C_2–C_{18} alcohols; and water to 100%.

4,178,265

OIL COAGULANT AND PROCESS FOR PREPARATION THEREOF

Yoshindo Matsuda; Shigeru Tomita, both of Tokyo; Keiji Abe, Higashi-Kurume, and Kazuki Terajima, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Feb. 22, 1978, Ser. No. 880,278

Claims priority, application Japan, Feb. 24, 1977, 52-19440

Int. Cl.[2] B01J *13/00;* **B01D** *17/02;* **C02B** *1/20*

U.S. Cl. 252—316 **29 Claims**

1. An oil coagulant comprising 100 parts by weight of a carboxymethyl yeast mixed with 10 to 150 parts by weight of a polyvalent metal salt of at least one carboxylic acid selected from the group consisting of a fatty acid having 8–22 carbon atoms and an alicyclic carboxylic acid having 8–22 carbon atoms.

12. A process for the preparation of oil coagulants which comprises mixing with (A) a carboxymethylated yeast obtained by carboxymethylating yeast and then heating the carboxymethylated yeast at a temperature within a range of from 50° to 90° C. for 0.5 to 5 hours, either (B) a polyvalent metal salt of at least one carboxylic acid selected from the group consisting of a higher fatty acid having 8 to 22 carbon atoms and an an alicyclic carboxylic acid having 8 to 22 carbon atoms or (C) a mixture capable of forming a polyvalent metal salt of a carboxylic acid comprising at least one carboxylic acid selected from the group consisting of a higher fatty acid having 8 to 22 carbon atoms and an alicyclic carboxylic acid having 8 to 22 carbon atoms, an alkali metal salt, ammonium salt or organic basic salt of said carboxylic acid, and a water soluble polyvalent metal salt of an inorganic acid, in which said (B) polyvalent metal salt of carboxylic acid or said (C) mixture capable of forming a polyvalent metal salt of carboxylic acid is mixed with said (A) carboxymethylated yeast at a compound ratio such that the polyvalent metal salt of carboxylic acid is present in an amount within a range of 10 to 150 parts by weight to 100 parts by weight of said (A) carboxymethylated yeast.

4,178,266

PROCESS FOR CONVEYING HOT CRUDE COKE OVEN GAS FROM COKE OVENS TO A POSITION OF UTILIZATION WHILE PREVENTING CONDENSATION OF HIGHER HYDROCARBONS

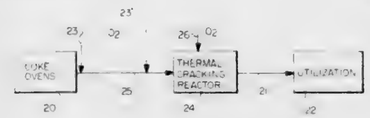
Rudolf Burkert; Claus Flockenhaus, both of Essen; Joachim F. Meckel, Heiligenhaus, and Dietrich Wagener, Essen, all of Fed. Rep. of Germany, assignors to Didier Engineering GmbH, Essen, Fed. Rep. of Germany

Filed Dec. 29, 1977, Ser. No. 865,723

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1977, 2700044

Int. Cl.[2] C01B *2/02*

U.S. Cl. 252—373 **7 Claims**



1. A process for conveying and treating hot, crude coke oven gas from coke ovens, said process comprising:

discharging hot, crude coke oven gas directly from coke ovens into a conveying means;

conveying said hot, crude coke oven gas through said conveying means, without any preliminary cooling or purification operations, to a thermal cracking reactor;

injecting a first quantity of O_2-containing gas into said coke oven gas within said thermal cracking reactor and thereby thermally cracking said coke oven gas to form a cracked gas;

injecting a second quantity of O_2-containing gas into said coke oven gas within said conveying means, thereby producing a partial combustion of said coke oven gas within said conveying means, and increasing the temperature of said coke oven gas within said conveying means to the reaction temperature of the thermal cracking operation within said thermal cracking reactor, thereby preventing the condensation of higher hydrocarbons from said coke oven gas within said conveying means; and

passing said cracked gas from said thermal cracking reactor to a position of utilization.

4,178,267

PASSIVATING METALS ON CRACKING CATALYSTS

Dwight L. McKay, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 819,027, Jul. 26, 1977, Pat. No. 4,141,858, which is a continuation-in-part of Ser. No. 671,231, Mar. 29, 1976, abandoned. This application Dec. 15, 1978, Ser. No. 970,078

Int. Cl.[2] B01J *21/20, 29/38, 27/02, 27/14*

U.S. Cl. 252—411 R **15 Claims**

1. A process for passivating metals selected from the group consisting of nickel, iron and vanadium on a catalyst consisting essentially of a clay based cracking catalyst comprising contacting the clay based cracking catalyst with at least one passivating compound selected from the group consisting of antimony selenide, antimony sulfide, antimony sulfate, bismuth selenide, bismuth sulfide and bismuth phosphate under elevated temperature conditions.

9. A process in accordance with claim 1 wherein said passivating compound is antimony selenide.

10. A process in accordance with claim 9 wherein the clay based cracking catalyst and the antimony selenide are intimately mixed with each other and subjected to high temperature and reducing conditions.

4,178,268

SELECTIVELY SULFIDED ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights; John C. Hayes, Palatine, and Roy T. Mitsche, Wauconda, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 795,055, May 9, 1977, Pat. No. 4,124,491. This application Jan. 25, 1978, Ser. No. 872,288

Int. Cl.[2] B01J *27/04*

U.S. Cl. 252—439 **8 Claims**

1. In a selectively sulfided catalytic composite comprising a halogenated porous material containing on an elemental basis about 0.01 to about 2 wt. % platinum group metal, about 0.01 to about 2 wt. % rhenium, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal and rhenium are uniformly dispersed throughout said halogenated porous material; wherein substantially all of said platinum group metal is present in the elemental metallic state; wherein said composite contains sulfur in an amount at least sufficient to provide an atomic ratio of sulfur to rhenium of about 0.5:1 so that a substantial portion of the rhenium is maintained in a sulfided state the improvement, which comprises the presence of Ziegler alumina as said porous material.

4,178,269

HYDROALKYLATION COMPOSITION AND PROCESS FOR PRODUCING SAID COMPOSITION

Timothy P. Murtha, and Ernest A. Zuech, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 766,640, Feb. 8, 1977, Pat. No. 4,094,920. This application Dec. 30, 1977, Ser. No. 866,135

Int. Cl.² B01J *27/06, 29/06*

U.S. Cl. 252—441 **16 Claims**

1. A composition comprising:

at least one platinum compound supported on a calcined, acidic, nickel and rare earth-treated crystalline zeolite which additionally has a halide content ranging from about 0.5 to about 10 milligrams of elemental halogen per gram of said composition,

wherein the rare earth content of the calcined, acidic, nickel and rare earth-treated crystalline zeolite is in the range of from about 2 to about 25 percent by weight of said composition; and

wherein the nickel content of the calcined, acidic nickel and rare earth-treated crystalline zeolite is in a range of from about 0.01 to about 15 percent by weight of said composition.

4,178,270

METHOD FOR SUPPORTING HYDROUS METAL OXIDE ON CARRIER

Kazunori Fujita, Tokaimura; Seiji Takeuchi, Hitachiota; Hisao Yamashita, and Fumito Nakajima, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 1, 1978, Ser. No. 882,334

Claims priority, application Japan, Mar. 1, 1977, 52/20877

Int. Cl.² C02B *7/44*

U.S. Cl. 252—447 **10 Claims**

1. A method for supporting a hydrous metal oxide on a carrier, which comprises hydrolyzing a metal salt near a surface of carrier in a pH range causing hydrolysis of the metal salt and allowing zeta potentials of the carrier and hydrous oxide of metal to have opposite polarities to each other.

4,178,271

SHEET-LIKE STRUCTURE OF POLYVINYL CHLORIDE, WHICH IS CAPABLE OF ABSORBING WATER VAPOR AND TRANSMITTING WATER VAPOR

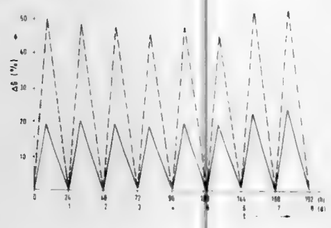
Walter Busch; Arno Holst, both of Wiesbaden, and Wilhelm Fischer, Pirmasens, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 22, 1977, Ser. No. 863,447

Claims priority, application Luxembourg, Dec. 24, 1976, 76471

Int. Cl.² C08L *1/28, 3/08*

U.S. Cl. 260—17 R **3 Claims**



1. In a sheet-like structure of polyvinyl chloride or a copolymer of vinyl chloride, which is capable of absorbing water vapor and transmitting water vapor, with a uniformly incorporated additive,

the improvement comprising that said additive is composed of polymeric particles of at least one modified starch ether or cellulose ether, which has been modified by cross-linking, effected by means of heat energy, radiation or an additional chemical compound, which is insoluble in water to the extent of at least 50% by weight, and which is swellable in aqueous liquids.

4,178,272

HOT-MELT ADHESIVES FOR BONDING POLYETHYLENE

Max F. Meyer, Jr.; Richard L. McConnell, and Frederick B. Joyner, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 2, 1977, Ser. No. 773,565

Int. Cl.² C08L *93/00, 23/14*

U.S. Cl. 260—27 R **8 Claims**

1. An adhesive composition capable of being used as a hot-melt adhesive comprising a blend of

(1) 35 to 88 weight percent substantially amorphous poly(-propylene-co-higher 1-olefin), in which the 1-olefin is a member of the group consisting of 1-hexene, 1-heptene, 1-octene, 1-nonene, and 1-decene, having a melt viscosity of about 10,000 to about 200,000 cp. at 190° C.,

(2) 10 to 50 weight percent of at least one tackifying resin having a softening point of at least 100° C. selected from the group consisting of hydrocarbon resins, polyterpene resins, and rosin esters, and

(3) 2 to 15 weight percent crystalline polypropylene or crystalline propylene/ethylene copolymers containing not more than 20 percent by weight ethylene, said polypropylene or propylene/ethylene copolymer having a melt viscosity of about 100 to 100,000 cp. at 190° C.

4,178,273

FIREPROOF BARRIER COATING COMPOSITIONS

William F. Brown, Wausau, Wis., assignor to Wausau Homes, Inc., Wausau, Wis.

Filed Oct. 10, 1978, Ser. No. 949,660

Int. Cl.² C08L *61/24*

U.S. Cl. 260—29.4 UA **5 Claims**

1. A composition adapted for coating the surface of a substrate and providing thereon an adherent, fireproof barrier coating, said composition comprising an aqueous dispersion containing vinyl acetate, titanium dioxide, pumice, zinc oxide, sodium silicate, hydrated magnesium aluminum silicate, a comminuted high temperature fluorocarbon resin, a furan resin, comminuted charcoal and a dispersing agent.

4,178,274

CASTING RESIN COMPOSITIONS FOR SEALING OPTO-ELECTRONIC COMPONENTS

Hans Denk, Gauting, and Ulrike Reeh, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 14, 1978, Ser. No. 886,432

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1976, 2642465

Int. Cl.² C08K *5/09, 5/10*

U.S. Cl. 260—31.8 E **15 Claims**

1. An acid anhydride-hardenable, epoxy-based casting resin composition which is liquid at room temperature comprising:

(a) at least one epoxy compound having a cycloaliphatic base and at least two oxiran rings;

(b) at least one carbonic acid anhydride;

(c) a zinc octoate; and

(d) a solvent selected from the group consisting of a low molecular weight polyol, a low molecular weight acid ester and mixtures thereof.

4,178,275

BLOCK COPOLYMERS OF DIENES AND HYDROCARBYL-SUBSTITUTED STYRENES AS ADHESIVES

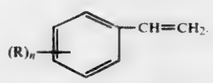
Henry L. Hsieh, and Floyd E. Naylor, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 636,488, Dec. 1, 1975, abandoned, which is a continuation-in-part of Ser. No. 141,996, May 10, 1971, abandoned. This application Jul. 7, 1977, Ser. No. 813,583

Int. Cl.² C08K *5/01, 5/02, 5/06, 5/07*

U.S. Cl. 260—33.6 A **13 Claims**

1. An adhesive composition comprising a block copolymer consisting essentially of radial copolymer of a conjugated diene styrene and a hydrocarbyl-substituted styrene of the formula



in which R is a hydrocarbon radial containing 1 to 12 carbon atoms selected from the group consisting of alkyl, cycloalkyl, aryl, alkenyl, cycloalkenyl, and combinations thereof and n is an integer having a value within the range of 1 to 5, said block copolymer having an inherent viscosity within the range of from about 0.5 to about 3, said conjugated diene containing 4 to 12 carbon atoms per molecule, a tackifier, and an organic liquid solvent, and wherein said block copolymer, based on 100 parts by weight of copolymer, contains from about 50 to about 90 parts by weight of said conjugated diene and from about 50 to about 10 parts by weight of said styrene and hydrocarbyl-substituted styrene and the amount of said hydrocarbyl-substituted styrene to the total of said conjugated diene, styrene, and hydrocarbyl-substituted styrene is within the range of from about 1 to about 20 parts by weight of said hydrocarbyl-substituted styrene per 100 parts by weight of the total of said conjugated diene, styrene, and hydrocarbyl-substituted styrene.

4,178,276

MOLD CORROSION INHIBITION

Robert S. Shue, and Donald L. Crain, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 21, 1978, Ser. No. 972,085

Int. Cl.² C08L *81/04*

U.S. Cl. 260—37 R **13 Claims**

1. A method for forming shaped products of normally solid poly(arylene sulfide) resin comprising (1) forming a poly(arylene sulfide) resin composition comprising poly(arylene sulfide) resin and a corrosion inhibiting amount of at least one metal oxalate wherein the metal is selected from Groups IA, IIA, and IIB of the Periodic Table of the Elements, and (2) molding said poly(arylene sulfide) resin composition.

4,178,277

MODIFIED POLYESTERS

Peter Gebauer; Wilhelm Kaüfer; Herbert Klinkenberg, and Hilde Söntgerath, all of Troisdorf, Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Jun. 14, 1978, Ser. No. 915,474

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727486

Int. Cl.² C08L *67/02;* **C08G** *63/76*

U.S. Cl. 260—40 R **34 Claims**

1. A modified polyester composition consisting essentially of the condensation product of a reaction mixture consisting essentially of a copolymer of terephthalic acid or a polyester forming derivative thereof, an aliphatic, cycloaliphatic or other aromatic dicarboxylic acid or its polyester forming derivative wherein the terephthalic acid or its polyester forming derivative comprises at least 50 mole percent based upon the combined amounts of acids or their polyester derivatives and a mixture of diols comprising at least 50 mole percent, based upon the combined amounts of diols, of butane diol-1,4, said copolymer having an arithmetical mean molecular weight M_n of more than 17,000 and up to 40,000, a carboxyl equivalent of at least 10 m Val/kg, a nitrogen content of less than 0.4 weight percent and urethane groups linked linearly to said copolymer.

19. A molding composition comprising the modified polyester of claim 1 and an additive.

20. A composition according to claim 19 wherein said said additive is a filler and said filler is present in an amount of 2 to 80 weight percent.

22. A composition according to claim 20 wherein said filler in glass sphere, glass powder, glass whiskers, asbestos fibers, carbon fibers, synthethic fibers, metal threads, metal chips, metal powder or mixtures thereof.

4,178,278

FRICTION MATERIAL FOR RAILROAD SERVICE

Harold J. Reynolds, Jr., Littleton, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 882,504, Mar. 1, 1978, abandoned. This application Jun. 26, 1978, Ser. No. 918,977

Int. Cl.² C08K *3/04, 3/08*

U.S. Cl. 260—42.22 **36 Claims**

1. A friction material composition suitable for use as a brake shoe for railroad service

(a) which comprises, in percent by volume:

organic component	30–60%
steel fibers	1–12%
carbonaceous component	5–30%
inorganic fillers	5–35%
additives	1–7%

(b) which also contains no lead metal, lead compounds or asbestos fiber; and

(c) wherein said organic component comprises rubber in an amount of at least 20% by volume of the composition.

4,178,279

PERMANENTLY STABILIZED POLYURETHANES

Paul Uhrhan, Cologne; Harald Oertel, Odenthal; Reinhard Lantzsch, Cologne; Ernst Roos, Odenthal, and Dieter Arlt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 19, 1977, Ser. No. 834,762

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1976, 2642374

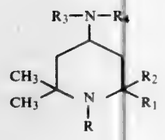
The portion of the term of this patent subsequent to Mar. 20, 1996, has been disclaimed.

Int. Cl.² C08K *5/34, 5/20*

U.S. Cl. 260—45.8 N **9 Claims**

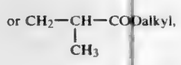
2. A process for the preparation of a permanently stabilized polyurethane which comprises incorporating a derivative of 2,2,6,6-tetraalkyl-piperidine having an active hydrogen-containing group in a reaction mixture used for the preparation of the polyurethane.

4. The process according to claim 2, wherein the derivative of 2,2,6,6-tetraalkyl-piperidine is represented by the following general formula:



wherein

R denotes hydrogen, a straight chain or branched chain alkyl group having from 1 to 20 C-atoms, an alkenyl group having from 3 to 5 C-atoms, an aralkyl group having from 7 to 12 C-atoms, CH_2—CH_2—CN, CH_2—CH_2—COO-alkyl



R_1 and R_2, which are identical or different, each denote a straight chain or branched chain alkyl group having from 1 to 6 C-atoms or, together with the ring carbon atoms to which they are attached, a cycloalkyl ring having from 5 to 7 C-atoms,

R_3 denotes hydrogen, a straight chain or branched chain alkyl group having from 1 to 20 C-atoms, a cycloalkyl group having from 5 to 12 C-atoms, an aralkyl group having from 7 to 12 C-atoms, an ω-cyanoalkyl group or a β-alkoxycarbonylalkyl group having from 1 to 3 C-atoms in the alkoxy part,

R_4 denotes hydrogen, CO—NH—NH_2 or, when R_3=H, a straight chain or branched chain alkyl group having from 1 to 20 C-atoms, a cycloalkyl group having from 5 to 12 C-atoms, an aralkyl group having from 7 to 12 C-atoms, an ω-cyanoalkyl group or a β-alkoxycarbonylalkyl group; or when R_3 is not H, an ω-aminoalkyl, an ω-N-alkylaminoalkyl, an ω-hydroxyalkyl or an ω-carboxylic acid hydrazidoalkyl group, and when R_3 and R_4 do not carry an active hydrogen-containing group, R may also denote an ω-aminoalkyl, β-hydroxyalkyl or β-carboxylic acid hydrazidoalkyl group.

4,178,280

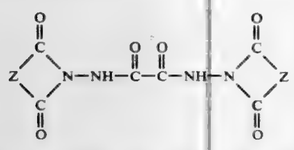
STABILIZED POLYOLEFIN COMPOSITION

Harry E. Hill, Wallingford, Conn., assignor to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

Division of Ser. No. 668,842, Mar. 22, 1976, Pat. No. 4,100,132.
This application Apr. 4, 1978, Ser. No. 893,466
Int. Cl.² C08K *5/34, 5/30;* **C07C** *109/087*
U.S. Cl. 260—45.8 A **28 Claims**

1. A compound selected from the group consisting of

(a) a dimethyl sulfoxide complex of a compound having the structural formula:

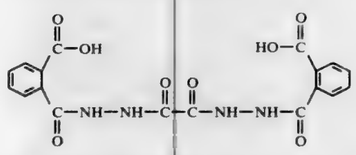


(I)

wherein Z is a bivalent radical having at least one C—C double bond and is selected from the group consisting of phenylene, vinylene, cyclohexenylene, cyclohexenylene substituted by a methyl group and norbornenylene;

(b) a tertiary amide complex of the compound of the structural formula (I) wherein Z is a bivalent radical having at least one C—C double bond and is selected from the group consisting of phenylene, vinylene, cyclohexenylene, cyclohexenylene substituted by a methyl group and norbornenylene;

(c) a compound having the structural formula:

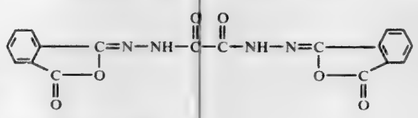


(II);

(d) a tertiary amide complex of the compound of structural formula (II);

(e) the hydrated enol form of the compound of the structural formula (I) wherein Z is phenylene;

(f) a compound having the structural formula:



(III);

and mixtures thereof.

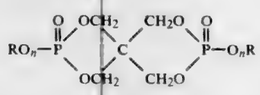
4,178,281

FLAME-RETARDANT POLYCARBONATE COMPOSITIONS

William E. Horn, Jr., Vincent, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 30, 1978, Ser. No. 910,258
Int. Cl.² C08K *5/02, 5/06, 5/52, 5/53*
U.S. Cl. 260—45.8 R **13 Claims**

1. An aromatic polycarbonate composition containing a minor proportion of at least one phosphorus compound having the structural formula:



wherein R is alkyl of 1–8 carbon atoms or aryl of 6–20 carbon atoms and n is 0 or 1.

4,178,282

VINYL RESIN STABILIZER

Kook J. Bae, East Northport, N.Y., assignor to Claremont Polychemical Corporation, Bethpage, N.Y.

Filed Mar. 16, 1978, Ser. No. 887,107
Int. Cl.² C08K *5/09, 5/52, 5/13*
U.S. Cl. 260—45.75 W **44 Claims**

1. A stabilizer composition especially adapted for use as a stabilizer for halogenated hydrocarbon resins which comprises at least one alkali metal salt of an organic acidic compound selected from the group consisting of carboxylic acids and phenols, at least one alkaline earth metal salt of an organic acidic compound selected from the group consisting of carboxylic acids and phenols, zinc chloride dissolved in an organic hydroxyl containing compound or an organic diphosphite, at least one organophosphite, and at least one inert organic solvent therefor.

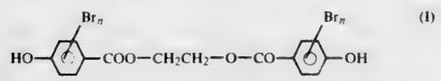
4,178,283

COMPOUNDS FOR OBTAINING POLYMERIC FLAMEPROOFING AGENTS AND THE PROCESS FOR OBTAINING THEM, AS WELL AS THE FLAMEPROOFING AGENTS THUS OBTAINED

Paul Couchoud, Dardilly, France, assignor to Rhone-Poulenc-Textile, Paris, France

Division of Ser. No. 790,997, Apr. 26, 1977, Pat. No. 4,117,042.
This application Mar. 8, 1978, Ser. No. 884,587
Claims priority, application France, May 5, 1976, 76 13664
Int. Cl.² C08K *5/53;* **C07C** *69/84*
U.S. Cl. 260—45.85 R **3 Claims**

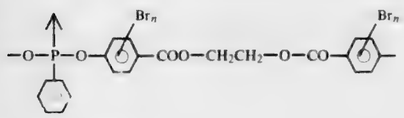
1. A phenol having the formula:



(I)

wherein n is 2.

2. Polyester flameproofed by admixture with an aromatic polyphenylphosphonate consisting of recurring units of the formula:



(II)

in which n equals 0 or 2.

4,178,284

OCTAPEPTIDES

Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Dec. 11, 1978, Ser. No. 968,658
Int. Cl.² C07C *103/52;* **A61K** *37/00*
U.S. Cl. 260—112.5 R **10 Claims**

1. A compound of the formula

H-Tyr-X_1-Gly-Phe-X_2-Lys-Gly-X_3-OH

in which

X_1 is Gly or D-Ala

X_2 is Met, Leu, D-Met or D-Leu, and

X_3 is Glu or Gln

or a pharmaceutically acceptable salt thereof.

4,178,285

SEPARATION OF ACTIVE α_1-ACID GLYCOPROTEIN AND UTILIZATION IN THE LIPOPROTEIN LIPASE ENZYME SYSTEM

James M. Felts, 2299 Pacific Ave. #62, San Francisco, Calif. 94115, and Ilona Staprans, 2052 20th St., San Francisco, Calif. 94117

Filed Dec. 20, 1978, Ser. No. 971,484
Int. Cl.² C07G *7/00, 15/00*
U.S. Cl. 260—112 R **4 Claims**

1. A method of separating the active α_1-acid glycoprotein fraction, which contains a co-factor in the lipoprotein lipase reaction, from nephrotic urine as follows:

(a) concentrate the said urine to about 10–20% by volume;

(b) precipitate undesired protein at pH 4 with ammonium sulfate;

(c) recover the α_1-acid glycoprotein fraction from the supernatant, neutralize with solid $NaHCO_3$, and purify by dialysis versus H_2O and lyophilize.

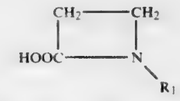
4,178,286

β-LACTAMS, THEIR PRODUCTION, INTERMEDIATES THERETO AND DERIVATIVES THEREOF

Harry H. Wasserman, and Bruce H. Lipshutz, both of New Haven, Conn., assignors to Research Corporation, New York, N.Y.

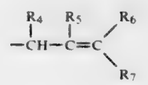
Filed Oct. 28, 1976, Ser. No. 736,343
Int. Cl.² C07D *205/08, 405/06*
U.S. Cl. 260—239 A **7 Claims**

1. A process for preparing a lactam from an aminocarboxylic acid of the formula



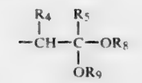
where R_1 is selected from the group consisting of:

(a) an alkenyl group of the formula



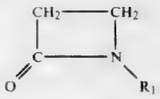
wherein R_4 is phenyl, phenylalkyl of 1–4 carbon atoms in the alkyl group or phenylalkenyl of 2–4 carbon atoms in the alkenyl group, each of which is unsubstituted or monosubstituted by lower alkyl, lower alkoxy or halogen; and R_5, R_6 and R_7 are hydrogen or alkyl of 1–3 carbon atoms; and

(b) an acetal of the formula



wherein R_4 and R_5 have the above-indicated values while R_8 and R_9 are each alkyl of 1–6 carbon atoms or together form ethylenedioxy or propylenedioxy;

which comprises oxygenation of a dianion formed at low temperatures by reacting said aminocarboxylic acid with a non-nucleophilic base whose corresponding conjugate acid has a pKa equal to or greater than 19 in a polar, aprotic solvent to form a corresponding dianion intermediate and acidification of said intermediate to form a corresponding lactam of the formula



wherein R_1 has the above-indicated values.

4,178,287

PROCESS FOR THE PURIFICATION OF CAPROLACTAM BY MEANS OF OZONE

Roberto Mattone, Frascati, and Mario Catoni, Colleferro, both of Italy, assignors to SNIA Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A., Italy

Continuation of Ser. No. 782,092, Mar. 28, 1977, abandoned.
This application Dec. 12, 1978, Ser. No. 968,807
Claims priority, application Italy, Apr. 9, 1976, 22108 A/76
Int. Cl.² C07D *201/16*
U.S. Cl. 260—239.3 A **5 Claims**

1. In a process for the purification of caprolactam from

oxidizable impurities present therein, by treatment with an oxidizing agent, the improvement which comprises dissolving caprolactam containing oxidizable impurities in water to form an aqueous solution and contacting said aqueous solution with ozone as said oxidizing agent, the ozone:caprolactam ratio being between about 150 to 1500 milligrams of ozone per kilogram of caprolactam.

4,178,288

SULFAMINOALKYL SUBSTITUTED TETRAZOLE THIOL INTERMEDIATES FOR PREPARING CEPHALOSPORINS

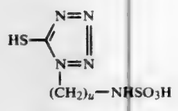
David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 704,142, Jul. 12, 1976, Pat. No. 4,118,491, which is a continuation-in-part of Ser. No. 665,837, Mar. 11, 1976, abandoned, which is a continuation-in-part of Ser. No. 627,164, Oct. 30, 1975, abandoned. This application Jul. 14, 1978, Ser. No. 924,523

Int. Cl.[2] C07D *257/04*

U.S. Cl. 548—251 **2 Claims**

1. A compound of the formula:



in which n is two to five.

4,178,289

CARBAZOLE ACETIC ACID DERIVATIVES

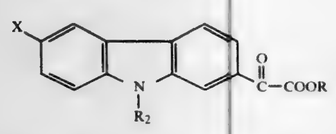
Leo Berger, Montclair; Alfred J. Corraz, Wayne; David R. Parrish, Glen Ridge, and John W. Scott, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 919,010, Jun. 26, 1978. This application Jan. 11, 1979, Ser. No. 2,486

Int. Cl.[2] C07D *209/86*

U.S. Cl. 260—315 **9 Claims**

1. A compound of the formula



wherein R is hydrogen or lower alkyl, R_2 is hydrogen or R_1OC—, wherein R_1 is lower alkyl, and X is hydrogen or chlorine.

9. 6-Chloro-α-methylenecarbazole-2-acetic acid.

4,178,290

DITHIINOACETIC ACID AND ITS PREPARATION

Christian Berger, Le Plessis Robinson; Dominique Deprez, Longjumeau; Daniel Farge, Thiais; Claude Moutonnier, Le Plessis Robinson, and Gerard Wolff, Vitry, all of France, assignors to Rhone-Poulenc Industries, Paris, France

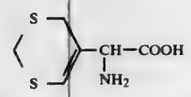
Filed Jun. 6, 1978, Ser. No. 913,088

Claims priority, application France, Jun. 9, 1977, 77 17663; Mar. 29, 1978, 78 09042; Mar. 30, 1978, 78 09224

Int. Cl.[2] C07D *339/08*

U.S. Cl. 549—22 **5 Claims**

1. The 1,3-dithiinoacetic acid of the formula:



in which the amine function is free or protected by a tert.-butoxycarbonyl or 2,2,2-trichloroethoxycarbonyl radical, in its D, L and D,L forms.

4,178,291

SUBSTITUTED ACYL DERIVATIVES OF AMINO ACIDS

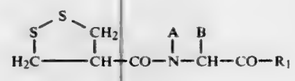
Miguel A. Ondetti, Princeton, and Frank L. Weisenborn, Titusville both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 889,769, Mar. 24, 1978, Pat. No. 4,154,936, which is a division of Ser. No. 747,280, Dec. 3, 1976, Pat. No. 4,116,962. This application Dec. 4, 1978, Ser. No. 966,284

Int. Cl.[2] C07D *339/04*

U.S. Cl. 549—39 **2 Claims**

1. A compound of the formula



wherein

R_1 is hydroxy or lower alkoxy;

A is hydrogen, lower alkyl or hydroxy-lower alkylene; and

B is hydrogen, lower alkyl, hydroxy-lower alkylene, amino-lower alkylene, guanidino-lower alkylene, mercapto-lower alkylene, lower alkylmercapto-lower alkylene, carbamoyl-lower alkylene or carboxy lower alkylene.

4,178,292

PROCESS FOR THE PREPARATION OF OXAZIRIDINE

Pierre Tellier, Oullins, and Francis Weiss, Benite, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Continuation of Ser. No. 412,407, Nov. 2, 1973, abandoned. This application Oct. 23, 1975, Ser. No. 625,113

Claims priority, application France, Nov. 3, 1972, 72.38897

Int. Cl.[2] C07D *273/00, 413/04*

U.S. Cl. 260—333 **3 Claims**

1. In the method of preparing oxaziridine which consists of reacting hydrogen peroxide with an azomethinic derivative or with a mixture of a carbonyl compound and a primary amine in the presence of a hydrogen peroxide catalyst, the improvement comprising carrying out the reaction in the presence of catalytic amounts of selenium or of oxygenated compounds of selenium.

4,178,293

ISOINDOLINYL DERIVATIVES

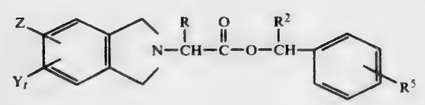
Clive A. Henrick; Robert L. Carney, and Jeffrey N. Labovitz, all of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 896,261, Apr. 14, 1978, abandoned. This application Jun. 12, 1978, Ser. No. 915,045

Int. Cl.[2] A01N *9/22*; **C07D** *209/44, 217/04*

U.S. Cl. 260—326.1 **18 Claims**

1. A compound of the formula:



wherein,

R is isopropyl;

R^2 is hydrogen, cyano, methyl or ethynyl;

R^5 is phenoxy;

Z is hydrogen, bromo, chloro or fluoro;

Y is bromo, chloro, fluoro or trifluoromethyl; and

t is zero, one, two or three; and the salts thereof of strong inorganic acids or organic acids.

4,178,294

p-TRIMETHYLSILYLOXYPHENYL GLYCYLOXY SUCCINIMIDE

Erling Guddal, Skovlunde, Denmark, assignor to Novo Industri A/S, Bagsvaard, Denmark

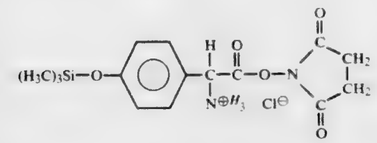
Division of Ser. No. 693,516, Jun. 7, 1976, Pat. No. 4,098,796. This application Nov. 2, 1977, Ser. No. 847,855

Claims priority, application United Kingdom, Jun. 13, 1975, 25447/75

Int. Cl.[2] C07F *7/18*

U.S. Cl. 260—326.4 **1 Claim**

1. A chemical compound of the formula:



4,178,295

METHOD OF PREPARING PHTHALIDE

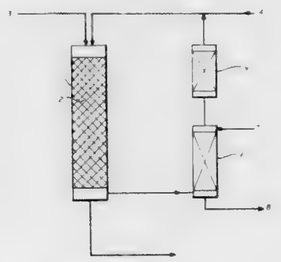
Fritz Englaender, Bonn-Bad Godesberg, and Fritz Robert Kappler, Troisdorf, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed May 2, 1978, Ser. No. 902,201

Claims priority, application Fed. Rep. of Germany, May 10, 1977, 2720929

Int. Cl.[2] C07D *307/88*

U.S. Cl. 260—343.3 R **9 Claims**



1. In a process for preparing phthalide by contacting chlorophthalide with hydrogen in the presence of a catalyst at a temperature between 50° and 350° C., the improvement which consists essentially of flowing chlorophthalide continuously in the fluid form through a fixedly disposed solid catalyst bed of grain size 1 to 12 mm, passing a stoichiometric excess amount of hydrogen gas therethrough at such rate so as to sweep off hydrogen chloride formed as a by-product and withdrawing phthalide from said reactor in fluid form and continuously withdrawing hydrogen gas and hydrogen chloride from said reactor.

4,178,296

INSECT PHEROMONE

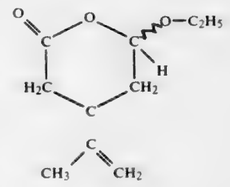
Richard J. Anderson, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 836,324, Mar. 13, 1978. This application Nov. 24, 1978, Ser. No. 963,535

Int. Cl.[2] C07D *309/30*

U.S. Cl. 260—343.5 **1 Claim**

1. The compound of the formula:



4,178,297

PREPARATION OF UNSATURATED ALCOHOLS AND INTERMEDIATES THEREIN

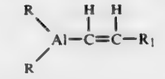
Spencer C. Watson; Dennis B. Malpass, and G. Scott Yeargin, all of La Porte, Tex., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Continuation of Ser. No. 739,780, Nov. 8, 1976, abandoned. This application Nov. 16, 1978, Ser. No. 961,360

Int. Cl.[2] C07D *307/00*

U.S. Cl. 260—346.11 **4 Claims**

1. A composition comprising predominantly the cis-isomer of a compound having the generic formula:



wherein R can be the same or different and is selected from a straight or branched chain alkyl group having from 1 to 6 carbon atoms; R_1 is selected from a straight or branched chain alkyl group having from 1 to 20 carbon atoms; and at least a molar equivalent of a stabilizing Lewis base coordinating agent selected from tetrahydrofuran, tetrahydropyran and dioxane.

4. A composition of claim 1 wherein the coordinating agent is tetrahydrofuran.

4,178,298

PROCESS FOR PREPARING MALEIC ANHYDRIDE

Giancarlo Stefani, Bergamo, Italy, and Pietro Fontana, Schaffhausen, Switzerland, assignors to Lonza, Ltd., Gampel, Switzerland

Division of Ser. No. 799,331, May 23, 1977. This application Oct. 12, 1977, Ser. No. 841,533

Claims priority, application Switzerland, May 21, 1976, 6466/76

Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—346.75 **12 Claims**

1. Process which comprises converting a straight-chain C_4-hydrocarbon in the gaseous phase to maleic anhydride using an activated catalyst, which can be reactivated, for oxidation reactions on the basis of a mixed oxide of vanadium and

phosphorus, said vanadium having an average valence of less than +3.9, said catalyst having been activated at a temperature of 300° to 450° C. by passing over the mixed oxide a gaseous hydrocarbon component, which has 2 to 6 carbon atoms, in the absence of molecular oxygen, said catalyst having been calcined before activation, and said catalyst having an atomic ratio of phosphorus to vanadium between 1.05 to 1 and 1.10 to 1.

4,178,299

PROCESS FOR PREPARING 1,3-DIACYL GLYCEROLS

Daniel A. Dunnigan, Winthrop Harbor, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 27, 1978, Ser. No. 890,433
Int. Cl.[2] C11C *3/12*; C09F *5/08*
U.S. Cl. 260—409 **10 Claims**

1. The process of preparing a 1,3-diacylglycerol consisting essentially in hydrogenating the corresponding 1,3-dialkanoylacetone in the presence of an inert neutral solvent and finely divided metallic ruthenium on an inert support at a temperature between 0° C. and the boiling point of the reaction mixture and at a hydrogen pressure of 0–30 atm.

4,178,300

SOLUTIONS OF ORGANIC MAGNESIUM COMPOUNDS CONTAINING OXYGEN IN HYDROCARBONS

Cornelis E. P. V. van den Berg, Geleen, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Oct. 31, 1978, Ser. No. 957,002
Claims priority, application Netherlands, Oct. 31, 1977, 7711923
Int. Cl.[2] C11C *1/00*; C07C *51/00, 27/00*
U.S. Cl. 260—413 **17 Claims**

1. A process for the preparation of low viscosity solutions of organooxy magnesium compounds, in which the organic radicals attached to magnesium by way of an oxygen atom contain from 3 to 30 carbon atoms each, and together at least 7 carbon atoms, which consists essentially in dissolving said compound in a hydrocarbon solvent in the presence of at least 5 mol %, calculated to the magnesium compound, of an organooxy transition metal compound from Groups IV through VI of the Periodic Table.

4,178,301

BENZOIC ACID DERIVATIVES

Tellis A. Martin, and William T. Comer, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 889,667, Mar. 24, 1978, Pat. No. 4,132,802, which is a division of Ser. No. 733,598, Oct. 18, 1976, Pat. No. 4,096,277, which is a division of Ser. No. 579,650, May 21, 1975, Pat. No. 4,005,222. This application Oct. 16, 1978, Ser. No. 952,034
Int. Cl.[2] C07C *153/11*
U.S. Cl. 260—455 R **1 Claim**

1. 4-[2-(Acetylthio)acetamido]benzoic acid.

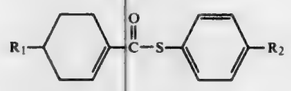
4,178,302

NEMATIC LIQUID CRYSTALLINE COMPOUNDS

Hisato Sato, Tokyo; Haruyoshi Takatsu, Kodaira, and Masayuki Tazume, Urawa, all of Japan, assignors to Dainippon Ink & Chemicals, Inc., Tokyo, Japan

Filed Nov. 21, 1978, Ser. No. 962,618
Claims priority, application Japan, Apr. 11, 1978, 53-41787
Int. Cl.[2] C07C *153/11*
U.S. Cl. 260—455 R **21 Claims**

1. A compound of the formula



wherein R_1 represents a linear alkyl group containing 3 to 7 carbon atoms and R_2 represents a linear alkoxy group containing 2 to 5 carbon atoms.

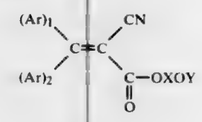
4,178,303

(2-CYANO-3,3-DIPHENYLACRYLOXY) ALKYLENE ACRYLIC ACID ESTERS

Donald H. Lorenz, Basking Ridge, and Bruce A. Gruber, Bloomingdale, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Jan. 26, 1979, Ser. No. 6,787
Int. Cl.[2] C07C *121/70*
U.S. Cl. 260—465 D **11 Claims**

1. Copolymerizable ultraviolet light absorber compounds having the formula:



where

$(Ar)_1$ and $(AR)_2$ are aromatic carbocyclic nuclei of the benzene and naphthalene series and are independently selected from phenyl or phenyl substituted with alkyl, halo, alkoxy, carboxy, carbalkoxy, cyano, acetyl, benzoyl, phenyl, alkyl phenyl, phenoxy phenyl, alkyl substituted phenoxy, or alkoxy phenyl substituted phenyl, and naphthyl;

X is alkylene, C_2–C_{17}, unsubstituted or substituted with halo, cyano, alkyl C_1–C_6, alkoxy C_1–C_6, alkoxyalkyl C_1–C_6 or alkoxyalkyleneoxy C_1–C_6; and,

Y is a copolymerizable radical selected from acryloyl C_3–C_{12}, alkylacryoyl C_3–C_{12}, acryloxyalkyl C_3–C_{12}, acryloxyhydroxyalkyl C_3–C_{12} and alkylacryloxyhydroxyalkyl C_3–C_{12}.

4,178,304

METHOD OF PRODUCING ORTHO-AMINOBENZONITRILE

Jury N. Litvishkov, ulitsa Gadzhibekova, 37-43, blok 3, kv. 44; Medzhid R. O. Efendiev, ulitsa 2 Zavodskaya, 9/1, kv. 24; Ramiz G. K. O. Rizaev, ulitsa Sharif-Zade, 148, blok 5, kv. 67, and Khalida Y. K. Kulieva, ulitsa Shaumiana, 28, kv. 27, all of Baku, U.S.S.R.

Filed Mar. 13, 1978, Ser. No. 885,366
Int. Cl.[2] C07C *121/78, 120/00, 120/14*
U.S. Cl. 260—465 E **4 Claims**

1. Method of producing ortho-aminobenzontrile, which comprises reacting ortho-toluidine with ammonia at a temperature of 360°–460° C. in the presence of oxygen, or a mixture thereof with inert gases, and a catalyst consisting essentially of a mixture of oxides of vanadium, antimony, bismuth, and phosphorus applied to a support, said oxides being present in a ratio by weight of 5–12:3–9:1–9:0.5–4, respectively.

4,178,305

OXIDATIVE DEHYDROGENATION OF PROPIONITRILE TO ACRYLONITRILE

Charles R. Campbell; William A. Heckle, and Marion J. Mathews, all of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 857,835, Dec. 5, 1977, abandoned, and a continuation-in-part of Ser. No. 732,556, Oct. 15, 1976, abandoned. This application Oct. 23, 1978, Ser. No. 953,984
Int. Cl.[2] C07C *120/00, 121/32*
U.S. Cl. 260—465.9 **6 Claims**

1. A primarily oxidative process for dehydrogenation of propionitrile to acrylonitrile comprising subjecting propionitrile to a temperature of about 725°–900° C. in a reaction medium consisting essentially of the propionitrile, a metal oxide oxygen donor, and an alumina carrier, the metal oxide being present in an excess of about 15% by weight of the metal oxide required to furnish the oxygen necessary for oxidative dehydrogenation of a propionitrile, the metal oxide oxygen donor being selected from the group consisting of stannic oxide, lead oxide, zinc oxide and antimony oxide.

4,178,306

PREPARATION OF N-(PHOSPHONOACETYL)-L-ASPARTIC ACID

Jack L. Parsons, 800 Maple Rd., East Aurora, N.Y. 14050

Filed Aug. 10, 1978, Ser. No. 932,487
Int. Cl.[2] C07F *9/38*
U.S. Cl. 260—502.5 **3 Claims**

1. In a method for the preparation of a sodium salt of N-(phosphonoacetyl)-L-aspartic acid, the improvement which comprises reacting L-aspartic acid, dibenzyl ester p-toluenesulfonate with triethylamine, followed by the addition of phosphonoacetyl chloride to produce the N-(phosphonoacetyl)-L-aspartic acid moiety in the form of the dibenzyl ester, wherein the carboxyl groups of the N-(phosphonoacetyl)-L-aspartic acid are esterified, and adding cyclohexylamine under anhydrous conditions to produce the cyclohexylamine salt of said dibenzyl ester, and hydrolyzing the cyclohexylamine salt to produce a sodium salt of N-(phosphonoacetyl)-L-aspartic acid.

4,178,307

PROCESS FOR PREPARING SULPHONIC ACIDS AND SULPHONATES

Aristide Boy; Henri Galy, both of Pau; Raoul Ivaldi, Orthez, and Hubert Passedroit, Gan, all of France, assignors to Ato Chimie, Paris, France

Continuation-in-part of Ser. No. 732,120, Oct. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 645,092, Dec. 29, 1975, abandoned, which is a continuation of Ser. No. 507,246, Sep. 18, 1974, abandoned, which is a continuation of Ser. No. 169,145, Aug. 4, 1971, abandoned. This application Apr. 12, 1978, Ser. No. 895,549
Claims priority, application France, Aug. 7, 1970, 70.29211
Int. Cl.[2] C07B *13/00*; C07C *143/02*
U.S. Cl. 260—504 S **10 Claims**

1. A process for separating the sulphonic acids in an untreated paraffin sulphonic solution containing in addition to said paraffin sulphonic acids, sulphuric acid, water, and nonsulphonated paraffins, which comprises:

(a) admixing with the paraffin sulphonic acid solution, at least one slightly polar solvent selected from the group consisting of alkanones, cycloalkanones, aliphatic ethers, cycloaliphatic ethers, alkyl alkanoates, cycloalkylalkanoates, alkylcycloalkanoates and aliphatic ketoesters containing at least 5 carbon atoms, having a solubility in water less than 7% by weight, which forms an azeotrope with water, thereby forming a mixture having an organic phase containing paraffin sulphonic acids dissolved therein and an aqueous phase containing the sulphuric acid;

(b) separating said organic phase from said aqueous phase;

(c) neutralizing said separated organic phase by admixture with a composition selected from the group consisting of alkali metal hydroxides, alkali metal carbonates, alkaline earth metal oxides, alkaline earth metal hydroxides, and alkaline earth metal carbonates thereby converting the sulphonic acids present in said organic phase into sulphonates, and forming a neutralized organic phase wherein the ratio of the amount of water to the amount of slightly polar solvent in said neutralized phase is at most equal to the corresponding ratio for the azeotrope which forms between water and the slightly polar solvent; and

(d) removing the volatile components from the neutralized organic phase to recover the sulphonates under temperature and pressure conditions whereby said sulphonates are in a molten state.

4,178,308

PROCESS FOR THE PREPARATION OF 1-AMINO-8-NAPHTHOL-3,6-DISULPHONIC ACID (H-ACID)

Willi Schössler, Cologne; Horst Behre, Odenthal, and Rolf Pütter, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 28, 1978, Ser. No. 920,033
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1977, 2732291
Int. Cl.[2] C07C *143/66*
U.S. Cl. 260—509 **11 Claims**

1. A process for the preparation of a mono-alkali metal salt of 1-amino-8-naphthol-3,6disulphonic acid which comprises reacting 1-naphthylamine-3,6,8-trisulphonic acid and/or a salt thereof and/or a naphthylamine-trisulphonic acid isomer mixture and/or salt thereof with an aqueous alkali metal hydroxide solution at elevated pressure and elevated temperature and in the presence of an aliphatic alcohol having 1 to 6 carbon atoms or alcoholate thereof, and separating out the mono-alkali metal salt by acidification.

4,178,309

MANUFACTURE OF SYMMETRICAL DIALKYLUREAS

Dietrich Luetzow, Limburgerhof; Norbert Neth, Bobenheim-Roxheim; Ulrich Wagner, Limburgerhof, and Klaus Volkamer, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 2, 1978, Ser. No. 930,160
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1977, 2735265
Int. Cl.[2] C07C *127/15*
U.S. Cl. 260—553 R **1 Claim**

1. A process for the manufacture of a symmetrical dialkylurea by reacting a monoalkylamine with CO_2 at an elevated temperature and under superatmospheric pressure, in which the unconverted starting

materials, water and the by-products formed in the reaction zone, as well as alkylamine alkylcarbamate, after thermal decomposition into monoalkylamine, CO_2 and water, are separated from the dialkylurea formed, and thereafter a part of the unconverted starting materials

plus reaction by-products, with or without water, may or may not be recycled to the reaction zone, before isolating an aqueous solution, containing a monoalkylamine, CO_2 and other reaction by-products, which solution is treated with alkali metal hydroxide solution in a column, the monoalkylamine, after separation from CO_2 and water, being recycled to the reaction zone, in which process the aqueous solution, before treatment with alkali metal hydroxide solution, is stripped, in a subsidiary column, with an inert gas to which CO_2 or monoalkylamine may or may not be admixed, and at least a part of the reaction by-products formed is taken off at the top of the column, the liquid discharged from the bottom of the subsidiary column is fed, via a collecting vessel, to the alkali treatment column, and the stream of gas issuing at the top of the

treatment column is compressed without further purification and is liquefied by cooling.

4,178,310
CATALYST FOR HYDRATION OF NITRILES

John A. Fetchin, Stamford, and Kin H. Tsu, Norwalk, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 558,998, Mar. 17, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 718,724
Int. Cl.[2] C07C *102/08*
U.S. Cl. 260—561 N **4 Claims**

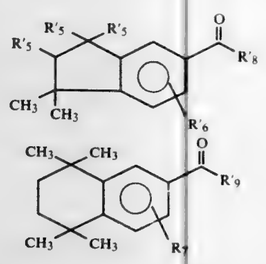
1. In a process for catalytic hydration of acrylonitrile to produce acrylamide by flowing a reactant solution comprising acrylonitrile in water through a fixed bed of copper-magnesium silicate type catalyst after reduction of the catalyst, the improvement wherein said catalyst has been treated prior to the hydration reaction by calcining the catalyst in a non-reactive atmosphere at calcining temperature in the range from 300° to 500° C. for time sufficient to substantially decrease the rate of decay of catalytic activity during use of the reduced catalyst in the defined hydration process.

4,178,311
PROCESS FOR THE PRODUCTION OF COMPOUNDS USEFUL IN PERFUMERY

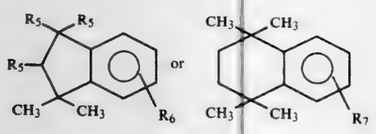
Mark A. Sprecker, Sea Bright, and Ernst T. Theimer, Rumson, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 897,903, Apr. 19, 1978. This application Oct. 27, 1978, Ser. No. 955,330
Int. Cl.[2] C07C *45/14*
U.S. Cl. 260—592 **4 Claims**

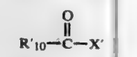
1. A process for preparing acyl benzene derivatives having the structures:



wherein R'_5 is hydrogen or methyl; R_6 and R'_7 are the same or different hydrogen or C_1–C_3 lower alkyl; R'_8 and R'_9 are C_1 to C_3 are the same or different lower alkyl comprising the steps of reacting an indane derivative or a tetrahydronaphthalene derivative having one of the structures:



with an acyl halide having the structure:



wherein R'_{10} is C_1–C_3 lower alkyl and X' is chloride, bromide or iodide, in the presence of a solvent selected from the group consisting of 2,2,4-trimethyl pentane, n-hexane, and n-octane at a temperature of between −20° C. and −5° C. in the presence of an aluminum chloride catalyst; the mole ratio of solvent to the indane or tetrahydronaphthalene derivative being from 1:10 up to 10:1; the mole ratio of aluminum chloride to acyl halide being from 1:2 up to 2:1; the mole ratio of indane or tetrahydronaphthalene derivative to acyl halide being from 1:1 up to 10:1.

4,178,312
IRIDIUM OR RHODIUM CATALYSTS FOR HYDROFORMYLATION AND ISOMERIZATION OF OLEFINS

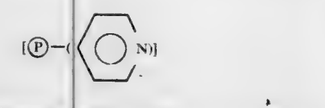
John T. Carlock, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Jul. 14, 1978, Ser. No. 924,603
Int. Cl.[2] C07C *45/08*
U.S. Cl. 260—604 HF **7 Claims**

1. A method for converting olefins to aldehydes comprising converting said olefins in the presence of a catalyst of the formula



said conversions carried out at temperatures of from about 60° C. to about 150° C. and hydrogen carbon monoxide pressures of from about 300 to about 3500 psig, wherein



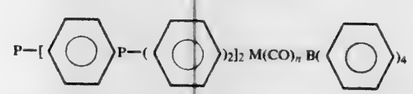
is a heterocyclic nitrogen-containing polymer is selected from the group consisting of 4-vinylpyridine/divinylbenzene, 3-vinylpyridine/divinylbenzene, 2-vinylpyridine/divinylbenzene, polyphenylquinoxaline/divinylbenzene, and poly[N-vinylcarbazole]/divinylbenzene with available pyridine linkages, M is rhodium or iridium, and X is selected from the group consisting of boron, chlorine, iodine, or fluorine and n is 1 or 2.

4,178,313
OLEFIN ISOMERIZATION AND HYDROFORMYLATION PROCESS

John T. Carlock, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Jul. 14, 1978, Ser. No. 924,601
Int. Cl.[2] C07C *45/08*
U.S. Cl. 260—604 HF **5 Claims**

1. A method for converting olefins to aldehydes wherein said olefins are converted to aldehydes in the presence of a catalyst having the general structure



said conversions carried out at temperatures of from about 60° to about 150° C. and hydrogen/carbon monoxide pressures of from about 50 to about 300 psig wherein Ⓟ is a diphenylphosphinated cross-linked polystyrene, M is rhodium or iridium, and n is 1 to 3.

4,178,314
IRIDIUM OR RHODIUM TRIHALIDE POLYMER BOUND HYDROGENATION AND HYDROFORMYLATION CATALYST

John T. Carlock, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Jul. 14, 1978, Ser. No. 924,596
Int. Cl.[2] C07C *45/08*
U.S. Cl. 260—604 HF **7 Claims**

1. An improved method for converting olefins to aldehydes in the presence of a catalyst at temperatures of from about 60° C. to about 150° C. and pressures of from about 300 to about 3500 psig in the presence of hydrogen and carbon monoxide, the improvement comprising converting said olefins in the presence of a catalyst of the generic formula Ⓟ—MX_3, wherein M is rhodium or iridium, X is selected from the group consisting of fluorine, chlorine, bromine, and iodine and Ⓟ is a polyvinyl pyridine/divinylbenzene copolymer.

4,178,315
PROCESS FOR THE PREPARATION OF NITROSOBENZENE

Hans Zengel, Kleinwallstadt, and Manfred Bergfeld, Erlenbach, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Mar. 24, 1978, Ser. No. 889,810
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1977, 2713602
Int. Cl.[2] C07C *76/00*
U.S. Cl. 260—647 **10 Claims**

1. An improved process for the preparation of nitrosobenzene by the catalytic reduction of nitrobenzene wherein the improvement comprises utilizing as a reducing agent a compound selected from the group consisting of aliphatic compounds containing from about one to about twenty carbon atoms, cycloaliphatic compounds containing from about four to about twelve carbon atoms, benzene, naphthalene, and ethylenically unsaturated compounds containing from about two to about 10 carbon atoms.

4,178,316
METHOD OF PREPARING 1,1-DIFLUOROETHYLENE FROM ACETYLENE

Neithart Schultz; Peter Martens, both of Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 800,605, May 25, 1977. This application Dec. 1, 1977, Ser. No. 856,567
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1976, 2659712
Int. Cl.[2] C07C *17/34*
U.S. Cl. 260—653.5 **5 Claims**

1. In a process for preparing 1,1-difluoroethylene by subjecting 1,1-difluoroethane to photochlorination at 20° to 150° C. to form 1,1-difluoro-1-chloroethane and effecting pyrolysis thereof without isolation of said 1,1-difluoro-1-chloroethane, the improvement which comprises employing as the difluoroethane charge an acetylene containing unrefined reaction product obtained by the catalytic hydrofluorination of acetylene employing an acetylene:HF mol ratio of 1:2.0–2.1 at a temperature up to 350° C. and a contact time of 5–30 seconds, said unrefined reaction product containing up to 3 volume percent acetylene and a maximum of 8 volume percent vinyl fluoride.

4,178,317
MANUFACTURE OF OLEFINICALLY UNSATURATED ALIPHATIC OR CYCLOALIPHATIC HYDROCARBONS

Peter Horn, Hirschberg; Otto-Alfred Grosskinsky, and Hugo Fuchs, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 19, 1978, Ser. No. 907,678
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726106
Int. Cl.[2] C07C *3/00*
U.S. Cl. 585—357 **9 Claims**

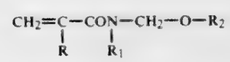
1. A process for the manufacture of olefinically unsaturated aliphatic or cycloaliphatic hydrocarbons which comprises:
contacting at least one member of the group consisting of (a) alkanecarboxylic acids of 3 to 20 carbon atoms, (b) 5-membered or 6-membered cycloalkanecarboxylic acids and (c) alkyl, cycloalkyl, aralkyl or phenyl esters of (a) or (b),
in the gas phase,
at a temperature of from about 250° to 800° C.,
with a catalyst in which the active material is a combination of a compound selected from the group consisting of boron trioxide, boric acid and boron nitride and a compound selected from the group consisting of aluminum oxide, silicon dioxide, titanium dioxide and zirconium dioxide.

4,178,318
GRAFT POLYBUTADIENE COPOLYMERS

Mo-Fung Cheung, Warren, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 26, 1978, Ser. No. 900,381
Int. Cl.[2] C08F *271/00*; C08L *51/00*; C09D *3/727*
U.S. Cl. 525—77 **18 Claims**

1. An alkaline resistant primer composition comprising a graft copolymer that has a self-crosslinking portion that is about 10–60% by weight of the graft copolymer, the graft copolymer made by reacting in the presence of polymerization catalyst and under non-aqueous conditions:
(A) aliphatic conjugated diolefin polymer having a number average molecular weight between about 1000–20,000 wherein about 40–90% of the aliphatic diolefin units are in 1,2 vinyl configuration;
(B) olefinically unsaturated grafting monomers, copolymerizable with one another, comprising (i) about 10–40 mole percent of acrylamide monomers corresponding to the formula



wherein R is a hydrogen or methyl, R_1 is hydrogen or C_1–C_{18} alkyl, R_2 is hydrogen or C_1–C_8 alkyl; (ii) about 5–40 mole percent of hydroxy functional monomers, (iii) about 0–25 mole percent of carboxy functional acrylic monomers and (iv) at least about 3 mole percent of one or more esters of acrylic or methacrylic acid and C_1–C_8 aliphatic alcohols, wherein there are above about 0.1 hydroxy groups in the graft copolymer for each amide group of (i).

4,178,319
HIGH SOLIDS COATING COMPOSITION WITH OLIGOMERIC HYDROXYPHOSPHATE CATALYST-A

Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1978, Ser. No. 973,331
Int. Cl.[2] C08L *63/00*
U.S. Cl. 525—188 **12 Claims**

1. A thermosetting coating composition adapted for low temperature bake applications which contains greater than about 60% by weight of nonvolatile solids, and which, exclu-

sive of pigments, solvents and other nonreactive components, consists essentially of:

(A) a polyepoxide resin having a number average molecular weight (M_n) of between about 140 and about 3,000;

(B) a reactive catalyst comprising at least one oligomeric hydroxy functional organophosphate ester having the formula:



$$(RO)_n-\overset{\overset{O}{\|}}{P}-(OH)_{3-n}$$

wherein n=1 to 2 and R is selected from the group consisting of mono or dihydroxy radicals containing one or more ester linkages and having a molecular weight of between about 120 and about 1500;

(C) an amine-aldehyde crosslinking agent; and

(D) up to about 45 weight percent based on the total weight of (A), (B), (C) and (D) of a hydroxy functional additive having a number average molecular weight (M_n) of between about 150 and about 6000, said oligomeric organophosphate ester being included in said composition in an amount sufficient to provide between about 0.8 and about 1.5 equivalents of acid functionality for each equivalent of epoxy functionality on said polyepoxide resin, and said amine aldehyde crosslinking agent being included in said composition in an amount sufficient to provide at least about 0.4 equivalents of nitrogen crosslinking functionality for each equivalent of hydroxy functionality included in said composition either as (i) an organic hydroxyl group on said oligomeric organophosphate ester, (ii) a hydroxyl group on said hydroxy functional additive, or (iii) as a result of esterification of said epoxy functionality of said polyepoxide resin during cure of said coating composition.

4,178,320

HIGH SOLIDS COATING COMPOSITION WITH OLIGOMERIC HYDROXYPHOSPHATE CATALYST-C

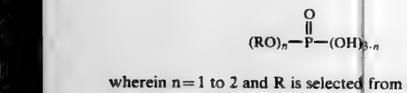
Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1978, Ser. No. 973,322
Int. Cl.[2] C08L *63/00*
U.S. Cl. 525—188 **16 Claims**

1. A thermosetting coating composition adapted for low temperature bake applications which contains greater than about 60% by weight of nonvolatile solids, and which, exclusive of pigments, solvents and other nonreactive components, consists essentially of:

(A) a copolymer bearing pendant epoxy functionality, having a number average molecular weight (M_n) of between about 1500 and about 10,000 and a glass transition temperature (Tg) of between about −25° C. and about 70° C., said copolymer consisting of between about 10 and about 30 weight percent of monoethylenically unsaturated monomers bearing glycidyl functionality and between about 90 and about 70 weight percent of other monoethylenically unsaturated monomers;

(B) a reactive catalyst comprising at least one oligomeric hydroxy functional organophosphate ester having the formula:



$$(RO)_n-\overset{\overset{O}{\|}}{P}-(OH)_{3-n}$$

wherein n=1 to 2 and R is selected from the group consisting of mono- or dihydroxy radicals containing one or more ester linkages and having a molecular weight of between about 120 and about 1500;

(C) an amine-aldehyde crosslinking agent; and

(D) up to 45 weight percent based on the total weight of (A), (B), (C), and (D) of a hydroxy functional additive having a number average molecular weight ($\bar{M}_n$) of between 150 and about 6000,

said oligomeric hydroxy functional organophosphate ester being included in said composition in an amount sufficient to provide between about 0.8 and about 1.5 equivalents of acid functionality for each equivalent of pendent epoxy functionality on said copolymer, and said amine aldehyde crosslinking agent being included in said composition in an amount sufficient to provide at least about 0.4 equivalents of nitrogen crosslinking functionality for each equivalent of hydroxy functionality included in said composition either as (i) an organic hydroxyl group on said oligomeric hydroxy functional organophosphate ester, (ii) a hydroxyl group on said hydroxy functional additive, or (iii) as a result of esterification of said pendent epoxy functionality of said copolymer during cure of said coating composition.

4,178,321

HIGH SOLIDS COMPOSITION WITH HYDROXY FUNCTIONAL ACRYLIC ORGANOPHOSPHATE REACTIVE CATALYST - I

Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1978, Ser. No. 973,326
Int. Cl.[2] C08L *63/00*
U.S. Cl. 525—188 **11 Claims**

1. A thermosetting coating composition adapted for low temperature bake applications which contains greater than about 50% by weight of nonvoltile solids, and which, exclusive of pigments, solvents and other nonreactive components, consists essentially of:

(A) a copolymer bearing pendant epoxy functionality, having a number average molecular weight (M_n) of between about 1500 and about 10,000 and a glass transition temperature (Tg) of between about −25° C. and about 70° C., said copolymer consisting of between about 10 and about 30 weight percent of monoethylenically unsaturated monomers bearing glycidyl functionality and between about 90 and about 70 weight percent of other monoethylenically unsaturated monomers;

(B) a hydroxy functional acrylic organophosphate reactive catalyst consisting essentially of the reaction product of:

(1) a hydroxy functional acrylic copolymer which (a) has a number average molecular weight (Mn) of between about 1500 and about 6000, (b) has a glass transition temperature of between about −25° C. and about 70° C., and (c) bears between about 2 and about 10 pendent hydroxy groups per molecule; and

(2) sufficient phosphorus pentoxide to produce a reaction product having an acid equivalent weight of between about 500 and about 3000;

(C) an amine-aldehyde crosslinking agent; and

(D) up to 45 weight percent based on the total weight of (A), (B), (C), and (D) of a hydroxy functional additive having a number average molecular weight ($\bar{M}_n$) of between 150 and about 6000,

said hydroxy functional acrylic organophosphate ester being included in said composition in an amount sufficient to provide between about 0.8 and about 1.5 equivalents of acid functionality for each equivalent of pendent epoxy functionality on said copolymer, and said amine aldehyde crosslinking agent being included in said composition in an amount sufficient to provide at least about 0.4 equivalents of nitrogen crosslinking functionality for each equivalent of hydroxy functionality included in said composition either as (i) an organic hydroxyl group on said hydroxy functional acrylic organophosphate reactive catalyst, (ii) a hydroxyl group on said hydroxy functional additive, or (iii) as a result of esterification of said pendent epoxy functionality of said copolymer during cure of said coating composition.

4,178,322

HIGH SOLIDS COATING COMPOSITION WITH ACRYLIC HYDROXYPHOSPHATE CATALYST-III

Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1978, Ser. No. 973,329
Int. Cl.[2] C08L *63/00*
U.S. Cl. 525—188 **8 Claims**

1. A thermosetting coating composition adapted for low temperature bake applications which contains greater than about 50% by weight of nonvolatile solids, and which, exclusive of pigments, solvents and other nonreactive components, consists essentially of:

(A) a polyepoxide resin having a number average molecular weight (M_n) of between about 140 and about 3,000;

(B) a hydroxy functional acrylic organophosphate reactive catalyst consisting essentially of the reaction product of:

(1) a hydroxy functional acrylic copolymer which (a) has a number average molecular weight (Mn) of between about 1500 and about 6000, (b) has a glass transition temperature of between about −25° C. and about 70° C., and (c) bears between about 2 and about 10 pendant hydroxy groups per molecule; and

(2) sufficient phosphorus pentoxide to produce a reaction product having an acid equivalent weight of between about 500 and about 3000;

(C) an amine aldehyde crosslinking agent; and

(D) up to about 45 weight percent based on the total weight of (A), (B), (C) and (D) of a hydroxy functional additive having a number average molecular weight (M_n) of between about 150 and about 6000, said hydroxy functional acrylic organophosphate reactive catalyst being included in said composition in an amount sufficient to provide between about 0.9 and about 1.5 equivalents of acid functionality for each equivalent of epoxy functionality on said polyepoxide resin, and said amine aldehyde crosslinking agent being included in said composition in an amount sufficient to provide at least about 0.4 equivalents of nitrogen crosslinking functionality for each equivalent of hydroxy functionality included in said composition either as (i) an organic hydroxyl group on said hydroxy functional acrylic organophosphate reactive catalyst, (ii) a hydroxyl group on said hydroxy functional additive, or (iii) as a result of esterification of said epoxy functionality of said polyepoxide resin during cure of said coating composition.

4,178,323

HIGH SOLIDS COATING COMPOSITION WITH HYDROXY FUNCTIONAL ACRYLIC ORGANOPHOSPHATE REACTIVE CATALYST-II

Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1978, Ser. No. 973,330
Int. Cl.[2] C08L *63/00*
U.S. Cl. 525—188 **12 Claims**

1. A thermosetting coating composition adapted for low temperature bake applications which contains greater than about 50% by weight of nonvolatile solids, and which, exclusive of pigments, solvents and other nonreactive components, consists essentially of:

(A) a bifunctional copolymer bearing hydroxy functionality and pendant epoxy functionality, having a number average molecular weight (Mn) of between about 1500 and about 10,000 and a glass transition temperature (Tg) of between about −25° C. and about 70° C., said copolymer consisting essentially of (i) between about 5 and about 25 weight percent of monoethylenically unsaturated monomers bearing glycidyl functionality and between about 5 and about 25 weight percent of monoethylenically unsaturated monomer bearing hydroxy functionality, with the total of said glycidyl and hydroxy functional monomers being not greater than about 30 weight percent of the monomers in said bifunctional copolymer and (ii) between about 90 and about 70 weight percent of other monoethylenically unsaturated monomers;

(B) a hydroxy functional acrylic organophosphate reactive catalyst consisting essentially of the reaction product of:

(1) a hydroxy functional acrylic copolymer which (a) has a number average molecular weight (Mn) of between about 1500 and about 6000, (b) has a glass transition temperature of between about −25° C. and about 70° C., and (c) bears between about 2 and about 10 pendent hydroxyl groups per molecule; and

(2) sufficient phosphorus pentoxide to produce a reaction product having an acid equivalent weight of between about 500 and about 3000;

(C) an amine-aldehyde crosslinking agent; and

(D) up to about 45 weight percent based on the total weight of (A), (B), (C), and (D) of a hydroxy functional additive having a number average molecular weight (Mn) of between about 150 and about 6000, said hydroxy functional acrylic organophosphate reactive catalyst being included in said composition in an amount sufficient to provide between about 0.9 and about 1.5 equivalents of acid functionality for each equivalent of pendent epoxy functionality on said bifunctional copolymer, and said amine aldehyde crosslinking agent being included in said composition in an amount sufficient to provide at least about 0.4 equivalents of nitrogen crosslinking functionality for each equivalent of hydroxy functionality included in said composition either as (i) an organic hydroxyl group on said hydroxy functional acrylic organophosphate reactive catalyst, (ii) a hydroxyl group on said bifunctional copolymer, (iii) a hydroxyl group on said hydroxy functional additive, or (iv) as a result of esterification of said pendent epoxy functionality of said bifunctional copolymer during cure of said coating composition.

4,178,324

HIGH SOLIDS COATING COMPOSITION WITH OLIGOMERIC HYDROXY PHOSPHATE CATALYST-B

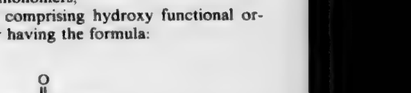
Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1978, Ser. No. 973,321
Int. Cl.[2] C08L *63/00*
U.S. Cl. 525—188 **17 Claims**

1. A thermosetting coating composition adapted for low temperature bake applications which contains greater than about 60% by weight of nonvolatile solids, and which, exclusive of pigments, solvents and other nonreactive components, consists essentially of:

(A) a bifunctional copolymer bearing hydroxy functionality and pendant epoxy functionality, having a number average molecular weight (Mn) of between about 1500 and about 10,000 and a glass transition temperature (Tg) of between about −25° C. and about 70° C., said copolymer consisting essentially of (i) between about 5 and about 25 weight percent of monoethylenically unsaturated monomers bearing glycidyl functionality and between about 5 and about 25 weight percent of monoethylenically unsaturated monomer bearing hydroxy functionality, with the total of said glycidyl and hydroxy functional monomers being not greater than about 30 weight percent of the monomers in said bifunctional copolymer and (ii) between about 90 and about 70 weight percent of other monoethylenically unsaturated monomers;

(B) a reactive catalyst comprising hydroxy functional organo-phosphate ester having the formula:



$$(R-O)_n-\overset{\overset{O}{\|}}{P}-(OH)_{3-n}$$

wherein n=1 to 2 and R is selected from the group consisting of mono or dihydroxy radicals containing one or more ester

linkages and having a molecular weight of between about 120 and about 1500;

(C) an amine-aldehyde crosslinking agent; and

(D) up to about 45 weight percent based on the total weight of (A), (B), (C), and (D) of a hydroxy functional additive having a number average molecular weight (Mn) of between about 150 and about 6000, said organophosphate ester being included in said composition in an amount sufficient to provide between about 0.8 and about 1.5 equivalents of acid functionality for each equivalent of pendent epoxy functionality on said bifunctional copolymer, and said amine aldehyde crosslinking agent being included in said composition in an amount sufficient to provide at least about 0.4 equivalents of nitrogen crosslinking functionality for each equivalent of hydroxy functionality included in said composition either as (i) an organic hydroxyl group on said organophosphate ester, (ii) a hydroxyl group on said bifunctional copolymer, (iii) a hydroxyl group on said hydroxy functional additive, or (iv) as a result of esterification of said pendent epoxy functionality of said bifunctional copolymer during cure of said coating composition.

4,178,325

HIGH SOLIDS COATING COMPOSITIONS CONTAINING LIQUID BISHYDROXY ETHYL ETHER OF A BISPHENOL

Kazys Sekmakas, Palatine, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Jan. 3, 1978, Ser. No. 866,256
Int. Cl.[2] C08L *61/26, 61/20*
U.S. Cl. 525—157 **9 Claims**

1. A fluid resinous coating composition containing less than about 30% of volatile organic solvent and which cures on baking, said coating composition consisting essentially of a mixture of:

(1) a copolymer of monoethylenic monomers including from about 5–20% of monoethylenic monomer having a functional group reactive with the N-methylol group and selected from carboxylic acid, hydroxy, and amide groups, said copolymer being produced by copolymerization in an organic solvent solution containing a major proportion of component (2) below:

(2) liquid bishydroxy ethyl ether of a bisphenol formed by reacting ethylene oxide with a bisphenol alone or in admixture with liquid bishydroxy propyl ether of a bisphenol formed by reacting propylene oxide with a bisphenol; and

(3) an aminoplast resin; said copolymer constituting from about 4.5% to 35% of the mixture, the bishydroxy propyl ether constituting from about 20% to 40% of the mixture, and the balance of the mixture of the three components consisting essentially of aminoplast resin, there being at least about 0.8 parts of aminoplast resin per part of copolymer, and said copolymer being present in an amount of from about 15–80% of the weight of the bishydroxy propyl ether.

4,178,326

LOW-SHRINK THERMOSETTING POLYESTERS

Donald R. Stevenson, Dover, and David A. Schmidt, Lorain, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 14, 1977, Ser. No. 851,085
Int. Cl.[2] C08L *67/06, 75/06*
U.S. Cl. 525—176 **12 Claims**

1. A low-shrink polyester molding resin composition for thickening with Group II metal oxides, hydroxides, or alkoxides, and thermosetting to form low-profile molded structures, wherein the resin composition comprises by weight at least about 25% ethylenically unsaturated thermosetting polyester polymer, about 5% to 20% of an acid functional thermoplastic polymer, and about 40% to 60% of an ethylenically unsaturated monomer copolymerizable with said thermosetting polyester polymer, the improvement comprising:

said thermoplastic polymer comprising a polymer mixture of vinyl copolymer dispersed in a polymeric diluent wherein the mixture contains by weight between about 60% and 90% vinyl copolymer, said polymeric diluent having number average molecular weight of between about 500 and 5,000 and said polymeric diluent is a linear saturated polyester or polyalkylene oxide.

4,178,327

AR-HALO-AR(T-ALKYL)STYRENES AND POLYMERS THEREOF

Richard H. Hall, Midland; Daniel H. Haigh, Sanford; Junior J. Lamson, Bay City, and Larry D. Yats, Clare, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 696,399, Jun. 16, 1976, Pat. No. 4,054,733, which is a continuation-in-part of Ser. No. 534,391, Dec. 19, 1974, abandoned, which is a division of Ser. No. 94,578, Dec. 2, 1970, abandoned. This application Aug. 5, 1977, Ser. No. 822,129
Int. Cl.[2] C08F *4/32, 267/06, 12/16*
U.S. Cl. 525—169 **9 Claims**

1. An ar-halo-ar-(t-alkyl)styrene wherein halo is chloro, bromo or fluoro and tertiary alkyl has from 4 to 8 carbon atoms and is in a ring position para or meta to the ethylenically unsaturated group of the ar-halo-ar-(t-alkyl)styrene.

8. A curable composition comprising from about 10 to about 70 weight percent of an unsaturated polyester, from about 90 to about 30 weight percent of the polymerizable ar-halo-ar-(t-alkyl)styrene of claim 1 and a catalytic amount of a free-radical generating catalyst; said percentages being based on the total weight of the polyester and the ar-halo-ar-(t-alkyl)styrene, said polyester being the condensation reaction product of an unsaturated polycarboxylic acid with a polyhydric alcohol.

4,178,328

RIGID, HIGH IMPACT POLYPROPYLENE COMPOSITIONS

Krishnan Thiruvillakkat, Parkersburg, W. Va., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 14, 1977, Ser. No. 860,349
Int. Cl.[2] C08L *53/02*
U.S. Cl. 525—98 **4 Claims**

1. A polymeric blend composition comprising from 80 to 60 wt. percent of a polypropylene polymer, from 10 to 20 wt. percent of a hydrogenated block copolymer having the general configuration A-B-A wherein prior to hydrogenation the A's are polymeric blocks of vinylaromatic monomer units and B is an elastomeric polymer block of a conjugated diene monomer, said copolymer being hydrogenated to remove the ethylenic unsaturation, and from 10 to 20 wt. percent polyethylene.

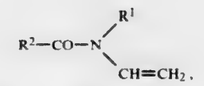
4,178,329

PLASTICS MATERIAL HAVING AN IMPROVED BLOOD TOLERANCE

Udo Becker, Marburg an der Lahn; Karlheinz Burg, Wiesbaden; Johann P. Fischer, Königstein, and Norbert Heimburger, Marburg an der Lahn, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed May 5, 1978, Ser. No. 902,901
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1977, 2751528
Int. Cl.[2] C08F *255/02*
U.S. Cl. 525—77 **7 Claims**

1. A plastics material, adaptable to biomedical uses, the surface of which material at least partially consists of a graft copolymer having a hydrocarbon main chain and side chains grafted thereon, said side chains being polymers comprising at least one vinyl monomer selected from the group consisting of vinylene carbonate and N-vinyl alkylamides of the formula



wherein R^1 and R^2 are the same or different and each is hydrogen or alkyl having 1 to 6 carbon atoms.

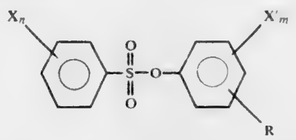
4,178,330

HALOARYL HALOBENZENESULFONATE FLAME RETARDANTS

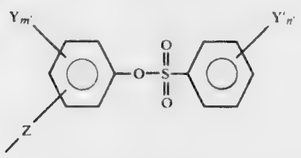
James A. Albright, Ann Arbor, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Aug. 29, 1977, Ser. No. 828,581
Int. Cl.[2] C08K *5/42*
U.S. Cl. 525—3 **16 Claims**

1. A flame retardant polyurethane composition comprising polyurethane and a flame retardant amount of haloaryl halobenzene sulfonate of the formula



wherein X and X′ are each independently selected halogen; n in an integer from 1 to 5 and m is an integer from 1 to 4, provided that the sum of m plus n is an integer from 4 to 9; and R is selected from the group consisting of hydrogen, halogen, and



wherein Y and Y′ are each independently selected halogen, M′ is an integer from 1 to 4 and n′ is an integer from 1 to 5, provided that the sum of m′ plus n′ is an integer from 4 to 9; and wherein Z is an alkylene or alkylidene group containing from 1 to about 6 carbon atoms.

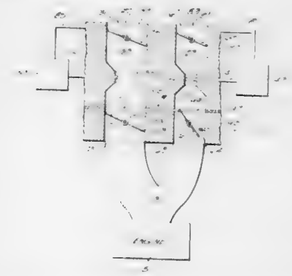
4,178,331

TWO STAGED CARBURETOR WITH ARRANGEMENT FOR REDUCING FUEL SPILLAGE

J. Bruce Emmons, Lindenhurst, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 29, 1977, Ser. No. 865,613
Int. Cl.[2] F02M *11/02*
U.S. Cl. 261—23 A **17 Claims**

1. A carburetor comprising a first stage including a vertically extending primary air induction passage including a venturi section and a portion downstream of and below said venturi section, a primary fuel passage communicating with said venturi section of said primary air induction passage and with a fuel source, a primary throttle valve mounted in said downstream portion of said primary air induction passage for movement between a relatively closed position and a relatively open position, and means permitting air or fuel flow past said primary throttle valve when in said relatively closed position, and a second stage including a vertically extending secondary air induction passage including a venturi section and a portion downstream of and below said venturi section, a secondary fuel passage communicating with said venturi section of said secondary air induction passage and with a fuel source, and a secondary throttle valve mounted in said downstream portion of said secondary air induction passage for movement between



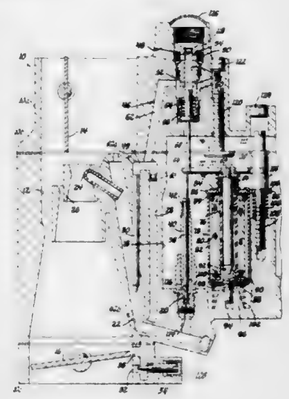
an open position and a closed position, and fuel or air passage means communicating soley between said primary and secondary air induction passages closely adjacent and above said secondary throttle valve for draining fuel accumulating in said secondary air induction passage above said secondary throttle valve to said primary air induction passage.

4,178,332

CARBURETOR AND METHOD OF CALIBRATION

Robert L. Hogeman, Rochester; Jack L. Seaman, and Roland S. Taylor, both of Fairport, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 868,713, Jan. 11, 1978, abandoned. This application Jun. 19, 1978, Ser. No. 916,783
Int. Cl.[2] F02M *7/18*
U.S. Cl. 261—50 R **5 Claims**



1. A carburetor comprising a fuel passage, a metering apparatus reciprocable between a rich position and a lean position, said apparatus including a bracket and a metering device biased against and operated by said bracket to restrict fuel flow through said passage in said lean position and to permit increased fuel flow through said passage in said rich position, said apparatus further including a solenoid armature carrying said bracket, a solenoid coil assembly surrounding said armature and energizable for moving said apparatus to one of said positions, and a spring biasing said apparatus to the other of said positions, and wherein the improvement comprises a mem-

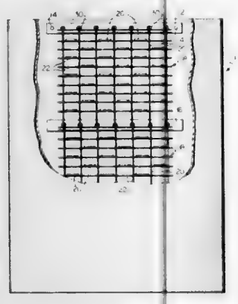
ber included as a portion of said coil assembly and engaged by said armature in said one position, and an adjustable stop controlling the position of said coil assembly for establishing said one position.

4,178,333

HANGER ASSEMBLY FOR FILL STRIPS

Charles E. Shepherd, 4202 Markham, Houston, Tex. 77027

Filed Jun. 15, 1978, Ser. No. 915,651
Int. Cl.² B01F 3/04
U.S. Cl. 261—111 **5 Claims**



1. A hanger assembly adapted for use in cooling towers comprising:

(a) at least one header formed with a plurality of openings extending through said header in aligned and spaced relation to each other, and

(b) a mesh hanger assembly comprised of a first series of spaced members extending in one direction and a second series of spaced members extending in a direction generally perpendicular to said first series of members, said members thus forming a mesh having a plurality of openings adapted to receive fill slats, each of said members of said first series being formed with a clamp end at at least one end thereof, said clamp end comprising a first rigid load-supporting leg portion extending generally perpendicular to the axis of said member, a cam portion reversely bent relative to said first leg portion, a shoulder portion, and a second leg portion spaced from said first leg portion, the movement of said clamp end through an associated opening in said header serving to compress said cam portion and said second leg portion toward said first leg portion, after which the shoulder portion snaps into contact engagement with the adjacent surface of said header thereby to prevent withdrawal of said clamp end from said opening.

4,178,334

HIGH VOLUME HUMIDIFIER/NEBULIZER

Kenneth G. Miller, Elk Grove Village, Ill., assignor to Respiratory Care, Inc., Arlington Heights, Ill.

Continuation-in-part of Ser. No. 826,119, Aug. 19, 1977, Pat. No. 4,110,419, which is a continuation of Ser. No. 569,490, Apr. 18, 1925, abandoned. This application Jan. 27, 1978, Ser. No. 872,875
The portion of the term of this patent subsequent to Jul. 11, 1993, has been disclaimed.
Int. Cl.² A61M 15/00
U.S. Cl. 261—142 **8 Claims**

1. Cartridge type humidifying and nebulizing apparatus for humidifying a breathable gas such as oxygen-supplemented air or the like to be inhaled by a patient undergoing inhalation therapy, said apparatus comprising in combination:

(a) cartridge module means including a tubular main body portion of metal with an inner peripheral wall;

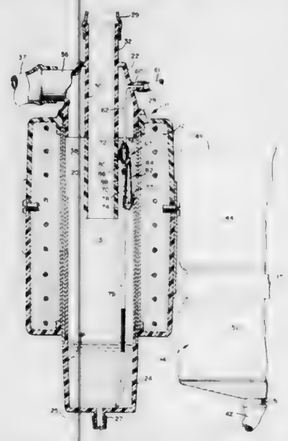
(b) said cartridge module means including an upper end portion means unitarily attached to said main body portion and a lower end portion means of a non-metallic material attached to said main body portion;

(c) said lower end portion means and the lower end part of said main body portion defining a liquid holding means for retaining humidifying liquid during operative use of said apparatus;

(d) said cartridge module means further comprising liquid absorption means including an open center generally tubular liquid-absorption column member with an inner peripheral face constituting an evaporating surface for humidifying liquid, disposed generally contiguously within coextensive with a substantial part of said main body portion and lower end portion means, said absorption column having a lower end part adapted to be wetted directly by the humidifying liquid when in said liquid holding means, and to convey by absorption liquid upwardly adjacent said evaporating surface;

(e) said upper end portion means and upper part of the main body defining an air space above the humidifying liquid level of said liquid holding means of paragraph (c);

(f) said upper end portion means unitarily including a gas inlet feed pipe for directing gas to be humidified into said main body portion, at a point above said liquid level, for humidifcation within said air space;



(g) said air space having a venturi means including an elongated body with longitudinally disposed upper and lower hollow stem portions that are axially offset and constitute gas and liquid inlet passage means, respectively, said upper hollow stem portion having means whereby it may be connected to a source of pressurized gas; said lower hollow stem portion having at the other end a tube extending downwardly into said liquid, said gas passage means terminating in transversely adjacent orifices whereby a flow of pressurized gas out of the gas passage orifice is directed past the orifice of said liquid passage creates a suction in the latter to draw liquid up said tube into the lower hollow stem and through the orifice to entrain liquid from the liquid passage orifice and to atomize said liquid into said air space;

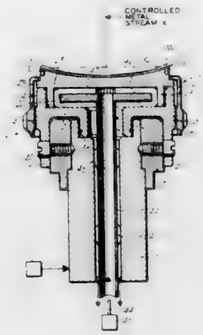
(h) said upper end portion means further including a separate projecting humidified-gas-outlet delivery pipe disposed a substantial distance above said liquid level and in direct fluid communication with said air space, said delivery pipe adapted to be connected to an output delivery tube leading to said patient, whereby said gas in said module and delivery tube is maintained in a substantially fully vapor-saturated condition.

4,178,335

METHOD OF PRODUCING SOLID PARTICLES OF METAL

Robert A. Metcalfe, West Palm Beach, and Romeo G. Bourdeau, Tequesta, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1977, Ser. No. 862,898
Int. Cl.² B01J 2/02
U.S. Cl. 264—8 **5 Claims**



1. A method of producing solid particles of metal comprising:

(1) melting metal to provide a source of molten metal;

(2) forming a metal disc having an upper surface with a ring of metal positioned around the metal disc at the top thereof, said ring of metal being formed of a metal which can be welded to the metal being melted,

(3) spinning said disc at a desired rate;

(4) pouring said molten metal on the surface of the spinning disc;

(5) controlling the temperature and flow rate of the molten metal and the temperature of the surface of the spinning disc to form a solidified skull of a desired thickness on the surface of the spinning disc with the skull being welded to the ring of metal;

(6) continue pouring molten metal on the spinning surface of the desired solidified skull formed whereby the molten metal is atomized in being thrown radially outward therefrom to form solid particles of a desired size.

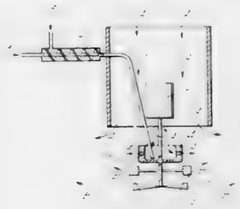
4,178,336

PRODUCTION OF FIBRES

Paul Snowden, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 10, 1978, Ser. No. 885,344
Claims priority, application United Kingdom, Mar. 11, 1977, 10405/77
Int. Cl.² B22D 23/08
U.S. Cl. 264—8 **10 Claims**

1. A process for centrifugally spinning formaldehyde fibres from a liquid formaldehyde resin which comprises the steps of feeding the resin and a resin-curing catalyst, which at temperatures above 100° C. will cure and chemically stabilize the resin and render it insoluble in cold water, into a rotating spinning cup, directing downwardly towards the cup a flow of cold, humid air, at least part of which flow enters the cup with the resin/catalyst mixture, the temperature and humidity of the air being such that it inhibits drying and reaction of the resin/catalyst mixture whilst in the cup, the rotation of the cup causing the resin/catalyst mixture to flow as an even film over the inner surface of the cup, in the presence of the cold, humid air, and to be spun centrifugally from the outer wall of the cup, in the form of individual, separate fibres which attenuate until they have achieved the desired diameter, providing from below the cup outwardly-directed currents of hot dry air at a temperature such as to heat the fibres to between 50° C. and 100° C. to dry the attenuated fibres and transport them to a



collecting zone, removing the dry fibres from the collecting zone, and curing and chemically stabilizing them by heating at above 100° C. until they are insoluble in cold water.

4,178,337

THERMOPLASTIC ELASTOMERIC FILM EXTRUSION PROCESS

Joseph J. Hall; Ralf Korpman, both of Bridgewater, and Stephen M. Sinker, Middlesex, all of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Oct. 18, 1977, Ser. No. 843,110
Int. Cl.³ B29D 7/02; B29B 3/00
U.S. Cl. 264—28 **5 Claims**



1. The process of extruding a thermoplastic elastomeric layer from a mixture of dry particles using a single screw extruder having a helical extruder screw rotating within an extruder barrel having a feed section, which comprises: feeding a mixture of dry particles into an inlet portion of said feed section and into rotative and axial driving contact with said screw, said mixture consisting predominantly of dry thermoplastic elastomer particles and about 20–300 parts per 100 parts by weight of the total elastomer particles of dry resin particles, said elastomer particles having a relatively high molecular weight, said molecular weight being a number average molecular weight of at least about 75,000, and said resin particles having a relatively low molecular weight, said molecular weight being a number average molecular weight of not above about 3,000:

(a) precooling at least the resin component of said mixture to provide a temperature of said mixture of about 0°,

(b) driving the cooled mixture axially forward with said screw and

(c) maintaining the temperatures of the particles below that which would cause the mixture to agglomerate and stick to the screw until the axial driving forces on the mixture have increased to the extent they will overcome any

tendency of the mixture to stick to the screw, said temperatures being achieved by cooling the barrel adjacent the inlet section sufficiently so that its outer surface is maintained at temperatures below about 5° C;

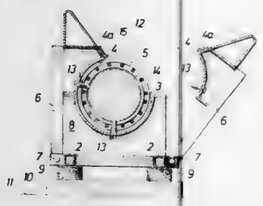
feeding said mixture forward in said barrel under substantially steady-state pressure conditions while thoroughly mixing and melting the mixture to cause it to become homogeneous; and passing the melted homogeneous mixture through an elongated extrusion die to form a thermoplastic elastomeric sheet or film not above about 50 mils in thickness.

4,178,338

METHOD OF CASTING THIN-WALLED, HOLLOW CONCRETE POSTS

Per-Erik Bondpers, and Göte Liljegren, both of Växjö, Sweden, assignors to A-Betong AB, Växjö, Sweden

Filed Feb. 7, 1978, Ser. No. 875,724
Claims priority, application Sweden, Feb. 7, 1977, 7701342
Int. Cl.[2] B28B 1/08
U.S. Cl. 264—42 **4 Claims**



1. A method of casting a hollow, reinforced, tapering concrete post having a thin wall and a length exceeding 10 m in a hoirzontal mould, a tapering reinforcing cage being disposed in the mould and a core of steel or the like being disposed within the reinforcing cage and centered within the mould by a plurality of support posts extending radially inwardly from the sides of the mould to thereby define an annular mould chamber having an elongated filling slot running along the upper side thereof, comprising the steps of:

(a) charging a readily pourable concrete mass into the annular mould chamber through the filling slot, said concrete mass comprising 16 to 20% by weight of cement, 4 to 8% by weight of water, a sufficient amount of flow-promoting agent to provide a slump measurement of between 12 and 14 cm, and an aggregate having a maximum size of 8 mm including 40 to 50% of said aggregate being gravel having a maximum size of 4 mm,

(b) vibrating the mould for 10 to 25 minutes without rotating it to settle the concrete mass and evenly fill the annular mould chamber,

(c) simultaneously and thereafter heating the concrete mass to accelerate its hardening,

(d) allowing the mould to remain stationary for 15 to 30 minutes,

(e) revibrating the mould for 2 to 3 minutes,

(f) withdrawing the core from the post 1.5 to 4 hours after the charging of the concrete mass and before it has completely hardened, and

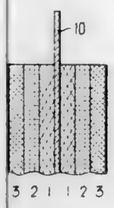
(g) removing the finished post from the mould.

4,178,339

LAMINATED ELECTRODE

Peter J. Powell, and Gerard D. Nagy, both of Ottawa, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence

Filed Oct. 25, 1977, Ser. No. 845,393
Claims priority, application Canada, Nov. 17, 1976, 265944
Int. Cl.[2] C04B 35/64
U.S. Cl. 264—61 **20 Claims**



1. A method for the manufacture of a silver/silver chloride electrode, said electrode comprising a plurality of layers of a porous material comprising an evenly dispersed matrix of metallic silver bonded to silver chloride particles, on both major surfaces of a metal grid, said method comprising:

(a) preparing a homogeneous mixture, in the form of a finely divided powder, of a major amount of silver chloride and a minor amount of a silver compound reducible to metallic silver at a temperature below the melting point of silver chloride, which silver compound is selected from the group consisting of silver oxides, silver carbonate, disilver fluoride, silver sulfide and mixtures thereof,

(b) individually compressing a plurality of layers of said mixture, one on top of another onto a metal grid at pressures of about 800 to about 1500 psi,

(c) subjecting the assembly so formed to a final pressing step at pressures of about 3,000 to about 5,000 psi, and

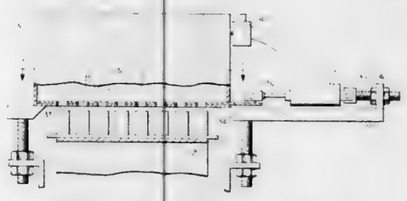
(d) sintering, at a temperature below the melting point of silver chloride, for a time sufficient to reduce the silver compound to metallic silver.

4,178,340

METHOD AND APPARATUS FOR MAKING CONCRETE BRICK HAVING ANTIQUE APPEARANCE

Niilo M. Hyytinen, Reno, Nev., assignor to A B C Concrete Products, Reno, Nev.

Filed Jun. 26, 1978, Ser. No. 919,529
Int. Cl.[2] B28B 1/29
U.S. Cl. 264—73 **2 Claims**



1. The method of making a brick having a different antique appearance on opposite sides only comprising the steps of spreading a first quantity of dry coloring material on a generally flat surface, molding at least one brick of liquefied hardenable material on said surface, said brick having a first side engaging said first quantity of coloring material so that the liquid in said hardenable material saturates said dry coloring material and imparts a mottled effect to said one side of said brick, placing a second quantity of coloring material on a second side of said brick which is remote from said first quantity of coloring material, spreading said second quantity of coloring material along said second side of said brick to impart a streaked effect thereto, spraying a liquid on said second quantity of coloring material to saturate the same, and curing said brick, whereby said coloring material on one side of said brick has a first appearance and the coloring material on the opposite side has a different appearance.

2. The method of making bricks having an antique appearance comprising the steps of intermittently moving a substantially flat pallet along a predetermined path. automatically spreading a first quantity of dry flowable coloring material on the upper surface of said pallet while said pallet is moving, interrupting the movement of said pallet, molding a plurality of concrete bricks on said coloring material carried by said pallet while the pallet is not moving so that the liquid in the concrete saturates the dry coloring material and imparts a mottled effect to one side of each of said bricks, moving said pallet and said bricks along said path, automatically placing a second quantity of dry flowable coloring material onto a second side of said bricks remote from said first quantity of coloring material, spreading said second quantity of coloring material on said bricks to impart a streaked effect to said second side of said bricks, spraying a liquid on said second coloring material to saturate the same, and curing said bricks, whereby substantially two opposite sides only of said bricks have coloring material thereon.

4,178,341

PROCESS FOR PREPARING AGGLOMERATES OF CLAYS

Bruce F. Caswell, Whitmore Lake, Mich., assignor to Arcanum Corporation, Ann Arbor, Mich.

Filed Apr. 12, 1978, Ser. No. 895,788
Int. Cl.[2] B01J 2/06
U.S. Cl. 264—117 **8 Claims**



1. A process for dewatering an aqueous clay dispersion and forming pellets of the clay particles, which comprises the steps of:

(a) adding to the aqueous clay dispersion (i) hydrophobic organic bridging liquid which is immiscible with water and (ii) liquid conditioner which is effective to displace water from the clay particles and to render the surfaces of the clay particles oleophilic, whereby to form a two-phase liquid system wherein the clay particles are dispersed in and wetted by said hydrophobic organic bridging liquid as one liquid phase and the other liquid phase is water which is essentially free of clay particles;

(b) agitating the two-phase liquid system to effect repeated collisions of the clay particles and thereby forming in said system a slurry of agglomerates in the water phase wherein said agglomerates consist essentially of the clay particles having said liquid conditioner adsorbed thereon and bound together by said hydrophobic organic bridging liquid;

(c) discontinuing said agitating and separating said agglomerates from the water;

(d) then drying said agglomerates to remove essentially all of said bridging liquid and said liquid conditioner therefrom;

(e) then dispersing said dried agglomerates and a binding agent for said agglomerates in hydrophobic organic suspending liquid to form a suspension;

(f) adding an aqueous bridging liquid to said suspension and agitating same to effect repeated collisons of said agglomerates whereby to form a dispersion of pellets in said hydrophobic organic suspending liquid wherein the pellets are coated with said aqueous bridging liquid and are impregnated and/or coated with said binding agent;

(g) then discontinuing said agitation and separating the pellets from said hydrophobic suspending liquid; and

(h) then recovering said pellets.

4,178,342

INJECTION MOLDING METHOD FOR THE MANUFACTURE OF A SNELLED FISHHOOK

Gerald B. Klein, 13451 Stuart Ct., Broomfield, Colo. 80020

Continuation-in-part of Ser. No. 763,825, Jan. 31, 1977, abandoned, which is a continuation of Ser. No. 580,182, May 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 473,721, May 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 277,756, Aug. 3, 1972, Pat. No. 3,834,061, which is a continuation-in-part of Ser. No. 274,307, Jul. 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 335,081, Feb. 23, 1973, Pat. No. 3,898,760, which is a continuation-in-part of Ser. No. 128,015, Mar. 25, 1971, Pat. No. 3,717,907. This application Feb. 10, 1978, Ser. No. 876,950
Int. Cl.[2] B29C 17/02, 6/04; B29D 3/00
U.S. Cl. 264—275 **2 Claims**



2. A method for the manufacture of a snelled fishhook from the injection molding of a thermoplastic, drawable, synthetic resin material, utilizing an injection mold of the type including elongated and separable superimposed mold halves having mating surfaces which incorporate registering and communicating cavities defining along its length a first slightly enlarged cylindrical end portion, an elongated narrow interconnecting passageway in the form of a strand, and an eyeloop passageway, with at least one of the mold halves being formed of at least two separable mold sections which effect a transverse split across said eyeloop passageway to define an end mold section and a remaining mold section, each said section being provided with stand rods which are raisable up from the surface of each mold section, said stand rods being disposed to either side of the transverse split within the embrace of the eyeloop passageway, said method comprising the steps of: inserting the shank of a fishhook into the enlarged cylindrical cavity of the superimposed mold halves; heating the resin to a moldable state; flowing the resin into the cavities of the mold halves about the shank of the fishhook, through the narrow interconnecting passageway to form an enlongated strand, and in the eyeloop passageway to form a loop strand; separating the mold halves after the mold has cooled so as to leave the snelled fishhook so formed in the half of the mold which is formed of the at least two sections; raising the stand rods in the mold sections from the surface of each section to be upstanding within the embrace of the loop strand; separating the end mold section and the remaining mold section of the mold half at the transverse split thereof and moving the sections longitudinally apart from each other such that the stand rods engage the loop at its apex and its crotch, respectively, and effect a drawing of the loop between its apex and crotch; effecting relative longitudinal movement between the fishhook and said mold section of said mold half so as to draw the snell strand between the en-

larged cylindrical portion and the apex of the loop; and ejecting the snelled fishhook so formed from the mold half.

4,178,343

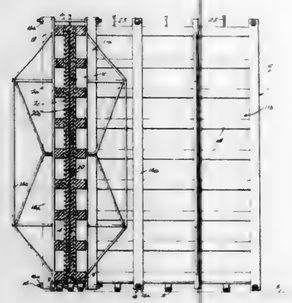
MANUFACTURE OF PRECAST CONCRETE UNITS AND A BUILDING CONSTRUCTED THEREWITH

Agustin Rojo, Jr., Paseo del Parque Z-12, Garden Hills, Bayamon, P.R. 00657

Division of Ser. No. 797,292, May 16, 1977, Pat. No. 4,127,971. This application Feb. 1, 1978, Ser. No. 874,057

Int. Cl.[2] B28B *7/22;* **E04G** *11/36*

U.S. Cl. 264—333 **5 Claims**



1. In a method for molding precast concrete building units, the steps of pouring the concrete into a mold cavity formed by a pair of opposite vertical walls and a supporting bottom, all separable from each other and mounted on wheels for transport on a horizontal supporting surface to effect said separation, maintaining the poured concrete in the assembled mold for a period of 2½ to 3 hours for partial curing of said unit, disassembling the mold cavity by separating the vertical walls from the supporting bottom by wheeling on said horizontal surface leaving the partially cured unit solely supported on said bottom, wheeling the bottom with the unit along said horizontal surface to clear the separated vertical walls, and maintaining the unit on said bottom until completely cured for vertical lifting therefrom while assembling the vertical walls with another supporting bottom into a mold cavity by wheeling the vertical walls and bottom into position on said horizontal surface and repeating the molding cycle therewith.

4,178,344

METHOD AND APPARATUS FOR REVERSING AND FLATTENING A DRIVER'S RESTRAINT CUSHION

Stanley E. Smith, Dayton; Richard W. Lyday, Vandalia, and Thomas R. Kushmaul, Springfield, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

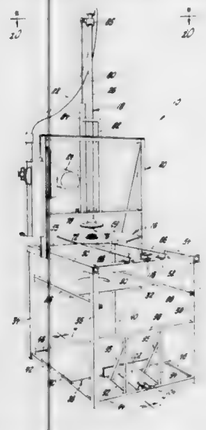
Filed Aug. 15, 1978, Ser. No. 933,711

Int. Cl.[2] B29C *17/06*

U.S. Cl. 264—572 **5 Claims**

1. Apparatus for reversing and flattening an occupant restraint cushion composed of a pair of overlapping sheets of flexible material secured along the outer edges thereof with one of said sheets having an opening located therein, said apparatus comprising a base supporting a loading platform having an aperture formed therein of a size generally corresponding to the size of said opening in said one of said sheets, a retaining member secured to said platform adjacent said aperture, said retaining member adapted to extend into said opening in said one of said sheets when the restraint cushion is positioned onto said loading platform and temporarily hold the latter mentioned sheet thereto, a ram supported by said base and adapted to engage the other of said sheets and force the latter through the opening in said one of said sheets and through the aperture in the loading platform and afterwards strip said one of said sheets from said retaining member so as to cause the inside and outside surfaces of said sheets to reverse, a source of pressurized air connected to said ram for supplying pressurized air to said restraint cushion so as to inflate the latter after said pair of sheets pass through said aperture, and means for compressing the inflated cushion into a pancake form.

4. A method for reversing an occupant restraint cushion and removing wrinkles therefrom wherein said restraint cushion is composed of a pair of overlapping sheets of flexible material sewn together along the outer edges thereof with one of the sheets having an opening located therein, said method comprising the steps of positioning the restraint cushion on a flat



platform with said one of said sheets contacting one side of said platform and with said opening registering with an aperture formed in said platform that is of a size corresponding to the size of said opening, forcing the other of said sheets through said aperture in the platform and through said opening so as to cause the inside and outside surfaces of said sheets to reverse in position and have the restraint cushion located adjacent the other side of the platform, supplying pressurized air to said restraint cushion through said opening so as to inflate the latter, and pressing the inflated restraint cushion between a pair of flat plate members so as to expel the air through said opening and thereby flatten the restraint cushion.

4,178,345

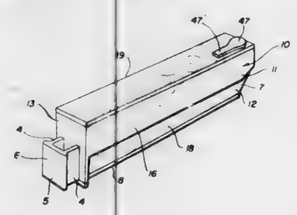
CUVETTE CARTRIDGE

Harold S. Terk, Richardson, Tex., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 8, 1978, Ser. No. 876,079

Int. Cl.[2] G01N *33/16, 21/24*

U.S. Cl. 422—61 **5 Claims**



1. A substantially rigid cuvette cartridge adapted for use with chemical and microbiological analysis apparatus, said cartridge comprising the following elements:

a cartridge having a chamber with an opening for receiving fluid to be analyzed and a floor portion;

a plurality of cuvettes in fluid communication with said chamber and extending in a given direction from said floor portion;

a first fluid passage means extending in a direction opposite said given direction;

a second fluid passage means extending in said given direction said first and second fluid passage means resulting in said fluid communication between said chamber and cuvettes.

4,178,346

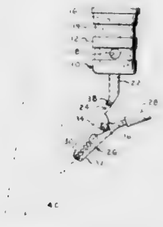
INCENSE BURNER DEVICE

Gerald L. Allen, 6765 Portage Ave., and Craig A. Chapman, 5417 Clem Rd., both of Portage, Ind. 46368

Filed Jun. 19, 1978, Ser. No. 916,968

Int. Cl.[2] A61L *9/02*

U.S. Cl. 422—126 **2 Claims**



1. A device for handling incense interior of an automobile, comprising:

a container having an open end, an opposing closed end and circumferentially spaced holes adjacent said closed end;

an exterior stem axially extending from said closed end;

lever members pivotally connected together intermediate the opposing distal ends thereof, said lever members having clamp means provided at one pair of corresponding distal ends for coacting against a component member of an automobile for support, and spring means between said lever members for biasing said clamp means together;

a handle means provided at the opposite distal end of one of said lever members;

a sleeve means provided at the opposite distal end of the other of said lever members for receiving said stem; and

means formed on said other of said lever members adjacent said sleeve means for manual deformation to orient said sleeve means to a vertical position.

4,178,347

PROCESS FOR THE SIMULTANEOUS PRODUCTION OF WET PROCESS PHOSPHORIC ACID AND SODIUM SILICOFLUORIDE

Ford T. Walker, Channahon, Ill., assignor to Olin Corporation, New Haven, Conn.

Filed May 17, 1978, Ser. No. 906,889

Int. Cl.[2] C01B *25/22*

U.S. Cl. 423—185 **4 Claims**

1. A process for recovering fluorine and silicon values from a waste-water stream produced in a wet-process phosphoric acid process which comprises:

(a) diluting concentrated sulfuric acid with said waste-water stream and producing an SiF_4-containing gas during said dilution;

(b) scrubbing said SiF_4-containing gas with phosphoric acid to produce a phosphoric acid solution containing fluosilicic acid and recycling said phosphoric acid solution back to the wet process phosphoric acid process;

(c) reacting sodium carbonate with said phosphoric acid solution after step (b) to precipitate solid sodium silicofluoride; and

(d) separating said solid sodium silicofluoride from said phosphoric acid.

4,178,348

PROCESS FOR REMOVING SULFUR OXIDES IN EXHAUST GASES

Etsuo Asanagi, Kashiwa, and Hideo Idemura, Tokyo, both of Japan, assignors to Chiyoda Chemical Engineering & Construction Company, Ltd., Kanagawa, Japan

Filed Jun. 9, 1977, Ser. No. 805,156

Claims priority, application Japan, Jun. 10, 1976, 51-67047

Int. Cl.[2] C01B *17/00*

U.S. Cl. 423—242 **3 Claims**

1. A process for the desulfurization of exhaust gas containing sulfur oxides comprising contacting the exhaust gas with a slurry of gypsum acidified with sulfuric acid to a pH of 4–2.5 and which contains 0.05–0.5 mole/l of at least one metal sulfate selected from the group consisting of zinc, copper and magnesium sulfates in the presence of oxygen, in a single reaction means, while adding lime to the slurry so as to effect the absorption and oxidation of said sulfur oxides and the simultaneous deposition of gypsum.

4,178,349

PROCESS FOR DRY REMOVAL OF SULFUR DIOXIDE FROM COMBUSTION GASES

Fritz O. Wienert, 394 Roosevelt Ave., Niagara Falls, N.Y. 14305

Continuation of Ser. No. 700,717, Jun. 28, 1976, abandoned. This application Sep. 6, 1977, Ser. No. 830,918

Int. Cl.[2] C01B *17/00;* **B01J** *8/00*

U.S. Cl. 423—244 **11 Claims**

1. In a process for removing sulfur dioxide from combustion gases of a steam-generating system that comprises a boiler, an economizer, an air preheater, a precipitator, and a stack, by reaction of the sulfur dioxide with dry particles of reactive lime-bearing materials, the improvement comprising: diverting the said combustion gases containing SO_2, prior to their passing said precipitator, from their normal flow path to a reaction chamber, retaining said gases in said reaction chamber with fine particles of dry reactive, lime-bearing materials for a reaction time longer than 2 seconds and not exceeding about 15 seconds while well and continuously mechanically agitating said gases and said particles whereby to maintain said particles in suspension, then passing said gases with said suspended particles from said reaction chamber to a settling chamber wherein the major portion of the solid particles are removed from the gases, said fine particles of dry, reactive lime-bearing materials comprising a product containing aggregates of fine particles obtained by grinding together a dry mixture of fresh, fine, reactive lime-bearing material and solid particles removed from said gases in said settling chamber, and then passing the said gases back into said normal flow path.

4,178,350

REMOVAL OF TRITIUM AND TRITIUM-CONTAINING COMPOUNDS FROM A GASEOUS STREAM

Martin F. Collins, Somerset, and Romuald Michalek, Hackensack, both of N.J., assignors to Engelhard Minerals & Chemicals Corp., Iselin, N.J.

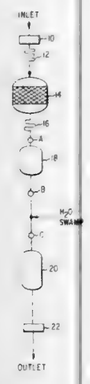
Filed Aug. 27, 1973, Ser. No. 391,862

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—248 **12 Claims**

1. A process for removing tritium from a gas stream comprising molecular tritium or compounds of tritium, said gas stream comprising at least one gas other than molecular protium and oxides thereof, and said gas stream containing tritium atoms in a larger concentration, on an atomic basis, relative to

protium atoms than its naturally-occurring relative concentration, said process comprising reacting said gas stream with at least sufficient oxygen to oxidize any molecular tritium and tritium-containing compounds to tritiated water, introducing the resulting oxidized stream into a first adsorption zone containing a desiccant and adsorbing therein said tritiated water to provide a first gaseous effluent which comprises constituents



of said gas stream or oxidation products thereof and a substantially reduced concentration of tritiated water, withdrawing said first gaseous effluent from said first adsorption zone, thereafter diluting said first effluent with ordinary water containing the naturally-occurring atomic ratio of protium to tritium, and subsequently introducing the thus-diluted effluent into a second adsorption zone containing a desiccant and adsorbing therein a mixture of tritiated water and ordinary water.

4,178,351

PROCESS FOR THE STABILIZATION OF SODIUM PERCARBONATE

Hans Klebe, and Gerd Knippschild, both of Rheinfelden, Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Oct. 16, 1978, Ser. No. 951,461

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1977, 2748783

Int. Cl.² C01B *15/10*

U.S. Cl. 423—275 **9 Claims**

1. A process for stabilizing sodium percarbonate particles comprising mixing sodium percarbonate containing 1 to 10 weight % of water based on the percarbonate with dry highly dispersed silica and then drying to form sodium percarbonate particles having a surrounding jacket of sodium silicate.

4,178,352

SYNTHESIS OF TYPE Y ZEOLITE

David E. W. Vaughan, Columbia; Grant C. Edwards, Silver Spring, and Michael G. Barrett, Laurel, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 879,266, Feb. 21, 1978, abandoned, and a continuation-in-part of Ser. No. 880,194, Feb. 22, 1978, abandoned, which is a continuation-in-part of Ser. No. 822,310, Aug. 5, 1977, abandoned, which is a continuation of Ser. No. 742,943, Nov. 18, 1976, abandoned, which is a continuation of Ser. No. 653,695, Jan. 30, 1976, abandoned. This application Sep. 21, 1978, Ser. No. 944,557

Int. Cl.² C01B *33/28*

U.S. Cl. 423—329 **5 Claims**

1. A process for preparing type Y zeolite comprising:

(a) preparing a slurry of zeolitic nucleation centers having an average particle size below about 0.1 micron, said slurry having the following mol ratio composition: 12 to 19 Na_2O; 0.7 to 9 Al_2O_3; 12 to 19 SiO_2; 220 to 900 H_2O;

(b) preparing an intermediate reaction mixture by combining the nucleation center composition of step (a) with additional sources of Na_2O, Al_2O_3, SiO_2 and H_2O to obtain a mixture having the following mol ratio composition: 2 to 6 Na_2O; 4.5 to 11 SiO_2; Al_2O_3; 30 to 200 H_2O;

(c) agitating and heating said intermediate reaction mixture of step (b) at a temperature of from about 30° to 80° C.;

(d) mixing an acid compound selected from the group comprising mineral acids, aluminum salts of mineral acids and mixtures thereof to the reaction mixture of step (c) to obtain a final reaction mixture having the following mol ratio composition: 0.5 to 2.5 $Na_n(A)$; 1.2 to 3 Na_2O; 4 to 7.5 SiO_2; Al_2O_3; 40 to 200 H_2O; wherein A is a mineral acid anion and n is the valence of A; and

(e) heating the final reaction mixture of step (d) to a temperature of from about 80° to 150° C. for from about 2 to 40 hours to obtain type Y zeolite.

4,178,353

PREPARATION AND PURIFICATION OF PHOSPHORYL CHLORIDE

Joseph W. Baker; Dario R. Cova, and James E. White, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 549,646, Feb. 13, 1975, abandoned, which is a continuation of Ser. No. 187,832, Oct. 8, 1971, abandoned. This application Aug. 4, 1975, Ser. No. 601,895

Int. Cl.² C01B *25/10*

U.S. Cl. 423—300 **5 Claims**

1. In a process for preparing phosphoryl chloride by oxidation of phosphorus trichloride wherein the phosphoryl chloride product thus-afforded contains a residual amount of phosphorus trichloride, the improvement wherein said residual phosphorus trichloride is converted to phosphoryl chloride by contacting said phosphoryl chloride/phosphorus trichloride product mixture with undiluted ozone or an ozone-enriched gas containing from about 0.01 to about 4 percent ozone by volume for a time sufficient to afford phosphoryl chloride essentially free of phosphorus trichloride.

4,178,354

SEQUESTERING AGENT

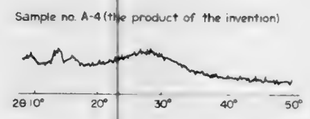
Moriyasu Murata, Chiba; Fumio Sai, Funabashi, and Takashi Fujino, Yokohama, all of Japan, assignors to Kao Soap Co., Ltd, Tokyo, Japan

Filed Dec. 8, 1977, Ser. No. 858,794

Claims priority, application Japan, Dec. 28, 1976, 51/157719

Int. Cl.² C01B *25/26*

U.S. Cl. 423—306 **6 Claims**



1. Dry particles of a water-insoluble, alkali metal aluminosilicophosphate having the formula (I):

$$x(M_2O).Al_2O_3.y(SiO_2).z(P_2O_5).w(H_2O) \quad \text{(amorphous)} \qquad (I)$$

wherein M is an alkali metal selected from the group consisting of Na, K and Li, x, y, z and w are numbers representing the mole numbers of the respective components wherein x, y and z satisfy the following relations:

$0.20 \leqq x \leqq 1.10$,

$0.20 \leqq y \leqq 4.00$, and

$0.001 \leqq z \leqq 0.80$,

and w is zero or an optional positive number, said aluminosilicophosphate being amorphous as determined by X-ray diffraction, said aluminosilicophosphate having a calcium ion-sequestering capacity of at least 180 mg (as $CaCO_3$) per gram of said aluminosilicophosphate and a magnesium ion-sequestering capacity of at least 100 mg (as $CaCO_3$) per gram of said aluminosilicophosphate, said particles having an average particle size smaller than 100μ and an average specific surface area of at least about 50 m^2/g, measured by the BET adsorption isotherm method.

4,178,355

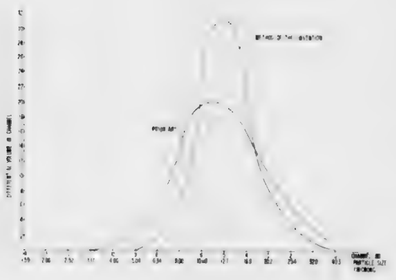
METHOD FOR PREPARING DICALCIUM ORTHOPHOSPHATE FOR USE IN FLUORESCENT LAMP PHOSPHORS

Herman R. Heytmeijer, Hanover Township, Morris County, N.J.; Larry P. Rusch, Salina, Kans., and Giuseppe Grasso, Parsippany Troy Hills, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 17, 1978, Ser. No. 878,852

Int. Cl.² C01B *25/32*

U.S. Cl. 423—308 **8 Claims**



1. A method of preparing anhydrous dicalcium orthophosphate of predetermined and substantially uniform particle size for making calcium halophosphate phosphors for use in fluorescent lamps, said method comprising:

(a) heating an acidified aqueous slurry of hydrated dicalcium orthophosphate ($CaHPO_4.2H_2O$) in a reaction vessel and simultaneously agitating said heated slurry within said vessel;

(b) continuing said heating and simultaneous agitation within said vessel until formation of a meta-stable gel-like material is manifested at the wall portions of said reaction vessel;

(c) discontinuing the application of heat to said slurry upon manifestation of said meta-stable gel-like material while continuing the agitation thereof within said vessel until all of said slurry is converted to said meta-stable gel-like material, at which time further agitation of the then-formed gel-like material is discontinued;

(d) maintaining said formed meta-stable gel-like material in a quiescent state until it converts completely to crystals of said anhydrous dicalcium orthophosphate, and permitting said orthophosphate crystals to settle to the bottom of residual liquid in said vessel; and

(e) separating said settled orthophosphate crystals from said residual liquid.

4,178,356

PROCESS FOR MANUFACTURING CHLORINE DIOXIDE

Morioki Shibuya, Shibukawa, and Isao Isa, Misato, both of Japan, assignors to The Japan Carlit Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1977, Ser. No. 856,989

Int. Cl.² C01B *11/02*

U.S. Cl. 423—478 **9 Claims**

1. A process for manufacturing chlorine dioxide, chlorine and an alkali metal chloride by the reaction of hydrochloric acid and the corresponding alkali metal chlorate in a single generator-crystallizer, comprising:

reacting an aqueous reaction medium containing (a) hydrochloric acid in a concentration of 0.01 to 0.23 normal, (b) said alkali metal chlorate in a concentration of 0.2 to 5 mol/l., (c) chloride ion in a concentration sufficient to saturate said reaction medium, (d) a chloropalladinate(II) complex catalyst or a mixed catalyst consisting of said chloropalladinate(II) complex catalyst and a compound or ions selected from the group consisting of vanadium pentoxide, manganese ions, dichromate ions, lead ions and arsenic ions, said chloropalladinate(II) complex having an absorption maximum wavelength longer than about 475 nm and being present at a concentration of 0.00001 to 0.001 g-atom/l based on palladium content and having an atomic ratio of said chloride ion to said palladium atom in said reaction medium of between about 4355 and 500,000, at a temperature of 25° to 90° C. under a reduced pressure of 20 to 400 mmHg.

evaporating water from said reaction medium, whereby a solid alkali metal chloride is formed,

withdrawing a gaseous mixture consisting of chlorine dioxide, chlorine and water vapor, and

recovering said solid alkali metal chloride.

4,178,357

STRIPPING SULPHUR COMPOUNDS FROM STACK AND OTHER DISCHARGE GASES AND THE COMMERCIAL PRODUCTS DERIVED THEREFROM

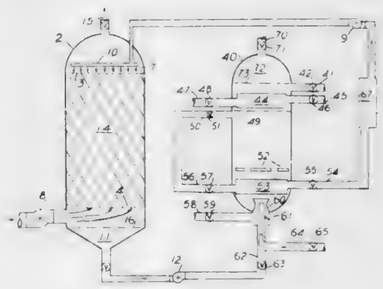
Xerxes T. Stoddard, 4617 W. 27th Ave., Denver, Colo. 80212; Vesper A. Vaseen, 9840 W. 35th Ave., Wheatridge, Colo. 80033, and Ruel C. Terry, 3090 S. High St., Denver, Colo. 80210

Filed Nov. 28, 1977, Ser. No. 855,244

The portion of the term of this patent subsequent to Mar. 6, 1996, has been disclaimed.

Int. Cl.² C01B *17/72*

U.S. Cl. 423—522 **5 Claims**



1. A method for production of sulphuric acid wherein a fuel combustor is coupled to a wet oxidation reactor, the said fuel combustor being operated with excess air in burning a fuel containing sulphur into flue gas, comprising the steps of

passing the flue gas through a scrubber in intimate contact

with $(C_8F_{17})_3N$, the said $(C_8F_{17})_3N$ having the inherent capability of absorbing sulphur dioxide and oxygen,

withdrawing the said $(C_8F_{17})_3N$ with absorbed sulphur dioxide and oxygen into the said wet oxidation reactor,

injecting water into the said wet oxidation reactor, and

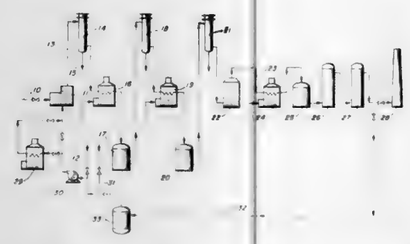
wet oxidizing sulphur dioxide in the presence of water into sulphuric acid.

4,178,358

SULFUR PLANT HEATUP PROCESS

George E. Smith, Parsippany, N.J.; Gregory L. Lorimor, Arvada, Colo.; Peter J. DeKluyver, Fullerton, and Henry E. McFarlin, Placentia, both of Calif., assignors to Conoco, Inc., Ponca City, Okla.

Filed Aug. 16, 1978, Ser. No. 934,238
Int. Cl.[2] C01B *17/04*
U.S. Cl. 423—574 R **4 Claims**



1. A process for heating up a modified Claus type sulfur recovery plant, comprised of a reaction furnace, a plurality of condensers, a plurality of catalytic converters, and heating means between at least one of said condensers and converters, prior to putting the plant on stream comprising:

(a) purging the plant with an inert gas;

(b) blocking in the purged plant; and

(c) circulating essentially inert gas through the blocked in plant while heating the circulating inert gas in an inert gas heating furnace prior to introducing heated circulating inert gas to said reaction furnace.

4,178,359

IMMUNOASSAY METHOD

Susan M. Mondabaugh, North Caldwell, and Magdalena U. Gomez, Wayne, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 731,237, Oct. 12, 1976, abandoned. This application Mar. 15, 1978, Ser. No. 886,849
Int. Cl.[2] G01N *33/16;* **A61K** *43/00*
U.S. Cl. 424—1 **10 Claims**

1. In an immunoassay for determining the presence of microbial antibodies in mammalian serum which comprises the steps of:

A. Providing a reaction mixture comprising a buffered aqueous medium; serum to be sampled; antigen derived from said virus or microbes and anti-antibody to the serum to be tested, said antigen or anti-antibody bearing a detectable label;

B. Incubating said reaction mixture at from about 4° to 45° C. for from about 24 to 2 hours at a pH of from about 6.5 to 8.5 to form an antigen-antibody conjugate when said microbial antibody is present in said serum sample; and

C. Determining the level of said label as a measure of the presence of said antigen-antibody conjugate;

the improvement which comprises adjusting the volume ratio of anti-antibody to serum sample to a value sufficient to form an agglutinate but less than required to effectuate precipitation of the antigen-antibody conjugate.

4,178,360

RADIOLABELLED RUBELLA VIRUS AND METHOD

Roy Cleeland, Short Hills, N.J.; Joanne Durkin, Staten Island, N.Y., and Michael J. Kramer, Glen Ridge, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 15, 1978, Ser. No. 886,848
Int. Cl.[2] G01N *33/16;* **A61K** *43/00*
U.S. Cl. 424—1 **5 Claims**

2. In an immunoassay for determining the presence of rubella virus specific antibodies in human serum which comprises the steps of:

A. Providing a reaction mixture comprising a buffered aqueous medium; human serum to be assayed; antigen derived from rubella virus and a second antibody specific to human IgG;

B. Incubating said reaction mixture to form an antigen-antibody-second antibody conjugate when said rubella virus specific antibody is present in said serum sample, said conjugate bearing a detectable label; and

C. Determining the level of said label as a measure of the presence of said antigen-antibody-second antibody conjugate and correlating said level against a standard curve to determine whether positive levels of said rubella virus specific antibody were present in said serum sample;

the improvement which comprises utilizing ^{125}I-rubella virus as the antigen.

4,178,361

SUSTAINED RELEASE PHARMACEUTICAL COMPOSITION

Arthur I. Cohen; James S. Y. Sim; Maurice H. Van Horn; Stanley E. Gordesky, and Stanley I. Gordon, all of Rochester, N.Y., assignors to Union Corporation, Verona, Pa.

Continuation of Ser. No. 395,861, Sep. 10, 1973, abandoned. This application Dec. 1, 1975, Ser. No. 636,494
Int. Cl.[2] A61K *9/22*
U.S. Cl. 424—22 **14 Claims**

1. A sustained release pharmaceutical composition comprising:

(A) a pharmacological material in an amount at least sufficient for the total dosage during a treatment period;

(B) a biological binding agent for said pharmacological material, said biological binding agent containing bonding sites complementary to bonding sites of the pharmacological material in an amount effective to bind the pharmacological materials and to provide for the sustained release of said pharmacological material in the desired dosage amount;

(C) a matrix of a water-insoluble but water-swellable hydrophilic polymer, which holds said biological binding agent;

(D) the molecular size or weight of the biological binding agent being sufficient to cause retention of said biological binding agent in said matrix and to prevent egress of said biological binding agent from said matrix during the treatment period.

4,178,362

ENZYMATIC DENTIFRICES

Hendrik Hoogendoorn, Krimpen aan den Ijssel; Rutger Matthijsen, and Huibert C. T. Moelker, both of Oss, all of Netherlands, assignors to Telec S.A., Geneva, Switzerland

Continuation of Ser. No. 870,815, Jan. 19, 1978, abandoned, which is a continuation of Ser. No. 651,862, Jan. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 349,317, Apr. 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 276,390, Jul. 21, 1972, abandoned, which is a continuation-in-part of Ser. No. 39,887, May 22, 1970, abandoned. This application Nov. 9, 1978, Ser. No. 959,162
Claims priority, application Netherlands, Jun. 3, 1969, 6908379
Int. Cl.[2] A61K *9/68, 7/28*
U.S. Cl. 424—48 **7 Claims**

1. An enzyme dentifrice chewing gum or tablet consisting of about 0.5 to about 20 units per gram/milliliter of glucose oxidase enzyme which forms hydrogen peroxide by oxidative decomposition of a glucose substrate provided by glucose present in sufficient amount in saliva and tooth plaque, said hydrogen peroxide being formed in a continuous concentration no greater than 10^{-4}%, said unit being the quantity of the enzyme which will oxidize 1 micromol of substrate per minute at 30° C. and pH 6, effective when applied to a dental surface exhibiting a pH below the neutral range, to restore the pH at said dental surface to an approximately neutral range, and

a pharmaceutically acceptable carrier.

4,178,363

METHOD FOR REDUCING DENTAL PLAQUE AND PELLICLE PRECURSOR OF PLAQUE

Taylor C. Miller, Jr., 210 Professional Center, Montgomery, Ala. 36104

Filed May 9, 1978, Ser. No. 904,335
Int. Cl.[2] A61K *7/16, 7/24, 31/20*
U.S. Cl. 424—49 **1 Claim**

1. A method for reducing dental plaque and pellicle precursor of plaque comprising brushing or irrigating the teeth with a dental preparation containing an active ingredient, the active ingredient consisting essentially of 2% by weight of undecylenic acid and 2% by weight of zinc undecylenate.

4,178,364

ART OF SHAVING

Jimmy Rucker, 400 E. 33rd St., Apt. 1401, Chicago, Ill. 60616

Filed Aug. 8, 1975, Ser. No. 603,145
Int. Cl.[2] A61K *7/15;* **B26D** *7/08*
U.S. Cl. 424—73 **2 Claims**

1. A method of shaving with a razor in which the skin is first washed clean and wet with water to provide a colorless transparent first liquid phase over the clean skin area from which the hair is to be shaved with the razor, spreading a drop of water-immiscible fluid consisting of a mixture of dimethyl polysiloxanes having a viscosity of 600 to 700 centistokes across the length of the razor edge to produce a trasparent colorless second liquid phase which adheres to the razor edge and is repellent to the first liquid phase, and moving the dimethyl-polysiloxane-coated razor edge across the water-wet area of the skin, a sharply defined low frictional interface being created between the two liquid phases such that the razor edge slides smoothly across the skin in the shaving act and cuts cleanly close to the skin with minimal pull on the hair and frictional resistance between the skin and the razor edge.

4,178,365

METHOD OF PREPARING AN ANTIPARASITIC IMMUNOLOGICAL AGENT, THE PRODUCT OBTAINED, AND ITS APPLICATION

Daniel Bout, Le Maisnil, France, assignor to Institut National de la Sante et de la Recherche Medicale - Centre de Technologie Biomedicale I.N.S.E.R.M., Paris and Institut Pasteur, Lille, both of, France

Filed Jul. 11, 1977, Ser. No. 814,211
Int. Cl.[2] A61K *39/00*
U.S. Cl. 424—88 **11 Claims**

1. A method of preparing an antischistosomic immunological agent from human or animal schistosomes, comprising the steps of

obtaining a total extract of antigens of schistosomes, the antigens being target antigens of the schistosomes with respect to a schistosomicidal drug,

contacting a schistosomicidal drug, which is a ligand, with the total extract, whereby the target antigens become fixed on the drug as target antigens bound to the ligand.

7. An antischistosome immunological agent comprising principally a schistosome extract constituting target antigens of a schitosomicidal drug.

4,178,366

NEMATODE LARVAE AS BIOLOGICAL INSECTICIDES

Robin A. Bedding, Taroona, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Australia

Continuation of Ser. No. 715,590, Aug. 18, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 909,404
Claims priority, application Australia, Aug. 26, 1975, 2930/75
Int. Cl.[2] A01N *15/00*
U.S. Cl. 424—93 **20 Claims**

1. A formulation for use in the biological control of insects, comprising mineral oil as a suspension medium containing an insecticidal amount of a larval stage of nematodes infective and parasitic to the larvae of said insects and a wax or wax-like material in an amount effective to reduce water loss from said formulation, said formulation substantially not containing any free water but retaining the body moisture of said nematodes.

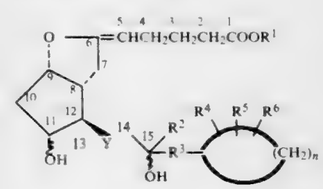
4,178,367

PROSTAGLANDIN I_2 ANALOGUES

Hayashi Masaki, Takatsuki; Yoshinobu Arai, Toyonaka; Yoshitaka Konishi; Katsuichi Shimoji, both of Takatsuki; Shuichi Ohuchida, Kyoto; Hiroyuki Ito, Suita, and Hirohisa Wakatsuka, Takatsuki, all of Japan, assignors to Ono Pharmaceutical Co. Ltd., Osaka, Japan

Filed Feb. 16, 1978, Ser. No. 878,571
Claims priority, application Japan, Feb. 21, 1977, 52/017141; Mar. 22, 1977, 52/030494
Int. Cl.[2] A61K *31/34;* **C07D** *307/93*
U.S. Cl. 424—285 **21 Claims**

1. A prostaglandin of the formula:



wherein Y is trans-vinylene or ethylene, R^1 is hydrogen or straight- or branched-chain alkyl of from 1 to 12 carbon atoms, R^2 is hydrogen, methyl, or ethyl, R^3 is a single bond, or straight- or branched-chain alkylene of from 1 to 4 carbon

atoms, R^4, R^5 and R^6, which may be the same or different, are each hydrogen, or straight- or branched-chain alkyl of from 1 to 8 carbon atoms, n is 3, 4, 5, or 6, the wavy line attached to the carbon atoms in positions 11 and 15 depicted in the formula show that the perspective hydroxyls attached to the said positions have the α- or β-configuration or a mixture thereof, and the double bond between C_5–C_6 is Z or E and, when R^1 is hydrogen, non-toxic salts thereof.

21. A pharmaceutical antithrombotic or hypotensive composition which comprises, as active ingredient, an antithrombotic or hypotensive amount of at least one compound as claimed in claim 1 in association with a pharmaceutical carrier or coating.

4,178,368

METHOD FOR THE TREATMENT OF THROMBOEMBOLISM

Norbert Heimburger; Hansjörg Ronneberger, and Manfred Schick, all of Frankfurt am Main, Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 850,808, Nov. 11, 1977, abandoned, which is a continuation of Ser. No. 736,831, Oct. 29, 1976, abandoned, which is a continuation of Ser. No. 293,213, Sep. 28, 1972, abandoned. This application Jun. 21, 1978, Ser. No. 917,583

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1971, 2148865

Int. Cl.[2] **A61K** *37/48*

U.S. Cl. 424—94 **2 Claims**

1. A method for the treatment of thromboembolisms in a patient, said method consisting essentially of intravenously administering to said patient an effective amount of a complex formed between streptokinase and plasminogen in a mol ratio from 2:1 to 1:2 in combination with a physiologically tolerable aqueous liquid diluent.

4,178,369

FEEDING TURKEYS

Elmer F. Glabe, Northbrook, Ill., and Herbert J. Rebhan, New Richmond, Wis., assignors to Food Technology Products, Chicago, Ill.

Continuation-in-part of Ser. No. 786,419, Apr. 11, 1977, abandoned. This application Apr. 17, 1978, Ser. No. 897,113

The portion of the term of this patent subsequent to Dec. 11, 1996, has been disclaimed.

Int. Cl.[2] **A23K** *1/00*

U.S. Cl. 424—177 **6 Claims**

1. A process of improving feed efficiency in the raising of turkeys which comprises feeding turkeys with a mixed turkey feed containing 0.1% to 0.3% by weight of sodium diacetate and dehydrated whey wherein the weight ratio of sodium diacetate to dehydrated whey is within the range of 25:1 to 1:4 thereby to enhance the feed efficiency of the feed.

4,178,370

FEEDING PIGS

Elmer F. Glabe, Northbrook, Ill., and Herbert J. Rebhan, New Richmond, Wis., assignors to Food Technology Products, Chicago, Ill.

Continuation-in-part of Ser. No. 817,001, Jul. 18, 1977, abandoned. This application Apr. 17, 1978, Ser. No. 897,112

The portion of the term of this patent subsequent to Dec. 11, 1996, has been disclaimed.

Int. Cl.[2] **A23K** *1/00*

U.S. Cl. 424—177 **5 Claims**

1. A process of improving feed efficiency in the raising of pigs which consists essentially in feeding pigs with a mixed pig feed and from 0.1% to 0.4% by weight of sodium diacetate and dehydrated whey wherein the weight ratio of sodium diacetate to dehydrated whey is within the range of 25:1 to 1:4 whereby to enhance the feed efficiency of the feed.

4,178,371

TETRAPEPTIDE DERIVATIVES

Barry A. Morgan, Hessle, England, assignor to Reckitt & Colman Products Limited, London, England

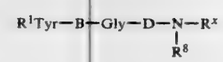
Filed Nov. 27, 1978, Ser. No. 964,074

Claims priority, application United Kingdom, Dec. 15, 1977, 52237/77; Apr. 8, 1978, 13845/78

Int. Cl.[2] **A61K** *37/00; C07C 103/52*

U.S. Cl. 424—177 **14 Claims**

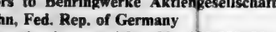
1. A compound of the formula:



wherein

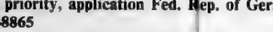
R^1 is hydrogen, methyl, allyl, dimethylallyl, propargyl, cyclopropylmethyl, cyclobutylmethyl or phenethyl;

B is the group



in which R^3 is alkyl C_{1-6} or $C_qH_{2q}YC_rH_{2r+1}$ (where q is 1-2, r is 0-1 and Y is O, S, SO or SO_2); the group having the D-configuration;

D is the group



in which

R^5 is hydrogen or methyl;

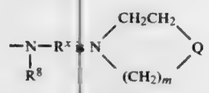
R^6 Ar-alkyl C_{1-3};

the group having the L-configuration;

R^8 is hydrogen, alkyl C_{1-5}, Ar or Ar-alkyl C_{1-2};

R^x is a group $(CH_2)_s$—X where s is 2-4 and X is NHR^9, $N\oplus R^{11}R^{12}R^{13}$, NR^9COR^{11}, NR^9COOR^{11}, NR^9CONH_2, $NR^9CONR^{10}R^{11}$, $N(O)_nR^{11}R^{12}$, $COOR^9$, $CONR^9R^{10}$, or $OCONR^9R^{10}$ (where R^9 is hydrogen, alkyl C_{1-3}, Ar or $ArCH_2$;

R^{10} is hydrogen or alkyl C_{1-3}; R^{11} is alkyl C_{1-3}, Ar or $ArCH_2$; R^{12} is alkyl C_{1-3}; R^{13} is alkyl C_{1-3}; and n is 0 or 1); or the group



where m is 1–3 and Q is SO, SO_2, CO CHOH, $N\oplus MeR^{11}$ or $N(O)R^{11}$;

Ar is phenyl or phenyl substituted by chlorine, methyl, hydroxy or methoxy; and their acid addition salts.

4,178,372

HYPOALLERGENIC STABILIZED ALOE VERA GEL

Billy C. Coats, 1419 Mapleton, Dallas, Tex. 75228

Filed Mar. 6, 1978, Ser. No. 883,749

Int. Cl.[2] **A61K** *35/78, 7/26, 47/00*

U.S. Cl. 424—195 **15 Claims**

1. A process for stabilizing a clear gel from the leaf of aloe vera comprising:

(a) mechanically separating aloe vera gel matrix from the outer cortex of aloe vera leaf;

(b) extruding said gel matrix through a filter to thereby remove particles of aloe vera leaf therefrom;

(c) heating said aloe vera gel matrix to a temperature within the range of from about 35 degrees C. to about 80 degrees C. and adding thereto a catalytic amount of hydrogen peroxide to thereby cause said gel to oxidize and assume a lighter appearance;

(d) adding ascorbic acid to said gel in an amount of from about 0.015 to about 0.5 ounce per gallon of said gel to thereby arrest catalytic oxidation;

(e) adding an amount of citric acid to said gel effective to maintain the pH of said gel solution at a value of between from about 4 to 6.

11. The product produced by the process of claim 1.

4,178,373

COAL TAR GEL COMPOSITION

Robert W. Klein, Blue Bell, and Mary E. Foxx, Lansdale, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Filed Aug. 21, 1978, Ser. No. 935,341

Int. Cl.[2] **A61K** *31/615, 31/00, 31/05, 47/00*

U.S. Cl. 424—233 **7 Claims**

1. In a coal tar gel composition for topically treating eczema or psoriasis containing a gelling agent and from about 0.5 to about 20% by weight based on said composition of coal tar, the improvement which comprises including the combination of from about 2 to about 10% by weight based on said composition of a fatty acid derivative of sarcosine, said fatty acid having from 6 to 16 carbons, and from about 25 to about 75% by weight based on said composition of a glyceryl ester of a fatty acid having 6 to 22 carbon atoms; said glyceryl ester having a melting point of about −20° to +80° C.

7. A method for treating eczema or psoriasis in humans which comprise topically administering an effective amount of the composition of claim 1.

4,178,374

NOVEL PHARMACEUTICAL COMPOSITIONS OF β-BLOCKERS WITH DIURETICS

Charles S. Sweet, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 734,702, Oct. 21, 1976, which is a continuation-in-part of Ser. No. 554,373, Mar. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 497,961, Aug. 16, 1974, abandoned. This application Apr. 10, 1978, Ser. No. 896,066

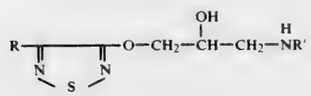
Int. Cl.[2] **A61U** *31/00;* **A61K** *31/54, 31/495*

U.S. Cl. 424—246 **20 Claims**

1. A method of treating a hypertensive animal to reduce blood pressure which comprises administration to said animal of a blood pressure reducing amount of a composition comprising:

(A) β-blocking agent selected from:

(i) compounds having the formula



wherein R is morpholino and R′ is selected from C_1–C_{10} alkyl, C_2–C_6 alkynyl, C_2–C_4 alkenyl, C_1–C_4 alkylthio, C_3–C_6 cycloalkyl and heterocycle

(ii) non-toxic pharmaceutically acceptable salt of (i); and

(iii) mixtures containing (i) and (ii); and

(B) diuretic mixture containing

(a) thiazides or their pharmaceutically acceptable salt and

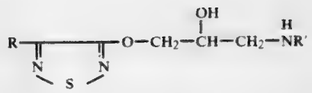
(b) amiloride or its pharmaceutically acceptable salt

wherein the weight ratio of (A):(B) is about 1:1 to about 1:10.

6. Composition comprising:

(A) β-blocking agent selected from:

(i) compounds having the formula



wherein R is morpholino and R′ is selected from C_1–C_{10} alkyl, C_2–C_6 alkynyl, C_2–C_4 alkenyl, C_1–C_4 alkylthio, C_3–C_6 cycloalkyl and heterocycle,

(ii) non-toxic pharmaceutically acceptable salt of (i); and

(iii) mixtures containing (i) and (ii); and

(B) diuretic mixture containing

(a) a 1,2,4-benzothiadiazine or their pharmaceutically acceptable salt, and

(b) amiloride or its pharmaceutically acceptable salt

wherein the weight ration of (A):(B) is about 1:1 to about 1:10.

4,178,375

PRESERVING AND DISINFECTING METHOD EMPLOYING CERTAIN OXAZINES

Heinz Eggensperger, Hamburg, and Karl-Heinz Diehl, Norderstedt, both of Fed. Rep. of Germany, assignors to Sterling Drug Inc., New York, N.Y.

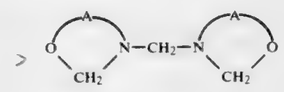
Division of Ser. No. 819,245, Jul. 27, 1977, Pat. No. 4,148,905. This application Aug. 17, 1978, Ser. No. 934,792

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1976, 2635389

Int. Cl.[2] **A01N** *9/22*

U.S. Cl. 424—248.4 **3 Claims**

1. A method for preventing or retarding the growth of bacteria and fungi in a material susceptible to bacterial and fungal contamination which comprises treating the inanimate material with an antibacterially and antifungally effective amount of a compound of the formula



where A is 1,3-alkanediyl having from 3 to 10 carbon atoms.

4,178,376

METHOD FOR INDUCING RAPID THERAPEUTICALLY EFFECTIVE ANTIMALARIAL LEVELS OF CERTAIN SELECTED CONVENTIONAL ANTIMALARIALS

Takeru Higuchi, and Siegfried Lindenbaum, both of Lawrence, Kans., assignors to Interx Research Corporation, Lawrence, Kans.

Filed Jan. 21, 1977, Ser. No. 760,859

Int. Cl.[2] **A61K** *31/47, 9/42, 31/44, 31/135*

U.S. Cl. 424—258 **10 Claims**

1. A method for inducing rapid therapeutically effective blood levels of 6,8-Dichloro-α-(dibutylaminomethyl-2-(3′,4′-dichlorophenyl)-4-quinolinemethanol, in a warm-blooded animal afflicted with malaria which comprises administering to said animal a composition consisting essentially of:

(a) an effective antimalarial amount of 6,8-Dichloro-α-(dibutylaminomethyl-2-(3′,4′-dichlorophenyl)-4-quinolinemethanol, dissolved in,

(b) a solubilizing amount of an organic fatty acid of the formula: R—COOH, wherein R represents a member selected from the group consisting of a saturated aliphatic hydrocarbon group of from seven to twenty carbon atoms and a mono-, di-, tri-, or tetra-unsaturated aliphatic hydrocarbon group of from seven to twenty carbon atoms.

4,178,377

(4-HYDROXY-4-PIPERIDYL)-ALKANOIC ACID AMIDES

Erwin Rissi, Basel, and Anton Ebnöther, Arlesheim, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

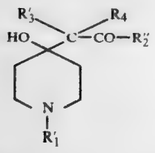
Continuation-in-part of Ser. No. 650,105, Jan. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 479,850, May 14, 1974, abandoned. This application Aug. 19, 1977, Ser. No. 826,201

Claims priority, application Switzerland, Jun. 22, 1973, 9177/73; Jun. 28, 1973, 9414/73; Jun. 29, 1973, 9509/73; Jul. 2, 1973, 9598/73; Mar. 21, 1975, 3649/75; Mar. 21, 1975, 3650/75; Jan. 9, 1976, 215/76

Int. Cl.[2] **A61K** *31/445;* **C07D** *211/48*

U.S. Cl. 424—267 **12 Claims**

1. A compound of the formula



wherein

R_1' is phenethyl or phenethyl monosubstituted in the phenyl ring by fluorine, chlorine, bromine, lower alkyl or lower alkoxy,

R_2'' is



wherein

R_6'' is lower alkyl, and

R_7'' is cycloalkyl,

R_3' is lower alkyl, and

R_4 is hydrogen or lower alkyl,

or a pharmaceutically acceptable acid addition salt thereof.

4,178,378

ETHERIFIED TRIAZOLOBENZODIAZEPINE DERIVATIVES

Hans Allgeier, Lörrach-Haagen, Fed. Rep. of Germany, and André Gagneux, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

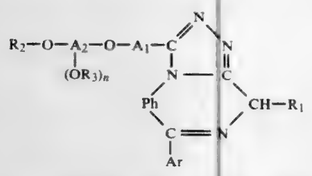
Filed Sep. 15, 1977, Ser. No. 833,421

Claims priority, application Luxembourg, Sep. 20, 1976, 75836

Int. Cl.[2] **A61K** *31/55, 31/62;* **C07D** *487/04*

U.S. Cl. 424—269 **32 Claims**

1. An etherified diazepine derivative of the formula

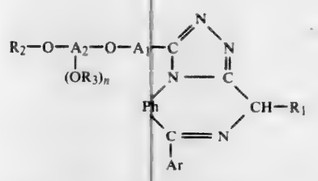


(I)

in which R_1 represents hydrogen or alkyl having up to 3 carbon atoms, R_2 and R_3 independently of one another each represent hydrogen or alkyl having up to 7 carbon atoms, or represent the partial formula R_4—$(OCH_2$—$CH_2)_m$, in which R_4 represents hydrogen or alkyl having up to 7 carbon atoms and m represents the number 1 to 3, A_1 represents alkylidene or alkylene having up to 3 carbon atoms, A_2, depending on the meaning of n, represents alkylene or alkanetriyl having 2 to 5 carbon atoms, no carbon atom in the radical A_2 being bonded to more than one oxygen atom, n represents the number 0 or 1, Ph represents 1,2-phenylene which is unsubstituted or substituted in 8-position by lower alkyl, lower alkoxy, halogen having an atomic number up to and including 35, or trifluoromethyl, and Ar represents phenyl which is unsubstituted or substituted by lower alkyl, lower alkoxy, halogen having an atomic number of up to and including 35, or trifluoromethyl in o-position.

10. 8-Chloro-6-(o-chlorophenyl)-1-[(2,2-dimethyi-1,3-dioxolan-4-yl)-methoxy-methyl]-4H-s-triazolo[4,3-a][1,4]-benzodiazepine.

13. A pharmaceutical composition useful in the treatment of states of epilepsy, stress and agitation in a warm-blooded animal, comprising a therapeutically effective amount of a compound according to claim 1, which corresponds to the formula



(I)

in which R_1 represents hydrogen or alkyl having up to 3 carbon atoms, R_2 and R_3 independently of one another each represent hydrogen or alkyl having up to 7 carbon atoms, or represent the partial formula R_4—$(OCH_2$—$CH_2)_m$, in which R_4 represents hydrogen or alkyl having up to 7 carbon atoms and m represents the number 1 to 3, A_1 represents alkylidene or alkylene having up to 3 carbon atoms, A_2, depending on the meaning of n, represents alkylene or alkanetriyl having 2 to 5 carbon atoms, no carbon atom in the radical A_2 being bonded to more than one oxygen atom, n represents the number 0 or 1, Ph represents 1,2-phenylene which is unsubstituted or substituted in 8-position by lower alkyl, lower alkoxy, halogen having an atomic number up to and including 35, or trifluoromethyl, and Ar represents phenyl which is unsubstituted or substituted by lower alkyl, lower alkoxy, halogen having an atomic number of up to and including 35, or trifluoromethyl in o-position, or an addition salt thereof, together with a pharmaceutical carrier.

4,178,379

SUBSTITUTED PYRANO[4,3-c]PYRAZOLES, COMPOSITIONS CONTAINING SAME, AND METHOD OF USE

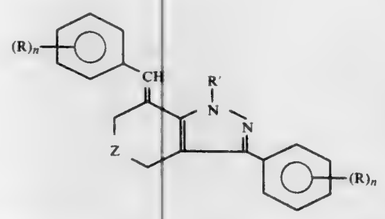
George C. Rovnyak, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 7, 1978, Ser. No. 913,268

Int. Cl.[2] **C07D** *491/04, 495/04*

U.S. Cl. 424—273 P **14 Claims**

1. A compound of the structure



wherein Z is O, S, SO or SO_2, n is 1 or 2, R is hydrogen, halogen, lower alkyl, lower alkoxy, lower alkanoyl, aroyl, cyano or trifluoromethyl, and R' is hydrogen, lower alkyl, aryl-lower alkyl, aryl, or halo-lower alkyl.

4,178,380

BENZOPYRANCARBOXAMIDES

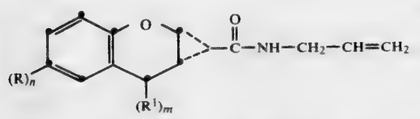
John B. Carr, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 778,534, Mar. 17, 1977, abandoned. This application Jul. 31, 1978, Ser. No. 929,400

Int. Cl.[2] **A61K** *31/35;* **C07D** *311/12*

U.S. Cl. 424—283 **10 Claims**

1. A compound of the formula



(I)

wherein n is zero or one, R is halogen; nitro; amino; trifluoromethyl; methylsulfonylamino; alkyl or alkoxy of from one to six carbon atoms; cycloalkyl of from three to six carbon atoms; phenyl, phenoxy, benzyl or 2-phenethyl, or any of these substituted by one or two of one or more of alkyl of from one to six carbon atoms, halogen and nitro; m is zero or one, and R^1 is hydroxyl, with the proviso that when m is one, the compound is in the cis isomeric configuration, the dotted lines indicating that 2-propenylaminocarbonyl moiety is bonded to the benzopyran ring at the 2-position or at the 3-position.

7. A method for inhibiting lipogenesis in a mammal, which comprises administering to a mammal in need of such treatment, orally or parenterally, an effective amount of a compound defined in claim 1.

4,178,381

C-HOMOESTRATRIENES

Gregor Haffer; Ulrich Eder; Gerhard Sauer; Rudolf Wiechert; Yukishige Nishino, and Günter Neff, all of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

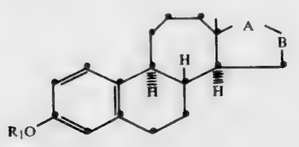
Filed Dec. 4, 1978, Ser. No. 966,162

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1977, 2755578

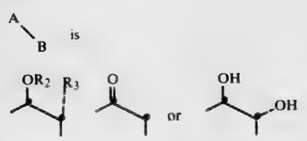
Int. Cl.[2] **A61K** *31/05, 31/085, 31/12*

U.S. Cl. 424—283 **19 Claims**

1. A C-homoestratriene of the formula



wherein



R_1 and R_2 are the same or different, and each is hydrogen, a conventional physiologically compatible acyl group derived from a hydrocarbon carboxylic or sulfonic acid, C_{1-5}alkyl, C_{3-8}cycloalkyl or tetrahydropyranyl, and R_3 is hydrogen, ethynyl or chloroethynyl.

4,178,382

N-SUBSTITUTED TRIORGANOSTANNYLHYDRO-CARBYLCARBOXYLIC ACID HYDRAZIDES

Chung-Ling Mao, Sandy Hook; Richard J. Strunk, Cheshire, and Winchester L. Hubbard, Woodbridge, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Jun. 19, 1978, Ser. No. 917,143

Int. Cl.[2] **C01B** *6/13, 6/22, 35/00*

U.S. Cl. 424—288 **21 Claims**

1. A compound having the formula $R_3SnACONR^1X$, wherein R is C_1–C_4 alkyl, C_3–C_6 cycloalkyl, or C_6–C_{10} aryl; A is C_1–C_5 alkylene or C_8 aralkylene; R^1 is hydrogen, C_1–C_{12} alkyl, C_7–C_9 aralkyl, C_2–C_{12} alkanoyl, C_7–C_{11} aroyl, or C_1–C_{12} alkyl substituted with hydroxy, cyano, C_1–C_{14} alkoxycarbonyl, C_1–C_4 alkylsulfonyl, C_6–C_{10} arylsulfonyl, C_1–C_4 alkanoyl, C_6–C_{10} aroyl, or C_5–C_6 2-hydroxycycloalkyl; and X is —NR^2R^3, —N=CR^4R^5, —NR^6COR^7, or —$NR^8CYNR^9R^{10}$, wherein Y is divalent oxygen or sulfur; R^2 and R^3 may be the same or different and are hydrogen, provided that one of R^2 and R^3 is other than hydrogen, or are 2-hydroxycyclohexyl, substituted or unsubstituted C_1–C_{17} alkyl, the substituents being the same or different and being hydroxy, C_6–C_{10} aryl, C_1–C_4 alkoxy, C_7–C_{11} alkoxyaryloxy, tetrahydropyranyloxy, phenylsulfonylethyl, phenyl substituted with halogen, C_1–C_{18} alkyl, C_6–C_{10} aryl, C_1–C_4 alkoxy, or phenoxy, or are —$R^{11}OOCNR^{12}R^{13}$, wherein R^{11} is C_3–C_6 cycloalkylene, substituted or unsubstituted C_2–C_{12} alkylene, the substituents being the same or different and being C_6–C_{10} aryl, C_1–C_4 alkoxy, C_7–C_{11} alkoxyaryloxy, or tetrahydropyranyloxy; R^{12} is C_1–C_{18} alkyl, C_3–C_{10} cycloalkyl, C_6–C_{10} aryl, or phenyl substituted with halogen or with C_1–C_8 alkyl, C_1–C_4 alkoxy, C_2–C_6 alkoxycarbonyl, trifluoromethyl or C_1–C_4 alkylphenylsulfonyl; and R^{13} has the meanings of R^1 above; or R^2 and R^3 are joined together forming C_4–C_6 alkylene, C_4–C_6 oxydialkylene or methylenebis(aminomethylene)-N,N'-bis(3-trimethylstannyl-ethylcarbonylamino); R^4 and R^5 may be the same or different and are hydrogen, provided that one of R^4 and R^5 is other than hydrogen, or are C_1–C_{11} alkyl, C_3–C_{10} cycloalkyl, C_7–C_{12} bicycloalbenyl C_7–C_{11} aralkyl, C_8–C_{10} arylalkenyl, C_6–C_{10} aryl, furyl, pyridyl indolyl, dihydropyranyl, or phenyl substituted with C_1–C_8 alkyl, hydroxy, halogen, C_1–C_8 alkoxy, methylenedioxy, C_6–C_{10} aryloxy, benzyloxy, C_2–C_8 dialkylamino, C_1–C_8 alkylamino, C_6–C_{12} arylamino, cyano, or nitro, or R^4 and R^5 are joined together forming C_2–C_5 alkylene; R^6, R^8 and R^{10} may be the same or different and have the meanings of R^1 above; R^7 is C_1–C_{17} alkyl, C_3–C_{10} cycloalkyl, C_6–C_{10} aryl, C_8–C_{10} aralkenyl, furyl, phenothiazin-10-yl, trimethylstannylethyl, or phenyl substituted with halogen, C_1–C_4 alkyl, C_6–C_{10} aryl, C_1–C_4 alkoxy, phenylazo, carboxy, nitro, alkali metal carboxy, or C_2–C_{12} alkoxycarbonyl, or R^7 is a pyridylenebis(carbonylamino) group connecting two $R_3SnACONR^1$— groups, wherein R, A, and R^1 are as defined above; R^9 is C_1–C_{18} alkyl, C_3–C_5 alkenyl, C_3–C_{10} cycloalkyl, C_6–C_{10} aryl, C_3–C_8 alkoxycarbonylalkyl, C_7–C_9 aralkyl, or phenyl substituted with halogen, C_1–C_{12} alkyl, C_1–C_4 alkoxy, nitro, cyano, trifluoromethyl, or alkali metal sulfo.

4,178,383

FUNGICIDALLY ACTIVE OXIME-ETHERS OF ISONITROSOCYANOACETAMIDES

Wilhelm Brandes, Cologne; Werner Daum, Krefeld, and Peter Kraus, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

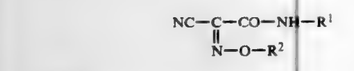
Filed May 12, 1977, Ser. No. 796,503

Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623847; Dec. 16, 1976, 2657145

Int. Cl.[2] C07C *121/52, 121/66;* **A01N** *9/20*

U.S. Cl. 424—304 **15 Claims**

1. An oxime-ether of isonitrosocyanoacetamide of the formula



in which

R^1 represents hydrogen or the —CO—NHR^3 group, wherein

R^3 is hydrogen or alkyl with up to 4 carbon atoms, and

R^2 represents phenyl which carries one or more substituents selected from nitro, trifluoromethyl and cyano groups and optionally carries one or more halogen substituents; or represents benzyl which carries one or more substituents, on the aromatic part, selected from benzoyl, monohalogenobenzoyl dihalogenobenzoyl, phenyl and alkoxy with 1 to 14 carbon atoms; or represents phenylaminocarbonyl-methyl or diphenylaminocarbonyl-methyl optionally substituted on the methyl radical by 1 or 2 alkyl groups each with up to 4 carbon atoms and on the phenyl nucleus by at least one of halogen and/or alkyl with up to 6 carbon atoms.

14. A method of combating fungi which compriss applying to the fungi, or to a habitat thereof, a fungicidally effective amount of an ether according to claim 1.

4,178,384

PYRETHROID INSECT REPELLENT

Kenneth J. Ensing, deceased, late of Middleport, N.Y. (by Lois K. Ensing, executrix), assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 669,371, Mar. 22, 1976, abandoned. This application Jan. 13, 1977, Ser. No. 758,981

Int. Cl.[2] A01N *9/24*

U.S. Cl. 424—305 **6 Claims**

1. A method of repelling a species of insect from a locus to which said species of insect is normally attracted which comprises depositing on said locus a non-toxic effective insect repellent amount of a formulation consisting essentially of no more than about 0.2% by weight 3-phenoxybenzyl 3-(β,β-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate and no other cyclopropanecarboxylate or synergist therefor in intimate admixture with a carrier or diluent therefor.

4,178,385

METHOD FOR TREATING HYPERLIPIDEMIA IN PRIMATES USING 4-((4-FLUOROPHENYLMETHYL)AMINO)BENZOIC ACID

Eugene R. Wagner, Carmel, and Alfred A. Renzi, Zionsville, both of Ind., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 3, 1978, Ser. No. 883,091

Int. Cl.[2] A61K *31/195, 31/205, 31/24*

U.S. Cl. 424—310 **5 Claims**

1. A method for lowering serum lipid levels in a primate which comprises administering internally to the primate an effective hypolipidemic amount of the compound 4-((4-fluorophenylmethyl)amino)benzoic acid, a pharmaceutically-acceptable salt or a lower ester thereof.

4,178,386

INHIBITORS OF GLYCOLIC ACID OXIDASE

Haydn W. R. Williams, Dollard des Ormeaux, Canada; Edward J. Cragoe, Jr., Lansdale, and Clarence S. Rooney, Worcester, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 11, 1978, Ser. No. 950,754

Int. Cl.[2] A61K *31/19*

U.S. Cl. 424—317 **2 Claims**

1. A method of treating or preventing the formation of calcium oxalate kidney or bladder stones which comprises administering to a patient with or prone to this disease an effective amount of 2-hydroxy-3-butynoic acid or a pharmaceutically acceptable salt or lower alkyl ester thereof.

4,178,387

METHOD FOR THE TREATMENT OF ARRHYTHMIA

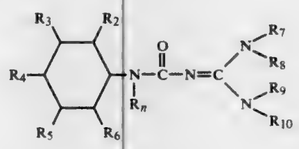
Julius Diamond, Morris Plains, N.J., and George H. Douglas, Malvern, Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation of Ser. No. 671,762, Mar. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 558,187, Mar. 31, 1975, Pat. No. 4,060,635. This application Jan. 10, 1978, Ser. No. 868,568

Int. Cl.[2] A61K *31/17, 31/33, 31/54, 31/535*

U.S. Cl. 424—322 **18 Claims**

1. A method for the treatment of arrhythmia in a patient suffering from arrhythmia which comprises administering to said patient an effective daily dosage of between 0.1 and 70 mg/kg of body weight of said patient a compound of the formula:



where:

R_2, R_3, R_4, R_5 and R_6 may be the same or different and are:
hydrogen,
halo,
loweralkyl having 1–5 carbon atoms,
halolоweralkyl having 1–5 carbon atoms,
nitro,
amino, acetylamino or
loweralkoxy having 1–5 carbon atoms and

R_n is hydrogen or
loweralkyl having 1–5 carbon atoms;

R_7, R_8, R_9 and R_{10} are:
hydrogen,
alkyl having 1–5 carbon atoms,
alkenyl having 3–7 carbon atoms,
alkynyl having 3–7 carbon atoms,
cycloalkyl having 3–7 carbon atoms,
cycloalkenyl having 5–7 carbon atoms,
cycloalkylloweralkyl, said cycloalkyl having 3–7 carbon atoms and said loweralkyl having 1–5 carbon atoms,
methoxyethyl,
ethoxyethyl or
benzyloxyethyl;

and the non-toxic acid addition salts thereof.

4,178,388

NOVEL RODENTICIDAL COMPOSITIONS EMPLOYING CHLOROPHACINONE

Jean-Claude Lechevin, Lyons, France, assignor to Lipha-Lyonnaise Industrielle Pharmaceutique, Lyons, France

Continuation of Ser. No. 389,114, Aug. 17, 1973, abandoned. This application Sep. 10, 1975, Ser. No. 611,908

Claims priority, application France, Aug. 21, 1972, 72.29765

Int. Cl.[2] A01N *9/24*

U.S. Cl. 424—331 **9 Claims**

1. A rodenticidal composition for use as a spray when diluted with water, comprising a solution of 2-(α-p-chlorophenyl-α-phenylacetyl)-1,3-indanedione in an amount of from 5–10% by weight, in a liquid monocyclic aromatic hydrocarbon solvent which is benzene or benzene substituted by at least one straight-chain or branched-chain saturated alkyl radical selected from the group consisting of methyl, ethyl, propyl, isopropyl, butyl, isobutyl, sec. butyl, tert. butyl, amyl, isoamyl, sec. amyl, tert. amyl and isohexyl, the said liquid solvent being present in an amount of from 75–85% by weight, in the presence of an emulsifier in an amount of from 2–20% by weight.

4,178,389

ALCOHOLIC BEVERAGE MAKING COMPOSITION AND PROCESS

Donald P. Pilla, 648 Cedar Ave., Burlington, Ontario, Canada

Filed Mar. 28, 1978, Ser. No. 890,932

Claims priority, application Canada, May 27, 1977, 279366

Int. Cl.[2] C12C *5/00, 5/04*

U.S. Cl. 426—11 **8 Claims**

1. A composition of matter suitable for preparing an alcoholic beverage or mixing with fermentable sugar and water and fermenting, said composition comprising:

(i) the dried granular product obtained by mixing with water to form a semi-solid, non-flowing paste a yeast nutrient combination comprising from about 3 to about 5 parts by weight ammonium phosphate, from about 3 to about 5 parts by weight urea, from about 1.5 to about 3.5 parts by weight monobasic potassium phosphate, and from about 0.5 to about 1.5 parts by weight tricalcium phosphate, drying the paste and granulating the dried product so obtained; in admixture with (ii) a combination of flavor conferring and fermentation ingredients comprising from about 3 to about 5 parts by weight of food grade lecithin, from about 5 to about 7 parts by weight of calcium carbonate, from about 10 to about 15 parts by weight of wine yeast, from about 20 to about 25 parts by weight of sodium citrate, and from about 60 to about 75 parts by weight of a palatable organic acid selected from malic acid, succinic acid, tartaric acid and citric acid, the weight ratio of dried granular product (i) to ingredients combination (ii) being from about 1:16 to about 1:7.

4,178,390

COMPOSITIONS FOR STABILIZING SOFT SERVE AND HARD FROZEN YOGURT

Robert S. Igoe, San Diego, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 14, 1977, Ser. No. 860,342

Int. Cl.[2] A23C *9/12;* **A23G** *9/04*

U.S. Cl. 426—43 **8 Claims**

1. A stabilizer for use in soft serve or hard frozen yogurt which comprises by weight:

Propylene glycol alginate—45–60%
Sodium Alginate—15–35%
Guar—10–20%
Carrageenan—2–10%

4,178,391

PROCESS FOR IMPROVING THE FUNCTIONAL PROPERTIES OF PROTEIN MATERIAL

Kwei C. Chao, Naperville, Ill.; John A. Ridgway, Jr., LaPorte, Ind.; Philip G. Schnell, Wheaton, and Jacqueline H. Pearce, Lisle, both of Ill., assignors to Standard Oil Company a corporation of Indiana, Chicago, Ill.

Continuation-in-part of Ser. No. 691,770, Jun. 1, 1976, abandoned. This application Dec. 16, 1977, Ser. No. 861,458

Int. Cl.[2] A23J *3/00*

U.S. Cl. 426—61 **23 Claims**

1. A process for improving the functional properties of protein-containing materials comprising the steps of:

(a) preparing an aqueous slurry of a protein-containing material selected from the group consisting of (1) single-cell protein in the form of a cream, and (2) mixtures of single-cell protein cream with plant protein, whey solids, or both plant protein and whey solids, said mixtures containing from about 1 to about 99 weight percent of the single-cell protein component;

(b) heating the aqueous slurry to a temperature of from about 75° to about 100° C.;

(c) adjusting the pH of the heated slurry to within the range of about 6.6 to about 8.0 by adding a compound selected from the group consisting of anhydrous ammonia, ammonium hydroxide, calcium hydroxide, sodium hydroxide, sodium bicarbonate, calcium sulfate, potassium carbonate, potassium bicarbonate, calcium carbonate, sodium carbonate, potassium hydroxide, magnesium hyrdoxide and mixtures thereof;

(d) maintaining the heated, pH-adjusted slurry at said conditions for a time period of from about 1 to about 10 minutes; and

(e) drying the material from step (d).

21. A process for improving the functional properties of plant protein comprising the steps of:

(a) preparing an aqueous suspension of the plant protein;

(b) adjusting the pH of the solution to within the range of about 6.5 to about 7.5 by the addition of calcium carbonate, and calcium hydroxide;

(c) heating the aqueous solution to a temperature of from about 75° to about 100° C.;

(d) maintaining the solution at the abovesaid conditions for from about 30 to about 60 minutes; and

(e) drying the material from step (d).

4,178,392

METHOD OF MAKING A READY-TO-EAT BREAKFAST CEREAL

Harold C. Gobble, Johnstown Township, Barry County; Richard M. Vondell, Battle Creek, and Raymond Mooi, Wyoming, all of Mich., assignors to Kellogg Company, Battle Creek, Mich.

Filed Jul. 1, 1977, Ser. No. 812,341

Int. Cl.[2] A23L *1/164*

U.S. Cl. 426—96 **12 Claims**

1. A method for making a ready-to-eat breakfast cereal product comprising the steps of first preparing a moldable, shape-retaining heterogeneous mixture comprising from about 20% to about 65% coarse particulate cereal components, sugar components in an amount sufficient to permit die molding of said mixture and from about 10% to about 35% moisture based on the total weight of the mixture, loosely compacting said mixture into a plurality of moist pieces on a cavity bearing roll, and then drying said pieces to a moisture content below 7% to produce a crisp, structure containing the particulate components adhered together by said sugar components.

V 9 8 9 2 DEC 11 79 UMI

4,178,393

METHOD OF PREPARING A MONOGLYCERIDE DOUGH ADDITIVE

Jens A. H. Gregersen, Skanderborg, Denmark, assignor to Aktieselskabet Grindstedvaerket, Arhus N, Denmark

Filed May 2, 1977, Ser. No. 792,612

Claims priority, application United Kingdom, May 3, 1976, 18022/76

Int. Cl.[2] **A21D** *2/16, 2/32*

U.S. Cl. 426—653 **9 Claims**

1. A method for preparing a pulverulent, free-flowing monoglyceride additive in the form of individual particles for use in the preparation of farinaceous and starch-containing edible products wherein the individual particles contain in substantially constant proportion (a) at least one monoglyceride and (b) at least one lecithin; comprising the steps of melting at least one distilled monoglyceride of saturated C_{12-24} fatty acids, adding at least one substantially dry lecithin in an amount so as to constitute 0.1–40% of the weight of the mixture and spray-cooling the resultant mixture substantially without adding water to obtain said individual particules.

4,178,394

PROCESS FOR PRODUCING SAUSAGE ANALOGS

Surinder Kumar, Buffalo Grove, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Sep. 12, 1977, Ser. No. 832,535

Int. Cl.[2] **A23J** *3/00*

U.S. Cl. 426—656 **11 Claims**

1. A process for the production of a sausage analog resembling the natural product in appearance, cooking characteristics, flavor, eating qualities and texture, said process comprising:

a. providing an aqueous mixture of flavors, spices, and coloring agents;

b. forming a first phase by continuously mixing vital wheat gluten, water and salt into a dough, thereafter extruding the dough to obtain strands of hydrated gluten;

c. forming a second phase by mixing one part by weight textured protein concentrate with from 1–4 parts by weight of the aqueous mixture, and thereafter cutting the second phase to a desired size;

d. providing a third phase of an edible protein fiber;

e. forming a fourth phase by blending from 12–25 parts by weight egg white, from 7–10 parts by weight non-fat dry milk, from 3–4 parts by weight sodium caseinate and from 2–4 parts by weight dextrose with from 20–35 parts by weight fat which has been heated to a temperature in the range of 180°–220° F., thereafter, forming a gelatinous mass by adding from 30–40 parts by weight of the aqueous mixture which is at a temperature in the range of from 170° to 212° F.;

f. forming a fifth phase by blending one part by weight fat which is at a temperature in the range of 180°–220° F., with from 1–3 parts by weight of the aqueous mixture;

g. adjusting each phase to a temperature in the range of from 40°–60° F.; and

h. thereafter, thoroughly mixing all of the phases together, and forming patties or links, wherein, the amount of dough of the first phase is from about 10 to about 25 percent by weight of the final product.

4,178,395

METHODS FOR IMPROVING SOLAR CELL OPEN CIRCUIT VOLTAGE

John F. Jordan, and Vijay P. Singh, both of El Paso, Tex., assignors to Photon Power, Inc., El Paso, Tex.

Filed Nov. 30, 1977, Ser. No. 855,887

Int. Cl.[2] **H01L** *31/18, 31/06*

U.S. Cl. 427—74 **8 Claims**

1. In a photovoltaic cell having a layer of polycrystalline CdS, a process for increasing the open circuit cell voltage, comprising the steps of:

exposing said layer of CdS to a sulfur-containing gas heated to a temperature range of 400°–600° C.

converting at least a portion of said layer of CdS to Cu_2S to obtain a photovoltaic heterojunction; and

applying a metallic positive electrode over at least a portion of said heterojunction, where said metallic electrode is selected from a group of materials effective to obtain an increased open circuit voltage from said photovoltaic cell.

4,178,396

METHOD OF FORMING AN INSULATING FILM

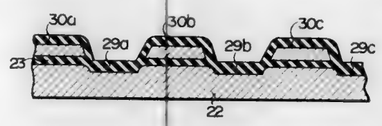
Haruo Okano; Nozomu Harada, and Nobuhisa Kubota, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 15, 1978, Ser. No. 933,844

Claims priority, application Japan, Aug. 30, 1977, 52-103192

Int. Cl.[2] **H01L** *21/312;* **C03C** *15/00, 25/06*

U.S. Cl. 427—93 **8 Claims**



1. A method of forming an insulating film on a polycrystalline substance layer which comprises the steps of preparing the polycrystalline substance layer; selectively removing the polycrystalline substance layer; heat-treating for the first time those portions of the polycrystalline substance layer which are left after said selective removal in an oxidizing atmosphere to provide an oxide layer; removing said oxide layer; and heat-treating for the second time the surface of the polycrystalline substance layer from which the preceding oxide layer was removed in an oxidizing atmosphere to form an insulating oxide film.

4,178,397

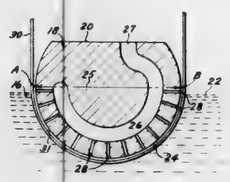
METHOD AND APPARATUS FOR TREATING ONE SIDE OF A STRIP

John B. Lovis, Allentown, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jul. 12, 1978, Ser. No. 924,113

Int. Cl.[2] **C23C** *1/02*

U.S. Cl. 427—300 **11 Claims**



1. A method of treating strip on one side comprising:

(a) providing a pressurized foil bearing with a lower curved surface extending a distance into a bath of liquid material,

(b) passing the strip into contact with the liquid material of said bath adjacent said foil bearing so that both sides of the strip are below the level of liquid material in said bath, and

(c) controlling the pressure of the pressurizing medium used within said foil bearing so as to support said strip on said foil bearing by a thin film of said pressurizing medium and to establish a curtain of pressurizing medium to prevent said liquid material from passing between said curved surface and said strip and contacting the side of said strip adjacent said foil bearing while the other side of said strip is in contact with said liquid material.

4,178,398

AMIDOPHOSPHATE REACTION PRODUCTS USED AS FLAMEPROOFING AGENTS

Hermann Nachbur, Dornach, and Peter Rohringer, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 684,988, May 10, 1976, Pat. No. 4,094,929. This application Mar. 23, 1978, Ser. No. 890,780

Claims priority, application Switzerland, May 15, 1975, 6264/75

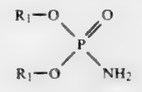
Int. Cl.[2] **C07F** *9/24;* **C09K** *3/28*

U.S. Cl. 427—379 **12 Claims**

1. A process for the flameproofing of organic fiber materials, which process comprises applying to these fiber materials

(A) an amidophosphate reaction product which has been produced by reacting together at temperatures of 20° to 80° C. with or without acidic or basic catalysts

(1) 1 or 2 moles of an amidophosphate of the formula



wherein

R_1 is alkyl with 1 to 3 carbon atoms, alkenyl or halogenoalkyl with 2 or 3 carbon atoms or both R_1's together are alkylene with 2 to 5 carbon atoms,

(2) 1 mole of formaldehyde or an agent releasing formaldehyde,

(3) an aliphatic diol with 2 to 6 carbon atoms, and/or

(4) an alkanol with 1 to 3 carbon atoms, and

(B) optionally an aminoplast precondensate; drying the materials and then subjecting them to a treatment at elevated temperature above 100° C.

4,178,399

FLAME RETARDANT AND PROCESS

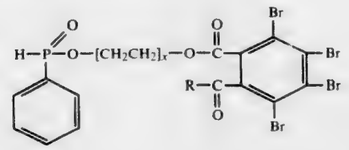
Seymour G. Hall, and Edward D. Mason, both of Greensboro, N.C., assignors to Chemonic Industries, Inc., Greensboro, N.C.

Filed Feb. 14, 1978, Ser. No. 877,578

Int. Cl.[2] **B05D** *3/02;* **C07F** *9/02*

U.S. Cl. 427—381 **3 Claims**

1. The process of flame retarding non-cellulosic fabrics comprising the steps of: raising the pH of a flame retardant containing the chemical compound:



where:

x = 1-250, R is selected from the group: —H, —OH, $—NH_3$ or —COOH

by adding a water soluble basic compound to thereby increase the water solubility of said flame retardant, padding the fabric with said basic flame retardant solution, absorbing 2–10% dry flame retardant, removing the fabric from the flame retardant solution and fixing said flame retardant to the fabric.

4,178,400

AUTODEPOSITED COATINGS

Frank P. Lochel, Jr., Lansdale, Pa., assignor to Amchem Products, Inc., New York, N.Y.

Division of Ser. No. 755,921, Dec. 30, 1976, Pat. No. 4,108,817. This application Jun. 8, 1978, Ser. No. 913,561

Int. Cl.[2] **B05D** *1/18;* **C23F** *7/00*

U.S. Cl. 427—435 **16 Claims**

1. In a coating process wherein an autodeposited coating is formed on a metal surface by contacting said surface with an autodepositing composition and wherein the nature of said surface is such that coatings formed from said composition tend to have defects such as pinholes, blisters, craters or bridges, the improvement comprising contacting said surface with an autodepositing composition containing an acid inhibitor soluble in said composition in an amount sufficient to reduce or prevent the tendency of said composition to form coatings which have defects such as pinholes, blisters, craters or bridges, said amount being less than that amount which substantially deters or prevents said composition from forming an autodeposited coating or an autodeposited coating having the desired thickness.

4,178,401

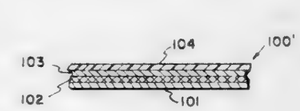
PACKAGING FILM COMPRISING A BLENDED SELF-WELDING LAYER

Alan S. Weinberg, Greenville, and Joseph Z. Sun, Spartanburg, both of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Filed Jan. 9, 1978, Ser. No. 868,158

Int. Cl.[2] **B32B** *27/08;* **D03D** *35/00;* **A21D** *10/02*

U.S. Cl. 428—35 **13 Claims**



1. A self-welding packaging film comprising:

(a) a self-welding layer comprising a blend of at least two copolymers of ethylene-vinyl acetate, each copolymer having a different melt flow, the melt flow of one copolymer being less than 5.0 and the melt flow of another copolymer being greater than 28.0;

(b) a substrate layer comprising a cross-linked, heat shrinkable polymeric material said polymeric material selected from the group consisting of polyethylene and ethylene-vinyl acetate copolymers; and,

(c) a layer having low gas permeability, the material for said layer being selected from the group consisting of:

(1) copolymers of vinylidene chloride;

(2) polyamides;

(3) polyesters;

(4) polyvinyl alcohol;

(5) acrylonitrile copolymers; and,

(6) hydrolized ethylene vinyl acetate copolymers; said substrate layer being located between the self-welding layer and the impermeable layer.

9. A multi-layer, self-welding packaging film comprising:

(a) a self-welding layer comprising a blend of two polymers,

(i) one polymer comprising the major portion of the blend and being selected from the group consisting of polyethylenes, ethylene-vinyl acetate copolymers, and ionomers having melt flows less than 5.0 and

(ii) the other polymer comprising a minor portion of the blend and being selected from the group consisting of ethylene-vinyl acetate copolymers and ethylene terpolymers having melt flows greater than 28.0; and,

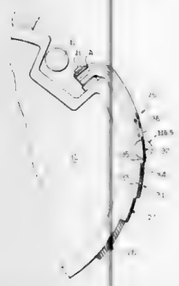
(b) at least one additional film layer comprising a polymeric

material selected from the group consisting of polyethylenes, ethylene-vinyl acetate copolymers, hydrolyzed ethylene-vinyl acetate copolymers, polyvinyl alcohols, copolymers of vinylidene chloride and vinyl chloride, polyamides, and acrylonitrile copolymers, said additional layer being heat shrinkable.

4,178,402
CYLINDER BLANKET FOR OFFSET PRINTING PRESSES

Friedrich Klapproth, deceased, late of Alsdorf, Fed. Rep. of Germany, and by Maria Elisabeth Klapproth, executrix, Uberheide 3, West, D 511 Alsdorf, Fed. Rep. of Germany

Continuation of Ser. No. 549,151, Feb. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 350,093, Apr. 11, 1973, abandoned. This application Feb. 2, 1978, Ser. No. 874,539
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1972, 2217796
Int. Cl.[2] B32B *3/02, 7/02*
U.S. Cl. 428—192 **13 Claims**

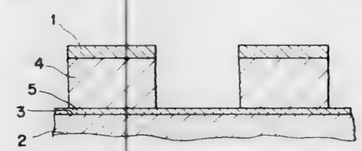


1. A composite printing blanket comprising at least a multi-ply printing blanket and a multi-ply supporting blanket, said multi-ply printing blanket being in overlying relationship to said multi-ply supporting blanket and being the outermost element relative to a printing cylinder to which said composite printing blanket is adapted to be attached, said multi-ply printing blanket and multi-ply supporting blanket each being constructed as a laminate of at least two individually, separately preformed sheets, an outermost sheet of said multi-ply printing blanket laminate being constructed of thin elastomeric material and being adapted to receive thereupon a fluid printing medium, an innermost sheet of said multi-ply printing blanket laminate being constructed of tear resistant relatively non-stretchable material, said two last-mentioned preformed sheets being immovably laminated relative to each other, an outermost sheet of said multi-ply supporting blanket laminate being disposed immediately adjacent to and against said innermost sheet of said multi-ply printing blanket laminate and being constructed of thick elastomeric material, an innermost sheet of said multi-ply supporting blanket laminate being constructed of tear resistant relatively non-stretchable material, said innermost and outermost preformed sheets of said multi-ply supporting blanket laminate being immovably laminated relative to each other, said outermost elastomeric sheet of said multi-ply printing blanket being thin as compared to said thick elastomeric outermost sheet of said multi-ply supporting blanket, said multi-ply supporting blanket being at least about five times as thick as said multi-ply printing blanket, said multi-ply printing blanket and multi-ply supporting blanket being in shifting relationship to each other whereby a foreign body impressed against said thin elastomeric outermost sheet of said multi-ply printing blanket laminate by the force of an associated printing cylinder creates limited localized deformation of said thin elastomeric outermost sheet which rapidly returns to a none-deformed state by virtue of the non-stretchable innermost sheet of said multi-ply printing blanket laminate, the thicker elastomeric outermost sheet of said multi-ply supporting blanket, and said shifting relationship between said multi-ply printing blanket and said multi-ply supporting blanket.

4,178,403
MASK BLANK AND MASK

Kunio Sakurai; Tadashi Kojima, both of Hino, and Hiroshi Itoh, Tachikawa, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1977, Ser. No. 821,777
Int. Cl.[2] B32B *15/04*
U.S. Cl. 428—209 **8 Claims**

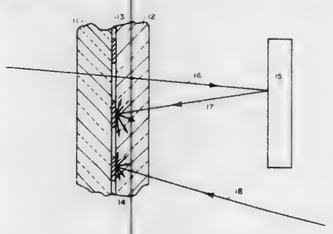


1. A mask blank comprising
an optically transparent substrate,
an electrically conductive and transparent coating layer covering substantially the entire surface of said substrate and being made of material which is resistant to an etchant, said coating layer being formed by vacuum evaporation,
a chromium mask layer overlying said coating layer and formed by vacuum evaporation or sputtering, said mask layer being capable of being etched off by the etchant, and
an anti-reflection layer made of chromium oxide overlaying said mask layer.

4,178,404
IMMERSED RETICLE

Edwin M. Allen; William C. Fitzgerald; Henry Blazek, and George Turner, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 6, 1978, Ser. No. 875,062
Int. Cl.[2] B32B *15/04;* **B05D** *5/06;* **G02B** *1/10*
U.S. Cl. 428—209 **3 Claims**

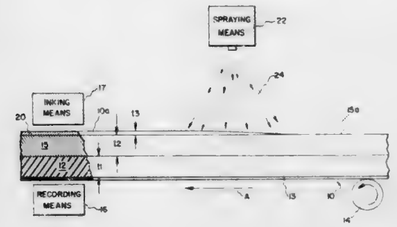


1. A metallic reticle, comprising:
a transparent optical substrate;
a layer of titanium attached to said transparent optical substrate;
a layer of copper attached to said layer of titanium, said layer of copper having an oxidized surface characterized by fine feathery dendritic clusters.

4,178,405
MAGNETIC BELT WITH CONDUCTIVE COATING

Ami E. Berkowitz, Schenectady, N.Y., and Joseph A. Lahut, Waynesboro, Va., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 7, 1977, Ser. No. 840,261
Int. Cl.[2] B32B *7/02;* **G11B** *5/78*
U.S. Cl. 428—215 **7 Claims**



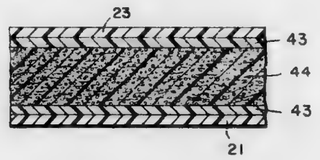
1. A magnetic belt for use in a magnetic printer having means for magnetically recording information on said belt, comprising:
a backing layer having opposed first and second surfaces, said first surface being positioned adjacent to said magnetic recording means when said belt is in use;
a recording layer having first and second opposed surfaces and fabricated of ferromagnetic material, the first surface of said recording layer being in abutment with said second surface of said backing layer; and
a layer of conductive material, including carbon particles supported in a resin, fabricated upon said second surface of said recording layer furthest from said backing layer and providing said second surface of said recording layer with a surface resistivity of less than 10^9 ohms-per-square.

7. A magnetic belt as set forth in claim 1, wherein said backing layer has a thickness of about 0.8 milli-inches.

4,178,406
THREE-LAYERED FIBERGLASS CONSTRUCTION

Larry M. Russell, Doylestown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 29, 1977, Ser. No. 865,567
Int. Cl.[2] B32B *5/16*
U.S. Cl. 428—283 **2 Claims**



1. A performed fiberglass construction comprising a three-layered member having (a) a center layer comprising at least one layer of continuous strand fiberglass mat containing lightweight microspheres in the voids between the fibers of said continuous strand fiberglass mat, the microspheres and the fibers being bonded together by thermoplastic binder resin which is soluble in polymerizable liquid thermosettable resin mixture, between (b) a first outer layer and a second outer layer, each outer layer comprising at least one layer of chopped strand fiberglass mat containing thermoplastic binder resin which is soluble in polymerizable liquid thermosettable resin mixture.

4,178,407
ABSORBENT FIBROUS TOWEL

Harry E. Rubens, 14 Brookside Ct., East Brunswick, N.J. 08816

Continuation of Ser. No. 15,819, Mar. 2, 1970, abandoned, which is a continuation of Ser. No. 581,771, Sep. 23, 1966, abandoned. This application Jun. 28, 1974, Ser. No. 484,169
Int. Cl.[2] B32B *15/06*
U.S. Cl. 428—284 **2 Claims**



1. An article of manufacture consisting of a thin compliant plastic sheet upon which is uniformly provided throughout on both sides thereof, an adhesive layer to which is adhered, a dry layer of soft, compliant, absorbent material having the absorbency of facial tissue with insufficient wet strength to permit handling when wet, said adhesive layer characterized by being flexible, thin, and insoluble when wet, and which will not strike through the absorbent material, nor change its appearance; said plastic sheet, adhesive and absorbent material, when assembled into the article of manufacture, having the softness and pliability of facial tissue, wherein the layer of compliant, absorbent material consists of loose fibers, each randomly attached to the adhering layer on the plastic sheet.

4,178,408
FLAME-PROOF EPOXY FIBROUS STRUCTURE AND LAMINATES THEREOF

Arnold Franz, Troisdorf-Spich, and Werner Stein. Troisdorf-Kriegsdorf, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 740,501, Nov. 10, 1976, abandoned, which is a continuation of Ser. No. 442,938, Feb. 15, 1974, abandoned. This application Feb. 3, 1978, Ser. No. 874,966
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1973, 2308433
Int. Cl.[2] D04H *1/58;* **B32B** *17/04*
U.S. Cl. 428—285 **23 Claims**

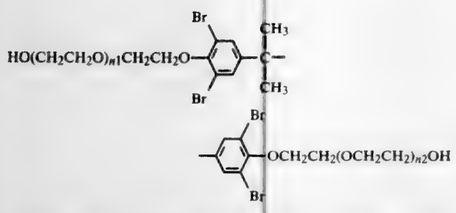
1 A fibrous structure consisting essentially of a cellulosic or glass fibrous substrate impregnated and imbibed with an epoxide resin and liquid pentabromodiphenyl ether, said pentabromodiphenyl ether being present in an amount of 5 to 30 percent by weight based upon the weight of said epoxide resin, said fibrous structure having a bending strength, determined after three days at 200° C. in accordance with Deutsche Industrie Norm 7735 of at least 1,000 kp/cm^2, said structure having a flamability rating according to Underwriters' Laboratory Test 492 of no greater than 1.

4,178,409
FLAME RETARDANT COATING COMPOSITION AND FABRIC COATED THEREWITH

Mikio Tomita, Kyoto, Japan, assignor to Meisei Chemical Works, Inc., Kyoto, Japan

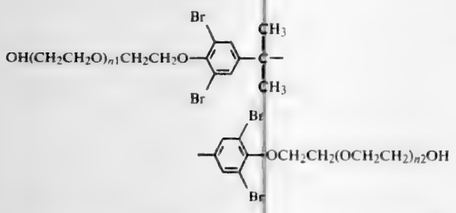
Filed Aug. 12, 1977, Ser. No. 824,020
Claims priority, application Japan, Aug. 25, 1976, 51-101962; Jun. 15, 1977, 52-71847
Int. Cl.[2] C08G *18/32;* **B32B** *27/18;* **C08K** *5/06*
U.S. Cl. 428—290 **7 Claims**

1. A flame retardant coating composition which consists essentially of a hydroxyl-terminated thermoplastic polyurethane and the additive 2,2-bis(4-hydroxy-3,5-dibromophenyl)-propane derivative having the following general formula



wherein each n1 and n2 represents zero or a positive integer and n1+n2 is zero or one of the positive integers from 1 to 8, in the weight ratio of 20 parts polyurethane to 3–30 parts of said propane derivative.

4. A coated fabric which is obtained by applying to a fabric a coating composition containing an organic solvent solution of a hydroxyl-terminated thermoplastic polyurethane admixed with a 2,2-bis(4-hydroxy-3,5-dibromophenyl)propane derivative having the following general formula



wherein each n1 and n2 represents zero or a positive integer and n1+n2 is zero or one of the positive integers from 1 to 8, in the weight ratio of 20 parts polyurethane to 3–30 parts of said propane derivative.

4,178,410

FLAME RETARDANT COATING COMPOSITION AND FABRIC COATED THEREWITH

Mikio Tomita, Kyoto, Japan, assignor to Meisei Chemical Works, Inc., Kyoto, Japan

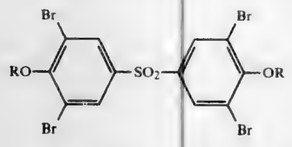
Filed Aug. 22, 1977, Ser. No. 826,486

Claims priority, application Japan, May 17, 1977, 52-57330; Jun. 15, 1977, 52-71848

Int. Cl.[2] **C08G** *18/32;* **B32B** *27/18;* **C08K** *5/41*

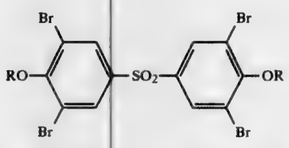
U.S. Cl. 428—290 **7 Claims**

1. A flame retardant coating composition which consists essentially of a hydroxyl-terminated thermoplastic polyurethane and a sulfone additive having the general formula



wherein R represents —H, —CH_3, —C_2H_5, —C_3H_7OH, —CH_2CH_2Br, or —$(CH_2CH_2O)_nH$ and n is an integer of 1 to 5, in the weight ratio of 20 parts polyurethane to 3–30 parts sulfone.

4. A coated fabric which is obtained by applying to a fabric a coating composition containing an organic solvent solution of a hydroxyl-terminated thermoplastic polyurethane admixed with a sulfone having the following general formula



wherein R represents —CH_3, —C_2H_5, —C_3H_7OH, —CH_2CH_2Br or —$(CH_2CH_2O)_nH$ and n is an integer of 1 to 5, in the weight ratio of 20 parts polyurethane to 3–30 parts sulfone.

4,178,411

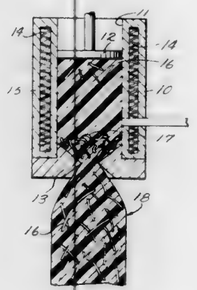
FIBRE EXPANDED REINFORCED MATERIALS AND THEIR PROCESS OF MANUFACTURE

Ernest A. Cole, Upper Gravenhurst; Frederic N. Cogswell, and Jonathan Huxtable, both of Welwyn Garden City, all of England, assignors to Imperial Chemical Industries, Limited, London, England

Filed Jul. 11, 1977, Ser. No. 814,670

Int. Cl.[2] **B29D** *27/00*

U.S. Cl. 428—310 **16 Claims**



1. A method for producing a low density material comprising extruding a composition comprising a settable fluid containing resilient fibres through a die generally having a minimal land length so that relaxation of the fibres causes the extrudate to expand to form an open fibrous structure as it leaves the die, wherein the settable fluid used when resinous is selected from those having a melt viscosity of between 10 Ns/m^2 and 10,000 Ns/m^2 measured at a shear rate of 100 reciprocal seconds and the ratio of average length of the fibres to the diameter of the die is at least 2.5 to 1, and then causing or allowing the fluid to set.

12. A low density structure comprising a fibre expanded material in the form of a shaped article produced according to the method of claim **1**.

13. A composite low density structure comprising a fibre expanded material and bonded surface layer in the form of a shaped article produced according to the method of claim **6**.

4,178,412

GLASS SIZE COMPOSITIONS AND GLASS FIBERS COATED THEREWITH

Donald B. Sage, Granville, and Fred G. Krautz, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 752,222, Nov. 20, 1976, abandoned. This application Apr. 13, 1978, Ser. No. 895,883

Int. Cl.[2] **B32B** *9/00;* **D02G** *3/00*

U.S. Cl. 428—391 **8 Claims**

1. A glass fiber having a portion of its surface coated with about 1.2 to 3.0 weight percent of a sizing composition, said sizing composition comprising:

(a) an unsaturated water-emulsifiable polyester resin;

(b) an emulsion of a copolymer of ethylene and vinyl acetate; and

(c) a copolymer of polyvinylacetate and an organo silane having about 1 to 7 weight percent of said organo silane.

4,178,413

FIBER REINFORCED CARBON AND GRAPHITE ARTICLES AND A METHOD OF PRODUCING SAID ARTICLES

Gabriel P. DeMunda, Niagara Falls, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Oct. 3, 1977, Ser. No. 838,702

Int. Cl.[2] **B32B** *9/00*

U.S. Cl. 428—408 **17 Claims**

1. A fiber reinforced article composed of a matrix of fibrous carbon material bonded together by a deposited pyrolytic material and having the residue of a carbonizable filler material deposited on said pyrolytic material, said residue produced by initially depositing and subsequently carbonizing said carbonizable filler material on said pyrolytic material.

4,178,414

METHOD OF TOUGHENING GLASS SHEETS

Geoffrey Greenhalgh, Orrell, near Wigan, England, assignor to Triplex Safety Glass Company Limited, Birmingham, England

Filed Jun. 19, 1978, Ser. No. 916,557

Claims priority, application United Kingdom, Jun. 23, 1977, 26360/77

Int. Cl.[2] **C03B** *27/00*

U.S. Cl. 428—410 **15 Claims**



1. A method of toughening a glass sheet comprising: advancing the glass sheet into and relative to a flow of quenching gas directed towards at least one surface of the glass sheet from individual gas outlets to induce overall toughening stresses therein, differentially toughening the glass sheet by terminating advance of the sheet relative to the flow of quenching gas for a predetermined time, whereby localised gas flows are applied to at least said one surface of the glass sheet from said individual gas outlets during said predetermined time to produce in the glass as the toughening stresses develop a distribution of regions of more highly toughened glass interspersed with regions of lesser toughened glass, in which distribution there are areas in which there are major and minor principal stresses acting in the plane of the glass sheet, and continuing the advance of the glass sheet relative to the flow of quenching gas after said predetermined time.

4,178,415

MODIFIED AMORPHOUS SEMICONDUCTORS AND METHOD OF MAKING THE SAME

Stanford R. Ovshinsky, Bloomfield Hills, and Krishna Sapru, Troy, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Mar. 22, 1978, Ser. No. 888,915

Int. Cl.[2] **H01B** *1/02*

U.S. Cl. 428—446 **21 Claims**

1. The method of making an amorphous semiconductor device comprising depositing on a substrate an amorphous semiconductor film including an amorphous semiconductor host matrix comprising silicon and oxygen and a modifier material comprising an alkali metal incorporated therein by codeposition of the same, and controlling the amounts of silicon and oxygen in the amorphous host matrix, wherein the silicon to oxygen ratio is represented by SiO_x where x can be controlled from above 0 to 2, and the amount of alkali metal incorporated therein for controlling the energy gap and the room temperature electrical conductivity of the device.

4,178,416

ACICULAR FERRIC OXIDE FOR MAGNETIC RECORDING AND PROCESS FOR PRODUCING SAME

Jean-Marie H. Hector, Ozoir-La-Ferriere, and Bernard J. Pingaud, Vincennes, both of France, assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 775,146, Mar. 7, 1977, abandoned. This application Nov. 9, 1978, Ser. No. 959,135

Claims priority, application France, Mar. 12, 1976, 76 07074

Int. Cl.[2] **C01G** *49/06*

U.S. Cl. 428—539 **12 Claims**

1. A process for preparing cobalt doped, acicular, gamma ferric oxide crystals that exhibit improved print-through without substantial loss in signal output or recording sensitivity which process comprises:

(1) forming an aqueous dispersion of ferrous hydroxide particles by adding an aqueous solution of ferrous salt having a pH up to about 5.5 to an aqueous solution of a stoichiometric excess of an alkaline hydroxide, in the presence of cobalt doping ions, while substantially avoiding local excesses of said ferrous salt,

(2) introducing oxygen into said dispersion at a temperature below 60° C. for a period of time sufficient to convert said ferrous hydroxide particles to ferric oxide hydrate crystals, and,

(3) subjecting said crystals to dehydration, reduction and oxidation to form cobalt doped, acicular, gamma ferric oxide, said process being characterized by the addition of about 0.5 to 20 percent, by weight, based on ferrous hydroxide, of a water soluble acyclic dicarboxylic acid or its precursor prior to said introduction of oxygen.

10. Cobalt doped, acicular, gamma ferric oxide crystals that exhibit improved print-through without substantial loss in signal output or recording sensitivity, said crystals being formed according to the process of claim **1** by cobalt doping in the presence of a water soluble, acyclic, dicarboxylic acid which directs cobalt ions into substitution sites within the crystal lattices, said crystals exhibiting an increase of at least 5 percent in the ratios between the intensities of each of the triplet lines 110, 210, 211, with respect to the 111 line, as determined by X-ray diffraction, in comparison to corresponding crystals prepared according to the process of claim **3** but, in the absence of said acid.

4,178,417
CLAD STEEL

Toyohisa Oda, and Kinichi Inouye, both of Funabashi, Japan, assignors to The Japan Steel Works, Ltd., Tokyo and Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, both of, Japan

Continuation-in-part of Ser. No. 780,276, Mar. 23, 1977, abandoned. This application Feb. 13, 1978, Ser. No. 876,902
Int. Cl.[2] B32B *15/18*
U.S. Cl. 428—679 **4 Claims**

1. A clad steel in which a base metal of extremely low carbon steel is bonded together with an austenite stainless steel, nickel or nickel alloy as a cladding metal by hot rolling, wherein in order to prevent diffusion of carbon contained in the base metal into the cladding metal due to a heat cycle subjected to during or after the manufacturing of the clad steel, the base metal contains 0.010 to 0.030 wt. % of carbon with Ti and/or Zr added as carbon fixing elements in such an amount that a Ti-equivalent is given by the following formula:

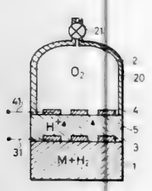
$$\text{Ti-equivalent (wt \%)} = Ti\ (\text{wt \%}) + [Zr\ (\text{wt \%})/1.5]$$

wherein, Ti (wt %) and Zr (wt %) representing the amounts of Ti and Zr, respectively in wt %; is 0.15 to 0.55 wt % and yet the ratio of the Ti-equivalent to the carbon content is 12:1 to 30:1, and during said hot rolling of the clad steel a 15 to 40% reduction ratio is adopted per pass, and directly after the hot rolling the clad steel is water cooled, said base metal thereby having a grain size number larger than No. 8.

4,178,418
GALVANIC CELL FOR THE ELECTROCHEMICAL PRODUCTION OR STORAGE OF ELECTRICAL ENERGY

Michel Croset, and Gonzalo Velasco, both of Paris, France, assignors to Thomson - CSF, Paris, France

Filed May 3, 1978, Ser. No. 902,760
Claims priority, application France, May 4, 1977, 77 13513
Int. Cl.[2] H01M *12/04*
U.S. Cl. 429—27 **4 Claims**



1. A galvanic cell of the kind in which an electrochemical reaction employing at least one ionisable species is used to produce electrical energy from chemical energy or to transform electrical energy into chemical energy, comprising:
(a) a first solid non-porous body belonging to the group of metals and metal hydrides capable of storing an ionisable species having a high coefficient of diffusion within said body;
(b) a first electrode constituted by a grid of catalytic material positioned on one side of the first non-porous body;
(c) a polycrystalline ceramic deposited on the first body through and over said grid according to the technology of thin-film deposition, constituting a layer so thin as to exhibit a low ohmic resistance to the current of the ion produced by said ionisable species and a relatively high ohmic resistance to the electronic current; and
(d) a second electrode constituted by a grid of catalytic material disposed on top of the polycrystalline ceramic for promoting the reduction of ionizable species.

4,178,419
PROCESS AND PRODUCT

Wesley Memeger, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 27, 1978, Ser. No. 881,731
Int. Cl.[2] C08J *9/02*
U.S. Cl. 521—89 **7 Claims**

1. Process for preparing an aromatic polyamide foam having a density of 0.025 to 0.7 g./cm^3 by heating a mixture of an N,N'-dialkyl aromatic polyamide having at least one β hydrogen atom on the alkyl groups and a plasticizer at a temperature of 250° to 340° C. for a time sufficient to remove substantially all of the N-alkyl groups wherein the mixture contains an aromatic sulfonic acid as catalyst.

4,178,420
AMINE ANTIOXIDANTS AS ANTISCORCH AGENTS IN FLAME RETARDED POLYURETHANE FOAMS

Michael J. Reale, Brewster, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 21, 1978, Ser. No. 926,678
Int. Cl.[2] C08K *5/52*
U.S. Cl. 521—107 **12 Claims**

1. A flame retardant polyurethane foam comprising a low density polyurethane foam, a flame retardant amount of a flame retardant comprised of a poly(haloethyl-ethyleneoxy)-phosphoric acid ester and from about 0.25 percent to about 5.0 percent by weight of said flame retardant of an amine antioxidant.

4,178,421
METHOD FOR DISPERSING AN ADDITIVE INTO A THERMOPLASTIC RESIN

Donald F. Thompson, Elburn; Joseph M. Mizenko, Naperville, both of Ill., and Elmer Sivak, Highland, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 27, 1978, Ser. No. 881,907
Int. Cl.[2] C08K *5/09*
U.S. Cl. 525—4 **15 Claims**

1. A process for dispersing a nucleating agent into a thermoplastic resin comprising (1) thoroughly mixing an aqueous solution of the nucleating agent into a powder of the thermoplastic resin to form a superficially dry powder blend; (2) without prior drying applying sufficient heat and shear to such powder blend to rapidly volatilize water and to form a molten flux of the thermoplastic resin; and (3) recovering the thermoplastic resin with the nucleating dispersed therein.

4,178,422
ETHYLSULFONATE-ALKYLAMINE COPOLYMERS AS COLORANT BACKBONES

Kenneth M. Otteson, San Carlos, and Daniel J. Dawson, Los Altos, both of Calif., assignors to Dynapol, Palo Alto, Calif.

Continuation-in-part of Ser. No. 638,731, Dec. 8, 1975, Pat. No. 4,096,134. This application Apr. 19, 1978, Ser. No. 897,812
The portion of the term of this patent subsequent to Jan. 20, 1995, has been disclaimed.
Int. Cl.[2] C08F *28/00*; C08G *75/00*
U.S. Cl. 525—336 **12 Claims**

1. A copolymer comprising a plurality of ethylsulfonate and 2 to 6 carbon atom lower alkylamine groups, the sum of the number of ethylsulfonate groups and lower alkylamine groups being from 20 to 8000 and the number of lower alkylamine groups being from 0.4 to 2.5 times the number of ethylsulfonate groups.

4,178,423
INTERNALLY STABILIZED VINYL CHLORIDE POLYMERS COMPRISING CALCIUM AND ZINC ACRYLATES

Donald F. Anderson, White Plains, N.Y., and Arthur J. Yu, Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 839,855, Oct. 6, 1977, Pat. No. 4,146,698. This application Sep. 14, 1978, Ser. No. 942,251
Int. Cl.[2] C08F *30/04, 230/04*
U.S. Cl. 526—240 **12 Claims**

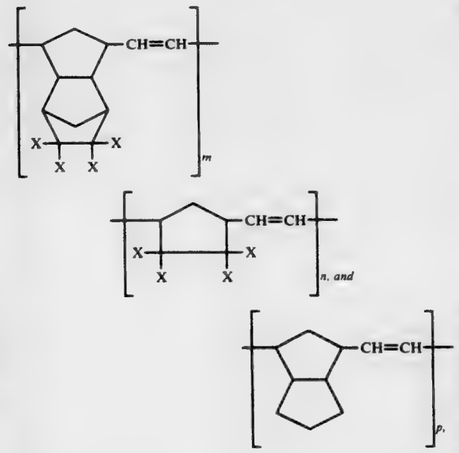
1. A polymer product having improved thermal stability which comprises a polymer of vinyl chloride, or vinyl chloride and up to 50%, by weight, of a monoethylenically unsaturated comonomer, and up to about 10%, by weight of the vinyl chloride or vinyl chloride and comonomer, of a mixture of calcium and zinc acrylate.

4,178,424
CYCLOOLEFIN COPOLYMERS

Linwood P. Tenney, Hudson, and Parley C. Lane, Jr., Cuyahoga Falls, both of Ohio, assignors to The BF Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 857,141, Dec. 5, 1977, Pat. No. 4,136,247. This application Dec. 29, 1978, Ser. No. 974,650
Int. Cl.[2] C08F *32/08, 232/08*
U.S. Cl. 526—283 **5 Claims**

1. A ring-opening polymerized copolymer comprising polymerized units of (1) about 5 to about 80 wt.% of tetracyclododecene, at least one alkyltetracyclododecene wherein each alkyl group contains from 1 to about 8 carbon atoms, or a mixture thereof, (2) about 10 to about 80 wt.% of norbornene, at least one alkylnorbornene wherein each alkyl group contains from 1 to about 8 carbon atoms, or a mixture thereof, (3) about 5 to about 80 wt.% of dicyclopentadiene, and (4) a minor amount of at least one acyclic monoolefin or nonconjugated acyclic olefin containing from 2 to 12 carbon atoms and having at least one hydrogen on each double-bonded carbon atom, all of said weight percentages being based upon total copolymer weight, and said copolymer containing groups of the following types, where m, n and p are numbers which are proportional to the concentrations of tetracyclododecene/alkyltetracyclododecene, norbornene/alkylnorbornene, and dicyclopentadiene respectively, and any X is hydrogen or an alkyl group containing from 1 to about 8 carbon atoms:



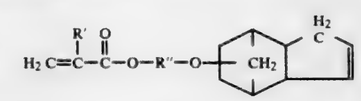
wherein the ring double bond in the last formula above can be in either position shown.

4,178,425
POLYURETHANE COATING COMPOSITIONS CONTAINING UNSATURATED ESTERS OF GLYCOL MONODICYCLOPENTENYL ETHERS

William D. Emmons, Huntingdon Valley, and Kayson Nyi, Sellersville, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 703,348, Jul. 7, 1976, Pat. No. 4,097,677. This application May 22, 1978, Ser. No. 908,415
Int. Cl.[2] C08G *18/22, 18/30*; C08L *27/00, 75/04*
U.S. Cl. 528—73 **12 Claims**

1. A composition having a film-forming binder comprising:
(1) A member selected from the group consisting of an organic polyisocyanate, a urethane oil, and a uralkyd;
(2) at least one non-volatile reactive liquid monomer having the general formula



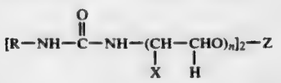
wherein R' is H or CH_3 and R" is selected from the group consisting of:
(a) Alkylene groups having 2 to 6 carbon atoms and
(b) Oxyalkylene groups having at least 4 to 12 carbon atoms and having at least one oxygen atom joining distinct segments of the alkylene group, each segment having at least 2 carbon atoms; and
(3) an effective amount of a polyvalent metal-containing complex or salt that catalyzes the curing of (1) and (2), component (2) being 5 to 95% by weight of the binder.

4,178,426
EPOXY RESIN COMPOSITIONS

Harold G. Waddill, Austin, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,500
Int. Cl.[2] C08G *59/56, 59/60*
U.S. Cl. 528—111 **12 Claims**

1. An epoxy resin composition having superior adhesion properties and being the cured product of a curable admixture which comprises:
a vicinal polyepoxide having an epoxide equivalency of greater than 1.8;
a curing amount of a polyamine curing agent comprising 3-aminopropyl ethylenediamine or bis-(3-aminopropyl) ethylenediamine; and,
an effective amount of an additive consisting essentially of a polyether diureide having terminal ureido or mono substituted ureido groups said diureide having the formula:



wherein R is hydrogen, or a branched or straight chain alkyl radical of from 1 to about 10 carbon atoms, or a monocyclic aryl, alkaryl or aralkyl radical having from 6 to about 12 carbon atoms; or, a branched or straight chain alkenyl or alkadienyl radical of from 2 to about 10 carbon atoms; X is hydrogen, a methyl radical or an ethyl radical; Z is a hydrocarbon alkylene radical having 2 to 5 carbon atoms and n is a number selected such that the molecule of the above formula has a molecular weight of from about 2000 to about 3000.

4,178,427

POLYETHER UREA EPOXY CURING AGENT

Harold G. Waddill, and Heinz Schulze, both of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.

Continuation-in-part of Ser. No. 683,359, May 5, 1976, abandoned, which is a division of Ser. No. 555,844, Mar. 6, 1975, Pat. No. 4,002,598. This application Feb. 6, 1978, Ser. No. 875,473

Int. Cl.[2] C08G 59/50

U.S. Cl. 528—124 **23 Claims**

1. A curable epoxy resin composition consisting essentially of:

a vicinal polyepoxide; and,

an effective amount of a polyether urea curing agent having terminal primary amino groups and being formed by the reaction of a compound selected from a group consisting of bifunctional isocyanates obtained by phosgenation of an aniline formaldehyde condensation product with a polyoxyalkylenepolyamine of the formula:

$$[H_2N-(CH(X)-CH(H)-O)_n]_r-Z$$

wherein X is a hydrogen, a methyl radical, or an ethyl radical; Z is a hydrocarbon radical having 2 to 5 carbon atoms forming from 2 to 4 external ether linkages, n is a number from 1 to about 15, and r is a number from 2 to 4 wherein the molar ratio of said isocyanate compound to said polyoxyalkylenepolyamine is from 0.25 to 0.50.

4,178,428

THERMALLY STABLE ENYNE POLYSULFONE POLYMERS

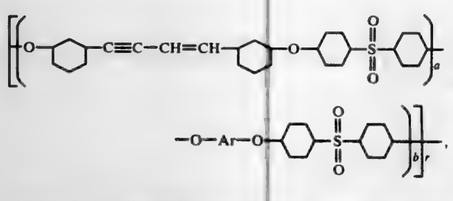
Fred E. Arnold, Centerville, and Bruce A. Reinhardt, New Carlisle, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 27, 1978, Ser. No. 946,291

Int. Cl.[2] C08G 75/23

U.S. Cl. 528—174 **9 Claims**

1. An enyne polysulfone consisting of essentially repeating units having the following structural formula:



wherein Ar is a divalent aromatic radical; a is equal to 0.05 to 1, b is equal to zero to 0.95, and the sum of a and b is equal to 1; and n is an integer ranging from about 1 to 100.

4,178,429

CATALYST FOR CURING RESINS

Karl D. Scheffer, 121 Governor Dr., Scotia, N.Y. 12302

Filed Nov. 17, 1978, Ser. No. 961,666

Int. Cl.[2] C08G 2/30, 4/00

U.S. Cl. 525—398 **31 Claims**

1. A resin curing catalyst comprising an aqueous solution of perchloric acid in a concentration of about 45 to about 72% based on weight.

8. A process of curing an acid catalyzed curing resin which comprises admixing said resin with an aqueous solution of perchloric acid containing about 45 to about 72% by weight of acid.

15. A process according to claim 8 wherein sand is added and said resin is a furan and said aqueous solution is employed at a level in the range of about 4 to about 10% by weight based on resin.

4,178,430

POLYMERIC SCHIFF'S BASES CONTAINING ACETYLENE TERMINAL GROUPS

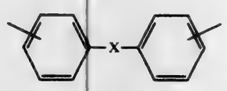
Norman Bilow, Encino, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 20, 1978, Ser. No. 962,573

Int. Cl.[2] C08G 12/08, 12/40

U.S. Cl. 528—245 **6 Claims**

1. A polymerizable acetylene terminated Schiff's base oligomer whose formula is HC≡C—Ar—R—AR—C≡CH where R may be —N=CH—Ar'—CH=N— or —CH=N—Ar'—N=CH—, Ar is phenylene, biphenylene, naphthylene, anthracene, phenanthrene, pyrene, alkyl and aryl substituted phenylene, alkyl or aryl substituted naphthylene, heterocyclic analogues of the above and wherein one or more of the aromatic carbon atoms is replaced by nitrogen, heterocyclic analogues of the above wherein one or more of the aromatic carbon atoms is replaced by sulfur or a moiety whose structure is



where X is O, S, CH_2, $—CH_2—_n$, —CO—, $—CF_2—_n$, $>C(CH_3)_2$, $—SO_2—$ or phenylene and Ar' is phenylene, diphenylene, terphenylene, naphthalene, anthracene, phenanthrene or a compound whose structure is $\phi—X'—\phi$ wherein ϕ is phenylene and X' is O, S, CH_2, $—CH_2—_n$, —CO—, $—CF_2—_n$, $>C(CH_3)_2$ or $—SO_2—$.

4,178,431

AROMATIC COPOLYAMIDE FIBER FROM BENZIDINE SULFONE OR DIAMINO PHENANTHRIDONE

Takaho Kaneda, Chiba; Seiji Ishikawa, Ichihara; Hiroshi Daimon, Ichihara; Toshio Katsura, Ichihara; Tatsuaki Maeda, Ichihara, and Tadahiro Hondo, Chiba, all of Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed May 20, 1977, Ser. No. 799,091

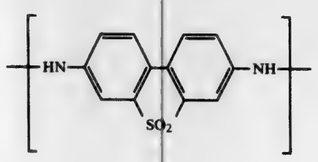
Claims priority, application Japan, May 28, 1976, 51/61234; Feb. 8, 1977, 52/12066

Int. Cl.[2] C08G 69/32

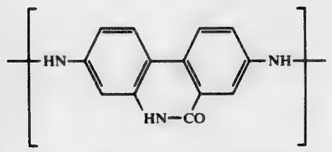
U.S. Cl. 528—337 **8 Claims**

1. A fiber composed of a high-molecular-weight copolyamide consisting essentially of units (A) represented by the following formula:

(A-1)

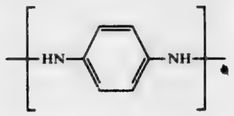


or



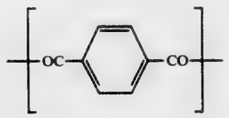
units (B) represented by the following formula:

(B)



and units (C) represented by the following formula:

(C)



in which the units (A), (B) and (C) are present in such amounts that the sum of amounts of units (A) and (B) is substantially equimolar to the amount of the units (C) and the molar ratio of the units (A) to the units (B) is in the range of from 10/90 to 50/50, said fiber having an initial modulus of elasticity of from 400 to 1,085 g/d and a tensile strength of from 16 to 44.1 g/d.

4,178,432

COPOLYOXALAMIDE FROM BRANCHED CHAIN DIAMINE

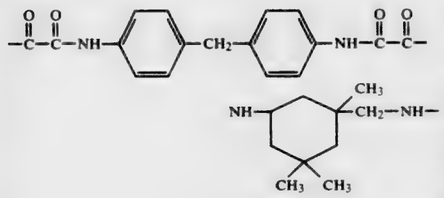
Augustin T. Chen, Cheshire, and Kemal B. Onder, North Haven, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 824,645, Aug. 15, 1977, abandoned. This application Jul. 19, 1978, Ser. No. 928,206

Int. Cl.[2] C08G 69/26

U.S. Cl. 528—340 **7 Claims**

6. A thermoplastic copolyoxalamide consisting essentially of the recurring unit



4,178,433

PROCESS FOR MAKING ARYLENE SULFIDE POLYMERS

Harry A. Smith, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

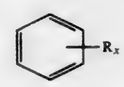
Filed May 11, 1978, Ser. No. 904,834

Int. Cl.[2] C08G 75/00

U.S. Cl. 528—381 **10 Claims**

1. A process for making an arylene monosulfide polymer which comprises heating a mixture of a benzenoid arylene compound having 1–3 benzene rings in the molecule and having the structural formula

(A-2)



wherein x is 0–2 and each R is halogen, lower alkyl, lower alkoxy, phenyl, phenoxy, biphenyl, biphenoxy, or a phenyl, biphenyl, phenoxy, or biphenoxy radical having a halogen, lower alkyl, or lower alkoxy substituent with about one mole of a sulfur halide which is S_2Cl_2 or S_2Br_2 per mole of arylene compound at a temperature of about 90° C.–350° C. in the presence of a metal halide Friedel-Crafts catalyst and recovering from the heated mixture a polyarylene sulfide resin essentially free of disulfide linkages.

4,178,434

AMINE-COUPLED POLYEPICHLOROHYDRIN AND POLYAMINES DERIVED THEREFROM

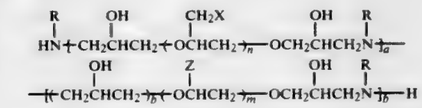
William K. Langdon, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 3, 1978, Ser. No. 866,207

Int. Cl.[2] C08G 65/32, 65/26

U.S. Cl. 528—405 **13 Claims**

1. A substantially linear polyamine, corresponding to the formula:



wherein R is either C_1 to C_4 alkyl group, 2-hydroxyethyl—or 2-hydroxypropyl, X is halogen, Z is either hydrogen, methyl or ethyl, n is a whole number ranging from 2 to 30, m is an integer from 2 to about 100, a is a value from about 0 to about 20, b is a value from about 0 to 20, the polyamine comprising the reaction product of (a) an epihalohydrin oligomer or a mixture of an epihalohydrin oligomer and a halohydrin-terminated derivative of a polyol and (b) a primary amine.

4,178,435

RECOVERY PROCESS FOR BRANCHED POLYPHENYLENE

Liong S. Tee, Naperville, Ill., and John C. Reindl, Troy, Mich., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 752,516, Dec. 20, 1976, abandoned. This application Dec. 29, 1977, Ser. No. 865,400

Int. Cl.[2] C08G 61/10

U.S. Cl. 528—501 **4 Claims**

1. A process for separating branched polyphenylene from a polymerization reaction mixture comprising branched polyphenylene formed by a metal oxide catalyst, hydrogen and unreacted monomer comprising the steps (a) discharging said reaction mixture from a polymerization reactor held at a pressure above about 1000 psig and at a temperature above about 400° C. into a first devolatilizing chamber maintained at a pressure below about 300 psig and at a temperature between about 300° and 600° C.; (b) after a time sufficient to remove a majority of unreacted monomer, removing volatile components from such first devolatilizing chamber; (c) transferring the remaining non-volatile components to a second devolatilizing chamber maintained at a pressure below atmospheric and at a temperature between about 400° and 500° C. for about 30 minutes; and (d) recovering the branched polyphenylene from such second devolatilizing chamber.

4,178,436

SEMI-SYNTHETIC OLEANDOMYCIN DERIVATIVES-C_8 MODIFICATIONS

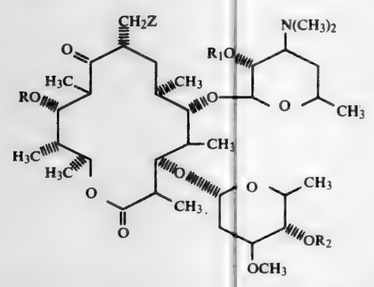
Frank C. Sciavolino, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 766,219, Feb. 7, 1977, Pat. No. 4,110,530, which is a division of Ser. No. 712,360, Aug. 5, 1976, Pat. No. 4,036,853. This application Apr. 10, 1978, Ser. No. 894,997

Int. Cl.[2] C07H *17/08*

U.S. Cl. 536—9 **5 Claims**

1. A compound of the structure:



and the pharmaceutically acceptable acid addition salts thereof wherein:

R is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

R_1 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

R_2 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

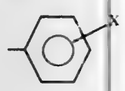
Z is—NHR_5;

R_5 is



and

R_6 is selected from the group consisting of hydrogen, alkyl having from one to six carbon atoms, amino (—NH_2), alkylamino having from one to six carbon atoms, pyridyl, anilino, α-thienyl, and



said substituent X being selected from the group consisting of hydrogen, halogen, alkyl having from one to four carbon atoms, alkoxycarbonyl having from one to four carbon atoms in the alkoxy group, CF_3, alkyloxy having from one to four carbon atoms, $CONH_2$ and —NO_2.

4,178,437

1-N-KANAMYCIN DERIVATIVES

Michael B. Thomas, Deal, England, assignor to Pfizer Inc., New York, N.Y.

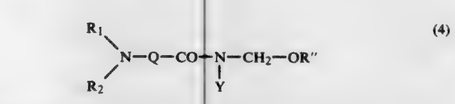
Filed Jul. 14, 1978, Ser. No. 924,515

Claims priority, application United Kingdom, Aug. 18, 1977, 34808/77

Int. Cl.[2] A61K *31/71;* **C07H** *15/22*

U.S. Cl. 536—10 **4 Claims**

1. A compound of the formula:



(II)

wherein R^2 is formyl; R^3 is selected from the group consisting of C_2 to C_4 alkanoyl and benzoyl; and R^4 is selected from the group consisting of hydroxy and NHR^3.

4,178,438

CATIONICALLY MODIFIED, CELLULOSE-CONTAINING MATERIALS

Jaroslav Haase, Basel; Peter Liechti, Arisdorf; Hans Wegmüller, Riehen; Rudolf F. Wurster, Pfeffingen, and Quentin Bowes, Rheinfelden, all of Switzerland, assignors to Ciba-Geigy Aktiengesellschaft, Basel, Switzerland

Continuation of Ser. No. 740,586, Nov. 10, 1976, abandoned. This application Sep. 11, 1978, Ser. No. 941,823

Claims priority, application Switzerland, Nov. 14, 1975, 14798/75

Int. Cl.[2] B01D *39/00;* **C08B** *15/06*

U.S. Cl. 536—30 **11 Claims**

1. Cationically modified cellulose material which contains at least 0.4% by weight of basic nitrogen and has a cationic constituent derived from a basic amide compound of the formula

(4)

wherein R″ represents hydrogen or C_1–C_4-alkyl, R_1 and R_2 independently of one another represent hydrogen, lower alkyl which is unsubstituted or substituted by halogen, hydroxyl, lower alkoxy or cyano, or cycloalkyl or benzyl, or R_1 and R_2, together with the nitrogen atom which links them, denote a 5-membered or 6-membered heterocyclic radical, Q denotes alkylene or alkyl-substituted alkylene each with up to 8 carbon atoms and Y denotes hydrogen, lower alkyl or —CH_2OR''—.

4,178,439

SULPHATED ION EXCHANGER AND METHOD FOR PREPARATION THEREOF

John S. Ayers, and David R. Husbands, both of Palmerston North, New Zealand, assignors to Development Finance Corporation of New Zealand, Wellington, New Zealand

Filed Mar. 1, 1977, Ser. No. 773,269

Claims priority, application New Zealand, Mar. 4, 1976, 180198

Int. Cl.[2] C08B *5/14, 7/00, 37/02, 37/04*

U.S. Cl. 536—59 **16 Claims**

1. A cationic ion exchanger comprising a water insoluble hydrophilic, water swellable matrix;

a plurality of sulphate groups chemically bonded to said matrix, the ion exchange capacity of said exchanger being provided by said sulphate groups; said matrix being a member selected from the group consisting of:

(a) a cross-linked carbohydrate, and,

(b) a cross-linked carbohydrate having a plurality of hydroxy C_a–C_4 alkyl groups chemically bonded thereto.

4,178,440

ENLARGED-HETERO-RING PROSTACYCLIN ANALOGS

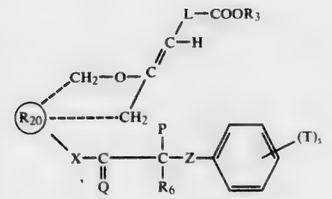
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 819,941, Jul. 28, 1977, Pat. No. 4,124,599, which is a continuation-in-part of Ser. No. 725,547, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,771, Aug. 23, 1976, abandoned. This application Aug. 21, 1978, Ser. No. 935,291

Int. Cl.[2] C07D *311/02*

U.S. Cl. 542—426 **24 Claims**

1. A 5Z compound of the formula



wherein  is

wherein L is

(1) —$(CH_2)_d$—$C(R_2)_2$—

(2) —CH_2—O—CH_2—Y— or

(3) —CH_2CH=CH—

wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, —CH_2— or —$(CH_2)_2$—,

wherein Q is



wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,

wherein R_3 is (a) hydrogen, (b) alkyl of one to 12 carbon atoms, inclusive, or (c) a pharmacologically acceptable cation;

wherein R_5 and R_6 are hydrogen. alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6— and the phenyl ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR— wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2 or 3, with the proviso that not more than two R's are other than alkyl and when s is 2 or 3 the T's are either the same or different; and

wherein x is

(1) trans—CH=CH—

(2) cis—CH=CH—

(3) —C≡C— or

(4) —CH_2CH_2—;

including the lower alkanoates thereof.

4,178,441

ENLARGED-HETERO-RING PROSTACYLIN ANALOGS

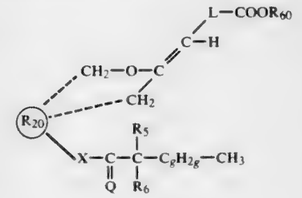
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 819,941, Jul. 28, 1977, Pat. No. 4,124,599, which is a continuation-in-part of Ser. No. 725,547, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,771, Aug. 23, 1976, abandoned. This application Aug. 21, 1978, Ser. No. 935.296

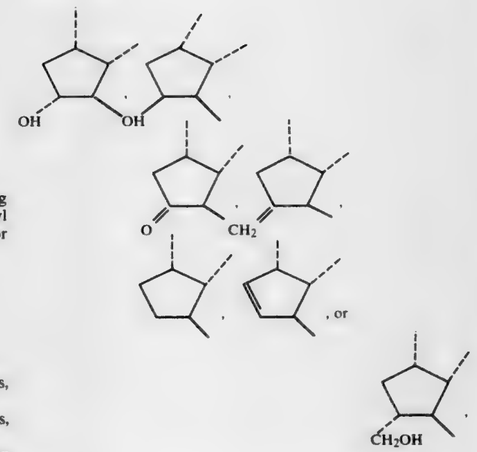
Int. Cl.[2] C07D *311/02*

U.S. Cl. 542—426 **17 Claims**

1. A 5Z compound of the formula



wherein R_{20} is



wherein

L is

(1) —$(CH_2)_d$—$C(R_2)_2$—

(2) —CH_2—O—CH_2—Y— or

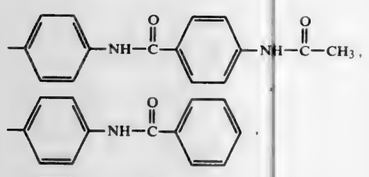
(3) —CH_2CH=CH—

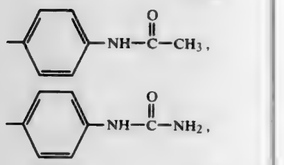
wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl

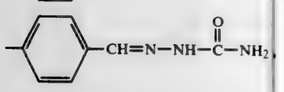
when the other is fluoro, and Y is a valence bond, —CH_2— or —$(CH_2)_2$—, wherein Q is

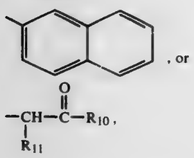


wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein
R_{60} is (a) cycloalkyl of 3 to 10 carbon atoms, inclusive, (b) aralkyl of 7 to 12 carbon atoms, inclusive, (c) phenyl, (d) phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive,









wherein R_{10} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, and wherein R_{11} is hydrogen or benzoyl, wherein C_qH_{2q} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between —CR_5R_6— and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro, and
wherein
X is
(1) trans—CH=CH—
(2) cis—CH=CH—
(3) —C≡C— or
(4) —CH_2CH_2—;
including the lower alkanoates thereof.

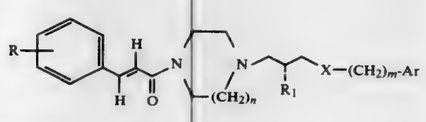
4,178,442

NOVEL CINNAMOYLES PIPERAZINES AND HOMOPIPERAZINES, THE METHOD OF PREPARING THEM AND THEIR APPLICATION IN THERAPEUTICS

Guy R. Bourgery, Colombes; Alain P. Lacour, La Varenne; Gerard H. Moinet, Orsay; Bernard M. Pourrias, Meudon la Foret, and Anne-Marie P. Ruch, Paris, all of France, assignors to Delalande S. A., Courbevoie, France

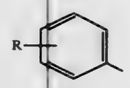
Filed Apr. 10, 1978, Ser. No. 894,965
Claims priority, application France, Apr. 19, 1977, 77 11707
Int. Cl.[2] C07D *241/04, 243/08*
U.S. Cl. 542—440 40 Claims

1. A compound having the formula



in which

(e)

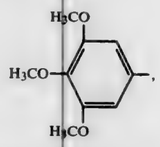


(f)

is selected from the group consisting of

(g)

(h)

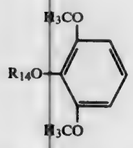


(i)

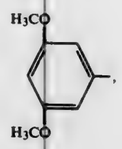
4-fluorophenyl, 3,5-dimethoxyphenyl, 3,4-methylenedioxyphenyl,

(j)

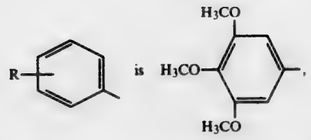
(k)



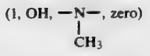
in which R_{14} is hydrogen or linear or branched alkyl having 2 or 3 carbon atoms, and



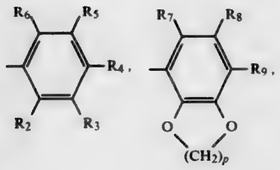
and in which
I. when

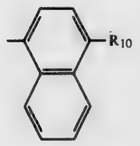


the parameters (n, R_1,X, m) are selected from the group consisting of (1, OH, oxygen, zero), (2, OH, Oxygen, zero), (1, H, oxygen, zero), (1, OH, S, zero),

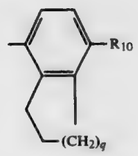


and (1, OH, oxygen, 1), and in which
A. when (n, R_1, X, m) is (1, OH, oxygen, zero), Ar is selected from the group consisting of

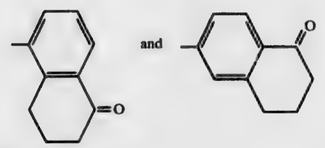




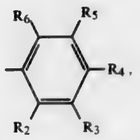
in which R_{10} is acetyl, acetamido or N-methylcarbamoylamino,



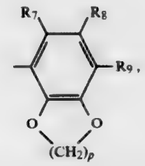
in which q is 1 or 2 and R_{10} has the same meaning as defined above,



and in which
1. when Ar is



R_2, R_3, R_4, R_5 and R_6 are selected from the group consisting of
a. R_3=R_4=R_5=R_6=H, and R_2 is chloro, fluoro, acetamido, acetyl, cyano, methoxy, methyl, allyl or alkyloxy,
b. R_2=R_4=R_5=R_6=H, and R_3 is acetamido, methyl, acetyl, cyano, methoxy or chloro,
c. R_2=R_3=R_5=R_6=H, and R_4 is chloro, cyano, nitro, methylthio, benzoyl, ethyl carboxylate, methyl, linear or branched alkyl having from 3 to 5 carbon atoms, cyclohexyl, alkanoyl in which alkyl has from 1 to 3 carbon atoms, alkanoylamino in which alkyl has from 1 to 3 carbon atoms, carboxamido, N-methylcarboxamido, cyanomethyl, carboxamidomethyl or N-methylcarbamoylamino,
d. R_3=R_5=R_6=H, R_2 is fluoro and R_4 is acetyl,
e. R_3=R_5=R_6=H, R_2 is chloro and R_4 is nitro, acetyl, or N-methylcarbamoylamino,
f. R_3=R_5=R_6=H, R_2 is methyl and R_4 is chloro, acetyl, acetamido or N-methylcarbamoylamino,
g. R_3=R_5=R_6=H, R_2 is methoxy and R_4 is acetyl, propionyl, formyl, cyano, acetamido, or N-methylcarboxamido,
h. R_4=R_5=R_6=H, and R_2 and R_3 are methoxy,
i. R_3=R_4=R_5=H, and R_2 and R_6 are methoxy,
j. R_2=R_4=R_6=H, and R_3 and R_5 are methoxy,
k. R_2=R_5=R_6=H, and R_3 and R_4 together are methylenedioxy,
l. R_2=R_5=R_6=H, R_3 is methyl and R_4 is nitro, acetamido or N-methylcarbamoylamino,
m. R_2=R_6=H, and R_3, R_4 and R_5 are methoxy,
n. R_2=R_6=H, R_3 and R_5 are methyl, and R_4 is chloro,
o. R_5=R_6=H, R_2 and R_3 are methoxy and R_4 is N-methylcarbamoylamino,
p. R_3=R_5=H, R_2 and R_6 are chloro, and R_4 is acetyl or N-methylcarbamoylamino,
q. R_3=R_5=H, R_2 and R_6 are methoxy and R_4 is acetyl, ethyl carboxylate or N-methylcarbamoylamino, and
r. R_6=H, R_3, R_4 and R_5 are methoxy and R_2 is acetyl,
and in which
2. when Ar is



p, R_7, R_8 and R_9 are selected from the group consisting of
a. p=2, R_7=R_8=H, and R_9 is hydrogen, hydroxy, acetoxy, methoxy, methyl, ethyl, cyano, acetyl, n-butyroyl, alkoxy carbonyl in which the alkoxy is linear or branched and has from 2 to 5 carbon atoms, cyclohexyloxycarbonyl, carboxamido, N-methylcarboxamido, N-cyclohexylcarboxamido, N-phenylcarboxamido, alkanoylamino in which the alkyl is linear or branched and has from 1 to 5 carbon atoms, cyclohexylcarbonylamino, benzoylamino, N-alkylcarbamoylamino in which the alkyl is linear or branched

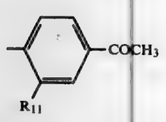
alkyl and has from 1 to 5 carbon atoms, N-cyclohexylcarbamoylamino, N-phenylcarbamoylamino, N-(paramethoxy-phenyl)-carbamoylamino, N-N-dimethylcarbamoylamino, morpholinocarbonylamino, N-N'-dimethylcarbamoylamino, ethoxycarbonylamino, hydroxymethyl, cyanomethyl, ethyl acetate, carboxamidomethyl or N-methylcarboxamidomethyl,

b. p=2, R_7=R_9=H, and R_8 is acetyl,

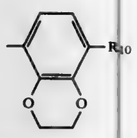
c. p=2, R_8=R_9=H, and R_7 is acetamido,

d. p=1 or 3, R_7=R_8=H, and R_9 is hydrogen, acetyl, acetamido or N-methylcarbamoylamino,

B. when (n, R_1, X, m) is (2, OH, oxygen, zero), Ar is selected from the group consisting of phenyl,

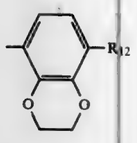


in which R_{11} is hydrogen or methoxy, and



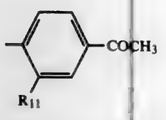
in which R_{10} has the same meaning as previously,

c. when (n, R_1, X, m) is (1, H, oxygen, zero), Ar is

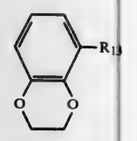


in which R_{12} is acetyl, acetamido, N-methylcarboxamido or N-methylcarbamoylamino,

D. when (n, R_1, X, m) is (1, OH, S, O), Ar is phenyl, metamethoxyphenyl, paratolyl,

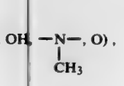


in which R_{11} is hydrogen or methoxy, or



in which R_{13} is hydrogen or acetyl,

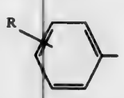
E. when (n, R_1, X, m) is



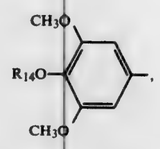
Ar is phenyl, and

F. when (n, R_1, X, m) is (1, OH, oxygen, 1), Ar is phenyl,

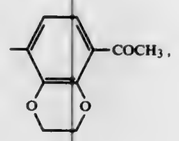
II. when



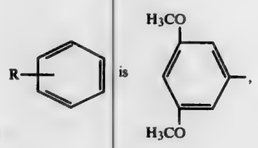
is 4-fluorophenyl, 3,5-dimethoxyphenyl, 3,4-methylenedioxyphenyl, or



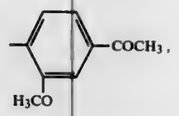
the parameters (n, R_1, X, m) are (1, OH, oxygen, zero) and Ar is



III. when



the parameters (n, R_1, X, m) are (1, OH, oxygen, zero) and Ar is



and the pharmacologically acceptable salts thereof.

4,178,443

DERIVATIVES OF 7 [-SUBSTITUTED OXYIMINS ACETAMIDO] CEPHALOSPORINS

Marc Montavon, and Roland Reiner, both of Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

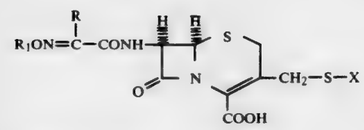
Filed May 23, 1978, Ser. No. 908,708

Claims priority, application Luxembourg, Jun. 3, 1977, 77485

Int. Cl.[2] **C07D** *501/36*

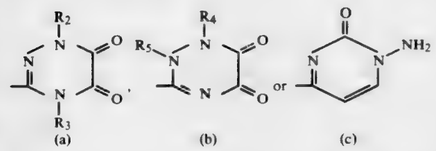
U.S. Cl. 544—27 **7 Claims**

1. A compound of the formula



(I)

wherein R represents furyl, thienyl phenyl or phenyl substituted by a member of the group consisting of halogen, hydroxy, lower alkoxy or lower alkyl, R_1 represents lower alkyl or aminocarbonylmethyl and X represents a group of the formula



(a) (b) (c)

in which one of the two symbols R_2 and R_3 or R_4 and R_5 represents hydrogen and the other represents lower alkyl, carboxymethyl or sulphomethyl,

and the pharmaceutically acceptable salts of said compounds and hydrates of said salts.

4,178,444

HYDRAZONO DERIVATIVES OF CEPHALOSPORINS

Riccardo Monguzzi, Corsico; Giorgio Pifferi, Milan; Mario Pinza, Corsico, and Giampietro Broccali, Milan, all of Italy, assignors to CRAF Sud, Aprilia Latina, Italy

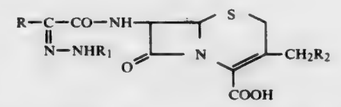
Filed Jun. 7, 1978, Ser. No. 913,475

Claims priority, application Italy, Jun. 7, 1977, 24436 A/77

Int. Cl.[2] **C07D** *501/36, 501/32*

U.S. Cl. 544—30 **5 Claims**

1. A hydrazonocephalosporin of the formula:



wherein R is selected from the group consisting of phenyl, 2-thienyl, 3-thienyl, 2-furyl, and 3-furyl;

R_1 is hydrogen or alkyl having from 1 to 4 carbon atoms; and

R_2 is selected from the group consisting of hydrogen, acetoxy, carbamoyloxy; 1,3,4-thiadiazol-2-yl-thio; methyl-substituted 1,3,4-thiadiazol-2-yl; 1,2,3,4-tetrazol-5-yl-thio; methyl-substituted 1,2,3,4-tetrazol-5-yl-thio; and pyrid-1-yl and a corresponding salt of an alkali or alkaline earth metal, procaine, N,N-dibenzylethylendiamine, and dibenzylamine or the pivaloyloxymethyl ester or 1-(ethoxy-carbonyloxy) ethyl ester thereof.

4,178,445

7-(α-SUBSTITUTED GLYCINAMIDO)-3-SUBSTITUTED METHYL-3-CEPHEM-4-CARBOXYLIC ACIDS AND THEIR DERIVATIVES

Tadayoshi Takano, Hirakata, and Susumu Horibe, Takatsuki, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 563,116, Mar. 28, 1975, Pat. No. 4,039,536.

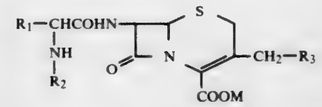
This application May 13, 1977, Ser. No. 796,663

Claims priority, application Japan, Mar. 28, 1974, 49-36080; Apr. 9, 1974, 49-40577; Apr. 10, 1974, 49-41130; Apr. 11, 1974, 49-41515; Apr. 11, 1974, 49-41516; Apr. 15, 1974, 49-42568

Int. Cl.[2] **C07D** *501/32, 501/44*

U.S. Cl. 544—30 **40 Claims**

1. Compounds of the formula:



wherein R_1 is hydrogen, lower alkyl, phenyl or thienyl,

R_2 is (a) phenyl(lower)alkanoyl, in which said phenyl is unsubstituted or substituted with one nitro,

(b) phenoxy(lower)alkanoyl, in which said phenoxy is unsubstituted or substituted with

one halogen,

one nitro,

one lower alkyl,

one lower alkoxy,

one halo(lower)alkyl,

one phenyloxycarbonyl,

one halogen at each 2- and 6-position,

one (lower)alkoxy at each 2- and 6-position,

one alkyl at each 2- and 6-position,

one nitro and one halogen at 2- and 4-positions,

or two halogens and one sulfo at 2-, 4- and 6-positions,

or

(c) phenylthio(lower)alkanoyl, in which said phenyl is unsubstituted or substituted with one halogen or one nitro,

R_3 is hydrogen, lower alkanoyloxy, or pyridinium group, provided that R_1 is hydrogen, lower alkyl or thienyl when R_2 is phenoxy(lower) alkanoyl, in which the phenyl moiety has no substituent and R_3 is lower alkanoyloxy, and

M is hydrogen,

and nontoxic pharmaceutically acceptable salt and their ester selected from lower alkyl ester, lower alkanoyloxy(lower)alkyl ester and phenyl(lower)alkyl ester, in which the phenyl is unsubstituted or substituted with 1 to 2 lower alkoxy, and

M is anionic charge when R_3 is pyridinium group.

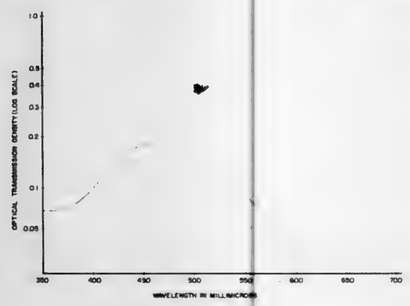
V 9 8 9 1 2 D E 1 1 7 9 UMI

4,178,446

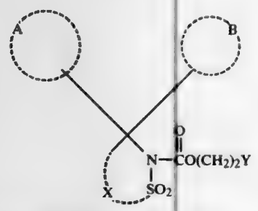
SULFAM(NA)PHTHALEINS

Stanley M. Bloom, Waban; Alan L. Borror, Lexington, and James W. Foley, Andover, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 23, 1977, Ser. No. 835,998
Int. Cl.[2] C07D 275/06
U.S. Cl. 544—33 **40 Claims**



1. A compound of the formula



wherein A is a 4′-hydroxy-1′-phenyl moiety or a 4′-hydroxy-1′-naphthyl moiety; B is a phenyl moiety or a naphthyl moiety, provided A is said 4′-hydroxy-1′-phenyl moiety when B is said naphthyl moiety; X represents the carbon atoms necessary to complete 2,3-dihydrobenz[d]isothiazole-1,1-dioxide or 2,3-dihydronaphtho[1,8-de]-1,2-thiazine-1,1-dioxide; and Y is an electron-withdrawing group having a positive sigma value greater than 0.60 as defined by Hammett's Equation.

4,178,447

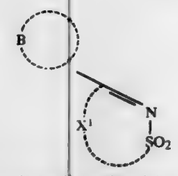
NOVEL SYNTHESIS OF 3,3-SUBSTITUTED DIHYDROBENZISOTHIAZOLE-1,1-DIOXIDES AND -2,3-DIHYDRONAPHTHO-1,2-THIAZINE-1,1-DIOXIDES

Alan L. Borror, Lexington; James W. Foley, Andover; Marcis M. Kampe, Brookline, and John W. Lee, Jr., Harvard, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

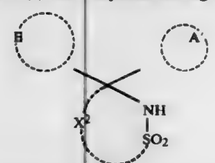
Filed Sep. 23, 1977, Ser. No. 836,025
Int. Cl.[2] C07D 275/06
U.S. Cl. 544—33 **26 Claims**

1. A process which comprises

(1) reacting (a) a 4-OP-carbocyclic aryllithium compound wherein P is a protecting group selected from a 4-OP-phenyllithium compound and a 4-OP-naphthyllithium compound and (b) a compound of the formula



wherein B is a carbocyclic aryl moiety other than a 4′-OP-carbocyclic aryl moiety selected from a phenyl moiety and a naphthyl moiety and X^1 represents the atoms necessary to complete a benz[d]isothiazole-1,1-dioxide moiety or a naphtho[1,8-de]-1,2-thiazine-1,1-dioxide moiety in an inert solvent at a temperature between about −80° and 50° C. to give (c) the compound having the formula

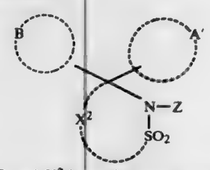


wherein A′ is a 4′-OP-1′-phenyl moiety or a 4′-OP-1′-naphthyl moiety; P is a protecting group; B has the same meaning given above; and X^2 represents the atoms necessary to complete a 2,3-dihydrobenz[d]isothiazole-1,1-dioxide moiety or a 2,3-dihydronaphtho[1,8-de]-1,2-thiazine-1,1-dioxide moiety;

(2) reacting said compound (c) with an excess of an acid halide of the formula W-Z wherein W is chloro or bromo and Z is a carbonyl moiety containing a



group in pyridine at a temperature between about 0° C. and 100° C. to yield (d) the corresponding acylated compound having the formula

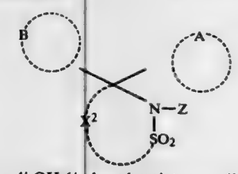


wherein A′, B and X^2 have the same meaning given above and Z is said carbonyl moiety and said



is bonded to said N atom; and

(3) treating said compound (d) with an organic or inorganic acid at a pH between about 0.1 and 5.0 at a temperature between about 20° and 100° C. to give (e) the compound having the formula



wherein A is a 4′-OH-1′-phenyl moiety or a 4′-OH-1′-naphthyl moiety and B, X^2 and Z have the same meaning given above.

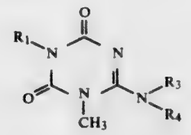
4,178,448

PROCESS FOR PREPARING HERBICIDAL TRIAZINES

Charles D. Adams, Newark; Earl W. Cummins, Wilmington, both of Del., and Steven I. Gleich, Seabrook, Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 777,324, Mar. 14, 1977, abandoned, which is a continuation-in-part of Ser. No. 675,921, Apr. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 574,351, May 5, 1975, abandoned. This application Apr. 12, 1978, Ser. No. 895,587
Int. Cl.[2] C07D 251/46
U.S. Cl. 544—194 **15 Claims**

1. A process for preparing a triazine compound of the formula:



wherein

R_1 is C_2–C_8 alkyl, C_5–C_8 cycloalkyl, norbornyl, methylcyclohexyl, methylcyclopentyl, phenyl, or chlorophenyl;

R_3 is methyl; and

R_4 is C_1–C_4 alkyl;

said process comprising the following steps in sequence:

(a) contacting cyanamide with a C_{2-3} alkyl chloroformate to form the corresponding alkoxycarbonylcyanamide;

(b) contacting said alkoxycarbonylcyanamide with an alkylating agent of the formula CH_3Z to form the corresponding N-alkoxycarbonyl-N-methylcyanamide;

(c) contacting said N-alkoxycarbonyl-N-methylcyanamide at a pH of 5.8–8.0 with an amine salt of the formula:

$$[R_3R_4NH_2]^+{}_n.y^{-n}$$

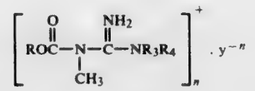
where

Y=Cl^- or SO_4^{--},

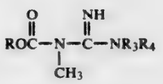
n=1 when Y=Cl^-, and

n=2 when Y=SO_4^{--},

to form a compound of the formula:



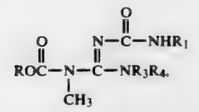
(d) contacting the product compound of step (c) with and alkali metal hydroxide to form a compound of the formula:



containing unreacted amine;

(e) removing unreacted amine, R_3R_4NH from the reaction product compound of step (d) by extraction of the product compound containing unreacted amine into an inert organic solvent and removal of unreacted amine from the extract by vaporization therefrom,

(f) contacting the product compound of step (e), from which the amine has been removed, with an isocyanate of the formula R_1NCO to form a compound of the formula:



(g) rapidly admixing a base $N'OR_5$ with amine-free product of step (f) by which the reaction product compound is cyclized to form triazine compound having the above formula and by-product alkanol and rapidly removing by-product alkanol from the cyclized reaction product by vaporization therefrom.

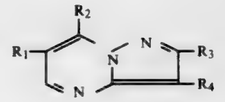
4,178,449

PYRAZOLO[1,5-a]PYRIMIDINES AND IMIDAZO-[1,5-a]PYRIMIDINES

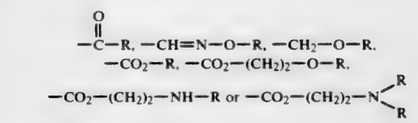
John P. Dusza, and Jay D. Albright, both of Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 896,826, Apr. 17, 1978. This application Dec. 15, 1978, Ser. No. 970,085
Int. Cl.[2] A61K 31/415; C07D 487/04
U.S. Cl. 544—281 **18 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen or alkyl having up to 3 carbon atoms; R_2 is selected from the group consisting of phenyl, o-trifluoromethylphenyl, m-trifluoromethylphenyl and m-methoxyphenyl; R_3 is hydrogen, fluoro, chloro, bromo, cyano, cyanomethyl, carbamoyl or alkyl having up to 3 carbon atoms; and R_4 is selected from the group consisting of hydrogen, fluoro, chloro, bromo, formyl, carboxyl, cyano, hydroxymethyl, N-hydroxyformimidoyl, alkyl having up to 3 carbon atoms and moieties of the formulae:



wherein R is alkyl having up to 3 carbon atoms.

4,178,450

2,5-DIMETHYL-BENZO(b) THIENE (3,2-f) MORPHAN AND PRECURSOR THEREOF

Ricardo Granados Jarque, Barcelona; Mercedes Alvarez Domingo, San Juan Despi; Juan Bosch Cartes, all of Barcelona; Cristöbal Martinez Roldán, and Fernando Rabadán Peinado, both of Madrid, all of Spain, assignors to Laboratories Made, S. A., Madrid, Spain

Filed Feb. 1, 1978, Ser. No. 874,089
Claims priority, application Spain, Feb. 25, 1977, 456281
Int. Cl.[2] C07D 495/08, 409/06
U.S. Cl. 546—63 **3 Claims**

1. 2,5-dimethyl-benzo[b]thiene[3,2-f]morphan or 2-(2-benzo[b]thienylmethyl)-1,4-dimethyl-1,2,3,6-tetrahydropyridine or one of their pharmacologically acceptable acid addition salts.

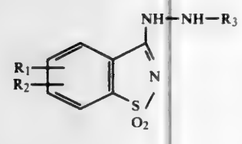
4,178,451

3-(SUBSTITUTED HYDRAZINO)BENZISOTHIAZOLE-1,1-DIOXIDES

Peter C. Wade, Pennington, N.J., and B. Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 13, 1978, Ser. No. 924,257
Int. Cl.[2] A61K *31/425*; C07D *275/06, 417/12*
U.S. Cl. 546—272 9 Claims

1. A compound having the formula



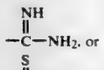
wherein:

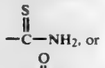
R_1 is hydrogen, halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, or nitro and R_2 is hydrogen, halogen, or alkoxy of 1 to 4 carbon atoms, provided that if R_2 is other than hydrogen, R_1 and R_2 are the same; and

R_3 is


(i)

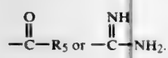
wherein R_4 is alkyl of 1 to 6 carbon atoms or cycloalkyl of 3 to 7 carbon atoms,


(ii)


(iii)


(iv)

wherein R_5 is 2-pyridinyl, 3-pyridinyl, 4-pyridinyl, 2-pyrimidinyl, 4-pyrimidinyl, 5-pyrimidinyl, or 2-pyrazinyl; or a pharmaceutically acceptable salt of those compounds wherein R_3 is



4,178,452

ETHYL 3-[(3,4-DIMETHOXYPHENYL)ETHYLAMINO]-1,2,5,6-TETRAHYDRO-2-OXOPYRIDINE-4-CARBOXYLATE

George C. Wright, and Ronald E. White, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Dec. 7, 1978, Ser. No. 967,364
Int. Cl.[2] C07D *213/55*
U.S. Cl. 546—297 1 Claim

1. The compound ethyl 3-[(3,4-dimethoxyphenyl)ethylamino]-1,2,5,6-tetrahydro-2-oxopyridine-4-carboxylate.

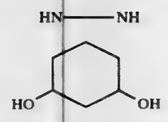
4,178,453

PROCESS FOR THE PREPARATION OF 2,5-DIDEOXYSTREPTAMINE AND OF A NOVEL INTERMEDIATE THEREFOR

Peter J. L. Daniels, Cedar Grove, and Mohammed M. N. Varchei, North Caldwell, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 443,051, Feb. 15, 1974, Pat. No. 4,092,359.
This application Jan. 13, 1978, Ser. No. 869,207
Int. Cl.[2] C07D *231/00*
U.S. Cl. 548—369 2 Claims

1. A compound of the formula:



and the non-toxic acid addition salts thereof.

4,178,454

STABILIZED PROSTAGLANDIN E COMPOSITION

Masanobu Naruto; Kiyotaka Ohno, and Norio Naruse, all of Kamakura, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Oct. 11, 1978, Ser. No. 950,451
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—2 6 Claims

1. A stabilized prostaglandin E composition comprising a prostaglandin E having incorporated therein a stabilizing amount of methylhesperidin.

4,178,455

PROCESS FOR PREPARING AROMATIC URETHANES

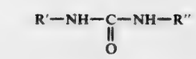
Yutaka Hirai; Katsuharu Miyata; Makoto Aiga, and Seiji Hasegawa, Omuta, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jul. 17, 1978, Ser. No. 925,543
Claims priority, application Japan, Jul. 25, 1977, 52-88441; Jul. 28, 1977, 52-89805
Int. Cl.[2] C07C *125/04*
U.S. Cl. 560—24 38 Claims

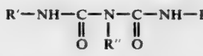
1. In a process for preparing an aromatic urethane which comprises reacting at temperature in the range of 80°–230° C. pressures in the range of 10–1000 Kg/cm^2G for a time ranging from 5 minutes to 6 hours an aromatic nitro compound, an organic hydroxyl-containing compound having at least one hydroxyl group, and carbon monoxide in the presence of a catalyst selected from the group consisting of platinum, palladium, rhodium or ruthenium metal or a compound thereof and mixtures thereof and a promoter selected from the group consisting of Lewis acids, Lewis acid-containing compounds and mixtures thereof, the improvement which comprises adding to the reaction system at least one compound selected from the group consisting of an organic primary amino compound of the formula

$$R_oNH_2 \quad (I)$$

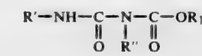
where R_o represents a linear or branched alkyl group containing from 1 to 16 carbon atoms, a cycloalkyl group of 6 carbon atoms with or without an alkyl substituent containing from 1 to 3 carbon atoms, or an aryl group with or without at least one alkyl substituent containing from 1 to 6 carbon atoms, and these alkyl, cycloalkyl and aryl groups may further have at least one halogen, aryl, alkenyl, cyano, nitro, alkoxy, phenoxy, thioalkoxy, thiophenoxy, carbalkoxy, carbamate, carbamyl, carbaryloxy or thiocarbamyl substituent; a urea compound of the formula


(II)

where each of R′ and R″ represents a hydrogen atom, a linear or branched alkyl group containing from 1 to 16 carbon atoms, a cycloalkyl group of 6 carbon atoms with or without an alkyl substituent containing from 1 to 3 carbon atoms, or an aryl group with or without at least one alkyl substituent containing from 1 to 6 carbon atoms, and these alkyl, cycloalkyl and aryl groups may further have at least one halogen, aryl, alkenyl, cyano, nitro, alkoxy, phenoxy, thioalkoxy, thiophenoxy, carbalkoxy, carbamate, carbamyl carbaryloxy or thiocarbamyl substituent; a biuret compound of the formula


(III)

where each of R′, R″ and R‴ has the same meaning as defined for R′ and R″ in formula (II); and an allophanate compound of the formula


(IV)

where each of R′ and R″ has the same meaning as defined for R′ and R″ in formula (II), R_1 represents a linear or branched alkyl group containing from 1 to 16 carbon atoms, a cycloalkyl group of 6 carbon atoms with or without an alkyl substituent containing from 1 to 3 carbon atoms, or an aryl group with or without at least one alkyl substituent containing from 1 to 6 carbon atoms, and these alkyl, cycloalkyl and aryl groups may further have at least one halogen, aryl, alkenyl, nitro, alkoxy, phenoxy or carbamate substituent.

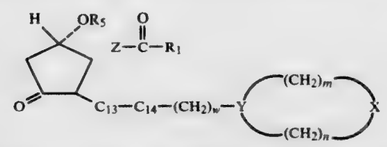
4,178,456

PROSTENOIC ACIDS AND ESTERS

Allan Wissner, Monsey, N.Y.; Martin J. Weiss, Oradell, and Karel F. Bernady, South Sommerville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 30, 1977, Ser. No. 782,653
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—53 97 Claims

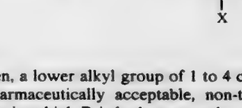
1. An optically active compound of the formula:



wherein R_1 is selected from the group consisting of hydroxy, tri-(C_1–C_4)-alkylsilyloxy, and C_1–C_6 alkoxy; R_5 is selected from the group consisting of hydrogen, tri-(C_1–C_4)-alkylsilyloxy and C_2–C_5 alkanoyloxy; Y is a trivalent radical selected from the group consisting of a moiety of the formula



wherein R_3 is selected from the group consisting of hydrogen tri-(C_1–C_4)alkylsilyloxy and C_2–C_5 alkanoyl; X is a divalent radical selected from the group consisting of a moiety of the formula



wherein R_4 is selected from the group consisting of C_1–C_7 alkyl, hydrogen, pehnoxy and phenoxy substituted with a compound selected from the group consisting of halogen, trifluoromethyl and methoxy; n is zero or an integer from 1 to 4; m is zero or an integer from 1 to 4, with the proviso that the sum of n and m has the value of 2 to 4; the moiety C_{13}–C_{14} is ethylene or trans-vinylene; w is zero or 1; and Z is a divalent radical selected from the group consisting of a moiety of the formula:

$$-(CH_2)_p-,$$

$$-CH_2-CH\overset{cis}{=}CH-CH_2-(CH_2)_q-\text{and}-(CH_2)_t-O-CH_2-$$

wherein p is an integer from 5 to 7, q is an integer from 1 to 3, and t is an integer from 3 to 5; R_5 is selected from the group consisting of hydrogen and C_1–C_3 alkyl; the racemic mixture thereof; and the pharmacologically acceptable cationic salts thereof when R_1 is hydrogen.

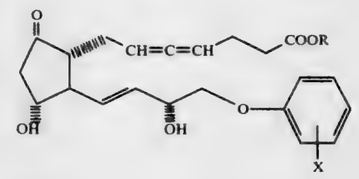
4,178,457

(DL)-16-PHENOXY- AND 16-SUBSTITUTED PHENOXY-9-KETO PROSTATRIENOIC ACID DERIVATIVES AND PROCESSES FOR THE PRODUCTION THEREOF

Albert R. Van Horn, Los Altos; Gabriel Garay, Sunnyvale, and John A. Edwards, Los Altos, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 10, 1973, Ser. No. 922,957
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—53 10 Claims

1. A compound selected from the group of those represented by the following formula:


(A)

wherein

R is hydrogen, a lower alkyl group of 1 to 4 carbon atoms, or the pharmaceutically acceptable, non-toxic salts of compounds in which R is hydrogen; and

X is hydrogen, o-, m-, or p-halo (fluoro, chloro or bromo), o-, m- or p-methyl or o-, m- or p-methoxy.

4,178,458

SMOKING COMPOSITION

Lina C. Teng, Richmond, Va., assignor to Philip Morris, Inc., New York, N.Y.

Division of Ser. No. 793,400, May 3, 1977, which is a division of Ser. No. 659,691, Feb. 20, 1976, Pat. No. 4,036,237. This application Oct. 17, 1978, Ser. No. 952,077
Int. Cl.[2] C07C *69/76*
U.S. Cl. 560—60 4 Claims

1. The compound n-amyl 2,2-dimethyl-3-hydroxy-3-phenylpropionate.

4,178,459

N-SUBSTITUTED PARAMENTHANE CARBOXAMIDES

Hugh R. Watson, Wargrave; David G. Rowsell, Staines, and David J. Spring, Datchet, all of England, assignors to Wilkinson Sword Limited, London, England

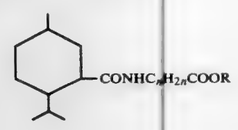
Division of Ser. No. 796,973, May 16, 1977, Pat. No. 4,150,052, which is a continuation of Ser. No. 486,566, Jul. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 221,755, Jan. 28, 1972, abandoned. This application Jan. 18, 1979, Ser. No. 4,320

Claims priority, application United Kingdom, Feb. 4, 1971, 3928/71; Feb. 4, 1971, 3934/71

Int. Cl.[2] **C07C** *101/18, 101/14*

U.S. Cl. 560—125 **4 Claims**

1. Substantially odorless, non-volatile physiologically active cooling compounds of the formula



where

C_nH_{2n} is a straight or branched chain alkylene group in which n is an integer of from 1–6, and

R is hydrogen, C_1–C_8 alkyl or C_1–C_8 hydroxyalkyl.

4,178,460

2-HALOALKYL(OXY-, THIO-, SULFINYL-, OR SULFONYL)-PHENYLALKANOIC ACIDS

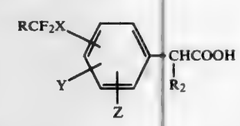
Gerald Berkelhammer, Princeton, and Venkataraman Kameswaran, Princeton Junction, both of N.J., assignors to American Cyanamid Co., Stamford, Conn.

Continuation-in-part of Ser. No. 830,515, Sep. 6, 1977, abandoned, which is a continuation-in-part of Ser. No. 728,817, Oct. 1, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 890,721

Int. Cl.[2] **C07C** *65/02, 149/40, 147/107, 147/14*

U.S. Cl. 562—426 **13 Claims**

1. A compound of the formula:



wherein RCF_2, X, Y and Z are all meta or para to the carbon to the acid group; X is O, S, SO or SO_2; Y and Z are each H, Cl, F, Br, NO_2, CH_3 or OCH_3; R is H, F, CHF_2 or CF_3 and R_2 is ethyl, n-propyl, isopropyl, isopropenyl or t-butyl; or the optical isomers thereof.

4,178,461

16,16-SPIROCYCLOALKYL PROSTAGLANDIN DERIVATIVES

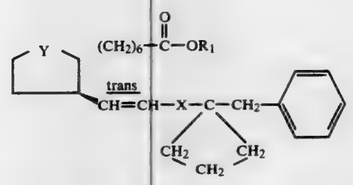
Robert E. Schaub, Upper Saddle River, and Martin J. Weiss, Oradell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 592,494, Jul. 2, 1975, Pat. No. 4,028,396. This application Mar. 16, 1977, Ser. No. 778,302

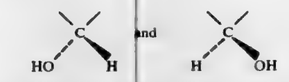
Int. Cl.[2] **C07C** *177/00*

U.S. Cl. 562—463 **9 Claims**

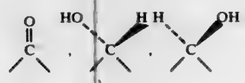
1. A compound selected from the group consisting of an optically active compound of the formula:



and a racemic compound of that formula and the mirror image thereof wherein X is a divalent radical selected from the group consisting of those of the formulae:



Y is a divalent radical selected from the group consisting of those of the formulae:



R_1 is hydrogen or alkyl having up to 4 carbon atoms; and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

4,178,462

NOVEL BICYCLODECADIENE COMPOUNDS AND PROCESS FOR PRODUCING THEM

Shingo Marumo, Owariasahi, and Masato Katayama, Nagoya, both of Japan, assignors to Noda Institute For Scientific Research, Noda, Japan

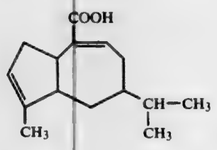
Filed Sep. 26, 1978, Ser. No. 945,831

Claims priority, application Japan, Sep. 29, 1977, 52-116139; Mar. 9, 1978, 53-25942

Int. Cl.[2] **C07C** *61/28*

U.S. Cl. 562—501 **2 Claims**

1. 5-Isopropyl-8-methyl bicyclo[5.3.0]deca-2,8-diene-2-carboxylic acid having a chemical structure represented by the formula



4,178,463

PROCESS FOR MAKING 4-AMINOHEX-5-ENOIC ACID

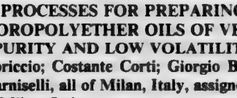
Maurice W. Gittos, Strasbourg, and Gérard J. Letertre, Souffelweyersheim, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Filed Jan. 30, 1978, Ser. No. 873,273

Int. Cl.[2] **C07C** *99/06*

U.S. Cl. 562—574 **2 Claims**

1. A process for the preparation of 4-aminohex-5-enoic acid or salt thereof which comprises treating a pyrrolidone compound of the formula



wherein R_1 is hydroxy, amino, or tertiary-butoxy with an excess of a strong acid, optionally preceded by treatment with an excess of a strong base, at about 100° to 150° C. for about 2 to 24 hours followed by treatment with base or application to an acid ion exchange resin when the free base is desired.

4,178,464

PROCESS FOR PRODUCING METHACRYLIC ACID

Teruhisa Sakamoto; Shigeo Nakamura, and Nobuyuki Taniguchi, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Jul. 14, 1978, Ser. No. 924,570

Claims priority, application Japan, Jul. 22, 1977, 52-87247

Int. Cl.[2] **C07C** *51/32, 57/04*

U.S. Cl. 562—535 **8 Claims**

1. A process for producing methacrylic acid by the vapor phase catalytic oxidation of methacrolein with molecular oxygen or a molecular oxygen-containing gas, which comprises:

conducting said oxidation reaction over a catalyst consisting of a multi-element complex oxide having the formula:

$$Mo_aP_bAs_cV_dCu_eCe_fCr_gO_h$$

wherein a=12, b=0.5 to 3.0, c=0.01 to 1.2, d=0.01 to 2.0, e=0.01 to 2.0, f=0.01 to 1.2, g=0 to 2.0 and h assumes a value which is dependent upon the valences of the other components of the catalyst within the range of 37 to 60.

4,178,465

PROCESSES FOR PREPARING PERFLUOROPOLYETHER OILS OF VERY HIGH PURITY AND LOW VOLATILITY

Gerardo Caporiccio; Costante Corti; Giorgio Belardinelli, and Giuliano Carniselli, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 708,791, Jul. 26, 1976, abandoned. This application Oct. 25, 1977, Ser. No. 844,834

Claims priority, application Italy, Jul. 30, 1975, 25907 A/75

Int. Cl.[2] **C07C** *43/30*

U.S. Cl. 568—601 **7 Claims**

1. Process for the preparation of anhydrous selected perfluoropolyether oil fractions having an average molecular weight between 3,000 and 5,000, with a variation of 500±100 units of molecular weight for each single selected fraction, and the general formula:

$$A\text{—}O\text{—}(C_3F_6O)_m\text{—}(CF_2O)_n\text{—}(CF\text{—}O)_q\text{—}B \quad (1)$$
$$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad |$$
$$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad CF_3$$

wherein m is a whole number between 15 and 100, preferably betwee 15 and 50, n is a whole number between 1 and 80, preferably between 1 and 10, q is a whole number between 1 and 9, preferably between 1 and 5, the sum (m+n+q) is a number between 17 and 100, preferably between 17 and 65, the ratio n/m+q is a number between 0.06 and 1, —C_3F_6O—, —CF_2O— and



are oxyperfluoroalkylene units randomly distributed along the chain and wherein A and B are independently selected from the group consisting of —CF_3, —C_2F_5 and —C_3F_7, or of oil fractions having an average molecular weight between 6,000 and 20,000, a vapor pressure equal to or below 5×10^{-11} torr at 20° C., and the general formula (2):

$$A\text{—}O\text{—}(C_2F_4O)_p\text{—}(CF_2O)_r\text{—}B \quad (2)$$

wherein p is a whole number between 30 and 300, preferably between 35 and 250, r is a whole number between 5 and 300, preferably between 6 and 250, the sum (p+r) is a number between 35 and 600, preferably between 41 and 500, the ratio r/p is a number between 0.15 and 1.5, —C_2F_4O— and —CF_2O are oxyperfluoroalkylene units randomly distributed along the chain; and A and B are independently selected from the group consisting of —CF_3 and —C_2F_5, said process comprising treating a perfluoropolyether oil of the formula (1) or (2), containing traces of water molecularly dissolved therein with chlorine trifluoride or chlorine monofluoride, at a pressure of 1 to 5 atm, at a temperature between 0° C. and 50° C., removing the excess chlorine trifluoride or chlorine monofluoride and the gases formed in the reaction, and subjecting the thus treated perfluoropolyether oil to selective fractionation under equilibrium conditions so as to obtain selected fractions corresponding to from 2% to 5% of the perfluoropolyether oil subjected to fractionation.

7. A perfluoropolyether oil fraction containing less than 1 ppm of water and prepared according to the process of claim 1.

4,178,466

PROCESS FOR PREPARING PHENYL TRICHLORO-ETHANES

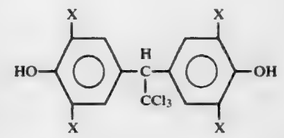
Russell A. Gardner, Voorheesville, and Charles M. Orlando, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 15, 1978, Ser. No. 886,727

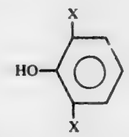
Int. Cl.[2] **C07C** *39/16*

U.S. Cl. 568—727 **6 Claims**

1. The process for preparing a trichloro-ethane of the formula



which comprises reacting at a temperature of from −50° to 20° C. a phenol of the formula



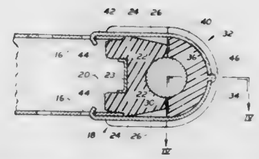
and chloral in liquid HF wherein the latter serves as both solvent and as catalyst for the reaction, and thereafter isolating the aforesaid trichloro-ethane, where X is the same or different member selected from the class consisting of hydrogen, the methyl radical and halogens.

4,178,467

BOLTLESS SPACER DEVICE

Ronald G. Hawkins, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jul. 7, 1978, Ser. No. 922,686
Int. Cl.[2] H02G 7/12
U.S. Cl. 174—40 R **8 Claims**



1. A boltless device for spacing two parallel conductors comprising

a hollow rigid arm structure adapted to extend between the conductors,

first resilient bushing means adapted to respectively engage the ends of the arm and the conductors,

second resilient bushing means adapted to respectively engage the conductors in opposed relation to the first bushing means,

two resilient metal clips, and

means associated with each clip and the rigid arm for securing the clips and arm together at locations adjacent the ends of the arm,

said clips having a shape that conforms to an outside shape and surface of the second bushing means, such that the clips engage the outside surfaces of the second bushing means the full distance of the surfaces when the clips are secured to the arm.

4,178,468

DUCT POST

George N. Jorgensen; Stephen L. Flee, and James C. Carroll, all of Oxford, Ohio, assignors to Square D Company, Palatine, Ill.

Filed May 4, 1977, Ser. No. 793,685
Int. Cl.[2] H02G 3/04
U.S. Cl. 174—48 **10 Claims**

1. A feeder duct post assembly including a power outlet receptacle, said assembly having securing means adjacent one end adapted to detachably secure said assembly to a ceiling rail and said assembly having engaging means at an opposite end adapted to engage a floor, the improvement comprising:

an integrally formed closed annular sheet metal post having a longitudinal axis and including an open top end and an open bottom end, said post carrying said receptacle at a position spaced intermediate said top end and said bottom end,

an integrally formed, closed, cylindrical conduit, substantially smaller in cross section than said receptacle, within said post extending parallel to the longitudinal axis of said post and defining a first compartment within said conduit adapted to extend a power line, said conduit extending from the top end of said post to a position adjacent said receptacle, said post and said conduit defining a second compartment therebetween adapted to extend a communication line therethrough;

a pair of spaced apart barrier walls in said post, each of said barrier walls extending transverse to said post axis, and spanning the cross section of said post, one of said barrier walls spaced intermediate said receptacle and said top end of said post and the other barrier wall spaced intermediate said receptacle and said bottom end of said post, said barrier walls and the portion of said post intermediate said pair of barrier walls forming an outlet box for said receptacle, said receptacle being located in said outlet box and external to said first and second compartments;

a passage in the portion of said post forming said outlet box aligned with said receptacle to enable access to said receptacle;



a barrier wall passage in said one barrier wall passing said conduit through said one barrier wall with said passage having an edge in close fitting encircling engagement with said conduit and thereby inhibiting communication between said outlet box and said second compartment, said barrier wall passage adapted to pass a power line into said outlet box for connection to said receptacle; and

a first communication passage in said post intermediate said one barrier wall and said top end of said post adapted to receive a telephone-type connector and an attached plurality of communication wires for extending said communication wires from said second compartment.

4,178,469

CLOSURE DEVICE AND FLOOR STRUCTURE UTILIZING THE SAME

Frank W. Fork, Allison Park, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Jul. 21, 1978, Ser. No. 926,846
Int. Cl.[2] H02G 3/28
U.S. Cl. 174—48 **22 Claims**

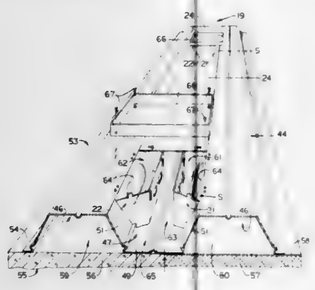
1. An electrical insert for use with an electrical underfloor distribution system to provide an electrical power outlet at the surface of the floor, said device comprising:

a first generally U-shaped member having a first vertical web, and first vertical flanges extending in the same direction from opposite ends of said first vertical web;

a second generally U-shaped member having a second vertical web spaced-apart from and generally parallel with said first vertical web, and second vertical flanges extending from opposite ends of said second vertical web in a direction away from said first flanges;

a third generally U-shaped member having a horizontal

upper web, and depending flanges adjacent to the first and second vertical webs;



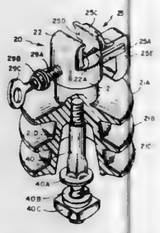
securing means securing said third U-shaped member to the first and second U-shaped members in vertically adjustable relation therewith.

4,178,470

INSULATOR FOR ELECTRICAL CONDUCTORS AND METHOD OF STRINGING SUCH CONDUCTORS ON INSULATORS

Leonard P. Jean, Nashua, and Ernest J. Lachance, Sr., Milford, both of N.H., assignors to Hendrix Wire & Cable Corp., Milford, N.H.

Filed Sep. 6, 1977, Ser. No. 830,671
Int. Cl.[2] H01B *17/16, 17/22;* **H02G** *1/04*
U.S. Cl. 174—168 **8 Claims**



1. An insulator for electrical conductors which comprises,
a body,
first jaw means integral with one end of the body of the insulator, said first jaw means having a clamping surface,
slide means,
means for mounting said slide means in said one end of the body for longitudinal movement substantially normal to the first jaw means,
second jaw means integral with said slide means, said second jaw means having a clamping surface facing the clamping surface of said first jaw means,
first passage means extending through the wall of said one end of the body beneath said first jaw means,
interiorly threaded second passage means extending longitudinally within said slide means with its axis substantially coinciding with the longitudinal centerline of said first passage means,
first bolt means comprising a portion extending through said first passage means and into said second passage means, at least the portion of said first bolt means which extends into said second passage means being provided with an exteriorly threaded portion for engaging the threads of said second passage means, and
third jaw means integral with said slide means, said third jaw means having a clamping surface and extending in a direction from said slide means opposite to the direction in which said second jaw means extends.

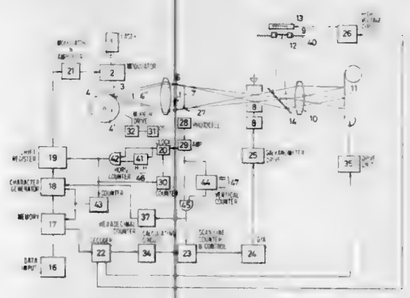
6. A method of stringing electrical conductor in a plurality of insulators including the steps of
a. providing a plurality of insulator bodies each of which comprises a portion which includes a clamping surface;
b. providing a plurality of slide means each of which is slideable transversely of an insulator body and comprises jaw means having a clamping surface facing the clamping surface of its associated insulator body;
c. providing a plurality of bolt means for moving said slide means and said jaw means towards and away from the clamping surfaces of their associated insulator bodies;
d. providing a plurality of stringing devices each of which comprises first and second semi-tubular members having means for detachably securing them together to provide a circular passage between them,
e. mounting a plurality of assembled insulators, slide means and bolt means on a series of poles of a distribution or transmission line,
f. mounting a series of said stringing devices between said jaw means and said clamping surfaces of the bodies of the insulators by manipulation of said bolt means,
g. pulling a conductor through the circular passages of said stringing devices,
h. tensioning the conductor to provide the desired amounts of sag between the poles,
i. opening said jaw means of the insulators by manipulation of the bolt means,
j. sliding the stringing devices longitudinally of the conductor outwardly of the jaw means and the clamping surfaces of the bodies,
k. separating the semi-tubular members of the stringing devices to remove them from the conductor, and
l. closing said jaw means of the insulators to grip the conductor between them and said clamping surfaces of the bodies by manipulation of the bolt means to move said jaw means towards said clamping surfaces.

4,178,471

LASER COMPUTER OUTPUT MICROFILMER WITH ELECTRICAL MISALIGNMENT CORRECTION

Masahiro Ohnishi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 7, 1978, Ser. No. 884,297
Claims priority, application Japan, Mar. 9, 1977, 52/26415
Int. Cl.[2] H04N *1/06;* **H04L** *15/00*
U.S. Cl. 178—15 **3 Claims**



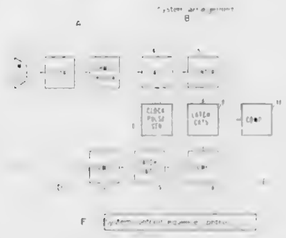
1. In a laser computer output microfilmer including means for two dimensionally scanning an intensity modulated laser beam to generate a data character image on a recording medium and means for superimposing a projected format slide image over the data character image, means for correcting horizontal and vertical misalignments between the relative positions of the data character and format slide images, characterized by:
(a) means for generating scan line synchronizing signals,
(b) means for generating clock pulses in response to said synchronizing signals,
(c) a first variable preset counter for counting said clock pulses, including means for presetting said counter,
(d) means for initiating the data character image formation in response to said first counter reaching its preset value,
(e) a second variable preset counter for counting said synchronizing signals, including means for presetting said second counter, and
(f) means for initiating an effective scan line in response to said second counter reaching its preset value, whereby the data character image may be shifted horizontally and/or vertically with respect to the format slide image in a desired direction and by a desired amount by appropriately incrementing or decrementing the preset values of said first and second counters.

4,178,472

VOICED INSTRUCTION IDENTIFICATION SYSTEM

Hiroyasu Funakubo, Tokyo, and Masataka Shiba, Yokohama, both of Japan, assignors to Hiroyasu Funakubo, Tokyo, Japan

Filed Feb. 13, 1978, Ser. No. 877,394
Claims priority, application Japan, Feb. 21, 1977, 52-17143; Jan. 19, 1978, 53-3702
Int. Cl.[2] G10L *1/00*
U.S. Cl. 179—1 SD **12 Claims**



1. A voiced instruction identification system comprising a means for detecting sound which is generated in a form divided into moras, through a microphone with provisions for mounting on a human body;
a means for sampling a fundamental wave from the detected sound;
a means for determining a value of at least one feature of the fundamental wave for each mora;
a means for forming a pattern in respect to relative changes of the value of said feature between contiguous moras; and
a means for identifying an instruction from the formed pattern.

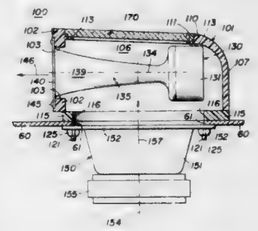
4,178,473

TWO-WAY LOUDSPEAKER FOR VEHICLE

Joseph P. Vermeren, Winlock, Wash., assignor to Acoustic Fiber Sound Systems, Inc., Indianapolis, Ind.

Filed Jun. 26, 1979, Ser. No. 919,079
Int. Cl.[2] H04R *1/20*
U.S. Cl. 179—1 VE **12 Claims**

1. A combination speaker assembly for use in a vehicle comprising an annular housing having a peripheral wall with an opening therein and having first and second open ends, a first speaker for reproducing audio mid frequencies and audio high frequencies mounted essentially within said housing in alignment with said opening to project the output of said first speaker out of said housing through said opening, and a second speaker for reproducing audio low frequencies mounted adjacent to said first open end and outside of said housing to inject the output of said second speaker into said housing and past said first speaker and out said second open end, the acoustical



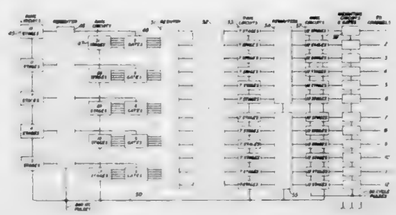
axis of said first speaker being arranged essentially normal to the acoustical axis of said second speaker and in use being directed essentially toward the ears of the listener.

4,178,474

SIGNALING SYSTEM

Amos E. Joel, Jr., New York, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 10, 1945, Ser. No. 592,959
Int. Cl.[2] H04L *9/04*
U.S. Cl. 179—1.5 R **18 Claims**



6. In a key pulse system for generating key pulses of definite length and highly irregular magnitude with intervening spaces, cyclically operating devices for generating groups of irregular sequences of pulses at a rate much higher than the rate of occurrence of said key pulses, each such group of pulses existing for the length of one of said spaces, and means to determine the magnitude of the next key pulse from the last pulse in the group of pulses occupying the preceding space.

4,178,475

METHOD AND CONTROL APPARATUS FOR RADIO PAGING SYSTEMS

Frank D. Taylor, and Ronald J. Novotny, both of Omaha, Nebr., assignors to General Communications Co., Inc., Omaha, Nebr.

Filed Mar. 9, 1978, Ser. No. 884,820
Int. Cl.[2] H04Q *7/04*
U.S. Cl. 179—2 EC **27 Claims**

1. A radio paging system comprising:
a plurality of telephone subscriber subsets operable to generate a plurality of tone singals, each telephone subset having an individual telephone dial number and being coupled with a telephone exchange network;
a plurality of mobile pagers, each pager being responsive to an individually coded paging signal;
paging tone encoder means for generating a plurality of individually coded paging signals, each paging signal corresponding to a different mobile pager;
means for transmitting said paging signal; and
a control apparatus coupled with said telephone exchange

network through a telephone subscriber subset such that said control apparatus is capable of receiving a ring pulse signal from a calling telephone subset, said control apparatus including:

means for receiving a ring pulse signal from said calling telephone subset, said receiving means being operable to produce a trigger signal in response to a ring pulse signal from said calling telephone subset;

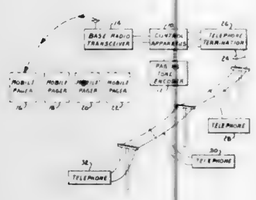
access timing means for establishing a time period of a set duration, said access timing means being operable to initiate said timing operation in response to said trigger signal;

means for checking the validity of a coded access tone signal received from the calling telephone subset, said validity checking means being operable to produce an output if a valid access tone signal is received within the time period established by said access timing means;

master timing means for generating an enable signal for a set period of time, said master timing means being operable to initiate generation of said enable signal in response to said output;

means for coupling the calling telephone subset with said paging tone encoder means for the duration of said enable signal; and

means for coupling said paging tone encoder means with said transmitting means for the duration of said enable signal.

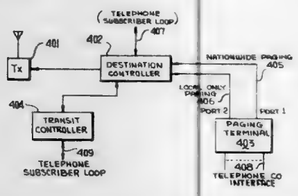


4,178,476

AUTOMATIC NATIONWIDE PAGING SYSTEM

Edward G. Frost, 12000 Old Georgetown Rd., Rockville, Md. 20852

Filed May 26, 1978, Ser. No. 909,988
Int. Cl.[2] H04Q *7/00;* **H04M** *11/02*
U.S. Cl. 179—2 EC **28 Claims**



1. In a paging system of the type wherein multiple subscribers are each provided with a subscriber receiver which responds to a uniquely coded radio transmission by providing a perceptible indication that the subscriber is being paged, and in which each subscriber is assigned to a home station which transmits said radio transmission throughout a prescribed geographic area served by that station, a method comprising the steps of:

responding to a predetermined command originating from at least one of said subscribers by automatically transferring page data subsequently received at said home station of said one subscriber to a further station which serves a further geographic area;

for each page intended for said one subscriber and for which page data is received at said further station, transmitting from said further station the uniquely coded radio transmission to which the receiver of said one subscriber responds; and

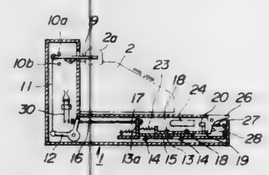
automatically suspending transmission of uniquely coded radio transmissions intended for a subscriber by the home station of that subscriber in response to receiving a suspend command from that subscriber.

4,178,477

TELEPHONE RECORDER MECHANICAL ACTUATOR

Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Mar. 27, 1978, Ser. No. 890,685
Claims priority, application Japan, Mar. 25, 1977, 52-32986; Mar. 25, 1977, 52-32987; Mar. 25, 1977, 52-32988
Int. Cl.[2] H04M *1/64;* **G11B** *31/00*
U.S. Cl. 179—6 R **8 Claims**



1. For a telephone having a handset and a switch-hook operable by the handset, a telephone answering set for use with a recording medium comprising:

a housing for receiving a telephone set,

a lever projecting from the housing into the area of the switchhook for movement in one direction when the handset goes off hook and another direction when the handset goes on hook,

pickup means in the housing for sensing messages passing through the telephone,

recording head means in the housing for recording on a recording medium,

roller means engageable with a recording medium for advancing the recording medium,

a switch coupled to the record head means for activating and deactivating the operation of said recording head means,

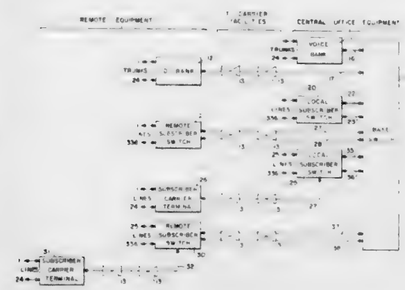
mechanical means having a plate and linking means coupled to the lever and said roller means as well as to said head means and engageable with said switch for moving said head means and said roller means into engagement with the recording medium in response to movement of said lever and for operating the switch so as to activate said pickup means.

4,178,478

SUBSCRIBER TERMINAL FOR USE IN A TDM SWITCHING SYSTEM

James R. Baichtal; John C. McDonald, both of Los Altos; Bradley A. Helliwell, Los Gatos; Alexander C. Ling, Mountain View, and Craig D. Schaffter, Sunnyvale, all of Calif., assignors to TRW, Inc., Los Angeles, Calif.

Filed Feb. 6, 1978, Ser. No. 875,493
Int. Cl.[2] H04Q *11/04*
U.S. Cl. 179—15 AQ **12 Claims**



12. In a telephone system operating in time frames consisting of a plurality of time slots, a subscriber terminal comprising:

codec means connected to a plurality of subscriber lines for encoding and multiplexing data on said subscriber lines into a time frame corresponding to said time frame format,

memory means having a plurality of channel units, each unit corresponding to one of said subscriber lines,

means for writing the encoded data from said codec means into said corresponding channel units,

means for reading said encoded data from said channel units onto specified time slots on a pair of multitime slot data buses,

said means for writing including means for writing other encoded data from other specified time slots on said pair of buses into channel units corresponding to said subscriber lines,

said means for reading including means for reading said other encoded data from said other channel units into said codec means,

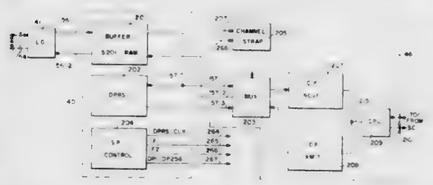
said codec means including means for decoding and demultiplexing said other encoded data thereby connecting the decoded data to said subscriber lines.

4,178,479

COMMUNICATION PROCESSOR APPARATUS FOR USE IN A TDM SWITCHING SYSTEM

John C. McDonald; James R. Baichtal, both of Los Altos, and Craig D. Schaffter, Sunnyvale, all of Calif., assignors to TRW, Inc., Los Angeles, Calif.

Filed Feb. 6, 1978, Ser. No. 875,495
Int. Cl.[2] H04J *3/12;* **H04Q** *3/54*
U.S. Cl. 179—15 BY **18 Claims**



18. In a telephone system operating in a multiframe format consisting of a plurality of time frames where each time frame includes a plurality of time slots and where said plurality of time frames includes signaling frames having supervisory signals where the supervisory signals occur as a signaling bit during each time slot in the signaling frame, said system including a base switch connected to a plurality of multitime slot data buses having time frames corresponding to the multiframe format, said base switch including communication apparatus comprising:

buffer means connected to said plurality of data buses for sending and receiving signaling bits on said plurality of multitime slot buses,

selector means for specifying a selected one of said plurality of buses,

multiplexer means connected to said buffer means for selecting in alternate signaling frames the signaling time slots on said specified bus,

transmitter means connected to said multiplexer means for transmitting in alternate signaling frames sequential signaling bits in the form of a first message to said selected bus,

receiver means for receiving in alternate signaling frames sequential signaling bits in the form of a second message from said multiplexer means, and

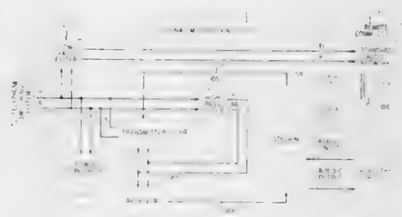
processing means for controlling the operation of the apparatus.

4,178,480

SIGNAL MULTIPLEXING CIRCUIT

Robert L. Carbrey, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 20, 1978, Ser. No. 926,422
Int. Cl.[2] H04J *3/00*
U.S. Cl. 179—15 BM **16 Claims**



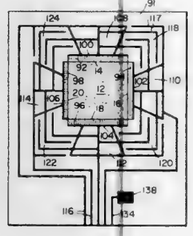
1. A signal multiplexing circuit for use between a central communication system and a remote communication circuit for concurrently transmitting outgoing voice signals, outgoing data, and outgoing auxiliary signals from said remote communication circuit to said central communication system via a communication path which comprises a single pair of wires, wherein said signal multiplexing circuit comprises:

encoding means for converting said outgoing auxiliary signals into pulse coded signals;

isolation means for separating said outgoing voice signals, said outgoing data and said outgoing encoded auxiliary signals from each other in both frequency and time, and

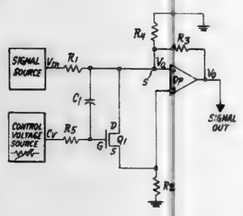
transmitting means for transmitting said separated signals to said central communication system via said single pair of wires.

4,178,481
ELECTRICAL DATA ENTRY DEVICES
Victor B. Kley, 2212 Byron St., Berkeley, Calif. 94702
Continuation-in-part of Ser. No. 712,748, Aug. 9, 1976, Pat. No. 4,079,194. This application Jan. 6, 1978, Ser. No. 867,516
The portion of the term of this patent subsequent to Mar. 14, 1995, has been disclaimed.
Int. Cl.[2] G08C *21/00*
U.S. Cl. 178—18 **9 Claims**



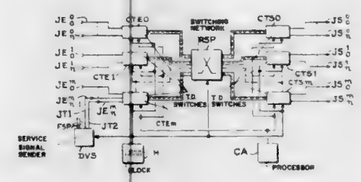
1. A graphical entry device comprising
a planar resistive sheet having a rectangular resistive graphic area with four edges and four resistive connecting means formed along and connected with the respective edges of the rectangular resistive graphic area,
four electrically conducting means joined to the respective four resistive connecting means and spaced from the resistive graphic area for connecting to external circuitry, and
said four resistive connecting means each being configured to have an effective resistance parallel to the respective edges of the rectangular graphic area substantially higher than that of the graphic area.

4,178,482
AUTOMATIC GAIN CONTROL CIRCUIT AND SYSTEM FOR USING SAME
Maurice J. Ouellette, North Berwick, Me., assignor to General Electric Company, Somersworth, N.H.
Filed Nov. 6, 1978, Ser. No. 957,907
Int. Cl.[2] H04J *1/12*
U.S. Cl. 179—15 AN **10 Claims**



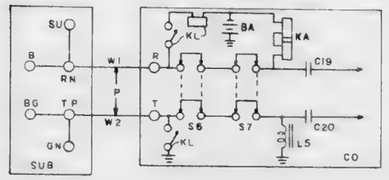
1. An automatic gain control circuit for substantially eliminating intermodulation frequency products from input signals applied thereto having several frequencies of which the magnitude of at least two frequencies are greater than the magnitude of the other frequencies comprising:
(a) a signal source for providing said input signals;
(b) a source of reference potential;
(c) a feedback gain controlled operational amplifier having a first input terminal connected to receive said input signals from said signal source, a second input terminal connected to said source of reference potential and an output terminal for providing output signals;
(d) a voltage source for generating a control voltage of a prescribed magnitude;
(e) a voltage controllable resistance element having a linear resistance characteristic connected across the first and second input terminals of said operational amplifier and having an input connected to receive said control voltage to establish therein a resistance of a prescribed value; and
(f) a signal bypass element for coupling at least a portion of the input signals to the input of said resistance element to prevent changes in the resistance of said resistance element with changes in the amplitude of said input signals while the resistance of said resistance element is held substantially constant as controlled by said control voltage to effect an attenuation in the magnitude of the input signals applied to the first input terminal of said operational amplifier whereby the output signals from said operational amplifier are maintained at a substantially constant magnitude, as controlled by the linear resistance of said resistance element, with changes in the amplitude of said input signals.

4,178,483
TIME-DIVISION SWITCHING TELEPHONE EXCHANGE COMPRISING A SERVICE SIGNAL SENDER
Jean P. Lager, La Celle St. Cloud; Jean P. Le Pabic, Ruell Malmaison, and Jean C. Ledey, Boulogne, all of France, assignors to Le Material Telephonique, Boulogne-Billancourt, France
Filed Sep. 29, 1977, Ser. No. 837,697
Claims priority, application France, Oct. 5, 1976, 76 29860
Int. Cl.[2] H04J *3/12*
U.S. Cl. 179—15 BY **6 Claims**



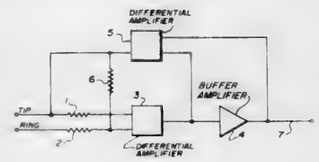
1. A telephone exchange comprising: a time-division switching network synchronized by means of a clock and controlled by means of a processor; and
a service signal sender for transmitting PCM encoded service signals, such as speech signals comprising short, recurrent messages or signal tones, over the time-multiplexed outgoing junctions of said time-division switching network, said PCM encoded signals originating from a plurality of generating circuits each having at least one read-only memory cyclically read under control of a counter activated by said clock, wherein the service signal sender comprises:
clock means for receiving and transmitting synchronization signals from the said clock and for generating, from said synchronization signals, time reference signals each comprising the combination of an output number for said service signal sender, a generating circuit number, a frame number and a channel number;
decoding means for receiving incomplete time reference signals and for selectively enabling the data outputs of said generating circuits and of said read-only memories; and
output means for receiving incomplete time reference signals and synchronization signals from said clock and for selectively enabling the injection of data outputs from said generating means into said switching network.

4,178,484
LONG LINE TELEPHONE SYSTEM WITH AN AMPLIFYING SUBSTATION
Ogden W. Vincent, 2166 La Miel Way, Campbell, Calif. 95008
Filed Jun. 27, 1977, Ser. No. 810,417
Int. Cl.[2] H04M *1/00, 3/00*
U.S. Cl. 179—16 C **19 Claims**



1. A telephone system with a substation comprising:
in combination,
a long line having a plurality of conductors that are connected at one end to tip and ring leads at a central office and are connected at the other end to said substation, said central office having an office battery and a ringing voltage source which are connected to earth ground, said central office being adapted to operate into said long line, said long line being used to conduct alternating current signals and direct current, at each end two wires of said long line being a pair that is balanced to earth ground and has an approximate characteristic impedance, said long line being at least two miles long,
a hybrid circuit having a long branch port, a network branch port, a transmitter input, and a receiver output, said hybrid circuit having a large signal loss between the transmitter input and the receiver output, said pair being connected to the long line branch port of said hybrid circuit,
a precision network being connected to the network branch port of said hybrid circuit for the purpose of balancing said hybrid circuit, said network containing a plurality of components that are connected so as to present the approximate characteristic impedance of said pair, said network also being used to approximately terminate said pair,
a transmitter circuit having at least one amplifier, the output of said transmitter circuit having a low impedance and being connected to the transmitter input of said hybrid circuit, a microphone being connected to the amplifier input of said transmitter circuit,
a receiver circuit having at least one amplifier, the input of said receiver circuit being connected to the receiver output of said hybrid circuit, the amplifier output of said receiver circuit being connected to a speaker,
a signaling means being used to transmit numbers in the form of signals to said central office, said signaling means being switched during signaling,
a power supply furnishing D.C. power for the active elements of said substation, said power supply receiving D.C. power from said long line, the D.C. line current to said power supply being used for supervision by said central office,
a switching means having a plurality of contacts, said switching means deactivating said substation when on-hook,
an audio sound making transducer responding to the ringing voltage source of said central office, said transducer being disconnected from said long line by said switch means when off-hook,
a mounting means having a frame for holding said microphone and said speaker with at least three inches between to prevent feedback via the atmosphere, said microphone and/or speaker being vibrationally damped, and
a return path being an electrical conductor other than the wires of said pair for returning direct current and ringing current from said substation to said central office, components of said substation being selected, arranged, and connected so that the interconnection of said substation to said pair is balanced to earth ground, the components of said central office being selected, arranged, and connected so that the interconnection of said central office to said pair is balanced to earth ground.

4,178,485
TRANSFORMERLESS TELEPHONE LINE CIRCUIT
Michael C. J. Cowpland, Ottawa, and Patrick R. Beirne, Stittsville, both of Canada, assignors to Mitel Corporation of Kanata, Ontario, Canada
Filed May 17, 1978, Ser. No. 906,772
Claims priority, application Canada, Feb. 1, 1978, 296137
Int. Cl.[2] H04Q *3/18*
U.S. Cl. 179—18 FA **13 Claims**



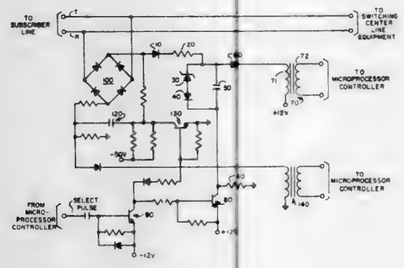
1. A telephone line circuit comprising
(a) balanced tip and ring leads for connection to a telephone set, and an unbalanced line output lead,
(b) first differential amplifier means having its input terminals connected through individual equal valued resistor means to the tip and ring leads, the values of each of the resistor means being at least 10 times the offhook impedance of the telephone set,
(c) a buffer amplifier having its input connected by a first circuit path to the output of the first differential amplifier means and its output connected by a second circuit path to the line output lead,
(d) second differential amplifier means having its input terminals connected respectively by circuit paths to said first and second circuit paths,
(e) the output of the second differential amplifier means being connected to one of the tip or ring leads,
(f) the output of the second differential amplifier means also being connected by a further resistor means to the input of the first differential amplifier means which is connected to the other of the tip or ring leads,
(g) the value of the further resistor means being selected to apply sufficient output signal from the second differential amplifier means to the input of the first differential amplifier means which is connected to said other of the tip or ring leads such as to substantially cancel a signal within the first differential amplifier means which is applied to its input terminals via said one of the tip or ring leads from the output of the second differential amplifier means.

4,178,486
RING SENSING CIRCUIT FOR USE WITH A SERVICE EVALUATION SYSTEM
John S. Young, Addison, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Sep. 13, 1978, Ser. No. 941,993
Int. Cl.[2] H04M *1/00*
U.S. Cl. 179—84 R **7 Claims**

1. A ring sensing circuit for use with a service evaluation system connected to a subscriber line, said line connecting a telephone subscriber to a switching center, said ring sensing circuit comprising:
current sensing means connected to said line, operated to detect and indicate the ringing status of said subscriber line;
circuit status interrogation means connected between said

service evaluation system and said current sensing means, operated in response to said evaluation system to determine the status of said current sensing means;

said current sensing means further operated in response to said circuit status interrogation means to generate a binary output signal; and



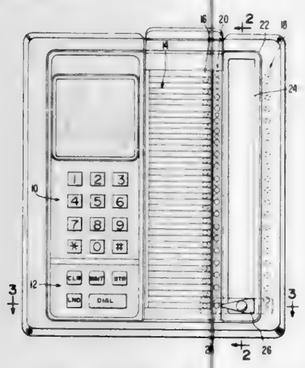
circuit status transmission means connected between said current sensing means and said service evaluation system, operated in response to said binary output signal from said current sensing means to couple said signal representing the binary status of said subscriber line to said service evaluation system.

4,178,487

SWITCH SELECTOR AND ACTUATOR

Don W. Lake, Cupertino, and Nagaraja Subramanian, Mountain View, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Jun. 7, 1978, Ser. No. 913,405
Int. Cl.[2] H04M *1/42*
U.S. Cl. 179—90 BD **17 Claims**



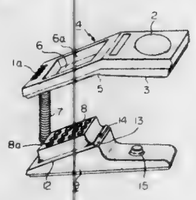
1. In electrical apparatus having a plurality of switch contacts which are selectively closed, switch actuation means comprising rail means mounted in close proximity to a row of switch contacts and yieldably biased away from said contacts, and selector means slidably mounted on said rail means with at least one contact engaging surface depending therefrom, said contact engaging surface normally being spaced from said contacts and engaging a contact upon depression of said selector means and said rail means.

4,178,488

TELEPHONE SET

Yukihiro Nishihata, Kobe, Japan, assignor to TOA Electric Co., Ltd., Japan

Filed Jul. 14, 1978, Ser. No. 924,831
Claims priority, application Japan, Aug. 2, 1977, 52/93212; Aug. 3, 1977, 52/104621[U]
Int. Cl.[2] H04M *1/02, 1/03, 1/20*
U.S. Cl. 179—100 L **9 Claims**



1. A combined loudspeaking and lowspeaking telephone set comprising:

a transmitter-receiver, said transmitter-receiver having:

a slightly bent portion at the center thereof,

a first portion on one side of said bent portion, said first portion having a microphone compartment therein and an opening therethrough, the sides of said opening connecting said microphone compartment to said bent portion, and

a second portion on the side of said bent portion opposite said first portion, said second portion having a speaker compartment therein;

microphone means in said microphone compartment for receiving sound waves;

speaker means in said speaker compartment for selectively delivering both loudspeaking and lowspeaking sound waves;

a base member shaped to receive said transmitter-receiver thereon, said base member having an inclined portion and a telephone number operating board projecting from said inclined portion; and

said opening through said first portion being removably fitted over and around said projecting operating board, whereby positioning said opening over and around said operating board permits access to said operating board through said opening and allows said first portion to rest on said inclined portion of said base member.

4,178,489

SUSPENSION SYSTEM FOR DISC RECORDING CUTTER HEAD

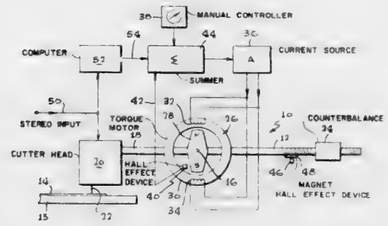
Arthur T. Lippel; John R. Valvo, both of Los Angeles, and Gerald B. Smith, Huntington Beach, all of Calif., assignors to Lippel Cybersonics, Inc., Sun Valley, Calif.

Filed May 1, 1978, Ser. No. 901,574
Int. Cl.[2] G11B *3/14*
U.S. Cl. 179—100.4 C **24 Claims**

1. A suspension system for a disc recording cutter head, said suspension system comprising:

an arm, pivot means for supporting said arm on a generally horizontal pivot axis so that said arm swings in a generally upright plane, means on the inner end of said arm for attachment of a cutter head for carrying a record cutting stylus, and a counterbalance on the outer end of said arm, said counterbalance being adjusted to balance said arm and attachments thereto about said pivot axis of said arm;

a DC torque motor mounted on said arm on said pivot axis for rotation of said arm around its pivot axis, said torque motor including at least one energizing coil for causing said torque motor to produce torque in a direction to urge a stylus toward a recording disc; and



means for energizing said torque motor for producing torque in said torque motor and producing recording disc cutting force at the stylus.

4,178,490

TAMPERPROOF HANDSET FOR RAILROAD APPLICATIONS

Charles A. Boenecke, 1 Capshire Dr., Cherry Hill, N.J. 08003

Continuation-in-part of Ser. No. 760,877, Jan. 21, 1977, Pat. No. 4,087,659. This application Apr. 13, 1978, Ser. No. 896,073
Int. Cl.[2] H04M *1/03*
U.S. Cl. 179—178 **2 Claims**

1. A tamperproof handset for installation in a railroad communication control having a housing provided with a front panel which has a threaded hole, said handset having a cable and a plurality of wires disposed within said cable for electrically connecting said control and handset, comprising:

a connector having a male section and a female section;

said female section having a slotted section and a threaded section, said female threaded section extending within the interior of said housing and being threadedly secured to said front panel within said front panel threaded hole;

said male section having a key section, a swaged section and a slotted section provided with an annular slot, said male section having a passage extending therethrough, said male key section matingly engaging said female slotted section;

said female section having a cylindrical passage extending therethrough for receiving said male swaged section and said male slotted section;

a retainer disposed within said annular slot and frictionally secured to said male slotted section to prevent displacement of said male connector section with respect to said female connector section;

a jam nut threadedly secured to said female threaded section extending within the interior of said housing, said jam nut frictionally contacting said housing to prevent rotation of said female threaded section; and

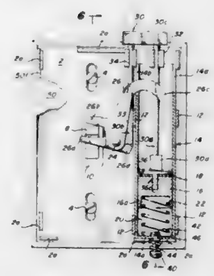
said handset cable passing through said male connector passage into the interior of the housing.

4,178,491

SWITCH ACTUATOR MEANS OF THE TIME DELAY TYPE

Don W. Orscheln, and Robert D. Bopp, both of Moberly, Mo., assignors to Orscheln Brake Lever Mfg. Co., Moberly, Mo.

Filed Oct. 7, 1977, Ser. No. 840,373
Int. Cl.[2] H01H *43/00*
U.S. Cl. 200—34 **6 Claims**



1. Time delay means for operating an electrical switch mounted in a switch box, said switch having an operating lever projecting from the face of said switch box and being pivotable between ON and OFF positions, comprising:

(a) a switch plate (**2**) adapted for mounting on the face of the switch box, said switch plate containing an aperture (**10**) for receiving the switch lever;

(b) a hollow cylinder (**14**) secured to said switch plate, one end of said cylinder being closed and the other end being open to atmosphere;

(c) a piston (**16**) arranged for sliding movement in said cylinder;

(d) one-way seal means (**18**) connected with said piston for defining a substantially fluid-tight chamber adjacent the closed end of said cylinder, said seal means comprising a flexible annular seal secured to the end of said piston remote from said closed cylinder end, said seal having a generally cup-shaped configuration with an annular circumferential lip portion in sliding engagement with the inner circumferential wall surface of said cylinder, said lip portion extending toward the open cylinder end;

(e) spring means (**22**) biasing said piston toward the said cylinder open end;

(f) activating means (**30**) for displacing said piston against the biasing force of said spring means toward a first position adjacent the closed end of the cylinder, thereby to force fluid out of said chamber via said seal means, said seal means being operable, when said piston is in the first position, to gradually leak fluid back into said chamber at a predetermined rate, whereby said piston is displaced by said spring means toward a second position adjacent the open end of said cylinder; (g) vent means for venting said chamber when said piston is in an intermediate position between said first and second positions, said vent means comprising a slot (**14*b***) contained in and extending axially from the open end of said cylinder; and

(h) a switch lever operating member (**26**) pivotally connected intermediate its ends with said switch plate for movement about a pivot axis normal to said switch plate, said operating member being adapted for engagement at one end with said lever, the other end (**26*c***) of said operating member extending through said slot for engagement by said piston when said piston is adjacent said intermediate position, said operating member being pivoted by said piston from a switch-on position to a switch-off position when said piston is displaced from its intermediate position to its second position, respectively, whereby said piston travels at a given velocity from said first position to

said intermediate position, and at a higher velocity from said intermediate position to said second position, thereby to quickly pivot said operating member from the switch-on position to the switch-off position.

4,178,492

INERTIAL ELECTRIC SWITCH

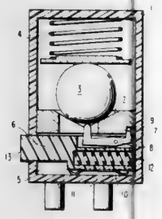
Carol Roesch, 6, Chemid du Wahflock, and René Heinimann, 42, rue du Tir, both of Colmar, France

Filed Jan. 3, 1978, Ser. No. 866,784

Claims priority, application France, Jan. 5, 1977, 77 00797; Nov. 23, 1977, 77 35974

Int. Cl.² H01H *35/10*

U.S. Cl. 200—61.45 R **6 Claims**



1. An inertial electric switch, comprising a housing, a conical seat in said housing, an inertial ball in said housing, a spring in said housing that presses said ball onto said seat, a slider mounted for sliding movement in said housing in a direction perpendicular to the axis of said conical seat between an armed position and an unarmed position, first electrical contacts carried by said slider, second electrical contacts fixedly carried by said housing in a position to be engaged with and disengaged from said first contacts in accordance with the said position of said slider in said housing, means for urging said slider from said armed toward said disarmed position, a latch swingably carried by said slider, said latch having two ends and being mounted for swinging movement on said slider about an axis spaced between said two ends, one of said ends extending through a central opening in said seat a distance sufficient to contact said ball when said ball is centered on said seat, the other of said ends comprising a hook that is adapted to engage in a recess in said housing, said ball contacting said one arm to maintain said latch in a position such that said hook is maintained in said recess in said armed position of said slider, and a resetting button to move said slider from said disarmed to said armed position.

4,178,493

PUSHBUTTON SWITCH WITH COLLAR

Heinrich Sauer, Amberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

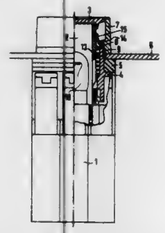
Filed Dec. 18, 1978, Ser. No. 970,216

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1978, 2800492

Int. Cl.² H01H *3/12, 13/04, 9/00*

U.S. Cl. 200—159 R **3 Claims**

1. In a front mounted pushbutton switching device mounted by means of a front ring screwed onto an external thread of a collar, the improvement comprising a disc shaped pushbutton having a diameter larger than that of the external mounting thread, the front ring having inward projecting extensions with an internal thread matched to the external thread, and the



pushbutton having cutouts corresponding to the extensions at its circumference.

4,178,494

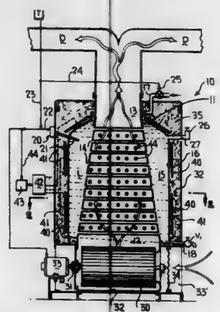
MICRO-WAVE AIR HEATER

Frank P. Bottalico, and Frank P. Bottalico, Jr., both of 9803 Healy Ct., Upper Marlboro, Md. 20870

Filed Nov. 10, 1977, Ser. No. 850,351

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 R **12 Claims**



1. A micro-wave air heater comprising a hollow air duct through which air is adapted to pass from an input end portion toward and through an output end portion thereof, a plurality of tubular conduits spanning said duct within an interior thereof between said input and output end portions, micro-wave transparent wall means externally of and in generally spaced relationship to said duct and defining therewith a liquid chamber, a liquid in said tubular conduits and said liquid chamber, and micro-wave generating means exteriorly of said liquid chamber for generating micro-wave energy for heating said liquid whereby air passing through said duct and past said tubular conduits is heated.

4,178,495

APPARATUS FOR WELDING STUDS TO WORKPIECES

Steve Spisak, Elyria, and Thomas E. Shoup, Amherst, both of Ohio, assignors to TRW, Inc., Cleveland, Ohio

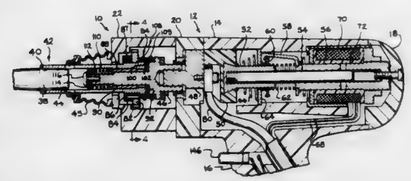
Continuation-in-part of Ser. No. 648,052, Jan. 12, 1976, Pat. No. 4,074,103. This application May 18, 1977, Ser. No. 798,141

The portion of the term of this patent subsequent to Feb. 14, 1995, has been disclaimed.

Int. Cl.² B23K *9/20*

U.S. Cl. 219—98 **8 Claims**

1. Apparatus for welding a stud to a workpiece having an electrically-resistant coating thereon, said apparatus comprising a welding tool having chuck holding means extending outwardly therefrom for holding a weldable stud, means for moving said chuck holding means toward and away from the workpiece, means connected to said chuck holding means for rotating said chuck holding means, a disc positioned between



portions of said chuck holding means and said moving means and in contact with both, electrically-conducting arcuate members located around said disc, and means for urging said members inwardly against portions of said chuck holding means and said moving means.

4,178,496

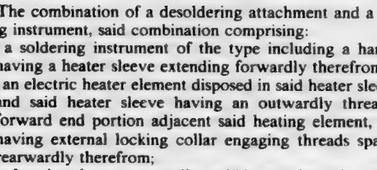
DESOLDERING ATTACHMENT FOR SOLDERING INSTRUMENT

William S. Fortune, 14250 Dearborn St., Panorama City, Calif. 91402

Filed Sep. 22, 1977, Ser. No. 835,670

Int. Cl.² B23K *3/00*

U.S. Cl. 219—230 **10 Claims**



1. The combination of a desoldering attachment and a soldering instrument, said combination comprising:

(a) a soldering instrument of the type including a handle having a heater sleeve extending forwardly therefrom;

(b) an electric heater element disposed in said heater sleeve, and said heater sleeve having an outwardly threaded forward end portion adjacent said heating element, and having external locking collar engaging threads spaced rearwardly therefrom;

(c) a housing sleeve surrounding said heater sleeve in spaced relation thereto and defining a solder receiving chamber surrounding said heater sleeve;

(d) a vacuum tube extending outwardly from the interior of said housing sleeve for communicating said chamber with a source of vacuum;

(e) an end cap engaging said heater sleeve and said housing sleeve for closing the rear end of said housing sleeve and having an opening for permitting the forward end of said heater sleeve to extend therethrough into said housing sleeve;

(f) a filter screen in said housing sleeve;

(g) means on said end cap for spacing said filter screen within said housing sleeve forwardly of said vacuum tube;

(h) a vented solder baffle means disposed in said housing sleeve and adapted to rest against the front of said filter screen;

(i) a head portion engaging said housing sleeve and said heater sleeve for closing the front end of said housing sleeve and having internal threads receivingthe external threads on said heater sleeve;

(j) a hollow desoldering tip supported for movement back and forth axially within said head portion and communicating with the interior of said housing sleeve forwardly of said baffle means, said tip extending off center with respect to the longitudinal axis of said heater sleeve, a portion of said tip being engageable by the forward end of said heater sleeve and acting as a stop to limit the extent to which the forward end of said heater sleeve can be threaded into the threads of said head portion, the extent to which the heater sleeve can be threaded into the head portion determining the angular position of the tip with respect to the vacuum tube, and

(k) adjustable locking means extending through said head portion into engagement with said tip for adjustably limiting the axial motion of said tip within said head portion, the angular position of said tip with respect to said vacuum tube being adjustable by adjusting the axial position of said tip within said head portion by said locking means.

4,178,497

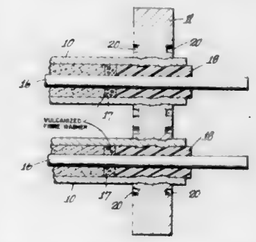
END SEALS FOR ELECTRIC IMMERSION HEATING ELEMENTS

Donald M. Cunningham, Pittsburgh, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 10, 1977, Ser. No. 805,594

Int. Cl.² H05B *3/82*; H01C *1/03*; H02G *15/04*

U.S. Cl. 219—336 **7 Claims**



1. In an electric heater for a water tank, said heater having a tubular metal sheath, a portion of which is adapted to be immersed within the water in said tank, a resistance conductor within said sheath, a metal terminal pin having one end within an end of said sheath and electrically connected to an adjoining end of said resistance conductor and having an opposite end extending outwardly of said sheath end for connecting said resistance conductor to a source of electrical energy to create heat, and insulating material within said sheath for electrically insulating resistance conductor and said terminal pin from said sheath and for conducting heat from said resistance conductor to said sheath, said insulating material stopping short of said sheath end to form a pocket thereat, the improvement comprising an improved end seal for said heater, comprising:

a resilient insulating plug within said pocket, the wall of said sheath at said pocket having an inward deformation to lock said plug in position within said pocket and to hold it in sealing engagement with the inner peripheral surface of said sheath and the peripheral surface of said terminal pin,

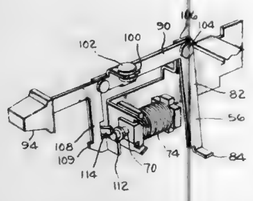
an electrically insulative fibrous member held within said pocket by said insulating plug in position between the latter and that portion of said insulating material forming the bottom of said pocket, said fibrous member spanning the adjacent peripheral space between said terminal pin and the inner surface of said sheath,

said fibrous member being resistant to abnormal heat within said sheath and adapted to absorb water which may enter the sheath in the event of fracture of that portion of the latter immersed in the water in said tank, absorption of water causing said fibrous member to swell to sealing engagement with the inner peripheral surface of said sheath and the peripheral surface of said terminal pin,

said inward deformation providing a stop to restrict movement of said fibrous member outwardly of said pocket in the event said resilient plug is unlocked from its said

position within said pocket, and in the event water pressure applied against said fibrous member is of sufficient force to tend to move the latter in a direction outwardly of said pocket.

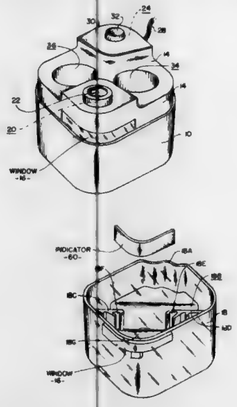
4,178,498
ELECTRIC TOASTER CONTROL
Paul V. Snyder, Whitehall, Pa., assignor to General Electric Company, New York, N.Y.
Filed Nov. 7, 1977, Ser. No. 848,884
Int. Cl.[2] F27D *11/02;* **A21B** *3/02*
U.S. Cl. 219—413 **6 Claims**



1. In an electric oven toaster wherein electric heating means supplies heat to a toasting chamber, switch means is provided for energizing and de-energizing the electric heating means, and a toasting period controller is provided for opening the switch means to de-energize the heating means at the end of a toasting cycle the improvement comprising:
a. a manually operable lever positioned between said switch means and said toasting period controller for manually closing the switch means and starting the operation of the toasting period controller;
b. said toasting period controller including a solenoid arranged to be actuated at the end of a toasting cycle;
c. said solenoid including a solenoid coil and a movable armature member;
d. said switch means being spring biased to an open position and said lever including a latch arm which is movable into engagement with the armature member of said solenoid for holding the lever and said switch in a closed position against the spring bias of said switch; and
e. said toasting period controller including means for actuating said solenoid at the end of the toasting cycle to move said armature to release said latch arm from said armature at the end of a toasting cycle to permit the switch to be opened under the force of its spring bias and to move the lever to an off position.

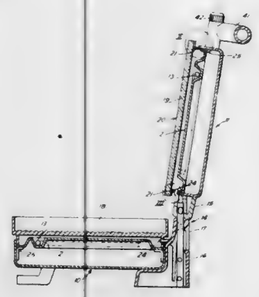
4,178,499
HEATING UNIT INDICATOR FOR DISINFECTING SOFT LENSES, OR THE LIKE
John G. Bowen, Santa Ana, Calif., assignor to Rincon Industries, Inc., Woodland Hills, Calif.
Filed Sep. 21, 1977, Ser. No. 835,420
Int. Cl.[2] F27D *11/02*
U.S. Cl. 219—439 **3 Claims**

1. An electrically energized heating unit comprising: a bowl having an open top; an incubator supported on and covering the open top of the bowl, said incubator including at least one well extending into said bowl; electrical heating means mounted in said bowl; wax contained in said bowl to be heated from a solid state to a molten state by said electrical heating means when the unit is energized so as to introduce heat into said well; at least a portion of said bowl being transparent and forming a window; and an indicator mounted in said bowl, displaced inwardly from said window, to be visible through said window when the wax in said bowl is in a molten state and



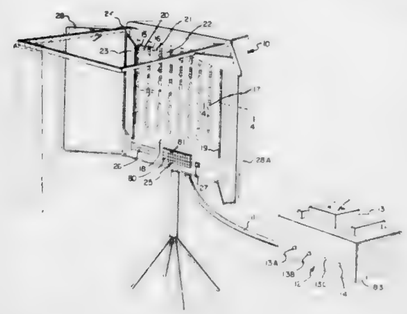
to be invisible through said window when the wax in said bowl is in a solid state.

4,178,500
ELECTRICALLY HEATABLE HOUSEHOLD APPLIANCE
Dieter Brindöpke, Mettmann, Fed. Rep. of Germany, assignor to Robert Krups, Solingen, Fed. Rep. of Germany
Filed Mar. 13, 1978, Ser. No. 885,567
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1977, 2711402; Nov. 19, 1977, 7735481
Int. Cl.[2] H05B *3/06*
U.S. Cl. 219—524 **19 Claims**



1. An electrically heatable household appliance comprising a stationary lower part and a movable upper part, each of said parts being provided with an electrically heating infrared radiating member, a heat-reflecting supporting member for each heating member, an adjustable hinge joint for swingably connecting said movable part to said lower part and for adjusting the level of said upper part with respect to said lower part, means for holding said movable upper part in a predetermined position with respect to the lower part, a protective piate for each heating member, at least one of said plates being of a glass ceramic material having at least 70% transparency to infrared radiation, said protective transparent piate being disposed directly above and operatively spaced from said electrically heating member.

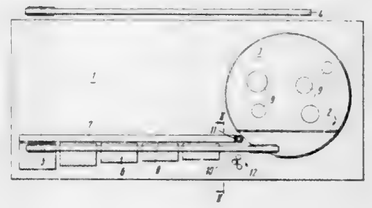
4,178,501
ELECTRONIC VOTING MACHINE
Henry D. Luther, Massillon, Ohio, assignor to R. F. Shouptronics Corp., Bryn Mawr, Pa.
Filed Sep. 17, 1976, Ser. No. 724,120
Int. Cl.[2] G07C *13/00*
U.S. Cl. 235—54 F **2 Claims**



1. A voting system comprising:
an electronic memory for storing votes cast for candidates,
a plurality of voting switches connected to said memory for storing said votes therein when said switches are actuated, said voting switches being mounted on a panel of said voting system, said panel having ballot information thereon,
a shield having one or more sets of ballot information thereon, with cut-out portions on said shield and exposing said switches, said shield being movable with respect to said panel so that said shield can be moved to one position with one set of ballot information visible adjacent to said voting switches, and moved to another position with another set of ballot information visible adjacent to said switches, and
switch means operated coincidentally with movement of said shield, said switch means connecting said voting switches to one portion of said memory when said shield is in said one position and to a different portion of said memory when it is in said other position whereby the same voting switches can be used to vote for two different groups of candidates.

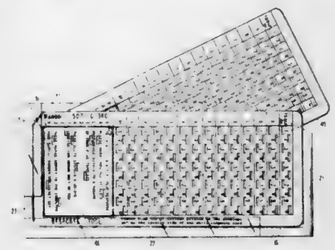
4,178,502
ARRANGEMENT FOR COUNTING COINS OF DIFFERENT DIAMETERS
Thomas Zimmermann, Berlin, Fed. Rep. of Germany, assignor to F. Zimmermann & Co., Berlin, Fed. Rep. of Germany
Filed Mar. 21, 1978, Ser. No. 888,663
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1977, 2713844
Int. Cl.[2] G07D *9/00*
U.S. Cl. 235—92 CN **9 Claims**

1. An arrangement for counting coins of different diameters and similar disk-shaped objects conveyed in irregular sequence, comprising: guide track means with guide edge for contacting the edge of said coins; a plurality of electronic proximity sensors located in said guide track means for identifying said coins and delivering identification signals; electronic evaluation and display means for receiving identification signals delivered by said proximity sensors; said electronic proximity sensors being offset along a line perpendicular to said guide edge at a distance from said guide edge such that paths of motions of coin edges away from said guide edge of several coins to be identified by one of said proximity sensors are located in active areas of said proximity sensors; said proximity sensors being capable of emitting analog linear identification signals proportional to coverage of said active areas of said proximity sensors by coins in transit, said coverage being determined by said paths of motion; the number of proximity



sensors being minimum for a maximum number of coins of different diameter to be identified and their values totaled.

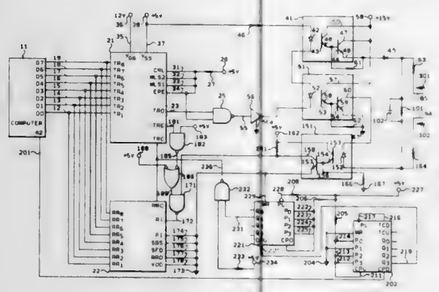
4,178,503
MARKING MESSAGE CARD AND TEMPLATE ASSEMBLY AND RELATED INPUT SWITCHING CIRCUITRY AND METHOD OF MAKING THE ASSEMBLY
Edward J. Corwin, 200 Central Park South, Apt. 11A, New York, N.Y. 10019
Division of Ser. No. 750,322, Dec. 13, 1976, Pat. No. 4,127,769, which is a continuation-in-part of Ser. No. 257,298, May 26, 1972, Pat. No. 4,001,549, which is a continuation-in-part of Ser. No. 151,676, Jun. 10, 1971, abandoned. This application Sep. 12, 1978, Ser. No. 941,897
Int. Cl.[2] G06K *21/06;* **G08C** *9/06*
U.S. Cl. 235—495 **5 Claims**



1. A marking template assembly for holding a message card containing marking areas thereon, said assembly comprising:
a generally rectangular base member having a notch in one corner thereof;
an upstanding rim extending around the periphery of said base member, except for said notch;
a generally rectangular template of the same general shape as said base member, except for said notch, and sized to fit within said rim to form a card-receiving cavity with one corner of said template extending through said notch, said template having marking openings corresponding to the marking areas;
a first strip of pressure-sensitive tape securing together the outer surfaces of one pair of adjacent short sides of said template and rim, these short sides being non-adjacent to said notch; and
a second strip of tape securing together the outer surfaces of only one pair of adjacent long sides of said template and said rim, these long sides being non-adjacent to said notch, thereby forming a jacket-like structure which permits a

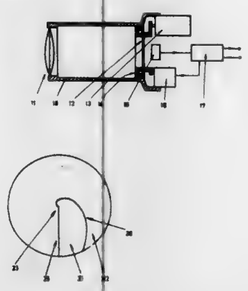
card to be inserted therein through said notch without any hinging action between said template and said base member.

4,178,504
BALANCED TERMINATION FOR A TRANSMISSION LINE
Robert L. Farmer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Jan. 18, 1978, Ser. No. 870,545
Int. Cl.² H04B 9/00
U.S. Cl. 250—199 **9 Claims**



1. Apparatus comprising:
a first optical isolation means having an input stage and an output stage;
a transmission line means which is made up of a transmit line having first and second ends and a receive line having first and second ends, said transmit line and said receive line forming a current loop, the first end of said transmit line forming the input of said current loop and the first end of said receive line forming the output of said current loop, the second end of said transmit line being resistively connected to the second end of said receive line, the first end of said transmit line being electrically connected to the output stage of said first optical isolation means;
means for supplying a first digital signal to the input stage of said first optical isolation means in such a manner that said first digital signal will be transmitted as the presence or absence of electrical current flow on said transmit line;
a second optical isolation means having an input stage and an output stage;
means for electrically connecting the first end of said receive line to the input stage of said second optical isolation means;
a third optical isolation means having an input stage and an output stage, said third optical isolation means being in an on condition when said first optical isolation means is in an on condition and said third optical isolation means being in an off condition when said first optical isolation means is in an off condition;
means for electrically connecting the input stage of said second optical isolation means to the output stage of said third optical isolation means in such a manner that the first end of said transmit line and the first end of said receive line are electrically balanced when electrical current is flowing in said transmit line, and the first end of said transmit line and the first end of said receive line are also electrically balanced when electrical current is not flowing in said transmit line.

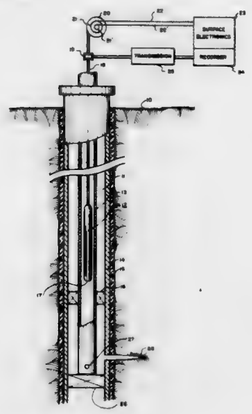
4,178,505
DEVICE FOR DETERMINING THE DIRECTION TOWARDS A REMOTE OBJECT
Lars-Erik Skagerlund, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden
Filed Dec. 14, 1977, Ser. No. 860,519
Int. Cl.² G01J 1/20
U.S. Cl. 250—203 R **12 Claims**



1. An apparatus for measuring the coordinates of a target source of radiation with respect to a reference point within a particular field of view, comprising:
means for generating one or more clearly defined sensitivity beams, the sensitivity beams shaped to define a source locating area positioned at said reference point and bounded by a straight line on one side and a substantially logarithmic curve on the other side, said straight line and said logarithmic curve meeting at said reference point;
means for rotating said sensitivity beams about said reference point at a reference frequency to scan said source locating area over said field of view;
means for focusing an image of said target source of radiation in a plane including said source locating area;
detector means for generating at least one electrical signal in response to the radiant energy passed by said sensitivity beams when said source locating area scans across the image of said target source of radiation, said at least one electrical signal defining a time duration corresponding to the radial distance of said target source from said reference point and said at least one electrical signal being shifted in phase with respect to said reference frequency by an amount corresponding to the angular position of said target.

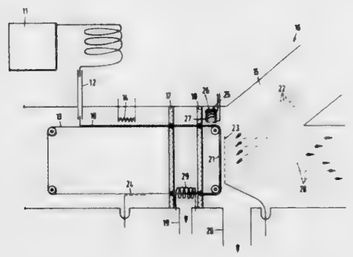
4,178,506
METHOD FOR DETECTING FRACTURES IN FORMATIONS SURROUNDING EARTH BOREHOLES
Walter H. Fertl, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Sep. 6, 1977, Ser. No. 830,554
Int. Cl.² G01V 5/00
U.S. Cl. 250—260 **6 Claims**

1. A method for locating a fracture in earth formations, comprising:
traversing an earth borehole with a gamma ray detection system, thereby creating a base log;
injecting a fluid containing a salt from the group consisting of potassium, thorium and uranium salts into the formation of interest; and



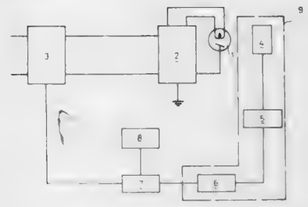
thereafter traversing the said earth borehole with said gamma ray detection system, thereby creating a second log indicative of a profile of said fracture.

4,178,507
IONIZATION OF ORGANIC SUBSTANCES ON CONVEYOR MEANS IN MASS SPECTROMETER
Curt Brunnée, Platjenwerbe; Jochen Franzen, Wildeshausen, and Stefan Meier, Bremen, all of Fed. Rep. of Germany, assignors to Varian Mat GmbH, Bremen, Fed. Rep. of Germany
Filed Nov. 29, 1977, Ser. No. 855,579
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1976, 2654057
Int. Cl.² B01D 59/54; H01J 39/34
U.S. Cl. 250—282 **14 Claims**



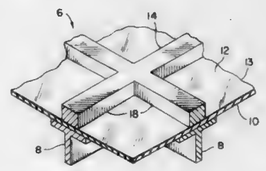
1. A method for analyzing samples of organic substances in a mass spectrometer comprising the steps of:
transferring a sample of a substance to be analyzed in a solvent from a liquid chromatograph onto a moving continuous belt;
vaporizing the solvent on the belt;
moving the belt so as to move the sample into an ionization chamber associated with a mass spectrometer;
ionizing the sample directly on the belt in the ionization chamber; and
removing the ions from the belt and conducting them into the mass spectrometer.

4,178,508
DEVICE FOR CONTROLLING AMOUNT OF X-RAY IRRADIATION
Toshihiro Hotta, Yashiki, and Takao Makino, Hikone, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan
Filed Jul. 26, 1978, Ser. No. 928,057
Claims priority, application Japan, Jul. 30, 1977, 52-91793; May 11, 1978, 53-56244
Int. Cl.² G01J 1/42
U.S. Cl. 250—355 **7 Claims**



1. A device for controlling an amount of X-ray irradiation in an X-ray apparatus having an X-ray tube, said device comprising:
a high-voltage transformer circuit having a primary side and a secondary side, said secondary side being connected to said X-ray tube;
a main control circuit for supplying preheating voltage to said X-ray tube and for applying tube voltage to said X-ray tube via said primary side of said high-voltage circuit;
an X-ray irradiation amount measuring circuit for measuring the amount of X-rays irradiated from said X-ray tube and for integrating the amount measured;
an X-ray irradiation amount setting circuit for presetting an amount of X-rays to be irradiated; and
a comparison circuit for comparing the integrated measured value from said X-ray irradiation amount measuring circuit with said preset amount of X-ray irradiation from said X-ray irradiation amount setting circuit and for generating an X-ray tube operation deactuating signal to said main control circuit when both said integrated value and said preset amount are in agreement with each other whereby when the measured amount of irradiation is equal to the preset amount, said X-ray tube is inactivated by said main control circuit.

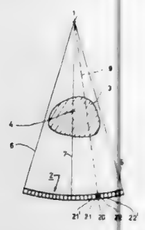
4,178,509
SENSITIVITY PROPORTIONAL COUNTER WINDOW
Keith A. More, and Donald R. Bianco, both of Ann Arbor, Mich., assignors to The Bendix Corporation, Teterboro, N.J.
Filed Jun. 2, 1978, Ser. No. 911,733
Int. Cl.² G01T 1/18; H01J 35/00
U.S. Cl. 250—374 **6 Claims**



1. A window for a proportional counter used in an X-ray spectrometer, comprising:

a thin metallic foil having a high X-ray transmission capability for passing a relatively wide range of X-ray spectra;
the thin metallic foil having a thin plastic coating thereon which is essentially X-ray transparent;
the proportional counter including a housing having an open area; and
means supporting the thin plastic coated metallic foil and supported in the open area of the housing for providing a proportional counter window having a relatively large unobstructed window area.

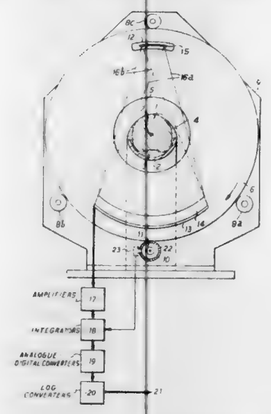
4,178,510
DEVICE FOR MEASURING THE SPATIAL DISTRIBUTION OF RADIATION ABSORPTION IN A SLICE OF A BODY
Wolfgang Wagner, Norderstedt, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jun. 16, 1977, Ser. No. 807,039
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1976, 2627885
Int. Cl.[2] A61B *6/02*
U.S. Cl. 250—445 T **35 Claims**



1. A device for measuring the spatial distribution of radiation absorption in a slice of a body, said device comprising a radiator for generating a fan-shaped radiation beam for irradiating the body, a row of adjacently arranged radiation detectors for determining measuring values concerning the radiation emerging from the body, the measurements being performed in a number of different angular positions of the radiator/detector system with respect to the body, the direction of the radiation beam extending in the slice of the body, and also comprising a reconstruction device for determining the absorption distribution in the slice on the basis of the measuring values obtained, characterized in that the device comprises a testing device for identifying defective detectors, and also an interpolation unit for replacement of measuring values of a detector which has been identified as being defective by correction values, formed by interpolation of measuring values measured along paths adjacent the paths along which the measuring values have been measured by the defective detector.

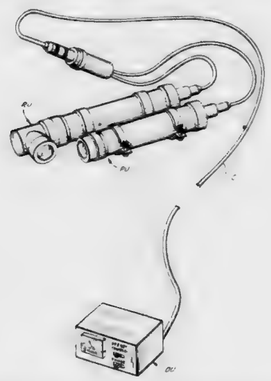
4,178,511
RADIOGRAPHY
Godfrey N. Hounsfield, Newark, and Richard M. Waltham, London, both of England, assignors to E M I Limited, Hayes, England
Filed Aug. 17, 1978, Ser. No. 934,311
Claims priority, application United Kingdom, Aug. 18, 1977, 34679/77
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—445 T **11 Claims**

1. Radiographic apparatus including a source of penetrating X-radiation arranged to irradiate a patient position with a flat fan-shaped distribution of the radiation, detector means arranged to receive radiation emergent from the patient position, the detector means including a plurality of detector devices reponsive to said x-radiation and extending across the said distribution, scanning means for causing the source and the detector means to move angularly around the patient position about an axis intersecting said position and extending substantially perpendicularly to the distribution of radiation, and further scanning means, synchronised in operation with the first-mentioned scanning means, to move the origin of said distribution of x-radiation, relative to the detector means, angularly in a sense opposite to that of the angular movement caused by said first-mentioned scanning means, the angular movement caused by said further scanning means being repetitive and at a rate higher than that caused by said first-mentioned scanning means; the synchronisation between the operations of the first-mentioned scanning means and the further scanning means causing a detector, during one cycle of the repetitive movement caused by said further scanning means, to provide output signals relating the a group of mutually inclined beam paths traversing said patient position, the group of paths for that detector intersecting, when extrapolated, at a pivot point disposed at a distance from said axis which exceeds the distance of the relevant detectors from said axis.

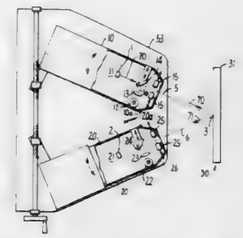


4,178,512
DEEPWATER IN-SITU FLUOROMETER
Frank Früngel, Hamburg, and Eberhard Gelbke, Uetersen, both of Fed. Rep. of Germany, assignors to Impulsphysik GmbH, Hamburg, Fed. Rep. of Germany
Filed Jul. 21, 1978, Ser. No. 926,847
Int. Cl.[2] G01N *21/38*; G01V *5/00*
U.S. Cl. 250—461 R **6 Claims**

1. An improved in-situ fluorometer for underwater use, the fluorometer being of the type comprising an underwater projector unit operative for emitting pulses of fluorescence-exciting radiation, a cooperating underwater receiver unit operative for receiving the resultant fluorescent radiation and generating a meterable output signal, an onboard power supply and metering unit, and an overboard connecting cable electrically connecting the onboard power supply and metering unit to the underwater units for transmission of operating power to the underwater units and for transmission of the meterable output signal to the onboard power supply and metering unit,
(a) the receiver unit comprising receiver circuit means, the projector unit comprising light-pulse-generating circuit means, the onboard power supply and metering unit comprising a constant-current source supplying operating power to the receiver circuit means and to the light-pulse-generating circuit means in the form of a constant current transmitted through said cable;
(b) the onboard power supply and metering units comprising a meter, the receiver circuit means generating in response to detected fluorescent radiation an output signal in the form of a current and transmitting the output signal current to the meter through said cable,
whereby, due to the energization of the circuit means to the underwater units by an onboard constant-current source, and due to the generation by the receiver unit of a cable-transmitted signal in the form of a current, the length of the overboard cable is made uncritical,
(c) the receiver circuit means comprising:
a photodiode exposed to the fluorescent radiation resulting from the pulsed radiation from the projector unit,
integrating means integrating the photodiode current to form an integrated photodiode-current signal,
peak-detecting means operative for determining and holding the peak value of the integrated photodiode-current signal, to form a held integrated photodiode-current peak-value persisting in the time beyond the peak value of the integrated photodiode current signal itself,
gating means, connected to the signal-transmission path intermediate the photodiode and the peak-detecting means for permitting and preventing signal transmission,
synchronizing means operative for rendering the gating means signal-transmissive for a brief time interval concurrent with the emission of a light pulse by the light-pulse-generating circuit means,
logarithmic amplifier means receiving the held integrated photodiode-current peak-value signal and deriving therefrom a logarithmized integrated photodiode-current peak-value signal,
sample-and-hold means operative for sampling and the holding the value of the logarithmized integrated photodiode-current peak-value signal, the sampling occurring subsequent to the signal-transmission interval of the gating means and subsequent to the peak-value determination by an interval sufficient to assure that the logarithmic amplifier means has fully responded to the held integrated photodiode-current peak-value signal, the signal held by the sample-and-hold means being in the form of a held voltage,
voltage-to-current converting means receiving a voltage derived from that held by the sample-and-hold means and producing a corresponding current constituting the output signal transmitted from the receiver unit through said cable to the onboard meter,
and automatic offset drift control means serving, during the time interval between the start of signal transmission by the gating means and the sampling by the sample-and-hold means, to counteract any offset and/or drift developed in the peak-detecting means and/or in the logarithmic amplifier means, by applying a balancing signal to the input of the peak-detecting means,
this automatic offset drift control means comprising means operative, intermediate successive pulse-measurement operations, for deriving the balancing signal by feeding back to the input of the peak-detecting means a signal derived from the output signal of the logarithmic amplifier means.



4,178,513
ART OBJECT ANALYZER
Jaques Dubois, deceased, late of Menlo Park, Calif., and Hans R. Zulliger, Portola Valley, Calif., assignors to Nuclear Semiconductor, Mountain View, Calif.
Filed Jan. 17, 1978, Ser. No. 870,143
Int. Cl.[2] H05G *1/62*
U.S. Cl. 250—491 **7 Claims**

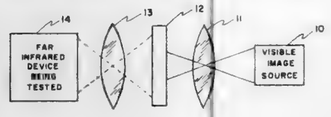


1. A method of analyzing an object with a beam of ionizing radiation comprising the steps of:
(a) aligning an ionizing radiation-emitting generator, mounted in a generator housing, with an ionizing radiation detector, mounted in a detector housing, emitting a beam of visible light from a visible light source mounted in said generator housing and directing said beam of visible light with a generator beam directing means onto a point on said object, emitting a beam of visible light from a light source mounted in said detector housing and directing said beam of visible light with a detector beam directing means onto said same object point, and pivoting said generator and said detector with respect to each other in a common plane until said detector visible light beam coincides with said generator visible light beam on said object point;
(b) de-energizing said generator and said detector visible light sources and removing said generator and said detector beam directing means when said generator light beam coincides with said detector light beam;
(c) generating a beam of ionizing radiation from said generator and projecting said beam onto said object including said point of coincidence; and
(d) detecting a beams of ionizing radiation with said detector where said beam is emitted by said point of coincidence when said generator radiation beam contacts said point of coincidence.

4,178,514
SYSTEM FOR GENERATING A DYNAMIC FAR INFRARED IMAGE
Vincent T. Bly, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Apr. 26, 1978, Ser. No. 900,205
Int. Cl.[2] G01J *1/02*
U.S. Cl. 250—493 **9 Claims**

1. A system for converting a visible image to an infrared image including:
a visible-to-infrared transducer comprised of a thin thermally insulating film coated with a thin black coating, and means for directing a visible image onto said transducer;

wherein said film is chosen from one of the group comprising: cellulose nitrate, polyvinyl alcohol, paralene, poly-



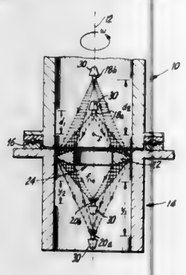
methyl metharcylate, vinyl formal copolymer, polyvinyl chloride, and aluminum oxide.

4,178,515

OPTICAL SIGNAL COMMUNICATING APPARATUS

Andrew Tarasevich, Califon, N.J., assignor to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed May 12, 1978, Ser. No. 905,545
Int. Cl.[2] G02B *27/00*
U.S. Cl. 250—551 **5 Claims**



1. Apparatus for coupling data between first and second members undergoing relative rotation about an axis of relative rotation, said apparatus comprising at least one light-emitting means located on one of said members, at least one light-detecting means located on the other of said members, and a light-directing means carried by one of said members and effective to direct light from said light emitting means onto said light-detecting means, said light-emitting means and said light-detecting means being arranged in communicating pairs, spaced from one another along a common optical axis substantially coincident with said axis of relative rotation, and located at conjugate optical positions on opposite sides of said light-directing means, the optical center of said light-directing means lying on an axis substantially coincident with said axis of relative rotation.

4,178,516

MOLD READER

Richard D. Brugger, Erie, Pa., assignor to Ball Corporation, Muncie, Ind.

Filed Nov. 25, 1977, Ser. No. 854,894
Int. Cl.[2] G06K *7/10*
U.S. Cl. 250—566 **16 Claims**



1. Apparatus for reading a code character from a non-opaque object, comprising:

means for illuminating the region of said object bearing said character;

means, including a plurality of small diameter optical fibers disposed to receive an image from said character, for forming a plurality of code character images indicative of said character on a given plane;

an optical mask disposed in said second given plane, having thereon at least one character corresponding to each possible code character image, said mask characters being respectively aligned with said images and of opposite contrast to said images;

means for deriving respective signals indicative of the light passed through the respective ones of said mask characters; and

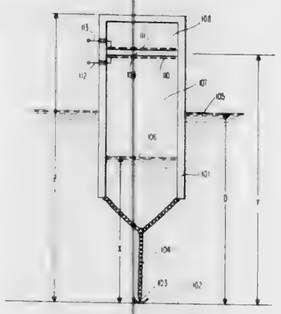
logic means, responsive to said derived signals, for generating signals indicative of the presence of individual ones of said possible code characters.

4,178,517

PROCESS FOR CONVERSION OF OCEAN WAVE ENERGY INTO ELECTRIC POWER AND APPARATUS

Robert E. Salomon, Dresher, and Susan M. Harding, Bala Cynwyd, both of Pa., assignors to Temple University

Filed Apr. 27, 1978, Ser. No. 900,668
Int. Cl.[2] F03B *13/10*
U.S. Cl. 290—53 **19 Claims**



1. A method of conversion of water-wave energy into electric power, comprising the steps of:

inserting an open-ended chamber having a protonic conductor mounted across the width of said chamber into an undulating body of water, said chamber being inserted to a sufficient depth such that the surface of said body of water defines a substantially gas-tight seal for the open end of said chamber;

evacuating the inside of said chamber;

filling the inside of said chamber with hydrogen gas; and

connecting a load electrically across said protonic conductor.

4,178,518

ELECTRONIC DIRECTIONAL CONTROL CIRCUIT

Weldon L. Phelps, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

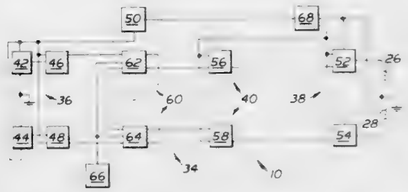
Filed Jun. 29, 1978, Ser. No. 920,587
Int. Cl.[2] B60K *31/00*
U.S. Cl. 307—9 **9 Claims**

1. In a vehicle (**10**) having a forward switch (**42**) controllably energizing a forward solenoid (**26**) for propelling the vehicle (**10**) in the forward direction and a reverse switch (**44**) controllably energizing a reverse solenoid (**28**) for propelling the vehicle (**10**) in the reverse direction, the improvement comprising:

first means (**38**), for controllably energizing one of the forward and reverse solenoids (**26,28**) in response to receiving a command signal;

second means (**40**), for delaying operation of one of the forward and reverse solenoids (**26,28**) a preselected time sufficient for the other of the forward and reverse solenoids (**26,28**) to deenergize;

third means (**60**), for storing the command signal and energizing the second means (**40**) in response to receiving the command signal; and



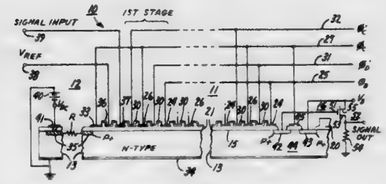
neutralizing means (**66**) for detecting the activation of both the forward and reverse switches (**42,44**) and preventing the operation of either of the forward and reverse solenoids (**26,28**) and maintaining the vehicle (**10**) in a neutral condition.

4,178,519

INPUT CIRCUIT FOR CHARGE TRANSFER APPARATUS

William E. Engeler, and Richard D. Baertsch, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 16, 1978, Ser. No. 934,011
Int. Cl.[2] G11C *19/28;* **H01L** *29/78, 27/02*
U.S. Cl. 307—221 D **6 Claims**



1. Charge transfer apparatus comprising

a semiconductor substrate of one conductivity type having a major surface,

a first electrode insulatingly overlying a first region of said substrate adjacent said major surface,

a second electrode insulatingly overlying a second region of said substrate adjacent said major surface and contiguous to said first region,

a third electrode insulatingly overlying a third region of said substrate adjacent said major surface and contiguous to said second region,

a fourth electrode insulatingly overlying a fourth region of said substrate adjacent said major surface and contiguous to said third region,

a fifth electrode insulatingly overlying a fifth region of said substrate adjacent said major surface and contiguous to said first region,

a region of opposite conductivity type in said major surface having a portion adjacent to said fifth region,

means for applying a reference voltage to said first electrode to establish a surface potential in said first region corresponding to said reference voltage,

means for applying a signal voltage to said second electrode to establish a surface potential in second region corresponding to said signal voltage,

means for applying a first clock voltage to said third electrode to establish a surface potential in said third region corresponding to said first clock voltage,

means for applying a second clock voltage to said fourth electrode to establish a surface potential in said fourth region corresponding to said second clock voltage,

said second clock voltage having a first value over a first portion of a cycle thereof which is unfavorable for the transfer of charge from said second region to said fourth region and having a second value over a second portion of said cycle which is favorable for the transfer of charge from said second region to said fourth region,

said first clock voltage having a first value during said first portion of said cycle of said second clock voltage which inhibits the transfer of charge from said second region to said fourth region and having a second value during said second portion of said cycle of said second clock voltage which enables the transfer of charge from said second region to said fourth region,

means for connecting said adjacent portion of said region of opposite conductivity type through a resistance to a source of potential unfavorable for the transfer of charge from said region of opposite conductivity type to said first region,

means for applying said second clock voltage to said fifth electrode to provide a surface potential in said fifth region and said adjacent portion of said region of opposite conductivity type during said first portion of said cycle of said second clock voltage energetically favorable for the flow of charge from said fifth region into said first region and to said second region and also for the flow of charge from said fifth region and said adjacent portion of said region of opposite conductivity through said resistance to said source of potential, and to provide a surface potential in said fifth region during said second portion of said cycle of said second clock voltage which is energetically favorable for the flow of charge carriers from said region of opposite conductivity type to said fifth region,

the time constant of the capacitance of said fifth electrode in relation to said substrate and said resistance being less than the duration of said first portion of said cycle of said second clock voltage whereby during an initial part of said first portion of said cycle of said second clock voltage sufficient charge flows to said second region to at least equilibrate the surface potential of said second region with said first region and during the remaining part of said first portion of said cycle of said second clock voltage excess charge flows into said adjacent portion of said region of opposite conductivity type,

whereby during said first portion of said second clock voltage a packet of charge is developed in said second region, the magnitude of which is dependent on the magnitude of separation in potential of said signal voltage from said reference voltage in the direction favorable to the transfer of charge from said first region to said second region, and during said second portion of said cycle of said second clock voltage said packet of charge is transferred from said second region to said fourth region.

4,178,520

BINARY FREQUENCY DIVIDER STAGES

Andreas Rusznyak, Chene-Bougeries, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Jun. 7, 1978, Ser. No. 913,378
Claims priority, application Switzerland, Jun. 8, 1977, 7041/77
Int. Cl.[2] H03K *23/30*
U.S. Cl. 307—255 C **1 Claim**

1. A binary frequency divider comprising:

an input terminal for receiving pulses, the frequency of which is to be divided;

an output terminal at which the divided frequency signals are to be delivered;

an electronic circuit comprising a plurality of insulated control electrode field effect transistors of the same type of conduction each having two secondary electrodes and a control electrode, and at least one storage capacitor

having two plates, the circuit being disposed between the input and output terminals;

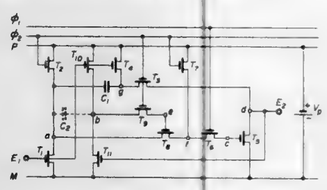
a first and a second supply line for said circuit, for connection to a source of direct current, said first line constituting the common point of said electronic circuit;

a first control line for said circuit, for receiving a first series of control pulses having a frequency equal to n times the frequency of the pulses to be divided, n being a positive whole number other than 0, and arranged to be fed in synchronism with the pulses to be divided; and

a second control line for said circuit, for receiving a second series of control pulses of the same frequency as the pulses of the first series, but in phase opposition thereto;

the first and second transistors of the plurality of transistors being connected in series via one of their secondary electrodes and being connected by their other secondary electrode to the first supply line in the case of the first transistor and to the second supply line in the case of the second transistor, the control electrode of the first transistor being connected to the input terminal and the control electrode of the second transistor being connected to the second control line;

the third and fourth transistors being connected in series via one of their secondary electrodes, and being connected via their other secondary electrode to the output terminal in the case of the third transistor and to the second supply line in the case of the fourth transistor, the control electrode of the third transistor being connected to the second control line and the control electrode of the fourth transistor being connected to the input terminal;



the storage capacitor being connected, via one of its plates, to the point of connection of the first transistor to the second transistor, and via its other plate to the point of connection of the third transistor to the fourth transistor;

the fifth transistor being connected via one of its secondary electrodes to the first supply line and via its other secondary electrode to the output terminal;

the sixth and seventh transistors of the plurality of transistors being connected in series via one of their secondary electrodes, and being connected via their other secondary electrode to the control electrode of the fifth transistor in the case of the sixth transistor and to the second supply line in the case of the seventh transistor, the control electrode of the sixth transistor being connected to the first control line and the control electrode of the seventh transistor being connected to the second control line;

the eighth transistor being connected via one of its secondary electrodes to the point of connection of the sixth transistor to the seventh transistor and via its other secondary electrode to the point of connection of the first transistor to the second transistor;

the ninth and tenth transistors being connected in series via one of their secondary electrodes, and being connected via their other secondary electrode to the control electrode of the eighth transistor in the case of the ninth transistor and to the second supply line in the case of the tenth transistor, the control electrode of the ninth transistor being connected to the second control line, and the control electrode of the tenth transitor being connected to the input terminal;

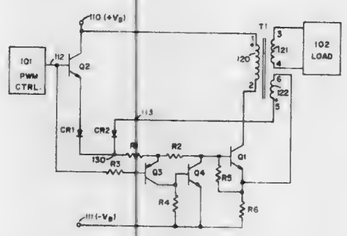
and the eleventh transistor being connected via one secondary electrode to the first supply line, via the other secondary electrode to the point of connection of the ninth transistor to the tenth transistor, and via its control electrode to the output terminal.

4,178,521

BASE DRIVE CIRCUIT

William R. Speth, Columbus, Ohio, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 14, 1977, Ser. No. 851,123
Int. Cl.[2] H03K *17/60, 1/00*
U.S. Cl. 307—270 **4 Claims**



1. In a power supply inverter circuit including a power transistor for intermittently coupling, via its collector-emitter circuit, a DC power supply to a primary winding of a transformer having a secondary winding coupled to a load circuit, means for controling the conduction state of the power transistor comprising;

pulse control means for furnishing at an output thereof turn-on and turn-off request signals,

turn-on control switch means having an enabling input terminal coupled to the pulse control means output, a second terminal coupled to the DC power supply, and a third terminal coupled to the base electrode of the power transistor operative on receipt of a turn-on request signal at the enabling input terminal to coupled current from the DC power supply to the base electrode circuit of the power transistor,

a feedback winding for the transformer, poled such that regenerative current coupling is provided between the transformer primary winding and the feedback winding, having a first terminal coupled to an emitter electrode of the power transistor and a second terminal coupled via a control diode to the base electrode circuit of the power transistor, the potential developed across the feedback winding upon initiation of power transistor turn-on being effective to render the turn-on control switch means nonconductive and to sustain power transistor conduction via the regenerative current coupling, and

turn-off control switch means having an enabling input coupled to the pulse control means output, operative on receipt of a turn-off request signal to divert drive current from the base electrode of the power transistor thereby initiating turn-off.

4,178,522

INFRARED DETECTION APPARATUS

Donald J. MacLennan, Ballston Lake, and Edwin E. Morris, Clinton, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

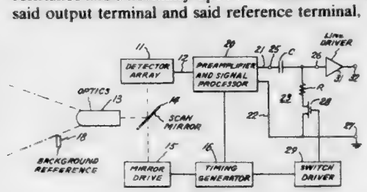
Filed Mar. 15, 1978, Ser. No. 886,729
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—338 **2 Claims**

1. Infrared detection apparatus for providing an output substantially free from background comprising

a signal channel of sequential input signals, each corresponding to a line of scan of a scene and a background reference, each signal including a sample corresponding to radiation

received from said background reference and a plurality of succeeding samples corresponding to radiation received from said scene,

circuit means for deriving a plurality of output signals, each corresponding to a respective one of said input signals in which the sample corresponding to said background reference is subtracted from each of the samples corresponding to said scene including an input terminal, an output terminal and a reference terminal, a capacitance connected between said input terminal and said output terminal, a resistance and a normally-open switch connected between said output terminal and said reference terminal,



means for applying the output of said signal channel between said input terminal and said reference terminal,

means for closing said normally-open switch during the time of occurrence of the sample of each input signal corresponding to said background reference,

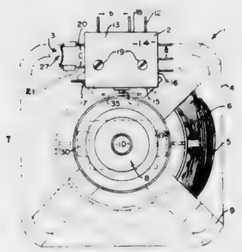
the reciprocal of the on-time of said switch being large in relation to the noise bandwidth of said sample corresponding to said background reference, the time constant of said capacitance and said resistance being greater than the on-time of said switch.

4,178,523

SWITCH JUMPER STRAP

Harold G. Lyerly, Paragould, Ark., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 24, 1978, Ser. No. 880,953
Int. Cl.[2] H02K *11/00*
U.S. Cl. 310—71 **5 Claims**



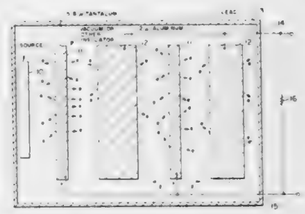
1. In a dynamoelectric machine employing a switch structure for electrically interconnecting said dynamoelectric machine to a source of electrical energy, said switch assembly including a plurality of accessible first electrical connector means, the improvement comprising jumper means for interconnecting various ones of said first connector means, said jumper means comprising a one piece, elongated strip of electrically conductive material having a first end and a second end, and a second electrical connector means integrally formed with said material strip at each end thereof, said second electrical connector means being positioned along the ends of said material strip at a right angle to said material strip, said material strip being deformed to adjust the spacing between the second electrical connector means, said second electrical connector means having a female type design complimentary to the design of said first electrical connector means so as to permit interconnection of said first and said second electrical connector means.

4,178,524

RADIOISOTOPE PHOTOELECTRIC GENERATOR

James C. Ritter, 13223 Ingleside Dr., Beltsville, Md. 20705

Continuation-in-part of Ser. No. 719,532, Sep. 1, 1976, abandoned. This application Jan. 10, 1978, Ser. No. 868,246
Int. Cl.[2] G21D *7/00*
U.S. Cl. 310—304 **15 Claims**



1. A radioisotope photoelectric generator which comprises:

a plurality of spaced first plates each of which is formed of a material with an atomic number greater than 46 with each of said first plates connected electrically to each other and having a thickness of less than one electron range at the maximum photon energy;

a plurality of spaced second plates each of which is formed of a material with an atomic number less than 23 with said second plates alternating with said first plates and connected electrically to each other with each of said second plates having a thickness of more than one electron range at the maximum photon source energy;

electrical insulation between each of said first and second plates, said insulation having a thickness of less than one electron range at the maximum energy of the photon source;

one or more grids inserted between each of said first and second plates;

means for applying a potential to each of said grids to suppress secondary electron emission; and

a photon—producing radioactive source of energy less than 1 MeV assembled relative to said first and second plurality of plates,

so that photons produced by said radioactive source interact preferentially with said first plurality of plates to eject electrons therefrom and transfer charge to said second plurality of plates thereby producing a potential between adjacent plates capable of sustaining a current in an electrical load.

4,178,525

TWO WIRE PIEZOELECTRIC ACCELERATION TRANSMITTER

Kenneth W. Barr, Brea, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 17, 1978, Ser. No. 878,739
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—319 **9 Claims**

1. A device for detecting and transmitting peak amplitudes of mechanical vibration which comprises:

(a) a piezoelectric crystal mechanical vibration to electrical voltage transducer and voltage preamplifier means;

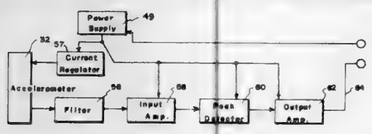
(b) a constant current generator to drive said preamplifier means;

(c) adjustable gain input amplifier means in circuit to receive the cyclic voltage signal from said transducer and generate an amplified signal therefrom;

(d) voltage peak detector means in circuit to receive said

amplified signal and to generate a pulsed voltage signal responsive to the peaks of said amplified signal;

(e) voltage peak summation means operatively connected to said peak detector means and to develop an analog output voltage signal responsive thereto after receipt and storage



of a predetermined number of pulses of said pulsed voltage signal; and

(f) output amplifier means operatively connected to said summation means to generate an output current signal proportional to said summed pulses of said voltage signal.

4,178,526

PIEZOELECTRICALLY DRIVEN TUNING FORK RESONATOR AND MOUNTING STRUCTURE

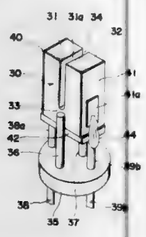
Takeshi Nakamura, Uji; Hiroshi Nishiyama, Muko; Yoshimasa Yamashita, Kameoka, and Yoshiko Kitayama, Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed May 4, 1978, Ser. No. 902,819

Claims priority, application Japan, May 9, 1977, 52/59328[U]

Int. Cl.[2] H01L *41/10*

U.S. Cl. 310—321 **5 Claims**



1. A tuning fork resonator which comprises:

an electrically driven metallic tuning fork having a pair of spaced opposed tines and a common junction portion integrally connected at opposite ends with respective ends of the tines, said tuning fork further having a substantially U-shaped groove defined between the opposed tines;

at least one piezoelectric transducer layer applied to at least a portion of the surface of one of the tines which is remote from the U-shaped groove and extending to and contacting said insulating layer;

an electrode applied to the external surface of said transducer layer;

a support base;

a pair of support rods extending outwardly from the support base and supporting said tuning fork on the free end thereof;

at least one electrode terminal pin having the opposite end portions thereof on the opposite sides of said support base and a substantially intermediate portion extending completely through the thickness of said support base, the end portion of said terminal pin on the side of said support base on which said tuning fork is positioned engaging said elastic layer and supporting said tuning fork therethrough; and

a deposit of an electroconductive bonding agent connecting said electrode to said terminal pin and extending across the position where the transducer layer and the insulating layer are in contact, whereby the bonding agent is kept out of electrical contact with the metallic tuning fork.

4,178,527

QUARTZ CRYSTAL TUNING FORK VIBRATOR WITH UNEXCITED TINE CENTERS FOR REDUCED FLEXURAL AMPLITUDES

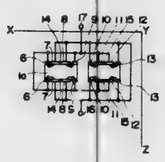
Hirofumi Kawashima, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Continuation-in-part of Ser. No. 844,827, Oct. 25, 1977, abandoned. This application Dec. 1, 1977, Ser. No. 856,756

Claims priority, application Japan, Oct. 22, 1976, 51-126878; Mar. 22, 1977, 52-31422

Int. Cl.[2] H01L *41/10*

U.S. Cl. 310—370 **18 Claims**



1. A quartz crystal tuning fork vibrator comprising: a quartz crystal vibrator having a tuning fork shape including a pair of vibratable tines each having opposite major planar surfaces; and means for establishing alternating electric fields within said tines except in the vicinity of the tine central portions to thereby excite said tines into flexural vibration at lower amplitudes of vibration of the tine ends than would otherwise occur if the said electric fields were also established in the vicinity of said tine central portions, said means comprising four electrode segments disposed on at least one of said major planar surfaces of each tine and extending lengthwise therealong to define two inner electrode segments disposed between two outer electrode segments, means electrically connecting the two outer electrode segments of one tine with the two inner electrode segments of the other tine, and means electrically connecting the two inner electrode segments of said one tine with the two outer electrode segments of said other tine.

4,178,528

IMAGE INTENSIFIER UNITUBE FOR INTENSIFIED CHARGE TRANSFER DEVICE AND METHOD OF MANUFACTURE

Andrew J. Kennedy, Lorton, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 5, 1978, Ser. No. 922,015

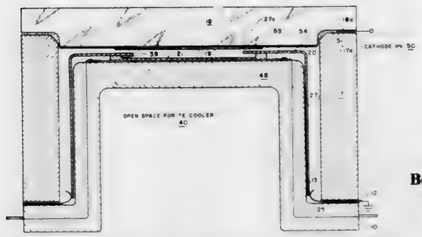
Int. Cl.[2] H01J *39/02, 39/14*

U.S. Cl. 313—102 **13 Claims**

13. In an image intensifier tube, a unitube device for intensified charge transfer device having said charge transfer device in proximity focus with the photocathode, the unitube device comprising:

a ceramic tube base having a cupped shaped inner centrally raised portion and an outer open space, said ceramic tube base having a plurality of internal conductors built therein extending from a plurality of mounting pads on the inner centrally raised portion to a plurality of external pins, said ceramic tube base further comprised of a charge transfer device having a plurality of beam leads therefrom whose ends are in electrical contact with said plurality of mounting pads and a metal shield placed over the inner area of said centrally raised portion extending from a smooth well rounded extended lip over the outer thick portion of said charge transfer device down the inside walls of said ceramic tube base;

a generally cylindrical tube wall high temperature brazed to said ceramic tube base by a Kovar ring wherein said Kovar ring has an inner spring loaded electrical contact that is in electrical contact with said metal shield; and



a cathode faceplate having a photocathode thereon in proximity focus with said charge transfer device, and cathode faceplate positioned with and vacuum sealed against said tube wall by a blunt edge type indium seal.

4,178,529

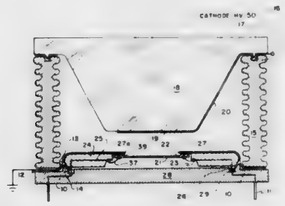
FLIP-HEADER AND TUBE BASE FOR CTD MOUNTING WITHIN AN IMAGE INTENSIFIER

Andrew J. Kennedy , Lorton, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 5, 1978, Ser. No. 922,017

Int. Cl.[2] H01J *39/02, 5/50*

U.S. Cl. 313—102 **12 Claims**



1. In a modified image intensifier tube, a tube base support body and flip-header device with a semiconductor charge transfer device thereon in proximity focus with the photocathode, other overall device comprised of:

a ceramic tube base having a plurality of electrically conductive material wells that are electrically connected by built-in electrical leads to a plurality of output pins, said tube base brazed to a tube wall with an electrically grounded Kovar ring therebetween;

a flip-header comprised of a ceramic body having an array of built-in electrical conductors connected to a plurality of external electrical pins for insertion into said plurality of electrically conductive material wells and a conductive refractory metal plate over the outside of the ceramic body that is connected by a spring loaded electrical contact to said electrically grounded Kovar ring at one end and has a smooth well rounded extended lip out from the ceramic body on the other end that extends past an electrically grounded thick portion of a charge transfer device and over a portion of the thinned region wherein a plurality of electrical connecting wires are attached between the outputs of said charge transfer device and a plurality of bonding pads connected to said array of built-in electrical conductors; and

an input transparent faceplate having a photocathode positioned opposite said charge transfer device on said flip-header and a knife sealing edge that is inserted in an indium alloy filled concentric groove built in said tube wall for sealing the ultra high vacuum in said image intensifier tube wherein a cathode high voltage is connected through said indium filled alloy to said photocathode and wherein said extended lip of said conductive refractory metal plate bleeds stray charges from said photocathode and backscatter charges from said charge transfer device to allow higher operating voltage in said image intensifier tube.

4,178,530

ELECTRON TUBE WITH PYROLYTIC GRAPHITE HEATING ELEMENT

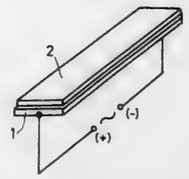
Bernhard Lersmacher, Aachen; Hans Lydtin, Stolberg; Horst Seifert, Hamburg, all of Fed. Rep. of Germany, and Johannes W. A. Krol, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 11, 1978, Ser. No. 923,495

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2732960

Int. Cl.[2] H01J *1/22, 19/16*

U.S. Cl. 313—337 **5 Claims**



1. An electron tube comprising a thermionic cathode including a planar emissive body having an emissive surface and a heating element of pyrolytic graphite which is provided on the side of the emissive body remote from said emissive surface wherein the heating element is planar and the crystallographic c-axis of the pyrolytic graphite extends everywhere normal to the surface of the heating element facing the emissive body.

4,178,531

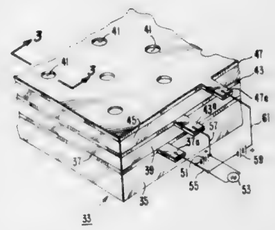
CRT WITH FIELD-EMISSION CATHODE

Roger C. Alig, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 15, 1977, Ser. No. 806,717

Int. Cl.[2] H01J *1/02, 29/48*

U.S. Cl. 313—409 **9 Claims**



1. A cathode-ray tube comprising an evacuated envelope having therein a target and an electron-beam-producing structure comprising

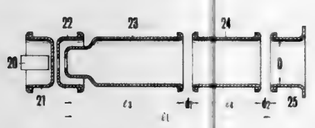
a plurality of spaced, pointed protuberances pointing in substantially the same direction,
each protuberance having associated therewith its own separate first electric-field-producing means for causing electric-field emission of electrons therefrom,
each protuberance also having associated therewith its own separate second electric-field-producing means for focusing the electrons emitted from said protuberance into a beam, said structure being adapted to project said beams along closely spaced substantially parallel paths to constitute a composite beam,
and further means along said paths for focusing said composite beam on said target.

4,178,532

ELECTRON GUNS FOR USE IN CATHODE RAY TUBES

Kenichi Fukuzawa, Mobara; Kunio Ando, Yokohama, and Masakazu Fukushima, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 19, 1977, Ser. No. 843,454
Claims priority, application Japan, Oct. 22, 1976, 51-126041
Int. Cl.² H01J *29/50*
U.S. Cl. 313—414 **7 Claims**



1. In a unipotential type electron gun for use in a cathode ray tube of the class comprising an electron emitting member which emits an electron beam of a controlled intensity under the control of an external control signal, a main electron lens adapted to focus said electron beam and constituted by three cylindrical electrodes disposed coaxially with predetermined gaps therebetween, wherein the same anode voltage is impressed upon the electrodes on both sides and a predetermined fixed focusing voltage is impressed upon an intermediate electrode, the improvement wherein the length of the intermediate electrode is set to be larger than 1.1 D, where D represents the inner diameter of said electrodes on both sides, and the sum of the length of one electrode located on the side of said electron emitting member, the length of said intermediate electrode, the gap length therebetween, the gap length between said intermediate electrode and the electrode on the opposite side is set to be within a range of from 4.0 D to 5.4 D.

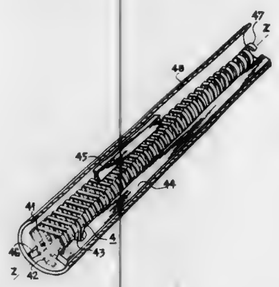
4,178,533

MICROWAVE DELAY LINE FOR TRAVELLING WAVE TUBE

Pierre Ribout, and Bernard Delory, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 15, 1977, Ser. No. 833,646
Claims priority, application France, Sep. 21, 1976, 7628319
Int. Cl.² H01J *25/34*
U.S. Cl. 315—3.6 **9 Claims**

1. A delay line for a travelling wave tube, comprising a helix having a plurality of adjacent turns about an axis; several of said adjacent turns having on each turn at least three first zones spaced approximately equally from each other and at least three second zones interspaced with said first zones, said first and second zones of one turn being adjacent to the corresponding first and second zones on an adjacent turn, the distance between the axis and said first zones being constant and the



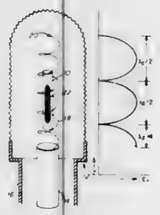
distance between the axis and said second zones varying from one turn to another.

4,178,534

METHODS OF AND APPARATUS FOR ELECTRODELESS DISCHARGE EXCITATION

William H. McNeill, Carlisle; Joseph M. Lech, Westford; Paul O. Haugsjaa, Acton, and Robert J. Regan, Needham, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jul. 7, 1978, Ser. No. 922,625
Int. Cl.² H01J *7/46*
U.S. Cl. 315—39 **25 Claims**



1. An electromagnetic discharge apparatus comprising
(a) a source of power at a high frequency f, having a wavelength λ which is proportional to the free space wavelength λ_o;
(b) an electrodeless lamp having a generally cylindrical shaped envelope made of a light transmitting substance and a volatile fill material enclosed within the envelope, the fill material emitting light upon breakdown and excitation, said envelope having an internal length substantially one-half of said wavelength λ;
(c) a termination fixture having an inner conductor and an outer conductor disposed around the inner conductor, the conductors having a first end which couples power to the lamp and a second end which is coupled to the power source; and
(d) conductive means having a first end thereof coupled to the first end of said inner conductor, and having a second end thereof open-circuited; the electrical length of said conductive means being said wavelength λ so that a voltage standing wave is presented on said conductive means with voltage maxima occurring at the ends and center of said conductive means, and axial electric field minima occurring at distances $\lambda/4$ from each of the two ends of said conductive means; said envelope being oriented centrally and axially within said conductive means so that an

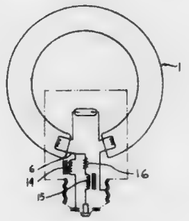
axial, non-toroidal arc occurs within said envelope which does not attach to the interior walls of said envelope thereby enhancing the life of the electrodeless lamp.

4,178,535

THREE-WAY BRIGHTNESS FLUORESCENT LAMPHOLDER FITTING

Jack V. Miller, 700 N. Auburn Ave., Sierra Madre, Calif. 91024

Filed Sep. 21, 1978, Ser. No. 944,389
Int. Cl.² H01J *17/34*
U.S. Cl. 315—53 **8 Claims**



1. A fluorescent lampholder fitting comprising:
a fluorescent lamp of preheat type having a first end provided with a starting filament including a first and second terminal wire, and a second end provided with a starting filament including a first and second terminal wire;
a male screw base electrical connector adapted to fit a three-way socket lampholder, said screw base extending from a generally hollow housing which supports the lamp in at least two places and said screw base being provided with three electrical input connections; a screw shell connection, a center connection and an intermediate ring connection;
a lamp starter connected between the first terminal wire of the first lamp end filament and the first terminal wire of the second lamp end filament;
a conductor connecting the screw shell connection of the male screw base to the second terminal wire of the first lamp end filament;
a first ballast means connected between the center connection of the male screw base and the second terminal wire of the second lamp end filament; and
a second ballast means connected between the intermediate ring connection of the male screw base and the second terminal wire of the second lamp end filament.

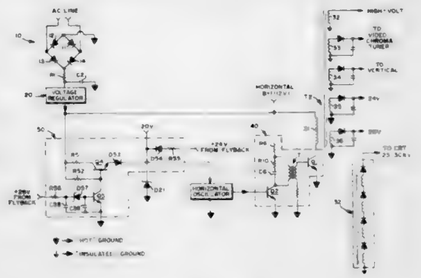
4,178,536

DUAL-MODE HORIZONTAL OUTPUT STAGE

David E. Manners, Alexander, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Aug. 14, 1978, Ser. No. 933,219
Int. Cl.² H01J *29/70, 29/76*
U.S. Cl. 315—408 **15 Claims**

1. A horizontal output stage for an Iso-Hot type television receiver, said output stage comprising:
an output device having a first electrode coupled through a winding (31) of a flyback transformer to a source of voltage derived from the AC line and returned to a Hot ground and having a second electrode returned to the Hot ground;
a switching device having a pole coupled to a third electrode of the output device, a control terminal coupled to a source of voltage derived from another winding (36) of the flyback transformer, and an NO terminal coupled to a horizontal interstage coupling means;
bias means connected to an NC terminal of the switching device; and
a feedback network connected to the NC terminal and coupled to winding 31, so that during startup the output device is connected to the NC terminal whereby it operates in an oscillatory mode and during steady-state it is



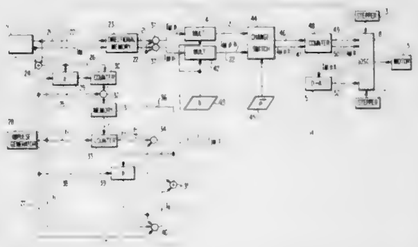
connected to the NO terminal whereby it operates in a substantially switching mode, driven by a signal developed by the horizontal oscillator.

4,178,537

SYSTEM FOR THE PRODUCTION OF AN ADDITIONAL ROTATIONAL MOTION OF A HELICALLY TOOTHED GEAR WORKPIECE IN A POSITIVELY CONTROLLED GEAR PROCESSING MACHINE

Arthur Angst, Wil, Switzerland, assignor to Reishauer AG, Zurich, Switzerland

Filed May 11, 1978, Ser. No. 904,969
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1977, 2724664
Int. Cl.² G05B *19/28*
U.S. Cl. 318—603 **12 Claims**



1. In a method for the production of an additional rotational movement of a helically toothed gear workpiece in an electronically controlled positive movement gear hobbing machine, said machine having separate turning drives for the tool and the workpiece, wherein sequences of pulses dependent upon the rotation of each drive are supplied to a controller, said pulses being compared to each other for the production of a control signal for the readjustment of the workpiece drive, with an additional signal supplied that is derived from the longitudinal feed of the workpiece with respect to the tool, the improvement comprising; producing measurement pulses dependent upon the longitudinal feed of the workpiece, producing a constant number of intermediate pulses after the beginning of every interval limited by two successive measurement pulses in time-wise at least approximately even sequence, the distance between the intermediate pulses during said limited interval being determined by the measurement of the length of the previous interval and of an at least approximately even distribution of a certain number of intermediate pulses with respect to the measured interval length, and providing in each interval that is longer than the previous one, a pulse-free inter-

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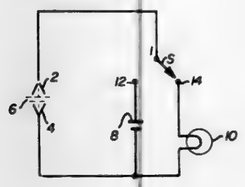
val section after the last of the intermediate pulses that have been produced with the specific number, and producing in each interval, which is shorter than the previous one, the excess intermediate pulses in the subsequent interval with a higher pulse sequence frequency between the measurement pulse forming the subsequent interval's beginning and the first subsequent intermediate pulse and in that the measurement pulses and intermediate pulses that are produced in all successive intervals are fed to the controller as an additional signal.

4,178,538

RECHARGEABLE CELL CHECKER

William T. Kelly, III, Wilton, Conn., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 18, 1977, Ser. No. 788,600
Int. Cl.² H02J *7/00*
U.S. Cl. 320—2 **10 Claims**



1. A portable, self-contained rechargeable cell checker comprising a power source having first and second contact terminals; a lamp having first and second contact terminals; first and second output contact terminals adapted for accommodating a rechargeable cell therebetween; and switching means having first switch contact means connected to the first output contact terminal, and second switch contact means adapted for alternately connecting to the first contact terminal of the power source and the first contact terminal of the lamp; the second terminal of the power source being connected to the second terminal of the lamp and the second output contact terminal, said checker being operable such that when a rechargeable cell is disposed and connected between the first and second output contact terminals, the switching means can be activated to sequentially connect the second switch contact means to the first contact of the power source thereby connecting the rechargeable cell across the power source for receiving a charge and then to the first contact terminal of the lamp thereby connecting the rechargeable cell across the lamp which will reveal whether the rechargeable cell held the charge received from the power source.

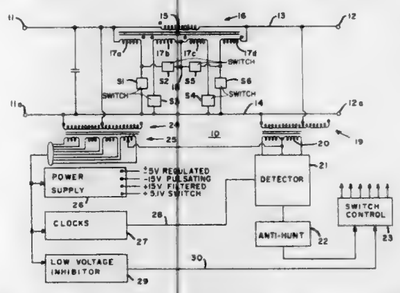
4,178,539

STEPPING AC LINE VOLTAGE REGULATOR

Roland L. Crapo, Bristol, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Aug. 3, 1978, Ser. No. 930,763
Int. Cl.² G05F *1/30*
U.S. Cl. 323—45 **12 Claims**

1. A stepping voltage regulator comprising a pair of input terminals connectable to a source of AC power, a pair of output terminals connectable to a load, a pair of lines connecting the two pair of terminals, a transformer having a secondary winding connected in series in one line and having four primary windings, a first primary winding being connected through a first switch from one line to the other line, a second primary winding being connected through a second switch from one line to the other line, a third primary winding having one end connected through a third switch to the end of the first winding, a fourth primary winding having one end connected through a fourth switch to the end of the second winding, said one end of the third and fourth windings having a common junction, a fifth switch connected between the other end of the third winding and the other line, a sixth switch connected between the other end of the fourth winding and the other line, each of said windings having the same number of turns, said first and third windings when energized inducing one direction of correcting voltage in the secondary winding and said second and fourth windings inducing the opposite direction of correcting voltage, switch control means for providing a conduction



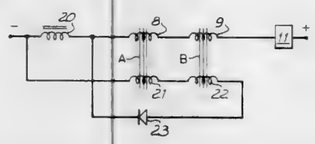
state of only one of either the first switch only or the third and fifth switches simultaneously or the fifth and sixth switches simultaneously or the fourth and sixth switches simultaneously or the second switch only, and detector means for sensing the value of the output voltage and providing a correcting signal to the switch control means to cause the switch control means to change to a different conduction state when the value of the output voltage exceeds a selected range of values.

4,178,540

SATURABLE REACTORS

Robert J. Logan, Sheffield, England, assignor to Inductive Controls Limited, Sheffield, England

Filed Mar. 20, 1978, Ser. No. 888,339
Claims priority, application United Kingdom, Mar. 22, 1977, 12131/77
Int. Cl.² G05F *1/32*
U.S. Cl. 323—89 R **3 Claims**



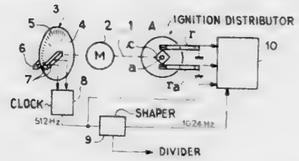
1. A saturable reactor circuit comprising: a magnetic core; main and excitation windings for carrying a.c. load current and d.c. excitation current, respectively mounted on said core; an inductor connected in series with said excitation winding; a compensating winding mounted on said core, connected across said inductor and inductively coupled to said excitation winding, said compensating winding having the same number of turns as said excitation winding to apply across said inductor a voltage of opposite polarity to that in said excitation winding; and a diode in series with said compensating winding to inhibit the flow of the d.c. excitation current therethrough.

4,178,541

APPARATUS FOR TESTING THE OPERATION OF A DEVICE CONTROLLING THE IGNITION OF AN INTERNAL COMBUSTION ENGINE

Gerard C. C. Brihier, Ollainville, France, assignor to Facom, Morangis, France

Filed May 31, 1978, Ser. No. 911,238
Claims priority, application France, Jun. 2, 1977, 77 16872; Jun. 2, 1977, 77 16873; Jun. 2, 1977, 77 16875
Int. Cl.² F02P *17/00*
U.S. Cl. 324—385 **26 Claims**



1. An apparatus for testing the operation of a device controlling the ignition of an internal combustion engine, such as an ignition distributor or an injection pump, and adapted to produce ignition initiating signals for said engine, comprising:
- means for driving said device in rotation and simulating the drive thereof in normal operation;
- an angular encoder mechanically coupled to the driving means, said encoder being capable of producing a train of clock pulses the frequency of which pulses is a function of the speed of rotation of said driving means, and capable of producing by revolution of said driving means a pair of successive locating pulses which are synchronized with the clock pulses;
- means for producing from said ignition initiating signals initiating oulses representing said signals;
- a measuring circuit for producing pulses the duration of which represents the evolution with respect to time of the occurrence of said ignition initiating signals in the course of each revolution of said driving means, said measuring circuit comprising:
  - means for establishing a first operational step and a second operational step of said measuring circuit, each of said operational steps respectively corresponding to a predetermined speed of said driving means;
  - memory means capable in the course of the first operational step of storing at least a pulse representing an ignition initiating signal immediately following on a second of said locating pulses;
  - output means for producing a measurement pulse constituting the relation with respect to time between said pulse stored in said memory means and the initiating pulse measured in the course of said second operational step;
- and a display device connected to said measuring circuit for displaying a value representing the length of said measurement pulse.

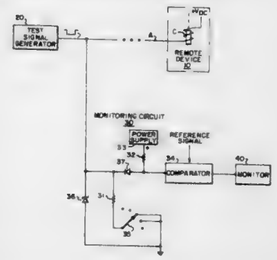
4,178,542

MONITORING THE OPERATION STATUS OF AN ELECTRICAL COMPONENT ON THE BASIS OF AN INHERENT PULL UP OR PULL DOWN CHARACTERISTIC

Charles C. McCarthy, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 30, 1978, Ser. No. 873,344
Int. Cl.² G01R *31/02*
U.S. Cl. 324—51 **2 Claims**

1. Apparatus for determining the operational status of an electronic or electrical component which exhibits either an inherent pull-up or pull-down characteristic comprising,
- a test signal generating means including a single electrical lead connecting said test signal generating means to said electrical component, said test signal generating means applying a test signal to said electrical component via said electrical lead, and
- monitoring circuit means connected to said electrical lead to monitor the response of said electrical component to said test signal, said monitoring circuit means including;
  1. a comparator circuit having a first and second input, said first input being connected to said electrical lead,
  2. a pull-up and a pull-down circuit means,



  3. means for selectively connecting either said pull-up or pull-down circuit means depending on the pull-up or pull-down characteristic of said electrical component, to the first input of said comparator circuit means, a predetermined reference signal being supplied to the second input of said comparator circuit means,

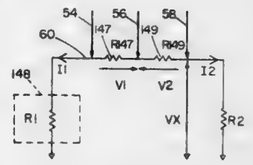
said monitoring circuit means responding to said input by producing an output indication of the operational status of said electrical component.

4,178,543

ANALYZING ELECTRICAL CIRCUIT BOARDS

Joseph F. Wrinn, North Quincy, and Mark S. Hoffman, Newton Center, both of Mass., assignors to Teradyne, Inc., Boston, Mass.

Filed Feb. 23, 1978, Ser. No. 880,589
Int. Cl.² G01R *27/14*
U.S. Cl. 324—64 **25 Claims**



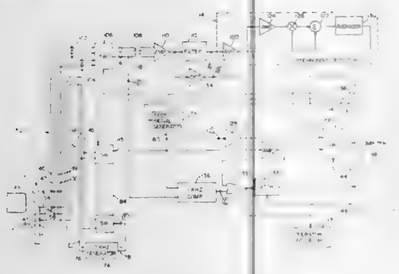
1. In apparatus for analyzing electrical circuit boards by measuring the voltage drops due to test currents flowing in opposite directions along the straight portion of the conductive lead of an integrated circuit element mounted on a board, that improvement comprising:
- A probe having at least three contact tips mounted to simultaneously contact three equally spaced points on said lead, said points being spaced apart sufficiently to permit measurement of electrical activity in each of the lead segments between adjacent pairs of said tips,
- means for injecting an ac test signal through the tip nearest said element and for measuring the voltage drop between the two tips farthest therefrom due to test current flowing through one said lead segment, and
- means for injecting a test signal through the tip farthest from said element and for measuring the voltage drop between the two tips nearest thereto due to test current flowing through the other said lead segment,

4,178,544

ELECTRICAL MEASUREMENT CIRCUITRY FOR LOW LEVEL AC SIGNALS

Mark S. Hoffman, Newton Center, Mass., assignor to Teradyne, Inc., Boston, Mass.

Filed Feb. 24, 1978, Ser. No. 880,791
Int. Cl.[2] G01R *27/14*
U.S. Cl. 324—64 **5 Claims**



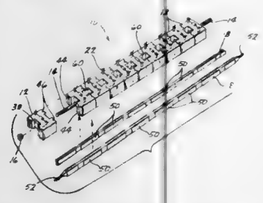
1. In electrical circuitry for measurement of low level ac signals during testing of an electrical element, comprising a three tip probe, and measurement circuitry connected to said probe to make successive voltage measurements between selected pairs of said tips while during each said measurement an ac test signal is injected into said element through the tip not in the then-selected pair, that improvement wherein the output cable from said probe to said measurement circuitry comprises four wires arranged in two twisted pairs, one said tip is connected to a said wire in each said twisted pair, and the other two said tips are respectively connected to the remaining two said wires.

4,178,545

ELECTRICAL RESISTOR TESTING FIXTURE

Jerome J. Kneifel, Columbus, Nebr., assignor to Dale Electronics, Inc., Columbus, Nebr.

Filed May 9, 1977, Ser. No. 795,137
Int. Cl.[2] G01R *31/00*
U.S. Cl. 324—158 F **9 Claims**



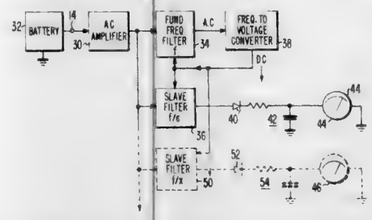
1. A modular electrical component test tray comprising,
a plurality of individual modules,
each said individual module having
an electrically insulative body structure with top and bottom surfaces,
means for supporting an electrical component at a position above said top surface, said means for supporting being attached to said body structure,
air flow channel means for guiding air flow to an area adjacent said position of an electrical component in non-direct impinging relation to said position, said air flow channel means comprising at least one air passageway through said body structure, said air passageway having inlet and outlet ends with said outlet end disposed in said top surface transversely remote from said position of an electrical component, said air passageway being in non-alignment with said position,
means for selectively detachably securing said individual modules together, and
means for electrically connecting the electrical components supported by each said individual modules to test equipment.

4,178,546

ALTERNATOR TEST APPARATUS AND METHOD

Leonard R. Hulls, Marblehead, and Toy Dowdell, Jr., Acton, both of Mass., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 6, 1978, Ser. No. 867,510
Int. Cl.[2] G01R *31/00;* **G08B** *21/00*
U.S. Cl. 324—158 MG **7 Claims**



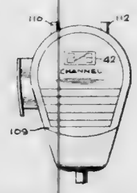
1. A method for testing a variable speed alternator having output winding means, and rectifier means connected to said output winding means for rectifying the alternating voltage produced at said winding means to obtain a direct current output having a variable ripple frequency component at a variable frequency f, said rectifier means including a plurality of diodes, for the failure of one of said diodes, comprising the step of:
tracking the frequency of and measuring the amplitude of a particular subharmonic of said variable frequency f, said amplitude, when it exceeds a given value, being indicative of a failed diode.

4,178,547

REMOTE MICROPHONE WITH APPROVED CHANNEL SELECTOR

Miguel E. Santana, 1050 Monte Verde Dr., Arcadia, Calif. 91006

Filed Sep. 22, 1976, Ser. No. 725,496
Int. Cl.[2] H01B *1/38*
U.S. Cl. 325—16 **9 Claims**



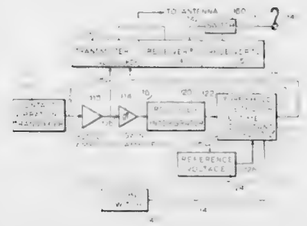
1. A remote microphone unit for use with a transceiver apparatus, said remote microphone unit comprising:
first and second switching means for selecting a desired channel from a plurality of available transmission channels, activation of said first and second switching means generating signals representing the selected channel,
an electronic digital display for displaying the selected channels, and
means responsive to said generated electrical signals for generating the channel selected in electronic digital form to said electronic digital display, wherein
said digital display contains at least first and second indicators, said first indicator indicating the unit digit of a two digit channel and said second indicator indicating the tens digit of said channel, said units digit display being controlled by said first switching means and said tens unit display being controlled by said second switching means.

4,178,548

VOICE ACTUATED MOBILE RADIO

James G. Thompson, 101 Diane Cir., Indialantic, Fla. 32903, assignor to Geraldine E. Thompson and James G. Thompson, both of Indialantic, Fla.

Filed Oct. 4, 1976, Ser. No. 729,163
Int. Cl.[2] H04B *1/38*
U.S. Cl. 325—16 **3 Claims**



1. An interface apparatus for controlling the operation of a communications transmitter/receiver type radio, said interface apparatus comprising in combination;
a capacitance type contact vibration transducer responsive to vibrations in the frequency range of at least 500 to 2,000 Hz, coupled to the throat area of the communicator for generating a transmit audio signal being coupled to a modulator section of said communications transmitter/-receiver for modulating the transmitter output;
voice operated switching means for switching the transmitter/receiver into and out of the transmit mode responsive to receiving said transmit audio signal from said contact vibration transducer, whereby the operation of and the transmit signal from the transmitter/receiver type radio will be relatively impervious to the high ambient noise level;
remote disabling means for generating a disable signal coupled to said voice operated switching means for disabling said voice operated switching means from switching said transmitter/receiver into said transmit mode;
means, coupled to said contact vibration transducer, for generating a keying signal responsive to receiving said transmit audio signal therefrom with said keying signal generating means continuing to generate said keying signal for a predetermined period of time after the loss of said transmit audio signal; and
keying means coupled to said keying signal generating means for switching the transmitter/receiver into the transmit mode responsive to receiving said keying signal, and for switching the transmitter/receiver into the receive mode responsive to one of the loss of said keying signal and receiving said disable signal from said disabling means.

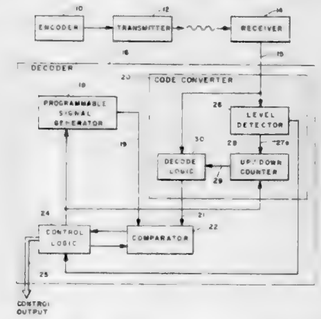
4,178,549

RECOGNITION OF A RECEIVED SIGNAL AS BEING FROM A PARTICULAR TRANSMITTER

Gregory W. Ledenbach, San Jose, and Dennis E. Morris, Saratoga, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 27, 1978, Ser. No. 890,464
Int. Cl.[2] H04B *1/06*
U.S. Cl. 325—38 R **18 Claims**

1. A system for recognizing a received encoded signal as being from a particular transmitter, comprising
an encoder for encoding a signal to have a predetermined sequence of pulses of different predetermined durations within a constant bit interval in accordance with a selected code; wherein each of the different predetermined durations corresponds to a different bit;
a transmitter for transmitting the encoded signal;
a receiver for receiving the transmitted encoded signal; and
a decoder for recognizing the received encoded signal as being from the transmitter, comprising
a programmable digital logic signal generator that is programmed in accordance with the selected code for generating a programmed digital logic signal having a predetermined sequence of different digital words corresponding to the predetermined sequence of pulses of different predetermined durations in the transmitted encoded signal;
a code converter for converting the received encoded signal to a decoded digital logic signal in accordance with the selected code;
a comparator for comparing the decoded digital logic signal with the programmed digital logic signal; and



a control logic circuit coupled to the programmable signal generator, the code converter and the comparator for synchronizing the programmed digital logic signal with the decoded digital logic signal and for recognizing the received encoded signal as being from the transmitter when said comparison indicates a predetermined number and sequence of valid comparisons between the decoded digital logic signal and the programmed digital logic signal;
characterized by the code converter comprising means for measuring and comparing the relative durations of the pulse and the non-pulse time during each bit interval, and for providing a decoded digital logic signal having digital words corresponding to one or another of the predetermined durations in accordance with said comparison of the relative durations.

4,178,550

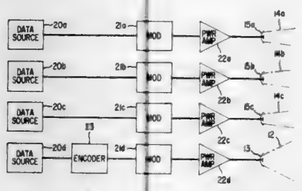
METHOD AND APPARATUS TO PERMIT SUBSTANTIAL CANCELLATION OF INTERFERENCE BETWEEN A RECEIVED FIRST AND SECOND SIGNAL

Anthony Acampora, Freehold; Douglas O. J. Reudink, Sea Grit, and Yu S. Yeh, Freehold Township, Monmouth County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 3, 1977, Ser. No. 803,152
Int. Cl.[2] H04J *13/00;* **H04B** *3/60, 15/00*
U.S. Cl. 325—41 **13 Claims**

9. A transmitter comprising
a first transmission section including means for modulating a first input digital information signal to a predetermined frequency spectrum;
a second transmission section including means capable of both encoding a second input digital information signal having a different informational content and a lower information transmission capacity than said first digital information signal using a forward error correcting code and

modulating the second digital information signal to said predetermined frequency spectrum; and



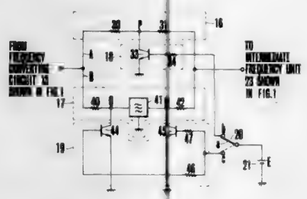
means for concurrently transmitting each of the digitally modulated first information signal and the encoded and digitally modulated second information signal in a predetermined direction.

4,178,551

BANDWIDTH SWITCHING CIRCUITS OF RADIO RECEIVER

Minoru Ogita, and Yuzo Ishigaki, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed Nov. 10, 1977, Ser. No. 850,310
Claims priority, application Japan, Dec. 14, 1976, 51-166694[U]
Int. Cl.² H04B *1/16, 1/06, 1/16*
U.S. Cl. 325—427 **1 Claim**



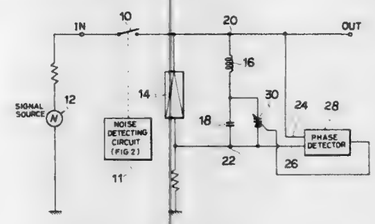
1. In an intermediate frequency stage of a bandwidth switching circuit of a radio receiver wherein an intermediate frequency signal may selectively pass through either one of two parallel branched signal paths, the improvement wherein the selection of said branched signal paths is effected by a switching operation of a transfer switch which includes two stationary contacts and a movable contact, and wherein one of said parallel branched paths comprises a first intermediate frequency circuit constituted by first and second resistors connected in series, a first three-terminal switching element constituted by a first transistor and a third resistor, the first transistor having a collector-emitter current path with one end grounded, the other end connected to the juncture between said first and second resistors, and its base electrode connected to one stationary contact of said transfer switch through our third resistor, and wherein the other of said parallel branched paths comprises a fourth resistor, an intermediate frequency filter and a fifth resistor which are connected in series, a second three terminal switching element constituted by second and third transistors and sixth and seventh resistors, one output electrode of said second transistor being connected to the juncture between the fourth resistor and the intermediate frequency filter, one output electrode of said third transistor being connected to the juncture between the intermediate frequency filter and the fifth resistor, the other output electrodes of both said second and third transistors being grounded, input electrodes of said second and third transistors being connected in common to the other stationary contact of said transfer switch through said sixth and seventh resistors, respectively, and wherein the movable contact of said transfer switch is connected to one terminal of a single d.c. voltage source, the other terminal of said source being grounded.

4,178,552

NOISE ELIMINATING CIRCUIT

Kiyoshi Amazawa, and Masaharu Mori, both of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1977, Ser. No. 864,549
Claims priority, application Japan, Dec. 28, 1976, 51-158405; Dec. 28, 1976, 51-158406
Int. Cl.² H04B *1/10*
U.S. Cl. 325—479 **5 Claims**



1. A noise eliminating circuit for an AM receiver including RF and IF stages and wherein a pulsed noise component included in an amplitude modulated wave signal is eliminated by making the RF or IF stage of the receiver an open circuit, while at the same time, compensating for the carrier components of the incoming signal that are blocked during the open circuit condition of the stage, said circuit comprising:

(i) noise detecting means for detecting said noise component and responsive thereto for generating a control signal;

(ii) switch means responsive to said control signal of said noise detecting means for blocking passage of the amplitude modulated wave signal through said stage; and

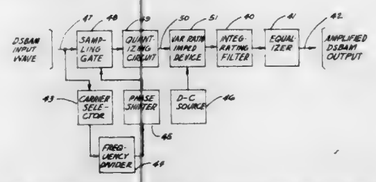
(iii) signal producing means responsive to the carrier component of said amplitude modulated wave signal passing through said stage just before the signal is blocked for duplicating said carrier component during such signal blockage.

4,178,553

SAMPLING MODULATED WAVES

Charles B. Fisher, 2850 Hill Park Rd., Montreal, Quebec, Canada (H3H 1T1), and Sidney T. Fisher, 53 Morrison, Montreal, Quebec, Canada (H3P 3C6)

Filed Nov. 30, 1978, Ser. No. 964,832
Int. Cl.² H04B *1/16*
U.S. Cl. 325—487 **9 Claims**



1. The method of processing a carrier double-sideband amplitude modulated by a message which comprises:

sampling said modulated carrier at instants which occur at a frequency which is between twice and four times the highest frequency of said message, said instants not all occurring at zero crossings of said carrier, said sampling frequency being equal to twice the carrier frequency divided by an integer, to produce a sequence of samples, and

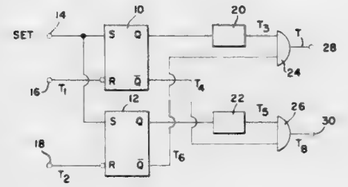
integrating said sequence of samples in a filter to produce an output wave containing the information of the message.

4,178,554

PHASE DIFFERENCE DETECTOR

Takashi Sase, Hitachi; Kazuo Katoh, Tokai, and Takeshi Hirayama, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 25, 1977, Ser. No. 844,989
Claims priority, application Japan, Oct. 25, 1976, 51-128613
Int. Cl.² H03K *5/20, 3/86*
U.S. Cl. 328—133 **5 Claims**



1. A phase detector comprising:

first and second input signal sources providing first and second input signals both of which signals rise at the same time;

a first bistable element having first and second output states coupled to the first input signal source wherein said first bistable element is switched from said first state to said second state at the leading edge of said first input signal;

first means for delaying said second state output signal of said first bistable element by a first predetermined time;

a second bistable element having first and second output states and coupled to the second signal source wherein said second bistable element is switched from said first state to said second state at the leading edge of said second input signal; and

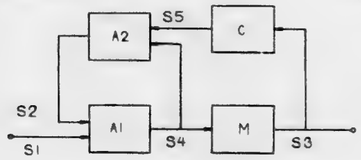
second means for producing an output pulse at the coincidence of said first-state output of the second bistable element when said second bistable element reswitches from said second state back to said first state at the trailing edge of said second input signal and the output of said first means which is delayed by the first predetermined time, the pulse length of said second means output pulse being determined by the trailing edge of said delayed output signal of said first means.

4,178,555

METHOD OF REDUCING DISTORTION IN ELECTRONIC NETWORKS

Vladan Temer, 1400 Fountain Grove Pkwy., Santa Rosa, Calif. 95404

Filed Mar. 31, 1978, Ser. No. 892,031
Int. Cl.² H03B *1/04*
U.S. Cl. 328—162 **6 Claims**



1. A method for the processing of electrical signals by means of an electronic system which comprises:

a. a first summing network having a first and a second input and an output, the input signal to the system being applied to said first input of first summing network, a correction signal being applied to said second input of first summing network and the output signal of said first summing network being determined in the frequency domain by the equation

$$S4 = P \cdot S1 + Q \cdot S2$$

with S4 being said output signal of first summing network, S1 being said input signal to the system, S2 being said correction signal and P and Q being linear transfer functions;

b. a main channel having an input and an output, said input to main channel being connected to said output of first summing network and said output of main channel being the output of said system;

c. a control network having an input , an output, and a transfer function C, said input to control network being connected to said output of main channel; and

d. a second summing network having a first and a second input and an output, said first input to second summing network being connected to said output of control network, said second input to second summing network being connected to said output of first summing network, the signal at said output of second summing network being applied to said second input of first summing network, thereby functioning as said correction signal, and being determined in the frequency domain by the equation

$$S2 = T \cdot S5 + R \cdot S4$$

with S2 being said correction signal, S5 being the signal at said first input to second summing network, S4 being said output signal of first summing network, T and R being linear transfer functions, and the relationship between said transfer functions R and Q being, in the frequency domain,

$$R \cdot Q = 1$$

so as to achieve for said system an overall transfer function F which is independent of the transfer characteristics of said main channel and is determined in the frequency domain by the equation

$$F = S3/S1 = -R \cdot P/T \cdot C$$

with S3 being the signal at said output of system, S1 being said input signal to the system, R, P, and T being said linear transfer functions, and C being said transfer function of control network and being equal in frequency domain to the ratio of said signal at output of control network to said signal at input of control network.

4,178,556

CLASS D AMPLIFIER SYSTEM

Brian E. Attwood, Sestri 49, Smithbarn Horsham, Sussex RH13 6DS, England

Filed Apr. 19, 1978, Ser. No. 897,699
Claims priority, application Japan, Apr. 22, 1977, 52/50399[U]
Int. Cl.² H03F *3/38*
U.S. Cl. 330—10 **4 Claims**

1. A Class D amplifier system comprising:

an audio amplifier for amplifying an audio signal;

a carrier signal source;

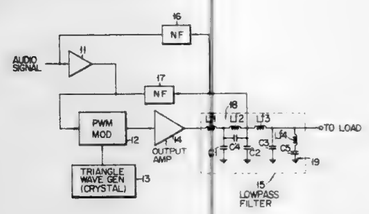
a pulse width modulator for pulse width modulating a carrier signal from said carrier signal source by an output signal of said audio amplifier;

means connecting the output of said audio amplifier and the output of said carrier signal source to said pulse width modulator as inputs;

an output amplifier having an input connected to the output of said pulse width modulator for amplifying a pulse width modulated signal;

a low pass filter having an input connected to the output of said output amplifier to apply a recovered audio signal to a load;

a trap circuit arranged in said lowpass filter to resonate at a carrier signal frequency; and



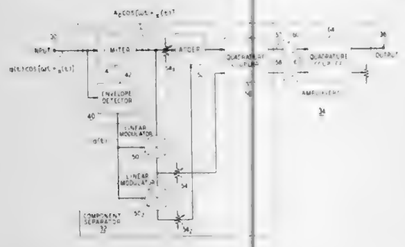
negative feed-back circuit means connecting an output voltage from said trap circuit as input to said pulse width modulator.

4,178,557

LINEAR AMPLIFICATION WITH NONLINEAR DEVICES

Paul S. Henry, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 15, 1978, Ser. No. 969,774
Int. Cl.[2] H03F *3/38*
U.S. Cl. 330—10 **5 Claims**



1. A circuit for linearly amplifying a bandpass input signal having amplitude and phase variations comprising:

a component separator comprising means for generating from the input signal a first signal representative of an amplitude limited version of the input signal and a second signal representative of the amplitude envelope of the input signal and a phase modulator connected to said first and second signal generating means, the component separator producing a first and a second output signal which are substantially constant in amplitude;

a first and a second amplifier coupled to enable reception and amplification of the first and second output signal, respectively, from the component separator; and

a coupler capable of combining the two amplified signals to produce a restructured replica of the bandpass input signal

CHARACTERIZED IN THAT

the phase modulator comprises

a first and second linear suppressed-carrier amplitude modulator with each modulator comprising a first and a second input terminal and an output terminal, the first and second modulators being connected in a cascade arrangement with the output of the first modulator connected to the first input of the second modulator and the first terminal of the first modulator and the second terminals of both modulators being connected to receive the first and second signals, respectively, from said generating means;

adding means having input terminals thereof connected to receive the first signal from the generating means and the output from the second linear modulator;

a quadrature coupler capable of combining in quadrature the output signals from said adding means and the output from said first linear modulator; and

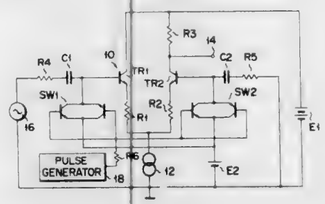
a first and a second weighting means disposed between the outputs of the first and second linear modulator and the inputs to the quadrature coupler and adding means, respectively, each weighting means being capable of introducing a separate predetermined weighting factor to the signal passing therethrough.

4,178,558

DC LEVEL CLAMPING CIRCUIT

Yoshitake Nagashima, Yokohama; Kazumasa Noyori, Oita, and Hideki Moriyama, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Sep. 26, 1978, Ser. No. 945,850
Claims priority, application Japan, Oct. 5, 1977, 52-119059
Int. Cl.[2] H03F *21/00*
U.S. Cl. 330—11 **6 Claims**



1. A DC level clamping circuit comprising a signal input terminal, a DC power source terminal, a reference power source terminal, a differential amplifier circuit having first and second input terminals, a first capacitor coupled between the signal input terminal and the first input terminal of the differential amplifier circuit, a second capacitor coupled between the reference power source terminal and the second input terminal of the differential amplifier circuit, first and second switching means coupled between the DC power source terminal and the first input terminal of the differential amplifier circuit and between the DC power source terminal and the second input terminal of the differential amplifier circuit, respectively, and control means for controlling the conductive state of the first and second switching means.

4,178,559

AMPLIFIER DISTORTION REDUCTION APPARATUS

Richard A. Nichols, Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 11, 1978, Ser. No. 941,521
Int. Cl.[2] H03F *1/32*
U.S. Cl. 330—296 **3 Claims**

2. Distortion reduction circuit apparatus comprising, in combination:

valve means, having determinable distortion characteristics, including input means, common means and output means;

power supply means including first and second terminal means;

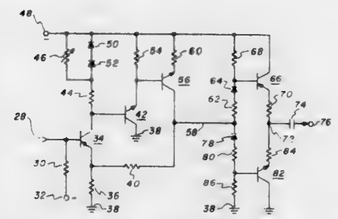
distortion product generation means including diode means and further means for adjusting current levels therein so that the distortion in said diode means is complementary to the distortion in said valve means;

load impedance means;

means connecting said distortion product generation means and said load impedance means in series between said output means of said valve means and said first terminal means of said power supply means;

further means connecting said common means of said valve means to said second terminal means of said power supply means;

signal means for supplying input signals to be amplified to said input means of said valve means; and



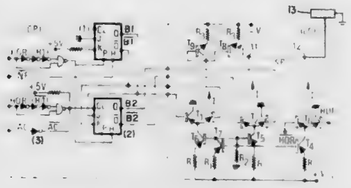
final means, connected to said output means of said valve means for supplying substantially distortion-free amplified output signals.

4,178,560

PHASE COMPARATOR ARRANGEMENT FOR CONTROLLING AN ELECTRICAL MEMBER

Christian Maury, Velizy, France, assignor to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme), Paris, France

Filed Feb. 1, 1978, Ser. No. 874,053
Claims priority, application France, Feb. 7, 1977, 77 03315
Int. Cl.[2] H03B *3/04*; H03K *5/20*
U.S. Cl. 331—1 A **17 Claims**



12. A phase comparator circuit arrangement having a lock-on phase and a control phase for developing a control signal for controlling an electrical load member wherein said control phase follows said lock-on phase, comprising the combination of:

first input means for receiving a first two-level waveform derived from the output of said electrical load member, said first waveform being periodic and having a constant cyclic ratio after having locked on a reference signal,

second input means for receiving a second two-level waveform which serves as the said reference signal during the lock-on phase and becomes non-periodic with a variable cyclic ratio after said first wave-form has locked-on the said second waveform,

circuit means for comparing the phases of the said first and second waveforms, said circuit means comprising a first bistable flip-flop member having first and second gating inputs, connected, respectively, to outputs of the said first and second input means,

means for deriving first and second complementary voltages from complementary outputs of the said first bistable flip-flop member and applying said voltages to enable the said first and second gating inputs, and,

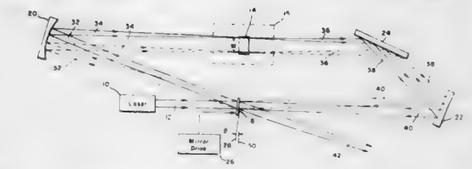
means for subtracting an output waveform from said first bistable flip-flop member from said first waveform to develop a three-level control signal responsive to the phase difference between said first and second waveforms.

4,178,561

SCANNING ARRANGEMENTS FOR OPTICAL FREQUENCY CONVERTERS

David T. Hon, Los Angeles; Hans W. Bruesselbach, Santa Monica; Alexander R. Muir, Playa Del Rey, and Harold J. Tuchnyer, Pacific Palisades, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 2, 1978, Ser. No. 947,915
Int. Cl.[2] G02B *27/17*
U.S. Cl. 350—6.6 **12 Claims**



1. An optical frequency converting arrangement comprising:

an optical signal converting medium having an input surface and output surface for developing from a light beam at a first frequency incident upon said input surface a light beam at a second frequency emerging from said output surface;

means for directing an input light beam at said first frequency toward said input surface of said medium while causing said beam to converge to a portion of reduced cross-section at said medium; and

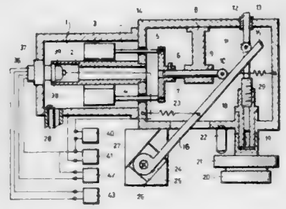
means for producing relative movement between said reduced cross-section portion of said beam and said medium such that said portion of said beam is caused to effectively reciprocatively scan said input surface of said medium while deriving from said light beam emerging from said output surface of said medium an output light beam at said second frequency along a stationary path.

4,178,562

CAVITY RESONATORS WITH FREQUENCY-LINEAR TUNING

Imre Torma; Maria Temesi nee Palmai; Sándor Földes, and József Dorogi, all of Budapest, Hungary, assignors to Távközlési Kutató Intézet, Budapest, Hungary

Filed Jan. 10, 1977, Ser. No. 757,868
Int. Cl.[2] H03B *9/06*; H01P *7/04, 7/06*
U.S. Cl. 331—84 **22 Claims**



1. A cavity resonator with straight-line frequency tuning, operating in a TEM basic waveform, comprising: at least one tuning element connected to a cavity of the resonator and including at least one first structural element that insures linear guidance and is displaceable along a straight forced trajectory; said tuning element being in a forced coupling with a straight guide path that is formed on a second structural element that is swingable about a rotational axis that is perpendicular to the direction of straight movement of said tuning element, said tuning element being provided with a first roller that bears

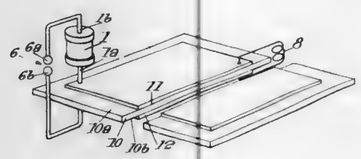
against said guide path; and a frequency-linear adjusting organ displaceable along another straight forced trajectory and being provided with a second roller that also bears against said guide path.

4,178,563

SYSTEM FOR GENERATING A HIGH-ENERGY ELECTRICAL SIGNAL THROUGH A BRIEF TIME, AND A LASER COMPRISING SUCH A SYSTEM

Philippe Huet, Gif-sur-Yvette; Roger H. Milléon, Levis-Saint-Nom, and Philippe Leprince, Gif-sur-Yvette, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Nov. 9, 1976, Ser. No. 740,217
Claims priority, application France, Nov. 17, 1975, 75 35084
Int. Cl.² H01S *3/097*
U.S. Cl. 331—94.5 PE **12 Claims**



1. A system for generating and transferring to a load an electrical pulse signal of high energy and low duration, comprising a voltage source, capacitor means for the storage of high voltage energy connected across said voltage source, and interposed between said voltage source and said load, an electronic switch for controlling the discharge of said capacitor connected in series with a flat line energy transfer means comprising an insulating sheet having on each side thereof a metal coating provided with an output terminal, said output terminals being connected respectively across said load, said flat line transfer means having an aperture therethrough, and said high energy storage capacitor means comprising a plurality of capacitors of the discrete type, each having first and second plates, said capacitors being disposed on one side of said transfer means in a parallel array around the said aperture, a first metal contact ring disposed coaxially with said aperture in contact with said first plates and the metal coating on the one side of said transfer means and a second metal contact ring interconnecting said second plates, and a metal contact base disposed on the metal coating on the other side of the transfer means symmetrically around the aperture, and said electronic switch comprises a first and a second electrode spaced from each other to define a spark gap, the first and second electrodes being connected respectively to the second metal ring and said metal contact bases so that the longitudinal axis of the electrodes of the spark gap corresponds substantially to the axis of the aperture of the insulating sheet.

4,178,564

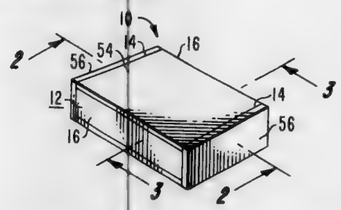
HALF WAVE PROTECTION LAYERS ON INJECTION LASERS

Ivan Ladany, Stockton; Michael Ettenberg, Freehold, both of N.J.; Harry F. Lockwood, New York, N.Y., and Henry Kressel, Elizabeth, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 15, 1976, Ser. No. 649,324
Int. Cl.² H01S *3/19*
U.S. Cl. 331—94.5 H **9 Claims**

1. A semiconductor injection laser comprising:

a rectangular parallelepiped body of a single crystalline semiconductor material having opposed facet surfaces, opposed side surfaces extending to said facet surfaces, opposed contact surfaces extending to said facet surfaces and said side surfaces, with a recombination region capable of generating electroluminescence in said body and capable of operating at power levels up to a few milliwatts per micrometer of emitting radiation width, said recombination region extending from one facet surface to the opposite facet surface; and



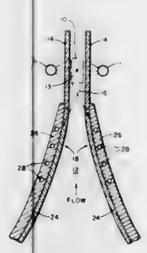
a protection layer on at least one facet surface capable of reducing facet erosion of said facet surface, said protection layer being of an optical thickness, equal to approximately "n" times one-half the vacuum wavelength of the emitted radiation, where "n" is an integer equal to or greater than 1.

4,178,565

FLUID LASER FLOW CHANNEL LINER

Richard G. Morton, North Reading, Mass., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Nov. 17, 1977, Ser. No. 852,224
Int. Cl.² H01S *3/02*
U.S. Cl. 331—94.5 D **17 Claims**



1. A fluid laser comprising:

a channel having a flow therethrough of a laseable fluid;

means for exciting the laseable fluid in said channel to cause laser radiation including fluorescent radiation to be produced in a region of said channel;

a conduit for the flow of said fluid upstream of said channel and having;

at least one cooled wall member;

means for thermally insulating said wall member from said flow in said conduit;

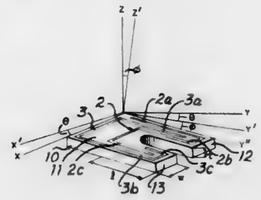
said insulating means being transmissive to said fluorescent radiation so that said fluorescent radiation passes through said insulating means to said cooled wall members thereby avoiding heating of said flow in said conduit.

4,178,566

QUARTZ CRYSTAL TUNING FORK VIBRATOR FOR A CRYSTAL OSCILLATOR

Hirofumi Kawashima, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Continuation-in-part of Ser. No. 751,336, Dec. 16, 1976, abandoned. This application Jul. 6, 1978, Ser. No. 922,435
Claims priority, application Japan, Dec. 19, 1975, 50-151670
Int. Cl.² H03B *5/36*; H03H *9/18, 9/20*
U.S. Cl. 331—156 **9 Claims**



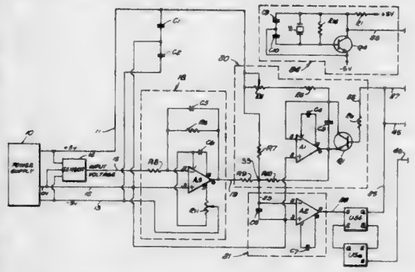
1. In an oscillator circuit, a flexural quartz crystal vibrator of the tuning fork type having an electromechanical coupling factor within the range of 2.5% to 3.5%.

4,178,567

PERIOD-MODULATED VOLTAGE CONTROLLED OSCILLATOR

Richard A. Johnson, Long Beach, Calif., assignor to Scientific Drilling Controls, Irvine, Calif.

Filed May 4, 1978, Ser. No. 903,011
Int. Cl.² H03B *3/04*
U.S. Cl. 331—177 R **15 Claims**



1. A period-modulated voltage controlled oscillator comprising:

a base oscillator operating at a predetermined uniform frequency;

a counter operable to count a predetermined number of oscillations of said base oscillator, and acting to thereby measure a base time period corresponding in duration to said number of oscillations;

a ramp generator controlled by an input signal of varying voltage and acting to produce a voltage ramp continuing for a second period whose duration varies in accordance with variations in the voltage of said input signal;

means responsive to said counter and said ramp generator for combining said base time period and said second period into a combined period; and

means controlled by said last mentioned means for producing an oscillating output signal having a period determined by said combined period.

4,178,568

STRIPLINE COUPLER HAVING COMB ELECTRODE IN COUPLING REGION

David J. Gunton, West Malvern, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Mar. 27, 1978, Ser. No. 890,767
Claims priority, application United Kingdom, Apr. 1, 1977, 13926/77
Int. Cl.² H01P *5/18*
U.S. Cl. 333—116 **14 Claims**



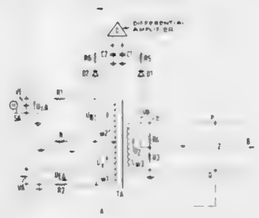
1. A coupling device comprising a dielectric substrate having two opposing faces, a ground sheet electrode on one face of the substrate and two elongate spaced electrodes on the other face of the substrate coupled to one another along at least a part of their respective lengths so that a portion of the power of a signal applied along one of the electrodes is transferred to the other, wherein at least one of the electrodes is a comb electrode comprising a main conductor or bus bar formed along its coupled length with a series of spaced electrode fingers projecting transversely from both sides thereof.

4,178,569

HYBRID FOR TWO-WIRE FULL-DUPLEX TRANSMISSION OF DIGITAL SIGNALS

Jörg Reutter, Pleidelsheim, and Wolfgang Dietze, Korntal, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 20, 1978, Ser. No. 888,086
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714803
Int. Cl.² H01P *5/16*
U.S. Cl. 333—119 **11 Claims**



1. A hybrid with a balancing network for connecting a transmitter and a receiver to a two-wire line having a given impedance for full-duplex transmission of digital signals comprising:

a control circuit including

first means coupled to said two-wire line to provide a first mean time value of voltage present on said two-wire line;

second means coupled to said balancing network to provide a second mean time value of voltage appearing across said balancing network; and

third means coupled to said first and second means to compare said first and second mean time value of voltages to generate a control signal to control the impedance of said balancing network.

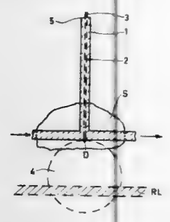
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4,178,570

MICRO-SLOT-STRIPLINE PHASE SHIFTER

Burkhard Schiek, and Jürgen Köhler, both of Halstenbek, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 21, 1978, Ser. No. 879,399
Int. Cl.² H01P *3/08, 1/18*
U.S. Cl. 333—161 **12 Claims**



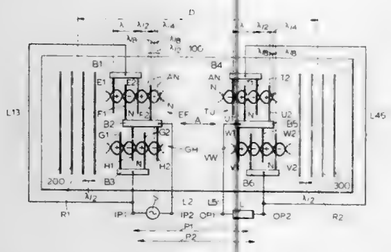
1. A phase shifter comprising a substrate having a top and a bottom surface, a microstrip line provided on the top surface, a conductive base plate arranged on the bottom surface, a microstrip stub arranged on the top surface and having one end connected electrically in parallel to the microstrip line, said stub being open at the end not connected to the microstrip line and a slotted line arranged in the base plate below the stub, one end of said slotted line being short circuited in the region of the open end of the stub and the other end of said slotted line being open.

4,178,571

ACOUSTIC SURGAVE WAVE RESONATOR DEVICES

Richard F. Mitchell, Merstham, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 26, 1978, Ser. No. 872,615
Claims priority, application United Kingdom, Feb. 4, 1977, 4643/77
Int. Cl.² H03H *9/04, 9/26, 9/32;* **H01L** *41/10*
U.S. Cl. 333—194 **12 Claims**



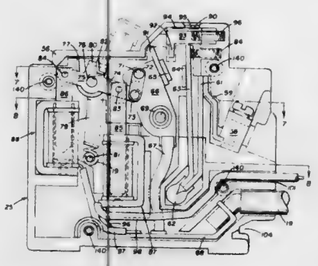
1. An acoustic surface wave resonator comprising
a substrate having a piezoelectric surface,
a pair of input terminals,
input transducing means disposed on the surface and connected to said input terminals for converting an electrical input signal into travelling acoustic surface waves with a predetermined direction of propagation,
a pair of reflectors on said surface which are disposed on both sides of the input transducing means in the direction of propagation so as to define a resonant cavity which is capable of supporting an acoustic surface standing wave resonance pattern,
a pair of output terminals, and
output transducing means connected to said output terminals and disposed on said surface inside the resonant cavity for converting acoustic surface wave energy into an electrical output signal, and wherein:
each of said transducing means comprise a first and a second interdigital transducer which are displaced relative to each other both normal to and parallel to said direction of propagation and with each transducer comprising two sets of electrodes, the electrodes of each set being electrically connected in common,
each of said input terminals and each of said output terminals is connected to a different pair of electrode sets, one set forming part of the first and the other set forming part of the second interdigital transducer of the relevant transducing means,
the two sets of electrodes which are jointly connected to a terminal are selected so that they are coupled to the same phase of the acoustic surface wave resonance pattern which co-operates with the relevant transducing means, whereas both the two input terminals and the two output terminals are coupled to mutually opposite phases of said resonance pattern via the sets of electrodes, and
the first interdigital transducers of the two transducing means are spaced apart by a first distance in the direction of propagation and the second interdigital transducers of said two transducing means are spaced apart by a second distance and the two sets of electrodes, which are connected to each of said terminals, are selected in cooperation with said first and second distances in such a way that for each output terminal the two sets of electrodes connected thereto respond to travelling acoustic surface waves launched by the input transducing means with opposite potentials.

4,178,572

LOAD MANAGEMENT APPARATUS

George Gaskill, Hatboro, and John Horn, Philadelphia, both of Pa., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Apr. 3, 1978, Ser. No. 893,209
Int. Cl.² H01H *75/00, 77/00*
U.S. Cl. 335—14 **14 Claims**



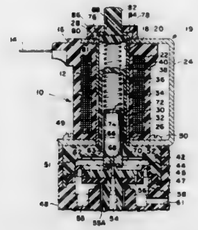
1. Load management apparatus including a manually operable switching section and a remotely operable management section; said switching section including interrupter contact means, a manually operable spring powered first mechanism connected to said interrupter contact means for opening and closing thereof, fault responsive trip means operatively connected to said first mechanism to operate the latter for opening of said interrupter contact means upon the occurence of predetermined fault currents at said switching section; said management section including main contact means connected in series circuit with said interrupter contact means and an electrical load energized through said apparatus, a spring powered second mechanism connected to said main contact means for opening and closing thereof, remotely controlled electrically powered operator means operatively connected to said second mechanism for selectively operating the latter to open and close said main contact means.

4,178,573

ELECTRICALLY OPERATED DEVICE AND VALVING MECHANISM EMPLOYING SAME

Wesley S. Swanson, Elk Grove Village, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 23, 1977, Ser. No. 854,182
Int. Cl.² H01F *7/16*
U.S. Cl. 335—255 **18 Claims**



1. An electrically operated device for performing a function in response to energization by an electrical source comprising:
(a) electrical coil means providing, upon energization by said electrical source, magnetic flux;
(b) ferromagnetic means defining a first magnetic pole, said first pole being movable between a first and second position; said ferromagnetic means including means defining a second magnetic pole disposed interiorly of said coil means, said second pole being stationary with respect to said coil means, said first and second magnetic poles forming a series magnetic flux circuit, said movable pole having a first position in which said magnetic flux traverses an air gap defined between said second pole means and said first pole, said movable pole having a second position in which said air gap is substantially closed;
(c) movable armature means disposed within said coil means and spaced closely adjacent said air gap, said armature means being movable between a first and second position in response to magnetomotive force generated by current flow in said coil means, said armature means in said second position being situated so as to minimize the reluctance encountered by said magnetic flux through said air gap;
(d) means biasing said armature means toward said first position;
(e) actuating means operably associated with said first ferromagnetic means and operable upon selective movement thereof for moving said first pole means to said second position thereby closing said air gap and dissipating the magnetomotive force on said armature means whereupon said biasing means returns said armature means to said first position.

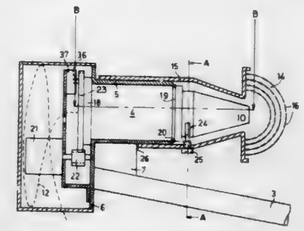
4,178,574

HORN ANTENNA WITH ROTATING WAVEGUIDE AND POLARIZATION LENS MEANS

Jan W. Edens; Theodorus H. A. M. Vlek, and Wilhelmus H. C. Withoos, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 5, 1978, Ser. No. 867,129
Claims priority, application Netherlands, Jan. 12, 1977, 7700230
Int. Cl.² H01Q *13/02*
U.S. Cl. 343—756 **6 Claims**

1. An antenna feed system comprising a rectangular horn having a rectangular aperture, a rectangular waveguide connected to said horn, said horn and waveguide being formed from two parts joined together so that the junction therebetween is in the longitudinal symmetry plane parallel to the electric field of the TE_{01} waveguide mode, a polarisation converter including a screen comprising a plurality of dielectric layers each having a conductor pattern provided thereon such that said patterns form a predominantly capacitive load for one component of the electric field of an electromagnetic wave incident on said screen, and a predominantly inductive load for a second component of said field which is perpendicular to said one component, first means for supporting said screen in front of said aperture for rotation about the longitudinal axis of said waveguide and second means for supporting said horn and waveguide connected thereto for rotation about said longitudinal axis relative to said screen.
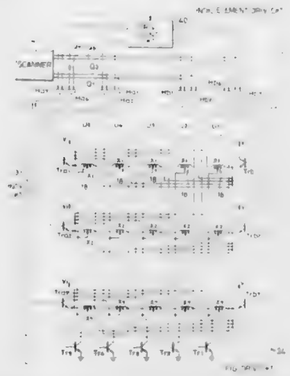


4,178,575

INDICATING APPARATUS FOR INDICATING NUMERALS OR LETTERS BY A PLURALITY NUMBER OF INDICATING ELEMENTS

Masami Ono, Yamanashi, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Jul. 12, 1977, Ser. No. 815,353
Claims priority, application Japan, Jul. 15, 1976, 51-83492
Int. Cl.² G09F *9/32*
U.S. Cl. 340—764 **3 Claims**



1. An indicating apparatus comprising: a plurality of indicating parts respectively having a plurality of indicating elements operated to indicate and maintain their indicating states; indicating element driving means provided in respective indicating elemtns and adapted to drive said indicating elements; a first group of transistors provided in correspondence with respective indicating parts and adapted to close and open current supplying lines to respective indicating element driving means for each of said indicating parts; a group of AND gates adapted to carry out ON and OFF control of respective transistors of said first group of transistors; means for sending a signal to said AND gates group interrelatedly with indicating initiation operation; means for generating indicating signals; indicating element driving circuits provided in correspondence with each of said indicating parts; and means for supplying said indicating

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UMI

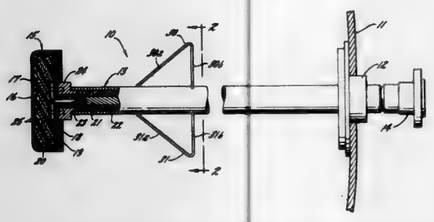
signal to said indicating element driving circuits sequentially in a time-division manner with a first period, and further for sending a time-division signal to said AND gates group sequentially with the first period, said transistors of said first group of transistors being rendered ON and OFF sequentially in a time-division manner with the first period by means of said AND gates group, and said indicating element driving circuits causing said indicating element driving means to operate sequentially in a time-division manner with a second period which is shorter than the first period.

4,178,576

FEED SYSTEM FOR MICROWAVE ANTENNA EMPLOYING PATTERN CONTROL ELEMENTS

Daniel R. Schmidt, Jr., Park Forest, and Joseph F. Busse, Calumet City, both of Ill., assignors to Andrew Corporation, Orland Park, Ill.

Filed Sep. 1, 1977, Ser. No. 829,604
Int. Cl.[2] H01Q *19/14*
U.S. Cl. 343—781 R **9 Claims**



1. A dish-type microwave antenna having a feed system comprising

(a) a prime-focus type radiator located at the focal point of the antenna for directing a primary radiation pattern onto the dish-type antenna,

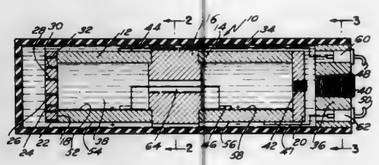
(b) and a pair of symmetrical pattern control elements aligned with the E plane of the antenna and extending radially outwardly from opposite sides of the axis of the primary radiator between the primary radiator and the antenna, the axial distance between the face of said primary radiator and the axial midpoint of said control elements being about the same as the wavelength of the microwaves radiated by said primary radiator to widen the primary pattern and distribute said pattern more uniformly over the surface of the antenna, thereby increasing the antenna gain and reducing the half power beamwidth of the antenna in both the E and H planes.

4,178,577

LOW FREQUENCY HYDROPHONE

Hector J. Cini, Mystic, and Theodore J. Meyers, Waterford, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 6, 1978, Ser. No. 875,056
Int. Cl.[2] H04B *13/00*
U.S. Cl. 367—159 **9 Claims**



1. A pressure-balanced acoustic transducer having a low cut-off frequency in a liquid medium comprising:

a plurality of piezo-ceramic tubes being connected together forming a unit with one end of one of said plurality of piezo-ceramic tubes forming a first open end of said unit and one end of another one of said plurality of piezo-ceramic tubes forming a second open end of said unit;

a solid cap means being secured to the first open end of said unit;

a sintered metal cap means having a plurality of pores therein, being secured to the second open end of said unit;

a flexible boot for housing said unit, said flexible boot having an open end;

means for covering said flexible boot at the open end thereof;

a fluid for filling said flexible boot and said unit of said plurality of piezo-ceramic tubes;

means for filling said flexible boot and said unit of said plurality of piezo-ceramic tubes with said fluid; and

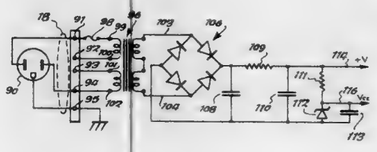
means for extracting voltage signals responsive to an acoustic wave impinging upon said acoustic transducer in the liquid medium.

4,178,578

PEST CONTROL APPARATUS

Lester B. Hall, 249 Kinsey Ave., Kenmore, N.Y. 14217, assignor to Gary Lester Hall, Kenmore, N.Y.

Filed Oct. 11, 1977, Ser. No. 840,536
Int. Cl.[2] H04B *11/00*
U.S. Cl. 367—139 **19 Claims**



1. Apparatus for generating and radiating ultrasonic sound waves for the control of pests comprising:

(a) supporting means;

(b) sound generating means carried by said supporting means and comprising first and second transducer means for providing sound waves when driven by corresponding electrical signals, each of said first and second transducer means having a natural frequency of oscillation, said sound waves being at frequencies normally inaudible to humans and intolerable by pests as rodents and the like, and driver means connected to said first and second transducer means for applying electrical signals to said first and second transducer means in a manner causing said first and second transducer means each to seek the natural frequency of oscillation thereof but never to stabilize at such natural frequencies so as to provide a composite output in the form of an unstable pattern of frequencies and amplitude peaking in the ultrasonic frequency range; and

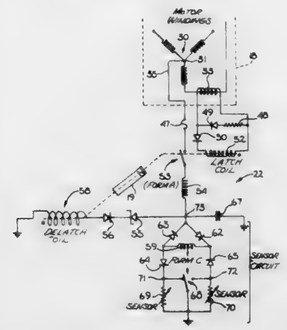
(c) a reflector extending from said supporting means and positioned relative to said first and second transducer means in a manner providing directional concentration of said output waves.

4,178,579

REMOTE INSTRUMENTATION APPARATUS

James R. McGibbeny; John D. Lydick, both of Manhattan Beach, Calif.; Anthony G. Linowiecki, Houston, Tex., and Robert R. Harms, Rancho Palos Verdes, Calif., assignors to TRW Inc., Cleveland, Ohio

Filed Oct. 5, 1976, Ser. No. 729,645
Int. Cl.[2] G01V *1/40*
U.S. Cl. 340—856 **30 Claims**



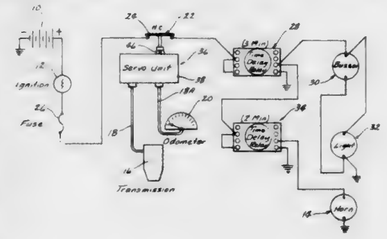
19. In an installation in which conductors of a cable carry AC power from a power source to an AC operating device disposed remotely from said source and at least some of the same cable conductors carry DC signals from a control site to instrumentation apparatus disposed remotely from said control site, the improvement comprising switching means disposed remotely from said control site for connecting said apparatus to and disconnecting said apparatus from said cable, coupling means reponsive to AC applied to said cable, and isolated from DC applied to said cable, for operating said switching means to connect said apparatus to said cable, and means responsive to DC of at least a predetermined magnitude applied to said cable for operating said switching means to disconnect said apparatus from said cable.

4,178,580

FUEL SAVING SIGNALING APPARATUS FOR A MOTOR VEHICLE

Anthony E. Dombrowski, 9903 Broadmoor Dr., Omaha, Nebr. 68114

Filed Mar. 12, 1979, Ser. No. 19,504
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—52 D **7 Claims**



1. A fuel saving signaling apparatus for a motor vehicle including an ignition system, a source of electrical energy, a motor and a rotatable means which is rotated when the vehicle is driven, comprising,

a normally closed switch means operatively electrically connected to the ignition system and source of electrical energy,

a signaling means,

a first electrical time delay means series connected to said switch means and said signaling means and imposed therebetween,

said first time delay means energizing said signaling means after a predetermined period of time has elapsed after said first time delay means has been energized by said switch means,

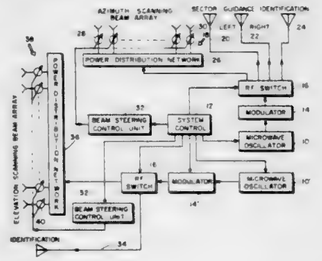
said switch means being positioned adjacent said rotatable means and being operatively connected thereto so that said rotatable means will cause said switch means to move from its closed position to its open position when said vehicle is being driven thereby preventing the energization of said signaling means while said vehicle is being driven but permitting said switch means to move to its closed position when the movement of the vehicle has been halted thereby energizing said first time delay means so that the signaling means will be energized when the motor vehicle has been idling for a predetermined length of time.

4,178,581

INTEGRATED ANTENNA APERTURE

Robert E. Willey, Sr., Joppa, Md., assignor to The Bendix Corporation, Southfield, Mich.

Filed Nov. 3, 1978, Ser. No. 957,492
Int. Cl.[2] G01S *1/16, 1/18*
U.S. Cl. 343—108 M **4 Claims**



1. In a microwave landing system providing narrow scanning beam of microwave energy for guiding an aircraft during approach and landing and providing data signals transmitted in a broad pattern so as to be receivable in a greater area than the area covered by said narrow scanning beam, said system including a phased array antenna having a plurality of radiating elements with adjustable phase shifter means for adjusting the relative phases of currents radiated by said elements and signal sequence control means for controlling the sequence of transmission of said narrow beam signals and said broad beam signals, the improvement comprising

means for applying non-uniform values of phase shift to said phase shifters of said array to broaden the antenna pattern of said array, said non-uniform values of phase satisfying the relationship

$$d^2\phi(x)/dx^2 = c\, f^2\,(x)/P\,(\theta)$$

wherein

c is a constant;

f(x) is the aperture illumination function;

θ is the space angle;

x is the distance along the array; and

$\phi(x)$ is the non-uniform phase function; and

means applying uniform values of phase shift to said phase shifters of said array to cause said array to transmit with a

narrow pattern in a direction determined by the value of said uniform phase shifts;

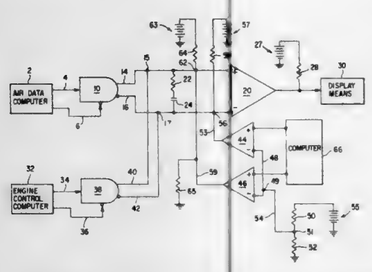
said sequencer selecting said means for applying non-uniform values of phase shift or said means for applying uniform values of phase shift according to whether or not transmission in a broad beam antenna pattern is desired.

4,178,582

DIGITAL SIGNAL TRANSMITTER/RECEIVER SYSTEM INCLUDING PROGRAMMABLE SELF-TEST CAPABILITY

Jay L. Richman, Montville, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Jun. 26, 1978, Ser. No. 919,105
Int. Cl.[2] G08C *25/00*
U.S. Cl. 340—146.1 E **14 Claims**



1. A digital signal transmitter/receiver system including self-test capability, comprising:

means for providing a digital data signal;

means for providing a digital control signal;

a digital line driver connected to the control signal means and responsive to the control signal for being rendered in ON and OFF states;

the digital line driver connected to the data signal means and responsive to the signal therefrom for providing a pair of differential signals, one of the signals switching between logic LOW and logic HIGH states and the other signal switching between logic HIGH and logic LOW states when the driver is rendered ON;

a pair of signal transmission lines connected to the driver, each of which transmits one of the differential signals when the driver is rendered ON and being in a high impedance state when the driver is rendered OFF to inhibit transmission of the signals;

a resistor and a capacitor serially connected across the signal transmission lines for providing a line impedance matching network;

differential receiver means connected to the signal transmission lines for receiving the signals transmitted thereby and for providing an output signal;

differential comparator means connected to the signal transmission lines; and

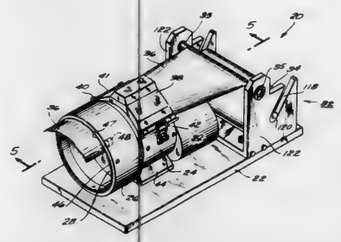
means for programming input signals to the comparator means whereby the comparator means provides output signals for controlling the logic state of the signals transmitted over the transmission lines to the receiver to control the logic state of the receiver output signal in accordance with a test program.

4,178,583

ROTARY PRINTING METHOD

Olin B. King, Huntsville, Ala., assignor to SCI Systems, Inc., Huntsville, Ala.

Division of Ser. No. 611,785, Sep. 9, 1975, Pat. No. 4,100,551.
This application Mar. 22, 1978, Ser. No. 888,975
Int. Cl.[2] G01D *15/08*; G03G *15/04*
U.S. Cl. 346—163 **2 Claims**



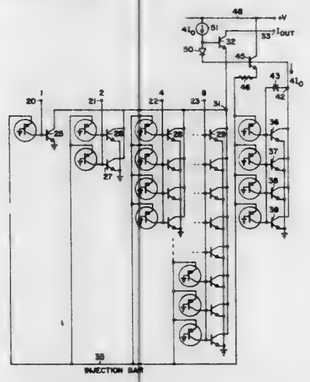
1. A method of rotary printing comprising providing a rotor with a plurality of styli, curving sideways an elongated strip of recording material to conform to the curvature of said rotor, passing said strip longitudinally past said rotor in a direction transverse to the plane of rotation of said rotor, energizing said styli in a pre-determined sequence to form characters on said strip in longitudinal lines and transverse columns, said characters being horizontally aligned in said longitudinal lines, said energizing step including storing in memory character codes representing the characters in a message of a pre-determined length, reading said codes out of memory in the order in which said characters are to appear in successive columns, and utilizing said codes to control the energization of said styli to form the corresponding characters on said strip.

4,178,584

INTEGRATED INJECTION LOGIC DIGITAL-TO-ANALOG CONVERTER EMPLOYING FEEDBACK REGULATION AND METHOD

William F. Davis, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 23, 1978, Ser. No. 871,672
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 DA **13 Claims**



12. An integrated circuit disposed in a substrate providing digital-to-analog conversion and employing feedback to regulate collector currents of a plurality of integrated injection logic (I^2L) switching transistors comprising:

(a) digital input means for receiving a digital signal,

(b) a plurality of switching transistors characterized by operating parameters, said plurality of switching transistors being disposed in the substrate, coupled to said digital input means, and responsive to said digital signal for switching said plurality of switching transistors between conductive and nonconductive states,

(c) at least one reference transistor disposed in the substrate and having at least a collector terminal,

(d) injection bar means disposed in the substrate in proximity to said plurality of switching transistors and in proximity to said at least one reference transistor, said injection bar means forming a plurality of lateral injection transistors in conjunction with said plurality of switching transistors and with said at least one reference transistor for supplying bias current to said plurality of switching transistors and for supplying bias current to said at least one reference transistor,

(e) biasing means disposed in the substrate and coupled to said injection bar means and to the collector terminal of said at least one reference transistor for supplying a constant current to the collector terminal of said at least one reference transistor and for providing a bias voltage to said injection bar means such that the collector current in each of said plurality of switching transistors is maintained substantially constant over variations in said operating parameters when each of said plurality of switching transistors is switched to said conductive state, and

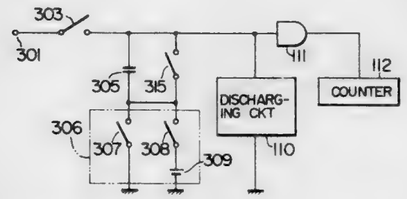
(f) summing means disposed in the substrate and coupled to said plurality of switching transistors for summing the currents conducted by said plurality of switching transistors and for providing an analog output signal.

4,178,585

ANALOG-TO-DIGITAL CONVERTER

Katsuaki Takagi; Toshiro Tsukada, both of Kokubunji; Hisashi Tsuruoka, Hachioji, and Michio Hara, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 22, 1978, Ser. No. 935,963
Claims priority, application Japan, Aug. 29, 1977, 52/102710
Int. Cl.[2] H03K *13/20*
U.S. Cl. 340—347 NT **12 Claims**



1. An analog-to-digital converter comprising:

(a) a storage means with an input terminal, to which an analog signal is applied, for storing said analog input signal,

(b) a discharging circuit coupled with said storage means for discharging the charge stored therein,

(c) a level detection circuit connected to said input terminal of said storage means,

(d) a counting means connected to said level detection circuit for counting the number of clock-pulses in the period of discharging,

(e) a bias voltage supply means connected in series with said storage means, and

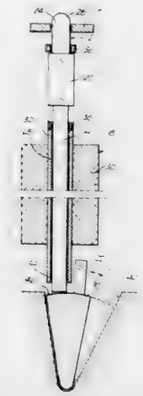
(f) a short-circuiting means connected in parallel with said storage means.

4,178,586

BISTABLE DEVICE FOR REPRESENTATION OF A POINT OF A TACTILE INFORMATION

Klaus P. Schönherr, Schloss Solitude 3, Stuttgart 1, Fed. Rep. of Germany (7000)

Filed Jul. 31, 1978, Ser. No. 929,695
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1977, 2734886; Nov. 5, 1977, 2749585
Int. Cl.[2] G09B *21/00*
U.S. Cl. 340—407 **11 Claims**



1. A bistable device for representation of a point of tactile information, comprising

a housing defining an upper touch surface formed with a vertical bore,

a touch pin having an upper touchable end and being axially displaceably disposed in said bore between a lifted position, in which said touchable end projects said touch surface and a lowered position in which said touchable end is underneath said touch surface,

a locking body operatively cooperating with said touch pin and mounted in said housing displaceable from an inoperative position into an operative position and reversely, in said operative position said locking body blocks a displacement of said touch pin into said lowered position, in said inoperative position said locking body permits the displacement of said touch pin into said lowered position,

an electromagnetic means for operatively moving said touch pin, said electromagnet means has an immoveable hollow core and a magnetic core surrounding said hollow core, said electromagnetic means forms an upper front pole and a lower rear pole,

a non-magnetic rod is moveably guided in said hollow core, said rod lengthens said touch pin, and said rod has a rear portion facing away from said touchable end of said touch pin, said rear portion cooperates with said locking body,

a first permanent magnet mounted on said touch pin and/or on said rod between said touchable end of said touch pin and said front pole of said electromagnet means, said front pole being adjacent to said first permanent magnet, said first permanent magnet defines a straight pole axis parallel to the axis of said rod,

said locking body is moveably disposed in said housing under said rear portion of said rod,

a second permanent magnet arranged operatively adjacent said rear pole of said electromagnet means, said rear pole facing away from said first permanent magnet, said second permanent magnet is connected with said locking body and forms a moveable unit with said locking body, said second permanent magnet has an operative pole spaced remote from said rear pole of said electromagnet means in said inoperative position of said locking body and lying

closely adjacent to said rear pole of said electromagnetic means in said operative position of said locking body,

said operative pole of said second permanent magnet facing said rear pole of said electromagnet means and is polewise the same as one pole of said first permanent magnet, said one pole of said first permanent magnet facing said front pole of said electromagnet means.

4,178,587

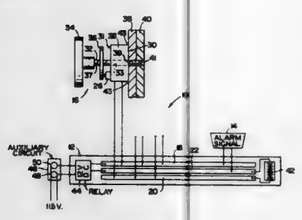
SECURITY LOCK SYSTEM

Fred W. Jamison, 215 E. Palm Ave., Apt. 411, Tampa, Fla. 33602

Continuation-in-part of Ser. No. 849,677, Nov. 8, 1977. This application Oct. 25, 1978, Ser. No. 954,657

Int. Cl.[2] G08B *13/06*

U.S. Cl. 340—542 **9 Claims**



1. A security lock system of the type primarily intended for signalling unauthorized opening of protected fixtures, said security lock system comprising in combination: at least one lock switch means attached to the fixture to be protected; and alarm means electrically connected to said lock switch means whereby unauthorized opening of said lock switch means will actuate said alarm means; said lock switch means comprising bolt means removably engageable with the fixture to be protected and switch means mechanically attached to said bolt means and the fixture to be protected; said bolt means comprising a threaded bolt and a collar formed thereon and said switch means including a threaded aperture formed therethrough and comprising on/off state control means disposed substantially adjacent said aperture in operative relation to said collar, said bolt being movably disposed in said aperture such that at least a portion of said bolt will extend beyond said switch means for engaging the fixture to be protected, and wherein said alarm means comprises direct current circuit means comprising signal means electrically connected to siad switch means, whereby said collar operatively engages said switch means and unauthorized removal of said collar from said switch means will energize said signal means.

4,178,588

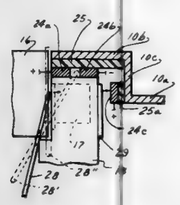
BURGLAR ALARM SYSTEM

James Queren, 218-07 43rd Ave., Bayside, N.Y. 11361

Filed Jul. 5, 1978, Ser. No. 921,903

Int. Cl.[2] G08B *13/06;* **H01H** *27/00*

U.S. Cl. 340—545 **7 Claims**



1. A burglar alarm system mounted in a doorway framing which comprises a wooden door jamb having two substantially parallel major faces and two minor faces substantially perpendicular to the major faces, one of the major faces having a recessed end portion delimited by one of the minor faces and a shoulder constituting a stop for a door, and the door jamb defining a door latch bolt hole in the recessed end portion, a wall including wooden wall stud means adjacent the other major face of the door jamb, the door jamb being mounted on the wall and the minor faces of the door jamb extending substantially parallel to the wall, and a reinforcement metal plate extending over a substantial portion of the wall stud means and a substantial portion of the one minor face of the door jamb, the reinforcement plate being securely affixed to the wall stud means and the one minor face of the door jamb and covering a substantial region of the minor door jamb face adjacent and beyond the door latch bolt hole, the securely affixed plate holding the door jamb firmly in position, the burglar alarm system comprising

(a) a pair of elongated electrically conductive sheets arranged between the minor door jamb face and the reinforcement plate, the electrically conductive sheets extending in side-by-side relationship along a major portion of the reinforcement plate and being electrically insulated from each other,

(b) an electrically insulating sheet arranged between the reinforcement plate and the pair of electrically conductive sheets,

(c) a burglar alarm, and

(d) an electric control circuit connected to the burglar alarm and energizable to set off the alarm, the circuit being connected to the electrically conductive sheets and being energized upon electrical contact being made between the sheets.

4,178,589

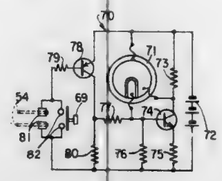
THUMB-SUCKING ALARM SYSTEM

Robert G. Nunn, 6416 E. Lake Dr., San Diego, Calif. 92119; Louis M. Frank, Sunnyvale, Calif., and Ronald G. Bittle, 108 Peach Dr., Anna, Ill. 62906, assignors to Robert Gregory Nunn, Evanston and Ronald G. Bittle, Anna, both of Ill., a part interest to each

Filed Mar. 23, 1978, Ser. No. 889,278

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—573 **6 Claims**



1. A thumb-sucking alarm system comprising a housing adapted to be secured to the wrist of a user, signal-generating means disposed in said housing, sensing means coupled to said signal-generating means and adapted to be secured to a thumb of the user for disposition in the user's mouth when the user sucks the thumb, said signal-generating means being responsive to the presence of moisture on said sensing means for producing an output signal, alarm means mounted in said housing and coupled to said signal-generating means and responsive to said output signal for producing an audible alarm indicating that the user is sucking his thumb, said sensing means being disposable and including an elongated flexible tape provided at one end thereof with a moisture-accepting portion adapted to be secured in use on the thumb of a user, a pair of electrodes spaced apart on said moisture-accepting portion, a pair of electrical conductor leads respectively connected to said electrodes and insulated from each other and extending the length of said tape to the other end thereof, and means releasably coupling said other end of said tape to said housing with the adjacent ends of said lead conductors electrically connected to said signal-generating means, said signal-generating means being operable to produce said output signal in response to the establishment of a low-resistance path by moisture on said moisture-accepting portion between said electrodes when the user sucks the thumb.

4,178,590

ELECTRONIC WEFT THREAD MONITOR FOR SHUTTLELESS WEAVING MACHINES

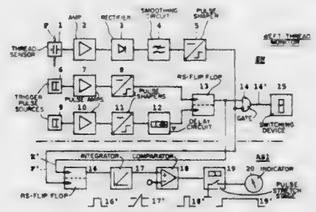
Erich Weidmann, Wetzikon, Switzerland, assignor to Gebrüder Loepfe AG, Zurich, Switzerland

Filed Jan. 17, 1978, Ser. No. 870,181

Claims priority, application Switzerland, Feb. 12, 1977, 001966/77

Int. Cl.[2] B65H *63/00;* **D04B** *35/14;* **G08B** *21/00*

U.S. Cl. 340—677 **6 Claims**



1. In an electronic weft thread monitoring device for shuttleless weaving machines, comprising a signal processing channel producing at its output an output signal in the form of a thread travel signal indicative of weft insertion; trigger circuitry controlled by the weaving machine and producing at its output an output signal in the form of a signal controlling the duration of monitoring the thread travel signal, the trigger circuitry comprising a delaying circuit for delaying the end of the controlling signal, the improvement which comprises:

the delaying circuit being provided with delay setting means;

timing circuitry having first and second input means respectively connected with the outputs of said signal processing channel and said trigger circuitry, said timing circuitry being actuated by the output signals of said signal processing channel and trigger circuitry, for generating a timing pulse indicating the time difference between the end of the thread travel signal and the controlling signal, minus a predetermined safety interval;

said timing circuitry having an output; and

indicator means connected in circuit with said output of said timing circuitry for indicating said time difference on the output of said timing circuitry.

4,178,591

CRANE OPERATING AID WITH OPERATOR INTERACTION

Steven Geppert, Bloomfield Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 21, 1978, Ser. No. 917,450

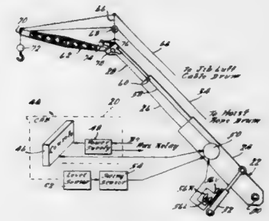
Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—685 **58 Claims**

1. A crane operating aid comprising:

sensor means operative to monitor a plurality of predetermined crane status parameters and to generate a separate output signal as a function of each said status parameter;

operator interface means operative in response to operator initiative to sequentially present a series of prompting crane status requests to an operator and to sequentially receive operator responses thereto; and



logic means operative to selectively receive said output signals and operator responses, and to generate a crane condition signal as a function thereof.

4,178,592

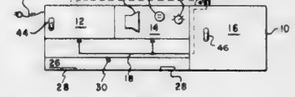
FIRE ALARM HAVING A SENSOR ON AN EXTENSIBLE ARM

Maureen K. McKee, 8200 Redlands Ave., Playa Del Rey, Calif. 90291

Filed Jan. 23, 1978, Ser. No. 871,384

Int. Cl.[2] G08B *17/06*

U.S. Cl. 340—693 **23 Claims**



1. A portable fire detector comprising:

(a) a sensor for producing an electrical signal when detecting signs of a fire,

(b) alarm circuitry coupled to said sensor for producing an alarm signal when said electrical signal is received from said sensor,

(c) alarm means coupled to said alarm circuitry for producing a detectable warning signal when activated by said alarm signal,

(d) a power supply coupled to said sensor, alarm circuitry and alarm means for providing operating power thereto,

(e) housing means for containing said alarm circuitry, alarm means and power supply, and

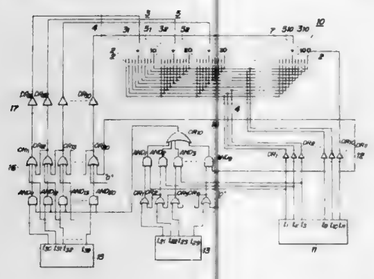
(f) extensible means pivotally and rotatably attached to said housing means for receiving said sensor at the outermost end thereof whereby said sensor may be positioned anywhere within a hemisphere of revolution generated by sweeping said extensible means through 360° of rotation about its pivot point while moving from a vertical position to a horizontal position, the maximum radius of said hemisphere of revolution being equal to the fully extended length of said extensible means and the minimum radius of said hemisphere being equal to the shortest collapsed length of said extensible means.

4,178,593

DRIVING CIRCUIT FOR A LUMINESCENT DISPLAY TUBE FOR ANALOG DISPLAY

Takao Kishino, and Toshio Kamagata, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Chiba, Japan

Filed Oct. 17, 1977, Ser. No. 842,804
Claims priority, application Japan, Oct. 15, 1976, 51-122951
Int. Cl.[2] H01J *17/48*
U.S. Cl. 340—753 **5 Claims**



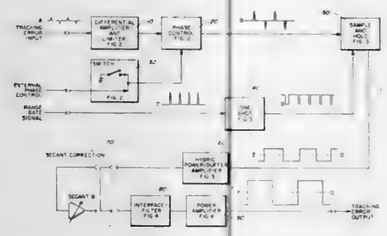
1. A driving circuit for a luminescent display tube for analog display, said luminescent display tube at least a plurality of segment anodes arranged in a predetermined direction and each provided with a luminescent material layer adapted to luminesce when bombarded with thermions, said segment anodes being divided into a plurality of groups each having the same number of said segment anodes, the corresponding segment anodes of the respective groups being connected in common, and a plurality of control grids provided separately for the respective groups, the driving circuit comprising:
a scanning pulse generating circuit section for generating scanning pulses for successively driving said segment anodes connected in common; and
a control circuit section adapted to receive said scanning pulses from said scanning pulse generating circuit section and inputted numeric signals and adapted to give driving signals to said control grids provided for the respective groups according to said input numeric signals,
whereby the ratio of the duration of luminescence of each segment to the scanning period of the control grids can be kept constant even if the total number of groups of said segment anodes is increased.

4,178,594

ANGLE SERVO PREAMPLIFIER

Stephen J. Senger, Jamestown, N. Dak., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 8, 1978, Ser. No. 913,624
Int. Cl.[2] G01S *3/14*
U.S. Cl. 343—7.4 **18 Claims**



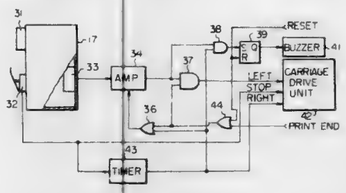
1. In a precision tracking radar system which functions to lock a narrow-beam tracking antenna onto a target in order to track the position of that target, the tracking radar system incorporating an antenna servo drive system to continuously reposition the tracking antenna on target, the antenna servo drive system being responsive to tracking error pulses, for both the antenna azimuth and the antenna elevation dimension, correlated in amplitude to the magnitude of tracking antenna pointing errors relative to the target; an angle servo preamplifier for amplifying the tracking error pulses associated with the antenna azimuth and antenna elevation dimensions comprising:
a. a differential amplifier circuit having first and second inputs coupled to receive the tracking error pulses, said differential amplifier circuit amplifying the tracking error pulses and, in addition, providing noise suppression by reason of the common mode rejection properties of differential amplifiers;
b. sample and hole circuit means coupled to receive the tracking error pulse output from said input circuit means, for sampling the tracking error pulses while suppressing any significant switching transients attendant to the sampling process; the output of said sample and hold circuit means being sampled tracking error pulses corresponding in phase and amplitude to the tracking error pulses sampled by said sample and hold circuit means; and
c. power amplifier circuit means coupled to receive the sampled tracking error pulses from said sample and hold circuit means for amplifying said sampled tracking error pulses.

4,178,595

INK JET PRINTING APPARATUS WITH INK REPLENISHING

Koichiro Jinnai; Masanori Horike; Kyuhachiro Iwasaki, and Yutaka Kodama, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 31, 1978, Ser. No. 956,245
Claims priority, application Japan, Nov. 4, 1977, 52-132378
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—140 R **7 Claims**



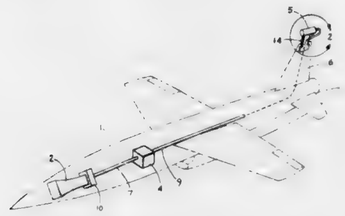
1. An ink jet printing apparatus including a movable ink jet printing head, a first ink tank attached to the printing head for supplying ink thereto and a second ink tank separate from the printing head, characterized by comprising:
sensor means for sensing when an amount of ink in the first ink tank is below a predetermined level and producing a first signal in response thereto;
control means;
supply means actuated by the control means in response to the first signal for communicating the second ink tank with the first ink tank and urging ink to flow from the second ink tank into the first ink tank; and
annunicator means for producing an indication in response to a second signal;
the control means producing the second signal when the first signal is produced by the sensor means after the supply means is actuated by the control means.

4,178,596

RADAR AUGMENTATION SYSTEM FOR AIRBORNE TARGET

Robert P. Rowlett, Thousand Oaks, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Jul. 19, 1978, Ser. No. 925,988
Int. Cl.[2] G01S *7/38*; H01Q *1/28*
U.S. Cl. 343—18 E **4 Claims**



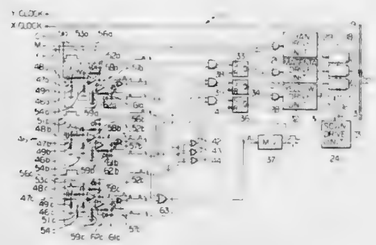
1. An active radar augmentation system for reducing aerial target losses from hits of radar guided missiles, comprising:
a. a receiving antenna in the forward portion of the target for receiving radar signals from an attacking missile system;
b. an amplifier connected to said receiving antenna; and
c. a transmitting antenna connected to the output of said amplifier for transmitting said radar signals as a return to the missile, said transmitting antenna mounted in a rearward location on said target in position to transmit over a wide unimpeded zone, whereby the radar guided missiles are guided by return signals from the rear area of said target and thus tend to pass behind said target.

4,178,597

COLOR INK JET PRINTING APPARATUS

Takuro Isayama, and Hiromichi Komai, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 31, 1978, Ser. No. 911,552
Claims priority, application Japan, Jun. 6, 1977, 52-66554
Int. Cl.[2] G01G *15/18*
U.S. Cl. 346—75 **6 Claims**



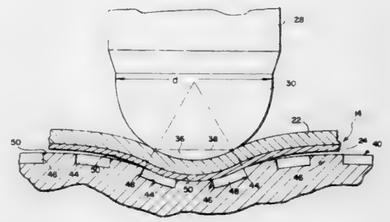
1. An ink jet printing apparatus comprising:
a first ink ejector for ejecting a first ink jet of a first color onto a sheet in response to a first electrical signal;
a second ejector for ejecting a second ink jet of a second color onto the sheet in superposition with the first ink jet in response to a second electrical signal;
drive means for producing relative movement between the first and second ink ejectors and the sheet; and
circuit means for sensing simultaneous initiation of the first signal and termination of the second signal and reducing an amount of ink ejection from the first ejector for a predetermined length of time in response thereto; the circuit means further sensing simultaneous initiation of the second signal and termination of the first signal and reducing an amount of ink ejection from the second ejector for the predetermined length of time in response thereto.

4,178,598

TRANSFER OR RECORDING SHEET HAVING A TEXTURED SURFACE

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 1, 1978, Ser. No. 911,346
Int. Cl.[2] G01D *15/20*
U.S. Cl. 346—105 **5 Claims**



1. In a printing system comprising a ball stylus having a given diameter, a transfer sheet having at least one surface coated with a printing medium, a recording sheet having at least one surface configured for receiving said printing medium, means for positioning said transfer and recording sheets with their said one surfaces in overlying relation, and means for repeatedly bringing said ball stylus into contact with portions of a surface of said transfer sheet opposite said one surface in an image forming program to thereby selectively transfer said printing medium from predetermined areas of said coating, established in response to each such contact by said ball stylus and ranging from minimum to maximum predetermined areas related in size to said given diameter of said ball stylus, to said one surface of said recording sheet to form marks thereon in an image forming relationship, the improvement wherein said one surface of at least one of said transfer and recording sheets is provided by a plurality of orderly spaced mesas, each of which includes a mesa surface that is smaller in area than said minimum predetermined area, and recessed areas in between said mesas thereby providing a wide range of image density in said printing system.

4,178,599

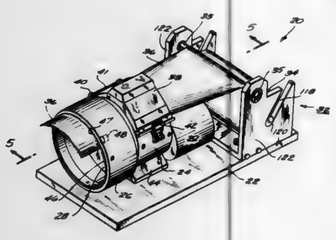
MOUNTING STRUCTURE FOR ROTARY ELECTRICAL STYLUS DEVICE

Olin B. King, Huntsville, Ala., assignor to SCI Systems, Inc., Huntsville, Ala.

Division of Ser. No. 611,785, Sep. 9, 1975, Pat. No. 4,100,551.
This application Mar. 22, 1978, Ser. No. 888,964
Int. Cl.[2] G01D *15/08*
U.S. Cl. 346—163 **4 Claims**

1. In or for a rotary electrical printer for forming images on electro-responsive recording paper having an opaque coating over a coating including a curved platen, a rotor, a plurality of styli mounted on said rotor to sweep across said platen when said rotor rotates, electrical energization means for selectively energizing said styli to cause said opaque coating to be selectively eroded away, and feed means for feeding said recording paper between said platen and said styli with said styli brushing

across said opaque coating, and a support member, said platen and rotor being mounted on said support member, said support

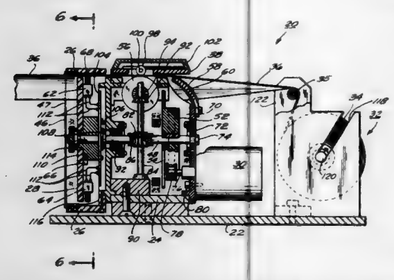


member being adapted to support said paper with said opaque coating facing downwardly towards the ground.

4,178,600
RECORD FEED MEANS FOR ROTARY ELECTRICAL STYLUS DEVICE

Olin B. King, Huntsville, Ala., assignor to SCI Systems, Inc., Huntsville, Ala.

Division of Ser. No. 611,785, Sep. 9, 1975, Pat. No. 4,100,551. This application Mar. 22, 1978, Ser. No. 888,965
Int. Cl.[2] G03G *15/00*; G01D *15/08*
U.S. Cl. 346—163 **8 Claims**



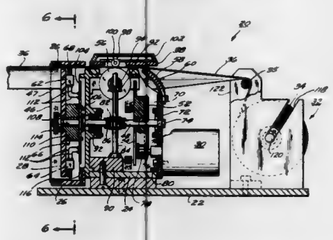
1. In a rotary electrical device including a rotor, a plurality of styli on said rotor, means for selectively energizing said styli to transcribe indicia on recording paper, a rounded housing having an opening, a shaft extending axially in said housing for rotatably supporting said rotor, a motor coupled to rotate said shaft, a paper feed roller mounted in said housing with one edge extending adjacent said opening, drive coupling means for drivably coupling said feed roller to said shaft, and curved guide means opposite said roller for guiding a strip of recording paper across the outside of said housing in arcuate form.

4,178,601
RECORD DRIVE MEANS FOR ROTARY ELECTRICAL STYLUS DEVICE

Olin B. King, Huntsville, Ala., assignor to SCI Systems, Inc., Huntsville, Ala.

Division of Ser. No. 611,785, Sep. 9, 1975, Pat. No. 4,100,551. This application Mar. 22, 1978, Ser. No. 888,968
Int. Cl.[2] G03G *15/00*; G01D *15/08*; B65H *23/02*
U.S. Cl. 346—163 **5 Claims**

1. In or for a rotary device including a rotor, a curved platen, a plurality of styli for transcribing indicia on a record sheet, said styli being secured to said rotor, support means for supporting said platen in a position such that said styli sweep over said platen when said rotor rotates, feed means for feeding a relatively thin elongated record sheet longitudinally between said styli and said platen, said feed means including guide means for curving said record sheet into an arcuate form, and drive means located closely adjacent said platen for pushing

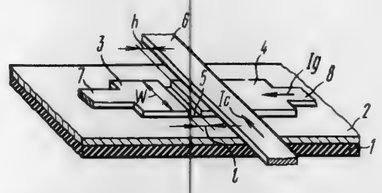


said sheet towards said platen at a point at which said sheet has said arcuate form.

4,178,602
THIN FILM CRYOTRON

Petr E. Kandyba, korpus 488, kv. 11; Dmitry P. Kolesnikov, korpus 301 b, kv. 111; Nina I. Komarovskikh, korpus 431, kv. 116; Gennady M. Lapir, korpus 851, kv. 69; Konstantin K. Likharev, Leninsky prospekt, 93, kv. 200; Vadim A. Ryzhkov, korpus 331, kv. 87, and Viktor G. Yastrebov, korpus 909, kv. 122, all of Moscow, U.S.S.R.

Filed Aug. 31, 1977, Ser. No. 829,527
Int. Cl.[2] H01L *27/12*
U.S. Cl. 357—4 **8 Claims**



1. A thin-film cryotron comprising: a superconducting layer serving as a ground plane; a first insulation layer located on said ground plane; a first superconducting thin-film electrode located on said first insulation layer having a lead-in path; a second superconducting film electrode located on said first insulation layer having a lead-in path; a first conducting jumper between said first and second superconducting electrodes made of a film thinner than that of said electrodes, said first and second superconducting electrodes being weakly connected by means of said jumper to form a bridge of variable thickness serving as a distributed Josephson junction; a control line made of a superconducting thin film strip located above a respective electrode and displaced from a boundary between said respective electrode and said jumper by distance less than the width of said jumper.

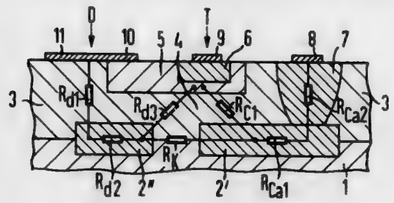
4,178,603
SCHOTTKY TRANSISTOR WITH LOW RESIDUAL VOLTAGE

Gerald Müendel, Gloan, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 22, 1977, Ser. No. 826,939
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1976, 2639799
Int. Cl.[2] H01L *29/48*
U.S. Cl. 357—15 **9 Claims**

1. In a transistor structure having a planar transistor and a

Schottky diode combined in a common semiconductor crystal, said transistor having base, emitter and collector zones, and said Schottky diode being connected between said base and collector zones by means of a doped buried layer zone, the

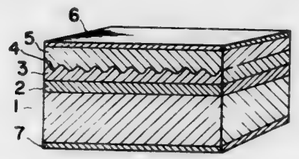


improvement comprising said buried layer zone having a pair of doped regions of one conductivity separated by a region of lesser conductivity to reduce the coupling between the diode and the transistor.

4,178,604
SEMICONDUCTOR LASER DEVICE

Michiharu Nakamura, Tokyo, and Junichi Umeda, Hachioji, both of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 608,342, Aug. 27, 1975, abandoned, which is a continuation of Ser. No. 512,969, Oct. 7, 1974, abandoned. This application Oct. 6, 1977, Ser. No. 839,770
Claims priority, application Japan, Oct. 5, 1973, 48-111454
Int. Cl.[2] H01S *3/19*; H01L *29/205*
U.S. Cl. 357—18 **102 Claims**



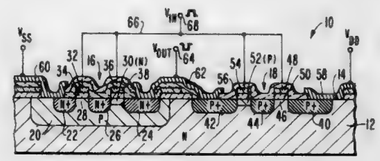
1. A semiconductor laser device comprising:
a semiconductor body of a first conductivity type having a major surface;
a laser active semiconductor layer, disposed on said major surface of said body;
a first semiconductor layer of a second conductivity type, opposite said first conductivity type, and having a thickness in the range from 500 Å to 0.5 μm and an index of refraction lower than that of said laser active layer, disposed on said laser active layer, the surface of said first semiconductor layer opposite that disposed on said laser active layer being corrugated; and
a second semiconductor layer of said second conductivity type, disposed on the corrugated surface of said first semiconductor layer and having an index of refraction lower than that of said first semiconductor layer.

4,178,605
COMPLEMENTARY MOS INVERTER STRUCTURE

Sheng T. Hsu, Lawrenceville, N.J., and James M. Cartwright, Jr., Cambria Heights, N.Y., assignors to RCA Corp., New York, N.Y.

Filed Jan. 30, 1978, Ser. No. 873,593
Int. Cl.[2] H01L *27/02*
U.S. Cl. 357—42 **10 Claims**

1. An improved complementary MOS inverter structure having N channel insulated gate field effect transistor means with source, drain, channel, and gate electrode means; P channel insulated gate field effect transistor means with source, drain, channel, and gate electrode means; means for applying a first supply voltage to the source of the P channel insulated gate field effect transistor means; means for applying a second supply voltage to the source of the N channel insulated gate field effect transistor means; means for connecting the drains of the N and P channel insulated gate field effect transistor means in common; and means for connecting the gate electrode means of the N and P channel insulated gate field effect transistor means in common, wherein the improvement comprises:

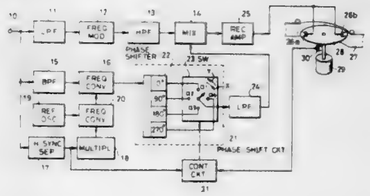


each of said N and P channel insulated gate field effect transistor means comprising a series combination of an enhancement channel having a predetermined threshold for conduction and a channel having a threshold for conduction lower than that of the enhancement channel, the lower threshold channel of each insulated gate field effect transistor means being adjacent the respective drain thereof.

4,178,606
COLOR VIDEO SIGNAL RECORDING AND/OR REPRODUCING SYSTEM

Akira Hirota, Chigasaki, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 13, 1976, Ser. No. 731,935
Claims priority, application Japan, Oct. 17, 1975, 50-124311; Jan. 30, 1976, 51-8937
Int. Cl.[2] H04N *5/79*
U.S. Cl. 358—4 **25 Claims**

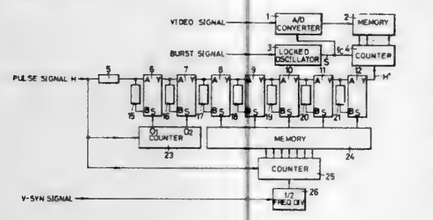


22. A system for recording a composite color television signal on a plurality of tracks along a record medium, said signal including chrominance signal components representative of image information during recurring line and field intervals, said system comprising:
means for generating first and second reference signals, said first reference signal progressing in phase at a rate corresponding to said line interval, and said second reference signal regressing in phase at a rate corresponding to said line interval;
means for combining said chrominance signal components during traversal of adjacent ones of said tracks alternately with said first and second reference signals; and
means for recording said combined signal on said record medium.

4,178,607
PAL COLOR TELEVISION SIGNAL GENERATOR FOR CONTROL OF TIME BASE CORRECTOR

Tsuneo Mikado, Tokyo, Japan, assignor to Nippon Television Industry Corporation, Tokyo, Japan

Filed Nov. 1, 1977, Ser. No. 847,536
Claims priority, application Japan, Nov. 5, 1976, 51-133528
Int. Cl.² H04N 5/795
U.S. Cl. 358—8 **21 Claims**

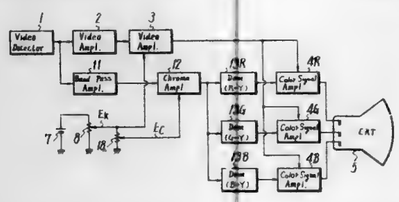


9. A video signal processing apparatus comprising:
(a) a video signal processing circuit for processing video signal on the basis of predetermined clock pulses;
(b) a timing signal generating circuit including:
(i) a delay circuit for delaying a pulse signal synchronized with a horizontal synchronizing signal in said video signal, the delay time of said delay circuit being controllable; and
(ii) a counter for counting said pulse signal synchronized with the horizontal synchronizing signal, the delay time of said delay circuit being changed at every horizontal period in a predetermined periodical sequence in accordance with the counting output of said counter; whereby a timing signal is obtained from said delay circuit having a frequency which is substantially 1/n (n: integer) times as high as the frequency of said clock pulses and is not integrally related to the frequency of said pulse signal synchronized with the horizontal synchronizing signal, and said video signal processing circuit is provided with said timing signal to process the video signal at every corrected horizontal period corresponding to said frequency of 1/n times as high as the frequency of said clock pulses.

4,178,608
CONTRAST/COLOR CONTROL FOR A TELEVISION RECEIVER

Keiji Shirato, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 23, 1978, Ser. No. 889,550
Claims priority, application Japan, Apr. 7, 1977, 52-39686
Int. Cl.² H04N 9/12
U.S. Cl. 358—21 R **9 Claims**

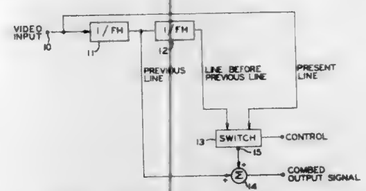


1. In television receiving apparatus of the type having a controllable video amplifier for amplifying a luminance signal and a controllable chrominance amplifier for amplifying a chrominance signal, control circuitry for selectively controlling the contrast of a video picture displayed by said television receiving apparatus and for selectively controlling the color level of said video picture comprising pulse generating means for generating contrast control pulses of selectively variable duty cycle and color level control pulses of selectively variable duty cycle; contrast control means responsive to said contrast control pulses for generating a contrast control signal in accordance with the duty cycle of said contrast control pulses; means for using said contrast control signal to control the gain of said video amplifier so as to correspondingly control the contrast of said video picture; color control means responsive to said color level control pulses for generating a color level control signal in accordance with the duty cycle of said color level control pulses; means for changing said color level control signal proportionally with a change in said contrast control signal so as to maintain a substantially constant chrominance-to-luminance signal ratio despite changes in said contrast control signal; and means for using said color level control signal to control the gain of said chrominance amplifier so as to correspondingly control the color level of said video picture.

4,178,609
COMB FILTER HAVING IMPROVED LUMINANCE RESPONSE

Robert C. Beutel, Fort Wayne, Ind., assignor to The Magnavox Company, Ft. Wayne, Ind.

Filed Oct. 25, 1977, Ser. No. 845,002
Int. Cl.² H04N 9/535
U.S. Cl. 358—31 **3 Claims**

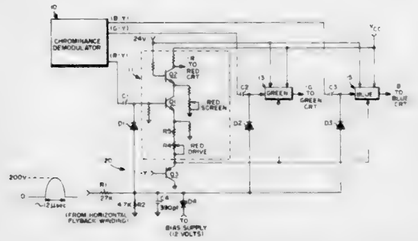


1. In a picture display system whereby an image is formed from a series of consecutive raster lines formed on a television picture tube, said lines having associated therewith a composite video signal for identifying the color and brightness of said lines whereby said color is represented by a chroma signal and said brightness is represented by a luminance signal, said luminance and chroma signals having an interleaved frequency spectrum, means for removing said luminance signal from said video signal comprising:
a. means for supplying a first video signal representing a first raster line;
b. means for supplying a second video signal representing a second raster line;
c. means for supplying a third video signal representing a raster line produced previous to said first raster line; and
d. means for selectively combining said second and third video signals with said first video signal, only said second video signal being combined with said first video signal when said first and second raster lines are correlated, and only said third video signal being combined with said first video signal in the absence of correlation between said first and second raster lines whereby a luminance signal is produced.

4,178,610
CLAMP CIRCUIT FOR RGB OUTPUT STAGES

Douglas W. Constable, and John D. Lovely, both of Batavia, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Feb. 17, 1978, Ser. No. 878,695
Int. Cl.² H04N 5/16
U.S. Cl. 358—34 **9 Claims**

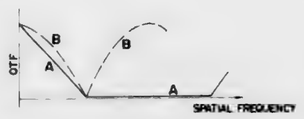


1. In a television receiver having a plurality of signals AC coupled from the output of a chrominance demodulator to the inputs of respective chrominance amplifiers, a clamp circuit comprising:
voltage dividing means coupled to a source of pulses characterized by an amplitude, A, and a pulsewidth, T, for dividing said pulses by a factor, K;
a plurality of clamping diodes having common ends coupled to the output of the dividing means and other ends separately connected to respective inputs of the chrominance amplifiers and capacitively coupled to associated signal outputs of the chrominance demodulator;
diode means having one end coupled to the output of the dividing means; and
a bias supply characterized by an amplitude B and coupled to another end of the diode means whereby a clamping period is established, said clamping period having a duration less than T by a factor directly related to K and inversely related to the ratio of A to B.

4,178,611
OPTICAL LOW PASS FILTER

Yukio Okano, Izumi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 22, 1978, Ser. No. 889,011
Claims priority, application Japan, Mar. 26, 1977, 52-33784
Int. Cl.² H04N 9/06
U.S. Cl. 358—44 **12 Claims**



1. In an optical system for a color television camera system including a spatial color encoding filter disposed in the light path of said optical system and serving to modulate at least two color images, the optical system comprising a photoelectric converting member for generating electrical signals corresponding to said images, an objective lens disposed in front of said photoelectric converting member to focus an image of an object thereon, and a phase grating filter member disposed between the object and said photoelectric converting member and having the configuration of a triangular wave in cross section taken along at least one direction, in which the height, d of the triangular wave is within a range defined by the following formula:

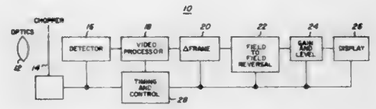
$$\left|\frac{0.75\,\lambda}{2\,(n-n')}\right| \leqq d \leqq \left|\frac{1.45\,\lambda}{2\,(n-n')}\right|$$

wherein
n=refractive index of the filter material,
n'=refractive index of the medium bordering the surface of the grating, and
λ=wave length of the light affected by passing through the filter member.

4,178,612
DELTA FRAME CIRCUIT

Dana Dudley, Dallas, and William M. Knight, Jr., Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 21, 1978, Ser. No. 926,991
Int. Cl.² H04N 5/21, 5/30
U.S. Cl. 358—167 **12 Claims**

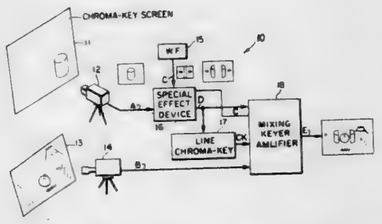


2. A circuit for removing offset voltages from video signals comprising: X and Y address means, an array of difference frame elements having terminals for connection to a source of video signals, a multiplexer, a voltage reference switch having an input terminal for connection to a reference voltage source, and an output amplifier, said X and Y address means operatively connected to the array of difference frame elements and multiplexer to address sequentially each element of the array of difference frame elements and multiplexer for connecting sequentially each element to the video signal terminal and multiplexer, said multiplexer having input terminals for connecting each element of rows of difference frame elements sequentially to the reference voltage switch and to the output amplifier whereby offset voltages of succeeding video frames are cancelled from the video signals.

4,178,613
TELEVISION PICTURE SPECIAL EFFECTS SYSTEM USING DIGITAL MEMORY TECHNIQUES

Ryosuke Takahashi; Masao Inaba, and Masashi Onosato, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 4, 1977, Ser. No. 839,212
Claims priority, application Japan, Oct. 5, 1976, 51-119950
Int. Cl.² H04N 9/535, 5/22, 5/76
U.S. Cl. 358—183 **11 Claims**



1. A special effects system for a television signal, said television signal including horizontal and vertical synchronizing signals, said system comprising:

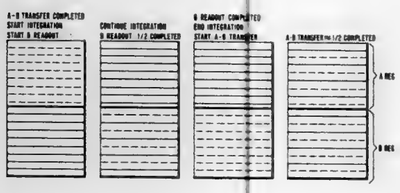
memory means responsive to a write-in address signal for storing said television signal;
means responsive to said horizontal and vertical synchronizing signals for producing said write-in address signal;
means for producing a read-out address signal, the stored television signal being read out in response to said readout address signal;
means responsive to a control signal for controlling at least one of said write-in and read-out address signals, said controlling means including means responsive to said control signal for producing a full control width signal representing the width of said control signal, means responsive to said full control width signal for producing a half control width signal representing a half of the width of said control signal, and means for adding said half control width signal to at least one of said address signals.

4,178,614

READOUT OF A DENSELY PACKED CCD

Donald J. Sauer, Plainsboro, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 24, 1978, Ser. No. 936,524
Int. Cl.[2] H04N *3/14;* **H01L** *27/10, 29/78, 31/10*
U.S. Cl. 358—213 **5 Claims**



1. In a charge-coupled device (CCD) which includes a substrate and overlying electrode means insulated from the substrate for creating potential wells in the substrate for the propagation and storage of signal charge packets in response to applied voltages, and in which there are initially stored in n adjacent ones of said potential wells each separated from an adjacent potential well by a space only occupied by a potential barrier in said substrate created by a single one of said electrode means, n signal charge packets $S_1, S_2 \ldots S_n$, respectively, and in which it is desired to shift said signal charge packets in a direction such that the charge packet S_1 is the leading or first charge packet and S_n the last charge packet, a method for shifting the charges comprising the steps of applying potentials to said electrode means for:

(a) starting with the signal charge packet $S_j = S_1$, sequentially, successively shifting during n successive time periods, the n successive charge packets $S_1, S_2 \ldots S_n$, respectively, each such signal charge packet S_j being shifted, when its turn arrives, from a position separated from the adjacent succeeding charge packet $S_{(j+1)}$ by the barrier created by only one of said electrode means, to a position further from said adjacent succeeding charge packet $S_{(j+1)}$ and separated from said adjacent succeeding charge packet $S_{(j+1)}$ by a space sufficient for accommodating both a potential well formed by a potential applied to an overlying electrode means into which a signal charge packet can flow and a potential barrier formed by a potential applied to another overlying electrode means; and

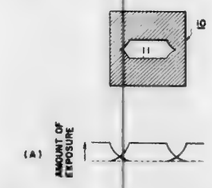
(b) when each signal packet S_j is shifted to the position described in (a) above, concurrently shifting through an equal distance, in the same direction, the preceding signal charge packets $S_{(j-1)}, S_{(j-2)} \ldots S_1$, if any such charge packets $S_{(j-1)} \ldots S_1$ are present.

4,178,615

APERTURE PLATE FOR AN EXPOSURE HEAD FOR USE IN A PICTURE SCANNING REPRODUCER

Riyo Shimooka, Kyoto; Masuo Kunisawa, Uji, and Seiji Okazaki, Kyoto, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Nov. 28, 1977, Ser. No. 855,472
Claims priority, application Japan, Nov. 30, 1976, 51-160331
Int. Cl.[2] H04N *1/22;* **G11B** *7/18;* **G03B** *27/50, 27/68*
U.S. Cl. 358—302 **3 Claims**



1. An exposure head of a picture scanning reproducer which traces scanning lines on a recording medium, comprising,

an intensity modulated light source element, a condenser lens element, an aperture plate element having an aperture therethrough, and a focusing lens element, said elements being arranged substantially co-axially in series and adapted to be positioned relative to the recording medium such that a light beam directed from said light source through said aperture is focused upon the recording medium,

said aperture having a shape delimited by:

an edge leading with respect to the scanning direction and an edge trailing with respect to the scanning direction which are parallel straight lines in the feed direction perpendicular to the scanning direction; and

end edges joining the ends of these leading and trailing edges, said end edges being curves oppositely and symmetrically disposed to one another with respect to the scan direction, and each of said end edges being composed of first and second lines which start from a mutually defined cusp and open up away from one another in the direction away from the cusp so that the angle between the tangents to them increases, the farther away from the cusp whereby the exposure distribution in the feed direction when each scanning line is exposed defines exponentially shaped curves in both of its ends corresponding to the exponentially shaped curves of the aperture to obtain a uniform concentration value distribution in the feed direction due to the overlapping of the exponentially shaped curves on the recording medium.

4,178,616

CASSETTE TAPE RECORDER

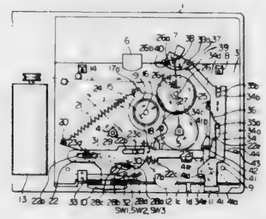
Kazumi Fukawa, Asaka, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed May 15, 1978, Ser. No. 906,212
Claims priority, application Japan, Jul. 29, 1977, 52-091089
Int. Cl.[2] G11B *15/48, 15/18*
U.S. Cl. 360—74.1 **8 Claims**

1. In a cassette tape recorder capable of manually switching the operation thereof to any one of a stop position, a reproducing position, a quick winding position and a quick rewinding position and having a manually operable actuating lever for switching the position of operation of the tape recorder, a swingable switching lever coupled with said actuating lever, a driving shaft mounted on said actuating lever and driving wheel means integral with said driving shaft and driven by a driving motor adapted to rotate in a predetermined direction, a winding reel mounting shaft having a frictionally driven wheel integral therewith and a supply or rewinding reel mounting shaft having a driven gear integral therewith which

is coupled with an idler wheel means, said idler wheel means being located at a position opposite to said frictionally driven wheel with respect to said driving shaft integral with said driving wheel means, said driving shaft and said driving wheel means being held disengaged from said frictionally driven wheel or said idler wheel means at the stop position of said actuating lever, but, when said actuating lever is switched to the reproducing position, said switching lever is swung in one direction so as to compressively contact said driving shaft with said frictionally driven wheel thereby driving said winding reel mounting shaft at a predetermined speed for the reproducing operation, while, when said actuating lever is switched to the quick rewinding position, said switching lever is swung in the opposite direction so as to compressively contact said driving wheel means with said idler wheel means thereby driving said rewinding reel mounting shaft at a higher speed through said driven gear for the quick rewinding operation, the improvement wherein said driving wheel means integral with said driving shaft comprises:

a frictional driving wheel integrally mounted on said driving shaft and said idler wheel means comprising an idler friction wheel and an idler gear integral with said idler friction wheel;



said idler friction wheel being adapted to engage with said frictional driving wheel at the rewinding position of said actuating lever and said idler gear meshing with said driven gear of said rewinding reel mounting shaft thereby permitting said rewinding reel mounting shaft to be frictionally driven through said idler friction wheel for the quick rewinding operation, and

means ensuring positive power transmission between said frictionally driven wheel and said idler friction wheel being ensured even with small engaging forces, including:

a swingable switching lever shaft for swingably supporting said swingable switching lever, such that a first line passing through the cengers of said swingable lever shaft and said rewinding reel supporting shaft, and

an idle gear shaft carried by said swingable lever, such that a second line passing through the centers of said swingable lever shaft and said idle gear shaft are displaced from each other by a small angle θ, so that the positive power transmission is ensured and results in a driving-in tendency even though the aforesaid engaging forces are small.

4,178,617

SUPPRESSOR-INSULATOR MEMBER AND CIRCUIT ARRANGEMENT THEREFOR

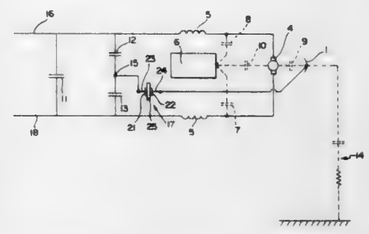
Alfred G. Reichel, Wallrabenstein, Fed. Rep. of Germany, assignor to Black & Decker Inc., Newark, Del.

Filed Nov. 16, 1977, Ser. No. 851,873
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1977, 2700388; Jan. 7, 1977, 7700253
Int. Cl.[2] H02H *1/02*
U.S. Cl. 361—43 **12 Claims**

7. In a portable, hand-held, electric-powered tool such as a double-insulated tool or the like having an exposed-metal part accessible to an operator of the tool and being equipped with input current supply means, an arrangement for suppressing asymmetrical noise in the tool and electrically isolating the exposed-metal part from the electrically conductive parts within the tool comprising:

filter means for conducting the asymmetrical noise and being connected across the input current supply means; and,

a suppressor-insulator member for conducting said asymmetrical noise away from said filter means, said suppressor-insulator including:



two electrodes and an electrically insulating structure disposed therebetween, one of said electrodes being connected into said filter means and the other one of said electrodes being connected to the exposed-metal part of the tool;

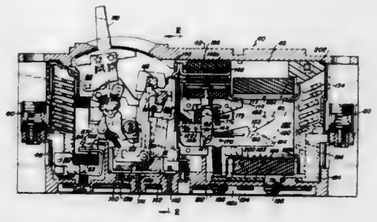
said insulating structure defining a creep-path between said electrodes of sufficient length to electrically isolate the exposed metal part from the input-current supply means in the event of a short-circuit failure in said filter means.

4,178,618

CURRENT LIMITING CIRCUIT BREAKER

Joseph M. Khalid, Cedar Rapids, Iowa, assignor to Square D Company, Park Ridge, Ill.

Division of Ser. No. 647,823, Jan. 9, 1976, Pat. No. 4,070,641, which is a continuation-in-part of Ser. No. 465,012, Apr. 29, 1974, Pat. No. 3,943,473. This application Aug. 15, 1977, Ser. No. 824,588
Int. Cl.[2] H02H *7/22*
U.S. Cl. 361—58 **10 Claims**



1. A current limiting resistor shunted by a pair of engaged contacts in a circuit breaker adapted to be separated in response to a fault current for directing said fault current through said resistor to a low resistance conductor with said fault current having sufficient magnitude to rupture a direct connection between said resistor and said conductor, the improvement comprising;

a wire of a material having a positive temperature coefficient of resistance to create a relatively high value of volume resistivity in response to the passage of said fault current through said wire,

and blowout preventive terminal end means having a volume resistivity intermediate the volume resistivity of said wire and the volume resistivity of said low resistance conductor interconnecting said wire to said low resistance

conductor through a path avoiding undue conduction constriction of said fault current.

4,178,619

PROTECTIVE INTEGRATED CIRCUIT NETWORK, PARTICULARLY FOR CONNECTION TO AN INDUCTIVE LOAD

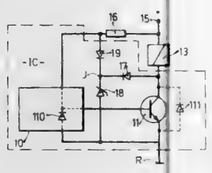
Hartmut Seiler, Reutlingen, and Adolf Kugelmann, Leonberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 10, 1977, Ser. No. 823,286

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638177

Int. Cl.² H02H 7/20

U.S. Cl. 361—91 **17 Claims**



1. Reverse polarity and excess voltage protected integrated circuit network in combination with and to control connection to an unbypassed load (**13**), particularly an unbypassed inductive load which is coupled to a power source (**15**), to protect an integrated load switching control circuit for said load against voltage surges and reverse polarity, said integrated circuit having

a controlled semiconductor switch (**11**), serially connectable with the load (**13**) and the power source (**15**);

a current limiting resistor (**16**) having at least first and second terminals, one terminal being connected to the power source (**15**) to which the load (**13**) is connected;

control means (**10**) coupled to said other terminal of said current limiting resistor (**16**) and to the controlled semiconductor switch (**11**) for controlling the conduction state of said controlled semiconductor switch (**11**);

and a protective circuit connected in parallel to the main current switching path of the controlled semiconductor switch (**11**) comprising

a series circuit having a diode (**17**), and a voltage responsive element (**18**, **20**, **20'**, **20''**) which becomes conductive when the voltage thereacross exceeds a predetermined limit, the diode and the voltage responsive element having a common junction (J) therebetween, said common junction (J) being coupled to said other terminal of said current limiting resistor (**16**), said series circuit (**17**; **18**, **20**) in parallel to the switching path of the controlled semiconductor switch (**11**) becoming conductive upon presence of a reverse voltage in excess of the breakdown voltage and the voltage drop across the load upon disconnection of the load, or application of reverse polarity due to improper poling of said source and limiting the voltage across the main current switching path of the controlled semiconductor switch to essentially said breakdown voltage and current flow through said controlled semiconductor switch and said protective circuit by the internal resistance of the load.

4,178,620

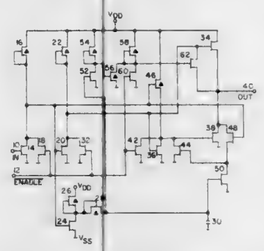
THREE STATE BUS DRIVER WITH PROTECTION CIRCUITRY

Steve K. Yu, San Jose, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Oct. 11, 1977, Ser. No. 841,001

Int. Cl.² H02H 7/20

U.S. Cl. 361—98 **10 Claims**



1. In a bus driver circuit of the kind having an input circuit for receiving an input logic signal, an output circuit including a push-pull field effect transistor pair for driving an output bus connected to a common junction of said transistor pair, each of said transistor pair having a gate, source, and drain, and means including at least one inverter stage coupled between said input circuit and said output circuit for translating said input logic signal from said input circuit to said output circuit and developing a three state logic output signal at said output bus, the improvement of means for limiting current flow through one of said transistors that is normally conducting when said output bus is short circuited from a normally HIGH logic level to a LOW logic level and for limiting current flow through the other one of said transistors that is normally conducting when said output bus is short circuited from a normally LOW logic level to a HIGH logic level, said current limiting means comprising:

a first field effect transistor having a source to drain circuit connected in shunt between the gate and source of said one transistor, second and third field effect transistors connected in series with each other at a common junction and in parallel with the source to drain circuit of said other one transistor, and a fourth field effect transistor connected in shunt between the gate and source of said other one transistor, each of said first, second, third and fourth transistors having a gate, source, and drain, means coupling the gate of said fourth transistor to the common junction of said second and third transistors, said first transistor being normally non-conducting and rendered conducting to reduce the gate drive to said one transistor when said output bus is short circuited from a normally HIGH logic level to a LOW logic level, and said fourth transistor being normally non-conducting and rendered conducting to reduce the gate drive to said other one transistor when said output bus is short circuited from a normally LOW logic level to a HIGH logic level, said first and fourth transistors returning to their respective non-conducting states when the short circuits are removed, thereby to preserve the logic information present on said output bus before it was short circuited.

4,178,621

ELECTROMECHANICAL PRESSURE TRANSDUCER

Joseph J. Simonelic, Huntsville, Ala., and Roland K. Ho, McHenry, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 23, 1978, Ser. No. 871,274

Int. Cl.² H01G 7/00

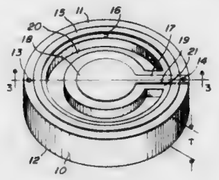
U.S. Cl. 361—283 **8 Claims**

1. A pressure transducer in which pressure changes displace a diaphragm whose position determines electrical characteristics of said transducer, comprising:

base substrate means having top and bottom substantially planar end surfaces;

flexible diaphragm means, relatively thin with respect to the distance between said top and bottom end surfaces, having a planar central portion and a peripheral portion; and

mounting means for mounting said peripheral portion of said diaphragm means to said base substrate top surface, said mounting means, said diaphragm planar central portion and said substrate top surface generally forming a sealed internal, substantially air tight cavity, a predetermined reference pressure being stored in said cavity, said base substantially thicker than said diaphragm means, said diaphragm central portion being displaceable with respect to said top surface in response to pressure changes, said base substrate means having at least one channel in the form of a surface groove in said substrate top surface



opening into said internal cavity, wherein said channel substantially increases the volume of said cavity and thereby permits said cavity to more readily maintain a predetermined reference pressure in said cavity for increasing the lifetime of the transducer despite any leakage of said reference pressure from said cavity;

said transducer including,

a first planar capacitor electrode mounted on said diaphragm central portion and a second planar electrode substantially mounted on a central planar portion of said substrate top surface, said electrodes being separated from each other by just a gap included in said internal cavity which contains a fixed predetermined reference pressure, the distance between said electrodes being determined by said mounting means, said electrodes forming a parallel plate capacitor with the capacitance created by said electrodes being altered in response to flexing said diaphragm means in response to pressure changes.

4,178,622

COMPACT, FLAT TRIMMER CAPACITORS

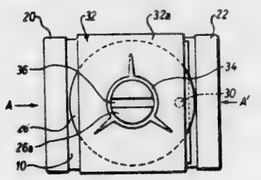
Robert F. Oxley, 8 rue Pedro-Meylan, Geneva 1208, Switzerland

Filed Aug. 29, 1977, Ser. No. 828,706

Claims priority, application United Kingdom, Sep. 18, 1976, 38796/76

Int. Cl.² H01G 5/04

U.S. Cl. 361—293 **9 Claims**



1. A trimmer capacitor comprising in combination:

(a) a base member of electrically insulating material having at least one flat side surface;

(b) a pair of uniformly spaced apart, flat, metallic electrodes carried by said base member in a common plane parallel to said flat side surface of the base member;

(c) a shuttle member defining a third flat metallic electrode;

(d) means mounting said shuttle member on said flat surface of the base member for slidable displacement along a linear path;

(e) means electrically insulating the third electrode from the electrodes carried by said base;

(f) a disc member;

(g) clip means engaging the base member and disc member and mounting said disc member over said shuttle member such that said disc member is rotatable about its axis in a plane parallel to the shuttle member but is constrained from axial and transverse movement relative to said base member;

(h) means defining a spiral-like groove in the underside of said disc;

(i) a projection member which is carried by the shuttle and is slidably received in said groove whereby rotation of the disc causes the projection to move along the groove and hence the shuttle to be displaced along said path relative to the base member and the fixed electrodes carried thereby; and

(j) a pair of end terminations disposed at opposite ends of the base member and respectively electrically connected to said electrodes carried by said base member.

4,178,623

MEASURING SENSOR FOR CAPACITIVE MEASUREMENT OF LIQUIDS AT SELECTED LEVELS

Bernd W. Emmerich, Bruehl; Rudolf Ehret, St. Augustin; Gerhard Hoyer, and Hans R. Trampert, both of Oftersheim, all of Fed. Rep. of Germany, assignors to Sybron Corporation, Rochester, N.Y.

Filed Apr. 17, 1978, Ser. No. 896,511

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1977, 2717301

Int. Cl.² H01G 7/00

U.S. Cl. 361—284 **4 Claims**



1. An improved measuring sensor for capacitive measuring of liquid level in a vessel of the type having a first electrode band embedded in an enamel layer of a steel body serving as an opposite electrode, and where at least part of the capacitance between the first electrode band and the steel body is a function of the dielectric effects of a liquid in electrical proximity to the first electrode band, wherein the improvement comprises a metallic screening band (**2**) which is wider than the first electrode band and which is embedded in the enamel layer (**3**) between the first electrode band (**1**) and the enamel surface, said screening band covering only a portion of the first electrical band providing a screened range of the first electrode band shielded from the dielectric effects of liquid and an unscreened range so that only liquid levels corresponding to the unscreened range affect the capacitance of the sensor.

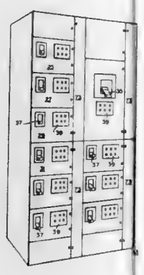
V 9 8 9 K 2 D E 1 1 7 9 UMI

4,178,624

CONTROL CENTER WITH INSULATED BUS BARS

John R. Wilson, Darien; Neal E. Rowe, Bremen Township, Cook County, and Brij M. Bhartecy, Bolingbrook, all of Ill., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 612,606, Sep. 11, 1975, abandoned. This application May 2, 1977, Ser. No. 792,837
Int. Cl.[2] H02B *1/04*
U.S. Cl. 361—341 3 Claims



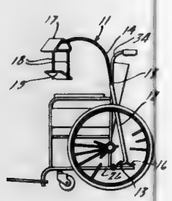
1. A control center for distributing electric power from a power supply source to power consuming devices, comprising a cabinet having a frame providing a compartment on the front side of the cabinet, a plurality of vertical bus bars in said cabinet, a barrier encasing the bus bars and being substantially coextensive therewith and consisting essentially of an electrically insulative material, at least one circuit interrupter in the compartment and having a conductor extending therefrom, the barrier having removable integral surface knockout sections adjacent to the bus bars to provide access to effect connection of the conductor to the bus bar, the knockout sections being demarked from the remainder of the barrier by a zone of reduced thickness, the knockout sections being surrounded by flanges extending from the planar area of the barrier on the side opposite the bus bars, and the barrier and the bus bars being almost completely in surface-to-surface contact with each other and without spacing therebetween except for the locations of the knockout sections when the knockout sections are removed to promote better heat conduction from the bus bars and through the barrier.

4,178,625

LAMP

Marcus T. Schudel, 1313 Maple Blvd., Monroe, Mich. 48161

Filed May 25, 1978, Ser. No. 909,198
Int. Cl.[2] A47B *97/00*
U.S. Cl. 362—131 13 Claims



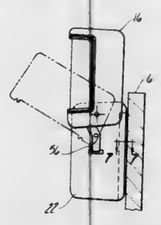
1. A lamp unit embodying a solid tube section, a flexible tube section extending from within said solid tube section outwardly thereof, the bottom of the solid tube section being bent at an angle and flattened, a flat finger extendable into the tube flattened end, a support for said flattened finger, said support being engageable with a supporting element, and means for securing said support in fixed relation to said supporting element with the flat finger parallel to and spaced from said support.

4,178,626

DRAWER LIGHT

Konrad H. Marcus, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Apr. 17, 1978, Ser. No. 896,986
Int. Cl.[2] F21V *33/00*
U.S. Cl. 362—133 8 Claims



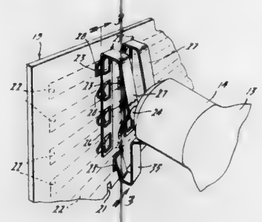
1. An illumination mechanism for a drawer comprising in combination: a housing, means for mounting said housing to a support surface proximate to the area to be illuminated, a lamp assembly pivoted to said housing for rotation between an active position facing said area to be illuminated, and an inactive position facing said support surface, a source of power in said housing, and electrical circuit means between said source and said lamp assembly for energizing the latter when in said active position.

4,178,627

LAMP ASSEMBLY

Erwin L. Baumann, Laguna Beach, Calif., assignor to Ford Aerospace & Communications Corp., Dearborn, Mich.

Filed Jan. 5, 1978, Ser. No. 867,213
Int. Cl.[2] F21V *11/00*
U.S. Cl. 362—240 6 Claims



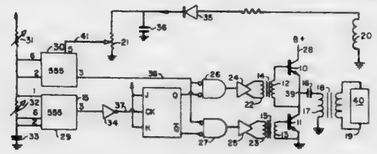
1. A lamp assembly comprising:
a lamp housing having a plurality of light bulb receiving sockets,
an electric ribbon cable,
an elongated slot means in the housing receiving the ribbon cable,
the ribbon cable consisting of a laminate of dielectric material having a plurality of parallel, longitudinally extending, mutually isolated, electrical conductors embedded therein,
the ribbon cable having a plurality of windows in its surface to expose contact surfaces on the conductors,
key slot means longitudinally locating the ribbon cable in the elongated slot means to align each window and thereby a related exposed contact surface with a specific light bulb socket,
and contact means retained within the housing extending from the exposed contact surface on the specific conductor to the specific light bulb socket.

4,178,628

SWITCHING TYPE REGULATED POWER SUPPLY

Francis H. Shepard, Jr., Summit, N.J., assignor to R & I Patent Corporation, Morristown, N.J.

Filed May 12, 1978, Ser. No. 905,232
Int. Cl.[2] H02M *1/08*
U.S. Cl. 363—25 12 Claims



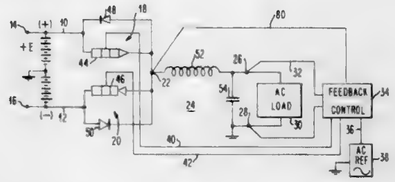
1. A switching type power supply, comprising:
a transformer having primary and secondary windings;
means for coupling said secondary winding to a load;
first and second alternately conductive semiconductor switching elements coupled in circuit with said primary winding, each of said elements having two main electrodes and a control electrode;
the main electrodes of said first element being connected in a first circuit path for supplying current to said primary winding from a source of potential difference during first recurrent time intervals;
the main electrodes of said second element being connected in a second circuit path to permit current flow through said primary winding during second recurrent time intervals when said first circuit path is open; and
a switching control circuit for providing first periodic switching signals to the control electrode of said first element during said first intervals and second periodic switching signals to the control electrode of said second element during said second intervals, said first and second switching signals being noncoincident, the dead time between successive ones of said first and second signals having a predetermined minimum value established by a given resistance-capacitance timing circuit, said circuit comprising (i) a first multivibrator circuit including said given timing circuit having a first output terminal for generating periodic first control pulses having a predetermined width, (ii) a second circuit synchronously coupled to said first multivibrator circuit and having a second output terminal for generating periodic second control pulses having a width at all times not exceeding the width of said first control pulses, (iii) a common resistance—capacitance timing circuit for both of said circuits, such that said first and second control pulses are mutually synchronized, with the leading edges of the first control pulses occurring coincident with the leading edges of the second control pulses, (iv) a bistable circuit having a clock switching terminal and first and second oppositely phased switch control terminals, (v) means for connecting said first output terminal of said first multivibrator circuit to said clock switching terminal, (vi) means for connecting said first control terminal as as input to a first AND circuit and said second control terminal as an input to a second AND circuit, (vii) means for connecting said second output terminal of said second circuit as another input to each of said AND circuits, and (viii) means for coupling the output of said first AND circuit to the control electrode of one of said switching elements and the output of the second AND circuit to the control electrode of the other of said switching elements.

4,178,629

D. C. POWERED A. C. SUPPLY FOR REACTIVE LOADS

George W. Allen, Rhinebeck, and Bruce C. Felton, Saugerties, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 772,784, Feb. 28, 1977, abandoned. This application Jun. 6, 1978, Ser. No. 913,142
Int. Cl.[2] H02M *7/515, 7/537*
U.S. Cl. 363—96 8 Claims



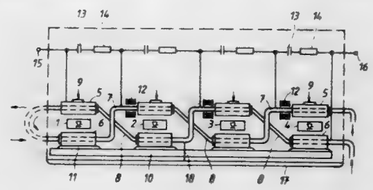
1. A power supply comprising:
direct current source/sink means,
a pair of output terminals for connection to a load,
bi-directional circuit means connected between said source/sink means and said output terminals;
voltage reference means having an output wave form comprising at least an alternating current component,
and feedback means responsive to deviation of the voltage across said output terminals in comparison to the wave form of said reference,
the current source/sink means being responsive to said feedback means to feed current to and accept current from said circuit means, the source/sink means being operative in alternation at a frequency which is high compared to tha of said reference wave form,
wherein said feedback means is operative to provide a feedback signal having a first component which is directly proportional to the error between the voltage across said output terminals and the voltage signal provided by said reference means, and
a second component which is proportional to the first derivative of said error with respect to time whereby said feedback signal includes an element of anticipation so that more accurate tracking with the reference signal is facilitated.

4,178,630

FLUID-COOLED THYRISTOR VALVE

Karl E. Olsson, Ludvika, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Jun. 30, 1978, Ser. No. 920,871
Claims priority, application Sweden, Jul. 12, 1977, 7708073
Int. Cl.[2] H02M *7/00*
U.S. Cl. 363—141 10 Claims



1. A fluid-cooled thyristor valve comprising:
an anode and a cathode connection;
a plurality of thyristors electrically connected in series;
a plurality of electrically conducting cooling bodies posi-

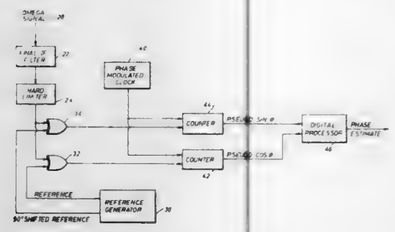
tioned at the anode and cathode sides of said thyristors to pass a cooling fluid to cool said thyristors;
a plurality of electrically conducting fluid pipes cooperating with said electrically conducting cooling bodies to electrically connect the thyristors in series by connecting the cooling body on the anode side of each thyristor with the cooling body on the cathode side of an adjacent thyristor;
a plurality of electrically insulated fluid pipes for connecting the cooling body on the anode side of each thyristor with the cooling body on the cathode side of another adjacent thyristor.

4,178,631

DIGITAL PHASE DETECTOR AND METHOD

Robert L. Nelson, Jr., Austin, Tex., assignor to Tractor, Inc., Austin, Tex.

Filed Feb 13, 1978, Ser. No. 877,259
Int. Cl.² G06F *15/20*; H03D *13/00*
U.S. Cl. 364—484 **17 Claims**



1. A digital phase detector, comprising:
a hard limiter, operably connected to an incoming signal of known frequency to produce a signal square wave having said frequency;
a reference generator, said generator producing a reference square wave and a 90° phase shifted reference square wave, each having said known frequency;
a first logic element operably connected to produce a multiplicative output from the input of said signal square wave and said reference square wave;
a second logic element operably connected to produce a multiplicative output from the input of said signal square wave and said 90° phase shifted reference square wave;
a phase modulated clock;
a first counter operably connected to count said phase modulated clock under control of the output from said first logic element;
a second counter operably connected to count said phase modulated clock under control of the output from said second logic element; and
a digital processor, said processor operably connected to compute a phase estimate from the counts registered by said first and second counters.

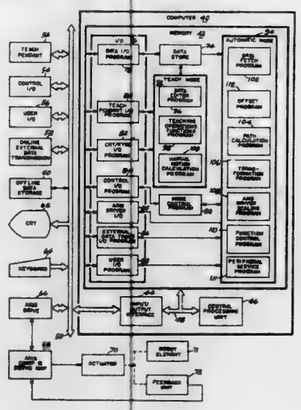
4,178,632

METHOD FOR CONTROLLING THE OPERATION OF A COMPUTER OPERATED ROBOT ARM

Donald W. Anthony, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Mar. 6, 1978, Ser. No. 883,472
Int. Cl.² G06F *15/46*; G05B *19/10*; B25J *9/00*
U.S. Cl. 364—513 **8 Claims**

1. A method for controlling a robot arm in response to sets of command signals stored in a memory, each set of command signals representing a programmed function and absolute coordinate values of a programmed position of the robot arm, said sets of command signals being divided into a first program represented by first sets of command signals and defining a basic cycle of operation of the robot arm and at least one second program represented by second sets of command signals and defining a conditional operation of the robot arm in response to a request signal, said sets of command signals being defined during a teaching mode of operation and being utilized during an automatic mode of operation, the method comprising the steps of:
(a) identifying during the teaching mode of operation one of the second programs as an offset program;
(b) recalling from the memory during the automatic mode of operation the first sets of command signals;
(c) moving the robot arm to the programmed positions defined by the absolute coordinate values of the first sets of command signals;



(d) detecting in response to the robot arm being moved to each programmed position a request for the offset program;
(e) determining offset values in response to the request for the offset program, each offset value representing the algebraic difference between one of the absolute coordinate values of the current programmed position of the robot arm and a corresponding absolute coordinate value of a programmed position in the offset program;
(f) producing new second sets of command signals by modifying the absolute coordinate values of each of the second sets of command signals in the offset program as a function of the offset values; and
(g) moving the robot arm to spatial positions defined by the new second sets of command signals.

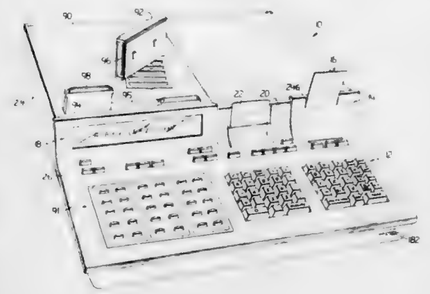
4,178,633

PROGRAMMABLE CALCULATOR INCLUDING MULTIFUNCTION KEYS

Emil E. Olander, Jr., Fort Collins; Rex L. James, Loveland; Ivar W. Larson, Loveland; Wayne F. Covington, Loveland; Jack M. Walden, Loveland; Robert E. Watson, Loveland; Francis J. Yockey, Loveland; Fred Wenninger, Jr., Loveland, and Homer C. Russell, Berthoud, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 510,921, Sep. 30, 1974, Pat. No. 4,028,538, which is a division of Ser. No. 212,581, Dec. 27, 1971, Pat. No. 3,839,630. This application Jun. 1, 1977, Ser. No. 802,323
Int. Cl.² G06F *3/02*
U.S. Cl. 364—709 **2 Claims**

1. An electronic calculator comprising:
keyboard input means including a plurality of alphabetic, numeric, and function keys for entering alphameric information, including algebraic statements, into the calculator, at least one of said function keys representing a plurality of different predetermined functions, each of said plurality of different predetermined functions being designated by a predetermined different number of successive actuations of said one or more of said function keys;
memory means, coupled to said keyboard input means, for storing alphameric information entered into the calculator from said keyboard input means;
processing means, coupled to said keyboard input means and memory means, for processing alphameric information entered into the calculator and stored in said memory means to perform selected functions and to compute the results of selected algebraic statements; and



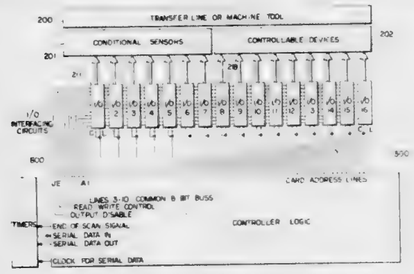
output means, coupled to said processing means, for providing a visual indication of selected alphameric information;
said processing means including logic means responsive to a particular number of successive actuations of one of said one or more of said function keys for causing entry of the one of said different predetermined functions associated therewith that has been designated by the particular number of successive actuations of that key, said processing means thereafter being operative for performing the entered function designated by the particular number of successive actuations of that key without at the same time performing any of the other predetermined functions represented by that key.

4,178,634

PROGRAMMABLE LOGIC CONTROLLER

Peter G. Bartlett, Davenport, Iowa, assignor to Automation Systems Inc., Eldridge, Iowa

Filed Jul. 11, 1977, Ser. No. 814,836
Int. Cl.² G06F *3/04, 9/06*
U.S. Cl. 364—900 **19 Claims**



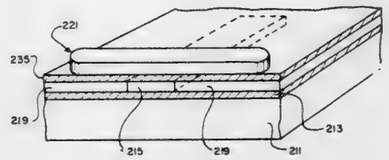
1. A programmable logic controller comprising:
(a) one bit output circuits having predetermined addresses;
(b) one bit input circuits having predetermined addresses;
(c) a one bit accumulator;
(d) means for generating a succession of program statements in the form of multiple-bit binary logic; and
(e) means for processing said program statements in succession to cause said output circuits to change state in response to the states of said accumulator, said output circuits and said input circuits and in response to said program statements, said processing means being operable upon a single statement at any given time and including
(1) a random access memory having several locations, each of said locations being for storage of a bit of binary logic, and each of said locations having a selected address different from said addresses of said input or output circuits,
(2) said processing means including means for addressing said locations in response to said program statements,
(3) said random access memory being divided into both a retentive portion and a non-retentive portion, each including several locations, each location being for storage of a bit of binary logic,
(4) means for automatically resetting, upon resumption of power to the controller after interruption, the memory in at least those locations in the non-retentive portions of the memory which were addressed in response to said program statements prior to said power interruption, and
(5) memory holding means including a battery for supplying power to said retentive portion when power to the controller is interrupted, said power being sufficient to maintain the bit status of the memory in said retentive portion, said memory holding means thus preventing said means for automatically resetting from resetting locations in said retentive portion.

4,178,635

PLANAR AND NEAR PLANAR MAGNETIC BUBBLE CIRCUITS

Donald K. Rose, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 14, 1976, Ser. No. 695,609
Int. Cl.² G11C *11/14*
U.S. Cl. 365—19 **7 Claims**



1. A magnetic bubble circuit device comprising:
a substrate of a magnetic material capable of sustaining magnetic bubble domains in the presence of a bias magnetic field;
a nominally electrically conducting layer on the substrate having regions of an electrically conducting material contiguous with insulating regions of the anodic oxide of said conducting material, said insulating regions having been formed by selective anodization of said nominally electrically conducting layer so that said electrically conducting regions and said insulating regions have substantially co-planar top surfaces; and

a substantially planar pattern of elements of a magnetic material on said layer of electrically conducting and insulating regions.

4,178,636
GRADIENTLESS PROPULSION OF MAGNETIC BUBBLE DOMAINS

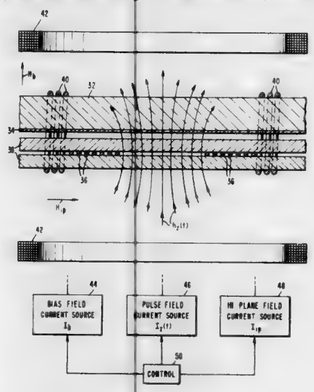
Bernell E. Argyle, Putnam Valley; John C. Slonczewski, Katonah, and Pieter Dekker, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 659,880, Feb. 20, 1976, abandoned.
This application Feb. 15, 1978, Ser. No. 877,928
Int. Cl.[2] G11C 19/08
U.S. Cl. 365—30 **39 Claims**

1. An apparatus for moving magnetic bubble domains having Bloch lines therein in a magnetic medium in the absence of active magnetic or conductor propagation elements, including:

means for applying a magnetic field in the plane of said medium,

means for applying a time varying magnetic field characterized by the absence of spatial gradients, said time varying magnetic field having a sufficient magnitude and sufficiently fast rise time or fall time to move said bubbles in said magnetic medium.



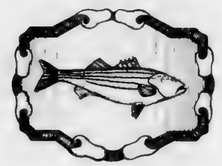
DESIGNS

DECEMBER 11, 1979

253,616
BELT BUCKLE

Ryk Van Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.

Filed Apr. 7, 1978, Ser. No. 894,580
Term of patent 14 years
Int. Cl. D2—07
U.S. Cl. D2—431



253,617
BELT BUCKLE

Ryk Van Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.

Filed Apr. 7, 1978, Ser. No. 894,581
Term of patent 14 years
Int. Cl. D2—07
U.S. Cl. D2—431



253,618
BELT BUCKLE

Ryk Van Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.

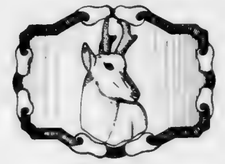
Filed Apr. 7, 1978, Ser. No. 894,582
Term of patent 14 years
Int. Cl. D2—07
U.S. Cl. D2—431



253,619
BELT BUCKLE

Ryk Van Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.

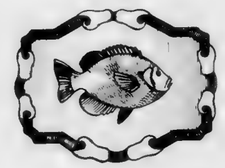
Filed Apr. 7, 1978, Ser. No. 894,583
Term of patent 14 years
Int. Cl. D02—07
U.S. Cl. D2—431



253,620
BELT BUCKLE

Ryk Van Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.

Filed Apr. 7, 1978, Ser. No. 894,584
Term of patent 14 years
Int. Cl. D02—07
U.S. Cl. D2—431



253,621
BELT BUCKLE

Ryk Van Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.

Filed Apr. 7, 1978, Ser. No. 894,585
Term of patent 14 years
Int. Cl. D02—07
U.S. Cl. D2—431

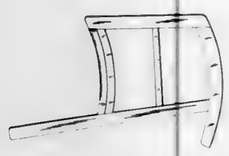


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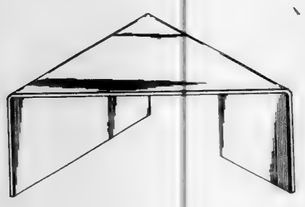
253,622
BELT BUCKLE
Ryk Van Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.
Filed Apr. 7, 1978, Ser. No. 894,586
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—431



253,623
ROCKING CHAIR
France Berlic, 37-31 73rd St., Jackson Heights, N.Y. 11372
Filed Dec. 6, 1977, Ser. No. 857,923
Claims priority, application Yugoslavia, Jun. 6, 1977, 142/77
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—49



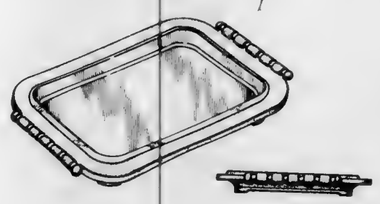
253,624
MODULAR TABLE OR THE LIKE
Dolores R. Browne, 2011 Spruce St., Philadelphia, Pa. 19103
Filed Aug. 8, 1977, Ser. No. 822,853
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—145



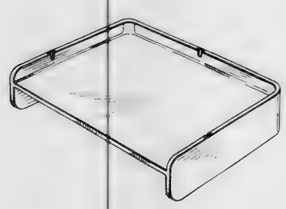
253,625
SPEAKER STAND
Larry K. Davis, 1701 S. Florence, Tulsa, Okla. 74104
Filed Oct. 28, 1977, Ser. No. 846,390
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—184



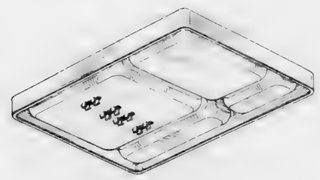
253,626
PLATTER
Richard N. Brandon, c/o Marco Tool & Die, 6868 Homestretch Rd., Dayton, Ohio 45414
Filed Jun. 6, 1977, Ser. No. 804,103
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—21



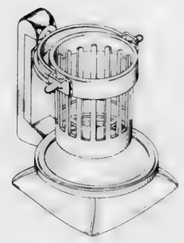
253,627
TRAY
Gerald J. Adamson, Toronto, Canada, assignor to Business Accessories Inc., Cambridge, Canada
Filed Aug. 1, 1977, Ser. No. 821,048
Claims priority, application Canada, May 3, 1977, 0305774
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—37



253,628
TRAY
Gerald J. Adamson, Toronto, Canada, assignor to Business Accessories Inc., Cambridge, Canada
Filed Aug. 1, 1977, Ser. No. 821,049
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—38



253,629
CUP HOLDER
James O. Sage, 2112 Strand, Manhattan Beach, Calif. 90266
Filed Aug. 15, 1977, Ser. No. 824,990
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—70



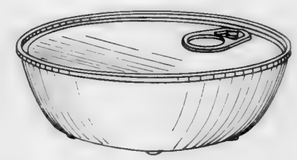
253,630
BOTTLE
Robert J. McCredie, Spring Lake Heights, N.J., assignor to J. L. Prescott Co., Passaic, N.J.
Filed Apr. 7, 1977, Ser. No. 785,768
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—60



253,631
TOOTHPASTE TUBE OR THE LIKE
Dennis L. Cuddy, 1018 Nichols Dr., Raleigh, N.C. 27605
Filed Jun. 2, 1977, Ser. No. 802,775
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—194



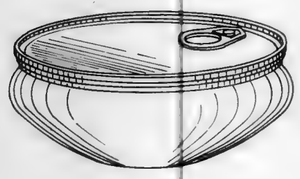
253,632
PACKAGING CONTAINER OR THE LIKE
Carmen T. Mascia, Clarendon Hills, Ill., assignor to The Continental Group, Inc., New York, N.Y.
Filed Aug. 15, 1977, Ser. No. 824,369
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—220



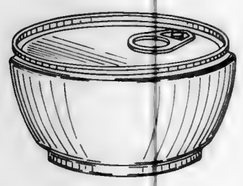
253,633
PACKAGING CONTAINER OR THE LIKE
Carmen T. Mascia, Clarendon Hills, Ill., assignor to The Continental Group, Inc., New York, N.Y.
Filed Aug. 15, 1977, Ser. No. 824,368
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—220



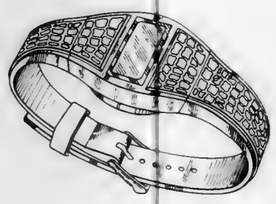
253,634
PACKAGING CONTAINER OR THE LIKE
Carmen T. Mascia, Clarendon Hills, Ill., assignor to The Continental Group, Inc., New York, N.Y.
Filed Aug. 15, 1977, Ser. No. 824,370
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—220



253,635
PACKAGING CONTAINER OR THE LIKE
Carmen T. Mascia, Clarendon Hills, Ill., assignor to The Continental Group, Inc., New York, N.Y.
Filed Aug. 15, 1977, Ser. No. 824,664
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—220



253,636
WRIST WATCH
Eugene J. Sulek, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Aug. 8, 1977, Ser. No. 822,492
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—32



253,637
ARTICULATABLE PARKING SPACE BARRIER
Dennis L. Welbourne, 3019 W. Rancho Dr., Phoenix, Ariz. 85017
Filed Mar. 13, 1978, Ser. No. 885,694
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—109



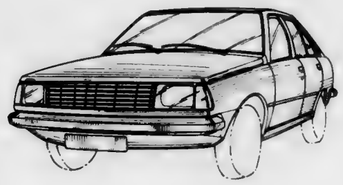
253,638
POOL EQUIPMENT CART
Keith L. Killingsworth, 73197 Adobe Springs, Palm Desert, Calif. 92660
Filed May 19, 1978, Ser. No. 907,781
Term of patent 3½ years
Int. Cl. D12—*02*
U.S. Cl. D12—34



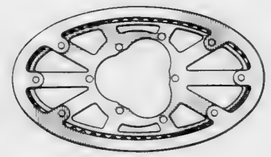
253,639
CONVEYOR BELT
Ronald D. Bourgeois, 138 Ellison Park, Waltham, Mass. 02154
Filed Dec. 26, 1978, Ser. No. 973,392
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—60



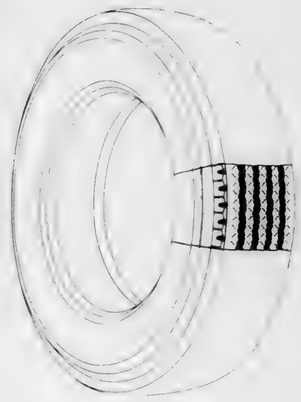
253,640
CAR BODY
Michel Tixier, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Billiancourt, France
Filed Dec. 13, 1977, Ser. No. 860,073
Claims priority, application France, Jun. 14, 1977, 75 754
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—92



253,641
COMBINED BICYCLE SPROCKET AND DEFLECTOR PLATE
Curtis W. Tritchka, P. O. Box 6, Fallbrook, Calif. 92028
Filed Nov. 21, 1977, Ser. No. 853,199
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—123



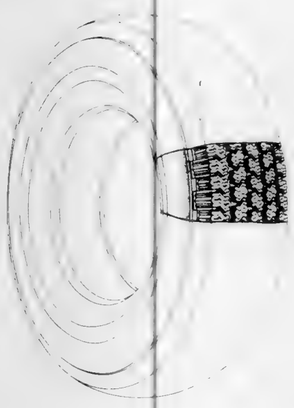
253,642
TIRE
Guy Amarger, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jul. 28, 1978, Ser. No. 929,207
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142



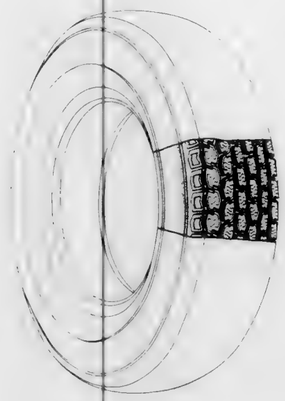
253,643
VEHICLE TIRE
Shigeo Makino, Tokorozawa; Hiroshi Kojima, Hino; Toshio Hayakawa, Higashi-Murayama, and Shigeo Watanabe, Kokubunji, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Jun. 27, 1977, Ser. No. 810,370
Claims priority, application Japan, Apr. 22, 1977, 52-14884
The portion of the term of this patent subsequent to Mar. 22, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142



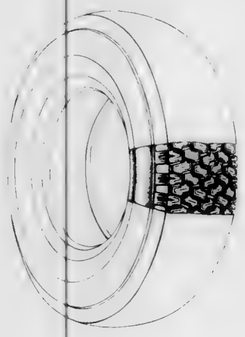
253,644
TIRE
Jean-Claude Peron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jun. 16, 1978, Ser. No. 916,301
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



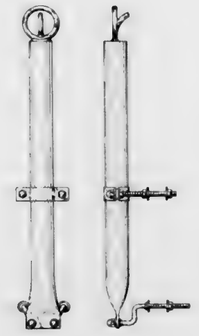
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TIRE
Jean-Claude Peron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jun. 16, 1978, Ser. No. 916,303
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



253,646
TIRE
Jean-Claude Peron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Dec. 7, 1978, Ser. No. 967,372
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—151



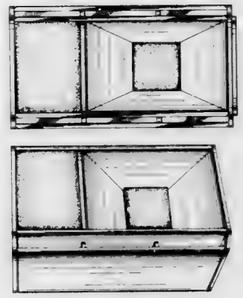
253,647
WATER SKI TOW HITCH
James F. Sell, R.R. #3, Box 157, Muncie, Ind. 47302
Filed May 18, 1977, Ser. No. 798,257
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D12—162



253,648
RECORD PLAYER
Kazuhito Ohtomo, c/o Sansui Electric Co., Ltd., No. 14-1, 2-chome, Izumi, Suginami-ku, Tokyo, Japan
Filed Jun. 6, 1977, Ser. No. 803,920
Claims priority, application Japan, Dec. 6, 1976, 51-47507
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—17



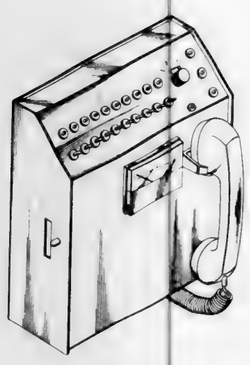
253,649
LOUDSPEAKER
Robert S. Peveto, Dallas, Tex., assignor to Beta Sound, Incorporated, Dallas, Tex.
Filed Nov. 11, 1977, Ser. No. 850,653
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—33



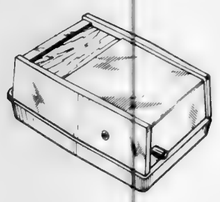
253,650
LOUDSPEAKER ENCLOSURE
Richard P. Shahinian, 1004 Old Medford Ave., Farmingville, N.Y. 11738
Filed Sep. 15, 1977, Ser. No. 833,573
Term of patent 14 years
Int. Cl. D14—*03;* D30—*02*
U.S. Cl. D14—34



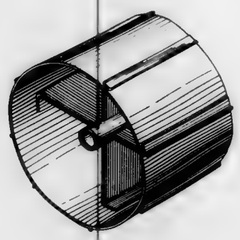
253,651
WALL MOUNTED CABINET FOR A PUBLIC ADDRESS SYSTEM
Paul E. Richards, P.O. Box 11536, San Diego, Calif. 92111
Filed Oct. 11, 1977, Ser. No. 841,329
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—52



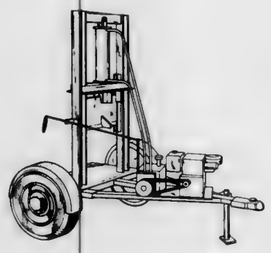
253,652
AIR PUMP OR SIMILAR ARTICLE
Peter A. Maryanski, Middletown, N.J., assignor to Metaframe Corporation, Elmwood Park, N.J.
Filed Feb. 17, 1978, Ser. No. 878,932
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—8



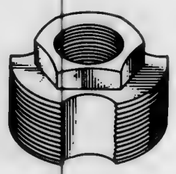
253,653
ROTOR FOR FOOD GRINDER
Ralph E. Reiner, 6474 Chestnut La., Orchard Park, N.Y. 14127
Filed Nov. 4, 1977, Ser. No. 848,453
Term of patent 14 years
Int. Cl. D7—*04;* D15—*08*
U.S. Cl. D15—98



253,654
TRAILER-MOUNTED LOG SPLITTER
Troy S. Davis, 800 Ross Trail, Arlington, Tex. 76012
Filed Sep. 19, 1978, Ser. No. 943,860
Term of patent 14 years
Int. Cl. D15—*09;* D12—*10*
U.S. Cl. D15—127



253,655
COLLET STOP
Philip H. Novodvorsky, 3700 Harding St., Long Beach, Calif. 90805
Filed May 22, 1978, Ser. No. 908,012
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—138



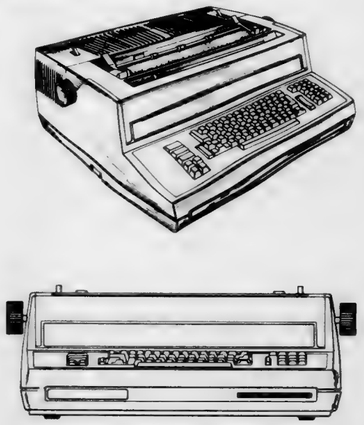
253,656
PAIR OF SPECTACLES
Richard M. Beane, E. Providence, R.I., assignor to American Optical Corporation, Southbridge, Mass.
Filed Jan. 3, 1978, Ser. No. 866,326
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



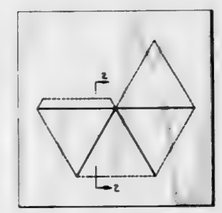
253,657
PAIR OF SPECTACLES
Richard M. Beane, E. Providence, R.I., assignor to American Optical Corporation, Southbridge, Mass.
Filed Jan. 3, 1978, Ser. No. 866,328
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



253,658
PRINTER/KEYBOARD FOR AN ELECTRONIC TYPING SYSTEM OR SIMILAR ARTICLE
Gregory F. Fossella, Boston, Mass.; Dan W. Matthias, Honey Brook, Pa., and Michael J. Mercadante, North Quincy, Mass., assignors to Exxon Research & Engineering Co., Florham Park, N.J.
Filed Jan. 30, 1978, Ser. No. 873,726
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—1



253,659
COMBINED RECORD JACKET AND DETACHABLE ERECTABLE PYRAMID
James F. Weeks, P. O. Box 7245, Macon, Ga. 31202
Filed Dec. 23, 1976, Ser. No. 753,812
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—26

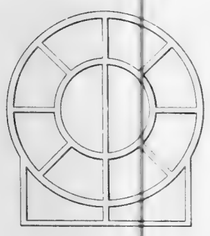


V 9 8 9 2 2 DEC 11 79 UMI

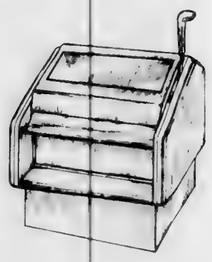
253,660
BALL-POINT PEN
Alain Carré, Paris, France, assignor to Waterman S.A.
Filed Apr. 7, 1977, Ser. No. 785,760
Claims priority, application France, Oct. 14, 1976, 75.144
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—51



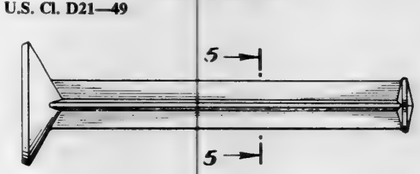
253,661
GAME PLAYING FIELD FRAME
LaMar Hopkins, R.D. 1, Norristown, Pa. 19401
Filed Sep. 26, 1977, Ser. No. 836,539
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—2



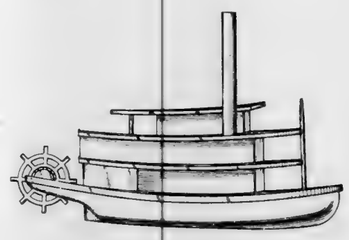
253,662
COIN-OPERATED GAMING MACHINE
Edward J. Stulik, Jr., Calabasas, Calif., assignor to Bally Manufacturing Corporation, Chicago, Ill.
Filed Jul. 19, 1977, Ser. No. 817,119
Claims priority, application United Kingdom, Apr. 13, 1977, 979664
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—38



253,663
DART
Bernard J. Cagan, Los Angeles, and Kenneth L. McQuary, Hermosa Beach, both of Calif., assignors to Placo Products Company
Filed Apr. 10, 1978, Ser. No. 895,145
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—49



253,664
TOY RIVER BOAT
Charles E. Hughes, 172 W. Eugenie St., Chicago, Ill. 60614
Filed Feb. 28, 1977, Ser. No. 772,973
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—130



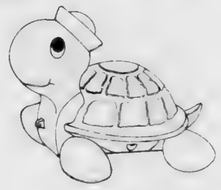
253,665
FIGURE TOY
Shigeru Saitoh, Tokyo, Japan, assignor to Masudaya Toy Company Limited, Tokyo, Japan
Filed Jul. 29, 1977, Ser. No. 820,394
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—149



253,666
FIGURE TOY
Shigeru Saitoh, Tokyo, Japan, assignor to Masudaya Toy Company Limited, Tokyo, Japan
Filed Aug. 1, 1977, Ser. No. 820,789
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—149



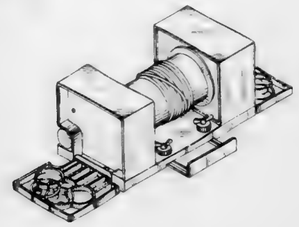
253,667
TOY TURTLE
Walter P. Doe, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 10, 1978, Ser. No. 876,845
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—157



253,668
TOY OCTOPUS
Akira Takasaka, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Jun. 21, 1978, Ser. No. 917,682
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—157



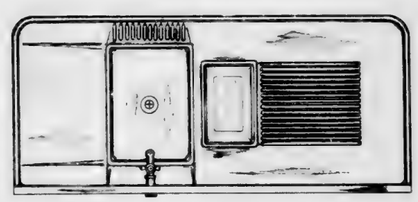
253,669
PHYSICAL EXERCISER
Thomas Turk, Pokfulam, Hong Kong, assignor to Portagym International Limited, Hong Kong, Hong Kong
Filed May 9, 1978, Ser. No. 904,148
Claims priority, application United Kingdom, Nov. 23, 1977, 982394
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—195



253,670
ICE SKATE
Holger B. I. Gustavsson, Nymilsgatan 5, 421 37 Västra Frölunda, Sweden; Adolf Hensler, and Ferdinand Haizinger, both of Michael Gruberstr. 10, A 8580 Köflach, Austria
Continuation of Ser. No. 684,896, May 10, 1976. This application Oct. 3, 1977, Ser. No. 839,288
Claims priority, application Sweden, Nov. 10, 1975, 2228
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—225

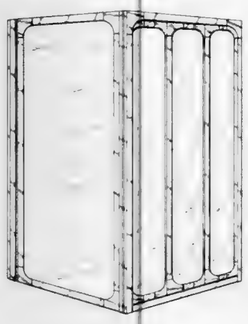


253,671
COMBINED SINK AND TABLE
Albert L. Kinsey, 18010 Burbank Dr., Potomac, Md. 20854
Filed Apr. 10, 1978, Ser. No. 895,187
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—61

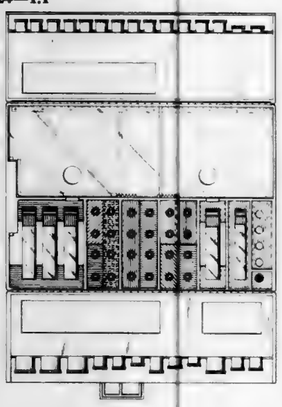


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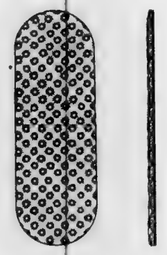
253,672
WALL UNIT FOR A CORNER SHOWER
Heinz G. Baus, Ulmenweg 46, Thun (Bern), Switzerland
Filed Sep. 1, 1977, Ser. No. 829,828
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1977, 193
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69



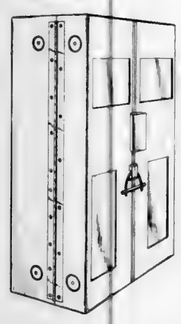
253,673
CARDIOPULMONARY RESUSCITATION KIT
Robert T. McKenzie, Syracuse, N.Y., assignor to Bristol-Myers Company, New York, N.Y.
Filed Aug. 7, 1978, Ser. No. 931,836
Term of patent years
Int. Cl. D24—*01*; D6—*01*
U.S. Cl. D24—1.1



253,674
THIN ABSORBENT PAD FOR A PANTY LINER OR THE LIKE
Howard A. Whitehead, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Feb. 13, 1978, Ser. No. 877,405
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—51



253,675
NAIL TREATMENT IMPLEMENT
William J. Rakocy, Nutley, and Ronald L. Muller, New Milford, both of N.J., assignors to North American Philips Corporation, New York, N.Y.
Filed Apr. 25, 1977, Ser. No. 790,686
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—58





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TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF DECEMBER, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Hyytinen, Niilo M., 4,178,340, Cl. 264-73.000.
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Abe, Keiji: *See*—
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Abe, Sigeya: *See*—
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Abex Corporation: *See*—
Frank, Earl E.; and Yee, Bing S., 4,177,837, Cl. 138-31.000.
Abrahamson, Daniel P. Method and apparatus for cubing brick. 4,178,122, Cl. 414-110.000.
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; by Boguslavskaya, Khaya S., administrator; by Komar, Olga E., administrator; and by Komar, Alexandr E., administrator. Method for producing mineral binder. 4,178,219, Cl. 204-157.10H.
Acampora, Anthony; Reudink, Douglas O. J.; and Yeh, Yu S., to Bell Telephone Laboratories, Incorporated. Method and apparatus to permit substantial cancellation of interference between a received first and second signal. 4,178,550, Cl. 325-41.000.
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Laitkep, Anthony A.; Meyer, Danny S.; and Sitton, Willard J., 4,177,998, Cl. 277-59.000.
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Achelpohl, Fritz, to Windmoller & Holscher. Lifting gear for filled sacks. 4,178,031, Cl. 294-82.00R.
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Ohling, Robert S., 4,177,648, Cl. 62-73.000.
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Adams, Charles D.; Cummins, Earl W.; and Gleich, Steven I., to Du Pont de Nemours, E. I., and Company. Process for preparing herbicidal triazines. 4,178,448, Cl. 544-194.000.
Adams, Kenneth D.; and Brauch, Robert B., to Singer Company, The. Needle bar guide for a sewing machine. 4,177,745, Cl. 112-221.000.
Adams, Michael E. Mounting for two pairs of cymbals. 4,177,709, Cl. 84-422.00R.
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Beaver, Robert I., II; Adams, Michael J.; Prodanovich, George L.; Key, Paul F.; Rawlings, Don O.; Santhanam, P.; and Hunt, Susan L., 4,178,113, Cl. 406-10.000.
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Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Angelini, Theophile A.; Nayrole, Bernard J. P.; Jessel, Maurice J.; Canevet, Georges; Mangiante, Gerard A.; and Carbone, Bernard, 4,177,874, Cl. 181-206.000.
Huet, Philippe; Milleon, Roger H.; and Leprince, Philippe, 4,178,563, Cl. 331-94.5PE.
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Ahroni, Joseph M. Fused electrical plug. 4,178,061, Cl. 339-147.00P.
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Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; Shimizu, Masami; and Takishima, Yoshiyuki, 4,178,086, Cl. 354-152.000.
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Andersen, Axel; Knudsen, Poul U.; and Jensen, Knud B., 4,178,069, Cl. 350-96.230.
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Albright, Jay D.: *See*—
Dusza, John P.; and Albright, Jay D., 4,178,449, Cl. 544-281.000.
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Metrailer, William J.; Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,178,227, Cl. 208-50.000.
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Allgeier, Hans; and Gagneux, Andre, to Ciba-Geigy Corporation. Etherified triazolobenzodiazepine derivatives. 4,178,378, Cl. 424-269.000.
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Deconinck, Didier, 4,177,901, Cl. 211-105.100.
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Farkas, Kalman; and Krebs, Gary A., 4,177,610, Cl. 51-241.00S.
Raber, Harry M., 4,177,999, Cl. 277-112.000.
Altarctic Engineering & Construction Ltd.: *See*—
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Aluminum Company of America: *See*—
Hawkins, Ronald G., 4,178,467, Cl. 174-40.00R.
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Alvarez Domingo, Mercedes: *See*—
Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, 4,178,450, Cl. 546-63.000.
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Amann, Robert; Lattmann, Werner; and Wildbolz, Rudolf, to Rieter Machine Works, Ltd. Apparatus for dividing a flock-laden air stream in pneumatic transporting systems for spinning machines. 4,178,114, Cl. 406-155.000.
Amazawa, Kiyoshi; and Mori, Masaharu, to Clarion Co., Ltd. Noise eliminating circuit. 4,178,552, Cl. 325-479.000.
Amchem Products, Inc.: *See*—
Lochel, Frank P., Jr., 4,178,400, Cl. 427-435.000.
American Can Company: *See*—
Meyers, George L., 4,177,715, Cl. 93-37.00R.
American Cyanamid Co.: *See*—
Berkelhammer, Gerald; and Kameswaran, Venkataraman, 4,178,460, Cl. 562-426.000.
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Fetchin, John A.; and Tsu, Kin H., 4,178,310, Cl. 260-561.00N.
Schaub, Robert E.; and Weiss, Martin J., 4,178,461, Cl. 562-463.000.
Wissner, Allan; Weiss, Martin J.; and Bernady, Karel F., 4,178,456, Cl. 560-53.000.

American Home Products Corporation: *See—*
Sarantakis, Dimitrios, 4,178,284, Cl. 260-112.50R.

American Hospital Supply Corporation: *See—*
Grow, Harry N.; and Zboralski, Jon A., 4,177,717, Cl. 98-115.0LH.
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American Minechem Corporation: *See—*
Messer, Leonard, 4,178,243, Cl. 210-54.000.

American Optical Corporation: *See—*
Metcalfe, Richard T., 4,178,081, Cl. 351-153.000.

American Sunroof Corporation: *See—*
Kalitz, Milton C., 4,178,036, Cl. 296-137.00B.

AMP Incorporated: *See—*
Fleischhacker, James E.; and Wasserlein, Henry G., Jr., 4,178,055, Cl. 339-98.000.
Hoover, Charles D., 4,178,068, Cl. 350-96.210.
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Kocher, Timothy L.; and Bennett, Benny M., 4,178,051, Cl. 339-45.00M.
Laudig, Ronald C., 4,178,054, Cl. 339-95.00R.

AMSTED Industries Incorporated: *See—*
Stanley, John M.; and Greene, Bernard A., 4,178,001, Cl. 277-152.000.

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Anaconda Company, The: *See—*
Arentzen, Charles, 4,178,174, Cl. 75-74.000.

Andersen, Axel; Knudsen, Poul U.; and Jensen, Knud B., to Aktieselskabet Nordiske Kabel-Traadfabriker. Process for preparing an optical element for incorporation into optical transmission means. 4,178,069, Cl. 350-96.230.

Anderson, Charles E., to Cherne Industries, Inc. Internal pipe cutter. 4,177,559, Cl. 30-105.000.

Anderson Company of Indiana, The: *See—*
Roadarmel, Gary W., 4,177,537, Cl. 15-250.320.

Anderson, Donald F.; and Yu, Arthur J., to Stauffer Chemical Company. Internally stabilized vinyl chloride polymers comprising calcium and zinc acrylates. 4,178,423, Cl. 526-240.000.

Anderson, James M.: *See—*
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Ando, Kunio: *See—*
Fukuzawa, Kenichi; Ando, Kunio; and Fukushima, Masakazu, 4,178,532, Cl. 313-414.000.

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Andres, Rudolf; and Knoll, Heinz W., to Daimler-Benz Aktiengesellschaft. Triggering installation for a passenger protection device in a vehicle. 4,178,016, Cl. 280-734.000.

Andrew Corporation: *See—*
Schmidt, Daniel R., Jr.; and Busse, Joseph F., 4,178,576, Cl. 343-781.00R.

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Attwood, Brian E. Class D amplifier system. 4,178,556, Cl. 330-10.000.

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Metcalfe, Robert A.; and Bourdeau, Romeo G., 4,178,335, Cl. 264-8.000.
Bourgeois, Ronald D. Wetting station, rotating conveyor station, self cleaning conveyor unit, and conveyor system using same. 4,177,753, Cl 118-16.000
Bourgery, Guy R.; Lacour, Alain P., Moinet, Gerard H.; Pourrias, Bernard M.; and Ruch, Anne-Marie P., to Delalande S. A. Novel cinnamoyles piperazines and homopiperazines, the method of preparing them and their application in therapeutics. 4,178,442, Cl. 542-440.000.
Bourns, Inc.: *See—*
Munson, Ramon J., 4,177,830, Cl. 137-501.000.
Bout, Daniel, to Institut National de la Sante et de la Recherche Medicale - Centre de Technologie Biomedicale I.N.S.E.R.M.; and Institut Pasteur. Method of preparing an antiparasitic immunological agent, the product obtained, and its application. 4,178,365, Cl. 424-88.000.
Boutin, Jean; and Neel, Jean, to Rhone-Poulenc Industries. Process for the preparation of water-soluble acrylic polymers by photopolymerization. 4,178,221, Cl. 204-159.230.
Bowe, Gerald J.; and Skuba, Thadeus, to Bowe, Gerald J. Automatic energy saver and fire damper for exhaust systems. 4,177,716, Cl. 98-115.0SB.
Bowen, Galt S.: *See—*
Sanders, Louis H.; Watkins, Kenneth L.; and Bowen, Galt S., 4,177,868, Cl. 177-211.000.
Bowen, John G., to Rincon Industries, Inc. Heating unit indicator for disinfecting soft lenses, or the like. 4,178,499, Cl. 219-439.000.
Bowes, Quentin: *See—*
Haase, Jaroslav; Liechti, Peter; Wegmuller, Hans; Wurster, Rudolf F.; and Bowes, Quentin, 4,178,438, Cl. 536-30.000.
Bowling, Roger: *See—*
Aldridge, David C.; Bowling, Roger; and Swait, John C., 4,178,213, Cl. 195-81.000.
Bowthorpe-Hellermann Limited: *See—*
McCormick, Mathew, 4,178,057, Cl. 339-103.00M.
Boy, Aristide; Galy, Henri; Ivaldi, Raoul; and Passedroit, Hubert, to Ato Chimie. Process for preparing sulphonic acids and sulphonates. 4,178,307, Cl. 260-504.00S.
Brakebill, Harold G.; and Dexter, Edwin M., to Robertshaw Controls Company. Condition responsive valve construction and method of making the same. 4,177,924, Cl. 236-86.000.
Brandes, Wilhelm; Daum, Werner; and Kraus, Peter, to Bayer Aktiengesellschaft. Fungicidally active oxime-ethers of isonitrosocyanoacetamides. 4,178,383, Cl. 424-304.000.
Brandt, Harold H. Hillside attachment for combines. 4,177,628, Cl. 56-209.000.
Branson Ultrasonics Corporation: *See—*
Dussault, Jean G. M.; Geckle, Robert A.; and Puskas, William L., 4,178,188, Cl. 134-1.000.
Brauch, Robert B.: *See—*
Adams, Kenneth D.; and Brauch, Robert B., 4,177,745, Cl 112-221.000.
Braud, Societe Anonyme: *See—*
Delfosse, Gilbert, 4,177,891, Cl. 198-570.000.
Bray, Geddes A., to Mather & Platt Limited. Sprinkler arrangements. 4,177,862, Cl. 169-17.000.
Breda Termomeccanica S.p.A.: *See—*
Panzeri, Cesare, 4,177,644, Cl. 60-721.000.
Bresler, Boris M.: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.
Brickman, Harold. Foldable convertible stool-table-bar. 4,177,737, Cl. 108-11.000.
Bridgestone Tire Company Limited: *See—*
Ogawa, Hiroshi; Aoki, Shigeta; and Arai, Tatsuo, 4,177,850, Cl. 152-209.00R.
Brihier, Gerard C. C., to Facom. Apparatus for testing the operation of a device controlling the ignition of an internal combustion engine. 4,178,541, Cl. 324-385.000.
Brina, Guido J. Container with mixing cartridge. 4,177,938, Cl. 222-80.000.
Brindopke, Dieter, to Robert Krups. Electrically heatable household appliance. 4,178,500, Cl. 219-524.000.
Bristol-Myers Company: *See—*
Thomas, Ralph H., 4,177,939, Cl. 222-153.000.
Broccali, Giampietro: *See—*
Menguzzi, Riccardo; Pifferi, Giorgio; Pinza, Mario; and Broccali, Giampietro, 4,178,444, Cl. 544-30.000.
Brod, Heinrich: *See—*
Gorges, Helmut; Brod, Heinrich; Pulvermacher, Wilfried; Rubens, Wolfgang; and Fischer, Otto, 4,178,173, Cl. 75-60.000.
Brodt, Rudolf: *See—*
Steck, Werner; Brodt, Rudolf; Sarnecki, Wilhelm; Jakusch, Helmut; Ohlinger, Manfred; and Koester, Eberhard, 4,178,171, Cl. 75-0.5AA.
Brooks, Alfred W., to Cannon Limited. Organic material treatment process. 4,177,575, Cl. 34-13.000.
Brotherston, Colin P., to Lucas Industries Limited. Pressure regulator for a fluid pump. 4,178,137, Cl. 417-294.000.
Brown, Alfred; Reynolds, Brian L.; and Hall, Wilbur L., to Texaco Inc. High vertical conformance steam drive oil recovery method. 4,177,752, Cl. 166-263.000
Brown, Robert C.; and Mickschl, Lyle H., to Minnesota Mining and Manufacturing Company. Tape structure and garment closure made therewith. 4,177,812, Cl. 128-284.000.
Brown, Thomas G., to Reed Manufacturing Company. Internal cutter for trimming plastic pipe. 4,177,558, Cl. 30-103.000.
Brown, Thomas W.: *See—*
Cook, Brian A.; and Brown, Thomas W., 4,178,260, Cl. 252-49.800.
Brown, William F., to Wausau Homes, Inc. Fireproof barrier coating compositions. 4,178,273, Cl. 260-29.4UA.
Brown & Williamson Tobacco Corporation: *See—*
Psaras, John D., 4,177,576, Cl. 34-33.000.
Brubaker, James E., to United States of America, Energy. Self locking drive system for rotating plug of a nuclear reactor. 4,178,208, Cl. 176-30.000.
Bruesselbach, Hans W.: *See—*
Hon, David T.; Bruesselbach, Hans W.; Muir, Alexander R.; and Tuchnyer, Harold J., 4,178,561, Cl. 350-6.600.
Brugger, Richard D., to Ball Corporation. Mold reader. 4,178,516, Cl. 250-566.000.
Brugler, Richard K., to Heltzel Company. Mobile side-by-side batching plant. 4,178,117, Cl. 414-21.000.
Brunnee, Curt; Franzen, Jochen; and Meier, Stefan, to Varian Mat GmbH. Ionization of organic substances on conveyor means in mass spectrometer. 4,178,507, Cl. 250-282.000.
Bruno, Roberto: *See—*
Azzerri, Nazzareno; and Bruno, Roberto, 4,178,194, Cl. 148-111.000.
Bryant, Herman G., Jr.; Norman, Vello; and Williams, Thomas B., to Liggett Group Inc. Tobacco composition. 4,177,822, Cl. 131-17.00R.
Bubar, Stanley F.; and Jennings, David L., to General Electric Company. Aluminum base for electric lamps having a plastic coating for improved corrosion resistance. 4,178,059, Cl. 339-115.00R.
Buchel, Erwin; de Fluiter, Ruurd; Wild, Peter J.; and Wullschleger, Jorg, to BBC Brown Boveri & Company, Limited. Method for the production marking of liquid displays. 4,177,729, Cl. 101-129.000.
Buchele, Wesley F.; Jeffries, Dennis L.; Madson, Ricky D.; Mattson, Timothy J.; Sparks, Gregory E.; Thompson, Raymond D.; and Uehle, Howard T., to Iowa State University Research Foundation, Inc. Compactor device for large round bales. 4,177,723, Cl. 100-8.000.
Budd, Tom A.: *See—*
Johnson, Eric A., III; Moore, Melvin E.; and Budd, Tom A., 4,177,724, Cl. 100-26.000
Budzyn, Boleslaw L.: *See—*
Siegel, Martin; Millevoi, Eugene; and Budzyn, Boleslaw L., 4,177,622, Cl. 53-511.000.
Bunch, Robert E. Tool for flaring pipe end portions. 4,178,148, Cl. 425-393.000
Bunker Ramo Corporation: *See—*
Coleman, Dennis C., 4,177,680, Cl. 73-718.000.
Marz, Frank H., 4,177,630, Cl. 58-7.000.
Burg, Karlheinz: *See—*
Becker, Udo; Burg, Karlheinz; Fischer, Johann P.; and Heimburger, Norbert, 4,178,329, Cl. 525-77.000.
Burkert, Rudolf; Flockenhaus, Claus; Meckel, Joachim F.; and Wagener, Dietrich, to Didier Engineering GmbH. Process for conveying hot crude coke oven gas from coke ovens to a position of utilization while preventing condensation of higher hydrocarbons. 4,178,266, Cl 252-373.000.
Burki, Jean-Jacques; Dill, Hans G.; and Hubner, Kurt, to Ebauches Electroniques S.A. Electronic watch. 4,177,632, Cl. 58-23.0BA.
Burroughs Corporation: *See—*
Cooke, Theodore M.; Carian, Lawrence T.; and Goetzinger, Gunther R., 4,177,727, Cl. 101-93.140.
Burroughs Wellcome Co.: *See—*
Krenitsky, Thomas A.; and Bushby, Stanley R. M., 4,178,212, Cl. 195-63.000
Burton, Robert S., III, to Occidental Oil Shale, Inc. Water treatment and heating in spent shale oil retort. 4,178,039, Cl. 299-2.000.
Busch, Gerhard. Arrangement for turning, multiple stacking and aligning a paper stack. 4,178,119, Cl. 414-28.000
Busch, Walter; Holst, Arno; and Fischer, Wilhelm, to Hoechst Aktiengesellschaft. Sheet-like structure of polyvinyl chloride, which is capable of absorbing water vapor and transmitting water vapor 4,178,271, Cl. 260-17.00R.
Bushby, Stanley R. M.: *See—*
Krenitsky, Thomas A.; and Bushby, Stanley R. M., 4,178,212, Cl 195-63.000
Busse, Joseph F.: *See—*
Schmidt, Daniel R., Jr.; and Busse, Joseph F., 4,178,576, Cl. 343-781.00R.
C. F. Sauer Company, The: *See—*
Cleevely, Bruce T., 4,177,932, Cl. 220-307.000.
C. Keller GmbH u. Co. KG: *See—*
Steingrover, Horst, 4,177,890, Cl. 198-434.000.
C. R. Bard, Inc.: *See—*
Bevilacqua, Albert J., 4,177,817, Cl. 128-802.000.
C. W. Zumbiel Company, The: *See—*
Lane, Robert W., 4,177,918, Cl. 229-39.00B.
Cabal, Albert V.; Bendoraitis, Joseph G.; Callen, Robert B.; Pavlica, Robert T.; and Voltz, Sterling E., to Electric Power Research Institute, Inc. Compatible mixtures of coal liquids and petroleum based fuels. 4,178,226, Cl. 208-15.000
Caelter Enterprises, Ltd.: *See—*
Martineau, Jacques, 4,178,007, Cl. 280-80.00R.
Calienes, Miguel. Multi-reflection clock. 4,177,634, Cl. 58-50.00R.
Callen, Robert B.: *See—*
Cabal, Albert V.; Bendoraitis, Joseph G.; Callen, Robert B.; Pavlica, Robert T.; and Voltz, Sterling E., 4,178,226, Cl. 208-15.000
Cameron, Robert G.: *See—*
Ciurca, Samuel J., Jr.; Cameron, Robert G.; and Walsh, Edward J., 4,178,183, Cl. 96-74.000
Camilleri, Thomas M. Pin orientator. 4,177,988, Cl. 273-43.00D.
Campbell, Charles R.; Heckle, William A.; and Mathews, Marion J., to Monsanto Company. Oxidative dehydrogenation of propionitrile to acrylonitrile. 4,178,305, Cl. 260-465.900.
Campbell, David N., to Hymatic Engineering Company Limited, The. Cryogenic cooling apparatus. 4,177,650, Cl. 62-222.000.

Campbell, Gene E. Coin drop game. 4,177,986, Cl. 273-1.00L.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Powell, Peter J.; and Nagy, Gerard D., 4,178,339, Cl. 264-61.000.
Canevet, Georges: *See—*
Angelini, Theophile A.; Nayrole, Bernard J. P.; Jessel, Maurice J.; Canevet, Georges; Mangiante, Gerard A.; and Carbone, Bernard, 4,177,874, Cl. 181-206.000.
Cannon Limited: *See—*
Brooks, Alfred W., 4,177,575, Cl. 34-13.000.
Canon Kabushiki Kaisha: *See—*
Asano, Noriyuki; Niwa, Yukichi; Owada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, 4,178,098, Cl. 356-1.000.
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; Shimizu, Masami; and Takishima, Yoshiyuki, 4,178,086, Cl. 354-152.000.
Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aiichiro; Okuno, Youichi; Tsunlkawa, Tokuichi; and Ito, Tadashi, 4,178,084, Cl. 354-59.000.
Murakawa, Syuzi; Kasamura, Toshirou; and Ando, Yujiro, 4,177,757, Cl. 118-658.000.
Suzuki, Masayuki; Ito, Tadashi; Yamamichi, Masayoshi; and Murakami, Hiroyasu, 4,178,085, Cl. 354-60.00R.
Tsuji, Sadahiko; and Agari, Yujiro, 4,178,076, Cl. 350-184.000.
Caporiccio, Gerardo; Corti, Costante; Belardinelli, Giorgio; and Carniselli, Giuliano, to Montedison S.p.A. Processes for preparing perfluoropolyether oils of very high purity and low volatility. 4,178,465, Cl. 568-601.000.
Carbone, Bernard: *See—*
Angelini, Theophile A.; Nayrole, Bernard J. P.; Jessel, Maurice J.; Canevet, Georges; Mangiante, Gerard A.; and Carbone, Bernard, 4,177,874, Cl. 181-206.000.
Carborundum Company, The: *See—*
DeMunda, Gabriel P., 4,178,413, Cl. 428-408.000.
Carbrey, Robert L., to Bell Telephone Laboratories, Incorporated. Signal multiplexing circuit. 4,178,480, Cl. 179-15.0BM.
Cargill, Incorporated: *See—*
Nollet, Anthony R., 4,178,232, Cl. 209-3.000.
Carian, Lawrence T.: *See—*
Cooke, Theodore M.; Carian, Lawrence T.; and Goetzinger, Gunther R., 4,177,727, Cl. 101-93.140.
Carl Freudenberg, Firma: *See—*
Kayser, Ernst, 4,178,002, Cl. 277-212.000.
Carl Zeiss-Stiftung: *See—*
Ganswein, Bernhard; Daniels, Erwin J.; Schurle, Herman; and Grosskopf, Klaus, 4,178,082, Cl. 351-159.000.
Werner, Walter; Herzog, Klaus; and Szenger, Franz, 4,177,568, Cl. 33-174.00L.
Carlock, John T., to Conoco, Inc. Iridium or rhodium catalysts for hydroformylation and isomerization of olefins. 4,178,312, Cl. 260-604.0HF.
Carlock, John T., to Conoco, Inc. Olefin isomerization and hydroformylation process. 4,178,313, Cl. 260-604.0HF.
Carlock, John T., to Conoco, Inc. Iridium or rhodium trihalide polymer bound hydrogenation and hydroformylation catalyst. 4,178,314, Cl. 260-604.0HF.
Carney, Robert L.: *See—*
Henrick, Clive A.; Carney, Robert L.; and Labovitz, Jeffrey N., 4,178,293, Cl. 260-326.100.
Carniselli, Giuliano: *See—*
Caporiccio, Gerardo; Corti, Costante; Belardinelli, Giorgio; and Carniselli, Giuliano, 4,178,465, Cl. 568-601.000.
Carpenter, Howard F.: *See—*
Miller, Curtis H; Arp, Robert A.; and Carpenter, Howard F., 4,177,813, Cl. 128-326.000.
Carr, John B., to Shell Oil Company. Benzopyrancarboxamides. 4,178,380, Cl. 424-283.000.
Carr-Rollett, Derrick. Sanding and buffing attachment for power tools. 4,177,611, Cl. 51-376.000.
Carroll, James C.: *See—*
Jorgensen, George N.; Flee, Stephen L.; and Carroll, James C., 4,178,468, Cl. 174-48.000.
Cartwright, James M., Jr.: *See—*
Hsu, Sheng T.; and Cartwright, James M., Jr., 4,178,605, Cl. 357-42.000.
Cartwright, John N., to General Motors Corporation. Floating seal. 4,177,997, Cl. 277-27.000.
Caswell, Bruce F., to Arcanum Corporation. Process for preparing agglomerates of clays. 4,178,341, Cl. 264-117.000.
Caterpillar Tractor Co.: *See—*
Phelps, Weldon L., 4,178,518, Cl. 307-9.000.
Catoni, Mario: *See—*
Mattone, Roberto; and Catoni, Mario, 4,178,287, Cl. 260-239.30A.
Cavier, Adolf J. J. F.; and Maass, Rudolf. Slicing machine for salmon. 4,177,703, Cl. 83-356.300.
Centanni, Michael J., to Continental Group, Inc., The. Lined bulk container and method of forming same. 4,177,935, Cl. 220-417.000.
Certain-teed Corporation: *See—*
Kinard, Gerald W., 4,177,726, Cl. 100-214.000.
Chakrabarti, Paritosh M., to GAF Corporation. Method of increasing the strength of wet glass fiber mats made by the wet-laid process. 4,178,203, Cl. 162-156.000.
Chakrabarti, Paritosh M., to GAF Corporation. Wet-strength of wet glass fiber mats by treatment with anionic polyelectrolytes. 4,178,204, Cl. 162-156.000.
Chakrabarti, Paritosh M., to GAF Corporation. Method of forming glass fiber dispersions with cationic quaternary ammonium surfactants having at least two long chain groups. 4,178,206, Cl. 162-156.000.
Chamdru, Jacques, to Regie Nationale des Usines Renault. Blow nozzle, notably for foundry cores. 4,177,857, Cl. 164-200.000.
Champion International Corporation: *See—*
Webinger, George P., 4,177,917, Cl. 229-34.0HW.
Champion, James R.; and Seigal, Steven D., to International Business Machines Corporation. Abnormally low reflectance photoconductor sensing system. 4,178,095, Cl. 355-14.00R.
Chang, Bong H., to Exxon Research & Engineering Co. Thermal cracking of gas oil to middle distillate. 4,178,228, Cl. 208-72.000.
Chang, Tommy J. C. Automatic golf ball teeing apparatus. 4,177,996, Cl. 273-201.000.
Chao, Kwei C.; Ridgway, John A., Jr.; Schnell, Philip G.; and Pearce, Jacqueline H., to Standard Oil Company a corporation of Indiana. Process for improving the functional properties of protein material. 4,178,391, Cl. 426-61.000.
Chapman, Andrew W. Orthopedic shoe with forefoot protective guard. 4,177,583, Cl. 36-77.00R.
Chapman, Craig A.: *See—*
Allen, Gerald L.; and Chapman, Craig A., 4,178,346, Cl. 422-126.000.
Chapman, David, to Acrow (Engineers) Limited. Concrete formwork soldier. 4,177,968, Cl. 249-211.000.
Charron, Marcel. Door lock guard. 4,178,027, Cl. 292-346.000.
Chattha, Mohinder, to Ford Motor Company. High solids coating composition with oligomeric hydroxyphosphate catalyst-C. 4,178,320, Cl. 525-188.000.
Chattha, Mohinder S., to Ford Motor Company. High solids coating composition with oligomeric hydroxyphosphate catalyst-A. 4,178,319, Cl. 525-188.000.
Chattha, Mohinder S., to Ford Motor Company. High solids composition with hydroxy functional acrylic organophosphate reactive catalyst - I. 4,178,321, Cl. 525-188.000.
Chattha, Mohinder S., to Ford Motor Company. High solids coating composition with acrylic hydroxyphosphate catalyst-III. 4,178,322, Cl. 525-188.000.
Chattha, Mohinder S., to Ford Motor Company. High solids coating composition with hydroxy functional acrylic organophosphate reactive catalyst-II. 4,178,323, Cl. 525-188.000.
Chattha, Mohinder S., to Ford Motor Company. High solids coating composition with oligomeric hydroxy phosphate catalyst-B. 4,178,324, Cl. 525-188.000.
Checcacci, Basilio: *See—*
Gatti, Maurizio; Tavano, Sergio; and Checcacci, Basilio, 4,177,859, Cl. 165-11.000.
Chemonic Industries, Inc.: *See—*
Hall, Seymour G.; and Mason, Edward D., 4,178,399, Cl. 427-381.000.
Chen, Augustin T.; and Onder, Kemal B., to Upjohn Company, The. Copolyoxalamide from branched chain diamine. 4,178,432, Cl. 528-340.000.
Cherbourg, Robert; Falluel, Jean-Pierre; and Menard, Michel, to Regie Nationale des Usines Renault. Device for driving panels in conveyance, especially horizontally-sliding windows in an automobile. 4,177,605, Cl. 49-98.000.
Cherne Industries, Inc.: *See—*
Anderson, Charles E., 4,177,559, Cl. 30-105.000.
Cheung, Mo-Fung, to Ford Motor Company. Graft polybutadiene copolymers. 4,178,318, Cl. 525-77.000.
Chevron Research Company: *See—*
Hickson, Donald A., 4,177,653, Cl. 62-534.000.
King, John M., 4,178,259, Cl. 252-42.700.
Chinook Manufacturing Co.: *See—*
Johnson, William R., 4,177,793, Cl. 121-121.000.
Chister, Rene A.: *See—*
Matuschek, Josip; and Chister, Rene A., 4,177,710, Cl. 85-70.000.
Chiyoda Chemical Engineering & Construction Company, Ltd.: *See—*
Asanagi, Etsuo; and Idemura, Hideo, 4,178,348, Cl. 423-242.000.
Choi, Eun S. Automated mechanism for imparting movement to limbs of a mechanical toy. 4,177,602, Cl. 46-150.000.
Chon, Pyong H. Portable fishing rod holder and stand. 4,177,595, Cl. 43-21.200.
Christoph, Dieter: *See—*
Schulz, Siegfried, 4,177,701, Cl. 82-39.000.
Chromatix, Inc.: *See—*
Wallace, Richard W., 4,178,103, Cl. 356-336.000.
Chupa, Charles M.: *See—*
Lippman, Seymour A.; Stokes, Gary P.; and Chupa, Charles M., 4,178,195, Cl. 156-110.00R.
Ciba-Geigy Aktiengesellschaft: *See—*
Haase, Jaroslav; Liechti, Peter; Wegmuller, Hans; Wurster, Rudolf F.; and Bowes, Quentin, 4,178,438, Cl. 536-30.000.
Ciba-Geigy Corporation: *See—*
Allgeier, Hans; and Gagneux, Andre, 4,178,378, Cl. 424-269.000.
Lee, Peter I.; and Holt, Brian, 4,178,253, Cl. 252-47.000.
Nachbur, Hermann; and Rohringer, Peter, 4,178,398, Cl. 427-379.000.
Cicci, George B., to International Harvester Company. Header suspension. 4,177,627, Cl. 56-15.800.
Cigognini, Luciano: *See—*
Riccardi, Clemente C.; Meda, Sergio; and Cigognini, Luciano, 4,178,102, Cl. 356-307.000.
Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., to BASF Wyandotte Corporation. Compositions for souring and softening laundered textile materials, method of preparing the same, and stock solutions prepared therefrom. 4,178,256, Cl. 252-8.750.
Cincinnati Milacron Inc.: *See—*
Anthony, Donald W., 4,178,632, Cl. 364-513.000.
Cini, Hector J.; and Meyers, Theodore J., to United States of America, Navy. Low frequency hydrophone. 4,178,577, Cl. 367-159.000.
Ciurca, Samuel J., Jr.; Cameron, Robert G.; and Walsh, Edward J., to Eastman Kodak Company. Thiazolyl coupler compositions and photographic elements suited to forming integral sound tracks. 4,178,183, Cl. 96-74.000.
Clanton, W. Porter, to Quaker Oats Company, The. Toy stethoscope. 4,177,871, Cl. 181-131.000.
Claremont Polychemical Corporation: *See—*
Bae, Kook J., 4,178,282, Cl. 260-45.75W.
Clarion Co., Ltd.: *See—*
Amazawa, Kiyoshi; and Mori, Masaharu, 4,178,552, Cl. 325-479.000.
Clarke, C. William: *See—*
Miller, Gregory C.; Albrecht, Henry R.; Clarke, C. William; and Longthorpe, Paul L., 4,177,973, Cl. 254-173.00R.
Clavin, Edward A., to Midcon Pipeline Equipment Co. Rotary internal pipe clamp apparatus. 4,177,914, Cl. 228-49.00B.
Cleeland, Roy; Durkin, Joanne; and Kramer, Michael J., to Hoffmann-La Roche Inc. Radiolabelled rubella virus and method. 4,178,360, Cl. 424-1.000.
Cleevely, Bruce T., to C. F. Sauer Company, The. Thermoplastic container for storing and dispensing solid particulate material. 4,177,932, Cl. 220-307.000.
Clegg, Russell B.: *See—*
Sipek, Charles B.; Johnstone, Richard; and Clegg, Russell B., 4,177,550, Cl. 29-568.000.
Cline, Harvey E.: *See—*
Anthony, Thomas R.; and Cline, Harvey E., 4,178,192, Cl. 148-1.500.
Coats, Billy C. Hypoallergenic stabilized aloe vera gel. 4,178,372, Cl. 424-195.000.
Cobbs, James H. Liner for large diameter borehole. 4,178,110, Cl. 405-133.000.
Coffey, James G. Mount for a communication device or the like. 4,178,060, Cl. 339-125.00R.
Cogswell, Frederic N.: *See—*
Cole, Ernest A.; Cogswell, Frederic N.; and Huxtable, Jonathan, 4,178,411, Cl. 428-310.000.
Cohen, Arthur I.; Sim, James S. Y.; Van Horn, Maurice H.; Gordesky, Stanley E.; and Gordon, Stanley I., to Union Corporation. Sustained release pharmaceutical composition. 4,178,361, Cl. 424-22.000.
Cole, Bernie R. Polishing apparatus. 4,177,535, Cl. 15-97.00R.
Cole, Ernest A.; Cogswell, Frederic N.; and Huxtable, Jonathan, to Imperial Chemical Industries, Limited. Fibre expanded reinforced materials and their process of manufacture. 4,178,411, Cl. 428-310.000.
Cole, Terrell A. Wound roll of fibrous material. 4,177,897, Cl. 206-389.000.
Coleman, Dennis C., to Bunker Ramo Corporation. Dual pressure sensor. 4,177,680, Cl. 73-718.000.
Colgate-Palmolive Company: *See—*
Stima, Joseph F.; Schreiber, Ronald S.; and Giordano, Annie S., 4,178,255, Cl. 252-8.800.
Collins, Martin F.; and Michalek, Romuald, to Engelhard Minerals & Chemicals Corp. Removal of tritium and tritium-containing compounds from a gaseous stream. 4,178,350, Cl. 423-248.000.
Combustion Engineering Inc.: *See—*
Makuch, John A., 4,177,951, Cl. 241-35.000.
Comer, William T.: *See—*
Martin, Tellis A.; and Comer, William T., 4,178,301, Cl. 260-455.00R.
Commissariat a l'Energie Atomique: *See—*
Lauro, Fernand; and Podevin, Roland, 4,178,021, Cl. 285-255.000.
Commonwealth Scientific and Industrial Research Organization: *See—*
Bedding, Robin A., 4,178,366, Cl. 424-93.000.
Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme): *See—*
Maury, Christian, 4,178,560, Cl. 331-1.00A.
Compton, John W.; and Eisenstein, Stephen E., to BASF Wyandotte Corporation. Spotting-agent composition. 4,178,262, Cl. 252-162.000.
Conoco, Inc.: *See—*
Carlock, John T., 4,178,312, Cl. 260-604.0HF.
Carlock, John T., 4,178,313, Cl. 260-604.0HF.
Carlock, John T., 4,178,314, Cl. 260-604.0HF.
McConaghy, James R.; Poynor, Paul C.; and Friday, John R., 4,178,229, Cl. 208-50.000.
Smith, George E.; Lorimor, Gregory L.; DeKluyver, Peter J.; and McFarlin, Henry E., 4,178,358, Cl. 423-574.00R.
Constable, Douglas W.; and Lovely, John D., to GTE Sylvania Incorporated. Clamp circuit for RGB output stages. 4,178,610, Cl. 358-34.000.
Continental Group, Inc., The: *See—*
Centanni, Michael J., 4,177,935, Cl. 220-417.000.
Kinsley, John P., 4,178,146, Cl. 425-289.000.
Control Logic (Proprietary) Limited: *See—*
Moshal, John H., 4,177,774, Cl. 123-102.000.
Cook, Brian A.; and Brown, Thomas W., to Exxon Research & Engineering Co. Ester based metal working lubricants. 4,178,260, Cl. 252-49.800.
Cook, Weldon R. Cat scratching post assembly. 4,177,763, Cl. 119-29.000.
Cooke, Theodore M.; Carian, Lawrence T.; and Goetzinger, Gunther R., to Burroughs Corporation. Line printer character chain lubricating device. 4,177,727, Cl. 101-93.140.
Copal Company Limited: *See—*
Fukawa, Kazumi, 4,178,616, Cl. 360-74.100.
Copp, Carl A., Jr.: *See—*
Reid, Earl; and Copp, Carl A., Jr., 4,178,136, Cl. 417-269.000.
Corraz, Alfred J.: *See—*
Berger, Leo; Corraz, Alfred J.; Parrish, David R.; and Scott, John W., 4,178,289, Cl. 260-315.000.
Corti, Costante: *See—*
Caporiccio, Gerardo; Corti, Costante; Belardinelli, Giorgio; and Carniselli, Giuliano, 4,178,465, Cl. 568-601.000.
Corwin, Edward J. Marking message card and template assembly and related input switching circuitry and method of making the assembly. 4,178,503, Cl. 235-495.000.
Cosgrove, James F.: *See—*
Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; McCain, William B.; Weller, Ronald W.; and Werstler, Lawrence J., 4,177,982, Cl. 271-5.000.
Costello, Norman F.; Huggins, Homer D.; and Kao, Stephen S. T., to Modine Manufacturing Company. Recuperator structure. 4,177,861, Cl. 165-101.000.
Couchoud, Paul, to Rhone-Poulenc-Textile. Compounds for obtaining polymeric flameproofing agents and the process for obtaining them, as well as the flameproofing agents thus obtained. 4,178,283, Cl. 260-45.85R.
Councill, Craig A. Modular container. 4,178,249, Cl. 210-281.000.
Courty, Aurele. Tube cutter with a ratchet handle. 4,177,557, Cl. 30-102.000.
Cova, Dario R.: *See—*
Baker, Joseph W.; Cova, Dario R.; and White, James E., 4,178,353, Cl. 423-300.000.
Covington, Wayne F.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,178,633, Cl. 364-709.000.
Cowpland Michael C. J.; and Beirne, Patrick R., to Mitel Corporation of Kanata. Transformerless telephone line circuit. 4,178,485, Cl. 179-18.0FA.
Crabiel, Wesley I., to Dresser Industries, Inc. Swivel joint for a vehicle. 4,177,869, Cl. 180-6.580.
CRAF Sud: *See—*
Monguzzi, Riccardo; Pifferi, Giorgio; Pinza, Mario; and Broccali, Giampietro, 4,178,444, Cl. 544-30.000.
Cragoe, Edward J., Jr.: *See—*
Williams, Haydn W. R.; Cragoe, Edward J., Jr.; and Rooney, Clarence S., 4,178,386, Cl. 424-317.000.
Crain, Donald L.: *See—*
Shue, Robert S.; and Crain, Donald L., 4,178,276, Cl. 260-37.00R.
Cramer, John J.: *See—*
Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., 4,178,256, Cl. 252-8.750.
Crapo, Roland L., to Superior Electric Company, The. Stepping AC line voltage regulator. 4,178,539, Cl. 323-45.000.
Crawford, Millard B., to Kaiser Aluminum & Chemical Corporation. Self-grinding valve mechanism. 4,177,825, Cl. 137-243.200.
Cremer, Gerhard: *See—*
Bischkopf, Gerd; Gawarecki, Herbert; and Cremer, Gerhard, 4,177,544, Cl. 28-119.000.
Cribbs, John R. Damped automatic variable valve timing device for internal combustion engines. 4,177,773, Cl. 123-90.150.
Crisci, Victor E., to Polysar Resins, Inc. Closure having opening means. 4,177,930, Cl. 220-284.000.
Crosby, Bruce R.; and Spector, George. Variable block puzzle and container. 4,177,993, Cl. 273-160.000.
Croset, Michel; and Velasco, Gonzalo, to Thomson - CSF. Galvanic cell for the electrochemical production or storage of electrical energy. 4,178,418, Cl. 429-27.000.
CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Di Vita, Pietro, 4,178,066, Cl. 350-96.180.
Cubic Western Data: *See—*
Adams, Ralph D.; and Wyckoff, James K., 4,177,889, Cl. 194-1.00B.
Cummins, Earl W.: *See—*
Adams, Charles D.; Cummins, Earl W.; and Gleich, Steven I., 4,178,448, Cl. 544-194.000.
Cunningham, Donald M., to Emerson Electric Co. End seals for electric immersion heating elements. 4,178,497, Cl. 219-336.000.
Curtis Dyna Products Corporation: *See—*
Curtis, Russell R.; and Schlensker, Albert L., 4,177,949, Cl. 239-582.000.
Stevens, Robert E.; and Schlensker, Albert L., 4,177,937, Cl. 222-63.000.
Curtis, Russell R.; and Schlensker, Albert L., to Curtis Dyna Products Corporation. Fog generating apparatus. 4,177,949, Cl. 239-582.000.
Cutting Room Appliances Corporation: *See—*
Melega, Albert, 4,177,980, Cl. 270-31.000.
CUV "Progress": *See—*
Samokovliski, David A.; Angelov, Angel S.; Nachev, Georgi N.; Petrov, Peter D.; Nemechek, Alfred E.; and Vajarova, Iliyana I., 4,177,912, Cl. 226-176.000.
Czeiner, Joseph A. Unitized roof and ceiling subassembly. 4,177,613, Cl. 52-86.000.

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Cziptschirsch, Kurt, to Gebr. Happich GmbH. Sun visor for motor vehicles. 4,178,035, Cl. 296-97.00K.
Dahlgrun, Rolf: *See—*
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Daimler-Benz Aktiengesellschaft: *See—*
Andres, Rudolf; and Knoll, Heinz W., 4,178,016, Cl. 280-734.000.
Scheying, Heinz, 4,178,141, Cl. 417-498.000.
Zeilinger, Karl; and Bachschmid, Reiner, 4,177,689, Cl. 74-242.800.
Daimon, Hiroshi: *See—*
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Dainippon Ink & Chemicals, Inc.: *See—*
Sato, Hisato; Takatsu, Haruyoshi; and Tazume, Masayuki, 4,178,302, Cl. 260-455.00R.
Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Shimooka, Riyo; Kunisawa, Masuo; and Okazaki, Seiji, 4,178,615, Cl. 358-302.000.
Daishin Kako Co., Ltd.: *See—*
Suzuki, Hiroyuki, 4,177,943, Cl. 222-591.000.
Dale Electronics, Inc.: *See—*
Kneifel, Jerome J., 4,178,545, Cl. 324-158.00F.
Daly, William P.; Lewis, Robert P.; and Pouliot, Oliver L., to Faser Industries. Method of forming a sterilizable package with tear-off indicators. 4,177,620, Cl. 53-425.000.
Daman, Ernest L.; and McCallister, Robert A., to Foster Wheeler Energy Corporation. Heat exchanger. 4,177,858, Cl. 165-11.000.
Damon Corporation: *See—*
Gourlandt, Albert J., 4,177,810, Cl. 128-218.00A.
Sodickson, Lester A., 4,178,153, Cl. 23-230.00R.
Danfoss A/S: *See—*
Tankred, Hans J., 4,178,140, Cl. 417-415.000.
Daniels, Erwin J.: *See—*
Ganswein, Bernhard; Daniels, Erwin J.; Schurle, Herman; and Grosskopf, Klaus, 4,178,082, Cl. 351-159.000.
Daniels, Peter J. L.; and Varchei, Mohammed M. N., to Schering Corporation. Process for the preparation of 2,5-dideoxystreptamine and of a novel intermediate therefor. 4,178,453, Cl. 548-369.000.
Danjushevsky, Solomon I.: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.
Dansk Industri Syndikat AS: *See—*
Jespersen, Emil; and Mogensen, Vagn, 4,177,892, Cl. 198-832.000.
Darmo Corporation: *See—*
Moses, Darcy C., 4,177,683, Cl. 74-200.000.
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; Shimizu, Masami; and Takishima, Yoshiyuki, to Canon Kabushiki Kaisha. Camera with a device for protecting film against fogging. 4,178,086, Cl. 354-152.000.
Daum, Werner: *See—*
Brandes, Wilhelm; Daum, Werner; and Kraus, Peter, 4,178,383, Cl. 424-304.000.
Dauvergne, Hector A. Bucket-less turbine wheel. 4,178,125, Cl. 415-80.000.
David Brown Tractors Limited: *See—*
Sykes, Alec, 4,178,042, Cl. 301-9.0TV.
Davis, Bryan T., to Ethyl Corporation. Fuel compositions. 4,177,768, Cl. 123-1.00A.
Davis, Edwin W., to Eastern Company, The. Cabinet lock. 4,177,656, Cl. 70-84.000.
Davis, William F., to Motorola, Inc. Integrated injection logic digital-to-analog converter employing feedback regulation and method. 4,178,584, Cl. 340-347.0DA.
Dawson, Daniel J.: *See—*
Otteson, Kenneth M.; and Dawson, Daniel J., 4,178,422, Cl. 525-336.000.
Dayco Corporation: *See—*
Howerton, Anderson W.; Klein, Darrell L.; and Thomas, James R., 4,177,688, Cl. 74-233.000.
Jacob, Richard J., 4,177,686, Cl. 74-231.0CB.
Decker, John J.; and Kantner, Donald J., to GTE Sylvania Incorporated. Method for making a glass-to-metal seal for electrochemical cells. 4,178,164, Cl. 65-59.00R.
Deconinck, Didier, to Allibert Exploitation. Bathroom wall fixture. 4,177,901, Cl. 211-105.100.
Deere & Company: *See—*
Henn, John L., 4,177,870, Cl. 180-243.000.
Peiler, Rolf W.; and Rohren, Ronald E., 4,177,821, Cl. 130-27.00T.
Sikula, William J., Jr., 4,177,529, Cl. 7-100.000.
Thompson, James E., 4,177,836, Cl. 138-30.000.
Wood, Homer J., 4,177,638, Cl. 60-39.51H.
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Buchel, Erwin; de Fluiter, Ruurd; Wild, Peter J.; and Wullschleger, Jorg, 4,177,729, Cl. 101-129.000.
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de Koning, Jan; Steyn, Jan; and Scheepswerf en Machinefabriek "De Liesbosch" B.V., to Ballast-Nedam Groep N.V.,*Amsterdamse Ballast Bagger en Grond (Amsterdam Ballast Dredging) B.V.; and Scheepswerf en Machinefabriek "De Liesbosch" B.V. Method and apparatus for dredging. 4,177,585, Cl. 37-67.000.
Delalande S. A.: *See—*
Bourgery, Guy R.; Lacour, Alain P.; Moinet, Gerard H.; Pourrias, Bernard M.; and Ruch, Anne-Marie P., 4,178,442, Cl. 542-440.000.
DeLancey, Warren H. Pulley. 4,177,685, Cl. 74-230.700.
Delfosse, Gilbert, to Braud, Societe Anonyme. Conveyor belt deformable in space. 4,177,891, Cl. 198-570.000.
Delory, Bernard: *See—*
Ribout, Pierre; and Delory, Bernard, 4,178,533, Cl. 315-3.600.
Delta Plastics Limited: *See—*
Slater, Paul, 4,177,760, Cl. 119-14.080.
DeLuca, Anthony; and DeLuca, Josephine. Thermal block. 4,177,617, Cl. 52-562.000.
DeLuca, Josephine: *See—*
DeLuca, Anthony; and DeLuca, Josephine, 4,177,617, Cl. 52-562.000.
Demain, Arnold L.; and Kohsaka, Masanobu, to Massachusetts Institute of Technology. Accellular synthesis of cephalosporins. 4,178,210, Cl. 195-29.000.
DeMunda, Gabriel P., to Carborundum Company, The. Fiber reinforced carbon and graphite articles and a method of producing said articles. 4,178,413, Cl. 428-408.000.
Denk, Hans; and Reeh, Ulrike, to Siemens Aktiengesellschaft. Casting resin compositions for sealing opto-electronic components. 4,178,274, Cl. 260-31.80E.
Denlinger, Michael C.; Korb, Robert W.; and Lardenoit, Vernon F., to Hughes Aircraft Company. Soldering method and solder joint. 4,177,916, Cl. 228-231.000.
Denney, James H., to Vector Engineering Corporation. Handhold insert for a twisted rope. 4,177,542, Cl. 24-115.00R.
De Pedro, Francisco L. Self attachable small-toothed electrode and a forceps for maneuvering it. 4,177,818, Cl. 128-418.000.
Deprez, Dominique: *See—*
Berger, Christian; Deprez, Dominique; Farge, Daniel; Moutonnier, Claude; and Wolff, Gerard, 4,178,290, Cl. 549-22.000.
DeSoto, Inc.: *See—*
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Klebe, Hans; and Knippschild, Gerd, 4,178,351, Cl. 423-275.000.
Kunst, Helmut; and Wahl, Georg, 4,178,244, Cl. 210-71.000.
Development Finance Corporation of New Zealand: *See—*
Ayers, John S.; and Husbands, David R., 4,178,439, Cl. 536-59.000.
Deveres, Ernest E.; Ouellette, Paul J.; and Pollitt, Joseph F., to Western Electric Co., Inc. Assembling leads to a substrate. 4,177,554, Cl. 29-626.000.
DeVore, Wilfred H. Door mounting, opening and locking apparatus for buildings conforming to sloping terrain. 4,177,854, Cl. 160-207.000.
DeVries, James L.: *See—*
Rolf, Steven R.; DeVries, James L.; and Ashworth, T., 4,177,667, Cl. 73-1.00G.
Dexter, Edwin M.: *See—*
Brakebill, Harold G.; and Dexter, Edwin M., 4,177,924, Cl. 236-86.000.
Dhein, Rolf; and Hentschel, Karl-Heinz, to Bayer Aktiengesellschaft. Carboxylic acid esters and their use as a base lubricating oil. 4,178,261, Cl. 252-57.000.
Diamond, Julius; and Douglas, George H., to William H. Rorer, Inc. Method for the treatment of arrhythmia. 4,178,387, Cl. 424-322.000.
Didier Engineering GmbH: *See—*
Burkert, Rudolf; Flockenhaus, Claus; Meckel, Joachim F.; and Wagener, Dietrich, 4,178,266, Cl. 252-373.000.
Diehl, Karl-Heinz: *See—*
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Dietze, Wolfgang: *See—*
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Dill, Hans G.: *See—*
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Dilley, Gerald G., to Peters Equipment Corporation. Tying machine. 4,177,842, Cl. 140-93.600.
Dillow, John P. Appendage for a fishhook. 4,177,596, Cl. 43-36.000.
Di Vita, Pietro, to CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A. Ray-path equalizer for signal-transmission system using multimode light guides. 4,178,066, Cl. 350-96.180.
Doi, Hachiro: *See—*
Takahashi, Katsuhiko; Ikura, Masakazu; and Doi, Hachiro, 4,177,963, Cl. 242-107.110.
Dolinsek, Hans, to Johannes Fuchs, Firma. Grapple or grab-bucket safety mechanism. 4,178,030, Cl. 294-70.000.
Dombrowski, Anthony E. Fuel saving signaling apparatus for a motor vehicle. 4,178,580, Cl. 340-52.00D.
Donigian, Doulgas W., to Westvaco Corporation. Whiskering test apparatus. 4,177,672, Cl. 73-150.00R.
Donnini, Edlo. Garden crook. 4,177,864, Cl. 172-371.000.

Dopyera, Emil E., to Big-Inch Marine Systems, Inc. Locking slip joint and method of use. 4,178,020, Cl. 285-18.000.
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Dorsen, Mac; and Saltzman, Philip A., to Stupell Industries, Inc. Name plate assembly for tote bag and the like. 4,177,587, Cl. 40-16.000.
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Diamond, Julius; and Douglas, George H., 4,178,387, Cl. 424-322.000.
Douglas, Raymond J.; Fekete, Ference; Gay, Derek J.; Hunter, Gary L.; and Wilson, Nicol S., to Mattel, Inc. Captive flying toy airplane having simulated motor sounds. 4,177,984, Cl. 272-31.00A.
Dovnar, Stanislav A.; Sidorenko, Valery A.; Morgunsky, Evgeny I. and Vishnev, Nikolai V. Method of machining end faces. 4,177,699, Cl. 82-1.00C.
Dow Chemical Company, The: *See—*
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Wagner, Eugene R.; and Renzi, Alfred A., 4,178,385, Cl. 424-310.000.
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Hulls, Leonard R.; and Dowdell, Toy, Jr., 4,178,546, Cl. 324-158.0MG.
Dowell, Terrence P.; and Banks, Edwin L., Jr., to Barry Wright Corporation. Mechanical snubbing device with inertia actuated braking means. 4,177,882, Cl. 188-1.00B.
Dresser Industries, Inc.: *See—*
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Du Bois, Edward F.; and Papastrat, Arthur L., to Singer Company, The. Method and apparatus for safely feeding a machine manually. 4,177,666, Cl. 72-420.000.
Dubois, Jaques, deceased; and Zulliger, Hans R., to Nuclear Semiconductor Art object analyzer. 4,178,513, Cl. 250-491.000.
Duchateau, Jean L.; and Sauttere, Bernard E., to Foseco Trading A.G Tundish and method of pouring molten metal therewith. 4,177,855, Cl. 164-82.000.
Dudley, Dana; and Knight, William M., Jr., to Texas Instruments Incorporated. Delta frame circuit. 4,178,612, Cl. 358-167.000.
Duff, James A.: *See—*
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Dunnigan, Daniel A., to Abbott Laboratories. Process for preparing 1,3-diacyl glycerols. 4,178,299, Cl. 260-409.000.
Du Pont de Nemours, E. I., and Company: *See—*
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Memeger, Wesley, Jr., 4,178,419, Cl. 521-89.000.
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Cleeland, Roy; Durkin, Joanne; and Kramer, Michael J., 4,178,360, Cl. 424-1.000.
Dussault, Jean G. M.; Geekie, Robert A.; and Puskas, William L., to Branson Ultrasonics Corporation. Method for cleaning workpieces by ultrasonic energy. 4,178,188, Cl. 134-1.000.
Dusza, John P.; and Albright, Jay D., to American Cyanamid Company. Pyrazolo[1,5-a]pyrimidines and imidazo-[1,5-a]pyrimidines. 4,178,449, Cl. 544-281.000.
Dykes, Willis G., to Lasco, Inc. Plant destruction using electricity 4,177,603, Cl. 47-1.300.
Dynamics Corporation of America: *See—*
Lewison, Howard L., 4,177,865, Cl. 172-705.000.
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Englaender, Fritz; and Kappler, Fritz Robert, 4,178,295, Cl. 260-343.30R.
Franz, Arnold; and Stein, Werner, 4,178,408, Cl. 428-285.000.
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Schultz, Neithart; Martens, Peter; and Vahlensieck, Hans-Joachim, 4,178,316, Cl. 260-653.500.
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Dynic Corporation: *See—*
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Wade, Peter C.; and Vogt, B. Richard, 4,178,451, Cl. 546-272.000.
Eastern Company, The: *See—*
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Eastman Kodak Company: *See—*
Ciurca, Samuel J., Jr.; Cameron, Robert G.; and Walsh, Edward J., 4,178,183, Cl. 96-74.000.
Hector, Jean-Marie H.; and Pingaud, Bernard J., 4,178,416, Cl. 428-539.000.
Meyer, Max F., Jr.; McConnell, Richard L.; and Joyner, Frederick B., 4,178,272, Cl. 260-27.00R
Solomon, Victor C., 4,178,091, Cl. 354-322.000.
Vinal, Richard S., 4,178,180, Cl. 96-48.0PD
Easton, James L.; and Filice, Gary W., to James D. Easton, Inc. Hollow bat and method of making. 4,177,989, Cl. 273-72.00A.
Eaton Corporation: *See—*
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Swanson, Wesley S., 4,178,573, Cl. 335-255.000.
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Ebauches S.A.: *See—*
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Ebnother, Anton: *See—*
Rissi, Erwin; and Ebnother, Anton, 4,178,377, Cl. 424-267.000.
Edelson, Stanley; and Feinberg, Samuel, to Amsterdam Brush Company. Paint brush merchandising display. 4,177,903, Cl. 211-49.00D.
Edens, Jan W.; Vlek, Theodorus H. A. M.; and Withoos, Wilhelmus H C., to U.S. Philips Corporation. Horn antenna with rotating waveguide and polarization lens means. 4,178,574, Cl. 343-756.000.
Eder, Ulrich. *See—*
Haffer, Gregor; Eder, Ulrich; Sauer, Gerhard; Wiechert, Rudolf; Nishino, Yukishige; and Neef, Gunter, 4,178,381, Cl. 424-283.000.
Ederer Incorporated: *See—*
Miller, Gregory C.; Albrecht, Henry R.; Clarke, C. William; and Longthorpe, Paul L., 4,177,973, Cl. 254-173.00R
Edwards, Grant C.: *See—*
Vaughan, David E. W.; Edwards, Grant C.; and Barrett, Michael G., 4,178,352, Cl. 423-329.000.
Edwards, John A.: *See—*
Van Horn, Albert R.; Garay, Gabriel; and Edwards, John A., 4,178,457, Cl. 560-53.000.
Edwin Cooper, Inc.: *See—*
Papay, Andrew G.; and Zawesky, Edward F., 4,178,258, Cl. 252-32.70E.
Efendiev, Medzhid R. O.: *See—*
Litvishkov, Jury N.; Efendiev, Medzhid R. O.; Rizaev, Ramiz G K. O., and Kulieva, Khalida Y. K., 4,178,304, Cl. 260-465.00E.
Eggensperger, Heinz; and Diehl, Karl-Heinz, to Sterling Drug Inc. Preserving and disinfecting method employing certain oxazines 4,178,375, Cl. 424-248.400.
Egorov, Georgy B.: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.
Ehret, Rudolf: *See—*
Emmerich, Bernd W.; Ehret, Rudolf; Hoyer, Gerhard; and Trampert, Hans R., 4,178,623, Cl. 361-284.000.
Ehrlich, Johann, Jr. Sole for shoes and process for the production thereof. 4,177,582, Cl. 36-33.000.
Eifort, Ralph C., to NCR Corporation. Zero-insertion force electrical connector. 4,178,053, Cl. 339-75.0MP.
Eisenstein, Stephen E.: *See—*
Compton, John W.; and Eisenstein, Stephen E., 4,178,262, Cl. 252-162.000.
Ekbom, Roger A.; and Friedlander, Sidney, to Tronomed, Inc. Medical terminal clip member for attachment to patient electrodes. 4,178,052, Cl. 339-61.00R
Elder, Eugene E. Adjustable nose piece assembly for eyeglasses 4,178,080, Cl. 351-137.000.
Electric Power Research Institute, Inc.: *See—*
Cabal, Albert V.; Bendoraitis, Joseph G.; Callen, Robert B.; Pavlica, Robert T.; and Voltz, Sterling E., 4,178,226, Cl. 208-15.000.
Elie, David K.: *See—*
Young, Dale E., II; Elie, David K.; and Schoening, Peter K., 4,177,758, Cl. 119-3.000.
Elliott Brothers (London) Limited: *See—*
Heller, Fritz P., 4,178,074, Cl. 350-171.000.
Elting, Larry M. Oscillating soot blower mechanism. 4,177,539, Cl 15-316.00R
Emerson Electric Co.: *See—*
Cunningham, Donald M., 4,178,497, Cl. 219-336.000.
Frank, William H., 4,177,879, Cl. 182-220.000.
Krump, Robert C., 4,177,923, Cl. 236-46.00R.
Lyerly, Harold G., 4,178,523, Cl. 310-71.000.
Emmerich, Bernd W.; Ehret, Rudolf; Hoyer, Gerhard; and Trampert, Hans R., to Sybron Corporation. Measuring sensor for capacitive measurement of liquids at selected levels. 4,178,623, Cl. 361-284.000.
Emmons, J. Bruce, to Outboard Marine Corporation. Two staged carburetor with arrangement for reducing fuel spillage. 4,178,331, Cl. 261-23.00A

Emmons, William D.; and Nyi, Kayson, to Rohm and Haas Company. Polyurethane coating compositions containing unsaturated esters of glycol monodicyclopentenyl ethers. 4,178,425, Cl. 528-73.000.
Energy Conversion Devices, Inc.: *See—*
Ovshinsky, Stanford R.; and Sapru, Krishna, 4,178,415, Cl. 428-446.000.
Engeler, William E.; and Baertsch, Richard D., to General Electric Company. Input circuit for charge transfer apparatus. 4,178,519, Cl. 307-221.00D.
Engelhard Minerals & Chemicals Corp.: *See—*
Collins, Martin F.; and Michalek, Romuald, 4,178,350, Cl. 423-248.000.
Enger, Carl C. Implantable biotelemetry transmitter and method of using same. 4,177,800, Cl. 128-2.10A.
Englaender, Fritz; and Kappler, Fritz Robert, to Dynamit Nobel Aktiengesellschaft. Method of preparing phthalide. 4,178,295, Cl. 260-343.30R.
Ensing, Kenneth J., deceased (by Ensing, Lois K., executrix), to FMC Corporation. Pyrethroid insect repellent. 4,178,384, Cl. 424-305.000.
Ensing, Lois K., executrix: *See—*
Ensing, Kenneth J., deceased, 4,178,384, Cl. 424-305.000.
Enso-Gutzeit Osakeyhtio: *See—*
Hakkinen, Seppo; Nyman, Niilo; Kilpelainen, Ossi; Paakkinen, Ilmari; Rautapaa, Kari; and Rasimus, Seppo, 4,177,942, Cl. 222-198.000.
Enterprises International, Inc.: *See—*
Lamb, Frank H.; Lefcort, Malcolm D.; and Rada, Petr, 4,177,740, Cl. 110-213.000.
Entner, Josef, to Hilti Aktiengesellschaft. Self-drilling dowel with an inclined rolling head. 4,177,867, Cl. 175-400.000.
Envirotech Corporation: *See—*
Rahman, Michael, 4,178,160, Cl. 55-436.000.
Epshtein, Yakov V.: *See—*
Shishkova, Zinaida P.; Kalninsh, Arvid Y.; Gailitis, Juris P.; Shmit, Uldis Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Kalinkin, Damir A.; Vaax, Viktor R.; Zimina, Maria A.; Belyaev, Vasily D.; Maximenko, Nikolai S.; and Epshtein, Yakov V., 4,178,214, Cl. 195-100.000.
Erlichman, Irving, to Polaroid Corporation. Transfer or recording sheet having a textured surface. 4,178,598, Cl. 346-105.000.
Ethyl Corporation: *See—*
Davis, Bryan T., 4,177,768, Cl. 123-1.00A.
Leavitt, Richard I., 4,178,211, Cl. 195-30.000.
Ettenberg, Michael: *See—*
Ladany, Ivan; Ettenberg, Michael; Lockwood, Harry F.; and Kressel, Henry, 4,178,564, Cl. 331-94.50H.
Eue, Ludwig: *See—*
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,178,166, Cl. 71-92.000.
Euteco S.p.A.: *See—*
Funaioli, Ettore; Rossetti, Alfio; and Landini, Pier C., 4,177,907, Cl. 220-1.500.
Merli, Claudio; and Francia, Carlo, 4,177,852, Cl. 152-354.00R.
Evangelista, Fred J. Stringless electronic musical instrument. 4,177,705, Cl. 84-1.160.
Evans, John H., to Stant Manufacturing Company, Inc. Breakaway gas cap. 4,177,931, Cl. 220-288.000.
Evans, Leo G.: *See—*
Ruthel, Walter W.; and Evans, Leo G., 4,178,225, Cl. 204-279.000.
EWG Import u. Export GmbH & Co. Handelskommanditgesellschaft: *See—*
Schmidt, Klaus, 4,177,720, Cl. 99-419.000.
Excel Plastic Products, Inc.: *See—*
Gruenewald, Manfred, 4,177,961, Cl. 242-85.100.
Exxon Research & Engineering Co.: *See—*
Chang, Bong H., 4,178,228, Cl. 208-72.000.
Cook, Brian A.; and Brown, Thomas W., 4,178,260, Cl. 252-49.800.
Metrailer, William J.; Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,178,227, Cl. 208-50.000.
F. Zimmermann & Co.: *See—*
Zimmermann, Thomas, 4,178,502, Cl. 235-92.0CN.
Fach, Horst: *See—*
Flockenhaus, Claus; Fach, Horst; Gabriel, Gunter; Galow, Manfred; and Meckel, Joachim, 4,178,150, Cl. 432-14.000.
Facom: *See—*
Brihier, Gerard C. C., 4,178,541, Cl. 324-385.000.
Fagerlie, Richard A.: *See—*
Neff, James A.; and Fagerlie, Richard A., 4,177,840, Cl. 137-599.000.
Fairchild Camera and Instrument Corporation: *See—*
Lake, Don W.; and Subramanian, Nagaraja, 4,178,487, Cl. 179-90.0BD.
Falge, Peter: *See—*
Tudoriu, Theodor, 4,177,805, Cl. 126-79.000.
Fallos, George: *See—*
Orsinger, Winston A.; and Fallos, George, 4,177,979, Cl. 270-54.000.
Falluel, Jean-Pierre: *See—*
Cherbourg, Robert; Falluel, Jean-Pierre; and Menard, Michel, 4,177,605, Cl. 49-98.000.
Farge, Daniel: *See—*
Berger, Christian; Deprez, Dominique; Farge, Daniel; Moutonnier, Claude; and Wolff, Gerard, 4,178,290, Cl. 549-22.000.
Farkas, Kalman; and Krebs, Gary A., to Allis-Chalmers Corporation. Apparatus for machining large heavy workpieces in situs. 4,177,610, Cl. 51-241.00S.
Farmer, Robert L., to Phillips Petroleum Company. Balanced termination for a transmission line. 4,178,504, Cl. 250-199.000.
Faser Industries: *See—*
Daly, William P.; Lewis, Robert P.; and Pouliot, Oliver L., 4,177,620, Cl. 53-425.000.
Fawcett, William E., to Kennametal Inc. Comminution machine with pulverizing blade assembly. 4,177,956, Cl. 241-188.00A.
Fecteau, Ronald D. Clean room filter assembly. 4,178,159, Cl. 55-385.00A.
Feder, Joseph: *See—*
Tolbert, William R.; Feder, Joseph; and Kimes, Richard C., 4,178,209, Cl. 195-1.800.
Feinberg, Samuel: *See—*
Edelson, Stanley; and Feinberg, Samuel, 4,177,903, Cl. 211-49.00D.
Fekete, Ference: *See—*
Douglas, Raymond J.; Fekete, Ference; Gay, Derek J.; Hunter, Gary L.; and Wilson, Nicol S., 4,177,984, Cl. 272-31.00A.
Felter, John V. Method and apparatus for installing insulation. 4,177,618, Cl. 52-743.000.
Felton, Bruce C.: *See—*
Allen, George W.; and Felton, Bruce C., 4,178,629, Cl. 363-96.000.
Felts, James M.; and Staprans, Ilona. Separation of active α_1-acid glycoprotein and utilization in the lipoprotein lipase enzyme system. 4,178,285, Cl. 260-112.00R.
Fennell Corporation: *See—*
James, William L.; and Wonso, Alex P., 4,177,754, Cl. 118-47.000.
Ferris, Donald L.; and Noehren, William L., to United Technologies Corporation. Helicopter rotor having lead-lag damper operable with pitch and flap decoupling. 4,178,130, Cl. 416-107.000.
Ferro Manufacturing Corporation: *See—*
Pickles, Joseph, 4,178,037, Cl. 297-326.000.
Fertl, Walter H., to Dresser Industries, Inc. Method for detecting fractures in formations surrounding earth boreholes. 4,178,506, Cl. 250-260.000.
Fetchin, John A.; and Tsu, Kin H., to American Cyanamid Company. Catalyst for hydration of nitriles. 4,178,310, Cl. 260-561.00N.
Fikentscher, Rolf: *See—*
Glaser, Klaus; Streit, Werner; Fikentscher, Rolf; and Gotsmann, Guenther; 4,178,217, Cl. 204-55.00Y.
Filice, Gary W.: *See—*
Easton, James L.; and Filice, Gary W., 4,177,989, Cl. 273-72.00A.
Fillmore, F. Lawrence, to Teleflex Incorporated. Motion transmitting remote control assembly. 4,177,691, Cl. 74-501.00P.
Finch, Clyde E., Jr. Drilling rig heater. 4,177,792, Cl. 126-93.000.
Fischer, Johann P.: *See—*
Becker, Udo; Burg, Karlheinz; Fischer, Johann P.; and Heimburger, Norbert, 4,178,329, Cl. 525-77.000.
Fischer, Otto: *See—*
Gorges, Helmut; Brod, Heinrich; Pulvermacher, Wilfried; Rubens, Wolfgang; and Fischer, Otto, 4,178,173, Cl. 75-60.000.
Fischer, Wilhelm: *See—*
Busch, Walter; Holst, Arno; and Fischer, Wilhelm, 4,178,271, Cl. 260-17.00R.
Fisher, Brian A.: *See—*
Blaiklock, William M.; and Fisher, Brian A., 4,177,538, Cl. 15-250.390.
Fisher, Charles B.; and Fisher, Sidney T. Sampling modulated waves. 4,178,553, Cl. 325-487.000.
Fisher, Sidney E.: *See—*
Jeavons, Philip S.; and Fisher, Sidney E., 4,177,606, Cl. 49-351.000.
Fisher, Sidney T.: *See—*
Fisher, Charles B.; and Fisher, Sidney T., 4,178,553, Cl. 325-487.000.
Fitzgerald, William C.: *See—*
Allen, Edwin M.; Fitzgerald, William C.; Blazek, Henry; and Turner, George, 4,178,404, Cl. 428-209.000.
Flatland, Lloyd P. Dental handpiece connector. 4,177,564, Cl. 433-82.000.
Flatley, Doris W., to RCA Corporation. Process of making a planar MOS silicon-on-insulating substrate device. 4,178,191, Cl. 148-1.500.
Flavin, Thomas R.: *See—*
Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; McCain, William B.; Weller, Ronald W.; and Werstler, Lawrence J., 4,177,982, Cl. 271-5.000.
Flee, Stephen L.: *See—*
Jorgensen, George N.; Flee, Stephen L.; and Carroll, James C., 4,178,468, Cl. 174-48.000.
Fleischhacker, James E.; and Wasserlein, Henry G., Jr., to AMP Incorporated. Connecting device for connecting pairs of wires. 4,178,055, Cl. 339-98.000.
Flockenhaus, Claus; Fach, Horst; Gabriel, Gunter; Galow, Manfred; and Meckel, Joachim, to Bergwerksverband GmbH. Process and installation for drying and heating coal. 4,178,150, Cl. 432-14.000.
Flockenhaus, Claus: *See—*
Burkert, Rudolf; Flockenhaus, Claus; Meckel, Joachim F.; and Wagener, Dietrich, 4,178,266, Cl. 252-373.000.
FMC Corporation: *See—*
Ensing, Kenneth J., deceased, 4,178,384, Cl. 424-305.000.
Foldes, Sandor: *See—*
Torma, Imre; Temesi nee Palmai, Maria; Foldes, Sandor; and Dorogi, Jozsef, 4,178,562, Cl. 331-84.000.
Foley, James W.: *See—*
Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., 4,178,446, Cl. 544-33.000.
Borror, Alan L.; Foley, James W.; Kampe, Marcis M.; and Lee, John W., Jr., 4,178,447, Cl. 544-33.000.

Fontana, Pietro: *See—*
Stefani, Giancarlo; and Fontana, Pietro, 4,178,298, Cl. 260-346.750.
Food Technology Products: *See—*
Glabe, Elmer F.; and Rebhan, Herbert J., 4,178,369, Cl. 424-177.000.
Glabe, Elmer F.; and Rebhan, Herbert J., 4,178,370, Cl. 424-177.000.
Ford Aerospace & Communications Corp.: *See—*
Baumann, Erwin L., 4,178,627, Cl. 362-240.000.
Ford, Mack L., Jr.; and McFarland, William W., to International Paper Company. Variable flute container. 4,177,936, Cl. 220-441.000.
Ford Motor Company: *See—*
Anderson, Robert L., 4,177,770, Cl. 123-32.0EE.
Chattha, Mohinder, 4,178,320, Cl. 525-188.000.
Chattha, Mohinder S., 4,178,319, Cl. 525-188.000.
Chattha, Mohinder S., 4,178,321, Cl. 525-188.000.
Chattha, Mohinder S., 4,178,322, Cl. 525-188.000.
Chattha, Mohinder S., 4,178,323, Cl. 525-188.000.
Chattha, Mohinder S., 4,178,324, Cl. 525-188.000.
Cheung, Mo-Fung, 4,178,318, Cl. 525-77.000.
Fork, Frank W., to H. H. Robertson Company. Closure device and floor structure utilizing the same. 4,178,469, Cl. 174-48.000.
Fortune, William S. Desoldering attachment for soldering instrument. 4,178,496, Cl. 219-230.000.
Foseco Trading A.G.: *See—*
Duchateau, Jean L.; and Sautiere, Bernard E., 4,177,855, Cl. 164-82.000.
Foster Wheeler Energy Corporation: *See—*
Daman, Ernest L.; and McCallister, Robert A., 4,177,858, Cl. 165-11.000.
Stewart, Robert D.; and Gamble, Robert L., 4,177,741, Cl. 110-263.000.
Foster, William A.: *See—*
Wessling, Ritchie A.; Foster, William A.; and Pickelman, Dale M., 4,178,205, Cl. 162-168.00R.
Fowler, Stephen L., to W. R. Grace & Co. Uniformly irradiated polymer film. 4,178,220, Cl. 204-159.140.
Fowles, Thomas A.: *See—*
Winchell, David A.; and Fowles, Thomas A., 4,177,905, Cl. 215-246.000.
Foxx, Mary E.: *See—*
Klein, Robert W.; and Foxx, Mary E., 4,178,373, Cl. 424-233.000.
Francia, Carlo: *See—*
Merli, Claudio; and Francia, Carlo, 4,177,852, Cl. 152-354.00R.
Franco-Vila, Jose J. Magnetic thermal vibrational device for the treatment of arthritis and the like. 4,177,796, Cl. 128-1.500.
Frank, Earl E.; and Yee, Bing S., to Abex Corporation. Accumulator. 4,177,837, Cl. 138-31.000.
Frank, Louis M.: *See—*
Nunn, Robert G.; Frank, Louis M.; and Bittle, Ronald G., 4,178,589, Cl. 340-573.000.
Frank, William H., to Emerson Electric Co. Ladder and method of construction therefor. 4,177,879, Cl. 182-220.000.
Franke, Walter. Method of operating a four-stroke internal combustion engine and internal combustion engine for carrying out this method. 4,177,772, Cl. 123-75.00B.
Franks, Nelson J.: *See—*
Yarick, Jon R.; and Franks, Nelson J., 4,177,548, Cl. 29-453.000.
Franz, Arnold; and Stein, Werner, to Dynamit Nobel Aktiengesellschaft. Flame-proof epoxy fibrous structure and laminates thereof. 4,178,408, Cl. 428-285.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef, 4,178,236, Cl. 209-215.000.
Theurer, Josef, 4,178,237, Cl. 209-215.000.
Franzen, Jochen: *See—*
Brunnee, Curt; Franzen, Jochen; and Meier, Stefan, 4,178,507, Cl. 250-282.000.
Friday, John R.: *See—*
McConaghy, James R.; Poynor, Paul C.; and Friday, John R., 4,178,229, Cl. 208-50.000.
Fried. Krupp Huttenwerke Aktiengesellschaft: *See—*
Gorges, Helmut; Brod, Heinrich; Pulvermacher, Wilfried; Rubens, Wolfgang; and Fischer, Otto, 4,178,173, Cl. 75-60.000.
Friedenberg, Leonald W.; and Baker, James A., to Baker Engineering Enterprises Ltd. Spreader application rate monitoring device. 4,177,674, Cl. 73-198.000.
Friedenberg, Leonald W.; and Baker, James A., to Baker Engineering Enterprises Ltd. Spreader application rate monitoring device. 4,177,675, Cl. 73-198.000.
Friedlander, Sidney: *See—*
Ekbom, Roger A.; and Friedlander, Sidney, 4,178,052, Cl. 339-61.00R.
Friedman, David. Float controlled valves. 4,177,829, Cl. 137-426.000.
Friedrich Wilh. Schwing GmbH: *See—*
Schwing, Friedrich, 4,178,142, Cl. 417-516.000.
Friesen, David L. Drip-action hydroponic garden. 4,177,604, Cl. 47-62.000.
Frost, Edward G. Automatic nationwide paging system. 4,178,476, Cl. 179-2.0EC.
Frungel, Frank; and Gelbke, Eberhard, to Impulsphysik GmbH. Deep-water in-situ fluorometer. 4,178,512, Cl. 250-461.00R.
Fuchs, Francis J., Jr.: *See—*
Ahmed, Nazeer; and Fuchs, Francis J., Jr., 4,177,658, Cl. 72-60.000.
Fuchs, Hugo: *See—*
Horn, Peter; Grosskinsky, Otto-Alfred; and Fuchs, Hugo, 4,178,317, Cl. 585-357.000.
Fuji Photo Film Co., Ltd.: *See—*
Ohnishi, Masahiro, 4,178,471, Cl. 178-15.000.
Saito, Hirokazu; Suzuki, Keiichi; Shimizu, Masayuki; and Miyahara, Junji, 4,178,185, Cl. 96-94.00R.
Fuji Photo Film Co., Ltd: *See—*
Tsubota, Motohiko; Sakaguchi, Shinji; and Tsuji, Nobuo, 4,178,182, Cl. 96-73.000.
Fujii, Masayuki: *See—*
Sekiguchi, Tomoyoshi; and Fujii, Masayuki, 4,177,977, Cl. 267-64.00R.
Fujino, Takashi: *See—*
Murata, Moriyasu; Sai, Fumio; and Fujino, Takashi, 4,178,354, Cl. 423-306.000.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Takano, Tadayoshi; and Horibe, Susumu, 4,178,445, Cl. 544-30.000.
Fujita, Kazunori; Takeuchi, Seiji; Yamashita, Hisao; and Nakajima, Fumito, to Hitachi, Ltd. Method for supporting hydrous metal oxide on carrier. 4,178,270, Cl. 252-447.000.
Fukawa, Kazumi, to Copal Company Limited. Cassette tape recorder. 4,178,616, Cl. 360-74.100.
Fukushima, Masakazu: *See—*
Fukuzawa, Kenichi; Ando, Kunio; and Fukushima, Masakazu, 4,178,532, Cl. 313-414.000.
Fukuzawa, Kenichi; Ando, Kunio; and Fukushima, Masakazu, to Hitachi, Ltd. Electron guns for use in cathode ray tubes. 4,178,532, Cl. 313-414.000.
Funaioli, Ettore; Rossetti, Alfio; and Landini, Pier C., to Euteco S.p.A. Shipping container. 4,177,907, Cl. 220-1.500.
Funakubo, Hiroyasu; and Shiba, Masataka, to Funakubo, Hiroyasu. Voiced instruction identification system. 4,178,472, Cl. 179-1.0SD.
Fusco, Raffaello, to Anic S.p.A. Method for the purification of sewage waters which contain organic compounds of an anionic character. 4,178,242, Cl. 210-54.000.
Fuso Keigokin Co., Ltd.: *See—*
Takahashi, Katsuhiko; Iikura, Masakazu; and Doi, Hachiro, 4,177,963, Cl. 242-107.110.
Futaba Denshi Kogyo K.K.: *See—*
Kishino, Takao; and Kamagata, Toshio, 4,178,593, Cl. 340-753.000.
Futaba Sangyo Kabushiki Kaisha: *See—*
Kurobe, Takao; Tachikawa, Katsuziro; Kato, Tetsuo; and Imatoku, Yoshinobu, 4,177,875, Cl. 181-265.000.
Gabriel, Gunter: *See—*
Flockenhaus, Claus; Fach, Horst; Gabriel, Gunter; Galow, Manfred; and Meckel, Joachim, 4,178,150, Cl. 432-14.000.
GAF Corporation: *See—*
Chakrabarti, Paritosh M., 4,178,203, Cl. 162-156.000.
Chakrabarti, Paritosh M., 4,178,204, Cl. 162-156.000.
Chakrabarti, Paritosh M., 4,178,206, Cl. 162-156.000.
Lorenz, Donald H.; and Gruber, Bruce A., 4,178,303, Cl. 260-465.00D.
Schneider, Louis; and Graham, David E., 4,178,167, Cl. 71-95.000.
Schneider, Louis; and Graham, David E., 4,178,168, Cl. 71-95.000.
Gagneux, Andre: *See—*
Allgeier, Hans; and Gagneux, Andre, 4,178,378, Cl. 424-269.000.
Gailitis, Juris P.: *See—*
Shishkova, Zinaida P.; Kalninsh, Arvid Y.; Gailitis, Juris P.; Shmit, Uldis Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Kalinkin, Damir A.; Vaax, Viktor R.; Zimina, Maria A.; Belyaev, Vasily D.; Maximenko, Nikolai S.; and Epshtein, Yakov V., 4,178,214, Cl. 195-100.000.
Galica, Edward: *See—*
Rudner, Bernard; Reich, David; and Galica, Edward, 4,178,161, Cl. 55-524.000.
Gallagher, Edward: *See—*
Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; McCain, William B.; Weller, Ronald W.; and Werstler, Lawrence J., 4,177,982, Cl. 271-5.000.
Galli, Ralph, Jr. Water dispensing razor. 4,177,556, Cl. 30-41.000.
Gallinati, Albert A. Safety vest. 4,177,877, Cl. 182-3.000.
Galloway, Ronald W.: *See—*
Mancini, Angelo J.; and Galloway, Ronald W., 4,178,189, Cl. 134-6.000.
Galow, Manfred: *See—*
Flockenhaus, Claus; Fach, Horst; Gabriel, Gunter; Galow, Manfred; and Meckel, Joachim, 4,178,150, Cl. 432-14.000.
Galy, Henri: *See—*
Boy, Aristide; Galy, Henri; Ivaldi, Raoul; and Passedroit, Hubert, 4,178,307, Cl. 260-504.00S.
Gamble, Robert L.: *See—*
Stewart, Robert D.; and Gamble, Robert L., 4,177,741, Cl. 110-263.000.
Gangl, William A. Shell box holding clip. 4,177,910, Cl. 224-252.000.
Ganswein, Bernhard; Daniels, Erwin J.; Schurle, Herman; and Groskopf, Klaus, to Carl Zeiss-Stiftung. Hardened circular spectacle-lens element and method of making the same. 4,178,082, Cl. 351-159.000.
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Garvare, Tore; and Isaksson, Sven-Erik, to ASEA AB. Method of sealing hot isostatic containers. 4,178,178, Cl. 75-226.000.
Gaskill, George; and Horn, John, to Gould Inc. Load management apparatus. 4,178,572, Cl. 335-14.000.
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Gebauer, Peter; Kaufer, Wilhelm; Klinkenberg, Herbert; and Sontgerath, Hilde, to Dynamit Nobel Aktiengesellschaft. Modified polyesters. 4,178,277, Cl. 260-40.00R.
Gebhardt, James L.; and Sanders, Carlos L., to Mead Corporation, The. Indicating device. 4,177,588, Cl. 40-16.400.
Gebr. Happich GmbH: *See—*
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Gedzelman, Milton. Date reminder calendar. 4,178,019, Cl. 283-2.000.
Geisinger, Wolfgang. Apparatus for inserting a resilient band on a container. 4,177,546, Cl. 29-235.000.
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Ouellette, Maurice J., 4,178,482, Cl. 179-15.0AN.
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Irwin, John A., 4,177,692, Cl. 74-573.000.
Johnson, George S.; and Reff, Robey C., 4,177,551, Cl. 29-623.100.
Lura, Loren E., 4,178,028, Cl. 293-135.000.
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Reid, Earl; and Copp, Carl A., Jr., 4,178,136, Cl. 417-269.000.
Ross, Phillip J., 4,177,885, Cl. 192-3.300.
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Smith, Stanley E.; Lyday, Richard W.; and Kushmaul, Thomas R., 4,178,344, Cl. 264-572.000.
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Gerber, Jerome J. Implement hitch assembly. 4,178,010, Cl. 280-412.000.
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Gittos, Maurice W.; and Letertre, Gerard J., to Merrell Toraude et Compagnie. Process for making 4-aminohex-5-enoic acid. 4,178,463, Cl. 562-574.000.
Glabe, Elmer F.; and Rebhan, Herbert J., to Food Technology Products. Feeding turkeys. 4,178,369, Cl. 424-177.000.
Glabe, Elmer F.; and Rebhan, Herbert J., to Food Technology Products. Feeding pigs. 4,178,370, Cl. 424-177.000.
Glaser, Klaus; Streit, Werner; Fikentscher, Rolf; and Gotsmann, Guenther, to BASF Aktiengesellschaft. Zinc electroplating bath. 4,178,217, Cl. 204-55.00Y.
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Gnaga, Vittorio. Device for automatic hair curling. 4,177,824, Cl. 132-34.00R.
Gobble, Harold G.; Vondell, Richard M.; and Mooi, Raymond, to Kellogg Company. Method of making a ready-to-eat breakfast cereal. 4,178,392, Cl. 426-96.000.
Goetzinger, Gunther R.: *See—*
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Gomez, Magdalena U.: *See—*
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Schneider, Louis; and Graham, David E., 4,178,168, Cl. 71-95.000.
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Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, to Laboratories Made, S. A. 2,5-Dimethyl-benzo(b) thiene (3,2-f) morphan and precursor thereof. 4,178,450, Cl. 546-63.000.
Grangirard, Henri; and Serres, Pierre F., to Dubernard Hospital, S.A. Process and apparatus for the non-intrusive measurement of circulatory parameters. 4,177,801, Cl. 128-2.05M.
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Greenberger, Alan J. Digital real time music synthesizer. 4,177,706, Cl. 84-1.010.
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Grell, Helmut; and Scharbach, Heinz, to Pfaudler-Werke A.G. Medical securement element with abrasive grains on thread surface. 4,177,524, Cl. 3-1.900.
Greneker, Lillian L. Finger fit implement. 4,177,698, Cl. 81-1.00R.
Griffin, Edward O. Panel carrier. 4,177,911, Cl. 224-45.00P.
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Grow, Harry N.; and Zboralski, Jon A., to American Hospital Supply Corporation. Baffle system for fume hood. 4,177,717, Cl. 98-115.0LH
Grow, Harry N.; and Zboralski, Jon A., to American Hospital Supply Corporation Fume hood. 4,177,718, Cl. 98-115.0LH.
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GTE Sylvania Incorporated: *See—*
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Guadagnin, Laurent J.; Grossiord, Claude R.; Jensen, John A.; Kawam, Antoine; Mouchet, Jacques M.; and Royer, Michel E., to S. T. Dupont. Liquefied gas apparatus. 4,177,646, Cl. 62-52.000.
Guddal, Erling, to Novo Industri A/S. p-Trimethylsilyloxyphenyl glycyloxy succinimide. 4,178,294, Cl. 260-326.400.
Guerrini, Giampaolo; and Bisone, Dario, to Ing. C. Olivetti & C., S.p.A. Typing device. 4,178,107, Cl. 400-144.200.
Guest, John D. Couplings for tubes. 4,178,023, Cl. 285-323.000.
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Haase, Jaroslav; Liechti, Peter; Wegmuller, Hans; Wurster, Rudolf F.; and Bowes, Quentin, to Ciba-Geigy Aktiengesellschaft. Cationically modified, cellulose-containing materials. 4,178,438, Cl. 536-30.000.
Haffer, Gregor; Eder, Ulrich; Sauer, Gerhard; Wiechert, Rudolf; Nishino, Yukishige; and Neef, Gunter, to Schering, Aktiengesellschaft. C-homoestratrienes. 4,178,381, Cl. 424-283.000.
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Hayashi Masaki; Arai, Yoshinobu; Konishi, Yoshitaka; Shimoji, Katsuichi; Ohuchida, Shuichi; Ito, Hiroyuki, and Wakatsuka, Hirohisa, to Ono Pharmaceutical Co. Ltd. Prostaglandin I_2 analogues. 4,178,367, Cl. 424-285.000
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Henry, Paul S., to Bell Telephone Laboratories, Incorporated. Linear amplification with nonlinear devices. 4,178,557, Cl. 330-10.000.

Hentschel, Karl-Heinz: *See—*
Dhein, Rolf; and Hentschel, Karl-Heinz, 4,178,261, Cl. 252-57.000.

Herbert Zippel Gmbh & Co. KG: *See—*
Zippel, Herbert, 4,178,048, Cl. 312-267.000.

Hermann Berstorff Maschinenbau GmbH: *See—*
Gersbeck, Rolf, 4,177,725, Cl. 100-38.000.

Herzig, Albert M. Air driven tool with double-ended aligned pistons oppositely driven. 4,177,712, Cl. 91-179.000.

Herzog, Klaus: *See—*
Werner, Walter; Herzog, Klaus; and Szenger, Franz, 4,177,568, Cl. 33-174.00L.

Hesston Corporation: *See—*
White, Allen A.; and Ankenman, Thomas W., 4,177,684, Cl. 74-212.000.

Hewitt, Allan R. Apparatus for gauging and pricing fasteners. 4,177,570, Cl. 33-174.00R.

Hewlett-Packard Company: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,178,633, Cl. 364-709.000.
Rose, Donald K., 4,178,635, Cl. 365-19.000.

Heytmeijer, Herman R.; Rusch, Larry P.; and Grasso, Giuseppe, to Westinghouse Electric Corp. Method for preparing dicalcium orthophosphate for use in fluorescent lamp phosphors. 4,178,355, Cl. 423-308.000.

Hickle, Jerry J.: *See—*
Kuss, Ralph L.; and Hickle, Jerry J., 4,177,844, Cl. 150-1.000.

Hickson, Donald A., to Chevron Research Company. Slush filtration method. 4,177,653, Cl. 62-534.000.

Higuchi, Masaaki; Nakatani, Genji; Ito, Haruo; Matsuda, Masamichi; and Suetake, Yoshinori, to Nippon Kokan Kabushiki Kaisha. Molten slag runner for blast-furnace plant. 4,177,974, Cl. 266-196.000.

Higuchi, Takeru; and Lindenbaum, Siegfried, to Interx Research Corporation. Method for inducing rapid therapeutically effective antimalarial levels of certain selected conventional antimalarials. 4,178,376, Cl. 424-258.000.

Hikosaka, Takashi: *See—*
Yamamoto, Shunji; Imaizumi, Koji; and Hikosaka, Takashi, 4,178,092, Cl. 355-3.00R.

Hildebrandt, Eckhard. Winding-in device for vehicle safety belts. 4,177,962, Cl. 242-107.40B.

Hill, Harry E., to R. T. Vanderbilt Company, Inc. Stabilized polyolefin composition. 4,178,280, Cl. 260-45.80A.

Hilti Aktiengesellschaft: *See—*
Entner, Josef, 4,177,867, Cl. 175-400.000.

Hindes, Ted E. Lighted sight pin for archery bows. 4,177,572, Cl. 33-265.000.

Hino, Minoru: *See—*
Yasui, Seimei; and Hino, Minoru, 4,178,186, Cl. 106-20.000.

Hirai, Seiji: *See—*
Yoshida, Toru; Hosoi, Kameo; Tanaka, Takehisa; Hirai, Seiji; and Nakauji, Masakazu, 4,178,158, Cl. 55-160.000.

Hirai, Yutaka; Miyata, Katsuharu; Aiga, Makoto; and Hasegawa, Seiji, to Mitsui Toatsu Chemicals, Incorporated. Process for preparing aromatic urethanes. 4,178,455, Cl. 560-24.000.

Hiraiwa, Kazuyoshi; and Takahashi, Kotei, to Nissan Motor Company, Limited. Parking brake mechanism for motor vehicle equipped with power transmission with torque converter. 4,177,886, Cl. 192-4.00A.

Hirayama, Takeshi: *See—*
Sase, Takashi; Katoh, Kazuo; and Hirayama, Takeshi, 4,178,554, Cl. 328-133.000.

Hirota, Akira, to Victor Company of Japan, Ltd. Color video signal recording and/or reproducing system. 4,178,606, Cl. 358-4.000.

Hitachi, Ltd.: *See—*
Fujita, Kazunori; Takeuchi, Seiji; Yamashita, Hisao; and Nakajima, Fumito, 4,178,270, Cl. 252-447.000.
Fukuzawa, Kenichi; Ando, Kunio; and Fukushima, Masakazu, 4,178,532, Cl. 313-414.000.
Iwamoto, Taro; and Ando, Shimon, 4,177,913, Cl. 228-9.000.
Nakamura, Michiharu; and Umeda, Junichi, 4,178,604, Cl. 357-18.000.
Nakaoka, Azuma; and Takahashi, Sankichi, 4,178,245, Cl. 210-81.000.
Nonaka, Yasuhiko, 4,178,196, Cl. 148-174.000.
Sase, Takashi; Katoh, Kazuo; and Hirayama, Takeshi, 4,178,554, Cl. 328-133.000.
Shiraishi, Atsuko; and Shioya, Makoto, 4,178,132, Cl. 417-5.000.
Takagi, Katsuaki; Tsukada, Toshiro; Tsuruoka, Hisashi; and Hara, Michio, 4,178,585, Cl. 340-347.0NT.
Yoshinari, Takashi; and Ookado, Terumi, 4,177,782, Cl. 123-148.00C.

Hiwatashi, Masaaki: *See—*
Hamamoto, Shoichi; and Hiwatashi, Masaaki, 4,178,145, Cl. 425-199.000.

Hlasnicek, Jean F.: *See—*
Hlasnicek, Richard S.; and Hlasnicek, Jean F., 4,177,985, Cl. 272-75.000.

Hlasnicek, Richard S.; and Hlasnicek, Jean F. Jump rope with variable weighting and rope configuration. 4,177,985, Cl. 272-75.000.

Ho, Roland K.: *See—*
Simonelic, Joseph J.; and Ho, Roland K., 4,178,621, Cl. 361-283.000.

Hobo, Nobuhito: *See—*
Naitou, Takashi; Sumiyoshi, Masaharu; Ito, Osamu; Hobo, Nobuhito; and Suzuki, Yutaka, 4,177,778, Cl. 123-122.00F.

Hobson, Carroll D., to Goshen Rubber Co., Inc. O-Ring and apparatus and method of manufacture. 4,178,003, Cl. 277-237.00R.

Hoechst Aktiengesellschaft: *See—*
Becker, Udo; Burg, Karlheinz; Fischer, Johann P.; and Heimburger, Norbert, 4,178,329, Cl. 525-77.000.
Busch, Walter; Holst, Arno; and Fischer, Wilhelm, 4,178,271, Cl. 260-17.00R.

Hofer, Gerald; Konrath, Karl; Schwarz, Manfred; and Muller, Willi, to Robert Bosch GmbH. Fuel injection pump. 4,177,775, Cl. 123-139.0AP.

Hoff, Alois: *See—*
Hammes, Theo; and Hoff, Alois, 4,177,934, Cl. 220-319.000.

Hoffman, Mark S., to Teradyne, Inc. Electrical measurement circuitry for low level AC signals. 4,178,544, Cl. 324-64.000.

Hoffman, Mark S.: *See—*
Wrinn, Joseph F.; and Hoffman, Mark S., 4,178,543, Cl. 324-64.000.

Hoffmann-La Roche Inc.: *See—*
Berger, Leo; Corraz, Alfred J.; Parrish, David R.; and Scott, John W., 4,178,289, Cl. 260-315.000.
Cleeland, Roy; Durkin, Joanne; and Kramer, Michael J., 4,178,360, Cl. 424-1.000.
Mondabaugh, Susan M.; and Gomez, Magdalena U., 4,178,359, Cl. 424-1.000.
Montavon, Marc; and Reiner, Roland, 4,178,443, Cl. 544-27.000.

Hogeman, Robert L.; Seaman, Jack L.; and Taylor, Roland S., to General Motors Corporation. Carburetor and method of calibration. 4,178,332, Cl. 261-50.00R.

Holmberg, Lars-Erik. Apparatus for determining the alcoholic content in the blood. 4,177,668, Cl. 73-23.000.

Holst, Arno: *See—*
Busch, Walter; Holst, Arno; and Fischer, Wilhelm, 4,178,271, Cl. 260-17.00R.

Holt, Brian: *See—*
Lee, Peter I.; and Holt, Brian, 4,178,253, Cl. 252-47.000.

Hon, David T.; Bruesselbach, Hans W.; Muir, Alexander R.; and Tuchnyer, Harold J., to Hughes Aircraft Company. Scanning arrangements for optical frequency converters. 4,178,561, Cl. 350-6.600.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Osada, Isao; and Sano, Shoichi, 4,177,849, Cl. 152-158.000.

Hondo, Tadahiro: *See—*
Kaneda, Takaho; Ishikawa, Seiji; Daimon, Hiroshi; Katsura, Toshio; Maeda, Tatsuaki; and Hondo, Tadahiro, 4,178,431, Cl. 528-337.000.

Hone, Horace T., to United Technologies Corporation. Apparatus for synchronously elevating and lowering air-ambulance litter with crash attenuation capability. 4,178,032, Cl. 296-19.000.

Honeywell Inc.: *See—*
Johnson, Vern C.; McCormick, Virgil K.; and Whitney, John M., 4,177,860, Cl. 165-26.000.

Hoogendoorn, Hendrik; Matthijsen, Rutger; and Moelker, Huibert C. T., to Telec S.A. Enzymatic dentifrices. 4,178,362, Cl. 424-48.000.

Hooker Chemicals & Plastics Corp.: *See—*
Ruthel, Walter W.; and Evans, Leo G., 4,178,225, Cl. 204-279.000.

Hoover, Charles D., to AMP Incorporated. Fiber optic cable termination means. 4,178,068, Cl. 350-96.210.

Hoover Company, The: *See—*
Powers, Joseph A., 4,177,536, Cl. 15-182.000.

Hopkins, William M.: *See—*
Gill, Michael L.; and Hopkins, William M., 4,177,851, Cl. 152-353.00R.

Horgan, John J., to United Technologies Corporation. Centrifugal fluidized bed combustor. 4,177,636, Cl. 60-39.350.

Horibe, Susumu: *See—*
Takano, Tadayoshi; and Horibe, Susumu, 4,178,445, Cl. 544-30.000.

Horike, Masanori: *See—*
Jinnai, Koichiro; Horike, Masanori; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,178,595, Cl. 346-140.00R.

Horn, John: *See—*
Gaskill, George; and Horn, John, 4,178,572, Cl. 335-14.000.

Horn, Peter; Grosskinsky, Otto-Alfred; and Fuchs, Hugo, to BASF Aktiengesellschaft. Manufacture of olefinically unsaturated aliphatic or cycloaliphatic hydrocarbons. 4,178,317, Cl. 585-357.000.

Horn, William E., Jr., to Borg-Warner Corporation. Flame-retardant polycarbonate compositions. 4,178,281, Cl. 260-45.80R.

Horst Zerhoch-Vorrinchtungs und Machinenbau GmbH & Co. KG: *See—*
Zerhoch, Horst, 4,177,663, Cl. 72-165.000.

Hosoi, Kameo: *See—*
Yoshida, Toru; Hosoi, Kameo; Tanaka, Takehisa; Hirai, Seiji; and Nakauji, Masakazu, 4,178,158, Cl. 55-160.000.

Hotta, Toshihiro; and Makino, Takao, to Kabushiki Kaisha Morita Seisakusho. Device for controlling amount of X-ray irradiation. 4,178,508, Cl. 250-355.000.

Hounsfield, Godfrey N.; and Waltham, Richard M., to E M I Limited. Radiography. 4,178,511, Cl. 250-445.00T.

Hovel, Harold J.; and Woodall, Jerry M., to International Business Machines Corporation. Semiconductor structure. 4,178,195, Cl. 148-171.000.

Howerton, Anderson W.; Klein, Darrell L.; and Thomas, James R., to Dayco Corporation. Endless power transmission belt and method for making same. 4,177,688, Cl. 74-233.000.

Hoyer, Gerhard: *See—*
Emmerich, Bernd W.; Ehret, Rudolf; Hoyer, Gerhard; and Trampert, Hans R., 4,178,623, Cl. 361-284.000.

Hsieh, Henry L.; and Naylor, Floyd E., to Phillips Petroleum Company. Block copolymers of dienes and hydrocarbyl-substituted styrenes as adhesives. 4,178,275, Cl. 260-33.60A.

Hsu, Sheng T.; and Cartwright, James M., Jr., to RCA Corporation. Complementary MOS inverter structure. 4,178,605, Cl. 357-42.000.

Hubbard, Winchester L.: *See—*
Mao, Chung-Ling; Strunk, Richard J.; and Hubbard, Winchester L., 4,178,382, Cl. 424-288.000.

Huber, Eugen W., deceased: *See—*
Schaffitz, Wolfgang; and Huber, Eugen W., deceased, 4,177,948, Cl. 239-533.300.

Huber-Patzold, Gerda A. O., Anke H. L. Huber, Christina G. E. Huber, heirs: *See—*
Schaffitz, Wolfgang; and Huber, Eugen W., deceased, 4,177,948, Cl. 239-533.300.

Hubner, Kurt: *See—*
Burki, Jean-Jacques; Dill, Hans G.; and Hubner, Kurt, 4,177,632, Cl. 58-23.0BA.

Huestis, Allan C., to Midrex Corporation. Apparatus for monitoring the feeding of particulate materials to a packed bed furnace. 4,178,151, Cl. 432-1.000.

Huet, Philippe; Milleon, Roger H.; and Leprince, Philippe, to Agence Nationale de Valorisation de la Recherche (ANVAR). System for generating a high-energy electrical signal through a brief time, and a laser comprising such a system. 4,178,563, Cl. 331-94.5PE.

Huggins, Homer D.: *See—*
Costello, Norman F.; Huggins, Homer D.; and Kao, Stephen S. T., 4,177,861, Cl. 165-101.000.

Hughes Aircraft Company: *See—*
Bilow, Norman, 4,178,430, Cl. 528-245.000.
Denlinger, Michael C.; Korb, Robert W.; and Lardenoit, Vernon F., 4,177,916, Cl. 228-231.000.
Hon, David T.; Bruesselbach, Hans W.; Muir, Alexander R.; and Tuchnyer, Harold J., 4,178,561, Cl. 350-6.600.

Hujsak, Edward J.; and Siden, LeRoy E., to General Dynamics Corporation. Docking system for space structures. 4,177,964, Cl. 244-161.000.

Hulls, Leonard R.; and Dowdell, Toy, Jr., to RCA Corporation. Alternator test apparatus and method. 4,178,546, Cl. 324-158.0MG.

Humphrey, Robert J., to Avco Corporation. Gift wrap package. 4,177,898, Cl. 206-494.000.

Hunt, Susan L.: *See—*
Beaver, Robert I., II; Adams, Michael J.; Prodanovich, George L.; Key, Paul F.; Rawlings, Don O.; Santhanam, P.; and Hunt, Susan L., 4,178,113, Cl. 406-10.000.

Hunter, Edwin J., to Toro Company, The. Water accumulator-distributor for agricultural sprinkler. 4,177,926, Cl. 239-99.000.

Hunter, Gary L.: *See—*
Douglas, Raymond J.; Fekete, Ference; Gay, Derek J.; Hunter, Gary L.; and Wilson, Nicol S., 4,177,984, Cl. 272-31.00A.

Husbands, David R.: *See—*
Ayers, John S.; and Husbands, David R., 4,178,439, Cl. 536-59.000.

Huseby, Irvin C.; and Klug, Frederic J., to General Electric Company. Mixed oxide compound $NdAlO_3$ for casting advanced superalloy materials. 4,178,187, Cl. 106-38.900.

Huston, Ernest L.: *See—*
Nordblom, George F.; Turillon, Pierre P.; Huston, Ernest L.; and Keresztes, Stephan L., 4,178,216, Cl. 204-2.100.

Huxtable, Jonathan: *See—*
Cole, Ernest A.; Cogswell, Frederic N.; and Huxtable, Jonathan, 4,178,411, Cl. 428-310.000.

Hymatic Engineering Company Limited, The: *See—*
Campbell, David N., 4,177,650, Cl. 62-222.000.

Hyytinen, Niilo M., to A B C Concrete Products. Method and apparatus for making concrete brick having antique appearance. 4,178,340, Cl. 264-73.000.

Iacotti, Italo; and Pasero, Edoardo, to Istituto di Ricerca Finsider per la Riduzione Diretta S.p.A. Process for the production of carburized sponge iron briquettes. 4,178,170, Cl. 75-3.000.

Ibaragi, Tetsuo: *See—*
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; and Nishioka, Kunihiko, 4,178,215, Cl. 201-6.000.

Ichihara, Isao; Oguni, Yasuo; and Shiratori, Harunori, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for sensing air-pressure drop in a tire. 4,177,671, Cl. 73-146.500.

Ichimura, Masaaki: *See—*
Itoh, Yuzuru; Ichimura, Masaaki; and Uenoyama, Masaru, 4,178,044, Cl. 303-47.000.

Idemura, Hideo: *See—*
Asanagi, Etsuo; and Idemura, Hideo, 4,178,348, Cl. 423-242.000.

Igoe, Robert S., to Merck & Co., Inc. Compositions for stabilizing soft serve and hard frozen yogurt. 4,178,390, Cl. 426-43.000.

Iijima, Yaichi, to Konishiroku Photo Industry Co., Ltd. Camera containing a movable automatic dimmer strobo. 4,178,083, Cl. 354-41.000.

Iikura, Masakazu: *See—*
Takahashi, Katsuhiko; Iikura, Masakazu; and Doi, Hachiro, 4,177,963, Cl. 242-107.110.

Ikegawa, Kiyohiro: *See—*
Obata, Hiroshi; Hasegawa, Takehisa; Watanabe, Hideto; Ikegawa, Kiyohiro; and Ashida, Toshiyuki, 4,177,976, Cl. 266-266.000.

Iles, Frank. Cartridge for peristaltic pump. 4,178,138, Cl. 417-360.000.

Illgner, Eberhard, to Magirus-Deutz AG. Device for adjusting and coupling amphibious vehicles. 4,177,531, Cl. 14-27.000.

Imaizumi, Koji: *See—*
Yamamoto, Shunji; Imaizumi, Koji; and Hikosaka, Takashi, 4,178,092, Cl. 355-3.00R.

Imatoku, Yoshinobu: *See—*
Kurobe, Takao; Tachikawa, Katsuziro; Kato, Tetsuo; and Imatoku, Yoshinobu, 4,177,875, Cl. 181-265.000.

Imperial Chemical Industries Limited: *See—*
Aldridge, David C.; Bowling, Roger; and Swait, John C., 4,178,213, Cl. 195-81.000.
Cole, Ernest A.; Cogswell, Frederic N.; and Huxtable, Jonathan, 4,178,411, Cl. 428-310.000.
Snowden, Paul, 4,178,336, Cl. 264-8.000.
Steele, Daniel, 4,177,732, Cl. 102-27.00R.

Impulsphysik GmbH: *See—*
Frungel, Frank; and Gelbke, Eberhard, 4,178,512, Cl. 250-461.00R.

Inaba, Masao: *See—*
Takahashi, Ryosuke; Inaba, Masao; and Onosato, Masashi, 4,178,613, Cl. 358-183.000.

Inductive Controls Limited: *See—*
Logan, Robert J., 4,178,540, Cl. 323-89.00R.

Ing. C. Olivetti & C., S.p.A.: *See—*
Guerrini, Giampaolo; and Bisone, Dario, 4,178,107, Cl. 400-144.200.

Innerspace Corporation: *See—*
Gongwer, Calvin A., 4,178,128, Cl. 416-72.000.

Inouye, Kimichi: *See—*
Oda, Toyohisa; and Inouye, Kimichi, 4,178,417, Cl. 428-679.000.

Institut fur Motorenbau Professor Huber Eingetragener Verein: *See—*
Schaffitz, Wolfgang; and Huber, Eugen W., deceased, 4,177,948, Cl. 239-533.300.

Institut National de la Sante et de la Recherche Medicale - Centre de Technologie Biomedicale I.N.S.E.R.M.: *See—*
Bout, Daniel, 4,178,365, Cl. 424-88.000.

Institut Pasteur: *See—*
Bout, Daniel, 4,178,365, Cl. 424-88.000.

Institut Straumann AG: *See—*
Wenger, Alfred, 4,177,669, Cl. 73-32.00A.

Intengan, Franklin S. Racquet display case. 4,177,845, Cl. 150-52.00G.

Intercraft Industries Corporation: *See—*
Tushner, Lawrence P.; and Krol, Walter J., 4,177,590, Cl. 40-156.000.

International Blind Company: *See—*
Anderson, Samuel J.; and Anderson, James M., 4,177,853, Cl. 160-168.00R.

International Business Development Co.: *See—*
Zenzaburo, Iwamoto, 4,177,790, Cl. 126-38.000.

International Business Machines Corporation: *See—*
Allen, George W.; and Felton, Bruce C., 4,178,629, Cl. 363-96.000.
Argyle, Bernell E.; Slonczewski, John C.; and Dekker, Pieter, 4,178,636, Cl. 365-30.000.

Champion, James R.; and Seigal, Steven D., 4,178,095, Cl. 355-14.00R.
Hovel, Harold J.; and Woodall, Jerry M., 4,178,195, Cl. 148-171.000.
Kane, Milburn H., 4,178,108, Cl. 400-144.200.
Marinace, John C., 4,178,197, Cl. 148-175.000.

International Flavors & Fragrances Inc.: *See—*
Sprecker, Mark A.; and Theimer, Ernst T., 4,178,311, Cl. 260-592.000.

International Harvester Company: *See—*
Cicci, George B., 4,177,627, Cl. 56-15.800.

International Nickel Company, Inc., The: *See—*
Nordblom, George F.; Turillon, Pierre P.; Huston, Ernest L.; and Keresztes, Stephan L., 4,178,216, Cl. 204-2.100.

International Paper Company: *See—*
Ford, Mack L., Jr.; and McFarland, William W., 4,177,936, Cl. 220-441.000.

International Research and Development Corporation: *See—*
Leong, Basil K. J., 4,177,941, Cl. 222-636.000.

International Standard Electric Corporation: *See—*
Reutter, Jorg; and Dietze, Wolfgang, 4,178,569, Cl. 333-119.000.

International Telephone and Telegraph Corporation: *See—*
Speth, William R., 4,178,521, Cl. 307-270.000.

Interx Research Corporation: *See—*
Higuchi, Takeru; and Lindenbaum, Siegfried, 4,178,376, Cl. 424-258.000.

Iowa State University Research Foundation, Inc.: *See—*
Buchele, Wesley F.; Jeffries, Dennis L.; Madson, Ricky D.; Mattson, Timothy J.; Sparks, Gregory E.; Thompson, Raymond D.; and Uehle, Howard T., 4,177,723, Cl. 100-8.000.

Irwin, John A., to General Motors Corporation. Shaft balancing. 4,177,692, Cl. 74-573.000.

Isa, Isao: *See—*
Shibuya, Morioki; and Isa, Isao, 4,178,356, Cl. 423-478.000.

Isaksson, Sven-Erik: *See—*
Garvare, Tore; and Isaksson, Sven-Erik, 4,178,178, Cl. 75-226.000.

Isayama, Takuro; and Komai, Hiromichi, to Ricoh Company, Ltd. Color ink jet printing apparatus. 4,178,597, Cl. 346-75.000.

Ishi, Takashi; Murakami, Takuzi; Kato, Masayoshi; and Nagaoka, Tadahiko, to Nissan Motor Company, Limited. Safety bag inflation apparatus with extendible guard member against contact of bag with heated gas generator. 4,178,017, Cl. 280-740.000.

Ishigaki Kiko Co., Ltd.: *See—*
Iwatani, Akitoshi, 4,178,251, Cl. 210-350.000.

Ishigaki, Yuzo: *See—*
Ogita, Minoru; and Ishigaki, Yuzo, 4,178,551, Cl. 325-427.000.

Ishikawa, Seiji: *See—*
Kaneda, Takaho; Ishikawa, Seiji; Daimon, Hiroshi; Katsura, Toshio; Maeda, Tatsuaki; and Hondo, Tadahiro, 4,178,431, Cl. 528-337.000.

Ishikawa, Shinzo: *See—*
Shono, Hiroaki; Ishikawa, Shinzo; Wakasa, Isao; and Adachi, Miyako, 4,178,162, Cl. 65-1.000.

Ishikawa, Tomihisa: *See—*
Uemura, Toshio; Watanabe, Yoshiki; Masumoto, Yoji; Ishikawa, Tomihisa; Kajimoto, Noboru; and Kawada, Shin, 4,177,742, Cl. 110-346.000.

Ishikawa, Youichi: *See—*
Ohashi, Minoru; Ishikawa, Youichi; Shouda, Makoto; and Watabe, Tamon, 4,178,223, Cl. 204-195.00P.

Istituto di Ricerca Finsider per la Riduzione Diretta S.p.A.: *See—*
Iacotti, Italo; and Pasero, Edoardo, 4,178,170, Cl. 75-3.000.

ITI Limited: *See—*
Mougin, Georges L., 4,177,748, Cl. 115-76.000.

Ito, Haruo: *See—*
Higuchi, Masaaki; Nakatani, Genji; Ito, Haruo; Matsuda, Masamichi; and Suetake, Yoshinori, 4,177,974, Cl. 266-196.000.

Ito, Hiroyuki: *See—*
Hayashi Masaki; Arai, Yoshinobu; Konishi, Yoshitaka; Shimoji, Katsuichi; Ohuchida, Shuichi; Ito, Hiroyuki; and Wakatsuka, Hirohisa, 4,178,367, Cl. 424-285.000.

Ito, Osamu: *See—*
Naitou, Takashi; Sumiyoshi, Masaharu; Ito, Osamu; Hobo, Nobuhito; and Suzuki, Yutaka, 4,177,778, Cl. 123-122.00F.

Ito, Tadashi: *See—*
Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aiichiro; Okuno, Youichi; Tsunlkawa, Tokuichi; and Ito, Tadashi, 4,178,084, Cl. 354-59.000.
Suzuki, Masayuki; Ito, Tadashi; Yamamichi, Masayoshi; and Murakami, Hiroyasu, 4,178,085, Cl. 354-60.00R.

Ito, Takamichi: *See—*
Narita, Kiichi; Mori, Takasuke; and Ito, Takamichi, 4,178,175, Cl. 75-93.00E.

Itoh, Hiroshi: *See—*
Sakurai, Kunio; Kojima, Tadashi; and Itoh, Hiroshi, 4,178,403, Cl. 428-209.000.

Itoh, Yuzuru; Ichimura, Masaaki; and Uenoyama, Masaru, to Kabushiki Kaisha Komatsu Seisakusho. Brake mechanism for tractors. 4,178,044, Cl. 303-47.000.

Itou, Masami: *See—*
Morita, Yoshiyuki; Itou, Masami; Nomura, Shigeyoshi; and Ueda, Masahiro, 4,177,788, Cl. 123-97.00B.

Ivaldi, Raoul: *See—*
Boy, Aristide; Galy, Henri; Ivaldi, Raoul; and Passedroit, Hubert, 4,178,307, Cl. 260-504.00S.

Ivanko, Theodore; and Saboe, Michael S., to Avco Corporation. Drive system. 4,177,693, Cl. 74-661.000.

Iwamoto, Taro; and Ando, Shimon, to Hitachi, Ltd. Automatic pipe welding apparatus. 4,177,913, Cl. 228-9.000.

Iwasaki, Kyuhachiro: *See—*
Jinnai, Koichiro; Horike, Masanori; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,178,595, Cl. 346-140.00R.

Iwatani, Akitoshi, to Ishigaki Kiko Co., Ltd. Apparatus for dehydration of sludge. 4,178,251, Cl. 210-350.000.

Jacob, Richard J., to Dayco Corporation. Endless power transmission belt. 4,177,686, Cl. 74-231.0CB.

Jaeneke, Christian: *See—*
Romer, Rudolf; Moll, Manfred; and Jaeneke, Christian, 4,177,733, Cl. 102-93.000.

Jakobsson, Sixten: *See—*
Seppanen, Rauno; Sarvanne, Hannu; and Jakobsson, Sixten, 4,178,139, Cl. 417-360.000.

Jakusch, Helmut: *See—*
Steck, Werner; Brodt, Rudolf; Sarnecki, Wilhelm; Jakusch, Helmut; Ohlinger, Manfred; and Koester, Eberhard, 4,178,171, Cl. 75-0.5AA.

James D. Easton, Inc.: *See—*
Easton, James L.; and Filice, Gary W., 4,177,989, Cl. 273-72.00A.

James, David R. Sanitary chairs. 4,177,528, Cl. 4-134.000.

James, Rex L.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,178,633, Cl. 364-709.000.

James, William L.; and Wonso, Alex P., to Fennell Corporation. Apparatus for obtaining bright finish galvanizing coating on wire. 4,177,754, Cl. 118-47.000.

Jamieson, Geoffrey A.: *See—*
Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., 4,178,256, Cl. 252-8.750.

Jamison, Fred W. Security lock system. 4,178,587, Cl. 340-542.000.

Jan-Bar Retrieval Corporation: *See—*
Janson, John J., 4,178,247, Cl. 210-96.100.

Janson, John J., to Jan-Bar Retrieval Corporation. Oil spill retrieval system. 4,178,247, Cl. 210-96.100.

Japan Carlit Co., Ltd., The: *See—*
Shibuya, Morioki; and Isa, Isao, 4,178,356, Cl. 423-478.000.

Japan Steel Works, Ltd., The: *See—*
Oda, Toyohisa; and Inouye, Kinichi, 4,178,417, Cl. 428-679.000.

Jean, Leonard P.; and Lachance, Ernest J., Sr., to Hendrix Wire & Cable Corp. Insulator for electrical conductors and method of stringing such conductors on insulators. 4,178,470, Cl. 174-168.000.

Jeavons, Philip S.; and Fisher, Sidney E., to Wilmot-Breeden Limited. Regulator assemblies. 4,177,606, Cl. 49-351.000.

Jeffries, Dennis L.: *See—*
Buchele, Wesley F.; Jeffries, Dennis L.; Madson, Ricky D.; Mattson, Timothy J.; Sparks, Gregory E.; Thompson, Raymond D.; and Uehle, Howard T., 4,177,723, Cl. 100-8.000.

Jenkinson, John, to Rolls-Royce Limited. Gas turbine engine cooling system. 4,178,129, Cl. 416-95.000.

Jennings, David L.: *See—*
Bubar, Stanley F.; and Jennings, David L., 4,178,059, Cl. 339-115.00R.

Jensen, John A.: *See—*
Guadagnin, Laurent J.; Grossiord, Claude R.; Jensen, John A.; Kawam, Antoine; Mouchet, Jacques M.; and Royer, Michel E., 4,177,646, Cl. 62-52.000.

Jensen, Knud B.: *See—*
Andersen, Axel; Knudsen, Poul U.; and Jensen, Knud B., 4,178,069, Cl. 350-96.230.

Jersey Nuclear-Avco Isotopes, Inc.: *See—*
Morton, Richard G., 4,178,565, Cl. 331-94.50D.

Jespersen, Emil; and Mogensen, Vagn, to Dansk Industri Syndikat AS. Conveyor comprising a driven flexible belt for stepwise advancing moulds. 4,177,892, Cl. 198-832.000.

Jessel, Maurice J.: *See—*
Angelini, Theophile A.; Nayrole, Bernard J. P.; Jessel, Maurice J.; Canevet, Georges; Mangiante, Gerard A.; and Carbone, Bernard, 4,177,874, Cl. 181-206.000.

Jinnai, Koichiro; Horike, Masanori; Iwasaki, Kyuhachiro; and Kodama, Yutaka, to Ricoh Company, Ltd. Ink jet printing apparatus with ink replenishing. 4,178,595, Cl. 346-140.00R.

Joel, Amos E., Jr., to Bell Telephone Laboratories, Incorporated. Signaling system. 4,178,474, Cl. 179-1.50R.

Johan ·s Fuchs, Firma: *See—*
Dolinsek, Hans, 4,178,030, Cl. 294-70.000.

John F. Lontz Associates, Inc.: *See—*
Lontz, John F., 4,178,096, Cl. 355-32.000.

John Thomas Batts, Inc: *See—*
Batts, John H.; and Garrison, Judd F., 4,177,908, Cl. 223-96.000.

Johns-Manville Corporation: *See—*
Reynolds, Harold J., Jr., 4,178,278, Cl. 260-42.220.

Johnson Controls, Inc.: *See—*
Matthews, Russell B., 4,178,149, Cl. 431-46.000.

Johnson, Eric A., III; Moore, Melvin E.; and Budd, Tom A., to Keystone Consolidated Industries, Inc. Strap tensioning device. 4,177,724, Cl. 100-26.000.

Johnson, George S.; and Reff, Robey C., to General Motors Corporation. Method of welding a arc battery intercell connector. 4,177,551, Cl. 29-623.100.

Johnson, James A.; and Touma, Raouf G., to UOP Inc. Process for the simultaneous production of aromatic hydrocarbons and isobutane. 4,178,230, Cl. 208-66.000.

Johnson & Johnson: *See—*
Hall, Joseph J.; Korpman, Ralf; and Sinker, Stephen M., 4,178,337, Cl. 264-28.000.

Johnson, Richard A., to Sanders Associates, Inc. Period-modulated voltage controlled oscillator. 4,178,567, Cl. 331-177.00R.

Johnson, Richard E. Furniture dolly. 4,178,006, Cl. 280-79.10A.

Johnson, Tore R.; Reyner, Emerson M., II; and Slysh, Roman S., to AMP Incorporated. Splicing optic waveguides by shrinkable means. 4,178,067, Cl. 350-96.210.

Johnson, Vern C.; McCormick, Virgil K.; and Whitney, John M., to Honeywell Inc. Heating and cooling thermostat with changeover switching operated upon control point adjustment. 4,177,860, Cl. 165-26.000.

Johnson, William R., to Chinook Manufacturing Co. Freestanding fireplace stove with heated air circulation. 4,177,793, Cl. 121-121.000.

Johnstone, Richard: *See—*
Sipek, Charles B.; Johnstone, Richard; and Clegg, Russell B., 4,177,550, Cl. 29-568.000.

Jolley, Kenneth A. Fishing lure hook up swivel. 4,177,598, Cl. 43-42.490.

Jordan, John F.; and Singh, Vijay P., to Photon Power, Inc. Methods for improving solar cell open circuit voltage. 4,178,395, Cl. 427-74.000.

Jorgensen, George N.; Flee, Stephen L.; and Carroll, James C., to Square D Company. Duct post. 4,178,468, Cl. 174-48.000.

Joseloff, Stanley. Combination supermarket counter and cart therefor 4,177,880, Cl. 186-1.00R.

Joyner, Frederick B.: *See—*
Meyer, Max F., Jr.; McConnell, Richard L.; and Joyner, Frederick B., 4,178,272, Cl. 260-27.00R.

Jung, Lothar. Apparatus for manufacturing hollow and solid ingots. 4,178,165, Cl. 65-144.000.

Kabushiki Kaisha Daini Seikosha: *See—*
Kawashima, Hirofumi, 4,178,527, Cl. 310-370.000.
Kawashima, Hirofumi, 4,178,566, Cl. 331-156.000.
Miyamoto, Masao, 4,177,633, Cl. 58-23.00R.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Itoh, Yuzuru; Ichimura, Masaaki; and Uenoyama, Masaru, 4,178,044, Cl. 303-47.000.
Okada, Masaru; and Kanai, Seikichi, 4,177,769, Cl. 123-30.00D.

Kabushiki Kaisha Morita Seisakusho: *See—*
Hotta, Toshihiro; and Makino, Takao, 4,178,508, Cl. 250-355.000.
Yada, Akio; and Tsukada, Naonobu, 4,178,038, Cl. 297-391.000.

Kabushiki Kaisha Sango: *See—*
Kurobe, Takao; Tachikawa, Katsuziro; Kato, Tetsuo; and Imatoku, Yoshinobu, 4,177,875, Cl. 181-265.000.

Kabushiki Kaisha Suwa Seikosha. *See—*
Yamada, Haruyoshi; and Ushikoshi, Kenichi, 4,177,631, Cl. 58-23.0BA

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Shinoda, Akibumi; and Shimizu, Masahiko, 4,178,004, Cl. 280-5.00A

Kadex, Inc.: *See—*
Aydin, Kemal, 4,177,657, Cl. 70-278.000.

Kaiser Aluminum & Chemical Corporation: *See—*
Crawford, Millard B., 4,177,825, Cl. 137-243.200.

Kajimoto, Noboru: *See—*
Uemura, Toshio; Watanabe, Yoshiki; Masumoto, Yoji; Ishikawa, Tomihisa; Kajimoto, Noboru; and Kawada, Shin, 4,177,742, Cl. 110-346.000.

Kajiwara, Takao, to Nippon Gakki Seizo Kabushiki Kaisha. Racket frame. 4,177,990, Cl. 273-73.00C.

Kakiuchi, Akio: *See—*
Kawai, Noriaki; Okamoto, Hisaji; Takeda, Yosiaki; Sano, Fukuzi; Kakiuchi, Akio; Manabe, Masami; Nomura, Takashi; and Abe, Sigeya, 4,177,776, Cl. 123-117.00A.

Kalinkin, Damir A.: *See—*
Shishkova, Zinaida P.; Kalninsh, Arvid Y.; Gailitis, Juris P.; Shmit, Uldis Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Kalinkin, Damir A.; Vaax, Viktor R.; Zinina, Maria A.; Belyaev, Vasily D.; Maximenko, Nikolai S.; and Epshtein, Yakov V., 4,178,214, Cl. 195-100.000.

Kalitz, Milton C., to American Sunroof Corporation. Positive lock mechanism for vehicular sliding roof panels. 4,178,036, Cl. 296-137.00B.

Kalninsh, Arvid Y.: *See—*
Shishkova, Zinaida P.; Kalninsh, Arvid Y.; Gailitis, Juris P.; Shmit, Uldis Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Kalinkin, Damir A.; Vaax, Viktor R.; Zinina, Maria A.; Belyaev, Vasily D.; Maximenko, Nikolai S.; and Epshtein, Yakov V., 4,178,214, Cl. 195-100.000.

Kamagata, Toshio: *See—*
Kishino, Takao; and Kamagata, Toshio, 4,178,593, Cl. 340-753.000.

Kameswaran, Venkataraman: *See—*
Berkelhammer, Gerald; and Kameswaran, Venkataraman, 4,178,460, Cl. 562-426.000.

Kampe, Marcis M.: *See—*
Borror, Alan L.; Foley, James W.; Kampe, Marcis M.; and Lee, John W., Jr., 4,178,447, Cl. 544-33.000.

Kanai, Seikichi: *See—*
Okada, Masaru; and Kanai, Seikichi, 4,177,769, Cl. 123-30.00D.

Kandyba, Petr E.; Kolesnikov, Dmitry P.; Komarovskikh, Nina I.; Lapir, Gennady M.; Likharev, Konstantin K.; Ryzhkov, Vadim A.; and Yastrebov, Viktor G. Thin film cryotron. 4,178,602, Cl. 357-4.000.

Kane, Milburn H., to International Business Machines Corporation. Apparatus for space synchronizing carrier and rotatable print disk positions in on-the-fly printing. 4,178,108, Cl. 400-144.200.

Kaneda, Takaho; Ishikawa, Seiji; Daimon, Hiroshi; Katsura, Toshio; Maeda, Tatsuaki, and Hondo, Tadahiro, to Ube Industries, Ltd. Aromatic copolyamide fiber from benzidine sulfone or diamino phenanthridone. 4,178,431, Cl. 528-337.000.

Kanesa Miso Kabushiki-Kaisha: *See—*
Kobayashi, Masakazu; and Harashima, Koh, 4,177,574, Cl. 34-12.000.

Kanter, Jerome J. Method of improving corrosion resistance with coating by friction. 4,178,193, Cl. 148-6.000.

Kantner, Donald J.: *See—*
Decker, John J.; and Kantner, Donald J., 4,178,164, Cl. 65-59.00R.

Kao Soap Co., Ltd: *See—*
Murata, Moriyasu; Sai, Fumio; and Fujino, Takashi, 4,178,354, Cl. 423-306.000.

Kao, Stephen S. T.: *See—*
Costello, Norman F.; Huggins, Homer D.; and Kao, Stephen S. T., 4,177,861, Cl. 165-101.000.

Kappenhagen, George A., to Westinghouse Electric Corp. Elevator system. 4,177,881, Cl. 187-56.000.

Kappler, Fritz Robert: *See—*
Englaender, Fritz; and Kappler, Fritz Robert, 4,178,295, Cl. 260-343.30R.

Kasamura, Toshirou: *See—*
Murakawa, Syuzi; Kasamura, Toshirou; and Ando, Yujiro, 4,177,757, Cl. 118-658.000.

Katayama, Masato: *See—*
Marumo, Shingo; and Katayama, Masato, 4,178,462, Cl. 562-501.000.

Kato, Masayoshi: *See—*
Ishi, Takashi; Murakami, Takuzi; Kato, Masayoshi; and Nagaoka, Tadahiko, 4,178,017, Cl. 280-740.000.

Kato, Tetsuo: *See—*
Kurobe, Takao; Tachikawa, Katsuziro; Kato, Tetsuo; and Imatoku, Yoshinobu, 4,177,875, Cl. 181-265.000.

Katoh, Kazuo: *See—*
Sase, Takashi; Katoh, Kazuo; and Hirayama, Takeshi, 4,178,554, Cl. 328-133.000.

Katsura, Toshio. *See—*
Kaneda, Takaho; Ishikawa, Seiji; Daimon, Hiroshi; Katsura, Toshio; Maeda, Tatsuaki, and Hondo, Tadahiro, 4,178,431, Cl. 528-337.000.

Kaufer, Wilhelm: *See—*
Gebauer, Peter; Kaufer, Wilhelm; Klinkenberg, Herbert; and Sontgerath, Hilde, 4,178,277, Cl. 260-40.00R.

Kawada, Shin: *See—*
Uemura, Toshio; Watanabe, Yoshiki; Masumoto, Yoji; Ishikawa, Tomihisa; Kajimoto, Noboru; and Kawada, Shin, 4,177,742, Cl. 110-346.000.

Kawai, Noriaki; Okamoto, Hisaji; Takeda, Yosiaki; Sano, Fukuzi; Kakiuchi, Akio; Manabe, Masami; Nomura, Takashi; and Abe, Sigeya, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Nippondenso Kabushiki Kaisha. Ignition system for internal combustion engines. 4,177,776, Cl. 123-117.00A.

Kawam, Antoine: *See—*
Guadagnin, Laurent J.; Grossiord, Claude R.; Jensen, John A.; Kawam, Antoine; Mouchet, Jacques M.; and Royer, Michel E., 4,177,646, Cl. 62-52.000.

Kawasaki Steel Corporation: *See—*
Obata, Hiroshi; Hasegawa, Takehisa; Watanabe, Hideto; Ikegawa, Kiyohiro; and Ashida, Toshiyuki, 4,177,976, Cl. 266-266.000.

Kawashima, Hirofumi, to Kabushiki Kaisha Daini Seikosha. Quartz crystal tuning fork vibrator with unexcited tine centers for reduced flexural amplitudes. 4,178,527, Cl. 310-370.000.

Kawashima, Hirofumi, to Kabushiki Kaisha Daini Seikosha. Quartz crystal tuning fork vibrator for a crystal oscillator. 4,178,566, Cl. 331-156.000.

Kayser, Ernst, to Carl Freudenberg, Firma. Separating piston for hydropneumatic one-tube vibration damper. 4,178,002, Cl. 277-212.000.

Kearney & Trecker Corporation: *See—*
Sipek, Charles B.; Johnstone, Richard; and Clegg, Russell B., 4,177,550, Cl. 29-568.000.

Keller, Douglas V., Jr.: *See—*
Smith, Clay D.; and Keller, Douglas V., Jr., 4,178,231, Cl. 209-3.000.
Smith, Clay D.; and Keller, Douglas V., Jr., 4,178,233, Cl. 209-3.000.

Kellett, Harry; and Searle, Harold L., to Vickers Limited. Reverse self-locking device. 4,177,887, Cl. 192-8.00R.

Kellogg Company: *See—*
Gobble, Harold G.; Vondell, Richard M.; and Mooi, Raymond, 4,178,392, Cl. 426-96.000.

Kelly, Robert C., to Upjohn Company, The. Enlarged-hetero-ring prostacyclin analogs. 4,178,440, Cl. 542-426.000.

Kelly, Robert C., to Upjohn Company, The. Enlarged-hetero-ring prostacylin analogs. 4,178,441, Cl. 542-426.000.

Kelly, William T., III, to Union Carbide Corporation. Rechargeable cell checker. 4,178,538, Cl. 320-2.000.

Kelpin, Thomas G. Aquatic plant sampler. 4,177,624, Cl. 56-9.000.

Kendall Company, The: *See—*
Patel, Bhupendra C., 4,177,815, Cl. 128-349.00B.

Kennametal Inc.: *See—*
Fawcett, William E., 4,177,956, Cl. 241-188.00A.

Kennedy, Andrew J., to United States of America, Army. Image intensifier unitube for intensified charge transfer device and method of manufacture. 4,178,528, Cl. 313-102.000.

Kennedy , Andrew J., to United States of America, Army. Flip-header and tube base for CTD mounting within an image intensifier. 4,178,529, Cl. 313-102.000.

Kennedy, Harry R., to Seabrook, Inc. Tunable noise suppression system for spinning machine fiber collector units. 4,177,629, Cl. 57-1.00R.

Kent, Frank N., Jr., to Austin Industries, Inc. Wheel mounting assembly. 4,178,005, Cl. 280-43.180.

Kent, Jan H. F., to Kentredder Limited. Method and apparatus for treading tires. 4,178,198, Cl. 156-96.000.

Kentredder Limited: *See—*
Kent, Jan H. F., 4,178,198, Cl. 156-96.000.

Keresztes, Stephan L.: *See—*
Nordblom, George F.; Turillon, Pierre P.; Huston, Ernest L.; and Keresztes, Stephan L., 4,178,216, Cl. 204-2.100.

Key, Paul F.: *See—*
Beaver, Robert I., II; Adams, Michael J.; Prodanovich, George L.; Key, Paul F.; Rawlings, Don O.; Santhanam, P.; and Hunt, Susan L., 4,178,113, Cl. 406-10.000.

Keystone Consolidated Industries, Inc.: *See—*
Johnson, Eric A., III; Moore, Melvin E.; and Budd, Tom A., 4,177,724, Cl. 100-26.000.

Khalid, Joseph M., to Square D Company. Current limiting circuit breaker. 4,178,618, Cl. 361-58.000.

Khartli, Inc.: *See—*
Rush, Kim E., 4,178,041, Cl. 301-5.0BA.

Khomyakov, Alexandr M.: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.

Kiesel, Rolf; Maier, Gerhard; and Grahmann, Helmut, to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH. Manufacture of halogen cycle incandescent lamps. 4,178,050, Cl. 316-19.000.

Kikuchi Kogyo K. K.: *See—*
Kikuchi, Kouichi, 4,177,839, Cl. 139-419.000.

Kikuchi, Kouichi, to NSK-Warner K.K.; and Kikuchi Kogyo K. K. Webbing for seat belt. 4,177,839, Cl. 139-419.000.

Kilpelainen, Ossi: *See—*
Hakkinen, Seppo; Nyman, Niilo; Kilpelainen, Ossi; Paakkinen, Ilmari; Rautapaa, Kari; and Rasimus, Seppo, 4,177,942, Cl. 222-198.000.

Kim, Bong K.: *See—*
Kim, Chin K., 4,177,594, Cl. 43-15.000.

Kim, Chin K., to Kim, Bong K., a part interest. Fishing rod attachment. 4,177,594, Cl. 43-15.000.

Kimes, Richard C.: *See—*
Tolbert, William R.; Feder, Joseph; and Kimes, Richard C., 4,178,209, Cl. 195-1.800.

Kinard, Gerald W., to Certain-teed Corporation. Automatic bag opener. 4,177,726, Cl. 100-214.000.

King, John M., to Chevron Research Company. Dispersant Mannich base compositions. 4,178,259, Cl. 252-42.700.

King, Olin B., to SCI Systems, Inc. Rotary printing method. 4,178,583, Cl. 346-163.000.

King, Olin B., to SCI Systems, Inc. Mounting structure for rotary electrical stylus device. 4,178,599, Cl. 346-163.000.

King, Olin B., to SCI Systems, Inc. Record feed means for rotary electrical stylus device. 4,178,600, Cl. 346-163.000.

King, Olin B., to SCI Systems, Inc. Record drive means for rotary electrical stylus device. 4,178,601, Cl. 346-163.000.

Kinsley, John P., to Continental Group, Inc., The. Mold having cutter means. 4,178,146, Cl. 425-289.000.

Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; and Nishioka, Kunihiko, to Sumitomo Metal Industries Limited; and Sumikin Coke Company Limited. Method of manufacturing blast furnace coke. 4,178,215, Cl. 201-6.000.

Kirsch, John G. Tapered fit coupling method and apparatus. 4,178,011, Cl. 280-477.000.

Kishino, Takao; and Kamagata, Toshio, to Futaba Denshi Kogyo K.K. Driving circuit for a luminescent display tube for analog display. 4,178,593, Cl. 340-753.000.

Kitayama, Yoshiko: *See—*
Nakamura, Takeshi; Nishiyama, Hiroshi; Yamashita, Yoshimasa; and Kitayama, Yoshiko, 4,178,526, Cl. 310-321.000.

Klapproth, Friedrich, deceased; and by Klapproth, Maria Elisabeth, executrix. Cylinder blanket for offset printing presses. 4,178,402, Cl. 428-192.000.

Klapproth, Maria Elisabeth, executrix: *See—*
Klapproth, Friedrich, deceased; and Klapproth, Maria Elisabeth, executrix, 4,178,402, Cl. 428-192.000.

Klebe, Hans; and Knippschild, Gerd, to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler. Process for the stabilization of sodium percarbonate. 4,178,351, Cl. 423-275.000.

Klein, Darrell L.: *See—*
Howerton, Anderson W.; Klein, Darrell L.; and Thomas, James R., 4,177,688, Cl. 74-233.000.

Klein, Gerald B. Injection molding method for the manufacture of a snelled fishhook. 4,178,342, Cl. 264-275.000.

Klein, Max. Separator for discrete solids from liquids. 4,178,246, Cl. 210-82.000.

Klein, Robert W.; and Foxx, Mary E., to William H. Rorer, Inc. Coal tar gel composition. 4,178,373, Cl. 424-233.000.

Klein, Theodore H., to Bell Telephone Laboratories, Incorporated. Reinforced flexible printed wiring board. 4,177,553, Cl. 29-625.000.

Kleist, Robert A.; and Matula, Jerry, to Printronix, Inc. Printer system ribbon drive having constant ribbon speed and tension. 4,177,731, Cl. 101-336.000.

Kley, Victor B. Electrical data entry devices. 4,178,481, Cl. 178-18.000.

KLI, Incorporated: *See—*
Knepshield, William R.; Polizzi, Jerry; and Okamoto, Allen H., 4,177,814, Cl. 128-348.000.

Klimazewski, Leo T., to ACF Industries, Incorporated. Diverter valve for exhaust system of internal combustion engine. 4,177,642, Cl. 60-290.000.

Klimezky, Frank. Swivel link for a dual chain conveyor. 4,177,635, Cl. 59-78.000.

Klinkenberg, Herbert: *See—*
Gebauer, Peter; Kaufer, Wilhelm; Klinkenberg, Herbert; and Sontgerath, Hilde, 4,178,277, Cl. 260-40.00R.

Klinkenberg, Hubert E., to Beaver Precision Products, Inc. Ball screw and nut. 4,177,690, Cl. 74-424.80R.

Klug, Frederic J.: *See—*
Huseby, Irvin C.; and Klug, Frederic J., 4,178,187, Cl. 106-38.900.

Kluthe, Eldon R. Grain scalping and cleaning apparatus and method. 4,177,900, Cl. 209-247.000.

Kneifel, Jerome J., to Dale Electronics, Inc. Electrical resistor testing fixture. 4,178,545, Cl. 324-158.00F.

Knepshield, William R.; Polizzi, Jerry; and Okamoto, Allen H., to KLI, Incorporated. Self-sealing cannula. 4,177,814, Cl. 128-348.000.

Knight, Andrew C.; and Meek, Nigel W., to Sperry Rand Corporation. Pull-type agricultural machine. 4,177,625, Cl. 56-13.600.

Knight, William M., Jr.: *See—*
Dudley, Dana; and Knight, William M., Jr., 4,178,612, Cl. 358-167.000.

Knippschild, Gerd: *See—*
Klebe, Hans; and Knippschild, Gerd, 4,178,351, Cl. 423-275.000.

Knoll, Heinz W.: *See—*
Andres, Rudolf; and Knoll, Heinz W., 4,178,016, Cl. 280-734.000.

Knox, Lloyd C., to Halliburton Company. Plat-gard leg closure. 4,178,112, Cl. 405-227.000.

Knudsen, Poul U.: *See—*
Andersen, Axel; Knudsen, Poul U.; and Jensen, Knud B., 4,178,069, Cl. 350-96.230.

Kobayashi, Masakazu; and Hanashima, Koh, to Kanesa Miso Kabushiki-Kaisha. Method and apparatus for granulating hydrated materials including food stuffs. 4,177,574, Cl. 34-12.000.

Kobe Steel, Ltd *See—*
Narita, Kiichi; Mori, Takasuke; and Ito, Takamichi, 4,178,175, Cl. 75-93.00E.

Kocher, Timothy L.; and Bennett, Benny M., to AMP Incorporated. Latch/eject pin header. 4,178,051, Cl. 339-45.00M.

Kodama, Yutaka: *See—*
Jinnai, Koichiro; Horike, Masanori; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,178,595, Cl. 346-140.00R.

Koehler, Horst: *See—*
Schwarzbach, Kurt; Koehler, Horst; and Muller, Franz, 4,177,661, Cl. 72-128.000.

Koester, Eberhard: *See—*
Steck, Werner; Brodt, Rudolf; Sarnecki, Wilhelm; Jakusch, Helmut; Ohlinger, Manfred; and Koester, Eberhard, 4,178,171, Cl. 75-0.5AA.

Kofsky, Harvey I.; and Levine, Arthur. Muscle stimulating apparatus. 4,177,819, Cl. 128-422.000.

Kohler, Jurgen: *See—*
Schiek, Burkhard; and Kohler, Jurgen, 4,178,570, Cl. 333-161.000.

Kohsaka, Masanobu: *See—*
Demain, Arnold L.; and Kohsaka, Masanobu, 4,178,210, Cl. 195-29.000.

Kojima, Tadashi: *See—*
Sakurai, Kunio; Kojima, Tadashi; and Itoh, Hiroshi, 4,178,403, Cl. 428-209.000.

Kolesnikov, Dmitry P.: *See—*
Kandyba, Petr E.; Kolesnikov, Dmitry P.; Komarovskikh, Nina I.; Lapir, Gennady M.; Likharev, Konstantin K.; Ryzhkov, Vadim A.; and Yastrebov, Viktor G., 4,178,602, Cl. 357-4.000.

Komai, Hiromichi: *See—*
Isayama, Takuro; and Komai, Hiromichi, 4,178,597, Cl. 346-75.000.

Komar, Alexandr E., administrator: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.

Komar, Evgeny G., deceased: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.

Komar, Olga E., administrator: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.

Komarovskikh, Nina I.: *See—*
Kandyba, Petr E.; Kolesnikov, Dmitry P.; Komarovskikh, Nina I.; Lapir, Gennady M.; Likharev, Konstantin K.; Ryzhkov, Vadim A.; and Yastrebov, Viktor G., 4,178,602, Cl. 357-4.000.

Konishi, Yoshitaka: *See—*
Hayashi Masaki; Arai, Yoshinobu; Konishi, Yoshitaka; Shimoji, Katsuichi; Ohuchida, Shuichi; Ito, Hiroyuki; and Wakatsuka, Hirohisa, 4,178,367, Cl. 424-285.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Iijima, Yaichi, 4,178,083, Cl. 354-41.000.
Sakurai, Kunio; Kojima, Tadashi; and Itoh, Hiroshi, 4,178,403, Cl. 428-209.000.
Taguchi, Masahiko; Mogaki, Katsuo; and Takada, Syun, 4,178,184, Cl. 96-74.000.

Konkler, Anthony W.: *See—*
Weavers, Mark W.; and Konkler, Anthony W., 4,177,896, Cl. 206-387.000.

Konrath, Karl: *See—*
Hofer, Gerald; Konrath, Karl; Schwarz, Manfred; and Muller, Willi, 4,177,775, Cl. 123-139.0AP.

Korb, Robert W.: *See—*
Denlinger, Michael C.; Korb, Robert W.; and Lardenoit, Vernon F., 4,177,916, Cl. 228-231.000.

Koreska, Peter, to W. Koreska GmbH. Method for producing duplicating stencils. 4,177,728, Cl. 101-128.200.

Kornfeld, William F. Merchandise container. 4,177,893, Cl. 206-45.140.

Kornylak Corporation: *See—*
Tabler, Charles P., 4,178,144, Cl. 425-150.000.

Korpman, Ralf: *See—*
Hall, Joseph J.; Korpman, Ralf; and Sinker, Stephen M., 4,178,337, Cl. 264-28.000.

Kovar, Jan; and Drkal, Jan, to Vyzkumny ustav tvarecich stroju a technologie tvareni. Apparatus for feeding workpieces for cross wedge rolling. 4,177,660, Cl. 72-108.000.

Koyama, Aichiro: *See—*
Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aichiro; Okuno, Youichi; Tsunlkawa, Tokuichi; and Ito, Tadashi, 4,178,084, Cl. 354-59.000

Kramer, Michael J.: *See—*
Cleeland, Roy; Durkin, Joanne; and Kramer, Michael J., 4,178,360, Cl. 424-1.000

Krastinsh, Valter P.: *See—*
Shishkova, Zinaida P.; Kalninsh, Arvid Y.; Galitis, Juris P.; Shmit, Uldis Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Kalnikin, Damir A.; Vaax, Viktor R.; Zinina, Maria A.; Belyaev, Vasily D.; Maximenko, Nikolai S.; and Epshtein, Yakov V., 4,178,214, Cl. 195-100.000.

Kraus, Peter: *See—*
Brandes, Wilhelm, Daum, Werner; and Kraus, Peter, 4,178,383, Cl. 424-304.000.

Krautz, Fred G.: *See—*
Sage, Donald B.; and Krautz, Fred G., 4,178,412, Cl. 428-391.000.

Krebs, Gary A.: *See—*
Farkas, Kalman; and Krebs, Gary A., 4,177,610, Cl. 51-241.00S

Krenitsky, Thomas A.; and Bushby, Stanley R. M., to Burroughs Wellcome Co. Stabilized thymidine phosphorylase formulation. 4,178,212, Cl. 195-63.000.

Kressel, Henry: *See—*
Ladany, Ivan; Ettenberg, Michael; Lockwood, Harry F.; and Kressel, Henry, 4,178,564, Cl. 331-94.50H.

Krol, Johannes W. A.: *See—*
Lersmacher, Bernhard; Lydtin, Hans; Seifert, Horst; and Krol, Johannes W. A., 4,178,530, Cl. 313-337.000

Krol, Walter J.: *See—*
Tushner, Lawrence P.; and Krol, Walter J., 4,177,590, Cl. 40-156.000.

Krone, Ray B. Device for separating particles from a fluid suspension and method for so doing. 4,178,252, Cl. 210-521.000.

Krueger, Rudolph E. Anemometer. 4,177,673, Cl. 73-189.000.

Krump, Robert C., to Emerson Electric Co. Battery operated thermostat timer with battery charging circuits. 4,177,923, Cl. 236-46.00R.

Krutenat, Robert A. Method for the disposal of nuclear or toxic waste materials. 4,178,109, Cl. 405-128.000.

Kubota, Nobuhisa: *See—*
Okano, Haruo; Harada, Nozomu; and Kubota, Nobuhisa, 4,178,396, Cl. 427-93.000.

Kugelmann, Adolf: *See—*
Seiler, Hartmut; and Kugelmann, Adolf, 4,178,619, Cl. 361-91.000.

Kulieva, Khalida Y. K.: *See—*
Litvishkov, Jury N.; Efendiev, Medzhid R. O.; Rizaev, Ramiz G. K. O.; and Kulieva, Khalida Y. K., 4,178,304, Cl. 260-465.00E.

Kumar, Surinder, to Quaker Oats Company, The. Process for producing sausage analogs. 4,178,394, Cl. 426-656.000.

Kunisawa, Masuo: *See—*
Shimooka, Riyo; Kunisawa, Masuo; and Okazaki, Seiji, 4,178,615, Cl. 358-302.000.

Kunst, Helmut; and Wahl, Georg, to Deutsche Gold- und Silber Scheideanstalt vormals Roessler. Process for removal of hardening and galvanizing waste water. 4,178,244, Cl. 210-71.000.

Kuppinger, Charlotte W., executrix: *See—*
Kuppinger, John C., deceased; and Kuppinger, Charlotte W., executrix, 4,177,526, Cl. 3-13.000.

Kuppinger, John C., deceased; and by Kuppinger, Charlotte W., executrix. Securing device for an intraocular lens. 4,177,526, Cl. 3-13.000.

Kurimoto Iron Works, Ltd.: *See—*
Obata, Hiroshi; Hasegawa, Takehisa; Watanabe, Hideto; Ikegawa, Kiyohiro; and Ashida, Toshiyuki, 4,177,976, Cl. 266-266.000

Kurobe, Takao; Tachikawa, Katsuziro; Kato, Tetsuo; and Imatoku, Yoshinobu, to Toyota Jidosha Kogyo Kabushiki Kaisha; Kabushiki Kaisha Sango; and Futaba Sangyo Kabushiki Kaisha. Muffler for internal combustion engine. 4,177,875, Cl. 181-265.000.

Kuroda, Hiroshi; Nakajima, Yasuo; and Hayashi, Yoshimasa, to Nissan Motor Company, Limited. Internal combustion engine system. 4,177,640, Cl. 60-274.000.

Kushmaul, Thomas R.: *See—*
Smith, Stanley E.; Lyday, Richard W.; and Kushmaul, Thomas R., 4,178,344, Cl. 264-572.000

Kuss Corporation: *See—*
Kuss, Ralph L.; and Hickle, Jerry J., 4,177,844, Cl. 150-1.000.

Kuss, Ralph L.; and Hickle, Jerry J., to Kuss Corporation. Silo breather bag. 4,177,844, Cl. 150-1.000

Kuttner, Gottfried, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengeselischaft. Sealing provided between the walls of a cooled continuous mould and the head of a starter bar. 4,178,000, Cl. 277-138.000.

Kyoto Ceramic Co., Ltd.: *See—*
Hamamoto, Shoichi; and Hiwatashi, Masaaki, 4,178,145, Cl. 425-199.000.

Laboratories Made, S. A.: *See—*
Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, 4,178,450, Cl. 546-63.000.

Labovitz, Jeffrey N.: *See—*
Henrick, Clive A.; Carney, Robert L.; and Labovitz, Jeffrey N., 4,178,293, Cl. 260-326.100

Lacasse, Rejean. Furniture with opening flap and support therefor. 4,177,738, Cl. 108-78.000.

Lachaize, Henri G., to Societe Anonyme Automobiles Citroen. Transmission mechanism with hydrokinetic coupling device and reversing device. 4,177,694, Cl. 74-732.000.

Lachance, Ernest J., Sr.: *See—*
Jean, Leonard P.; and Lachance, Ernest J., Sr., 4,178,470, Cl. 174-168.000

Lacour, Alain P.: *See—*
Bourgery, Guy R.; Lacour, Alain P.; Moinet, Gerard H.; Pourrias, Bernard M.; and Ruch, Anne-Marie P., 4,178,442, Cl. 542-440.000

Ladany, Ivan; Ettenberg, Michael; Lockwood, Harry F.; and Kressel, Henry, to RCA Corporation. Half wave protection layers on injection lasers. 4,178,564, Cl. 331-94.50H

Lager, Jean P.; Le Pabic, Jean P.; and Ledey, Jean C., to Le Material Telephonique. Time-division switching telephone exchange comprising a service signal sender. 4,178,483, Cl. 179-15.0BY.

Lahut, Joseph A.: *See—*
Berkowitz, Ami E.; and Lahut, Joseph A., 4,178,405, Cl. 428-215.000.

Laitkep, Anthony A.; Meyer, Danny S.; and Sitton, Willard J., to ACF Industries, Incorporated. Packing gland assembly. 4,177,998, Cl. 277-59.000

Lake, Don W., and Subramanian, Nagaraja, to Fairchild Camera and Instrument Corporation. Switch selector and actuator. 4,178,487, Cl. 179-90.0BD

Lamb, Frank H.; Lefcort, Malcolm D.; and Rada, Petr, to Enterprises International, Inc. Apparatus for generating heat from waste fuel. 4,177,740, Cl. 110-213.000.

Lambertz, Martin R., to Stanley Works, Limited, The. Fastening method and product. 4,177,545, Cl. 29-11.000

Lampert, Albert J. Insulated furnace structure. 4,177,616, Cl. 52-509.000

Lamson, Junior J.: *See—*
Hall, Richard H.; Haigh, Daniel H.; Lamson, Junior J.; and Yats, Larry D., 4,178,327, Cl. 525-169.000.

Lancaster, Patrick R., III: *See—*
Lancaster, William G.; and Lancaster, Patrick R., III, 4,177,959, Cl. 242-58.200

Lancaster, William G.; and Lancaster, Patrick R., III. Flying splice apparatus and process. 4,177,959, Cl. 242-58.200.

Landamore, Leslie E., to Pilgrim Engineering Developments Limited. Sea cock valve. 4,177,971, Cl. 251-215.000

Lande, Arnold J. Artificial heart. 4,177,523, Cl. 3-1.700.

Landini, Pier C.: *See—*
Funaioli, Ettore; Rossetti, Alfio; and Landini, Pier C., 4,177,907, Cl. 220-1.500

Lane, Parley C., Jr.: *See—*
Tenney, Linwood P.; and Lane, Parley C., Jr., 4,178,424, Cl. 526-283.000

Lane, Robert W., to C. W. Zumbiel Company, The. Carton. 4,177,918, Cl. 229-39.00B.

Langdon, William K., to BASF Wyandotte Corporation. Amine-coupled polyepichlorohydrin and polyamines derived therefrom. 4,178,434, Cl. 528-405.000.

Lantzsch, Reinhard: *See*—
Uhrhan, Paul; Oertel, Harald; Lantzsch, Reinhard; Roos, Ernst; and Arlt, Dieter, 4,178,279, Cl. 260-45.80N.

Lanzisera, Joseph C. Washing machine for cleaning cooking pots or similar articles. 4,177,534, Cl. 15-56.000.

LaPan, LeRoy A. Ferrous object retriever. 4,178,029, Cl. 294-65.500.

Lapir, Gennady M.: *See*—
Kandyba, Petr E.; Kolesnikov, Dmitry P.; Komarovskikh, Nina I.; Lapir, Gennady M.; Likharev, Konstantin K.; Ryzhkov, Vadim A.; and Yastrebov, Viktor G., 4,178,602, Cl. 357-4.000.

Lardenoit, Vernon F.: *See*—
Denlinger, Michael C.; Korb, Robert W.; and Lardenoit, Vernon F., 4,177,916, Cl. 228-231.000.

Larson, Ivar W.: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,178,633, Cl. 364-709.000.

Lasco, Inc.: *See*—
Dykes, Willis G., 4,177,603, Cl. 47-1.300.

Lattmann, Werner: *See*—
Amann, Robert; Lattmann, Werner; and Wildbolz, Rudolf, 4,178,114, Cl. 406-155.000.

Laudig, Ronald C., to AMP Incorporated. Plug termination for coaxial cable. 4,178,054, Cl. 339-95.00R.

Lauro, Fernand; and Podevin, Roland, to Commissariat a l'Energie Atomique. Leak-tight coupling device. 4,178,021, Cl. 285-255.000.

Lazarus, Harry J. Spectacle frame with angularly adjustable temples and means for manufacturing and assembling same. 4,178,116, Cl. 408-108.000.

Le Material Telephonique: *See*—
Lager, Jean P.; Le Pabic, Jean P.; and Ledey, Jean C., 4,178,483, Cl. 179-15.0BY.

Leavitt, Richard I., to Ethyl Corporation. Process for producing citric acid. 4,178,211, Cl. 195-30.000.

Lech, Joseph M.: *See*—
McNeill, William H.; Lech, Joseph M.; Haugsjaa, Paul O.; and Regan, Robert J., 4,178,534, Cl. 315-39.000.

Lechevin, Jean-Claude, to Lipha-Lyonnaise Industrielle Pharmaceutique. Novel rodenticidal compositions employing chlorophacinone. 4,178,388, Cl. 424-331.000.

Lechler, Rolf: *See*—
Leitermann, Wulf; and Lechler, Rolf, 4,177,786, Cl. 123-196.00R.

Ledenbach, Gregory W.; and Morris, Dennis E., to National Semiconductor Corporation. Recognition of a received signal as being from a particular transmitter. 4,178,549, Cl. 325-38.00R.

Ledey, Jean C.: *See*—
Lager, Jean P.; Le Pabic, Jean P.; and Ledey, Jean C., 4,178,483, Cl. 179-15.0BY.

Lee, Harry W., Jr.; Wallace, Joseph W.; and Woolard, James M., to Reynolds Metals Company. Method of forming a container. 4,177,746, Cl. 113-120.00H.

Lee, Hop. Electric plug with novel cable securing means. 4,178,056, Cl. 339-103.00R.

Lee Industries, Inc.: *See*—
Price, Lewis H., 4,177,832, Cl. 137-625.470.

Lee, John W., Jr.: *See*—
Borror, Alan L.; Foley, James W.; Kampe, Marcis M.; and Lee, John W., Jr., 4,178,447, Cl. 544-33.000.

Lee, Peter I.; and Holt, Brian, to Ciba-Geigy Corporation. Corrosion inhibited lubricant compositions. 4,178,253, Cl. 252-47.000.

Lee, Richard J. Shotgun shell loading. 4,177,711, Cl. 86-38.000.

Lefcort, Malcolm D.: *See*—
Lamb, Frank H.; Lefcort, Malcolm D.; and Rada, Petr, 4,177,740, Cl. 110-213.000.

Legris, Andre, to Societe Legris France S.A. Cocks having rotating manipulation spindles. 4,177,972, Cl. 251-288.000.

Leifheit International Guenter Leifheit GmbH: *See*—
Liebscher, Johannes; and Schulein, Rolf G., 4,177,533, Cl. 15-42.000.

Leikhim, John W.; and Mitchell, Sharon J., to Procter & Gamble Company, The. Fabric care compositions containing smectite clay and starch. 4,178,254, Cl. 252-8.600.

Leitermann, Wulf; and Lechler, Rolf, to Audi Nsu Auto Union Aktiengesellschaft. Lubricant feeding means. 4,177,786, Cl. 123-196.00R.

Leong, Basil K. J., to International Research and Development Corporation. Metering device. 4,177,941, Cl. 222-636.000.

Le Pabic, Jean P.: *See*—
Lager, Jean P.; Le Pabic, Jean P.; and Ledey, Jean C., 4,178,483, Cl. 179-15.0BY.

Leprince, Philippe: *See*—
Huet, Philippe; Milleon, Roger H.; and Leprince, Philippe, 4,178,563, Cl. 331-94.5PE.

Lersmacher, Bernhard; Lydtin, Hans; Seifert, Horst; and Krol, Johannes W. A., to U.S. Philips Corporation. Electron tube with pyrolytic graphite heating element. 4,178,530, Cl. 313-337.000.

Letertre, Gerard J.: *See*—
Gittos, Maurice W.; and Letertre, Gerard J., 4,178,463, Cl. 562-574.000.

Leusner, Bernhard: *See*—
Schmitz-Josten, Robert; Borgardt, Manfred; Schulz, Hans-Hermann; Walkowiak, Michael; Leusner, Bernhard; and Suling, Carlhans, 4,177,563, Cl. 433-228.000.

Leveque, Jean-Luc; and Gras, Gilbert, to L'Oreal. Apparatus for measuring the mechanical characteristics of a material such as living skin. 4,177,798, Cl. 128-2.00S.

Levine, Arthur: *See*—
Kofsky, Harvey I.; and Levine, Arthur, 4,177,819, Cl. 128-422.000.

Levis, Curt A.: *See*—
United States of America, National Aeronautics and Space Administration; and Levis, Curt A., 4,178,100, Cl. 356-216.000.

Lewis, Leon D.; Wiher, Wilfried; and Parker, Warde L., to Garrett Corporation, The. Electrohydraulic proportional actuator apparatus. 4,177,713, Cl. 91-375.00R.

Lewis Refrigeration Co.: *See*—
Overbye, Milan R., 4,177,647, Cl. 62-63.000.

Lewis, Robert P.: *See*—
Daly, William P.; Lewis, Robert P.; and Pouliot, Oliver L., 4,177,620, Cl. 53-425.000.

Lewison, Howard L., to Dynamics Corporation of America. Cultivator tool shank assembly. 4,177,865, Cl. 172-705.000.

Liao, Paul F.: *See*—
Bjorklund, Gary C.; Bloom, David M.; and Liao, Paul F., 4,178,079, Cl. 350-353.000.

Liebermann, Howard H., to General Electric Company. Critical gas boundary layer Reynolds number for enhanced processing of wide glassy alloy ribbons. 4,177,856, Cl. 164-87.000.

Liebscher, Johannes; and Schulein, Rolf G., to Leifheit International Guenter Leifheit GmbH. Cleaning device. 4,177,533, Cl. 15-42.000.

Liechti, Peter: *See*—
Haase, Jaroslav; Liechti, Peter; Wegmuller, Hans; Wurster, Rudolf F.; and Bowes, Quentin, 4,178,438, Cl. 536-30.000.

Liggett Group Inc.: *See*—
Bryant, Herman G., Jr.; Norman, Vello; and Williams, Thomas B., 4,177,822, Cl. 131-17.00R.

Likharev, Konstantin K.: *See*—
Kandyba, Petr E.; Kolesnikov, Dmitry P.; Komarovskikh, Nina I.; Lapir, Gennady M.; Likharev, Konstantin K.; Ryzhkov, Vadim A.; and Yastrebov, Viktor G., 4,178,602, Cl. 357-4.000.

Liljegren, Gote: *See*—
Bondpers, Per-Erik; and Liljegren, Gote, 4,178,338, Cl. 264-42.000.

Limbach, Walter S., 2nd; Swoager, Jon R.; and Swoager, James M., to Automation Equipment Inc. Tracer head. 4,177,567, Cl. 33-23.00K.

Lindenbaum, Siegfried: *See*—
Higuchi, Takeru; and Lindenbaum, Siegfried, 4,178,376, Cl. 424-258.000.

Lindner, Henry, to Beatrice Foods Co. Demountable two-component roadway signal assembly. 4,177,749, Cl. 116-63.00T.

Lindquist, Everet F., to University of Iowa Research Foundation. Golf game and practice apparatus. 4,177,994, Cl. 273-176.0FA.

Ling, Alexander C.: *See*—
Baichtal, James R.; McDonald, John C.; Helliwell, Bradley A.; Ling, Alexander C.; and Schaffter, Craig D., 4,178,478, Cl. 179-15.0AQ.

Linowiecki, Anthony G.: *See*—
McGibbeny, James R.; Lydick, John D.; Linowiecki, Anthony G.; and Harms, Robert R., 4,178,579, Cl. 340-356.000.

Lipha-Lyonnaise Industrielle Pharmaceutique: *See*—
Lechevin, Jean-Claude, 4,178,388, Cl. 424-331.000.

Lippel, Arthur T.; Valvo, John R.; and Smith, Gerald B., to Lippel Cybersonics, Inc. Suspension system for disc recording cutter head. 4,178,489, Cl. 179-100.40C.

Lippel Cybersonics, Inc.: *See*—
Lippel, Arthur T.; Valvo, John R.; and Smith, Gerald B., 4,178,489, Cl. 179-100.40C.

Lippman, Seymour A.; Stokes, Gary P.; and Chupa, Charles M., to Uniroyal, Inc. Noise reduction in pneumatic tires. 4,178,199, Cl. 156-110.00R.

Lipshutz, Bruce H.: *See*—
Wasserman, Harry H.; and Lipshutz, Bruce H., 4,178,286, Cl. 260-239.00A.

Lisle Corporation: *See*—
Pool, James L., 4,178,115, Cl. 408-82.000.

Litvishkov, Jury N.; Efendiev, Medzhid R. O.; Rizaev, Ramiz G. K. O.; and Kulieva, Khalida Y. K. Method of producing ortho-aminobenzonitrile. 4,178,304, Cl. 260-465.00E.

Lochel, Frank P., Jr., to Amchem Products, Inc. Autodeposited coatings. 4,178,400, Cl. 427-435.000.

Lockey, James E. Device having indicia announcing an event. 4,177,593, Cl. 40-488.000.

Lockheed Electronics Co., Inc.: *See*—
Tarasevich, Andrew, 4,178,515, Cl. 250-551.000.

Lockwood, Harry F.: *See*—
Ladany, Ivan; Ettenberg, Michael; Lockwood, Harry F.; and Kressel, Henry, 4,178,564, Cl. 331-94.50H.

Loeffler, Robert B. Trailer box loader system. 4,178,123, Cl. 414-523.000.

Logan, Robert J., to Inductive Controls Limited. Saturable reactors. 4,178,540, Cl. 323-89.00R.

Lohr & Bromkamp G.m.b.H.: *See*—
Aucktor, Erich, 4,177,654, Cl. 64-21.000.

Longthorpe, Paul L.: *See*—
Miller, Gregory C.; Albrecht, Henry R.; Clarke, C. William; and Longthorpe, Paul L., 4,177,973, Cl. 254-173.00R.

Lontz, John F., to John F. Lontz Associates, Inc. High fidelity color prints. 4,178,096, Cl. 355-32.000.

Lonza, Ltd.: *See*—
Stefani, Giancarlo; and Fontana, Pietro, 4,178,298, Cl. 260-346.750.

Loo, Ricky F., to Lyon Metal Products, Incorporated. Shelf box with dual pivoting stop mechanism. 4,178,049, Cl. 312-286.000.

L'Oreal: *See*—
Leveque, Jean-Luc; and Gras, Gilbert, 4,177,798, Cl. 128-2.00S.

Lorenz, Donald H.; and Gruber, Bruce A., to GAF Corporation. (2-Cyano-3,3-diphenylacryloxy) alkylene acrylic acid esters. 4,178,303, Cl. 260-465.00D.

Lorenzen, Heinz-Christen: *See*—
Heitmann, Uwe; Lorenzen, Heinz-Christen; Wahle, Gunter; and Dahlgrun, Rolf, 4,177,670, Cl. 73-38.000.

Lorimor, Gregory L.: *See*—
Smith, George E.; Lorimor, Gregory L.; DeKluyver, Peter J.; and McFarlin, Henry E., 4,178,358, Cl. 423-574.00R.

Lorphelin, Michel. Method for collecting energy from swell and plant for carrying out said method. 4,177,643, Cl. 60-496.000.

Louis A. Grant, Inc.: *See*—
Meyers, Leo J.; and Grant, Louis A., 4,177,975, Cl. 266-158.000.

Lovely, John D.: *See*—
Constable, Douglas W.; and Lovely, John D., 4,178,610, Cl. 358-34.000.

Lovis, John B., to Bethlehem Steel Corporation. Method and apparatus for treating one side of a strip. 4,178,397, Cl. 427-300.000.

Lowther, Frank E., to Union Carbide Corporation. Biological intermediate sewage treatment with ozone pretreatment. 4,178,239, Cl. 210-15.000.

Lucas Industries Limited: *See*—
Brotherston, Colin P., 4,178,137, Cl. 417-294.000.

Lucke Apparate-Bau Gesellschaft mit beschraenkter Haftung: *See*—
Lucke, Florian, 4,177,957, Cl. 242-53.000.

Lucke, Florian, to Lucke Apparate-Bau Gesellschaft mit beschraenkter Haftung. Apparatus for clamping a thread. 4,177,957, Cl. 242-53.000.

Luckenbill, Lawrence F., to Mueller Co. Fire hydrant with improved shoe and valve. 4,177,826, Cl. 137-307.000.

Luetzow, Dietrich; Neth, Norbert; Wagner, Ulrich; and Volkamer, Klaus, to BASF Aktiengesellschaft. Manufacture of symmetrical dialkylureas. 4,178,309, Cl. 260-553.00R.

Lumpp, Gunter, to Rieber Werke Heinrich Rieber KG. Container and closure therefore. 4,177,933, Cl. 220-307.000.

Lura, Loren E., to General Motors Corporation. Energy absorbing mounting for vehicle bumper. 4,178,028, Cl. 293-135.000.

Luther, Henry D., to R. F. Shouptronics Corp. Electronic voting machine. 4,178,501, Cl. 235-54.00F.

Lyday, Richard W.: *See*—
Smith, Stanley E.; Lyday, Richard W.; and Kushmaul, Thomas R., 4,178,344, Cl. 264-572.000.

Lydick, John D.: *See*—
McGibbeny, James R.; Lydick, John D.; Linowiecki, Anthony G.; and Harms, Robert R., 4,178,579, Cl. 340-856.000.

Lydtin, Hans: *See*—
Lersmacher, Bernhard; Lydtin, Hans; Seifert, Horst; and Krol, Johannes W. A., 4,178,530, Cl. 313-337.000

Lyerly, Harold G., to Emerson Electric Co. Switch jumper strap. 4,178,523, Cl. 310-71.000.

Lyon Metal Products, Incorporated: *See*—
Loo, Ricky F., 4,178,049, Cl. 312-286.000.

Maass, Rudolf: *See*—
Cavier, Adolf J. J. F.; and Maass, Rudolf, 4,177,703, Cl. 83-356.300.

MAC Valves, Inc.: *See*—
Neff, James A.; and Fagerlie, Richard A., 4,177,840, Cl. 137-599.000.

MacLennan, Donald J.; and Morris, Edwin E., to General Electric Company. Infrared detection apparatus. 4,178,522, Cl. 250-338.000.

Macronetics, Inc.: *See*—
Beaver, Robert I., II; Adams, Michael J.; Prodanovich, George L.; Key, Paul F.; Rawlings, Don O.; Santhanam, P.; and Hunt, Susan L., 4,178,113, Cl. 406-10.000.

Madson, Ricky D.: *See*—
Buchele, Wesley F.; Jeffries, Dennis L.; Madson, Ricky D.; Mattson, Timothy J.; Sparks, Gregory E.; Thompson, Raymond D.; and Uehle, Howard T., 4,177,723, Cl. 100-8.000.

Maeda, Tatsuaki: *See*—
Kaneda, Takaho; Ishikawa, Seiji; Daimon, Hiroshi; Katsura, Toshio; Maeda, Tatsuaki; and Hondo, Tadahiro, 4,178,431, Cl. 528-337.000.

Magirus-Deutz AG: *See*—
Illgner, Eberhard, 4,177,531, Cl. 14-27.000.

Magnavox Company, The: *See*—
Beutel, Robert C., 4,178,609, Cl. 358-31.000.

Magnesium Elektron Limited: *See*—
Roebuck, Peter; and Petch, James H. T., 4,178,177, Cl. 75-135.000.

Magnetic Peripherals Inc.: *See*—
Green, Paul N.; and Duff, James A., 4,177,899, Cl. 206-509.000.

Maheo, Guy, to Societe Civile G. M. Maheo - Conseil. Apparatus and method for collecting oysters. 4,177,759, Cl. 119-4.000.

Maier, Gerhard: *See*—
Kiesel, Rolf; Maier, Gerhard; and Grahmann, Helmut, 4,178,050, Cl. 316-19.000.

Mailer, Werner H.; and Milliser, Charles E., to General Electric Company. Print gap adjust mechanism for printers. 4,178,106, Cl. 400-57.000.

Makeev, Jury A.: *See*—
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.

Makino, Takao: *See*—
Hotta, Toshihiro; and Makino, Takao, 4,178,508, Cl. 250-355.000.

Makuch, John A., to Combustion Engineering Inc. Pulverizer air flow and temperature control. 4,177,951, Cl. 241-35.000.

Malbec, Edouard. Anti-bubble safety valve for a liquid-circuit. 4,177,808, Cl. 128-214.00R.

Malpass, Dennis B.: *See*—
Watson, Spencer C.; Malpass, Dennis B.; and Yeargin, G. Scott, 4,178,297, Cl. 260-346.110.

Malyshev, Ivan F.: *See*—
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.

Manabe, Masami: *See*—
Kawai, Noriaki; Okamoto, Hisaji; Takeda, Yosiaki; Sano, Fukuzi; Kakiuchi, Akio; Manabe, Masami; Nomura, Takashi; and Abe, Sigeya, 4,177,776, Cl. 123-117.00A.

Mancini, Angelo J.; and Galloway, Ronald W. Apparatus and method for cleaning and polishing cartridge cases. 4,178,189, Cl. 134-6.000.

Mangiante, Gerard A.: *See*—
Angelini, Theophile A.; Nayrole, Bernard J. P.; Jessel, Maurice J.; Canevet, Georges; Mangiante, Gerard A.; and Carbone, Bernard, 4,177,874, Cl. 181-206.000.

Manners, David E., to GTE Sylvania Incorporated. Dual-mode horizontal output stage. 4,178,536, Cl. 315-408.000.

Mannesmann Aktiengesellschaft: *See*—
Hakert, Karl-Heinz; and Quitmann, Walter, 4,178,200, Cl. 156-187.000.
Schwarzbach, Kurt; Koehler, Horst; and Muller, Franz, 4,177,661, Cl. 72-128.000.

Mao, Chung-Ling; Strunk, Richard J.; and Hubbard, Winchester L., to Uniroyal, Inc. N-substituted triorganostannylhydro-carbylcarboxylic acid hydrazides. 4,178,382, Cl. 424-288.000.

Marchant, Nicholas G., to Waterford Ironfounders Limited. Woodburning stoves. 4,177,791, Cl. 126-65.000.

Marchelletta, Ronald L.; and Wheeler, Charles W., to Moto-Tronics. Electromechanical engine timing device. 4,177,781, Cl. 123-146.50A.

Marchus, L. Mark. Guidance arm for tripod apparatus. 4,177,967, Cl. 248-178.000.

Marcus, Konrad H., to Prince Corporation. Drawer light. 4,178,626, Cl. 362-133.000.

Margetts, Hugh G., to Girling Limited. Discs for disc brakes. 4,177,883, Cl. 188-218.0XL.

Marinace, John C., to International Business Machines Corporation. Formation of epitaxial tunnels utilizing oriented growth techniques. 4,178,197, Cl. 148-175.000.

Marks, Alvin M.; and Marks, Mortimer. 3-Dimensional camera device. 4,178,090, Cl. 354-117.000.

Marks, Mortimer: *See*—
Marks, Alvin M.; and Marks, Mortimer, 4,178,090, Cl. 354-117.000.

Marocco, Giuseppe. Method for the production of slabs of marble or similar stony material. 4,177,789, Cl. 125-1.000.

Marshall, Albert H.; and Siragusa, George A., to United States of America, Navy. Laser marksmanship target. 4,177,580, Cl. 35-25.000.

Martens, Peter: *See*—
Schultz, Neithart; Martens, Peter; and Vahlensieck, Hans-Joachim, 4,178,316, Cl. 260-653.500.

Martin, Tellis A.; and Comer, William T., to Mead Johnson & Company. Benzoic acid derivatives. 4,178,301, Cl. 260-455.00R.

Martineau, Jacques, to Caelter Enterprises, Ltd. Hydraulic anti-shimmy device for caster wheels. 4,178,007, Cl. 280-80.00R.

Martinez Roldan, Cristobal: *See*—
Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, 4,178,450, Cl. 546-63.000.

Marumo, Shingo; and Katayama, Masato, to Noda Institute For Scientific Research. Novel bicyclodecadiene compounds and process for producing them. 4,178,462, Cl. 562-501.000.

Maruyama, Kimiomi; Hata, Yoshitaka; and Ohnishi, Akihiro, to Nissan Motor Company, Limited. Exhaust gas recirculation control system. 4,177,777, Cl. 123-119.00A.

Marvin Glass & Associates: *See*—
Meyer, Burton C.; and Schoenfield, Palmer J., 4,177,991, Cl. 273-95.00B.

Marz, Frank H., to Bunker Ramo Corporation. Sweep seconds to jump seconds conversion for clocks. 4,177,630, Cl. 58-7.000.

Mason, Edward D.: *See*—
Hall, Seymour G.; and Mason, Edward D., 4,178,399, Cl. 427-381.000.

Masreliez, Carl J. Dental pulp tester. 4,177,799, Cl. 128-2.10R.

Massachusetts Institute of Technology: *See*—
Demain, Arnold L.; and Kohsaka, Masanobu, 4,178,210, Cl. 195-29.000.

Massey-Ferguson Services N.V.: *See—*
McNaught, James B., 4,177,626, Cl. 56-14.500.
Masumoto, Yoji: *See—*
Uemura, Toshio; Watanabe, Yoshiki; Masumoto, Yoji; Ishikawa, Tomihisa; Kajimoto, Noboru; and Kawada, Shin, 4,177,742, Cl 110-346.000.
Mather & Platt Limited: *See—*
Bray, Geddes A., 4,177,862, Cl. 169-17.000.
Mathews, Marion J.: *See—*
Campbell, Charles R.; Heckle, William A.; and Mathews, Marion J., 4,178,305, Cl. 260-465.900.
Matsuda, Masamichi: *See—*
Higuchi, Masaaki; Nakatani, Genji; Ito, Haruo; Matsuda, Masamichi; and Suetake, Yoshinori, 4,177,974, Cl. 266-196.000.
Matsuda, Yoshindo; Tomita, Shigeru; Abe, Keiji; and Terajima, Kazuki, to Agency of Industrial Science & Technology. Oil coagulant and process for preparation thereof. 4,178,265, Cl. 252-316.000.
Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aiichiro; Okuno, Youichi; Tsunlkawa, Tokuichi; and Ito, Tadashi, to Canon Kabushiki Kaisha. Device for measuring light incident on an image forming optical system. 4,178,084, Cl. 354-59.000.
Matsumoto, Yoichi: *See—*
Tashiro, Koji; and Matsumoto, Yoichi, 4,178,156, Cl. 55-5.000.
Matsumura, Susumu: *See—*
Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aiichiro; Okuno, Youichi; Tsunlkawa, Tokuichi; and Ito, Tadashi, 4,178,084, Cl. 354-59.000.
Matsushita Electric Industrial Company, Limited: *See—*
Mori, Kazuhiro; Misawa, Yoshihiko; and Mayahara, Kiyoshi, 4,177,549, Cl. 29-564.200.
Mattel, Inc.: *See—*
Douglas, Raymond J.; Fekete, Ference; Gay, Derek J.; Hunter, Gary L.; and Wilson, Nicol S., 4,177,984, Cl. 272-31.00A.
Matthews, Russell B., to Johnson Controls, Inc. Fuel ignition control system. 4,178,149, Cl. 431-46.000.
Matthijsen, Rutger: *See—*
Hoogendoorn, Hendrik; Matthijsen, Rutger; and Moelker, Huibert C. T., 4,178,362, Cl. 424-48.000.
Mattone, Roberto; and Catoni, Mario, to SNIA Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A. Process for the purification of caprolactam by means of ozone. 4,178,287, Cl. 260-239.30A.
Mattson, Timothy J.: *See—*
Buchele, Wesley F.; Jeffries, Dennis L.; Madson, Ricky D.; Mattson, Timothy J.; Sparks, Gregory E.; Thompson, Raymond D.; and Uehle, Howard T., 4,177,723, Cl. 100-8.000.
Matula, Jerry: *See—*
Kleist, Robert A.; and Matula, Jerry, 4,177,731, Cl. 101-336.000.
Matuschek, Josip; and Chister, Rene A., to Townsend Textron. Blind fastener. 4,177,710, Cl. 85-70.000.
Maul Lochkartenkerate GmbH: *See—*
Maul, Michael, 4,177,981, Cl. 270-58.000.
Maul, Michael, to Maul Lochkartenkerate GmbH. Collating method and machine. 4,177,981, Cl. 270-58.000.
Maury, Christian, to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme). Phase comparator arrangement for controlling an electrical member. 4,178,560, Cl. 331-1.00A.
Mauser Kommandit-Gesellschaft: *See—*
Hammes, Theo; and Hoff, Alois, 4,177,934, Cl. 220-319.000.
Maxcap Inc.: *See—*
Von Hagel, Leo, 4,177,906, Cl. 215-252.000.
Maximenko, Nikolai S.: *See—*
Shishkova, Zinaida P.; Kalninsh, Arvid Y.; Gailitis, Juris P.; Shmit, Uldis Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Kalinkin, Damir A.; Vaax, Viktor R.; Zinina, Maria A.; Belyaev, Vasily D.; Maximenko, Nikolai S.; and Epshtein, Yakov V., 4,178,214, Cl. 195-100.000.
Mayahara, Kiyoshi: *See—*
Mori, Kazuhiro; Misawa, Yoshihiko; and Mayahara, Kiyoshi, 4,177,549, Cl. 29-564.200.
McCain Manufacturing Corporation: *See—*
Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; McCain, William B.; Weller, Ronald W.; and Werstler, Lawrence J., 4,177,982, Cl. 271-5.000.
McCain, William B.: *See—*
Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; McCain, William B.; Weller, Ronald W.; and Werstler, Lawrence J., 4,177,982, Cl. 271-5.000.
McCallister, Robert A.: *See—*
Daman, Ernest L.; and McCallister, Robert A., 4,177,858, Cl. 165-11.000.
McCarthy, Charles C., to Westinghouse Electric Corp. Monitoring the operation status of an electrical component on the basis of an inherent pull up or pull down characteristic. 4,178,542, Cl. 324-51.000.
McConaghy, James R.; Poynor, Paul C.; and Friday, John R., to Conoco, Inc. Process for producing premium coke from vacuum residuum. 4,178,229, Cl. 208-50.000.
McConnell, Richard L.: *See—*
Meyer, Max F., Jr.; McConnell, Richard L.; and Joyner, Frederick B., 4,178,272, Cl. 260-27.00R.
McCormack, John L.: *See—*
Van Wilson, Marlin; Nickell, Larry C.; and McCormack, John L., 4,177,838, Cl. 139-353.000.
McCormick, Mathew, to Bowthorpe-Hellermann Limited. Clip for fixing an electric cable to a support structure. 4,178,057, Cl. 339-103.00M.
McCormick, Virgil K.: *See—*
Johnson, Vern C.; McCormick, Virgil K.; and Whitney, John M., 4,177,860, Cl. 165-26.000.
McDonald, John C.; Baichtal, James R.; and Schaffter, Craig D., to TRW, Inc. Communication processor apparatus for use in a TDM switching system. 4,178,479, Cl. 179-15.0BY.
McDonald, John C.: *See—*
Baichtal, James R.; McDonald, John C.; Helliwell, Bradley A.; Ling, Alexander C.; and Schaffter, Craig D., 4,178,478, Cl. 179-15.0AQ.
McDunn, Edward C. Apparatus for sharpening a chain saw. 4,177,697, Cl. 76-25.00A.
McFarland, Lorrell C. Apparatus and method of heating and cooling. 4,177,651, Cl. 62-238.000.
McFarland, William W.: *See—*
Ford, Mack L., Jr.; and McFarland, William W., 4,177,936, Cl. 220-441.000.
McFarlin, Henry E.: *See—*
Smith, George E.; Lorimor, Gregory L.; DeKluyver, Peter J.; and McFarlin, Henry E., 4,178,358, Cl. 423-574.00R.
McGibbeny, James R.; Lydick, John D.; Linowiecki, Anthony G.; and Harms, Robert R., to TRW Inc. Remote instrumentation apparatus. 4,178,579, Cl. 340-856.000.
McHugh, John P., to Solar Suede Corporation. Flock fiber feeding apparatus having a plurality of impellers and a venturi flow tube. 4,177,940, Cl. 222-636.000.
McKay, Dwight L., to Phillips Petroleum Company. Passivating metals on cracking catalysts. 4,178,267, Cl. 252-411.00R.
McKee, Maureen K. Fire alarm having a sensor on an extensible arm. 4,178,592, Cl. 340-693.000.
McNally, George S.: *See—*
Przybylinski, Phillip G.; Patil, Babgaunda A.; and McNally, George S., 4,177,736, Cl. 105-377.000.
McNaught, James B., to Massey-Ferguson Services N.V. Crop gathering apparatus. 4,177,626, Cl. 56-14.500.
McNeill, William H.; Lech, Joseph M.; Haugsjaa, Paul O.; and Regan, Robert J., to GTE Laboratories Incorporated. Methods of and apparatus for electrodeless discharge excitation. 4,178,534, Cl. 315-39.000.
Mead Corporation, The: *See—*
Gebhardt, James L.; and Sanders, Carlos L., 4,177,588, Cl. 40-16.400.
Mead Johnson & Company: *See—*
Martin, Tellis A.; and Comer, William T., 4,178,301, Cl. 260-455.00R.
Meckel, Joachim: *See—*
Flockenhaus, Claus; Fach, Horst; Gabriel, Gunter; Galow, Manfred; and Meckel, Joachim, 4,178,150, Cl. 432-14.000.
Meckel, Joachim F.: *See—*
Burkert, Rudolf; Flockenhaus, Claus; Meckel, Joachim F.; and Wagener, Dietrich, 4,178,266, Cl. 252-373.000.
Meckstroth, Alan F. Hanger for supporting pants and the like and method of production. 4,177,841, Cl. 140-81.500.
Med General, Inc.: *See—*
Miller, Curtis H; Arp, Robert A.; and Carpenter, Howard F., 4,177,813, Cl. 128-326.000.
Meda, Sergio: *See—*
Riccardi, Clemente C.; Meda, Sergio; and Cigognini, Luciano, 4,178,102, Cl. 356-307.000.
Meek, Nigel W.: *See—*
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Meier, Stefan: *See—*
Brunnee, Curt; Franzen, Jochen; and Meier, Stefan, 4,178,507, Cl. 250-282.000.
Meierhoefer, Eugene J.: *See—*
Schwartz, Charles M.; and Meierhoefer, Eugene J., 4,177,945, Cl. 239-338.000.
Meisei Chemical Works, Ltd.: *See—*
Tomita, Mikio, 4,178,409, Cl. 428-290.000.
Tomita, Mikio, 4,178,410, Cl. 428-290.000.
Meisinger, Robert H.; and Yu, Pyung K., to Rohm and Haas Company. Diphenyl sulfide, sulfoxide and sulfone plant growth regulators. 4,178,169, Cl. 71-98.000.
Melega, Albert, to Cutting Room Appliances Corporation. Cloth-laying machine. 4,177,980, Cl. 270-31.000.
Memeger, Wesley, Jr., to Du Pont de Nemours, E. I., and Company. Process and product. 4,178,419, Cl. 521-89.000.
Menard, Michel: *See—*
Cherbourg, Robert; Falluel, Jean-Pierre; and Menard, Michel, 4,177,605, Cl. 49-98.000.
Menges, Hans G. L.; Harms, Engelbert G.; and Hegele, Rainer, to Uniroyal, AG. Method and apparatus for mixing viscous materials. 4,178,104, Cl. 366-80.000.
Menzel, Stanley W. O., to Reed Irrigation Systems Pty. Ltd. Irrigation device. 4,177,947, Cl. 239-542.000.
Merck & Co., Inc.: *See—*
Igoe, Robert S., 4,178,390, Cl. 426-43.000.
Sweet, Charles S., 4,178,374, Cl. 424-246.000.
Williams, Haydn W. R.; Cragoe, Edward J., Jr.; and Rooney, Clarence S., 4,178,386, Cl. 424-317.000.
Merli, Claudio; and Franca, Carlo, to Euteco S.p.A. Structure of pneumatic tire covers. 4,177,852, Cl. 152-354.00R.
Merrell Toraude et Compagnie: *See—*
Gittos, Maurice W.; and Letertre, Gerard J., 4,178,463, Cl. 562-574.000.
Merriman, Henry H.; and White, William J., to Merriman Products, Inc. Inflated vehicle spring and lift. 4,178,015, Cl. 280-711.000.

Merriman Products, Inc.: *See—*
Merriman, Henry H.; and White, William J., 4,178,015, Cl. 280-711.000.
Merten, Gerhard, to Gewerkschaft Eisenhutte Westfalia. Movable mining planer with direction responsive adjustable cutter depth. 4,178,040, Cl. 299-34.000.
Messer, Leonard, to American Minechem Corporation. Method and apparatus for controlled dewaterizing of coal treatment underflow 4,178,243, Cl. 210-54.000.
Metallgesellschaft AG: *See—*
Tashiro, Koji; and Matsumoto, Yoichi, 4,178,156, Cl. 55-5.000.
Metcalfe, Richard T., to American Optical Corporation. Spectacles hinge. 4,178,081, Cl. 351-153.000.
Metcalfe, Robert A.; and Bourdeau, Romeo G., to United Technologies Corporation. Method of producing solid particles of metal. 4,178,335, Cl. 264-8.000.
Metrailer, William J.; Bearden, Roby, Jr.; and Aldridge, Clyde L., to Exxon Research & Engineering Co. Combination hydroconversion, fluid coking and gasification. 4,178,227, Cl. 208-50.000.
Meyer, Burton C.; and Schoenfield, Palmer J., to Marvin Glass & Associates. Amusement apparatus. 4,177,991, Cl. 273-95.00B.
Meyer, Danny S.: *See—*
Laitkep, Anthony A.; Meyer, Danny S.; and Sitton, Willard J., 4,177,998, Cl. 277-59.000.
Meyer, Max F., Jr.; McConnell, Richard L.; and Joyner, Frederick B., to Eastman Kodak Company. Hot-melt adhesvies for bonding polyethylene. 4,178,272, Cl. 260-27.00R.
Meyers, George L., to American Can Company. Method of making partitioned tray. 4,177,715, Cl. 93-37.00R.
Meyers, Leo J.; and Grant, Louis A., to Louis A. Grant, Inc. Exhaust hood apparatus with tilting furnace. 4,177,975, Cl. 266-158.000.
Meyers, Theodore J.: *See—*
Cini, Hector J.; and Meyers, Theodore J., 4,178,577, Cl. 367-159.000.
Michalek, Romuald. *See—*
Collins, Martin F.; and Michalek, Romuald, 4,178,350, Cl. 423-248.000.
Mickschl, Lyle H.: *See—*
Brown, Robert C.; and Mickschl, Lyle H., 4,177,812, Cl. 128-284.000.
Midcon Pipeline Equipment Co.: *See—*
Clavin, Edward A., 4,177,914, Cl. 228-49.00B.
Rhoden, Gary S., 4,177,734, Cl. 104-138.00G.
Midrex Corporation: *See—*
Huestis, Allan C., 4,178,151, Cl. 432-1.000.
Mikado, Tsuneo, to Nippon Television Industry Corporation. PAL color television signal generator for control of time base corrector. 4,178,607, Cl. 358-8.000.
Milleon, Roger H.: *See—*
Huet, Philippe; Milleon, Roger H.; and Leprince, Philippe, 4,178,563, Cl. 331-94.5PE.
Miller, Alvin L.; and Viscido, Anthony J. Dental implant and method of inserting the same. 4,177,562, Cl. 433-174.000
Miller, Curtis H; Arp, Robert A.; and Carpenter, Howard F., to Med General, Inc. Vessel occluder. 4,177,813, Cl. 128-326.000.
Miller, Gregory C.; Albrecht, Henry R.; Clarke, C. William; and Longthorpe, Paul L., to Ederer Incorporated. Cable drum safety brake. 4,177,973, Cl. 254-173.00R.
Miller, Jack V. Three-way brightness fluorescent lampholder fitting. 4,178,535, Cl. 315-53.000.
Miller, Kenneth G., to Respiratory Care, Inc. High volume humidifier/-nebulizer. 4,178,334, Cl. 261-142.000.
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Miller, Taylor C., Jr. Method for reducing dental plaque and pellicle precursor of plaque. 4,178,363, Cl. 424-49.000.
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Mitchell, Howard E., to Dresser Industries, Inc. System for boring raises having portions of different diameters. 4,177,866, Cl. 175-53.000.
Mitchell, Richard F., to U.S. Philips Corporation. Acoustic surgave wave resonator devices. 4,178,571, Cl. 333-194.000.
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Mittendorf, Theodor H. Vehicle insect protection apparatus. 4,178,034, Cl. 296-91.000.
Miyamoto, Masao, to Kabushiki Kaisha Daini Seikosha. Time correcting means for a digital electronic watch. 4,177,633, Cl. 58-23.00R.
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Monguzzi, Riccardo; Pifferi, Giorgio; Pinza, Mario; and Broccali, Giampietro, to CRAF Sud. Hydrazono derivatives of cephalosporins. 4,178,444, Cl. 544-30.000.
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Moorehead, Harvey R., to Warner-Lambert Company. Intravenous catheter apparatus and method. 4,177,809, Cl. 128-214.400
More, Keith A.; and Bianco, Donald R., to Bendix Corporation, The. Sensitivity proportional counter window. 4,178,509, Cl. 250-374.000
Morgan, Barry A., to Reckitt & Colman Products Limited. Tetrapeptide derivatives. 4,178,371, Cl. 424-177.000
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Morita, Yoshiyuki; Itou, Masami; Nomura, Shigeyoshi; and Ueda, Masahiro, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Diesel engine fuel control apparatus. 4,177,788, Cl. 123-97.00B.
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Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.
Nunn, Robert G.; Frank, Louis M.; and Bittle, Ronald G., to Nunn, Robert Gregory; and Bittle, Ronald G. Thumb-sucking alarm system. 4,178,589, Cl. 340-573.000.
Nunn, Robert Gregory: *See—*
Nunn, Robert G.; Frank, Louis M.; and Bittle, Ronald G., 4,178,589, Cl. 340-573.000.
Nunogaki, Yoshiaki, to Sanki Engineering Ltd. Cell fragility testing method and appliance therefor. 4,178,152, Cl. 23-230.00B.
Nutku, Ata. Rotary engines with free reciprocating-rotating pistons and jet thrust drive. 4,177,771, Cl. 123-43.00C.
Nyi, Kayson: *See—*
Emmons, William D.; and Nyi, Kayson, 4,178,425, Cl. 528-73.000.
Nyman, Niilo: *See—*
Hakkinen, Seppo; Nyman, Niilo; Kilpelainen, Ossi; Paakkinen, Ilmari; Rautapaa, Kari; and Rasimus, Seppo, 4,177,942, Cl. 222-198.000.
O.K. Machine and Tool Corp.: *See—*
Weltman, David; and Rivera, Thomas, 4,177,555, Cl. 29-751.000.
Obata, Hiroshi; Hasegawa, Takehisa; Watanabe, Hideto; Ikegawa, Kiyohiro; and Ashida, Toshiyuki, to Kawasaki Steel Corporation; and Kurimoto Iron Works, Ltd. Tuyere for a melting furnace. 4,177,976, Cl. 266-266.000.
Occidental Oil Shale, Inc.: *See—*
Burton, Robert S., III, 4,178,039, Cl. 299-2.000.
Ocel, Donald J.: *See—*
Ocel, John J.; Ocel, Thomas; and Ocel, Donald J., 4,177,807, Cl. 128-133.000
Ocel, John J.; Ocel, Thomas; and Ocel, Donald J., to Ocelco, Inc. Restraining belt for patients in wheelchairs, stretchers or the like. 4,177,807, Cl. 128-133.000.
Ocel, Thomas: *See—*
Ocel, John J.; Ocel, Thomas; and Ocel, Donald J., 4,177,807, Cl. 128-133.000
Ocelco, Inc.: *See—*
Ocel, John J.; Ocel, Thomas; and Ocel, Donald J., 4,177,807, Cl. 128-133.000
Oda, Toyohisa; and Inouye, Kinichi, to Japan Steel Works, Ltd., The; and Asahi Kasei Kogyo Kabushiki Kaisha. Clad steel. 4,178,417, Cl. 428-679.000.
Oertel, Harald: *See—*
Uhrhan, Paul; Oertel, Harald; Lantzsch, Reinhard; Roos, Ernst; and Arlt, Dieter, 4,178,279, Cl. 260-45.80N.
Officine Cevolani S.p.A.: *See—*
Pazzaglia, Luigi, 4,177,702, Cl. 83-79.000.
Ogami, Noboru. Self retaining skin retractor. 4,177,802, Cl. 128-20.000.
Ogawa, Hiroshi; Aoki, Shigeta; and Arai, Tatsuo, to Bridgestone Tire Company Limited. Large-sized pneumatic radial tire. 4,177,850, Cl. 152-209.00R
Ogawa, Shigeru; Uemura, Kenzi; and Tanida, Masao, to Dynic Corporation. Yellowing resistant label comprising a porous polyamide layer containing a plasticizer. 4,177,586, Cl. 40-2.00R.
Ogita, Minoru; and Ishigaki, Yuzo, to Nippon Gakki Seizo Kabushiki Kaisha. Bandwidth switching circuits of radio receiver. 4,178,551, Cl. 325-427.000.
Ogle, Thomas H. W. W. P. Fuel economy system for an internal combustion engine. 4,177,779, Cl. 123-133.000.
Oguni, Yasuo: *See—*
Ichihara, Isao; Oguni, Yasuo; and Shiratori, Harunori, 4,177,671, Cl. 73-146.500.

Ohashi, Minoru; Ishikawa, Youichi; Shouda, Makoto; and Watabe, Tamon, to Oriental Yeast Co., Ltd. Electrical oxygen probe. 4,178,223, Cl. 204-195.00P.

Ohio Willow Wood Co., Inc.: *See—*
Arbogast, Charles J.; and Arbogast, Robert E., 4,177,525, Cl. 3-7.000.

Ohling, Robert S., to Acoolco Corporation. Freezing apparatus and method. 4,177,648, Cl. 62-73.000.

Ohlinger, Manfred: *See—*
Steck, Werner; Brodt, Rudolf; Sarnecki, Wilhelm; Jakusch, Helmut; Ohlinger, Manfred; and Koester, Eberhard, 4,178,171, Cl. 75-0.5AA.

Ohnishi, Akihiro: *See—*
Maruyama, Kimiomi; Hata, Yoshitaka; and Ohnishi, Akihiro, 4,177,777, Cl. 123-119.00A.

Ohnishi, Masahiro, to Fuji Photo Film Co., Ltd. Laser computer output microfilmer with electrical misalignment correction. 4,178,471, Cl. 178-15.000.

Ohno, Kiyotaka: *See—*
Naruto, Masanobu; Ohno, Kiyotaka; and Naruse, Norio, 4,178,454, Cl. 560-2.000.

Ohtsu Tire & Rubber Co., Ltd.: *See—*
Osada, Isao; and Sano, Shoichi, 4,177,849, Cl. 152-158.000.

Ohuchida, Shuichi: *See—*
Hayashi Masaki; Arai, Yoshinobu; Konishi, Yoshitaka; Shimoji, Katsuichi; Ohuchida, Shuichi; Ito, Hiroyuki; and Wakatsuka, Hirohisa, 4,178,367, Cl. 424-285.000.

Okada, Masaru; and Kanai, Seikichi, to Kabushiki Kaisha Komatsu Seisakusho. Combustion chamber for an internal combustion engine of direct injection type. 4,177,769, Cl. 123-30.00D.

Okamoto, Allen H.: *See—*
Knepshield, William R.; Polizzi, Jerry; and Okamoto, Allen H., 4,177,814, Cl. 128-348.000.

Okamoto, Hisaji: *See—*
Kawai, Noriaki; Okamoto, Hisaji; Takeda, Yosiaki; Sano, Fukuzi; Kakiuchi, Akio; Manabe, Masami; Nomura, Takashi; and Abe, Sigeya, 4,177,776, Cl. 123-117.00A.

Okano, Haruo; Harada, Nozomu; and Kubota, Nobuhisa, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of forming an insulating film. 4,178,396, Cl. 427-93.000.

Okano, Yukio, to Minolta Camera Kabushiki Kaisha. Optical low pass filter. 4,178,611, Cl. 358-44.000.

Okazaki, Seiji: *See—*
Shimooka, Riyo; Kunisawa, Masuo; and Okazaki, Seiji, 4,178,615, Cl. 358-302.000.

Okazaki, Shigeru: *See—*
Watanabe, Shinichi; Okazaki, Shigeru; and Osata, Mamoru, 4,177,872, Cl. 181-144.000.

Okuno, Youichi: *See—*
Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aiichiro; Okuno, Youichi; Tsunlkawa, Tokuichi; and Ito, Tadashi, 4,178,084, Cl. 354-59.000.

Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., to Hewlett-Packard Company. Programmable calculator including multifunction keys. 4,178,633, Cl. 364-709.000.

Olin Corporation: *See—*
Walker, Ford T., 4,178,347, Cl. 423-185.000.

Olson, Wayne P.: *See—*
Porter, Mark C.; and Olson, Wayne P., 4,178,248, Cl. 210-167.000.

Olsson, Karl E., to ASEA Aktiebolag. Fluid-cooled thyristor valve. 4,178,630, Cl. 363-141.000.

Olympus Optical Company Ltd.: *See—*
Sato, Masaaki, 4,178,477, Cl. 179-6.00R.

Onder, Kemal B.: *See—*
Chen, Augustin T.; and Onder, Kemal B., 4,178,432, Cl. 528-340.000.

Ondetti, Miguel A.; and Weisenborn, Frank L., to E. R. Squibb & Sons, Inc. Substituted acyl derivatives of amino acids. 4,178,291, Cl. 549-39.000.

Ono, Masami, to Tokico Ltd. Indicating apparatus for indicating numerals or letters by a plurality number of indicating elements. 4,178,575, Cl. 340-764.000.

Ono Pharmaceutical Co. Ltd.: *See—*
Hayashi Masaki; Arai, Yoshinobu; Konishi, Yoshitaka; Shimoji, Katsuichi; Ohuchida, Shuichi; Ito, Hiroyuki; and Wakatsuka, Hirohisa, 4,178,367, Cl. 424-285.000.

Onosato, Masashi: *See—*
Takahashi, Ryosuke; Inaba, Masao; and Onosato, Masashi, 4,178,613, Cl. 358-183.000.

Ookado, Terumi: *See—*
Yoshinari, Takashi; and Ookado, Terumi, 4,177,782, Cl. 123-148.00C.

Oriental Yeast Co., Ltd.: *See—*
Ohashi, Minoru; Ishikawa, Youichi; Shouda, Makoto; and Watabe, Tamon, 4,178,223, Cl. 204-195.00P.

Orlando, Charles M.: *See—*
Gardner, Russell A.; and Orlando, Charles M., 4,178,466, Cl. 568-727.000.

Orscheln Brake Lever Mfg. Co.: *See—*
Orscheln, Don W.; and Bopp, Robert D., 4,178,491, Cl. 200-34.000.

Orscheln, Don W.; and Bopp, Robert D., to Orscheln Brake Lever Mfg. Co. Switch actuator means of the time delay type. 4,178,491, Cl. 200-34.000.

Orsinger, Winston A.; and Fallos, George, to Bell & Howell Company. Signature gathering machine. 4,177,979, Cl. 270-54.000.

Osada, Isao; and Sano, Shoichi, to Ohtsu Tire & Rubber Co., Ltd.; and Honda Giken Kogyo Kabushiki Kaisha. Safety wheel. 4,177,849, Cl. 152-158.000.

Osata, Mamoru: *See—*
Watanabe, Shinichi; Okazaki, Shigeru; and Osata, Mamoru, 4,177,872, Cl. 181-144.000.

Otisca Industries, Ltd.: *See—*
Smith, Clay D.; and Keller, Douglas V., Jr., 4,178,231, Cl. 209-3.000.
Smith, Clay D.; and Keller, Douglas V., Jr., 4,178,233, Cl. 209-3.000.

Otteson, Kenneth M.; and Dawson, Daniel J., to Dynapol. Ethylsulfonate-alkylamine copolymers as colorant backbones. 4,178,422, Cl. 525-336.000.

Ouellette, Maurice J., to General Electric Company. Automatic gain control circuit and system for using same. 4,178,482, Cl. 179-15.0AN.

Ouellette, Paul J.: *See—*
Deveres, Ernest E.; Ouellette, Paul J.; and Pollitt, Joseph F., 4,177,554, Cl. 29-626.000.

Outboard Marine Corporation: *See—*
Emmons, J. Bruce, 4,178,331, Cl. 261-23.00A.

Outokumpu Oy: *See—*
Tiitinen, Heikki A.; Rastas, Jussi K.; Hamalainen, Matti J.; and Niemi, Tom O., 4,178,172, Cl. 75-0.5BA.

Overbye, Milan R., to Lewis Refrigeration Co. Air slide freezer system. 4,177,647, Cl. 62-63.000.

Oversohl, Wilhelm, to Wasag Chemie AG. Apparatus for production of combustible ammunition containers. 4,178,207, Cl. 162-384.000.

Ovshinsky, Stanford R.; and Sapru, Krishna, to Energy Conversion Devices, Inc. Modified amorphous semiconductors and method of making the same. 4,178,415, Cl. 428-446.000.

Owada, Mitsutoshi: *See—*
Asano, Noriyuki; Niwa, Yukichi; Owada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, 4,178,098, Cl. 356-1.000.

Owens-Corning Fiberglas Corporation: *See—*
Sage, Donald B.; and Krantz, Fred G., 4,178,412, Cl. 428-391.000.
Stevenson, Donald R.; and Schmidt, David A., 4,178,326, Cl. 525-176.000.

Owens-Illinois, Inc.: *See—*
Yarick, Jon R.; and Franks, Nelson J., 4,177,548, Cl. 29-453.000

Oxley, Robert F. Compact, flat trimmer capacitors. 4,178,622, Cl. 361-293.000.

Oy E. Sarlin AB: *See—*
Seppanen, Rauno; Sarvanne, Hannu; and Jakobsson, Sixten, 4,178,139, Cl. 417-360.000.

Paakkinen, Ilmari: *See—*
Hakkinen, Seppo; Nyman, Niilo; Kilpelainen, Ossi; Paakkinen, Ilmari; Rautapaa, Kari; and Rasimus, Seppo, 4,177,942, Cl. 222-198.000.

Paley, Hyman W. Plastic manifold assembly. 4,177,835, Cl. 137-883.000.

Palomeque, Osvaldo. Dual spark plug ignition system. 4,177,783, Cl. 123-148.00C.

Panzeri, Cesare, to Breda Termomeccanica S.p.A. Apparatus for controlling and taking up axial displacement in machinings on large diameter cylinders. 4,177,644, Cl. 60-721.000.

Papastrat, Arthur L.: *See—*
Du Bois, Edward F.; and Papastrat, Arthur L., 4,177,666, Cl. 72-420.000.

Papay, Andrew G.; and Zaweski, Edward F., to Edwin Cooper, Inc. Lubricating oil composition. 4,178,258, Cl. 252-32.70E.

Papistas-Scherer, Bertha; and Spector, George. Foot exerciser. 4,177,803, Cl. 128-25.00B.

Parker, Warde L.: *See—*
Lewis, Leon D.; Wiher, Wilfried; and Parker, Warde L., 4,177,713, Cl. 91-375.00R.

Parrish, David R.: *See—*
Berger, Leo; Corraz, Alfred J.; Parrish, David R.; and Scott, John W., 4,178,289, Cl. 260-315.000.

Parsons, Jack L. Preparation of N-(phosphonoacetyl)-L-aspartic acid. 4,178,306, Cl. 260-502.500.

Pasero, Edoardo. *See—*
Iacotti, Italo; and Pasero, Edoardo, 4,178,170, Cl. 75-3.000.

Pask, George, to Rolls-Royce Limited. Inlet for annular gas turbine combustor. 4,177,637, Cl. 60-39.360.

Passedroit, Hubert: *See—*
Boy, Aristide; Galy, Henri; Ivaldi, Raoul; and Passedroit, Hubert, 4,178,307, Cl. 260-504.00S.

Patel, Bhupendra C., to Kendall Company, The. Catheter balloon structure. 4,177,815, Cl. 128-349.00B.

Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH: *See—*
Kiesel, Rolf; Maier, Gerhard; and Grahmann, Helmut, 4,178,050, Cl. 316-19.000.

Patil, Babgaunda A.: *See—*
Przybylinski, Phillip G.; Patil, Babgaunda A.; and McNally, George S., 4,177,736, Cl. 105-377.000.

Pavlica, Robert T.: *See—*
Cabal, Albert V.; Bendoraitis, Joseph G.; Callen, Robert B.; Pavlica, Robert T.; and Voltz, Sterling E., 4,178,226, Cl. 208-15.000.

Pazzaglia, Luigi, to Officine Cevolani S.p.A. Device for automatically forming piles out of strips exiting from a machine on which the said strips are produced. 4,177,702, Cl. 83-79.000.

Pearce, Jacqueline H.: *See—*
Chao, Kwei C.; Ridgway, John A., Jr.; Schnell, Philip G.; and Pearce, Jacqueline H., 4,178,391, Cl. 426-61.000.

Peiler, Rolf W.; and Rohren, Ronald E., to Deere & Company. Feed rotor for an axial flow rotary combine. 4,177,821, Cl. 130-27.00T.

Pellerin, Albert. Device for increasing the uniformity of the air-fuel mixture in internal combustion engines. 4,177,780, Cl. 123-141.000.

Perkin-Elmer Limited: *See—*
Taylor, Leonard H., 4,178,121, Cl. 414-104.000.

Perry, Wayne W. Stirrup strap fastener. 4,177,623, Cl. 24-176.000.

Petch, James H. T.: *See—*
Roebuck, Peter; and Petch, James H. T., 4,178,177, Cl. 75-135.000.

Peters, David L.; Schnitzer, Arthur P.; Trzeciak, John R.; and Wovcechowsky, Brain J., to Singer Company, The. Simulation technique for generating a visual representation of an illuminated area. 4,177,579, Cl. 35-12.00N.

Peters Equipment Corporation: *See—*
Dilley, Gerald G., 4,177,842, Cl. 140-93.600.

Petersen, Steven D. Lens case. 4,177,894, Cl. 206-316.000.

Petrov, Peter D.: *See—*
Samokovliski, David A.; Angelov, Angel S.; Nachev, Georgi N.; Petrov, Peter D.; Nemechek, Alfred E.; and Vajarova, Iliyana I., 4,177,912, Cl. 226-176.000.

Pettersen, Alfred. Downrigger release device. 4,177,599, Cl. 43-43.120.

Pfaudler-Werke A.G.: *See—*
Grell, Helmut; and Scharbach, Heinz, 4,177,524, Cl. 3-1.900.

Pfizer Inc.: *See—*
Sciavolino, Frank C., 4,178,436, Cl. 536-9.000.
Thomas, Michael B., 4,178,437, Cl. 536-10.000.

Phelps, Richard D., to Back Bay Company, Inc. Vertically adjustable table. 4,177,739, Cl. 108-144.000.

Phelps, Weldon L., to Caterpillar Tractor Co. Electronic directional control circuit. 4,178,518, Cl. 307-9.000.

Philip Morris, Inc.: *See—*
Teng, Lina C., 4,178,458, Cl. 560-60.000.

Phillips Petroleum Company: *See—*
Farmer, Robert L., 4,178,504, Cl. 250-199.000
Hsieh, Henry L.; and Naylor, Floyd E., 4,178,275, Cl. 260-33.60A.
McKay, Dwight L., 4,178,267, Cl. 252-411.00R.
Murtha, Timothy P.; and Zuech, Ernest A., 4,178,269, Cl. 252-441.000.
Shue, Robert S.; and Crain, Donald L., 4,178,276, Cl. 260-37.00R

Photon Power, Inc.: *See—*
Jordan, John F.; and Singh, Vijay P., 4,178,395, Cl. 427-74.000

Pichl, Heinz, to Ab Volvo Penta. Outboard motor bracket assembly. 4,177,747, Cl. 115-41.0HT.

Pickelman, Dale M.: *See—*
Wessling, Ritchie A.; Foster, William A.; and Pickelman, Dale M., 4,178,205, Cl. 162-168.00R.

Pickles, Joseph, to Ferro Manufacturing Corporation. Seat recliner assembly. 4,178,037, Cl. 297-326.000.

Pifferi, Giorgio: *See—*
Monguzzi, Riccardo; Pifferi, Giorgio; Pinza, Mario; and Broccali, Giampietro, 4,178,444, Cl. 544-30.000.

Pilgrim Engineering Developments Limited. *See—*
Landamore, Leslie E., 4,177,971, Cl. 251-215.000.

Pilkington P. E. Limited: *See—*
Rogers, Philip J., 4,178,072, Cl. 350-145.000.
Rogers, Philip J., 4,178,075, Cl. 350-175.0FS.

Pilla, Donald P. Alcoholic beverage making composition and process. 4,178,389, Cl. 426-11.000.

Pingaud, Bernard J.: *See—*
Hector, Jean-Marie H.; and Pingaud, Bernard J., 4,178,416, Cl. 428-539.000.

Pinkerton, Harry E. Fluid handling system. 4,178,240, Cl. 210-22.00A

Pinz, Rochelle; and Silverman, Gordon, to Pinz, Rochelle. Combined computer and recorder for musical sound reproduction. 4,177,708, Cl. 84-1.280.

Pinza, Mario: *See—*
Monguzzi, Riccardo; Pifferi, Giorgio; Pinza, Mario; and Broccali, Giampietro, 4,178,444, Cl. 544-30.000.

Pipe Line Development Co., The: *See—*
Smith, Joseph B.; Smith, Edward B.; Schroeder, Gregory D.; and Smith, William B., 4,177,827, Cl. 137-318.000.

Plourde, Fernand; and Plourde, Maurice. Apparatus for the excavation of subterranean tunnels. 4,178,111, Cl. 405-142.000.

Plourde, Maurice: *See—*
Plourde, Fernand; and Plourde, Maurice, 4,178,111, Cl. 405-142.000.

Podevin, Roland: *See—*
Lauro, Fernand; and Podevin, Roland, 4,178,021, Cl. 285-255.000.

Polaroid Corporation: *See—*
Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., 4,178,446, Cl. 544-33.000.
Borror, Alan L.; Foley, James W.; Kampe, Marcis M.; and Lee, John W., Jr., 4,178,447, Cl. 544-33.000.
Erlichman, Irving, 4,178,598, Cl. 346-105.000.
Gordon, Michael E.; and Stieger, Frank, 4,177,552, Cl. 29-623.400.
Shenk, Edwin K.; and Tam, Shirley Y., 4,178,087, Cl. 354-195.000.

Polinsky, Murray A., to RCA Corporation. Method of making a bipolar transistor with high-low emitter impurity concentration. 4,178,190, Cl. 148-1.500.

Polizzi, Jerry: *See—*
Knepshield, William R.; Polizzi, Jerry; and Okamoto, Allen H., 4,177,814, Cl. 128-348.000.

Pollitt, Joseph F.: *See—*
Deveres, Ernest E.; Ouellette, Paul J.; and Pollitt, Joseph F., 4,177,554, Cl. 29-626.000.

Polysar Resins, Inc.: *See—*
Crisci, Victor E., 4,177,930, Cl. 220-284.000.

Pool, James L., to Lisle Corporation. Valve seat ring installation tool. 4,178,115, Cl. 408-82.000.

Poole, Judith A. Toilet paper service pedestal. 4,177,958, Cl. 242-55.420.

Porter, Mark C.; and Olson, Wayne P., to Nuclepore Corporation. Non-clogging microporous filter with cross flow operation. 4,178,248, Cl. 210-167.000.

Porter, Vernon R., to Texas Instruments Incorporated. Apparatus for generation and control of dopant and reactive gases. 4,178,224, Cl. 204-237.000.

Pouliot, Oliver L.: *See—*
Daly, William P.; Lewis, Robert P.; and Pouliot, Oliver L., 4,177,620, Cl. 53-425.000.

Pourrias, Bernard M.: *See—*
Bourgery, Guy R.; Lacour, Alain P.; Moinet, Gerard H.; Pourrias, Bernard M.; and Ruch, Anne-Marie P., 4,178,442, Cl. 542-440.000.

Powell, Harry C., Jr., to Powell Machinery, Inc. Automatic fruit bagging. 4,177,621, Cl. 53-468.000.

Powell Machinery, Inc.: *See—*
Powell, Harry C., Jr., 4,177,621, Cl. 53-468.000.

Powell, Peter J.; and Nagy, Gerard D., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Laminated electrode. 4,178,339, Cl. 264-61.000.

Power, John J.; Van Wagener, Raymond H.; and Raasch, Ernest M., to Swinglne, Inc. Carrier for holding sheets of material for use with a thermal binding machine. 4,178,201, Cl. 156-499.000.

Powers, Joseph A., to Hoover Company, The. Kinetic brush agitator with back up beater bar. 4,177,536, Cl. 15-182.000.

Poynor, Paul C.: *See—*
McConaghy, James R.; Poynor, Paul C.; and Friday, John R., 4,178,229, Cl. 208-50.000.

Pres-To-Line Corporation of America: *See—*
Thompson, John J.; Gorman, Paul D.; and Dowd, Patrick, 4,177,591, Cl. 40-343.000.

Price, Lewis H., to Lee Industries, Inc. Inline ball valve. 4,177,832, Cl. 137-625.470.

Priddy, Duane B., to Dow Chemical Company, The. Organic peroxide compositions. 4,178,263, Cl. 252-186.000.

Prince Corporation: *See—*
Marcus, Konrad H., 4,178,626, Cl. 362-133.000.

Printronix, Inc.: *See—*
Kleist, Robert A.; and Matula, Jerry, 4,177,731, Cl. 101-336.000.

Procter & Gamble Company, The: *See—*
Leikhim, John W.; and Mitchell, Sharon J., 4,178,254, Cl. 252-8.600.

Prodanovich, George L.: *See—*
Beaver, Robert L., II; Adams, Michael J.; Prodanovich, George L.; Key, Paul F.; Rawlings, Don O.; Santhanam, P.; and Hunt, Susan L., 4,178,113, Cl. 406-10.000.

Produits Chimiques Ugine Kuhlmann. *See—*
Tellier, Pierre; and Weiss, Francis, 4,178,292, Cl. 260-333.000.

Prudnikov, Igor A.: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator, Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H

Przybylinski, Phillip G.; Patil, Babgaunda A.; and McNally, George S., to Pullman Incorporated. Mechanically and weldingly secured bracket. 4,177,736, Cl. 105-377.000.

Psaras, John D., to Brown & Williamson Tobacco Corporation. Method and apparatus for conditioning material utilizing airflow control means. 4,177,576, Cl. 34-33.000.

PTI - Dolco: *See—*
Robins, Milton, 4,178,025, Cl. 292-117.000.

Puig Planas, Antonio. Seal assembly for bottles or flasks. 4,177,904, Cl. 215-12.00R.

Pujolie, Jean, to Telediffusion de France. Prefabricated element to form a double sound insulation and absorption wall of a dwelling. 4,177,876, Cl. 181-284.000.

Pullman Incorporated: *See—*
Przybylinski, Phillip G.; Patil, Babgaunda A.; and McNally, George S., 4,177,736, Cl. 105-377.000.

Pulvermacher, Wilfried: *See—*
Gorges, Helmut; Brod, Heinrich; Pulvermacher, Wilfried; Rubens, Wolfgang; and Fischer, Otto, 4,178,173, Cl. 75-60.000.

Puskas, Alexander. Turbine apparatus. 4,178,124, Cl. 415-2.000.

Puskas, William L.: *See—*
Dussault, Jean G. M.; Geckle, Robert A.; and Puskas, William L., 4,178,188, Cl. 134-1.000.

Putter, Rolf: *See—*
Schossler, Willi; Behre, Horst; and Putter, Rolf, 4,178,308, Cl. 260-509.000.

Quaker Oats Company, The: *See—*
Clanton, W. Porter, 4,177,871, Cl. 181-131.000
Kumar, Surinder, 4,178,394, Cl. 426-656.000.

Queren, James. Burglar alarm system. 4,178,588, Cl. 340-545.000.
Quitmann, Walter: *See—*
Hakert, Karl-Heinz; and Quitmann, Walter, 4,178,200, Cl. 156-187.000.
R. A. Jones & Co. Inc.: *See—*
Weichhand, Robert J., 4,178,120, Cl. 414-41.000.
R. F. Shouptronics Corp.: *See—*
Luther, Henry D., 4,178,501, Cl. 235-54.00F.
R & I Patent Corporation: *See—*
Shepard, Francis H., Jr., 4,178,628, Cl. 363-25.000.
R. T. Vanderbilt Company, Inc.: *See—*
Hill, Harry E., 4,178,280, Cl. 260-45.80A.
Raasch, Ernest M.: *See—*
Power, John J.; Van Wagener, Raymond H.; and Raasch, Ernest M., 4,178,201, Cl. 156-499.000.
Rabadan Peinado, Fernando: *See—*
Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, 4,178,450, Cl. 546-63.000.
Raber, Harry M., to Allis-Chalmers Corporation. Infinitely adjustable bearing seal for non-parallel surfaces. 4,177,999, Cl. 277-112.000.
Rada, Petr: *See—*
Lamb, Frank H.; Lefcort, Malcolm D.; and Rada, Petr, 4,177,740, Cl. 110-213.000.
Rahman, Michael, to Envirotech Corporation. Humidifier duct system. 4,178,160, Cl. 55-436.000.
Rain Bird Sprinkler Mfg. Corp.: *See—*
Wichman, William J., 4,177,944, Cl. 239-230.000.
Rameckers, Stephanus J.; Wanninkhop, Peter; and Moolenaar, Antonie J., to Skil Corporation. Automatic belt centering device. 4,177,609, Cl. 51-170.0EB.
Randle, Rae. Portable saw mill. 4,177,704, Cl. 83-435.100.
Rasimus, Seppo: *See—*
Hakkinen, Seppo; Nyman, Niilo; Kilpelainen, Ossi; Paakkinen, Ilmari; Rautapaa, Kari; and Rasimus, Seppo, 4,177,942, Cl. 222-198.000.
Rastas, Jussi K.: *See—*
Tiitinen, Heikki A.; Rastas, Jussi K.; Hamalainen, Matti J.; and Niemi, Tom O., 4,178,172, Cl. 75-0.5BA.
Rautapaa, Kari: *See—*
Hakkinen, Seppo; Nyman, Niilo; Kilpelainen, Ossi; Paakkinen, Ilmari; Rautapaa, Kari; and Rasimus, Seppo, 4,177,942, Cl. 222-198.000.
Rawicki, Waldemar, to Binks Manufacturing Company. Double-acting flexible tube pump. 4,178,133, Cl. 417-63.000.
Rawlings, Don O.: *See—*
Beaver, Robert I., II; Adams, Michael J.; Prodanovich, George L.; Key, Paul F.; Rawlings, Don O.; Santhanam, P.; and Hunt, Susan L., 4,178,113, Cl. 406-10.000.
RCA Corporation: *See—*
Alig, Roger C., 4,178,531, Cl. 313-409.000.
Flatley, Doris W., 4,178,191, Cl. 148-1.500.
Hsu, Sheng T.; and Cartwright, James M., Jr., 4,178,605, Cl. 357-42.000.
Hulls, Leonard R.; and Dowdell, Toy, Jr., 4,178,546, Cl. 324-158.0MG.
Ladany, Ivan; Ettenberg, Michael; Lockwood, Harry F.; and Kressel, Henry, 4,178,564, Cl. 331-94.50H.
Polinsky, Murray A., 4,178,190, Cl. 148-1.500.
Sauer, Donald J., 4,178,614, Cl. 358-213.000.
Reale, Michael J., to Stauffer Chemical Company. Amine antioxidants as antiscorch agents in flame retarded polyurethane foams. 4,178,420, Cl. 521-107.000.
Rebhan, Herbert J.: *See—*
Glabe, Elmer F.; and Rebhan, Herbert J., 4,178,369, Cl. 424-177.000.
Glabe, Elmer F.; and Rebhan, Herbert J., 4,178,370, Cl. 424-177.000.
Reckitt & Colman Products Limited: *See—*
Morgan, Barry A., 4,178,371, Cl. 424-177.000.
Redhead, Walden K. Barbecue rotisserie baster. 4,177,721, Cl. 99-345.000.
Reed Irrigation Systems Pty. Ltd.: *See—*
Menzel, Stanley W. O., 4,177,947, Cl. 239-542.000.
Reed Manufacturing Company: *See—*
Brown, Thomas G., 4,177,558, Cl. 30-103.000.
Reeh, Ulrike: *See—*
Denk, Hans; and Reeh, Ulrike, 4,178,274, Cl. 260-31.80E.
Reff, Robey C.: *See—*
Johnson, George S.; and Reff, Robey C., 4,177,551, Cl. 29-623.100.
Regamey, Pierre E. Method and device for feeding a system of generation and distribution of vapor condensable into make-up liquid. 4,177,767, Cl. 122-456.000.
Regan, Robert J.: *See—*
McNeill, William H.; Lech, Joseph M.; Haugsjaa, Paul O.; and Regan, Robert J., 4,178,534, Cl. 315-39.000.
Regie Nationale des Usines Renault: *See—*
Chamdru, Jacques, 4,177,857, Cl. 164-200.000.
Cherbourg, Robert; Falluel, Jean-Pierre; and Menard, Michel, 4,177,605, Cl. 49-98.000.
Reich, David: *See—*
Rudner, Bernard; Reich, David; and Galica, Edward, 4,178,161, Cl. 55-524.000.
Reichel, Alfred G., to Black & Decker Inc. Suppressor-insulator member and circuit arrangement therefor. 4,178,617, Cl. 361-43.000.
Reid, Earl; and Copp, Carl A., Jr., to General Motors Corporation. Guide shoe members for wobble plate compressor. 4,178,136, Cl. 417-269.000.
Reindl, John C.: *See—*
Tee, Liong S.; and Reindl, John C., 4,178,435, Cl. 528-501.000.
Reiner, Roland: *See—*
Montavon, Marc; and Reiner, Roland, 4,178,443, Cl. 544-27.000.
Reinhardt, Bruce A.: *See—*
Arnold, Fred E.; and Reinhardt, Bruce A., 4,178,428, Cl. 528-174.000.
Reishauer AG: *See—*
Angst, Arthur, 4,178,537, Cl. 318-603.000.
Renier, Gary L. Ophthalmic device for measuring vertex distance and pantoscopic tilt angle. 4,177,571, Cl. 33-200.000.
Renzi, Alfred A.: *See—*
Wagner, Eugene R.; and Renzi, Alfred A., 4,178,385, Cl. 424-310.000.
Repco Limited: *See—*
Harant, Gerhart W., 4,177,678, Cl. 73-460.000.
Research Corporation: *See—*
Wasserman, Harry H.; and Lipshutz, Bruce H., 4,178,286, Cl. 260-239.00A.
Respiratory Care, Inc.: *See—*
Miller, Kenneth G., 4,178,334, Cl. 261-142.000.
Reudink, Douglas O. J.: *See—*
Acampora, Anthony; Reudink, Douglas O. J.; and Yeh, Yu S., 4,178,550, Cl. 325-41.000.
Reutter, Jorg; and Dietze, Wolfgang, to International Standard Electric Corporation. Hybrid for two-wire full-duplex transmission of digital signals. 4,178,569, Cl. 333-119.000.
Reyner, Emerson M., II: *See—*
Johnson, Tore R.; Reyner, Emerson M., II; and Slysh, Roman S., 4,178,067, Cl. 350-96.210.
Reynolds, Brian L.: *See—*
Brown, Alfred; Reynolds, Brian L.; and Hall, Wilbur L., 4,177,752, Cl. 166-263.000.
Reynolds, Harold J., Jr., to Johns-Manville Corporation. Friction material for railroad service. 4,178,278, Cl. 260-42.220.
Reynolds, Howard, to General Electric Company. Rejection type fuse clip assembly. 4,178,063, Cl. 339-259.00F.
Reynolds Metals Company: *See—*
Lee, Harry W., Jr.; Wallace, Joseph W.; and Woolard, James M., 4,177,746, Cl. 113-120.00H.
Rheinmetall GmbH.: *See—*
Romer, Rudolf; Moll, Manfred; and Jaeneke, Christian, 4,177,733, Cl. 102-93.000.
Rhoden, Gary S., to Midcon Pipeline Equipment Co. Drive unit for internal pipe line equipment. 4,177,734, Cl. 104-138.00G.
Rhone-Poulenc Industries: *See—*
Berger, Christian; Deprez, Dominique; Farge, Daniel; Moutonnier, Claude; and Wolff, Gerard, 4,178,290, Cl. 549-22.000.
Boutin, Jean; and Neel, Jean, 4,178,221, Cl. 204-159.230.
Rhone-Poulenc-Textile: *See—*
Couchoud, Paul, 4,178,283, Cl. 260-45.85R.
Ribeiro Pinto, Luiz Antonio C., to Santal Equipamentos S. A. Comercio E. Industria. Chopping-raising-cleaning assembly for sugar cane harvesting machines. 4,177,953, Cl. 241-58.000.
Ribout, Pierre; and Delory, Bernard, to Thomson-CSF. Microwave delay line for travelling wave tube. 4,178,533, Cl. 315-3.600.
Riccardi, Clemente C.; Meda, Sergio; and Cigognini, Luciano, to U.S. Philips Corporation. Process and apparatus for measuring the concentration of a molecule of selective spectrum in a sample substance. 4,178,102, Cl. 356-307.000.
Richman, Jay L., to Bendix Corporation, The. Digital signal transmitter/receiver system including programmable self-test capability. 4,178,582, Cl. 340-146.10E.
Richter, Edward S. Heat recovery system for furnaces and the like. 4,177,766, Cl. 122-20.00B.
Ricoh Company, Ltd.: *See—*
Isayama, Takuro; and Komai, Hiromichi, 4,178,597, Cl. 346-75.000.
Jinnai, Koichiro; Horike, Masanori; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,178,595, Cl. 346-140.00R.
Yanagawa, Nobuyuki; and Tabata, Yasuhiro, 4,178,093, Cl. 355-8.000.
Ridgway, John A., Jr.: *See—*
Chao, Kwei C.; Ridgway, John A., Jr.; Schnell, Philip G.; and Pearce, Jacqueline H., 4,178,391, Cl. 426-61.000.
Rieber Werke Heinrich Rieber KG: *See—*
Lumpp, Gunter, 4,177,933, Cl. 220-307.000.
Rieke, Johannes C.: *See—*
van Turnhout, Jan; and Rieke, Johannes C., 4,178,157, Cl. 55-155.000.
Rieter Machine Works, Ltd.: *See—*
Amann, Robert; Lattmann, Werner; and Wildbolz, Rudolf, 4,178,114, Cl. 406-155.000.
Rikker, Leslie D., to National Engineering Company. Impact scrubber. 4,177,952, Cl. 241-40.000.
Rincon Industries, Inc.: *See—*
Bowen, John G., 4,178,499, Cl. 219-439.000.
Ring Jr., Harry K., to Trane Company, The. Valve assembly for use in an air distribution system. 4,177,970, Cl. 251-61.300.
Ripple, Warren. Loudspeaker equipment. 4,177,873, Cl. 181-148.000.
Rissi, Erwin; and Ebnother, Anton, to Sandoz Ltd. (4-Hydroxy-4-piperidyl)-alkanoic acid amides. 4,178,377, Cl. 424-267.000.
Ritter, James C. Radioisotope photoelectric generator. 4,178,524, Cl. 310-304.000.

Rivera, Thomas: *See—*
Weltman, David; and Rivera, Thomas, 4,177,555, Cl. 29-751.000.
Rizaev, Ramiz G. K. O.: *See—*
Litvishkov, Jury N.; Efendiev, Medzhid R. O.; Rizaev, Ramiz G. K. O.; and Kulieva, Khalida Y. K., 4,178,304, Cl. 260-465.00E.
Roadarmel, Gary W., to Anderson Company of Indiana, The. Arm to blade connector. 4,177,537, Cl. 15-250.320.
Robert Bosch GmbH: *See—*
Hofer, Gerald; Konrath, Karl; Schwarz, Manfred; and Muller, Willi, 4,177,775, Cl. 123-139.0AP.
Seiler, Hartmut; and Kugelmann, Adolf, 4,178,619, Cl. 361-91.000.
Robert Krups: *See—*
Brindopke, Dieter, 4,178,500, Cl. 219-524.000.
Roberts, Richard W., to Borg-Warner Corporation. Variable capacity compressor. 4,178,135, Cl. 417-222.000.
Robertshaw Controls Company: *See—*
Barr, Kenneth W., 4,178,525, Cl. 310-319.000.
Brakebill, Harold G.; and Dexter, Edwin M., 4,177,924, Cl. 236-86.000.
Robins, Milton, to PTI - Dolco. Narrow clearance gate latch. 4,178,025, Cl. 292-117.000.
Rockwell International Corporation: *See—*
Nichols, Richard A., 4,178,559, Cl. 330-296.000.
Roebuck, Peter; and Petch, James H. T., to Magnesium Elektron Limited. Stirring means to make magnesium alloys. 4,178,177, Cl. 75-135.000.
Roesch, Carol; and Heinimann, Rene. Inertial electric switch. 4,178,492, Cl. 200-61.45R.
Rogers, Philip J., to Pilkington P. E. Limited. Optical systems. 4,178,072, Cl. 350-145.000.
Rogers, Philip J., to Pilkington P. E. Limited. Lenses with distortion. 4,178,075, Cl. 350-175.0FS.
Rohm and Haas Company: *See—*
Emmons, William D.; and Nyi, Kayson, 4,178,425, Cl. 528-73.000.
Meisinger, Robert H.; and Yu, Pyung K., 4,178,169, Cl. 71-98.000.
Russell, Larry M., 4,178,406, Cl. 428-283.000.
Rohren, Ronald E.: *See—*
Peiler, Rolf W.; and Rohren, Ronald E., 4,177,821, Cl. 130-27.00T.
Rohringer, Peter: *See—*
Nachbur, Hermann; and Rohringer, Peter, 4,178,398, Cl. 427-379.000.
Rojo, Agustin, Jr. Manufacture of precast concrete units and a building constructed therewith. 4,178,343, Cl. 264-333.000.
Rolf, Steven R.; DeVries, James L.; and Ashworth, T., to United States of America, Navy. Quick response humidity chamber. 4,177,667, Cl. 73-1.00G.
Rolls-Royce Limited: *See—*
Jenkinson, John, 4,178,129, Cl. 416-95.000.
Pask, George, 4,177,637, Cl. 60-39.360.
Taylor, Maurice I., 4,177,639, Cl. 60-226.00A.
Romer, Rudolf; Moll, Manfred; and Jaeneke, Christian, to Rheinmetall GmbH. Spin stabilized projectile assembly. 4,177,733, Cl. 102-93.000.
Ronneberger, Hansjorg: *See—*
Heimburger, Norbert; Ronneberger, Hansjorg; and Schick, Manfred, 4,178,368, Cl. 424-94.000.
Rooney, Clarence S.: *See—*
Williams, Haydn W. R.; Cragoe, Edward J., Jr.; and Rooney, Clarence S., 4,178,386, Cl. 424-317.000.
Roos, Ernst: *See—*
Uhrhan, Paul; Oertel, Harald; Lantzsch, Reinhard; Roos, Ernst; and Arlt, Dieter, 4,178,279, Cl. 260-45.80N.
Rose, Donald K., to Hewlett-Packard Company. Planar and near planar magnetic bubble circuits. 4,178,635, Cl. 365-19.000.
Ross, Phillip J., to General Motors Corporation. Torque converter and lock-up clutch. 4,177,885, Cl. 192-3.300.
Rossetti, Alfio: *See—*
Funaioli, Ettore; Rossetti, Alfio; and Landini, Pier C., 4,177,907, Cl. 220-1.500.
Roth, Walter; and Woitschatzke, Hans, to Trak Incorporated. Ski with three-dimensional running surface. 4,178,012, Cl. 280-609.000.
Rothlisberger, Henri. Light synthetic fuel. 4,178,154, Cl. 44-53.000.
Roto-Finish Company, Inc.: *See—*
Balz, Gunther W., 4,177,608, Cl. 51-163.200.
Rountree, Jean. Roll-up place mat. 4,177,846, Cl. 150-52.00C.
Rovnyak, George C., to E. R. Squibb & Sons, Inc. Substituted pyrano[4,3-c]pyrazoles, compositions containing same, and method of use. 4,178,379, Cl. 424-273.00P.
Rowe, Neal E.: *See—*
Wilson, John R.; Rowe, Neal E.; and Bharteey, Brij M., 4,178,624, Cl. 361-341.000.
Rowland-Hill, Edward W., to Sperry Rand Corporation. Combine with offset rotor. 4,177,820, Cl. 130-27.00T.
Rowlett, Robert P., to Northrop Corporation. Radar augmentation system for airborne target. 4,178,596, Cl. 343-18.00E.
Rowsell, David G.: *See—*
Watson, Hugh R.; Rowsell, David G.; and Spring, David J., 4,178,459, Cl. 560-125.000.
Roy E. Roth Company: *See—*
Sieghartner, Leonard J., 4,178,131, Cl. 416-175.000.
Royer, Michel E.: *See—*
Guadagnin, Laurent J.; Grossiord, Claude R.; Jensen, John A.; Kawam, Antoine; Mouchet, Jacques M.; and Royer, Michel E., 4,177,646, Cl. 62-52.000.
Rubens, Harry E. Absorbent fibrous towel. 4,178,407, Cl. 428-284.000.
Rubens, Wolfgang: *See—*
Gorges, Helmut; Brod, Heinrich; Pulvermacher, Wilfried; Rubens, Wolfgang; and Fischer, Otto, 4,178,173, Cl. 75-60.000.
Rubey, Ulyss R., to Detectors, Inc. Method of forming a device for showing receipt of predetermined shock. 4,177,751, Cl. 116-201.000.
Ruch, Anne-Marie P.: *See—*
Bourgery, Guy R.; Lacour, Alain P.; Moinet, Gerard H.; Pourrias, Bernard M.; and Ruch, Anne-Marie P., 4,178,442, Cl. 542-440.000.
Ruck Engineering, Inc.: *See—*
Ruck, Mildred R., 4,177,592, Cl. 40-426.000.
Ruck, Mildred R., to Ruck Engineering, Inc. Miniature animated display. 4,177,592, Cl. 40-426.000.
Rucker, Jimmy. Art of shaving. 4,178,364, Cl. 424-73.000.
Rudner, Bernard; Reich, David; and Galica, Edward, to Tenneco Chemicals, Inc. Manufacture of rigidized convoluted foam from flexible polyurethane foam and resultant product. 4,178,161, Cl. 55-524.000.
Rusch, Larry P.: *See—*
Heytmeijer, Herman R.; Rusch, Larry P.; and Grasso, Giuseppe, 4,178,355, Cl. 423-308.000.
Rush, Kim E., to Khartli, Inc. Wheel attached balancing device. 4,178,041, Cl. 301-5.0BA.
Russ, Paul E., Sr., to Gates Rubber Company, The. V-belt. 4,177,687, Cl. 74-231.00C.
Russell, Homer C.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,178,633, Cl. 364-709.000.
Russell, Larry M., to Rohm and Haas Company. Three-layered fiberglass construction. 4,178,406, Cl. 428-283.000.
Rusznyak, Andreas, to Ebauches S.A. Binary frequency divider stages. 4,178,520, Cl. 307-255.00C.
Ruthel, Walter W.; and Evans, Leo G., to Hooker Chemicals & Plastics Corp. Cathode busbar structure. 4,178,225, Cl. 204-279.000.
Ruzicka, Jaromir; and Hansen, Elo H., to Bifok AB. Sample supply to automatic analyzers. 4,177,677, Cl. 73-422.0GC.
Rydin, Carl N. Car impact cushioning and coupler centering arrangement for railroad track bumping posts. 4,177,735, Cl. 104-254.000.
Ryzhkov, Vadim A.: *See—*
Kandyba, Petr E.; Kolesnikov, Dmitry P.; Komarovskikh, Nina I.; Lapir, Gennady M.; Likharev, Konstantin K.; Ryzhkov, Vadim A.; and Yastrebov, Viktor G., 4,178,602, Cl. 357-4.000.
S. T. Dupont: *See—*
Guadagnin, Laurent J.; Grossiord, Claude R.; Jensen, John A., Kawam, Antoine; Mouchet, Jacques M.; and Royer, Michel E., 4,177,646, Cl. 62-52.000.
Saboe, Michael S.: *See—*
Ivanko, Theodore; and Saboe, Michael S., 4,177,693, Cl. 74-661.000.
Sage, Donald B.; and Krautz, Fred G., to Owens-Corning Fiberglas Corporation. Glass size compositions and glass fibers coated therewith. 4,178,412, Cl. 428-391.000.
Sahagun-Barragan, Jaime. Improvements in integral drip irrigation system. 4,177,946, Cl. 239-533.100.
Sai, Fumio: *See—*
Murata, Moriyasu; Sai, Fumio; and Fujino, Takashi, 4,178,354, Cl. 423-306.000.
Sakaguchi, Shinji: *See—*
Tsubota, Motohiko; Sakaguchi, Shinji; and Tsuji, Nobuo, 4,178,182, Cl. 96-73.000.
Sakamoto, Teruhisa; Nakamura, Shigeo; and Taniguchi, Nobuyuki, to Toyo Soda Manufacturing Co., Ltd. Process for producing methacrylic acid. 4,178,464, Cl. 562-535.000.
Sakurai, Hiroshi. Safety knife. 4,177,560, Cl. 30-160.000.
Sakurai, Kunio; Kojima, Tadashi; and Itoh, Hiroshi, to Komshiroku Photo Industry Co., Ltd. Mask blank and mask. 4,178,403, Cl 428-209.000.
Salomon, Georges P. J., to S.A. des Etablissements Francois Salomon & Fils. Binding with vertical pivot axes. 4,178,014, Cl. 280-629.000.
Salomon, Robert E.; and Harding, Susan M., to Temple University. Process for conversion of ocean wave energy into electric power and apparatus. 4,178,517, Cl. 290-53.000.
Saltzman, Philip A.: *See—*
Dorsen, Mac; and Saltzman, Philip A., 4,177,587, Cl. 40-16.000.
Salvarezza, Robert M. Rope ladder. 4,177,878, Cl. 182-199.000.
Samokovliski, David A.; Angelov, Angel S.; Nachev, Georgi N.; Petrov, Peter D.; Nemechek, Alfred E.; and Vajarova, Iliyana I., to CUV "Progress". Apparatus for planetary feeding of electrode wire. 4,177,912, Cl. 226-176.000.
Sanders Associates, Inc.: *See—*
Johnson, Richard A., 4,178,567, Cl. 331-177.00R.
Sanders, Carlos L.: *See—*
Gebhardt, James L.; and Sanders, Carlos L., 4,177,588, Cl. 40-16.400.
Sanders, Louis H.; Watkins, Kenneth L.; and Bowen, Galt S., to Bio-Dynamics Inc. Weight-measuring and display device. 4,177,868, Cl. 177-211.000.
Sandoz Ltd.: *See—*
Rissi, Erwin; and Ebnother, Anton, 4,178,377, Cl. 424-267.000.

Sangamo Weston, Inc.: *See*—
Hart, David G.; and Venaas, Norman B., 4,177,922, Cl. 235-144.0MA.
Sanki Engineering Ltd.: *See*—
Nunogaki, Yoshiaki, 4,178,152, Cl. 23-230.00B.
Sano, Fukuzi: *See*—
Kawai, Noriaki; Okamoto, Hisaji; Takeda, Yosiaki; Sano, Fukuzi; Kakiuchi, Akio; Manabe, Masami; Nomura, Takashi; and Abe, Sigeya, 4,177,776, Cl. 123-117.00A.
Sano, Shoichi: *See*—
Osada, Isao; and Sano, Shoichi, 4,177,849, Cl. 152-158.000.
Sansanelli, Edward: *See*—
Streit, Allan L.; and Sansanelli, Edward, 4,178,264, Cl. 252-316.000.
Santal Equipamentos S. A. Comercio E. Industria: *See*—
Ribeiro Pinto, Luiz Antonio C., 4,177,953, Cl. 241-58.000.
Santana, Miguel E. Remote microphone with approved channel selector. 4,178,547, Cl. 325-16.000.
Santhanam, P.: *See*—
Beaver, Robert I., II; Adams, Michael J.; Prodanovich, George L.; Key, Paul F.; Rawlings, Don O.; Santhanam, P.; and Hunt, Susan L., 4,178,113, Cl. 406-10.000.
Sapru, Krishna: *See*—
Ovshinsky, Stanford R.; and Sapru, Krishna, 4,178,415, Cl. 428-446.000.
Sara, George M., to Beach Manufacturing Corporation. Automatic lithographic plate processor. 4,178,097, Cl. 355-100.000.
Sarantakis, Dimitrios, to American Home Products Corporation. Octapeptides. 4,178,284, Cl. 260-112.50R.
Sarnecki, Wilhelm: *See*—
Steck, Werner; Brodt, Rudolf; Sarnecki, Wilhelm; Jakusch, Helmut; Ohlinger, Manfred; and Koester, Eberhard, 4,178,171, Cl. 75-0.5AA.
Sarvanne, Hannu: *See*—
Seppanen, Rauno; Sarvanne, Hannu; and Jakobsson, Sixten, 4,178,139, Cl. 417-360.000.
Sarver, Douglas R. Wire straightener die. 4,177,843, Cl. 140-147.000.
Sase, Takashi; Katoh, Kazuo; and Hirayama, Takeshi, to Hitachi, Ltd. Phase difference detector. 4,178,554, Cl. 328-133.000.
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. 4,5-Dichloro-imidazole derivatives and their use as plant protection agents. 4,178,166, Cl. 71-92.000.
Sato, Hisato; Takatsu, Haruyoshi; and Tazume, Masayuki, to Dainippon Ink & Chemicals, Inc. Nematic liquid crystalline compounds. 4,178,302, Cl. 260-455.00R.
Sato, Masaaki, to Olympus Optical Company Ltd. Telephone Recorder mechanical actuator. 4,178,477, Cl. 179-6.00R.
Sauer, Donald J., to RCA Corporation. Readout of a densely packed CCD. 4,178,614, Cl. 358-213.000.
Sauer, Gerhard: *See*—
Haffer, Gregor; Eder, Ulrich; Sauer, Gerhard; Wiechert, Rudolf; Nishino, Yukishige; and Neef, Gunter, 4,178,381, Cl. 424-283.000.
Sauer, Heinrich, to Siemens Aktiengesellschaft. Pushbutton switch with collar. 4,178,493, Cl. 200-159.00R.
Sautiere, Bernard E.: *See*—
Duchateau, Jean L.; and Sautiere, Bernard E., 4,177,855, Cl. 164-82.000.
Sawyer, George M. Interference film photography. 4,178,181, Cl. 96-67.000.
Scarlet, Ted. Pennant and method of making a pennant. 4,177,750, Cl. 116-173.000.
Schaffitz, Wolfgang; and Huber, Eugen W., deceased (by Huber-Patzold, Gerda A. O., Anke H. L. Huber, Christina G. E. Huber, heirs), to Institut fur Motorenbau Professor Huber Eingetragener Verein. Fuel injection nozzle for internal combustion engines with internal mixing. 4,177,948, Cl. 239-533.300.
Schaffter, Craig D.: *See*—
Baichtal, James R.; McDonald, John C.; Helliwell, Bradley A.; Ling, Alexander C.; and Schaffter, Craig D., 4,178,478, Cl. 179-15.0AQ.
McDonald, John C.; Baichtal, James R.; and Schaffter, Craig D., 4,178,479, Cl. 179-15.0BY.
Scharbach, Heinz: *See*—
Grell, Helmut; and Scharbach, Heinz, 4,177,524, Cl. 3-1.900.
Schaub, Robert E.; and Weiss, Martin J., to American Cyanamid Company. 16,16-Spirocycloalkyl prostaglandin derivatives. 4,178,461, Cl. 562-463.000.
Scheepswerf en Machinefabriek "De Liesbosch" B.V.: *See*—
de Koning, Jan; Steyn, Jan; and Scheepswerf en Machinefabriek "De Liesbosch" B.V., 4,177,585, Cl. 37-67.000.
Scheffer, Karl D. Catalyst for curing resins. 4,178,429, Cl. 525-398.000.
Schering, Aktiengesellschaft: *See*—
Haffer, Gregor; Eder, Ulrich; Sauer, Gerhard; Wiechert, Rudolf; Nishino, Yukishige; and Neef, Gunter, 4,178,381, Cl. 424-283.000.
Schering Corporation: *See*—
Daniels, Peter J. L.; and Varchei, Mohammed M. N., 4,178,453, Cl. 548-369.000.
Scheying, Heinz, to Daimler-Benz Aktiengesellschaft. Fuel injection pump for air-compressing injection internal combustion engines. 4,178,141, Cl. 417-498.000.
Schick, Manfred: *See*—
Heimburger, Norbert; Ronneberger, Hansjorg; and Schick, Manfred, 4,178,368, Cl. 424-94.000.
Schiek, Burkhard; and Kohler, Jurgen, to U.S. Philips Corporation. Micro-slot-stripline phase shifter. 4,178,570, Cl. 333-161.000.
Schlensker, Albert L.: *See*—
Curtis, Russell R.; and Schlensker, Albert L., 4,177,949, Cl. 239-582.000.
Stevens, Robert E.; and Schlensker, Albert L., 4,177,937, Cl. 222-63.000.
Schluckebier, Floyd A., to General Motors Corporation. Torsion bar for power steering gear. 4,177,714, Cl. 91-375.00A.
Schmelzer Corporation: *See*—
Benjamin, Benjamin C., 4,177,831, Cl. 137-513.500.
Schmidt, Daniel R., Jr.; and Busse, Joseph F., to Andrew Corporation. Feed system for microwave antenna employing pattern control elements. 4,178,576, Cl. 343-781.00R.
Schmidt, David A.: *See*—
Stevenson, Donald R.; and Schmidt, David A., 4,178,326, Cl. 525-176.000.
Schmidt, Klaus, to EWG Import u. Export GmbH & Co. Handelskommanditgesellschaft. Portable grilling device. 4,177,720, Cl. 99-419.000.
Schmidt, Robert R.: *See*—
Sasse, Klaus; Beck, Gunther; Eue, Ludwig; and Schmidt, Robert R., 4,178,166, Cl. 71-92.000.
Schmitz-Josten, Robert; Borgardt, Manfred; Schulz, Hans-Hermann; Walkowiak, Michael; Leusner, Bernhard; and Suling, Carlhans, to Bayer Aktiengesellschaft. Dental filling material. 4,177,563, Cl. 433-228.000.
Schneider, Louis; and Graham, David E., to GAF Corporation. Herbicidal N-(haloacetyl)-N-(N'-methylenepyrrolidonyl)-2-alkoxyanilines useful as herbicides. 4,178,167, Cl. 71-95.000.
Schneider, Louis; and Graham, David E., to GAF Corporation. Herbicidal n-(haloacetyl)-n-(n-methylene pyrrolidonyl)-2-oxyalkyleneoxyalkylanilines. 4,178,168, Cl. 71-95.000.
Schnell, Philip G.: *See*—
Chao, Kwei C.; Ridgway, John A., Jr.; Schnell, Philip G.; and Pearce, Jacqueline H., 4,178,391, Cl. 426-61.000.
Schnitzer, Arthur P.: *See*—
Peters, David L.; Schnitzer, Arthur P.; Trzeciak, John R.; and Woycechowsky, Brain J., 4,177,579, Cl. 35-12.00N.
Schoenfield, Palmer J.: *See*—
Meyer, Burton C.; and Schoenfield, Palmer J., 4,177,991, Cl. 273-95.00B.
Schoening, Peter K.: *See*—
Young, Dale E., II; Elie, David K.; and Schoening, Peter K., 4,177,758, Cl. 119-3.000.
Schonherr, Klaus P. Bistable device for representation of a point of a tactile information. 4,178,586, Cl. 340-407.000.
Schossler, Willi; Behre, Horst; and Putter, Rolf, to Bayer Aktiengesellschaft. Process for the preparation of 1-amino-8-naphthol-3,6-disulphonic acid (H-acid). 4,178,308, Cl. 260-509.000.
Schreiber, Ronald S.: *See*—
Stima, Joseph F.; Schreiber, Ronald S.; and Giordano, Annie S., 4,178,255, Cl. 252-8.800.
Schriber, Louis; Stephens, Robert E.; and Blaha, John F., to Harris Corporation. Method and apparatus for web printing. 4,177,730, Cl. 101-248.000.
Schroeder, Gregory D.: *See*—
Smith, Joseph B.; Smith, Edward B.; Schroeder, Gregory D.; and Smith, William B., 4,177,827, Cl. 137-318.000.
Schudel, Marcus T. Lamp. 4,178,625, Cl. 362-131.000.
Schulein, Rolf G.: *See*—
Liebscher, Johannes; and Schulein, Rolf G., 4,177,533, Cl. 15-42.000.
Schultz, Neithart; Martens, Peter; and Vahlensieck, Hans-Joachim, to Dynamit Nobel Aktiengesellschaft. Method of preparing 1,1-difluoroethylene from acetylene. 4,178,316, Cl. 260-653.500.
Schultz, Robert T. Triggering device responsive to energy flow and controlled solar heating system incorporating the device. 4,177,795, Cl. 126-271.000.
Schulz, Hans-Hermann: *See*—
Schmitz-Josten, Robert; Borgardt, Manfred; Schulz, Hans-Hermann; Walkowiak, Michael; Leusner, Bernhard; and Suling, Carlhans, 4,177,563, Cl. 433-228.000.
Schulz, Siegfried, to Christoph, Dieter, a part interest. Steady rest for use in apparatus for supporting and precision-turning of large rotary devices. 4,177,701, Cl. 82-39.000.
Schulze, Heinz: *See*—
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Schurle, Herman: *See*—
Ganswein, Bernhard; Daniels, Erwin J.; Schurle, Herman; and Grosskopf, Klaus, 4,178,082, Cl. 351-159.000.
Schurmann, Heinz P. Cold flow forming. 4,177,665, Cl. 72-359.000.
Schwartz, Charles M.; and Meierhoefer, Eugene J., to Warner-Lambert Company. Humidifier unit. 4,177,945, Cl. 239-338.000.
Schwarz, Hans-Helmut, to Bayer Aktiengesellschaft. Process for isolating dinitrogen monoxide. 4,177,645, Cl. 62-23.000.
Schwarz, Manfred: *See*—
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Schwarzbach, Kurt; Koehler, Horst; and Muller, Franz, to Mannesmann Aktiengesellschaft. Method and apparatus for bending large pipes. 4,177,661, Cl. 72-128.000.
Schwing, Friedrich, to Friedrich Wilh. Schwing GmbH. Double-cylinder pump especially for conveying cement. 4,178,142, Cl. 417-516.000.
Sci-Med Life Systems, Inc.: *See*—
Torgeson, William L., 4,177,816, Cl. 128-400.000.

SCI Systems, Inc.: *See*—
King, Olin B., 4,178,583, Cl. 346-163.000.
King, Olin B., 4,178,599, Cl. 346-163.000.
King, Olin B., 4,178,600, Cl. 346-163.000.
King, Olin B., 4,178,601, Cl. 346-163.000.
Sciavolino, Frank C., to Pfizer Inc. Semi-synthetic oleandomycin derivatives-C_8 modifications. 4,178,436, Cl. 536-9.000.
Sciortino, August M. Self-locking coin receptacle and cover therefor. 4,177,920, Cl. 232-16.000.
Scott, John W.: *See*—
Berger, Leo; Corraz, Alfred J.; Parrish, David R.; and Scott, John W., 4,178,289, Cl. 260-315.000.
Scott Paper Company: *See*—
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Seabrook, Inc.: *See*—
Kennedy, Harry R., 4,177,629, Cl. 57-1.00R.
Seakan, Raymond N., to Acro-Fab Industries, Inc. Bicycle cable. 4,177,541, Cl. 24-73.00A.
Seaman, Jack L.: *See*—
Hogeman, Robert L.; Seaman, Jack L.; and Taylor, Roland S., 4,178,332, Cl. 261-50.00R.
Searle, Harold L.: *See*—
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Seifert, Horst: *See*—
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Seigal, Steven D.: *See*—
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Seiler, Hartmut; and Kugelmann, Adolf, to Robert Bosch GmbH. Protective integrated circuit network, particularly for connection to an inductive load. 4,178,619, Cl. 361-91.000.
Sekiguchi, Tomoyoshi; and Fujii, Masayuki, to Nissan Motor Company, Limited. Hydropneumatic suspension unit with a level selector mechanism. 4,177,977, Cl. 267-64.00R.
Sekmakas, Kazys, to DeSoto, Inc. High solids coating compositions containing liquid bishydroxy ethyl ether of a bisphenol. 4,178,325, Cl. 525-157.000.
Seko, Maomi, to Asahi Kasei Kogyo Kabushiki Kaisha. Cation exchange membrane and use thereof in the electrolysis of sodium chloride. 4,178,218, Cl. 204-98.000.
Senger, Stephen J., to United States of America, Navy. Angle servo preamplifier. 4,178,594, Cl. 343-7.400.
Seppanen, Rauno; Sarvanne, Hannu; and Jakobsson, Sixten, to Oy E. Sarlin AB. Cistern pumping plant. 4,178,139, Cl. 417-360.000.
Serres, Pierre F.: *See*—
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Shell Oil Company: *See*—
Carr, John B., 4,178,380, Cl. 424-283.000.
Shelton, Marcus H. Moisture stabilized package. 4,177,895, Cl. 206-386.000.
Shenk, Edwin K.; and Tam, Shirley Y., to Polaroid Corporation. Autofocus movie camera having focus correction means. 4,178,087, Cl. 354-195.000.
Shepard, Francis H., Jr., to R & I Patent Corporation. Switching type regulated power supply. 4,178,628, Cl. 363-25.000.
Shepherd, Charles E. Hanger assembly for fill strips. 4,178,333, Cl. 261-111.000.
Shiba, Masataka: *See*—
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Shibuya, Morioki; and Isa, Isao, to Japan Carlit Co., Ltd., The. Process for manufacturing chlorine dioxide. 4,178,356, Cl. 423-478.000.
Shigematsu, Syozo. Surface coating device of bamboos. 4,177,756, Cl. 118-404.000.
Shimizu, Masahiko: *See*—
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Shimooka, Riyo; Kunisawa, Masuo; and Okazaki, Seiji, to Dainippon Screen Seizo Kabushiki Kaisha. Aperture plate for an exposure head for use in a picture scanning reproducer. 4,178,615, Cl. 358-302.000.
Shinoda, Akibumi; and Shimizu, Masahiko, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Spare fuel tank for vehicle use. 4,178,004, Cl. 280-5.00A.
Shioya, Makoto: *See*—
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Shiraishi, Atsuko; and Shioya, Makoto, to Hitachi, Ltd. Method and device for controlling the number of pumps to be operated. 4,178,132, Cl. 417-5.000.
Shiraishi, Hideo: *See*—
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Shirato, Keiji, to Sony Corporation. Contrast/color control for a television receiver. 4,178,608, Cl. 358-21.00R.
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Shishkova, Zinaida P.; Kalninsh, Arvid Y.; Gailitis, Juris P.; Shmit, Uldis Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Kalinkin, Damir A.; Vaax, Viktor R.; Zimina, Maria A.; Belyaev, Vasily D.; Maximenko, Nikolai S.; and Epshtein, Yakov V. Culture medium for cultivation of fodder yeasts. 4,178,214, Cl. 195-100.000.
Shmit, Uldis Y.: *See*—
Shishkova, Zinaida P.; Kalninsh, Arvid Y.; Gailitis, Juris P.; Shmit, Uldis Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Kalinkin, Damir A.; Vaax, Viktor R.; Zimina, Maria A.; Belyaev, Vasily D.; Maximenko, Nikolai S.; and Epshtein, Yakov V., 4,178,214, Cl. 195-100.000.
Shono, Hiroaki; Ishikawa, Shinzo; Wakasa, Isao; and Adachi, Miyako, to Nitto Boseki Co., Ltd. Bushing for apparatus for spinning glass fibers. 4,178,162, Cl. 65-1.000.
Shouda, Makoto: *See*—
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Shoup, Thomas E.: *See*—
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Shue, Robert S.; and Crain, Donald L., to Phillips Petroleum Company. Mold corrosion inhibition. 4,178,276, Cl. 260-37.00R.
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Dovnar, Stanislav A.; Sidorenko, Valery A.; Morgunsky, Evgeny I.; and Vishnev, Nikolai V., 4,177,699, Cl. 82-1.00C.
Sieber-Muller, Paul. Flow control device. 4,177,969, Cl. 251-9.000.
Siegel, Martin; Millevoi, Eugene; and Budzyn, Boleslaw L., to Weldotron Corporation. Bag sealing apparatus with bag evacuation means. 4,177,622, Cl. 53-511.000.
Sieghartner, Leonard J., to Roy E. Roth Company. Centrifugal impellers. 4,178,131, Cl. 416-175.000.
Siemens Aktiengesellschaft: *See*—
Denk, Hans; and Reeh, Ulrike, 4,178,274, Cl. 260-31.80E.
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Signetics Corporation: *See*—
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Sikula, William J., Jr., to Deere & Company. Filter wrench. 4,177,529, Cl. 7-100.000.
Silver, Alexander; and Wenban, James R., to Garrett Corporation, The Foil bearing. 4,178,046, Cl. 308-9.000.
Silverberg, Morton, to Xerox Corporation. Belt support and steering module. 4,178,094, Cl. 355-16.000.
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Sim, James S. Y.: *See*—
Cohen, Arthur I.; Sim, James S. Y.; Van Horn, Maurice H.; Gordesky, Stanley E.; and Gordon, Stanley I., 4,178,361, Cl. 424-22.000.
Simmons, Thomas R. Apparatus for shaping and positioning fluid dispersal patterns. 4,177,927, Cl. 239-101.000.
Simon, Sydney. Safety liquid dispenser. 4,177,863, Cl. 169-62.000.
Simonelic, Joseph J.; and Ho, Roland K., to Motorola, Inc. Electromechanical pressure transducer. 4,178,621, Cl. 361-283.000.
Singer Company, The: *See*—
Adams, Kenneth D.; and Brauch, Robert B., 4,177,745, Cl. 112-221.000.
Du Bois, Edward F.; and Papastrat, Arthur L., 4,177,666, Cl. 72-420.000.
Peters, David L.; Schnitzer, Arthur P.; Trzeciak, John R.; and Woycechowsky, Brain J., 4,177,579, Cl. 35-12.00N.
Wurst, John W.; and Dunn, William H., 4,177,744, Cl. 112-158.00E.
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Sinker, Stephen M.: *See*—
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Sinkhorn, William A. Security door lock. 4,178,026, Cl. 292-295.000.
Sipek, Charles B.; Johnstone, Richard; and Clegg, Russell B., to Kearney & Trecker Corporation. Machine tool with hollow structural steel members. 4,177,550, Cl. 29-568.000.
Siragusa, George A.: *See*—
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Sitton, Willard J.: *See*—
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Skagerlund, Lars-Erik, to Aktiebolaget Bofors. Device for determining the direction towards a remote object. 4,178,505, Cl. 250-203.00R.
SKF Compagnie d'Applications Mechaniques: *See*—
Thomas, Georges; and Nicol, Henri, 4,178,202, Cl. 159-15.000.
Skil Corporation: *See*—
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Smith, Bernie B., Jr. Pipeline blow down technique. 4,178,155, Cl. 48-191.000.
Smith, Clay D.; and Keller, Douglas V., Jr., to Otisca Industries, Ltd. Method and apparatus for coal separation using fluorinated hydrocarbons. 4,178,231, Cl. 209-3.000.
Smith, Clay D.; and Keller, Douglas V., Jr., to Otisca Industries, Ltd. Fluorinated hydrocarbons in coal mining and beneficiation. 4,178,233, Cl. 209-3.000.
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Smith, Gerald B.: *See—*
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Smith, Harry A., to Dow Chemical Company, The. Process for making arylene sulfide polymers. 4,178,433, Cl. 528-381.000.
Smith International, Inc.: *See—*
Neilson, William J., 4,178,045, Cl. 308-8.200.
Smith, Joseph B.; Smith, Edward B.; Schroeder, Gregory D.; and Smith, William B., to Pipe Line Development Co., The. Pipe plugging device. 4,177,827, Cl. 137-318.000.
Smith, Stanley E.; Lyday, Richard W.; and Kushmaul, Thomas R., to General Motors Corporation. Method and apparatus for reversing and flattening a driver's restraint cushion. 4,178,344, Cl. 264-572.000.
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SNIA Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A.: *See—*
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Snowden, Paul, to Imperial Chemical Industries Limited. Production of fibres. 4,178.336, Cl. 264-8.000.
Snyder, Paul V., to General Electric Company. Electric toaster control. 4,178,498, Cl. 219-413.000.
Societe Anonyme Automobiles Citroen: *See—*
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S.A. des Etablissements Francois Salomon & Fils: *See—*
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Sodickson, Lester A., to Damon Corporation. Method and apparatus for chemical spot test analysis. 4,178,153, Cl. 23-230.00R.
Solar Suede Corporation: *See—*
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Soldner, Richard E., to Siemens Aktiengesellschaft. Ultrasonic applicator for ultrasonic scanning of bodies and method of using the same. 4,177,679, Cl. 73-625.000.
Sollich, Helmut, to Sollich KG Spezialmaschinenfabrik. Apparatus for controlling the temperature of flowable chocolate materials. 4,178,105, Cl. 366-312.000.
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Rowland-Hill, Edward W., 4,177,820, Cl. 130-27.00T.
Speth, William R., to International Telephone and Telegraph Corporation. Base drive circuit. 4,178,521, Cl. 307-270.000.
Spindler, Stanley G. Slip-on guitar cover. 4,177,847, Cl. 150-52.00R.
Spisak, Steve; and Shoup, Thomas E., to TRW, Inc. Apparatus for welding studs to workpieces. 4,178,495, Cl. 219-98.000.
Spors, Howard P. Combined blank forming and bending tool. 4,177,664, Cl. 72-326.000.
Sprecker, Mark A.; and Theimer, Ernst T., to International Flavors & Fragrances Inc. Process for the production of compounds useful in perfumery. 4,178,311, Cl. 260-592.000.
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Watson, Hugh R.; Rowsell, David G.; and Spring, David J., 4,178,459, Cl. 560-125.000.
Square D Company: *See—*
Jorgensen, George N.; Flee, Stephen L.; and Carroll, James C., 4,178,468, Cl. 174-48.000.
Khalid, Joseph M., 4,178,618, Cl. 361-58.000.
Stamicarbon, B.V.: *See—*
van den Berg, Cornelis E. P. V., 4,178,300, Cl. 260-413.000.
Standard Oil Company a corporation of Indiana: *See—*
Chao, Kwei C.; Ridgway, John A., Jr.; Schnell, Philip G.; and Pearce, Jacqueline H., 4,178,391, Cl. 426-61.000.
Standard Oil Company (Indiana): *See—*
Tee, Liong S.; and Reindl, John C., 4,178,435, Cl. 528-501.000.
Thompson, Donald F.; Mizenko, Joseph M.; and Sivak, Elmer, 4,178,421, Cl. 525-4.000.
Stanley, John M.; and Greene, Bernard A., to AMSTED Industries Incorporated. Pipe coupling. 4,178,001, Cl. 277-152.000.
Stanley Works, Limited, The: *See—*
Lambertz, Martin R., 4,177,545, Cl. 29-11.000.
Stant Manufacturing Company, Inc.: *See—*
Evans, John H., 4,177,931, Cl. 220-288.000.
Staprans, Ilona: *See—*
Felts, James M.; and Staprans, Ilona, 4,178,285, Cl. 260-112.00R.
Stauffer Chemical Company: *See—*
Anderson, Donald F.; and Yu, Arthur J., 4,178,423, Cl. 526-240.000.
Reale, Michael J., 4,178,420, Cl. 521-107.000.
Steck, Werner; Brodt, Rudolf; Sarnecki, Wilhelm; Jakusch, Helmut; Ohlinger, Manfred; and Koester, Eberhard, to BASF Aktiengesellschaft. Manufacture of acicular ferromagnetic iron particles. 4,178,171, Cl. 75-0.5AA.
Steele, Daniel, to Imperial Chemical Industries Limited. Explosive fuse-cord. 4,177,732, Cl. 102-27.00R.
Stefani, Giancarlo; and Fontana, Pietro, to Lonza, Ltd. Process for preparing maleic anhydride. 4,178,298, Cl. 260-346.750.
Stein, Werner: *See—*
Franz, Arnold; and Stein, Werner, 4,178,408, Cl. 428-285.000.
Steingrover, Horst, to C. Keller GmbH u. Co. KG. Device for the formation of separated rows of green bricks. 4,177,890, Cl. 198-434.000.
Stephens, Robert E.: *See—*
Schriber, Louis; Stephens, Robert E.; and Blaha, John F., 4,177,730, Cl. 101-248.000.
Sterling Drug Inc.: *See—*
Eggensperger, Heinz; and Diehl, Karl-Heinz, 4,178,375, Cl. 424-248.400.
Stevens, Robert E.; and Schlensker, Albert L., to Curtis Dyna Products Corporation. Constant pressure spraying apparatus. 4,177,937, Cl. 222-63.000.
Stevenson, Donald R.; and Schmidt, David A., to Owens-Corning Fiberglas Corporation. Low-shrink thermosetting polyesters. 4,178,326, Cl. 525-176.000.
Stewart, Robert D.; and Gamble, Robert L., to Foster Wheeler Energy Corporation. System and method for improving the reaction efficiency of a fluidized bed. 4,177,741, Cl. 110-263.000.
Steyn, Jan: *See—*
de Koning, Jan; Steyn, Jan; and Scheepswerf en Machinefabriek "De Liesbosch" B.V., 4,177,585, Cl. 37-67.000.
Stieger, Frank: *See—*
Gordon, Michael E.; and Stieger, Frank, 4,177,552, Cl. 29-623.400.
Stima, Joseph F.; Schreiber, Ronald S.; and Giordano, Annie S., to Colgate-Palmolive Company. Detergent compositions. 4,178,255, Cl. 252-8.800.
Stoddard, Xerxes T.; Vaseen, Vesper A.; and Terry, Ruel C. Stripping sulphur compounds from stack and other discharge gases and the commercial products derived therefrom. 4,178,357, Cl. 423-522.000.
Stokes, Gary P.: *See—*
Lippman, Seymour A.; Stokes, Gary P.; and Chupa, Charles M., 4,178,199, Cl. 156-110.00R.
Streit, Allan L.; and Sansanelli, Edward, to Airwick Industries, Inc. Air treating gel composition. 4,178,264, Cl. 252-316.000.
Streit, Werner: *See—*
Glaser, Klaus; Streit, Werner; Fikentscher, Rolf; and Gotsmann, Guenther, 4,178,217, Cl. 204-55.00Y.
Strunk, Richard J.: *See—*
Mao, Chung-Ling; Strunk, Richard J.; and Hubbard, Winchester L., 4,178,382, Cl. 424-288.000.
Stupell Industries, Inc.: *See—*
Dorsen, Mac; and Saltzman, Philip A., 4,177,587, Cl. 40-16.000.
Subramanian, Nagaraja: *See—*
Lake, Don W.; and Subramanian, Nagaraja, 4,178,487, Cl. 179-90.0BD.

Suetake, Yoshinori: *See—*
Higuchi, Masaaki; Nakatani, Genji; Ito, Haruo; Matsuda, Masamichi; and Suetake, Yoshinori, 4,177,974, Cl. 266-196.000.
Suling, Carlhans: *See—*
Schmitz-Josten, Robert; Borgardt, Manfred; Schulz, Hans-Hermann; Walkowiak, Michael; Leusner, Bernhard; and Suling, Carlhans, 4,177,563, Cl. 433-228.000.
Sullivan, Thomas E.; and Wright, Oscar L. Method of removing urea and/or creatinine. 4,178,241, Cl. 210-24.000.
Sumikin Coke Company Limited: *See—*
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; and Nishioka, Kunihiko, 4,178,215, Cl. 201-6.000.
Sumitomo Chemical Company, Limited: *See—*
Yasui, Seimei; and Hino, Minoru, 4,178,186, Cl. 106-20.000.
Sumitomo Metal Industries Limited: *See—*
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; and Nishioka, Kunihiko, 4,178,215, Cl. 201-6.000.
Sumiyoshi, Masaharu: *See—*
Naitou, Takashi; Sumiyoshi, Masaharu; Ito, Osamu; Hobo, Nobuhito; and Suzuki, Yutaka, 4,177,778, Cl. 123-122.00F.
Sun, Joseph Z.: *See—*
Weinberg, Alan S.; and Sun, Joseph Z., 4,178,401, Cl. 428-35.000.
Sunami, Yoshihiko: *See—*
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; and Nishioka, Kunihiko, 4,178,215, Cl. 201-6.000.
Sundeen, Arthur R., to General Motors Corporation. Diesel engine glow plug energization control device. 4,177,785, Cl. 123-179.00H.
Sunflower Manufacturing Company, Inc.: *See—*
Worick, Richard A., 4,178,009, Cl. 280-411.00A
Superior Electric Company, The: *See—*
Crapo, Roland L., 4,178,539, Cl. 323-45.000
Surland, Charles C. Golf practice device. 4,177,995, Cl. 273-199.00A.
Suzuki, Hiroyuki, to Daishin Kako Co., Ltd. Refractory releasing agent. 4,177,943, Cl. 222-591.000
Suzuki, Masayuki; Ito, Tadashi; Yamamichi, Masayoshi, and Murakami, Hiroyasu, to Canon Kabushiki Kaisha. Photographic camera with a release locking device. 4,178,085, Cl. 354-60.00R.
Suzuki, Yutaka: *See—*
Naitou, Takashi; Sumiyoshi, Masaharu; Ito, Osamu; Hobo, Nobuhito; and Suzuki, Yutaka, 4,177,778, Cl. 123-122.00F.
Svinin, Mikhail P.: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.
Swait, John C.: *See—*
Aldridge, David C.; Bowling, Roger; and Swait, John C., 4,178,213, Cl. 195-81.000.
Swanson, Wesley S., to Eaton Corporation. Electrically operated device and valving mechanism employing same. 4,178,573, Cl. 335-255.000.
Sweet, Charles S., to Merck & Co., Inc. Novel pharmaceutical compositions of β-blockers with diuretics. 4,178,374, Cl. 424-246.000.
Swenson, John H. Test probe for telephone wire connector. 4,178,058, Cl. 339-108.0TP.
Swenson, Richard C., to United States of America, Navy. Buoy system for vertical ocean profiling. 4,177,530, Cl. 9-8.00R
Swingline, Inc.: *See—*
Power, John J.; Van Wagener, Raymond H.; and Raasch, Ernest M., 4,178,201, Cl. 156-499.000.
Swoager, James M.: *See—*
Limbach, Walter S., 2nd; Swoager, Jon R.; and Swoager, James M., 4,177,567, Cl. 33-23.00K.
Swoager, Jon R.: *See—*
Limbach, Walter S., 2nd; Swoager, Jon R.; and Swoager, James M., 4,177,567, Cl. 33-23.00K.
Sybron Corporation: *See—*
Emmerich, Bernd W.; Ehret, Rudolf; Hoyer, Gerhard; and Trampert, Hans R., 4,178,623, Cl. 361-284.000
Sykes, Alec, to David Brown Tractors Limited. Variable-track wheels 4,178,042, Cl. 301-9.0TV.
Syntex (U.S.A.) Inc.: *See—*
Van Horn, Albert R.; Garay, Gabriel; and Edwards, John A., 4,178,457, Cl. 560-53.000.
Szauer, Jorge S.: *See—*
Baylis, Shelby M.; and Szauer, Jorge S., 4,177,797, Cl. 128-2.00B.
Szenger, Franz: *See—*
Werner, Walter; Herzog, Klaus; and Szenger, Franz, 4,177,568, Cl 33-174.00L.
Tabata, Yasuhiro: *See—*
Yanagawa, Nobuyuki; and Tabata, Yasuhiro, 4,178,093, Cl. 355-8.000.
Tabler, Charles P., to Kornylak Corporation. Molding conveyor drive. 4,178,144, Cl. 425-150.000.
Tachikawa, Katsuziro: *See—*
Kurobe, Takao; Tachikawa, Katsuziro; Kato, Tetsuo; and Imatoku, Yoshinobu, 4,177,875, Cl. 181-265.000.
Taguchi, Masahiko; Mogaki, Katsuo; and Takada, Syun, to Konishiroku Photo Industry Co., Ltd. Color photographic materials containing dye-fading inhibitors. 4,178,184, Cl. 96-74.000.
Takada, Syun: *See—*
Taguchi, Masahiko; Mogaki, Katsuo; and Takada, Syun, 4,178,184, Cl. 96-74.000
Takagi, Katsuaki; Tsukada, Toshiro; Tsuruoka, Hisashi; and Hara, Michio, to Hitachi, Ltd. Analog-to-digital converter. 4,178,585, Cl. 340-347.0NT.
Takahashi, Katsuhiko; Iikura, Masakazu; and Doi, Hachiro, to Fuso Keigokin Co., Ltd. Cord winding apparatus. 4,177,963, Cl. 242-107.110.
Takahashi, Kotei: *See—*
Hiraiwa, Kazuyoshi; and Takahashi, Kotei, 4,177,886, Cl. 192-4.00A.
Takahashi, Ryosuke; Inaba, Masao; and Onosato, Masashi, to Nippon Electric Co., Ltd. Television picture special effects system using digital memory techniques. 4,178,613, Cl. 358-183.000.
Takahashi, Sankichi: *See—*
Nakaoka, Azuma; and Takahashi, Sankichi, 4,178,245, Cl 210-81.000.
Takano, Tadayoshi; and Horibe, Susumu, to Fujisawa Pharmaceutical Co., Ltd. 7-(α-Substituted glycinamido)-3-substituted methyl-3-cephem-4-carboxylic acids and their derivatives. 4,178,445, Cl. 544-30.000.
Takasago Thermal Engineering Co., Ltd.: *See—*
Yoshida, Toru; Hosoi, Kameo; Tanaka, Takehisa; Hirai, Seiji; and Nakauji, Masakazu, 4,178,158, Cl. 55-160.000.
Takatsu, Haruyoshi: *See—*
Sato, Hisato; Takatsu, Haruyoshi; and Tazume, Masayuki, 4,178,302, Cl. 260-455.00R.
Takeda, Yosiaki: *See—*
Kawai, Noriaki; Okamoto, Hisaji; Takeda, Yosiaki; Sano, Fukuzi; Kakiuchi, Akio, Manabe, Masami; Nomura, Takashi; and Abe, Sigeya, 4,177,776, Cl. 123-117.00A.
Takeuchi, Seiji: *See—*
Fujita, Kazunori; Takeuchi, Seiji; Yamashita, Hisao; and Nakajima, Fumito, 4,178,270, Cl. 252-447.000.
Takishima, Yoshiyuki: *See—*
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; Shimizu, Masami; and Takishima, Yoshiyuki, 4,178,086, Cl. 354-152.000.
Tam, Shirley Y.: *See—*
Shenk, Edwin K.; and Tam, Shirley Y., 4,178,087, Cl. 354-195.000.
Tanaka, Takehisa: *See—*
Yoshida, Toru; Hosoi, Kameo; Tanaka, Takehisa; Hirai, Seiji; and Nakauji, Masakazu, 4,178,158, Cl. 55-160.000.
Tanida, Masao: *See—*
Ogawa, Shigeru; Uemura, Kenzi; and Tanida, Masao, 4,177,586, Cl. 40-2.00R.
Taniguchi, Nobuyuki: *See—*
Sakamoto, Teruhisa; Nakamura, Shigeo; and Taniguchi, Nobuyuki, 4,178,464, Cl. 562-535.000.
Tankred, Hans J., to Danfoss A/S. Compressor with reciprocating piston particularly for small refrigerators. 4,178,140, Cl. 417-415.000.
Tarasevich, Andrew, to Lockheed Electronics Co., Inc. Optical signal communicating apparatus. 4,178,515, Cl. 250-551.000.
Tashiro, Koji; and Matsumoto, Yoichi, to Metallgesellschaft AG. Process and apparatus for the collection of high-resistance dust. 4,178,156, Cl. 55-5.000.
Tatsutomi, Yasuo; Shiraishi, Hideo; and Hamamoto, Takashi, to Toyo Kogyo Co., Ltd. Engine starting device. 4,177,784, Cl. 123-179.00G.
Tavano, Sergio: *See—*
Gatti, Maurizio; Tavano, Sergio; and Checcacci, Basilio, 4,177,859, Cl. 165-11.000.
Tavkozlesi Kutato Intezet: *See—*
Torma, Imre; Temesi nee Palmai, Maria; Foldes, Sandor; and Dorogi, Jozsef, 4,178,562, Cl. 331-84.000.
Taylor, Frank D.; and Novotny, Ronald J., to General Communications Co., Inc. Method and control apparatus for radio paging systems. 4,178,475, Cl. 179-2.0EC.
Taylor, Leonard H., to Perkin-Elmer Limited. Repetitive-cycle object handling apparatus. 4,178,121, Cl. 414-104.000.
Taylor, Maurice L., to Rolls-Royce Limited. Thrust reverser for a fluid flow propulsion engine. 4,177,639, Cl. 60-226.00A.
Taylor, Roland S.: *See—*
Hogeman, Robert L.; Seaman, Jack L.; and Taylor, Roland S., 4,178,332, Cl. 261-50.00R.
Tazume, Masayuki: *See—*
Sato, Hisato; Takatsu, Haruyoshi; and Tazume, Masayuki, 4,178,302, Cl. 260-455.00R.
Technisch Handels- en Adviesbureau van Geffen B.V.: *See—*
van Geffen, Johannes A., 4,177,659, Cl. 72-71.000.
Tee, Liong S.; and Reindl, John C., to Standard Oil Company (Indiana). Recovery process for branched polyphenylene. 4,178,435, Cl. 528-501.000.
Telec S.A.: *See—*
Hoogendoorn, Hendrik; Matthijsen, Rutger; and Moelker, Huibert C. T., 4,178,362, Cl. 424-48.000.
Telediffusion de France. *See—*
Pujolle, Jean, 4,177,876, Cl. 181-284.000.
Teleflex Incorporated: *See—*
Fillmore, F. Lawrence, 4,177,691, Cl. 74-501.00P

Tellier, Pierre; and Weiss, Francis, to Produits Chimiques Ugine Kuhlmann. Process for the preparation of oxaziridine. 4,178,292, Cl. 260-333.000.
Temer, Vladan. Method of reducing distortion in electronic networks. 4,178,555, Cl. 328-162.000.
Temesi nee Palmai, Maria: *See—*
Torma, Imre; Temesi nee Palmai, Maria; Foldes, Sandor; and Dorogi, Jozsef. 4,178,562, Cl. 331-84.000.
Temple University: *See—*
Salomon, Robert E.; and Harding, Susan M., 4,178,517, Cl. 290-53.000.
Teng, Lina C., to Philip Morris, Inc. Smoking composition. 4,178,458, Cl. 560-60.000.
Tenneco Chemicals, Inc.: *See—*
Rudner, Bernard; Reich, David; and Galica, Edward. 4,178,161, Cl 55-524.000.
Tenney, Linwood P.; and Lane, Parley C., Jr., to BF Goodrich Company, The. Cycloolefin copolymers. 4,178,424, Cl. 526-283.000.
Teradyne, Inc.: *See—*
Hoffman, Mark S., 4,178,544, Cl. 324-64.000.
Wrinn, Joseph F.; and Hoffman, Mark S., 4,178,543, Cl. 324-64.000.
Terajima, Kazuki: *See—*
Matsuda, Yoshindo; Tomita, Shigeru; Abe, Keiji; and Terajima, Kazuki, 4,178,265, Cl. 252-316.000.
Terk, Harold S., to Abbott Laboratories. Cuvette cartridge. 4,178,345, Cl. 422-61.000.
Terry, Ruel C.: *See—*
Stoddard, Xerxes T.; Vaseen, Vesper A.; and Terry, Ruel C., 4,178,357, Cl. 423-522.000.
Te Velde, Ties S., to U.S. Philips Corporation. Electrostatically controlled picture display device. 4,178,077, Cl. 350-285.000.
Texaco Development Corp.: *See—*
Waddill, Harold G., 4,178,426, Cl. 528-111.000.
Waddill, Harold G.; and Schulze, Hemz, 4,178,427, Cl. 528-124.000.
Texaco Inc.: *See—*
Brown, Alfred; Reynolds, Brian L.; and Hall, Wilbur L., 4,177,752, Cl. 166-263.000.
Texas Alkyls, Inc.: *See—*
Watson, Spencer C.; Malpass, Dennis B.; and Yeargin, G. Scott, 4,178,297, Cl. 260-346.110.
Texas Instruments Incorporated: *See—*
Dudley, Dana; and Knight, William M., Jr., 4,178,612, Cl. 358-167.000.
Porter, Vernon R., 4,178,224, Cl. 204-237.000.
Theimer, Ernst T.: *See—*
Sprecker, Mark A.; and Theimer, Ernst T., 4,178,311, Cl. 260-592.000.
Thelen, William G.; and Bein, Thomas W., to United States of America, Navy. Relative orbiting motion by synchronoously rotating scroll impellers. 4,178,143, Cl. 418-19.000.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile apparatus for receiving and conveying ferrous rail fastening elements. 4,178,236, Cl. 209-215.000.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile apparatus for receiving and conveying ferrous rail fastening elements. 4,178,237, Cl. 209-215.000.
Thibodeau, Robert W., Sr. Bicycle safety device. 4,178,070, Cl. 350-99.000.
Thiruvillakkat, Krishnan, to Borg-Warner Corporation. Rigid, high impact polypropylene compositions. 4,178,328, Cl. 525-98.000.
Thomas, Georges; and Nicol, Henri, to SKF Compagnie d'Applications Mechaniques. Method and apparatus for facilitating the disposal of cutting liquid. 4,178,202, Cl. 159-15.000.
Thomas, James R.: *See—*
Howerton, Anderson W.; Klein, Darrell L.; and Thomas, James R., 4,177,688, Cl. 74-233.000.
Thomas, Michael B., to Pfizer Inc. 1-N-Kanamycin derivatives. 4,178,437, Cl. 536-10.000.
Thomas, Ralph H., to Bristol-Myers Company. Squeeze bottle. 4,177,939, Cl. 222-153.000.
Thomassin, Robert C. Fishing lure simulating lifelike movement. 4,177,597, Cl 43-42.300.
Thompson, Donald F.; Mizenko, Joseph M.; and Sivak, Elmer, to Standard Oil Company (Indiana). Method for dispersing an additive into a thermoplastic resin. 4,178,421, Cl. 525-4.000.
Thompson, Geraldine E.: *See—*
Thompson, James G., 4,178,548, Cl. 325-16.000
Thompson, James E., to Deere & Company. Disposable pressure vessel 4,177,836, Cl. 138-30.000.
Thompson, James G., to Thompson, Geraldine E.; and Thompson, James G. Voice actuated mobile radio, 4,178,548, Cl. 325-16.000.
Thompson, John J.; Gorman, Paul D.; and Dowd, Patrick, to Pres-To-Line Corporation of America. Copy holder. 4,177,591, Cl. 40-343.000.
Thompson, Raymond D.: *See—*
Buchele, Wesley F.; Jeffries, Dennis L.; Madson, Ricky D.; Mattson, Timothy J.; Sparks, Gregory E.; Thompson, Raymond D.; and Uehle, Howard T., 4,177,723, Cl. 100-8.000.
Thomson - CSF. *See—*
Croset, Michel; and Velasco, Gonzalo, 4,178,418, Cl. 429-27.000.
Ribout, Pierre; and Delory, Bernard, 4,178,533, Cl. 315-3.600.
Tiitinen, Heikki A.; Rastas, Jussi K.; Hamalainen, Matti J.; and Niemi, Tom O., to Outokumpu Oy. Process for the production of extra fine cobalt powder. 4,178,172, Cl. 75-0.5BA.
TOA Electric Co., Ltd.: *See—*
Nishihata, Yukihiro, 4,178,488, Cl. 179-100.00L.
Tochihara, Joe I. Beauty operator wall structure. 4,177,612, Cl. 52-28.000.
Toda, Kikujiro, to Toyoda-Koki Kabushiki-Kaisha. End surface machining apparatus for a matching workpiece. 4,177,607, Cl. 51-165.00R.
Todokoro, Masatoshi. Ball fling-out structure with pivoting goals. 4,177,992, Cl. 273-101.000.
Tokico Ltd.: *See—*
Ono, Masami, 4,178,575, Cl. 340-764.000.
Tokyo Kikai Seisakusho Ltd.: *See—*
Nakagawa, Hiroshi, 4,177,960, Cl. 242-58.300.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Okano, Haruo; Harada, Nozomu; and Kubota, Nobuhisa, 4,178,396, Cl. 427-93.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Nagashima, Yoshitake; Noyori, Kazumasa; and Moriyama, Hideki, 4,178,558, Cl. 330-11.000.
Tolbert, William R.; Feder, Joseph; and Kimes, Richard C., to Monsanto Company. Continuous cell culture method and apparatus. 4,178,209, Cl. 195-1.800.
Tolley, William K., to UOP Inc. Recovery of iron and titanium metal values. 4,178,176, Cl. 75-101.00R.
Tomita, Mikio, to Meisei Chemical Works, Inc. Flame retardant coating composition and fabric coated therewith. 4,178,409, Cl. 428-290.000.
Tomita, Mikio, to Meisei Chemical Works, Inc. Flame retardant coating composition and fabric coated therewith. 4,178,410, Cl. 428-290.000.
Tomita, Shigeru: *See—*
Matsuda, Yoshindo; Tomita, Shigeru; Abe, Keiji; and Terajima, Kazuki, 4,178,265, Cl. 252-316.000.
Toray Industries, Inc.: *See—*
Naruto, Masanobu; Ohno, Kiyotaka; and Naruse, Norio, 4,178,454, Cl. 560-2.000.
Torgeson, William L., to Sci-Med Life Systems, Inc. Heat exchanger for blood. 4,177,816, Cl. 128-400.000.
Torkko, Reino. Animal trap. 4,177,600, Cl. 43-82.000.
Torma, Imre; Temesi nee Palmai, Maria; Foldes, Sandor; and Dorogi, Jozsef, to Tavkozlesi Kutato Intezet. Cavity resonators with frequency-linear tuning. 4,178,562, Cl. 331-84.000.
Toro Company, The: *See—*
Hunter, Edwin J., 4,177,926, Cl. 239-99.000.
Touma, Raouf G.: *See—*
Johnson, James A.; and Touma, Raouf G., 4,178,230, Cl. 208-66.000.
Townsend Textron: *See—*
Matuschek, Josip; and Chester, Rene A., 4,177,710, Cl. 85-70.000.
Toyo Kogyo Co., Ltd.: *See—*
Tatsutomi, Yasuo; Shiraishi, Hideo; and Hamamoto, Takashi, 4,177,784, Cl. 123-179.00G.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Sakamoto, Teruhisa; Nakamura, Shigeo; and Taniguchi, Nobuyuki, 4,178,464, Cl. 562-535.000.
Toyoda-Koki Kabushiki-Kaisha: *See—*
Toda, Kikujiro, 4,177,607, Cl. 51-165.00R.
Toyota Jidosha Kobyo Kabushiki Kaisha: *See—*
Naitou, Takashi; Sumiyoshi, Masaharu; Ito, Osamu; Hobo, Nobuhito; and Suzuki, Yutaka, 4,177,778, Cl. 123-122.00F.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Ichihara, Isao; Oguni, Yasuo; and Shiratori, Harunori, 4,177,671, Cl. 73-146.500.
Kawai, Noriaki; Okamoto, Hisaji; Takeda, Yosiaki; Sano, Fukuzi; Kakiuchi, Akio; Manabe, Masami; Nomura, Takashi; and Abe, Sigeya, 4,177,776, Cl. 123-117.00A.
Kurobe, Takao; Tachikawa, Katsuziro; Kato, Tetsuo; and Imatoku, Yoshinobu, 4,177,875, Cl. 181-265.000.
Morita, Yoshiyuki; Itou, Masami; Nomura, Shigeyoshi; and Ueda, Masahiro, 4,177,788, Cl. 123-97.00B.
Wakita, Nobuaki, and Hashimoto, Eiji, 4,177,641, Cl. 60-278.000.
Tractor, Inc.: *See—*
Nelson, Robert L., Jr., 4,178,631, Cl. 364-484.000.
Trak Incorporated: *See—*
Roth, Walter; and Woitschatzke, Hans, 4,178,012, Cl. 280-609.000.
Trampert, Hans R.: *See—*
Emmerich, Bernd W.; Ehret, Rudolf; Hoyer, Gerhard; and Trampert, Hans R., 4,178,623, Cl. 361-284.000.
Trane Company, The: *See—*
Ring Jr., Harry K., 4,177,970, Cl. 251-61.300.
Tridon Limited: *See—*
Blaiklock, William M.; and Fisher, Brian A., 4,177,538, Cl. 15-250.390.
Triplex Safety Glass Company Limited: *See—*
Greenhalgh, Geoffrey, 4,178,414, Cl. 428-410.000.
Tronomed, Inc.: *See—*
Ekbom, Roger A.; and Friedlander, Sidney, 4,178,052, Cl. 339-61.00R.
TRW, Inc.: *See—*
Baichtal, James R.; McDonald, John C.; Helliwell, Bradley A.; Ling, Alexander C.; and Schaffter, Craig D., 4,178,478, Cl. 179-15.0AQ.
McDonald, John C.; Baichtal, James R.; and Schaffter, Craig D., 4,178,479, Cl. 179-15.0BY.
McGibbeny, James R.; Lydick, John D.; Linowiecki, Anthony G.; and Harms, Robert R., 4,178,579, Cl. 340-856.000.
Spisak, Steve; and Shoup, Thomas E., 4,178,495, Cl. 219-98.000.
Trzeciak, John R.: *See—*
Peters, David L.; Schnitzer, Arthur P.; Trzeciak, John R.; and Woycechowsky, Brain J., 4,177,579, Cl. 35-12.00N.

Tseitlin, Janetta M.: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.
Tsu, Kin H.: *See—*
Fetchin, John A.; and Tsu, Kin H., 4,178,310, Cl. 260-561.00N.
Tsubota, Motohiko; Sakaguchi, Shinji; and Tsuji, Nobuo, to Fuji Photo Film Co., Ltd; and National Patent Development Corporation. Color diffusion-transfer photographic element. 4,178,182, Cl. 96-73.000.
Tsuda, Shin: *See—*
Asano, Noriyuki; Niwa, Yukichi; Owada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, 4,178,098, Cl. 356-1.000.
Tsuji, Nobuo: *See—*
Tsubota, Motohiko; Sakaguchi, Shinji; and Tsuji, Nobuo, 4,178,182, Cl. 96-73.000.
Tsuji, Sadahiko; and Agari, Yujiro, to Canon Kabushiki Kaisha. Macro zoom lens. 4,178,076, Cl. 350-184.000.
Tsukada, Naonobu: *See—*
Yada, Akio; and Tsukada, Naonobu, 4,178,038, Cl. 297-391.000.
Tsukada, Toshiro: *See—*
Takagi, Katsuaki; Tsukada, Toshiro; Tsuruoka, Hisashi; and Hara, Michio, 4,178,585, Cl. 340-347.0NT.
Tsunlkawa, Tokuichi: *See—*
Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aiichiro; Okuno, Youichi; Tsunlkawa, Tokuichi; and Ito, Tadashi, 4,178,084, Cl. 354-59.000.
Tsuruoka, Hisashi: *See—*
Takagi, Katsuaki; Tsukada, Toshiro; Tsuruoka, Hisashi; and Hara, Michio, 4,178,585, Cl. 340-347.0NT.
Tsuyuguchi, Michio: *See—*
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; and Nishioka, Kunihiko, 4,178,215, Cl. 201-6.000.
Tuchnyer, Harold J.: *See—*
Hon, David T.; Bruesselbach, Hans W.; Muir, Alexander R.; and Tuchnyer, Harold J., 4,178,561, Cl. 350-6.600.
Tudoriu, Theodor, to Falge, Peter, a part interest. Penile implantation prosthesis. 4,177,805, Cl. 128-79.000.
Turetsky, Isadore. Filter-purifier cartridge having manually separable elements. 4,178,250, Cl. 210-315.000.
Turillon, Pierre P.: *See—*
Nordblom, George F.; Turillon, Pierre P.; Huston, Ernest L.; and Keresztes, Stephan L., 4,178,216, Cl. 204-2.100.
Turner, George: *See—*
Allen, Edwin M.; Fitzgerald, William C.; Blazek, Henry; and Turner, George, 4,178,404, Cl. 428-209.000.
Tushner, Lawrence P.; and Krol, Walter J., to Intercraft Industries Corporation. Picture frame assembly. 4,177,590, Cl. 40-156.000.
Ube Industries, Ltd.: *See—*
Kaneda, Takaho; Ishikawa, Seiji; Daimon, Hiroshi; Katsura, Toshio; Maeda, Tatsuaki; and Hondo, Tadahiro, 4,178,431, Cl 528-337.000.
Uchida, Teiji; and Ueki, Atsufumi, to Nippon Electric Co., Ltd. Optical isolator. 4,178,073, Cl. 350-151.000.
Uchidoi, Masanori: *See—*
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; Shimizu, Masami; and Takishima, Yoshiyuki, 4,178,086, Cl. 354-152.000.
Ueda, Masahiro: *See—*
Morita, Yoshiyuki; Itou, Masami; Nomura, Shigeyoshi; and Ueda, Masahiro, 4,177,788, Cl. 123-97.00B.
Uehle, Howard T.: *See—*
Buchele, Wesley F.; Jeffries, Dennis L.; Madson, Ricky D.; Mattson, Timothy J.; Sparks, Gregory E.; Thompson, Raymond D.; and Uehle, Howard T., 4,177,723, Cl. 100-8.000
Ueki, Atsufumi: *See—*
Uchida, Teiji; and Ueki, Atsufumi, 4,178,073, Cl. 350-151.000.
Uemura, Kenzi: *See—*
Ogawa, Shigeru; Uemura, Kenzi; and Tanida, Masao, 4,177,586, Cl. 40-2.00R.
Uemura, Toshio; Watanabe, Yoshiki; Masumoto, Yoji; Ishikawa, Tomihisa; Kajimoto, Noboru; and Kawada, Shin, to Babcock-Hitachi Kabushiki Kaisha. Incinerator for burning waste and a method of utilizing same. 4,177,742, Cl. 110-346.000.
Uenoyama, Masaru: *See—*
Itoh, Yuzuru; Ichimura, Masaaki; and Uenoyama, Masaru, 4,178,044, Cl. 303-47.000.
Uhlig, Richard E., to Aluminum Plumbing Fixture Corp. Latch on masquerader unit. 4,177,527, Cl. 4-3.000.
Uhrhan, Paul; Oertel, Harald; Lantzsch, Reinhard; Roos, Ernst; and Arlt, Dieter, to Bayer Aktiengesellschaft. Permanently stabilized polyurethanes. 4,178,279, Cl. 260-45.80N.
Umeda, Junichi: *See—*
Nakamura, Michiharu; and Umeda, Junichi, 4,178,604, Cl 357-18.000.
Union Carbide Corporation: *See—*
Berry, Daniel D.; and Girardi, Richard V., 4,178,257, Cl. 252-21.000.
Kelly, William T., III, 4,178,538, Cl. 320-2.000.
Lowther, Frank E., 4,178,239, Cl. 210-15.000.
Union Corporation: *See—*
Cohen, Arthur I.; Sim, James S. Y.; Van Horn, Maurice H.; Gordesky, Stanley E.; and Gordon, Stanley I., 4,178,361, Cl. 424-22.000.
Uniroyal, AG: *See—*
Menges, Hans G. L.; Harms, Engelbert G.; and Hegele, Rainer, 4,178,104, Cl. 366-80.000.
Uniroyal Aktiengesellschaft: *See—*
Van der Burg, Sjirk, 4,177,848, Cl. 152-158.000.
Uniroyal, Inc.: *See—*
Lippman, Seymour A.; Stokes, Gary P.; and Chupa, Charles M., 4,178,199, Cl. 156-110.00R
Mao, Chung-Ling; Strunk, Richard J.; and Hubbard, Winchester L., 4,178,382, Cl. 424-288.000
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Gunton, David J., 4,178,568, Cl. 333-116.000.
United States of America
Air Force: *See—*
Arnold, Fred E.; and Reinhardt, Bruce A., 4,178,428, Cl. 528-174.000.
Wess, Thomas B., 4,177,681, Cl. 74-110.000.
Army: *See—*
Bly, Vincent T., 4,178,514, Cl. 250-493.000.
Kennedy, Andrew J., 4,178,528, Cl. 313-102.000.
Kennedy , Andrew J., 4,178,529, Cl. 313-102.000.
Williams, Lowell F., 4,178,099, Cl. 356-73.000.
Energy: *See—*
Brubaker, James E., 4,178,208, Cl. 176-30.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Levis, Curt A. Distributed-switch Dicke radiometers. 4,178,100, Cl. 356-216.000.
Navy: *See—*
Allen, Edwin M.; Fitzgerald, William C.; Blazek, Henry; and Turner, George, 4,178,404, Cl. 428-209.000.
Cini, Hector J.; and Meyers, Theodore J., 4,178,577, Cl. 367-159.000.
Marshall, Albert H.; and Siragusa, George A., 4,177,580, Cl. 35-25.000.
Rolf, Steven R.; DeVries, James L.; and Ashworth, T., 4,177,667, Cl. 73-1.00G.
Senger, Stephen J., 4,178,594, Cl. 343-7.400.
Swenson, Richard C., 4,177,530, Cl. 9-8.00R.
Thelen, William G.; and Bein, Thomas W., 4,178,143, Cl. 418-19.000
U.S. Philips Corporation: *See—*
Edens, Jan W.; Vlek, Theodorus H. A. M.; and Withoos, Wilhelmus H. C., 4,178,574, Cl. 343-756.000.
Lersmacher, Bernhard; Lydtin, Hans; Seifert, Horst; and Krol, Johannes W. A., 4,178,530, Cl. 313-337.000.
Mitchell, Richard F., 4,178,571, Cl. 333-194.000.
Riccardi, Clemente C.; Meda, Sergio; and Cigognini, Luciano, 4,178,102, Cl. 356-307.000.
Schiek, Burkhard; and Kohler, Jurgen, 4,178,570, Cl. 333-161.000.
Te Velde, Ties S., 4,178,077, Cl. 350-285.000
Wagner, Wolfgang, 4,178,510, Cl. 250-445.00T.
United Technologies Corporation: *See—*
Ferris, Donald L.; and Noehren, William L., 4,178,130, Cl 416-107.000
Hausmann, George F., 4,178,078, Cl. 350-319.000.
Hone, Horace T., 4,178,032, Cl. 296-19.000.
Horgan, John J., 4,177,636, Cl. 60-39.350.
Metcalfe, Robert A., and Bourdeau, Romeo G., 4,178,335, Cl. 264-8.000.
University of Iowa Research Foundation: *See—*
Lindquist, Everet F., 4,177,994, Cl. 273-176.0FA.
UOP Inc.: *See—*
Antos, George J.; Hayes, John C.; and Mitsche, Roy T., 4,178,268, Cl. 252-439.000.
Johnson, James A.; and Touma, Raouf G., 4,178,230, Cl. 208-66.000
Tolley, William K., 4,178,176, Cl. 75-101.00R.
Upjohn Company, The: *See—*
Chen, Augustin T.; and Onder, Kemal B., 4,178,432, Cl. 528-340.000
Kelly, Robert C., 4,178,440, Cl. 542-426.000.
Kelly, Robert C., 4,178,441, Cl. 542-426.000.
Ushikoshi, Kenichi: *See—*
Yamada, Haruyoshi; and Ushikoshi, Kenichi, 4,177,631, Cl. 58-23.0BA
v. d. Marwitz, Hans-Gunther: *See—*
Muth, Hans-Albrecht, and v. d. Marwitz, Hans-Gunther, 4,178,033, Cl. 296-78.100
Vaax, Viktor R.: *See—*
Shishkova, Zinaida P.; Kalninsh, Arvid Y.; Gailitis, Juris P.; Shmit, Uldis Y., Vcuernikov, Nikolai A., Krastinsh, Valter P., Kalinkin, Damir A., Vaax, Viktor R., Zinina, Maria A.; Belyaev, Vasily D.; Maximenko, Nikolai S.; and Epshtein, Yakov V., 4,178,214, Cl. 195-100.000
Vache, Marcel, to Application des Gaz. Tapping of gas from a cartridge. 4,177,828, Cl. 137-318.000.
Vahlensieck, Hans-Joachim: *See—*
Schulz, Neithart; Martens, Peter; and Vahlensieck, Hans-Joachim, 4,178,316, Cl. 260-653.500.

Vajarova, Iliyana I.: *See—*
Samokovliski, David A.; Angelov, Angel S.; Nachev, Georgi N.; Petrov, Peter D.; Nemechek, Alfred E.; and Vajarova, Iliyana I., 4,177,912, Cl. 226-176.000.

Valvo, John R.: *See—*
Lippel, Arthur T.; Valvo, John R.; and Smith, Gerald B., 4,178,489, Cl. 179-100.40C.

van den Berg, Cornelis E. P. V., to Stamicarbon, B.V. Solutions of organic magnesium compounds containing oxygen in hydrocarbons. 4,178,300, Cl. 260-413.000.

Van der Burg, Sjirk, to Uniroyal Aktiengesellschaft. Run - flat tire. 4,177,848, Cl. 152-158.000.

van der Horst, Eberhard, to A. Monforts. Turning machine tool. 4,177,700, Cl. 82-2.00R.

van Geffen, Johannes A., to Technisch Handels- en Adviesbureau van Geffen B.V. Rotatable piercing tools for forming holes surrounded each by a boss in metal plates or the wall of metal tubes. 4,177,659, Cl. 72-71.000.

Van Horn, Albert R.; Garay, Gabriel; and Edwards, John A., to Syntex (U.S.A.) Inc. (dl)-16-Phenoxy- and 16-substituted phenoxy-9-keto prostatrienoic acid derivatives and processes for the production thereof. 4,178,457, Cl. 560-53.000.

Van Horn, Maurice H.: *See—*
Cohen, Arthur I.; Sim, James S. Y.; Van Horn, Maurice H.; Gordesky, Stanley E.; and Gordon, Stanley I., 4,178,361, Cl. 424-22.000.

van Olphen, George C., to Westfalia Separator Aktiengesellschaft. Apparatus for the continuous separation of the flesh of fruit from the pits and skins, especially of the pulp of grapes from their seeds and skins. 4,177,722, Cl. 99-540.000.

van Turnhout, Jan; and Rieke, Johannes C., to N. V. Verto. Method for manufacturing a filter of electrically charged electret fiber material and electret filters obtained according to said method. 4,178,157, Cl. 55-155.000.

Van Wagener, Raymond H.: *See—*
Power, John J.; Van Wagener, Raymond H.; and Raasch, Ernest M., 4,178,201, Cl. 156-499.000.

Van Wilson, Marlin; Nickell, Larry C.; and McCormack, John L., to Appalachian Electronic Instruments, Inc. Stop motion system for high speed looms and the like. 4,177,838, Cl. 139-353.000.

Varchei, Mohammed M. N.: *See—*
Daniels, Peter J. L.; and Varchei, Mohammed M. N., 4,178,453, Cl. 548-369.000.

Varian Mat GmbH: *See—*
Brunnee, Curt; Franzen, Jochen; and Meier, Stefan, 4,178,507, Cl. 250-282.000.

Vaseen, Vesper A.: *See—*
Stoddard, Xerxes T.; Vaseen, Vesper A.; and Terry, Ruel C., 4,178,357, Cl. 423-522.000.

Vaughan, David E. W.; Edwards, Grant C.; and Barrett, Michael G., to W. R. Grace & Co. Synthesis of type Y zeolite. 4,178,352, Cl. 423-329.000.

Vector Engineering Corporation: *See—*
Denney, James H., 4,177,542, Cl. 24-115.00R.

Vedernikov, Nikolai A.: *See—*
Shishkova, Zinaida P.; Kalninsh, Arvid Y.; Gailitis, Juris P.; Shmit, Uldis Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Kalinkin, Damir A.; Vaax, Viktor R.; Zinina, Maria A.; Belyaev, Vasily D.; Maximenko, Nikolai S.; and Epshtein, Yakov V., 4,178,214, Cl. 195-100.000.

Velasco, Gonzalo: *See—*
Croset, Michel; and Velasco, Gonzalo, 4,178,418, Cl. 429-27.000.

Velsicol Chemical Corporation: *See—*
Albright, James A., 4,178,330, Cl. 525-3.000.

Venaas, Norman B.: *See—*
Hart, David G.; and Venaas, Norman B., 4,177,922, Cl. 235-144.0MA.

Venema, Harry J., to Borg-Warner Corporation. Surge suppression apparatus for compressor-driven system, 4,177,649, Cl. 62-209.000.

Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
Kuttner, Gottfried, 4,178,000, Cl. 277-138.000.

Vermeren, Joseph P., to Acoustic Fiber Sound Systems, Inc. Two-way loudspeaker for vehicle. 4,178,473, Cl. 179-1.0VE.

Vickers Limited: *See—*
Kellett, Harry; and Searle, Harold L., 4,177,887, Cl. 192-8.00R.

Victor Company of Japan, Ltd.: *See—*
Hirota, Akira, 4,178,606, Cl. 358-4.000.

Villa, Alvaro J., to Walt Disney Productions. Three-dimensional animated facial control. 4,177,589, Cl. 40-467.000.

Vinal, Richard S., to Eastman Kodak Company. Copper physical development using heterocyclic ligand copper (I) complexes. 4,178,180, Cl. 96-48.0PD.

Vincent, Ogden W. Long line telephone system with an amplifying substation. 4,178,484, Cl. 179-16.00C.

Vinten, William P., to W. Vinten Limited. Damping mechanisms. 4,177,884, Cl. 188-290.000.

Virtis Company, Inc., The: *See—*
Bird, Harry L., 4,177,577, Cl. 34-92.000.

Viscido, Anthony J.: *See—*
Miller, Alvin L.; and Viscido, Anthony J., 4,177,562, Cl. 433-174.000.

Vishnev, Nikolai V.: *See—*
Dovnar, Stanislav A.; Sidorenko, Valery A.; Morgunsky, Evgeny I.; and Vishnev, Nikolai V., 4,177,699, Cl. 82-1.00C.

Vlek, Theodorus H. A. M.: *See—*
Edens, Jan W.; Vlek, Theodorus H. A. M.; and Withoos, Wilhelmus H. C., 4,178,574, Cl. 343-756.000.

Vogel, Heinz: *See—*
Weinmann, Gunter; and Vogel, Heinz, 4,177,662, Cl. 72-138.000.

Vogt, B. Richard: *See—*
Wade, Peter C.; and Vogt, B. Richard, 4,178,451, Cl. 546-272.000.

Volk, Lawrence C. Refrigeration system. 4,177,652, Cl. 62-239.000.

Volkamer, Klaus: *See—*
Luetzow, Dietrich; Neth, Norbert; Wagner, Ulrich; and Volkamer, Klaus, 4,178,309, Cl. 260-553.00R.

Volkonsky, Boris V.: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.

Voltz, Sterling E.: *See—*
Cabal, Albert V.; Bendoraitis, Joseph G.; Callen, Robert B.; Pavlica, Robert T.; and Voltz, Sterling E., 4,178,226, Cl. 208-15.000.

Vondell, Richard M.: *See—*
Gobble, Harold G.; Vondell, Richard M.; and Mooi, Raymond, 4,178,392, Cl. 426-96.000.

Von Hagel, Leo, to Maxcap Inc. Blow molded plastic bottle and plastic cap. 4,177,906, Cl. 215-252.000.

Vyzkumny ustav tvarecich stroju a technologie tvareni: *See—*
Kovar, Jan; and Drkal, Jan, 4,177,660, Cl. 72-108.000.

W. Koreska GmbH: *See—*
Koreska, Peter, 4,177,728, Cl. 101-128.200.

W. R. Grace & Co.: *See—*
Fowler, Stephen L., 4,178,220, Cl. 204-159.140.
Vaughan, David E. W.; Edwards, Grant C.; and Barrett, Michael G., 4,178,352, Cl. 423-329.000.
Weinberg, Alan S.; and Sun, Joseph Z., 4,178,401, Cl. 428-35.000.

W. Vinten Limited: *See—*
Vinten, William P., 4,177,884, Cl. 188-290.000.

Waddill, Harold G., to Texaco Development Corp. Epoxy resin compositions. 4,178,426, Cl. 528-111.000.

Waddill, Harold G.; and Schulze, Heinz, to Texaco Development Corp. Polyether urea epoxy curing agent. 4,178,427, Cl. 528-124.000.

Wade, Peter C.; and Vogt, B. Richard, to E. R. Squibb & Sons, Inc. 3-(Substituted hydrazino)benzisothiazole-1,1-dioxides. 4,178,451, Cl. 546-272.000.

Wagener, Dietrich: *See—*
Burkert, Rudolf; Flockenhaus, Claus; Meckel, Joachim F.; and Wagener, Dietrich, 4,178,266, Cl. 252-373.000.

Wagner, Eugene R.; and Renzi, Alfred A., to Dow Chemical Company, The. Method for treating hyperlipidemia in primates using 4-((4-fluorophenylmethyl)amino)benzoic acid. 4,178,385, Cl. 424-310.000.

Wagner, Remigius. Rod lock for doors or gates having two wings. 4,178,024, Cl. 292-57.000.

Wagner, Ulrich: *See—*
Luetzow, Dietrich; Neth, Norbert; Wagner, Ulrich; and Volkamer, Klaus, 4,178,309, Cl. 260-553.00R.

Wagner, Wolfgang, to U.S. Philips Corporation. Device for measuring the spatial distribution of radiation absorption in a slice of a body. 4,178,510, Cl. 250-445.00T.

Wahl, Georg: *See—*
Kunst, Helmut; and Wahl, Georg, 4,178,244, Cl. 210-71.000.

Wahle, Gunter: *See—*
Heitmann, Uwe; Lorenzen, Heinz-Christen; Wahle, Gunter; and Dahlgrun, Rolf, 4,177,670, Cl. 73-38.000.

Wakasa, Isao: *See—*
Shono, Hiroaki; Ishikawa, Shinzo; Wakasa, Isao; and Adachi, Miyako, 4,178,162, Cl. 65-1.000.

Wakatsuka, Hirohisa: *See—*
Hayashi Masaki; Arai, Yoshinobu; Konishi, Yoshitaka; Shimoji, Katsuichi; Ohuchida, Shuichi; Ito, Hiroyuki; and Wakatsuka, Hirohisa, 4,178,367, Cl. 424-285.000.

Wakita, Nobuaki; and Hashimoto, Eiji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for cleaning exhaust gas for an internal combustion engine. 4,177,641, Cl. 60-278.000.

Walden, Jack M.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,178,633, Cl. 364-709.000.

Walker, Ford T., to Olin Corporation. Process for the simultaneous production of wet process phosphoric acid and sodium silicofluoride. 4,178,347, Cl. 423-185.000.

Walker, Hazel. Device for teaching concepts of numbers and mathematical principles. 4,177,581, Cl. 35-31.00D.

Walkowiak, Michael: *See—*
Schmitz-Josten, Robert; Borgardt, Manfred; Schulz, Hans-Hermann; Walkowiak, Michael; Leusner, Bernhard; and Suling, Carlhans, 4,177,563, Cl. 433-228.000.

Wallace, Joseph W.: *See—*
Lee, Harry W., Jr.; Wallace, Joseph W.; and Woolard, James M., 4,177,746, Cl. 113-120.00H.

Wallace, Richard W., to Chromatix, Inc. Light scattering photometer and sample handling system therefor. 4,178,103, Cl. 356-336.000.

Walsh, Edward J.: *See—*
Ciurca, Samuel J., Jr.; Cameron, Robert G.; and Walsh, Edward J., 4,178,183, Cl. 96-74.000.

Walt Disney Productions: *See—*
Villa, Alvaro J., 4,177,589, Cl. 40-457.000.

Waltham, Richard M.: *See—*
Hounsfield, Godfrey N.; and Waltham, Richard M., 4,178,511, Cl. 250-445.00T.

Wanninkhop, Peter: *See—*
Rameckers, Stephanus J.; Wanninkhop, Peter; and Moolenaar, Antonie J., 4,177,609, Cl. 51-170.0EB.

Warner-Lambert Company: *See—*
Moorehead, Harvey R., 4,177,809, Cl. 128-214.400.
Schwartz, Charles M.; and Meierhoefer, Eugene J., 4,177,945, Cl. 239-338.000.

Warsaw, Arthur J. Universal shop stand with breakdown feature. 4,177,978, Cl. 269-17.000.

Wasag Chemie AG: *See—*
Oversohl, Wilhelm, 4,178,207, Cl. 162-384.000.

Wasserlein, Henry G., Jr.: *See—*
Fleischhacker, James E.; and Wasserlein, Henry G., Jr., 4,178,055, Cl. 339-98.000.

Wasserman, Harry H.; and Lipshutz, Bruce H., to Research Corporation. β-Lactams, their production, intermediates thereto and derivatives thereof. 4,178,286, Cl. 260-239.00A.

Watabe, Tamon: *See—*
Ohashi, Minoru; Ishikawa, Youichi; Shouda, Makoto; and Watabe, Tamon, 4,178,223, Cl. 204-195.00P.

Watanabe, Hideto: *See—*
Obata, Hiroshi; Hasegawa, Takehisa; Watanabe, Hideto; Ikegawa, Kiyohiro; and Ashida, Toshiyuki, 4,177,976, Cl. 266-266.000.

Watanabe, Shinichi; Okazaki, Shigeru; and Osata, Mamoru, to Sony Corporation. Speaker system. 4,177,872, Cl. 181-144.000.

Watanabe, Yoshiki: *See—*
Uemura, Toshio; Watanabe, Yoshiki; Masumoto, Yoji; Ishikawa, Tomihisa; Kajimoto, Noboru; and Kawada, Shin, 4,177,742, Cl. 110-346.000.

Waterford Ironfounders Limited: *See—*
Marchant, Nicholas G., 4,177,791, Cl. 126-65.000.

Watkins, Kenneth L.: *See—*
Sanders, Louis H.; Watkins, Kenneth L.; and Bowen, Galt S., 4,177,868, Cl. 177-211.000.

Watson, Hugh R.; Rowsell, David G.; and Spring, David J., to Wilkinson Sword Limited. N-Substituted paramenthane carboxamides. 4,178,459, Cl. 560-125.000.

Watson, Robert E.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,178,633, Cl. 364-709.000.

Watson, Spencer C.; Malpass, Dennis B.; and Yeargin, G. Scott, to Texas Alkyls, Inc. Preparation of unsaturated alcohols and intermediates therein. 4,178,297, Cl. 260-346.110.

Wausau Homes, Inc.: *See—*
Brown, William F., 4,178,273, Cl. 260-29.4UA.

Weavers, Mark W.; and Konkler, Anthony W., to Minnesota Mining and Manufacturing Company. Recessed hook and handle for a plastic box. 4,177,896, Cl. 206-387.000.

Webinger, George P., to Champion International Corporation. Container cover with interlocking flap configuration. 4,177,917, Cl. 229-34.0HW.

Webster, Herschel L. Seedling transplanter. 4,177,743, Cl. 111-3.000.

Weed Eater, Inc.: *See—*
Ballas, George C., 4,177,561, Cl. 30-276.000.

Weed, Gehres D., to Altarctic Engineering & Construction Ltd., a part interest. Wind driven power generator. 4,178,126, Cl. 416-17.000.

Wegmuller, Hans: *See—*
Haase, Jaroslav; Liechti, Peter; Wegmuller, Hans; Wurster, Rudolf F.; and Bowes, Quentin, 4,178,438, Cl. 536-30.000.

Wehrmeister, Allen E., to Babcock & Wilcox Co., The. Output control for fluidized bed boilers. 4,177,765, Cl. 122-4.00D.

Weichhand, Robert J., to R. A. Jones & Co. Inc. Apparatus for transferring elongated articles from a single file supply into product buckets of a cartoner. 4,178,120, Cl. 414-41.000.

Weidmann, Erich, to Gebruder Loepfe AG. Electronic weft thread monitor for shuttleless weaving machines. 4,178,590, Cl. 340-677.000.

Weinberg, Alan S.; and Sun, Joseph Z., to W. R. Grace & Co. Packaging film comprising a blended self-welding layer. 4,178,401, Cl. 428-35.000.

Weingarten, Fred. Automatic massaging device. 4,177,804, Cl. 128-52.000.

Weinmann, Gunter; and Vogel, Heinz. Machine for the manufacture of axially prestressed coils from strip. 4,177,662, Cl. 72-138.000.

Weisenborn, Frank L.: *See—*
Ondetti, Miguel A.; and Weisenborn, Frank L., 4,178,291, Cl. 549-39.000.

Weiss, Francis: *See—*
Tellier, Pierre; and Weiss, Francis, 4,178,292, Cl. 260-333.000.

Weiss, Martin J.: *See—*
Schaub, Robert E.; and Weiss, Martin J., 4,178,461, Cl. 562-463.000.
Wissner, Allan; Weiss, Martin J.; and Bernady, Karel F., 4,178,456, Cl. 560-53.000.

Welch, Montgomery J., to Modular Systems, Inc. Furniture units with concealed fasteners and method therefor. 4,178,047, Cl. 312-140.000.

Weldotron Corporation: *See—*
Siegel, Martin; Millevoi, Eugene; and Budzyn, Boleslaw L., 4,177,622, Cl. 53-511.000.

Welker, Robert H. Sensor positioning apparatus. 4,177,676, Cl. 73-198.000.

Weller, Ronald W.: *See—*
Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; McCain, William B.; Weller, Ronald W.; and Werstler, Lawrence J., 4,177,982, Cl. 271-5.000.

Weltman, David; and Rivera, Thomas, to O.K. Machine and Tool Corp. Wire-wrapping tool for non-stripped wire. 4,177,555, Cl. 29-751.000.

Wenban, James R.: *See—*
Silver, Alexander; and Wenban, James R., 4,178,046, Cl. 308-9.000.

Wenger, Alfred, to Institut Straumann AG. Device for measuring the density of a fluid. 4,177,669, Cl. 73-32.00A.

Wenninger, Fred, Jr.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,178,633, Cl. 364-709.000.

Werner, Walter; Herzog, Klaus; and Szenger, Franz, to Carl Zeiss-Stiftung. Measurement head. 4,177,568, Cl. 33-174.00L.

Werstler, Lawrence J.: *See—*
Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; McCain, William B.; Weller, Ronald W.; and Werstler, Lawrence J., 4,177,982, Cl. 271-5.000.

Wess, Thomas B., to United States of America, Air Force. Apparatus for adjusting and locking a linear actuator. 4,177,681, Cl. 74-110.000.

Wessling, Ritchie A.; Foster, William A.; and Pickelman, Dale M., to Dow Chemical Company, The. High strength non-woven fibrous material. 4,178,205, Cl. 162-168.00R.

Western Electric Co., Inc.: *See—*
Ahmed, Nazeer; and Fuchs, Francis J., Jr., 4,177,658, Cl. 72-60.000
Deveres, Ernest E.; Ouellette, Paul J.; and Pollitt, Joseph F., 4,177,554, Cl. 29-626.000.

Westfalia Separator Aktiengesellschaft: *See—*
van Olphen, George C., 4,177,722, Cl. 99-540.000.

Westinghouse Electric Corp.: *See—*
Heytmeijer, Herman R.; Rusch, Larry P.; and Grasso, Giuseppe, 4,178,355, Cl. 423-308.000.
Kappenhagen, George A., 4,177,881, Cl. 187-56.000.
McCarthy, Charles C., 4,178,542, Cl. 324-51.000.
Smith, William J., 4,177,950, Cl. 241-33.000.
Wilson, John R.; Rowe, Neal E.; and Bharteey, Brij M., 4,178,624, Cl. 361-341.000.

Westvaco Corporation: *See—*
Donigian, Doulgas W., 4,177,672, Cl. 73-150.00R.

Wheatland, David A., to Scott Paper Company. Electrophotographic master conversion solution. 4,178,179, Cl. 96-33.000.

Wheeler, Charles W.: *See—*
Marchelletta, Ronald L.; and Wheeler, Charles W., 4,177,781, Cl. 123-146.50A.

White, Allen A.; and Ankenman, Thomas W., to Hesston Corporation. Angularly adjustable mounting for sprocket wheels and the like. 4,177,684, Cl. 74-212.000.

White, James E.: *See—*
Baker, Joseph W.; Cova, Dario R.; and White, James E., 4,178,353, Cl. 423-300.000.

White, Ronald E.: *See—*
Wright, George C.; and White, Ronald E., 4,178,452, Cl. 546-297.000.

White, William J.: *See—*
Merriman, Henry H.; and White, William J., 4,178,015, Cl. 280-711.000.

Whitney, John M.: *See—*
Johnson, Vern C.; McCormick, Virgil K.; and Whitney, John M., 4,177,860, Cl. 165-26.000.

Wichman, William J., to Rain Bird Sprinkler Mfg. Corp. Rotary irrigation sprinkler. 4,177,944, Cl. 239-230.000.

Wiechert, Rudolf: *See—*
Haffer, Gregor; Eder, Ulrich; Sauer, Gerhard; Wiechert, Rudolf; Nishino, Yukishige; and Neef, Gunter, 4,178,381, Cl. 424-283.000.

Wienert, Fritz O. Process for dry removal of sulfur dioxide from combustion gases. 4,178,349, Cl. 423-244.000.

Wiher, Wilfried: *See—*
Lewis, Leon D., Wiher, Wilfried; and Parker, Warde L., 4,177,713, Cl. 91-375.00R.

Wikstrom International AB: *See—*
Blankenburg, Carl H. T., 4,177,915, Cl. 228-184.000.

Wild, Peter J.: *See—*
Buchel, Erwin; de Fluiter, Ruurd; Wild, Peter J.; and Wullschleger, Jorg, 4,177,729, Cl. 101-129.000.

Wildbolz, Rudolf: *See—*
Amann, Robert; Lattmann, Werner; and Wildbolz, Rudolf, 4,178,114, Cl. 406-155.000.

Wilkinson Sword Limited: *See—*
Watson, Hugh R.; Rowsell, David G.; and Spring, David J., 4,178,459, Cl. 560-125.000.

Willey, Robert E., Sr., to Bendix Corporation, The. Integrated antenna aperture. 4,178,581, Cl. 343-108.00M.

Wilham H. Rorer, Inc.: *See—*
Diamond, Julius; and Douglas, George H., 4,178,387, Cl. 424-322.000.

Klein, Robert W.; and Foxx, Mary E., 4,178,373, Cl. 424-233.000.
Williams, Haydn W. R.; Cragoe, Edward J., Jr.; and Rooney, Clarence S., to Merck & Co., Inc. Inhibitors of glycolic acid oxidase. 4,178,386, Cl. 424-317.000.
Williams, Lowell F., to United States of America, Army. Scanning optical spectral analyzer. 4,178,099, Cl. 356-73.000.
Williams, Thomas B.: *See—*
Bryant, Herman G., Jr.; Norman, Vello; and Williams, Thomas B., 4,177,822, Cl. 131-17.00R.
Willis, Raymond D.: *See—*
Murphy, Michael P.; and Willis, Raymond D., 4,178,222, Cl. 204-195.00S.
Wilmot-Breeden Limited: *See—*
Jeavons, Philip S.; and Fisher, Sidney E., 4,177,606, Cl. 49-351.000.
Wilson, James A. Flotation recovery of pyrochlore. 4,178,235, Cl. 209-166.000.
Wilson, John R.; Rowe, Neal E.; and Bharteey, Brij M., to Westinghouse Electric Corp. Control center with insulated bus bars. 4,178,624, Cl. 361-341.000.
Wilson, Nicol S.: *See—*
Douglas, Raymond J.; Fekete, Ference; Gay, Derek J.; Hunter, Gary L.; and Wilson, Nicol S., 4,177,984, Cl. 272-31.00A.
Winchell, David A.; and Fowles, Thomas A., to Baxter Travenol Laboratories, Inc. Closure system for containers. 4,177,905, Cl. 215-246.000.
Windmoller & Holscher: *See—*
Achelpohl, Fritz, 4,178,031, Cl. 294-82.00R.
Winn, Ronald R. Display unit. 4,177,902, Cl. 211-162.000.
Wissner, Allan; Weiss, Martin J.; and Bernady, Karel F., to American Cyanamid Company. Prostenoic acids and esters. 4,178,456, Cl. 560-53.000.
Withoos, Wilhelmus H. C.: *See—*
Edens, Jan W.; Vlek, Theodorus H. A. M.; and Withoos, Wilhelmus H. C., 4,178,574, Cl. 343-756.000.
Woitschatzke, Hans: *See—*
Roth, Walter; and Woitschatzke, Hans, 4,178,012, Cl. 280-609.000.
Wolff, Gerard: *See—*
Berger, Christian; Deprez, Dominique; Farge, Daniel; Moutonnier, Claude; and Wolff, Gerard, 4,178,290, Cl. 549-22.000.
Wonso, Alex P.: *See—*
James, William L.; and Wonso, Alex P., 4,177,754, Cl. 118-47.000.
Wood, Homer J., to Deere & Company. Single shaft gas turbine engine with radial exhaust diffuser. 4,177,638, Cl. 60-39.51H.
Woodall, Jerry M.: *See—*
Hovel, Harold J.; and Woodall, Jerry M., 4,178,195, Cl. 148-171.000.
Woolard, James M.: *See—*
Lee, Harry W., Jr.; Wallace, Joseph W.; and Woolard, James M., 4,177,746, Cl. 113-120.00H.
Worick, Richard A., to Sunflower Manufacturing Company, Inc. Multi-section implement and drafting structure therefor. 4,178,009, Cl. 280-411.00A.
Wossler, Manfred, to Siemens Aktiengesellschaft. Device for picking up, depositing and transporting thin metal foils by means of a vacuum lifting device. 4,177,983, Cl. 271-268.000.
Woycechowsky, Brain J.: *See—*
Peters, David L.; Schnitzer, Arthur P.; Trzeciak, John R.; and Woycechowsky, Brain J., 4,177,579, Cl. 35-12.00N.
Wright, George C.; and White, Ronald E., to Morton-Norwich Products, Inc. Ethyl 3-[(3,4-dimethoxyphenyl)ethylamino]-1,2,5,6-tetrahydro-2-oxopyridine-4-carboxylate. 4,178,452, Cl. 546-297.000.
Wright, Oscar L.: *See—*
Sullivan, Thomas E.; and Wright, Oscar L., 4,178,241, Cl. 210-24.000.
Wrinn, Joseph F.; and Hoffman, Mark S., to Teradyne, Inc. Analyzing electrical circuit boards. 4,178,543, Cl. 324-64.000.
Wullschleger, Jorg: *See—*
Buchel, Erwin; de Fluiter, Ruurd; Wild, Peter J.; and Wullschleger, Jorg, 4,177,729, Cl. 101-129.000.
Wurst, John W.; and Dunn, William H., to Singer Company, The. Digital override control of bight and feed in a sewing machine. 4,177,744, Cl. 112-158.00E.
Wurster, Rudolf F.: *See—*
Haase, Jaroslav; Liechti, Peter; Wegmuller, Hans; Wurster, Rudolf F.; and Bowes, Quentin, 4,178,438, Cl. 536-30.000.
Wustefeld, Claus. Method for the manufacture of foamed glass. 4,178,163, Cl. 65-22.000.
Wyckoff, James K.: *See—*
Adams, Ralph D.; and Wyckoff, James K., 4,177,889, Cl. 194-1.00B.
Wynn Oil Company: *See—*
Babish, John A.; Arnot, Larry K.; and Appel, Douglas C., 4,178,134, Cl. 417-181.000.
Xerox Corporation: *See—*
Mrdjen, Peter, 4,178,064, Cl. 350-6.600.
Silverberg, Morton, 4,178,094, Cl. 355-16.000.
Yada, Akio; and Tsukada, Naonobu, to Kabushiki Kaisha Morita Seisakusho. Headrest of treatment table. 4,178,038, Cl. 297-391.000.
Yamada, Haruyoshi; and Ushikoshi, Kenichi, to Kabushiki Kaisha Suwa Seikosha. Small-sized quartz crystal wristwatch. 4,177,631, Cl. 58-23.0BA.
Yamagata, Takaaki: *See—*
Asano, Noriyuki; Niwa, Yukichi; Owada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, 4,178,098, Cl. 356-1.000.
Yamaguchi, Hiroaki: *See—*
Hattori, Tadashi; Yamaguchi, Hiroaki; and Nakase, Takamichi, 4,177,787, Cl. 123-198.00D.
Yamamichi, Masayoshi: *See—*
Suzuki, Masayuki; Ito, Tadashi; Yamamichi, Masayoshi; and Murakami, Hiroyasu, 4,178,085, Cl. 354-60.00R.
Yamamoto, Shunji; Imaizumi, Koji; and Hikosaka, Takashi, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying apparatus with gas evacuating means. 4,178,092, Cl. 355-3.00R.
Yamamoto, Takeshi. Multi-page problem and answer workbook. 4,177,578, Cl. 35-9.00R.
Yamashita, Hisao: *See—*
Fujita, Kazunori; Takeuchi, Seiji; Yamashita, Hisao; and Nakajima, Fumito, 4,178,270, Cl. 252-447.000.
Yamashita, Yoshimasa: *See—*
Nakamura, Takeshi; Nishiyama, Hiroshi; Yamashita, Yoshimasa; and Kitayama, Yoshiko, 4,178,526, Cl. 310-321.000.
Yanagawa, Nobuyuki; and Tabata, Yasuhiro, to Ricoh Company, Ltd. Optomechanical scanning apparatus for copying machine. 4,178,093, Cl. 355-8.000.
Yano, Katsuhiro: *See—*
Kiritani, Yoshio; Tsuyuguchi, Michio; Ibaragi, Tetsuo; Yano, Katsuhiro; Sunami, Yoshihiko; and Nishioka, Kunihiko, 4,178,215, Cl. 201-6.000.
Yarick, Jon R.; and Franks, Nelson J., to Owens-Illinois, Inc. Method and device for assembling coaxially interfitting parts. 4,177,548, Cl. 29-453.000.
Yastrebov, Viktor G.: *See—*
Kandyba, Petr E.; Kolesnikov, Dmitry P.; Komarovskikh, Nina I.; Lapir, Gennady M.; Likharev, Konstantin K.; Ryzhkov, Vadim A.; and Yastrebov, Viktor G., 4,178,602, Cl. 357-4.000.
Yasui, Seimei; and Hino, Minoru, to Sumitomo Chemical Company, Limited. Resin for coatings. 4,178,186, Cl. 106-20.000.
Yats, Larry D.: *See—*
Hall, Richard H.; Haigh, Daniel H.; Lamson, Junior J.; and Yats, Larry D., 4,178,327, Cl. 525-169.000.
Yeargin, G. Scott: *See—*
Watson, Spencer C.; Malpass, Dennis B.; and Yeargin, G. Scott, 4,178,297, Cl. 260-346.110.
Yee, Bing S.: *See—*
Frank, Earl E.; and Yee, Bing S., 4,177,837, Cl. 138-31.000.
Yeh, Yu S.: *See—*
Acampora, Anthony; Reudink, Douglas O. J.; and Yeh, Yu S., 4,178,550, Cl. 325-41.000.
Yockey, Francis J.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,178,633, Cl. 364-709.000.
Yoshida, Toru; Hosoi, Kameo; Tanaka, Takehisa; Hirai, Seiji; and Nakauji, Masakazu, to Takasago Thermal Engineering Co., Ltd.; and Nippon Steel Corporation. Apparatus for wet process dehydration of air to be supplied to blast furnace. 4,178,158, Cl. 55-160.000.
Yoshinari, Takashi; and Ookado, Terumi, to Hitachi, Ltd. Ignition system providing sparks for two ignition plugs in each cylinder from a single ignition coil. 4,177,782, Cl. 123-148.00C.
Young, Dale E., II; Elie, David K.; and Schoening, Peter K. Rearing apparatus for fish fry. 4,177,758, Cl. 119-3.000.
Young, John S., to GTE Automatic Electric Laboratories Incorporated. Ring sensing circuit for use with a service evaluation system. 4,178,486, Cl. 179-84.00R.
Yu, Arthur J.: *See—*
Anderson, Donald F.; and Yu, Arthur J., 4,178,423, Cl. 526-240.000.
Yu, Pyung K.: *See—*
Meisinger, Robert H.; and Yu, Pyung K., 4,178,169, Cl. 71-98.000.
Yu, Steve K., to Signetics Corporation. Three state bus driver with protection circuitry. 4,178,620, Cl. 361-98.000.
Zahorecz, Zoltan P. Variable pitch impeller. 4,178,127, Cl. 416-23.000.
Zaweski, Edward F.: *See—*
Papay, Andrew G.; and Zaweski, Edward F., 4,178,258, Cl. 252-32.70E.
Zboralski, Jon A.: *See—*
Grow, Harry N.; and Zboralski, Jon A., 4,177,717, Cl. 98-115.0LH.
Grow, Harry N.; and Zboralski, Jon A., 4,177,718, Cl. 98-115.0LH.
Zeilinger, Karl; and Bachschmid, Reiner, to Daimler-Benz Aktiengesellschaft. Chain drive, especially for the control drive of internal combustion engines. 4,177,689, Cl. 74-242.800.
Zengel, Hans; and Bergfeld, Manfred, to Akzona Incorporated. Process for the preparation of nitrosobenzene. 4,178,315, Cl. 260-647.000.
Zenzaburo, Iwamoto, to International Business Development Co. Pocket camp stove. 4,177,790, Cl. 126-38.000.
Zerhoch, Horst, to Horst Zerhoch-Vorrinchtungs und Machinenbau GmbH & Co. KG. Pivotable roller frame assembly for a material straightening machine. 4,177,663, Cl. 72-165.000.
Zharnitsky, Anatoly M.: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.

Zimmerman, Warren B. Marble game with scoop and cups. 4,177,987, Cl. 273-1.00R.
Zimmermann, Thomas, to F. Zimmermann & Co. Arrangement for counting coins of different diameters. 4,178,502, Cl. 235-92.0CN.
Zinina, Maria A.: *See—*
Shishkova, Zinaida P.; Kalninsh, Arvid Y.; Gailitis, Juris P.; Shmit, Uldis Y.; Vedernikov, Nikolai A.; Krastinsh, Valter P.; Kalinkin, Damir A.; Vaax, Viktor R.; Zinina, Maria A.; Belyaev, Vasily D.; Maximenko, Nikolai S.; and Epshtein, Yakov V., 4,178,214, Cl. 195-100.000.
Zippel, Herbert, to Herbert Zippel Gmbh & Co. KG. Curved guide for paternoster-type document carriers. 4,178,048, Cl. 312-267.000.
Zoecon Corporation: *See—*
Anderson, Richard J.; and Henrick, Clive A., 4,178,296, Cl. 260-343.500.
Henrick, Clive A.; Carney, Robert L.; and Labovitz, Jeffrey N., 4,178,293, Cl. 260-326.100.
Zozulya, Raisa A.: *See—*
Abramson, Iosif G.; Volkonsky, Boris V.; Glukhikh, Vasily A.; Danjushevsky, Solomon I.; Egorov, Georgy B.; Zozulya, Raisa A.; Natnenkov, Alexei I.; Nikiforov, Jury V.; Nudelman, Rafail M.; Khomyakov, Alexandr M.; Bresler, Boris M.; Prudnikov, Igor A.; Tseitlin, Janetta M.; Axelrod, Zalman L.; Zharnitsky, Anatoly M.; Makeev, Jury A.; Malyshev, Ivan F.; Svinin, Mikhail P.; Komar, Evgeny G., deceased; Boguslavskaya, Khaya S., administrator; Komar, Olga E., administrator; and Komar, Alexandr E., administrator, 4,178,219, Cl. 204-157.10H.
Zuech, Ernest A.: *See—*
Murtha, Timothy P.; and Zuech, Ernest A., 4,178,269, Cl. 252-441.000.
Zulliger, Hans R.: *See—*
Dubois, Jaques, deceased; and Zulliger, Hans R., 4,178,513, Cl. 250-491.000.

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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF DECEMBER, 1979

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abbe, Gunter: *See—*
Eppe, Rudolf; Schnall, Gunther; Abbe, Gunter; and Ettelbruck, Rudiger, Re. 30,164, Cl. 355-69.000.

AGFA-Gevaert, A.G.: *See—*
Eppe, Rudolf; Schnall, Gunther; Abbe, Gunter; and Ettelbruck, Rudiger, Re. 30,164, Cl. 355-69.000.

Cayless, Maurice A.: *See—*
Mason, David R.; Cole, Susan M.; Cayless, Maurice A.; and Wharmby, David O., Re. 30,165, Cl. 313-221.000.

Cole, Susan M.: *See—*
Mason, David R.; Cole, Susan M.; Cayless, Maurice A.; and Wharmby, David O., Re. 30,165, Cl. 313-221.000.

Eppe, Rudolf; Schnall, Gunther; Abbe, Gunter; and Ettelbruck, Rudiger, to AGFA-Gevaert, A.G. Exposure system for electrophotographic copying apparatus. Re. 30,164, Cl. 355-69.000.

Ettelbruck, Rudiger: *See—*
Eppe, Rudolf; Schnall, Gunther; Abbe, Gunter; and Ettelbruck, Rudiger, Re. 30,164, Cl. 355-69.000.

Honeywell Inc.: *See—*
Lee, Tzuo-Chang, Re. 30,166, Cl. 365-122.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Komura, Ikuo; Tamai, Hideo; Morita, Takayuki; and Kobayakawa, Masanao, Re. 30,162, Cl. 57-266.000.

Kobayakawa, Masanao: *See—*
Komura, Ikuo; Tamai, Hideo; Morita, Takayuki; and Kobayakawa, Masanao, Re. 30,162, Cl. 57-266.000.

Komura, Ikuo; Tamai, Hideo; Morita, Takayuki; and Kobayakawa, Masanao, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method and device for transferring fresh bobbins from a bobbin supply device to a conveyor belt of a textile machine. Re. 30,162, Cl. 57-266.000.

Lee, Tzuo-Chang, to Honeywell Inc. Heterodyne readout holographic memory. Re. 30,166, Cl. 365-122.000.

Mason, David R.; Cole, Susan M.; Cayless, Maurice A.; and Wharmby, David O., to Thorn Lighting Limited. Electric discharge lamp. Re. 30,165, Cl. 313-221.000.

Meyer, Melvin H.; and Weitzel, Gerald G., to Stone Container Corporation. Carton. Re. 30,163, Cl. 206-424.000.

Morita, Takayuki: *See—*
Komura, Ikuo; Tamai, Hideo; Morita, Takayuki; and Kobayakawa, Masanao, Re. 30,162, Cl. 57-266.000.

Schnall, Gunther: *See—*
Eppe, Rudolf; Schnall, Gunther; Abbe, Gunter; and Ettelbruck, Rudiger, Re. 30,164, Cl. 355-69.000.

Stone Container Corporation: *See—*
Meyer, Melvin H.; and Weitzel, Gerald G., Re. 30,163, Cl. 206-424.000.

Tamai, Hideo: *See—*
Komura, Ikuo; Tamai, Hideo; Morita, Takayuki; and Kobayakawa, Masanao, Re. 30,162, Cl. 57-266.000.

Thorn Lighting Limited: *See—*
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Bourgeois, Ronald D. Conveyor belt. 253,639, 12-11-79, Cl. D12-60.000.

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Ohtomo, Kazuhito. Record player. 253,648, 12-11-79, Cl. D14-17.000.

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Peveto, Robert S., to Beta Sound, Incorporated. Loudspeaker. 253,649, 12-11-79, Cl. D14-33.000.

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Sage, James O. Cup holder. 253,629, 12-11-79, Cl. D7-70.000.

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Sulek, Eugene J., to Texas Instruments Incorporated. Wrist watch. 253,636, 12-11-79, Cl. D10-32.000.

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Turk, Thomas, to Portagym International Limited. Physical exerciser. 253,669, 12-11-79, Cl. D21-195.000.

Van Brouwer, Ryk, to Raintree Buckle & Jewelry, Inc. Belt buckle. 253,616, 12-11-79, Cl. D2-431.000.

Van Brouwer, Ryk, to Raintree Buckle & Jewelry, Inc. Belt buckle. 253,617, 12-11-79, Cl. D2-431.000.

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Waterman S.A.: *See—*
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Weeks, James F. Combined record jacket and detachable erectable pyramid. 253,659, 12-11-79, Cl. D19-26.000.

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CLASSIFICATION OF PATENTS

ISSUED DECEMBER 11, 1979

NOTE.—First number, class; second number, subclass; third number, patent number

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	4,178,025		4,177,828		4,177,794		4,177,590		4,177,885		4,178,352
	4,178,046		4,177,830		4,177,854		4,177,594		4,177,931		4,178,476
	4,178,056		4,177,835		4,177,967		4,177,627		4,177,937		4,178,494
	4,178,103		4,177,846		4,177,985		4,177,649		4,177,949		4,178,524
	4,178,123		4,177,878		4,178,039		4,177,701		4,177,997		4,178,542
	4,178,134		4,177,882		4,178,095		4,177,709		4,178,003		4,178,581
	4,178,250		4,177,894		4,178,342		4,177,735		4,178,149	25 :	4,177,541
	4,178,252		4,177,921		4,178,480		4,177,737		4,178,301		4,177,552
	4,178,296		4,177,926		4,178,633		4,177,749		4,178,346		4,177,554
	4,178,481		4,177,944	09 :	4,177,636		4,177,754		4,178,385		4,177,608
	4,178,484		4,177,947		4,177,693		4,177,815		4,178,609		4,177,753
	4,178,487		4,177,964		4,177,739		4,177,817	19 :	4,177,529		4,178,081
	4,178,549		4,177,984		4,178,032		4,177,821		4,177,565		4,178,087
	4,178,555		4,177,986		4,178,063		4,177,826		4,177,628		4,178,153
	4,178,567		4,178,008		4,178,078		4,177,877		4,177,723		4,178,210
	4,178,589		4,178,040		4,178,111		4,177,920		4,177,762		4,178,446
	4,178,596		4,178,045		4,178,130		4,177,923		4,177,836		4,178,447
8 :	4,177,687		4,178,052		4,178,280		4,177,952		4,177,870		4,178,534
	4,178,278		4,178,068		4,178,286		4,177,978		4,177,994		4,178,543
	4,178,357		4,178,097		4,178,310		4,177,982		4,178,115		4,178,544
9 :	4,177,951		4,178,101		4,178,432		4,177,991		4,178,618		4,178,546
	4,178,027		4,178,113		4,178,436		4,178,049		4,178,634		4,178,565
	4,178,188		4,178,125		4,178,538		4,178,131	20 :	4,177,684		4,178,598
	4,178,382		4,178,127		4,178,539		4,178,133		4,178,009	26	4,177,572
01 :	4,178,363		4,178,128		4,178,577		4,178,135		4,178,010		4,177,598
	4,178,599		4,178,148	10 :	4,178,096		4,178,146		4,178,053		4,177,690
	4,178,601		4,178,181		4,178,232		4,178,169		4,178,376		4,177,691
04 :	4,177,573		4,178,248		4,178,419		4,178,176	21 :	4,177,576		4,177,714
	4,177,722		4,178,259		4,178,448		4,178,193		4,177,879		4,177,768
	4,178,174		4,178,285	12 :	4,177,542		4,178,230		4,177,918		4,177,770
06 :	4,177,527		4,178,293		4,177,580		4,178,268		4,177,940		4,177,785
	4,177,532		4,178,390		4,177,617		4,178,299		4,177,959		4,177,797
	4,177,535		4,178,404		4,177,634		4,178,325		4,178,120		4,177,831
	4,177,540		4,178,422		4,177,635		4,178,331	22 :	4,177,624		4,177,840
	4,177,564		4,178,430		4,177,719		4,178,334		4,177,825		4,177,847
	4,177,569		4,178,457		4,177,727		4,178,347		4,177,935		4,177,908
	4,177,589		4,178,478		4,177,766		4,178,364		4,177,995		4,177,941
	4,177,612		4,178,479		4,177,796		4,178,369		4,178,211		4,177,965
	4,177,616		4,178,489		4,177,845		4,178,370		4,178,227		4,178,015

	4,178,029		4,178,545		4,178,614		4,178,522		4,178,238		4,177,779
	4,178,036		4,178,580		4,178,628		4,178,536	42 :	4,177,558		4,177,792
	4,178,037	32 :	4,178,011	35 :	4,177,868		4,178,578		4,177,567		4,177,833
	4,178,047		4,178,340	36 :	4,177,534		4,178,588		4,177,570		4,177,866
	4,178,143	33 :	4,178,470		4,177,555		4,178,610		4,177,592		4,177,895
	4,178,159	34 :	4,177,522		4,177,556		4,178,629		4,177,610		4,177,914
	4,178,199		4,177,553		4,177,577		4,178,636		4,177,615		4,177,927
	4,178,205		4,177,562		4,177,579	37 :	4,177,601		4,177,814		4,177,993
	4,178,222		4,177,613		4,177,587		4,177,822		4,177,820		4,177,998
	4,178,247		4,177,622		4,177,591		4,178,055		4,177,832		4,178,020
	4,178,256		4,177,657		4,177,614		4,178,160		4,177,853		4,178,088
	4,178,262		4,177,696		4,177,620		4,178,212		4,177,863		4,178,108
	4,178,263		4,177,706		4,177,666		4,178,399		4,177,864		4,178,155
	4,178,318		4,177,741		4,177,698	38 :	4,177,571		4,177,881		4,178,224
	4,178,319		4,177,744		4,177,708		4,178,594		4,177,929		4,178,234
	4,178,320		4,177,745		4,177,761	39 :	4,177,525		4,177,932		4,178,297
	4,178,321		4,177,750		4,177,803		4,177,536		4,177,950		4,178,333
	4,178,322		4,177,804		4,177,837		4,177,539		4,177,956		4,178,345
	4,178,323		4,177,811		4,177,856		4,177,548		4,177,975		4,178,372
	4,178,324		4,177,858		4,177,871		4,177,656		4,177,979		4,178,380
	4,178,327		4,177,938		4,177,893		4,177,681		4,177,999		4,178,395
	4,178,330		4,177,939		4,177,903		4,177,685		4,178,051		4,178,426
	4,178,341		4,178,079		4,177,906		4,177,686		4,178,054		4,178,427
	4,178,392		4,178,099		4,177,961		4,177,730		4,178,067		4,178,506
	4,178,415		4,178,116		4,177,966		4,177,800		4,178,068		4,178,559
	4,178,433		4,178,161		4,177,980		4,177,827		4,178,124		4,178,612
	4,178,434		4,178,165		4,177,988		4,177,841		4,178,164		4,178,631
	4,178,440		4,178,167		4,178,019		4,177,844		4,178,208	49 :	4,177,809
	4,178,441		4,178,168		4,178,022		4,177,851		4,178,216	50 :	4,177,898
	4,178,509		4,178,190		4,178,062		4,177,869		4,178,243	51 :	4,177,621
	4,178,591		4,178,191		4,178,090		4,177,936		4,178,284		4,177,746
	4,178,625		4,178,196		4,178,091		4,177,945		4,178,288		4,177,765
	4,178,626		4,178,203		4,178,094		4,177,955		4,178,373		4,177,838
27 :	Re.30,166		4,178,204		4,178,180		4,178,026		4,178,374		4,178,106
	4,177,559		4,178,206		4,178,183		4,178,028		4,178,397		4,178,458
	4,177,593		4,178,226		4,178,187		4,178,059		4,178,400		4,178,514
	4,177,683		4,178,246		4,178,192		4,178,100		4,178,406		4,178,528
	4,177,695		4,178,255		4,178,195		4,178,117		4,178,425		4,178,529
	4,177,697		4,178,264		4,178,197		4,178,136		4,178,469	53 :	4,177,647
	4,177,807		4,178,289		4,178,201		4,178,144		4,178,497		4,177,721
	4,177,812		4,178,291		4,178,225		4,178,254		4,178,498		4,177,799
	4,177,813		4,178,303		4,178,231		4,178,281		4,178,516		4,177,973
	4,177,816		4,178,311		4,178,233		4,178,326		4,178,517		4,178,061
	4,177,860		4,178,337		4,178,235		4,178,344		4,178,572		4,178,109
	4,177,865		4,178,350		4,178,240		4,178,412	43 :	4,178,343	54 :	4,177,930
	4,177,896		4,178,355		4,178,257		4,178,424	45 :	4,177,619		4,178,005
	4,177,910		4,178,358		4,178,282		4,178,468		4,177,629		4,178,328
	4,177,917		4,178,359		4,178,306		4,178,495		4,177,922	55 :	4,177,543
	4,177,925		4,178,360		4,178,332		4,178,501		4,178,151		4,177,550
	4,177,958		4,178,379		4,178,349		4,178,521		4,178,220		4,177,630
	4,178,058		4,178,387		4,178,361		4,178,632		4,178,401		4,177,664
	4,178,060		4,178,407		4,178,384	40 :	4,177,651	47 :	4,177,924		4,177,680
28 :	4,177,530		4,178,428		4,178,405		4,178,110		4,178,272		4,177,711
	4,177,603		4,178,451		4,178,413		4,178,112	48 :	4,177,523		4,177,715
	4,177,806		4,178,453		4,178,420		4,178,229		4,177,526		4,177,716
29 :	4,177,642		4,178,460		4,178,423		4,178,267		4,177,561		4,177,717
	4,177,688		4,178,461		4,178,429		4,178,269		4,177,596		4,177,718
	4,177,909		4,178,490		4,178,449		4,178,275		4,177,618		4,177,861
	4,178,209		4,178,515		4,178,452		4,178,276		4,177,676		4,177,902
	4,178,258		4,178,531		4,178,456		4,178,312		4,177,707		4,177,905
	4,178,353		4,178,550		4,178,466		4,178,313		4,177,726		4,177,954
31 :	4,177,899		4,178,557		4,178,467		4,178,314		4,177,734		4,177,970
	4,177,900		4,178,564		4,178,474		4,178,504		4,177,751	56 :	4,178,273
	4,178,080		4,178,582		4,178,503	41 :	4,177,842		4,178,006		4,177,667
	4,178,475		4,178,605		4,178,519		4,178,006		4,177,752		4,178,189

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6 :	253,619		253,629	17 :	253,632		253,658		253,673	45 :	253,644
	253,620		253,638		253,633	34 :	253,630	37 :	253,631		253,645
	253,621		253,641		253,634		253,652	39 :	253,626		253,646
	253,622		253,651		253,635		253,675	40 :	253,625	48	253,636
04 :	253,637		253,655		253,664	36 :	253,623	42 :	253,624		253,649
06 :	253,616		253,662	18 :	253,647		253,650		253,661		253,654
	253,617		253,663	24 :	253,671		253,653	44 :	253,656		253,674
	253,618	13 :	253,659	25 :	253,639		253,667		253,657	55 :	253,674

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

July 3, 1979.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,312,124, Re. S.N. 077,353, Filed Sep. 20, 1979, Cl. 74/558, STEERING WHEEL ASSEMBLY FOR AUTOMOTIVE VEHICLES, Klaus Meier, et al., Owner of Record: *Kamei-Autokomfort, Wolfsburg, Germany,* Attorney or Agent: Francis A. Utecht, et al., Ex. Gp.: 352

3,437,032, Re. S.N. 066,881, Filed Aug. 16, 1979, Cl. 100/93, HEATED FUSER ROLL AND METHOD OF MANUFACTURE, Arjan T. Manghirmalani, et al., Owner of Record: *Zerox Corp., Rochester, N.Y.,* Attorney or Agent: Harvey M. Brownrout, Ex. Gp.: 242

3,493,020, Re. S.N. 080,307, Filed Oct. 1, 1979, Cl. 144/34 R, SHEAR TYPE TREE CUTTING DEVICE, Joseph S. Choat, Owner of Record: *Inventor,* Attorney or Agent: Clarence A. O'Brien, et al., Ex. Gp.: 324

3,996,681, Re. S.N. 077,605, Filed Sep. 21, 1979, Cl. 40/116, VEHICLE DISPATCH INDICATOR WITH COLOR-CODED, ALPHABETICAL AND NUMERICAL INDICIA, John H. King, et al., Owner of Record: *said Gore assignor of one-half to said King, Oak Lawn, Ill.,* Attorney or Agent: None, Ex. Gp.: 333

4,048,850, Re. S.N. 080,111, Filed Sep. 28, 1979, Cl. 73/133 R, MECHANISM FOR GAUGING THE CATCH WITHIN A TRAWL NET, Kjell Oystein Ramberg, et al., Owner of Record: *Simrad A.S., Horten, Norway,* Attorney or Agent: Lawrence R. Radanovic, Ex. Gp.: 244

4,052,228, Re. S.N. 080,252, Filed Oct. 1, 1979, Cl. 136/89 PC, OPTICAL CONCENTRATOR AND COOLING SYSTEM FOR PHOTOVOLTAIC CELLS, Charles R. Russell, Owner of Record: *Inventor,* Attorney or Agent: William E. O'Brien, Ex. Gp.: 114

4,076,312, Re. S.N. 079,876, Filed Sep. 28, 1979, Cl. 299/2, METHOD AND APPARATUS FOR RETORTING OIL SHALE AT SUBATMOSPHERIC PRESSURE, Chang Yul Cha, et al., Owner of Record: *Occidental Oil Shale Inc., Grand Junction, Colo.,* Attorney or Agent: Robert L. Parker, et al., Ex. Gp.: 354

4,082,142, Re. S.N. 079,511, Filed Sep. 27, 1979, Cl. 165/76, HOUSING FOR EXPANSION UNIT OF COOLING SYSTEM, James R. Blackburn, et al., Owner of Record: *John E. Mitchell Company, Dallas, Tex.,* Attorney or Agent: Rey Eilers, et al., Ex. Gp.: 345

4,084,180, Re. S.N. 078,617, Filed Sep. 24, 1979, Cl. 358/55, COLOR SPLITTING PRISM ASSEMBLY, Jacobus Stoffels, et al., Owner of Record: *U.S. Philips Corporation, New York, N.Y.,* Attorney or Agent: Thomas A. Briody, Ex. Gp.: 233

4,100,056, Re. S.N. 078,616, Filed Sep. 24, 1979, Cl. 208/57, MANUFACTURE OF NAPHTHENIC TYPE LUBRICATING OILS, Ronald W. Reynolds, Owner of Record: *Sun Oil Company of Pennsylvania, Philadelphia, Pa.,* Attorney or Agent: J. Edward Hess, Ex. Gp.: 116

4,110,601, Re. S.N. 080,110, Filed Sep. 28, 1979, Cl. 219/506, CONTROL SYSTEM AND METHOD AND CONTROL DEVICE THEREFOR, Cloyd E. Decker, Owner of Record: *Robertshaw Controls Company, Richmond, Va.,* Attorney or Agent: Auzville Jackson, Jr., et al., Ex. Gp.: 213

4,116,183, Re. S.N. 077,553, Filed Sep. 21, 1979, Cl. 123/122 F, FUEL ATOMIZING UNIT WITH OVEN CHAMBER, Arthur Hayward, Owner of Record: *Electronic Fuel Saver, Inc., Bronx, N.Y.,* Attorney or Agent: Joseph M. Lane, et al., Ex. Gp.: 342

4,124,943, Re. S.N. 069,830, Filed Aug. 27, 1979, Cl. 35/8 A, AUDIO VISUAL INFORMATION SYSTEM, James A. H. Mitchell, et al., Owner of Record: *Mitchell Beazley Encyclopedias, Ltd., London, England,* Attorney or Agent: None, Ex. Gp.: 334

4,125,499, Re. S.N. 077,444, Filed Sep. 19, 1979, Cl. 260/22 T, WATER-RESTRICTED, WATER SOLUBLE PAINT, Jerald D. Howard, Owner of Record: *Pactra Industries, Inc., Los Angeles, Calif.,* Attorney or Agent: Byard G. Nelsson, et al., Ex. Gp.: 141

4,145,481, Re. S.N. 078,565, Filed Sep. 24, 1979, Cl. 428/678, PROCESS FOR PRODUCING ELEVATED TEMPERATURE CORROSION RESISTANT METAL ARTICLES, Dinesh K. Dupta, et al., Owner of Record: *Howmet Turbine Components Corporation, Muskegon, Mich.,* Attorney or Agent: Dugald S. McDougal, et al., Ex. Gp.: 111

PATENT NOTICES

Certificates of Correction for the Week of Dec. 18, 1979

Re. 30,060	4,124,001	4,155,967	4,166,542
D. 252,481	4,124,151	4,159,365	4,166,628
3,891,916	4,126,702	4,160,280	4,166,826
4,026,419	4,131,779	4,161,163	4,167,935
4,027,450	4,136,503	4,161,681	4,167,997
4,029,235	4,140,384	4,162,254	4,168,366
4,039,571	4,141,761	4,162,279	4,168,391
4,049,589	4,141,772	4,162,347	4,168,405
4,049,666	4,141,841	4,163,002	4,168,810
4,069,336	4,141,843	4,163,554	4,168,837
4,074,221	4,144,213	4,163,709	4,168,850
4,089,029	4,144,578	4,163,721	4,169,033
4,103,093	4,145,465	4,163,841	4,169,140
4,108,408	4,149,185	4,164,963	4,169,294
4,110,952	4,152,344	4,165,309	4,169,377
4,111,680	4,152,418	4,165,324	4,169,418
4,115,457	4,152,666	4,166,039	4,169,634
4,117,118	4,153,643	4,166,134	4,169,659
4,118,404	4,154,833	4,166,255	4,170,095
4,123,300			

Erratum

All reference to Patent No. 4,176,569 to Raymond F. DeLuca of Stamford, Connecticut, for MULTIPLE WOUND ROLL DISPENSER FOR FLEXIBLE SHEET MATERIAL appearing in the Official Gazette of December 4, 1979, should be deleted since no patent was granted.

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	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
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	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
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Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library. Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 3, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-1-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.; Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	11-13-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	2-5-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	5-30-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	4-13-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	5-19-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-5-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-31-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-1-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	12-12-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-17-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	10-13-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	11-30-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-4-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	7-10-78

Expiration of patents: The patents within the range of numbers indicated below expire during November 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,061,833 to 3,066,301, inclusive
Plant Patents..... Numbers 2,189 to 2,197, inclusive

V 9 8 9 / 3 DE 18 79 UMI

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,167

APPARATUS AND METHOD FOR START-SPINNING ON AN OPEN-END SPINNING MACHINE

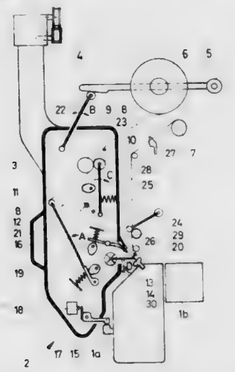
Fritz Stahlecker, Josef Neidhart-Strasse 18, D-7341 Bad Uberlingen, and Hans Stahlecker, Haldenstrasse 20, D-7334 Suessen, both of Fed. Rep. of Germany

Original No. 3,892,062, dated Jul. 1, 1975, Ser. No. 463,151, Apr. 22, 1974. Application for reissue Jul. 1, 1977, Ser. No. 812,411

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1973, 2321775

Int. Cl.[2] D01H *15/00, 13/14*

U.S. Cl. 57—263 33 Claims



1. An apparatus for start-spinning, movable along an open-end spinning machine to a spinning unit, which returns a thread to a spinning rotor of said spinning unit and removes said thread therefrom again after spinning has been started, containing means for controlling the moment the start-spinning operation is commenced in such a manner that said start-spinning operation is performed during the period in which [the] *a* previously braked spinning rotor of said spinning unit starts up and at a speed which is lower than the operating speed of said spinning rotor, *said spinning machine including a plurality of said spinning units with common driving means, said spinning unit including rotor brake means actuable independently of neighboring commonly driven spinning units, said apparatus including brake control means for controlling actuation and release of the rotor brake means, said means for controlling including means for automatically initiating the start spinning operation in response to release of the rotor brake means to assure piecing during acceleration of the rotor toward its operating speed.*

Re. 30,168

END PLUG FOR ROLLED MATERIALS

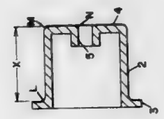
Henry L. Mason, Westport, Conn., assignor to Precision Plastic Industries Inc., Bridgeport, Conn.

Original No. 4,015,711, dated Apr. 5, 1977, Ser. No. 565,246, Apr. 4, 1975. Continuation-in-part of Ser. No. 465,762, May 1, 1974, abandoned. Application for reissue Sep. 22, 1978, Ser. No. 944,185

Int. Cl.[2] B65D *85/67, 85/672, 85/676, 85/677*

U.S. Cl. 206—413 6 Claims

1. An improved end plug for a rolled goods packaging container which comprises a [circular cylinder known as a] *cylindrical* sleeve having an external surface upon which the rolled goods are placed and an internal surface, [which is] *said sleeve being* concentric to and around a symmetrical axis with a continuous back flange, said back flange being nearly perpendicular to the sleeve[;], the outer diameter of said back flange [is] *being* greater than the sleeve, and a second flange attached continuously to the sleeve [at] *and recessed therein inwardly a distance from* the front of said sleeve, said second flange being concentric to and symmetrical with said sleeve and at least 20% of the area of said second flange being perpendicular to said sleeve, *a first portion of the external surface of*



said sleeve being at an angle of 90° to the back flange for a distance *extending from said back flange of said sleeve* of up to one-half of the sleeve length and [then] *the remainder portion of said sleeve external surface* tapers [at an angle of up to 10% off the vertical] *with a taper of up to 10° inwardly toward said symmetrical axis* and the internal surface *of said sleeve* tapers [at an angle of up to 10° off the vertical with respect to the back flange in the direction of the symmetrical axis] *with a taper of up to 10° inwardly toward said symmetrical axis and from said back flange in the direction of said second flange.*

Re. 30,169

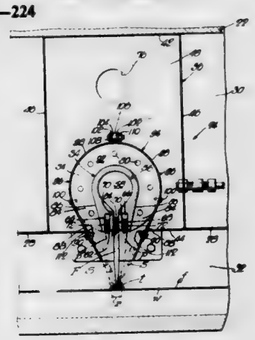
METHOD OF DRYING COATED WEBS

John H. Flynn, 234 Elk Ave., New Rochelle, N.Y. 10802

Original No. 3,962,213, dated Jun. 8, 1976, Ser. No. 435,851, Jan. 23, 1974. Application for reissue Sep. 19, 1977, Ser. No. 834,506

Int. Cl.[2] B05D *3/08*

U.S. Cl. 427—224 15 Claims



1. A method of drying on a web face an applied coating containing volatile products, which comprises feeding the web past a station at a rate of at least 50 feet per minute, supplying a high-capacity burner at said station with a combustible air-gas mixture to sustain a stable flame sheet and directing the flame sheet substantially with its tip into contact with the

coated face of the fed web transversely thereof for evaporating and igniting the volatile products in the passing coating, and confining the evaporated products to, and completely burning them within a fixed zone through which the coated face of the fed web passes, by directing into contact with the coated face of the fed web on opposite sides of and at a spacing from zero to less than 1 inch from the contacting flame sheet, stable air sheets of a velocity within a range from about 400 feet per minute to about 1700 feet per minute.

15. The method of drying a volatile wet coating on the surface of a body moving past a station, said method comprising the steps of:

(A) directing a sheet of flame toward said body to cause the tip of the flame to impinge on a zone across said wet coating to evaporate the volatiles of said coating; and

(B) directing two sheets of air at high velocity toward said body on opposite sides of the sheet of flame to cause the air sheets to impinge on said wet coating on either side of said zone to substantially restrict the action of said flame to said zone.

Re. 30,170

HYDROLYZABLE POLYMERS OF AMINO ACID AND HYDROXY ACIDS

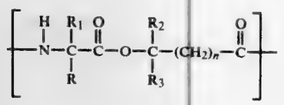
Murray Goodman, Brooklyn, N.Y., and Gerald S. Kirshenbaum, Fanwood, N.J., assignors to Sutures, Inc., Coventry, Conn.

Original No. 3,773,737, dated Nov. 20, 1973, Ser. No. 151,577, Jun. 9, 1971. Continuation of Ser. No. 565,076, Apr. 4, 1975, abandoned. Application for reissue Oct. 11, 1977, Ser. No. 842,379

Int. Cl.[2] C08G *69/10, 69/44*

U.S. Cl. 528—327 **5 Claims**

15. [A] *An absorbable* surgical suture [comprising polyfilaments of the polymer of clam 1] *of a hydrolyzable film- and fiber-forming polymer having a plurality of repeating units of the formula:*



wherein R is lower alkyl, aryl, alkaryl or aralkyl; R_1, R_2 and R_3 are each selected from H or lower alkyl with the proviso that at least one of R_1, R_2 and R_3 is H; and n is an integer of 0 to 2.

Re. 30,171

MULTICONFIGURATION IONIZATION SOURCE

William P. Kruger, Los Altos Hills, and John A. Michnowicz, Santa Clara, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Original No. 3,992,632, dated Nov. 16, 1976, Ser. No. 568,499, Apr. 16, 1975. Continuation of Ser. No. 391,721, Aug. 27, 1973, Pat. No. 3,886,365. Application for reissue Jun. 12, 1978, Ser. No. 914,660

The portion of the term of this patent subsequent to May 27, 1992, has been disclaimed.

Int. Cl.[2] H01J *27/00*

U.S. Cl. 250—423 R **9 Claims**

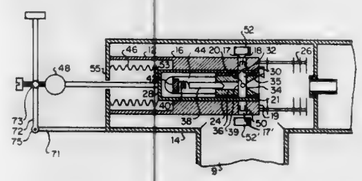
3. An ionization source comprising:

a vacuum tight envelope;

a chamber having walls surrounding an internal cavity and mounted within the envelope, said chamber having a plurality of openings;

an electron source disposed exterior to the chamber for supplying electrons to the chamber through a first of said openings;

sample inlet means for supplying a gaseous sample for reaction with the electrons inside the chamber to create ions, said ions exiting through a second of said openings; and



aperture control means for cooperatively changing the size of the first and second openings for changing the pressure of the sample in the chamber.

Re. 30,172

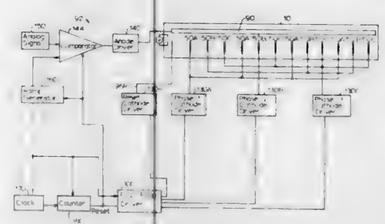
CIRCUIT FOR OPERATING A BAR GRAPH DISPLAY PANEL

Richard A. Saxon, Basking Ridge, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Original No. 3,967,158, dated Jun. 29, 1976, Ser. No. 543,882, Jan. 24, 1975. Application for reissue Jun. 29, 1977, Ser. No. 811,341

Int. Cl.[2] H05B *37/00*

U.S. Cl. 315—169.4 **5 Claims**



1. A bar graph display system comprising

a display panel comprising a gas-filled envelope including a base plate and a viewing face plate hermetically sealed together,

a plurality of thin, parallel, linear cathodes disposed in a series along the surface of said base plate and positioned sufficiently close together so that, as the series of cathodes is energized and selected cathodes are caused to exhibit cathode glow, the glow of adjacent cathodes appears to blend to form a bar of light, said series of cathodes including a first cathode, a last cathode, and intermediate cathodes,

a reset cathode positioned adjacent to and ahead of the first cathode in said series for use in starting a scanning cycle for said series of cathodes,

an anode electrode disposed on said face plate overlying said series of cathodes,

conductors connected to said cathodes and connecting said cathodes in groups with a single common conductor connected to each such group,

a separate cathode driver connected to each common conductor for energizing each cathode in turn along said series of cathodes,

a reset cathode driver connected to said reset cathode and adapted to be energized first before said separate cathode drivers in a cathode scanning cycle,

an anode driver connected to said anode electrode for applying operating potential thereto, and

a circuit coupled to said anode driver including a signal comparator circuit having a single output connected to said anode driver, said comparator circuit having two inputs, one input comprising a source of a sawtooth voltage, and the second input comprising a source of an analog signal to be represented in said panel by a bar of light made up of a group of energized cathodes, said cathode drivers continually energizing said cathodes in said series and causing said cathodes to exhibit cathode glow as long as there is an output from said comparator and said anode driver is energized thereby and energizes said anode.

Re. 30,173

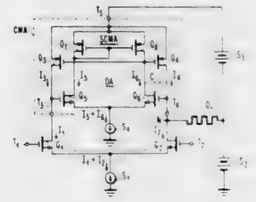
CURRENT MIRROR AMPLIFIER

Adel A. A. Ahmed, Clinton Township, Hunterdon County, N.J., assignor to RCA Corporation, New York, N.Y.

Original No. 4,068,184, dated Jan. 10, 1978, Ser. No. 768,593, Feb. 14, 1977. Application for reissue Jul. 31, 1978, Ser. No. 929,679

Int. Cl.[2] H03F *3/45*

U.S. Cl. 330—257 **6 Claims**



1. A current mirror amplifier comprising:

an input terminal;

an output terminal;

a common terminal;

first and second transistors of a first conductivity type, having respective input electrodes, having respective common electrodes connected to said common terminal, and having respective output electrodes connected respectively to said input terminal and to said output terminal; and

a differential-input single-ended-output amplifier having non-inverting and inverting input connections respectively at said input terminal and at said output terminal and having an output connection connected to an interconnection between the input electrodes of said first and said second transistors, said amplifier applying a signal to said interconnection having positive polarity when the potential at said non-inverting input connection is positive relative to the potential at said inverting input connection and having negative polarity when the potential at said non-inverting input connection is negative relative to the potential at said inverting input connection.

Re. 30,174

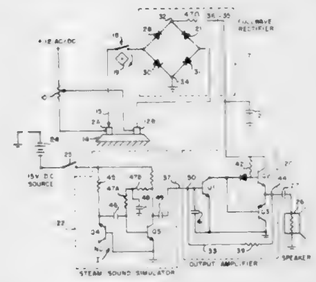
SOUND SIMULATOR FOR MODEL STEAM ENGINE

Walter J. Schedler, 1576 Chickasaw Rd., Arnold, Md. 21012

Original No. 3,913,097, dated Oct. 14, 1975, Ser. No. 502,423, Sep. 3, 1974. Application for reissue Oct. 13, 1977, Ser. No. 841,970

Int. Cl.[2] G08B *3/00*

U.S. Cl. 340—384 E **23 Claims**



1. A sound generation system for a multi-wheeled model steam engine operating at a speed determined by the magnitude of electric power received from a controller, said system comprising:

an electronic circuit for generating a [constant] white noise signal representing a steam sound;

a switch electrically connected to receive electric power from the engine and including an actuator for turning the switch on momentarily at a rate responsive to the operating speed of the engine;

a full wave rectifier connected to receive electric current from the switch;

an amplifier having power terminals connected to receive electric power from the rectifier for providing an output signal responsive to the magnitude of the power received and synchronously with the closing of the switch, said amplifier also having signal input terminals connected to receive said white noise signal;

a capacitor connected across the power input terminals of the amplifier to filter and smooth out the power signal when any brief interruptions occur due primarily to the controller regulation and electrical connections between the engine and power source being momentarily broken;

a sound speaker connected to receive the amplifier output signal with such signal being the amplified white noise signal representing escaping steam occurring synchronously with the operating speed of the engine to simulate the actual sound of a steam engine.

V.989/3 DEC 18 79 UMI

PATENTS

GRANTED DEC. 18, 1979

ERRATA

For CLASS	See PATENT NO.
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433–201	4,178,686
433–013	4,178,687
433–220	4,178,688
433–166	4,178,689
035–005	4,178,695
052–648	4,178,736
052–663	4,178,738
054–080	4,178,742
409–080	4,178,834
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123–101	4,178,907
414–551	4,179,034
414–002	4,179,035
227–067	4,179,063
250–416 TV	4,179,100
430–034	4,179,290
430–223	4,179,291
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430–551	4,179,293
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585–251	4,179,474

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525–080	4,179,481
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235–092 QC	4,179,611
367–110	4,179,681
367–135	4,179,682

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PATENTS

GRANTED DECEMBER 18, 1979

GENERAL AND MECHANICAL

4,178,637

FILLED BODY ROBE

John C. Wrightson, Darien, Conn., assignor to Heritage Quilts Inc., New York, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,270
Int. Cl.[2] A41B *9/00*
U.S. Cl. 2—69.5 **2 Claims**



1. A quilted garment adapted to enclose an adult wearer thereof while allowing relatively free movement of the hands external of the garment comprising:

(a) a quilted textile fabric having a back portion and outlying quarter portions, the bottom portion of each outlying quarter portion on each side of which is folded towards the other said outlying quarter portion until they abut;

(b) a first seam joining the bottom of each of the folded outlying quarter portions to the said back portion;

(c) a second seam joining the outer side edge of the bottom portion of one said folder quarter portions to the outer side edge of the bottom portion of the other said folded quarter portion for a distance of approximately one foot;

(d) a slide fastener for joining the outer side edge of one said folded quarter portion to the outer edge of the other said folded quarter portion, said slide fastener extending from substantially the upper end of said second seam to a point approximately thirty inches thereabove;

(e) first fastening means on the outer edge of each said quarter portions positioned at about the end of said slide fastener;

(f) second fastening means at the top of the outer edge of each said quarter portion, each said second fastening means cooperativey attaching to one said first fastening means wherein open unobstructed arm holes are formed for the wearer through which the hands are free to protrude.

4,178,638

SPLIT LEAFLET CHECK VALVES

Louis C. Meyer, Denver, Colo., assignor to Louis C. Meyer, Denver and Anna T. Loeffler, Englewood, both of, Colo.

Filed Aug. 1, 1977, Ser. No. 820,769
Int. Cl.[2] A61F *1/22;* **F16K** *15/03*
U.S. Cl. 3—1.5 **5 Claims**

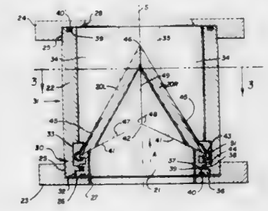
3. A split leaflet check valve comprising:

(a) a base ring having a seat surface at one side thereof and diametrically opposing socket portions at the outer wall thereof;

(b) a pair of diametrically opposed curved leaflets with each having a base edge, side edges extending to a top point and a hinge means extending from the base edge and to a socket portion of the base ring to attach the leaflet to the base edge, and with each leaflet being proportioned such that with the valve closed, each leaflet base edge seats on the base ring seat surface and each leaflet side edge seats against an adjacent side edge of an adjacent leaflet;

(c) a retainer tube wherein said base ring is fitted with said leaflets moving against the retainer tube when they swing to an open position; and

(d) a flat surface on the retainer tube at the side of each leaflet to engage the adjacent leaflet point between the base edge and side edge of the leaflet as the leaflet swings from the open to the closed position and thereby limit lateral shifting of the leaflet during its opening and closing movements.



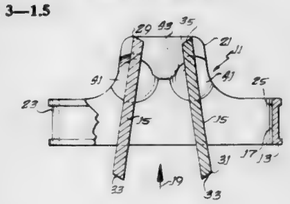
5. The check valve defined in claim **3**, wherein:
the retainer tube is a comparatively narrow member; and
a suture ring is mounted thereon.

4,178,639

TWO-LEAFLET HEART VALVE

Jack C. Bokros, Alpine, Calif., assignor to Carbomedics, Inc., San Diego, Calif.

Filed Apr. 6, 1978, Ser. No. 894,166
Int. Cl.[2] A61F *1/22*
U.S. Cl. 3—1.5 **8 Claims**



1. A heart valve prosthesis including

an annular valve body having a central passageway extending therethrough,

a pair of valve leaflets,

means supporting said pair of leaflets for substantially pivotal movement between a closed position blocking blood flow through said central passageway and an open position allowing blood flow therethrough, and

stop means limiting movement of said leaflets between said open and closed positions,

wherein the improvement comprises

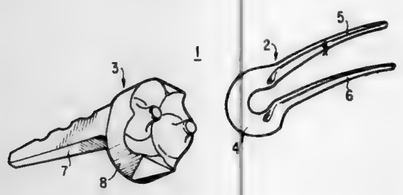
said leaflets each having a pair of guides projecting in opposite directions along the pivotal axis of the leaflet which are formed with spheroidal surfaces,

said annular body having a pair of upstanding supports at generally diametrically opposite locations thereon, which supports contain spheroidal depression means proportioned to receive said spheroidal guides, and

wherein said supports are formed with stops outside of said depressions which contact the distal surface of said leaflets

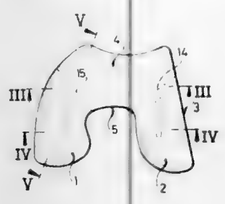
at a region apart from said spheroidal guides and determine the open position thereof.

4,178,640
WRIST PROSTHESIS
Ulrich H. Buechler, 3037 Stuckishaus, Halen 50, Switzerland; Dennis B. Phelps, 4517 Vieja Dr., Santa Barbara, Calif. 93110, and John A. Boswick, Jr., 4502 S. Vine Way, Englewood, Colo. 80110
Filed Feb. 23, 1978, Ser. No. 880,397
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 **7 Claims**



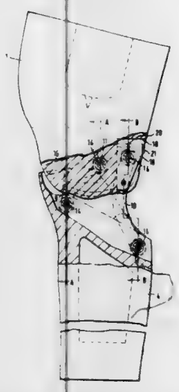
1. A prosthesis for replacing a joint between a first bone structure having first medullary canals and a second bone structure having a second medullary canal, said prosthesis comprising:
(A) a first component having a tubular base with a curved longitudial axis, said base having ends terminating into intermedullary pins for insertion into the first medullary canals; and
(B) a second component having a generally concave seat for receiving a side of said tubular base and an intramedullary stem extending from said seat for insertion into the second medullary canal.

4,178,641
KNEE-JOINT-ENDOPROTHESE
Hans Grundei, and Wolfram Thomas, both of Lübeck, Fed. Rep. of Germany, assignors to Schutt and Grundei O.H.G., Lubeck, Fed. Rep. of Germany
Filed Dec. 1, 1977, Ser. No. 856,226
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1977, 2703059
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.911 **4 Claims**



1. A knee-joint endoprosthetic member embodying condylar replacement surface means to simulate the natural slideway for the knee cap, said slideway defining a space for the cruciate ligaments of the natural joint, and a curved boundary to be brought into alignment with the transverse edge of the natural joint which forms the upper boundary of the space for the cruciate ligaments relative to the intercondylar eminence, and wherein the prosthesis for the inner tibial plateau is made concave and the prosthesis for the outer tibial plateau is made saddle-shaped to match the natural tibial plateaus, said members being made from a wear-resistant material.

4,178,642
KNEE JOINT STRUCTURE FOR ARTIFICIAL LEGS
Denis R. W. May, London, England, assignor to J. E. Hanger & Company Limited, London, England
Filed Nov. 14, 1977, Ser. No. 851,323
Claims priority, application United Kingdom, Nov. 18, 1976, 48085/76
Int. Cl.[2] A61F *1/04*
U.S. Cl. 3—28 **5 Claims**



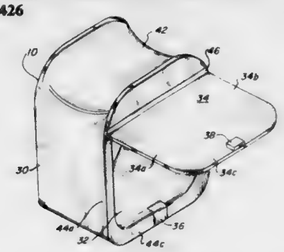
1. An artificial leg comprising a solid shaped knee portion, a solid shaped shin portion, confronting surfaces of each of said portions being each formed with a pair of transverse grooves, a pair of front links each engaged in said grooves and pivotally connected at their opposite ends to said knee portion and said shin portion respectively, and a pair of rear links each engaged in said grooves and pivotally connected at their opposite ends to said knee portion and said shin portion respectively, said front links having an effective length less than that of said rear links, and said pivotal connections of said front and rear links to said knee and shin portion being positioned to form an articulation of which the instantaneous center of rotation lies upon an ascending curve for a predetermined angle of relative rotation between said knee portion and said shin portion from the fully extended position thereof, each said pivotal connection comprising a tubular central distance piece having a portion of reduced diameter at each end thereof, a first tubular bearing piece at one end of said distance piece and of reduced diameter adjacent said distance piece, a second internally threaded bearing piece at the other end of said distance piece and of reduced diameter adjacent said distance piece, the ends of said links being engaged over said adjacent portions of reduced diameter, and a screw passing through said first bearing piece and said distance piece and threaded into said second bearing piece to clamp the links between said central piece and said first and second bearing piece.

4,178,643
VALVE FOR INFLATABLE PROSTHESIS
James E. Cox, Jr., 1257 San Antonio Creek Rd., Santa Barbara, Calif. 93111
Filed Sep. 26, 1977, Ser. No. 836,736
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—36 **8 Claims**

6. In combination: an inflatable prosthesis comprising an envelope having a fluid impermeable outside boundary with an aperture therethrough; and a valve mounted to said envelope in said aperture so as to control flow of fluid into and out of said envelope, said valve comprising: a flat enlongated conduit having a pair of sealed edges, and between said edges a pair of flat flexible wall members facing each other to form a fluid seal when they bear against one another, the conduit being open at one end, and at the other end closed but for a slit formed in one of said wall members without removal of material whereby to have a pair of contiguous slit edges when the slit is closed, said slit being spaced from both of said ends and edges, and thereby being totally surrounded by the material of its respective wall member so that both of said edges are distensible, whereby said valve tends to remain closed both as a consequence of inherent closure of said slit, and also as a consequence of pressure of said walls against one another, said conduit being sufficiently flexible to receive a fill-tube in said open end, said fill tube when inserted separating the wall members from one another, and when fully inserted holding the slit open; and a layer of viscous gel disposed between said wall members, whereby to improve the sealing properties of the conduit, said layer being non-adhesive and so thin that pressure against the walls does not substantially extrude the gel from the conduit, said wall members projecting beyond said outside boundary of said prosthesis whereby to be available for pressing by the hands of the surgeon to press the wall members together.



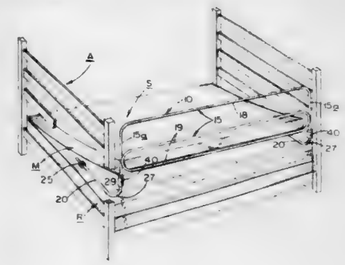
4,178,644
WATER SAVING DEVICE FOR TOILET
Dominic A. Zarlengo, 3025 W. Scott Pl., Denver, Colo. 80211
Filed Jul. 21, 1978, Ser. No. 926,631
Int. Cl.[2] E03D *1/00, 11/02, 11/18*
U.S. Cl. 4—426 **13 Claims**



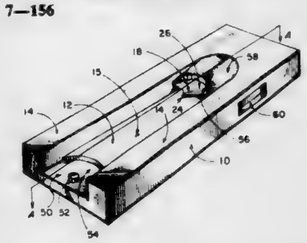
1. Apparatus for reducing the quantity of fluid utilized in flushing a closet type toilet bowl wherein the fluid flows through a trap which defines a passage connecting the bowl to a sewer access opening, said apparatus comprising:
(a) a supporting frame adapted to be positioned in the trap, said frame being designed to conform with the particular contours of the trap so as to remain in position within the trap;
(b) a gate affixed to the supporting frame,
(c) means for retaining the gate in closed position until a predetermined level of fluid is reached in the bowl and for releasing the gate to allow the flow of fluid from the bowl through the trap upon the fluid attaining the predetermined level.

4,178,645
SAFETY BED
Peter A. Cosme, R.R. 1, Box 319, Lockport, Ill. 60441
Filed Dec. 29, 1977, Ser. No. 865,736
Int. Cl.[2] A47C *21/08*
U.S. Cl. 5—426 **8 Claims**

1. A knockdown, readily detachable attachment for the side of a bed and mattress with an underlying support for the latter, comprising
(a) a restraining gate of planar form with vertical end legs, adapted to assume selectively an elevated operative position above the side of the bed and mattress, to block egress therefrom, and an alternative lowered inoperative position below the bed and mattress, to permit egress from the bed, both positions being in the same substantially vertical plane,
(b) anchor means for said gate adapted to be disposed between the mattress and said support, said anchor means comprising a pair of bar members constituting extensions of the respective end legs, each said extension having a free end portion with frictional resistance means against accidental displacement, the other end of each bar member being bent substantially normally to provide a connecting portion between the bar member and its adjacent leg,
(c) linkage means pivoted respectively to each bar member and its adjacent leg, permitting articulation of the gate from said elevated to lowered position, and
(d) relatively slidable means coaxial with each bar member and its adjacent leg for locking the gate in elevated position and, alternatively, freeing the gate for rotation downwardly to inoperative position.



4,178,646
VIAL CAP OPENER DEVICE
Peter J. Swartz, 33 Pine Ave., Randolph, Mass. 02368, and Ronald J. Sostek, 51 Ansie Rd., Chelmsford, Mass. 01824
Continuation-in-part of Ser. No. 780,285, Mar. 23, 1977, abandoned. This application May 26, 1978, Ser. No. 903,880
Int. Cl.[2] B67B *7/36*
U.S. Cl. 7—156 **7 Claims**



1. A device for assisting in opening a vial having a vial sealing cap that incorporates a lift tab, comprising:
a body member having a channel defined therein, said channel having a back wall, a top, an open front, a bottom, and sides which are spaced apart a distance at least slightly greater than the maximum width of the lift tab;
a blade bridging a portion of the front of the channel and

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mounted on the body member so as to be approximately parallel to the back wall and spaced forward from it so that when the vial is held perpendicular to the blade adjacent to the back wall and moved so as to bring the vial cap into proximity with the blade, further motion of the vial causes the blade to enter into the space inside the vial cap immediately beneath a portion of the lift tab whereby the lift tab can be more readily separated from the surface of the vial cap; and

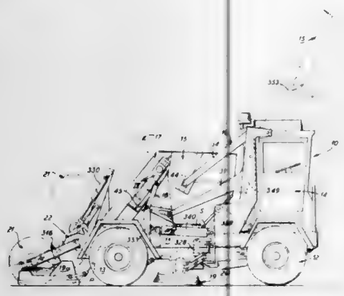
means affixed to the body member for assisting in deforming the vial cap in such a way that a portion of the lift tab is caused to be partially bent away from and out of the outside surface of the vial cap, whereby the balance of the lift tab can thereafter be more readily removed through proper manipulation of the vial cap in relation to the blade.

4,178,647

FOUR-WHEELED SWEEPER

John J. Wolynec, Chicago; Donald L. Hildebrand, Elgin, and Victor Wasynczuk, Mount Prospect, all of Ill., assignors to Elgin Sweeper Company, Elgin, Ill.

Filed Sep. 8, 1978, Ser. No. 940,598
Int. Cl.² E01H *1/04*
U.S. Cl. 15—84 **20 Claims**



1. A street sweeper having a frame, a cab positioned at a forward end of the frame, main and side brooms on the frame behind the cab, a hopper for receiving sweepings positioned on the frame behind the cab, means on the frame behind the cab for loading sweepings from the main and side brooms in the hopper and hydraulically operated linkage for moving the hopper through an arc over the cab to a dumping position for unloading sweepings into a truck at a forward end of the sweeper.

4,178,648

DRYER CURTAIN FOR CAR WASH

Harry K. Gougoulas, 1875 Philomene, Lincoln Park, Mich. 48146

Continuation-in-part of Ser. No. 929,079, Jul. 28, 1978, abandoned. This application Nov. 13, 1978, Ser. No. 960,374
Int. Cl.² B60S *3/04*
U.S. Cl. 15—97 B **13 Claims**

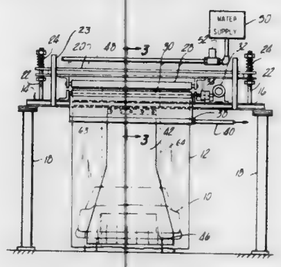
1. A curtain-type dryer for use in a car wash comprising:

an endless loop of material, said loop having at least portions associated therewith for the absorbtion of water from vehicles:

first roller means supporting said loop so as to define a free end which depends vertically into a car wash lane;

and second roller means independent of said first roller means for writing water from said portions,

the combination further including drive means for causing intermittent incremental travel of said loop relative to the first and second roller means, said drive means including sensor means disposed in said wash lane to cause incremental travel of said loop for a circumferential distance less than the total developed length thereof immediately



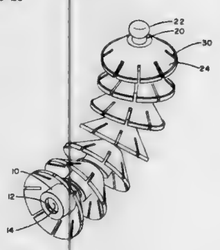
prior to engagement with a car in said lane whereby a freshly wrung area is caused to engage each of said cars in said wash lane in succession.

4,178,649

TUBE CLEANING DEVICE

Charles H. Kouse, and James L. Herzog, both of Springfield, Ohio, assignors to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 28, 1978, Ser. No. 900,837
Int. Cl.² B08B *9/04*
U.S. Cl. 15—104.06 R **8 Claims**



1. A tube cleaning device comprising:

a body extending both in a longitudinal direction and a transverse direction and defining an opening in a first end thereof and a longitudinally extending recess in communication with the opening, wherein the perimeter of the recess is larger than the perimeter of the opening;

a neck extending longitudinally from a second end of the body and having a perimeter less than the perimeter of the opening;

a plug extending longitudinally from the neck and having a perimeter larger than the perimeter of the opening but smaller than the perimeter of the recess; and

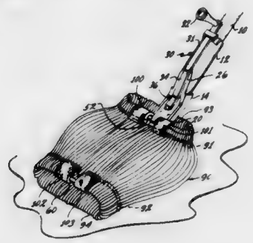
a scraper extending from a side of the body toward the trailing side of the cleaning device at an acute angle to the longitudinal axis thereof, wherein the surface of the scraper facing the leading side of the cleaning device defines a substantially transverse peripheral lip for facilitating cleaning the tube.

4,178,650

SELF-WRINGING MOP

Reuben E. Aasland, 31900 Happy Valley Dr., Indio Hills, Calif. 92240

Filed Jan. 2, 1979, Ser. No. 360
Int. Cl.² A47L *13/142*
U.S. Cl. 15—120 R **7 Claims**



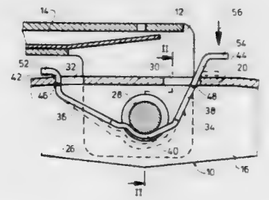
1. In an improved self-wringing mop of the type having a head, a crank having a crank pin journaled in the head, a mop holder carried by the head, a mop spreader having a stem, one end of the stem being secured to the crank pin, the improvements comprising a clamping member configurated to engage an end part of the head and to clamp the mop holder to the head, the clamping member having aperture means for the crank pin, the crank pin extending through the clamping member and a registering aperture in the head.

4,178,651

WIPING ARRANGEMENT FOR A VEHICLE WINDOW

Jürgen Mayer, Gaggenau, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 24, 1978, Ser. No. 927,536
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735627
Int. Cl.² B60S *1/40*
U.S. Cl. 15—250.32 **19 Claims**



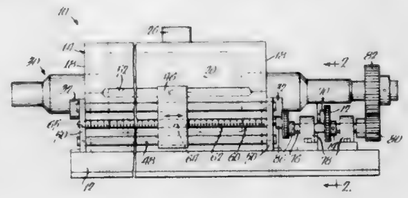
1. A wiping arrangement for a vehicle window, comprising a wiping blade element; a support element, one of said elements being U-shaped and having two side walls and a web which connects said side walls with one another and together with said side walls bounds a hollow, said web of said one element being provided with two holes spaced from one another; an axle movable between a first position in which it extends through said elements so as to pivotally connect the latter with one another, and a second position in which it is withdrawn from said elements so that the latter can be disconnected from one another; and a substantially V-shaped spring member having a central portion surrounding said axle and two diverging legs located at opposite sides of the latter, said legs of said spring member extending through said holes outwardly beyond said one element and being biased to said one element so as to be retained under the spring action of said spring member, said spring member being movable between one position in which it engages said axle so as to retain the same in said first position thereof for connecting said elements with one another, and another position in which said spring member is disengaged from said axle so that the latter can be moved into its second position for disconnecting said elements from one another, each of said legs of said spring member having an end portion which extends outwardly beyond said web of said one element and through said holes and has a width which is smaller than that of the remainder portion of said spring member so that a shoulder is formed between each of said end portions and the remainder portion of said spring member, each of said end portions of said legs of said spring member having an outer section located outwardly beyond said web of said one element and bent in a direction away from said axle so that said web of said one element is clamped between the outer portion and the shoulder of one of said legs of said spring member whereby said spring member is retained by said one element.

4,178,652

APPARATUS FOR CLEANING ROLLER SURFACES

Leo Adams, River Edge, and Edward Kooi, Jersey City, both of N.J., assignors to Arvey Corporation, Chicago, Ill.

Filed Apr. 24, 1978, Ser. No. 899,516
Int. Cl.² B08B *3/00, 7/00;* A47L *5/38*
U.S. Cl. 15—302 **6 Claims**



1. Apparatus for cleaning the surface of a roller comprising a base with a housing extending above said base and having opposite end walls, said housing having a lower portion and an upper portion separable to expose an upper open end of said lower portion and each end wall having means defining an opening with a portion of each opening in each portion, support means on each end wall of said lower portion overlapping said openings for supporting a roller in said housing means for supplying pressurized steam with a nozzle connected thereto to produce a small stream of high pressure steam, said housing having an elongated slot through which said nozzle extends, a support member outside said housing for supporting said nozzle for reciprocal movement along said slot, and drive means for reciprocating said support means and simultaneously rotating said roller within said housing.

4,178,653

IMPROVED AGITATOR CHAMBER

Donald B. Tschudy, Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio

Filed Jan. 26, 1978, Ser. No. 872,646
Int. Cl.² A47L *5/30*
U.S. Cl. 15—383 **4 Claims**

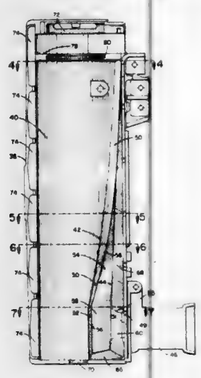
1. An agitator housing for a floor care appliance including an air and entrained dirt entrance disposed at least partly around its periphery and having;

(a) an elongated chamber in said agitator housing, and having a rearwardly located suction opening communicating with said elongated chamber and through which said air and entrained dirt leave said chamber,

(b) an agitator rotatably mounted in said chamber and tending to drive at least a portion of said air and entrained dirt, after its entrance about said periphery, in a generally

circular path between said chamber and said agitator and about the axis of rotation of the latter,

(c) a ledge exterior to said chamber communicating with said chamber and formed by a recess in the wall of said agitator housing exteriorly of said chamber and extending longitudinally thereof, said ledge being slanted upwardly towards the front of said chamber in the longitudinal direction to interrupt the driven movement of the air and



entrained dirt in said path and to deflect said air and entrained dirt toward said rearwardly located suction opening, and

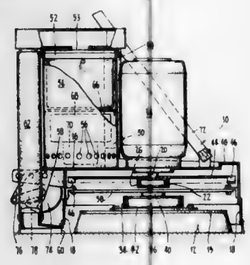
(d) said agitator for driving air being disposed forwardly of said ledge and said rearwardly located suction opening, and in the flowpath of said air and entrained dirt from said entrance disposed around the periphery of said agitator housing to tend to carry, by its rotation, said air and entrained dirt against said ledge.

4,178,654

FLOOR POLISHING MACHINES

Alfred Mitchell, Montrose, Australia, assignor to Alfred Mitchell, Montrose, Australia

Filed Oct. 26, 1977, Ser. No. 845,677
Claims priority, application Australia, Nov. 29, 1976, PC8282
Int. Cl.[2] A47L *11/202*
U.S. Cl. 15—385 **5 Claims**



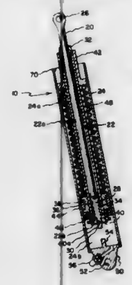
1. A floor polishing machine comprising a housing having an upper substantially horizontal surface and a substantially vertical wall extending around the periphery of the upper surface, a ground engaging skirt depending from the vertical wall and being provided with air inlet means for admitting air to the interior of the housing, a rotary polishing means located within the housing, drive means arranged to rotate the polishing means in a horizontal plane, a fan located within the housing and arranged to be rotated in a horizontal plane when the polishing means is rotated, means forming a channel in a major portion of the periphery of the housing and open to the upper interior of the housing, the formed channel being of gradually increasing thickness to provide a gradually larger zone in cross-sectional area, and a particulate matter collection means in communication with the channel at its point of greatest cross-sectional area, whereby, when the polishing means is rotated the simultaneous rotation of the fan produces an updraught around the entire periphery of the polishing means so as to direct particulate matter into the channel in the periphery of the housing for removal through the particulate matter collection means.

4,178,655

COUNTERBALANCE MECHANISM

Carl H. Little, St. Louis, Mo., assignor to Weber-Knapp Company, Jamestown, N.Y.

Filed Oct. 12, 1978, Ser. No. 950,560
Int. Cl.[2] E05F *3/00*
U.S. Cl. 16—52 **5 Claims**



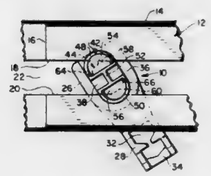
1. A counterbalance mechanism comprising in combination:
an outer cylinder having a closed inner end and an open outer end;
an inner cylinder telescopically received within said outer cylinder and having open inner and outer ends;
first means fixed adjacent said outer end of said outer cylinder for slidably supporting said outer end of said inner cylinder;
an outer piston head fixed to said inner cylinder for slidably supporting said inner end of said inner cylinder within said outer cylinder and for dividing said outer cylinder into first and second axially spaced chambers, said first chamber being arranged intermediate said outer piston head and said first means, said second chamber being arranged intermediate said outer piston head and said inner end of said outer cylinder;
resilient means disposed in said first chamber;
a piston rod telescopically received within said inner cylinder;
second means for slidably supporting an outer end of said piston rod;
an inner piston head fixed to an inner end of said piston rod for slidably supporting said inner end of said piston rod within said inner cylinder and for dividing said inner cylinder into first and second axially spaced chambers;
a charge of hydraulic fluid disposed in at least one of the second chambers and said second chambers being disposed in flow communication through said inner end of said inner cylinder, said mechanism being characterized as having a piston rod contracted condition, wherein said second chambers of said outer and inner cylinders have maximum and minimum values, respectively, and a piston rod extended condition wherein said second chambers of said outer and inner cylinders have minimum and maximum values, respectively, and in that said resilient means tends to move said outer piston head and said inner cylinder towards said inner end of said outer cylinder for placing said mechanism in said piston rod extended condition.

4,178,656

GLIDE FOR DRAPERY TRAVERSE ROD

Walter J. MacFarlane, Kensington, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Dec. 11, 1978, Ser. No. 968,266
Int. Cl.[2] A47H *15/00*
U.S. Cl. 16—93 D **10 Claims**



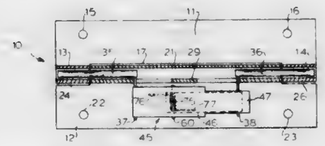
1. A drapery hook support glide for mounting on the slotted track of a drapery rod comprising an upper glide body portion vertically positionable on the exterior of the rod, a head portion positionable within the interior of the rod, a neck portion integrally connecting said body and head portions and positionable within the track slot, and a lower pendant portion for supportably mounting a drapery hook, said pendant portion integrally depending from said upper body portion, said head portion being elongated and having a longitudinal dimension greater than the width of said track slot to provide retentive engagement with the interior of said rod when said body portion is vertically positioned and a transverse dimension less than the width of said slot to permit passage of said head portion therethrough when said body portion is horizontally positioned, said neck portion having interference means thereon for engaging said track upon movement of said body portion out of said vertical position to resist inadvertent movement into said horizontal position and prevent accidental release of said head portion from said rod, said interference means permitting rapid mounting of the glide on the track intermediate the ends of the rod.

4,178,657

SEPARABLE HINGE

Lee V. Way, Jr., Rte. 4, Box 185F, Sumter, S.C. 29150

Filed Nov. 29, 1978, Ser. No. 964,498
Int. Cl.[2] E05D *7/10*
U.S. Cl. 16—173 **4 Claims**



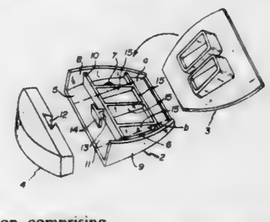
1. A separable hinge, comprising:
(a) a first rectangular hinge plate formed on one side thereof with a central rectangular notch and a pair of aligned hinge pin receiving tubular portions at opposite ends of said plate adjacent said notch;
(b) a second rectangular hinge plate formed on one side thereof with an outwardly extending central hinge pin receiving tubular portion adapted to fit within said first plate notch between said pair of first hinge plate tubular portions to be aligned therewith;
(c) a pair of hinge pins mounted within said second hinge plate tubular portion, said pins being adapted when said first and second plate tubular portions are aligned to be moved outwardly from said second plate tubular portion to enter said first plate tubular portions to effect an assembly of said plates and to be moved inwardly to retract completely within said second plate tubular portion to allow said plates to be disassembled; and
(d) an actuating mechanism mounted on said second hinge plate and comprising a pivotal lever and associated linkage connected to said pins at the inner ends thereof and being adapted when said lever is rotated fully in one direction to cause said pins to retract within said second hinge plate tubular portion to allow the assembled plates to be separated and when rotated fully in the opposite direction to allow said plates when said tubular portions are aligned to be assembled by causing said pins to move outwardly from said second hinge plate tubular portion into said first hinge plate tubular portions to effect an assembly of said hinge.

4,178,658

DOOR STOP WITH REMOVABLE DAMPING MEMBER

Pierre Gergonne, Oyannax, France, assignor to Etablissements Gergonne, Oyannax, France

Filed Jun. 27, 1978, Ser. No. 919,493
Claims priority, application France, Jun. 29, 1977, 77 19995
Int. Cl.[2] E05F *5/02*
U.S. Cl. 16—86 A **7 Claims**



1. A door stop, comprising
(a) a rigid body member including a planar horizontal bottom wall, a pair of generally parallel vertical side walls, and a vertical partition extending between and normal to said side walls, said partition being spaced from one end edge of said bottom wall, thereby to define a recess adjacent one end of said body member;
(b) resilient damping means extending within said recess in contiguous relation with said partition;
(c) connecting means removably connecting said damping means with said body member; and
(d) a cover member removably connected with said body member for retaining said damping means within said body member recess.

4,178,659

TRANSFER APPARATUS FOR POULTRY PROCESSING CONVEYOR

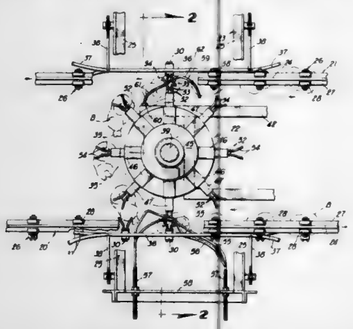
Michael E. Simonds, Gainesville, Ga., assignor to Stork Gamco, Inc., Gainesville, Ga.

Filed Oct. 31, 1977, Ser. No. 847,086
Int. Cl.[2] A22B *5/00*
U.S. Cl. 17—24 **10 Claims**

1. A transfer apparatus comprising spaced oppositely moving conveyors each having a line of spaced article carriers, an intervening rotary transfer conveyor having spaced article carriers arranged to coact in succession with article carriers on the oppositely moving conveyors, and relatively stationary cam means adjacent to article transfer points between the oppositely moving and rotary transfer conveyors and engageable with articles at the transfer points to force them from the article carriers of one first-named conveyor to the article carriers of the rotary transfer conveyor and from the article carriers

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of the latter to the article carriers of the other of said first-named oppositely moving conveyors, and said oppositely moving conveyors comprising a pair of substantially parallel linear conveyors disposed at different elevations relative to said rotary transfer conveyor, and said line of spaced article carriers on each oppositely moving linear conveyor including



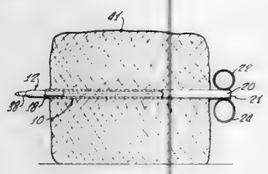
a plurality of equidistantly spaced article suspension shackles, said rotary transfer conveyor having plural circumferentially equidistantly spaced article suspension shackles adapted to register in succession with the shackles of the linear conveyors at two diametrically opposite article transfer points on said apparatus.

4,178,660

METHOD AND APPARATUS FOR INTRODUCING AND DISTRIBUTING FOOD ADDITIVES IN MEATS

Alvin A. Olney, and Rachel I. Olney, both of P.O. Box 1642, Newport Beach, Calif. 92663

Filed Mar. 27, 1978, Ser. No. 890,040
Int. Cl.[2] A22C *17/00*
U.S. Cl. 17—42.1 **3 Claims**



1. Apparatus for introducing and distributing additives into a body of meat consisting of, in combination:

(a) a rigid unitary cylindrical tube having an inside diameter between about 3/16 inch and about 7/16 inch, said tube having a circular opening at each end and having a length sufficient to extend entirely through said body of meat and having an interior cavity adapted to contain a supply of additives, said tube having a distributing end portion and an outer end portion;

(b) an elongated sealing member adapted for detachable connection to the distributing end portion of said tube, said sealing member consisting of:

(i) a sealing end portion adapted to fit within and seal the circular opening of the distributing end portion of said tube and prevent leakage of additives therefrom, said sealing end portion being a solid cylinder whose diameter is just sufficiently smaller than the internal diameter of said cylindrical tube to fit snugly therein,

(ii) a mid portion consisting of a solid cylinder having a diameter intermediate the internal and external diameters of said cylindrical tube, said mid portion being integrally connected with said sealing end portion and in axial alignment therewith, said mid portion terminating at the interconnection with said sealing end portion to form a radially extending shoulder perpendicular to the axis of said mid portion, and

(iii) a pointed end portion having a sharpened tip adapted to be forced through and to penetrate said body of meat without excessive destruction of tissue thereof, said pointed end portion consisting of a tapered solid section ranging in length between about 1.5 and about 3.5 diameters of said cylindrical tube, said tapered section being integrally connected in axial alignment with said mid portion, said tapered section tapering smoothly down from the diameter of said mid portion symmetrically about a straight linear axis to a pointed tip; and

(c) an elongated piston means adapted to fit within the cylindrical opening of the outer end portion of said tube and to substantially seal said outer end portion against leakage of additives therefrom and to displace additives from said interior cavity of said tube through said distributing end portion when said tube is moved axially and concentrically about said piston means.

4,178,661

SELF-CLEATING ROPE HOLDER

Keith W. Klein, 18 Walker Dr., Simsbury, Conn. 06070

Filed Jun. 1, 1978, Ser. No. 911,374
Int. Cl.[2] F16G *11/00*
U.S. Cl. 24—130 **3 Claims**



1. A holder for adjustably belaying the free end of a rope or the like, said holder comprising, in combination:

A. an elongated body of sheet stock having first and second opposed ends;

B. means defining a first enclosed aperture in said body at a location spaced from said first end, said first aperture accommodating the passage therethrough of the free end of a rope running to an object to be secured;

C. means defining a second enclosed aperture in said body at a location adjacent said second end thereof, said second aperture having a non-binding edge adjacent said second end, said second aperture accommodating the passage therethrough of the rope free end extending from said first aperture;

D. means defining a V-shaped slot in said body intermediate said first and second apertures, the wide end of said V-shaped slot being in open communication with said second aperture and the narrow end thereof terminating short of said first aperture, the edge of said first aperture adjacent said slot narrow end being a non-binding, generally laterally extending edge, the portions of the body that include said first aperture and said slot forming a generally coplanar mid-section, the portion of said body bounding the side of said second aperture opposite said slot being bent out of the plane of said body mid-section to the side where the rope free end portion extending between said first and second apertures is located; and

E. a portion of said body intermediate said first end and said first aperture being turned back on itself to form a hook accommodating attachment to a stationary object,

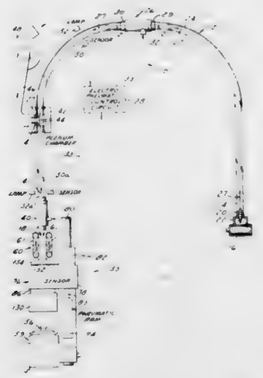
F. whereby the first end of the rope is pulled in a direction away from the stationary object and generally toward the secured object in reflex fashion to draw the rope freely through the first and second apertures to a desired tension, whereupon the rope free end is wedged in said slot to maintain the desired rope tension on the secured object.

4,178,662

SPARK PLUG CONVEYOR AND ASSEMBLING MEANS

Daniel J. Borodin, Detroit, Mich., assignor to U.S. Automation Company, Warren, Mich.

Filed Jun. 5, 1978, Ser. No. 912,192
Int. Cl.[2] B65G *51/02;* **H01J** *21/02*
U.S. Cl. 29—25.2 **23 Claims**



1. A pneumatic conveyor adapted for transferring fragile parts at high speed comprising a hollow pneumatic transfer line having an upstream end adapted to receive parts to be transferred and a downstream end from which the parts are discharged, first pneumatic vacuum pump means disposed in said line between said ends for generating a first high velocity air stream in said line to propel a part from said upstream end toward said downstream end, second pneumatic vacuum pump means disposed in said line adjacent said downstream end for generating a second high velocity air stream in said line in opposition to said first stream to decelerate a part approaching said downstream end, and means connected to said line between said first and second pump means for exhausting said first and second air streams from said line.

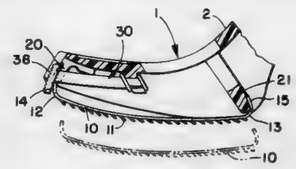
4,178,663

HAND SCRAPER

Robert R. Hayes, Euclid, Ohio, assignor to Oatey Co., Cleveland, Ohio

Filed Aug. 14, 1978, Ser. No. 933,501
Int. Cl.[2] B23D *71/00, 71/04;* **B24D** *15/04*
U.S. Cl. 29—78 **14 Claims**

1. A tool holder for a scraping or cutting blade having mounting tabs at opposite ends thereof, said tool holder comprising a body portion having a pair of longitudinally spaced transversely extending blade retaining ribs thereon, said ribs being oppositely angularly disposed and extending downwardly and outwardly from the underneath side of said body portion, the longitudinal spacing between said retaining ribs being slightly greater than the spacing between the mounting



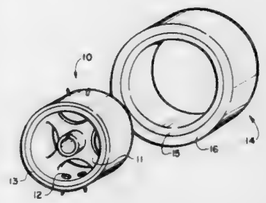
tabs on the blade, at least one of the retaining ribs being somewhat flexible to permit slight inward flexing of said one retaining rib during assembly of the blade mounting tabs onto said retaining ribs for retaining the blade on said tool holder.

4,178,664

ROLLER WITH REPLACEABLE SLEEVE

Nelson E. McLoughlin, P.O. Box 47, Newell, N.C. 28126

Filed Jul. 17, 1978, Ser. No. 925,037
Int. Cl.[2] B21B *31/08*
U.S. Cl. 29—130 **3 Claims**



1. A roller having a readily replaceable sleeve, comprising:

A cylindrical metal roller having a layer of rubber-like material fixedly secured to the outer peripheral surface thereof;

A cylindrical removable sleeve adapted to longitudinally slide onto said metal roller and maintain a concentric relationship therewith, said removable sleeve comprising an inner paper fiber sleeve for slidably receiving said metal roller and frictionally engaging the outer peripheral surface thereof so as to rotate with said metal roller, and a surface coating sleeve of a rubber-like material fixedly secured to the outer surface of said paper fiber sleeve; and

A pointed steel locking nut, said locking nut being die-tapped into said metal roller and extending radially outwardly therefrom through said metal roller and the peripheral surface layer thereof, and with the point of said locking nut extending into the inner paper fiber sleeve of said removable sleeve so as to assist in preventing relative rotational and longitudinal movement between said metal roller and said removable sleeve.

4,178,665

METHOD OF MAKING A FABRICATED GATE VALVE

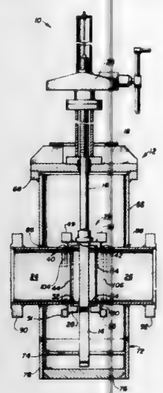
Willard E. Kemp, and Bert L. Morrison, both of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Continuation of Ser. No. 734,155, Oct. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 623,236, Oct. 17, 1975, abandoned. This application Jan. 9, 1978, Ser. No. 868,008
Int. Cl.[2] F16K *27/10;* **B23K** *28/02*
U.S. Cl. 29—157.1 R **3 Claims**

1. A method of making a fabricated gate valve body structure, comprising the following steps:

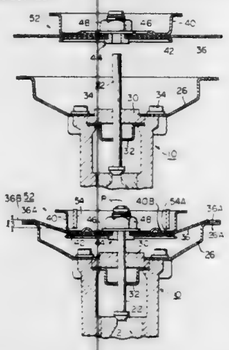
(a) forming a pair of openings through a hollow cylindrical

body member with the openings being in axial transverse alignment;
(b) inserting a straight continuous conduit through the openings to position the conduit in extension through the body member with opposite ends of the conduit spaced outwardly of the body member;
(c) welding the conduit to the body member about each opening with the conduit in a single integral piece;
(d) stress relieving the welds by heating the body member and conduit at a predetermined elevated temperature for a predetermined time then cooling with the conduit in a single integral piece to minimize thermally induced distortion, whereby the conduit is maintained in a straight condition;
(e) thereafter cutting and removing an intermediate segment of the conduit within the body member to form a pair of outer conduit segments which have inner ends spaced apart inside of the body member and which are axially aligned due to the straight condition of the conduit from which the outer conduit segments are formed;
(f) providing a pair of seat support members each having a cylindrical inside surface which presents in an inner end portion thereof a seat pocket of a predetermined depth for receiving a valve seat;
(g) forming in the inside surface of each seat support member



an annular groove having a depth substantially equal to said predetermined depth and located to provide on the inner side of the groove an annular seat supporting lip adjacent the seat pocket and on the outer side of the groove an annular cantilever beam which is substantially equal in size to the lip and which is capable of flexing at the groove relative to the lip to minimize distortion of the lip;
(h) welding a pair of opposed side members to the seat support members to space the support members a predetermined distance apart with the seat pockets in opposition to one another for receiving a gate valve member therebetween;
(i) welding a cylindrical inner conduit segment to the cantilever beam of each seat support member in outward extension therefrom to form a prefabricated seat support assembly which is separate from the body member;
(j) stress relieving the seat support assembly by heating at a predetermined elevated temperature for a predetermined time then cooling with the seat support assembly separate from the body member;
(k) inserting the seat support assembly in the body member with ends of the inner conduit segments abutting the inner ends of the outer conduit segments; and
(l) welding the inner conduit segments to the outer conduit segments from the inside of the conduit segments to mount the seat support assembly in the body member.

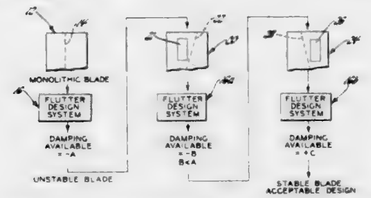
4,178,666
METHOD OF ASSEMBLING A VALVE DEVICE FOR AN EXHAUST GAS RECIRCULATION SYSTEM OF AN INTERNAL COMBUSTION ENGINE
Masahisa Ando, Aichi; Keigo Katow, Toyota, and Masami Yamazaki, Toyokawa, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Division of Ser. No. 696,856, Jun. 16, 1976, Pat. No. 4,120,480.
This application Apr. 20, 1978, Ser. No. 898,123
Claims priority, application Japan, Feb. 24, 1976, 51/18419
Int. Cl.[2] B23P *15/00;* **F16K** *27/00;* **F16J** *3/02*
U.S. Cl. 29—156.7 R **8 Claims**



1. A method for assembling a valve device for an exhaust gas recirculation system of an internal combustion engine, which device includes a body having passageways connected to an engine, a valve member between said passageways and a diaphragm mechanism connected to said valve member through a rod slidably supported by said body, said diaphragm mechanism includes a casing having a first half secured to said body and a second half secured to said first half, and a diaphragm arranged between said halves so as to form at least one chamber which should be connected to an engine port, said method comprising the steps of:
(a) forming a sub-assembly comprised of said diaphragm sandwiched between a set of plates by means of a sleeve member having a flange portion and a stem portion extending through the diaphragm and the plates, and of a nut member screwed to said stem portion with the diaphragm and the plates held securely between the nut member and the flange portion;
(b) inserting said sleeve member of said formed sub-assembly onto said end of said rod, until a peripheral portion of said diaphragm is rested on a flange portion of said first half of said casing which is secured to said body;
(c) displacing said sleeve member of said formed sub-assembly along said rod while clamping said peripheral portion of said diaphragm to said flange portion of said first half of said casing, in such a manner that the set of plates and the portion of the diaphragm sandwiched therebetween are located in a predetermined position with respect to the first half by means of a positioning member so that said sleeve member is located in a desired position on said rod;
(d) fixedly securing said sleeve member to said rod at the desired position; and
(e) mounting said second half of said casing to said first half of said casing in such a manner that said peripheral portion of said diaphragm is secured between said flange portion of said first half of said casing and a flange portion of said second half of said casing, whereby such a valve device,

capable of being opened at a predetermined constant vacuum level, is obtained.

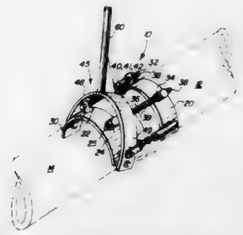
4,178,667
METHOD OF CONTROLLING TURBOMACHINE BLADE FLUTTER
Eloy C. Stevens, Indianapolis, and Kenneth Swain, Lizton, both of Ind., assignors to General Motors Corporation, Detroit, Mich.
Filed Mar. 6, 1978, Ser. No. 883,688
Int. Cl.[2] B23P *15/02;* **G01M** *1/32*
U.S. Cl. 29—156.8 B **3 Claims**



1. A method for controlling the first torsional node line position in a rotatable blade of a turbomachine to improve its flutter stability including the steps of: forming a first monolithic blade having an airfoil shape with convex and concave side walls; arranging several of the monolithic blade shapes in a cascade array and subjecting the cascade array to an unsteady flow condition and thereafter determining the unsteady surface pressure forces acting on the monolithic blades; independently determining the first torsional node line of each of the monolithic blades and comparing the resultant surface pressure force on the monolithic blades and its relationship to the first torsional node line to determine whether or not the monolithic blade is absorbing or adding energy to the air flow thereacross; thereafter forming a plurality of first and subsequently modified composite blades by adding dissimilar material to the blade shape of said monolithic blade within the confines of its convex and concave side walls with the location of the dissimilar material and the amount of the dissimilar material being determined by subjecting the first composite blade and modifications thereof to unsteady flow conditions while the first composite blades and modification thereof are located in a cascade array to determine the resultant unsteady surface pressures thereon and comparing such unsteady surface pressures to the location of an independently determined first torsional vibration mode node line positions of the first composite blades and modifications thereof so as to optimize the location of their first torsional vibration mode node line with respect to unsteady surface pressures produced thereon under unsteady flow conditions so as to produce a flutter stable blade.

4,178,668
PIPE TOOL
Leroy George, 7915 W. Orangewood, Glendale, Ariz. 85301
Filed Jan. 6, 1978, Ser. No. 867,604
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—237 **2 Claims**

1. An apparatus for moving the hub end of a first pipe section into sealing engagement with the spigot end of second pipe section having an annular seal thereon when said ends are placed in abutment, said apparatus comprising:
(a) a first generally semi-circular collar adapted to complementarily engage the outer diameter of said first section of pipe in a position in abutment with said hub;
(b) a generally semi-circular bracket adapted to complementarily engage the outer diameter of said second pipe section at a position immediately adjacent and in abutment with said annular seal;
(c) a yoke having an intermediate bight section and oppositely disposed arm sections positioned at opposite ends of said bight section and depending therefrom, each of said arms being pivotally connected to said bracket at opposite sides of said bracket along a common axis which is transverse to said pipe sections;
(d) handle means carried on said yoke for pivotally actuating said yoke;
(e) compressible means extending between said bracket means and said collar means for maintaining said bracket and collar in proper spaced relationship; and



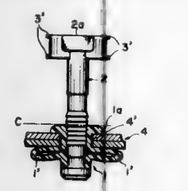
(f) a crank assembly interconnecting said yoke and said collar means, said crank assembly comprising:
(i) a clevis pivotally attached to said yoke means;
(ii) a pivot socket carried on said collar; and
(iii) adjustable means interconnecting said clevis, and said collar for adjusting the relative spacing between said collar and said bracket whereby pivotal movement of said crank will exert a generally axial pipe joining force through said crank assembly urging said pipe sections into sealing engagement.

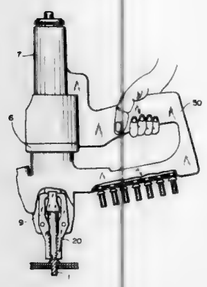
4,178,669
METHOD FOR CONTINUOUSLY FIXING A PLURALITY OF TUBULAR FASTENERS ONE BY ONE TO A PLURALITY OF APERTURES PROVIDED IN A SUPPORT PANEL
Kunio Hara, Kawasaki, and Kohsaku Yoshida, Funabashi, both of Japan, assignors to Nichi-Ei Bussan Co., Ltd., Tokyo, Japan
Division of Ser. No. 738,463, Nov. 3, 1976, Pat. No. 4,131,009.
This application Mar. 13, 1978, Ser. No. 885,979
Claims priority, application Japan, Nov. 14, 1975, 50-136154
Int. Cl.[2] B23P *17/00*
U.S. Cl. 29—412 **4 Claims**

3. A method for continuously feeding and operatively applying pull-lock blind fasteners each having a shaft with a head at one end and a flanged collar carried by the other end comprising the steps of:
(a) providing a fastener fixing means having a fastener loading groove at the forward end thereof;
(b) continuously feeding fasteners successively into the fastener loading groove of the fastener fixing means;
(c) reciprocally stroking the fastener fixing means;
(d) press fitting the flanged collar portion of the loaded fastener into an aperture during the forward stroke of the fastener fixing means;
(e) pulling up the shaft portion of the fastener during a first portion of the rearward stroke of the fastener fixing means to thereby lock the fastener in that aperture;
(f) severing the shaft at a point rearward of the flange of the fastener collar during a second portion of the rearward stroke of the fastener fixing means;

V 9 8 9 3 D E 1 8 7 9 UMI

(g) loading the next succeeding fastener into the fastener loading groove of the fastener fixing means and removing





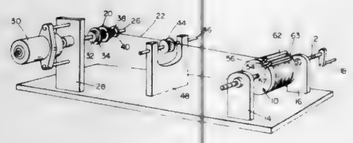
the severed portion of the fastener during a third portion of the rearward stroke of the fastener fixing means.

4,178,670

PROCESS OF FORMING A WIRE PACK

Frederick Schmid, Marblehead, Mass., assignor to Crystal Systems, Inc., Salem, Mass.

Filed Jun. 22, 1978, Ser. No. 917,918
Int. Cl.² B23P *17/00*
U.S. Cl. 29—417 **9 Claims**



1. The process of forming a wire pack in which a plurality of wires of predetermined length extend between a pair of spaced supports comprising:

wrapping a plurality of turns of wire in a helix arounnd an axially-extending portion of the periphery of a roll while exerting on the wire drag in the direction opposite to the direction of movement of wire passing onto the roll;

placing each of said pair of supports in a respective position spaced from the other of said supports, and extending generally axially of the roll;

fixing each of the plurality of turns of wire wrapped around the roll to each of said pair of supports; and

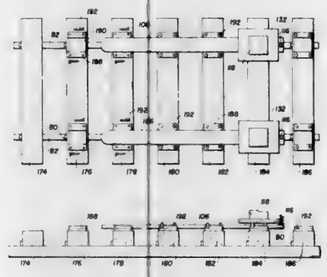
cutting wire segments extending between the spaced pair of supports.

4,178,671

TIE PREPLATING METHOD AND APPARATUS

Dale Luttig, Rte. 1, Emmett, Kans. 66422

Filed Aug. 4, 1977, Ser. No. 821,666
Int. Cl.² B23P *19/04;* **E01B** *29/32*
U.S. Cl. 29—429 **31 Claims**



1. A tie preplater for aligning and securing a pair of rail plates to a rail tie comprising:

means for conveying rail ties along a path;

means along said path for aligning the rail seat of a pair of rail plates relative to each other while positioned on a moving respective rail tie; and

means along said path for securing said aligned rail plates to said rail tie by fasteners.

24. A method of securing a pair of rail plates to a rail tie comprising:

conveying said rail tie along a path;

positioning a pair of rail plates on said rail tie;

temporarily attaching said positioned rail plates to said rail tie to travel thereon;

aligning the rail seat of said rail plates relative to each other on said rail tie during the conveying of said rail tie; and

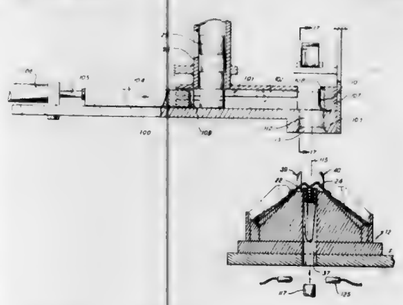
securing said aligned rail plates to said rail tie.

4,178,672

APPARATUS FOR ASSEMBLING AND BANDING AN EXPANSION SHELL

Raymond F. Amico, 8235 Bitternut La., Liverpool, N.Y. 13088, and Peter J. Amico, 4854 Glenfield Dr., Syracuse, N.Y. 13215

Filed May 17, 1978, Ser. No. 906,823
Int. Cl.² B23P *11/02, 19/02*
U.S. Cl. 29—430 **14 Claims**



7. Apparatus for assembling and banding together the components of an expansion shell including

a die arranged to support the shell components in a predetermined alignment thereon,

a forming gage positioned over the die having a passage passing therethrough for conforming the shell components supported upon said die into an assembled relationship when passed therethrough,

a banding means positioned adjacent to the exit to said passage in the forming gage for positioning a resilient sleeve over the exit of said passage whereby the assembly moved through the gage is passed into said sleeve, and

a dejector for moving the shell components aligned on said die through the passage in the forming gage whereby the components are brought into an assembled relationship and are banded together.

12. The method of assembling and banding together the components of an expansion shell made up of a wedging nut, two shell halves and a strap, the method including

automatically loading the components into a die so that the components are supported in alignment therein,

moving the aligned components from said die through the passage of a forming gage whereby the components are brought into a desired assembly with the shell halves symmetrically positioned on either side of the wedging nut, and

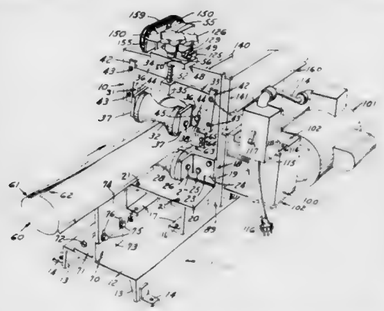
passing the assembly as it leaves the passage of the forming gage into a resilient sleeve for supporting the components in assembly.

4,178,673

PIPE SNAPPER MACHINE AND METHOD

Eugene S. Swanson, and Joel M. Winters, both of Rockford, Ill., assignors to Rockford Machine Tool Co., Rockford, Ill.

Filed Jul. 14, 1978, Ser. No. 924,468
Int. Cl.² B23P *11/02, 19/00*
U.S. Cl. 29—453 **14 Claims**



1. In a pipe assembly machine for assembling a finished pipe from a rectangular pipe blank having either a flat or rounded cross section and having a male lock joint member along one longitudinal edge and a female lock joint member along the other longitudinal edge, the combination comprising:

(a) a base member;

(b) a vertical support member on said base member having a front side and a rear side, and a pipe passage formed therethrough;

(c) a pair of spaced apart idler rollers on the front side of said vertical support member for receiving the hand elastically folded and hand assembled leading end of a pipe blank therebetween and exerting pressure on one axis on the pipe blank perpendicular to a plane through the assembled lock joint members; and,

(d) a pair of spaced apart power driven rollers on the rear side of said vertical support member for engaging said leading end of said pipe blank and pulling the pipe blank between the driven rollers and exerting pressure on another axis on the pipe blank perpendicular to the axis of pressure exerted by the idler rollers so as to assemble the male and female lock joint members together.

14. A method for assembling sheet metal pipes from a preformed pipe blank having a male lock joint member along one longitudinal edge, and a female lock joint member along the other longitudinal edge, comprising the steps of:

(a) manually elastically folding a leading end of the pipe blank so as to move the longitudinal edges toward each other;

(b) manually inserting the leading end of the male lock joint member into the female lock joint member on a vertical plane;

(c) encircling the leading end of the pipe blank with a first pair of rollers which are disposed on nonparallel axes to exert pressure on the pipe blank on a vertical plane; and,

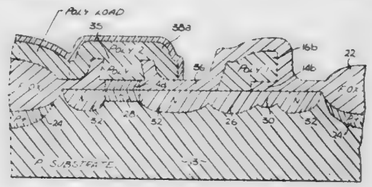
(d) moving the leading edge of the pipe beyond the first pair of rollers and between a second pair of rollers which are disposed on parallel axes to exert a pressure on the pipe blank on a horizontal plane and effect the assembly of the male lock joint into the female lock joint as the pipe blank is moved through the second pair of rollers.

4,178,674

PROCESS FOR FORMING A CONTACT REGION BETWEEN LAYERS OF POLYSILICON WITH AN INTEGRAL POLYSILICON RESISTOR

Sheau-Ming S. Liu, Sunnyvale; William H. Owen, III, Mountain View, and Richard D. Pashley, Sunnyvale, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Mar. 27, 1978, Ser. No. 890,139
Int. Cl.² B01J *17/00*
U.S. Cl. 29—571 **6 Claims**



1. In the processing of an MOS integrated circuit on a silicon substrate which circuit includes first and second polysilicon layers, an improved process for providing a polysilicon resistor formed from said second polysilicon layer in contact with a selected member formed from said first polysilicon layer, comprising the steps of:

forming said first polysilicon layer;

forming a silicon nitride layer overlying said first polysilicon layer;

defining a plurality of patterns in said silicon nitride layer;

etching a plurality of members in said first polysilicon layer corresponding to said patterns;

selectively removing said patterns, leaving in place at least a portion of one of said patterns over said selected member;

growing an oxide layer on said substrate;

removing from said selected member the remaining pattern formed from said silicon nitride layer;

forming said second polysilicon layer;

doping said second polysilicon layer to obtain a predetermined resistivity;

forming a mask over a portion of said second polysilicon layer, said portion corresponding to said polysilicon resistor;

again doping said second polysilicon layer such that the doping level under said mask is substantially unchanged;

forming at least one line from said second polysilicon layer which includes said portion of said second polysilicon layer corresponding to said polysilicon resistor and which overlies said selected member;

whereby a polysilicon resistor formed from said second polysilicon layer contacts said selected member formed from said first polysilicon layer.

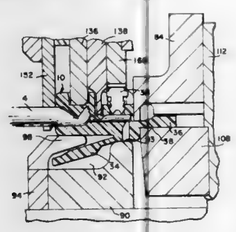
V 9 8 9 K 3 DEC 18 79 UMI

4,178,675

APPLICATOR FOR TELEPHONE CONNECTORS

Howard C. Phillips, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 12, 1978, Ser. No. 895,556
Int. Cl.[2] B23P *23/00*
U.S. Cl. 29—566.1 **6 Claims**



1. Apparatus for installing a connector on a cable, said connector comprising an insulating housing having a mating end and a cable-receiving end, said ends being oppositely directed, said housing having a top wall, a bottom wall, and sidewalls extending between said ends, a cable-receiving cavity extending into said cable-receiving end towards said mating end, a plurality of side-by-side contact members partially inserted into said top wall adjacent to said mating end, and inwardly deformable strain-relief portions in said top wall adjacent to said contact members, said connector extending from a continuous strip of identical connectors, said strip comprising a carrier strip having said connectors extending laterally from said carrier strip at spaced apart intervals, said apparatus comprising:

frame means, a connector application zone and a first ram in said frame means, said ram being reciprocable towards and away from said application zone, strip feeding means for feeding said strip towards said application zone thereby to position the leading connector of said strip in said zone,

deforming tool means on said first ram, said deforming tool means being engageable with said deformable strain-relief portions of a connector in said application zone upon movement of said first ram from a retracted position towards said application zone, stop means effective between said frame means and said first ram, said stop means being effective to stop motion of said first ram after inward deformation of said strain relief portions of said connector,

a second ram which is reciprocable towards and away from said application zone, contact insertion tool means on said second ram, said contact insertion tool means being engageable with said contact members upon movement of said second ram towards said application zone thereby to drive said contact members into said housing,

compressible coupling means serving to couple said second ram to said first ram whereby,

upon positioning a connector in said application zone, inserting a cable into said cable-receiving cavity and upon movement of said second ram towards said application zone, said first and second rams initially move towards said zone and said strain-relief portions of said connector are inwardly deformed whereby said cable is clamped in said cavity and said first ram is stopped from movement by said stop, and said second ram continues to move towards said application zone with accompanying compression of said coupling means, and said contact members are driven into said housing and into electrical contact with the conductors of said cable and,

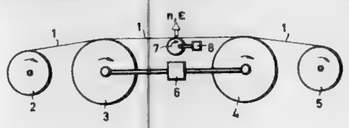
a connector aligning means for precisely aligning said leading connector of said strip so that said strain-relief portions and said contact members are positioned in alignment with said deforming tool means and said contact insertion tool means respectively, said connector aligning means comprising a primary aligning tool and a secondary aligning tool, said primary aligning tool being engageable with portions of said connector adjacent to said cable-receiving end and being effective to align said connector in an endwise sense, said secondary aligning tool being engageable with said sidewalls of said housing and being effective to align said connector in a sidewise sense.

4,178,676

METHOD FOR TREATING A SUPERCONDUCTOR

Cord-Henrich Dustmann, Leopoldshafen; Curt Schmidt, Karlsruhe, and Gabriel Pasztor, Eggenstein-Leopoldshafen, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed May 5, 1978, Ser. No. 902,907
Claims priority, application Fed. Rep. of Germany, May 5, 1977, 2720119
Int. Cl.[2] H01L *39/24*
U.S. Cl. 29—599 **3 Claims**



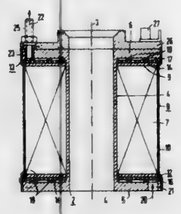
1. In a method of making a superconducting coil from a superconducting wire, including the step of winding the wire to form a coil, the improvement comprising the step of submitting said wire, prior to the winding step, to repeated tension-stressing of a predetermined stretch and a predetermined number of cycles.

4,178,677

SUPERCONDUCTING MAGNET ASSEMBLY AND METHOD OF MAKING

Hanns-Jörg Weisse, Erlangen; Wilhelm Jäger, Nüremberg, and Helmut Uhlmann, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,343
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1977, 2709300
Int. Cl.[2] H01F *7/06*
U.S. Cl. 29—605 **10 Claims**



1. A method of forming an impregnated superconducting magnet winding comprising:

(a) disposing a superconducting magnet winding on a coil form having a hollow cylindrical central part and washer-like end flanges, so as to leave a free space at each end between the winding and a respective end flange;

(b) disposing a disk containing a plurality of axial canals in each of said free spaces such as to form a subspace between each of said disks and a respective end flange;

(c) sealing the winding and spaces at the outer periphery thereof so as to form annular cavities at each of said subspaces between said disks and said end flanges thereby forming a manifold interior of each of said end flanges;

(d) forming an opening into each of said manifolds;

(e) feeding an impregnating medium through one of said openings to one of said manifolds whereby the medium will flow through said canals in the one disk, through said winding and the canals in said other disk to the other manifold; and

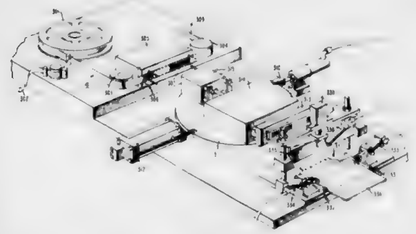
(f) removing excess impregnating medium through the other opening.

4,178,678

APPARATUS AND METHOD FOR AFFIXING BONDABLE FINGER CONTACTS TO A PRINTED CIRCUIT BOARD

Leo Carrillo, Denver, and Thomas C. Madden, Boulder, both of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 28, 1978, Ser. No. 891,039
Int. Cl.[2] B41M *3/08;* **H01R** *43/00;* **B32B** *31/00*
U.S. Cl. 29—625 **17 Claims**



1. A method for affixing bondable finger contacts to a printed circuit board wherein the finger contacts are formed out of a strip of electrically conductive material and interconnected by at least one support carrier, the finger contacts having an adhesive tape affixed to one side and a coat of thermally curable adhesive on an opposite side, CHARACTERIZED IN THAT the method includes the steps of

severing at a first station said support carrier;

transferring said finger contacts supported by said tape to a second station;

aligning at said second station said circuit board for engagement with said adhesive coating on said finger contacts; and

bonding said aligned finger contacts to said circuit board.

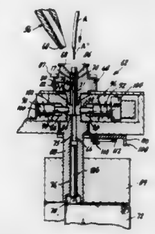
4,178,679

CONTACT CRIMPING MACHINE

Bernard Lichtenstein, 4-26 Second St., Fair Lawn, N.J. 07410

Filed Mar. 13, 1978, Ser. No. 885,768
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—715 **6 Claims**

1. An automatic crimping device for use with a pin having a wire-receiving seat axially aligned with an elongated point, said automatic crimping device comprising: a chamber including a gate with a port displaced from said gate; supply means for providing a continuous flow of said pins at said gate; positioning means for selectively displacing one of said pins through said chamber from a first location adjacent said gate to a second location discharged from said port; a housing including an entrance positioned to receive a pin discharged from said port, a bore axially aligned with said entrance, a plurality of crimping dies in normally spaced relation with each other and radially disposed about said bore below said entrance, actuating means mounted within said bore below said crimping dies, and means for selectively displacing one of said pins from a suspended position removed from said actuating means to an active position engaging said actuating means, when said pin is in said active position its wire-receiving seat being disposed within said bore radially aligned with said crimping dies; and circuit means coupled with said actuating means whereby



when said actuating means are engaged, said crimping dies are momentarily urged against the wire-receiving seat of said pin and after a time delay, said positioning means displace another of said pins into said second position.

4,178,680

WIRE WRAPPING DEVICE INCORPORATING RELEASABLE BIT LOCKING MECHANISM CONTROLLED BY INSERTION DEPTH OF TERMINAL

Jarrel D. Lyon, Oklahoma City, Okla., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,929
Int. Cl.[2] B21F *15/00, 3/04*
U.S. Cl. 29—751 **26 Claims**



1. A wire wrapping device for wrapping a conductive wire around and in intimate contact with an electrical terminal at a controllable location therealong, said device comprising;

a main housing for said device;

actuable drive means mounted within said housing;

stationary sleeve means secured to said housing, and having an opening extending through the wall thereof;

bit means mounted within said sleeve means, and including a longitudinally disposed, rotatable cylindrical member adapted to be operably driven by said drive means, the forward end of said cylindrical member forming a terminal-receiving recess, the length of which is controlled by a bit means base-defining member that is spring-biased and displaceable in the axial direction over at least a predetermined distance within said cylindrical member, said latter member also including a longitudinally extending slot formed in the wall thereof, and positioned to selectively communicate with the opening in said sleeve means, and

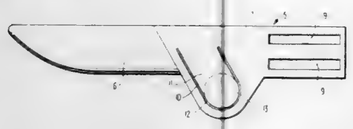
releasable locking means, including an actuably displaceable locking member, supported on said sleeve means, said locking member being adapted to have a portion thereof continuously positioned within the opening of said sleeve means, and another portion thereof selectively positioned within the slot of said cylindrical member, to lock the latter to the sleeve means, the actuable displacement of said locking member out of the cylindrical member slot being dependent on, and responsive to, a terminal to be wire wrapped being inserted within the terminal-receiving recess of said cylindrical member to a depth that causes the associated spring-biased, base-defining member to be displaced said predetermined distance.

4,178,681

KNIFE AND SUPPORT ELEMENT THEREFOR

Ulf Hanses, Borganäsvägen 20, 78100 Borlänge, Sweden

Filed May 2, 1978, Ser. No. 902,027
Claims priority, application Sweden, Nov. 3, 1977, 772240
Int. Cl.² B26B *29/02*
U.S. Cl. 30—151 **5 Claims**



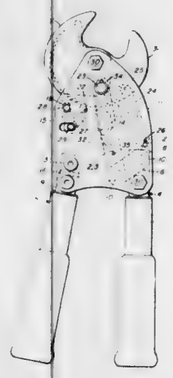
1. In a knife and sheath combination of the type wherein a knife is adapted to be inserted into and releasably latched in a sheath, the improvement wherein said knife comprises an elongated flat-sided handle of substantially uniform thickness having an elongated flat blade attached thereto, said handle being a substantially uniform width along a first portion of its length extending from the free end of said handle toward said blade, said first portion of said handle being substantially equal in width to the width of said knife blade, and said handle being widened outwardly along a second portion of its length to provide a flat-sided first flange which extends integrally from said handle beyond the cutting edge of said knife in a plane parallel to the plane of said blade at a location adjacent the junction of said handle and blade, said first flange having a cylindrical hole extending completely therethrough along an axis transverse to the plane of said knife blade and outwardly of said cutting edge, said hole being of sufficient diameter to permit the insertion of the finger of a user therein, said sheath comprising an elongated support member having a length substantially equal to that of said knife, said support member including a flat-sided sheath portion integral therewith for receiving said knife blade, said sheath portion extending from one end of said support member to an intermediate point on said support member and having a length substantially equal to the length of said knife blade, and said support member including a further flat-sided portion integral with said sheath portion and extending from said intermediate point on said support member to the other end of said support member, said further portion of said support member having a length substantially equal to the length of said knife handle, said further portion of said support member having a first section of substantially uniform width which is parallel to and underlies the uniform width portion of said flat-sided handle when said blade is fully inserted into said sheath portion, and a second section which is widened outwardly of said first section to provide an integral flat-sided second flange which is parallel to and underlies the said first flange of said knife handle when said blade is fully inserted into said sheath portion of said support member, at least part of said second flange being resiliently displaceable relative to said first flange, and a cylindrical protrusion integral with said second flange and extending upwardly therefrom toward said first flange of said knife handle along an axis which is substantially coincident with the axis of said cylindrical hole in said first flange when said blade is fully inserted into said sheath portion, said cylindrical protrusion having a diameter substantially equal to the diameter of said hole and having an upper surface which is inclined downwardly and outwardly relative to the said sheath portion of said support member whereby, when said knife blade is inserted into said sheath portion, said cylindrical protrusion on said second flange snaps into the cylindrical hole on said first flange from the lower end of said cylindrical hole to latch said knife to said support member, and said knife may be unlatched from said support member for removal from said sheath portion by insertion of the finger of a user into the upper end of said cylindrical hole to press against said inclined upper surface of said protrusion and to push said protrusion completely out of said hole by resilient displacement of said second flange on said support member relative to said first flange on said knife handle.

4,178,682

RATCHET CABLE CUTTER

Joseph J. Sadauskas, Marlboro, Mass., assignor to H. K. Porter, Inc., Somerville, Mass.

Filed Aug. 31, 1978, Ser. No. 938,401
Int. Cl.² B26B *13/26*
U.S. Cl. 30—250 **2 Claims**



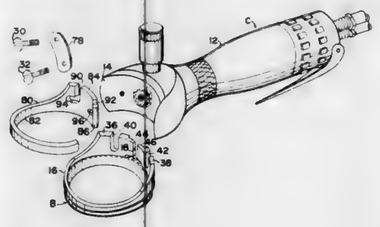
1. A ratchet cable cutter comprising, in combination, a stationary frame assembly having a stationary blade and a stationary handle assembly, a ratchet blade rotatably supported upon said frame, a driving handle assembly rotatably supported upon said frame, a drive lever rotatably supported upon said frame, a pawl rotatably supported upon said drive lever in cooperative relationship with said ratchet blade to drive said ratchet blade forward, a detent rotatably supported upon said frame assembly in cooperative relationship with said ratchet blade to restrain backward movement of said ratchet blade, and a drive link between said driving handle assembly and said drive lever.

4,178,683

KNIFE WITH REMOVABLE BLADE

Louis A. Bettcher, Amherst, Ohio, assignor to Bettcher Industries, Inc., Birmingham, Ohio

Continuation-in-part of Ser. No. 924,914, Jul. 17, 1978. This application Nov. 15, 1978, Ser. No. 960,966
Int. Cl.² A22C *17/04, 17/12*
U.S. Cl. 30—276 **6 Claims**



1. A hand knife suitable for use in the packing house and related industries comprising a handle assembly having a concave arcuate surface at one end with two tapped apertures opening thereinto, a drive gear adjacent to the arcuate surface of the handle assembly between the tapped apertures opening

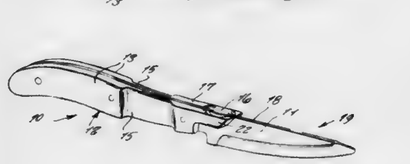
thereinto and rotatably supported in the handle assembly, a ring-like blade housing member of short axial length having portions of greater axial length at one end thereof having apertures therein, headed and threaded fasteners extending through the apertures in the housing member and threaded into the tapped aperture in the handle assembly detachably securing the housing member to the handle assembly, a ring-like blade member having an axial length about twice that of the housing member rotatably supported in the housing member and having a cutting edge at one end projecting from the housing member extending through an aperture therein and gear teeth at its opposite end in mesh with the drive gear, characterized by said knife having a split ring-like member within the blade thereof guiding the movement of a part of a product being severed from a product being processed in its movement through the blade connected to the handle assembly by the same fasteners which connect the housing member thereto and by the apertures in the housing member being slots opening into the end of the housing member opposite to the end from which the cutting edge of the blade projects, whereby the housing member and the blade carried thereby can be removed from the handle assembly without removing the fasteners connecting the housing member to the handle assembly.

4,178,684

COMFORT GRIP CUTLERY

Pamela Mightly, 1770 Grand Concourse Apt. #5D, Bronx, N.Y. 10457

Filed Apr. 10, 1978, Ser. No. 894,912
Int. Cl.² B25G *3/00*
U.S. Cl. 30—344 **2 Claims**



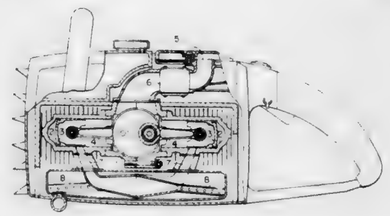
1. A comfort-grip cutlery, comprising in combination, a knife including a steel blade and a handle at one end of said blade, said handle being comprised of a pair of plates positioned on opposite sides of said blade therebetween, a single, longitudinally extending depression on an outer side of each said plate for receiving either a right or left hand thumb, said depressions extending a full length vertically between an upper and lower edges of said plates and extending across a longitudinally intermediate portion of said handle, and a depression upon an upper edge of said handle for receiving a finger tip, wherein the last said depression for receiving a finger tip on said handle upper edge is at a forward extension of the handle over the top of the blade and includes at the center of said finger tip depression a depression in the top of the blade, said finger tip depression being oval-shaped at its edge and downwardly inclining toward the center thereof.

4,178,685

CHAIN SAW

Hisashi Inaga, Tokyo, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Jul. 21, 1978, Ser. No. 926,994
Claims priority, application Japan, Jul. 29, 1977, 52-101778[U]
Int. Cl.² B23D *57/02*
U.S. Cl. 30—381 **2 Claims**



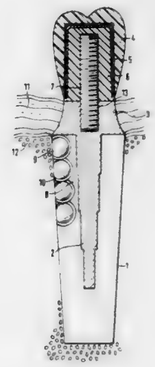
1. A chain saw comprising: a two-cycle opposed cylinder engine of simultaneous ignition type, said engine having at least a pair of cylinders which are made to oppose to each other in the back and forth direction; an intake system disposed in the space above said engine and including a carburetor and so on; an exhaust system disposed in the space below said engine; and a main body section of the chain saw having chain-saw handling handles disposed in the back and forth direction, said main body section being connected to and held by opposite end portions of said engine section through vibration-absorbing resilient members.

4,178,686

ARTIFICIAL TOOTH WITH IMPLANTABLE TOOTH ROOT

Guido Riess, Marienplatz 7, 8100 Garmisch-Partenkirchen, Fed. Rep. of Germany; Helmut Heide, Schwalbach, Fed. Rep. of Germany; Roland Reiner, Eschborn, Fed. Rep. of Germany; Kari Köster, Lorsbach, Fed. Rep. of Germany, and Günther Brötz, Stierstadt, Fed. Rep. of Germany, assignors to Guido Reiss, Garmisch-Partenkirchen, Fed. Rep. of Germany

Filed Jan. 6, 1978, Ser. No. 867,336
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1977, 2733394
Int. Cl.² A61C *13/00*
U.S. Cl. 433—201 **20 Claims**



1. An artificial tooth including an implantable tooth root, said tooth root being essentially constituted of a biostable

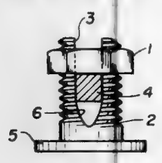
polymer matrix compatible with human tissue; reabsorbable, bioreactive calciumphosphate in finely dispersed form being introduced in said polymer matrix; a thin, porous layer of essentially non-reabsorbable calciumphosphate encompassing said bioreactive calciumphosphate; a core being inserted in said polymer matrix, said core forming connecting means for mounting of a dental superstructure thereon; and an intermediate member being arranged in the region of the tooth neck encompassed by the gingiva and extending between the tooth root and the dental superstructure, said intermediate member being constituted of a tissue-compatible material supportive of the sealing contact of the gingiva, said dental superstructure being shock-absorbingly connected with said tooth root.

4,178,687

CLAMP, PARTICULARLY FOR ORTHODONTIA

Melvin Wallshein, 8645 Bay Pkwy., Brooklyn, N.Y. 11214

Filed Feb. 28, 1977, Ser. No. 772,595
Int. Cl.[2] A61C *7/00*
U.S. Cl. 433—13 **15 Claims**



1. In combination with a rectangular orthodontic wire of given rectangular cross-sectional dimension, an orthodontic clamping device for clamping said rectangular orthodontic wire comprising:

a screw member having an external thread thereon;

a nut member having an internal thread which is threadably engageable with the external thread of said screw member;

said screw member having a notch thereacross to receive said rectangular orthodontic wire therethrough, the depthwise direction into said notch being at least generally towards one end of the thread on said screw member, said notch opening on a surface of said screw and having a first portion adjacent said opening which is defined by substantially flat and substantially parallel opposing walls which are spaced apart to receive said rectangular orthodontic wire therebetween with opposite flat surfaces of said rectangular orthodontic wire adjacent respective opposing substantially flat walls of said notch so that said wire is substantially non-rotational in said notch about the longitudinal axis of said wire, and said notch having a second bottom portion adjacent said first portion and remote from said opening, said second portion being generally V- or U-shaped and defined by inclined walls which are directed toward each other and toward the bottom of said notch, the inclination of said inclined walls of said second portion of said notch being such that said rectangular orthodontic wire when received in said second portion is intercepted by said inclined walls near the portion where said inclined walls meet said opposing substantially flat walls; and

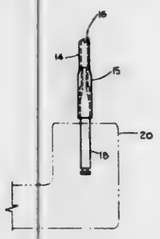
said screw member being threaded along its length at least to a position substantially where said bottom portion of said notch begins, and having a resilient quality whereby on turning at least one of said screw and nut members relative to the other so that said rectangular orthodontic wire positioned through said notch is intercepted by said nut member and then forced deeper into said second portion of said notch, the angle of said inclined notch walls is increased, the wire is clamped by said members and said nut member is locked on said screw member.

4,178,688

REMOVING POST FROM HUMAN BONY STRUCTURE

Walter R. Polanin, 17802 Dogwood La., Hazel Crest, Ill. 60429

Filed Mar. 24, 1977, Ser. No. 781,019
Int. Cl.[2] A61C *3/02*
U.S. Cl. 433—220 **6 Claims**



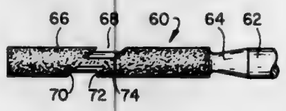
1. In a method of removing a post secured within a hole of a human tooth, the steps of measuring the length of said post in an x-ray picture thereof, then positioning a rod within a cylindrical drill having tooth cutters at one end and locking said rod within said drill with the inner end of said rod at a distance from said cutters approximately equal to the length of said segment and then rotating said drill with said cutters positioned around said post while forcing said drill toward the inner end of said hole until said rod abuts said post.

4,178,689

DENTAL BURR

John E. Nash, Downington, Pa., assignor to Star Dental Manufacturing Co., Inc., Valley Forge, Pa.

Continuation of Ser. No. 668,334, Mar. 19, 1976, Pat. No. 4,058,898. This application Aug. 10, 1977, Ser. No. 823,366
Int. Cl.[2] A61C *3/06*
U.S. Cl. 433—166 **5 Claims**



1. A one-piece dental burr comprising a shank terminating, at the operative end thereof, in a cutting surface devoid of teeth-like projections, said cutting surface having only one groove therein, said groove being the only groove in said cutting surface, said groove being defined by a plane which encircles said cutting surface at a skewed angle with respect to the axis of rotation of said burr, said groove only partially encircling said cutting surface and having curved side walls, said groove providing an oscillatory chip clearing action as the burr is rotated to thereby afford fast chip clearance.

4,178,690

METHOD FOR MAKING A SWIMMING POOL COVER TEMPLATE

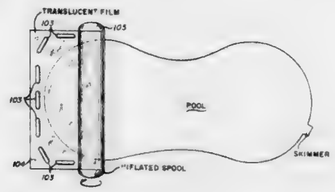
Harry E. Aine, 1804 Stierlin Rd., Mountain View, Calif. 94040

Continuation-in-part of Ser. No. 734,349, Oct. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 613,443, Sep. 15, 1975, Pat. No. 3,927,427, which is a continuation-in-part of Ser. No. 367,198, Jun. 5, 1973, abandoned. This application Jan. 7, 1977, Ser. No. 758,021
Int. Cl.[2] G01B *3/00*
U.S. Cl. 33—174 G **2 Claims**

1. In a method for making a swimming pool cover template the steps of:

placing a sheet of translucent material over the swimming pool;

feeding air at positive pressure under said sheet to hold it off the pool water as said sheet is placed over the swimming pool;



weighting the margins of said sheet to hold it in position over said pool; and

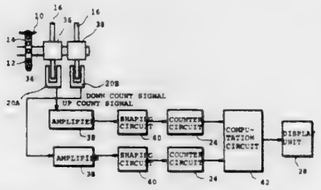
marking the translucent sheet as placed over the swimming pool to conform to the contour of the pool, whereby a template of the swimming pool is fabricated.

4,178,691

ELECTRONIC DIGITAL SCALE

Iwao Tateishi, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 27, 1977, Ser. No. 819,686
Claims priority, application Japan, Jul. 30, 1976, 51/103762[U]; Jul. 30, 1976, 51/103763[U]
Int. Cl.[2] G01B *5/02*
U.S. Cl. 33—139 **3 Claims**



1. An electronic digital scale comprising:

an extensible member adapted to be extended and retracted from a housing of the electronic digital scale;

a first plate including a plurality of spaced sprockets, said sprockets being adapted to engage said extensible member and rotate in unison with the movement of the extensible member in a forward direction and a backward direction;

forward movement responsible means driven only in a relationship to the movement of the extensible member in the forward direction;

means for developing count up information in response to the movement of the forward movement responsible means;

backward movement responsible means driven only in a relationship to the movement of the extensible member in the backward direction;

means for developing count down information in response to the movement of the backward movement responsible means;

a shaft means fixed to said first plate, said forward movement responsible means and said backward movement responsible means such that said forward and backward movement responsible means are driven in unison with said first plate in the forward movement and the backward movement

a forward counter circuit responsive to said count up information developing means for calculating the count up information;

a backward counter circuit responsive to said count down information for calculating the count down information; and

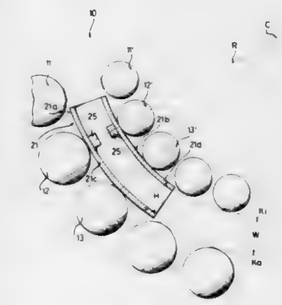
a computation circuit responsive to said forward counter circuit and said backward counter circuit for determining count information corresponding to the count up information and the count down information.

4,178,692

MEASURING DEVICE FOR CHECKING THE DIMENSIONAL ACCURACY OF THE TRACK WIDTH OF CURVED TRANSPORT TRACKS, PARTICULARLY FOR CONTINUOUS CASTING OR EXTRUSION

Helmut Schultz, Dortmund, Fed. Rep. of Germany, assignor to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Apr. 18, 1977, Ser. No. 788,370
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1976, 2617143
Int. Cl.[2] G01B *5/14, 3/46*
U.S. Cl. 33—182 **9 Claims**



1. A measuring device for checking the dimensional accuracy of the track width of curved transport tracks formed by paired rollers lying on a radius of curvature equidistantly from each other at elevated temperatures, comprising:

(A) carrier means placeable into a transport track and moveable along the transport track, said carrier means including:

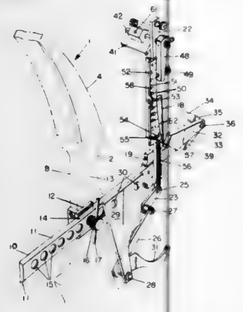
(a) a plurality of latterally spaced elongated members, each of said members having a height corresponding to the track width, a length providing continuous spanning of at least two successive roller pairs when said members are placed in said transport track, and contours corresponding at least approximately to the curvature of the transport track;

(b) connecting means extending intermediate each of said elongated members to interconnect said members one to the other; and

(c) bar means intermediate said elongated members and connecting means for permitting the carrier means to have a height reducible by external effects;

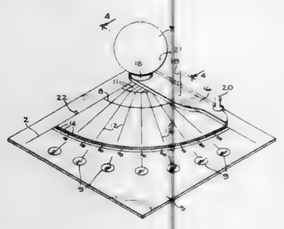
(B) at least two displacement sensing means on at least one of said members and spaced apart at a distance dependent on the track width, said displacement sensing means being located on a radius of the circle of curvature of said track and continuously at a perpendicular orientation to said curved transport track when moving along said track on said carrier means for checking the dimensional accuracy of the track width perpendicular to said curved transport track.

4,178,693
SPLIT IMAGE BOW SIGHT AND RANGE FINDER
Gene D. Smith, 4113 Edwinstowe, Colorado Springs, Colo. 80907
Filed Oct. 30, 1978, Ser. No. 955,592
Int. Cl.[2] F41G *1/46*
U.S. Cl. 33—265 **10 Claims**



1. A split image bow sight and range finder assembly comprising bracket means for mounting said sight on a bow relative to an arrow horizontally positioned against said bow, slidable means on said bracket means having trigger means pivotally associated therewith for actuating said slidable means, vertically spaced mirror means mounted on said slidable means and angularly oriented to reflect an image of a target to the archer, one of said mirror means being pivotally mounted on said slidable means, cam means associated with said bracket means and slidable means whereby actuation of said trigger means moves said slidable means to adjust said pivotal mirror means with reference to the other of said mirror means and reflects an image of a target in said latter mirror means, and range scale means on said bracket means and cam means for determining target range during mirror means trigger means controlled adjustment to enable determination of the angle of bow elevation before release of the arrow.

4,178,694
POINT-OF-AIM INDICATOR
Maurice C. Bonney, 48 Primrose St., Aptos, Calif. 95003
Filed Dec. 20, 1976, Ser. No. 752,604
Int. Cl.[2] G01C *15/00*; A63B *21/00*; A63D *13/00*
U.S. Cl. 33—289 **5 Claims**

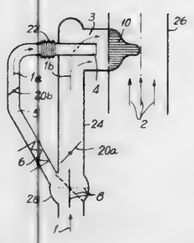


1. A point-of-aim indicator for pool balls or the like which comprises
a relatively flat base member,
means forming a center line on said base member adapted for horizontal alignment with the central vertical axis of an object ball,
means on said base member indicating the desired contact point of a cue ball with the object ball, and
means on said base member correlated with said contact point to indicate the point of aim for the cue ball to establish contact with the object ball at said contact point,
said contact point indicating means including a simulated object ball having an indicating point on its surface, and
means supporting said ball for angular adjustment about a vertical axis aligned with said center line wherein said ball supporting means includes a pointer supported for pivotal motion about a vertical axis of said ball.

4,178,695
NEW PROCESS FOR PREPARING PHARMACEUTICAL, COSMETIC OR DIAGNOSTIC FORMULATIONS
Angelo Erbeia, 6 rue René Blanc, 74100 Annemasse, France
Filed Feb. 6, 1978, Ser. No. 875,542
Claims priority, application France, Sep. 19, 1977, 77 28193
Int. Cl.[2] F26B *5/06*
U.S. Cl. 34—5 **20 Claims**

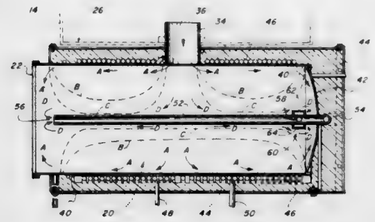
1. A process for preparing pharmaceutical, cosmetic or diagnostic formulations by the freeze drying of at least one substance contained in at least one solvent, comprising locally and progressively cooling in a controlled manner while agitating the solvent containing said substance so as to produce microcrystals of solvent which are put in suspension in the remainder of the liquid until the obtainment of a high-viscosity microcrystalline complex system comprising essentially isolated microcrystals of solvent in intimate mixture with interstitial liquid phases having a high concentration of the initially present substance, hardening the microcrystalline complex system by cooling at a temperature of about −50° to −70° C. and then lyophilizing the hardened microcrystalline complex system.

4,178,696
METHOD AND APPARATUS FOR MIXING TWO GAS CURRENTS
Georg Beckmann, and Alfred Trötzmüller, both of Vienna, Austria, assignors to Waagner-Biro A.G., Vienna, Austria
Filed Jun. 19, 1978, Ser. No. 916,788
Claims priority, application Austria, Jul. 1, 1977, 4685/77
Int. Cl.[2] F26B *7/00, 21/10*
U.S. Cl. 34—13 **13 Claims**



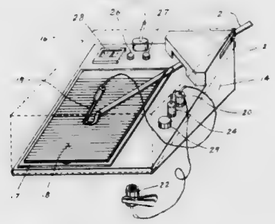
1. A method for mixing a first relatively cool gas current and a second relatively hot gas current comprising the steps of:
separating the first gas current into a first partial gas current and a second partial gas current, said first partial gas current being smaller and having a greater velocity than said second partial gas current;
directing said second partial gas current into a ring nozzle, said ring nozzle being in fluid communication with said second gas current;
directing said first partial gas current into a central nozzle in fluid communication with said second gas current, said ring nozzle concentrically surrounding the central nozzle; and
directing said first and second partial gas currents into said second gas current, the velocity of said first partial gas current being greater than the velocity of said second partial gas current.

4,178,697
CONDENSATION CHAMBER FOR FREEZE DRYING APPARATUS
David T. Sutherland, Woodstock, N.Y., assignor to The Virtis Company, Gardiner, N.Y.
Filed Mar. 28, 1978, Ser. No. 890,976
Int. Cl.[2] F26B *13/30*
U.S. Cl. 34—92 **4 Claims**



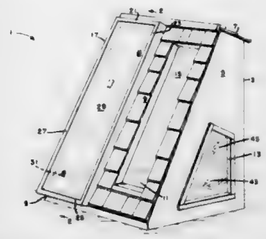
1. In apparatus for freeze drying moisture containing items of the type including a sealable vacuum tight drying chamber for holding the moisture containing item, a hollow vacuum-tight condensation chamber communicating with the drying chamber, a means for supplying heat to the drying chamber, a vacuum pump communicating with the condensation chamber for evacuating air from the drying chamber through the condensation chamber, a refrigeration compressor, refrigeration coils connected to the refrigeration compressor, the refrigeration coils being positioned around the condensation chamber to cool the hollow interior of the condensation chamber; wherein the improvement comprises:
means for causing air evacuated from the drying chamber to flow substantially uniformly over the entire cooled hollow interior of the condensation chamber so that moisture sublimated from the moisture-containing item will freeze substantially uniformly on the hollow interior of the condensation chamber thereby maximizing moisture removal for the volume of the condensation chamber before there is a necessity for removal of the frozen moisture from the condensation chamber.

4,178,698
TEACHING SYSTEM
William D. Cornell, 907 Camargo Dr., Ballwin, Mo. 63011
Filed Sep. 28, 1977, Ser. No. 837,377
Int. Cl.[2] G09B *5/06*
U.S. Cl. 35—8 A **17 Claims**



1. A system for recording and subsequent playback of the audio and graphic presentation of a classroom, teaching experience comprising;
a microphone for inputing the audio text,
a writing desk with a writing instrument connected to displacement transducers for inputing writing instrument coordinate position information,
a writing instrument incorporating a switch means capable of signaling writing instrument contact with the writing surface,
an oscillator connected to the writing instrument switch means,
means for pulse width modulation encoding of the writing instrument coordinate analog signals,
means for differentiation of the pulse width modulation encoded analog signals,
record circuits for recording the audio, the writing instrument switched tone signals and the differentiated pulse width modulation encoded writing instrument coordinate analog signals,
four record/playback head channels,
four erase head channels,
a tape transport,
a playback circuit for the audio text,
a playback circuit for the writing instrument controlled tone signal plus rectifier and integrating capacitor driving a solid state relay which controls the writing means of the plotter,
means for decoding the twice differentiated pulse width modulation encoded writing instrument coordinate analog signals,
a plotter for receiving the decoded writing instrument coordinate analog signals plus the electrical writing control from the solid state relay and reproducing the graphic portion of the text,
an audio transducer for reproducing the audio portion of the text,
switching means for controling the record and reproduction functions.

4,178,699
SOLAR ENERGY TEACHING AID
Carol A. Burkhart, Rte. 29, R.D. #1, St. Johnsville, N.Y. 13452
Filed Jul. 6, 1978, Ser. No. 922,325
Int. Cl.[2] G09B *25/00*
U.S. Cl. 35—10 **10 Claims**



1. A solar energy teaching aid for use in instruction and experimentation to demonstrate the effects and results of active and passive home heating through solar energy, said teaching aid being in the form of a miniature home unattached to the ground and comprising a rear wall, side walls, angled roofs and a floor representing discrete surface areas with one of said roofs having the largest surface area: such roof mounting an active collector to absorb solar energy and convert same to heat energy, said active collector having means for communicating with the interior of such home to permit the movement of cooler air from such home through said active collector, for the heating of such cooler air in said active collector and the discharge of such active-collector heated air into the interior of such home, to thereby demonstrate active home heating; and such roof having a transparent means, said home having heat

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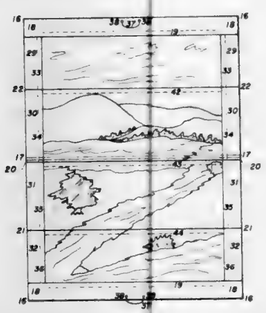
sink means to passively absorb solar energy, convert same to heat energy and store same, said transparent means and heat sink means cooperating to demonstrate such passive home heating by said transparent means allowing solar energy to pass therethrough to said heat sink means where such solar energy is absorbed, converted to heat energy and stored.

4,178,700

BIBLE BOARD WITH BIBLE CUTOUTS

Avis M. Dickey, South Milford, Ind., assignor to Dickey, Inc., South Milford, Ind.

Filed Nov. 21, 1977, Ser. No. 853,021
Int. Cl.[2] G09B *1/06*
U.S. Cl. 35—23 R **1 Claim**



1. An appropriately decorated improved Tell Board with Show Pieces wherein to a firm rectangular backing with horizontal center fold is permanently affixed in layered sequence four rectangular panels of 12-ply matting board or comparable weight material, in width coextensive to the backing and in height equal to one-fourth the backing length plus one and one-fourth inches for panels one and four, plus two and one-half inches for panel two, and plus three/fourths inch for panel three, each top edge of panels two, three, and four overlapping the bottom edge of the previously affixed panel by 1¼ inches and unaffixed in the said 1¼ inch overlapping to within border depth of the panel sides, thereby creating slot pockets; pockets being additionally created by the permanent affixing of border pieces at top of panel one and bottom of panel four coextensive with panel width and having 1¼ inch inner edge unaffixed to within border depth of panel sides and by the permanent affixing of border pieces along each visible portion of panel side height between top and bottom borders, all side border pieces having 1¼ inch unaffixed inner edges to within 1¼ inches of the border piece ends; all created slot pockets, both vertical and horizontal providing for the discretionary insertion of top, side, and bottom protrusions of the accompanying minimally detailed, identically sided show pieces and their differently sided, additionally horizontally slit background changes, storage for which is provided in the zip-closing envelope affixed to the reverse upper half of the Tell Board, which board further employs simple eyelet-secured hanging/carrying handles at center top and bottom ends.

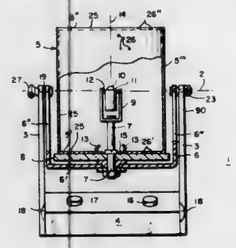
4,178,701

CYLINDRICAL PLANETARIUM PROJECTOR

Philip M. Sadler, 93 Hammond St., Cambridge, Mass. 02138

Filed Dec. 1, 1977, Ser. No. 856,252
Int. Cl.[2] G09B *27/00*
U.S. Cl. 35—42.5 **11 Claims**

1. A star projection device comprising,
an opaque film forming the surface of a nonspherical enclosure having a geometrical center and an axis of symmetry,
said enclosure being an assembly of pieces of originally flat film, which pieces of film are attached to each other near their edges to form said enclosure,
said film having transparent spots thereon whose positions and areas are representative of the true positions and brightness of selected stars when projected onto a viewing surface,
a point source of light positioned at the center of said enclosure,
a gimbal,
an enclosure support means attached to said gimbal,
means for attaching said enclosure to said support means to



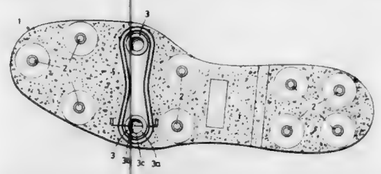
allow the enclosure's axis of symmetry to be tilted with respect to the vertical in response to positioning of said gimbal while maintaining the light source at the center of said enclosure,
said enclosure support means also being adapted to allow said enclosure to be rotated about its axis of symmetry while being supported by said support means,
whereby light projected through said spots and impinging on said viewing surface spaced from said light source provides a true representation of the star pattern as seen from a point on the Earth at a selected time corresponding to the selected tilt and rotation angle of said enclosure.

4,178,702

GOLF-SHOE SOLE

Hubert J. M. Mayer, Marly, Switzerland, assignor to Bata-Schuh-Aktiengesellschaft, Riburg, Switzerland

Filed Dec. 20, 1977, Ser. No. 862,394
Claims priority, application Switzerland, Dec. 22, 1976, 16190/76
Int. Cl.[2] A43C *15/02*; A43B *5/00*
U.S. Cl. 36—59 R **3 Claims**



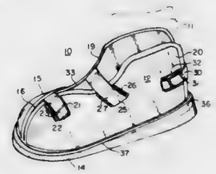
1. In a golf-shoe sole of the type made of polyurethane-base foamed material and having spikes, the improvement comprising:
a spike-free transverse zone situated at a location intended to be occupied by the ball of a wearer's foot, and
two or more volcano-shaped elevations disposed in said zone, each of said elevations having a base, a conical outer surface, and a cup-shaped central depression, the apex angle of said conical outer surface being approximately 90°, and said outer surface intersecting with the surface of said depression to form a circular rim from 10 to 12 mm in diameter situated approximately 3 mm below said base.

4,178,703

SHOE TO BE WORN OVER CAST

Sidney Pols, c/o E. J. Sabel & Co., Benson E. Bldg., P.O. Box 644, Jenkintown, Pa. 19046

Filed May 24, 1978, Ser. No. 909,016
Int. Cl.[2] A43B *21/00*
U.S. Cl. 36—110 **4 Claims**



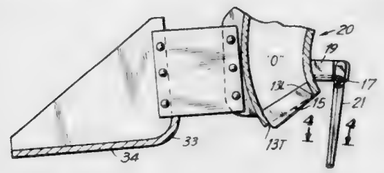
1. A shoe to be worn over a cast which comprises
an upper which is adapted to fit around the lower portion of a cast which has a toe and heel portion, the upper including
a pair of side halves detachably secured around the cast by a plurality of straps,
a sole attached to said upper,
said upper side halves meeting at the front and back of said sole,
a heel wedge portion associated with said sole which imparts a lift to the heel portion of the cast,
said straps being attached to one of said upper halves,
said straps comprising a rear strap horizontally disposed for restraining relative movement between the cast and the sole, and
spaced forwardly disposed straps for restraining relative movement between the cast and the sole,
said straps having strips of thistle cloth attached thereto for adjustable engagement with strips of complemental thistle cloth attached to said other of said halves.

4,178,704

SUCTION NOZZLE DREDGE HEAD

John P. Latimer; Robert M. Donaldson; Ted W. Christian, and Glen E. Miller, all of Newport News, Va., assignors to Deepsea Ventures, Inc., Gloucester Point, Va.

Filed Nov. 1, 1977, Ser. No. 847,482
Int. Cl.[2] E02F *3/94*
U.S. Cl. 37—57 **17 Claims**



1. A suction nozzle assembly, adapted for gathering objects from the ocean floor, the nozzle assembly comprising a nozzle having nozzle edges framing a nozzle opening at a first end of the nozzle, a plurality of relatively slender, elongated fingers resiliently, pivotally connected adjacent a first edge of the nozzle opening, movement-limiting means permitting pivotal movement of at least a portion of the fingers from a first, extended position to a second pivoted position, wherein the fingers are juxtaposed across the nozzle opening so as to interfere with the passage of material into the nozzle opening, the elongated fingers being biased towards the first position, the fingers in the first position extending beyond a second, opposite edge of the first end of the nozzle.

4,178,705

PROCESS FOR THE REDUCTION OF THE FROSTING EFFECT IN DYEING OF TEXTILE FABRICS

Walter Birke; Hans-Ulrich von der Eltz, and Franz Schön, all of Frankfurt am Main, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 17, 1977, Ser. No. 825,378
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1976, 2637303
Int. Cl.[2] D06B *3/10*; D06F *69/00*; D06P *5/20*
U.S. Cl. 38—144 **8 Claims**



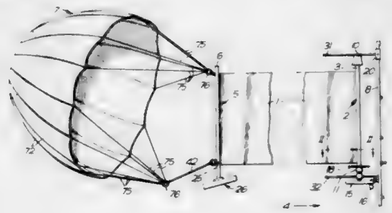
1. In a continuous process for uniform dyeing a web of textile material containing staple fibres of polyester or spun rayon, which process comprises dyeing, intermediate drying and dyestuff fixation steps, the improvement which comprises: applying pressure against a surface of the said textile material after said material has been dyed but prior to intermediate drying, whereby fiber ends protruding from the said surface are caused to adhere to said surface, and thereby uniformly dyeing each fiber in the material.

4,178,706

VEHICLE TOWED DISPLAY DEVICE

Robert A. L. Boyce, Ashwell Farm, Halwell, Totnes, Devon, England

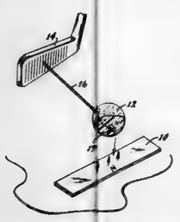
Filed Jun. 8, 1977, Ser. No. 804,636
Int. Cl.[2] G09F *3/00*
U.S. Cl. 40—326 **26 Claims**



1. A display device for towing behind a vehicle, comprising:
a banner having a leading edge, a trailing edge and two longitudinal edges;
leading edge attachment means for attachment of said leading edge of the banner to said vehicle, including a roller on which the banner may be wound when not in use and support means adapted to be mounted on the vehicle to support the roller above the surface over which the vehicle moves, for rotation about its longitudinal axis with said axis substantially vertical;
a stay attached to said trailing edge of said banner at positions adjacent said longitudinal edges thereof to maintain said trailing edge extended, in use;
aerodynamically stable drogue means comprising an open-ended, flexible sleeve having a leading end and a trailing end, and
means connecting said leading end of said drogue means to said stay such that the upper portion, in use of said device, of said leading end is closer to said stay than the lower portion of said leading end,
said drogue means providing sufficient lift and drag to main-

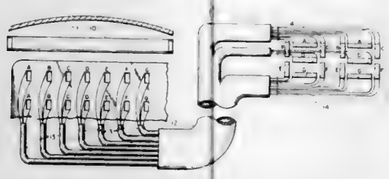
tain said towed banner in a substantially vertical plane with its longitudinal axis substantially horizontal.

4,178,707
DISPLAY APPARATUS UTILIZING MAGNETIC MATERIALS
John V. Littlefield, Box 69507, Los Angeles, Calif. 90069
Filed Jul. 18, 1977, Ser. No. 816,298
Int. Cl.[2] G09F *19/00*
U.S. Cl. 40—426 **12 Claims**



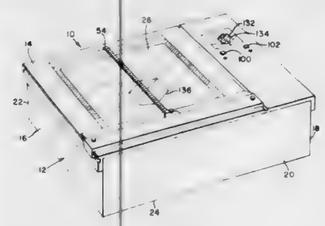
1. A display apparatus for maintaining an object in an apparently unsupported position, the apparatus including a sheet-like body of magnetic material having a continuous flat surface area, the material being magnetized in such a way that the entire surface area is of the same polarity, an object being magnetized in a region of less lateral extent than said area and adapted to be maintained in a position spaced from said surface, said object being polarized such as to be acted on by repulsive magnetic force of said material and gravity, means including a tether attached to said object for restraining it, the tether having a position in relation to the dimensions of said piece of material that the object is normally held in a stabilized position whereby if the object is displaced laterally with respect to said surface it will return to said stable position.

4,178,708
FIBER OPTIC VISUAL DISPLAY SYSTEM
Paul C. Fletcher, El Cajon, and Parviz Soltan, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jun. 21, 1977, Ser. No. 809,146
Int. Cl.[2] G09F *9/32, 13/18*
U.S. Cl. 40—451 **3 Claims**



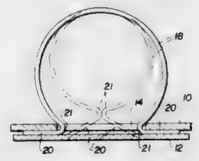
1. A low cost fiber optic visual display system having the capability to be rapidly updated comprising:
a source of light energy;
a plurality of fiber optic cables having first terminal ends disposed to transmit light energy from said source to second terminal ends arranged in a multiple character alpha-numeric display plane, each character being definable within a uniform multi-segment format such as seven segments arranged in a double rectangular configuration;
discrete groups of said fiber optic cables having their first terminal ends disposed in juxtaposed columns and juxtaposed rows of separate aperture areas spatially positioned contiguous to said source of light energy;
second terminal ends of said discrete groups of fiber optic cables arranged in said display plane for separately defining each segment of each character in said uniform multi-segment format; and
a computer produced punched card adapted to be rapidly and completely inserted between said first terminal ends and said source of light energy, and having columns and rows of aperture areas corresponding to said separate aperture areas, with selectively determined punched out aperture areas produced by information developed in a computer for permitting the transmission of light energy therethrough to illuminate desired segments of characters in said uniform multi-segment character format in said display plane whereby to visually present alpha-numeric information.

4,178,709
MACHINE FOR USE IN PICTORIAL DRAFTING
Alan T. Ford, P.O. Box 591, Green Harbor, Mass. 02041, and Norman G. Graf, 255 High St., Hingham, Mass. 02043
Filed Jul. 6, 1976, Ser. No. 702,674
Int. Cl.[2] G09F *11/18*
U.S. Cl. 40—471 **15 Claims**



1. Apparatus for use in making axonometric and perspective drawings, comprising
(a) a support including a generally rectangular flat portion providing a working surface to receive a generally rectangular stratum of drafting material placed thereon,
(b) a narrow elongated window located along the opposite side edges of said flat portion, and at least one of the top and bottom edges thereof beyond the edges of the drafting material and said working surface,
(c) laterally movable changeable display means below said flat portion and dimensionally larger than said working surface and visible through said windows and presenting selectively changeable reference lines visible along the opposite edges of said flat portion and at least one of the top and bottom edges thereof from which axonometric and perspective drawings may be constructed on said drafting material, and
(d) control means connected to said display means for changing said lines with respect to said material by laterally shifting said display means,
(e) said reference lines including side reference lines along the side edges of said flat portion and scale reference lines at least along one of the top and bottom edges of said flat portion,
(f) said side reference lines providing reference indicia for drawing on the drafting material lines to a projected vanishing point when constructing perspective views and parallel lines when constructing axonometric views, on said drafting material and said scale reference lines providing spacing indicia for the dimensions in said perspective views that are being progressively foreshortened along the sides of said perspective views towards a vanishing point.

4,178,710
FLIP LEAF EXHIBITOR HAVING SEPARABLE RING FASTENERS FOR LEAVES
Hans F. Schmid, Verona, N.J., assignor to Mar-Kal Products Corporation, Montclair, N.J.
Filed Nov. 28, 1977, Ser. No. 855,217
Int. Cl.[2] G09F *19/00*
U.S. Cl. 40—530 **2 Claims**



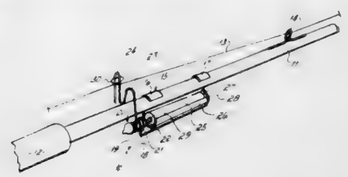
1. A changeable exhibitor comprising a substantially flat base plate having plural spaced rectangular slots formed therethrough centrally of the base plate in a row across the base plate, a comparatively narrow elongated flat backbone strip underlying the base plate adjacent to said row of rectangular slots and covering said slots, means fixedly securing opposite end portions only of the backbone strip to the base plate with the main body portion of the backbone strip adjacent to said rectangular slots unattached to the base plate, plural independently operable separately formed retainer rings formed of flat spring strip stock and corresponding in number to said rectangular slots, said retainer rings being identical and each including a major circumference body portion having opposite end abrupt elbows and a pair of oppositely extending flat terminals projecting outwardly of the elbows in a common plane generally tangentially to the body portion, said terminals of each retainer ring being resiliently biased toward separated positions, and said retainer rings being manually contractable to allow said terminals to enter and pass through said rectangular slots of the base plate and to then pass between the base plate and the unattached body portion of said backbone strip with said elbows engaging opposite ends of said rectangular slots when the retainer rings are allowed to expand, and plural flip leaves bearing indicia components and having openings near corresponding edges thereof receiving the body portions of the retainer rings.

4,178,711
METHOD FOR USE IN HARVESTING EARTHWORMS
Howard J. Mermal, 4045 S. Pine Ave.; Gary A. Mermal, 4060 S. Taylor Ave.; Donald J. Mermal, 4409 S. Pine Ave., and Robert M. Mermal, 4045 S. Pine Ave., all of Milwaukee, Wis. 53207
Filed Dec. 22, 1977, Ser. No. 863,571
Int. Cl.[2] A01K *97/00*
U.S. Cl. 43—1 **4 Claims**

1. A method for causing earthworms to come out of soil so that they can be conveniently harvested, the method comprising the steps of forming a liquid composition achieved by mixing husks of walnuts and water and applying said liquid composition to an area of surface of the ground.

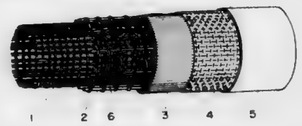
4,178,712
LIGHT APPARATUS FOR FISHING ROD
Chalmer Williams, Rte. 3, Dry Ridge, Ky. 41035
Filed Nov. 3, 1977, Ser. No. 848,209
Int. Cl.[2] A01K *91/06*
U.S. Cl. 43—17 **10 Claims**

1. Line-actuated light apparatus for a fishing rod comprising:
a bracket including means for releasably attaching the bracket to a fishing rod, means for releasably holding a battery therein, and means at one end of said bracket for operatively contacting one terminal of a battery placed in said releasable battery holding means,
a yieldable trigger arm attached at one end to another end of said bracket and having a fishing line engageable trigger finger at another end of said arm, said arm further comprising a bulb socket operatively and movably disposed in relation to another terminal of a battery in said releasable battery holding means,
said means for operatively contacting said one terminal of a battery being electrically connected to said bulb socket; and



wherein said trigger arm includes two trigger fingers formed therein proximate said other end thereof, a first trigger finger comprising a bend in said arm and having a first bend radius, and a second trigger finger comprising a bend in said arm having a lesser bend radius than the first bend radius, said fingers being formed one after the other in said trigger arm and said fingers extending outwardly of said bracket to a position for engagement with a loop in a fishing line when said bracket is mounted on a fishing rod, said finger being disengageable from said line in response to a predetermined tension exerted on said line.

4,178,713
FISHING ROD MADE OF FIBER REINFORCED SYNTHETIC RESIN
Kenichi Higuchi, No. 2-17, 7-chome, Shinimazato, Ikuno-ku, Osaka-shi, Osaka-fu, Japan
Filed Oct. 17, 1977, Ser. No. 842,871
Int. Cl.[2] A01K *87/00*
U.S. Cl. 43—18 GF **5 Claims**

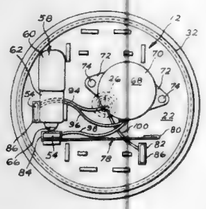


1. A tubular fishing rod having a circular cross-section and comprising an inner layer formed of a woven cloth; a space retaining layer formed of woven cloth which has relatively large interstices, large thickness and small weight per unit area over said inner layer; an intermediate layer formed of fibers longitudinally unidirectionally oriented over said space retaining layer; an outermost layer formed of a woven cloth; and a cured synthetic resin binding the cloth and fibers to form a unitary solid mass.

4,178,714
LIGHTED AND SOUNDING TOY
John B. Tsen, and Fan B. Tsen, both of 7700 Clark La., Manlius, N.Y. 13104
Filed Jun. 28, 1978, Ser. No. 920,010
Int. Cl.[2] H01H *35/02*; A63H *33/26, 27/12*
U.S. Cl. 46—228 **9 Claims**

1. A lighted yo-yo comprising a pair of hollow shell sections each having a removable cover and formed of translucent material and joined together by an axle portion to define a

central groove for receiving an elongated string that is attached to the axle portion, and lighting means to produce a source of light for each shell section, said lighting means comprising heavy duty battery means in one shell section and a lamp in each shell section, and electrical conductors connecting the battery means to the lamps, and centrifugal switch means in one conductor whereby when the yo-yo is rotating the switch will be biased closed to energize the lamps; the invention comprising locating the battery means in a first shell



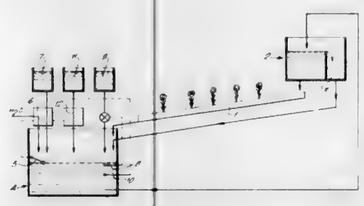
section with its central portion adjacent the central axis of the axle portion, while the second shell section is provided with a light weight audible electrical signal device that is electrically connected in the lighting means circuit to function simultaneously with the lamps, the relative heavy weight of the battery means versus the light weight of the audible signal device creating an unbalanced condition, whereby the heavy side dominates the light side and controls the rotational stability of the yo-yo.

4,178,715
CHANNEL CULTURE ARRAY USING SALINE WATER
George Greenbaum, 790 Boylston St., Boston, Mass. 02199
Filed Jul. 26, 1978, Ser. No. 928,150
Int. Cl.² A01G *9/02, 1/00*
U.S. Cl. 47—58 **18 Claims**



1. A channel culture array which is received on a base over which contaminated water flows comprising:
a fluid permeable floor,
walls extending upwardly from the floor and defining with the floor a cavity to contain soil,
means joined to the floor
to support the floor and engage the base,
to maintain the floor spaced apart from the contaminated liquid, and
to prevent contact of the soil with the liquid,
the undersurface of the floor, said means and the surface of the water defining a zone which is at a temperature lower than the ambient temperature outside of the zone whereby the moisture in the vapor phase in the zone condenses, coalesces on the underside of the floor and wets the soil.

4,178,716
NUTRIENT FILM TECHNIQUE
Douglas C. Harper, and Derek C. Attenburrow, both of Ipswich, England, assignors to Fisons Limited, Suffolk, England
Filed Jan. 11, 1978, Ser. No. 868,505
Claims priority, application United Kingdom, Jan. 15, 1977, 1636/77; Aug. 26, 1977, 35976/77
Int. Cl.² A01G *31/00*
U.S. Cl. 147—62 **13 Claims**



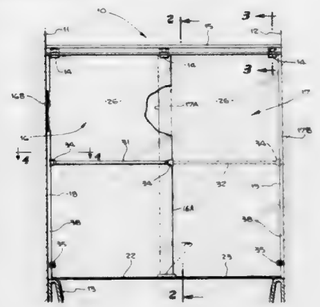
1. In the method of propagating plants wherein the roots of the plants are at least partially immersed in a circulating aqueous solution containing plant nutrient salts which are consumable by the plants, the water and the nutrient salts which are consumed by the plants being replenished by feeding to the circulating solution water and a mixture of nutrient salts having a major proportion of main nutrient salts which are consumable and a minor proportion of non-nutrient salts which are not consumable by said plants, the improvement wherein said mixture of consumable and non-consumable salts is fed to said circulating solution in a proportion such that the concentration of consumable salts in said solution is maintained at a predetermined excess over the concentration of non-consumable salts, whereby the useful life of said solution is increased.

4,178,717
DEVICE FOR SEALING THE GAP UNDER A DOOR
Wallace S. Sakauye, 1333 Heulu St. Apt. #604, Honolulu, Hi. 96822
Filed Apr. 13, 1978, Ser. No. 896,064
Int. Cl.² E06B *7/00, 7/16*
U.S. Cl. 49—70 **5 Claims**



1. In combination, a hinged door and a device for sealing the gap under a hinged door, said door having a vertical face and a bottom surface with a gap therebeneath, said device including an elongated member unconnected to the door and having a length approximately equal to the door width, said elongated member having a base portion extending beneath the bottom surface of the door for resting on the floor, said base portion including a forward tip portion inserted under the door and obstructing substantially the entire gap under the door, said elongated member having an elongated sealing flange spaced from said tip portion and having a lower surface which extends from the base portion at an upward and forward inclination, said sealing flange having at its upper end a sealing surface in contact with the door face.

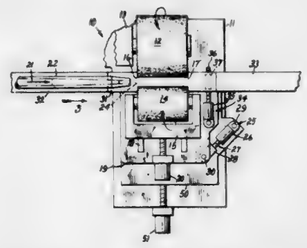
4,178,718
DOOR ASSEMBLY FOR A TUB AND SHOWER ENCLOSURE
Jordan M. Laby, Sherman Oaks, Calif., assignor to American Shower Door Co., Inc., Santa Monica, Calif.
Filed Feb. 10, 1978, Ser. No. 876,646
Int. Cl.² E05D *13/02*
U.S. Cl. 49—411 **2 Claims**



1. A sliding door assembly for use with top and bottom horizontal guide tracks extending between spaced vertical uprights and comprising at least one unpierced movable door panel defined by four edges and obverse and reverse faces; a door panel support roller engaging the top guide track, clamp means securing a support roller to the door panel, a central bottom track panel guide, means securing said bottom track panel guide to the bottom track centrally thereof; a horizontal article holder on said movable panel comprised of a pair of spaced holder ends, a bar extending between said holder ends spaced from a face of said door panel, each of said holder ends having parallel mounting flanges on each face of said door panel; a binding laminate comprising a plastic sheet, an adhesive on obverse and reverse faces of said sheet, and protruding shoulders on each of the upper and lower peripheries of said sheet, said shoulders contacting said mounting flanges in support relationship thereto; said binding laminate intervening between said flanges and said door panel faces and compressed therebetween because of the small dimensional difference between panel thickness and flange separations.

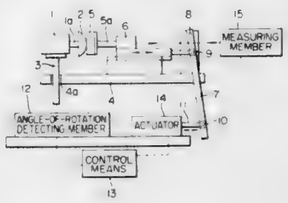
4,178,719
CENTERLESS GRINDING MACHINE
Wilbur F. Jessup, The Hague, Netherlands, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed Jul. 20, 1978, Ser. No. 926,316
Int. Cl.² B24B *5/18*
U.S. Cl. 51—103 TF **5 Claims**

1. A centerless grinder, comprising in combination:
(a) a base;
(b) a grinding wheel, rotatably journaled in a grinding wheelhead on said base;
(c) a regulating wheel, rotatably journaled in a regulating wheelhead on said base and disposed relative to said grinding wheel so as to form an inlet end and an outlet end between said wheels;
(d) a work support located between said wheels, adapted to support a workpiece of revolution;
(e) a pivot joint proximate to said inlet end;
(f) means to pivot one of said regulating wheel and said grinding wheel relative to the other, about said pivot joint, while grinding;
(g) means to axially move said workpiece relative to said wheels while grinding; and



(h) pivot feed means operable to achieve variable feed distances along the face of said regulating wheel relative to said grinding wheel, from said inlet end to said outlet end, while grinding.

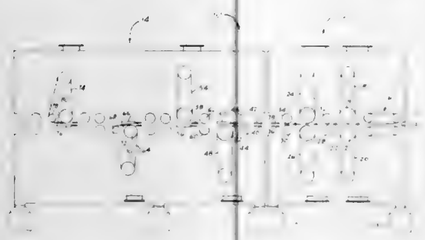
4,178,720
DEVICE FOR FABRICATING AXIALLY SYMMETRIC ASPHERICS
Hiroshi Hashimoto, Tokyo, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan
Filed Jan. 25, 1978, Ser. No. 872,032
Claims priority, application Japan, Jan. 27, 1977, 52-7231
Int. Cl.² B24B *13/00*
U.S. Cl. 51—124 L **7 Claims**



1. A device for fabricating a workpiece into an axially symmetric aspheric configuration, comprising:
(a) means having a first axis for mounting thereon said workpiece and rotating said workpiece about said axis;
(b) means having a second axis orthogonal to said first axis and for swinging said first axis so that said workpiece is swung within a predetermined angle about said second axis;
(c) means for detecting the angle of swing of said workpiece about said second axis;
(d) means for grinding said workpiece;
(e) drive means for displacing said grinding means in a direction orthogonal to said second axis within a range permitting the grinding;
(f) means for measuring the grinding position of said grinding means; and
(g) means coupled to said detecting means and said measuring means for pre-memorizing, in accordance with said angle of swing, a predetermined position of each point on the aspheric configuration to be ground and for controlling said drive means so that said grinding position measured by said measuring means is equal to said memorized predetermined position.

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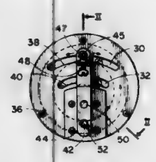
4,178,721
APPARATUS FOR SIZING AND FINISHING BATCHES OF LUMBER
F. David Evans, Eugene, Oreg., assignor to Kimwood Corporation, Cottage Grove, Oreg.
Filed Dec. 28, 1977, Ser. No. 865,218
Int. Cl.[2] B24B *21/04*
U.S. Cl. 51—139 **3 Claims**



1. Apparatus for sizing and finishing lumber comprising:
sizing means including a first pair of opposed, powerdriven belt abraders operable for receiving and dimensionally sizing the lumber to a first predetermined thickness by simultaneously abrading directly opposed areas on opposed, first and second lumber faces and conveying the lumber downstream and a second pair of opposed, powerdriven belt abraders positioned downstream from said first pair of opposed belt abraders, said second pair being operable for receiving and dimensionally sizing the lumber, conveyed from said first pair of belt abraders, to a second predetermined thickness by simultaneously abrading directly opposed areas on the opposed, first and second lumber faces; and
staggered finishing means including a first belt abrader which is power-driven and operable for receiving the lumber and finishing the first lumber face, a second belt abrader positioned downstream relative to said first belt abrader, said second belt abrader being power-driven and operable for receiving the lumber and finishing the second lumber face, a third belt abrader positioned downstream from said second belt abrader, said third belt abrader being power-driven and operable for receiving the lumber and final finishing the first lumber face and a fourth belt abrader positioned downstream from said third belt abrader, said fourth belt abrader being power-driven and operable for receiving the lumber and final finishing the second lumber face.

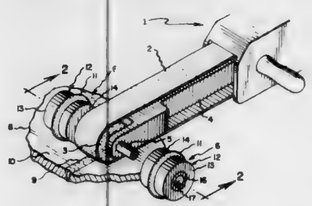
4,178,722
GRINDING AND POLISHING TOOL
Donald B. Forman, and Gary M. Holma, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jan. 18, 1978, Ser. No. 870,387
Int. Cl.[2] B24B *23/00*
U.S. Cl. 51—170 T **9 Claims**

1. A grinding tool comprising:
a disc member having at least one flat circular abrasive band;
means for rotatably driving said disc member about an axis;
means for supporting an elongate workpiece having a longitudinal axis in a perpendicular relationship with respect to said abrasive surface and in oscillatory movement with respect to said abrasive surface in an arc having a radius greater than the radius of said disc member, said axis of the disc member lying between the axis of the supporting means and the workpiece;
means for locking the workpiece in the supporting means;
whereby during the grinding operation the abrasive scratch marks on said workpiece surface overlap to improve the smoothness and flatness of the workpiece surface and said



flat workpiece surface extends perpendicular to said workpiece axis.

4,178,723
GUIDE WHEELS FOR BELT GRINDER
Elwin H. Fleckenstein, Alden, and Walter N. Welsch, Tonawanda, both of N.Y., assignors to Dynabrade, Inc., Tonawanda, N.Y.
Filed Sep. 5, 1978, Ser. No. 939,425
Int. Cl.[2] B24B *23/06*
U.S. Cl. 51—170 EB **12 Claims**

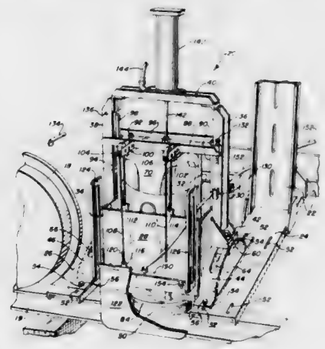


1. A guide for an endless belt abrading device (1) of the type having an endless abrasive belt (2) trained over a contact wheel (3), said contact wheel (3) providing support for said belt (2) at the point of contact between said belt (2) and a workpiece (8), said contact wheel (3) being supported by a laterally extending axle (5) which is in turn supported by a contact arm (4) extending outwardly from a motor unit which drives said belt, characterized in that:
said guide includes a laterally disposed guide wheel (6) rotationally disposed on the lateral extension of said axle (5), said guide wheel (6) including a circumferentially round continuous guide ring (11) and means for adjustably varying the radius of said guide ring (11) continuously of its circumference to compensate for variations of the combined radius of said contact wheel (3) and the thickness of said abrasive belt (2).

4,178,724
RAIL GRINDING SYSTEM
Anthony T. Bruno, East Syracuse, N.Y., assignor to Harsco Corporation, Camp Hill, Pa.
Filed Mar. 23, 1978, Ser. No. 889,289
Int. Cl.[2] B24B *23/00*
U.S. Cl. 51—178 **26 Claims**

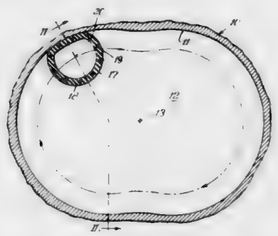
1. A rail grinding unit for grinding the running surface of a railroad track comprising:
(a) a support frame mounted on said railroad track and extending over the track surface to be ground;
(b) a housing structure upstandingly-supported on said support frame over, and in spaced relation from, the track surface to be ground, said housing structure being adjustably movable on said support frame transverse to said track over a predetermined arc generally centered about said track;

(c) motor means telescopically disposed and reciprocally movable with respect to said housing structure, said motor means having a rotatable shaft downwardly disposed toward said track;
(d) a grinding wheel mounted concentrically on said rotatable shaft and having a working surface disposed to contact the running surface of said track when said motor means is gravitationally advanced toward the same; and
(e) a single piston-cylinder assembly controlling the reciprocal movement of said motor means with respect to said housing structure and the force with which the working surface of said grinding wheel contacts the running surface by counter-



balancing gravitational forces, said single piston-cylinder assembly being disposed upwardly of said motor means and operatively affixed to said housing structure and said motor means with the center line of said piston-cylinder assembly aligned with the center of rotation of said motor means and said grinding wheel throughout the reciprocal movement of said motor means;
said grinding wheel thereby being movable throughout said predetermined arc and reciprocally movable relative to the surface to be ground whereby the working surface of said grinding wheel is contactable with any selected areas of the running surface to be ground.

4,178,725
ROTARY ENGINE HOUSING MANUFACTURE
Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Division of Ser. No. 611,100, Sep. 8, 1975, abandoned. This application Apr. 17, 1978, Ser. No. 897,636
Int. Cl.[2] B24B *1/00;* **B24D** *11/00*
U.S. Cl. 51—290 **9 Claims**



1. The method of finishing a rotary internal combustion engine inner wall surface, comprising
honing said wall surface to define a crosshatched topography wherein unfilled cross-hatching lines are provided at a substantial angle to the line of intersection of a transverse plane with said wall surface, said honing step being effected by a flexible cylindrical hone having rigid longitudinal reinforcing stays arranged in a coaxially annular array about the axis of the cylindrical hone whereby the hone is axially substantially rigid and circumferentially substantially flexible, said hone being rotated about said axis and concurrently oscillated parallel to said axis during the honing operation to provide a preselected substantially uniformly angled cross-hatching of the wall surface.

4,178,726
METHOD AND APPARATUS FOR PROTECTING THREAD ON AN EARTH ANCHOR
Gary Q. Watson, P.O. Box 1374, Del Rio, Tex. 78840
Filed Aug. 8, 1978, Ser. No. 931,941
Int. Cl.[2] E02D *5/74*
U.S. Cl. 52—98 **16 Claims**

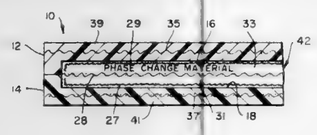


1. An earth anchor adapted for attachment to a cable that pulls in a first direction generally parallel to a longitudinal axis of said earth anchor upon installation in the earth, said earth anchor comprising:
a rod extending along said longitudinal axis of said earth anchor, an upper end of said rod having means for attachment to said cable;
an anchor nut threadably attached to a lower end of said rod;
wing means pivotably attached to said nut means;
plate means retained on said rod and spaced above said anchor nut, said plate means being generally perpendicular to said longitudinal axis;
collapsible cylinder means located concentrically about said rod and abutting said plate means and said anchor nut on opposite ends thereof; and
insulating means about said rod for insulating said rod above said anchor nut from the earth, some of said insulating means being a pliable substance contained inside of said collapsible cylinder means.

4,178,727
HEAT ABSORBING PANEL
Richard C. Prusinski, Dearborn, Mich., and Timothy E. Johnson, Newton Center, Mass., assignors to Architectural Research Corporation, Livonia, Mich.
Filed Feb. 1, 1978, Ser. No. 874,117
Int. Cl.[2] F24D *5/10;* **E04B** *1/76*
U.S. Cl. 52—173 R **16 Claims**

1. A rigid heat absorbing panel comprising an outer casing of

resinous material, a central core within said casing including at least one water-tight capsule, and a substantial amount of phase



change material having a melting point in the range of normal room temperature in said water-tight capsule.

4,178,728

FIRE-PROOF WINDOW

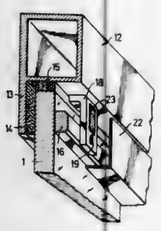
Gunther Ortmanns; Franz Kraemling, both of Aachen, and Siegfried Pikhard, Roetgen, all of Fed. Rep. of Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Dec. 5, 1977, Ser. No. 857,417

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2654776

Int. Cl.² E04C 2/00

U.S. Cl. 52—232 **12 Claims**



1. In a fire-resistant window having at least one glass sheet normal in a main frame disposed about the peripheral edge of the glass sheet with the edge region of the sheet on the side thereof to be exposed to the heating effect of fire being at least partially exposed and free of frame structure, the improvement comprising:

(a) means disposed along the peripheral edge of the glass sheet for securing said sheet to the main frame, said means being disposed to leave the edge region of the sheet sufficiently exposed so that no stresses causing rupture of the glass will occur when the glass sheet is subjected to the heating effect of fire;

(b) listel means disposed over said edge region;

(c) connection means for attaching said listel means to either or both of said glass sheet or frame; and

(d) said listel means or connection means or both being constructed of material which in response to the heat of fire changes its physical properties to remove said listel means from said edge region.

4,178,729

WALL STRUCTURE FOR A NUCLEAR REACTOR CONTAINMENT HOUSING

Ralph L. Jennings, Des Moines, Iowa, assignor to Economy Forms Corporation, Des Moines, Iowa

Filed May 15, 1978, Ser. No. 905,643

Int. Cl.² E04B 1/70

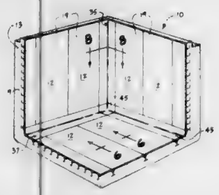
U.S. Cl. 52—284 **5 Claims**

1. A wall structure for a nuclear reactor containment housing comprising:

(a) at least two metal concrete form panels each of which include:

(1) a rectangularly shaped main plate having side edges and end edges,

(2) a laterally extended flange about the periphery of said main plate, said flange having an outer portion and an inwardly inclined inner leg portion connected with said main plate inwardly from the side edges and end edges thereof,



(b) means for connecting said two form panels together at the outer portions thereof such that when said forms are connected together at the outer portions thereof adjacent side edges are in a closely spaced relation,

(c) a liquid tight seal between adjacent ones of said side edges.

4,178,730

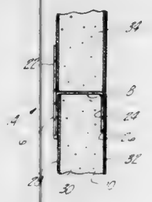
DRY WALL REPAIR KIT

Anthony S. Rowinski, 2635 Rambling Way, Bloomfield Hills, Mich. 48013

Filed Jun. 6, 1977, Ser. No. 803,742

Int. Cl.² E02D 37/00; E04G 23/00

U.S. Cl. 52—514 **5 Claims**



1. In a drywall repair device which is inserted into the periphery of a drywall, having paper and plaster sections, about an opening formed in the drywall for enabling a repair plug to be inserted into the opening, the improvement comprising:

(a) an extended linear first leg having a first portion abutting the drywall at the rear of the opening and a second portion, continuous with the first portion which projects into the opening formed in the drywall, the second portion defining stop means for limiting the degree of insertion of a repair plug into the opening,

(b) a second leg projecting from the first leg spanning the width of the drywall, the second leg having a length less than the width of the drywall, and

(c) drywall penetrating means depending from the second leg which are inserted into the drywall between the paper and plaster sections, about the opening for fixing the device in position, and

wherein the first portion cooperates with the second leg and penetrating means to define the sole means by which the device is supported on the drywall.

4,178,731

ROOF COVERING

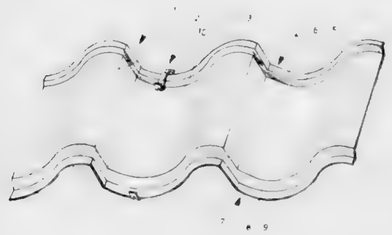
Bengt O. Petersson, Kungsbacka, Sweden, assignor to Bengt Petersson New Products Investment AB, Gothenburg, Sweden

Filed Nov. 18, 1977, Ser. No. 852,912

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1977, 7708919

Int. Cl.² E04D 1/34

U.S. Cl. 52—520 **1 Claim**



1. Roof covering comprising a number of surface covering sheet metal strips and a number of fastening elements to be fastened to a foundation structure and to grip over the respective sheet metal strips and thereby hold them in place against the foundation structure, said surface covering sheet metal strips being highly profiled into a wave shape extending in the longitudinal direction of the strips with a wave length which is of the same order as the width of each strip, said wave shape having raised portions and countersunk portions as seen from the intended upper side of the strip and bent edge portions extending along the longitudinal edges of the strip, one of said bent edge portions having a portion extending in outwardly direction from said upper side and preferably a subsequently following portion which is parallel to the principal surface of the strip, while the other edge portion has a portion extending in an opposite direction away from the principal surface and preferably is followed by a portion parallel to the principal surface, said edge portions being arranged to overlap each other when a number of strips are laid close to each other in order to form coverings, said fastening elements each being arranged with a first portion adapted to be secured to the foundation structure, a second U-shaped portion to grip over the underlying edge portion of the edge portions overlapping each other and with a third outer portion constructed to form a bending angle therein and adapted to grip over the following portion of the overlying edge portion of the edge portions overlapping each other after the mounting of the same by means of a downwards bending operation, said bending angle being positioned at a distance from the edge of said following portion of the overlying edge portion, and the fastening elements being arranged to cooperate with the edge portions of the strips at the countersunk portions of the strips, whereby said second portion of the fastening element fixes the underlying edge portion against movements in the transverse direction of the strips and forms a support for the overlying edge portion, and said position of the bending angle of said third portion of said fastening element permits movements of the strip at the edge of its overlying edge portion.

4,178,732

APPARATUS FOR CLOSING AND OPENING THE THREADED NECKS OF CONTAINERS

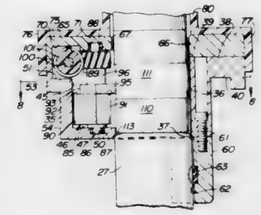
Frederick W. Pfleger, 1152 Barbara Dr., Cherry Hill, N.J. 08034

Filed Apr. 21, 1978, Ser. No. 898,825

Int. Cl.² B65B 7/28; B67B 3/20

U.S. Cl. 53—309 **13 Claims**

1. Apparatus for closing or opening the threaded neck of containers, said apparatus comprising a body having an open ended generally cylindrical passageway for receiving through one end a container neck, and a roller rotatably mounted in said body generally proximate to and projecting radially into said passageway for rolling engagement with a closure in said passageway, said roller having a reduced region for receiving



a closure during a limited angle of roller rotation and passing a closure into rolling relation with the roller upon continued roller rotation, said roller serving to frictionally rotate the passed closure to closed or open relation, respectively, upon oppositely directed rotation of the roller.

4,178,733

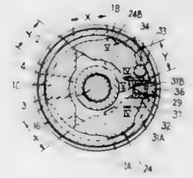
TORQUE OPEN CAPPING CHUCK IMPROVEMENT

Harry S. Dankert, Texas Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 3, 1978, Ser. No. 874,749

Int. Cl.² B67B 3/20; B65B 7/28

U.S. Cl. 53—331.5 **5 Claims**



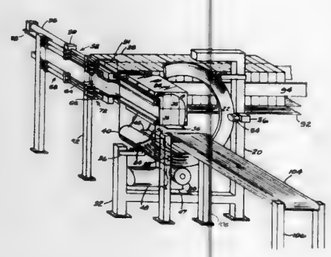
1. In a chuck for a bottle capping machine, said chuck comprising:

an annular outer casing and torque means for accelerating and decelerating rotation thereof, a plurality of collet-type chuck jaws arranged within said outer casing and cooperable therewith for opening and closing in response to axial movement of said casing relative to said jaws, pin means extending from said casing and received between two of said jaws for transmitting thereto the rotation applied to said casing by said torque means, and means responsive to a predetermined resistance of said jaws to said rotation thereof by said casing for effecting axial movement of said casing, thereby causing opening of said jaws, the improvement comprising:

a bearing ball positioned rotatably on an outer face of that one of said jaws which receives an accelerating circumferential thrust from said pin means, said ball being near said pin means and bearing against the opposed surface of said casing for limiting the movement of that portion of said one jaw adjacent said ball toward said casing in response to an application of said circumferential thrust by said pin means to said one jaw.

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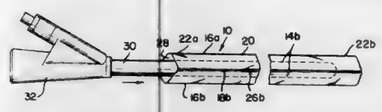
4,178,734
REVERSE WRAP
William G. Lancaster, 5101 Upper River Rd., Louisville, Ky. 40222, and Patrick R. Lancaster, 2906 N. Osage, Louisville, Ky. 40210
Division of Ser. No. 730,612, Oct. 7, 1976, Pat. No. 4,110,957, which is a continuation-in-part of Ser. No. 594,506, Jul. 9, 1975, abandoned. This application Feb. 3, 1978, Ser. No. 875,104
Int. Cl.[2] B65B *13/04*
U.S. Cl. 53—399 **8 Claims**



1. A process of making unitary packages from a plurality of loads of individual units by automatically wrapping the loads with a stretchable material having a width that is about the same width as the load length comprising the steps of:
a. transporting one of said loads to a wrapping apparatus;
b. withdrawing a leading edge of stretchable material from said wrapping apparatus and holding said leading edge in a film clamping assembly having a length that is at least equal to the width of said material in a fixed position adjacent to said load so that the clamping assembly clamps the film material across the material width;
c. placing said stretchable material under tension to cause said material web to be continuously and substantially stretched and wrapping said substantially stretched material around said load and film clamping assembly a plurality of times;
d. moving a member of a second film clamping assembly having a length that is at least equal to the width of said material substantially perpendicularly to the width of said material adjacent to said stretched material load overwrap and continuing the wrapping of stretched material around said load, said first film clamping assembly and past said second film clamp member;
e. stopping the wrapping of said stretched material around said load;
f. moving a second member of the second clamping assembly having a length equivalent to said first member substantially perpendicularly to the width of said material to clamp the web of stretched material between it and the first member and sever it from said wrapping apparatus;
g. releasing said leading edge of stretched material from said first film clamping assembly;
h. sliding the wrapped load off of the first film clamping assembly; and
i. transporting the wrapped load from the wrapping apparatus.

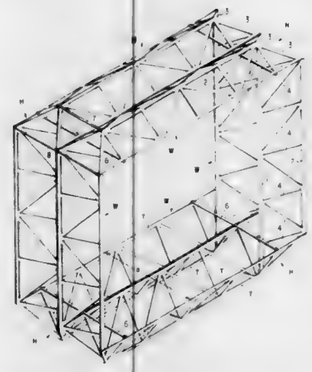
4,178,735
METHOD OF SHEATHING CATHETER
Knute D. Jackson, McHenry, Ill., assignor to The Kendall Company, Boston, Mass.
Filed Jul. 13, 1977, Ser. No. 815,120
Int. Cl.[2] A61M *25/00*; B65B *5/04*
U.S. Cl. 53—473 **4 Claims**

1. A method of covering an elongated limp cylindrical catheter shaft of generally uniform diameter with an elongated sleeve of non-rigid flexible plastic material having opposed first and second walls extending between a pair of opposed folds defining a generally flat configuration of the sleeve, and having a high coefficient of friction relative to the catheter shaft, comprising the steps of:
creasing said first and second walls along longitudinally extending first and second lines respectively located in said first and second walls generally centrally between



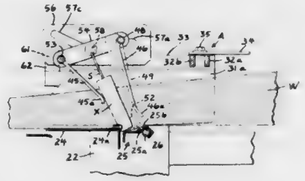
said opposed folds while modifying the sleeve from said generally flat to an open configuration of square cross section having inner side dimensions slightly larger than the diameter of said catheter shaft to facilitate insertion of said catheter shaft into said sleeve; and
inserting the catheter shaft between the walls of the sleeve while in said open configuration.

4,178,736
HOUSING MODULE AND SPACE FRAME
Frank D. Salas, 4200 Alhambra Cir., Coral Gables, Fla. 33146
Continuation-in-part of Ser. No. 655,504, Feb. 5, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 888,498
Int. Cl.[2] E04H *12/00*
U.S. Cl. 52—648 **22 Claims**



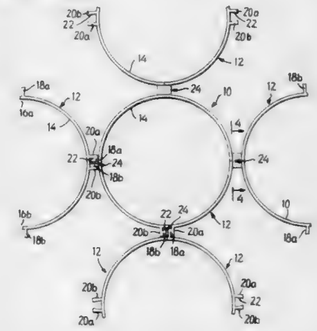
1. A rigid housing module formed of a plurality of module walls connected to one another at a predetermined angle other than 0° and 180°; the improvement wherein each module wall has
(a) an assembly of identical planar structural elements each having the shape of a trapezoid; each said element having a relatively long inner side constituting the long base of the trapezoid, a relatively short outer side constituting the short base of the trapezoid and two diagonal sides constituting the two non-parallel sides of the trapezoid; said inner and outer sides and said diagonal sides enclosing a quadrilateral area defining an element plane; the said inner sides of the elements in each said assembly lying in one plane constituting an inner assembly plane; the elements of each assembly being arranged in a juxtapositioned series wherein all said inner and outer sides are parallel to one another and wherein adjoining elements are connected to one another alternatingly along adjoining outer sides and along adjoining inner sides and further wherein said elements are in a zigzag arrangement and each said element plane is oriented at a predetermined oblique angle with respect to said inner assembly plane; adjoining module walls being connected to one another along adjoining, parallel-extending diagonal sides of the elements forming two said assemblies that constitute two adjoining module walls; each outer side and each inner side in any one said assembly continuing as an inner side and as an outer side, respectively, in any adjoining said assembly; and
(b) rigid transverse connecting means extending along each line of intersection formed between the inner assembly planes of said assemblies; each said rigid transverse connecting means being attached to each said inner side it traverses along the respective said line of intersection.

4,178,737
WRAPPING MACHINE WITH IMPROVED ARTICLE DEPOSITING APPARATUS
Roger H. Stohlquist, Rockford, Ill., assignor to Anderson Bros. Mfg. Co., Rockford, Ill.
Filed Jul. 10, 1978, Ser. No. 923,078
Int. Cl.[2] B65B *9/06, 39/14*
U.S. Cl. 53—550 **13 Claims**



1. In a machine for wrapping elongate articles of the type having means for advancing a strip of wrapping material lengthwise in a forward direction along a generally horizontal path past an article loading station and wherein elongate articles are intermittently dropped endwise onto the strip of wrapping material at the loading station, article depositing apparatus above the strip at the loading station including a pair of lateral article guides and elongate forward and rear article guides, the lateral article guides being spaced apart in a direction crosswise of the path of advance of the strip to laterally position the article on the strip, forward and rear guide support means disposed above the lateral article guides and respectively supporting the elongate forward and rear article guides adjacent their upper ends, means mounting the forward and rear guide support means for movement from a rear position in which the forward and rear article guides extend downwardly between the lateral article guides respectively at the front and rear sides of the article loading station with their lower ends spaced apart a distance to laterally confine the elongate article against lengthwise turning when the article is dropped endwise therebetween onto the strip of wrapping material at the loading station; forwardly through an intermediate position in which the forward and rear article guides extend downwardly between the lateral article guides adjacent the forward side of the loading station with their lower ends spaced apart a distance to laterally confine the elongate article therebetween against lengthwise turning while tilting the elongate article forwardly; to a forward position in which the forward article guide has its lower end spaced from the rear article guide and from the article loading station a distance sufficient to allow the elongate article to fall forwardly on its side onto the strip of wrapping material, and means for moving the forward and rear guide support means through an article depositing cycle from a rear position forwardly through said intermediate position to said forward position and then back to said rear position.

4,178,738
MODULAR GRILLE
Edward C. Hallock; Robert Olsen, both of Summit, and George Ennesser, Cranford, all of N.J., assignors to Construction Specialties, Inc., Cranford, N.J.
Filed Apr. 12, 1978, Ser. No. 895,644
Int. Cl.[2] E04C *2/42*
U.S. Cl. 52—663 **12 Claims**

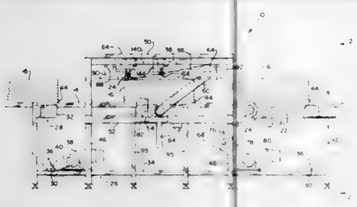


6. A grille comprising a multiplicity of pieces of uniform transverse cross section along their lengths, each piece having walls terminating in spaced-apart parallel edges defining a base plane of the piece that includes a medial longitudinal axis centered between the edges, an edge flange extending generally radially outwardly, relative to the longitudinal axis, from portions of the walls adjacent each edge, and a pair of closely-spaced parallel slot flanges extending generally radially outwardly, relative to the axis, from portions of the walls and defining an outwardly open slot centered on a medial plane of the piece that is perpendicular to the base plane and includes the longitudinal axis of the piece, the slot being spaced radially from the longitudinal axis of the piece a distance substantially equal to one-half the distance between the edge flanges, said pieces of the grille being placed together in opposite edge-to-edge relation in pairs to form closed cells having two pairs of opposed edge flanges and the cells being interconnected by reception of each pair of opposed edge flanges of each cell, other than those flanges at the perimeter of the grille, in a slot of a piece of each of a pair of adjacent cells that are located opposite each other adjacent said pairs of edge flanges, and the grille further comprising means for holding each pair of opposed edge flanges of each cell in tight frictional engagement with the slot flanges receiving them.

4,178,739
CONSTRUCTION FOR APPLYING TAPE
Warren Du Broff, Highland Park, Ill., assignor to Lathrop Paulson Company, Chicago, Ill.
Filed Feb. 1, 1978, Ser. No. 874,267
Int. Cl.[2] B65B *13/04*
U.S. Cl. 53—588 **11 Claims**

1. In a construction for applying tape around the perimeter of an object wherein a supply of tape is provided on a spool, support means are provided for the tape, and means are provided for transporting the spool and its support means around the periphery of the object, said tape being dispensed from the spool during its movement around the object whereby the tape is brought into engagement with said periphery, roller means including a single roller for engaging said tape, said roller means being movable over one surface of said object to press a section of tape into engagement with the surface, a roller means support, and drive means for said support, the improvement comprising means operating said drive means to drive said roller means across and beyond said one surface when

pressing a first tape section into engagement with said one surface, and means operating said drive means to drive said roller means back across said one surface after said spool com-



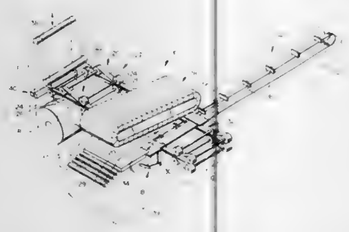
pletes its movement around said periphery whereby said roller means engages an additional section of said tape during its return movement for pressing said additional section against said one surface.

4,178,740

WRAPPING MACHINE

James S. Groom, Wales, and Clarence F. Prince, Springfield, both of Mass., assignors to Package Machinery Company, East Longmeadow, Mass.

Filed Jan. 23, 1978, Ser. No. 871,623
Int. Cl.[2] B65B *11/18*
U.S. Cl. 53—556 **12 Claims**



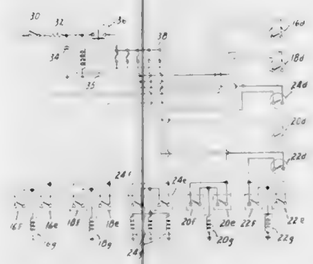
1. A machine for wrapping articles in stretchable wrapping material comprising folding mechanism including a pair of transversely extending first folding members, means for moving said folding members relative to each other between first and second positions, wrapper feeding means for positioning a stretchable wrapper in juxtaposition to said folding mechanism including transversely spaced longitudinally extending conveyor belts for engaging the wrapper along longitudinally extending opposite marginal portions thereof, holding means for releasably securing in fixed position opposing portions of the wrapper positioned by said feeding means, article moving means for receiving an article to be wrapped in one position and for moving the article toward the folding members and into stretching engagement with the wrapping material secured by said holding means and to another position beyond said folding members, and means defining a generally rectangular opening through which the article is constrained to pass when the article is moved from its one to its other position by said article moving means, said opening defining means comprising said feeding means and said first folding members in said first position, said conveyor belts defining longitudinally extending sides of said rectangular opening and said first folding members defining transversely extending sides of said rectangular opening, said holding means comprising means for releasably securing the longitudinally extending marginal portions of the wrapper to said conveyor belts and transversely extending portions of the wrapper to said first folding members.

4,178,741

SAFETY SYSTEM FOR RIDING MOWER

Dana R. Lonn, Minneapolis, and Melvin H. Jendersee, Apple Valley, both of Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Aug. 17, 1978, Ser. No. 934,369
Int. Cl.[2] A01D *75/30*
U.S. Cl. 56—7 **5 Claims**



1. In a riding mower of the type having propulsion means, a seat for the operator thereof, and at least one cutting head which is hydraulically driven and is controllable between an operating norm and a non-operating norm by means of a hydraulic valve having first and second moveable spools, wherein said first spool is moveable between first and second positions, and wherein said second spool is moveable between first, second and third positions, said cutting head being moveable between a cutting position and a transport position by means of a hydraulic cylinder, wherein the improvement comprises:

(a) solenoid means adapted to move said first spool between said first and second positions;

(b) first electrical switch means actuatable by pressure in said seat and which is adapted to actuate said solenoid means;

(c) second electrical switch means actuatable by said hydraulic cylinder and which is adapted to actuate said solenoid means; and

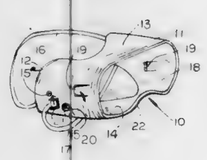
(d) third electrical switch means actuatable by movement of said second spool to said third position and which is adapted to actuate said solenoid means.

4,178,742

PROTECTIVE ANIMAL GOGGLES

Forrest E. Longfellow, 982 Young Ave., Barberton, Ohio 44203

Filed Nov. 7, 1977, Ser. No. 848,893
Int. Cl.[2] B68C *5/00*
U.S. Cl. 54—80 **4 Claims**



1. An eye protection device adaptable to mammalian, non-human animals, comprising:

a soft, flexible plastic envelope forming a goggle enclosure about the eyes, protecting the eyes of the animal from direct exposure to foreign objects and fumes; said envelope having a front, upper, lower, and two side portions, said upper, lower and said side portions extending rearward to comfortably conform to the angular anterior cranial features of the particular mammalian, non-human animal; said front portion normal to said upper, lower, and side portions of said envelope;

said side portions having two elastic band means for securing said envelope to the cranium, one said band means extending around the posterior surface of the cranium and the other said band means extending around the mandible of the animal;

said side portions having venting means for permitting indirect exposure of the animal's eyes to the atmosphere; and

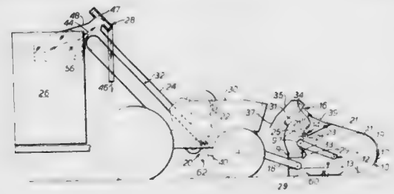
a shatterproof, plastic window positioned at said front portion of said envelope, said window normal to the line of sight by the eyes of the animal.

4,178,743

HARVESTER AIR SEPARATOR

Gustaaf M. Persoons, Schoten, Belgium, and Corneel C. Wijts, San Jose, Calif., assignors to FMC Corporation, San Jose, Calif.

Filed May 14, 1976, Ser. No. 686,604
Claims priority, application United Kingdom, Jul. 4, 1975, 28169/75
Int. Cl.[2] A01D *45/22*
U.S. Cl. 56—12.9 **10 Claims**



1. A cleaning stage of a harvester for beans and the like comprising a casing; a bean picking reel and a conveyor for receiving and conveying the beans, leaves and vine fragments picked by said reel; said casing being formed with an arcuate portion shrouding the upper part of the reel, a generally planar portion overlying said conveyor and a partition terminating at the discharge and spaced above the upper reach of said conveyor to define a gap; a moveable valve bridging the gap between said partition and the upper reach of said conveyor, said valve being substantially coextensive with the width of said conveyor; means for producing a stream of high velocity air from an area generally beneath the lower reach of said conveyor extending into a passage-way laterally adjacent and downstream of the discharge end of said conveyor and said valve to entrain and thus separate lighter from heavier crop components; said moveable valve means serving to permit the delivery of the material from the upper run of the conveyor to the passage but to restrict and minimize air flow from the casing and the upper run of the conveyor whereby no substantial separation occurs thereat; and a conveyor adjacent said first mentioned conveyor to receive the remaining heavier crop components.

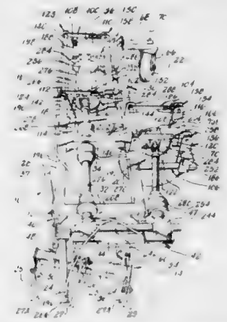
4,178,744

AGRICULTURAL MOWERS

Robert Allely, Coventry, and Alfred J. Bailey, Berkswell, both of England, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Dec. 23, 1977, Ser. No. 863,660
Claims priority, application United Kingdom, Jan. 6, 1977, 00309/77; Jun. 3, 1977, 23595/77
Int. Cl.[2] A01D *35/26*
U.S. Cl. 56—16.2 **7 Claims**

1. An agricultural mower comprising: a rotor support member; at least two crop-cutting rotors adapted to have crop cutting blades mounted thereon, the rotors being mounted on the support member and being rotatable about respective upwardly-extending axes; a plurality of crop cutting blades mounted on each crop cutting rotor; a ground engageable support wheel mounted on the support member to support it at a level above that of the crop cutting blades; and attachment means secured to the support member for connecting the support member to a tractor whereby the mower can be drawn by the tractor; characterized in that said rotor support member comprises a rigid rotor support framework having a front beam located on the forward side, with respect to the direction of operative forward motion of the mower, of the axes of rotation of the crop-cutting rotors, a rear beam rigidly secured



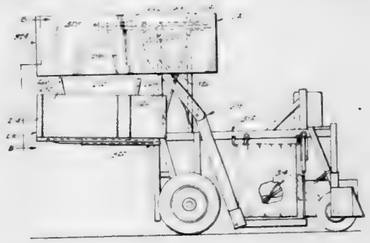
to the front beam and located on the rearward side, with respect to said direction, of the axes of rotation of the crop-cutting rotors, said ground-engageable support wheel is mounted on the rear beam of the rotor support; said one crop-cutting rotor is connected to the front beam by a linkage capable of pivotal movement relative to the front beam whereby the rotor can rise and fall relative to the front beam during use so as to follow ground contours, the forward end of the linkage with respect to said direction of operative forward motion being connected to the front beam and the rearward end of the linkage being connected to said one rotor so that, in use, the rotor is trailed from the front beam.

4,178,745

TOBACCO HANDLING APPARATUS

Robert W. Wilson, Charlotte, N.C., assignor to Powell Manufacturing Company, Inc., Bennettsville, S.C.

Continuation-in-part of Ser. No. 629,974, Nov. 7, 1975, abandoned. This application Nov. 4, 1976, Ser. No. 738,968
Int. Cl.[2] A01D *45/16*
U.S. Cl. 56—27.5 **7 Claims**



1. Tobacco handling apparatus for transferring harvested tobacco leaves from a source to tobacco container means in preparation for support of said tobacco leaves during subsequent curing thereof, said apparatus comprising conveyor means adapted to receive harvested tobacco leaves from a

source and arranged for discharging the leaves from an end thereof in a flow path having a substantial maximum horizontal extent, tobacco container means disposed below said horizontal extent of said flow path and having a longitudinal horizontal extent aligned with and disposed underneath the maximum horizontal extent of said flow path for receipt of the tobacco leaves discharging from said conveyor means discharge end, and means for varying the horizontal extent of said flow path within said maximum extent and over said longitudinal horizontal extent of said container means in a generally uniform manner to cause said leaves to be distributed substantially uniformly along the longitudinal extent of said tobacco container means, said means for varying the extent of the flow path of discharging tobacco leaves comprising baffle means having surfaces for stopping the horizontal movement of the leaves in said flow path while permitting continued downward movement and for imparting a lateral movement to the leaves in conjunction with the continued downward movement thereof and moving means for effecting repetitious cyclical movements of said baffle means in both longitudinal and lateral horizontal directions sufficient to distribute the leaves within said tobacco container means not only uniformly along the longitudinal extent thereof, as aforesaid, but the lateral extent thereof as well.

4,178,746

ROTARY MOWERS

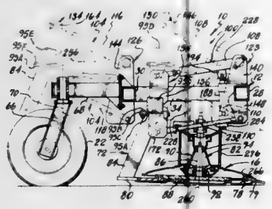
Robert Allely, Coventry, England, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Dec. 23, 1977, Ser. No. 864,023

Claims priority, application United Kingdom, Mar. 17, 1977, 11283/77; Jun. 1, 1977, 00309/77

Int. Cl.² A01D *45/02*

U.S. Cl. 56—53 **5 Claims**



1. An agricultural mower comprising a frame, hitch means on the frame for connecting the frame to a tractor; at least one crop cutting rotor assembly comprising a generally flat plate, a support leg secured to the rear portion of the flat plate and extending generally upwardly from the flat plate, an upwardly extending stub shaft secured to the forward end of the flat plate, a tubular drive shaft rotatably journaled on the upwardly extending stub shaft, a blade carrier plate secured to the lower portion of the tubular drive shaft, a plurality of crop cutting blades secured to the blade carrier plate and extending outwardly beyond the outer edge of the blade carrier plate, drive means for rotating the tubular drive shaft and the blade carrier plate attached to and supported on the upper end of the tubular drive shaft, and a linkage assembly secured to the upper end of the support leg and the frame, said linkage assembly permitting the generally flat plate to move up and down relative to the frame.

4,178,747

ROTARY EDGE CUTTER

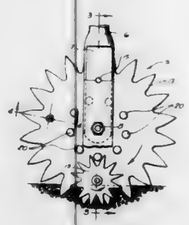
Stanley H. Williams, 52 Princes Hwy., Sylvania, New South Wales, Australia (2224)

Filed Mar. 6, 1978, Ser. No. 883,976

Claims priority, application Australia, Mar. 11, 1977, 9366

Int. Cl.² A01G *3/06*

U.S. Cl. 56—256 **2 Claims**



1. A herbage trimmer comprising a larger, toothed rotatable cutting blade, a smaller, toothed rotatable cutting blade lying flatly against the larger blade and positioned within the tooth tip circle of the larger blade such that some of its teeth overlap with some of the teeth of the larger blade, a plurality of bosses on said larger blade disposed in circular array concentric with said larger blade and in gear-tooth relationship with the teeth of the smaller blade such that counter clock-wise rotation of the larger blade effects clockwise rotation of the smaller blade, thereby producing a continuous shearing action between those teeth of the two blades overlapping for the time being.

4,178,748

OPEN-END SPINNING MACHINE APPARATUS WITH A TRAVELING DEVICE FOR BOBBIN EXCHANGE AND METHOD OF USING SAME

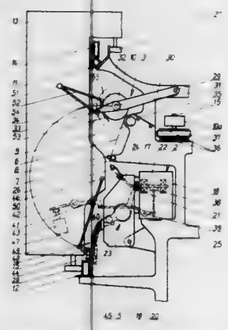
Fritz Stahlecker, Josef-Neidhart-Str. 18, 7341 Bad Überkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Süssen, both of Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,556

Claims priority, application Fed. Rep. of Germany, May 8, 1976, 2620428

Int. Cl.² D01H *15/00, 9/10*

U.S. Cl. 57—263 **9 Claims**



1. Spinning machine apparatus comprising:

a plurality of spinning units, each having an open-end spinning rotor for spinning thread,

a bobbin holder at each spinning unit for holding bobbins to wind up thread produced by the spinning units,

a supply station fixedly disposed at each spinning unit for storing a supply of at least one empty spool tube to be wound, each of said empty spool tubes being provided with a starter thread thereon of a length sufficient for at least one winding on process,

tube transfer means carried by a traveling servicing device guided on tracks for movement to respective servicing positions adjacent respective spinning units, said tube transfer means including means for automatically sequentially removing a full bobbin from one of said bobbin holders and transferring one of said empty spool tubes from a respective supply station at a spinning unit to said bobbin holder,

and means for returning a free end of the respective starter thread to a spinning rotor of a spinning unit to accommodate a piecing operation,

whereby the supply of the prepared empty spool tubes at said supply stations simplifies the constructional arrangement of the automatic tube transfer means while providing the advantages of substantially automatic bobbin changing operations for an open-end spinning machine.

4,178,749

METHOD AND APPARATUS FOR EXECUTION OF A PIECING PROCESS

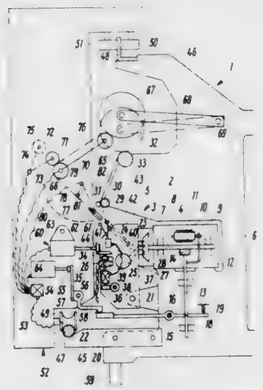
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7341 Bad Überkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Suessen, both of Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,465

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725105

Int. Cl.² D01H *15/00, 1/12, 1/32*

U.S. Cl. 57—263 **34 Claims**



1. A process for yarn piecing on an open-end spinning machine comprising:

returning a yarn end to piece the same with a fiber ring in a spinning rotor of a spinning assembly of the spinning machine,

withdrawing the pieced yarn from the spinning assembly,

and controlling the operations of said spinning assembly during piecing by way of a predetermined piecing control program,

wherein a plurality of different piecing control programs are provided for accommodating selection of respective different programmed operating conditions of the spinning assembly during at least a portion of the piecing operations,

wherein the quality or presence of the spun yarn at the intended piecing place is monitored during said withdrawing,

wherein the selection of the piecing control program to be utilized for the next piecing operation at said spinning assembly is automatically made in dependence on the monitored quality or presence of the pieced place,

and wherein the selection of the piecing control program to be utilized, when the next preceding piecing operation at said spinning assembly results in no pieced place, includes selection of a different control program than the one used in said next preceding piecing operation.

4,178,750

CONTROL CIRCUIT FOR ELECTRONIC TIMEPIECE

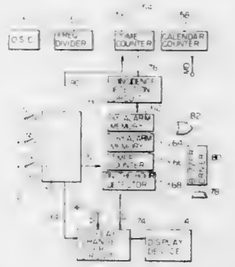
Tomomi Murakami, Higashiyamato, and Singo Ichikawa, Sayama, both of Japan, assignors to Citizen Watch Company Limited, Japan

Filed Oct. 4, 1977, Ser. No. 839,259

Claims priority, application Japan, Oct. 6, 1976, 51-119977; Oct. 6, 1976, 51-119978

Int. Cl.² G04B *19/24;* **G04C** *3/00, 9/00*

U.S. Cl. 58—4 A **9 Claims**



1. A multi-function electronic timepiece which operates in a time-keeping function mode and a plurality of secondary function modes, comprising:

a frequency standard providing a relatively high frequency signal;

a frequency divider providing a time unit signal in response to said relatively high frequency signal;

time-keeping circuit means responsive to said time unit signal for providing time information signals;

a function circuit including a plurality of circuit means for performing said plurality of secondary functions and for providing function display signals;

display means including a time display station for displaying time information in response to said time information signals, and a plurality of function display marks for displaying said plurality of secondary functions, respectively, in response to said function display signals;

a manually operable switch for providing an output pulse when actuated;

a control circuit including means responsive to said output pulse for generating an output signal indicative of a state in which a selected one of said plurality of circuit means is in a controllable state; and

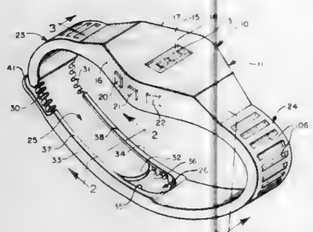
display change-over circuit means for passing said time information signals and said function display signals to said display means in said time-keeping function, whereby said time display station is operative to display said time information and said plurality of function display marks are effective to indicate that said plurality of secondary functions are set, in said time-keeping function mode; said display change-over circuit being responsive to said output signal from said control circuit whereby only one of said plurality of function display marks corresponding to the circuit means in said selected state is effective to indicate when said selected one of said plurality of circuit means is in the controllable state.

4,178,751

INTEGRALLY MOLDED WATCH CASING AND BAND

James P. Liautaud, River and Bluff Rds. Trout Valley, Cary, Ill. 60013

Filed Mar. 9, 1977, Ser. No. 775,785
Int. Cl.[2] G04B *37/08;* **G04C** *3/00*
U.S. Cl. 58—23 R **14 Claims**



1. A casing for a wrist watch of the type including a time-keeping module having a read-out portion therein, said casing comprising:

a base strip of pliable material including opposing elongate end portions and an enlarged raised central portion therebetween;

an exterior plastic body portion molded over said base strip substantially surrounding same and defining opposed wrist band portions formed over said base strip elongate ends and an enlarged central portion formed over said raised central portion of said base strip, contiguously with said band portions, said plastic central portion including a recess for mounting said time-keeping module therein; and

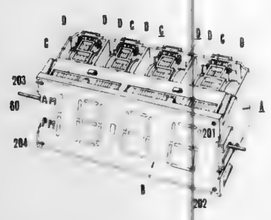
said enlarged central portions of said strip and said body portion including apertures therein for rendering said module read-out portion visible from the exterior of the watch casing when said module is mounted in said recess.

4,178,752

SHUTTER TYPE DIGITAL CLOCKS

Hideo Umezaki; Katsuharu Doma, both of Tokyo; Toshiro Konno, Kawanishi; Fumio Yanashita, Izumi; Yoshio Saito, Kurokawa, and Tosuke Sawafuji, Izumi, all of Japan, assignors to Tamura Electric Works, Ltd., Tokyo and Yanashita Seiko Kabushiki Kaisha, Izumi, both of, Japan

Filed Nov. 21, 1977, Ser. No. 853,765
Claims priority, application Japan, Nov. 24, 1976, 51-157802; Dec. 10, 1976, 51-149091; Dec. 25, 1976, 51-175078; Mar. 31, 1977, 52-40524
Int. Cl.[2] G04C *17/02*
U.S. Cl. 58—126 E **17 Claims**



1. A shutter type digital clock comprising a display substrate including hour, ten minutes and minute display members each constituted by a plurality of display digit openings which are arranged in the form of a letter 8 and a ten o'clock display member constituted by display digit openings which are arranged in the form of a letter "1"; a light diffusion plate located on the rear side of said display substrate and provided with a plurality of shutter guide openings corresponding to said respective display members; a lamp house block located on the rear side of said light diffusion plate and provided with a plurality of lamp openings corresponding to said respective display members; a plurality of lamps respectively accommodated in said lamp openings; a frame made of a synthetic resin and adapted to support said display substrate, said light diffusion plate and said lamp house block; a plurality of shutter units each including a plurality of shutter members located on the rear side of said lamp house block and extending to the front side of said light diffusion plate for selectively opening and closing said display digit openings; each shutter member being provided for each one of said display digit openings; and a plurality of cam control mechanisms associated with a synchronously operated digit shift mechanism and adapted to control the positions of respective shutter members of said shutter units; said frame including a pair of opposed side walls, and a supporting wall which is parallel with said display substrate and provided with a plurality of bearing members adapted to pivotally support said shutter members of said shutter units, and a plurality of bearing members adapted to rotably support rotary cams of said cam control mechanisms.

6. A shutter type digital clock comprising a display substrate provided with hour, ten minutes and minute display members each constituted by a plurality of display digit openings which are arranged in the form of a letter 8, and a ten o'clock display member constituted by display digit openings which are arranged in the form of a letter 1; a light diffusion plate disposed on the rear side of said display substrate and provided with a plurality of shutter guide openings corresponding to respective display members; a lamp house block disposed on the rear side of said light diffusion plate and provided with a plurality of lamp openings corresponding to respective display members; a plurality of lamps respectively contained in said lamp openings; a frame made of a synthetic resin and supporting an assembly of said display substrate, said light diffusion plate and said lamp house block; a plurality of shutter units disposed on the rear side of said lamp house block; each shutter unit including a plurality of shutter members, each including a shutter piece extending toward the front face of a respective and associated display digit opening for selectively opening and closing the same; synchronously operated digit shift mechanisms; and a plurality of cam control mechanisms cooperating with said digit shift mechanisms for controlling the positions of respective shutter members of said shutter units; said display substrate and the respective shutter pieces of said shutter members of the shutter units being made of opaque synthetic resins of the same color and said light diffusion plate being made of a colored synthetic resin containing a phosphor pigment.

4,178,753

PENDANT COMPRISING A SLEEVE IN COMBINATION WITH A TIMEPIECE

Emil Schenker, Grenchen, Switzerland, assignor to Sorna Watch S.A., Grenchen, Switzerland

Filed Aug. 29, 1978, Ser. No. 937,718
Claims priority, application Switzerland, Sep. 7, 1977, 10916/77; Feb. 15, 1978, 1651/78
Int. Cl.[2] G04B *47/00*
U.S. Cl. 58—152 R **7 Claims**

1. A pendant comprising a sleeve, to which a writing implement, more especially, a ballpoint pen may be attached at one end of said sleeve in combination with a timepiece, in which the timepiece has a housing which, by means of a plurality of locking detents having gaps therebetween, is removably connected to the sleeve, wherein one of said gaps between the locking detents is wider than the others of said gaps and in which a projection is provided in the sleeve, a clip disposed in said projection, and in which the sleeve has two opposed apertures for pulling through a necklace-type strip and in which the wider gap and the apertures for the necklace-type



strip are so arranged that the timepiece, when worn around the neck, is readable.

4,178,754

THROTTLEABLE TURBINE ENGINE

Ernest R. Earnest, Hobe Sound, Fla., assignor to The Hydragon Corporation, Lake Park, Fla.

Continuation-in-part of Ser. No. 706,810, Jul. 19, 1976, abandoned. This application Jul. 13, 1977, Ser. No. 815,251
Int. Cl.[2] F02C *9/04, 9/14*
U.S. Cl. 60—39.03 **18 Claims**



1. An integrated Brayton cycle-Rankine cycle engine comprising a Rankine turbine and a rotary compressor driven thereby, a Brayton turbine and an intercycle heat exchanger heated by the exhaust of the Brayton turbine and delivering heat to the Rankine fluid for powering the Rankine turbine, a combustor and air supply assembly for delivering to the Brayton turbine air from the compressor together with products of combustion from the combustor, and control means responsive to engine operating conditions for adjusting the fuel flow into the combustor and for throttling the amount of air entering the compressor.

4,178,755

FORCED AIR CONTROL VALVE FOR EXHAUST SYSTEM OF INTERNAL COMBUSTION ENGINE

Leo T. Klimazewski, and James A. McNairy, both of St. Louis, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

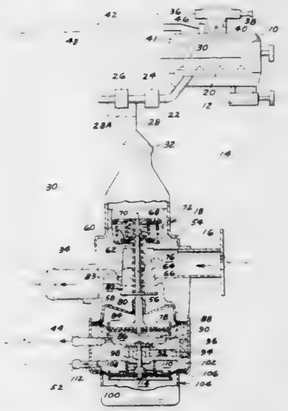
Filed Dec. 23, 1977, Ser. No. 864,138
Int. Cl.[2] F01N *3/10*
U.S. Cl. 60—290 **2 Claims**

1. An air control valve for use on an internal combustion engine having an exhaust system with a catalytic converter bed therein and an air pump for supplying air to the exhaust system, said air control valve comprising:

a valve body having a main air chamber, an air inlet extending to the main air chamber, and a pair of air outlets leading from the main air chamber, one of said air outlets being connected to the exhaust manifold upstream of the catalytic converter bed and the other outlet diverting air away from the catalytic converter bed;

a valve assembly positioned in the main air chamber between the inlet and said pair of outlets for alternating air flow between said pair of outlets, said valve assembly having a main valve member and a secondary valve member mounted thereon, said main valve member controlling air flow through said one outlet and said secondary valve member controlling air flow through said other outlet, said valve assembly being shifted between two positions, one in which the main valve member is open to supply air to said one outlet with the secondary valve member closed and a second position in which the secondary valve member is open to supply air to said other outlet with the main valve member being closed;

a main diaphragm assembly secured to the valve body and connected to the valve assembly, spring biasing means to urge the diaphragm assembly and the valve assembly to



said other position in which the main valve member is closed and the secondary valve member is open, said valve body having a main vacuum chamber on one side of the main diaphragm assembly, a vacuum line extending from the intake manifold of the internal combustion engine to the main vacuum chamber, temperature responsive means operatively connected to said vacuum line to permit the exertion of a vacuum against the diaphragm assembly only during cold engine operation, said temperature responsive means being effective to interrupt the vacuum exerted against the diaphragm assembly during warm engine operation to maintain the main valve member in a closed position for diverting air away from the catalytic converter bed during warm engine operation; and

vent valve means venting the main vacuum chamber to atmosphere upon a rapid deceleration of the internal combustion engine during both cold engine operation and warm engine operation.

4,178,756

VACUUM UNION FOR AN INTERNAL COMBUSTION ENGINE

Eiji Adachi; Juichi Shibatani, and Sadayoshi Ito, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 14, 1977, Ser. No. 815,772
Claims priority, application Japan, Oct. 25, 1976, 51-127374
Int. Cl.[2] B60T *13/46*
U.S. Cl. 60—397 **1 Claim**

1. A vacuum-operated system in a vehicle internal combus-

tion engine having an intake pipe in which vacuum pressure is produced, said system comprising:

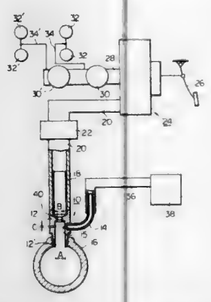
a vacuum-operated brake booster;

at least one vacuum-operated engine controlling device; and

a vacuum union for transmitting a vacuum signal from the intake pipe to both the brake booster and the at least one engine controlling device, said vacuum union comprising:

a tubular body which has one end thereof connected to the intake pipe and the other end thereof connected to the brake booster, said body having a lateral hole formed in the tubular wall of said body, said hole having a portion of a small dimension;

a branch pipe having one end thereof fixably inserted into an



outer end of the lateral hole of the tubular body, the other end of said branch pipe being connected to said at least one engine controlling device; and

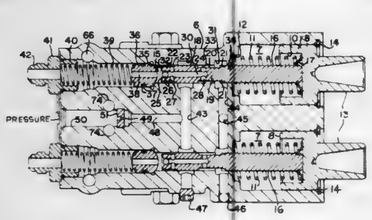
a stationary orifice defined in said tubular body at a position located on one side of said lateral hole remote from said intake pipe, said orifice having a dimension larger than the dimension of said lateral hole and smaller than a corresponding dimension of said one end of the tubular body, whereby a sufficient level of the vacuum signal transmitted to said brake booster via said orifice is effectively maintained for maintaining proper operation of the brake booster even if the branch pipe is accidentally opened to the atmosphere during the use of the union due to one of said at least one engine controlling device being damaged.

4,178,757

FLOW CONTROL MEANS

Edwin Ketterling, Libertyville, and Benjamin R. Nelson, Lindenhurst, both of Ill., assignors to White Farm Equipment Company, Eastlake, Ohio

Filed Aug. 10, 1977, Ser. No. 823,469
Int. Cl.² B60T *13/12*
U.S. Cl. 60—548 **4 Claims**



1. For combination in a vehicle hydraulic brake system having right and left wheel brake cylinders, a source of hydraulic pressure when the vehicle is operating, a hydraulic fluid reservoir, and manually actuated brake applicator means,

brake system actuating and control valve means for operatively interconnecting said source of hydraulic pressure, said hydraulic fluid reservoir, said manually activated brake applicator means and said wheel brake means, comprising in combination

a valve for each of said brake cylinders adapted to be operatively interconnected therewith by conduit means and having a valve body which has,

an elongated straight-through primary bore extending between first and second sides of said valve body and having at its first end adjacent said first side a chamber for receiving a manually actuated brake piston with a capacity for containing a substantial volume of hydraulic fluid, said primary bore at its opposite second end adjacent said second side having a hydraulic fluid discharge section for receiving a free piston and adapted to be interconnected by conduit means with one of said brake cylinders, and said primary bore having an interconnecting section including a pair of spaced circumferential chambers dividing said interconnecting section into lands at opposite ends thereof and an intermediate land between said circumferential chambers, one of said circumferential chambers being nearest said valve body first side and the other of said circumferential chambers being nearest said valve body second side,

a first auxiliary bore paralleling said primary bore and extending from open communication at its first end with said brake piston receiving chamber to a closed second end adjacent said valve body second side,

a second auxiliary bore paralleling said primary bore and closed at opposite ends and extending inwardly from adjacent said valve body second side to an inner end,

a first passageway interconnecting said auxiliary bores at a location spaced substantially inwardly from said valve body second side,

a second passageway interconnecting said auxiliary bores at a location spaced further from said valve body second side than said first passageway,

a third passageway interconnecting said first auxiliary bore at its end adjacent said valve body second side and said hydraulic fluid discharge section of said primary bore,

a fourth passageway interconnecting said second auxiliary bore at its end adjacent said valve body second side with said hydraulic fluid discharge section of said primary bore,

a first fluid-return passageway for interconnecting said inner end of said second auxiliary bore with said hydraulic fluid reservoir,

a second fluid-return passageway for interconnecting the circumferential chamber of said interconnecting section nearest said valve body first side with said hydraulic fluid reservoir,

a pressurized fluid inlet passageway with metering orifice therein for receiving hydraulic fluid under pressure from said source thereof and interconnecting on the downstream side of said metering orifice with said circumferential chamber of said interconnecting section nearest said valve body second side,

a fifth passageway interconnecting said pressurized fluid inlet passageway on the upstream side of said metering orifice with said second auxiliary bore therein at a location intermediate the connections therewith of said first and fourth passageways;

a manually actuated brake piston in said piston receiving chamber of said primary bore adapted to be operatively interconnected with said manually actuated brake applicator means of said brake system;

said free piston in said hydraulic fluid discharge section having a passage permitting fluid flow from side to side therethrough;

a first valve spool interfitting and reciprocal within said interconnecting section of said primary bore and having, an extension on a first end engageable with said brake piston for reciprocation in unison therewith, a second end opposite said first end operable in the end land of said interconnecting primary bore adjacent said hydraulic fluid discharge section,

a reduced diameter section providing in one position of said valve spool communication between said spaced circumferential chambers in said interconnecting section said one position being the one said valve spool occupies when said brake system is in its brake fill stage,

spaced radial passageways a first being adjacent said second end of said valve spool and providing fluid flow communication into said hydraulic fluid discharge section of said primary bore and the second opening into said reduced diameter section,

a passageway interconnecting said radial passageways,

said valve spool having a neutral position in said primary bore when said brake piston is in its non-actuated fully retracted position, a first actuated position wherein fluid under pressure is allowed to flow from said pressurized fluid inlet passageway through said spaced radial passageways and said interconnecting passageway into said hydraulic fluid discharge section, a second actuated position wherein said reduced diameter section provides communication between said first and second circumferential chambers, and a third actuated position wherein hydraulic fluid cannot flow into said hydraulic fluid discharge section and said second end of said valve spool acts directly on said free piston in said fluid discharge section;

a first spring-closed check valve in said third passageway unseatable to allow fluid to flow from said first auxiliary bore into said hydraulic fluid discharge section,

a second spring-closed check valve in said second passageway unseatable to allow fluid to flow from said second auxiliary bore into said first auxiliary bore;

a free relief valve piston in said second auxiliary bore in the end thereof adjacent said second valve body side whereby fluid from said hydraulic fluid discharge section introduced into said second bore through said fourth passageway acts on the end of said free relief valve piston nearest said valve body second side and whereby pressurized fluid introduced into said second auxiliary bore through said fifth passageway acts on the opposite end of said free relief valve piston;

a relief valve spool reciprocable in said second auxiliary bore having a radial passageway therein communicating with a longitudinal passageway therein extending on the side of said radial passageway opposite from said free relief valve piston and into communication with said inner end of said second auxiliary bore, said relief valve spool being positionable on actuating engagement by said free relief valve piston to where said radial passageway therein communicates with said first passageway;

a first spring in said piston-receiving chamber biasing said brake piston therein towards its retracted position;

a second spring in said hydraulic fluid discharge section biasing said free piston therein toward said spool valve therein; and

a third spring in said second auxiliary bore biasing said relief valve spool therein towards said free relief valve piston.

4,178,758

PARTIAL OXIDATION PROCESS

Peter L. Paull, Weston, Conn., and Rodney McGann, Santa Cruz, Calif., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 855,645, Nov. 29, 1977, which is a continuation-in-part of Ser. No. 698,439, Jun. 21, 1976, Pat. No. 4,099,382. This application Oct. 30, 1978, Ser. No. 956,135
Int. Cl.² F01K *27/00*
U.S. Cl. 60—648 **46 Claims**

1. In the process for producing gaseous mixtures comprising H_2, CO and containing at least one member of the group H_2O, CO_2, H_2S, COS, CH_4, N_2, A_r, and particulate carbon by the partial oxidation of a hydrocarbonaceous fuel, or liquid oxygenated hydrocarbonaceous fuel, or a slurry of solid carbonaceous fuel and water or a liquid hydrocarbon with a free oxygen containing gas and optionally in the presence of a temperature moderator, at a temperature in the range of about 1 to 250 atmospheres absolute in the reaction zone of a free-flow noncatalytic gas generator, the improvement comprising: (1) continuously passing the effluent gas stream leaving the reaction zone of said gas generator through a first heat exchange zone comprising a shell and tube heat exchanger in heat exchange with a continuous stream of steam, at a higher pressure than



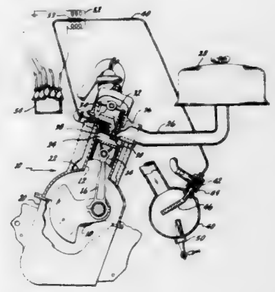
said effluent gas stream, thereby converting said steam into a continuous stream of superheated steam while simultaneously reducing the temperature of the continuous stream of effluent gas, and simultaneously continuously bleeding a portion of said steam into said stream of effluent gas by way of openings in the walls of said tubes while placing a sheath of steam between the surface of said tubes and the stream of effluent gas passing through said first heat exchange zone; (2) removing from said first heat exchange zone a continuous stream of effluent gas containing said bleed steam; and (3) simultaneously removing a continuous stream of said superheated steam from said first heat exchange zone.

4,178,759

ION REPULSION ENGINE AND METHOD OF OPERATING SAME

Billy G. Cook, 140 E. Millan St., Chula Vista, Calif. 92010

Filed Apr. 7, 1978, Ser. No. 894,474
Int. Cl.² F03G *7/00*
U.S. Cl. 60—721 **11 Claims**



1. In a reciprocating engine having at least one cylinder closed at one end by a cylinder head and having a slidable piston located in said cylinder defining a cylinder space between said head and said piston, at least one intake valve com-

municating between said cylinder space and a source of an oxygen-containing gas and at least one exhaust valve communicating between said cylinder space and an exhaust system, the improvement comprising:

at least one first enclosed porous conductive electrode in fluid flow communication with said cylinder space;

at least one second enclosed porous conductive electrode in fluid flow communication with said exhaust system;

an electrical conductor connectable between said first and second electrodes;

means permitting said oxygen containing gas to be compressed in said first electrode during movement of said piston toward said cylinder head; and

means for feeding fuel to said second electrode;

whereby oxygen is ionized in said first electrode as said air is compressed, electrons flow through said conductor to said second electrode to ionize fuel therein, providing an increase in pressure in said cylinder space due to ion repulsion.

4,178,760

FILTER DUST EJECTOR AND CHECK VALVE ARRANGEMENT IN EXHAUST SYSTEM OF INTERNAL COMBUSTION ENGINE

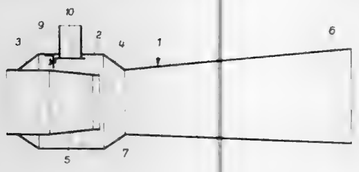
Herbert Alf, Ludwigsburg, and Fritz Bussinger, Grossachsenheim, both of Fed. Rep. of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Nov. 30, 1977, Ser. No. 856,413

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1976, 7636707[U]

Int. Cl.[2] F01N *5/04*

U.S. Cl. 60—319 **7 Claims**



1. A filter dust ejector designed for incorporation in the exhaust system of an internal combustion engine and for connection to its air intake filter, so that a negative pressure created by engine exhaust gas in the ejector draws dust-laden air from the filter into the exhaust system, for discharge with the exhaust gas, said filter dust ejector comprising in combination:

an ejector housing defining a longitudinal flow axis and having an upstream opening and a downstream opening on opposite axial extremities;

an inlet pipe extending into the ejector housing from the upstream opening thereof so as to define an annular suction space between it and the wall of the ejector housing, the inlet pipe having an open downstream extremity located a short axial distance from the downstream opening of the ejector housing, thereby forming an annular suction gap therewith;

an outlet pipe connected to and extending away from the downstream opening of the ejector housing; the wall portion of the ejector housing which leads to said downstream opening and the wall of the connected outlet pipe being so shaped that they define a venturi-type flow profile, so that a gas flow from the inlet pipe to the outlet pipe creates a negative pressure in the annular suction gap and, consequently, in the suction space of the ejector housing;

a suction connector in the form of a length of pipe which protrudes a short distance into the suction space of the ejector housing and serves as an inlet for said dust-laden air drawn from the filter; and

check valve means arranged inside the ejector housing and associated with the suction connector, the check valve means being operable to close the suction connector, in the event of a pressure condition in the suction space of the ejector housing tending to create an outflow of gas through the suction connector; and wherein said check valve means includes:

a valve seat on the inwardly protruding extremity of the suction connector; and

a pivotable flapper cooperating with the valve seat, the pivot axis of the flapper being located outside the suction connector, on the axially upstream side thereof within the ejector housing, and oriented perpendicularly to a plane which includes the axes of the suction connector and of the ejector housing.

4,178,761

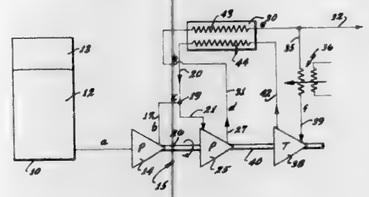
HEAT SOURCE AND HEAT SINK PUMPING SYSTEM AND METHOD

Everett H. Schwartzman, 724 Cloyden Rd., Palos Verdes Estates, Calif. 90274

Filed Jun. 17, 1977, Ser. No. 807,359

Int. Cl.[2] F01K *25/10;* **F17C** *7/02*

U.S. Cl. 60—648 **27 Claims**



25. A pumping system for a liquid in which the output of the system is at a higher pressure than the pressure of the liquid in a storage source comprising:

pump means connected to said source for receiving the liquid whose thermodynamic condition of state is that of liquid saturation or in the subcooled region based on the pressure-enthalpy curve for the material in said source,

means forming an outlet for said pumping system,

heat exchanger means receiving the liquid from said pump means,

means forming a supply of vaporized liquid whose thermodynamic condition of state is in the saturated or superheated region of the pressure-enthalpy curve for the material,

turbine means receiving said vaporized liquid for producing power for the operation of said pump means and providing a turbine exhaust in gaseous form but at a pressure at or below said system output pressure,

means to flow said turbine exhaust through said heat exchanger for recondensation of said exhaust into liquid form such that the thermodynamic condition of state of said recondensed exhaust is that of liquid saturation or in the subcooled region based on the pressure-enthalpy curve for said material, and

means for admixing said recondensed vapor with liquid material whose thermodynamic condition of state is that of liquid saturation or in the subcooled region based on the pressure-enthalpy curve for said material.

4,178,762

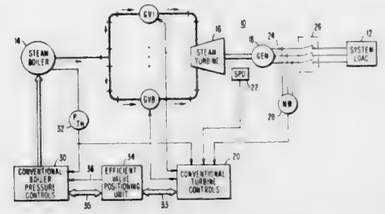
EFFICIENT VALVE POSITION CONTROLLER FOR USE IN A STEAM TURBINE POWER PLANT

Morton H. Binstock, Pittsburgh, and Steven J. Johnson, McCandless Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 24, 1978, Ser. No. 889,764

Int. Cl.[2] F01K *13/02*

U.S. Cl. 60—667 **27 Claims**



1. In a power plant for generating electrical energy at a desired power generation level including a boiler for generating steam at a boiler throttle pressure which is governed by a pressure set point; a steam turbine having a plurality of steam admission valves for regulating the amount of generated steam therethrough; a valve control means governed by a reference signal corresponding to the desired power generation level to position said plurality of steam admission valves in a state according to a predetermined valve positioning pattern based on the value of said reference signal; and an electrical generator driven by said steam turbine to generate electrical energy, a system for efficiently positioning said plurality of steam admission valves to effect the desired power generation level, said system comprising:

first means for adjusting said pressure set point based on a function of a selected one of a plurality of predetermined values of said reference signal, said predetermined values substantially corresponding to efficient valve position states for regulating steam admission to said turbine;

second means governed by said pressure set point adjustment to modulate said reference signal substantially to the selected value, whereby the steam admission valves are positioned at an efficient valve position state to regulate steam admission corresponding to the desired power generation level.

4,178,763

SYSTEM FOR MINIMIZING VALVE THROTTLING LOSSES IN A STEAM TURBINE POWER PLANT

Louis P. Stern, Wadsworth, Ohio, and Steven J. Johnson, McCandless Township, Allegheny County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 24, 1978, Ser. No. 889,770

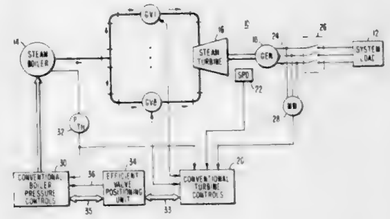
Int. Cl.[2] F01K *13/02*

U.S. Cl. 60—667 **18 Claims**

7. In a power plant that generates electrical energy at a desired power generation level including a steam producing boiler having a boiler throttle pressure associated therewith; a steam turbine having a plurality of steam admission valves for regulating the amount of boiler produced steam conducted therethrough; and an electrical generator driven by said steam turbine to generate electrical energy at said desired power level, a system for minimizing the power plant energy losses substantially caused by steam flow throttling across partially opened steam admission valves, said system comprising:

means for selecting one of a plurality of predetermined steam admission valve position states which substantially correspond to minimizing valve throttling losses;

first means governed by said selected predetermined steam admission valve position state to adjust the boiler throttle pressure of said steam boiler; and



second means responsive to said adjustment of boiler throttle pressure to position said plurality of steam admission valves to selected state by maintaining the generated energy substantially at the desired power generation level.

4,178,764

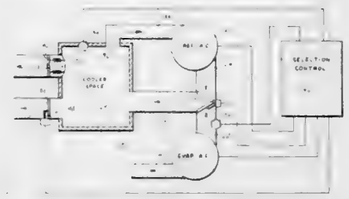
AIR CONDITIONING SYSTEM

Jerry R. Rowe, Rte. #2, Box 153-10, Springtown, Tex. 76082

Filed Nov. 21, 1977, Ser. No. 853,253

Int. Cl.[2] F25D *7/00*

U.S. Cl. 62—81 **17 Claims**



1. In an air conditioning system having

a. an evaporative cooler which uses outside air from outside the cooled space,

b. a refrigerated cooler,

c. a cooled space,

d. at least one duct connecting each of said coolers to the cooled space, and

e. a space thermostat providing means for sensing space temperature of said cooled space;

the improved structure comprising in combination with the above:

f. initiation means for initiating cooling when said space temperature exceeds a limit space temperature, including

g. switching means for switching between said evaporative cooler and said refrigerated cooler responsive to the effectiveness of the evaporative cooler as it responds to relative humidity of outside air and temperature of outside air.

4,178,765

MEANS FOR CAUSING THE ACCUMULATION OF REFRIGERANT IN A CLOSED SYSTEM

Curtis R. Slayton, Fern Creek, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jun. 28, 1978, Ser. No. 920,098

Int. Cl.[2] F25B *43/00, 43/02, 39/04*

U.S. Cl. 62—83 **17 Claims**

1. A refrigeration system comprising:

a condenser,

an evaporator,

a hermetic compressor casing in a sealed series circuit, for permitting circulation of a charge of refrigerant,

an expansion device intermediate said condenser and evapo-

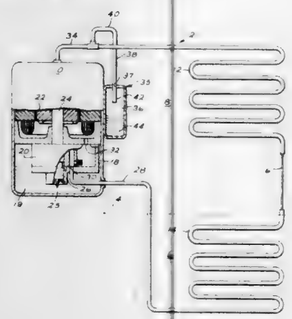
rator dividing said system into a high and low pressure portion,

said hermetic compressor casing having a refrigerant compressor for compressing refrigerant gas and a motor for driving said compressor, and a sump portion containing a supply of lubricating oil for said compressor,

a member providing a sealed reservoir, having an opening in its upper portion,

means connecting said reservoir in sealed communication with said system,

a material arranged in said reservoir having a high solubility for refrigerant relative to said lubricating oil in said casing sump, the volume of said material being an amount sufficient to cause enough of said refrigerant charge in said system to migrate as a vapor into the lower pressure area of said reservoir and into solution with said material so that liquid refrigerant present when the system is inactive will collect in the reservoir.



11. The method of causing liquid refrigerant into a preselected area in a sealed inactive refrigeration system including an oil lubricated compressor to migrate which comprises:

providing a member forming a sealed reservoir,

providing means connecting said resevoir in fluid communication with said sealed system,

arranging a volume of material in said reservoir having greater miscibility with said refrigerant relative to said compressor oil,

absorbing substantially all of said refrigerant which can exist as a liquid into the lower pressure area of said reservoir and into solution with said material when said system is inactive; and

allowing said refrigerant to migrate back into said system when said compressor operation causes a temperature rise in said reservoir that is sufficient to drive out the refrigerant that is in solution with said material.

4,178,766

THERMODYNAMIC COMPRESSOR METHOD

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042

Division of Ser. No. 708,863, Jul. 26, 1976, Pat. No. 4,107,945. This application Mar. 9, 1978, Ser. No. 884,832

Int. Cl.² F25B *3/00*

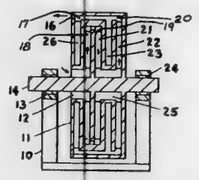
U.S. Cl. 62—88 **8 Claims**

1. A method of compressing a compressible fluid comprising:

a. alternately compressing and expanding said fluid in a first compressing and expanding means; subsequently

b. compressing said fluid in a second compressing means with accompanying temperature increase;

c. removing heat from said fluid downstream of the second compressing means and adding said heat into said fluid



during the alternate compressing and expanding steps, within either said first compressing or expanding means.

4,178,767

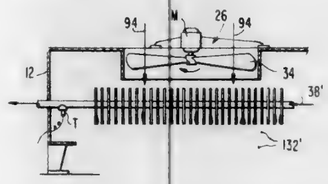
REVERSE FAN HEAT PUMP DEFROST CONTROL SYSTEM

David N. Shaw, Unionville, Conn., assignor to Dunham-Bush, Inc., West Hartford, Conn.

Filed Jun. 19, 1978, Ser. No. 917,040

Int. Cl.² F25B *13/00*

U.S. Cl. 62—155 **7 Claims**



1. In a heat pump including a finned outdoor coil acting selectively as a refrigeration condenser and evaporator and having a fan mounted adjacent the coil for blowing air upwardly and across the coil fins for effecting heat exchange between the moving air and refrigerant within the coil tubing, said heat pump including control means responsive to frost accumulation on the fins of said outdoor coil when said outdoor coil is acting as an evaporator under near-freezing ambient conditions for effecting a change in heat pump operation from heating mode to cooling mode and to thereby initiate defrosting of the coil by supplying hot refrigerant vapor to said coil and for terminating fan operation, the improvement comprising: said fan being a reversible direction fan, and said control means further comprising means for first delaying the termination of the heat pump cooling mode for defrost operation and the initiation of the heating mode, and secondly, for reversing the direction of forced air flow over the coil such that the air flow acts in conjunction with gravity to remove the last of the melted condensate from the fins.

4,178,768

INTERNALLY PILOTED REVERSING VALVE FOR HEAT PUMP

Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

Filed Jan. 25, 1978, Ser. No. 872,231

Int. Cl.² F25B *13/00*

U.S. Cl. 62—160 **8 Claims**

1. A reversing valve for selectively porting refrigerant from compressor to air-conditioning/heat pump system comprising:

a housing means,

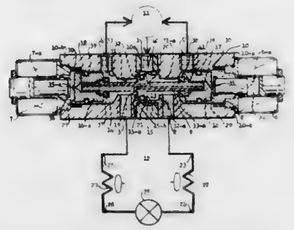
a first port means in said housing means for receiving compressor fluid under pressure,

a second port means in said housing means connected to a system condenser,

a third port means in said housing means connected to a system evaporator,

a fourth and a fifth port means connected to said compressor for fluid return thereto selectively,

a valve means in said housing slidable from a first position allowing pressurized fluid flow through interconnecting conduit means from said compressor to said condenser via said first and second port means for pressure reduction in an expander and for low pressure cold fluid return by way of said evaporator performing air conditioning before entering said compressor via said third and fourth port means, to a second heat pump position reversing fluid flow through said conduit means by forcing fluid from said compressor to flow under pressure to said evaporator



for heat extraction first via said first and third port means thereof to continue subsequent fluid expansion and return at low pressure to said compressor by way of said condenser via said second and fifth port means,

an operator means for changing said positions of said valve means when desired, an internal pilot piston means in said valve means communicating with compressor fluid under pressure at said first port means in an operable relationship with said operator means and connected to shift said valve means from one of said positions to the other of said positions by means of pilot fluid pressure force over said pilot piston means, and means for exhausting said pilot fluid into said conduit means at low pressure, at the end of each change of said positions, including means for maintaining said valve means in one of said positions substantially driftless.

4,178,769

SYSTEM FOR PRODUCING REFRIGERATION AND A HEATED LIQUID AND CONTROL THEREFOR

Clifford N. Johnsen, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Division of Ser. No. 872,406, Jan. 26, 1978, Pat. No. 4,134,274. This application Jun. 23, 1978, Ser. No. 918,529

Int. Cl.² F25B *39/04, 29/00*

U.S. Cl. 62—180 **5 Claims**

1. A system for producing refrigeration and selectively operable for producing a heated liquid comprising

a. compressor means for compressing a vaporized refrigerant;

b. air cooled condenser means connected to said compressor means for receiving compressed refrigerant and condensing same by heat exchange with a source of air, further including fan means for forcing said air in heat exchange relationship with said air cooled condenser means;

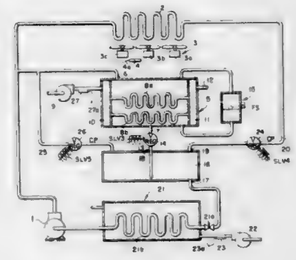
c. liquid cooled condenser means connected to said compressor means in parallel flow relationship with said air cooled condenser means for receiving compressed refrigerant and condensing same by heat exchange with a source of liquid, whereby a heated liquid is produced;

d. evaporator means for expanding and vaporizing said condensed refrigerant in heat exchange relationship with a refrigeration load and returning the vaporized refrigerant to said compressor means;

e. means for transferring condensed refrigerant from said air cooled and liquid cooled condenser means to said evaporator means and comprising

i. receiver means having a condensed refrigerant outlet connected to said evaporator means;

ii. first conduit means connecting said air cooled condenser means to said receiver means;



iii. second conduit means connecting said liquid cooled condenser means to said receiver means and including valve means therein for controlling the flow of condensed refrigerant through said second conduit means; and

iv. means for sensing the level of condensed refrigerant in said liquid cooled condenser means and controlling said valve means so as to maintain a predetermined level therein during operation of said system, whether or not heated liquid is being produced by said liquid cooled condenser means.

4,178,770

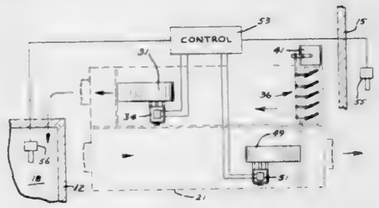
COLD AIR FLOW CONTROL APPARATUS

Lyle Fox, New Hope, Minn., assignor to Econo-Cooler, Inc., Osseo, Minn.

Filed Apr. 24, 1978, Ser. No. 899,560

Int. Cl.² F25D *17/04*

U.S. Cl. 62—186 **19 Claims**



1. A cold air flow and control apparatus to transfer cold outside air from the exterior of a building to a cold room in the building to supplement the refrigeration provided to the cold room by the usual refrigeration equipment, said apparatus comprising: housing means mounted exteriorly of the cold room having a chamber; air intake means disposed between the interior of the cold room and the exterior of the building to permit movement of cold air from the exterior of the building to the interior of the building comprising an upstream air intake duct extending from a location outside of the building to the intake chamber of the housing, and a downstream air intake duct extending from the intake chamber of the housing to a location inside of the cold room; an intake blower located in the chamber to move cold air through the air intake means from the exterior of the building to the interior of the cold

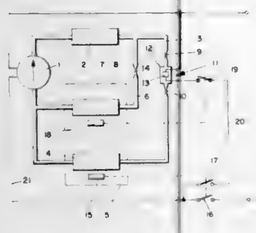
room; air exhaust means allowing air to flow out of the cold room; and control means including outside thermal responsive regulator means operative to prohibit operation of the intake blower when the outside temperature sensed by the control means exceeds a pre-selected upper temperature limit, and operative to permit operation of the intake blower when the outside temperature sensed by the control means is less than said upper temperature limit; said control means also including inside thermal responsive regulator means operable to cause the intake blower to operate when the temperature in the cold room approaches an upper temperature boundary and when the intake blower is permitted to operate by the outside thermal responsive regulator means, and operative to shut off the intake blower when the temperature in the cold room reaches a low temperature boundary.

4,178,771

COMPRESSOR REFRIGERATOR

Bent Karll, Augustenborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Apr. 19, 1978, Ser. No. 897,584
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1977, 2717050
Int. Cl.² F25B *41/06*
U.S. Cl. 62—200 **2 Claims**



1. A refrigeration assembly, comprising, first and second compartments having lesser and greater cold requirements, compressor and condenser means in fluid flow series, first and second evaporator means in said compartments, first and second parallel conduit means extending from said condenser means to said first and second evaporator means, electrically operated blocking means in said first conduit means, a parallel circuit having first and second conductor means for said blocking means and said compressor means, a main switch in series with said parallel circuit, a blocking switch in series with said blocking means, and first and second thermostats for said compartments for operating said main switch and said blocking switch.

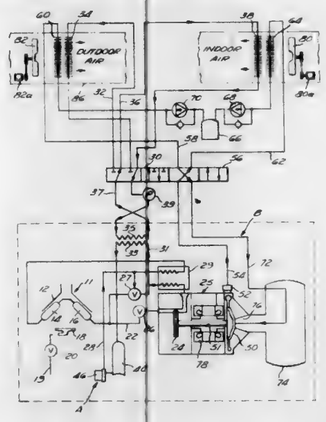
4,178,772

HEAT PUMP SYSTEM

Paul F. Swenson, Cleveland, Ohio, and Paul B. Moore, Fedhaurn, Fla., assignors to Consolidated Natural Gas Service Company, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 737,776, Nov. 1, 1976, Pat. No. 4,055,964. This application Oct. 25, 1977, Ser. No. 845,229
The portion of the term of this patent subsequent to Nov. 1, 1994, has been disclaimed.
Int. Cl.² F25B *27/02, 13/00, 1/00*
U.S. Cl. 62—238 **40 Claims**

1. A fluid heating and cooling system comprising:
- a refrigeration circuit having a compressor with an inlet and an outlet, an indoor refrigeration circuit heat exchanger, and an outdoor refrigeration circuit heat exchanger,
- a heat engine, said heat engine having a heat rejection circuit with means for receiving rejected heat from said heat engine, a primary heat exchanger connected to said means for receiving rejected heat, an evaporator in heat exchange relation with said primary heat exchanger, a heat engine indoor heat exchanger, a heat engine outdoor heat exchanger,
- first fluid moving means for conducting a first fluid in series across both of said indoor heat exchangers,
- second fluid moving means for conducting a second fluid in series across both of said outdoor heat exchangers,
- means for drivingly interconnecting said heat engine with said compressor,
- first valve means movable to a cooling position for discontinuing flow of vapor from said evaporator to said heat engine indoor heat exchanger when said heat engine is drivingly connected to said compressor,



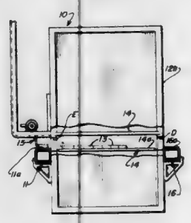
- second valve means movable to a heating position for discontinuing flow of vapor from said evaporator to said heat engine outdoor heat exchanger when said heat engine is drivingly connected to said compressor,
- third valve means movable to a cooling position for connecting said compressor outlet to said refrigeration circuit outdoor heat exchanger when said first valve means is moved to said cooling position,
- fourth valve means movable to a heating position for connecting said compressor outlet to said refrigeration circuit indoor heat exchanger when said second valve means is moved to said heating position.

4,178,773

MATERIAL HANDLING SYSTEM

Alden H. Wakeman, Lake Mills, Wis., assignor to Crepaco, Inc., Lake Mills, Wis.

Filed Mar. 24, 1978, Ser. No. 889,731
Int. Cl.² F25C *5/14*
U.S. Cl. 62—341 **6 Claims**



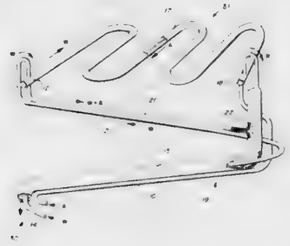
1. A material handling system for use in successively pushing a plurality of products between a pair of refrigerated plates when the latter assume a predetermined separated substantially parallel relation, said system comprising a plurality of substantially rigid framelike members, each member being adapted to loosely encompass a predetermined number of products prior to the latter being fed between the pair of plates, each product and the encompassing framelike member moving substantially as a unit between the pair of separated plates, each member including an encompassing wall section having substantially planar exterior surface portions disposed substantially normal to the direction of travel of the product and member between the pair of plates, predetermined exterior surface portions of successive framelike members being in abutting relation while being moved between the pair of plates; the height of each wall section being at least substantially equal to the maximum height of the product encompassed thereby; said framelike members being successively removed from the products subsequent to said member and product being discharged from between the pair of plates.

4,178,774

ABSORPTION REFRIGERATION APPARATUS

Karl-Gosta Almén, Joinville, Brazil, assignor to Consul S. A., Joinville,, Brazil

Filed Sep. 1, 1978, Ser. No. 939,070
Claims priority, application Brazil, Sep. 8, 1977, 54509
Int. Cl.² F25B *15/10*
U.S. Cl. 62—493 **8 Claims**



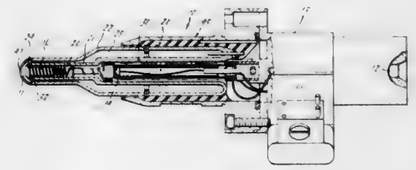
1. In an absorption refrigeration apparatus utilizing refrigerant and inert gas fluids and consisting of a generator, a condenser, an absorber, and an evaporator structure having a first portion and a substantially horizontal coil defining a coldest portion and a warmest portion, all interconnected with one another, improved means for effecting a two-stage precooling of liquid refrigerant and weak refrigerant and auxiliary gas media in said apparatus, said means comprising:
- means for effecting an initial precooling of the weak gas media and liquid refrigerant through heat exchange thereof with said first portion of the evaporator structure;
- means for effecting a final precooling of the weak gas media by conducting the initially precooled weak gas media in heat exchange relationship with a tube through which flows liquid refrigerant and a portion of the initially precooled weak gas media and delivering the finally precooled weak gas media to said coldest portion of the evaporator coil;
- means for introducing the initially precooled refrigerant to said warmest portion of said evaporator coil; and
- means for flowing said refrigerant from said warmest portion through said evaporator coil in countercurrent to the stream of weak gas media flowing through it from said coldest portion to said warmest portion.

4,178,775

CRYOSTAT ASSEMBLY

Daryl L. Smetana, West Covina, Calif., assignor to Ford Aerospace and Communications Corporation, Newport Beach, Calif.

Filed Sep. 18, 1978, Ser. No. 943,594
Int. Cl.² F25B *19/00*
U.S. Cl. 62—514 JT **12 Claims**



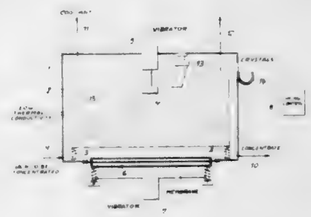
1. A cryostat assembly for an infrared detection device comprising:
- a substantially electrically insulating interior wall member for defining at least a portion of the boundary of a recess adapted to contain a coolant such as, for example, nitrogen, said wall member having a cylindrical portion; and
- a cryostat means provided within said recess for guiding the coolant and having an exit nozzle for distributing the coolant from said cryostat means at a position adjacent said cylindrical portion and in a direction tangential to an adjacent portion of said cylindrical portion so as to reduce the force of impingement of the coolant on said cylindrical portion with respect to a radial impingement of the coolant on said cylindrical portion thus reducing noise sensed by the infrared detection device.

4,178,776

INTERMITTENT VIBRATION IN FRACTIONAL CRYSTALLIZATION

Wolfgang Baldus, Pullach, and Wilhelm Lehmer, Munich, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jun. 2, 1977, Ser. No. 803,113
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1976, 2625296; Jun. 4, 1976, 2625276
Int. Cl.² B01D *9/04*
U.S. Cl. 62—538 **16 Claims**



1. A method of concentrating a solution by the freezing of crystals of a solvent from the solution, said method comprising the steps of:
- contacting said solution with at least one heat-exchange surface;
- cooling said surface with a fluid coolant to a temperature below the freezing point of said solvent to freeze crystals of said solvent from said solution;
- imparting relative vibratory movement to said surface and said solution; and

intermittently interrupting the relative vibratory movement of said surface and said solution to establish rest periods between intervals of such vibration, said relative vibratory motion being imparted to said solution and said surface by vibrating said surface and vibrating said solution independently and alternately.

4,178,777

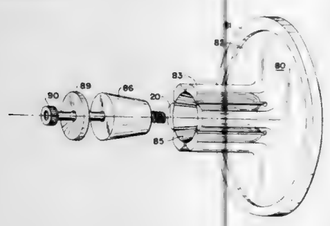
SLIDING SUPPORT FOR A SUPERCONDUCTING GENERATOR ROTOR

Sui-chun Ying, Monroeville, and Glen D. Cooper, North Huntington Township, Westmoreland County, both of Pa., assignors to Electric Power Research Institute, Palo Alto, Calif.

Division of Ser. No. 732,561, Oct. 15, 1976. This application Nov. 7, 1977, Ser. No. 848,849

Int. Cl.[2] F16D *3/78*

U.S. Cl. 64—13 **4 Claims**



1. A high speed rotating coupling including a flexible diaphragm member attached to a first end of said coupling; a plurality of axially disposed fingers defining outer contacting surfaces parallel to said axis intergrally attached to said flexible diaphragm, said fingers providing a rigid torsional connection to said diaphragm and extending axially of said rotating structures from the first end of said coupling toward the second end of said coupling; a member defining a corresponding plurality of spline receiving, axially extending slots for receiving fingers of said diaphragm attached to the second end of said coupling; means biasing said fingers relative to said axis with a force into said slots; said biased fingers received within said finger receiving slots to slide with excursion of one of said rotating structures with respect to the other of said rotating structures and to remain in non-slipping contact across said coupling during rotation of said rotating structures together whereby non-axial loading forces of one of said structures is elastically received at said flexible diaphragm during rotation of said inner and outer rotating structures.

4,178,778

HOMOKINETIC JOINT OF THE TRIPOD TYPE

Michel Orain, Conflans Sainte Honorine, France, assignor to Glaenzer Spicer, Poissy, France

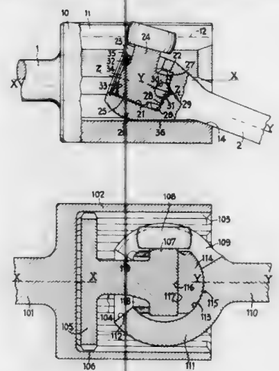
Filed Feb. 23, 1978, Ser. No. 880,489

Claims priority, application France, Mar. 4, 1977, 77 06428

Int. Cl.[2] F16D *3/30*

U.S. Cl. 64—21 **13 Claims**

1. A tripod homokinetic joint comprising a first shaft, a second shaft, a first member constituting a tripod and connected to the first shaft and defining three trunnions, three part-spherical rollers respectively rotatably mounted on the trunnions, and a second member connected to said second shaft and defining three raceways in which said rollers are respectively received, the tripod being distinct from the first shaft, and an auxiliary homokinetic coupling capable of operating at an angle of displacement which is small relative to the maxi-



mum angle of displacement of said first and second shafts connecting the tripod to the first shaft.

4,178,779

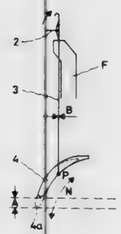
STITCH CAMS FOR CIRCULAR KNITTING MACHINES

Juan M. Schreiner, Barcelona, Spain, assignor to Jumberca, S.A., Spain

Filed Feb. 27, 1978, Ser. No. 881,368

Int. Cl.[2] D04B *15/32*

U.S. Cl. 66—54 **4 Claims**



1. In circular knitting machines having stitch cams and needles in which a stitch adjustment is effected by rotating a cam around an axis of rotation, the improvement wherein the main portion of an active portion of the cam is disposed along an arc having the same center as the axis of rotation of the cam, the angle of incidence and the point of closing of the needle latches on said main portion of the can active portion remaining constant for any position of the cam between the maximum and minimum stitch graduation.

4,178,780

NEEDLE BED FOR FLAT KNITTING MACHINE

Hans Maisel, Mistelbach, Fed. Rep. of Germany

Filed Jun. 19, 1978, Ser. No. 916,682

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728223

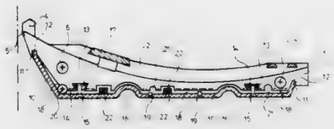
Int. Cl.[2] D04B *15/00*

U.S. Cl. 66—115 **9 Claims**

1. A needle bed for flat knitting machines of the type having a needle bed including a plurality of firmly compressed, laminated, plate-like webs, which plurality of webs includes relatively short webs, each of which form the base of a needle bed groove and relatively tall webs, each of which form the needle

bed web surfaces and which are arranged in a regularly alternate manner with said short webs, and said needle bed also including tightening means for pressing said plurality of webs together to form a solid pack, the improvement comprising:

said plurality of webs pressed together to form a solid pack having at least one longitudinal fitting groove formed therein; and



a trough-shaped sheet steel section which extends in the longitudinal direction of said needle bed and in which said solid pack is inserted and firmly clamped thereto, said trough-shaped sheet steel section having at least one fitting edge configured for mating receipt within said fitting groove of said solid pack, said fitting edge being fitted within said fitting groove so as to at least partially aid in the secure clamping of said pack to said trough-shaped sheet steel section.

4,178,781

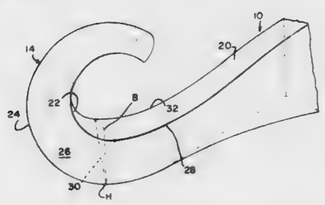
KNITTING NEEDLE

Douglas R. Virgilio, Winsted; Robert G. Campbell, Torrington; Alfred J. Fortunato, Torrington, and Carl F. Benson, Torrington, all of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Mar. 6, 1978, Ser. No. 884,016

Int. Cl.[2] D04B *35/04*

U.S. Cl. 66—121 **5 Claims**



1. A machine knitting needle having a blade and a hook, said hook having a curved inside surface and a curved outside surface, and shaped so that substantially more of the hook material is located nearer the curved inside surface of the hook than the curved outside surface of the hook so as to decrease the maximum stress levels generated in the hook when compared to conventional knitting needle hooks.

4,178,782

DEVICE FOR PRINTING BY SUBLIMATION

Günter Schiffer, Krefeld, Fed. Rep. of Germany, assignor to Kleinewefers Gesellschaft mit beschränkter Haftung, Krefeld, Fed. Rep. of Germany

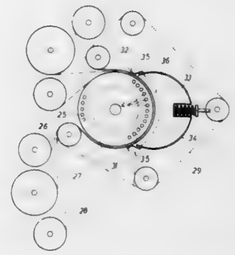
Filed Aug. 17, 1977, Ser. No. 825,427

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638128

Int. Cl.[2] B44C *1/16*; D06P *1/00*; D06B *1/14*

U.S. Cl. 68—5 D **5 Claims**

1. A device for printing in a continuous manner upon a web of textile material by sublimation of dyestuff, which includes in combination: a rotatable drum provided with heating means for heating the outer peripheral surface of said drum, pressure belt operable to pass around a portion of said peripheral surface of said drum and in spaced relationship to said peripheral surface so as to define with the latter a passage for receiving a dyestuff carrier adjacent to said peripheral surface and a web of textile material to be printed upon between said dyestuff carrier and said pressure belt, and roller means for supplying said dyestuff carrier and web of textile material into said passage and withdrawing same therefrom, said pressure belt being permeable to a gaseous substance and being operable to engage and press a web of textile material and a dyestuff carrier both received in said passage against each other and the dyestuff carrier against said outer peripheral surface of said drum and regionally at level of the peripheral surface there being a gaseous pressure differential effective peripherally thereof, a strong



pressing of the web of textile material being less important than that essentially dye gas generated during sublimation has the possibility freely and without material resistance to press out of the web of textile material an equal quantity of air absorbed by the web and thus unimpedededly to penetrate into the web of textile material pressed against said dyestuff carrier merely at such a pressure that the web of textile material closely engages said dyestuff carrier and that dyestuff gas is kept from laterally escaping from the pattern so that blurring of the pattern is prevented, a protective belt permeable to a gaseous medium and extending between said drum and said pressure belt and directly engaged by the latter, and a vacuum chamber encompassing at least a section of that portion of said peripheral outer drum surface which is passed around by said pressure belt.

4,178,783

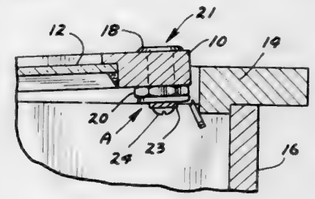
YIELDABLE LOCK LATCH FOR FIRE EXTINGUISHER CABINET

Walter F. Lee, Bloomington, Minn.

Filed Oct. 6, 1977, Ser. No. 839,826

Int. Cl.[2] E05B *15/16*

U.S. Cl. 70—422 **1 Claim**



1. A door latch for a fire extinguisher cabinet comprising in combination:

(a) an enclosure having a hinge mounted

(b) door,

(c) a lock mounted on said door and having,

(d) a latch extending therefrom and engageable with a portion of said enclosure to secure the door in a closed position upon the enclosure,

(e) said latch made of yieldable material whereby when said door is pulled outwardly of the enclosure said latch yields and bypasses said portion of said enclosure to allow an opening of said lock,

said yieldable latch constructed of frangible plastic.

4,178,784

METHOD FOR REMOVING PLATING RESIDUES FROM A PLATED WIRE

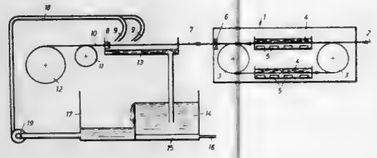
Asbjörn Storfossen, Drammen, Norway, assignor to Kabmatik AB, Vallingby, Sweden

Filed May 2, 1978, Ser. No. 902,087

Claims priority, application Norway, May 6, 1977, 771613

Int. Cl.[2] B21C *23/24, 43/02*; C25D *7/06*

U.S. Cl. 72—47 **7 Claims**



1. In a method of continuously electrolytically plating wire, an improvement for removing from the surface of the wire acid crystal and liquid residues originating from the plating bath, the improvement including the steps of: mechanically treating the surface of the wire to remove residue thereon, and supplying a non-aqueous liquid to the wire prior to said mechanical treating so that the wire undergoes such treating in the presence of the supplied liquid, the composition of the liquid and residues being such that said residues are not dissolved or emulgated in the liquid.

4,178,785

SKEW ROLLING MILL

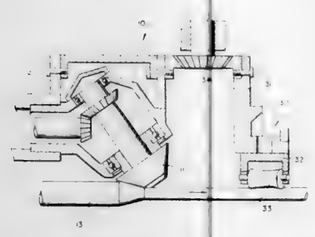
Eckhard Tuschy, and Georg Wischmeyer, both of Osnabruck, Fed. Rep. of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshuette AG, Fed. Rep. of Germany

Filed Mar. 20, 1978, Ser. No. 888,204

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1977, 2712245

Int. Cl.[2] B21B *13/00*

U.S. Cl. 72—78 **3 Claims**



1. In a skew rolling mill for cross section reduction of an elongated stock as it moves along a longitudinal axis without rotation about such axis, comprising:

a roller support means mounted for rotation about said longitudinal axis;

a plurality of working rollers mounted within said roll support means and symmetrically about said longitudinal axis, each of said rollers being mounted for rotation about a secondary axis which intersects the elongated stock;

primary means for rotating said roll support means in a first direction; and

first intermediate means for rotating said rollers about said secondary axis and into the surface of said elongated stock for reducing the cross section of said stock, the improvement comprising:

a deforming means for smoothing helically shaped protrusions and grooves caused by said working rollers in the surface of the elongated stock, said deforming means including:

frame means adapted to be rotated about said longitudinal axis;

second intermediate means for rotating said frame means; and

freely rotating smoothing rollers supported by said frame means, each having a longitudinal axis angularly displaced and not intersecting said longitudinal axis, and having a concave surface to maintain a linear engagement with helically shaped protrusions and groove markings in the surface of said elongated stock caused by said working rollers.

4,178,786

NECKING-OUT TOOL FOR FORMING NECKS ON PIPES

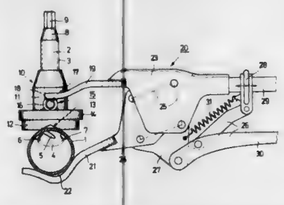
Karl Rothenberger, Walldorf,Hessen, Fed. Rep. of Germany, assignor to Rothenberger GmbH & Co., Frankfurt, Fed. Rep. of Germany

Filed Mar. 11, 1976, Ser. No. 666,118

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1975, 2511491

Int. Cl.[2] B21D *51/40*

U.S. Cl. 72—117 **8 Claims**



1. A necking-out tool for forming cylindrical nipples on the circumferential surface of pipelines, containers and the like having screw plug means with hook-shaped forming head means and thrust sleeve means fitted with coaxial downholder flange means cooperating with the forming head means and the screw plug means; said thrust sleeve means having a hollow cylindrical interior having a central longitudinal axis and corresponding to the forming head means for the reception of the formed neck, the improvement which comprises holding means comprising two pivotally connected jaws and means pivotally connecting one jaw to the downholder flange means and the thrust sleeve means such that they pivot parallel to the pivoting of the jaws and comprising a hinge pin disposed perpendicular to the longitudinal axis and at least adjacent thereto at the terminal end of said one jaw and wherein the other jaw forming a trough-shaped support diametrically opposite the hinge.

4,178,787

REMOTELY OPERATED TUBE EXPANDING TOOL AND SUPPORT

Kenneth S. Gerkey, Mt. Lebanon, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 10, 1978, Ser. No. 932,583

Int. Cl.[2] B21D *39/06*

U.S. Cl. 72—122 **5 Claims**

1. A tool and tool support means for attachment to and operation with remotely disposed and automatically operated apparatus for repairing the tubes and tube sheet of a steam generator, said apparatus having a generally horizontally extending member and means thereon for mounting said tool

support means for rotational movement in a plane above and generally parallel to said member and wherein said tool and tool support means do not project below any portion of said member so as to permit uninterrupted rotational positioning of said tool within said plane and wherein said tool support means comprises:

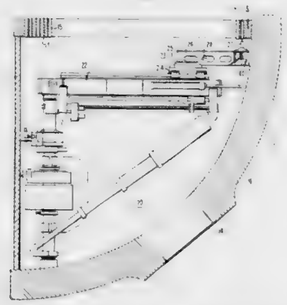
a generally horizontally projecting arm and means for attaching one end of said arm to said mounting means and wherein said arm is configured such that the opposite end thereof is disposed in a plane a predetermined vertical distance above said mounting means;

and wherein said tool comprises:

a tool head mounted on said arm adjacent said opposite end and having an upwardly projecting collar member, a mandrel projecting vertically therethrough and supported therein for rotational and vertical movement;

a drive motor and means for supporting said motor on said arm generally horizontally between said one end and said opposite end thereof;

a flexible drive mechanism for connecting the drive of said horizontal motor to said vertical mandrel, said mechanism



comprising a gear drive including a first gear attached to the lower end of said mandrel and engaging a second gear attached to means for connecting said gear to said motor, said first and second gears rotationally mounted in a housing, and means for supporting said housing generally below said opposite end of said arm for guided vertical movement between a lowermost position above the plane of said horizontally extending member of said apparatus and an elevated position for elevating said mandrel of said tool head as required by said tool;

means interconnected between said arm and said housing for raising and lowering said housing in accordance with a predetermined operation sequence and wherein said flexible drive means permits vertical movement of said gears while said motor remains at a constant horizontal plane;

means for moving said motor in said horizontal plane between an at-rest rearward position and activated forward position, in accordance with a predetermined operation sequence; and

means for controlling the operation of said motor, said lift means and motor moving means to effect operation of said tool.

4,178,788

ADJUSTABLE CLAMP DIE

Richard T. Zollweg, Garden Grove, and Homer L. Eaton, Leucadia, both of Calif., assignors to Eaton-Leonard Corporation, Carlsbad, Calif.

Filed Mar. 24, 1978, Ser. No. 889,863

Int. Cl.[2] B21D *7/04*

U.S. Cl. 72—154 **5 Claims**

1. A rotary bending machine comprising,

a support

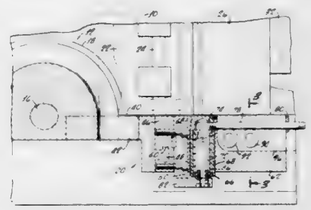
a swinging bend arm assembly mounted on said support for rotation about a bend axis, said swinging bend arm assembly including

a bend die having a fixed member adapted to engage a pipe pressed by a clamp die,

a bend arm slide mounted for motion substantially radially of said bend die,

a slide holder secured to said bend arm slide,

a clamp slide carrying a clamp die and mounted to said slide holder for tangential motion parallel to a tangent to said bend die, said clamp slide being mounted for cooperation with and for said tangential motion relative to said fixed bend die member between a first position in which the clamp die is directly opposed to said fixed bend die mem-



ber, so as to press a pipe directly against said fixed bend die member, and a second position in which the clamp die is shifted forwardly of said bend die fixed member, forwardly of said bend arm slide, and forwardly of a pipe positioned at said bend die, so as to press a pipe against said fixed member and exert a force thereon having an increased moment arm about said bend axis, said clamp die being movable along a pipe positioned against said fixed bend die member either forwardly toward or rearwardly from a previously made bend in the pipe according to the relation between the length of said clamp die and the distance between bends,

means for rotating said swinging bend arm assembly, and

a pressure die for pressing against a pipe to be bent.

4,178,789

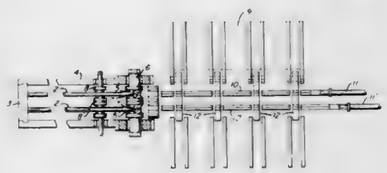
SIMULTANEOUS PLUG-MILL ROLLING FOR INCREASED PRODUCTION AND ENHANCED TUBE QUALITY

James W. Ruff, Westlake, Ohio, assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 30, 1978, Ser. No. 910,973

Int. Cl.[2] B21B *7/12*

U.S. Cl. 72—209 **6 Claims**



1. In the production of seamless tubing, wherein shells are transferred to a plug rolling mill to receive a rolling operation consisting of at least two plug-rollng passes, each of said rolling passes consisting of pushing the shell over a plug attached to a supported mandrel bar, said plug lying within a first roll groove of the work rolls of said rolling mill, drawing said shell over the plug by the rolling friction of the roll groove, removing the plug and reversing the travel of the shell so as to strip

it from the plug, thereafter repeating the rolling procedure for at least one additional pass in the same roll groove,

the improvement for significantly increasing the production rate of said plug rolling operation, which comprises,

(a) after completion of the first pass, and without removal of the mandrel bar from its support, laterally transferring the first shell to position for effecting the second pass in a second roll groove of the same roll,

(b) moving a second shell into position for effecting a first pass thereon in said first roll groove, and

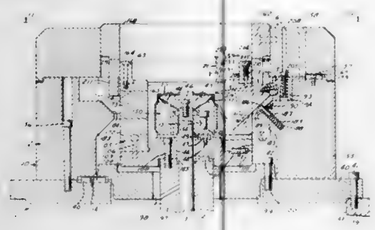
(c) simultaneously pushing said second shell and said first shell through said first and second roll grooves, respectively.

4,178,790

ROLL-THROUGH COLD FORMING APPARATUS

James E. Buckley, Sterling Heights; Mitchell E. Bartold, St. Clair Shores; Marshall S. Heist, Sterling Heights, and James L. Jessup, Livonia, all of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed May 22, 1978, Ser. No. 908,033
Int. Cl.[2] B21D *51/12*
U.S. Cl. 72—224 **16 Claims**



1. In a roll-through cold forming apparatus for forming teeth on a workpiece, the combination comprising:

(a) a housing means;

(b) a tooth forming mandrel for carrying a workpiece;

(c) means for movably mounting said tooth forming mandrel on said housing means for movement along the longitudinal axis of the mandrel;

(d) a plurality of tooth forming blades disposed in a circle about the longitudinal axis of said tooth forming mandrel, in spaced apart radial positions;

(e) each of said tooth forming blades mounted on a supporting pin and having at least one tooth forming edge formed thereon;

(f) means for movably mounting each of said tooth forming blades on said housing means so that the tooth forming edges on all of the tooth forming blades will be engaged by the workpiece when the mandrel is moved past the tooth forming blades and be moved into a rolling, material displacing, tooth forming operation on the workpiece by the moving mandrel; said means for movably mounting each of said tooth forming blades on said housing includes:

(1) a pivot pin operatively mounted on the other end of each of said tooth forming blades; and,

(2) a pivot pin seat means on said housing for supporting said pivot shaft for pivoting movement of the blade; said pivot pin seat means comprises:

A. a pivot pin seat block having an arcuate seat formed thereon for receiving said pivot pin for pivotally seating said pivot pin;

B. spring means on said housing for biasing said pivot pin into a pivoting seating engagement on said arcuate pivot seat;

C. adjustment means mounted on said housing for adjusting said pivot pin seat block toward said mandrel against the action of said spring means for adjusting the depth of teeth formed on a workpiece on said mandrel; said adjustment includes:

I. an adjustable gib engagable with the seat block for moving it toward said mandrel; and

II. screw means for adjusting an adjustable gib;

(g) means for stripping a finished workpiece from said mandrel after a teeth forming operation on said workpiece, and for loading a new workpiece on the mandrel; and

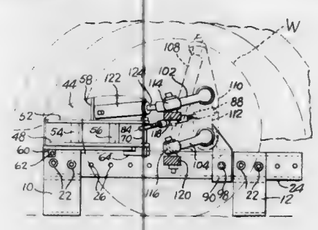
(h) resiliently biased pin means on said housing for each of said tooth forming blades for allowing each blade to be moved to a position to permit the mandrel and a workpiece thereon to move past the blade in one direction to an initial position for a teeth forming operation, and return the blade to an initial workpiece engaging position after said movement of each blade to its initial position.

4,178,791

METHOD AND APPARATUS FOR CORRECTING BENT AXLE MISALIGNMENT

Danny O. Daniel, Rte. 3, Box 57A, Blackfoot, Id. 83221

Filed Feb. 25, 1977, Ser. No. 772,294
Int. Cl.[2] B21D *1/12*
U.S. Cl. 72—388 **25 Claims**



1. Apparatus, which comprises:

means for clamping an axle assembly of a vehicle having an inner wheel housing;

hydraulic jack means operatively coupled to said clamping means for bending said axle assembly while installed in said vehicle; and

means for supporting said hydraulic jack means, said means for supporting comprising base means adapted to be positioned underneath said axle assembly, said means for supporting further comprising breast plate means pivotally coupled to said base means;

wherein said breast plate means includes means for supporting the base of said hydraulic jack means such that the latter means is disposed substantially horizontally in use and an outer, vertically oritented wall that is curved congruently to the inner wheel housing against which said breast plate means is positioned during use.

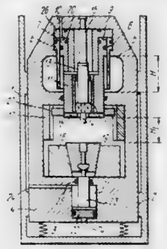
4,178,792

HIGH-SPEED ANVILLESS HAMMER

Petr P. Matviets, ulitsa Lizjukova 43, kv. 167; Iosif L. Makhtjuk, prospekt Truda 60, kv. 11; Valentin I. Grigoriev, ulitsa Pushkinskaya 36, kv. 73; Mark M. Zaidlin, ulitsa Geroev Sibiryakov 24, kv. 158, all of, Voronezh; Alexandr I. Khotilin, ulitsa Novo-Sadovaya 15, kv. 21, Kuibyshev; Jury N. Krasnov, ulitsa Fizkulturnaya 129, kv. 35, Kuibyshev, and Isaak R. Khaimovich, ulitsa Juria Pavlova 3, kv. 8, Kuibyshev, all of U.S.S.R.

Filed Apr. 18, 1978, Ser. No. 897,265
Int. Cl.[2] B21J *7/28*
U.S. Cl. 72—436 **5 Claims**

1. A high-speed anvilless hammer comprising: a bed; guides provided on said bed; a frame supported on cushions and mounted in said bed guides; a hammer head mounted on said frame; a working tool mounted on the lower end of said hammer head; a die block mounted underneath said working tool; a drive for imparting an axial reciprocating motion to said hammer head so that said hammer head moves between an initial position and a work position, in which the working tool strikes a workpiece, said drive being constructed in the form of a power chamber with a working medium contained therein and a power cylinder with a piston and a piston rod; retention means for retaining said hammer head in the initial position; said piston rod having a central guide hole which is situated in the piston rod portion nearest the die block, is sealed at the end nearest said power chamber and accommodates said hammer



head; the stroke of said piston exceeding the distance between said die block and the lower end of said piston rod, due to which, when the piston is in a lowermost position, a closed zone is formed around said hammer head between said piston rod and the surface of said die block in which zone deformation of the blank is effected; means operative after formation of the closed zone for releasing said hammer head from said retention means so that said drive moves said hammer head to said work position; and means for lifting said hammer head to the said retention means after the working tool strikes a workpiece.

4,178,793

APPARATUS FOR OXYGEN SENSOR IMPEDANCE MEASUREMENT

Richard J. Bremer, Grand Blanc, and Daniel J. Richardson, Swartz Creek, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 5, 1978, Ser. No. 939,465
Int. Cl.[2] G01N *27/46*
U.S. Cl. 73—23 **1 Claim**



1. In combination with a vehicle engine exhaust mounted oxygen sensor of the type having a pair of output terminals with a variable internal impedance across said terminals and being effective to generate an output signal voltage across said terminals, apparatus for measuring said internal impedance, comprising:

a test impedance;

a semiconductor switch connected in series with said sensor and said test impedance, the semiconductor switch being characterized by an internal impedance which may increase greatly with low current therethrough;

a constant current source connected to supply a constant electrical current to the one sensor terminal, said constant current source being effective to provide current through the reference impedance and semiconductor switch when the sensor internal impedance becomes large;

first means effective to sense and store the magnitude of the voltage at the one sensor terminal with the semiconductor switch not conducting;

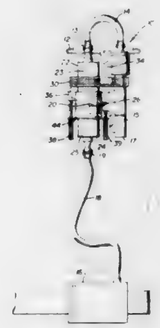
second means effective to sense the magnitude of the voltage at the one sensor terminal with the semiconductor switch conducting for comparison with the magnitude stored in the first means, the ratio of said magnitudes varying with and thus indicating said sensor impedance.

4,178,794

ENVIRONMENTAL SAMPLING DEVICE

Lawrence C. Jugle, Niagara Falls; Emil R. Inderbitzen, Eggertsville, and Paul W. McDaniel, Port Chester, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Feb. 28, 1978, Ser. No. 882,190
Int. Cl.[2] G01N *1/22;* **B01D** *46/10*
U.S. Cl. 73—28 **1 Claim**



1. In combination with a portable means for providing a flow of dust laden air, a portable sampling device adapted for attachment to a worker's apparel for receiving a flow of dust laden air from said portable means and collecting air-borne dust samples therefrom, said portable sampling device comprising a first housing member having an inlet for receiving a dust laden air sample, a chamber communicating with said inlet and an annular recessed end portion opposite said inlet said chamber having a length which is about **13** times the diameter of said inlet and an inner diameter which is about **6.75** times the diameter of said inlet; a second housing member arranged adjacent to and in-line with said first housing member having an annular recessed portion adjacent the recessed portion of said first housing member to define an annular groove, a chamber within said second housing member having a length about **35%** shorter than the length of the chamber of said first housing member communicating with the chamber of said first housing member, and an outlet; a closely engaging pair of ring-shaped members arranged in said annular groove; and a dust collecting membrane being supportably engaged only peripherally between said ring-shaped members, the diameter

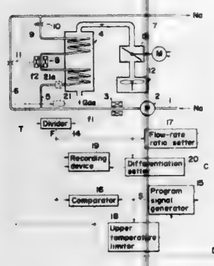
of the inner surfaces of said chambers and said ring-shaped members being essentially the same so as to provide a smooth surfaced passageway.

4,178,795

PLUGGING METER

Akinori Nagai, Higashi, Japan, assignor to Doryokuro Kakunen-ryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Sep. 8, 1977, Ser. No. 831,678
Claims priority, application Japan, Sep. 22, 1976, 51-113937
Int. Cl.[2] G01N *11/00*
U.S. Cl. 73—61 LM **7 Claims**



1. In a plugging meter for measuring impurity concentration in a liquid metal and having a liquid metal inlet pipe provided with a first flow meter, a liquid metal outlet pipe, parallel passages connected between said liquid metal inlet and outlet pipes and including a cooling passage provided with cooling equipment and a by-pass passage, a second flow meter disposed in said cooling passage, a plugging orifice disposed in said cooling passage downstream from said cooling equipment and equipped with a temperature sensor, a divider adapted to divide the output from the second flow meter by the output from the first flow meter and produce a flow-rate ratio signal, and a recording device adapted to record said flow-rate ratio signal and the temperature signal delivered from said temperature sensor, the improvement which comprises a program signal generator adapted to transmit a reference signal for elevating and lowering the temperature of said plugging orifice with predetermined gradients, a comparator adapted to compare said reference signal with said temperature signal and to produce a temperature difference signal, and a flow-rate ratio setting device adapted to compare said flow-rate ratio signal with a signal representing a pre-set value and to produce a flow-rate ratio difference signal, the operation of said program signal generator being controlled by the flow-rate ratio difference signal from said flow-rate ratio setting device, and the operation of said cooling equipment being controlled by said temperature difference signal so as to control the temperature of said plugging orifice.

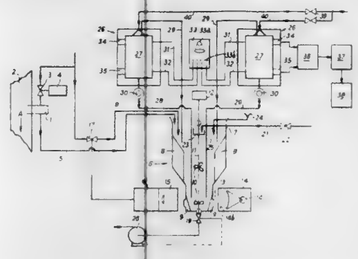
4,178,796

METHOD AND APPARATUS FOR PARTICLE SIZE ANALYSIS

James D. Zwicker, and Ghyslain Dube, both of Arvida, Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed May 4, 1978, Ser. No. 902,689
Claims priority, application United Kingdom, May 9, 1977, 19433/77
Int. Cl.[2] G01N *15/04*
U.S. Cl. 73—61.4 **24 Claims**

1. A particle size analyser comprising a sequential sampler for periodically collecting a sample of a material to be analysed flowing along a line, a mixing tank for separately and sequentially receiving said samples, said mixing tank having means for automatically diluting each samle to a predetermined concentration, a sedimentation cell in which analysis of each individual sample by sedimentation is performed, a first fluid flow line leading from the mixing tank to the bottom of the sedimentation cell, and a second fluid flow line leading from the top of the sedimentation cell to the mixing tank, and means, including



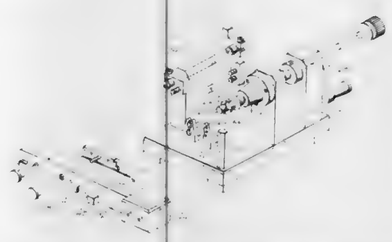
a pump, for separately and successively transferring a diluted sample from the mixing tank around a closed loop including the sedimentation cell and its fluid flow lines and for draining each sample from the sedimentation cell when the analysis of that sample is complete.

4,178,797

SHARPNESS TESTING MACHINE

George J. Kozlowski, Jr., Billerica, Mass., assignor to Rudolph Beaver, Inc., Belmont, Mass.

Filed Jan. 4, 1978, Ser. No. 866,849
Int. Cl.[2] G01M *13/00*
U.S. Cl. 73—104 **4 Claims**



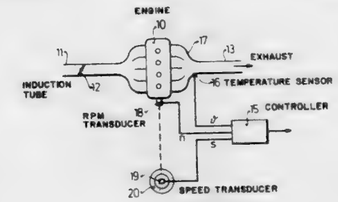
1. A machine for testing the sharpness of knife blades comprising means for supporting an elongated cylindrical rod of test material so that an end portion thereof protrudes from the support means, an arm pivoted at one end and having a weight spaced from the pivot point, said arm carrying means for retaining a knife blade to be tested, said arm being pivoted in a plane perpendicular to the axis of the rod and so positioned that when the arm with a retained test blade is lowered toward the rod, the cutting edge of the blade rests on the periphery of the protruding end portion of the rod with a predetermined force, and means for rotating the rod so that the cutting edge of the blade cuts into the surface of the rod.

4,178,798

METHOD AND APPARATUS FOR MEASURING FUEL CONSUMPTION IN INTERNAL COMBUSTION ENGINES

Wolf Wessel, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 7, 1978, Ser. No. 940,410
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 2757180
Int. Cl.[2] G01L *3/26*; G01M *15/00*
U.S. Cl. 73—113 **10 Claims**



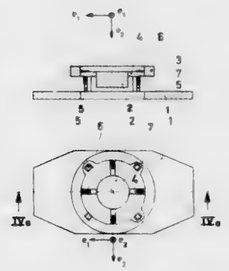
2. An apparatus for measuring relative fuel consumption in an internal combustion engine, comprising:
- an exhaust gas temperature transducer disposed in the exhaust manifold of the engine, for generating a first signal related to exhaust gas temperature;
- an engine speed tachometer for generating a second signal related to the rotational speed of the engine (rpm);
- timer means, connected to said tachometer to receive said second signal for actuation and connected to said transducer to receive said first signal for controlling the timing characteristics, for generating an output signal; and
- display means for processing and displaying said output signal as representing relative fuel consumption per unit time.

4,178,799

FORCE AND BENDING MOMENT SENSING ARRANGEMENT AND STRUCTURE

Lothar Schmieder, Gilching; August Vilgertshofer, Oberpfaffenhofen, and Florian Mettin, Eichenau, all of Fed. Rep. of Germany, assignors to Deutsch Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Linder Höhe, Fed. Rep. of Germany

Filed Jun. 16, 1978, Ser. No. 916,064
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1977, 2727704
Int. Cl.[2] G01L *1/22*
U.S. Cl. 73—141 A **15 Claims**



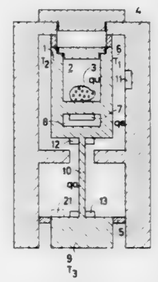
1. Force and bending moment sensing arrangement having a base plate (1) and a load support plate (2) to determine loading and bending stresses applied between the base plate and the load support plate, and further comprising:
- a coupling element (3);
- at least three parallel support posts (5) of equal length connected to and positioned between one of said plates and the coupling element (3) and supporting the coupling element spaced from said one plate, said posts being both rigidly secured to said one plate and to the coupling element;
- at least three support spokes (4) rigidly secured to said coupling element (3) and to said other plate and running therebetween with the spoke axes lying substantially in a single plane,
- whereby said base plate (1) and said load support plate (2) are held together by a rigid post-coupling element-spoke connection system;
- and bending deformation sensing means (6, 7) associated with each of said posts (5) and said spokes (4) and providing output signals representative of bending deformation of said respective posts and spokes.

4,178,800

METHOD OF AND APPARATUS FOR THE MEASURING OF QUANTITIES OF HEAT

Christoph Thomann, Pfannenstielstrasse 7, CH-8132 Egg, Switzerland

Continuation-in-part of Ser. No. 819,058, Jul. 26, 1977, abandoned. This application May 22, 1978, Ser. No. 908,371
Claims priority, application Switzerland, Sep. 22, 1976, 11988/76
Int. Cl.[2] G01K *17/00*
U.S. Cl. 73—190 R **8 Claims**



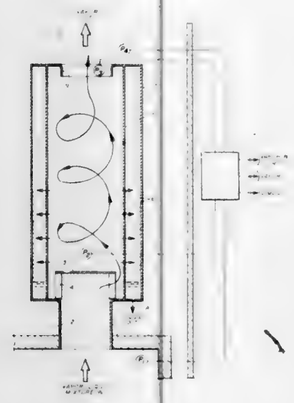
1. An apparatus for measuring an unknown heat quantity comprising: a vessel formed of a material having good heat conducting properties and heat-insulated relative to the environment and intended for receiving an unknown heat source, a known heat source associated with said vessel, a cold source connected with the vessel by way of a heat-conducting element, a first heat sensor located outside of said vessel for measuring a temperature T_2 of the vessel adjacent a connection between said vessel and said heat-conducting element, and a second heat sensor located outside of the cold source for measuring a temperature T_3 of the cold source adjacent a connection between said heat-conducting element and said cold source, a third heat sensor for measuring the temperature of the environment and an electrical control device for controlling the known heat source and the cold source by way of the heat sensors in such a manner that the temperature of the vessel is maintained equal to a temperature T_1 of the environment of the vessel in response to the difference sensed between the temperatures T_1 and T_2 and at the same time the difference between the temperature of the vessel and the temperature of the cold source is maintained the same in response to the difference sensed between T_3 and T_1.

4,178,801

MEASUREMENT OF GAS-LIQUID FLOW

Don S. Cassell, and Brice W. Kinyon, both of Chattanooga, Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 10, 1978, Ser. No. 950,183
Int. Cl.[2] G01F *1/34;* **B01D** *45/16*
U.S. Cl. 73—195 **3 Claims**



1. A system for measuring the flow of vapor and liquid phases through a centrifugal separator, including,

a cylindrical tube, which is vertically oriented,

means for introducing a mixture of liquid and vapor mounted on the lower end of the tube and creating a centrifugal force on the mixture,

perforations through the side of the tube to function as passages for the liquid centrifuged to the internal wall of the tube,

a restrictive structure mounted on the upper end of the tube for the flow of the vapor from the tube,

a first pressure sensor mounted to respond to the pressure upstream of the tube,

a second pressure sensor mounted to respond to the pressure downstream of the tube,

an instrument station connected to both pressure sensors to respond to the differentials of their inputs to the station in terms of total flow of vapor and liquid through the tube,

a third pressure sensor mounted within the cylindrical tube responding to the pressure of the separated vapor flowing to the restrictive structure,

a fourth pressure sensor mounted in the cylindrical tube so as to respond to the lowest pressure developed by the restrictive structure, and

connections between the third and fourth pressure sensors and the instrument station to manifest differentials between the outputs of the third and fourth pressure sensors in terms of the flow of the vapor,

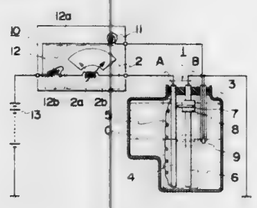
whereby the arrangement within the control station automatically manifests the flow of vapor and flow of liquid separately.

4,178,802

APPARATUS FOR INDICATING QUANTITY OF FUEL OF A VEHICLE

Harushige Yamamoto, Tokyo, Japan, assignor to Niles Parts Co., Ltd., Japan

Filed Mar. 28, 1978, Ser. No. 890,948
Claims priority, application Japan, Apr. 20, 1977, 52/49807[U]
Int. Cl.[2] G01F *23/10*
U.S. Cl. 73—313 **10 Claims**



1. An apparatus for indicating the quantity of liquid in a container, comprising:

(1) a gauge adapted to indicate the quantity of liquid, the gauge having a first side connected in electrical circuit with a power source and a second side connected in electrical circuit with a variable resistance device;

(2) a variable resistance device comprising:

(a) a resistance means having a first end connected in electrical circuit with the gauge, the resistance means having a point near the first end short-circuited to a point near a second end thereof;

(b) a float responsive to the liquid level in the container; and

(c) a contact means responsive to the float and further connected in electrical circuit with the resistance means and with a source of reference potential,

whereby in operation the gauge indicates liquid quantity in response to changes in resistance in the variable resistance device, such changes including at least one non-linear change in resistance occurring at a predetermined liquid level thereby causing a reciprocal displacement in the gauge; and

(3) a warning indication means connected in electrical circuit with the power source and with a detector switch means responsive to the predetermined liquid level, whereby a warning indication occurs when the predetermined liquid level is reached.

4,178,803

PIPETTING DEVICES

Thomas E. Lee, 3938 Canyon Rd., Lafayette, Calif. 94549

Continuation of Ser. No. 797,285, May 16, 1977, abandoned, which is a continuation of Ser. No. 662,942, Mar. 1, 1976, abandoned. This application May 11, 1978, Ser. No. 904,925
Int. Cl.[2] B01L *3/02;* **G01F** *13/00*
U.S. Cl. 73—425.6 **2 Claims**

1. A precision liquid pipetting device for use with a disposable pipette tube, comprising

a tubular body having means adjacent a first end thereof for supporting the disposable pipette tube inserted coaxially therein in a precisely predetermined fixed position longitudinally of said body,

a plunger assembly coaxial with said tubular body and mounted therein for reciprocal movement longitudinally thereof, said plunger assembly extending beyond said tubular body and into the disposable pipette tube inserted therein,

a cylindrical plunger tip carried on one end of said plunger assembly within said tubular body, said plunger tip having an external diameter substantially equal to the internal diameter of the disposable pipette tube,

a finger button removably connected to the other end of said plunger assembly externally of said tubular body and opposite that of said plunger tip, said finger button having a sleeve extending longitudinally of said plunger assembly,

a removable end cap mounted on said tubular body at the end thereof opposite said first end and having a passageway therethrough through which said plunger assembly extends in sliding engagement,

a first stop slidably mounted on said sleeve of said finger button for abutting said end cap to determine one limit of travel of said plunger tip within the disposable pipette tube,



means for fixedly clamping said first stop at selectable positions longitudinally of said sleeve of said finger button, and

a second stop fixedly attached to said plunger assembly within said tubular body for abutting said end cap to determine a second limit of travel of said plunger tip; whereby said finger button and first stop, as a unit, may be removed from and resecured to said plunger assembly, allowing said volume end cap to be removed and substituted with another volume end cap, a predetermined gauged distance being maintained between the first stop and a substituted volume end cap while said second stop abuts against said end cap.

4,178,804

PRESSURE TRANSDUCERS

Peter N. Potter, Ewshot, England, assignor to The Solartron Electronic Group Limited, Farnborough, England

Filed Jul. 31, 1978, Ser. No. 929,396
Claims priority, application United Kingdom, Aug. 12, 1977, 33829/77
Int. Cl.[2] G01L *11/00*
U.S. Cl. 73—702 **12 Claims**

1. A pressure transducer comprising:

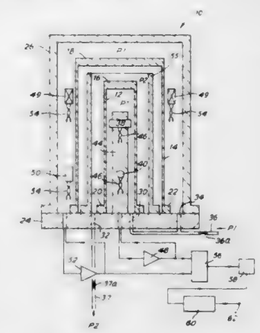
first and second similar hollow resonantly vibratable bodies whose respective resonant frequencies vary in dependence upon the difference in fluid pressure inside and outside the respective body, each of said bodies comprising a right cylinder integrally closed at one end and open at the other end,

base means for sealingly closing the respective said other ends of the cylinders,

casing means enclosing the cylinders,

means for exciting and maintaining resonant vibrations of the cylinders and for producing respective output signals representative of said resonant frequencies, and

means for applying a first fluid pressure to the inside of the first cylinder and to the outside of the second cylinder and for applying a second fluid pressure to the inside of the second cylinder and to the outside of the first cylinder, whereby said resonant frequencies vary in opposite senses in dependence upon the difference between first and second pressures, and the difference between said resonant frequencies, as represented by said output signals, is dependent upon said pressure difference, wherein the fluid pressure applying means comprises at least a first inlet conduit in said base means for applying said first fluid pressure to the inside of the first cylinder and a second inlet conduit in said base means for applying said second fluid pressure to the inside of the second cylinder.



4,178,805

STARTERS FOR INTERNAL COMBUSTION ENGINE

Alfred Mazzorana, Venissieux, France, assignor to Societe de Paris et du Rhone, Lyons, France

Filed Jan. 11, 1978, Ser. No. 868,635
Claims priority, application France, Jan. 17, 1977, 77 01827
Int. Cl.[2] F02N *15/06;* **F16D** *41/06*
U.S. Cl. 74—6 **2 Claims**



1. A starter gearing adapted to be mounted on the end of the shaft of an electric motor to cooperate with a toothed ring carried by the flywheel of an internal combustion engine, the said shaft having a splined portion followed by a smooth portion, said gearing comprising:

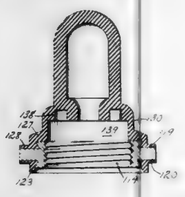
a pinion having a smooth axial bore, said pinion carrying a co-axial lateral outwardly cup-shaped member formed with inwardly opening chambers each having an outer wall at a small angle with respect to the corresponding radii, with said member thus constituting the outer casing of an overrunning clutch of the spring-pressed roller type;

a sleeve having inner ribs, one end of said sleeve being disposed in said cup-shaped member with the periphery of said one end forming the inner race of said clutch;

means to axially retain said sleeve and said pinion with respect to each other;

rollers each disposed within each one of said chambers;
and springs each disposed in one of said chambers to urge the corresponding roller towards a position at which it simultaneously engages said inner race and the outer wall of said one of said chambers;
said sleeve having a smooth axial bore portion at said one end and said pinion being formed with a tubular extension which is rotatably received within said smooth axial bore portion to center said outer casing with respect to said inner race.

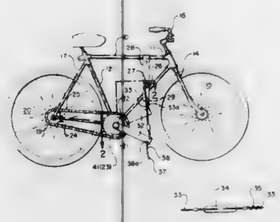
4,178,806
TOGGLE SWITCH SEAL
Milton Morse, 44 Honeck St., Englewood, N.J. 07631
Filed Jul. 10, 1974, Ser. No. 486,961
Int. Cl.² F16J *15/50*
U.S. Cl. 74—17.8 **5 Claims**



1. In a toggle switch seal of a type performing an hermetic seal about an opening in a panel surface in which a switch having a movable toggle is positioned, said toggle switch seal including a nut element and a molded boot element surrounding said nut element, said boot element including a lower sealing member adapted to surround an opening in said panel surface and abut the same, and a toggle encircling member adapted to flex relative to said nut member with movement of said toggle, the improvement comprising: said toggle encircling member including a relatively thick-walled base abutting a planar end surface of said nut element, a relatively thin-walled intermediate portion extending longitudinally outwardly of the axis of said nut element and defining a cylindrical chamber interconnected to said base, a relatively thick-walled upper portion connected to said intermediate thin-walled portion, said upper portion defining an axially disposed bore communicating with said chamber, and an annular groove coaxially disposed with respect to said bore, said groove forming an annular area of relatively thin cross section in said upper member; whereby upon the flexing of said boot element by movement of an engaged toggle, said boot element tends to fold about said thin-walled intermediate portion and said last-mentioned annular area on one said thereof, with a minimum of distortion of the relatively thick-walled base and upper portion.

4,178,807
ADAPTER FOR RECIPROCAL LEVER FRICTION DRIVE MECHANISM FOR UNIDIRECTION DRIVE
Timothy T. J. Young, 788 Walnut St., Apt. 2, San Carlos, Calif. 94070
Continuation-in-part of Ser. No. 628,074, Nov. 3, 1975, Ser. No. 739,351, Nov. 5, 1976, Pat. No. 4,117,915, and a continuation-in-part of Ser. No. 810,948, Jun. 29, 1977. This application Oct. 11, 1977, Ser. No. 840,970
The portion of the term of this patent subsequent to Mar. 10, 1995, has been disclaimed.
Int. Cl.² F16H *11/00*
U.S. Cl. 74—217 B **1 Claim**

1. In an occupant propelled vehicle including a frame, a ground engaging wheel mounted on said frame, a driven sprocket for rotating said wheel, a drive sprocket, and an endless sprocket chain trained over said drive and driven sprockets, a drive shaft freely journaled concentric to said drive sprocket, a first lever arm disposed rotatable on one end of said shaft, a second lever arm disposed rotatable on the other end of said shaft; an attachment shaft journaled on said frame, a first cable having one end attached to the tip of one of said lever arms and the other end wound clockwise on said attachment shaft, and a second cable having one end attached to the tip of the other of said lever arm, and the othr end wound counterclockwise on said attachment shaft, and a turnbuckle with right-and-left threaded screws fitted to each of said cable whereby the cable length may be adjusted, and a compression spring mounted on said turnbuckle for moving into stopping engagement with said attachment shaft to limit the travel of said cables, and a leverage adding weight suspend from the tip of each of said lever arms by a link chain; and comprising a reciprocal lever friction drive mechanism for a man-powered

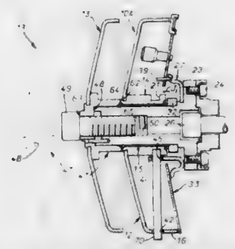


vehicle, said mechanism consists of the first elements disposed keyed to both ends of the said drive shaft, each first element having cylindrical friction engagement means thereon; and a second element disposed contiguous and coaxial with each of the first element and rotatably relative thereto; a plurality of members connected to the second element adapted to frictionally engage and disengage the cylindrical friction engagement means and relative rotation of the second element in one direction causes engagement of the friction engagement, and opposite relative rotation causes disengagement of the friction engagement; and create a rotation of the drive shaft and simultaneously create a rotation of the sprocket wheel;
characterized by the adaptability of the drive mechanism to a manpowered propelled vehicle by fitting the mechanism to each end of the common driving shaft on which transmission of power generated is effected.

4,178,808
SHEAVE FOR A SPEED VARIATOR AND A METHOD OF REPLACING A BELT THEREON
Michel Bacher, Garges-les-Gonesse, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France
Filed Dec. 22, 1977, Ser. No. 863,239
Claims priority, application France, Dec. 31, 1976, 76 39743
Int. Cl.² F16H *55/52, 55/56;* **F16F** *1/34;* **B23P** *19/04*
U.S. Cl. 74—230.17 E **21 Claims**

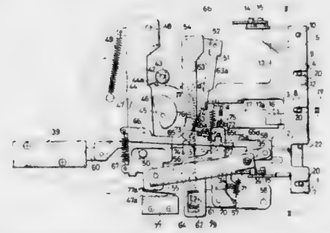
1. A sheave for a speed variator of the kind comprising a shaft, two coaxial sheave sides facing each other including a movable side mounted for sliding movement on said shaft and rotation with said shaft, and a fixed side also fixed for rotation with said shaft, joined in operation to said shaft against axial movement and adapted to be dismounted with respect to both said shaft and said movable side, said fixed side having an axially extending hub and a retaining shoulder, a screw fastener normally effectively bearing axially against the retaining shoulder for securing said hub at an end of said shaft, and resilient biasing means normally urging said movable side towards said fixed side, wherein the improvement comprises: a thrust shoulder on said hub adapted to effectively bear against

said movable side once the fixed side has been dismounted and, turned around, and a bearing shoulder also on said hub against which said screw fastener is adapted to bear once said fixed



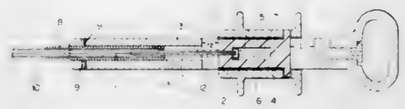
side has been turned around, releasable retaining means coacting with means fixed axially with respect to said shaft so as to axially retain the movable side temporarily against biasing force exerted thereon by said resilient biasing means.

4,178,809
MODE CHANGE-OVER DEVICE FOR RECORDING AND/OR REPRODUCING APPARATUS
Hisashi Hanzawa, and Kozi Yoshino, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Mar. 14, 1978, Ser. No. 886,428
Claims priority, application Japan, Mar. 17, 1977, 52-33180[U]
Int. Cl.² G05G *1/02, 5/08;* **G11B** *15/10*
U.S. Cl. 74—483 PB **10 Claims**



1. A mode change over device for a recording and/or reproducing apparatus comprising a plurality of push buttons corresponding to a selected one of a plurality of operating modes of said recording and/or reproducing apparatus, mode selecting means movable to a selected one of a plurality of positions in accordance with the selective actuation of one of said plurality of push buttons, mode change over means selectively movable from a first rest position to a plurality of operative positions corresponding to movement of said mode selecting means to one of said plurality of positions, a plurality of mode selecting levers and a drive mechanism including drive means for said drive mechanism to selectively drive said drive mechanism through predetermined degrees of angular rotation to move said mode change over means from said rest position to one of said plurality of operating positions thereby to move selected ones of said mode selecting levers from a first inoperative position to a second operative position to effect mode change in said recording and/or reproducing apparatus corresponding to the operative mode selected by the particular push button which has been activated.

4,178,810
APPARATUS FOR MANIPULATING A MEDICAL INSTRUMENT
Nagashige Takahashi, Tokiwadai Green Haitsu 602, No. 28-10, Tokiwadai 3-chome, Itabashi-ku, Tokyo, Japan
Filed Aug. 9, 1977, Ser. No. 823,074
Claims priority, application Japan, Aug. 12, 1976, 51/107796
Int. Cl.² F16C *1/10;* **A61B** *5/00, 17/00;* **F16B** *7/10*
U.S. Cl. 74—501 R **4 Claims**

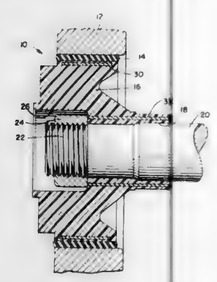


1. An apparatus for manipulating a medical instrument, such as a tissue sampling forceps, via a control wire slidably disposed within a flexible guide coil, comprising a flexible guide coil and a control wire slidably disposed within said guide coil, said apparatus further comprising:
(a) a hollow, elongated support tube,
(b) a plunger having an elongated cavity therein and being slidably disposed in the support tube,
(c) means coupled to the plunger for moving same within the support tube,
(d) a flexible expansion coil concentrically surrounding the guide coil within the support tube, one end of the expansion coil being secured to the support tube and the other end of the expansion coil being secured to the end of the guide coil,
(e) a stop member secured to the end of the control wire and slidably disposed within the cavity, and
(f) a spring disposed within the cavity for biasing the stop member against one end thereof, whereby the expansion coil yieldingly extends in response to excessive tension exerted on the control wire and the spring yieldingly compresses in response to excessive compression exerted on the control wire, thereby preventing breakage of or damage to the control wire and/or a medical instrument controlled thereby.

4,178,811
META REINFORCED PLASTIC DAMPER HUB
Michael Shepherd, Indianapolis, Ind., assignor to Wallace Murray Corporation, New York, N.Y.
Filed Jun. 15, 1977, Ser. No. 806,709
Int. Cl.² F16F *15/00*
U.S. Cl. 74—574 **7 Claims**

1. A torsional vibration damper of the type having an outer inertia ring, a radially intermediate elastomer annulus, and a centrally apertured, radially innermost hub, the hub adapted to be secured to the end of a rotary crankshaft subject to torsional vibrations, the hub formed of plastic to thereby reduce its polar moment of inertia and thereby reduce the parasitic mass of the entire damper, the improvement comprising, a first rigid hoop, the first hoop embedded in the hub and positioned contiguous

to the outer peripheral surface of the hub, a second rigid hoop, the second hoop embedded in the hub and positioned contiguous to the surface of the central hub aperture which is adapted to receive the end of a crankshaft, the second hoop being of an axial extent substantially equal to the axial extent of the crank-



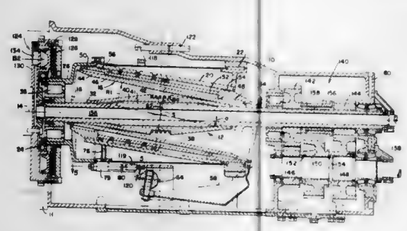
shaft receiving aperture of the hub, whereby the first hoop resists creep of the hub due to radially inwardly directed force of the said intermediate elastomer annulus and whereby the second hoop resists radial and clamping forces occasioned by attachment of the hub to a crankshaft.

4,178,812

VARIABLE SPEED TRANSMISSION DEVICE

Yves J. Kemper, Birmingham, Mich., and Lucien Bigot, Nantes, France, assignors to Vadetec Corporation, Troy, Mich.

Division of Ser. No. 738,472, Nov. 3, 1976, Pat. No. 4,112,779.
This application Apr. 21, 1978, Ser. No. 898,980
Int. Cl.[2] F16H *3/02*
U.S. Cl. 74—745 **3 Claims**



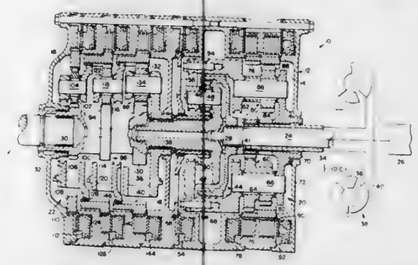
1. A torque transmission apparatus comprising:
a frame;
a first element including a first shaft supported by said frame for rotation on a first axis and supporting for rotation therewith a pair of axially movable cone-like members having oppositely converging exterior rolling surfaces of revolution defined by curved generatrices to be convex in axial section;
a second cylindrical element having an internal rolling surface concentric with a second axis intersecting said first axis at a point of axis intersection;
support means rotatable in said frame on said first axis to support said second element for nutating movement in which said second axis revolves in a conical path about said first axis so that the rolling surfaces of said first and second elements are in rolling frictional engagement at two points in a plane containing said first and second axes and located one on each side of said point of axes intersection;
eccentric means for adjusting the angle of intersection between first and second axes to shift said two points of rolling frictional engagement in opposite axial directions along said cone-like members thereby to vary the radii of the rolling surfaces on said first element at said two points of rolling frictional engagement;
means including an externally controlled pump carried by said support means for controlling the angular disposition of said eccentric means with respect to said cylindrical element and said support means to adjust the angle of intersection between said first and second axes;
clutch means having a driving member adapted to be connected with a source of driving torque and a driven member adapted to be keyed for rotation directly with said support means on one end thereof, and means for releasably engaging said driving and driven members;
a rotatable output shaft spaced from and parallel to said first shaft; and
a shiftable gear-type transmission for coupling said output shaft to said first shaft.

4,178,813

SPLIT INPUT PLANETARY TRANSMISSION

Alfred S. Smemo, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jan. 26, 1977, Ser. No. 762,587
Int. Cl.[2] F16H *57/10*
U.S. Cl. 74—764 **3 Claims**



1. A planetary transmission comprising: an input section, including a reversible planetary drive adapted for connection to a prime mover, an output section and an intermediate drive shaft coupled between said input and output sections; said output section including an output shaft coaxially aligned with and positioned adjacent to the intermediate drive shaft; low, intermediate and high speed planetary gear sets; each gear set including a sun and ring gear meshed with a plurality of planet gears; each sun gear being coupled for rotation with the output shaft; each gear set including a brake coupled to its ring gear and selectively operable for preventing rotation of the ring gear; and each gear set further including a planet carrier with the planet carrier of the low speed planetary gear set being coupled for rotation with the ring gear of the intermediate speed planetary gear set, with the planet carrier of the intermediate speed planetary gear set being coupled for rotation with the ring gear of the high speed planetary gear set and with the planet carrier of the high speed gear set being coupled for rotation with the intermediate shaft.

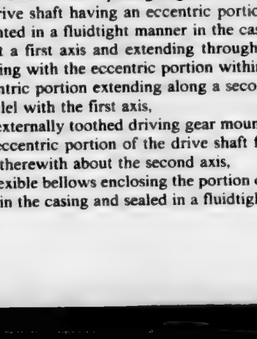
4,178,814

TWO-SPEED GEAR TRANSMISSION

Karl G. Ahlen, Stockholm, Sweden, assignor to S.R.M. Hydromekanik Aktiebolag, Stockholm,, Sweden

Continuation-in-part of Ser. No. 450,781, Mar. 13, 1974, abandoned. This application Oct. 4, 1976, Ser. No. 729,261
Int. Cl.[2] F16H *57/10*
U.S. Cl. 74—781 R **35 Claims**

1. A transmission comprising:
a casing;
an input shaft and an output shaft,
a planetary gear including a sun gear, a ring gear and at least one planet gear between and operatively engaging the sun gear and the ring gear, said planet gear or gears mounted on a planet carrier, said planet carrier operatively engaged with one of said shafts, the ring gear operatively engaged with the other of said shafts,
a clutch arranged to operatively connect the gears of the planetary gear together for direct drive between the input and output shafts,
a brake arranged to hold stationary said sun gear, permitting a second gear drive between the two shafts at a drive ratio different from said direct drive,
rotating bearing means for mounting said shafts and said gears for receiving radial forces upon relative rotating motion,



a spring means for urging said clutch into engagement, and an actuating means mounted stationarily relative to the casing for offsetting the force of the spring means to disconnect the clutch and connect the brake, said spring means including a Belleville spring acting against two parts, both of which rotate together in the clutch engaged direct drive condition,
the gears of the planetary gear, the spring means and the actuating means being arranged such that upon engagement of the clutch means the force of the spring means bypasses all of said rotating bearing means which rotate during direct drive, and upon engagement of the brake, the force of the further actuating means bypasses all of said rotating bearing means which rotate during said second gear drive.

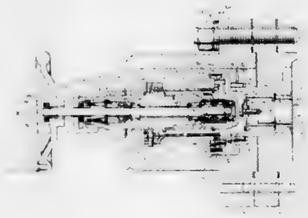
4,178,815

SEALED TORQUE TRANSMISSION ASSEMBLY

Cyril J. Astill, Deep River, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Dec. 2, 1977, Ser. No. 857,110
Claims priority, application Canada, Feb. 16, 1977, 271874
Int. Cl.[2] F16H *1/28*
U.S. Cl. 74—805 **2 Claims**

1. A sealed torque transmission assembly comprising:
(a) a casing with wall portions having a drive shaft opening and a driven shaft opening aligned therewith,
(b) a drive shaft having an eccentric portion and rotatably mounted in a fluidtight manner in the casing for rotation about a first axis and extending through the drive shaft opening with the eccentric portion within the casing, the eccentric portion extending along a second axis which is parallel with the first axis,
(c) an externally toothed driving gear mounted coaxially on the eccentric portion of the drive shaft for relative rotation therewith about the second axis,
(d) a flexible bellows enclosing the portion of the drive shaft within the casing and sealed in a fluidtight manner at one end to the casing and at the other end to the externally toothed driving gear,
(e) an anti-rotation sleeve around the portion of the drive shaft within the casing,
(f) casing, universal coupling means coupling one end of the anti-rotation sleeve against relative rotation to the casing,
(g) driving gear, universal coupling means coupling the other end of the anti-rotation sleeve against relative rotation to the driving gear,
(h) a driven shaft rotatably mounted in the casing and extending through the driven shaft opening and into the casing, and
(i) an internally toothed driven gear, having a greater number of teeth than the driving gear, mounted on the driven shaft for rotation therewith, with the internal teeth thereof meshing with at least one external tooth to one side only of the driving gear, and wherein



(j) the axis of the eccentric portion of the drive shaft is parallel to and radially offset from the axis of rotation of the drive shaft by an amount 't', where:
$t = (PCDi - PCDe)2$.

and where:
PCDi = The pitch circle diameter of the teeth of the internally toothed driven gear, and
PCDe = The pitch circle diameter of the teeth of the externally toothed driving gear.

4,178,816

PORTABLE HYDRANT WRENCH

Robert Radice, 405 Oak Neck Rd., West Islip, Suffolk County, N.Y. 11795

Filed Jul. 31, 1978, Ser. No. 929,361
Int. Cl.[2] B25B *17/00*
U.S. Cl. 81—57.3 **3 Claims**

1. A portable hydrant wrench for assembly and use by a single workman to operate and replace valves located in underground portions of hydrants comprising one or more detachable drive bars having a rectangular cross-section, detachable heads for interchangeable mating with the different types of valves employed in the undergroundportion of hydrants, said heads being attached to the free end of said drive bars proximate to the valves in the underground portion of the hydrant, platform means secured to said hydrant to be serviced for positioning said drive bars within the center of said hydrant to be serviced, a gear assembly for connection to the free end of the combination of said drive bars opposite the free end having said detachable heads connected thereto, said gear

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assembly being positioned upon said platform means, and a drive gear assembly positioned upon said platform means in



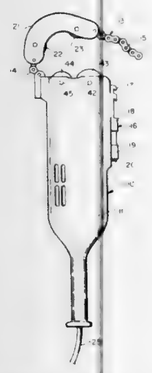
proximity to said gear assembly for cooperating with said gear assembly to rotate said hydrant wrench.

4,178,817

POWERED PIPE WRENCH

John Gibson, P.O. Box 2226, Gastonia, N.C. 28052

Continuation-in-part of Ser. No. 899,373, Apr. 24, 1978, abandoned. This application May 8, 1978, Ser. No. 903,722
Int. Cl.[2] B25B *17/00*
U.S. Cl. 81—57.13 **7 Claims**



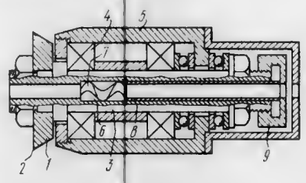
1. A power pipe wrench comprising a housing, a drive motor mounted in said housing, only one driving roller rotatably mounted in said housing and protruding peripherally beyond one end of the housing, said driving roller having a toothed surface configuration, means driven by said motor for rotating said driving roller, a smooth surfaced idler roller rotatably mounted in said housing and extending peripherally beyond said one end of the housing, pipe retaining means carried by the housing, and means for positioning the said pipe retaining means about a pipe and attaching the pipe retaining means to opposite sides of the housing in operative relation to the driving roller and the idler roller, whereby said pipe is rotated from the toothed driving roller to the smooth surfaced idler roller and pressed against the smooth surfaced idler roller to smooth the surface of the pipe following its engagement by the driving roller.

4,178,818

METHOD OF CUTTING SOLIDS OF REVOLUTION BY A ROTARY TOOL HAVING CIRCULAR CUTTING LIP, AND A ROTARY TOOL FOR CARRYING SAME INTO EFFECT

Petr I. Yascheritsyn; Alexandr V. Borisenko; Valery A. Sidorenko, and Evgeny A. Serebryakov, all of Minsk, U.S.S.R., assignors to Fiziko-Tekhnichesky Institut Akademii Nauk Belorusskoi SSR, U.S.S.R.

Filed Apr. 17, 1978, Ser. No. 897,020
Claims priority, application U.S.S.R., Apr. 19, 1977, 2475943
Int. Cl.[2] B23B *29/00, 3/00;* **B26D** *1/12*
U.S. Cl. 82—36 R **1 Claim**



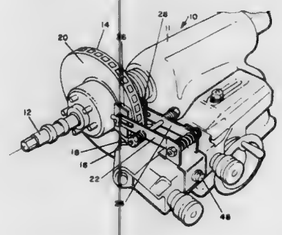
1. A rotary tool for carrying into effect a method of cutting solids of revolution, comprising: a working portion shaped as a solid of revolution; a circular cutting lip provided on said working portion; a spindle on which said working portion is set, said spindle having a centre through bore adapted for the stream of coolant to be fed therethrough; a screw-type wind turbine located in said through bore of said spindle and adapted to impart rotation to the tool when the stream of coolant is being fed through said bore.

4,178,819

VIBRATION DAMPENING DEVICE FOR ROTATING DISK

Fred F. Mahon, 23 Willis Ave., Greenville, S.C. 29611

Filed Aug. 11, 1978, Ser. No. 932,774
Int. Cl.[2] B23B *25/00;* **B23Q** *11/00*
U.S. Cl. 82—38 A **3 Claims**



1. A device for reducing chattering in a rotating disk while opposed surfaces of said disk are being cut with cutting tools on a disk cutting machine, said device comprising:

a pair of laterally spaced elongated rigid arms,

pads carried on inner ends of said arms,

a bracket for mounting said device on said cutting machine adjacent said disk,

a pair of spaced flanges carried on said bracket,

a rod member extending between said flanges,

said outer ends of said rigid arms having holes provided therein through which said rod member extends pivotally supporting said arms on said bracket,

a first resilient member carried on said rod between said outer ends of said rigid arms resiliently biasing said outer ends of said arms against said flanges,

second resilient biasing means engaging said arms forcing said pads in engagement with said opposed surfaces of said disk minimizing vibrations, and

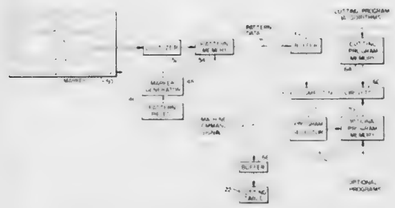
means for adjusting said second resilient biasing means for varying the pressure exerted by said pads on said opposed surfaces of said disk.

4,178,820

METHOD AND APPARATUS FOR CUTTING SHEET MATERIAL WITH IMPROVED ACCURACY

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Garment Technology,, South Windsor, Conn.

Division of Ser. No. 790,035, Apr. 22, 1977, Pat. No. 4,133,234. This application May 18, 1978, Ser. No. 907,330
Int. Cl.[2] B26D *5/00;* **B26F** *1/38*
U.S. Cl. 83—13 **39 Claims**



1. A method of cutting sheet material with an automatically controlled cutting machine having a cutting tool advanced along a cutting path during relative movements of the sheet material and cutting tool and in accordance with predetermined information defining the cutting path comprising:

reducing the predetermined information to a machine readable form;

establishing a primary program for processing the reduced predetermined information and generating fundamental commands for advancing the sheet material and the cutting tool relative to one another along the cutting path in accordance with the predetermined information;

establishing an optional program for processing the reduced predetermined information in conjunction with the primary program and generating supplemental machine commands;

storing the primary and optional programs in a program memory;

activating the primary program stored in the memory;

selectively activating or not activating the optional program stored in the memory by means of a selector on the cutting machine;

processing the predetermined information with the primary program and generating fundamental machine commands when the optional program has not been selected at the cutting machine;

processing the predetermined information with the primary and the optional program and generating supplemental and fundamental machine commands when the optional program has been selected at the cutting machine; and

controlling the relative movement of the sheet material and the cutting tool with the machine commands generated.

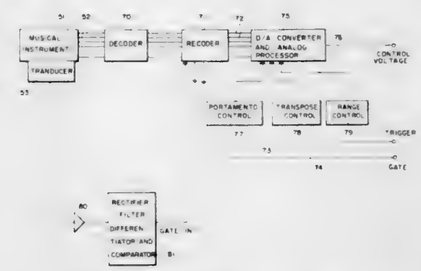
9. An automatically controlled cutting machine for cutting sheet material comprising: a cutting table including a cutting tool and a support surface on which sheet material is held during a cutting operation; motive means responsive to machine command signals for moving the sheet material and cutting tool relative to one another in cutting engagement; computing means receiving data defining desired cutting paths in the sheet material for generating machine command signals which produce the desired cutting paths from the received data, said computing means also including an optional program memory having a program of biassing signals for combination with the machine command signals; and means for selecting the optional program.

4,178,821

CONTROL SYSTEM FOR AN ELECTRONIC MUSIC SYNTHESIZER

Salvatore Gallina, and Stan Davidson, both of New York, N.Y., assignors to M. Morell Packaging Co., Inc., New York, N.Y.

Filed Jul. 14, 1976, Ser. No. 705,120
Int. Cl.[2] G10H *1/02, 5/00*
U.S. Cl. 84—1.01 **11 Claims**



1. In a system for synthesizing music including a plurality of selected operable switch means, a synthesizer at least responsive to analog input voltages for synthesizing tones of a frequency related to the amplitude of said analog input voltages, and control means responsive to operation of said switch means for producing said analog input voltages; the improvements wherein said control means comprises means responsive to the operation of said switch means for producing a binary coded signal proportional to a tone to be reproduced, said means for producing a binary coded signal being a decoder connected to said switch means and having a plurality of output lines each corresponding to a separate tone and recoder means responsive to the energization of said output lines for producing said binary coded signal, digital-to-analog converter means connected to convert said binary coded signal to an analog output signal, means applying said analog output signal to said synthesizer and said recoder means having means for scanning said output lines to provide a binary coded output signal corresponding to an output line having a signal thereon, said means for scanning including multiplexer means, a counter, clock means for continually stepping in said counter, the output of said counter being applied to said multiplexer for continually addressing said multiplexer to scan said output lines, and a means responsive to a coincidence between the address of said counter and an output line having a signal for recessing said counter, whereby the output count of said counter is a binary coded signal proportional to the tone to be synthesized.

4,178,822

MUSICAL SYNTHESIS ENVELOPE CONTROL TECHNIQUES

Sydney A. Alonso, Strafford, Vt. 05072

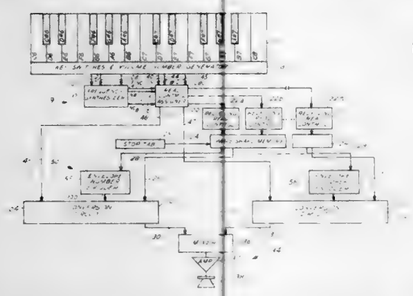
Filed Jun. 7, 1977, Ser. No. 804,361
Int. Cl.[2] G10H *1/00, 3/00*
U.S. Cl. 84—1.01 **12 Claims**

1. A method of synthesizing an audible note comprising the steps of:

generating a time-spaced series of digital amplitude numbers representing the average amplitude of the note at discrete

instants in time, said step of generating a time-spaced series of digital amplitude numbers comprising the separate steps of generating a time-spaced series of digital volume numbers representing the average volume component of the note amplitude and generating a time-spaced series of digital envelope numbers representing the attack or decay envelope component of the note amplitude;

generating a time-spaced series of digital wave numbers representing the waveshape and fundamental frequency characteristics of the note at discrete instants in time;



converting the series of digital amplitude numbers into a corresponding analog amplitude signal;

multiplying the value of the analog amplitude signal and the digital wave numbers together to generate an analog tone signal; and

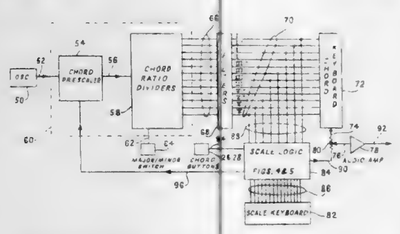
converting the analog tone signal into the audible note, whereby the composite and complex characteristics of the note can be rapidly generated in real time.

4,178,823

PORTABLE ELECTRONIC MUSICAL INSTRUMENT

J. Marion McCoskey, and R. Britton Webb, both of Box 225, Round Mountain, Calif. 96084

Filed Sep. 7, 1978, Ser. No. 940,252
Int. Cl.[2] G10H *1/00, 5/00*
U.S. Cl. 84—1.01 **23 Claims**



1. A portable electronic musical instrument, which comprises:

(a) a keyboard including a plurality of scale keys and a plurality of chord keys,

(b) a programmable frequency divider network capable of producing different output frequencies depending on which keys of said keyboard are activated,

(c) decoding means connected between said keyboard and said programmable frequency divider network for supplying signals to cause said programmable frequency divider network to produce different output frequencies depending on which keys of said keyboard are activated, and

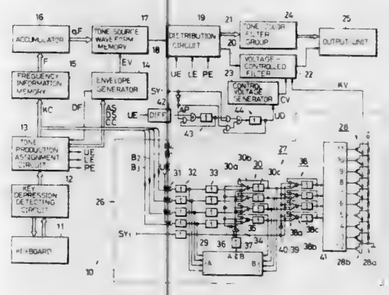
(d) means connected between said scale keys and said programmable frequency divider network for altering the output frequencies for generating chords produced by said programmable frequency divider network, the alteration being based on scale key closures so that chords produced from the output frequencies are compatible with scale notes corresponding to the scale key closures.

4,178,824

ELECTRONIC MUSICAL INSTRUMENT

Eiichiro Aoki, and Shigeru Yamada, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 21, 1977, Ser. No. 862,780
Claims priority, application Japan, Dec. 23, 1976, 51/155507
Int. Cl.[2] G10H *1/00*
U.S. Cl. 84—1.19 **7 Claims**



1. A polyphonic musical instrument comprising:

(a) a single controlled type signal processing means for forming musical tones, to which plural time division multiplexed tone source signals corresponding to plural tones are applied, the tones produceable by said instrument being divided into ranges,

(b) means for generating tone identifying signals respectively identifying the range containing each of said plural tones;

(c) means for preferentially selecting one of said generated tone identifying signals; and

(d) means for producing a control signal in accordance with the tone identifying signal thus selected, said control signal being applied to said controlled type signal processing means so as to control a characteristic thereof.

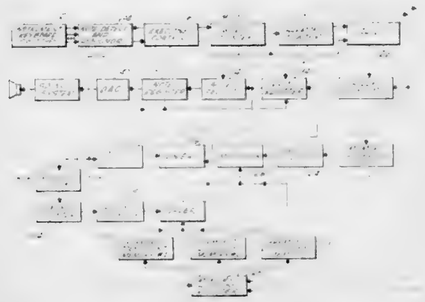
4,178,825

MUSICAL TONE SYNTHESIZER FOR GENERATING A MARIMBA EFFECT

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co. Ltd., Hamamatsu, Japan

Filed Jun. 6, 1977, Ser. No. 803,446
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.24 **6 Claims**

1. In a keyboard operated digital tone generator in which a musical tone is produced by repeatedly calculating a master data set representing the relative amplitudes of a series of points on the waveform of the tone to be generated and converting the data set to an analog voltage input applied to a sound system, the data set being calculated when a key is depressed by multiplying in multiplier means a set of stored harmonic coefficients one coefficient at a time with a stored table of sinusoid values and summing the product values from one coefficient value with the product values from each of the other coefficient values to provide said data set, apparatus for producing a marimba effect comprising: means storing first and second sets of harmonic coefficients, means including a clock source for reading out coefficient values from the first set of harmonic coefficients in sequence during one clock interval of the clock source and coefficient values from the second set of harmonic coefficients in sequence, the sets being read out alternately during successive time intervals of the clock source, variable scaler means, means changing the scale factor of the variable scaler means in the same predetermined manner during each of said successive time intervals of the clock source, the harmonic coefficient values read out of said storing



means being applied to said scaler means, the output of the scaler means being coupled to said multiplier means for calculating a master data set which changes in time with changes in the scale factor of the scaler means and with alternate reading out of the two sets of coefficient values, the coefficients in said second set having the odd numbered coefficients equal to zero.

4,178,826

ENVELOPE GENERATOR

Teruo Hiyoshi; Akira Nakada; Tsutomu Suzuki; Eiichiro Aoki, and Eiichi Yamaga, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 6, 1977, Ser. No. 839,912
Claims priority, application Japan, Oct. 8, 1976, 51/120936
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.26 **9 Claims**



1. An envelope generator for an electronic musical instrument, said generator providing selectably different musical envelope shapes, comprising:

a counting circuit selectively operable in a linear counting mode and in a non-linear counting mode, each in response to count pulses applied thereto;

a count mode control means for switching said counting circuit to one of said linear or non-linear counting modes;

a plurality of clock pulse sources, each supplying count pulses at different rates;

a count rate control means for applying to said counting circuit count pulses from a selected one of said sources;

an envelope shape selection means for programmatically causing (a) said count mode control means to select said counting modes and (b) said count rate control means to apply count pulses from different sources so that the resultant count values of said counting circuit will correspond to a selectable envelope shape; and

a conversion circuit for converting said resultant count values of said counting circuit to amplitude data;

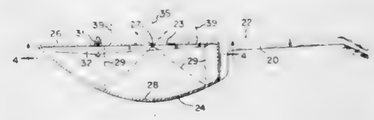
said envelope generator thereby generating an envelope shape having an amplitude variation corresponding to the resultant variation in said count value.

4,178,827

STRINGED INSTRUMENT CONSTRUCTION

William K. Mallory, 2115 S. 128th St., Seattle, Wash. 98168

Filed Apr. 19, 1978, Ser. No. 897,797
Int. Cl.[2] G10D *1/08*
U.S. Cl. 84—291 **4 Claims**



1. A stringed musical instrument having a body with a soundboard assembly for producing an optimum sound volume comprising in combination:

a. a soundboward having a planar interior underside surface and an exterior top surface and a sound hole passing therethrough;

b. a string bridge attached to said exterior surface of said soundboard;

c. a first and a second longitudinal main brace attached to said interior underside surface, each opposite of said sound hole and each disposed from said soundboard substantial upper to said soundboard substantial lower end, thereby each having a portion intersecting with said string bridge location being opposite at said exterior side of said soundboard;

d. a first and a second compressioned transmission joint having each a compression mechanical fastener, each said joint formed by

(1) said bridge,

(2) said soundboard inbetween said bridge and said portion of each said main braces intersecting with said bridge,

(3) said portion of each said main braces intersecting with said bridge,

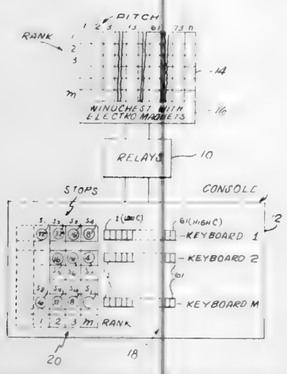
(4) said compression mechanical fastener for connecting said bridge, soundboard and each said respective main braces in a predetermined constant compression;

e. a plurality of side braces fastened to said soundboard interior underside surface and to each said first and to each said second compressioned transmission joint at each said portion of each said main braces intersecting with said bridge at said soundboard interior underside and emanating in fan-shaped fashion from each said joint;

f. a plurality of parallel braces, parallel to one another at predetermined positions, each interconnecting said first and said second main braces at opposite sides of said sound hole; and

g. a backside having a parabolic interior shape rigidly connected at its periphery to said soundboard, whereby said parabolic interior shape is shaped and located in predetermined relationship to said sound hole location so that an imaginary focal point is obtained substantially at said sound hole center, said backside adapted to effect immediate transmission of associated sound wave vibrations from said soundboard interior underside surface towards said parabolic shape and for direct reflection therefrom through said sound hole focal point.

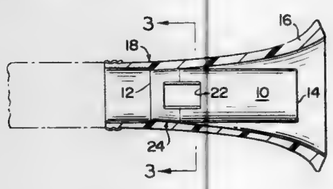
4,178,828
COMPUTERIZED UNIT ORGAN RELAY
Lawrence J. Henschen, 780 S. Warrington Rd., Des Plaines, Ill. 60016
Filed Jul. 29, 1977, Ser. No. 820,149
Int. Cl.[2] G10B 3/10
U.S. Cl. 84—337 **20 Claims**



1. In a unit pipe organ which includes a plurality of air-actuated pipes arranged in a plurality of ranks and a console for designating which of said plurality of pipes are to be played, said console including a plurality of keyboards each having a plurality of keys, and a plurality of stops associated with each keyboard, wherein a given rank of said pipes may be enabled by different stops on different keyboards, the improvement which comprises:

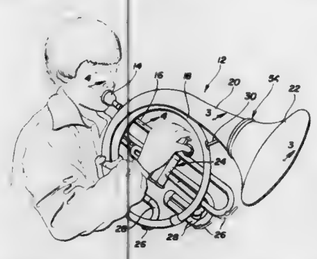
a unit organ relay means comprising a programmable data processor connected between said console and said plurality of pipes operating under the control of a program for calculating which of said pipes should be actuated in response to the key-stop combinations designated on said console.

4,178,829
POWER TUBE FOR FLARED BELL MUSICAL INSTRUMENTS
John W. Wolford, P.O. Box 1024, Dundee, Fla. 33838
Filed May 24, 1978, Ser. No. 909,057
Int. Cl.[2] G10D 9/00
U.S. Cl. 84—386 **7 Claims**



1. A power tube for attachment within the bell of a flared bell musical instrument, said power tube comprising a hollow tubular member of a substantially constant inner diameter and open at both ends, said tubular member having first and second parallel oriented circular end surfaces aligned perpendicular to the longitudinal axis of said tube, the outer surface of the first end surface forming an airtight seal with the interior surface of the bell at a point just prior to the point were the bell commences its rapid outward sweep, said tube having a length such that the second end surface is positioned within the interior of said bell and an interior wall aligned at a constant angle with respect to the longitudinal axis of said tube, said tube including a pair of diametrically opposed vents positioned in close proximity to the first end surface which provide fluid communication between the exterior wall of said tube and the interior surface of said bell to permit a flow of air from said space into the interior volume of said tube.

4,178,830
COMPACT B-FLAT HORN AND CASE THEREFOR
Lawrence V. Ramirez, Kenosha, Wis., assignor to G. Leblanc Corporation, Kenosha, Wis.
Filed Sep. 14, 1977, Ser. No. 833,004
Int. Cl.[2] G10D 7/10
U.S. Cl. 84—388 **3 Claims**



1. A brass horn comprising convoluted lengths of tubing in laterally close-coupled disposition and having an entering end length of tubing for mouthpiece attachment at one end thereof and an exit end including a tubing loop traversing the tubing convolutions within the maximum extent thereof and merging with a flare having the center axis thereof parallel to and above the longitudinal axis of the entering end length of tubing, a bell with a detachable connection to the end of the flare at a location where the center axis of the bell is coincident with the center axis of the flare and parallel to the longitudinal axis of the entering end length of tubing to open oppositely to an attached mouthpiece giving the player clear vision below the bell to see sheet music or the frontal area if marching, the axial extent of the bell being relatively short to not substantially exceed the transverse extent of the close-coupled tubing and flare for compact case packing when detached, and touch keys for piston valve actuation disposed along the entering end length of tubing below the adjacent tubing loop and flare.

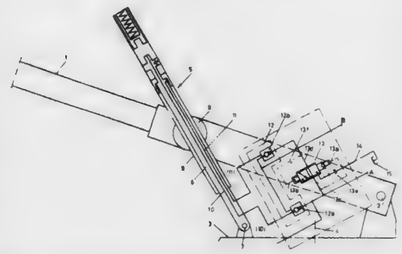
4,178,831
FLUID PRESSURE DEVICE FOR SUPPORTING AND ELEVATING A GUN BARREL
Gustav H. Tidemalm, and Björn E. Vidinghoff, both of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden
Filed Jun. 27, 1977, Ser. No. 810,465
Claims priority, application Sweden, Jul. 5, 1976, 7607651
Int. Cl.[2] F41F 21/08
U.S. Cl. 89—41 H **18 Claims**

1. Apparatus for supporting and elevating the barrel of an artillery weapon and the like, said apparatus comprising:

first and second telescoping cylinder members, one of said cylinder members pivotally attached to a frame portion of said weapon and said remaining cylinder member rotatably attached to said barrel;

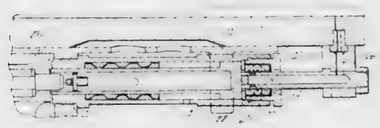
a first piston member fixed within said telescoping cylinder members and a second piston member selectively movable within said telescoping cylinder members toward and away from said fixed piston member for supporting said barrel while dampening any sudden movement of said barrel;

passage means extending through said telescoping members into contact with said piston assembly means for selectively providing a first, positive pressure against a first side of said piston assembly means and for providing a second, positive pressure against a second side of said piston assembly means; and



pressure distributing valve means joining said passage means for controlling the pressure ratio across said piston assembly means to support and elevate said barrel as required.

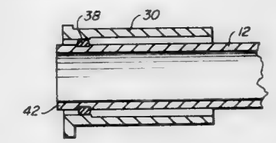
4,178,832
AUTOMATIC GUN HAVING GAS LEAKAGE CONTROL MECHANISM
Robert B. Crowell, Newport Beach, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed May 25, 1978, Ser. No. 909,741
Int. Cl.[2] F41D 1/06
U.S. Cl. 89—159 **3 Claims**



1. In a recoil-operated automatic gun comprising a receiver, a barrel mounted for reciprocal axial movement in the forward portion of the receiver, a bolt carrier slidably disposed within the receiver, and means for operating the bolt carrier; said bolt-operating means comprising a gas cylinder projectly forwardly from the receiver, a piston slidably disposed within the cylinder, a yoke depending from the barrel forwardly of the receiver and a gas tube extending rearwardly from the yoke into the gas cylinder; said piston having its forward end normally engaged with the gas tube and its rearward end engaged with the bolt carrier, whereby the action of firing a round causes hot combustion gases to be introduced from the barrel into the gas tube through the afore-mentioned yoke, after which the barrel recoils to produce both mechanical and gas pressure forces on the forward end of the piston:

the improvement comprising a series of leakage control rings floatably positioned within the gas cylinder in surrounding relationship to the gas tube, each control ring having an internal diameter that is only slightly larger than the external diameter of the tube by a specified amount; each leakage control ring being capable of independent adjustment in any radial direction whereby the individual rings are precluded from binding frictional contact with the tube even though the tube and barrel may not move precisely parallel to one another.

4,178,833
SNAP RING BEARING FOR A GUN BARREL BUSHING
Fred R. Miller, 2620 E. 32nd St., Davenport, Iowa 52807
Filed Oct. 18, 1976, Ser. No. 733,658
Int. Cl.[2] F41C 5/06
U.S. Cl. 89—163 **5 Claims**



1. In combination:

a pistol frame,

a slide slidably mounted on said frame between a forward battery position and a rearward recoil position,

a barrel bushing on the forward portion of said slide,

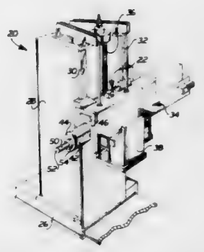
a barrel having its forward muzzle end slidably and pivotally positioned in said barrel bushing, and

a bearing on said barrel engageable with said bushing when said slide is in said forward battery position,

said barrel having a groove near the muzzle end thereof with said bearing positioned therein,

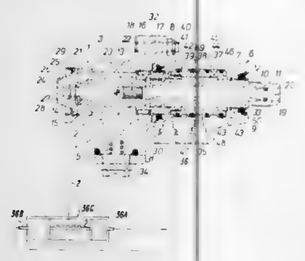
said bearing consisting of a split ring having a rounded outer shoulder.

4,178,834
MACHINE TOOL HAVING DEFLECTION COMPENSATION FOR TOOL SUPPORT ARM
Paul E. Holmstrom, Cincinnati, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio
Filed Jun. 23, 1977, Ser. No. 809,170
Int. Cl.[2] B23Q 11/00
U.S. Cl. 409—80 C **50 Claims**



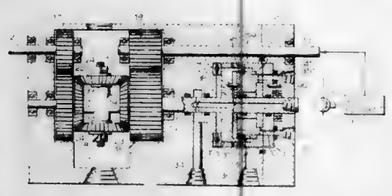
19. A method of operating a machine tool having an upwardly extending track along which a carriage for an extendible tool support arm is movable, said method comprising the steps of moving the carriage along the track to raise and lower the tool support arm, extending the tool support arm, allowing the tool support arm to deflect when it is extended, and compensating for deflection of the tool support arm by changing the angular orientation of the carriage relative to the track to change the position of an inner end portion of the tool support arm relative to the position of an outer end portion of the tool support arm.

4,178,835
ROTARY VALVE FOR POWER-ASSISTED STEERING MECHANISM
Barry J. Millard, Reading, England, assignor to Adwest Engineering Limited, Great Britain
Filed Jan. 30, 1978, Ser. No. 873,679
Claims priority, application United Kingdom, Feb. 16, 1977, 6382/77
Int. Cl.[2] F15B *9/10*
U.S. Cl. 91—375 A **11 Claims**



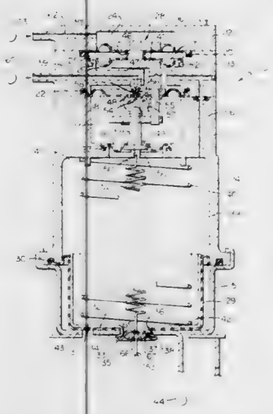
1. A rotary valve for a power-assisted rack-and-pinion steering mechanism for a motor vehicle, the rotary valve comprising a valve sleeve, a rotor member rotatable within the valve sleeve, the rotor member having an input connection whereby it is connectible with the steering control of a vehicle so that rotary motion will be imparted thereto when the steering control is operated, the rotor member and the valve sleeve each having axially extending grooves therein which cooperate to control the flow of fluid under pressure through the valve according to the angular disposition of the rotor member relative to the valve sleeve, a cylindrical pinion, an annular coupling member rigidly connecting the pinion to the valve sleeve, one end portion of said annular coupling member being fitted over an end portion of the pinion and having internal teeth which intermesh with the teeth of the pinion, the annular coupling member being bonded to the pinion and to the valve sleeve, and an elongated torsion bar having one end connected to the rotor member and the remaining end connected to the pinion.

4,178,836
MECHANICAL HYDRO SERVO VALVE
Hubert Maisonneuve, West Columbia, S.C., assignor to Canron Inc., New York, N.Y.
Filed Feb. 8, 1977, Ser. No. 766,672
Int. Cl.[2] F15B *9/12*
U.S. Cl. 91—381 **8 Claims**



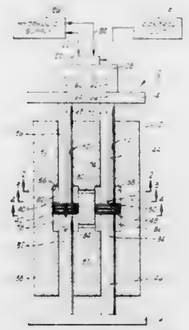
1. A condition responsive servo control valve for controlling a variable condition of an actuator means for controlling a remote element, the valve comprising a first input shaft rotatable according to a desired input condition and a second input shaft rotatable according to the condition of the remote element, an output shaft, a differential gear train interconnecting said first and second input shafts to said output shaft, and a rotary fluid valve operably connected to said output shaft to provide a fluid output representing the difference between the conditions determining the first and second input shaft positions, said rotary fluid valve having a valve inlet means and a valve outlet means, a rotary valve plate drivably connected to said output shaft and a stationary valve plate with which said rotary valve plate is in mating relationship, said rotary and stationary valve plates each having fluid flow ports therein respectively connected to the valve inlet means and the valve outlet means and arranged in a cooperative relationship to control fluid flow from the valve inlet means and direct it to the valve outlet means with the flow being according to the relative angular positions of said rotary and stationary valve plates, whereby said output can be applied to the actuator means operable to bring the condition of the remote element other than the desired input condition and the desired input condition into conformity.

4,178,837
PNEUMATICALLY OPERATED ACTUATOR AND METHOD OF MAKING THE SAME
Alfred A. Frankenberg, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.
Filed Dec. 27, 1977, Ser. No. 864,374
Int. Cl.[2] F15B *13/16*
U.S. Cl. 91—387 **8 Claims**



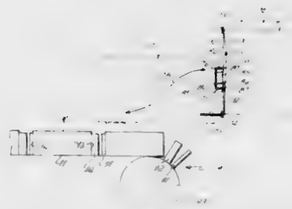
1. In a method of making a pneumatically operated actuator having a housing means provided with a pneumatically operated movable wall interconnected by a feedback tension spring to a pilot valve positioner that is adapted to pneumatically move said movable wall of said actuator in relation to a pneumatic signal directed to said positioner and in opposition to a biasing means of said wall, the improvement comprising the steps of loosely projecting one end of said spring through an opening in said wall after the other end of said spring has been interconnected to said pilot valve positioner, directing a predetermined pneumatic signal to said positioner, pulling on said one end of said spring until said wall moves relative to said one end of said spring in opposition to said biasing means and assumes a position thereof relative to said one end of said spring and said housing means that corresponds to said predetermined pneumatic signal, and securing said one end of said spring to said wall while said wall is in said position thereof and said spring is in the pulled condition thereof that caused said wall to move to said position thereof.

4,178,838
OIL PORTING SYSTEM FOR DUAL CYLINDER VIBRATOR
Jay H. Stafford, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.
Filed Nov. 3, 1977, Ser. No. 848,226
Int. Cl.[2] F01B *15/02;* **F15B** *11/16*
U.S. Cl. 92—117 A **7 Claims**



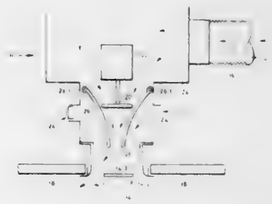
1. A method of porting hydraulic fluid to a seismic vibrator of the type having a frame, reaction mass including plural internal cylinders, and plural respective double rod end pistons secured to said frame and disposed for controlled relative reciprocation within a respective internal cylinder, comprising:
communicating by cross-porting each of said internal cylinders on one side of said pistons;
communicating by cross-porting each of said internal cylinders on the opposite side of said pistons; and
providing hydraulic fluid communication through a selected different piston rod end to each of the one and opposite sides of said internal cylinders to enable reciprocal drive of said reaction mass.

4,178,839
CARTON ERECTING APPARATUS
Charles C. Hughes, Ludlow, Ky., assignor to R. A. Jones & Co. Inc., Covington, Ky.
Continuation-in-part of Ser. No. 723,992, Sep. 16, 1976, Pat. No. 4,057,008. This application Sep. 19, 1977, Ser. No. 834,166
Int. Cl.[2] B31B *5/00*
U.S. Cl. 93—53 SD **8 Claims**



1. In apparatus for erecting tubular carton blanks which are flat folded and have a first surface on one side and a second surface on the other side, a mechanism for partially opening said flat folded blank comprising,
at least one suction cup,
a support on each side of said suction cup,
means for positioning said cup and supports against the second surface of a flat folded carton blank with said supports in engagement with said surface of said blank inboard of the edges of said blank,
said supports having carton engaging surfaces lying in a plane,
said cup having a lip normally located approximately in said plane and engageable with a carton blank surface and movable away from the plane of said supports upon application of vacuum to said cup to pull said second surface past the plane of said supports and thereby bow the surface of the blank engaged by said cup to partially open said blank,
and means for applying vacuum to said cup.

4,178,840
AIR DISCHARGE TERMINAL UNIT
Nicholas Caknis, c/o P.O. Box 4035, Pretoria 0001, South Africa
Filed Mar. 10, 1978, Ser. No. 885,113
Claims priority, application South Africa, Mar. 11, 1977, 77/1500
Int. Cl.[2] F24F *13/06*
U.S. Cl. 98—38 E **2 Claims**



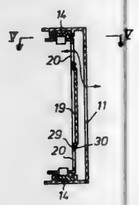
1. An air discharge terminal unit comprising a plenum having a main air inlet, an induced air inlet, a first air outlet and a second air outlet, spaced from the first air outlet in a direction away from the induced air inlet, the induced air inlet being located unilaterally along the flow path of a main air stream which flows between the main air inlet and the air outlets, a pair of modulating control vanes located along the flow path of the main air stream on opposite sides thereof, one of said vanes being disposed between said flow path and said induced air inlet, and means for simultaneously moving said vanes toward and away from each other thereby respectively to restrict said main air inlet and expand said main air inlet and respectively to move said one vane away from and toward said induced air opening thereby respectively to expose and to mask said induced air opening.

4,178,841
AIR VENT
Gerhard Frank, Wilnsdorf-Obersdorf, and Eckhard Kucharczyk, Netphen, both of Fed. Rep. of Germany, assignors to Siegenia-Frank AG., Siegen, Fed. Rep. of Germany
Filed Jan. 25, 1978, Ser. No. 872,317
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1976, 2703207
Int. Cl.[2] F24F *13/18, 7/00*
U.S. Cl. 98—98 **11 Claims**

1. Air vent consisting of a fixed, gridlike apertured front panel and of a stop plate disposed behind it, which is movable by a control mechanism transversely of its plane and to the plane of the front panel, which stop plate in a position resting against the back of the front panel closes the grid apertures, but which in a position raised therefrom opens the grid apertures of the front panel for the passage of air,
characterized by the fact that the control mechanism has at least one thrust rod (**24**, **54**) that is adjustable parallel to the longitudinal edges of the front panel (**9**, **39**) and that is

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linearly movable in guides (13, 14, 43, 44) thereof, beside which lies a flange (21, 51) extending over the entire length of the stop plates (15, 45) and essentially oriented transversely of their plane, and that adjusting elements are provided distributed along the length of the thrust rod (24,



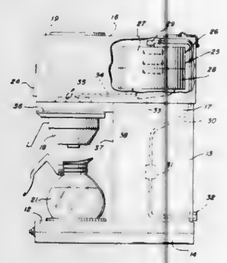
54) and of the flange (21, 51), the adjusting elements consisting of studs (25, 55) engaging oblique slide slots (22, 52), and that holders (26, 27) are provided at the front panel (9, 39) holders, so that the stop plate (15, 45) is fixed in such a way that it is movable only in an transverse direction.

4,178,842

CANTILEVERED INSTANTANEOUS HEATING BREWER

Charles J. Vitous, Berwyn, Ill., assignor to Cory Food Services, Inc., Chicago, Ill.

Filed Aug. 2, 1978, Ser. No. 930,813
Int. Cl.² A47J *31/10*
U.S. Cl. 99—281 **9 Claims**



1. In a beverage brewer having a base defining a rear portion, an upright upstanding from said base rear portion, and a head having a rear portion mounted to the top of said upright and cantilevered forwardly from the upper end of the upright to overlie the base, said head further defining a front portion, and means on said front porin of the head for removably supporting a brewing cartridge thereunder, an improved structural arrangement for delivering hot brewing water to the cartridge comprising:

massive heat transfer means mounted in said head at said rear portion thereof fully above said brewing cartridge and defining an effectively instantaneous heat transfer device;

means for delivering cold water to said heat transfer means to be heated by heat transfer association therewith to a preselected hot brewing temperature; and

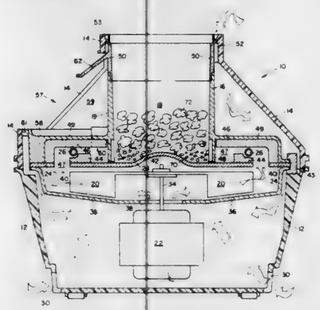
conduit means extending forwardly from said heat transfer means to the cartridge for delivering the hot brewing water from said heat transfer means into the cartridge for brewing a beverage in the cartridge.

4,178,843

PORTABLE CORN POPPER

Steven B. Crabtree, Chillicothe; Hugh F. Groth; Guilbert M. Hunt, both of Brecksville; Thomas E. Lipinski, Bath; James T. McMaster; Guy R. Moffitt, Jr., both of Chillicothe; Anthony D. Szpak, Parma, and Robert A. Williams, Chillicothe, all of Ohio, assignors to Wear-Ever Aluminum, Inc., Chillicothe, Ohio

Filed Feb. 6, 1978, Ser. No. 875,339
Int. Cl.² A23L *1/18*
U.S. Cl. 99—323.8 **5 Claims**



1. An apparatus for popping corn by heated air comprising:

a housing;

means for heating air;

a cylindrical popping chamber within said housing having its axis vertical, said chamber being open at the top and having its diameter larger at its upper portion than at its lower portion;

means for flowing air in a generally circular path about the outside periphery of said chamber to facilitate heating of the air; and

means for introducing heated air into the lower portion of said chamber to flow the air within the chamber into a generally circular path about said axis to provide a fluidized bed of corn to be popped moving in a generally circular path within said chamber;

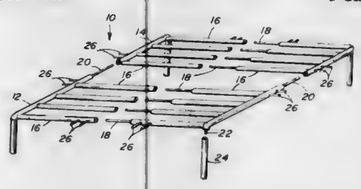
the air controlled to retain popped corn within said chamber to form a column of popped corn rising upwardly above said popping chamber and to be discharged out the open top of said chamber in a controlled manner.

4,178,844

TWO-WAY ADJUSTABLE COOKING GRID

Frances S. Ward, 21906 10 Mile Rd., St. Clair Shores, Mich. 48080, and John J. Ward, 28971 Little Mack, Apt. B-1, St. Clair Shores, Mich. 48081

Filed Jul. 27, 1978, Ser. No. 928,404
Int. Cl.² A47J *37/07*
U.S. Cl. 99—449 **5 Claims**



1. A first two-way adjustable cooking grid comprising:

a first set of parallel, spaced apart tubes perpendicularly attached to a first end tube;

a second set of parallel spaced tubes perpendicularly attached to a second end tube, said first and second sets spaced apart from but parallel to each other, said second end tube having a first rod fixedly attached to its center and projecting therefrom to slidingly engage the open end of said first end tube;

a third set and a fourth set of parallel, spaced apart tubes perpendicularly attached to a third and a fourth end tube, respectively, said third and fourth sets of tubes spaced opposite and coaxial with said first and said second sets of parallel, spaced apart tubes;

a multiplicity of rods fixedly attached to the open ends of said third and fourth sets of parallel tubes, said rods extending from the open ends of said third and fourth sets of parallel tubes a distance, said multiplicity of rods slidingly engaging the open ends of said first and second sets of parallel, spaced apart tubes;

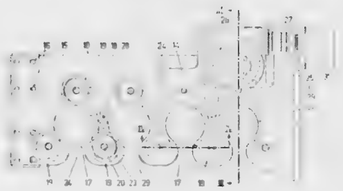
a second rod extending from the center of said fourth end tube toward said third end tube and fixedly attached to said fourth end tube, said second rod extending therefrom a distance, said second rod slidingly engaging the open end of said third end tube; when the various rods engage their adjacent tubes, a two-way adjustable grid is formed.

4,178,845

TWISTING AND CUTTING DEVICE FOR BINDING AT LEAST ONE THREAD PUT AROUND A PRESSED BALE

Jean-Claude De Gryse, Dadizele, Belgium, assignor to Naamloze Vennootschap Declametaal, Dadizele, Belgium

Filed Mar. 17, 1978, Ser. No. 887,804
Claims priority, application Belgium, Mar. 23, 1977, 852797
Int. Cl.² B65B *13/28*
U.S. Cl. 100—11 **8 Claims**



1. A twisting device for two parts of thread running from different feed spools and made to be adjacent to each other at the location of the device, said device comprising:

a frame,

three gear-wheels rotatably mounted in relation to the frame,

a twisting member consisting of a fourth gear-wheel mounted in relation to the frame in the space enclosed by said three gear-wheels and being in

direct mesh with each of said three gear-wheels, and

driving means for one of said three gear-wheels,

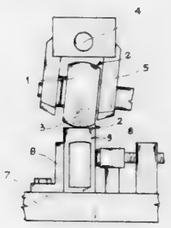
said twisting member having teeth and valleys between the teeth, at least some of these valleys being deep enough to receive simultaneously a tooth of one of said three gear-wheels and the thread, said frame being provided with a cut out aperture in front of the twisting member permitting the thread to enter into one of said deep enough valleys.

4,178,846

APPARATUS FOR, AND A PROCESS OF, SECTOR ENGRAVING METAL ELEMENTS

Cesare Giovanelli, Gardone Val Trompia, Italy, assignor to Bottega Incisioni di Orizio-Giovanelli, Gardone Val Trompia, Italy

Filed Jun. 30, 1977, Ser. No. 811,868
Claims priority, application Italy, Apr. 21, 1977, 22724 A/77
Int. Cl.² B41F *17/00*
U.S. Cl. 101—5 **15 Claims**



1. Apparatus for engraving metal elements, comprising:

an engraving roller having a predetermined pattern formed upon the peripheral surface thereof and being rotatable about a first axis;

means mounting said roller for permitting said roller to pivot about a second axis;

a workpiece disposed in contact with said peripheral surface of said engraving roller; and

means mounting said workpiece for movement in planes parallel to said first and second axes such that fractional portions of said predetermined pattern are sequentially reproduced upon said workpiece.

4,178,847

ITEM ENDORSING APPARATUS

Heinrich S. Erhardt, Warminster, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sep. 14, 1977, Ser. No. 833,298
Int. Cl.² B41L *47/46*
U.S. Cl. 101—91 **10 Claims**



1. High speed item printing/endorsing apparatus of modular construction usable for example with item sorting apparatus for endorsing or printing on checks and the like and being demountably removable and replaceable at will comprising:

an input shaft driven at a single speed,

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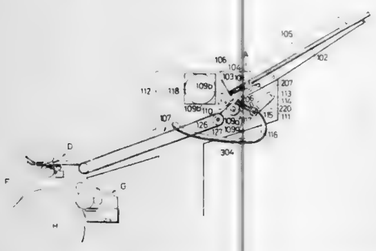
an output shaft,
drive means for rotating said input shaft and said output shaft,
differential gear train shaft speed determining means interconnecting said input shaft with said output shaft settable into one of two states to set a desired one of two speeds of the output shaft to select the printing speed,
means coupled to said shaft speed determining means effective when energized to change the output speed of the output shaft to the selected state, print means coupled to said output shaft, cam means driven by said output shaft operably associated with said print means for moving said print means so as to print consecutive data, means responsive to the movement of said cam means to consecutively advance the print means,
item moving means coupled to said print means for passing an item to be printed before said print means to produce printed indicia upon said item as the item is moved therepast, and
means for energizing said drive means effective to bring said printing means into printing engagement with an item as the item is passed before said print means.

4,178,848

AUTOMATIC PLATE SUPPLYING DEVICE FOR USE IN AN OFFSET PRINTING MACHINE

Koji Ishii, Fuchu, Japan, assignor to Ryobi Ltd., Hiroshima, Japan

Filed Jun. 13, 1977, Ser. No. 806,127
Claims priority, application Japan, Jun. 14, 1976, 51/70021
Int. Cl.[2] B41F *7/00, 21/06;* **B65H** *3/08*
U.S. Cl. 101—142 **15 Claims**



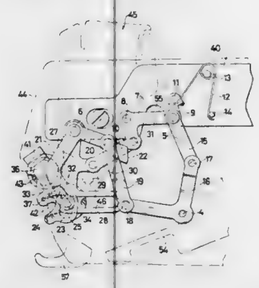
1. An automatic plate supplying device for suplying plates sequentially to an offset printing machine including a pair of side walls, a drive motor disposed at one of the side walls and a plate conveying means driven by said motor, comprising:
(a) a plate storing means for supporting the plates in a stack having a bottom plate, said plate storing means being formed with a normally substantially closed opening through which the plates are to be drawn sequentially,
(b) a swingable suction means for sucking the bottom plate and transporting it to said conveying means, said swingable suction means comprising a pivotable member having a pivoting end and a swinging end, a swingable suction pipe in communication with a negative pressure source and mounted on the swinging end of said pivotable member, and a plurality of suction feet supported by said suction pipe in fluid communication therewith, said suction pipe and suction feet being rotatable with respect to said pivotable member,
(c) means for actuating said suction means to swing it between said plate storing means and said plate conveying means, and
(d) cam means driven by said driving motor for operating said swingable suction means and said means for actuating said suction means.

4,178,849

INKING DEVICE FOR LABEL PRINTING AND APPLYING MACHINE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan

Continuation-in-part of Ser. No. 813,291, Jul. 6, 1977, abandoned, which is a division of Ser. No. 787,937, Apr. 15, 1977. This application Sep. 2, 1977, Ser. No. 830,187
Claims priority, application Japan, Apr. 26, 1976, 51-46606; Jul. 6, 1976, 51-79440
Int. Cl.[2] B41J *3/60;* **B41F** *1/50*
U.S. Cl. 101—305 **13 Claims**



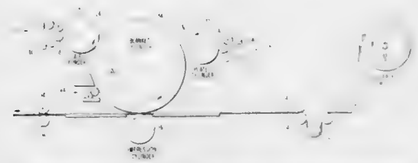
1. In a label printing machine, comprising a machine frame; said machine frame having a front end; a platen supported by said machine frame; a yoke movably supported by said machine frame for motion in a print direction toward said platen and in the opposite direction; said yoke being pivotally supported at a first pivot on said machine frame for pivotal motion with respect to said machine frame and extending from said first pivot toward said machine frame front end; a print head supported by and movable with said yoke, and including types opposable to and movable to said platen;
inking means for inking said types comprising:
an inking roller; a support for said linking
link means connecting said yoke and said inking roller support; said support holding said inking roller at one side, measured across said print direction, of said print head types before said yoke moves in said print direction; said link means moving said support to move said inking roller past said types in an inking direction, that crosses said print direction, as said yoke moves in said print direction, and said inking direction being directed into said machine frame such that when said types move to said platen, said inking roller is stowed inside said machine frame;
said link means comprises:
a first link including guide means for said support such that said support moves along and with respect to said guide means in said inking direction;
a second linkage connected with said support for moving said support in said inking direction along said guide means;
a third linkage connected with said first link for moving said first link generally in said inking direction and into said machine frame; said support remaining in engagement with said first link for being moved into said machine frame rearwardly from said machine frame front end with said first link;
said second and said third linkages being connected with said yoke for moving as described as said yoke moves in said print direction whereby the ink roller and support, as a result of the recited interconnection of the first link, the second and third linkages with the support, is given a motion in said inking direction faster than the motion of said first link in said inking direction.

4,178,850

METHOD AND APPARATUS FOR OFFSET PRINTING EMPLOYING FLUOROELASTOMERS

Richard W. Helmig, Garrison Forest Rd., Owings Mills, Md. 21117

Continuation of Ser. No. 602,908, Aug. 7, 1975, abandoned. This application Apr. 8, 1977, Ser. No. 785,956
Int. Cl.[2] B41M *1/00*
U.S. Cl. 101—451 **1 Claim**



1. A method of lithographic printing comprising the steps of:
applying ink to a surface of a roller provided with a solid fluoroelastomer surface;
contacting a printing plate carried by a plate cylinder with water to apply water to the plate and with a surface of the roller to apply a film of ink to the plate from the roller;
moving the water and the ink bearing printing plate into contact with an image receiving surface of a transfer medium consisting essentially of a solid fluoroelastomer image receiving surface to transfer the film of ink in the form of an image from the printing plate to the image receiving surface of the transfer medium, the fluoroelastomer being resistant to swelling in lithographic printing and having ink receptivity sufficient to receive the ink from the plate in the form of a film without forming globules of ink in imprinted areas, and having ink release sufficient to release a major portion of the ink during subsequent transfer of the image from the blanket; and
transferring a major portion of the film of ink from the image receiving surface to another surface;
and wherein the fluoroelastomer image receiving surface of the transfer medium and the fluoroelastomer surface of the roller are each a copolymer of vinylidene fluoride and hexafluoropropylene.

4,178,851

DUAL PURPOSE MUNITION

Joseph F. Brady, Bethlehem, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 8, 1972, Ser. No. 233,831
Int. Cl.[2] F42B *25/02, 25/16*
U.S. Cl. 102—4 **7 Claims**



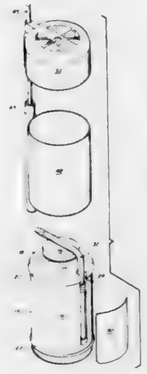
1. A dual purpose air deliverable submunition comprising:
a pair of hemispherical overlay shells;
means for releasably securing said hemispheres together;
means for spacially securing one of said hemispheres to a high explosive munition disposed in the plenum defined by said hemispheres and including therein;
a fragmentation outer shell having disposed therein,
an inertial fuze and booster for impact detonating,
a shaped high explosive charge,
standoff means carried by said munition for providing a standoff spacing between said munition and a target upon impact therebetween.

4,178,852

DELAY ACTUATED EXPLOSIVE DEVICE

Don H. Smith, Dallas, and Leslie W. Barton, Carrollton, both of Tex., assignors to Atlas Powder Company, Dallas, Tex.

Filed Aug. 29, 1977, Ser. No. 828,910
Int. Cl.[2] F42B *3/10*
U.S. Cl. 102—24 R **5 Claims**



1. An explosive device for use with delay actuated explosives, adapted to be initiated by a detonator cord, comprising:
a water proof container for containing delay actuated explosives, said container having a substantially flat bottom section and a substantially cylindrical mid section, said mid section defining a U-shaped detonator receiving well along an outer surface thereof longitudinally along its length, said container also having a top portion integral with said mid section terminating at a threaded tubular neck;
a container cap having threaded means on the interior thereof adapted to threadably cooperate with threads on the neck of said container in sealing engagement therewith;
a tubular sleeve disposed about the mid section of the container and comprising a detonator cord conduit affixed thereto and offset from said detonator receiving well of said container;
a detonation delay unit having an initiating means adapted to be positioned proximate said detonator cord conduit and a delay detonating means for detonating said container, said delay detonating means communicating with said initiating means, and said delay detonating means being disposed in the detonator receiving well of said container;
a protective tape retaining means covering said detonator receiving well, and between said container and said tubular sleeve for holding said detonating means in position during ignition of the detonating cord passing through said detonating cord conduit; and
an alignment means removably affixed to the top of said container and extending over a portion thereof, said alignment means having a substantially cylindrical shape and comprising in the interior thereof, channel wall means for aligning said initiating means with said detonator cord conduit and for securing said delay detonator means within said detonator receiving well, when said alignment means is mounted onto said container, said alignment means also comprising an interior corridor parallel to the axis thereof, said corridor communicating with the detonating cord conduit affixed to said tubular sleeve, and a lip

formed by the top of said alignment means extending radially inwardly and having a plurality of air outlets for allowing the escape of air from the interior of said alignment means.

4,178,853

MILD DETONATING CORD CONFINEMENT

C. Gene Garrison, San Jose, and William Southern, Gilroy, both of Calif., assignors to Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc., Hollister, Calif.

Continuation of Ser. No. 681,085, Apr. 28, 1976, Pat. No. 4,083,305. This application Apr. 11, 1978, Ser. No. 895,410
The portion of the term of this patent subsequent to Apr. 11, 1995, has been disclaimed.
Int. Cl.[2] **C06C** *5/00*
U.S. Cl. 102—27 R **9 Claims**



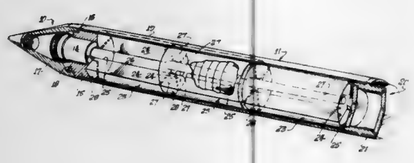
1. A mild detonating cord confinement comprising:
(A) An approximately 2.50 grain/foot metallic covered inner core of detonating high explosive material and means for confining the explosive effects without rupture when the explosive is detonating, further comprising:
(i) a layer of plastic fiber overbraid encircling said inner core;
(ii) a layer of foam encircling said overbraid, and
(iii) at least one layer of plastic fiber overbraid as an outer covering;
said mild detonating cord outer diameter being no larger than about 0.320 inches.

4,178,854

MULTIPLE SEQUENTIAL BURST SYSTEM

George H. Schillreff, Glendora, Calif., assignor to General Dynamics Corporation, Pomona Division, Pomona, Calif.

Filed Dec. 22, 1967, Ser. No. 692,995
Int. Cl.[2] **F42B** *13/42*
U.S. Cl. 102—89 CD **10 Claims**



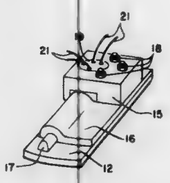
1. In a decoy round containing at least a nose cone section, a payload section having at least two payload units, and a propulsion section; a multiple sequential burst system comprising a timing mechanism, a time delay assembly means positioned in each of said payload units, each of said payload units consisting of at least two sections, means within each of said payload units for separating said unit sections, fuzing means operatively connecting a first of said time delay assembly means with said timing mechanism for activating said time delay assembly means, fuze means interconnecting said time delay assembly means and extending adjacent an external surface of said payload unit section for splitting the skin of said payload section upon activation of said fuze means and for activating the next of said time delay assembly means, means operatively connecting said time delay assembly means with said payload unit separating means for activating same, time delay means within each of said payload unit sections for activating dispersing means for said unit sections, means for connecting said time delay assembly means with each of said unit section time delay means of the associated payload unit for activating said time delay means, whereby after a predetermined condition of flight of said round the timing mechanism initiates said multiple sequential burst system by activating said first of said time delay assembly means which in turn activates a first of said payload unit separating means and said interconnecting fuze means of said first payload unit and activates the time delay means of each of said unit sections of that payload unit thereby splitting the skin of said payload unit and activating the next time delay assembly means while substantially simultaneously blowing the sections of that payload unit apart and whereafter said time delay means of said unit sections disperses said section and said next time delay assembly means causes the next payload unit to be blown apart and dispersed and so on throughout the payload section.

4,178,855

EXPLOSIVE ACTUATED ARMING SWITCH DEVICE

James V. McVay, and Patrick A. Yates, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 20, 1978, Ser. No. 890,561
Int. Cl.[2] **H01H** *39/00;* **F42C** *15/00*
U.S. Cl. 102—262 **9 Claims**



1. An arming system insensitive to mechanical shock which provides a predetermined arming signal upon termination of a preset electric current due to interruption by an explosive shock comprising;
an explosive for creating an explosive shock wave;
a frangible base in proximity to said explosive for sensing said explosive shock wave, such that said frangible base is shattered by said explosive shock wave;
conducting means affixed to said frangible base for transmitting said preset electric current except when said frangible base is shattered;
a resilient elastomeric compound placed between said frangible base and said explosive for cushioning said frangible base such that it is not shattered by mechanical shock;
an electrical insulating pad placed over said conducting means for protecting said conducting means and said frangible base;
housing means for supporting said cushioned and protected frangible base in proximity to said explosive; and
potting compound in said housing means for imbedding said frangible base and resilient elastomeric compound in a fixed position within said housing means.

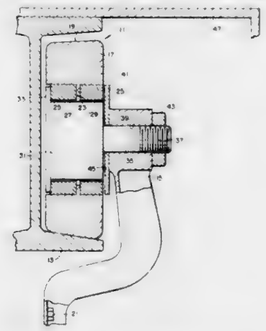
4,178,856

WHEEL ASSEMBLY FOR OVERHEAD CONVEYOR

Martin Dunville, Dearborn Heights, Mich., assignor to Dearborn Fabricating & Engineering Company, Detroit, Mich.

Filed Jul. 3, 1978, Ser. No. 921,274
Int. Cl.[2] **B61B** *3/00;* **E01B** *25/22;* **F16C** *13/02*
U.S. Cl. 104—95 **4 Claims**

1. In an overhead conveyor including an I-beam having a web and a pair of side flanges, a pair of opposed centrally interconnected brackets adapted to support a load, and a trolley wheel assembly journalled upon each of said brackets and movably mounted upon and along said flanges;
said wheel assembly comprising a cylindrical shell;
an annular shoulder flange at one end of said shell;
an axial shaft of reduced diameter relative to and extending from the other end of said shell, projected through the upper end of a bracket and secured thereto;
A hardened wheel having an axial bore;
an internal annular flange on said wheel intermediate the ends of said bore;
a pair of graphite alloy sleeve bearings press-fitted into said wheel bore and operatively engaging said wheel flange;



said bearings being loosely disposed upon said shell, with said shell flange loosely engaging one of said bearings and retaining said bearing against axial movement in one direction;
and a washer on said shaft between said shell and bracket loosely engaging the other bearing and retaining said bearing against axial movement in the opposite direction; said shell flange and said washer each having a diameter that is less that the diameter of said axial bore, such that said shell flange and said washer engage only said bearings, respectively, said sleeve bearings thus acting as both radial and thrust bearings.

4,178,857

RAIL HOUSE CAR DOOR WEAR SKIDS

Thorvald Madland, Arlington Heights, Ill., assignor to The Youngstown Steel Door Company, Cleveland, Ohio

Filed Nov. 25, 1977, Ser. No. 854,890
Int. Cl.[2] **B61D** *19/00;* **E05D** *15/10*
U.S. Cl. 105—378 **7 Claims**



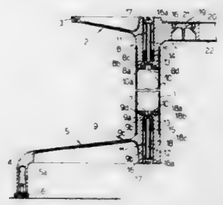
1. In a rail house car having openings along its sides,
doors for closing said openings by movement along said car sides and laterally into and out of said openings,
bottom and top rotating crank means moveably supporting and retaining said doors adjacent the lower portions thereof on longitudinal track means and adjacent the upper portions thereof within longitudinal retainer means,
means to rotationally drive said crank means for selective lateral movement of said doors,
the improvement comprising:
said top crank means adjacent the upper portion of said doors including skid means moveably engageable with the inner surface of said longitudinal retaining means when said doors are laterally substantially within said openings and roller means moveably engageable with the inner surface of said longitudinal retaining means when said doors are laterally substantially outside of said openings and free to move on said longitudinal track, thereby minimizing wear of said longitudinal retaining means by means of relative movement of said roller means and said longitudinal retaining means when said doors are laterally substantially within said openings and said rail house car is in motion.

4,178,858

DISASSEMBLABLE TABLE

Giulio Ponzellini, Bologna, Italy, assignor to Anonima Castelli S.p.A., Italy

Filed Dec. 16, 1977, Ser. No. 861,430
Claims priority, application Italy, Apr. 29, 1977, 49200 A/77
Int. Cl.[2] **A47B** *13/02*
U.S. Cl. 108—150 **11 Claims**



8. A table construction, comprising a vertical column having respective ends with a top cylindrical and bottom cylindrical cavity opening upwardly and downwardly respectively, an upright vertically extending securing bolt centrally arranged in each top and bottom cavity and secured to the inner end of said column, a plurality of table top supporting arm members each having a central sector portion engageable in said top cavity and disposed in side by side relationship around the respective securing bolts in said top cavity, each table top supporting arm member having a table top support arm extending radially outwardly from the top of said column, a plurality of foot members, each having a central vertical sector portion disposed in the bottom cylindrical cavity in side by side relationship around the respective securing bolt in said bottom cavity, an elastic sleeve disposed around each securing bolt between said securing bolt and said sector portions of the respective top supporting arm members and said foot members, and threaded clamping means connected to said bolt and to said elastic sleeve and being threadable on said bolt to act on said sleeve to engage it between said clamping bolt and said sector portions to hold respective sector portions in said column.

4,178,859

DOOR-LIKE CLOSURE

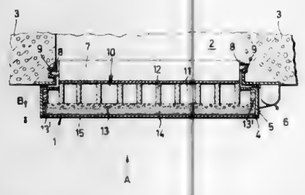
Rudolf Seiz, Herrsching; Heinz Eickhoff, Bochum; Herbert Meyer, Bochum, and Dieter Steppke, Bochum, all of Fed. Rep. of Germany, assignors to Bochumer Eisenhütte Heintzmann GmbH & Co., Bochum, Fed. Rep. of Germany

Filed Aug. 30, 1977, Ser. No. 829,256

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1976, 2639691

Int. Cl.[2] **E05G** *1/026*

U.S. Cl. 109—27 **15 Claims**



1. An improved high-security door structure of the type only slowly destructible by non-explosive mechanical, thermal and chemical attack and comprising a door frame and means mounting the door frame for movement between closed and open positions, a multi-layer metallic protective front plate of uninterrupted surface area mounted on the door frame and being of the type only slowly destructible by non-explosive mechanical, thermal and chemical attack but destructible by discharge of locally applied explosive material and a metallic door plate of uninterrupted surface area mounted on the back side of the door frame,

the improvement comprising:

a metal back-up grid constituted by regularly organized and interconnected solid portions defining intermediate themselves an array of regularly disposed empty apertures interiorly of the front plate and door plate portions has a width measured in the plane of said grid, the distance between any two neighboring solid portions amounts to 2.5 to 4 times said width, said apertures having such dimensions as not to permit an intruder to reach through a respective aperture the back-up grid being juxtaposed with and connected to the back side of the multi-layer protective front plate, the thickness of the back-up grid as measured in the direction perpendicular to the general plane of the door being at least substantially equal to the thickness of the multi-layer protective front plate, the apertures of the array of regularly disposed apertures being empty and due to the thickness of the grid having a depth measured in the direction perpendicular to the general plane of the door which is at least substantially equal to the thickness of the multi-layer protective front plate and serving upon the discharge of explosive material locally applied to a section of the front face of the protective front plate for taking up the explosive pressure shock generated at such section so as to permit explosive destruction of such section and dissipation of the local explosive pressure shock into the respective adjoining aperture so as to localize the damage to the protective front plate without substantial damage to the reminder of the back-up grid.

4,178,860

SOIL TREATMENT LIQUID INJECTION DEVICE

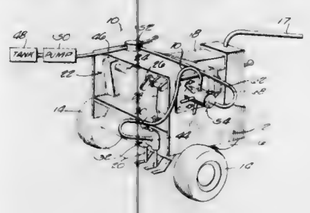
Charles E. Hines, and Dwight E. Williams, both of Lincoln, Nebr., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 1, 1978, Ser. No. 874,159

Int. Cl.[2] **A01C** *23/02*

U.S. Cl. 111—7 **10 Claims**

1. A device for introducing soil treatment liquids into the ground, which device comprises a frame, a power source supported by said frame, means supporting said frame for movement along the ground, a plurality of injection tines each including a downwardly directed tip portion and mounted for reciprocative movement between a raised position wherein said tip portion is located above the ground surface and an injection position wherein said tip portion is located beneath the ground surface, each of said tines further including a flow passage, at least one injection port in said tip portion communicating with said flow passage for dispensing the treatment liquid into the soil when said tine is located beneath the ground surface, said tip portion having an outermost tip made from a



high alumina ceramic material and located below and adjacent to said injection port, said outermost tip having a generally spherical shape, a plurality of conduit means each connecting selected of said tine flow passages in communication with a pressurized supply of treatment liquid, drive means drivingly connecting said power source with said tines for reciprocating said tines between the raised and injection positions, and means for selectively controlling the flow of treatment liquid from the supply to each of said tine flow passages so that treatment liquid is supplied at a predetermined pressure to each of said tine flow passages only when the respective tine is in the injection position.

4,178,861

METHOD FOR THE DELIGNIFICATION OF LIGNOCELLULOSIC MATERIAL IN AN AMINE DELIGNIFYING LIQUOR CONTAINING A QUINONE OR HYDROQUINONE COMPOUND

Naphtali N. Vanderhoek, Doncaster; Peter F. Nelson, Kew, and Alan Farrington, Donvale, all of Australia, assignors to Australian Paper Manufacturers Limited, Melbourne, Australia

Filed Dec. 13, 1977, Ser. No. 860,058

Claims priority, application Australia, Dec. 13, 1976, PC8476

Int. Cl.[2] **D21C** *1/00, 3/22, 3/26*

U.S. Cl. 162—72 **14 Claims**

10. A process for the delignification of lignocellulosic raw materials in the production of cellulosic pulps suitable for use in the manufacture of paper or paperboard and the like, which consists of cooking said lignocellulosic raw materials with a quinone or hydroquinone compound in an essentially non-aqueous cooking liquor consisting of an amine.

4,178,862

PROGRAMMED SEWING MACHINE WITH TWO CONNECTABLE AND DISCONNECTABLE NEEDLE BARS

Nereo Bianchi, and Piergentino Zatti, both of Pavia, Italy, assignors to Necchi, S.p.A., Pavia, Italy

Filed Apr. 14, 1975, Ser. No. 568,027

Claims priority, application Italy, Apr. 12, 1974, 42903 A/74

Int. Cl.[2] **D05B** *19/00, 1/08*

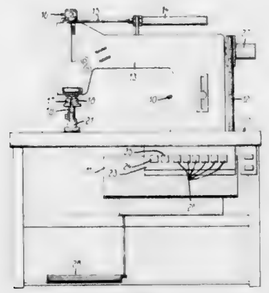
U.S. Cl. 112—121.11 **2 Claims**

1. In a sewing machine with two connectable and disconnectable needle bars the combination of a motor of the "motor-stop" type having a low and high speed, a keyboard programmer on the sewing machine assembly to select the needle bar to

be disconnected and the stitches number to be sewn at low speed with one needle only, and control means connected to said programmer and to said motor-stop, said combination being so arranged to execute automatically, in changing of the sewing direction, a series of operations as follows:

(a) disconnecting one needle bar;

(b) operating the needle bar to sew a few stitches at low speed in the first direction;



(c) shutting down the machine;

(d) operating the needle bar to sew the same number of stitches as in stage (b) in the second direction;

(e) connecting the disconnected needle bar for restarting the two-needle sewing and switching the sewing machine back on high speed.

4,178,863

FEED CAM REPHASING DEVICE

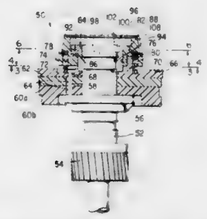
Donald Lawrie, Clydebank, Scotland, assignor to The Singer Company, New York, N.Y.

Filed Mar. 1, 1979, Ser. No. 16,636

Claims priority, application United Kingdom, Dec. 20, 1978, 49195/78

Int. Cl.[2] **D05B** *3/02, 3/04*

U.S. Cl. 112—158 D **3 Claims**



1. A sewing machine comprising a frame; a needle bar supported in said frame for endwise reciprocation and lateral oscillation; a work feeding system supported in said frame for urging work material in a direction transverse said lateral oscillation of said needle bar; said frame further supporting at least one first cam, first means operatively connecting said at least one first cam to said needle bar for influencing lateral oscillation thereof, a second cam, a second means operatively connecting said second cam to said work feeding mechanism for regulating the direction and rate at which work material is urged, and drive means for urging said needle bar in endwise reciprocation, for operting said work feeding system and for driving said first and second cams, and means for supporting said second cam for selective rotative repositioning to a first and second position relative to said at least one first cam, said support means including a cam shaft, means for mounting said second cam on said cam shaft in a fashion to accomodate selective rotative repositioning of said second cam, a repositioning bushing affixed to said cam shaft, and an actuator interposed between said bushing and said second cam, said actuator and said bushing having interacting means thereon for maintaining a selected one of a plurality of possible angular relationships between said actuator and said bushing, means for connecting said actuator to said second cam for rotation therewith and for limited axial movement of said actuator to and from said second cam, resilient means for biasing said actuator into engagement with said positioning bushing in a selecting one of said plurality of angular relationships of said actuator and said bushing whereby movement of said actuator against the urgings of said resilient means will disengage the interacting means from engagement in said selected one of said plurality of possible angular relationships to permit rotative repositioning of said actuator and said second cam to obtain reengagement of said interacting means in another of said plurality of possible angular relationships.

4,178,864

LOOPER CONTROL APPARATUS FOR SEWING MACHINES

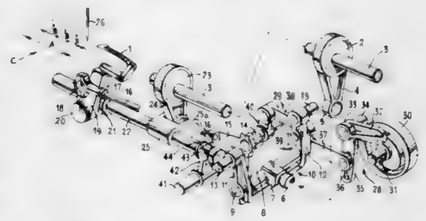
Ulderico Marcandalli, Milan, Italy, assignor to Rockwell-Rimoldi, S.p.A., Milan, Italy

Filed Oct. 6, 1977, Ser. No. 840,084

Claims priority, application Italy, Nov. 2, 1976, 28954 A/76

Int. Cl.[2] **D05B** *3/00, 57/32*

U.S. Cl. 112—159 **2 Claims**



1. A looper control apparatus for chain stitch sewing machines having a needle laterally movable to positions to form zig-zag stitches in a workpiece and a looper support bracket for controlling movement of the machine's looper to and from operative associaton with the needle in each of its stitch forming positions, said looper control apparatus comprising:

(a) a first drive device connected to the looper support bracket including:

(i) a control device (**28**);

(ii) a forked support bracket (**10**) operatively connected to said control device having an oscillatably driven looper drive lever (**8**) pivotably mounted therein for effecting oscillating movement of the looper in a direction perpendicular to the direction of travel of the workpiece and to maintain the looper in alignment with the needle in each of its lateral positions.

(b) a second drive device connected to the looper support bracket and functioning in timed sequence with said first drive device including:

(i) a linking apparatus (**29**) interconnecting said forked support bracket (**10**) with a driven shaft (**22**) on which the looper support bracket is mounted for effecting longitudinal movement of said driven shaft and move the looper to and from operative association with the needle in a plane parallel to that which it traveled to form each preceeding stitch; and

(c) said control device (**28**) including a grooved cam (**30**) having a follower arm (**32**) of a bell crank lever (**33**) connected thereto and a link member (**37**) operatively inter-

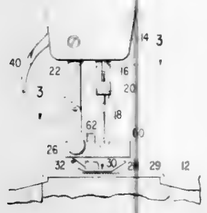
connecting the latter with said forked support bracket (**10**) and linking apparatus (**29**).

4,178,865

FINGER GUARD FOR SEWING MACHINES

Charles R. Odermann, Montville, and Ralph E. Johnson, Convent Station, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Jun. 30, 1978, Ser. No. 921,032
Int. Cl.[2] D05B *29/12, 83/00*
U.S. Cl. 112—261 **4 Claims**



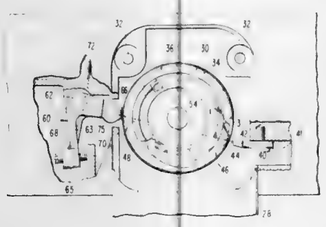
1. A finger guard for a sewing machine having a needle bar; a needle fastened to said needle bar; a presser bar a presser foot shank having a socket fastened to said presser bar; a presser foot having a work engaging sole plate formed with bifurcated toe portions; detachable connection means comprising a cylindrical pivot pin carried on said sole plate, said pivot pin being resistively engaged in said socket of said presser foot shank to fasten said sole plate to said presser foot shank, said connection means locating said toe portions one on each side of the area penetrated by said needle; said finger guard comprising a mounting portion and a body portion; means for securing said mounting portion to said presser bar; said body portion of said finger guard being joined at one extremity to said mounting portion; said body portion being shaped so as to enclose a space overlying and accommodating only one of said toe portions of said presser foot sole plate and including a free extremity terminating between said bifurcated sole plate toe portions; whereby the other of said presser foot sole plate toe portions is accessible outside the space enclosed by said body portion of said finger guard so that said other toe portion may be grasped and rotated upwardly for disengagement of said presser foot from said shank.

4,178,866

ADJUSTABLE BOBBIN THREAD RUN-OUT INDICATOR

Kenneth D. Adams, Madison, N.J., assignor to The Singer Company, New York, N.Y.

Filed Jun. 19, 1978, Ser. No. 916,614
Int. Cl.[2] B65H *63/08*; **D05B** *51/00*
U.S. Cl. 112—278 **4 Claims**



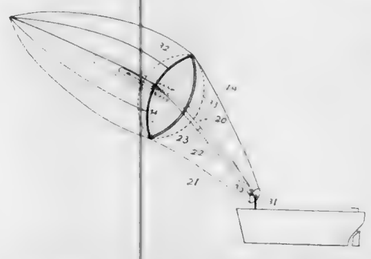
1. A lockstitch sewing machine having a frame, said frame supporting sewing instrumentalities including a needle carrying needle bar supported by said frame for endwise reciprocation, a feed system for urging work material in a path under said needle, a looptaker supported in said frame for cooperation with said needle in the formation of stitches, and a bobbin case supported by said looptaker, said bobbin case supporting therein a bobbin having a pair of flanges separated by a thread carrying hub; wherein the improvement comprises; an adjustable bobbin thread run-out indicator including a light source, means for extending light rays from said light source adjacent said hub of said bobbin between said flanges thereof, means on the opposite side of said bobbin case and looptaker from said extending means for sensing the presence of a light ray, and, means for supporting said sensing means for selective movement in a direction substantially normal to said light rays.

4,178,867

RESCUE SIGNAL DEVICE

Ji Y. Shyu, Kaohsiung, Taiwan, assignor to Yin-Lung Yang, Kangshan, Taiwan, a part interest

Filed Jan. 19, 1978, Ser. No. 870,817
Int. Cl.[2] B64B *1/50*
U.S. Cl. 114—39 **4 Claims**



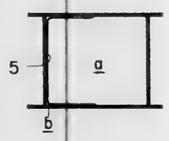
1. A rescue signal device used for a lifeboat and other objects comprising an inflatable balloon in cone shape with one end flat like a cut football, a circular board made of thicker material than the balloon, having a circular frame secured to a circular skirt at the flat end of the balloon, said circular board being linked to the boat or object by four cables which are fastened equally apart to the circular frame of the circular board, the other end of the cables being fastened to a follow-up wheel on the boat or other object in the same manner as to the circular board, said wheel and cables changing the angle of attack of said board relative to the wind, thus operating the board as a sail to co-operate with the rudder of the boat to achieve a desired heading.

4,178,868

METHOD AND APPARATUS FOR DISPLACING OIL AND SEAWATER IN TANKS OF AN OIL TANK

Jinya Iizuka; Seinosuke Kato, and Akio Matsuda, all of Osaka, Japan, assignors to Sumitomo Electric Industries Ltd., Osaka, Japan

Continuation of Ser. No. 770,144, Feb. 18, 1977, abandoned.
This application Mar. 17, 1978, Ser. No. 887,915
Int. Cl.[2] B63B *25/12*
U.S. Cl. 114—74 R **6 Claims**



1. An apparatus for displacing oil and seawater in an oil tanker having a plurality of sealed compartments, each having a deck plate, side walls and bottom plate, comprising:

(a) a single partition membrane made of oil-resistant and chemically stable flexible material clamped to the compartment in a liquid seal arrangement, said membrane dividing the compartment into a first section adapted to be filled with oil and a second section adapted to be filled with seawater, said membrane configured to contact opposite sides of said compartment, said membrane being connected at one end to the upper surface of the compartment and at the opposite end to the lower surface of said compartment, the surface area of one side of said membrane being substantially one-half the inner surface area of said compartment,

(b) a first port means connected to the first section at an upper portion of said compartment,

(c) a second port means connected to the second section at a lower portion of said compartment,

(d) a first valve means adapted to connect said first port means to oil,

(e) a second valve means adapted to connect said second port means to seawater, and

(f) means for controlling said first and second valve means to discharge said first section while charging said second section wherein said compartment is maintained in a full condition.

4. In a method for displacing oil and seawater in an oil tanker, said tanker having a plurality of sealed compartments having therein a single flexible membrane configured to contact opposite sides of said compartment, said membrane dividing said compartment into a first section adapted to be filled with oil and a second section adapted to be filled with seawater, and valve means for the supply and discharge of oil through first port means at upper portions of said compartments, valve means for the supply and discharge of seawater through second port means at lower portions of said compartments, comprising the steps of: supplying oil through first port means at an upper portion of said compartment while simultaneously discharging water through second port means at a lower portion of said compartment and then supplying water through said second port means at a lower portion of said compartment while discharging oil through said first port means at said upper portion of said compartment to maintain said compartment in a full condition wherein, when filled with oil said membrane will contact one wall of said compartment and when said compartment is filled with seawater said membrane will contact an opposite wall of said compartment, said membrane being connected at one end to the upper surface of the compartment and at the opposite end to the lower surface of said compartment, the surface area of one side of said membrane being substantially one-half the inner surface area of said compartment.

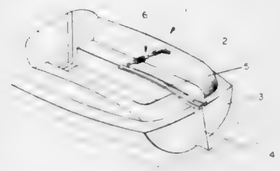
4,178,869

COMBINED REMOVABLE TILLER EXTENSION HOLDING AND CONTROLLING DEVICE FOR WATERCRAFT

Fred C. Turrentine, 14201 SE. Parmenter, Milwaukie, Oreg. 97222

Filed Apr. 27, 1978, Ser. No. 900,348
Int. Cl.[2] B63H *25/52*
U.S. Cl. 114—172 **6 Claims**

1. In a tiller tender and holding device for sail boats and the like, including a rudder with an inwardly projecting tiller, a transversely and generally horizontally disposed tubular connecting member interposed between an end of said tiller and a side wall of said sail boat, said member having downwardly disposed pins pivotally arranged in opposing ends thereof, and sockets in said tiller and side wall for removably receiving said pins whereby said tiller is retained in a generally longitudinally extending and neutral on course position, said member having sleeved tubular sections, threaded elongated screw rod means arranged in said sections, control sleeve means arranged on one of said tubular sections and fixedly connected to said screw rod means, a first piston means fixed on one end of said rod means, a second piston means threadedly arranged on said rod means in spaced relation to said first piston means, bearing means spacedly arranged on said rod means between said spaced piston means, spacer means fixedly arranged on said rod means intermediate said spaced bearing means with one of said tubular sections and said control sleeve means being anchored to said spacer means, and spring means arranged on said rod means whereby manual rotation of said control sleeve means rotates said rod means longitudinally and adjusts the length of said tubular connecting member and controls the lateral steering movement of said tiller.

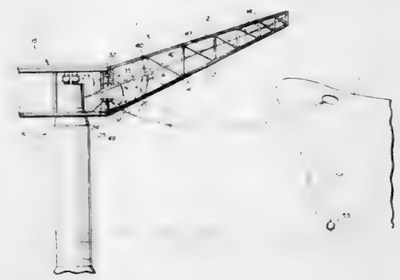


4,178,870

MOORING LINE HANDLING APPARATUS

Jack Pollack, Winfield, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Jan. 12, 1978, Ser. No. 868,814
Int. Cl.[2] B63B *21/00*
U.S. Cl. 114—230 **29 Claims**



3. In combination:

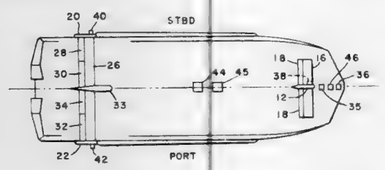
a mooring station and a ship moored thereto by a first line, the mooring station comprising a structure having thereon a pinion gear and a large diameter sheave, with the pinion gear and the large sheave axially mounted to a shaft secured to a base on the structure, a first line wrapped for at least part of its length on the large sheave and connected to and extending to the ship, and a plurality of elastic lines of equal length extending from an anchor means on the structure to means connected to the pinion gear for yieldably resisting rotation, by means of the elasticity of the elastic lines, of the large sheave and unwrapping of the first line therefrom when the load applied to the first line is increased as the distance between the ship and structure is increased.

4,178,871

AUTOMATIC CONTROL SYSTEM FOR HYDROFOIL CRAFT

Irving A. Hirsch, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 23, 1974, Ser. No. 435,672
Int. Cl.[2] B63H *1/18*
U.S. Cl. 114—275 **6 Claims**



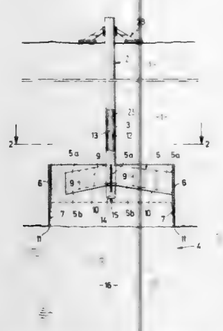
1. In a control system for a hydrofoil craft of the type having at least one control surface, the combination of:
electrical circuit means including a primary servo system for controlling said surface during normal operation of the hydrofoil,
auxiliary electrical circuit means including a secondary servo feedback system preset to position said surface to cause said hydrofoil craft to descend from a foil-borne to a hull-borne mode of operation,
first and second sensing means for sensing motion of the craft about its roll axis and providing output signals in response thereto,
means for comparing the output signals of said first and second sensing means, and
means responsive to a predetermined difference between said signals for disabling said primary servo system and enabling said secondary servo feedback system to position said surface to cause said hydrofoil craft to descend from a foil-borne to a hull-borne mode of operation.

4,178,872

MEMBER FOR ATTACHING A PROPULSION UNIT TO A TABULAR ICEBERG

Georges L. Mougin, Paris, France, assignor to ITI Limited, Paris, France

Filed Feb. 15, 1978, Ser. No. 877,844
Claims priority, application France, Apr. 14, 1977, 77 11276
Int. Cl.[2] B63H *21/30*
U.S. Cl. 115—72 **15 Claims**



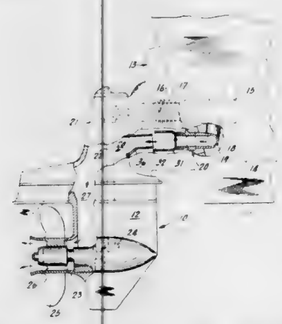
1. A member for attaching an underwater propulsion unit to the substantially horizontal lower surface of a tabular iceberg, the member comprising a central tube and a ring attached to a central hub by fins, the hub forming a removable nose of the central tube which serves for lining a bore made through the iceberg by operation of the member, and the torpedo including heating means whereby, in operation, it melts the ice of the iceberg and sinks therethrough with the ice re-freezing above it.

4,178,873

EXHAUST COUPLING ASSEMBLY FOR A MARINE STERN DRIVE

Herbert A. Bankstahl, Fond Du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Feb. 6, 1978, Ser. No. 875,447
Int. Cl.[2] F01N *3/00*
U.S. Cl. 115—73 **10 Claims**



1. A stern drive for propulsion of a boat including
(A) an inboard engine having an exhaust passageway means,
(B) an outboard driven unit coupled to the engine having an exhaust passageway means,
(C) a transom mounting assembly including pivot mounting means positioned between the inboard engine and the drive unit, the pivot mounting means including a vertical pivot axis for steering of the drive unit and a horizontal pivot axis for trimming of the drive unit, the improvement which comprises
(a) a first exhaust pipe connected to said inboard engine exhaust passageway means and extending outward through the transom of a boat and having an open end position centered on, adjacent said vertical pivot axis, and below said horizontal pivot axis
(b) a second exhaust pipe connected to said exhaust passageway means of said drive unit, said second exhaust pipe pivoting with the trim movement of the drive unit and extending towards and ending in alignment with said end position of said first exhaust pipe to form an interface therebetween which includes an opening therebetween providing a substantially equal exhaust leakage over the entire pivotal steering movement of the drive unit for any given trim position of the drive unit.

4,178,874

ROADSIDE EMERGENCY SIGNALLING DEVICE

Michael S. Berns, and William J. Chafe, both of c/o Messrs. Mann & Macera, Suite 1, 201 McLeod St., Ottawa, Ontario, Canada (K2P 0Z9)

Filed Jun. 15, 1978, Ser. No. 915,154
Int. Cl.[2] G09F *21/04*
U.S. Cl. 116—28 R **5 Claims**

1. An information and signalling device for use on downwardly openable windows, said device having a collapsed mode and a constructed mode, comprising:
(a) a first semi-rigid or rigid substantially rectangular panel having a top flange extending rearwardly over said window when suspended therefrom a distance greater than the window thickness;

(b) a second semi-rigid or rigid substantially rectangular panel substantially the same size as said first panel having its top affixed to said top flange on said first panel, and having a sign retaining means to hold information signs and signalling signs, said first and second panels parallel to the window when suspended therefrom;
(c) a third semi-rigid or rigid substantially rectangular panel having an information/signalling sign display means adaptable to visibly display information signs and signalling signs when the device is in the constructed mode;
(d) first flexible hinge means connecting one side of said third panel to one side of said first panel;
(e) fourth semi-rigid or rigid substantially rectangular panel having an information/signalling sign display means adaptable to visibly display information signs and signalling signs when the device is in the constructed mode on the window;



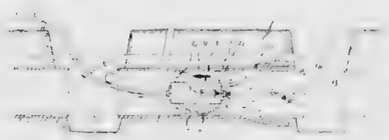
(f) second flexible hinge means connecting one sign of said fourth panel to the side of the third panel opposite said first flexible hinge means;
(g) engaging means to lockingly engage the other side of said fourth panel to the other side of said first panel;
(h) a plurality of information signs and signalling signs adapted to be removably connected to said information/-signalling sign display means and to said sign retaining means;
wherein said device, when in the constructed mode and on a window, has a substantially triangular configuration visibly displaying a predetermined signalling sign or information sign on said third and fourth panels.

4,178,875

APPARATUSES FOR PRODUCING TIGHT JOINTS OR SEALS IN UNDERGROUND PIPELINES

Armando Moschetti, Milan, Italy, assignor to Siargas — Societa' Italiana Assistenza Reti Gas S.p.A., Milan, Italy

Filed Nov. 30, 1977, Ser. No. 856,577
Claims priority, application Italy, Nov. 15, 1977, 29709 A/77
Int. Cl.[2] B05C *11/00*
U.S. Cl. 118—712 **9 Claims**



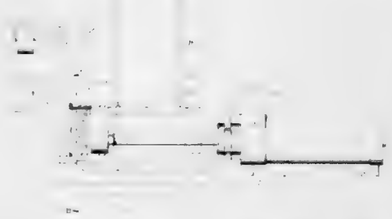
1. An underground pipeline repair apparatus positionable inside an underground pipeline for producing an internal tight joint at a socket juncture between two pipes of an underground pipeline, said repair apparatus comprising a carriage, at least two angularly spaced sets of radially extendable rolling members mounted on the carriage to be engageable with the inner surface of the pipeline to support the carriage, retractable radially extending anchoring means, actuator means for said anchoring means for selectively moving said anchoring means radially to forcefully engage the inner surface of the pipeline for preventing movement of the carriage with respect to the pipeline, a plurality of reservoirs of synthetic components, a longitudinal support member mounted for axial reciprocation on said carriage and having an outer end, a spray head mounted on the outer end of the longitudinal support member, a first driving means connected to said rolling members for rapidly moving said carriage along the interior of said underground pipeline, said spraying head being connected to said reservoirs for receiving the contents thereof and second driving means for reciprocating said longitudinal support member at a variable speed when said anchoring means is in an extended position.

4,178,876

APPARATUS FOR MELTING AND APPLYING A FUSION ADHESIVE

Walter Nicklas, Nuertingen-Oberensingen; Dietrich Hesler, Frickenhausen, and Gerhard Gresser, Oberboihingen, all of Fed. Rep. of Germany, assignors to Firma Karl M. Reich Maschinenfabrik GmbH, Nuertingen, Fed. Rep. of Germany

Filed Jun. 23, 1978, Ser. No. 918,570
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1977, 2731799
Int. Cl.[2] B05C *1/00*
U.S. Cl. 118—681 **14 Claims**



1. An apparatus for melting and mechanically applying a fusion adhesive to a workpiece in a gluing machine, comprising chamber means (**16**, **35**), a fusion adhesive supply aperture (**30**) in said chamber means, heatable melting wall means (**22**, **36**) forming part of said chamber means at one end thereof, said heatable melting wall means comprising outlet holes for the molten fusion adhesive, said apparatus further comprising supply piston means movably supported inside said chamber means, feed unit means operatively connected to said supply piston means, and fusion adhesive magazine means for holding fusion adhesive units (**28**) operatively located relative to said supply aperture (**30**) for supplying a fusion adhesive unit from said magazine means through said supply aperture into said chamber means when said supply piston means is in a retracted position whereby said supply piston means is enabled to press fusion adhesive against said heatable melting wall means when said supply piston means are moved out of said retracted position to melt only that quantity of adhesive which is presently needed.

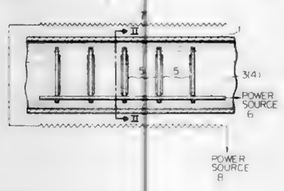
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4,178,877

APPARATUS FOR PLASMA TREATMENT OF SEMICONDUCTOR MATERIALS

Daiziro Kudo, Yokohama, Japan, assignor to Fujitsu Limited, Japan

Filed Mar. 13, 1978, Ser. No. 885,996
Claims priority, application Japan, Mar. 11, 1977, 52-26862
Int. Cl.[2] H01L *21/306;* **C03F** *00/00*
U.S. Cl. 118—728 **19 Claims**



8. An apparatus for plasma treatment of a plurality of pieces of material, said treatment comprising at least one treatment selected from coating and etching, said apparatus comprising:

a reaction tube;

means for introducing a gas comprising a reaction gas into said reaction tube,

a plurality of conducting electrode plates located in said reaction tube, the number of each said electrode plates corresponding to the number of said pieces, each of said plates comprising means for supporting the corresponding one(s) of said pieces, said plates being oriented parallel to each other and transversely to said reaction tube,

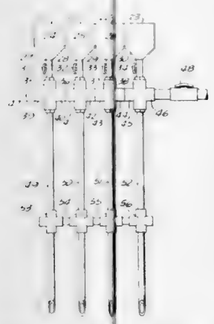
means for applying voltage across adjacent ones of said plates to create a plasma with said reaction gas for effecting said treatment.

4,178,878

FISH EGG PLANTING METHOD

Tod A. Jones, Box 1288, Wrangell, Ak. 99929

Division of Ser. No. 806,445, Jun. 14, 1977, Pat. No. 4,130,086. This application Jul. 24, 1978, Ser. No. 927,357
Int. Cl.[2] A01K *61/00*
U.S. Cl. 119—3 **14 Claims**



1. Method of planting fertilized fish eggs in a stream or lake bed substrate which comprises the steps of:

subjecting the substrate to high pressure hydraulic flushing with a flushing device to loosen gravel and remove sediment prior to deposition of the fertilized fish eggs;

selecting the depth at which to deposit fertilized fish eggs in the flushed substrate; and

depositing said fertilized fish eggs into the flushed substrate at the depth previously selected, said depositing being accomplished with a flushing device.

4,178,879

RESTRAINING DEVICE FOR ANIMALS

Louise B. Cunningham, 1505 N. 22nd St., Corsicana, Tex. 75110

Filed Sep. 26, 1977, Ser. No. 836,483
Int. Cl.[2] A01K *27/00;* **G09F** *3/08*
U.S. Cl. 119—106 **10 Claims**



1. A restraining device for animals comprising in combination:

a flexible belt member having attachment means thereon for removably securing the belt member about said animal;

said belt member having a transparent face along one side of the belt member lying substantially flush with the belt member and extending along most of the length of the belt member to form an elongated pouch said transparent face being attached about its periphery to said belt member and having a transverse slotted aperture in the transparent face near one end of the pouch opening into said pouch; and

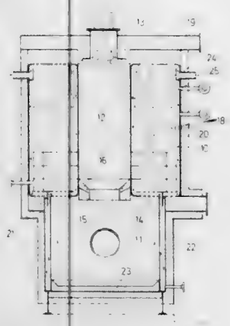
a flexible strip removably inserted in said pouch and extending substantially the entire length of the pouch, said strip having removable indicia along one face visible through the transparent face on said belt.

4,178,880

FURNACE

Nils Östbo, Volrat Thamsgatan 4, Gotebörg, Swéden (41278)

Filed Oct. 27, 1977, Ser. No. 845,972
Claims priority, application Sweden, Nov. 11, 1976, 7612550; Nov. 11, 1976, 7612551; Nov. 11, 1976, 7612552
Int. Cl.[2] F22B *7/12*
U.S. Cl. 122—182 S **1 Claim**



1. In a vertical furnace comprising a smooth-walled fire tube and a final combustion chamber located axially downstream thereof, said fire tube having means for mounting a burner at its upper end remote from said final combustion chamber,

(A) a partition wall including a body of refractory material, adapted to be mounted in the fire tube for separating said fire tube from said combustion chamber, said partition wall, towards the fire tube being defined by a smooth surface sloping towards its centre,

(B) a restricted area passage, centrally located in said partition wall, and

(C) a number of grooves, open towards the fire tube in said sloping surface and directed tangentially with respect to an imaginary circle, inscribed within said passage, said grooves being formed with a cross-sectional area, tapering in the direction from the smooth wall of the fire tube towards said passage to thereby increase the flow velocity of the on-flowing gases.

4,178,881

VAPOR GENERATING SYSTEM UTILIZING ANGULARLY ARRANGED BIFURCATED FURNACE BOUNDARY WALL FLUID FLOW TUBES

Harry H. Pratt, West Orange, N.J., and David Cranstoun, Spring Valley, N.Y., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Dec. 16, 1977, Ser. No. 861,388
Int. Cl.[2] F22B *29/02;* **F22D** *7/00*
U.S. Cl. 122—235 A **8 Claims**



1. A vapor generator comprising an upright furnace section the boundary walls of which are formed by a plurality of tubes and means for passing fluid through said tubes to apply heat to said fluid; a first portion of said tubes extending substantially vertically in the lower portions of said boundary walls, a second portion of said tubes extending substantially vertically in the upper portions of said boundary walls and a third portion of tubes extending at an acute angle with respect to a horizontal plane in the intermediate portions of said boundary walls; and a plurality of bifurcates extending in said boundary walls, said bifurcates connecting one tube of said third portion of tubes of two tubes of said first portion of tubes and connecting one tube of said third portion of tubes to two tubes of said second portion of tubes; said tubes and said bifurcates have fins extending outwardly from diametrically opposed portions thereof, with the fins of adjacent tubes and adjacent bifurcates being welded together to form a gastight structure.

4,178,882

HYDROGEN FUEL SUPPLY SYSTEM

Vaughn R. Anderson; Ronald L. Woolley, and Edward H. Davis, all of Orem, Utah, assignors to Billings Energy Corporation, Provo, Utah

Filed Jan. 20, 1978, Ser. No. 871,094
Int. Cl.[2] F02B *43/10*
U.S. Cl. 123—1 A **8 Claims**

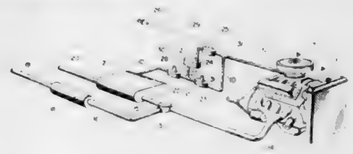
1. A hydrogen fuel supply system in combination with an internal combustion engine having feed means for feeding gaseous hydrogen to the intake manifold thereof, said fuel system comprising:

a fuel tank containing a metal hydride which is capable of reacting with and adsorbing hydrogen at a given temperature and pressure, and of releasing hydrogen gas at least under one of the conditions of a temperature higher than said given temperature or a pressure lower than said given pressure;

a supply conduit connected between said fuel tank and said feed means of said engine for flow of gaseous hydrogen from said fuel tank to said feed means;

a bypass conduit having one end thereof connected to the supply conduit at a point between said tank and said feed means, and having its other end connected to the supply conduit downstream from the connection of said one end to said supply conduit;

a pressure regulator in combination with said bypass conduit, said pressure regulator being capable of regulating the pressure downstream thereof at a preset value when the pressure upstream thereof is greater than the preset value and of allowing the pressure downstream to decrease below the preset value when the pressure upstream is below the preset value;



valve means in combination with the supply conduit and the bypass conduit, said valve means being adapted to either direct the flow of hydrogen gas directly through the supply conduit or to divert the flow of hydrogen gas from the supply conduit through the bypass conduit and back to the supply conduit downstream from the valve means;

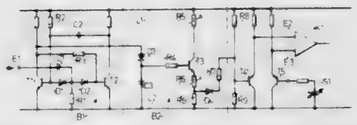
a pressure actuated controller adapted to monitor the pressure downstream from said regulator, said controller also being adapted to control said valve means so that hydrogen flows through the bypass conduit when the monitored pressure is greater than a second preset pressure of said regulator, and said controller also being adapted to control said valve means so that hydrogen flows directly through the supply conduit when the monitored pressure is less than said second preset pressure.

4,178,883

METHOD AND APPARATUS FOR FUEL/AIR MIXTURE ADJUSTMENT

Harro Herth, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 25, 1978, Ser. No. 872,140
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1977, 2702863
Int. Cl.[2] F02B *3/08;* **F02M** *7/12;* **F01N** *3/08*
U.S. Cl. 123—32 EE **8 Claims**



1. A method for adjusting the operating point of a fuel mixture control system of an internal combustion engine, said mixture control system including a fuel mixture generator, an exhaust gas sensor for providing an actual value signal and a set-point signal generator, said actual valve signal and said set-point signal being compared in a comparator circuit which generates a comparator signal which is used by a final control element within said fuel mixture generator and wherein the improvement comprises the steps of:

(a) generating a correction signal which contains informa-

tion related to the frequency of amplitude alternations in the actual value signal provided by said exhaust gas sensor; and

(b) applying said correction signal to an input of said comparator to thereby adjust said set-point signal; whereby, when the engine load changes, the fuel-mixture ratio is changed from a first value to at least one second value distinct from said first value.

4. An apparatus for adjusting the operating point of a fuel mixture control system of an internal combustion engine, said mixture control system including a fuel mixture generator, an exhaust gas sensor for providing an actual value signal and a set-point signal generator, said actual value signal and said set-point signal being compared in a comparator circuit which generates a comparator signal which is used by a final control element within said fuel mixture generator and wherein the improvement comprises:

a pulse generator for generating an electrical pulse whenever said comparator signal crosses the zero voltage level;

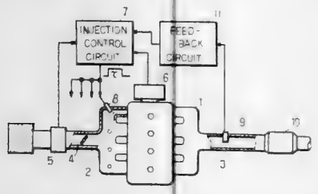
an integrator for integrating said electrical pulses from said pulse generator, the output from said integrator being fed to said set-point generator; whereby the set-point signal is adjusted in dependence on the rate of mass flow through said engine.

4,178,884

METHOD AND SYSTEM TO CONTROL THE MIXTURE AIR-TO-FUEL RATIO

Hideaki Norimatsu; Akio Kobayashi; Akira Masuda, and Sigenori Kitajima, all of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 688,390, May 20, 1976, abandoned.
This application Apr. 27, 1978, Ser. No. 900,505
Claims priority, application Japan, Jun. 5, 1975, 50-683201; Jun. 19, 1975, 50-70295; Jul. 23, 1975, 50-89857
Int. Cl.[2] F02B *3/00*; F02M *7/00*
U.S. Cl. 123—32 EE **10 Claims**



1. An air-to-fuel ratio control system for an internal combustion engine comprising:

a sensor, disposed in the exhaust pipe of an engine, for producing a sensor output signal having a signal level indicative of the air-to-fuel ratio of mixture supplied to said engine;

a comparison circuit, connected to said sensor, for producing a comparison output signal the signal level of which is stepwise changed between two constant levels each time said signal level of said sensor output signal reaches a constant level predetermined with reference to a desired air-to-fuel ratio;

an integration circuit, connected to said comparison circuit, for producing an integration output signal the signal level of which is increased and decreased with the time lapse while said signal level of said comparison output signal is kept at one and the other between said two constant levels, respectively;

a correction circuit, connected between said comparison circuit and said integration circuit, for stepwise correcting said signal level of said integration output signal in synchronism with the level change of said comparison output signal such that said signal level of said integration output signal is abruptly decreased and increased by a predetermined level when the changing direction of said integration output signal is reversed from the increasing to decreasing directions and from the decreasing to increasing directions, respectively; and

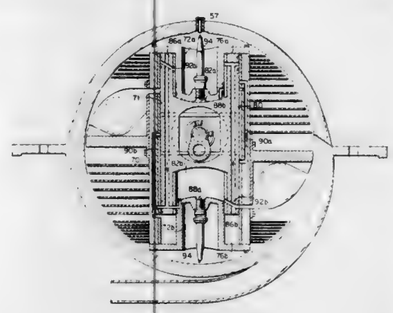
mixture supply means for supplying said engine with the mixture having an air-to-fuel ratio corrected in accordance with said signal level of said integration output signal.

4,178,885

ROTARY PISTON/CYLINDER ENGINES

Siegfried Konther, Rua Azara; Sigfrido Konther Chamorro, Rua Cerro Cora, and Udi Konther Chamorro, Rua Cerro Cora, all of, San Lorenzo, Paraguay

Filed Jun. 20, 1977, Ser. No. 808,419
Int. Cl.[2] F02B *57/06*
U.S. Cl. 123—44 C **13 Claims**



1. A rotary internal combustion engine having a fuel inlet and comprising:

support means defining an axis of rotation and provided with static crankshaft means defining a crank axis which is offset from said axis of rotation; and

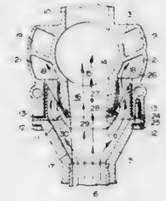
a rotor assembly which is mounted by said support means to rotate about said axis of rotation and comprises a double-headed piston member having two pistons at opposite ends respectively of an intermediate portion of the piston member and a double-headed cylinder member defining two cylinders in which the two pistons are fitted respectively to define two combustion chambers, the piston member and the cylinder member defining two precompression spaces in addition to the combustion chambers, the cylinder member being connected to said crankshaft means to rotate about the crank axis defined thereby and the piston member being rotatable about said axis of rotation, whereby each piston reciprocates relative to the cylinder in which it is fitted as the rotor assembly rotates about said axis of rotation, said piston member being formed with a bore extending therewithin and having said cylinder member fitted reciprocably therein, said piston member being provided with said two pistons projecting into the interior of the bore at the two ends respectively of the piston member, said cylinder member being formed at its two ends with respective cyinders in which said pistons are fitted respectively, and at least one of said members being formed with passage means which establish communication between the fuel inlet and the two precompression spaces and between the two precompression spaces and the combustion chambers respectively, and which enable gas to be exhausted from the combustion chambers, and wherein each precompression space is at the opposite end with respect to the intermediate portion from the combustion chamber with which it communicates by way of said passage means.

4,178,886

TWO STROKE ENGINES

Eizaburo Uchinishi, Kakogawa, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed Feb. 17, 1977, Ser. No. 769,700
Claims priority, application Japan, Feb. 18, 1976, 51-17709
Int. Cl.[2] F02B *33/04*
U.S. Cl. 123—73 A **8 Claims**



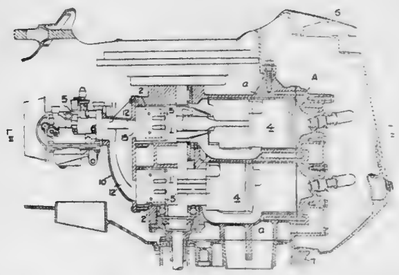
1. Two stroke engine comprising cylinder means, crankchamber means provided beneath the cylinder means, piston means disposed in said cylinder means for reciprocating movement, combustion chamber means defined in the cylinder means by said piston means, scavenging port means provided in said cylinder means and adapted to co-operate with said piston means so as to be cyclically opened to said combustion chamber means, scavenging passage means extending between said scavenging port means and said crankchamber means, intake port means provided in said cylinder means and adapted to co-operate with said piston means so as to be cyclically opened to said crankchamber means, intake passage means connected with said intake port means, auxiliary passage means extending between the intake passage means and said scavenging passage means and including one-way valve means which allows gas flow only toward the scavenging passage means.

4,178,887

INTAKE DISTRIBUTOR FOR TWO-CYCLE INTERNAL COMBUSTION ENGINES

Kazumi Iida, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Oct. 12, 1977, Ser. No. 841,525
Claims priority, application Japan, Oct. 13, 1976, 51-138058
Int. Cl.[2] F02B *33/04*
U.S. Cl. 123—73 V **4 Claims**



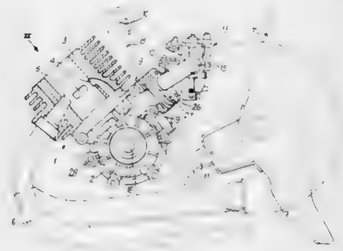
1. In combination with a two-cyclinder, two-cycle internal combustion engine, whose cylinders are substantially horizontal, and one of which lies directly above the other, each of said cylinders having a cylinder inlet port to receive air/fuel mixture to be combusted in the respective cylinder, an intake gas system comprising: only one carburetor for providing an air/fuel mixture for both of said cylinders; and a distributor comprising a conduit having a distributor inlet port receiving air/fuel mixture from said carburetor, and two branches, each leading to a respective one of said cylinder inlet ports, said distributor inlet port being disposed at an elevation nearer the upper one of the cylinder inlet ports, the cross-section of the cylinder inlet ports, the direction of flow from the distributor inlet port, and the length and cross-section of the branches being such as to provide substantially equal quantities of air/fuel mixture of substantially equal density to the two cyinder inlet ports in which the cross-section of the upper cylinder inlet port is smaller than the cross section of the lower cylinder inlet port.

4,178,888

CARBURETOR AND CRANKCASE ARRANGEMENT IN A SINGLE-CYLINDER TWO-STROKE ENGINE

Eric Jaulmes, Paris, France, assignor to Ateliers de la Motobecane S.A., Pantin, France

Filed May 2, 1978, Ser. No. 902,226
Claims priority, application France, May 6, 1977, 77 13836
Int. Cl.[2] F02B *33/04*
U.S. Cl. 123—73 V **2 Claims**



1. In a single-cylinder two-stroke engine having a carburetor and an intake tube leading into the crankcase through an intake valve, the elements of the engine being located between two relatively close planes perpendicular to the crankshaft axis, the improvement wherein the carburetor flow axis is essentially parallel to the crankshaft axis, wherein the intake valve is of the symmetric type, wherein the axis of the intake valve and the axis of the downstream part of the intake tube form an acute angle with the planes perpendicular to the crankcase axis, wherein the crankcase is formed of two parts having their joining plane perpendicular to the crankshaft axis, and wherein said joining plane of the two crankcase parts intersects the joining plane of the crankshaft and the intake valve nonperpendicularly, the intake valve being mounted on both crankcase parts.

4,178,889

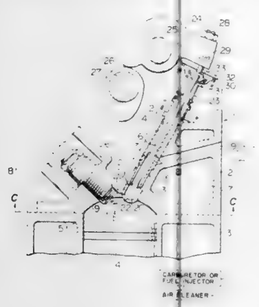
INTERNAL COMBUSTION ENGINE

Hirokazu Nakamura; Tsuneo Ohinouye, both of Kyoto; Kenji Hori; Yuhiko Kiyota, both of Nagaokakyo; Tatsuro Nakagami, Kyoto; Yutaka Tsukamoto, Jyoyo, and Katsuo Akishino, Kameoka, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Apr. 21, 1977, Ser. No. 789,709
Claims priority, application Japan, Jul. 12, 1976, 51-83113
Int. Cl.[2] F02B *31/00*
U.S. Cl. 123—75 B **15 Claims**

1. An internal combustion engine, which comprises a cylinder head, a combustion chamber in said cylinder head and having an intake port and an exhaust port, a main intake passage introducing air-fuel mixture from an air-fuel mixture producing means through said intake portion into said combustion chamber, a spark plug screwed into the cylinder head of the engine so that the spark gap rests in a given position in said

combustion chamber, an injection chamber provided in the cylinder head in close vicinity to said spark gap, the volume of said injection chamber being limited to between 0.5 cc and 1.5 cc, an injection port provided in the vicinity of said spark gap so as to connect said combustion chamber with said injection chamber, said injection port being directed toward said spark gap or its vicinity and to produce a swirl and turbulence of air-fuel mixture inducted through said intake port into said



combustion chamber, an auxiliary intake passage opening to said injection chamber, an auxiliary intake valve for opening and closing said auxiliary intake passage, and means for actuating said auxiliary intake valve, wherein air, exhaust gas or air-fuel mixture introduced by way of the auxiliary intake passage is injected through the injection port into the combustion chamber under the influence of vacuum produced in the combustion chamber during the intake stroke.

4,178,890

DECELERATION CONTROL APPARATUS FOR VEHICLE ENGINE

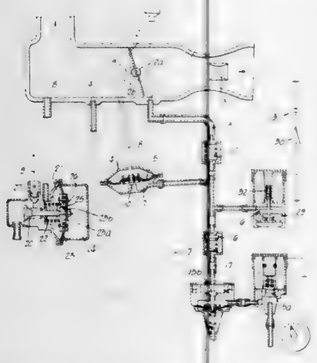
Hitoshi Yamabe, Saitama; Syoichi Otaka, Miyoshi, and Masao Watanabe, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 702,053, Jul. 2, 1976, abandoned. This application Dec. 8, 1977, Ser. No. 858,841

Claims priority, application Japan, Jul. 8, 1975, 50-83129

Int. Cl.[2] F02D *11/08*

U.S. Cl. 123—103 R **4 Claims**



1. Deceleration control apparatus for a vehicle engine having a throttle valve mounted in an intake passage, the improvement comprising, in combination: a dash pot mechanism having a diaphragm operatively connected to said throttle valve, a vacuum chamber having a wall thereof formed by said diaphragm, a vacuum outlet positioned slightly upstream of the adjacent portion of the throttle valve at its minimum opening position, a vacuum passage connected between said vacuum chamber and said vacuum outlet, a check valve positioned in said vacuum passage opening on increased vacuum intensity in said vacuum outlet, a restricted passage connecting said vacuum chamber to atmosphere, an air passage communicating with said intake passage downstream from the throttle valve, a control valve operatively interposed in said air passage and having a movable valve element, pressure responsive means including a movable member for moving said valve element between open and closed position, said pressure responsive means including a vacuum chamber on one side of said movable member subjected to pressure in said air passage, means providing a closed chamber on the other side of said movable member, and valve means on the movable member acting to restrict flow from the closed chamber to the vacuum chamber while permitting relatively unrestricted flow in the opposite direction, whereby the control valve is opened quickly upon increase in vacuum intensity in said air passage to permit flow of atmospheric air into the engine intake passage, said control valve closing relatively slowly upon reduction of vacuum intensity in said air passage.

4,178,891

METHOD AND APPARATUS FOR CONTROLLING THE OPERATION OF AN INTERNAL COMBUSTION ENGINE

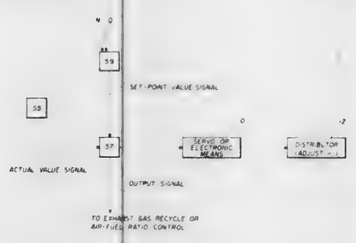
Reinhard Latsch, Vaihingenn; Valerio Bianchi, Hochdorf, both of Fed. Rep. of Germany, and Reiner Burkel, Le Chesney, France, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 564,073, May 27, 1975, abandoned. This application Mar. 11, 1976, Ser. No. 665,797

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1975, 2510526

Int. Cl.[2] F02P *5/04*

U.S. Cl. 123—117 R **3 Claims**



1. A method for controlling the operation of an internal combustion engine, comprising the steps of:

(A) determining a measurement-time interval, the duration of which corresponds to an angular region of the crankshaft rotation related to at least one stroke of a piston of the engine;

(B) generating a measurement value from an engine operating parameter during the measurement-time interval, said generated measurement value varying during the measurement-time interval as a measure of the fluctuations of the angular speed of the crankshaft over said angular region, and corresponding to the average combustion chamber pressure;

(C) integrating the measurement value generated;

(D) comparing an integrated measurement value generated during a subsequent measurement-time interval and generating a differential value as an actual value of the combustion chamber's average pressure;

(E) generating a nominal value of the combustion chamber average pressure; and

(F) adjusting the ignition timing angle of the engine in accordance with the difference between the nominal and actual values.

4,178,892

SPEED-DEPENDENT IGNITION TIME ADVANCEMENT APPARATUS IN MAGNETO GENERATOR IGNITION SYSTEMS

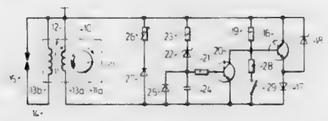
Jiri Podrapsky, Buchschwabach, and Josef Orova, Schwabach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 2, 1978, Ser. No. 874,651

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2712695

Int. Cl.[2] F02P *5/04*; H03K *17/64*

U.S. Cl. 123—117 R **6 Claims**



1. In an ignition system for an internal combustion engine, said ignition system having a rotating magneto system driven by said engine and armature means including a primary winding (**13*a***) and a second winding (**13*b***) cooperating with said rotating magneto system, a spark plug connected to said secondary winding, controllable impedance means (**16**) having a controlled impedance circuit connected in series with said primary winding and having a control electrode for changing the impedance of said controlled impedance circuit in accordance with a control signal applied to said control electrode and for interrupting current flowing through said primary winding in response to an ignition timing signal applied to said control electrode, and means (**20–25**) connected to said primary winding and said control electrode for furnishing said ignition timing signal to said control electrode when the voltage across said primary winding reaches a predetermined voltage, apparatus for abruptly advancing the ignition timing when the speed of said engine exceeds a predetermined speed, comprising

bistable means (**29**; **31**) having a first and second stable state when said speed of said engine is less than and greater than said predetermined speed, respectively, connected to said control electrode for causing said controlled impedance circuit to have a greater impedance prior to the ignition time when said bistable means is in said second stable state than when said bistable means is in said first stable state, thereby advancing said ignition timing at higher engine speeds.

4,178,893

IGNITION CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Keiji Aoki, Susono, Japan, assignor to Toyota Jidoshi Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Feb. 3, 1978, Ser. No. 874,756

Claims priority, application Japan, Jul. 19, 1977, 52-08556

Int. Cl.[2] F02P *5/04*

U.S. Cl. 123—117 D **4 Claims**

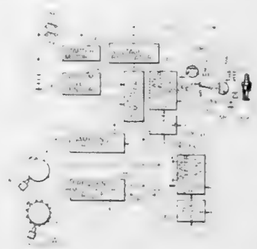
1. An ignition control apparatus for an internal combustion engine having a power supply, cylinders, and spark plugs each of which is mounted on each of said cylinders, comprising:

a signal generating means for generating electrical signals which indicate the conditions of said engine;

a first electrical circuit, which would be inoperable at low voltages from the power supply which may occur at the time of starting the engine, for calculating ignition timing of each of said spark plugs in response to the value of said electrical signals, and for generating a control signal based on said calculated ignition timing;

a second electrical circuit for generating a control signal based on ignition timing of a fixed spark-advance angle, said second electrical circuit comprising a C-MOS type electrical circuit which is operable at low voltages from the power supply which may occur at the time of starting the engine;

a third electrical circuit for controlling the timing of sparks



produced by said spark plugs in response to the value of a control signal provided from either one of said first electrical circuit and said second electrical circuit; and

a switching means which is automatically changed over and controlled for applying said control signal from said second electrical circuit to said third circuit at the time of starting said engine and for applying said control signal from said first electrical circuit to said third circuit during periods of operation of the engine other than at the time of starting the engine.

4,178,894

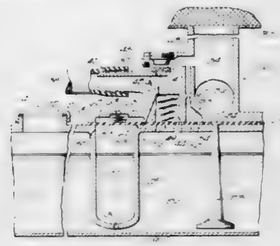
NONPOLLUTING LIQUID FUEL SYSTEM FOR ENGINES

Paul R. Nau, Wauwatosa, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Mar. 17, 1978, Ser. No. 887,476

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 B **9 Claims**



1. In a fuel system for a cyclically operating internal combustion engine that has a crankcase in which there is a subatmospheric pressure during at least a portion of each engine cycle when the engine is operating, and which system comprises a tank that holds a liquid fuel supply for the engine and wherein a substantially constant atmospheric pressure is to be maintained:

A. an imperforate removable closure for an opening in the tank through which fuel is filled thereinto, said closure, when in place, providing a substantially vapor-proof seal for the tank;

B. means defining a suction chamber which is at all times

communicated with the interior of the crankcase and which is communicable with the atmosphere through a breather passage;

C. a check valve in said breather passage arranged to normally close the same but to open when pressure in the suction chamber exceeds atmospheric pressure;

D. means defining a fuel tank pressure relief passage communicated at one end with the interior of the fuel tank and communicated at its other end with the interior of the crankcase;

E. pressure responsive outlet valve means operatively associated with said pressure relief passage, comprising a movable element having opposite surfaces that are respectively exposed to the atmosphere and to the interior of the tank, at the top thereof, said outlet valve means being normally closed to prevent flow through said pressure relief passage but being arranged to be opened by pressure in the tank that exceeds atmospheric pressure;

F. means defining a fuel tank suction relief passage communicated at one end with the interior of the tank and communicated at its other end with the atmosphere; and

G. pressure responsive valve means operatively associated with said suction relief passage, comprising a movable element having opposite surfaces that are respectively exposed to the interior of the tank, at the top thereof, and to the interior of the suction chamber, said inlet valve means being normally closed to prevent flow through said suction relief passage but being arranged to be opened by subatmospheric pressure in said suction chamber.

4,178,895

TWO STAGE VACUUM BREAK ASSEMBLY

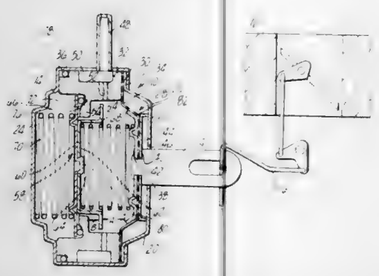
Benjamin C. Benjamin, Flint, Mich., assignor to Schmelzer Corporation, Durand, Mich.

Filed Apr. 17, 1978, Ser. No. 896,940

The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.

Int. Cl.[2] **F02M** *7/24*

U.S. Cl. 123—119 F **14 Claims**



12. In combination, a vacuum responsive device, a choke valve, and an internal combustion engine, said engine including a carburetor and an intake manifold, said carburetor including an induction passage, said choke valve in said passage, said vacuum responsive device being operatively connected to move said choke valve initially from a closed position to a partly open position in response to a predetermined vacuum in the engine intake manifold when the engine is started and subsequently after a period of delay to move said choke valve from said partially open position to a fully open position, said vacuum responsive device including a housing, a diaphragm in said housing forming a constant pressure chamber at one side, a movable wall in said housing forming a delay chamber at one side, said diaphragm and said movable wall forming a variable pressure chamber therebetween, means communicating said manifold with said variable pressure chamber, passage means between said manifold and said delay chamber, a plunger connected to said choke valve and to said diaphragm, said diaphragm being movable in a first range upon starting of said engine to establish vacuum pressure in said variable pressure chamber to engage said movable wall, said diaphragm and wall being movable as a unit in a second stage upon establishing vacuum pressure in said delay chamber through said passage means.

4,178,896

EXHAUST GAS RECYCLING SYSTEM

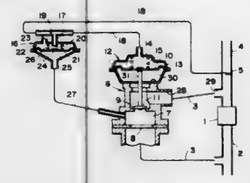
Masafumi Horikoshi, Toyota; Hidetaka Nohira, Mishima, and Masaaki Tanaka, Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 757,834, Jan. 10, 1977, abandoned. This application Nov. 16, 1978, Ser. No. 961,119

Claims priority, application Japan, Sep. 10, 1976, 51-109098

Int. Cl.[2] **F02M** *25/06*

U.S. Cl. 123—119 A **10 Claims**



1. An exhaust gas recycling system combined with an internal combustion engine having an air intake and exhaust manifold comprising:

exhaust regulating means coupled to said air intake and exhaust manifold for restricting the amount of exhaust gas recycled from said exhaust manifold to said air intake manifold and for controlling a ratio of recycled exhaust gas to air intake volume, said exhaust regulating means further including a valve means for restricting the amount of recycled gas when the air intake of said internal combustion engine increases above a predetermined magnitude such that the ratio of the amount of recycled exhaust gas to air intake volume decreases as the amount of air flow continues to increase after said valve is fully opened; and

control means coupled to said exhaust regulating means communicating with at least one of said air intake and exhaust manifolds for controlling said exhaust regulating means.

4,178,897

SYSTEM AND METHOD OF FEEDING GASOLINE FUEL INTO AN INTERNAL COMBUSTION ENGINE

Robert C. Strem; R. C. Strem, both of New Castle, and John H. Eberle, Colfax, all of Calif., assignors to Omnewtronics, Inc., Reno, Nev.

Filed Oct. 20, 1977, Ser. No. 843,799

Int. Cl.[2] **F02M** *7/18*

U.S. Cl. 123—122 E **2 Claims**

2. A system for feeding gasoline fuel into a gasoline burning internal combustion engine which includes a carburetor and an intake manifold and which, when operating draws a vacuum through said manifold, the level of said vacuum being inversely proportionate to the power developed by the engine, said system comprising:

(a) a liquid gasoline collection area;

(b) first supply line means for supplying gasoline in a liquid state to said first collection area;

(c) a liquid gasoline vaporization chamber;

(d) second supply line means for directing the liquid gasoline passing out of said liquid gasoline collection area to said vaporization chamber;

(e) means located within said vaporization chamber for vaporizing the liquid gas therein;

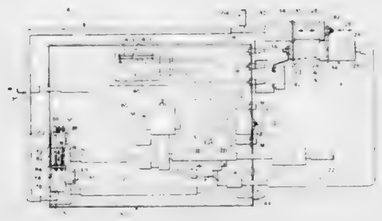
(f) means connected with said intake manifold and responsive to the vacuum level thereat for

(i) automatically varying the liquid gasoline passing out of said collection area in an amount which is inversely proportional to the vacuum level at said manifold, and

(ii) automatically directing the vaporized gasoline into said intake manifold in an amount which is inversely proportional to said vacuum level;

(g) a first valve means located in one of said supply lines means for opening and closing the latter;

(h) a third supply line means for supplying liquid gasoline from said supply tank to said carburetor, said third line



means bypassing said collection area and said vaporization chamber, whereby said gasoline enters said engine without first being vaporized;

(i) a second valve means located in said third supply line means for opening and closing said third line means; and

(j) means for alternatively

(i) actuating said first valve means to open said first and second supply line means, while maintaining said second valve means deactuated to maintain said third line means closed, and

(ii) actuating said second valve means for opening said third supply line means while maintaining said first valve means deactuated to maintain the first and second lines closed.

4,178,898

THERMOSTATIC VALVE FOR INTAKE AIR TEMPERATURE COMPENSATION FOR INTERNAL COMBUSTION ENGINE

Hajime Akado, Anjo; Yoshiro Uchida, Toyota; Kenichi Kubota, Kariya; Toshiharu Hasebe, Kariya; Akihide Yamaguchi, Kariya; Tsutomu Tomita, Okazaki; Suminobu Ootsubo, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan

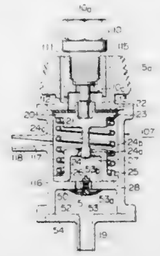
Filed Jul. 3, 1978, Ser. No. 921,566

Claims priority, application Japan, Jul. 21, 1977, 52-98059[U]

Int. Cl.[2] **F02M** *31/00;* **G05D** *23/00*

U.S. Cl. 123—122 D **5 Claims**

1. A thermostatic valve for making intake air temperature compensation for an internal combustion engine by sensing a temperature increase in the intake air being supplied to the engine and, when necessary, directly supplying an additional amount of air to the intake manifold space downstream of the throttle valve in the carburetor of the engine, to make up for any deficiency of the intake air for the engine while, at the same time, controlling, according to the temperature change of the intake air, the introduction of a negative pressure from the intake manifold into a negative pressure motor which adjusts the temperature of the intake air being supplied to the carburetor, said valve comprising a temperature sensor including a piston rod to be actuated by a thermally expandable element whose volume increases or decreases with a temperature change of said intake air, a first opening leading to the atmosphere, a second opening leading to said negative pressure motor, a third opening leading to said intake manifold, a housing formed with said first to third openings and adapted to support said temperature sensor, a partition member disposed in said housing to provide partitions between said first and third openings and between said second and third openings, said partition member being formed with holes, a valve element so located in said housing as to be actuated by said piston rod of said temperature sensor, a valve seat provided in said housing to be in and out of contact with said valve element, and a check valve installed between said partition member and said third opening to open in one direction only, said housing being formed therein with a first passageway connecting said second and third openings through the holes of said partition member, a second passageway connecting said first and second



passageways, and a third passageway connecting said first and third openings through said holes of said partition member, said first passageway being opened when the negative pressure in said intake manifold acting upon said check valve is high enough to open said valve and closed when the negative pressure acting upon said check valve becomes lower than the negative pressure in said second opening and closes said check valve, said second and third passageways being opened and closed by said valve element, in such a manner that, when the intake air temperature is low, said valve element is in contact with said valve seat, thus closing said second and third passageways and, when the temperature increases, said valve element moves away from said valve seat to open said second and third passageways.

4,178,899

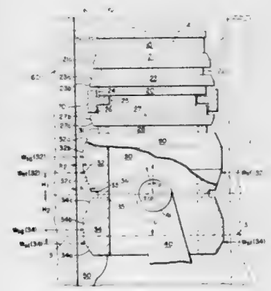
LOW-FRICTION PISTON

Harry Julich, 6807 Winter La., Annandale, Va. 22003

Filed Sep. 20, 1978, Ser. No. 944,132

Int. Cl.[2] **F16J** *9/20;* **F02F** *3/28*

U.S. Cl. 123—193 P **14 Claims**



1. A piston for minimizing friction and substantially eliminating abrasion, said piston being received in a bore defined by a generally cylindrical cylinder wall, and said piston including

surface means for responding to hydrodynamic reactions within said bore for maintaining said entire piston at all times at a minimum distance from said cylindrical wall to substantially entirely eliminate abrasive friction during relative motion of said piston within said bore, said piston carrying at least one expansible sealing ring for sealing against oil-pumping and gas-leakage as a function of pressure differential across said piston, said sealing ring being at at all times out of contact with said cylinder wall, and said hydrodynamic surface reaction means is formed by at least said sealing ring

6. A piston for minimizing friction and substantially eliminating abrasion, said piston including ring means being received in a bore defined by a generally cylindrical cylinder wall, and said piston including means for responding to hydrodynamic reactions comprising at least two hydrodynamic reaction surface means within said bore for maintaining said entire piston and ring means at all times at a minimum distance from said cylindrical wall to substantially entirely eliminate abrasive friction during relative motion of said piston within said bore.

4,178,900

ROTARY INTERNAL COMBUSTION ENGINE

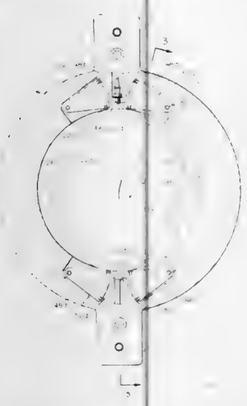
Dallas J. Larson, 2001 S. 2300 East, Salt Lake City, Utah 84108

Continuation-in-part of Ser. No. 713,942, Aug. 12, 1976, Pat. No. 4,033,300, which is a continuation-in-part of Ser. No. 633,346, Nov. 19, 1975, Pat. No. 3,986,483. This application Apr. 20, 1977, Ser. No. 789,054

The portion of the term of this patent subsequent to Oct. 19, 1993, has been disclaimed.

Int. Cl.[2] **F02B** *53/00*

U.S. Cl. 123—244 **19 Claims**



1. A rotary engine comprising:

a generally annular stator member having side walls and an interior peripheral wall and a first and second pair of spaced apart sockets located in the interior peripheral wall,

a first and second pair of wedges each pivotally mounted at one of their vertices on the interior peripheral wall of the stator member to pivot in and out of respective ones of said sockets as said rotor member rotates within the stator member, said wedges being mounted relative to said stator member such that a base of each wedge pivots along an arc generally towards the center of the stator member, and such that each of said bases of the wedges in each pair face each other so that a space is formed by said bases of each pair of wedges,

a rotor member having an exterior periphery and two exterior side walls and a shaft extending from one side wall thereof and mounted to rotate within said stator member, said rotor member formed to define combustion and compression cavities between the portions of the interior peripheral wall of the stator member between the bases of the wedges and the exterior periphery of the rotor member, said combustion and compression cavities being disposed substantially 180° apart about the interior peripheral wall of the stator member, said exterior periphery having two outermost portions thereof substantially parallel to the interior peripheral wall of the stator member, said portions extending at least the distance between the bases of the wedges of each pair thereof, and said portions being disposed substantially 180° apart, said portions of the exterior periphery being joined tangentially by two curved portions thereof which each first curves convexly and inwardly away from the stator member and then curves concavely and outwardly toward the stator member,

a cam track defined in at least one side wall of said rotor member,

cam followers extending from at least one portion of each wedge and guided by said cam track to cause said wedges to pivot in and out of said sockets and to maintain sliding contact with the exterior periphery of said rotor member,

means for introducing a fuel mixture into the spaces between each pair of wedges,

means for igniting the fuel mixture between each pair of wedges,

means for timing the ignition of the fuel mixture to selectively coincide with or slightly precede the time the said portions of the rotor periphery are each disposed substantially entirely across the spaces defined between each pair of wedges, and

means for exhausting the combustion products from the spaces between each pair of wedges.

4,178,901

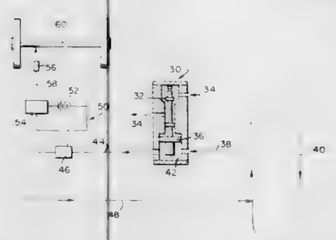
DIESEL TRUCK ROAD SPEED CONTROL

Paul B. Cunningham, 607 Orchard Hill Dr., Pittsburgh, Pa. 15238

Filed Feb. 7, 1978, Ser. No. 875,887

Int. Cl.[2] **F02B** *77/08*

U.S. Cl. 123—198 D **3 Claims**



1. An improved engine shut-down control valve for providing road speed supervision of a diesel truck, said control valve being of the type wherein fuel for powering said truck engine flows through an internal valve opening therein that is normally spring-biased closed except as a piston therein is biased by the oil pressure of said truck engine through movement towards said internal valve opening for maintaining the same in an open condition, the improvements for effectively obtaining road speed supervision of said diesel truck by said shut-down control valve comprising a conduit operatively connected to provide an escape passage from said control valve for said oil pressure therein incident to causing the shut-down operation of said control valve upon the escape of said oil pressure therefrom, a normally closed valve in said conduit for normally maintaining closed said escape passage thereof, and a truck road speed-sensing control operatively connected to open said normally closed valve when said truck is travelling in excess of a selected speed, whereby an artificially induced condition of loss of oil pressure is made responsive to said truck road speed so as to advantageously impose an upper limit on the road speed operation of said diesel truck.

4,178,902

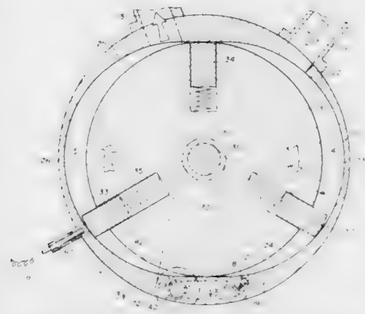
ROTARY ENGINE

Thomas Ganley, 46-08 195th St., Flushing, N.Y. 11358

Filed Nov. 24, 1975, Ser. No. 634,843

Int. Cl.[2] **F02B** *53/00*

U.S. Cl. 123—231 **8 Claims**



1. A rotary engine comprising a generally cylindrical rotor housing, a generally cylindrical rotor mounted for rotation within said rotor housing about the central axis thereof, a first chamber formed between said rotor and said rotor housing for compressing a combustible fluid or gas supplied thereto, a second chamber formed between said rotor housing and said rotor for expanding the combustible gas compressed in said first chamber, said rotor housing having a third chamber formed entirely within the wall of said rotor housing between said first and second chambers and extending along the axial length thereof, inlet channel extending through said wall directly connecting said first chamber with said third chamber for the passage of compressed media, one way valve means in said inlet channel permitting communication from said first to thid chamber only, and an outlet channel axially offset from said inlet channel and directly connecting said third chamber with said second chamber, and feed means located in said outlet channel for permitting a portion of the gas collected in said third chamber to exit into said second chamber in timed relationship with the rotation of said rotor, said feed means comprising a rotatable hollow pin having a plurality of radial openings formed in the circumference thereof arranged in a plurality of series each series lying along a straight line on said circumference of said pin, each series having at least one first opening aligned with the third chamber and at least one second opening aligned with the outlet channel, whereby as each opening aligns respectively with the chamber and channel, the gas or fluid in said third chamber enters said pin through said first openings and collects therein and subsequently exits through said second openings of each series when said openings are in alignment with the respective channel, means for supplying the combustible gas or fluid to said first chamber, means for removing the gas or fluid from second chamber, said second chamber having igniting means mounted therein for igniting the compressed gas fed thereby by said third chamber, and a drive shaft connected to the center of said rotor for rotation therewith, whereby the gas compressed in said first chamber is forced into said third chamber and fed to said second chamber via said hollow pin for ignition therein to thereby drive said rotor and drive shaft.

4,178,903

INTERNAL COMBUSTION ENGINE WITH AN AUXILIARY COMBUSTION CHAMBER

Hiromichi Yanagihara, and Nobuhiro Miura, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

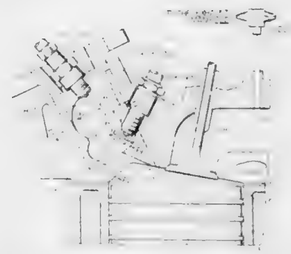
Filed Nov. 7, 1977, Ser. No. 849,355

Claims priority, application Japan, Aug. 17, 1977, 52/97876

The portion of the term of this patent subsequent to Sep. 26, 1995, has been disclaimed.

Int. Cl.[2] **F02B** *3/00, 33/02*

U.S. Cl. 123—32 SP **6 Claims**



1. An internal combustion engine provided with an intake passage having no throttle valve therein, said engine comprising:

a cylinder block having a cylinder bore therein;

a cylinder head having a cavity therein and mounted on said cylinder block, said cavity having an inner wall which defines an auxiliary chamber with an axis;

a piston reciprocally movable in said cylinder bore, said piston and said cylinder head forming a main chamber therebetween;

an intake valve movably mounted on said cylinder head for leading air into said main chamber via the intake passage;

an exhaust valve movably mounted on said cylinder head for discharging exhaust gas into the atmosphere;

a raised portion formed on the inner wall of said auxiliary chamber and defining a restricted opening, said raised portion dividing said auxiliary chamber into a first chamber and a second chamber which are arranged in tandem along the axis of said auxiliary chamber and forming a recess in said second chamber beneath said raised portion;

a connecting passage formed in said cylinder head and communicating said main chamber with said auxiliary chamber, said connecting passage being arranged to be tangentially connected to the inner wall of said second chamber for creating a swirl motion of the air at the time of the compression stroke, the sum of the volumes of said auxiliary chamber and the connecting passage being more than 80 percent of the sum of the volumes of the auxiliary chamber, the connecting passage and said main chamber when said piston reaches the top dead center position;

means for recirculating a large amount of the exhaust gas into the intake passage;

fuel injecting means having an injecting nozzle disposed in the first chamber of said auxiliary chamber and directed to said recess located opposite to the inner wall to which said connecting passage is tangentially connected with respect to the axis of said auxiliary chamber for forming a combustible mixture having the total air-fuel ratio which is increased within the range of 30 through 100:1 in accordance with a decrease in the level of the load of the engine; and

ignition means having a spark plug with a spark gap located in said recess for advancing the ignition timing within the range of 15 through 50 degrees before the top dead center

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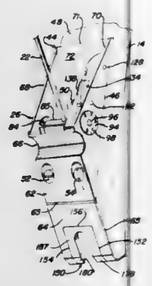
position in accordance with a decrease in the level of the load of the engine.

4,178,904
ARCHERY BOW
Karl Meininger, P.O. Box 391, Sheboygan, Wis. 53081
Filed Nov. 19, 1976, Ser. No. 743,329
Int. Cl.[2] F41B 5/00
U.S. Cl. 124—23 R **1 Claim**



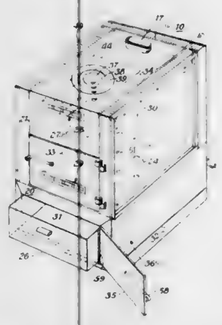
1. An archery bow comprising, in combination:
(a) a frame comprising an elongated straight central portion having limbs extending from the ends thereof and with said frame defining an axis of draw for an arrow,
(b) said limbs being integral with the frame and terminating in end portions which are normally disposed at an angle of less than 90° from the inner face of said central portion and with said end portions facing toward the axis of draw of the bow,
(c) and a free straight draw string connected between the terminal end portions of said limbs,
(d) said draw string being substantially coplanar with the plane formed by the frame and the limbs, said string being parallel to the said straight central portion of said frame and being the same length as said central portion, the construction being such that during an arrow projecting operation said string is drawn toward said straight central portion by one hand of a user while the other hand of the user holds the control portion in front of the user's body.

4,178,905
COMPOUND BOW ADJUSTMENT AND INDICATING MECHANISM
Norman A. Groner, Kalkaska, Mich., assignor to Victor United, Inc., Chicago, Ill.
Division of Ser. No. 619,370, Nov. 10, 1975, Pat. No. 4,061,124.
This application Aug. 31, 1977, Ser. No. 829,488
Int. Cl.[2] F41B 5/00
U.S. Cl. 124—23 R **9 Claims**



1. A compound archery bow comprising, an elongated handle portion having a longitudinal axis, a pair of limb portions attached to opposite ends of said handle portion, cable means attached to the bow for propelling an arrow from the bow, wheel means fixedly journaled adjacent the outer end portions of said limb portions for rotatably supporting said cable means for propelling an arrow from the bow, cable attachment means fixedly mounted adjacent the juncture of each said limb portion and handle portion, at least one flange portion on each of said attachment means and having an outer side wall, rotatable shaft means transversely journaled through each said attachment means flange portion and engaging said cable means, said shaft means displaceable to vary the tension upon said cable means to change the draw length of said bow, tool receiving means on one end of said shaft means exposed for access outside said flange portion outer side wall to permit rotary displacement of said shaft means, indicia means on said cable attachment means viewable outside said flange portion outer side wall to signify uniform draw length positions for each said shaft means, and indicia means on said wheel means for signifying uniform rotation during the timing of said wheel means.

4,178,906
KITCHEN COUNTERTOP WOOD OR COAL STOVE
Lloyd W. Lund, R.F.D. #2, Chapel Rd., Waldoboro, Me. 04572
Continuation of Ser. No. 676,113, Apr. 12, 1976, abandoned.
This application Nov. 9, 1977, Ser. No. 849,949
Int. Cl.[2] F24C 1/14
U.S. Cl. 126—6 **10 Claims**

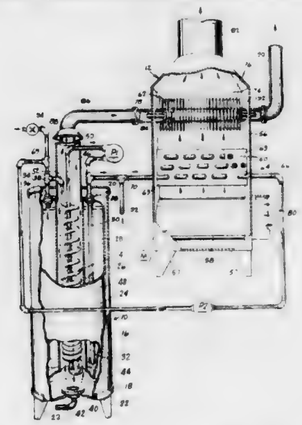


1. A solid fuel stove of a size to operatively fit alongside a kitchen counter unit, in which said stove is formed with a combustion chamber lined on its sides and rear by a lining and bounded externally by insulating side wall assemblies and an insulating rear wall assembly,
wherein said side and rear wall assemblies are formed of an exterior imperforate panel spaced from said lining by baffles, with a continuous series of vents extending along the front face and top face of each side wall assembly opening to the interior of said side wall assemblies.

4,178,907
UNIFIED HOT WATER AND FORCED AIR HEATING SYSTEM
James R. Sweat, Jr., 2284 Heritage Dr., San Jose, Calif. 95124
Filed Jul. 27, 1978, Ser. No. 928,366
Int. Cl.[2] F24D 9/00; F24H 1/22
U.S. Cl. 126—101 **12 Claims**

6. A forced air heating system comprising:
a gas-to-liquid heat exchange unit disposed within an exhaust flue of a water heater of the type having an inflow port, an outflow port and a hot gas exhaust flue, said heat exchange unit having a water inflow end and a water outflow end, said water outflow end being coupled to said water heater outflow port, whereby water flowing through said gas-to-liquid heat exchange unit is heated by hot gas within said flue;
a forced air heater including
a casing means having an inflow duct and an outflow duct and defining an air chamber,

a liquid-to-gas heat exchange unit disposed within said chamber and having a water inflow end and a water outflow end,
a gas-to-gas heat exchange unit disposed within said chamber and having a gas inflow end and a gas outflow end, and
blower means for moving air through said inflow duct into said chamber, past said liquid-to-gas heat exchange unit and said gas-to-gas heat exchange unit and out said outflow duct;
a first pump means coupling said inflow port to said first water inflow end to pump water into said first water inflow end;

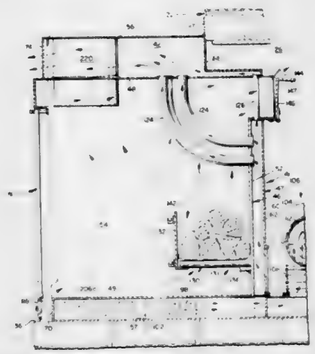


a second pump means coupling said outflow port to said second water inflow end to pump water into said second water inflow end;
means coupling both said inflow port and said second water outflow end to a source of pressurized water; and
means connecting the terminal end of said exhaust flue to said gas inflow end;
whereby said air flowing through said chamber and out said outflow duct is heated by the hot water flowing through said liquid-to-gas heat exchange unit from said water heater and by the hot gases flowing through said gas-to-gas heat exchange unit from said exhaust flue and whereby hot water is always present at said outflow port due to the rapid heating of the water within said gas-to-liquid heat exchange unit.

4,178,908
FIREPLACE HEATING UNIT
Charles H. Trexler, Sr., 6229 Debora Dr., Richmond, Va. 23225
Filed Oct. 5, 1978, Ser. No. 948,785
Int. Cl.[2] F24B 7/00
U.S. Cl. 126—121 **17 Claims**

1. A fireplace heating unit adapted to be supported on the hearth and fireplace floor of an existing fireplace to extend into the existing fireplace recess, comprising a housing structure having (a) a metal furnace jacket defining a combustion chamber for receiving a fuel to be burned and (b) metal housing means receiving said jacket, said housing means and said furnace jacket having spaced apart wall portions to provide an interior air space between said furnace jacket and said housing means, wall means forming a part of said housing structure and partitioning said interior space into a plenum and an air conduction space, said plenum overlying said furnace jacket and combustion chamber, and said air conduction space extending at least along the back of the furnace jacket, conduit means exposed in said combustion chamber and establishing fluid communication between said air conduction space and said plenum to provide for the flow of air from said conduction space to said plenum without mixing with combustion gases in said combustion chamber, a forced air blower connected to feed air to be heated to said air conduction space for flow through said air conduction space and said conduit means to said plenum, the air flowing through said air conduction space and said conduit means being heated by the fire produced by the burning of fuel in said combustion chamber whereby heated air is delivered to said plenum, said plenum having an air outlet opening to provide for the passage of the heated air from said plenum to the room area being heated, said housing structure being adapted to seat on the fireplace floor and said hearth at a location where only a rearward portion of said housing structure is received in said fireplace recess, at least a portion of said plenum and a portion of the combustion chamber vertically underlying said plenum being disposed forwardly of said rearward portion to be positioned forwardly of said fireplace recess when said rearward portion is received in said recess, and at least one upwardly opening water-receiving receptacle mounted in housing structure, said receptacle having its open upper end disposed at the top wall of said plenum at a location where it is disposed forwardly of said fireplace recess to open into the room area being heated, said receptacle extending at least in said plenum and being exposed to the heat produced by burning fuel in said combustion chamber to provide for the vaporization of water in said receptacle.

2. A fireplace heating unit adapted to be supported on the hearth and fireplace floor of an existing fireplace to extend into



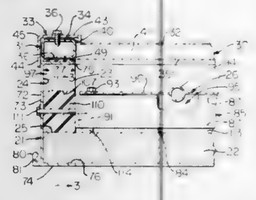
the existing fireplace recess, comprising a housing structure having (a) a metal furnace jacket defining a combustion chamber for receiving a fuel to be burned and (b) metal housing means receiving said jacket, said housing means and said furnace jacket having spaced apart wall portions to provide an interior air space between said furnace jacket and said housing means, wall means forming a part of said housing structure and partitioning said interior space into a plenum and an air conduction space, said plenum overlying said furnace jacket and combustion chamber, and said air conduction space extending at least along the back of the furnace jacket, said housing structure further defining a combustion gas outlet at a rearward region of said combustion chamber to provide for the exhaust of hot combustion gases from said combustion chamber, an array of air conveying tubes exposed in said combustion chamber and establishing fluid communication between said air conduction space and said plenum to provide for the flow of air from said conduction space to said plenum without mixing with combustion gases in said combustion chamber, said tubes being disposed in a region lying between said combustion gas outlet and the fuel in said combustion chamber such that the hot combustion gases pass around said tubes before exiting through said combustion gas outlet, said tubes providing the only fluid communication between said plenum and said air conduction space, and a forced air blower connected to feed air to be heated to said air conduction space for

flow through said air conduction space and said tubes to said plenum, the air flowing through said air conduction space and said tubes being heated by the fire produced by the burning of fuel in said combustion chamber whereby heated air is delivered to said plenum, and said plenum having an air outlet opening to provide for the passage of the heated air from said plenum to the room area being heated.

4,178,909
SOLAR COLLECTOR

Patrick F. Goolsby, Richmond, Va.; David J. Laudig, Palos Verdes, Calif.; Paul A. Mechler, La Palma, Calif.; Steven J. Osterhus, Westminster, Calif., and George F. Swenck, Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed May 1, 1978, Ser. No. 901,300
Int. Cl.[2] F24J *3/02;* **E04B** *1/00*
U.S. Cl. 126—417 **17 Claims**

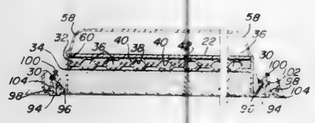


1. In a solar collector having a cover assembly comprising a structural frame, a flexible polymeric cover sheet disposed on said structural frame and a top retaining frame sandwiching peripheral edge portions of said polymeric cover sheet, the improvement wherein said retaining frame comprises at least one substantially L-shaped member having a pair of legs extending from a common bight, one of said legs of said member having a projecting lip that extends generally parallel to and in the same direction as the other leg or said member and engages said cover sheet to provide stretching thereof and to maintain said cover sheet taut under various ambient temperature conditions.

4,178,910
SOLAR COLLECTOR AND SYSTEM FOR MOUNTING A PLURALITY OF SOLAR COLLECTORS ON A SURFACE

Eben J. Gramer, 5441 E. Nassau Cir., Englewood, Colo. 80110, and Melvin O. Johnson, 6488 Southwood Dr., Littleton, Colo. 80121

Continuation-in-part of Ser. No. 700,040, Jun. 25, 1976, abandoned. This application Jul. 8, 1977, Ser. No. 814,030
Int. Cl.[2] F24J *3/02;* **F16M** *13/00;* **F16L** *21/02;* **F16J** *15/10*
U.S. Cl. 126—442 **12 Claims**



1. A solar energy collecting system adapted to be mounted on a supporting surface comprising:

a plurality of individual solar collector units, each of said units having a base sheet member having flange members extending along opposite sides thereof, wherein each of said base sheet members has a substantially planar main portion from which said flange members extend upwardly at an angle,

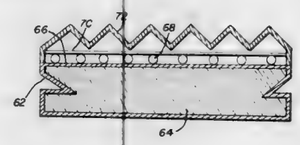
mounting rails extending in parallel relationship along said supporting surface between adjacent units, each of said mounting rails includes a bead member having a symmetrical cross-sectional width greater than the portion of the rail immediately below said bead member extending along an upper edge thereof, and

clip means for maintaining the upwardly extending flanges of said units against said mounting rails, said clip means extending over at least a portion of said mounting rails and a portion of said flange units to integrate the units into a solar energy collecting system, said clip means being sufficiently resilient to snap onto said bead members, said flange members abutting a lower portion of the bead members of the respective mounting rails when said solar energy system is assembled.

4,178,911
SOLAR ENERGY HEAT COLLECTOR

John P. Mattson, Duxbury, Mass., assignor to Solarspan, Inc., Duxbury, Mass.

Division of Ser. No. 649,032, Jan. 14, 1976, Pat. No. 4,077,393, which is a continuation-in-part of Ser. No. 621,759, Oct. 14, 1975, abandoned. This application Dec. 21, 1977, Ser. No. 862,822
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—449 **2 Claims**



1. A solar energy collector comprising a cover means comprising a surface having a plurality of spaced raised portions, said spaced raised portions having surfaces angularly disposed to said cover surface to transmit radiant solar energy to an energy receiving means for converting radient solar energy to thermal energy, said energy receiving means comprising an integral structure having a top surface and side surfaces, insulation means disposed within said top and side surfaces and forming the base of said collector, said top surface comprising the energy receiving surface, said energy receiving surface having a plurality of channels extending along said top surface for controlling the flow of a heat exchange fluid over said top surface and provide for exchange of heat from said energy receiving surface to said heat exchange fluid, means for introducing a heat exchange fluid to said energy receiving surface, means for collecting said heat exchange fluid after contact with said energy receiving surface, other channel means carried by each of said side surfaces, means for attaching to a supporting surface and having a configuration to removably engage said other channel means, and means for holding said cover means in spaced relationship to said energy receiving means.

4,178,912
SOLAR HEATING SYSTEM

John V. Felter, P.O. Box 7464, Houston, Tex. 77008

Filed Aug. 9, 1977, Ser. No. 823,088
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—452 **27 Claims**

1. Method for providing solar heating over the entire area of an upwardly facing roof structure and for providing a roof over the entire area of such roof structure, said roof structure having plural parallel spaced rafters sloping downwardly over its entire area, comprising

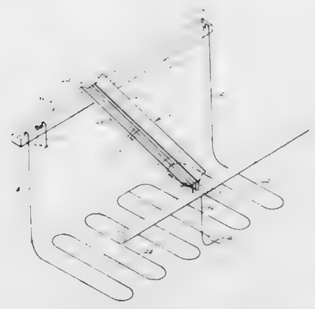
installing solar heating assemblies on said rafters to bridge across the spaces between adjacent of said rafters over the entire area of said roof structure,

each said solar heating assembly having means along each of its opposite sides adapted for connection to a rafter along each side thereof whereby said solar heating assemblies may be assembled on said rafters,

each said solar heating assembly having fluid inlet means at its upper end and having fluid outlet means at its lower end and having flow conduit means therebetween for use in absorbing heat resulting from solar radiation,

providing a circulating fluid reservoir adjacent the upper ends of said solar heating assemblies along the upper edge of said roof structure and exposing circulating fluid therein to atmospheric pressure,

disposing the ends of said fluid inlet means to be immersed in the circulating fluid in said reservoir so that circulating fluid may be drawn through said fluid inlet means from said reservoir into said flow conduit means by syphoning action,



providing a flow manifold connecting all of said fluid outlet means of said solar heating assemblies along the lower edge of said roof structure,

connecting said flow manifold and said reservoir to heat extracting means for circulating fluid through said conduits between said flow inlet and outlet means and for utilizing heat extracted from said fluid,

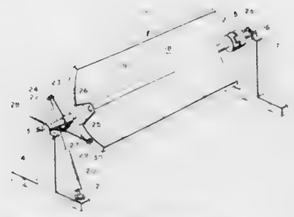
and providing sheathing means bridging across said spaces between said rafters and providing a roof over said solar heating assemblies over the entire area of said roof structure,

said method providing solar heat collection over the entire area of said roof structure and providing a roof over the entire area of said roof structure.

4,178,913
SOLAR COLLECTOR SYSTEM

J. A. Hutchison, Dallas, Tex., assignor to Solar Kinetics, Inc., Dallas, Tex.

Filed Dec. 23, 1977, Ser. No. 864,089
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—424 **11 Claims**



1. A solar collector system comprising:

(a) a moveable solar collector surface;

(b) rotation axle means supporting said solar collector surface;

(c) support means for supporting said rotation axis means whereby said rotation axle means can be rotated about the axis of said rotation axle means;

(d) a primary piston and cylinder means operably connected to said support means;

(e) a rotation collar means, rotatably supported by said support means;

(f) means for operably connecting said rotation collar means to said primary piston and cylinder means whereby movement of said primary piston within said primary cylinder causes rotation of said rotation collar;

(g) a secondary piston and cylinder means operably supported by said rotation collar;

(h) means for operably connecting said secondary piston and cylinder means to said solar collector surface whereby movement of said secondary piston within said secondary cylinder causes movement of said solar collector surface;

(i) means for selectively adding and removing hydraulic fluid to and from said primary cylinder to cause said primary piston to move within said primary cylinder; and

(j) means for selectively adding and removing hydraulic fluid to and from said secondary cylinder to cause said secondary piston to move within said secondary cylinder.

4,178,914
HEADER FOR A SOLAR ENERGY COLLECTION SYSTEM

Robert A. Erb, Valley Forge, Pa., assignor to The Franklin Institute, Philadelphia, Pa.

Continuation-in-part of Ser. No. 645,648, Dec. 31, 1975, Pat. No. 4,114,597. This application Aug. 3, 1978, Ser. No. 930,797
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—449 **35 Claims**



7. In a solar thermal energy collection system comprising at least one solar collector panel, capable of being affixed to a structure, the collector panel having an upper, heat insulating region comprising first channels longitudinally extending therethrough which contain a first fluid therein, and a lower, heat absorbing region comprising second channels longitudinally extending therethrough which contain a second fluid therein, and at least one header, connected to the collector panel along an interface abutting the first and second channels, and connecting the collector panel to the remainder of the energy collection system, an improved header which comprises:

an inner and an outer wall, separating the interior cavity defined by the header from the exterior of the header, and

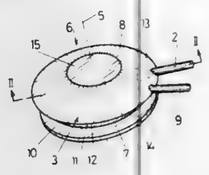
a plurality of ribs, connected between the inner and outer wall, which separate the inner and outer wall from each other.

4,178,915

SELECTIVELY OPERATABLE BLOCKING DEVICE FOR TUBULAR BODY ORGANS

Gerhard Szinicz, and Werner Trawöger, both of Innsbruck, Austria (6020)

Filed Aug. 16, 1977, Ser. No. 825,104
Int. Cl.[2] A61F *1/00*; A61B *17/00*
U.S. Cl. 128—1 R **22 Claims**



1. A closure device for the selective blocking and unblocking of a tubular body organ, said device comprising:

a sleeve surrounding said body organ within the body of a subject, said sleeve being formed with an expandable compartment;

a connecting duct communicating with said compartment and disposed within the body of said subject;

a variable-volume supply vessel containing a pressure medium and communicating with said sleeve, said vessel being disposed within the body of said subject and being actuatable between a compressed state and an expanded state, said vessel being formed from a pair of shells sealingly interconnected along their edges;

means within said vessel for releasably retaining said vessel in said compressed state; and

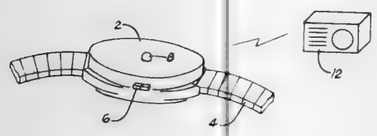
restoring means in said vessel for biasing same into said expanded state.

4,178,916

DIABETIC INSULIN ALARM SYSTEM

Elger W. McNamara, 5520 W. Camino Cielo, Santa Barbara, Calif. 93105

Filed Sep. 26, 1977, Ser. No. 836,250
Int. Cl.[2] A16B *5/4*
U.S. Cl. 128—734 **9 Claims**



1. A diabetic shock alarm system designed to be worn on a person's wrist and to monitor the wearer's body temperature and skin resistance, signalling to the wearer the onset of diabetic shock, the system including:

Means to sense the body temperature of the wearer and to produce an electrical output,

Means to sense the skin resistance of the wearer and to produce an electrical output,

Pulse generator means actuated by an abnormal output of both the body temperature sensor means and the skin resistance sensor means to generate pulses only in response to an abnormal output of said sensor means,

Oscillator means actuated by pulses of a given polarity produced by the pulse generator,

A tuned circuit directly connected to both the pulse generator means and the oscillator means to be energized by both the pulses produced by the pulse generator and oscillations produced by the oscillator means, and

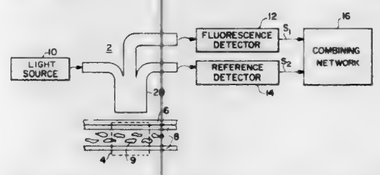
Antenna means connected to the tuned circuit to radiate electromagnetic energy at a frequency of an electromagnetic receiver, whereby the wearer may tune the electromagnetic receiver to the frequency of the tuned circuit, the system then alerting the wearer of the onset of diabetic shock through the electromagnetic receiver.

4,178,917

METHOD AND SYSTEM FOR NON-INVASIVE DETECTION OF ZINC PROTOPORPHYRIN IN ERYTHROCYTES

Howard M. Shapiro, 283 Highland Ave., West Newton, Mass. 02165

Filed Jan. 3, 1979, Ser. No. 866,788
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—665 **21 Claims**



1. A system for the non-invasive detection of zinc protoporphyrin (ZPP) in erythrocytes in a region underlying a sample surface of a patient, comprising:

A. source means for generating excitation light in a predetermined spectrum, said predetermined spectrum being outside the characteristic fluorescence emission spectrum of ZPP and at least a portion of said predetermined spectrum being in the characteristic fluorescence excitation spectrum of ZPP,

B. first detection means for generating a first signal representative of the intensity of light incident thereon and in said characteristic fluorescence emission spectrum of ZPP,

C. second detection means for generating a second signal representative of the intensity of light incident thereon and within said predetermined spectrum,

D. transfer means for directing said excitation light to be incident on said sample surface, and for directing light emitted from said sample surface to be incident on said first and second detection means,

E. circuit means responsive to said first and second signals to generate a signal representative of the concentration of ZPP in said erythrocytes.

4,178,918

AUTOMATIC BLOOD PRESSURE MEASURING AND RECORDING SYSTEM

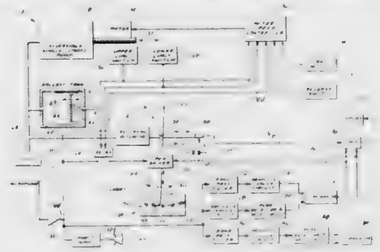
Lionel B. Cornwell, 52 Madison Springs Dr., Madison, Conn. 06443

Filed Sep. 15, 1977, Ser. No. 833,608
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—682 **10 Claims**

1. In a noninvasive blood pressure measuring and recording system of the type which includes an inflatable cuff forencircling a portion of the human body, means for inflating and deflating the cuff for selectively occluding an arterial vessel, means for detecting flow variations through the artery and means for recording the arm cuff pressure values corresponding to the detection of desired flow variations through the artery as cuff pressure is decreased, the improvement therein enabling reproducibility of cuff pressure decrease and controlled variability of constant rates of pressure decrease which comprises:

the means for inflating and deflating the cuff comprising a single stroke reversible pump having a piston, a cylinder and a flexible sleeve diaphragm, the piston being movable within the cylinder and joined thereto through the flexible sleeve diaphragm, the diaphragm being arranged to fit in a folded position between the cylinder and piston and to maintain a pressure seal therebetween, the piston, cylinder and diaphragm forming a variable volume, contained air chamber pneumatically coupled to the cuff,

controllable motor means operable at a preselected constant



speed for moving the piston within the cylinder to vary the volume of the contained air chamber in a predetermined fashion, thereby to produce a corresponding predetermined and precise pressure variation in the inflatable cuff for accurate blood pressure measurements, and

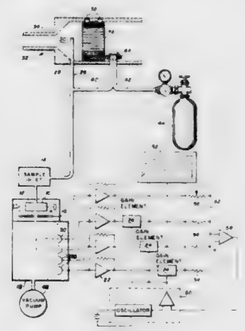
control means for controlling the motor means during decrease of cuff pressure in response to the flow variation detection means to operate the motor means at a different preselected constant speed following initial detection of flow variations in the arterial vessel.

4,178,919

FLOWMETER FOR PROVIDING SYNCHRONIZED FLOW DATA AND RESPIRATORY GAS SAMPLES TO A MEDICAL MASS SPECTROMETER

Lawrence G. Hall, Creve Coeur, Mo., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Apr. 3, 1978, Ser. No. 893,033
Int. Cl.[2] A61B *5/08*
U.S. Cl. 128—719 **6 Claims**



1. A flowmeter for providing synchronized gas flow data concurrently with gas samples to a mass spectrometer comprising:

a mass spectrometer having an input port,

a tubular flowmeter element for a gas flow to be sampled and having a first end, a second end, and a flow restricting means interposed between said first and second ends;

a gas transmission tube connecting the first end of said flowmeter element to said input port of said mass spectrometer;

first means for introducing a second gas into the second end of said flowmeter element, said second gas being foreign to the gases to be sampled;

conduit means coupled between said second end and said gas transmission tube, one end of said conduit means positioned in said second end to withdraw only said second gas, the other end of said conduit means being connected into said transmission tube at a point where a sample of gas will combine with said second gas withdrawn at substantially the same instant as said sample; and

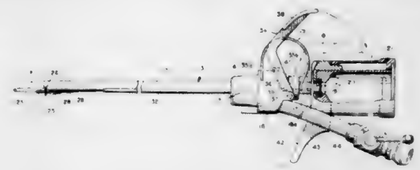
second means within said mass spectrometer for measuring the quantity of second gas in the combined sample transmitted to said mass spectrometer, said quantity being proportional to the pressure difference across said flow restricting means and indicative of the gas flow through said flowmeter.

4,178,920

UROLOGICAL INSTRUMENT WITH DEFLECTING ELEMENT

Charles D. Cawood, Jr., Houston, Tex., and John S. Ziegler, Arlington Heights, Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 3, 1977, Ser. No. 838,989
Int. Cl.[2] A61B *1/00*
U.S. Cl. 128—4 **14 Claims**



1. A urological instrument having an elongated sleeve for receiving the stem of an endoscope; said sleeve having proximal and distal ends; a deflecting element pivotally connected to said sleeve adjacent the distal end thereof; said element being movable between a retracted position generally parallel with said sleeve and an extended position projecting away from said sleeve; an operating lever pivotally supported upon said sleeve adjacent the proximal end thereof for pivotal movement of said lever between first and second positions; means operatively interconnecting said lever and said element for movement of said element between its retracted and extended positions as said lever is shifted between its first and second positions; and spring means urging said lever into its first position; said lever having a free end portion movable towards the axis of said sleeve when the lever pivots from its first position to its second position; said spring means urging said lever to shift said free end portion away from the axis of said sleeve.

4,178,921

TAPERED ROLLER PRESSURE RELIEF SUPPORT

Michael Kosiak, Minneapolis, Minn., assignor to Medrest Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 777,525, Mar. 14, 1977, abandoned, which is a continuation-in-part of Ser. No. 632,179, Nov. 17, 1975, Pat. No. 4,011,862, which is a continuation-in-part of Ser. No. 545,726, Jan. 31, 1975, abandoned. This application Mar. 27, 1978, Ser. No. 890,398
Int. Cl.[2] A61H *11/00*
U.S. Cl. 128—58 **31 Claims**

1. A structure for support of a buttocks in a partially cradled and varied pressure manner to facilitate movement of blood through the buttocks tissues, said structure comprising a sheet-

like flexible cover and a mechanical apparatus under said cover, said mechanical apparatus consisting essentially of

(i) a horizontally-oriented perimeter frame having front, rear, and side members;

(ii) a single endless flexible composite belt assembly consisting essentially of a pair of laterally spaced flexible endless base belts, a plurality of discrete roller members, an axis shaft projection from each end of each said roller member, and means for mounting said roller members through said axis shaft projections to said base belts, with said roller members in substantially parallel relationship between said base belts and freely rotatable with respect to said base belts, each said roller member being tapered from each end thereof toward the medial portion thereof, all ends of said roller members being substantially the same in diameter, all medial portions of said roller members being substantially the same in diameter but of a lesser diameter than at said ends, said taper of each said roller member being substantially circumferentially uniform and at an angle between 1° and 20° from a straight axis-parallel path between the ends of the roller member, said composite belt assembly being mounted in said frame to provide an upper stretch of said roller members under said flexible cover and a lower return stretch of said roller members,



(iii) a pair of horizontally-oriented track members mounted within said frame on said side members of said frame, said track members being laterally spaced to accommodate said roller members as transverse elements therebetween as said composite belt assembly is mounted in said frame, said track members providing support for said axis shaft projections of at least those of said upper stretch roller members intermediate the front and rear ends of said upper stretch, said track members being contoured to form a relatively depressed portion thereof at a location between the front and rear ends of said upper stretch, said relatively depressed portion being such as to allow said roller members at said portion of said upper stretch to be depressed relatively to end rollers of said upper stretch, the combination of said tapered roller members and said relatively depressed portion serving to provide a partially cradled comfort support for a buttocks, and

(iv) means for moving said composite belt assembly to cause said roller members thereof to move in sequence along said upper stretch, thereby to effect a stroking action of alternate pressure and release of pressure to facilitate blood movement through buttocks tissues resting on said structure.

4,178,922
THERAPEUTIC BELT
James D. Curlee, 347 Rivermoor Dr., Marietta, Pa. 17547
Filed Sep. 23, 1977, Ser. No. 835,867
Int. Cl.[2] A61F *5/02*
U.S. Cl. 128—78 **11 Claims**

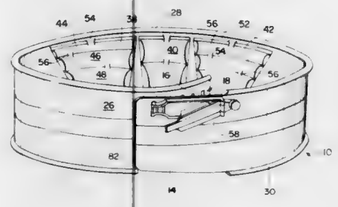
1. A therapeutic belt for application to the sacro-lumbar region of the human body comprising:

a one-piece synthetic plastic body encircling member having free ends;

cooperating releasable connecting means at said free ends for securing said body in position about a human torso;

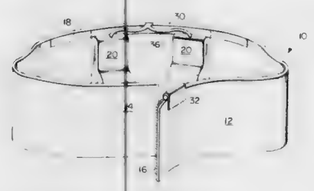
said body including a supporting band structure having upper and lower edge portions and of sufficient thickness to retain its body encircling relationship;

a connecting strip of the same material as, but thinner than, said band structure and extending downwardly from said upper edge portion on the inner side thereof;



and a plurality of inflatable air cell assemblies of the same material as said band structure and connecting strip and integral with and depending from said connecting strip.

4,178,923
THERAPEUTIC CORSET
James D. Curlee, 347 Rivermoor Dr., Marietta, Pa. 17547
Filed Sep. 23, 1977, Ser. No. 835,868
Int. Cl.[2] A61F *5/02*
U.S. Cl. 128—78 **13 Claims**



1. A therapeutic appliance for application to the sacro-lumbar region of the human body comprising:

a band-like support means having free ends and a length sufficient to extend around the back and encircle the abdominal region of the body;

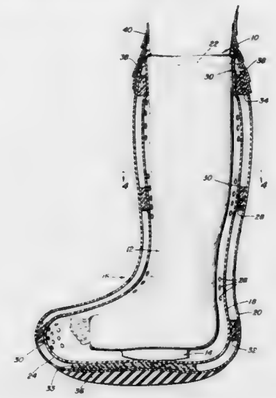
releasable connecting means embodied with free ends of said support means to secure the same in position;

at least one inflatable air cell means; and

releasable cooperating fastening means operably related between said air cell means and the surface of said support means that faces and extends across the sacro-lumbar region of the human body for releasably and adjustably positioning said air cell means within said suport means.

4,178,924
CAST PROTECTOR
Samuel H. Baxter, 3010 Graceland Ave., Northeast, Albuquerque, N. Mex. 87110
Continuation of Ser. No. 805,592, Jun. 6, 1977, abandoned, which is a continuation of Ser. No. 726,818, Sep. 27, 1976, abandoned, which is a continuation of Ser. No. 592,323, Jul. 1, 1975, abandoned. This application Feb. 10, 1978, Ser. No. 877,036
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—82 **13 Claims**

1. In combination, an elongate tubular protective cover for a cast enclosed body limb portion to be inserted into said cover from one open end thereof and with said one end including seal means for forming a substantially fluid tight seal between said one end of said cover and the adjacent body limb portion, said cover comprising inner and outer telescopingly engaged tubular members constructed of flexible material, said inner tubular member including means rendering it pervious to air flow therethrough, said outer tubular member being impervious to the flow of liquids therethrough, at least one substantially continuous band member disposed between said inner and



outer tubular members, intermediate their opposite ends, and secured to one of the opposing outer and inner surfaces thereof, said band member including means for absorbing moisture and comprising means to maintain at least the adjacent portions of said inner and outer tubular members spaced apart.

4,178,925
ADJUSTABLE POST-SURGICAL SHOE
Paul R. Hirt, 1 Needle Point La., Willingboro, N.J. 08046
Filed Mar. 7, 1978, Ser. No. 884,192
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—83.5 **7 Claims**



1. An adjustable post-surgical shoe comprising:

two sole elements,

first pin and tube connection means slidably connecting said elements for relative movement to one of several positions and second separate means securing the elements in adjusted position.

4,178,926
PEDIATRIC RESTRAINT DEVICE
Arnold K. Cohn, 2086 Drury La., Northfield, Ill. 60093
Filed May 1, 1978, Ser. No. 901,289
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—133 **6 Claims**

1. A restraint device for preventing a person's hands from contacting that person's legs while lying in a bed having side rails, comprising

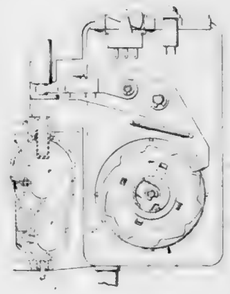
a generally flat plate which is positioned in a generally upright manner transversely to the person along the person's waist, said plate having a bottom wall which is



contoured to define a base portion at opposite ends which is positioned on said bed on opposite sides of the person's waist, and a central portion which overlies the person's waist, and

means for releasably securing said plate to said bed.

4,178,927
INTRAVENOUS LIQUID DELIVERY SYSTEM
Ingemar H. Lundquist, Oakland, Calif., assignor to Valleylab, Boulder, Colo.
Continuation of Ser. No. 627,842, Nov. 3, 1975, abandoned. This application Jul. 8, 1977, Ser. No. 813,980
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214 F **5 Claims**
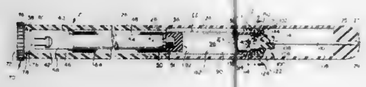


1. In an intravenous liquid delivery system for delivery of intravenous liquid from a source of supply to the patient, intravenous pump having a liquid filled chamber and having an inlet adapted to be connected to the source of supply, and an outlet adapted to be connected to the patient, a reciprocating plunger for causing the flow of intravenous liquid to be pumped through the pump chamber from the inlet to the outlet and an actuator for causing the reciprocatory movement of said plunger, said actuator including housing, drive means carried by the housing and having a rotatable output shaft, a set of removable cam members, each of said cam members having a plurality of peaks and valleys, said peaks and valleys on each of said cam members being different from the other cam members, a selected one of said cam members being coupled to said shaft so that it is driven thereby, a cam follower carried by said housing, yieldable means urging the cam follower into engagement with said cam member so that the cam follower is caused to move in accordance with the peaks and valleys of the selected cam as the rotatable shaft is rotated and means coupled to the cam follower for providing reciprocatory motion from

the cam follower for driving the plunger of said pump whereby intravenous liquid is dispensed by the pump in accordance with the selected one of said cam members.

4,178,928
SELF INJECTOR

Edward A. Tischlinger, 7 Froghollow Rd., East Lyme, Conn. 06333

Filed Aug. 10, 1977, Ser. No. 823,419
The portion of the term of this patent subsequent to Feb. 7, 1995, has been disclaimed.
Int. Cl.[2] A61M 5/20
U.S. Cl. 128—215 **8 Claims**

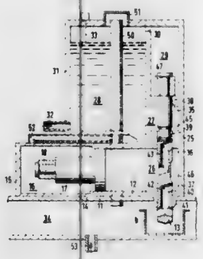


1. A self injector comprising in combination:
a spring powered gun assembly, said assembly including a cylindrical housing, a plunger rod movably carried within said housing, spring means for actuating the plunger rod, and retaining means for holding the spring means in compressed position and upon actuation for releasing said spring means; and
a cartridge assembly connected to the gun assembly, said cartridge assembly comprising a cylindrical shield connected to the gun housing, a cartridge slidably carried within the shield, said cartridge including a cylindrical tube, a plunger slidably mounted in the rearward end of said tube to close same off, a diaphragm positioned in the forward end of the tube to close off that end of the tube and form a medicament chamber between the plunger and the confronting face of the diaphragm, a nose piece fitted on the forward end portion of the tube, said nose piece having a body portion with a central bore therethrough and aligned with the longitudinal axis of the cartridge tube, the body portion having a forward and a rearward face, means extending forwardly from the nose piece body and in fluid communication with the aforesaid bore for receiving and mounting an injection cannula, means extending rearwardly from the nose piece body to receive the forward end of the cartridge tube, a spike distinct from any injection needle that might be mounted on the forward needle mounting means on the rearward side of the nose piece body with its point directed rearwardly, means for mounting the spike in the aforesaid position, and
a diaphragm positioned in the forward end of the cartridge tube on the rearward side of the nose piece body, said diaphragm comprising a cylindrical body having a forward open end, a flexible and pierceable diaphragm portion closing off the rearward end, the diaphragm fits around and over the spike with the diaphragm closed end being spaced rearwardly of the spike point, whereby with the plunger rod aligned with the plunger firing of the gun will cause the plunger rod to move the plunger and force the medicament in the medicament chamber to flex the diaphragm and pierce same in the spike to establish flow from the medicament chamber to and through the cannula, said cartridge tube being simultaneously moved to insert the cannula in the prescribed locus.

4,178,929
DOSING DEVICE FOR GERM-FREE MEASUREMENTS AND FILLING OF LIQUID MATERIAL

Guenther Voegele, Schönaich, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 20, 1977, Ser. No. 862,314
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658147
Int. Cl.[2] A61J 7/00
U.S. Cl. 128—213 R **3 Claims**



1. A dosing device for germ-free measuring and filling of individual portions of a liquid material, comprising:
a supply chamber for the liquid material;
a filling chamber to which a measured quantity of liquid material is delivered; and
a dosing pump connected to the supply chamber and the filling chamber, for delivering the measured quantity of liquid material from the supply chamber to the filling chamber, said dosing pump including:
(i) a piston; and
(ii) an extended chamber to allow a freeing of the piston, wherein the upper portion of the supply chamber, the extended chamber and the filling chamber are interconnected by rigidly arranged channels, and wherein the supply chamber, the extended chamber and the filling chamber are in contact with a sterile atmosphere maintained within said rigidly arranged channels.

4,178,930
COMBINED CAP AND NEEDLE STRUCTURE

Frank R. Fisher, Jr., 9614 N. Charlotte Ave., Kansas City, Mo. 64155

Filed Oct. 31, 1977, Ser. No. 847,158
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—215 **4 Claims**

1. A combined cap and needle structure adapted for use with a syringe tube having a hollow body portion with a plunger end and a discharge end and a neck portion integrally formed with said body portion to provide a discharge opening at the discharge end of said body portion, said neck portion being of a reduced diameter and tapered to its discharge opening, said cap and needle structure comprising:
a cap member having an opening defined therein, said opening being arranged to receive the neck portion of said syringe tube to removably install said cap member on the syringe tube;
said cap member is also provided with a cylindrically shaped bore which is adjacent to said opening and interconnected with said opening by a hollow channel;
a sealing member positioned within said opening between the discharge opening of the neck portion of said syringe tube and said hollow channel to substantially seal the discharge opening of said syringe from the passage of fluid;
the needle having inlet and outlet ends with a passage extending between the inlet and outlet ends thereof;
a guide member attached to a portion of said needle intermediate its inlet and outlet ends, said guide member having a cylindrically shaped base portion which fits slidably within the cylindrical shaped bore of said cap member to move the needle from a non-piercing position wherein the inlet end of said needle is in proximity to said sealing member to a piercing position wherein the inlet end of said

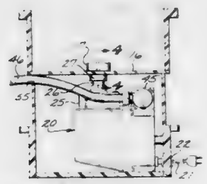


needle passes through said sealing member into communication with the interior of said syringe tube; and
a frangible heat seal connecting said guide member to said cap member in a non-piercing position, said frangible heat seal being adapted to be broken to permit movement of the needle to said piercing position.

4,178,931
PORTABLE BIDET, ENEMA AND DOUCHE

Gene C. Lind; Ralph C. Lind, both of 3701 Lewis Ave., Long Beach, Calif. 90807; Frank L. Lind, 5958 Gaviota, Long Beach, Calif. 90805; Edmund K. Burchman, 2642 Copa De Oro Dr., Los Alamitos, Calif. 90720, and Robert Trauger, 19127 S. Pioneer Space 95, Artesia, Calif. 90701

Filed Dec. 5, 1977, Ser. No. 857,228
Int. Cl.[2] A61M 1/00
U.S. Cl. 128—230 **5 Claims**

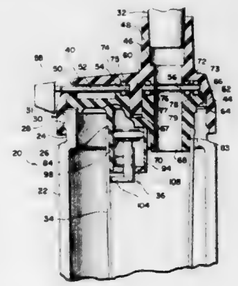


1. A portable cleansing assembly comprising:
a pump assembly adapted for excitation by a source of A.C. electrical power;
a first rectangular, hollow container including a rectangular first interior cavity conformed to support said pump assembly, said first container including a planar peripheral surface surrounding said first cavity, the free edge of said surface being conformed to define a plane;
an input fitting attached to said pump and including an input pipe aligned to extend across said plane defined by said free edge of said peripheral surface, said input pipe includes an end closure formed on the free end thereof, a cylindrical projection extending axially from said end closure and a plurality of bores formed in said end closure in circumferential alignment around said projection;
a second rectangular hollow container including a second cavity conformed for telescopic receipt of said peripheral surface in a first mode of cooperative alignment and to be supported on said edge in an inverted arrangement in a second mode of cooperative alignment;
a spring loaded normally closed poppet valve assembly extending across the surface of said second container in receiving alignment with said input pipe when said second container is inverted according to said second mode whereby said poppet valve assembly is unseated by said input pipe, said poppet valve assembly including a valve housing disposed on the interior of said second cavity, a plurality of openings formed in the lateral surfaces of said housing, a through-wall fitting extending from the interior of said housing to the exterior of said second container conformed to receive said input pipe, and a spring-loaded valve urged against said fitting within said housing and deployed for vertical translation by said cylindrical projection;
output fitting means connected to said pump; and
liquid dispensing means connected to said output fitting means for dispensing liquids deposited in said second container and transferred through said poppet valve assembly and said pipe.

4,178,932
VACUUM CURETTAGE DEVICE WITH VACUUM INDICATOR

Francis E. Ryder, Barrington, Ill., and Michael D. Thomas, Arab, Ala., assignors to Ryder International Corporation, Barrington, Ill.

Filed Sep. 6, 1977, Ser. No. 830,770
Int. Cl.[2] A61M 1/00
U.S. Cl. 128—276 **11 Claims**



1. A medical device such as a curette or the like, comprising a vessel including cover structure with aperture means in the cover for attachment of a medical implement, such as a cannula, or the like, which vessel is adapted to be evacuated, valve means intermediate said vessel and said medical implement for selectively applying said vacuum to said medical implement, vacuum indicator means carried by said cover structure, interiorly of said vessel to provide a visual indication corresponding to the presence or absence of a vacuum in said vessel, said vacuum indicator means including cylinder means having a closed end and an open end, a piston member having a head portion disposed in said open end of said cylinder means, an O-ring carried by said head portion to adapt said head portion for sliding sealed engagement with the walls of said cylinder means and said piston also having a shaft of lesser diameter dimension than said head portion, and guide means with said cylinder open end receiving said shaft to maintain said head portion in co-axial alignment with said cylinder, thereby guiding the sliding sealed movement of said head portion within said cylinder means, said cylinder means including a recessed portion in said closed end and said head portion being of a lesser diameter dimension than said cylinder means to allow said head portion to enter said cylinder means in a tilted posi-

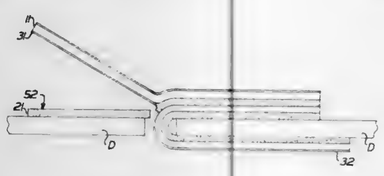
tion for displacing a quantity of air from said cylinder upon assembly and for retaining a residual supply of air such that said piston member may be disposed in said cylinder means proximate the closed end thereof at atmospheric pressure to trap a quantity of air in said recessed portion, and said piston member further comprising an indicator member carried by said shaft whereby upon evacuation of said vessel a pressure differential will exist across said piston causing said retained quantity of air to expand and move said piston toward said open end, with the position of said indicator member being adapted to be employed to provide a visual indication of the existance of a vacuum in said vessel.

4,178,933

EXTRACTIVE TRANSFER DIAPER TAB MEANS

Suzette B. Nemeth, Painesville, Ohio, assignor to Avery International Corporation, San Marino, Calif.

Filed Mar. 23, 1977, Ser. No. 780,411
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—284 **3 Claims**



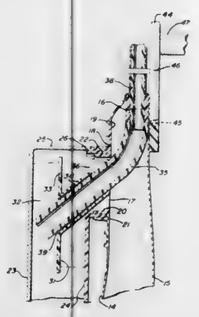
1. A diaper having a linerless refastenable two-substrate diaper tab formed of diaper tab stock comprising a web construction made up of initially flat but flexible substrate material and suitable to be formed in long passes along the machine direction of a coating and laminating line and to be rolled up for storage and shipment, and unrolled for use by diaper manufacturers, and fabricatable for storage and shipment completely by web coating and web-to-web laminating operations and without the necessity for folding or slitting operations, and suitable for high speed dispensing on automatic equipment, said tab including a first substrate extending, transversely to machine direction, along first and second length portions and bearing first substrate adhesive on its underside at both said length portions, a second substrate extending along said first and second length portions and bearing second substrate adhesive on its underside at both said first and second length portions, first and second release means for said first substrate adhesive being located respectively above and below said first substrate adhesive at said second length portion, said first length portion being substantially free of both first and second release means, said first release means being on the underside of said first substrate and said second release means being on the topside of said second substrate, said second release means having physical and structural characteristics for providing a release from said first substrate adhesive at a lower separating force level than that required by the physical and structural characteristics of said first release means, the tab initially being applied to one edge of a diaper with the first length portions of the second substrate adhesive, second substrate, first substrate adhesive, and first substrate respectively layered on one side of said one diaper edge and with the second length portions of the second substrate adhesive and second substrate, the second release means, the second length portion of the first substrate adhesive, the first release means and the second length portion of the first substrate respectively layered on the opposite side of said one diaper edge, whereby when the tab, mounted on said one edge of the diaper, is manipulated in the normal manner by a person who fastens and then unfastens the diaper by separating the second length portion of the first substrate adhesive, first release means, and second length portion of the first substrate from the second release means and applying the same to another part of the diaper for fastening and then removing the first release means and second length portion of the first substrate for unfastening, the part of said first substrate adhesive that is at said second length portion being exclusively extractively transferred from between said first and second substrates and from said second length portion of said first substrate permanently to said other part of the diaper.

4,178,934

URINE METER AND COLLECTION ASSEMBLY

Hugh M. Forman, Waukesha, Wis., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Dec. 27, 1977, Ser. No. 864,178
Int. Cl.[2] A61R *5/44*
U.S. Cl. 128—295 **9 Claims**



1. A urine metering and collection assembly comprising:
a fluid collection container having at least one flexible wall, a first inlet port near the top end of said container and a transfer port in said flexible wall below said inlet port;
a rigid measuring container having at least one first volume calibrated compartment, said first volume calibrated compartment, having a second inlet port;
means for attaching said measuring container to said flexible wall, said means aligning said transfer port and said second inlet port; and
a flexible tubular conduit continuously extending from said first inlet port, through said transfer port and into said second inlet port to deliver fluid from said first inlet port to said second inlet port.

4,178,935

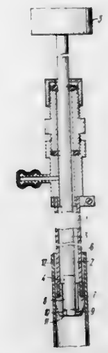
METHOD AND APPARATUS FOR DISINTEGRATION OF URINARY CONCRETIONS

Boris S. Gekhman, ulitsa Parizhskoi kommuny, 22-B, kv. 24; Petr N. Vasilevsky, bulvar Druzhby narodov, 8, kv. 27; Jury G. Ediny, prospekt 40-letia Oktyabrya, 88, kv. 67; Ivan V. Parfinenko, ulitsa Kochubeevskaya, 12[a], kv. 1, and Alfred M. Podgursky, Elektrotekhnichesky pereulok, 3, kv. 10, all of Kiev, U.S.S.R.

Filed Jul. 21, 1977, Ser. No. 817,787
Int. Cl.[2] A61B *17/00*
U.S. Cl. 128—328 **12 Claims**

1. An apparatus for disintegration of urinary concretions comprising:
a catheter for insertion into the ureter;
a bushing having an axial bore coaxially mounted on one end of said catheter, having an inwardly projecting annular lip, said lip defining an axial bore smaller than the axial bore of said bushing and being provided with longitudinal through ducts extending through said lip for the supply of liquid to the region of the concretion;
an operating element within said catheter adapted to act upon the concretion and provided with a bearing surface adjacent said lip having a cross section larger than the

axial bore defined by said lip, said bearing surface interacting with said lip inside said bushing for restriction of axial movement of said operating element from said bushing; and
a coupling member supporting said operating element on one end, means connected to said coupling member on the



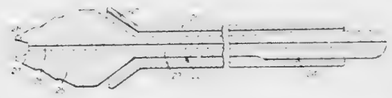
opposite end for transmitting power to said operating element via said coupling member to activate it, said coupling member being coaxially disposed in said catheter; and
wherein said bushing and the lip thereof are shaped and sized to permit alternate mounting of a milling cutter and a discharge arrester to be used as said operating element.

4,178,936

APPARATUS FOR USE IN COLLECTING EGGS FROM ANIMALS

Raymond Newcomb, Sudbury, England, assignor to Milk Marketing Board, Surrey, England

Filed Jul. 27, 1977, Ser. No. 819,419
Claims priority, application United Kingdom, Aug. 2, 1976, 32184/76
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—349 B **8 Claims**



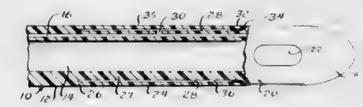
1. An apparatus for collecting eggs from the upper reaches of the uterine horn of an animal, which apparatus comprises:
(i) an introducer comprising (a) a generally rigid tubular outer member open at both ends and having a smooth leading end region, and (b) an inner member locatable within the outer member and provided over its length with a duct, the inner member having a smooth leading end region; and
(ii) a catheter of greater length than the introducer and comprising (a) a flexible tubular portion provided over at least part of its length with a plurality of internal channels and terminating at one end in a leading region, and (b) an inflatable cuff provided on the outside of an intermediate region of the tubular portion; wherein a first channel within the tubular portion communicates with at least one outwardly opening hole in the leading region, a second channel within the tubular portion communicates with at least one outwardly opening hole in the tubular portion in a region between the inflatable cuff and the leading region; and a third channel within the tubular portion communicates with the interior of the inflatable cuff; wherein the tubular portion and cuff, when non-inflated, are slidable within the rigid tubular outer member of the introducer; and wherein, when the inner member is within the outer member with the leading end of the inner member projecting slightly beyond that of the outer member, the leading end region of the introducer is generally smooth such that the leading end region of the introducer can be passed through the cervix of the animal without snagging any tissue; the arrangement being such that, in use, the leading region of the introducer is passed through the cervix of the animal with the inner member within the outer member, after which mucous may be withdrawn through the duct of the inner member, the inner member is withdrawn from the outer member, and the catheter is introduced into the outer member until the cuff has passed beyond the outer member, the flexibility of the catheter permitting the catheter to follow the curve of the uterine horn, whereupon, once the leading end region of the catheter is in the desired position, the cuff is inflated and fluid introduced through the first channel.

4,178,937

CATHETER WITH INTEGRAL BALLOON AND METHOD

Glenn N. Taylor, Cary, and Bhupendra C. Patel, Elgin, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Sep. 1, 1977, Ser. No. 829,868
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—349 B **7 Claims**



1. A catheter comprising, an elongated shaft of elastic material having a main lumen, and an annular sleeve overlying a distal surface region of said shaft, with one end of said sleeve being of one-piece construction with the shaft, with said shaft being of one-piece construction intermediate said distal surface region including said sleeve and a proximal end portion of the catheter located outside the patient's body when the catheter is placed in the body, with a circumferential end portion of said sleeve spaced from said one sleeve end being bonded to the shaft to define a cavity between the sleeve and said shaft surface, and with said one sleeve end being proximal said circumferential end portion of the sleeve, and means defining an inflation lumen extending along the shaft and communicating with said cavity to inflate the sleeve.

4,178,938

PRESSURE CONTROL SYSTEMS

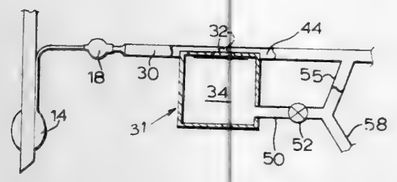
Anthony S. Au, P.O. Box 2593, Station A, Sudbury, Ontario, Canada (P3A 4S9)

Filed Jun. 24, 1977, Ser. No. 809,802
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—207.15 **9 Claims**

1. A self-contained automatic penumatic vent valve comprising:
(a) a body,
(b) a through passage opening through said body, said through passage having a longitudinally extending first side wall which is arcuate in shape in a direction transverse to its longitudinal extent,
(c) an enclosed pressure chamber formed in said body and disposed outwardly from said through passage,
(d) a valve passage extending between said pressure chamber and said through passage, said valve passage having a first

end disposed opposite and opening toward said first side wall of said through passage,

(e) a flexible valve closure member mounted in said body and extending across said first end of said valve passage to close said valve passage, said flexible closure member being disposed opposite said first side wall of said through passage in a face-to-face relationship therewith and being extendable from a first position in which it is spaced from said first side wall to permit free flow of fluid through said through passage to a second position in which it extends into engagement with said first side wall to close said through passage in response to variations in the differential pressure between the pressure in said pressure chamber and the pressure in said through passage,



(f) a single input passage means opening into said pressure chamber for admitting air under pressure to and venting air from said pressure chamber,

(g) valve means in said single input passage which is operable for selectively opening and closing said input passage whereby when said valve is closed it completely isolates said pressure chamber such that after pressurizing said pressure chamber, said valve may be closed and said pneumatic vent valve may operate automatically to open and close said through passage as required in use.

4,178,939

VISUAL INDICATOR FOR CUFF-TYPE CATHETER

Thomas P. Stephens, Boxford, Mass., assignor to Portex, Inc., Wilmington, Mass.

Filed Sep. 29, 1977, Ser. No. 838,026
Int. Cl.² A61M 25/00
U.S. Cl. 128—207.15 **7 Claims**





1. A deformable apparatus for visually indicating the shape of an inflatable cuff that surrounds a surgicomedico catheter and the like of the type adaptable for insertion into a body passage, and comprising:

a deformable, hollow-walled indicator enclosing a substantially empty, chamber-like area and including first and second apertures each extending through a wall portion thereof;

a tubular-connecting member including a first end portion in fluid-tight engagement with a wall portion forming said first aperture, said tubular member further including a second end portion in fluid-tight engagement with said inflatable cuff to provide a continuous, fluid-tight passageway between the chamber of said indicator and said cuff;

fluid pressure means in fluid-tight engagement with a wall portion forming said second aperture for selectively varying the fluid pressure within said continuous, fluid-tight passageway to inflate and deflate said indicator and said cuff, respectively; and

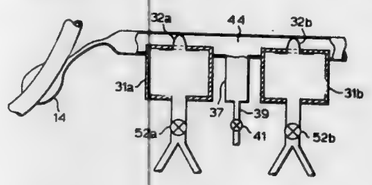
preformed deformable ridge means extending substantially longitudinally along substantially the length of said hollow-walled indicator for controlling the configuration of said indicator responsive to selective actuation of said fluid pressure means, said ridge means being present in odd numbered multiples thereof preventing occlusion of said indicator chamber during deflation of said cuff.

4,178,940

PRESSURE CONTROL SYSTEMS

Anthony S. Au, P.O. Box 2593, Station A, Sudbury, Ontario, Canada (P3A 4S9)

Continuation-in-part of Ser. No. 809,802, Jun. 24, 1977. This application Feb. 15, 1978, Ser. No. 877,986
Int. Cl.² A61M 25/00
U.S. Cl. 128—207.15 **4 Claims**



1. An inflatable cuff system for a tracheal or endotracheal tube or the like, comprising:

(a) an inflatable cuff,

(b) an inflation passage communicating with said cuff by means of which the cuff may be inflated by an inflating medium,

(c) a pressure releasing first valve and a pressure releasing second valve arranged in series with one another in the inflation passage for regulating the flow of inflating medium through the inflation passage,

(d) said first and second valves being spaced from one another to provide a reservoir for inflating medium therebetween,

(e) said first valve being located between said cuff and said reservoir and being set to open to permit inflating medium to escape from said cuff into said reservoir when the pressure in the cuff rises above a predetermined first pressure,

(f) said second valve being located outwardly from said reservoir in relation to the cuff and being set to open to permit inflating medium to escape from said reservoir when the pressure in the reservoir rises above a predetermined second pressure which is greater than said first pressure whereby at least a portion of the inflating medium displaced from the cuff into the reservoir may be retained in the reservoir at a pressure up to said second pressure and may be returned to said cuff when the pressure in the cuff drops below the pressure in the reservoir.

4,178,941

METHOD FOR DRAWING A BLOOD SAMPLE

Russell G. Raitto, Fitzwilliam, N.H., assignor to Concord Laboratories, Inc., Keene, N.H.

Division of Ser. No. 715,678, Aug. 19, 1976, abandoned, which is a continuation of Ser. No. 542,578, Jan. 20, 1975, abandoned. This application May 9, 1977, Ser. No. 795,187
Int. Cl.² A61M 5/00
U.S. Cl. 128—763 **6 Claims**



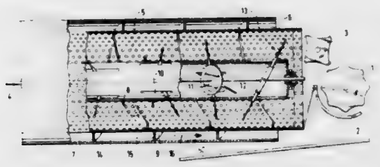
1. A method of drawing a blood sample into a syringe having a barrel with a barrel floor, a needle, a plunger with a compressible plunger tip forming with the end of said barrel a chamber containing anti-coagulant and means to limit the minimum size of said chamber by movement of said plunger to its innermost limit, said method comprising expelling from said chamber air which is present and anticoagulant in excess of an amount sufficient to prevent coagulation in the blood sample to be taken but less than an amount which will adversely affect the test to be performed by moving said plunger into the syringe to said innermost limit, and thereafter inserting said needle into a blood vessel of a patient and allowing the blood pressure of the patient to force the blood sample into the chamber and thereby move said plunger outwardly, whereby the blood sample mixes with the anticoagulant left in said syringe.

4,178,942

APPARATUS FOR AGRICULTURAL MACHINES

Josef Nusser, D-7963 Eichstegen, Fed. Rep. of Germany

Filed Mar. 8, 1978, Ser. No. 884,646
Int. Cl.² A01F 7/06
U.S. Cl. 130—23 **27 Claims**



26. An apparatus for conveying material comprising:

a frame;

a central shaft mounted on said frame;

a first wall means defining an outer cylinder mounted on said shaft with its longitudinal axis in a substantially non-vertical position;

a second wall means defining an inner cylinder disposed within said outer cylinder and mounted on said central shaft with its longitudinal axis in a substantially non-vertical position, said second wall means of said inner cylinder defining apertures therein;

a plurality of discs spaced along and secured to said shaft with the plane of each disc at a non-right angle relative to said central shaft;

a ring mounted around the periphery of each said disc in the plane of the disc and adapted to rotate relative to said disc; and

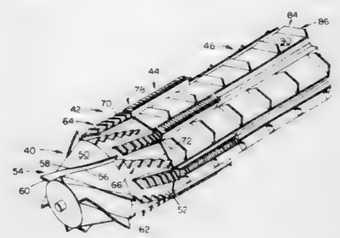
tines secured to said ring in the plane of the ring and projecting outwardly through said apertures on said inner cylinder and into the space between said inner and outer cylinders whereby relative rotation of said shaft and said cylinders causes said tines to rotate and to move said material along the space between said cylinders.

4,178,943

ROTOR FOR AN AXIAL FLOW ROTARY SEPARATOR

Neil L. West, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 24, 1978, Ser. No. 889,626
Int. Cl.² A01F 12/18
U.S. Cl. 130—27 T **33 Claims**



1. In an axial flow rotary separator for processing crop material including a housing having walls including a foraminous portion, an inlet for receiving crop material and an outlet axially spaced downstream from the inlet, an improved rotor, mounted for rotation in the housing about an axis of rotation and disposed so as to create in cooperation with the housing an annular space extending axially between the inlet and the outlet, comprising:

a frame;

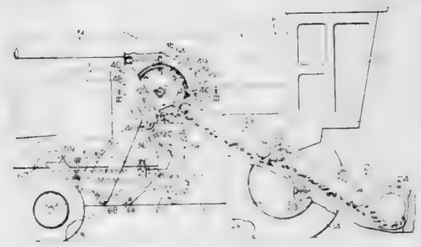
a plurality of material control blades carried by the frame, each blade being inclined away from a radial line passing through the blade and having a line of slope directed generally downstream and having a radially inwardly disposed inner edge and a radially outwardly disposed working edge, said working edge having, with respect to rotor rotation, a leading and a trailing portion and being disposed substantially athwart the direction of rotation with the leading portion upstream of the trailing portion, said blades being disposed to engage crop material delivered to the inlet and propel it in the annular space, cooperating with the housing to agitate and separate the material so that a first portion is expelled through the foraminous portion of the housing wall and said working edges urging the material downstream so that a second portion is discharged through the outlet.

4,178,944

TAILINGS RETURN FOR AN AXIAL FLOW COMBINE

Roger D. Hanaway, Blue Springs, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 11, 1977, Ser. No. 841,212
Int. Cl.² A01F 7/00
U.S. Cl. 130—27 R **11 Claims**



1. In an axial flow combine for harvesting seed, the combination comprising:

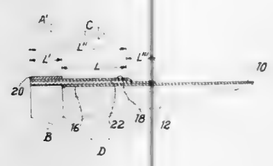
a threshing section including
a housing having walls including a pair of lateral spaced vertical sidewalls extending in the longitudinal direction of the combine and a transversely extending discharge opening permitting discharge of threshed material from the threshing section,
a foraminous cylindrical cage extending between said sidewalls,
a threshing cylinder disposed within said cage, said cage and cylinder being disposed on a horizontal axis disposed transverse to the direction of travel of said combine, and
a transversely disposed distribution auger in said housing for conveying some of the threshed material passing through said cage to said discharge opening,
a cleaning section receiving threshed material discharged from said threshing section by way of said discharge opening, said cleaning section including means or separating light particles and tailings from the seed and
a tailings elevator connected at its lower end to said cleaning section to receive said tailings and having its upper end disposed in delivery relation to said distribution auger.

4,178,945

CIGARETTES HAVING AN INDIVIDUAL LIGHTING MEANS, AND METHOD OF MAKING THEREOF

Francesco De Capitani, Corso Magenta 83, Milan, Italy

Filed Jan. 10, 1977, Ser. No. 760,768
Claims priority, application Italy, Jan. 26, 1976, 19580 A/76
Int. Cl.[2] A24C *5/60;* **A24D** *1/08*
U.S. Cl. 131—23 R **4 Claims**



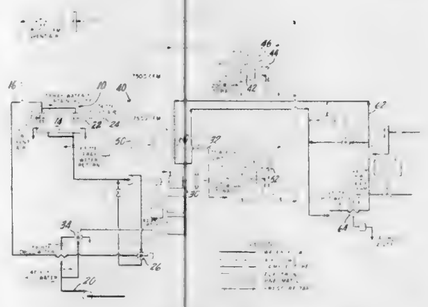
1. A process for manufacturing tobacco articles, such as cigarettes, small cigars and the like, having on outer ends thereof self-lighting means for lighting the tobacco articles without the use of external heat sources, said process comprising:
providing conventional tobacco articles and advancing said tobacco articles in a feed direction, with said tobacco articles arranged in pairs extending transverse to said feed direction, and with adjacent ends of said tobacco articles of each said pair being coaxially spaced;
forming an elongated continuous composite band including a continuous supporting band of combustible material having on a first side thereof a continuous outer band of a first material that can be ignited by rubbing and that allows for a quick spreading of flame, said supporting band having on a second side thereof a continuous inner band of a second material that can easily be ignited and that can be charred and converted into embers capable of igniting said tobacco articles;
longitudinally advancing said composite band in said feed direction to a position adjacent said adjacent ends of said pairs of advancing tobacco articles;
dividing said advancing composite band into pieces having lengths, taken in said feed direction, substantially equal to the circumferential dimensions of said tobacco articles;
wrapping each said piece circumferentially around said adjacent ends of a respective said pair of tobacco articles, such that said first material is positioned radially outwardly and said second material is positioned radially inwardly and in contact with the outer circumferences of said ends of said respective pair of tobacco articles; and
dividing the thus wrapped pieces substantially between the said adjacent ends of said respective pairs of tobacco articles.

4,178,946

APPARATUS AND METHOD FOR CONTROL OF AIR RELATIVE HUMIDITY WITH REDUCED ENERGY USAGE IN THE TREATMENT OF TOBACCO

Jack B. Knight, Richmond, Va., assignor to Philip Morris Incorporated, Richmond, Va.

Division of Ser. No. 699,880, Jun. 25, 1976, Pat. No. 4,089,666.
This application Sep. 26, 1977, Ser. No. 836,525
Int. Cl.[2] A24B *3/02, 3/04*
U.S. Cl. 131—135 **17 Claims**



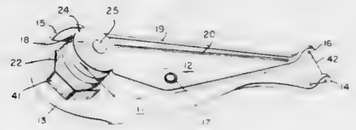
15. Apparatus for moistening relatively dry tobacco to provide same with a desired predetermined moisture content with a conditioned air stream having desired predetermined dry bulb temperature and relative humidity values, which apparatus comprises
means for establishing and maintaining a water spray curtain,
means for passing the air through said water spray curtain to condition it, said water spray curtain being disposed transversely of the direction of the air flow and presenting a variable area of heat exchange confrontation to said flow,
means for conveying a first portion of said conditioned air through the tobacco to add moisture thereto up to a certain content less than said predetermined moisture content,
means for heating the remainder portion of said conditioned air to reduce the relative humidity thereof by a predetermined level and means for passing said remainder portion of said conditioned air through the tobacco to add sufficient additional moisture thereto to raise the tobacco moisture content to said desired predetermined content,
means for sensing the dry bulb temperature of the conditioned air downstream of the spray curtain and varying the spray curtain area responsive to variations of the sensed dry bulb temperature from said desired predetermined value to correspondingly control the quantity of heat exchange effected to the air stream in said spray curtain, and
means for sensing the dew point temperature of the conditioned air stream downstream of the spray curtain and controlling the temperature of the water supplied to said spray curtain responsive to variations of the sensed dew point temperature from a predetermined value thereby to control the dew point temperature of said conditioned air at said predetermined value whereby the air leaving said spray curtain is at said desired relative humidity value.

4,178,947

TENSIONING DEVICE FOR A DENTAL FLOSSING APPARATUS

Phyllis J. McCourry, 3306 McCourry St., Bakersfield, Calif. 93304, and Victoria L. Fuhrman, 4506 Knoll Dr., Bakersfield, Calif. 93308

Filed Feb. 1, 1978, Ser. No. 874,261
Int. Cl.[2] A61C *15/00*
U.S. Cl. 132—92 R **2 Claims**



1. In a dental flossing apparatus an improved tensioning mechanism for use in combination with dental floss on spool in a hexagonally shaped dental floss container having an inner lip, said improved tensioning mechanism comprising:
a. a first elongated member, which has a hexagonally shaped hole at a first end in which the dental floss container is snugly placed and which has a raised tip-portion at a second end, said raised tip-portion having a hole which is disposed perpendicularly to said first elongated member and through which the dental floss passes;
b. a second elongated member, which also has a first end and a second end, having a raised tip-portion at its second end that has a hole which is disposed perpendicularly to said elongated member and through which the dental floss passes, said second elongated member is formed so that when it is pivotally coupled to said first elongated member in a scissor-like manner said raised tip-portion of said second elongated member will separate from said raised tip-portion of said first elongated member when said first ends of said first and second elongated members are brought together;
c. dispensing means for controlling the dispensing of the dental floss from the dental floss container, mechanically coupled to said first and second elongated members, said dispensing means comprising:
a. a shaft which forceably engages the dental floss spool;
b. a disc is positively placed into the floss container so that its peripheral edge is adjacent to the inner lip of the dental floss container, said disc is mechanically coupled to said shaft; and
c. a collecting spool, which receives used dental floss, mechanically coupled to said shaft; and
d. a ratchet system mechanically coupled to said collecting spool so that it allows said collecting spool to rotate in only one direction.

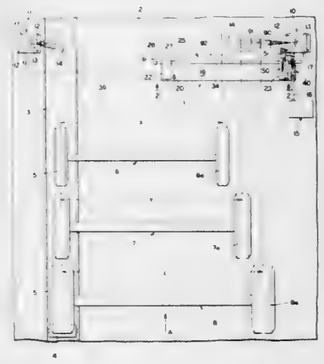
4,178,948

APPARATUS FOR USE IN CLEANING VEHICLE TIRES

Lonn L. Swinehart, 1215 Seventh St. NE., North Canton, Stark County, Ohio 44720

Filed Sep. 6, 1978, Ser. No. 940,444
Int. Cl.[2] B08B *3/02;* **B60S** *3/04*
U.S. Cl. 134—45 **18 Claims**

1. An apparatus for cleaning the sidewalls of tires of passing vehicles in an automatic carwash system of the type having fluid spray nozzle means for spraying the sidewalls of the passing vehicle tires with a cleaning fluid, a supply of cleaning fluid communicating with the nozzle means, valve means for controlling the flow of cleaning fluid to the nozzle means, and treadleplate means mounted in the travel path of at least one of the vehicle tires and having a movably mounted contact plate communicating with the valve means for actuating said valve means when the contact plate is depressed by a passing vehicle tire, wherein the improvement includes a stepped outer end formed on the contact plate providing a plurality of tire contact zones of different lengths for regulating the activation



time of the valve means depending upon the particular contact zone contacted by a vehicle tire.

4,178,949

ROTATING WEAR RINGS FOR SWIMMING POOL WHIP HOSES

Gus G. Mazon, III, 1625 Avenida De Las Americas, Tucson, Ariz. 85704

Filed May 26, 1978, Ser. No. 909,625
Int. Cl.[2] B08B *3/02, 9/08*
U.S. Cl. 134—167 R **9 Claims**



9. A rotational device for use on a flexible whip hose for cleaning a swimming pool, said rotational device comprising in combination:
(a) rotating means concentrically disposed about said flexible whip hose for rolling along interior surfaces of the swimming pool while supporting said flexible whip hose to prevent abrading of said flexible whip hose by the interior surfaces; and
(b) bearing means concentrically disposed on and frictionally engaging said flexible whip hose for axially and rotatably supporting said rotating means, said bearing means including a first cylindrical tubular shaft concentrically disposed about and frictionally engaging said flexible whip hose and having an outside diameter less than the inside diameter of said cylindrical collar, the difference between said outside diameter and said inside diameter being a predetermined tolerance dimension selected to permit substantially free rotation of said cylindrical collar about said first cylindrical tubular shaft.

V 9 8 9 3 DE 1 8 7 9 UMI

4,178,950
RESIDUAL FUEL COMPOSITIONS WITH LOW POUR POINTS
William M. Sweeney, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.
Filed Oct. 10, 1978, Ser. No. 949,915
Int. Cl.[2] F17D *1/17*
U.S. Cl. 137—13 **9 Claims**

1. A low pour residual fuel oil composition comprising a major amount of a high pour point, low sulfur, waxy, residual fuel and a minor amount of a low wax, low pour residual fuel oil and an effective pour depressant amount of an oil-soluble polymer selected from the group consisting of a terpolymer comprising recurring units of vinyl acetate, ethylene and an olefin selected from the group consisting of propylene and butylene and a graft copolymer comprising an ethylene-vinyl acetate copolymer backbone having grafted thereto an olefin selected from the group consisting of propylene and butylene.

7. In the transportation of residual fuel oils, the improvement which comprises introducing into a pipeline a low pour residual fuel composition comprising a major amount of a high pour point, low sulfur waxy residual fuel and a minor amount of a low wax, low pour residual fuel and an effective pour depressant amount of an oil-soluble polymer selected from the group consisting of a terpolymer comprising recurring units of vinyl acetate, ethylene and an olefin selected from the group consisting of propylene and butylene and a graft copolymer comprising an ethylene-vinyl acetate copolymer backbone having grafted thereto an olefin selected from the group consisting of propylene and butylene.

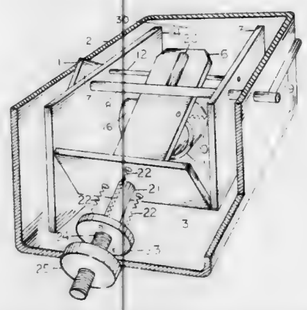
4,178,951
LOW POUR POINT CRUDE OIL COMPOSITIONS
William M. Sweeney, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.
Filed Oct. 10, 1978, Ser. No. 950,197
Int. Cl.[2] F17D *1/17*
U.S. Cl. 137—13 **9 Claims**

1. A crude oil composition having improved pour point characteristics comprising a waxy crude oil and an effective pour depressant amount of an oil-soluble polymer selected from the group consisting of (A) a terpolymer of vinyl acetate, ethylene and an olefin selected from the group consisting of propylene and butylene and (B) a graft copolymer comprising an ethylene-vinyl acetate copolymer backbone having grafted thereto an olefin selected from the group consisting of propylene and butylene.

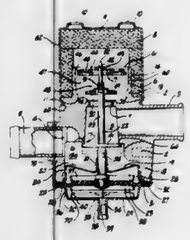
7. In the transportation of crude oils, the improvement which comprises introducing into a pipeline the crude oil composition comprising a waxy crude oil and an effective pour depressant amount of an oil-soluble polymer selected from the group consisting of (A) a terpolymer comprising of vinyl acetate, ethylene and an olefin selected from the group consisting of propylene and butylene and a graft copolymer comprising an ethylene-vinyl acetate copolymer backbone having grafted thereto an olefin selected from the group consisting of propylene and butylene.

4,178,952
INERTIAL VALVE
William J. Baker, 1469 Belview, Apt. 702, Burlingame, Calif. 94010, and Gerry L. Baker, 34 Alviso Ct., Pacifica, Calif. 94044
Filed Oct. 20, 1977, Ser. No. 843,881
Int. Cl.[2] F16K *17/36*
U.S. Cl. 137—38 **9 Claims**

1. A safety inertial valve system which comprises:
a. a housing;
b. at least one first valve contained within said housing,
c. means for closing said first valve in response to vibration;
d. means for opening said first valve;
e. at least one second valve contained within said housing; and
f. means for opening and closing said second valve coupled to said first valve opening means said means for opening said first valve and said means for opening and closing said second valve causing said second valve to be closed while opening said first valve.



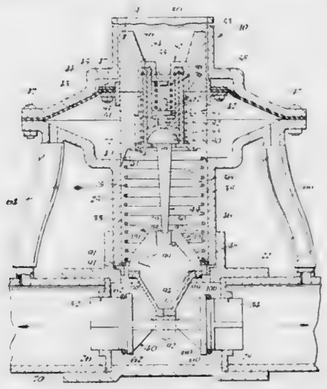
4,178,953
FAIL SAFE BYPASS VALVE
Jack M. White, Florissant, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.
Filed Dec. 23, 1974, Ser. No. 535,955
The portion of the term of this patent subsequent to Dec. 18, 1995, has been disclaimed.
Int. Cl.[2] F02B *75/10*
U.S. Cl. 137—116 **6 Claims**



1. A valve structure comprising:
a valve body having inlet and outlet openings and main and by-pass ports in said valve body, said valve body having a passage between said inlet opening, said main valve port, said by-pass port and said outlet opening;
a diaphragm chamber structure mounted to said valve body;
a source of engine vacuum connected to said chamber;
a diaphragm assembly mounted in said diaphragm chamber structure, said diaphragm assembly including a valve stem having a first end and a second end, and a flexible diaphragm mounted to said second end of said valve stem, said diaphragm being flexible in response to variations in said engine vacuum forces acting on it so as to define at least a first position and a second position for said valve stem and wherein a low vacuum will permit said first position and a high vacuum will urge said diaphragm to said second position;
a first valve member fixed to said valve stem and adapted to close said main outlet port in said first position of said valve stem;
a second valve member of a diameter substantially equal to said by-pass port for engaging said by-pass port and movably mounted on said valve stem, movement of said second valve member being independent of said valve stem movement;

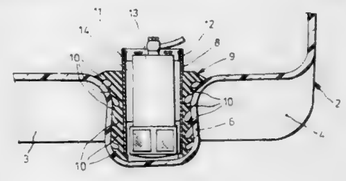
means operatively connected along said first end of said valve stem for biasing said second valve member against said by-pass port, and means for biasing said diaphragm assembly toward the first position of said valve stem, said valve body including a skirt defining said by-pass port and said diaphragm assembly biasing means including a substantially circular valve plate operatively connected to said first end of said valve stem and movable with said valve stem within the space enclosed by said skirt, said plate having a diameter substantially greater than said second valve member and defining a flow restriction with said skirt, said skirt having a canted interior wall by which air passing through said by-pass port is directed at said valve plate to strike said valve plate whereby the force of air striking said valve plate urges said valve stem toward its first said position and increasing air flow will overcome said vacuum to move said valve stem entirely to said second position.

4,178,954
DIAPHRAGM VALVE AND VALVE SYSTEM
Hal Klieves, 2830 NE. 29 Ave., Lighthouse Point, Fla. 33064
Filed Jun. 14, 1977, Ser. No. 806,354
Int. Cl.[2] F16K *31/363*
U.S. Cl. 137—119 **3 Claims**



1. An automatic valve comprising:
a body having an upper and lower portion, said upper portion having a fluid inlet for receiving incoming fluid,
two separate fluid outlets in said lower portion fluidly connected to said fluid inlet for alternately distributing said fluid to outlet conduits,
an intermediate portion connecting said fluid inlet to said fluid outlets,
two separate hydraulic by-pass means including an aperture disposed through said lower portion, an aperture disposed through said outlet conduits and a conduit means connecting said apertures for fluidly connecting said intermediate portion to said outlet conduits downstream of said fluid outlets for the equalization of pressure between said intermediate portion and said outlet conduits,
a valve gating means movably connected to each of said fluid outlets for alternate engagement with said outlets for securing flow through said alternate fluid outlets, and
a cycling mechanism movably connected in said intermediate portion for distributing said incoming fluid out alternate fluid outlets and including,
a diaphragm separator means movable in said intermediate portion for sealing said aperture in said lower body portion flexibly connected to said body between said upper portion and said lower portion and movably responsive to fluid pressure of said incoming fluid for moving said diaphragm separator means to a first position to seal said aperture of said hydraulic by-pass means disposed through said lower portion, thereby preventing fluid from flowing through said by-pass means when fluid is flowing through said fluid inlet,
an actuating means for passing said inlet fluid from said upper body portion to said lower body portion movably connected to said diaphragm separator means responsive to movement of said diaphragm separator for passing said incoming fluid through said intermediate portion when said diaphragm separator means is in said first position while preventing fluid from flowing through said by-pass means , and
a cycling drive means for alternately moving said valve gating means into contact with said fluid outlets having a drive arm driven by and connected to said actuating means at a first end and a cam means having a base member for receiving a second end of said drive arm for imparting alternate motion to said cam means for alternately moving said valve gating means into and out of contact with said fluid outlets to allow alternate fluid flow to said outlet conduits.

4,178,955
VEHICLE FUEL TANK
Wolfram Dau, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany
Filed May 3, 1978, Ser. No. 902,412
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727497
Int. Cl.[2] B65D *1/24*
U.S. Cl. 137—264 **5 Claims**



1. A vehicle fuel tank comprising a tank enclosure having a bottom wall, said bottom wall being formed with first and second indentations, said indentations being arranged to form an internal pocket within the tank between oppositely facing surfaces of said indentations, and a reserve tank, communicating with a fuel outlet line and mounted to said bottom in said pocket and clamped by its lower periphery between said oppositely facing surfaces.

4,178,956
SELF-DRAINING SILL COCK ASSEMBLY
Russell L. Fillman, Mitchellville, Iowa, assignor to Woodford Manufacturing Company, Des Moines, Iowa
Filed Apr. 3, 1978, Ser. No. 893,040
Int. Cl.[2] E03B *9/14*
U.S. Cl. 137—360 **14 Claims**

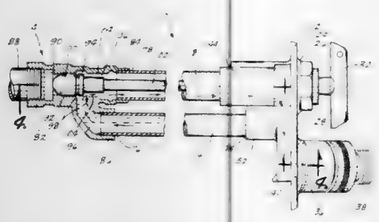
1. A self draining sill cock assembly comprising,
fluid outlet means adapted for disposition on an exterior wall,
fluid flow inlet means spaced remotely from said fluid outlet means and adapted for disposition adjacent an interior wall,
first conduit means having first and second ends connecting said fluid flow outlet means and said fluid inlet means in fluid communication, said first end being operationally

connected to said outlet means and said second end being operationally connected to said inlet means,

selectively operable valve means disposed adjacent said fluid inlet means and remote from said fluid outlet means, said valve means adapted to alternately open and close said inlet means to alternately permit and prevent fluid flow from said inlet means through said first conduit to said outlet means,

manually operable valve control means positioned remotely from said first conduit means, having first and second ends, said first end adapted for disposition on an exterior wall in separate and spaced relationship to said outlet means, said second end being operatively connected to said valve means to provide the selective manual operation of said valve means from an exterior wall remote from said valve means,

second conduit means having first and second ends operatively connected to said second end to said valve means to



provide selective fluid communication between said first conduit means and said second conduit means when said inlet means is closed by said valve means,

drain discharge means operationally connected to said first end of said second conduit means, said drain means adapted for disposition on an exterior wall adjacent said fluid outlet means,

said first and second conduit means being relatively disposed such that said first end of said first conduit means is vertically higher than said second end of said first conduit means and said first end of said second conduit means is vertically lower than said second end of said second conduit means and said second end of said first conduit means so that fluid will drain from said first conduit means, through said valve means, through said second conduit means and outwardly from said drain discharge means when said fluid inlet means is closed by said valve means and said valve means fluidly connects said first and second conduit means.

4,178,957

DISHWASHER FILL SYSTEM

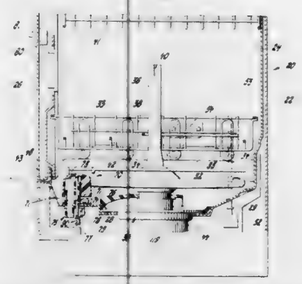
Robert E. Hoffman, Dayton; Richard B. Williams, Kettering, and Carl J. Wright, Bellbrook, all of Ohio, assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Nov. 20, 1978, Ser. No. 962,060

Int. Cl.[2] F16K *21/18;* **D06F** *39/08;* **B08B** *3/02*

U.S. Cl. 137—387 **2 Claims**

1. A water fill and cycle advance system for assuring a predetermined lesser rinse level of water and a greater wash level of water for a dishwasher having a sump for containing said levels, fill valve means adapted for normally supplying the wash level and rinse level of water from a domestic supply of water available at varying line pressures and a timer for controlling said fill valve means in a dishwashing cycle including sequential fill cycle portions for rinse fill and wash fill, said timer including a timer motor and a timer motor switch operable for selectively energizing and deenergizing the timer motor during either of said cycle portions to advance said dishwashing cycle through said cycle portions, said system including rinse fill and wash fill timer switches and a rinse level switch responsive to water level in said sump, said timer motor switch and said rinse fill timer switch adapted during either of said cycle portions to supply power for energizing said timer motor and being in shunt relation to each other so that said rinse fill timer switch may supply such power when said timer motor switch does not, said rinse level switch being in series circuit relation with said rinse fill timer switch and having a first position in series circuit relation with said fill valve means for energizing said fill valve means when water in said sump is below said rinse level and movable to a second position in series circuit relation with said timer motor for deenergizing said fill valve means when water in said sump is at said rinse fill level and for reenergizing said timer motor through said rinse fill timer switch to advance said dishwashing cycle through either of said cycle portions after said timer motor switch has



been selectively operated for deenergizing said timer motor, thereby assuring said rinse level irrespective of said line pressure and the operation of said timer motor switch and further assuring the advance of said dishwashing cycle when said rinse fill level has been assured, said wash fill timer switch being in series circuit relation with said fill valve means and in shunt with said rinse fill timer switch and said rinse level switch in its first position for energizing said fill valve means when water in said sump is above said rinse fill level, said wash fill timer switch being operable to supply power for energizing said fill valve means during said fill cycle portion for wash fill and inoperable to supply power for energizing said fill valve means during said fill cycle portion for rinse fill, thereby to supply less water for rinse during the fill cycle portion for rinse fill than for wash during the fill cycle portion for wash fill.

4,178,958

NON-RETURN DEVICES FOR WELDING INSTALLATIONS

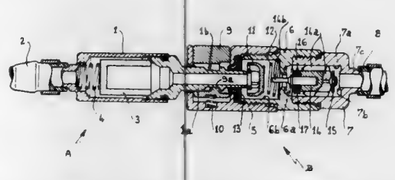
Joseph Palau, Duignt, France, assignor to Societe Anonyme des Etablissements Staubli, Faverges, France

Filed Feb. 15, 1978, Ser. No. 878,150

Claims priority, application France, Mar. 15, 1977, 77 08327

Int. Cl.[2] F16K *17/30*

U.S. Cl. 137—460 **3 Claims**



1. An improved non-return device for coupling the piping from a welding torch to a welding generator supplying gas under pressure, the device being of the type having a tubular body having a bore therein communicating through an opening at an upstream end of the bore with said gas generator and communicating through an opening at a downstream end of the bore with said torch piping, and the device having a valve in the bore moveable by the flow of gas toward the upstream end to close the opening thereat in the case of backflow from the torch end, and the device having calibrated means for yieldably urging the valve away from the downstream end of the bore, the calibrated means being yieldable to permit the valve to close the opening at the downstream end of the bore in the case of excessive downstream flow of gas therethrough, the improvement wherein the tubular body comprises separable male and female elements coupling said torch piping and generator together when a portion of the male element is inserted and latched in position in the female element; and means dispoed in said body between the valve and said portion of the male element and actuated to displace the valve from said downstream end of the bore when said male portion is inserted further into the female element beyond said latched position.

4,178,959

FLUID TRUCK SNUBBER

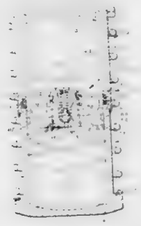
Richard C. Farris, Joshua, and William S. Butler, Burleson, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 679,620, Apr. 23, 1976, Pat. No. 4,106,412.

This application Jun. 2, 1978, Ser. No. 912,125

Int. Cl.[2] F16K *17/18*

U.S. Cl. 137—493.3 **4 Claims**



1. A valve assembly for use in a shock absorber having a high pressure chamber and a reservoir chamber and a first passageway fluidly communicating the chamber and reservoir to control fluid flow through the first passageway, comprising:

first valve member means for opening and closing said first passageway, said valve member means having first end communicating with said high pressure chamber, a second end communicating with said reservoir chamber, an outwardly projecting seating shoulder adjacent said first end and facing said second end, a flange portion adjacent said second end, a plurality of external recesses extending between said flange portion and said seating shoulder, an inlet opening in continuous fluid communication with said high pressure chamber, an outlet opening in continuous fluid communication with said reservoir chamber, a second passageway fluidly communicating said inlet opening with said outlet opening and a valve seat within said passageway;

first biasing means for maintaining said seating shoulder in positions opening and closing said first passageway responsive to pressures in said high pressure chamber respectively not exceeding and exceeding the pressure in said reservoir chamber;

second valve member means, within said second passageway, for cooperating with said valve seat to open and close said second passageway;

second biasing means for maintaining said second valve member in positions opening and closing said second passageway in responsive to pressures in said high pressure chamber respectively exceeding and not exceeding the pressure in said reservoir by a predetermined amount.

4,178,960

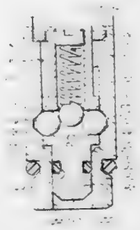
RESETTABLE PRESSURE RESPONSIVE VALVE

Joseph J. Napolitano, Paramus, and Michael Richardson, Paterson, both of N.J., assignors to Auto Research Corporation, Oakland, N.J.

Filed May 24, 1977, Ser. No. 801,201

Int. Cl.[2] F16K *31/12*

U.S. Cl. 137—494 **16 Claims**



1. A pressure responsive valve, comprising:

a cylinder having a longitudinally extending bore therethrough; one end of said cylinder bore being connectable to a pressure source;

a piston in said cylinder bore and movable therethrough;

detent means for retaining said piston at a predetermined longitudinal position along said cylinder bore; said detent means comprising:

a detent element on said piston; a detent element receiving recess in said cylinder bore; said detent element being shaped to be received in said recess while said detent element is also on said piston; a radially extending bore in said piston, in which said detent element is supported; said radially extending bore being registrable with said cylinder recess upon shifting of said piston to said predetermined longitudinal position; said detent element being in said radially extending bore at all times including when it is also in said recess;

a biasing element on and movable along with said piston; said biasing element being movable along a longitudinally extending axis of and with respect to said piston; said biasing element also being in engagement with said detent element and said biasing element normally urging said detent element radially outwardly of said radially extending bore and in a direction into said recess; said detent element being normally offset from said biasing element axis of longitudinal motion; said detent element and said biasing element both being respectively so shaped that longitudinal motion of said biasing element translates into radial motion of said detent element into and out of said recess, and radial motion of said detent element translates into longitudinal motion of said biasing element;

biasing means connected with said biasing element for normally urging said biasing element to move longitudinally with respect to said piston to contact said detent element and to urge said detent element into said recess; said biasing element and said detent element being placed to charge said biasing element as said detent element is moved out of said recess.

V 9 8 9 3 DEC 18 79 UMI

4,178,961

LUNG-CONTROLLED MEMBRANE VALVE FOR COMPRESSED GAS RESPIRATORS

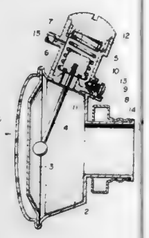
Ernst Warncke, Lübeck, Fed. Rep. of Germany, assignor to Dragerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 11, 1977, Ser. No. 840,961

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2646338

Int. Cl.[2] A62B *7/04*

U.S. Cl. 137—495 **4 Claims**



1. A lung controlled valve for compressed gas respirators, comprising a valve housing having a diaphragm chamber, a diaphragm extending across said chamber and being displaceable by pressure changes therein, a connecting piece for supplying breathing gas connected into said chamber on one side of said diaphragm, a valve member having a valve chamber with a pressure gas inlet, a valve seat in said valve chamber with an opening therein from said valve chamber to one side of said diaphragm chamber, a valve body enclosing said valve seat and shutting off the pressure gas flow into said one side of said diaphragm chamber, a tipping lever connected to said valve and extending through said valve opening into said one side of said diaphragm chamber in a position to be contacted by said diaphragm during displacement thereof to raise said valve and open said valve opening, a hand-operated lift off member mounted in said valve member for displacement into engagement with said valve body to lift it off said seat, including spring means biasing said valve to a closed position, said lift-off member comprising a push button having a conical end engageable with said valve body.

4,178,962

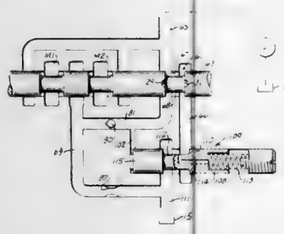
CONTROL VALVE WITH FLOW CONTROL MEANS

Francis H. Tennis, Oconomowoc, Wis., assignor to Tomco, Inc., Racine, Wis.

Filed Oct. 30, 1972, Ser. No. 302,594

Int. Cl.[2] F15B *13/02*

U.S. Cl. 137—596.13 **15 Claims**



8. A control valve of the type having an inlet, an outlet, a motor port for connection with a fluid motor, a valve spool movable in a bore from a neutral position to an operating position connecting the motor port with the inlet, and a bypass intersecting the bore and having an inlet portion upstream from the bore connecting with the inlet and an outlet portion downstream from the bore connecting with the outlet, said bypass providing for substantially unrestricted flow of fluid from the inlet to the outlet in the neutral position of the valve spool, and the latter being operable to close off communication between the inlet and outlet portions of the bypass in a full operating position of the spool, wherein the improvement comprises:

A. bypass restricting means rendered effective in a partial operating position of the spool to limit fluid flow through the bypass so as to thereby divert to the motor port a metered amount of fluid from the inlet and to create a differential in pressure between the inlet and outlet portions of the bypass;

B. and a flow control mechanism having fluid pressure responsive valve means to restrict and regulate fluid flow to the outlet from said outlet portion of the bypass in accordance with variations in the pressure differential between the inlet and outlet portions of the bypass in said partial operating position of the valve spool.

4,178,963

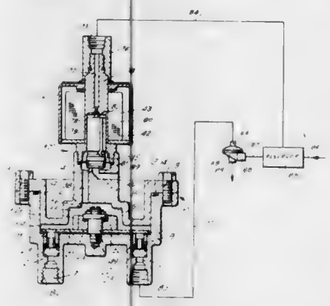
PILOT OPERATED SEQUENCING VALVE

Roger G. Riefler, Kinnelon, and Alfred Rolfe, Pottersville, both of N.J., assignors to Automatic Switch Company, Florham Park, N.J.

Filed Apr. 14, 1978, Ser. No. 896,257

Int. Cl.[2] F16K *11/02*

U.S. Cl. 137—624.18 **14 Claims**



1. A valve for sequentially operating a plurality of main valves, comprising:

(a) a valve body having a plurality of inlet ports for connection to a plurality of main valves, respectively,

(b) a chamber within said valve body for receiving high pressure fluid from said inlet ports,

(c) a pilot valve for selectively permitting or preventing communication between said chamber and a low pressure region, so that when said pilot valve is open the pressure in said chamber is relieved and when said pilot valve is closed the pressure in said chamber increases,

(d) sequencing valve means including a movable member for permitting only one of said inlet ports to be in communication with said chamber each time said pilot valve is opened, so as to relieve pressure in only the main valve connected to that one inlet port,

(e) operator means for indexing said movable member from one stationary position to another upon each closure of said pilot valve and resulting increase in pressure in said chamber, and

(f) said movable member having an aperture through which a different one of said inlet ports communicates with said chamber in each stationary position of said movable member, said inlet ports being spaced apart along the path of movement of said aperture, and the length of said aperture being greater than the shortest distance between each two successive inlet ports measured along the path of movement of said aperture, so that at all times at least one of said inlet ports communicates with said chamber through said aperture.

4,178,964

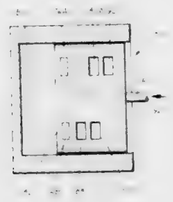
DOUBLE VALVE MECHANISM FOR CONTROLLING FLUID FLOWS

Marvin L. Moore, 16204 Diana La., Apt. 323A, Houston, Tex. 77062; Karen H. Moore, 4520 Duval, Apt. 203, Austin, Tex. 78751, and William M. Moore, 8820 Mountain Path Cir., Austin, Tex. 78750

Filed Oct. 22, 1976, Ser. No. 734,829

Int. Cl.[2] F16K *11/06, 11/20*

U.S. Cl. 137—625.4 **9 Claims**



1. A flow control apparatus comprising:

a casing adapted for interconnection in a fluid flow conduit;

an upstream partition mounted within said casing, said upstream partition having a rectangular orifice therein said rectangular orifice having a flow cross section area less than the flow cross section of said conduit;

a downstream partition mounted within said casing, said downstream partition having a rectangular orifice therein, said rectangular orifice having a flow cross section area less than the flow cross section of said conduit yet larger than the flow cross section of said orifice in said upstream partition;

said upstream and said downstream partitions cooperating with said casing to define a separate valve plate chamber; and,

a valve plate slidably moveable within said valve plate chamber from a first, closed, to a second open, position, said valve plate having a rectangular passage therein, said passage having a flow cross section substantially equal to the flow cross section of said rectangular orifice in said downstream partition;

means for moving said valve plate from the first to the second position within said valve plate chamber;

said valve plate in said first, closed, position blocking communication between said rectangular orifice in said upstream partition and said rectangular orifice in said downstream partition,

said rectangular passage in said valve plate registering with said orifice in said upstream partition and said orifice in said downstream partition when said valve plate is in said second, open, position, with the axes of each of said orifices and said passage being in parallel relationship when said valve plate is in the open position;

movement of said valve plate within said valve plate chamber in response to said moving means disposing said rectangular orifice in said valve plate chamber in fluid communication with said rectangular orifice in said downstream partition before said passage in said valve plate is in fluid communication with said rectangular orifice in said upstream partition to thereby minimize direct fluid impingement on said partition about said downstream orifice as said valve plate moves from said first, closed, to said second, open, position.

4,178,965

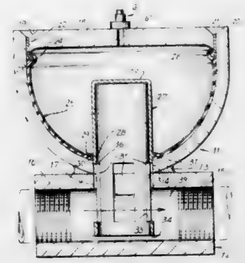
PULSATION DAMPENER DEVICE

Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Inc., Chatsworth, Calif.

Filed Dec. 4, 1978, Ser. No. 966,518

Int. Cl.[2] F16L *55/00*

U.S. Cl. 138—30 **5 Claims**



1. A pulsation dampener device comprising, in combination, a pressure vessel including an axially directed cylindrical oil port at one end and a top abutment member at the other end in spaced relation to said oil port, said abutment member including a gas charging valve, a liquid flow conduit member fixed to said vessel below said oil port, said conduit member including an orifice adjacent said oil port, said orifice and oil port being in registry and defining an axially elongated vertical bearing surface, a cylindrical actuator sleeve closed at its upper end and slidably guided in said bearing surface for axial movement relative to said vessel between a lower limiting position wherein a shank portion adjacent the lower end of said sleeve projects into said conduit, and an upper limiting position whereat said upper end of said sleeve is disposed adjacent said abutment member and parts of said shank portion are disposed within said vessel, a plurality of apertures formed in said shank portion of said sleeve, said apertures, in said lower limiting position being below the level of said oil port, and a resilient, elastomeric bladder member mounted in said pressure vessel and dividing the same into two chambers, said bladder member including an upper portion surrounding said gas charging valve, and a lower portion secured to said sleeve at a position above the level of said apertures.

4,178,966

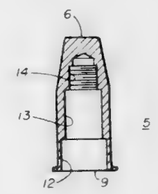
TUBE PLUG

Dennis E. Savor, Hixson, Tenn., and Roderick G. Rohrberg, Torrance, Calif., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 13, 1978, Ser. No. 876,958

Int. Cl.[2] F16L *55/10*

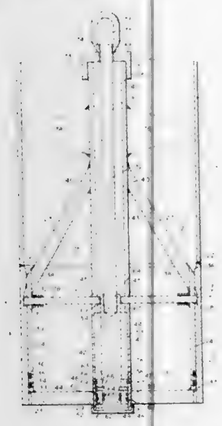
U.S. Cl. 138—89 **2 Claims**



1. A metallic plug body to be seal-welded in the end of a tube which tube extends through and is welded to a tubesheet, the plug body having,

a generally cylindrical and bullet-shaped form which is tapered on the first end to be inserted into the tube to which the body is to be seal-welded and which is sized from the second end to have a clearance fit with the wall of the tube hole,
a first bore formed from the second end with a diameter which provides a wall with a predetermined flexure,
a second bore formed from the second end as a counterbore to the first bore to provide a cylindrical bearing area for the mandrel of a welding machine which seal-welds the plug to the tube,
and a flange on the second end and formed to flare from the outside wall of the plug body in a radius which matches the radius which is spot faced at the weld zone on the entrance to the tube hole to be plugged in forming a positive stop limitation to the plug body as it is inserted into the tube while the flange also provides filler material at the weld zone between the plug body and the tube.

4,178,967
RETRIEVABLE PLUG FOR OFFSHORE PLATFORMS
Steven G. Streich, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.
Filed Sep. 14, 1978, Ser. No. 942,255
Int. Cl.² F16L *55/10*
U.S. Cl. 138—89 **18 Claims**



1. A plug for sealing the interior of a hollow cylindrical member to prevent the flow of fluid therethrough, said plug comprising:
a central body member releasably secured to said hollow cylindrical member in sealing engagement with the interior surface of said hollow cylindrical member, said central body member including:
circular plug means having a central opening therein;
annular wall means secured to the outer periphery of said circular plug means having aperture means located therein and having seal means located in the outer surface thereof; and
cylindrical body means secured about the periphery of the central opening of said circular plug means having first and second aperture means therein, said second aperture means therein allowing the flow of said fluid therethrough;
retractable retaining means for releasably securing said central body member to said hollow cylindrical member; and
pressure equalization means for allowing the pressure of said fluid to equalize across said central body member before the removal thereof from said hollow cylindrical member to allow the flow of said fluid through said hollow cylindrical member, said pressure equalization means including:
sleeve means releasably secured within said cylindrical body means of said central body means in sealing engagement therewith;
plug means releasably secured to said sleeve means in sealing engagement therewith; and
rod means secured to said plug means to initially release said sleeve means from said cylindrical body means and subsequently release said plug means from said sleeve means when a force is applied to said rod means
whereby the sleeve means are released from sealing engagement with said central body means by applying a first force to the rod means therby allowing the flow of said fluid through said hollow cylindrical member and the plug means are released from sealing engagement with the sleeve means by subsequently applying a second force to the rod means, the second force having a magnitude greater than the first force applied to the rod means thereby allowing the removal of said plug from said hollow cylindrical member.

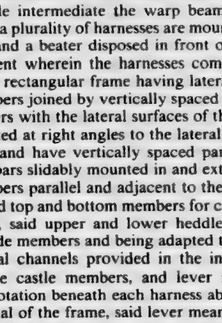
4,178,968
PROCESS FOR MANUFACTURING REINFORCED ELASTOMERIC HOSES AND RESULTANT PRODUCT
Angioletti, Attilio, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy
Filed May 27, 1977, Ser. No. 801,212
Claims priority, application Italy, Jun. 4, 1976, 23928 A/76
Int. Cl.² B29C *25/00*; F16L *11/08*
U.S. Cl. 138—126 **11 Claims**



1. A process for vulcanizing a hose of elastomeric material provided with a reinforcing structure embedded in its wall comprising the steps of smoothing and completely vulcanizing the external surface of the hose while all the elastomeric material of the hose itself is substantially mantained in an uncured state, and subsequently vulcanizing the remaining uncured elastomeric material forming said hose.
11. Reinforced flexible hose made from elastomeric material by the process of claim **1**.

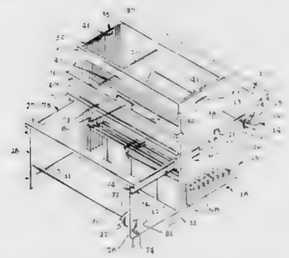
4,178,969
SYSTEM AND METHOD FOR CONTROLLING THE STOPPING OPERATIONS OF WEAVING MACHINES
Miyuki Gotoh, Tokorozawa, and Mikiyoshi Ogawa, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Japan
Filed Aug. 24, 1978, Ser. No. 936,191
Claims priority, application Japan, Sep. 5, 1977, 52-105876
Int. Cl.² D03D *51/00*
U.S. Cl. 139—1 R **7 Claims**

1. A system for controlling the sequence of stopping operations of a plurality of weaving machines during emergency conditions to minimize the loss of time due to the stoppage, comprising:
first and second detectors associated with each one of said weaving machines for generating high and low priority emergency signals respectively when the associated weaving machine is under an emergency condition of high or low priority; and
preference controlling means for activating a brake actuator of the associated weaving machine in response to the presence of said high priority emergency signal and to the presence of said low priority emergency signal in the absence of high priority emergency signal generated from the detector associated with another weaving machine and activating said brake actuator after the elapse of a



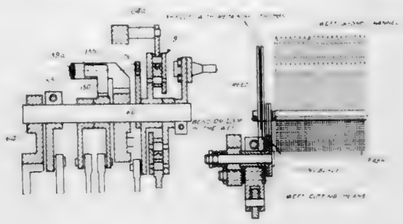
predetermined period of time in response to said low priority emergency signal in the presence of said another high priority emergency signal.

4,178,970
HAND LOOM
William F. Mueller, Tarzana, Calif., assignor to Christine E. Mueller, Tarzana, Calif.
Filed May 1, 1978, Ser. No. 901,355
Int. Cl.² D03D *29/00*
U.S. Cl. 139—30 **15 Claims**



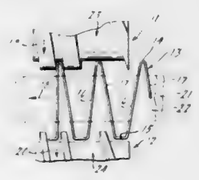
1. In a hand loom having a frame, a warp beam at the rear of the frame, a cloth beam at the front of the frame, a vertically extending castle intermediate the warp beam and the cloth beam in which a plurality of harnesses are mounted for vertical reciprocation and a beater disposed in front of the harnesses, the improvement wherein the harnesses comprise a narrow, rigid generally rectangular frame having laterally spaced parallel side members joined by vertically spaced parallel top and bottom members with the lateral surfaces of the bottom member being twisted at right angles to the lateral surfaces of said side members and have vertically spaced parallel upper and lower heddle bars slidably mounted in and extending between said side members parallel and adjacent to the inner confronting faces of said top and bottom members for carrying a plurality of heddles, said upper and lower heddle bars extending beyond said side members and being adapted to be received in aligned vertical channels provided in the inner confronting surfaces of the castle members, and lever means pivotally mounted for rotation beneath each harness about a horizontal axis longitudinal of the frame, said lever means comprising an elongated arm having an integral upstanding leg at its inner end portion which is in communication with the bottom member of said harness, said leg having a width no greater than the width of said harnesses, and an outer portion extending exterior of the castle, whereby when the said outer portion of the lever means is depressed, the upstanding leg at the inner end portion of the lever means is pivotally moved upwardly and laterally to thereby raise the harness beneath which the said lever means is mounted, the lever means mounted beneath the forward harness of the loom being adapted to raise such harness a sufficient distance to provide an ample shed and the lever means mounted beneath each successive harness being adapted to raise each successive harness a short distance higher than the preceding harness.

4,178,971
METHOD OF AND APPARATUS FOR INSERTING WEFT THREADS INTO A JET LOOM
Jaromir Malasek, Brno; Vladimir Kuda, Blazovice, and Miroslav Bucek, Brnenske Ivanovice, all of Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi, Brno, Czechoslovakia
Continuation-in-part of Ser. No. 826,715, Aug. 22, 1977, abandoned. This application May 24, 1978, Ser. No. 909,344
Claims priority, application Czechoslovakia, Aug. 24, 1976, 5479/76
Int. Cl.² D03D *47/30*
U.S. Cl. 139—435 **7 Claims**



1. A method of controlling weft threads in jet looms which operate with alternation of insertion of different first and second weft threads, comprising the following steps in the order named: opening a first shed of the loom, inserting the first weft thread into the first shed, beating up the inserted first weft thread, closing the first shed, retaining the inserted first weft thread in uncut condition under tension, opening a second, subsequent shed, inserting the second weft thread into the second shed, beating up the inserted second weft thread, retaining the inserted second weft thread under tension, and cutting off the first weft thread.

4,178,972
MACHINE FOR MANUFACTURING ZIG ZAG WIRE BINDERS
Ernst Pfaffle, Neuffen, Fed. Rep. of Germany, assignor to Hans Sickinger Co., Pontiac, Mich.
Filed Aug. 14, 1978, Ser. No. 933,677
Int. Cl.² B21F *45/16*
U.S. Cl. 140—105 **3 Claims**



1. A wire binder forming machine comprising a pair of companion die rolls for receiving the oppositely facing bends

of a wire with a preliminary zig zag formation, the groove on each die roll having a helical configuration with a first section of progressively decreasing width and a second section of constant width, the groove side walls of the first section being initially spaced apart a substantially greater distance than the size of the wire bend received therein and progressively narrowing down to approximately the size of the wire bend, the second section having side walls spaced apart approximately the size of the wire bend received therein so as to avoid substantial friction thereon, and a projection formed on at least one side wall of each groove at the juncture of said first and second sections, the size of said projection being such that when it reaches the wire bend it will impact the bend to bring the wire legs extending from the bend closer together.

4,178,973

TOOL FOR APPLYING BUNDLE TIES

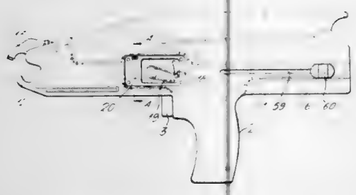
John C. Collier, Southport, and Leonard J. Owen, Watford, both of England, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 23, 1978, Ser. No. 936,261

Claims priority, application United Kingdom, Sep. 6, 1977, 37098/77

Int. Cl.[2] **B21F** *9/02*

U.S. Cl. 140—123.6 **3 Claims**



1. A tool for applying bundle ties of the kind having a flexible strap portion formed at one end with an apertured frame for passage of the other free end of the strap, the tool comprising a tool frame reciprocably supporting a carriage in a rectilinear guide path leading to a loop guide at a forward end of the guide path, the tool including means for positioning a tie longitudinally in the guide path between the carriage and the loop guide with the tie frame adjacent the carriage, the loop guide being adapted releasably to embrace material to be bundled and defining a concave guide path arranged to engage the leading end of a strap portion driven forwardly by the carriage and to deflect the strap around the concave guide path and back into the rectilinear guide path, releasably gripping means at the carriage for gripping the reversed leading end of the strap portion, and a shear device operable transversely of the rectilinear guide path, disposed at the forward end of the frame rearwardly of the loop guide, characterised by means for reciprocating the carriage comprising a drive rod **5** extending rearwardly from the carriage **26** and slidably mounted in the tool frame **1**, a handle **60** projecting laterally from the rod **5** through a slot **59** in the frame **1**, and a trigger **3** mounted at a handle **2** of the tool frame **1** coupled to the rod **5** by a clutch device **4** operable to drive the rod **5** rearwards on pulling the trigger **3**.

4,178,974

FLOW CONTROLLER

Jonathan S. Levin, Levittown, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,751

Int. Cl.[2] **B65B** *3/36, 3/12, 31/00*

U.S. Cl. 141—51 **2 Claims**

1. In combination:

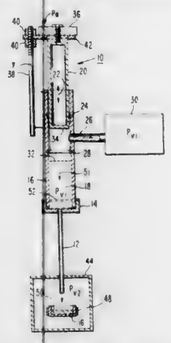
a fluid reservoir cylinder containing a liquid;

an evacuated chamber;

a hollow conduit between the reservoir and chamber in communication with the liquid, the hollow in the conduit being of sufficiently small cross section that pressure is required to cause said liquid to flow through said conduit;

means including a piston in the cylinder for applying pressure to the liquid for forcing the liquid through the conduit and into the chamber; and

means for terminating the flow of liquid comprising means for concurrently removing the pressure applied to the liquid and means for reducing the pressure in the reservoir



over the fluid to the same value as is present in the chamber, said means for reducing the pressure comprising evacuation means connected to said cylinder at a point such that said piston operates to block the path between said evacuation means and said cylinder when the piston is applying pressure to said liquid and said piston opens the path between the two when the piston is moved more than a given distance away from the fluid.

4,178,975

DISPENSING DEVICE ACTUATED BY A RECEIVING MEMBER

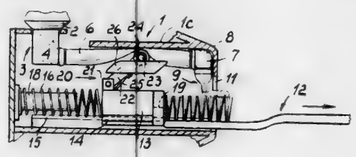
Carlo Crespi, Via Bertinoro, 9, Milano, Italy

Filed Oct. 18, 1977, Ser. No. 843,109

Claims priority, application Italy, Aug. 30, 1977, 27080 A/77

Int. Cl.[2] **B65D** *35/40, 35/56*

U.S. Cl. 141—362 **3 Claims**



1. A dispensing device for paste-like material, particularly toothpaste, comprising a housing, an opening in said housing, a container of said material secured to said housing, a delivery mouth proximate to said opening for dispensing a controlled amount of said material on a receiving member like a toothbrush when inserted into said housing through said opening, an elastically deformable duct between said container and said delivery mouth in air-tight connection therewith, a carriage slidable substantially parallel to said duct and operable by said receiving member to move substantially parallel to said duct together with said receiving member when said receiving member is introduced into said housing through said opening, a squeezing member journaled to said carriage and resiliently urged toward said duct, cams arranged in the path of said squeezing member for causing said squeezing member to move spaced from said duct when said receiving member is moved within said housing in engagement with said carriage away from said opening and to progressively squeeze said duct toward said delivery mouth when said receiving member is moved within said housing together with said carriage toward said opening to dispense a controlled amount of said material onto said receiving member while simultaneously sucking a substantially equal amount into said duct from said container, and resilient means for urging said carriage toward said delivery mouth during delivery of said material.

4,178,976

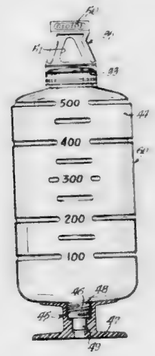
UNITARY, HERMETICALLY-SEALED BUT PIERCEABLE DISPENSING CONTAINER

Gerhard H. Weiler, South Barrington; Dieter H. Nagel, Des Plaines, and Louis T. Pagels, Hanover Park, all of Ill., assignors to Automatic Liquid Packaging, Inc., Arlington Heights, Ill.

Division of Ser. No. 876,730, Feb. 10, 1978. This application Oct. 16, 1978, Ser. No. 951,568

Int. Cl.[2] **B65D** *1/02*

U.S. Cl. 150—0.5 **15 Claims**



1. A unitary, hermetically-sealed but pierceable dispensing container, suitable for containing parenteral solutions, which comprises

a flexible, generally tubular body of thermoplastic material, closed at one end and terminating at the other end in a draining region provided with an annular sealing means unitary with said tubular body and defining an access aperture, and a pierceable membrane hermetically occluding the aperture and being unitary with said sealing means;

said membrane being sufficiently thin to permit penetration by a cannula without coring, and said annular sealing means being adapted to receive the cannula in a sealing, frictional engagement when the membrane has been penetrated.

4,178,977

LAWNMOWER COVER

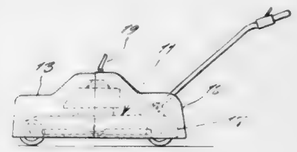
Ferdinand Sur, and George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y.

Filed May 12, 1978, Ser. No. 905,473

Int. Cl.[2] **B65D** *85/68*

U.S. Cl. 150—52 R **2 Claims**

1. A lawnmower cover, comprising in combination, two molded plastic shells that interslide together adjustably to fit over different sized mowers, a pair of inward extending lips on opposite lower edges of said cover, one said lip being on each



said shell, for anchoring under edges of a housing of said mower.

4,178,978

MANUAL OPERATOR FOR COILING DOOR

Peter B. Burnham, Columbus, Ohio, assignor to Harsco Corporation, Camp Hill, Pa.

Filed Jun. 26, 1978, Ser. No. 919,293

Int. Cl.[2] **A47G** *5/02;* **E06B** *9/08*

U.S. Cl. 160—321 **1 Claim**



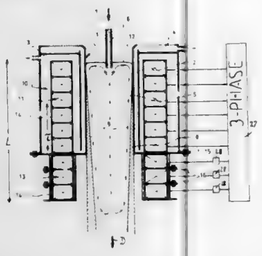
1. A manual operator for a coiling door including spaced brackets secured adjacent the top of the door opening, a shaft fixed to said brackets; drums rotatably mounted on said shaft and a coiling door having an edge secured to said drums comprising a reel rotatably mounted on said shaft adjacent one of said brackets; means for securing said reel to the adjacent one of said drums; an endless flexible non-extensible element, opposite ends for said element secured to said reel, a plurality of turns of said element on said reel, guide means directly secured to said bracket adjacent said reel and underlying said reel for guiding said element onto and off of said reel and a plurality of spaced stops on said element and a plurality of manually grasped grips slidably mounted on said element for engagement with said stops whereby when said element is manually pulled in one direction rotation of said reel opens said door and when said element is manually pulled in the other direction opposite rotation of said reel will close said door.

4,178,979

METHOD OF AND APPARATUS FOR ELECTROMAGNETIC MIXING OF METAL DURING CONTINUOUS CASTING

Jean-Pierre Birat, Algrange, and Roger Ventavoli, Metz, both of France, assignors to Institut de Recherches de la Siderurgie Francaise, Saint-Germain-en-Laye, France

Filed Jul. 13, 1977, Ser. No. 815,416
Claims priority, application France, Jul. 13, 1976, 76 21577
Int. Cl.² B22D *11/10, 27/02*
U.S. Cl. 164—49 **10 Claims**



1. A method of continuously casting a metal having a conductivity γ in 1/ohm-meter comprising the steps of:

continuously pouring said metal in molten condition into the top of a vertically tubular mold to form therein a descending column of said metal;

continuously cooling said mold to harden the periphery of said column;

continuously displacing a magnetic field having an effective strength B in tesla and a vertical length L in meters vertically upwardly in said mold at a propagation velocity v in meters per second to mix said metal in said mold;

establishing a desired subsurface depth d in millimeters of inclusions in the metal in said mold by setting the numerical values of the parameters B, L, γ, and v in accordance with the formula $B^2 \times L = (1/\gamma v)(16d^2 + 120d)$; and

continuously withdrawing a cooled casting from the bottom of said mold.

4,178,980

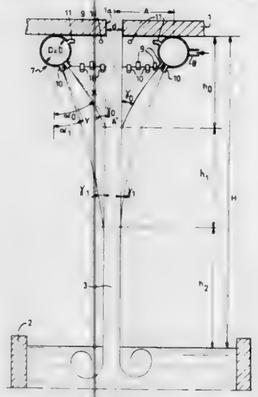
PROTECTION OF MOLTEN METAL

Ghislain Gilbert, Bures-sur-Yvette; Jean Galey, Voisins Bretonneux, and Gérard Bentz, Elancourt-Trappes, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Sep. 15, 1978, Ser. No. 942,532
Claims priority, application France, Sep. 22, 1977, 77 28561
Int. Cl.² B22D *21/02*
U.S. Cl. 164—66 **7 Claims**

1. A method of protecting a stream of molten metal of substantially circular cross-section and of a mean diameter d, which flows vertically, over a height H, between an upper supply container and a lower receptacle, by means of a liquefied inert gas which is distributed by an apparatus comprising a phase-separating member of annular form which surrounds the stream and which is intended to supply on the one hand the gaseous phase to form an atmosphere which envelops the upper part of the stream and on the other hand the liquid phase to form a substantially conical layer converging towards the stream, which it meets at an angle α, which method consists in that, with d greater than 40 mm and H greater than 900 mm, said liquid phase is distributed in the form of at least two layers, the upper layer meeting said stream of metal at a distance h_o which is not greater than 300 mm from the bottom of said upper supply container, each layer forming with said stream an angle γ which is not greater than 30° and being intended to protect a proportion of the vertical extent of the stream h not greater than 600 mm.

3. Apparatus for protecting, by means of liquefied inert gas, a vertical stream of molten metal of substantially circular cross-section and of a mean diameter d which flows vertically, over a height H, between an upper supply container and a lower receptacle, of the kind comprising a phase-separating member of annular form which is adapted to surround said stream and which is provided with injectors which supply on the one hand a gaseous phase, which forms an inert atmosphere enveloping the upper part of the stream, and on the other hand a liquid phase, which forms a substantially conical layer converging towards said stream which it meets at an angle γ, wherein said apparatus consists in that, with d greater than 40 mm and H greater than 900 mm, said separator has at least two tiers of injectors for injecting said liquid phase which tiers are regularly distributed in two superimposed circles each situated in a single horizontal plane, the injectors in said upper tier forming an angle α_o with the vertical such that the layer emerging from said upper tier meets the stream of metal at a height h which is not greater than 300 mm from the bottom of said upper container while each of said lower tiers forms an angle α_1, α_2, etc. with the vertical such that each layer meets said stream at an angle γ_o, γ_1, γ_2, etc. less than 30°.



4,178,981

COPPER CASTING METHOD USING TITANIUM DIOXIDE RELEASE METHOD

Edward C. Murray, Edmond, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Jun. 29, 1978, Ser. No. 920,466
Int. Cl.² B22C *3/00*
U.S. Cl. 164—72 **9 Claims**

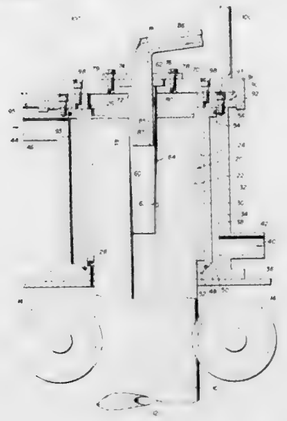
1. In the casting of copper in a mold wherein, the internal surface of the mold initially is coated with a release material slurried in a liquid medium, the mold then is filled with molten copper, and thereafter cooled and solidified copper is removed from the mold, the improvement which comprises utilizing as the release material a material consisting essentially of titanium dioxide in a particulate form having a particle size in the range of from about 0.1 micron to about 200 microns.

4,178,982

METHOD AND APPARATUS FOR CONTINUOUSLY CASTING HOLLOW BARS

Gus Sevastakis, 5645 Angola Rd., Toledo, Ohio 43615

Filed Oct. 28, 1977, Ser. No. 846,423
Int. Cl.² B22D *11/04*
U.S. Cl. 164—85 **12 Claims**



12. In the process of continuously casting hollow bars from a female die having an internal through passage, and a mandrel extending longitudinally in said passage of the female die and spaced from internal surfaces of the female die to define a forming chamber; the method of installing and locating the mandrel in a predetermined position within the passage of the female die during a casting operation comprising the steps of; mounting the mandrel to a mandrel support member having guide apertures on opposite end portions thereof, providing guiding pins vertically upstanding from the upper end of the female die, placing the mandrel support member on the guide pins with the guide pins received in the apertures of the mandrel support member, and grasping the mandrel support member and moving the mandrel support member downwardly towards the female die under the guidance of said guide pins to force the mandrel through molten metal in the female die to position the mandrel within the female die.

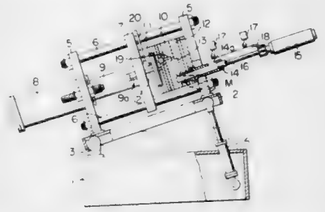
4,178,983

METHOD FOR MANUFACTURING STAINLESS STEEL DIE CAST PRODUCTS HAVING LOW MELTING POINT

Zenichi Mochizuki, Fuji; Yasuo Sugiura, Numazu, and Nobuo Kashiwagi, Nagaizumimachi, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1978, Ser. No. 945,886
Claims priority, application Japan, Sep. 29, 1977, 52/117174
Int. Cl.² B22D *27/10;* **C22C** *38/42, 38/44, 38/54*
U.S. Cl. 164—113 **1 Claim**

1. A method for manufacturing a stainless steel die cast product having low melting point comprising the step of die casting an alloy consisting of 0.01–0.1% by weight of carbon, 1.0–3.0% by weight of silicon, 1–12% by weight (but excluding 3–7% by weight) of manganese, 8–25% by weight of nickel, 16–20% by weight of chromium, 1.5–2.5% by weight of copper 0.2–0.7% by weight of boron, 0.5–2.0% by weight of molybdenum and the balance of iron into a metal mold made of a tungsten alloy or a molybdenum alloy and maintained at a temperature of 250°–450° C. under conditions of a casting temperature higher than the liquid phase temperature of the



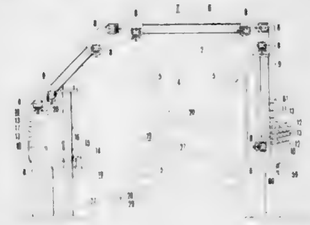
molten alloy by 100°–150° C., an injection pressure of 200–500 kg/cm², and an injection plunger speed of 0.2–1.0 m/sec.

4,178,984

APPARATUS FOR SUPPLYING INSERTS TO THE METAL MOLD OF INJECTION MOLDING MACHINES

Tatsuo Ishikawa, Ube, Japan, assignor to Ube Industries, Japan

Filed Jul. 6, 1978, Ser. No. 922,293
Int. Cl.² B22D *17/24, 17/32*
U.S. Cl. 164—333 **6 Claims**



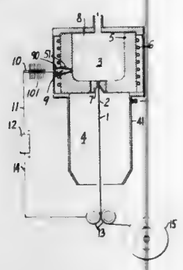
1. Apparatus for supplying inserts to a metal mold of an injection molding machine comprising an inverted U-shaped frame which straddles said injection molding machine, a chain conveyor extending along said frame, drive means for intermittently driving said chain conveyor, means provided on working side of said frame for supplying the inserts to said chain conveyor, means provided on the opposite side of said frame for transferring the inserts to insert holding means from said chain conveyor, and means for mounting the inserts transferred to said insert holding means into said metal mold, wherein said chain conveyor is provided with a plurality of L-shaped insert carriers, and said insert supply means comprises a chute containing a plurality of inclined plates on which cylindrical inserts roll into said insert carriers, wherein a predetermined number of said insert carriers are grouped and are spaced apart a predetermined pitch along the length of said chain conveyor, and wherein said insert transfer means comprises a plurality of insert receiving rods which are disposed in a predetermined pattern corresponding to that of the inserts when they are disposed in said metal mold and means for simultaneously moving said insert receiving rods into cylindrical inserts.

4,178,985

INSTALLATION FOR MANUFACTURING A METAL WIRE BY CONTINUOUS CASTING

Philippe Sauvage, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Dec. 29, 1977, Ser. No. 865,608
Claims priority, application France, Jan. 10, 1977, 77 00667
Int. Cl.[2] B22D *27/02, 11/00, 11/12*
U.S. Cl. 164—250 **13 Claims**



1. An installation for manufacturing wire by projecting a jet of electrically conductive molten metal through a die and subsequently through a cooling devie, said installation comprising:

a crucible adapted to contain molten metal and formed of an electrically insulating refractory material, said crucible being equipped with a heating device and provided with at least one passageway extending through a wall of said crucible;

a die for forming wire, associated with said crucible, and adapted to shape molten metal received from said crucible;

a closure member associated with said crucible to define an enclosure adapted to contain a gas under pressure;

means associated with said closure member for providing gas under pressure to said defined enclosure;

a cooling device associated with said crucible and said die and located to receive and cool said shaped metal exiting from said die and

means for establishing and maintaining electrical contact with the metal throughout the manufacture, comprising:

(a) at least one hot piece, said hot piece being a conductor of heat and electricity, provided in said at least one passageway and sized so as to create a gap between said hot piece and walls defining said at least one passageway, said hot piece including two ends, one end of which extends at least to an interior wall of said crucible;

(b) means associated with said hot piece to cool said hot piece, said means to cool said hot piece being located to cool the other end of said hot piece remote from said end which extends at least to said interior wall of said crucible causing said hot piece to function as a heat sink to solidify molten metal which has entered said gap to produce a gas-and-metal-tight seal;

(c) a source of electrical current;

(d) means associated with said source and attaching one pole of said source with hot piece;

(e) means associated with said hot piece for holding said hot piece immobile with respect to said crucible against the pressure created by the presence of any pressurized metal in said crucible;

(f) at least one cold piece, said cold piece being a conductor of electricity, connected to another pole of said source of electricity and of a shape and arrangement suitable for assuring electrical contact with said shaped metal; and

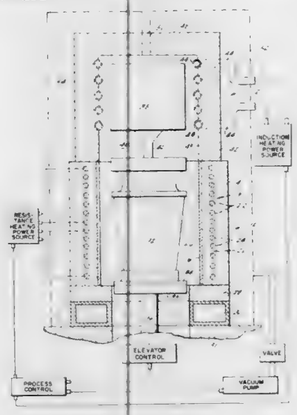
(g) means provided between said hot piece and said cold piece to electrically insulate said hot piece from said cold piece.

4,178,986

FURNACE FOR DIRECTIONAL SOLIDIFICATION CASTING

Russell W. Smashey, Albuquerque, N. Mex., assignor to General Electric Company, Cincinnati, Ohio

Filed Mar. 31, 1978, Ser. No. 892,434
Int. Cl.[2] B22D *25/00, 27/04*
U.S. Cl. 164—251 **1 Claim**



1. In a directional solidification melting and self-casting apparatus of the withdrawal type including a furnace, means to supply electric power to the furnace, means to control the electric power to control heat within the furnace, means to move a mold into and out of the furnace and means to maintain desired atmospheric conditions within the apparatus, the furnace being of a multi-zone, enclosed, insitu charge melting and self-casting type comprising, in combination:

a resistance heated zone; and

an induction heated zone;

the resistance heated zone being a directional solidification casting furnace including:

(a) resistance heated walls having an inner surface which defines a lateral boundary of a resistance heated hollow interior,

(b) a stationary chill disposed peripherally substantially vertically beneath said walls,

(c) a peripherally disposed radiation baffle disposed between said walls and said stationary chill, and

(d) a platform disposed axially within the apparatus and movable vertically and adapted to carry a casting mold into which molten metal is disposed;

the improvement wherein

the induction heated zone is disposed above, aligned with and communicates directly with the resistance heated zone to define the resistance heated zone as a lower zone and the induction heated zone as an upper zone,

the upper zone including:

(a) upper walls having an inner surface enclosing an upper hollow interior substantially vertically aligned and coextensive with the resistance heated hollow interior and carrying at least inner surface an open bottom induction heating coil about the periphery of the upper hollow interior the inner surface of the resistance heated walls and the inner surface of the upper walls defining a substantially continuous inner furnace wall adapted to be in close proximity to lateral walls of the casting mold carried by the platform, and

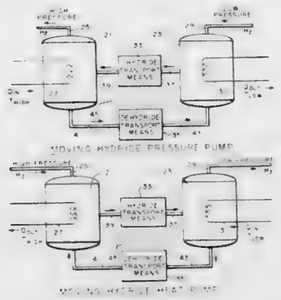
(b) a furnace top member disposed across the upper walls and upper hollow interior to define an upper boundary of the hollow interior.

4,178,987

MOVING BED HYDRIDE/DEHYDRIDE SYSTEMS

Walker H. Bowman, St. Charles, and Bruce E. Sirovich, Naperville, both of Ill., assignors to Standard Oil Company, a corporation of Indiana, Chicago, Ill.

Filed Jul. 12, 1978, Ser. No. 923,805
Int. Cl.[2] F28D *15/00*
U.S. Cl. 165—1 **40 Claims**



1. An apparatus for cycling a hydride-forming material between a first temperature and a second temperature comprising:

a plurality of reaction zones for containing the hydride-forming material, said plurality including first and second reaction zones;

means for supplying heat at the first temperature to the first reaction zone to promote the desorption of hydrogen from hydride-forming material in the first reaction zone;

means for supplying hydrogen to the second reaction zone;

means for removing hydrogen from the first reaction zone;

means for removing heat at the second temperature from the second reaction zone to promote the absorption of hydrogen by hydride-forming material in the second reaction zone;

transport means including first means for transporting hydride-forming material which has been at least partially dehydrided in the first reaction zone from the first reaction zone to the second reaction zone;

second means, included in the transport means, for transporting hydride-forming material which has been at least partially hydrided in the second reaction zone from the second reaction zone to at least one other reaction zone, said first and second means cooperating to cycle hydride-forming material between the first and second reaction zones while permitting the first and second reaction zones to be maintained at substantially constant temperature.

9. A method for thermally cycling a hydride-forming material between a first temperature and a second temperature in a hydride pump, said pump including a plurality of reaction zones comprising first and second reaction zones, wherein the method comprises the following steps:

supplying heat at the first temperature to hydride-forming material in the first reaction zone to promote desorption of hydrogen;

removing hydrogen from the first reaction zone;

transporting at least partially dehydrided hydride-forming material from the first reaction zone to the second reaction zone;

supplying hydrogen to the second reaction zone;

removing heat at the second temperature from hydride-forming material in the second reaction zone to promote absorption of hydrogen; and

transporting at least partially hydrided hydride-forming material from the second reaction zone to at least one other reaction zone such that hydride-forming material is cyclically transported between the first and second reaction zones.

4,178,988

CONTROL FOR A COMBINATION FURNACE AND HEAT PUMP SYSTEM

Peter L. Cann, Canastota, N.Y.; Phil J. Karns, Sanibel, Fla., and Fred V. Honnold, Fayetteville, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 10, 1977, Ser. No. 850,180
Int. Cl.[2] F25B *13/00*
U.S. Cl. 165—2 **10 Claims**



1. A control circuit for a combination heating means and heat pump for conditioning an enclosure wherein the heating means has an actuating device to commence the generation of heat and blower actuated by a blower relay which circulates air through the area to be conditioned and wherein the heat pump has a compressor motor for operating the compressor, an outdoor fan motor for circulating fluid in a heat exchange relationship with an outdoor heat exchanger means including a defrost relay for defrosting the outdoor coil, an indoor coil mounted in communication with the air circulated by the blower and a reversing valve actuated by a reversing valve relay which comprises:

a temperature sensing means for making an electrical connection when heating is required in the enclosure;

means for supplying an electric current to the temperature sensing means;

switching means electrically connected to the temperature sensing means for selectively energizing either the compressor motor of the heat pump or the actuating device of the heating means depending on the temperature of the ambient fluid in communication with the outdoor heat exchanger, including no delay other than that which naturally occurs between switching from heating means heating to heat pump heating and the means for actuating the heating means for defrost includes no delay other than that which naturally occurs through switching; and

means for actuating the heating means to provide heat to the indoor coil when the means for defrosting the outdoor coil is energized including termination means for discontinuing defrost before heat pump refrigerant temperature or pressure reached excessive levels.

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SOLAR HEATING AND COOLING SYSTEM

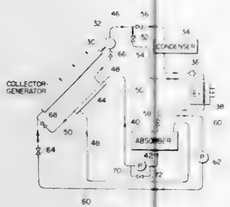
Isao Takeshita; Nobuhiko Wakamatsu; Eiji Ando; Hiroyoshi Tanaka, and Shiro Hozumi, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 14, 1978, Ser. No. 896,492

Claims priority, application Japan, Apr. 15, 1977, 52-53925; Jan. 27, 1978, 53-8755

Int. Cl.[2] F25B *13/00*

U.S. Cl. 165—62 **5 Claims**



1. A solar heating and cooling system comprising:
- a solar collector to heat a liquid passing therethrough by solar radiation;
- means for circulating a solution of an evaporable refrigerant in a less evaporable solvent through said solar collector;
- an absorption refrigeration system including a vapor-liquid separator connected to an outlet of said collector, a condenser for condensation of a heated vapor of said refrigerant, an expansion valve through which the condensed refrigerant is introduced into an indoor heat exchanger for heat exchange between the refrigerant and air and an absorber in which the cooled refrigerant is absorbed in said solvent, said collector serving also as a vapor generator of said absorption refrigeration system;
- a first fluid passage connecting said vapor-liquid separator to an inlet of said indoor heat exchanger through said condenser and said expansion valve;
- a second fluid passage connecting an outlet of said indoor heat exchanger to an inlet of said collector through said absorber;
- a third fluid passage to return unvaporized portion of said solution from said vapor-liquid separator to said absorber;
- a fourth fluid passage which connects said vapor-liquid separator to said inlet of said indoor heat exchanger and bypasses said condenser and said expansion valve;
- a fifth fluid passage which connects said outlet of said indoor heat exchanger to said inlet of said collector and bypasses said absorber;
- first valve means for selectively blocking one of said first passage and said fourth passage;
- second valve means for selectively blocking one of said second passage and said fifth passage such that said second passage is blocked when said first passage is blocked; and
- third valve means for blocking said third passage when said second passage is blocked.

4,178,990

SOLAR ENERGY COLLECTOR SYSTEM

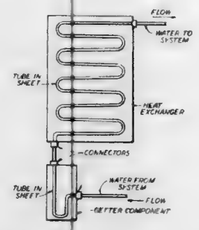
James M. Popplewell, Guilford, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Nov. 15, 1977, Ser. No. 851,699

Int. Cl.[2] F28F *19/00*; F24J *3/02*

U.S. Cl. 165—134 R **17 Claims**

1. In a solar energy collector system including at least one heavy metal element, at least one heat exchange panel having passage surfaces of aluminum or aluminum alloy, and a heat exchange medium, the improvement which comprises:
- getter panel means having at least one passageway for providing turbulent passage of said heat exchange medium, said getter panel being located upstream and in close proximity with said heat exchange panel, and said passageway having a surface layer of material having a high affinity for heavy ions,



whereby heavy metal ions are removed from said heat exchange medium prior to contact of said ions with said heat exchange panel.

4,178,991

HEAT EXCHANGER AND A HEAT EXCHANGER ELEMENT THEREFOR

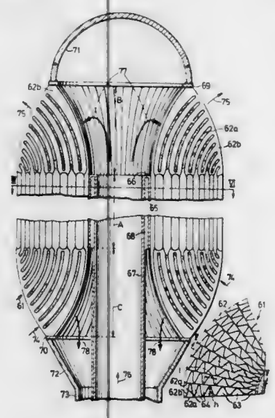
Hans Bieri, Dietikon, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Oct. 6, 1976, Ser. No. 729,978

Claims priority, application Switzerland, Jul. 30, 1976, 9754/76

Int. Cl.[2] F28F *3/02*

U.S. Cl. 165—166 **11 Claims**



1. In a heat exchanger having a longitudinally disposed tube for guiding one heat transfer medium therethrough,
- a heat exchanger element disposed coaxially of the tube, said element having a plurality of walls extending outwardly from a longitudinally disposed central area, each of said walls being connected at an inner radial end to an adjacent wall and at an outer radial end to another adjacent wall to define flow zones on opposite sides of each wall, at least every second one of said walls following each other in the circumferential direction of said heat exchanger element being corrugated and having crests running in the direction of the longitudinal axis of said heat exchanger element;
- a flat wall disposed between two corrugated walls, said corrugated walls having respective crests and troughs braced against said flat walls; and
- means closing alternating flow zones to the remaining flow zones to form separate flow paths for two heat exchange media on opposite sides of each wall, said means defining an inlet for one heat exchange medium from the tube and an outlet for the other heat exchange medium to and from alternating flow zones at one longitudinal end of said element, and an outlet for the one heat exchange medium and an inlet for the other heat exchange medium from and to the alternating flow zones at the opposite longitudinal end of said element whereby the two heat exchange media flow in countercurrent through said element.

4,178,992

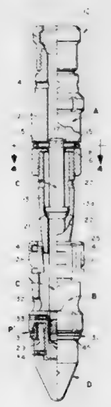
METAL SEAL TUBING PLUG

Louis M. Regan, Beaumont, Calif.; Thomas W. Childers, Mandeville, La.; Roy E. Anderson, and Joseph A. Burkhardt, both of New Orleans, La., assignors to Exxon Production Research Company, Houston, Tex.

Filed Jan. 30, 1978, Ser. No. 873,304

Int. Cl.[2] E21B *7/06*

U.S. Cl. 166—117.6 **10 Claims**



1. A plug for use in sealing a tubing, said tubing having a locking recess and a tapered sealing surface formed on the inner wall thereof, said recess having a tapered surface, comprising:
- first and second housings;
- an inner mandrel connecting said first and second housings together for limited movement therebetween;
- locking means on said first and second housings cooperating to lock said plug in said tubing recess when said first housing is moved relative to said second housing,
- said locking means on said first housing comprising a cone-shaped section and said locking means on said second housing comprising expansible-retractable lugs capable of being expanded by said cone-shaped section, said lugs having tapered surfaces for wedging against said tapered surface of said recess;
- said second housing containing a tapered sealing surface and an annular metal seal means, said metal seal means having a first tapered sealing surface for sealing against said sealing surface on said tubing and a second tapered sealing surface for sealing against said sealing surface on said second housing to seal off the space between said tubing and said second housing, the distance between said tapered surfaces on said lugs and said first sealing surface on said metal seal means being precisely selected to ensure that said metal seal means is properly loaded for sealing when said plug is locked in said tubing recess.

4,178,993

METHOD OF STARTING GAS PRODUCTION BY INJECTING NITROGEN-GENERATING LIQUID

Edwin A. Richardson, and Ronald F. Scheuerman, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 807,946, Jun. 20, 1977, abandoned. This application May 4, 1978, Ser. No. 902,636

Int. Cl.[2] E21B *43/25*

U.S. Cl. 166—300 **12 Claims**

1. A process for treating a gas well from which production is prevented by the hydrostatic pressure of liquid contained within the well, comprising:
- injecting into the well at least one aqueous liquid solution which forms or contains a nitrogen gas-forming mixture of (a) at least one water-soluble compound which contains at least one nitrogen atom to which at least one hydrogen atom is attached and is capable of reacting within an aqueous medium to yield nitrogen gas and byproducts which are substantially inert to the components of the well and reservoir formation, (b) at least one oxidizing agent which is capable of reacting with said nitrogen-containing compound to form said gas and byproducts, and (c) an aqueous liquid which is capable of dissolving or homogeneously dispersing said nitrogen-containing compound, the oxidizing agent and the byproducts of the nitrogen-gas-producing reaction;
- correlating the composition of the nitrogen-gas-forming mixture with the pressure, temperature and volume properties of the reservoir and well components so that pressure and volume of the gas which is generated displaces sufficient liquid from the well to reduce the hydrostatic pressure to less than the reservoir fluid pressure; and,
- initiating gas production from the well by displacing liquid from the well in response to a flow of the pressurized gas formed by the generation of nitrogen gas and allowing gas to flow from the reservoir to the well.

4,178,994

FIRE EXTINGUISHING SYSTEM FOR WAREHOUSES

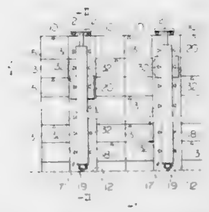
Akira Ito, Yokohama, and Masao Matsui, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Feb. 16, 1978, Ser. No. 878,466

Claims priority, application Japan, Feb. 16, 1977, 52-15690

Int. Cl.[2] A62C *3/00*

U.S. Cl. 169—52 **9 Claims**



1. A system for extinguishing a fire in a warehouse having a plurality of framed storage rack structures arranged parallel in a first coordinate axis to define parallel lanes between adjacent rack structures, each of said structures having a plurality of columns horizontally spaced along a second coordinate axis and a plurality of racks vertically spaced along a third coordinate axis so that a plurality of storage locations are defined and addressable in terms of the positions on said first, second and third coordinate axes and a vehicle-mounted, remote-controlled structure provided for each of said lanes and movable in response to a command signal along the lane including means

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for carrying an article to a selected storage location for storage and delivery purposes, comprising:

a first plurality of fire detecting means located at various points of said storage rack structures for generating a first signal indicating the position of the fire in terms of said first and second coordinate axes;

a second plurality of fire detecting means mounted on opposite sides of said movable structures and vertically spaced to correspond to said storage locations to generate a second signal indicating the position of said fire in terms of said third coordinate axis;

control means responsive to said first signal to cause said movable structure to move to the indicated position on said first and second coordinate axes and responsive to said second signal to cause said article carrying means to move to the indicated position on said third coordinate axis; and

a fire extinguisher mounted on the article carrying means of each of said movable structures for directing a flow of fire extinguishing material toward the storage rack structure in response to said article carrying means reaching said position on said third coordinate axis, said fire extinguisher being provided with a pair of oppositely pointing nozzles to direct a flow of fire extinguishing material in opposite directions, and means for activating one of said nozzles depending on which side the fire is detected by said second fire detecting means.

4,178,995

SELF-PROPELLED BALLAST CLEANING MACHINE FOR ON- AND OFF-TRACK WORK

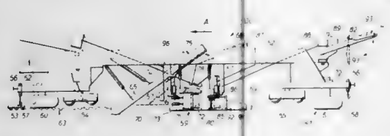
Josef Theurer, Vienna, and Karl Fölser, Linz-Urfahr, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed May 13, 1977, Ser. No. 796,841

Claims priority, application Austria, May 31, 1976, 3987/76; Sep. 13, 1976, 6782/76

Int. Cl.[2] **E01B** *27/06*

U.S. Cl. 171—16 **19 Claims**



1. A self-propelled ballast cleaning machine useful for work in track switch and other widening track sections and comprising the combination of

(a) a machine frame,

(b) selectively operable on-track and off-track undercarriages supporting the machine frame at respective end regions thereof for selected on-track or off-track operation,

(c) a drive for the undercarriages for propelling the machine frame on- or off-track,

(d) a ballast material excavation chain mounted on the machine frame and adjustable in width for operation in widening track sections, the chain having a portion for excavating engagement with the ballast,

(e) a screen arrangement mounted on the machine frame and arranged to receive ballast material excavated by the chain from the chain for cleaning the excavated ballast material,

(f) a ballast storage means mounted on the frame immediately adjacent the ballast excavating chain portion, the ballast storage means having adjustable ballast discharge port means capable of discharging controlled amounts of ballast from the storage means,

(g) means for moving the excavated ballast material to the ballast storage means, and

(h) a ballast plow means vertically movably mounted on the machine frame and arranged to level the ballast discharged from the storage means, the plow means including

(I) plowshare means adjustable for leveling ballast in widening track sections.

4,178,996

SOIL CULTIVATING MACHINE

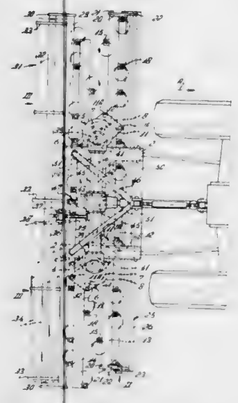
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Oct. 6, 1977, Ser. No. 840,045

Claims priority, application Netherlands, Oct. 12, 1976, 7611244

Int. Cl.[2] **A01B** *33/06*

U.S. Cl. 172—59 **20 Claims**



1. A soil cultivating implement comprising a frame and at least two elongated carriers pivoted to said frame, said carriers extending transverse to the direction of travel, one behind the other and each carrier mounting downwardly extending tine means along the length thereof, driving means comprising common upwardly extending rotary shaft means and a corresponding eccentric mechanism that is pivoted to each carrier being journalled on said shaft means, each carrier being driven by spaced apart respective eccentric mechanisms with rotary shafts located at each side of the centerline of the machine, each rotary shaft having eccentric mechanisms mounted thereon, one above the other, a respective eccentric mechanism being pivoted to each carrier.

4,178,997

IMPLEMENTS WITH SIDE SCREENING PLATES

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N. V., Maasland, Netherlands

Continuation of Ser. No. 393,026, Aug. 30, 1973, abandoned, which is a division of Ser. No. 172,511, Aug. 17, 1971, Pat. No. 3,774,689. This application Apr. 14, 1975, Ser. No. 567,695

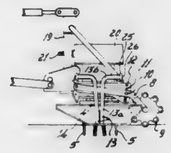
Claims priority, application Netherlands, Aug. 18, 1970, 7012157

Int. Cl.[2] **A01B** *33/12*

U.S. Cl. 172—112 **12 Claims**

1. A harrow comprising an elongated frame extending transverse to the normal direction of travel, a plurality of soil working members supported in a row on said frame, said soil-working members being rotatably mounted on upwardly extending shafts and each of said members comprising a support with at least one downwardly extending tine, a substantially vertical screening plate being normally positioned adjacent each opposite lateral side of said row and extending in the general direction of travel, said plate having an upper edge and a lower edge

that rides over the ground during travel, said plate being pivotably connected to said frame through arm means, said arm means extending from said plate and connected to said frame a



substantial distance from the lateral side of said frame, said plate being pivotably connected to said frame and freely turnable about an axis which extends generally parallel to the direction of travel of the harrow.

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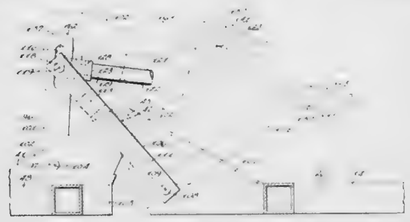
FOLDING MECHANISM FOR A MULTIPLE SECTION AGRICULTURAL IMPLEMENT

Randal L. Rockwell, La Porte, Ind., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Apr. 17, 1978, Ser. No. 896,682

Int. Cl.[2] **A01B** *73/00*

U.S. Cl. 172—311 **12 Claims**



1. In a foldable, multiple section agricultural implement of the type having a pair of horizontally aligned sections and depending earthworking tools, said sections being pivotally interconnected on a longitudinal folding axis permitting one section to pivot relative to the other section between an extended working position in which said sections are horizontally aligned and a folded position in which said one section is in a reversed position above said other section with its tools projecting upwardly, a folding mechanism comprising:

a first link having one end pivotally connected to said one section on a first axis spaced from said folding axis,

a second link having one end pivotally connected to the other section on a second axis spaced from said folding and first axes,

lost motion connecting means pivotally connecting the other ends of said links to one another including,

a slot in the other end of said first link, said slot being elongated lengthwise of said first link, and

a pin part secured to the other end of said second link and operatively disposed in said slot, and

a linear actuating means mounted on said implement and connected to said second link operable to pivot said one section relative to said other section from said working position to a balanced overhead position and to said folded position, said actuating means including a (component) clevis having a base part from which a pair of legs extend, said legs being pivotally connected to said other end of said second link and said base part having an abutment shoulder in thrust transmitting engagement with said other end of said first link when said one section is in said overhead and folded positions, said abutment shoulder being out of engagement with said other end of said first link when said one section is in said working position.

4,178,999

REVERSIBLE TOOL MOUNTING BRACKET FOR AGRICULTURAL IMPLEMENTS

Elmer K. Hansen, 801 S. Martha, Sioux City, Iowa 51102

Filed Oct. 3, 1977, Ser. No. 838,744

Int. Cl.[2] **A01B** *23/02*

U.S. Cl. 172—702 **6 Claims**



1. A reversible mounting bracket for releasably securing a tool having a shank portion to the leg sections of a forwardly facing V-shaped tool bar of a farm implement for tilling soil, said mounting bracket comprising:

(a) a base plate with upper and lower surfaces,

(b) elongated tool mounting means fixed to and extended longitudinally of the lower surface of said base plate and having a tool supporting end portion projected outwardly therefrom,

(c) coupling means for attaching said base plate against the under surface of one of said tool bar leg sections such that in one position the projected end portion is located to the front of said tool bar leg section and in a reversed position is located to the rear of said tool bar leg section with the longitudinal axis of said tool mounting means directed parallel to the direction of travel of said farm implement,

(d) socket means fixed along the lower portion of the projected end portion of said tool mounting means and open at both ends to receive said shank portion through either end thereof, and

(e) retention means for releasably securing the shank portion of said tool in said socket means.

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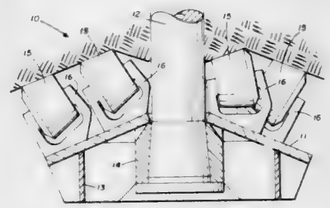
SELF-CLEANING RAISE BORING HEAD SYSTEM

Howard E. Mitchell, Duncanville, and William C. Saxman, Irving, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jun. 5, 1978, Ser. No. 912,624

Int. Cl.[2] **E21C** *23/00*

U.S. Cl. 175—53 **2 Claims**



1. A raise head for enlarging a pilot hole into a large diameter hole by disintegrating the formations surrounding the pilot hole into debris and allowing the debris to fall down said large diameter hole, said raise head to be attached to a rotary drill string that extends through said pilot hole, comprising:

a conical main body, said conical main body comprising a truncated cone main plate having a smooth downward

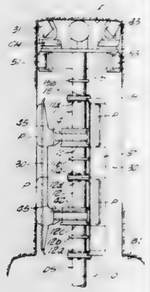
sloping outer surface, a central opening and a conical interior;
a drive stem projecting through said central opening and connected to said truncated cone main plate for attachment to said rotary drill string;
a cylindrical support frame positioned in said conical interior of said truncated cone main plate;
a series of inner struts positioned between said truncated cone main plate and said cylindrical support frame;
a multiplicity of outer struts extending radially outward from said cylindrical support frame supporting said truncated cone main plate;
a multiplicity of rolling cutter members for disintegrating the formations into debris and allowing the debris to fall onto said smooth downward sloping outer surface of said truncated cone main plate and continue down said large diameter hole, said rolling cutter members having a cutting profile that is substantially parallel to said downward sloping outer surface of said truncated cone main plate;
a multiplicity of cutter saddles mounted on said smooth downward sloping outer surface of said truncated cone main plate of said conical main body for rotatably supporting said rolling cutter members; and
a series of openings in said truncated cone main plate adjacent said cutter saddles.

4,179,001

UNDERGROUND DRILLING AND CASING METHOD AND APPARATUS

Norman H. Still, 617 Brookwood, and Robert W. Berry, Jr., 1566 N. Wardman, both of Brea, Calif. 92621

Filed Sep. 23, 1977, Ser. No. 836,219
Int. Cl.[2] E21D *3/00;* **E21B** *19/00*
U.S. Cl. 175—57 **19 Claims**



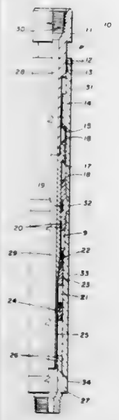
1. Underground drilling apparatus comprising:
a drill string;
a casing string disposed about said drill string;
a collapsible cutterhead attached to the forward end of said drill string, said cutterhead having a normal diameter which is significantly greater than the exterior diameter of said casing string, and having a collapsed diameter which is smaller than the interior diameter of said casing string;
the forward end of said casing string having a plurality of circumferentially spaced external ribs thereon, the effective diameter of said ribs being substantially equal to the normal diameter of said cutterhead; and
means for supporting and stabilizing said drill string within said casing string in concentric relation therewith, including skid means adapted to slide longitudinally within the interior surface of said casing string, and rotating bearing means secured to said drill string and to said skid means for supporting said skid means from said drill string in rotatable relationship to the longitudinal axis thereof;
whereby said drill string may be advanced relative to said casing string and concurrently drivingly rotated so as to cause said cutterhead to drill a hole, or alternatively, said cutterhead may be collapsed and said drill string may be retracted through said casing string so as to withdraw said cutterhead therethrough.

4,179,002

VARIABLE HYDRAULIC RESISTOR JARRING TOOL

James W. Young, Irving, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 25, 1978, Ser. No. 936,974
Int. Cl.[2] E21B *1/06, 1/10*
U.S. Cl. 175—297 **4 Claims**



1. In a hydraulic jarring tool having an outer member and an inner member telescopically arranged with spline means between said outer member and said inner member for transmitting torque, an anvil and hammer means for providing a jarring effect, first seal means between said outer member and said inner member for providing a fluid seal, second seal means between said outer member and said inner member for providing a fluid seal, a working fluid chamber located between said inner member and said outer member and located between said first seal means and said second seal means, an operating fluid contained in said working fluid chamber, and sleeve valve means in said working fluid chamber for metering said operating fluid at a sleeve valve detent flow rate to allow said anvil and hammer means to provide said jarring effect, an improvement for externally adjusting the sleeve valve detent flow rate comprising:
said sleeve valve means including an adjustable orifice passage means having a moveable valve element that can be moved to provide different sleeve valve detent flow rates;
a hole in said outer member;
a removeable closure plug to be positioned in said hole and removed from said hole; and
an adjustment wrench for extending through said hole, contacting said moveable valve element and moving said moveable valve element to provide different sleeve valve detent flow rates.

4,179,003

SEAL FOR A ROLLING CONE CUTTER EARTH BORING BIT

Thomas W. Cooper, Mansfield, and Ernest E. Taylor, Irving, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 21, 1978, Ser. No. 971,776
Int. Cl.[2] E21B *9/08*
U.S. Cl. 175—371 **1 Claim**



1. A rolling cone cutter earth boring bit for operation in a fluid-filled borehole, comprising:
a bit body, said bit body having at least one downwardly extending arm;
a cantilevered bearing pin extending from said arm;
a rolling cone cutter rotatably mounted on said bearing pin, said rolling cone cutter having a cone mouth;
bearing and cutter retaining means between said bearing pin and said rolling cone cutter;
lubricant between said bearing pin and said rolling cone cutter;
an outer rigid seal ring positioned around said bearing pin within said cone mouth, said outer rigid seal ring comprising an annular rigid ring that is split to allow radial expansion and contraction, said outer rigid seal ring positioned to be in contact with said rolling cone cutter in said cone mouth;
an inner rigid seal ring positioned around said bearing pin within said cone mouth, said inner rigid seal ring comprising an annular rigid ring that is split to allow radial expansion and contraction, said inner rigid ring being smaller in diameter than said outer rigid ring and positioned to be in contact with said bearing pin in said cone mouth inside said outer rigid seal ring; and
an elastomer ring located between said outer and inner rigid rings in said cone mouth, said elastomer ring being affixed to said outer and inner rigid rings, whereby fluid in said borehole can cause said elastomer ring to force said inner rigid ring to contract into tighter contact with said bearing pin and said lubricant between said bearing pin and said rolling cone cutter can cause said elastomer ring to force said outer rigid ring to expand into tighter contact with said rolling cone cutter.

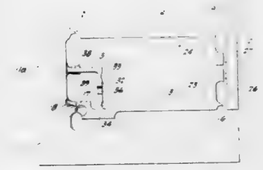
4,179,004

FORCE MULTIPLYING LOAD CELL

Willem Ebbinge, Petaluma, Calif., assignor to National Controls, Inc., Santa Rosa, Calif.

Filed Feb. 15, 1978, Ser. No. 878,063
Int. Cl.[2] G01G *3/14;* **G01L** *5/12*
U.S. Cl. 177—211 **22 Claims**

1. In a load cell: a base, a load arm spaced from the base for receiving a load applied in an axial direction, a lever arm with flexures toward the ends thereof interconnecting the load arm and base, a stabilizing arm with flexures interconnecting the load arm and base and cooperating with the lever arm to constrain the load arm for movement in the axial direction, a load beam affixed at one end to the base, a coupling link interconnecting the lever arm and the load beam, said link being connected to the lever arm at a point intermediate the ends thereof, and means responsive to stress in the load beam for providing an output signal corresponding to the load applied to the load arm.

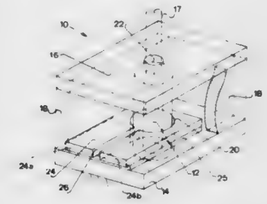


4,179,005

WEIGHING APPARATUS CALIBRATION MEANS AND METHOD

Peter Kunz, Tann-Rüti, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

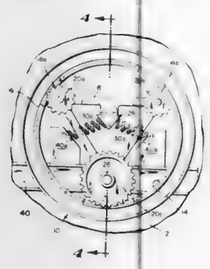
Filed Oct. 13, 1978, Ser. No. 951,087
Claims priority, application Switzerland, Apr. 19, 1978, 4184/78
Int. Cl.[2] G01G *7/00, 3/14*
U.S. Cl. 177—212 **10 Claims**



1. In a weighing apparatus of the electromagnetic load compensation type including stationary permanent magnet means, a load compensation coil connected with the movable scale member for movement relative to said permanent magnet means, means for supplying compensating current to said coil for returning the scale member to an initial no-load position, and means for indicating the magnitude of the load as a function of the compensating current;
the improvement which comprises
(a) a generally U-shaped conductive metal plate (**24**); and
(b) means mounting said plate in spaced insulated relation adjacent a portion of said permanent magnet means, whereby when the leg portions of said plate are connected with an alternating current source, said plate functions as a single winding turn for varying the magnetization of said permanent magnet means.

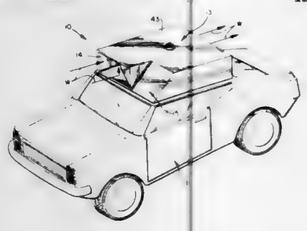
V 9 8 9 3 DE 18 79 UMI

4,179,006
TORSIONALLY RESILIENT COUPLING FOR TRANSMITTING ROTARY MOTION
Isidore J. Lenack, 6120 Jamieson Ave., Reseda, Calif. 91335, and Roger D. Lenack, 20357 Tuba St., Chatsworth, Calif. 91311
Filed Feb. 27, 1978, Ser. No. 881,777
Int. Cl.[2] B62D *55/00*
U.S. Cl. 180—10 **8 Claims**



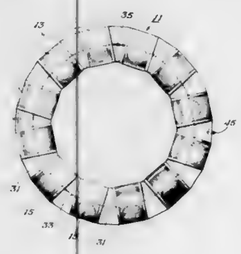
1. A torsionally resilient coupling for transmitting rotary motion, comprising, in combination:
a cylindrical track;
a rotatable member fixedly secured to said track to rotate therewith;
a roller frame cooperatively associated with said track and having three separate roller means rotatably supported thereon, said three roller means rollingly engaging said track and being circumferentially spaced thereon so that said roller frame is rotatable relative to said track about the axis thereof;
a shaft coaxially attached to one of said roller means to rotate therewith;
housing means cooperatively associated with said shaft, said shaft being rotatable relative to said housing means in order to drivingly rotate said one roller means, said track, and said rotatable member; and
bi-directional spring means coupled between said frame and said housing means and being resiliently deflectable so as to permit said frame to intermittently oscillate relative to said housing means by a significant part of a revolution;
whereby in response to a varying load thereupon the rotation of said rotatable member may be retarded or advanced relative to the rotation of said shaft in accordance with the intermittent oscillation of said frame.

4,179,007
WIND OPERATED POWER GENERATING APPARATUS
Robert R. Howe, 4229 Timber Valley Ct., Decatur, Ga. 30032
Filed Jun. 1, 1978, Ser. No. 911,464
Int. Cl.[2] B60L *11/00*
U.S. Cl. 180—65 DD **15 Claims**



1. In combination, a self propelled vehicle and a wind operated electrical power system mounted on said self propelled vehicle, said power system comprising:
a flywheel including an inner and an outer circumferential rim, said inner and outer rims being concentric and at least one of said circumferential rims comprising an annular track portion;
a plurality of rotor vanes mounted on said flywheel, said vanes arranged such that wind striking said vanes urges rotation of said flywheel about an axis perpendicular to the direction of flow of the wind; and
at least one electric generator including a generator shaft and a wheel mounted to said generator shaft, said generator being positioned with said wheel in direct rotating engagement with said annular track portion,
whereby said wheel tracks on said track portion and tracking of said wheel on said track portion rotates said generator shaft in response to rotation of said flywheel.

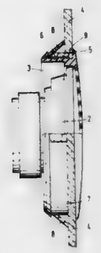
4,179,008
STRUCTURE AND ARRANGEMENT FOR LOUDSPEAKER ASSEMBLAGE
Ted L. LeTourneau, P.O. Box 7655, Longview, Tex. 75602
Filed Apr. 24, 1978, Ser. No. 899,324
Int. Cl.[2] H05K *5/00;* **A47B** *81/06*
U.S. Cl. 181—147 **9 Claims**



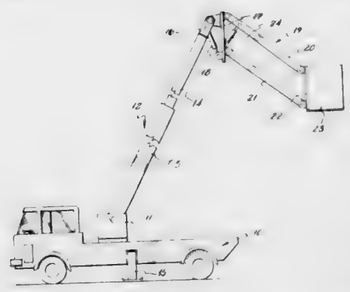
1. A loudspeaker assemblage comprising:
a. a group of speakers, with each speaker having a central axis;
b. support means for each said speaker, with each said speaker being fixed to a respective said support means;
c. means interconnecting all said support means to form an annular structure having a central axis and providing individual adjustment of said speakers to respective selected positions relative to a respective rotational axis which intersects and is normal to the respective said speaker central axis and also is normal to a radial plane of said annular structure that bisects said respective speaker and contains the speaker central axis, and with each said speaker facing away from a common side of the central plane of said annular structure.

4,179,009
MOUNTING ARRANGEMENT FOR A LOUDSPEAKER TO A RESONANCE PANEL PERMITTING FRONT INSERTION ASSEMBLY
Udo Birkner, Heinde, Fed. Rep. of Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany
Filed Mar. 6, 1978, Ser. No. 883,813
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1977, 2711126
Int. Cl.[2] G10K *13/00;* **H04R** *7/00;* **H04M** *1/00*
U.S. Cl. 181—171 **6 Claims**

1. Mounting arrangement for a loudspeaker to a resonance panel (4) permitting assembly from the front side through an opening (9) in the panel having
a holding ring (3) secured to the basket (2) of the loudspeaker and formed with a radially extending flange (5) adapted to overlap the panel (4) at the front side thereof, and comprising, in accordance with the invention,
an outer thread (6) formed on the circumference of the holding ring (3);
and a mounting ring (7) having an inner thread matching the outer thread (6) of the holding ring, the mounting ring (7) having a plurality of resilient gripper fingers (8) extending from the circumference thereof which, in normal position, extend outwardly from the outline thereof and beyond the back side of the panel (4) and being resiliently movable to within essentially the outline of the mounting ring (7) to permit snapping the assembly of the mounting ring and of the loudspeaker with the holding ring (3) thereon through the opening (9) and subsequent tightening of the loudspeaker flange (5) against the panel (4) by rotating the loudspeaker and the holding ring in the inner threads of the mounting ring, which is then held against rotation by frictional engagement of the gripper fingers (8) with the rear side of the panel (4).

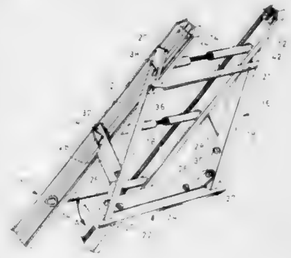


4,179,010
ACCESS EQUIPMENT
Denis H. Ashworth, Sedgley, England, assignor to Simon Engineering Dudley Limited, West Midlands, England
Filed Nov. 21, 1977, Ser. No. 853,414
Claims priority, application United Kingdom, Dec. 14, 1976, 52209/76
Int. Cl.[2] B66F *11/04*
U.S. Cl. 182—2 **2 Claims**



1. In a crane of the kind having a telescopically extendible jib pivotally connected at one end to a turntable, an accessory unit to be fitted to the free end of the jib of the crane, a bracket pivotally connected to said unit for rotation about a horizontal axis, first hydraulic cylinder means extending between said unit and the bracket and capable of being actuated to adjust the orientation of said bracket relative to the jib of the crane, said bracket comprising a bracket member having on one side means at its upper end for directly pivotally connecting it to said unit and lower vertically spaced means for directly pivotally connecting it to one end of said first hydraulic cylinder means which has its other end pivoted on said unit, said bracket being formed in two parts, one of which is said bracket member and the other of which is a spaced member to which the boom structure is pivotally connected, and there being means in said bracket for relatively pivoting said members about a vertical axis, a boom structure pivotally connected relative to said bracket for movement in a vertical plane about a horizontal axis, a working platform or cage pivotally connected to the end of said boom structure remote from said bracket, second hydraulic cylinder means for causing pivotal movement of said boom structure relative to said bracket and means for maintaining said working platform or cage level regardless of the angle of inclination of said boom structure.

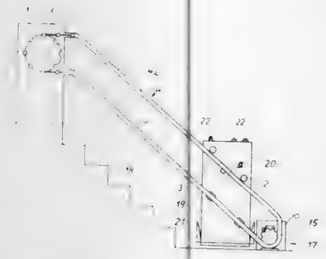
4,179,011
ROOFING LADDER AND BRACES THEREFOR
Janus Morawski, P.O. Box 562, Station P, Toronto, Ontario, Canada
Filed Oct. 21, 1977, Ser. No. 844,358
Int. Cl.[2] E06C *1/36, 7/48*
U.S. Cl. 182—45 **6 Claims**



1. Roofing ladder attachment means for a ladder of the type having hollow tubular rungs, said attachment means comprising:
an upper end brace for use on such a ladder and having leg means attachable to the upper end of the ladder, with its free end extending outwardly and downwardly, and strut means attachable to another point on the ladder, and connected with the leg means to secure the same in its angular relations to the ladder;
releaseable fastening means for securing the leg means, and the strut means to the ladder;
foot means on the leg means for lying on the roof and holding the ladder, and,
a ladder spacer attachable to said ladder spaced apart from said upper end brace, and having ladder connection means attachable in predetermined location on said ladder, and foot means on said connection means spaced downwardly from said ladder and adapted to lie on a said roof thereby raising said ladder off said roof, and wherein said ladder connection means comprises a pair of plate members spaced apart so as to register with two separate rungs of said ladder and further said fastening means extending through said holes and respective said rungs.

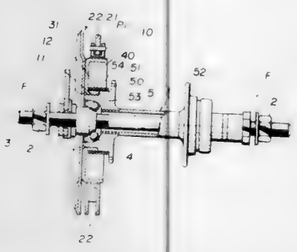
V 9 8 9 3 3 DE 18 7 9 UMI

4,179,012
STAIRWAY-TYPE PASSENGER LIFT
Heinz Heberle, Friedberg-West, Fed. Rep. of Germany, assignor to Rigert Maschinenbau AG, Immensee, Switzerland
Filed Apr. 28, 1978, Ser. No. 901,106
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1977, 2719120
Int. Cl.² B66B *9/08*
U.S. Cl. 187—12 **10 Claims**



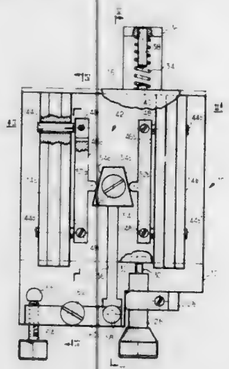
1. A lift comprising:
a wheel;
an endless flexible and generally inextensible conveyor element reeved over said wheel;
a pair of guides extending from said wheel and receiving said element to subdivide same into a respective pair of stretches, said guides and element being relatively dimensioned to prevent lateral bowing of said element;
a platform fixed on one stretch of said element;
drive means connected to said element for displacing same and conveying said platform along one of said guides; and
means including a speed-responsive brake in at least indirect continuous operative engagement with said element for arresting same when the displacement speed thereof exceeds a predetermined maximum level.

4,179,013
MEANS FOR ENSURING SECUREMENT OF A BRAKE ROTARY BODY TO A WHEEL HUB
Masayoshi Kine, Osaka, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed Aug. 4, 1978, Ser. No. 931,003
Claims priority, application Japan, Aug. 9, 1977, 52/106846[U]
Int. Cl.² B62L *1/00*
U.S. Cl. 188—26 **11 Claims**



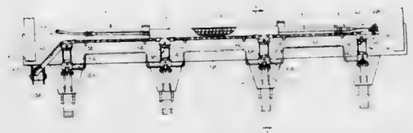
1. A brake mechanism for a bicycle which is screwed into engagement with a mounting tube forming a portion of a hub for a bicycle, the hub further comprising a hub shaft, a hub shell rotatably supported on said hub shaft, and a pair of hub flanges provided on said shell, comprising:
a rotary body screwed onto the mounting tube of a hub to rotate together with said hub, a cylindrical boss having a screw thread engaged with a screw thread on said mounting tube being provided on the center of said rotary body,
a braking member having a contact face which contacts said rotary body to stop the rotation of the rotary body, and
a coil spring wound on the outer periphery of the boss portion of said rotary body, the inner diameter of said coil spring being the equal to or smaller than the outer diameter of said boss portion in its unstressed condition, the inner face of said coil spring being in contact against the outer periphery of said boss portion, one end of said coil spring along the lengthwise direction extending onto said mounting tube when said rotary body is engaged with said mounting tube, the inner face of said extending portion being in contact against the outer peripheral face of said mounting tube, said coil spring having its diameter reduced through the rotation of said rotary body in a direction which would unscrew the rotary body from said mounting tube.

4,179,014
MECHANISM FOR LOCKING A PLATE WHICH IS MOVABLE ON A TABLE ALONG GUIDE MEANS
Emile Bailly, Les Lilas, France, assignor to Compagnie International pour l'Informatique Cii-Honeywell Bull, Paris, France
Filed Mar. 23, 1978, Ser. No. 889,516
Claims priority, application France, Apr. 19, 1977, 77 11743
Int. Cl.² B61H *13/00*
U.S. Cl. 188—43 **14 Claims**



9. A mechanism for locking a plate in situ on a table provided with at least two guiding surfaces for guiding movement of the plate in a predetermined direction, comprising members movable between a first position where they are applied to fixedly connect the plate to said guiding surfaces at at least three contact areas and a rest position where the plate can be moved, at least one bar connecting one end of certain of said members together and having a projection, and ramp means inclined relative to said predetermined direction and freely movable substantially in the plane of said contact areas, said ramp means cooperating with said projection of said bar and with the remaining of said members for moving all of said members between said first and rest positions when said ramp means are displaced substantially in said predetermined direction.

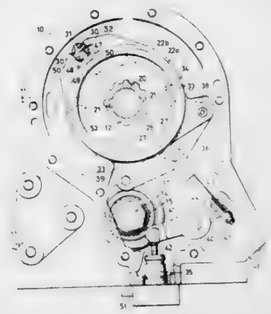
4,179,015
MULTIPLE PARKING BRAKE
Robert L. Siewert, Benton Harbor, Mich., assignor to Clark Equipment Company, Buchanan, Mich.
Filed Oct. 30, 1978, Ser. No. 956,462
Int. Cl.² F16D *65/30*
U.S. Cl. 188—106 P **5 Claims**



1. In a vehicle having a plurality of spaced apart adjacent compacting wheels, wherein at least some of said wheels have operably associated braking mechanisms, a control system for actuating said braking mechanisms comprising:
a plurality of adjacent, spaced apart, pulley assemblies including a first and last pulley assembly, each of said assemblies including two side-by-side rotatably mounted fixed pulleys;
a corresponding plurality of adjacent, spaced apart, free pulleys, each of said pulleys associated with respective assemblies;
cable means linking each of said pulley assemblies to adjacent assemblies, and linking each of said assemblies to said corresponding free members by passing said cable means around one of said side-by-side pulleys to said free pulley and then back to said other side-by-side pulley, said cable means having two ends;
selectively operable means for shortening said cable between said first assembly and said last assembly, so that said respective free pulleys move substantially simultaneously toward associated respective assemblies when said shortening means is applied, said one end of said cable means connecting said first assembly to said shortening means;
an anchor point for the other end of said cable means;
said other end of said cable means linking said last assembly to said anchor point; and
a selectively operable actuator on each of said brake mechanisms for applying said brake mechanism to said wheels, each of said actuators connected with one of said free pulleys, so that said actuators are operated when said shortening means is operated, whereby the brake mechanisms of each wheel are substantially simultaneou ¹y applied.

4,179,016
FINAL DRIVE GEARING WITH BRAKE
William Alderman, and Eric C. Hodgson, both of Huddersfield, England, assignors to David Brown Tractors Limited, Huddersfield, England
Filed Jan. 25, 1977, Ser. No. 762,300
Claims priority, application United Kingdom, Feb. 27, 1976, 7759/76
Int. Cl.² B60K *29/02*
U.S. Cl. 192—4 A **9 Claims**

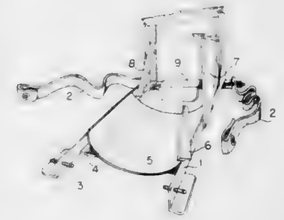
1. A final drive assembly, for an agricultural tractor or the like, comprising a casing in which there are journalled a final drive shaft and the outer end of a half-shaft, speed reduction gearing housed within the casing and driveably interconnecting the two shafts, a brake mounted on one of said shafts within the casing for establishing a frictional connection between said one shaft and the casing, and means for operating the brake comprising a hydraulic cylinder housed within the casing and having a piston rod extending within the casing, a bell crank lever fulcrumed within the casing and having one arm pivotally connected to said piston rod, and a rod within said casing



pivotally connected to the other arm of said bell crank lever and having an operative connection with said brake

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4,179,017
BALE TURNER
Martin C. Tilley, 683 Eastland Dr. S., Twin Falls, Id. 83301
Filed Apr. 3, 1978, Ser. No. 893,008
Int. Cl.² B65G *11/00*
U.S. Cl. 193—47 **5 Claims**



1. A bale turner for attachment to a bale making machine comprising:
(a) a first frame defining a rectangular space removably attached to a bale making machine and disposed in a downwardly sloping horizontal plane away from said bale making machine;
(b) a second frame disposed in a vertical plane attached to the first frame at its lower end, said second frame defining a space through which turned bales exit the bale turner;
(c) a concave platform attached to the first frame for receiving end first the bale to be turned;
(d) first guide means attached to said platform for rotating the turned bottom edge of the bale downwardly into said concave platform thereby partially rotating said bale around its longitudinal axis;
(e) second guide means disposed between and attached to the first and second frames for urging the new turned bottom edge of the bale in a downwardly direction;
(f) third guide means attached to the first and second frames and positioned on the first frame opposite the second guide means for urging the new turned top edge of the bale in an upward direction; and
(g) fourth guide means for urging the turned bale through the space defined by the second frame and off the bale turner without further rotation.

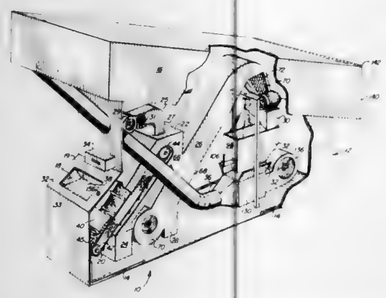
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4,179,018

METHOD AND APPARATUS FOR SELECTIVE RECOVERY OF METAL CONTAINERS

John H. Miller, 6412 E. Voltaire Ave., Scottsdale, Ariz. 85254

Filed Dec. 27, 1976, Ser. No. 754,493
Int. Cl.[2] G07F *1/06*
U.S. Cl. 194—4 R **6 Claims**



1. An apparatus for receiving trash and recovering metallic containers of a preselected type from said trash, said apparatus comprising:

(a) a frame;

(b) an inlet hopper for receiving said trash;

(c) first conveyor means located to receive trash discharged from said inlet hopper;

(d) magnetic means for retaining ferrous materials on said first conveyor means to convey said ferrous materials to a first location and discharge said non-ferrous materials at a second location;

(e) pneumatic conveying means communicating with said second location for conveying materals of predetermined specific weight to a third discharge location, said pneumatic conveying means including a pressurized duct inclined upwardly from an inlet to an outlet at said third discharge location;

(f) crushing means receiving material fro said third discharge location for reducing the size of materials received;

(g) weighing means receiving the materials discharged from said crusher means;

(h) means responsive to said weighing means for issuing compensation related to the weight of material weighed;

(i) control means for regulating the flow of materials into said weighing means during a weighing cycle and for dumping said weighing means upon completion of a weighing cycle; and

(j) second conveying means for receiving the discharge from said weighing means and conveying same to a storage compartment.

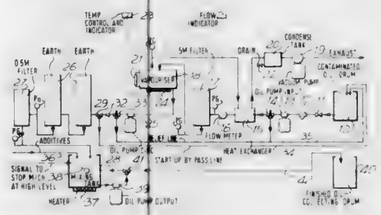
4,179,019

APPARATUS FOR RECLAIMING USED LUBRICATING OILS

Harry L. Danziger, 21a Cork St., Old Bond St., London, England (W1X 1HB)

Filed Jan. 9, 1978, Ser. No. 868,262
Int. Cl.[2] C10G *33/00, 34/00, 41/00*
U.S. Cl. 196—46.1 **13 Claims**

1. Apparatus for reclaiming used lubricating oil on a continuous flow basis, comprising an inlet line for oil to be reclaimed, a first filter unit receiving oil from said inlet line, inlet pump means for pumping oil through said inlet line and said filter unit, a vaporizer unit receiving the oil after passage through said filter unit and wherein the oil is heated to drive off water and volatiles, further filter means including a plurality of earth filters, circulating pump means for pumping the oil from said vaporizer unit through said earth filters in succession, and



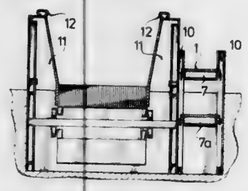
additive adding means for adding additives to the oil after passage through said further filter means.

4,179,020

TRANSPORTER FOR THE TRANSPORTATION OF PIECES OF BAGGAGE INTEGRATED WITH AN ESCALATOR

Helmut Heusler, Dortmund, and Fritz Behle, Hattingen, both of Fed. Rep. of Germany, assignors to O&K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Jan. 30, 1978, Ser. No. 873,368
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703436
Int. Cl.[2] B66B *9/12*
U.S. Cl. 198—326 **10 Claims**



1. A conveyor system for the transportation of pieces of baggage and the like from one conveying plane to another conveying plane integrated with an escalator for the transportation of people, comprising

an escalator,

at least one endless baggage conveyor belt arranged parallel to the escalator,

first balustrades cooperatively mounted at said baggage conveyor belt on both lateral sides thereof,

means for driving said conveyor belt synchronously with the escalator, said baggage conveyor belt is integrated with the escalator, said escalator has two second balustrades of a height substantially larger than that of said first balustrades,

one of the first balustrades is integrally mounted on one of said second balustrades.

4,179,021

LIFT DEVICE ARRANGEMENT

Charles H. Wallace, Carrollton, Va., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Mar. 24, 1978, Ser. No. 889,713
Int. Cl.[2] B65G *42/00*
U.S. Cl. 198—341 **9 Claims**

1. An arrangement to measure the back fat thickness at three selected locations on animal carcasses conveyed on an overhead conveyor comprising:

a hydraulically operated lift means to raise and lower a single operator to enable said operator to make measurements of said back fat thickness at said selected locations; and

circuit means coupled to said lift means and synchronized to



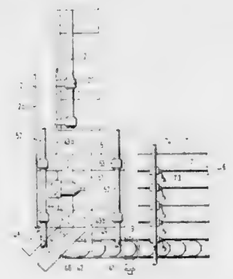
the movement of said conveyor to automatically control the movement of said lift means and to provide automatically an indication of the position of said lift means at which said operator is making each of said measurements.

4,179,022

INSTALLATION FOR THE PRODUCTION OF A MULTIPLE ROW CASK OF CONTAINERS

Diethelm W. K. Grocke, Nüremberg, and Klaus Wittmann, Lauf-Schönberg, both of Fed. Rep. of Germany, assignors to NUTRO Patentverwertungs- und Maschinenhandels-GmbH, Nuremberg, Fed. Rep. of Germany

Filed Aug. 23, 1977, Ser. No. 827,183
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638280
Int. Cl.[2] B65G *43/08, 47/68;* G06M *7/00*
U.S. Cl. 198—437 **7 Claims**
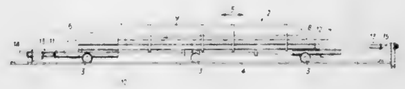


1. An installation for the production of a multirow cask of containers such as bottles, glasses, etc., including a conveyor belt, a feed track for the containers leading to said conveyor belt, and a guide channel for the introduction of the containers into several magazine tracks disposed in parallel side by side fashion, the improvement wherein the guide channel is of L-shape, formed of spaced lateral rails, said rails being continuous and including a first leg aligned in parallel to the direction of conveyance of the conveyor belt and a second leg integral with said first leg and extending coaxially to the feed track, means for stepwise shifting the L-shaped guide channel perpendicularly in relation to the direction of conveyance of the conveyor belt such that the end of the second channel leg is continuously connected with the feed track with its rails aligned therewith and the end of the first channel leg is stepwise connected to a given one of the parallel magazine tracks with its rails aligned therewith such that said bottles, glasses, etc., are fed sequentially to a given magazine track with the L-shaped guide channel stationary during feeding of multiple containers to said given magazine track.

4,179,023

APPARATUS FOR DISTRIBUTING SOLIDS IN GRANULAR OR LUMP FORM

Hermann Hacker, and Waldemar Zehenthofer, both of Zeltweg, Austria, assignors to Vereinigte Oesterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Jul. 8, 1977, Ser. No. 814,126
Claims priority, application Austria, Jul. 6, 1976, 4932/76
Int. Cl.[2] B65G *41/02*
U.S. Cl. 198—631 **11 Claims**



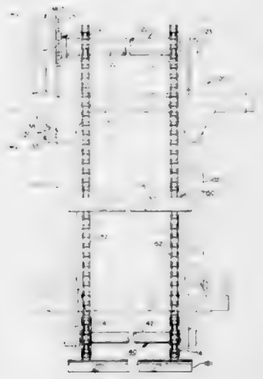
9. In apparatus for distributing solids in granular or lump form over an area of defined width comprising a wheeled carriage which is reciprocal between two end positions along a path which corresponds to said width, said carriage carrying a longitudinally extending endless conveyor which is charged with the solids to be distributed and which has a discharge end that moves above said width during movement of said carriage, the improvement which comprises an elastically deformable energy storage and release device for limiting the movement of said carriage at each end of the path of movement of said carriage thereby absorbing energy from said carriage and for thereafter transferring energy back to said carriage to move the latter in an opposite direction, said device in its deformed position defining the respective end position of said carriage.

4,179,024

SCRAPER ELEVATOR DRIVE MOUNTING

Richard F. Boersma, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Dec. 13, 1976, Ser. No. 749,820
Int. Cl.[2] B65G *39/16*
U.S. Cl. 198—806 **5 Claims**



1. A mounting for a conveyor roller to establish tracking of a conveyor supported for movement in a predetermined endless path of movement upon drive and idler rollers comprising

conveyor means supported for movement in a predeter-

mined endless path of movement upon a drive roller and a tail idler roller,

a support arm supporting one end of one of said rollers for pivotal movement relative to the endless path of movement of said conveyor means and cantilevered for movement in a plane transverse to the rotational axis of said roller,

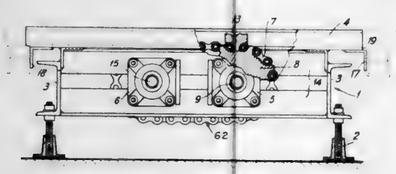
said support arm being a cantilever resiliently mounted to a frame within which said drive and tail idler rollers rotatably support said conveyor means, and an end of said support arm being fixedly secured to a bushing block supported about a resilient bushing secured to said frame to pivot said roller to a position in alignment with the endless path of movement of said conveyor means to track said conveyor means in said predetermined endless path of movement in response to movement of said conveyor means from said predetermined path of movement.

4,179,025

CONVEYOR SYSTEMS UTILIZING A CHAIN DRIVE MEANS

Remi R. Piette, Paris, and Francois M. A. Hubert, Vaucresson, both of France, assignors to Tissmetal Lionel-Dupont, Lyons, France

Filed May 12, 1977, Ser. No. 796,200
Claims priority, application France, May 18, 1976, 76 14938
Int. Cl.[2] B65G *23/16*
U.S. Cl. 198—833 **1 Claim**



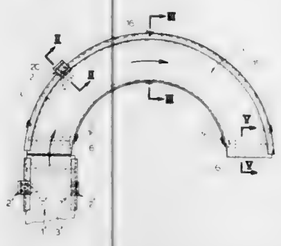
1. A conveyor system comprising a multiplicity of pallet assemblies linked to each other end-to-end in a closed loop, support and guide means mounting said pallet assemblies for movement about said loop and drive means connected to drive said pallet assemblies around said loop, wherein said drive means comprises at least one toothed wheel, chain means meshing with the teeth of said at least one wheel, the pitch of said chain means being a sub-multiple of the pitch of the teeth of said at least one wheel, and teeth means provided on said pallet assemblies having a pitch selected from the group consisting of a pitch equal to, and a pitch a multiple of, the pitch of the teeth of said at least one wheel, said teeth means of said pallet assemblies being adapted to engage selected ones of openings in the links of said chain means while the teeth of said at least one wheel engage other ones of the openings in the links of said chain means, in which each pallet assembly comprises a support, a pallet being removably mounted on a pallet support, so that the upper surfaces of the pallets form a continuous platform, said pallet supports being linked to each other end-to-end, and a vertical bearing axle providing a dismantable connection between successive pallet assemblies when the two adjacent pallets are removed, and wherein said vertical bearing axle has an end portion adapted to engage in a link of said chain means.

4,179,026

BELT CONVEYOR

Jacobus de Vries, Krommenie, Netherlands, assignor to Amneral Nederland B.V., Wormerveer, Netherlands

Filed Sep. 14, 1977, Ser. No. 834,254
Claims priority, application Netherlands, Sep. 28, 1976, 7610713; Dec. 8, 1976, 7613616
Int. Cl.[2] B65G *23/06*
U.S. Cl. 198—834 **8 Claims**



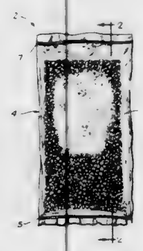
1. A conveyor belt assembly comprising: an endless conveyor belt having an upper and a lower run, said conveyor belt being provided near at least one edge with an endless protrusion on the face of the conveyor belt opposite to the bearing surface thereof and following the conveyor belt in its longitudinal direction, said protrusion being in engagement with a plurality of guide discs which are rotatably supported adjacent the conveyor belt, at least one guide disc coupled with drive means through a drive shaft, said driven guide disc being displaceable in the transverse direction of the conveyor belt and pressing against the protrusion under the influence of a spring, counter-disc means being aligned with the driven guide disc and engaging the protrusion on a side remote from said guide disc, said counter-disc being mounted for free rotation on said drive shaft of the co-operating driven guide disc and bearing against a shoulder on said drive shaft, the endless conveyor belt being guided along stationary end guide members during its passage from the upper run to the lower run and vice versa.

4,179,027

HIGH IMPACT STRENGTH PARTIALLY LIQUID FILLED BAG

Warren Weisberg, 1048 Judson Ave., Evanston, Ill. 60202

Filed Aug. 24, 1978, Ser. No. 936,214
Int. Cl.[2] B65D *85/30*
U.S. Cl. 206—205 **3 Claims**



1. In combination: a completely sealed, rupture-proof, flat flexible bag comprising relatively closely spaced confronting walls of a flexible sheet material sealed together at contacting confronting peripheral surfaces thereof to form a sealed enclosed space which is opened only by severing a portion of the bag, said bag walls being so flexible as to collapse inwardly into

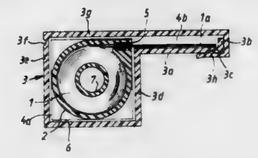
contiguous relation when otherwise unsupported and lying flat on a horizontal support surface; an open-cellular compressible body in said space and extending for most of the length of the bag, a liquid to be dispensed in said space and immersing said body so as to be pourable from the bag but which at all times only partially fills the unoccupied space in the bag whether the bag is oriented vertically or horizontally, so that when the bag is lying on a horizontal support surface the liquid therein still only initially fills the same so that the walls of the bag are not bulged thereby; and the cell-defining structure of said open-cellular compressible body providing a multitude of misaligned cell-defining structures which form numerous obstructions to the flow of the liquid in a direction parallel to the confronting walls thereof when the bag is supported on a horizontal support surface, so that when an impact force is than externally applied to the bag the liquid will not flow outwardly with a force which can rupture the bag.

4,179,028

CASING

Otto Stemme, Münich; Peter Lermann, Narring; Dieter Engelsmann, Unterhaching, and Werner Went, Leverkusen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Jul. 26, 1978, Ser. No. 928,414
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1977, 2734322
Int. Cl.[2] B65D *85/67*
U.S. Cl. 206—316 **27 Claims**



1. A casing, particularly for roll film cartridges, comprising first wall means defining a hollow housing having a chamber adapted for closely receiving a film cartridge therein; and second wall means bounding a channel communicating with said chamber and operative for receiving an end portion of roll film which extends out of the cartridge when the latter is inserted into said chamber, said channel extending substantially tangentially to the outer surface of said cartridge and having at least one flat inner surface along which the end portion of roll film can extend.

4,179,029

FUNCTIONAL BLISTER PACKAGE FOR SNIPPER-TYPE SCISSORS

Wayne G. Fethke, Wausau, and Paul C. Mayer, Rothschild, both of Wis., assignors to Fiskars Manufacturing Corporation, Wausau, Wis.

Filed Jun. 1, 1978, Ser. No. 911,546
Int. Cl.[2] B65D *73/00, 85/00*
U.S. Cl. 206—349 **1 Claim**

1. A functional blister package for snipper-type scissors having a springy U-shaped end and free movable ends carrying pointed diamond-shaped blades and an integral thumb loop formed on one limb of the U-shaped end comprising a display card, a cut-out portion in the display card to allow free access to the thumb loop, a transparent, flexible, blistered elongated covering, an outwardly bent edge on the transparent covering facing the display card and made to adhere to said card, the transparent covering being generally shaped to conform to the shape of the snippers, one end of the generally elongated transparent covering being shaped to substantially enclose and lock in place the U-shaped end of the snipper, the other end of the transparent covering being trapezoidal in shape to permit restricted movement of the pointed blades which in their open position rest against the sides of the trapezoidal area of the said transparent covering and a cut-out portion in the transparent



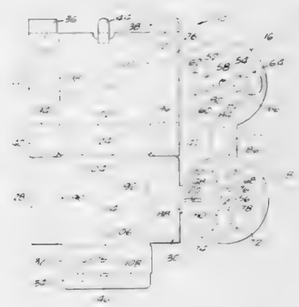
blistered covering substantially midway between said free ends and said U-shaped end allowing the thumb loop of the snipper to project outside so as to permit the snippers to be grasped and moved back and forth by a prospective purchaser in the plane of the display card.

4,179,030

UNITARY FOLDABLE DISPENSER REEL AND CONTAINER WITH REMOVABLE DISPENSER PORTION

James L. Hayes, Garden Grove, and John T. Greenslade, El Toro, both of Calif., assignors to Eltra Corporation, Toledo, Ohio

Filed Nov. 24, 1978, Ser. No. 963,401
Int. Cl.[2] B65D *85/67*
U.S. Cl. 206—396 **15 Claims**



1. A foldable container for both containing and dispensing wire wound on a spool, the container being of unitary structure and comprising:

a. a first substantially rectangular portion having foldable margin portions along three sides thereof;

b. a second substantially rectangular portion connected to said first substantially rectangular portion at a margin thereof and having foldable margin portions along three sides thereof;

c. a first substantially circular portion tangentially connected to a margin portion of said second substantially rectangular portion;

d. a second substantially circular portion spaced from said first substantially circular portion;

e. a bridge tangentially connected to said first and second

substantially circular portions for supporting said circular portions substantially parallel to each other when folded; and

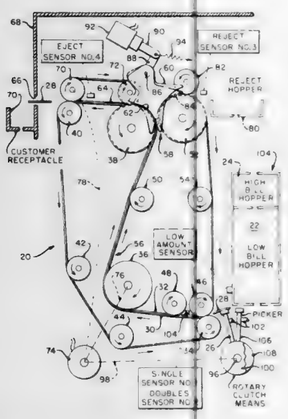
f. spindle means adapted for placement between said first and second substantially circular portions when said circular portions are folded into said parallel relation, whereby said spindle means may receive said spool of wire for selective dispensing thereof.

4,179,031

DOCUMENT DISPENSING SYSTEM

Stephen W. Ward, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed May 11, 1978, Ser. No. 904,957
Int. Cl.[2] B07C 5/00
U.S. Cl. 209—534 **17 Claims**



1. A document dispensing system comprising:
a dispensing path;
means for feeding documents from a source to and along said dispensing path;
sensors positioned along said dispensing path to detect the presence or absence of said documents in said dispensing path;
means for sampling said sensors to produce first and second states therein in accordance with the presence or absence, respectively, of said documents in said dispensing path;
first means for storing said first and second states to provide short-term and long-term histories of said states of each of said sensors;
second means for storing status data including a time in transport in said dispensing path for each of said documents in said dispensing path; and
means utilizing said short and long-term histories of said states and said times in transport for evaluating the status of each of said documents in said dispensing path with regard to predetermined criteria to control the disposition of each said document.

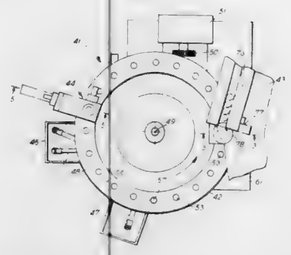
4,179,032

METHODS OF AND APPARATUS FOR CONVEYING, ORIENTING, TESTING AND SORTING ARTICLES

Walter M. Artz, Wyomissing Spring; Charles R. Bauer, West Lawn, and Paul W. Moyer, Wyomissing, all of Pa., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Sep. 11, 1978, Ser. No. 941,899
Int. Cl.[2] B07C 5/02, 5/344
U.S. Cl. 209—538 **10 Claims**

1. A method of conveying and orienting an article having at least one end with at least a pair of intersecting planes terminating in a taper having an edge, which comprises the steps of:
positioning the article for rotatable movement into an opening in a first plate, the opening terminating with a contacting element of a second plate, said contacting element



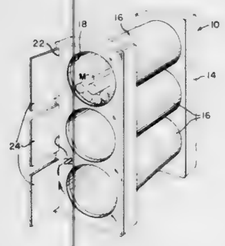
being capable of frictionally engaging the outer portion of the edge of the taper; and
moving the first plate relative to the second plate to rotate the article in the opening to align one of the planes of the taper with the contacting element of the second plate.

4,179,033

MODULAR RACK FOR DISPLAYING MERCHANDISE

Patrick J. Mitchell, 836 Industry Dr., Tukwila, Wash. 98188

Continuation of Ser. No. 757,367, Jan. 6, 1977, abandoned. This application Feb. 27, 1978, Ser. No. 881,419
Int. Cl.[2] A47F 7/17
U.S. Cl. 211—60 R **9 Claims**



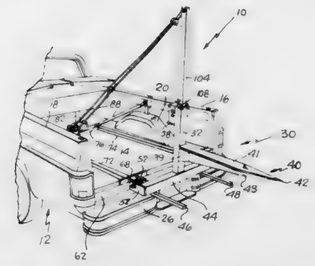
1. A display rack for holding cylindrical objects such as rolls of wall coverings and displaying samples of the objects in a store showroom comprising:
multiple upright freestanding, lightweight, individual, freely movable tube support means, each having at least one circular opening whose axis is in a horizontal plane, and positioned adjacent one another to form a multiple, rack assembly,
separate, independent horizontal circular tube means fitted in said tube support means so as to form a horizontal object supply storage compartment having a lower object supporting surface lying lengthwise of said tube means for receiving said cylindrical objects, and
display means external to and operatively associated with each storage compartment visible to the passing customer and adjacent an end of each storage compartment whereby samples of the objects being stored in each tube means can be conveniently displayed adjacent the end of the respective storage compartment.

4,179,034

BALE LOADER

Ferne Van Antwerp, Rte. #1, Unionville, Iowa 52594, and Raymond R. Murdy, Rte. #2, Moulton, Iowa 52572

Filed Nov. 24, 1976, Ser. No. 744,774
Int. Cl.[2] B66F 9/18
U.S. Cl. 414—551 **21 Claims**



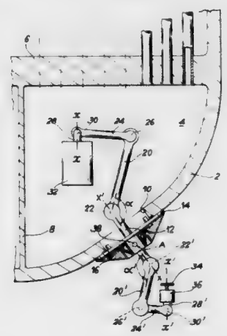
1. A bale loader adapted to be mounted in the bed of a pickup truck, which comprises:
a frame assembly positionable in the bed of a pickup truck, said frame assembly including a rear transverse frame member positioned in use along the rear edge of said truck bed, a front transverse frame member positioned in use toward the front end of said truck bed, and rigid frame means connecting said front and rear frame members;
means for releasably securing said frame assembly to said truck comprising means for diagonally interconnecting said front transverse frame member to the respective sides of said pickup truck;
fork means mounted to said frame assembly for engaging a bale of hay; and
motor means mounted to said frame assembly for selectively operating said fork means.

4,179,035

BALANCED ARTICULATED MANIPULATOR

Daniel François, Vendome; Jean-Claude Germond, Paris; Paul Marchal, Gif-sur-Yvette, and Jean Vertut, Issy les Moulineaux, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 19, 1977, Ser. No. 862,152
Claims priority, application France, Dec. 22, 1976, 76 38698
Int. Cl.[2] B25J 1/02
U.S. Cl. 414—2 **3 Claims**



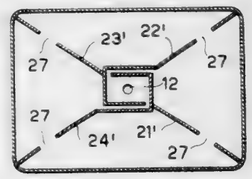
1. A manipulator of the type comprising a master arm and a slave arm and capable of operating within an enclosure limited by a wall provided with an opening for the introduction of said slave arm into said enclosure, wherein said manipulator comprises a central body of cylindrical shape having a longitudinal axis, a penetration plate designed to be fixed on said enclosure wall at the level of said opening, said cylindrical body being pivotally mounted in said plate around said longitudinal axis but not movable translationally along said longitudinal axis, said cylindrical body being provided with a handling trunnion externally of the enclosure, said central cylindrical body being provided with a first and a second extremity, a slave arm being pivoted to said first extremity and constituted by n (where n is strictly greater than 1) segments of generally cylindrical shape mounted in end-to-end relation and articulated with respect to each other, the last segment being fitted with a tool, a master arm pivoted to said second extremity and constituted by n segments of generally cylindrical shape mounted in end-to-end relation and articulated with respect to each other, the last segment being fitted with a control handle and with a balance weight, the segments of the master arm being in an inverted homothetic relationship with those of the slave arm with respect to the point of intersection of the axis of the central cylindrical body with the axis of said trunnion in a negative homothetic ratio equal to $-k$, the weights of the homothetic elements being substantially in a ratio equal to $1/k$, and transmission means constituted by chains, belts, cables or tapes and by pulleys for transmitting the movements of the master arm to the slave arm in such a manner as to ensure at each instant that the angle made by two segments of the master arm and the angle made by the two homothetic segments of the slave arm are equal and opposite, one segment of the master arm being such as to have dimensions equal to k times those of the corresponding segment of the slave arm.

4,179,036

MOTOR VEHICLE FUEL TANK

Luciano Pasini, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed Jul. 10, 1978, Ser. No. 923,381
Claims priority, application Italy, Jul. 27, 1977, 26205 A/77
Int. Cl.[2] B65D 87/12, 87/46; F17D 1/00
U.S. Cl. 220—22 **7 Claims**

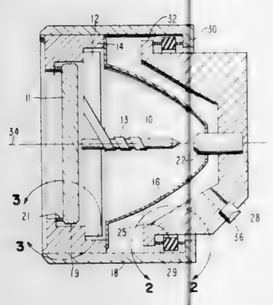


1. A motor vehicle fuel tank at the base of which there opens the mouth of a withdrawal conduit for the fuel fed to the vehicle engine, wherein said mouth is situated in a small chamber contained in the tank, bounded laterally by a baffle and communicating with the rest of the tank via at least one gap in the baffle, this gap extending in the form of a channel formed by parallel walls disposed side-by-side over a length substantially equal to the chamber dimension in the direction parallel to the side-by-side walls, wherein said baffle is of generally rectangular layout, and communicates with the rest of the tank via two gaps situated in proximity to the corners and extending in the form of channels in opposite directions along two opposing sides of the baffle.

4,179,037
XENON ARC LAMP WITH COMPRESSIVE CERAMIC TO METAL SEALS

Edwin T. Chan, Sunnyvale, and Stanley R. Jepson, Campbell, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 767,854, Feb. 11, 1977, abandoned. This application May 15, 1978, Ser. No. 906,371
Int. Cl.[2] H01K 1/36
U.S. Cl. 220—2.3 R 14 Claims



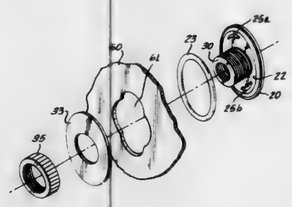
1. An envelope for an arc lamp, said envelope being capable of containing a gas therewithin at a pressure higher than atmospheric pressure, said envelope comprising:
- a first metallic member having an inwardly projecting flange portion,
- a second metallic member having an outwardly projecting flange portion,
- the outwardly projecting flange portion of said second metallic member being received within said first metallic member, the inwardly projecting flange portion of said first metallic member being disposed to overlap the outwardly projecting flange portion of said second metallic member, said overlapping flange portions of said first and second metallic members being radially spaced apart to define a generally annular region between said first and second metallic members,
- a ceramic member disposed in said annular region, and
- means for hermetically sealing said ceramic member to said inwardly and outwardly projecting flange portions so that said ceramic member is under compression when said envelope contains a gas at a pressure higher than atmospheric pressure.

4,179,038
SELF-SEALING FLANGE AND METHOD OF INSTALLATION THEREOF

José Rosán, Jr., Newport Beach, Calif., assignor to Rosan Engineering Corp., Newport Beach, Calif.

Filed Mar. 7, 1977, Ser. No. 774,880
Int. Cl.[2] F16L 3/12
U.S. Cl. 220—243 4 Claims

1. A self-sealing flange assembly capable of being removably attached about a generally elliptical opening in a blind wall or similar structure; the self-sealing flange assembly comprising:
- a generally elliptical opening in a workpiece;
- an elliptical flange;
- to which is fastened at a 90° angle thereto threaded attachment means;
- the surface of the flange on which the threaded attachment means is located contains an elliptical groove around the outer periphery thereto;
- at least one outwardly extending dimple means located at each end of the eliptical flange between the annular groove and the attachment means;
- elliptical sealing means located in the elliptical groove;
- elliptical washer means; and

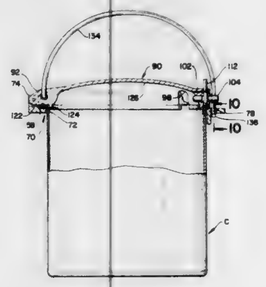


- threaded fastener means to coact with threads of the attachment means to draw the parts in sealing engagement with the inner and outer surfaces of the wall surrounding the elliptical opening.

4,179,039
CLOSURE FASTENING MEANS

Raymond P. Kawolics, Solon, Ohio, assignor to The Meyer Dairy Products Company, Cleveland, Ohio

Filed May 19, 1977, Ser. No. 798,475
Int. Cl.[2] B65D 45/32
U.S. Cl. 220—319 10 Claims



1. A lid and bail assembly for cooking pots or the like comprising: a generally flat transport ring member defining a circular opening; a lid member hinged to said ring member for movement between open and closed positions relative to said opening; a bail attached to at least one of said members for movement between a generally vertical transport position and a generally horizontal serving position; and, cooperating locking means between said bail and said ring and lid members for locking said lid member in said closed position with said bail in said generally vertical position and for releasing said lid member for movement to said open position with said bail in said generally horizontal position.

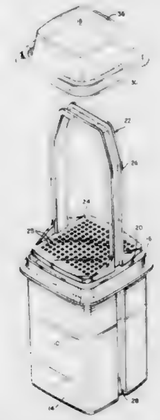
4,179,040
STORAGE AND SERVING CONTAINER OR THE LIKE

Robert F. Bateman, Greenville, and Jack V. Croyle, North Providence, both of R.I., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Aug. 11, 1978, Ser. No. 933,003
Int. Cl.[2] B65D 25/10, 25/28
U.S. Cl. 220—410 11 Claims

1. In combination a storage and serving container and including a receptacle having a plurality of generally vertically extending side wall members, an integral bottom wall portion, and a top end opening, at least one of said side wall members incorporating integral guide means, an insert positioned within

said receptacle and including a tray and rigid, unitary handle projecting therefrom and affixed thereto, said tray being of the approximate size and shape of said bottom wall, said handle being of such extent to protrude from said top end opening when said bottom wall and tray are in juxtaposition and being

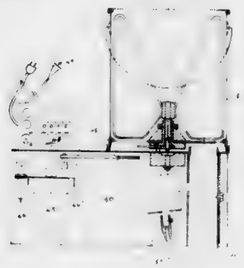


shaped to cooperate with said guide means to enable the user to readily move the insert with respect to the receptacle while maintaining a relatively uniform parallel relationship between said tray and bottom wall, and a seal closuring said top end opening.

4,179,041
METHOD OF AN APPARATUS FOR EXTRACTING, MEASURING AND ADDING A PRODUCT

René Chambon, Chemin de la Pene, 65 310 Odos, France

Filed Jul. 18, 1977, Ser. No. 817,087
Claims priority, application France, Jul. 16, 1976, 76 22461; Nov. 10, 1976, 76 34543; May 13, 1977, 77 15469
Int. Cl.[2] B65B 1/04
U.S. Cl. 222—1 15 Claims

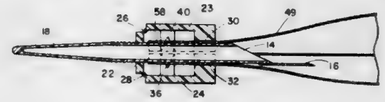


1. A method of extracting and measuring out a first product and adding said product to a second product comprising:
- (a) pressing a small quantity of the first product into a top opening in a measuring space, while a bottom opening in said space is closed,
- (b) closing said top opening and opening said bottom opening whereby said small quantity of first product falls out of said space,
- (c) making a cavity in said second product adjacent an exit position for said second product,
- (d) feeding said quantity of said first product into said second product,
- (e) mixing said quantity of said first product with said second product in the cavity, and
- (f) feeding said mixed products out of said cavity.

4,179,042
SEALED DISPENSER SPOUT ASSEMBLY

William H. Schuck, 9338 Perrin Beitel, Apt. #902, San Antonio, Tex. 78217

Filed Aug. 29, 1977, Ser. No. 828,305
Int. Cl.[2] B67B 7/26
U.S. Cl. 222—89 7 Claims

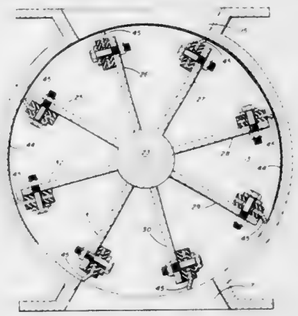


1. A spout assembly for use in dispensing material from a flexible bag container, said assembly comprising a nozzle having an open inlet end, said inlet end being adapted to be disposed within said container and securing means carried by said nozzle for securing a portion of said container about said nozzle in sealing engagement therewith upon said inlet end of said nozzle being disposed within said container;
- said securing means comprises at least one flexible arm member hingedly secured to said nozzle and means carried by said arm member for pressing a portion of said container against said nozzle in sealing engagement therewith.

4,179,043
ROTARY VALVE APPARATUS

John Fischer, Montoursville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jan. 3, 1978, Ser. No. 866,644
Int. Cl.[2] G01F 11/24
U.S. Cl. 222—368 2 Claims



1. A rotary valve apparatus comprising:
- (a) a housing defining an open-ended generally cylindrical chamber;
- (b) a plurality of end walls axially spaced along said housing, mounted to said housing enclosing said cylindrical chamber;
- (c) inlet means for receiving material in said chamber;
- (d) outlet means for depositing material from said chamber;
- (e) a rotatable shaft extending axially throughout said cylindrical chamber and rotatably mounted in said end walls;
- (f) a plurality of vanes fixably mounted to said shaft and extending radially from said shaft, said vanes having an axial extension throughout said chamber;

(g) vane blade means fixably mounted to said vanes, said vane blade means comprised of a plurality of elastomer strips and a metal strip partially sandwiched between said elastomer strips, and said metal strips fixably mounted to the radial extremes of each of said vanes and having an axial extension equal to that of said vane, said metal strip having an elbow extension not sandwiched by said elastomer strips and is in contact with said housing walls, said elbow extension being directed away from the direction of rotation of said shaft, said vane blade means in sealing engagement with the walls of said housing chamber such that thermal expansion of said vane creates a reactive compressive load from said housing wall on said metallic member which translates said compressive load to a rotational displacement within said vane blade means while maintaining an effective sealing engagement with said wall of said housing;

(h) a plurality of shrouds fixably mounted to the opposing axial extremes of said vanes parallel to said end walls, said shrouds are also fixably mounted to said shaft to form pockets with said vanes, said shrouds being of a circular construction with a radial extension within said cylindrical chamber providing for a minimum clearance sufficient to allow for thermal change without engaging said cylindrical chamber; and

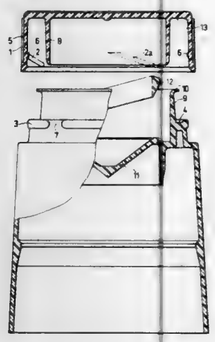
(i) means for providing a seal between said end walls and said shrouds.

4,179,044

CLOSURE CAP FOR POURING OR DISPENSING TOPS OF BOTTLES OR SIMILAR RECEPTACLES

Daniel Fitte, Paris, France, assignor to Rical, S.A., Longvic, France

Filed Feb. 27, 1978, Ser. No. 881,673
Claims priority, application France, Feb. 28, 1977, 77 05794
Int. Cl.[2] B65D 41/06
U.S. Cl. 222—551 **4 Claims**



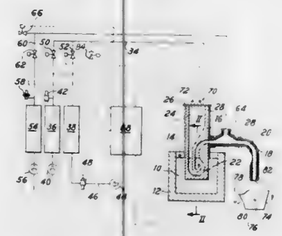
1. Assembly consisting of a pouring top at the upper portion of a bottle neck and a closure cap having an outer skirt for said top, in which said cap is provided, on the inside, at the lower portion of its outer skirt with helicoidal ribs defined by disposed ribs of a small but constant width spaced apart and having a height component far greater than their width, said pouring top being provided with a peripheral rim having mutually spaced interruptions in number equal to the number of said helicoidal ribs, said ribs and said rim being of similar thickness in order that simple vertical pressure will cause, said ribs to pass in their entirety below said peripheral rim, the upper end of said helicoidal ribs being profiled in such a manner as to permit the lifting of said cap only after arcuate movement of said cap to register the upper end of said helicoidal ribs with said interruptions provided in said peripheral rim and so, by continuation of the arcuate movement to cause said ribs to pass through said interruptions to separate said cap from said top.

4,179,045

LIQUID TRANSFERRING DEVICE

Piero Colombani, 11, Via Stgieri, Milan, Italy

Filed Feb. 8, 1978, Ser. No. 876,292
Claims priority, application Italy, Feb. 14, 1977, 20245 A/77
Int. Cl.[2] B22D 41/00, 45/00
U.S. Cl. 222—590 **11 Claims**



1. In a liquid transfer device suitable for transferring high temperature liquids, contained at a given level in a first container, to a second container located at an elevation lower than said given level, said device comprising an inverted generally U-shaped siphon having a rising leg, a bight and a descending leg, and communicating with a gas-tightly sealable crucible filling chamber to form a hydraulic circuit having at least one liquid inlet port; wherein communication may be selectively effected between the crucible filling chamber and (1) a first vacuum means to withdraw liquid into the crucible filling chamber or (2) pressure means to push the liquid through the hydraulic circuit to prime the siphon, the improvement which comprises:

a prime-maintaining and degassing chamber formed in the bight of the inverted generally U-shaped siphon; and

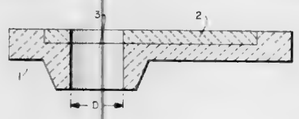
second vacuum means communicating with the degassing chamber and selectively operable to apply a negative pressure to the degassing chamber throughout the transfer operation sufficient to maintain the prime and to degas the liquid in the siphon pipe.

4,179,046

REFRACTORY PLATE FOR SLIDE CLOSURES OF METALLURGICAL VESSELS

Peter Jeschke, Walluf, and Günter Gelsdorf, Wiesbaden-Nordenstadt, both of Fed. Rep. of Germany, assignors to Didier-Werke A.G., Wiesbaden, Fed. Rep. of Germany

Filed Apr. 5, 1978, Ser. No. 893,690
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1977, 2719105
Int. Cl.[2] B22D 37/00
U.S. Cl. 222—600 **15 Claims**



1. A refractory plate for use in slide closures for metallurgical vessels, said refractory plate comprising:

a basic plate element adapted to face a liquid metal melt, said basic plate element being formed of a moldable refractory concrete material;

said basic plate element having embedded therein and forming a melt contacting surface thereof a ceramic oxide insert having a cold bending strength higher than 300 kp/cm^2, a hot bending strength at 1500° C. higher than 40 kp/cm^2, a cold compressive strength higher than 2000 kp/cm^2, and a permeability to gas lower than 1.0 nanoperm;

said insert being enbedded directly in said moldable refractory concrete material of said basic plate element before said moldable refractory concrete material has set;

said basic plate element and said insert having extending therethrough a throughflow opening; and

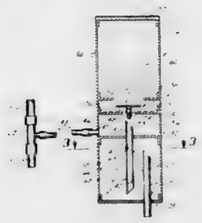
said insert having a width, taken in a direction transverse to the direction of movement of said refractory plate when used in a slide closure, of from 1.3 to 3.5 times the diameter of said throughflow opening.

4,179,047

CHEMICAL METERING APPARATUS

Alfred H. Abdoo, 2116 W. Encanto Blvd., Phoenix, Ariz. 85009

Filed Mar. 27, 1978, Ser. No. 890,248
Int. Cl.[2] B67D 5/60
U.S. Cl. 222—133 **12 Claims**



1. An apparatus for controlled dissolution and metering of a dry water soluble water treatment chemical comprising:

(a) a housing having a closed top and bottom;

(b) a partition in said housing to provide a chemical compartment therein immediately above a humidity compartment;

(c) a dry water treatment chemical in said chemical compartment, said water treatment chemical in powdered or granulated form and having the characteristic of dissolving into a liquid upon being exposed to moisture in vaporous form;

(d) inlet means on said housing for supplying water to said humidity compartment for production of moisture in vaporous form;

(e) outlet means in said housing for allowing water to exit from said humidity compartment; and

(f) metering means on said partition and communicating between said chemical compartment and said humidity compartment, said metering means for controlling the migration of the moisture in vaporous form from said humidity compartment to said chemical compartment to control the dissolution of said chemical and for metering the liquified chemical into the water flowable through said humidity compartment.

4,179,048

SEED SPREADER

Carl M. Pickett, 12 Robin Rd., Farmington, Conn. 06032

Filed Mar. 1, 1978, Ser. No. 882,330
Int. Cl.[2] A01C 7/02
U.S. Cl. 222—44 **19 Claims**

1. A hand held dispenser for seeds or the like comprising:

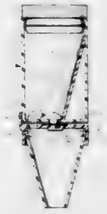
(a) a receptacle adapted to contain seeds or the like therein, and having a bottom wall;

(b) a selector plate disposed in close proximity to said bottom wall, one of said selector plate and receptacle bottom wall having an outlet opening and the other of said selector plate and receptacle bottom wall having a plurality of spaced apart, differently configured control openings formed therein;

(c) selector mounting means mounting said selector plate to extend along and be movable relative to said bottom wall to permit selective alignment of any one of said control openings with said outlet opening to provide a discharge opening extending from within said receptacle to exteriorly thereof;

(d) an agitator blade within said receptacle;

(e) blade mounting means mounting said agitator blade for periodic movement within said receptacle adjacent said bottom wall;



(f) a closure plate having a dispenser opening therein and extending exteriorly of said bottom wall to close said discharge opening; and

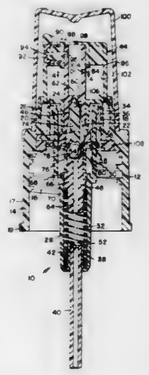
(g) closure mounting means mounting said closure plate to be movable relative to said discharge opening to permit selective movement of said closure plate dispenser opening into and out of register with said discharge opening for intermittent opening and closing thereof, whereby to cooperate with movement of said agitator blade for intermittent discharge of seeds or the like from said receptacle through said discharge opening.

4,179,049

PUMP DISPENSER

Herbert R. Umstead, Warwick, N.Y., assignor to Avon Products, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 792,414, Apr. 29, 1977, abandoned. This application Jan. 26, 1978, Ser. No. 872,544
Int. Cl.[2] B05B 7/32
U.S. Cl. 222—631 **3 Claims**



1. A dispenser for communicating both a liquid from a reservoir of a receptacle and a pressurized fluid carrier from an air

pump chamber to a flow path and passing a liquid in an atomized state from an exit orifice comprising:

(a) a housing adapted for receipt on said receptacle;

(b) a liquid pumping mechanism, said liquid pumping mechanism carried by said housing and including

(1) a liquid pump chamber adapted for communication with said reservoir,

(2) a piston movable in said liquid pump chamber and including a hollow stem defining a portion of said flow path,

(3) a valve seat in said stem,

(4) a valve in said liquid pump chamber adapted for movement relative to said valve seat to control communication of liquid from said liquid pump chamber to said flow path,

(5) a spring urging said piston and valve in one direction whereby said valve moves into said valve seat, and

(6) an actuator mounted on said stem for moving said piston in the other direction to pressurize said liquid pump chamber, which pressure acts on said valve to overcome the force of said spring whereby said valve moves in said other direction relative to said piston and out of said valve seat;

(c) an air pumping mechanism including said air pump chamber, said air pump chamber defined by a wall of said housing continuous around said stem and a skirt of said actuator juxtaposed to said wall, one of said wall and skirt having sealing means cooperating therebetween so that said air pump chamber which normally is open to atmosphere is sealed when said actuator is moved relative to said wall in said other direction and the air therein is compressed; and,

(d) a plurality of openings formed in said stem, said openings disposed equiangularly around said stem and arranged thereby to direct air under pressure and along multiple paths into said flow path to enhance mechanical break-up and atomization of liquid flowing therein.

4,179,050

FLUID DISPENSING PISTON

Francis M. Farrell, III, Grant Township, Washington County; Robert B. Otto, Champlin, and William J. Seim, Roseville, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 10, 1978, Ser. No. 904,600
Int. Cl.[2] B67D *5/42*; **G01F** *11/04*
U.S. Cl. 222—386 **8 Claims**



1. A fluid dispensing piston for a cylindrical dispensing tube, comprising:

a plastic body having

a hollow cylindrical sealing portion with an outside diameter equal to the internal diameter of a said tube,

a cylindrical stacking portion extending coaxially from said sealing portion and having an outside diameter less than the internal diameter of said sealing portion, and

a transverse wall spanning said body, said transverse wall being recessed axially inward from the ends of said body and being formed with at least one aperture therethrough, and

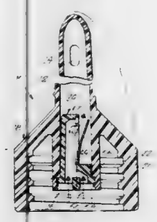
a fluid seal retained on one face of said transversewall over said aperture and movable away from said transverse wall in response to fluid pressure applied to the opposite face of said transverse wall to permit fluid to flow through said aperture only from said opposite face toward said one face.

4,179,051

ONE-PIECE CHECK VALVE FOR USE IN A FLUID DISPENSER

Michael D. Thomas, Arab, Ala., assignor to Ryder International Corporation, Barrington, Ill.

Filed Aug. 1, 1977, Ser. No. 820,638
Int. Cl.[2] B65D *39/00*; **F16K** *15/14*
U.S. Cl. 222—494 **7 Claims**



1. A one-piece molded check valve for use in a fluid applicator tip, or the like, comprising a first portion having an open chamber with a seat about the open end thereof, and a fluid inlet port opening to said chamber, a second portion including a flexible reed member, and an integral flexible hinge section joining said first and second portions, and enabling said portions to be folded over and engaged in superposed relation, with said second portion overlying said seat to close said chamber provided by said first portion, said second portion further including an enlarged section, adjacent said reed member, with port means formed in said enlarged section and leading into said chamber when said portions are engaged in superposed relation to provide an additional inlet port for said chamber with said flexible reed member being displaceable under fluid flow from said inlet ports through said chamber to permit fluid to pass out of said chamber, with fluid flow in the opposite direction forcing said reed member into engagement with said seat to prevent flow through said chamber in said opposite direction.

4,179,052

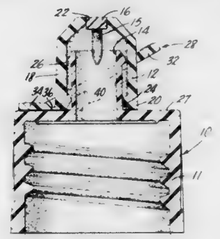
CONTAINER CAP

Horace P. Abbott, Lake Leelanau, Mich., assignor to Lever Brothers Company, New York, N.Y.

Filed Sep. 16, 1977, Ser. No. 833,854
Int. Cl.[2] B67D *3/00*
U.S. Cl. 222—509 **8 Claims**

1. In a container cap including base means for attachment to an open end portion of a container, said base means including

a tubular portion terminating in an open end, a plug member, support means for fixedly securing said plug member to and axially beyond said open end of said tubular portion, said support means extending over and leaving at least partially open said open end of said tubular portion, and a sleeve constrained in surrounding relation on said tubular portion, said sleeve being displaceable axially along said tubular portion between two extreme positions, said sleeve terminating in an open end corresponding cross-sectionally in size and configuration to said plug member, said sleeve having an axial extent such that when it is in one of said extreme positions said open end thereof surrounds said plug member substantially in fluid-sealing relation, an improvement comprising sleeve-displacement means for shifting said sleeve relative to said tubular member to the other of said extreme positions, said sleeve when in said other of said extreme positions having a disposition such that said open end thereof is remote from said plug member and entirely open, said sleeve-displacement means including a hand-operable first actuation element which is uni-directionally actuable in a direction opposite the direction said sleeve is displaced to said other of said extreme positions at which said open end of said sleeve is remote from said plug member, and a hand-operable second actuation element which is uni-directionally actuable in a direction which is the same as the direction said sleeve is displaced to said one of said extreme positions at which said open end of said sleeve surrounds said plug member in substantially fluid-sealing relation.

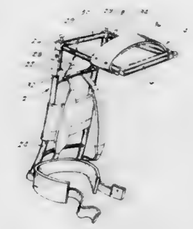


4,179,053

AWNING FOR BACK PACK

Gene B. Figura, 1502 Linden Dr., Ames, Iowa 50010

Filed Jan. 26, 1978, Ser. No. 872,507
Int. Cl.[2] A45B *11/02*
U.S. Cl. 224—190 **1 Claim**



1. In combination, a back pack having a first frame means, and an awning comprising,

a second support frame means including opposite, spaced apart side members, said side members being detachably secured at one end to said first frame means,

a canopy member attached to and extended between said side members, said canopy member comprising a pliable material capable of providing insulation from sunlight and rain,

said side members and canopy being capable of being rolled together into a compact shape upon detachment of said side members from said first frame means,

means for detachably securing said side members to said first frame means such that said canopy member resides above and extends over the head of the wearer of said back pack, and

a stiffener element connected to and extended between said side members, said stiffener element having a raised center portion to maintain said canopy member in a concave disposition relative to said wearer's head to facilitate rain water run off from said canopy member, and

an elastic shock absorbing member having first and second ends extending between said second frame means and said first frame means to provide support to said second frame means and to maintain said second frame means in a generally horizontal plane above said wearer's head, said first end being detachably secured to said second frame means and said second end being detachably secured to said first frame means,

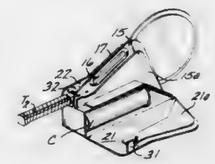
said means for detachably securing said second frame means to said first frame means comprising at least one clamp detachably receiving one of said side members, said clamp being pivotally attached to said first frame means for pivotal movement between a first position wherein said second frame means is supported forwardly of and in a relatively perpendicular disposition to said first frame means and a second position wherein said second frame means is supported rearwardly of said first frame means, said clamp including stop means for limiting pivotal movement of said clamp to said first and second positions.

4,179,054

RACQUET CARRIER

Edwin L. Bredehoeft, 16761 Green St., #A, Huntington Beach, Calif. 92649, and Robert E. Lee, 15 Ima Loa, Newport Beach, Calif. 92663

Filed Jun. 12, 1978, Ser. No. 914,793
Int. Cl.[2] B65D *71/00*
U.S. Cl. 224—45 L **5 Claims**



1. A carrying structure adapted to store a plurality of racquets or other athletic devices together with the balls useful therewith, comprising:

a hollow base structure conformed as a rectangular cavity including a dorsal peripheral segment and a ventral peripheral segment joined in common at the ends thereof and separated relative each other to receive a plurality of said balls therebetween;

a planar handle assembly attached to the exterior surface of said dorsal segment to project orthogonally therefrom;

a first and second side plate hinged from the respective lateral edges of said ventral segment and disposed for pivotal motion to abut the lateral edges of said dorsal segment for alignment adjacent said planar handle assembly, said side plates and said handle assembly projecting beyond said dorsal segment to form opposing surfaces of a planform substantially smaller than said racquets;

a deformeable liner attached to the lateral surfaces of said

handle assembly and to the opposing surfaces of said first and second side plate; and

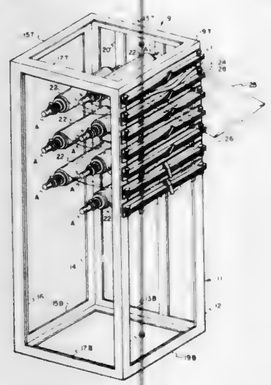
engaging means extending proximate the free edges of said side plates and deployed to engage said handle assembly said engaging means releasably securing said side plates to said handle assembly at a separation whereby said liner is deformably engaged against said racquets inserted therebetween.

4,179,055

DEVICE FOR SEPARATING SHEET BAGS

Burl D. Milner, Grand Prairie, Tex., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Jun. 3, 1977, Ser. No. 803,184
Int. Cl.² B26F *3/02*
U.S. Cl. 225—80 **5 Claims**



1. A device for separating sheets from a continuous strip of material comprising:

a horizontal plate for supporting said material to be separated;

a horizontal pressure bar juxtapositioned to said plate and spaced apart to define a horizontal slot therebetween to permit passage of said material therebetween;

means for urging said pressure bar into contact with said material to restrain the passage of material; and

a bearing having a cutting edge projecting outwardly from the central portion only of said plate toward said pressure bar, said bearing vertically traversing the full height of said slot and terminating at a point offset from said pressure bar whereby said material must contact said pressure bar during passage through said slot and across said bearing and whereby said bearing facilitates separation of sheet sections along scores therebetween and display of the next succeeding sheet for easy grasp by an operator.

4,179,056

WIRE-FEEDING MECHANISM

Donald W. Schmerling, York, Pa., assignor to Chemetron Corporation, Chicago, Ill.

Continuation of Ser. No. 714,519, Aug. 16, 1976. This application Apr. 5, 1978, Ser. No. 893,654
Int. Cl.² B65H *17/34*
U.S. Cl. 226—171 **5 Claims**

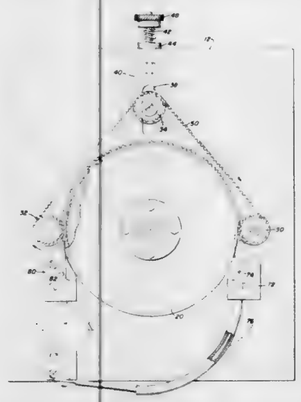
1. A wire feeding mechanism for feeding malleable wire comprising:

a housing;

a pulley formed on its edge with a continuous circumferential grove and rotably mounted on said housing;

a plurality of toothed rollers rotatably mounted on said housing;

an endless flexible belt disposed around said rollers and in the same general plane as that defined by the circumferential groove of the pulley, said belt lugged on one face so as to interengage with said rollers, said belt engaged between a first of said rollers and said pulley and between a second of said rollers and said pulley, and engaged against at least a portion of said edge of said pulley and completely overlying the groove over a substantial arcuate segment of the pulley, said belt presenting a continuous smooth face to said edge of said pulley, a third roller mounted within the endless belt to maintain the lugs on the inner face of the belt in spaced relation and to maintain the belt in continuous tension; and



means for driving said second of said rollers,

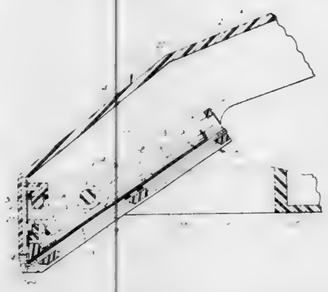
whereby said pulley and said belt are driven, and whereby malleable wire inserted into said groove between said belt and said edge of said pulley at said first of said rollers is held in and fed through said groove over said substantial arcuate segment where said belt engages said edge of said pulley and emerges from said groove at said second of said rollers.

4,179,057

DISPOSABLE SURGICAL STAPLING INSTRUMENT

Carl T. Becht, Cincinnati, and J. Charles Hueil, Loveland, both of Ohio, assignors to Senco Products, Inc., Cincinnati, Ohio

Filed Nov. 17, 1978, Ser. No. 961,740
Int. Cl.² A61B *17/04;* **B25C** *5/02*
U.S. Cl. 227—19 **16 Claims**



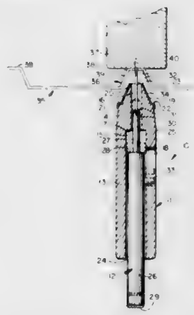
1. A surgical stapling instrument for implanting and forming surgical staples in the skin or fascia of a patient, said instrument comprising an elongated body having a rearward portion constituting a handle portion and a forward portion, a staple driver and a staple driver actuator attached to said staple driver being housed within said body forward portion, a surgical staple magazine affixed to said body forward portion, an anvil plate mounted within said magazine, said anvil plate terminating at its forward end in a coextensive anvil surface, a row of staples slidably mounted on said anvil plate, a feeder assembly mounted in said magazine to constantly urge and advance said row of staples along said anvil plate toward said anvil surface to locate the forwardmost staple of said row thereon to be implanted and formed thereabout by said driver and to disengage said forwardmost staple therefrom when formed, said staple driver being shiftable between a retracted position above said anvil surface and a staple forming position wherein it forms said forwardmost staple about said anvil surface, trigger means to shift said staple driver between said retracted and said staple forming positions, said trigger means being pivotally affixed to said body and operatively connected to said staple driver by way of said staple driver actuator, and means to bias said staple driver to said retracted position.

4,179,058

SOFFIT NAIL SET

Neal E. Yost, 415 Nescopec St., Tamaqua, Pa. 18252

Filed Jun. 15, 1978, Ser. No. 915,785
Int. Cl.² B25C *9/00*
U.S. Cl. 227—147 **7 Claims**



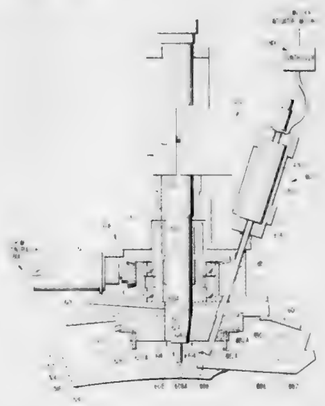
1. Nail set assembly for use as an overhead device in driving nails through the bottom planar portion of a U-shaped indentation in an aluminum soffit and into a supporting surface for the soffit, said U-shaped configuration characterized by a bottom planar portion and equally outwardly sloping planar sides extending downwardly therefrom and terminating at the soffit surface comprising in combination a punch holder and a punch, said punch holder comprising an elongated main body portion and an end portion integral with said main body portion for association with the said U-shaped indentation, said punch holder further comprising a main circular bore in said main body portion and a smaller circular bore communicating with said main bore and concentric therewith in said integral end portion and of a predetermined diameter to accommodate a nail head and an annular seat separating the main bore from the smaller bore, said punch holder end portion being of a conical shape tapering inwardly at a predetermined angle from the interface of the end portion with said main body portion toward the end of the end portion, said punch holder end portion having a pair of planar sides which taper inwardly toward one another at equal angles corresponding to the angles of the sloping planar sides of the U-shaped indentation and terminating at a planar elongated end surface lateral to the longitudinal centerline of the punch holder, support edges for the punch holder in said punch holder end portion and in the same lateral plane from which the said planar tapering sides depend for supporting the punch holder upright in the U-shaped indentation and the planar end surface of the punch holder against the bottom planar surface of the said U-shaped indentation whereby a nail will be driven into the soffit supporting surface at 90°, said support edges being in the same plane and parallel to the said elongated planar end surface, and said punch comprising an elongated cylindrically shaped blow receiving body portion and a smaller diameter cylindrically shaped concentric driving portion in longitudinal alignment and integral therewith, the blow receiving body portion being provided on its end with a planar surface perpendicular to the centerline of the body portion for receiving a blow by a driving device, a planar drive face on the end of the driving portion parallel to the planar blow receiving surface for contact with the nail to be driven, an annular seat separating said blow receiving body portion from said driving portion whereby forward movement of the punch is limited by said annular seat of the punch holder, the diameters of the circular bores being such as to accommodate the respective diameters of the punch and to allow freedom in longitudinal movement, the respective lengths of said driving portion of the punch and the smaller circular bore and the location of the shoulders on each being such that the planar drive face of the punch will be in the same plane as the planar end surface of the punch holder on the punch being at its forward extremity.

4,179,059

AUTOMATIC PIPE WELDING APPARATUS AND METHOD

Nuke M. Chang, Santa Anna, Calif.; John O. Emmerson, West Granby; Donald Ritchie, Ellington, both of Conn., and William Hollenbeck, Montrose, Calif., assignors to Santa Fe International Corporation, Orange, Calif.,

Filed Apr. 6, 1977, Ser. No. 785,219
Int. Cl.² B23K *9/12, 9/16, 9/02*
U.S. Cl. 228—103 **52 Claims**



1. An automatic pipe joint welding method, comprising the steps of:

placing one end portion of a pipe length provided with a machined reference surface thereon in facing relationship with one end of a second pipe length to define a weld zone therebetween, including said at least one reference surface;

mounting four rotatable welding heads spaced 90° from each other around the circumference of said pipes over said weld zone;

rotating said welding heads around the circumference of said pipes through an arc of about 180° to weld said facing ends to each other and so that the arc of travel of one of said heads at least significantly overlaps the arc of travel of an immediately preceeding one of said heads;

V 9 8 9 1 3 D E 1 8 7 9 UMI

sensing the position of said welding head relative to said reference surface; and

adjusting said welding head relative to said weld zone depending on the sensed position of the welding head to maintain said welding head in substantially optimum relationship to said weld zone.

21. Apparatus for use in an automatic pipe welding system, in which a pair of pipe lengths are arranged to lie end to end to define a joint to be welded and wherein the welding system circumferentially traverses the pipe joint to be welded, comprising:

means defining a welding chamber around said joint;

at least one welding torch mounted for circumferential movement relative to said pipe lengths, said torch having a welding electrode extending into said welding chamber for heating a weld zone to form a weld puddle at said joint;

means for introducing a flow of inert gas around the electrode to provide a gas shield in the region of the weld zone adjacent said electrode; and

means for pressurizing said welding chamber with a fluid so as to exert a force on the gas shield, said force being transmitted by the gas shield to the weld zone to cause a puddle-pushing effect on the weld puddle which tends to displace weld material toward the interior of said pipe joint.

4,179,060

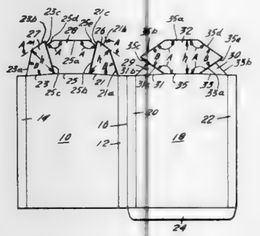
DISPLAY CARTON

George L. Meyers, Menasha, Wis., assignor to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 860,563, Dec. 14, 1977, abandoned. This application Jun. 23, 1978, Ser. No. 918,692

Int. Cl.[2] **B65D** *5/00*

U.S. Cl. 229—8 **4 Claims**



1. A display carton blank, comprising:

front and back panels separated at one side by a hinge line;

a hexagonal outer bottom panel in the shape of the bottom of said carton and hinged from the bottom of one of said panels chosen from the class consisting of said front and back panels;

a plurality of overlappable bottom panels hinged from the bottoms of said front and back panels to overlie said bottom panel,

said hexagonal outer panel being irregular and hinged by a first edge to the center of the bottom edge of a first one of said front and back panels, the edges of said outer panel being numbered in sequence with said first and fourth edges being equal in length and parallel, the longer edges separated by a distance h, the second, third, fifth and sixth edges being equal, the internal angles B between the second and third edges and between the fifth and sixth edges being equal and acute, the remaining internal angles A being equal and obtuse;

first and second said identical overlappable panels each being shaped as a quadrilateral with its edges consecutively numbered starting with the hinged edge which is hinged to the sides of the bottom edge of the second one of said front and back panels, the first and second edges being equal in length to said second and third edges of said hexagon panel, the internal angles between said first and second edges being equal to B, and the internal angles between said second and third edges being equal to A;

a third said overlappable panel in the shape of an irregular hexagon, the edges of which are consecutively numbered, with the first edge hinged to the center of the bottom edge of the second one of said front and back panels, the first and fourth edges being parallel and equal in length to the longer side of said outer hexagonal panel, the internal angle between the third and fourth edges and between the fourth and fifth edges being equal to A, the second and fifth edges being colinear with but separated from said fourth edges of said first and second overlappable panels; and,

fourth and fifth identical said overlappable panels each triangular shaped and having consecutively numbered edges, with the first said edges hinged to the sides of the bottom edge of said first one of said front and back panels, said first edges being equal to the shorter edges of said outer hexagonal panel, said third edges being colinear but separated from the second and fifth edges of said outer hexagonal panel, the lengths of said second and third edges being such that the areas of said fourth and fifth panels are substantially equal to the portions of the areas of said first and second overlappable panels which are exposed to be attachable to said outer hexagon panel when said blank is erected.

4,179,061

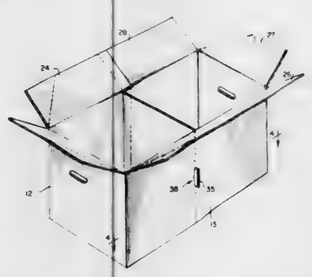
PARTITIONED CONTAINER

Earl F. Gilbert, Farmington Hills, Mich., assignor to Westvaco Corporation, New York, N.Y.

Filed Oct. 5, 1978, Ser. No. 948,818

Int. Cl.[2] **B65D** *5/42, 5/48*

U.S. Cl. 229—27 **1 Claim**



1. A collapsible, partitioned container prepared from a single blank of corrugated paperboard or the like comprising a first half side panel, a first end panel, a full side panel, a second end panel, a second half side panel and a partition panel connected in series, said series of hinged panels defining the primary walls and an integral partition panel for said container, top and bottom closure flaps foldably attached to the ends of said primary walls, and means for adhering the terminal edge of the first half side panel to the edge of said second half side panel adjacent to said partition panel, the improvement comprising means for releasibly locking said partition panel between the side walls formed by the first and second half side panels and the full side panel of said container, said means comprising cooperating elements located on the end of said partition panel and in said full side wall panel for retaining said partition panel in position said means consisting of at least one locking tab element integral with said partition panel and extending beyond the end of said partition panel and at least one locking slot located in said full side panel.

4,179,062

CARTON BLANKS AND CARTONS MADE THEREFROM

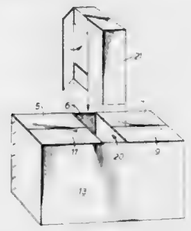
Brian G. Baker, 32, Shaftsbury Cir., South Harrow, Middlesex, England

Filed Feb. 27, 1979, Ser. No. 15,627

Claims priority, application United Kingdom, May 31, 1978, 25010/78

Int. Cl.[2] **B65D** *5/02*

U.S. Cl. 229—37 R **7 Claims**



1. A carton blank comprising a substantially rectangular portion having first, second, third and fourth flaps along one major side of said substantially rectangular portion and, along the opposite major side of said substantially rectangular portion, a first flap directly opposite said first flap on said one major side and extending along a shorter length of said rectangular portion than does said first flap on said one major side, and a second flap directly opposite said third flap on said one major side and extending along a shorter length of said rectangular portion than does said third flap on said one major side, said flaps on said opposite major side being symmetrically disposed about a straight line which extends at right angles across said rectangular portion and passes centrally through said second flap on said one major side; the blank further comprising fold lines which extend across said substantially rectangular portion at right angles to said one major side from between the adjacent flaps on said one major side, the carton blank being such that, when the flaps are folded to form a carton, the carton comprises a defined volume which can receive goods sized in accordance therewith and be sealed and further comprises an open slot beside said defined volume into which slot another, smaller carton can be slotted at a later date and sealed in position.

4,179,063

FEED AND SEVERING APPARATUS

David B. Russell, Southboro, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

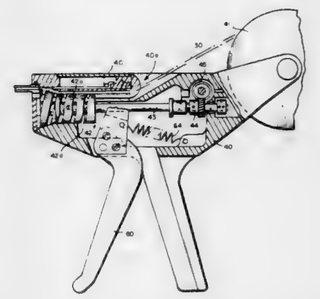
Continuation-in-part of Ser. No. 671,518, Mar. 29, 1976, abandoned. This application Dec. 19, 1977, Ser. No. 862,249

The portion of the term of this patent subsequent to Apr. 6, 1993, has been disclaimed.

Int. Cl.[2] **B25C** *1/00*

U.S. Cl. 227—67 **15 Claims**

1. In a machine for dispensing fasteners, each having a pair of side members cross coupled by a link member, the improvement comprising means for advancing connected plurality of the fasteners to a position for being dispensed and means on the advancing means for severing each of said side members without interrupting the advance of said side members.



4,179,064

VENDING APPARATUS

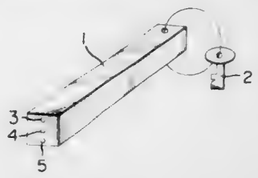
Toshihiro Yoshioka, Katano; Tasuku Ishimoto, Toyonaka; Hiroshi Yamane, Hirakata; Takahiro Kita, Osaka, all of Japan, and Matsushita Reiki Corp., Ltd., 03, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd.

Filed Mar. 16, 1977, Ser. No. 778,110

Claims priority, application Japan, Mar. 18, 1976, 51-30122; Mar. 19, 1976, 51-30194

Int. Cl.[2] **G07F** *7/08;* **G06K** *19/06*

U.S. Cl. 235—381 **14 Claims**



1. An article vending and accounting system, comprising

(a) a plurality of vending machines each containing different kinds of merchandise which may be freely selected by a customer,

(b) a merchandise code generator disposed within each vending machine for generating a merchandise code of a merchandise item selected by the customer,

(c) first connection means disposed within each vending machine,

(d) a plurality of memory holders each of which may be carried by a customer for permitting the selection of merchandise when connected to said first connection means,

(e) memory means such as a shift register disposed within each of said memory holders for storing therein the merchandise code transmitted from said merchandise code generator,

(f) means for transmitting the merchandise data generated by the code generator,

(g) switching means disposed within each memory holder for enabling the storage in and read out from said memory means of merchandise data transmitted from said merchandise code generator when said switching means is activated,

(h) an accounting machine for reading the merchandise

codes stored in said memory means in the memory holder when connected thereto for preparing a bill, and

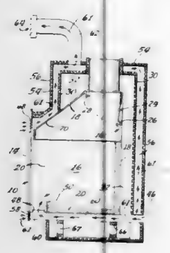
(i) actuating means disposed adjacent to said first connection means of the vending machine and a second connection means of said accounting machine for activating said switching means when the memory holder is connected to said first or second connection means.

4,179,065

CIRCULATING AIR BUILDING HEATING SYSTEM

Joseph T. Zung, 65 Cedar Grove Rd., Rolla, Mo. 65401

Filed Jul. 5, 1978, Ser. No. 921,980
Int. Cl.² F24B *7/02*
U.S. Cl. 237—51 **8 Claims**



7. In a circulating-air building temperature control system including means defining a pumped air circulation conduit for distributing controlled temperature air throughout the building and collecting return air, and a heating unit positioned within the air circulation conduit comprising a fireplace chamber for burning solid fuel, defined by the fireplace chamber walls, a portion of said air circulation conduit being positioned about the exterior of the fireplace chamber walls, chimney means communicating with said fireplace chamber through said air circulation conduit, and an outer housing defining an outer chamber and enclosing said fireplace chamber and the pumped air circulation conduit portion adjacent said fireplace chamber, air inlet means positioned at a lower portion of said outer housing and communicating with the outer chamber, and air outlet means positioned at an upper portion of said outer housing and communicating between said outer chamber and an indoors location for receiving hot air from said outlet means, to serve as an automatic means for cooling said air circulation conduit portion while warming the building by convective circulation, and a pair of combustion air conduits communicating between said fireplace chamber and the exterior of said heat unit, said combustion air conduits passing underneath said fireplace chamber in communication with said fireplace chamber at a front location of the bottom wall thereof, said air inlet means comprising a conduit defining an air inlet in a front location of said fireplace chamber and passing between the respective combustion air conduits under the bottom wall of said fireplace chamber into communication with said outer chamber at a lower location thereof in which an added inlet is positioned adjacent said upper portion of said fireplace chamber to direct air along at least a portion of the top wall of said fireplace chamber for removal of heat therefrom, said added air inlet communicating with said air outlet means.

4,179,066

MEANS FOR JOINING TOY TRACK SECTIONS

Edward C. Teter, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

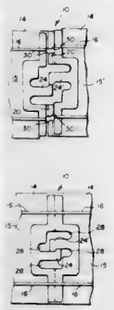
Filed Feb. 10, 1978, Ser. No. 876,741
Int. Cl.² A63H *19/30, 18/02*
U.S. Cl. 238—10 E **6 Claims**

1. Joining means on end portions of an elongated molded toy track section for interlocking with end portions of adjoining track sections to form a track for a train, comprising:

a longitudinally extending first projection on each of said end portions of said track section insertable into a complimentary recess in an end portion of an adjoining track section;

a longitudinally extending first recess on each of said end portions laterally spaced from said first projection for receiving a complementary projection on the end portion of the adjoining track section; and

a flexible latch member on each of said end portions having



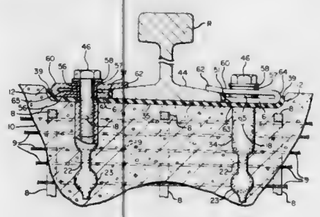
a free end part for engaging and retaining a free end part of a complementary flexible latch member on the end portion of the adjoining track section for releasably securing said track section to the adjoining track section, each of said latch members comprising a longitudinally extending flexible finger defined by a pair of laterally spaced apart, longitudinally extending blind slots extending from the end of each end portion for laterally spacing said finger from said first projection and first recess, said slots further extending completely through each of said end portions in a direction transverse to the length of said track section.

4,179,067

RAILWAY TRACK HOLD-DOWN HARDWARE

Ludwig S. Baier, 9998 French Prairie Dr., Wilsonville, Oreg. 97070

Continuation-in-part of Ser. No. 716,269, Aug. 20, 1976, abandoned, and Ser. No. 774,741, Mar. 7, 1977, abandoned. This application Feb. 1, 1978, Ser. No. 874,257
Int. Cl.² E01B *3/34, 9/28, 9/30, 9/62*
U.S. Cl. 238—91 **6 Claims**



1. A railway rail holding assembly comprising a molded base member having a depression in its top surface with side walls on opposite sides of the rail; a pad of cushion material adhered in said depression with the ends of the pad bent upward to cover said side walls, the molded material of said base member being heat cured and said pad being adhered to said base member while said base member is warm from heat curing, grooves

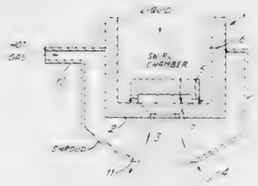
in the top surface of said pad in an area of the pad in contact with the rail; a pair of elongated vertical tubular nuts embedded in said base member with their upper ends underlying said pad on opposite sides of the rail, each tubular nut having a reduced cylindrical neck portion connecting the upper end of the nut with a lower end which is thicker and wider than said neck and which is transversely flattened at its lower extremity, a corrosion preventing coating on said tubular nuts, and sand adhered to said coating to provide a bond between said tubular nuts and said molded material of said base member; an apertured clip on said pad on each side of the rail, one end of each clip bearing against said pad on said side wall of the depression and the opposite end of the clip bearing against the top of the rail flange and having a vertical abutment surface confronting an edge of the rail flange; a bolt extending through the aperture in said clip and having threaded engagement in said tubular nut; aligned radial threaded holes in opposite sides of said tubular nut containing threaded plastic plugs having inner ends frictionally engaging threads on said bolt to prevent rotation of the bolt, the outer ends of said plugs being flush with the outer surface of said tubular nut and engaging the molded material of said base member, said plastic plugs being spaced from the upper end of said nut so that they are not engaged by a threaded tool which positions the upper end of the nut in a mold for said base member when the base member is molded; and bolt holes in said pad of smaller diameter than said bolts causing said pad to grip the bolts and assist in preventing rotation of the bolts in service.

4,179,068

LIQUID SPRAY DEVICES

Norman Dombrowski, Leeds, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 708,735, Jul. 26, 1976, abandoned. This application Jul. 20, 1978, Ser. No. 926,335
Claims priority, application United Kingdom, Jul. 24, 1975, 31000/75
Int. Cl.² B05B *1/24*
U.S. Cl. 239—13 **13 Claims**



1. A device for spraying liquid in droplet form through a first and movable atmosphere onto receiving surfaces and for reducing the quantity of small sized droplets relative to a spectrum of droplet sizes sprayed by the device to reduce the tendency of the droplets to be disturbed by air currents, said device comprising:

an orifice;

means to emit only liquid from said orifice in the form of a non-atomized thin sheet of a kind that, in the absence of further treatment, breaks down after a time interval within said first atmosphere into droplets falling within a spectrum of sizes;

means to contact said sheet close to said orifice and before said sheet breaks down with a second atmosphere comprising hot gas, whereby said time interval is shortened and the proportion of small droplets is diminished, and

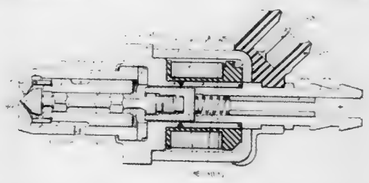
outlet means for discharging said liquid from said device to proceed toward said receiving surfaces.

4,179,069

ELECTROMAGNETICALLY OPERATED FUEL INJECTION VALVE

Heinrich Knapp, Leonberg, and Waldemar Hans, Bamberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 26, 1978, Ser. No. 900,231
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725135
Int. Cl.² B05B *1/32*
U.S. Cl. 239—125 **10 Claims**



1. Electromagnetically operated fuel injection valve to inject fuel into a plenum of an internal combustion engine comprising

an elongated valve body (**1, 6**) having a fuel supply inlet (**31**) and a fuel drain outlet (**14**);

an operating magnet (**10**) located in said body;

means (**33, 34, 35, 30, 19, 24**) formed in said body and providing a continuous fluid path between the supply inlet and the drain outlet,

said fluid path including a chamber (**30**) formed in the valve body and connecting means (**35**) leading to the chamber inclined with respect to the walls of the chamber to establish a swirling fluid flow therein;

a nozzle (**3**) in fluid communication with said fluid path, positioned at an end portion of the valve body and located adjacent the chamber (**30**);

a movable, dual valve function valve element (**17, 18**) coupled to said magnet and, to carry out one function, selectively, closing off said nozzle (**3**) and operable to open a flow path through said nozzle upon energization of the magnet;

and an auxiliary valve (**40, 41**) having a movable portion (**40**) secured to and moving with said valve element (**17, 18**) to carry out the second function, located downstream of the nozzle (**3**), and a fixed valve portion secured in said valve body, the auxiliary valve interrupting the fluid flow path between the fluid inlet (**31**) and the drain outlet (**14**) when the valve element is in a position to open the flow path through the nozzle, and permitting fluid flow between the fuel inlet and the drain outlet when the valve element (**17, 18**) closes off the fluid flow path through the nozzle.

4,179,070

SPRAYER

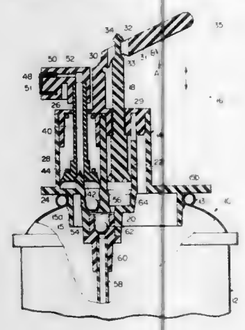
Tetsuya Tada, 6-3, 2-chome, Kakinokizaka, Meguro-ku, Tokyo, Japan

Filed Nov. 21, 1977, Ser. No. 853,535
Claims priority, application Japan, May 9, 1977, 52/52886; May 19, 1977, 52/64321[U]
Int. Cl.² B05B *9/04*
U.S. Cl. 239—333 **7 Claims**

1. In a sprayer having a body which comprises a piston slidably received in the body; a pressurizing cylinder for defining a liquid receiving pressurized chamber together with the piston; a valve rod slidably received in the body; a pressure accumulating cylinder for defining a liquid receiving pressure accumulating chamber together with the valve rod; nozzle means having an ejection hole communicating with the pressure accumulating chamber; and biasing means disposed in the pressure accumulating cylinder to bias the valve rod;

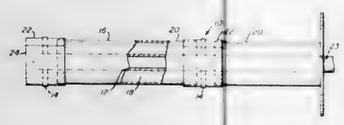
V 989 I 3 DEC 18 79 UMI

the improvement wherein:
the pressurizing cylinder and the pressure accumulating cylinder are arranged substantially in parallel;
the pressure accumulating chamber has a larger diameter than the diameter of the pressurizing chamber; and
the sprayer body further comprises a lever rotatable about a pivotable point lying substantially between the pressurizing and pressure accumulating cylinders; a vertically



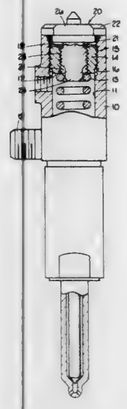
movable push button disposed adjacent to and substantially in parallel with the pressurizing cylinder and drivingly connected to the free end of the lever, and a stationary check valve coupled between the pressurizing chamber and the pressure accumulating chamber for communicating the chambers with each other and for preventing liquid from flowing backward from the pressure accumulating chamber to the pressurizing chamber.

4,179,071
INDUSTRIAL SULFUR TRIOXIDE GAS INJECTION PROBE AND METHOD OF MANUFACTURE
Wayne R. Kozacka, Laguna Hills, Calif., assignor to Wahlco, Inc., Santa Ana, Calif.
Filed Jul. 7, 1978, Ser. No. 922,770
Int. Cl.[2] B05B *1/14*; B32B *31/06*
U.S. Cl. 239—397.5 **7 Claims**



1. An industrial sulfur trioxide gas injection probe comprising: an elongated outer metallic sheathing portion; an elongated sulfur trioxide gas conveying pipe having at least a major portion thereof received within said sheathing portion; the outer diameter of said conveying pipe being less than the inner diameter of said sheathing portion; a refractory disposed intermediate the adjacent peripheral surfaces of said pipe and said sheathing portion; said refractory being disposed between said adjacent surfaces as a poured refractory and thereafter being allowed to set up to uniformly fill the space between said adjacent surfaces; the outer diameter of said refractor and the outer diameter of said sheathing portion being constant through the respective major longitudinal extents thereof; and a plurality of longitudinally spaced generally transversely extending sulfur trioxide gas injection nozzles communicating between the interior of said pipe and the exterior of said sheathing portion.

4,179,072
FUEL INJECTOR
Donald Worby, Stonehouse, England, assignor to Lucas Industries Limited, Birmingham, England
Filed Jan. 31, 1978, Ser. No. 873,780
Claims priority, application United Kingdom, Feb. 12, 1977, 6007/77
Int. Cl.[2] B05B *1/30*; F16K *21/10*
U.S. Cl. 239—533.9 **2 Claims**

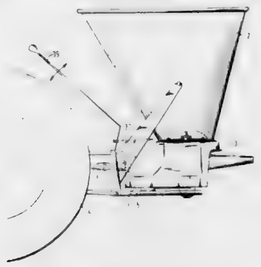


1. A fuel injector comprising a body having a bore therethrough, a seating, a valve member slidable within the bore and co-operating with the seating to control the flow of fuel therepast, means biasing the valve member into engagement with the seating, a collar disposed in the bore and having internal and external screw-threading thereon, the external screw-threading being engaged with complementary screw-threading on the interior of the bore, rotation of the collar relative to the body being arranged to adjust the biasing force of the biasing means, and a retaining member for retaining the collar in position in the bore, the retaining member having external screw-threading engaged with the internal screw-threading on the collar and including an abutment which is engageable with the body.

4,179,073
DRIVING UNIT FOR AN OSCILLATING SPREADING PIPE OF A DEVICE FOR DISTRIBUTING MATERIAL
Pieter A. Oosterling, and Hermanus H. Vissers, both of Nieuw-Vennep, Netherlands, assignors to Multinorm, B.V., Nieuw-Vennep, Netherlands
Filed Feb. 24, 1978, Ser. No. 881,062
Claims priority, application Netherlands, May 5, 1977, 7704974
Int. Cl.[2] A01C *3/06*
U.S. Cl. 239—659 **11 Claims**

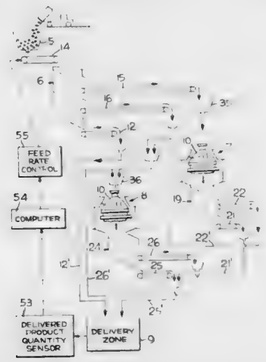
1. A driving unit supported by a frame for the oscillating distributing pipe of a device for spreading material, for example, fertilizer, said unit mainly comprising a drivable fly-wheel, a distirbuting-pipe holder to be oscillated by the fly-wheel through a coupling element eccentrically journalled in said fly-wheel and a dosing mechanism arranged above said holder,

characterized in that a portion of the frame extends in a dish-shaped fashion on either side of the driving unit, said dish-



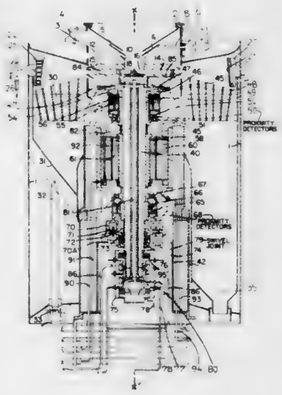
shaped portion having an opening receiving and locating said dosing mechanism.

4,179,074
METHOD OF CONTROLLING FEED RATE TO CRUSHING PLANT WHILE CRUSHERS ARE ADJUSTED TO CONTINUALLY OPERATE AT FULL POWER
Malcolm D. Flavel, Appleton, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Aug. 30, 1978, Ser. No. 938,259
Int. Cl.[2] B02C *23/00*
U.S. Cl. 241—24 **11 Claims**



1. A method of controlling operation of a crushing plant having a crushing mechanism (7 and 8) for which a predetermined amount of power is constantly available, means (14) for feeding raw material to the crushing mechanism (7 and 8) at a controllably variable feed rate, and a delivery zone (9) to which product material of less than a predetermined particle size is delivered, said method enabling a predetermined quantity of product material to be delivered to the delivery zone (9) during a predetermined working period while also ensuring that the product material delivered to said zone (9) during said period is of optimum economic value by reason of having the smallest particle size attainable within the constraints imposed by said predetermined quantity and the available power, said method being characterized by:
A. at each of a plurality of measurement times during the working period
(1) ascertaining the quantity of material that has been delivered to the delivery zone (9) from the beginning of the working period to the measurement time, and
(2) by reference to
(a) the amount of material that still needs to be delivered to the delivery zone (9) to make up said predetermined quantity,
(b) the time remaining from the measurement time to the end of the working period, and
(c) the rate at which raw material was being fed to the crushing mechanism (7,8) during an interval immediately preceding the measurement time,
adjusting the rate of feed (at 14) of raw material to the crushing mechanism (7,8) to a value which, if maintained to the end of the working period, is calculated to cause said predetermined quantity of material to have arrived at the delivery zone (9) by the end of the working period; and
B. at all times so controlling the crushing mechanism (7,8) as to cause it to consume the full amount of power available to it while it continues to process material at substantially the prevailing feed rate.

4,179,075
VACUUM-SPRAYING GRINDER
Claude Rachais, Paris, France, assignor to Creusot-Loire, Paris, France
Filed Nov. 9, 1977, Ser. No. 849,981
Claims priority, application France, Nov. 23, 1976, 76 35175
Int. Cl.[2] B02C *19/00*
U.S. Cl. 241—67 **8 Claims**



1. A vacuum-spraying grinder in which material to be ground is sprayed by centrifugal force on to an impact surface, said grinder comprising:
a fixed chamber;
means connected to said chamber for connection to suction means so that the chamber is under suction pressure;
a target mounted in said chamber comprising a ring having an impact surface directed inwardly of said chamber, said impact surface having a vertical axis of symmetry of revolution;
a rotor located at least partially in said chamber and defining a vertical axis of rotation coincident with said axis of symmetry of revolution of said impact surface of said target, said rotor comprising an upper part in the form of a horizontal disc defining radial channels which communicate with a central orifice provided in the upper part of said disc, and a lower part in the form of a vertical shaft for the support and drive of said rotor, said disc being located at the level of said target and inside the space defined by said impact surface thereof;
means for feeding material to be ground to said central orifice of said disc and permitting continuous feeding of said grinder;

means for removing ground material from the lower end of said vacuum chamber; and

means for supporting, driving and guiding said shaft of said rotor comprising:

at least one active radial magnetic bearing comprising a stator surrounding said shaft over a part of the height thereof, and a rotor carried by said shaft in spaced relation with said stator;

an active axial magnetic stop comprising a movable part carried on said shaft and a fixed part located in spaced relation opposite said movable part of said stop;

radial and axial position detector means for detecting the radial and axial positions of said shaft, said detector means being connected to circuit means for controlling the energization of said stator of said magnetic bearing and said magnetic stop in accordance with output signals from said detector means to compensate any unsymmetrical wear of said rotor by shifting of the rotor within the space between the stator and rotor of the radial magnetic bearing;

an electric motor comprising a stator surrounding said shaft over a part of the height thereof and a rotor mounted on said shaft in spaced relation with said stator; and

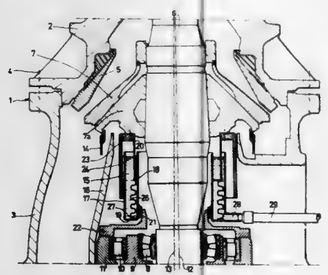
ball bearing means, mounted around said shaft and on which said shaft rests when it is not in operation.

4,179,076

SEALING DEVICE BETWEEN THE MOVABLE CRUSHING MEMBER AND THE BODY OF A GIRATORY CRUSHER

Jean C. Barrot, Neuilly-sur-Seine, and Philippe Pulido, Aubervilliers, both of France, assignors to Babbitless, Paris, France

Filed Jul. 24, 1978, Ser. No. 927,605
Claims priority, application France, Jul. 27, 1977, 77 23143
Int. Cl.[2] B02C 2/04
U.S. Cl. 241—216 **9 Claims**



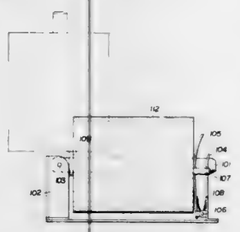
1. In a gyratory crusher comprising a shaft line supporting a movable crushing member within a body of the gyratory crusher, the said shaft line being able to be actuated with a pendulum movement, a rotary movement, and an axial translatory movement relative to the body; a sealing device comprising an annular chamber carried by the body, surrounding the volume swept out by the shaft line in the course of its pendulum movement, open upwards and containing a liquid, and a substantially cylindrical rigid wall carried by the movable shaft line, and projecting downwards into the liquid in the chamber, the width of this chamber being greater than the amplitude of the pendulum movement of the shaft line at the level of the said wall, with the improvement that the said rigid wall is extended downwards, around all its periphery, by a flexible skirt.

4,179,077

DEVICE FOR LOADING A PAPER ROLL

Taneji Morishita, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1978, Ser. No. 896,239
Claims priority, application Japan, Apr. 21, 1977, 52-49528
Int. Cl.[2] B65H 23/08, 19/10
U.S. Cl. 242—55 **5 Claims**



1. A device for loading a paper roll, comprising:

a first support member;

a center shaft adapted to be fitted into the center hole of the paper roll, one end of said center shaft being pivotally supported with the first support member;

a second support member having a part for holding the other end of the center shaft;

pressure means having a face able to contact with one side of the paper roll;

spring means for urging said pressure means in the direction toward the first support member around at least one fulcrum;

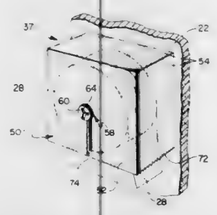
at least one stopper means for limiting the movement of said pressure means which is urged by said spring means in the direction toward the first support member.

4,179,078

TOILET PAPER DISPENSER

Donna J. Mansfield, 292 D Meridian St., Groton, Conn. 06340

Filed Oct. 10, 1978, Ser. No. 949,700
Int. Cl.[2] B65H 19/04, 19/00
U.S. Cl. 242—55.53 **18 Claims**



1. Toilet paper dispensing apparatus comprising:

a support plate adapted to be mounted to a wall and having portions contiguous with the wall when mounted thereon;

a spindle mounted to said plate having a longitudinal axis transverse to a plane of said contiguous portions, said spindle adapted to freely receive thereon a roll of toilet paper;

retainer means removably mounted to said spindle adjacent to a free end of said spindle for retaining the roll in position on said spindle; and

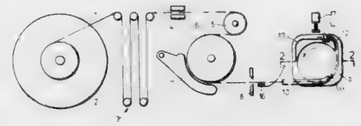
locking means cooperatively associated with said retainer means and said spindle for releasably securing said retainer means on said spindle.

4,179,079

PROCESS AND AN APPARATUS FOR LOADING A CASSETTE WITH AN ENDLESS ROLL

Heinz Johanns, Leverkusen, Fed. Rep. of Germany, assignor to AGFA-Gevaert A.G., Leverkusen, Fed. Rep. of Germany

Filed Jul. 19, 1978, Ser. No. 926,520
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1977, 2733585
Int. Cl.[2] B65H 19/20, 35/02, 17/02
U.S. Cl. 242—56 R **4 Claims**



1. A method for loading a cassette with an endless roll from a cut length of film strip disposed in a supply plane having a pair of ends which

(a) one end of film strip is supplied and led, with deflection into a coiled path, into a stationary track, which is laterally offset from the supply plane by a film width and corresponds to the path of the film guide passage of a cassette from the outer winding of a roll to its film gate, the coiled one end is then fixed at the end of the track, an adhesive surface of the one end of the film strip being kept free for adhesive tape;

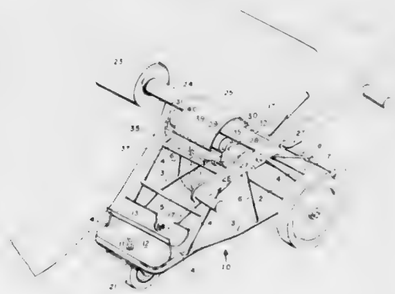
(b) with the coiled deflection maintained, a further portion of the film strip is supplied and is wound into a coiled roll, from the outside to the inside, within a rotating winding chamber which is joined to the track, and corresponds to the film take-up in a cassette; bringing the film strip to a stand still upon completion of the winding process and cutting it off and simultaneously displacing the cut end laterally by a film width along a contour corresponding to the film guide passage of a cassette, from the inner winding of the coiled roll around the side of the roll to its film gate and pushing it in front of and in line with the said one end of the film strip, where the ends of the film strip are spliced to form an endless roll with the aid of an adhesive tape, and the endless roll is then pushed into a parallel open film cassette by means of an ejector.

4,179,080

DOLLY

Henry A. Patnaude, 831 Los Molinos Way, Sacramento, Calif. 95825

Filed Apr. 12, 1978, Ser. No. 895,800
Int. Cl.[2] B65H 17/46, 75/40
U.S. Cl. 242—86.52 **5 Claims**



1. A dolly comprising a substantially rectangular lower frame member having a tapered front portion, an axle rearwardly disposed on said frame to carry two wheels, a pair of inverted U-shaped frame members which are connected to said lower frame member and provide a support structure for upper frame members, a housing nested on an upper portion of said upper frame members, a pair of rollers disposed within said housing on a roller carriage, a cover carrying pole overlying said rollers, and a shroud overlying said pole to provide a latched safety catch and to prevent the cover carrying pole from being dislodged from the roller carriage, a flexible rear suspension means for dissipating shock loads throughout the frame members, said rear suspension means includes a resilient tie bar connecting each inverted U-shaped frame member to said lower frame member through a sleeve on the inverted frame, U-shaped frame member and lower frame and a pivot carried at each extremity of said resilient tie bar, and a handle means disposed at both extremities of said cover carrying pole defined by a flanged end of said cover carrying pole fastened to an elongate crank handle member substantially medially along said handle member's elongate extent and lock handle means releasably fastening said flange to said elongate crank handle member used when paying out the cover, and a front wheel disposed at the bottom of and in the front of said lower frame member.

4,179,081

APPARATUS FOR APPLICATION OF PLASTICS STRETCH FILMS

John C. Parry, 6729 Brookmont Dr., Baltimore, Md. 21207

Filed Jun. 12, 1978, Ser. No. 914,801
Int. Cl.[2] B65H 17/44
U.S. Cl. 242—99 **11 Claims**



1. An apparatus for manually applying plastics stretch films for packaging units consisting of:

a core for a roll of plastics stretch film, said core having extended ends; and

a pair of flexible hand grips removably encircled about the ends of said core for control of the tension on said plastics stretch film while unrolling during manual application for packaging, said core having an outside diameter essentially the same as the inside diameter of said flexible hand grip so that inside surface of said flexible hand grip slidingly interfaces with the outside surface of said core.

4,179,082

BOBBIN HOLDER

Takeshi Suzuki, 19, Hacchodori, 4-chome, Toyohashi-shi, Aichi-ken, Japan

Filed Mar. 29, 1978, Ser. No. 891,181
Int. Cl.[2] B65H 54/54, 54/74, 79/00
U.S. Cl. 242—129.51 **5 Claims**

1. A bobbin holder, comprising:

a bushing having an interior cavity with a cylindrical wall adjacent one end thereof;

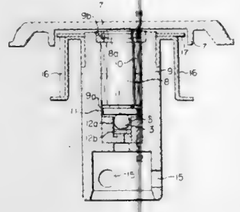
a shaft disposed in said cavity with a free end of said shaft extending from said end of said bushing and the other end of said shaft adjacent an interior supporting surface within said cavity;

bearing means disposed between the peripheral surface of said shaft and the cylindrical wall of said cavity;

means for securing a bobbin holder to said free end of said shaft;

a thrust receiving ball disposed in contact with said interior supporting surface;

a thrust receiving plate disposed between said ball and said other end of said shaft; and



a peripheral protective flange secured to said bushing adjacent said one end thereof, said flange having a plurality of protrusions for cutting and undoing any yarn which may become wound around said flange.

4,179,083

WIRE FORCING DEVICE FOR A WIRE TAKE UP APPARATUS

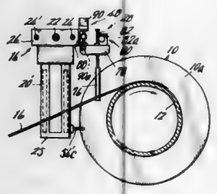
Ryoichi Hara, Chiba; Masamichi Yajima; Chiaki Akai, both of Ichihara, and Takuzo Matsumoto, Osaka, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan

Division of Ser. No. 772,339, Feb. 25, 1977, Pat. No. 4,143,834. This application Dec. 13, 1978, Ser. No. 968,975

Claims priority, application Japan, Feb. 25, 1976, 51-20521; Feb. 25, 1976, 51-20522

Int. Cl.[2] **B65H** *54/28*

U.S. Cl. 242—158 R **3 Claims**



1. A distributor for use with a take up apparatus which winds wire onto a reel with flanges at each end, said distributor comprising:

at least one pair of rotatable guide rollers adjacent said reel, one roller on each side of said wire;

carriage means carrying said guide rollers thereon for moving said rollers parallel to the longitudinal axis of said reel;

a single vertically movable wire engaging roller between said guide rollers and said reel;

adjustment means connected to said wire engaging roller for moving said roller up and down beside said wire; and

urging means operatively connected to said carriage means and said wire engaging roller for selectively positioning said wire engaging roller on the side of said wire opposite the side of said wire approaching one of said flanges as said wire is wound on said reel and for urging said wire engaging roller and said wire toward said flange approached by said wire after said engaging roller has been positioned next to said wire by said adjustment means.

4,179,084

FISHING REEL

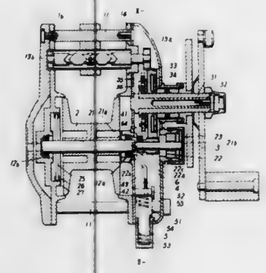
Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed May 4, 1978, Ser. No. 902,698

Claims priority, application Japan, May 9, 1977, 52-53317

Int. Cl.[2] **A01K** *89/00, 89/02*

U.S. Cl. 242—212 **5 Claims**



1. A fishing reel comprising;

first and second spaced apart side plates arranged in parallel with one another;

a spool shaft rotatably journalled between said first and second side plates;

a spool mounted to said spool shaft for rotation therewith;

a handle shaft supported to said first side plate;

a mechanism for transmitting the driving force from said handle shaft to said spool shaft comprising a driving gear and a clutch in mesh therewith, said clutch being axially movable and rotatable with respect to said spool shaft; and

a clutch control mechanism for controlling said clutch, said clutch control mechanism comprising, means for reciprocally mounting a clutch lever to said first side plate, a control member for controlling movement of said clutch lever and having a holding face, a clutch holder connected to said clutch for moving said clutch axially of said spool shaft to thereby disconnect said clutch from said spool shaft, and a return plate rotating together with said handle shaft and having projections thereon for restoring said clutch lever to its original position, said clutch holder being biased by means of springs to urge said clutch into engagement with said spool shaft and said clutch lever against an outside surface of said first side plate, said clutch lever comprising control arms and a guide in parallel with said first side plate, each of said control arms having a slant face formed at a bent portion thereof, said slant face causing said guide to be displaced from said first side plate, said clutch lever being received by said holding face of said control member such that operation of said control member causes initial movement of said clutch lever in a direction which is parallel to said first side plate and subsequent swinging movement of said clutch lever axially of said return plate, thereby shifting said clutch lever to a position where the utmost ends of said control arms engage with projections of the return plate.

4,179,085

OPTICAL BORESIGHT METHOD FOR NUTATING SYSTEM

Walter E. Miller, Jr., Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 3, 1978, Ser. No. 866,580

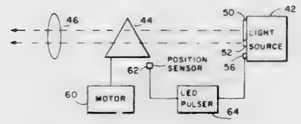
Int. Cl.[2] **F41G** *3/32, 11/00, 1/00, 1/54*

U.S. Cl. 244—3.11 **5 Claims**

1. In a beamrider guidance system wherein rotation of a nutating device moves an optical beam to periodically vary the inclination of the beam axis, a method for determining and maintaining boresight alignment of the nutating system with an adjacent optical telescope on the same stable platform comprising the steps of:

directing a beam of optical energy generated by said guidance system through said nutating mechanism;

emitting rapid, brief, directional flashes of visible light through said nutating mechanism at preselected points around the plane of rotation of the nutating device for



providing a visible optical reference in said modulated beam for identifying said boresight;

nutating said beam;

retro-directing a portion of said beam in a plane parallel to and opposite in direction to said directed beam;

capturing said retro-directed beam in a telescope;

displaying said retro-directed beam on the focal plane of said telescope; and

observing said directional flashes of optical energy displayed on said telescope focal plane for identifying the beamrider guidance system boresight.

4,179,086

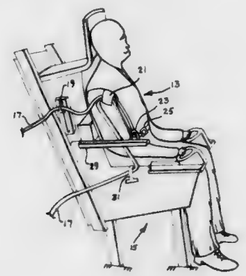
ARMY RESTRAINT SYSTEM

Edwin Y. Yamada, Orange, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 20, 1978, Ser. No. 926,361

Int. Cl.[2] **B64D** *25/02*

U.S. Cl. 244—122 AG **2 Claims**



1. In combination, an aircraft ejection seat holding a crewman therein and an arm restraint system for use therewith comprising, a restraint strap, a first ring member fixedly attached to the upper back rest of the ejection seat, a foldable shoulder flap attached to the side of the outer garment of the crewman in the lower shoulder area, a second ring member attached to a seat belt around the crewman's abdomen, and a third ring member attached to the lower side portion of the ejection seat, said restraint strap extending through said first ring member, past said foldable shoulder flap through said second ring member, back past said foldable shoulder flap through said third ring member, said shoulder flap being folded upward to slidably dispose said restraint strap therein whereby retraction of said restraint strap causes said foldable shoulder flap to unfold allowing the strap to slide down the crewman's arm so that further retraction operates to press the arm tightly against the body thereby preventing flailing of the crewman's arms during and immediately after ejection.

4,179,087

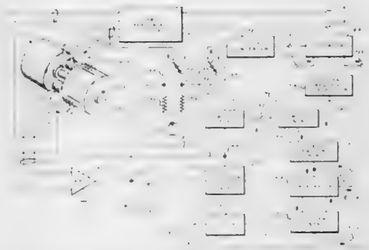
GYROSCOPE RATE RANGE SWITCHING AND CONTROL SYSTEM

James S. Johnson, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 2, 1977, Ser. No. 847,861

Int. Cl.[2] **G01C** *19/28*

U.S. Cl. 244—175 **14 Claims**



1. In an inertial reference system for aircraft, apparatus for adapting the full angular rate range characteristics of a rebalanceable rate gyroscope, having pick off means and rebalancing torquer means, to operation with converter means having a limited precision conversion range, said apparatus comprising:

amplifier means responsive to said pick off means for supplying a rebalancing torquing current to said torquer means,

first and second impedance means having different characteristic impedance values,

switch means for selectively placing said first or said second impedance means in series relation with said amplifier means and said torquer means whereby selectively to provide first and second voltages corresponding to said torquer current,

detector means responsive to the output of said amplifier means for selection of said first or said second impedance means,

voltage-to-frequency converter means having a linear conversion range less than said gyro rate range and responsive to the voltage developed across one of said first or said second impedance means for providing an output signal having a corresponding first or second frequency,

counter means responsive to said voltage-to-frequency converter means for counting cycles of said first and second frequency and for producing a count output proportional to the rate sensed by said rate gyroscope,

compensator circuit means responsive to said detector means for rendering said counter means output independent of which of said first or second impedance means is placed in said series relation by said switch means, and

rate tracking circuit means responsive to said amplifier means for further controlling said switch means.

4,179,088

OFFSET BEACON HOMING

John A. French, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 17, 1976, Ser. No. 742,407

Int. Cl.[2] **F41G** *7/14, 9/00, 7/00, 11/00*

U.S. Cl. 244—3.19 **2 Claims**

1. A system for enabling homing of a missile onto a target, said target having a radio frequency beacon disposed at a remote predetermined distance and direction therefrom: a missile having computer means thereon for storing signals

indicative of the distance and direction of said target relative to said beacon for storing signals indicative of the inverse of the coordinates of said target; seeker means carried by said missile for acquiring and tracking beacon radiations, said seeker means disposed for emitting signals indicative of spatial coordinates thereof responsive to acquiring and tracking said beacon radiations; said computer means disposed for comparing said signals indicative of said seeker coordinates with said inverse target coordinates and providing signals indicative of the differences in said coordinates; and, means carried on said missile for receiving said signals indicative of the differences in and coordinates for guiding said missile in a direction to reduce to zero the differences between the target coordinates and said inverse coordinates responsive to beacon emissions to home the missile onto the target.

2. A method of homing a missile, having a guidance computer thereon and a seeker responsive to a predetermined



signal frequency, onto a target comprising the steps of: placing a beacon remote from a target; surveying the target area relative to the beacon to determine the geographic coordinates of said target area, said geographic coordinates being defined as azimuth, range and elevation; providing signals to said guidance computer which signals are correlative with said geographic coordinates; surveying said target area to determine the beacon's distance and direction from said target and providing signals to said guidance computer which are correlative with the beacon's distance and direction from said target; establishing control communication between said beacon and said missile whereby said beacon responds to the missile seeker frequency thereby enabling the seeker to locate and track the beacon; and, receiving and comparing signals of the seeker coordinates with the inverse of the signals of the target coordinates stored in the computer memory until the missile is at the target.

4,179,089

APERTURED PANEL CORNER MOUNT FASTENER FOR CONCRETE WALLS

Guy H. Parr, Jr., P.O. Box 16201, Baltimore, Md. 21210

Filed Jul. 5, 1978, Ser. No. 922,139
Int. Cl.[2] **F04F** *13/00;* **A47G** *1/16*
U.S. Cl. 248—216.1 **4 Claims**

1. A corner mount fastener for fastening a pegboard or the like at its corner to a hard concrete wall or the like, said fastener comprising:

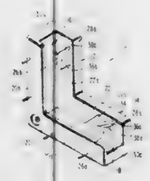
a unitary, hollow member of L-shaped configuration formed of intersecting legs,

each leg including a portion of modified U-shape in transverse cross-section formed by a vertical front wall, a vertical rear wall and transverse outer and inner walls, with the transverse inner wall joining the rear wall to the front wall at a point such that said front wall extends beyond said transverse inner wall to form with the vertical rear wall a slot which intersects with the slot of the other leg of said corner mount fastener,

at least one of said inner front or rear walls is partially cut out to form a flexible finger which projects into said slot,

said slot being of a transverse dimension slightly in excess of the thickness of said apertured panel whereby, said pegboard is frictionally gripped by said fastener when said corner is inserted within said intersecting slot,

and wherein said fastener further comprises vertical mounting pin supporting means extending within both legs and transversely over at least the distance between said front wall and said rear wall and being positioned between the transverse inner and outer walls,



transversely extending holes within said support means and pointed metal pins mounted within said holes and having their head ends projecting outwardly of the front wall.

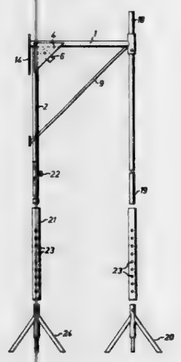
whereby, the corner of said apertured panel may be mounted to the corner mount fastener with respective edges of said apertured panel at its corner within respective slots defined by said intersecting legs and being frictionally held by said flexible fingers, and said pins may be driven through said support means from said front wall towards said rear wall, with the pointed ends embedded some distance within said hard concrete wall.

4,179,090

SCAFFOLDING

Alfred S. Williams, 10 Gloucester Rd., Ealing, London, W5 4BJ, and Raymond Foskett, 20 Grove Park Ter., Chiswick, London, W4, both of England

Filed May 26, 1977, Ser. No. 800,739
Int. Cl.[2] **E04G** *3/08, 5/04*
U.S. Cl. 248—235 **13 Claims**



1. A scaffolding bracket, for use adjacent a vertical surface and which is constructed to receive a scaffolding support member, comprising:

a horizontal member adapted to support scaffolding boards or the like;

a vertical member connected to said horizontal member and arranged to be located adjacent the vertical surface;

mounting means comprising a flat plate connected to said horizontal member and having apertures therein, spaced apart from said vertical member, for securing the scaffolding bracket to the vertical surface;

coupling means pivotally mounted within the angle formed between said horizontal member and said vertical member and being constructed to receive the scaffolding support member;

a pair of bracing struts extend between the extremities of said horizontal member and said vertical member, opposite and remote from the angle which they form;

said coupling means, which is adapted to receive the scaffolding support member, positioned so the scaffolding support member passes between the pair of bracing struts;

a vertical support member;

clamping means located near the end of said horizontal member remote from the angle formed from the vertical member for clamping said vertical support member;

said vertical support member arranged to project above the level of the horizontal member to form a support for a horizontal guard rail;

said clamping means is of a split tubular construction having two halves which are hinged together; and,

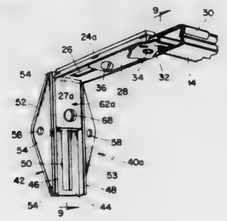
retaining means for retaining the two halves in engagement.

4,179,091

VERTICALLY ADJUSTABLE DRAPERY ROD SUPPORT

Roger Bidney, 3997 N. Victoria St., Saint Paul, Minn. 55112

Filed Jun. 6, 1977, Ser. No. 803,844
Int. Cl.[2] **A47H** *1/10*
U.S. Cl. 248—265 **5 Claims**



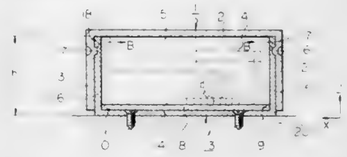
1. A vertically adjustable rod support comprising a mounting plate including a central web and a pair of laterally spaced ribs extending vertically throughout the length of said central web and projecting perpendicularly from the front side thereof, said web having a slot extending vertically throughout substantially the length of said central web between said ribs and parallel thereto, and a pair of flat flange members secured to the rear side of said web, each having a portion projecting laterally therefrom, said flange members being spaced from each other to form a vertical groove therebetween extending the length of said central web and the laterally projecting portion of each flange member having a mounting hole therein, and a rectangular block between said ribs, said block having upper and lower edges and a hole extending therethrough, a screw having a threaded shank extending through both said block hole and said vertical slot, a retention nut in said groove received on said shank, and arm means connected at one end to said block adjacent the upper edge thereof and projecting perpendicularly from said block for engaging a drapery rod at the other or free end thereof, the upper end of said vertical slot and the hole in said block being relatively located with respect to each other so that the upper edge of said block and said arm means can be adjusted to a height corresponding to the upper end of said central web, whereby said screw, when tightened, maintains said block and said arm means at selected vertically adjusted positions including a position in which said arm means is at said corresponding height.

4,179,092

MOUNTING DEVICE FOR DOOR CLOSER

Hiroshi Miyazawa, Hiratsuka, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Dec. 9, 1977, Ser. No. 859,107
Claims priority, application Japan, Dec. 20, 1976, 51-170674
Int. Cl.[2] **F16M** *13/00*
U.S. Cl. 248—309 R **5 Claims**



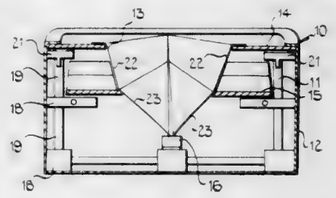
1. A mounting device for a door closer comprising a generally box-shaped main body for containing the door closer mechanism, a mounting plate having a bottom plate and a pair of position control wall portions extending generally perpendicular to said bottom plate from the opposite ends thereof, one wall of said main body having a pair of elongated openings therein at positions along the inner surfaces of said opposite side walls of the main body and being complementary in shape to the cross-sectional shape of said wall portions, said openings having said position control wall portions extending therethrough into said main body with the inner surfaces of said side walls in face-to-face contact with said position control wall portions when the main body is mounted on the mounting plate, and retaining means between the position control wall portions and said opposite side walls for permitting said side walls and said position control wall portions to slide along each other as said position control wall portions are moving into said main body during mounting of said main body on said mounting plate and for retaining said main body from being pulled off said mounting plate.

4,179,093

MOULDING APPARATUS

William J. T. Western, 4 Elston Ave., Denistone, New South Wales, Australia (2114)

Filed Sep. 1, 1978, Ser. No. 938,839
Claims priority, application Australia, Sep. 5, 1977, PD1513; Mar. 22, 1978, PD3767
Int. Cl.[2] **B28B** *7/32, 7/06;* **B29C** *5/00, 1/16*
U.S. Cl. 249—65 **11 Claims**



1. A moulding apparatus for use in the formation of an open-top bowl-like shell whereof at least some of the surface is curved, comprising:

(a) a flexible form layer adapted to be formed into a moulding face for the said shell,

(b) first template means having an edge corresponding in shape to the desired shape of the shell rim bordering said curved surface,

(c) further template means having an edge surface corre-

sponding in shape to a contour of at least a portion of said curved surface of the shell and

(d) containment means to form, together with the flexible form layer, a fluid tight container enclosing the said further template means,

the container being connected to means to vary the fluid pressure within the container so that the fluid pressure on the moulding face of said form layer is different from that on its opposite face to thereby urge said layer into a condition of tensed stiffness in which condition the form layer directly bears against and is supported by the said further template means and the form layer assumes the shape required of the surface of the shell to be formed.

4,179,094

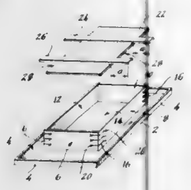
PORTABLE, EXPANDABLE MOLD FOR FABRICATING SUBSTANTIALLY ISOTROPIC ISOCYANATE BASED POLYMER FOAM BUNS

John N. Curtiss, Seabrook; Charles E. Koehler, Baytown, and Pat L. Murray, Dayton, all of Tex., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 709,777, Jul. 29, 1976, Pat. No. 4,104,346. This application May 26, 1978, Ser. No. 910,077

Int. Cl.[2] B29D *27/04*

U.S. Cl. 249—82 **7 Claims**



1. A portable, expandable mold for fabricating isocyanate-based polymer foam buns from the corresponding polymer foam forming mixture and adapted to be readily dismantled for transportation, which mold comprises a box mold having a floor, sidewalls and lid;

said mold floor being in sheet form provided with stop means mounted on the periphery thereof;

at least one oppositely disposed pair of said sidewalls having their lower edges in sliding contact with said floor and having their vertical edges held in abutting relationship with the vertical edges of adjacent sidewall members by extensible coupling means;

said sidewalls, when held in said abutting relationship, defining a cross-sectional area less than that of said mold floor and of the foam bun to be fabricated;

said lid having side projecting members adapted to provide sliding contact with the upper edges of said sidewalls during lateral movement of the latter;

said lid being free to rise vertically and out of contact with the upper edges of said sidewalls under pressure from expanding foam mix; and

said extensible coupling means being yieldable under pressure from expanding foam mix to permit such of said sidewalls as are free to do so to move outwardly and to engage said stop means on theperiphery of said mold floor.

4,179,095

PNEUMATICALLY OPERATED AIR LOCK FOR AIR DUCTS, PARTICULARLY FOR AIR CONDITIONING PLANTS

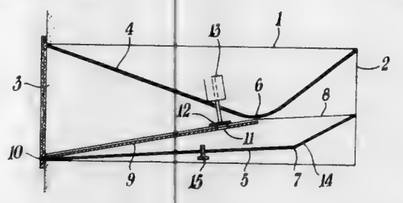
Luciano Tesolin, Via Conserva, Villanova (Pescara), Italy

Filed Mar. 9, 1978, Ser. No. 885,047

Claims priority, application Italy, Mar. 10, 1977, 48422 A/77

Int. Cl.[2] F16K *31/385*

U.S. Cl. 251—30 **3 Claims**



1. A pneumatically operated air lock comprising a casing having an inlet end, adapted to be connected to an air conveying duct, and an outlet end; a choke duct within said casing and having an outlet area coincident with said casing outlet end; a membrane positioned within said choke duct and consisting of a layer of flexible material having first and second cross sides fastened respectively to corresponding sides of one wall of said choke duct, said layer of flexible material having a breather hole therethrough; an electromagnet; a disk responsive to said electromagnet and capable of assuming a first position in which the breather hole is open permitting said membrane to be substantially adherent to said one wall of said choke duct, allowing the passage of air from said inlet end to said outlet end, and a second position in which the breather hole is blocked by said disk, causing inflation of said membrane and extension of said membrane across said choke duct to prevent airflow from said inlet end to said outlet end.

4,179,096

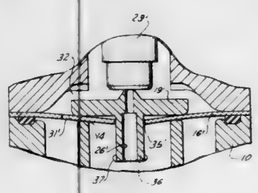
VALVE MEMBER FOR PILOT OPERATED VALVES

James P. Fromfield, Belleville, N.J., assignor to Automatic Switch Company, Florham Park, N.J.

Filed Apr. 3, 1978, Ser. No. 892,621

Int. Cl.[2] F16K *31/10*

U.S. Cl. 251—38 **4 Claims**



1. In a pilot operated valve having a valve body formed with an inlet port, an outlet port, an orifice between the ports, and a valve seat surrounding the orifice,

a valve member cooperable with the valve seat to close and open the valve, said valve member comprising:

a flexible diaphragm within the valve body movable into direct engagement with the valve seat to close the valve and out of engagement with the valve seat to open the valve, said diaphragm having a hole in its region surrounded by the valve seat when the valve is closed,

a rigid support plate resting against the face of said diaphragm opposite the face which engages the valve seat, said support plate having a diameter at least as large as the diameter of the valve seat so that said rigid support plate presses said diaphragm against the valve seat when the valve is closed,

a stem projecting from said plate through the hole in said diaphragm, and

said valve member being devoid of means for rigidly securing said diaphragm and plate together so that the portion of said diaphragm within the orifice surrounded by the valve seat is free to flex away from the lower surface of said support plate.

4,179,097

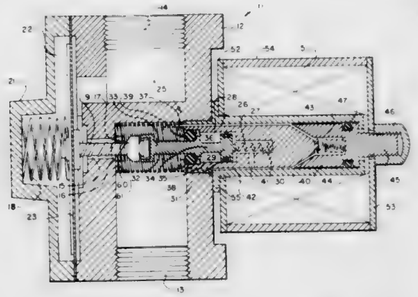
SAFETY SHUT-OFF VALVE

Frank Fiedler, Jr., 2429 Agostino Dr., Rowland Heights, Calif. 91748

Filed May 31, 1978, Ser. No. 911,273

Int. Cl.[2] F16K *31/02*

U.S. Cl. 251—130 **9 Claims**



1. A pressure responsive shut-off valve comprising:

a valve housing means defining a fluid inlet and a fluid outlet and a valve seat therebetween;

a valve closure means movable between a closed position against said valve seat and an open position away therefrom, said closure means preventing fluid flow between said inlet and outlet when in said closed position and permitting said fluid flow when in said open position;

a valve operator means comprising a pressure responsive piston movable between set and release positions, said operator means coupled to said valve closure means so as to effect location thereof in said open position with said piston in said set position and location thereof in said closed position with said piston in said release position;

a cylinder body means retaining said piston, said cylinder body means defining an activating volume communicating with said inlet and establishing an activating fluid pressure forcing said piston toward said release position, said cylinder body means further defining a reference volume communicating with said inlet and establishing a reference volume on the opposite face of said piston;

a seal means for sealing said inlet from said reference volume with said piston in said set position and providing fluid communication therebetween with said piston in said release position;

latching means for latching said piston in said set position; and manual reset means for moving said piston from said release position to said set position.

4,179,098

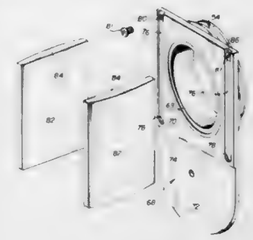
SPACER PLATES FOR GATE VALVE SEAT ASSEMBLIES

Anthony A. Laitkep, Wharton; Danny S. Meyer, Richmond, and Hamid J. Saka, Houston, all of Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Sep. 28, 1978, Ser. No. 946,907

Int. Cl.[2] F16K *25/00*

U.S. Cl. 251—167 **4 Claims**



1. A gate valve structure comprising a valve body having a valve chamber therein and inlet and outlet flow passages communicating with the valve chamber, an annular recess in the valve body surrounding each flow passage and opening into the valve chamber;

an expanding gate valve assembly including a gate element and segment slidably mounted within the valve chamber for movement between open and closed positions with said gate element and segment expanding away from each other at the fully open and closed position, said gate element and segment having ports therethrough alignable with said flow passages in the open position of the valve assembly;

a seat assembly fitting within each recess for floating back and forth movement each seat assembly having a flow passage and a skirt about the flow passage movable with the seat assembly, thereby forming a pair of skirts in opposed facing relation with the gate assembly positioned between the skirts, each skirt having a planar sealing face in facing relation to and in contact with the gate assembly, said skirts each having a pair of generally parallel grooves outwardly of the gate assembly extending in a direction generally parallel to the longitudinal axis of the gate assembly; and

a pair of spacer plates alongside the gate assembly and between the skirts fitting in grooves in opposed skirts and extending in a direction generally parallel to the longitudinal axis of the flow passages and maintaining a minimum clearance between the seat assemblies and gate assembly.

4,179,099

EXPANDING GATE VALVE

Elwood K. Pierce, Jr., Coldspring, Tex., assignor to Petroleum Designers, Inc., Houston, Tex.

Filed Jul. 3, 1978, Ser. No. 921,460

Int. Cl.[2] F16K *25/00*

U.S. Cl. 251—168 **16 Claims**

1. A gate valve for controlling the flow of fluid, said gate valve comprising:

valve body means being formed to define a valve chamber and inlet and outlet flow passages intersecting said valve chamber;

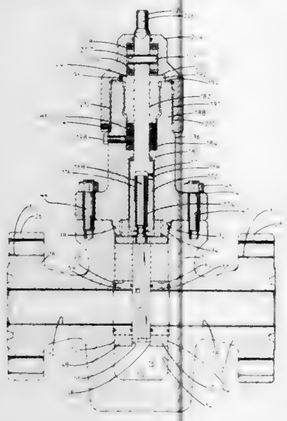
a pair of valve seats located in opposed relation within said valve chamber and in surrounding relation with respective ones of said flow passages;

a pair of gate segments being movably positioned within said valve chamber and being interposed between said valve seats, each of said gate segments defining sealing surface means in sealing engagement with respective ones of said valve seats, said gate segments defining port means for

registry with said flow passages in the open position of said valve and defining blocking means for blocking the flow of fluid through said flow passages in the closed position of said valve;

bonnet means being secured to said valve body and forming a closure for said valve chamber;

actuator means being provided on said bonnet means and being connectable to said gate segments for causing reciprocation of said segments within said valve chamber; and



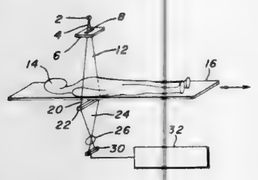
spreader means being positioned within said valve and engaging said gate segments, said spreader means allowing collapsing of said gate segments to facilitate segment travel between the open and closed positions of said valve and causing expansion of said segments in the open and closed positions of said valve to mechanically enhance the sealing ability of said gate valve.

4,179,100

RADIOGRAPHY APPARATUS

Donald Sashin, and Ernest J. Sternglass, both of Pittsburgh, Pa., assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed Aug. 1, 1977, Ser. No. 820,424
Int. Cl.² G03B *41/16*
U.S. Cl. 250—416 TV **36 Claims**



1. Radiography apparatus comprising

a source of radiation,

collimator means interposed between said radiation source and an object to be exposed to radiation for converting said radiation into a generally fan-shaped beam,

scintillator means disposed on the opposite side of said object from said radiation source for converting radiation into light,

a self-scanning integrated array of photodiodes for receiving light produced by said radiation and emitting responsive electrical signals,

optical coupling means connecting said scintillator means to said self-scanning photodiode array,

said optical coupling means having fiber optic means operatively associated with said scintillator means and said self-scanning array of photodiodes, whereby light emitted by said scintillator means will be delivered with substantial continuity to said self-scanning array of photodiodes,

signal receiving means operatively associated with said self-scanning photodiode array to store, process or display said image information,

said self-scanning array of photodiodes being a planar array having at least two parallel rows of linear self-scanning photodiode arrays, and

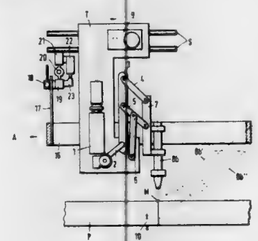
said self-scanning array of photodiodes having two said rows of linear self-scanning photodiode arrays, disposed with said linear arrays of a first said row being staggered with respect to said linear arrays of a second said row.

4,179,101

TWO TORCH HEAD FOR OXYGEN CUTTING MACHINES

Hans Bräutigam, Klein-Krotzenburg, Fed. Rep. of Germany, assignor to Esab-Kebe GmbH, Karben, Fed. Rep. of Germany

Filed Jan. 9, 1978, Ser. No. 868,144
Int. Cl.² B23K *7/10*
U.S. Cl. 266—77 **11 Claims**



1. A torch head for an oxygen-cutting torch machine comprising, in combination, a torch head; a first torch mounted on the torch head for cutting perpendicular cuts; a second torch mounted on the torch head for cutting at an angle to the perpendicular; the mounting for the second torch having two parallel side shaft members and two parallel cross shaft members, each pivotably attached to the other at spaced locations so as to define a parallelogram swinging means in which the four members move pivotably and in parallel together; the second torch being mounted to one of the side shaft members so that the second torch can be positioned according to the cutting requirement at any preselected angle to the perpendicular according to the relative movement of the parallelogram members; a drive means mounted on the torch head for swinging the parallelogram swinging means; a shaft member rotatable about a point fixed to the torch head and having two spaced pivot mountings, one on each side of the fixed point, one pivot mounting being pivotably attached to the other of the side shaft members, and the other pivot mounting being pivotably attached to the drive means, a supporting shaft member having two spaced pivot mountings, one pivot mounting being pivotably attached to the torch head, and the other pivot mounting being pivotably attached to one of the cross shaft members at about the midway point between the two shaft members, thereby supporting the parallelogram swinging means against collapse; so that operation of the drive means rotates the rotatable shaft member and thereby swings the parallelogram swinging means and the second torch means through a selected arc, and thus moves the second torch means into a selected angular cutting position.

4,179,102

APPARATUS FOR THE DEGASSING AND FILTRATION OF MOLTEN METAL

Joseph A. Clumpner, Creve Coeur, Mo., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jun. 12, 1978, Ser. No. 914,511
Int. Cl.² C22B *9/02*
U.S. Cl. 266—218 **15 Claims**



1. An improved apparatus for use in the degassing of molten metal which comprises:

chamber means having an elongated side wall portion;

inlet means at a first height for introducing said molten metal into said chamber;

outlet means at a second height below said first height for removing said molten metal from said chamber;

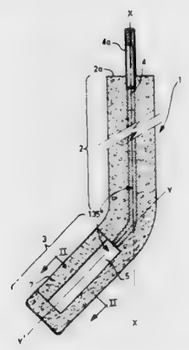
fluxing gas inlet means at a third height below said first height for introducing said fluxing gas into said chamber wherein said molten metal inlet means is located with respect to said side wall portion for tangentially introducing said molten metal into said chamber in either a clockwise or counterclockwise flow direction such that said molten metal swirlingly flows in a clockwise or counterclockwise manner from said metal inlet towards said metal outlet as said fluxing gas percolates up through said molten metal.

4,179,103

MEANS FOR INJECTING GAS INTO A MOLTEN METAL

Gérard Bentz, Elancourt-Trappes, and Bernard Racouchot, Franconville, both of France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude, Paris, France

Filed Jan. 30, 1978, Ser. No. 873,618
Claims priority, application France, Feb. 10, 1977, 77 03701
Int. Cl.² C22B *21/06*; C21C *7/00*
U.S. Cl. 266—225 **11 Claims**



1. A delivery device for injecting a gas into a mass of molten metal, the device comprising, in combination:

an elongate member of impermeable refractory material, the elongate member including a straight body portion and a straight head portion having an angled connection with the body portion, the head portion including a closed end, a side wall disposed between the closed end and the body portion, and a recess extending inwardly into the head portion from said side wall;

a porous refractory element located in the recess; and

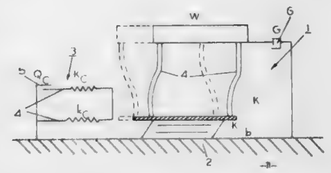
a gas inlet conduit positioned within the elongate member, the inner end of the conduit being in open communication with the recess.

4,179,104

MECHANICAL ATTENUATOR

Robert I. Skinner, and Arnold J. Heine, both of Wellington, New Zealand, assignors to Development Finance Corporation of New Zealand, Wellington, New Zealand

Continuation-in-part of Ser. No. 575,747, May 8, 1975, abandoned. This application Jan. 4, 1977, Ser. No. 756,607
Int. Cl.² F16F *1/16*
U.S. Cl. 267—154 **13 Claims**



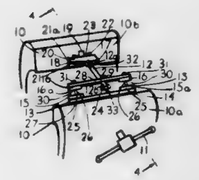
1. In a structure such as a building, a bridge or a nuclear reactor said structure resting on a base, the improvement comprising at least one support interposed between a first portion of said structure and said base, said support carrying at least a part of the weight of the structure and having flexibility in a horizontal direction of motion of at least a major portion of the structure and at least one hysteretic energy absorber connected between a further portion of said structure and a further portion of said base for absorbing horizontal accelerating forces originating from earthquakes and consequential motions, said hysteretic energy absorber being substantially unaffected by normal ambient accelerating forces.

4,179,105

MAGNETIC PRESS FOR VISES

Lester S. Krulwich, 241 Central Park West, New York, N.Y. 10024

Filed Aug. 22, 1978, Ser. No. 935,969
Int. Cl.² B25B *11/00*
U.S. Cl. 269—8 **1 Claim**



1. A magnetic press for vises provided with two parallel flat faced jaws and a handle comprising magnets fastened on a flat plate removably attached to a jaw of the vise, said magnets having their magnetic poles the same as those on the opposite faces of magnets attached to a projection aligned movably and

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right angularly to said plate, thereby repelling said magnets with said projection towards the jaw opposite said flat plate with increasing compression as the jaws are drawn towards each other by the vise handle.

4,179,106

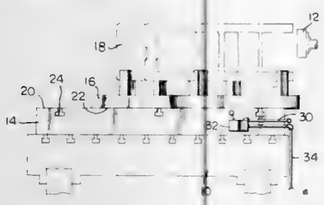
APPARATUS FOR LOCATING AND CLAMPING A WORK MEMBER SUPPORTING FIXTURE

Raymond A. Bergman, 107 E. Second St., Minster, Ohio 45865

Continuation of Ser. No. 815,676, Jul. 14, 1977, abandoned, which is a division of Ser. No. 684,725, May 10, 1976, Pat. No. 4,058,885. This application Jul. 17, 1978, Ser. No. 924,958

Int. Cl.² B23Q *7/00*

U.S. Cl. 269—20 **26 Claims**



1. An apparatus for supporting a work member in a machine tool for the machining thereof comprising:

a table in a machine tool having an upwardly facing upper surface,

a fixture having a downwardly facing lower surface resting on the upper surface of the table and adapted for having a work member mounted thereon,

means for supplying fluid under pressure between said surfaces for floatingly supporting the fixture on the table to permit free movement of the fixture thereon,

locating means for selectively positively locking said fixture on said table in at least two different predetermined positions against any horizontal movement thereon and for permitting translational movement of the fixture on the table and mechanically confining the movement of said fixture on said table when it is translated from one of said predetermined positions to the other,

said locating means comprising a pair of spaced apart locating pin means extending from one of said surfaces and at least three openings in the other of said surfaces, said pair of pin means being engageable respectively with a pair of said openings when said fixture is in one of said predetermined positions, one of said pin means being engageable with one of said openings during the movement of said fixture between one of said predetermined positions to the other of said predetermined positions, and said pair of pin means being engageable with a pair of said openings when said fixture is in the other of said positions,

at least one of said pin means being selectively retractable, and

clamp means on the table for clamping the fixture thereto.

4,179,107

PRINTING AND COLLATING METHOD

Jerome R. Harris, Charlottesville, Va., assignor to Amprint Corp., Gordinsville, Va.

Continuation of Ser. No. 623,748, Oct. 20, 1975, abandoned. This application Apr. 20, 1977, Ser. No. 789,339

Int. Cl.² B41F *13/58*

U.S. Cl. 270—4 **11 Claims**

1. A method for collating printed material on a web having printed longitudinal inner and outer web sections wound as a web roll on a common core with each of said web sections having a series of aligning holes along an edge thereof comprising the steps of loading a plurality of said roll wound webs in said collator in proper relative orientation with respect to said preprinting, unwinding each of said roll wound webs by utilizing said series of aligning holes, separating said web sections, then moving said separated inner and outer web sections into superposed relationship with one another, moving said plurality of webs into superposed collated orientation utilizing said series of aligning holes forming a superposed stack of collated web sections.

2. A method of concurrently printing side-by-side groups of pages on an elongated web having first and second surfaces for subsequent collation and final finishing comprising printing first and second groups of pages on corresponding first and second longitudinally extending side-by-side web sections on the first surface of said elongated web in at least a first color,



perforating said elongated web along its length with corresponding first and second series of aligning holes along edges of said corresponding first and second web sections with said aligning holes being oriented in relation to each other and to the respective groups of printed pages in registration with said first and second groups of pages, slitting said elongated web to separate said first and second web sections for subsequent collation and final finishing, rewinding said separated first and second web sections on a common core for subsequent collation and final finishing utilizing said first and second series of aligning holes for moving said separated first and second web sections into superposed relationship to one another.

4,179,108

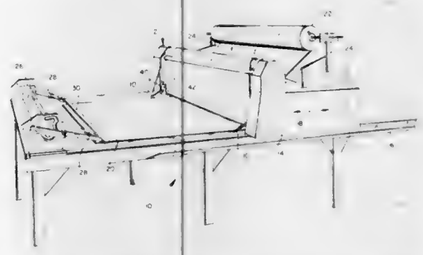
SUPPLEMENTAL FEED ASSEMBLY FOR SHEET MATERIAL SPREADING MACHINE

Harold Grimm, Bronx, and Ira Zuckerman, Rosedale, both of N.Y., assignors to Panther Machine Corp., New York, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,292

Int. Cl.² B65H *29/45*

U.S. Cl. 270—31 **7 Claims**



1. In a fabric spreading machine for spreading sheet material in superimposed layers on a table surface, and including a carriage which moves back and forth over said table surface in opposed operative strokes between a pair of spaced fold-retaining members, with said carriage having a fold-forming assembly, a shaft, and a positive feed roller mounted on said shaft for rotation therewith, for feeding a supply of sheet material carried by said carriage onto said table, and first drive means connected to said positive feed roller for continuously rotating the latter during said operative strokes with said sheet material fed at a rate corresponding to the speed of travel of said carriage;

a supplemental feed assembly comprising second, intermittent drive means connected to said shaft through a one-way clutch mounted on said shaft and operatively connected to said positive feed roller for intermittent additional rotation thereof to provide an overfeed of said sheet material as said carriage approaches and engages each of said fold-retaining members,

actuating means mounted on said carriage and operatively connected to said intermittent drive means for actuating the latter in response to arrival of the carriage at that portion of each of said operative strokes in which the fold-forming assembly moves into contact with a respective fold-retaining member,

and lost motion means mounted on said shaft for operatively connecting said first drive means to said positive feed roller and operable by said second, intermittent drive means, after the latter has turned said roller through said additional rotation to provide said overfeed of material, for disconnecting said feed roller from said first drive means for a selected period sufficient to take up slack of excess sheet material fed as said carriage commences movement in the opposite stroke,

said lost motion means comprising a first coupling block rigidly mounted on said shaft, a second coupling block rotatably mounted on said shaft and spaced apart from said first coupling block, a first drive pin connected to said first coupling block and projecting toward said second coupling block, and a second drive pin connected to said second coupling block and projecting toward said first coupling block, said second drive pin being positioned to engage said first drive pin to form a driving connection therewith, said first drive means being connected to said second coupling block for rotating the latter.

4,179,109

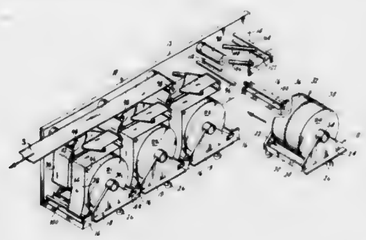
COLLATING EQUIPMENT INCLUDING COLLATOR AND CART

Jerome R. Harris, Charlottsville, Va., assignor to Amprint Corp., Gordonsville, Va.

Continuation of Ser. No. 789,341, Apr. 20, 1977, abandoned, which is a continuation of Ser. No. 623,749, Oct. 20, 1975, abandoned. This application Jan. 9, 1978, Ser. No. 868,038

Int. Cl.² B65H *39/00*

U.S. Cl. 270—52 **17 Claims**



1. An apparatus for collating printed material on a web roll with individual inner and outer web sections printed thereon which web sections are on a common core each of said sections having a series of aligning holes thereon along one edge of each of said web sections comprising a frame, at least one station of said frame adapted to receive said web roll, web drive means mounted on said frame and adapted to be engaged with said web roll when the latter is loaded into said station, a powered master roller mounted on said frame and positioned at said station, first means positioned at said station for directing said inner web section of said web over said master roller, second means positioned at said station for directing said outer web section of said web roll into collated and superposed relation to said inner web section on said master roller, and means associated with said master roller for maintaining said superposed relationship between said inner and outer web sections and for directing said superposed inner and outer web sections away from said station whereby the pre-printed inner and outer web sections emerge from said station in collated and superposed relation.

17. A collator for assembling printed material from a plurality of web rolls each containing two individual side-by-side web sections wound on a common core with each web section having a series of aligning holes along one edge thereof comprising a support, a plurality of work stations along said support and each being adapted to receive one of said web rolls, drive means mounted on said support at each work station and adapted to engage with the corresponding web roll, a plurality of powered master rollers each of said master rollers mounted on said support at each work station, a plurality of first positioning means mounted at each work station adjacent a first web section adapted to direct said first web section over one of said master rollers, a plurality of second positioning means mounted at each work station adjacent a second web section adapted to direct said second web section over another of said master rollers at an adjacent work station, means for superposing said second web section with said first web section, and a plurality of extensible aligning pins on each of said master rollers engaging said aligning holes in each of said web sections at each work station and adapted to direct said web sections along said support to an adjacent work station.

4,179,110

METHOD FOR OPPOSING A SHEET-LIKE MATERIAL TO A STANDARD PLANE WITH PREDETERMINED SPACE THEREBETWEEN

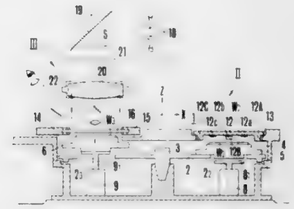
Masao Kosugi, and Hideki Yoshinari, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 679,825, Apr. 23, 1976, abandoned, which is a continuation of Ser. No. 580,704, May 27, 1975, abandoned. This application Feb. 18, 1977, Ser. No. 769,900

Claims priority, application Japan, May 28, 1974, 49-59922; May 28, 1974, 49-59923

Int. Cl.² B65H *39/00*

U.S. Cl. 270—58 **2 Claims**



1. An apparatus for precisely opposing a semi-conductor wafer with a mask and having a parallel and perdetermined space therebetween without contact of said wafer and mask, comprising:

a mask carrier, for holding a mask having a surface, said mask carrier to be opposed with a mask;

a wafer carrier, for holding a semiconductor wafer having a front surface, said front surface to be opposed with said surface of the mask;

a first calibrator having a first reference plane which has a predetermined relationship with said mask surface and being in contact with the front surface of the wafer;

first movable means for mounting said wafer carrier and for movement between a retracted position at which the wafer carrier may be loaded onto and unloaded from the first movable means and an extended position at which the

front surface of the wafer may be in contact with the first reference plane;

second movable means for mounting said wafer carrier and for movement between a retracted position and an extended position;

turn table for transferring said wafer carrier from said first movable means to said second movable means when in said retracted positions respectively;

equalizer means for tilting the wafer held by said carrier and for obtaining a parallel condition of the front surface of the wafer with respect to the first reference plane of the first calibrator when said wafer contacted with the first calibrator and the back surface and front surface of the wafer is not parallel;

spacing means mounted on said wafer carrier for providing an amount of tilt of the wafer with respect to the reference plane of the first calibrator; and

a second calibrator having a second reference plane which has a predetermined relationship with said surface of the mask and being contacted with the spacing means when said second movable means is positioned at the extended position.

4,179,111

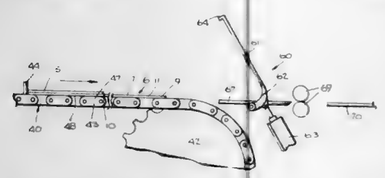
FOLDING MECHANISM

William H. Gunther, Jr., Mystic; Roman M. Golicz, Clinton, and James W. Hough, Madison, all of Conn., assignors to G. B. R., Ltd., Dover, Del.

Continuation-in-part of Ser. No. 680,788, Apr. 27, 1976, Pat. No. 4,071,997. This application Nov. 21, 1977, Ser. No. 853,134

Int. Cl.² B65H *45/14*

U.S. Cl. 270—68 R **2 Claims**



1. A mechanism for folding a sheet comprising a conveyor, a ramp, a feed plate, a deflecting mechanism and a pulling roller, said conveyor terminating short of said pulling roller, said ramp, feed plate and deflecting mechanism being interposed between said conveyor and said pulling roller, said conveyor moving said sheet on a horizontal plane, said ramp extending upwardly away from said plane, said ramp being at an angle to said plane which is no greater than 90° to the direction from which the sheets are advancing, said ramp having a forward end and a rear end and having a stop at its forward end, said feed plate being located below said ramp to support said moving sheets in a horizontal plane, the rear end of said ramp being spaced above said feed plate to form a gap between said plane and rear end, said deflecting mechanism movable relative to said feed plate from a gap-closing position below said plane and out of the path of the sheet to open the gap to permit the folded sheet to pass through the gap along said feed plate and said pulling roller mounted to grasp the folded sheet after it moves through the gap and past said feed plate.

4,179,112

APPARATUS FOR CONVEYING SHEETLIKE ORIGINAL MATERIAL TO BE COPIED

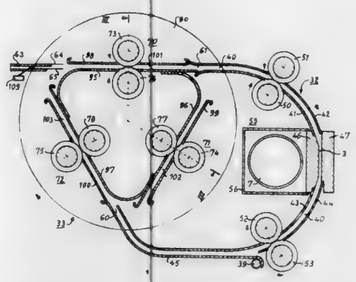
Theo P. C. Breuers, Venlo, and Joannes J. W. M. Joosten, Baarlo, both of Netherlands, assignors to Oce-van der Grinten N.V., Venlo, Netherlands

Filed Nov. 10, 1977, Ser. No. 850,291

Claims priority, application Netherlands, Nov. 16, 1976, 7612693

Int. Cl.² B65H *9/10, 5/18, 9/08*

U.S. Cl. 271—3 **13 Claims**



1. In an apparatus for conveying a sheetlike original to be copied past the exposure window of a copying machine, which apparatus includes a feed section, an exposure section provided with the exposure window, with an entry, with an exit and with conveying and guiding elements, an ejection section and return means, to be selectively engaged, for returning an original from the exit to the entry of the exposure section, the improvement wherein the return means comprises at least two sets of gripping and conveying elements mounted in a common supporting element which can be displaced cyclically to a number of positions, in each position of the supporting element and with the return means being engaged, one set occupying a first location situated in a path of movement of an original sheet leaving the exposure section, and the other set occupying a second location situated in a path of movement joining the entry to the exposure section, switching means for switching the gripping and conveying elements of each set on and off, the gripping elements being switched off and the conveying elements being switched on as soon as a set arrives in the second location, and the gripping elements being switched on and the conveying elements being switched off when a set is in the first location and after an original sheet has been gripped by this set by at least its leading edge, and means for displacing the supporting element after the trailing edge of an original sheet has passed the entry of the exposure section.

4,179,113

APPARATUS FOR FEEDING LEAFLETS TO RAPIDLY MOVING ARTICLES

Claris C. Gallimore, Lake Villa, Ill., assignor to F. D. Graphics, Inc., Lake Villa, Ill.

Filed Jan. 9, 1978, Ser. No. 867,714

Int. Cl.² B65H *5/08*

U.S. Cl. 271—12 **15 Claims**

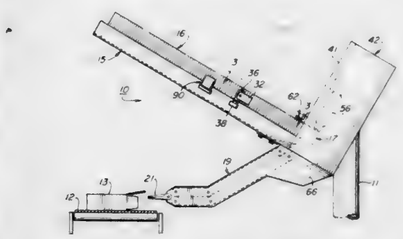
1. Apparatus for feeding leaflets to articles moving past said apparatus, comprising in combination

an inclined tray for holding a plurality of said leaflets in face-to-face relationship for movement toward one end of said tray,

reciprocating means mounted at said one end of said tray for reciprocal movement in a direction transverse to the direction of movement of said leaflets in said tray,

transport means mounted at one end of the path of said reciprocal movement of said feed means for propelling leaflets supplied thereto to said articles as they move past the discharge end of said transport means,

feed means carried by said reciprocating means for removing said leaflets one by one from said one end of said tray and feeding them seriatem to said transport means,



a plurality of elongated arms extending into the path of movement of said leaflets in said tray, and

support means mounting said arms at respectively adjustable angles relative to said path of movement.

4,179,114

FILM SHEET HANDLING DEVICE

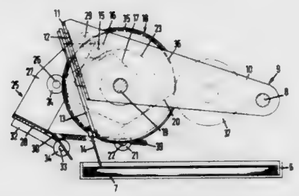
Lucas van der Does, Oenkerk, Netherlands, assignor to N. V. Optische Industrie "De Oude Delft", Delft, Netherlands

Filed Dec. 15, 1977, Ser. No. 860,747

Claims priority, application Netherlands, Dec. 20, 1976, 7614149

Int. Cl.² B65H *3/22*

U.S. Cl. 271—19 **6 Claims**



1. A device for removing a film sheet from a stack of such film sheets present in a cassette, said device comprising:

a frame;

means on said frame for holding said cassette containing said stack of said film sheets;

a pivoting member pivotally mounted to said frame, said pivoting member comprised of at least one arm pivoting about an axis extending transversely to the direction of transport of said film sheets, said arm having a portion bent-over substantially at right angles to said arm;

a bell crank lever pivotally mounted to said bent portion of said arm of said pivoting member;

a pin fixedly carried by said bell crank lever;

first camming means for controlling the movement of said pivoting member and operable to pivot said pivoting member and the lever attached to the latter, so that said pin is moved into engagement with the uppermost film sheet of said stack in a marginal area thereof;

second camming means for controlling the movement of said bell crank lever, and operable to pivot said bell crank lever so that said pin, whilst in engagement with the uppermost film sheet of said stack, is moved in a direction substantially parallel to the plane of said sheet, thereby causing said sheet to become bulged;

a film sheet guiding member connected to said frame;

means for moving said film sheet guiding member under the uppermost film sheet of said stack when said film sheet is at least partially separated from said stack; and

means for further removal of said film sheet via said film sheet guiding member.

4,179,115

SHEET FEEDING AND COLLATING APPARATUS

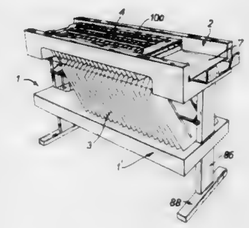
Kurt Ruenzi, Kuesnachterstrasse 59, Zumikon, Switzerland (8126)

Continuation-in-part of Ser. No. 674,917, Apr. 8, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 848,899

Claims priority, application Switzerland, Apr. 15, 1975, 4759/75

Int. Cl.² B65H *29/60, 31/24*

U.S. Cl. 271—297 **20 Claims**



1. A sheet collating apparatus comprising frame means including a bottom portion and a top portion separable from said bottom portion, a plurality of collating compartments arranged in a row and having substantially upwardly facing openings, sheet advance means also supported by said frame means above said openings, sheet deflecting gate means each of which is arranged for cooperation with its respective collating compartment for deflecting a sheet into said respective collating compartment, actuating means connected to the sheet deflecting gate means, and control means operatively connected to said actuating means for sequentially positioning said sheet deflecting gate means into the path of an advancing sheet to sequentially place a sheet in each collating compartment, said control means comprising an electromagnet for each sheet deflecting gate means and circuit means including light switch means and electromagnets arranged to be sequentially activated by one sheet after another for sequentially tilting each sheet deflecting gate means into a sheet deflecting position, said sheet advance means comprising driven rollers (**8**, **11**), drive shaft means (**25**) rotatably supporting said driven rollers in said frame means, positive drive means (**12**) operatively connected to said drive shaft means (**25**) of said driven rollers for positively rotating said driven rollers, said sheet deflecting gate means comprising tilting shafts (**24**) and gates (**10**) secured to said tilting shafts which are tiltably supported in said frame means intermediate adjacent drive shafts (**25**), said gates (**10**) being spaced from each other in the feed advance direction of the sheets so that gaps extend across the feed advance direction, said driven rollers extending in said gaps between adjacent sheet deflecting gates (**10**), said sheet deflecting gates (**10**) having a sheet passing position below a plane defined by said driven rollers (**8**, **11**) whereby each gate substantially closes its respective collating compartment, and a sheet deflecting position, whereby the gate reaches with its free end above the plane defined by said driven rollers (**8**, **11**) thereby opening the respective collating compartment, and further comprising cover means hinged to said frame means and positioned above said driven rollers (**8**, **11**), said cover means comprising sheet hold down means extending in the feed advance direction of said sheets, said sheet hold down means comprising a plurality of rotatable hold down ball elements, means operatively securing said hold down ball elements to said hinged cover means in such positions that the hold down ball elements protrude downwardly

through said gaps between said gates (10), said securing means including means for preventing said ball elements from falling downwardly out of said securing means when the securing means are tilted with said hinged cover means and wherein said collating compartments are arranged in said bottom portion of said frame means, said sheet deflecting gate means being arranged in said separable top portion of said frame means.

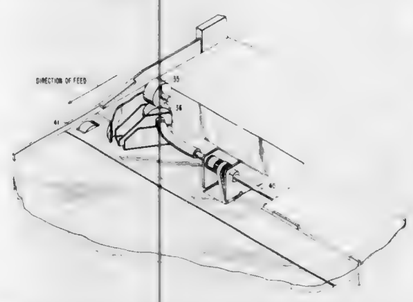
4,179,116
SEPARATING MECHANISM
Kazumi Umezawa, Kawasaki; Hiroyuki Hattori, Inagi; Hiroshi Ogawa, Kawasaki; Hirotoshi Kishi, Tokyo, and Seiji Sagara, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 26, 1978, Ser. No. 919,148
Claims priority, application Japan, Jul. 8, 1977, 52/81569
Int. Cl.[2] B65H *29/54*
U.S. Cl. 271—306 **9 Claims**



1. A separating mechanism having a separation guide disposed between an image bearing member and a side edge of transfer medium to direct the transfer medium away from the image bearing member, said separation guide being disposed adjacent to or in contact with said image bearing member with one end thereof as a supported end and the other end as a free end, a first bearing member adapted to bear against the free end of said separation guide from the non-image bearing member side and a second bearing member adapted to bear against the free end of said separation guide from the image bearing member side, said free end of said separation guide being supported by said first and second bearing members.

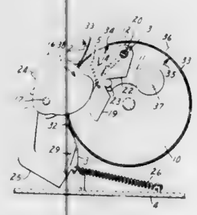
4,179,117
PAPER ALIGNMENT ROLLERS
John H. Rhodes, Jr., Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 30, 1977, Ser. No. 865,803
Int. Cl.[2] B65H *9/16*
U.S. Cl. 271—251 **2 Claims**

1. In a system for aligning a sheet of fragile material against a reference edge parallel to the direction of sheet travel;
first roll means skewed to the direction of travel for moving said sheet toward said reference edge;
mating roll means skewed oppositely to said first roll means for urging said sheet away from said reference edge; and
said first roll means having a higher coefficient of friction than said mating roll means so that said sheet is moved toward said reference edge;



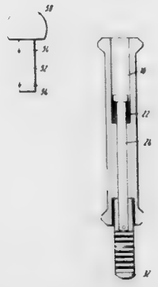
whereby the force tending to crumple said sheet at the reference edge is minimized while the drive force in the direction of sheet travel remains high.

4,179,118
APPARATUS AND METHOD FOR RELEASABLY SECURING SHEET MATERIAL TO THE DRUM OF A DRUM-TYPE FACSIMILE MACHINE
Charles P. Huss, Oak Park Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Sep. 8, 1977, Ser. No. 831,361
Int. Cl.[2] B65H *5/2*
U.S. Cl. 271—277 **7 Claims**



1. In a facsimile machine having a rotatable drum and apparatus for loading sheet material onto the drum and unloading the sheet material from the drum comprising:
a clamping means carried by the drum and movable between a clamped position at which the sheet material is held at an edge portion to the drum by the clamping means and an unclamped position at which the clamping means is spaced from the drum;
means for engaging said clamping means for moving said clamping means from said clamped position to said unclamped position and imparting limited rotation to the drum when so moving said clamping means;
gripping means movable between a position spaced from the drum and a position in contact with the sheet material carried on the drum for inhibiting movement of the sheet material in response to movement of the drum;
means for engaging said gripping means for moving said gripping means into contact with the sheet material; and
means for providing time coordinated operation of said last-mentioned and said means for engaging said clamping means to move said gripping means into contact with the sheet material before said limited rotation is imparted to the drum during the time said clamping means is moved to an unclamped position causing said limited rotation imparted to the drum to displace said edge portion of said sheet material relative to said clamping means allowing the inherent resiliency of said sheet material to move said edge portion away from the drum and said clamping means, said time coordinated operation then positioning said means for engaging said gripping means to place said gripping means at a position spaced from the drum whereby said sheet material can be grasped at said edge portion for manual unloading of said sheet material from the drum while said gripping means is at a position spaced from the drum.

4,179,119
SKIPPING ROPE OR WIRE
Gerard Wolf, Oliggasse 46, D-6733 HaBlock, Fed. Rep. of Germany
Filed Mar. 28, 1978, Ser. No. 890,985
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1977, 2716107
Int. Cl.[2] A63B *5/20*
U.S. Cl. 272—75 **14 Claims**



1. A skipping rope with handles attached at the ends, each said handle having a longitudinal axis and comprising:
a peg rotatably supported within each handle, said peg protruding axially from said handle; and
a rope-accommodating part fastened to the free end of said peg and extending along the handle axis, said part having a plurality of means spaced along said axis whereby a rope end may be selectively connected to one of said means to hold the rope in an adjusted position relative to said handle.

4,179,120
BOWLING BALL KICKER PRESSURE DEVICE
Fred Hendricks, 3008 S. 134th St., Omaha, Nebr. 68144, and Cassius W. Draper, 810 5th St., Fairbury, Nebr. 68352
Filed Jul. 11, 1977, Ser. No. 814,530
Int. Cl.[2] A63D *5/02*
U.S. Cl. 273—49 **9 Claims**



1. In an automatic bowling pin spotter apparatus having a ball return mechanism of the type which includes an endless belt ball lift, a ball kicker assembly having a powered ball kicker wheel rotatably mounted on a pivotal shaft and a side kick back plate disposed proximate the ball kicker assembly, an improved ball kicker pressure device therein and therewith comprising:
(a) a rod having a first end and a second end, said second end adapted to be operably disposed against the ball kicker pivotal shaft;
(b) mounting means for mounting the device to the kickback plate, said mounting means slidably connected to the second end of the rod; and
(c) spring biasing means for exerting force between said rod and the mounting means, said spring biasing means operably connected between said mounting means and said rod.

4,179,121
TENNIS RACKET WITH ADJUSTABLE WEIGHT
Pedro Kelmanski, Buenos Aires, Argentina
Filed Nov. 22, 1977, Ser. No. 854,013
Int. Cl.[2] A63B *49/04*
U.S. Cl. 273—73 R **3 Claims**

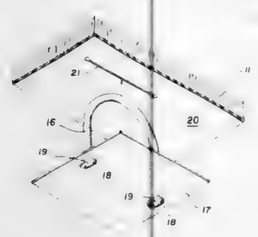


1. A tennis racket comprising a racket head and a racket handle extending from said head toward a grip remote from said head, said handle including a flat member defining a longitudinal slot substantially aligned with the longitudinal axis of the handle and a counterweight means movable along said slot for adjusting the position of the center of gravity of the racket, said counterweight means comprising a pair of clamps having edge portions engaging opposite surfaces of said flat member on opposite sides of said slot, screw means connecting said clamps for movement toward and away from each other, and means for rotating said screw means by thumb and finger pressure, said edge portions of said clamps being tightened against said opposite surfaces of said flat member by tightening said screw means and said counterweight means being movable along said slot by loosening said screw means.

4,179,122
MARBLE GAME APPARATUS
Otis E. Ray, P.O. Box 40302, St. Petersburg, Fla. 33743
Filed Jun. 8, 1978, Ser. No. 913,688
Int. Cl.[2] A63F *7/00;* **A63B** *67/04*
U.S. Cl. 273—85 R **9 Claims**

1. A game apparatus for use in playing several specifically different games utilizing rolling spheres propelled by knuckle or finger action, said apparatus comprising a flexible artificial grass mat adapted for placement on a level supporting surface

to thereby form a level and smooth playing surface on which spheres propelled by finger or knuckle action of players can roll, said artificial grass mat having a base sheet provided with spaced narrow slits arranged on the mat in the pattern of a miniature croquet course, and croquet wickets adapted for removable insertion upwardly through said slits from beneath said mat so that the bights and legs of the wickets project well



above said level and smooth playing surface and said spheres can be propelled by players through said wickets during the playing of croquet, and said mat being convertible to a playing surface for a pool-like game and/or a regular game of marbles by the removal of said wickets from said slits, and there being no discernible gaps or irregularities in said playing surface due to said slits.

4,179,123

BASEBALL GAME BOARD

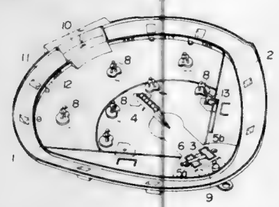
Mitsuo Tsukuda, No. 1-3, 3-chome, Moto-Asakusa, Taito-ku, Tokyo, Japan

Filed May 30, 1978, Ser. No. 910,775

Claims priority, application Japan, Sep. 16, 1977, 52-123540[U]; Sep. 16, 1977, 52-123541[U]

Int. Cl.[2] H63F *7/10*

U.S. Cl. 273—89 **1 Claim**



1. In a baseball game board wherein a board resembling an actual baseball ground in shape is provided in which fielding bodies are located at the positions corresponding to a catcher and other infielders as well as outfielders, a pitching mechanism is installed at the position corresponding to a pitcher and a batting mechanism is disposed at the position corresponding to a batter, said batting mechanism being designed to hit a ball fed rollingly from said pitching mechanism as soon as it reaches the home base and a runner doll which is advanced to a base in response to a position which the batted ball reaches to score runs, the improvements comprising a batting mechanism consisting of a batting lever having racks on both sides of its front portion and pinions engaging said racks and said batting lever having an end protruding from the peripheral wall of the baseball game board to the rear side of the home base and the front end being connected by way of a coil spring to a shaft vertically provided in a bottom plate, both pinions being disposed by supporting a shaft for both pinions in a shaft hole of the board, and said both pinions being provided on its shaft with mounting holes for securing a bat support rod such that a bat is detachably secured to either one of said mounting holes, a pitching mechanism comprising an inclined groove which slants downwardly with respect to the home base and a means for receiving a plurality of balls which is provided on said inclined groove at a gentle gradient, the bottom of said means being arranged at a position lower than that of said inclined groove by one step and a groove being provided therebetween; a rod having the same inclined surface as in the bottom of said inclined groove and having a through hole in its side in the horizontal direction which rod is slidingly supported on the bottom plate such that its inclined surface is arranged at a position lower than the bottom of said means by one step so as to receive the forefront ball of the balls fed into said means and thereby prevent it from rolling down into said inclined groove and a pitching lever protruding outwardly from the outfield fence, the upwardly inclined portion of the front end of said pitching lever being inserted into said through hole and being connected by way of a coil spring to a shaft having an end vertically provided in the bottom plate whereby the rod is permitted to go up through traction of said pitching lever so as to feed a ball on said rod into said inclined groove so that the ball rolls down toward the home base, and a band-like rubber magnet plate with indications of HIT, 2BH and 3BH applied onto the front surface of the outfield fence, which holds a magnetic ball reaching the outfield fence by attraction.

4,179,124

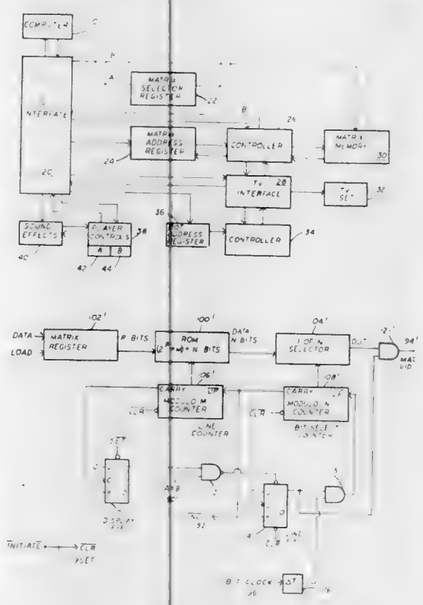
ELECTRONIC VIDEO GAME

Jed Margolin, 96 Devonshire Ct., Somerville, N.J. 08876

Filed Dec. 12, 1977, Ser. No. 859,937

Int. Cl.[2] A63F *9/02*

U.S. Cl. 273—101.2 **8 Claims**



1. A player control for a TV game comprising:
a first cylindrical member having an outer surface and two ends;
a plurality of control switch members disposed on said outer surface in position to be operated by the fingers and thumb of a player; and
a loudspeaker disposed in one end of said cylindrical member for providing the player with audio signals relating to the TV game.

2. Playing apparatus that comprises in combination:
a television receiver operable within a channel for television broadcasting having an image screen;
an electronic controller for generating horizontal (X) and vertical (Y) coordinates of a point on said image screen;
an electronic interface interconnecting said electronic controller with said television receiver;
a matrix address means interacting with said electronic controller;
a display address means interacting with said electronic controller;
a matrix memory means interacting with said electronic controller;
said controller including a data comparator means for comparing the outputs of said display address means and said matrix address means such that said matrix memory means may produce an appropriate output for display on said image screen when said display address means and said matrix address means outputs are equal;
a matrix selector register means having P bits providing an input to said matrix memory means, said matrix memory means having a bit storage capacity of at least 2^P times M times N bits where 2^P is the number of matrices to be stored, M is the vertical bit size and N is the horizontal bit size of the matrix to be displayed;
said electronic controller further including a "1 of N" decoder responsive to said matrix memory means, a modulo M binary counter operative to provide an output to said matrix memory means, and a modulo N binary counter operative to provide an output to said "1 of N" decoder; and
logic circuit means for controlling the output of said "1 of N" decoder in a selected sequence.

4,179,125

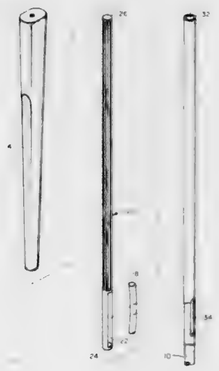
LEVEL-INDICATING PUTTER

Bryan N. Cone, Carpinteria, and Michael F. Aboussouan, Lake View Terrace, both of Calif., assignors to Michael F. Aboussouan, Lake View Terrace, Calif.

Filed Mar. 17, 1978, Ser. No. 887,704

Int. Cl.[2] A63B *53/00*

U.S. Cl. 273—162 B **5 Claims**



1. A level-indicating putter comprising:
a shaft;
an offset head at one end of said shaft;
a grip at the other end of said shaft;
an insert mounted within and extending a substantial distance along the length of said shaft;
a receptacle preformed in and located near one end of said insert;
a levelling vial placed in said receptacle and exposed to view through a slot cut in the shaft; and
said insert so positioning said level within said shaft with respect to said offset head and grip that the vial is supported in a level position when the head and grip rest upon a level plane.

4,179,126

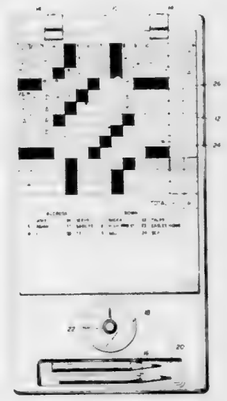
CROSSWORD PUZZLE GAME

Nina Coefield, 2225 Beech Dr., Great Falls, Mont. 59404

Division of Ser. No. 860,512, Dec. 15, 1977, Pat. No. 4,106,773, which is a continuation of Ser. No. 777,877, Mar. 15, 1977, abandoned. This application Mar. 9, 1978, Ser. No. 916,656

Int. Cl.[2] A63F *9/18*

U.S. Cl. 273—240 **5 Claims**



1. Apparatus for playing a competitive game, said apparatus comprising:
(a) a board;
(b) a plurality of sheets having crossword puzzles thereon releasably mounted on said board;
(c) a timer mounted on said board;
(d) at least two writing instruments capable of filling in said crossword puzzles in different colors;
(e) a retention compartment for said writing instruments carried by said board; and
(f) each of said sheets having at least two vertical columns or horizontal rows of blanks adjacent the crossword puzzle thereon for entry therein by respective writing instruments of the score achieved by the player using that writing instrument in the associated column or row of the crossword puzzle.

4,179,127

THREE DIMENSIONAL CHESS GAME APPARATUS

Vernon T. Goodman, 4820 Eastern La., Apt. 103, Suiteland, Md. 20023

Filed Jun. 13, 1978, Ser. No. 915,005

Int. Cl.[2] A63F *3/01*

U.S. Cl. 273—241 **3 Claims**

1. A gameboard for chess or checkers having an obverse side comprising a conventional checkerboard grid of square spaces, alternately colored in a checkered pattern, each row of said grid consisting of 8 said square spaces, the rows being in stepped configuration with the 2 outermost rows being at the lowest level, and each successively more inward row being raised an additional level from the preceding row, so that the centermost 2 rows are highest, said gameboard further having a reverse side comprising a grid identical to that on the obverse side in size and coloration but wherein successively more

V. 998 / 3 DEC 18 79 UMI

inward rows are lowered one additional level from that of the preceding row so that the centermost 2 rows are lowest, the



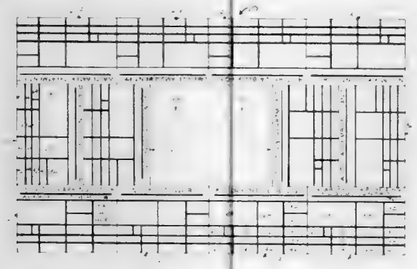
elevations on the obverse side thereby corresponding to depressions on the reverse side.

4,179,128

CONSTRUCTION BOARD GAME

David M. Zelazny, 7803 Stanelan, Detroit, Mich. 48228

Filed Sep. 26, 1977, Ser. No. 836,487
Int. Cl.² A63F *3/00*
U.S. Cl. 273—243 **5 Claims**



1. A game for a plurality of players, said game comprising:
a game board having a plurality of adjacent individual sections, each section comprising a self-contained playing course wherein no playing course extends into any adjacent section, only one of each of said players playing a playing course at one time;
a plurality of bid cards which each player selectively uses to bid so as to play one of said courses;
a plurality of game tokens, one for each player;
a plurality of sub-steps associated with each self-contained course and through which one token is moved, each of said substeps having indicia thereon distinct from the indicia on any other said substep, said one token being moved sequentially through each sub-step;
a plurality of instruction cards, each having indicia thereon, the indicia on each of said substeps corresponding to the indicia on one of said instruction cards, each card having a plurality of instructions which determine, by chance, the player's reward or penalty at each sub-step of said associated playing course; and
a plurality of chance cards providing selected rewards and/or penalties in addition to said instruction cards, at least one such card being drawn by a player during the play on each playing course.

4,179,129

STRUCTURALIZATION OF RULES

Louie P. Loomis, 601 North View Terr., Alexandria, Va. 22301

Continuation of Ser. No. 844,037, Oct. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 683,335, May 12, 1976, abandoned. This application Aug. 30, 1978, Ser. No. 938,062
Int. Cl.² A63F *3/00*
U.S. Cl. 273—272 **1 Claim**



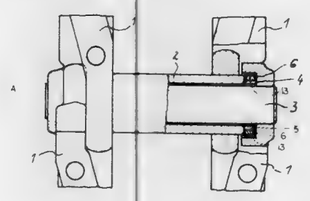
1. A word forming board game comprising a board having a rectangular matrix of evenly spaced apertures, a plurality of letter bearing apertured playing pieces, a plurality of peg structures receivable through the apertures in said playing pieces and in said board apertures to fixedly secure pieces selectively on the board, said pieces being locatable on said board in linear, non-linear, adjacent and/or non-adjacent arrays in accordance with prescribed placement rules to form words, tie means located along opposing edges of the board, and cord means having a ring at one end sized to receive said peg structures, said cord means being of sufficient length such that the cord means can be extended from a selected peg structure associated with a playing piece bearing the first letter of a word formed by playing pieces on the board, wrapped in sequence around peg structures associated with the playing pieces bearing successive letters of said word, and finally tied to one or the other of said tie means.

4,179,130

SEAL ASSEMBLY FOR TRACK-SEGMENT PIVOT

Carl Fass, Ennepetal, and Hansjoachim Brunn, Damme, both of Fed. Rep. of Germany, assignors to Firma Intertrac Viehmann & Co., Gevelsberg, Fed. Rep. of Germany

Filed Jun. 9, 1978, Ser. No. 914,083
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1978, 2808159
Int. Cl.² F16J *15/34*
U.S. Cl. 277—84 **4 Claims**



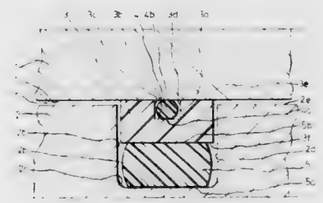
1. A seal assembly comprising:
a pair of members relatively rotatable about an axis and together forming a radially outwardly opening groove having a pair of axially confronting flanks:
an annular nonmetallic and elastomeric seal in said groove having a pair of sides each engageable with a respective one of said flanks, formed between said sides with a radially outwardly open recess having a pair of axially confronting inner surfaces, and formed between said surfaces in said recess with a radially outwardly projecting ridge;
a pair of similar load-ring forming and oppositely directed dished washers spaced axially from each other in said recess and both bearing on said ridge, each washer lying flatly against the respective surface and being dished away from the other washer for pressing the respective sides of said seal into snug axial contact with the respective flanks of said groove.

4,179,131

SEAL ARRANGEMENTS

Thomas Nussbaumer, Zug, Switzerland, assignor to Patent & Inventions Ltd., Zug, Switzerland

Filed Nov. 21, 1977, Ser. No. 853,191
Claims priority, application Switzerland, Nov. 23, 1976, 14689/76
Int. Cl.² F16J *15/16, 9/08*
U.S. Cl. 277—165 **12 Claims**



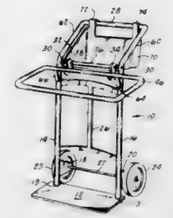
1. A seal arrangement comprising:
(a) a first sealing ring intended to locate in a groove in a first machine element and having a bearing surface by which said first sealing ring is bearable against the base of said groove of said first machine element, and a surface spaced from said bearing surface,
(b) a second sealing ring having a first bearing surface by which said second sealing ring is bearable against said spaced surface of said first sealing ring, and a second bearing surface which is spaced from said first bearing surface of said second sealing ring, contactable with surface portions of a second machine element and which is provided with an annular groove therein,
(c) a third sealing ring intended to locate in said annular groove of said second sealing ring and having a first bearing surface by which said third sealing ring is bearable against a wall portion of said groove of said second sealing ring, and a second bearing surface which is spaced from said first bearing surface of said third sealing ring and which is bearable against said second machine element, wherein said second sealing ring is formed of a deformable synthetic material and has a modulus of elasticity which is greater than the modulus of elasticity of said first sealing ring and greater than the modulus of elasticity of said third sealing ring, said modulus of elasticity of said second ring being in the range of 3000 to 25000 kiloponds per square centimeter, and wherein said third sealing ring is of such a size and shape that when said third sealing ring is located in said groove of said second sealing ring a radial spacing between said second bearing surface of said third sealing ring and said first bearing surface of said second sealing ring is at least equal to a radial spacing between said second bearing surface and said first bearing surface of said second sealing ring.

4,179,132

MULTI-PURPOSE HAND TRUCK

Robert L. Rich, 13371 Lucille St., Garden Grove, Calif. 92641

Filed Dec. 27, 1977, Ser. No. 864,465
Int. Cl.² B62B *1/14*
U.S. Cl. 280—47.26 **4 Claims**



1. A hand truck having a load platform, a pair of side support members extending upwardly from the load platform and a handle connected to the side support members, the improvement comprising:
a trash bag ring; and
means to pivotally support said trash bag ring in first and second predetermined positions, said first position being substantially parallel to, above and spaced from the load platform and said second position being rotated more than 90° upwardly therefrom, the support members each including upper portions which are slanted away from said trash bag ring when said trash bag ring is in its first position, said upper portions each forming an angle of less than 90° to its associated support member, said handle being connected to said upper portions, said second position of said trash bag ring placing said ring in contact with at least one of said upper portions of said support members, said means to pivotally support said trash bag ring including, an axle connected between said support members and a pair of attachment members pivotally connected to said axle and fixedly connected to said trash bag ring, said trash bag ring being formed from material which has a generally circular cross-section so that said ring also has a circular cross-section and upper and lower semi-circular surfaces wherein said attachment members are hook-shaped members, when in its first position said hook-shaped member pivots to said axle above said trash bag ring and is fixedly connected to said lower semi-circular surface thereof, and said hand truck further including at least one stop member extending downwardly from said ring when said ring is in said first position, said stop member including a sidewardly facing abutment surface which engages one of said support members when said trash bag ring is in said first position.

4,179,133

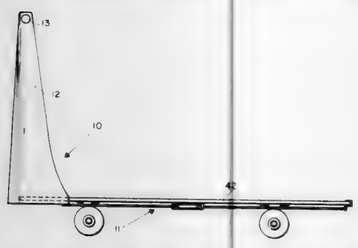
APPARATUS FOR CONVERTING A SKATEBOARD INTO A SCOOTER

Robert B. Robb, P.O. Box 385, Oroville, Calif. 95965

Filed Mar. 20, 1978, Ser. No. 888,014
Int. Cl.² B62K *9/00*
U.S. Cl. 280—87.04 R **15 Claims**

1. Apparatus for converting a conventional skateboard having a platform and wheels to a scooter comprising:
a skateboard-receiving support means having a skateboard retaining member at one end,
an upright member, mounted at the other end of said support means,
said support means being longitudinally adjustable between said upright member and said retaining member;
said upright member having a skateboard retaining portion adjacent the support means, both said retaining member

and said retaining portion being aligned in a horizontal plane for securing a skateboard therebetween; and



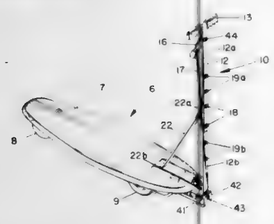
handle means at the upper end of said upright member extending transverse to the longitudinal axis of said upright member.

4,179,134

REMOVABLE TRAINER HANDLE AND BRAKE FOR SKATEBOARD

Wallace E. Atkinson, Rte. 3, Box 656, Petersburg, Va. 23803

Filed Jul. 26, 1978, Ser. No. 928,306
Int. Cl.[2] A63C *17/14*
U.S. Cl. 280—87.04 A **5 Claims**



1. The combination of a trainer handle and brake for removable attachment to a skateboard and the like, the skateboard having transversely spaced front and rear wheel sets comprising:

a handle strut;

a handle bar fastened to one end of said strut;

clamping means secured at the other end of said strut for clamping said strut to the front end of a skateboard in upstanding relation thereto, said clamping means including an upper jaw extending substantially perpendicular to said strut, a lower jaw underlying said upper jaw, and means for moving said jaws together and apart for attaching and detaching said clamping means relative to the front end of the skateboard;

a pair of transversely spaced brake shoes, means pivotally supporting said spaced brake shoes beneath the lower jaw of said clamp to overlie the front wheels of the skateboard;

a lever arm connected to said brake shoes;

a brake handle pivotally supported on said handle strut adjacent said handle; and

brake operating linkage means connecting said brake handle with said lever arm for pivoting said brake shoes against the top of said front wheel set when said brake handle is actuated from a normal position and for disengaging said brake shoes from said front wheel set when said brake handle is released,

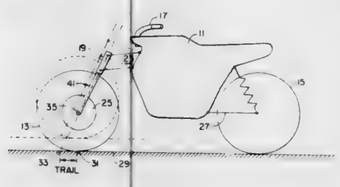
said upper and lower jaws being elongated channel members the upper jaw channel member being open in the upper direction and the lower jaw channel member being open in the downward direction, the end of said strut to which the clamping means is secured having a rigid right angle extension secured in one end of said upper jaw channel member and said brace having a base portion secured in the other end of said upper channel member from said right angle extension.

4,179,135

MOTORCYCLE FRONT WHEEL SUSPENSION SYSTEM

John Slater, Hulme 6-C Escondido Vil., Stanford, Calif. 94305

Filed Jan. 13, 1978, Ser. No. 869,041
Int. Cl.[2] B62K *11/12*
U.S. Cl. 280—276 **14 Claims**



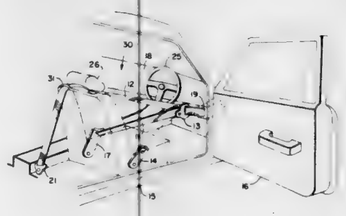
1. In a vehicle having a passenger carrying frame, front and rear wheels and steering handlebars pivotably mounted on said frame for rotating a front wheel fork about a steering axis defined with respect to said fork, the improvement comprising means connecting said fork at a position only above the front wheel to said frame for constraining the fork to move relative to said frame with its steering axis movable substantially parallel to itself, such fork movement occurring in response to the front wheel encountering bumps and independent of any rear wheel motion with respect to the vehicle frame.

4,179,136

SEAT BELT SYSTEM

Fumio Matsuoka, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Division of Ser. No. 796,325, May 12, 1977, Pat. No. 4,124,224. This application Aug. 3, 1978, Ser. No. 930,852
Claims priority, application Japan, May 26, 1976, 51-61556
Int. Cl.[2] B60R *21/02*
U.S. Cl. 280—744 **5 Claims**



1. A seat belt system for a motor vehicle comprising:

a lap restraining belt anchored at one end to adjacencies of a rear bottom portion of a seat of said motor vehicle and adjacent a center line of said vehicle;

a shoulder restraining belt anchored to adjacencies of said anchored end of said lap belt and extending over a top portion of said seat;

a retractor for retracting said lap and shoulder belts, said retractor being provided forward of said seat and adjacent a door of said motor vehicle such that said lap and shoulder belts extend obliquely from one side of said seat to the other side of said seat;

a tongue plate coupled to said lap and shoulder belts; and

a buckle provided adjacent said door and to the rear of said seat for engagement with said tongue plate whereby a driver is prevented from operating said vehicle when said seat belt system is not in use.

4,179,137

ADJUSTABLE STEERING COLUMN FOR VEHICLES

Harold J. Burke, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 28, 1978, Ser. No. 937,485
Int. Cl.[2] B62D *1/18*
U.S. Cl. 280—775 **4 Claims**



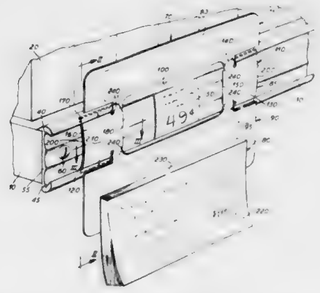
1. An adjustable steering column for a vehicle comprising a first tubular member rectilinear in cross section, fastener means for attaching one end of said first tubular member to the vehicle, a second tubular member rectilinear in cross section mounted for sliding telescopic movement with respect to said first tubular member, a steering column housing secured to the projecting end of said second tubular member and projecting therefrom, a steering wheel supported at the upper end of said steering column housing, a steering shaft attached to said steering wheel extending through said steering column, a brakeshoe operatively disposed between the inner and outer tubular members, and actuator means operatively connected to said brakeshoe for exerting a diagonal force across said tubular members so that two adjacent surfaces of said members are in close frictional engagement with each other to thereby releasably couple said tubular members at an adjusted telescoped position and the steering wheel at a selected translated position with respect to said outer support member.

4,179,138

RAIL STRIP AND LOCKING DEVICE

George Bogdanovic, Lyons, Ill., assignor to Jet Press, Inc., Berkeley, Ill.

Filed Mar. 17, 1978, Ser. No. 887,930
Int. Cl.[2] A47F *7/00*
U.S. Cl. 281—15 B **23 Claims**



1. A strip for use with a rail having a top and bottom groove comprising:

a piece of sheet stock;

said piece of sheet stock having at least a first and second tab defined thereon;

each of said first and second tabs having three connected sides separated from said piece of sheet stock;

said second tab being foldingly alignable with respect to said first tab by being folded so as to be laterally disposed with and adjacent to said first tab;

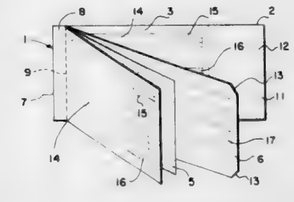
said first tab being joined to said second tab along said fold; said three sides of said first and second tabs having preselected dimensions with said first and said second tab being removably engageable with the top and bottom groove of the rail.

4,179,139

COMBINATION CHECK AND CREDIT CARD SALES SLIP

Eugene J. Savar, and Cindy Savar, both of 11B Ivy Ct., Mapleshade, N.J. 08052

Filed Nov. 6, 1978, Ser. No. 958,098
Int. Cl.[2] B41L *1/24*
U.S. Cl. 282—23 R **17 Claims**



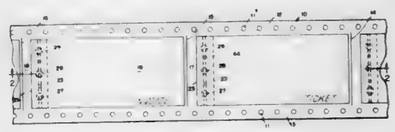
1. A financial transaction package comprising a plurality of superposed sheets, a first sheet being printed as a check blank on one side, and being printed with a credit card sales slip blank on the reverse side, and a second sheet being positoned adjacent said credit card sales slip blank and printed with a credit card receipt blank.

4,179,140

FORM SUITABLE FOR AIRLINE TICKETING

Donald J. Steidinger, Barrington, Ill., assignor to Wallace Business Forms, Inc., Hillside, Ill.

Continuation of Ser. No. 483,952, Jun. 28, 1974, Pat. No. 4,109,936, which is a continuation-in-part of Ser. No. 453,556, Mar. 21, 1974, which is a continuation-in-part of Ser. No. 374,274, Jun. 27, 1973. This application Jun. 12, 1978, Ser. No. 914,437
Int. Cl.[2] B41L *1/20*
U.S. Cl. 282—11.5 R **3 Claims**



1. A form suitable for processing to provide airline ticketing, comprising:

an elongated web having a plurality of equally longitudinally spaced lines of weakness extending transversely to provide discrete ticketing panels,

a plurality of generally rectangular, superposed plies of web material for each panel,

said plurality of plies and the associated panel being secured together with said panel providing one exterior of said

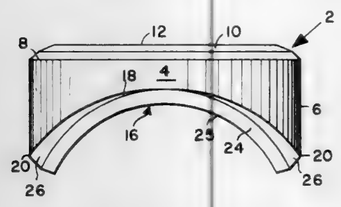
form, alternate of said pluralities of plies having more plies than the intervening pluralities.

4,179,141

BRANCH CONNECTION FITTING

John W. Newman, Wayne, Pa., assignor to Allied Piping Products Company, Inc., Marshall, Tex.

Filed May 4, 1978, Ser. No. 903,026
Int. Cl.² F16L *5/00, 13/02, 27/00, 47/02*
U.S. Cl. 285—189 **4 Claims**



1. In a cylindrical branch pipe connection fitting for use with a header pipe of substantially uniform wall thickness having at one end a pair of ears with their centers lying in the transverse plane through the axis of the fitting, and a pair of crotches with their centers lying in the longitudinal plane through the axis of the fitting, and having the other end adapted to be connected to a branch pipe the improvement comprising:

a weld bevel on said one end of the fitting extending outwardly from the inner edge of said one end with the weld bevel angle A in the transverse plane being in the range of from about angle B between the axis of the fitting and a line from the intersection of the axes of the header pipe and fitting to an inner edge of the weld bevel in said transverse plane to about angle B plus 40° with the portions of the weld bevel outside of the transverse plane having a bevel angle in the range of from about weld bevel angle A to about weld bevel angle A minus 20°,

a pair of transition bevels each extending from the center of an ear towards the centers of the crotches with the outer edge of the transition bevel gradually approaching and intersecting the outer edge of the weld bevel,

the bevel angle of each transition bevel being in the range equal to weld bevel angle A divided by from about 1.75 to 2.5 and the maximum depth of each transition bevel being at the center of the ear and being from about 0.2 to about 0.5 times the maximum wall thickness of the fitting and the fitting having a maximum wall thickness in the range of from about 95% to about 350% of the header pipe.

4,179,142

FLEXIBLE PIPE FITTING

Edgar Schopp, 2210 Gratton St., Riverside, Calif. 92504

Filed Jun. 6, 1977, Ser. No. 803,426
Int. Cl.² F16L *33/00*
U.S. Cl. 285—239 **2 Claims**

1. A pipe fitting comprising:

a flexible body having a threaded coupling section at one end thereof;

said coupling section having a portion thereof integrally formed with said flexible body and wherein a continuous bore is formed in said flexible body and said coupling section; and

a rigid shape-retaining portion defining a portion of said continuous bore, said rigid shape-retaining portion including an annular sleeve whose inner surface defines a portion of said continuous bore and whose outer surface and terminal ends are juxtaposed with said coupling section enabling said coupling section dimensions to remain relatively constant when a member is secured to the threaded portion of said coupling section, said coupling section being molded around the outer surface and terminal ends of said rigid shape-retaining portion, said rigid shape-retaining portion further including at one terminal end a partial arc section flange extending radially outwardly from said outer surface and having radially extending ends defining the limit of said partial arc section flange, said



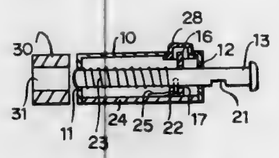
flange formed on said annular sleeve in a plane intersecting the axis of said bore for preventing movement of said sleeve with respect to said flexible body in a direction parallel to the axis of the bore, said molded portion of said coupling section being juxtaposed with said radially extending ends of said flange for preventing said rigid shape-retaining portion from rotating about said bore axis.

4,179,143

FIXED LATCH LOCK

Min C. Shy, No. 20, Alley 18, Lane 109, Hoping St., Yang Ho Town, Taipei, Taiwan

Filed Jan. 31, 1978, Ser. No. 873,981
Int. Cl.² E05C *1/10*
U.S. Cl. 292—179 **3 Claims**



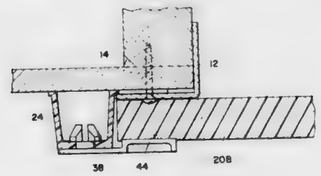
1. A latch lock comprising a housing with a front end and a rear end and a hole at each of said ends, a controlling plate movable up or down in the housing and having a fixing hole therethrough, an up-down movable pressing button located at and extending through the top of the housing, a shaft latch, a bottom stand set firmly at the bottom of the housing, a spring sheet set firmly on the bottom stand and against said controlling plate, the shaft latch being in alignment with the holes located at the front end and the rear end of the housing and the fixing hole and passing therethrough; the shaft latch having a U-shape notch on the underside thereof; a small abutment extending on the shaft latch at a location away from the notch; a pressing spring extending around the shaft latch between the front of the housing and the small abutment in compressed relationship therebetween; whereby as the notch is passed through the fixing hole in the controlling plate, the controlling plate taking the force pushed upward by the spring sheet set firmly on the bottom stand will be driven upwardly toward the notch on the shaft latch, until the notch of the shaft latch engages in the fixing hole on the controlling plate, the pressing button upon being pressed operates to push the controlling plate down so that the notch on the shaft latch disengages from the fitting position with the controlling plate and the shaft latch will take the force of the pressing spring at the front end and will press back to where it was automatically from the latching position with said fixing hole being located in the center of the controlling plate, a projection extending from the top of the controlling plate receiving the pressing button, two notches are formed at the bottom of the controlling plate with projecting edges on both sides of said notches respectively to inlay the controlling plate in a guiding channel in the housing so that the controlling plate can move freely along the guiding channel.

4,179,144

REMOVABLE COVER AND HOLDER THEREFOR

Donald L. Henderson, 2536 E. 56th Pl., Tulsa, Okla. 74105

Filed Nov. 21, 1977, Ser. No. 853,220
Int. Cl.² E05C *3/04*
U.S. Cl. 292—202 **4 Claims**



1. A device for supporting a removable panel over an opening in a wall, comprising:

a longitudinal hollow boss member having a top end adapted to engage the wall and a bottom end, the boss member having a leg portion integrally extending therefrom at said wall engaging top end, the leg portion extending perpendicular the longitudinal axis of the boss member, the leg portion comprising a first portion and a parallel second portion, the two portions having their ends adjacent the boss member joined such that the leg portion is substantially in the shape of a "U"; said first and second portion spaced apart sufficiently that the leg portion may be slid under a screw head or the like whereby the boss member is attached to a wall adjacent an opening to be closed;

and an arm member having the inner end pivotally secured to the bottom end of said boss portion and extending in a plane parallel said boss leg portion, the outer end is configured of an integral wedge, the upper surface of which is in a plane inclined at an angle to the plane of the arm whereby when the arm is pivoted to engage a panel the wedge portion engages the panel to facilitate pivotation of the outer end of the arm over the panel.

4,179,145

SANITARY DOG LITTER BAGGER

Joe H. Shinsako, 171 W. 79th St., New York, N.Y. 10024

Filed Aug. 15, 1978, Ser. No. 933,862
Int. Cl.² A01K *29/00*
U.S. Cl. 294—19 R **9 Claims**

1. A sanitary manual scoop and dog litter bagger comprising a hollow rectilinear barrel, a partially rotatable member, said partially rotatable member being mounted at one end of said barrel, said partially rotatable member having a hollow rectilinear leg and a handle, said hollow rectilinear leg being partially rotatable about its longitudinal axis, said handle extending substantially transverse to said leg and being attached to the terminal end of said leg, said barrel and said leg being coaxially aligned in tandem and abutting, a sleeve, one end of said sleeve being attached to the end of said leg which abuts said barrel and extending coaxially within said barrel, the outer surface of said sleeve being contiguous with the inner surface of said barrel, so that said sleeve is slidably displaceable both longitudinally and partially rotatably within said barrel, an axle, said axle being mounted to said barrel adjacent the other end of said barrel and extending substantially transversely through said barrel and said sleeve, the other end of said sleeve extending beyond the other end of said barrel, a substantially rectilinear resilient elastic member, said elastic member extending within said sleeve and said leg, means attaching one end of said elastic member to said axle, means attaching the other end of said elastic member to said handle, said sleeve having a pair of opposed longitudinal slots adjacent its other end, said axle extending through said slots, the end of each of said slots which is juxtaposed with the other end of said sleeve having a lateral extension, so that sleeve retention recesses are defined by said lateral extensions, said axle extending into said recesses when said elastic member is elongated by longitudinal displacement of said partially rotatable member away from said barrel and subsequent partial rotation of said partially rotatable member, with concomitant partial rotation of said sleeve, a rectangular planar baffle, said planar baffle being centrally mounted to the other end of said sleeve so that said sleeve is substantially perpendicular to said planar baffle, a pair of opposed scoops, and opposed lateral means mounting each of said scoops to both adjacent corners of said planar baffle and pivotally to the ends of said axle, so that when said partially rotatable member is displaced away from said barrel, the free ends of said scoops are retracted away from each other, a deformable open-mouthed bag being mountable on said scoops with the bottom of said bag adjacent said planar baffle, so that when said barrel and the leg of said partially rotatable member are abutting, the free ends of said scoops are juxtaposed.



4,179,146

POT HANDLE

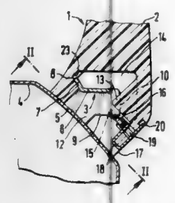
Wolfgang Fischbach, Daaden, Fed. Rep. of Germany, assignor to Heinrich Baumgarten,Eisen- und Blechenwaren Fabrik, Neunkirchen, Fed. Rep. of Germany

Filed Jun. 27, 1978, Ser. No. 919,457
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1977, 2729269
Int. Cl.² A47J *45/06*
U.S. Cl. 294—27 H **5 Claims**

1. In a pot handle comprising a handle member having a recess therein and a support bar received in said recess and which is permanently connected to said pot and which has at least one hook, the free end of which extends substantially parallel to the pot wall and cooperates with a suitably constructed shoulder on said handle member and a spring to effect a holding of said handle member on said support bar, the improvement comprising wherein said support bar has two sloped surfaces which form an obtuse angle with one another on a side of the support bar which is opposite the hook,

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wherein a spring is arranged in said recess and cooperates with said sloped surfaces, said handle having an undercut section in said recess, said spring being guided in said undercut section which opens outwardly to facilitate an insertion of said spring into said undercut section, said spring being tensioned during movement of said handle onto said support bar with the aid of



one of the two sloped surfaces, said spring gripping toward the end of the movement of said handle onto said support bar behind the other surface and urges said handle on the one hand against the pot and on the other hand against said support bar, said spring being supported on the one side thereof on the sloped surface and on the other side on a movable clip, which clip covers the outwardly opening part of the undercut section.

4,179,147

GOLF GREEN TOOL

Arthur L. Mendenhall, 4132 Gary Rd., Salt Lake City, Utah 84117

Continuation of Ser. No. 787,812, Apr. 15, 1977. This application May 30, 1978, Ser. No. 910,488

Int. Cl.[2] A01B 1/16

U.S. Cl. 294—50.7 **10 Claims**



1. A tool for raising green indentations comprising, in combination, a pair of relatively moveable telescoping members; a handle carried by the outer one of said telescoping members; a plurality of fingers fulcrumed in angularly spaced relation on means carried by the inner one of said members, their lower ends approaching each other but not touching in operating relationship; means defining a plane inclined from the axis of said members bearing on the upper ends of said fingers to positively move said fingers by relative movement of said members; resiliently deformable means connecting the upper ends of said fingers and urging them radially inward; said outer telescoping member having means defining a longitudinal slot, a pocket offset to one side of said slot and at the lower end thereof, a pin carried by said inner member disposed to travel in said slot and to lodge in said pocket; said pocket having means for preventing significant axial movement of said pin such that rotation of the members relative each other is required to move said pin from said pocket into said slot.

4,179,148

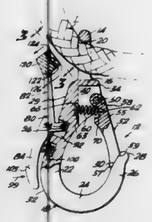
SNAP HOOK

Robert J. Johnson, 3245 Virginia St., No. 2, Coconut Groove, Fla. 33133

Filed Jul. 14, 1978, Ser. No. 924,651

Int. Cl.[2] B66C 1/36

U.S. Cl. 294—78 R **10 Claims**



1. A snap hook comprising a body having a first end zone comprising an eye with an opening defining a line passageway and a second end zone comprising a J-hook portion, said hook portion and eye being connected together at a zone of juncture,

said hook portion including a first leg portion extending generally axially away from said zone of juncture and said eye and a shorter second leg portion spaced from said first leg portion, and a generally U-shaped portion spaced from said zone of juncture between said leg portions and defining a hook bite,

said second leg portion having a terminal end zone spaced from said zone of juncture and said terminal end zone having an abutment surface confronting said first leg portion,

said zone of juncture having a first surface common with said first leg portion and a second opposite surface and a pair of outer surfaces extending between said first and second opposite surfaces, and said zone of juncture having a first recess in the second opposite surface between the outer surfaces and a first pin spanning said recess in perpendicular relation generally to said outer surfaces;

a latch arm of rigid material of a length greater than the distance between said first pin and said terminal end zone of said second leg portion and having a first end and a second end, said first end having a lateral hole sized for passage and rotatable on said first pin and said second end having an abutment surface in confronting engagement with the abutment surface of said terminal end zone of said second leg portion;

spring means normally urging said abutment surfaces into abutting engagement and said latch arm being yieldable swingably away from said second leg portion and toward said first leg portion to accommodate snap hook movement of said latch arm to automatically open and close the bite of the snap hook; and the improvement which resides in,

said first leg portion having a first and second main surface common with the outer surfaces of said zone of juncture and a recess in the first surface common with said first surface of said zone of juncture and between said first and second main leg surfaces and second pin means spanning said recess, said second pin means having a centerline spaced from said eye opening a predetermined distance,

a keeper arm having a first end and a second end and an intermediate zone between said first and second end, said keeper arm comprising a rigid member and including a projection extending from said intermediate zone and having a through hole, said projection and keeper arm being journaled on said second pin means, said second end of said keeper arm comprising an operator means for swinging movement of said keeper arm pivotally about said second pin means,

spring means captivated between said keeper arm and said hook portion normally urging said keeper arm into a predetermined normal position,

said first end of said keeper arm, when said keeper arm is in said perdetermined normal position being of a length from said second pin means at least as great as said predetermined distance to extend from said second pin means to said eye opening and said first end of said keeper arm having a terminal foot with an abutment surface confrontingly arranged in blocking relation at said eye opening and adapted to be moved into and out of clamping engagement of a line passed through said eye and yieldably movable upon swinging movement of said keeper arm to open passage through the eye to clampingly engage a line.

4,179,149

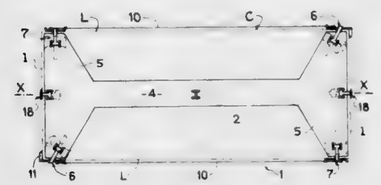
SUSPENDED SEIZING DEVICE OR THE LIKE

Felix A. Brochard, Nantes, France, assignor to Brissonneau & Lotz Marine S. A., Carquefou-Nantes, France

Filed Jun. 2, 1978, Ser. No. 911,942

Int. Cl.[2] B66C 1/66

U.S. Cl. 294—81 SF **12 Claims**



1. A seizing device comprising a frame, means for suspending the frame from handling means for the purpose of bringing the frame into a position of coincidence defined by at least one frame-locating element of a structure to be seized, for example an edge of a container, and at least two arms disposed on a side of the frame and in spaced relation to each other on said side of the frame, the arms being provided for placing alongside the locating element in said position of coincidence, and flexible and elongated guiding means interconnecting the arms and capable of contacting and cooperating with the locating element so as to guide the frame toward said position of coincidence.

4,179,150

SAFETY ARMING DEVICE FOR MISSILES

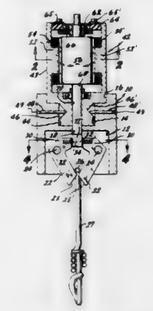
Coleman W. Conrad, Whittier, and Edward W. Fenska, Altadena, both of Calif., assignors to IMC Magnetics Corporation, Los Angeles, Calif.

Filed Oct. 31, 1977, Ser. No. 846,712

Int. Cl.[2] B66C 1/38

U.S. Cl. 294—83 R **15 Claims**

1. In an electrically actuated control device, in combination, holding means including at least one pivotally movable holding member, a second member with which the said one member cooperates, said first and second members having portions constructed for relative movement for purposes of releasing, the improvement comprising means to control relative movement of said portions, said last means including an element having an axis mounted to be movable angularly about its axis, the said element having a configuration such that in one position said portions are permitted to move for releasing and in



another position said portions are held from moving, and electrical means for actuating said element.

4,179,151

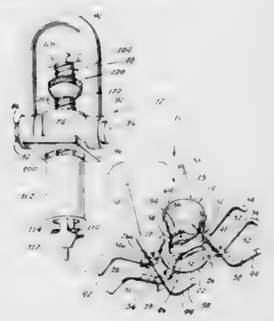
ANCHOR INSERT FOR EMBEDMENT IN A CONCRETE SLAB

Dennis W. Tye, Fremont, Calif., assignor to Superior Concrete Accessories, Inc., San Diego, Calif.

Continuation of Ser. No. 568,585, Apr. 16, 1975, abandoned, which is a continuation of Ser. No. 435,700, Jan. 23, 1974, abandoned. This application Jan. 10, 1978, Ser. No. 868,315 The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.

Int. Cl.[2] B66C 1/66

U.S. Cl. 294—89 **6 Claims**



6. An anchor insert adapted to be embedded in a concrete slab for cooperation with a pick-up unit which includes a locking stem having a pair of lift shoulders extending from opposite sides of the stem, said insert comprising:

a concrete-excluding cage which includes a single-walled hollow body and a base closing one end of the body, the opposite end of said body being adapted for insertion of said locking stem and lift shoulders into the cage, said cage being adapted to be emplaced within a form for a concrete slab with its base lowermost in the form,

a pair of spaced apart single-walled shoulders formed in the wall of said cage body on opposite sides of the body and spaced from said base, said body shoulders extending inwardly of the body to define a pair of downwardly facing downwardly curved arcuate internal thrust surfaces on one side of said wall each adapted for lifting engagement in contact with one of said lift shoulders, said body shoulders also defining a pair of upwardly facing

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downwardly curved arcuate external lift surfaces on the reverse side of said wall each adapted for lifting engagement in contact with a section of an anchor rod,

a first pair of spaced apart anchor rod sections each including a central portion defining a downwardly facing thrust surface contacting one of said lift surfaces on the body, a transition portion extending from each of the opposite ends of the central portion, a reverse bend portion extending from each transition portion, an extension portion extending from each reverse bend portion, and a terminal portion extending from each extension portion,

said central portions each being curved downwardly substantially on the arc of a circle and having ends extending downwardly and outwardly at small angles from the vertical, and said transition portions extending downwardly and outwardly at small angles from the vertical, thereby to provide for the transmission to the anchor rod sections of initial lifting forces with relatively large vertical components of force and relatively small horizontal components of force, and extension portions extending upwardly and outwardly, said terminal portions extending downwardly and outwardly, and

a second pair of spaced apart anchor rod sections extending transversely of said first pair of anchor rod sections and fixedly secured thereto on opposite sides of said cage body, said pairs of anchor rod sections thereby being securely mounted on said cage,

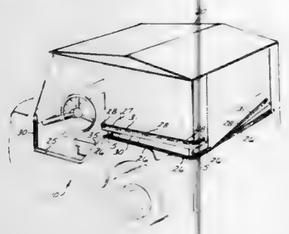
whereby said locking stem of a pick-up unit may be inserted in said cage with said lift shoulders disposed beneath said body shoulders, said lift shoulders may be brought into lifting engagement in contact with said thrust surfaces on the body, and a lifting force when imparted to said locking stem is transmitted to said anchor rod sections for lifting a slab in which the insert is embedded.

4,179,152

METHOD AND APPARATUS FOR SECURING FABRIC TOPS TO A VEHICLE

James K. Kent, Jr., 18014 San Gabriel, Cerritos, Calif. 90048

Filed Jul. 13, 1977, Ser. No. 815,201
Int. Cl.² B60J *1/20*
U.S. Cl. 296—196 **1 Claim**



1. In a vehicle including a passenger receiving cavity and a deployable fabric top, said top including a plurality of spaced grommets above the edges thereof for receiving corresponding fasteners disposed along the periphery of said cavity, the improvement comprising:

a plurality of elongate strips of pile dimensioned for receipt between adjacent ones of said fasteners;

a corresponding plurality of elongate strips of semi-rigid backing adhesively secured to associated ones of said strips of pile, each said strip of backing being, in turn, attached to the periphery of said cavity in interspaced relationship between said fasteners for supporting said strips of pile in exposed alignment;

a plurality of elongate strips of loop material attached to said top in interspaced disposition between adjacent ones of said grommets said strips of loop material being disposed on the surfaces of said top opposing said strips of pile for unbedding therein;

said loop strips and said strips of pile are conformed to substantially identical plan forms; and

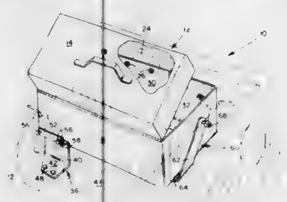
said strips of backing are secured to the periphery of said cavity by adhesive.

4,179,153

TOOL BOX CARRYING APPARATUS AND METHOD

Bert Cole, Jr., 1353 W. French Pl., San Antonio, Tex. 78201

Filed Apr. 3, 1978, Ser. No. 892,669
Int. Cl.² B60R *5/00, 7/00;* **B23P** *19/00*
U.S. Cl. 296—37.1 **11 Claims**



1. A method of mounting a tool box under a hood of an automobile having a pickup type front comprising the following steps:

removing a window washing bottle from a side wall of said automobile;

first attaching a side of an elongated carrying means to said side wall of said automobile where said window washing bottle was formerly located;

second attaching an end of said elongated carrying means to a front end wall of said automobile;

third attaching a bottom of said elongated carrying means to a wheel well of said automobile; and

relocating said window washing bottle under said hood.

6. An apparatus for mounting a tool box under a hood of an automobile having a pickup truck type front comprising:

tool box carrying means having a box like structure with box sides and a bottom;

securing means connecting a first of said box sides of said tool box carrying means to a side wall of said automobile;

first bracket means connecting to a front of said bottom of said tool box carrying means and extending generally upward to connect to a front wall of said automobile;

second bracket means connecting to a rear of said bottom of said tool box carrying means and extending generally downward to connect a wheel well of said automobile; and

means for amounting adjacent to a second of said box sides of said tool box carrying means said means for mounting being adapted to secure a window washing bottle to said tool box carrying means.

4,179,154

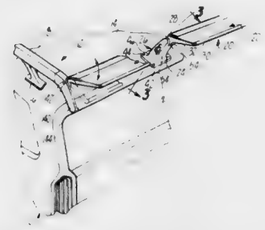
AIR VELOCITY RESPONSIVE DEFLECTOR

Charles E. Ingram, Warren, Mich., assignor to Four Star Corporation, Troy, Mich.

Filed Nov. 4, 1977, Ser. No. 848,402
Int. Cl.² B60J *1/20*
U.S. Cl. 296—91 **27 Claims**

1. In a luggage carrier of the type comprising an air deflector blade, the improvement which comprises:

means for rendering the deflector blade rotatable between a substantially vertical position and a substantially horizontal position in response to the velocity of air flowing therepast, the blade being rotatable from the vertical position to horizontal position as the velocity of the air



impinging thereagainst increases, the blade being adapted to minimize the drag created thereby.

4,179,155

LIGHT SHADE MOUNTABLE IN A PLURALITY OF POSITIONS ON A PLURALITY OF ITEMS IN AN AUTOMOBILE

Jose E. Ortiz, 6422 Virginia Hills Ave., Alexandria, Va. 22310

Filed Jul. 18, 1978, Ser. No. 925,861
Int. Cl.² B60J *3/02*
U.S. Cl. 296—97 C **9 Claims**

1. A light shade mountable in a plurality of positions on a plurality of items inside an automobile such as on a sun visor or on a side windowpane of a wide window opening and having a reversible mounting means with an extended first position for attachment to the top edge of the sun visor when said visor is in a downward position and a reverse, upside down position wherein said mounting means is shortened for attachment to the upper edge of the windowpane, and means so that when mounted to said windowpane with the windowpane in the up position the uppermost portion of the window opening is coverable, said light shade comprising a frame, a storage member having a circumference and rotatably supported by the frame, a flexible light attenuating screen wound about the circumference of said storage member, and a screen supporting member supported by at least one of the mounting means and the frame and disposed so that when the lightshade is mounted in the reverse upside down position on the windowpane and the windowpane is in an up position with said supporting member extending above the uppermost portion of the window opening and when the screen is unwound from about said storage member, said screen extends over and is supported by said screen supporting member and hangs downward therefrom covering at least the uppermost portion of the window opening thereby to modify incoming sun's rays reaching the driver by holding said screen interposed between the driver and a glass surface of the automobile without an uncovered gap in the uppermost portion of the window opening to protect the driver from the sun's rays whether the shade is mounted on the visor in said first position or on a side window in said reverse upside down position and whereby a short length of the screen member is almost completely disposed over the window area in either position.

4,179,156

VEHICLE SUN ROOF COVER

Marinus Huisman, Braunschweig, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Oct. 5, 1977, Ser. No. 839,422
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1977, 2648664
Int. Cl.² B60J *7/04*
U.S. Cl. 296—137 B **6 Claims**



1. A displaceable cover for an automobile roof, capable of being longitudinally displaced to open and close a roof opening and having a rigid outer top member capable of being pivoted outward from said roof opening about a first axis at one longitudinal end of said cover and an inner panel member covering said opening from the vehicle interior when said cover is closed, said panel member having first and second panel portions pivotably mounted to each other on a second axis transverse to the direction of said longitudinal displacement, said first panel portion being mounted on said cover so that it remains substantially parallel to said roof at all cover positions and said second panel portions being mounted on and interacting with said cover so that it remains parallel to said first panel portion when said cover is longitudinally displaced to open and close the roof opening and so that it pivots outward on said second axis with respect to said first panel portion when said cover is pivoted outward from said roof, thereby opening a passage through said panel member.

4,179,157

WALL RECLINING ROCKING CHAIR

Edwin J. Shoemaker; William Pacitti, and Marvin J. Baumann, all of Monroe, Mich., assignors to La-Z-Boy Chair Company, Monroe, Mich.

Filed May 8, 1978, Ser. No. 903,806
Int. Cl.² A47C *1/02*
U.S. Cl. 297—83 **11 Claims**



1. In a wall reclining rocking chair, a sub-frame, a base for said sub-frame, a rockable chair embodying a back, seat and frame mounted on said sub-frame, means on said base sloping downwardly at the forward end on which said sub-frame is supported for forward and downward movement, a pair of links having the adjacent ends pivoted together, means for pivoting one end of one link to the base and the other end of the other link to said sub-frame in a manner to permit them to move into aligned locking relation one above and in extension of each other for locking the chair in rearward and forward

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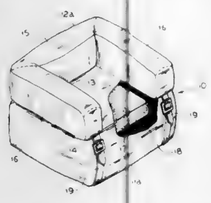
positions, and means actuated when the sub-frame is locked at the forward and rearward positions for deflecting the two links out of alignment when disposed one above the other and in extension of each other for releasing said lock in both positions.

4,179,158

MODULAR BEAN BAG SEATING DEVICES

Dennis M. Flaum, 1 E. Schiller, Chicago, Ill. 60610, and H. Lawrence Fleishman, 6518 N. Kenton, Lincolnwood, Ill. 60645

Filed Dec. 19, 1977, Ser. No. 861,830
Int. Cl.[2] A47C *13/00, 15/00*
U.S. Cl. 297—118 **4 Claims**



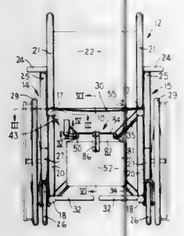
1. A modular furniture construction, comprising:
at least one pedestal formed from a plurality of panels including an upper, horizontal seating surface, a lower horizontal bottom, a front, a back and a plurality of sides;
at least one cushion,
each said pedestal and each said cushion at least partially stuffed with a filling material allowing each said pedestal and each said cushion to substantially maintain their respective shapes when force is exerted thereon; and
means for firmly and detachably securing selected of said cushions to selected of said pedestals with a bottom of each said cushion resting atop each said pedestal, and for firmly and detachably securing selected of said pedestals one to the other,
said securing means including means positioned horizontally on each said pedestal about the periphery of each said pedestal where said seating surface meets said back and said sides, and characterized by being horizontally slidably engagable to enable lateral attachment of selected of said pedestals one to the other as well as enabling vertical attachment of selected of said cushions to selected of said pedestals.

4,179,159

URINARY DRAINAGE BAG SUPPORT

James F. Sieklucki, 1510 Spruce Dr., Kalamazoo, Mich. 49008, and Ralph Veld, Jr., Kalamazoo, Mich., assignors to James F. Sieklucki, Kalamazoo, Mich.

Filed Mar. 13, 1978, Ser. No. 886,068
Int. Cl.[2] A47C *7/62*; **A61F** *5/44*
U.S. Cl. 297—192 **12 Claims**



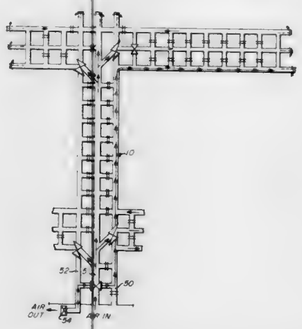
1. In combination with a conventional wheelchair of the kind having a transversely collapsible seat, spaced opposed side frames including opposed side rail members and connected for transverse movement toward and away from each other between a full width use position, for supporting a person on said chair, and a reduced width nonuse position, said chair having a seat, a said rail member extending longitudinally adjacent one side of said seat and being accessible from below said seat, a urinary drainage bag support, comprising:
a bracket fixed to said rail member and extending in transversely cantilevered relation therefrom beneath said seat;
an arm extending substantially horizontally from said bracket and pivoted thereon for movement from a transversely extending use position to a longitudinal stowed position substantially parallel to said rail member;
an envelope, for receiving a urinary drainage bag therein, supported on said arm and pivotable therewith between said use and stowed positions, said arm in its use position extending transversely between said side frames and supporting said envelope in forward facing orientation beneath said seat, said stowed position of said arm being angled rearward through about a right angle from said use position of said arm.

4,179,160

MINE LIFE LINE SYSTEM

Robert C. Sabo, Rte. 2, Box 159-2, Fairmount, W. Va. 26554

Filed Sep. 26, 1977, Ser. No. 836,329
Int. Cl.[2] E21F *11/00*; **E04H** *17/04, 17/20*; **E06C** *9/00*
U.S. Cl. 299—12 **6 Claims**



1. A life line system for use in the designated escape way of a mine comprising:
a spring loaded support compressable between a maximum extended length and a minimum compressed length;
a line holder supported from said spring loaded support;
a life line supported between a plurality of said spring loaded supports and extending along said designated escape way; and,
a plurality of enlargements formed on said life line, each enlargement having a gradual slope to said line on one side providing little resistance when a hand is slid along said line in a direction along said designated escape way and having an abrupt slope to said line on the other side providing a substantially higher resistance when a hand is slid along said life line in a direction opposite said designated escape way.

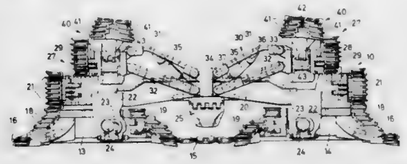
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4,179,161

PLOUGH FOR WINNING MATERIAL FROM A MINERAL FACE

Oswald Breuer, Dortmund-Husen, and Bernd Steinkuhl, Lunen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Mar. 6, 1978, Ser. No. 883,931
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1977, 2709392
Int. Cl.[2] E21C *27/34*
U.S. Cl. 299—34 **35 Claims**



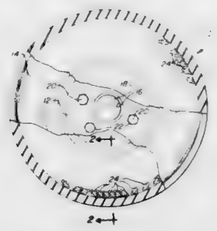
1. A plough for winning material from a mineral face, wherein the plough includes two plough bodies connected together in a tension-proof manner, a beam connected to the two plough bodies at a pre-determined height, and linkage means to vertically pivot at least one plough upper part with respect to the beam, said plough further comprising:
(a) guide means for supporting each plough upper part on the beam,
(b) said guide means including a substantially vertical guide flange and a mating slot for receiving each said guide flange,
(c) each said vertical guide flange being located on a corresponding plough upper part, and
(d) each said mating slot being formed in the beam.

4,179,162

DYNAMIC WHEEL BALANCING SYSTEM

Dominic A. Zarlengo, 3025 W. Scott Pl., Denver, Colo. 80211

Filed Nov. 25, 1977, Ser. No. 854,594
Int. Cl.[2] B60B *13/00*
U.S. Cl. 301—5 BA **2 Claims**



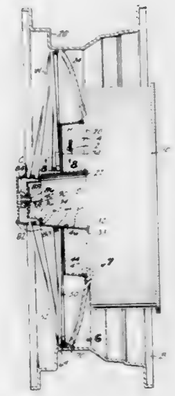
1. In a system for balancing a wheel-tire assembly wherein the assembly includes a wheel upon which a tire is mounted, the improvement comprising a plurality of separate independently movable mass means positioned within said tire, said mass means having a generally cylindrical configuration defining a cylindrical wall, with the ends of the cylinder lying in planes which are oblique to the longitudinal axis of the cylinder such that the mass means can roll along their cylindrical wall until a balanced condition of the assembly is attained and will then seat on one of said ends to inhibit further movement of the mass means upon a change in rotational speed of the assembly.

4,179,163

SIMULATED WIRE SPOKE WHEEL ASSEMBLY

Raymond C. Brown, Tarzana, Calif., assignor to Superior Industries International, Inc., Van Nuys, Calif.

Continuation of Ser. No. 875,444, Feb. 6, 1978, abandoned. This application Nov. 27, 1978, Ser. No. 963,952
Int. Cl.[2] B60B *7/04*
U.S. Cl. 301—37 SS **7 Claims**



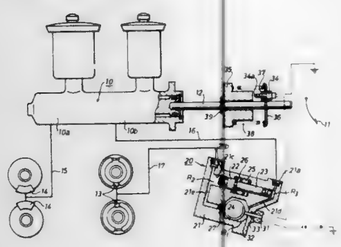
1. A simulated wire spoke wheel assembly for use with a wheel body having a centrally apertured bolt-on flange that merges into an attachment flange to the radially outer end of which is affixed a tire rim, with the bolt-on flange receiving lug bolts to be engaged by lug nuts, said assembly comprising:
an outwardly extending spider cup having means at its inner end coaxially removably seated within the central aperture of the bolt-on flange so as to be locked against outward movement relative to said bolt-on flange, the outer end of said spider cup having an end wall;
a hub cup telescopically slidably supported upon said spider cup, said hub cup including an open inner end resting against the outer surface of said bolt-on flange radially outwardly of the lug bolt area thereof so as to protectively cover the lug bolts and lug nuts disposed within such lug bolt area;
a wire spoke basket having a row of inner spokes and a row of outer spokes that slope radially rearwardly and inwardly relative to the axis of rotation of the wheel body, the radially inner ends of said outer spokes terminating adjacent the outer end of said spider cup;
inner and outer support rings affixed respectively to the radially inner ends of said inner and outer rows of spokes, said rings being telescopically received by said spider cup;
peripheral support ring means affixed to the radially outer ends of said inner and outer rows of spokes and engaging said wheel body adjacent the intersection of said attachment flange and said tire rim;
a cap coaxial with and telescopically encompassing the end wall of said spider cup; and
attachment means interposed between said cap and the end wall of said spider cup which when engaged draw said cap and said spider cup together and urge said wire spoke basket inwardly against said hub cup.

4,179,164

BRAKING PRESSURE CONTROL VALVE UNIT

Hiromu Konishi, Toyota, and Kiyoshi Nishiwaki, Susono, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 7, 1978, Ser. No. 913,434
Claims priority, application Japan, Jul. 26, 1977, 52-89585
Int. Cl.[2] B60T *8/14, 8/26*
U.S. Cl. 303—24 F **3 Claims**



1. In a fluid pressure control device for a vehicle braking system incorporating between a master cylinder and rear wheel brake cylinders, said master cylinder being operated by a push-rod of a brake pedal, which control device comprises a housing adapted to be mounted on a vehicle body frame, said housing being provided thereon with an inlet port for connection to said master cylinder and an outlet port for connection to said rear wheel brake cylinders and provided therein with a valve chamber in communication with said inlet and outlet ports; a valve seat provided within said valve chamber to permit fluid flow therethrough; and an inertia-controlled ball disposed within said valve chamber for normally permitting fluid communication between said inlet and outlet ports through said valve seat but adapted to co-operate with said valve seat to cut-off the fluid communication when said ball is subjected to a deceleration in excess of a predetermined value; the improvement comprising:

solenoid means having a solenoid winding attached to said housing and a plunger extending through said solenoid winding into said valve chamber and located behind said ball, said plunger being moved forwardly by energization of said solenoid winding to engage said ball against said valve seat;

a normally open switch means attached to a portion of said push-rod for connecting said solenoid winding to a source of electricity when closed; and

a movable element slidable on said push-rod to be displaced toward said switch means by inertia force acting thereon when said brake pedal is rapidly depressed, said movable element closing said switch means when engaged with said switch means.

4,179,165

MODULATING VALVE ASSEMBLY FOR RAILROAD CAR BRAKE CYLINDERS

William R. Page, 400 E. Randolph St., Chicago, Ill. 60601, and James G. Rees, 1212 Lake Shore Dr., Chicago, Ill. 60610

Continuation-in-part of Ser. No. 813,005, Jul. 5, 1977, Pat. No. 4,093,315. This application May 30, 1978, Ser. No. 910,687
The portion of the term of this patent subsequent to Jun. 6, 1995, has been disclaimed.
Int. Cl.[2] B60T *11/12*
U.S. Cl. 303—59 **14 Claims**

1. In railroad car air brake equipment including a brake cylinder pipe connected to the brake cylinder head for communicating fluid under pressure to the brake cylinder from the outlet of the brake cylinder pipe to the inlet of the brake cylinder head, a modulating valve assembly therefor for supplying the braking pressure fluid to the brake cylinder at a pressure that is a predetermined percentage of the pressure fluid in the brake cylinder pipe for brake service strokes above minimum service applications, said assembly comprising:

a bracket plate connected in the brake cylinder pipe to define the brake cylinder pipe into upstream and downstream sections on either side of same with regard to the direction of fluid flow through the brake cylinder pipe on brake service strokes of the equipment,

said bracket plate being formed to define a first passage communicating with the brake cylinder pipe upstream section and a second passage communicating with the brake cylinder pipe downstream section,

a modulating valve device carried by said bracket plate,

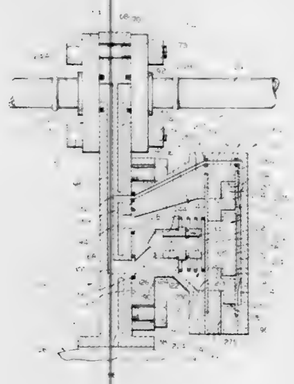
said valve device comprising:

a housing defining a cavity,

a differential valve member mounted across said cavity to define first and second chambers on either side of said valve member and for flexing movement laterally of said valve member,

said bracket plate first passage being in free communication with said first chamber,

an annular valve seat positioned in said first chamber adjacent said valve member, with said bracket plate second passage being in communication with said first chamber through said valve seat, and said valve member being mounted to be flexed against said seat for sealing off communication,



said second chamber being in free communication with said bracket plate second passage,

said valve member having exposed in said chambers on either side of same working areas of which the working area exposed to said second chamber is greater than the working area of same that is exposed to said first chamber by a predetermined ratio, whereby when said chambers are subject to fluid pressure in said passages, said valve member will be subject to a differential pressure force biasing same toward said seat,

means for spring biasing said valve member away from said seat that is overcome when said differential force reaches a predetermined amount,

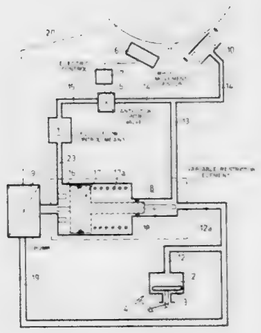
and check valve means in shunting relation to said seat for releasing fluid under pressure in said brake cylinder and second passage to said first passage when said brake cylinder pipe is free of the fluid under pressure.

4,179,166

ANTI-LOCK VEHICLE BRAKE SYSTEM WITH VARIABLE DECAY RATE

Denis Sharp, and Derek R. Skoyles, both of East Grinstead, England, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 421,511, Dec. 4, 1973, abandoned, which is a continuation of Ser. No. 154,487, Jun. 18, 1971, abandoned. This application May 10, 1976, Ser. No. 684,800
Claims priority, application United Kingdom, Jun. 26, 1970, 31129/70; May 12, 1971, 31129/71
Int. Cl.[2] B60T *8/02*
U.S. Cl. 303—119 **1 Claim**



1. An anti-lock vehicle brake system for an associated vehicle having a plurality of wheels comprising: a source of fluid pressure, a wheel brake cooperating with at least one of said wheels, a first fluid conduit interconnecting said source of fluid pressure and said brake, an anti-lock control valve coupled to said first fluid conduit to relieve brake pressure when opened, sensing and control means connected to said control valve for detecting when one of said associated wheels tends to lock, said control valve opening responsive to said sensing and control means to allow fluid flow from said brake to relieve braking pressure therein, restricting means in said first fluid conduit for selectively restricting fluid flow to said brake from said source of fluid pressure, a second fluid conduit coupling said control valve to said restricting means, said restricting means being responsive to fluid flow from said brake through said control valve for restricting fluid flow from said source of fluid pressure to said brake to reduce fluid pressure delivered to said brake, and means connected in series with said control valve between said brake and said restricting means for controlling fluid flow through said control valve to said restricting means to a limited rate after an initial surge of fluid flow at a rate higher than said limited rate only during pressure values in said brake greater than a predetermined value to limit the rate of change of pressure in said brake, said means connected in series comprising a piston member, flow restricting means actuated by said piston member, spring means normally urging said piston member to a non-restricting position and pressure balancing means for balancing the fluid pressure on opposite sides of said piston.

4,179,167

ANTIFRICTION BEARING WITH MULTIPLE PIECE RACE

Loren E. Lura, Sandusky, and Philip B. Zeigler, Port Clinton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 789,829, Apr. 22, 1977, abandoned. This application Dec. 21, 1977, Ser. No. 862,948
Int. Cl.[2] F16C *33/30*
U.S. Cl. 308—189 A **4 Claims**



1. An antifriction bearing assembly comprising:

a first race having first raceway means,

circumferentially spaced antifriction element means engaging said first raceway means,

a second race comprising a first piece and a second piece, said first piece carrying a fixed angular contact raceway engaging said antifriction means for providing a thrust load acting on said first raceway means,

said second piece being carried by said first piece and having an angular contact raceway engaging said antifriction means for providing an opposing thrust load acting on said first raceway means,

said first piece having a circumferential groove receiving a plurality of hardened keeper ring parts which engage an end face of the second piece, said keeper ring parts being of a selected width to produce a desired end play or preload, and

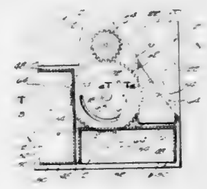
an annular retainer ring having a portion which engages said keeper ring parts to retain said keeper ring parts in said groove and another portion which is permanently secured to said second piece.

4,179,168

DISPLAY DEVICE HAVING A LOCKING MECHANISM

L. Henry Isaac, Greendale; Edward J. Nowak, Cudahy, and Charles R. Schmitz, Muskego, all of Wis., assignors to Display Corporation International, Milwaukee, Wis.

Filed Jul. 12, 1978, Ser. No. 923,998
Int. Cl.[2] A47F *3/10*
U.S. Cl. 312—125 **13 Claims**



1. A display device including:

a plurality of generally vertical display racks forming a closed rectangular configuration having a plurality of

vertical sides, each of said display racks including a front face for supporting display items, a rear face and vertical end walls,

means for supporting each of said display racks for rotation between a first position wherein said front face of each of said display racks faces outwardly of said rectangular configuration for displaying the display items and wherein each of said vertical sides is formed by a front face of one of said display racks and an end wall of an adjacent display rack, and a second position wherein said front face of each of said display racks faces inwardly of said rectangular configuration, and

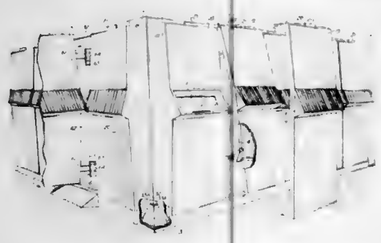
means for connecting the display racks for simultaneous shifting movement from said first position to said second position.

4,179,169

FACADE FOR A DATA PROCESSING SYSTEM

George R. Daniels, Phoenix, Ariz., and Helmut Henneberg, Canton, Mass., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Dec. 1, 1977, Ser. No. 856,362
Int. Cl.[2] A47B *43/00*; H02B *1/06*
U.S. Cl. 312—257 R **13 Claims**



1. A facade structure for enclosing data processing units comprising:

a superstructure having at least two walls being generally perpendicular, wherein each of said walls is comprised of unit sections and sections which are multiples of said unit sections, said superstructure walls being comprised of vertical and horizontal members,

a plurality of panels each including a release mechanism and capable of being detachably coupled to said super-structure, each of said panels having a dimension generally equivalent to said unit section dimension, wherein each of said panels is supported by a lower horizontal member and is coupled to an upper horizontal member by said release mechanisms, said panels being uncoupled from said superstructure by pressure applied to said release mechanisms; and

at least one entrance unit, said entrance unit including a one of said panels, said entrance unit having a first closed configuration with said entrance unit panel in a position in a plane formed by panels coupled to said superstructure;

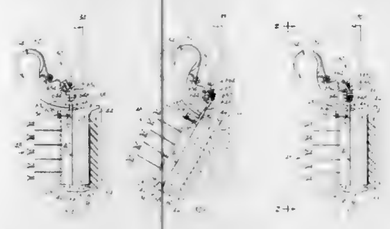
said entrance unit having a second closed configuration with said entrance unit panel in position in front of a plane formed by panels coupled to said superstructure, said entrance unit having an open configuration permitting access to an interior of said facade structure.

4,179,170

CONNECTOR ASSEMBLY FOR TELEPHONE DISTRIBUTION EQUIPMENT

Frank G. Splitt, Mt. Prospect; Casimir Cwirzen, Arlington Heights; William W. Hines, Arlington Heights, and Arnold M. Ladd, Arlington Heights, all of Ill., assignors to Cook Electric Company, Morton Grove, Ill.

Filed Mar. 13, 1978, Ser. No. 885,624
Int. Cl.[2] H01R *3/06*
U.S. Cl. 339—14 R **45 Claims**



1. A connector for telephone distributing equipment, said connector comprising:

a generally elongated connector base having first and second opposed faces and first and second elongated edges,

a ground plate means having opposed ground sides, one of said sides having conductive means, said ground plate means being adapted to be positioned against said second face of said connector base,

pedestal means being adapted to be positioned agaist said ground plate means, and

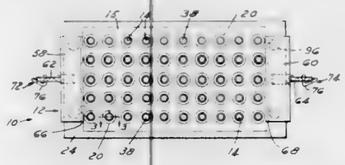
terminal means extending through said pedestal means, said ground plate means and said connector base to maintain said pedestal means against said ground plate means and to maintain said ground plate means against said second face of said connector base.

4,179,171

ELECTRICAL CONNECTOR

Shelly L. Shannon, 20 Timothy La., Battle Creek, Mich. 49017

Filed Mar. 3, 1978, Ser. No. 883,166
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—17 LC **12 Claims**



1. In an electrical connector adapted to mate with a terminal block of the type having a plurality of terminal contact blades upstanding therefrom and including a connector body adapted to be received over a said plurality of blades and means for making electrical contact with the contact blades, improved means for clamping said connector to a said terminal block comprising a pair of clamp members pivotally carried on opposite sides of said body, said clamp members having respective clamp heads adapted to embrace a said terminal block and clamp legs extending from said heads, a coil spring extending between said clamp members and normally resiliently biasing said clamp members such that said heads are in a retracted position, cam means carried centrally of said body in operative engagement with said clamp legs on a side of said body remote from the terminal block, and means for manually selectively rotating said cam means to pivot said clamp numbers including

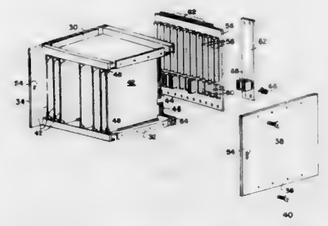
said heads from said retracted position to a position embracing a said terminal block, said clamp legs including respective leg portions extending in opposed lateral directions and being biased by said coil spring into operative engagement with said cam means.

4,179,172

MODULAR HARDWARE PACKAGING APPARATUS

Ernest E. Godsey; George W. Hoyle, and Rusty S. Christensen, all of Tucson, Ariz., assignors to Burr-Brown Research Corporation, Tucson, Ariz.

Filed Jun. 30, 1978, Ser. No. 920,671
Int. Cl.[2] H05K *1/07*
U.S. Cl. 339—17 LM **10 Claims**



1. Apparatus for electrically coupling modular electronic hardware to a digital system bus and to an industrial end device, said modular hardware including first and second groups of contacts, said apparatus comprising:

a motherboard electrically coupled to said bus and having at least one connector mounted thereon for engaging said first group of contacts from a first direction, said motherboard having at least one clearance hole therein; and

at least one termination assembly having at least one connector thereon which electrically couples said second group of contacts from said first direction and through said at least one clearance hole, said termination assembly comprising a printed circuit board having a conductor pattern thereon and at least one terminal block thereon for coupling to said end device, said conductor pattern connecting terminals of said terminal block to said at least one connector of said termination assembly.

4,179,173

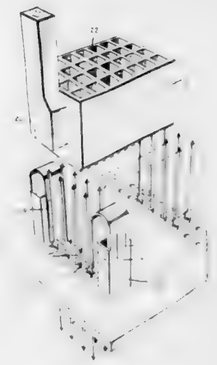
SHORTING CONTACT FOR USE WITH A MALE PIN BOARD

Samuel F. Rise, III, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 886,557, Mar. 14, 1978, abandoned. This application Jan. 15, 1979, Ser. No. 3,103
Int. Cl.[2] H01R *33/54*
U.S. Cl. 339—19 **2 Claims**

1. Apparatus for forming electrical connections between leads and pins (**11**) extending from a board (**10**), said pins being adapted to receive a female connector (**20**), said connector having an insulating body (**21**) and being adapted to fit over said pins and being further adapted to connect to said leads, and characterized in that

said apparatus further comprises a free standing folded spring contact (**100**) for shorting pins and adapted for mounting on said board, said contact including a generally box-shaped base (**110**) for securing said contact to said board and for providing a structural strengthening of said contact, a strengthened (**116, 117**) cantilever leg (**115**) extending from said base through an inverted generally U-shaped, concave curvature (**120**) to a strengthened (**118, 119**) arm (**125**) of said spring, said curvature enclosing said base, said arm having a spoonlike, sperical contact surface (**140**) juxtaposed each pin to be shorted and being adapted to touch an area (**150**) of predetermined ones (**11-1, 11-2**)



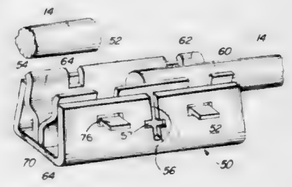
of said pins whereby an electrical short occurs between said predetermined pins.

4,179,174

JOINT CLIP ASSEMBLY FOR BUS BARS

George N. Jorgensen, Oxford, Ohio, assignor to Square D Company, Palatine, Ill.

Filed Oct. 16, 1978, Ser. No. 951,552
Int. Cl.[2] H01R *7/28*
U.S. Cl. 339—22 B **10 Claims**



1. A spring clip assembly for connecting a pair of longitudinally extending bus bars to each other with each bar carried in a respective housing, the improvement comprising:

an insulating member;

means for securing said insulating member in one of said housings;

a U-shaped metal spring member located between said insulating member and one bar carried in said one housing with said spring member extending beyond one end of said one bar;

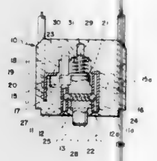
respective integrally formed means on said insulating member and said spring for securing said spring to said insulating member,

a pair of metal clip members each engaged with a respective diametrically opposed portion of said one bar and engaged by said one bar against the legs of said spring member to hold said clip members and spring member engaged with said insulating member against movement transverse to the longitudinal axis of said one bar, said clip members extending beyond the one end of said one bar for receiving the other bar of said pair therebetween to electrically connect said bars; and

respective integrally formed means on said spring and clip members interlocking said clip members with said spring member and insulating member.

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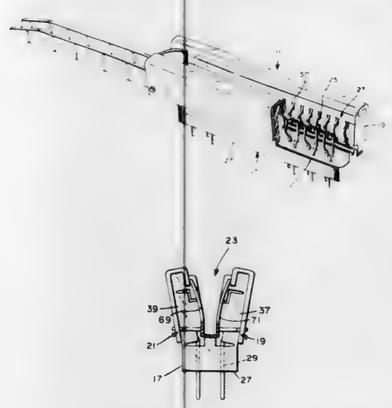
4,179,175
SAFETY SOCKET
Ivan A. Farnworth, 441 S. State, and Ivan R. Farnworth, 946 S. 500 East, both of Orem, Utah 84057
Filed Oct. 2, 1978, Ser. No. 947,995
Int. Cl.[2] H01R *13/44, 33/30*
U.S. Cl. 339—42 **7 Claims**



1. A safety socket assembly comprising a non-conductive housing having mounted therein two parallel conductive prong sheaths having facing apertures on the inside walls thereof and corresponding electrical terminals wherein one of said prong sheaths has mounted thereon a slidable contact and is electrically connectable to its corresponding terminal only by means of the slidable contact; a non-conductive, spring-loaded displaceable peg axially located in a peg cavity in the housing between the prong sheaths, said peg having a larger center portion extending transversely from one prong sheath to the other and having a transverse aperture therein, said peg also having a forward portion of reduced diameter which, when the peg is in its forward position, extends beyond the end of the prong sheaths, said peg also having a rear portion of reduced diameter attached to said slidable contact and containing means for keeping said peg in axial alignment; a peg spring surrounding the rear peg portion positioned in said peg cavity between the end of the peg cavity and the larger center portion of the peg; compressible peg locking means tensioned in the transverse aperture of the central portion of the peg locking the peg in a forward displaceable position; the prong sheaths, slidable contact, electrical terminals and displaceable peg being so positioned that the socket can be energized only when the prongs of an electrical plug are inserted into the prong sheaths compressing the peg locking means allowing the plug to displace the peg backwardly into the peg cavity thereby compressing the peg spring and moving the slidable contact backwardly on the prong sheath and into contact with its electrical terminal thereby energizing the socket until the plug is removed allowing the peg spring to move the peg and slidable contact forward de-energizing the socket and locking the peg in its forward position between the prong sheaths by the peg locking means.

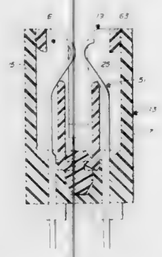
4,179,176
CIRCUIT BOARD CONNECTOR
Max L. Jayne, North Warren, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.
Filed May 24, 1978, Ser. No. 909,136
Int. Cl.[2] H01R *13/62*
U.S. Cl. 339—74 R **16 Claims**

1. A low insertion force connector for making electrical contact beween a circuit board and an external circuit comprising a housing having two longitudinal and substantially parallel side walls forming a zone for receiving the circuit board, a plurality of the contacts mounted within said zone in spaced apart rows, said contacts having upper portions for contacting opposite sides of the circuit board and lower portions for making electrical contact with an external circuit, a camming means journaled for rotation about an axis substantially normal to said side walls and having camming surfaces engageable therewith so as to move said side walls apart when said camming means is actuated, said contacts being operably associated with respective sides of said housing for movement there-



with and adapted to apply a low insertion force on said circuit board.

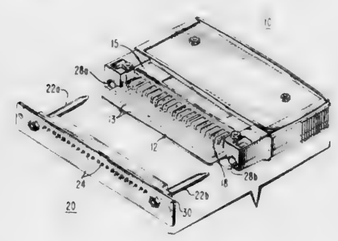
4,179,177
CIRCUIT BOARD CONNECTOR
Scott J. Lapraik, Pleasantville, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.
Filed Aug. 23, 1978, Ser. No. 936,316
Int. Cl.[2] H01R *13/62;* **H05K** *1/07*
U.S. Cl. 339—74 R **10 Claims**



1. A low insertion force connector for making electrical connection between a circuit board and an external circuit comprising an elongated outer housing having a centrally located opening with a channel extending longitudinally along the bottom thereof, said channel including a plurality of outwardly facing ramps along the length thereof, a plurality of contacts mounted on said housing on either side of said channel, said contacts having end portions interior said opening and bowed inwardly for contacting a circuit board and opposite end portions projecting exterior of said outer housing for making electrical contact with an external circuit, an elongated cam having a longitudinal groove on either side thereof and a bottom surface configured to mate with said ramps and adapted to be actuated in a longitudinal direction for movement in a transverse direction, an inner housing interior said opening includes cam follower means projecting interior said grooves for providing positive engagement therewith and transverse movement corresponding to the transverse movement of said cam, said inner housing including a pair of upright

sections forming a zone for receiving the circuit board, each of said upright sections including means for abutting bowed portions on respective sides of said channel and being adapted to urge said bowed portions to a position disengaged from said circuit board when said cam is actuated.

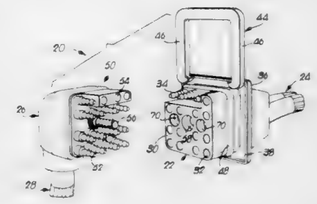
4,179,178
PLUG-IN CIRCUIT CARTRIDGE WITH ELECTROSTATIC CHARGE PROTECTION
William J. Bachman, Mt. Laurel, and Franklin R. Dimeo, Woodbury, both of N.J., assignors to RCA Corporation, New York, N.Y.
Filed Feb. 2, 1978, Ser. No. 874,636
Int. Cl.[2] H01R *13/52*
U.S. Cl. 339—111 **5 Claims**



1. Cartridge apparatus, for use with a connector assembly including an actuator device, comprising:
a housing defining a receptacle for receiving said actuator device and an aperture, along a wall of said housing;
a rigid member secured within said housing;
an electrical circuit mounted on said rigid member, said electrical circuit including a plurality of mutually spaced conductive contact areas disposed along an edge of said rigid member and exposed through said aperture; and
a conductive member having an actuator contact region, and also including a plurality of mutually spaced conductive elements disposed along an edge of said conductive member and electrically connected in common to said actuator contact region, said conductive member being pivotally mounted within said housing for motion between (**1**) a first position in which (a) said conductive elements respectively conductively engage said contact areas, and (b) said actuator contact region is disposed within said receptacle in the path of travel of an actuator device to a seated position in said receptacle and (**2**) a second position in which said conductive elements are disengaged from said contact areas; said conductive member being subject to occupancy of said first position when said receptacle is unoccupied, and subject to displacement from said first position to said second position in response to displacement of said contact region from said path by an actuator device travelling to said seated position.

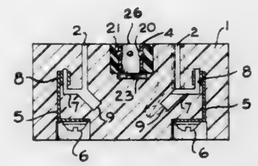
4,179,179
ELECTRICAL CONNECTOR HAVING MULTIPLE TERMINAL RECEPTACLE RECEIVING DIFFERENT PLUGS
Lawrence C. Lowden, Kansas City, Mo., assignor to Whitaker Cable Corporation, North Kansas City, Mo.
Filed May 17, 1978, Ser. No. 906,736
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—186 M **16 Claims**

1. In a multiple contact connector, a universal receptacle for mating with a plug assembly comprising either a single multiple terminal plug or various combinations of smaller plugs, said universal receptacle including:
a formed body;
a plurality of female connector terminals supported on said body; and
a number of male connector terminals carried on the body,



said male terminals being arranged relative to said female terminals in a manner to permit only one orientation and position for each of said plugs relative to said receptacle, whereby polarity across the connector is assured for all combinations of plugs.

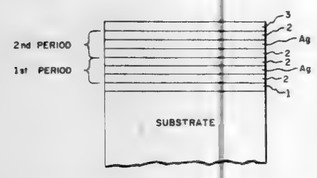
4,179,180
SAFETY ELECTRICAL RECEPTACLE AND PLUG THEREFOR
Bobby W. Hanna, Box 174, Shiloh, Ga. 31826
Filed May 15, 1978, Ser. No. 905,723
Int. Cl.[2] H01R *33/46*
U.S. Cl. 339—189 R **4 Claims**



1. The interlocking electrical connector comprising:
(a) a base of electrical insulation material, said base having a front and back and intervening side walls, said base having at least one pair of arcuate slots in spaced relationship in the front of the base, each slot extending into the interior of the base in an interior extending segment and turning outwardly towards a side wall of the base to form an outwardly extending segment of the slot and then turning towards the front of the base to form a front extending segment, with an electrical contact lying adjacent to an end of the front extending segment of each slot, with the interior extending segment of each slot connected to a channel that extends further into the interior of the base in a direction to avoid being adjacent the electrical contacts at any point, with the opposite end of the slot connecting with an enlarged opening in the front of the base, and
(b) a plug-in connector carrying spaced electrical contacts, with each contact having a shape corresponding to the shape of the slot in the base, with the contacts adapted to enter the enlarged openings in the front of the base and to be rotated into interlocking position with the electrical contacts in the base.

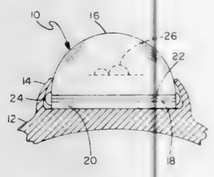
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4,179,181
INFRARED REFLECTING ARTICLES
Leei Chang, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.
Filed Apr. 3, 1978, Ser. No. 892,585
Int. Cl.[2] G02B *5/28;* **B05D** *5/06, 1/36*
U.S. Cl. 350—1.7 **15 Claims**



1. An interference-coated, infrared reflecting article comprising, in sequence,
(a) a substrate having a surface,
(b) a first layer of a refractory dielectric,
(c) a layer of silver having a thickness between about 110 and 250 A,
(d) a second layer of the refractory dielectric.

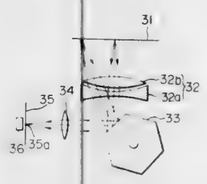
4,179,182
HOLOGRAPHIC JEWEL
Morris R. Smith, 1346 Caminito Septimo, Cardiff, Calif. 92007
Filed Oct. 28, 1977, Ser. No. 845,727
Int. Cl.[2] G03H *1/20, 1/24*
U.S. Cl. 350—3.69 **13 Claims**



1. A white light hologram jewel for jewelry, comprising:
(a) a second generation Lippmann-Bragg hologram having an orthoscopic image of an object recorded therein, said image appearing on the viewer side of the hologram, said second generation hologram being made by using a psuedoscopic image reconstructed from a first hologram as the object for making said second generation hologram;
(b) a thick lens discrete from said hologram, bonded to and covering the viewer side of said hologram;
(c) said lens providing optical leverage in that a small tilt of the jewel relative to a read-out incident light beam causes a large spectral shift enhancing color change and amplifying the optical illusion of the object turning about a point in the jewel.

4,179,183
DEVICE FOR SCANNING A LIGHT BEAM AT A CONSTANT SPEED
Masamichi Tateoka, Kawasaki, and Kazuo Minoura, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 3, 1978, Ser. No. 902,401
Claims priority, application Japan, May 7, 1977, 52-52532
Int. Cl.[2] G02B *27/17, 9/10*
U.S. Cl. 350—6.1 **3 Claims**

1. A light beam scanning device comprising:
(a) a light source section for generating a scanning beam;
(b) a deflector which receives the light beam from said light source section, and effects deflection of said light beam in a predetermined direction at a constant angular speed;
(c) a surface to be scanned by said light beam which has been deflected by said deflector; and
(d) a focussing lens for the scanning operation, said lens being disposed between said deflector and said scanning surface and being composed of a front single lens, having



a negative refractive power, at the side facing the deflector and a rear single lens, having a positive reflective power, at the side facing said surface to be scanned, wherein the light beam from said deflector passes through said front single lens and then through said rear single lens and is focussed on said scanning surface, and wherein said focussing lens causes the focussed beam which scans said scanning surface to move at a constant speed.

4,179,184
ELECTROOPTICAL MODULATOR
Arthur R. Nelson, Troutville, Va., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Mar. 30, 1978, Ser. No. 891,651
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.14 **12 Claims**

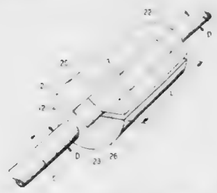
1. Optical modulator apparatus comprising:
optically transparent plate means characterized by an electrically variable effective index of refraction,
optical input and output port means for establishing a path for the propagation of light through said plate means, and
a plurality of isolated electrode means for establishing variable electric fields through said plate means generally normal to said path for changing said effective index of refraction, thereby diverting corresponding portions of said light from said path and from said output port means,
said plurality of isolated electrode means including first and second mutually coplanar electrode means,
said first coplanar electrode means lying generally symmetrically at one side of said path and having a generally triangular shape,
said second coplanar electrode means lying generally symmetrically at said one side of said path and having an internal shape conformal with said generally triangular shape for forming first vee-shaped gap means between said first and second coplanar electrode means, and
said plurality of isolated electrode means including cooperating electrode means spaced from said first and second coplanar electrode means at a second side of said path.

4,179,185
COUPLER FOR OPTICAL COMMUNICATION SYSTEM
Robert M. Hawk, Bath, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Feb. 27, 1978, Ser. No. 881,623
Int. Cl.[2] G02B *5/16*
U.S. Cl. 350—96.16 **8 Claims**



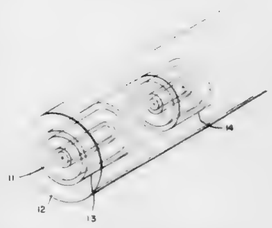
1. An optical signal coupler comprising a plurality of optical waveguide filaments each having a core of transparent material having a refractive index n_1 surrounded by a layer of transparent cladding material having a refractive index n_2 that is lower than n_1, the end portions of which are disposed in fused, side-by-side relation to form a unitary, multi-cored structure wherein the space between adjacent cores is occupied by only said cladding material, the cross-sectional shape of said multi-cored structure being substantially circular, the end of said multi-cored structure opposite that from which said filaments extend being planar and being substantially perpendicular to the axes of said cores at said end,
means disposed on said end for reflecting light, the wavelength of which is to be transmitted by said optical waveguide filaments, and
means in addition to the fusing together of said fibers for enhancing optical signal cross-talk among the cores of said multi-cored structure.

4,179,186
APPARATUS AND METHOD OF SPLICING OPTICAL FIBERS
Arthur R. Tynes, Red Bank, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Mar. 31, 1978, Ser. No. 892,275
Int. Cl.[2] G02B *5/14;* **B65H** *69/02*
U.S. Cl. 350—96.21 **8 Claims**



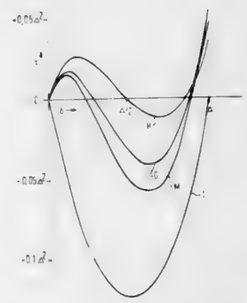
1. A coupler for splicing one or more pairs of optical fibers (**10, 11**) end to end, comprising a sleeve (**20**) having at least one fiber holding channel (**23**) extending longitudinally therethrough, each holding channel having at least one V-shaped groove of sufficient size so that the circumference of the optical fibers is capable of tangentially contacting each side (**24, 25**) of the groove CHARACTERIZED IN THAT said sleeve further includes a first slot (**26**) beginning at the outer periphery of said sleeve and extending into each holding channel, said slot having a small width (W) that is less than the diameter (D) of the fibers to be spliced, said sleeve being collapsed about said fibers as a result of the application of a predetermined elevated temperature in combination with a predetermined elevated pressure, said temperature serving to soften the sleeve material to permit the controlled collapse of said sleeve under said elevated pressure, said collapsed sleeve retaining said fibers in precise alignment by insuring that all fibers tangentially contact each side of said groove.

4,179,187
MULTIPLE MODE WAVEGUIDE HAVING CYLINDRICAL PERTURBATIONS
Robert D. Maurer, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Aug. 12, 1977, Ser. No. 824,152
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.30 **2 Claims**



1. A multiple mode waveguide comprising:
a glass core,
a glass cladding around said core, said core having a higher index of refraction than said cladding, and
cylindrical perturbations in said core having a different index of refraction than the unperturbed core between the ends of said cylindrical perturbations, said perturbations being spaced along the axial length of said core, each of said perturbations including index of refraction variations in concentric rings within said core.

4,179,188
GRADIENT OPTICAL FIBER
Siegfried Geckeler, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Filed Jul. 3, 1978, Ser. No. 921,495
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1978, 2732444
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.31 **2 Claims**



1. A gradient optical fiber with an optimized index of refraction profile with the improvement being a normalized difference in the index of refractionΔbeing in a range of 0.005 to 0.011, with $-(k_0/\Delta \cdot d\Delta/dk_0)$ being in a range of 0.09 to 0.11, an

index of refraction profile function f(r/a) according to a formula of

$$f(r/a)=(r/a)^{\alpha}+A((r/a)^{\alpha}-(r/a)^{2\alpha})$$

and a profile dispersion function F_N according to

$$F_N=f^{g},$$

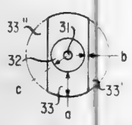
wherein α being in a range of 2.013 to 2.015, A being in a range of 0.114 to 0.116 and g being in a range of 2.4 to 2.6.

4,179,189

SINGLE POLARIZATION OPTICAL FIBERS AND METHODS OF FABRICATION

Ivan P. Kaminow, Tinton Falls, and Vellayan Ramaswamy, Lincroft, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 13, 1978, Ser. No. 869,366
Int. Cl.² G02B 5/14
U.S. Cl. 350—96.33 **7 Claims**



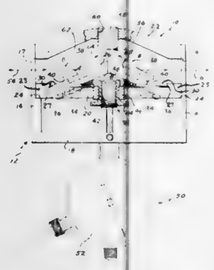
1. A single polarization optical waveguide at least partially surrounded by an outer jacket having a different thermal expansion coefficient than said waveguide, and a thickness a along one direction that is different than its thickness b along a direction orthogonal to said one direction;
characterized in that:
the ratio of b to a is equal to or less than 0.1; and in that the induced strain birefringence Δn of the waveguide is greater than 5×10^{-5}.

4,179,190

WIDE BAND ADJUSTABLE BREWSTER ANGLE POLARIZER

Jerome D. Friedman, and Carl A. Pitha, both of Lexington, Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 3, 1978, Ser. No. 866,742
Int. Cl.² G02B 5/30
U.S. Cl. 350—152 **8 Claims**



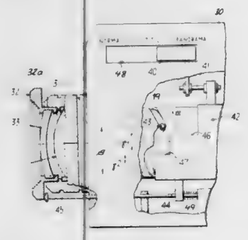
1. A wide band adjustable polarizer comprising a housing, a first and a second mount, each of said mounts being movably connected in the knife-edge type relationship at one end thereof to said housing, a dielectric element being secured to said first mount, another dielectric element being secured to said second mount, each of said dielectric elements being made of a material capable of transmitting light in both the visible and infrared range of the optical spectrum means operably connected to said housing and optically interposed between said pair of dielectric elements for directing a reflected beam of light from one of said dielectric elements to the other of said dielectric elements, and means operably connected to said first and second mounts for equally displacing said first and second mounts a preselected distance whereby upon proper adjustment of said first and second mounts the angle between the normal to said dielectric element and an incoming light beam is established at the Brewster angle thereby producing a reflected beam of light from said dielectric element which is polarized.

4,179,191

ADJUSTING MECHANISM FOR OPTICAL OBJECTIVE WITH LOST-MOTION ZONE

Otto Freudenschuss; Eduard Keznickl, and Gottfried Patels, all of Vienna, Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Nov. 14, 1977, Ser. No. 851,353
Claims priority, application Austria, Nov. 15, 1976, 8469/76
Int. Cl.² G02B 7/10, 15/14, 15/10
U.S. Cl. 350—187 **14 Claims**



1. An optical system comprising:
a varifocal objective including lens means axially shiftable over a predetermined range of displacement including a first subrange for varying the focal length of the objective and a second subrange for varying the position of an object plane thereof;
control means adjustable over a predetermined operating range corresponding to said range of displacement; and
drive means operatively linking said control means with said lens means, said drive means positively connecting said control means with said lens means throughout said operating range except for at least one lost-motion zone coinciding with a predetermined position of said lens means in said second subrange in which said object plane lies at a certain close distance from the objective.

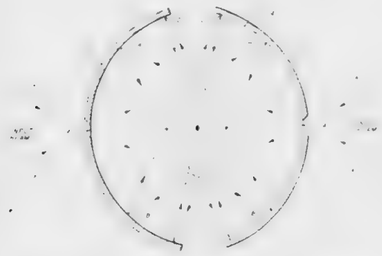
4,179,192

LASER FUSION OPTICAL SYSTEM

David R. Shafer, Fairfield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Division of Ser. No. 695,370, Jun. 14, 1976, abandoned. This application Aug. 18, 1977, Ser. No. 825,662
Int. Cl.² G02B 5/10
U.S. Cl. 350—294 **2 Claims**

1. A laser optical system comprising, in combination, a pair of concave mirrors having substantially the same radius and the same surface figure,
said mirrors being disposed in opposed relationship to form a mirror cavity therebetween,
a laser target centrally disposed in said cavity,
means for directing a laser beam into said mirror cavity,
said mirrors being spaced apart one with respect to the other and contoured so that said beam enters the mirror cavity and reflects off one mirror, which focuses the light at a point located in said cavity, from which it diverges and



fills the other mirror, and the other mirror focuses it at said target to thereby heat said target.

4,179,193

FOCUSING REFLECTOR

Roger B. Gillette, Auburn, and Weightstill W. Woods, Redmond, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 10, 1978, Ser. No. 894,819
Int. Cl.² G02B 5/10
U.S. Cl. 350—295 **7 Claims**



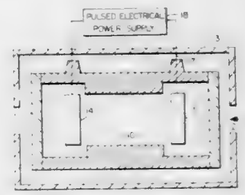
1. A focusing mirror comprising:
a rigid exterior closed frame member defining a substantially planar surface on both the front and the back,
gas impermeable members covering the front and the back of the frame member, spanning the distance defined by the frame and secured thereto, at least one of which gas impermeable members is flexible and has a reflective coating upon its exterior surface,
capacitive sensor means electrically isolated from the reflective membrane, mounted by a suspension system within the frame and between the gas impermeable members,
means for controlling the pressure between the gas impermeable members relative to the ambient pressure said means responsive to a variance in capacitance between the capacitive sensor means and the coated membrane caused by a varying distance between the capacitive sensor means and the reflective membrane and by varying the relative pressure adjusting the curvature of the reflective membrane and controlling the focus whereby a predetermined focus is maintained even though the orientation of the mirror is altered or the ambient pressure changes.

4,179,194

ELECTRICALLY CONTROLLABLE WIDE ANGLE OF VIEW OPTICAL NOTCH FILTER

Myer Geller; Daniel E. Altman, and Glidden J. Barstow, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 2, 1976, Ser. No. 654,124
Int. Cl.² G02F 1/17
U.S. Cl. 350—356 **10 Claims**



1. An electrically controllable, wide angle field of view, notch filter for attenuating narrow bandwidth wavelengths of light energy in an optical path comprising:
an enclosure containing a selected material,
said material being characterized by exhibiting strong quantum mechanical coupling between two determinable energy states of different levels above its ground energy state, and producing radiated emission within said narrow bandwidth wavelengths when externally excited to populate the upper of said two determinable energy states;
means for maintaining said enclosure at a temperature to vaporize the selected material;
windows supported at opposite ends of said enclosure in alignment with said optical path,
said windows being substantially transparent to the light energy propagated in said optical path;
first and second electrodes oppositely positioned within said enclosure contiguous to said optical path and having external terminals for connection to a source of electrical energy;
a source of pulsed electrical energy controllably connectable to said electrodes for generating an electric current discharge thereacross within said enclosure,
said electric current discharge being of sufficient strength to raise the vaporized selected material from its ground energy state to the lower of said two determinable energy states, causing selective absorption of said narrow bandwidth wavelengths of light energy propagated in said optical path.

4,179,195

METHOD AND APPARATUS FOR DETERMINING THE STRABISMUS ANGLE BETWEEN THE OPTICAL AXES OF A FIXING AND A STRABISMIC EYE

Jörg Krumeich, Wattenscheid, and Hermann Rössler, Essen, both of Fed. Rep. of Germany, assignors to Hermann Rössler, Essen, Fed. Rep. of Germany

Filed Apr. 13, 1977, Ser. No. 787,063
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616870
Int. Cl.² A61B 3/08
U.S. Cl. 351—4 **12 Claims**

1. A method for determining the strabismus angle between the optical axes of a fixing and of a strabismic eye, comprising the steps of
adjusting the spacing of the centers of two light sources from one another to the pupillary distance of the fixing and of the strabismus eye respectively,
adjusting the spacing of parallel optical axes of two optical receiving devices from one another with the optical axes

remaining parallel to one another to a distance corresponding to the pupillary distance,

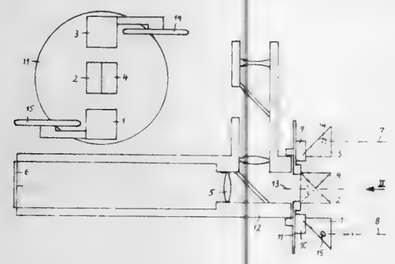
illuminating each eye from said two light sources, respectively, and producing a light reflection on the corneas of the eyes, and

imaging the pupils of both eyes and both of the light reflections on the corneas of both eyes on one common image plane via the two optical receiving devices.

5. An apparatus for determining the strabismus angle between the optical axes of a fixing eye and a strabismic eye, comprising

a common image plane,

two optical receiving means for imaging respectively one



eye each by one of said receiving means onto said common image plane, said receiving means each defining an optical axis and being aligned axially parallel with said optical axes,

two light source means, each for respectively illuminating one of the eyes, are coordinated to said two optical receiving means, respectively, and

said two optical receiving means and said two light source means are mounted transversely displaceable to the direction of the optical axes of said receiving means for changing the respective spacing of the centers of the two light source means as well as the spacing of the optical axes of said two optical receiving means relative to one other corresponding to the pupillary distance of the eyes.

4,179,196

COMPACT SUBJECTIVE REFRACTIVE INSTRUMENT

Staffan B. Persson, Danielson, Conn., and Robert B. Tackaberry, Williamsville, N.Y., assignors to American Optical Corporation, Southbridge, Mass.

Filed Sep. 30, 1977, Ser. No. 838,178
Int. Cl.[2] A61B *3/02*
U.S. Cl. 351—30 **8 Claims**

1. A subjective refractor for determining lens values required to correct visual deficiencies of an eye which comprises,

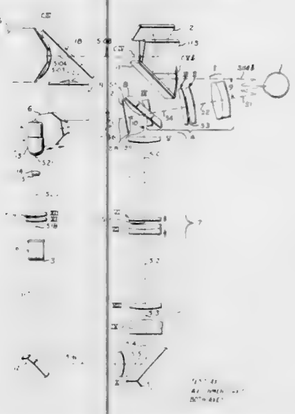
a target, means to project an image of said target to a normal image plane on a test axis,

first reflection means to axially move said target image to either side of said normal image plane,

second and third reflection means to fold the test axis,

an axially-rotatable cylinder means to axially move one meridian of said target image to either side of said image, said cylinder means being located between said second and third reflection means, and

an eyepiece having a front focal plane located at a position up to 4 mm from said normal image plane



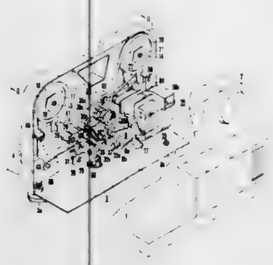
whereby any single exterior dimension of said instrument is substantially less than the test axis distance between said target and said eyepiece.

4,179,197

SOUND MOTION PICTURE PROJECTION SYSTEM

Kuniyoshi Suzuki, Machida; Akira Ashida, Yokohama; Takashi Itani, Yokohama; Tateo Yamada, Yokohama; Masaya Maeda, Kawasaki; Kiyoshi Takahashi, Kunitachi, and Hiroyuki Takimoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 25, 1977, Ser. No. 790,762
Claims priority, application Japan, Apr. 27, 1976, 51/48289
Int. Cl.[2] G03B *31/00*
U.S. Cl. 352—14 **5 Claims**



1. A sound motion picture projection system comprising:

(A) a picture projection unit having;

(A-1) a driving motor,

(A-2) a first film advancing means for intermittently advancing film through a picture projection station, and

(A-3) a picture projecting means disposed adjacent to said picture projection station,

(B) a sound recording and reproducing unit attachable to said picture projection unit, having;

(B-1) a second film advancing means for continuously advancing the film through a sound recording and reproducing station,

(B-2) a sound recording and reproducing means disposed adjacent to said sound recording and reproducing station,

(B-3) a first connecting means for operatively connecting said second film advancing means with said driving motor, said first connecting means including first speed change means manually operable from outside the sound recording and reproducing unit for changing the film projection speed and the sound recording or reproduction speed,

(B-4) a second connecting means for operatively connecting said first film advancing means with said driving motor through said first change means, said second connecting means being operatively coupled to said first speed change means and including second speed change means for changing the film projection speed relative to the sound recording or reproduction speed, and

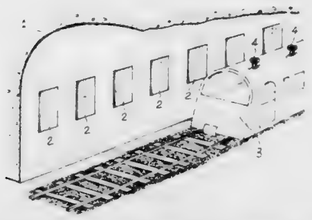
(B-5) a film loop sensing means for detecting the change in the amount of a film loop formed between said picture projection station and said sound recording and reproducing station, wherein said loop sensing means has an output member, which is applied to said second speed change means to change the film projection speed according to the change in the size of the film loop amount by adjusting the second speed change means.

4,179,198

INSTALLATION FOR THE ANIMATION OF PICTURES

Roland F. C. Brachet, Domaine d'Arnaga, 83810 Callian, and Pierre M. Boismard, 10, rue de Castellane, 75008 Paris, both of France

Filed Mar. 27, 1978, Ser. No. 890,689
Claims priority, application France, Mar. 25, 1977, 77 09086
Int. Cl.[2] G03B *25/00*
U.S. Cl. 352—100 **1 Claim**



1. An installation for the animation for pictures for transportation systems such as railway systems and the like wherein a passenger vehicle moves along a path with respect to a generally parallel tunnel wall, said installation comprising:

a series of stationary pictures mounted along the path of travel of the passenger vehicle, said pictures being spaced apart by a predetermined interval;

a plurality of light emitting devices mounted on the vehicle in spacially displaced locations along the length of the vehicle;

normally inoperative means for simultaneously actuating all of said light emitting devices; and

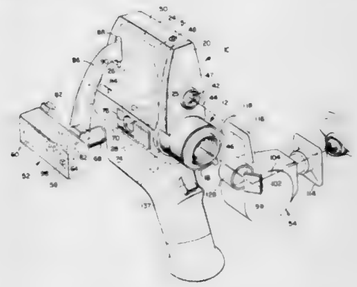
control means for periodically operating said actuating means, said control means being responsive to the motion of the vehicle to cause actuation of said light emitting devices when the vehicle has travelled a distance equal to the predetermined interval between the stationary pictures whereby each time said actuating means is operated a plurality of stationary pictures spanning a distance commensurate with the length of the vehicle will be illuminated.

4,179,199

COMBINATION MOTION PICTURE CAMERA AND VIEWING APPARATUS

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 2, 1979, Ser. No. 506
Int. Cl.[2] G03B *19/18*
U.S. Cl. 352—138 **3 Claims**



1. Apparatus for permitting viewing of images carried by a motion picture film strip contained within a cassette of the type wherein projection illumination may be directed to the backside of the film strip by a reflecting prism mounted within the cassette behind the film plane at a projection station; said apparatus comprising a movie camera adapted to receive and operatively engage the cassette to effect movement of the film past said projection station, said camera including a taking lens having a lens axis passing through said projection station and operative in an exposure mode for recording scene images on unexposed film; said apparatus further comprising means for cooperating with said movie camera and the cassette for directing light into said reflecting prism to result in projection of the image carried by the frame of the film strip at the projection station along the lens axis of said camera; and said apparatus further comprising an optical viewing system for providing visual access along said lens axis of said camera for viewing of said images projected therealong, said optical viewing means comprising; an objective lens disposed along said lens axis to receive an aerial image formed by the camera's taking lens, a reflective element disposed along said lens axis outwardly from said objective lens to receive the image formed by said objective lens and to direct said image bearing light along a viewing axis substantially perpendicular to said lens axis, and, an eye piece element disposed along said viewing axis for focusing and viewing therethrough said image directed thereto by said reflective element.

4,179,200

SCREEN COATING SYSTEM FOR PANEL OF COLOR PICTURE TUBE

Akira Kotoyori, Ichinomiyamachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 30, 1978, Ser. No. 891,624
Claims priority, application Japan, Apr. 4, 1977, 52-40920[U]
Int. Cl.[2] G03B *41/00*
U.S. Cl. 354—1 **5 Claims**

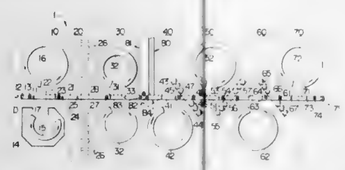
1. In a screen coating system for a panel comprising an automatic coating line including conveying line for conveying panels and dummy panels which serve to hold shadow masks and a plurality of panel coating stations and exposing stations provided along said conveying line the improvement comprising:

panel storage means disposed adjacent to the conveying line;

panel transfer means for transferring panels forwarded to a first position on said panel conveying line to said storage

V 9 8 9 1 3 DEC 18 79 UMI

means and for conversely transferring panels from said storage means to said first given position; and



ejecting means for sending to the outside of said conveying line panels and dummy panels forwarded to a second position downstream of said first position on said conveying line.

4,179,201

LENS STOP BRAKING IN AUTOMATIC EXPOSURE CAMERAS OF STOP VALUE CONTROL TYPE

Hiroshi Kurei, Kawagoe; Masahiro Kawasaki, Tokyo, and Yukio Takaoka, Asaka, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1977, Ser. No. 831,022

Claims priority, application Japan, Sep. 6, 1976, 51-106465; Sep. 7, 1976, 51-106912

Int. Cl.² G03B *7/08, 9/06*

U.S. Cl. 354—41 **9 Claims**



1. In an automatic exposure camera of the stop value control type wherein a suitable lens aperture diameter is obtained with respect to light reflected by an object, a preset shutter speed and film sensitivity, said automatic exposure camera having a lens stopping mechanism operated by a first magnet in response to measured variations in the object's light passed through the lens aperture to effect stop value control, the improvement comprising:

a brake magnet mechanism means having a second magnet for decelerating but not stopping the lens stopping mechanism, and

a control circuit responsive to the measured variations in the object's light passed through the lens aperture for controlling said second magnet of said brake magnet mechanism means.

4,179,202

DIAPHRAGM APERTURE CONTROL DEVICE IN A CAMERA

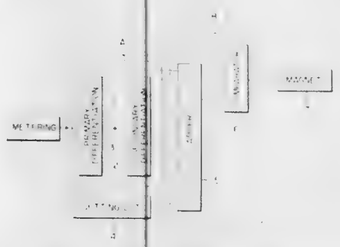
Toru Fukuhara, Isehara, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Sep. 25, 1978, Ser. No. 945,117

Claims priority, application Japan, Sep. 29, 1977, 52-116156

Int. Cl.² G03B *7/08*

U.S. Cl. 354—43 **3 Claims**



1. An automatic diaphragm aperture control device used with a camera having an objective lens, a diaphragm having a diaphragm aperture, a shutter mechanism and a shutter speed selecting mechanism, said device including:

(1) means for stopping down the diaphragm from its open position prior to the commencement of exposure in association with a shutter releasing operation;

(2) light measuring means for measuring the light passing through the objective lens the diaphragm aperture and for producing an output signal indicative of such measurement;

(3) output means providing an output signal commensurate to a shutter speed selected by the shutter speed selecting mechanism;

(4) locking means for determining a diaphragm aperture by locking said means for stopping down the diaphragm so as to stop its stopping down operation;

(5) correction signal generating means putting out a primary differentiation signal resulting from the time-differentiation of the output signal of at least said light measuring means; and

(6) comparator means receiving as input the output signals from said light measuring means, said output means and said correction signal generating means and operating said locking means when said three signals assume a relationship providing a proper diaphragm aperture;

the improvement residing in that said correction signal generating means further puts out a secondary differentiation signal resulting from secondary time differentiation of the output signal of said light measuring means.

4,179,203

CAMERA EQUIPPED WITH DATA RECORDING DEVICE

Michio Hirohata, Kawasaki; Toyotosi Suzuki; Hideo Yokota, both of Tokyo; Mutsuhide Matsuda, Yokohama; Tetsuya Taguchi, Kawasaki, and Noriaki Sanada, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

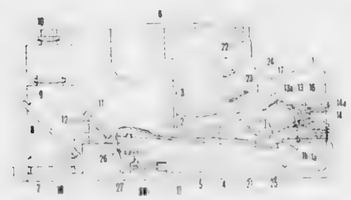
Filed Nov. 17, 1976, Ser. No. 742,581

Claims priority, application Japan, Nov. 20, 1975, 50/139681; Mar. 19, 1976, 51/30491

Int. Cl.² G03B *17/24*

U.S. Cl. 354—106 **10 Claims**

1. A camera equipped with a data recording device comprising: a view finder, a data source having data marks required for denoting photographing data; a means for selecting and setting the data marks to be recorded; a light source for illuminating the data marks arranged on the data source, means forming a first optical path for photographic insertion of data and a second optical path for displaying data in the view finder, light blocking means movable into and out of the first optical path, the optical paths being disposed inside a camera body independently of each other in such a manner that data signal light which is transmitted through said data marks is guided separately to a photosensitive film and also to a view finder optical



path, said blocking means causing the light to be transmitted along the two paths in different time stages; said data marks being directly visible along two directions; said photographic data insertion optical path and said data display optical path having at least portions extending along the respective directions and directly to the marks.

4,179,204

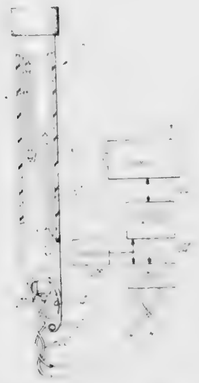
METHOD AND APPARATUS FOR PHOTOGRAPHING CHEMILUMINESCENT OBJECTS

Gregory A. Robinson, 3746 Hutchins Hill Dr., Orchard Lake, Mich. 48033

Filed Oct. 25, 1978, Ser. No. 954,706

Int. Cl.² F21V *9/16;* **G03B** *15/02, 15/03, 19/00*

U.S. Cl. 354—145 **4 Claims**



1. A method of photographing an object which is normally chemiluminescent having a hollow body of light transmitting material utilizing light produced internally of the object comprising the steps of:

removing an end of the body to empty out any chemiluminescent materials therein and to provide access to the interior of the body;

placing an electronic white flash light source within the body of the object;

placing a film of material around the source and within the body to conceal the source and to add color to the light output therefrom, and

simultaneously momentarily energizing the source to produce a light flash and opening the shutter of a camera aimed at the object to photograph the light flash output and the object itself.

4,179,205

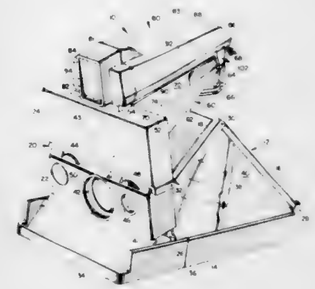
STROBE-LIGHT APPARATUS FOR USE WITH PHOTOGRAPHIC CAMERA

Fred M. Finnemore, North Reading, and Robert A. Goodwin, Braintree, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 8, 1978, Ser. No. 884,471

Int. Cl.² G03B *15/03*

U.S. Cl. 354—145 **2 Claims**



1. Photographic strobe-light apparatus for use with a camera of the type which includes a shutter-lens housing having a front wall behind which is mounted an automatic exposure control system and through which extends an objective-taking lens having an optical axis therethrough and a rearwardly extending top wall having a centrally disposed, downwardly extending, elongated flash socket which includes electrical contacts for providing an electrical signal from the automatic exposure control system to said apparatus during an exposure cycle of the camera, the camera additionally including a viewing device which includes an elongated cover of given width and a pair of spaced apart longitudinal side walls extending in a direction from the camera's front end to its rear end, said apparatus comprising:

an elongated housing including a front wall having an aperture therein, a rear wall spaced from said front wall, and a generally flat bottom wall extending between said front and rear walls;

a flash tube mounted within said elongated housing in predetermined alignment with said aperture of said front wall;

control means, responsive to the signal from the camera's automatic exposure control system, for energizing said flash tube;

an elongated, blade-like flash plug mounted adjacent said elongated housing's front wall and extending downwardly and generally perpendicular to said bottom wall of said elongated housing, said plug being structured to fit the camera's flash socket so that, when inserted into the flash socket, said flash plug and the flash socket, in combination, support the front end of said apparatus on the camera, said flash plug also having electrical contacts for mating with the electrical contacts of the flash socket to provide an electrically conducting path along which the signal from the camera's automatic exposure control system is transmitted to said apparatus's control means; and

means for releasably gripping the lower edges of the longitudinal side walls of the viewing device's cover, adjacent the rear end of the cover, to support the rear end of said apparatus adjacent the rear end of the viewing device's cover, said gripping means being located adjacent said rear wall of said elongated housing, depending downwardly from said elongated housing's bottom wall, and structured either to be initially slidably engaged with the cover's longitudinal side walls and then rotated with respect thereto so that said apparatus's rear end can be slid into engagement with the cover's rear end after which

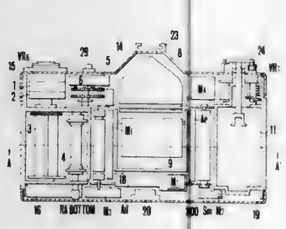
said apparatus can be rotated with respect to its rear end to insert said flash plug into the flash socket to complete the attachment of said apparatus to the camera or alternatively to initially effect a snap-type connection about the lower edges of the cover's longitudinal side walls so that said apparatus's rear end can be engaged with the cover's longitudinal side walls by pushing said apparatus rear end against the cover in a direction generally perpendicular to the cover after which said apparatus can be rotated with respect to its rear end to insert said flash plug into the flash socket to complete the attachment of said apparatus to the camera, said gripping means comprising a pair of spaced apart flexible fingers each cantilevered from said housing's bottom wall, extending downwardly therefrom and generally perpendicular thereto, each of said fingers having inwardly-facing sections shaped to fit a corresponding longitudinal lower edge of a side wall of the viewing device's cover, each finger additionally including wedge-shaped end portions for forcing said fingers away from one another in response to pushing said apparatus's rear end generally perpendicular to the viewing device's cover thereby allowing said apparatus's rear end to be snap-connected to the viewing device's cover, said gripping means additionally including camming means structured to automatically effect the release of said gripping means in response to rotation of said apparatus about its rear end by first detaching said apparatus front end from the camera flash socket and then rotating the apparatus front end with respect to its rear end, said camming means comprising a pair of spaced-apart, opposed planar camming surfaces one each of which is formed in a corresponding one of said wedge-shaped end portions of said flexible fingers, each of said planar camming surfaces being disposed at an oblique angle with respect to a corresponding longitudinal side wall of the viewing device's cover to force said fingers away from one another in response to rotating said apparatus.

4,179,206

SINGLE LENS REFLEX CAMERA WITH ELECTROMECHANICALLY INITIATED DIAPHRAGM AND SHUTTER CONTROL

Nobuo Tezuka, Tokyo; Masanori Uchidoi, Kawasaki; Yukio Iura, Yokosuka; Satoshi Watanabe, Inagi; Masayoshi Yamamichi, Kawasaki, and Hiroshi Aizawa, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 593,301, Jul. 7, 1975, Pat. No. 4,062,028. This application Apr. 26, 1977, Ser. No. 790,935
Claims priority, application Japan, Jul. 9, 1974, 49-78494; Jul. 9, 1974, 49-78495; Jul. 17, 1974, 49-83061; Jul. 17, 1974, 49-83062
The portion of the term of this patent subsequent to Dec. 6, 1994, has been disclaimed.
Int. Cl.² G03B *19/12*
U.S. Cl. 354—152 **2 Claims**



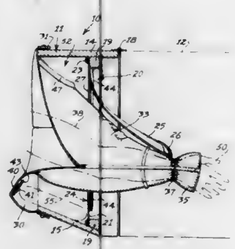
1. A single lens reflex camera comprising:
a shutter device,
shutter driving means for driving the shutter device,
a mirror device,
mirror driving means for driving the mirror device,
a diaphragm device,
diaphragm driving means for driving the diaphragm device,
starting means for starting the shutter driving means, the mirror driving means and the diaphragm driving means,
a magnetic release device for actuating the starting means and including an electromagnet, coupling means magnetically responsive to the electromagnet and coupled to the starting means for actuating the starting means in response to the energization of the electromagnet and release thereof, and
a dust proof case for casing the electromagnet and the coupling means, a portion of the coupling means projecting from the case for coupling to said starting means.

4,179,207

DAYLIGHT LOADER COVER DEVICE FOR PHOTOGRAPHIC PRINTING MACHINE

E. W. Phillips, P.O. Box 42, Hixson, Tenn. 37343

Filed Jan. 2, 1979, Ser. No. 124
Int. Cl.² G03D *17/00*
U.S. Cl. 354—308 **9 Claims**



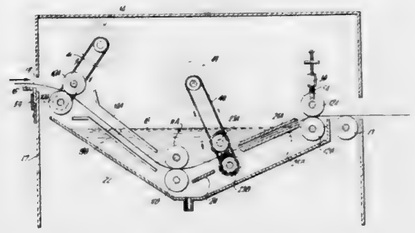
1. A daylight loader cover device adapted to cover the opening of the loader compartment of a photographic printing machine comprising:
(a) an open frame having a perimetric, light-impervious wall and spaced front and rear openings,
(b) means for mounting said frame upon the loader compartment so that said rear opening registers with the opening of the loader compartment in operative position,
(c) a rear curtain of light-impervious material attached to said frame closing said rear opening,
(d) a rear passage through said curtain, and means for opening and closing said passage,
(e) a front cover of flexible, light-impervious material attached to said frame and spaced in front of said rear curtain to form an antechamber between said front cover and said rear curtain,
(f) at least one flexible sleeve appendage projecting from and opening through said front cover and terminating in a cuff having a wrist opening, adapted to snugly fit around the wrist of a person loading the machine, said sleeve appendage being capable of being inverted and being long enough when inverted to project rearward through said antechamber and said curtain passage into the loader compartment of the photographic printing machine in operative position, and
(g) a front passage through said front cover, and means for opening and closing said front passage.

4,179,208

HORIZONTAL ONE STEP AUTOMATIC PLATE PROCESSOR

Peter V. Martino, 99-60 65th Rd., Rego Park, N.Y. 11374

Continuation of Ser. No. 785,985, Apr. 8, 1977, Pat. No. 4,119,991. This application Jun. 15, 1978, Ser. No. 915,742
The portion of the term of this patent subsequent to Oct. 10, 1995, has been disclaimed.
Int. Cl.² G03D *3/08*
U.S. Cl. 354—320 **16 Claims**



1. An apparatus for continuously processing a printing plate in a horizontal through-put manner, comprising:
a tank for containing the processing solution, said tank having an entry end and a delivery end;
a pair of substantially parallel entry rollers disposed adjacent the entry end of said tank, said rollers being disposed one above the other above the solution, with the top roller leading the bottom roller to form a downwardly directed nip for receiving the plate and driving it towards the processing solution;
a pair of substantially parallel orientation rollers disposed adjacent said entry rollers, said orientation rollers being disposed one above the other to form a nip for receiving said plate and transporting it in a horizontal direction, said orientation rollers being submerged in the processing solution;
plate deflector means disposed adjacent the nip of said orientation rollers within the processing solution for directing said plate upwardly;
a pair of brush rollers disposed adjacent said deflector means, and one above the other with the top brush roller trailing the bottom brush roller to form an upwardly directed nip for receiving the plate, directing it in an upward direction and scrubbing both sides of said plate, said nip being disposed within the solution such that the plate is fully submerged in the solution as it is being scrubbed, said brush rollers being adapted to rotate at a higher speed than said orientation rollers and entry rollers;
a pair of squeegee rollers disposed adjacent the said brush rollers, one above the other to form a nip for receiving the plate, removing excess solution from the plate, and transporting the plate in a horizontal direction towards the delivery end of the tank;
means for rotating said entry rollers, orientation rollers, and squeegee rollers at substantially the same speed;
and means for rotating said brush rollers at a speed greater than that of said entry rollers, orientation rollers, and squeegee rollers.

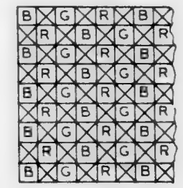
4,179,209

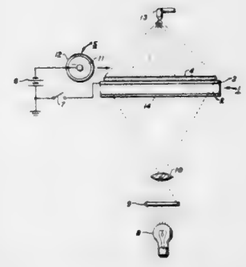
MULTICOLOR LINE SCREEN

Robert N. Goren, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 3, 1977, Ser. No. 821,455
Int. Cl.² G03G *15/01*; G03B *27/32*
U.S. Cl. 355—3 P **14 Claims**

1. In a photoelectrophoretic imaging device comprising in combination
a blocking electrode;
an injecting electrode;
inking means for applying a layer of a mono or polychromic photoelectrophoretic ink onto the injection electrode;
an imaging station wherein the blocking and injecting electrodes and applied ink are image-wise exposed, while in register, to a light pattern or image;
means for applying an electric field across the ink layer at least during image-wise exposure;





the improvement comprising a light filtering lattice arranged at the imaging station between the image-wise light pattern and the applied ink layer, said light filtering lattice being geometrically subdivided into repetitive areas of individual light reflective cells of at least three different colors, inclusive of red, green, blue and corresponding complementary colors, thereby forming positive and negative images on the respective electrodes as a plurality of separate but closely proximate loci corresponding to at least each cell of the filter lattice.

4,179,210

APPARATUS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES

Friedrich Bestenreiner, Grunwald; Dieter Giglberger, Unterhaching; Karl Hoeft, Germering, and Robert Kohler, Olching, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Sep. 26, 1977, Ser. No. 836,541
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644216
Int. Cl.² G03G *15/10*; G03D *3/02*
U.S. Cl. 355—10 **11 Claims**

1. In an apparatus for developing latent electrostatic images on carrier sheets, the combination of means for conveying carrier sheets in a predetermined direction along a predetermined path; electrode means adjacent to and defining with a carrier sheet in said path an elongated gap, said electrode means having at least one fluid-admitting first orifice communicating with said gap and at least two fluid-evacuating second orifices communicating with said gap, one of said second orifices being located ahead of and the other of said second orifices being located behind said first orifice, as considered in said direction, and said one second orifice being nearer to said

first orifice than said other second orifice; a source of pressurized developing fluid; and means for connecting said source with said first orifice so that the fluid issuing from said first orifice forms first and second streams flowing in and counter to said direction to respectively enter said other and said one second orifice whereby the speed of said first stream exceeds



the speed of said second stream as a result of movement of the carrier sheet in said direction, the distances between said first orifice and said second orifices being such that the interval of dwell of each increment of said first stream in said gap at least approximates the interval of dwell of each increment of said second stream in said gap.

4,179,211

ELECTROSTATIC PHOTOGRAPHIC COPYING MACHINE

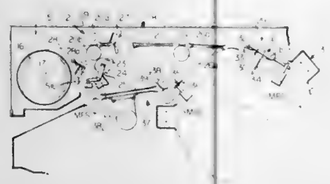
Hiroshi Kimura, Neyagawa; Takaichi Kitagawa, Takatsuki; Masahiko Hisajima, Suita; Shoji Yoshikado, Sakai, and Tatsuo Aizawa, Osaka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan and Mita Industrial Co., Ltd., Osaka, Japan

Filed Jun. 2, 1977, Ser. No. 802,973

Claims priority, application Japan, Jun. 2, 1976, 51-72007[U]; Jun. 17, 1976, 51-79470[U]; Jun. 17, 1976, 51-79471[U]; Jun. 17, 1976, 51-96015[U]; Jun. 17, 1976, 51-96016[U]; Jun. 17, 1976, 51-96017[U]; Jun. 28, 1976, 51-76188; Oct. 4, 1976, 51-119600

Int. Cl.[2] **G03G** *15/00*

U.S. Cl. 355—14 R **102 Claims**



1. An electrostatic photographic copying machine comprising:

a rotatable master holding body adapted to have attached to the peripheral surface thereof an electrostatic photographic sensitive master paper;

a charging apparatus, a development apparatus and a transfer apparatus positioned along the passage of rotation of said surface of said master holding body;

an optical system to project an image of a copying original paper onto the surface of said master paper charged by said charging apparatus;

a transfer paper carrying passage to supply transfer paper to said transfer apparatus and to discharge transfer paper therefrom at a position whereat said image is transferred from said master paper to said transfer paper;

a fixing apparatus to fix the transferred image onto said transfer paper;

a master paper supply;

means for removing master paper from said surface of said master holding body;

means for feeding new master paper from said supply to said surface of said master holding body to replace the removed master paper; and

means for rotating said master holding body in a first forward direction during normal operation of the machine and during feeding of said new master paper to said master holding body and in a second reverse direction during removal of said master paper from said master holding body.

4,179,212

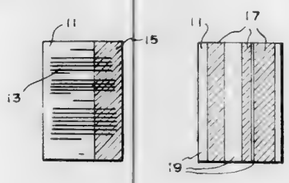
DEMAND PUBLISHING ROYALTY ACCOUNTING SYSTEM

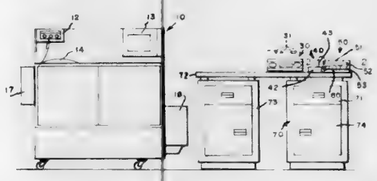
Roy J. Lahr, Fairfield, Conn., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 6, 1977, Ser. No. 830,928

Int. Cl.[2] **G03G** *15/00*

U.S. Cl. 355—14 R **16 Claims**





1. An information coded paper document comprising:

(a) a paper base sheet;

(b) a plurality of invisible, electrically conductive, substantially parallel bands on said base sheet and having information coded thereon in units of specific electrical conductivity modified in accordance with an intelligence code;

(c) visual indicia on said base sheet and

(d) wherein said document may be reproduced by a compatible document copier which senses the coded information thereon.

4,179,213

VECTOR PINNING IN AN ELECTROPHOTOGRAPHIC MACHINE

Carl A. Queener, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 10, 1978, Ser. No. 894,954

Int. Cl.[2] **G03G** *15/00*

U.S. Cl. 355—14 R **15 Claims**

8. Apparatus for maintaining a white, gray or otherwise shaded or colored vector in an electrophotographic machine where said vector is the value of the image voltage on the photoconductor produced by imaging a single-shaded surface minus the developer bias voltage comprising:

a photoconductor;

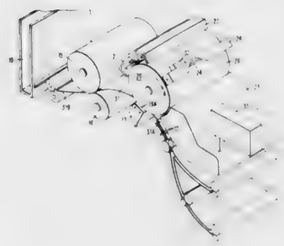
a charge corona for laying down a relatively uniform charge on said photoconductor;

an erase lamp means for producing a discharged reference test area in the area of the photoconductor used for document reproductions;

a document lamp means for illuminating a single-shaded original for producing a charged test area in the area of the photoconductor used for document reproductions;

developing means for toning said charged test area;

reflectivity-sensing means for viewing said reference test area and producing a reference voltage therefrom;





said reflectivity means also viewing said charged test area and producing a representative image voltage therefrom;

first circuit means for comparing said reference and representative image voltages; and

second circuit means for adjusting said apparatus for maintaining said vector to maintain the level of said vector within an acceptable predetermined range.

4,179,214

PHOTOGRAPHIC PRINTER CONTROL SYSTEM

John Poné, Jr., Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Jan. 9, 1978, Ser. No. 867,897

Int. Cl.[2] **G03B** *27/78*

U.S. Cl. 355—35 **10 Claims**



1. In a photographic printer, the improvement comprising:

storage means for storing alterable digital control information used to control printing, the control information including printer operating parameters for a plurality of setups for different film/photosensitive medium combinations;

digital processor means for controlling operation of the printer as a function of the stored alterable digital control information, the digital processor means controlling operation of the printer on first and second working levels, the first working level including initiating printing, applying user selected density corrections, selection of an automatic or manual printing mode, and selection of one of the plurality of setups, and the second working level including altering the alterable digital control information;

user input means for supplying input signals to the digital processor means to affect operation on the first or second working levels; and

security means for normally permitting input signals supplied by the user input means to affect operation of the printer only on the first working level, and permitting input signals supplied by the user input means to affect operation of the printer on the second working level only if an authorization condition has been met.

4,179,215

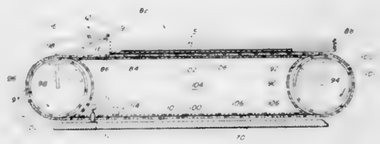
RECIRCULATING DOCUMENT FEEDER

Charles T. Hage, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 24, 1978, Ser. No. 927,257

Int. Cl.[2] **G03B** *27/48, 27/50;* **G03G** *15/00;* **B65H** *5/22*

U.S. Cl. 355—50 **9 Claims**



1. In an apparatus for feeding document sheets seriatim to an exposure station of a copier for exposure, including support means for receiving and holding a plurality of document sheets, means for removing the sheets sequentially from the support means and means for returning the removed sheets to the support means following a plurality of exposures at the exposure station, the improvement comprising:

means for repeatedly transporting the removed sheets seriatim to the exposure station for exposure prior to returning the removed sheets to said support means.

4,179,216

APPARATUS FOR MEASURING THE PROFILE OF A RAILROAD TUNNEL

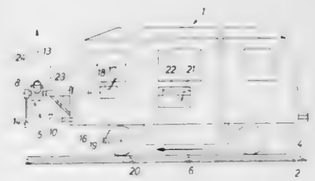
Josef Theurer, and Klaus Riessberger, both of Vienna, Austria assignors to Franz Plasser Bahnbaumaschinen Industriegesellschaft m.b. H; Vienna, Austria

Filed May 18, 1978, Ser. No. 907,813

Claims priority, application Austria, May 31, 1977, 3848/77

Int. Cl.[2] **G01C** *3/08;* **E01B** *35/02*

U.S. Cl. 356—4 **11 Claims**



1. A mobile apparatus for measuring and indicating the profile of a bounded space surrounding a track having two rails and a longitudinal axis intermediate and parallel to the track rails, which comprises

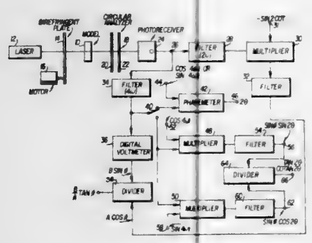
(a) a distance measuring instrument capable of continuously receiving a signal corresponding to the distance of the profile of the bounded space from the instrument,

(b) a car mounted for mobility on the track rails and supporting the instrument for pivoting about an axis extending parallel to the longitudinal track axis,
(c) a drive arranged to pivot the instrument about the axis extending parallel to the longitudinal track axis whereby the instrument may sweep the profile of the bounded space and continuously receive the signal, (1) the drive comprising a rotatable axle extending in the pivoting axis,
(d) a drive for moving the car on the track rails,
(e) a transmission means connecting the rotatable axle to the car drive for pivoting the distance measuring instrument in synchronism with the car drive, and
(f) an indicating instrument operatively connected to the distance measuring instrument and capable of indicating the signal received thereby.

4,179,217
DYNAMIC PHOTOELASTICIMETER WITH ROTATING BIREFRINGENT ELEMENT

André J. Robert, Paris; Jean C. Filippini, Grenoble, and Michel Ferré, Palaiseau, all of France, assignors to Etat Francais as represented by the Delegue General pour l'armement, Paris, France

Filed Feb. 14, 1978, Ser. No. 877,758
Claims priority, application France, Feb. 21, 1977, 77 04871
Int. Cl.[2] G01J *4/04*; G01L *1/24*
U.S. Cl. 356—33 **5 Claims**



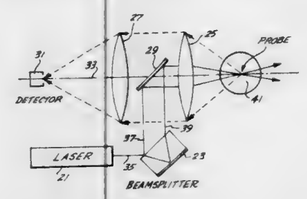
1. A dynamic photoelasticimeter for measuring as a function of time the birefringent parameters θ (t) and θ (t) of a model at a point subjected to stresses comprising, in succession
a birefringent plate rotatable at a constant angular speed;
a circular analyzer, said model being interposed between said birefringent plate and said circular analyzer;
a photoelectric receiver;
means for detecting the output signals from said photoelectric receiver at frequencies of 2ω and 4ω;
means for determining the ratio of the amplitudes of said 2ω and 4ω output signals; and
means for detecting the phase of said 4ω signal with respect to a reference frequency.

4,179,218
PARTICLE SIZE ANALYZER

Joachim C. Erdmann, Seattle; Robert I. Gellert, Redmond, and Richard L. Skaugset, Kennewick, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 15, 1978, Ser. No. 905,793
Int. Cl.[2] G01N *21/26*
U.S. Cl. 356—336 **16 Claims**

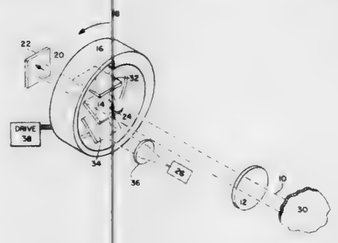
1. A particle size analyzer comprising:
a crossed beam laser anemometer that produces a non-contacting probe formed of a series of fringes that produce blinking scattered light when a particle passes transversely through the series of fringes, detects the blinking scattered light produced by particles passing through said fringes and produces a fluctuating output signal having a magnitude related to the magnitude of the light scattered by particles passing through said fringes;
analyzing means for: (a) receiving the fluctuating output signal of said crossed beam laser anemometer; (b) verifying that a particle causing a fluctuating output signal has passed through a number of fringes of said probe above a predetermined number; and (c) producing a coded output signal if the particle causing said fluctuating output signal has passed through said number of fringes, said coded output being a function of the magnitude of said fluctuating output signal:
storage means, including a plurality of data bins, for: (a) receiving said coded output of said analyzing means; (b) reading out the data stored in a particular data bin each time a coded output occurs; (c) changing said data; and (d) writing the changed data back into the same data bin; and,
readout means connected to said storage means for sequentially reading out the data stored in said data bins.



4,179,219
REVOLVING MIRROR SCANNING INTERFEROMETER

Stanley T. Smith, 612 Weiman, Ridgecrest, Calif. 93555

Filed Apr. 10, 1978, Ser. No. 894,675
Int. Cl.[2] G01B *9/02*; G01J *3/00*
U.S. Cl. 356—346 **8 Claims**

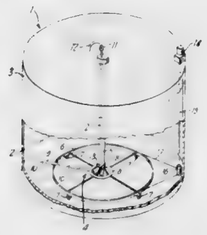


1. A spectral scanning interferometer of a light beam from a source comprising:
a beamsplitter in the path of said light beam for dividing said light beam into two components, a reflected component and a transmitted component,
a fixed mirror positioned in the path of said transmitted component so that said transmitted component is reflected back to said beamsplitter;
an aspheric cylindrical drum mirror positioned around said beamsplitter such that whereever said reflected component impinges on said drum mirror said reflected component is reflected back to said beamsplitter;
means attached to said drum mirror for rotating said drum mirror, whereby said component reflected from said beamsplitter to said drum mirror and back travels a different path length for every possible orientation of said drum mirror as it rotates;
an output mirror positioned in the path of the light from said beamsplitter caused by the recombining of said two components at said beamsplitter for reflecting the image of said recombined components away from said drum mirror; and
means for detecting said reflected image optically positioned in line with said output mirror.

4,179,220
APPARATUS FOR ANAEROBIC DIGESTION OF BIODEGRADABLE WASTE MATERIAL

George M. Rippon, Ashford, England, assignor to Biomechanics Limited, Ashford, England

Filed Jun. 28, 1978, Ser. No. 919,809
Claims priority, application United Kingdom, Jul. 5, 1977, 28183/77
Int. Cl.[2] B01F *7/16*
U.S. Cl. 366—102 **8 Claims**



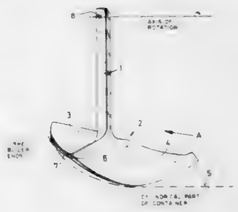
1. Apparatus for anaerobic digestion of biodegradable waste material comprising a closed substantially vertical cylindrical tank having a central axis, a gas delivery duct having an outlet disposed near to the central axis of the tank and to the base of the tank, a mixing assembly located within the tank for rotation about the central axis of the tank, the mixing assembly comprising an annular gas-holding member which has an open lower surface and which defines an annulus concentric with the said central axis, a part of the annulus defined by the gas-holding member being positioned above the outlet of the gas delivery duct, and a gas distribution arm extending substantially radially outwardly from the said gas-holding member towards the periphery of the tank and having exhaust apertures spaced along the length of the arm for delivering gas from the gas-holding member at different radial distances along the arm, supporting means for supporting the gas-holding member and the gas distribution arm near the base of the tank, and drive means for causing the mixing assembly to be rotated about the said central axis.

4,179,221
PLOUGH-SHARE-LIKE MIXING TOOL

Roland Lucke, Paderborn-Wewer, Fed. Rep. of Germany, assignor to Gebruder Lodige Maschinenbaugesellschaft mbH, Paderborn, Fed. Rep. of Germany

Filed Jun. 13, 1978, Ser. No. 915,251
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1977, 2729477
Int. Cl.[2] B01F *7/00*
U.S. Cl. 366—309 **5 Claims**

1. A plough-share-like mixing tool for a mixing mechanism rotatably mounted in a mixer with a cylindrical mixing container having dished boiler ends, which mixing tool is carried at the outer end of a radial arm adapted to be mounted to the shaft of a mixing mechanism and with the radial outer surfaces thereof brushing the internal wall of the mixing container, the radially outermost portion of said mixing tool being asymmetrical and forming a convexly curved envelope corresponding to the curvature of the internal surface of the dished boiler end, one section of said mixing tool being, in plan view, disposed on one side of said radial arm and being provided with an extension to penetrate into the cylindrical part of the container, the other section of said tool being, in plan view, disposed on the opposite side of said radial arm and provided with a shaving portion to produce a shaving action on a dished boiler end.



4,179,222
FLOW TURBULENCE GENERATING AND MIXING DEVICE

John R. Strom; George W. Finch, and Harvey W. Weyrick, all of Seattle, Wash., assignors to Systematix Controls, Inc., Seattle, Wash.

Filed Jan. 11, 1978, Ser. No. 868,490
Int. Cl.[2] B01F *5/00*
U.S. Cl. 366—337 **3 Claims**



1. In combination with an elongated tubular duct adapted to conduct fluid axially therein, turbulent mixing apparatus comprising flow divider means fixedly mounted in said duct comprising a plurality of pairs of elongated septum panels mounted at successively spaced locations along said duct, the respective panels of each such pair having substantially planar first end portions constituting a minor fraction of the lengths of such panels and disposed in longitudinally overlapping and mutually transverse relationship, intersecting along the duct axis, said septum panels of each pair further having second end portions projecting longitudinally from the respective first end portions and each including two longitudinally coextending panel elements transversely angled in mutually divergent relationship, with inner edges forming a progressively widening gap between them along the duct axis and with outer edges extending along the duct interior wall, the angling of the two panel elements of one such second end portion being in the opposite hand from that of the two panel elements of the other second end portion as viewed in the same direction along the duct, the transversely angled panel elements of each septum panel pair longitudinally overlapping those of respectively adjacent septum panel pairs.

V 9 8 9 N 3 D E 1 8 7 9 UMI

4,179,223

PRINTER CENTER SENSING MECHANISM

Okun Kwan, Trumbull, and Nicholas Zaccagnino, Stamford, both of Conn., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 702,279, Jul. 2, 1976, abandoned. This application Sep. 22, 1977, Ser. No. 835,559
Int. Cl.[2] B41J *19/14, 19/18, 21/00, 21/08*
U.S. Cl. 400—320 **19 Claims**



5. In a printer mechanism, a center sensing system comprising:

a frame for supporting components of the mechanism;

a movable carriage for supporting a printer head;

means mounted to the frame for guiding the motion of the carriage;

left, right and intermediately disposed photodetecting means mounted in colinear spaced relationship to each other, and stationary with respect to the frame;

shutter means mounted to the carriage for movement therewith, the shutter means detected by the respective photodetecting means when the carriage passes by corresponding left, right and intermediate margins of a document being printed by the printer head; and

means connected to the left, right and intermediate photodetecting means for feeding detection signals therefrom to logic control circuits for selective elimination of full travel by said carriage on one or another side of said intermediate margin position by providing at least one additional optional starting and stopping point for a line of print intermediate said left and right margin positions.

4,179,224

SELF-CENTERING PRESSURE ROLLER FOR SHEET FEEDING MECHANISM

Edward Feldman, Teaneck, and Heinz R. Guenther, Cedar Knolls, both of N.J., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 754,861, Dec. 27, 1976, abandoned. This application Mar. 30, 1978, Ser. No. 892,006
Int. Cl.[2] B41J *13/02*
U.S. Cl. 400—637 **15 Claims**

1. A paper web feed apparatus comprising, in combination:

a platen mounted for rotation about a rotation axis;

a pair of pressure rollers each rotatable about a rotation axis;

a roller support bracket for supporting said pressure rollers for paper web against the platen; said rotation axis of each said roller is parallel to said rotation axis of the other said roller;

bracket support means operative to support said bracket in a manner constraining said bracket to linear movement along a line relative to a fixed point in space and permitting rotation of said bracket in three orthogonal degrees of freedom about said fixed point in space independently of the extent of said linear movement; and

said platen, said pressure rollers and said bracket are dimensioned so that two unique lines may be drawn in a plane including a line colinear with said linear movement of said bracket in one degree of freedom, each said unique line being drawn perpendicularly through said platen rotation axis and through the rotation axis of one said pressure roller and two further unique lines may be drawn in said plane each perpendicular to one of said two lines and perpendicular to one said pressure roller rotation axis, said two further lines intersecting each other at a second point in space so that said fixed point in space lies between said second point in space and said platen rotation axis.

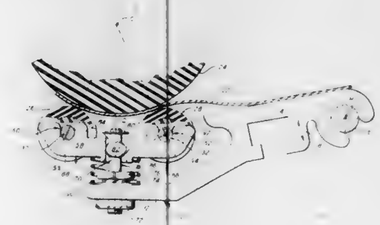
5. A paper feed mechanism comprising, in combination:

a platen mounted for rotation about a longitudinal rotation axis;

a pair of pressure rollers, each said roller being generally cylindrical in shape with a longitudinal rotation axis, a centrally located undercut portion and an elevated end portion on either side of said centrally located portion;

a roller mounting bracket for supporting said pair of pressure rollers, each said roller being supported for rotation about its longitudinal rotation axis and disposed parallel to the longitudinal rotation axis of the other said roller;

a bracket positioning means permitting linear movement of



said bracket in one degree of freedom relative to a fixed point in space and permitting rotation of said bracket in three orthogonal rotational degrees of freedom about said fixed point in space independently of the extent of linear movement;

means to urge said bracket toward said platen to place each said pressure roller into pressure contact with said platen;

said platen, said pressure rollers and said bracket are dimensioned so that two lines may be drawn in a given plane including a line co-linear with said linear movement of said bracket, each said line being drawn perpendicularly through said platen rotation axis and through the rotation axis of one said pressure roller and two further lines may be drawn in said plane each perpendicular to one of said two lines, said two further lines intersecting each other at a second point in space so that said fixed point in space lies between said second point in space and said platen rotation axis; and

said bracket positioning means comprising a stud with a longitudinal axis on which said bracket is free to move longitudinally along said stud, to rotate about the longitudinal axis of said stud and to pivot about any axis through and perpendicular to the longitudinal stud axis.

4,179,225

QUICKLY DETACHABLE COUPLING

Alf A. Asplund, Kristineham, Sweden, assignor to Agergards Maskiner AB, Karlstad, Sweden

Continuation-in-part of Ser. No. 762,214, Jan. 24, 1977. This application Jul. 28, 1978, Ser. No. 929,070
Int. Cl.[2] B25G *3/18*
U.S. Cl. 403—322 **3 Claims**

1. Means for coupling a working vehicle to a work attachment to be pulled by said vehicle, comprising

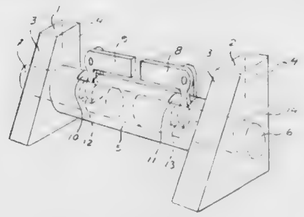
(a) a first assembly comprising

(i) two wedge shaped members each having a transverse orifice in its central portion;

(ii) an at least partly hollow pipe member extending into said transverse orifice of each of said wedge members to provide a fixed connection therebetween;

(iii) two locking bars mounted for sliding movement in opposite ends of said hollow pipe member, each said locking bar having a recess therein;

(iv) two lever means pivotally mounted on said pipe member and having depending portions each engaging a said recess in a said locking bar, whereby said locking bars are slidable within said hollow pipe member; and



(b) a second assembly comprising

(i) a set of two substantially parallel members each having an interior cavity congruent with that of each of said wedge-shaped members, for receiving said wedge-shaped members during coupling;

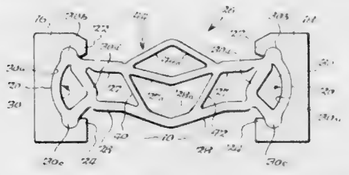
(ii) an orifice in the wall of each of said last-mentioned members facing away from the other of said last-mentioned members, said orifices being in substantial alignment with said locking bars, whereby upon sliding movement of said locking bars said ends thereof are received in said orifices, for coupling said working vehicle to said work attachment.

4,179,226

ELASTOMERIC EXPANSION SEAL

Guy S. Puccio, Snyder, N.Y., assignor to Acme Highway Products Corporation, Amherst, N.Y.

Filed Oct. 2, 1978, Ser. No. 947,489
Int. Cl.[2] E01C *11/10*
U.S. Cl. 404—64 **7 Claims**



1. An expansion joint seal for bridging and sealing a gap between a pair of spaced-apart elongated edge members being respectively disposed in a pair of structural slabs to define the gap therebetween, each said edge member having in cross-section a generally C-shaped cavity with a preselected radius of curvature, each said cavity opening towards said gap defined between said edge members wherein each said cavity opening is defined between opposed projecting portions of said respective edge members spaced from each other at a distance less than the maximum dimension within said cavity taken generally parallel to said opening, said seal comprising:

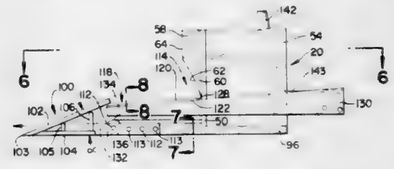
a web portion spanning said gap and a mounting bead portion extending along each longitudinal edge of said web portion wherein each of said mounting bead portions is received within said cavity of a corresponding edge member, and each said mounting bead having in cross-section an outer surface portion for matching engagement with said cavity with opposed portions of said mounting bead correspondingly abutting said opposed projecting portions of said edge member whereby relative lateral movement of said mounting bead with respect to said edge member is resisted and, said web portion including upper and lower walls spaced apart from one another to span said gap and being attached along their longitudinal edges to correspondingly upper and lower portions of said mounting bead portions wherein each of said walls includes a longitudinal, downwardly extending fold located substantially along the center line of said gap, said web portion further including a pair of strut members extending between said walls in a downwardly converging relationship with respect to one another for coordinating the movement of said walls during expansion and contraction of said seal, and the upper surface of said upper wall having an inverted V-shaped crown portion joined thereto and located substantially along the center line of said gap whereby the apex of said crown portion is adapted to remain disposed below the upper surface of the structural slabs associated therewith throughout the operational range of said seal.

4,179,227

DYNAMIC PLOW ASSEMBLY AND METHOD OF OPERATING SAME

James L. Child, Jr.; James L. Fouss, and Erwin K. Nowicki, all of Findlay, Ohio, assignors to Hancor, Inc., Findlay, Ohio

Filed Aug. 17, 1977, Ser. No. 825,192
Int. Cl.[2] F16L *1/00;* **E02F** *5/10*
U.S. Cl. 405—182 **42 Claims**



1. A method of generating a trench-like area in the soil comprising the steps of:

(a) providing a first plow member having a base, a tapered forward nose portion, and a top section extending rearwardly from said nose portion over said base;

(b) positioning said first plow member at a predetermined distance beneath the surface of the soil with its base extending generally horizontally;

(c) moving said plow member through the soil in the direction of its nose portion;

(d) oscillating said top section and rupturing the soil above said plow member by pivotally moving said top section up and down in a generally vertical plane at a rate in the range of 20 to 120 cycles per minute simultaneously with said step of moving said plow member through the soil; and

(e) each said cycle being from a first position in which said top section extends generally parallel to said base then upwardly through an angle in the range of 15 to 30 degrees to a second position and then back to said first position.

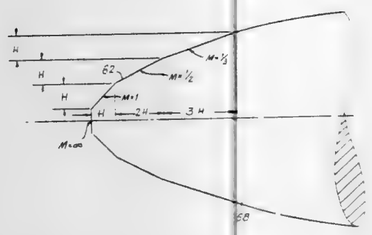
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4,179,228

NUMERICALLY CONTROLLED MILLING WITH PARABOLIC PROFILE TOOLS FOR SURFACE SMOOTHNESS

Joseph A. Ross, Fort Salonga, and Howard K. Stern, Greenlawn, both of N.Y., assignors to Solid Photography Inc., Melville, N.Y.

Division of Ser. No. 801,818, May 31, 1977. This application Jul. 21, 1978, Ser. No. 926,930
Int. Cl.[2] B23C *5/04*
U.S. Cl. 407—57 **2 Claims**



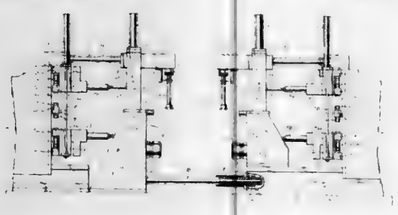
1. A cutting tool with cutting edges having a parabolic profile, said profile being comprised of cutting surfaces interconnected to form said parabolic profile, the slopes on said cutting tool varying in value from zero to infinity, said cutting tool having an axis of rotation and a free end, said cutting tool having cutting edges with slopes varying in value from substantially infinity as said free end of said tool to zero at a predetermined distance along said axis of rotation from the end of said tool, said tool being selectively positioned for locating the cutting surface conforming to the desired slope against the surface to be machined.

4,179,229

MULTIPLE SPINDLE DRILLING MACHINE FOR WIDE FLANGE BEAMS

Toshikatsu Kitagawa, Seki, Japan, assignor to Miyakawa Industry Company Limited, Gifu, Japan

Filed Dec. 19, 1977, Ser. No. 861,550
Int. Cl.[2] B23B *41/00, 39/18, 39/22*
U.S. Cl. 408—39 **9 Claims**



1. A multiple spindle drilling machine having a frame for receiving wide flange beams at a work station, comprising in combination:

(a) guide members vertically movable and vertically disposed on a pair of gear boxes (**21,27**) at said work station;

(b) horizontal drills disposed on each guide member in two upper and lower rows (**111, 112, 121, 122**), so arranged and disposed that when they are moved and brought close to a wide flange beam at said work station together with said gear boxes, both flanges of the wide flange beam are drilled;

(c) at least one pair of gripping members (**31**) mounted on inner side faces of each gear box to grip and immovably fix a wide flange beam from both sides (**101**) thereof at said work station previous to the drilling operation;

(d) sensing means (**69**) having a lower end (**71**) and a top end and being capable of bearing against a web surface of a wide flange beam, said sensing means (**69**) being attached to a part of each guide member;

(e) a centering device for vertically moving said sensing means (**69**) together with the guide member and stopping said vertical movement when the sensing means bears against the web surface of the wide flange beam so that the central position between the two rows of the drills is made to agree with the center of the thickness of the web of the wide flange beam, said centering device including, a fixed stand (**59**) fixed to at least one of said gripping members, and a connecting member (**60**) with inner and outer end portions vertically supported and vertically movable on said fixed stand, said sensing means being attached to said connecting member inner end portion, said connecting member outer end portion being connected to said guide member; and,

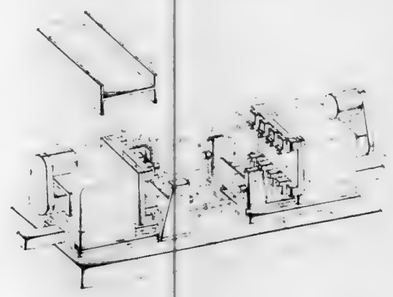
(f) a cylinder device (**62**) mounted on said fixed stand to move said connecting member in the vertical direction so that said sensing means is moved downwards through said connecting member by said cylinder device so that the lower end of said sensing means bears against the upper face of the web of the wide flange beam.

4,179,230

MULTIPLE SPINDLE DRILLING MACHINE FOR WIDE FLANGE BEAMS

Toshikatsu Kitagawa, Seki, Japan, assignor to Miyakawa Industry Company Limited, Gifu, Japan

Filed Feb. 6, 1978, Ser. No. 875,299
Int. Cl.[2] B23B *41/00, 39/22*
U.S. Cl. 408—39 **7 Claims**



1. A multiple spindle drilling machine for wide flange beams, said beams having an elongated flat central portion (**102**) with peripheral edges and wide flanges (**101**) at right angles to said central portion (**102**) and extending above and below said edges so that the cross-sectional configuration of said beam is H-shaped, said machine comprising in combination:

(a) a defined travel path with input and output ends including a lower bed (**2**) and an upper work station;

(b) at least one pair of spaced apart gripping members (**31**) mounted over said bed on both sides of said travel path with horizontal plates (**32**) thereon;

(c) at least one pair of flange support rollers (**36**) with at least one of said rollers (**36**) being attached to said gripping members (**31**), said rollers being disposed towards said lower bed (**2**) so as to receive said beam flanges (**101**) thereon;

(d) guide means (**20**) mounted on said bed including rails (**25**) for movement normal to and along said travel path between said input and output ends, gear box means (**21**) mounted on said rails supporting drills (**23**) so that said drills (**23**) can move in the longitudinal and withwide direction of said beam for drilling said beam; and

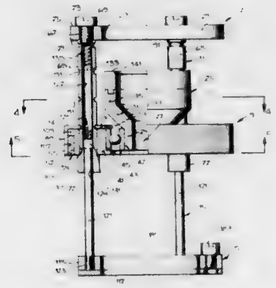
(e) moving means for moving at least one of said beam support rollers (**36**), said gripping members (**31**) and said gear boxes (**21**) integrally in the widthwise direction of the beam, said moving means including a sliding member disposed on the bed of the machine, said sliding member supporting said gear box and gripping member, and a screw lever (**38**) stretched across said bed (**2**) coupling said gripping members so as to move said gripping members with respect to each other, said screw lever (**38**) being rotatably inserted into said sliding member, and, motor means for driving and rotating said screw lever.

4,179,231

DRILL GUIDE

Terence B. Hadden, 1745 De Sève, Apt. 3, Montreal, Quebec, Canada (H4E 2B1)

Filed Oct. 30, 1978, Ser. No. 956,196
Int. Cl.[2] B23B *39/00*
U.S. Cl. 408—112 **6 Claims**



1. A drill guide comprising:

(a) drill holding means including a leg support, drill centering means and a set of tubular legs extending from the leg support to the centering means for connecting the same together, said drill centering means being slidably mounted on the legs for movement toward or away from the leg support and including means for fixing the drill,

(b) guide positioning means,

(c) a set of rods slidably mounted in the tubular legs for movably connecting the drill holding means and guide positioning means together, and

(d) manually operable means on the drill holding means for use in adjusting the distance between the positioning means and the centering means; said manually operable means comprising a locking member on the drill centering means and spaced-apart stops on the legs, said locking member being rotatably mounted on the drill centering means, and including means provided for retaining the locking member in a locked position, said locking member being operable to selectively cooperate with the stops to lock the drill centering means in a selected position on the legs.

4,179,232

MATERIAL CONVEYOR

Douglas E. Laseter, Jackson, Miss.

Filed Apr. 18, 1978, Ser. No. 897,338
Int. Cl.[2] B65G *53/46*
U.S. Cl. 406—63 **9 Claims**

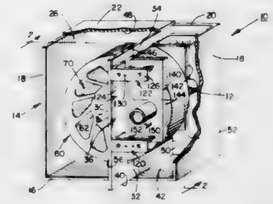
1. A device for conveying granular material comprising:

a housing having a material entrance defined therein;

an induction wheel rotatably mounted on said housing, said wheel having a plurality of elongate open-ended chambers defined therein;

a pair of wipers mounted on said housing adjacent said wheel and located so that said wheel passes between said wipers to gently remove excess material from the ends of said chambers without damaging that removed material, said pair of wipers including wipers spaced from each other to define a material escape path through which said gently removed material passes;

sealing means mounted on said housing to sealingly cover said chamber ends in a secure manner, said sealing means being separate from and spaced apart from said wipers to be located so that a chamber on said induction wheel



passes between said pair of wipers prior to passing said sealing means, said wipers removing excess material from adjacent the ends of a chamber before such chamber is sealed by said sealing means so that material does not interfere with any seal formed between said sealing means and said chamber ends such that said chambers are securely closed to minimize loss of any gas introduced into said chambers for moving material out of said chambers;

gas introducing means connected to said sealing means to introduce gas from a source into a chamber; and

material transport means connected to said sealing means to receive gas and material from said chambers for transporting said material away from said induction wheel.

4,179,233

VERTICAL MOTION COMPENSATED CRANE APPARATUS

Raymond J. Bromell, Dallas, and John N. J. Sideris, Grand Prairie, both of Tex., assignors to National Advanced Drilling Machines, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 815,529, Jul. 14, 1977, abandoned. This application Sep. 30, 1977, Ser. No. 838,085
Int. Cl.[2] B66C *23/76*
U.S. Cl. 414—139 **15 Claims**

1. Load transfer apparatus comprising:

(a) boom means secured to a first platform and extending over a second platform,

(b) hoist means comprising a winch, a boom sheave secured to said boom means above said second platform, and a cable secured to said winch and passing over said boom sheave to support load hook means above said second platform,

(c) relative vertical motion compensation means secured to said boom means comprising a cylinder and piston assembly operative to vary the vertical distance between said boom sheave and said load hook means in response to relative vertical movement between said first platform and said second platform,

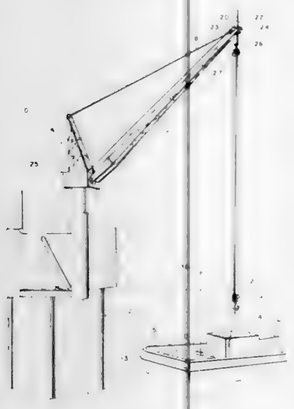
(d) means to selectively supply fluid to and remove fluid from said cylinder, thereby to raise and lower said piston in said cylinder,

(e) first sheave means supported by said piston,

(f) second sheave means supporting said load hook means, said cable being reeved between said first and second sheave means,

(g) sensing means to detect relative vertical movement be-

tween said first platform and said second platform and generate a signal in response to said relative movement, and



(h) control means responsive to said signal and operative in response thereto to control said means to selectively supply fluid to and remove fluid from said cylinder.

4,179,234

BLENDING FLOWABLE SOLID MATERIALS

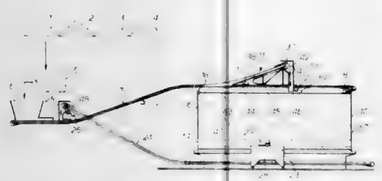
William Young, Swanley, England, assignor to Davy International (Oil & Chemicals) Limited, London, England

Filed Mar. 14, 1978, Ser. No. 886,562

Claims priority, application United Kingdom, Mar. 15, 1977, 10922/77

Int. Cl.[2] **B65G** *65/32*

U.S. Cl. 414—268 **23 Claims**



10. Apparatus for blending flowable solid materials comprising means defining a first storage location; feed means for feeding the flowable solid materials continuously in turn to the first storage location so as to establish at the first storage location an elongate first charge of the materials to be blended of substantially uniform height comprising a plurality of contiguous transverse first bands, each extending from top to bottom of the first charge and each being comprised of a different flowable solid material from that of the or each adjacent first band; first extractor means longitudinally traversable with respect to the first storage location for removing material from the first charge; means for traversing the first extractor means longitudinally of the first charge in a plurality of first passes and arranged to remove material from each first band in turn in each first pass, the quantity of material removed from the first charge in each first pass being small in comparison to the initial volume of the first charge; means defining a second storage location; conveying means for conveying to the second storage location material removed from the first charge and arranged so as to establish at the second storage location an elongate second charge of substantially uniform height comprising a plurality of contiguous transverse second bands, each extending from top to bottom of the second charge and each being composed substantially of material removed from a corresponding first band; second extractor means traversable with respect to the second storage location for removing material from the second charge; and means for traversing the second extractor means longitudinally of the second charge in a plurality of second passes and arranged so as to remove material from each second band in turn during each second pass, the quantity of material removed from the second charge on each second pass being small in comparison to the initial volume of the second charge.

4,179,235

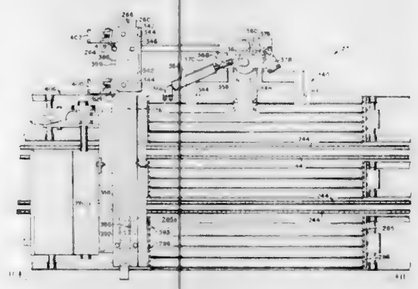
PAN STACK RETRIEVER DOLLY

William E. Lanham; William E. Lanham, Jr., and Gene C. Miller, all of Decatur, Ga., assignors to Lanham Machinery Company, Inc., Atlanta, Ga.

Division of Ser. No. 584,026, Jun. 4, 1974, abandoned, which is a continuation of Ser. No. 325,108, Jan. 19, 1973, Pat. No. 3,937,335, and a continuation-in-part of Ser. No. 243,074, Apr. 11, 1972, abandoned. This application Sep. 8, 1977, Ser. No. 831,481

Int. Cl.[2] **B65G** *1/06*

U.S. Cl. 414—351 **4 Claims**



1. A pan retriever dolly for transferring a stack of pans or the like from a stack storage conveyor to a stack conveyor, said dolly comprising stack-engaging means for operatively engaging a stack of pans on said storage conveyor and for moving said stack over and onto said stack conveyor, said stack-engaging means including a relatively rigid retriever arm mounted on said dolly for reciprocating movement across said stack conveyor, towards and away from said storage conveyor, a magnet mounted on said retriever arm, and means for selectively reciprocating said retriever arm across said stack conveyor; said dolly including pan support means vertically movably mounted on said storage dolly, means for raising and lowering said pan support means between positions above and below said stack conveyor, means for actuating said raising and lowering means to raise said pan support means as said retriever arm is moved towards said storage conveyor, and means on said retriever dolly for determining movement of said arm into a predetermined position adjacent said storage conveyor and for reversing said reciprocating means to return said arm towards a predetermined position remote from said storage conveyor, whereby the retrieved stack is supported above said stack conveyor, as said arm is moved away from said storage conveyor with a stack of pans magnetically secured to said arm.

4,179,236

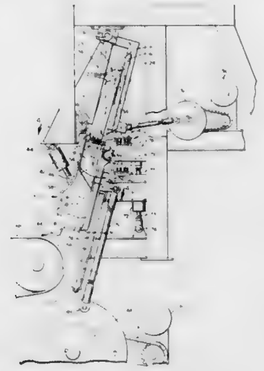
BOARD SEPARATOR

Aaron U. Jones, Eugene, Oreg., assignor to Seneca Sawmill Company, Inc., Eugene, Oreg.

Filed Mar. 15, 1978, Ser. No. 886,879

Int. Cl.[2] **B65G** *59/08*

U.S. Cl. 414—117 **12 Claims**



1. Board separating apparatus, comprising:

input conveyor means for conveying boards in groups with each group including a plurality of boards;

separator means for separating the boards of each group;

transfer means for transferring the groups of boards from said input conveyor means to an input position at the input of the separator means;

said separator means including elevator means for lowering the groups of boards from said input position to a separation position within said separator means;

separator arms aligned with the group of boards in said separation position; and

control means for moving the separator arms to cause them to move the boards in each group off the elevator means one at a time in said separation position to separate the boards from each other and cause them to be discharged at different times from the outlet of said separator means.

4,179,237

METHOD FOR CONTROLLING THE OPERATION OF A FLUID MACHINE IN SPINNING RESERVE

Kenzyu Ogiwara; Hisao Inoue, and Susumu Naganuma, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 11, 1977, Ser. No. 840,727

Claims priority, application Japan, Oct. 8, 1976, 51-120387

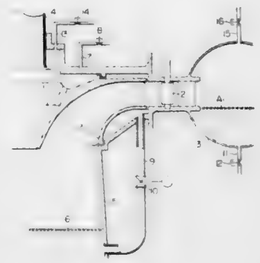
Int. Cl.[2] **F01D** *19/00*

U.S. Cl. 415—1 **5 Claims**

1. A method for controlling the operation of a fluid machine in spinning reserve wherein the runner is rotated in compressed air atmosphere in the runner chamber for practicing a phase modifier operation or for producing a standby condition which permits immediate switchover to a power-generating or pumping-up operation, comprising the steps of:

providing a fluid machine having a runner rotatably mounted in a runner chamber in communication between a high pressure casing through closable guide vanes and a low pressure portion, with a valve between the high pressure casing and a high pressure portion;

closing the guide vanes and closing the valve between the high pressure casing and the high pressure portion; thereafter with the guide vanes closed and the valve closed, introducing compressed air into the runner chamber so as to force the water level in the runner chamber down so that the runner may spin in a compressed air atmosphere during reserve; thereafter, while the runner is spinning in reserve in the compressed air, discharging water from the casing and simultaneously introducing compressed air into the casing to take the place of the discharged water to lower the water level within the casing with respect to the guide vanes so as to substantially prevent leakage of water



through the closed guide vanes from the casing into the runner chamber, whereby a spinning reserve condition may be obtained with a minimum quantity of compressed air to fill the runner chamber and thereafter the casing may be filled with compressed air to reduce leakage.

4,179,238

CENTRIFUGAL PUMPS

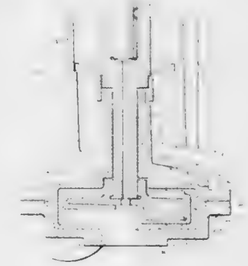
Stewart I. Ashworth, Vale, Channel Islands, assignor to Abrasives International Limited, West Midlands, England

Filed Jun. 8, 1977, Ser. No. 804,658

Claims priority, application United Kingdom, Jun. 8, 1976, 23547/76

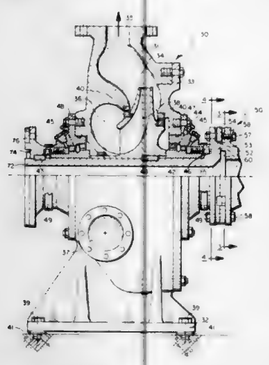
Int. Cl.[2] **F01D** *5/28*

U.S. Cl. 415—197 **4 Claims**



1. A centrifugal pump for pumping a mixture of abrasive particles and a carrier fluid, the pump comprising a casing having a hollow cylindrical interior defining a central axis, an axially disposed inlet and a tangentially disposed outlet, and an impeller rotatably mounted in the interior of the casing about said axis and comprising an imperforate disc of a diameter closely approaching the internal diameter of the casing and a plurality of imperforate rectangular blades extending radially of the disc to the circumference thereof, the radially outermost edges of the blades being parallel to and almost touching the cylindrical interior wall of the casing so that the rotating impeller, in use, sweeps substantially the entire volume of the interior of the casing, both the interior of the casing and the impeller being provided with a coating of abrasion resistant rubberlike material.

4,179,239
MODULAR PUMP UNIT FOR MULTISTAGE HIGH PRESSURE SLURRY PUMP
Fritz C. Catterfeld, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Jun. 23, 1978, Ser. No. 918,230
Int. Cl.[2] F04D *29/04*; F16D *1/02*
U.S. Cl. 415—198.1 **11 Claims**



1. In a multiple pump assembly wherein single pump units are connected in series to a drive means, the improvement which comprises:

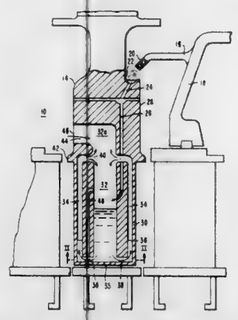
a modular pump housing forming inlet and outlet means therein, said pump having a first mating coupling flange on an impeller shaft and a second mating coupling flange on a second end on said shaft,

conduit means connecting the outlet from one modular pump to the inlet of an adjacent pump,

an axially adjustable, forced center drive coupling connectable to said first and second ends of said impeller shaft, said drive coupling having a circular disc forming an inner concentric opening with a conical surface therein, said disc further forming at least three drive keys equidistantly spaced and extending radially from said disc, said keys interfit with slots formed in an opposing coupling flange of an adjacent pump, said coupling flange having a short impeller shaft extension with a conical surface formed at its end to conform to said conical surface in said disc, said disc as it is moved by mechanical means from one mating flange into an opposing flange, the adjacent pump shafts are forced concentric one with the other, thus aligning one modular pump with an adjacent pump.

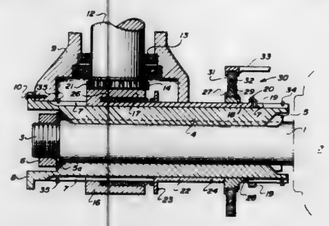
4,179,240
COOLED TURBINE BLADE
Richard E. Kothmann, Churchill, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Aug. 29, 1977, Ser. No. 828,466
Int. Cl.[2] F01D *5/18*
U.S. Cl. 416—96 R **6 Claims**

1. A fluid cooled gas turbine blade having an airfoil portion and a root portion with at least one radially extending chamber within the airfoil portion of said blade, a first fluid channel providing a liquid coolant inlet to said chamber, a plurality of second fluid channels subadjacent the blade surface in said airfoil portion, each of said second channels having an inlet in fluid communication with said chamber subadjacent the top of said blade and an outlet in fluid communication with said chamber generally adjacent the root portion of said blade, a third fluid channel providing fluid communication from said chamber to exit the blade adjacent said tip, the entry to said third channel from within said chamber being disposed at an intermediate position in the radial extent of said chamber and generally radially inwardly of the desired depth of fluid accumulated therein to limit the depth of said fluid in said chamber from adjacent said tip to said entry position whereby any further fluid entering said chamber will exit via said third channel, and, an exhaust channel providing vapor flow communication from said chamber to exit said blade on the downstream face thereof adjacent said root portion whereby, liquid cooling fluid entering said blade is collected in said chamber



and under the generally high centrifugal force field of said blade when rotating enters each of said plurality of second channels for flow therethrough promoting vaporization of the liquid to cool the blade, and wherein the flow of the fluid in said second channels and the flow of said vapor generated therein are in a common direction from said tip to said root portion to provide stability for the fluid flow through all said second channels.

4,179,241
FULL FEATHERING, REVERSIBLE PITCH, CONSTANT RPM PROPELLER
Jacob B. Courshon, Jr., Park Forest, Ill., assignor to High Harbin, Elk Grove Village, Ill., a part interest
Filed Oct. 31, 1977, Ser. No. 847,245
Int. Cl.[2] B64C *11/34*; B63H *3/04*
U.S. Cl. 416—137 **2 Claims**



1. Variable pitch propeller means comprising:

(a) an engine shaft adapted to be rotated about its longitudinal axis,

(b) a plurality of propeller blades spaced around the longitudinal axis of the engine shaft, each propeller blade having a longitudinal axis arranged perpendicularly to the longitudinal axis of the engine shaft,

(c) first means mounting each of said propeller blades to said engine shaft for rotation about its respective longitudinal axis,

(d) a plurality of weights, each weight being secured to one of said propeller blades spaced from the longitudinal axis thereof, said weights being adapted to generate centrifugal force tending to rotate the propeller blades about their respective longitudinal axes when said engine shaft is rotating,

(e) a plurality of spur gears, each spur gear being mounted to one of said propeller blades,

(f) a plurality of toothed racks, each toothed rack engaging one of said spur gears,

(g) second means mounting said toothed racks for movement longitudinally of said engine shaft,

(h) spring means bearing against said second means,

(i) third means bearing against said spring means and adapted to compress said spring means and thereby resiliently force said toothed racks longitudinally of said engine shaft to rotate said propeller blades about their respective longitudinal axes,

(j) the force exerted by said third means and resiliently applied to said toothed racks to rotate said propeller blades completing the balance of the centrifugal forces exerted by the weights and the aerodynamic pitching moments of the propeller blades, thereby providing constant RPM of the propeller blades at a desired value corresponding to the degree of compression of said spring means,

(k) fourth means adapted to move said second means and said third means to a first extreme position overriding said spring means and rotating said propeller blades to an extreme low pitch position or selectively to a second extreme position rotating said propeller blades to a reverse thrust position,

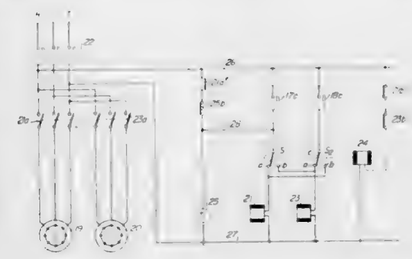
(l) a tubular sleeve mounted on said engine shaft and having radially spaced longitudinally extending splineways formed in the exterior surface thereof,

(m) said second means having radially spaced longitudinally extending splines, said splines being slidably received in the splineways of said tubular sleeve,

(n) said third means having radially spaced longitudinally extending splines, said splines being slidably received in the splineways of said tubular sleeve,

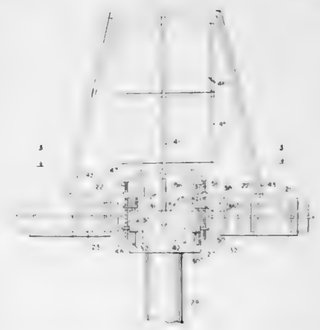
(o) said fourth means having radially spaced longitudinally extending splines, said splines being slidably received in the splineways of said tubular sleeve, said fourth means being adapted to move said third means in a first direction against said spring means or selectively to move said second means in the opposite direction.

4,179,242
METHOD AND APPARATUS FOR LIQUID SUPPLY
Tadao Tateshita, Kashiwa; Yasuhiro Mita, Kamagaya; Junichi Nakayama, Chiba, and Koichi Sato, Funabashi, all of Japan, assignors to Hitachi, Ltd., Japan
Filed Apr. 26, 1978, Ser. No. 900,320
Int. Cl.[2] F04B *41/06*
U.S. Cl. 417—8 **9 Claims**



1. An apparatus for liquid supply comprising a plurality of pumps connected on the delivery sides to a main, a pressure tank provided on the delivery sides of said pumps, first sensor means for sensing the demand for the liquid and determining whether the preceding or regular one of said pumps should be started or not in response to a variation in the demand, second sensor means for sensing the demand for the liquid and determining whether the remaining or standby one of said pumps should be started or not in response to a variation in the demand, third sensor means for sensing the demand for the liquid and determining whether said regular pump may be stopped or not in response to a variation in the demand, fourth sensor means for sensing the demand for the liquid and determining whether said standby pump may be stopped or not in response to a variation in the demand, a timer which begins working upon receipt of the output from said first sensor means to generate a signal after the lapse of a predetermined period of time, standby-pump stop control means for stopping said standby pump immediately upon generation of a signal by said fourth sensor means, and regular-pump stop control means for keeping said regular pump running as long as said timer is in operation, regardless of the signal generation by said third sensor means, and for stopping said pump in response to a signal from said third sensor means after the operation of said timer.

4,179,243
FLOATATION PUMP DEVICE
Richard J. Aide, R.R. #2, Bismarck, N. Dak. 38501
Filed Jun. 21, 1977, Ser. No. 808,457
Int. Cl.[2] F04B *21/00*; B01F *3/04*
U.S. Cl. 417—61 **1 Claim**



1. A pumping device for pumping water from the bottom of a lake to the top of the lake for circulating water comprising raft means, said raft means comprising a plurality of floats mounted at spaced intervals to one another, elongated pipe means on said raft means extending vertically downward, a wind driven shaft rotatably mounted on said pipe means with a propeller at the lower end of the shaft within the upper end of the pipe means, whereby rotation of the shaft by the wind rotates the propeller to draw water up through the pipe means from the bottom of the lake out of the top of the pipe means to circulate the water, said pipe means being pivotally mounted at one upper end to said raft means, to pivot relative to said raft means about a horizontal axis at one of the spaced intervals between the floats from a horizontal position between said floats to a vertical position beneath said floats, locking means along the opposite upper end of said pipe means locking said pipe means to the raft means in a vertical position for use in circulating the water, said locking means when unlocked allowing the pipe means to be pivoted upward toward a horizontal position when not in use, said pivoting means and locking means being adapted to be reversed in function whereby said pivoting means may serve as said locking means and said locking means may serve as said pivoting means, said locking and pivoting means each having a vertical sliding connection to said pipe means with a threaded rod threadable to raise and

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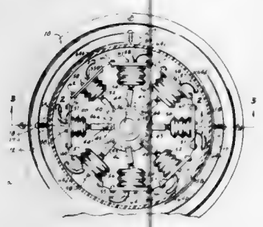
lower the pipe means relative to the raft means on said vertical sliding connection.

4,179,244

ROTARY LOW PRESSURE AIR DISPLACEMENT PUMP

Elwood Marple, Pinellas Park, Fla., assignor to Hargraves Aerobic Systems, Inc., Tampa, Fla.

Filed May 31, 1977, Ser. No. 802,131
Int. Cl.² F04B *1/04, 27/04*
U.S. Cl. 417—273 **5 Claims**



1. A multiple pump assembly for supplying fluid under different fluid pressure outputs to a plurality of utility devices, comprising in combination:

a housing member for enclosing the pump assembly;

a support mounted in said housing member;

a plurality of pumps circumferentially mounted on said support about a central region of said support;

each of said pumps comprising an inlet valve communicating directly with an ambient source of the fluid and an outlet valve communicating with one of the plurality of utility devices;

each of said pumps further comprising a bellow member communicating with said respective inlet and outlet valves;

a shaft rotatably mounted in proximity to said central region of said support;

eccentric means secured to said shaft;

a plurality of connecting rods interconnecting said eccentric means to said plurality of bellow members for providing uniform reciprocal displacement of said plurality of bellow members upon rotation of said shaft; and

means establishing said plurality of bellow members to be of different bellow cross-sectional areas to provide different fluid pressure outputs to the plurality of utility devices upon rotation of said shaft.

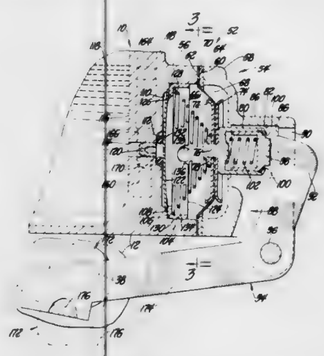
4,179,245

ACCELERATION PUMP WITH TEMPERATURE-RESPONSIVE CONTROL OF DELIVERY

William A. Fuller, St. Clair Shores, Mich., assignor to Colt Industries Operating Corp., New York, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,829
Int. Cl.² F02M *7/08*
U.S. Cl. 417—292 **11 Claims**

1. A carburetor accelerating pump for discharging a first quantity of fluid when the fluid is at a first temperature and a second quantity of fluid when the fluid is at a second temperature, comprising body means formed to provide a pumping chamber having a movable wall, an inlet communicating between said pumping chamber and an associated source of supply of said fluid, a discharge outlet communicating between said pumping chamber and an associated fluid consuming area, movement in one direction of said movble wall with respect to said chamber causing said fluid to be drawn into said pumping chamber through said inlet and movement in an other direction of said movable wall causing fluid to be pumped from said pumping chamber, first calibrated passage means effectively communicating between said pumping chamber and said source of supply of said fluid, said first calibrated passage means being effective to cause a first portion of said fluid being pumped from said pumping chamber to be returned to said source of supply while permitting the remaining portion of said fluid being pumped from said pumping chamber to be pumped into said discharge outlet, and second calibrated passage means effective to communicate between said pumping chamber and said source of supply of said fluid, said second calibrated passage means being effective to meter a second portion of a magnitude different from said first portion of said fluid being



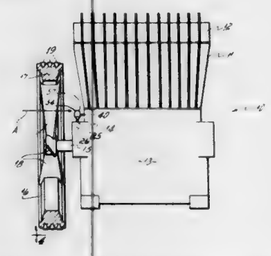
pumped from said pumping chamber to be returned to said source of supply while permitting the then remaining portion of said fluid being pumped from said pumping chamber to be pumped into said discharge outlet, said first and second calibrated passage means being in series flowing relationship to each other when said first portion of said fluid is being returned to said source, and temperature responsive valving means operatively associated with at least one of said calibrated passage means to effectively remove said first and second calibrated passages from series flow relationship when said fluid attains a preselected temperature.

4,179,246

CRANKCASE VENT APPARATUS AND METHOD

James W. Volker, Cincinnati, Ohio, assignor to The Scott & Fetzer Company, Lakewood, Ohio

Filed Jan. 24, 1978, Ser. No. 871,780
Int. Cl.² F04B *21/00*
U.S. Cl. 417—313 **27 Claims**



27. In a compressor of the type having at least one cylinder, a lubricant containing crankcase, a crankcase vent opening, and a drive pulley mounted on a shaft extending from said crankcase, said pulley having spokes disposed for creating an air flow toward said cylinder and crankcase and over said vent opening when driven to operate said compressor, crankcase vent stack apparatus for exhausting said crankcase and comprising

a vent stack having a first open end adapted for fitting in said vent opening, a second open end, disposed within said air flow when said pulley is driven, a filter in said stack between said ends and a longitudinal axis,

said second open end being defined by first, second and third stack end edges,

said first stack end edges comprising two edge portions on opposite sides of said stack and lying in a plane parallel to the direction of said air flow, and normal to said axis,

said second stack end edges lying in a second plane intersecting said direction of air flow at one angle and said axis at an angle of other than 90°, and

said third stack end edges lying in a third and different plane intersecting said direction of air flow at one angle and said axis at an angle of other than 90°,

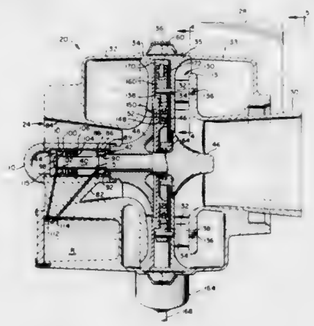
said first, second and third edges being connected to form an irregular opening.

4,179,247

TURBOCHARGER HAVING VARIABLE AREA TURBINE NOZZLES

Norbert L. Osborn, Irving, Tex., assignor to WRR Industries, Inc., Dallas, Tex.

Filed Jan. 14, 1977, Ser. No. 759,773
Int. Cl.² F04B *17/00*
U.S. Cl. 417—406 **22 Claims**



1. In combination with an internal combustion engine, a turbocharger comprising:

a shaft,

a turbine attached to one end of said shaft for receiving driving exhaust gases from said engine,

a compressor fitted on said shaft for rotation with said turbine, said compressor supplying air to the engine,

bearing means for rotatively supporting said shaft such that said compressor and turbine are overhung to one side of said bearing means such that said bearing means is removed from said turbine,

a plurality of nozzle vanes spaced about said turbine and in the inlet through which exhaust air from the engine is received to said turbine, and

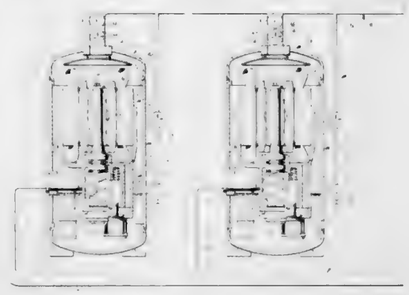
control means intermediate of said compressor and turbine for rotating said nozzle vanes to vary the flow of exhaust air to said turbine.

4,179,248

OIL EQUALIZATION SYSTEM FOR PARALLEL CONNECTED HERMETIC HELICAL SCREW COMPRESSOR UNITS

David N. Shaw, Unionville, Conn., assignor to Dunham-Bush, Inc., West Hartford, Conn.

Filed Aug. 2, 1978, Ser. No. 930,444
Int. Cl.² F04B *23/04, 39/02, 17/00*
U.S. Cl. 417—427 **4 Claims**



1. A compressed gas distribution system comprising; a plurality of hermetic, helical screw rotary compressors compressor units, said compressor units including a hermetic casing defining a sump for the accumulation of oil, intermeshed helical rotary screws and a compressor inlet and outlet, said gas distribution system further comprising a suction manifold and a discharge manifold, means for connecting the suction manifold to the compressor inlets of respective compressors, the compressor outlets opening to the interior of the compressor unit casing such that the lower portion of each casing defines a sump for the accumulation of oil within the casing interior at compressor discharge pressure, each casing being provided with an outlet port well above the level of accumulated oil and opening to the discharge manifold such that the compressor units are connected in parallel, the improvement comprising; an oil bleed port within each casing at the normal level of accumulated oil and a small diameter oil bleed line connecting the oil bleed port to the discharge manifold at a point downstream of the hermetic compressor casing outlet port connection to the discharge manifold for respective compressor units whereby, the compressor discharge pressure within the casings causes excessive oil accumulating within a given casing to flow through the small diameter oil line of that compressor casing to the discharge manifold for redistribution to the remaining compressors to equalize the amount of oil within each compressor unit.

4,179,249

QUICK LOADING PERISTALTIC PUMP

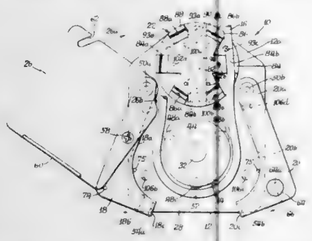
Emil J. Guttmann, Morton Grove, Ill., assignor to Cole-Parmer Instrument Company, Chicago, Ill.

Filed Dec. 7, 1977, Ser. No. 858,270
Int. Cl.² F04B *43/12, 45/08*
U.S. Cl. 417—477 **18 Claims**

1. A peristaltic pump comprising a base plate defining a generally planar mounting surface, a rotor rotatably supported by said base plate for rotation about an axis substantially perpendicular to said mounting surface, said rotor including at least one compression surface movable in a plane substantially parallel to said mounting surface, a pair of reaction members pivotally supported by said base plate for movement relative to said base plate between closed positions juxtaposed to said rotor and open positions spaced from said rotor, said reaction members defining cam surface means operative when said reaction members are in their said closed positions to maintain

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a compressible fluid flow tube in position to be engaged by said compression surface upon rotation of said rotor so as to effect a peristaltic pumping action on said tube, said reaction members facilitating loading and removal of said tube relative to said rotor when in their said open positions and exposing an outer surface of said rotor when in their said closed positions,



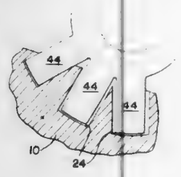
and locking plate means mounted on one of said reaction members and selectively cooperable with the other of said reaction members to releasably retain said reaction members in their said closed positions, said locking plate means being adapted to cover said exposed outer surface of said rotor when in said retaining relation with said reaction members so as to prevent access to said rotor.

4,179,250

THREAD CONSTRUCTION FOR ROTARY WORM COMPRESSION-EXPANSION MACHINES

Ghanshyam C. Patel, Franklin, Pa., assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Nov. 4, 1977, Ser. No. 848,591
Int. Cl.[2] F01C *1/08*; F04C *17/04*
U.S. Cl. 418—195 **8 Claims**



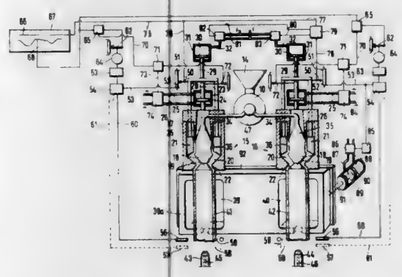
1. In a rotary worm compression-expansion machine having a rotor supported in a casing for rotation on a first axis, the rotor having a plurality of spirally extending threads to establish correspondingly spiral grooves having opposite high and low pressure ends, each having a root surface lying between a pair of side surfaces at the low pressure end and extending toward the opposite high pressure end, the casing having an inner surface portion defining with the spiral grooves a plurality of compression-expansion chambers, and at least one rotary pinion wheel supported rotatably in the casing on a second axis tangential to the rotor and having radiating teeth projecting through the inner casing surface into the grooves so that rotation of the rotor and pinion wheel effects relative travel of each tooth between the high and low pressure ends of each groove to vary the volume of the compression-expansion chambers in the performance of a fluid working operation, the improvement comprising: means defining each groove with a cross-sectional size at the low pressure end thereof larger than the effective size of each pinion wheel tooth, the cross-sectional size of each groove being progressively reduced toward the high pressure end thereof to effect sealing contact between the groove surfaces and each pinion wheel tooth as each tooth moves relative to the rotor in the region of the high pressure end portion of each groove.

4,179,251

MULTIPLE EXTRUSION HEAD EXTRUSION BLOW MOULDING APPARATUS

Dieter Hess, Swistal-Morenhoven; Carsten Friedrichs, Bad Honnef, and Werner Daubenbüchel, Bensberg-Refrath, all of Fed. Rep. of Germany, assignors to Kautex-Werke Reinold Hagen GmbH, Fed. Rep. of Germany

Filed Dec. 21, 1976, Ser. No. 753,152
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558780
Int. Cl.[2] B29D *23/04*
U.S. Cl. 425—140 **12 Claims**



1. Multiple extrusion head extrusion blow moulding apparatus comprising a plurality of extrusion heads for forming parisons of a thermoplastic material to be blown, each extrusion head being provided with: (a) an inlet orifice, (b) an accumulator chamber in communication with said inlet orifice, (c) an outlet orifice for the thermoplastic material, and (d) a piston slidably positioned within said accumulator chamber for emptying said accumulator through said outlet orifice to form a parison of said thermoplastic material, and means operatively associated with said pistons for driving all the pistons of all extrusion heads for identical and simultaneous movement in respect of position and/or speed during their parison-extruding strokes, said means comprising a plurality of drive means and position indicators, each of said plurality of drive means being associated with a respective one of the pistons, and wherein a comparator device is connected to receive the signals triggered by the position indicators of all extrusion heads for generating a comparison signal for controlling the various drive means in a common manner.

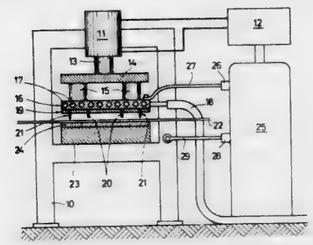
4,179,252

APPARATUS FOR FORMING FLEXIBLE FOLD LINES IN THERMOPLASTIC SHEETS AND ARTICLE SO FORMED

Gerhard Seufert, Otto-Hahn-Strasse 3, 6051 Hainhausen, Fed. Rep. of Germany

Division of Ser. No. 653,053, Jan. 28, 1976, Pat. No. 4,064,206. This application Sep. 6, 1977, Ser. No. 830,536
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1975, 2541324
Int. Cl.[2] B29C *17/00*
U.S. Cl. 425—174.6 **5 Claims**

1. An apparatus for the production of container blanks by forming flexible fold lines in a thermoplastic sheet comprising a rule-shaped forming tool and a substantially flat surface for supporting said sheet, means for cooling said tool, means for moving said tool toward said substantially flat surface, means for electrically insulating said cooling means from said moving means, and means for creating a high frequency electric field between said tool and said substantially flat surface whereby the temperature applied to the surface of said sheet adjacent



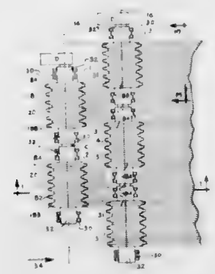
said tool is less than the temperature applied in the middle of said sheet in an area adjacent said tool.

4,179,253

LINEAR CORRUGATING ROLL DEFLECTION CONTROL

Herbert D. Lightfoot, Montreal, Canada, assignor to Domtar Inc., Montreal, Canada

Filed Apr. 10, 1978, Ser. No. 895,160
Int. Cl.[2] B29D *7/14*
U.S. Cl. 425—369 **4 Claims**



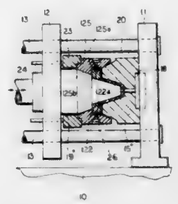
1. A linear corrugator for simultaneously corrugating and consolidating a non-consolidated dry formed fibrous web comprising; means to advance said web in a direction, a first consolidating press means and a second consolidating press means, said second press means being spaced from said first press means in said direction, each of said press means being formed by a pair of mating rolls having their rotational axes perpendicular to said direction, each said roll having a plurality of circumferentially extending ridges and grooves adapted to mate with similar ridges and grooves in the mating roll thereby to simulataneously corrugate and consolidate said dry formed web; said first press means providing a first consolidating pressure nip and said second press means providing a second consolidating pressure nip; said first and said second nips being axially offset in the direction of said rotational axes of said rolls to corrugate and consolidate substantially only discrete areas of said web, said second nip being positioned to at most corrugated and consolidate only a portion of the web corrugated and consolidated by said first nip, the longitudinal length of each of said nip in the direction of said axes of rotation being between 5 and 36".

4,179,254

INJECTION MOLD WITH FLOATING STRIPPER RING

Paul Brown, Orangeville, Canada, assignor to Husky Injection Molding Systems Inc., Bolton, Canada

Filed Sep. 26, 1978, Ser. No. 945,901
Int. Cl.[2] B29C *7/00*; B29F *3/00*
U.S. Cl. 425—438 **11 Claims**



1. In an injection-molding machine provided with two relatively movable platens interconnected by tie bars, a male mold portion on one of said platens, a female mold portion on the other of said platens having a cavity enterable in a mold-closed position by a core projecting from said male mold portion, and a stripper ring surrounding said core for dislodging a molded article therefrom in a mold-open position,

the combination therewith of:

a stripper plate supported on said tie bars between said platens for movement parallel to said tie bars in said mold-open position; and

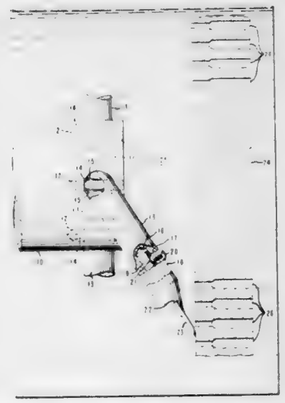
a locking ring provided with inner centering surfaces engaging respective outer centering surfaces of said mold portions in said mold-closed position for maintaining said mold portions in mutual alignment, said stripper ring being seated in said locking ring between said inner centering surfaces thereof, said locking ring being mounted on said stripper plate for entrainment thereby in said mold-open position.

4,179,255

MELT CUTTER APPARATUS

Alan D. Hale, Orange, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 13, 1978, Ser. No. 886,262
Int. Cl.[2] B29C *17/14*
U.S. Cl. 425—67 **12 Claims**



1. An improved rotary melt cutter apparatus for producing

pellets from at least one strand of a partly molten thermosplastic resin in cooperation with a die, said die having a die surface with at least one orifice, said improved rotary melt cutter apparatus adapted to be driven rotationally by a rotating shaft structure, said apparatus comprising rotating knife assembly and means connecting said assembly to said rotating shaft structure, said rotating knife assembly comprising a drive rod connected to said shaft structure, a knife holder and attached thereto an approximately center-supported knife, said drive rod cooperating with said knife assembly connecting means such that said drive rod has limited free rotation about its axis running to said rotating shaft structure, said knife holder being connected to said drive rod, said knife holder being axially aligned with and connected to said drive rod such that said knife holder has limited axial free rotation, said rotating knife assembly mounted and supported in cooperative association with said die surface and said orifice of said die such that the plane of rotation of said knife assembly about the axis of said rotating shaft structure is maintained adjacent and in alignment substantially parallel to said die surface and said orifice such that only a limited amount of wear of both the knife and the die occurs during operation, and means for advancing said rotating knife assembly toward said die surface and said extrusion orifice.

4,179,256

VULCANIZATION APPARATUS FOR A CONTINUOUS LENGTH OF ARTICLE OF RUBBER, PLASTICS OR THE LIKE MATERIAL

Shoji Tomioka; Toshiaki Nakao; Hisatsugu Nakamura, all of Kitakyushu; Nobuyoshi Mine, Fukuoka; Katsuo Yamamoto, Ichihara; Seiji Fukushima, Ichihara, and Akira Nogami, Ichihara, all of Japan, assignors to Furukawa Electric Co., Ltd., Marunouchi, Japan

Filed Aug. 15, 1978, Ser. No. 933,872
Int. Cl.² B29H 5/28; B29C 25/00
U.S. Cl. 425—71 **16 Claims**



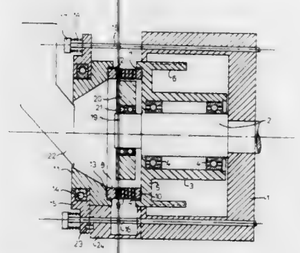
1. A vulcanization apparatus for a continuous length of article of rubber, plastics or the like material, comprising a curved vulcanizing pipe having its inlet portion where said continuous length of article enters therein and its outlet portion where said continuous length of article goes out thereof disposed at elevated positions of substantially the same height and having its curved central bottom portion disposed at a position lower than said inlet and outlet portions, said vulcanizing pipe being provided with a recirculation system which causes a heating liquid medium fed into said vulcanizing pipe from said curved bottom portion thereof by means of a feeding device to flow out from the underside of said inlet and outlet portions for recirculation into said vulcanizing pipe from said curved bottom portion, said inlet and outlet portions being each provided with a pressurized gas feeding system which pressurizes the heating liquid medium so that the liquid surfaces at said inlet and outlet portions are on same level, a cooling pipe which is provided on the outlet side of said vulcanizing pipe and which is inclined so that the inlet portion thereof is disposed at a position higher than the outlet portion thereof, and a tubular cleaner for removing the heating liquid medium deposited on the vulcanized continuous length of article which is interposed between said vulcanizing pipe outlet portion and said cooling pipe inlet portion that are both at elevated positions as compared with the position of said outlet portion of said cooling pipe, said vulcanizing pipe, tubular cleaner and cooling pipe being coupled from one to another in this sequence to form the entire vulcanization apparatus.

4,179,257

PRESS

Theodorus J. Heesen, Selissen 6, Boxtel, Netherlands

Filed Feb. 10, 1978, Ser. No. 876,943
Claims priority, application Netherlands, Feb. 11, 1977, 7701448
Int. Cl.² B29C 3/00
U.S. Cl. 425—331 **10 Claims**



1. A press for compressing powdery material into granular material, comprising a rotatable, annular, perforated mould, a drivable mould holder supporting said mould, a stationary shaft located within said mould eccentrically of the longitudinal axis of said mould, a roller rotatably mounted on said shaft within said mould, a supporting member for supporting the side of the mould remote from the mould holder, said supporting member urging the mould and the mould holder against one another in an axial direction so that the mould will be rotated by the mould holder as a result of the frictional forces between the mould and the mould holder.

4,179,258

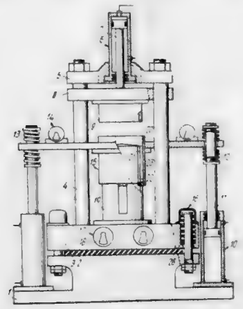
METHOD OF MOLDING PRODUCTS FROM MOIST MATERIALS AND APPARATUS REALIZING SAME

Genrikh E. Karas, ulitsa 8 Marta, 3, kv. 12, Semiluki Voronezhskoi oblasti; Ljudmila P. Lebedeva, Vitebsky prospekt, 53, korpus, 2, kv. 54, Leningrad; Anatoly A. Mukhin, ulitsa 8 Marta, 7, kv. 12; Anatoly D. Pivovarov, ulitsa 9 Yanvarya, 5, kv. 7, both of Semiluki Voronezhskoi oblasti; Vladimir I. Skrynnikov, ulitsa Leni Golikova, 84, kv. 17, Leningrad; Vladimir M. Yam, ulitsa Vernosti, 13, kv. 152, Leningrad; Vladimir T. Oleinik, 8 Sovetskaya ulitsa, 38, kv. 3, Leningrad; Vladimir V. Miroshnichenko, Drovyanoi pereulok, 4, kv. 9, Leningrad, all of U.S.S.R.; Vasily A. Kovtun, deceased, late of Semiluki Voronezhskoi oblasti, U.S.S.R.; by Lidia P. Kovtun, administrator, ulitsa 8 Marta, 7, kv. 19, Semiluki Voronezhskoi oblasti, U.S.S.R.; by Inna V. Soshnikova, administrator, ulitsa 8 Marta, 7, kv. 19, Semiluki Voronezhskoi oblasti, U.S.S.R., and by Sergei V. Kovtun, administrator, ulitsa 8 Marta, 7, kv. 19, Semiluki Voronesbakoi oblasti, U.S.S.R.

Division of Ser. No. 760,436, Jan. 13, 1977, Pat. No. 4,140,744, which is a continuation of Ser. No. 529,531, Dec. 4, 1974, abandoned. This application Sep. 26, 1978, Ser. No. 945,911
Int. Cl.² B28B 1/08
U.S. Cl. 425—352 **1 Claim**

1. An apparatus for molding products from moist bulk materials comprising:
a base;
an elastic padding mounted on said base;
a vibrating frame resting on said elastic padding;

a fastening means for fastening said vibrating frame to said base;
columns secured on said vibrating frame;
a stationary crosshead interconnecting said columns in the upper portion thereof;
a power cylinder comprising a rod and a piston mounted on said stationary crosshead, said rod extending beyond said stationary crosshead in a downwardly direction;
a mobile crosshead attached to said rod of said power cylinder guided by said columns;
an upper punch secured to said mobile crosshead;



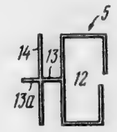
a lower punch secured on said vibrating frame;
further power cylinders comprising further rods and further pistons being mounted on said base;
an additional crosshead mounted on said further rods and adapted to reciprocate and be guided along said columns;
vibrations exciters mounted on said vibrating frame and said additional crosshead;
a power means for powering said vibration exciters; and
a mold case mounted on said additional crosshead, said mold case, said upper punch, and said lower punch being arranged collinearly.

4,179,259

SPINNERET FOR THE PRODUCTION OF WOOL-LIKE MAN-MADE FILAMENT

Mikhail N. Belitsin, 2 Donskoi proezd, 6, kv. 9, Moscow; Sergei A. Kudryashov, ulitsa Mira, 16, kv. 33, Klin Moskovskoi oblasti; Alexandr G. Borik, Borodinsky prospekt, 7, kv. 27, Klin Moskovskoi oblasti; Valentin V. Kulikov, Leningradskoe shosse, 44, kv. 58, Klin Moskovskoi oblasti; Natalia A. Sadkova, ulitsa Oxkaya, 22/2, kv. 13, Moscow; Galina A. Kudryashova, ulitsa Mira, 16, kv. 33, and Leonid F. Vorontsov, ulitsa Gagarina, 45, kv. 8, both of Klin Moskovskoi oblasti, all of U.S.S.R.

Filed Sep. 20, 1977, Ser. No. 835,221
Int. Cl.² D01D 3/00
U.S. Cl. 425—461 **7 Claims**



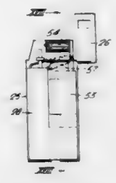
1. A spinneret for obtaining a chemical filament having a cross-section defining a first ring shaped portion and a second rectilinearly shaped portion integral therewith, comprising: a dope spinning hole shaped as a slot, the configuration of the slot defining an open polygon comprising means for forming said first ring shaped portion of said filament; means defining a first rectilinear portion adjoining at least one of the sides of the polygon at a right angle thereto; means defining at least one more slot shaped as a rectilinear section intersecting said first rectilinear portion at a right angle thereto, whereby a cross-shaped slot is formed by the first rectilinear portion and the rectilinear section.

4,179,260

SMOKERS' LIGHTER

Hans Lowenthal, London, England, assignor to Colibri Lighters Limited, England

Filed May 10, 1977, Ser. No. 795,493
Claims priority, application United Kingdom, May 11, 1976, 19406/76
Int. Cl.² F23Q 7/12
U.S. Cl. 431—255 **18 Claims**



1. A smokers' lighter of the boxtype comprising: a substantially rectangular casing of elongate horizontal cross section having a pair of narrower opposed ends separated by a pair of relatively broader sides with an upper part of said casing constituted by a lid; means connecting said lid to said casing whereby said lid may be swung upwards generally adjacent to one narrower end thereof; a fuel reservoir tank having a burner at the upper end thereof and mounted within said casing adjacent to the other narrower end of said casing remote from said one end about which said lid swings upwards whereby said burner is exposed for use upon upward swinging of said lid; and a piezoelectric spark generating unit having a depressible actuating plunger at the upper end thereof and mounted side by side with said fuel reservoir tank within said casing and adjacent to said one narrower end of said casing about which said lid swings upwards, said actuating plunger being mounted to be depressed by an operator's thumb applied at one broader side of said casing and having an indentation in its side so shaped as to make engagement with the operator's thumb when pressed thereagainst and drawn down said one broader side of said casing to thereby operate said spark generating unit and being mounted such that at least that part thereof which must be contacted by the operator to depress said plunger becomes exposed for use only upon raising of said lid.

4,179,261

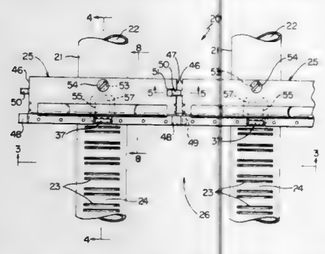
BURNER CONSTRUCTION AND PARTS THEREFOR AND METHODS OF MAKING THE SAME

Fred Riehl, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 15, 1977, Ser. No. 824,482
Int. Cl.² F23D 13/36
U.S. Cl. 431—286 **24 Claims**

1. In a burner construction having a plurality of burners disposed in a spaced arrangement thereof and each having port means for issuing fuel to be ignited, said construction having a plurality of ignition carry-over units respectively carried by said burners and each being adapted to receive fuel from its respective burner and issue the same out of an ignition slot means thereof that bridges part of the spacing between said burners adjacent thereto, each said carry-over unit having joining mens joining with said joining means of an adjacent carry-over unit in such a manner that said joined joining means causes said ignition slot means thereof to be continuous be-

tween adjacent joined carry-over units, each said carry-over unit having opposed ends, the improvement wherein said joining means of each said carry-over unit comprises a pair of tabs respectively disposed at said opposed ends thereof, said pair of tabs for each said carry-over unit being disposed in



planes offset relative to each other whereby adjacent tabs of adjacent carry-over units overlap each other in spaced relation to define part of said continuous slot means between said adjacent carry-over units, each said carry-over unit having hook means hooking to its respective burner to tend to hold the same together in their assembled relation.

4,179,262

GAS-HEATING APPLIANCE

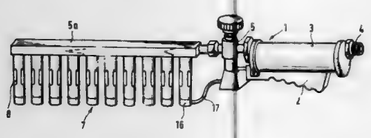
Volker Wardt, Muhlenweg 3a, Kleve Nutterden, Brd., and Heinz L. Gantevoort, Gruner Weg 4-6, Goch 5, Brd., Fed. Rep. of Germany

Filed Oct. 7, 1977, Ser. No. 840,232

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1976, 2645263

Int. Cl.² F23D *13/40*

U.S. Cl. 431—354 **3 Claims**



1. A gas heating applicance comprising a gripping and operating handle, a gas feed pipe extending from said handle, means associated with said handle for supplying said feed pipe with a controlled flow of fuel and a plurality of gas burners disposed side by side along the length of said feed pipe, each burner comprising a gas jet communicating with said feed pipe, a mixer pipe having one end surrounding said gas jet, said mixer pipe defining lateral holes for the admission of combustion air from the atmosphere, a burner nozzle means at the other end of said mixer pipe and a pair of part-cylindrical baffle walls forming an extension of said mixer pipe beyond said nozzle means, said baffle walls defining a pair of spacer gaps therebetween and wherein the spacer gaps of the respective burners are in mutual alignment, each burner nozzle means comprising an annular disc with a central hole, said central hole being surrounded by outwardly directed jets extending radially obliquely through the annular disc, and wherein the individual cross sectional area of the jets as well as the total cross sectional areas of the jets is small as compared with the central hole in the disc.

4,179,263

PROCESS FOR THE UTILIZATION OF WASTE SUBSTANCES AND DEVICE FOR CARRYING OUT THE PROCESS

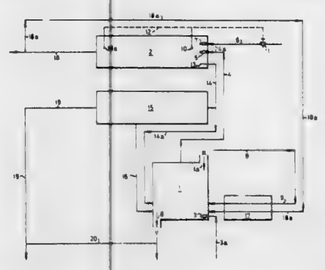
Fritz Jung, Vienna, and Ludwig Kwech, Kaltenleutgeben, both of Austria, assignors to Perlmooser Zementwerke Aktiengesellschaft, Vienna, Austria

Filed Oct. 28, 1977, Ser. No. 846,340

Claims priority, application Austria, Oct. 29, 1976, 8077/76

Int. Cl.² F24J *3/00*

U.S. Cl. 432—1 **20 Claims**



1. Apparatus for carrying out the process for the utilization of waste substances containing combustible components and showing fluctuations in their composition and properties, in their water content, in their content of components undergoing endothermic reactions at heating or in their calorific value, said process comprising subjecting the waste substances to decomposition under liberation of their volatile components by means of incomplete combustion and of burning the gases thus formed, comprising a first heating means for volatilizing, decomposing and incompletely burning the waste substances to produce pyrolysis gases and a second heating means to burn the pyrolysis gases immediately after they are produced.

4,179,264

METHOD FOR EXPANDING PERLITE

Gerard R. Vancauwenberghe, St. Denijs Westrem, Belgium, assignor to Dicalite Europe Nord, S.A., Brussels, Belgium

Filed Nov. 8, 1977, Ser. No. 849,592

Claims priority, application Belgium, Nov. 9, 1976, 0172205

Int. Cl.² F27B *15/00*

U.S. Cl. 432—13 **7 Claims**

1. A method of expanding unexpanded particulate perlite, comprising the steps of:

(a) mixing said particulate perlite with a combustible gas, air and oxygen, wherein the amount of combustible gas in the mixture is on the order of 1 volume of combustible gas for 2 to 6 volumes of air and said oxygen is introduced to said mixture in an amount comprising 1.5 to 16 weight percent of said air in said mixture; and

(b) effecting combustion of said combustible gas to expand substantially all of said particulate perlite.

4,179,265

METHOD AND APPARATUS FOR OPERATING ROTARY DRIERS

Hayden P. Gildersleeve, Colorado Springs, Colo., assignor to Holly Sugar Corporation, Colorado Springs, Colo.

Filed Oct. 17, 1977, Ser. No. 842,397

Int. Cl.² F27B *7/20*; F27D *19/00*

U.S. Cl. 432—36 **21 Claims**

1. A method of controlling the operation of a drier having an induced draft, elongated rotating drum supplied with heated gases, a product to be dried being supplied to the intake end of the drum and moved to the discharge end of the drum generally by said gases, said method comprising:

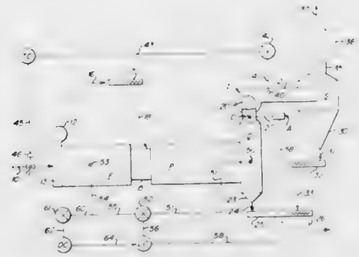
determining the pressure of gases supplied to said drum;

determining the pressure of gases discharging from said drum;

determining the differential in pressure between the pressure of the supply gases and the discharge gases; supplying the determination of the differential in pressure to a control device and

controlling, through said control device, the induced draft of said drum by variations in said pressure differential by decreasing said draft upon an increase in said differential pressure and increasing said draft upon a decrease in said differential pressure.

12. Apparatus for controlling the operation of a drier having an induced draft, elongated rotating drum supplied with heated gases, wherein a product to be dried is supplied to the intake end of the drum and moved to the discharge end of the drum generally by said gases, wherein said heated gases are supplied



by a fuel burning furnace and wherein the pressure in said furnace corresponds to the pressure of heated gases supplied to said drum, said apparatus including:

means for determining the pressure of gases supplied to said drum;

means for determining the pressure of gases discharging from said drum;

means for determining the differential in pressure between the pressure of the supply gases and the discharge gases;

means for controlling the induced draft for said drum by variations in said pressure differential by decreasing said draft upon an increase in said differential pressure and increasing said draft upon a decrease in said differential pressure; and

means for overriding the control of said induced draft to restrain further reduction in said draft when the pressure in said furnace increases to approach atmospheric within a predetermined amount.

4,179,266

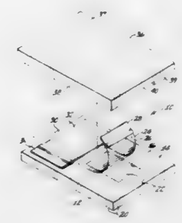
METHOD AND APPARATUS FOR CULTURING AND EXAMINING FUNGI

Patricia A. Lukacsek, 4014 W. Navajo Dr., Phoenix, Ariz. 85021

Continuation-in-part of Ser. No. 789,773, Apr. 22, 1977, abandoned. This application Oct. 27, 1977, Ser. No. 845,897

Int. Cl.² C12B *1/00*

U.S. Cl. 435—254 **4 Claims**



1. A method for culturing fungi preparatory to microscopic examination thereof, said method comprising:

(a) removing a cover from a base to expose a planar top surface thereof, said cover and said base formed of optically clear material;

(b) removing a sealing membrane from said planar top surface to expose a culture nutrient medium in jelled form contained within a compartment of said base, said compartment opening upwardly onto and surrounded by said planar top surface and said jelled culture nutrient medium disposed in said compartment to be flush with said planar top surface;

(c) inoculating a fungi into said culture nutrient medium;

(d) placing a cover slip atop said jelled culture nutrient medium after inoculation of said medium, said cover slip resting on said planar top surface to sealingly cover said compartment and to be in contiguous engagement with said jelled culture nutrient medium;

(e) replacing said cover on said base to hold said cover slip in place and to enclose said base; and

(f) incubating the fungi inoculated into said culture nutrient medium for development of fungal growth on said culture nutrient medium and on the downwardly facing surface of said cover slip to complete preparation thereof for microscopic examination.

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4,179,267

STABLE, HIGHLY CONCENTRATED DYESTUFF SOLUTIONS MISCIBLE WITH WATER IN ANY PROPORTION

Roger Lacroix, Huningue, France, and Hans Mollet, Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 377,881, Jul. 9, 1973, abandoned. This application Mar. 3, 1976, Ser. No. 663,419

Claims priority, application Switzerland, Jul. 14, 1972, 10605/72; Jun. 7, 1973, 8257/73

Int. Cl.[2] C09B *5/62;* D06P *1/02*

U.S. Cl. 8—41 R 7 Claims

1. A stable water-miscible dyestuff solution containing 10–60% by weight of a non-metallized dyestuff, containing a sulfonic acid group and selected from the group consisting of an azo dyestuff and a nitro dyestuff, dissolved in a mixed solvent consisting of an aprotic solvent or a mixture of aprotic solvents selected from the group consisting of dimethylsulfoxide, N-methylpyrrolidone and tetramethylurea each of said aprotic solvent or mixture of said solvents "being mixed with" together with a water-miscible glycol or glycol ether and 0 to 50% water.

4,179,268

METHOD OF MACHINE WASHING OF SOLID SOILED MATERIALS BY REVERSIBLY CONTACTING THE CIRCULATING WASH LIQUID WITH ALUMINOSILICATES

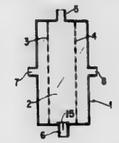
Elmar Reinwald, Dusseldorf; Heinz Smolka, Langenfeld; Milan J. Schwuger, Haan, and Edgar Koppelmann, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

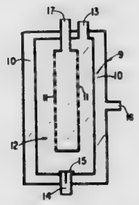
Filed Nov. 16, 1977, Ser. No. 852,028

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1976, 2653479

Int. Cl.[2] B08B *3/00;* C02B *1/00*

U.S. Cl. 8—137 12 Claims





1. A method for machine washing and cleaning of solid materials utilizing washing and cleaning solutions in the presence of water-insoluble cation exchange agents which are capable of binding the hardness components of the water and the soil, comprising withdrawing and recycling the wash liquid in contact with said solid soiled materials through a silicate cation exchange compound having some combined water and a particle size of between 10μ and 1000μ of the formula:

$$(M_{2/n}O)_x \cdot Me_2O_3 \cdot (SiO_2)_y$$

wherein M is a cation of valence n exchangeable with calcium, Me is a member selected from aluminum and boron, x is a number from 0.7 to 1.5 and y is a number from 0.8 to 6, said agent having a calcium binding power of at least 50 mg of CaO per gram, said silicate cation exchange compound being maintained completely out of contact with said solid soiled materials in a separate area from the washing area, said wash liquor at some time during said recycling containing soluble washing and cleaning compounds and washing said solid materials while continuing the recycling of the wash liquor through said silicate cation exchange compound, wherein the total amount of washing liquor is continuously or intermittently cyclically circulated from the washing area through the separate area with the cation exchange compound and then back to the washing area at least five times during the cleaning process, and during this period the direction of flow of said wash liquor through said silicate compound is reversed repeatedly, and where the amount of the cation exchange compound is 0.2 gm to 10 gm per liter of washing solution, and said washing solution contains from 0.2 to 10 gm per liter of other soluble washing and cleaning compounds, whereby said silicate cation exchange compound is never in contact with said solid materials.

4,179,269

SYNTHETIC LOG PRODUCTION

Willard L. Yates, Rte. 1, Box 326 A, Parker City, Ind. 47368, and Floyd W. Lee, Penz Dr., Oakwook, Ill. 61858

Filed Apr. 12, 1978, Ser. No. 896,023

Int. Cl.[2] C10L *5/00*

U.S. Cl. 44—10 B 21 Claims

1. A method of making fireplace logs or the like comprising the steps of

mixing a major portion of ground coal and a minor portion of relatively fine wood fiber material,

heating a minor portion of slack wax to its melting temperature,

mixing the minor portion of melted wax with the major portion of ground coal and the minor portion of wood fiber material so that a putty-like, extrudable mixture is formed, and

extruding the putty-like mixture to produce cylindrical logs or the like.

12. A cylindrical fireplace log or the like consisting of

a major portion of ground coal,

a minor portion of relatively fine wood fiber material,

a minor portion of slack wax, and

a flame coloring agent.

4,179,270

AID FOR KINDLING FIRES

William J. Clayton, Fairport, and Donald F. Kutniewski, Macedon, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 27, 1978, Ser. No. 928,340

Int. Cl.[2] C10L *11/00*

U.S. Cl. 44—40 9 Claims

1. A fire kindling aid comprising:

(a) a substantially solid composition comprised of about 50 to about 90 percent by weight of wax and about 10 to about 50 percent by weight of cellulosic particles, based on the total weight of said composition;

(b) one or more layers of absorbant flammable material adjacent to said composition; and

(c) a container enclosing said composition and said absorbant material, said container comprising a flammable, oil impervious packaging material.

4,179,271
AMINE OXIDE POLYMERS AND USE THEREOF AS FUEL DETERGENT

Paul F. Vartanian, Wappingers Falls, and Anthony L. Ippolito, Beacon, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

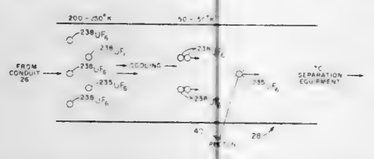
Filed Dec. 14, 1977, Ser. No. 860,547
Int. Cl.[2] C10L 1/18
U.S. Cl. 44—62 4 Claims

1. A motor fuel composition comprising a gasoline base fuel and from 0.005 to 1 weight percent of a detergent reaction product where said detergent reaction product is obtained by preparing an initial reaction mixture consisting of from 5 to 30 weight percent of a butyl methacrylate, 50 to 81 weight percent of a higher ester of methacrylic acid consisting of between 10 and 25% by weight of C_{16}–C_{20} esters of methacrylic acid and 40 to 60 weight percent of a C_{12}–C_{15} aliphatic ester of methacrylic acid, from 4 to 20 weight percent of a nitrogen containing compound selected from the group consisting of 4-vinyl-pyridine and dimethylaminoethyl methacrylate and reacting said initial mixture in the presence of a polymerization catalyst and polymerization initiator to produce a first reaction product, admixing said first reaction product with an oxidizing agent selected from the group consisting of hydrogen peroxide, potassium permanganate, acetic acid, C_2–C_8 alkenyl peracid and C_1–C_8 alkyl peracid to form a second reaction mixture and reacting said second reaction mixture at a temperature ranging from 50° to 200° C. to form said detergent reaction product.

4,179,272
LASER ISOTOPE SEPARATION USING SELECTIVE INHIBITION AND ENCOURAGEMENT OF DIMER FORMATION

Bennett Kivel, Melrose, Mass., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Aug. 1, 1977, Ser. No. 820,621
Int. Cl.[2] B01J 1/10; B01D 1/00
U.S. Cl. 55—1 59 Claims

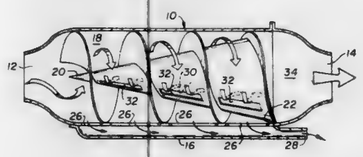


1. A method for producing mass dependent isotopic separation among molecules having an atom present in plural isotope types, the method comprising the steps of:
establishing a flowing environment of the molecules having an atom thereof present in several isotope types;
inducing isotopically selective vibrational excitation of the molecules of said flowing environment so as to produce molecular vibration of molecules having an atom of a predetermined isotope type without correspondingly inducing vibration of molecules having an atom of another isotope type;
inducing aggregation of the flowing molecules having atoms of an isotope other than the predetermined isotope type to form clusters of such molecules while substantially avoiding the formation of dimers and larger clusters of molecules having an atom of the predetermined vibrationally excited isotope type, whereby the selectively excited molecules predominate in monomers; and
separating the selectively excited monomers from the flowing environment of molecules.

4,179,273
DUAL SCAVENGING SEPARATOR

Robert R. Montusi, East Northport, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Oct. 27, 1978, Ser. No. 955,259
Int. Cl.[2] B01D 45/16
U.S. Cl. 55—457 15 Claims



1. A means to separate contaminants from pressure fluid flow while simultaneously scavenging clean fluid from said fluid flow, said means comprising:
an annular housing having a fluid inlet at one end and open at the other, said housing having openings in a wall thereof extending from adjacent the inlet to the other end;
a cone insert for said housing for closing said open end, said cone insert having a spiralling baffle thereabout supporting it in said housing, openings through the cone insert communicating the annular housing to the interior of the cone insert, and a fluid outlet for the interior of the cone insert; and
a sump connected to said annular housing to underlie said openings in the wall thereof, said sump being purged by pressure fluid flow from said annular housing.

4,179,274
RESPIRATOR FILTER AND METHOD OF MAKING THE SAME

William F. Moon, 310 W. Front St., Buchanan, Mich. 49107

Filed Jan. 7, 1976, Ser. No. 647,113
Int. Cl.[2] B01D 39/14
U.S. Cl. 55—524 4 Claims

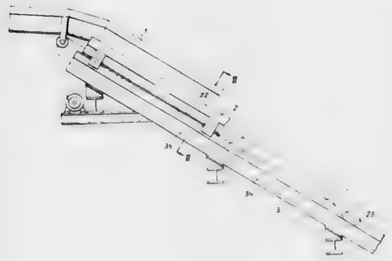


1. In a filter for use at the intake opening of a respirator comprising a felted body of fibers impregnated with a rosin which is uniformly fractured, the improvement wherein said body is characterized by a surface at which the ends of fibers are loose and fluffed and extend outwardly from the body to provide a fluffed or lofted substantially uniform surface texture, said body being of substantially uniform thickness throughout.

4,179,275
METHOD OF EXPANDING METALLURGICAL SLAG

Paul Metz, Luxembourg; Robert Schockmel, Esch-sur-Alzette, and Roland Mersch, Dudelange, all of Luxembourg, assignors to Acieries Reunies de Burbach-Eich-Dudelange S.A. Arbed, Luxembourg, Luxembourg

Division of Ser. No. 851,636, Nov. 15, 1977, Pat. No. 4,123,247. This application May 15, 1978, Ser. No. 906,110
Claims priority, application Luxembourg, Nov. 17, 1976, 76218; Sep. 26, 1977, 78186
Int. Cl. C03B 19/08
U.S. Cl. 65—20 2 Claims



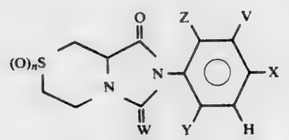
1. In a method of expanding metallurgical molten slag wherein the molten slag is passed downwardly along a pre-expanding path and is contacted with a film of an expanding agent, and the pre-expended slag at the end of said path is further expanded, the improvement which comprises the steps of varying the position at which molten slag is delivered to said path in accordance with the temperature and viscosity thereof so that poorer-foaming slags at lower temperature traverse a longer pre-foaming path, maintaining a constant inclination of said path along its length, and varying lengths of paths for slags of different physical characteristics are varied so that the pre-foamed slag subjected to further expansion for all of the slags has essentially the same characteristics, the length of the path being varied by shifting an intermediate trough relative to a fixed upper trough and a fixed lower trough parallel to the lower trough, the upper trough dispensing a flow of molten slag and the intermediate trough underlying said upper trough and having a discharge edge shiftable along the lower trough.

4,179,276
NOVEL IMIDAZOTHIAZINE-1,3 (2H)-DIONES

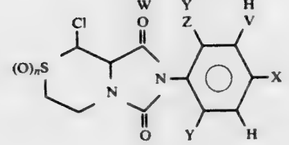
Jiin-Duey Cheng, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 764,582, Feb. 1, 1977, abandoned. This application Mar. 27, 1978, Ser. No. 890,295
Int. Cl.[2] C07D 53/04; A01N 9/12, 9/14
U.S. Cl. 71—91 51 Claims

1. A compound of the formula:



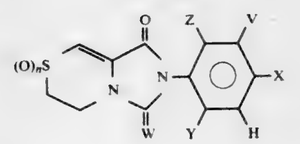
Ia



Ib

-continued

or



Ic

where
n is 0, 1 or 2;
W is oxygen or sulfur;
X is hydrogen, fluorine, chlorine, bromine, cyano, methyl, methoxy or nitro;
Y is hydrogen, fluorine, chlorine or methyl;
Z is hydrogen, fluorine or methyl;
V is hydrogen, fluorine, chlorine or OR; and
R is propargyl or alkyl of 1 to 4 carbon atoms with the proviso that (1) X, Y, Z and V cannot all be hydrogen when n is 0 and W is oxygen; and (2) when V is other than H at least one of X, Y and Z must be other than H; and (3) n is 0 when W is sulfur, for compounds of Formula Ic.

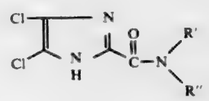
18. A composition for the control of undesirable vegetation consisting essentially of a compound of Formula Ia, Ib or Ic of claim 1 and at least one of (a) a surface active agent and (b) a solid or liquid diluent.

4,179,277
4,5-DICHLOROIMIDAZOLE-2-CARBOXYLIC ACID DERIVATIVES

Gunther Beck, Leverkusen; Klaus Sasse, Schildgen; Helmut Heitzer; Ludwig Eue, both of Leverkusen; Robert R. Schmidt, Cologne; Hans Scheinpflug, Leverkusen; Ingeborg Hammann, and Wilhelm Brandes, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 18, 1977, Ser. No. 770,260
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1976, 2610527; Jun. 2, 1976, 2624759; Jul. 29, 1976, 2634053
Int. Cl.[2] A01N 9/22; C07D 233/66
U.S. Cl. 71—92 25 Claims

1. A 4,5-dichloro-imidazole-2-carboxylic acid amide of the formula



wherein R′ and R″ independently of one another denote hydrogen, C_{1-12}-alkyl optionally substituted by CN, OH, $CONH_2$, COOH, phenyl or N-4,5-dichloroimidazole-2-carboxamide; cyclohexyl, alkenyl or alkynyl with 3-6 carbon atoms; or phenyl or naphthyl, optionally substituted by C_{1-4}-alkoxy, C_{1-4}-halogenoalkyl, halogen, C_{1-4}-halogenoalkyl, halogen, C_{1-4}-alkoxy, C_{1-4}-halogenoalkoxy, acetyl, or phenoxy, naphthoxy, phenylmercapto or naphthylmercapto optionally substituted by halogen, C_{1-4}-alkyl, CF_3, C_{1-4}-alkoxy, NO_2 or C_{1-4}-alkylmercapto, or an acid addition salt thereof.

4,179,278

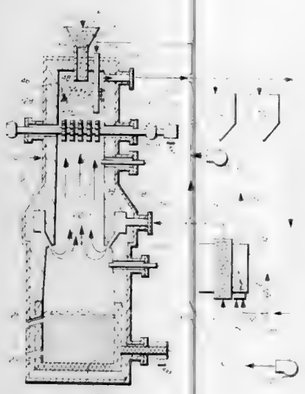
METHOD FOR REDUCING PARTICULATE IRON OXIDE TO MOLTEN IRON WITH SOLID REDUCTANT

Donald Beggs, and David C. Meissner, both of Charlotte, N.C., assignors to Midrex Corporation, Charlotte, N.C.

Continuation-in-part of Ser. No. 769,242, Feb. 16, 1977, Pat. No. 4,082,543. This application Apr. 3, 1978, Ser. No. 892,564

Int. Cl.[2] **C21C** *5/52*

U.S. Cl. 75—11 **7 Claims**



1. A method of reducing particulate iron oxide material to molten iron with a solid reductant comprising:

(a) continously feeding particulate iron oxide and solid particulate carbonaceous fuel to a particle inlet at the top of a shaft furnace to establish a packed burden therein;

(b) passing an electric current through the burden to provide sufficient heat by electric resistance heating to react said carbonaceous fuel with oxygen from said particulate iron oxide to reduce said iron oxide substantially to metallic iron and to melt the iron and form a molten iron pool;

(c) causing the reaction products to move through said particulate burden in counterflow relation with it, and form a top gas;

(d) removing top gas from the upper region of the shaft furnace;

(e) cooling said top gas;

(f) preheating the cooled top gas;

(g) recirculating the heated gas to the burden through a gas inlet at the lower region of said furnace above said molten metal pool; and

(h) removing molten iron product and slag from an outlet at the bottom of said furnace.

4,179,279

PROCESS FOR TREATING MOLTEN STEEL SLAG WITH RED MUD FROM ALUMINUM INDUSTRY

Genzaburo Harada; Takuma Yen, and Masao Tomari, all of Kitakyushu, Japan, assignors to Nippon Jiryoku Senko Co., Ltd., Fukuoka, Japan

Continuation of Ser. No. 727,502, Sep. 28, 1976, abandoned. This application Jan. 30, 1978, Ser. No. 873,529

Claims priority, application Japan, Oct. 9, 1975, 50-122136; Nov. 7, 1975, 50-134518

Int. Cl.[2] **C12B** *3/04*

U.S. Cl. 75—24 **3 Claims**

1. A process for treating slag from known converter and electric furnaces to improve the structural stability of such slag and render such slag suitable such as a landfill and construction material as well as a substitute for base material or crushed stone for road construction, comprising the steps of:

(1) providing molten slag produced from a conventional converter or electric furnace in which the furnace is used in conventional steel production and wherein the molten slag when cooled contains Free CaO and $2CaO.SiO_2$ which render such cooled slag unsuitable for landfill purposes due to swelling and structural instability of the Free CaO and $2CaO.SiO_2$ therein,

(2) adding red mud obtained as a by-product from the aluminum industry to the molten slag thereby creating a thermochemical reaction between the red mud and the molten slag to transform a composition of said cooled slag containing the Free CaO and $2CaO.SiO_2$ to a relatively non-swelling and non-crumbling composition, said red mud accounting for 5 to 20 percent of said molten slag after the addition of said red mud, said red mud comprising as a major component Fe_2O_3 and as a lesser component Na_2O, said red mud melting at a temperature lower than the melting temperature of said slag, and

(3) utilizing the heat value of the molten slag to melt said red mud into said molten slag and cause said thermo-chemical reaction, whereby the thus processed cooled slag has structural ability rendering it suitable as a landfill.

4,179,280

DIRECT-REDUCTION PROCESS CARRIED OUT IN A ROTARY KILN

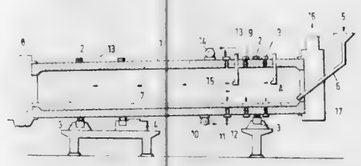
Gerhard Reuter, Frankfurt am Main; Wolfram Schnabel, Hattersheim, and Harry Serbent, Hanau, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,256

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1977, 2719422

Int. Cl.[2] **C21B** *13/08*

U.S. Cl. 75—33 **7 Claims**



1. In a process for preparing sponge iron by directly reducing an iron oxide-containing material with the use of solid carbonaceous reducing agents having a content of volatile combustile constituents in a rotary kiln said kiln having a heating-up zone in which the solid charge of iron oxide and reducing agent is heated to approximately the reduction temperature through which kiln the kiln atmosphere and the solid charge material of iron oxide-containing material and reducing agent are countercurrently passed, and wherein oxygen-containing gas is injected at a controlled rate through shell pipes into the free kiln space, the improvement which comprises injecting oxygen-containing gas at controlled rates through nozzle blocks into charge material disposed over said nozzle blocks at that horizontal region of the heating-up zone of which is defined by a point along the length of said heating-up zone where ignitable particles of the solid reducing agent first appear and a second point along the length of said heating-up zone before the point at which the reducing zone begins and injecting oxygen-containing gas at controlled rates through shell pipes into the free kiln space of the heating-up zone.

4,179,281

METHOD FOR COOLING HIGH-TEMPERATURE REDUCED IRON

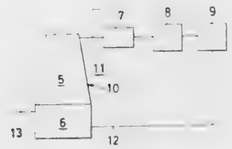
Katsuya Ono, Kitakyushu; Takashi Nakamura, and Toru Wakabayashi, both of Himeji, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 19, 1978, Ser. No. 907,850

Claims priority, application Japan, Sep. 7, 1977, 52-107612; Mar. 23, 1978, 53-33322

Int. Cl.[2] **C23F** *7/04, 9/02*

U.S. Cl. 75—35 **5 Claims**



1. A method for cooling high-temperature reduced iron in a cooling zone, integrated with a direct reducing furnace, under a high pressure condition, which comprises contacting said high-temperature reduced iron, having a temperature of 700° C. or higher, with a hydrogen-containing cooling gas in said cooling zone, the pressure in said cooling zone being 1.5 to 5 kg/cm^2 G, said hydrogen-containing cooling gas containing 5–20% by volume of CO_2 and also containing CO in an amount satisfying the condition that $CO(\%) \leqq 26.7X^{-0.234}$, wherein X is the pressure in said cooling zone.

4,179,282

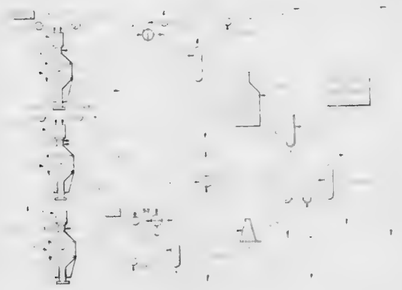
METHOD FOR THE REDUCTION OF METAL OXIDES

Charles A. Rubio, Houston, Tex., assignor to CVG-Siderurgica del Orinoco, C.A., Venezuela

Filed May 11, 1978, Ser. No. 904,976

Int. Cl.[2] **C21B** *13/00*

U.S. Cl. 75—35 **15 Claims**



1. A process for the production of sponge metal by direct gaseous reduction of metal oxides, comprising:

initially preheating a mass of particulated metal oxide, including

mixing and combusting a stream of fuel with no more than a stoichiometric quantity of an oxygen-containing gas stream to produce a hot combustion gas stream which is depleted of substantially free oxygen; and

passing the hot combustion gas stream through the metal oxide mass;

reducing the preheated metal oxide mass to sponge metal by passing a stream of hot reducing gas through the mass, said hot reducing gas being comprised primarily of hydrogen and carbon monoxide heated to an elevated temperature required for metal oxide reduction by

mixing and combusting a stream of fuel with no more than a stoichiometric quantity of an oxygen-containing gas stream to produce a hot combusion gas stream which is depleted of free oxygen; and

intimately mixing the hot combustion gas stream with a stream of reducing gas comprised primarily of hydrogen and carbon dioxide to elevate the reducing gas stream temperature to said required metal oxide reducing temperature without depleting any hydrogen and carbon monoxide reducing components thereof; and

cooling a resulting mass of reduced sponge metal by passing a stream of cool gas through the resulting mass.

4,179,283

PRODUCTION OF METALS

John E. Rehder, 36 Castle Frank Rd., Apt. 309, Toronto, Ontario, Canada

Filed Mar. 20, 1978, Ser. No. 888,027

Claims priority, application United Kingdom, Mar. 21, 1977, 11872/77; Jul. 13, 1977, 29376/77; Jul. 13, 1977, 29377/77

Int. Cl.[2] **C22B** *1/08, 1/24*

U.S. Cl. 75—40 **10 Claims**

1. A process for smelting metal oxide to molten metal with improved combustion efficiency, comprising:

forming compacts having a nominal diameter of at least about two inches and consisting essentially of an intimate mixture of metal oxide, solid carbonaceous material, slag material and a binder, the carbon content of said compacts being sufficient for complete reduction of the metal oxide and for combustion, the solid carbonaceous material used for combustion having a volatile matter content of less than about 15% by weight;

charging said compacts to a shaft furnace;

burning said solid carbonaceous material used for combustion in said compacts by air introduced through primary tuyeres near the base of the shaft primarily to carbon dioxide;

controlling the mass flow rate and velocity of air through each tuyere to provide a maximum thrust of air at each primary tuyere to a value of less than 15 pounds, whereby no raceway or cavity is formed at any tuyere, and a space velocity of the combustion air in the furnace referred to the empty shaft at normal temperature and pressure (STP) of greater than 200 feet per minute,

reducing said metal oxide to the corresponding metal under the influence of the heat generated by said combustion using the portion of said solid carbonaceous material in said compacts not used for said combustion; and

withdrawing the resulting molten metal and slag from the shaft furnace.

4,179,284

METHOD FOR DIRECT RECOVERY OF METAL FROM METAL-BEARING ORES

Horst Weigel, and Karl Muller, both of Cologne, Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 7, 1977, Ser. No. 858,391

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1976, 2655813

Int. Cl.[2] **C22B** *5/12;* **C21B** *13/02*

U.S. Cl. 75—92 **8 Claims**

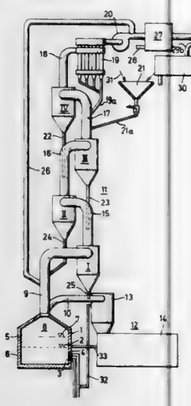
1. In a method for direct recovery of a metal from relatively fine-grained metal-bearing ore particles having an average particle granulation range of less than about 250 microns wherein carbon-containing materials are utilized for reducing such ore to a product of value via a multi-stage counter-current reduction-smelting system having separate and interconnected reaction regions including a reduction gas generator region, a multi-stage sequential ore reduction region and a smelting

reactor region, each region having gas and solid passageways interconnected with corresponding gas and solid passageways of a proceeding region so that a reduction gas flows in one direction from said reduction gas generator region through said system and solid particles flow in an opposite direction from a source thereof through such system, the improvement comprising the following combination of sequential steps:

(a) feeding carbon-containing material and oxygen-containing material to said reduction gas generator region which includes a molten metal bath, said materials being fed into said bath at a location thereof below an upper surface of said bath so as to convert at least a portion of said materials into a relatively hot CO/H_2-rich reduction gas having a temperature above that at which ore particles tend to agglormorate;

(b) diverting a relatively small portion of said hot reduction gas from said reduction gas generator region and conveying such small portion of hot reduction along with a controlled amount of oxygen-containing material to said smelting reactor region for use in smelting of substantially reduced ore;

(c) admixing the remaining portion of said hot reduction gas with expended reduction gas drawn-off from a relatively cool area of said multi-stage sequential ore reduction region to attain a beneficial CO/H_2-rich reduction gas



having a temperature about below that at which ore particles tend to agglormorate and at about the temperature required from dry reduction of ore particles;

(d) conveying said beneficial CO/H_2-rich reduction gas in said one direction through said multi-stage sequential ore reduction region at gas speeds ranging from about 3 to 30 meters per second while substantially simultaneously conveying said relatively fine-grained metal-bearing ore particles in said opposite direction from a source thereof through said multi-stage sequential ore reduction region whereby said ore particles are in counter-current intimate contact with said beneficial CO/H_2-rich reduction gas within said multi-stage sequential ore reduction region so that relatively high and alternating speeds occurs between said gas and said particles as such gas and particles travel from one stage to another stage of said multi-stage sequential or reduction region whereby said ore particles are reduced to such an extend after a last stage of said reduction region as to form substantially reduced ore particles;

(e) admixing the so-attained reduced ore particles along with the mixture of hot reduction gas and oxygen-containing material obtained at step (b) and feeding the resultant admixture directly into said smelting reactor region so as to convert said reduced ore particles to liquid metal; and

(f) withdrawing a portion of so-attained liquid metal from said smelting reactor region as a product of value and conveying another portion of such liquid metal into the molten metal bath within said reduction gas generator region.

4,179,285

FERRITIC STAINLESS STEEL

Harry Tanczyn, Baltimore, Md., assignor to Armco Inc., Middletown, Ohio

Filed Jul. 27, 1978, Ser. No. 928,595
Int. Cl.² C22C *38/24, 38/26*
U.S. Cl. 75—126 E **2 Claims**

1. A substantially fully ferritic stainless steel consisting essentially of, in weight percent, from about 0.05% to about 0.15% carbon, about 0.1% to about 0.7% manganese, about 0.2% to about 0.75% silicon, about 23% to about 28% chromium, about 0.1% to about 0.25% nitrogen, about 0.25% to about 0.6% columbium, about 0.02% to about 0.2% vanadium, about 0.2% maximum molybdenum, about 0.04% maximum phosphorus, about 0.03% maximum sulfur, and remainder essentially iron, with the columbium plus vanadium contents being not more than about 4 times the carbon plus nitrogen contents.

4,179,286

SILVER FREE, LOW GOLD-NOBLE METAL ALLOYS FOR FIRING OF DENTAL PORCELAIN

Helmut Knosp, Pforzheim, Fed. Rep. of Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Jan. 17, 1979, Ser. No. 4,191
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1978, 2813813
Int. Cl.² C22C *5/02, 5/00*
U.S. Cl. 75—134 N **10 Claims**

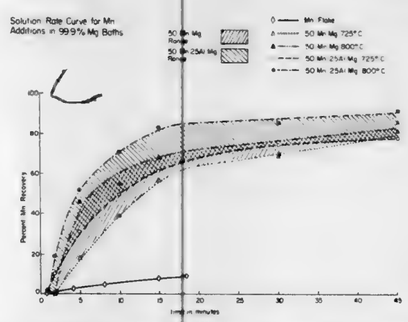
1. A silver-free, low gold, noble metal alloy suitable for firing on dental porcelain consisting essentially of 30 to 55% gold, 30 to 60% palladium, 1 to 12% tin, 0 to 10% indium, 0.1 to 3% germanium and at least one member of the group consisting of 0.05 to 1% rhenium and 0.05 to 1% ruthenium.

4,179,287

METHOD FOR ADDING MANGANESE TO A MOLTEN MAGNESIUM BATH

Timothy J. Kosto, Youngstown, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 19, 1978, Ser. No. 970,983
Int. Cl.² C22C *1/02*
U.S. Cl. 75—168 E **12 Claims**



1. A method for making manganese additions to a molten magnesium bath which comprises introducing into the molten magnesium bath a blended mixture consisting essentially of finely divided manganese and a finely divided metal selected from the group consisting of magnesium and magnesium base alloys containing at least 90 percent magnesium wherein the ratio of manganese to magnesium by weight in the mixture is from about ¼ to 8 and the ratio of magnesium to manganese by weight in the mixture is from about 4 to ¼ so that the manganese addition is substantially dissolved in the molten magnesium bath at a rate substantially greater than that which would be obtained by the addition of elemental manganese and with substantially complete retention of the finely divided manganese and magnesium addition.

4,179,288

PALLADIUM BASE DENTAL ALLOY

Emil M. Prosen, Bala-Cynwyd, Pa., assignor to Neoloy Products, Inc., Posen, Ill.

Filed Jan. 24, 1979, Ser. No. 6,078
Int. Cl.² C22C *5/02*
U.S. Cl. 75—172 G **4 Claims**

2. A dental alloy especially adapted for the adhesion of porcelain having a fusing temperature of 1750° F. to 1850° F., consisting essentially of:
Gallium—7% to 12%
Gold—2% to 5%
Boron—0.125% to 0.50%
Palladium—Balance

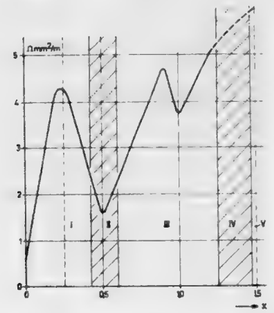
said alloy having a melting temperature of 2375° F. to 2550° F.

4,179,289

ELECTRODE FOR ELECTROCHEMICAL PROCESSES AND METHOD OF PRODUCING THE SAME

Franz Brandmair, Rain; Ottmar Rubisch, Meitingen bei Augsburg, and Dietmar Honig, Augsburg, all of Fed. Rep. of Germany, assignors to Sigri Elektrographit GmbH, Meitingen, Fed. Rep. of Germany

Division of Ser. No. 765,899, Feb. 7, 1977, Pat. No. 4,078,988, which is a division of Ser. No. 541,348, Jan. 15, 1978, Pat. No. 4,029,566. This application Dec. 14, 1977, Ser. No. 860,299
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1974, 2405010
Int. Cl.² B22F *3/00, 5/00*
U.S. Cl. 75—206 **1 Claim**



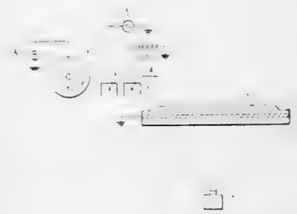
1. Method of producing an electrode for electrochemical processes which comprises mixing titanium powder and titanium dioxide powder in a ratio of 7:1 to 1:3, adding a binding agent thereto, compressing the resulting mixture and sintering it at temperature of 1200° to 1400° C. in an argon atmosphere, and coating the thus compressed and sintered body with a covering layer containing an activating substance.

4,179,290

PHOTOELECTROPHORETIC PHOTOGRAPHY PROCESS INVOLVING DUAL CORONA TREATMENTS OF OPPOSITE POLARITY

Isoji Takahashi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 8, 1978, Ser. No. 884,507
Claims priority, application Japan, Mar. 14, 1977, 52-28321
Int. Cl.² G03G *13/22*
U.S. Cl. 430—34 **21 Claims**



1. A photoelectrophoretic image-forming process using a pair of electrodes at least one of which is transparent and at least one of which has an electrically insulating surface, comprising the steps of:

(1) forming a liquid film of a suspension of light-sensitive particles on the electrically insulating surface of one of the electrodes as the first electrode,

(2) in a first showering, showering the liquid film with corona ions of either polarity,

(3) further showering the charged liquid film with corona ions containing corona ions of an polarity opposite to that of the corona ions of the first showering,

(4) positioning the other of the two electrodes facing the first electrode with the liquid film therebetween,

(5) image-wise exposing the liquid film to light through the transparent electrode while simultaneously applying an electric potential across both electrodes such that the polarity of the second electrode is the same as the polarity of corona ions in the first showering, and thereby causing optically-exposed light-sensitive particles in the liquid film to migrate from the first electrode onto the surface of the second electrode, resulting in the production of an image of the light-sensitive particles on at least one of the electrodes.

2. The process of claim 1, wherein the voltage applied to produce said corona ions in said first showering ranges from about 4 kV to about 8 kV, wherein said voltage applied to produce said corona ions in said further showering is an A.C. voltage of about 3 to about 12 kV with a frequency ranging from about 10 Hz to about 100 kHz and the electric potential applied across both electrodes simultaneously with said image-wise exposing of said liquid film ranges from about 300 volts to about 6,000 volts.

4,179,291

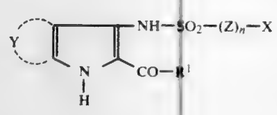
PHOTOGRAPHIC DYE DIFFUSION TRANSFER PROCESS

Hans Vetter, Cologne, and Paul Marx, Leverkusen, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Fed. Rep. of Germany

Filed Oct. 4, 1977, Ser. No. 839,374
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1976, 2645656
Int. Cl.² G03C *1/40, 5/54, 7/00, 1/10*
U.S. Cl. 430—223 **3 Claims**

1. The photographic dye diffusion transfer process for the production of colored images, in which a photographic material comprising at least one light-sensitive silver halide emulsion layer and, associated therewith, a non-diffusible dye-prov-

iding compound which in its oxidized form is capable of releasing a diffusible dye in an alkaline medium, is exposed imagewise and developed with a silver halide alkaline developer which in its oxidized form oxidizes the non-diffusible dye-providing compound and the latter is split by the developer alkali as a consequence of this oxidation, releasing a diffusible dye in image distribution, in which the improvement comprises the non-diffusible dye-providing compound is represented by the following formula:



in which

X represents the residue of a dye precursor which is attached to to the SO_2 group either directly or by way of an intermediate member Z;

Z represents an alkylene group with 1 to 6 carbon atoms, arylene or a heterocyclic group which is attached to the residue X either directly or by way of an —O—, —S—, —SO_2—, —NR— (R=hydrogen or alkyl), —CO—, —CO—NH— or —SO_2—NH—group;

n is 0 or 1;

Y represents the residue to complete a condensed benzene ring;

R^1 represents —OR^2—, or



R^2 represents hydrogen, an alkyl group having from 1 to 22 carbon atoms, or a cycloalkyl or aryl group; the said alkyl, cycloalkyl and aryl groups may in turn be substituted;

R^3 represents one of the residues given under the definition for R^2 or an acyl group derived from aliphatic or aromatic carboxylic or sulphonic acids;

R^4 represents hydrogen or a substituted or unsubstituted alkyl group having from 1 to 22 carbon atoms; and in which R^1 and/or a substituent on the condensed benzene ring which is completed by Y represents or contains a residue which confers diffusion resistance.

4,179,292

LIGHT-SENSITIVE COPYING COMPOSITION

Kurt-Walter Klupfel, and Heide Sprengel, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 16, 1977, Ser. No. 851,875

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1976, 2652304

Int. Cl.[2] **G03F** *7/02;* **G03C** *1/00, 1/94, 1/52*

U.S. Cl. 430—175 **14 Claims**

1. In a negative-working light-sensitive copying composition comprising at least one condensation product of a diazonium, salt, at least one water-soluble synthetic polymer, and at least one acrylic resin having an acid number between 60 and 200 and which is soluble in an aqueous-alkaline solution, the weight ratio of water-soluble synthetic polymer and acrylic resin being within the limits of 10:90 and 90:10,

the improvement that the water-soluble synthetic polymer is a copolymer of a C_3 to C_{16} alkyl acrylate and an N-vinyl N-alkyl carboxylic acid amide, the alkyl and carboxylic acid groups of which contain 1 to 6 carbon atoms each.

4,179,293

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Shigeo Hirano; Keiichi Adachi; Seiki Sakanoue, and Takayoshi Kamio, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 9, 1978, Ser. No. 932,384

Claims priority, application Japan, Aug. 9, 1977, 52-95256

Int. Cl.[2] **G03C** *1/76, 7/00*

U.S. Cl. 430—551 **17 Claims**

1. A color photographic light-sensitive material comprising a support having thereon at least one layer of a silver halide photographic emulsion with the light-sensitive material containing at least one liquid hydroquinone compound substituted with one or two tertiary alkyl groups having 15 carbon atoms, or a precursor thereof, wherein said tertiary alkyl groups individually have 15 carbon atoms.

4,179,294

SILVER HALIDE LIGHT-SENSITIVE ELEMENT CONTAINING DYE

Masatoshi Sugiyama, and Eiichi Kato, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 781,802, Mar. 28, 1977, abandoned. This application Jul. 31, 1978, Ser. No. 929,602

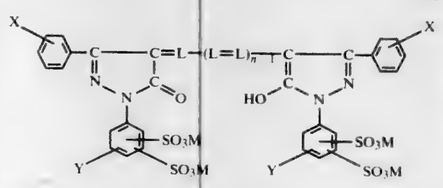
Claims priority, application Japan, Mar. 26, 1976, 51-33165

Int. Cl.[2] **G03C** *1/84*

U.S. Cl. 430—522 A **16 Claims**

1. A silver halide photographic light-sensitive element comprising a silver halide emulsion layer on a support and at least one hydrophilic colloid layer thereon, the element containing the combination of (1) at least one basic polymer and (2) at least one oxonol dye at a coverage of about 8 to about 800 mg/m^2 represented by the following formula (I):

(I)



wherein X represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, an alkylthio group, an alkoxycarbonyl group or an amino group; Y represents a hydrogen atom, a halogen atom, a sulfo group, a lower alkyl group or a hydroxy group; L represents a methine group; M represents a cation; and n represents a positive integer of from 1 to 3, wherein said basic polymer is present in an amount such that about 4 to 20 basic functional groups in the basic polymer are present per mole of said dye.

4,179,295

ORGANOPOLYSILOXANE CONTAINING PLANOGRAPHIC MASTERS

Minoru Takamizawa; Yoshio Inoue, and Toshikazu Sugita, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co. Ltd., Tokyo, Japan

Filed Jun. 1, 1977, Ser. No. 802,318

Claims priority, application Japan, Jun. 7, 1976, 51/66256

Int. Cl.[2] **G03G** *1/71;* **G03F** *7/02*

U.S. Cl. 428—447 **9 Claims**

1. In a planographic master composed of a substrate and an overlying layer of an organopolysiloxane composition and a photosensitizer, the improvement which comprises said organopolysiloxane composition being composed of

(a) an organopolysiloxane with aliphatically unsaturated linkages in the molecule containing organosiloxane units represented by the general formula

$$R^1(R^2)_nSiO_{(3-n)/2}$$

where

R^1 is vinyl, allyl, or ethynyl,

R^2 is a substituted or unsubstituted monovalent hydrocarbon group with from 1 to 10 carbon atoms, free of aliphatic unsaturation and having no mercapto group and

n is zero, 1 or 2, in a mole fraction of from 0.1 to 100 mole %, the balance being organosiloxane units represented by the general formula

$$(R^3)_mSiO_{(4-m)/2}$$

where

R^3 has the same meaning as R^2 above and

m is zero, 1, 2 or or 3, and

(b) a mercapto-containing organopolysiloxane containing organosiloxane units represented by the general formula

$$R^4(R^5)_pSiO_{(3-p)/2}$$

where

R^4 is an organic group with at least one mercapto group bonded to a carbon atom selected from the group consisting of $—C_3H_6SH$, $—CH_2SH$, $—C_6H_4SH$, $—C_2H_4CH(CH_2SH)_2$, $—C_2H_4C(C_2H_4SH)_3$, $—C_2H_4SCH_2CH(CH_2SH)_2$, and $—C_2H_4SCH_2C(CH_2SH)_3$,

R^5 has the same meaning as R^2 and

p is zero, 1 or 2, in a mole fraction of from 0.1 to 100 mole %, the balance being organosiloxane units represented by the general formula

$$(R^6)_qSiO_{(4-q)/2}$$

where

R^6 has the same meaning as R^2 and

q is zero, 1, 2 or 3, in an amount that is sufficient to provide from 0.02 to 50 moles of the mercapto groups bonded to the carbon atoms per mole of the aliphatically unsaturated linkages in component (a), and

wherein the amount of component (b) is such that from 0.1 to 10 moles of the mercapto groups in component (b) are provided per mole of the aliphatically unsaturated linkages in component (a), and the amount of the photosensitizer is from 0.05 to 5% by weight based on the total amount of components (a) and (b).

4,179,296

SILVER HALIDE PHOTOGRAPHIC EMULSION

Akira Sato; Atsuo Iwamoto; Takeo Sakai, and Haruo Takei, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 751,833, Dec. 17, 1976, abandoned. This application Dec. 15, 1977, Ser. No. 860,919

Claims priority, application Japan, Dec. 29, 1975, 50/159261

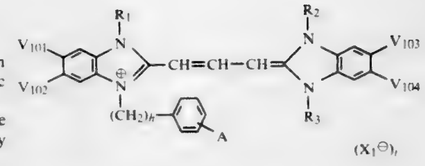
Int. Cl.[2] **G03C** *1/14, 1/18, 1/19*

U.S. Cl. 430—574 **7 Claims**

1. A silver halide photographic emulsion containing, in supersensitizing amounts, a combination of

at least one benzimidazolocarbocyanine dye wherein an aralkyl group substituted with an acidic group is connected to at least one nitrogen atom in the imidazole ring, which is represented by the following general formula (I-B)

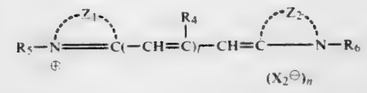
(I-B)



wherein V_{101}, V_{102}, V_{103} and V_{104}, which may be the same or different, each represents a hyrogen atom, a halogen atom, an alkyl group, an alkenyl group, a cycloalkyl group, an acyl group, an acyloxy group, an alkoxycarbonyl group, a carbamoyl group, a sulfamoyl group, a cyano group, a trifluoromethyl group or a hydroxy group, with the proviso that at least one of V_{101} and V_{102}, and V_{103} and V_{104}, represents simultaneously a chlorine atom; R_1, R_2 and R_3, which may be the same or different, each represents an aliphatic group, with the proviso that R_3 can also be a substituted alkyl group; A represents a sulfo group or a carboxy group; X_1 represents an acid residue; h represents an integer from 1 to 6; and i represents 0 or 1;

at least one cyanine dye represented by the following general formula (II):

(II)



wherein Z_1 and Z_2 are selected from one of the following combinations (A)–(E):

(A) Z_1 represents the atoms necessary to complete a naphthothiazole nucleus, and Z_2 represents the atoms necessary to complete a benzothiazole or a naphthothiazole nucleus;

(B) Z_1 represents the atoms necessary to complete a benzothiazole nucleus, and Z_2 represents the atoms necessary to complete a benzoxazole nucleus;

(C) Z_1 represents the atoms necessary to complete a benzothiazole nucleus, and Z_2 represents the atoms necessary to complete a naphthoxazole nucleus;

(D) Z_1 represents the atoms necessary to complete a naphthothiazole nucleus, and Z_2 represents the atoms necessaty to complete a benzoxazole nucleus;

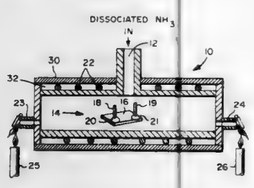
(E) Z_1 represents the atoms necessary to complete a naphthothiazole nucleus, and Z_2 represents the atoms necessary to complete a naphthoxazole nucleus, wherein a heterocyclic nucleus and/or a benzene nucleus, present in a naphthothiazole or naphthoxaxole group, may be substituted with one or more substituents selected from the group consisting of an alkyl group containing 6 or less carbon atoms, an alkenyl group containing 6 or less carbon atoms, a cycloalkyl group containing 6 or less carbon atoms, an aryl group, which may be mono- or bicyclic, a hydroxy group, an alkoxy group containing 7 or less carbon atoms, an acyl group containing 8 or less carbon atoms, a carboxy group, an alkoxycarbonyl group containing 8 or less carbon atoms, or a halogen atom; R_4 represents a hydrogen atom, an aliphatic group or an aryl group; R_5 and R_6, which may be the same or different, each represents an aliphatic group; X_2 represents an acid residue; and l represents 1 and n represents 0 or 1.

4,179,297

BRAZING SLURRY

William E. Buescher, Seneca Falls, N.Y.; Frederick J. Roberto, Emporium, and Isabelle M. Sobierajski, St. Marys, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 26, 1978, Ser. No. 955,087
Int. Cl.[2] C23C 1/12; B23K 35/34
U.S. Cl. 106—1.12 4 Claims



1. A brazing composition comprising, by weight, a substantially homogeneous suspension of about 15–16.5% fine particle metallic tungsten; about 5–6% calcium oxide; about 4–5% silicon dioxide; about 6–7% aluminum oxide; and about 67–70% of an organic binder.

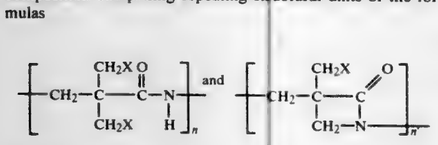
4,179,298

FLAME RETARDANT INTUMESCENT POLYAMIDES

Linnea E. Nelson, and Charles E. Reineke, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 18, 1978, Ser. No. 870,312
Int. Cl.[2] C08J 9/02
U.S. Cl. 106—18.21 5 Claims

1. An intumescent flame retardant coating formulation comprising from about 40 to about 99 percent by weight of a combination of a film-forming binder and dispersing agent, and from about 1 to about 60 percent by weight of a polyamide composition comprising repeating structural units of the formulas



and

wherein

X is independently chloro or bromo, and n and n′ are each independently a positive integer.

4,179,299

SINTERED ALPHA SILICON CARBIDE CERAMIC BODY HAVING EQUIAXED MICROSTRUCTURE

John A. Coppola, Lewiston; Laurence N. Hailey, Niagara Falls, and Carl H. McMurtry, Youngstown, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Continuation of Ser. No. 901,406, May 1, 1978, abandoned, which is a continuation-in-part of Ser. No. 584,226, Jun. 5, 1975. This application Mar. 26, 1979, Ser. No. 24,148
Int. Cl.[2] C04B 35/56
U.S. Cl. 106—44 16 Claims

1. A sintered ceramic body consisting essentially of:
(a) from about 91 to about 99.85% by weight silicon carbide, wherein at least 95% by weight of the silicon carbide is of the alpha phase;
(b) up to about 5.0% by weight carbonized organic material;
(c) from about 0.15 to about 3.0% by weight boron; and
(d) up to about 1.0% by weight additional carbon; and having a predominantly equiaxed microstructure.

4,179,300

OPTICAL GLASS

Hiroji Sagara, Akikawa, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Jan. 20, 1978, Ser. No. 871,169
Claims priority, application Japan, Jan. 27, 1977, 52-8096
Int. Cl.[2] C03C 3/10
U.S. Cl. 106—47 Q 1 Claim

1. An optical glass not containing PbO and consisting essentially of, in percent by weight, about 33.0% SiO_2, about 4.0% B_2O_3, about 2.0% Li_2O, about 27.4% BaO, about 5.9% CaO, about 4.3% ZnO, about 5.0% ZrO_2, and about 18.4% TiO_2 having a refractive index of about 1.7630, and Abbe number of about 33.0 and an acid resistance of less than 0.1%.

4,179,301

Si_3N_4 CONTAINING INTERGRANULAR PHASE NUCLEATING AGENT AND METHOD

Sergej-Tomislav Buljan, Acton, Mass., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 8, 1979, Ser. No. 1,641
Int. Cl.[2] C04B 35/58, 35/04, 35/50
U.S. Cl. 106—73.5 14 Claims

1. A polycrystalline ceramic body consisting essentially of a first phase of Si_3N_4 grains, and a second crystalline intergranular phase comprising SiO_2 and at least one densifying additive, characterized in that the body additionally contains from 100 to 1,000 parts per million of at least one nucleating agent selected from the group consisting of Ti, Fe, and the oxides and nitrides of Ti and Fe to facilitate substantially complete crystallization of the intergranular phase.

4,179,302

RAW MIXTURE FOR THE PRODUCTION OF CEMENT CLINKER

Boris I. Nudelman; Anatoly Y. Gadaev; Marsel Y. Bikbau, and Petr T. Shishkin, all of Tashkent, U.S.S.R., assignors to Tashkentsky Nauchno-Issledovatelsky I Proektny Institut Stroitelnykh Materialov "Niistromproekt", U.S.S.R.

Filed Jun. 7, 1977, Ser. No. 804,268
Claims priority, application U.S.S.R., Aug. 20, 1976, 2400246[I]
Int. Cl.[2] C04B 7/02
U.S. Cl. 106—100 6 Claims

1. A raw mixture for the production of a cement clinker consisting of the following components, percent by mass:
lime component—55 to 63
clay component—23 to 17
ferrous component—4 to 1
calcium chloride—17.8 to 4
potassium chloride—0.1 to 7.5
sodium chloride—0.1 to 7.5.

4,179,303

METHOD OF PRODUCING STRUCTURAL INSULATION MATERIALS CONTAINING AT LEAST 50 PERCENT XONOTLITE

Richard F. Shannon, Lancaster, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 31, 1978, Ser. No. 929,638
Int. Cl.[2] C04B 15/06
U.S. Cl. 106—119 6 Claims

1. The method of producing xonotlite containing structural insulation materials comprising: preparing an aqueous slurry of calcareous and siliceous materials (that are free) having less than approximately 0.01% of reaction poisoning aluminum producing ion in a calcia to silica ratio above approximately 0.90, dispersing more than 2 percent by weight of solids of a filamentizable glass strand throughout the slurry in a monofilament network having a fiber length of more than approximately one eighth inch, causing more than 1 percent by weight of solids of negatively charged wood pulp fibers free of aluminum ions to be dispersed throughout the slurry, causing all materials to be sufficiently negatively charged and the water to solids ratio to be less than approximately 4.0 to 1 to produce a thixotropic mixture, shaping the slurry and autoclaving the slurry under heat and pressure to produce the insulation.

4,179,304

FINGER NAIL LACQUER

Robert Rossomando, Branchburg, N.J., assignor to Polychrome Corporation, Yonkers, N.Y.

Filed Apr. 3, 1978, Ser. No. 893,094
Int. Cl.[2] C08L 1/18; A61K 7/043
U.S. Cl. 106—177 10 Claims

1. A composition comprising,
a. sucrose benzoate; and
b. sucrose acetate isobutyrate; and
c. an optional plasticizer selected from the group consisting of organic phthalates, adipates and phosphates; and
d. nitrocellulose.

4,179,305

PIGMENT PREPARATION AND USE IN COATING COMPOSITIONS

Russell C. Miller, Chicago, Ill., assignor to J. M. Eltzroth & Associates, Inc., Schaumburg, Ill.

Continuation of Ser. No. 660,173, Feb. 23, 1976, Pat. No. 4,154,620, which is a continuation-in-part of Ser. No. 505,212, Sep. 12, 1974, abandoned. This application Nov. 20, 1978, Ser. No. 961,872
The portion of the term of this patent subsequent to Jan. 10, 1995, has been disclaimed.
Int. Cl.[2] C09C 1/08, 1/20, 1/34
U.S. Cl. 106—292 8 Claims

1. A pigment consisting essentially of a finely divided intimate mixture of calcium silicofluoride and at least one chromium compound selected from the group consisting of chromic acid, strontium chromate, zinc chromate and lead chromate, the quantity of said chromium compound being within the range of 0.05% to 50% by weight of the total solids.

4,179,306

STABILIZING TITANIUM DIOXIDE PIGMENTS WITH VANADATES

Peter Woditsch; Eckhard Bayer; Peter Panek, and Heribert Stutgens, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 8, 1978, Ser. No. 913,711
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1977, 2729496
Int. Cl.[2] G04B 31/02
U.S. Cl. 106—300 4 Claims

1. A process for the production of a light-stable and weather-stable titanium dioxide pigment comprising precipitating onto the pigment in aqueous suspension a colorless vanadate of at least one of zinc, magnesium, calcium, strontium and barium at a pH-value above 7 in about 0.01 to 5% by weight, expressed as V_2O_5, based on TiO_2.

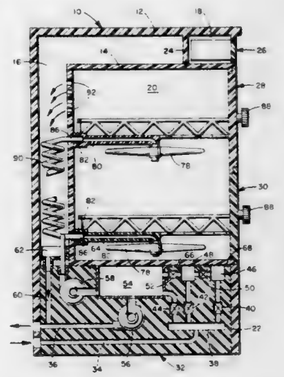
4,179,307

DISH-WASHER CONSISTING OF AN ASSEMBLY OF FUNCTIONAL UNITS MADE OF THERMOPLASTIC MATERIAL

Pasqualino Cau, Oggiono, and Vincenzo Cocca, Cormano, both of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed May 15, 1978, Ser. No. 906,195
Claims priority, application Italy, May 13, 1977, 23537 A/77
Int. Cl.[2] B08B 3/02
U.S. Cl. 134—58 D 8 Claims

1. A dish-washing machine comprising
an outer enclosure comprised of thermoplastic material and having an opening at one side thereof;
an inner enclosure comprised of thermoplastic material and having an opening at one side thereof, said inner enclosure being supported within said outer enclosure and being spaced therefrom;
a plurality of functional units each comprised of a thermoplastic material including
at least one dish-carrying drawer unit slidably mounted within said inner enclosure, a rotor mounted on said drawer unit for distributing water to the dishes in said dish-carrying drawer unit, and a duct coupled to said rotor;
an electrical control unit located in the space between the upper end of said inner enclosure and said outer enclosure, said control unit being provided with openings for the mounting of electrical components; and



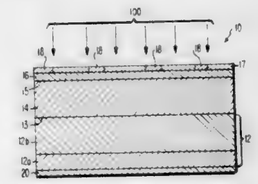
an hydraulic unit located in the space between the lower end of said inner enclosure and said outer enclosure, said hydraulic unit being provided with openings for hydraulic components, salt and ion-exchanging resin containers and water adding and distributing conduits; and
a vapor condenser located in the space between said inner and outer enclosures connecting said hydraulic components to the duct coupled to the rotor of said dish-carrying drawer unit.

4,179,308

LOW COST HIGH EFFICIENCY GALLIUM ARSENIDE HOMOJUNCTION SOLAR CELL INCORPORATING A LAYER OF INDIUM GALLIUM PHOSPHIDE

Gregory H. Olsen, Dayton, and Michael Ettenberg, Freehold, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 23, 1978, Ser. No. 918,643
Int. Cl.[2] H01L 31/06
U.S. Cl. 136—89 GA 7 Claims



1. A photovoltaic device comprising:
a body of gallium arsenide exhibiting one type of conductivity;
a layer of gallium arsenide of conductivity opposite to that

of said body overlying and forming a PN junction with said body;

a layer of $In_xGa_{1-x}P$ of the same conductivity type as said layer of gallium arsenide overlying and forming a hetero-transition with said layer of gallium arsenide, wherein x is from about 0.35 to about 0.62 and the thickness of said layer of $In_xGa_{1-x}P$ is less than about 50 nanometers thick whereby said layer is transmissive to photons with a shorter wavelength than the bandgap wavelength of the $In_xGa_{1-x}P$; and

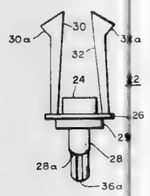
means for electrically contacting said body and said layer of $In_xGa_{1-x}P$.

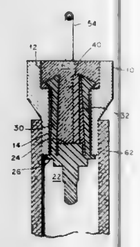
4,179,309

MEANS FOR ASSEMBLING EXPENDABLE IMMERSION THERMOCOUPLES

Richard J. Hance, Philadelphia, and John R. Wiese, Dresher, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Oct. 18, 1978, Ser. No. 952,378
Int. Cl.[2] H01V *1/02*
U.S. Cl. 136—234 **5 Claims**





1. In an expendable immersion thermocouple for determining the temperature of molten metal

a cylindrical body member open at both ends;

a tailpiece member having a plug portion for supporting said thermocouple,

a contact portion for providing a resilient contact backup, and

a flange portion for seating against one end of said body member; and

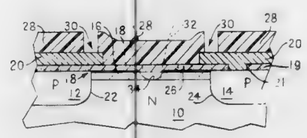
latching means for securing said body member and said tailpiece member together including at least one latch element resiliently supported by said tailpiece member and a cooperating latch element in the inner surface of said body member.

4,179,310

LASER TRIM PROTECTION PROCESS

James B. Compton, Los Gatos; Robert A. Cometta, San Jose, and Daniel D. Culmer, Sunnyvale, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 3, 1978, Ser. No. 921,743
Int. Cl.[2] H01L *21/268*; B23K *27/00*
U.S. Cl. 148—1.5 **15 Claims**



1. In a process for laser trimming of an integrated circuit, the improvement comprising:

(a) forming an oxide at least over a selected portion of the circuit to be trimmed by the laser,

(b) forming a bare layer of a metal reflective to the laser surrounding the selected portion of the circuit and over at least one P-N junction, and

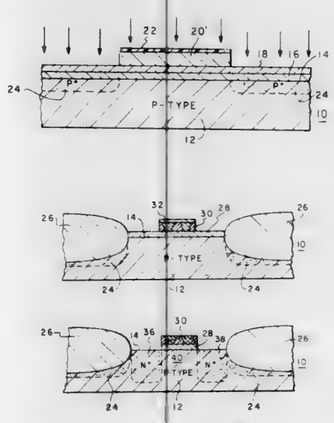
(c) trimming the selected portion of the integrated circuit with the laser.

4,179,311

METHOD OF STABILIZING SEMICONDUCTOR DEVICE BY CONVERTING DOPED POLY-SI TO POLYOXIDES

Terry G. Athanas, Lewisville, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Division of Ser. No. 759,803, Jan. 17, 1977, abandoned. This application Sep. 25, 1978, Ser. No. 945,361
Int. Cl.[2] H01L *21/26*
U.S. Cl. 148—1.5 **7 Claims**



4. A method of making an isoplanar MOS device comprising the steps:

(a) growing a thick isoplanar field oxide around an active area in a semiconductor substrate,

(b) forming an MOS device in the active area,

(c) growing a thin thermal oxide in the active area,

(d) depositing a polysilicon layer over both the thick field oxide and the thin thermal oxide,

(e) oxidizing the entire polysilicon layer to produce a polyoxide layer, and

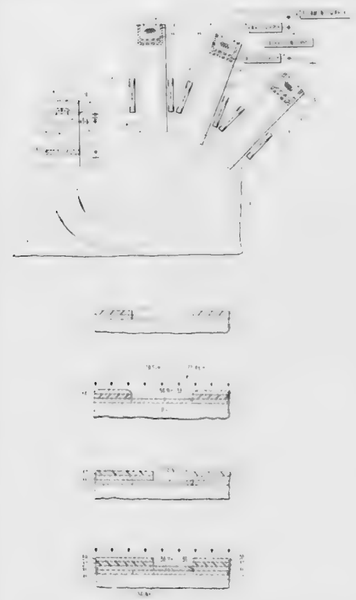
(f) forming contacts through windows in the polyoxide layer.

4,179,312

FORMATION OF EPITAXIAL LAYERS DOPED WITH CONDUCTIVITY-DETERMINING IMPURITIES BY ION DEPOSITION

John H. Keller, Newburgh; Charles M. McKenna, Fishkill, and James R. Winnard, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 858,486, Dec. 8, 1977, Pat. No. 4,151,420. This application Nov. 20, 1978, Ser. No. 962,442
Int. Cl.[2] H01L *21/203, 21/263*
U.S. Cl. 148—1.5 **15 Claims**



1. A method for depositing a monocrystalline epitaxial layer of a semiconductor material containing selected conductivity-determining impurities on a semiconductor substrate comprising

directing a beam of ions of said semiconductor material at the surface of the semiconductor substrate at an energy level below 0.5 Kev., and simultaneously directing a beam of said conductivity-determining impurity ions at at least a portion of said substrate surface whereby a layer of semiconductor material containing said conductivity-determining impurities is formed on said surface, and

heating said layer to a temperature of from 550° to 900° C.

4,179,313

METHOD OF MAKING AN ARTICLE HAVING A CAST-IN PLACE BEARING

James H. Koch, Oregon, and Richard A. Ritzenthaler, Toledo, both of Ohio, assignors to N L Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 715,418, Aug. 18, 1976, abandoned. This application Dec. 23, 1977, Ser. No. 863,717
Int. Cl.[2] B23P *11/00*; C22F *1/00*
U.S. Cl. 148—3 **19 Claims**

1. A method for making a composite part having at least two components wherein one component is movable with respect to another, comprising:

a. introducing a first component having a bearing surface thereon into a casting die;

b. casting a second component within said casting die to form a composite part with said first component;

c. cooling said composite part to ambient temperature to form a casting in which said first component is captured by and is essentially incapable of relative movement with said second component; and

d. then thermally treating said casting by establishing and then substantially eliminating a sufficient temperature differential between said first and second components to free said first component and its bearing surface from said second component, establish a clearance therebetween, and permit relative movement between said components.

4,179,314

TREATMENT OF BERYLLIUM-COPPER ALLOY AND ARTICLES MADE THEREFROM

Keith G. Wikle, Riverview Park, Pa., assignor to Kawecki Berylco Industries, Inc., Boyertown, Pa.

Filed Dec. 11, 1978, Ser. No. 968,218
Int. Cl.[2] C22C *9/04*
U.S. Cl. 148—12.7 C **21 Claims**

1. A process for treating beryllium-copper alloy to optimize elevated temperature properties thereof, said process comprising in sequence:

(a) annealing the alloy at a temperature of between about 1500° F. and about 1800° F.;

(b) quenching the annealed alloy;

(c) cold working the quenched alloy a minimum of about 30%;

(d) subjecting the cold worked alloy to an initial age hardening for between about 0.25 and about 48 hours at a temperature of between about 500° F. and about 800° F.; and

(e) subjecting the age-hardened alloy to a secondary age hardening for between about 0.25 and about 48 hours at a temperature of between about 900° F. and about 1200° F.

4,179,315

SILICON STEEL AND PROCESSING THEREFORE

Clarence L. Miller, Jr., Pittsburgh, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 696,965, Jun. 17, 1976, abandoned. This application Jan. 12, 1978, Ser. No. 868,956
Int. Cl.[2] H01F *1/04*
U.S. Cl. 148—113 **6 Claims**

1. In a process for producing electromagnetic silicon steel having a cube-on-edge orientation, a permeability of at least 1900 (G/O_e) at 10 oersteds and a core loss of no more than 0.700 watts per pound at 17 kilogauss, which includes the steps of: preparing a melt of silicon steel consisting essentially of, by weight, from 0.02 to 0.06% carbon, from 0.015 to 0.15% manganese, from 0.01 to 0.05% of material from the group consisting of sulfur and selenium, from 0.0006 to 0.0080% boron, up to 0.0100% nitrogen, up to 1.0% copper, no more than 0.008% aluminum, from 2.5 to 4.0% silicon, balance iron; casting said steel; hot rolling said steel; cold rolling said steel; decarburizing said steel; applying a refractory oxide base coating to said steel; and final texture annealing said steel; the improvement

V 9 8 9 1 3 DEC 18 79 UMI

comprising the steps of coating the surface of said steel with a refractory oxide base coating consisting essentially of:

(a) 100 parts, by weight, of at least one substance from the group consisting of oxides, hydroxides, carbonates and boron compounds of magnesium, calcium, aluminum and titanium;

(b) up to 100 parts, by weight, of other substances from the group consisting of boron and compounds thereof, said coating containing at least 0.5%, by weight, of boron;

(c) from 0.5 to 40 parts, by weight, of SiO_2 added as colloidal silica;

(d) up to 20 parts, by weight, of inhibiting substances; and

(e) up to 10 parts, by weight of fluxing agents;

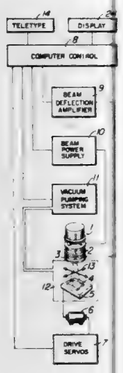
and final texture annealing said steel with said coating thereon; said steel's magnetic properties being in part, attributable to the inclusion of boron and SiO_2 in the base coating.

4,179,316

METHOD AND APPARATUS FOR HEAT TREATING

John F. Connors, Buffalo Grove; Douglas D. Bass, Western Springs; Michael G. Bell, Oak Lawn, all of Ill., and Stanley L. Ream, Columbus, Ohio, assignors to Sciaky Bros., Inc., Chicago, Ill.

Filed Oct. 17, 1977, Ser. No. 843,141
Int. Cl.[2] C21D *1/00, 1/12*
U.S. Cl. 148—152 **19 Claims**



1. A method of surface hardening selected areas of a metal workpiece by means of a concentrated beam of electrons comprising the steps of: generating a beam of electrons;

directing and focusing the said beam of electrons to a desired spot on the surface of the said workpiece;

causing the beam to be displaced to and to dwell in sequence for a pre-settable period ranging from 2 to 200 microseconds at each of a pre-determined matrix of spots over the said selected area in a pre-determined order;

repeating without interruption the said beam displacement and dwell sequence and matrix a pre-set number of times and controlling the beam current so that the material of said selected area and that adjacent to it reaches a temperature above the transformation temperature and close to the melting point for said material and is maintained at the said temperature for a pre-determined interval;

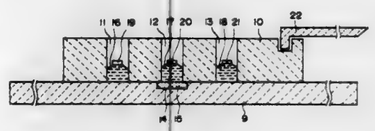
terminating the flow of electron beam current and allowing the material to be quenched rapidly.

4,179,317

METHOD FOR PRODUCING COMPOUND SEMICONDUCTOR CRYSTALS

Kazuo Sakai, Tokyo; Shigeyuki Akiba, Tanashi, and Takaya Yamamoto, Niza, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed May 25, 1978, Ser. No. 909,498
Claims priority, application Japan, May 31, 1977, 52/62853
Int. Cl.[2] H01L *21/208*
U.S. Cl. 148—171 **5 Claims**



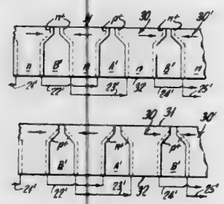
1. In a method for liquid phase epitaxially growing a III–V compound semiconductor crystal comprising at least four constituent elements, the improvement comprising: providing a melt of the III–V compound semiconductor on a two-element single crystal substrate; providing another two-element single crystal having the same composition as said substrate and in contact with said melt; and selecting a contact area between the two-element single crystal and the melt and the Miller index of the single crystal for determining the composition of III–V compound semiconductor crystals grown by liquid phase epitaxial growth on said substrate and for minimizing any difference between crystal lattice constants of the III–V compound semiconductor crystals grown on said substrate and said substrate.

4,179,318

METHOD OF MAKING A SOLAR-CELL ARRAY

Roy Kaplow, Newton; Robert I. Frank, Lexington, and Joel L. Goodrich, Quincy, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 877,356, Feb. 13, 1978, Pat. No. 4,129,458.
This application Jul. 20, 1978, Ser. No. 926,235
Int. Cl.[2] H01L *31/06, 27/14*
U.S. Cl. 148—187 **6 Claims**



1. The method of making a solar-cell array comprising a plurality of spaced, elongate, units having body material of a first conductivity type, each unit having upstanding sidewalls and having therebetween an upper surface adapted for exposure to receive incident radiation, adjacent pairs of sidewalls at first spaces between adjacent units each including a region of a second conductivity type, adjacent pairs of sidewalls at second spaces between adjacent units being devoid of second conductivity-type regions, and first-space pairs of sidewalls being in alternating interlace with second-space pairs of sidewalls in a given direction of traverse of the units of said array; which method comprises selecting a wafer of semiconductor substrate material of said first conductivity type, cutting a first series of elongate parallel grooves in said wafer at twice the center-to-center spacing of said units, forming said second

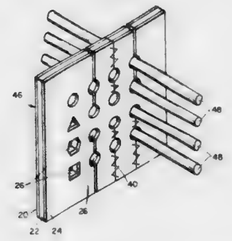
conductivity-type regions in the sidewalls of the grooves of said first series, and thereafter cutting a second series of elongate grooves parallel to those of said first series, the grooves of said second series being in alternating interlace with those of said first series.

4,179,319

HEAT RECOVERABLE ARTICLE AND METHODS USING SAME

Clyde A. Lofdahl, Los Altos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 24, 1977, Ser. No. 762,432
Int. Cl.[2] B32D *3/10;* **B29C** *27/00*
U.S. Cl. 156—86 **15 Claims**



1. A heat recoverable article comprising at least two wafers of heat recoverable material, each of the wafers being a thin layer of a polymeric material which is heat-shrinkable in at least two directions in its plane such that each wafer recovers from its outer circumferential periphery towards its center, and at least one layer of adhesive positioned between and bonded to two of the wafers such that the wafers are at all times separated by the layer of adhesive, said article further comprising at least one aperture extending continuously through the wafers and the adhesive layer therebetween such that none of the adhesive is disposed within the apertures of the wafers before the recovery of the article, the apertures being adapted to receive a substrate extending through the article, whereby heating the article to the recovery temperature of the wafers causes each of the wafers to recover from its outer circumferential periphery towards its center such that the wafers draw the adhesive layer down against the substrate to form a bond with the portion of the substrate which lies between the wafers, and the wafers provide strain relief for the substrate.

15. A method for environmentally sealing the rear of an electrical connector of the type having a plurality of individually insulated electrical conductors extending from a tubular rear portion comprising the steps of:

positioning the individually insulated electrical conductors through corresponding apertures extending continuously through the thickness of a heat recoverable sealing disc which comprises a first and a second wafer of a heat recoverable material, each of the wafers being a thin layer of a polymeric material which is heat-shrinkable in at least two directions in its plane such that each wafer recovers from its outer circumferential periphery towards its center, and a layer of adhesive positioned between and bonded to both of the wafers such that the wafers are at all times separated by the adhesive layer;

positioning a heat shrinkable sleeve over the tubular rear position of the electrical connector and the periphery of the heat recoverable sealing disc; and

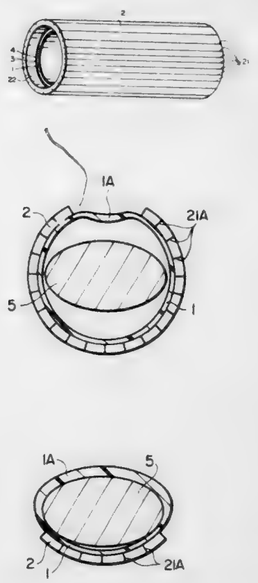
heating the heat recoverable sealing disc and the heat-shrinkable sleeve to their recovery temperatures causing each of the wafers to recover from its outer circumferential periphery towards its center such that each of the wafers recovers around the conductors thereby drawing the adhesive layer down against the conductors to form a bond with the portion of each conductor which lies between the wafers, and causing a portion of the adhesive layer to be extended from the outer circumferential periphery of the heat recoverable sealing disc such that the extruded adhesive forms a bond with an interior surface portion of the heat shrinkable sleeve, and said heat shrinkable sleeve to recover around said tubular rear portion of the electrical connector thereby environmentally sealing the rear of the electrical conductor.

4,179,320

RECOVERABLE ARTICLES

John A. Midgley, San Carlos, and David D. Nyberg, Sunnyvale, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 10, 1978, Ser. No. 895,064
Int. Cl.[2] B32B *31/00;* **F16L** *11/00;* **B29C** *13/00, 27/00*
U.S. Cl. 156—86 **50 Claims**



1. A flexible, shrinkable, hollow article which comprises

(1) a hollow inner member which is composed of an elastomeric material and which is in a radially extended condition; and

(2) a hollow outer restraining means

(a) whose inner surface is secured to the outer surface of said inner member and which maintains said inner member in said radially extended condition, said inner and outer surfaces being secured to each other by a bond whose peel strength is less than 50 lb. per linear inch width at 21° C.;

(b) whose outer surface forms the outer surface of said article and is provided with at least one score line whose depth is 5 to 90% of the thickness of the restraining means; and

(c) is composed of a material which

(i) has a 2% secant modulus at 21° C. of 4,000 to 120,000 psi;

(ii) has an ultimate elongation at 21° C. of at least 20% at a separation speed of 200% per minute and at most 150% at a separation speed of 2,000% per minute; and

(iii) has a notch sensitivity such that by distorting the article so as to exert a bending moment about the axis of the score line, the depth of said score line can be sub-

stantially increased to provide at least one section of the restraining means which can be pulled away from the inner member.

28. A flexible, shrinkable, hollow article which comprises

(1) a flexible hollow inner member which is composed of an elastomeric material and which is in a radially extended condition; and

(2) a flexible hollow outer restraining means

(a) whose inner surface is bonded to the outer surface of the inner member and which maintains the inner member in the radially extended condition, the inner and outer surface being bonded to each other by a bond whose peel strength is 7 to 15 lbs. per linear inch width at 21° C.;

(b) whose outer surface is provided with at least one linear indentation whose depth is 50 to 90% of the thickness of the restraining means; and

(c) is composed of a material which

(i) has a notch sensitivity such that by distorting the article so as to exert a bending moment about the axis of such a linear indentation, the depth of such linear indentation can be substantially increased to provide at least one section of the restraining means which can be pulled away from the inner member; and

(ii) has a 2% secant modulus at 21° C. of 15,000 to 40,000 psi and has an ultimate elongation at 21° C. of 50 to 100% at a separation speed of 20% per minute, wherein the material has sufficient flexibility that (a) the cross-section of the restraining means can be deformed without breaking the bond between the inner member and the restraining means and (b) such a pulled away section can bend through at least a 90° angle without cracking.

4,179,321

METHOD OF APPLYING AND ADHEREING LUBRICANT TO A TIRE INNER TUBE AS IT IS FORMED

George T. Verghese, Bombay, India, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 17, 1978, Ser. No. 906,721

Int. Cl.[2] B29H *15/00*

U.S. Cl. 156—118 **5 Claims**

5. In the method of manufacturing a tube for pneumatic tires comprising a rubber compound containing natural or synthetic rubber, the steps comprising mixing a binder having a melting point below a first temperature and a powdery lubricating agent in a predetermined ratio to form a lubricant, extruding an unvulcanized rubber compound through an extruder to form a continuous annular shape, the surfaces of said shape when it exits said tuber being at a second temperature which is above said first temperature, applying said lubricant to both the inner and external surface of said annular shape, melting said binder to form a film containing said lubricating agent on said surfaces of said shape, cooling said shape to solidify said binder and encapsulate said lubricating agent within said binder film, and processing the resulting lubricated shape by further, standard means to form said tube.

4,179,322

METHOD FOR MAKING BONDABLE FINGER CONTACTS

Vernon L. Brown, Boulder; Wade H. Greenwood, Northglenn, and Gary L. Griffith, Arvada, all of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 28, 1978, Ser. No. 891,038

Int. Cl.[2] H01R *9/00;* **B65H** *81/00*

U.S. Cl. 156—192 **11 Claims**

1. A method for making bondable finger contacts for application to a printed circuit board including the steps of:

forming a strip of virtually continuous, flat, electrically conductive material so as to produce a plurality of spaced-apart finger contacts integral with and interconnected by at least one support carrier, each of the finger contacts having a contact region thereon;

selectively applying a coating of contact metal to said contact region of said finger contacts wherein said coating of contact metal applied to the contact region is a layer of soft gold followed by a stripe of hard gold;

applying a tape having an adhesive on one side thereof to



one side of the contact region of said plurality of contacts to protect, interconnect and support said contacts; and

applying a coat of adhesive to an opposite side of said contact region of said plurality of contacts to facilitate bonding said contacts to said circuit board.

4,179,323

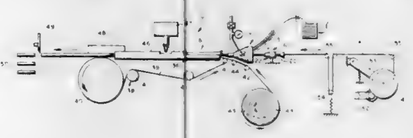
METHOD FOR MAKING A HOLLOW FILTER ROD

Ned A. Sigmon, Durham, N.C., assignor to Liggett Group Inc., Montvale, N.J.

Division of Ser. No. 596,471, Jul. 16, 1975, Pat. No. 4,024,012, which is a continuation of Ser. No. 391,581, Aug. 27, 1973, abandoned. This application Feb. 17, 1977, Ser. No. 769,616

Int. Cl.[2] A24C *5/50*

U.S. Cl. 156—201 **1 Claim**



1. In a method of making a filter rod for cigarette filter tips, the steps of

generating a first stream composed of self-supporting, non-deformable rigid tubing;

generating a second stream composed of fibrous cellulose acetate filter material;

passing said first stream through a guide mandrel for coaxially centering said first stream in relation to said second stream;

placing said streams in juxtaposition during travel while simultaneously enveloping said second stream of fibrous material circumferentially about said first stream of tubing by passing said second stream through a Venturi shaped nozzle which coaxially surrounds said guide mandrel;

directing a flow of air through said nozzle in a direction toward the exit end of said guide mandrel causing said second stream to be bloomed and pushed along the surface of said mandrel into an inwardly tapering passageway;

generating a third stream of paper;

moving said three streams into said passageway and constricting said second stream about said first stream as said first stream leaves the exit end of said mandrel inside said passageway to frictionally engage said first stream under a force sufficient to cause the continued travel of said first stream with said second stream;

circumferentially enveloping said third stream about said

juxtaposed first and second stream during continued travel of said three streams;

folding opposite edges of said paper stream over each other and adhere said edges together after enveloping said paper stream about said first and second streams to form a filter rod, and

cutting said filter rod into predetermined lengths.

4,179,324

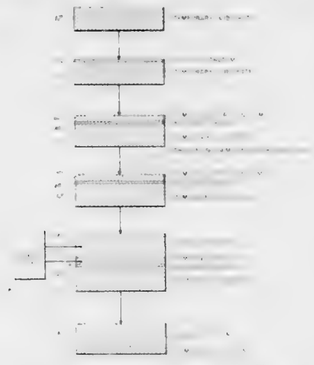
PROCESS FOR FABRICATING THIN FILM AND GLASS SHEET LAMINATE

Allen R. Kirkpatrick, Lowell, Mass., assignor to Spire Corporation, Bedford, Mass.

Filed Nov. 28, 1977, Ser. No. 855,418

Int. Cl.[2] B29C *19/02;* **B32B** *31/00*

U.S. Cl. 156—230 **10 Claims**



1. A method for fabricating a thin film and glass stratum laminate comprising the steps of:

(a) depositing applying thin film material onto a temporary substrate by a deposition process;

(b) superposing a glass stratum on said thin film;

(c) exposing said superposed glass stratum and thin film to a thermal environment which does not exceed the softening point of said glass stratum;

(d) electrostatically bonding said glass stratum and said thin film; and

(e) removing said temporary substrate from said bonded thin film and glass stratum laminate structure.

4,179,325

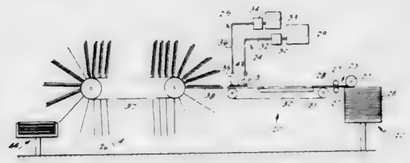
APPARATUS FOR MANUFACTURING ADHESIVE COVERS

Henry N. Staats, Deerfield; Waldemar M. Schmidt, Niles, and Efrain A. Davila, Chicago, all of Ill., assignors to General Binding Corporation, Northbrook, Ill.

Continuation of Ser. No. 558,794, Mar. 17, 1975, abandoned. This application Jun. 5, 1978, Ser. No. 912,831

Int. Cl.[2] B05C *1/02, 1/04;* **B42C** *9/00*

U.S. Cl. 156—498 **21 Claims**



1. Apparatus for manufacturing adhesive covers, each said cover having a backbone portion to which hot melt adhesive is applied, said apparatus comprising:

feed means for feeding cover material into the apparatus;

transport means moving said cover material forwardly in an edgewise direction;

scoring means for making score lines on the cover material to define a backbone on the cover;

pre-warming means for moving excess moisture from the cover backbone;

hot melt adhesive applicator means for applying adhesive to the backbone portion of the cover material; and

cooling means for cooling the molten adhesive below its tack point;

said hot melt adhesive applicator means comprising an extrusion die including a plurality of discharge nozzles rotational about an axis transverse to the direction of movement of the cover material about which axis said extrusion die may be rotated to bring each of said discharge nozzles successively into position for extruding hot melt adhesive onto the moving cover material and whereby each of said discharge nozzles may be flipped away from the cover material and substantially forward in the direction of movement of the forward moving cover material as cessation of adhesive flow occurs to effect breaking of an adhesive thread created during the adhesive applying process.

3. Apparatus for manufacting adhesive covers, said cover having a backbone portion to which hot melt adhesive is applied, said apparatus comprising:

feed means for feeding cover material into the apparatus;

transport means moving said cover material forwardly in an edgewise direction;

scoring means for making score lines on the cover material to define a backbone on the cover;

pre-warming means for removing excess moisture from the cover backbone;

hot melt adhesive applicator means for applying adhesive to the backbone portion of the cover material;

said hot melt adhesive applicator means comprising an extrusion die having at least one discharge nozzle, said extrusion die being rockably mounted about a pivot axis substantially spaced from the transport means and generally transverse to the direction of movement of the cover material whereby said at least one discharge nozzle may be flipped away from the cover material as cessation of adhesive flow occurs with the component of movement of said at least one discharge nozzle in the direction of movement of the forward moving cover material being substantially greater than its component of movement away from the cover material thereby breaking the adhesive thread created during the adhesive applying process and displacing it in said forward direction; and

cooling means for cooling the molten adhesive below its tack point.

4,179,326

PROCESS FOR THE VAPOR GROWTH OF A THIN FILM

Daiziro Kudo, Yokohama; Kazuo Maeda, Chigasaki, and Eiki Tanikawa, Kawasaki, all of Japan, assignors to Fujitsu Limited, Japan

Filed Apr. 14, 1977, Ser. No. 787,495

Claims priority, application Japan, Apr. 22, 1976, 51-44922; Apr. 22, 1976, 51-44923; Apr. 30, 1976, 51-48507

Int. Cl.[2] B01J *17/26*

U.S. Cl. 156—612 **23 Claims**

1. A process for the vapor growth of a thin film on the exposed surface of each of a plurality of wafers, said method comprising the steps of:

supporting said plurality of wafers at their peripheral edges within, and essentially concentric with and substantially perpendicular to the axis of, a reaction tube, to provide a constant clearance W between the inner wall of said reaction tube and said wafers around substantially the entire portion of said peripheral edges, and said wafers being

arranged to have a constant distance H between adjacent pairs of said exposed surfaces;
flowing a reaction gas through said reaction tube via said clearance W;
heating said wafers to a required uniform temperature for depositing said film on said wafers; and
maintaining a pressure within said reaction tube at a predetermined reduced average value P;
wherein said supporting step comprises arranging said wafers so that the ratio of said H to said W is determined by



$$H/W = a \cdot P + b \quad (1)$$

in the range $1.2 \leqq P \leqq 5.0$ Torr, wherein "a" $\leqq 0.8$ Torr^{-1} and "b" is a constant in the range from 0.3 to 1.2 depending on the kind of said reaction gas, and by

$$0.8P + 0.3 = H/W = 2 \quad (2)$$

in the range $0.5 \leqq P \leqq 1.2$ Torr.

4,179,327

PROCESS FOR COATING PYROTECHNIC MATERIALS

Alvin A. Seldner, Saugus, Calif., assignc to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jul. 13, 1978, Ser. No. 924,262
Int. Cl.[2] C23F *1/00*
U.S. Cl. 156—667 **8 Claims**

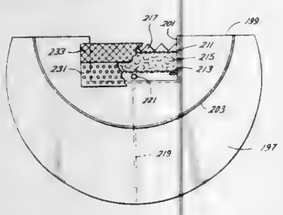
1. A method of treating the surface of a pyrotechnic propellant material prior to application of a coating on said material which comprises etching the surface of the material with a solution comprised of about 1 to 10 vol. % water and 99 to 90 vol. % of a C_1 to C_4 aliphatic alcohol for an effective amount of time.

4,179,328

METHOD AND APPARATUS FOR INJECTING STRIPPING GAS INTO THE REBOILER SECTION OF A GLYCOL REBOILER

Frank J. Barra, and Richard L. Schleier, both of Houston, Tex., assignors to Smith Industries, Inc., Houston, Tex.

Filed Jan. 13, 1978, Ser. No. 869,300
Int. Cl.[2] B01D *1/14*
U.S. Cl. 159—16 R **9 Claims**



1. A glycol dehydration reboiler comprising:
a generally cylindrical tank having a front end and a back end with heating means extending longitudinally in the tank from the front end thereof part way toward the back end of the tank and means at the upper part of the tank near the front end thereof for connection to a still column and to glycol inlet means, and outlet means at the lower part of the tank near the back end thereof for removal of glycol from the tank;
divider means located in the tank between the heating means and the back end of the tank and dividing the tank between upstream and downstream sections, said divider means including a partition extending upwardly from the bottom of the tank near the heating means and terminating at a level a distance below the top of the tank, said partition having a slot in its upper edge, a trough extending from the slot longitudinally of the tank at a distance above the bottom of the tank toward the back end of the tank, and a weir across the back end of the trough; and
sparging means for introducing dry gas into the upstream section of the tank comprising an apertured pipe extending along the length of the trough below the level of the weir, said sparging means further including a layer of packing means in the trough above the pipe.

4,179,329

REMOVAL OF COLOR FROM PAPER MILL WASTE WATERS

Jerry J. Svarz, La Grange, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Jan. 9, 1976, Ser. No. 647,757
Int. Cl.[2] D21C *11/00*
U.S. Cl. 162—29 **2 Claims**

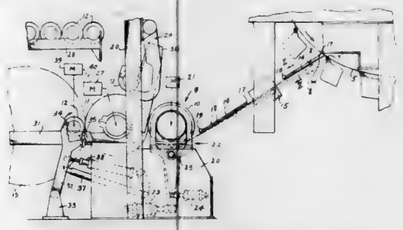
1. A process for removing color from cellulose paper pulp bleachery effluent waste waters wherein color bodies are present due to chemical reaction on or degradation of lignin which comprises adjusting the pH of said waste waters to a pH within the range of 2 to 7, mixing with the resultant waste waters a polyethylene imine having an average molecular weight of 300 to 1800, the amount of said imine being within the range of 10 to 2000 ppm of said waste waters and being sufficient to combine with said color bodies to form water insoluble solids, subsequently adding to said waste waters an amine having at least one hydrocarbon group containing from 8 to 24 carbon atoms linked to amino nitrogen without organic solvent, and separating the resultant solids.

4,179,330

APPARATUS FOR HANDLING WEB MATERIAL, AND METHOD

Robert E. Page, R.R. 1, Lake Summerset, Davis, Ill. 61019

Filed Sep. 5, 1978, Ser. No. 939,462
Int. Cl.[2] D21F *7/02*; D21G *1/02, 9/00*
U.S. Cl. 162—113 **35 Claims**



27. A method of handling a continuously running creped tissue web following creping at a creping roll, comprising:
transferring the creped web at high speed a short draw span from the creping roll to a proximate calender including a rotary roll;
suppressing flutter of the web as it travels said draw span at said high speed;
calendering the web in a nip of said calender roll with a rotary reel drum;
and rotatably driving a reel core by nipping the reel core with said reel drum and thereby winding the web onto the reel core.

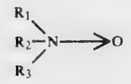
4,179,331

GLASS FIBER DISPERSIONS FOR MAKING UNIFORM GLASS FIBER MATS BY THE WET-LAID PROCESS

Paritosh M. Chakrabarti, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Nov. 15, 1977, Ser. No. 851,683
Int. Cl.[2] D21F *11/00*
U.S. Cl. 162—156 **22 Claims**

1. In the manufacture of uniform glass mats at a high rate of production by the wet-laid process, the improved method which comprises
forming an aqueous dispersion of glass fibers by mixing bundles of said fibers of about ¼ to 3 inches in length in an aqueous medium at a fiber consistency of about 0.001 to 3.0% with about 5–500 ppm of an amine oxide surfactant having the formula:



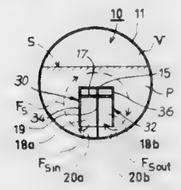
where R_1, R_2, and R_3 are selected from the group consisting of aliphatic and aromatic hydrocarbon radicals, substituted or unsubstituted, containing between 1 and 30 carbon atoms, being the same or different, the sum of R_1, R_2 and R_3 being between about 14 to 40, thereby to substantially disperse said bundles into individual fibers within the aqueous medium, and,
passing said dispersion through a mat-forming screen to form the desired uniform glass fiber mat.

4,179,332

APPARATUS FOR DAMPING PRESSURE AND CONSISTENCY PERTURBATIONS IN A PULP SUSPENSION FLOW

Erkki Ilmoniemi, Vaajakoski, and Olavi Kokkonen, Jyväskylä, both of Finland, assignors to Valmet Oy, Finland

Filed Jun. 26, 1978, Ser. No. 918,948
Claims priority, application Finland, Jul. 1, 1977, 772075
Int. Cl.[2] D21F *1/06*
U.S. Cl. 162—380 **3 Claims**



1. Apparatus for damping pressure and consistency disturbances or perturbations in the flow of a pulp suspension to a headbox of a paper making machine, comprising:
an enclosed damping tank defining therewithin a space for a volume of air and a space for pulp suspension, such that said pulp suspension and air volume will have direct interfacing contact therebetween;
distribution header means disposed within said tank for conducting a flow of pulp suspension into said tank;
collecting header means disposed within said tank for conducting a flow of said pulp suspension out of said tank; and
said distribution and collecting header means each defining pulp suspension flow passages, each of said flow passages being in fluid communication with said pulp suspension space within said damping tank through an elongate, continuous slit, said distribution and collecting header means being open at one side of said damping tank and being defined by an upper wall member, a pair of longitudinally extending side wall members and a longitudinally extending, substantially vertical partition member disposed between said side wall members, each elongate, continuous slit being defined by the lower edge of a respective side wall member and said damping tank.

4,179,333

METHOD FOR MAKING WATER-SOLUBLE ELASTIN HYDROLYZATES

Klaus Braeumer, Weinheim an der Bergstrasse; Zdenek Eckmayer, Heidelberg; Alexander Berg, Holzminden; Rolf Monsheimer, Darmstadt-Eberstadt, and Ernst Pfleiderer, Darmstadt-Arheilgen, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim and Rohm GmbH, Darmstadt, both of, Fed. Rep. of Germany

Filed Feb. 9, 1978, Ser. No. 876,237
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1977, 2705670
Int. Cl.[2] C12D *13/06*
U.S. Cl. 435—60 **7 Claims**

1. A method for making a water-soluble elastin hydrolyzate from starting materials containing elastin which comprises first subjecting said starting material to acid treatment at a pH below about 4 and at a temperature above about 80° C. and then enzymatically degrading the acid-treated material, while in comminuted form, in an aqueous bath at a temperature between about 30° C. and 70° C. for from 4 to 24 hours, in the presence of urea, with an alkaline bacterial proteinase having an activity optimum in a range between pH 9 and pH 13, the initial pH of the enzymatic treatment being within the pH range optimum for the enzyme employed.

4,179,334

HYDROLYSIS OF PROTEIN-BOUND TRIGLYCERIDES

Theodore W. Esders, Webster; Charles T. Goodhue, Rochester, and Christine A. Michrina, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 19, 1976, Ser. No. 715,798
Int. Cl.[2] G01N *31/14*
U.S. Cl. 195—30 **25 Claims**

1. A process for hydrolyzing protein-bound triglycerides consisting of contacting in an aqueous medium protein-bound triglycerides and a reagent consisting of a compatible mixture of (i) a lipase preparation having triglyceride hydrolase activity and derived from a source selected from the group consisting of *Candida rugosa* and *Chromobacterium viscosum* (variant *paralipolyticum*); and (ii) a synthetic surfactant selected from the group consisting of salts of alkylaryl polyether sulfonates and alkoxy polyethoxy ethanols.

4,179,335

THERMOSTABLE LACTASE DERIVED FROM *BACILLUS COAGULANS*

Margaret E. Long, and Chin K. Lee, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Continuation-in-part of Ser. No. 529,329, Dec. 4, 1974, abandoned. This application Feb. 23, 1976, Ser. No. 660,094
Int. Cl.[2] C12D *13/10*
U.S. Cl. 435—99 **6 Claims**

1. A process for producing a lactase having improved ther-

mal stability which comprises cultivating an organism belonging to the species *Bacillus coagulans* in a nutrient medium under conditions suitable for producing said lactase and recovering the lactase thereby produced, said lactase retaining a substantial amount of activity for at least one hour at 60° C. as determined by assaying lactase activity associated with washed cells of said organism suspended in a 0.05 M phosphate buffer at pH 7.0 in the presence of o-nitrophenyl-β-galactoside.

4,179,336

MICROBIOLOGICAL DEGRADATION OF STEROL SIDE CHAINS TO A 17-KETO GROUP

Alfred Weber; Mario Kennecke, and Helmut Dahl, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengellschaft, Bergkamen and Berlin, Fed. Rep. of Germany

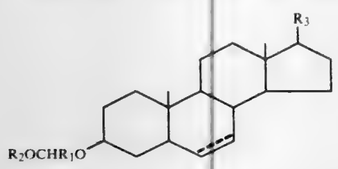
Filed Jul. 6, 1977, Ser. No. 813,391

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2632677

Int. Cl.² C07B *29/02*

U.S. Cl. 435—55 **10 Claims**

1. In a process for the production of 17-keto steroids of the androstane series by subjecting a steroid having a sterol hydrocarbon side chain at the 17-position to the oxidative degradation activity of a culture of microorganism which degrades sterol side chains to 17-keto group, the improvement which comprises conducting the fermentation in the absence of an inhibitor whch inhibits attack on the ring system and employing as the starting steroid a sterol 3-acetal of the formula



wherein ⌣ is a single bond or a double bond; R_1 is H or lower alkyl, R_2 is alkyl, whose chain optionally is interrupted by an oxygen atom; and R_3 is a sterol side chain.

4,179,337

NON-IMMUNOGENIC POLYPEPTIDES

Frank F. Davis, 19 Farmingdale Rd., East Brunswick, N.J. 08816; Theodorus Van Es, 313 Overbrook Rd., Piscataway, N.J. 08854, and Nicholas C. Palczuk, 45 W. Franklin St., Bound Brook, N.J. 08805

Continuation-in-part of Ser. No. 596,931, Jul. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 381,191, Jul. 20, 1973, abandoned. This application Jul. 28, 1977, Ser. No. 819,831

Int. Cl.² C07G *7/00, 7/02*; A61K *37/26, 37/48*

U.S. Cl. 435—181 **27 Claims**

1. A physiologically active, substantially non-immunogenic water soluble polypeptide composition comprising, a physiologically active polypeptide coupled with a coupling agent to at least one substantially linear polymer having a molecular weight of between about 500 to about 20,000 daltons selected from the group consisting of polyethylene glycol and polypropropylene glycol

wherein the polymer is unsubstituted or substituted by alkoxy or alkyl groups, said alkoxy or alkyl group possessing less than 5 carbon atoms.

4,179,338

MICROBIOLOGICAL MEDIUM SUITABLE FOR STERILIZATION BY IONIZING RADIATION

Maurice R. Gordon, 15 Stuyvesant Cir. W., South Setauket, N.Y. 11733

Continuation-in-part of Ser. No. 834,169, Sep. 19, 1977, abandoned. This application Apr. 27, 1978, Ser. No. 900,791

Int. Cl.² C12K *1/00, 1/10*

U.S. Cl. 435—243 **7 Claims**

1. An improved microbiological medium suitable for sterilization by ionizing radiation comprising a buffer solution containing nutrients for microorganisms and an electron acceptor, the electron acceptor comprising α or β nicotinamide adenine dinucleotide reduced form, disodium (NADH) in combination with a compound selected from the group consisting of β nicotinamide mononucleotide; β nicotinamide mononucleotide reduced form, disodium; α or β nicotinamide adenine dinucleotide (NAD); pyridoxine hydrochloride; pyridoxal-5-phosphate, HCl; nicotinamide adenine dinucleotide phosphate (NADP); cytochrome-C and nicotinamide-1 N^6 etheno adenine dinucleotide phosphate, the electron acceptor being present at a level sufficient to allow the medium to be sterilized using ionization radiation without causing adverse change in the medium as compared to when no electron acceptor is present and at a sufficient level to increase the degree of ionization caused by ionizing radiation whereby the number of microorganisms destroyed during sterilization is increased as compared to when no electron acceptor is present.

4,179,339

LIQUID FEEDER FOR AUTOMATIC CULTURE APPARATUS

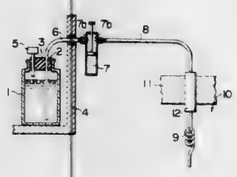
Shinroku Sogi; Makoto Yoshinaga, both of Hachioji; Toshio Shinohara, Chofu; Takayuki Aihara, and Ikuo Tawara, both of Hachioji, all of Japan, assignors to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Feb. 13, 1978, Ser. No. 876,894

Claims priority, application Japan, Mar. 2, 1977, 52-24766[U]; Apr. 5, 1977, 52-41589[U]; Apr. 5, 1977, 52-41592[U]

Int. Cl.² C12K *1/10*

U.S. Cl. 435—292 **8 Claims**



1. A liquid feeder for automatic culture apparatus comprising:

a liquid storage container for storing a a liquid;

a liquid suction and delivery pump for withdrawing said stored liquid from said container and for delivering said liquid through a liquid delivery port of said pump;

a first tube interconnecting said pump with said container;

a second tube extending through a wall of an incubator, which wall serves to isolate the environment in said incubator from the ambient environment, said second tube having a first end connected with said liquid delivery port of said pump and a second end directed towards a given position within said incubator; and

a tube fitting extending through said wall and including an outer pipe hermetically secured to said wall and extending into said incubator, and also including an inner pipe which is hermetically and detachably secured to said outer pipe, said second end of said second tube extending through said inner pipe and surrounded by a silicone filler which seals and secures said second tube to said inner pipe.

4,179,340

APPARATUS FOR SUPPLYING PREHEATED COAL CHARGES TO COKING CHAMBERS

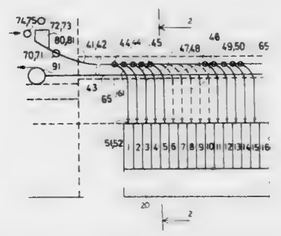
Jaroslav Limberg; Tomas Limberg, both of Prague, and Vaclav Rayman, Milevsko, all of Czechoslovakia, assignors to Hutni project Praha, projekcni a inzenyrska, Prague, Czechoslovakia

Filed Mar. 11, 1977, Ser. No. 776,747

Claims priority, application Czechoslovakia, Mar. 26, 1976, 1990/76

Int. Cl.² C10B *31/00*

U.S. Cl. 202—262 **4 Claims**



1. Arrangement for supplying preheated coal particles to a battery of coking ovens, comprising pneumatic charging containers for preheated coal particles, means for closing the charging containers, means for supplying a pressurized inert carrier gas to said containers, a pneumatic transport conduit for conveying a mixture of the preheated coal particles and the carrier gas connected to said containers and extending substantially above the longitudinal axis of the coking ovens forming the coking battery and adapted for feeding the coking ovens with coal, at least two spaced charging ports at the top of each coking oven, a degassing separator disposed above each coking oven and below said pneumatic transport conduit, conduit means including valve means for connecting the degassing separators to the pneumatic transport conduit, each degassing separator having an inlet for the mixture of coal particles and inert carrier gas, an outlet for the carrier gas, and an outlet for the separated coal particles, means to divide the separated coal charge into at least two streams, and conduit means for receiving the respective streams of coal particles connected to the respective charging ports of the respective coking ovens.

4,179,341

METHOD FOR PREPARATION OF A PLATED PRODUCT

Hajime Sakano, Hirakata; Shigemitsu Kawagishi, Kadoma; Mikio Kodama, Takatsuki; Akitoshi Ito, Yao; Toshihiro Shoji, Amagasaki; Miyuki Terada, Amagasaki, and Isao Yoshida, Amagasaki, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Japan

Filed Jun. 12, 1978, Ser. No. 914,824

Claims priority, application Japan, Jun. 10, 1977, 52-69013; Jun. 14, 1977, 52-70179; Aug. 1, 1977, 52-92775

Int. Cl.² C25D *5/56*

U.S. Cl. 204—20 **23 Claims**

1. A method for preparation of a plated product which comprises electroplating a molded product of a resin composition consisting essentially of at least one kind of thermoplastic resin and carbon black having an oil absorption amount of not less than 200 ml/100 g and a surface area of not less than 500 m^2/g in a weight proportion of 100:3–100 and having an intrinsic volume resistivity of not more than 10^3 Ω.cm without previous electroless plating.

4,179,342

COATING SYSTEM METHOD FOR COLORING ALUMINUM

Adam J. Walsh, Barrington, R.I., assignor to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 920,053, Jun. 28, 1978, abandoned. This application Jan. 2, 1979, Ser. No. 22

Int. Cl.² C25D *11/22*

U.S. Cl. 204—35 N **17 Claims**

1. In a process for the production of colored protective coatings on previously anodized articles of aluminum or aluminum alloys wherein an alternating current is passed between an electrode system comprising said previously anodized aluminum article and a counterelectrode immersed in an acidic aqueous bath containing salts of metals capable of coloring the anodized layer and wherein voltage with controlled asymmetry is applied to the electrodes so as to control the color tone of the aluminum article by modulating the voltage externally of said electrode system, the improvement which comprises,

anodizing said aluminum article in aqueous acid electrolyte comprising from about 12 to about 24 weight percent sulfuric acid and from about 1 to about 4 volume percent of a polyhydric alcohol of from 3 to 6 carbon atoms and from about 1 to about 4 volume percent of an organic carboxylic acid containing at least one reactive group in the alpha-position wherein said reactive group is a hydroxy, amino, keto or carboxyl group, and carrying out the anodizing at a temperature of from 65°–85° F. at a current density of 24–36 amperes/sq. ft. so as to obtain an anodized layer from 0.2–1.1 mils.

4,179,343

ELECTROPLATING BATH AND PROCESS FOR PRODUCING BRIGHT, HIGH-LEVELING NICKEL IRON ELECTRODEPOSITS

Robert A. Tremmel, Woodhaven, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Filed Feb. 12, 1979, Ser. No. 11,270

Int. Cl.² C25D *3/56*

U.S. Cl. 204—43 T **14 Claims**

1. An aqueous bath suitable for the electrodeposition of bright, high-leveling nickel-iron electrodeposits comprising nickel ions and iron ions, from about 5 to about 100 g/l of a complexing agent selected from the group consisting of tartaric acid, bath soluble salts thereof and mixtures thereof, from about 1 to about 50 g/l of a reducing saccharide, from about 0.5 to about 3 g/l of a compound selected from the group consisting of ascorbic acid, isoascorbic acid, bath soluble salts thereof and mixtures thereof, from about 30 to about 60 g/l of a buffering agent selected from the group consisting of boric acid and sodium acetate, from about 0.5 to about 20 g/l of a bath soluble primary brightener selected from the group consisting of sulfo-oxygen, sulfur bearing compounds, from about 0.25 mg/l to about 1 g/l of a secondary brightener, and hydrogen ions to provide a pH ranging from about 2.6 to about 4.5.

4,179,344

GOLD ALLOY PLATING COMPOSITIONS AND METHOD

Donald W. Thomson, East Northport, N.Y., assignor to Lea-Ronal, Inc., Freeport, N.Y.

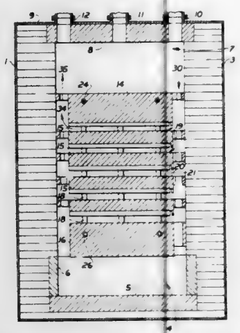
Continuation of Ser. No. 375,370, Jul. 2, 1973, abandoned. This application Jan. 15, 1976, Ser. No. 649,321

Int. Cl.² C25D *3/62*

U.S. Cl. 204—44 **8 Claims**

1. An aqueous alkaline bath for direct current plating gold-copper-cadmium alloys comprising an alkaline aqueous bath containing a soluble gold cyanide, a soluble copper cyanide, free cyanide, and a cadmium compound in sufficient amount to plate gold-copper-cadmium alloys, and a chelating agent capable of chelating the cadmium in the presence of free cyanide in a sufficient amount to chelate the cadmium.

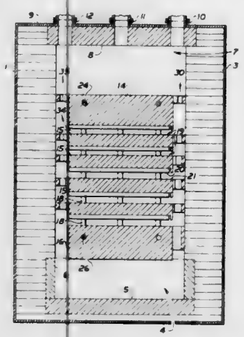
4,179,345
CONTROLLED WETTABILITY GRAPHITE ELECTRODES FOR SELECTIVE USE IN ELECTROLYSIS CELLS
Subodh K. Das, Apollo, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed Feb. 26, 1979, Ser. No. 15,302
Int. Cl.[2] C25B *11/12;* **C25C** *3/06, 3/12*
U.S. Cl. 204—67 **21 Claims**



1. A method for the production of aluminum in an electrolytic cell containing a halide of said aluminum dissolved in a molten solvent bath of higher decomposition potential, the cell including a plurality of interelectrode spaces between opposed anode and graphite cathode electrode surfaces wherein:
(a) said bath is moved through a plurality of said interelectrode spaces where said bath is electrolyzed to deposit molten aluminum at the cathode surface thereof, the bath moving through at least one first interelectrode space at a velocity of 1½ feet per second or less;
(b) said first interelectrode space being provided with a graphite cathode surface which is wetted by said aluminum produced from said bath as it is deposited at said cathode surface, said wetted graphite being produced:
(1) from isotropic coke graphitized at a temperature of 1800° to 3000° C.; or
(2) from non-acicular coke graphitized at less than 2500° C.; or
(3) from acicular coke graphitized at a temperature of less than 2300° C.;
(c) such interelectrode spaces through which said bath moves through a velocity of over 1½ feet per second are provided with a graphite cathode surface which is not wetted by said aluminum produced from said bath as it is deposited at said cathode surface, said non-wetted graphite being produced:
(1) from non-acicular coke graphitized at a temperature of at least 500° C.; or
(2) from acicular coke graphitized at a temperature of at least 2300° C.

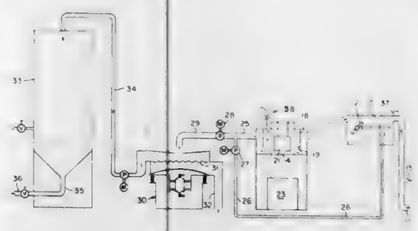
4,179,346
SELECTIVE USE OF WETTABLE AND NON-WETTABLE GRAPHITE ELECTRODES IN ELECTROLYSIS CELLS
Subodh K. Das, Apollo, and Paul J. Boget, Murrysville, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed Feb. 26, 1979, Ser. No. 15,303
Int. Cl.[2] C25C *3/06*
U.S. Cl. 204—67 **21 Claims**

1. A method for the production of aluminum in an electrolytic cell containing a halide of said aluminum dissolved in a molten solvent bath of higher decomposition potential, the cell including a plurality of interelectrode spaces between opposed anode and graphite cathode electrode surfaces wherein:
(a) said bath is moved through a plurality of said interelectrode spaces where said bath is electrolyzed to deposit molten aluminum at the cathode surface thereof, the bath moving through at least one first interelectrode space at a velocity of 1½ feet per second or less;



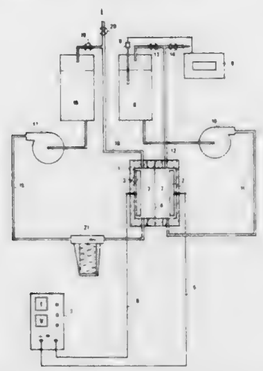
(b) said first interelectrode space being provided with a graphite cathode surface which is wetted by said aluminum produced from said bath as it is deposited at said cathode surface;
(c) such interelectrode spaces through which said bath moves through a velocity of over 1½ feet per second are provided with a graphite cathode surface which is not wetted by said aluminum produced from said bath as it is deposited at said cathode surface.

4,179,347
SYSTEM FOR ELECTROCATALYTIC TREATMENT OF WASTE WATER STREAMS
William A. Krause, Houston, Tex., and Evan P. Shea, Kansas City, Mo., assignors to Omnipure, Inc., Houston, Tex.
Filed Feb. 28, 1978, Ser. No. 882,264
Int. Cl.[2] C02B *1/82*
U.S. Cl. 204—149 **8 Claims**



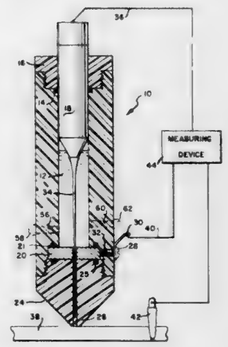
1. A process for the electrocatalytic treatment of waste water stream containing suspended solids and pathogenic organisms comprising:
adding a measured quantity of an electrolyte which, on being subjected an electrolyzing current, generates chlorine in situ, to an influent waste water stream,
passing the waste water stream through and between a plurality of closely spaced, planar, electrocatalytically active electrode plates having exposed surfaces including a precious metal or precious metal oxide positioned in an electrolytic treatment vessel parallel to the flow of the waste water stream through the treatment vessel,
maintaining the liquid level of the waste water stream in the electrolytic treatment vessel substantially constant relative to the plurality of electrode plates,
delivering an electrolyzing quantity of electric current to the electrode plates to generate chlorine, oxygen and other disinfecting chemicals in situ and concurrently generate a multitude of gaseous bubbles which entrain and float nutrient-containing suspended solids in the waste water stream as a foam on the surface of the stream in the electrolytic treatment vessel,
withdrawing the foam containing the entrained suspended solids from the surface of the stream in the electrolytic treatment vessel,
discharging the treated waste water stream from the electrolytic treatment vessel into a filter for removal of fibrous residual suspended solids contained in the stream, and
measuring the conductivity of the waste water stream entering the electrolytic treatment vessel and continuously controlling the amount of electrolyte added to the incoming waste water stream to maintain the conductivity of the stream being treated substantially constant, thereby controlling the amount of residual chlorine present in the treated waste water stream discharged from the electrolytic treatment vessel.

4,179,348
REMOVAL OF CYANIDE FROM WASTE WATER
Jean-Pierre Bernat, Pau, France, assignor to Societe Nationale Elf Aquitaine (Production), Paris, France
Filed Nov. 3, 1977, Ser. No. 848,298
Claims priority, application France, Nov. 3, 1976, 76 33076
Int. Cl.[2] B01D *13/02*
U.S. Cl. 204—151 **5 Claims**



1. A method of eliminating CN^{31} ions from waste water by anodic oxidation, wherein the water for processing enters only the anodic compartment of an electro-dialyser consisting essentially of a semi-permeable diaphragm which is permeable to cations and separates the anode compartment from the cathode compartment, and a separate aqueous solution of electrolyte is conveyed through the cathode compartment, said separate electrolyte comprising an electrolyte from a source other than said water to be processed.

4,179,349
PORTABLE PROBE TO MEASURE SENSITIZATION OF STAINLESS STEEL
Jang Y. Park, Downers Grove, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Sep. 26, 1978, Ser. No. 945,924
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 R **4 Claims**

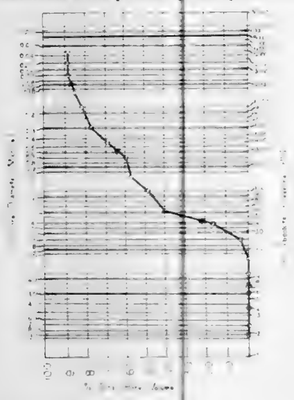


1. A probe for field measurement of sensitization of a test piece of stainless steel at a test point comprising:
a reservoir containing an electrolyte;
a connecting capillary tube connecting the reservoir to the test piece;
a standard calomel reference electrode having an extended capillary tube disposed in the connecting tube and open near the test point, and further having an external connecting wire;
a graphite electrode disposed in the reservoir in electrical contact with the electrolyte;
an external electrical connection disposed outside the reservoir;
means for connecting the external electrical connection to the graphite electrode; and
means for establishing electrical contact with the test piece near the test point.

4,179,350
CATALYTICALLY INNATE ELECTRODE(S)
Gary A. Deborski, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Sep. 5, 1978, Ser. No. 939,561
Int. Cl.[2] C25B *11/06;* **C25C** *7/02;* **C25D** *17/10;* **H01B** *1/02*
U.S. Cl. 204—284 **14 Claims**

1. An integral, catalytically-active porous electrode body formed of:
a shaped mass of compacted, integrated powder comprised of an intimate, substantially uniform admixture of:
a preponderant proportion of said mass of finely communitated, particulate, metal powder; and
a minor proportion of an electrocatalytic metal phthalocyanine powder;

said mass being cohesively bonded together by consolidation of the individual metal phthalocyanine powder and metal



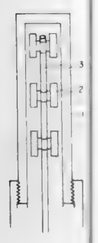
particles therein so as to leave internal pores and interstitial passageway voids in said body.

4,179,351

CYLINDRICAL MAGNETRON SPUTTERING SOURCE

John T. Hawton, Jr., and William G. Shumate, both of Colorado Springs, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 9, 1976, Ser. No. 721,740
Int. Cl.² C23C *15/00*
U.S. Cl. 204—298 **7 Claims**



1. A magnetron sputtering source comprising:

a cathode having a face of material to be sputtered, having a hollow interior, and having base and end regions;

means for circulating a coolant within said cathode comprising a first coolant tube within said cathode extending from the base region to substantially the end region of said cathode and forming a first fluid conduit for the flow of coolant throughout the interior of said cathode, and comprising means forming a second fluid conduit for the flow of coolant throughout the interior of said cathode terminating near the base region of said cathode;

a magnet within the hollow interior of said cathode for the generation of a magnetic field proximate to the outer surface of said cathode for concentrating charged particles proximate to said cathode, said magnet mounted to said first coolant tube whereby said cathode can be replaced without disturbing said first coolant tube or said magnet; and

means providing an electrical connection to said cathode.

4,179,352

COAL LIQUEFACTION PROCESS

Edward Effron, Springfield, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 7, 1975, Ser. No. 602,956
Int. Cl.² C10G *1/00*
U.S. Cl. 208—8 LE **10 Claims**

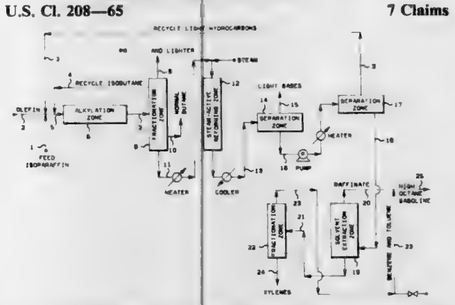
1. A process for the production of liquid hydrocarbons from coal or similar liquefiable carbonaceous solids which comprises contacting said carbonaceous solids with a hydrogen-donor solvent and a hydrogen-containing gas under liquefaction conditions in a liquefaction zone and recovering a liquefaction effluent from said liquefaction zone; separating said liquefaction effluent into a vaporous stream and a liquids stream; treating at least a portion of said vaporous stream for the removal of ammonia and acid gas constituents and recovering a hydrogen-containing gaseous effluent; recovering a liquid hydrocarbon stream containing hydrogen-donor solvent constituents from said liquids stream; introducing said hydrogen-containing gaseous effluent and said liquid hydrocarbon stream into a catalytic solvent hydrogenation zone maintained under solvent hydrogenation conditions; recovering a hydrogenated effluent from said solvent hydrogenation zone; separating said hydrogenated effluent into a vaporous fraction containing molecular hydrogen and a liquids fraction; recycling at least a portion of said vaporous fraction including molecular hydrogen for introduction into said liquefaction zone; and recovering from said liquids fraction a liquid product stream and a recycle liquid stream for introduction as solvent into said liquefaction zone.

4,179,353

CONVERSION OF LOW OCTANE NUMBER ALKYLATE TO HIGH OCTANE GASOLINE AND AROMATICS

Thomas Hutson, Jr., and Floyd E. Farha, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 6, 1977, Ser. No. 813,365
Int. Cl.² C10G *39/00*; C07C *3/52*
U.S. Cl. 208—65 **7 Claims**



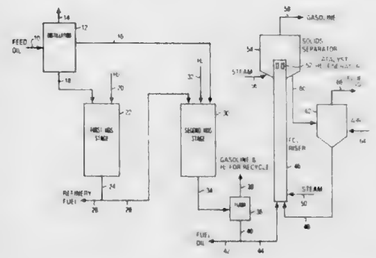
1. An alkylation process comprising alkylating an isoparaffin intentionally with olefins which yield a low octane value alkylate, in the presence of an alkylation catalyst intentionally under conditions including the deliberate selection and use of low-octane producing olefins including a substantial proportion of propylene and butene-1 which produce low-octane alkylate, said olefins having been formed in an ensuing reforming operation, and intentionally at a low isoparaffin to olefin ratio which will produce a low octane value alkylate product, thus to produce an alkylate product constituted by C_5 hydrocarbons and heavier and composed of components of relatively low octane value of the order of about below 90, Research Octane Number clear, and then reforming said alkylate product as obtained upon separation only of n-butane and lighter hydrocarbons therefrom in a reforming zone in the presence of a catalyst under conditions including a temperature in the approximate range of from about 1000° to about 1150° F. to produce reformed alkylate product having Research Octane Number clear of at least about 95, said reforming zone being the situs of said reforming operation.

4,179,354

COMBINATION RESIDUAL OIL HYDRODESULFURIZATION AND CATALYTIC CRACKING PROCESS

James A. Frayer, Pittsburgh; Harry C. Stauffer, Cheswick, and Stephen J. Yanik, Valencia, all of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Oct. 20, 1977, Ser. No. 843,878
Int. Cl.² C10G *23/02*
U.S. Cl. 208—89 **16 Claims**



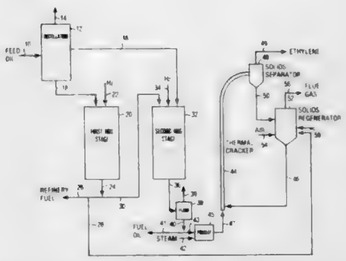
1. A combination process including hydrodesulfurization of an aromatics- and asphaltene-containing feed oil to produce at least two hydrodesulfurized residual oil streams having different respective 1050° F.+ hydrocarbon and sulfur contents, said process employing upstream and downstream hydrodesulfurization stages containing hydrodesulfurization catalyst comprising Group VI and Group VIII metal on a noncracking support at a temperature between 600° and 900° F. and a hydrogen pressure between 500 and 5,000 psi, followed by a catalytic cracking step at a temperature between 900° and 1,100° F. and a residence time up to 5 seconds, said process comprising fractionating said feed oil into an asphaltene-containing residual oil and a distillate oil, passing said residual oil and hydrogen through said upstream hydrodesulfurization stage and recovering an upstream stage effluent stream containing 1050° F.+ hydrocarbons including refractory sulfur asphaltenes, splitting said upstream stage effluent stream into a first effluent portion comprising between about 10 and 75 weight percent of the normally liquid material in said upstream stage effluent stream and a second effluent portion, removing said first effluent portion from said process to selectively remove refractory sulfur asphaltenes from said process and to increase the concentration of more sulfur-reactive material in said downstream stage, passing said second effluent portion and said distillate oil and hydrogen through said downstream stage, recovering a downstream stage effluent stream containing hydrodesulfurized oil including 1050° F.+ hydrocarbons, said downstream stage effluent stream containing aromatics and having a sulfur concentration which is at least 75 percent lower than the sulfur concentration of said feed oil, the removal of said first effluent portion allowing the sulfur concentration in said downstream effluent stream to be achieved with a relatively high aromatics concentration as compared to the aromatics concentration when achieving the same sulfur concentration by hydrodesulfurization without selective removal of refractory sulfur asphaltenes, passing said hydrodesulfurized oil through a zeolitic cracking riser for conversion to gasoline, the removal of said first effluent portion from said process increasing the amount of 1050° F.+ hydrocarbons per barrel of oil vaporized at the flash vaporization temperature in said cracking riser.

4,179,355

COMBINATION RESIDUAL OIL HYDRODESULFURIZATION AND THERMAL CRACKING PROCESS

James A. Frayer, Pittsburgh; Harry C. Stauffer, Cheswick; Francis E. Wynne, Jr., Allison Park, and Stephen J. Yanik, Valencia, all of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Oct. 20, 1977, Ser. No. 843,880
Int. Cl.² C10G *23/02*
U.S. Cl. 208—89 **16 Claims**



1. A combination process including hydrodesulfurization of an aromatics- and asphaltene-containing feed oil to produce at least two hydrodesulfurized residual oil streams having different respective asphaltene and sulfur contents, said process employing upstream and downstream hydrodesulfurization stages containing hydrodesulfurization catalyst comprising Group VI and Group VIII metal on a non-cracking support at a temperature between 600° and 900° F. and a hydrogen pressure between 500 and 5,000 psi, followed by a thermal cracking step utilizing inert hot solids as a heat source, said process comprising fractionating said feed oil into an asphaltene-containing residual oil and a distillate oil, passing said residual oil and hydrogen through said upstream hydrodesulfurization stage and recovering an upstream stage effluent stream containing refractory sulfur asphaltenes, splitting said upstream stage effluent stream into a first effluent portion comprising between about 10 and 75 weight percent of the normally liquid material in said upstream stage effluent stream and a second effluent portion, removing said first effluent portion from the hydrodesulfurization operation to selectively remove refractory sulfur asphaltenes from said process and to increase the concentration of more sulfurreactive material in said downstream stage, passing said second effluent portion and said distillate oil and hydrogen through said downstream hydrodesulfurization stage, said distillate oil bypassing said upstream hydrodesulfurization stage, recovering a downstream stage effluent stream, said downstream stage effluent stream containing aromatics and having a sulfur concentration which is at least 75 percent lower than the sulfur concentration of said feed oil, the removal of said first effluent portion allowing the sulfur concentration in said downstream stage effluent stream to be achieved with a relatively high aromatics concentration as compared to the aromatics concentration when achieving the same sulfur concentration by hydrodesulfurization without selective removal of refractory sulfur asphaltenes, passing said downstream stage effluent stream and regenerated inert hot solids through a thermal cracking riser at a temperature between 1,300° and 2,500° F. for a residence time between 0.05 and 2 seconds for conversion to a thermally cracked effluent stream including ethylene, separating coke-containing solids from said thermally cracked effluent stream, passing said coke-containing solids to a regeneration zone for combustion of coke therefrom, and recycling hot solids from said regeneration zone to said thermal cracking riser.

4,179,356
HYDROCRACKING WITH CATALYST MODIFIED BY GROUP IIA
Mark J. O'Hara, Mt. Prospect; Russell W. Johnson, Hoffman Estates, and Lee Hilfman, Mt. Prospect, all of Ill., assignors to UOP Inc., Des Plaines, Ill.
Division of Ser. No. 838,435, Sep. 30, 1977, Pat. No. 4,141,860. This application Nov. 13, 1978, Ser. No. 960,333
Int. Cl.[2] C10G *13/02*; B01J *29/12*
U.S. Cl. 208—111 7 Claims

1. In a process for hydrocracking hydrocarbons boiling above about 650° F. at a temperature in the range of about 400° F. to about 1000° F. at elevated pressures up to about 3000 psig. selectively to middle distillate hydrocarbons boiling in the range of about 350° F. to about 650° F. which comprises contacting said hydrocarbons boiling above about 650° F. with a hydrocracking catalyst composition comprising an alumina-zeolite support, a rare earth exchange metal component, at least one metal component from Group VIB or Group VIII and from about 0.1 to about 5 wt. % of at least one component from Group IIA based on the weight of the finished catalyst.

4,179,357
SELECTIVE HYDROCRACKING PROCESS FOR MIDDLE DISTILLATE
Mark J. O'Hara, Mt. Prospect, and Russell W. Johnson, Villa Park, both of Ill., assignors to UOP Inc., Des Plaines, Ill.
Filed Jul. 27, 1978, Ser. No. 928,655
Int. Cl.[2] C10G *13/02*; B01J *35/02, 29/12*
U.S. Cl. 208—111 3 Claims

1. In a process for the hydrocracking of hydrocarbon feed stock having an initial boiling point of at least about 650° F. in contact with a catalyst comprising an alumina-zeolite support, a rare earth exchange metal component, and a Group VIB or Group VIII metal component, the method of improving the hydrocracking selectivity of said catalyst with respect to the formation of middle distillate hydrocarbons boiling in the range of about 300° F. to about 650° F., which comprises employing said catalyst in the form of particles having a nominal diameter of less than 0.04 inches.

4,179,358
FLUID CRACKING CATALYST PROCESS USING A ZEOLITE DISPERSED IN A MAGNESIA-ALUMINA-ALUMINUM PHOSPHATE MATRIX
Harold E. Swift, Gibsonia; John J. Stanulonis, Pittsburgh, and Elizabeth H. Reynolds, Verona, all of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.
Filed Nov. 8, 1978, Ser. No. 958,628
Int. Cl.[2] C10G *11/02*; B01J *8/24, 23/94, 27/14*
U.S. Cl. 208—114 17 Claims

1. A process for increasing the gasoline yield and quality in a petroleum cracking reaction by contacting a hydrocarbon feedstock under catalytic cracking conditions with a catalyst comprising a magnesia-alumina-aluminum phosphate matrix characterized after calcination at 500° C. for 10 hours as amorphous, and having an average pore radius of from about 10° A to about 200° A; a surface area ranging from about 100 M^2/g to about 350 M^2/g; a pore volume of from about 0.3 cc/g to about 1.5 cc/g; and wherein the magnesia-alumina-aluminum phosphate matrix has a mole percent ratio of from about 10:80:10 to about 25:10:65, and wherein said matrix retains at least 90% of its surface area when the matrix is additionally calcined at a temperature up to about 750° C. for about 10 hours; said matrix being composited with from about 5 to about 50 weight percent of a REY-zeolite.

4,179,359
HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE
John C. Hayes, Palatine, and Ernest L. Pollitzer, Skokie, both of Ill., assignors to UOP Inc., Des Plaines, Ill.
Continuation-in-part of Ser. No. 739,887, Nov. 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 632,041, Nov. 14, 1975, Pat. No. 4,009,123, which is a division of Ser. No. 522,209, Nov. 8, 1974, Pat. No. 3,960,710. This application Jul. 12, 1978, Ser. No. 924,112
Int. Cl.[2] C10G *35/08*
U.S. Cl. 208—139 15 Claims

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon and hydrogen at hydrocarbon conversion conditions with an acidic catalytic composite comprising a porous carrier material contaoning, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % iridium, about 0.05 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % Group IVA metal, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum or palladium, iridium, Group IVA metal and catalytically available cobalt are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum or palladium and iridium are present in the elemental metallic state; wherein substantially all of the Group IVA metal is present in an oxidation state above that of the corresponding metal; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

4,179,360
HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE
John F. Flagg, Rosemont, and George J. Antos, Arlington Heights, both of Ill., assignors to UOP Inc., Des Plaines, Ill.
Filed Jul. 27, 1978, Ser. No. 928,650
Int. Cl.[2] C10G *35/08*
U.S. Cl. 208—139 19 Claims

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt.% platinum group metal, about 0.05 to about 5 wt.% nickel, about 0.1 to about 10 wt.% uranium, and about 0.1 to about 3.5 wt.% halogen; wherein the platinum group, catalytically available nickel, and uranium components are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group component is present in the elemental metallic state; wherein substantially all of the uranium component is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalytically available nickel component is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

4,179,361
SORBENT REGENERATION IN A PROCESS FOR REMOVING SULFUR-CONTAINING IMPURITIES FROM MINERAL OILS
Manfred J. Michlmayr, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Filed Nov. 13, 1978, Ser. No. 960,501
Int. Cl.[2] C10G *29/16, 25/12*
U.S. Cl. 208—244 7 Claims

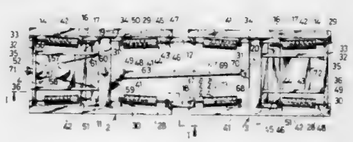
1. A non-hydrogenative process for upgrading a mineral oil feed containing a minor amount of sulfur-containing impurities, comprising:
(1) producing a sulfur-containing sorbent and a resulting oil by contacting said feed and a particulate sorbent at a temperature in the range of from about 250° C. to 500° C. and a liquid hourly space velocity in the range of from about 0.1 to 20, said sorbent consisting essentially of a minor amount of cobalt oxide disposed upon porous alumina, and said resulting oil, relative to the feed, having a substantially lower content of said impurities;
(2) separating said resulting oil and sulfur-containing sorbent; and
(3) regenerating said sorbent by steps including:
(a) oxidizing at least a major portion of the sulfur content of said sulfur-containing sorbent by heating said sorbent in the presence of molecular oxygen at a temperature in the range of from about 400° to 800° C. for a period in the range of from about 0.5 to 2 hours;
(b) heating said oxidized sorbent resulting from step (a) at a temperature in the range of from about 700° to 1000° C. for a period in the range of from about 0.2 to 5 hours; and
(c) contacting the heated sorbent resulting from step (b) with wet air or steam at a temperature in the range of from about 400° to 600° C. for a period in the range of from about 0.5 to 2 hours.

4,179,362
PROCESS FOR AROMATICS EXTRACTION FROM A 300°-430° F. BOILING RANGE NAPHTHA
Cyrus A. Irani, 312 Penn Lear Ct., Monroeville, Pa. 15146; Stephen S. Kasegrande, 80 Mountain Height Ave., Lincoln Park, N.J. 07035; Daniel J. McHugh, 204 W. Grant Ave., Edison, N.J. 08817, and Frederic Leder, 1635 Reefview Cir., Corona Del Mar, Calif. 92625
Filed Jan. 5, 1978, Ser. No. 867,209
Int. Cl.[2] C10G *21/16, 21/28*
U.S. Cl. 208—321 11 Claims



1. A process for the separation of aromatic and paraffinic hydrocarbon constituents of an aromatic-containing petroleum distillate which comprises the steps of
(1) contacting the petroleum distillate at a temperature of about 150°–450° F. with a solvent comprising a mixture of methanol and water in which the water comprises at least 10% by volume to produce an aromatic-rich extract phase and a paraffinic-rich raffinate phase;
(2) separating the aromatic-rich extract phase from the paraffinic-rich raffinate phase; and
(3) contacting the separated aromatic-rich extract phase and paraffinic-rich raffinate phase directly, without further processing, with water to result in a water/methanol solvent containing at least 80% water by volume, thereby separating said aromatic-rich extract phase and paraffinic-rich raffinate phase from their respective solvent streams and recovering as products a paraffinic-rich hydrocarbon stream and an aromatic-rich hydrocarbon stream.

4,179,363
DUAL-TABLE SEPARATING APPARATUS
Kurt Schnellbacher; Klaus Müller, and Frank-Otto Görlitz, all of Braunschweig, Fed. Rep. of Germany, assignors to Buhler-Miag GmbH, Braunschweig, Fed. Rep. of Germany
Continuation of Ser. No. 782,832, Mar. 30, 1977, abandoned. This application Aug. 17, 1978, Ser. No. 934,549
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 2614247; Oct. 28, 1976, 2648950
Int. Cl.[2] B07B *13/10*
U.S. Cl. 209—481 26 Claims

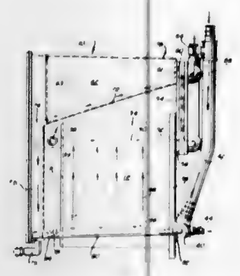


1. A separating apparatus for particulate material, especially for separating shelled grain from unshelled grain in dependence on the different elasticity of these grains, said apparatus comprising a frame defining a generally horizontally longitudinal direction; a front separating table on said frame; a rear separating table on said frame spaced longitudinally from said front table, each of said tables being provided with a plurality of separating chambers extending transverse to said direction and each having an inclined bottom and zig-zag baffles; means supporting said tables on said frame for independent linear displacement only in said longitudinal direction; a link extending at least generally in said direction and having a rear end connected to said rear table and a front end; biasing means for each of said tables for urging the same into a respective rest position; drive means completely supported on said front separating table and having an output end connected to said front end and limitedly reciprocable in said direction relative to said front separating table for limitedly longitudinally displacing said link and thereby oppositely longitudinally and linearly displacing said tables; a counterweight on said rear separating table dimensioned so that the mass of said front separating table including said drive means is substantially equal to that of said rear separating table including said counterweight; and stabilizing means including a stabilizing element secured to said frame for coupling said tables longitudinally together in such a manner that longitudinal displacement of said front table in one longitudinal direction through a predetermined first distance is matched by displacement of said rear table in the opposite longitudinal direction through a predetermined second distance bearing a fixed ratio to said first distance.

4,179,364
DIFFUSION DEVICE FOR BLOOD
William R. Bratten, Antioch, and Joel N. Helfer, Buffalo Grove, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed May 5, 1978, Ser. No. 903,314
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—321 B 8 Claims

1. In a diffusion device for blood having as a diffusion means a flexible, semi-permeable membrane folded into a stack to provide a plurality of membrane layers arranged for flow of blood in a plurality of parallel first flow paths and for flow of another fluid in a plurality of parallel second flow paths positioned between and separated from said first flow paths by said membrane, and a stiff, integral backing having transversely extending, generally parallel score lines and folded on said score lines into sections and arranged on one side of said membrane in said second flow paths for support of said layers and spaced port means defined in said backing to permit fluid flow therethrough, the improvement comprising: laterally positioned tabs on each edge of the stiff backing, said tabs being

folded inwardly against inner portions of said backing and sealed thereto to provide double thickness edge portions of



said backing, to provide a spacing and gasket seal at opposed edges of said stack.

4,179,365

PROCESS FOR TREATING WASTE WATER

Etsuo Sumi, Fujieda, Japan, assignor to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Oct. 19, 1978, Ser. No. 952,911
Claims priority, application Japan, Oct. 28, 1977, 52-128647
Int. Cl.[2] **C02C** *1/06, 5/10;* **B01D** *11/04*
U.S. Cl. 210—8 **4 Claims**

1. A process for treating a waste aqueous stream containing greater than 10,000 ppm of free phenols which comprises the steps of:

(1) subjecting said waste stream to a solvent extraction process or an adsorption process to reduce the phenol content of the waste stream to less than 100 ppm,

(2) treating the waste aqueous stream resulting from step (1) in a conditioning zone with nutrients and adjusting the concentration, pH and temperature of said waste aqueous stream to be within a pH range of about 6.4 to 7.6, a temperature range of about 15° to 35° C., and BOD range of about 350 to 800 ppm,

(3) agitating the aqueous stream from step (2) in an aerating zone in contact with activated sludge containing aerobic bacteria, and

(4) settling the activated sludge from the aqueous stream from step (3) to provide a purified water stream.

4,179,366

METHOD FOR THE BIOLOGICAL PURIFICATION OF EFFLUENT AND THE PLANT FOR CARRYING OUT THE PROCESS

Joseph R. Kaelin, Buochs, Switzerland, assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 745,567, Nov. 29, 1976, abandoned, which is a continuation of Ser. No. 585,572, Jun. 10, 1975, abandoned. This application Aug. 2, 1978, Ser. No. 930,136
Claims priority, application Switzerland, Nov. 18, 1974, 15346/74
Int. Cl.[2] **C02C** *5/10*
U.S. Cl. 210—14 **3 Claims**



1. An activated sludge wastewater treatment process comprising

(a) providing a first tank, an intermediate tank and a final tank;

(b) serially hydraulically interconnecting the tanks below normal wastewater surface level therein;

(c) feeding wastewater to be treated into said first tank;

(d) aerating the contents of said first tank and said intermediate tank so as to maintain activated sludge present and in suspension in said first tank and intermediate tank;

(e) flowing aerated wastewater from said first tank serially through said intermediate tank to said final tank, so that during the course of treatment activated sludge continuously declines in concentration in said first tank and intermediate tank and continually increases in concentration in said final tank;

(f) settling sludge from the wastewater in said final tank;

(g) removing sludge-depleted wastewater from the final tank as treated effluent from the process;

(h) discontinuing said feeding of wastewater into the first tank, the aeration of said first tank contents and the removal of treated wastewater from said final tank when the concentration of activated sludge in said first tank has been reduced to a first predetermined value;

(i) feeding wastewater to be treated into said final tank while continuing the aeration of the intermediate tank contents but without removal of wastewater from any of said tanks during a time sufficient to permit settling of activated sludge in said first tank;

(j) when activated sludge in said first tank has settled to a predetermined extent, initiating aerating of the contents of the final tank, with the aeration of the intermediate tank continuing, so as to maintain activated sludge present and in suspension in said final tank and intermediate tank;

(k) flowing aerated wastewater from said final tank serially through said intermediate tank to the first tank, so that during the course of treatment activated sludge continuously declines in concentration in said final tank and intermediate tank and continually increases in concentration in said first tank;

(l) settling sludge from wastewater in said first tank;

(m) removing sludge-depleted wastewater from the first tank as treated effluent from the process;

(n) discontinuing the feed of wastewater into the final tank, the aeration of said final tank contents and the removal of treated wastewater from the first tank when the concentration of activated sludge in said final tank has been reduced to a second predetermined value;

(o) feeding wastewater to be treated into said first tank while continuing the aeration of the intermediate tank contents but without removal of wastewater from any of said tanks during a time sufficient to permit settling of activated sludge in said final tank;

(p) reinitiating aerating of the contents of the first tank while continuing the aeration of the second tank contents so as to maintain activated sludge present and in suspension in said first tank and intermediate tank;

(q) thereafter repeating steps (e) to (p) in sequence.

4,179,367

THICKENING URINARY AND INTESTINAL TRACT EXCREMENT

Eduard Barthell, and Otto Schmid, both of Krefeld, Fed. Rep. of Germany, assignors to Chemische Fabrik, Bakerpfad, Fed. Rep. of Germany

Filed Feb. 10, 1978, Ser. No. 876,824
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1977, 2706135
Int. Cl.[2] **C02B** *1/14;* **B01D** *15/00*
U.S. Cl. 210—41 **7 Claims**

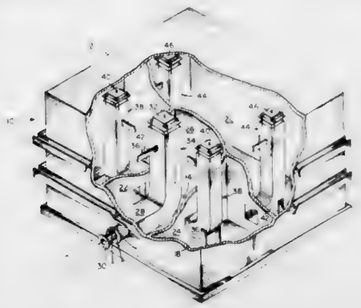
1. A method of thickening urinary tract and intestinal excrement comprising mixing said excrement with about 1 to 5 grams of a cross-linked water-swelling polymer per 100 ml of excrement and with about 0.1-0.5 parts of a hydrophilic adsorption agent per part by weight of polymer.

4,179,368

G-FACTOR COMPENSATED HYDRAULIC FLOCCULATION SYSTEM

Roderick M. Willis, 2624 W. Crockett St., Seattle, Wash. 98199

Filed Apr. 28, 1978, Ser. No. 901,255
Int. Cl.[2] **B01D** *21/01*
U.S. Cl. 210—42 R **16 Claims**



1. A method of compensating for variations in flow rate of a treated liquid through a hydraulic flocculation system having an orifice through which said liquid flows, comprising automatically adjusting the effective size of said orifice in accordance with said flow rate in order to maintain the head loss across said orifice and the G-factor of said flocculation system substantially constant as said flow rate varies.

8. A hydraulic flocculation system, comprising:

a detention tank having a discharge port;

an orifice opening into said tank;

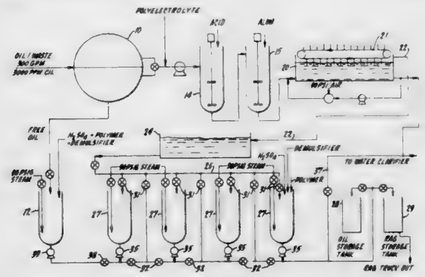
constant pressure-loss valve means position adjacent said orifice receiving a liquid containing a flocculation chemical for maintaining a constant head loss across said orifice thereby maintaining the G-factor of said system substantially constant with variations in flow rate of said liquid through said system.

4,179,369

POLYMER TO AGGLOMERATE RESOLVED EMULSIONS

Robert L. Bradley, Lake Hiawatha, N.J., and Frank A. Mauceri, Clarendon Hills, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 550,858, Feb. 18, 1975, abandoned. This application May 10, 1978, Ser. No. 903,771
Int. Cl.[2] **B01D** *17/04*
U.S. Cl. 210—43 **5 Claims**



1. A method of resolving an emulsified oily sludge, in which oil is the external phase, to separate an oil phase and a water phase during agitation of the sludge while it is hot, at least about 180° F., and comprising treating the sludge with at least about 4500 ppm of a demulsifying agent to break the emulsion and adding at least about 200 ppm of an acrylamide polymer concurrently to retard re-emulsification for a protracted period of time, adding about ½ to 2% acid, and separating said phases, during said time period, said demulsifying agent being selected from the group consisting of ethoxylated amines, ethoxylated fatty alcohols, sulfo succinates, and salts of sulfonic acid, and said polymer being polyacrylamide or acrylamide copolymer which hydrolyzes to polyacrylic acid of molecular weight 5×10^5 to 10^7.

4,179,370

FLOCCULATING AGENT COMPRISING WATER-IN-OIL EMULSION OF STABILIZER PLUS NH-ACTIVE POLYMER CARRYING FORMALDEHYDE AND AMINE RADICALS

Wolfgang Hübner, Kempen; Eduard Barthell, Krefeld, and Kurt Dahmen, Mönchen-Gladbach, all of Fed. Rep. of Germany, assignors to Chemische Fabrik Stockhause & Cie, Krefeld, Fed. Rep. of Germany

Division of Ser. No. 682,543, May 3, 1976, Pat. No. 4,113,685, which is a continuation-in-part of Ser. No. 538,428, Jan. 2, 1975, Pat. No. 4,093,542, which is a continuation-in-part of Ser. No. 485,474, Jul. 3, 1974, abandoned. This application Jul. 10, 1978, Ser. No. 923,423
Claims priority, application Fed. Rep. of Germany, May 6, 1975, 2520028
Int. Cl.[2] **B01D** *21/01;* **C02B** *1/20*
U.S. Cl. 210—51 **11 Claims**

1. In the process of clarifying an aqueous liquid having material suspended therein comprising mixing said aqueous liquid with a settling composition, and allowing said mixture to settle, whereby the suspended material settles out more rapidly than in the absence of said composition, the improvement which comprises employing as said settling composition a stable dispersion of about 10 to 50% concentration by weight of a water-soluble polymeric Mannich base in a mixture of water, a water-insoluble liquid, a quantity of an emulsifier of a suitable HLB number effective to produce a stable water-in-oil emulsion, the Mannich base comprising an NH active polymer carrying carbonamide groups reacted with formaldehyde and a primary or secondary alkyl-or hydroxylakylamine wherein the alkyl groups have up to about 18 carbon atoms, said formaldehyde and said amine being employed in the reaction in approximately equimolar amounts and said formaldehyde being present in at least about 0.1 times the molar amount of the carbonamide groups, and a stabilizing member selected from the group consisting of

(a) a water-soluble salt of an amine,

(b) (a)in admixture with an amine,

(c) (a)in admixture with ammonia,

(d) an ammonium salt of a mineral acid plus ammonia, and

(e) a carboxylic acid amide.

4,179,371

VACUUM SEWAGE SYSTEM

Brian E. Foreman, and Mark A. Jones, both of Rochester, Ind., assignors to Burton Mechanical Contractors, Inc., Rochester, Ind.

Filed Mar. 20, 1978, Ser. No. 890,581
Int. Cl.[2] **B01D** *1/00*
U.S. Cl. 210—63 R **6 Claims**

1. An improved vacuum sewage system for transporting sewage from a source at a given air pressure comprising:

vacuum collection means for receiving sewage and having a pressure less than the pressure of the source;

sewage injection means having an inlet coupled to the source of sewage and having an outlet for injecting the sewage and air; and

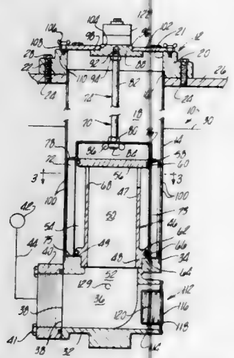
conduit means coupled to the vacuum collection means and coupled to the outlet of the injection means, said conduit

means having at least one riser, low point, and downslope, and being laid out in sawtooth fashion between the collection means and the injection means outlet so that when no



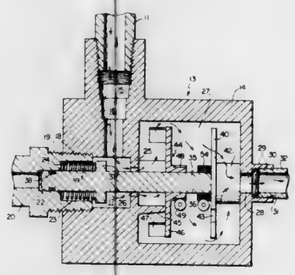
flow occurs sewage collects in the low point and permits the same pressure to be distributed throughout the conduit means.

4,179,372
FLUID FILTERING DEVICE
Nils O. Rosaen, 7108 Bridge Way, W. Bloomfield, Mich. 48033
Filed Nov. 8, 1978, Ser. No. 958,670
Int. Cl.[2] B01D *35/14*
U.S. Cl. 210—90 **10 Claims**



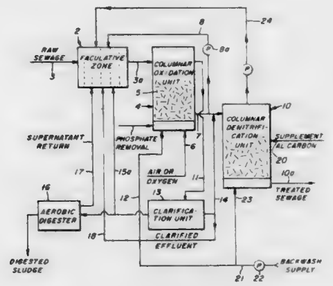
1. A fluid filtering device for use with a fluid reservoir in which fluid is contained substantially at a predetermined level, said filtering device comprising:
an elongated tubular cylindrical main housing having a fluid outlet means formed at one end;
means for securing said main housing to the fluid reservoir so that a portion of the main housing is positioned below the reservoir fluid level;
fluid inlet means formed through said housing to establish fluid communication between said reservoir and the interior of said housing;
an annular housing member coaxially disposed in said main housing and below the reservoir fluid level, said housing member being spaced radially inwardly from said main housing and forming an annular chamber therebetween, the lower portion of said housing member being connected to said main housing so that the interior of the housing member is open to the fluid outlet means, fluid passage means formed through the housing member for establishing fluid communication between said annular chamber and said outlet means and means for closing the upper end of the housing member;
a filter assembly comprising:
a tubular filter element and means for positioning said filter element in said annular chamber; and
means for sealing both the upper and lower ends of the housing member to said filter element.

4,179,373
SHUTOFF AND BYPASS VALVE
Milan Sablich, Bloomfield Hills, and Eugene J. Bedard, Detroit, both of Mich., assignors to Consolidated Foods Corporation, Old Greenwich, Conn.
Filed Sep. 14, 1978, Ser. No. 942,242
Int. Cl.[2] B01D *35/00*
U.S. Cl. 210—98 **6 Claims**



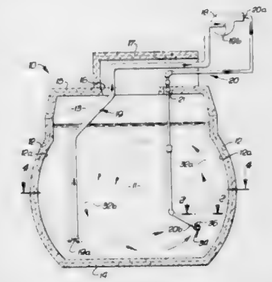
6. A shutoff and bypass valve apparatus for use in a water supply system having a water purifier means and an appliance which uses water, comprising a body having wall structure defining a hollow distribution chamber and a separate metering chamber, an opening normally providing communication between said distribution chamber and said metering chamber, said distribution chamber communicating with an inlet port which is connected to a supply of water by a first pipe means, a first outlet port located in the wall structure of said metering chamber and a second outlet port located in the wall structure of said distribution chamber, second pipe means connecting said first outlet port to said purifier means and said appliance, third pipe means connecting said second outlet port of said appliance, plunger means extending through said opening and having a first portion located within said distribution chamber and a second portion located within said metering chamber, said first portion of said plunger means including a first seal means for closing said second outlet port when said plunger means is in a first position and opening said second outlet port when said plunger means is in a second position, said first portion of said plunger means including a second seal means for permitting water to flow from said distribution chamber to said metering chamber when said plunger means is in said first position and interrupting the flow of water when said plunger means is in said second position, metering means located within said metering chamber for metering the flow of water therethrough, said metering means normally maintaining said plunger means in said first position until a predetermined quantity of water has passed through said metering chamber and then permitting said plunger means to move to said second position, and resilient means urging said plunger means toward said second position, whereby a predetermined quantity of water flows from said first pipe means through said distribution chamber and said metering chamber and is discharged through said second pipe means and said purifier means to said appliance and thereafter, when said plunger means moves to said second position, the water flows from said distribution chamber through said third pipe means to said appliance.

4,179,374
APPARATUS FOR THE TREATMENT OF WASTEWATER
Elton S. Savage, Wexford, and Jeffrey J. Chen, Pittsburgh, both of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.
Continuation of Ser. No. 685,770, May 12, 1976, abandoned, which is a division of Ser. No. 483,231, Jun. 26, 1974, abandoned. This application Oct. 18, 1977, Ser. No. 843,203
Int. Cl.[2] C02C *1/06*
U.S. Cl. 210—151 **7 Claims**



1. A sewage treatment plant comprising:
(a) an enclosed facultative unit arranged to simultaneously receive and contain a liquid mixture of raw sewage and sewage that is recycled after partial processing in the plant and having an effluent conduit for the discharge of said mixture therefrom and having inlet means for connection with a source of raw sewage;
(b) an enclosed columnar oxidizing unit comprising a deep bed filter with a filter bed therein arranged to receive the effluent from the facultative unit at a location where said effluent will percolate downwardly through the filter bed, said oxidizing unit having an inlet below said filter bed arranged for connection with a controlled flow of gas comprising oxygen or air which is discharged into the oxidizing unit to flow countercurrent to the downwardly percolating effluent from the facultative unit, and means arranged to provide an effluent outlet after it has percolated through said filter bed;
(c) said columnar oxidizing unit being provided with means for backwashing the filter bed with water, and means arranged to digest and remove sludge from the spent backwash water after its passage through the filter bed and recycle at least part of the partially treated sewage after removal of the sludge therefrom to the facultative unit;
(d) conduit means arranged to conduct part of the effluent from said effluent outlet of the oxidizing unit into the facultative unit while excluding contact thereof with ambient air whereby the dissolved oxygen carried over from the oxidizing unit in the mixture in the facultative unit may be maintained below a preselected level;
(e) a columnar denitrification unit in the nature of a deep bed filter;
(f) conduit means for discharging that portion of the effluent from the oxidizing unit which is not returned to the facultative unit into the upper end of the denitrification unit to percolate down through the filter bed of said unit for effecting denitrification of dissolved nitrates in the downflowing liquid by establishment and growth of facultative microorganisms in the filter bed of the said denitrification unit, said columnar denitrification unit having an outlet below the filter bed for the discharge of the filtered effluent; and
(g) backwashing means to effect the reverse flow of wash water through the filter bed of the denitrification unit and outlet means above the filter bed for removing the spent backwash water from the filter bed and conducting at least a portion of the backwash water along with facultative bacteria removed by such backwashing into the facultative zone to replenish facultative bacteria in the facultative zone that are removed with the effluent liquid mixture from the facultative zone or otherwise destroyed; and
(h) conduit means leading from above the filter bed of the columnar oxidation unit for the removal of spent backwash water therefrom and comprising means to digest and remove entrained sludge therefrom and recycle the water to the facultative zone.

4,179,375
AERATION OF WASTE IN SEPTIC TANK
Alvin J. Smith, 228 Cordova Dr., Santa Barbara, Calif. 93109
Continuation of Ser. No. 823,622, Aug. 11, 1978, abandoned. This application Oct. 23, 1978, Ser. No. 953,475
Int. Cl.[2] C02C *1/08*
U.S. Cl. 210—197 **4 Claims**



1. In an aerated sewage disposal system to aerate sewage waste in a septic tank having walls curved to aid in causing a revolving flow of waste and including said tank having opening means in the top of the tank above the level of said waste, the combination comprising
(a) ducting means to effect flow of waste from the tank, and to effect return flow of said waste to the tank,
(b) additional means connected to said ducting means to effect entry of oxidizing fluid into the waste flow of said ducting means,
(c) said first means including distributed outlet means in the tank to discharge said oxidizing fluid in the form of small bubbles into the waste in the tank along with return of the flowing waste into the tank,
(d) said ducting means including a pump, a suction line extending through said opening means and having an intake end extending into waste in the tank and a discharge end, a return line in the form of piping extending through said opening means and having an intake end and an opposite end extending into the tank and connected to the distributed outlet means, the pump operable to effect flow of waste between the suction line discharge end and the return line intake end, said means to effect entry of oxidizing fluid into the waste flow connected to the return line above the level of waste in the tank to effect said entry of oxidizing fluid into the waste flowing in the return line to mix therewith as the waste flows downwardly in said return line in the tank, said distributed outlet means located in the tank to create a revolving flow of waste upwardly and downwardly in the tank,
(e) said distributed outlet means being openly unconfined within the tank and including at least one elongated slit through a duct side wall defined by the distributed outlet means, the slit extending lengthwise of said duct and lengthwise of the tank so as to be substantially parallel to the axis of rotation of the revolving flow, the duct consisting of expandable material and characterized in that the

slit widens in response to application of pressure to waste liquid flowing in the duct, the slit being closed in the absence of pressure application to said waste liquid within said distributed outlet means, the slit located at generally the same lower interior level in the tank as the intake end of the suction line,

(f) said return line extending downwardly from said opening and toward said distributed outlet means whereby pressurized waste in said return line exerts pressure sufficient to effect opening of said slit,

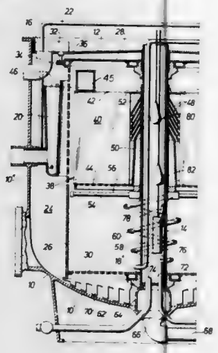
(g) said slit located proximate one interior curved side of the tank, and said intake end of the suction line located proximate another interior curved side of the tank which faces oppositely toward said one side of the tank.

4,179,376

DEVICE FOR PURIFICATION OF LIQUIDS

Lars Å. H. Håkansson, Lindöhällsvägen 15, S-603 65 Norrköping, Sweden

Filed Feb. 14, 1978, Ser. No. 877,749
Claims priority, application Sweden, Feb. 16, 1977, 7701734
Int. Cl.² C02B 1/20; C02C 1/34
U.S. Cl. 210—208 **8 Claims**



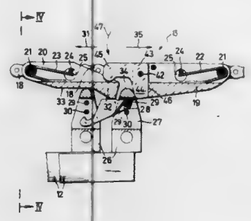
1. Device for purification of liquids, especially waste water from industrial processes, and including a flocculation chamber (20) having means (22) for supply of a flocculant, a precipitation or sedimentation chamber (24) for separation of the precipitate and a filter unit (38) for further purification of the liquid from the precipitation or sedimentation chamber (24), characterized in that the filter unit is arranged as an annular filter array (38) having substantially radially arranged, inclined lamellas (40), said filter array being slidably and rotatably arranged on a vertical outlet tube (14) in the precipitation or sedimentation chamber (24) and is provided with a float member 45, which keeps the filter array (38) in predetermined height relative to the surface of the liquid in the precipitation or sedimentation chamber (24), that the flocculation chamber (20) comprises an annular, upwardly open channel, which is arranged around the filter array (38) in the precipitation or sedimentation chamber (24), and in that a cylindrical casing (26) having apertures is arranged between the filter array (38) and the annular flocculation chamber (20), said casing being arranged to slowly rotate around the outlet tube (14) and being provided with the driving means, so that the filter array (38) follows the casing (26) in its rotational movement.

4,179,377

SHIFTING DEVICE FOR A PLATE FILTER PRESS

Alfons Schotten, Düren, and Hermann J. Spölgen, Langerwehe, both of Fed. Rep. of Germany, assignors to Eberhard Hoesch & Söhne GmbH & Co., Düren, Fed. Rep. of Germany

Filed Jun. 22, 1978, Ser. No. 918,284
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1977, 2728997
Int. Cl.² B01D 25/00
U.S. Cl. 210—230 **8 Claims**



1. In a plate filter press having a horizontal guide carrier; a plurality of filter plates shiftably supported on the guide carrier; a projection affixed to each filter plate; a spring-loaded pivotal locking hook and a locking pin mounted on each projection for releasably locking adjoining filter plates to one another to form an interlocked filter plate stack; and a filter plate shifting device for dissolving the stack on a closed side of the press by successively displacing the filter plates on the guide carrier in a first direction toward an open side of the press; the filter plate shifting device including a carrier element supported for displacement parallel to the guide carrier and driving means for selectively moving the carrier element in said first direction and in a second direction oriented opposite to said first direction; the improvement in said filter plate shifting device comprising

(a) a shifting lever pivotally secured to said carrier element for swinging into and out of a depressed position, said shifting lever being oriented in said first direction and having a free end arranged to abut the projection of a filter plate to be shifted and moving the last-named filter plate in said first direction when said drive means moves said carrier element in said first direction;

(b) a reversing lever pivotally secured to said carrier element at a location spaced in said first direction from the articulation between said shifting lever and said carrier element; said reversing lever being oriented in said second direction and having a free end; the respective free ends of said shifting lever and said reversing lever being oriented towards one another; and

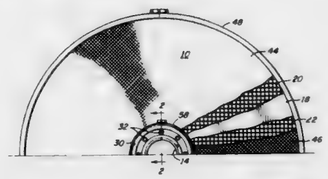
(c) a bell crank lever pivotally mounted on the free end of said reversing lever and having a first end for cooperating with the projection of the filter plate to be shifted and a second end for cooperating with a portion of said shifting lever; said bell crank lever being arranged to abut, with said first end, the projection of the filter plate to be shifted, whereby the filter plate to be shifted is urged in said second direction and said bell crank lever is urged into an operative pivotal position depressing said shifting lever when said drive means moves said carrier element in said second direction for effecting a disengagement of the locking hook of the filter plate to be shifted from the cooperating locking pin of the adjoining filter plate.

4,179,378

FILTER LEAF

Earl A. Borre, Itasca, Ill., assignor to Industrial Filter & Pump Mfg. Co., Cicero, Ill. and Industrial Filter & Pump Mfg. Co., Cicero, Ill.

Filed Jun. 7, 1978, Ser. No. 913,482
Int. Cl.² B01D 33/26
U.S. Cl. 210—232 **6 Claims**



1. For use in the pressure chamber of a pressure filter having a tubular, liquid outlet manifold disposed therein and on which a plurality of filter leaves are mounted in juxtaposed relationship for entraining solids from a liquid passed through said leaves from said chamber to said manifold, the combination wherein each of said filter leaves includes:

a generally planar supporting and drainage core,

a pair of axially aligned mounting rings forming the hub of the associated leaf, filter media mounted over said core sealably clamped to said hubs,

means for clamping the supporting and drainage core of each leaf between the associated mounting rings,

at least one of said rings having an annular groove in the circumferential surface thereof,

a resilient sealing gasket mounted in said groove, and

a rigid, tubular, imperforate cylindrical member extending over said gasket in sealing relationship therewith and being sealably connected to the mutually adjacent ring of the next adjacent filter leaf,

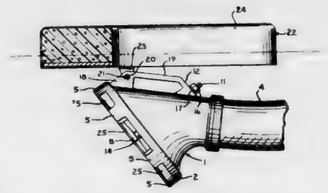
whereby the juncture between adjacent filter leaves is sealed by said cylindrical member from the chamber in which said filter leaves are disposed.

4,179,379

PICK-UP NOZZLE

Robert D. Mitchell, Fond du Lac, Wis., assignor to Firl Industries, Inc., Fond du Lac, Wis.

Filed Feb. 23, 1978, Ser. No. 880,433
Int. Cl.² B01D 35/28
U.S. Cl. 210—242 R **4 Claims**



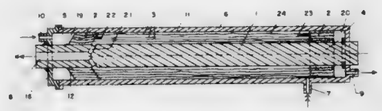
1. A pickpup nozzle comprising a tapered generally tubular body having its upper smaller end adapted to be connected to a suction conduit and disposed at an angle to the flat base of the lower larger end, a filter screen disposed across said base, means extending downwardly from the upper side of the inclined nozzle body and connecting centrally of said screen to suspend the same, a lug on said nozzle body above said base and forward of said small end, a float having a bracket beneath the same complementary to said lug, and a removable pivot means connecting said lug and said bracket to pivotally suspend said nozzle body from said float, said float having a recess therein to accommodate said nozzle body in upward pivoting position.

4,179,380

HOLLOW FIBRE APPARATUS

Charles Amicel, Carrieres sur Seine; Bernard Biot, Craponne; Yves Butruille, Ferrol-Attilly, and Christian Ollivier, Vienne, all of France, assignors to Sodip S.A., Meyzieu, France

Filed Dec. 27, 1977, Ser. No. 865,097
Int. Cl.² B01D 31/00
U.S. Cl. 210—321 A **15 Claims**



1. Hollow fibre apparatus for the fractionation of fluids which comprises,

a mandrel towards the ends of which two sealing elements are situated which surround the said mandrel and by which the hollow fibres are held, the fibres extending from one sealing element to the other, at least one of these sealing elements being traversed by the hollow fibres so that open ends thereof are exposed at an outer side thereof and having an inner side opposite to the inner side of the other sealing element which is inclinded at least in part with respect to the longitudinal axis of the mandrel, the said at least one sealing element with an inner side inclined comprising a ribbon means enrolled around the said mandrel, the end part of the fibres being held in a leaktight manner between the spirals of the ribbon means,

a casing which is arranged at least around the hollow fibres and the sealing elements and which defines, between its inner wall, the inner sides of the sealing elements and the mandrel, a chamber in which the hollow fibres are arranged,

first inlet and/or outlet means for introducing and/or withdrawing fluid which is circulated inside the hollow fibres, and second inlet and outlet means for introducing and withdrawing of fluid which is circulated outside the fibres inside the chamber.

4,179,381

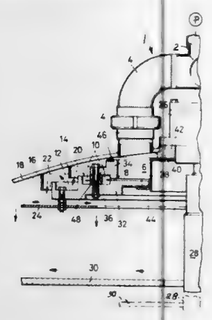
INTAKE DISTRIBUTOR FOR A SETTLING TANK FILTER

Rolf Baur, Heubach-Lautern, Fed. Rep. of Germany, assignor to Schenk-Filterbau Gesellschaft mit beschränkter Haftung, Waldstetten, Fed. Rep. of Germany

Filed Nov. 24, 1978, Ser. No. 963,201
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1977, 2752486
Int. Cl.² B01D 29/42
U.S. Cl. 210—456 **12 Claims**

1. An inlet distributor for a settling tank filter, which includes: a vertical shaft arranged centrally and adapted to receive horizontally extending filter elements one above the other, annular chamber means coaxially arranged with regard to said vertical shaft, inlet conduit means spaced at equal angles from each other and leading into said annular chamber means, said annular chamber means having an annular slot associated therewith for fluid communication with said tank filter, said annular slot being coaxial with said vertical shaft, and having a flow cross section relatively small with regard to the flow

cross section of said inlet conduit means, and deflecting means arranged in fluid communication with and located outside of



said annular slot for reducing the flow energy and flow velocity of fluid from said annular chamber means.

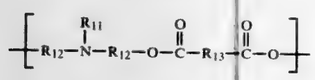
4,179,382

TEXTILE CONDITIONING COMPOSITIONS CONTAINING POLYMERIC CATIONIC MATERIALS

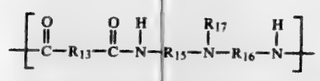
Arthur L. Rudkin, Hitchin; John H. Clint, and Kenneth Young, both of Whitley Bay, all of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 27, 1978, Ser. No. 955,559
Int. Cl.[2] D06M *13/26*
U.S. Cl. 252—8.8 **11 Claims**

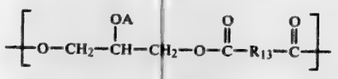
1. A textile conditioning composition comprising:
(a) a cationic textile softening agent having either one alkyl or alkenyl group with at least 16 carbon atoms or two alkyl or alkenyl groups having from 10 to 22 carbon atoms,
(b) from 0.001 to 0.70% by weight of a polymeric cationic salt or mixture of such salts selected from the group consisting of
(i) cationic polysaccharide gums,
(ii) cationic starch and starch derivatives
(iii) polyvinyl pyridine and polyvinyl pyridinium salts and co-polymers therewith,
(iv) cationic polyvinyl alcohol,
(v) cationic polyvinyl polyvinyl pyrrolidone co-polymers
(vi) co-polymer of dialkylaminoalkyl methacrylate, wherein each alkyl has 1-3 carbon atoms, with styrene, or a neutral acrylic ester,
(vii) condensation co-polymers having the repeating unit



wherein R_{11} is hydrogen or a C_{1-6} alkyl group, or is $R_{12}OA$, wherein A is a hydrogen or a C_{1-20} acyl group or a quaternary nitrogen-containing group, each R_{12} independently is a C_{1-6} alkylene group, and R_{13} is a C_{1-6} alkylene, hydroxy alkylene or alkenylene group or an arylene group said co-polymer being rendered cationic either by the presence of said quaternary group in some or all of radicals A, or by rendering some or all of the nitrogen atoms in the back bone cationic, or by both,
(viii) condensation co-polymers having the repeating unit



wherein R_{13} is a C_{1-6} alkylene hydroxyalkylene or alkyl or an aryl group, R_{15} and R_{16} independently are a C_{1-6} alkylene group, and R_{17} is hydrogen or a C_{1-6} alkyl group, said co-polymer being rendered cationic at some or all of the nitrogen atoms which are not adjacent to CO groups,
(ix) condensation co-polymers having the repeating unit



wherein R_{13} is a C_{1-6} alkane, hydroxy alkane or alkene residue or an aryl group and some or all of radicals A are quaternary nitrogen-containing groups the remainder being hydrogen atoms, and
(x) quaternised polyethyleneimines having at least 10 ethyleneimine residues in the molecule, and (c) optionally a substantially water-insoluble nonionic textile conditioning agent, in amount such that the weight ratio of component (c), if present, to components (a) and (b) together is not greater than 1:10.

4,179,383

PREPARATION OF MAGNESIUM-CONTAINING DISPERSIONS FROM MAGNESIUM CARBOXYLATES

William J. Cheng, and David B. Guthrie, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Oct. 7, 1977, Ser. No. 840,192
Int. Cl.[2] C10M *1/40, 1/24, 3/34, 3/18*
U.S. Cl. 252—25 **16 Claims**

1. A process of preparing a stable, fluid magnesium-containing dispersion which comprises substantially quantitatively decomposing a magnesium carboxylate to MgO in a non-volatile process fluid capable of being heated to the decomposition temperature of the magnesium carboxylate also containing a dispersant capable of retaining the magnesium oxide formed by the decomposition in stable suspension at a temperature between about 230° C. and about 400° C.

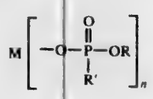
4,179,384

STABILIZED HYDRAULIC FLUID

James T. Mann, Plum Borough, Pa., assignor to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Nov. 9, 1978, Ser. No. 959,307
Int. Cl.[2] C10M *1/48, 1/46, 3/42, 3/40*
U.S. Cl. 252—32.7 E **5 Claims**

1. A hydraulic fluid stabilized against thermal degradation comprising a base oil having a 100° F. (37.8° C.) viscosity of between about 100 SUS (20.6 cs.) and about 1,000 SUS (215 cs.) and selected from highly refined mineral oils, alpha-olefin oligomers and mixtures thereof; from about 0.1 to about 2.0 volume percent of one or more zinc bis(dialkyldithiophosphate)s in which the alkyl groups have between about four and about twelve carbon atoms; and from about 0.01 to about one volume percent of an alkali metal or alkaline earth metal phosphonate having the general formula



in which M is an alkali metal or alkaline earth metal, n is the valence of the metal, R is lower alkyl having one to about four carbon atoms and R' is higher alkyl having from about 10 to about 30 carbon atoms, or a mixture of said phosphonates.

4,179,385

PROCESS FOR THE PRODUCTION OF OVERBASED MANGANESE SALTS OF ORGANIC ACIDS

Asghar Ali, Edison; Robert Caruso, Westfield, both of N.J.; Alfred Fischer, Forest Hills, N.Y.; Adolph J. Deinet, East Brunswick, N.J.; Pasquale P. Minieri, Woodside, N.Y., and Henri Sidi, Paramus, N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed May 3, 1978, Ser. No. 902,464
Int. Cl.[2] C10M *1/40, 1/24, 3/34;* C10L *1/24*
U.S. Cl. 252—33 **16 Claims**

1. In the process for the production of overbased manganese salts of organic acids that comprises contacting with carbon dioxide at a temperature in the range of 50° C. to 100° C. until the carbonation reaction is complete a reaction mixture that comprises (1) excess manganous oxide, (2) an organic acid selected from the group consisting of oil-soluble organic carboxylic acids and oil-soluble organic sulfonic acids, (3) a promoter selected from the group consisting of ammonium halides, ammonium nitrate, mono, di-, and trihydrocarbyl amine hydrohalides containing 1 to 3 carbon atoms, ammonium sulfide, and ammonium peroxysulfate, (4) a copromoter selected from the group consisting of alkaline earth halides, aluminum chloride, and ferric chloride, and (5) a solvent system containing from 10% to 90% by weight of an alcohol having from 1 to 18 carbon atoms and from 10% to 90% by weight of an inert solvent selected from the group consisting of hydrocarbons, halogenated hydrocarbons, and mixtures thereof, wherein the proportion of promoter and copromoter is from 2% to 20%, based on the weight of manganous oxide, and the amount of the solvent system is that which will produce a product that contains from 2% to 10% by weight of manganese, the improvement that comprises carrying out the carbonation reaction at a pressure in the range of 1 atmosphere to 10 atmospheres in the presence of from 0.3% to 0.8% of water, based on the weight of the solvent system in the reaction mixture.

4,179,386

SYNTHETIC AIRCRAFT TURBINE OIL

Russell R. Reinhard, Hopewell Junction, and Roberta Yaffe, Beacon, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed May 30, 1978, Ser. No. 910,719
Int. Cl.[2] C10M *1/48*
U.S. Cl. 252—46.6 **10 Claims**

1. A synthetic lubricating oil composition consisting of a major portion of an aliphatic ester base oil having lubricating properties formed from the reaction of pentaerythritol or a polypentaerythritol or trimethylolpropane and an organic monocarboxylic acid having from about 2 to 18 carbon atoms per molecule and:
(a) from about 0.25 to 10 percent by weight of a hydrocarbyl phosphate ester in which said hydrocarbyl radical contains an aryl ring and contains from about 16 to 18 carbon atoms, and
(b) from about 0.01 to 0.5 percent by weight of a polyhydroxy-substituted anthraquinone,
(c) from about 0.10 to about 5.0 percent by weight of a dialkyl sulfide compound having the following formula:

$$R_1—S—R^1$$

wherein R and R^1 each can be a C_1–C_{14} straight chain or branched chain alkyl group or mixtures thereof,
and either one of the following classes of compounds
(1) from about 0.3 to 5 percent by weight of the lubricating oil composition of a phenylnaphthylamine or an alkyl or alkaryl phenyl naphthylamine in which the alkyl radical has from 4 to 12 carbon atoms, or
(2) from about 0.3 to 5 percent by weight of a dialkyldiphenylamine in which the alkyl radicals have from 4 to 12 carbon atoms.

4,179,387

PROCESS FOR PRODUCING MAGNETIC FE OXIDE

Koji Sasazawa; Mahito Shimizu, and Tatsuji Kitamoto, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Division of Ser. No. 792,956, May 2, 1977, abandoned, which is a continuation of Ser. No. 557,431, Mar. 11, 1975, abandoned. This application Dec. 21, 1977, Ser. No. 862,884
Claims priority, application Japan, Mar. 12, 1974, 49-28423
Int. Cl.[2] C04B *35/26;* C01G *49/06, 49/08*
U.S. Cl. 252—62.56 **5 Claims**

1. A process for producing a magnetic Fe oxide having a coercive force of at least about 300 Oe and and optionally an element selected from the group consisting of Mg, Cu, Cr, Mn, Ni, Zn, Mo, Sn, Sb, Te, Rh, Ba, La, Ce, W, Bi and mixtures thereof, the amount of the element plus the Co being from about 0.5 to 33 atomic %, in which the oxidation degree indicated by the following equation ranges from about 30% to 80%:

$$\text{Oxidation Degree} = (1 - \frac{300 - y}{100 - y} \cdot R) \times 100\,(\%)$$

wherein y is the amount of Co, plus divalent metal if present, in atomic % contained in the magnetic Fe oxide, and R is the ratio of the divalent Fe ions to the total Fe ions,
which comprises
(i) dehydrating goethite containing Co and optionally said element and (ii) reducing the dehydrated goethite containing Co, and optionally said element at a temperature of about 300° to 400° C., to obtain magnetite containing Co, and optionally, said element, followed by (iii) cooling the magnetite product of step (ii) to room temperature under a flow of nitrogen gas, (iv) covering the product of step (iii) with water, (v) removing excess water from the wet magnetite so that the magnetite particles produced in covering step (iv) have a moisture content of about 50 to 200% by weight relative to dried magnetite particles and (vi) oxidizing the magnetite at a relatively low temperature of less than 100° C. to form a magnetic iron oxide having said oxidation degree

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4,179,388

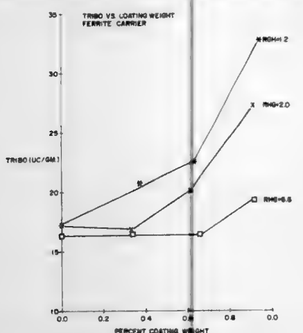
ELECTROSTATOGRAPHIC DEVELOPER WITH SMOOTH SURFACED CARRIER

Arthur W. Rahn; Lewis O. Jones, and Chin H. Lu, all of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 18, 1977, Ser. No. 788,482
Int. Cl.[2] G03G *9/10;* B32B *27/14*
U.S. Cl. 430—108 **8 Claims**

1. An electrostatographic developer mixture comprising finely-divided toner particles electrostatically clinging to the surface of classified carrier particles, said carrier particles having an average diameter of between about 30 microns and about 1,000 microns, said carrier particles having been classified as to have a surface roughness value of less than about 2.0 wherein said surface roughness value is defined as the ratio of

the BET area measured by gas absorption to that of the calculated geometric surface area of said carrier particles, and



wherein said carrier particles have a polymeric resin coating thereon.

4,179,389

STABILIZED HYDRAULIC FLUID

James T. Mann, Plum Borough, Pa., assignor to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Nov. 3, 1978, Ser. No. 957,654
Int. Cl.[2] C10M *1/48, 1/40, 3/42, 3/34*
U.S. Cl. 252—32.7 E **5 Claims**

1. A hydraulic fluid stabilized against thermal degradation comprising a base oil having a 100° F. (37.8° C.) viscosity of between about 100 SUS (20.6 cs.) and about 1,000 SUS (215 cs.) and selected from highly refined mineral oils, alpha-olefin oligomers and mixtures thereof; from about 0.1 to about 2.0 volume percent of a zinc bis(dialkyldithiophosphate) in which the alkyl groups have between about four and about twelve carbon atoms; and from about 0.01 to about one volume percent of a metal dialkylnaphthalene sulfonate in which the metal is selected from lithium, sodium, magnesium, calcium, barium and zinc and the alkyl groups contain between about six and about twenty carbon atoms.

4,179,390

LAUNDRY ADDITIVE PRODUCT

Gianfranco L. Spadini, and Ian D. Tolliday, both of Newcastle upon Tyne, England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 4, 1977, Ser. No. 839,490
Claims priority, application United Kingdom, Oct. 6, 1976, 41491/76; May 13, 1977, 20213/77
Int. Cl.[2] C11D *3/395, 7/54*
U.S. Cl. 252—95 **6 Claims**

1. A method of making a laundry additive product for use as a bleaching aid, comprising the steps of

(a) forming a fluid mass containing organic peroxy bleach precursor; said organic peroxy bleach precursor being organic compound which is capable of reacting in aqueous washing liquor with inorganic peroxy bleach selected from the group consisting of alkali metal percarbonate, persilicate and perpyrophosphate bleaches to form organic peroxy bleach having a bleaching performance at least equivalent to that of the inorganic peroxy bleach;

(b) contacting flexible solid means with said fluid mass; said flexible solid means being suitable as a substrate for solidified fluid mass;

(c) causing fluid mass to solidify on said flexible solid means to provide a precursor:flexible solid means weight ratio lying within the range from about 30:1 to about 1:10; thereby forming laundry additive product for use as a bleaching aid consisting essentially of peroxy bleach precursor attached to flexible substrate and releasable in aqueous washing liquor by solution, dispersion, bleaching, softening or melting to react with said inorganic peroxy bleach to form said organic peroxy bleach.

4,179,391

PHOSPHATE-FREE TEXTILE DETERGENT, ESPECIALLY FOR WASHING AT TEMPERATURES OF OVER 75° C.

Jochen Kaufmann, Düsseldorf; Markus Berg, Düsseldorf-Holthausen, and Peter Krings, Krefeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Apr. 17, 1978, Ser. No. 896,691
Claims priority, application Austria, Apr. 22, 1977, 2839/77
Int. Cl.[2] C11D *3/12, 3/36, 3/39, 3/60*
U.S. Cl. 252—99 **32 Claims**

1. A pulverulent, phosphate-free textile detergent consisting essentially of:

(a) from 25% to 35% by weight of a water-insoluble, finely-divided, synthetically-produced, crystalline alkali metal aluminosilicate containing at least some combined water and having primary particles in the size range of from 100μ to 0.01μ and a calcium binding power of from 50 to 200 mg CaO/gm of anhydrous active substance when measured at 22° C. by the Calcium Binding Power Test Method described in the specification and the formula on the anhydrous basis:

$$0.7\text{–}1.5\ Me_2O.Al_2O_3.1.3\text{–}2.4\ SiO_2$$

where Me is an alkali metal;

(b) from 5% to 17% by weight of a surface-active component selected from the group consisting of the combination (ba) consisting of:

(ba1) 1 part by weight of at least one nonionic surface-active agent which is an ethoxylated aliphatic C_{10}–C_{20} alcohol having a degree of ethoxylation of from 2 to 20;

(ba2) 0.3 to 1.75 parts by weight of a foam inhibitor selected from the group consisting of:

(i) an alkali metal soap of C_{12}–C_{22} fatty acids containing to an extent of more than 50% by weight, alkali metal salts of saturated C_{18}–C_{22} fatty acids, and

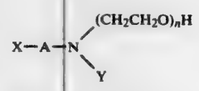
(ii) mixtures of said alkali metal soap with a non-surface-active foam inhibitor in proportions of soap to non-surface-active foam inhibitor within the range of from 25:1 to 2:1, and

(ba3) 0.5 to 6 parts by weight of an anionic surface-active agent selected from the group consisting of anionic surface-active sulfonates, anionic surface-active sulfates and mixtures thereof, and the combination (bb) consisting of:

(bb1) 1 part by weight of at least one nonionic surface-active agent from the group comprising the ethoxylated aliphatic C_{10}–C_{20} alcohols having a degree of ethoxylation of from 2 to 20;

(bb2) 0.05 to 0.75 parts by weight of a foam inhibiting alkali metal soap of C_{12}–C_{22} fatty acids containing, to an extent of more than 50% by weight, alkali metal salts of saturated C_{18}–C_{22} fatty acids, and

(bb3) 0.05 to 0.3 parts by weight of a compound having the formula:



wherein X-A together represent a C_{10}–C_{18} fatty acid acyl, X represents a β-hydroxy-C_8–C_{22})-alkyl having the attachment in the terminal or non-terminal position, and A is a bivalent linkage selected from the group consisting of a simple C—N bond, an aminoalkylene and a polyaminopolyalkylene, which aminoalkylene or polyaminopolyalkylene may be substituted with polyethylene glycol ether groups, Y represents a member selected from the group consisting of hydrogen and the group $—(CH_2CH_2O)_m$-H, and n and m each represent a number of between 1 and 3,

(c) from 0.2% to 0.6% by weight of a water-soluble organic complex former selected from the group consisting of:

(i) diphosphonates having the formula:



wherein X is a member selected from the group consisting of hydroxy and amino, Y is a member selected from the group consisting of alkane having from 1 to 5 carbon atoms, aminoalkane having from 2 to 5 carbon atoms, hydroxyalkane having from 2 to 5 carbon atoms, phenyl, hydroxyphenyl, aminophenyl and halophenyl, and M is a member selected from the group consisting of hydrogen and alkali metal, and

(ii) aminotri-(lower alkylene phosphonic acid) and its alkali metal salts;

(d) from 15% to 30% by weight of a perborate releasing hydrogen peroxide in water,

(e) 2% to 5% by weight of a sodium silicate having a ratio of Na_2O to SiO_2 of from 1 to 3.5, and

(f) from 1% to 50% by weight of other conventional ingredients for detergents of the type: soil suspension agents, optical brighteners, enzymes, antimicrobial agents, textile softeners, coloring compounds, perfumes, sodium sulfate and water.

4,179,392

BIODEGRADABLE HARD WATER DETERGENTS

El-Ahmadi I. Heiba, and Albert L. Williams, both of Princeton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 100,543, Dec. 21, 1970, Pat. No. 3,770,643. This application Aug. 3, 1973, Ser. No. 385,623
Int. Cl.[2] C11D *9/26;* **C07C** *59/23*
U.S. Cl. 252—108 **3 Claims**

1. A detergent composition consisting essentially of a water soluble derivative of an alkanoic acid having a polyethylene glycol ether substituent attached to a carbon atom 2 to 5 positions from the carboxyl carbon, said polyethylene glycol containing 1 to 20 ethylene oxide residues, said derivative selected from the group consisting of alkali metal salts and ammonium salts of the said substituted alkanoic acid.

2. A detergent composition consisting essentially of the sodium or ammonium salt of 4-hydroxy tetradecanoic acid or 4-hydroxy eiconsanic acid.

4,179,393

STABLE AQUEOUS SUSPENSION OF WATER-INSOLUBLE, CALCIUM-BINDING ALUMINOSILICATES AND ORGANIC SUSPENDING AGENTS

Hans Andree; Dieter Jung, both of Hilden; Martin Bischoff, Gelsenkirchen; Jens Conrad, Hilden; Josef Huppertz, Dusseldorf-Holthausen; Günter Jakobi, Hilden; Peter Krings, Krefeld; Dieter Kühling, Monheim; Herbert Reuter, Hilden; Wolfgang Rupilius, Dusseldorf; Horst Rutzen, Langenfeld, and Harald Schnegelberger, Leichlingen, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Feb. 2, 1977, Ser. No. 764,854
Claims priority, application Austria, Feb. 6, 1976, 841/76
Int. Cl.[2] C01B *33/28;* **C11D** *1/44, 1/48, 3/12*
U.S. Cl. 252—155 **19 Claims**

1. Stable, pumpable aqueous suspensions having a pH of between 7 and 12 of water-insoluble, calcium-binding aluminosilicates suitable as stock suspensions consisting essentially of:

(A) from 20% to 55% by weight on the anhydrous basis of at least one finely-divided, water-insoluble silicate compound having an average particle size in the range of from 0.01μ to 100μ and a calcium-binding power of from 50 to 200 mg CaO/gm of anhydrous substance when measured at 22° C. by the Calcium Binding Power Test Method described in the specification and having the formula, combined water not shown

$$(M_2O)_x.Me_2O_3.(SiO_2)_y$$

wherein M is a cation selected from the group consisting of sodium, potassium and lithium, x is a number from 0.7 to 1.5, Me is a member selected from the group consisting of aluminum and boron, and y is a number from 0.8 to 6,

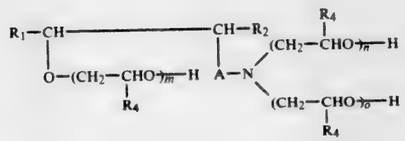
(B) from 0.2% to 5% by weight of at least one organic dispersing agent selected from the group consisting of:

(1) the adduct of an oxide selected from the group consisting of 1 to 3 mols of ethylene oxide, 1 to 3 mols of propylene oxide and 0.5 to 3 mols of glycide onto 1 mol of a diamine of the formula

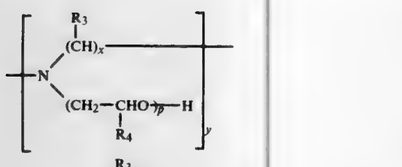
$$R—NH—(CH_2)_k—NH_2$$

wherein R is a member having from 8 to 24 carbon atoms selected from the group consisting of alkyl and alkenyl and k is an integer from 2 to 6, and

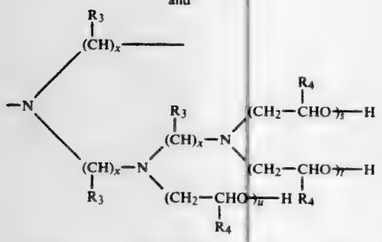
(2) hydroxyalkyl amines of the formula



wherein R_1 is alkyl having 1 to 16 carbon atoms, R_2 is a member selected from the group consisting of hydrogen and alkyl having 1 to 16 carbon atoms, and the sum of the carbon atoms in R_1+R_2 is from 6 to 20 with the proviso that when R_2 is H, R_1 is alkyl having 6 to 16 carbon atoms, R_4 is a member selected from the group consisting of hydrogen and methyl, m, n and o represent integers from 0 to 3 and A is a bridging bond selected from the group consisting of:



and



wherein R_3 is a member selected from the group consisting of hydrogen and methyl, x is an integer from 2 to 6, y is an integer from 1 to 3, p, q, r, s, t, and u represent integers from 0 to 3, with the proviso that the sum of m to u does not exceed 4, and

(C) water.

16. In the process for the preparation of a granular, tricklable washing and cleansing agent composition which comprises spraying an aqueous slurry of some of the ingredients onto a moving bed of the remaining ingredients in a dehydrated form, and recovering a granular tricklable washing and cleansing agent composition, the improvement consisting of employing the aqueous suspension of claim 1 in the preparation of said aqueous slurry.

4,179,394

PROCESS FOR IMPROVING THE STORAGE STABILITY OF ALKALI PERSALTS

Helmut Dillenburg, Rheinbrohl; Werner Doetsch, B. Hoenningen, and Rudolf Siegel, Neuwied, all of Fed. Rep. Of Germany, assignors to Peroxid-Chemie GmbH, Hoellriegelskreuth, Fed. Rep. of Germany

Filed Jan. 10, 1978, Ser. No. 868,311

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1977, 2700797

Int. Cl.[2] C11D *3/395, 7/54, 7/18*

U.S. Cl. 252—186 **22 Claims**

1. A process for preparing a storage-stable granulate formulation of alkali persalts which comprises the steps of

(a) granulating a solid alkali persalt, wherein the alkali cation is an alkali metal cation or ammonium and which is selected from the group consisting of solid addition-products of an alkali salt with hydrogen-peroxide and alkali salts of peroxo-acids in the presence of a sodium phosphate which is selected from the group consisting of sodium polyphosphates and sodium pyrophosphate and of water to obtain a granulate comprising granulate particles containing fully hydrated sodium phosphate adhered to solid alkali persalt particles, and

(b) drying the resulting granulate.

13. A storage stable granulate formulation of alkali persalts which comprises an alkali persalt wherein the alkali cation is an alkali metal cation or ammonium and which is selected from the group consisting of solid addition-products of an alkali salt with hydrogen peroxide and alkali salts of peroxo-acids and a fully hydrated sodium phosphate which is derived from a sodium phosphate selected from the group consisting of sodium polyphosphates and sodium pyrophosphate, which granulate formulation is obtained by the process as defined in claim 1.

4,179,395

DICHROIC DYES HAVING A PLURALITY OF AZO BONDING GROUPS

Herbert S. Cole, Jr., Scotia, and Siegfried Aftergut, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 802,358, Jun. 2, 1977, Pat. No. 4,128,497, which is a continuation-in-part of Ser. No. 721,668, Sep. 9, 1976, abandoned. This application Sep. 22, 1978, Ser. No. 944,695

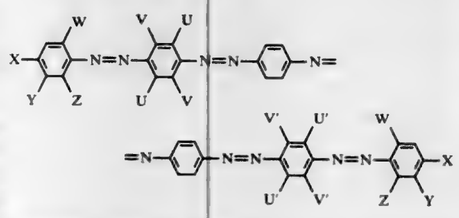
Int. Cl.[2] C09K *3/34;* **G02F** *1/13*

U.S. Cl. 252—299 **7 Claims**

1. A dichroic liquid crystal composition for use in a liquid crystal display, comprising:

a host liquid crystal material of positive dielectric anisotropy; and

a guest dichroic dye dissolved in said liquid crystal material, said dichroic dye being a penta-azo dichroic dye having a general chemical formula

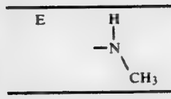


wherein the substituents at bonds U,U', V, V', W, X, Y, and Z are coordinately selected for a desired set of an approximate order parameter and an approximate wavelength of maximum absorption in accordance with the following table:

DYE	U	U'	V	V'	W
A	$-CH_3$	$-CH_3$	$-H$	$-H$	$-H$
B	$-CH_3$	$-CH_3$	$-H$	$-H$	$-OH$
C	$-CH_3$	$-CH_3$	$-H$	$-H$	$-H$
D	$-H$	$-CH_3$	$-CH_3$	$-H$	$-H$
E	$-H$	$-CH_3$	$-CH_3$	$-H$	$-H$

DYE	X	Y	Z	S (approx.)	max.(nm.) (approx.)
A	$(CH_3)_2N-$	$-H$	$-H$	0.73	525
B				0.70	545
C				0.65	590–620
D				0.80	595
E				0.80	595

-continued



the approximate order parameter and approximate wavelength of maximum absorption being measured with said dye dissolved in a host material consisting of a mixture of 70% by weight of p-pentylphenyl-2-chloro-4-(p-pentyl-benzoyloxy) benzoate, and 30% by weight of an ester mixture composed approximately 50–60% by weight of 4'-n-pentylphenyl ester of anisic acid, 25–35% by weight of 4'-n-pentylphenyl ester of 4-hexyloxybenzoic acid, and 10–15% by weight (2'-cyano-4'-butylphenyl) ester of 4-(hexanoyloxybenzoyloxy)-benzoic acid.

4,179,396

SINGLE ADDITION ORGANIC-INORGANIC BLEND EMULSION BREAKING COMPOSITION

Robert K. Gabel, Houston, Tex.; William H. Lindenberger, Darien, and Audrone M. Pavilcius, Chicago, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Feb. 23, 1978, Ser. No. 880,504

Int. Cl.[2] B01D *17/04*

U.S. Cl. 252—329 **18 Claims**

1. A single addition organic-inorganic blend emulsion breaking composition suitable for breaking oil-in-water emulsions, said blend consisting essentially of an aqueous solution having homogeneously dissolved therein a water soluble acidic inorganic aluminum salt and a water soluble quaternized dehydration condensation polymer of triethanolamine or acylated triethanolamine, or mixtures of triethanolamine or acylated triethanolamine, said polymer containing tertiary amino groups of which 20–100% are quaternized, said composition being acidic and having an acidity and a concentration such that said aluminum salt and said polymer remain dissolved in said solution for at least 14 days at temperatures of 40° F. to 110° F.

4,179,397

INDICATOR INK

Stanley E. Rohowetz, Barrington, and Eric Schoenfisch, Palatine, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed May 22, 1978, Ser. No. 907,903

Int. Cl.[2] C09D *11/10;* **C08L** *61/10;* **G01N** *21/06, 31/00, 31/22, 33/00;* **G01K** *11/16;* **C09K** *3/00*

U.S. Cl. 252—408 **22 Claims**

1. An ink composition suitable for use in contact or ink jet printing operations comprising a solution of (a) a soluble resole resin; (b) a combination of dyes of different color wherein one dye is water extractible and the other is relatively water non-extractible; said water extractible dye being present in proportion to said water-insoluble dye in a ratio of at least about 2:1; and (c) a solvent for said resin and dye combination consisting essentially of a lower aliphatic monohydric alcohol or mixture thereof, said composition undergoing a color change upon exposure to water at a temperature of at least about 120° F.

4,179,398

PLATELET CONTROL COMPOSITION

Roger A. Hunt, Woodland, Wash., assignor to ICN Medical Laboratories, Inc., Portland, Oreg.

Filed Mar. 21, 1977, Ser. No. 779,322

Int. Cl.[2] G01N *33/16;* **C09K** *3/00*

U.S. Cl. 252—408 **5 Claims**

1. A fluid suspension comprising red blood cells of a goat shrunken to substantially the size of human blood platelets, and fixed, the fluid being such that it does not cause hemolysis, cell association or biodegradation of the fixed cells.

4,179,399

METHOD OF REGENERATING ADSORBENTS

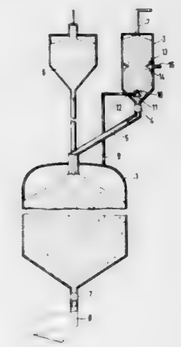
Horst Lichtenberger, Oberhausen; Karl Knoblauch, Essen; Horst Grochowski, Oberhausen; Harald Juntgen, and Jurgen Schwarte, both of Essen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

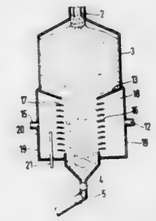
Filed Mar. 9, 1977, Ser. No. 775,982

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610074

Int. Cl.[2] B01J *21/20*

U.S. Cl. 252—411 S **6 Claims**





1. A method of regenerating an adsorbent charged with adsorbed substances, comprising the steps of confining a first and a second body of the adsorbent in separate first and second confining zones; mixing and contacting the first body of adsorbent in said first confining zone with a particulate heat carrier thereby heating the first body of the charged adsorbent to a temperature at which the charged adsorbent of the first body is desorbed and a desorption gas develops in the first confining zone; and passing the desorption gas from the first into the second confining zone and then through the second body of the charged adsorbent to capture at least one component of the desorption gas in the charged adsorbent of the second body.

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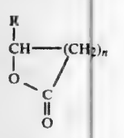
4,179,400

PROCESS FOR PREPARING CATALYTIC SOLUTIONS OF SULFONIUM SALTS

Jung-Hsien Tsao, and Arthur D. Ketley, both of Columbia, Md., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 904,158, May 9, 1978, Pat. No. 4,154,872.
This application Jan. 25, 1979, Ser. No. 6,322
Int. Cl.[2] B01J *31/02*
U.S. Cl. 252—429 R 5 Claims

1. A process for preparing a photocatalytic solution of a sulfonium salt of a complex anion, capable of yielding a Lewis Acid when irradiated by UV light which comprises reacting a sulfonium halide with an alkali metal or ammonium salt of a complex anion in a solvent mixture containing a polyol containing at least two OH groups and a lactone of the formula:



wherein R is H or CH_3 and n is 2 to 4, the weight ratio of sulfonium halide:polyol:lactone is in the range 1:1 to 5:1 to 20, respectively.

4,179,401

PREPARATION OF HETEROGENEOUS CATALYSTS INCLUDING THE STEPS OF RADIATION GRAFTING OF AN ALPHA UNSATURATED MONOMER TO A METAL OR TO AN ORGANIC POLYMER

John L. Garnett, 29 Arabella St., Longueville, New South Wales, and Robert S. Kenyon, 29 Glen St., Eastwood, New South Wales, both of Australia

Continuation-in-part of Ser. No. 720,042, Aug. 30, 1976, abandoned, Continuation of Ser. No. 594,081, Jul. 8, 1971, abandoned. This application Jul. 11, 1977, Ser. No. 814,772
Claims priority, application Australia, Jul. 10, 1974, PB8162
Int. Cl.[2] B01J *31/28, 31/20, 31/24;* G08F *8/00*
U.S. Cl. 252—429 R 10 Claims

1. A process for the production of a heterogeneous catalyst which is a member selected from the group consisting of hydrogenation-, hydroformylation-, isomerisation-, cracking- and dehydrogenation-catalysts for organic molecules comprising the steps of:

(a) irradiating a substrate selected from the group consisting of a metal and an organic polymer with ionizing radiation in the presence of an α olefin monomer having the formula:

$$X—R—C{=}CH_2$$

wherein R is a member selected from the group consisting of organic moieties containing a carbon chain of at least two carbon atoms and organic moieties containing an aromatic group, and wherein X is a member selected from the group consisting of nitrogen-containing and halogen-containing groups, the nitrogen- and halogen-containing groups being capable of being chemically converted to a group capable of coordinating with a member of the group consisting of metal salts and organometallic complexes so as to graft the monomer to the substrate to produce a monomer-substrate conjugate;

(b) chemically converting the X group of the monomer-substrate conjugate to a group which is capable of coordinating with a member selected from the group consisting of the metal salts and the organometallic complexes; and,

(c) reacting the X group of the monomer-substrate conjugate with a member selected from the group consisting of catalytic metal salts and catalytic organometallic complexes, which salts and complexes contain a metal selected from the group consisting of Ruthenium, Rhodium, Palladium, Osmium, Iridium and Platinum so as to transform the monomer-substrate conjugate into a ligand of the selected member of the group consisting of the catalytic metal salts and the catalytic organometallic complexes.

6. A process for the production of a heterogeneous catalyst which is a member selected from the group consisting of hydrogenation-, hydroformylation-, isomerisation-, cracking- and dehydrogenation-catalysts for organic molecules comprising the steps of:

(a) irradiating a substrate selected from the group consisting of a metal or an organic polymer with ionizing radiation in the presence of a monomer having the formula:

$$X—A$$

wherein A is a member selected from the group consisting of organic moieties containing an α olefin monomer group and organic moieties containing an α acetylene monomer group, and wherein X is a phosphorus-containing organic moiety capable of being chemically converted to a group capable of coordinating with a member selected from the group consisting of metal salts and organometallic complexes, so as to graft the monomer to the substrate to produce a monomer-substrate conjugate;

(b) chemically converting the X group of the monomer-substrate conjugate to a group which is capable of coordinating with a selected member of the group of the metal salts and organometallic complex and,

(c) reacting the X group of the monomer substrate conjugate with a member of the group consisting of catalytic metal salts and catalytic organometallic complexes which salts and complexes contain a metal selected from the group consisting of Ruthenium, Rhodium, Palladium, Osmium, Iridium and Platinum such that the monomer-substrate conjugate becomes a ligand of the selected member of the group consisting of the catalytic metal salts and catalytic organometallic complexes.

4,179,402

RESIN-METAL-LIGAND COMPOSITION

Leo Kim; Timm E. Paxson, and Sunny C. Tang, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 15, 1978, Ser. No. 905,813
Int. Cl.[2] B01J *31/08, 31/10*
U.S. Cl. 252—431 C 9 Claims

1. A composition comprising:

(a) an ion exchange resin having a strongly acidic, weakly acidic, or mixed acid-base type functional group;

(b) an element, selected from the transition group of elements and which is directly bonded either coordinately or ionically to the ion exchange resin; and

(c) an organic linking compound of from 1 to about 100 carbon atoms which has at least one moiety selected from the group consisting of trivalent nitrogen, trivalent phosphorus, trivalent arsenic, trivalent bismuth and trivalent antimony which is coordinately bonded to said element and further has at least one moiety selected from the group consisting of monohydrocarboyl ammonium, dihydrocarbyl ammonium, trihydrocarbyl ammonium, quaternary ammonium, pyridinium, phosphinium, arsenium and sulfonium ion which is ionically bonded to the ion exchange resin.

2. A composition comprising:

(a) an ion exchange resin having a basic-type functional group,

(b) an element selected from the transition group of elements and which is directly bonded either coordinately or ionically to the ion exchange resin; and

(c) an organic linking compound of from 1 to about 100 carbon atoms which has at least one moiety containing a heteroatom selected from the group consisting of trivalent nitrogen, trivalent phosphorus, trivalent arsenic, trivalent bismuth and trivalent antimony which is coordinately bonded to said element and further has at least one moiety derived from the group consisting of carboxylic acid, phosphonic acid, phosphinic acid, sulfenic acid, sulfinic acid, sulfonic acid, boronic acid and boronous acid which is ionically bonded to the ion exchange resin.

4,179,403

RESIN-LIGAND-METAL COMPLEX COMPOSITIONS

Leo Kim; Timm E. Paxson, and Sunny C. Tang, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 19, 1977, Ser. No. 861,916
Int. Cl.[2] B01J 31/08; *31/10*
U.S. Cl. 252—431 C 9 Claims

1. A composition comprising:

(a) an ion exchange resin having a strongly acidic, weakly acidic, or mixed acid-base type functional group;

(b) an element, selected from the transition group of elements; and

(c) an organic linking compound of from 1 to about 100 carbon atoms which has at least one moiety selected from the group consisting of monohydrocarbyl ammonium, dihydrocarbyl ammonium, trihydrocarbyl ammonium, pyridinium and phosphonium which is ionically bonded to said ion exchange resin and further has at least one moiety which contains a heteroatom selected from the group consisting of trivalent nitrogen, trivalent phosphorus, trivalent arsenic, trivalent bismuth and trivalent antimony which is coordinately bonded to said element.

2. A composition comprising:

(a) an ion exchange resin having a basic-type functional group;

(b) an element selected from the transition group of elements; and

(c) an organic linking compound of from 1 to about 100 carbon atoms which has at least one moiety derived from the group consisting of carboxylic acid, phosphonic acid, phosphinic acid, sulfenic acid, sulfinic acid, sulfonic acid, boronic acid and boronous acid which is ionically bonded to said ion exchange resin and further has at least one moiety which contains a heteroatom selected from the group consisting of trivalent nitrogen, trivalent phosphorus, trivalent arsenic, trivalent bismuth and trivalent antimony which is coordinately bonded to said element.

4,179,404

CATALYST PREPARATIVE METHOD

Bruno J. Barone, Houston, Tex., assignor to Denka Chemical Corporation, Houston, Tex.

Filed Dec. 15, 1976, Ser. No. 750,920
Int. Cl.[2] B01J *27/14*
U.S. Cl. 252—435 7 Claims

1. In the process for the preparation of vanadium-phosphorus containing oxidation catalysts comprising the reduction of pentavalent vanadium to a valence of less than +5 with a trivalent phosphorus compound, reducing agent, wherein the improvement comprises employing from about 75 to 90% of the stoichiometric amount of reducing agent necessary to reduce the valency of the vanadium from +5 to +4.

4,179,405

ACIDIC SULFUR-FREE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 810,321, Jun. 27, 1977, Pat. No. 4,110,200, which is a continuation-in-part of Ser. No. 713,020, Aug. 9, 1976, Pat. No. 4,036,742, which is a continuation-in-part of Ser. No. 656,925, Feb. 10, 1976, Pat. No. 4,025,418, which is a continuation-in-part of Ser. No. 550,083, Feb. 14, 1975, Pat. No. 3,939,056. This application May 17, 1978, Ser. No. 906,728
Int. Cl.[2] B01J *27/08, 27/10*
U.S. Cl. 252—441 15 Claims

1. An acidic sulfur-free catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 2 wt. % rhenium, about 0.01 to about 5 wt. % indium and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt, rhenium and indium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the indium is present in an oxidation state above that of the elemental metal; and wherein substantially all of the rhenium and catalytically available cobalt are present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

4,179,406

ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 744,061, Nov. 22, 1976, Pat. No. 4,115,252.
This application Mar. 31, 1978, Ser. No. 892,369
Int. Cl.[2] B01J *27/08, 27/10*
U.S. Cl. 252—442 14 Claims

1. In an acidic catalytic composite comprising a halogenated porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % cobalt, and about 0.1 to about 3.5 wt. % halogen; wherein said platinum group metal and catalytically available cobalt are uniformly dispersed throughout said halogenated porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; and wherein substantially all of said catalytically available cobalt is present in the elemental state or in a state which is reducible to said elemental metallic state or in a mixture of these states under hydrocarbon conversion conditions, THE IMPROVEMENT WHICH COMPRISES the uniform dispersal of from about 0.01 to about 5 wt. % zinc throughout said halogenated porous material.

4,179,407

CATALYST BED FOR USE IN DECOMPOSITION OF AMMONIA GAS

Kiyotaka Iiyama; Takeshi Matsui, both of Yokohama; Shigeru Kusakata, Kawasaki; Hideo Watanabe, Yokohama, and Michihisa Takahashi, Tachikawa, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 768,026, Feb. 14, 1977, abandoned.
This application May 25, 1978, Ser. No. 909,696
Claims priority, application Japan, Feb. 20, 1976, 51-17037
Int. Cl.[2] B01J *21/18, 29/06*
U.S. Cl. 252—446 5 Claims

1. A catalyst bed for use in oxidizing ammonia gas, said catalyst bed consisting essentially of a mixture of (1) one part by weight of granules carrying catalyst effective for catalyzing oxidation of ammonia gas by air, at an elevated temperature higher than 180° C., to oxidize said ammonia gas into nitrogen gas and water vapor, said granules carrying catalyst consisting essentially of particles in which at least one catalyst material selected from the group consisting of platinum, rhodium, ruthenium and alloys thereof is carried on round spherical bases made of a carrier material selected from the group consisting of alumina, silica, zeolite, kaolin and silicon carbide, said bases having a diameter of from 2 mm to 10 mm and carrying from 0.05% to 1.0% by weight of said catalyst material, and (2) from 0.2 to 10 parts by weight of granules consisting of catalytically inert substance which inert substance does not catalyze reaction of the ammonia gas and is effective to maintain the maximum temperature of ammonia gas flowing through the catalyst bed at a level such that generation of nitrogen oxides is minimized, said granules of catalytically inert substance consisting of at least one substance selected from the group consisting of alumina, silica, zeolite, kaolin, silicon carbide, catalytically

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inert metals and metal oxides, said granules of catalytically inert substance having a diameter of from 2 mm to 10 mm.

4,179,408

PROCESS FOR PREPARING SPHEROIDAL ALUMINA PARTICLES

Moises G. Sanchez, Severna Park; Michael V. Ernest, Baltimore, and Norman R. Laine, Rockville, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Mar. 25, 1977, Ser. No. 781,379
Int. Cl.[2] B01J *21/04, 37/00*
U.S. Cl. 252—448 27 Claims

1. A process for preparing spheroidal alumina particles comprising:

(a) commingling a precipitated alumina and an acidic aqueous medium to provide a slurry;

(b) forming droplets of the slurry;

(c) passing the droplets downwardly through air into an upper body of water-immiscible liquid and ammonia and into a lower body comprising aqueous ammonia to form spheroidal particles;

(d) aging the particles in aqueous ammonia; and

(e) drying and calcining the aged particles.

4,179,409

HYDROCARBON CRACKING CATALYST

Elroy M. Gladrow, and Kenneth S. Wheelock, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 9, 1977, Ser. No. 850,038
Int. Cl.[2] B01J *29/06*
U.S. Cl. 252—455 Z 19 Claims

1. A catalyst comprising (1) a crystalline aluminosilicate zeolite, (2) an inorganic oxide gel, and (3) an effective amount of a perovskite having at least one transition metal cation.

17. A catalyst comprising (1) from about 5 to about 16 weight percent of a crystalline aluminosilicate zeolite, (2) from about 60 to about 90 weight percent of an inorganic oxide gel, and (3) from about 1.5 to about 4 weight percent of a perovskite having a transition metal cation selected from the group consisting of lanthanum, cobalt, cerium, hafnium, chromium, zirconium and mixtures thereof, each of said weights being based on the total catalyst.

4,179,410

COBALT-MOLYBDENUM-ALUMINA DESULFURIZATION CATALYST

Howard D. Simpson, Irvine, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 751,383, Dec. 17, 1976, Pat. No. 4,097,413. This application Jan. 3, 1978, Ser. No. 866,282
Int. Cl.[2] B01J *21/04, 23/88*
U.S. Cl. 252—465 3 Claims

1. An intimately composited hydrodesulfurization catalyst composition comprising a molybdenum component corresponding to about 22–28wt.% of MoO_3 and a cobalt component corresponding to about 6–10 wt.% of CoO dispersed and supported on an alumina base, said catalyst being free of X-ray detectable crystallites of $CoMoO_4$, and having a surface area of at least about M/0.14 m^2/g, where M is the molybdenum content of the catalyst expressed as wt.% MoO_3.

4,179,411

METHOD OF PREPARING A CONTROLLED PORE VOLUME ALUMINA WITH CITRIC ACID

Frank R. Broersma, Anaheim, Calif., and Monica E. Choca, Chicago, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 825,995, Aug. 19, 1977, abandoned, which is a continuation-in-part of Ser. No. 630,485, Nov. 10, 1978, abandoned. This application Nov. 10, 1977, Ser. No. 850,123
Int. Cl.[2] B01J *21/04, 23/28, 23/30, 23/74*
U.S. Cl. 252—465 4 Claims

1. A method for preparing an alumina useful as a catalyst support having a controlled pore volume distribution, said method consisting essentially of:

A. Preparing an aqueous solution of a soluble aluminum salt containing a quantity to be defined in step B of a water-soluble polycarboxylic acid containing 2–12 carbon atoms;

B. Precipitating an aluminum/hydroxide gel from the solution of the soluble aluminum salt, the quantity of polycarboxylic acid present in step A being from 0.1–15% by weight of the total dry weight of alumina present in said aluminum hydroxide gel;

C. Purifying said aluminum hydroxide gel;

D. Forming said aluminum hydroxide gel;

E. Drying said aluminum hydroxide gel;

F. Calcining said aluminum hydroxide gel; and then,

G. Recovering an alumina useful as a catalyst support having a controlled pore volume distribution;

said pore volume distribution being characterized in that:

A. Nitrogen desorption measurements indicate that less than 10% of the total pores as determined by said method fall between 100–1200 Å in diameter;

B. Nitrogen adsorption measurements indicate that between 10–50% of the total pore volume as determined fall between 100–1200 Å in diameter; and,

C. Mercury penetration porisimetry indicates that less than 10% of the total pores as determined by both nitrogen desorption and mercury methods fall between 100–50,000 Å in diameter.

4,179,412

PROCESS FOR PRODUCING CATALYST PRECURSORS FOR DECOMPOSING AMMONIA BY OXIDATION AND PRECURSORS PRODUCED BY SAID PROCESS

Hideya Inaba; Yasumi Kamino; Shigenori Onizuka, and Chikashi Inazumi, all of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Jan. 30, 1978, Ser. No. 873,693
Claims priority, application Japan, Mar. 14, 1977, 52/28297; Sep. 20, 1977, 51/113079
The portion of the term of this patent subsequent to Oct. 9, 1996, has been disclaimed.
Int. Cl.[2] B01J *23/22, 23/42, 25/00*
U.S. Cl. 252—472 15 Claims

1. A process for producing a catalyst precursor for decomposing NH_3 by oxidation consisting essentially of the steps of converting the surface layer of steel material of specified shape resembling a ring, honeycomb or plate to an aluminum alloy, treating the steel material with an aluminum dissolving solution to dissolve out the aluminum and to render the surface layer porous, subjecting the resulting steel material to oxidation treatment to obtain a catalyst carrier, immersing the carrier in a solution of a platinum compound selected from the group consisting of chroloplatinic acid and platinum sulfate, and drying it.

4,179,413

ENRICHED RHODIUM CATALYST AND METHOD FOR MAKING SAME

Haren S. Gandhi, Farmington Hills; Mordecai Shelef, Birmingham, and Paul P. Wynblatt, Southfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 775,809, Mar. 9, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,573
Int. Cl.[2] B01J *23/42, 23/46*
U.S. Cl. 252—472 18 Claims

1. A method for enriching the amount of rhodium which is actively available for use as a catalyst in a catalyst system which includes a substrate and at least platinum and rhodium as catalyst elements, said platinum and rhodium being in a ratio of about 8:1 to 19:1, which method comprises:

thermally treating the catalyst system by heating it in an oxidizing atmosphere to a temperature in the range from 650° C. to 875° C. for a period of at least two hours.

4,179,414

FATTY ACID DIETHANOL AMIDE-CONTAINING GENERAL PURPOSE CLEANER IN PASTE FORM

William J. Clayton, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 23, 1978, Ser. No. 953,823
Int. Cl.[2] C11D *3/10, 3/32, 17/00*
U.S. Cl. 252—548 6 Claims

1. A stable paste comprising between about 50 and about 65 weight percent sodium bicarbonate and between about 50 and about 35 weight percent water, containing between about 5 and about 20 weight percent sodium chloride based on water and between about 10 and about 30 weight percent based on water of a diethanolamide of a fatty acid having about 12–16 carbon atoms.

4,179,415

PRESSURE SENSITIVE ADHESIVE AND PROCESS

Cyrus W. Bemmels, North Brunswick, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Aug. 8, 1977, Ser. No. 822,455
Int. Cl.[2] C09J *3/12, 3/14*
U.S. Cl. 260—4 R 17 Claims

1. A water-based pressure-sensitive adhesive composition which comprises: a mixture of a latex component comprising polymeric elastomer solids in a water system, and a high solids tackifier resin solution comprising about 50–90 percent tackifier resin solids for pressure-sensitive adhesive dissolved in organic solvent, said resin solution being dispersed in the latex component; said latex component comprising about 50–100 percent isoprene polymer portions by weight of said elastomer solids and said resin solids being present in the amount of about 50–200 parts per 100 parts by weight of said elastomer solids; said composition comprising a small amount of carboxylation in the form of carboxyl groups on the elastomer solids, and having a pH of at least about 8.

4,179,416

ALLOY RAYON FIBERS HAVING DISPERSED THEREIN AN AMIDE POLYMER AND A POLYACRYLIC ACID SALT

Frederick R. Smith, Toms Brook, Va., assignor to Avtex Fibers Inc., Valley Forge, Pa.

Continuation-in-part of Ser. No. 309,076, Nov. 24, 1972, Pat. No. 3,919,385, and Ser. No. 530,476, Dec. 6, 1974, Pat. No. 3,951,889, and Ser. No. 625,445, Oct. 24, 1975, Pat. No. 4,041,121, and Ser. No. 629,952, Nov. 7, 1975, abandoned, and Ser. No. 741,172, Nov. 12, 1976, abandoned, said Ser. No. 530,476, is a division of Ser. No. 309,076, , said Ser. No. 625,445, is a continuation-in-part of Ser. No. 309,290, Nov. 24, 1972, abandoned. This application Feb. 23, 1978, Ser. No. 880,535
The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.
Int. Cl.[2] C08L *1/02*
U.S. Cl. 260—17.4 CL 4 Claims

1. Alloy rayon fibers of higher fluid-holding capacity than non-alloy rayon, comprising a regenerated cellulose matrix having dispersed therein a polyvinylpyrrolidone polymer and an alkali metal salt of a polyacrylic acid.

4,179,417

COMPOSITION FOR WATER-BASE PAINT COMPRISING WATER-SOLUBLE RESIN AND WATER-DISPERSIBLE POLYMER

Masuyuki Sunada, Chiba; Hirotugu Takanashi, Tateyama; Hidenobu Ishikawa, Chiba; Akikazu Takahashi, Matsudo, and Fumio Yoshino, Ichihara, all of Japan, assignors to Dainippon Ink & Chemicals Inc., Tokyo, Japan

Filed Jun. 27, 1977, Ser. No. 810,076
Claims priority, application Japan, Dec. 17, 1976, 51/150759
Int. Cl.[2] C09D *3/52, 3/58, 3/76, 5/02*
U.S. Cl. 260—18 EP 18 Claims

1. A composition for water-base paints, said composition comprising (I) a water-soluble resin, and (II) a water-dispersible polymer containing at least one member selected from the group consisting of hydroxyl and carboxyl groups, said water-soluble resin (I) being obtained by polymerizing (1) 50 to 99.5% by weight of an alkyl ester of an α,β-monoethylenically unsaturated acid or an alkenyl benzene, (2) 0.5 to 20% by weight of an α,β-monoethylenically unsaturated acid and (3) 0 to 30% by weight of a hydroxyalkyl ester of an α,β-monoethylenically unsaturated acid in the presence of (4) at least one unsaturated compound selected from the group consisting of alkyd resins containing a polymerizable unsaturated group, epoxy esters containing a polymerizable unsaturated group, drying oils, fatty acids of drying oils and diene polymers, and water-solubilizing the product with ammonia or an amine, said water-dispersible polymer (II) being obtained by emulsion polymerization of at least one member selected from the group consisting of an α,β-monoethylenically unsaturated acid and a hydroxyalkyl ester of an α,β-monoethylenically unsaturated acid with an ethylenically unsaturated monomer, the amount of the water-dispersible polymer (II) being 10 to 900 parts by weight per 100 parts by weight of the water-soluble resin (I).

4,179,418

WATER-BASED EPOXY RESIN COATING COMPOSITION

Harold G. Waddill, Austin, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Continuation-in-part of Ser. No. 865,050, Dec. 27, 1977. This application Mar. 6, 1978, Ser. No. 884,077
The portion of the term of this patent subsequent to Sep. 11, 1996, has been disclaimed.
Int. Cl.[2] C08L *63/02*
U.S. Cl. 260—18 PN 8 Claims

1. An epoxy resin composition being the cured product of a curable admixture which comprises:

V 9 8 9 1 3
DEC 18 79
UMI

an epoxy resin comprising a condensation product of epichlorohydrin with 2,2-bis(p-hydroxyphenyl) propane ,
a curing amount of a reactive water compatible polyamide prepared from multifunctional carboxylic acids, esters, anhydrides or mixtures and an aminopropyl derivative of a polyoxyalkylenepolyamine and
an aqueous medium.

4,179,419
Patent Not Issued For This Number

4,179,420
WATER SOLUBLE INSULATING VARNISH

Deno Laganis, Schenectady, N.Y., assignor to Schenectady Chemicals, Inc., Schenectady, N.Y.

Continuation-in-part of Ser. No. 624,569, Oct. 21, 1975, abandoned. This application Jul. 27, 1976, Ser. No. 709,107
Int. Cl.[2] C09D *3/52, 3/64, 3/66, 5/02*
U.S. Cl. 260—21 **27 Claims**

1. A process for forming a water-dispersible polyester capable of being solubilized to become water-soluble comprising reacting (1) with (2a) to form (I), wherein
(1) is isophthalic acid, terephthalic acid, benzophenone dicarboxylic acid or mixtures thereof and wherein
(2a) includes a polyol having at least three hydroxyl groups and a diol, wherein said polyol is trimethylol-propane, tris(hydroxymethyl)aminoethane, trimethylolethane, glycerine, pentaerythritol or tris(hydroxyethyl)isocyanurate and said diol is neopentyl glycol, 1,4-butylene glycol, dimethyl hydantoin, dipropylene glycol, ethylene glycol, diethylene glycol, propylene glycol, cyclohexane dimethanol, hydrogenated bisphenol A, hydroquinone di-(beta-hydroxyethyl) ether, the diether of propylene glycol and bisphenol A, or the diether of ethylene glycol and bisphenol A; wherein said triol is present in amounts up to 35 mole percent of all reactants used to form said polyester;
wherein said polyol and said diol are heated together and then said component (1) is added thereto;
and adding (II) which is (a) trimellitic anhydride; (b) an aliphatic dibasic acid which is adipic acid, succinic acid, azelaic acid, sebacic acid, dimerized fatty acids, maleic acid, fumaric acid or an anhydride of said acids or (c) a cycloaliphatic acid which is tetrahydrophthalic acid, hexahydrophthalic acid, 3,6-endomethylene, delta[4]-tetrahydrophthalic acid or an anhydride of said acid, which component (II) is 15 to 65 mole percent based on the total moles of (1) and (II), and wherein (1) comprises 35 to 85 mole percent of the total amount of (1) and (II);
wherein the mixture of (1) and (2a) is heated until a portion of the mixture containing 100 percent solids is characterized by an acid number of at least about 10.

4,179,421
SILICA FILLED VULCANIZATES

Douglas C. Edwards, and Kyosaku Sato, both of Sarnia, Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Mar. 6, 1978, Ser. No. 883,742
Claims priority, application Canada, Apr. 14, 1977, 276158
Int. Cl.[2] C08K *3/36, 5/09, 5/17;* **C08L** *15/00*
U.S. Cl. 260—23.7 M **8 Claims**

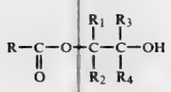
4. An improved silica filled rubbery vulcanizate obtained by the vulcanization of a mixture comprising 100 parts by weight of a vulcanizable hydrocarbyl polymer containing from about 4 to about 60 millimoles of epoxy groups per 100 grams of polymer, and from about 5 to about 100 parts by weight of silica, said mixture having been subjected to shearing at a temperature of from about 100° to about 175° C. prior to incorporation of vulcanization active compounds and vulcanization, said shearing being for a time of from about 0.25 to about 10 minutes, said vulcanizable hydrocarbyl polymer being selected from C_4–C_6 conjugated diolefin polymers containing epoxy groups and from epoxy group containing polymers of a C_4–C_6 conjugated diolefin and at least one other copolymerizable vinyl or vinylidene-containing monomer, and said silica having an average particle size of about 0.01 to about 0.1 microns.

4,179,422
ELASTOMERIC BLEND COMPOSITIONS OF A SULFONATED ELASTOMER POLYMER AND A CRYSTALLINE POLYOLEFINIC THERMOPLASTIC RESIN

Henry S. Makowski, Scotch Plains, and Charles P. O'Farrell, Clark, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 29, 1977, Ser. No. 855,772
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—28.5 B **31 Claims**

1. A blend composition comprising:
(a) a neutralized sulfonated elastomeric polymer having about 15 to about 50 meq of metal sulfonate groups per 100 grams of said polymer said metal sulfonate groups being neutralized with a metal counterion;
(b) a hydroxyalkyl carboxylate having the formula:



wherein R, R_1, R_2, R_3 and R_4 are independently selected from the group consisting of hydrogen, C_1 to C_{18} straight and branched chain acyclic, alicyclic, aryl, alkylaryl, or arylalkyl groups and functional derivatives thereof and mixtures thereof; and
(c) about 120 to about 900 parts by weight of a thermoplastic resin per 100 parts of said neutralized sulfonated elastomeric polymer and said hydroxyalkyl carboxylate ester.

4,179,423
WATER-SOLUBLE POLYESTER IMIDE RESINS

Deno Laganis, Schenectady, and Paul M. Begley, Scotia, both of N.Y., assignors to Schenectady Chemicals, Inc., Schenectady, N.Y.

Continuation of Ser. No. 694,432, Jun. 9, 1976, abandoned. This application Mar. 27, 1978, Ser. No. 890,798
Int. Cl.[2] C08L *67/02, 77/12;* **C08G** *73/16*
U.S. Cl. 260—29.2 N **24 Claims**

1. A water soluble thermosetting second polyester - imide prepolymer composition prepared by reacting reactants consisting essentially of a tertiary amine and a first polyester - imide prepolymr having a number average molecular weight of 600–1300, an OH:COOH ratio of from 1.8:1 to 2.5:1 and an imide content of 5 to 60% based on the total imide and ester moieties, the alcohol of the ester moiety consisting essentially of 10 to 90% of the total equivalents of dihydric alcohol and the balance of the alcohol containing at least three hydroxyl groups, the acid component of the ester moiety consisting essentially of dicarboxylic acid, the imide moiety consisting essentially of the reaction product of approximately two moles of an aromatic monocarboxylic acid monoanhydride with one mole of an aromatic diamine.

4. A composition according to claim 1, dissolved in water said composition being suitable for use as a wire enamel.

4,179,424
METHOD FOR RAPIDLY PRODUCING AMINO METHYLATED POLYMERS AND QUATERNARY AMMONIUM SALTS THEREOF

Kenneth G. Phillips, River Forest; Edward G. Ballweber, Glenwood, and John R. Hurlock, Hickory Hills, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 21, 1977, Ser. No. 853,772
Int. Cl.[2] C08L *61/20*
U.S. Cl. 260—29.4 UA **5 Claims**

1. An improved process for rapidly preparing amino methylated derivatives of dilute aqueous solutions of acrylamide polymers which comprises the steps:
A. Preparing a 2.8–6% aqueous solution of an acrylamide polymer which has a molecular weight of at least 500,000;
B. Adding to the solution formed in A approximately 1 mole of formaldehyde and approximately 1 mole of a dialkyl amine which contains from 2–4 carbon atoms based on the amide content of the acrylamide polymer under conditions of good agitation;
C. Reacting the acrylamide polymer with the formaldehyde and the dialkyl amine at a temperature between 80°–100° C. for a period of time ranging between 2–15 minutes to form an amino methylated acrylamide polymer.

4,179,425
SELF-CROSSLINKING CATIONIC POLYURETHANE BASED ELECTRODEPOSITABLE BINDERS

Georgios Pampouchidis, and Helmut Hönig, both of Graz, Austria, assignors to Vianova Kunstharz, A.G., Vienna, Austria

Filed Feb. 2, 1978, Ser. No. 874,563
Claims priority, application Austria, Feb. 7, 1977, 757/77
Int. Cl.[2] C08L *33/08*
U.S. Cl. 260—29.6 NR **12 Claims**

1. Thermosetting binders which are water-dilutable and suitable for cathodically depositable coatings comprising the reaction product of (A) 1 mole polyisocyanate, (B) at least 1 mole dialkylalkanolamine and (C) at least one member of the group consisting of monohydroxyalkyl(meth)acrylate, monohydroxyalkoxy(meth)acrylate, and monohydroxyallylether of a polyol, said reaction product having an NCO-value of substantially zero, a molecular weight of from about 500 to about 5000, a basic content of about 0.5 to 3 for each 1000 molecular weight unit of binder, and a double bond content of from about 0.5 to 4.

4,179,426
STABLE ALKYLHYDRIDOPOLYSILOXANE EMULSIONS

Hans-Horst Steinbach, Bergisch-Gladbach; Karl Schnurrbusch, Leverkusen; Matthias Rieder, Cologne, and Otto Weiden, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 4, 1978, Ser. No. 866,965
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1977, 2701724
Int. Cl.[2] C08L *83/04*
U.S. Cl. 260—29.2 M **5 Claims**

1. In an aqueous alkylhydridopolysiloxane emulsion, the improvement which comprises about 0.1–5% by weight of the total amount of emulsion of an emulsifier containing perfluoroalkyl groups and selected from the group consisting of an ether of the formula

$$C_xF_{2x+1}SO_2N(CH_3)CO—(OCH_2—CH_2)_n—(OCHCH_3CH_2)_m—OC_4H_9$$

and an alkanesulphonic acid salt of the formula

$$C_xF_{2x+1}SO_3N(C_pH_{2p+1})_4$$

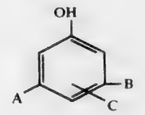
wherein
x=6–12,
m=2–40,
n=2–40, and
p=1–3,
thereby stabilizing the emulsion against loss of hydrogen.

4,179,427
PHENOLIC RESIN-POLYISOCYANATE BINDERS

John J. Gardikes, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Mar. 21, 1978, Ser. No. 888,715
Int. Cl.[2] C08L *61/14, 75/08*
U.S. Cl. 260—29.2 TN **20 Claims**

1. A binder composition comprising in admixture a resin component, a hardener component and a curing agent, wherein the resin component comprises an aqueous emulsion of a phenolic resin which comprises the condensation product of a phenol having the general formula:



wherein A, B and C are hydrogen, hydrocarbon radicals, oxyhydrocarbon radicals or halogen, with an aldehyde having the general formula R'CHO wherein R' is hydrogen or a hydrocarbon radical of 1 to 8 carbon atoms; the hardener component comprising a liquid polyisocyanate containing at least two isocyanate groups; and the curing agent comprising a tertiary amine or a metal ion.

4,179,428
PROCESS FOR PRODUCING WATER-EMULSIFIABLE PAINT BINDERS FOR STOVING PAINTS

Bertram Zückert; Wolfgang Schmut, and Klaus Behmel, all of Graz, Austria, assignors to Vianova Kunstharz, A.G., Vienna, Austria

Filed May 19, 1977, Ser. No. 798,492
Claims priority, application Austria, May 21, 1976, 3748/76
Int. Cl.[2] C08L *61/28, 67/08;* **C09D** *3/66*
U.S. Cl. 260—29.4 R **4 Claims**

1. A water-emulsifiable paint binder which includes the water emulsion of the co-condensation product of from

V 9 8 9 N 3 DEC 18 79 UMI

(1) 5–30% by weight of a reaction product (A),
(2) 50–85% by weight, in relation to said reaction product (A), of an alkyd resin with an acid number of below 5 mg KOH/g and an intrinsic viscosity of from about 4 to 8 ml/g in chloroform at 20° C., and
(3) 10–25% by weight, in relation to said reaction product (A), of an alkyd resin with an acid value of between from about 80 and 140 mg KOH/g and an intrinsic viscosity of from about 4 to 10 ml/g in dimethylformamide at 20° C.,

said co-condensation product having been produced by carrying out the reaction of (1), (2), and (3) at a temperature of from about 50° to 150° C. to an intrinsic viscosity of between from about 6 and 12 ml/g in chloroform at 20° C. without surpassing the emulsifiable state; said reaction product (A) being the reaction product obtained by reacting at a temperature of from about 70° to 200° C. from about

(1) 30–75% by weight of an aminoaldehyde resin at least partly etherified with monoalcohols with from about 1 to 4 C-atoms, and
(2) 25–70% by weight, in relation to said aminoaldehyde resin, of polyethylene glycols with an average molecular weight of from about 500 to 3000 and having an intrinsic viscosity of from about 5 to 15 ml/g in chloroform at 20° C.

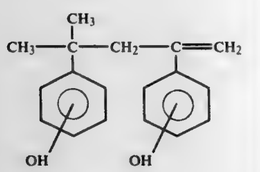
4,179,429

LAMINATES PREPARED FROM RESOL-TYPE PHENOL RESINS

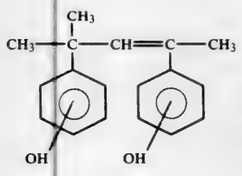
Kunio Hanauye; Tsutomu Takase, and Yoshio Morimoto, all of Nagoya, Japan, assignors to Mitsui Toatsu Chemicals Incorporated, Tokyo, Japan

Continuation-in-part of Ser. No. 732,917, Oct. 15, 1976, abandoned. This application Jan. 19, 1978, Ser. No. 871,072
Claims priority, application Japan, Oct. 22, 1975, 50-126281
Int. Cl.[2] C08G *8/20, 8/24;* **B32B** *27/42*
U.S. Cl. 260—32.8 R **4 Claims**

1. A laminate prepared from the product of a basic-catalyst-catalyzed reaction of, based on the total weight of the phenol components of said a resol-type phenol resin, 2–60% of a dimer of isopropenyl phenol of the formula selected from:



and



and 40–98% of other phenolic compounds selected from the group consisting of phenol, alkyl phenols having from 1 to 20 carbon atoms in the alkyl group, bisphenol-A, phenylphenols, cumyl phenol, styrenated phenols, catechol and resorcinol with formaldehyde.

4,179,430

Patent Not Issued For This Number

4,179,431

PRECIPITATED SILICIC ACID GRANULES

Eberhard Kilian, Hanau; Alfons Kreher, Frankfurt; Peter Nauroth, Wesseling, and Günter Türk, Hanau, all of Fed. Rep. of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt vormals Rosseler, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 16, 1979, Ser. No. 3,845
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1978, 2803917
Int. Cl.[2] C08K *9/08*
U.S. Cl. 260—42.37 **20 Claims**

1. Precipitated silicic acid granules having the following physical-chemical properties:
tamped weight (DIN 53 194): 200–320 g/l
l/d ratio: $0.8 \leqq l/d \leqq 3.5$
hardness of individual granule: 80–175 pond
dust content (DIN 53 583): 0.2–0.4% by weight
abrasion (DIN 53 583): 0.2–0.3% by weight.

4,179,432

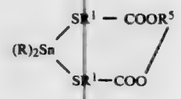
STABILIZED POLYPROPYLENE COMPOSITIONS

Kenneth R. Molt, Montgomery, Ohio, assignor to Cincinnati Milacron Chemicals, Inc., Reading, Ohio

Filed Sep. 2, 1975, Ser. No. 609,816
Int. Cl.[2] C08K *5/58*
U.S. Cl. 260—45.75 S **40 Claims**

1. A composition comprising polypropylene stabilized against ultraviolet light by a stabilizingly effective amount of a synergistic mixture of (1) a 2-hydroxybenzophenone and (2) an organotin compound of the formula:

(a) $RnSn\text{-}(SR^1COOR^2)_{4-n}$,
(b) $RnSn\text{-}(S\text{-}R^2)_{4-n}$,
(c) $RnSn\text{-}(SR^1OOCR^2)_{4-n}$,
(d) $((R)_3Sn\text{—}S)_x R_4\text{-}(Z)_y$, or



(e)

where R is alkyl, aryl, alkenyl, alkaryl, alkaryl or cycloalkyl, R^1 is alkylene, arylene, cycloalkylene, aralkylene or alkarylene, R^2 is an alkyl, aryl, aralkyl, alkenyl, al-aryl or cycloalkyl, R^5 is alkylene, R^4 is aliphatic, aromatic, araliphatic, alkyl substituted aromatic or cycloaliphatic radical and having a free valence of x+y, Z is —OH, —COOH, —$COOR^2$ or —$OOCR^2$, x is 1 to 4, y is 0 to 3, x+y is 1 to 4 and n is 1 to 3, with the proviso that when x is 1 and y is 1 and R^4 is alkylene, arylene, cycloalkylene, aralkylene or alkarylene Z is not $COOR^2$ or —$OOCR^2$ and when x is 1 y is not 0.

4,179,433

ANGIOTENSIN II ANTAGONIST PEPTIDES CONTAINING AN ALPHA-AMINOOXYACID IN THE POSITION-1

Lajos Kisfaludy; Olga Nyéki née Kuprina; Maria Skirmai née Sárközi; Egon Kárpáti; Katalin Gidai, and László Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Jul. 11, 1978, Ser. No. 923,681
Claims priority, application Hungary, Jul. 18, 1977, RI 640
Int. Cl.[2] C07C *103/52;* **A61K** *37/00*
U.S. Cl. 260—112.5 R **5 Claims**

1. A peptide of the formula:

X-Arg-Val-Tyr-Ile-His-Pro-Y

wherein
X is aminooxyacetyl or alpha-aminooxypropionyl and Y is leucyl, isoleucyl, alanyl or threonyl or an acid addition salt or complex thereof.

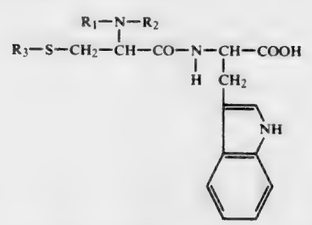
4,179,434

AMINO ACID DERIVATIVES

Miguel A. Ondetti, Princeton, and Michael E. Condon, Lawrenceville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 759,685, Jan. 17, 1977, Pat. No. 4,113,715. This application Jun. 29, 1978, Ser. No. 920,602
Int. Cl.[2] C07C *103/52;* **A61K** *37/00*
U.S. Cl. 260—112.5 R **4 Claims**

1. A compound of the formula



wherein
R_1 is hydrogen, lower alkanoyl, or amino (imino)methyl;
R_2 is hydrogen, lower alkyl or phenyl-lower alkylene; and
R_3 is hydrogen, lower alkanoyl, or benzoyl.

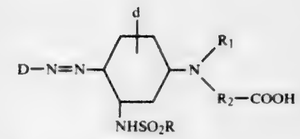
4,179,435

AZO DYESTUFFS HAVING A CARBOXYL GROUP AND A SUBSTITUTED SULFONYLIMINO GROUP IN THE COUPLING COMPONENT

Visvanathan Ramanathan, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 723,120, Sep. 14, 1976, Pat. No. 4,115,381, which is a continuation of Ser. No. 485,054, Jul. 1, 1974, abandoned, which is a continuation of Ser. No. 243,469, Apr. 12, 1972, abandoned. This application Jun. 22, 1978, Ser. No. 918,209
Claims priority, application Switzerland, May 3, 1971, 6468/71
Int. Cl.[2] C09B *29/08, 29/26, 29/36;* **D06P** *3/52*
U.S. Cl. 260—158 **6 Claims**

1. A dyestuff of the formula



where R_3 and R_4 are C_1–C_5 alkyl, or R_3 and R_4 together with the nitrogen to which they are attached, represent morpholino or piperidino.

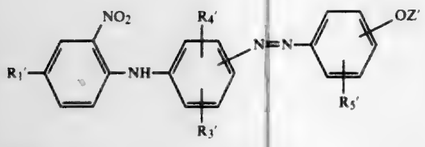
4,179,436

MONOAZODYESTUFFS CONTAINING DIPHENAMINE AND PHENOXY COMPONENTS

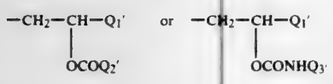
Herbert Hugl; Karl H. Schündehutte, both of Leverkusen; Kersten Trautner, Cologne, and Gerhard Wolfrum, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 6, 1977, Ser. No. 813,312
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1976, 2630989
Int. Cl.[2] C09B *29/12, 43/00;* **D06P** *1/18, 3/54*
U.S. Cl. 260—206 **11 Claims**

1. Azo dyestuff having the formula



wherein
Z′ is C_1–C_4-alkyl; C_1–C_4-hydroxyalkyl;



in which
Q_1′ is H or C_1–C_4-alkyl; and
Q_2′ and Q_3′ are C_1–C_4-alkyl, phenyl or tolyl;
R_1′ is H, CN, CF_3, COX_1′ or $CONX_1'X_2'$;
R_3′ is H, chlorine, C_1–C_4-alkyl, C_1–C_4-alkoxy or $SO_2NX_1'X_2'$;
R_4′ is H, chlorine, C_1–C_4-alkyl or C_1–C_4-alkoxy;
R_5′ is H, chlorine, C_1–C_4-alkyl or phenyl;
X_1′ is C_1–C_4-alkyl, phenyl, benzyl or phenethyl; and
X_2′ and X_3′ independently of one another represent C_1–C_4-alkyl, phenyl, benzyl or phenethyl.

4,179,437
AMINO ACID DERIVATIVES OF 6-(2-AMINO-2-ARYLACETAMIDO) PENICILLANIC ACIDS
Yoshiharu Morita; Kenzo Omata, both of Yokohama; Junichi Ohya, Zama; Kazuo Wagatsuma, Yokohama, and Tadashi Shirasaka, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan
Continuation of Ser. No. 713,808, Aug. 12, 1976, Pat. No. 4,111,932. This application Apr. 24, 1978, Ser. No. 899,458
Claims priority, application Japan, Sep. 8, 1975, 50/108708; Sep. 8, 1975, 50/108709; Feb. 5, 1976, 51/12119; Feb. 6, 1976, 51/12121; Feb. 14, 1976, 51/15335; Feb. 16, 1976, 51/15563
The portion of the term of this patent subsequent to Oct. 10, 1995, has been disclaimed.
Int. Cl.[2] C07D *499/68*
U.S. Cl. 260—239.1 **1 Claim**

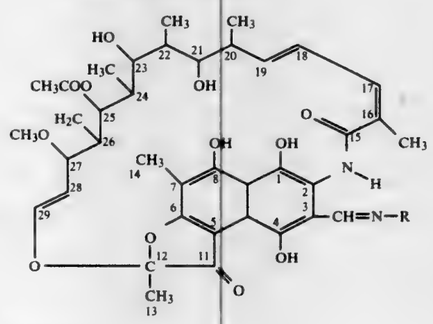
1. 6-(D-2-prolylamino-2-phenylacetamido) penicillanic acid and non-toxic pharmaceutically acceptable salts thereof.

4,179,438
PROCESS FOR THE PREPARATION OF 3 IODO- AND 3 BROMORIFAMYCIN S
Egidio Marchi, and Lauretta Montecchi, both of Bologna, Italy, assignors to Alfa Farmaceutici, S.p.A., Bologna, Italy
Filed Nov. 6, 1978, Ser. No. 957,844
Claims priority, application Italy, Nov. 29, 1977, 3620 A/77
Int. Cl.[2] C07D *498/08*
U.S. Cl. 260—239.3 P **5 Claims**

1. Improved process for the preparation of 3 iodo- and 3 bromorifamycin S characterized by the fact that rifamycin S is made to react with at least two equivalents of an halogen selected from the group consisting of iodine and bromine, per mole of rifamycin S in the presence of at least one mole of pyridine per each equivalent of halogen and in the presence of ethanol, methanol or mixtures thereof with water, operating at a temperature not above the room temperature.

4,179,439
RIFAMYCINS AND METHOD FOR THEIR PREPARATION
Alexandru Sauciuc, Iassi; Ion Nitelea; Eugeniu Paunescu, both of Bucharest; Constantin Diaconescu, Iassi; Margareta Albu, Iassi; Liliana Bulgaru, Iassi, and Eugen Diaconu, Iassi, all of Romania, assignors to Intreprinderea de Antibiotice Iassi, Iassi, Romania
Filed Jul. 1, 1977, Ser. No. 812,429
Int. Cl.[2] C07D *498/08*
U.S. Cl. 260—239.3 P **3 Claims**

1. A compound of the formula:



wherein R is



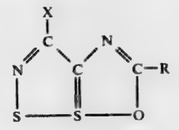
wherein
R^1 is hydrogen; and
R^2 is phenylpyridazinyl with the phenyl substituted with a 1 to 3 carbon alkyl group or a halogen atom.

4,179,440
EPOXY EMULSION WATER-BASED COATING USING WATER-DISPERSIBLE EPOXY EMULSIFIER
Carlos J. Martinez, Edison, N.J., assignor to Mobil Oil Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 909,858, May 26, 1958, abandoned. This application Dec. 26, 1978, Ser. No. 973,276
Int. Cl.[2] C08L *61/28*
U.S. Cl. 260—29.4 R **6 Claims**

1. An oil-in-water emulsion coating formulation containing in parts by weight:
(a) a capped epoxy resin having an epoxy equivalent weight between about 400 and about 6,000;
(b) a carboxyl functional epoxy resin having an epoxy equivalent weight between about 400 and about 6,000 having an acid number between about 35 and about 150 or a carboxyl functional capped epoxy resin having an epoxy equivalent weight between about 400 and about 6,000 having an acid number between about 35 and about 150;
(c) the ratio of (a):(b) being between about 90 parts:10 parts and about 10 parts:90 parts, the relative proportions of the following components, based upon (a) plus (b) being 100 parts;
(d) sufficient tertiary amine, ammonia, or ammonium hydroxide to neutralize (b) to a pH of about 7.0 to about 9.1;
(e) between about 25 parts and about 160 parts of an alkoxyethanol solvent having the formula $ROCH_2CH_2OH$, wherein R is C_{5-7} alkyl, or a mixture of said alkoxyethanol and at least one co-solvent, selected from the group consisting of alkoxy alcohols, and ketones, containing at least about 30 weight percent of said alkoxyethanol;
(f) between about 0 part and about 2 parts of an acid cross-linking catalyst;
(g) between about 1 part and about 30 parts of a conventional curing agent for an epoxy resin; and
(h) between about 200 parts and about 600 parts of water.

4,179,441
FUNGIDAL AND HERBICIDAL 2-SUBSTITUTED-3-OXA-3Aλ[4], 4-DITHIA-6-HALO-1,5-DIAZAPENTALENE
Joseph E. Moore, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Filed Dec. 30, 1977, Ser. No. 866,122
Int. Cl.[2] C07D *277/20*
U.S. Cl. 548—122 **10 Claims**

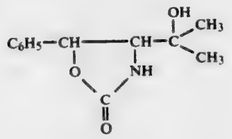
1. A compound of the formula



wherein X is chloro or bromo and R is alkyl of 1 to 6 carbon atoms; haloalkyl of 1 to 6 carbon atoms and of 1 to 3 of the same or different halogen selected from fluoro, chloro, bromo or iodo; halovinyl of 1 to 3 of the same or different halogens selected from fluoro, chloro, bromo or iodo; cycloalkyl of 3 to 6 carbon atoms; thiocyanatoalkyl of 1 to 3 carbon atoms; phenyl or phenoxy substituted with up to 3 of the same or different substituents selected from hydroxy, fluoro, chloro, bromo, iodo, trifluoromethyl, trichloromethyl, tribromomethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkoxycarbonylalkoxy of 3 to 6 carbon atoms, nitro, cyano, thiocyanato or isothiocyanato; phenoxymethyl or phenylthiomethyl wherein the phenyl ring is substituted with up to 3 of the same or different substituents selected from fluoro, chloro, bromo, iodo or alkyl of 1 to 4 carbon atoms; benzyloxymethyl or benzylthiomethyl wherein the benzyl ring is substituted with up to 2 of the same or different substituents selected from fluoro, chloro, bromo, iodo, or alkyl of 1 to 4 carbon atoms; furyl; or thienyl.

4,179,442
4-(ALPHA-HYDROXY-ISOPROPYL)-5-PHENYL-OXAZOLIDIN-2-ONE
Friedrich-Gero Köllensperger, Galvanistrasse 20, Linz, Austria; York Hartleben, Kleiner Ring 7, 2081 Heist, Fed. Rep. of Germany; Rolf Kretzschmar, An der Düne 2, 2082 Moorrege, Fed. Rep. of Germany, and Bernhard Neteler, Huntestrasse 13, 29 Oldenburg, Fed. Rep. of Germany
Division of Ser. No. 718,610, Aug. 30, 1976, Pat. No. 4,139,538. This application Aug. 9, 1978, Ser. No. 932,102
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1975, 2538424
Int. Cl.[2] C07D *263/24*
U.S. Cl. 548—232 **1 Claim**

1. 4-[1′(1′-Hydroxy-1′-methyl)-ethyl]-5-phenyl oxazolidin-2-one corresponding to the formula

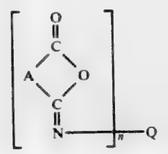


4,179,443
6-CHLORO-1,2,3,4-TETRAHYDROCARBAZOLE-2-ONE
Leo Berger, Montclair, and John W. Scott, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
Division of Ser. No. 914,465, Jun. 12, 1978. This application Dec. 21, 1978, Ser. No. 972,142
Int. Cl.[2] C07D *209/88*
U.S. Cl. 260—315 **1 Claim**

1. 6-Chloro-1,2,3,4-tetrahydrocarbazole-2-one.

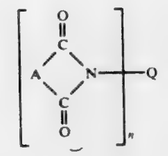
4,179,444
PROCESS FOR THE MANUFACTURE OF ISO-IMIDES OR MIXTURES OF ISO-IMIDES AND IMIDES
Martin Roth, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Continuation of Ser. No. 764,624, Feb. 1, 1977, abandoned. This application May 22, 1978, Ser. No. 908,338
Claims priority, application Switzerland, Feb. 11, 1976, 1648/76
Int. Cl.[2] C07D *403/10*
U.S. Cl. 260—326 N **9 Claims**

1. Process for the manufacture of an iso-imide of the formula I



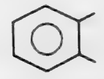
(I)

or a mixture of an iso-imide of the formula I and an imide of the formula Ia

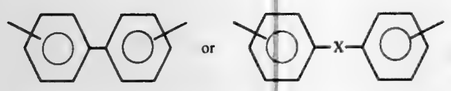


(Ia)

in which A represents —CH=CH— or



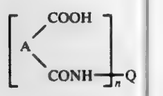
n represents the number 1 or 2 and, when n=1, Q represents a phenyl, 1-naphthyl or 2-naphthyl group; and, when n=2, represents a phenylene or naphthylene group; or said phenyl, naphthyl, phenylene or naphthylene group substituted by 1 or 2 moieties which are free from acid hydrogen atoms and which are selected from the group consisting of halogen, alkyl with 1 to 8 carbon atoms, halogenoalkyl with 1 to 3 carbon atoms, alkylthio with 1 to 4 carbon atoms, N,N-dialkylamino with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, phenoxy, alkoxycarbonyl with 2 to 5 carbon atoms, alkanoyl with 2 to 5 carbon atoms, phenylsulphonyl, alkylsulphonyl with 1 to 4 carbon atoms, cyano and nitro; or when n=2, Q also represents a group of the formulae



in which X denotes the bridge member —O—, —S—, —S—S, —SO_2—, —CH_2—, —CO— or



which process comprises reacting an amide-acid of the formula II



(II)

in which that stated under formula I applies in respect of A, Q and n, with ketene at a temperature of about −10° C. to +80° C.

4,179,445

METHOD OF PREPARATION OF 2-PHOSPHATE ESTERS OF ASCORBIC ACID

Paul A. Sieb; Charles W. Deyoe, and Russell C. Hoseney, all of Manhattan, Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans.

Continuation of Ser. No. 817,555, Jul. 21, 1977, abandoned, which is a continuation of Ser. No. 683,888, May 6, 1976, abandoned. This application Jun. 1, 1978, Ser. No. 911,669

Int. Cl.[2] C07F 9/09

U.S. Cl. 260—340.9 R **3 Claims**

1. A method of preparing a 2-phosphated ester of 5,6-isopropylidene-L-ascorbic acid which comprises the steps of:

admixing a quantity of 5,6-isopropylidene-L-ascorbic acid, a quantity of pyridine, and a sufficient amount of an alkali metal hydroxide to initially elevate the pH of the admixture to a level of about 12–13, in water,

said 5,6-isopropylidene-L-ascorbic acid being present in said admixture at a concentration of from about 0.3 to 0.6 molar, said pyridine being present in said admixture at a concentration of from about 1.5 to 3.0 molar; and adding a quantity of phoshorous oxychloride to said admixture, and reacting the components of said admixture at a temperature of from about −10° to 10° C., and, during said reaction, adding additional quantities of said phosphorous oxychloride and said hydroxide to said admixture, said hydroxide being added for maintaining said pH at a level of from about 12–13 throughout the entirety of the reaction, in order to form primarily a 2-phosphated ester of said 5,6-isopropylidene-L-ascorbic acid.

4,179,446

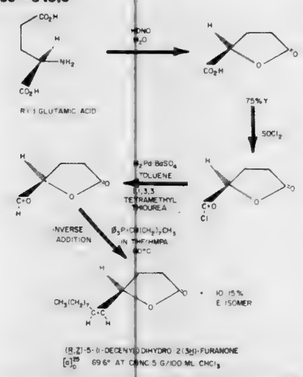
SEX PHEROMONE PRODUCED BY THE FEMALE JAPANESE BEETLE: SPECIFICITY OF MALE RESPONSE TO ENANTIOMERS

James H. Tumlinson, III, Gainesville, Fla.; Michael G. Klein, Wooster, Ohio; Robert E. Doolittle, Gainesville, Fla., and Thyril L. Ladd, Jr., Wooster, Ohio, assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 8, 1978, Ser. No. 932,079

Int. Cl.[2] C07D 307/32

U.S. Cl. 260—343.6 **2 Claims**



1. A process for preparing (R,Z)-5-(1-decenyl)dihydro-2-(3H)-furanone comprising:

(a) deaminating R(−)glutamic acid by reacting it with sodium nitrate to produce R(−)5-carboxydihydro-2(3H) furanone;

(b) heating the R(−)5-carboxydihydro-2(3H)furanone with thionyl chloride to produce the acid chloride from (b);

(c) reducing the acid chloride from (b) to the corresponding aldehyde;

(d) reacting the aldehyde from (c) with ylide generated with butyl lithium from nonyltriphenyl-phosphorium bromide to produce a mixture of the Z- and E-isomers of the pheromone (R,Z)-5-(1-decenyl)dihydro-2(3H) furanone; and

(e) separating the Z isomer from the E isomer by liquid chromatography.

2. The compound (R,Z)-5-(1-decenyl)dihydro-2(3H)-furanone.

4,179,447

PROCESS FOR THE PRODUCTION OF 2-SUBSTITUTED CHROMONES

David T. Connor, Ann Arbor, Mich.; Patricia A. Young, Madison, N.J., and Max von Strandtmann, New Castle, Del., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 816,122, Jul. 15, 1977, abandoned. This application Nov. 30, 1978, Ser. No. 964,998

Int. Cl.[2] C07D 311/22

U.S. Cl. 260—345.2 **3 Claims**

1. 7,8-dimethyl-2-[(methylsulfinyl)methyl]-4H-1-benzopyran-4-one.

2. 2-[(methyl-sulfinyl)methyl]-4H-1-benzopyran-4-one.

3. 7-methoxy-2-[(methylsulfinyl)methyl]-4H-1-benzopyran-4-one.

4,179,448

SPIRANE DERIVATIVES USEFUL AS PERFUMING AND FLAVOR-MODIFYING INGREDIENTS

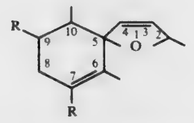
Karl-Heinrich Schulte-Elte; Peter Fankhauser, both of Onex, and Günther Ohloff, Bernex, all of Switzerland, assignors to Firmenich, S.A., Geneva, Switzerland

Filed Oct. 11, 1977, Ser. No. 841,124

Int. Cl.[2] C07D 307/94

U.S. Cl. 260—346.11 **3 Claims**

1. A compound having the formula



wherein one of the symbols R represents a methyl group and the other a hydrogen atom.

4,179,449

HALOALKYL HYDROXY-AROMATIC CONDENSATION PRODUCTS AS FUEL AND LUBRICANT ADDITIVES

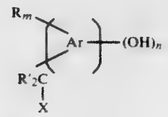
David E. Ripple, Kirtland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 684,818, May 10, 1976, Pat. No. 4,108,783, which is a continuation-in-part of Ser. No. 459,424, Apr. 9, 1974, abandoned. This application Aug. 11, 1978, Ser. No. 932,977

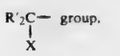
Int. Cl.[2] C07D 307/60

U.S. Cl. 260—346.74 **19 Claims**

1. A reaction product made by the process comprising reacting at a temperature ranging from about 15° C. to the decomposition temperature of the reactant or product present having the lowest decomposition temperature (A) at least one alpha haloalkyl hydroxyl aromatic compound of the general formula



wherein Ar is a hydrocarbyl aromatic nucleus of 6 to about 30 carbon atoms, or a substituted analog of such an aromatic nucleus substituted with one or more up to 3 each of lower alkoxy, lower alkylthio, chloro, or nitro substituents, each R is a nonfused hydrocarbyl group of about 25 to about 700 carbon atoms, X is a halogen atom, each R′ is independently a hydrogen atom, an alkyl group of 1 to 36 carbon atoms, or a halogen-substituted alkyl group of 1 to about 36 carbon atoms, n is 1 to 3 and m is 1 to 5 with the provisos that (i) the total number of carbon atoms in both the R′ groups does not exceed 36 and (ii) where m exceeds 1, one of the R groups can also be a



with

(B) at least one alpha-beta olefinically unsaturated compound selected from the group consisting of C_{2-40} hydrocarbyl nitriles, C_{2-40} hydrocarbyl carboxylic acids and anhydrides, esters, amides and ammonium and metal salts of said C_{2-40} carboxylic acids, the reaction of (A) with (B) resulting in the formation of a carbon-to-carbon bond, said bond including the carbon of at least one



group

wherein the ratio of (A) to (B) between 0.5:1 to about 2:1.

4,179,450

PROCESS FOR THE PREPARATION OF 1-ACYLAMINO-5(8)-CHLOROANTHRAQUINONES

Detlef-Ingo Schütze, Bergisch-Gladbach, Fed. Rep. of Germany; Hans-Samuel Bien, deceased, late of Burscheid, Fed. Rep. of Germany (by Else Bien, Gabriele Bien, Dorothee Bien, legal representatives); Petra Bien, heir, and Daniel Bien, heir, both of Burscheid, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 5, 1977, Ser. No. 794,143

Claims priority, application Fed. Rep. of Germany, May 8, 1976, 2620372

Int. Cl.[2] C07C 97/24, 103/75

U.S. Cl. 260—377 **10 Claims**

1. In a process for the preparation of 1-acylamino-5-chloroanthraquinone or 1-acylamino-8-chloroanthraquinone by acylation of the corresponding monoaminochloroanthraquinone, the improvement comprising

(a) aminating 1,5-dichloroanthraquinone or 1,8-dichloroanthraquinone with aqueous ammonia at temperatures from 190° C. to 240° C. to form a mixed amination product of the corresponding diaminoanthraquinone and at least 50% of the corresponding mono-(1)-aminochloroanthraquinone;

(b) acylating the mixed amination product at a temperature from 100° C. to 180° C. in an inert organic solvent in which the acylated monoaminochloroanthraquinone is readily soluble and the acylated diaminoanthraquinone is sparingly soluble; and

(c) separating the resultant monoacylaminochloroanthraquinone product from the diacylaminoanthraquinone product by recovery of the monoacylaminochloroanthraquinone product from the solvent.

4,179,451

NOVEL HYDROXY SUBSTITUTED 15-DEOXY-5-CIS-PROSTENOIC ACIDS AND ESTERS

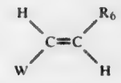
Middleton B. Floyd, Jr., Suffern, N.Y.; Martin J. Weiss, Oradell, N.J.; William J. McGahren, Demarest, N.J., and Robert E. Schaub, Upper Saddle River, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 607,867, Aug. 26, 1975, Pat. No. 4,107,441, which is a continuation-in-part of Ser. No. 370,256, Jun. 15, 1973, abandoned. This application Jun. 12, 1978, Ser. No. 914,770

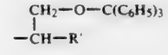
Int. Cl.[2] C07C 43/27, 43/28

U.S. Cl. 260—395 **5 Claims**

1. A compound selected from the group consisting of those of the formula:



and the optical isomers, enantiomers, diastereomers, racemates and racemic mixtures thereof wherein R_6 is selected from the moieties consisting of those of the formulae:



and

$-CH_2-R_8$

wherein R' is a straight chain alkyl or alkenyl group having from 3 to 10 carbon atoms or a straight chain alkyl or alkenyl group having from 3 to 7 carbon atoms and having one or two branched alkyl groups each of from 1 to 3 carbon atoms; and R_8 is a straight chain alkyl or alkenyl group having from 3 to 10 carbon atoms and substituted with a triphenylmethoxy group or a stragh chain alkyl or alkenyl group having from 3 to 7 carbon atoms and having one or two branched alkyl groups each of from 1 to 3 carbon atoms and substituted with a triphenylmethoxy group with the proviso that when R_8 is alkenyl then the triphenylmethoxy group must be on a saturated carbon atom; and W is selected from the group consisting of iodine and lithium atoms.

4,179,452

3α,6α-DIHYDROXY-5β-CHOLESTAN-24-ONE DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Kiyoshige Ochi, Kawagoe; Isao Matsunaga; Minoru Shindo, both of Tokyo, and Chikara Kaneko, Kanazawa, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

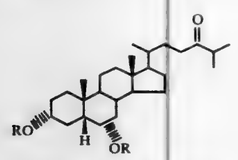
Filed May 17, 1978, Ser. No. 906,866

Claims priority, application Japan, May 23, 1977, 52/58815

Int. Cl.² C07J 9/00

U.S. Cl. 260—397.2 **5 Claims**

1. A 3α,6α-dihydroxy-5β-cholestan-24-one derivative represented by the formula



wherein R is hydrogen, acyl, triarylmethyl, methoxymethyl, tetrahydropyranyl, alkylsilyl or benzyl.

4,179,453

PROCESS FOR PREPARING 17β-CARBOXY-5-ANDROSTEN-3-ONES

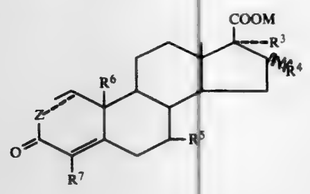
David B. R. Johnston, Warren, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 13, 1978, Ser. No. 896,120

Int. Cl.² C07J 9/00

U.S. Cl. 260—397.1 **4 Claims**

1. A method for preparing a 17β-carboxy-4-androsten-3-one having the formula:



where

R^3, R^4, R^5, and R^6 are the same or different and are hydrogen or lower alkyl;

R^7 is hydrogen or cyano;

M is hydrogen, lower alkyl, or alkali metal;

Z is CH—R^9 where R^9 is hydrogen, α-fluoro, or α-lower alkyl; and the dotted line between positions 1 and 2 represents the possibility of a single bond when Z is CH—R^9 and a double bond when Z is C—R^9; comprising the steps of

(1) reacting a 17β-(1-ketoethy)-5-androsten-3-ol with pyridine and iodine to form a pyridinium iodide compound;

(2) reacting the pyridinium iodide compound with alkali metal methoxide in methanol to form a methyl-5-androsten-3-ol-17β-carboxylate;

(3) oxidizing the 5-androsten-3-ol to form methyl-4-androsten-3-one-17β-carboxylate; and

(4) hydrolyzing the methyl-17β-carboxylate to the corresponding 17β-carboxylic acid.

4,179,454

PRODUCTION OF HYDROGENATED FATTY ACIDS FROM CRUDE GLYCERIDE OILS

Anil B. Mehta, Strongsville, and Richard J. Zielinski, Middleburg Heights, both of Ohio, assignors to SCM Corporation, Cleveland, Ohio

Filed Jul. 24, 1978, Ser. No. 927,452

Int. Cl.² C11C 3/12, 1/04

U.S. Cl. 260—409 **10 Claims**

1. A process for producing hydrogenated fatty acids which comprises:

subjecting a crude glyceride oil to hydrogenation in a hydrogenation zone with hydrogen gas under hydrogenation conditions in the presence of a hydrogenation catalyst;

discontinuing said hydrogenation after at least a significant increase in saturation of said oil has occurred;

passing said hydrogenated crude oil into a splitting zone and therein splitting said hydrogenated oil under oil splitting conditions into component hydrogenated fatty acids and by-product glycerine; and

withdrawing said hydrogenated fatty acids and said by-product glycerine from said splitting zone.

4,179,455

PROCESS FOR THE PRODUCTION OF MODIFIED VEGETABLE FATS

Raghuram D. Shenoy, and Anantharam Ganapathy, both of Bombay, India, assignors to Cadbury India Limited, Bombay, India

Filed Jan. 25, 1978, Ser. No. 872,145

Int. Cl.² C11C 3/12; A23D 5/00; A23G 1/00

U.S. Cl. 260—409 **9 Claims**

1. A process for the production of modified vegetable fats which comprises the steps of:

(a) partially hydrogenating a refined, bleached and deodorized vegetable fat selected from the group which consists of sal seed fat, Mowrah fat, phulwara fat and mixtures thereof in the presence of a conventional metal catalyst to obtain hardened fat of an iodine value in the range of about 35 to 38 and containing less than about 2% of trisaturated glycerides;

(b) allowing the hardened fat formed during step (a) to remain for 3 to 4 days at a temperature of 20° to 35° C.; and

(c) following step (b) subjecting the hardened fat to hydraulic pressure within a range of 200 to 700 p.s.i. under a controlled temperature range of about 20° to 35° C. to remove liquid oil.

4,179,456

PROCESS FOR THE PRODUCTION OF MODIFIED VEGETABLE FATS

Raghuram D. Shenoy, and Anantharam Ganapathy, both of Bombay, India, assignors to Cadbury India Limited, Bombay, India

Filed Jan. 25, 1978, Ser. No. 872,150

Int. Cl.² C11C 3/12; A23D 5/00; A23G 1/00

U.S. Cl. 260—409 **8 Claims**

1. A process for the production of modified vegetable fat which comprises the steps of:

(a) partially hydrogenating at a temperature of 100° to 180° C. a refined, bleached, and deodorized vegetable fat selected from the group consisting of sal seed fat, mowrah fat, phulwara fat and the mixtures thereof and containing glycerides of C_{16}, C_{18} and C_{20} acids, in the presence of a conventional metal catalyst to obtain hardened fat of an iodine value in the range of about 33 to 36 and containing less than about 2% trisaturated glycerides; and

(b) removing from said hardened fat high melting glycerides by thermal crystallization at a temperature of about 30° C. to 40° C. and recovering a low melting fat having an iodine value of about 37–40.

4,179,457

CONVERSION OF FATTY ACID ESTERS TO FATTY ACIDS

Richard R. Crawford, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,281

Int. Cl.² C11C 1/04; C11D 13/00

U.S. Cl. 260—418 **10 Claims**

1. Process for obtaining fatty acids from the lower alkyl esters of said acids which comprises the steps of

(a) dissolving said esters in a solvent consisting essentially of water and from about 25 to about 300 parts by weight of a lower alcohol,

(b) saponifying said ester solution with an alkali metal hydroxide,

(c) mixing a sufficient quantity of an acidic substance with said solution to lower the pH to between about 5 and about 8,

(d) distilling the mixture to remove solvent therefrom,

(e) mixing additional acidic substance with the mixture to lower the pH thereof to between about 1 and about 4, and

(f) washing the reaction product to obtain said fatty acid.

4,179,458

PROCESS FOR PREPARING ORGANOTIN COMPOUNDS

Trevor E. Jones, Halesowen, England, assignor to Albright & Wilson Limited, Warley, England

Filed Jan. 13, 1977, Ser. No. 759,179

Claims priority, application United Kingdom, Jan. 14, 1976, 1461/76; Jul. 19, 1976, 29937/76

The portion of the term of this patent subsequent to May 30, 1995, has been disclaimed.

Int. Cl.² C07F 7/22

U.S. Cl. 260—429.7 **24 Claims**

1. A process for preparing organotin compounds containing at least 50% tetraorganotin and at most 50% triorganotin halide which comprises reacting an organic halide of formula RX where R is an alkyl group of 1 to 20 carbon atoms or alkenyl group of 2–20 carbon atoms and X is a chlorine, bromine or iodine atom, with a heated suspension of metallic material selected from the group consisting of (i) a mixture of zinc and tin, and (ii) an alloy consisting essentially of tin and zinc, the atomic proportion of zinc to tin in said material being at least 0.5:1, in a liquid comprising at least one 'onium salt, which is an organic quaternary ammonium or phosphonium salt or tertiary sulphonium salt, to produce a mixture containing tetraorganotin, and at least some of said tetraorganotin is in the liquid.

4,179,459

PROCESS FOR THE SYNTHESIS OF MIXED POLYIMINO DERIVATIVES OF ALUMINIUM AND ALKALINE EARTH METALS

Giovanni Dozzi, Milan; Salvatore Cucinella, and Alessandro Mazzei, both of San Donato Milanese, all of Italy, assignors to ANIC S.p.A., Palermo, Italy

Filed Sep. 7, 1977, Ser. No. 831,240

Claims priority, application Italy, Oct. 28, 1976, 28776 A/76; Oct. 28, 1976, 28777 A/76

Int. Cl.² C07F 5/06

U.S. Cl. 260—448 R **9 Claims**

1. A process for the synthesis of mixed polyimino derivatives of aluminum and alkaline earth metals, said process consisting of reacting aluminum, a primary or secondary amine, and an alkaline earth metal or a hydride or amide derivative thereof, in the presence of hydrogen.

4,179,460

DERIVATIVES OF R,S-[X2-(2-HYDROXYETHYLAMINO)-1-PHENYL]-ETHYLAMINE, AND PROCESS

Atanas G. Georgiev; Hristo P. Daskalov; Ventzel G. Michaylov, and Kina V. Konstantinova, all of Sofia, Bulgaria, assignors to DSO "Pharmachim", Sofia, Bulgaria

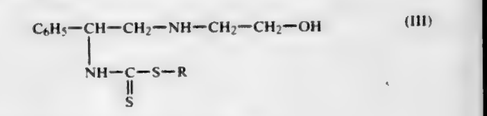
Filed Jun. 30, 1978, Ser. No. 921,003

Claims priority, application Bulgaria, Jul. 6, 1977, 37908

Int. Cl.² C07C 153/09

U.S. Cl. 260—455 R **4 Claims**

1. An R,S-[2-(2-hydroxyethylamino)-1-phenyl]-ethylamine of the formula III



(III)

wherein R represents hydrogen or allyl.

4,179,461

PROCESS FOR THE PREPARATION OF DIPHENYL ETHERS

Albrecht Marhold, Leverkusen, and Erich Klauke, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

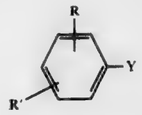
Continuation of Ser. No. 731,474, Oct. 12, 1976, abandoned. This application Jul. 31, 1978, Ser. No. 929,464

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1975, 2547037

Int. Cl.² C07C 41/00

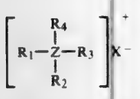
U.S. Cl. 260—465 H **3 Claims**

1. In a process for the preparation of a diphenyl ether substituted in the 4,4'-position and/or the 2,2'-position relative to the ether oxygen atom by reaction of a reactive benzene compound substituted in the 1- and in the 2- or 4-position, said reactive benzene compound having the formula



in which Y denotes a halogen atom or the nitro group, R denotes an NO_2, CN or R''SO_2 group which is in the ortho-

position or para-position relative to Y, and R′ denotes hydrogen fluorine, chlorine, a C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-alkylmercapto radical, which is optionally substituted by halogen, or the $N(R'')_2$ radical in which R″ represents alkyl or aryl which is optionally substituted by halogen, with an alkali or alkaline earth metal nitrite at 100°–220° C., the improvement which comprises carrying out the reaction in the presence of a quaternary onium salt in water, said quaternary onium salt having the formula



in which Z represents nitrogen or phosphorous, R_1, R_2, R_3 and R_4 represent C_{1-18} alkyl radicals, aralkyl radicals in which the aryl portion is a benzyl radical which is optionally substituted by C_{1-4} alkyl radicals, a methoxy group or halogen, a phenyl radical which is optionally substituted by C_1–C_4 alkyl, C_1–C_2 alkoxy or by halogen or a cycloalkyl radical selected from the group consisting of cyclopentyl and cyclohexyl which cycloalkyl radical can be optionally substituted by a C_1–C_4 alkyl radical, or two adjacent radicals amongst R_1, R_2, R_3 and R_4 together with the central atom Z and optionally further heteroatoms, form a heterocyclic structure containing oxygen, sulfur or nitrogen in the ring, said heterocyclic structure being a 5- or 6-membered ring and X^- represents a halide, cyanide or hydroxy ion.

4,179,462

PROCESS FOR PREPARING ACETONITRILE

Gisela Olivé, and Salvador Olivé, both of Cary, N.C., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 699,284, Jun. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 591,550, Jun. 30, 1975, abandoned. This application Jan. 16, 1978, Ser. No. 869,400

Int. Cl.[2] **C07C** *120/00, 121/18, 121/32*

U.S. Cl. 260—465.1 **34 Claims**

1. The process of preparing acetonitrile, by contacting carbon monoxide, hydrogen and ammonia at a temperature of at least about 350° C. and sufficiently high to induce reaction in the presence of a catalytically effective amount of catalyst comprising a transition metal in a reduced valence state which renders it effective toward the synthesis of acetonitrile, and recovering acetonitrile, said transition metal consisting essentially of transition metal other than copper, the temperature being sufficiently high at the pressure employed to cause acetonitrile production to predominate over amine production.

4,179,463

2-AMINO-CYCLOPENT-1-ENE-1-DITHIOCARBOXYLIC ACIDS

György Matolcsy; Piroska Bartok, née Berencsy, both of Budapest; Bella Kiss, Vecses; Eva Palosi, Budapest; Egon Karpati, Budapest, and László Szporny, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

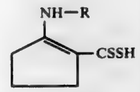
Filed Dec. 29, 1977, Ser. No. 865,426

Claims priority, application Hungary, Dec. 30, 1977, RI 609

Int. Cl.[2] **C07C** *153/043;* **A61K** *31/185*

U.S. Cl. 260—502.6 **6 Claims**

1. A 2-(substituted amino)-cyclopent-1-ene-1-dithiocarboxylic acid of the formula I



(I)

wherein R is, C_{1-6} alkyl having a C_{1-4} alkoxy, hydroxy, and both a carboxy and an amino substituent.

4,179,464

PREPARATION OF N-(PHOSPHONOACETYL)-L-ASPARTIC ACID

Robert J. Schultz, 68 Tomeyn Dr., Amherst, N.Y. 14221, and Fred W. Starks, 742 Highland Ave., Kenmore, N.Y. 14223

Continuation-in-part of Ser. No. 851,382, Nov. 14, 1977, abandoned. This application Aug. 10, 1978, Ser. No. 932,501

Int. Cl.[2] **C07F** *9/38*

U.S. Cl. 260—502.5 **7 Claims**

1. In a method for the preparation of a sodium salt of N-(phosphonoacetyl)-L-aspartic acid, the improvement which comprises reacting L-aspartic acid with benzyl alcohol and p-toluenesulfonic acid monohydrate to obtain L-aspartic acid, dibenzyl ester p-toluenesulfonate, and reacting said L-aspartic acid, dibenzyl ester p-toluenesulfonate with triethylamine, followed by the addition of phosphonoacetyl chloride to produce the N-(phosphonoacetyl)-L-aspartic acid moiety in the form of the dibenzyl ester, wherein the carboxyl groups of the N-(phosphonoacetyl)-L-aspartic acid are esterified and unreacted phosphonoacetyl chloride is separated therefrom, and hydrolyzing the dibenzyl ester to obtain a sodium salt of N-(phosphonoacetyl)-L-aspartic acid.

4,179,465

N-FLUOROMETHYL-CARBAMIC ACID FLUORIDES AND THEIR MANUFACTURE

Sabine Thym, Heidelberg-Dossenheim; Karl-Heinz Koenig, Frankenthal, and Gerhard Hamprecht, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

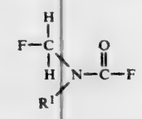
Filed Jan. 13, 1978, Ser. No. 869,383

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1977, 2706683

Int. Cl.[2] **C07C** *51/58, 125/00*

U.S. Cl. 260—544 C **5 Claims**

1. A process for the manufacture of a N-fluoromethyl-carbamic acid fluoride of the formula

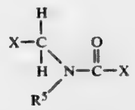


I

where R^1 is a cycloaliphatic radical or is



where R^2, R^3 and R^4 may be identical or different and each is hydrogen or an aliphatic radical, and in addition R^2 may be fluorine if R^3 and R^4 are each hydrogen, wherein a halomethyl-carbamic acid halide of the formula



II

where the individual radicals X are each chlorine or bromine and R^5 has the same meaning as R^1 or, if R^2 is fluorine, may also represent



where X has the above meaning, is reacted at from 40° to 300° C. with a fluoride of a metal of groups Ia, Ib, IIa, IIb, IIIa, IIIb, IVa, IVb, Va, VIb, VIIb and VIIIb of the periodic table.

4,179,466

PHTHALIC DIANILIDES

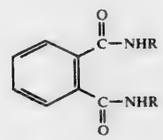
Frederic G. Bollinger, and John J. D'Amico, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 546,236, Feb. 3, 1975, abandoned. This application Nov. 9, 1978, Ser. No. 959,286

Int. Cl.[2] **A01N** *5/00, 9/20;* **C07C** *103/78, 103/76*

U.S. Cl. 260—558 A **4 Claims**

1. A compound having the formula



wherein R is selected from the group consisting of 3′-trifluoromethylphenyl, 2′-chloro-5′-trifluoromethylphenyl and 3′,5′-dimethoxyphenyl.

4,179,467

DOPAMINE HYDROXYLASE INHIBITING 2-AMINO-CYCLOPENT-1-ENE-1-THIOCARBOXYLIC ACID-DISULFIDES

György Matolcsy; Piroska Bartok nee Berencsy, both of Budapest; Bella Kiss, Vecses; Eva Palosi, Budapest; Egon Karpati, Budapest, and Laszlo Szporny, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

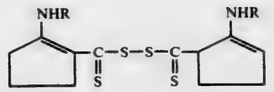
Filed Dec. 29, 1977, Ser. No. 865,429

Claims priority, application Hungary, Dec. 30, 1976, 610

Int. Cl.[2] **C07C** *87/02;* **A61K** *31/13*

U.S. Cl. 260—563 R **7 Claims**

1. A 2-amino-cyclopent-1-ene-thiocarboxylic acid disulfide of the formula



wherein R is C_{1-6} alkyl or C_{1-6} alkyl substituted with C_{1-4} alkoxy, C_{2-4} alkenyl or C_{3-8} cycloalkyl group.

4,179,468

CYCLIC TERPENOID ONIUM SALTS, THEIR PREPARATION AND USES

Bernard J. Kane, Atlantic Beach, and Richard A. Von Genk, Jacksonville, both of Fla., assignors to SCM Corporation, Cleveland, Ohio

Filed Jun. 19, 1978, Ser. No. 916,966

Int. Cl.[2] **C07C** *87/68*

U.S. Cl. 260—567.6 M **23 Claims**

1. A process for cyclizing an acyclic terpenoid group of an onium salt selected from a quaternary ammonium salt and a phosphonium salt, where said terpenoid group is a neryl group or a geranyl group, which comprises

maintaining an acidic aqueous solution of said onium salt at a temperature of at least about 80° C. until said acyclic terpenoid group cyclizes, there being at least about 1.1 equivalents of acid per equivalent of said onium salt.

4,179,469

PREPARATION OF AMINES

Tamotsu Imai, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 20, 1978, Ser. No. 971,285

Int. Cl.[2] **C07C** *85/18*

U.S. Cl. 260—577 **18 Claims**

1. A process for the preparation of an amine which comprises dehydrogenating a dehydrogenatable compound at dehydrogenating conditions in the presence of a dehydrogenating catalyst, treating the resultant product mixture in the absence of any separation with carbon monoxide, hydrogen and a nitrogen-containing compound in the presence of a catalyst comprising a rhodium- or ruthenium-containing compound at reaction conditions, and recovering the resultant amine.

4,179,470

PROCESS FOR PRODUCING ANILINE WITH A PERMSELECTIVE PALLADIUM AND RUTHENIUM CATALYST

Alexandr P. Mischenko, Teply Stan, 2 mikroraion, korpus 24, kv. 426; Vladimir M. Gryaznov, Lomonosovsky prospekt, 14, kv. 504; Viktor S. Smirnov, Kutuzovsky prospekt, 26, kv. 555; Elena D. Senina, Sevastopolsky prospekt, 75, korpus 1, kv. 13; Iraida L. Parbuzina, Metrostroevskaya ulitsa, 3/14, kv. 44; Natalia R. Roshan, Yaroslavskoe shosse, 57, kv. 36; Viktoria P. Polyakova, ulitsa Trofimova, 15, kv. 201, and Evgeny M. Savitsky, ulitsa Dmitria Ulyanova, DNR-3, kv. 13, all of Moscow, U.S.S.R.

Filed Apr. 24, 1978, Ser. No. 899,418

Claims priority, application U.S.S.R., Aug. 12, 1977, 2521297[I]

Int. Cl.[2] **C07C** *85/11*

U.S. Cl. 260—580 **3 Claims**

1. A process for producing aniline, comprising subjecting nitrobenzene to catalytic hydrogenation using gaseous hydrogen at a temperature of from 20° to 260° C. and under atmospheric pressure, using a membrane catalyst which is essentially an alloy containing palladium and ruthenium, taken in a mass percent ratio of 88–98:12–2, respectively, said catalyst being permselective to hydrogen; the hydrogenation process being carried out by feeding nitrobenzene vapors on one side of the membrane catalyst and hydrogen, on the other side thereof.

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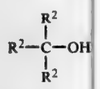
4,179,471

CATALYTIC ALKYLATION OF ALKYL-SUBSTITUTED AROMATICS WITH MONOOLEFINS

Raymond L. Cobb, and Lawrence M. Fodor, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 14, 1978, Ser. No. 969,599
Int. Cl.[2] C07C 3/52
U.S. Cl. 585—452 **18 Claims**

1. A process comprising reacting a monoolefin hydrocarbon with an alkyl aromatic compound having a hydrogen bonded to at least one benzylic carbon of at least one alkyl group in the presence of a catalytic amount of alkali metal and a conversion promoting amount of a promoter composition comprising naphthalene, and at least one tertiary alcohol of the formula



wherein each R^2 is a hydrocarbyl radical having 1 to 4 carbon atoms and wherein each R^2 may be the same of different, or alkali metal salt of said tertiary alcohol, under such reaction conditions that at least one benzylic carbon of said alkyl aromatic compound is alkylated.

4,179,472

CATALYTIC ALKYLATION OF ALKYL-SUBSTITUTED AROMATICS WITH MONOOLEFINS

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 14, 1978, Ser. No. 969,600
Int. Cl.[2] C07C 3/52
U.S. Cl. 585—452 **38 Claims**

1. A process comprising reacting a monoolefin hydrocarbon with an alkyl aromatic compound having a hydrogen atom bonded to at least one benzylic carbon of at least one alkyl group in the presence of a catalytic amount of alkali metal and a conversion promoting amount of a promoter composition selected from the group consisting of (1) biphenyl and a conjugated diene hydrocarbon containing 4 to 12 carbon atoms per molecule, (2) biphenyl, a conjugated diene hydrocarbon containing 4 to 12 carbon atoms per molecule, and a tertiary amine and (3) naphthalene and a tertiary amine under such reaction conditions that at least one benzylic carbon of said alkyl aromatic compound is alkylated.

4,179,473

PRODUCTION OF MONOALKYL AROMATICS

Robert P. Cox, Wyckoff, N.J., assignor to The Lummus Company, Bloomfield, N.J.

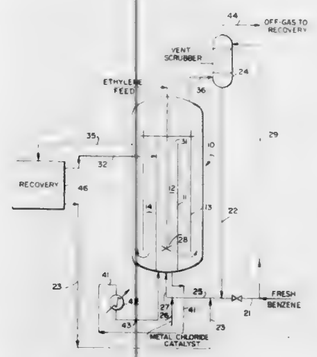
Filed Oct. 10, 1978, Ser. No. 950,243
Int. Cl.[2] C07C 3/54, 3/62
U.S. Cl. 585—313 **5 Claims**

1. A process for producing a monoalkyl aromatic by reaction between olefin and aromatic, comprising:

introducing aromatic, olefin and alkylation catalyst into a combination alkylation-transalkylation reactor comprised of a central alkylation zone and a surrounding transalkylation zone, said aromatic and olefin being introduced into said alkylation zone and caused to flow cocurrently therethrough at alkyl aromatic production conditions to produce monoalkyl aromatic product and polyalkyl aromatic by-product, and then in plug flow through said surrounding transalkylation zone to effect transalkylation to monoalkyl aromatic;

withdrawing an effluent from the transalkylation zone containing monoalkyl aromatic product and polyalkyl aromatic by-product;

recovering monoalkyl aromatic product and polyalkyl aromatic by-product from the effluent; and



introducing polyalkyl aromatic by-product into the inlet portion of the transalkylation zone.

4,179,474

PROCESS FOR CONVERSION OF NAPHTHA TO ETHYLENE

Harold Beuther, Cheswick, and Harold E. Swift, Gibsonia, both of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Dec. 22, 1977, Ser. No. 863,404
Int. Cl.[2] C07C 5/04
U.S. Cl. 585—251 **25 Claims**

1. A process comprising catalytically hydrotreating a feed naphtha stream containing olefins, naphthenes and aromatics to produce a hydrogenated naphtha stream containing less than 10 ppm by weight of sulfur and less than 5 volume percent of olefins plus aromatics and more than 10 volume percent of cycloparaffins, passing said hydrogenated naphtha stream to a pyrolysis zone, also passing to said pyrolysis zone a sulfur compound in an amount sufficient to increase the sulfur content based on hydrogenated naphtha to between about 20 and about 1,000 ppm by weight, operating said pyrolysis zone without added molecular hydrogen and without a catalyst at a temperature between 1,300° and 2,300° F. for a residence time between 0.05 and 2 seconds to produce a pyrolysis product containing ethylene and ethane wherein the ethylene yield is more than twice the ethane yield on a weight basis.

4,179,475

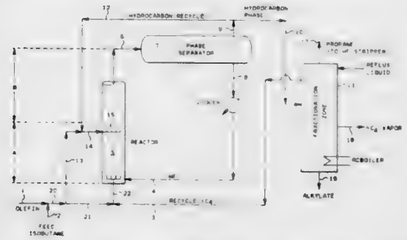
OLEFIN FEED IN HF ALKYLATION OF ISOPARAFFIN WITH OLEFIN

Donald J. Makovec, and Donald M. Haskell, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 11, 1978, Ser. No. 905,073
Int. Cl.[2] C07C 3/54
U.S. Cl. 585—714 **3 Claims**

1. The alkylation of an isoparaffin with an olefin in the presence of an acid catalyst which comprises introducing into one end of an elongated alkylation reaction zone a first portion of feed olefin together with a first portion of feed isoparaffin, together with recycled isoparaffin, at alkylation conditions for at least some reaction to take place and then downstream of said end introducing a second portion of said feed olefin, additional feed isoparaffin together with substantially all of a recycled hydrocarbon phase obtained in an ensuing settling zone, as hereinafter delineated, at alkylation conditions for additional reaction to take place, passing the effluent from said alkylation zone to said settling zone to separate a hydrocarbon phase

from an acid phase, recycling the acid phase to said alkylation zone, separating said hydrocarbon phase into at least two portions, recycling a first portion of said hydrocarbon phase as



said recycled hydrocarbon phase and passing another portion of said hydrocarbon phase to fractionation to withdraw an alkylate product.

4,179,476

SEMI-CONTINUOUS PROCESS FOR OBTAINING AMINO COMPOUNDS

Gerhard Franz, Frick, Switzerland; Georg Halfter, Wyhlen, Fed. Rep. of Germany; Walter Jaeckle, and Fritz Mindermann, both of Grenzach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 706,370, Jul. 19, 1976, abandoned. This application Nov. 23, 1977, Ser. No. 854,443
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1975, 2534176
Int. Cl.[2] C07C 85/11, 143/56
U.S. Cl. 260—706 **8 Claims**

1. In a process for the production of a water-soluble aromatic amine compound by the reduction of a corresponding nitro compound selected from the group consisting of nitrobenzene, 2-nitro-4-methylsulphonyl-phenol, 2-nitro-2'-sulpho-4,4'-dichloro-diphenyl ether, 4,4'-dinitro-stilbene-2,2'-disulphonic acid, nitrobenzenedisulphonic acid-2,5,3-nitrobenzenesulphonic acid, 6-nitro-2-naphthol-4-sulphonic acid or 2-chloro-5-nitrobenzoic acid, with iron in acidic aqueous medium, the improvement comprising, a semi-continuous process comprising the steps of

(1) providing an aqueous solution or suspension of the aromatic nitro compound in a first vessel,

(2) providing an acidic aqueous suspension of iron particles in a second vessel,

(3) introducing a less-than-stoichiometric amount of the suspension of the aromatic nitro compound from the first vessel into the second vessel,

(4) allowing the acidic suspension of iron to react with the aromatic nitro compound to yield to aromatic amine compound and iron oxide, at about 50° C. to about 110° C.,

(5) substantially separating the unreacted iron particles from the reaction mixture by removal of a substantial portion of the iron oxide, water and aromatic amine compound from the second vessel, while leaving the unreacted iron particles therein,

(6) repeating steps (3), (4) and (5) while maintaining the acidity and the stoichiometric excess of unreacted iron in the reaction mixture.

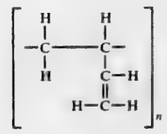
4,179,477

FAST CURING COATING COMPOSITION

Lawrence G. Bockstie, Jr., Bradford, Pa., assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 8, 1974, Ser. No. 486,395
Int. Cl.[2] C08F 279/02
U.S. Cl. 525—284 **5 Claims**

1. A dielectric coating composition consisting essentially of (a) from about 35 to 90 parts by weight of a polybutadiene resin system consisting essentially of 45 to 85 parts by weight of a polybutadiene resin having a molecular weight between about 750 to about 14,000, at least about 75 percent concentration of pendant vinyl groups and a molecular structure of



1 to 5 parts by weight of at least one catalyst selected from the group consisting of dicumyl peroxide, benzoyl peroxide, lauroyl peroxide, and t-butyl hydroperoxide, and up to 40 parts by weight of at least one reactive monomer selected from the group consisting of vinyl toluene, t-butylstyrene, alkyl substituted styrene and diallyl maleate, and

(b) from about 10 to 65 parts by weight of at least one silane selected from the group consisting of vinyltriethoxysilane, vinyl silane, vinyltriacetoxysilane, and vinyltrimethoxysilane.

4,179,478

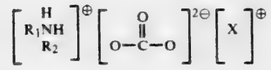
PROCESS FOR THE PRODUCTION OF BINDERS

Hans J. Rosenkranz; Hans-Joachim Traenckner, and Karl Fuhr, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 13, 1978, Ser. No. 914,999
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727417
Int. Cl.[2] C08L 63/00
U.S. Cl. 525—113 **5 Claims**

1. A process for the production of lacquer binders from 1,2-polyepoxides having more than one 1,2-epoxide group per molecule which comprises the steps of:

(a) reacting the 1,2-polyepoxide with from 0.01 to 0.6 NH-equivalents as hereinbefore defined, based on one epoxide equivalent, of a compound having the general formula (I)



wherein X is a hydrogen atom or a group H_2NR_1,R_2; and R_1 and R_2 are the same or different and each is a hydrogen atom, an alkyl group having from 1 to 18 carbon atoms, a cyclopentyl group, a cyclohexyl group, a hydroxyalkyl group having from 2 to 18 carbon atoms in the alkyl moiety, an alkoxylalkyl group having from 1 to 4 carbon atoms in the alkoxy moiety and from 2 to 18 carbon atoms in the alkyl moiety, an alkoxy carbonylalkyl group having from 1 to 4 carbon atoms in the alkoxy moiety and from 2 to 18 carbon atoms in the alkyl moiety, an N-dialkylaminoalkyl group having from 2 to 18 carbon atoms in the alkyl moiety and from 1 to 4 carbon atoms in the N-dialkylamino moiety, a carboxyalkyl group having from 1 to 6 carbon atoms in the alkyl moiety, an aminoalkyl group having from 2 to 6 carbon atoms, an aminoalkyl group having from 2 to 6 carbon atoms in the alkyl moiety and having the carbon chain thereof interrupted by one or more —NH— or —N(CH_3)-groups; or R_1 and R_2 together with the nitrogen atom to which they are both attached form a piperidine or pyrrolidine ring structure;

(b) reacting the thus obtained compound with from 0.40 to 0.90 carboxyl equivalent as hereinbefore defined, based on

V 9 8 9 N 3 D
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UMI

one epoxide equivalent of acrylic acid, methacrylic acid or a mixture thereof; and optionally

(c) reacting the compound obtained from step (b) with from 0.40 to 0.2 carboxyl equivalents as hereinbefore defined, based on one epoxide group, or a saturated aliphatic monocarboxylic acid;

so that at least 80% of the epoxide groups originally present are reacted.

4,179,479

THERMOPLASTIC POLYURETHANE BLENDS CONTAINING A PROCESSING AID

Russell P. Carter, Jr., New Martinsville, W. Va., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Apr. 20, 1978, Ser. No. 897,982

Int. Cl.[2] C08L 75/00

U.S. Cl. 525—66 **4 Claims**

4. The composition of claim 2, wherein component (B) comprises a thermoplastic polycarbonate.

4,179,480

BLENDS OF CYCLODIENE-CONTAINING COPOLYMERS AND BLOCK COPOLYMERS HAVING IMPROVED HIGH TEMPERATURE GREEN TENSILE STRENGTH

Henry L. Hsieh, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 5, 1976, Ser. No. 739,175

Int. Cl.[2] C08L 53/02

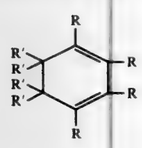
U.S. Cl. 525—99 **16 Claims**

9. A composition of matter consisting essentially of:

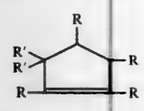
(a) a block copolymer represented by the formula $Z(B\text{-}A)_n$ wherein A is an essentially homopolymer block of a vinyl aromatic compound and Z is selected from the group consisting of an essentially homopolymer block of a conjugated diene having from 4 to 8 carbon atoms and a random copolymer block of said conjugated diene and said vinyl aromatic compound wherein the weight ratio of said vinyl aromatic compound to said conjugated diene is in the approximate range of 1:4 to 4:1, Z is derived from a polyfunctional compound having 3 or 4 reactive sites, and n is an integer having a value of 3 or 4, and

(b) from 5 to 100 parts of a copolymer of cyclodiene per 100 parts of said block copolymer, wherein said copolymer of cyclodiene is prepared by polymerizing a mixture of

(1) from 10 to 90 weight percent of 1,3-cyclodiene compound having from 5 to 20 carbon atoms selected from the group consisting of 1,3-cyclohexadiene and substituted derivatives thereof represented by the formula



and 1,3-cyclopentadiene and substituted derivatives thereof represented by the formula



wherein each of the above formulas each R is individually selected from the group consisting of hydrogen, methyl and ethyl, and each R′ is individually selected from the group consisting of hydrogen, alkyl having from 1 to 6 carbon atoms, cycloalkyl having from 5 to 6 carbon atoms, phenyl and methylcyclopentyl, and

(2) from 90 to 10 weight percent of at least one monomer selected from the group consisting of acyclic conjugated dienes having from 4 to 8 carbon atoms per molecule, vinyl-substituted aromatic compounds having from 8 to 14 carbon atoms per molecule, and mixtures thereof in which the weight ratio of said acyclic conjugated diene to said vinyl aromatic compound is in the approximate range of 99:1 to 1:99.

4,179,481

VINYL CHLORIDE RESIN COMPOSITIONS

Minoru Tuzuki; Kuniyoshi Matuba, both of Kobe, and Kazuo Saito, Nishinomiya, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 641,506, Dec. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 428,814, Dec. 27, 1973, abandoned, which is a continuation of Ser. No. 235,400, Mar. 16, 1972, abandoned. This application Nov. 7, 1977, Ser. No. 849,538

Int. Cl.[2] C08L 53/00

U.S. Cl. 525—80 **5 Claims**

1. Vinyl chloride resin composition having improved physical properties and improved workability, comprising

(A) 100 parts by weight of vinyl chloride series resin selected from the group consisting of polyvinyl chloride, copolymer of at least 80% by weight vinyl chloride with other monomers copolymerizable therewith, and after chlorinated polyvinyl chloride; and blended therewith

(B) 0.1 to 100 parts by weight of a composite interpolymer having a specific viscosity of at least 0.1, obtained by emulsion polymerizing in an aqueous medium consisting essentially of an emulsifier and a polymerization initiator, 70 to 95 parts by weight of a first member selected fromm the group consisting of methyl methacrylate and a first monomer mixture consisting of 85.71 weight percent or more of methyl methacrylate and 14.29 weight percent or less of a second member selected from the group consisting of n-butyl methacrylate, ethyl methacrylate, ethyl acrylate, acrylonitrile and mixtures thereof; and then, emulsion polymerizing by adding to said aqueous medium containing the polymerization product of the prior polymerization step, 5 to 30 parts by weight of a second monomer mixture consisting essentially of 20 to 40 weight percent methyl methacrylate and 80 to 60 weight percent of a third member selected from the group consisting of ethyl acrylate, n-butyl methacrylate, acrylonitrile, ethyl methacrylate, n-butyl acrylate, and mixtures thereof.

4,179,482

2-CHLOROETHYL PHOSPHONATE COMPOSITIONS

Gail H. Birum, Kirkwood, and Richard F. Jansen, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 855,533, Nov. 28, 1977, abandoned, which is a continuation of Ser. No. 831,707, Sep. 9, 1977, abandoned. This application Sep. 25, 1978, Ser. No. 945,668

Int. Cl.[2] C07F 9/40; C08J 9/00

U.S. Cl. 260—941 **1 Claim**

1. The composition prepared by the step-wise treatment of phosphorus trichloride with ethylene oxide in about stoichiometric proportions and at temperatures of from about −20° C. to about 125° C. followed by treatment of the resulting phosphite ester intermediate with from about 0.4 to about 1.2 moles of acrylic acid per mole of said phosphite ester intermediate in the presence of lower alkyl acrylate ester to substantially reduce the acidity of said composition and at temperatures of from about 20° C. to about 185° C. until substantially all the phosphite ester is converted to phosphonate structures.

4,179,483

2-CHLOROETHYL PHOSPHONATES

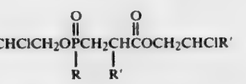
Gail H. Birum, Kirkwood, and Richard F. Jansen, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 855,533, Nov. 28, 1977, abandoned, which is a continuation-in-part of Ser. No. 831,707, Sep. 9, 1977, abandoned. This application Sep. 25, 1978, Ser. No. 945,669

Int. Cl.[2] C07F 9/40; C08N 5/53

U.S. Cl. 260—941 **3 Claims**

1. 2-chloroalkyl (2-chloroalkoxy)hydrocarbylphosphinylpropionates of the general formula,



where R is phenyl, methyl or ethyl and R′ is hydrogen or methyl.

4,179,484

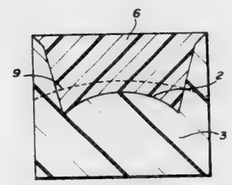
METHOD OF MAKING TORIC LENSES

Charles W. Neefe, Box 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 874,934, Feb. 3, 1978, Pat. No. 4,150,073, which is a continuation-in-part of Ser. No. 793,388, May 25, 1977, abandoned. This application Jan. 15, 1979, Ser. No. 3,724

Int. Cl.[2] B29D 11/00

U.S. Cl. 264—1 **2 Claims**



1. A method of making toric plastic lenses comprising the steps of; providing a positive lens mold having a first spherical surface curvature, and a second surface corresponding to the edge surface of the finished lens with the second surface extending from the first surface curvature a distance greater than the height of the thickness of the lens, forming a negative mold from the positive mold by applying a heat softened resinous material against the first surface curvature and the second surface of the positive mold to form an open top cylinder from the resinous material with an image of the first spherical surface curvature as the bottom of the cylinder and the image of the second surface as the walls of the cylinder, removing the positive lens mold from the negative lens mold, applying sufficient heat to soften the resinous cylinder, applying pressure to two opposing sides of the resinous cylinder to change the shape of the cylinder from a circle to an ellipse and to change the spherical curve present in the bottom of the cylinder from a sphere to toric, allowing the resinous cylinder to cool before removing the pressure, filling the resinous negative mold with a liquid monomer lens material, allowing the liquid monomer lens material to polymerize to form a solid monlithic mass within the resinous negative mold having one finished toric optical surface molded by the toric surface curvature formed in the bottom of the resinous mold, cutting and polishing a second optical surface on the polymerized lens material while the lens material is supported within the resinous mold adjacent to the lens material, and removing the toric lens from the resinous cylinder of the negative mold.

4,179,485

BONE PROSTHESIS AND METHOD OF MANUFACTURE THEREOF

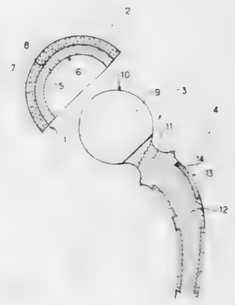
Paul Tritten, Tarbes, France, assignor to Ceraver, France

Continuation-in-part of Ser. No. 739,789, Nov. 8, 1976, abandoned, which is a continuation of Ser. No. 434,685, Jan. 18, 1974, abandoned. This application Jan. 13, 1978, Ser. No. 869,292

Claims priority, application France, Jan. 18, 1973, 73 01668

Int. Cl.[2] C04B 35/10

U.S. Cl. 264—44 **8 Claims**



1. A method for manufacturing a bone prosthesis formed at least in part from substantially pure porous alumina and having porosity of about 30% and a pore size of about 100 to 200 microns, comprising granulating a powder of substantially pure alumina with an organic binder into grains of a size between about 0.5 and 1.5 millimeters, heating said grains in bulk to a temperature of at least 1.400° C., but lower than their sintering temperature, disintegrating the bulk so heated, compressing the disintegrated alumina grains at a pressure of at least about 1 metric ton per square centimeter into a first pressed mass, and sintering said first pressed mass at a temperature of about 1.650°–1.700° C. to form said porous alumina.

4,179,486

METHOD OF PROTECTING Si_3N_4 CERAMIC ALLOY DURING HEATING

Frederick F. Lange, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 21, 1978, Ser. No. 926,770

Int. Cl.[2] C04B 35/58, 35/50

U.S. Cl. 264—65 **9 Claims**

1. A method of protecting a Si_3N_4 ceramic alloy article during heating comprising the steps of:

providing a Si_3N_4 ceramic alloy article;

loosely packing said article in Si_3N_4 powder;

heating said article and said powder to a processing temperature in an oxidizing atmosphere;

cooling said article and said powder to a temperature below said processing temperature; and

removing said article from said powder.

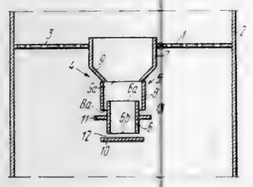
V 9 8 9 1 3 D E 1 8 7 9 UMI

4,179,487

CONTACT APPARATUS FOR CARRYING OUT HEAT-AND-MASS EXCHANGE PROCESSES

Oleg S. Chekhov, Leninsky prospekt, 152, kv. 77; Alexandr G. Rybinsky, ulitsa Geroev Panfilovtsev, 1, korpus 5, kv. 84, both of Moscow; Anatoly B. Tjutjunnikov, ulitsa Frunze, 17, kv. 34, Kharkov; Gennady P. Solomakha, ulitsa Pervomaiskaya, 56, kv. 25, Moskovskaya oblast, Dolgoprudny, and Viktor V. Dilman, ulitsa Kravchenko, 4, korpus 2, kv. 6, Moscow, all of U.S.S.R.

Filed Apr. 4, 1978, Ser. No. 894,083
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—114 R **8 Claims**



1. A contact apparatus for carrying out heat-and-mass processes running in a gas-liquid system, comprising: a perforated base having ports formed therein adapted for gas to pass therethrough; at least one liquid overflow device defining a substantially vertical liquid flow passage including a top shell having a substantially vertically extending axis fixed at its upper region to said perforated base, a bottom shell arranged coaxially with respect to said top shell, said bottom shell having an upper region which partly extends within said top shell a clearance being defined between said bottom shell upper region and said top shell, and top shell being defined by a top shell piece, the upper region thereof comprising said upper region which is fixed to said perforated base, a bottom shell piece having a smaller flow passage area than that of said top shell piece, and a guide member extending between and integrally interconnecting said top and bottom shell pieces, the lower edge of said guide member being situated above the upper end of said bottom shell, a first baffle provided under the lower end of said bottom shell piece, and a second baffle provided under the lower end of said bottom shell whereby liquid is adapted to flow from said perforated base through said overflow device by passing over the upper end of said top shell piece into said top shell whereupon it is directed by said guide member to flow into said bottom shell, the liquid discharging from said overflow device as a substantially flat stream as the same impinges on said second baffle, said clearance defined by said bottom shell upper region and said top shell into which it partly extends being adapted to provide a liquid flow passage for liquid which accumulates within and extends over the upper edge of said lower shell, any liquid passing through said liquid flow passage adapted to impinge on said first baffle.

4,179,488

METHOD OF MAKING A FROSTED BOTTLE OF SATURATED POLYESTER

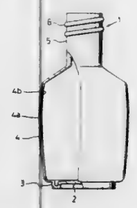
Masanori Nishikawa, Tochigi, and Masao Hattori, Hatano, both of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Division of Ser. No. 779,473, Mar. 21, 1977. This application Sep. 6, 1977, Ser. No. 830,864
Claims priority, application Japan, Mar. 31, 1976, 51/36636
The portion of the term of this patent subsequent to Aug. 14, 1996, has been disclaimed.
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—521 **3 Claims**

1. A method of making a frosted bottle of a saturated polyester resin comprising the steps of:

preparing an uncrystallized transparent cylinder of a saturated polyester resin formed by injecting molding and having a bottom wall and upper opening;

heating said cylinder from only the outside thereof at a predetermined temperature above the glass transition temperature for a predetermined time such that, through the thickness, only an outer fraction of the cylinder is crystallized, the interior of the cylinder being at a lower temperature due to the temperature gradient across the



thickness of the cylinder such that the interior of the cylinder is maintained to be uncrystallized and transparent;

placing the heated and differentially crystallized cylinder in a mold, and

subsequently blow-molding said cylinder at a temperature suitable for biaxial orientation upon inflation to form said frosted bottle.

4,179,489

CHLORINATION OF IRON-CONTAINING MATERIALS

John Lumsden, Bristol, England, assignor to Mineral Process Licensing Corporation B.V., The Hague, Netherlands

Filed May 19, 1978, Ser. No. 907,766
Claims priority, application United Kingdom, May 19, 1977, 21189/77; Sep. 21, 1977, 39243/77
Int. Cl.[2] C01G *23/02, 49/10*
U.S. Cl. 423—79 **16 Claims**

1. A process for the chlorination of a solid material containing iron and titanium chemically combined with oxygen, comprising feeding the material to be chlorinated in particulate solid form into a fluidized bed of solids containing ferrous chloride at a temperature between about 200° C. and 677° C., and simultaneously feeding to said fluidized bed at least one chlorinating agent selected from the group consisting of molecular chlorine, sulphur monochloride, and ferric chloride, and a source of sulphur selected from the group consisting of elemental sulphur and sulphur monochloride, the free and combined chlorine and sulphur being present in such molar proportions, relative to the starting material containing iron, titanium, and oxygen, as to produce, as principal reaction products, only solid ferrous chloride, sulphur dioxide gas, and titanium tetrachloride vapor.

4,179,490

PREPARATION OF PURE MAGNESIAN VALUES

George G. Judd, Woodville, Ohio, assignor to Woodville Lime & Chemical Company, Woodville, Ohio

Continuation of Ser. No. 732,528, Oct. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 628,093, Nov. 3, 1975, abandoned. This application Aug. 23, 1978, Ser. No. 936,109
Int. Cl.[2] C01F *5/24*
U.S. Cl. 423—165 **2 Claims**

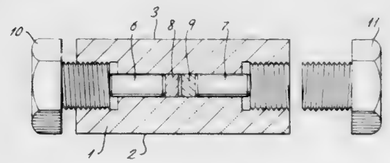
1. A method for recovering a magnesium carbonate of very high purity from a composition containing at least one calcium compound and at least one magnesium compound, which method comprises the steps of producing an aqueous slurry consisting of a mixture of precipitated calcium carbonate, precipitated hydrated magnesium carbonate, water insoluble impurities and water, introducing carbon dioxide into the slurry while maintaining the temperature thereof not higher than about 40° C. until there is an appreciable concentration of magnesium cations in the water of the slurry, discontinuing the carbon dioxide introduction while most of the calcium is present as calcium carbonate, separating solids from the aqueous solution of magnesium cations which results, removing carbon dioxide from the aqueous solution of magnesium cations to precipitate hydrated magnesium carbonate, and separating precipitated hydrated magnesium carbonate from the aqueous phase.

4,179,491

ELECTRICAL DEVICE WITH SEPARATOR AS CONDUCTOR FOR HYDROGEN CATIONS

Arthur T. Howe, and Mark G. Shilton, both of Leeds, England, assignors to National Research Development Corporation, London, England

Filed Jan. 20, 1978, Ser. No. 871,003
Claims priority, application United Kingdom, Nov. 15, 1976, 47470/76; May 5, 1977, 18897/77
Int. Cl.[2] C01G *43/00;* **H01M** *8/10, 6/18;* **G01N** *27/46*
U.S. Cl. 423—253 **3 Claims**



1. An electrical device including a separator which is a conductor for hydrogen cations, said conductor comprising the material

$$Y(UO_2)XO_4 \cdot nH_2O$$

wherein Y is a cation which is at least partially H cation, the remainder being at least one other cation, and wherein X is phosphorous, arsenic or $I(OH)_2$ and wherein n is at about its equilibrium value, said device further including means for causing said hydrogen cations to pass through said separator.

4,179,492

PROCESS FOR MAKING RARE EARTH METAL CHLORIDES

Paul R. Kruesi, Golden, Colo., assignor to Cato Research Corp., Wheatridge, Colo.

Filed Jul. 8, 1977, Ser. No. 813,884
Int. Cl.[2] C01F *17/00*
U.S. Cl. 423—263 **14 Claims**

1. A process for chlorinating a rare earth metal oxide to its chloride consisting essentially of:

(a) forming a liquid fused salt bath having a lower melting temperature than that of said chloride and wherein said liquid fused salt bath comprises ferric chloride and at least one other metal chloride selected from the group consisting of alkali metal chlorides, alkaline earth metal chlorides, zinc chloride, and ammonium chloride, which bath dissolves the rare earth metal chloride to be formed;

(b) introducing said rare earth metal oxide into said liquid fused bath having a temperature of from about 150° C. to about 550° C. to form said rare earth metal chloride; and

(c) recovering the formed rare earth metal chloride from the fused bath mixture.

4,179,493

DEHYDRATION PROCESS

Abraham Sadan, 1618 E. St. Charles Pl., Salt Lake City, Utah 84121

Filed Feb. 24, 1978, Ser. No. 880,868
Claims priority, application Israel, Mar. 18, 1977, 51692
Int. Cl.[2] B01D *1/00;* **C01B** *15/12;* **C01D** *15/06, 17/00*
U.S. Cl. 423—279 **6 Claims**

1. A process for the partial or complete dehydration of hydrated forms of salts having an increasing solubility with an increase of temperature, and possessing a transition temperature from an existing highly hydrated form to a less hydrated form in the range of between about 30° C. to about 100° C., comprising the steps of:

(a) preparing an aqueous solution of said highly hydrated form of salts;

(b) introducing said aqueous solution into a solar pond which is maintained non-convecting by means of a salt concentration gradient;

(c) concentrating said aqueous solution in an upper layer of the pond to form crystals of said highly hydrated form of the salt;

(d) allowing said formed crystals of the hydrated form of the salt to settle to a hotter bottom layer of the pond and to recrystallize into a partially or completely dehydrated form of the salt; and

(e) recovering the partially or completely dehydrated form of the salt from the bottom layer of the pond.

4,179,494

PROCESS FOR THE PRODUCTION OF CARBON BLACK

Lothar Rothbühr, Hermulheim, and Manfred Voll, Hanau, both of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Jun. 25, 1976, Ser. No. 699,973
Claims priority, application Fed. Rep. of Germany, May 12, 1976, 2530371
Int. Cl.[2] C01B *31/02;* **C09C** *1/48*
U.S. Cl. 423—456 **1 Claim**

1. A process for the production of furnace black comprising thermally splitting a carbon black forming oil by introducing air tangentially into a combustion chamber oxidizing with this air a fuel gas in the combustion chamber and thereby producing a stream of hot combustion gases, introducing this stream stepwise into a mixing chamber constricted compared to the combustion chamber, spraying the carbon black forming material into the mixing chamber at a spraying angle between 45° and 180°, conveying the resultant mixture into a reaction chamber enlarged compared to the mixing chamber, quenching the carbon black containing reaction mixture formed and recovering the carbon black, the fuel gas being introduced radially from a point near the axis of the combustion chamber outwardly, said stream of hot combustion gases either (1) being introduced into the mixing chamber via a annular channel or (2) being introduced into an annular channel shaped mixing chamber, the axial velocity of the hot combustion gases at the entrance of the annular channel or mixing chamber being between 600 and 850 meters/sec., the carbon black forming material being sprayed into said mixing chamber or annular channel from a position within said mixing chamber or annular channel to a position outwardly from said within position.

4,179,495

METHOD FOR REMOVING AS, OR AS AND SB AND/OR BI FROM SULFURIC ACID

Seiichi Murakita; Akio Ohta, and Satoshi Narahara, all of Niihama, Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed Aug. 22, 1978, Ser. No. 935,860
Claims priority, application Japan, Aug. 25, 1977, 52/102380
Int. Cl.[2] C01B *17/90;* C25C *1/12*
U.S. Cl. 423—531 44 Claims

34. A method for reducing the concentration of As, Sb and Bi in acidic solutions of sulfuric acid comprising providing an acidic solution of sulfuric acid having a free sulfuric acid concentration of less than 700 g./l. and containing arsenic, antimony and bismuth as impurities, warming the acidic solution to above 50° C., adding and mixing to the solution an additive selected from the group consisting of Sb_2O_3, Bi_2O_3 and mixtures thereof, allowing the solution to react with the additive for a time sufficient to cause some of each of the contained impurities to precipitate so that the concentration of arsenic, antimony and bismuth in the solution is less than the initial concentration of arsenic, antimony and bismuth in the solution, and separating the produced precipitate from the solution.

4,179,496

FIBROUS CRYSTALLINE POTASSIUM TITANATE AND PROCESSES FOR PREPARING FIBROUS POTASSIUM TITANATES

Hiroaki Yanagida, Kashiwashi; Tadao Shimizu, Tachikawashi, and Yasuo Nishikawa, Okayamashi, all of Japan, assignors to Kyushu Refractories Co., Ltd., Japan

Filed Aug. 22, 1977, Ser. No. 826,534
Claims priority, application Japan, Aug. 23, 1976, 51-100453; May 6, 1977, 52-51815
Int. Cl.[2] C01G *23/00*
U.S. Cl. 423—598 3 Claims

1. A process for preparing fibrous potassium titanate hydrate comprising kneading a mixture of one or more potassium compounds selected from the group consisting of potassium carbonate, potassium hydroxide, potassium sulfate, potassium nitrate, and potassium chloride, and one or more titanium compounds selected from the group consisting of titanium dioxide and titanium hydroxide with a ratio of potassium atom to titanium atom of between 2:2.5 to 2:8, forming the thus kneaded mixture into lumps or pellets, calcining the lumps or pellets at a temperature of from about 950° C. to 1150° C., recovering the bulk of the pellets after removing the whiskers produced on the surface thereof and then treating the thus recovered bulk in water for at least 30 minutes to form fibrous crystalline potassium titanate hydrate of the formula $2K_2O.1\text{-}1TiO_2.2HO_2$.

2. Fibrous crystalline potassium titanate of the formula $2K_2O.11T.O_2.2H_2O$ prepared by the process of claim 1.

4,179,497

SOLID STATE OPHTHALMIC MEDICATION

Edward M. Cohen, Beaumont, France; Wayne M. Grim, Doylestown, Pa.; Richard J. Harwood, Philadelphia, Pa., and Gunvant N. Mehta, Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 553,399, Feb. 26, 1975, abandoned, which is a continuation-in-part of Ser. No. 519,323, Oct. 31, 1974, abandoned, which is a continuation-in-part of Ser. No. 425,426, Dec. 17, 1973, abandoned. This application Nov. 13, 1978, Ser. No. 959,550
Int. Cl.[2] A61K *9/22, 9/26*
U.S. Cl. 424—22 1 Claim

1. The method of applying pilocarpine to the eye which comprises inserting a solid ophthalmic insert comprising between 0.1 to about 35% of pilocarpine pamoate as an ophthalmic active agent admixed in a matrix of from about 65 to about 99% of hydroxypropyl cellulose in the cul-de-sac of the conjunctiva to thereby dispense the active agent pilocarpine to the eye over a prolonged period of time.

4,179,498

STREPTOMYCETAL ANTIBIOTIC

Stephen J. Box, Plummers Plain Nr. Horsham, and John D. Hood, Cranleigh, both of England, assignors to Beecham Group Limited, England

Continuation-in-part of Ser. No. 664,917, Mar. 8, 1976, abandoned. This application Aug. 24, 1976, Ser. No. 717,336
Claims priority, application United Kingdom, Mar. 15, 1975, 10914/75
Int. Cl.[2] A61K *25/00*
U.S. Cl. 424—117 9 Claims

1. A pharmaceutically acceptable di-basic salt of MM 17880 which is at least 75% pure wherein MM 17880 is a di-acidic solid of the molecular formula $C_{11\text{-}14}H_{18\text{-}23}O_{8\text{-}11}N_2S_2$ which in the form of a substantially pure di-sodium salt, has the following properties:

(a) when present at 0.4% w/w in a freshly prepared KBr disc, it has a characteristic infra-red spectrum substantially as shown in FIG. 1;

(b) it has a characteristic nuclear magnetic resonance spectrum which when taken in deuterium oxide is substantially as shown in FIG. 2;

(c) it has a characteristic ultra-violet spectrum which in water has an absorption maximum at about 297 n.m. substantially as shown in FIG. 3;

(d) it possesses antibacterial activity against certain gram-positive and gram-negative organisms, including strains of *Bacillus subtilis, Enterobacter cloacae, Escherichia coli, Klebsiella aerogenes, Proteus mirabilis, Salmonella typhimurium, Serratia marcescens* and *Staphylococcus aureus;* and

(e) when mixed with ampicillin or amoxycillin it synergizes their antibacterial activity against certain bacteria, including strains of *Staphylococcus aureus* and *Klebsiella aerogenes.*

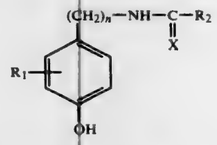
4,179,499

PESTICIDES FOR SNAILS

Kresten Christensen, Brig, Switzerland, assignor to Lonza Ltd., Gampel, Switzerland

Continuation-in-part of Ser. No. 515,473, Oct. 17, 1974, abandoned, and a continuation-in-part of Ser. No. 515,603, Oct. 17, 1974, abandoned. This application Oct. 1, 1975, Ser. No. 618,361
Claims priority, application Switzerland, Jul. 5, 1974, 009310/74; Jul. 8, 1974, 009369/74
Int. Cl.[2] A01N *11/04, 9/22, 9/02*
U.S. Cl. 424—143 15 Claims

1. The pesticide composition for snails comprised of an edible binder, a bait substance for snails, a pesticide for snails, a carrier and an amide having the formula:



wherein X is an oxygen atom or a sulfur atom, n is 0 or 1, R_1 is —OH or —OCH_3 and R_2 is (i) an alkyl group having 5 to 11 carbon atoms, (ii) an alkylene group having 5 to 11 carbon atoms, (iii) an alkyl group having 5 to 11 carbon atoms and which is substituted with a phenyl group or with a phenyl group that is substituted with one to three alkyl groups, each such alkyl group having one to five carbon atoms, or (iv) an alkylene group having 5 to 11 carbon atoms and which is substituted with a phenyl group or with a phenyl group that is substituted with one to three alkyl groups, each alkyl group having one to five carbon atoms, said amide being present in an amount between 0.005 and 5 percent by weight, based on the total weight of said pesticide composition, and said carrier being present in an amount between 30 and 70 percent by weight, based on the total weight of said pesticide composition.

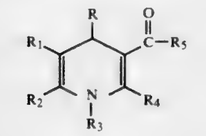
4,179,500

1,4-DIHYDROPYRIDINE-SUGAR DERIVATIVES, AND THEIR USE AS MEDICAMENTS

Bodo Junge; Friedrich Bossert; Horst Meyer, all of Wuppertal; Egbert Wehinger, Velbert; Wulf Vater, Leverkusen; Arend Heise, Wuppertal; Stanislav Kazda, Wuppertal, and Kurt Stoepel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 26, 1977, Ser. No. 828,135
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1976, 2641746
Int. Cl.[2] A61K *31/70, 31/72;* C07H *15/00*
U.S. Cl. 424—180 13 Claims

1. A 1,4-Dihydropyridine-sugar derivative of the formula I



I

in which

R represents a phenyl radical which is unsubstituted or carries one or two of the substituents nitro, halogen, trifluoromethyl and cyano, or represents pyridyl, quinolyl or isoquinolyl, the pyridyl radical being unsubstituted or substituted by alkyl with 1 to 4 carbon atoms,

R_1 represents a group of the formula



and —$S(O)_m$—R_6 (m=0 or 2),

wherein

R_6 denotes an alkyl, alkenyl, cycloalkyl or an alkoxyalkyl radical with up to 6 carbon atoms in each case

or wherein

R_6 represents benzyl, phenethyl, phenoxyethyl β-aminoethyl which carries a methyl and a benzyl group on the nitrogen,

R_2 and R_4 identical or different and represent hydrogen, alkyl with 1 to 2 carbon atoms or benzyl,

R_3 represents hydrogen, alkyl with 1 to 4 carbon atoms or benzyl and

R_5 represents a D-glucose, D-fructose, D-mannose, D-galactose, D-ribose, 2-desoxy-D-ribose, D-xylose, D- and L-arabinose, maltose, lactose, saccharose, isomaltose and cellobiose radical, which is bonded to the carbonyl group of the 1,4-dihydropyridine radical either directly or via a short bridge —O—X—, wherein

X represents an alkylene chain of 2 to 4 carbon atoms, the bond to the sugar being via the hydroxyl groups of the sugar unit and being both an ester bond and a glycosidic bond.

11. A method of combating circulatory disease influenced by vasodilation in a warm-blooded animal which comprises administering to said animal an effective amount of an active compound according to claim 1 either alone or in admixture with a diluent or in the form of a medicament.

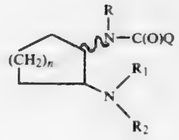
4,179,501

ANALGESIC N-(2-AMINOCYCLOALIPHATIC)AZIDOBENZAMIDES

Jacob Szmuszkovicz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 741,467, Nov. 12, 1976, Pat. No. 4,098,904. This application May 10, 1978, Ser. No. 904,475
Int. Cl.[2] A61K *31/165;* C07C *117/00*
U.S. Cl. 424—226 10 Claims

1. A compound of the formula



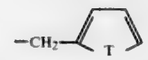
I

wherein

the wavy line (~) at the 1-position of the cycloaliphatic ring denotes trans-stereoconfiguration of the 1-position substituent with respect to the substituent in position 2 of the same cycloaliphatic ring; n is 1 to 8;

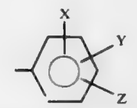
R is hydrogen or C_1 to C_3-alkyl;

R_1 and R_2, taken separately, are hydrogen, C_1 to C_3-alkyl, or when R_1 is hydrogen or C_1 to C_3-alkyl, R_2 is C_1 to C_6-alkyl, CH_2CF_3, -C_3 to C_6-(allylic)alkenyl, a group of the formula



wherein T is —O— or —S—; C_2 to C_5-hydroxyalkyl, phenyl-C_2 to C_3-alkyl, C_3 to C_6-cycloalkyl, C_3 to C_4-cycloalkylmethyl, or R_1 and R_2, taken together with the nitrogen to which they are bonded, complete an azetidinyl, pyrrolidinyl, piperidinyl, or piperizinyl ring group, or an azetidinyl or pyrrolidinyl ring group substituted in the 3-position with hydroxy, C_1 to C_3-alkyl, C_1 to C_3-alkyloxy, C_1 to C_3-alkanoyloxy, a piperidinyl ring group substituted in the 3- or 4- position with hydroxy, C_1 to C_3-alkyl, C_1 to C_3 alkyloxy, or C_1 to C_3-alkanoyloxy or a piperazinyl ring group substituted on the p-nitrogen thereof with C_1 to C_3-alkyl,

Q is the radical



wherein one of X, Y and Z is azido, and the remaining X, Y and Z moieties are hydrogen, and the pharmaceutically acceptable salts thereof.

5. A composition useful in pharmaceutical dosage unit form in an amount ranging from about 0.5 to about 350 mg. per dosage unit for alleviating pain in warm blooded animals which comprises a compound of Formula I of claim 1 in combination with a pharmaceutically acceptable carrier.

DE 18 79 UMI

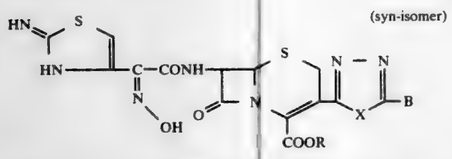
4,179,502

7[2-HYDROXYIMINOACETAMIDO]CEPHALOSPORINS

Mitsuo Numata, 25-13, Ankojicho 4-chome, Takatsuki, Osaka, Japan ((569)); Isao Minamida, 526-13, Oharano-kamisatominaminocho, Nishikyo-ku, Kyoto, Japan ((615)), and Susumu Tsushima, A1-1201, 8 Momoyamadai 2-chome, Suita, Osaka, Japan ((565))

Filed Feb. 14, 1978, Ser. No. 877,746
Claims priority, application Japan, Feb. 17, 1977, 52/16994
Int. Cl.[2] A61K *31/545;* C07D *501/20*
U.S. Cl. 424—246 5 Claims

1. A 2-hydroxyiminoacetamide of the formula:



(syn-isomer)

wherein X is S; B is —NHCOCH$_3$, and R is hydrogen and pharmaceutically acceptable salts thereof.

4. A method for the treatment of diseases caused by bacteria, which comprises internally administering to a human a pharmaceutically effective amount of the compound as claimed in claim 1.

5. An antibacterial composition, which comprises a therapeutically effective amount of the compound as claimed in claim 1 and a pharmaceutically acceptable carrier thereof.

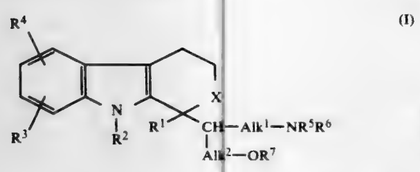
4,179,503

1-HYDROXYALKANAMINE PYRANO[3,4-b]INDOLE DERIVATIVES

Andre A. Asselin, St. Laurent; Leslie G. Humber, Dollard des Ormeaux; Gervais Dionne, St. Laurent; Clara Revesz, Montreal, and Amedeo Failli, St. Laurent, all of Canada, assignors to American Home Products Corp., New York, N.Y.

Filed May 8, 1978, Ser. No. 904,081
Int. Cl.[2] C07D *491/04, 495/04;* A61K *31/40*
U.S. Cl. 424—248.51 49 Claims

1. A compound of formula I



(I)

in which R^1 is lower alkyl; R^2 is hydrogen or lower alkyl; R^3 and R^4 each independently is hydrogen, lower alkyl, halo, nitro, trifluoromethyl or lower alkoxy; R^5 and R^6 each independently is hydrogen or lower alkyl or R^5 and R^6 together with the nitrogen atom form a pyrrol-1-yl, piperidino or morpholino; R^7 is hydrogen or lower alkyl; Alk^1 and Alk^2 each independently is a straight or branched chain lower alkylene having one to six carbon atoms; and X is oxa or thia, or a therapeutically acceptable acid addition salt thereof.

40. A method of increasing the excretion of urine in a mammal which comprises administering to said mammal an effective diuretic amount of a compound of formula I or a therapeutically acceptable salt thereof, as claimed in claim 1.

48. A pharmaceutical composition comprising a diuretic effective amount of a compound of formula I or a therpeutically acceptable acid addition salt thereof, as claimed in claim 1, in combination with a non-mineralocorticoid antagonizing diuretic agent and a pharmaceutically acceptable carrier.

4,179,504

ALKYL AMINE OXIDE TOXICANTS

Donald M. Lynch, Waldwick; Myron J. Lover, Mountainside; Arnold J. Singer, South Orange, and William E. Rhodes, III, Cranford, all of N.J., assignors to Block Drug Company, Inc., Jersey City, N.J.

Filed Oct. 14, 1977, Ser. No. 842,057
Int. Cl.[2] A61K *31/535*
U.S. Cl. 424—248.4 8 Claims

1. A method of controlling lice, mites or their ova which comprises applying to a human or an animal in need of such control, an effective toxic amount of at least one alkyl amine oxide wherein said oxide is of the formula



wherein R is alkyl, alkenyl or alkylaminoalkyl of 8 to 20 carbon atoms and R′ and R″ are individually selected from the group consisting of lower alkyl and hydroxy lower alkyl, or are linked so as to form with the nitrogen to which they are attached a morpholine group.

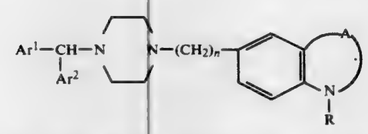
4,179,505

5-[4-(DIARYLMETHYL)-1-PIPERAZINYLALKYL]BENZIMIDAZOLE DERIVATIVES

Alfons H. M. Raeymaekers, Beerse; Josephus L. H. Van Gelder, Tielen; Gustaaf M. Boeckx, Oud-Turnhout, and Lodewijk L. Van Hemeldonck, Rijkevorsel, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 782,651, Mar. 30, 1977, abandoned. This application Jan. 4, 1978, Ser. No. 866,882
Int. Cl.[2] A61K *31/495;* C07D *401/14, 403/06, 409/14*
U.S. Cl. 424—250 39 Claims

1. A chemical compound selected from the group consisting of a 5-[4-(diarylmethyl)-1-piperazinylalkyl]benzimidazole derivative having the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein:

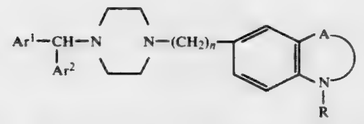
Ar^1 and Ar^2 are each independently selected from the group consisting of phenyl, halophenyl, (lower alkyl)phenyl, (lower alkyloxy)phenyl, nitrophenyl, thienyl and pyridinyl;

R is a member selected from the group consisting of hydrogen, lower alkyl, aryl(lower alkyl), hydroxy(lower alkyl), cycloalkyl having from 3 to 6 carbons, (lower alkyl)carbonyloxy(lower alkyl), aroyloxy(lower alkyl), (lower alkyl)sulfonyloxy(lower alkyl), halo(lower alkyl), arylthio(lower alkyl) and (lower alkyl)oxy(lower alkyl) wherein said aryl is selected from the group consisting of phenyl, substituted phenyl, thienyl and pyridinyl, said substituted phenyl being phenyl having from 1 to 2 substituents independently selected from the group consisting of halo, lower alkyl, and lower alkyloxy;

A is a member selected from the group consisting of the bivalent radicals —NH—CO— and —N=C(R^1)—, said bivalent radicals being attached to the benzene nucleus with their nitrogen atom, and, said R^1 being selected from the group consisting of hydrogen, lower alkyl, aryl(lower alkyl), hydroxy(lower alkyl), cycloalkyl having from 3 to 6 carbons, aryl, amino, (lower alkyl)carbonylamino, (lower alkyl)carbonyloxy(lower alkyl), aroyloxy(lower alkyl), (lower alkyl)oxycarbonylamino, (lower alkyl)aminocarbonylamino, and (lower alkyl)oxycarbonyl(lower alkyl), wherein said aryl is selected from the group consisting of phenyl, substituted phenyl, pyridinyl, furanyl, thienyl and halothienyl, said substituted phenyl having from 1 to 2 substituents independently selected from the group consisting of halo, lower alkyl and lower alkyloxy;

n is an integer of from 1 to 2 inclusive, provided that when said n is 2 then said R is selected from the group consisting of hydrogen, lower alkyl and cycloalkyl, and then said R^1 is selected from the group consisting of hydrogen, lower alkyl, cycloalkyl and aryl.

27. A method of inhibiting vasoactive agonist activity in warm-blooded animals which comprises the systemic administration thereto of a pharmaceutical composition comprising an inert carrier material and as an active ingredient an effective antihistaminic, anti-allergic or anti-asthmatic amount of a chemical compound selected from the group consisting of a 5-[4-(diarylmethyl)-1-piperazinylalkyl]-benzimidazole derivative having the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein:

Ar^1 and Ar^2 are each independently selected from the group consisting of phenyl, halophenyl, (lower alkyl)phenyl, (lower alkyloxy)phenyl, nitrophenyl, thienyl and pyridinyl;

R is a member selected from the group consisting of hydrogen, lower alkyl, aryl(lower alkyl), hydroxy(lower alkyl), cycloalkyl having from 3 to 6 carbons, (lower alkyl)carbonyloxy(lowr alkyl), aroyloxy(lower alkyl), (lower alkyl)sulfonyloxy(lower alkyl), halo(lower alkyl), arylthio(lower alkyl) and (lower alkyl)oxy(lower alkyl) wherein said aryl is selected from the group consisting of phenyl, substituted phenyl, thienyl and pyridinyl, said substituted phenyl being phenyl having from 1 to 2 substituents independently selected from the group consisting of halo, lower alkyl, and lower alkyloxy;

A is a member selected from the group consisting of the bivalent radicals —NH—CO— and —N=C(R^1)—, said bivalent radicals being attached to the benzene nucleus with their nitrogen atom, and, said R^1 being selected from the group consisting of hydrogen, lower alkyl, aryl(lower alkyl), hydroxy (lower alkyl), cycloalkyl having from 3 to 6 carbons, aryl, amino, (lower alkyl)carbonylamino, (lower alkyl)carbonyloxy(lower alkyl), aroyloxy(lower alkyl), (lower alkyl)oxycarbonylamino, (lower alkyl)aminocarbonylamino, and (lower alkyl)oxycarbonyl(lower alkyl), wherein said aryl is selected from the group consisting of phenyl, substituted phenyl, pyridinyl, furanyl, thienyl and halothienyl, said substituted phenyl having from 1 to 2 substituents independently selected from the group consisting of halo, lower alkyl and lower alkyloxy;

n is an integer of from 1 to 2 inclusive, provided that when said n is 2 then said R is selected from the group consisting of hydrogen, lower alkyl and cycloalkyl, and then said R^1 is selected from the group consisting of hydrogen, lower alkyl, cycloalkyl and aryl.

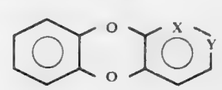
4,179,506

NEW PYRIDOBENZODIOXIN COMPOUNDS AND METHODS FOR THEIR PRODUCTION

Donald E. Butler, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 13, 1978, Ser. No. 960,252
Int. Cl.[2] A61K *31/535;* C07D *491/04*
U.S. Cl. 424—256 10 Claims

1. A compound of the formula



where X is N or N→O and Y is CH or X is CH and Y is N or N→O and pharmaceutically-acceptable acid addition salts of compounds where X is N or Y is N.

6. A pharmaceutical composition comprising a compound of claim 1 and a pharmaceutical carrier.

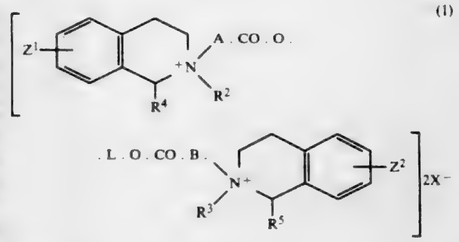
4,179,507

QUARTERNARY AMMONIUM COMPOUNDS

John B. Stenlake, Glasgow, Scotland; Roger D. Waigh, Wilmslow, England; George H. Dewar, Bath, England; John Urwin, South Shields, England, and Nirmal C. Dhar, Glasgow, Scotland, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Dec. 9, 1976, Ser. No. 749,174
Claims priority, application United Kingdom, Dec. 10, 1975, 50589/75; Oct. 29, 1976, 45028/76
Int. Cl.[2] A61K *31/47;* C07D2 *17/10*
U.S. Cl. 424—258 43 Claims

1. A compound of formula



(I)

wherein

Z^1 and Z^2 are the same or different and each represents a methylenedioxy substituent, or up to three methoxy substituents:

R^2 and R^3 are the same or different and each is alkyl having 1–3 carbon atoms, prop-2-enyl or prop-2-ynyl;

R^4 and R^5 are the same or different and each is a benzyl or phenethyl group wherein the phenyl ring is unsubstituted or is substituted by one or more of halogen, alkoxy having 1 to 3 carbon atoms and methylenedioxy;

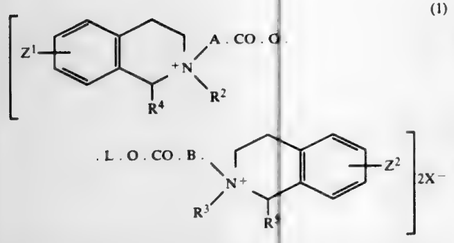
A and B are the same or different and each is an alkylene radical containing 1, 2 or 3 carbon atoms;

L is an alkylene chain having from 2 to 12 carbon atoms or is a group—L^1.0.L^2—wherein each of L^1 and L^2 is alkylene having at least two carbon atoms and taken together L^1 and L^2 have upto 11 carbon atoms; and

X^- is an anion.

16. A pharmaceutical composition comprising a compound of formula (I)

(1)



in amount sufficient to effect neuromuscular paralysis wherein

Z^1 and Z^2 are the same or different and each represents a methylenedioxy substituent, or up to three methoxy substituents;

R^2 and R^3 are the same or different and each is alkyl having 1–3 carbon atoms, prop-2-enyl or prop-2-ynyl;

R^4 and R^5 are the same or different and each is a benzyl or phenethyl group wherein the phenyl ring is optionally substituted by one or more of halogen, alkoxy having 1 to 3 carbon atoms and methylenedioxy;

A and B are the same or different and each is an alkylene radical containing 1, 2 or 3 carbon atoms;

L is an alkylene chain having from 2 to 12 carbon atoms or is a group—$L^1.O.L^2$—wherein each of L^1 and L^2 is alkylene having at least two carbon atoms and taken together L^1 and L^2 have upto 11 carbon atoms; and

X^- is a pharmaceutically acceptable anion;

in association with a pharmaceutically acceptable carrier.

4,179,508

SULFUR-CONTAINING DERIVATIVES OF 4,4-DIMETHYL-2H,4H-ISOQUINOLINE-1,3-DIONE, AND ANTICONVULSANT AND ANTIHYPERLIPIDEMIC COMPOSITIONS THEREOF

Volkhard Austel; Eberhard Kutter; Wolfgang Eberlein, all of Biberach; Joachim Heider, Warthausen, and Joachim Kähling, Biberach, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

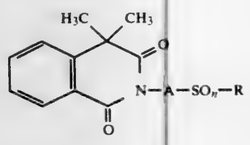
Filed Jul. 18, 1978, Ser. No. 925,877

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1977, 2734222

Int. Cl.[2] **C07D** *217/24;* **A61K** *31/47*

U.S. Cl. 424—258 **9 Claims**

1. A compound of the formula



where

A is lower alkylene,

R is a lower alkyl, and

n is 0, 1 or 2.

8. An anticonvulsant or antihyperlipidemic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective anticonvulsant or antihyperlipidemic amount of a compound of claim **1**.

4,179,509

(SUBSTITUTED 2-CARBOXYANILINO)NICOTINIC ACIDS AS INHIBITORS OF ALLERGIC REACTIONS

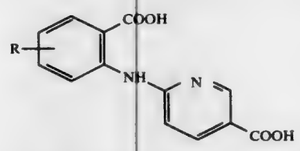
Charles F. Schwender, Dexter, Mich., and Brooks R. Sunday, Hackettstown, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 18, 1978, Ser. No. 943,504

Int. Cl.[2] **A61K** *31/455;* **C07D** *213/80*

U.S. Cl. 424—266 **5 Claims**

1. A method of inhibiting an allergic reaction in a mammal which comprises administering a compound of the formula:



wherein R is selected from the group consisting of hydrogen, or lower alkyl or alkoxy of 1 to 4 carbon atoms and the pharmaceutical salts thereof to a mammal in an amount sufficient to inhibit an allergic reaction.

4,179,510

METHODS OF TREATING PSYCHOSIS

John M. McCall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

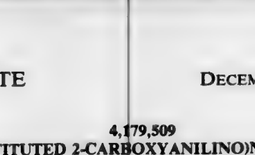
Filed Oct. 31, 1977, Ser. No. 847,371

Int. Cl.[2] **A61U** *31/40, 31/44, 31/445, 31/495*

U.S. Cl. 424—267 **16 Claims**

1. A method of treating psychosis in humans which comprises administering systemically to a psychotic human an antipsychotic dose of a compound selected from the group consisting of compounds having the formula:

I



wherein

R_1 is the same or different and is selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy and one through three;

a is one through three;

b is zero or one;

R_2 through R_7 are the same or different and are selected from the group consisting of hydrogen, alkyl of one through three carbons, inclusive, hydroxy, alkoxy of one through three carbons; phenyl; halo; cycloalkyl of three through six carbons when R_2 and R_3, R_4 and R_5, or R_6 and R_7 are taken together with the carbon to which they are attached; cycloalkyl of four through seven carbons when R_2 and R_4 or R_4 and R_6 are taken together with the carbons to which they are attached; and cycloalkyl of five or six carbons, with the overall provisos that no more than one ring may be attached to any one carbon and that at least two of R_2 through R_7 are hydrogen.

R_8 is alkyl of one through three carbons, hydrogen, or phenyl unsubstituted or substituted with a maximum of three substituents selected from the group consisting of alkyl of one through three carbons, halo, alkoxy of one through three carbons, and trihaloalkyl of one to two carbons;

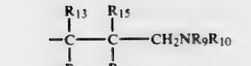
W is oxygen;

and A is selected from the group consisting of:

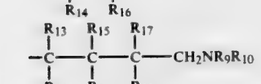
(i) $—(CH_2)nNR_9R_{10}$, wherein n is one to five with the proviso that when b is zero, and n is one or two, R_2 through R_5 cannot all be hydrogen at the same time;

(ii) $—(CH_2)m—(OCH_2CH_2)q—NR_{21}R_{22}$, wherein m and q are each one to three, and R_{21} and R_{22} can be the same or different and are selected from the group consisting of H, alkyl of one through four carbons, and together with the N to which they are attached form heterocyclic rings of four to six ring atoms, morpholine, and NR_9R_{10},

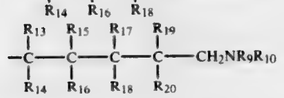
(iii)



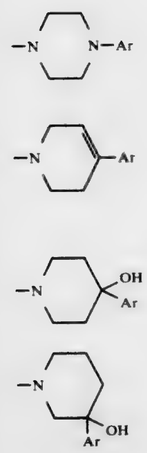
(iv)



(v)



wherein NR_9R_{10} is a heterocyclic amine selected from the group consisting of



R_{13} through R_{20} may be the same or different and are selected from the group hydrogen and alkyl of from 1 or 2 carbon atoms, inclusive;

Ar is phenyl unsubstituted or substituted with one through three substituents selected from the group consisting of alkyl or alkoxy of one through three carbons, hydroxy, halo, and trihaloalkyl or trihaloalkoxy of one or two carbons and pharmaceutically acceptable acid addition salts thereof.

4,179,511

ANTIBACTERIAL 3-(5-TETRAZOLYL) PENAM COMPOUNDS

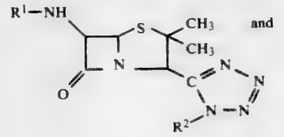
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 786,817, Apr. 12, 1977, Pat. No. 4,143,039, which is a continuation-in-part of Ser. No. 561,147, Mar. 24, 1975, which is a continuation-in-part of Ser. No. 491,510, Jul. 24, 1974, abandoned, which is a continuation-in-part of Ser. No. 450,435, Mar. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 407,097, Oct. 17, 1973, abandoned. This application Nov. 1, 1978, Ser. No. 957,197

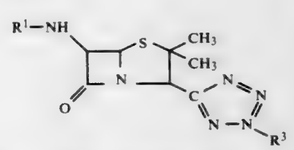
Int. Cl.[2] **A61K** *31/43*

U.S. Cl. 424—271 **9 Claims**

1. A method of treating bacterial infections in a mammal which comprises administering to said mammal an antibacterial effective amount of a compound having antibacterial activity and selected from the group consisting of



and



and the pharmaceutically acceptable salts thereof wherein R^1 is an acyl group of an organic carboxylic acid or the acyl group of an acyl derivative selected from the group consisting of esters, amides and chlorides of organic carboxylic acids and R^2 and R^3 are each selected from the group consisting of hydrogen, alkanoyloxymethyl having from 3 to 8 carbon atoms, 1-(alkanoyloxy)ethyl having from 4 to 9 carbon atoms and 3-phthalidyl.

4,179,512

4-SUBSTITUTED-2-ARYLIMIDAZOLES

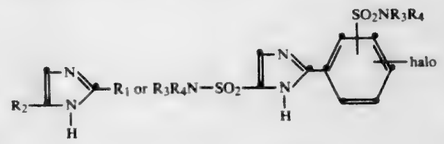
John J. Baldwin, Lansdale, and Frederick C. Novello, Berwyn, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 773,248, Mar. 1, 1977, Pat. No. 4,110,456. This application May 26, 1978, Ser. No. 910,151

Int. Cl.[2] **A61K** *31/415;* **C07D** *233/84*

U.S. Cl. 424—273 R **15 Claims**

1. A compound having the formula



I IA

wherein

R_1 is selected from the group consisting of mono chloro, bromo, iodo or fluoro- phenyl and dichloro- or dibromophenyl,

halo is chloro, bromo, iodo or fluoro;

R_2 is selected from the group consisting of C_1–C_5alkyl-S—,

C_1–C_5alkyl-SO—, C_1–C_5alkyl-SO_2— and R_3R_4N—SO_2—, and

R_3 and R_4 are independently selected from H, C_1-C_6alkyl and hydroxy substituted C_2–C_5alkyl,

such that when R_1 is 4-chlorophenyl, R_2 is other than C_1–C_5alkyl-SO— or C_1–C_5alkyl-SO_2—.

14. A composition for treating hypertension containing an effective amount of a compound of claim **1** having formula IA and an inert pharmaceutical carrier.

4,179,513

INDOLE-2-CARBOXYLIC ACIDS TO EFFECT CNS DEPRESSANT ACTIVITY

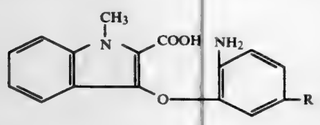
Richard E. Brown, Hanover, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 831,629, Sep. 8, 1977, Pat. No. 4,117,129, which is a continuation-in-part of Ser. No. 734,791, Oct. 22, 1976, Pat. No. 4,066,660, which is a division of Ser. No. 620,734, Oct. 8, 1975, Pat. No. 4,013,641. This application Apr. 10, 1978, Ser. No. 895,201

Int. Cl.[2] **A61K** *31/40*

U.S. Cl. 424—274 **3 Claims**

1. A method of producing a central nervous system depressant activity in a mammal which comprises the administration to said mammal of an effective CNS depressing amount of a compound or a pharmaceutical composition comprising a compound of the formula:



wherein R is —H or —Cl or a pharmaceutical acceptable salt thereof.

4,179,514

KETOALKANESULFENYL AND KETOALKANETHIOSULFENYL CARBAMATES

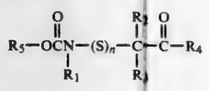
Themistocles D. J. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 688,410, May 20, 1976, Pat. No. 4,081,550. This application Jan. 6, 1978, Ser. No. 867,368

Int. Cl.[2] **A01N** *9/12;* **C07C** *149/12, 149/20*

U.S. Cl. 424—277 **47 Claims**

1. A compound of the formula:



wherein:

n is 1 or 2;

R_1 is alkyl;

R_2 is alkyl or chlorine;

R_3 is hydrogen, alkyl, phenyl, alkoxycarbonyl, alkanoyl or phenoxycarbonyl;

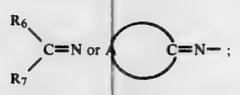
R_4 is hydrogen, phenoxy, alkyl, alkoxy or phenyl;

R_3 and R_4 together may form an alkylene chain completing a five or six membered alicyclic ketone or dione;

R_5 is:

A. naphthyl, benzofuranyl, benzothienyl, indanyl or phenyl; or

B. phenyl substituted with one or more chloro, bromo, fluoro, nitro, cyano, alkyl, alkynyloxy, alkoxy, dioxalanyl, dialkylamino, alkoxycarbonylamino, dicyanoethylidene, alkylthio, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, dithiolanyl or dialkylaminomethyleneimino groups; or



C.

R_6 and R_7 are individually hydrogen, cyano, chloro, alkyl, phenyl, alkylthio, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, cyanoalkyl, nitroalkyl, cyanoalkylthio alkanoyl or aminocarbonylalkylthio groups; and

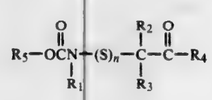
A is a divalent alkylene chain completing a five or six membered alicyclic ring which includes up to three hetero atoms selected from among oxygen, sulfur, sulfinyl, sulfonyl, aminocarbonyl or alkylaminocarbonyl provided that not more than one or said hetero atoms may be aminocarbonyl or alkylaminocarbonyl;

with the proviso that:

A. The total number of aliphatic carbon atoms included in R_1, R_2, R_3, R_4, R_6 and R_7 individually may not exceed six; and

B. At least one R_3 or R_5, substituent includes an oxocarbonyl, heterocyclic function or cyano group.

18. An insecticidal, miticidal and nematocidal composition comprising an acceptable carrier and an insecticidally, miticidally or nematocidally effective amount of a compound of the formula:



wherein:

n is 1 or 2;

R_1 is alkyl;

R_2 is alkyl or chlorine;

R_3 is hydrogen, alkyl, phenyl, alkoxycarbonyl, alkanoyl or phenoxycarbonyl;

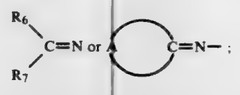
R_4 is hydrogen, phenoxy, alkyl, alkoxy or phenyl;

R_3 and R_4 together may form an alkylene chain completing a five or six membered alicyclic ketone or dione;

R_5 is:

A. naphthyl, benzofuranyl, benzothienyl, indanyl or phenyl; or

B. phenyl substituted with one or more chloro, bromo, fluoro, nitro, cyano, alkyl, alkynyloxy, alkoxy, dioxalanyl, dialkylamino, alkoxycarbonylamino, dicyanoethylidene, alkylthio, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, dithiolanyl or dialkylaminomethyleneimino groups; or



C.

R_6 and R_7 are individually hydrogen, cyano, chloro, alkyl, phenyl, alkylthio, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, cyanoalkyl, nitroalkyl, cyanoalkylthio alkanoyl or aminocarbonylalkylthio groups; and

D. A is a divalent alkylene chain completing a five or six membered alicyclic ring which includes up to three hetero atoms selected from among oxygen, sulfur, sulfinyl, sulfonyl, aminocarbonyl or alkylaminocarbonyl provided that not more than one of said hetero atoms may be aminocarbonyl or alkylaminocarbonyl;

With the proviso that:

A. The total number of aliphatic carbon atoms included in

R_1, R_2, R_3, R_4, R_6 and R_7 substituents individually may not exceed six; and

B. At least one R_3 or R_5, substituent includes an oxocarbonyl group, a heterocyclic group or a cyano group.

31. A composition according to claim **18** wherein the active toxicant is 2-[[0-[N-Methyl-N-(2,4-dimethyl-3-oxo-2-pentanesulfenyl) carbamoyl]oximino]]-1,4-dithiane.

4,179,515

BENZOYLPHENOXY PROPIONIC ACID, ESTERS THEREOF AND PHARMACEUTICAL COMPOSITION

André Mieville, Lausanne, Switzerland, assignor to Orchimed S. A., Switzerland

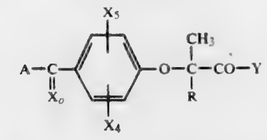
Division of Ser. No. 656,711, Feb. 9, 1976, Pat. No. 4,072,705. This application Oct. 28, 1977, Ser. No. 846,323

Claims priority, application United Kingdom, Feb. 12, 1975, 5979/75; Dec. 10, 1975, 50630/75

Int. Cl.[2] **A61K** *31/335;* **C07C** *69/95*

U.S. Cl. 424—278 **6 Claims**

1. A compound of the formula:



(II)

wherein

A represents 2-methylphenyl, 2,6-dimethylphenyl, 4-ethylphenyl, 4-methoxyphenyl, 3,4,5-trimethoxyphenyl, 4-nitrophenyl, 4-aminophenyl, 4-trifluoromethylphenyl, 3-trifluoromethylphenyl or 4-chloro-3-methoxyphenyl;

R, X_4 and X_5 are the same or different and represent hydrogen or C_{1-4}alkyl;

Y represents OH or C_{1-12}alkoxy; and

X_o represents oxygen if Y is OH or represents oxygen or the —O—CH_2—CH_2—O—group if Y is C_{1-12}alkoxy; or an acid addition thereof.

3. A pharmaceutical composition for the treatment of hyperlipaemia comprising a therapeutically active amount of a compound as claimed in claim **1** or a non-toxic acid-addition salt thereof, and a physiologically acceptable pharmaceutical excipient.

4,179,516

ETHERS OF 3,4-DIHYDRO-1-BENZOXEPIN-5-ONE OXIME TO TREAT INTESTINAL DISORDERS

Germaine Thuillier, Paris; Jacqueline Laforest, Vincennes, and Pierre Bessin, Chilly-Mazarin, all of France, assignors to Albert Rolland, S.A., Paris, France

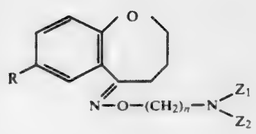
Division of Ser. No. 685,410, May 11, 1976, abandoned, which is a continuation of Ser. No. 492,911, Jul. 29, 1974, abandoned. This application Feb. 14, 1978, Ser. No. 877,616

Claims priority, application France, Jul. 31, 1973, 73 28038; May 22, 1974, 74 17976

Int. Cl.[2] **A61K** *27/00, 31/40, 31/335*

U.S. Cl. 424—278 **3 Claims**

1. A therapeutic composition particularly for treating intestinal disorders comprising a therapeutically effective amount of at least one isomer of the oximino group of the compound having the formula



in which:

R is selected from the group consisting of halogen atoms and lower alkoxy groups;

n is an integer 2 or 3, and

Z_1 and Z_2 are the same or different lower alkyl groups, or NZ_1Z_2 represents a saturated heterocyclic group which may have a second heteroatom selected from the group consisting of N and O,

and the addition salts of the amino group with pharmaceutically acceptable acids,

with a physiological acceptable excipient.

4,179,517

NOVEL TETRAHYDROCANNABINOL TYPE COMPOUNDS

Raphael Mechoulam, Jerusalem; Naphtali Lander, Tel-Aviv; Shabtay Dikstein, and Benyamin Shalita, both of Jerusalem, all of Israel, assignors to Yissum Research Development Company of the Hebrew University of Jerusalem, Jerusalem, Israel

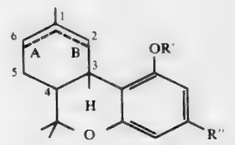
Filed Dec. 28, 1976, Ser. No. 755,083

Claims priority, application Israel, Jan. 12, 1976, 48824

Int. Cl.[2] **A61K** *31/35;* **C07D** *311/02*

U.S. Cl. 424—283 **15 Claims**

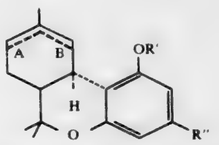
1. A pharmaceutical composition of matter substantially devoid of "cannabis-type" CNS activity, comprising an amount sufficient to effectively treat pain, glaucoma, asthma or stomach or intestinal ulcers of, as active ingredient, a compound of the formula



where A ------B designates a 1(2) or a 6(1) double bond and wherein R' designates —H or —CO—R where R is lower alkyl, and

R'' designates 1,1-dimethylheptyl or 1,2-dimethylheptyl, and a pharmaceutically acceptable excipient.

9. A compound having pharmaceutical activity but devoid of "cannabis-type" CNS activity of 3S,4S-configuration of the formula



wherein A-----B designates a 1(2) or a 6(1) double bond,

R' designates —H or —CO—R where R is lower alkyl, and

R'' designates 1,1-dimethyl-heptyl or 1,2-dimethylpeptyl.

4,179,518

SYNERGISTIC PESTICIDAL COMPOSITION

John C. Felton, Sittingbourne; John S. Badmin, Isle of Sheppey, and Roland S. Twydell, Rodmersham, all of England, assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 820,269, Jul. 29, 1977, abandoned. This application Jan. 30, 1978, Ser. No. 873,309

Int. Cl.[2] A01N *9/02*

U.S. Cl. 424—300 **2 Claims**

1. A composition for combating acarid pests comprising

(a) S-methyl N-(methylcarbamoyloxy) thioacetamidate and

(b) an acaridically active α-cyano-3-phenoxybenzyl α-isopropyl-4-chlorophenylacetate on a ratio of (a) to (b) of from about 1 to 1 to about 1 to 5.

4,179,519

METHOD AND COMPOSITION FOR REDUCING SERUM LIPID LEVELS USING P-CHLOROPHENYL P-CHLOROPHENOXYISOBUTYRATE

François Fauran, Castanet Tolosan; Claude Feniou, Pessac; Jacqueline Mosser, St. Medard en Jalles, and Gisële Prat, Talence, all of France, assignors to Laboratoires Sarget, Merignac, France

Filed Mar. 8, 1978, Ser. No. 884,497

Int. Cl.[2] A61K *31/235*

U.S. Cl. 424—308 **7 Claims**

1. A method of reducing serum lipid levels in humans or animals which comprises administering a hypolipidemically effective amount of p-chlorophenyl 2-(p-chlorophenoxy)-2-methylpropionate.

4. A hypolipidemic composition in unit dosage form, which comprises, per dosage unit, a hypolipidemically effective amount of p-chlorophenyl 2-(p-chlorophenoxy)-2-methylpropionate, as principal active ingredient, in combination with a pharmaceutically acceptable carrier.

4,179,520

L- AND DL-PHENYLGLYCINES TO TREAT A DISEASE OR CONDITION ATTRIBUTABLE TO REDUCED BLOOD FLOW

Ian T. Barnish, Ramsgate; Peter E. Cross; John C. Danilewicz, both of Canterbury, and Malcolm Morville, Cliftonville, all of England, assignors to Pfizer Inc., New York, N.Y.

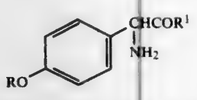
Division of Ser. No. 834,768, Sep. 19, 1977, Pat. No. 4,148,120. This application Aug. 30, 1978, Ser. No. 937,940

Claims priority, application United Kingdom, Sep. 28, 1976, 40306/76

Int. Cl.[2] A61K *31/24*

U.S. Cl. 424—309 **5 Claims**

1. A method of treating a mammalian subject suffering from a disease or condition attributable to reduced blood flow or oxygen availability, which comprises orally or parenterally administering to said subject a blood or flow, oxygen availability increasing amount of the L- or DL-form of a compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein R is hydrogen or methyl and R^1 is OR^2, wherein R^2 is alkyl having from one to five carbon atoms.

4,179,521

L- AND DL-PHENYLGLYCINES TO TREAT DISEASES OR CONDITIONS ATTRIBUTABLE TO REDUCED CARBOHYDRATE METABOLISM

Ian T. Barnish, Ramsgate; Peter E. Cross; John C. Danilewicz, both of Canterbury, and Malcolm Morville, Cliftonville, all of England, assignors to Pfizer Inc., New York, N.Y.

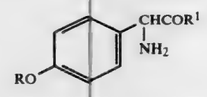
Division of Ser. No. 834,768, Sep. 19, 1977, Pat. No. 4,148,120. This application Aug. 30, 1978, Ser. No. 938,002

Claims priority, application United Kingdom, Sep. 28, 1976, 40306/76

Int. Cl.[2] A61K *31/24*

U.S. Cl. 424—309 **5 Claims**

1. A method of treating a mammalian subject suffering from a disease or condition attributable to reduced carbohydrate metabolism, which comprises orally or parenterally administering to said subject a carbohydrate metabolism increasing amount of the L- or DL- form of a compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein R is hydrogen or methyl and R^1 is OR^2, wherein R^2 is alkyl having from one to five carbon atoms.

4,179,522

CERTAIN COMPLEX SALTS OF MONO CARBOXYLIC ACIDS USED AS PRESERVATIVES

John J. Huitson, Banstead, England, assignor to BP Chemicals Limited, London, England

Filed Oct. 26, 1976, Ser. No. 735,160

Claims priority, application United Kingdom, Nov. 27, 1975, 48779/75

Int. Cl.[2] A01N *9/00, 9/24*

U.S. Cl. 424—317 **9 Claims**

1. A process for preserving substrates against degradation by microorganisms comprising applying to the said substrate a preservative effective amount of a liquid composition comprising in aqueous solution a complex salt of a cation of ammonium, sodium, potassium, calcium or magnesium and at least one monocarboxylic acid selected from the group consisting of propionic acid, isobutyric acid, and butyric acid, the ratio of acid to cation in the complex salt being in the range of 2:1 and 4:1 on a chemical equivalent basis and the concentration of water in the aqueous solution being between 15% and 75% by weight of the total composition.

4,179,523

CERTAIN CYANODITHIOIMIDOCARBONATES FOR CONTROLLING BACTERIA AND FUNGI

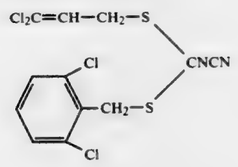
Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 863,319, Oct. 2, 1969, Pat. No. 4,124,637. This application Jun. 5, 1978, Ser. No. 912,905

Int. Cl.[2] A01N *9/20*

U.S. Cl. 424—324 **2 Claims**

1. The method of controlling bacteria which comprises applying thereto a bactericidally effective amount of a compound of the formula



4,179,524

BIOLOGICALLY ACTIVE AMIDE

Eugene M. Grivsky, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jun. 16, 1978, Ser. No. 916,276

Int. Cl.[2] A61K *31/165;* **C07D** *239/64*

U.S. Cl. 424—324 **17 Claims**

1. Trans-3-fluoro-N-allylcinnamamide

9. The method of treatment on prophylaxis of convulsions in a mammal comprising the administration to the mammal of an anticonvulsant effective non toxic amount of the compound trans-3-fluoro-N-allylcinnamamide.

4,179,525

METHODS FOR FORMING STABLE DISPERSIONS OF GLUTENS WHICH TEND TO AGGLOMERATE

Albert W. Kleinschmidt, Park Forest, Ill., assignor to J. R. Short Milling Company, Chicago, Ill.

Continuation of Ser. No. 705,838, Jul. 16, 1976, abandoned. This application Jun. 15, 1978, Ser. No. 915,583

Int. Cl.[2] A21D *2/36;* **A23J** *3/00*

U.S. Cl. 426—19 **12 Claims**

1. The method for producing stable aqueous dispersions of particulate wheat gluten, comprising

providing the gluten in finely particulate form such that the average maximum particle size thereof does not exceed 350 microns;

dispersing the gluten in the aqueous medium; and

also maintaining dispersed in the aqueous medium a finely particulate agglomeration-inhibiting additive which is rich in protein and contains a substantial proportion of native globular protein in at least substantially undenatured form,

said particulate additive being present in an amount equal to at least 3% by weight based on the combined weight of the gluten and said additive but substantially smaller than the amount of gluten and having an average maximum particle dimension not exceeding 350 microns,

particles of said additive interposing between particles of the gluten in the dispersion, and the presence of said globular protein in said additive inhibiting hydrogen bonding between the gluten particles which would otherwise cause the gluten to agglomerate.

4,179,526

USES OF α-SUBSTITUTED ALKYLIDENE METHIONALS IN FOODSTUFFS AND FLAVORS FOR FOODSTUFFS

Donald A. Withycombe, Lincroft; Anne Hruza, Bricktown; Manfred H. Vock, Locust; Christopher Giacino, Califon; Braja D. Mookherjee, Holmdel; Alan O. Pittet, Atlantic Highlands, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

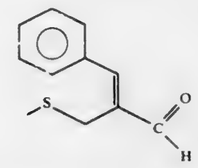
Division of Ser. No. 753,462, Dec. 22, 1976, Pat. No. 4,064,279. This application Aug. 24, 1977, Ser. No. 827,265

The portion of the term of this patent subsequent to May 22, 1996, has been disclaimed.

Int. Cl.[2] A23L *1/226*

U.S. Cl. 426—535 **2 Claims**

1. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising adding to said foodstuff from about 0.02 parts per million up to about 50 parts per million based on the total weight of said foodstuff, of 2-[(methylthio)methyl]-3-phenyl-2-propenal having the structure:



said 2-[(methylthio)methyl]-3-phenyl-2-propenal being substantially pure and synthetically produced.

4,179,527

PROCESS FOR MANUFACTURING A WHOLE WHEAT FOOD PRODUCT

E. Gurney White, deceased, late of McAllen, Tex. (by Robert G. Williams, executor), assignor to Nabisco, Inc., East Hanover, N.J.

Filed May 3, 1978, Ser. No. 902,448

Int. Cl.[2] A23L *1/164*

U.S. Cl. 426—620 **12 Claims**

1. A process for manufacturing a whole wheat food product which comprises:

(a) cooking a mixture of water and whole wheat to provide a cooked whole wheat containing from about 28% to about 55% moisture by weight;

(b) holding the cooked whole wheat for a period of from 0 to about 12 hours under ambient temperature and pressure conditions;

(c) chilling the cooked whole wheat to a temperature of from about 1° C. to about 12° C. to temper the wheat, the temperature selected being such that as the duration of the holding period of step (b) is increased from 0 to about 12 hours, the chilling temperature is proportionately increased from about 1° C. to about 12° C.;

(d) shaping the chilled tempered whole wheat to a desired configuration; and

(e) baking or toasting the shaped, tempered whole wheat food product.

4,179,528

METHOD OF MAKING SILICON DEVICE WITH UNIFORMLY THICK POLYSILICON

David L. Losee, Fairport, and Alvin D. Wilder, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 18, 1977, Ser. No. 797,971

Int. Cl.[2] H01L *21/363, 21/38*

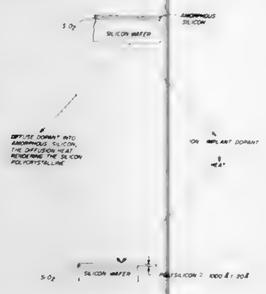
U.S. Cl. 427—9 **7 Claims**

1. The process for forming polysilicon of a uniform thickness on a silicon semiconductor device comprising the steps of:

(a) heating monocrystalline silicon in a vacuum to form a vapor of silicon;

(b) exposing the silicon semiconductor device to the silicon

vapor, thereby depositing amorphous silicon on said silicon semiconductor device; and



(c) heating said device to a temperature sufficient to crystallize said amorphous silicon into polycrystalline silicon.

4,179,529

METHOD OF LUBRICATING A THERMOPLASTIC RESIN STRAND FOR SLIDING CONTACT IN A RESHAPING DEVICE

Heinz Vetter, Rossdorf, Fed. Rep. of Germany, assignor to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Mar. 13, 1978, Ser. No. 885,903

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1977, 2712874

Int. Cl.[2] B05D *3/06*

U.S. Cl. 427—44 **10 Claims**

1. The method of making a formed strand of thermoplastic synthetic resin having a solidified coating thereon, which method comprises coating an extruded strand of said resin, while in a thermoplastic or thermoelastic condition, with a lubricating layer of a lubricating liquid which can be solidified by heat or radiation, bringing said lubricated synthetic resin strand into sliding contact with a solid surface, whereby form is imparted to said strand, separating the formed strand from said solid surface, and then hardening said layer of lubricating liquid to form a solid coat on said strand.

4,179,530

PROCESS FOR THE DEPOSITION OF PURE SEMICONDUCTOR MATERIAL

Franz Köppl, Altötting; Helmut Hamster, Burghausen; Rudolf Griesshammer, Burghausen, and Helmut Lorenz, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

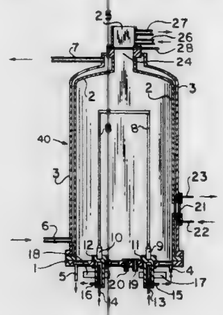
Division of Ser. No. 878,127, Feb. 14, 1978. This application Jan. 12, 1979, Ser. No. 3,060

Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722778

Int. Cl.[2] B05D *5/12*

U.S. Cl. 427—51 **4 Claims**

1. A process for the deposition of pure semiconductor material, particularly silicon, by thermal decomposition of gaseous compounds of the semiconductor material on thin rods serving as carrier bodies heated to the decomposition temperature of the compounds by the passage of an electrical current comprising: providing an open topped reaction chamber whose interior surfaces are either of silver or silver plated and mounting said electrially heatable carrier rods therein; providing a cover cylinder about the reaction chamber and forming therewith a closed annular chamber; attaching a heating element at said open top and preheating said carrier rods; sealing the open top and removing said heating element; passing a heating current through the carrier rods; passing a coolant through the annular chamber; feeding said gaseous compounds into the reaction



chamber and maintaining an excess pressure of 1-16 bar therein.

4,179,531

POLYTHIOL EFFECT, CURABLE MONOALKENYL AROMATIC-DIENE AND ENE COMPOSITION

Paul R. Hein, and Robert A. Irvin, both of Marietta, Ga., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Aug. 23, 1977, Ser. No. 827,002

Int. Cl.[2] B05D *3/06*

U.S. Cl. 430—300 **14 Claims**

1. The method of forming a printing plate which comprises exposing to actinic radiation projected through an image-bearing transparency selected portions of a radiation curable composition comprising

(1) at least about 20% by weight of said composition of monoalkenyl aromatic-diene copolymer resin;

(2) at least about 2% by resin weight of at least one monomer substantially compatible with said resin and having at least one photo-cross-linkable C—C-double bond;

(3) about 0.1 to about 35% by resin weight of polythiol containing at least two-SH groups per molecule and

(4) about 0.01 to about 10% by resin weight of photoinitiator.

4,179,532

PROCESS FOR PRODUCING A DISC-SHAPED INFORMATION CARRIER WHICH HAS INFORMATION IN THE FORM OF A BEAM-REFLECTING STRUCTURE

Horst Soeding, Hanover, Fed. Rep. of Germany, assignor to Polygram GmbH, Hamburg, Fed. Rep. of Germany

Division of Ser. No. 784,522, Apr. 4, 1977, Pat. No. 4,126,726. This application Apr. 17, 1978, Ser. No. 897,279

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1976, 2615605

Int. Cl.[2] B05D *3/06*

U.S. Cl. 427—54.1 **8 Claims**

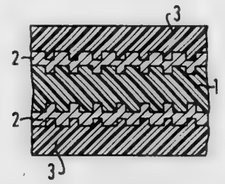
1. A process for producing an information carrier, comprising the steps of:

embossing opposite lacquer portions of a base element with respective surface profiles corresponding to information to be stored;

exposing the embossed lacquer portions to radiant energy to set the profiles;

applying metallic layers over the profiled surfaces while

maintaining the same profile structures on the outer metallic surfaces; and



applying transparent protective coatings over the metallic layers.

4,179,533

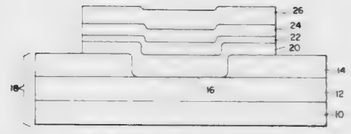
MULTI-REFRACTORY FILMS FOR GALLIUM ARSENIDE DEVICES

Aristos Christou, Springfield, Va., and Howard M. Day, Hillcrest Heights, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 25, 1978, Ser. No. 899,935

Int. Cl.[2] H01L *29/48*

U.S. Cl. 427—84 **7 Claims**



1. A method for constructing systems of sealed refractory layers, in a vacuum, for GaAs semiconductor devices having gold as a conducting electrode, said method requiring no annealing of said systems, comprising the steps of:

forming a refractory layer of a material selected from the group consisting of tantalum, tungsten, and titanium tungsten alloy on a surface of a GaAs substrate for providing a Schottky barrier therebetween, said substrate being maintained at an elevated temperature of approximately 90° C. for said tantalum and said tungsten and approximately 110° C. for said titanium tungsten alloy, said temperatures being sufficient for desorbing interfacial oxides and surface impurities and for providing adhesion between said refractory layer and GaAs;

sealing said refractory layer by depositing a layer of platinum at a substrate temperature in the range of appproximately 90° C. to 175° C. for the tantalum and the tungsten and approximately 90° C. for the titanium tungsten alloy, said temperature being sufficient for doping said refractory layer with the platinum, causing said platinum to migrate to the refractory grain boundaries and seal said boundaries, and preventing grain boundary migration of said GaAs and gold; and

sealing said layer of platinum from said gold by depositing a layer of tantalum at a substrate temperature in the range of approximately 50° C. to 90° C. if said refractory layer is tantalum, or by depositing a layer of tungsten at a substrate temperature in the range of approximately 50° C. to 90° C. if said refractory layer is tungsten, said temperature being sufficient for interdiffusing said tantalum or said tungsten into said platinum and preventing interdiffusion between the platinum and the gold,

said steps providing controlled heat in the range of about 50° C. to 175° C. to the substrate for individual depositions of said layers and providing thermal stabilization of the Schottky barrier and forming the entire refractory systems within a vacuum and without annealing the refractory systems, said systems forming a barrier layer of tantalum, tungsten, and titanium tungsten alloy doped with platinum at the tantalum, tungsten, and titanium tungsten alloy grain boundaries for preventing migration of said GaAs and gold across said grain boundaries.

4,179,534

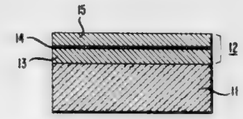
GOLD-TIN-GOLD OHMIC CONTACT TO N-TYPE GROUP III-V SEMICONDUCTORS

Chuan C. Chang, Berkeley Heights; Felix Ermanis, Summit; Robert J. McCoy, Chatham; Shohei Nakahara, North Plainfield, and Tan T. Sheng, Millington, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 24, 1978, Ser. No. 909,024

Int. Cl.[2] H01L *23/48*

U.S. Cl. 427—89 **9 Claims**



1. Method for making a semiconductor device comprising making contact to a semiconductor portion at least one micrometer thick, which said portion includes at least 95 mole percent of Group III-V compound semiconductor, which method comprises (a) depositing a contacting layer of metal on the surface of the semiconductor portion and (b) heat treating the semiconductor portion in a nonoxidizing atmosphere CHARACTERIZED IN THAT the depositing includes the sequential deposition of gold, tin and gold, the first gold deposition and the tin deposition taking place while the body is at a temperature of less than 200 degrees C. and the first gold deposition deposits a layer at least 0.1 micrometers thick and the heat treating step includes a residence time of at least one-half minute in the temperature range from 350 degrees C. to 500 degrees C.

4,179,535

METHOD OF FORMING A FIRE-RESISTANT SILICATE COATING

Reinhard Kalbskopf, and Felix Trojer, both of Geneva, Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland

Filed Jun. 3, 1977, Ser. No. 803,281

Claims priority, application Switzerland, Jun. 4, 1976, 7100/76

Int. Cl.[2] B05D *3/02, 1/36, 7/00*

U.S. Cl. 427—206 **17 Claims**

1. A method for protecting a substrate from fire damage by coating said substrate with a tumescent material, said method comprising the steps of:

(a) mixing hydrated alkali-metal silicate particles in an aqueous solution of alkali metal silicate to form a suspension of said particles, said particles containing 15 to 20 weight percent of water as water of hydration prior to said mixing step, said aqueous solution containing 40 to 80 weight percent dissolved alkali-metal silicate and 60 to 20 weight percent water prior to said mixing step

(b) applying a layer of said suspension to said substrate to form a coating thereon prior to significant absorption of water from said solution portion of said suspension by said particles.

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4,179,536

ANTICORROSIVE PAINTS FOR OIL CONTAINERS

Hiroshi Kasamatsu, 47-7, Higashihon-cho, and Koshiro Suzuki, 52-25, Higashihon-cho, both of Otashi, Gunma-ken, Japan

Continuation of Ser. No. 253,816, May 16, 1972, abandoned, and a continuation-in-part of Ser. No. 73,683, Sep. 18, 1970, abandoned, and Ser. No. 877,850, Nov. 18, 1969, abandoned.
This application Feb. 15, 1974, Ser. No. 442,867
Int. Cl.[2] B05D *1/00*; C09D *5/08, 5/14*
U.S. Cl. 427—239 3 Claims

1. An anti-corrosive paint for oil containers consisting essentially of a tri-n-butyltin compound selected from the group consisting of tri-n-butyltin 4-nitrophenoxy acetate, tri-n-butyltin 4-t-butylphenyl-thio acetate, tri-n-butyltin methoxy acetate, tri-n-butyltin t-butoxy acetate, tri-n-butyltin n-propoxy acetate, tri-n-butyltin ethylthio acetate and tri-n-butyltin 4-t-butylphenyl thioether dissolved, mixed or dispersed in a vehicle comprising synthetic resin and a volatile organic solvent having said resin dissolved therein, said resin being selected from the group consisting of epoxy, and acrylic, resins, the amount of the tin compound being 0.1 to 0.5 part by weight for each 100 parts by weight of whole paint.

4,179,537

SILANE COUPLING AGENTS

John J. Rykowski, 1026 S. Fircroft St., West Covina, Calif. 91791

Filed Jan. 4, 1978, Ser. No. 866,877
Int. Cl.[2] B05D *1/36*; B32D *17/10*; C07F *7/18*
U.S. Cl. 427—387 20 Claims

1. A coating composition for improving adhesion between an organic matrix and an inorganic substrate. which comprises:
from about 5 to 95 weight percent of a component selected from a first group consisting of methacryloxyalkyltrialkoxysilanes, mercaptoalkyltrialkoxysilanes, vinyltrialkoxysilanes, vinyltrihalosilanes, and alkylvinyldihalosilanes wherein each alkyl or alkoxy group has 1 to 3 carbon atoms inclusive, and from about 5 to 95 weight percent of a second component selected from a second group consisting of alkyltrialkoxysilanes, dialkyldialkoxysilanes, trialkylalkoxysilanes, trialkoxysilanes, tetraalkoxysilanes, aryltrialkoxysilanes, alkylaryldialkoxysilanes, and diaryldialkoxysilanes, wherein each aryl group is phenyl, chlorophenyl or or para-tolyl, and each alkyl group has 1 to 8 carbon atoms inclusive, and each alkoxy group has 1 to 3 carbon atoms inclusive.

9. A method for improving adhesion between glass and a polymerizate of an ethylenically unsaturated resin which comprises:
treating glass with a solution of a silane composition, the composition comprising from about 5 to 95 weight percent of a methacryloxyalkyltrialkoxysilane and from about 5 to 95 weight percent of an alkyltrialkoxysilane, each alkyl or alkoxy group having 1 to 3 carbon atoms;
contacting treated glass with an ethylenically unsaturated resin, and
curing the resin to provide a solid material having said glass bonded thereto.

4,179,538

PROCESS OF ELIMINATING CRACKING IN THE COATING OF TiO_2 LAYERS

Herbert R. Sassenhausen, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 6, 1977, Ser. No. 831,206
Claims priority, application United Kingdom, Sep. 10, 1976, 37421/76
Int. Cl.[2] B05D *1/34, 1/36*; B32B *27/30, 27/18, 23/04, 9/02*
U.S. Cl. 430—213 11 Claims

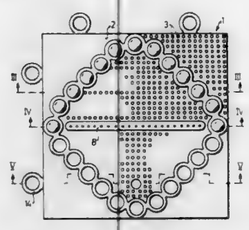
1. In a process of coating a layer comprising a titanium dioxide pigment and a hydroxyethylcellulose binder on a water-absorbent layer carried by a support wherein the ratio of titanium dioxide to hydroxyethylcellulose is such that said titanium dioxide layer has a propensity to crack during said coating, the improvement wherein during said coating of said titanium dioxide layer, a hydrophilic colloid layer is simultaneously coated thereover, thereby eliminating the propensity of said titanium dioxide layer to crack.

4,179,539

SKI SLOPE

Herbert Schweizer, Kirchstrasse 47, D 7024 Filderstadt, IV, Fed. Rep. of Germany

Filed Aug. 16, 1978, Ser. No. 934,117
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1977, 2737222
Int. Cl.[2] A63G *21/00*; B44F *7/00*
U.S. Cl. 428—58 6 Claims



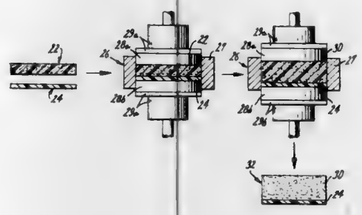
1. A skiing surface comprising a plurality of single elements formed of plastic and adapted to be joined together in a side-by-side relationship, each single element including a base layer, a plurality of glide fingers on the upper surface of said base layer extending perpendicular to said base layer surface, a plurality of sockets in the upper surface of said base layer, a glide ball which extends upwardly from each socket to a height at which the top of the ball is coincident with the height of the glide fingers and is rotatably disposed in each of said sockets, at least one elongated groove in the upper surface of said base layer and a guidance comb which includes a plurality of easily flexible teeth, said teeth extending upwardly from the surface of said base layer to a height greater than the height of the glide fingers, each of the teeth being provided with a spherical thickening on its upper end, said guidance comb mounted in said groove.

4,179,540

FABRICATION OF FOAMED ARTICLES

Walter H. Smarook, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 536,955, Dec. 23, 1974, Pat. No. 4,127,547.
This application Feb. 19, 1976, Ser. No. 659,256
Int. Cl.[2] B29D *27/00*
U.S. Cl. 428—71 61 Claims



1. Method of fabricating low density, foamed articles comprising the steps of:

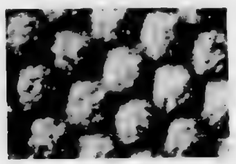
(a) blending at least one normally solid thermoplastic polymer resin with about 25 to about 80 parts per 100 parts by weight of said resin of a normally liquid organic solvent having a solubility parameter, δ, within about (1.3 calories/cc)[½] of that of said resin or a mixture of normally liquid organic solvents having an average solubility parameter, δ, within about (1.3 calories/cc)[½] of that of said resin;
(b) blending the mixture obtained in step (a) with at least about 1 part by weight, per 100 parts of said resin, of water until a white homogeneous mixture of resin, solvent, and water is obtained whereby a non-tacky hydrogel dough is obtained;
(c) shaping the non-tacky hydrogel dough obtained in step (b);
(d) vaporizing the solvent and water;
(e) removing the solvent and water; and
(f) recovering a foamed resin article.

4,179,541

PHOTOGRAPHIC SUPPORT MATERIAL AND METHOD OF PRODUCING SAME

Masao Miyama; Sakan Yamaguti, and You Kusama, all of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Aug. 12, 1977, Ser. No. 824,114
Claims priority, application Japan, Aug. 16, 1976, 51-96947
Int. Cl.[2] B32B *3/30*; B05D *5/02*; B32B *31/20*
U.S. Cl. 428—165 12 Claims



1. A method for producing a photographic support material, which comprises extrusion-coating a polyolefin resin over a pattern embossed on a base paper material and pressing the polyolefin resin coating onto the embossed paper with a cooling roll to form an embossed polyolefin-coated paper, said cooling roll having a surface finish to impart a desired amount of gloss to the embossed surface.

12. A photographic support material produced by the method according to claim 1.

4,179,542

SYNERGISTIC PRIMER FOR FLUOROPOLYMER COATINGS

Alkis Christofas, Levittown, and Julius E. Dohany, Berwyn, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 865,762, Dec. 29, 1977, abandoned. This application Dec. 13, 1978, Ser. No. 969,108
Int. Cl.[2] B32B *15/08, 15/16, 27/38*
U.S. Cl. 428—324 29 Claims

1. A primer coating composition comprising from about 34 to about 70 percent by weight of the solids in said composition of a resin binder consisting of (a) a thermoplastic resin selected from the group consisting of vinylidene fluoride homopolymers and copolymers of at least 40 mole percent of at least one fluorinated aliphatic monomer having a terminal ethylenic bond with at least one different aliphatic monomer having a terminal ethylenic bond, and (b) from about 18 to about 45 percent, based on the weight of said thermoplastic resin, of a heat curable epoxy resin; and, as the remainder of the solids in said composition, a filler pigment consisting of (a) finely-divided mica and (b) from about 20 to about 40 percent, based on the weight of said mica, of metallic pigment powder.

14. A heat cured composite structure comprising (A) a solid base member, (B) a primer coating of a thickness ranging from about 1 to about 10 mils adhering to at least one surface of said base member comprising a mixture of from about 34 to about 70 percent by weight of said mixture of a resin binder consisting of (a) a thermoplastic resin selected from the group consisting of vinylidene fluoride homopolymer and copolymers of at least 40 mole percent of at least one fluorinated aliphatic monomer having a terminal ethylenic bond with at least one different aliphatic monomer having a terminal ethylenic bond, and (b) from about 18 to about 45 percent, based on the weight of said thermoplastic resin, of an epoxy resin, and, as the remainder of said mixture, a filler pigment consisting of (a) finely-divided mica and (b) from about 20 to about 40 percent, based on the weight of said mica, of metallic pigment powder, and (C) a top coating having a thickness of at least about 2 mils adhering to said primer coating, said top coating comprising a thermoplastic resin containing at least 50 mole percent of polymerized monomeric units which are identical to those of the thermoplastic resin of said resin binder.

24. A method of making a composite structure comprising (a) providing a clean, grease free solid substrate, (b) coating the substrate with a liquid dispersion of a primer composition as described in claim 1, (c) drying the primer dispersion at a temperature no greater than about 90° C., (d) topcoating the primer with a coating composition comprising a thermoplastic resin containing at least 50 mole percent of polymerized monomer units identical to those of the resin binder of said primer, and (e) subjecting the topcoating to a fusion temperature above the melting point, but below the decomposition temperature of the top coat resin whereby a pin-hole free surface is produced.

4,179,543

STAPLE FIBER, FINISH THEREFOR AND PROCESS FOR USE OF SAME

Roland L. Hawkins, Spartanburg, S.C., assignor to Hoechst Fibers Industries, Division of American Hoechst Corporation, Spartanburg, S.C.

Filed Aug. 19, 1976, Ser. No. 715,719
Int. Cl.[2] D02G *3/00*
U.S. Cl. 428—361 5 Claims

1. A synthetic polymeric textile fiber in staple form in lengths of from about ¼ inches to about 3 inches having a finish thereon consisting essentially of:
(a) an ethoxylated primary emulsifier containing at least five moles of ethylene oxide and having a surface tension of at least 30 dynes per centimeter in a 0.10 weight percent aqueous solution of same at about 25 degrees Centrigrade,
(b) a lubricant for said fiber,
(c) a secondary emulsifier for said lubricant, said secondary emulsifier being compatible with said primary emulsifier, said finish being present on the fiber in an amount of at least 0.1 percent based on fiber weight and exhibiting a low foaming propensity and being conducive to good fiber bondability in the presence of a chemical binder.

4,179,544

FIBER FINISH COMPOSITIONS

David D. Newkirk, Woodhaven; Basil Thir, Wyandotte, and Robert B. Login, Woodhaven, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 5, 1977, Ser. No. 857,382
Int. Cl.[2] D02G *3/00*
U.S. Cl. 428—395 12 Claims

1. A synthetic polyamide or polyester fiber having deposited thereon a composition consisting essentially of a mixture of (1) a major amount of a polyoxyalkylene ether compound lubricant and (2) a minor effective amount of stabilizer sufficient to

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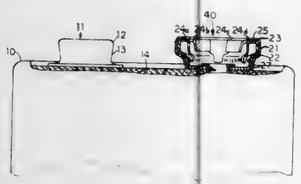
prevent oxidative degradation of said lubricant upon exposure to heat in the presence of oxides of nitrogen, said stabilizer a reaction product of one mole of dicyclopentadiene, at least one mole of p-cresol and at least one-half mole of isobutylene wherein the amount of stabilizer ranges from about 0.05 to about 0.45 weight percent based on the weight of the lubricant.

4,179,545

BATTERY WITH PROTECTIVELY JACKETED FEMALE TERMINAL

Frank L. Ciliberti, Jr., Ossining, N.Y., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed May 25, 1978, Ser. No. 909,337
Int. Cl.² H01M 2/30
U.S. Cl. 429—65 **8 Claims**



1. An electric battery having an exposed female terminal protruding from a wall thereof characterized in that said female terminal is jacketed by protective means, with said female terminal substantially supporting said protective means and wherein said protective means permits external electrical connection with said female terminal.

4,179,546

METHOD FOR EXPANDING MICROSPHERES AND EXPANDABLE COMPOSITION

Joseph L. Garner, Sanford, and Peter A. Tiffany, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 284,175, Aug. 28, 1972, abandoned. This application Sep. 12, 1974, Ser. No. 505,298
Int. Cl.² C08J 9/12; B01J 13/02
U.S. Cl. 521—56 **6 Claims**

1. An aqueous mass of expandable synthetic resinous microspheres, the microspheres beng expandable to form a monocellular hollow gas filled polymer cell at a temperature below the boiling point of water, the microspheres having a synthetic resinous thermosplastic shell symmetrically encapsulating therein a single droplet of volatile liquid raising agent, the microspheres being in an aqueous dispersing medium, the aqueous dispersing medium having dissolved therein from about 0.2 to 5 weight percent, based on the weight of the microspheres, of hydrogen peroxide.

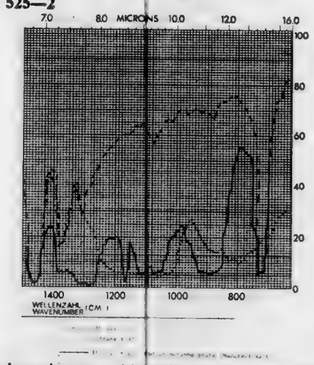
4. A method for the expansion of expandable synthetic resinous microspheres, the microspheres having a synthetic resinous thermoplastic shell symmetrically encapsulating therein a single droplet of a volatile liquid raising agent and on heating being capable of expanding to form a hollow gas filled polymeric monocellular particle, the steps of the method comprising providing a mass of expandable microspheres in an aqueous medium, adding to and dissolving in the aqueous medium from about 0.2 to 5 weight percent, based of the weight of the microspheres, of hydrogen peroxide and subsequently heating the aqueous medium to a temperature below the boiling point of water to cause the microspheres to expand to form monocellular gas filled particles.

4,179,547

POLYETHYLENE SHEETS AND FILMS

Yael Allingham; David Vofsi, and Saul A. Gassner, all of Rehovot, Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Filed Jun. 14, 1978, Ser. No. 915,433
Claims priority, application Israel, Jun. 29, 1977, 52412
Int. Cl.² C08K 3/32
U.S. Cl. 525—2 **6 Claims**



1. A polymeric composition of matter substantially transparent to solar radiation and constituting an effective barrier to infra-red radiation, especially in the region of about 7 μ to 15 μ, comprising polyethylene or a copolymer of mainly polyethylene, containing an effective quantity of an insoluble metaphosphate.

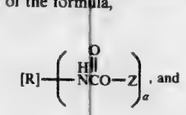
4,179,548

UV CURABLE RESIN COMPOSITIONS CONTAINING URETHANES OF HYDROXYBENZOTRIAZOLES OR URETHANES OF HYDROXY BENZOPHENONES

Siegfried H. Schroeter, and Daniel R. Olson, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

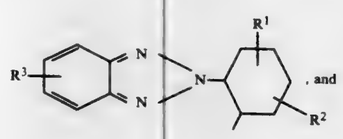
Division of Ser. No. 626,490, Oct. 28, 1975, Pat. No. 4,061,652. This application Sep. 14, 1977, Ser. No. 833,144
Int. Cl.² C08L 33/10, 33/12, 63/02, 67/02
U.S. Cl. 525—329 **4 Claims**

1. A UV curable composition comprising an organic resin, 0.1 to 10% by weight of the UV curable composition of an organic urethane of the formula,



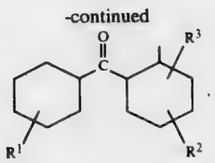
, and

0.01 to 1% by weight of the UV curable composition of a urethane decomposition catalyst, where R is a is a member selected from the group consisting of a $C_{(1-12)}$ aliphatic hydrocarbon radical, a $C_{(6-13)}$ aromatic hydrocarbon radical, and halogenated derivatives thereof, "a" is an integer equal to 1 or 2, and when a is 1, R is monovalent, and when a is 2, R is divalent, Z is an aromatic organic radical having the formula,



, and

-continued



where R^1, R^2, and R^3 can be the same or different monovalent radicals selected from the group consisting of $C_{(1-12)}$ alkyl radicals, $C_{(1-12)}$ alkoxy radicals, halogen and hydrogen.

4,179,549

QUATERNARY AMMONIUM ADDUCTS OF POLYMERIZABLE TERTIARY AMMONIUM SALTS AND ACRYLAMIDE

Rudolf S. Buriks; Allen R. Fauke, and David W. Griffiths, all of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Nov. 14, 1974, Ser. No. 523,813
Int. Cl.² C08F 2/32, 18/22, 22/22, 20/70
U.S. Cl. 525—374 **6 Claims**

1. A polymer which is a terpolymer of the following units:
(1) acrylamide,
(2) dimethylaminoethylmethacrylate, and
(3) the quaternary adduct of dimethylaminoethylmethacrylate and acrylamide; and the anion is chloride or acetate.

4,179,550

METHOD FOR PREPARING A NOVEL POLYMER

Ryoichi Miyamoto, Ohtake, and Minoru Morita, Iwakuni, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Apr. 25, 1978, Ser. No. 899,966
Claims priority, application Japan, Apr. 26, 1977, 52-47337
Int. Cl.² C08F 4/34, 32/08; C08G 59/02
U.S. Cl. 526—212 **25 Claims**

1. A method for preparing a novel polymer which comprises polymerizing a polymerizable material selected from the group consisting of
(a) substituted or unsubstituted dicyclopentadiene,
(b) cationically polymerizable unsaturated hydrocarbon-containing fraction obtained by distilling a cracking or reforming product of a petroleum and having a boiling point in the range of −20° C. to 280° C.,
(c) a cationically polymerizable vinyl aromatic hydrocarbon having 8 to 10 carbon atoms,
(d) a mixture of two or three of ingredients (a), (b) and (c), and
(e) a mixture of any one of ingredients (a) to (d) with a cationically polymerizable unsaturated aliphatic hydrocarbon having 4 to 8 carbon atoms in the presence of a cationic polymerization catalyst; wherein a high-boiling product having a boiling point of at least about 150° C. and an oyxgen content of at least 0.5% by weight is introduded into the polymerization system at any stage of the polymerization process, or the high-boiling product is reacted with a polymer produced by polymerizing the polymerizable material in the presence of the cationic polymerization catalyst, said high-boiling product being obtained as a residue, comprising a mixture of by-products, in a process comprising oxidizing a benzene or naphthalene ring-substituted with at least one isopropyl group to convert it to the corresponding hydroperoxide, decomposing the hydroperoxide with an acid to produce the corresponding phenol or naphthol, and separating the phenol or naphthol from the resultant reaction mixture to obtain said residue comprising a mixture of said by-products.

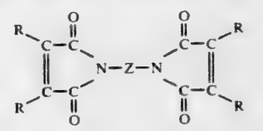
4,179,551

LOW TEMPERATURE CURABLE COMPLIANT BISMALEIMIDE COMPOSITIONS

Robert J. Jones, Hermosa Beach; Howard E. Green, Seal Beach, and Sandra C. Quinlivan, Torrance, all of Calif., assignors to TRW, Inc., Redondo Beach, Calif.

Filed Oct. 25, 1977, Ser. No. 845,058
Int. Cl.² C08F 226/06
U.S. Cl. 526—262 **49 Claims**

1. A low temperature free radical curable composition which comprises:
(a) a curable prepolymer which is a polyimide formed at an elevated temperature sufficient to cause thermal reaction between heated components of a mixture of:
(i) at least one aliphatic bismaleimide of the formula:



wherein Z is a polyaliphatic ether in which each aliphatic ether group individually contains from 1 to about 6 carbon atoms and in which each R is independently selected from the group consisting of hydrogen, an aliphatic group containing 1 or 2 carbon atoms, a benzenoid radical and a halogen; and
(ii) at least one aromatic polyamine; and (b) at least one cross linking agent containing at least two functional vinyl groups.

4,179,552

PROCESS FOR ACCELERATED CURE OF EPOXY RESINS

Harold G. Waddill, Austin, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,748
Int. Cl.² C08G 59/50, 59/60
U.S. Cl. 528—111 **22 Claims**

1. An epoxy resin composition comprising:
a vicinal polyepoxide having an average of at least 1.8 reactive 1,2-epoxy groups per molecule, and
a reaction product of an epoxy resin with an excess of an aminopropyl derivative of a polyoxyalkylenepolyamine.

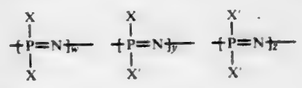
4,179,553

POLYPHOSPHAZENE POLYMERS CONTAINING CYCLIC KETAL SUBSTITUENTS

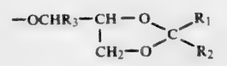
William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Nov. 3, 1978, Ser. No. 957,512
Int. Cl.² C08G 79/04
U.S. Cl. 528—168 **11 Claims**

1. A polyphosphazene polymer containing units represented by the formulas:



wherein X is



in which R_1 and R_2 are independently selected from a group consisting of substituted and unsubstituted aliphatic, aryl, arayl, alkylaryl and heterocyclic radicals or R_1 and R_2 can be linked to form a cyclic radical and R_3 is selected from the group consisting of an aliphatic hydrocarbon radical and hydrogen wherein X′ is selected from the group consisting of chlorine and a substituted and unsubstituted alkoxy, aryloxy, amino and mercapto radical or mixtures thereof; $20 \leqq (w+y+z) \leqq 50{,}000$ per polymer; and X and X′ are independently selected for each unit.

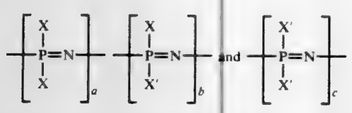
4,179,554

POLYPHOSPHAZENE COPOLYMERS CONTAINING DIALKYL AMINOXY SUBSTITUENTS

William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Nov. 3, 1978, Ser. No. 957,399
Int. Cl.² C08G 79/04
U.S. Cl. 528—168 **9 Claims**

1. A polyphosphazene copolymer containing units represented by the formulas:



wherein X is —O—NR_2 in which R is alkyl containing from 1 to 8 carbon atoms or cycloalkyl containing from 3 to 12 ring carbon atoms; wherein X′ is selected from the group consisting of substituted or unsubstituted alkoxy, aryloxy, amino and mercapto groups and wherein $20 \leqq (a+b+c) \leqq 50{,}000$ per polymer.

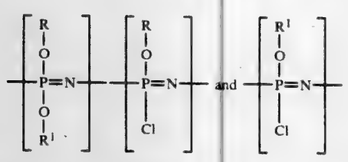
4,179,555

OIL-FREE ELASTOMERIC POLY(ARYLOXYPHOSPHAZENE) COPOLYMERS

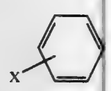
Tai C. Cheng, Akron; John W. Fieldhouse, Mogadore; Arthur E. Oberster, Canton, and Daniel F. Graves, Clinton, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jun. 28, 1978, Ser. No. 919,888
Int. Cl.² C08G 79/02
U.S. Cl. 528—168 **20 Claims**

1. Oil-free elastomeric poly(aryloxyphosphazene) copolymers consisting essentially of randomly distributed repeating units represented by the formulas:



wherein R and R^1 may be the same or different and are selected from the group consisting of monovalent aryl radicals and substituted aryl radicals having the structure:



wherein X is a substituent selected from the group consisting of alkyl, alkoxy, aryl, aryloxy, amino and halogen substituted on any sterically permissible position on the phenyl group and the amount of Cl present in the form of P—Cl bonds is from about 0.4 percent to about 10.0 percent by weight based on the total weight of copolymer.

4,179,556

POLYPHOSPHAZENE POLYMERS CONTAINING SUBSTITUENTS DERIVED FROM KETOXIMES

William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Nov. 3, 1978, Ser. No. 957,513
Int. Cl.² C08G 79/04
U.S. Cl. 528—168 **13 Claims**

1. A polyphosphazene polymer containing units represented by the formulas:



wherein X is —O—N=CR_1R_2 in which R_1 and R_2 are independently selected from a group consisting of substituted and unsubstituted alkyl radicals containing from 1 to 15 carbon atoms substituted and unsubstituted cycloalkyl, aryl, arylalkyl and heterocyclic radicals or R_1 and R_2 taken together form a cyclic ring, wherein X′ is selected from the group consisting of chlorine and a substituted and unsubstituted alkoxy, aryloxy, amino and mercapto radical or mixtures thereof; $20 \leqq (w+y+z) \leqq 50{,}000$ per polymer, and X and X′ are independently selected for each unit.

4,179,557

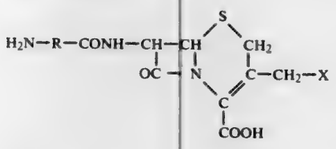
ACYLATION OF 7-AMINOCEPHALOSPORANIC ACIDS

Toshiyasu Ishimaru, Suita; Yasutsugu Shimonishi, Nishinomiya; Hisayuki Sakurai, Osaka, and Minoru Hatanaka, Takatsuki, all of Japan, assignors to President of Osaka University, Japan

Division of Ser. No. 82,814, Oct. 21, 1970, abandoned. This application Dec. 26, 1973, Ser. No. 428,037
Int. Cl.² C07D 501/04, 501/06
U.S. Cl. 544—28 **24 Claims**

1. In a process for producing a member selected from the group consisting of

(a) a 7-aminoacylamidocephalosporanic acid represented by the formula:



(VII)

and

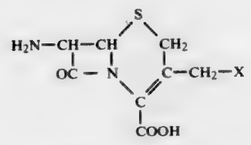
(b) a non-toxic salt of said 7-aminoacylamidocephalosporanic acid, wherein R is an alkylene group or



wherein R_5 is selected from the group consisting of a hydrogen atom; a methyl group and a methylthio group and R_6 is selected from the group consisting of an alkyl, alkylthio, aryl, arylthio, arylalkyl, aryloxy and hetercyclic groups, R_5 and R_6 together representing a substituted or

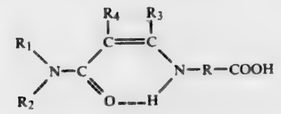
unsubstituted cycloalkyl or heterocyclic group, X is selectd from the group consisting of hydrogen atom, acetoxy group, and S—Y wherein Y is an alkyl, alkenyl, or nucleophilic group, wherein a 7-aminocephalosporanic acid or derivatives thereof are acylated with an N-protected amino acid and the resulting product is hydrolyzed followed by separation and recovery of said group member, the improvement which comprises:

(A) acylating the 7-aminocephalosporanic acid represented by the formula



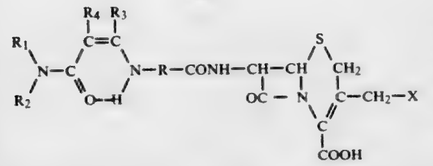
(II)

where X is defined as above, or derivatives thereof with a N-protected amino acid represented by the formula,



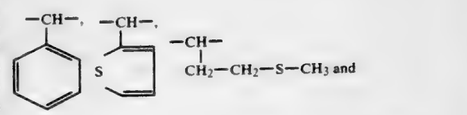
(III)

or functional acid derivative thereof, wherein R is the same as defined above, R_1 and R_2 each is a lower alkyl group having 1 to 3 nitrogen atom, R_1 and R_2 when taken together jointly form with the carbon atoms attached thereto a piperidine ring or a morpholine ring, R_3 is a lower alkyl group having 1 to 3 carbon atoms, R_4 is a hydrogen atom or a lower alkyl group having 1 to 3 carbon atoms, R_3 and R_4 when taken together jointly form with the carbon atoms attached thereto a cyclopentenyl ring or a cyclohexenyl ring to form the corresponding N-protected 7-aminoacylamidocephalosporanic acid represented by the formula:



(V)

and a non-toxic salt thereof, wherein R is selected from the group consisting of



X is selected from the group consisting of hydrogen atom and acetoxy group, R_1 and R_2 each is methyl or ethyl or jointly form together with the nitrogen atom attached thereto a piperidine ring or a morpholine ring, R_3 is a lower alkyl group having 1 to 3 carbon atoms, R_4 is a hydrogen atom or a lower alkyl group having 1 to 3 carbon atoms, R_3 and R_4 when taken together jointly form with the carbon atoms attached thereto a cyclopentenyl ring.

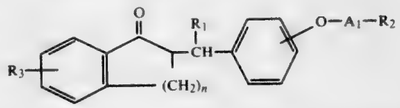
4,179,558

NAPHTHALENONE DERIVATIVES AND ANALOGS

John Krapcho, and Joseph Schwartz, both of Somerset, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 30, 1978, Ser. No. 873,644
Int. Cl.² C07D 295/00; A01N 9/22
U.S. Cl. 544—174 **18 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, alkyl, phenyl or phenyl substituted with a halogen, alkyl, alkoxy or trifluoromethyl group; R_2 is alkylamino, dialkylamino, 1-piperidinyl, 1-pyrrolidinyl, 4-morpholinyl, 4-alkyl-1-piperidinyl or 4-(2-hydroxyethyl)-1-piperidinyl; R_3 is hydrogen, halogen, alkyl, alkoxy, or trifluoromethyl; A_1 is a straight or a branched chain alkylene group having 2 to 5 carbon atoms; and n is 1, 2 or 3; wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 8 carbon atoms.

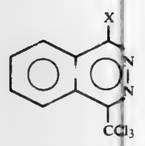
4,179,559

1-HALO- AND 1-LOWER ALKOXY-4-TRICHLOROMETHYLPHTHALAZINES

Eugene F. Rothgery, North Branford, and Hansjuergen A. Schroeder, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 844,004, Oct. 20, 1977, Pat. No. 4,139,622. This application Aug. 28, 1978, Ser. No. 937,692
Int. Cl.² C07D 237/30
U.S. Cl. 544—237 **5 Claims**

1. A compound of the formula



where X is either a halo group or a lower alkoxy group.

4,179,560

IMIDAZO- AND PYRIMIDO[2,1-b]QUINAZOLINES AND PREPARATION THEREOF

Michihiro Yamamoto; Shigeaki Morooka; Masao Koshiba, all of Nishinomiya; Shigeho Inaba, Takarazuka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 27, 1975, Ser. No. 553,676

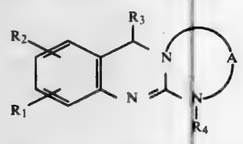
Claims priority, application Japan, Feb. 28, 1974, 49-24500

Int. Cl.[2] A61K *31/395;* **C07D** *487/04*

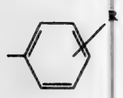
U.S. Cl. 544—250 **4 Claims**

1. A process for preparing a compound of the formula,

[I]

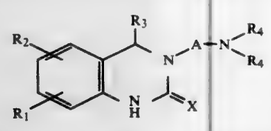


wherein R_1 and R_2 are independently hydrogen, halogen, trifluoromethyl, nitro, C_{1-4} alkyl or C_{1-4} alkoxy, or R_1 and R_2 may together represent methylenedioxy; R_3 is hydrogen, C_{1-4} alkyl, phenyl or substituted phenyl of the formula



(wherein R is halogen, C_{1-4} alkyl or C_{1-4} alkoxy); R_4 is hydrogen, C_{1-4} alkyl or benzyl; and A is C_{2-3} alkene which may be optionally substituted by one or two C_{1-2} alkyl radicals; or a pharmaceutically acceptable acid addition salt thereof, which comprises the step of reacting a compound of the formula,

[II]



wherein R_1, R_2, R_3, R_4 and A are as defined above; and X is oxygen or sulfur, with a halogenating agent selected from the group consisting of phosphorus oxyhalide, phosphorus trihalide, phosphorus pentahalide, thionyl chloride and a mixture thereof, at a temperature within the range of from about 30° C. to about 180° C.

4,179,561

METHOD FOR MAKING PYRAZOLO[1,5-C]QUINAZOLINE DERIVATIVES AND RELATED COMPOUNDS

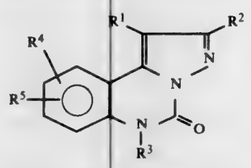
B. Richard Vogt, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 778,397, Mar. 17, 1977, Pat. No. 4,112,096, which is a division of Ser. No. 702,364, Jul. 2, 1976, Pat. No. 4,076,818. This application Dec. 2, 1977, Ser. No. 856,883

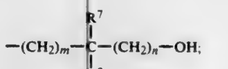
Int. Cl.[2] C07D *487/04;* **A61K** *31/505*

U.S. Cl. 544—250 **4 Claims**

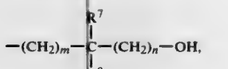
1. A method for preparing compounds havng the structure



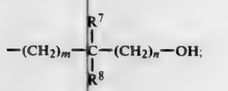
wherein R^1 and R^2 are the same or different, and R^1 is selected from the group consisting of hydrogen, lower alkyl, phenyl, phenyl having a single substituent selected from the group consisting of halogen, lower alkyl, lower alkoxy, and trifluoromethyl, or



R^2 is selected from the group consisting of



hydrogen, lower alkyl, phenyl or phenyl having a single substituent selected from the group consisting of halogen, lower alkyl, lower alkoxy, and trifluoromethyl, with the proviso that at least one of R^1 and R^2 is



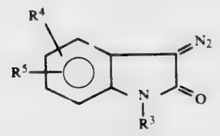
R^3 is selected from the group consisting of hydrogen, lower alkyl, benzyl, phenyl, or phenyl having a single substituent selected from the group consisting of lower alkoxy and trifluoromethyl;

R^4 and R^5 are the same or different and are selected from the group consisting of hydrogen, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, lower alkanoyloxy of 1 to 4 carbons, nitro, benzyloxy, benzyloxy having a single mono-lower alkoxy substituent, halogen, hydroxy, and trifluoromethyl;

R^7 and R^8 may be the same or different and are selected from the group consisting of hydrogen, alkyl having 1 to 3 carbons, phenyl, phenyl having a mono-lower alkoxy substituent, benzyl, or benzyl having a mono-lower alkoxy substituent, or R^7 and R^8 taken together is a single cycloalkyl ring of 3 to 7 carbons;

$(CH_2)_m$ and $(CH_2)_n$ represent straight or branched chain alkylene radicals, m and n are integers which may be the same of different and are 0 to 10, with the proviso that

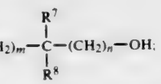
m+n is ≦10, and where m is 0, $(CH_2)_m$ represents a single bond, or where n is 0, $(CH_2)_n$ represents a single bond; and physiologically acceptable salts thereof, which comprises the steps of reacting a compound of the structure



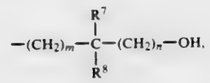
with an acetylenic compound of the structure

$R^1—C\equiv C—R^2$

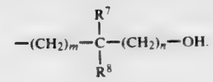
wherein R^1 and R^2 are the same or different, and R^1 is selected from the group consisting of hydrogen, lower alkyl, phenyl, phenyl having a single substituent selected from the group consisting of halogen, lower alkyl, lower alkoxy, and trifluoromethyl, or



R^2 is selected from the group consisting of



hydrogen, lower alkyl, phenyl or phenyl having a single substituent selected from the group consisting of halogen, lower alkyl, lower alkoxy, and trifluoromethyl, with the proviso that at least one of R^1 and R^2 is



4,179,562

2,4-DIAMINO-5-ALKYLOXY-PYRIMIDINES

Roger J. Ponsford, Horsham, England, assignor to Beecham Group Limited, England

Filed Jul. 14, 1977, Ser. No. 815,565

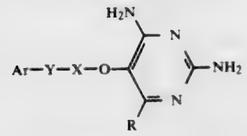
Claims priority, application United Kingdom, Jul. 29, 1976, 31582/76

Int. Cl.[2] C07D *239/48*

U.S. Cl. 544—298 **26 Claims**

1. A compound of the formula (II):

(II)



or a pharmaceutically acceptable salt thereof wherein R is hydrogen, methyl or ethyl; X is alkylene of 1 to 10 carbon atoms; Y is O or S; and Ar is phenyl, naphthyl, anthranyl, phenanthryl or phenyl substituted by from 1 to 5 substituents selected from the group consisting of fluorine, chlorine, bromine, lower alkoxyl, lower acyloxyl, lower lkyl, lower alkenyl, cycloalkyl of 5 or 6 carbon atoms, cycloalkenyl of 5 or 6 carbon atoms and lower alkylthio.

4,179,563

3-ARYLOXY-SUBSTITUTED-AMINOPYRIDINES AND METHODS FOR THEIR PRODUCTION

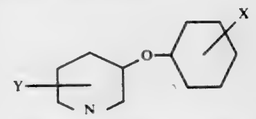
Donald E. Butler, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed May 19, 1978, Ser. No. 907,422

Int. Cl.[2] A61K *31/44, 31/505;* **C07D** *213/65, 401/04*

U.S. Cl. 544—360 **8 Claims**

1. A compound of the formula



and pharmaceutically acceptable acid addition salts thereof; where X is hydrogen, fluorine or chlorine and Y is 1-piperazinyl, 3-methyl-1-piperazinyl, hexahydro-2-methyl-1-H-1, 4-diazepin-1-yl, anilino, or 2[di(lower alkyl)amino] ethylamino.

4,179,564

1,5,6,11-TETRAHYDRO[5,6]CYCLOHEPTA[1,2-b]PYRAZOLO[4,3-e]PYRIDINE DERIVATIVES

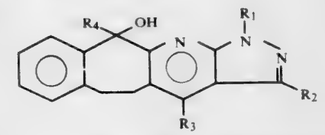
Hans Hoehn, Tegernheim, Del.X; Jack Bernstein, New Brunswick, N.J., and Berthold R. Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 785,398, Apr. 7, 1977, Pat. No. 4,111,940. This application Jun. 23, 1978, Ser. No. 918,638

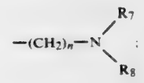
Int. Cl.[2] C07D *471/04*

U.S. Cl. 546—64 **9 Claims**

1. A compound of the formula:



wherein R_1 is lower alkyl, phenyl, or phenyl-lower alkyl; R_2 is hydrogen, lower alkyl, or phenyl; R_3 is hydrogen, halogen, or lower alkoxy; R_4 is hydrogen or



n is an integer from 2 to 6; and R_7 and R_8 are the same or different and each is lower alkyl or R_7 and R_8 taken together with N-atom form a heterocyclic ring of the formula



wherein R_9 is hydrogen or lower alkyl; and a pharmaceutically acceptable acid addition salt thereof.

4,179,565

2,5-DIMETHYL-BENZO[b]-THIENO[2,3-b]MORPHAN AND PRECURSORS THEREOF

Ricardo Granados Jarque, Barcelona; Mercedes Alvarez Domingo, San Juan Despi; Juan Bosch Cartes, Barcelona; Cristóbal Martinez Roldán, and Fernando Rabadan Peinado, both of Madrid, all of Spain, assignors to Laboratorios Made, S.A., Madrid, Spain

Filed Jan. 23, 1978, Ser. No. 871,653

Claims priority, application Spain, Feb. 25, 1977, 456.283

Int. Cl.[2] **C07D** *495/08, 409/06*

U.S. Cl. 546—63 **4 Claims**

1. A compound selected from the group consisting of 2,5-dimethyl-benzo[b]-thieno[2,3-f]morphan (I), 2-(3-benzo[b]-thienylmethyl)-1,4-dimethyl-1,2,3,6-tetrahydropyridine (II) or 2-(3-benzo[b]-thienylmethyl)-1,4-dimethyl-1,2,5,6-tetrahydropyridine (III) or a pharmacologically acceptable acid addition salt thereof.

4,179,566

SUBSTITUTED HYDROXY PYRIDONES

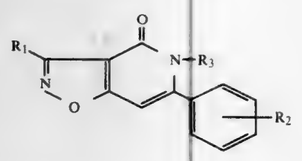
Jeffrey Nadelson, Lake Parsippany, N.J., assignor to Sandoz, Inc., East Hanover, N.J.

Division of Ser. No. 759,399, Jan. 14, 1977, Pat. No. 4,120,967, which is a division of Ser. No. 664,237, Mar. 5, 1976, Pat. No. 4,024,262, which is a continuation-in-part of Ser. No. 602,324, Aug. 6, 1975, abandoned. This application Jul. 17, 1978, Ser. No. 925,388

Int. Cl.[2] **C07D** *498/04, 261/14*

U.S. Cl. 546—116 **3 Claims**

1. A compound of the formula



where

R_1 represents lower alkyl and

R_2 represents hydrogen, halo having an atomic weight of about 19 to 36, lower alkyl or alkoxy, and

R_3 represents straight chain lower alkyl.

4,179,567

2-ARYLTROPANE COMPOUNDS

Robert L. Clarke, Bethlehem, and Sol J. Daum, Albany, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Apr. 10, 1978, Ser. No. 894,894

Int. Cl.[2] **C07D** *471/08*

U.S. Cl. 546—124 **42 Claims**

1. A compound of the formula:



wherein:

R is selected from the group consisting of:

hydrogen,

alkyl of 1–8 carbon atoms optionally interrupted by an oxygen atom,

phenylalkyl where alkyl has 1–3 carbon atoms,

cyclopropylmethyl,

hydroxyalkyl of 2–4 carbon atoms, and

2,2-diethoxyethyl;

Ar is selected from the group consisting of:

phenyl,

benzyl,

3-hydroxyphenyl,

3-methoxyphenyl, and

2-thienyl; and

R′ is hydrogen or alkyl of 1 to 3 carbon atoms;

or a pharmaceutically acceptable acid-addition salt thereof.

4,179,568

(N-LOWER ALKYL-3,5-DIOXO-3-PYRROLIDINYL)THIOALKANOYLPYRROLIDINE-AND PIPERIDINE-CARBOXYLIC ACID COMPOUNDS

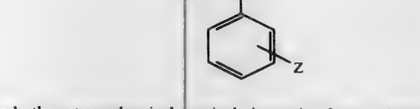
Allen I. Cohen, Highland Park, and Kishin J. Kripalani, East Brunswick, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 31, 1978, Ser. No. 929,877

Int. Cl.[2] **C07D** *401/12, 403/12;* **A61K** *31/445, 31/40*

U.S. Cl. 546—208 **7 Claims**

1. A compound having the formula



or a salt thereof, wherein R_1 and R_4 each is hydrogen, lower alkyl or phenyl-lower alkyl; R_2 is lower alkyl; R_3 is hydrogen, hydroxy or lower alkyl; R_5 is hydrogen or lower alkyl; m is 2 or 3; and n is 0, 1 or 2.

4,179,569

N-(4-PIPERIDINYL)-N-PHENYLAMIDES

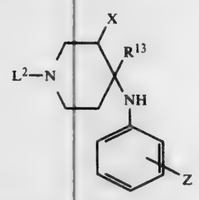
Paul A. J. Janssen, Vosselaar, and Georges H. P. Van Daele, Turnhout, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 695,509, Jun. 11, 1976, abandoned, which is a division of Ser. No. 648,685, Jan. 13, 1976, Pat. No. 3,998,834, which is a continuation-in-part of Ser. No. 558,511, Mar. 14, 1975, abandoned. This application Dec. 19, 1977, Ser. No. 862,073

Int. Cl.[2] **C07D** *211/58*

U.S. Cl. 546—223 **3 Claims**

1. A compound selected from the group consisting of a piperidine derivative having the formula:



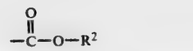
and the stereochemical optical isomeric forms thereof, wherein:

Z is a member selected from the group consisting of hydrogen, halo, lower alkyl, lower alkyloxy and trifluoromethyl;

X is a member selected from the group consisting of hydrogen and methyl;

L^2 is a member selected from the group consisting of alkyl having from 3 to 10 carbons and lower alkenyl; and

R^{13} is a carboxylate radical represented by the formula:



wherein R^2 is a member selected from the group consisting of lower alkyl, lower alkenyl and phenylmethyl.

4,179,570

PYRIDINES AND DIHYDROPYRIDINES

Bernardus A. Oude Alink, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Dec. 18, 1978, Ser. No. 970,415

Int. Cl.[2] **C07D** *213/16, 211/70*

U.S. Cl. 546—252 **6 Claims**

1. A process of preparing alkyl (or aralkyl) pyridines and N-substituted alkyl (or aralkyl) dihydropyridines which comprises treating a 2,5,6,8,9-pentaalkyl (or aralkyl) substituted 1,3,7-triazabicyclo (3,3,1) non-3-ene with a Lewis acid, in the presence or absence of a solvent and at a temperature range of from 100 to 300 degrees C.

4,179,571

MONOHALOALKENYL BENZOATES AND TRIHALOALKYL BENZOATES

Donnie G. Brady, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

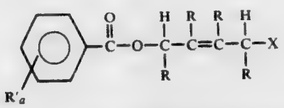
Division of Ser. No. 540,568, Jan. 13, 1975, Pat. No. 4,158,655, which is a division of Ser. No. 245,387, Apr. 19, 1972, Pat. No. 3,879,445. This application Dec. 28, 1978, Ser. No. 973,977

Int. Cl.[2] **C07C** *69/76*

U.S. Cl. 560—64 **7 Claims**

1. Unsaturated monohaloalkenyl benzoate compounds represented by the general formula

(I)



in which each R is individually selected from hydrogen and a radical which is alkyl, aryl, aralkyl, or alkaryl; X is halogen and is chlorine, bromine, or iodine; each R′ is individually selected from hydrogen or a radical which is cycloalkyl, aralkyl, or alkoxy, such that at least one R′ is cycloalkyl, aralkyl, or alkoxy; a is an integer and is 5; and wherein the total number of carbon atoms per said unsaturated monohaloalkenyl benzoate compound does not exceed 20.

4,179,572

TRANS-N-ACYL-N-ALKYL-1-AMINO-1,3-BUTADIENES AND TRANS-N-ACYL-N-ARYL-1-AMINO-1,3,-BUTADIENES

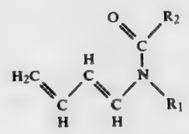
Wolfgang Oppolzer, Thônex, Switzerland, assignor to CHON Corporation, Cambridge, Mass.

Division of Ser. No. 647,049, Jan. 7, 1976, Pat. No. 4,065,496. This application Sep. 21, 1977, Ser. No. 835,322

Int. Cl.[2] **C07C** *125/06*

U.S. Cl. 560—115 **8 Claims**

1. A trans-compound of the formula



wherein R_1 is alkyl, 4-pentenyl, 4-hexenyl, 2-propenyl, or cycloalkyl and R_2 is alkoxy or aryloxy, wherein R_1 and R_2 each contain 1 to about 8 carbon atoms.

4,179,573

(2S,3R)-3-AMINO-2-HYDROXY-4-PHENYLBUTANOIC ACID

Hamao Umezawa, Tokyo; Takaaki Aoyagi, Fujisawa; Tomio Takeuchi, Tokyo; Masa Hamada, Hoya, and Yoshiro Okami, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Division of Ser. No. 690,457, May 27, 1976, Pat. No. 4,052,449, which is a continuation-in-part of Ser. No. 591,924, Jun. 30, 1975, abandoned. This application Aug. 19, 1977, Ser. No. 825,997

Claims priority, application Japan, Jul. 1, 1974, 49-75090

Int. Cl.[2] **C07C** *101/72*

U.S. Cl. 562—444 **1 Claim**

1. (2S,3R)-3-amino-2-hydroxy-4-phenylbutanoic acid.

4,179,574

NOVEL 2-SUBSTITUTED-3,4-EPOXYCYCLOPENTAN-1-ONES, 2-SUBSTITUTED-3,4-EPOXYCYCLOPENTAN-1-OLS, AND VARIOUS 2-SUBSTITUTED-CYCLO-PENTENONES

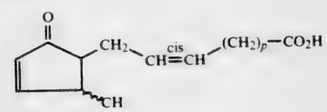
Karel F. Bernady; Middleton B. Floyd, Jr., both of Suffern; John F. Poletto, Nanuet, all of N.Y.; Robert E. Schaub, Upper Saddle River, and Martin J. Weiss, Oradell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 737,941, Nov. 2, 1976, abandoned, which is a division of Ser. No. 603,467, Aug. 11, 1975, abandoned, which is a division of Ser. No. 355,101, Apr. 27, 1973, abandoned. This application Sep. 22, 1977, Ser. No. 835,613

Int. Cl.[2] **C07C** *11/38*

U.S. Cl. 562—503 **2 Claims**

1. Compounds of the formula:



wherein p is an integer from 3 to 6 inclusive.

4,179,575

POLYHALOGENATED CARBOXYLIC ACIDS

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Jean-Pierre Demoute, Montreuil-sous-Bois, all of France, assignors to Roussel UCLAF, Paris, France

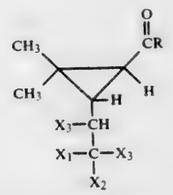
Filed Sep. 19, 1977, Ser. No. 834,573

Claims priority, application France, Sep. 21, 1976, 76 28279; Jul. 19, 1977, 77 22078

Int. Cl.[2] **C07C** *61/18;* **A01N** *9/30*

U.S. Cl. 562—506 **8 Claims**

1. A compound of the formula



wherein X_1 is selected from the group consisting of hydrogen, fluorine, chlorine and bromine, X_2 is selected from the group

consisting of fluorine, chlorine and bromine, X_3 is selected from the group consisting of chlorine, bromine and iodine and R is hydroxy in any of the possible isomer forms.

4,179,576

PROCESS FOR PREPARING PYRIDINE BASES

Tetsuya Miyake, Tokyo; Kohji Noguchi, and Kazuo Imamura, both of Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 11, 1977, Ser. No. 841,083

Claims priority, application Japan, Oct. 27, 1976, 51/128192; Oct. 27, 1976, 51/128194; Oct. 27, 1976, 51/128195

Int. Cl.[2] C07D *213/16*

U.S. Cl. 546—251 **14 Claims**

1. A process for preparing pyridine bases from acetaldehyde and ammonia by gas phase catalytic reaction, wherein the gas phase catalytic reaction is carried out at a temperature of 300° to 550° C. and at a space velocity of 200 to 10,000 hr^{-1} in the presence of a catalyst prepared by subjecting silica-alumina to ion exchange with ions of a member selected from the group consisting of lead, tin, lead plus nickel, silver plus lead, silver plus cadmium, silver plus calcium, silver plus strontium, silver plus manganese, silver plus zinc, and silver plus tin to adsorb the ions on said silica-alumina.

4,179,577

POLYMERISABLE ESTERS DERIVED FROM A PHENOLIC UNSATURATED KETONE

George E. Green, Cherry Hinton, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 633,770, Nov. 20, 1975, Pat. No. 4,079,183. This application Dec. 27, 1977, Ser. No. 865,042

Claims priority, application United Kingdom, Nov. 30, 1974, 51972/74

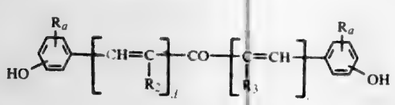
Int. Cl.[2] C07C *69/76, 69/95*

U.S. Cl. 560—52 **7 Claims**

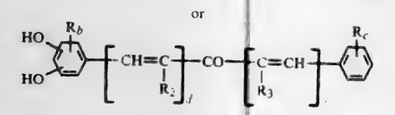
1. An ester as a composition of matter, which is soluble in an aqueous solution of a base before exposure to actinic radiation, but which polymerizes on exposure to actinic radiation and becomes insoluble in said aqueous solution, which comprises the condensation product of

(A) the reaction product of

(1) a phenol of the formula



or



where

each R represents a halogen atom, an alkyl, cycloalkyl, alkenyl or alkoxy group of 1 to 9 carbon atoms or a nitro group,

each a represents zero or an integer of 1 to 4,

each b represents zero or an integer of 1 to 3,

each c represents zero or an integer of 1 to 5,

R^2 and R^3 individually are each a hydrogen atom, an alkyl group of 1 to 4 carbon atoms, or a phenyl group, or conjointly denote a polymethylene chain of 2 to 4 methylene groups,

d and e are each zero, 1, or 2, with proviso that they are not both zero, and

(2) a compound containing one or more 1,2-epoxy groups comprising a glycidyl ether, N-glycidyl compound or S-glycidyl compound selected from the group consisting of the glycidyl ethers of ethylene glycol, of diethylene glycol, of poly(oxyethylene) glycol, of propane-1,2-diol, of poly(oxypropylene) glycol, of propane-1,3-diol, of butane-1,4-diol, of poly(oxytetramethylene) glycol, of pentane-1,5-diol, of hexane-1,6-diol, of hexane-2,4,6-triol, of glycerol, of 1,1,1-trimethylolpropane, of pentaerythritol, of sorbitol, of resorcitol, of quinitol, of bis(4-hydroxycyclohexyl)methane, of 2,2-bis(4 hydroxycyclohexyl)-propane, of 1,1bis(hydroxymethyl)cyclohex-3-ene, of N,N-bis(2hydroxyethyl)aniline, of p,p'-bis(2-hydroxyethylamino)diphenylmethane, of resorcinol, of hydroquinone, of bis(4-hydroxyphenyl)methane, of 4,4'-dihydroxydiphenyl, of bis(4-hydroxyphenyl) sulfone, of 1,1,2,2-tetrakis(4-hydroxyphenyl)ethane, of 2,2-bis(4-hydroxyphenyl)propane, of 2,2-bis(3,5-dibromo-4-hydroxyphenyl)propane, of methanol, of ethanol, of n-butanol, of allyl alcohol, of phenol, of o-cresol, of m-cresol and of p-cresol; the N-glycidyl compounds of bis(4-aminophenyl)methane, of bis(4-aminophenyl) sulfone, of isocyanuric acid, of 5,5-dialkylhydantoins, of hydantoin, of uracil, of dihydrouracil, of parabanic acid, of bis(-(hydantoin-1-yl) methane, of ethyleneurea and of 1,3-propyleneurea; the N,N,O-triglyidyl compound of p-aminphenol; and the S-glycidyl compound of cyclododecanetrithol,

said phenol (1) and 1,2-epoxy compound (2) being reacted at a temperature of 80° to 150° C. in the presence of an inert solvent, a free-radical polymerization inhibitor and a ring opening catalyst selected from the group consisting of a tertiary amine and a quaternary ammonium compound, and in a ratio of from 0.75 to 1.25 phenolic hydroxyl equivalents per each 1,2-epoxide group in the epoxy co-reactant, with

(B) a dianhydride selected from the group consisting of benzophenone-3,3',4,4'-tetracarboxylic acid dianhydride, pyromellitic acid dianhydride and naphthalene-2,3,6,7-tetracarboxylic acid dianhydride,

said reaction product (A) and the dianhydride (B) being reacted at a temperature of 80°–150° C. in an inert solvent and with a tertiary amine esterification catalyst, and in a ratio of 0.7 to 1.2 carboxylic acid anhydride equivalents of the anhydride for each hydroxyl group of product (A).

4,179,578

PARA-PHENYL STILBENE DERIVATIVES

Fritz Fleck, Bottmingen; Hans Kittl, Riehen, and Salvatore Valenti, Bottmingen, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

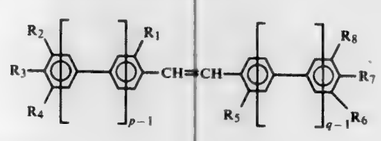
Division of Ser. No. 596,287, Jul. 16, 1975, Pat. No. 4,032,558, which is a continuation of Ser. No. 316,448, Dec. 19, 1972, abandoned. This application Apr. 14, 1977, Ser. No. 787,510

Claims priority, application Switzerland, Dec. 24, 1971, 18907/71; Jan. 26, 1972, 1129/72

Int. Cl.[2] C07C *63/60, 69/76*

U.S. Cl. 560—76 **5 Claims**

1. A compound of the formula,



I

in which

R_1 and R_5 each signifies hydrogen or linear alkyl of 1 to 4 carbon atoms,

R_2, R_3, R_4, R_6, R_7 and R_8 each signifies hydrogen, halogen, alkyl or alkoxy of 1 to 8 carbon atoms, alkenyl of 3 to 8 carbon atoms, or -COOR',

in which R' signifies hydrogen, alkyl of 1 to 22 carbon atoms, hydroxyalkyl of 2 to 4 carbon atoms, phenyl or methyl- or chlorine-substituted phenyl,

p signifies an integer from 1 to 3, and

q signifies an integer from 1 to 3, provided that the total of p and q is 4, 5 or 6, at least one of

R_3 and R_7 being -COOR'.

4,179,579

SUBSTITUTED PROPARGYL ALCOHOLS, ALLYLIC ALCOHOLS AND UNSATURATED KETONES, AND METHODS FOR THE PRODUCTION THEREOF

Yoshiji Fujita; Fumio Wada; Takashi Ohnishi; Takashi Nishida, all of Kurashiki; Yoshiaki Omura, Mitsu; Fumio Mori, Kurashiki; Takeo Hosogai, Kurashiki, and Sukeji Aihara, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

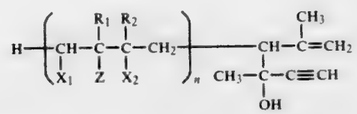
Continuation-in-part of Ser. No. 746,738, Dec. 2, 1976, abandoned. This application Jul. 25, 1977, Ser. No. 818,875

Claims priority, application Japan, Dec. 2, 1975, 50-144267; Dec. 2, 1975, 50-144268; Dec. 30, 1975, 50-159584; Feb. 16, 1976, 51-16611

Int. Cl.[2] C07C *33/02, 33/04*

U.S. Cl. 568—840 **29 Claims**

1. An intermediate compound for the production of an unsaturated ketone via Oxy-Cope rearrangement reaction which comprises heating the corresponding allylic alcohol obtained by the hydrogenation of said compound to a temperature from 100° to 400° C., said compound being represented by the formula:



wherein X_1 and X_2 are both hydrogen atoms or wherein one of X_1 and X_2 is a hydrogen atom and the other jointly with Z represents a bond; Z jointly with X_1 or X_2 represents a bond, or separately represents a hydrogen atom; R_1 and R_2 are the same or different and represent hydrogen atoms or lower alkyl groups; n is 1 or 2; and when n is 2, X_1, X_2, Z, R_1, and R_2 may be the same or different.

4,179,580

ORGANIC CHEMICAL REACTION

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 11, 1978, Ser. No. 905,071

Int. Cl.[2] C07C *3/52*

U.S. Cl. 546—349 **23 Claims**

1. A process comprising reacting at least one non-conjugated non-aromatic olefinically unsaturated hydrocarbon with at least one active hydrogen-containing organic compound selected from the group consisting of monoolefinic hydrocarbons and carbocyclic aromatic or heterocyclic aromatic compounds having attached to an aromatic nuclear carbon atom a saturated carbon atom to which at least one hydrogen atom is bonded, in the presence of a catalytic amount a catalyst system consisting essentially of alkali metal promoted by elemental titanium under conditions such that a condensation product of said at least one active hydrogen-containing organic compound and said at least one non-conjugated non-aromatic olefinically unsaturated hydrocarbon is formed.

4,179,581

PARAFFINIC HYDROCARBON ISOMERIZATION PROCESS

Roy T. Mitsche, Wauconda, and George N. Pope, McHenry, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 788,376, Apr. 18, 1977, Pat. No. 4,098,874. This application Jun. 30, 1978, Ser. No. 921,159

Int. Cl.[2] C07C *5/28, 5/30*

U.S. Cl. 585—744 **17 Claims**

1. A process for isomerizing an isomerizable paraffinic hydrocarbon which comprises contacting said paraffinic hydrocarbon, at isomerization conditions, with a catalytic composite comprising a combination of a platinum group metal component and an alumina support wherein said support is prepared by admixing a finely divided alpha-alumina monohydrate with an aqueous ammoniacal solution having a pH of at least about 7.5 to form a stable suspension, commingling a catalytic metal salt of a strong acid with said suspension to form the suspension into an extrudable paste or dough, extruding the paste or dough to form an extrudate, drying and calcining said extrudate to form said alumina support.

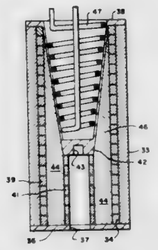
V 9 8 9 / 3 DEC 18 79 UMI

4,179,582

HIGH VOLTAGE HIGH CURRENT CABLE TERMINAL WITH DUAL GRADING CAPACITOR STACK

Felipe G. Garcia, Sunnyvale, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Nov. 23, 1977, Ser. No. 854,155
Int. Cl.² H02G *15/22*; H01B *17/28*
U.S. Cl. 174—15 BH **10 Claims**



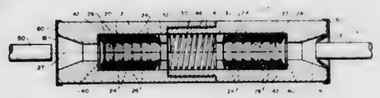
1. A high voltage cable terminal for an insulated high voltage cable having a high current carrying capacity, comprising: an insulating shell, an external grading capacitor stack mounted adjacent to the inside surface of said insulating shell and operating to grade the interface between said insulating shell and the surrounding environment, an internal grading capacitor stack mounted substantially concentrically within and being shorter than said external capacitor stack, being spaced therefrom, being adapted to surround the high voltage cable, and operating to grade the interface between the insulated high voltage cable and surrounding insulation, a conductor end member mounted at one end of said shell closing one end of the space between said internal and external capacitor stacks, a ground end member mounted at the other end of said shell closing the other end of the space between said internal and external capacitor stacks, whereby a closed chamber is formed therebetween, a dielectric within said closed chamber, said conductor and ground end members being formed to connect to a high voltage conductor and to pass the insulated high voltage cable respectively.

4,179,583

ELECTRO-MECHANICAL LOW BACKLASH CABLE CONNECTOR

Sergius S. Sergev, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 6, 1978, Ser. No. 883,557
Int. Cl.² H01R *5/00, 5/08*
U.S. Cl. 174—21 R **16 Claims**



1. An electro mechanical connector comprising:

a. a housing containing a plurality of chambers respectively having a plurality of openings with each opening being adapted to receive an insertion member;

b. gripping means inwardly inclined within each said chamber and engageable between said insertion member and said housing for preventing withdrawal of said insertion member, said gripping means including a plurality of aligned, inwardly biased spring washers for engaging said insertion member and spacer means disposed between each spring washer for maintaining independent actuation of each said spring washer; and

c. means adjacent each said chamber opening for maintaining said gripping means inwardly inclined.

4,179,584

SYNTHETIC-SPEECH CALCULATORS

Akira Tanimoto, Kashihara; Sigeaki Masuzawa, Nara; Shinya Shibata, Nara, and Shinzo Nishizaki, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 28, 1978, Ser. No. 882,267
Claims priority, application Japan, Feb. 28, 1977, 52-22083; Mar. 1, 1977, 52-22514; Mar. 23, 1977, 52-32487
Int. Cl.² G10L *1/00*
U.S. Cl. 179—1 SM **16 Claims**



1. A synthetic-speech calculator having a housing comprising:

a keyboard having digit keys and function keys;

a processor unit for performing operations on numerical information entered via said keyboard resulting in specific operation results of said keyed information;

means for producing audible sound signals indicative of said operation results, said operation results being presented audibly digit by digit or, said operation results being capable of being audibly presented in groups each group comprising three-digits including a punctuation mark followed by another group comprising three-digits including a punctuation mark;

mode selector means selectable on said housing for directing said synthetic-speech calculator to generate the audible sound signal either digit by digit or in three-digit groups.

4,179,585

VARIABLE RATIO FULL RANGE DIRECT-REFLECTED PYRAMID INCLINED LOUDSPEAKER

Gilles R. Herrenschmidt, 71 rue de Passy, 75016 Paris, France

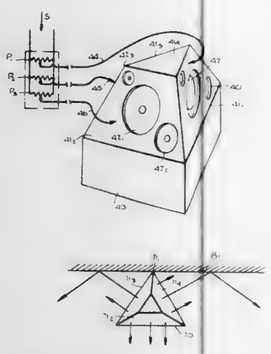
Filed May 9, 1978, Ser. No. 904,330
Claims priority, application France, Oct. 27, 1977, 77 32517
Int. Cl.² H04R *1/20*
U.S. Cl. 179—1 E **5 Claims**

1. A loudspeaker arrangement adapted to provide variable direct and reflected sounds at a desired ratio with the loudspeaker arrangement disposed adjacent a wall external to the speaker enclosure and disposed between said wall and a listening area, including

means for producing reflected sounds including first and second sidewalls of a truncated pyramid formed enclosure, said first and second sidewalls including acoustic transducers and meeting at a junction with the junction being adjacent and facing said will with the first and second sidewalls being directed at the wall with sound emanating from the first and second sidewalls striking the wall before being reflected toward the listening area;

means for producing direct sounds having relatively high, middle and low sound frequencies, said direct sound producing means including the third sidewall of the pyramid formed enclosure, and including acoustic transducers for producing at least low sound frequencies and mid-range sound frequencies with the third sidewall and the included transducers being disposed opposite said junction and

facing the listening area and having an angle with respect to the vertical of approximately 15° so that sound emanating from said third sidewall will reach a listener before being reflected by surfaces external to the speaker arrangement,



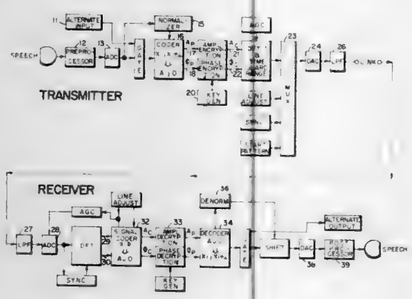
control means for increasing and decreasing the quantity of reflected sound relative to direct sound including means for respectively increasing and decreasing the output of transducers in the first and second sidewalls relative to the output of the transducer in the third sidewall.

4,179,586

SYSTEM OF ENCODED SPEECH TRANSMISSION AND RECEPTION

Mitford M. Mathews, Jr., deceased, late of Silver Spring, Md. (by Georgina H. Mathews, executrix); Thomas E. Tremain, Laurel, and Myron T. Zmurko, Bowie, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 2, 1972, Ser. No. 277,211
Int. Cl.[2] H04K *1/00*
U.S. Cl. 179—1.5 R **17 Claims**



1. A system of information transmission and reception comprising:

means for obtaining values for amplitude and phase of a digital information signal, the values being related to the original amplitude and phase by predefined algorithms;

means for separately routing said values in separate signal paths;

means for transforming the information in said signal paths from the frequency domain into the time domain;

means for modulating a number of carrier tones with the information in said signal paths, the output of said modulating means being suitable for transmission, and

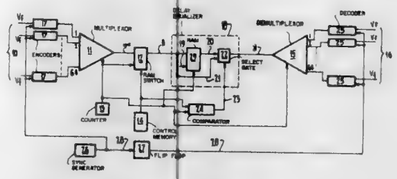
receiving means for recovering the original digital information.

4,179,587

BIT SWITCHING OF WORD FORMATTED DATA

Ludwik Herschtal, North Balwyn, Australia, assignor to L. M. Ericsson Pty. Ltd., Broadmeadows, Australia

Filed Jun. 1, 1978, Ser. No. 911,481
Claims priority, application Australia, Jun. 20, 1977, PD0511
Int. Cl.[2] H04Q *11/04*
U.S. Cl. 179—15 AT **4 Claims**



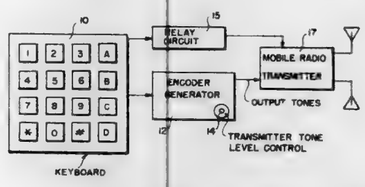
1. A method for serially bit-switching digital word synchronized (word aligned) data between inputs and outputs of a digital switch comprising the steps of converting data from different incoming channels to said switch into a bit interleaved bitstream on a single data highway, bit switching said bitstream via a switch memory, determining those bits which incur a switch memory delay as opposed to those bits which do not incur a said delay, applying a said delay to said bits which do not incur said delay, and applying a said delay to a synchronization signal for synchronizing the word boundary of outgoing data from the switch relative to a synchronization signal for synchronizing the word boundary of incoming data to the switch.

4,179,588

ENCODER UNIT FOR MOBILE RADIO TRANSMITTER

Joseph P. Oliveira, II, 8060 Willoughby Ave., Hollywood, Calif. 90046

Filed Nov. 14, 1977, Ser. No. 851,131
Int. Cl.[2] H04M *1/50*; H04Q *7/04*
U.S. Cl. 179—90 K **2 Claims**



1. The multi-frequency encoder unit comprising: a keyboard switching circuit including a plurality of keys; a mobile radio transmitter; an encoder generator connected to said keyboard switching circuit and controlled thereby to generate selected dual tones for application to said mobile radio transmitter upon the selective operation of said keys; a relay including an energizing coil and a pair of contacts, said contacts being connected to said mobile radio transmitter to activate said transmitter when said energizing coil is energized; and circuit means including a plurality of diodes connecting said energizing coil to said keys so that actuation of any one of said keys causes the energizing coil to be energized to activate said transmitter, and said circuit means further including capacitor means for causing said relay coil to be de-energized a predetermined time interval after said keys are released.

4,179,589

PHONO CARTRIDGE

Kenkichi Tsukamoto, 47, Koyamashimofusa-cho, Kita-ku Kyoto-shi, Kyoto-fu, Japan

Continuation-in-part of Ser. No. 704,803, Jul. 13, 1976, abandoned. This application May 12, 1978, Ser. No. 905,351
Int. Cl.[2] H04R *11/08*; G11B *3/02*
U.S. Cl. 179—100.41 D **2 Claims**



1. A phono-cartridge comprising a casing, a magnet mounted in the casing, a coil disposed to receive the magnetic flux of the magnet, a straight cantilever having a stylus tip on one end thereof for picking up information stored in grooves of a recorded disk, the magnet and the coil being driven relative to each other by the motions of the cantilever, the cantilever being supported by a suspension wire means limiting the motion in a direction along the cantilever axis and a leaf spring means limiting the motion around the cantilever axis, the suspension wire means engaging the leaf spring means to form a fulcrum on or above the cantilever at about a 90 degree angle, the action line formed by connecting the top of the stylus tip and the fulcrum made by the suspension wire means and the leaf spring means being coincident with the gravitational center of the cantilever.

4,179,590

APPARATUS FOR CONTROLLING RELATED EQUIPMENT AND FOR ENABLING HAND FREE USAGE

Milton L. Snow, 150 Fifth Ave., New York, N.Y. 10011

Filed Dec. 23, 1977, Ser. No. 863,881
Int. Cl.[2] H04M *1/05*
U.S. Cl. 179—156 A **24 Claims**



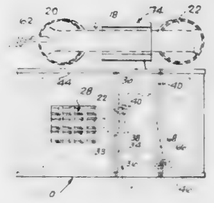
1. An apparatus for use with a telephone instrument and other equipment connected therewith, for simultaneous use in conjunction with the telephone instrument, such as: a timing device, a recording device, and the like; said instrument and equipment each having respective on-off switch means, said apparatus comprising: faceset means formed of a transmitter-receiver assembly and associated support means; said support means being provided as part of said assembly for supporting said assembly along a user's face, by positioning said transmitter in proximity to a user's mouth and said receiver in proximity to said user's ear and module means being operatively associated with said telephone instrument, other equipment, and faceset means, having on-off switch means and electrical circuitry providing electrical signals to said telephone instrument and the transfer of said signals between said faceset means and said telephone instrument; and mechanical linkage means, said linkage means being adapted to actuate said telephone instrument on-off switch means when said telephone instrument is placed in working relationship with said module means, to actuate said module means on-off switch means for controlling the operation of said faceset and other equipment in circuit relation to said telephone instrument.

4,179,591

TELEPHONE COVER

William M. Becker, 5915 Onondoga Rd., Bethesda, Md. 20016

Filed Jun. 30, 1978, Ser. No. 921,118
Int. Cl.[2] H04M *1/02*
U.S. Cl. 179—179 **4 Claims**



1. A substitute cover, to replace that of a modern, single line, desk, or table top, telephone, of the type which cradles the handset transversely between four fixed posts and across the top of the instrument, comprising a hollow shell of generally rectangular configuration having top and side walls and open at the bottom, said shell being adapted to be secured to the horizontal base of a telephone instrument by the normal securing means of the instrument so as to house without change or rearrangement its working circuits and parts other than the handset, said top wall having an upwardly and forwardly sloping rear portion, a generally flat, horizontal center portion and a forwardly and downwardly sloping forward portion, an opening in said forward portion of the top wall for reception of a telephone dialing unit, an elongated bar pivoted at one end within said shell and extending substantially entirely across the hollow interior with its free end protruding through an opening in a side wall of the shell, a cradle arranged to seat a handset alongside and longitudinally of said shell and fixed to the free end of said bar outside the shell, said bar being adapted to rest by gravity on a switch actuator within the shell and to be moved upwardly by the actuator when the handset is lifted from said cradle, and said opening in the side wall of the shell being sufficiently large to permit up and down rocking movements of the arm so that seating a handset on the cradle lowers the bar and moves the switch actuator and switch to off position, while lifting the handset from the cradle permits the switch actuator to lift the bar and close the telephone switch to its on position, whereby removing the normal instrument cover and substituting said cover vastly improves the aesthetic appearance of the telephone without changing or moving any other component parts or circuits and without need for any special tools.

4,179,592

SIGNAL SWITCH ASSEMBLY

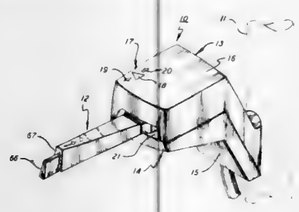
Edward J. Nitsch, Camillus, N.Y., assignor to R. E. Dietz Co., Syracuse, N.Y.

Filed Dec. 21, 1977, Ser. No. 862,864
Int. Cl.[2] H01H *3/16*; B60Q *1/46*
U.S. Cl. 200—61.27 **13 Claims**

1. A signal switch for use in a motor vehicle including a housing that is adapted to be secured to said vehicle, first and second electrical contact units contained within

said housing, said first unit being arranged when actuated to electrically connect front and rear lamps mounted on the right side of the vehicle to circuit means for illuminating said right side lamps and said second unit being arranged when actuated to electrically connect front and rear lamps on the left side of the vehicle to said circuit means for illuminating said left side lamps,

a movable arm affixed to a flat spring, said spring being rotatably supported within said housing upon a pivot pin so that said arm is rotatable about said pivot within a first plane of rotation and independently deflectable upon said spring within a second plane that is substantially perpendicular with said first plane of rotation regardless of the rotational position of said arm, said arm extending outwardly from said housing through an opening formed in a sidewall thereof and having an actuator means associated therewith that is normally located in a neutral position



between said two contact units and being arranged to actuate said contacts of said first unit when said arm is rotated in one direction to a first operative position and to actuate said contacts of said second unit when said arm is rotated in the opposite direction to a second operative position,

a slide slidably mounted within said arm and being arranged to move inwardly toward said housing from a home position to an extended position, said slide having camming means operatively associated therewith for simultaneously actuating said contacts of both of said units when said slide is in an extended position and for releasing said contacts when said slide is in the home position, and

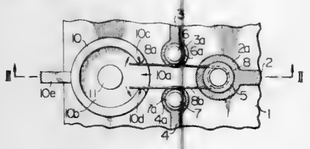
switch means supported adjacent to said arm within said housing, said switch means being actuated by said arm when said arm is deflected upon said spring in a plane generally perpendicular to said plane of rotation of said arm.

4,179,593

CHANGE-OVER SWITCH FOR PRINTED CIRCUIT BOARD

Katsuhiko Tsunefuji, Suwa, Japan, assignor to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Mar. 13, 1979, Ser. No. 885,875
Int. Cl.² H01H *9/00*
U.S. Cl. 200—292 **15 Claims**



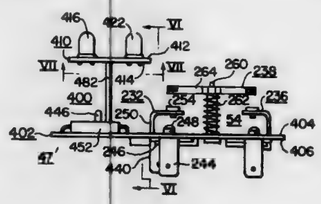
1. A change-over switch for a printed circuit board comprising: a substrate of an insulating material on which a plurality of patterned electrical circuit elements are formed; a first electrically conductive support stud fixedly mounted on the substrate in electrical contact with a first of said circuit elements and having a portion extending in front of a first surface of the substrate; a switching member formed of an electrically conductive, resilient wire and comprising a torsion spring having at least one turn wound on said portion of the support stud; said resilient wire having a first extension therefrom which is formed from said torsion spring and which is formed as a first movable contact; said resilient wire having a second extension therefrom which is formed from said torsion spring and which is formed as a second movable contact; said first and second extensions of said torsion spring extending generally in the same direction and being biased by said torsion spring to move in opposite directions; a second electrically conductive stud fixedly mounted on the substrate in electrical contact with a second of said patterned circuit elements and having a first section extending in front of said first surface, said first section of said second conductive stud being formed as a first stationary contact and disposed intermediate the length of said first extension; said first extension of the switching member being normally resiliently biased by said torsion spring and said first stationary contact being located in the path of movement of said first extension under its bias; a third electrically conductive stud fixed to said substrate and in electrical contact with a third of said patterned circuit elements and having a second section extending in front of said first surface; said second section of said third conductive stud being formed as a second stationary contact and disposed intermediate the length of said second extension; said second extension of the switching member being normally resiliently biased by said torsion spring and said second stationary contact being located in the path of movement of said second extension under its bias; said first and second extensions being normally biased toward engagement with said second and third studs, respectively, and an operating member for engaging the end portion of each said extension at the end thereof away from said first stud and past its respective said stationary contact for constraining or permitting movement of each said extension under its said normal bias to selectively connect or disconnect each said extension with the respective said stationary contact; said extensions and said stationary contacts being so placed that as said operating member moves one said extension to constrain it and thereby disconnect that said extension from its said stationary contact, said operating member, combined with said torsion spring, urges and permits the other said extension to connect that other said extension with its said stationary contact; said operating member comprising a body of electrically insulating material which is movable generally parallel to and with respect to the first surface of the substrate for engaging said extensions; said operating member being provided with a switching piece to which force is applied for moving said body.

4,179,594

ILLUMINATED PUSHBUTTON ASSEMBLY

Forrest E. Coyle, and Alan F. Mandel, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 12, 1978, Ser. No. 941,610
Int. Cl.² H01H *9/02*
U.S. Cl. 200—310 **5 Claims**



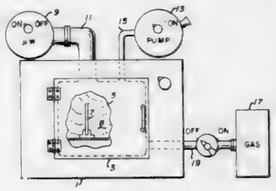
1. An illuminable pushbutton assembly, comprising:
a housing having front and back sides, and a cavity accessible from the back side, said front side including a portion to be illuminated,
a first printed circuit board mounted on said housing,
a contact assembly mounted on said first printed circuit board,
an actuating member carried by said housing which is operatively coupled with said contact assembly,
and illuminating means including at least one solid state light source mounted on a second printed circuit board having an electrical circuit thereon connected to said at least one light source, electrical circuit elements mounted on said first printed circuit board having an electrical circuit thereon which interconnects said components, and stand-off means mounting said second printed circuit board on said first printed circuit board, said stand-off means rigidly spacing the second printed circuit board from the first printed circuit board, with the at least one light source adjacent to the portion of the housing to be illuminated, said stand-off means being formed of electrically conductive material and being electrically connected to the electrical circuits of both of said first and second printed circuit boards to provide a current carrying path between the first and second printed circuit boards as well as mechanical support for the second printed circuit board.

4,179,596

METHOD FOR PROCESSING FIBEROPTIC ELECTRONIC COMPONENTS OF ELECTRONIC VACUUM DEVICES

Lennart W. Bjork, Palo Alto, Calif., assignor to Litton Systems, Inc., San Carlos, Calif.

Filed Apr. 27, 1978, Ser. No. 900,716
Int. Cl.² C03B *37/10*
U.S. Cl. 219—10.55 M **1 Claim**



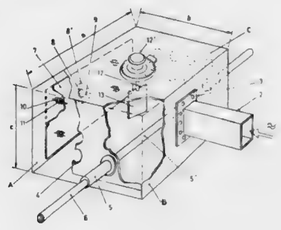
1. The method of removing entrapped contaminants from an already fused matrix of solid or hollow glass fibers, comprising the following steps to be performed after fusing and subsequent cooling of the matrix:
enclosing the matrix in a chamber for confining microwave energy;
subjecting the matrix in the chamber to microwave energy radiation to heat the entrapped contaminants and remove them from the matrix by outgassing without substantially heating the glass fibers; and
removing the gases from the chamber.

4,179,595

MULTIMODAL RESONANT CAVITY FOR VERY HIGH FREQUENCY HEATING

Georges Chiron, Chambery, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Aug. 15, 1977, Ser. No. 824,732
Claims priority, application France, Aug. 19, 1976, 76 25205
Int. Cl.² H05B *9/06*
U.S. Cl. 219—10.55 F **7 Claims**



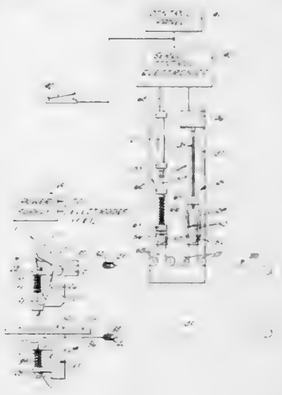
1. High frequency heating apparatus comprising a resonant parallelepipedal metallic enclosure, generating means for generating high frequency electromagnetic energy in the microwave range, wave guide means for connecting the generator to the enclosure, the three dimensions of the enclosure being odd multiples of ½ the wavelength of the electromagnetic energy generated by the generator; a rough adjustment member comprising a plate spaced parallel to one side of the enclosure and means mounting the plate for movement a distance in the range between zero and ½ the wavelength of the energy supplied by the generator in a direction normal to the plane of said side of the enclosure; and a fine adjustment member having a planar surface facing the wave guide means and means for changing the angular relationship of the plane of the planar surface with respect to the wave guide means.

4,179,597

CONTINUOUS THRU-WIRE WELDING MACHINE

Stephen J. Bartholet, Orange, Calif., assignor to Odetics, Inc., Anaheim, Calif.

Filed Jul. 31, 1978, Ser. No. 929,735
Int. Cl.² B23K *11/00, 9/28*
U.S. Cl. 219—56.1 **11 Claims**



1. A welding machine for welding a conductor to a terminal comprising:
a pair of elongated conductive electrodes having adjacent ends mounted for axial movement toward said terminal;
a cable;
means for attaching said cable to said electrodes for moving same toward said terminal;
drive means operatively connected to said cable for applying a tension force thereto;
input means for establishing a predetermined force between

said electrodes and said terminal and for generating a first electrical signal proportional thereto;

sensing means operatively coupled to said cable for sensing the tension force therein and for generating a second electrical signal proportional thereto;

comparison means for comparing said first and second signals and for generating a third electrical signal as a function of said comparison; and

control means responsive to said third signal for controlling said drive means.

4,179,598

ELECTRIC RESISTANCE WELDING MACHINE

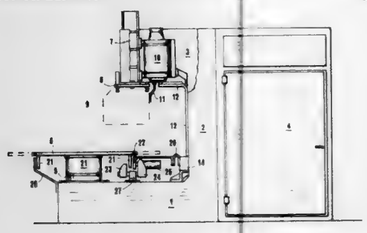
Attilio Alessio, Strada San Gillio 23, I - 10.040 Druento (Turin); Carlo Parpaiola, and Pier Antonio, both of Via Garibaldi 48, I - 10.091 Alpignano (Turin), all of Italy

Filed Dec. 22, 1977, Ser. No. 863,576

Claims priority, application Italy, Jan. 28, 1977, 67174 A/77

Int. Cl.[2] B23K *11/24, 37/04*

U.S. Cl. 219—79 **9 Claims**



9. An electric resistance welding machine comprising an upper bracket, an implement holding head vertically movable in said upper bracket, a welding transformer mechanically connected to said implement holding head, a vertical bar mechanically and electrically connected to said welding transformer, a lower bracket, a connection means mounted on said lower bracket and electrically connected to said vertical bar, a movable workpiece holding table mounted on said lower bracket, clamping means mounted on said lower bracket and engageable during the welding periods with portions of said table, and a flexible strap electrically connecting said connection means and said clamping means.

4,179,599

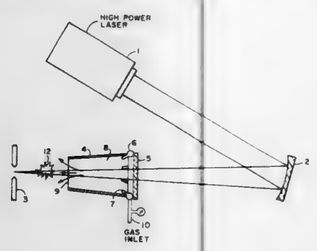
LASER PLASMATRON

Raymond W. Conrad, Russellville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 8, 1978, Ser. No. 903,417

Int. Cl.[2] B23K *9/00*

U.S. Cl. 219—121 P **5 Claims**



1. A plasma generator comprising: a continuous wave, high power laser, focusing means for focusing radiation of said laser to an irradiance high enough to sustain a plasma, means for igniting said plasma, gas flow means adapted for directing gas at a controllable, variable velocity in the direction of and uniformly dispersed within said laser beam, said laser beam being coaxial with the flow of gas, and wherein said gas flow restrains plasma motion up the laser beam in response to the variation in gas velocity for controlling plasma temperature and position in the laser beam.

4,179,600

DEVICE FOR FUSING TONER ON A CARRIER OF ELECTROSTATIC IMAGES

Helmuth Haberhauer, Taunusstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 24, 1978, Ser. No. 908,957

Claims priority, application Fed. Rep. of Germany, May 27, 1977, 2724052

Int. Cl.[2] H01B *1/00*

U.S. Cl. 219—216 **14 Claims**



1. A device for fusing toner on a carrier of electrostatic images, said carrier having a predetermined width and moving through a fusion zone heated by infrared radiation, said device comprising a plurality of shortwave infrared radiating means arranged above and transverse to said moving direction of said carrier, each of said radiating means having a length less than the width of said carrier, each of said radiating means being mutually unaligned with the remaining plurality of said radiating means, and wherein the ends of said infrared radiating means are interleaved in a comb-like manner in the center of said fusion zone.

4,179,601

FIXING APPARATUS FOR ELECTROPHOTOGRAPHIC COPYING MACHINE

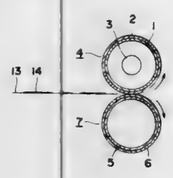
Noriyoshi Tarumi; Kenji Ueno, both of Hachioji, and Hirofumi Sakaguchi, Akigawa, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1978, Ser. No. 911,345

Claims priority, application Japan, Jun. 7, 1977, 52-66273

Int. Cl.[2] H05B *1/00*

U.S. Cl. 219—216 **7 Claims**



1. A fixing apparatus for an electrophotographic copying machine which apparatus comprises a rotatable heated fixing roller having a resinous surface layer comprising a resinous fluorine material and carbon black.

4,179,602

METHOD AND SYSTEM OF VELOCITY CONTROL FOR AUTOMATIC WELDING APPARATUS

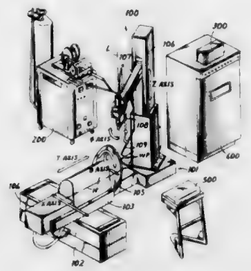
Shigeo Maruyama, Nishinomiya; Yuji Nishikaiji, Takarazuka; Tatsuya Miura, and Shigeki Fujinaga, both of Nishinomiya, all of Japan, assignors to Shin Meiwa Industry Co., Ltd., Japan

Filed Jul. 14, 1977, Ser. No. 815,783

Claims priority, application Japan, Jul. 16, 1976, 51-85427; Jul. 23, 1976, 51-88448; Jul. 23, 1976, 51-88449; Jul. 23, 1976, 51-88450; Jan. 20, 1977, 52-6280; Mar. 30, 1977, 52-36422; Mar. 30, 1977, 52-36423

Int. Cl.[2] B23K *9/12*

U.S. Cl. 219—125.1 **60 Claims**



1. In an automatic welding system comprising means for fixing a workpiece and means for holding a welding torch, said workpiece fixing means and said welding torch holding means having a mutual positional relationship with respect to each other in terms of an at least two-axis coordinate system and at least one of said workpiece fixing means and said welding torch holding means being movably mounted for allowing adjustment of said mutual positional relationship of said workpiece fixing means and said welding torch holding means in terms of said at least two axes of the coordinate system; a method for controlling adjustment of said mutual positional relationship, said method comprising the steps of:

(a) presetting position information concerning at least two positions, comprising at least an origin point and a destination point, between which said at least one of said workpiece fixing means and said welding torch holding means is to be moved through a plurality of interpolation points;

(b) presetting composite velocity information concerning the composite velocity of movement by said at least one of said workpiece fixing means and said welding torch holding means between said at least two positions;

(c) determining pitch information concerning said at least two axes based on said preset position information concerning said at least two positions for utilization of said pitch information with respect to a first one of said at least two positions and at each successive interpolation point;

(d) determining velocity component information concerning the velocity components, in terms of said at least two axes of the coordinate system, of said preset composite velocity of movement for utilization of said velocity component information with respect to a first one of said at least two positions and at each successive interpolation point;

(e) determining, based on said pitch information, a next successive interpolation point through which said at least one of said workpiece fixing means and said welding torch holding means is to pass;

(f) determining whether or not said next successive interpolation point exceeds said destination point;

(g) if said next successive interpolation point does not exceed said destination point, providing said velocity component information concerning the velocity components, determined in terms of said at least two axes of the coordinate system, as velocity commands of the respective axes, driving said at least one of said workpiece fixing means and said welding torch holding means in the directions of said axes in response to said determined velocity component information concerning the velocity components, determining whether or not there exists at least one of a clock condition and null condition defining reduced velocity of said at least one of said workpiece fixing means and said welding torch holding means, and, if said at least one of a clock condition and null condition does exist, repeating steps (c) through (g) for said next successive interpolation point; and

(h) if said next successive interpolation point does exceed said destination point, providing said preset position information and said preset velocity information concerning said destination point, and driving said at least one of said workpiece fixing means and said welding torch holding means in the directions of said axes in response to said provided preset position information and said preset velocity information concerning said destination point.

4,179,603

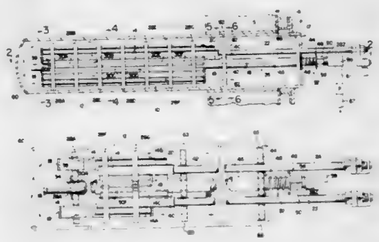
RADIAL BLADE HEATING DEVICE

Jon G. Zeigler, Salem; Elmer L. Kerr, Damascus, and David V. Bell, Hanoverton, all of Ohio, assignors to The Electric Furnace Company, Salem, Ohio

Filed Nov. 21, 1977, Ser. No. 853,274

Int. Cl.[2] H05B *3/02*

U.S. Cl. 219—538 **27 Claims**



1. An electric heating device in an industrial furnace for heating metal work products by radiation and for being mounted adjacent to said metal work products, said electric heating device comprising: a plurality of rigid, straight, flat, rectangular interconnected conductors of rectangular cross section having cross sectional widths substantially greater than their thicknesses, the width portions of said conductors being radially aligned and concentric about a longitudinal support member; a plurality of rigid insulator means concentric about said support member and adapted to space said conductors one from another and from said support member without substantially inhibiting radiation of heat from said conductors and without restricting expansion and contraction of said conductors relative to said insulator means and said support member, means to space said plurality of insulator means apart longitudinally along said support member and means to secure said insulator means, said spacer means and said support member to form a substantially rigid self-supporting structure through which said conductors are free to expand and contract, whereby outward radiation of heat from said device is maximized and the life of said device is prolonged.

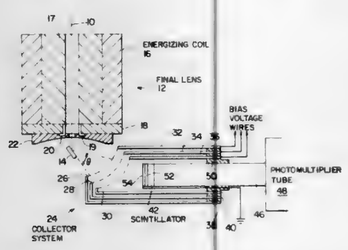
V 9 8 9 \ 3 DE 18 79 UMI

4,179,604

ELECTRON COLLECTOR FOR FORMING LOW-LOSS ELECTRON IMAGES

Aristos Christou, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 29, 1978, Ser. No. 946,986
Int. Cl.[2] H01J 39/00
U.S. Cl. 250—305 **10 Claims**



1. In a device wherein a primary electron beam accelerated by a specific accelerating potential is scanned over the surface of a specimen and electron images are generated by collecting electrons scattered from the surface, an improved collector system for selectively collecting backscattered low-loss electrons having energies within a selectable energy range comprising:

electron-responsive means positioned in the path of the backscattered electrons for producing a signal when struck by an electron;

first grid means, positioned between said specimen and said electron-responsive means in the path of the backscattered electrons, for establishing a first negative electric field potential having a magnitude near ground potential in the path of the backscattered electrons;

second grid means, positioned between said first grid means and said electron-responsive means in the path of the backscattered electrons, for establishing a second negative electric field potential in the path of the backscattered electrons, said second electric field potential being approximately equal in magnitude to the energy of the lowest energy electrons to be collected; and

third grid means, positioned between said second grid means and said electron-responsive means in the path of the backscattered electrons, for establishing a third negative electric field potential in the path of the backscattered electrons, said third electric field potential being approximately equal in magnitude to the energy of the highest energy electrons to be collected.

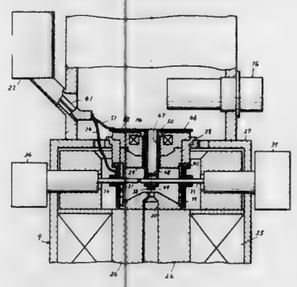
4,179,605

COLD TRAP FOR ELECTRON MICROSCOPE

Hisao Watanabe, and Terukazu Etoh, both of Akishimashi, Japan, assignors to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1978, Ser. No. 917,288
Claims priority, application Japan, Jul. 11, 1977, 52-91893[U]
Int. Cl.[2] G01M 23/00
U.S. Cl. 250—311 **4 Claims**

1. In an electron microscope the improvement comprising an objective lens having two annular coaxial magnetic pole pieces closely spaced axially and between which a specimen holder and an objective lens aperture plate are located, said annular pole pieces being axially spaced by an annular non-magnetic spacer, a cylindrical cold trap positioned radially outside the non-magnetic spacer and the space between said magnetic pole pieces, and means for cooling the trap such that residual gas molecules are absorbed by said trap, thereby preventing or



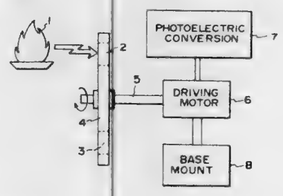
substantially reducing the build-up of contamination on the specimen.

4,179,606

FLAME SENSOR

Shunsaku Nakauchi, Mitaka, and Akifusa Takahashi, Tokyo, both of Japan, assignors to Security Patrols Co., Ltd. and Kokusai Gijutsu Kaihatsu Co., Ltd., both of Tokyo, Japan

Filed Aug. 1, 1977, Ser. No. 820,699
Claims priority, application Japan, Oct. 2, 1976, 51-117920
Int. Cl.[2] G01J 1/00
U.S. Cl. 250—339 **12 Claims**



1. A flame sensor for monitoring the condition of a flame comprising a rotary disc having a first band-pass filter of an infra-red region containing a wavelength of a resonant radiation of carbon dioxide and a second band-pass filter of an infra-red region containing no such wavelength, a single photoelectric conversion device for measuring intensity of the radiation having passed said band-pass filters and a division circuit for providing a ratio of an output of the photoelectric conversion device containing the wavelength of the resonant radiation of the carbon dioxide to an output of the device containing no such wavelength.

4,179,607

GAMMA CAMERA SYSTEM WITH IMPROVED MEANS FOR CORRECTING NONUNIFORMITY

Kai Lange, Vedbaek, and Jørgen Jeppesen, Mariehøj, both of Denmark, assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 13, 1978, Ser. No. 895,895
Int. Cl.[2] G01T 1/20
U.S. Cl. 250—363 S **8 Claims**

1. In a scintillation camera system comprising means for producing scintillation events over a relatively large area field in response to interception of radiation, a plurality of photosensitive devices adjacent each other on one side of said photosensitive means for producing electric pulses in response to said scintillations, means responsive to said pulses by producing

analog signals representing respectively the x and y coordinates of the scintillations in said field, pulse height analyzer means and means responsive to said analyzer means determining that said pulses are within predetermined limits by producing z signals, and display means responsive to coincidence of z signals and said analog signals by producing intensity changes at coordinates corresponding with the coordinates of the scintillations to thereby form an image,

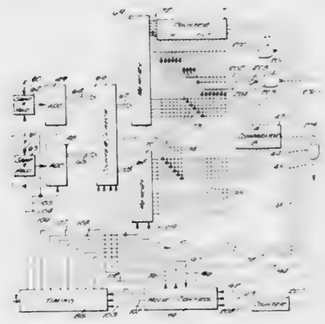
improved means for correcting for nonuniformity between the positions of said events and their positions on said display means comprising:

analog-to-digital converter means operative to convert said analog signals to digital x and y coordinate signals,

memory means having first locations corresponding respectively with small area increments in said large field and operative in response to occurrence of said digital coordinate signals during an accumulate mode to accumulate and store counts of said events in locations, respectively, substantially corresponding with the positions of said area increments, said counts being made when a uniform radiation source is presented to said means for producing scintillation events,

means for determining when a memory location has accumulated a predetermined number of counts of said events during the accumulation mode,

means responding to a determination that a particular memory location has accumulated said predetermined number



of counts of events by prohibiting the addition of counts to that particular memory location,

first means for counting the number of memory locations that have accrued said predetermined number of counts,

means responding to said means for counting have counted a selected number of locations containing said predetermined number counts by terminating counting of said events while a plurality of said locations still contain fewer than said predetermined number,

said memory means having second locations corresponding respectively with said area increments in said large field and operative in response to said digital coordinate signals occurring during a run mode to store counts of said events in locations, respectively, substantially corresponding with the positions of said area increments, said counts being made when a nonuniform radiation source is presented to said means for producing scintillation events,

comparator means operative during said run mode to compare the most significant bits of said accumulated counts from said first locations with a corresponding number of bits for the counts in said second locations, respectively, and to produce correction signals for each location, respectively, substantially equal in number to the difference in counts between the corresponding first and second locations, and

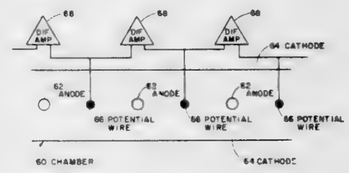
means operative in response to said correction signals to produce z signals and, hence, additional intensity changes in corresponding incremental areas of said display means.

4,179,608

RIGHT/LEFT ASSIGNMENT IN DRIFT CHAMBERS AND PROPORTIONAL MULTIWIRE CHAMBERS (PWC'S) USING INDUCED SIGNALS

Albert H. Walenta, Upton, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 10, 1978, Ser. No. 904,678
Int. Cl.[2] H01J 39/28
U.S. Cl. 250—385 **6 Claims**



1. An improved multiwire chamber for the detection and localization of ionizing radiation and having a plurality of anode wires wherein the improvement comprises:

(a) a pair of localizing wires spaced from substantially parallel to and coextensive with one of said anode wires, one wire of said pair being positioned on either side of said anode wire; and,

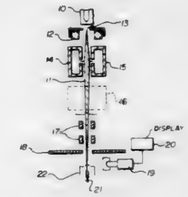
(b) means for determining the difference in signal between the wires of said pair caused by an ionizing event, whereby the ambiguity as to whether said event occurred to the right or left of said anode wire may be resolved.

4,179,609

POINT SCATTERING DETECTOR

Peter B. Sewell, 68 Cleadon, and Kovilvila N. Ramachandran, 40 Columbus Ave., both of Ottawa, Ontario, Canada

Filed Mar. 10, 1978, Ser. No. 885,295
Int. Cl.[2] G01N 27/00
U.S. Cl. 250—397 **3 Claims**



1. An imaging system for analyzing electron intensity distributions of electron beams in scanning electron microscopes and similar apparatus comprising a point scattering detector positioned in the electron beam where the distribution is to be measured and including a base, a metal rod having a sharpened tip adjustably mounted on the base, and an apertured plate mounted on but insulated from said base with its aperture positioned in the beam path and adapted to carry a positive electrical potential in relation to the tip such that the electrons can impinge on the sharpened tip of the detector causing secondary electrons to be emitted, means for collecting secondary electron from said tip, and means for measuring and displaying the secondary electron intensity to provide an image pattern of the electron beam.

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4,179,610

APPARATUS TO INDICATE BIO-RHYTHM CURVES

James T. Chester, 13352 Maham Rd., Dallas, Tex. 75240

Filed Dec. 12, 1977, Ser. No. 859,743
Int. Cl.² G06C 3/00
U.S. Cl. 235—89 R **8 Claims**



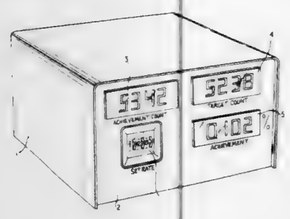
1. Apparatus for indicating bio-rhythm curves comprising: a body; a calendar scale having numerals to indicate the days of the year positioned on the body; a reference scale positioned at the beginning of the calendar scale, said reference scale being numbered to indicate the number of days within the longest cycle; a first slide element mounted with said body and having a first sine wave printed thereon representing a first bio-rhythm cycle; a second slide element mounted with said body and having a second sine wave printed thereon to represent a second bio-rhythm cycle; a third slide element mounted with said body having a third sine wave printed thereon representing a third bio-rhythm cycle, the first, second and third slide elements cooperating with said body to provide three bio-rhythm curves for a first individual over the calendar year; a fourth slide element mounted with said body and having a sine wave printed thereon representing one of the three bio-rhythmic cycles; a fifth slide element mounted with said body and having a sine wave printed thereon representing another of the three bio-rhythmic cycles; and a sixth slide element mounted with said body and having a sine wave printed thereon representing the third of the three bio-rhythmic curves, the fourth, fifth and sixth slide elements cooperating with said body to provide three additional bio-rhythmic curves for a second individual over the calendar year to thereby permit the first and second individuals to compare their bio-rhythm curves over such calendar year.

4,179,611

EFFICIENCY MONITORING DEVICE

Kenneth G. Mill, 21 Hayward Dr., Galashiels, Scotland; Christian P. Lynch, Portbello, Scotland; Richard T. Strathie, and Alexander F. H. Dixon, both of Tweedbank, Scotland, assignors to Kenneth G. Mill, Scotland

Filed Jan. 18, 1978, Ser. No. 870,422
Int. Cl.² G07C 3/10
U.S. Cl. 235—92 QC **4 Claims**



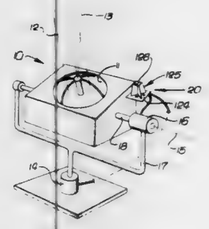
1. Monitoring equipment for use with a processing machine to indicate the efficiency of the machine in achieving a desired processing rate comprising, in combination, a housing remote from the machine, electronic clocking means within the housing to generate timing pulses, a presettable control with the housing to determine the rate at which pulses are fed from the clocking means to a computing circuit as a first signal, the presettable control including a manually settable device on which the repetition rate for the first signal can be set digitally, input terminals to the housing connected to the computing circuit to which input terminals can be attached a sensing means associated with the processing machine and which generates second signal pulses at a rate indicative of the performance of the machine in processing, the computing circuit including means to generate a third signal which represents a ratio of the first and second signals and including digital display devices on the housing on which, respectively, a cumulative count of the first and second signals and periodically updated values of the third signal are displayed.

4,179,612

RADIATION TRACKING CONTROL

Peter D. Smith, 1912 Kathryn Ct., Bakersfield, Calif. 93308

Filed Jan. 12, 1979, Ser. No. 2,884
Int. Cl.² G01J 1/20
U.S. Cl. 250—203 R **22 Claims**



1. In radiation tracking apparatus,
(a) mounting means and two photo sensors carried thereby to receive incident radiation,
(b) edge means to intercept radiation directed toward each sensor so that primary and secondary locations on each sensor respectively receive and do not receive incident radiation, the sensors controlling tracking movement of the apparatus,
(c) the sensors being electrically energized and having electrical outputs which vary as a function of radiation interception by the sensors, and there being means responsive to said outputs to control said tracking movement,
(d) and there being control means connected with the sensors and responsive to increases and decreases in the intensity of said radiation to respectively decrease and increase electrical energization of the sensors.

4,179,613

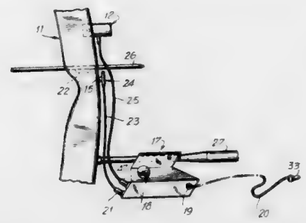
BOW DRAW INDICATOR AND SIGHTING DEVICE

James T. Koren, 1915 Grand St., Trevose, Pa. 19047

Filed May 1, 1978, Ser. No. 901,859
Int. Cl.² F41G 1/32
U.S. Cl. 250—215 **15 Claims**

1. A device suitable for attaching to an archery bow comprising the combination of
(a) An energy source,
(b) A photoelectric sensor connected to the energy source which activates a signal means when an arrow used with the bow is at predetermined draw,
(c) A vertical control means which inactivates said signal means when the bow is canted more than a predetermined angle from vertical, and

(d) A sight means connected to the energy source and containing thereon adjustable omnidirectional sensor means



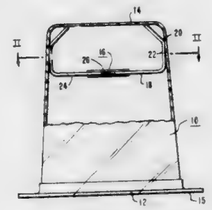
set to activate a signal when the bow is not directed to the elevation at which the omnidirectional sensors are set.

4,179,614

THERMOLUMINESCENT DOSIMETER SYSTEM

Patrick E. Felice, Hempfield Township, Allegheny County; Joseph L. Gonzalez, White Oak Borough, and John G. Seidel, McCandless Township, Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 3, 1978, Ser. No. 874,976
Int. Cl.² G01V 5/00; H05B 33/00; G01T 1/11
U.S. Cl. 250—253 **8 Claims**



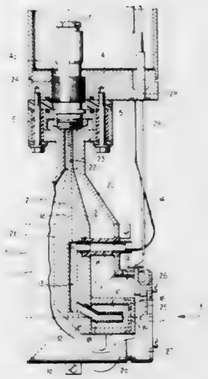
6. Apparatus for locating underground deposits of uranium by thermoluminescence produced by the alpha particle decay from radioactive radon gas and its daughter products comprising:
a cup-shaped body open at one end and closed at the other end, so that the open end can be placed upon the ground within a test bore hole;
a dosimeter support bracket disposed within the cup-shaped body and having an aperture through the bracket, including means for removably mounting the bracket to the cup-shaped body side walls;
a thin thermoluminescent body fitted within the aperture in the mounting bracket;
a pair of thin metallized plastic films which are transmissive to alpha, beta and gamma radiation disposed on opposed sides of the mounting bracket over the aperture within which the thermoluminescent body is disposed; and
peripheral seal means for retaining the metallized plastic films on opposed sides of the mounting bracket and for providing a moisture and soil impenetrable barrier.

4,179,615

FARADAY DISH FOR MAKING MEASUREMENTS AT THE BEAM PATHS OF A HEAVY ION ACCELERATOR

Hubert Kraus, and Peter Strehl, both of Wixhausen, Fed. Rep. of Germany, assignors to Gesellschaft fur Schwerionenforschung mbH, Darmstadt, Darmstadt, Fed. Rep. of Germany

Filed Sep. 1, 1978, Ser. No. 938,870
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1977, 2740227
Int. Cl.² B01D 59/44
U.S. Cl. 250—489 **10 Claims**



1. A Faraday dish for making measurements at a beam path of a heavy ion accelerator comprising
a supporting structure,
a hollow outer conductor including first and second portions secured to and insulated from said supporting structure, said first portion having an open end, the longitudinal axis of the first portion of said outer conductor being adapted for positioning substantially parallel to said beam path with the open end thereof transverse to said beam path, and the longitudinal axis of the second portion of said outer conductor being perpendicular to the longitudinal axis of the first portion of said outer conductor, and
an inner conductor having first and second portions positioned within said outer conductor, said first portion having an open end, the longitudinal axes of the first and second portions of said inner conductor being coaxial with the longitudinal axes of the first and second portions of said outer conductor, respectively.

4,179,616

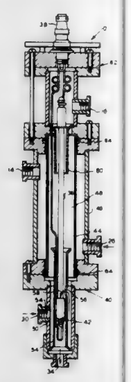
APPARATUS FOR SANITIZING LIQUIDS WITH ULTRA-VIOLET RADIATION AND OZONE

Allan J. Coviello; Frederick E. Bernardin, Jr., both of Ann Arbor, and Robert R. Rohrkemper, Chelsea, all of Mich., assignors to Thetford Corporation, Ann Arbor, Mich.

Continuation of Ser. No. 879,204, Feb. 21, 1978, abandoned. This application Oct. 2, 1978, Ser. No. 947,505
Int. Cl.² C02B 1/00, 1/38, 3/08; H01J 61/52
U.S. Cl. 250—527 **16 Claims**

1. Apparatus for sanitizing liquids comprising an elongated ultraviolet lamp, an inner duct surrounding the lamp and formed from a material which is transparent to the germicidal wavelengths of the ultraviolet light, an outer duct surrounding said inner duct, means to pass air through said inner duct so that said air is irradiated and ozone is formed, means to pass a liquid through said outer duct so that said liquid is irradiated, a tank, and means to pass the irradiated liquid and the irradiated air into said tank, the improvement comprising said inner duct including a zone wherein said air will flow at a predeter-

mined relatively slow rate so that the air that is irradiated will produce a relatively high concentration of ozone, and air means to pass cooling air along at least a portion of the length



of the lamp at a relatively high velocity to maintain the lamp at a temperature sufficient to achieve a relatively high radiation output.

4,179,617

ION-NITRIDING APPARATUS

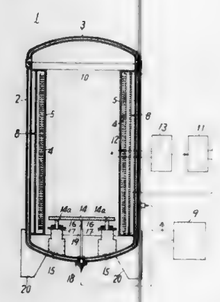
Akio Tanaka, Ono; Mizuo Edamura, Kobe; Satoshi Furuitsu, Kakogawa, and Satoru Kunise, Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Nov. 29, 1977, Ser. No. 855,902

Claims priority, application Japan, Dec. 1, 1976, 51-145105

Int. Cl.[2] B01K *1/00*

U.S. Cl. 250—531 **6 Claims**



1. In an ion-nitriding apparatus for heating and nitriding a workpiece, said apparatus having:

a vacuum reacting furnace adapted to receive said workpiece therein;

heating means inside and spaced from the interior wall of said reacting furnace for heating the inside of said furnace;

screening means inside said furnace between the position for said workpiece and said heating means for electrically screening said heating means from said workpiece; and

voltage impressing means connected between said screening means as an anode and said workpiece as a cathode for creating a glow discharge,

an improvement comprising:

an outer wall covering means within said reacting furnace between said heating means and the interior wall of said furnace for selectively shielding said heating means from and opening said heating means toward said interior furnace wall, whereby the amount of heat released toward said furnace wall is controllable.

4,179,618

APPARATUS FOR ION-NITRIDING TREATMENT

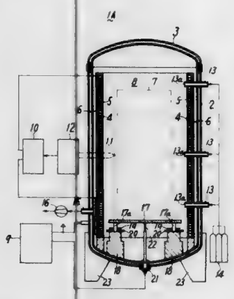
Akio Tanaka, Ono; Mizuo Edamura, Kobe; Satoshi Furuitsu, Kakogawa, and Satoru Kunise, Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed Nov. 29, 1977, Ser. No. 855,908

Claims priority, application Japan, Dec. 1, 1976, 51/145102; Dec. 1, 1976, 51/145103; Dec. 1, 1976, 51/145104

Int. Cl.[2] B01K *1/00*

U.S. Cl. 250—531 **2 Claims**



1. In an apparatus for ion-nitriding a workpiece, said apparatus having:

a vacuum reacting furnace adapted to receive said workpiece;

a heat-producing element inside said vacuum reacting furnace;

an inner wall screening body between said heat-producing element and said workpiece for electrically screening said heat-producing element from said workpiece;

a first power source connected between said screening body and said workpiece for creating glow discharge by impressing DC voltage between said screening body as an anode and said workpiece as a cathode; and

a second power source connected to said heat-producing element for heating said heat-producing element by impressing AC voltage upon said heat-producing element, whereby said workpiece is heated and ion-nitrided by the combined use of said glow discharge and heat generated by said heat-producing element;

an improvement comprising:

control means connected to said first and second power sources for controlling the temperature inside said furnace by concurrently controlling the voltage impressed from said first and second power sources in relation to the temperature inside said furnace, whereby the heat generated by said heat-producing element and the heat generated during glow discharge are maintained at desired levels, said voltage impressed by said second power source to said heat-producing element having a maximum value of 220 volts.

4,179,619

OPTOCOUPLER HAVING INTERNAL REFLECTION AND IMPROVED ISOLATION CAPABILITIES

James S. Cook, Tully, N.Y., assignor to General Electric Company, Auburn, N.Y.

Filed Dec. 2, 1977, Ser. No. 856,755

Int. Cl.[2] G02B *27/00*

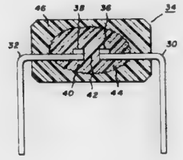
U.S. Cl. 250—551 **21 Claims**

1. An optoelectric device comprising:

an optical source;

an optical sensor spaced apart from said optical source; and

means for providing enhanced transmission of radiation between said source and said sensor including an essentially homogeneous body of solid dielectric medium having an inner light transmissive region, optically coupling



said optical source and said optical sensor, and an outer light reflective region essentially surrounding said inner light transmissive region, said inner and outer regions being simultaneously cured to eliminate an interface therebetween.

4,179,620

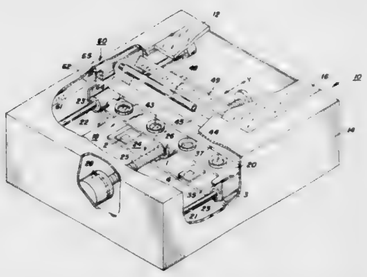
CROSSOVER ARRANGEMENT FOR MULTIPLE SCANNING ARRAYS

Martin A. Agulnek, Sharon, Mass., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 793,001, May 2, 1977. This application Apr. 17, 1978, Ser. No. 896,857

Int. Cl.[2] G06K *7/10*

U.S. Cl. 250—566 **2 Claims**



1. In a raster imaging apparatus for producing images on a member in response to image signals, the improvement comprising:

at least two imaging arrays, each of said arrays comprising a plurality of discrete imaging elements arranged in succession along the imaging axis of said array, the length of the area imaged by each of said arrays being less than the width of said member along said imaging axis;

means supporting said arrays for movement relative to said member with the imaging axis of said arrays extending in a direction substantially perpendicular to the direction of said movement;

said arrays being supported so that the areas imaged by each of said arrays overlap whereby to provide a composite imaged area;

and image signal input means for inputting image signals to said array imaging elements to actuate said imaging elements selectively in accordance with said image signals to produce images on said member, said image signal input means including crossover means for crossing over from one array to the next succeeding array within the overlapping portion of the areas imaged by each of said arrays on a random basis.

4,179,621

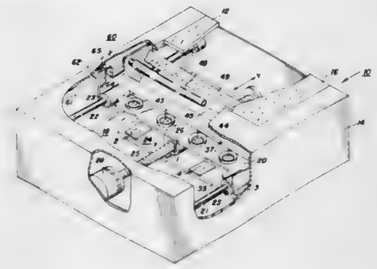
SCANNING APPARATUS

Peter A. Crean; Pierre A. Lavallee, both of Penfield, N.Y., and Martin A. Agulnek, Sharon, Mass., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 793,202, May 2, 1977. This application Apr. 17, 1978, Ser. No. 896,858

Int. Cl.[2] G06K *7/10*

U.S. Cl. 250—566 **9 Claims**



1. In a raster imaging apparatus for producing images on a member in response to image signals, the improvement comprising:

at least two imaging arrays, each of said arrays comprising a plurality of discrete imaging elements arranged in succession along the imaging axis of said array, the length of the area imaged by each of said arrays being less than the width of said member along said imaging axis;

means supporting said arrays for movement relative to said member with the imaging axis of said arrays extending in a direction substantially perpendicular to the direction of said movement;

said arrays being supported so that the areas imaged by each of said arrays overlap whereby to provide a composite image area; and

image signal input means for inputting image signals to said array imaging elements to actuate said imaging elements selectively in accordance with said image signals to produce images on said member, said image signal input means crossing over from one array to the next succeeding array within the overlapping portion of the areas imaged by each of said arrays.

4,179,622

METHOD AND SYSTEM FOR IN SITU CONTROL OF MATERIAL REMOVAL PROCESSES

Holger Moritz, Holzgerlingen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 25, 1978, Ser. No. 900,028

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728361

Int. Cl.[2] G01N *21/30*

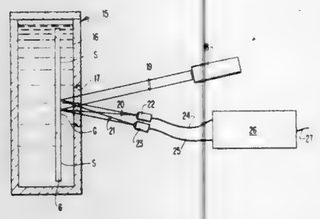
U.S. Cl. 250—571 **17 Claims**

1. A method of detecting the end point in a process for removing material from a workpiece, said workpiece comprising at least a support layer of one material supporting a top layer of a radiation sensitive material, comprising the steps of:

a. forming, by exposure to radiation of the radiation sensitive top layer, a grid pattern on the workpiece in addition to the pattern of material to be removed,

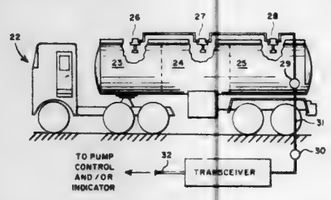
b. positioning the workpiece, in a material removal environment so that said material removal process acts to remove portions of said top layer,

c. directing a beam of monochromatic radiation onto the grid pattern,



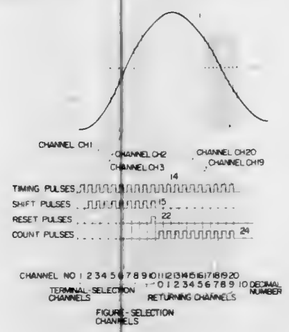
d. sensing the intensity of a diffraction order of radiation reflected from the grid pattern, and
e. determining the end point from said intensity.

4,179,623
PULSED LEVEL SENSOR
William F. Jacobsen, Toronto, Canada, assignor to Honeywell Ltd., Scarborough, Canada
Filed Aug. 25, 1977, Ser. No. 827,494
Claims priority, application Canada, Sep. 2, 1976, 260390
Int. Cl.[2] G01N *21/26*
U.S. Cl. 250—573 **33 Claims**



1. An apparatus for continuously supplying pulses to sense the level of a material and for terminating said pulses when said material is at a predetermined level comprising:
first triggerable pulse means for supplying a pulse, said first triggerable pulse means having input means;
level sensing means connected to said first triggerable pulse means for transmitting said pulse to an output, and for blocking said pulse when said material is at a predetermined level;
second triggerable pulse means connected to said output of said level sensing means whereby said second triggerable pulse means is triggered by said pulse for supplying a pulse to an output;
means connecting said output of said second triggerable pulse means to said input means of said first triggerable pulse means whereby said pulse supplied by said second triggerable pulse means triggers said first triggerable pulse means to produce a second pulse; and,
output means connected to said output of said triggerable pulse means,
whereby said first triggerable pulse means supplies a pulse to said level sensing means each time said input means receives a pulse from second triggerable pulse means.

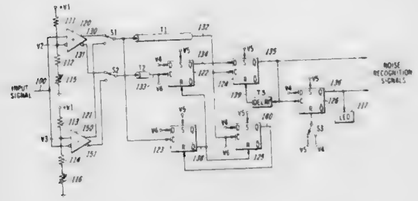
4,179,624
CARRIER CONTROL METHOD BY USING PHASE-PULSE SIGNALS
Yoshio Shindo, Sagamihara; Takahiro Kimijima, Kokubunji; Hiroyasu Onishi, Yokohama, and Massayasu Endo, Machida, all of Japan, assignors to The Tokyo Electric Power Co. Inc. and Osaki Electric Co., Ltd., both of Tokyo, Japan
Filed Oct. 7, 1977, Ser. No. 840,369
Claims priority, application Japan, Jan. 25, 1977, 52/6396
Int. Cl.[2] G08C *19/24*
U.S. Cl. 307—3 **4 Claims**



1. A carrier control method using phase-pulse signals comprising forming a plurality of terminal-selection channels, a plurality of figure-selection channels, and a plurality of returning channels having a respective predetermined phase width in one cycle of an alternating-current carrier wave; each of said returning channels being assigned a particular figure value; inserting a terminal-selection phase-pulse signal comprising a coded combination of the existence and the non-existence of a phase pulse of each terminal-selection channel in the terminal-selection channels of the alternating current carrier wave, corresponding to a code assigned to each terminal equipment at the center; inserting a figure-selection phase-pulse signal comprising a coded combination of the existence and the non-existence of a phase pulse of each figure-selection channel in the figure-selection channels of the alternating-current carrier wave, corresponding to a code which designates a figure of a datum of a plural number of figures stored in the terminal in the electrically readable state, also at the center; receiving the terminal-selection phase-pulse signal at the terminal equipment; inserting a returning phase-pulse signal comprising the existence and the non-existence of a phase pulse on only one of the returning channels of the alternating-current carrier wave at the terminal equipment, corresponding to the value of the designated figure of the datum memorized in the terminal, when a code of the terminal-selection phase-pulse signal coincides with the code of the terminal equipment; and receiving said returning phase-pulse signal at the center; the transmission of said terminal-selection phase-pulse signal and said figure-selection phase-pulse signal and the return of the returning phase-pulse signal being made for every figure of the datum stored in the terminal.

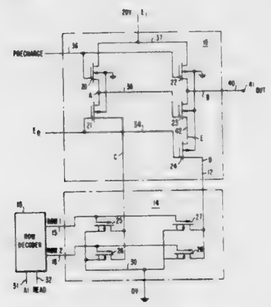
4,179,625
NOISE PULSE PRESENCE DETECTION CIRCUIT
Aaron B. Carter, Chicago, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Nov. 28, 1977, Ser. No. 855,456
Int. Cl.[2] H03K *5/153, 5/18*
U.S. Cl. 307—234 **10 Claims**

1. A noise pulse detection circuit, having an input terminal, for generating an output recognition signal indicative of an incoming signal pulse applied to said input terminal having a pulse duration less than a prescribed duration, comprising:
circuit means having a first circuit terminal and a second circuit terminal;
delay means connected to said input terminal and to said first circuit terminal and responsive to a direct input signal applied to said input terminal for generating a delayed signal delayed by a predetermined period of time from said direct input signal and having a discernible leading edge and trailing edge;
characterized in that said noise pulse detection circuit further comprises:



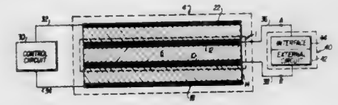
signal inverter means connected to said input terminal and said second circuit terminal for generating an inverted input signal having a discernible leading edge and trailing edge, which is the logical inverse of said direct input signal applied to said input terminal; and
said circuit means is responsive to said delayed signal and said inverted input signal for generating an output recognition signal when said trailing edge of said inverted input signal is applied to said circuit means prior to said leading edge of said delayed signal.

4,179,626
SENSE CIRCUIT FOR USE IN VARIABLE THRESHOLD TRANSISTOR MEMORY ARRAYS
Harry G. Oehler, Pasadena, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jun. 29, 1978, Ser. No. 920,299
Int. Cl.[2] H03K *5/20*; G11C *7/00, 11/40*; H03K *3/353*
U.S. Cl. 307—238 **3 Claims**



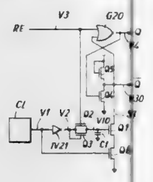
1. A memory sense circuit for comparing the threshold voltage of a first and second variable threshold transistor wherein the source electrode of said first and second variable threshold transistors are coupled to a first voltage supply terminal and the gate electrodes are coupled to a first control signal terminal comprising:
third, fourth and fifth field effect transistors each having a gate, source and drain electrode,
the gate electrode of said third and fifth transistors coupled to a voltage source terminal,
the source electrode of said third transistor coupled to the drain electrode of said first variable threshold transistor,
the source electrode of said fifth transistor coupled to the drain electrode of said second variable threshold transistor,
the drain electrode of said third transistor coupled to the gate electrode of said fourth transistor,
the drain electrode of said fifth transistor coupled to the source electrode of said fourth transistor,
means for applying a second control signal, and
first means responsive to said second control signal for coupling the drain electrode of said third and fourth transistors to a return path of said first voltage supply terminal to precharge selected circuit nodes.

4,179,627
ELECTRICAL APPARATUS
Ronald P. Reitz, Annapolis, Md., assignor to Tom Swift Enterprises, Inc., Annapolis, Md.
Continuation-in-part of Ser. No. 805,399, Jun. 10, 1977, Pat. No. 4,126,149. This application Mar. 8, 1978, Ser. No. 884,396
Int. Cl.[2] H01L *31/04*
U.S. Cl. 307—261 **26 Claims**



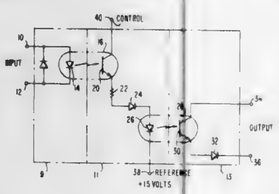
1. An electrical apparatus comprising:
(a) a first electrode having major opposed surfaces;
(b) a first dielectric having major opposed surfaces, one surface thereof positioned proximate one surface of said first dielectric;
(c) a second electrode having major opposed surfaces, one surface thereof positioned proximate the other surface of said first dielectric;
(d) a second dielectric positioned proximate the other surface of said second electrode;
(e) a third electrode having major opposed surfaces, one surface thereof positioned proximate said second dielectric and generally facing said other surface of said second electrode, said second dielectric thereby positioned in between said second and third electrodes;
(f) a third dielectric having major opposed surfaces, one surface thereof positioned proximate the other surface of said third electrode;
(g) a fourth electrode having major opposed surfaces, one surface thereof positioned proximate the other surface of said third dielectric;
(h) means connecting said first and fourth electrodes to a control circuit whereby an electrical potential is established between said first and fourth electrodes; and
(i) means connecting said second and third electrodes to an external circuit whereby, upon operation of said external circuit, said second and third electrodes are connected in said external circuit.

4,179,628
FLIP-FLOP HAVING RESET PREFERENTIAL FUNCTION
Tsutomu Ohgishi, Hirakata; Toru Akiyama, and Tadashi Sakurai, both of Neyagawa, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan
Filed Nov. 21, 1977, Ser. No. 853,584
Claims priority, application Japan, May 13, 1977, 52-55614; May 17, 1977, 52-57188
Int. Cl.² H03K *3/286, 3/353, 5/20;* **H03D** *13/00*
U.S. Cl. 307—279 **19 Claims**



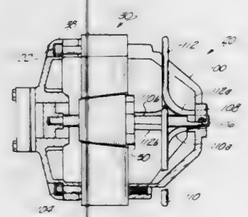
1. A flip-flop having a set input terminal and a reset input terminal, comprising
field effect switching means coupled to said set input terminal and having a gate electrode,
capacitance means formed associated with said gate electrode of said field effect switching means,
set signal source means coupled through said field effect switching means to said set input terminal for providing a set signal through said field effect switching means to said set input terminal,
reset signal source means coupled to said reset input terminal for providing a reset signal to said reset input terminal, and
charging/discharging control means operatively coupled to said set signal source means for precharging said capacitance means prior to said set signal and operatively coupled to said reset signal source means for discharging said capacitance means responsive to said reset signal, said field effect switching means being rendered conductive as a function of the electric charge stored in said capacitance means, whereby said set signal is applied through said field effect switching means to said set input terminal as a function of the conduction state of said field effect switching means.

4,179,629
FAILSAFE LOGIC FUNCTION APPARATUS
Arun P. Sahasrabudhe, West Mifflin, and Jayant K. Kapadia, Pleasant Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Aug. 10, 1977, Ser. No. 823,482
Int. Cl.² H03K *3/42*
U.S. Cl. 307—311 **10 Claims**



1. In logic function apparatus having a predetermined voltage reference and providing an output signal in accordance with a first input signal and a second input signal applied to said apparatus, the combination of
first means having a voltage bias and including a first diode and emitting light energy in response to said first input signal,
second means including a second diode biased by the voltage reference and emitting light energy in response to said second input signal having a voltage greater than said voltage reference,
with said second means being responsive to the light energy emitted by said first means,
third means having a voltage bias and being coupled with the light energy emitted by said second means for providing said output signal, and
with said second means being provided with a voltage bias by the voltage reference that is different than the voltage bias across the first means and the third means.

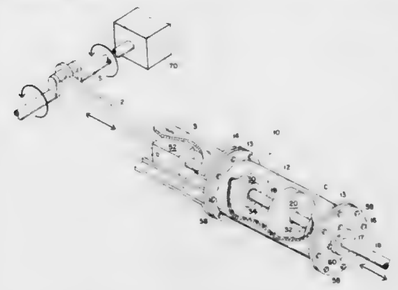
4,179,630
LINEAR COMPRESSOR
Richard A. Stuber, Ann Arbor, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.
Continuation of Ser. No. 738,708, Nov. 4, 1976, abandoned. This application Apr. 6, 1978, Ser. No. 893,873
Int. Cl.² H02K *33/00*
U.S. Cl. 310—15 **23 Claims**



1. In a moving-iron linear-motor compressor of the type including a gas pump having a pumping chamber, a magnetic circuit fixedly attached to said gas pump and a magnetically permeable armature attached to a pumping member and disposed to axially reciprocate within an air-gap in said magnetic circuit, the improved magnetic core in said magnetic circuit comprising
first and second inner convoluted loops spirally wound of magnetic strip material and placed on a common plane perpendicular to the axis of reciprocation of said armature in flatwise abutment on a plane perpendicular to said common plane,
means clamping said abutting inner loops tightly together, and
means forming said air-gap in the area of flatwise abutment of said inner loops, the central axis of said air-gap being coaxial with said axis of reciprocation.

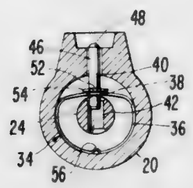
4,179,631
ELECTROMAGNETIC MOTOR
William S. Funderburg, 2103 Pender Ave., Wilmington, N.C. 27892
Continuation-in-part of Ser. No. 770,938, Feb. 24, 1977, abandoned. This application Dec. 5, 1977, Ser. No. 857,772
Int. Cl.² H02K *7/06*
U.S. Cl. 310—20 **1 Claim**

1. An electromagnetic motor comprising:
(a) a cylinder housing including a cylindrical shell enclosed at the ends thereof by a front and rear cylinder head, at least the front cylinder head having a central opening therein;
(b) a disc-shaped armature having a drive rod extending therefrom and through said central opening, bearing means in said front cylinder head surrounding said central opening and supporting said drive rod therein, said armature being thereby mounted for reciprocal movement in said cylinder housing, the diameter of said armature being less than the inner diameter of said cylindrical shell so that an air space exists therebetween;
(c) a toroidal shaped, bifilar wound electromagnetic coil mounted inside the front and rear ends of said housing adjacent said front and rear cylinder heads, at least the front end coils having a central opening therein aligned with and corresponding to the opening in said adjacent cylinder head;



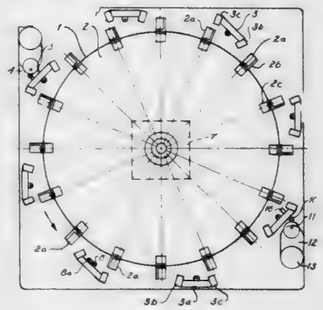
(d) the arrangement and positioning of the magnetic coils and the armature being such that, upon activation of said armature, its path of movement is between said coils only and not within the central opening therein;
(e) a source of direct current and a switching means connecting said source of direct current with said magnetic coils in such a manner that said direct current is caused to flow alternatingly to one coil and then to the others; and
(f) a force transmitting means connected to the free end of said drive rod for delivering the force generated by said motor to a mechanism.

4,179,632
SPINDLE LOCKING MECHANISM FOR A ROTARY POWER DEVICE
Don L. Harvell, Greenville, S.C., assignor to The Singer Company, New York, N.Y.
Filed Dec. 6, 1978, Ser. No. 967,176
Int. Cl.² H02K *7/14*
U.S. Cl. 310—50 **7 Claims**



1. A manually operable locking mechanism for a rotary power tool, comprising:
a housing for the rotary power tool, said housing having an opening therein;
a spindle rotatably mounted within the housing, said spindle having a radially extending aperture in axial alignment with the housing opening;
a loop spring disposed adjacent the housing, said spring having a hole in alignment with the opening in the housing;
a lock pin having an outer section slidingly engaging the opening in the housing, a manually engagable button at its outer end extending radially outwardly from the housing, and a shaft at the inner end extending radially inwardly of the housing and through the hole of the loop spring; and
means connected to the lock pin for collapsing the loop spring radially inwardly so that, when the aperture in the spindle is aligned with the lock pin, the shaft of the lock pin may enter said aperture and thereby prevent rotation of the spindle.

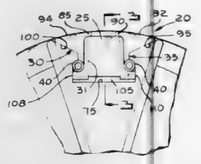
4,179,633
MAGNETIC WHEEL DRIVE
Donald A. Kelly, 58-06 69th Pl., Maspeth, N.Y. 11378
Filed Feb. 21, 1978, Ser. No. 879,608
Int. Cl.² H02K *7/10*
U.S. Cl. 310—80 **10 Claims**



1. A magnetic wheel drive comprised of two basic coacting magnetic components which are,
a large flat non-magnetic wheel containing equally spaced identical permanent magnets secured to the outer rim of said large flat non-magnetic wheel with pole faces all exposed in the same direction.
support angles and bracket means for securing said identical permanent magnets to the outer rim of said large flat non-magnetic wheels,
a drive shaft secured to said large flat non-magnetic wheel by means of a central hub,
ball bearing support means for said drive shaft, one of said ball bearings is retained in a large rectangular base plate, a second ball bearing is retained in a box-base secured to said large rectangular base plate,
multiple identical oscillating magnet couples consisting of a rectangular flat non-magnetic plate on which opposite pole magnets are secured at the sides of said rectangular flat non-magnetic plate,
a pivot bracket fastened to the top and bottom of said rectangular flat non-magnetic plate, a pivot rod fitted into said large rectangular base plate, the opposite end of said pivot rod supported by an elongate Z bracket secured to said large rectangular base plate,
a support arm secured to said rectangular flat non-magnetic plate fitted with a cylindrical pin and ball bearing,
an eccentric in direct contact with said ball bearing, said eccentric fastened to the slow speed shaft of a gear reduction unit, said gear reduction unit is driven by a small D.C. motor,
a return tension spring fastened to said rectangular flat non-magnetic plate, retention of the opposite end of said return tension spring by a post pressed into said large rectangular base plate,
multiple arrays of silicon solar photovoltaic cells placed at convenient outside locations for the powering of said small D.C. motors, electrical conduction means from said solar photovoltaic cells to said small D.C. motors,

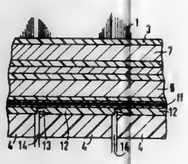
link arms fastened to some of said rectangular flat non-magnetic plates,
straight links pinned to said link arm on most of said rectangular flat non-magnetic plates,
connection of the end of one straight link with a link arm on one rectangular flat non-magnetic plate driven by one said small D.C. motor through said eccentric and ball bearing means.

4,179,634
MAGNETO ROTOR CONSTRUCTION
Bob O. Burson, East Longmeadow, Mass., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.
Filed Jun. 2, 1978, Ser. No. 911,898
Int. Cl.[2] H02K *28/22*
U.S. Cl. 310—153 **7 Claims**



1. Rotor for a magnetomotive device comprising an annular rotatable body having a cavity defined by nonmagnetic material in the rim thereof including locating surfaces, a permanent magnet and circumferentially spaced pole shoes disposed in said cavity, said pole shoes being disposed in clamping relation with said magnet and each pole shoe having an arcuate surface and other portions engaged with said magnet and said locating surfaces, and means for retaining said pole shoes in said clamping relation with said permanent magnet within said cavity and for urging said pole shoes radially against said locating surfaces which are oriented to cause said pole shoes to exert clamping forces against said magnet while said arcuate surfaces are held in coaxial relation in said rotor.

4,179,635
DEVICE FOR BRACING A STATOR WINDING DISPOSED IN THE AIR GAP OF A SYNCHRONOUS GENERATOR
Heinrich Beermann, Mülheim, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany
Filed Jul. 20, 1977, Ser. No. 817,225
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1976, 2633278
Int. Cl.[2] H02K *3/48*
U.S. Cl. 310—214 **3 Claims**



1. Device for bracing a stator winding disposed in the air gap of a synchronous generator and inserted into radially inwardly opening slots formed in a hollow cylindrical holding member of nonmagnetic steel received in a central bore formed in a stator lamination stack and radially supported by an inner hollow cylinder formed of synthetic material, the holding member and the hollow cylinder being subdivided axially and having radial cooling slots formed between the axial subdivisions thereof, the improvement therein which comprises the sections of the hollow cylinder being centered at the teeth disposed between the slots formed in the holding member and being flattened in vicinity of the individual winding slots, wedges of insulating material extending in axial direction of the generator in sections according to the axial subdivision and disposed between the hollow cylindrical sections and the radially inner winding bars of each slot, said wedges having parallel flanks and being beveled in a wedge-shaped manner at an end thereof, and slot shims interposing the uppermost bar and the wedge associated therewith, said slot shims being at least partly in the form of wave-shaped leaf springs and partly in the form of insulating strips.

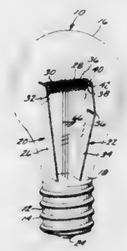
4,179,636
ELECTRIC INCANDESCENT LAMP
Eduard J. P. Janssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 7, 1978, Ser. No. 884,375
Claims priority, application Netherlands, May 2, 1977, 7704774
Int. Cl.[2] H01J *1/96, 19/50;* H01K *1/18*
U.S. Cl. 313—274 **4 Claims**



1. An electric lamp which comprises: a tubular lamp envelope having a ball, a filament of helically wound wire disposed in generally axially aligned relationship in said envelope, first and second current supply conductors extending through said wall of said lamp envelope in a vacuum-tight manner, said filament having in axial sequence a first double coiled axial segment, a first single coiled axial segment and a second double coiled axial segment, said first double coiled axial segment being connected to said single coiled axial segment which is connected to said second double coiled axial segment, the inside diameters of each of said segments being equal, said filament being supported between the ends thereof by at least one axially elongated wire support which has a spiral part at one end which is disposed with the periphery thereof in contact with the interior of said wall of said lamp envelope, said support including a helix at the other end thereof, said helix contacting said first single coiled segment.

4,179,637
INCANDESCENT LIGHT BULB WITH MULTIPLE FILAMENTS PROVIDING MULTIPLE LIVES
James V. Santora, 1228 Irvine Ave., Newport Beach, Calif. 92660
Filed Apr. 14, 1978, Ser. No. 896,368
Int. Cl.[2] H01K *9/00*
U.S. Cl. 313—316 **21 Claims**

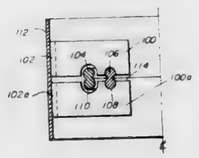
1. An incandescent light bulb comprising:
a first current supply member;
a second current supply member having at least one aperture;
a first electrically conductive filament capable of emitting light upon passage of current therethrough, the filament being permanently and electrically connected to the first and second current supply members;
at least one additional, electrically conductive reserve filament capable of emitting light upon passage of current therethrough, the reserve filament being electrically connected to the first current supply member and having an electrically insulating member which penetrates the aperture whereby the reserve filament is supported by the second current supply member but is not electrically connected thereto, and
connecting means for electrically connecting the reserve filament to the second current supply member when the first filament becomes inoperative whereby the reserve filament becomes operative to emit light upon passage of current therethrough.



4,179,638
CATHODE RAY TUBE PANEL
David C. Boyd, Corning; Henry E. Hagy, Painted Post, and David A. Thompson, Horseheads, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed Jun. 29, 1978, Ser. No. 920,150
Int. Cl.[2] H01J *29/86;* C03C *3/04*
U.S. Cl. 313—480 **3 Claims**

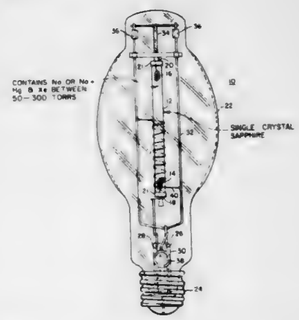
1. In a cathode ray tube for reception and display of color television comprising a display panel portion, a neck portion having an electron gun mounted therein, an intermediate funnel portion, and an electron mask having a pattern of perforations aligned with a pattern of phosphor configurations forming a screen on the panel, said panel consisting of a silicate glass having a low compaction when heated to temperatures between 400°-500° C., a strain point over 470° C., a liquidus below 900° C., and a composition, as calculated in weight percent from the batch on the oxide basis, chemically composed essentially of, in addition to silica, 1-3% Al_2O_3, 1.5-3% MgO, 2.5-4.5% CaO, 5-10% SrO, 3-10% BaO, 1-2.5% PbO, 6-10% Na_2O, 4-8% K_2O, the ratio of Na_2O:K_2O being at least 1:1, and the total content of SrO + BaO + CaO + MgO being 15-24%.

4,179,639
ANODE ASSEMBLY FOR ELECTRON DISCHARGE DEVICES
Palmer P. Derby, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.
Division of Ser. No. 724,813, Sep. 20, 1976, which is a continuation of Ser. No. 571,891, Apr. 25, 1975, abandoned. This application Sep. 28, 1977, Ser. No. 837,652
Int. Cl.[2] H01J *23/22*
U.S. Cl. 315—39.69 **5 Claims**



1. An anode structure for an electromagnetic energy generator comprising:
a plurality of substantially similar shaped conductive anode member sections;
each of said anode member sections having a cylindrical boundary wall portion and a radially extending vane section joined at one end to said wall portion and having a free end;
at least one annular conductive strap member disposed between said conductive anode member sections and contacting alternative vanes of each of said anode member sections;
said conductive anode member sections being joined to said strap member by non-thermal metallurgical techniques to define an anode member; and
said conductive anode member sections being supported within a conductive shell and the adjacent boundary wall portions and vane section edges are spaced apart with contact only therebetween by said strap member.

4,179,640
HID SODIUM LAMP WHICH INCORPORATES A HIGH PRESSURE OF XENON AND A TRIGGER STARTING ELECTRODE
Daniel A. Larson, Cedar Grove, N.J., and Robert J. Zollweg, Monroeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Dec. 5, 1977, Ser. No. 857,482
Int. Cl.[2] H01J *17/34*
U.S. Cl. 315—47 **7 Claims**



1. A high-pressure sodium vapor discharge lamp adapted to be operated at about a predetermined nominal wattage input in conjunction with ballast means which generates a high-voltage starting pulse to initiate the lamp discharge and thereafter limit the current through said lamp to cause it to normally operate at about said predetermined wattage, said lamp comprising:
a. a sealed, light-transmitting, elongated, refractory arc tube of predetermined dimensions and design enclosing electrodes operatively positioned therein proximate the ends thereof, said arc tube during lamp operation is impervious to migration of sodium ions therethrough under the influence of an electrode field; a first pair of lead-in conductors sealed through said arc tube proximate the ends thereof, and one conductor of said first pair of lead-in conductors connecting to one of said electrodes and the other conductor of said first pair of lead-in conductors connecting to the other of said electrodes;
b. sodium in predetermined amount or sodium plus mercury in predetermined total amount and in predetermined atom ratio along with xenon at a fill pressure between 50 torrs to 300 torrs included in said arc tube as a starting and operating discharge-sustaining filling;
c. an outer light-transmitting envelope enclosing said arc tube to provide a predetermined operating environment therefor, external electric contact means secured to said outer envelope to provide electrical connection to said

lamp, and a second pair of lead-in conductors sealed through said outer envelope and connecting to said external electrical contact means;

d. metallic supporting frame means retained within said outer envelope and supporting said arc tube therein in predetermined position and electrically connecting said one conductor of said first pair of said lead-in conductors to one conductor of said second pair of said lead-in conductors, and said other conductor of said first pair of said lead-in conductors is electrically connected to the other conductor of said second pair of said lead-in conductors;

e. trigger starting means comprising an elongated refractory metal member directly connected at least at one end thereof to said frame means, said trigger starting means extending from said supporting frame means to a position contiguous with and at least partially surrounding that outer surface portion of said arc tube which is proximate said other electrode which connects to said other conductor of said first pair of said lead-in conductors, said elongated metal member also extending a predetermined distance toward said one electrode and along the outer surface of said arc tube and contiguous therewith; and

f. said predetermined discharge-sustaining filling coupled with said predetermined arc tube dimensions and design and operating environment therefor together with said nominal wattage input at which said lamp is intended to be operated causing said lamp to normally operate with about a predetermined rated voltage drop thereacross and to emit therefrom a predetermined spectral power distribution of visible emissions.

4,179,641

CIRCUITS FOR OPERATING DISCHARGE LAMPS

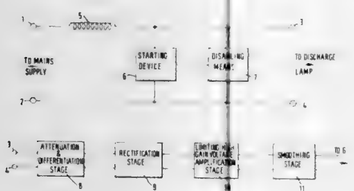
John Britton, West Kingsdown, England, assignor to The General Electric Company Limited, London, England

Filed Feb. 9, 1978, Ser. No. 876,229

Claims priority, application United Kingdom, Feb. 9, 1977, 5312/77

Int. Cl.² H05B *41/16*

U.S. Cl. 315—289 **3 Claims**



1. An electrical circuit for operating an electrical discharge lamp, the circuit comprising:

a pair of terminals for connection to a supply of voltage of substantially sinusoidal waveform;

a second pair of terminals for connection with a discharge lamp;

a ballast impedance connected between one of the first pair of terminals and one of the second pair of terminals;

a starting device for aiding initiation of discharge in the lamp; and

means for disabling the starting device when a discharge has been initiated in the lamp,

wherein the means for disabling the starting device is arranged to detect a change in the voltage waveform across the second pair of terminals from substantially sinusoidal to substantially square.

4,179,642

RASTER CORRECTION CIRCUIT WITH LOW DISSIPATION RESISTIVE DAMPING

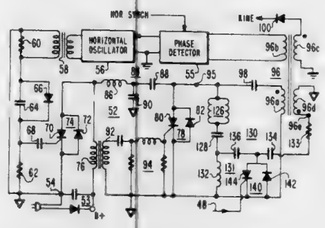
Willem den Hollander, Schlieren, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Mar. 10, 1978, Ser. No. 885,203

Claims priority, application United Kingdom, Sep. 2, 1977, 36792/77

Int. Cl.² H01J *29/56*

U.S. Cl. 315—370 **6 Claims**



1. A kinescope deflection arrangement, comprising:

a deflection winding;

deflection current generating means coupled with said deflection winding for promoting the flow of current therethrough, said deflection current generator also producing retrace voltage pulses at said winding;

raster distortion correction means, said correction means comprising variable impedance means serially coupled with said deflection winding, a portion of said retrace voltage pulses appearing across said impedance means;

a second source of voltage pulses in synchronism with said retrace pulses; and

resistance means coupled between said second source and said impedance means for attenuating transient voltages appearing across said impedance means.

4,179,643

CIRCUIT FOR VARYING AN OPERATING VOLTAGE OF A DEFLECTION AMPLIFIER OF A MAGNETODYNAMIC DEFLECTION SYSTEM

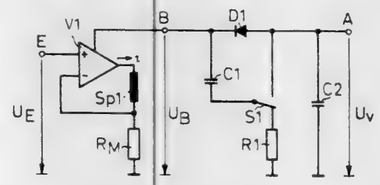
Hans Neuendorff, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 21, 1978, Ser. No. 879,587

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1977, 2711535

Int. Cl.² H01J *29/70*

U.S. Cl. 315—411 **4 Claims**



1. In a circuit for the stepwise variation of an operating voltage of a deflection amplifier of a magnetodynamic deflection system for a charged-particle beam in dependence upon a required deflection speed, the improvement comprising

a single voltage supply source for generating a supply voltage,

at least one diode coupled to said voltage supply source and poled in its forward conduction direction to an operating voltage terminal of said deflection amplifier,

at least one capacitor having one terminal thereof coupled to the cathode of said diode, and

a switch coupled to the other terminal of said capacitor and driven by a control device for connecting said capacitor either to ground through a resistor or to the anode of said diode, said circuit generating a first operating voltage at said operating voltage terminal of said deflection amplifier which is approximately equal to said supply voltage and is coupled to said operating voltage terminal of said deflection amplifier when said capacitor is connected by said switch to ground through said resistor, and a second operating voltage which is greater than said first operating voltage and is coupled to said operating voltage terminal of said deflection amplifier when said capacitor is connected by said switch to said anode of said diode.

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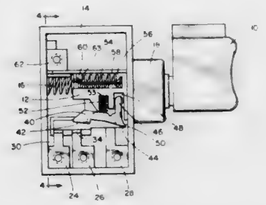
POWER TOOL SWITCH INCLUDING SPEED CONTROL

Louis J. Vassos, Park Ridge, Ill., assignor to Skil Corporation, Chicago, Ill.

Filed Jan. 10, 1978, Ser. No. 868,269

Int. Cl.² H05K *7/14*

U.S. Cl. 318—17 **14 Claims**



1. In a double pole, trigger actuated switch of the type contained within a housing and adapted for mounting within the casing of a power tool for selectively connecting and disconnecting both sides of a power source for the tool motor in response to movement of the trigger between extended and depressed positions, the improvements comprising:

(a) a first pair of contacts including a first fixed contact and an associated first movable contact for making and breaking one side of the power source for the tool motor;

(b) a second pair of contacts including a second fixed contact and an associated second movable contact for making and breaking the other side of the power source for the tool motor;

(c) means connecting said trigger with said first and second movable contacts for closing said first and second pairs of contacts sequentially such that the first pair of contacts is closed prior to closing of the second pair of contacts in response to movement of the trigger from its extended position to its depressed position and for opening said pairs of contacts in reverse order in response to movement of the trigger from its depressed position to its extended position;

(d) said connecting means including camming means for rapidly making and breaking engagement of the second pair of contacts in a snap-action manner to minimize arcing;

(e) a speed control circuit contained within the switch housing on a circuit board operatively connected to the trigger whereby the speed of the tool motor may be varied in response to the amount of trigger movement; and

(f) a heat sink contained within said housing in intimate contact with said circuit board, said heat sink having a planar portion and an integral cooling fin in parallel spaced relation with said planar portion.

4,179,645

CIRCUIT FOR DRIVING AND BRAKING A SPEED-CONTROLLED DIRECT CURRENT MOTOR

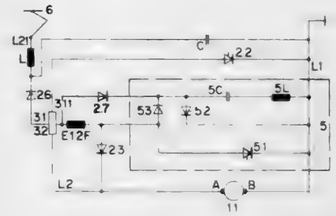
Beat Wehrmüller, Hellbühl, Switzerland, and Paul Wienenga, Mannheim, Fed. Rep. of Germany, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Dec. 30, 1977, Ser. No. 865,892

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659514

Int. Cl.² H02P *3/12*

U.S. Cl. 318—139 **4 Claims**



1. A circuit for the driving and braking of a speed-controlled direct current motor which is energized during driving operations by a direct current source by way of a choking coil and a direct current regulator that includes a quenching diode, especially for the drive of a vehicle, including a braking resistance and a first diode, connected in parallel with a field winding of the motor, a plurality of switching means to carry out the regrouping of the components from a driving to a braking operation, the field winding being in series with one of the switching means and during the driving operation being connected in shunt with the armature of the motor, the braking resistance being in series with one of the switching means and during the braking operation being connected in shunt with the armature of the motor, a second diode connected between the quenching diode of the direct current regulator and the braking resistance, a third diode connected during braking operations between one terminal of the field winding and one terminal of the choking coil, one terminal of the second diode being connected to the braking resistance at the connection of the braking resistor to the field winding.

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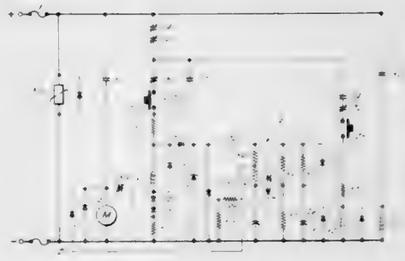
CONTROL CIRCUIT FOR CIRCUIT BREAKER DC MOTOR OPERATOR

Ronald R. Russell, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed Mar. 24, 1978, Ser. No. 889,755

Int. Cl.² H02P *3/12*

U.S. Cl. 318—380 **9 Claims**



1. A circuit for controlling a circuit breaker motor operator

mechanism in executing a breaker operating mechanism charging cycle, said control circuit comprising, in combination:

A. first and second buses for connection to a source of DC voltage;

B. a relay including

(1) an operating coil,

(2) a first set of normally open contacts, and

(3) a second set of normally closed contacts;

C. a DC motor connected in series with said first set of relay contacts across said first and second buses;

D. a dynamic braking resistor connected across said motor through said second set of relay contacts; and

E. means connecting said relay operating coil and said braking resistor in series across said first and second buses for the selective establishment of an energization circuit for said relay operating coil,

F. whereby upon establishment of said energization circuit, said relay is activated to initiate a charging cycle by closing said first set of relay contacts and opening said second set of relay contacts, and, upon interruption of said energization circuit, said relay is deactivated to reopen said first set of relay contacts and reclose said second set of relay contacts thereby initiating a dynamic braking cycle during which said motor generates a voltage across said braking resistor of a polarity to prevent the effective re-establishment of said energization circuit for said relay operating coil until said braking cycle has been substantially completed.

4,179,647

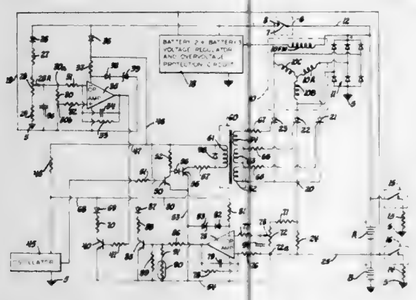
DUAL OUTPUT BATTERY CHARGING SYSTEM

Donald L. Cummins, and Daniel W. Stahura, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 2, 1977, Ser. No. 856,642

Int. Cl.[2] H02J *7/14*

U.S. Cl. 320—6 **4 Claims**



1. A dual output battery charging system for supplying direct current charging potentials for two series connected storage batteries comprising:

means for producing an alternating current potential;

first circuit means for rectifying said alternating current potential to a first direct current charging potential and for applying said first charging potential across said two series connected batteries;

second circuit means for rectifying said alternating current potential to a second direct current charging potential and for applying said second charging potential across a selected one of said batteries, said second circuit means being of the type that is enabled only in response to electrical enabling signals;

an oscillator circuit for producing a series of electrical signals and for applying said signals as enabling signals to said second circuit means; and

means responsive to the output current of said second circuit means for disabling said oscillator circuit when said output current is greater than a predetermined maximum value whereby said second circuit means is disabled when said output current thereof is greater than said predetermined maximum value.

4,179,648

METHOD AND APPARATUS FOR RAPID BATTERY CHARGING

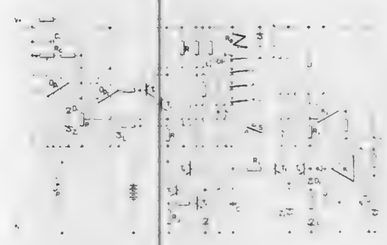
Per-Edward Samsioe, Edsviksvägen 138, 191 43 Sollentuna, Sweden

Filed Nov. 16, 1977, Ser. No. 851,820

Claims priority, application Sweden, Jan. 24, 1977, 7700703

Int. Cl.[2] H02J *7/04*

U.S. Cl. 320—11 **11 Claims**



1. A method of rapidly charging a battery having a known nominal amperage, comprising:

discharging the battery to a predetermined value to discharge a possible residual charge on the battery, and

automatically charging the battery with a charging current having a value which initially is greater than the value of the nominal battery amperage, decreasing said charging current from its initial value at an exponential rate determined by a resistor-capacitor discharge circuit, and decreasing said charging current to a value sufficiently less than the nominal battery amperage to prevent damage to the battery.

4,179,649

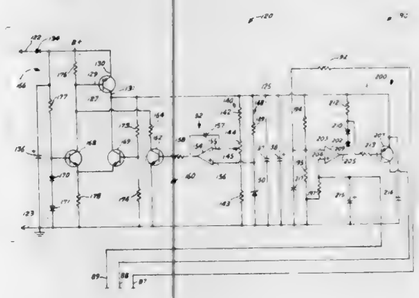
VOLTAGE SUPPLY APPARATUS POWERED FROM A VEHICULAR ELECTRICAL SYSTEM

Richard A. Karlin; Robert W. McDonald, both of Chicago, and Gary F. Comiskey, Evanston, all of Ill., assignors to Sun Electric Corporation, Crystal Lake, Ill.

Division of Ser. No. 709,458, Jul. 28, 1976. This application Feb. 27, 1978, Ser. No. 881,421

Int. Cl.[2] G05F *1/56, 1/66;* **H02J** *7/00*

U.S. Cl. 320—13 **3 Claims**



1. Apparatus for supplying regulated DC voltage to circuitry powered by a vehicular electrical system comprising:

a rechargeable battery for the vehicle having a first terminal and a second terminal;

a voltage supply bus;

a series regulating transistor comprising a base element, an emitter element for receiving voltage from the first terminal of the battery, and a collector element for transmitting voltage to the supply bus;

first sampling means for generating a first sampling voltage proportional to the bus voltage on the supply bus;

reference means for establishing a reference voltage;

comparison means for comparing the first sampling voltage with the reference voltage and for generating a correction signal having a value proportional to the difference between the first sampling voltage and the reference voltage;

means for applying the correction signal to the base-emitter junction of the regulating transistor so that the emitter-collector junction impedance of said transistor provides a voltage drop sufficiently small to maintain the bus voltage at a regulated value under low-voltage battery conditions; and

a starting circuit for biasing the series regulating transistor to a conductive state when the apparatus initially is connected to the battery, said starting circuit comprising:

i. a first resistor operatively connected between the base and the emitter elements of the regulating transistor;

ii. first switch means operatively connected between the base element of the regulating transistor and the second terminal of the battery;

iii. means for establishing a predetermined switching voltage for biasing the first switch means into a conductive state in response to the connection of the battery to the apparatus, whereby the current is drawn through the first resistor so that the regulating transistor is biased to a conductive state;

iv. second sampling means for generating a second sampling voltage proportional to the supply bus voltage; and

v. second switch means operatively connected between the collector of the regulating transistor and the first switch means for switching the first switch means to a non-conductive state when the second sampling voltage attains a predetermined relationship with respect to the predetermined switching voltage.

4,179,650

VARIABLE IMPEDANCE CIRCUITS

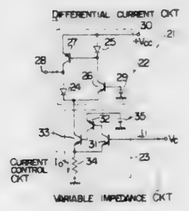
Isao Fukushima, Fujisawa; Akihiro Asada, Yokohama, and Kazuya Takahashi, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 27, 1977, Ser. No. 864,266

Claims priority, application Japan, Dec. 27, 1976, 51-156537

Int. Cl.[2] G05F *1/48*

U.S. Cl. 323—1 **7 Claims**



1. A variable impedance circuit, comprising:

a differential current circuit including a semi-conductor element having at least one PN-junction, a first transistor having a collector, a base, an emitter, an emitter-base junction and a collector-base junction with said emitter-base junction being connected to said PN-junction of said semiconductor element with opposite polarities relative to each other, a current supply means for supplying current to the connection between said PN-junction and said base-emitter junction therethrough, and an impedance terminal connected to said PN-junction at the side opposite to the connection to said emitter-base junction;

a current control circuit including a resistor, a second transistor having a base, a collector connected to said connection between said emitter-base junction of said first transistor and said PN-junction of said semiconductor element and an emitter grounded through said resistor, a third transistor of same conduction type as that of said second transistor having a base adapted to be applied with a control voltage, an emitter connected to the emitter of said second transistor and a collector connected to a fourth transistor of a conduction type opposite to that of said second and third transistors, said fourth transistor having a collector connected to the base of said second transistor, a base connected to said collector of said third transistor and an emitter, wherein current flowing through said second transistor is adapted to control current flowing through said differential current circuit.

wherein impedance at said impedance terminal is given by an operating resistance determined by a current flowing through said PN-junction of said semiconductor element and a current flowing said emitter-base junction of said first transistor, and

wherein said emitter of said fourth transistor is actuated with a voltage from a first power source which is electrically isolated from said differential current circuit to provide a high impedance to said current control circuit as seen by said differential current circuit.

4,179,651

METHOD AND APPARATUS FOR SUPERVISING AN ELECTRICAL LINE FOR SHORT CIRCUITS

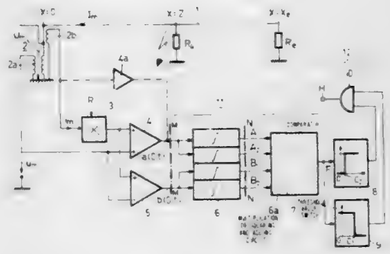
Michael Vitins, Zurich, Switzerland, assignor to BBC Brown Boveri & Company Limited, Switzerland

Filed Sep. 22, 1977, Ser. No. 835,852

Claims priority, application Switzerland, Sep. 30, 1976, 12360/76

Int. Cl.[2] G01R *31/02*

U.S. Cl. 324—51 **14 Claims**



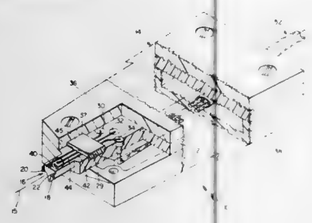
1. A method of supervising an electrical line for short circuits, comprising the steps of: deriving current and voltage signals (i_m and u_m) from line current and line voltage at a measuring point (x=0), modifying relatively the current and voltage signals by multiplying at least one of these signals by a modifying factor (R or 1R) which is at least approximately free of phase rotation, forming at least one auxiliary signal (a or b) corresponding to the sum or difference in each case of a pair of relatively modified current and voltage signals (R.i_m, u_m and i_m, u_m/R), performing an amplitude comparsion between said auxiliary signal (a, b) and a reference signal (i_m or a), and generating a short-circuit signal (H) upon exceeding at least one predetermined limiting value (C_1, C_2) for the difference of the compared signals, or for a comparsion signal (F) generated during amplitude comparsion.

4,179,652

ANALYZING ELECTRICAL CIRCUIT BOARDS

Richard P. Davis, Carlisle, Mass., assignor to Teradyne, Inc., Boston, Mass.

Filed Feb. 21, 1978, Ser. No. 879,881
Int. Cl.[2] G01R 27/14
U.S. Cl. 324—64 **5 Claims**



1. Apparatus for analyzing electrical circuit boards, comprising

a probe having first, second, and third contact tips,

said second and third tips being close enough to each other to simultaneously contact a conductive lead of an integrated circuit element mounted on said board, but spaced apart from each other sufficiently to permit measurement of electrical activity in the lead segment between said second and third tips,

a test signal source for injecting said test signal into said lead through said first tip, and

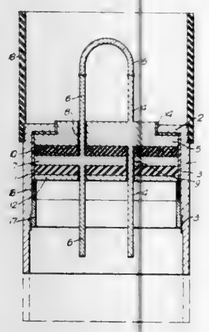
measurement means for measuring the voltage drop between said second and third tips resulting from the flow of test current through the resistance of said lead segment, said measurement means being sensitive enough to detect voltage differences as small as 10 microvolts.

4,179,653

CORROSION MONITORING PROBE

Michael Davies; Glyn Hourihan, and Frank Smith, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 22, 1978, Ser. No. 880,305
Claims priority, application United Kingdom, Mar. 3, 1977, 9000/77
Int. Cl.[2] G01R 27/02
U.S. Cl. 324—65 CR **12 Claims**



1. A corrosion monitoring probe comprising

an elongated tubular body member having an annular lip at an upper end thereof;

a probe element comprising at least two metallic discs, each disc having a pin above and below the plane of the disc and at least one channel through the disc, the discs being positioned one on top of the other so that the pins of a particular disc pass through a channel in an adjacent disc;

a seal comprising at least one gasket in the form of a channelled disc of an electrically insulating material, positioned between adjacent metallic discs, and an annular gasket of an electrically insulating material positioned between the upper metallic disc and the lip of the body member; and

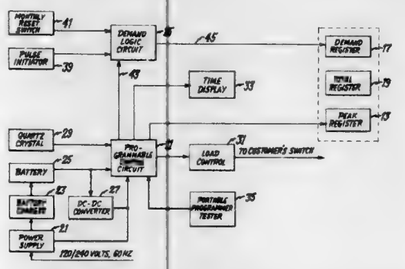
means for compressing the channelled disc and the annular gasket so as to effect a seal.

4,179,654

DEMAND METER INCLUDING MEANS FOR SELECTIVELY CONTROLLING THE LENGTH OF DEMAND INTERVALS

Warren R. Germer, Rochester, N.H., assignor to General Electric Company, Somersworth, N.H.

Filed Feb. 27, 1978, Ser. No. 881,741
Int. Cl.[2] G01R 15/08, 11/64; G06F 15/20
U.S. Cl. 324—116 **3 Claims**



1. In a programmable time-of-day demand meter of the type including a control circuit for generating a control signal at prescribed intervals to enable a demand logic circuit of said meter to control the engagement and disengagement of a demand register of said meter during demand intervals, apparatus for selectively controlling the length of said demand intervals comprising:

(a) counter means for counting said control signal at each prescribed interval, said counter means having output terminals, each capable of providing, as an output, an end of interval signal representative of the length of a demand interval in accordance with the count in said counter means; and

(b) means adapted to selectively connect any one of the output terminals of said counter means to said demand logic circuit to provide an end of interval signal thereto to enable said demand logic circuit to disengage said demand register to terminate a demand interval at a time determined by the length of time it takes said counter means to accumulate a count which effects the generation of the end of interval signal at the selected output terminal connected to said demand logic circuit.

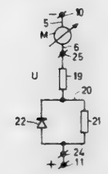
4,179,655

MOVING COIL INSTRUMENT WITH LINEAR CHARACTERISTIC

Peter M. J. Peeters, Herts, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 15, 1977, Ser. No. 816,000
Claims priority, application Netherlands, Aug. 2, 1976, 7608559
Int. Cl.[2] G01R 15/10, 19/22
U.S. Cl. 324—132 **12 Claims**

1. A moving coil instrument provided with a linear deflection characteristic comprising, a magnet core and a yoke with an air gap to accommodate a rotatable coil, a coil rotatable about an axis and located within the yoke air gap, a non-linear relationship normally existing between the angular rotation of the coil and a direct current flowing in the coil in response to a DC electric quantity applied to the instrument, means for correcting said non-linear relationship comprising a diode-resistor network having two input terminals, means for applying the DC electric quantity to said two input terminals, said diode-resistor network comprising a first branch circuit including a first resistor connected in series with a first parallel circuit



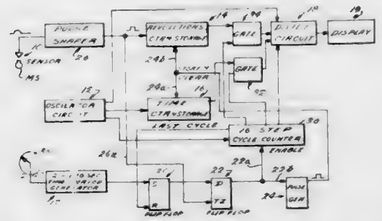
that includes a second resistor in parallel with at least one first diode connected in the forward direction relative to the DC electric quantity applied to said two input terminals and, in parallel with the first diode, a series connection of a third resistor and a second diode whose forward direction is reversed relative to that of the first diode, and means coupling the coil to the diode-resistor network so that the DC current distribution among the network elements and the coil produces an angular rotation of the coil which is a substantially linear function of the DC electric quantity.

4,179,656

DETERMINATION OF AVERAGE SPEED OF ROTATION OF A CYCLICALLY LOADED SHAFT DURING PERIODS OF UP TO TWO MINUTES DURATION

Raymond L. Wagner, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Feb. 6, 1978, Ser. No. 875,578
Int. Cl.[2] G01P 11/00
U.S. Cl. 324—166 **17 Claims**



5. An electronic tachometer for determining average speeds of rotating cyclically loaded shafts, comprising

means for sensing each revolution of a rotating shaft,

means for electronically counting and storing the number of revolutions of the shaft,

means for electronically generating a highly time-regular pulse stream,

means for counting and storing the number of pulses in the highly time-regular pulse stream over a given time span simultaneously with the counting of the number of shaft revolutions,

means for controlling the given time span so that it is adjustable to a time span within the range of 2 to about 120 seconds,

means for electronically dividing the number of revolution pulses counted by the number of time pulses counted during the given time span to determine the shaft average speed, and

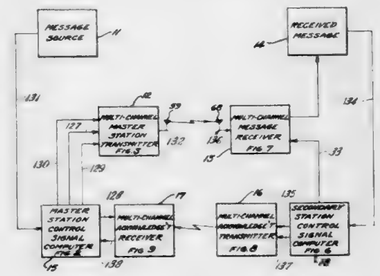
means for digitally displaying the average speed determined.

4,179,657

ANTI-JAMMING COMMUNICATION SYSTEM

Charles F. Hobbs, Medford, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 28, 1958, Ser. No. 757,885
Int. Cl.[2] H04K 1/00; H04L 9/00
U.S. Cl. 325—33 **6 Claims**



1. A system of communications to an intended destination in a manner to elude detection by unauthorized sources, and to prevent jamming, which comprises multi-channel transmitting means, each of said channel and transmitting means having a different frequency and delay, said frequency and delay being variable, means to generate time and address digits, means to encipher said time and address digits, means to initially set the frequencies and delays in each of said transmitting channels, said setting means receiving said enciphered time and address digits, means to convert a message to be transmitted into digital bits, means to encipher said message digital bits, means for multiple transmission of the initial message digital bit after said setting of channels, and means to successively reset the frequency and delay in each of said transmitting channels after said multiple transmission of said first message digital bit, said resetting means receiving successive enciphered message digital bits until said message is completely transmitted.

4,179,658

SECRET-SIGNALLING SYSTEM UTILIZING NOISE COMMUNICATION

David R. Bitzer, Hyattsville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 23, 1968, Ser. No. 755,010
Int. Cl.[2] H04K 1/00
U.S. Cl. 325—34 **18 Claims**

1. In a secret-signalling system, the combination comprising:

an information signal source;

a reference signal source, the reference signal being a noise signal;

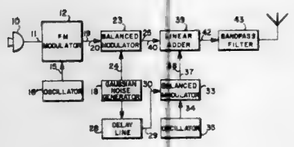
means for providing a first suppressed-carrier signal from the information signal, the first suppressed carrier providing means being connected to the information signal source and the reference signal source, the reference signal being the carrier signal;

means for providing a delayed reference signal from the reference signal;

means for combining the delayed reference signal with the first suppressed carrier information signal to yield at least one first spread spectrum signal of the information signal in combination with the reference signal;

means for selecting the desired first spread spectrum signal

to be transmitted to yield a desired secret signal which is to be transmitted; and



means for receiving the transmitted first spread spectrum signal and extracting from the first spread spectrum signal received, solely the information signal generated.

4,179,659

SIGNAL TRANSMISSION SYSTEM

Isao Tashiro, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 22, 1977, Ser. No. 863,178
Claims priority, application Japan, Dec. 25, 1976, 51/156960
Int. Cl.² H03K *13/22*
U.S. Cl. 325—38 B **8 Claims**

1. A signal transmission system which comprises:

input signal-coding means for sampling an input signal at a prescribed sampling period and converting said sampled data into a predictive signal train and a differential pulse code modulated (DPCM) signal train, each signal train including the information of said input signal;

transmission signal train-forming means coupled to said input signal-coding means and which is supplied with said DPCM signal train and said predictive signal train, and including means, when, a specified group of adjacent words included in said DPCM signal train is detected to have prescribed contents, for replacing the specified group of adjacent words by a specified pattern signal never applied as a DPCM signal and a predictive signal, thereby forming a transmission signal train to be transmitted; and

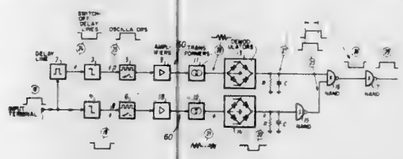
predictive signal train-reproducing means for receiving the transmitted transmission signal train and detecting said specified pattern signal in said received transmission signal train and inserting said transmitted predictive signal into the respective positions of said adjacent words, thereby reproducing said predictive signal train previously produced by said input signal-coding means out of said received transmission signal train.

4,179,660

METHOD AND DEVICE FOR TRANSMITTING PULSE-DURATION MODULATED SIGNALS USING TWO OSCILLATORS

Jürgen Zeis, Berlin, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Fed. Rep. of Germany

Filed May 11, 1978, Ser. No. 904,935
Claims priority, application Fed. Rep. of Germany, May 14, 1977, 2721993
Int. Cl.² H04B *1/04*
U.S. Cl. 325—59 **11 Claims**



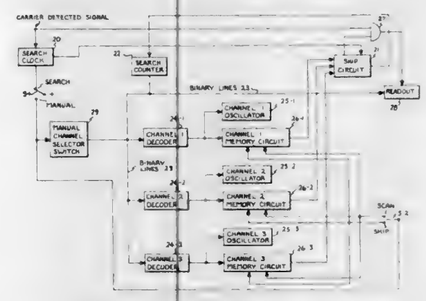
11. A method for transmitting a pulse duration modulated signal having a switch-on and switch-off edge comprising delaying the switch-on edge of a pulse in the signal, using the delayed switch-on edge of the pulse to start a first oscillator and generate a first carrier frequency pulse train, delaying the switch-off edge of a pulse in the signal, using the delayed switch-off pulse to start a second oscillator and generate a second carrier frequency pulse train, said first carrier frequency pulse train being switched off by a delayed switch-off edge of a pulse in the signal whereby the switch-off of said first carrier frequency pulse train is separated in time from the switch-on of said second carrier frequency pulse train, comparing the switch-on of said first and second carrier frequency pulse trains to reconstitute the pulse duration modulated signal.

4,179,661

CIRCUIT FOR PROGRAMMING THE SEARCH CIRCUIT OF A RADIO RECEIVER

Raymond W. Harris, Rustburg, and Ralph R. Sherman, Jr., Forest, both of Va., assignors to General Electric Company, Lynchburg, Va.

Filed Jul. 28, 1977, Ser. No. 819,862
Int. Cl.² H04B *1/32*
U.S. Cl. 325—455 **8 Claims**



1. An improved circuit for selectively programming a search circuit of a radio receiver comprising:

a. a first manual switch for energizing said search circuit in one state and for energizing said improved circuit in a second state;

b. channel decoder means connected to said search circuit;

c. a manual channel selector switch connected between said first switch and said channel decoder means, said manual channel selector switch being energized in response to said first switch being in said second state, and said manual channel selector switch having a plurality of positions, each of which produces a distinct predetermined channel signal;

d. memory means connected to said decoder means and to said search circuit;

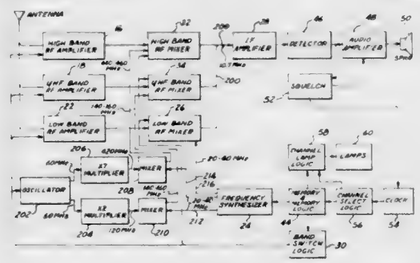
e. and a second manual switch connected between said first switch and said memory means, said second manual switch being energized in response to said first switch being in said second state, and said second manual switch having a scan state and a skip state for selectively programming said memory means in response to said memory means being activated by a respective channel signal.

4,179,662

MULTIBAND SCANNING RADIO RECEIVER USING FREQUENCY SYNTHESIZER

Peter W. Pflasterer, Oak Ridge, Tenn., assignor to Masco Corporation of Indiana, Taylor, Mich.

Continuation-in-part of Ser. No. 450,983, Mar. 14, 1974, Pat. No. 3,961,261, and a continuation of Ser. No. 779,794, Mar. 21, 1977, abandoned, which is a continuation of Ser. No. 586,178, Jun. 12, 1975, abandoned. This application Aug. 4, 1978, Ser. No. 931,131
Int. Cl.² H04B *1/26*
U.S. Cl. 325—470 **3 Claims**



1. A signal seeking receiver for automatically scanning and monitoring a plurality of channels of predetermined radio frequencies lying in a low RF band and in a plurality of separate and spaced apart higher RF bands, and for tuning a received channel signal having a frequency corresponding to one of said channels, said receiver comprising:

a separate RF section uniquely associated with each of said RF bands and including a RF amplifier and a RF band mixer, each of said RF band mixers having an output;

band switch logic means for producing a band logic signal indicating that a channel being scanned is within a particular one of said RF bands for energizing only one of said RF sections corresponding to said band logic signal;

phase-locked-loop frequency synthesizing means responsive to a predetermined combination of input signals applied thereto for generating a synthesized frequency beating signal at an output of said frequency synthesizing means;

programmable memory means connected to said frequency synthesizing means for storing various preselected combinations of said input signals at predetermined addresses;

means for programming said memory means to enter said various preselected combinations of input signals at predetermined addresses in said memory means, said programming means including means for manually and separately producing each of said various combinations of signals;

means connected to said memory means for selectively addressing said memory means to thereby cause a selected combination of input signals to be applied to said frequency synthesizing means;

a first supplemental mixer connected between the output of said frequency synthesizing means and a first one of said RF band mixers;

a second supplemental mixer connected between the output of said frequency synthesizing means and a second one of said RF band mixers, a third one of said RF band mixers directly connected to the output of said frequency synthesizing means for receiving said synthesized frequency beating signal;

oscillator means responsive to said band logic signal for providing a substantially constant oscillator frequency signal to at least one of said supplemental mixers when said band signal indicates that the channel being scanned is within one of said RF bands corresponding to said first or said second supplemental mixer;

first frequency multiplier means connected between said oscillator means and said first supplemental mixer for multiplying said oscillator signal by a first factor;

second frequency multiplier means connected between said oscillator means and said second supplemental mixer for multiplying said oscillator signal by a factor different from said first factor;

means responsive to said band logic signal for energizing only one of said RF sections to tune a received channel signal and provide an intermediate signal at the output of the RF band mixer of said energized RF section;

an IF section directly connected in common to the output of each of said RF band mixers, and including an IF amplifier for amplifying said intermediate signal;

detector means coupled to said IF amplifier for producing an audio signal in response to said intermediate signal;

an audio amplifier connected to said detector means for driving an audio speaker with said audio signal; and

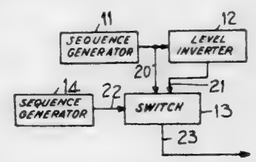
means for producing an inhibiting signal and for disabling said audio amplifier when a channel signal is not being received.

4,179,663

DEVICES FOR GENERATING PSEUDO-RANDOM SEQUENCES

Jean-Pierre Vasseur, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Apr. 3, 1969, Ser. No. 813,178
Claims priority, application France, Apr. 10, 1968, 68.147660
Int. Cl.² H03K *1/00*; H04L *9/00*
U.S. Cl. 328—59 **4 Claims**



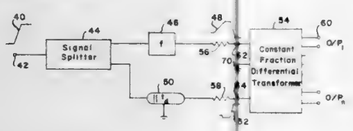
1. A device for delivering N′ pseudo-random sequences of digits in a system of base b, b being an integer greater than 1, and N′ being an integer, said device comprising: a sequence generator, having m outputs, for respectively delivering thereto m sequences of digits, referred to as primary sequences, m being an integer; p devices having respective inputs respectively coupled to p of said m outputs, for deriving from each one p of said primary sequences the (b−1) complementary sequences thereof, p being an integer smaller than m+1; a switch having m+p(b−1) inputs and N′ outputs for delivering said pseudo-random sequences; means for respectively applying said m primary sequences and said p(b−1) complementary sequences to said inputs of said switch; and a control system for connecting each output of said switch to one of the inputs thereof for each set of simultaneous digits respectively applied to the inputs thereof.

4,179,664

CONSTANT FRACTION SIGNAL SHAPING APPARATUS

Michael O. Bedwell, Concord, Tenn., assignor to Ortec Incorporated, Oak Ridge, Tenn.

Filed Jul. 26, 1977, Ser. No. 819,211
Int. Cl.² H03K *5/153*
U.S. Cl. 328—150 **5 Claims**



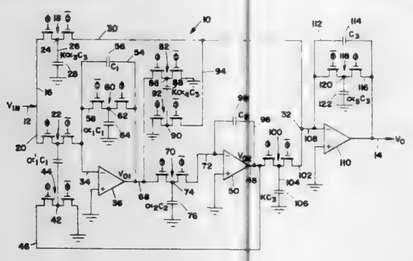
1. An electronic circuit for generating a constant-fraction bipolar output signal related in time to the occurrence of an event identified with an input trigger signal, comprising:
input circuit means for splitting said input trigger signal into a first and second component;
first means connected to said input circuit means for attenuating the first component of said input trigger signal;
second means connected to said input circuit means for delaying the second component of said input trigger signal;
passive means having first and second terminals connected to said respective first and second means for inverting said second component and summing the first component with the second inverted component of said input signal applied thereto and generating a constant-fraction bipolar timing signal at the output of said passive means, said timing signal being accurately correlated with the time of occurrence of said event regardless of the shape and amplitude of the input signal, said passive means including a differential transformer having first and second primary windings respectively connected to said first and second terminals of said passive means and said first primary winding being wound to have opposite polarity relative to said second primary winding.

4,179,665

SWITCHED CAPACITOR ELLIPTIC FILTER

Roubik Gregorian, Sunnyvale, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Filed Sep. 8, 1978, Ser. No. 940,473
Int. Cl.² H03F *1/36*
U.S. Cl. 330—107 **5 Claims**



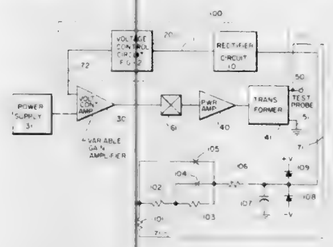
1. An electronic filter comprising:
an input terminal means adapted for connection with an input voltage source to be filtered;
a first integrating operational amplifier having a capacitor feedback means and an input connected to said input terminal means;
a second integrating operational amplifier connected to the output of said first operational amplifier;
a third integrating operational amplifier having a capacitor feedback means and connected to the output of said second operational amplifier;
a negative feedback connection between the output of said second operational amplifier and the input to said first operational amplifier;
a feed forward connection between said input terminal means, the output of said first operational amplifier and the output of said second operational amplifier and the input of said third operational amplifier;
switch means in said feed forward conduit, said feedback conduit, said capacitor feedback means for said first and third operational amplifiers and between said first and second operational amplifiers and between said first operational amplifier and said feed forward conduit, each said switch means connected to a capacitor which is continuously charged and discharged on alternative, successive clock cycles;
whereby an analog voltage from said input source is converted into a sampled data signal and an output is produced from said third operational amplifier having only those frequencies in a preselected pass band.

4,179,666

METHOD AND CIRCUIT FOR CONTROLLING THE OUTPUT SIGNAL OF A VARIABLE CONTROL CIRCUIT

Jon M. Lindenborg, Indianapolis, Ind., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 21, 1978, Ser. No. 898,563
Int. Cl.² H03G *3/20*
U.S. Cl. 330—138 **13 Claims**



1. A method for controlling the output voltage of a variable voltage generating circuit comprising the steps of:
determining whether the output voltage falls within a predetermined range of voltages, and
charging a capacitor, interconnected with an input of the variable voltage generating circuit, when the output voltage falls within the predetermined range of voltages, so as to control the output voltage in response to the charge on the capacitor.

4,179,667

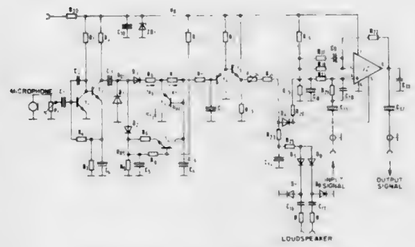
CIRCUIT ARRANGEMENT FOR ADJUSTING THE VOLUME OF AN AUTOMOBILE RADIO RECEIVER IN DEPENDENCE ON ROAD NOISE

Peter Böttcher, Tannenbergalee 4C, D-3000 Hanover 1, Fed. Rep. of Germany

Filed Jan. 24, 1978, Ser. No. 871,835
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1977, 2703249
Int. Cl.² H03F *1/26*
U.S. Cl. 330—149 **7 Claims**

1. A circuit arrangement for adjusting the volume of an automobile radio receiver in dependence on road noise, comprising;
microphone means for picking up noise and responsively producing an electrical signal having a magnitude value representative of the magnitude level of the noise;

amplifier means for amplifying said electrical signal;
rectifying means for rectifying the amplified signal;
time-controlled circuit means responsive to the rectified signal for producing a time-dependent signal advancing in magnitude toward the instantaneous magnitude value of said rectified signal at a substantially linear rate, said time-controlled circuit means maintaining the magnitude of said time-dependent signal when the magnitude of said time-dependent signal equals the magnitude value of said rectified signal and
control means positioned in the low frequency channel of the receiver for controlling the volume of the receiver, said control means responsive to the magnitude of said time-dependent signal.

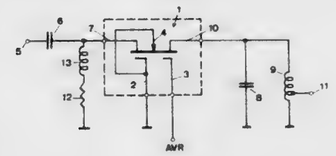


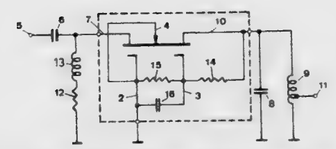
4,179,668

HF-AMPLIFIER CIRCUIT

Josef H. Schuermann, Oberhummel, Fed. Rep. of Germany, assignor to Texas Instruments Deutschland GmbH, Freising, Fed. Rep. of Germany

Filed Feb. 24, 1978, Ser. No. 881,105
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1977, 2709314
Int. Cl.² H03F *3/16*
U.S. Cl. 330—277 **18 Claims**





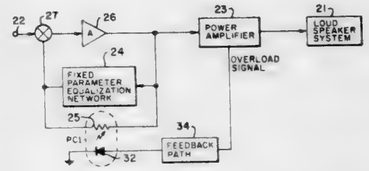
1. A high frequency amplifier circuit comprising a gated field effect transistor including a semiconductor substrate incorporating source and drain regions having respective source and drain electrodes, a channel region interposed between said source and drain regions, two gate electrode means disposed between the source electrode and the drain electrode for electrical cooperation with the channel region to control current carrier flow between the source and drain regions, wherein said substrate is connected by direct connection means solely to one of said gate electrodes, input means coupled to said source electrode for application of high frequency input signals to said source electrode, output means coupled to said drain electrode for deriving output signals from said drain electrode, means for coupling a control voltage at least to the other one of said gate electrodes; and bias resistor means having one terminal connected to said source electrode and a further terminal connected with said one gate electrode means to a common potential.

4,179,669

AMPLIFYING AND EQUALIZING

George B. Dodson, Framingham, and John A. Nangeroni, Newton, both of Mass., assignors to Bose Corporation, Framingham, Mass.

Filed Jun. 5, 1978, Ser. No. 912,334
Int. Cl.² H03G *5/28*
U.S. Cl. 330—282 **11 Claims**



1. In a power amplifying system having power amplifying means energizing loudspeaker means and active equalizing means responsive to an input audio signal for providing an equalized audio signal to said power amplifying means for rendering more uniform the radiated sound power response of said system, the improvement comprising,
variable gain means responsive to a feedback signal from said power amplifying means for altering the gain of said system in at least one predetermined frequency range relative to that of another,
means responsive to said power amplifying means beginning to overload for providing said feedback signal only when said power amplifying means overloads,
and means for coupling said feedback signal from said power amplifying means to said variable gain means to alter the relative gain to prevent audible overloading of said amplifying means in response to spectral components of said input audio signal in said predetermined frequency range.

4,179,670

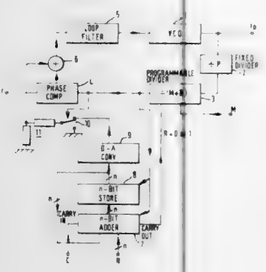
FREQUENCY SYNTHESIZER WITH FRACTIONAL DIVISION RATIO AND JITTER COMPENSATION

Nicholas G. Kingsbury, Portsmouth, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Jan. 27, 1978, Ser. No. 872,828
Claims priority, application United Kingdom, Feb. 2, 1977, 4204/77
Int. Cl.² H03B *3/04*
U.S. Cl. 331—10 **7 Claims**

1. A frequency synthesizer including a feedback loop comprising a controllable oscillator, a frequency divider, said frequency divider having an integral dividing factor, a phase comparator, the output of said oscillator being divided by said frequency divider and applied to said phase comparator for comparison with a reference signal, and the frequency of said oscillator being controlled by an error signal from said phase comparator, the synthesizer further including a digital store for accumulating a periodically occurring first quantity, means responsive to the accumulated sum of said first quantity to change said integral dividing factor by an integer when the content of said store reaches a predetermined second quantity, to produce, on average, a non-integral relation between the

oscillator frequency and the reference frequency, a digital-/analogue converter for converting the content of said store



into a jitter compensating signal and means for combining said jitter compensating signal with said error signal to suppress phase jitter in said oscillator output signal.

4,179,671

CAPACITOR SWITCHING CIRCUITS FOR ADJUSTING CRYSTAL OSCILLATOR FREQUENCY

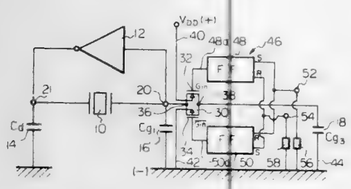
Hirohiko Yoshida, Hoya, and Fumio Nakajima, Tokyo, both of Japan, assignors to Citizen Watch Company Limited, Japan

Filed Jan. 3, 1978, Ser. No. 866,420

Claims priority, application Japan, Jan. 10, 1977, 52-841; Jan. 12, 1977, 52-2151

Int. Cl.[2] H03B 5/36

U.S. Cl. 331—116 FE **1 Claim**



1. A piezo-electric oscillator comprising:

a quartz crystal having input and output terminals;

an inverting amplifier connected across the input and output terminals of said quartz crystal;

a first capacitor normally connected to the input terminal of said quartz crystal;

a second capacitor; and

electronic switching means connected between said input terminal of said quartz crystal and said second capacitor for controlling connection of said second capacitor relative to the input terminal of said quartz crystal for thereby adjusting an operating frequency of said quartz crystal to a prescribed value, said electronic switching means comprising a transmission gate having first and second control gate terminals, a first resistor, said first control gate terminal of said transmission gate being connected to the positive side of a power supply through said first resistor, a second resistor, said second control gate terminal of said transmission gate being connected to the negative side of said power supply through said second resistor, a first lead connecting said first control gate terminal directly to the negative side of said power supply, a second lead connecting said second control gate terminal directly to the positive side of said power supply, whereby said transmission gate is nonconductive to interrupt connection between the input terminal of said quartz crystal and said second capacitor, and said first and second leads being cut by a laser trimming to allow said transmission gate to turn on for thereby connecting said second capacitor to the input terminal of said quartz crystal to adjust the operating frequency thereof.

4,179,672

PHASE MODULATION SYSTEM FOR COMBINING CARRIER WAVE SEGMENTS CONTAINING SELECTED PHASE TRANSITIONS

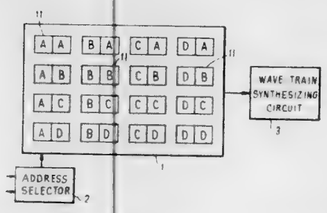
Roger Voles, London, England, assignor to E M I Limited, Hayes, England

Continuation-in-part of Ser. No. 809,365, Jun. 23, 1977, abandoned. This application Jun. 28, 1978, Ser. No. 919,907

Claims priority, application United Kingdom, Jun. 26, 1976, 26729/76

Int. Cl.[2] H04L 27/20

U.S. Cl. 332—16 R **6 Claims**



1. Signalling apparatus for producing a wave train which maintains one of a plurality of predetermined phase positions representing respective symbols during symbol transmitting periods, and which changes from one to another of said phase positions only during short transition periods between said symbol transmitting periods, said apparatus comprising waveform source means which makes separately available a plurality of different oscillations respectively defining all the possible phase transitions, each oscillation including a respective phase transition and a plurality of cycles at both sides of that transition the phases at the respective sides defining that transition, and selecting means for changing from one of said oscillations to another during symbol transmitting periods, the two oscillations between which changing occurs being in the same phase position while changing occurs and the second oscillation undergoing the desired phase transition during the next transition period.

4,179,673

INTERDIGITAL FILTER

Toshio Nishikawa, Nagaokakyo; Youhei Ishikawa; Sadahiro Tamura, both of Kyoto, and Haruo Matsumoto, Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Feb. 9, 1978, Ser. No. 876,247

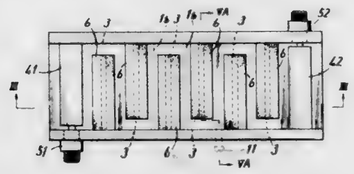
Claims priority, application Japan, Feb. 14, 1977, 52/15204; Jul. 6, 1977, 52/81429

Int. Cl.[2] H01P 1/20

U.S. Cl. 333—204 **11 Claims**

1. An interdigital filter, comprising casing means of an electrically conductive material said casing means having an inner upper and an inner lower opposing surface, a plurality of dielectric resonator means protruding inwardly from each of the side surfaces of said casing means, said plurality of resonator means being interdigitally arranged relative to each other

and extending in a direction perpendicular to said side surfaces, each of said plurality of resonator means comprising a core resonant conductor member and a solid dielectric member disposed to continuously enclose said core resonant conductor member along substantially the entire length of said member, each of said solid dielectric members which comprise each of said plurality of resonator means having a conductive layer formed on the upper surface of said solid dielectric member and formed on the lower surface of said solid dielectric member, said conductive layer on the upper surface of said dielectric member being in contact with said inner upper opposing surface of said casing means, said conductive layer on the



lower surface of said dielectric member being in contact with said inner lower opposing surface of said casing means, the adjacent resonator means being coupled in the even and odd modes of the transverse electromagnetic wave, the coupling of said adjacent resonator means causing the ratio of the characteristic impedance in the odd mode to the characteristic impedance in the even mode of said resonator means to increase, a further dielectric portion having a lower dielectric constant relative to the dielectric constant of said solid dielectric member being formed between adjacent ones of said plurality of resonator means, said resonator means being further connected to an input and an output connector means.

4,179,674

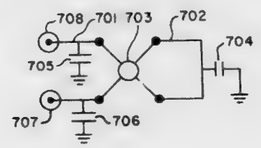
COMPACT RF STRUCTURE FOR NONRECIPROCAL FERROMAGNETIC RESONANCE COUPLING

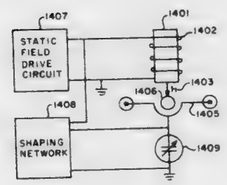
William J. Keane, and John A. Mezak, both of San Jose, Calif., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 5, 1978, Ser. No. 966,743

Int. Cl.[2] H01P 1/20, 3/08, 3/06

U.S. Cl. 333—204 **12 Claims**





1. A ferromagnetic resonant device of the type in which a ferromagnetic resonant material is subjected to a static magnetic field, coupling to the ferromagnetic material is provided by two lines in proximity to said material, and the currents in said lines have a generally orthogonal phase relationship, characterized in that said orthogonal phase relationship is produced in part by a capacitive reactance coupled to one of said lines and said material is offset from the plane of said lines.

4,179,675

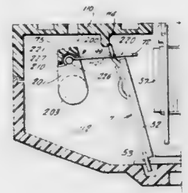
TRIP BAR MEANS SUBASSEMBLY

Norman P. Perkins, Jr., Westminster, Md., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Apr. 3, 1978, Ser. No. 893,205

Int. Cl.[2] H01H 75/00, 77/00

U.S. Cl. 335—9 **10 Claims**



1. A multipole circuit breaker including cooperating contact means for each pole thereof; an operating mechanism operatively connected to said contact means; latch means for maintaining a releasable portion of said operating mechanism in a reset position wherein said operating means is effective to close said contact means; an automatic trip means including an individual overload sensing means for each of said poles; said automatic trip means including a common trip bar means comprising an elongated element including first means defining a pivot axis for said trip bar means, an elongated bar having its longitudinal axis generally parallel to and laterally offset from said pivot axis, and second means operatively connected to said latch means; said automatic trip means also including an extension unit and pin means pivotally connecting said extension unit to said bar at a pivotal axis generally parallel to the pivot axis; said extension unit including an elongated main section having its longitudinal axis generally parallel to said pivotal axis; said extension unit also including third means for each of said poles spaced along the length of said main section and extending laterally therefrom into operative engagement with said automatic trip means whereby operation of the latter is effective to pivot said trip bar means about said pivot axis causing said second means to trip said latch means to release said portion whereby said operating mechanism opens said contact means.

4,179,676

TIME DELAY RELAY MOVEMENT

George J. Selas, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Apr. 12, 1978, Ser. No. 895,547

Int. Cl.[2] H01H 7/00, 43/02, 7/03

U.S. Cl. 335—59 **16 Claims**

1. In a relay movement for actuating switch contacts, the combination comprising:

an elongated operating plunger longitudinally movable in forward and backward strokes;

a contact actuator reciprocably movable along said plunger with a pair of spaced spring stops disposed longitudinally of said plunger and adapted to be coupled to said switch contacts to operate the same;

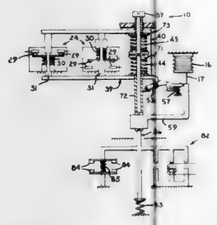
a pair of springs disposed between said spring stops;

spring-stressing means, carried by said plunger between said springs, for loading one of said springs to apply a force against one of said spring stops on a forward stroke of said plunger, and for loading the other of said springs to apply

a spring force against the other of said spring stops on a backward stroke of said plunger;

catch means;

a latch coupled to said actuator for movement therewith, said latch being restricted by said catch means upon a



movement of the plunger to load one of said springs against said actuator; and

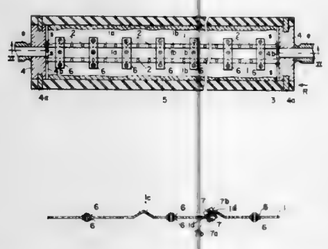
a timer adapted to move said catch means after a time delay from the movement of said plunger, thereby releasing said latch to actuate the switch contacts with spring action.

4,179,677

COMBINATION OF FUSIBLE ELEMENTS FOR ELECTRIC FUSES

Frederick J. Kozacka, South Hampton, N.H., and Richard J. Perreault, Amesbury, Mass., assignors to Gould Inc., Rolling Meadows, Ill.

Filed May 15, 1978, Ser. No. 905,960
Int. Cl.[2] H01H *85/12*
U.S. Cl. 337—161 **4 Claims**



1. A combination of fusible elements for electric fuses comprising

(a) a plurality of parallel ribbon-type fusible elements, the preponderant portion of the length of said plurality of fusible elements being arranged in a common plane;

(b) each of said plurality of fusible elements having a plurality of serially arranged points of reduced cross-sectional area;

(c) said plurality of points of reduced cross-sectional area each consisting of a perforation and a pair of current paths each to opposite sides of said perforation;

(d) a plurality of separate pairs of electric insulating members arranged transversely to said plurality of fusible elements and extending across said plurality of fusible elements, each of said pairs of electric insulating members sandwiching said plurality of fusible elements at at least two points of reduced cross-sectional area of said plurality of points of reduced cross-sectional area;

(e) said plurality of pairs of electric insulating members consisting of a laminate of glass-cloth and synthetic resin;

(f) said plurality of pairs of electric insulating members being non-interconnected by any insulating or conductive structure; and

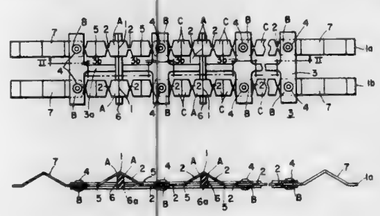
(g) fastener means projecting through each of said plurality of pairs of electric insulating members to firmly position the same relative to said plurality of fusible elements.

4,179,678

ELECTRIC FUSE WITH GAS EVOLVING MATERIALS

Richard Perreault, Amesbury, Mass., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Apr. 7, 1978, Ser. No. 894,594
Int. Cl.[2] H01H *85/12*
U.S. Cl. 337—293 **7 Claims**



1. Fusible elements and a support therefor comprising

(a) a pair of parallel fusible ribbon elements each including a plurality of fusible element sections and a plurality of points of reduced cross-section;

(b) said plurality of fusible element sections of each of said pair of fusible elements including angularly bent sections having a point of reduced cross-section arranged in spaced relation from the edge formed by said angular bent, and said plurality of fusible element sections of each of said fusible elements further including non-bent planar sections;

(c) a support of electric insulating material for said pair of fusible elements, said support including a portion arranged between said pair of fusible elements and extending in a direction longitudinally thereof, and said support further including transverse arms arranged to both sides of said portion of said support extending in a direction longitudinally of said fusible elements, said arms sandwiching said planar sections and supporting said planar sections; and

(d) a member of a gas-evolving substance being wedge-shaped on one side thereof and engaging with said wedge-shaped side thereof a pair of said angularly bent sections, the center region of said member of a gas-evolving substance opposite said wedge-shaped side thereof abutting against said portion of said support extending in a direction longitudinally of said pair of fusible elements.

4,179,679

THERMAL SWITCH

Stephen E. Houghland, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 19, 1978, Ser. No. 943,691
Int. Cl.[2] H01H *37/76*
U.S. Cl. 337—407 **8 Claims**

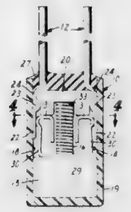
1. A thermal switch comprising:

a thin rectangular housing providing a thin rectangular cavity,

a pair of spaced parallel electrical leads extending into said cavity through one end of said housing,

a contact spring formed from a flat strip of metal, said contact spring having a U shape with inward extensions from the ends of legs of the U, the outside face of each of the legs of the U normally resiliently contacting one of said leads spaced from the end thereof to electrically connect said leads through said contact spring, said

contact spring being movable in said cavity away from said one end of said housing to move the legs thereof out of contact with said leads, said inward extensions of said contact spring defining with the side walls and said one end of said housing a compression spring pocket,



a fusible pellet in said cavity at the end of said housing opposite said one end, said pellet extending between said opposite end and the base of the U of said contact spring to support said contact spring in its normal position with the legs thereof contacting said leads, and

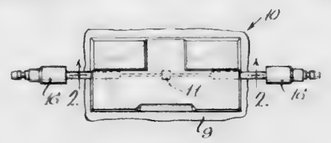
a compression spring in said pocket urging said contact spring against said pellet.

4,179,680

TEMPERATURE SENSOR

Otfried W. G. Heybey, Niles, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 3, 1977, Ser. No. 848,241
Int. Cl.[2] H01C *7/04*
U.S. Cl. 338—25 **10 Claims**



1. a thermally responsive integrating sensor assembly for use in providing a delayed warning signal indicating a sensed high temperature condition, said sensor assembly comprising:

a temperature sensing detector;

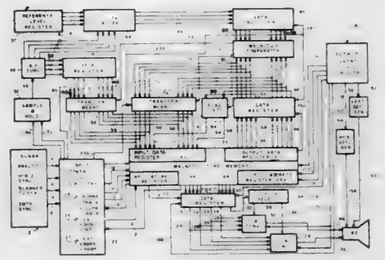
a body of synthetic resin material defining an outer surface and an internal cavity substantially surrounded by the resin material and spaced within said outer surface approximately 5/16", said detector being disposed within said cavity in heat transfer association with said outer surface solely through said resin material thereby to sense the temperature produced thereat by a temperature condition existing outwardly of said body outer surface and having a preselected thermal transmission to said cavity controlled solely by the parameters of said resin material body including the surface heat transfer coefficient of the body, the thermal conductivity of the body material, and the heat capacity of the body to provide a preselected time delay in sensing said temperature condition, said synthetic resin material having a substantially constant thermal diffusivity over the desired operating range of the sensor assembly.

4,179,681

TARGET TRACKING SONAR SIGNAL PROCESSING AND DISPLAY SYSTEM

William J. Zehner, Lynn Haven, and Henry L. Warner, Panama City, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 5, 1973, Ser. No. 339,664
Int. Cl.[2] G01S *9/66, 7/62*
U.S. Cl. 367—110 **12 Claims**



1. A sonar signal processing and display system for use with a source of analog sonar return signals, transmitter sync signals, scanner clock signals, and line sync signals, said system comprising:

memory means for storing and reading out data in multi-bit digital word form;

sample and hold means for periodically sampling said analog return signals;

analog to digital converter means, connected to said sample and hold means, for converting samples of said analog return signals into digital word signals;

first data register means, connected to said analog to digital converter means, for accumulating a predetermined number of digital words;

transfer means, connected between said first data register means and said memory means, for effecting transfer of said digital words for storage in said memory means;

input control logic circuit means for controlling said sample and hold means, said first data register means, said transfer means, and said memory means in response to said transmitter sync signals, said scanner clock signals, and said line sync signals to effect said converting and said storage at a predetermined sonar frame rate and at addresses in said memory means corresponding to locations in the sonar field of observation;

second data register means, connected to said memory means, for temporarily storing said words in a one at a time sequence as they are read out of said memory means;

digital to analog conversion means, connected to said second data register means, for converting said digital words temporarily stored therein into analog output signals;

cathode ray tube display means connected to said digital to analog conversion means, for generating a display of said analog output signals; and

output control logic circuit means for controlling said memory means, said second data register means, said digital to analog conversion means, and said display means so as to display said analog output signals at a display frame rate which is a multiple of said predetermined sonar frame rate.

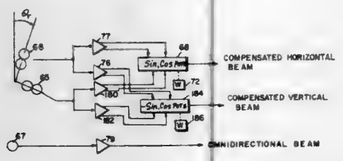
V 9 8 9 3 DEC 18 79 UMI

4,179,682

TILT COMPENSATION FOR ACOUSTIC TRANSDUCING SYSTEM

Robert L. Townsend, Amherst, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Aug. 3, 1978, Ser. No. 930,824
Int. Cl.[2] G01S 3/80
U.S. Cl. 367—135 **8 Claims**



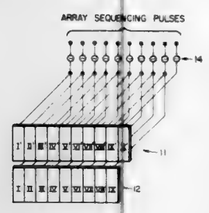
1. An acoustic transducer system comprising first and second bi-directional electro-acoustic transducers each having a maximum response axis, means for mounting said transducers with said maximum response axes perpendicular to each other and to a predetermined axis about which they may rotate, and a compensator including a vertical reference device for measuring the deflection angle between the vertical and a reference direction fixed with respect to said transducers and also including means for modifying the outputs of said transducers by functions of said deflection angle and for combining such modified outputs so as to obtain an output signal corresponding to a predetermined response pattern which does not vary substantially with rotation of said transducers about said axis.

4,179,683

METHOD AND APPARATUS FOR ENERGIZING AN ARRAY OF ACOUSTIC TRANSDUCERS TO ELIMINATE GRATING LOBES

B. Percy Hildebrand, and Gerald J. Posakony, both of Richland, Wash., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jan. 23, 1978, Ser. No. 871,157
Int. Cl.[2] H04B 1/02, 11/00
U.S. Cl. 367—138 **10 Claims**



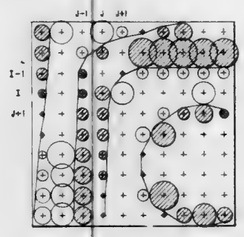
1. A method for energizing an array of acoustic transducer elements to eliminate grating lobes, comprising the steps of:
(a) propagating a first acoustic beam by energizing a first subarray of transducer elements, said first acoustic beam having odd grating lobes with a positive amplitude;
(b) propagating a second acoustic beam by energizing a second subarray of transducer elements, said second acoustic beam being physically independent from the first beam and having odd grating lobes with a negative amplitude, said first and second subarrays being substantially adjacent and said first and second acoustic beams substantially co-existing in space; and
(c) combining the first and second co-existing acoustic beams together so that the odd grating lobes from one subarray cancel the odd grating lobes from the other subarray.

4,179,684

GRAPHIC CONVERSION SYSTEM FOR ELECTRONIC DATA PROCESSING

George C. Cheng, 2220 SW. 34th St. #106, Gainesville, Fla. 32608

Filed Jul. 19, 1974, Ser. No. 490,012
Int. Cl.[2] G06K 9/00
U.S. Cl. 340—146.3 AE **11 Claims**



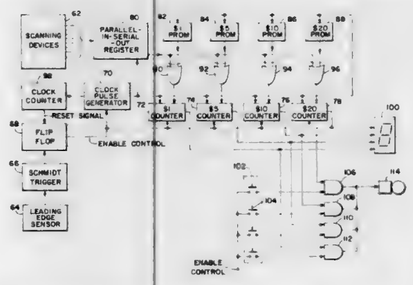
1. A method of graphic conversion for electronic data processing, comprising the steps of:
interpreting an image as a first analog electrical signal;
converting said first analog electrical signal into digital signals representing discrete, identifiable segments of said image and containing quantitative data representing a color value for said segments;
generating a boundary tangent circle for each of said segments as a function of said segment quantitative color data;
generating two pairs of common tangents to said boundary tangent circle for each of said segments as a function of adjacent segments quantitative color data;
selecting one tangent from each of said two pairs of common tangents as dominant tangents as a function of adjacent segments quantitative color data;
generating a second analog electrical signal as a continuous function of said dominant tangents of adjacent segments; and
converting said second analog electrical signal into a visual display.

4,179,685

AUTOMATIC CURRENCY IDENTIFICATION SYSTEM

James B. O'Maley, Lighthouse Point, Fla., assignor to Abbott Coin Counter Company, Inc., Stamford, Conn.

Filed Nov. 8, 1976, Ser. No. 739,424
Int. Cl.[2] G06K 9/00; B07C 5/342
U.S. Cl. 340—146.3 H **35 Claims**



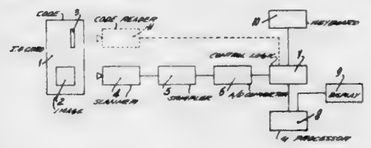
1. An automatic currency identifying system, comprising:
transport means for moving the currency past a detecting position;
scanning means at said detecting position for scanning at least a portion of the moving currency and providing scanned information about the currency;
storage means for retaining the scanned information;
memory means for storing a predetermined information concerning the currency; and
comparison means for comparing the scanned information from the storage means with the stored information from the memory means and providing an output signal upon concurrence of a predetermined amount of information therebetween and further comprising processing means for analyzing the scanned information and controlling the other means, and wherein said scanning means comprises scanning elements and at least two leading edge sensors positioned at spaced apart locations transversely to moving the currency, each of said leading edge sensors producing an output when respectively detecting the leading edge of the currency, and wherein said processing means includes means for measuring the time difference between the occurrence of said leading edge sensor outputs, and timing means associated with said transport means and coupled to said processing means for providing an indication of the speed of the transport, said processing means utilizing said time difference and said speed indication to determine the skew angle of the currency.

4,179,686

SYSTEM FOR CHECKING THE AUTHENTICITY OF IDENTIFICATION PAPERS

Maria P. Bonicalzi, via Rovere 15, and Mario M. De Gasperi, Vic. Ciovasso 11, both of Milan, Italy

Filed Nov. 2, 1977, Ser. No. 847,906
Claims priority, application Italy, Nov. 3, 1976, 29011 A/76[U]
Int. Cl.[2] G06K 9/00
U.S. Cl. 340—146.3 AG **4 Claims**



1. A system for checking the authenticity of identification papers, wherein the use is made of an identification paper provided with the image or photo of the person to be identified, comprising the steps of determining and storing an image code formed of characteristic parameters based on luminance levels of said image and checking the authenticity of the paper at the time of use in a suitable control apparatus by scanning the image thereon, providing for redetermining the characteristic parameters of the image, and comparing said redetermined parameters with the coded ones, upon which a signal of effected check is emitted.

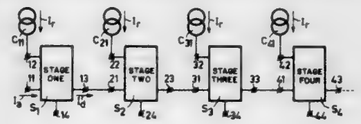
4,179,687

ANALOG-TO-DIGITAL CONVERTER CIRCUIT EMPLOYING ITERATIVE SUBTRACTION

Rudy J. van de Plassche, and Eise C. Dijkmans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 22, 1977, Ser. No. 818,105
Claims priority, application Netherlands, Aug. 30, 1976, 7609608
Int. Cl.[2] H03K 13/02
U.S. Cl. 340—347 AD **31 Claims**

1. Analog-to-digital conversion circuit having a plurality of series-connected stages, each stage comprising:
a common terminal;
an output terminal;
a first reference current source being connected to said common terminal;
diode means connecting said common terminal to said output terminal forming a first current path and having a forward direction; the forward direction, viewed from said common terminal being the same for all stages in said series-connection and being the same as the current direction of said reference current source;
a current sink;
a logic output;
a first transistor, the base being connected to said common terminal, the emitter being connected to said current sink and a collector being connected to said logic output, forming a second current path, said first transistor having a conductivity type such that the forward direction of its base-emitter junction, viewed from said common terminal, is opposite to the forward direction of said diode means; and
means for biasing said two current paths such that at one time only one of said two current paths is forward biased;
said common terminal of the first stage of said series-connection forming an input for an analog input current and the common terminal of each other stage being connected to the output terminal of the stage preceding it.
means for detecting the polarity of said difference serving to indicate the level of current output of said stage;
a detection output terminal connected to said polarity detection means to provide digital indication of the level of current at each stage;
means to count the number of successive stages having a positive current on said current output terminal; said count being a digital measure of the magnitude of said input current.

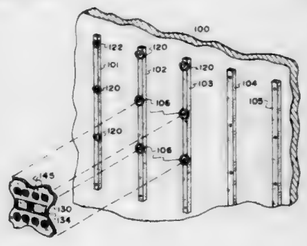


4,179,688

INFORMATION DISPLAY SYSTEM

Russell H. Romney, 3259 Bon View Dr., Salt Lake City, Utah 84109

Filed Jan. 31, 1977, Ser. No. 763,914
Int. Cl.[2] G08B 5/00
U.S. Cl. 340—373 **18 Claims**



1. Apparatus for presenting and controlling a large number of individual radiatively functional elements over a large display area and for ultimately connecting each and all of said elements with a main central area control station comprising, in combination:
(a) a supporting base behind and generally coextensive with

the display area, said main station being associated with said base,

(b) a plurality of separate individual module support members supported by said base in rows and columns for holding the elements in the display area in module groups and in contiguous rows and columns, each of said separate module support members including separate sub-area means for holding a plurality of small sub-groups of said elements in respective module sub-areas,

(c) front panel means located between the modular support members and the functional elements and including sub-groups of electrical connectors for establishing electrical contact between each individual element in the sub-group and a central sub-group control point, said sub-group control points being symmetrically arranged behind the elements which constitute the module area,

(d) further panel means arranged between the front panel means and the respective module support members and including electrical connectors between each of the sub-group control points and a central module control point, and

(e) means connecting each of said central module points to the main control station.

4,179,689

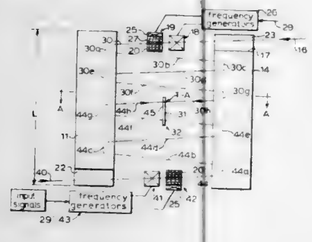
GRAPHIC SYMBOL DISPLAY SYSTEM

Joseph T. McNaney, 8548 Boulder Dr., La Mesa, Calif. 92041

Filed Oct. 26, 1978, Ser. No. 955,111

Int. Cl.² G01J *1/34*; G08B *5/36*

U.S. Cl. 340—378.3 **5 Claims**



1. In a graphic symbol display system:

(a) a primary source of light;

(b) light mask means for providing an array of graphic symbol light beam forming means and means for exposing beam forming means of said array, selectively, to light from said primary source for providing any one of a plurality of individual graphic symbol shaped sources of light;

(c) a graphic symbol display medium;

(d) said array of beam forming means and said display medium positioned, respectively, at first and second ends of graphic symbol shaped light beam optical paths of said system;

(e) optical means positioned along an optical axis of said system intermediate said array of beam forming means and said display medium for projecting an image of a beam forming means selectively exposed to light from said primary source toward a predetermined symbol display position at said display medium, said display position representative of a reference position at said display medium;

(f) acousto-optic light reflector means including an interaction medium and acoustic wave generator means for establishing any of a number of different acoustic wave light reflecting conditions within said medium thereof, said interaction medium positioned intermediate said array of beam forming means and said optical means positioned along said optical axis;

(g) means for exposing a predetermined one of said beam forming means of said array to light from said primary source and establishing, simultaneously, a predetermined one of said light reflecting conditions within said interaction medium for allowing said display medium to be exposed to a light image of said predetermined one of said beam forming means through said optical means and coincident with said reference position at said display medium;

(h) means for exposing another predetermined one of said beam forming means to light from said primary source and establishing, simultaneously, another predetermined one of said light reflecting conditions within said interaction medium for allowing said display medium to be exposed to a light image of said other predetermined one of said beam forming means through said optical means and coincident with said reference position at said display medium.

4,179,690

TWO-TONE AUDIBLE WARNING CIRCUITS

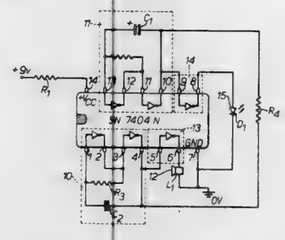
Mark S. Nicholls, Northampton, England, assignor to The Metoy Company Limited, Northampton, England

Filed Oct. 3, 1977, Ser. No. 838,832

Claims priority, application United Kingdom, Oct. 7, 1976, 41831/76

Int. Cl.² G08B *3/10*

U.S. Cl. 340—384 E **10 Claims**



1. A circuit for producing an audible signal, comprising:

a sounder connected to an audio frequency signal generator circuit for producing the audible signal;

a modulator circuit connected to the signal generator circuit for controlling the signal generator circuit to alter the frequency of operation thereof; said signal generating circuit and said modulator circuit each comprises two inverters connected in series with a resistor connected in parallel with one of the two inverters; and

a capacitor connected in parallel with the series combination of the two inverters, all said inverters being provided on a single integrated circuit package.

4,179,691

INFRARED INTRUSION DETECTOR CIRCUIT

Hansjürg Keller, Männedorf, Switzerland, assignor to Cerberus AG, Männedorf, Switzerland

Filed Jul. 22, 1977, Ser. No. 817,916

Claims priority, application Switzerland, Nov. 15, 1976, 14272/76

Int. Cl.² G01D *27/04*; G08B *13/18*

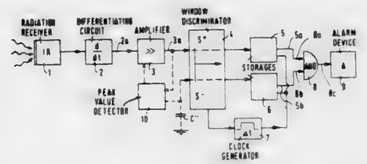
U.S. Cl. 340—567 **19 Claims**

1. In a circuit arrangement for an infrared intrusion detector of the type possessing a number of mutually spaced receiving regions and a spacing between each two adjacent receiving regions and a radiation receiver providing output electrical signals in accordance with the infrared radiation which is absorbed from all of the receiving regions, the improvement which comprises:

said output electrical signals having an ascent and descent representative of a change in infrared radiation due to an intruder traversing one single receiving region or one single spacing between adjacent receiving regions;

said circuit including:

means responsive to said output electrical signals for providing output electrical signals indicative of the ascent and descent of said change in infrared radiation; and



means for processing said output electrical signals of said responsive means for triggering an alarm signal when the received infrared radiation, within a predetermined delay time, only once ascends in a predetermined manner and only once descends in a predetermined manner.

4,179,692

APPARATUS TO INDICATE WHEN A PATIENT HAS EVACUATED A BED OR DEMONSTRATES A RESTLESS CONDITION

Dwight A. Vance, 8709 E. 29, Tulsa, Okla. 74129

Filed May 5, 1977, Ser. No. 794,041

Int. Cl.² G08B *21/00*

U.S. Cl. 340—573 **9 Claims**

1. A monitoring system for bed patients comprising;

(a) a binary signal generating means adapted to produce a first signal when a body is in a rest position in a bed; and a second signal when said body is out of said bed;

said signal generating means adapted to produce transient changes from one to another of said first and second signals, when said body is in said bed but is not at rest; the frequency of said changes from one to the other of said first and second signals, increasing with the restlessness of said body in said bed;

(b) signal processing means comprising;

(1) means responsive to said second signal to increase the magnitude of a selected physical quantity at at least one selected rate;

(2) means responsive to said first signal to decrease said magnitude of said physical quantity at a selected one of a plurality of rates;

(3) latch means and means to set said latch means responsive to a predetermined magnitude of said physical quantity, and means responsive to the setting of said latch means to set an alarm when said magnitude reaches a selected value.

4,179,693

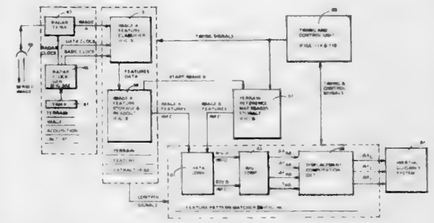
AUTONOMOUS, CHECK-POINTING, NAVIGATIONAL SYSTEM FOR AN AIRBORNE VEHICLE

Gregory W. Evans, Whittier, and James E. Paul, Anaheim, both of Calif., assignors to Rockwell Internation Corporation, El Segundo, Calif.

Filed May 23, 1977, Ser. No. 799,423

Int. Cl.² G01S *9/02*

U.S. Cl. 343—5 MM **6 Claims**



1. A navigational system comprising:

means for periodically generating a first pattern of terrain features from a sensed image of ground terrain, said generating means including:

means for periodically sensing an image of ground terrain; and

means for extracting the first pattern of terrain features contained in the sensed image;

means for prestoring a second pattern of terrain features contained in a reference image, said sensed image substantially corresponding to a portion of the reference image;

means selectively responsive to the first and second patterns of terrain features for determining the relative coordinate and orientation displacements of the first pattern within the second pattern, said determining means including:

means responsive to the features of the first and second patterns for selectively developing a feature neighborhood of nearby features surrounding each feature in the first and second patterns;

means selectively responsive to the feature neighborhoods of the first and second patterns for developing a plurality of neighborhood comparison signals indicative of the closeness of match and coordinate and orientation displacements between each feature neighborhood of the first pattern with respect to each feature neighborhood of the second pattern; and

means responsive to the neighborhood comparison signals for computing the relative coordinate and orientation displacements of the first pattern within the second pattern; and

means responsive to the relative coordinate and orientation displacements for updating position and heading coordinates of the navigational system.

4,179,694

FREQUENCY CONTROL SYSTEMS

Christopher J. Alder, Emsworth, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Dec. 19, 1977, Ser. No. 862,186

Claims priority, application United Kingdom, Dec. 21, 1976, 53259/76

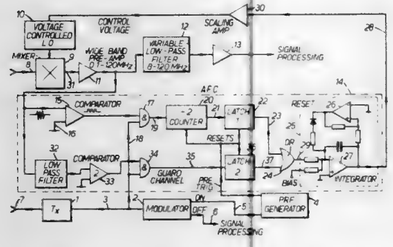
Int. Cl.² G01S *9/02*

U.S. Cl. 343—5 AF **6 Claims**

1. An AFC system for a radar system comprising a radar pulse transmitter, a radar echo pulse receiver including a mixer responsive to received echo signals and to transmitted pulses generated by the radar pulse transmitter, a controlled local oscillator providing a local oscillator signal for the said mixer nominally at the same carrier frequency as the said pulse transmitter so that the said receiver operates without an intermedi-

V989/3 DEC 18 79 UMI

ate frequency stage, a counter, gating means operative responsively to the transmission of the radar pulse by the said pulse transmitter for passing signals derived from the said mixer to said counter and control signal producing means operative responsively to said counter reaching a predetermined count



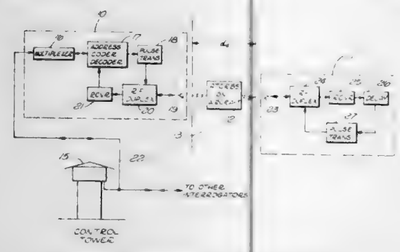
stage indicative of a frequency difference between the carrier frequency of the said radar pulse transmitter and the controlled local oscillator, for providing a control signal which is fed to the controlled oscillator so as to tend to nullify the said frequency difference.

4,179,695

SYSTEM FOR IDENTIFICATION OF AIRCRAFT ON AIRPORT SURFACE PATHWAYS

Arnold M. Levine, Chatsworth, Calif., and Ray O. Waddoups, Mesa, Ariz., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 2, 1978, Ser. No. 947,729
Int. Cl.[2] G01S *9/56*
U.S. Cl. 343—6.5 R **10 Claims**



1. A vehicle identification system particularly for surveillance of aircraft on predetermined surface pathways including runways and other areas of an airport surface, said aircraft having ATCRBS equipment comprising:

at least one transmitting interrogation located on said airport surface adjacent to a selected one of said surface pathways and spaced laterally by a first distance with respect to the centerline of said pathway;

first means connected at said remote location and connected to said interrogator for providing activating signals to said interrogator to transmit a first RF pulse;

second means comprising a transponder responsive to said first RF pulse to produce a second RF pulse, said transponder being located on said surface on the side of said pathway centerline opposite said interrogator to generate a second RF pulse in fixed time relationship after said first RF pulse, said first and second pulse forming a pulse pair for activation of said ATCRBS equipment on a selected aircraft on said pathway in the vicinity of said interrogator and said second means transponder;

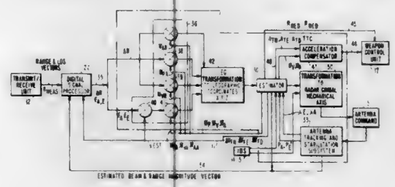
delay means within said second means transponder for delaying the generation of said second RF pulse after reception of said first RF pulse such that said fixed time relationship between said first and second RF pulses forms a properly spaced pulse pair for activation of said ATCRBS equipment, said ATCRBS thereafter broadcasting a predetermined reply code comprising at least an identification code receivable at said remote location.

4,179,696

KALMAN ESTIMATOR TRACKING SYSTEM

Elmen C. Quesinberry, Severna Park; Michael Tom, Glen Burnie, and James L. Farrell, Baltimore, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 24, 1977, Ser. No. 800,121
Int. Cl.[2] G01S *9/22, 9/44*
U.S. Cl. 343—7.4 **6 Claims**



1. A radar system for tracking a target comprising:

an antenna for repetitively sensing reflected radar pulses from the target,

means responsive to the reflected pulses to generate signals referenced to a line-of-sight coordinate system, including signals representative of measured range and measured angle of the target,

means governed by the measured range and angle signals for comparison with predictions based upon previously estimated values to generate residuals, including residuals representative of range and angle,

means to generate variable estimation gain factors to weight said residuals,

means to transform the product of gain factors and residuals from the line-of-sight coordinate system reference to a stable coordinate system reference,

estimating means including means governed by the product of the gain factors and residuals referenced to the stable coordinate system to generate vector component values, including values representative of estimated target range, and

means to transform the generated values representative of estimated target range to corresponding values referenced to the radar gimbal mechanical axis for positioning the antenna in accordance with the estimated target position.

4,179,697

PASSIVE RANGING METHOD

Martin Golinsky, East Hills, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jan. 27, 1978, Ser. No. 873,005
Int. Cl.[2] G01S *5/02*
U.S. Cl. 343—112 D **9 Claims**

9. A method of passively determining the range of an airborne target from a test aircraft comprising:

traversing a circular path in the test aircraft;

detecting the presence of a radio energy signal by the test aircraft at least four discrete times;

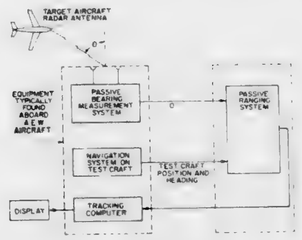
generating a detection signal responsive to the angle of arrival of each of said radio energy signals;

generating a positioning signal derived from the test vehicle's position at the time of reception of each of said radio energy signals;

storing said detection signals and said positioning signals in a storage device;

energizing an apparatus for determining the course and range of the target from said stored signals;

generating an electrical target indication signal representative of the range and course of the target as determined, and



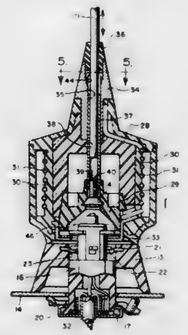
using said indication signal to activate a display representative of the target.

4,179,698

MOBILE ANTENNA WITH ADJUSTABLE RADIATING ELEMENT

James P. Liautaud, Cary, Ill., assignor to American Antenna Corporation, Elgin, Ill.

Filed Dec. 13, 1977, Ser. No. 860,245
Int. Cl.[2] H01Q *1/32, 9/00, 1/50, 9/30*
U.S. Cl. 343—715 **9 Claims**



1. A mobile antenna comprising, in combination:

an antenna base housing comprising walls defining a first opening means in said housing, the walls adjacent said opening means being inwardly converging;

an elongated radiating element extending into said first opening means;

a loading coil carried within said housing;

an elongated sleeve slidably carried within said housing and said first opening means and in conductive relationship with said coil, said sleeve comprising an enlarged outer end portion positioned between said converging walls and telescopically receiving said radiating element therewithin, the other end of said sleeve being disposed within said housing, inwardly of said outer end portion,

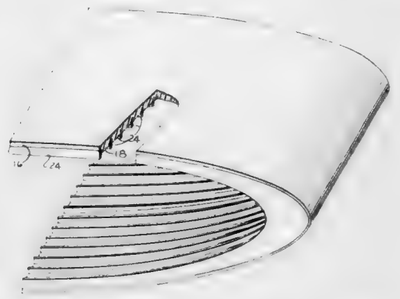
locking means disposed within said housing and operable from the exterior thereof for cooperating with the inward end portion of said sleeve to draw said sleeve into said housing, whereby engagement between said converging walls and said enlarged end of said sleeve causes said sleeve to securely grip said radiating element, thereby locking said radiating element in position with respect to said housing.

4,179,699

LOW REFLECTIVITY RADOME

Clarence D. Lunden, Federal Way, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 5, 1977, Ser. No. 813,065
Int. Cl.[2] H01O *1/42*
U.S. Cl. 343—872 **10 Claims**



1. A low reflectivity radome for a radar antenna, said radome essentially including an enclosure consisting of foamed plastic material, said enclosure defining a smooth air-side surface and a concave inner surface, and a plurality of stiffener ribs each consisting of resin-bonded glass fibers, each of said ribs being disposed to compressively strengthen and reinforce said enclosure against buckling under compression by extending in an orthogonal manner along a plane normal to a tangent to said air-side surface and at least partially embedded within said enclosure, said ribs being spaced apart and spaced from both the air-side surface and the concave inner surface of said enclosure to reduce microwave reflections.

4,179,700

METHOD AND APPARATUS FOR CONTROLLING ELECTROMAGNETIC RERADIATION FROM AN ELECTRICALLY CONDUCTING STRUCTURE

Ogden L. Prestholdt, 8905 Maxwell Dr., Potomac, Md. 20854

Filed Nov. 17, 1977, Ser. No. 852,453
Int. Cl.[2] H01Q *1/52*
U.S. Cl. 343—885 **10 Claims**



1. Apparatus for controlling electromagnetic reradiation of electrically conducting structures wherein the reradiation is caused by current flow in said structures from an electromagnetic field radiated in space from a primary source at a spaced distance from the said structure, wherein said structure has a cross-sectional equivalent radius a interfering with electromagnetic radiation of a wavelength λ (meters), comprising an annular prism-shaped sleeve of high magnetic permeability material μ, said sleeve having a length *l* (cm), a cross-sectional equivalent outer radius b (cm), a cross-sectional equivalent inner radius a (cm), wherein the inductance L (microhenries) of said sleeve is,

$$L = 0.002l\left[\ln_e \frac{2lb^{(\mu-1)}}{a^{\mu}} - 1\right],$$

means for positioning a plurality of said sleeves about said

electrically conducting structure at a spaced-apart distance d such that

$$\tan \frac{\pi d}{\lambda} \cong \frac{2Z_o}{x}$$

where Z_o is the characteristic impedance of the structure between adjacent sleeves and

$$Z_o = 60 \ln_e \frac{d}{2a},$$

and

$$x = 2\pi fL$$

where f is the frequency of the electromagnetic radiation wherein the current flow in said structure undergoes a phase reversal such that the current in said structure near the sleeves is substantially reversed in phase from the current in said structure substantially midway between adjacent sleeves.

4,179,701

DEVICE FOR ELECTROMECHANICALLY POSITIONING A UNILATERALLY PIVOTED LEVER ARM IN THREE DIFFERENT STABLE POSITIONS

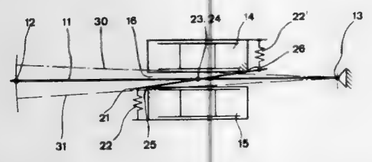
Jean-Jacques Bärtschi, Bern, Switzerland, assignor to Hasler AG, Bern, Switzerland

Filed May 15, 1978, Ser. No. 905,743

Claims priority, application Switzerland, May 13, 1977, 6011/77

Int. Cl.[2] G01D *9/28, 15/16*

U.S. Cl. 346—62 **6 Claims**



1. Device for positioning a unilaterally pivoted lever arm in three different stable positions with two solenoids characterized by the facts that lever arm (**11**) is rigidly connected in a forked fashion to a second parallel arm (**10**), that a shaft (**13**) perpendicular to the two arms (**10,11**) provides the pivoting axis, that each arm (**10,11**) possesses an opening (**24**) at equal distances from shaft (**13**), that a plate-shaped pivoting armature (**21**) is suspended with tabs (**23**) in these openings (**24**) while positioned in a gap (**16**) between two axially opposed, individually switched solenoids (**14,15**), each having a contact area and diagonally opposing abutments (**25,26**) for pivoting armature (**21**), and that at least one spring (**22**) is provided to press pivoting armature (**21**) against the two abutments (**25,26**) in such a manner that when in the neutral position the pivoting armature (**21**) will be at rest diagonal in the gap (**16**) between the two solenoids (**14,15**).

4,179,702

CASCADE SOLAR CELLS

Michael F. Lamorte, Durham, N.C., assignor to Research Triangle Institute, N.C.

Filed Mar. 9, 1978, Ser. No. 885,077

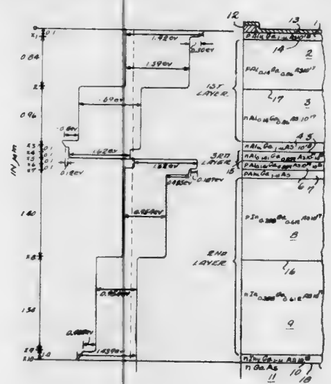
Int. Cl.[2] H01L *27/14*

U.S. Cl. 357—30 **25 Claims**

1. A monolithic cascade cell for converting incident radiation into electrical energy comprising:

a first semi-conductive layer of a first material having a first given bandgap, said first layer being doped into p and n regions with a junction therebetween so that incidence of radiation of wavelength above a predetermined energy produces an electrical potential across said junction of said first layer and below said first predetermined energy substantially passes through said first layer;

a second layer of a second material having a second given bandgap, said second layer being doped into p and n regions with a junction therebetween so that the radiation passing through said first layer above a second predetermined energy produces an electrical potential across said junction of said second layer; and



a third layer between said first and second layers of a third material having a bandgap greater than said first bandgap, so that substantially no electrical energy is produced by radiation absorbed in said third layer, and doped into p and n regions with a homojunction forming a tunnel junction therebetween to electrically connect said potentials in said first and second layers in series.

4,179,703

SYSTEM FOR TRANSMITTING TWO COLOR TV SIGNALS

Liston Abbott, E. Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 24, 1978, Ser. No. 927,628

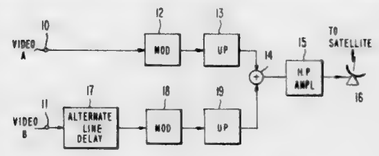
Int. Cl.[2] H04N *9/00*

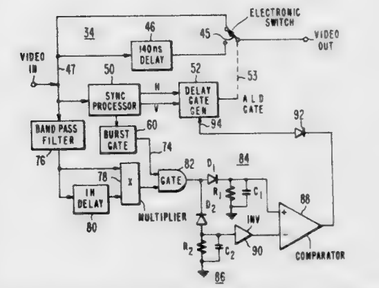
U.S. Cl. 358—11 **6 Claims**

1. In a system in which alternate lines of one color television video signal normally are delayed half the period of the color subcarrier at a transmitting terminal to minimize the cross modulation of the color subcarrier with the color subcarrier of another video signal amplified in a common amplifier such as in a satellite transponder, the combination of

an intermediate line delay unit at the receiving terminal normally operative to delay intermediate lines of said one video signal half the period of the color subcarrier, and having an inhibit input, and

inhibit signal generating means coupled to said inhibit input automatically to inhibit said intermediate line delay unit from delaying intermediate lines of said one video signal





when the received alternate lines of said one video signal are not delayed at the transmitting terminal.

4,179,704

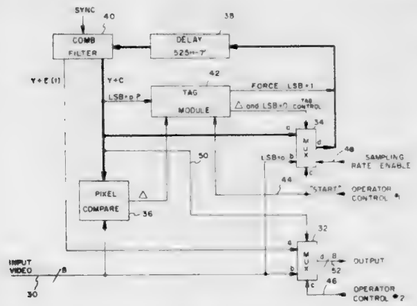
TELEVISION SYSTEM FOR DISPLAYING AND RECORDING PATHS OF MOTION

J. Kenneth Moore, Stamford; Arthur Kaiser, Trumbull, and Henry W. Mahler, Newtown, all of Conn., assignors to CBS Inc., New York, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,405

Int. Cl.[2] H04N *5/22, 9/32, 7/18, 5/24*

U.S. Cl. 358—22 **26 Claims**



22. Method for generating a video signal for displaying simultaneously a succession of images of an object moving over a selected time period in an otherwise substantially static scene, comprising the steps of:

(a) storing a reference field of video representing said scene at the start of said selected time period;

(b) comparing picture elements of selected time-separated television fields subsequently arriving during said selected time period with corresponding picture elements of said reference field;

(c) substituting in said stored reference field those picture elements of said subsequently arriving fields shown by step (b) to be different from those in said reference field and tagging said substituted picture elements to preclude another substitution of the same picture elements in the reference field; and

(d) at the termination of said selected time period, providing a video signal representing said scene with the substitution therein of those picture elements tagged during the selected time period.

4,179,705

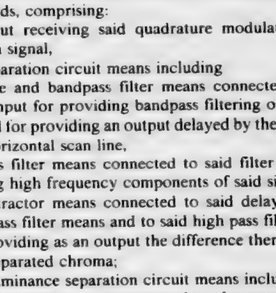
METHOD AND APPARATUS FOR SEPARATION OF CHROMINANCE AND LUMINANCE WITH ADAPTIVE COMB FILTERING IN A QUADRATURE MODULATED COLOR TELEVISION SYSTEM

Yves C. Faroudja, 26595 Anacapa Dr., Los Altos Hills, Calif. 94022

Filed Mar. 13, 1978, Ser. No. 886,164

Int. Cl.[2] H04N *9/535*

U.S. Cl. 358—31 **10 Claims**



1. An adaptive comb filter for separating chrominance and luminance information of a quadrature modulated color television signal and the like having interleaved chroma and luminance sidebands, comprising:

a filter input receiving said quadrature modulated color television signal,

chroma separation circuit means including

delay line and bandpass filter means connected to said filter input for providing bandpass filtering of said signal and for providing an output delayed by the period of one horizontal scan line,

high pass filter means connected to said filter input for passing high frequency components of said signal, and

first subtractor means connected to said delay line and bandpass filter means and to said high pass filter means for providing as an output the difference thereof, being said separated chroma;

adaptive luminance separation circuit means including

threshold circuit means connected to the output of said first subtractor means to receive said separated chroma, for putting out only those portions of said separated chroma which exceed a predetermined threshold,

limiting amplifier means connected to said threshold circuit means for putting out squared waves in phase with said portions only when they exceed said predetermined threshold,

adder circuit means having inputs connected to combine the outputs of said threshold circuit means and said limiting amplifier means,

second subtractor means connected to said filter input and to said adder circuit means for subtracting the output of said adder circuit means from said received color television signal the difference therefrom being said adaptively separated and filtered luminance.

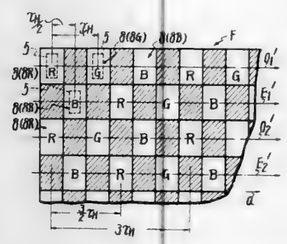
V 9 8 9 \ 3 DE 1 8 7 9 UMI

4,179,706

COLOR CAMERA SYSTEM

Toshimichi Nishimura, Tama; Seisuke Yamanaka, Mitaka, and Masaru Shimada, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 22, 1977, Ser. No. 863,596
Claims priority, application Japan, Jan. 14, 1977, 52-3316
Int. Cl.[2] H04N *9/07*
U.S. Cl. 358—44 **12 Claims**



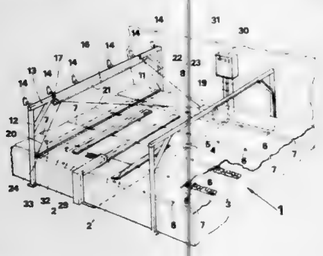
1. Color camera system in which colors are modulated at a frequency f_s and is obtained in opposite phase line by line comprising:
(a) means for deriving a composite signal from a pickup device,
(b) means for shifting the phase by 180° of one horizontal line with respect to an adjacent horizontal line,
(c) means for mixing said composite signals obtained from adjacent two lines,
(d) means for checking whether the signal is chromatic,
(e) means for generating a luminance signal from said mixed composite signal,
(f) means for detecting a second harmonic component of f_s from said mixed composite signal, and
(g) means for controlling the frequency response of said luminance signal in response to said second harmonic.

4,179,707

AUTOMATIC MEASUREMENT OF LENGTHS OF ELONGATED WORKPIECES

Bo Sjödin, Jönköping, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed Oct. 12, 1977, Ser. No. 841,378
Claims priority, application Sweden, Oct. 13, 1976, 7611329
Int. Cl.[2] H04N *7/18*
U.S. Cl. 358—107 **7 Claims**



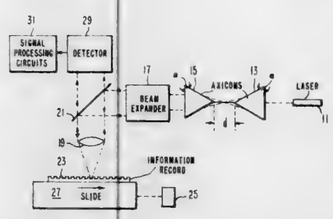
1. Apparatus for automatically producing an output corresponding to the length of each of a plurality of elongated workpieces, said apparatus being characterized by:
A. transporting means for supporting workpieces with their lengths extending substantially in a scanning direction and for moving the workpieces transversely to said scanning direction, said transporting means defining a plane in which the workpieces move and in which there is an elongated measuring zone that extends lengthwise in the scanning direction and is at least as long as the longest workpiece to be measured;
B. an array camera optically equidistant from the opposite ends of the measuring zone and located in a reflected light path that has a portion extending to one side of said plane from the measuring zone, said array camera being arranged to scan along the length of the measuring zone and being responsive to light reflected from said zone to produce an output corresponding to the length of a segment along said zone from which light is reflected;
C. illumination means for enabling a workpiece at the measuring zone to reflect light along said reflected light path, said illumination means being
(1) spaced to said one side of said plane,
(2) spaced in one direction transverse to the scanning direction from said portion of the reflected light path, and
(3) arranged for illuminating the measuring zone all along the length thereof;
D. means defining a background surface which
(1) is spaced to the opposite side of said plane,
(2) faces towards said plane, and
(3) is at least coextensive with the length and width of the measuring zone; and
E. opaque screening means located between said illumination means and said background surface and spaced in said one direction transverse to the scanning direction from said portion of the reflected light path, said screening means being arranged to shadow the background surface from light from the illumination means so that the shadowed background surface provides a strong contrast to the light reflecting surface of a workpiece as the measuring zone, to afford accuracy in scanning the workpiece.

4,179,708

OPTICAL PLAYBACK SYSTEM HAVING INCREASED DEPTH-OF-FIELD

Ping Sheng, Princeton, and Arthur H. Firester, Skillman, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,366
Int. Cl.[2] G11B *7/00*
U.S. Cl. 358—128 **8 Claims**



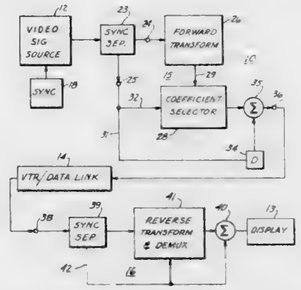
1. In an optical playback system for retrieval of information recorded in the form of an elongated track on a surface of a record medium, said elongated track comprising a succession of depressed areas, of a given width, of a given depth and of variable lengths, alternating along the length of said track with relatively non-depressed areas; and apparatus comprising:
means for providing a beam of coherent light;
means for rendering a central portion of said beam substantially free of the light forming said beam, said rendering means providing a beam output having uniform light phase along transverse cross-sections thereof;
means for focusing said beam output of said rendering means to a light spot near said surface of said recording medium;
means for establishing relative motion between said elongated track and said focused light spot; and
light detection means, responsive to light which interacted with said elongated track during the occurrence of said relative motion, for developing electrical signals representative of said recorded information.

4,179,709

VIDEO INFORMATION BANDWIDTH COMPRESSION

Dennis L. Workman, Morgan Hill, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 10, 1978, Ser. No. 868,236
Int. Cl.[2] H04M *7/12*
U.S. Cl. 358—133 **130 Claims**



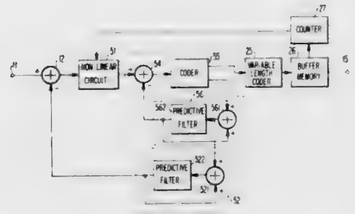
1. A method of video information bandwidth compression, comprising in combination the steps of:
arranging said video information in image fields and subfields;
providing for said subfields a system of coefficients having a first coefficient indicative of average subfield luminance as to any given subfield and including a selected number of further coefficients indicative of spatial content of the particular subfield; and
updating said first and further coefficients, with said first coefficient being updated for each subfield as to each utilized field and said further coefficients being updated less frequently than said first coefficient.

4,179,710

PREDICTIVE ENCODER WITH A NON-LINEAR QUANTIZING CHARACTERISTIC

Tatsuo Ishiguro; Norio Suzuki, and Yukihiko Iijima, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 771,048
Claims priority, application Japan, Feb. 23, 1976, 51-19294, Jun. 11, 1976, 51-68521
Int. Cl.[2] H04N *5/40, 9/40*
U.S. Cl. 358—135 **6 Claims**



1. A predictive encoder for encoding an input signal of high correlation by the use of correlation techniques, said encoder comprising:
means for producing a predictive signal corresponding to the amplitude value to said input signal at a preceding sample;
means supplied with said input signal and said predictive signal in a timed relation for producing a predictive error signal representing the difference therebetween; and
quantizer means for quantizing said predictive error signal to produce information codes, said quantizer means including a plurality of circuits having different non-linear characteristics wherein said circuits are read-only memories which produce information codes according to respective ones of said different non-linear characteristics, the transmission gain of said quantizer means being less than unity when the amplitude component of said predictive error signal is smaller than a predetermined level and being substantially equal to unity when said amplitude component of said predictive error signal is higher than said predetermined level.

6. A predictive encoder for encoding an input signal of high correlation by the use of correlation techniques, said encoder comprising:
means for producing a predictive signal corresponding to the amplitude value to said input signal at a preceding sample;
means supplied with said input signal and said predictive signal in a timed relation for producing a predictive error signal representing the difference therebetween;
quantizer means including a plurality of circuits having different non-linear characteristics for quantizing said predictive error signal to produce information codes, the transmission gain of said quantizer means being less than unity when the amplitude component of said predictive error signal is smaller than a predetermined level and being substantially equal to unity when said amplitude component of said predictive error signal is higher than said predetermined level;
means for converting said information codes into variable length codes;
buffer memory means for temporarily storing said variable length codes for readout at a predetermined rate and including means for producing a buffer status signal indicative of buffer occupancy of said buffer memory means;
said quantizer means further including an intraframe predictive coder providing outputs to said means for producing a predictive signal and to said means for converting said information codes into variable length codes, said means for producing a predictive error signal being an intraframe local demodulator, and control means responsive to said buffer status signal for selecting one of said plurality of non-linear characteristics.

4,179,711

DEFECT NOISE COMPENSATING SYSTEM

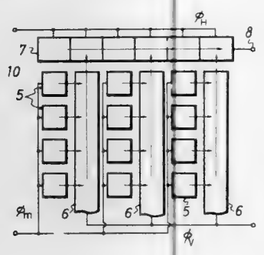
Fumio Nagumo, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 3, 1978, Ser. No. 866,216
Claims priority, application Japan, Jan. 14, 1977, 52/3314
Int. Cl.[2] H04N *3/14*
U.S. Cl. 358—213 **5 Claims**

1. A defect noise compensating system for a solid state television camera which employs a solid state area imaging device having a predetermined number of picture elements aligned in both horizontal and vertical directions, optical means for projecting an image of an object on said solid state area imaging device, generator means for supplying a drive signal to said area imaging device, and means for deriving a video signal corresponding to said image out of said area imaging device, said defect noise compensating system comprising:
(a) memory means having a plurality of memory cells each corresponding to each of said picture elements of the area imaging device, wherein predetermined memory cells corresponding to deteriorated picture elements delivers identification signals for defect noise occurrence,
(b) means for reading out the whole contents of said memory

device in accordance with the reading out order of said picture elements, and

(c) means for suppressing defect noises contained in the output of said area imaging device in response to the identification signals appearing at the output of said memory device,



said memory means including a memory device having a plurality of photo sensitive elements as memory cells, and a photo mask to be positioned in front of said memory device, said photo mask being coded in accordance with the defect positions of said picture elements.

4,179,712

SYSTEM FOR ELECTRONIC EDITING OF TAPE

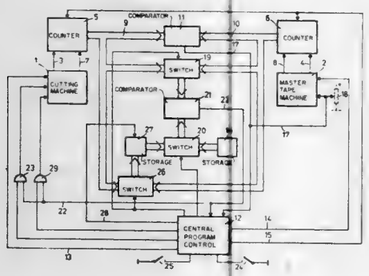
Christian Opelt, Bernbach, Fed. Rep. of Germany, assignor to GRUNDIG E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig, Fuerth, Fed. Rep. of Germany

Filed May 18, 1978, Ser. No. 907,160

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1977, 2727760

Int. Cl.[2] H04N *5/78;* **G11B** *27/08*

U.S. Cl. 360—14 **7 Claims**



1. A system for electronic tape editing with magnetic tape recording and play-back machines for video signals, whereby program portions are recorded from a feeding machine to a cutting machine in arbitrarily chosen sequence and length, the machines are movable in forward and reverse motion by means of tape feeding shafts and servo controls containing tacho generator pulses for driving the feeding shafts, the count of said tacho generator pulses from an arbitrary editing start serving as information of the actual tape position in both machines and in both running directions.

4,179,713

METHOD AND EQUIPMENT FOR THE PRODUCTION OF MULTI-CHANNEL SOUND SIGNAL

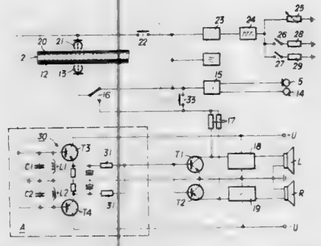
Otto Freudenschuss, and Gerd Kittag, both of Vienna, Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Continuation of Ser. No. 677,123, Apr. 15, 1976. This application Oct. 26, 1977, Ser. No. 845,674

Claims priority, application Austria, Apr. 18, 1975, 3012/75

Int. Cl.[2] G11B *5/43, 5/02*

U.S. Cl. 360—27 **4 Claims**



1. A method for converting a single channel sound signal which has been recorded on a first sound track of a recording medium into at least a two channel stereo sound signal, comprising the steps of:

reproducing said single channel sound signal from said first sound track,

deriving a second sound signal by changing the phase of said reproduced single channel sound signal,

recording said second sound signal on a second sound track of the recording medium,

reproducing simultaneously said single channel sound signal from said first sound track and said second sound signal from said second sound track,

feeding said reproduced single channel sound signal and said reproduced second sound signal to an addition stage and a substraction stage, each of said stages producing an output signal, and

introducing one of said output signals into a first playback channel corresponding to one of said two stereo channels and introducing the other of said output signals into a second playback channel corresponding to the other of said two stereo channels.

4,179,714

METHOD OF RECORDING AN INDEX SIGNAL IN DICTATING TAPE RECORDER

Minoru Kobayashi, Hachioji, Japan, assignor to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Sep. 23, 1976, Ser. No. 725,964

Claims priority, application Japan, Sep. 30, 1975, 50-118472; Sep. 30, 1975, 50-118473

Int. Cl.[2] G11B *15/12, 5/02*

U.S. Cl. 360—61 **5 Claims**

1. Apparatus for providing a plurality of functional operations within a portable tape recorder device through the use of only a single operating button, said apparatus comprising:

slidably mounted plate means having an extension thereof carrying said button which is positioned along the exterior surface of the tape recorder housing to facilitate manipulation thereof for selective operation in either a first or a second opposing direction;

a capstan;

first swingably mounted pinch roller means;

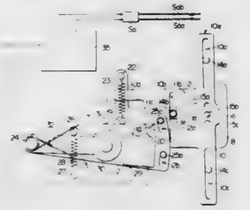
second swingably mounted magnetic head means;

pivotally mounted intermediate lever means;

bias means interconnecting said intermediate lever means and one of said first and second swingably mounted means;

said slidable plate having a first projection adapted to pivot said intermediate lever means in a first direction when said slidable plate is urged in said first direction, and second projection means on said slidable plate adapted to pivot said intermediate lever means in the reverse direction when said slidable plate is moved in said second opposite direction;

second resilient means interconnecting said first and second swingably mounted means whereby pivotal movement of said intermediate lever means in a first direction causes



movement of the first and second swingable assemblies in a first direction to move the tape head toward engagement with the tape for a record operation and to move the pinch roller toward abutting relationship with said capstan;

normally deenergized switch-actuated oscillator means engaged by said sliding plate when moved further in said direction to operate the switch of the switch-actuated oscillator means and thereby create a constant frequency signal adapted to be coupled to the aforesaid magnetic head while said capstan and pinch roller are in abutting relationship and said magnetic head and tape are in the record position.

4,179,715

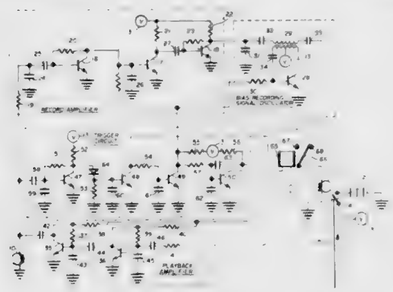
ELECTRIC CIRCUIT FOR ACCESSORY FOR HOST TAPE RECORDER

Francis X. MacDonough, Penfield, N.Y., assignor to Tapecon, Inc., Rochester, N.Y.

Filed Apr. 10, 1978, Ser. No. 894,530

Int. Cl.[2] G11B *5/12*

U.S. Cl. 360—61 **12 Claims**



1. Electric circuitry for an accessory for a host recorder and player, said accessory having a magnetic head for tape recording and playback and an electromagnetic transducer for sending and receiving electric signals to and from said host recorder and player, said circuitry comprising:

a. a recording amplifier arranged for amplifying an information signal and applying said amplified signal to said magnetic head for tape recording in said accessory;

b. means for generating a recording bias signal and applying said recording bias signal to said magnetic head along with said amplified signal for tape recording in said accessory;

c. a playback amplifier for receiving a playback signal from said magnetic head and amplifying said playback signal and applying said amplified playback signal to said transducer for transmission to said host recorder/player;

d. switch means for switching said circuitry into a record mode and a playback mode, said switch means activating said recording amplifier and said generating means and deactivating said playback amplifier in said record mode and deactivating said recording amplifier and said generating means and activating said playback amplifier in said playback mode; and

e. means for making said switching means responsive to a bias portion of a recording signal received from said host recorder/player via said transducer for switching said circuitry into said record mode when said bias portion of said recording signal from said host is received by said transducer and for switching said circuitry into said playback mode when said transducer is not receiving said bias portion of said recording signal.

4,179,716

TAPE END WARNING APPARATUS

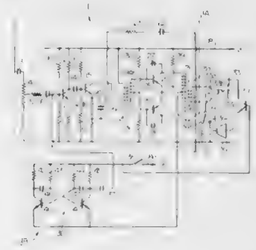
Ken Satoh, and Tuneo Yanagida, both of Hachioji, Japan, assignors to Olympus Optical Company, Ltd., Tokyo, Japan

Division of Ser. No. 713,344, Aug. 11, 1976. This application Nov. 13, 1978, Ser. No. 959,573

Claims priority, application Japan, Aug. 19, 1975, 50-113951; Aug. 22, 1975, 50-115878; Aug. 22, 1975, 50-115879; Oct. 3, 1975, 50-135385; Oct. 3, 1975, 50-135386; Dec. 12, 1975, 50-168208; Dec. 17, 1975, 50-170896; Dec. 23, 1975, 50-173289; Dec. 23, 1975, 50-173290; Dec. 23, 1975, 50-173291; Dec. 27, 1975, 50-177357; Dec. 27, 1975, 50-177358

Int. Cl.[2] G11B *15/06, 23/30*

U.S. Cl. 360—74.3 **2 Claims**



1. A tape end warning apparatus for use in a tape recorder of the type which includes an audio amplifier, a loudspeaker connected to the output of said audio amplifier, a tape cassette receiving chamber, a drive shaft extending into said receiving chamber and adapted to engage a drive shaft recess in said tape cassette when a tape cassette is placed within said receiving chamber, and a drive means for driving said drive shaft, said tape end warning apparatus comprising:

a power supply;

an oscillator for generating an electrical alarm signal when said power supply is applied thereto, the output of said oscillator being coupled to an input of said amplifier whereby said amplifier amplifies said electrical alarm signal;

a normally open switch adapted to apply said power source to said oscillator when said normally open switch is closed;

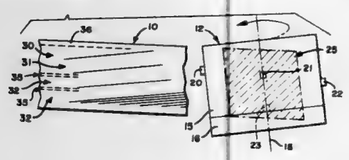
end of tape detecting means for closing said normally open switch when an end of tape condition is detected;

a diode connected between said normally open switch and said oscillator for preventing an undesirable audio alarm by said loudspeaker during a recording operation;
a delay circuit connected to said normally open switch and said oscillator for activating said oscillator a given time interval after said normally open switch is closed; and
an input path for a signal to be recorded, said input path being connected to said amplifier, and an electronic switch means connected to said input path and said normally open switch for preventing the signal to be recorded from being applied to said amplifier when said normally open switch is closed.

4,179,717
METHOD AND APPARATUS FOR VIDEO SIGNAL RECORDING

Alexander R. Maxey, Redwood City, Calif., assignor to Arvin Industries, Inc., Columbus, Ind.

Continuation-in-part of Ser. No. 874,118, Feb. 1, 1978. This application Sep. 25, 1978, Ser. No. 945,421
Int. Cl.[2] G11B *21/04*
U.S. Cl. 360—84 **5 Claims**

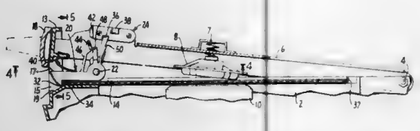


1. The method of signal recording comprising, moving a recording medium along a predetermined path, rotating a plurality of circularly and axially spaced transducer heads, guiding the tape at an angle to the axis of rotation and to such an angular extent that the heads scan sequentially in helical fashion along separate parallel longitudinal paths of equal width on the record medium, setting the rate of rotation such that a plurality of scans of equal length occur on the separate paths at predetermined spacing, and diverting the signal equally and in predetermined sequence to different ones of said heads.

4,179,718
FLEXIBLE MAGNETIC RECORDING DISC DRIVE WITH INTERLOCK TO PROTECT RECORDING DISC CARTRIDGE

Donald L. Rolph, Pleasanton, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Filed Sep. 2, 1977, Ser. No. 830,136
Int. Cl.[2] G11B *5/016*
U.S. Cl. 360—99 **8 Claims**

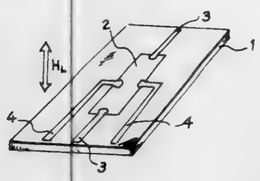


1. A disc drive for use with an operator-inserted flexible magnetic recording disc cartridge, comprising
means selectively openable and closable for receiving such an inserted cartridge when open and releasably clamping the recording disc contained within said cartridge in a position for recording and playback when said receiving and clamping means is closed,
door means selectively movable between a fully closed position covering and a fully open position exposing access to said receiving and clamping means from outside said disc drive,
interlock means to prevent closing of said door means and said clamping means if an inserted cartridge is only partially inserted, said interlock means comprising
cartridge insertion sensing means for sensing the insertion of a disc cartridge into said receiving and clamping means when said receiving and clamping means is open and for sensing whether said cartridge is fully inserted or not and for providing to the inserting operator a tactile signal when said cartridge is fully inserted, said cartridge insertion sensing means comprising a member which is both mounted for pivotal movement into and out of the path of insertion of said cartridge and which is resiliently urged pivotally into said path of insertion such that insertion of said cartridge into said receiving means forces said cartridge insertion sensing means out of said path of insertion until said cartridge is fully inserted into said receiving means,
means cooperating with said cartridge insertion sensing means for preventing both closing of said receiving and clamping means and engagement between said door means and said cartridge if said inserted cartridge is less than fully inserted whereby the receiving and clamping means and door means may be closed over an inserted cartridge only if that cartridge is fully inserted,
means resiliently urging an inserted said cartridge outwardly of said fully inserted position and cartridge retaining means for releasably retaining a fully inserted said cartridge in said fully inserted position, said cartridge retaining means comprising means adjacent and operatively connected to said cartridge insertion sensing means such that pivotal movement of said cartridge insertion sensing means out of said insertion path will move said retaining means out of the path of insertion and the path of removal of said cartridge and thus out of latching engagement with said cartridge.

4,179,719
THIN FILM MAGNETIC HEAD

Nobutake Imamura, Tokyo; Yoshinori Mimura, Tachikawa, and Toshihiko Kobayashi, Mitaka, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Jan. 25, 1977, Ser. No. 762,232
Claims priority, application Japan, Apr. 28, 1976, 51-48929
Int. Cl.[2] G11B *5/38, 5/22*
U.S. Cl. 360—112 **8 Claims**

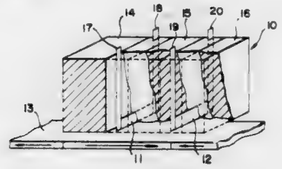


1. A thin film magnetic head comprising: a substrate of insulating material; an amorphous magnetic thin film deposited on the substrate, the amorphous magnetic thin film having a width smaller than each of unit areas of magnetic records on a magnetic recording medium to be separately read out therefrom and having an easy axis of manetization in a direction perpendicular to the film surface; a pair of current terminals formed on the substrate for flowing a current in the amorphous magnetic thin film in the lengthwise direction thereof; and a pair of voltage terminals formed on the substrate for deriving from the amorphous magnetic thin film a voltage induced in the transverse direction thereof.

4,179,720
MAGNETIC RECORDED INFORMATION REPRODUCING APPARATUS

Yoshimasa Miura, Yokohama, Japan, assignor to Fujitsu Limited, Japan

Filed May 12, 1977, Ser. No. 796,458
Claims priority, application Japan, May 13, 1976, 51-54734
Int. Cl.[2] G11B *5/30, 21/10*
U.S. Cl. 360—113 **10 Claims**

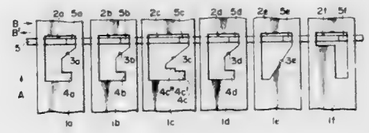


1. A magnetic recorded information reproducing apparatus for reproducing information in accordance with recorded patterns spaced apart on a magnetic recording medium by a minimum spacing, said apparatus comprising:
two magnetoresistive elements having resistance values which vary in accordance with an external magnetic field intensity, and which are disposed in parallel to the direction of said patterns recorded on said magnetic recording medium, and which are spaced apart from each other by a distance shorter than said minimum spacing of the patterns; and
magnetic shield means disposed between said two magnetoresistive elements and on that respective side of each of said magnetoresistive elements remote from the other magnetoresistive element for preventing magnetic coupling between said two magnetoresistive elements;
said magnetic shield means comprising shields disposed in spaced relationship to said magnetoresistive elements so as to form respective air gaps surrounding each magnetoresistive element;
said respective air gaps surrounding each magnetoresistive element comprising insulator means for electrically insulating each of said magnetoresistive elements from the other of said magnetoresistive elements so as to preclude electrical coupling between said magnetoresistive elements;
whereby to provide said apparatus with high resolution for reproducing magnetic recorded information.

4,179,721
TAPE RECORDER HAVING PLAYBACK RETAINING MECHANISM

Akio Nakazono, and Shizuo Nakamura, both of Nagoya, Japan, assignors to Shin-Shirasuna Electric Corporation, Aichi, Japan

Filed Oct. 31, 1977, Ser. No. 847,223
Claims priority, application Japan, Nov. 8, 1976, 51-149881[U]; Nov. 24, 1976, 51-157190[U]; Feb. 18, 1977, 52-19237[U]; Feb. 18, 1977, 52-19238[U]
Int. Cl.[2] G11B *15/04*
U.S. Cl. 360—137 **4 Claims**

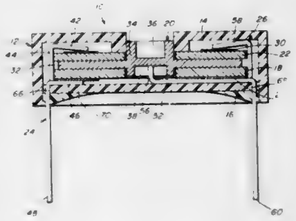


1. An operating mechanism of a tape recorder comprising a play-back lever and at least one of a review lever or a cue lever, each lever capable of being pushed in against a spring bias, and a common slider bar extending transversely to the length of each said lever and slidable in a plane orthogonal to the major surface of each said lever, characterized in that said slider bar is provided with a plurality of projections formed at predetermined intervals and associated with respective ones of said levers, said review lever and said cue lever are formed with inclined edges effective to engage said projections to guide said projections in a predetermined direction when said levers are pushed in, thereby sliding said slider bar in said direction, and restraining recesses effective to restrain said projections to hold said slider bar in said slidden position, said play-back lever is formed with an inclined edge and a restraining recess functionally similar to said inclined edges and said restraining recesses, said restraining recess in said play-back lever is provided with a first and a second stepped portion, so that when said play-back lever is pushed in, said projection associated with said play-back lever may first be restrained by said first stepped portion and in such position, when said review lever or said cue lever is pushed in, said slider bar may be slidden in said direction, whereby said projection associated with said play-back lever may be shifted from said first stepped portion to said second stepped portion and restrained by said second stepped portion, and in this latter position, even if said review lever or said cue lever is pushed in, said slider bar may not be slidden but said play-back lever may be held in said pushed-in position.

4,179,722
SEALED TUNABLE CAPACITOR

John E. Johanson, Boonton, N.J., assignor to Johanson Manufacturing Corporation, Boonton, N.J.

Filed Aug. 17, 1978, Ser. No. 934,357
Int. Cl.[2] H01G *5/06*
U.S. Cl. 361—293 **6 Claims**



1. A sealed tunable disc capacitor comprising:
a tunable capacitor assembly comprising:
a pair of outer dielectric discs;
a central electrically conductive rotor interposed between said outer discs in face-to-face stacked relation;
the ouside of each of said outer discs having an electrically conductive portion in spaced parallel registration with one another;
spring clamp means for retaining said outer dielectric discs in mutually substantially fixed relation and in face-to-face stacked relation with respect to said rotor;
said rotor comprising a flat segmental rotor plate portion and means constraining said rotor to co-axial rotative movement with respect to said dielectric discs;
said spring clamp means comprising an electrically conductive first spring clamp electrode having a base portion electrically and mechanically connected with the electrically conductive portion of one of said dielectric discs and a clamp finger portion electrically and mechanically connected with the electrically conductive portion of the other of said discs;
said spring clamp means further comprising a second electri-

cally conductive spring clamp electrode having contact means abutting a central portion of said rotor through a central opening in one of said dielectric discs and spring finger means overlying and abutting outer surface portions of the other of said dielectric discs at a zone thereof removed from said electrically conductive portion thereof;

a central opening in the other of said dielectric discs;

said rotor being integrally formed with a central post portion having a first axially outwardly-extending portion rotatively journaled in said opening in said one of said dielectric discs and a second axially outwardly-extending portion rotatively journaled in said opening of the other of said dielectric discs;

a recess in the outer end of one of said outwardly extending portions of said rotor post portion, said recess comprising means for sliding interengagement of an adjustment tool having a bit of conforming cross-sectional shape;

a sealed housing for said capacitor assembly comprising:

an upper housing member having a generally cylindrical shape including a top and circular side wall;

a circular opening in said top of said upper housing member of a diameter slightly less than the outside diameter of said rotor post portion, such that one end of said rotor post portion may be frictionally fitted within said opening and recessed within said top to form a friction sealing of said rotor post portion within said upper housing member top, permitting access to said rotor post recess capable of receiving said adjustment tool;

a base housing member to seal said capacitor assembly within said upper housing member, said base housing member having an outside diameter slightly greater than the inside diameter of said upper housing member such that said base housing member may be friction-fitted within said upper housing member;

said base housing member having two diametrically opposed rectangular slots at its periphery to receive the contact leads of said spring clamp members in sealed engagement therewith;

said housing members being fabricated of a semi-rigid, non-conductive plastic material to permit the friction-fitting sealing of said capacitor assembly within said housing.

4,179,723
KIOSK UNIT
Anthony Spencer, 340 Orienta Ave., Mamaroneck, N.Y. 10543
Filed Feb. 4, 1977, Ser. No. 765,682
Int. Cl.[2] H05K 7/20; B05G 1/00
U.S. Cl. 361—384 **2 Claims**

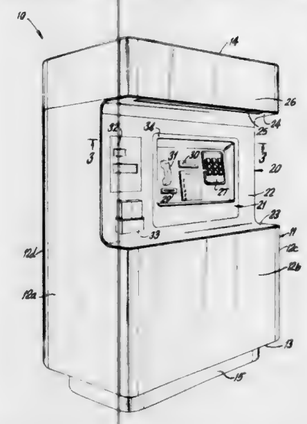
1. A self-contained Kiosk Unit comprises:

a metal frame forming a self-supporting structure including vertical walls, a base and a roof, said frame having a recessed portion extending backwardly from one wall thereof to form a working counter, a vertical wall extending upwardly thereform, controls including communications means, identification means and withdrawal means mounted on said vertical wall and an overhanging portion extending from the recessed vertical wall to the frame wall,

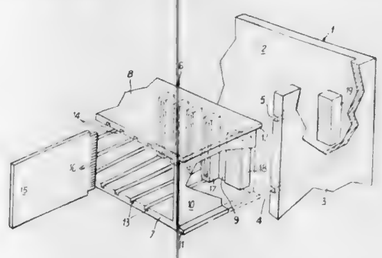
a pedestal upon which the base of said frame is mounted and extends outwardly thereover, said base portion including a predetermined number of perforations to permit a flow of air therethrough into the unit,

a roof having an upper readily removable portion with an aperture therein and a fan mounted within said aperture to direct the flow of air outwardly from the unit and, a lower secure portion fixedly coupled to the frame and extending transversely across the frame in a plane corresponding substantially to the plane of the overhanging portion to restrict access to the interior of the unit, and

a computer unit mounted within the frame with controls mounted on the face of the vertical recessed wall, said computer unit being hinged to the frame in a locked arrangement to permit ready access thereto by authorized personnel.

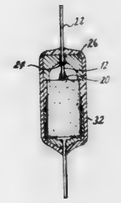


4,179,724
CABINETS FOR ELECTRICAL OR ELECTRONIC EQUIPMENT
François R. Bonhomme, 6, Parc de Bearn, 92210 Saint Cloud, France
Continuation-in-part of Ser. No. 779,302, Mar. 21, 1977. This application Aug. 31, 1977, Ser. No. 829,440
Claims priority, application France, Apr. 2, 1976, 76 09571
Int. Cl.[2] H02B 1/02
U.S. Cl. 361—391 **9 Claims**



1. A cabinet for electrical or electronic equipment including lateral walls consisting of a first set of printed circuit board, connector means carried by said printed circuit boards forming said lateral walls, a second set of printed circuit boards adapted for endwise insertion within said connector means which form slides for receiving the edges of said second set of printed circuit boards, said connector means providing electrical connections between said second set of printed circuit boards and said first printed circuit boards forming the walls of said cabinet, complementary slides formed on respective ones of said individual printed circuit boards of said second set, a third set of printed circuit boards adapted for insertion or extraction from the complementary slides provided by spaced ones of said second set of printed circuit boards, contact members adapted to engage respective conducting tracks of said printed circuit boards, and means for insuring that such contact members are open during insertion or extraction of said printed circuit boards.

4,179,725
CONFORMALLY EPOXY COATED ELECTROLYTE CAPACITOR HAVING AXIAL LEADS
David E. Maguire, Greenville, S.C., assignor to Union Carbide Corporation, New York, N.Y.
Filed Sep. 19, 1977, Ser. No. 834,301
Int. Cl.[2] H01G 9/00; B01J 17/00
U.S. Cl. 361—433 **1 Claim**



1. A capacitance device comprising a generally cylindrical solid tantalum anode body having a solder coated end portion of increased outer diameter due to said solder coating and an axially aligned negative lead wire joined thereto, an axially aligned anode riser wire extending from the anode body at the end thereof opposite the negative lead wire, an anode lead wire attached to the anode riser wire by means of a weld, the anode lead wire being substantially in alignment with the riser wire, a generally cylindrically shaped cap member formed of electrically insulative material having outer cross-section dimensions substantially the same as the solder coated end portion of said anode body, and said cap member having an axially aligned passageway which closely, slideably engages said anode lead wire and having an open chamber communicating with said passageway, said open chamber being adjacent said anode body and being adapted to surround said anode riser, said weld and an intermediate portion of said anode lead wire adjacent said weld when slideably moved into contact with said anode body, said cap member being thereby held in axial alignment with said anode body; and a continuous conformal resin coating enclosing said anode body and said cap member in a substantially cylindrical shape and sealing said capacitor body and enclosing within said open chamber said anode riser, said weld and said intermediate portion of said anode wire adjacent said weld, said resin coating being formed in situ by the solidification of a surrounding coating of fluid resin in contact with said anode body and said cap member, said cap member being slideably moved into contact with said anode body prior to solidification of the resin.

4,179,726
BARN DOOR LAMP ATTACHMENT
Daniel L. Aron, Northridge, Calif., assignor to Mole-Richardson Co., Hollywood, Calif.
Filed Sep. 19, 1977, Ser. No. 834,331
Int. Cl.[2] G03B 15/02
U.S. Cl. 362—17 **10 Claims**

1. An attachment for a lamp comprising:

a frame including a flat centerpiece that is substantially square in outline and dimensioned to surround a light bulb, a circular opening defined by said centerpiece, said opening being of sufficient diameter to expose substantially the entire face of said light bulb, and four sidepieces rigidly and immovably attached to the edges of said centerpiece, arranged perpendicular thereto and connected to each other in a box-like manner;

at least four resilient retaining tabs each of which is integrally formed with one of said sidepieces extending inwardly therefrom and away from said centerpiece to releasably retain the front end of said light bulb between said tabs and said centerpiece;

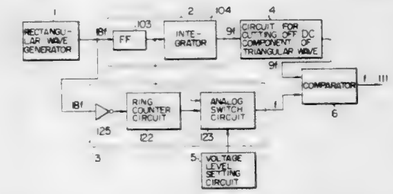
a pair of light blocking barn door panels;

hinge means for pivotably attaching each of said panels to one of said sidepieces;

a pair of opposing, parallel, resilient plates extending from two of said sidepieces away from said retaining tabs, said plates having slots therein; and

a means for modifying the light from said lamp inserted in said slots and thus releasably held by said plates across said opening overlying the face of said bulb.

4,179,727
CONTROL DEVICE FOR A PULSE-WIDTH MODULATED INVERTER
Nobuyoshi Muto; Yasuo Matsuda, and Kazuo Honda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan
Filed Nov. 18, 1977, Ser. No. 852,980
Claims priority, application Japan, Dec. 1, 1976, 51-143361
Int. Cl.[2] H02M 7/515
U.S. Cl. 363—41 **6 Claims**



1. A control device for a pulse-width modulated inverter comprising means for generating as a carrier wave a triangular wave synchronizing with an AC output from the inverter, means for generating as a modulating wave a train of rectangular wave pulses which synchronize with said triangular wave and have a width corresponding to a section effective for a modulating operation and a predetermined amplitude, voltage level setting means for setting the amplitude of said train of rectangular wave pulses, and means for modulating said triangular wave with said train of rectangular wave pulses and generating a control pulse for said AC output.

4,179,728
CAPACITOR CHARGING CIRCUIT
Sherman J. Pirkle, Waltham, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Oct. 3, 1977, Ser. No. 839,076
Int. Cl.[2] H02M 3/24; H02J 15/00
U.S. Cl. 363—59 **13 Claims**

1. Apparatus for charging a capacitor with energy from a direct current energy source comprising,

an inverter energized by said source so as to produce an alternating current voltage,

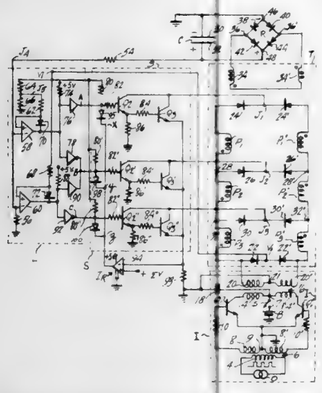
a transformer coupled to said inverter,

a rectifier coupled to said transformer,

means coupling said rectifier to said capacitor, and

control means responsive to the voltage on said capacitor for

changing the turns ratio of said transformer from one value to another so as to increase the voltage coupled to



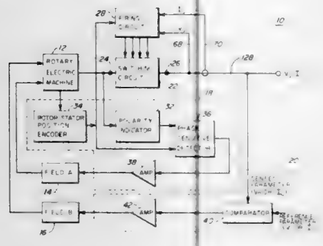
said rectifier when the voltage on said capacitor increases through predetermined levels.

4,179,729

ROTARY ELECTRIC MACHINE AND POWER CONVERSION SYSTEM USING SAME

William E. Stanton, Newton; David B. Eisenhaure, Hull; George A. Oberbeck, Belmont, and Kenneth Fertig, Sudbury, all of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Apr. 15, 1977, Ser. No. 787,930
Int. Cl.[2] H02M *7/00*
U.S. Cl. 363—175 **21 Claims**



1. A rotary electrical machine for use in power conversion between a higher frequency power signal and a lower frequency power signal including: a rotor; a stator; an armature; and first and second independently controllable field windings in spatial quadrature for selectively shaping the back EMF waveform of the machine to control the amplitude and phase relation of the voltage and current outputs of the machine;

a first field control circuit responsive to the phase difference between the voltage and current of the higher frequency signal generated in the armature winding of the machine for driving said first field winding to minimize said phase difference;

a second field control circuit for monitoring the amplitude difference between a selected one of the voltage and current parameters of said lower frequency signal and a reference level for driving said second field winding to adjust that load signal amplitude toward said reference level; and

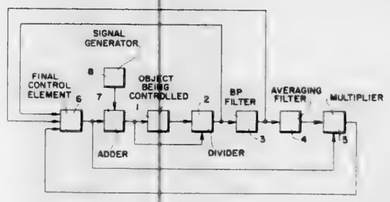
switching means responsive to said higher frequency signal and said lower frequency signal for selectively transferring power between said higher and lower frequency signals.

4,179,730

SELF-OPTIMIZING CONTROL SYSTEM FOR OBJECT WITH UNIMODAL QUALITY FUNCTION

Boris M. Antonov, Khimki Moskovskoi oblasti; Viktor V. Vasiliev, and Sergei I. Pischikov, both of Moscow, all of U.S.S.R., assignors to Institut vysokikh temperatur Akademii Nauk SSSR, Moscow, U.S.S.R.

Filed Mar. 29, 1978, Ser. No. 891,226
Claims priority, application U.S.S.R., Apr. 8, 1977, 2476357
Int. Cl.[2] G05B *13/02*
U.S. Cl. 364—105 **1 Claim**



1. A self-optimizing control system for an object with a unimodal quality function, comprising:

an input of said object being controlled; an output of said object being controlled; a divider having inputs and an output and connected with one of its inputs to said output of said object being controlled, and with its other input to said input of said object being controlled; an adder having inputs and an output and connected with its said output to said input of said object being controlled; a search signal generator having an input and an output and connected with said output to one of said inputs of said adder; a final control element having inputs and an output and connected with said output to another of said inputs of said adder; a band-pass filter having an input and an output and connected with said input to said output of said divider and with said input to a first of said inputs of said final control element; an averaging filter having an input and an output and connected with said input to said output of said band-pass filter and with said input to a second of said inputs of said final control element; a multiplier having inputs and an output of said averaging filter, with another of said inputs to said output of said final control element, and with said output to the third of said inputs of said final control elememt.

4,179,731

MICROPROGRAMMED CONTROL SYSTEM

Isamu Yamazaki, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 4, 1977, Ser. No. 784,459
Claims priority, application Japan, Apr. 2, 1976, 51-36073
Int. Cl.[2] G06F *9/16, 9/20*
U.S. Cl. 364—200 **6 Claims**

1. A microprogrammed control system comprising:

a first memory for storing a microprogram having ordinary and branch instructions, the branch instruction including an operation code, a control code and an address, said first memory including an address input port;

a second memory for storing instructions, which includes an address input port;

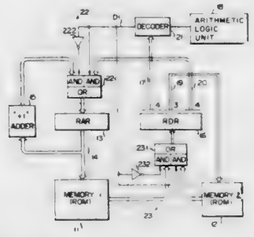
an address register for storing an address of an instruction to be next executed, which includes an input port;

address updating means for updating the address in the address register to a further next instruction;

an instruction register for storing a currently executed instruction, which includes an input port;

first means connected to the instruction register for generating a first signal when the instruction in the instruction register is the ordinary instruction and a second signal when the instruction is the branch instruction;

second means connected to the first means and responsive to the first signal for transferring the instruction to be next executed which corresponds to the address in the address register from the first memory to the input port of the instruction register and for transferring the update address



of the address updating means to the address input port of the address register; and

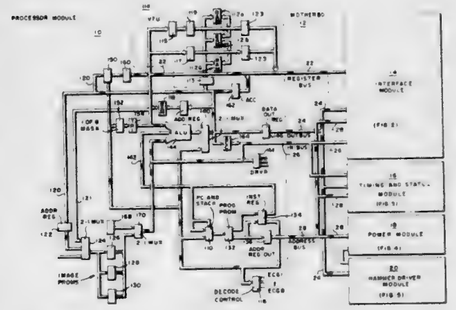
third means connected to the first means and responsive to the second signal for transferring the branch address designated by the branch instruction into the address input port of the address register and for transferring an instruction designated by the control code of the branch instruction in the instruction register from the second memory to the input port of the instruction register, said branch address and said instruction from the second memory being stored in the address register and the instruction register in response to a clock pulse.

4,179,732

MICROPROGRAMMABLE PROCESSOR CONTROL PRINTER SYSTEM

Sultan W. Khan, West Lake; John K. Ham, Simi, and Richard A. Strissel, Simi Valley, all of Calif., assignors to DataProducts Corporation, Woodland Hills, Calif.

Filed Jun. 10, 1977, Ser. No. 805,527
Int. Cl.[2] G06F *3/12*
U.S. Cl. 364—200 **19 Claims**



1. A printer controller operable in a plurality of modes for interrogating and controlling a printer mechanism, comprising:

a plurality of buses;

interface means, coupled to at least one of said buses, for interfacing a data source to said at least one bus, said interface means including circuitry for receiving digital data and commands from that data source, said interface means also providing status and fault indicating signals indicative of operating conditions of said interface means;

timing and status means, coupled to at least one of said buses, for generating timing, status and fault indicating signals indicative of operating parameters of said printer mechanism;

printer mechanism actuating means, coupled to at least one of said buses, for receiving actuating signals from at least one of said buses and for actuating said printer mechanism in response thereto so as to produce formatted hardcopy printout, said printer mechanism actuating means also providing status and fault indicating signals indicative of operating conditions of said printer mechanism actuating means; and

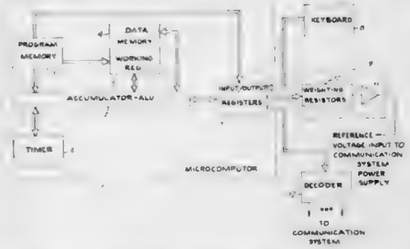
a programmable central processor, coupled to said buses, (a) for manipulating said digital data to generate said actuating signals for said printer mechanism actuating means, (b) for controlling said interface means, said timing and status means and said printer mechanism actuating means, and (c) for interrogating status and fault indicating signals in said interface means, said timing and status means, and said printer mechanism actuating means so as to provide in response thereto a plurality of condition indicating signals and diagnostic signals indicative of fault detection.

4,179,733

COMPUTER FOR CONTROL OF COMMUNICATION SIGNALS

Edward A. Launzel, 1501 Broadway, New York, N.Y. 10036, and Gordon Silverman, New York, N.Y., assignors to Edward A. Launzel, New York, N.Y.

Filed Aug. 25, 1977, Ser. No. 827,608
Int. Cl.[2] G06F *3/02*
U.S. Cl. 364—200 **4 Claims**



1. A device for controlling a communication system having a sequence of operation, said device comprising:

program memory means including a plurality of previously stored sequences of binary qunatities for control of said sequence of operation of said device;

accumulator-ALU means connected to said program memory means wherein both calculations and comparisons of binary quantities occur;

data memory means connected to said accumulator-ALU and to said program memory means wherein results of said both calculations and comparisons are stored as an independent and a second sequence of binary quantities;

timer means connected to said accumulator-ALU means wherein signals are produced at a fixed predetermined rate;

input/output register means having a multiplicity of inputs and outputs connected to said accumulator-ALU means and to said program memory means wherein said plurality of previously stored sequences of binary quantities and said second sequence of binary quantities are transmitted between the said accumulator-ALU means and other elements of said device, such other elements including:

a. keyboard means connected to said input/output register

means wherein a third sequence of binary quantities may be generated by a user for purpose of comparision with one of said plurality of previously stored sequences of binary quantities, such comparison being stored as part of said second sequence of binary quantities;

b. D/A converter means connected to one of said multiplicity of outputs of said input/output register means such that said second sequence of binary quantities produces a unique potential in said D/A converter means, such unique potential actuating said communication system;

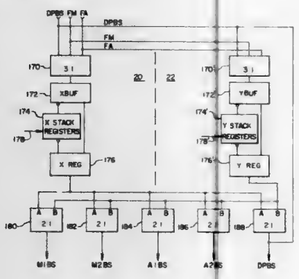
c. decoder means connected to another of said multiplicity of outputs of said input/output register means such that said second sequence of binary quantities produces a predetermined voltage on one of a multiplicity of control lines, such predetermined voltage actuating the frequency at which said communication system is to operate.

4,179,734

FLOATING POINT DATA PROCESSOR HAVING FAST ACCESS MEMORY MEANS

George P. O'Leary, Beaverton, Oreg., assignor to Floating Point Systems, Inc., Portland, Oreg.

Division of Ser. No. 702,148, Jul. 2, 1976, Pat. No. 4,075,704.
This application Oct. 31, 1977, Ser. No. 846,889
Int. Cl.[2] G06F *13/06*
U.S. Cl. 364—200 9 Claims



1. A data processor including arithmetic means and memory register means comprising a data pad, said data pad comprising:

an input register,

an output register,

a plurality of stack registers,

means for individually addressing said stack registers for writing in and reading out information, wherein said means for addressing includes a first address register for storing a data pad base address and means for adding that base address to an index or relative address for selecting among a group of stack registers designated by said data pad address, and further including means for changing said data pad address in said first address register,

means for coupling said input register to an addressed stack register for writing in information,

means for normally coupling said output register to an addressed stack register for reading out information,

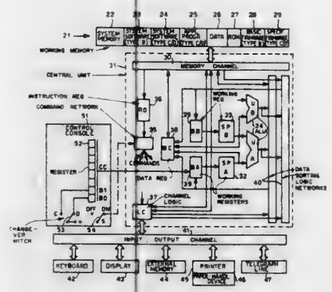
and means for selectively coupling said output register to read out information from said input register when information is addressed for read out next after writing in of the same information.

4,179,735

COMPUTER WITH AN ARRANGEMENT FOR CHANGING ITS WORKING ENVIRONMENT

Franco Lodi, Turin, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Turin, Italy

Filed Apr. 4, 1977, Ser. No. 784,430
Claims priority, application Italy, Apr. 22, 1976, 67965 A/76
Int. Cl.[2] G06F *9/18*
U.S. Cl. 364—200 5 Claims



1. A computer system for processing data under control of different selectable information groups each corresponding to a different working environment, each information group being defined by an operating system program, at least one application program and a plurality of microprograms associated with the operating system and application programs, said computer system including a working memory for storing an information group, a central processing unit controlled by the information group stored in said working memory for processing data and a plurality of peripheral units selectively connectable to said central processing unit according to the operating system program of the information group stored in said working memory, said plurality of peripheral units being controlled by said central processing unit in accordance with the application program of the information group stored in said working memory, said plurality of peripheral units including an external memory for storing a plurality of information groups corresponding to different working environments, the improvement comprising:

environment changing means coupled to said central processing unit for changing the working environment of the computer system by selectively connecting said peripheral units to said central processing unit to specialize said computer system for a desired working environment, wherein the information groups stored in said external memory include at least one program and microprogram common to all working environments and at least one program and microprogram specialized for the desired working environment, said environment changing means comprising:

switching means having a plurality of positions each associated with a different working environment for selecting the desired working environment;

group forming means controlled by said switching means for forming an information group from the programs and microprograms stored in said external memory including the programs and microprograms common to all working environments and the programs and microprograms specialized for the desired working environment; and

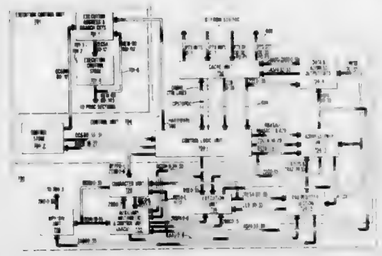
loading means coupled to said group forming means and responsive to said switching means for introducing the information group formed by said group forming means into said working memory.

4,179,736

MICROPROGRAMMED COMPUTER CONTROL UNIT CAPABLE OF EFFICIENTLY EXECUTING A LARGE REPERTOIRE OF INSTRUCTIONS FOR A HIGH PERFORMANCE DATA PROCESSING UNIT

John E. Wilhite, Glendale, Ariz., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Nov. 22, 1977, Ser. No. 853,946
Int. Cl.[2] G06F *9/16*
U.S. Cl. 364—200 41 Claims



1. A data processing system for performing data manipulations under the control of instructions, said system including buffer storage apparatus, instruction processing apparatus and instruction execution apparatus, said instructions being processed in a pipelined fashion by said instruction processing apparatus during a number of different successive phases of operation to completion, said instruction processing apparatus comprising:

a plurality of registers for storing instructions to be processed received from said buffer storage apparatus, each instruction including an operation code having a first number of bits;

a first addressable control store coupled to a first one of said plurality of registers for receiving signals corresponding to an operation code of an instruction to be processed, said first control store including a plurality of locations, each for storing a word including at least a control sequence code and an address, said control sequence code including a second number of bits which is less than said first number of bits coded for specifying one of a number of hardwired control sequences and said address identifying a first microinstruction of a different one of a plurality of execution sequences and an output register connected to said store for storing the word contents of a location specified by said operation code;

control sequence decode circuit means coupled to said first control store output register for decoding signals corresponding to said control sequence code; and,

hardware control sequencing means coupled to said sequence decode circuit means for generating sequences of control signals in response to said signals for defining the operations to be performed during selected ones of said different successive phases;

said first control store being conditioned in response to said signals corresponding to each operation code of an instruction stored in said first register to read out the contents of a predetermined one of said plurality locations into said first control store output register and

said decode circuit means in response to said control sequence code conditioning said hardware control sequencing means for generating a predetermined sequence of said control signals for enabling the completion of the operations of as many of said selected ones of said different successive phases under hardwired control before transferring control to said first microinstruction of one of said plurality of execution sequences specified by said address read out from said predetermined location of said first control store.

4,179,737

MEANS AND METHODS FOR PROVIDING GREATER SPEED AND FLEXIBILITY OF MICROINSTRUCTION SEQUENCING

Dongsung R. Kim, Laguna Hills, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 23, 1977, Ser. No. 864,150
Int. Cl.[2] G06F *9/20*
U.S. Cl. 364—200 16 Claims



1. In a cyclically operating microprogrammed data processing system having a plurality of possible states indicating system conditions and wherein a cycle corresponds to the time between clock pulses, the combination comprising:

microinstruction memory means for storing selectively addressable microinstruction control words each containing a microinstruction to be executed and an accompanying sequencing control portion;

microinstruction memory output means for storing a microinstruction control word read out from said microinstruction memory means;

microinstruction execution means for executing during a cycle a microinstruction contained in a microinstruction control word stored in said output means;

addressing means operable concurrently with said execution means during a cycle for addressing said microinstruction memory means so as to read out a next microinstruction control word therefrom for storage in said output means; and

sequencing control means operable concurrently with said execution means and said addressing means during a cycle, said sequencing control means being responsive to a sequencing control portion stored in said output means during a cycle and the states of selected system conditions for providing during the same cycle a microinstruction control indication, and a plurality of inhibit indications;

said sequencing control means including logic circuit means responsive to said inhibit indications for selectively controlling storage in said output means of a microinstruction control word read out of said microinstruction memory means and also selectively controlling execution of the microinstruction contained in said output means during a current cycle and during the next occuring cycle;

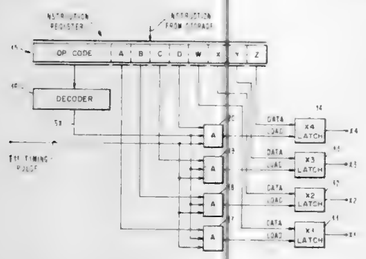
said logic circuit means being responsive to said microinstruction control indication when it is of a first type for controlling the addressing provided by said addressing means in the next cycle and when it is of a second type for modifying the operations provided by said logic circuit means in response to said inhibit indications.

4,179,738

PROGRAMMABLE CONTROL LATCH MECHANISM FOR A DATA PROCESSING SYSTEM

Peter T. Fairchild, and Joel C. Leininger, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 23, 1978, Ser. No. 918,223
Int. Cl.[2] G06F *1/00*
U.S. Cl. 364—200 **5 Claims**



1. In a data processing system which includes various data flow elements for handling data signals, a storage unit for storing instructions, an instruction register for receiving stored instructions from the storage unit and control circuitry coupled to the instruction register for controlling the data flow elements and the reading of instructions from the storage unit, a programmable control latch mechanism comprising:

a latch circuit having a data input for receiving a binary data signal, a load input for receiving a load signal for causing the binary data signal to be loaded into the latch circuit and at least one output for providing a control signal for the data processing system;

circuitry for coupling the data input of the latch circuit to a predetermined bit position of the instruction register;

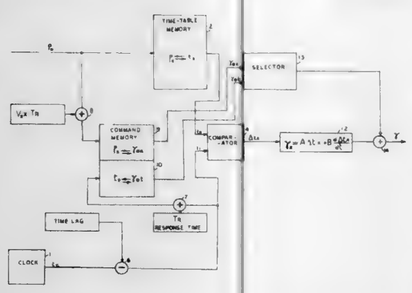
and circuitry coupled to the instruction register and responsive to the occurrence therein of an instruction having a predetermined operation code for supplying a load signal to the load input of the latch circuit, the predetermined bit position of the instruction determining the binary value loaded into the latch circuit.

4,179,739

MEMORY CONTROLLED PROCESS FOR RAILROAD TRAFFIC MANAGEMENT

Alain D. Virnot, 146 24th St., Del Mar, Calif. 92014

Filed Feb. 13, 1978, Ser. No. 877,050
Int. Cl.[2] G06F *15/48*
U.S. Cl. 364—436 **10 Claims**



1. A method for regulating the flow of vehicular traffic over a network of interconnected itineraries travelled by a plurality of vehicles which comprises:

(a) defining at least one time-table for each vehicle over each itinerary to be travelled by said vehicle;

(b) storing said time-table on board said vehicles;

(c) assigning to each vehicle a time-table and a time-lag in coordination with the time-tables and time-lags assigned to other vehicles scheduled to travel over said network; on board each vehicle Hx,

(d) continuously reckoning the location coordinates px of said vehicle Hx;

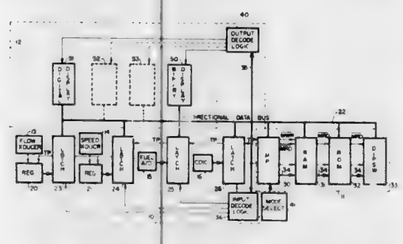
(e) controlling the movement of vehicle Hx along said itinerary in function of the time of day and the coordinates px in order to meet its assigned time-table as modified by its assigned time-lag.

4,179,740

VEHICLE PERFORMANCE ANALYZER

John R. Malin, 215 Eastridge La., Escondido, Calif. 92026

Filed Sep. 2, 1977, Ser. No. 830,171
Int. Cl.[2] G01M *15/00*
U.S. Cl. 364—442 **25 Claims**



1. A user calibratable vehicle performance system comprising:

a plurality of on-board sensing means including speed measuring means for generating a digital representation of the instantaneous vehicle speed;

flow measuring means for generating a digital representation of the instantaneous fuel consumption of the vehicle;

fuel gauge means for generating a digital representation of the amount of fuel remaining in the vehicle fuel supply;

digital computer means responsive to the output of said speed measuring means, said flow measuring means and said fuel gauge means for computing instantaneous miles per gallon of fuel consumption and miles to the end of the vehicle fuel supply;

and manually operated calibration means coupled to said computer means for inputting actual data observed by the user at a series of sets of conditions;

said manually operated calibration means including manually controlled means for introducing into said digital computer observed data in numerical form;

said digital computer responding to said sensing means and the numerical input for generating and displaying a binary signal representative of the calibration constant to be stored in the memory of said digital computer;

said manually operated calibration means including a plurality of user operated binary switches for matching the display to input calibration data to the memory of said computer.

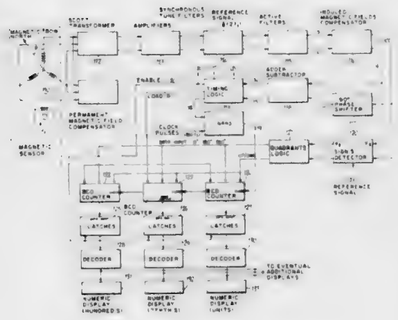
said computer means thereafter operative to calculate vehicle performance as a function of said calibration values.

4,179,741

MAGNETIC COMPASSES

Aldo Rossani, Rome, Italy, assignor to C.I.E.R. Compagnia Importazioni Esportazioni Rappresentanze S.R.L., Rome, Italy

Filed Aug. 8, 1977, Ser. No. 822,415
Claims priority, application Italy, Aug. 26, 1976, 51036 A/76
Int. Cl.[2] G01C *17/28*; G06F *15/20*
U.S. Cl. 364—457 **5 Claims**



1. In a static compass system for indicating the head-angle error with respect to a selected head angle by taking into consideration the deviation:

(a) a magnetic sensor which generates sensor analog signals corresponding to the horizontal orthogonal components of the earth's magnetic field and the permanent and induced perturbing magnetic fields which it senses;

(b) analog circuit means for receiving said analog signals and generating analog head-angle signals, said analog circuit means including means for eliminating the deviation in heading in accordance with the Poisson equations;

(c) first digital circuit means receiving said analog head-angle signals from said analog circuit, said first digital circuit means comprising:

(i) converter means for converting said analog signals into digital signals;

(ii) counting means for quantifying the signal output from said converter means;

(iii) memory and decoder means for storing and decoding the signal output from said counting means and generating decoded head-angle signals; and

(iv) digital indicator means for receiving the decoded head-angle signals and displaying a decoded head angle corresponding thereto;

(d) selector circuit means in which a selected head angle can be manually entered and which provides an encoded signal corresponding thereto;

(e) a second digital circuit means comprising a comparator for comparing the decoded head-angle signal received from said first digital circuit means with said selected head-angle signal received from said selector circuit means and for supplying an error angle signal in accordance with said comparison;

(f) counter means for quantifying said error angle signal; and

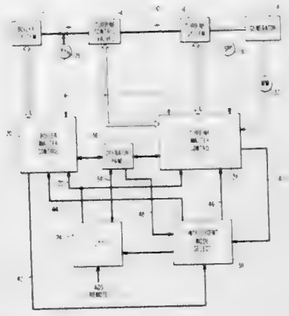
(g) display means for receiving said error angle signal and visually displaying an error angle corresponding thereto.

4,179,742

SYSTEM FOR INTELLIGENTLY SELECTING THE MODE OF CONTROL OF A POWER PLANT

Louis P. Stern, Wadsworth, Ohio, and Steven J. Johnson, McCandless Township, Allegheny County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 6, 1978, Ser. No. 894,073
Int. Cl.[2] G05B *15/02*; F01D *17/02*
U.S. Cl. 364—494 **10 Claims**



1. In a steam turbine power plant having a boiler for generating steam to a steam turbine which is mechanically coupled to an electrical generator which generates electrical energy at a desired power generation level and including a boiler master controller for controlling boiler firing rate, said boiler controller being operative to generate a first plurality of status signals representative of plant control status; a turbine master controller for controlling a plurality of turbine steam admission valves, said turbine controller being operative to generate a second plurality of status signals representative of plant control status; said boiler and turbine master controllers being concurrently operative in one of a boiler follow and turbine follow control mode; and selecting means for switching the mode of control of said power plant between said boiler follow and turbine follow modes, a system for governing said selecting means comprising:

means for governing said selecting means to switch power plant control to said boiler follow control mode in accordance with a first set of predetermined plant control conditions established from said generated first and second plurality of status signals; and

means for governing said selecting means to switch power plant control to said turbine follow control mode in accordance with a second set of predetermined plant control conditions established from said generated first and second plurality of status signals.

4,179,743

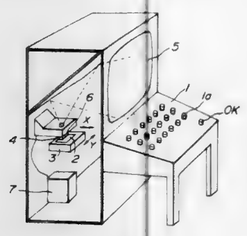
AUTOMATIC MICROFILM RETRIEVAL SYSTEM

Takeomi Suzuki, Tokyo, and Asao Hayashi, Hachioji, both of Japan, assignors to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Jul. 24, 1978, Ser. No. 927,164
Claims priority, application Japan, Jul. 25, 1977, 52-88270; Jul. 26, 1977, 52-89421; Aug. 23, 1977, 52-100121
Int. Cl.[2] G06F *15/02*; G03B *23/08*
U.S. Cl. 364—518 **7 Claims**

1. In an automatic microfilm retrieval system comprising a stage movable in X and Y directions, a microfilm disposed on said stage and bearing contents of a dictionary or the like recorded thereon, an optical system and reading head arranged above and opposed to said microfilm, a screen and a key board provided thereon with a number of keys corresponding to index words to be retrieved, a microfilm portion corresponding to index words selected by depressing said keys being

projected on said screen, the improvement comprising a retrieval cord recorded on said microfilm, the surface of said microfilm being divided into a plurality of unit regions to be displayed on said screen at the same time, a cord added to each of said unit regions and representing an index word whose contents are included in each of said unit regions, a plurality of



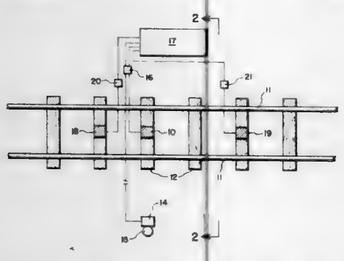
said unit regions being assembled into a plurality of groups, cords added to each of said groups and representing first and last index words included in each of said groups, and a subtracter comparing said cords read out by said reading head with key inputs obtained by depressing said keys and controlling movements of said stage and retrieving said microfilm disposed thereon.

4,179,744

METHOD AND APPARATUS FOR ANALYZING PERFORMANCE OF ELECTRIC-TRACTION-MOTOR POWERED VEHICLES AND ELECTRICAL OPERATING COMPONENTS THEREOF

Carl W. Lowe, Milford, Utah, assignor to Magtronics Incorporated, Milford, Utah

Filed Mar. 2, 1978, Ser. No. 882,864
Int. Cl.[2] G06F *15/20*; G01R *33/02*
U.S. Cl. 364—551 **13 Claims**



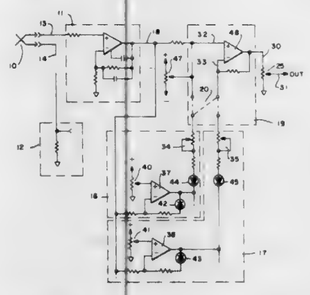
7. A power propulsion system performance analyzer for vehicles having electric traction motors, comprising a pathway for vehicle travel; stationary sensing means located in proximity to said pathway and positioned to sense magnetic fields produced by at least one selected operating electrical component of the propulsion systems of respective ones of said vehicles as they pass said sensing means and to produce respective signals in response to and indicative of the magnetic fields sensed; and means for processing said signals to produce respective perceptible outputs representative of said magnetic fields and indicative in general of performance of respective electrical operating components of the vehicle whose magnetic fields were sensed and of any maintenance work that must be done to maintain optimum operating performance.

4,179,745

THERMOCOUPLE LINEARIZER CIRCUIT

James W. Wuertele, Sunnyvale, Calif., assignor to Gentran, Inc., Sunnyvale, Calif.

Filed May 30, 1978, Ser. No. 910,766
Int. Cl.[2] G01K *7/14*
U.S. Cl. 364—571 **8 Claims**



2. A thermocouple linearizer circuit for use in a digital display device comprising:

a plurality of proportional correction means connected to receive a non-linear electrical signal, each of said linearization correction means including means for generating a correction signal proportional to the difference between said non-linear signal and a predetermined reference signal, said linearization correction signals being generated when said non-linear signal exceeds said reference signal, and

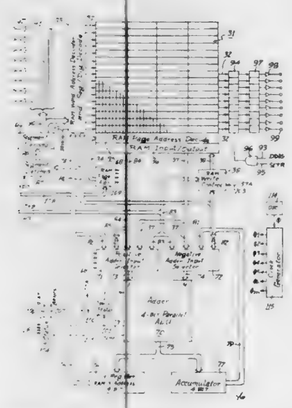
arithmetic means for adding said correction signals and said non-linear signals thereby forming a linear signal corresponding to the temperature of said thermocouple.

4,179,746

DIGITAL PROCESSOR SYSTEM WITH CONDITIONAL CARRY AND STATUS FUNCTION IN ARITHMETIC UNIT

Graham S. Tubbs, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 19, 1976, Ser. No. 706,711
Int. Cl.[2] G06F *7/50, 13/00*
U.S. Cl. 364—900 **9 Claims**



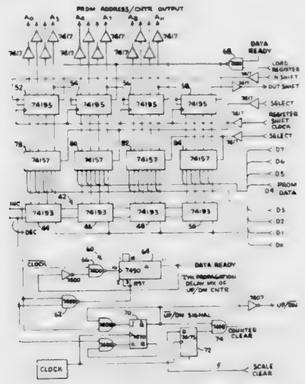
1. An electronic digital processor system of the type implemented in a semiconductor LSI device, said system having a bit-parallel arithmetic unit with first and second inputs and an output, the arithmetic unit performing during a machine cycle arithmetic and logic operations on digits of numerical information applied to said inputs, one digit being produced at said output for each machine cycle, each digit having a plurality of parallel bits, memory means having input/output means and having a plurality of memory locations, addressing means associated with the memory means for selecting in response to command signals one of the plurality of memory locations for storing digits of numerical information in the memory means via the input/output means or recalling such information from the memory means via the input/output means, selector means coupled to the first and second inputs of the arithmetic unit for selecting in response to command signals any one of a plurality of different sources of digits of numerical information including said input/output means of the memory means and for applying such information to said inputs of the arithmetic unit, a carry output from the arithemtic unit and a carry input to the arithmetic unit, and logic means for applying a carry to the carry input in response to whether or not a carry was generated in the arithmetic unit at the carry output for the operation performed on the digits of numerical information by the arithmetic unit for either the digits applied to the inputs of the arithmetic unit during the current machine cycle or the digits applied to the inputs of the arithmetic unit during the previous machine cycle.

4,179,747

MAILING SYSTEM

Daniel F. Dlugos, Huntington, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Division of Ser. No. 750,534, Dec. 14, 1976, Pat. No. 4,131,946.
This application Jul. 24, 1978, Ser. No. 927,705
Int. Cl.[2] G06F *3/00*
U.S. Cl. 364—900 **3 Claims**



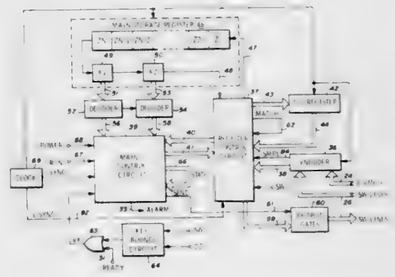
1. An interface for providing selective information transfer channels between a processing unit, a memory and a peripheral, the interface comprising register means for storing and transferring information, the register means including means for receiving information in a parallel mode and means for transferring information in a parallel mode, the parallel mode transfer means being adapted to address the memory and the parallel receiving means being adapted to load memory information into the register means, the processing unit including means for simultaneous serial loading of address information into the register means and serial unloading of memory information from the register means, the register means being thereby adapted to effect reduced cycle time.

4,179,748

PROGRAMMER AND METHOD OF STORING INFORMATION THEREIN AND ACCESSING INFORMATION THEREFROM

Floyd P. Brown, Santa Clara, and Peter D. Narvaez, Cupertino, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 587,284, Jun. 16, 1975, abandoned.
This application May 22, 1978, Ser. No. 908,062
Int. Cl.[2] G06F *3/02*
U.S. Cl. 364—900 **9 Claims**



1. A programmer adaptor module for converting a non-programmable calculator into a programmable calculator, said non-programmable calculator including an arithmetic-logic unit connected via a bus to a keyboard, said keyboard operating to generate key-closure signals on said bus representative of the respective keys thereon as they are manually pressed, and said arithmetic-logic unit operating to receive said key-closure signals from said bus and to take predetermined action in response thereto; wherein said programmer adaptor module includes:

digital encoder means for connection to said bus to receive said key-closure signals and for encoding said key-closure signals into sequences of digital words representative of the sequence in which said keys are manually depressed;

digital memory means for storing therein and for subsequently retrieving therefrom said sequences of digital words;

means for generating mode control logic signals;

memory input control means having first inputs connected to said encoder for receiving said digital words therefrom, second inputs for receiving said logic signals, and coupled to said digital memory means for storing therein said sequences of digital words when said logic signals are in a first predetermined state; and

memory output control means having first inputs connected to said encoder for receiving said digital data words therefrom, second inputs for receiving said logic signals, and coupled to said digital memory means for retrieving therefrom portions of said sequences of data words starting with a first predetermined word and ending with a second predetermined word and for generating simulated key-closure signals on outputs for connection to said bus to simulate the closing of said keys in the sequence represented by said retrieved portion of words in response to receiving predetermined digital words from said encoder means when said logic signals are in a second predetermined state.

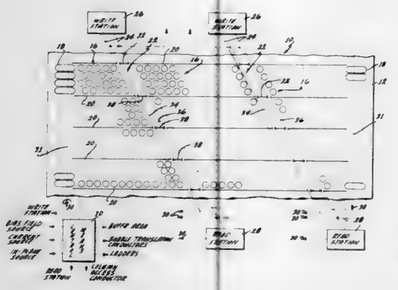
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4,179,749

DEFECT TOLERANT SCHEME FOR A BUBBLE LATTICE FILE

Robert L. Zwingman, Poway, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 23, 1978, Ser. No. 918,477
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—3 **19 Claims**



1. A defect tolerant lattice bubble memory having structure for supporting arrays of lattice bubbles which interact with each other comprising,

confinement means for confining lattice bubbles and including means for moving said bubbles in a first direction in said confinement means,

access means for accessing said lattice bubbles within said confinement means,

said access means including second confinement means for supporting and confining selected lattice bubbles apart from other lattice bubbles and wherein said lattice bubbles can move in a second direction and means for moving said lattice bubbles in said second direction, and

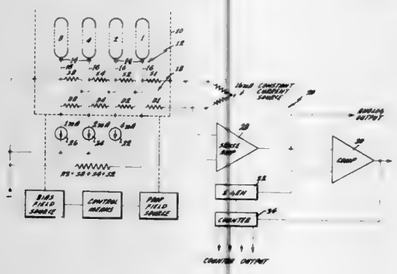
annihilating means located within said second confinement means for annihilating a predetermined number of lattice bubbles while in said second confinement means.

4,179,750

MAGNETIC BUBBLE TYPE D/A CONVERTER

Farooq M. Quadri, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 13, 1978, Ser. No. 895,991
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—8 **11 Claims**



1. A digital-to-analog magnetic domain converter comprising:

a domain propagation structure including magnetic elements disposed in an arrangement on which magnetic domains propagate in response to a rotating in-plane magnetic field,

the arrangement including a predetermined number of storage loops positioned in a predetermined order and having a predetermined number of magnetic elements on which said domains circulate, said domains, or the absence of said domains, on said magnetic elements in said storage loops representing weighted binary bits due to the predetermined order position of said storage loops,

means for transferring said weighted binary bits out of each of said storage loops in parallel as a weighted binary number, and

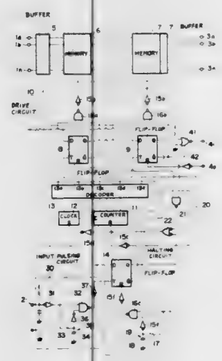
means for receiving and sensing said transferred bits and converting same into electrical signals the magnitude of which depends upon their binary weight to represent a weighted binary number.

4,179,751

MEMORY APPARATUS FOR DISASTER PREVENTING SYSTEM

Akio Adachi, Kawasaki, Japan, assignor to Hockiki Corporation, Tokyo, Japan

Filed Nov. 21, 1978, Ser. No. 962,797
Claims priority, application Japan, Nov. 24, 1977, 52-139820
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—228 **3 Claims**



1. In a memory apparatus for a disaster preventing system which is disposed to serve as an interface apparatus wherein alarm signals applied from an alarm system to its input terminals are successively stored and stored contents are delivered from its output terminals to an external computer, the improvement comprising:

a main circuit including a plurality of memory circuits connected in cascade between said input terminals and said output terminals so as to successively store alarm signals;

a plurality of flip-flop means each disposed to be operatively associated with one of said memory circuits whereby when each said flip-flop means is in a set state write operation of said associated memory circuit is disabled, and when each said flip-flop means is in a reset state write operation of said associated memory circuit is enabled;

a drive circuit whereby each time a control signal is received from said alarm system upon application of an alarm signal to said input terminals, one cycle of write operation of each of said memory circuits and the following setting of associated one of said flip-flop means is effected sequentially in the order of the arrangement thereof from said input terminal side to said output terminal side;

a halting circuit disposed to disable the operation of said drive circuit irrespective of the application of a control signal when each of said flip-flop means is in a set state;

means whereby each time one of said memory circuits performs a write operation, said flip-flop means associated with said memory circuit preceding said one memory circuit is reset;

means responsive to an end-of-interruption signal from said computer to reset said flip-flop means associated with final-stage one of said memory circuits which is nearest to said output terminals; and

means disposed to apply an interruption signal to said computer when said final-stage flip-flop means is set;

whereby when an alarm signal is applied to said input terminals, said alarm signal is shifted sequentially from first-stage one of said memory circuits to the following ones thereof until said alarm signal is stored in said final-stage memory circuit, thereby a plurality of alarm signals applied sequentially in time to said input terminals are sequentially stored in said memory circuits in a manner that the first one of said alarm signals is stored in said final-stage memory circuit.

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DESIGN PATENTS

GRANTED DEC. 18, 1979

ERRATA

For CLASS	See PATENT NO.
D21–255	253,735

V 9 8 9 \ 3 DE 18 79 UMI

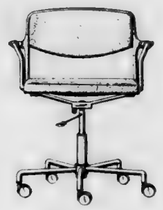
DESIGNS

DECEMBER 18, 1979

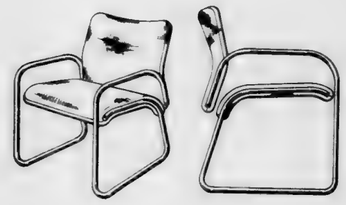
253,676
BELT FOB
Robert G. Mathieson, 4457 Lakeshore Rd., Burlington, Ontario, Canada
Filed Feb. 27, 1978, Ser. No. 881,871
Term of patent 14 years
Int. Cl. D02—*99*
U.S. Cl. D2—400



253,677
SWIVEL CHAIR
Karl Lübke, Rheda, Fed. Rep. of Germany, assignor to Lübke KG, Rheda, Fed. Rep. of Germany
Filed Sep. 9, 1977, Ser. No. 831,796
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31



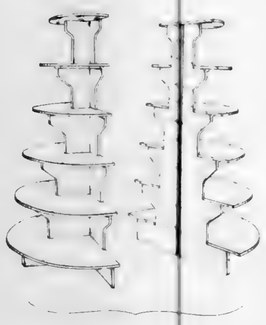
253,678
CHAIR
Charles A. Gibilterra, Granada Hills, Calif., assignor to Vecta Contract, Inc., Dallas, Tex.
Filed Aug. 24, 1977, Ser. No. 827,389
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56



253,679
CHAIR
Karl Lübke, Rheda, Fed. Rep. of Germany, assignor to Lübke KG, Rheda, Fed. Rep. of Germany
Filed Sep. 9, 1977, Ser. No. 831,798
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—66



253,680
DISPLAY STAND
Ronald D. Jaros, 2765 Crocker Rd., and Ernest J. Leone, 996 Blackfoot, both of Eugene, Oreg. 97404
Filed Jan. 3, 1978, Ser. No. 866,761
Term of patent 14 years
Int. Cl. D6—*04*; D20—*02*
U.S. Cl. D6—146



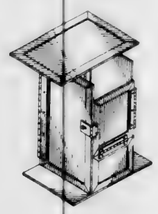
253,681
DECAL FOR CULINARY WARE OR THE LIKE
Estelle G. Rothstein, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Jul. 21, 1977, Ser. No. 817,854
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—39



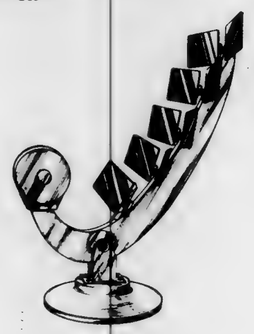
253,682
DECAL FOR CULINARY WARE OR THE LIKE
Estelle G. Rothstein, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Jul. 21, 1977, Ser. No. 817,856
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—39



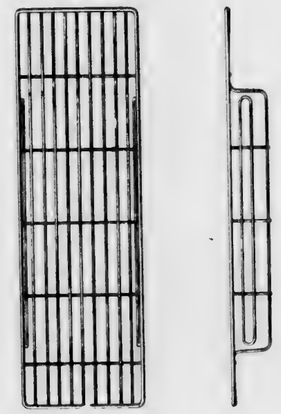
253,683
PORTABLE OUTDOOR COOKING AND BODY HEATER STOVE
Joseph D. Goetz, 1914 W. Tuscarawas, Canton, Ohio 44708
Filed Sep. 29, 1977, Ser. No. 837,755
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—107



253,684
SOLAR STOVE
Merton L. Clevett, and Mildred L. Clevett, both of 4685 S. Ogden St., Englewood, Colo. 80110
Filed Jul. 5, 1977, Ser. No. 813,124
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—109



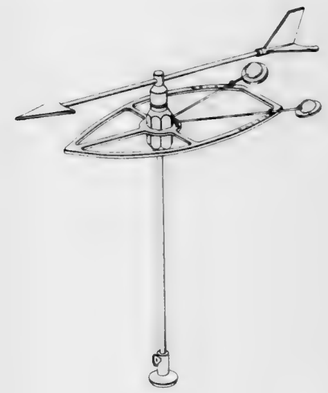
253,685
OVER THE SINK RINSE BASKET
George Chapman, 1712 Park Blvd., Cherry Hill, N.J. 08002
Filed Dec. 12, 1977, Ser. No. 859,307
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—187



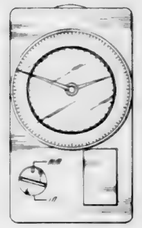
253,686
CONTROL KNOB
Darrel Wooldridge, Los Angeles, and Eugene T. McKinnon, Pacific Palisades, both of Calif., assignors to Gem Products, Inc.
Filed Oct. 25, 1977, Ser. No. 845,158
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—312



253,687
SAIL BOAT WIND INDICATOR
Ronald A. Fannon, Victor, and Ronald T. Kosmider, East Rochester, both of N.Y., assignors to Fannon Metal Industries, Inc., Rochester, N.Y.
Filed Oct. 13, 1977, Ser. No. 841,643
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—59

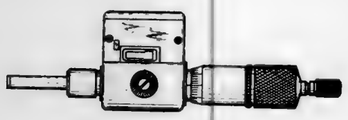


253,688
FRICTION WHEEL MEASURING DEVICE
Irven H. Culver, Playa Del Rey, and Oleg Szymber, Palos Verdes, both of Calif., assignors to Primus Mfg., Inc.
Filed Jan. 18, 1978, Ser. No. 870,341
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—70

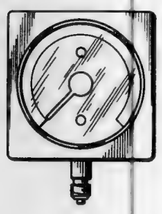


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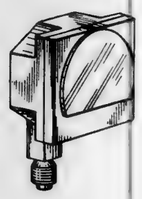
253,689
MICROMETER HEAD
Tetsunori Tanada, Kure, Japan, assignor to Mitutoyo Manufacturing Company, Ltd., Tokyo, Japan
Filed May 12, 1977, Ser. No. 796,270
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73



253,690
PRESSURE GAUGE
Zigmund G. Bljumshtein, ulitsa Pavljukhina, 85, kv. 25, Kazan, and Oleg A. Kosheverov, ulitsa Kartashova, 68, kv. 25, Tomsk, both of U.S.S.R.
Filed Jul. 1, 1977, Ser. No. 812,394
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—85



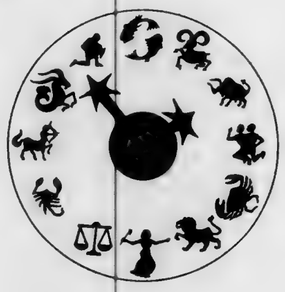
253,691
PRESSURE GAUGE
Zigmund G. Bljumshtein, ulitsa Pavljukhina 85, kv. 25; Lev A. Bychkin, ulitsa Universitetskaya, 5/37, kv. 14, and Nikolai S. Ivanshin, ulitsa Sotsialisticheskaya, 8/10, kv. 1, all of Kazan, U.S.S.R.
Filed Jul. 6, 1977, Ser. No. 813,344
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—85



253,692
HIGHWAY MARKER
Gordon R. Lange, Bartlett, Ill., assignor to Lighthouse Industries, Inc., Bartlett, Ill.
Filed Mar. 20, 1978, Ser. No. 879,689
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—109



253,693
COMBINED TIMEPIECE DIAL AND HANDS THEREFOR
Sandra M. Guyll, 4400 91st St., NE., Bellevue, Wash. 98004
Filed Apr. 11, 1977, Ser. No. 786,501
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—126



253,694
PENDANT
Charles W. Ellis, 7250 E. Diamond, Scottsdale, Ariz. 85257
Filed Mar. 1, 1978, Ser. No. 882,960
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—79



253,695
MOBILE BROILER
James Simmons, P.O. Box 312, 5044 St. Joseph Ave., Stevensville, Mich. 49127
Filed Apr. 14, 1977, Ser. No. 787,581
Term of patent 14 years
Int. Cl. D7—*02;* D12—*13*
U.S. Cl. D12—22



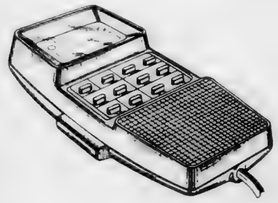
253,696
HYDRAULIC LIFTING JACK
Yasunori Suzuki, Fujinomiya, Japan, assignor to Yasui Sangyo Co. Ltd., Fujinomiya, Japan
Filed Jan. 5, 1978, Ser. No. 867,373
Claims priority, application Japan, Aug. 22, 1977, 52-32961
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—55



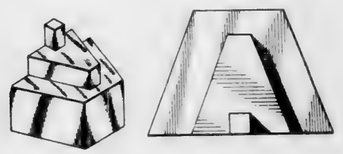
253,697
TOWING ROD
Henry K. Zephir, 28 Eastwood Dr., Wilbraham, Mass. 01095
Filed Jul. 19, 1977, Ser. No. 817,113
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—162



253,698
REMOTE CONTROL UNIT FOR RADIO OR SIMILAR ARTICLE
Stephen A. Nichols, Lincoln, Nebr., and David P. Chuboff, North Barrington, Ill., assignors to Hy-Gain de Puerto Rico, Inc.
Filed Aug. 8, 1977, Ser. No. 822,782
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12



253,699
LOUDSPEAKER SYSTEM
Gary C. Gillum, Hope, Ark., assignor to Klipsch and Associates, Inc. of Hope, Arkansas
Filed Nov. 14, 1977, Ser. No. 851,538
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33

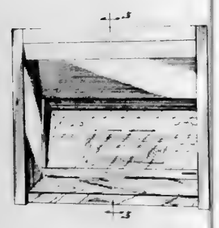


253,700
MIDRANGE FREQUENCY LOUDSPEAKER
Gary C. Gillum, Hope, Ark., assignor to Klipsch and Associates, Inc., Hope, Ark.
Filed Nov. 14, 1977, Ser. No. 851,539
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—35

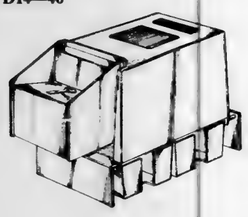


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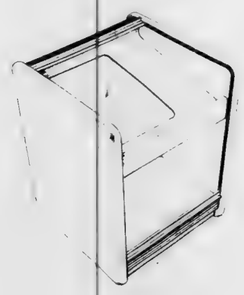
253,701
AUTOMATED TELLER TERMINAL
Thomas H. Woods, Middletown, Ohio, assignor to TRW, Los Angeles, Calif.
Filed Jan. 30, 1978, Ser. No. 873,404
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—42



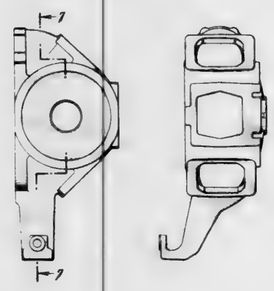
253,702
AUTOMATIC DISKETTE LOADER
Amancio Alcala, Santa Ana, Calif., assignor to Three Phoenix Company, Phoenix, Ariz.
Filed Jun. 8, 1977, Ser. No. 804,723
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—46



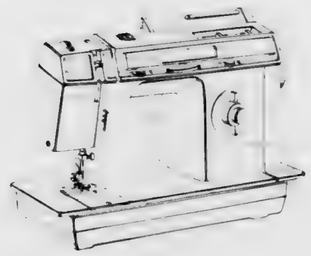
253,703
HOUSING FOR TELEPHONE SET
Robert E. Hillmer, Carleton Place; Donald T. Chadwick, and John F. Tyson, both of Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Sep. 19, 1977, Ser. No. 834,700
Claims priority, application Canada, Jul. 20, 1977, 2007774
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—65



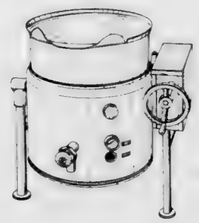
253,704
FLAPPER VALVE HOUSING FOR A CONCRETE PUMP OR THE LIKE
John T. McGraw, Laguna Beach, Calif., assignor to Thomsen Equipment Company, Gardena, Calif.
Filed May 20, 1977, Ser. No. 798,913
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7



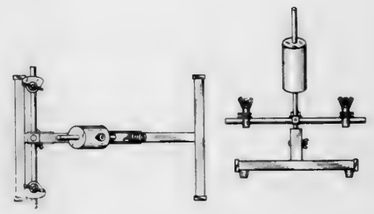
253,705
SEWING MACHINE
Christian J. Felix, Flushing, N.Y.; Donald M. Genaro, Haworth, and Stephen J. Illes, Scotch Plains, both of N.J., assignors to The Singer Company
Filed Apr. 4, 1977, Ser. No. 784,015
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—69



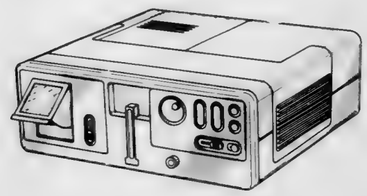
253,706
ELECTRIC SELF CONTAINED KETTLE
William M. Bardeau, 158 Norfinch Dr., Downsview, Ontario, Canada (M3N 1Y1)
Filed Jun. 13, 1977, Ser. No. 804,081
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—104



253,707
MACHINE FOR STRINGING RACQUETS
Donald A. Chartier, 88 Walnut St., Nashua, N.H. 03060, and Richard Janes, 4 E. Pine Isle Dr., Derry, N.H. 03038
Filed Feb. 1, 1978, Ser. No. 874,277
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—199



253,708
PHOTOGRAPHIC SLIDE PROJECTOR
Dieter Mankau, Brunswick, Fed. Rep. of Germany, assignor to Rollei-Werke Franke & Heidecke, Brunswick, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 738,837, Nov. 4, 1976, Pat. No. Des. 250,199. This application Oct. 14, 1977, Ser. No. 842,372
Claims priority, application Fed. Rep. of Germany, May 10, 1976, MR 1085; Apr. 20, 1977, MR 1125
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—21

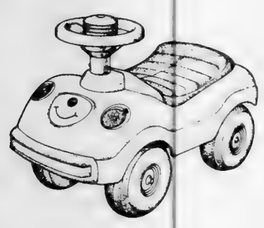


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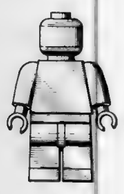
253,709
APPARATUS FOR INDICATING NUMERICAL CONCEPTS
Masami Shiraishi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Oct. 14, 1977, Ser. No. 842,112
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62



253,710
VEHICLE TOY
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Taira Hanashima, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 725,914, Sep. 22, 1976. This application Mar. 13, 1978, Ser. No. 886,012
Claims priority, application Japan, Jun. 28, 1976, 51-24677
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—78



253,711
TOY FIGURE
Godtfred K. Christiansen, and Jens N. Knudsen, both of Billund, Denmark, assignors to Interlego AG, Baar, Switzerland
Filed Feb. 14, 1978, Ser. No. 877,800
Claims priority, application Denmark, Aug. 29, 1977, 650
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—166



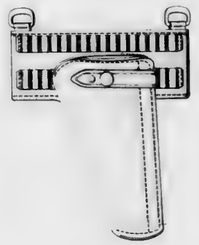
253,712
TENNIS POST
George R. Marolt, Englewood, and Norbert Vogler, Lakewood, both of Colo., assignors to E. J. Renner & Associates, a part interest
Filed Apr. 17, 1978, Ser. No. 897,527
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—199



253,713
TENNIS RACKET
Mark L. Robinson, Andover, and Paul E. Brefka, Southborough, both of Mass., assignors to Acro Incorporated, Stoneham, Mass.
Filed Jan. 5, 1978, Ser. No. 867,425
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—212



253,714
HOLSTER
Arthur E. Katz, 18A Hilltop Apts., Little Falls, N.J. 07424
Filed Oct. 6, 1977, Ser. No. 839,971
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—13



253,715
WATER FILTER
Philip L. Emery, P.O. Box 18590, Irvine, Calif. 92713
Filed Jul. 22, 1977, Ser. No. 818,021
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



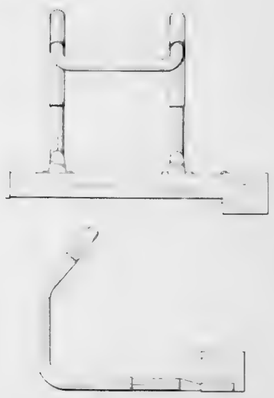
253,716
VALVE SPOOL
Russell W. Spitz, 6802 Tanglewood Dr., Boardman, Ohio 44512
Filed Aug. 8, 1977, Ser. No. 822,422
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



253,717
FAUCET HANDLE
George H. Frost, Kent, Ohio, assignor to Sajar Plastics, Inc., Middlefield, Ohio
Filed Jan. 3, 1978, Ser. No. 866,755
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28

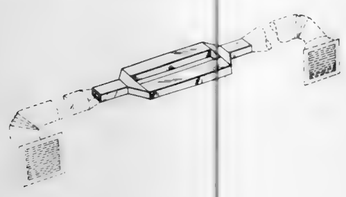


253,718
FIREPLACE HEATER
Donald A. Boyd, Euclid, and Allen W. Gale, Rocky River, both of Ohio, assignors to Cardinal American Corporation, Cleveland, Ohio
Filed Jan. 5, 1978, Ser. No. 867,422
Term of patent 14 years
Int. Cl. D23—*03*; D7—*08*
U.S. Cl. D23—95



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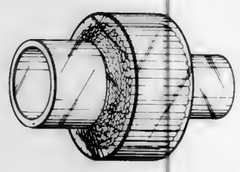
253,719
FIREPLACE HEAT EXCHANGE TUBING DEVICE
Ronald C. DiDonato, 6200 W. Ohio Ave., Lakewood, Colo. 80226
Filed Jul. 25, 1977, Ser. No. 818,822
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—136



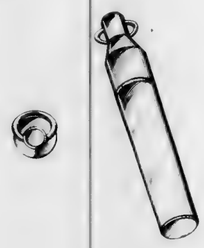
253,720
SYRINGE PLUNGER TIP
Marcus J. Millet, New York, N.Y., assignor to Johnson & Johnson, New Brunswick, N.J.
Filed Oct. 26, 1977, Ser. No. 845,750
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—25



253,721
MOISTURE AND HEAT EXCHANGER FOR RESPIRATORY APPARATUS
Sten G. Gibeck, Upplands Vasby, Sweden, assignor to Louis Gibeck AB
Filed Jul. 25, 1977, Ser. No. 818,729
Claims priority, application Sweden, Jan. 28, 1977, 770203
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—52



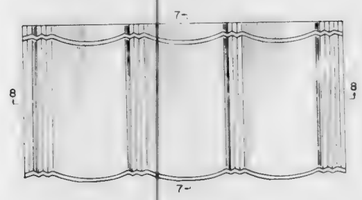
253,722
MEDICATION CARRIER
Donald G. Allen, Box 131, Dayton, Nev. 89403
Filed Aug. 2, 1977, Ser. No. 821,326
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—56



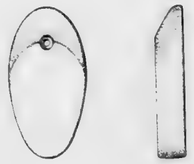
253,723
EAR PLUG
Howard S. Leight, 3945 Ridgemont Dr., Malibu, Calif. 90265
Filed Feb. 6, 1978, Ser. No. 875,609
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—67



253,724
METAL ROOFING TILE
Tomoo Yanoh, 3-1-7, Eifuku, Suginami-ku, Tokyo, Japan
Filed Mar. 7, 1978, Ser. No. 884,258
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—92



253,725
CIGARETTE HOLDER
Anneliese Martin, and Leslie A. Martin, both of 2611 W. Olive Ave., Ste. 13, Burbank, Calif. 91505
Filed Apr. 13, 1978, Ser. No. 895,939
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—07

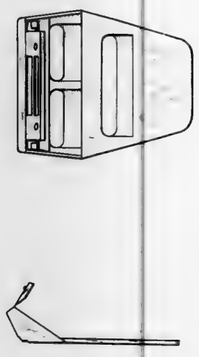


253,726
RAZOR
April A. Schuman, 161 Palisade Ave., Cresskill, N.J. 07626; Wilfred G. Hoole, 10615 Stanwin Ave., Mission Hills, Calif. 91352, and Larry S. Harrison, 17640 Horace St., Granada Hills, Calif. 91344
Filed Jul. 5, 1977, Ser. No. 812,527
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46

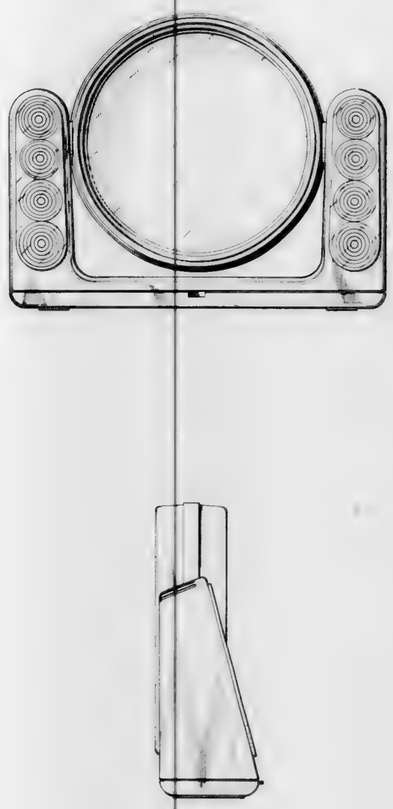


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253,727
DISPOSABLE RAZOR
Adolf Kowal, Tagarp 10, S-270 54 Tommarp, Sweden
Filed Nov. 16, 1977, Ser. No. 851,870
Claims priority, application Sweden, May 18, 1977, 771150
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46



253,728
ELECTRIC MAKE-UP MIRROR OR SIMILAR ARTICLE
Walter C. Anderson, West Redding, Conn., assignor to General Electric Company
Filed Dec. 19, 1977, Ser. No. 861,660
Term of patent 7 years
Int. Cl. D28—*03*
U.S. Cl. D28—67

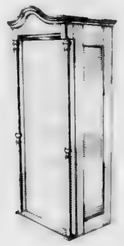


253,729
AQUARIUM OR SIMILAR ARTICLE
Nazareen Ward, 2038 85th Ave., Oakland, Calif. 94621
Continuation-in-part of Ser. No. 753,918, Dec. 23, 1976. This application Jun. 5, 1978, Ser. No. 912,934
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—6

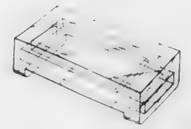




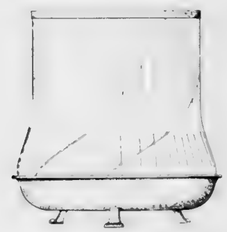
253,730
AQUARIUM
Michelle E. Browne, 6678 SW. 140th Ct., Miami, Fla. 33183
Filed Sep. 14, 1978, Ser. No. 942,400
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—9



253,731
IDENTIFICATION TAG FOR AN ANIMAL COLLAR OR SIMILAR ARTICLE
Esther O. Mayfield, 5565 Thunderbird La., La Jolla, Calif. 92037
Filed Sep. 12, 1977, Ser. No. 832,840
Term of patent 14 years
Int. Cl. D30—*04*
U.S. Cl. D30—38



253,732
COMBINED CANDLEHOLDER AND CENTERPIECE OR THE LIKE
John Van Koert, 190 E. 72nd St., New York, N.Y. 11209
Filed Sep. 23, 1977, Ser. No. 835,989
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2



253,733
POCKET FLASHLIGHT
Raymond W. Simmons, North Pinellas, Fla., assignor to Concept Inc., Clearwater, Fla.
Filed Nov. 23, 1977, Ser. No. 854,502
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A



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BECKET

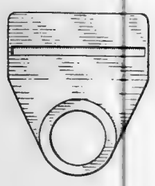
John Howard, Scarborough, Canada, assignor to Reliance Products Ltd.

Filed Feb. 16, 1977, Ser. No. 769,167

Term of patent 14 years

Int. Cl. D21—*04*

U.S. Cl. D21—255



253,735

ROOFING TILE

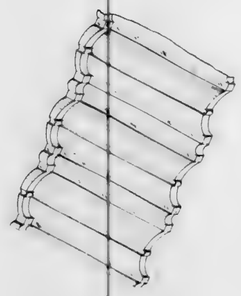
Miles H. K. Furley, Grampian Rd., St. Heliers, Auckland, New Zealand

Filed Apr. 20, 1977, Ser. No. 789,111

Term of patent 14 years

Int. Cl. D25—*01*

U.S. Cl. D92—29



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF DECEMBER, 1979

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aasland, Reuben E. Self-wringing mop. 4,178,650, Cl. 15-120.00R.

AB Bofors: *See—*
Tidemalm, Gustav H.; and Vidinghoff, Bjorn E., 4,178,831, Cl. 89-41.00H.

Abbott Coin Counter Company, Inc.: *See—*
O'Maley, James B., 4,179,685, Cl. 340-146.30H.

Abbott, Horace P., to Lever Brothers Company. Container cap. 4,179,052, Cl. 222-509.000.

Abbott, Liston, to RCA Corporation. System for transmitting two color TV signals. 4,179,703, Cl. 358-11.000.

Abdoo, Alfred H. Chemical metering apparatus. 4,179,047, Cl. 222-133.000.

Aboussouan, Michael F.: *See—*
Cone, Bryan N.; and Aboussouan, Michael F., 4,179,125, Cl. 273-162.00B.

Abrasives International Limited: *See—*
Ashworth, Stuart I., 4,179,238, Cl. 415-197.000.

ACF Industries, Incorporated: *See—*
Kemp, Willard E.; and Morrison, Bert L., 4,178,665, Cl. 29-157.10R.
Klimazewski, Leo T.; and McNairy, James A., 4,178,755, Cl. 60-290.000.
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White, Jack M., 4,178,953, Cl. 137-116.000.

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Metz, Paul; Schockmel, Robert; and Mersch, Roland, 4,179,275, Cl. 65-20.000.

Acme Highway Products Corporation: *See—*
Puccio, Guy S., 4,179,226, Cl. 404-64.000.

Adachi, Akio, to Hockiki Corporation. Memory apparatus for disaster preventing system. 4,179,751, Cl. 365-228.000.

Adachi, Eiji; Shibatani, Juichi; and Ito, Sadayoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Vacuum union for an internal combustion engine. 4,178,756, Cl. 60-397.000.

Adachi, Keiichi: *See—*
Hirano, Shigeo; Adachi, Keiichi; Sakanoue, Seiki; and Kamio, Takayoshi, 4,179,293, Cl. 430-551.000.

Adams, Kenneth D., to Singer Company, The. Adjustable bobbin thread run-out indicator. 4,178,866, Cl. 112-278.000.

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Adwest Engineering Limited: *See—*
Millard, Barry J., 4,178,835, Cl. 91-375.00A.

Aftergut, Siegfried: *See—*
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Asplund, Alf A., 4,179,225, Cl. 403-322.000.

AGFA-Gevaert, A.G.: *See—*
Bestenreiner, Friedrich; Giglberger, Dieter; Hoeft, Karl; and Kohler, Robert, 4,179,210, Cl. 355-10.000.
Johanns, Heinz, 4,179,079, Cl. 242-56.00R.
Stemme, Otto; Lermann, Peter; Engelsmann, Dieter; and Went, Werner, 4,179,028, Cl. 206-316.000.
Vetter, Hans; and Marx, Paul, 4,179,291, Cl. 430-223.000.

Agulnek, Martin A., to Xerox Corporation. Crossover arrangement for multiple scanning arrays. 4,179,620, Cl. 250-566.000.

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Crean, Peter A.; Lavallee, Pierre A.; and Agulnek, Martin A., 4,179,621, Cl. 250-566.000.

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Aide, Richard J. Floatation pump device. 4,179,243, Cl. 417-61.000.

Aihara, Sukeji: *See—*
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, 4,179,579, Cl. 568-840.000.

Aihara, Takayuki: *See—*
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,179,339, Cl. 435-292.000.

Aine, Harry E. Method for making a swimming pool cover template. 4,178,690, Cl. 33-174.00G.

Aizawa, Hiroshi: *See—*
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Watanabe, Satoshi; Yamamichi, Masayoshi; and Aizawa, Hiroshi, 4,179,206, Cl. 354-152.000.

Aizawa, Tatsuo: *See—*
Kimura, Hiroshi; Kitagawa, Takaich; Hisajima, Masahiko; Yoshikado, Shoji; and Aizawa, Tatsuo, 4,179,211, Cl. 355-14.00R.

Akado, Hajime; Uchida, Yoshiro; Kubota, Kenichi; Hasebe, Toshiharu; Yamaguchi, Akihide; Tomita, Tsutomu; Ootsubo, Suminobu; and Toyota Jidosha Kogyo Kabushiki Kaisha, to Nippondenso Co., Ltd. Thermostatic valve for intake air temperature compensation for internal combustion engine. 4,178,898, Cl. 123-122.00D.

Akai, Chiaki: *See—*
Hara, Ryoichi; Yajima, Masamichi; Akai, Chiaki; and Matsumoto, Takuzo, 4,179,083, Cl. 242-158.00R.

Akiba, Shigeyuki: *See—*
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Akishino, Katsuo: *See—*
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Albert Rolland, S.A.: *See—*
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Zwicker, James D.; and Dube, Ghyslain, 4,178,796, Cl. 73-61.400.

Alder, Christopher J., to Plessey Handel und Investments AG. Frequency control systems. 4,179,694, Cl. 343-5.0AF.

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Marchi, Egidio; and Montecchi, Lauretta, 4,179,438, Cl. 260-239.30P.

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Pasini, Luciano, 4,179,036, Cl. 220-22.000.

Ali, Asghar; Caruso, Robert; Fischer, Alfred; Deinet, Adolph J.; Minieri, Pasquale P.; and Sidi, Henri, to Tenneco Chemicals, Inc. Process for the production of overbased manganese salts of organic acids. 4,179,385, Cl. 252-33.000.

Allegheny Ludlum Industries, Inc.: *See—*
Miller, Clarence L., Jr., 4,179,315, Cl. 148-113.000.

Allely, Robert; and Bailey, Alfred J., to Massey-Ferguson Services N.V. Agricultural mowers. 4,178,744, Cl. 56-16.200.

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Selas, George J., 4,179,676, Cl. 335-59.000.

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Seldner, Alvin A., 4,179,327, Cl. 156-667.000.

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Newman, John W., 4,179,141, Cl. 285-189.000.

Allingham, Yael; Vofsi, David; and Gassner, Saul A., to Yeda Research and Development Co. Ltd. Polyethylene sheets and films. 4,179,547, Cl. 525-2.000.

Allis-Chalmers Corporation: *See—*
Flavel, Malcolm D., 4,179,074, Cl. 241-24.000.
Hanaway, Roger D., 4,178,944, Cl. 130-27.00R.
Rockwell, Randal L., 4,178,998, Cl. 172-311.000.

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Altman, Daniel E.: *See—*
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Das, Subodh K., 4,179,345, Cl. 204-67.000.
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Alvarez Domingo, Mercedes: *See—*
Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, 4,179,565, Cl. 546-63.000.

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Liautaud, James P., 4,179,698, Cl. 343-715.000.

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Meyers, George L., 4,179,060, Cl. 229-8.000.

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Rohowetz, Stanley E.; and Schoenfisch, Eric, 4,179,397, Cl. 252-408.000.

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Bernady, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., 4,179,574, Cl. 562-503.000.
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Asselin, Andre A.; Humber, Leslie G.; Dionne, Gervais; Revesz, Clara; and Failli, Amedeo, 4,179,503, Cl. 424-248.510.

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Cawood, Charles D., Jr.; and Ziegler, John S., 4,178,920, Cl. 128-4.000.

American Microsystems, Inc.: *See—*
Gregorian, Roubik, 4,179,665, Cl. 330-107.000.

American Optical Corporation: *See—*
Chang, Leei, 4,179,181, Cl. 350-1.700.
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Laby, Jordan M., 4,178,718, Cl. 49-411.000.

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Amico, Peter J.: *See—*
Amico, Raymond F.; and Amico, Peter J., 4,178,672, Cl. 29-430.000.

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de Vries, Jacobus, 4,179,026, Cl. 198-834.000.

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Collier, John C.; and Owen, Leonard J., 4,178,973, Cl. 140-123.600.
Phillips, Howard C., 4,178,675, Cl. 29-566.100.

Amprint Corp.: *See—*
Harris, Jerome R., 4,179,107, Cl. 270-4.000.
Harris, Jerome R., 4,179,109, Cl. 270-52.000.

Anderson Bros. Mfg. Co.: *See—*
Stohlquist, Roger H., 4,178,737, Cl. 53-550.000.

Anderson, Roy E.: *See—*
Regan, Louis M.; Childers, Thomas W.; Anderson, Roy E.; and Burkhardt, Joseph A., 4,178,992, Cl. 166-117.600.

Anderson, Vaughn R.; Woolley, Ronald L.; and Davis, Edward H., to Billings Energy Corporation. Hydrogen fuel supply system. 4,178,882, Cl. 123-1.00A.

Ando, Eiji: *See—*
Takeshita, Isao; Wakamatsu, Nobuhiko; Ando, Eiji; Tanaka, Hiroyoshi; and Hozumi, Shiro, 4,178,989, Cl. 165-62.000.

Ando, Masahisa; Katow, Keigo; and Yamazaki, Masami, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of assembling a valve device for an exhaust gas recirculation system of an internal combustion engine. 4,178,666, Cl. 29-156.70R.

Andree, Hans; Jung, Dieter; Bischoff, Martin; Conrad, Jens; Huppertz, Josef; Jakobi, Gunter; Krings, Peter; Kuhling, Dieter; Reuter, Herbert; Rupilius, Wolfgang; Rutzen, Horst; and Schnegelberger, Harald, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Stable aqueous suspension of water-insoluble, calcium-binding aluminosilicates and organic suspending agents. 4,179,393, Cl. 252-155.000.

Angioletti, Attilio, to Industrie Pirelli S.p.A. Process for manufacturing reinforced elastomeric hoses and resultant product. 4,178,968, Cl. 138-126.000.

ANIC S.p.A.: *See—*
Dozzi, Giovanni; Cucinella, Salvatore; and Mazzei, Alessandro, 4,179,459, Cl. 260-448.00R.

Anonima Castelli S.p.A.: *See—*
Ponzellini, Giulio, 4,178,858, Cl. 108-150.000.

Antonio, Pier: *See—*
Alessio, Attilio; Parpaiola, Carlo; and Antonio, Pier, 4,179,598, Cl. 219-79.000.

Antonov, Boris M.; Vasiliev, Viktor V.; and Pischikov, Sergei I., to Institut vysokikh temperatur Akademii Nauk SSSR. Self-optimizing control system for object with unimodal quality function. 4,179,730, Cl. 364-105.000.

Antos, George J., to UOP Inc. Acidic sulfur-free multimetallic catalytic composite. 4,179,405, Cl. 252-441.000.

Antos, George J., to UOP Inc. Acidic multimetallic catalytic composite. 4,179,406, Cl. 252-442.000.

Antos, George J.: *See—*
Flagg, John F.; and Antos, George J., 4,179,360, Cl. 208-139.000.

Aoki, Eiichiro; and Yamada, Shigeru, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,178,824, Cl. 84-1.190.

Aoki, Eiichiro: *See—*
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Yamaga, Eiichi, 4,178,826, Cl. 84-1.260.

Aoki, Keiji, to Toyota Jidoshi Kogyo Kabushiki Kaisha. Ignition control apparatus for an internal combustion engine. 4,178,893, Cl. 123-117.00D.

Aoyagi, Takaaki: *See—*
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Okami, Yoshiro, 4,179,573, Cl. 562-444.000.

Architectural Research Corporation: *See—*
Prusinski, Richard C.; and Johnson, Timothy E., 4,178,727, Cl. 52-173.00R.

Armco Inc.: *See—*
Tanczyn, Harry, 4,179,285, Cl. 75-126.00E.

Aron, Daniel L., to Mole-Richardson Co. Barn door lamp attachment. 4,179,726, Cl. 362-17.000.

Artz, Walter M.; Bauer, Charles R.; and Moyer, Paul W., to Western Electric Co., Inc. Methods of and apparatus for conveying, orienting, testing and sorting articles. 4,179,032, Cl. 209-538.000.

Arvey Corporation: *See—*
Adams, Leo; and Kooi, Edward, 4,178,652, Cl. 15-302.000.

Arvin Industries, Inc.: *See—*
Maxey, Alexander R., 4,179,717, Cl. 360-84.000.

Asada, Akihiro: *See—*
Fukushima, Isao; Asada, Akihiro; and Takahashi, Kazuya, 4,179,650, Cl. 323-1.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Miyake, Tetsuya; Noguchi, Kohji; and Imamura, Kazuo, 4,179,576, Cl. 546-251.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Kurei, Hiroshi; Kawasaki, Masahiro; and Takaoka, Yukio, 4,179,201, Cl. 354-41.000.

Ashida, Akira: *See—*
Suzuki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takashashi, Kiyoshi; and Takimoto, Hiroyuki, 4,179,197, Cl. 352-14.000.

Ashland Oil, Inc.: *See—*
Gardikes, John J., 4,179,427, Cl. 260-29.2TN.

Ashworth, Denis H., to Simon Engineering Dudley Limited. Access equipment. 4,179,010, Cl. 182-2.000.

Ashworth, Stuart I., to Abrasives International Limited. Centrifugal pumps. 4,179,238, Cl. 415-197.000.

Asplund, Alf A., to Agergards Maskiner AB. Quickly detachable coupling. 4,179,225, Cl. 403-322.000.

Asselin, Andre A.; Humber, Leslie G.; Dionne, Gervais; Revesz, Clara; and Failli, Amedeo, to American Home Products Corp. 1-Hydroxyalkanamine pyrano[3,4-b]indole derivatives. 4,179,503, Cl. 424-248.510.

Astill, Cyril J., to Atomic Energy of Canada Limited. Sealed torque transmission assembly. 4,178,815, Cl. 74-805.000.

Ateliers de la Motobecane S.A.: *See—*
Jaulmes, Eric, 4,178,888, Cl. 123-73.00V.

Athanas, Terry G., to Mostek Corporation. Method of stabilizing semiconductor device by converting doped poly-Si to polyoxides. 4,179,311, Cl. 148-1.500.

Atkinson, Wallace E. Removable trainer handle and brake for skateboard. 4,179,134, Cl. 280-87.04A.

Atlas Powder Company: *See—*
Smith, Don H.; and Barton, Leslie W., 4,178,852, Cl. 102-24.00R.

Atomic Energy of Canada Limited: *See—*
Astill, Cyril J., 4,178,815, Cl. 74-805.000.

Attenburrow, Derek C.: *See—*
Harper, Douglas C.; and Attenburrow, Derek C., 4,178,716, Cl. 147-62.000.

Au, Anthony S. Pressure control systems. 4,178,938, Cl. 128-207.150.

Au, Anthony S. Pressure control systems. 4,178,940, Cl. 128-207.150.

Austel, Volkhard; Kutter, Eberhard; Eberlein, Wolfgang; Heider, Joachim; and Kahling, Joachim, to Boehringer Ingelheim GmbH. Sulfur-containing derivatives of 4,4-dimethyl-2H,4H-isoquinoline-1,3-dione, and anticonvulsant and antihyperlipidemic compositions thereof. 4,179,508, Cl. 424-258.000.

Australia Paper Manufacturers Limited: *See—*
Vanderhoek, Naphthali N.; Nelson, Peter F.; and Farrington, Alan, 4,178,861, Cl. 162-72.000.

Auto Research Corporation: *See—*
Napolitano, Joseph J.; and Richardson, Michael, 4,178,960, Cl. 137-494.000.

Automatic Liquid Packaging, Inc.: *See—*
Weiler, Gerhard H.; Nagel, Dieter H.; and Pagels, Louis T., 4,178,976, Cl. 150-0.500.

Automatic Switch Company: *See—*
Fromfield, James P., 4,179,096, Cl. 251-38.000.
Riefler, Roger G.; and Rolfe, Alfred, 4,178,963, Cl. 137-624.180.

Avery International Corporation: *See—*
Nemeth, Suzette B., 4,178,933, Cl. 128-284.000.

Avon Products, Inc.: *See—*
Umstead, Herbert R., 4,179,049, Cl. 222-631.000.

Avtex Fibers Inc.: *See—*
Smith, Frederick R., 4,179,416, Cl. 260-17.4CL.

Babbitless: *See—*
Barrot, Jean C.; and Pulido, Philippe, 4,179,076, Cl. 241-216.000.

Bacher, Michel, to Societe Anonyme Francaise du Ferodo. Sheave for a speed variator and a method of replacing a belt thereon. 4,178,808, Cl. 74-230.17E.

Bachman, William J.; and Dineo, Franklin R., to RCA Corporation. Plug-in circuit cartridge with electrostatic charge protection. 4,179,178, Cl. 339-111.000.

Badmin, John S.: *See—*
Felton, John C.; Badmin, John S.; and Twydell, Roland S., 4,179,518, Cl. 424-300.000.

Baier, Ludwig S. Railway track hold-down hardware. 4,179,067, Cl. 238-91.000.

Bailey, Alfred J.: *See—*
Allely, Robert; and Bailey, Alfred J., 4,178,744, Cl. 56-16.200.

Bailly, Emile, to Compagnie International pour l'Informatique Cii-Honeywell Bull. Mechanism for locking a plate which is movable on a table along guide means. 4,179,014, Cl. 188-43.000.

Baker, Brian G. Carton blanks and cartons made therefrom. 4,179,062, Cl. 229-37.00R.

Baker, Gerry L.: *See—*
Baker, William J.; and Baker, Gerry L., 4,178,952, Cl. 137-38.000.

Baker, William J.; and Baker, Gerry L. Inertial valve. 4,178,952, Cl. 137-38.000.

Baldus, Wolfgang; and Lehmer, Wilhelm, to Linde Aktiengesellschaft. Intermittent vibration in fractional crystallization. 4,178,776, Cl. 62-538.000.

Baldwin, John J.; and Novello, Frederick C., to Merck & Co., Inc. 4-Substituted-2-arylimidazoles. 4,179,512, Cl. 424-273.00R.

Ballweber, Edward G.: *See—*
Phillips, Kenneth G.; Ballweber, Edward G.; and Hurlock, John R., 4,179,424, Cl. 260-29.4UA.

Bankstahl, Herbert A., to Brunswick Corporation. Exhaust coupling assembly for a marine stern drive. 4,178,873, Cl. 115-73.000.

Barnish, Ian T.; Cross, Peter E.; Danilewicz, John C.; and Morville, Malcolm, to Pfizer Inc. L- and DL-Phenylglycines to treat a disease of condition attributable to reduced blood flow. 4,179,520, Cl. 424-309.000.

Barnish, Ian T.; Cross, Peter E.; Danilewicz, John C.; and Morville, Malcolm, to Pfizer Inc. L- and DL-Phenylglycines to treat diseases or conditions attributable to reduced carbohydrate metabolism. 4,179,521, Cl. 424-309.000.

Barone, Bruno J., to Denka Chemical Corporation. Catalyst preparative method. 4,179,404, Cl. 252-435.000.

Barra, Frank J.; and Schleier, Richard L., to Smith Industries, Inc. Method and apparatus for injecting stripping gas into the reboiler section of a glycol reboiler. 4,179,328, Cl. 159-16.00R.

Barrot, Jean C.; and Pulido, Philippe, to Babbitless. Sealing device between the movable crushing member and the body of a giratory crusher. 4,179,076, Cl. 241-216.000.

Barstow, Glidden J.: *See—*
Geller, Myer; Altman, Daniel E.; and Barstow, Glidden J., 4,179,194, Cl. 350-356.000.

Barth, Wayne E., to Pfizer Inc. Antibacterial 3-(5-tetrazolyl) penam compounds. 4,179,511, Cl. 424-271.000.

Barthell, Eduard; and Schmid, Otto, to Chemische Fabrik. Thickening urinary and intestinal tract excrement. 4,179,367, Cl. 210-41.000.

Barthell, Eduard: *See—*
Hubner, Wolfgang; Barthell, Eduard; and Dahmen, Kurt, 4,179,370, Cl. 210-51.000.

Bartholet, Stephen J., to Odetics, Inc. Continuous thru-wire welding machine. 4,179,597, Cl. 219-56.100.

Bartok nee Berencsy, Piroska: *See—*
Matolcsy, Gyorgy; Bartok nee Berencsy, Piroska; Kiss, Bella; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, 4,179,467, Cl. 260-563.00R.

Bartok, Piroska, nee Berencsy: *See—*
Matolcsy, Gyorgy; Bartok, Piroska, nee Berencsy; Kiss, Bella; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, 4,179,463, Cl. 260-502.600.

Bartold, Mitchell E.: *See—*
Buckley, James E.; Bartold, Mitchell E.; Heist, Marshall S.; and Jessup, James L., 4,178,790, Cl. 72-224.000.

Barton, Leslie W.: *See—*
Smith, Don H.; and Barton, Leslie W., 4,178,852, Cl. 102-24.00R.

Bartschi, Jean-Jacques, to Hasler AG. Device for electromechanically positioning a unilaterally pivoted lever arm in three different stable positions. 4,179,701, Cl. 346-62.000.

BASF Aktiengesellschaft: *See—*
Thym, Sabine; Koenig, Karl-Heinz; and Hamprecht, Gerhard, 4,179,465, Cl. 260-544.00C.

BASF Wyandotte Corporation: *See—*
Newkirk, David D.; Thir, Basil; and Login, Robert B., 4,179,544, Cl. 428-395.000.

Bass, Douglas D.: *See—*
Connors, John F.; Bass, Douglas D.; Bell, Michael G.; and Ream, Stanley L., 4,179,316, Cl. 148-152.000.

Bata-Schuh-Aktiengesellschaft: *See—*
Mayer, Hubert J. M., 4,178,702, Cl. 36-59.00R.

Bateman, Robert F.; and Croyle, Jack V., to Dart Industries Inc. Storage and serving container or the like. 4,179,040, Cl. 220-410.000.

Battelle Memorial Institute: *See—*
Kalbskopf, Reinhard; and Trojer, Felix, 4,179,535, Cl. 427-206.000.

Bauer, Charles R.: *See—*
Artz, Walter M.; Bauer, Charles R.; and Moyer, Paul W., 4,179,032, Cl. 209-538.000.

Baumann, Marvin J.: *See—*
Shoemaker, Edwin J.; Pacitti, William; and Baumann, Marvin J., 4,179,157, Cl. 297-83.000.

Baur, Rolf, to Schenk-Filterbau Gesellschaft mit beschrankter Haftung. Intake distributor for a settling tank filter. 4,179,381, Cl. 210-456.000.

Baxter, Samuel H. Cast protector. 4,178,924, Cl. 128-82.000.

Baxter Travenol Laboratories, Inc.: *See—*
Bratten, William R.; and Helfer, Joel N., 4,179,364, Cl. 210-321.00B.

Bayer Aktiengesellschaft: *See—*
Beck, Gunther; Sasse, Klaus; Heitzer, Helmut; Eue, Ludwig; Schmidt, Robert R.; Scheinpflug, Hans; Hammann, Ingeborg; and Brandes, Wilhelm, 4,179,277, Cl. 71-92.000.
Hugl, Herbert; Schundehutte, Karl H.; Trautner, Kersten; and Wolfrum, Gerhard, 4,179,436, Cl. 260-206.000.
Junge, Bodo; Bossert, Friedrich; Meyer, Horst; Wehinger, Egbert; Vater, Wulf; Heise, Arend; Kazda, Stanislav; and Stoepel, Kurt, 4,179,500, Cl. 424-180.000.
Marhold, Albrecht; and Klauke, Erich, 4,179,461, Cl. 260-465.00H.
Rosenkranz, Hans J.; Traenckner, Hans-Joachim; and Fuhr, Karl, 4,179,478, Cl. 525-113.000.
Schutze, Detlef-Ingo; Bien, Hans-Samuel, deceased; Bien, Petra, heir; and Bien, Daniel, heir, 4,179,450, Cl. 260-377.000.
Steinbach, Hans-Horst; Schnurrbusch, Karl; Rieder, Matthias; and Weiden, Otto, 4,179,426, Cl. 260-29.20M.
Woditsch, Peter; Bayer, Eckhard; Panek, Peter; and Stutgens, Heribert, 4,179,306, Cl. 106-300.000.

Bayer, Eckhard: *See—*
Woditsch, Peter; Bayer, Eckhard; Panek, Peter; and Stutgens, Heribert, 4,179,306, Cl. 106-300.000.

BBC Brown Boveri & Company Limited: *See—*
Vitins, Michael, 4,179,651, Cl. 324-51.000.
Wehrmuller, Beat; and Wienenga, Paul, 4,179,645, Cl. 318-139.000

Becht, Carl T.; and Hueil, J. Charles, to Senco Products, Inc. Disposable surgical stapling instrument. 4,179,057, Cl. 227-19.000.

Beck, Gunther; Sasse, Klaus; Heitzer, Helmut; Eue, Ludwig; Schmidt, Robert R.; Scheinpflug, Hans; Hammann, Ingeborg; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. 4,5-Dichloroimidazole-2-carboxylic acid derivatives. 4,179,277, Cl. 71-92.000.

Becker, William M. Telephone cover. 4,179,591, Cl. 179-179.000.

Beckmann, Georg; and Trotzmuller, Alfred, to Waagner-Biro A.G. Method and apparatus for mixing two gas currents. 4,178,696, Cl. 34-13.000.

Bedard, Eugene J.: *See—*
Sablich, Milan; and Bedard, Eugene J., 4,179,373, Cl. 210-98.000.

Bedwell, Michael O., to Ortec Incorporated. Constant fraction signal shaping apparatus. 4,179,664, Cl. 328-150.000.

Beecham Group Limited: *See—*
Box, Stephen J.; and Hood, John D., 4,179,498, Cl. 424-117.000.
Ponsford, Roger J., 4,179,562, Cl. 544-298.000.

Beermann, Heinrich, to Kraftwerk Union Aktiengesellschaft. Device for bracing a stator winding disposed in the air gap of a synchronous generator. 4,179,635, Cl. 310-214.000.

Beggs, Donald; and Meissner, David C., to Midrex Corporation. Method for reducing particulate iron oxide to molten iron with solid reductant. 4,179,278, Cl. 75-11.000.

Begley, Paul M.: *See—*
Laganis, Deno; and Begley, Paul M., 4,179,423, Cl. 260-29.20N.

Behle, Fritz: *See—*
Heusler, Helmut; and Behle, Fritz, 4,179,020, Cl. 198-326.000.

Behmel, Klaus: *See—*
Zuckert, Bertram; Schmut, Wolfgang; and Behmel, Klaus, 4,179,428, Cl. 260-29.40R.

Belitsin, Mikhail N.; Kudryashov, Sergei A.; Borik, Alexandr G.; Kulikov, Valentin V.; Sadkova, Natalia A.; Kudryashova, Galina A.; and Vorontsov, Leonid F. Spinneret for the production of wool-like man-made filament. 4,179,259, Cl. 425-461.000.

Bell, David V.: *See—*
Zeigler, Jon G.; Kerr, Elmer L.; and Bell, David V., 4,179,603, Cl 219-538.000.

Bell & Howell Company: *See—*
Workman, Dennis L., 4,179,709, Cl. 358-133.000.

Bell, Michael G.: *See—*
Connors, John F.; Bass, Douglas D.; Bell, Michael G.; and Ream, Stanley L., 4,179,316, Cl. 148-152.000.

Bell Telephone Laboratories, Incorporated: *See—*
Brown, Vernon L.; Greenwood, Wade H.; and Griffith, Gary L., 4,179,322, Cl. 156-192.000.
Carrillo, Leo; and Madden, Thomas C., 4,178,678, Cl. 29-625.000.
Carter, Aaron B., 4,179,625, Cl. 307-234.000.
Chang, Chuan C.; Ermanis, Felix; McCoy, Robert J.; Nakahara, Shohei; and Sheng, Tan T., 4,179,534, Cl. 427-89.000.
Kaminow, Ivan P.; and Ramaswamy, Vellayan, 4,179,189, Cl. 350-96.330.
Rise, Samuel F., III, 4,179,173, Cl. 339-19.000.
Tynes, Arthur R., 4,179,186, Cl. 350-96.210.

Bemmels, Cyrus W., to Johnson & Johnson. Pressure sensitive adhesive and process. 4,179,415, Cl. 260-4.00R.

Bengt Petersson New Products Investment AB: *See—*
Petersson, Bengt O., 4,178,731, Cl. 52-520.000.

Benjamin, Benjamin C., to Schmelzer Corporation. Two stage vacuum break assembly. 4,178,895, Cl. 123-119.00F.

Benson, Carl F.: *See—*
Virgilio, Douglas R.; Campbell, Robert G.; Fortunato, Alfred J.; and Benson, Carl F., 4,178,781, Cl. 66-121.000.

Bentz, Gerard; and Racouchot, Bernard, to L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude. Means for injecting gas into a molten metal. 4,179,103, Cl. 266-225.000.

Bentz, Gerard: *See—*
Gilbert, Ghislain; Galey, Jean; and Bentz, Gerard, 4,178,980, Cl. 164-66.000.

Berg, Alexander: *See—*
Braeumer, Klaus; Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,179,333, Cl. 435-60.000.

Berg, Markus: *See—*
Kaufmann, Jochen; Berg, Markus; and Krings, Peter, 4,179,391, Cl. 252-99.000.

Berger, Leo; and Scott, John W., to Hoffmann-La Roche Inc. 6-Chloro-1,2,3,4-tetrahydrocarbazole-2-one. 4,179,443, Cl. 260-315.000.

Bergman, Raymond A. Apparatus for locating and clamping a work member supporting fixture. 4,179,106, Cl. 269-20.000.

Bergwerksverband GmbH: *See—*
Lichtenberger, Horst; Knoblauch, Karl; Grochowski, Horst; Juntgen, Harald; and Schwarte, Jurgen, 4,179,399, Cl. 252-411.00S.

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Bernady, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., to American Cyanamid Company. Novel 2-substituted-3,4-epoxycyclopentan-1-ones, 2-substituted-3,4-epoxycyclopentan-1-ols, and various 2-substituted-cyclo-pentenones. 4,179,574, Cl. 562-503.000.

Bernardin, Frederick E., Jr.: *See*—
Coviello, Allan J.; Bernardin, Frederick E., Jr.; and Rohrkemper, Robert R., 4,179,616, Cl. 250-527.000.

Bernat, Jean-Pierre, to Societe Nationale Elf Aquitaine (Production). Removal of cyanide from waste water. 4,179,348, Cl. 204-151.000.

Berns, Michael S.; and Chafe, William J. Roadside emergency signalling device. 4,178,874, Cl. 116-28.00R.

Bernstein, Jack: *See*—
Hoehn, Hans; Bernstein, Jack; and Vogt, Berthold R., 4,179,564, Cl. 546-64.000.

Berry, Robert W., Jr.: *See*—
Still, Norman H.; and Berry, Robert W., Jr., 4,179,001, Cl. 175-57.000.

Bessin, Pierre: *See*—
Thuillier, Germaine; Laforest, Jacqueline; and Bessin, Pierre, 4,179,516, Cl. 424-278.000.

Bestenreiner, Friedrich; Giglberger, Dieter; Hoeft, Karl; and Kohler, Robert, to AGFA-Gevaert, A.G. Apparatus for developing latent electrostatic images. 4,179,210, Cl. 355-10.000.

Bettcher Industries, Inc.: *See*—
Bettcher, Louis A., 4,178,683, Cl. 30-276.000.

Bettcher, Louis A., to Bettcher Industries, Inc. Knife with removable blade. 4,178,683, Cl. 30-276.000.

Beuther, Harold; and Swift, Harold E., to Gulf Research and Development Company. Process for conversion of naphtha to ethylene. 4,179,474, Cl. 585-251.000.

Bianchi, Nereo; and Zatti, Piergentino, to Necchi, S.p.A. Programmed sewing machine with two connectable and disconnectable needle bars. 4,178,862, Cl. 112-121.110.

Bianchi, Valerio: *See*—
Latsch, Reinhard; Bianchi, Valerio; and Burkel, Reiner, 4,178,891, Cl. 123-117.00R.

Bidney, Roger. Vertically adjustable drapery rod support. 4,179,091, Cl. 248-265.000.

Bien, Daniel, heir: *See*—
Schutze, Detlef-Ingo; Bien, Hans-Samuel, deceased; Bien, Petra, heir; and Bien, Daniel, heir, 4,179,450, Cl. 260-377.000.

Bien, Else, Gabriele Bien, Dorothee Bien, legal representatives: *See*—
Schutze, Detlef-Ingo; Bien, Hans-Samuel, deceased; Bien, Petra, heir; and Bien, Daniel, heir, 4,179,450, Cl. 260-377.000.

Bien, Hans-Samuel, deceased: *See*—
Schutze, Detlef-Ingo; Bien, Hans-Samuel, deceased; Bien, Petra, heir; and Bien, Daniel, heir, 4,179,450, Cl. 260-377.000.

Bien, Petra, heir: *See*—
Schutze, Detlef-Ingo; Bien, Hans-Samuel, deceased; Bien, Petra, heir; and Bien, Daniel, heir, 4,179,450, Cl. 260-377.000.

Bieri, Hans, to Sulzer Brothers Ltd. Heat exchanger and a heat exchanger element therefor. 4,178,991, Cl. 165-166.000.

Bigot, Lucien: *See*—
Kemper, Yves J.; and Bigot, Lucien, 4,178,812, Cl. 74-745.000.

Bikbau, Marsel Y.: *See*—
Nudelman, Boris I.; Gadaev, Anatoly Y.; Bikbau, Marsel Y.; and Shishkin, Petr T., 4,179,302, Cl. 106-100.000.

Billings Energy Corporation: *See*—
Anderson, Vaughn R.; Woolley, Ronald L.; and Davis, Edward H., 4,178,882, Cl. 123-1.00A

Binstock, Morton H.; and Johnson, Steven J., to Westinghouse Electric Corp. Efficient valve position controller for use in a steam turbine power plant. 4,178,762, Cl. 60-667.000.

Biomechanics Limited: *See*—
Rippon, George M., 4,179,220, Cl. 366-102.000.

Biot, Bernard: *See*—
Amicel, Charles; Biot, Bernard; Butruille, Yves; and Ollivier, Christian, 4,179,380, Cl. 210-321.00A.

Birat, Jean-Pierre; and Ventavoli, Roger, to Institut de Recherches de la Siderurgie Francaise. Method of and apparatus for electromagnetic mixing of metal during continuous casting. 4,178,979, Cl. 164-49.000.

Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, to Hoechst Aktiengesellschaft. Process for the reduction of the frosting effect in dyeing of textile fabrics. 4,178,705, Cl. 38-144.000.

Birkner, Udo, to Blaupunkt-Werke GmbH. Mounting arrangement for a loudspeaker to a resonance panel permitting front insertion assembly. 4,179,009, Cl. 181-171.000.

Birum, Gail H.; and Jansen, Richard F., to Monsanto Company. 2-Chloroethyl phosphonate compositions. 4,179,482, Cl. 260-941.000.

Birum, Gail H.; and Jansen, Richard F., to Monsanto Company. 2-Chloroethyl phosphonates. 4,179,483, Cl. 260-941.000.

Bischoff, Martin: *See*—
Andree, Hans; Jung, Dieter; Bischoff, Martin; Conrad, Jens; Huppertz, Josef; Jakobi, Gunter; Krings, Peter; Kuhling, Dieter; Reuter, Herbert; Rupilius, Wolfgang; Rutzen, Horst; and Schnegelberger, Harald, 4,179,393, Cl. 252-155.000.

Bitzer, David R., to United States of America, Army. Secret-signalling system utilizing noise communication. 4,179,658, Cl. 325-34.000.

Bjork, Lennart W., to Litton Systems, Inc. Method for processing fiberoptic electronic components of electronic vacuum devices. 4,179,596, Cl. 219-10.55M.

Blaupunkt-Werke GmbH: *See*—
Birkner, Udo, 4,179,009, Cl. 181-171.000.

Block Drug Company, Inc.: *See*—
Lynch, Donald M.; Lover, Myron J.; Singer, Arnold J.; and Rhodes, William E., III, 4,179,504, Cl. 424-248.400.

Bochumer Eisenhutte Heintzmann GmbH & Co.: *See*—
Seiz, Rudolf; Eickhoff, Heinz; Meyer, Herbert; and Steppke, Dieter, 4,178,859, Cl. 109-37.000.

Bockstie, Lawrence G., Jr., to Corning Glass Works. Fast curing coating composition. 4,179,477, Cl. 525-284.000.

Boeckx, Gustaaf M.: *See*—
Raeymaekers, Alfons H. M.; Van Gelder, Josephus L. H.; Boeckx, Gustaaf M.; and Van Hemeldonck, Lodewijk L., 4,179,505, Cl. 424-250.000.

Boehringer Ingelheim GmbH: *See*—
Austel, Volkhard; Kutter, Eberhard; Eberlein, Wolfgang; Heider, Joachim; and Kahling, Joachim, 4,179,508, Cl. 424-258.000.

Boeing Company, The: *See*—
Erdmann, Joachim C.; Gellert, Robert I.; and Skaugset, Richard L., 4,179,218, Cl. 356-336.000.
Gillette, Roger B.; and Woods, Weightstill W., 4,179,193, Cl. 350-295.000.
Hirsch, Irving A., 4,178,871, Cl. 114-275.000.
Lunden, Clarence D., 4,179,699, Cl. 343-872.000.

Boersma, Richard F., to Fiat-Allis Construction Machinery, Inc. Scraper elevator drive mounting. 4,179,024, Cl. 198-806.000.

Bogdanovic, George, to Jet Press, Inc. Rail strip and locking device. 4,179,138, Cl. 281-15.00B.

Boget, Paul J.: *See*—
Das, Subodh K.; and Boget, Paul J., 4,179,346, Cl. 204-67.000.

Boismard, Pierre M.: *See*—
Brachet, Roland F. C.; and Boismard, Pierre M., 4,179,198, Cl. 352-100.000.

Bokros, Jack C., to Carbomedics, Inc. Two-leaflet heart valve. 4,178,639, Cl. 3-1.500.

Bollinger, Frederic G.; and D'Amico, John J., to Monsanto Company. Phthalic dianilides. 4,179,466, Cl. 260-558.00A.

Bom, Cornelis J. G.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,178,997, Cl. 172-112.000.

Bonhomme, Francois R. Cabinets for electrical or electronic equipment. 4,179,724, Cl. 361-391.000.

Bonicalzi, Maria P.; and De Gasperi, Mario M. System for checking the authenticity of identification papers. 4,179,686, Cl. 340-146.3AG.

Bonney, Maurice C. Point-of-aim indicator. 4,178,694, Cl. 33-289.000.

Borik, Alexandr G.: *See*—
Belitsin, Mikhail N.; Kudryashov, Sergei A.; Borik, Alexandr G.; Kulikov, Valentin V.; Sadkova, Natalia A.; Kudryashova, Galina A.; and Vorontsov, Leonid F., 4,179,259, Cl. 425-461.000.

Borisenko, Alexandr V.: *See*—
Yascheritsyn, Petr I.; Borisenko, Alexandr V.; Sidorenko, Valery A.; and Serebryakov, Evgeny A., 4,178,818, Cl. 82-36.00R.

Borodin, Daniel J., to U.S. Automation Company. Spark plug conveyor and assembling means. 4,178,662, Cl. 29-25.200.

Borre, Earl A., to Industrial Filter & Pump Mfg. Co.; and Industrial Filter & Pump Mfg. Co. Filter leaf. 4,179,378, Cl. 210-232.000.

Bosch Cartes, Juan: *See*—
Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, 4,179,565, Cl. 546-63.000.

Bose Corporation: *See*—
Dodson, George B.; and Nangeroni, John A., 4,179,669, Cl. 330-282.000.

Bossert, Friedrich: *See*—
Junge, Bodo; Bossert, Friedrich; Meyer, Horst; Wehinger, Egbert; Vater, Wulf; Heise, Arend; Kazda, Stanislav; and Stoepel, Kurt, 4,179,500, Cl. 424-180.000.

Boswick, John A., Jr.: *See*—
Buechler, Ulrich H.; Phelps, Dennis B.; and Boswick, John A., Jr., 4,178,640, Cl. 3-1.910.

Bottcher, Peter. Circuit arrangement for adjusting the volume of an automobile radio receiver in dependence on road noise. 4,179,667, Cl. 330-149.000.

Bottega Incisioni di Orizio-Giovanelli: *See*—
Giovanelli, Cesare, 4,178,846, Cl. 101-5.000.

Bowman, Walker H.; and Sinovich, Bruce E., to Standard Oil Company, a corporation of Indiana. Moving bed hydride/dehydride systems. 4,178,987, Cl. 165-1.000.

Box, Stephen J.; and Hood, John D., to Beecham Group Limited. Streptomycetal antibiotic. 4,179,498, Cl. 424-117.000.

Boyce, Robert A. L. Vehicle towed display device. 4,178,706, Cl. 40-326.000.

Boyd, David C.; Hagy, Henry E.; and Thompson, David A., to Corning Glass Works. Cathode ray tube panel. 4,179,638, Cl. 313-480.000.

BP Chemicals Limited: *See*—
Huitson, John J., 4,179,522, Cl. 424-317.000.

Brachet, Roland F. C.; and Boismard, Pierre M. Installation for the animation of pictures. 4,179,198, Cl. 352-100.000.

Bradley, Robert L.; and Mauceri, Frank A., to Nalco Chemical Company. Polymer to agglomerate resolved emulsions. 4,179,369, Cl. 210-43.000.

Brady, Donnie G., to Phillips Petroleum Company. Monohaloalkenyl benzoates and trihaloalkyl benzoates. 4,179,571, Cl. 560-64.000.

Brady, Joseph F., to United States of America, Army. Dual purpose munition. 4,178,851, Cl. 102-4.000.

Braeumer, Klaus; Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, to Carl Freudenberg, Firma; and Rohm GmbH. Method for making water-soluble elastin hydrolyzates. 4,179,333, Cl. 435-60.000.

Brandes, Wilhelm: *See*—
Beck, Gunther; Sasse, Klaus; Heitzer, Helmut; Eue, Ludwig; Schmidt, Robert R.; Scheinpflug, Hans; Hammann, Ingeborg; and Brandes, Wilhelm, 4,179,277, Cl. 71-92.000.

Brandmair, Franz; Rubisch, Ottmar; and Honig, Dietmar, to Sigri Elektrographit GmbH. Electrode for electrochemical processes and method of producing the same. 4,179,289, Cl. 75-206.000.

Bratten, William R.; and Helfer, Joel N., to Baxter Travenol Laboratories, Inc. Diffusion device for blood. 4,179,364, Cl. 210-321.00B.

Brautigam, Hans, to Esab-Kebe GmbH. Two torch head for oxygen cutting machines. 4,179,101, Cl. 266-77.000.

Bredehoeft, Edwin L.; and Lee, Robert E. Racquet carrier. 4,179,054, Cl. 224-45.00L.

Bremer, Richard J.; and Richardson, Daniel J., to General Motors Corporation. Apparatus for oxygen sensor impedance measurement. 4,178,793, Cl. 73-23.000.

Breuer, Oswald; and Steinkuhl, Bernd, to Gewerkschaft Eisenhutte Westfalia. Plough for winning material from a mineral face. 4,179,161, Cl. 299-34.000.

Breuers, Theo P. C.; and Joosten, Joannes J. W. M., to Oce-van der Grinten N.V. Apparatus for conveying sheetlike original material to be copied. 4,179,112, Cl. 271-3.000.

Briggs & Stratton Corporation: *See*—
Nau, Paul R., 4,178,894, Cl. 123-119.00B.

Brissonneau & Lotz Marine S. A.: *See*—
Brochard, Felix A., 4,179,149, Cl. 294-81.0SF.

Britton, John, to General Electric Company Limited, The. Circuits for operating discharge lamps. 4,179,641, Cl. 315-289.000.

Brochard, Felix A., to Brissonneau & Lotz Marine S. A. Suspended seizing device or the like. 4,179,149, Cl. 294-81.0SF.

Broersma, Frank R.; and Choca, Monica E., to Nalco Chemical Company. Method of preparing a controlled pore volume alumina with citric acid. 4,179,411, Cl. 252-465.000.

Bromell, Raymond J.; and Sideris, John N. J., to National Advanced Drilling Machines, Inc. Vertical motion compensated crane apparatus. 4,179,233, Cl. 414-139.000.

Brotz, Gunther: *See*—
Riess, Guido; Heide, Helmut; Reiner, Roland; Koster, Kari; and Brotz, Gunther, 4,178,686, Cl. 433-201.000.

Brown, Floyd P.; and Narvaez, Peter D., to National Semiconductor Corporation. Programmer and method of storing information therein and accessing information therefrom. 4,179,748, Cl. 364-900.000.

Brown, Paul, to Husky Injection Molding Systems Inc. Injection mold with floating stripper ring. 4,179,254, Cl. 425-438.000.

Brown, Raymond C., to Superior Industries International, Inc. Simulated wire spoke wheel assembly. 4,179,163, Cl. 301-37.0SS.

Brown, Richard E., to Warner-Lambert Company. Indole-2-carboxylic acids to effect CNS depressant activity. 4,179,513, Cl. 424-274.000.

Brown, Vernon L.; Greenwood, Wade H.; and Griffith, Gary L., to Bell Telephone Laboratories, Incorporated. Method for making bondable finger contacts. 4,179,322, Cl. 156-192.000.

Brunn, Hansjoachim: *See*—
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Bruno, Anthony T., to Harsco Corporation. Rail grinding system. 4,178,724, Cl. 51-178.000.

Brunswick Corporation: *See*—
Bankstahl, Herbert A., 4,178,873, Cl. 115-73.000.

Bucek, Miroslav: *See*—
Malasek, Jaromir; Kuda, Vladimir; and Bucek, Miroslav, 4,178,971, Cl. 139-435.000.

Buckley, James E.; Bartold, Mitchell E.; Heist, Marshall S.; and Jessup, James L., to Ex-Cell-O Corporation. Roll-through cold forming apparatus. 4,178,790, Cl. 72-224.000.

Buechler, Ulrich H.; Phelps, Dennis B.; and Boswick, John A., Jr. Wrist prosthesis. 4,178,640, Cl. 3-1.910.

Buescher, William E.; Roberto, Frederick J.; and Sobierajski, Isabelle M., to GTE Sylvania Incorporated. Brazing slurry. 4,179,297, Cl. 106-1.120.

Buhler-Miag GmbH: *See*—
Schnellbacher, Kurt; Muller, Klaus; and Gorlitz, Frank-Otto, 4,179,363, Cl. 209-481.000.

Bulgaru, Liliana: *See*—
Sauciuc, Alexandru; Nitelea, Ion; Paunescu, Eugeniu; Diaconescu, Constantin; Albu, Margareta; Bulgaru, Liliana; and Diaconu, Eugen, 4,179,439, Cl. 260-239.30P.

Buljan, Sergej-Tomislav, to GTE Sylvania Incorporated. Si_3N_4 containing intergranular phase nucleating agent and method. 4,179,301, Cl. 106-73.500.

Bunker Ramo Corporation: *See*—
Kwan, Okun; and Zaccagnino, Nicholas, 4,179,223, Cl. 400-320.000.

Burchman, Edmund K.: *See*—
Lind, Gene C.; Lind, Ralph C.; Lind, Frank L.; Burchman, Edmund K.; and Trauger, Robert, 4,178,931, Cl. 128-230.000.

Buriks, Rudolf S.; Fauke, Allen R.; and Griffiths, David W., to Petrolite Corporation. Quaternary ammonium adducts of polymerizable tertiary ammonium salts and acrylamide. 4,179,549, Cl. 525-374.000

Burke, Harold J., to General Motors Corporation. Adjustable steering column for vehicles. 4,179,137, Cl. 280-775.000.

Burkel, Reiner: *See*—
Latsch, Reinhard; Bianchi, Valerio; and Burkel, Reiner, 4,178,891, Cl. 123-117.00R.

Burkhardt, Joseph A.: *See*—
Regan, Louis M.; Childers, Thomas W.; Anderson, Roy E.; and Burkhardt, Joseph A., 4,178,992, Cl. 166-117.600.

Burkhart, Carol A. Solar energy teaching aid. 4,178,699, Cl. 35-10.000.

Burlington Industries, Inc.: *See*—
Wagner, Raymond L., 4,179,656, Cl. 324-166.000.

Burnham, Peter B., to Harsco Corporation. Manual operator for coiling door. 4,178,978, Cl. 160-321.000.

Burr-Brown Research Corporation: *See*—
Godsey, Ernest E.; Hoyle, George W.; and Christensen, Rusty S., 4,179,172, Cl. 339-17.0LM.

Burroughs Corporation: *See*—
Erhardt, Heinrich S., 4,178,847, Cl. 101-91.000.
Kim, Dongsung R., 4,179,737, Cl. 364-200.000.
Quadri, Farooq M., 4,179,750, Cl. 365-8.000.
Zwingman, Robert L., 4,179,749, Cl. 365-3.000.

Burroughs Wellcome Co.: *See*—
Grivsky, Eugene M., 4,179,524, Cl. 424-324.000.
Stenlake, John B.; Waigh, Roger D.; Dewar, George H.; Urwin, John; and Dhar, Nirmal C., 4,179,507, Cl. 424-258.000.

Burson, Bob O., to R. E. Phelon Company, Inc. Magneto rotor construction. 4,179,634, Cl. 310-153.000.

Burton Mechanical Contractors, Inc.: *See*—
Foreman, Brian E.; and Jones, Mark A., 4,179,371, Cl. 210-63.00R.

Bussinger, Fritz: *See*—
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Butler, Donald E., to Warner-Lambert Company. New pyridobenzodioxin compounds and methods for their production. 4,179,506, Cl. 424-256.000.

Butler, Donald E., to Warner-Lambert Company. 3-Aryloxy-substituted-aminopyridines and methods for their production. 4,179,563, Cl. 544-360.000.

Butler, William S.: *See*—
Farris, Richard C.; and Butler, William S., 4,178,959, Cl. 137-493.300.

Butruille, Yves: *See*—
Amicel, Charles; Biot, Bernard; Butruille, Yves; and Ollivier, Christian, 4,179,380, Cl. 210-321.00A.

C.I.E.R. Compagnia Importazioni Esportazioni Rappresentanze S.R.L.: *See*—
Rossani, Aldo, 4,179,741, Cl. 364-457.000.

C. van der Lely N. V.: *See*—
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Cadbury India Limited: *See*—
Shenoy, Raghuram D.; and Ganapathy, Anantharam, 4,179,455, Cl. 260-409.000.
Shenoy, Raghuram D.; and Ganapathy, Anantharam, 4,179,456, Cl. 260-409.000.

Caknis, Nicholas. Air discharge terminal unit. 4,178,840, Cl. 98-38.00E.

Campbell, Robert G.: *See*—
Virgilio, Douglas R.; Campbell, Robert G.; Fortunato, Alfred J.; and Benson, Carl F., 4,178,781, Cl. 66-121.000.

Cann, Peter L.; Karns, Phil J.; and Honnold, Fred V., to Carrier Corporation. Control for a combination furnace and heat pump system. 4,178,988, Cl. 165-2.000.

Canon Kabushiki Kaisha: *See*—
Hirohata, Michio; Suzuki, Toyotosi; Yokota, Hideo; Matsuda, Mutsuhide; Taguchi, Tetsuya; and Sanada, Noriaki, 4,179,203, Cl. 354-106.000.
Kosugi, Masao; and Yoshinari, Hideki, 4,179,110, Cl. 270-58.000.
Suzuki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takashashi, Kiyoshi; and Takimoto, Hiroyuki, 4,179,197, Cl. 352-14.000.
Tateoka, Masamichi; and Minoura, Kazuo, 4,179,183, Cl. 350-6.100.
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Watanabe, Satoshi; Yamamichi, Masayoshi; and Aizawa, Hiroshi, 4,179,206, Cl. 354-152.000
Umezawa, Kazumi; Hattori, Hiroyuki; Ogawa, Hiroshi; Kishi, Hirotoshi; and Sagara, Seiji, 4,179,116, Cl. 271-306.000.

Canron Inc.: *See*—
Maisonneuve, Hubert, 4,178,836, Cl. 91-381.000.

Carbomedics, Inc.: *See*—
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Carborundum Company, The: *See*—
Coppola, John A.; Hailey, Laurence N.; and McMurtry, Carl H., 4,179,299, Cl. 106-44.000.

Carl Freudenberg, Firma: *See*—
Braeumer, Klaus; Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,179,333, Cl. 435-60.000.

Carrier Corporation: *See*—
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Kouse, Charles H.; and Herzog, James L., 4,178,649, Cl. 15-104.06R.

Carrillo, Leo; and Madden, Thomas C., to Bell Telephone Laboratories, Incorporated. Apparatus and method for affixing bondable finger contacts to a printed circuit board. 4,178,678, Cl. 29-625.000.

Carter, Aaron B., to Bell Telephone Laboratories, Incorporated. Noise pulse presence detection circuit. 4,179,625, Cl. 307-234.000.

Carter, Russell P., Jr., to Mobay Chemical Corporation. Thermoplastic polyurethane blends containing a processing aid. 4,179,479, Cl. 525-66.000.

Caruso, Robert: *See*—
Ali, Asghar; Caruso, Robert; Fischer, Alfred; Deinet, Adolph J.; Minieri, Pasquale P.; and Sidi, Henri, 4,179,385, Cl. 252-33.000.

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Cassell, Don S.; and Kinyon, Brice W., to Combustion Engineering, Inc. Measurement of gas-liquid flow. 4,178,801, Cl. 73-195.000.
Caterpillar Tractor Co.: *See—*
Goloff, Alexander, 4,178,725, Cl. 51-290.000.
Cato Research Corp.: *See—*
Kruesi, Paul R., 4,179,492, Cl. 423-263.000.
Catterfeld, Fritz C., to Rockwell International Corporation. Modular pump unit for multistage high pressure slurry pump. 4,179,239, Cl. 415-198.100.
Cau, Pasqualino; and Cocca, Vincenzo, to Montedison S.p.A. Dishwasher consisting of an assembly of functional units made of thermoplastic material. 4,179,307, Cl. 134-58.00D.
Cawood, Charles D., Jr.; and Ziegler, John S., to American Hospital Supply Corporation. Urological instrument with deflecting element. 4,178,920, Cl. 128-4.000.
CBS Inc.: *See—*
Moore, J. Kenneth; Kaiser, Arthur; and Mahler, Henry W., 4,179,704, Cl. 358-22.000.
Ceraver: *See—*
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Chafe, William J.: *See—*
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Chakrabarti, Paritosh M., to GAF Corporation. Glass fiber dispersions for making uniform glass fiber mats by the wet-laid process. 4,179,331, Cl. 162-156.000.
Chambon, Rene. Method of an apparatus for extracting, measuring and adding a product. 4,179,041, Cl. 222-1.000.
Chan, Edwin T.; and Jepson, Stanley R., to Varian Associates, Inc. Xenon arc lamp with compressive ceramic to metal seals. 4,179,037, Cl. 220-2.30R.
Chang, Chuan C.; Ermanis, Felix; McCoy, Robert J.; Nakahara, Shohei; and Sheng, Tan T., to Bell Telephone Laboratories, Incorporated. Gold-tin-gold ohmic contact to N-type group III–V semiconductors. 4,179,534, Cl. 427-89.000.
Chang, Leei, to American Optical Corporation. Infrared reflecting articles. 4,179,181, Cl. 350-1.700.
Chang, Nuke M.; Emmerson, John O.; Ritchie, Donald; and Hollenbeck, William, to Santa Fe International Corporation. Automatic pipe welding apparatus and method. 4,179,059, Cl. 228-103.000.
Charles Stark Draper Laboratory, Inc., The: *See—*
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Chekhov, Oleg S.; Rybinsky, Alexandr G.; Tjutjunnikov, Anatoly B.; Solomakha, Gennady P.; and Dilman, Viktor V. Contact apparatus for carrying out heat-and-mass exchange processes. 4,179,487, Cl. 261-114.00R.
Chemetron Corporation: *See—*
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Chemische Fabrik: *See—*
Barthell, Eduard; and Schmid, Otto, 4,179,367, Cl. 210-41.000.
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Chen, Jeffrey J.: *See—*
Savage, Elton S.; and Chen, Jeffrey J., 4,179,374, Cl. 210-151.000.
Cheng, George C. Graphic conversion system for electronic data processing. 4,179,684, Cl. 340-146.3AE.
Cheng, Jiin-Duey, to Du Pont de Nemours, E. I., and Company. Novel imidazothiazine-1,3 (2H)-diones. 4,179,276, Cl. 71-91.000.
Cheng, Tai C.; Fieldhouse, John W.; Oberster, Arthur E.; and Graves, Daniel F., to Firestone Tire & Rubber Company, The. Oil-free elastomeric poly(aryloxyphosphazene) copolymers. 4,179,555, Cl. 528-168.000.
Cheng, William J.; and Guthrie, David B., to Petrolite Corporation. Preparation of magnesium-containing dispersions from magnesium carboxylates. 4,179,383, Cl. 252-25.000.
Chester, James T. Apparatus to indicate bio-rhythm curves. 4,179,610, Cl. 235-89.00R.
Chevron Research Company: *See—*
Michlmayr, Manfred J., 4,179,361, Cl. 208-244.000.
Moore, Joseph E., 4,179,441, Cl. 548-122.000.
Chicago Bridge & Iron Company: *See—*
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Chicago Pneumatic Tool Company: *See—*
Patel, Ghanshyam C., 4,179,250, Cl. 418-195.000.
Child, James L., Jr.; Fouss, James L.; and Nowicki, Erwin K., to Hancor, Inc. Dynamic plow assembly and method of operating same. 4,179,227, Cl. 405-182.000.
Childers, Thomas W.: *See—*
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Chiron, Georges, to Saint-Gobain Industries. Multimodal resonant cavity for very high frequency heating. 4,179,595, Cl. 219-10.55F.
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CHON Corporation: *See—*
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Christensen, Kresten, to Lonza Ltd. Pesticides for snails. 4,179,499, Cl. 424-143.000.
Christensen, Rusty S.: *See—*
Godsey, Ernest E.; Hoyle, George W.; and Christensen, Rusty S., 4,179,172, Cl. 339-17.0LM.
Christian, Ted W.: *See—*
Latimer, John P.; Donaldson, Robert M.; Christian, Ted W.; and Miller, Glen E., 4,178,704, Cl. 37-57.000.
Christofas, Alkis; and Dohany, Julius E., to Pennwalt Corporation. Synergistic primer for fluoropolymer coatings. 4,179,542, Cl. 428-324.000.
Christou, Aristos; and Day, Howard M., to United States of America, Navy. Multi-refractory films for gallium arsenide devices. 4,179,533, Cl. 427-84.000.
Christou, Aristos, to United States of America, Navy. Electron collector for forming low-loss electron images. 4,179,604, Cl. 250-305.000.
Chugai Seiyaku Kabushiki Kaisha: *See—*
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Ciba-Geigy Corporation: *See—*
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Green, George E., 4,179,577, Cl. 560-52.000.
Lacroix, Roger; and Mollet, Hans, 4,179,267, Cl. 8-41.00R.
Ramanathan, Visvanathan, 4,179,435, Cl. 260-158.000.
Roth, Martin, 4,179,444, Cl. 260-326.00N.
Ciliberti, Frank L., Jr., to P. R. Mallory & Co. Inc. Battery with protectively jacketed female terminal. 4,179,545, Cl. 429-65.000.
Cincinnati Milacron Chemicals, Inc.: *See—*
Molt, Kenneth R., 4,179,432, Cl. 260-45.75S.
Cincinnati Milacron Inc.: *See—*
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Citizen Watch Company Limited: *See—*
Murakami, Tomomi; and Ichikawa, Singo, 4,178,750, Cl. 58-4.00A.
Yoshida, Hirohiko; and Nakajima, Fumio, 4,179,671, Cl. 331-116.0FE.
Clark Equipment Company: *See—*
Siewert, Robert L., 4,179,015, Cl. 188-106.00P.
Clarke, Robert L.; and Daum, Sol J., to Sterling Drug Inc. 2-Aryltropane compounds. 4,179,567, Cl. 546-124.000.
Clayton, William J.; and Kutniewski, Donald F., to Mobil Oil Corporation. Aid for kindling fires. 4,179,270, Cl. 44-40.000.
Clayton, William J., to Mobil Oil Corporation. Fatty acid diethanol amide-containing general purpose cleaner in paste form. 4,179,414, Cl. 252-548.000.
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Cole, Bert, Jr. Tool box carrying apparatus and method. 4,179,153, Cl. 296-37.100.
Cole, Herbert S., Jr.; and Aftergut, Siegfried, to General Electric Company. Dichroic dyes having a plurality of azo bonding groups. 4,179,395, Cl. 252-299.000.
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Curlee, James D. Therapeutic corset. 4,178,923, Cl. 128-78.000.
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Esders, Theodore W.; Goodhue, Charles T.; and Michrina, Christine A., 4,179,334, Cl. 195-30.000.
Hage, Charles T., 4,179,215, Cl. 355-50.000.
Losee, David L.; and Wilder, Alvin D., 4,179,528, Cl. 427-9.000.
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Econo-Cooler, Inc.: *See—*
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Edwards, Douglas C.; and Sato, Kyosaku, to Polysar Limited. Silica filled vulcanizates. 4,179,421, Cl. 260-23.70M
Effron, Edward, to Exxon Research & Engineering Co. Coal liquefaction process. 4,179,352, Cl. 208-8.0LE.
Eickhoff, Heinz: *See—*
Seiz, Rudolf; Eickhoff, Heinz; Meyer, Herbert; and Steppke, Dieter, 4,178,859, Cl. 109-27.000.
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Electric Power Research Institute, Inc.: *See—*
Garcia, Felipe G., 4,179,582, Cl. 174-15.0BH.
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Erb, Robert A., to Franklin Institute, The. Header for a solar energy collection system. 4,178,914, Cl. 126-449.000.
Erbeia, Angelo. New process for preparing pharmaceutical, cosmetic or diagnostic formulations. 4,178,695, Cl. 34-5.000.
Erdmann, Joachim C.; Gellert, Robert I.; and Skaugset, Richard L., to Boeing Company, The. Particle size analyzer. 4,179,218, Cl. 356-336.000.
Erhardt, Heinrich S., to Burroughs Corporation. Item endorsing apparatus. 4,178,847, Cl. 101-91.000.
Ermanis, Felix: *See—*
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Esders, Theodore W.; Goodhue, Charles T.; and Michrina, Christine A., to Eastman Kodak Company. Hydrolysis of protein-bound triglycerides. 4,179,334, Cl. 195-30.000.
Eskeli, Michael. Thermodynamic compressor method. 4,178,766, Cl. 62-88.000.
Etablissements Gergonne: *See—*
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Beck, Gunther; Sasse, Klaus; Heitzer, Helmut; Eue, Ludwig; Schmidt, Robert R.; Scheinpflug, Hans; Hammann, Ingeborg; and Brandes, Wilhelm, 4,179,277, Cl. 71-92.000.
Evans, F. David, to Kimwood Corporation. Apparatus for sizing and finishing batches of lumber. 4,178,721, Cl. 51-139.000.
Evans, Gregory W.; and Paul, James E., to Rockwell Internation Corporation. Autonomous, check-pointing, navigational system for an airborne vehicle. 4,179,693, Cl. 343-5.0MM.
Ex-Cell-O Corporation: *See—*
Buckley, James E.; Bartold, Mitchell E.; Heist, Marshall S.; and Jessup, James L., 4,178,790, Cl. 72-224.000.
Exxon Production Research Company: *See—*
Regan, Louis M.; Childers, Thomas W.; Anderson, Roy E.; and Burkhardt, Joseph A., 4,178,992, Cl. 166-117.600.
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Gladrow, Elroy M.; and Wheelock, Kenneth S., 4,179,409, Cl. 252-455.00Z.
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Failli, Amedeo: *See—*
Asselin, Andre A.; Humber, Leslie G.; Dionne, Gervais; Revesz, Clara; and Failli, Amedeo, 4,179,503, Cl. 424-248.510.
Fairchild, Peter T.; and Leininger, Joel C., to International Business Machines Corporation. Programmable control latch mechanism for a data processing system. 4,179,738, Cl. 364-200.000.
Fankhauser, Peter: *See—*
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Farha, Floyd E., Jr.: *See—*
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Farnworth, Ivan A.; and Farnworth, Ivan R. Safety socket. 4,179,175, Cl. 339-42.000.
Farnworth, Ivan R.: *See—*
Farnworth, Ivan A.; and Farnworth, Ivan R., 4,179,175, Cl. 339-42.000.
Faroudja, Yves C. Method and apparatus for separation of chrominance and luminance with adaptive comb filtering in a quadrature modulated color television system. 4,179,705, Cl. 358-31.000.
Farrell, Francis M., III; Otto, Robert B.; and Seim, William J., to Minnesota Mining and Manufacturing Company. Fluid dispensing piston. 4,179,050, Cl. 222-386.000.
Farrell, James L.: *See—*
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Farrington, Alan: *See—*
Vanderhoek, Naphthali N.; Nelson, Peter F.; and Farrington, Alan, 4,178,861, Cl. 162-72.000.
Farris, Richard C.; and Butler, William S., to Halliburton Company. Fluid truck snubber. 4,178,959, Cl. 137-493.300.
Fass, Carl; and Brunn, Hansjoachim, to Intertrac Viehmann & Co., Firma. Seal assembly for track-segment pivot. 4,179,130, Cl. 277-84.000.
Fauke, Allen R.: *See—*
Buriks, Rudolf S.; Fauke, Allen R.; and Griffiths, David W., 4,179,549, Cl. 525-374.000.
Fauran, Francois; Feniou, Claude; Mosser, Jacqueline; and Prat, Gisele, to Laboratoires Sarget. Method and composition for reducing serum lipid levels using p-chlorophenyl p-chlorophenoxyisobutyrate. 4,179,519, Cl. 424-308.000.
Feldman, Edward; and Guenther, Heinz R., to Perkin-Elmer Corporation, The. Self-centering pressure roller for sheet feeding mechanism. 4,179,224, Cl. 400-637.000.
Felice, Patrick E.; Gonzalez, Joseph L.; and Seidel, John G., to Westinghouse Electric Corp. Thermoluminescent dosimeter system. 4,179,614, Cl. 250-253.000.
Felter, John V. Solar heating system. 4,178,912, Cl. 126-452.000.
Felton, John C.; Badmin, John S.; and Twydell, Roland S., to Shell Oil Company. Synergistic pesticidal composition. 4,179,518, Cl. 424-300.000.

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Ferre, Michel: *See—*
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Fertig, Kenneth: *See—*
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Fethke, Wayne G.; and Mayer, Paul C., to Fiskars Manufacturing Corporation. Functional blister package for snipper-type scissors. 4,179,029, Cl. 206-349.000.
Fiat-Allis Construction Machinery, Inc.: *See—*
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Fieldhouse, John W.: *See—*
Cheng, Tai C.; Fieldhouse, John W.; Oberster, Arthur E.; and Graves, Daniel F., 4,179,555, Cl. 528-168.000.
Figura, Gene B. Awning for back pack. 4,179,053, Cl. 224-190.000.
Filippini, Jean C.: *See—*
Robert, Andre J.; Filippini, Jean C.; and Ferre, Michel, 4,179,217, Cl. 356-33.000.
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Filterwerk Mann & Hummel GmbH: *See—*
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Finch, George W.: *See—*
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Finnemore, Fred M.; and Goodwin, Robert A., to Polaroid Corporation. Strobe-light apparatus for use with photographic camera. 4,179,205, Cl. 354-145.000.
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Firestone Tire & Rubber Company, The: *See—*
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Hergenrother, William L.; and Halasa, Adel F., 4,179,553, Cl. 528-168.000.
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Hergenrother, William L.; and Halasa, Adel F., 4,179,556, Cl. 528-168.000.
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Fischbach, Wolfgang, to Heinrich Baumgarten,Eisen- und Blechenwaren Fabrik. Pot handle. 4,179,146, Cl. 294-27.00H.
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Fischer, John, to Koppers Company, Inc. Rotary valve apparatus. 4,179,043, Cl. 222-368.000.
Fisher, Frank R., Jr. Combined cap and needle structure. 4,178,930, Cl. 128-215.000.
Fiskars Manufacturing Corporation: *See—*
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Fitte, Daniel, to Rical, S.A. Closure cap for pouring or dispensing tops of bottles or similar receptacles. 4,179,044, Cl. 222-551.000.
Fiziko-Tekhnichesky Institut Akademii Nauk Belorusskoi SSR: *See—*
Yascheritsyn, Petr I.; Borisenko, Alexandr V.; Sidorenko, Valery A.; and Serebryakov, Evgeny A., 4,178,818, Cl. 82-36.00R.
Flagg, John F.; and Antos, George J., to UOP Inc. Hydrocarbon conversion with an acidic multimetallic catalytic composite. 4,179,360, Cl. 208-139.000.
Flaum, Dennis M.; and Fleishman, H. Lawrence. Modular bean bag seating devices. 4,179,158, Cl. 297-118.000.
Flavel, Malcolm D., to Allis-Chalmers Corporation. Method of controlling feed rate to crushing plant while crushers are adjusted to continually operate at full power. 4,179,074, Cl. 241-24.000.
Fleck, Fritz; Kittl, Hans; and Valenti, Salvatore, to Sandoz Ltd. Paraphenyl stilbene derivatives. 4,179,578, Cl. 560-76.000.
Fleckenstein, Elwin H.; and Welsch, Walter N., to Dynabrade, Inc. Guide wheels for belt grinder. 4,178,723, Cl. 51-170.0EB.
Fleishman, H. Lawrence: *See—*
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Fletcher, Paul C.; and Soltan, Parviz, to United States of America, Navy. Fiber optic visual display system. 4,178,708, Cl. 40-451.000.
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Floyd, Middleton B., Jr.; Weiss, Martin J.; McGahren, William J.; and Schaub, Robert E., to American Cyanamid Company. Novel hydroxy substituted 15-deoxy-5-cis-prostenoic acids and esters. 4,179,451, Cl. 260-395.000.
Floyd, Middleton B., Jr.: *See—*
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FMC Corporation: *See—*
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Fodor, Lawrence M.: *See—*
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Ford Aerospace and Communications Corporation: *See—*
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Ford, Alan T.; and Graf, Norman G. Machine for use in pictorial drafting. 4,178,709, Cl. 40-471.000.
Ford Motor Company: *See—*
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Foreman, Brian E.; and Jones, Mark A., to Burton Mechanical Contractors, Inc. Vacuum sewage system. 4,179,371, Cl. 210-63.00R.
Forman, Donald B.; and Holma, Gary M., to United States of America, Navy. Grinding and polishing tool. 4,178,722, Cl. 51-170.00T.
Forman, Hugh M., to G. D. Searle & Co. Urine meter and collection assembly. 4,178,934, Cl. 128-295.000.
Fortunato, Alfred J.: *See—*
Virgilio, Douglas R.; Campbell, Robert G.; Fortunato, Alfred J.; and Benson, Carl F., 4,178,781, Cl. 66-121.000.
Foskett, Raymond: *See—*
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Foster Wheeler Energy Corporation: *See—*
Pratt, Harry H.; and Cranstoun, David, 4,178,881, Cl. 122-235.00A.
Four Star Corporation: *See—*
Ingram, Charles E., 4,179,154, Cl. 296-91.000.
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Child, James L., Jr.; Fouss, James L.; and Nowicki, Erwin K., 4,179,227, Cl. 405-182.000.
Fox, Lyle, to Econo-Cooler, Inc. Cold air flow control apparatus. 4,178,770, Cl. 62-186.000.
Francois, Daniel; Germond, Jean-Claude; Marchal, Paul; and Vertut, Jean, to Commissariat a l'Energie Atomique. Balanced articulated manipulator. 4,179,035, Cl. 414-2.000.
Frank, Gerhard; and Kucharczyk, Eckhard, to Siegenia-Frank AG. Air vent. 4,178,841, Cl. 98-98.000.
Frank, Robert I.: *See—*
Kaplow, Roy; Frank, Robert I.; and Goodrich, Joel L., 4,179,318, Cl. 148-187.000.
Frankenberg, Alfred A., to Robertshaw Controls Company. Pneumatically operated actuator and method of making the same. 4,178,837, Cl. 91-387.000.
Franklin Institute, The: *See—*
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Franz, Gerhard; Halfter, Georg; Jaeckle, Walter; and Mindermann, Fritz, to Ciba-Geigy Corporation. Semi-continuous process for obtaining amino compounds. 4,179,476, Cl. 260-706.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
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Frayer, James A.; Stauffer, Harry C.; and Yanik, Stephen J., to Gulf Research and Development Company. Combination residual oil hydrodesulfurization and catalytic cracking process. 4,179,354, Cl. 208-89.000.
Frayer, James A.; Stauffer, Harry C.; Wynne, Francis E., Jr.; and Yanik, Stephen J., to Gulf Research and Development Company. Combination residual oil hydrodesulfurization and thermal cracking process. 4,179,355, Cl. 208-89.000.
French, John A., to United States of America, Army. Offset beacon homing. 4,179,088, Cl. 244-3.190.
Freudenschuss, Otto; Kezmickl, Eduard; and Patels, Gottfried, to Vockenhuber, Karl; and Hauser, Raimund. Adjusting mechanism for optical objective with lost-motion zone. 4,179,191, Cl. 350-187.000.
Freudenschuss, Otto; and Kittag, Gerd, to Vockenhuber, Karl; and Hauser, Raimund. Method and equipment for the production of multi-channel sound signal. 4,179,713, Cl. 360-27.000.
Friedman, Jerome D.; and Pitha, Carl A., to United States of America, Air Force. Wide band adjustable brewster angle polarizer. 4,179,190, Cl. 350-152.000.
Friedrichs, Carsten: *See—*
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Fromfield, James P., to Automatic Switch Company. Valve member for pilot operated valves. 4,179,096, Cl. 251-38.000.
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Fuji Photo Film Co., Ltd.: *See—*
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Sasazawa, Koji; Shimizu, Mahito; and Kitamoto, Tatsuji, 4,179,387, Cl. 252-62.560.
Sato, Akira; Iwamoto, Atsuo; Sakai, Takeo; and Takei, Haruo, 4,179,296, Cl. 430-574.000.
Sugiyama, Masatoshi; and Kato, Eiichi, 4,179,294, Cl. 430-522.00A.

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Fujinaga, Shigeki: *See—*
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Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, to Kuraray Co., Ltd. Substituted propargyl alcohols, allylic alcohols and unsaturated ketones, and methods for the production thereof. 4,179,579, Cl. 568-840.000.
Fujitsu Limited: *See—*
Kudo, Daiziro, 4,178,877, Cl. 118-728.000.
Kudo, Daiziro; Maeda, Kazuo; and Tanikawa, Eiki, 4,179,326, Cl. 156-612.000.
Miura, Yoshimasa, 4,179,720, Cl. 360-113.000.
Fukuhara, Toru, to Nippon Kogaku K.K. Diaphragm aperture control device in a camera. 4,179,202, Cl. 354-43.000.
Fukushima, Isao; Asada, Akihiro; and Takahashi, Kazuya, to Hitachi, Ltd. Variable impedance circuits. 4,179,650, Cl. 323-1.000.
Fukushima, Seiji: *See—*
Tomioka, Shoji; Nakao, Toshiaki; Nakamura, Hisatsugu; Mine, Nobuyoshi; Yamamoto, Katsuo; Fukushima, Seiji; and Nogami, Akira, 4,179,256, Cl. 425-71.000.
Fuller, William A., to Colt Industries Operating Corp. Acceleration pump with temperature-responsive control of delivery. 4,179,245, Cl. 417-292.000.
Funderburg, William S. Electromagnetic motor. 4,179,631, Cl. 310-20.000.
Furuitsu, Satoshi: *See—*
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Furukawa Electric Co., Ltd., The: *See—*
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G. B. R., Ltd.: *See—*
Gunther, William H., Jr.; Golicz, Roman M.; and Hough, James W., 4,179,111, Cl. 270-68.00R.
G. D. Searle & Co.: *See—*
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G. Leblanc Corporation: *See—*
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Gabel, Robert K.; Lindenberger, William H.; and Pavlicius, Audrone M., to Nalco Chemical Company. Single addition organic-inorganic blend emulsion breaking composition. 4,179,396, Cl. 252-329.000.
Gadaev, Anatoly Y.: *See—*
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GAF Corporation: *See—*
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Galey, Jean: *See—*
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Gallimore, Claris C., to F. D. Graphics, Inc. Apparatus for feeding leaflets to rapidly moving articles. 4,179,113, Cl. 271-12.000
Gallina, Salvatore; and Davidson, Stan, to M. Morell Packaging Co., Inc. Control system for an electronic music synthesizer. 4,178,821, Cl. 84-1.010.
Ganapathy, Anantharam: *See—*
Shenoy, Raghuram D.; and Ganapathy, Anantharam, 4,179,455, Cl. 260-409.000.
Shenoy, Raghuram D.; and Ganapathy, Anantharam, 4,179,456, Cl. 260-409.000.
Gandhi, Haren S.; Shelef, Mordecai; and Wynblatt, Paul P., to Ford Motor Company. Enriched rhodium catalyst and method for making same. 4,179,413, Cl. 252-472.000.
Ganley, Thomas. Rotary engine. 4,178,902, Cl. 123-231.000.
Gantevoort, Heinz L.: *See—*
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Garcia, Felipe G., to Electric Power Research Institute, Inc. High voltage high current cable terminal with dual grading capacitor stack. 4,179,582, Cl. 174-15.0BH.
Gardikes, John J., to Ashland Oil, Inc. Phenolic resin-polyisocyanate binders. 4,179,427, Cl. 260-29.2TN.
Garner, Joseph L.; and Tiffany, Peter A., to Dow Chemical Company, The. Method for expanding microspheres and expandable composition. 4,179,546, Cl. 521-56.000.
Garnett, John L.; and Kenyon, Robert S. Preparation of heterogeneous catalysts including the steps of radiation grafting of an alpha unsaturated monomer to a metal or to an organic polymer. 4,179,401, Cl. 252-429.00R.
Garrison, C. Gene; and Southern, William, to Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc. Mild detonating cord confinement. 4,178,853, Cl. 102-27.00R.
Gassner, Saul A.: *See—*
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Gebruder Lodige Maschinenbaugesellschaft mbH: *See—*
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Geckeler, Siegfried, to Siemens Aktiengesellschaft. Gradient optical fiber. 4,179,188, Cl. 350-96.310.
Gekhman, Boris S.; Vasilevsky, Petr N.; Ediny, Jury G.; Parfinenko, Ivan V.; and Podgursky, Alfred M. Method and apparatus for disintegration of urinary concretions. 4,178,935, Cl. 128-328.000.
Geller, Myer; Altman, Daniel E.; and Barstow, Glidden J., to United States of America, Navy. Electrically controllable wide angle of view optical notch filter. 4,179,194, Cl. 350-356.000.
Gellert, Robert I.: *See—*
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Schillreff, George H., 4,178,854, Cl. 102-89.0CD.
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Germer, Warren R., 4,179,654, Cl. 324-116.000.
Harris, Raymond W.; and Sherman, Ralph R., Jr., 4,179,661, Cl. 325-455.000.
Lange, Kai; and Jeppesen, Jorgen, 4,179,607, Cl. 250-363.00S.
Russell, Ronald R., 4,179,646, Cl. 318-380.000.
Schroeter, Siegfried H.; and Olson, Daniel R., 4,179,548, Cl. 525-329.000.
Slayton, Curtis R., 4,178,765, Cl. 62-83.000.
Smashey, Russell W., 4,178,986, Cl. 164-251.000.
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Britton, John, 4,179,641, Cl. 315-289.000.
General Motors Corporation: *See—*
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Burke, Harold J., 4,179,137, Cl. 280-775.000.
Cummins, Donald L.; and Stahura, Daniel W., 4,179,647, Cl. 320-6.000.
Lura, Loren E.; and Zeigler, Philip B., 4,179,167, Cl. 308-189.00A.
Stevens, Eloy C.; and Swain, Kenneth, 4,178,667, Cl. 29-156.80B.
Gentran, Inc.: *See—*
Wuertele, James W., 4,179,745, Cl. 364-571.000.
George, Leroy. Pipe tool. 4,178,668, Cl. 29-237.000.
Georgiev, Atanas G.; Daskalov, Hristo P.; Michaylov, Ventzel G.; and Konstantinova, Kina V., to DSO "Pharmachim". Derivatives of R,S-[X2-(2-hydroxyethylamino)-1-phenyl]-ethylamine, and process. 4,179,460, Cl. 260-455.00R.
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Gerber, Heinz J., to Gerber Garment Technology,. Method and apparatus for cutting sheet material with improved accuracy. 4,178,820, Cl. 83-13.000.
Gergonne, Pierre, to Etablissements Gergonne. Door stop with removable damping member. 4,178,658, Cl. 16-86.00A.
Gerkey, Kenneth S., to Westinghouse Electric Corp. Remotely operated tube expanding tool and support. 4,178,787, Cl. 72-122.000.
Germer, Warren R., to General Electric Company. Demand meter including means for selectively controlling the length of demand intervals. 4,179,654, Cl. 324-116.000.
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Gilbert, Earl F., to Westvaco Corporation. Partitioned container. 4,179,061, Cl. 229-27.000.
Gilbert, Ghislain; Galey, Jean; and Bentz, Gerard, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Protection of molten metal. 4,178,980, Cl. 164-66.000.
Gildersleeve, Hayden P., to Holly Sugar Corporation. Method and apparatus for operating rotary driers. 4,179,265, Cl. 432-36.000.
Gillette, Roger B.; and Woods, Weightstill W., to Boeing Company, The. Focusing reflector. 4,179,193, Cl. 350-295.000.
Giovanelli, Cesare, to Bottega Incisioni di Orizio-Giovanelli. Apparatus for, and a process of, sector engraving metal elements. 4,178,846, Cl. 101-5.000.
Gladrow, Elroy M.; and Wheelock, Kenneth S., to Exxon Research & Engineering Co. Hydrocarbon cracking catalyst. 4,179,409, Cl. 252-455.00Z.
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Godsey, Ernest E.; Hoyle, George W.; and Christensen, Rusty S., to Burr-Brown Research Corporation. Modular hardware packaging apparatus. 4,179,172, Cl. 339-17.0LM.
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Goodman, Vernon T. Three dimensional chess game apparatus. 4,179,127, Cl. 273-241.000.
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Goolsby, Patrick F.; Laudig, David J.; Mechler, Paul A.; Osterhus, Steven J.; and Swenck, George F., to Reynolds Metals Company. Solar collector. 4,178,909, Cl. 126-417.000.
Gordon, Maurice R. Microbiological medium suitable for sterilization by ionizing radiation. 4,179,338, Cl. 435-243.000.
Goren, Robert N., to Xerox Corporation. Multicolor line screen. 4,179,209, Cl. 355-3.00P.
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Gotoh, Miyuki; and Ogawa, Mikiyoshi, to Nissan Motor Company, Limited. System and method for controlling the stopping operations of weaving machines. 4,178,969, Cl. 139-1.00R.
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Gramer, Eben J.; and Johnson, Melvin O. Solar collector and system for mounting a plurality of solar collectors on a surface. 4,178,910, Cl. 126-442.000.
Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, to Laboratorios Made, S.A. 2,5-Dimethyl-benzo[b]-thieno[2,3-f]morphan and precursors thereof. 4,179,565, Cl. 546-63.000.
Graves, Daniel F.: *See—*
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Grocke, Diethelm W. K.; and Wittmann, Klaus, to NUTRO Patentverwertungs- und Maschinenhandels-GmbH. Installation for the production of a multiple row cask of containers. 4,179,022, Cl. 198-437.000.
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Jayne, Max L., 4,179,176, Cl. 339-74.00R.
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Gutman, Arnold D., to Stauffer Chemical Company. Certain cyanodithioimidocarbonates for controlling bacteria and fungi. 4,179,523, Cl. 424-324.000.
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Haberhauer, Helmuth, to Hoechst Aktiengesellschaft. Device for fusing toner on a carrier of electrostatic images. 4,179,600, Cl. 219-216.000.
Hacker, Hermann; and Zehenthofer, Waldemar, to Vereinigte Oesterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Apparatus for distributing solids in granular or lump form. 4,179,023, Cl. 198-631.000.
Hadden, Terence B. Drill guide. 4,179,231, Cl. 408-112.000.
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Hakansson, Lars A. H. Device for purification of liquids. 4,179,376, Cl. 210-208.000.
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Hergenrother, William L.; and Halasa, Adel F., 4,179,554, Cl. 528-168.000.
Hergenrother, William L.; and Halasa, Adel F., 4,179,556, Cl. 528-168.000.
Hale, Alan D., to Du Pont de Nemours, E. I., and Company. Melt cutter apparatus. 4,179,255, Cl. 425-67.000.
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Hanauye, Kunio; Takase, Tsutomu; and Morimoto, Yoshio, to Mitsui Toatsu Chemicals Incorporated. Laminates prepared from resol-type phenol resins. 4,179,429, Cl. 260-32.80R.
Hanaway, Roger D., to Allis-Chalmers Corporation. Tailings return for an axial flow combine. 4,178,944, Cl. 130-27.00R.
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Hanna, Bobby W. Safety electrical receptacle and plug therefor. 4,179,180, Cl. 339-189.00R.
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Hansen, Elmer K. Reversible tool mounting bracket for agricultural implements. 4,178,999, Cl. 172-702.000.
Hanses, Ulf. Knife and support element therefor. 4,178,681, Cl. 30-151.000.
Hanzawa, Hisashi; and Yoshino, Kozi, to Sony Corporation. Mode change-over device for recording and/or reproducing apparatus. 4,178,809, Cl. 74-483.0PB.
Hara, Kunio; and Yoshida, Kohsaku, to Nichi-Ei Bussan Co., Ltd. Method for continuously fixing a plurality of tubular fasteners one by one to a plurality of apertures provided in a support panel. 4,178,669, Cl. 29-412.000.
Hara, Ryoichi; Yajima, Masamichi; Akai, Chiaki; and Matsumoto, Takuzo, to Furukawa Electric Co., Ltd., The; and Sumitomo Electric Industries, Ltd. Wire forcing device for a wire take up apparatus. 4,179,083, Cl. 242-158.00R.
Harada, Genzaburo; Yen, Takuma; and Tomari, Masao, to Nippon Jiryoku Senko Co., Ltd. Process for treating molten steel slag with red mud from aluminum industry. 4,179,279, Cl. 75-24.000.
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Harris, Jerome R., to Amprint Corp. Printing and collating method. 4,179,107, Cl. 270-4.000.
Harris, Jerome R., to Amprint Corp. Collating equipment including collator and cart. 4,179,109, Cl. 270-52.000.
Harris, Raymond W.; and Sherman, Ralph R., Jr., to General Electric Company. Circuit for programming the search circuit of a radio receiver. 4,179,661, Cl. 325-455.000.
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Harvell, Don L., to Singer Company, The. Spindle locking mechanism for a rotary power device. 4,179,632, Cl. 310-50.000.
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Hawk, Robert M., to Corning Glass Works. Coupler for optical communication system. 4,179,185, Cl. 350-96.160.
Hawkins, Roland L., to Hoechst Fibers Industries, Division of American Hoechst Corporation. Staple fiber, finish therefor and process for use of same. 4,179,543, Cl. 428-361.000.
Hawton, John T., Jr.; and Shumate, William G., to Hewlett-Packard Company. Cylindrical magnetron sputtering source. 4,179,351, Cl. 204-298.000.
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Hayes, James L.; and Greenslade, John T., to Eltra Corporation. Unitary foldable dispenser reel and container with removable dispenser portion. 4,179,030, Cl. 206-396.000.
Hayes, John C.; and Pollitzer, Ernest L., to UOP Inc. Hydrocarbon conversion with an acidic multimetallic catalytic composite. 4,179,359, Cl. 208-139.000.
Hayes, Robert R., to Oatey Co. Hand scraper. 4,178,663, Cl. 29-78.000.
Heberle, Heinz, to Rigert Maschinenbau AG. Stairway-type passenger lift. 4,179,012, Cl. 187-12.000.
Heesen, Theodorus J. Press. 4,179,257, Cl. 425-331.000.
Heiba, El-Ahmadi I.; and Williams, Albert L., to Mobil Oil Corporation. Biodegradable hard water detergents. 4,179,392, Cl. 252-108.000.
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Heider, Joachim: *See—*
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Hein, Paul R.; and Irvin, Robert A., to W. R. Grace & Co. Polythiol effect, curable monoalkenyl aromatic-diene and ene composition. 4,179,531, Cl. 430-300.000.
Heine, Arnold J.: *See—*
Skinner, Robert I.; and Heine, Arnold J., 4,179,104, Cl. 267-154.000.
Heinrich Baumgarten,Eisen- und Blechenwaren Fabrik: *See—*
Fischbach, Wolfgang, 4,179,146, Cl. 294-27.00H.
Heise, Arend: *See—*
Junge, Bodo; Bossert, Friedrich; Meyer, Horst; Wehinger, Egbert; Vater, Wulf; Heise, Arend; Kazda, Stanislav; and Stoepel, Kurt, 4,179,500, Cl. 424-180.000.
Heist, Marshall S.: *See—*
Buckley, James E.; Bartold, Mitchell E.; Heist, Marshall S.; and Jessup, James L., 4,178,790, Cl. 72-224.000.
Heitzer, Helmut: *See—*
Beck, Gunther; Sasse, Klaus; Heitzer, Helmut; Eue, Ludwig; Schmidt, Robert R.; Scheinpflug, Hans; Hammann, Ingeborg; and Brandes, Wilhelm, 4,179,277, Cl. 71-92.000.
Helfer, Joel N.: *See—*
Bratten, William R.; and Helfer, Joel N., 4,179,364, Cl. 210-321.00B.
Helmig, Richard W. Method and apparatus for offset printing employing fluoroelastomers. 4,178,850, Cl. 101-451.000.
Henderson, Donald L. Removable cover and holder therefor. 4,179,144, Cl. 292-202.000.
Hendricks, Fred; and Draper, Cassius W. Bowling ball kicker pressure device. 4,179,120, Cl. 273-49.000.
Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See—*
Andree, Hans; Jung, Dieter; Bischoff, Martin; Conrad, Jens; Huppertz, Josef; Jakobi, Gunter; Krings, Peter; Kuhling, Dieter; Reuter, Herbert; Rupilius, Wolfgang; Rutzen, Horst; and Schnegelberger, Harald, 4,179,393, Cl. 252-155.000.
Kaufmann, Jochen; Berg, Markus; and Krings, Peter, 4,179,391, Cl. 252-99.000.
Reinwald, Elmar; Smolka, Heinz; Schwuger, Milan J.; and Koppelmann, Edgar, 4,179,268, Cl. 8-137.000.
Henneberg, Helmut: *See—*
Daniels, George R.; and Henneberg, Helmut, 4,179,169, Cl. 312-257.00R.
Henschen, Lawrence J. Computerized unit organ relay. 4,178,828, Cl. 84-337.000.
Hergenrother, William L.; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Polyphosphazene polymers containing cyclic ketal substituents. 4,179,553, Cl. 528-168.000.
Hergenrother, William L.; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Polyphosphazene copolymers containing dialkyl aminoxy substituents. 4,179,554, Cl. 528-168.000.
Hergenrother, William L.; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Polyphosphazene polymers containing substituents derived from ketoximes. 4,179,556, Cl. 528-168.000.
Heritage Quilts Inc.: *See—*
Wrightson, John C., 4,178,637, Cl. 2-69.500.
Hermann Rossler: *See—*
Krumeich, Jorg; and Rossler, Hermann, 4,179,195, Cl. 351-4.000.
Herrenschmidt, Gilles R. Variable ratio full range direct-reflected pyramid inclined loudspeaker. 4,179,585, Cl. 179-1.00E.
Herschtal, Ludwik, to L. M. Ericsson Pty. Ltd. Bit switching of word formatted data. 4,179,587, Cl. 179-15.0AT.
Herth, Harro, to Robert Bosch GmbH. Method and apparatus for fuel/air mixture adjustment. 4,178,883, Cl. 123-32.0EE.

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Hesler, Dietrich: *See—*
Nicklas, Walter; Hesler, Dietrich; and Gresser, Gerhard, 4,178,876, Cl. 118-681.000.
Hess, Dieter; Friedrichs, Carsten; and Daubenbuchel, Werner, to Kautex-Werke Reinold Hagen GmbH. Multiple extrusion head extrusion blow moulding apparatus. 4,179,251, Cl. 425-140.000.
Heusler, Helmut; and Behle, Fritz, to O&K Orenstein & Koppel Aktiengesellschaft. Transporter for the transportation of pieces of baggage integrated with an escalator. 4,179,020, Cl. 198-326.000.
Hewlett-Packard Company: *See—*
Hawton, John T., Jr.; and Shumate, William G., 4,179,351, Cl. 204-298.000.
Pirkle, Sherman J., 4,179,728, Cl. 363-59.000.
Heybey, Otfried W. G., to Whirlpool Corporation. Temperature sensor. 4,179,680, Cl. 338-25.000.
Higuchi, Kenichi. Fishing rod made of fiber reinforced synthetic resin. 4,178,713, Cl. 43-18.0GF.
Hildebrand, B. Percy; and Posakony, Gerald J., to Electric Power Research Institute, Inc. Method and apparatus for energizing an array of acoustic transducers to eliminate grating lobes. 4,179,683, Cl. 367-138.000.
Hildebrand, Donald L.: *See—*
Wolynec, John J.; Hildebrand, Donald L.; and Wasynczuk, Victor, 4,178,647, Cl. 15-84.000.
Hilfman, Lee: *See—*
O'Hara, Mark J.; Johnson, Russell W.; and Hilfman, Lee, 4,179,356, Cl. 208-111.000.
Hines, Charles E.; and Williams, Dwight E., to Outboard Marine Corporation. Soil treatment liquid injection device. 4,178,860, Cl. 111-7.000.
Hines, William W.: *See—*
Splitt, Frank G.; Cwirzen, Casimir; Hines, William W.; and Ladd, Arnold M., 4,179,170, Cl. 339-14.00R.
Hirano, Shigeo; Adachi, Keiichi; Sakanoue, Seiki; and Kamio, Takayoshi, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material. 4,179,293, Cl. 430-551.000.
Hirohata, Michio; Suzuki, Toyotosi; Yokota, Hideo; Matsuda, Mutsuhide; Taguchi, Tetsuya; and Sanada, Noriaki, to Canon Kabushiki Kaisha. Camera equipped with data recording device. 4,179,203, Cl. 354-106.000.
Hirsch, Irving A., to Boeing Company, The. Automatic control system for hydrofoil craft. 4,178,871, Cl. 114-275.000.
Hirt, Paul R. Adjustable post-surgical shoe. 4,178,925, Cl. 128-83.500.
Hisajima, Masahiko: *See—*
Kimura, Hiroshi; Kitagawa, Takaichi; Hisajima, Masahiko; Yoshikado, Shoji; and Aizawa, Tatsuo, 4,179,211, Cl. 355-14.00R.
Hitachi, Ltd.: *See—*
Fukushima, Isao; Asada, Akihiro; and Takahashi, Kazuya, 4,179,650, Cl. 323-1.000.
Kotoyori, Akira, 4,179,200, Cl. 354-1.000.
Muto, Nobuyoshi; Matsuda, Yasuo; and Honda, Kazuo, 4,179,727, Cl. 363-41.000.
Ogiwara, Kenzyu; Inoue, Hisao; and Naganuma, Susumu, 4,179,237, Cl. 415-1.000.
Tateshita, Tadao; Mita, Yasuhiro; Nakayama, Junichi; and Sato, Koichi, 4,179,242, Cl. 417-8.000.
Hitachi Shipbuilding & Engineering Co., Ltd.: *See—*
Inaba, Hideya; Kamino, Yasumi; Onizuka, Shigenori; and Inazumi, Chikashi, 4,179,412, Cl. 252-472.000.
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Yamaga, Eiichi, to Nippon Gakki Seizo Kabushiki Kaisha. Envelope generator. 4,178,826, Cl. 84-1.260.
Hobbs, Charles F., to United States of America, Air Force. Anti-jamming communication system. 4,179,657, Cl. 325-33.000.
Hockiki Corporation: *See—*
Adachi, Akio, 4,179,751, Cl. 365-228.000.
Hodgson, Eric C.: *See—*
Alderman, William; and Hodgson, Eric C., 4,179,016, Cl. 192-4.00A.
Hoechst Aktiengesellschaft: *See—*
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 4,178,705, Cl. 38-144.000.
Haberhauer, Helmuth, 4,179,600, Cl. 219-216.000.
Klupfel, Kurt-Walter; and Sprengel, Heide, 4,179,292, Cl. 430-175.000.
Hoechst Fibers Industries, Division of American Hoechst Corporation: *See—*
Hawkins, Roland L., 4,179,543, Cl. 428-361.000.
Hoeft, Karl: *See—*
Bestenreiner, Friedrich; Giglberger, Dieter; Hoeft, Karl; and Kohler, Robert, 4,179,210, Cl. 355-10.000.
Hoehn, Hans; Bernstein, Jack; and Vogt, Berthold R., to E. R. Squibb & Sons, Inc. 1,5,6,11-Tetrahydro[5,6]cyclohepta[1,2-b]pyrazolo[4,3-e]pyridine derivatives. 4,179,564, Cl. 546-64.000.
Hoesch Werke Aktiengesellschaft: *See—*
Schultz, Helmut, 4,178,692, Cl. 33-182.000.
Hoffman, Robert E.; Williams, Richard B.; and Wright, Carl J., to White Consolidated Industries, Inc. Dishwasher fill system. 4,178,957, Cl. 137-387.000.
Hoffmann-La Roche Inc.: *See—*
Berger, Leo; and Scott, John W., 4,179,443, Cl. 260-315.000.
Hollenbeck, William: *See—*
Chang, Nuke M.; Emmerson, John O.; Ritchie, Donald; and Hollenbeck, William, 4,179,059, Cl. 228-103.000.
Holly Sugar Corporation: *See—*
Gildersleeve, Hayden P., 4,179,265, Cl. 432-36.000.
Holma, Gary M.: *See—*
Forman, Donald B.; and Holma, Gary M., 4,178,722, Cl. 51-170.00T.
Holmstrom, Paul E., to Warner & Swasey Company, The. Machine tool having deflection compensation for tool support arm. 4,178,834, Cl. 409-80.00C.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Yamabe, Hitoshi; Otaka, Syoichi; and Watanabe, Masao, 4,178,890, Cl. 123-103.00R.
Honda, Kazuo: *See—*
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Honeywell Information Systems Inc.: *See—*
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Wilhite, John E., 4,179,736, Cl. 364-200.000.
Honeywell Ltd.: *See—*
Jacobsen, William F., 4,179,623, Cl. 250-573.000.
Honig, Dietmar: *See—*
Brandmair, Franz; Rubisch, Ottmar; and Honig, Dietmar, 4,179,289, Cl. 75-206.000.
Honig, Helmut: *See—*
Pampouchidis, Georgios; and Honig, Helmut, 4,179,425, Cl. 260-29.6NR.
Honnold, Fred V.: *See—*
Cann, Peter L.; Karns, Phil J.; and Honnold, Fred V., 4,178,988, Cl. 165-2.000.
Hood, John D.: *See—*
Box, Stephen J.; and Hood, John D., 4,179,498, Cl. 424-117.000.
Hoover Company, The: *See—*
Tschudy, Donald B., 4,178,653, Cl. 15-383.000.
Hori, Kenji: *See—*
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Kiyota, Yuhiko; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,178,889, Cl. 123-75.00B.
Horikoshi, Masafumi; Nohira, Hidetaka; and Tanaka, Masaaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recycling system. 4,178,896, Cl. 123-119.00A.
Hoseney, Russell C.: *See—*
Sieb, Paul A.; Deyoe, Charles W.; and Hoseney, Russell C., 4,179,445, Cl. 260-340.90R.
Hosogai, Takeo: *See—*
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, 4,179,579, Cl. 568-840.000.
Hough, James W.: *See—*
Gunther, William H., Jr.; Golicz, Roman M.; and Hough, James W., 4,179,111, Cl. 270-68.00R.
Houghland, Stephen E., to Minnesota Mining and Manufacturing Company. Thermal switch. 4,179,679, Cl. 337-407.000.
Hourihan, Glyn: *See—*
Davies, Michael; Hourihan, Glyn; and Smith, Frank, 4,179,653, Cl. 324-65.0CR.
Howe, Arthur T.; and Shilton, Mark G., to National Research Development Corporation. Electrical device with separator as conductor for hydrogen cations. 4,179,491, Cl. 423-253.000.
Howe, Robert R. Wind operated power generating apparatus. 4,179,007, Cl. 180-65.0DD.
Hoya Corporation: *See—*
Sagara, Hiroji, 4,179,300, Cl. 106-47.00Q.
Hoyle, George W.: *See—*
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Hozumi, Shiro: *See—*
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Hruza, Anne: *See—*
Withycombe, Donald A.; Hruza, Anne; Vock, Manfred H.; Giacino, Christopher; Mookherjee, Braja D.; Pittet, Alan O.; and Schreiber, William L., 4,179,526, Cl. 426-535.000.
Hsieh, Henry L., to Phillips Petroleum Company. Blends of cyclodiene-containing copolymers and block copolymers having improved high temperature green tensile strength. 4,179,480, Cl. 525-99.000.
Hubert, Francois M. A.: *See—*
Piette, Remi R.; and Hubert, Francois M. A., 4,179,025, Cl. 198-833.000.
Hubner, Wolfgang; Barthell, Edward; and Dahmen, Kurt, to Chemische Fabrik Stockhause & Cie. Flocculating agent comprising water-in-oil emulsion of stabilizer plus NH-active polymer carrying formaldehyde and amine radicals. 4,179,370, Cl. 210-51.000.
Hueil, J. Charles: *See—*
Becht, Carl T.; and Hueil, J. Charles, 4,179,057, Cl. 227-19.000.
Hughes, Charles C., to R. A. Jones & Co. Inc. Carton erecting apparatus. 4,178,839, Cl. 93-53.0SD.
Hugl, Herbert; Schundehutte, Karl H.; Trautner, Kersten; and Wolfrum, Gerhard, to Bayer Aktiengesellschaft. Monoazodyestuffs containing diphenamine and phenoxy components. 4,179,436, Cl. 260-206.000.
Huisman, Marinus, to Volkswagenwerk Aktiengesellschaft. Vehicle sun roof cover. 4,179,156, Cl. 296-137.00B.

Huitson, John J., to BP Chemicals Limited. Certain complex salts of mono carboxylic acids used as preservatives. 4,179,522, Cl. 424-317.000.
Humber, Leslie G.: *See—*
Asselin, Andre A.; Humber, Leslie G.; Dionne, Gervais; Revesz, Clara; and Failli, Amedeo, 4,179,503, Cl. 424-248.510.
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Hunt, Roger A., to ICN Medical Laboratories, Inc. Platelet control composition. 4,179,398, Cl. 252-408.000.
Huppertz, Josef: *See—*
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Husky Injection Molding Systems Inc.: *See—*
Brown, Paul, 4,179,254, Cl. 425-438.000.
Huss, Charles P., to Minnesota Mining and Manufacturing Company. Apparatus and method for releasably securing sheet material to the drum of a drum-type facsimile machine. 4,179,118, Cl. 271-277.000.
Hutchison, J. A., to Solar Kinetics, Inc. Solar collector system. 4,178,913, Cl. 126-424.000.
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Limberg, Jaroslav; Limberg, Tomas; and Rayman, Vaclav, 4,179,340, Cl. 202-262.000.
Hutson, Thomas, Jr.; and Farha, Floyd E., Jr., to Phillips Petroleum Company. Conversion of low octane number alkylate to high octane gasoline and aromatics. 4,179,353, Cl. 208-65.000.
Hydragon Corporation, The: *See—*
Earnest, Ernest R., 4,178,754, Cl. 60-39.030.
Ichikawa, Singo: *See—*
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ICN Medical Laboratories, Inc.: *See—*
Hunt, Roger A., 4,179,398, Cl. 252-408.000.
Iida, Kazumi, to Yamaha Hatsudoki Kabushiki Kaisha. Intake distributor for two-cycle internal combustion engines. 4,178,887, Cl. 123-73.00V.
Iijima, Yukihiko: *See—*
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Iiyama, Kiyotaka; Matsui, Takeshi; Kusakata, Shigeru; Watanabe, Hideo; and Takahashi, Michihisa, to Ricoh Co., Ltd. Catalyst bed for use in decomposition of ammonia gas. 4,179,407, Cl. 252-446.000.
Iizuka, Jinya; Kato, Seinosuke; and Matsuda, Akio, to Sumitomo Electric Industries Ltd. Method and apparatus for displacing oil and seawater in tanks of an oil tank. 4,178,868, Cl. 114-74.00R.
Ilmoniemi, Erkki; and Kokkonen, Olavi, to Valmet Oy. Apparatus for damping pressure and consistency perturbations in a pulp suspension flow. 4,179,332, Cl. 162-380.000.
Imai, Tamotsu, to UOP Inc. Preparation of amines. 4,179,469, Cl. 260-577.000.
Imamura, Kazuo: *See—*
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Imamura, Nobutake; Mimura, Yoshinori; and Kobayashi, Toshihiko, to Kokusai Denshin Denwa Kabushiki Kaisha. Thin film magnetic head. 4,179,719, Cl. 360-112.000.
IMC Magnetics Corporation: *See—*
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Imperial Chemical Industries Limited: *See—*
Davies, Michael; Hourihan, Glyn; and Smith, Frank, 4,179,653, Cl. 324-65.0CR.
Inaba, Hideya; Kamino, Yasumi; Onizuka, Shigenori; and Inazumi, Chikashi, to Hitachi Shipbuilding & Engineering Co., Ltd. Process for producing catalyst precursors for decomposing ammonia by oxidation and precursors produced by said process. 4,179,412, Cl. 252-472.000.
Inaba, Shigeho: *See—*
Yamamoto, Michihiro; Morooka, Shigeaki; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 4,179,560, Cl. 544-250.000.
Inaga, Hisashi, to Kioritz Corporation. Chain saw. 4,178,685, Cl. 30-381.000.
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Inderbitzen, Emil R.: *See—*
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Borre, Earl A., 4,179,378, Cl. 210-232.000.
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Ing. C. Olivetti & C., S.p.A.: *See—*
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Ingram, Charles E., to Four Star Corporation. Air velocity responsive deflector. 4,179,154, Cl. 296-91.000.
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Inoue, Yoshio: *See—*
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Institut de Recherches de la Siderurgie Francaise: *See—*
Birat, Jean-Pierre; and Ventavoli, Roger, 4,178,979, Cl. 164-49.000.
Institut vysokikh temperatur Akademii Nauk SSSR: *See—*
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Intel Corporation: *See—*
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International Business Machines Corporation: *See—*
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Keller, John H.; McKenna, Charles M.; and Winnard, James R., 4,179,312, Cl. 148-1.500.
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Queener, Carl A., 4,179,213, Cl. 355-14.00R.
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International Flavors & Fragrances Inc.: *See—*
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International Telephone and Telegraph Corporation: *See—*
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Wallace, Charles H., 4,179,021, Cl. 198-341.000.
Intertrac Viehmann & Co., Firma: *See—*
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Intreprinderea de Antibiotice Iasi: *See—*
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Irani, Cyrus A.; Kasegrande, Stephen S.; McHugh, Daniel J.; and Leder, Frederic. Process for aromatics extraction from a 300°–430° F. boiling range naphtha. 4,179,362, Cl. 208-321.000.
Irvin, Robert A.: *See—*
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Isaac, L. Henry; Nowak, Edward J.; and Schmitz, Charles R., to Display Corporation International. Display device having a locking mechanism. 4,179,168, Cl. 312-125.000.
Ishiguro, Tatsuo; Suzuki, Norio; and Iijima, Yukihiko, to Nippon Electric Co., Ltd. Predictive encoder with a non-linear quantizing characteristic. 4,179,710, Cl. 358-135.000.
Ishii, Koji, to Ryobi Ltd. Automatic plate supplying device for use in an offset printing machine. 4,178,848, Cl. 101-142.000.
Ishikawa, Hidenobu: *See—*
Sunada, Masuyuki; Takanashi, Hirotugu; Ishikawa, Hidenobu; Takahashi, Akikazu; and Yoshino, Fumio, 4,179,417, Cl. 260-18.0EP.
Ishikawa, Tatsuo, to Ube Industries. Apparatus for supplying inserts to the metal mold of injection molding machines. 4,178,984, Cl. 164-333.000.
Ishikawa, Youhei: *See—*
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Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
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Ishimaru, Toshiyasu; Shimonishi, Yasutsugu; Sakurai, Hisayuki; and Hatanaka, Minoru, to Osaka University, President of. Acylation of 7-aminocephalosporanic acids. 4,179,557, Cl. 544-28.000.
Ishimoto, Tasuku: *See—*
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ITI Limited: *See—*
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Ito, Akira; and Matsui, Masao, to Nissan Motor Company, Limited; and Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Fire extinguishing system for warehouses. 4,178,994, Cl. 169-52.000.
Ito, Akitoshi: *See—*
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Ito, Sadayoshi: *See—*
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Iura, Yukio: *See—*
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Watanabe, Satoshi; Yamamichi, Masayoshi; and Aizawa, Hiroshi, 4,179,206, Cl. 354-152.00C.
Iwamoto, Atsuo: *See—*
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J. E. Hanger & Company Limited: *See—*
May, Denis R. W., 4,178,642, Cl. 3-28.000.
J. M. Eltzroth & Associates, Inc.: *See—*
Miller, Russell C., 4,179,305, Cl. 106-292.000.

J. R. Short Milling Company: *See—*
Kleinschmidt, Albert W., 4,179,525, Cl. 426-19.000.
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Jacobsen, William F., to Honeywell Ltd. Pulsed level sensor. 4,179,623, Cl. 250-573.000.
Jaeckle, Walter: *See—*
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Janssen, Eduard J. P., to U.S. Philips Corporation. Electric incandescent lamp. 4,179,636, Cl. 313-274.000.
Janssen, Paul A. J.; and Van Daele, Georges H. P., to Janssen Pharmaceutica N.V. N-(4-piperidinyl)-N-phenylamides. 4,179,569, Cl. 546-223.000.
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Raeymaekers, Alfons H. M.; Van Gelder, Josephus L. H.; Boeckx, Gustaaf M.; and Van Hemeldonck, Lodewijk L., 4,179,505, Cl. 424-250.000.
Jaulmes, Eric, to Ateliers de la Motobecane S.A. Carburetor and crankcase arrangement in a single-cylinder two-stroke engine. 4,178,888, Cl. 123-73.00V.
Jayne, Max L., to GTE Sylvania Incorporated. Circuit board connector. 4,179,176, Cl. 339-74.00R.
Jendersee, Melvin H.: *See—*
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Jennings, Ralph L., to Economy Forms Corporation. Wall structure for a nuclear reactor containment housing. 4,178,729, Cl. 52-284.000.
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Jepson, Stanley R.: *See—*
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Kivel, Bennett, 4,179,272, Cl. 55-1.000.
Jeschke, Peter; and Gelsdorf, Gunter, to Didier-Werke A.G. Refractory plate for slide closures of metallurgical vessels. 4,179,046, Cl. 222-600.000.
Jessup, James L.: *See—*
Buckley, James E.; Bartold, Mitchell E.; Heist, Marshall S.; and Jessup, James L., 4,178,790, Cl. 72-224.000.
Jessup, Wilbur F., to Cincinnati Milacron Inc. Centerless grinding machine. 4,178,719, Cl. 51-103.0TF.
Jet Press, Inc.: *See—*
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Johanns, Heinz, to AGFA-Gevaert A.G. Process and an apparatus for loading a cassette with an endless roll. 4,179,079, Cl. 242-56.00R.
Johanson, John E., to Johanson Manufacturing Corporation. Sealed tunable capacitor. 4,179,722, Cl. 361-293.000.
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Johnsen, Clifford N., to Trane Company, The. System for producing refrigeration and a heated liquid and control therefor. 4,178,769, Cl. 62-180.000.
Johnson, James S., to Sperry Rand Corporation. Gyroscope rate range switching and control system. 4,179,087, Cl. 244-175.000.
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Bemmels, Cyrus W., 4,179,415, Cl. 260-4.00R.
Johnson, Melvin O.: *See—*
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Johnson, Ralph E.: *See—*
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Johnson, Robert J. Snap hook. 4,179,148, Cl. 294-78.00R.
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Stern, Louis P.; and Johnson, Steven J., 4,179,742, Cl. 364-494.000.
Johnson, Timothy E.: *See—*
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Johnston, David B. R., to Merck & Co., Inc. Process for preparing 17β-carboxy-5-androsten-3-ones. 4,179,453, Cl. 260-397.100.
Jones, Aaron U., to Seneca Sawmill Company, Inc. Board separator. 4,179,236, Cl. 414-117.000.
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Jones, Mark A.: *See—*
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Jones, Robert J.; Green, Howard E.; and Quinlivan, Sandra C., to TRW, Inc. Low temperature durable compliant bismaleimide compositions. 4,179,551, Cl. 526-262.000.
Jones, Tod A. Fish egg planting method. 4,178,878, Cl. 119-3.000.
Jones, Trevor E., to Albright & Wilson Limited. Process for preparing organotin compounds. 4,179,458, Cl. 260-429.700.
Joosten, Joannes J. W. M.: *See—*
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Jorgensen, George N., to Square D Company. Joint clip assembly for bus bars. 4,179,174, Cl. 339-22.00B.
Judd, George G., to Woodville Lime & Chemical Company. Preparation of pure magnesian values. 4,179,490, Cl. 423-165.000.
Jugle, Lawrence C.; Inderbitzen, Emil R.; and McDaniel, Paul W., to Union Carbide Corporation. Environmental sampling device. 4,178,794, Cl. 73-28.000.
Julich, Harry. Low-friction piston. 4,178,899, Cl. 123-193.00P.
Jumberca, S.A.: *See—*
Schreiner, Juan M., 4,178,779, Cl. 66-54.000.
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Juntgen, Harald: *See—*
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Kane, Bernard J.; and Von Gemk, Richard A., to SCM Corporation. Cyclic terpenoid onium salts, their preparation and uses. 4,179,468, Cl. 260-567.60M.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
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Kaplow, Roy; Frank, Robert L.; and Goodrich, Joel L., to Massachusetts Institute of Technology. Method of making a solar-cell array. 4,179,318, Cl. 148-187.000.
Karas, Genrikh E.; Lebedeva, Ljudmila P.; Mukhin, Anatoly A.; Pivovarov, Anatoly D.; Skrynnikov, Vladimir I.; Yam, Vladimir M.; Oleinik, Vladimir T.; Miroshnichenko, Vladimir V.; Kovtun, Vasily A., deceased; by Kovtun, Lidia P., administrator; by Soshnikova, Inna V., administrator; and by Kovtun, Sergei V., administrator. Method of molding products from moist materials and apparatus realizing same. 4,179,258, Cl. 425-352.000.
Karl M. Reich Maschinenfabrik GmbH, Firma: *See—*
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Karlin, Richard A.; McDonald, Robert W.; and Comiskey, Gary F., to Sun Electric Corporation. Voltage supply apparatus powered from a vehicular electrical system. 4,179,649, Cl. 320-13.000.

Karll, Bent, to Danfoss A/S. Compressor refrigerator. 4,178,771, Cl. 62-200.000.
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Keane, William J.; and Mezak, John A., to Eaton Corporation. Compact RF structure for nonreciprocal ferromagnetic resonance coupling. 4,179,674, Cl. 333-204.000.
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Keller, John H.; McKenna, Charles M.; and Winnard, James R., to International Business Machines Corporation. Formation of epitaxial layers doped with conductivity-determining impurities by ion deposition. 4,179,312, Cl. 148-1.500.
Kelly, Donald A. Magnetic wheel drive. 4,179,633, Cl. 310-80.000.
Kelmanski, Pedro. Tennis racket with adjustable weight. 4,179,121, Cl. 273-73.00R.
Kemp, Willard E.; and Morrison, Bert L., to ACF Industries, Incorporated. Method of making a fabricated gate valve. 4,178,665, Cl. 29-157.10R.
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Kim, Leo; Paxson, Timm E.; and Tang, Sunny C., to Shell Oil Company. Resin-metal-ligand composition. 4,179,402, Cl. 252-431.00C.
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Kitagawa, Toshikatsu, to Miyakawa Industry Company Limited. Multiple spindle drilling machine for wide flange beams. 4,179,230, Cl. 408-39.000.
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Kleinschmidt, Albert W., to J. R. Short Milling Company. Methods for forming stable dispersions of glutens which tend to agglomerate. 4,179,525, Cl. 426-19.000.

Klieves, Hal. Diaphragm valve and valve system. 4,178,954, Cl. 137-119.000.

Klimazewski, Leo T.; and McNairy, James A., to ACF Industries, Incorporated. Forced air control valve for exhaust system of internal combustion engine. 4,178,755, Cl. 60-290.000.

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Klupfel, Kurt-Walter; and Sprengel, Heide, to Hoechst Aktiengesellschaft. Light-sensitive copying composition. 4,179,292, Cl. 430-175.000.

Knapp, Heinrich; and Hans, Waldemar, to Robert Bosch GmbH. Electromagnetically operated fuel injection valve. 4,179,069, Cl. 239-125.000.

Knight, Jack B., to Philip Morris Incorporated. Apparatus and method for control of air relative humidity with reduced energy usage in the treatment of tobacco. 4,178,946, Cl. 131-135.000.

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Knosp, Helmut, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Silver free, low gold-noble metal alloys for firing of dental porcelain. 4,179,286, Cl. 75-134.00N.

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Kobayashi, Minoru, to Olympus Optical Company, Ltd. Method of recording an index signal in dictating tape recorder. 4,179,714, Cl. 360-61.000.

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Imamura, Nobutake; Mimura, Yoshinori; and Kobayashi, Toshihiko, 4,179,719, Cl. 360-112.000.

Koch, James H.; and Ritzenthaler, Richard A., to N L Industries, Inc. Method of making an article having a cast-in place bearing. 4,179,313, Cl. 148-3.000.

Kodama, Mikio: *See—*
Sakano, Hajime; Kawagishi, Shigemitsu; Kodama, Mikio; Ito, Akitoshi; Shoji, Toshihiro; Terada, Miyuki; and Yoshida, Isao, 4,179,341, Cl. 204-20.000.

Koehler, Charles E.: *See—*
Curtiss, John N.; Koehler, Charles E.; and Murray, Pat L., 4,179,094, Cl. 249-82.000.

Koenig, Karl-Heinz: *See—*
Thym, Sabine; Koenig, Karl-Heinz; and Hamprecht, Gerhard, 4,179,465, Cl. 260-544.00C.

Kohler, Robert: *See—*
Bestenreiner, Friedrich; Giglberger, Dieter; Hoeft, Karl; and Kohler, Robert, 4,179,210, Cl. 355-10.000.

Kokkonen, Olavi: *See—*
Ilmoniemi, Erkki; and Kokkonen, Olavi, 4,179,332, Cl. 162-380.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Imamura, Nobutake; Mimura, Yoshinori; and Kobayashi, Toshihiko, 4,179,719, Cl. 360-112.000.
Sakai, Kazuo; Akiba, Shigeyuki; and Yamamoto, Takaya, 4,179,317, Cl. 148-171.000.

Kokusai Gijutsu Kaihatsu Co., Ltd.: *See—*
Nakauchi, Shunsaku; and Takahashi, Akifusa, 4,179,606, Cl. 250-339.000.

Kollensperger, Friedrich-Gero; Hartleben, York; Kretzschmar, Rolf; and Neteler, Bernhard. 4-(Alpha-hydroxy-isopropyl)-5-phenyl-oxazolidin-2-one. 4,179,442, Cl. 548-232.000.

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Konishiroku Photo Industry Co., Ltd.: *See—*
Morishita, Taneji, 4,179,077, Cl. 242-55.000.
Tarumi, Noriyoshi; Ueno, Kenji; and Sakaguchi, Hirofumi, 4,179,601, Cl. 219-216.000.

Konno, Toshiro: *See—*
Umezaki, Hideo; Doma, Katsuharu; Konno, Toshiro; Yanashita, Fumio; Saito, Yoshio; and Sawafuji, Tosuke, 4,178,752, Cl. 58-126.00E.

Konstantinova, Kina V.: *See—*
Georgiev, Atanas G.; Daskalov, Hristo P.; Michaylov, Ventzel G.; and Konstantinova, Kina V., 4,179,460, Cl. 260-455.00R.

Konther Chamorro, Sigfrido: *See—*
Konther, Siegfried; Konther Chamorro, Sigfrido; and Konther Chamorro, Udi, 4,178,885, Cl. 123-44.00C.

Konther Chamorro, Udi: *See—*
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Kooi, Edward: *See—*
Adams, Leo; and Kooi, Edward, 4,178,652, Cl. 15-302.000.

Koppelmann, Edgar: *See—*
Reinwald, Elmar; Smolka, Heinz; Schwuger, Milan J.; and Koppelmann, Edgar, 4,179,268, Cl. 8-137.000.

Koppers Company, Inc.: *See—*
Fischer, John, 4,179,043, Cl. 222-368.000.

Koppl, Franz; Hamster, Helmut; Griesshammer, Rudolf; and Lorenz, Helmut, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Process for the deposition of pure semiconductor material. 4,179,530, Cl. 427-51.000.

Koren, James T. Bow draw indicator and sighting device. 4,179,613, Cl. 250-215.000.

Koshiba, Masao: *See—*
Yamamoto, Michihiro; Morooka, Shigeaki; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 4,179,560, Cl. 544-250.000.

Kosiak, Michael, to Medrest Corporation. Tapered roller pressure relief support. 4,178,921, Cl. 128-58.000.

Koster, Kari: *See—*
Riess, Guido; Heide, Helmut; Reiner, Roland; Koster, Kari; and Brotz, Gunther, 4,178,686, Cl. 433-201.000.

Kosto, Timothy J., to Union Carbide Corporation. Method for adding manganese to a molten magnesium bath. 4,179,287, Cl. 75-168.00E.

Kosugi, Masao; and Yoshinari, Hideki, to Canon Kabushiki Kaisha. Method for opposing a sheet-like material to a standard plane with predetermined space therebetween. 4,179,110, Cl. 270-58.000.

Kothmann, Richard E., to Westinghouse Electric Corp. Cooled turbine blade. 4,179,240, Cl. 416-96.00R.

Kotoyori, Akira, to Hitachi, Ltd. Screen coating system for panel of color picture tube. 4,179,200, Cl. 354-1.000.

Kouse, Charles H.; and Herzog, James L., to Carrier Corporation. Tube cleaning device. 4,178,649, Cl. 15-104.06R.

Kovtun, Lidia P., administrator: *See—*
Karas, Genrikh E.; Lebedeva, Ljudmila P.; Mukhin, Anatoly A.; Pivovarov, Anatoly D.; Skrynnikov, Vladimir I.; Yam, Vladimir M.; Oleinik, Vladimir T.; Miroshnichenko, Vladimir V.; Kovtun, Vasily A., deceased; Kovtun, Lidia P., administrator; Soshnikova, Inna V., administrator; and Kovtun, Sergei V., administrator, 4,179,258, Cl. 425-352.000.

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Karas, Genrikh E.; Lebedeva, Ljudmila P.; Mukhin, Anatoly A.; Pivovarov, Anatoly D.; Skrynnikov, Vladimir I.; Yam, Vladimir M.; Oleinik, Vladimir T.; Miroshnichenko, Vladimir V.; Kovtun, Vasily A., deceased; Kovtun, Lidia P., administrator; Soshnikova, Inna V., administrator; and Kovtun, Sergei V., administrator, 4,179,258, Cl. 425-352.000.

Kovtun, Vasily A., deceased: *See—*
Karas, Genrikh E.; Lebedeva, Ljudmila P.; Mukhin, Anatoly A.; Pivovarov, Anatoly D.; Skrynnikov, Vladimir I.; Yam, Vladimir M.; Oleinik, Vladimir T.; Miroshnichenko, Vladimir V.; Kovtun, Vasily A., deceased; Kovtun, Lidia P., administrator; Soshnikova, Inna V., administrator; and Kovtun, Sergei V., administrator, 4,179,258, Cl. 425-352.000.

Kozacka, Frederick J.; and Perreault, Richard J., to Gould Inc. Combination of fusible elements for electric fuses. 4,179,677, Cl. 337-161.000.

Kozacka, Wayne R., to Wahlco, Inc. Industrial sulfur trioxide gas injection probe and method of manufacture. 4,179,071, Cl. 239-397.500.

Kozlowski, George J., Jr., to Rudolph Beaver, Inc. Sharpness testing machine. 4,178,797, Cl. 73-104.000.

Kraemling, Franz: *See—*
Ortmanns, Gunther; Kraemling, Franz; and Pikhard, Siegfried, 4,178,728, Cl. 52-232.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Beermann, Heinrich, 4,179,635, Cl. 310-214.000.

Krapcho, John; and Schwartz, Joseph, to E. R. Squibb & Sons, Inc. Naphthalenone derivatives and analogs. 4,179,558, Cl. 544-174.000.

Krasnov, Jury N.: *See—*
Matviets, Petr P.; Makhtjuk, Iosif L.; Grigoriev, Valentin I.; Faidlin, Mark M.; Khotilin, Alexandr I.; Krasnov, Jury N.; and Khaimovich, Isaak R., 4,178,792, Cl. 72-436.000.

Kraus, Hubert; and Strehl, Peter, to Gesellschaft fur Schwerionenforschung mbH, Darmstadt. Faraday dish for making measurements at the beam paths of a heavy ion accelerator. 4,179,615, Cl. 250-489.000.

Krause, William A.; and Shea, Evan P., to Omnipure, Inc. System for electrocatalytic treatment of waste water streams. 4,179,347, Cl. 204-149.000.

Kreher, Alfons: *See—*
Kilian, Eberhard; Kreher, Alfons; Nauroth, Peter; and Turk, Gunter, 4,179,431, Cl. 260-42.370.

Kretzschmar, Rolf: *See—*
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Krings, Peter: *See—*
Andree, Hans; Jung, Dieter; Bischoff, Martin; Conrad, Jens; Huppertz, Josef; Jakobi, Gunter; Krings, Peter; Kuhling, Dieter; Reuter, Herbert; Rupilius, Wolfgang; Rutzen, Horst; and Schnegelberger, Harald, 4,179,393, Cl. 252-155.000.
Kaufmann, Jochen; Berg, Markus; and Krings, Peter, 4,179,391, Cl. 252-99.000.

Kripalani, Kishin J.: *See—*
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Kruesi, Paul R., to Cato Research Corp. Process for making rare earth metal chlorides. 4,179,492, Cl. 423-263.000.

Krulwich, Lester S. Magnetic press for vises. 4,179,105, Cl. 269-8.000.

Krumeich, Jorg; and Rossler, Hermann, to Hermann Rossler. Method and apparatus for determining the strabismus angle between the optical axes of a fixing and a strabismic eye. 4,179,195, Cl. 351-4.000.

Kubota, Kenichi: *See—*
Akado, Hajime; Uchida, Yoshiro; Kubota, Kenichi; Hasebe, Toshiharu; Yamaguchi, Akihide; Tomita, Tsutomu; Ootsubo, Suminobu; and Toyota Jidosha Kogyo Kabushiki Kaisha, 4,178,898, Cl. 123-122.00D.

Kucharczyk, Eckhard: *See—*
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Kuda, Vladimir: *See—*
Malasek, Jaromir; Kuda, Vladimir; and Bucek, Miroslav, 4,178,971, Cl. 139-435.000.

Kudo, Daiziro, to Fujitsu Limited. Apparatus for plasma treatment of semiconductor materials. 4,178,877, Cl. 118-728.000.

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Kudryashov, Sergei A.: *See—*
Belitsin, Mikhail N.; Kudryashov, Sergei A.; Borik, Alexandr G.; Kulikov, Valentin V.; Sadkova, Natalia A.; Kudryashova, Galina A.; and Vorontsov, Leonid F., 4,179,259, Cl. 425-461.000.

Kudryashova, Galina A.: *See—*
Belitsin, Mikhail N.; Kudryashov, Sergei A.; Borik, Alexandr G.; Kulikov, Valentin V.; Sadkova, Natalia A.; Kudryashova, Galina A.; and Vorontsov, Leonid F., 4,179,259, Cl. 425-461.000.

Kuhling, Dieter: *See—*
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Kulikov, Valentin V.: *See—*
Belitsin, Mikhail N.; Kudryashov, Sergei A.; Borik, Alexandr G.; Kulikov, Valentin V.; Sadkova, Natalia A.; Kudryashova, Galina A.; and Vorontsov, Leonid F., 4,179,259, Cl. 425-461.000.

Kunise, Satoru: *See—*
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Tanaka, Akio; Edamura, Mizuo; Furuitsu, Satoshi; and Kunise, Satoru, 4,179,618, Cl. 250-531.000.

Kunz, Peter, to Mettler Instrumente AG. Weighing apparatus calibration means and method. 4,179,005, Cl. 177-212.000.

Kuraray Co., Ltd.: *See—*
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, 4,179,579, Cl. 568-840.000.

Kurei, Hiroshi; Kawasaki, Masahiro; and Takaoka, Yukio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Lens stop braking in automatic exposure cameras of stop value control type. 4,179,201, Cl. 354-41.000.

Kusakata, Shigeru: *See—*
Iiyama, Kiyotaka; Matsui, Takeshi; Kusakata, Shigeru; Watanabe, Hideo; and Takahashi, Michihisa, 4,179,407, Cl. 252-446.000.

Kusama, You: *See—*
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Kutniewski, Donald F.: *See—*
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Kutter, Eberhard: *See—*
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Kwan, Okun; and Zaccagnino, Nicholas, to Bunker Ramo Corporation. Printer center sensing mechanism. 4,179,223, Cl. 400-320.000.

Kwech, Ludwig: *See—*
Jung, Fritz; and Kwech, Ludwig, 4,179,263, Cl. 432-1.000.

Kyushu Refractories Co., Ltd.: *See—*
Yanagida, Hiroaki; Shimizu, Tadao; and Nishikawa, Yasuo, 4,179,496, Cl. 423-598.000.

L. M. Ericsson Pty. Ltd.: *See—*
Herschtal, Ludwik, 4,179,587, Cl. 179-15.0AT.

La-Z-Boy Chair Company: *See—*
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Laboratoires Sarget: *See—*
Fauran, Francois; Feniou, Claude; Mosser, Jacqueline; and Prat, Gisele, 4,179,519, Cl. 424-308.000.

Laboratorios Made, S.A.: *See—*
Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, 4,179,565, Cl. 546-63.000.

Laby, Jordan M., to American Shower Door Co., Inc. Door assembly for a tub and shower enclosure. 4,178,718, Cl. 49-411.000.

Lacroix, Roger; and Mollet, Hans, to Ciba-Geigy Corporation. Stable, highly concentrated dyestuff solutions miscible with water in any proportion. 4,179,267, Cl. 8-41.00R.

Ladd, Arnold M.: *See—*
Splitt, Frank G.; Cwirzen, Casimir; Hines, William W.; and Ladd, Arnold M., 4,179,170, Cl. 339-14.00R.

Ladd, Thyril L., Jr.: *See—*
Tumlinson, James H., III; Klein, Michael G.; Doolittle, Robert E.; and Ladd, Thyril L., Jr., 4,179,446, Cl. 260-343.600.

Laforest, Jacqueline: *See—*
Thuillier, Germaine; Laforest, Jacqueline; and Bessin, Pierre, 4,179,516, Cl. 424-278.000.

Laganis, Deno, to Schenectady Chemicals, Inc. Water soluble insulating varnish. 4,179,420, Cl. 260-21.000.

Laganis, Deno; and Begley, Paul M., to Schenectady Chemicals, Inc. Water-soluble polyester imide resins. 4,179,423, Cl. 260-29.20N.

Lahr, Roy J., to Xerox Corporation. Demand publishing royalty accounting system. 4,179,212, Cl. 355-14.00R.

Laine, Norman R.: *See—*
Sanchez, Moises G.; Ernest, Michael V.; and Laine, Norman R., 4,179,408, Cl. 252-448.000.

L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude: *See—*
Bentz, Gerard; and Racouchot, Bernard, 4,179,103, Cl. 266-225.000.
Gilbert, Ghislain; Galey, Jean; and Bentz, Gerard, 4,178,980, Cl. 164-66.000.

Laitkep, Anthony A.; Meyer, Danny S.; and Saka, Hamid J., to ACF Industries, Incorporated. Spacer plates for gate valve seat assemblies. 4,179,098, Cl. 251-167.000.

Lamorte, Michael F., to Research Triangle Institute. Cascade solar cells. 4,179,702, Cl. 357-30.000.

Lancaster, Patrick R.: *See—*
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Lancaster, William G.; and Lancaster, Patrick R. Reverse wrap. 4,178,734, Cl. 53-399.000

Land, Edwin H., to Polaroid Corporation. Combination motion picture camera and viewing apparatus. 4,179,199, Cl. 352-138.000.

Lander, Naphtali: *See—*
Mechoulam, Raphael; Lander, Naphtali; Dikstein, Shabtay; and Shalita, Benyamin, 4,179,517, Cl. 424-283.000

Lange, Frederick F., to Rockwell International Corporation. Method of protecting Si_3N_4 ceramic alloy during heating. 4,179,486, Cl. 264-65.000

Lange, Kai; and Jeppesen, Jorgen, to General Electric Company. Gamma camera system with improved means for correcting nonuniformity. 4,179,607, Cl. 250-363.00S.

Lanham Machinery Company, Inc.: *See—*
Lanham, William E.; Lanham, William E., Jr.; and Miller, Gene C., 4,179,235, Cl. 414-351.000.

Lanham, William E.; Lanham, William E., Jr.; and Miller, Gene C., to Lanham Machinery Company, Inc. Pan stack retriever dolly. 4,179,235, Cl. 414-351.000

Lanham, William E., Jr.: *See—*
Lanham, William E.; Lanham, William E., Jr.; and Miller, Gene C., 4,179,235, Cl. 414-351.000

Lapraik, Scott J., to GTE Sylvania Incorporated. Circuit board connector. 4,179,177, Cl. 339-74.00R.

Larson, Dallas J. Rotary internal combustion engine. 4,178,900, Cl. 123-244.000

Larson, Daniel A.; and Zollweg, Robert J., to Westinghouse Electric Corp. Hid sodium lamp which incorporates a high pressure of xenon and a trigger starting electrode. 4,179,640, Cl. 315-47.000.

Laseter, Douglas E. Material conveyor. 4,179,232, Cl. 406-63.000.

Lathrop Paulson Company: *See—*
Du Broff, Warren, 4,178,739, Cl. 53-588.000.

Latimer, John P.; Donaldson, Robert M.; Christian, Ted W.; and Miller, Glen E., to Deepsea Ventures, Inc. Suction nozzle dredge head. 4,178,704, Cl. 37-57.000

Latsch, Reinhard; Bianchi, Valerio; and Burkel, Reiner, to Robert Bosch GmbH. Method and apparatus for controlling the operation of an internal combustion engine. 4,178,891, Cl. 123-117.00R.

Laudig, David J.: *See—*
Goolsby, Patrick F.; Laudig, David J.; Mechler, Paul A.; Osterhus, Steven J.; and Swenck, George F., 4,178,909, Cl. 126-417.000.

Launzel, Edward A.; and Silverman, Gordon, to Launzel, Edward A. Computer for control of communication signals. 4,179,733, Cl. 364-200.000

Lavallee, Pierre A.: *See—*
Crean, Peter A.; Lavallee, Pierre A.; and Agulnek, Martin A., 4,179,621, Cl. 250-566.000

Lawrie, Donald, to Singer Company, The. Feed cam rephasing device. 4,178,863, Cl. 112-158.00D.

Lea-Ronal, Inc.: *See—*
Thomson, Donald W., 4,179,344, Cl. 204-44.000.

Lebedeva, Ljudmila P.: *See—*
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Leder, Frederic: *See—*
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Lee, Chin K.: *See—*
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Lee, Floyd W.: *See—*
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Lee, Robert E.: *See—*
Bredehoeft, Edwin L.; and Lee, Robert E., 4,179,054, Cl. 224-45.00L.

Lee, Thomas E. Pipetting devices. 4,178,803, Cl. 73-425.600.
Lee, Walter F. Yieldable lock latch for fire extinguisher cabinet. 4,178,783, Cl. 70-422.000.
Leeds & Northrup Company: *See*—
Hance, Richard J.; and Wiese, John R., 4,179,309, Cl. 136-234.000.
Lehmer, Wilhelm: *See*—
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Leininger, Joel C.: *See*—
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Lenack, Isidore J.; and Lenack, Roger D. Torsionally resilient coupling for transmitting rotary motion. 4,179,006, Cl. 180-10.000.
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Lermann, Peter: *See*—
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LeTourneau, Ted L. Structure and arrangement for loudspeaker assemblage. 4,179,008, Cl. 181-147.000.
Lever Brothers Company: *See*—
Abbott, Horace P., 4,179,052, Cl. 222-509.000.
Levin, Jonathan S., to RCA Corporation. Flow controller. 4,178,974, Cl. 141-51.000.
Levine, Arnold M.; and Waddoups, Ray O., to International Telephone and Telegraph Corporation. System for identification of aircraft on airport surface pathways. 4,179,695, Cl. 343-6.50R.
Liautaud, James P. Integrally molded watch casing and band. 4,178,751, Cl. 58-23.00R.
Liautaud, James P., to American Antenna Corporation. Mobile antenna with adjustable radiating element. 4,179,698, Cl. 343-715.000.
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Zeis, Jurgen, 4,179,660, Cl. 325-59.000.
Lichtenberger, Horst; Knoblauch, Karl; Grochowski, Horst; Juntgen, Harald; and Schwarte, Jurgen, to Bergwerksverband GmbH. Method of regenerating adsorbents. 4,179,399, Cl. 252-411.00S.
Lichtenstein, Bernard. Contact crimping machine. 4,178,679, Cl. 29-715.000.
Liggett Group Inc.: *See*—
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Lightfoot, Herbert D., to Domtar Inc. Linear corrugating roll deflection control. 4,179,253, Cl. 425-369.000.
Limberg, Jaroslav; Limberg, Tomas; and Rayman, Vaclav, to Hutni project Praha, projekcni a inzenyrska. Apparatus for supplying preheated coal charges to coking chambers. 4,179,340, Cl. 202-262.000.
Limberg, Tomas: *See*—
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Lind, Frank L.: *See*—
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Lind, Gene C.; Lind, Ralph C.; Lind, Frank L.; Burchman, Edmund K.; and Trauger, Robert. Portable bidet, enema and douche. 4,178,931, Cl. 128-230.000.
Lind, Ralph C.: *See*—
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Linde Aktiengesellschaft: *See*—
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Lindenberger, William H.: *See*—
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Lindenborg, Jon M., to Western Electric Company, Inc. Method and circuit for controlling the output signal of a variable control circuit. 4,179,666, Cl. 330-138.000.
Lipinski, Thomas E.: *See*—
Crabtree, Steven B.; Groth, Hugh F.; Hunt, Guilbert M.; Lipinski, Thomas E.; McMaster, James T.; Moffitt, Guy R., Jr.; Szpak, Anthony D.; and Williams, Robert A., 4,178,843, Cl. 99-323.800.
Little, Carl H., to Weber-Knapp Company. Counterbalance mechanism. 4,178,655, Cl. 16-52.000.
Littlefield, John V. Display apparatus utilizing magnetic materials. 4,178,707, Cl. 40-426.000.
Litton Systems, Inc.: *See*—
Bjork, Lennart W., 4,179,596, Cl. 219-10.55M.
Liu, Sheau-Ming S.; Owen, William H., III; and Pashley, Richard D., to Intel Corporation. Process for forming a contact region between layers of polysilicon with an integral polysilicon resistor. 4,178,674, Cl. 29-571.000.
Lodi, Franco, to Ing. C. Olivetti & C., S.p.A. Computer with an arrangement for changing its working environment. 4,179,735, Cl. 364-200.000.
Loeffler, Anna T.: *See*—
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Lofdahl, Clyde A., to Raychem Corporation. Heat recoverable article and methods using same. 4,179,319, Cl. 156-86.000.
Login, Robert B.: *See*—
Newkirk, David D.; Thir, Basil; and Login, Robert B., 4,179,544, Cl. 428-395.000.
Long, Margaret E.; and Lee, Chin K., to R. J. Reynolds Tobacco Company. Thermostable lactase derived from *Bacillus coagulans*. 4,179,335, Cl. 435-99.000.
Longfellow, Forrest E. Protective animal goggles. 4,178,742, Cl. 54-80.000.
Lonn, Dana R.; and Jendersee, Melvin H., to Toro Company, The. Safety system for riding mower. 4,178,741, Cl. 56-7.000.
Lonza Ltd.: *See*—
Christensen, Kresten, 4,179,499, Cl. 424-143.000.
Loomis, Louie P. Structuralization of rules. 4,179,129, Cl. 273-272.000.
Lorenz, Helmut: *See*—
Koppl, Franz; Hamster, Helmut; Griesshammer, Rudolf; and Lorenz, Helmut, 4,179,530, Cl. 427-51.000.
Losee, David L.; and Wilder, Alvin D., to Eastman Kodak Company. Method of making silicon device with uniformly thick polysilicon. 4,179,528, Cl. 427-9.000.
Lover, Myron J.: *See*—
Lynch, Donald M.; Lover, Myron J.; Singer, Arnold J.; and Rhodes, William E., III, 4,179,504, Cl. 424-248.400.
Lowden, Lawrence C., to Whitaker Cable Corporation. Electrical connector having multiple terminal receptacle receiving different plugs. 4,179,179, Cl. 339-186.00M.
Lowe, Carl W., to Magtronics Incorporated. Method and apparatus for analyzing performance of electric-traction-motor powered vehicles and electrical operating components thereof. 4,179,744, Cl. 364-551.000.
Lowenthal, Hans, to Colibri Lighters Limited. Smokers' lighter. 4,179,260, Cl. 431-255.000.
Lu, Chin H.: *See*—
Rahn, Arthur W.; Jones, Lewis O.; and Lu, Chin H., 4,179,388, Cl. 430-108.000.
Lubrizol Corporation, The: *See*—
Ripple, David E., 4,179,449, Cl. 260-346.740.
Lucas Industries Limited: *See*—
Worby, Donald, 4,179,072, Cl. 239-533.900.
Lucke, Roland, to Gebruder Lodige Maschinenbaugesellschaft mbH. Plough-share-like mixing tool. 4,179,221, Cl. 366-309.000.
Lukacsek, Patricia A. Method and apparatus for culturing and examining fungi. 4,179,266, Cl. 435-254.000.
Lummus Company, The: *See*—
Cox, Robert P., 4,179,473, Cl. 585-313.000.
Lumsden, John, to Mineral Process Licensing Corporation B.V. Chlorination of iron-containing materials. 4,179,489, Cl. 423-79.000.
Lund, Lloyd W. Kitchen countertop wood or coal stove. 4,178,906, Cl. 126-6.000.
Lunden, Clarence D., to Boeing Company, The. Low reflectivity radome. 4,179,699, Cl. 343-872.000.
Lundquist, Ingemar H., to Valleylab. Intravenous liquid delivery system. 4,178,927, Cl. 128-214.00F.
Lura, Loren E.; and Zeigler, Philip B., to General Motors Corporation. Antifriction bearing with multiple piece race. 4,179,167, Cl. 308-189.00A.
Luttig, Dale. Tie preplating method and apparatus. 4,178,671, Cl. 29-429.000.
Lynch, Christian P.: *See*—
Mill, Kenneth G.; Lynch, Christian P.; Strathie, Richard T.; and Dixon, Alexander F. H., 4,179,611, Cl. 235-92.0QC.
Lynch, Donald M.; Lover, Myron J.; Singer, Arnold J.; and Rhodes, William E., III, to Block Drug Company, Inc. Alkyl amine oxide toxicants. 4,179,504, Cl. 424-248.400.
Lyon, Jarrel D., to Western Electric Company, Inc. Wire wrapping device incorporating releasable bit locking mechanism controlled by insertion depth of terminal. 4,178,680, Cl. 29-751.000.
M. Morell Packaging Co., Inc.: *See*—
Gallina, Salvatore; and Davidson, Stan, 4,178,821, Cl. 84-1.010.
MacDonough, Francis X., to Tapecon, Inc. Electric circuit for accessory for host tape recorder. 4,179,715, Cl. 360-61.000.
MacFarlane, Walter J., to Stanley Works, The. Glide for drapery traverse rod. 4,178,656, Cl. 16-93.00D.
Madden, Thomas C.: *See*—
Carrillo, Leo; and Madden, Thomas C., 4,178,678, Cl. 29-625.000.
Madland, Thorvald, to Youngstown Steel Door Company, The. Rail house car door wear skids. 4,178,857, Cl. 105-378.000.
Maeda, Kazuo: *See*—
Kudo, Daiziro; Maeda, Kazuo; and Tanikawa, Eiki, 4,179,326, Cl. 156-612.000.
Maeda, Masaya: *See*—
Suzuki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takashashi, Kiyoshi; and Takimoto, Hiroyuki, 4,179,197, Cl. 352-14.000.
Magtronics Incorporated: *See*—
Lowe, Carl W., 4,179,744, Cl. 364-551.000.
Maguire, David E., to Union Carbide Corporation. Conformally epoxy coated electrolyte capacitor having axial leads. 4,179,725, Cl. 361-433.000.
Mahler, Henry W.: *See*—
Moore, J. Kenneth; Kaiser, Arthur; and Mahler, Henry W., 4,179,704, Cl. 358-22.000.
Mahon, Fred F. Vibration dampening device for rotating disk. 4,178,819, Cl. 82-38.00A.
Maisel, Hans. Needle bed for flat knitting machine. 4,178,780, Cl. 66-115.000.
Maisonneuve, Hubert, to Canron Inc. Mechanical hydro servo valve. 4,178,836, Cl. 91-381.000.
Makhtjuk, Iosif L.: *See*—
Matviets, Petr P.; Makhtjuk, Iosif L.; Grigoriev, Valentin I.; Zaidlin, Mark M.; Khotilin, Alexandr I.; Krasnov, Jury N.; and Khaimovich, Isaak R., 4,178,792, Cl. 72-436.000.
Makovec, Donald J.; and Haskell, Donald M., to Phillips Petroleum Company. Olefin feed in HF alkylation of isoparaffin with olefin. 4,179,475, Cl. 585-714.000.

Makowski, Henry S.; and O'Farrell, Charles P., to Exxon Research & Engineering Co. Elastomeric blend compositions of a sulfonated elastomer polymer and a crystalline polyolefinic thermoplastic resin. 4,179,422, Cl. 260-28.50B.
Malasek, Jaromir; Kuda, Vladimir; and Bucek, Miroslav, to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi. Method of and apparatus for inserting weft threads into a jet loom. 4,178,971, Cl. 139-435.000.
Malin, John R. Vehicle performance analyzer. 4,179,740, Cl. 364-442.000.
Mallory, William K. Stringed instrument construction. 4,178,827, Cl. 84-291.000.
Mandel, Alan F.: *See*—
Coyle, Forrest E.; and Mandel, Alan F., 4,179,594, Cl. 200-310.000.
Mann, James T., to Gulf Research and Development Company. Stabilized hydraulic fluid. 4,179,384, Cl. 252-32.70E.
Mann, James T., to Gulf Research and Development Company. Stabilized hydraulic fluid. 4,179,389, Cl. 252-32.70E.
Mansfield, Donna J. Toilet paper dispenser. 4,179,078, Cl. 242-55.530.
Mar-Kal Products Corporation: *See*—
Schmid, Hans F., 4,178,710, Cl. 40-530.000.
Marcandalli, Ulderico, to Rockwell-Rimoldi, S.p.A. Looper control apparatus for sewing machines. 4,178,864, Cl. 112-159.000.
Marchal, Paul: *See*—
Francois, Daniel; Germond, Jean-Claude; Marchal, Paul; and Vertut, Jean, 4,179,035, Cl. 414-2.000.
Marchi, Egidio; and Montecchi, Lauretta, to Alfa Farmaceutici, S.p.A. Process for the preparation of 3 iodo- and 3 bromorifamycin s. 4,179,438, Cl. 260-239.30P.
Marconi Company Limited, The: *See*—
Kingsbury, Nicholas G., 4,179,670, Cl. 331-10.000.
Margolin, Jed. Electronic video game. 4,179,124, Cl. 273-101.200.
Marhold, Albrecht; and Klauke, Erich, to Bayer Aktiengesellschaft. Process for the preparation of diphenyl ethers. 4,179,461, Cl. 260-465.00H.
Marple, Elwood, to Hargraves Aerobic Systems, Inc. Rotary low pressure air displacement pump. 4,179,244, Cl. 417-273.000.
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, to Roussel UCLAF. Polyhalogenated carboxylic acids. 4,179,575, Cl. 562-506.000.
Martinez, Carlos J., to Mobil Oil Corporation. Epoxy emulsion water-based coating using water-dispersible epoxy emulsifier. 4,179,440, Cl. 260-29.40R.
Martinez Roldan, Cristobal: *See*—
Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, 4,179,565, Cl. 546-63.000.
Martino, Peter V. Horizontal one step automatic plate processor 4,179,208, Cl. 354-320.000.
Maruyama, Shigeo; Nishikaiji, Yuji; Miura, Tatsuya; and Fujinaga, Shigeki, to Shin Meiwa Industry Co., Ltd. Method and system of velocity control for automatic welding apparatus. 4,179,602, Cl. 219-125.100.
Marx, Paul: *See*—
Vetter, Hans; and Marx, Paul, 4,179,291, Cl. 430-223.000.
Masco Corporation of Indiana: *See*—
Pflasterer, Peter W., 4,179,662, Cl. 325-470.000.
Massachusetts Institute of Technology: *See*—
Kaplow, Roy; Frank, Robert I.; and Goodrich, Joel L., 4,179,318, Cl. 148-187.000.
Massey-Ferguson Services N.V.: *See*—
Allely, Robert; and Bailey, Alfred J., 4,178,744, Cl. 56-16.200.
Allely, Robert, 4,178,746, Cl. 56-53.000.
Masuda, Akira: *See*—
Normatsu, Hideaki; Kobayashi, Akio; Masuda, Akira; and Kitajima, Sigenori, 4,178,884, Cl. 123-32.0EE.
Masuzawa, Sigeaki: *See*—
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Mathews, Georgina H., executrix: *See*—
Mathews, Mitford M., Jr., deceased; Tremain, Thomas E.; and Zmurko, Myron T., 4,179,586, Cl. 179-1.50R.
Mathews, Mitford M., Jr., deceased (by Mathews, Georgina H., executrix); Tremain, Thomas E.; and Zmurko, Myron T., to United States of America, Army. System of encoded speech transmission and reception. 4,179,586, Cl. 179-1.50R.
Matolcsy, Gyorgy; Bartok, Piroska, nee Berencsy; Kiss, Bella; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar Rt. 2-Amino-cyclopent-1-ene-1-dithiocarboxylic acids. 4,179,463, Cl. 260-502.600.
Matolcsy, Gyorgy; Bartok nee Berencsy, Piroska; Kiss, Bella; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar Rt. Dopamine hydroxylase inhibiting 2-amino-cyclopent-1-ene-1-thiocarboxylic acid-disulfides. 4,179,467, Cl. 260-563.00R.
Matsuda, Akio: *See*—
Iizuka, Jinya; Kato, Seinosuke; and Matsuda, Akio, 4,178,868, Cl. 114-74.00R.
Matsuda, Mutsuhide: *See*—
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Matsuda, Yasuo: *See*—
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Matsui, Masao: *See*—
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Matsui, Takeshi: *See*—
Iiyama, Kiyotaka; Matsui, Takeshi; Kusakata, Shigeru; Watanabe, Hideo; and Takahashi, Michihisa, 4,179,407, Cl. 252-446.000.
Matsumoto, Haruo: *See*—
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Matsumoto, Takuzo: *See*—
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Matsunaga, Isao: *See*—
Ochi, Kiyoshige; Matsunaga, Isao; Shindo, Minoru; and Kaneko, Chikara, 4,179,452, Cl. 260-397.200.
Matsuoka, Fumio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Seat belt system. 4,179,136, Cl. 280-744.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Takeshita, Isao; Wakamatsu, Nobuhiko; Ando, Eiji; Tanaka, Hiroyoshi; and Hozumi, Shiro, 4,178,989, Cl. 165-62.000.
Yoshioka, Toshihiro; Ishimoto, Tasuku; Yamane, Hiroshi; Kita, Takahiro; and Matsushita Reiki Corp., Ltd., 4,179,064, Cl. 235-381.000.
Matsushita Reiki Corp., Ltd.: *See*—
Yoshioka, Toshihiro; Ishimoto, Tasuku; Yamane, Hiroshi; Kita, Takahiro; and Matsushita Reiki Corp., Ltd., 4,179,064, Cl. 235-381.000.
Mattson, John P., to Solarspan, Inc. Solar energy heat collector. 4,178,911, Cl. 126-449.000.
Matuba, Kuniyoshi: *See*—
Tuzuki, Minoru; Matuba, Kuniyoshi; and Saito, Kazuo, 4,179,481, Cl. 525-80.000.
Matviets, Petr P.; Makhtjuk, Iosif L.; Grigoriev, Valentin I.; Zaidlin, Mark M.; Khotilin, Alexandr I.; Krasnov, Jury N.; and Khaimovich, Isaak R. High-speed anvilless hammer. 4,178,792, Cl. 72-436.000.
Mauceri, Frank A.: *See*—
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Maurer, Robert D., to Corning Glass Works. Multiple mode waveguide having cylindrical perturbations. 4,179,187, Cl. 350-96.300.
Maxey, Alexander R., to Arvin Industries, Inc. Method and apparatus for video signal recording. 4,179,717, Cl. 360-84.000.
May, Denis R. W., to J. E. Hanger & Company Limited. Knee joint structure for artificial legs. 4,178,642, Cl. 3-28.000.
Mayer, Hubert J. M., to Bata-Schuh-Aktiengesellschaft. Golf-shoe sole. 4,178,702, Cl. 36-59.00R.
Mayer, Jurgen, to Robert Bosch GmbH. Wiping arrangement for a vehicle window. 4,178,651, Cl. 15-250.320.
Mayer, Paul C.: *See*—
Fethke, Wayne G.; and Mayer, Paul C., 4,179,029, Cl. 206-349.000.
Mazon, Gus G., III. Rotating wear rings for swimming pool whip hoses. 4,178,949, Cl. 134-167.00R.
Mazzei, Alessandro: *See*—
Dozzi, Giovanni; Cucinella, Salvatore; and Mazzei, Alessandro, 4,179,459, Cl. 260-448.00R.
Mazzorana, Alfred, to Societe de Paris et du Rhone. Starters for internal combustion engine. 4,178,805, Cl. 74-6.000.
McCall, John M., to Upjohn Company, The. Methods of treating psychosis. 4,179,510, Cl. 424-267.000.
McCoskey, J. Marion; and Webb, R. Britton. Portable electronic musical instrument. 4,178,823, Cl. 84-1.010.
McCourry, Phyllis J.; and Fuhrman, Victoria L. Tensioning device for a dental flossing apparatus. 4,178,947, Cl. 132-92.00R.
McCoy, Robert J.: *See*—
Chang, Chuan C.; Ermanis, Felix; McCoy, Robert J.; Nakahara, Shohei; and Sheng, Tan T., 4,179,534, Cl. 427-89.000.
McDaniel, Paul W.: *See*—
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McDonald, Robert W.: *See*—
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McGann, Rodney: *See*—
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McKenna, Charles M.: *See*—
Keller, John H.; McKenna, Charles M.; and Winnard, James R., 4,179,312, Cl. 148-1.500.
McLoughlin, Nelson E. Roller with replaceable sleeve. 4,178,664, Cl. 29-130.000.
McMaster, James T.: *See*—
Crabtree, Steven B.; Groth, Hugh F.; Hunt, Guilbert M.; Lipinski, Thomas E.; McMaster, James T.; Moffitt, Guy R., Jr.; Szpak, Anthony D.; and Williams, Robert A., 4,178,843, Cl. 99-323.800.
McMurtry, Carl H.: *See*—
Coppola, John A.; Hailey, Laurence N.; and McMurtry, Carl H., 4,179,299, Cl. 106-44.000.
McNairy, James A.: *See*—
Klimazewski, Leo T.; and McNairy, James A., 4,178,755, Cl. 60-290.000.
McNamara, Elger W. Diabetic insulin alarm system. 4,178,916, Cl. 128-734.000.

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McNaney, Joseph T. Graphic symbol display system. 4,179,689, Cl. 340-378.300.
McVay, James V.; and Yates, Patrick A., to United States of America, Navy. Explosive actuated arming switch device. 4,178,855, Cl. 102-262.000.
Mechler, Paul A.: *See—*
Goolsby, Patrick F.; Laudig, David J.; Mechler, Paul A.; Osterhus, Steven J.; and Swenck, George F., 4,178,909, Cl. 126-417.000.
Mechoulam, Raphael; Lander, Naphtali; Dikstein, Shabtay; and Shalita, Benyamin, to Yissum Research Development Company of the Hebrew University of Jerusalem. Novel tetrahydrocannabinol type compounds. 4,179,517, Cl. 424-283.000.
Medrest Corporation: *See—*
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Mehta, Anil B.; and Zielinski, Richard J., to SCM Corporation. Production of hydrogenated fatty acids from crude glyceride oils. 4,179,454, Cl. 260-409.000.
Mehta, Gunvant N.: *See—*
Cohen, Edward M.; Grim, Wayne M.; Harwood, Richard J.; and Mehta, Gunvant N., 4,179,497, Cl. 424-22.000.
Meininger, Karl. Archery bow. 4,178,904, Cl. 124-23.00R.
Meissner, David C.: *See—*
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Memorex Corporation: *See—*
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Mendenhall, Arthur L. Golf green tool. 4,179,147, Cl. 294-50.700.
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Mermal, Donald J.: *See—*
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Mermal, Gary A.: *See—*
Mermal, Howard J.; Mermal, Gary A.; Mermal, Donald J.; and Mermal, Robert M., 4,178,711, Cl. 43-1.000.
Mermal, Howard J.; Mermal, Gary A.; Mermal, Donald J.; and Mermal, Robert M. Method for use in harvesting earthworms. 4,178,711, Cl. 43-1.000.
Mermal, Robert M.: *See—*
Mermal, Howard J.; Mermal, Gary A.; Mermal, Donald J.; and Mermal, Robert M., 4,178,711, Cl. 43-1.000.
Mersch, Roland: *See—*
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Metallgesellschaft Aktiengesellschaft: *See—*
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Mettin, Florian: *See—*
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Kunz, Peter, 4,179,005, Cl. 177-212.000.
Mettoy Company Limited, The: *See—*
Nicholls, Mark S., 4,179,690, Cl. 340-384.00E.
Metz, Paul; Schockmel, Robert; and Mersch, Roland, to Acieries Reunies de Burbach-Eich-Dudelange S.A. Arbed. Method of expanding metallurgical slag. 4,179,275, Cl. 65-20.000.
Meyer Dairy Products Company, The: *See—*
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Meyer, Louis C., to Meyer, Louis C.; and Loeffler, Anna T. Split leaflet check valves. 4,178,638, Cl. 3-1.500.
Meyers, George L., to American Can Company. Display carton. 4,179,060, Cl. 229-8.000.
Mezak, John A.: *See—*
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Michaylov, Ventzel G.: *See—*
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Michlmayr, Manfred J., to Chevron Research Company. Sorbent regeneration in a process for removing sulfur-containing impurities from mineral oils. 4,179,361, Cl. 208-244.000.
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Midgley, John A.; and Nyberg, David D., to Raychem Corporation. Recoverable articles. 4,179,320, Cl. 156-86.000.
Midrex Corporation: *See—*
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Mieville, Andre, to Orchimed S. A. Benzoylphenoxy propionic acid, esters thereof and pharmaceutical composition. 4,179,515, Cl. 424-278.000.
Mightly, Pamela. Comfort grip cutlery. 4,178,684, Cl. 30-344.000.
Milk Marketing Board: *See—*
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Mill, Kenneth G.; Lynch, Christian P.; Strathie, Richard T.; and Dixon, Alexander F. H., to Mill, Kenneth G. Efficiency monitoring device. 4,179,611, Cl. 235-92.0QC.
Millard, Barry J., to Adwest Engineering Limited. Rotary valve for power-assisted steering mechanism. 4,178,835, Cl. 91-375.00A.
Miller, Clarence L., Jr., to Allegheny Ludlum Industries, Inc. Silicon steel and processing therefore. 4,179,315, Cl. 148-113.000.
Miller, Fred R. Snap ring bearing for a gun barrel bushing. 4,178,833, Cl. 89-163.000.
Miller, Gene C.: *See—*
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Miller, Glen E.: *See—*
Latimer, John P.; Donaldson, Robert M.; Christian, Ted W.; and Miller, Glen E., 4,178,704, Cl. 37-57.000.
Miller, John H. Method and apparatus for selective recovery of metal containers. 4,179,018, Cl. 194-4.00R.
Miller, Russell C., to J. M. Eltzroth & Associates, Inc. Pigment preparation and use in coating compositions. 4,179,305, Cl. 106-292.000.
Miller, Walter E., Jr., to United States of America, Army. Optical boresight method for nutating system. 4,179,085, Cl. 244-3.110.
Milner, Burl D., to W. R. Grace & Co. Device for separating sheet bags. 4,179,055, Cl. 225-80.000.
Mimura, Yoshinori: *See—*
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Minamida, Isao: *See—*
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Mindermann, Fritz: *See—*
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Mine, Nobuyoshi: *See—*
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Mineral Process Licensing Corporation B.V.: *See—*
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Minieri, Pasquale P.: *See—*
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Minnesota Mining and Manufacturing Company: *See—*
Farrell, Francis M., III; Otto, Robert B.; and Seim, William J., 4,179,050, Cl. 222-386.000.
Houghland, Stephen E., 4,179,679, Cl. 337-407.000.
Huss, Charles P., 4,179,118, Cl. 271-277.000.
Minoura, Kazuo: *See—*
Tateoka, Masamichi; and Minoura, Kazuo, 4,179,183, Cl. 350-6.100.
Miroshnichenko, Vladimir V.: *See—*
Karas, Genrikh E.; Lebedeva, Ljudmila P.; Mukhin, Anatoly A.; Pivovarov, Anatoly D.; Skrynnikov, Vladimir I.; Yam, Vladimir M.; Oleinik, Vladimir T.; Miroshnichenko, Vladimir V.; Kovtun, Vasily A., deceased; Kovtun, Lidia P., administrator; Soshnikova, Inna V., administrator; and Kovtun, Sergei V., administrator, 4,179,258, Cl. 425-352.000.
Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Smirnov, Viktor S.; Senina, Elena D.; Parbuzina, Iraida L.; Roshan, Natalia R.; Polyakova, Viktoria P.; and Savitsky, Evgeny M. Process for producing aniline with a permselective palladium and ruthenium catalyst. 4,179,470, Cl. 260-580.000.
Mita Industrial Co., Ltd.: *See—*
Kimura, Hiroshi; Kitagawa, Takaich; Hisajima, Masahiko; Yoshikado, Shoji; and Aizawa, Tatsuo, 4,179,211, Cl. 355-14.00R.
Kimura, Hiroshi; Kitagawa, Takaich; Hisajima, Masahiko; Yoshikado, Shoji; and Aizawa, Tatsuo, 4,179,211, Cl. 355-14.00R.
Mita, Yasuhiro: *See—*
Tateshita, Tadao; Mita, Yasuhiro; Nakayama, Junichi; and Sato, Koichi, 4,179,242, Cl. 417-8.000.
Mitchell, Alfred, to Mitchell, Alfred. Floor polishing machines. 4,178,654, Cl. 15-385.000.
Mitchell, Howard E.; and Saxman, William C., to Dresser Industries, Inc. Self-cleaning raise boring head system. 4,179,000, Cl. 175-53.000.
Mitchell, Patrick J. Modular rack for displaying merchandise. 4,179,033, Cl. 211-60.00R.
Mitchell, Robert D., to Firl Industries, Inc. Pick-up nozzle. 4,179,379, Cl. 210-242.00R.
Mitsche, Roy T.; and Pope, George N., to UOP Inc. Paraffinic hydrocarbon isomerization process. 4,179,581, Cl. 585-744.000.
Mitsubishi Chemical Industries Limited: *See—*
Morita, Yoshiharu; Omata, Kenzo; Ohya, Junichi; Wagatsuma, Kazuo; and Shirasaka, Tadashi, 4,179,437, Cl. 260-239.100.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Kiyota, Yuhiko; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,178,889, Cl. 123-75.00B.
Mitsubishi Paper Mills, Ltd.: *See—*
Miyama, Masao; Yamaguti, Sakan; and Kusama, You, 4,179,541, Cl. 428-165.000.
Mitsui Petrochemical Industries, Ltd.: *See—*
Miyamoto, Ryoichi; and Morita, Minoru, 4,179,550, Cl. 526-212.000.
Mitsui Toatsu Chemicals Incorporated: *See—*
Hanauye, Kunio; Takase, Tsutomu; and Morimoto, Yoshio, 4,179,429, Cl. 260-32.80R.

Miura, Nobuhiro: *See—*
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Miura, Tatsuya: *See—*
Maruyama, Shigeo; Nishikaiji, Yuji; Miura, Tatsuya; and Fujinaga, Shigeki, 4,179,602, Cl. 219-125.100.
Miura, Yoshimasa, to Fujitsu Limited. Magnetic recorded information reproducing apparatus. 4,179,720, Cl. 360-113.000.
Miyakawa Industry Company Limited: *See—*
Kitagawa, Toshikatsu, 4,179,229, Cl. 408-39.000.
Kitagawa, Toshikatsu, 4,179,230, Cl. 408-39.000.
Miyake, Tetsuya; Noguchi, Kohji; and Imamura, Kazuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for preparing pyridine bases. 4,179,576, Cl. 546-251.000.
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Miyamoto, Ryoichi; and Morita, Minoru, to Mitsui Petrochemical Industries, Ltd. Method for preparing a novel polymer. 4,179,550, Cl. 526-212.000.
Miyazawa, Hiroshi, to Tokico Ltd. Mounting device for door closer. 4,179,092, Cl. 248-309.00R.
Mobay Chemical Corporation: *See—*
Carter, Russell P., Jr., 4,179,479, Cl. 525-66.000.
Mobil Oil Corporation: *See—*
Clayton, William J.; and Kutniewski, Donald F., 4,179,270, Cl. 44-40.000.
Clayton, William J., 4,179,414, Cl. 252-548.000.
Heiba, El-Ahmadi I.; and Williams, Albert L., 4,179,392, Cl. 252-108.000.
Martinez, Carlos J., 4,179,440, Cl. 260-29.40R.
Mochizuki, Zenichi; Sugiura, Yasuo; and Kashiwagi, Nobuo, to Toshiba Kikai Kabushiki Kaisha. Method for manufacturing stainless steel die cast products having low melting point. 4,178,983, Cl. 164-113.000.
Moffitt, Guy R., Jr.: *See—*
Crabtree, Steven B.; Groth, Hugh F.; Hunt, Guilbert M.; Lipinski, Thomas E.; McMaster, James T.; Moffitt, Guy R., Jr.; Szpak, Anthony D.; and Williams, Robert A., 4,178,843, Cl. 99-323.800
Mole-Richardson Co.: *See—*
Aron, Daniel L., 4,179,726, Cl. 362-17.000.
Mollet, Hans: *See—*
Lacroix, Roger; and Mollet, Hans, 4,179,267, Cl. 8-41.00R.
Molt, Kenneth R., to Cincinnati Milacron Chemicals, Inc. Stabilized polypropylene compositions. 4,179,432, Cl. 260-45.75S.
Monsanto Company: *See—*
Birum, Gail H.; and Jansen, Richard F., 4,179,482, Cl. 260-941.000.
Birum, Gail H.; and Jansen, Richard F., 4,179,483, Cl. 260-941.000.
Bollinger, Frederic G.; and D'Amico, John J., 4,179,466, Cl. 260-558.00A.
Olive, Gisela; and Olive, Salvador, 4,179,462, Cl. 260-465.100.
Monsheimer, Rolf: *See—*
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Montecchi, Lauretta: *See—*
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Montedison S.p.A.: *See—*
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Montusi, Robert R., to Grumman Aerospace Corporation. Dual scavenging separator. 4,179,273, Cl. 55-457.000.
Mookherjee, Braja D.: *See—*
Withycombe, Donald A.; Hruza, Anne; Vock, Manfred H.; Giacino, Christopher; Mookherjee, Braja D.; Pittet, Alan O.; and Schreiber, William L., 4,179,526, Cl. 426-535.000
Moon, William F. Respirator filter and method of making the same. 4,179,274, Cl. 55-524.000.
Moore, J. Kenneth; Kaiser, Arthur; and Mahler, Henry W., to CBS Inc. Television system for displaying and recording paths of motion. 4,179,704, Cl. 358-22.000.
Moore, Joseph E., to Chevron Research Company. Fungidal and herbicidal 2-substituted-3-oxa-3a^4, 4-ditha-6-halo-1,5-diazapentalene. 4,179,441, Cl. 548-122.000.
Moore, Karen H.: *See—*
Moore, Marvin L.; Moore, Karen H.; and Moore, William M., 4,178,964, Cl. 137-625.400.
Moore, Marvin L.; Moore, Karen H.; and Moore, William M. Double valve mechanism for controlling fluid flows. 4,178,964, Cl. 137-625.400.
Moore, Paul B.: *See—*
Swenson, Paul F.; and Moore, Paul B., 4,178,772, Cl. 62-238.000.
Moore, William M.: *See—*
Moore, Marvin L.; Moore, Karen H.; and Moore, William M., 4,178,964, Cl. 137-625.400.
Morawski, Janus. Roofing ladder and braces therefor. 4,179,011, Cl. 182-45.000.
Mori, Fumio: *See—*
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, 4,179,579, Cl. 568-840.000.
Morimoto, Yoshio: *See—*
Hanauye, Kunio; Takase, Tsutomu; and Morimoto, Yoshio, 4,179,429, Cl. 260-32.80R.
Morishita, Taneji, to Konishiroku Photo Industry Co., Ltd. Device for loading a paper roll. 4,179,077, Cl. 242-55.000.
Morita, Minoru: *See—*
Miyamoto, Ryoichi; and Morita, Minoru, 4,179,550, Cl. 526-212.000.
Morita, Yoshiharu; Omata, Kenzo; Ohya, Junichi; Wagatsuma, Kazuo; and Shirasaka, Tadashi, to Mitsubishi Chemical Industries Limited. Amino acid derivatives of 6-(2-amino-2-arylacetamido) penicillanic acids. 4,179,437, Cl. 260-239.100.
Moritz, Holger, to International Business Machines Corporation. Method and system for in situ control of material removal processes. 4,179,622, Cl. 250-571.000.
Morooka, Shigeaki: *See—*
Yamamoto, Michihiro; Morooka, Shigeaki; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 4,179,560, Cl. 544-250.000.
Morrison, Bert L.: *See—*
Kemp, Willard E.; and Morrison, Bert L., 4,178,665, Cl. 29-157.10R.
Morse, Milton. Toggle switch seal. 4,178,806, Cl. 74-17.800.
Morville, Malcolm: *See—*
Barnish, Ian T.; Cross, Peter E.; Danilewicz, John C.; and Morville, Malcolm, 4,179,520, Cl. 424-309.000.
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Moschetti, Armando, to Siargas — Societa' Italiana Assistenza Reti Gas S.p.A. Apparatuses for producing tight joints or seals in underground pipelines. 4,178,875, Cl. 118-712.000.
Mosser, Jacqueline: *See—*
Fauran, Francois; Feniou, Claude; Mosser, Jacqueline; and Prat, Gisele, 4,179,519, Cl. 424-308.000.
Mostek Corporation: *See—*
Athanas, Terry G., 4,179,311, Cl. 148-1.500.
Mougin, Georges L., to ITI Limited. Member for attaching a propulsion unit to a tabular iceberg. 4,178,872, Cl. 115-72.000.
Moyer, Paul W.: *See—*
Artz, Walter M.; Bauer, Charles R.; and Moyer, Paul W., 4,179,032, Cl. 209-538.000.
Mueller, Christine E.: *See—*
Mueller, William F., 4,178,970, Cl. 139-30.000.
Mueller, William F., to Mueller, Christine E. Hand loom. 4,178,970, Cl. 139-30.000.
Mukhin, Anatoly A.: *See—*
Karas, Genrikh E.; Lebedeva, Ljudmila P.; Mukhin, Anatoly A.; Pivovarov, Anatoly D.; Skrynnikov, Vladimir I.; Yam, Vladimir M.; Oleinik, Vladimir T.; Miroshnichenko, Vladimir V.; Kovtun, Vasily A., deceased; Kovtun, Lidia P., administrator; Soshnikova, Inna V., administrator; and Kovtun, Sergei V., administrator, 4,179,258, Cl. 425-352.000.
Muller, Karl: *See—*
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Multinorm, B.V.: *See—*
Oosterling, Pieter A.; and Vissers, Hermanus H., 4,179,073, Cl. 239-659.000.
Murakami, Tomomi; and Ichikawa, Singo, to Citizen Watch Company Limited. Control circuit for electronic timepiece. 4,178,750, Cl. 58-4.00A.
Murakita, Seiichi; Ohta, Akio; and Narahara, Satoshi, to Sumitomo Metal Mining Company Limited. Method for removing As, or As and Sb and/or Bi from sulfuric acid. 4,179,495, Cl. 423-531.000.
Murata Manufacturing Co., Ltd.: *See—*
Nishikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Matsumoto, Haruo, 4,179,673, Cl. 333-204.000.
Murdy, Raymond R.: *See—*
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Murray, Edward C., to Kerr-McGee Corporation. Copper casting method using titanium dioxide release method. 4,178,981, Cl. 164-72.000.
Murray, Pat L.: *See—*
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Muto, Nobuyoshi; Matsuda, Yasuo; and Honda, Kazuo, to Hitachi, Ltd. Control device for a pulse-width modulated inverter. 4,179,727, Cl. 363-41.000.
N L Industries, Inc.: *See—*
Koch, James H.; and Ritzenthaler, Richard A., 4,179,313, Cl. 148-3.000.
N. V. Optische Industrie "De Oude Delft": *See—*
van der Does, Lucas, 4,179,114, Cl. 271-19.000.
Naamloze Vennootschap Declametaal: *See—*
De Gryse, Jean-Claude, 4,178,845, Cl. 100-11.000.
Nabisco, Inc.: *See—*
White, E. Gurney, deceased, 4,179,527, Cl. 426-620.000.
Nadelson, Jeffrey, to Sandoz, Inc. Substituted hydroxy pyridones. 4,179,566, Cl. 546-116.000.
Nagai, Akinori, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Plugging meter. 4,178,795, Cl. 73-61.0LM.
Naganuma, Susumu: *See—*
Ogiwara, Kenzyu; Inoue, Hisao; and Naganuma, Susumu, 4,179,237, Cl. 415-1.000.
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Nagumo, Fumio, to Sony Corporation. Defect noise compensating system. 4,179,711, Cl. 358-213.000.

Nakada, Akira: *See—*
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Nakagami, Tatsuro: *See—*
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Kiyota, Yuhiko; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,178,889, Cl. 123-75.00B.

Nakahara, Shohei: *See—*
Chang, Chuan C.; Ermanis, Felix, McCoy, Robert J.; Nakahara, Shohei; and Sheng, Tan T., 4,179,534, Cl. 427-89.000.

Nakajima, Fumio: *See—*
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Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Kiyota, Yuhiko; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine. 4,178,889, Cl. 123-75.00B.

Nakamura, Hisatsugu: *See—*
Tomioka, Shoji; Nakao, Toshiaki; Nakamura, Hisatsugu; Mine, Nobuyoshi; Yamamoto, Katsuo; Fukushima, Seiji; and Nogami, Akira, 4,179,256, Cl. 425-71.000.

Nakamura, Shizuo: *See—*
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Nakamura, Takashi: *See—*
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Nakao, Toshiaki: *See—*
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Nakauchi, Shunsaku; and Takahashi, Akifusa, to Security Patrols Co., Ltd.; and Kokusai Gijutsu Kaihatsu Co., Ltd. Flame sensor. 4,179,606, Cl. 250-339.000.

Nakayama, Junichi: *See—*
Tateshita, Tadao; Mita, Yasuhiro; Nakayama, Junichi; and Sato, Koichi, 4,179,242, Cl. 417-8.000.

Nakazono, Akio; and Nakamura, Shizuo, to Shin-Shirasuna Electric Corporation. Tape recorder having playback retaining mechanism. 4,179,721, Cl. 360-137.000.

Nalco Chemical Company: *See—*
Bradley, Robert L.; and Mauceri, Frank A., 4,179,369, Cl. 210-43.000.
Broersma, Frank R.; and Choca, Monica E., 4,179,411, Cl. 252-465.000.
Gabel, Robert K.; Lindenberger, William H.; and Pavilcius, Audrone M., 4,179,396, Cl. 252-329.000.
Phillips, Kenneth G.; Ballweber, Edward G.; and Hurlock, John R., 4,179,424, Cl. 260-29.4UA.
Svarz, Jerry J., 4,179,329, Cl. 162-29.000.

Nangeroni, John A.: *See—*
Dodson, George B.; and Nangeroni, John A., 4,179,669, Cl. 330-282.000.

Napolitano, Joseph J.; and Richardson, Michael, to Auto Research Corporation. Resettable pressure responsive valve. 4,178,960, Cl. 137-494.000.

Narahara, Satoshi: *See—*
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Narvaez, Peter D.: *See—*
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Nash, John E., to Star Dental Manufacturing Co., Inc. Dental burr. 4,178,689, Cl. 433-166.000.

National Advanced Drilling Machines, Inc.: *See—*
Bromell, Raymond J.; and Sideris, John N. J., 4,179,233, Cl. 414-139.000.

National Controls, Inc.: *See—*
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National Research Development Corporation: *See—*
Dombrowski, Norman, 4,179,068, Cl. 239-13.000.
Howe, Arthur T.; and Shilton, Mark G., 4,179,491, Cl. 423-253.000.

National Semiconductor Corporation: *See—*
Brown, Floyd P.; and Narvaez, Peter D., 4,179,748, Cl. 364-900.000.
Compton, James B.; Cometta, Robert A.; and Culmer, Daniel D., 4,179,310, Cl. 148-1.500.

Nau, Paul R., to Briggs & Stratton Corporation. Nonpolluting liquid fuel system for engines. 4,178,894, Cl. 123-119.00B.

Nauroth, Peter: *See—*
Kilian, Eberhard; Kreher, Alfons; Nauroth, Peter; and Turk, Gunter, 4,179,431, Cl. 260-42.370.

NCR Corporation: *See—*
Ward, Stephen W., 4,179,031, Cl. 209-534.000.

Necchi, S.p.A.: *See—*
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Neefe, Charles W. Method of making toric lenses. 4,179,484, Cl. 264-1.000.

Nelson, Arthur R., to Sperry Rand Corporation. Electrooptical modulator. 4,179,184, Cl. 350-96.140.

Nelson, Benjamin R.: *See—*
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Nelson, Linnea E.; and Reineke, Charles E., to Dow Chemical Company, The. Flame retardant intumescent polyamides. 4,179,298, Cl. 106-18.210.

Nelson, Peter F.: *See—*
Vanderhoek, Naphthali N.; Nelson, Peter F.; and Farrington, Alan, 4,178,861, Cl. 162-72.000.

Nemeth, Suzette B., to Avery International Corporation. Extractive transfer diaper tab means. 4,178,933, Cl. 128-284.000.

Neoloy Products, Inc.: *See—*
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Neteler, Bernhard: *See—*
Kollensperger, Friedrich-Gero; Hartleben, York; Kretzschmar, Rolf; and Neteler, Bernhard, 4,179,442, Cl. 548-232.000.

Neuendorff, Hans, to Siemens Aktiengesellschaft. Circuit for varying an operating voltage of a deflection amplifier of a magnetodynamic deflection system. 4,179,643, Cl. 315-411.000.

Newcomb, Raymond, to Milk Marketing Board. Apparatus for use in collecting eggs from animals. 4,178,936, Cl. 128-349.00B.

Newkirk, David D.; Thir, Basil; and Login, Robert B., to BASF Wyandotte Corporation. Fiber finish compositions. 4,179,544, Cl. 428-395.000.

Newman, John W., to Allied Piping Products Company, Inc. Branch connection fitting. 4,179,141, Cl. 285-189.000.

Nichi-Ei Bussan Co., Ltd.: *See—*
Hara, Kunio; and Yoshida, Kohsaku, 4,178,669, Cl. 29-412.000.

Nicholls, Mark S., to Mettoy Company Limited, The. Two-tone audible warning circuits. 4,179,690, Cl. 340-384.00E.

Nicklas, Walter; Hesler, Dietrich; and Gresser, Gerhard, to Karl M. Reich Maschinenfabrik GmbH, Firma. Apparatus for melting and applying a fusion adhesive. 4,178,876, Cl. 118-681.000.

Nihon Denshi Kabushiki Kaisha: *See—*
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Niles Parts Co., Ltd.: *See—*
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Nippon Electric Co., Ltd.: *See—*
Ishiguro, Tatsuo; Suzuki, Norio; and Iijima, Yukihiko, 4,179,710, Cl. 358-135.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Aoki, Eiichiro; and Yamada, Shigeru, 4,178,824, Cl. 84-1.190.
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Yamaga, Eiichi, 4,178,826, Cl. 84-1.260.

Nippon Jiryoku Senko Co., Ltd.: *See—*
Harada, Genzaburo; Yen, Takuma; and Tomari, Masao, 4,179,279, Cl. 75-24.000.

Nippon Kogaku K. K.: *See—*
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Nippon Kogaku K.K.: *See—*
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Nippon Steel Corporation: *See—*
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Nippondenso Co., Ltd.: *See—*
Akado, Hajime; Uchida, Yoshiro; Kubota, Kenichi; Hasebe, Toshiharu; Yamaguchi, Akihide; Tomita, Tsutomu; Ootsubo, Suminobu; and Toyota Jidosha Kogyo Kabushiki Kaisha, 4,178,898, Cl. 123-122.00D.
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Nishida, Takashi: *See—*
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Nishikaiji, Yuji: *See—*
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Nishikawa, Masanori; and Hattori, Masao, to Yoshino Kogyosho Co., Ltd. Method of making a frosted bottle of saturated polyester. 4,179,488, Cl. 264-521.000.

Nishikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Matsumoto, Haruo, to Murata Manufacturing Co., Ltd. Interdigital filter. 4,179,673, Cl. 333-204.000.

Nishikawa, Yasuo: *See—*
Yanagida, Hiroaki; Shimizu, Tadao; and Nishikawa, Yasuo, 4,179,496, Cl. 423-598.000.

Nishimura, Toshimichi; Yamanaka, Seisuke; and Shimada, Masaru, to Sony Corporation. Color camera system. 4,179,706, Cl. 358-44.000.

Nishiwaki, Kiyoshi: *See—*
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Nishizaki, Shinzo: *See—*
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Nitsch, Edward J., to R. E. Dietz Co. Signal switch assembly. 4,179,592, Cl. 200-61.270.

Noda, Hideo, to Shimano Industrial Company Limited. Fishing reel. 4,179,084, Cl. 242-212.000.

Nogami, Akira: *See—*
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Noguchi, Kohji: *See—*
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Nohira, Hidetaka: *See—*
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Schroeter, Siegfried H.; and Olson, Daniel R., 4,179,548, Cl. 525-329.000.

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Inaba, Hideya; Kamino, Yasumi; Onizuka, Shigenori; and Inazumi, Chikashi, 4,179,412, Cl. 252-472.000

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Ortiz, Jose E. Light shade mountable in a plurality of positions on a plurality of items in an automobile. 4,179,155, Cl. 296-97.00C.
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Osborn, Norbert L., to WRR Industries, Inc. Turbocharger having variable area turbine nozzles. 4,179,247, Cl. 417-406.000.
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Hines, Charles E.; and Williams, Dwight E., 4,178,860, Cl. 111-7.000.
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Owen, William H., III: *See—*
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Shannon, Richard F., 4,179,303, Cl. 106-119.000.
Oxy Metal Industries Corporation: *See—*
Tremmel, Robert A., 4,179,343, Cl. 204-43.00T.
P. R. Mallory & Co. Inc.: *See—*
Ciliberti, Frank L., Jr., 4,179,545, Cl. 429-65.000.
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Weiler, Gerhard H.; Nagel, Dieter H.; and Pagels, Louis T., 4,178,976, Cl. 150-0.500.
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Pone, John, Jr., 4,179,214, Cl. 355-35.000.
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Davis, Frank F.; Van Es, Theodorus; and Palczuk, Nicholas C., 4,179,337, Cl. 435-181.000.
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Matolcsy, Gyorgy; Bartok, Piroska, nee Berencsy; Kiss, Bella; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, 4,179,463, Cl. 260-502.600.
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Panek, Peter: *See—*
Woditsch, Peter; Bayer, Eckhard; Panek, Peter; and Stutgens, Heribert, 4,179,306, Cl. 106-300.000.
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Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Smirnov, Viktor S.; Senina, Elena D.; Parbuzina, Iraida L.; Roshan, Natalia R.; Polyakova, Viktoria P.; and Savitsky, Evgeny M., 4,179,470, Cl. 260-580.000.
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Parry, John C. Apparatus for application of plastics stretch films. 4,179,081, Cl. 242-99.000.
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Patel, Ghanshyam C., to Chicago Pneumatic Tool Company. Thread construction for rotary worm compression-expansion machines. 4,179,250, Cl. 418-195.000.
Patels, Gottfried: *See—*
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Hall, Lawrence G., 4,178,919, Cl. 128-719.000.
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Perkins, Norman P., Jr., to Gould Inc. Trip bar means subassembly. 4,179,675, Cl. 335-9.000.
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Jung, Fritz; and Kwech, Ludwig, 4,179,263, Cl. 432-1.000.
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Dillenburg, Helmut; Dotsch, Werner; and Siegel, Rudolf, 4,179,394, Cl. 252-186.000.
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Kozacka, Frederick J.; and Perreault, Richard J., 4,179,677, Cl. 337-161.000.
Persoons, Gustaaf M.; and Wijts, Corneel C., to FMC Corporation. Harvester air separator. 4,178,743, Cl. 56-12.900.
Persson, Staffan B.; and Tackaberry, Robert B., to American Optical Corporation. Compact subjective refractive instrument. 4,179,196, Cl. 351-30.000.
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Petroleum Designers, Inc.: *See—*
Pierce, Elwood K., Jr., 4,179,099, Cl. 251-168.000.
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Buriks, Rudolf S.; Fauke, Allen R.; and Griffiths, David W., 4,179,549, Cl. 525-374.000.
Cheng, William J.; and Guthrie, David B., 4,179,383, Cl. 252-25.000.
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Barnish, Ian T.; Cross, Peter E.; Danilewicz, John C.; and Morville, Malcolm, 4,179,520, Cl. 424-309.000.
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Braeumer, Klaus; Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,179,333, Cl. 435-60.000.
Phelps, Dennis B.: *See—*
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Brady, Donnie G., 4,179,571, Cl. 560-64.000.
Cobb, Raymond L.; and Fodor, Lawrence M., 4,179,471, Cl. 585-452.000.
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Hsieh, Henry L., 4,179,480, Cl. 525-99.000.
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Makovec, Donald J.; and Haskell, Donald M., 4,179,475, Cl. 585-714.000.
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Pittet, Alan O.: *See—*
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Gekhman, Boris S.; Vasilevsky, Petr N.; Ediny, Jury G.; Parfinenko, Ivan V.; and Podgursky, Alfred M., 4,178,935, Cl. 128-328.000.
Podrapsky, Jiri; and Orova, Josef, to Robert Bosch GmbH. Speed-dependent ignition time advancement apparatus in magneto generator ignition systems. 4,178,892, Cl. 123-117.00R
Polanin, Walter R. Removing post from human bony structure. 4,178,688, Cl. 433-220.000.
Polaroid Corporation: *See—*
Finnemore, Fred M.; and Goodwin, Robert A. 4,179,205, Cl. 354-145.000.
Land, Edwin H., 4,179,199, Cl. 352-138.000.
Poletto, John F.: *See—*
Bernady, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., 4,179,574, Cl. 562-503.000.
Pollack, Jack, to Chicago Bridge & Iron Company. Mooring line handling apparatus. 4,178,870, Cl. 114-230.000.
Pollitzer, Ernest L.: *See—*
Hayes, John C.; and Pollitzer, Ernest L., 4,179,359, Cl. 208-139.000.
Pols, Sidney. Shoe to be worn over cast. 4,178,703, Cl. 36-110.000.
Polyakova, Viktoria P.: *See—*
Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Smirnov, Viktor S.; Senina, Elena D.; Parbuzina, Iraida L.; Roshan, Natalia R.; Polyakova, Viktoria P.; and Savitsky, Evgeny M., 4,179,470, Cl. 260-580.000.
Polychrome Corporation: *See—*
Rossomando, Robert, 4,179,304, Cl. 106-177.000.
Polygram GmbH: *See—*
Soeding, Horst, 4,179,532, Cl. 427-54.100.
Polysar Limited: *See—*
Edwards, Douglas C.; and Sato, Kyosaku, 4,179,421, Cl. 260-23.70M.
Pone, John, Jr., to Pako Corporation. Photographic printer control system. 4,179,214, Cl. 355-35.000.
Ponsford, Roger J., to Beecham Group Limited. 2,4-Diamino-5-alkyloxy-pyrimidines. 4,179,562, Cl. 544-298.000.
Ponzellini, Giulio, to Anonima Castelli S.p.A. Disassemblable table. 4,178,858, Cl. 108-150.000.
Pope, George N.: *See—*
Mitsche, Roy T.; and Pope, George N., 4,179,581, Cl. 585-744.000.
Popplewell, James M., to Olin Corporation. Solar energy collector system. 4,178,990, Cl. 165-134.00R.
Portex, Inc.: *See—*
Stephens, Thomas P., 4,178,939, Cl. 128-207.150.
Posakony, Gerald J.: *See—*
Hildebrand, B. Percy; and Posakony, Gerald J., 4,179,683, Cl. 367-138.000.
Potter, Peter N., to Solartron Electronic Group Limited, The. Pressure transducers. 4,178,804, Cl. 73-702.000.
Powell Manufacturing Company, Inc.: *See—*
Wilson, Robert W., 4,178,745, Cl. 56-27.500.
Prat, Gisele: *See—*
Fauran, Francois; Feniou, Claude; Mosser, Jacqueline; and Prat, Gisele, 4,179,519, Cl. 424-308.000.
Pratt, Harry H.; and Cranstoun, David, to Foster Wheeler Energy Corporation. Vapor generating system utilizing angularly arranged bifurcated furnace boundary wall fluid flow tubes. 4,178,881, Cl. 122-235.00A.
Prestholdt, Ogden L. Method and apparatus for controlling electromagnetic reradiation from an electrically conducting structure. 4,179,700, Cl. 343-885.000.
Prince, Clarence F.: *See—*
Groom, James S.; and Prince, Clarence F., 4,178,740, Cl. 53-556.000.
Procter & Gamble Company, The: *See—*
Rudkin, Arthur L.; Clint, John H.; and Young, Kenneth, 4,179,382, Cl. 252-8.800.
Spadini, Gianfranco L.; and Tolliday, Ian D., 4,179,390, Cl. 252-95.000.
Prosen, Emil M., to Neoloy Products, Inc. Palladium base dental alloy. 4,179,288, Cl. 75-172.00G.
Prusinski, Richard C.; and Johnson, Timothy E., to Architectural Research Corporation. Heat absorbing panel. 4,178,727, Cl. 52-173.00R.
Puccio, Guy S., to Acme Highway Products Corporation. Elastomeric expansion seal. 4,179,226, Cl. 404-64.000.
Pulido, Philippe: *See—*
Barrot, Jean C.; and Pulido, Philippe, 4,179,076, Cl. 241-216.000.
Quadri, Farooq M., to Burroughs Corporation. Magnetic bubble type D/A converter. 4,179,750, Cl. 365-8.000.
Quaker Oats Company, The: *See—*
Teter, Edward C., 4,179,066, Cl. 238-10.00E.
Queener, Carl A., to International Business Machines Corporation. Vector pinning in an electrophotographic machine. 4,179,213, Cl. 355-14.00R.
Quesinberry, Elmen C.; Tom, Michael; and Farrell, James L., to Westinghouse Electric Corp. Kalman estimator tracking system. 4,179,696, Cl. 343-7.400.
Quinlivan, Sandra C.: *See—*
Jones, Robert J.; Green, Howard E.; and Quinlivan, Sandra C., 4,179,551, Cl. 526-262.000
R. A. Jones & Co. Inc.: *See—*
Hughes, Charles C., 4,178,839, Cl. 93-53.0SD.
R. E. Dietz Co.: *See—*
Nitsch, Edward J., 4,179,592, Cl. 200-61.270.
R. E. Phelon Company, Inc.: *See—*
Burson, Bob O., 4,179,634, Cl. 310-153.000.
R. J. Reynolds Tobacco Company: *See—*
Long, Margaret E.; and Lee, Chin K., 4,179,335, Cl. 435-99.000.
Rabadan Peinado, Fernando: *See—*
Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, 4,179,565, Cl. 546-63.000.
Rachais, Claude, to Creusot-Loire. Vacuum-spraying grinder. 4,179,075, Cl. 241-67.000.
Racouchot, Bernard: *See—*
Bentz, Gerard; and Racouchot, Bernard, 4,179,103, Cl. 266-225.000.
Radice, Robert. Portable hydrant wrench. 4,178,816, Cl. 81-57.300.
Raeymaekers, Alfons H. M.; Van Gelder, Josephus L. H.; Boeckx, Gustaaf M.; and Van Hemeldonck, Lodewijk L., to Janssen Pharmaceutica N.V. 5-[4-(Diarylmethyl)-1-piperazinylalkyl]benzimidazole derivatives. 4,179,505, Cl. 424-250.000.
Rahn, Arthur W.; Jones, Lewis O.; and Lu, Chin H., to Xerox Corporation. Electrostatographic developer with smooth surfaced carrier. 4,179,388, Cl. 430-108.000.
Raitto, Russell G., to Concord Laboratories, Inc. Method for drawing a blood sample. 4,178,941, Cl. 128-763.000.
Ramachandran, Kovilvila N.: *See—*
Sewell, Peter B.; and Ramachandran, Kovilvila N., 4,179,609, Cl 250-397.000.
Ramanathan, Visvanathan, to Ciba-Geigy Corporation. Azo dyestuffs having a carboxyl group and a substituted sulfonylimino group in the coupling component. 4,179,435, Cl. 260-158.000.
Ramaswamy, Vellayan: *See—*
Kaminow, Ivan P.; and Ramaswamy, Vellayan, 4,179,189, Cl. 350-96.330.
Ramirez, Lawrence V., to G. Leblanc Corporation. Compact B-flat horn and case therefor. 4,178,830, Cl. 84-388.000.
Ray, Otis E. Marble game apparatus. 4,179,122, Cl. 273-85.00R.
Raychem Corporation: *See—*
Lofdahl, Clyde A., 4,179,319, Cl. 156-86.000.
Midgley, John A.; and Nyberg, David D., 4,179,320, Cl. 156-86.000.
Rayman, Vaclav: *See—*
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RCA Corporation: *See—*
Abbott, Liston, 4,179,703, Cl. 358-11.000.
Bachman, William J.; and Dimeo, Franklin R., 4,179,178, Cl. 339-111.000.
den Hollander, Willem, 4,179,642, Cl. 315-370.000.
Levin, Jonathan S., 4,178,974, Cl. 141-51.000.
Olsen, Gregory H.; and Ettenberg, Michael, 4,179,308, Cl. 136-89.0GA.
Sheng, Ping; and Firester, Arthur H., 4,179,708, Cl. 358-128.000.
Ream, Stanley L.: *See—*
Connors, John F.; Bass, Douglas D.; Bell, Michael G.; and Ream, Stanley L., 4,179,316, Cl. 148-152.000.
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Page, William R.; and Rees, James G., 4,179,165, Cl. 303-59.000.
Regan, Louis M.; Childers, Thomas W.; Anderson, Roy E.; and Burkhardt, Joseph A., to Exxon Production Research Company. Metal seal tubing plug. 4,178,992, Cl. 166-117.600.
Rehder, John E. Production of metals. 4,179,283, Cl. 75-40.000.
Reineke, Charles E.: *See—*
Nelson, Linnea E.; and Reineke, Charles E., 4,179,298, Cl. 106-18.210.
Reiner, Roland: *See—*
Riess, Guido; Heide, Helmut; Reiner, Roland; Koster, Kari; and Brotz, Gunther, 4,178,686, Cl. 433-201.000.
Reinhard, Russell R.; and Yaffe, Roberta, to Texaco Inc. Synthetic aircraft turbine oil. 4,179,386, Cl. 252-46.600.
Reinwald, Elmar; Smolka, Heinz; Schwuger, Milan J.; and Koppelmann, Edgar, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Method of machine washing of solid soiled materials by reversibly contacting the circulating wash liquid with aluminosilicates. 4,179,268, Cl. 8-137.000.
Reiss, Guido: *See—*
Riess, Guido; Heide, Helmut; Reiner, Roland; Koster, Kari; and Brotz, Gunther, 4,178,686, Cl. 433-201.000.
Reitz, Ronald P., to Tom Swift Enterprises, Inc. Electrical apparatus. 4,179,627, Cl. 307-261.000.
Research Triangle Institute: *See—*
Lamorte, Michael F., 4,179,702, Cl. 357-30.000.
Reuter, Gerhard; Schnabel, Wolfram; and Serbent, Harry, to Metallgesellschaft Aktiengesellschaft. Direct-reduction process carried out in a rotary kiln. 4,179,280, Cl. 75-33.000.
Reuter, Herbert: *See—*
Andree, Hans; Jung, Dieter; Bischoff, Martin; Conrad, Jens; Huppertz, Josef; Jakobi, Gunter; Krings, Peter; Kuhling, Dieter; Reuter, Herbert; Rupilius, Wolfgang; Rutzen, Horst; and Schnegelberger, Harald, 4,179,393, Cl. 252-155.000.
Revesz, Clara: *See—*
Asselin, Andre A.; Humber, Leslie G.; Dionne, Gervais; Revesz, Clara; and Failli, Amedeo, 4,179,503, Cl. 424-248.510.
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Reynolds Metals Company: *See—*
Goolsby, Patrick F.; Laudig, David J.; Mechler, Paul A.; Osterhus, Steven J.; and Swenck, George F., 4,178,909, Cl. 126-417.000.
Walsh, Adam J., 4,179,342, Cl. 204-35.00N.
Rhodes, John H., Jr., to International Business Machines Corporation. Paper alignment rollers. 4,179,117, Cl. 271-251.000.
Rhodes, William E., III: *See—*
Lynch, Donald M.; Lover, Myron J.; Singer, Arnold J.; and Rhodes, William E., III, 4,179,504, Cl. 424-248.400.
Rical, S.A.: *See—*
Fitte, Daniel, 4,179,044, Cl. 222-551.000.
Rich, Robert L. Multi-purpose hand truck. 4,179,132, Cl. 280-47.260.
Richardson, Daniel J.: *See—*
Bremer, Richard J.; and Richardson, Daniel J., 4,178,793, Cl. 73-23.000.
Richardson, Edwin A.; and Scheuerman, Ronald F., to Shell Oil Company. Method of starting gas production by injecting nitrogen-generating liquid. 4,178,993, Cl. 166-300.000.
Richardson, Michael: *See—*
Napolitano, Joseph J.; and Richardson, Michael, 4,178,960, Cl. 137-494.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Kisfaludy, Lajos; Nyeki nee Kuprina, Olga; Skirmai nee Sarkozi, Maria; Karpati, Egon; Gidai, Katalin; and Szporny, Laszlo, 4,179,433, Cl. 260-112.50R.
Matolcsy, Gyorgy; Bartok, Piroska, nee Berencsy; Kiss, Bella; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, 4,179,463, Cl. 260-502.600.
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Ricoh Co., Ltd.: *See—*
Iiyama, Kiyotaka; Matsui, Takeshi; Kusakata, Shigeru; Watanabe, Hideo; and Takahashi, Michihisa, 4,179,407, Cl. 252-446.000.
Rieder, Matthias: *See—*
Steinbach, Hans-Horst; Schnurrbusch, Karl; Rieder, Matthias; and Weiden, Otto, 4,179,426, Cl. 260-29.20M.
Riefler, Roger G.; and Rolfe, Alfred, to Automatic Switch Company. Pilot operated sequencing valve. 4,178,963, Cl. 137-624.180.
Riehl, Fred, to Robertshaw Controls Company. Burner construction and parts therefor and methods of making the same. 4,179,261, Cl. 431-286.000.
Riess, Guido; Heide, Helmut; Reiner, Roland; Koster, Kari; and Brotz, Gunther, to Reiss, Guido. Artificial tooth with implantable tooth root. 4,178,686, Cl. 433-201.000.
Riessberger, Klaus: *See—*
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Rigert Maschinenbau AG: *See—*
Heberle, Heinz, 4,179,012, Cl. 187-12.000.
Ripple, David E., to Lubrizol Corporation, The. Haloalkyl hydroxy-aromatic condensation products as fuel and lubricant additives. 4,179,449, Cl. 260-346.740.
Rippon, George M., to Biomechanics Limited. Apparatus for anaerobic digestion of biodegradable waste material. 4,179,220, Cl. 366-102.000.
Rise, Samuel F., III, to Bell Telephone Laboratories, Incorporated. Shorting contact for use with a male pin board. 4,179,173, Cl. 339-19.000.
Ritchie, Donald: *See—*
Chang, Nuke M.; Emmerson, John O.; Ritchie, Donald; and Hollenbeck, William, 4,179,059, Cl. 228-103.000.
Ritzenthaler, Richard A.: *See—*
Koch, James H.; and Ritzenthaler, Richard A., 4,179,313, Cl. 148-3.000.
Robb, Robert B. Apparatus for converting a skateboard into a scooter. 4,179,133, Cl. 280-87.04R.
Robert, Andre J.; Filippini, Jean C.; and Ferre, Michel, to Etat Francais as represented by the Delegue General pour l'armement. Dynamic photoelasticimeter with rotating birefringent element. 4,179,217, Cl. 356-33.000.
Robert Bosch GmbH: *See—*
Herth, Harro, 4,178,883, Cl. 123-32.0EE.
Knapp, Heinrich; and Hans, Waldemar, 4,179,069, Cl. 239-125.000.
Latsch, Reinhard; Bianchi, Valerio; and Burkel, Reiner, 4,178,891, Cl. 123-117.00R.
Mayer, Jurgen, 4,178,651, Cl. 15-250.320.
Podrapsky, Jiri; and Orova, Josef, 4,178,892, Cl. 123-117.00R.
Voegele, Guenther, 4,178,929, Cl. 128-213.00R.
Wessel, Wolf, 4,178,798, Cl. 73-113.000.
Roberto, Frederick J.: *See—*
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Robertshaw Controls Company: *See—*
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Riehl, Fred, 4,179,261, Cl. 431-286.000.
Robinson, Gregory A. Method and apparatus for photographing chemiluminescent objects. 4,179,204, Cl. 354-145.000.
Rockford Machine Tool Co.: *See—*
Swanson, Eugene S.; and Winters, Joel M., 4,178,673, Cl. 29-453.000.
Rockwell Internation Corporation: *See—*
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Rockwell International Corporation: *See—*
Catterfeld, Fritz C., 4,179,239, Cl. 415-198.100.
Lange, Frederick F., 4,179,486, Cl. 264-65.000.
Rockwell, Randal L., to Allis-Chalmers Corporation. Folding mechanism for a multiple section agricultural implement. 4,178,998, Cl. 172-311.000.
Rockwell-Rimoldi, S.p.A.: *See—*
Marcandalli, Ulderico, 4,178,864, Cl. 112-159.000.
Rohm GmbH: *See—*
Braeumer, Klaus; Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,179,333, Cl. 435-60.000.
Vetter, Heinz, 4,179,529, Cl. 427-44.000.
Rohowetz, Stanley E.; and Schoenfisch, Eric, to American Can Company. Indicator ink. 4,179,397, Cl. 252-408.000.
Rohrberg, Roderick G.: *See—*
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Rohrkemper, Robert R.: *See—*
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Rolfe, Alfred: *See—*
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Rolph, Donald L., to Memorex Corporation. Flexible magnetic recording disc drive with interlock to protect recording disc cartridge. 4,179,718, Cl. 360-99.000.
Romney, Russell H. Information display system. 4,179,688, Cl. 340-373.000.
Rosaen, Nils O. Fluid filtering device. 4,179,372, Cl. 210-90.000.
Rosan Engineering Corp.: *See—*
Rosan, Jose, Jr., 4,179,038, Cl. 220-243.000.
Rosan, Jose, Jr., to Rosan Engineering Corp. Self-sealing flange and method of installation thereof. 4,179,038, Cl. 220-243.000.
Rosenkranz, Hans J.; Traenckner, Hans-Joachim; and Fuhr, Karl, to Bayer Aktiengesellschaft. Process for the production of binders. 4,179,478, Cl. 525-113.000.
Roshan, Natalia R.: *See—*
Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Smirnov, Viktor S.; Senina, Elena D.; Parbuzina, Iraida L.; Roshan, Natalia R.; Polyakova, Viktoria P.; and Savitsky, Evgeny M., 4,179,470, Cl. 260-580.000.
Ross, Joseph A.; and Stern, Howard K., to Solid Photography Inc. Numerically controlled milling with parabolic profile tools for surface smoothness. 4,179,228, Cl. 407-57.000.
Rossani, Aldo, to C.I.E.R. Compagnia Importazioni Esportazioni Rappresentanze S.R.L. Magnetic compasses. 4,179,741, Cl. 364-457.000.
Rossler, Hermann: *See—*
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Rossomando, Robert, to Polychrome Corporation. Finger nail lacquer. 4,179,304, Cl. 106-177.000.
Roth, Martin, to Ciba-Geigy Corporation. Process for the manufacture of iso-imides or mixtures of iso-imides and imides. 4,179,444, Cl. 260-326.00N.
Rothbuhr, Lothar; and Voll, Manfred, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of carbon black. 4,179,494, Cl. 423-456.000.
Rothenberger GmbH & Co.: *See—*
Rothenberger, Karl, 4,178,786, Cl. 72-117.000.
Rothenberger, Karl, to Rothenberger GmbH & Co. Necking-out tool for forming necks on pipes. 4,178,786, Cl. 72-117.000.
Rothgery, Eugene F.; and Schroeder, Hansjuergen A., to Olin Corporation. 1-Halo- and 1-lower alkoxy-4-trichloromethylphthalazines. 4,179,559, Cl. 544-237.000.
Roussel UCLAF: *See—*
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,179,575, Cl. 562-506.000.
Rowe, Jerry R. Air conditioning system. 4,178,764, Cl. 62-81.000.
Rowinski, Anthony S. Dry wall repair kit. 4,178,730, Cl. 52-514.000.
Rubio, Charles A., to CVG-Siderurgica del Orinoco, C.A. Method for the reduction of metal oxides. 4,179,282, Cl. 75-35.000.
Rubisch, Ottmar: *See—*
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Rudkin, Arthur L.; Clint, John H.; and Young, Kenneth, to Procter & Gamble Company, The. Textile conditioning compositions containing polymeric cationic materials. 4,179,382, Cl. 252-8.800.
Rudolph Beaver, Inc.: *See—*
Kozlowski, George J., Jr., 4,178,797, Cl. 73-104.000.
Ruenzi, Kurt. Sheet feeding and collating apparatus. 4,179,115, Cl. 271-297.000.
Ruff, James W., to United States Steel Corporation. Simultaneous plug-mill rolling for increased production and enhanced tube quality. 4,178,789, Cl. 72-209.000.
Rupilius, Wolfgang: *See—*
Andree, Hans; Jung, Dieter; Bischoff, Martin; Conrad, Jens; Huppertz, Josef; Jakobi, Gunter; Krings, Peter; Kuhling, Dieter; Reuter, Herbert; Rupilius, Wolfgang; Rutzen, Horst; and Schnegelberger, Harald, 4,179,393, Cl. 252-155.000.
Russell, David B., to Dennison Manufacturing Company. Feed and severing apparatus. 4,179,063, Cl. 227-67.000.
Russell, Ronald R., to General Electric Company. Control circuit for circuit breaker DC motor operator. 4,179,646, Cl. 318-380.000.
Rutzen, Horst: *See—*
Andree, Hans; Jung, Dieter; Bischoff, Martin; Conrad, Jens; Huppertz, Josef; Jakobi, Gunter; Krings, Peter; Kuhling, Dieter; Reuter, Herbert; Rupilius, Wolfgang; Rutzen, Horst; and Schnegelberger, Harald, 4,179,393, Cl. 252-155.000.
Rybinsky, Alexandr G.: *See—*
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Ryder, Francis E.; and Thomas, Michael D., to Ryder International Corporation. Vacuum curettage device with vacuum indicator. 4,178,932, Cl. 128-276.000.
Ryder International Corporation: *See—*
Ryder, Francis E.; and Thomas, Michael D., 4,178,932, Cl. 128-276.000.
Thomas, Michael D., 4,179,051, Cl. 222-494.000.
Rykowski, John J. Silane coupling agents. 4,179,537, Cl. 427-387.000.
Ryobi Ltd.: *See—*
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Saab-Scania Aktiebolag: *See—*
Sjodin, Bo, 4,179,707, Cl. 358-107.000.
Sablich, Milan; and Bedard, Eugene J., to Consolidated Foods Corporation. Shutoff and bypass valve. 4,179,373, Cl. 210-98.000.
Sabo, Robert C. Mine life line system. 4,179,160, Cl. 299-12.000.
Sadan, Abraham. Dehydration process. 4,179,493, Cl. 423-279.000.
Sadauskas, Joseph J., to H. K. Porter, Inc. Ratchet cable cutter. 4,178,682, Cl. 30-250.000.
Sadkova, Natalia A.: *See—*
Belitsin, Mikhail N.; Kudryashov, Sergei A.; Borik, Alexandr G.; Kulikov, Valentin V.; Sadkova, Natalia A.; Kudryashova, Galina A.; and Vorontsov, Leonid F., 4,179,259, Cl. 425-461.000.
Sadler, Philip M. Cylindrical planetarium projector. 4,178,701, Cl. 35-42.500.
Sagara, Hiroji, to Hoya Corporation. Optical glass. 4,179,300, Cl. 106-47.00Q.
Sagara, Seiji: *See—*
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Sahasrabudhe, Arun P.; and Kapadia, Jayant K., to Westinghouse Electric Corp. Failsafe logic function apparatus. 4,179,629, Cl. 307-311.000.
Saint-Gobain Industries: *See—*
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Ortmanns, Gunther; Kraemling, Franz; and Pikhard, Siegfried, 4,178,728, Cl. 52-232.000.
Saito, Kazuo: *See—*
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Sato, Yoshio: *See—*
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Saka, Hamid J.: *See—*
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Sakaguchi, Hirofumi: *See—*
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Sakai, Kazuo; Akiba, Shigeyuki; and Yamamoto, Takaya, to Kokusai Denshin Denwa Kabushiki Kaisha. Method for producing compound semiconductor crystals. 4,179,317, Cl. 148-171.000.
Sakai, Takeo: *See—*
Sato, Akira; Iwamoto, Atsuo; Sakai, Takeo; and Takei, Haruo, 4,179,296, Cl. 430-574.000.
Sakano, Hajime; Kawagishi, Shigemitsu; Kodama, Mikio; Ito, Akitoshi; Shoji, Toshihiro; Terada, Miyuki; and Yoshida, Isao, to Sumitomo Naugatuck Co., Ltd. Method for preparation of a plated product. 4,179,341, Cl. 204-20.000.
Sakanoue, Seiki: *See—*
Hirano, Shigeo; Adachi, Keiichi; Sakanoue, Seiki; and Kamio, Takayoshi, 4,179,293, Cl. 430-551.000.
Sakauye, Wallace S. Device for sealing the gap under a door. 4,178,717, Cl. 49-70.000.
Sakurai, Hisayuki: *See—*
Ishimaru, Toshiyasu; Shimonishi, Yasutsugu; Sakurai, Hisayuki; and Hatanaka, Minoru, 4,179,557, Cl. 544-28.000.
Sakurai, Tadashi: *See—*
Ohgishi, Tsutomu; Akiyama, Toru; and Sakurai, Tadashi, 4,179,628, Cl. 307-279.000.
Salas, Frank D. Housing module and space frame. 4,178,736, Cl. 52-648.000.
Samstoe, Per-Edward. Method and apparatus for rapid battery charging. 4,179,648, Cl. 320-11.000.
Sanada, Noriaki: *See—*
Hirohata, Michio; Suzuki, Toyotosi; Yokota, Hideo; Matsuda, Mutsuhide; Taguchi, Tetsuya; and Sanada, Noriaki, 4,179,203, Cl. 354-106.000.
Sanchez, Moises G.; Ernest, Michael V., and Laine, Norman R., to W. R. Grace & Co. Process for preparing spheroidal alumina particles. 4,179,408, Cl. 252-448.000.
Sanders Associates, Inc.: *See—*
Townsend, Robert L., 4,179,682, Cl. 367-135.000.
Sandoz, Inc.: *See—*
Nadelson, Jeffrey, 4,179,566, Cl. 546-116.000.
Sandoz Ltd.: *See—*
Fleck, Fritz; Kittl, Hans; and Valenti, Salvatore, 4,179,578, Cl. 560-76.000.
Santa Fe International Corporation: *See—*
Chang, Nuke M.; Emmerson, John O.; Ritchie, Donald; and Hollenbeck, William, 4,179,059, Cl. 228-103.000.
Santora, James V. Incandescent light bulb with multiple filaments providing multiple lives. 4,179,637, Cl. 313-316.000.
Sanyo Electric Co., Ltd.: *See—*
Ohgishi, Tsutomu; Akiyama, Toru; and Sakurai, Tadashi, 4,179,628, Cl. 307-279.000.
Sasazawa, Koji; Shimizu, Mahito; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Process for producing magnetic FE oxide. 4,179,387, Cl. 252-62.560.
Sashin, Donald; and Sternglass, Ernest J., to University of Pittsburgh. Radiography apparatus. 4,179,100, Cl. 250-416.0TV.
Sasse, Klaus: *See—*
Beck, Gunther; Sasse, Klaus; Heitzer, Helmut; Eue, Ludwig; Schmidt, Robert R.; Scheinpflug, Hans; Hammann, Ingeborg; and Brandes, Wilhelm, 4,179,277, Cl. 71-92.000.
Sassenhausen, Herbert R., to Eastman Kodak Company. Process of eliminating cracking in the coating of TiO_2 layers. 4,179,538, Cl. 430-213.000.
Sato, Akira; Iwamoto, Atsuo; Sakai, Takeo; and Takei, Haruo, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion. 4,179,296, Cl. 430-574.000.
Sato, Koichi: *See—*
Tateshita, Tadao; Mita, Yasuhiro; Nakayama, Junichi; and Sato, Koichi, 4,179,242, Cl. 417-8.000.
Sato, Kyosaku: *See—*
Edwards, Douglas C.; and Sato, Kyosaku, 4,179,421, Cl. 260-23.70M.
Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Inking device for label printing and applying machine. 4,178,849, Cl. 101-305.000.
Satoh, Ken; and Yanagida, Tuneo, to Olympus Optical Company, Ltd. Tape end warning apparatus. 4,179,716, Cl. 360-74.300.
Sauciuc, Alexandru; Nitelea, Ion; Paunescu, Eugeniu; Diaconescu, Constantin; Albu, Margareta; Bulgaru, Liliana; and Diaconu, Eugen, to Intreprinderea de Antibiotice Iasi. Rifamycins and method for their preparation. 4,179,439, Cl. 260-239.30P.
Sauvage, Philippe, to Compagnie Generale des Etablissements Michelin. Installation for manufacturing a metal wire by continuous casting. 4,178,985, Cl. 164-250.000.
Savage, Elton S.; and Chen, Jeffrey J., to Dravo Corporation. Apparatus for the treatment of wastewater. 4,179,374, Cl. 210-151.000.
Savar, Cindy: *See—*
Savar, Eugene J.; and Savar, Cindy, 4,179,139, Cl. 282-23.00R.
Savar, Eugene J.; and Savar, Cindy. Combination check and credit card sales slip. 4,179,139, Cl. 282-23.00R.

Savitsky, Evgeny M.: *See—*
Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Smirnov, Viktor S.; Senina, Elena D.; Parbuzina, Iraida L.; Roshan, Natalia R.; Polyakova, Viktoria P.; and Savitsky, Evgeny M., 4,179,470, Cl. 260-580.000.

Savor, Dennis E.; and Rohrberg, Roderick G., to Combustion Engineering, Inc. Tube plug. 4,178,966, Cl. 138-89.000.

Sawafuji, Tosuke: *See—*
Umezaki, Hideo; Doma, Katsuharu; Konno, Toshiro; Yanashita, Fumio; Saito, Yoshio; and Sawafuji, Tosuke, 4,178,752, Cl. 58-126.00E.

Saxman, William C.: *See—*
Mitchell, Howard E.; and Saxman, William C., 4,179,000, Cl. 175-53.000.

Schaub, Robert E.: *See—*
Bernady, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., 4,179,574, Cl. 562-503.000.
Floyd, Middleton B., Jr.; Weiss, Martin J.; McGahren, William J.; and Schaub, Robert E., 4,179,451, Cl. 260-395.000.

Scheinpflug, Hans: *See—*
Beck, Gunther; Sasse, Klaus; Heitzer, Helmut; Eue, Ludwig; Schmidt, Robert R.; Scheinpflug, Hans; Hammann, Ingeborg; and Brandes, Wilhelm, 4,179,277, Cl. 71-92.000.

Schenectady Chemicals, Inc.: *See—*
Laganis, Deno, 4,179,420, Cl. 260-21.000.
Laganis, Deno; and Begley, Paul M., 4,179,423, Cl. 260-29.20N.

Schenk-Filterbau Gesellschaft mit beschrankter Haftung: *See—*
Baur, Rolf, 4,179,381, Cl. 210-456.000.

Schenker, Emil, to Sorna Watch S.A. Pendant comprising a sleeve in combination with a timepiece. 4,178,753, Cl. 58-152.00R.

Schering Aktiengellschaft: *See—*
Weber, Alfred; Kennecke, Mario; and Dahl, Helmut, 4,179,336, Cl. 435-55.000.

Scheuerman, Ronald F.: *See—*
Richardson, Edwin A.; and Scheuerman, Ronald F., 4,178,993, Cl. 166-300.000.

Schiffer, Gunter, to Kleinewefers Gesellschaft mit beschrankter Haftung. Device for printing by sublimation. 4,178,782, Cl. 68-5.00D.

Schillreff, George H., to General Dynamics Corporation, Pomona Division. Multiple sequential burst system. 4,178,854, Cl. 102-89.0CD.

Schleier, Richard L.: *See—*
Barra, Frank J.; and Schleier, Richard L., 4,179,328, Cl. 159-16.00R.

Schmelzer Corporation: *See—*
Benjamin, Benjamin C., 4,178,895, Cl. 123-119.00F.

Schmerling, Donald W., to Chemetron Corporation. Wire-feeding mechanism. 4,179,056, Cl. 226-171.000.

Schmid, Frederick, to Crystal Systems, Inc. Process of forming a wire pack. 4,178,670, Cl. 29-417.000.

Schmid, Hans F., to Mar-Kal Products Corporation. Flip leaf exhibitor having separable ring fasteners for leaves. 4,178,710, Cl. 40-530.000.

Schmid, Otto: *See—*
Barthell, Eduard; and Schmid, Otto, 4,179,367, Cl. 210-41.000.

Schmidt, Curt: *See—*
Dustmann, Cord-Henrich; Schmidt, Curt; and Pasztor, Gabriel, 4,178,676, Cl. 29-599.000.

Schmidt, Robert R.: *See—*
Beck, Gunther; Sasse, Klaus; Heitzer, Helmut; Eue, Ludwig; Schmidt, Robert R.; Scheinpflug, Hans; Hammann, Ingeborg; and Brandes, Wilhelm, 4,179,277, Cl. 71-92.000.

Schmidt, Waldemar M.: *See—*
Staats, Henry N.; Schmidt, Waldemar M.; and Davila, Efrain A., 4,179,325, Cl. 156-498.000.

Schmieder, Lothar; Vilgertshofer, August; and Mettin, Florian, to Deutsch Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Force and bending moment sensing arrangement and structure. 4,178,799, Cl. 73-141.00A.

Schmitz, Charles R.: *See—*
Isaac, L. Henry; Nowak, Edward J.; and Schmitz, Charles R., 4,179,168, Cl. 312-125.000.

Schmut, Wolfgang: *See—*
Zuckert, Bertram; Schmut, Wolfgang; and Behmel, Klaus, 4,179,428, Cl. 260-29.40R.

Schnabel, Wolfram: *See—*
Reuter, Gerhard; Schnabel, Wolfram; and Serbent, Harry, 4,179,280, Cl. 75-33.000.

Schnegelberger, Harald: *See—*
Andree, Hans; Jung, Dieter; Bischoff, Martin; Conrad, Jens; Huppertz, Josef; Jakobi, Gunter; Krings, Peter; Kuhling, Dieter; Reuter, Herbert; Rupilius, Wolfgang; Rutzen, Horst; and Schnegelberger, Harald, 4,179,393, Cl. 252-155.000.

Schnellbacher, Kurt; Muller, Klaus; and Gorlitz, Frank-Otto, to Buhler-Miag GmbH. Dual-table separating apparatus. 4,179,363, Cl. 209-481.000.

Schnurrbusch, Karl: *See—*
Steinbach, Hans-Horst; Schnurrbusch, Karl; Rieder, Matthias; and Weiden, Otto, 4,179,426, Cl. 260-29.20M.

Schockmel, Robert: *See—*
Metz, Paul; Schockmel, Robert; and Mersch, Roland, 4,179,275, Cl. 65-20.000.

Schoenfisch, Eric: *See—*
Rohowetz, Stanley E.; and Schoenfisch, Eric, 4,179,397, Cl. 252-408.000.

Schon, Franz: *See—*
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 4,178,705, Cl. 38-144.000.

Schopp, Edgar. Flexible pipe fitting. 4,179,142, Cl. 285-239.000.

Schotten, Alfons; and Spolgen, Hermann J., to Eberhard Hoesch & Sohne GmbH & Co. Shifting device for a plate filter press. 4,179,377, Cl. 210-230.000.

Schreiber, William L.: *See—*
Withycombe, Donald A.; Hruza, Anne; Vock, Manfred H.; Giacino, Christopher; Mookherjee, Braja D.; Pittet, Alan O.; and Schreiber, William L., 4,179,526, Cl. 426-535.000.

Schreiner, Juan M., to Jumberca, S.A. Stitch cams for circular knitting machines. 4,178,779, Cl. 66-54.000.

Schroeder, Hansjuergen A.: *See—*
Rothgery, Eugene F.; and Schroeder, Hansjuergen A., 4,179,559, Cl. 544-237.000.

Schroeter, Siegfried H.; and Olson, Daniel R., to General Electric Company. UV curable resin compositions containing urethanes of hydroxybenzotriazoles or urethanes of hydroxy benzophenones. 4,179,548, Cl. 525-329.000.

Schuck, William H. Sealed dispenser spout assembly. 4,179,042, Cl. 222-89.000.

Schuermann, Josef H., to Texas Instruments Deutschland GmbH. HF-amplifier circuit. 4,179,668, Cl. 330-277.000.

Schulte-Elte, Karl-Heinrich; Fankhauser, Peter; and Ohloff, Gunther, to Firmenich, S.A. Spirane derivatives useful as perfuming and flavor-modifying ingredients. 4,179,448, Cl. 260-346.110.

Schultz, Helmut, to Hoesch Werke Aktiengesellschaft. Measuring device for checking the dimensional accuracy of the track width of curved transport tracks, particularly for continuous casting or extrusion. 4,178,692, Cl. 33-182.000.

Schultz, Robert J.; and Starks, Fred W. Preparation of N-(phosphonoacetyl)-L-aspartic acid. 4,179,464, Cl. 260-502.500.

Schundehutte, Karl H.: *See—*
Hugl, Herbert; Schundehutte, Karl H.; Trautner, Kersten; and Wolfrum, Gerhard, 4,179,436, Cl. 260-206.000.

Schutt and Grundei O.H.G.: *See—*
Grundei, Hans; and Thomas, Wolfram, 4,178,641, Cl. 3-1.911.

Schutze, Detlef-Ingo; Bien, Hans-Samuel, deceased (by Bien, Else, Gabriele Bien, Dorothee Bien, legal representatives); Bien, Petra, heir; and Bien, Daniel, heir, to Bayer Aktiengesellschaft. Process for the preparation of 1-acylamino-5(8)-chloroanthraquinones. 4,179,450, Cl. 260-377.000.

Schwarte, Jurgen: *See—*
Lichtenberger, Horst; Knoblauch, Karl; Grochowski, Horst; Juntgen, Harald; and Schwarte, Jurgen, 4,179,399, Cl. 252-411.00S.

Schwartz, Joseph: *See—*
Krapcho, John; and Schwartz, Joseph, 4,179,558, Cl. 544-174.000.

Schwartzman, Everett H. Heat source and heat sink pumping system and method. 4,178,761, Cl. 60-648.000.

Schweizer, Herbert. Ski slope. 4,179,539, Cl. 428-58.000.

Schwender, Charles F.; and Sunday, Brooks R., to Warner-Lambert Company. (Substituted 2-carboxyanilino)nicotinic acids as inhibitors of allergic reactions. 4,179,509, Cl. 424-266.000.

Schwuger, Milan J.: *See—*
Reinwald, Elmar; Smolka, Heinz; Schwuger, Milan J.; and Koppelmann, Edgar, 4,179,268, Cl. 8-137.000.

Sciaky Bros., Inc.: *See—*
Connors, John F.; Bass, Douglas D.; Bell, Michael G.; and Ream, Stanley L., 4,179,316, Cl. 148-152.000.

SCM Corporation: *See—*
Kane, Bernard J.; and Von Genk, Richard A., 4,179,468, Cl. 260-567.60M.
Mehta, Anil B.; and Zielinski, Richard J., 4,179,454, Cl. 260-409.000.

Scott & Fetzer Company, The: *See—*
Volker, James W., 4,179,246, Cl. 417-313.000.

Scott, John W.: *See—*
Berger, Leo; and Scott, John W., 4,179,443, Cl. 260-315.000.

Security Patrols Co., Ltd.: *See—*
Nakauchi, Shunsaku; and Takahashi, Akifusa, 4,179,606, Cl. 250-339.000.

Seidel, John G.: *See—*
Felice, Patrick E.; Gonzalez, Joseph L.; and Seidel, John G., 4,179,614, Cl. 250-253.000.

Seim, William J.: *See—*
Farrell, Francis M., III; Otto, Robert B.; and Seim, William J., 4,179,050, Cl. 222-386.000.

Seiz, Rudolf; Eickhoff, Heinz; Meyer, Herbert; and Steppke, Dieter, to Bochumer Eisenhutte Heintzmann GmbH & Co. Door-like closure. 4,178,859, Cl. 109-27.000.

Selas, George J., to Allen-Bradley Company. Time delay relay movement. 4,179,676, Cl. 335-59.000.

Seldner, Alvin A., to Allied Chemical Corporation. Process for coating pyrotechnic materials. 4,179,327, Cl. 156-667.000.

Senco Products, Inc.: *See—*
Becht, Carl T.; and Hueil, J. Charles, 4,179,057, Cl. 227-19.000.

Seneca Sawmill Company, Inc.: *See—*
Jones, Aaron U., 4,179,236, Cl. 414-117.000.

Senina, Elena D.: *See—*
Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Smirnov, Viktor S.; Senina, Elena D.; Parbuzina, Iraida L.; Roshan, Natalia R.; Polyakova, Viktoria P.; and Savitsky, Evgeny M., 4,179,470, Cl. 260-580.000.

Serbent, Harry: *See—*
Reuter, Gerhard; Schnabel, Wolfram; and Serbent, Harry, 4,179,280, Cl. 75-33.000.

Serebryakov, Evgeny A.: *See—*
Yascheritsyn, Petr I.; Borisenko, Alexandr V.; Sidorenko, Valery A.; and Serebryakov, Evgeny A., 4,178,818, Cl. 82-36.00R.

Sergev, Sergius S., to United States of America, Navy. Electromechanical low backlash cable connector. 4,179,583, Cl. 174-21.00R.

Seufert, Gerhard. Apparatus for forming flexible fold lines in thermoplastic sheets and article so formed. 4,179,252, Cl. 425-174.600.

Sevastakis, Gus. Method and apparatus for continuously casting hollow bars. 4,178,982, Cl. 164-85.000.

Sewell, Peter B.; and Ramachandran, Kovilvila N. Point scattering detector. 4,179,609, Cl. 250-397.000.

Shafer, David R., to Perkin-Elmer Corporation, The. Laser fusion optical system. 4,179,192, Cl. 350-294.000.

Shalita, Benyamin: *See—*
Mechoulam, Raphael; Lander, Naphtali; Dikstein, Shabtay; and Shalita, Benyamin, 4,179,517, Cl. 424-283.000.

Shannon, Richard F., to Owens-Corning Fiberglas Corporation. Method of producing structural insulation materials containing at least 50 percent xonotlite. 4,179,303, Cl. 106-119.000.

Shannon, Shelly L. Electrical connector. 4,179,171, Cl. 339-17.0LC.

Shapiro, Howard M. Method and system for non-invasive detection of zinc protoporphyrin in erythrocytes. 4,178,917, Cl. 128-665.000.

Sharp, Denis; and Skoyles, Derek R., to U.S. Philips Corporation. Anti-lock vehicle brake system with variable decay rate. 4,179,166, Cl. 303-119.000.

Sharp Kabushiki Kaisha: *See—*
Tanimoto, Akira; Masuzawa, Sigeaki; Shibata, Shinya; and Nishizaki, Shinzo, 4,179,584, Cl. 179-1.0SM.
Tateishi, Iwao, 4,178,691, Cl. 33-139.000.

Shaw, David N., to Dunham-Bush, Inc. Reverse fan heat pump defrost control system. 4,178,767, Cl. 62-155.000.

Shaw, David N., to Dunham-Bush, Inc. Oil equalization system for parallel connected hermetic helical screw compressor units 4,179,248, Cl. 417-427.000.

Shea, Evan P.: *See—*
Krause, William A.; and Shea, Evan P., 4,179,347, Cl. 204-149.000

Shelef, Mordecai: *See—*
Gandhi, Haren S.; Shelef, Mordecai; and Wynblatt, Paul P., 4,179,413, Cl. 252-472.000.

Shell Oil Company: *See—*
Felton, John C.; Badmin, John S.; and Twydell, Roland S., 4,179,518, Cl. 424-300.000.
Kim, Leo; Paxson, Timm E.; and Tang, Sunny C., 4,179,402, Cl. 252-431.00C.
Kim, Leo; Paxson, Timm E.; and Tang, Sunny C., 4,179,403, Cl 252-431.00C.
Richardson, Edwin A.; and Scheuerman, Ronald F., 4,178,993, Cl. 166-300.000.

Sheng, Ping; and Firester, Arthur H., to RCA Corporation. Optical playback system having increased depth-of-field. 4,179,708, Cl. 358-128.000.

Sheng, Tan T.: *See—*
Chang, Chuan C.; Ermanis, Felix; McCoy, Robert J.; Nakahara, Shohei; and Sheng, Tan T., 4,179,534, Cl. 427-89.000.

Shenoy, Raghuram D.; and Ganapathy, Anantharam, to Cadbury India Limited. Process for the production of modified vegetable fats. 4,179,455, Cl. 260-409.000.

Shenoy, Raghuram D.; and Ganapathy, Anantharam, to Cadbury India Limited. Process for the production of modified vegetable fats. 4,179,456, Cl. 260-409.000.

Shepherd, Michael, to Wallace Murray Corporation. Meta reinforced plastic damper hub. 4,178,811, Cl. 74-574.000.

Sherman, Ralph R., Jr.: *See—*
Harris, Raymond W.; and Sherman, Ralph R., Jr., 4,179,661, Cl. 325-455.000.

Shibata, Shinya: *See—*
Tanimoto, Akira; Masuzawa, Sigeaki; Shibata, Shinya; and Nishizaki, Shinzo, 4,179,584, Cl. 179-1.0SM.

Shibatani, Juichi: *See—*
Adachi, Eiji; Shibatani, Juichi; and Ito, Sadayoshi, 4,178,756, Cl. 60-397.000.

Shilton, Mark G.: *See—*
Howe, Arthur T.; and Shilton, Mark G., 4,179,491, Cl. 423-253.000.

Shimada, Masaru: *See—*
Nishimura, Toshimichi; Yamanaka, Seisuke; and Shimada, Masaru, 4,179,706, Cl. 358-44.000.

Shimano Industrial Company Limited: *See—*
Kine, Masayoshi, 4,179,013, Cl. 188-26.000.
Noda, Hideo, 4,179,084, Cl. 242-212.000.

Shimizu, Mahito: *See—*
Sasazawa, Koji; Shimizu, Mahito; and Kitamoto, Tatsuji, 4,179,387, Cl. 252-62.560.

Shimizu, Tadao: *See—*
Yanagida, Hiroaki; Shimizu, Tadao; and Nishikawa, Yasuo, 4,179,496, Cl. 423-598.000.

Shimonishi, Yasutsugu: *See—*
Ishimaru, Toshiyasu; Shimonishi, Yasutsugu; Sakurai, Hisayuki; and Hatanaka, Minoru, 4,179,557, Cl. 544-28.000.

Shin-Etsu Chemical Co. Ltd.: *See—*
Takamizawa, Minoru; Inoue, Yoshio; and Sugita, Toshikazu, 4,179,295, Cl. 428-447.000.

Shin Meiwa Industry Co., Ltd.: *See—*
Maruyama, Shigeo; Nishikatji, Yuji; Miura, Tatsuya; and Fujinaga, Shigeki, 4,179,602, Cl. 219-125.100.

Shin-Shirasuna Electric Corporation: *See—*
Nakazono, Akio; and Nakamura, Shizuo, 4,179,721, Cl. 360-137.000.

Shindo, Minoru: *See—*
Ochi, Kiyoshige; Matsunaga, Isao; Shindo, Minoru; and Kaneko, Chikara, 4,179,452, Cl. 260-397.200.

Shindo, Yoshio; Kimijima, Takahiro; Omishi, Hiroyasu; and Endo, Masayasu, to Tokyo Electric Power Co. Inc., The; and Osaki Electric Co., Ltd. Carrier control method by using phase-pulse signals. 4,179,624, Cl. 307-3.000.

Shinohara, Toshio: *See—*
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,179,339, Cl. 435-292.000.

Shinsako, Joe H. Sanitary dog litter bagger. 4,179,145, Cl. 294-19.00R.

Shirasaka, Tadashi: *See—*
Morita, Yoshiharu; Omata, Kenzo; Ohya, Junichi; Wagatsuma, Kazuo; and Shirasaka, Tadashi, 4,179,437, Cl. 260-239.100.

Shishkin, Petr T.: *See—*
Nudelman, Boris I.; Gadaev, Anatoly Y.; Bikbau, Marsel Y.; and Shishkin, Petr T., 4,179,302, Cl. 106-100.000.

Shoemaker, Edwin J.; Pacitti, William; and Baumann, Marvin J., to La-Z-Boy Chair Company. Wall reclining rocking chair. 4,179,157, Cl. 297-83.000.

Shoji, Toshihiro: *See—*
Sakano, Hajime; Kawagishi, Shigemitsu; Kodama, Mikio; Ito, Akitoshi; Shoji, Toshihiro; Terada, Miyuki; and Yoshida, Isao, 4,179,341, Cl. 204-20.000.

Shumate, William G.: *See—*
Hawton, John T., Jr.; and Shumate, William G., 4,179,351, Cl. 204-298.000.

Shy, Min C. Fixed latch lock. 4,179,143, Cl. 292-179.000.

Shyu, Ji Y., to Yang, Yin-Lung, a part interest. Rescue signal device. 4,178,867, Cl. 114-39.000.

Siargas — Societa' Italiana Assistenza Reti Gas S.p.A.: *See—*
Moschetti, Armando, 4,178,875, Cl. 118-712.000.

Sideris, John N. J.: *See—*
Bromell, Raymond J.; and Sideris, John N. J., 4,179,233, Cl. 414-139.000.

Sidi, Henri: *See—*
Ali, Asghar; Caruso, Robert; Fischer, Alfred; Deinet, Adolph J.; Minieri, Pasquale P.; and Sidi, Henri, 4,179,385, Cl. 252-33.000.

Sidorenko, Valery A.: *See—*
Yascheritsyn, Petr I.; Borisenko, Alexandr V.; Sidorenko, Valery A.; and Serebryakov, Evgeny A., 4,178,818, Cl. 82-36.00R.

Sieb, Paul A.; Deyoe, Charles W.; and Hoseney, Russell C., to Kansas State University Research Foundation. Method of preparation of 2-phosphate esters of ascorbic acid. 4,179,445, Cl. 260-340.90R.

Siegel, Rudolf: *See—*
Dillenburg, Helmut; Dotsch, Werner; and Siegel, Rudolf, 4,179,394, Cl. 252-186.000.

Siegenia-Frank AG.: *See—*
Frank, Gerhard; and Kucharczyk, Eckhard, 4,178,841, Cl. 98-98.000.

Sieklucki, James F.; and Veld, Ralph, Jr., to Sieklucki, James F. Urinary drainage bag support. 4,179,159, Cl. 297-192.000.

Siemens Aktiengesellschaft: *See—*
Geckeler, Siegfried, 4,179,188, Cl. 350-96.310.
Neuendorff, Hans, 4,179,643, Cl. 315-411.000.
Weisse, Hanns-Jorg; Jager, Wilhelm; and Uhlmann, Helmut, 4,178,677, Cl. 29-605.000.

Siewert, Robert L., to Clark Equipment Company. Multiple parking brake. 4,179,015, Cl. 188-106.00P.

Sigmon, Ned A., to Liggett Group Inc. Method for making a hollow filter rod. 4,179,323, Cl. 156-201.000.

Sigri Elektrographit GmbH: *See—*
Brandmair, Franz; Rubisch, Ottmar; and Honig, Dietmar, 4,179,289, Cl. 75-206.000.

Silverman, Gordon: *See—*
Launzel, Edward A.; and Silverman, Gordon, 4,179,733, Cl. 364-200.000.

Simon Engineering Dudley Limited: *See—*
Ashworth, Denis H., 4,179,010, Cl. 182-2.000.

Simonds, Michael E., to Stork Gamco, Inc. Transfer apparatus for poultry processing conveyor. 4,178,659, Cl. 17-24.000.

Simpson, Howard D., to Union Oil Company of California. Cobalt-molybdenum-alumina desulfurization catalyst. 4,179,410, Cl. 252-465.000.

Singer, Arnold J.: *See—*
Lynch, Donald M.; Lover, Myron J.; Singer, Arnold J.; and Rhodes, William E., III, 4,179,504, Cl. 424-248.400.

Singer Company, The: *See—*
Adams, Kenneth D., 4,178,866, Cl. 112-278.000.
Harvell, Don L., 4,179,632, Cl. 310-50.000.
Lawrie, Donald, 4,178,863, Cl. 112-158.00D.
Odermann, Charles R.; and Johnson, Ralph E., 4,178,865, Cl. 112-261.000.

Sirovich, Bruce E.: *See—*
Bowman, Walker H.; and Sirovich, Bruce E., 4,178,987, Cl. 165-1.000.

Sjodin, Bo, to Saab-Scania Aktiebolag. Automatic measurement of lengths of elongated workpieces. 4,179,707, Cl. 358-107.000.

Skaugset, Richard L.: *See*—
Erdmann, Joachim C.; Gellert, Robert I.; and Skaugset, Richard L., 4,179,218, Cl. 356-336.000.

Skil Corporation: *See*—
Vassos, Louis J., 4,179,644, Cl. 318-17.000.

Skinner, Robert I.; and Heine, Arnold J., to Development Finance Corporation of New Zealand. Mechanical attenuator. 4,179,104, Cl. 267-154.000.

Skirmai nee Sarkozi, Maria: *See*—
Kisfaludy, Lajos; Nyeki nee Kuprina, Olga; Skirmai nee Sarkozi, Maria; Karpati, Egon; Gidai, Katalin; and Szporny, Laszlo, 4,179,433, Cl. 260-112.50R.

Skoyles, Derek R.: *See*—
Sharp, Denis; and Skoyles, Derek R., 4,179,166, Cl. 303-119.000.

Skrynnikov, Vladimir I.: *See*—
Karas, Genrikh E.; Lebedeva, Ljudmila P.; Mukhin, Anatoly A.; Pivovarov, Anatoly D.; Skrynnikov, Vladimir I.; Yam, Vladimir M.; Oleinik, Vladimir T.; Miroshnichenko, Vladimir V.; Kovtun, Vasily A., deceased; Kovtun, Lidia P., administrator; Soshnikova, Inna V., administrator; and Kovtun, Sergei V., administrator, 4,179,258, Cl. 425-352.000.

Slater, John. Motorcycle front wheel suspension system. 4,179,135, Cl. 280-276.000.

Slayton, Curtis R., to General Electric Company. Means for causing the accumulation of refrigerant in a closed system. 4,178,765, Cl. 62-83.000.

Smarook, Walter H., to Union Carbide Corporation. Fabrication of foamed articles. 4,179,540, Cl. 428-71.000.

Smashey, Russell W., to General Electric Company. Furnace for directional solidification casting. 4,178,986, Cl. 164-251.000.

Smemo, Alfred S., to Deere & Company. Split input planetary transmission. 4,178,813, Cl. 74-764.000.

Smetana, Daryl L., to Ford Aerospace and Communications Corporation. Cryostat assembly. 4,178,775, Cl. 62-514.0JT.

Smirnov, Viktor S.: *See*—
Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Smirnov, Viktor S.; Senina, Elena D.; Parbuzina, Iraida L.; Roshan, Natalia R.; Polyakova, Viktoria P.; and Savitsky, Evgeny M., 4,179,470, Cl. 260-580.000.

Smith, Alvin J. Aeration of waste in septic tank. 4,179,375, Cl. 210-197.000.

Smith, Don H.; and Barton, Leslie W., to Atlas Powder Company. Delay actuated explosive device. 4,178,852, Cl. 102-24.00R.

Smith, Frank: *See*—
Davies, Michael; Hourihan, Glyn; and Smith, Frank, 4,179,653, Cl. 324-65.0CR.

Smith, Frederick R., to Avtex Fibers Inc. Alloy rayon fibers having dispersed therein an amide polymer and a polyacrylic acid salt. 4,179,416, Cl. 260-17.4CL.

Smith, Gene D. Split image bow sight and range finder. 4,178,693, Cl. 33-265.000.

Smith Industries, Inc.: *See*—
Barra, Frank J.; and Schleier, Richard L., 4,179,328, Cl. 159-16.00R.

Smith, Morris R. Holographic jewel. 4,179,182, Cl. 350-3.690.

Smith, Peter D. Radiation tracking control. 4,179,612, Cl. 250-203.00R.

Smith, Stanley T. Revolving mirror scanning interferometer. 4,179,219, Cl. 356-346.000.

Smolka, Heinz: *See*—
Reinwald, Elmar; Smolka, Heinz; Schwuger, Milan J.; and Koppelmann, Edgar, 4,179,268, Cl. 8-137.000.

Snow, Milton L. Apparatus for controlling related equipment and for enabling hand free usage. 4,179,590, Cl. 179-156.00A.

Sobierajski, Isabelle M.: *See*—
Buescher, William E.; Roberto, Frederick J.; and Sobierajski, Isabelle M., 4,179,297, Cl. 106-1.120.

Societe Anonyme des Etablissements Staubli: *See*—
Palau, Joseph, 4,178,958, Cl. 137-460.000.

Societe Anonyme Francaise du Ferodo: *See*—
Bacher, Michel, 4,178,808, Cl. 74-230.17E.

Societe de Paris et du Rhone: *See*—
Mazzorana, Alfred, 4,178,805, Cl. 74-6.000.

Societe Nationale Elf Aquitaine (Production): *See*—
Bernat, Jean-Pierre, 4,179,348, Cl. 204-151.000.

Sodip S.A.: *See*—
Amicel, Charles; Biot, Bernard; Butruille, Yves; and Ollivier, Christian, 4,179,380, Cl. 210-321.00A.

Soeding, Horst, to Polygram GmbH. Process for producing a disc-shaped information carrier which has information in the form of a beam-reflecting structure. 4,179,532, Cl. 427-54.100.

Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, to Olympus Optical Company, Ltd. Liquid feeder for automatic culture apparatus. 4,179,339, Cl. 435-292.000.

Solar Kinetics, Inc.: *See*—
Hutchison, J. A., 4,178,913, Cl. 126-424.000.

Solarspan, Inc.: *See*—
Mattson, John P., 4,178,911, Cl. 126-449.000.

Solartron Electronic Group Limited, The: *See*—
Potter, Peter N., 4,178,804, Cl. 73-702.000.

Solid Photography Inc.: *See*—
Ross, Joseph A.; and Stern, Howard K., 4,179,228, Cl. 407-57.000.

Solomakha, Gennady P.: *See*—
Chekhov, Oleg S.; Rybinsky, Alexandr G.; Tjutjunnikov, Anatoly B.; Solomakha, Gennady P.; and Dilman, Viktor V., 4,179,487, Cl. 261-114.00R.

Soltan, Parviz: *See*—
Fletcher, Paul C.; and Soltan, Parviz, 4,178,708, Cl. 40-451.000.

Sony Corporation: *See*—
Hanzawa, Hisashi; and Yoshino, Kozi, 4,178,809, Cl. 74-483.0PB.
Nagumo, Fumio, 4,179,711, Cl. 358-213.000.
Nishimura, Toshimichi; Yamanaka, Seisuke; and Shimada, Masaru, 4,179,706, Cl. 358-44.000.

Sorna Watch S.A.: *See*—
Schenker, Emil, 4,178,753, Cl. 58-152.00R.

Soshnikova, Inna V., administrator: *See*—
Karas, Genrikh E.; Lebedeva, Ljudmila P.; Mukhin, Anatoly A.; Pivovarov, Anatoly D.; Skrynnikov, Vladimir I.; Yam, Vladimir M.; Oleinik, Vladimir T.; Miroshnichenko, Vladimir V.; Kovtun, Vasily A., deceased; Kovtun, Lidia P., administrator; Soshnikova, Inna V., administrator; and Kovtun, Sergei V., administrator, 4,179,258, Cl. 425-352.000.

Sostek, Ronald J.: *See*—
Swartz, Peter J.; and Sostek, Ronald J., 4,178,646, Cl. 7-156.000.

Southern, William: *See*—
Garrison, C. Gene; and Southern, William, 4,178,853, Cl. 102-27.00R.

Spadini, Gianfranco L.; and Tolliday, Ian D., to Procter & Gamble Company, The. Laundry additive product. 4,179,390, Cl. 252-95.000.

Spector, George: *See*—
Sur, Ferdinand; and Spector, George, 4,178,977, Cl. 150-52.00R.

Spencer, Anthony. Kiosk unit. 4,179,723, Cl. 361-384.000.

Sperry Rand Corporation: *See*—
Johnson, James S., 4,179,087, Cl. 244-175.000.
Nelson, Arthur R., 4,179,184, Cl. 350-96.140.

Spire Corporation: *See*—
Kirkpatrick, Allen R., 4,179,324, Cl. 156-230.000.

Splitt, Frank G.; Cwirzen, Casimir; Hines, William W.; and Ladd, Arnold M., to Cook Electric Company. Connector assembly for telephone distribution equipment. 4,179,170, Cl. 339-14.00R.

Spolgen, Hermann J.: *See*—
Schotten, Alfons; and Spolgen, Hermann J., 4,179,377, Cl. 210-230.000.

Sprengel, Heide: *See*—
Klupfel, Kurt-Walter; and Sprengel, Heide, 4,179,292, Cl. 430-175.000.

Square D Company: *See*—
Jorgensen, George N., 4,179,174, Cl. 339-22.00B.

Staats, Henry N.; Schmidt, Waldemar M.; and Davila, Efrain A., to General Binding Corporation. Apparatus for manufacturing adhesive covers. 4,179,325, Cl. 156-498.000.

Stafford, Jay H., to Conoco, Inc. Oil porting system for dual cylinder vibrator. 4,178,838, Cl. 92-117.00A.

Stahlecker, Fritz; and Stahlecker, Hans. Open-end spinning machine apparatus with a traveling device for bobbin exchange and method of using same. 4,178,748, Cl. 57-263.000.

Stahlecker, Fritz; and Stahlecker, Hans. Method and apparatus for execution of a piecing process. 4,178,749, Cl. 57-263.000.

Stahlecker, Hans: *See*—
Stahlecker, Fritz; and Stahlecker, Hans, 4,178,748, Cl. 57-263.000.
Stahlecker, Fritz; and Stahlecker, Hans, 4,178,749, Cl. 57-263.000.

Stahura, Daniel W.: *See*—
Cummins, Donald L.; and Stahura, Daniel W., 4,179,647, Cl. 320-6.000.

Standard Oil Company, a corporation of Indiana: *See*—
Bowman, Walker H.; and Sirovich, Bruce E., 4,178,987, Cl. 165-1.000.

Stanley Works, The: *See*—
MacFarlane, Walter J., 4,178,656, Cl. 16-93.00D.

Stanton, William E.; Eisenhaure, David B.; Oberbeck, George A.; and Fertig, Kenneth, to Charles Stark Draper Laboratory, Inc., The. Rotary electric machine and power conversion system using same. 4,179,729, Cl. 363-175.000.

Stanulonis, John J.: *See*—
Swift, Harold E.; Stanulonis, John J.; and Reynolds, Elizabeth H., 4,179,358, Cl. 208-114.000.

Star Dental Manufacturing Co., Inc.: *See*—
Nash, John E., 4,178,689, Cl. 433-166.000.

Starks, Fred W.: *See*—
Schultz, Robert J.; and Starks, Fred W., 4,179,464, Cl. 260-502.500.

Stauffer Chemical Company: *See*—
Gutman, Arnold D., 4,179,523, Cl. 424-324.000.

Stauffer, Harry C.: *See*—
Frayer, James A.; Stauffer, Harry C.; and Yanik, Stephen J., 4,179,354, Cl. 208-89.000.
Frayer, James A.; Stauffer, Harry C.; Wynne, Francis E., Jr.; and Yanik, Stephen J., 4,179,355, Cl. 208-89.000.

Steidinger, Donald J., to Wallace Business Forms, Inc. Form suitable for airline ticketing. 4,179,140, Cl. 282-11.50R.

Steinbach, Hans-Horst; Schnurrbusch, Karl; Rieder, Matthias; and Weiden, Otto, to Bayer Aktiengesellschaft. Stable alkylhydridopolysiloxane emulsions. 4,179,426, Cl. 260-29.20M.

Steinkuhl, Bernd: *See*—
Breuer, Oswald; and Steinkuhl, Bernd, 4,179,161, Cl. 299-34.000.

Stemme, Otto; Lermann, Peter; Engelsmann, Dieter; and Went, Werner, to AGFA-Gevaert, A.G. Casing. 4,179,028, Cl. 206-316.000.

Stenlake, John B.; Waigh, Roger D.; Dewar, George H.; Urwin, John; and Dhar, Nirmal C., to Burroughs Wellcome Co. Quarternary ammonium compounds. 4,179,507, Cl. 424-258.000.

Stephens, Thomas P., to Portex, Inc. Visual indicator for cuff-type catheter. 4,178,939, Cl. 128-207.150.

Steppke, Dieter: *See*—
Seiz, Rudolf; Eickhoff, Heinz; Meyer, Herbert; and Steppke, Dieter, 4,178,859, Cl. 109-27.000.

Sterling Drug Inc.: *See*—
Clarke, Robert L.; and Daum, Sol J., 4,179,567, Cl. 546-124.000.

Stern, Howard K.: *See*—
Ross, Joseph A.; and Stern, Howard K., 4,179,228, Cl. 407-57.000.

Stern, Louis P.; and Johnson, Steven J., to Westinghouse Electric Corp. System for minimizing valve throttling losses in a steam turbine power plant. 4,178,763, Cl. 60-667.000.

Stern, Louis P.; and Johnson, Steven J., to Westinghouse Electric Corp. System for intelligently selecting the mode of control of a power plant. 4,179,742, Cl. 364-494.000.

Sternglass, Ernest J.: *See*—
Sashin, Donald; and Sternglass, Ernest J., 4,179,100, Cl. 250-416.0TV.

Stevens, Eloy C.; and Swain, Kenneth, to General Motors Corporation. Method of controlling turbomachine blade flutter. 4,178,667, Cl. 29-156.80B.

Still, Norman H.; and Berry, Robert W., Jr. Underground drilling and casing method and apparatus. 4,179,001, Cl. 175-57.000.

Stoepel, Kurt: *See*—
Junge, Bodo; Bossert, Friedrich; Meyer, Horst; Wehinger, Egbert; Vater, Wulf; Heise, Arend; Kazda, Stanislav; and Stoepel, Kurt, 4,179,500, Cl. 424-180.000.

Stohlquist, Roger H., to Anderson Bros. Mfg. Co. Wrapping machine with improved article depositing apparatus. 4,178,737, Cl. 53-550.000.

Storfossen, Asbjorn, to Kabmatik AB. Method for removing plating residues from a plated wire. 4,178,784, Cl. 72-47.000.

Stork Gamco, Inc.: *See*—
Simonds, Michael E., 4,178,659, Cl. 17-24.000.

Strathie, Richard T.: *See*—
Mill, Kenneth G.; Lynch, Christian P.; Strathie, Richard T.; and Dixon, Alexander F. H., 4,179,611, Cl. 235-92.0QC.

Strehl, Peter: *See*—
Kraus, Hubert; and Strehl, Peter, 4,179,615, Cl. 250-489.000.

Streich, Steven G., to Halliburton Company. Retrievable plug for offshore platforms. 4,178,967, Cl. 138-89.000.

Strem, R. C.: *See*—
Strem, Robert C.; Strem, R. C.; and Eberle, John H., 4,178,897, Cl. 123-122.00E.

Strem, Robert C.; Strem, R. C.; and Eberle, John H., to Omnewtronics, Inc. System and method of feeding gasoline fuel into an internal combustion engine. 4,178,897, Cl. 123-122.00E.

Strissel, Richard A.: *See*—
Khan, Sultan W.; Ham, John K.; and Strissel, Richard A., 4,179,732, Cl. 364-200.000.

Strom, John R.; Finch, George W.; and Weyrick, Harvey W., to Systematix Controls, Inc. Flow turbulence generating and mixing device. 4,179,222, Cl. 366-337.000.

Stuber, Richard A., to Tecumseh Products Company. Linear compressor. 4,179,630, Cl. 310-15.000.

Stutgens, Heribert: *See*—
Woditsch, Peter; Bayer, Eckhard; Panek, Peter; and Stutgens, Heribert, 4,179,306, Cl. 106-300.000.

Sugita, Toshikazu: *See*—
Takamizawa, Minoru; Inoue, Yoshio; and Sugita, Toshikazu, 4,179,295, Cl. 428-447.000.

Sugiura, Yasuo: *See*—
Mochizuki, Zenichi; Sugiura, Yasuo; and Kashiwagi, Nobuo, 4,178,983, Cl. 164-113.000.

Sugiyama, Masatoshi; and Kato, Eiichi, to Fuji Photo Film Co., Ltd. Silver halide light-sensitive element containing dye. 4,179,294, Cl. 430-522.00A.

Sulzer Brothers Ltd.: *See*—
Bieri, Hans, 4,178,991, Cl. 165-166.000.

Sumi, Etsuo, to Sumitomo Durez Company, Ltd. Process for treating waste water. 4,179,365, Cl. 210-8.000.

Sumitomo Chemical Company, Limited: *See*—
Yamamoto, Michihiro; Morooka, Shigeaki; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 4,179,560, Cl. 544-250.000.

Sumitomo Durez Company, Ltd.: *See*—
Sumi, Etsuo, 4,179,365, Cl. 210-8.000.

Sumitomo Electric Industries, Ltd.: *See*—
Hara, Ryoichi; Yajima, Masamichi; Akai, Chiaki; and Matsumoto, Takuzo, 4,179,083, Cl. 242-158.00R.
Iizuka, Jinya; Kato, Seinosuke; and Matsuda, Akio, 4,178,868, Cl. 114-74.00R.

Sumitomo Metal Mining Company Limited: *See*—
Murakita, Seiichi; Ohta, Akio; and Narahara, Satoshi, 4,179,495, Cl. 423-531.000.

Sumitomo Naugatuck Co., Ltd.: *See*—
Sakano, Hajime; Kawagishi, Shigemitsu; Kodama, Mikio; Ito, Akitoshi; Shoji, Toshihiro; Terada, Miyuki; and Yoshida, Isao, 4,179,341, Cl. 204-20.000.

Sun Electric Corporation: *See*—
Karlin, Richard A.; McDonald, Robert W.; and Comiskey, Gary F., 4,179,649, Cl. 320-13.000.

Sunada, Masuyuki; Takanashi, Hirotugu; Ishikawa, Hidenobu; Takahashi, Akikazu; and Yoshino, Fumio, to Dainippon Ink & Chemicals Inc. Composition for water-base paint comprising water-soluble resin and water-dispersible polymer. 4,179,417, Cl. 260-18.0EP.

Sunday, Brooks R.: *See*—
Schwender, Charles F.; and Sunday, Brooks R., 4,179,509, Cl. 424-266.000.

Superior Concrete Accessories, Inc.: *See*—
Tye, Dennis W., 4,179,151, Cl. 294-89.000.

Superior Industries International, Inc.: *See*—
Brown, Raymond C., 4,179,163, Cl. 301-37.0SS

Sur, Ferdinand; and Spector, George. Lawnmower cover. 4,178,977, Cl. 150-52.00R.

Sutherland, David T., to Virtis Company, The. Condensation chamber for freeze drying apparatus. 4,178,697, Cl. 34-92.000.

Suzuki, Koshiro: *See*—
Kasamatsu, Hiroshi; and Suzuki, Koshiro, 4,179,536, Cl 427-239.000.

Suzuki, Kuniyoshi; Ashida, Akira; Itani, Takashi, Yamada, Tateo; Maeda, Masaya; Takashashi, Kiyoshi; and Takimoto, Hiroyuki, to Canon Kabushiki Kaisha. Sound motion picture projection system. 4,179,197, Cl. 352-14.000.

Suzuki, Norio: *See*—
Ishiguro, Tatsuo; Suzuki, Norio; and Iijima, Yukihiko, 4,179,710, Cl. 358-135.000.

Suzuki, Takeomi; and Hayashi, Asao, to Olympus Optical Company, Ltd. Automatic microfilm retrieval system. 4,179,743, Cl 364-518.000.

Suzuki, Takeshi. Bobbin holder. 4,179,082, Cl. 242-129.510.

Suzuki, Toyotosi: *See*—
Hirohata, Michio; Suzuki, Toyotosi; Yokota, Hideo; Matsuda, Mutsuhide; Taguchi, Tetsuya; and Sanada, Noriaki, 4,179,203, Cl. 354-106.000

Suzuki, Tsutomu: *See*—
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Yamaga, Eiichi, 4,178,826, Cl. 84-1.260

Svarz, Jerry J., to Nalco Chemical Company. Removal of color from paper mill waste waters. 4,179,329, Cl. 162-29.000.

Swain, Kenneth: *See*—
Stevens, Eloy C.; and Swain, Kenneth, 4,178,667, Cl. 29-156.80B.

Swanson, Eugene S.; and Winters, Joel M., to Rockford Machine Tool Co. Pipe snapper machine and method. 4,178,673, Cl. 29-453.000.

Swartz, Peter J.; and Sostek, Ronald J. Vial cap opener device. 4,178,646, Cl. 7-156.000.

Sweat, James R., Jr. Unified hot water and forced air heating system. 4,178,907, Cl. 126-101.000.

Sweeney, William M., to Texaco Inc. Residual fuel compositions with low pour points. 4,178,950, Cl. 137-13.000.

Sweeney, William M., to Texaco Inc. Low pour point crude oil compositions. 4,178,951, Cl. 137-13.000.

Swenck, George F.: *See*—
Goolsby, Patrick F.; Laudig, David J.; Mechler, Paul A.; Osterhus, Steven J.; and Swenck, George F., 4,178,909, Cl. 126-417.000.

Swenson, Paul F.; and Moore, Paul B., to Consolidated Natural Gas Service Company, Inc. Heat pump system. 4,178,772, Cl. 62-238.000.

Swift, Harold E.; Stanulonis, John J.; and Reynolds, Elizabeth H., to Gulf Research and Development Company. Fluid cracking catalyst process using a zeolite dispersed in a magnesia-alumina-aluminum phosphate matrix. 4,179,358, Cl. 208-114.000

Swift, Harold E.: *See*—
Beuther, Harold; and Swift, Harold E., 4,179,474, Cl. 585-251.000.

Swinehart, Lonn L. Apparatus for use in cleaning vehicle tires. 4,178,948, Cl. 134-45.000.

Swiss Aluminium Ltd.: *See*—
Clumpner, Joseph A., 4,179,102, Cl. 266-218.000.

Systematix Controls, Inc.: *See*—
Strom, John R.; Finch, George W.; and Weyrick, Harvey W., 4,179,222, Cl. 366-337.000.

Szinicz, Gerhard; and Trawoger, Werner. Selectively operatable blocking device for tubular body organs. 4,178,915, Cl. 128-1.00R.

Szmuszkovicz, Jacob, to Upjohn Company, The. Analgesic N-(2-aminocycloaliphatic)azidobenzamides. 4,179,501, Cl. 424-226.000.

Szpak, Anthony D.: *See*—
Crabtree, Steven B.; Groth, Hugh F.; Hunt, Guilbert M.; Lipinski, Thomas E.; McMaster, James T.; Moffitt, Guy R., Jr.; Szpak, Anthony D.; and Williams, Robert A., 4,178,843, Cl. 99-323.800.

Szporny, Laszlo: *See*—
Kisfaludy, Lajos; Nyeki nee Kuprina, Olga; Skirmai nee Sarkozi, Maria; Karpati, Egon; Gidai, Katalin; and Szporny, Laszlo, 4,179,433, Cl. 260-112.50R.
Matolcsy, Gyorgy; Bartok, Piroska, nee Berencsy; Kiss, Bella; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, 4,179,463, Cl. 260-502.600.
Matolcsy, Gyorgy; Bartok nee Berencsy, Piroska; Kiss, Bella; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, 4,179,467, Cl. 260-563.00R.

Tackaberry, Robert B.: *See*—
Persson, Staffan B.; and Tackaberry, Robert B., 4,179,196, Cl. 351-30.000.

Tada, Tetsuya. Sprayer. 4,179,070, Cl. 239-333.000.

Taguchi, Tetsuya: *See*—
Hirohata, Michio; Suzuki, Toyotosi; Yokota, Hideo; Matsuda, Mutsuhide; Taguchi, Tetsuya; and Sanada, Noriaki, 4,179,203, Cl. 354-106.000.

Takahashi, Akifusa: *See*—
Nakauchi, Shunsaku; and Takahashi, Akifusa, 4,179,606, Cl. 250-339.000.

Takahashi, Akikazu: *See*—
Sunada, Masuyuki; Takanashi, Hirotugu; Ishikawa, Hidenobu; Takahashi, Akikazu; and Yoshino, Fumio, 4,179,417, Cl. 260-18.0EP.

Takahashi, Isoji, to Fuji Photo Film Co., Ltd. Photoelectrophoretic photography process involving dual corona treatments of opposite polarity. 4,179,290, Cl. 430-34.000.
Takahashi, Kazuya: *See—*
Fukushima, Isao; Asada, Akihiro; and Takahashi, Kazuya, 4,179,650, Cl. 323-1.000.
Takahashi, Michihisa: *See—*
Iiyama, Kiyotaka; Matsui, Takeshi; Kusakata, Shigeru; Watanabe, Hideo; and Takahashi, Michihisa, 4,179,407, Cl. 252-446.000.
Takahashi, Nagashige. Apparatus for manipulating a medical instrument. 4,178,810, Cl. 74-501.00R.
Takamizawa, Minoru; Inoue, Yoshio; and Sugita, Toshikazu, to Shin-Etsu Chemical Co. Ltd. Organopolysiloxane containing planographic masters. 4,179,295, Cl. 428-447.000.
Takanashi, Hirotugu: *See—*
Sunada, Masuyuki; Takanashi, Hirotugu; Ishikawa, Hidenobu; Takahashi, Akikazu; and Yoshino, Fumio, 4,179,417, Cl. 260-18.0EP.
Takaoka, Yukio: *See—*
Kurei, Hiroshi; Kawasaki, Masahiro; and Takaoka, Yukio, 4,179,201, Cl. 354-41.000.
Takase, Tsutomu: *See—*
Hanauye, Kunio; Takase, Tsutomu; and Morimoto, Yoshio, 4,179,429, Cl. 260-32.80R.
Takashashi, Kiyoshi: *See—*
Suzuki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takashashi, Kiyoshi; and Takimoto, Hiroyuki, 4,179,197, Cl. 352-14.000.
Takei, Haruo: *See—*
Sato, Akira; Iwamoto, Atsuo; Sakai, Takeo; and Takei, Haruo, 4,179,296, Cl. 430-574.000.
Takeshita, Isao; Wakamatsu, Nobuhiko; Ando, Eiji; Tanaka, Hiroyoshi; and Hozumi, Shiro, to Matsushita Electric Industrial Co., Ltd. Solar heating and cooling system. 4,178,989, Cl. 165-62.000.
Takeuchi, Tomio: *See—*
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Okami, Yoshiro, 4,179,573, Cl. 562-444.000.
Takimoto, Hiroyuki: *See—*
Suzuki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takashashi, Kiyoshi; and Takimoto, Hiroyuki, 4,179,197, Cl. 352-14.000.
Tamura Electric Works, Ltd.: *See—*
Umezaki, Hideo; Doma, Katsuharu; Konno, Toshiro; Yanashita, Fumio; Saito, Yoshio; and Sawafuji, Tosuke, 4,178,752, Cl. 58-126.00E.
Tamura, Sadahiro: *See—*
Nishikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Matsumoto, Haruo, 4,179,673, Cl. 333-204.000.
Tanaka, Akio; Edamura, Mizuo; Furuitsu, Satoshi; and Kunise, Satoru, to Kawasaki Jukogyo Kabushiki Kaisha. Ion-nitriding apparatus. 4,179,617, Cl. 250-531.000.
Tanaka, Akio; Edamura, Mizuo; Furuitsu, Satoshi; and Kunise, Satoru, to Kawasaki Jukogyo Kabushiki Kaisha. Apparatus for ion-nitriding treatment. 4,179,618, Cl. 250-531.000.
Tanaka, Hiroyoshi: *See—*
Takeshita, Isao; Wakamatsu, Nobuhiko; Ando, Eiji; Tanaka, Hiroyoshi; and Hozumi, Shiro, 4,178,989, Cl. 165-62.000.
Tanaka, Masaaki: *See—*
Horikoshi, Masafumi; Nohira, Hidetaka; and Tanaka, Masaaki, 4,178,896, Cl. 123-119.00A.
Tanczyn, Harry, to Armco Inc. Ferritic stainless steel. 4,179,285, Cl. 75-126.00E.
Tang, Sunny C.: *See—*
Kim, Leo; Paxson, Timm E.; and Tang, Sunny C., 4,179,402, Cl. 252-431.00C.
Kim, Leo; Paxson, Timm E.; and Tang, Sunny C., 4,179,403, Cl. 252-431.00C.
Tanikawa, Eiki: *See—*
Kudo, Daiziro; Maeda, Kazuo; and Tanikawa, Eiki, 4,179,326, Cl. 156-612.000.
Tanimoto, Akira; Masuzawa, Sigeaki; Shibata, Shinya; and Nishizaki, Shinzo, to Sharp Kabushiki Kaisha. Synthetic-speech calculators. 4,179,584, Cl. 179-1.0SM.
Tapecon, Inc.: *See—*
MacDonough, Francis X., 4,179,715, Cl. 360-61.000.
Tarumi, Noriyoshi; Ueno, Kenji; and Sakaguchi, Hirofumi, to Konishiroku Photo Industry Co., Ltd. Fixing apparatus for electrophotographic copying machine. 4,179,601, Cl. 219-216.000.
Tashiro, Isao, to Tokyo Shibaura Electric Co., Ltd. Signal transmission system. 4,179,659, Cl. 325-38.00B.
Tashkentsky Nauchno-Issledovatelsky I Proektny Institut Stroitelnykh Materialov "Niistromproekt": *See—*
Nudelman, Boris I.; Gadaev, Anatoly Y.; Bikbau, Marsel Y.; and Shishkin, Petr T., 4,179,302, Cl. 106-100.000.
Tateishi, Iwao, to Sharp Kabushiki Kaisha. Electronic digital scale. 4,178,691, Cl. 33-139.000.
Tateoka, Masamichi; and Minoura, Kazuo, to Canon Kabushiki Kaisha. Device for scanning a light beam at a constant speed. 4,179,183, Cl. 350-6.100.
Tateshita, Tadao; Mita, Yasuhiro; Nakayama, Junichi; and Sato, Koichi, to Hitachi, Ltd. Method and apparatus for liquid supply. 4,179,242, Cl. 417-8.000.
Tawara, Ikuo: *See—*
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,179,339, Cl. 435-292.000.
Taylor, Ernest E.: *See—*
Cooper, Thomas W.; and Taylor, Ernest E., 4,179,003, Cl. 175-371.000.
Taylor, Glenn N.; and Patel, Bhupendra C., to Kendall Company, The. Catheter with integral balloon and method. 4,178,937, Cl. 128-349.00B.
Tecumseh Products Company: *See—*
Stuber, Richard A., 4,179,630, Cl. 310-15.000.
Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc.: *See—*
Garrison, C. Gene; and Southern, William, 4,178,853, Cl. 102-27.00R.
Tenneco Chemicals, Inc.: *See—*
Ali, Asghar; Caruso, Robert; Fischer, Alfred; Deinet, Adolph J.; Minieri, Pasquale P.; and Sidi, Henri, 4,179,385, Cl. 252-33.000.
Tennis, Francis H., to Tomco, Inc. Control valve with flow control means. 4,178,962, Cl. 137-596.130.
Terada, Miyuki: *See—*
Sakano, Hajime; Kawagishi, Shigemitsu; Kodama, Mikio; Ito, Akitoshi; Shoji, Toshihiro; Terada, Miyuki; and Yoshida, Isao, 4,179,341, Cl. 204-20.000.
Teradyne, Inc.: *See—*
Davis, Richard P., 4,179,652, Cl. 324-64.000.
Tesolin, Luciano. Pneumatically operated air lock for air ducts, particularly for air conditioning plants. 4,179,095, Cl. 251-30.000.
Tessier, Jean: *See—*
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,179,575, Cl. 562-506.000.
Teter, Edward C., to Quaker Oats Company, The. Means for joining toy track sections. 4,179,066, Cl. 238-10.00E.
Texaco Development Corp.: *See—*
Waddill, Harold G., 4,179,418, Cl. 260-18.0PN.
Waddill, Harold G., 4,179,552, Cl. 528-111.000.
Texaco Inc.: *See—*
Paull, Peter L.; and McGann, Rodney, 4,178,758, Cl. 60-648.000.
Reinhard, Russell R.; and Yaffe, Roberta, 4,179,386, Cl. 252-46.600.
Sweeney, William M., 4,178,950, Cl. 137-13.000.
Sweeney, William M., 4,178,951, Cl. 137-13.000.
Vartanian, Paul F.; and Ippolito, Anthony L., 4,179,271, Cl. 44-62.000.
Texas Instruments Deutschland GmbH: *See—*
Schuermann, Josef H., 4,179,668, Cl. 330-277.000.
Texas Instruments Incorporated: *See—*
Tubbs, Graham S., 4,179,746, Cl. 364-900.000.
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Watanabe, Satoshi; Yamamichi, Masayoshi; and Aizawa, Hiroshi, to Canon Kabushiki Kaisha. Single lens reflex camera with electromechanically initiated diaphragm and shutter control. 4,179,206, Cl. 354-152.000.
Thetford Corporation: *See—*
Coviello, Allan J.; Bernardin, Frederick E., Jr.; and Rohrkemper, Robert R., 4,179,616, Cl. 250-527.000.
Theurer, Josef; and Folser, Karl, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Self-propelled ballast cleaning machine for on- and off-track work. 4,178,995, Cl. 171-16.000.
Theurer, Josef; and Riessberger, Klaus. Apparatus for measuring the profile of a railroad tunnel. 4,179,216, Cl. 356-4.000.
Thir, Basil: *See—*
Newkirk, David D.; Thir, Basil; and Login, Robert B., 4,179,544, Cl. 428-395.000.
Thomann, Christoph. Method of and apparatus for the measuring of quantities of heat. 4,178,800, Cl. 73-190.00R.
Thomas, Michael D., to Ryder International Corporation. One-piece check valve for use in a fluid dispenser. 4,179,051, Cl. 222-494.000.
Thomas, Michael D.: *See—*
Ryder, Francis E.; and Thomas, Michael D., 4,178,932, Cl. 128-276.000.
Thomas, Wolfram: *See—*
Grundei, Hans; and Thomas, Wolfram, 4,178,641, Cl. 3-1.911.
Thompson, David A.: *See—*
Boyd, David C.; Hagy, Henry E.; and Thompson, David A., 4,179,638, Cl. 313-480.000.
Thomson-CSF: *See—*
Vasseur, Jean-Pierre, 4,179,663, Cl. 328-59.000.
Thomson, Donald W., to Lea-Ronal, Inc. Gold alloy plating compositions and method. 4,179,344, Cl. 204-44.000.
Thuillier, Germaine; Laforest, Jacqueline; and Bessin, Pierre, to Albert Rolland, S.A. Ethers of 3,4-dihydro-1-benzoxepin-5-one oxime to treat intestinal disorders. 4,179,516, Cl. 424-278.000.
Thym, Sabine; Koenig, Karl-Heinz; and Hamprecht, Gerhard, to BASF Aktiengesellschaft. N-fluoromethyl-carbamic acid fluorides and their manufacture. 4,179,465, Cl. 260-544.00C.
Tidemalm, Gustav H.; and Vidinghoff, Bjorn E., to AB Bofors. Fluid pressure device for supporting and elevating a gun barrel. 4,178,831, Cl. 89-41.00H.
Tiffany, Peter A.: *See—*
Garner, Joseph L.; and Tiffany, Peter A., 4,179,546, Cl. 521-56.000.
Tilley, Martin C. Bale turner. 4,179,017, Cl. 193-47.000.
Tischlinger, Edward A. Self injector. 4,178,928, Cl. 128-215.000.
Tissmetal Lionel-Dupont: *See—*
Piette, Remi R.; and Hubert, Francois M. A., 4,179,025, Cl. 198-833.000.
Tjutjunnikov, Anatoly B.: *See—*
Chekhov, Oleg S.; Rybinsky, Alexandr G.; Tjutjunnikov, Anatoly B.; Solomakha, Gennady P.; and Dilman, Viktor V., 4,179,487, Cl. 261-114.00R.

Tokico Ltd.: *See—*
Miyazawa, Hiroshi, 4,179,092, Cl. 248-309.00R.
Tokyo Electric Power Co. Inc., The: *See—*
Shindo, Yoshio; Kimijima, Takahiro; Onishi, Hiroyasu; and Endo, Masayasu, 4,179,624, Cl. 307-3.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Tashiro, Isao, 4,179,659, Cl. 325-38.00B.
Yamazaki, Isamu, 4,179,731, Cl. 364-200.000.
Tolliday, Ian D.: *See—*
Spadini, Gianfranco L.; and Tolliday, Ian D., 4,179,390, Cl. 252-95.000.
Tom, Michael: *See—*
Quesinberry, Elmen C.; Tom, Michael; and Farrell, James L., 4,179,696, Cl. 343-7.400.
Tom Swift Enterprises, Inc.: *See—*
Reitz, Ronald P., 4,179,627, Cl. 307-261.000.
Tomari, Masao: *See—*
Harada, Genzaburo; Yen, Takuma; and Tomari, Masao, 4,179,279, Cl. 75-24.000.
Tomco, Inc.: *See—*
Tennis, Francis H., 4,178,962, Cl. 137-596.130.
Tomioka, Shoji; Nakao, Toshiaki; Nakamura, Hisatsugu; Mine, Nobuyoshi; Yamamoto, Katsuo; Fukushima, Seiji; and Nogami, Akira, to Furukawa Electric Co., Ltd. Vulcanization apparatus for a continuous length of article of rubber, plastics or the like material. 4,179,256, Cl. 425-71.000.
Tomita, Tsutomu: *See—*
Akado, Hajime; Uchida, Yoshiro; Kubota, Kenichi; Hasebe, Toshiharu; Yamaguchi, Akihide; Tomita, Tsutomu; Ootsubo, Suminobu; and Toyota Jidosha Kogyo Kabushiki Kaisha, 4,178,898, Cl. 123-122.00D.
Toro Company, The: *See—*
Lonn, Dana R.; and Jendersee, Melvin H., 4,178,741, Cl. 56-7.000.
Torrington Company, The: *See—*
Virgilio, Douglas R.; Campbell, Robert G.; Fortunato, Alfred J.; and Benson, Carl F., 4,178,781, Cl. 66-121.000.
Toshiba Kikai Kabushiki Kaisha: *See—*
Mochizuki, Zenichi; Sugiura, Yasuo; and Kashiwagi, Nobuo, 4,178,983, Cl. 164-113.000.
Townsend, Robert L., to Sanders Associates, Inc. Tilt compensation for acoustic transducing system. 4,179,682, Cl. 367-135.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Adachi, Eiji; Shibatani, Juichi; and Ito, Sadayoshi, 4,178,756, Cl. 60-397.000.
Akado, Hajime; Uchida, Yoshiro; Kubota, Kenichi; Hasebe, Toshiharu; Yamaguchi, Akihide; Tomita, Tsutomu; Ootsubo, Suminobu; and Toyota Jidosha Kogyo Kabushiki Kaisha, 4,178,898, Cl. 123-122.00D.
Ando, Masahisa; Katow, Keigo; and Yamazaki, Masami, 4,178,666, Cl. 29-156.70R
Horikoshi, Masafumi; Nohira, Hidetaka; and Tanaka, Masaaki, 4,178,896, Cl. 123-119.00A.
Konishi, Hiromu; and Nishiwaki, Kiyoshi, 4,179,164, Cl. 303-24.00F.
Matsuoka, Fumio, 4,179,136, Cl. 280-744.000.
Yanagihara, Hiromichi; and Miura, Nobuhiro, 4,178,903, Cl. 123-32.0SP.
Toyota Jidoshi Kogyo Kabushiki Kaisha: *See—*
Aoki, Keiji, 4,178,893, Cl. 123-117.00D.
Traenckner, Hans-Joachim: *See—*
Rosenkranz, Hans J.; Traenckner, Hans-Joachim; and Fuhr, Karl, 4,179,478, Cl. 525-113.000.
Trane Company, The: *See—*
Johnsen, Clifford N., 4,178,769, Cl. 62-180.000.
Trauger, Robert: *See—*
Lind, Gene C.; Lind, Ralph C.; Lind, Frank L.; Burchman, Edmund K.; and Trauger, Robert, 4,178,931, Cl. 128-230.000.
Trautner, Kersten: *See—*
Hugl, Herbert; Schundehutte, Karl H.; Trautner, Kersten; and Wolfrum, Gerhard, 4,179,436, Cl. 260-206.000.
Trawoger, Werner: *See—*
Szimicz, Gerhard; and Trawoger, Werner, 4,178,915, Cl. 128-1.00R.
Tremain, Thomas E.: *See—*
Mathews, Mitford M., Jr., deceased; Tremain, Thomas E.; and Zmurko, Myron T., 4,179,586, Cl. 179-1.50R.
Tremmel, Robert A., to Oxy Metal Industries Corporation. Electroplating bath and process for producing bright, high-leveling nickel iron electrodeposits. 4,179,343, Cl. 204-43.00T.
Trexler, Charles H., Sr. Fireplace heating unit. 4,178,908, Cl. 126-121.000.
Tritten, Paul, to Ceraver. Bone prosthesis and method of manufacture thereof. 4,179,485, Cl. 264-44.000.
Trojer, Felix: *See—*
Kalbskopf, Reinhard; and Trojer, Felix, 4,179,535, Cl. 427-206.000.
Trotzmuller, Alfred: *See—*
Beckmann, Georg; and Trotzmuller, Alfred, 4,178,696, Cl. 34-13.000.
TRW, Inc.: *See—*
Jones, Robert J.; Green, Howard E.; and Quinlivan, Sandra C., 4,179,551, Cl. 526-262.000.
Tsao, Jung-Hsien; and Ketley, Arthur D., to W. R. Grace & Co. Process for preparing catalytic solutions of sulfonium salts. 4,179,400, Cl. 252-429.00R.
Tschudy, Donald B., to Hoover Company, The. Improved agitator chamber. 4,178,653, Cl. 15-383.000.
Tsen, Fan B.: *See—*
Tsen, John B.; and Tsen, Fan B., 4,178,714, Cl. 46-228.000.
Tsen, John B.; and Tsen, Fan B. Lighted and sounding toy. 4,178,714, Cl. 46-228.000.
Tsukamoto, Kenkichi. Phono cartridge. 4,179,589, Cl. 179-100.41D.
Tsukamoto, Yutaka: *See—*
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Kiyota, Yuhiko; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,178,889, Cl. 123-75.00B
Tsukuda, Mitsuo. Baseball game board. 4,179,123, Cl. 273-89.000.
Tsunefuji, Katsuhiko, to Olympus Optical Company, Ltd. Change-over switch for printed circuit board. 4,179,593, Cl. 200-292.000.
Tsushima, Susumu: *See—*
Numata, Mitsuo; Minamida, Isao; and Tsushima, Susumu, 4,179,502, Cl. 424-246.000.
Tubbs, Graham S., to Texas Instruments Incorporated. Digital processor system with conditional carry and status function in arithmetic unit. 4,179,746, Cl. 364-900.000.
Tumlinson, James H., III; Klein, Michael G.; Doolittle, Robert E.; and Ladd, Thyril L., Jr., to United States of America, Agriculture. Sex pheromone produced by the female Japanese beetle: specificity of male response to enantiomers. 4,179,446, Cl. 260-343.600.
Turk, Gunter: *See—*
Kilian, Eberhard; Kreher, Alfons; Nauroth, Peter; and Turk, Gunter, 4,179,431, Cl. 260-42.370.
Turrentine, Fred C. Combined removable tiller extension holding and controlling device for watercraft. 4,178,869, Cl. 114-172.000.
Tuschy, Eckhard; and Wischmeyer, Georg, to Kabel-und Metallwerke Gutehoffnungshuette AG. Skew rolling mill. 4,178,785, Cl. 72-78.000.
Tuzuki, Minoru; Matuba, Kuniyoshi; and Saito, Kazuo, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Vinyl chloride resin compositions. 4,179,481, Cl. 525-80.000.
Twydell, Roland S.: *See—*
Felton, John C.; Badmin, John S.; and Twydell, Roland S., 4,179,518, Cl. 424-300.000
Tye, Dennis W., to Superior Concrete Accessories, Inc. Anchor insert for embedment in a concrete slab. 4,179,151, Cl. 294-89.000.
Tynes, Arthur R., to Bell Telephone Laboratories, Incorporated. Apparatus and method of splicing optical fibers. 4,179,186, Cl. 350-96.210.
Ube Industries: *See—*
Ishikawa, Tatsuo, 4,178,984, Cl. 164-333.000
Uchida, Yoshiro: *See—*
Akado, Hajime; Uchida, Yoshiro; Kubota, Kenichi; Hasebe, Toshiharu; Yamaguchi, Akihide; Tomita, Tsutomu; Ootsubo, Suminobu; and Toyota Jidosha Kogyo Kabushiki Kaisha, 4,178,898, Cl. 123-122.00D.
Uchidoi, Masanori: *See—*
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Watanabe, Satoshi; Yamamichi, Masayoshi; and Aizawa, Hiroshi, 4,179,206, Cl. 354-152.000.
Uchinishi, Eizaburo, to Kawasaki Jukogyo Kabushiki Kaisha. Two stroke engines. 4,178,886, Cl. 123-73.00A.
Ueno, Kenji: *See—*
Tarumi, Noriyoshi; Ueno, Kenji; and Sakaguchi, Hirofumi, 4,179,601, Cl. 219-216.000.
Uhlmann, Helmut: *See—*
Weisse, Hanns-Jorg; Jager, Wilhelm; and Uhlmann, Helmut, 4,178,677, Cl. 29-605.000.
Umezaki, Hideo; Doma, Katsuharu; Konno, Toshiro; Yanashita, Fumio; Saito, Yoshio; and Sawafuji, Tosuke, to Tamura Electric Works, Ltd.; and Yanashita Seiko Kabushiki Kaisha. Shutter type digital clocks. 4,178,752, Cl. 58-126.00E.
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Okami, Yoshiro, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. (2S,3R)-3-amino-2-hydroxy-4-phenylbutanoic acid. 4,179,573, Cl. 562-444.000.
Umezawa, Kazumi; Hattori, Hiroyuki; Ogawa, Hiroshi; Kishi, Hirotoshi; and Sagara, Seiji, to Canon Kabushiki Kaisha. Separating mechanism. 4,179,116, Cl. 271-306.000.
Umstead, Herbert R., to Avon Products, Inc. Pump dispenser. 4,179,049, Cl. 222-631.000.
Union Carbide Corporation: *See—*
D'Silva, Themistocles D. J., 4,179,514, Cl. 424-277.000.
Jugle, Lawrence C.; Inderbitzen, Emil R.; and McDaniel, Paul W., 4,178,794, Cl. 73-28.000.
Kaelin, Joseph R., 4,179,366, Cl. 210-14.000.
Kosto, Timothy J., 4,179,287, Cl. 75-168.00E.
Maguire, David E., 4,179,725, Cl. 361-433.000.
Smarook, Walter H., 4,179,540, Cl. 428-71.000.
Union Oil Company of California: *See—*
Simpson, Howard D., 4,179,410, Cl. 252-465.000
U.S. Automation Company: *See—*
Borodin, Daniel J., 4,178,662, Cl. 29-25.200.
United States of America
Agriculture: *See—*
Tumlinson, James H., III; Klein, Michael G.; Doolittle, Robert E.; and Ladd, Thyril L., Jr., 4,179,446, Cl. 260-343.600.
Air Force: *See—*
Friedman, Jerome D.; and Pitha, Carl A., 4,179,190, Cl. 350-152.000.
Hobbs, Charles F., 4,179,657, Cl. 325-33.000.
Yamada, Edwin Y., 4,179,086, Cl. 244-122.0AG.
Army: *See—*
Bitzer, David R., 4,179,658, Cl. 325-34.000.
Brady, Joseph F., 4,178,851, Cl. 102-4.000.
Conrad, Raymond W., 4,179,599, Cl. 219-121.00P.

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Crowell, Robert B., 4,178,832, Cl. 89-159.000.
French, John A., 4,179,088, Cl. 244-3.190.
Mathews, Mitford M., Jr., deceased; Tremain, Thomas E.; and Zmurko, Myron T., 4,179,586, Cl. 179-1.50R.
Miller, Walter E., Jr., 4,179,085, Cl. 244-3.110.

Energy: *See—*
Park, Jang Y., 4,179,349, Cl. 204-195.00R.
Walenta, Albert H., 4,179,608, Cl. 250-385.000.

Navy: *See—*
Christou, Aristos; and Day, Howard M., 4,179,533, Cl. 427-84.000.
Christou, Aristos, 4,179,604, Cl. 250-305.000.
Fletcher, Paul C.; and Soltan, Parviz, 4,178,708, Cl. 40-451.000.
Forman, Donald B.; and Holma, Gary M., 4,178,722, Cl. 51-170.00T.
Geller, Myer; Altman, Daniel E.; and Barstow, Glidden J., 4,179,194, Cl. 350-356.000.
McVay, James V.; and Yates, Patrick A., 4,178,855, Cl. 102-262.000.
Sergev, Sergius S., 4,179,583, Cl. 174-21.00R.
Zehner, William J.; and Warner, Henry L., 4,179,681, Cl. 367-110.000.

U.S. Philips Corporation: *See—*
Janssen, Eduard J. P., 4,179,636, Cl. 313-274.000.
Peeters, Peter M. J., 4,179,655, Cl. 324-132.000.
Sharp, Denis; and Skoyles, Derek R., 4,179,166, Cl. 303-119.000.
van de Plassche, Rudy J.; and Dijkmans, Eise C., 4,179,687, Cl. 340-347.0AD.

United States Steel Corporation: *See—*
Ruff, James W., 4,178,789, Cl. 72-209.000.

University of Pittsburgh: *See—*
Sashin, Donald; and Sternglass, Ernest J., 4,179,100, Cl. 250-416.0TV.

UOP Inc.: *See—*
Antos, George J., 4,179,405, Cl. 252-441.000.
Antos, George J., 4,179,406, Cl. 252-442.000.
Flagg, John F.; and Antos, George J., 4,179,360, Cl. 208-139.000.
Hayes, John C.; and Pollitzer, Ernest L., 4,179,359, Cl. 208-139.000.
Imai, Tamotsu, 4,179,469, Cl. 260-577.000.
Mitsche, Roy T.; and Pope, George N., 4,179,581, Cl. 585-744.000.
O'Hara, Mark J.; Johnson, Russell W.; and Hilfman, Lee, 4,179,356, Cl. 208-111.000.
O'Hara, Mark J.; and Johnson, Russell W., 4,179,357, Cl. 208-111.000.

Upjohn Company, The: *See—*
Curtiss, John N.; Koehler, Charles E.; and Murray, Pat L., 4,179,094, Cl. 249-82.000.
Dankert, Harry S., 4,178,733, Cl. 53-331.500.
McCall, John M., 4,179,510, Cl. 424-267.000.
Szmuszkovicz, Jacob, 4,179,501, Cl. 424-226.000.

Urwin, John: *See—*
Stenlake, John B.; Waigh, Roger D.; Dewar, George H.; Urwin, John; and Dhar, Nirmal C., 4,179,507, Cl. 424-258.000.

Vadetec Corporation: *See—*
Kemper, Yves J.; and Bigot, Lucien, 4,178,812, Cl. 74-745.000.

Valenti, Salvatore: *See—*
Fleck, Fritz; Kittl, Hans; and Valenti, Salvatore, 4,179,578, Cl. 560-76.000.

Valleylab: *See—*
Lundquist, Ingemar H., 4,178,927, Cl. 128-214.00F.

Valmet Oy: *See—*
Ilmoniemi, Erkki; and Kokkonen, Olavi, 4,179,332, Cl. 162-380.000.

Van Antwerp, Ferne; and Murdy, Raymond R. Bale loader. 4,179,034, Cl. 414-551.000.

Vancauwenberghe, Gerard R., to Dicalite Europe Nord, S.A. Method for expanding perlite. 4,179,264, Cl. 432-13.000.

Vance, Dwight A. Apparatus to indicate when a patient has evacuated a bed or demonstrates a restless condition. 4,179,692, Cl. 340-573.000.

Van Daele, Georges H. P.: *See—*
Janssen, Paul A. J.; and Van Daele, Georges H. P., 4,179,569, Cl. 546-223.000.

van de Plassche, Rudy J.; and Dijkmans, Eise C., to U.S. Philips Corporation. Analog-to-digital converter circuit employing iterative subtraction. 4,179,687, Cl. 340-347.0AD.

van der Does, Lucas, to N. V. Optische Industrie "De Oude Delft". Film sheet handling device. 4,179,114, Cl. 271-19.000.

Vanderhoek, Naphthali N.; Nelson, Peter F.; and Farrington, Alan, to Australia Paper Manufacturers Limited. Method for the delignification of lignocellulosic material in an amine delignifying liquor containing a quinone or hydroquinone compound. 4,178,861, Cl. 162-72.000.

van der Lely, Ary; and Bom, Cornelis J. G.; to C. van der Lely N. V. Implements with side screening plates. 4,178,997, Cl. 172-112.000.

van der Lely, Cornelis. Soil cultivating machine. 4,178,996, Cl. 172-59.000.

Van Es, Theodorus: *See—*
Davis, Frank F.; Van Es, Theodorus; and Palczuk, Nicholas C., 4,179,337, Cl. 435-181.000.

Van Gelder, Josephus L. H.: *See—*
Raeymaekers, Alfons H. M.; Van Gelder, Josephus L. H.; Boeckx, Gustaaf M.; and Van Hemeldonck, Lodewijk L., 4,179,505, Cl. 424-250.000.

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Raeymaekers, Alfons H. M.; Van Gelder, Josephus L. H.; Boeckx, Gustaaf M.; and Van Hemeldonck, Lodewijk L., 4,179,505, Cl. 424-250.000.

Varian Associates, Inc.: *See—*
Chan, Edwin T.; and Jepson, Stanley R., 4,179,037, Cl. 220-2.30R.

Vartanian, Paul F.; and Ippolito, Anthony L., to Texaco Inc. Amine oxide polymers and use thereof as fuel detergent. 4,179,271, Cl. 44-62.000.

Vasilevsky, Petr N.: *See—*
Gekhman, Boris S.; Vasilevsky, Petr N.; Ediny, Jury G.; Parfinenko, Ivan V.; and Podgursky, Alfred M., 4,178,935, Cl. 128-328.000.

Vasiliev, Viktor V.: *See—*
Antonov, Boris M.; Vasiliev, Viktor V.; and Pischikov, Sergei I., 4,179,730, Cl. 364-105.000.

Vasseur, Jean-Pierre, to Thomson-CSF. Devices for generating pseudo-random sequences. 4,179,663, Cl. 328-59.000.

Vassos, Louis J., to Skil Corporation. Power tool switch including speed control. 4,179,644, Cl. 318-17.000.

Vater, Wulf: *See—*
Junge, Bodo; Bossert, Friedrich; Meyer, Horst; Wehinger, Egbert; Vater, Wulf; Heise, Arend; Kazda, Stanislav; and Stoepel, Kurt, 4,179,500, Cl. 424-180.000.

Veld, Ralph, Jr.: *See—*
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Ventavoli, Roger: *See—*
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Vereinigte Oesterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: *See—*
Hacker, Hermann; and Zebenthofer, Waldemar, 4,179,023, Cl. 198-631.000.

Verghese, George T., to Firestone Tire & Rubber Company. The. Method of applying and adhering lubricant to a tire inner tube as it is formed. 4,179,321, Cl. 156-118.000.

Vertut, Jean: *See—*
Francois, Daniel; Germond, Jean-Claude; Marchal, Paul; and Vertut, Jean, 4,179,035, Cl. 414-2.000.

Vetter, Hans; and Marx, Paul, to AGFA-Gevaert, A.G. Photographic dye diffusion transfer process. 4,179,291, Cl. 430-223.000.

Vetter, Heinz, to Rohm GmbH. Method of lubricating a thermoplastic resin strand for sliding contact in a reshaping device. 4,179,529, Cl. 427-44.000.

Vianova Kunstharz, A.G.: *See—*
Pampouchidis, Georgios; and Honig, Helmut, 4,179,425, Cl. 260-29.6NR.
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Victor United, Inc.: *See—*
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Vidinghoff, Bjorn E.: *See—*
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Vilgertshofer, August: *See—*
Schmieder, Lothar; Vilgertshofer, August; and Mettin, Florian, 4,178,799, Cl. 73-141.00A.

Virgilio, Douglas R.; Campbell, Robert G.; Fortunato, Alfred J.; and Benson, Carl F., to Torrington Company, The. Knitting needle. 4,178,781, Cl. 66-121.000.

Virnot, Alain D. Memory controlled process for railraod traffic management. 4,179,739, Cl. 364-436.000.

Virtis Company, The: *See—*
Sutherland, David T., 4,178,697, Cl. 34-92.000.

Vissers, Hermanus H.: *See—*
Oosterling, Pieter A.; and Vissers, Hermanus H., 4,179,073, Cl. 239-659.000.

Vitins, Michael, to BBC Brown Boveri & Company Limited. Method and apparatus for supervising an electrical line for short circuits. 4,179,651, Cl. 324-51.000.

Vitous, Charles J., to Cory Food Services, Inc. Cantilevered instantaneous heating brewer. 4,178,842, Cl. 99-281.000.

Vock, Manfred H.: *See—*
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Vockenhuber, Karl: *See—*
Freudenschuss, Otto; Kezniekl, Eduard; and Patels, Gottfried, 4,179,191, Cl. 350-187.000.
Freudenschuss, Otto; and Kittag, Gerd, 4,179,713, Cl. 360-27.000.

Voegele, Guenther, to Robert Bosch GmbH. Dosing device for germ-free measurements and filling of liquid material. 4,178,929, Cl. 128-213.00R.

Vofsi, David: *See—*
Allingham, Yael; Vofsi, David; and Gassner, Saul A., 4,179,547, Cl. 525-2.000.

Vogt, B. Richard, to E. R. Squibb & Sons, Inc. Method for making pyrazolo[1,5-c]quinazoline derivatives and related compounds. 4,179,561, Cl. 544-250.000.

Vogt, Berthold R.: *See—*
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Voles, Roger, to E M I Limited. Phase modulation system for combining carrier wave segments containing selected phase transitions. 4,179,672, Cl. 332-16.00R.

Volker, James W., to Scott & Fetzer Company, The. Crankcase vent apparatus and method. 4,179,246, Cl. 417-313.000.

Volkswagenwerk Aktiengesellschaft: *See—*
Dau, Wolfram, 4,178,955, Cl. 137-264.000.
Huisman, Marinus, 4,179,156, Cl. 296-137.00B.

Voll, Manfred: *See—*
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von der Eltz, Hans-Ulrich: *See—*
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 4,178,705, Cl. 38-144.000.

Von Genk, Richard A.: *See—*
Kane, Bernard J.; and Von Genk, Richard A., 4,179,468, Cl. 260-567.60M.

von Strandtmann, Max: *See—*
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Vorontsov, Leonid F.: *See—*
Belitsin, Mikhail N.; Kudryashov, Sergei A.; Borik, Alexandr G.; Kulikov, Valentin V.; Sadkova, Natalia A.; Kudryashova, Galina A.; and Vorontsov, Leonid F., 4,179,259, Cl. 425-461.000.

Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi: *See—*
Malasek, Jaromir; Kuda, Vladimir; and Bucek, Miroslav, 4,178,971, Cl. 139-435.000.

W. R. Grace & Co.: *See—*
Hein, Paul R.; and Irvin, Robert A., 4,179,531, Cl. 430-300.000.
Milner, Burl D., 4,179,055, Cl. 225-80.000.
Sanchez, Moises G.; Ernest, Michael V.; and Laine, Norman R., 4,179,408, Cl. 252-448.000.
Tsao, Jung-Hsien; and Ketley, Arthur D., 4,179,400, Cl. 252-429.00R.

Waagner-Biro A.G.: *See—*
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Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH: *See—*
Koppl, Franz; Hamster, Helmut; Griesshammer, Rudolf; and Lorenz, Helmut, 4,179,530, Cl. 427-51.000.

Wada, Fumio: *See—*
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Waddill, Harold G., to Texaco Development Corp. Water-based epoxy resin coating composition. 4,179,418, Cl. 260-18.0PN.

Waddill, Harold G., to Texaco Development Corp. Process for accelerated cure of epoxy resins. 4,179,552, Cl. 528-111.000.

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Wagatsuma, Kazuo: *See—*
Morita, Yoshiharu; Omata, Kenzo; Ohya, Junichi; Wagatsuma, Kazuo; and Shirasaka, Tadashi, 4,179,437, Cl. 260-239.100.

Wagner, Raymond L., to Burlington Industries, Inc. Determination of average speed of rotation of a cyclically loaded shaft during periods of up to two minutes duration. 4,179,656, Cl. 324-166.000.

Wahlco, Inc.: *See—*
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Waigh, Roger D.: *See—*
Stenlake, John B.; Waigh, Roger D.; Dewar, George H.; Urwin, John; and Dhar, Nirmal C., 4,179,507, Cl. 424-258.000.

Wakabayashi, Toru: *See—*
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Wakamatsu, Nobuhiko: *See—*
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Wakeman, Alden H., to Crepaco, Inc. Material handling system. 4,178,773, Cl. 62-341.000.

Walenta, Albert H., to United States of America, Energy. Right/left assignment in drift chambers and proportional multiwire chambers (PWC's) using induced signals. 4,179,608, Cl. 250-385.000.

Wallace Business Forms, Inc.: *See—*
Steidinger, Donald J., 4,179,140, Cl. 282-11.50R.

Wallace, Charles H., to International Telephone and Telegraph Corporation. Lift device arrangement. 4,179,021, Cl. 198-341.000.

Wallace Murray Corporation: *See—*
Shepherd, Michael, 4,178,811, Cl. 74-574.000.

Wallshein, Melvin. Clamp, particularly for orthodontia. 4,178,687, Cl. 433-13.000.

Walsh, Adam J., to Reynolds Metals Company. Coating system method for coloring aluminum. 4,179,342, Cl. 204-35.00N.

Ward, Frances S.; and Ward, John J. Two-way adjustable cooking grid. 4,178,844, Cl. 99-449.000.

Ward, John J.: *See—*
Ward, Frances S.; and Ward, John J., 4,178,844, Cl. 99-449.000.

Ward, Stephen W., to NCR Corporation. Document dispensing system. 4,179,031, Cl. 209-534.000.

Wardt, Volker; and Gantevoort, Heinz L. Gas-heating appliance. 4,179,262, Cl. 431-354.000.

Warncke, Ernst, to Dragerwerk Aktiengesellschaft. Lung-controlled membrane valve for compressed gas respirators. 4,178,961, Cl. 137-495.000.

Warner, Henry L.: *See—*
Zehner, William J.; and Warner, Henry L., 4,179,681, Cl. 367-110.000.

Warner-Lambert Company: *See—*
Brown, Richard E., 4,179,513, Cl. 424-274.000.
Butler, Donald E., 4,179,506, Cl. 424-256.000.
Butler, Donald E., 4,179,563, Cl. 544-360.000.
Connor, David T.; Young, Patricia A.; and von Strandtmann, Max, 4,179,447, Cl. 260-345.200.
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Warner & Swasey Company, The: *See—*
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Wasynczuk, Victor: *See—*
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Watanabe, Hideo: *See—*
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Watanabe, Hisao; and Etoh, Terukazu, to Nihon Denshi Kabushiki Kaisha. Cold trap for electron microscope. 4,179,605, Cl. 250-311.000.

Watanabe, Masao: *See—*
Yamabe, Hitoshi; Otaka, Syoichi; and Watanabe, Masao, 4,178,890, Cl. 123-103.00R.

Watanabe, Satoshi: *See—*
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Watanabe, Satoshi; Yamamichi, Masayoshi; and Aizawa, Hiroshi, 4,179,206, Cl. 354-152.000.

Watson, Gary Q. Method and apparatus for protecting thread on an earth anchor. 4,178,726, Cl. 52-98.000.

Way, Lee V., Jr. Separable hinge. 4,178,657, Cl. 16-173.000.

Wear-Ever Aluminum, Inc.: *See—*
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Webb, R. Britton: *See—*
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Weber, Alfred; Kennecke, Mario; and Dahl, Helmut, to Schering Aktiengellschaft. Microbiological degradation of sterol side chains to a 17-keto group. 4,179,336, Cl. 435-55.000.

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Wehinger, Egbert: *See—*
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Wehrmuller, Beat; and Wienenga, Paul, to BBC Brown, Boveri & Company Limited. Circuit for driving and braking a speed-controlled direct current motor. 4,179,645, Cl. 318-139.000.

Weiden, Otto: *See—*
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Weigel, Horst; and Muller, Karl, to Klockner-Humboldt-Deutz Aktiengesellschaft. Method for direct recovery of metal from metal-bearing ores. 4,179,284, Cl. 75-92.000.

Weiler, Gerhard H.; Nagel, Dieter H.; and Pagels, Louis T., to Automatic Liquid Packaging, Inc. Unitary, hermetically-sealed but pierceable dispensing container. 4,178,976, Cl. 150-0.500.

Weisberg, Warren. High impact strength partially liquid filled bag. 4,179,027, Cl. 206-205.000.

Weiss, Martin J.: *See—*
Bernady, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., 4,179,574, Cl. 562-503.000.
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Weisse, Hanns-Jorg; Jager, Wilhelm; and Uhlmann, Helmut, to Siemens Aktiengesellschaft. Superconducting magnet assembly and method of making. 4,178,677, Cl. 29-605.000.

Welsch, Walter N.: *See—*
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Went, Werner: *See—*
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Wessel, Wolf, to Robert Bosch GmbH. Method and apparatus for measuring fuel consumption in internal combustion engines. 4,178,798, Cl. 73-113.000.

West, Neil L., to Deere & Company. Rotor for an axial flow rotary separator. 4,178,943, Cl. 130-27.00T.

Western Electric Co., Inc.: *See—*
Artz, Walter M.; Bauer, Charles R.; and Moyer, Paul W., 4,179,032, Cl. 209-538.000.
Lindenborg, Jon M., 4,179,666, Cl. 330-138.000.
Lyon, Jarrel D., 4,178,680, Cl. 29-751.000.

Western, William J. T. Moulding apparatus. 4,179,093, Cl. 249-65.000.

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Weyrick, Harvey W.: *See—*
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White Consolidated Industries, Inc.: *See—*
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White, E. Gurney, deceased (by Williams, Robert G., executor), to Nabisco, Inc. Process for manufacturing a whole wheat food product. 4,179,527, Cl. 426-620.000.
White Farm Equipment Company: *See—*
Ketterling, Edwin; and Nelson, Benjamin R., 4,178,757, Cl. 60-548.000.
White, Jack M., to ACF Industries, Incorporated. Fail safe bypass valve. 4,178,953, Cl. 137-116.000.
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Wikle, Keith G., to Kawecki Berylco Industries, Inc. Treatment of beryllium-copper alloy and articles made therefrom. 4,179,314, Cl. 148-12.70C.
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Wilhite, John E., to Honeywell Information Systems Inc. Microprogrammed computer control unit capable of efficiently executing a large repertoire of instructions for a high performance data processing unit. 4,179,736, Cl. 364-200.000.
Williams, Albert L.: *See—*
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Williams, Alfred S.; and Foskett, Raymond. Scaffolding. 4,179,090, Cl. 248-235.000.
Williams, Chalmer. Light apparatus for fishing rod. 4,178,712, Cl. 43-17.000.
Williams, Dwight E.: *See—*
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Williams, Richard B.: *See—*
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Williams, Robert G., executor: *See—*
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Williams, Stanley H. Rotary edge cutter. 4,178,747, Cl. 56-256.000.
Willis, Roderick M. G-factor compensated hydraulic flocculation system. 4,179,368, Cl. 210-42.00R.
Wilson, Robert W., to Powell Manufacturing Company, Inc. Tobacco handling apparatus. 4,178,745, Cl. 56-27.500.
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Withycombe, Donald A.; Hruza, Anne; Vock, Manfred H.; Giacino, Christopher; Mookherjee, Braja D.; Pittet, Alan O.; and Schreiber, William L., to International Flavors & Fragrances Inc. Uses of α-substituted alkylidene methionals in foodstuffs and flavors for foodstuffs. 4,179,526, Cl. 426-535.000.
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Wolf, Gerard. Skipping rope or wire. 4,179,119, Cl. 272-75.000.
Wolford, John W. Power tube for flared bell musical instruments. 4,178,829, Cl. 84-386.000.
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Wolynec, John J.; Hildebrand, Donald L.; and Wasynczuk, Victor, to Elgin Sweeper Company. Four-wheeled sweeper. 4,178,647, Cl. 15-84.000.
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Wuertele, James W., to Gentran, Inc. Thermocouple linearizer circuit. 4,179,745, Cl. 364-571.000.
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Yamabe, Hitoshi; Otaka, Syoichi; and Watanabe, Masao, to Honda Giken Kogyo Kabushiki Kaisha. Deceleration control apparatus for vehicle engine. 4,178,890, Cl. 123-103.00R.
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Yascheritsyn, Petr I.; Borisenko, Alexandr V.; Sidorenko, Valery A.; and Serebryakov, Evgeny A., to Fiziko-Tekhnichesky Institut Akademii Nauk Belorusskoi SSR. Method of cutting solids of revolution by a rotary tool having circular cutting lip, and a rotary tool for carrying same into effect. 4,178,818, Cl. 82-36.00R.
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Yost, Neal E. Soffit nail set. 4,179,058, Cl. 227-147.000.
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Zarlengo, Dominic A. Water saving device for toilet. 4,178,644, Cl. 4-426.000.
Zarlengo, Dominic A. Dynamic wheel balancing system. 4,179,162, Cl. 301-5.0BA.
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Zehner, William J.; and Warner, Henry L., to United States of America, Navy. Target tracking sonar signal processing and display system. 4,179,681, Cl. 367-110.000.
Zeigler, Jon G.; Kerr, Elmer L.; and Bell, David V., to Electric Furnace Company, The. Radial blade heating device. 4,179,603, Cl. 219-538.000.
Zeigler, Philip B.: *See—*
Lura, Loren E.; and Zeigler, Philip B., 4,179,167, Cl. 308-189.00A.
Zeis, Jurgen, to Licentia Patent-Verwaltungs-G m.b.H. Method and device for transmitting pulse-duration modulated signals using two oscillators. 4,179,660, Cl. 325-59.000.
Zelazny, David M. Construction board game. 4,179,128, Cl. 273-243.000.
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Zung, Joseph T. Circulating air building heating system. 4,179,065, Cl. 237-51.000.
Zwicker, James D.; and Dube, Ghyslain, to Alcan Research and Development Limited. Method and apparatus for particle size analysis. 4,178,796, Cl. 73-61.400.
Zwingman, Robert L., to Burroughs Corporation. Defect tolerant scheme for a bubble lattice file. 4,179,749, Cl. 365-3.000.

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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF DECEMBER, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ahmed, Adel A. A., to RCA Corporation. Current mirror amplifier. Re. 30,173, Cl. 330-257.000.

Burroughs Corporation: *See—*
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Flynn, John H. Method of drying coated webs. Re. 30,169, Cl. 427-224.000.

Goodman, Murray; and Kirshenbaum, Gerald S., to Sutures, Inc. Hydrolyzable polymers of amino acid and hydroxy acids. Re. 30,170, Cl. 528-327.000.

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Kruger, William P.; and Michnowicz, John A., to Hewlett-Packard Company. Multiconfiguration ionization source. Re. 30,171, Cl. 250-423.00R.

Mason, Henry L., to Precision Plastic Industries Inc. End plug for rolled materials. Re. 30,168, Cl. 206-413.000.

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Precision Plastic Industries Inc.: *See—*
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RCA Corporation: *See—*
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Saxon, Richard A., to Burroughs Corporation. Circuit for operating a bar graph display panel. Re. 30,172, Cl. 315-169.400.

Schedler, Walter J. Sound simulator for model steam engine. Re. 30,174, Cl. 340-384.00E.

Stahlecker, Fritz; and Stahlecker, Hans. Apparatus and method for start-spinning on an open-end spinning machine. Re. 30,167, Cl. 57-263.000.

Stahlecker, Hans: *See—*
Stahlecker, Fritz; and Stahlecker, Hans, Re. 30,167, Cl. 57-263.000.

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Allen, Donald G. Medication carrier. 253,722, 12-18-79, Cl. D24-56.000.

Anderson, Walter C., to General Electric Company. Electric make-up mirror or similar article. 253,728, 12-18-79, Cl. D28-67.000.

Bardeau, William M. Electric self contained kettle. 253,706, 12-18-79, Cl. D15-104.000.

Bljumshtein, Zigmund G.; and Kosheverov, Oleg A. Pressure gauge. 253,690, 12-18-79, Cl. D10-85.000.

Bljumshtein, Zigmund G.; Bychkin, Lev A.; and Ivanshin, Nikolai S. Pressure gauge. 253,691, 12-18-79, Cl. D10-85.000.

Boyd, Donald A.; and Gale, Allen W., to Cardinal American Corporation. Fireplace heater. 253,718, 12-18-79, Cl. D23-95.000.

Brefka, Paul E.: *See—*
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Chapman, George. Over the sink rinse basket. 253,685, 12-18-79, Cl. D7-187.000.

Chartier, Donald A.; and Janes, Richard. Machine for stringing racquets. 253,707, 12-18-79, Cl. D15-199.000.

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Gibeck, Sten G., to Louis Gibeck AB. Moisture and heat exchanger for respiratory apparatus. 253,721, 12-18-79, Cl. D24-52.000.

Gibilterra, Charles A., to Vecta Contract, Inc. Chair. 253,678, 12-18-79, Cl. D6-56.000.

Gillum, Gary C., to Klipsch and Associates, Inc. of Hope, Arkansas. Loudspeaker system. 253,699, 12-18-79, Cl. D14-33.000.

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Martin, Anneliese; and Martin, Leslie A. Cigarette holder. 253,725, 12-18-79, Cl. D27-07.000.

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Mayfield, Esther O. Identification tag for an animal collar or similar article. 253,731, 12-18-79, Cl. D30-38.000.

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Millet, Marcus J., to Johnson & Johnson. Syringe plunger tip. 253,720, 12-18-79, Cl. D24-25.000.

Mitutoyo Manufacturing Company, Ltd.: *See—*
Tanada, Tetsunori, 253,689, Cl. D10-73.000.

Nakao, Shinroku; Ishii, Yoshiyasu; and Hanashima, Taira, to Combi Co., Ltd. Vehicle toy. 253,710, 12-18-79, Cl. D21-78.000.

Nichols, Stephen A.; and Chuboff, David P., to Hy-Gain de Puerto Rico, Inc. Remote control unit for radio or similar article. 253,698, 12-18-79, Cl. D13-12.000.

Northern Telecom Limited: *See—*
Hillmer, Robert E.; Chadwick, Donald T.; and Tyson, John F., 253,703, Cl. D14-65.000.

Primus Mfg., Inc.: *See—*
Culver, Irven H.; and Szymber, Oleg, 253,688, Cl. D10-70.000.

Reliance Products Ltd.: *See—*
Howard, John, 253,734, Cl. D21-255.000.

Robinson, Mark L.; and Brefka, Paul E., to Acro Incorporated. Tennis racket. 253,713, 12-18-79, Cl. D21-212.000.

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Mankau, Dieter, 253,708, Cl. D16-21.000.

Rothstein, Estelle G., to Corning Glass Works. Decal for culinary ware or the like. 253,681, 12-18-79, Cl. D7-39.000.

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Sajar Plastics, Inc.: *See—*
Frost, George H., 253,717, Cl. D23-28.000.

Schuman, April A.; Hoole, Wilfred G.; and Harrison, Larry S. Razor. 253,726, 12-18-79, Cl. D28-46.000.

Shiraishi, Masami, to Tomy Kogyo Co., Inc. Apparatus for indicating numerical concepts. 253,709, 12-18-79, Cl. D19-62.000.

Simmons, James. Mobile broiler. 253,695, 12-18-79, Cl. D12-22.000.

Simmons, Raymond W., to Concept Inc. Pocket flashlight. 253,733, 12-18-79, Cl. D48-24.00A.

Singer Company, The: *See—*
Felix, Christian J.; Genaro, Donald M.; and Illes, Stephen J., 253,705, Cl. D15-69.000.

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Suzuki, Yasunori, to Yasui Sangyo Co. Ltd. Hydraulic lifting jack. 253,696, 12-18-79, Cl. D12-55.000.

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Thomsen Equipment Company: *See—*
McGraw, John T., 253,704, Cl. D15-7.000.

Three Phoenix Company: *See—*
Alcala, Amancio, 253,702, Cl. D14-46.000.

Tomy Kogyo Co., Inc.: *See—*
Shiraishi, Masami, 253,709, Cl. D19-62.000.

TRW: *See—*
Woods, Thomas H., 253,701, Cl. D14-42.000.

Tyson, John F.: *See—*
Hillmer, Robert E.; Chadwick, Donald T.; and Tyson, John F., 253,703, Cl. D14-65.000.

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Vecta Contract, Inc.: *See—*
Gibilterra, Charles A., 253,678, Cl. D6-56.000.

Vogler, Norbert: *See—*
Marolt, George R.; and Vogler, Norbert, 253,712, Cl. D21-199.000.

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CLASSIFICATION OF PATENTS

ISSUED DECEMBER 18, 1979

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
69.5 4,178,637

CLASS 3
1.5 4,178,638
4,178,639
1.91 4,178,640
1.911 4,178,641
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CLASS 4
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CLASS 8
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344 4,178,684
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341 4,178,773
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CLASS 91
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CLASS 93
53 SD 4,178,839

CLASS 98
38 E 4,178,840
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CLASS 99
281 4,178,842
323.8 4,178,843
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CLASS 100
11 4,178,845

CLASS 101
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91 4,178,847
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305 4,178,849
451 4,178,850

CLASS 102
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27 R 4,178,853
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CLASS 104
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73.5 4,179,301
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CLASS 118
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CLASS 119
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32 SP 4,178,903
44 C 4,178,885
73 A 4,178,886
73 V 4,178,887
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75 B 4,178,889
103 R 4,178,890
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122 D 4,178,898
122 E 4,178,897
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198 D 4,178,901
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442 4,178,910
449 4,178,911
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207.15 4,178,938
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213 R 4,178,929
214 F 4,178,927
215 4,178,928
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230 4,178,931
276 4,178,932
284 4,178,933
295 4,178,934
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349 B 4,178,936
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CLASS 136
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119 4,178,954
264 4,178,955
360 4,178,956
387 4,178,957
460 4,178,958
493.3 4,178,959
494 4,178,960
495 4,178,961
596.13 4,178,962
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CLASS 160

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CLASS 162

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113 4,179,330
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380 4,179,332

CLASS 164

49 4,178,979
66 4,178,980
72 4,178,981
85 4,178,982
113 4,178,983
250 4,178,985
251 4,178,986
333 4,178,984

CLASS 165

1 4,178,987
2 4,178,988
62 4,178,989
134 R 4,178,990
166 4,178,991

CLASS 166

117.6 4,178,992
300 4,178,993

CLASS 169

52 4,178,994

CLASS 171

16 4,178,995

CLASS 172

59 4,178,996
112 4,178,997
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702 4,178,999

CLASS 174

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21 R 4,179,583

CLASS 175

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57 4,179,001
297 4,179,002
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211 4,179,004
212 4,179,005

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1 E 4,179,585
1 SM 4,179,584
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90 K 4,179,588
100.41 D 4,179,589
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179 4,179,591

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65 DD 4,179,007

CLASS 181

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CLASS 182

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CLASS 187

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43 4,179,014
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4 R 4,179,018

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CLASS 196

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631 4,179,023
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310 4,179,594

CLASS 202

262 4,179,340

CLASS 204

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195 R 4,179,349
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111 4,179,356
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114 4,179,358
139 4,179,359
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CLASS 209

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CLASS 210

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10.55 M 4,179,596
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121 P 4,179,599
125.1 4,179,602
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37 R 4,179,062

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89 R 4,179,610
92 QC 4,179,611
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129.51 4,179,082
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309 R 4,179,092

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455 R 4,179,460
465 H 4,179,461
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502.6 4,179,463
544 C 4,179,465
558 A 4,179,466
563 R 4,179,467
567.6 M 4,179,468
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4,179,570	4,178,699	4,178,817	4,179,734	4,178,726	4,179,218
30 : 4,179,126	4,178,714	4,179,278	42 : 4,178,675	4,178,764	4,179,222
31 : 4,178,860	4,178,723	4,179,323	4,178,689	4,178,766	4,179,368
4,179,120	4,178,724	4,179,335	4,178,703	4,178,879	4,179,398
33 : 4,178,941	4,178,794	4,179,462	4,178,762	4,178,912	4,179,683
4,179,654	4,178,806	4,179,524	4,178,777	4,178,913	4,179,699
4,179,677	4,178,816	4,179,631	4,178,787	4,178,920	54 : 4,179,160
4,179,682	4,178,821	4,179,656	4,178,847	4,178,959	4,179,479
34 : Re.30,172	4,178,902	4,179,702	4,178,851	4,178,964	4,179,514
Re.30,173	4,178,924	38 : 4,179,243	4,178,901	4,178,993	55 : 4,178,711
4,178,652	4,178,950	39 : 4,178,649	4,178,914	4,179,000	4,178,769
4,178,679	4,178,951	4,178,653	4,178,922	4,179,002	4,178,773
4,178,710	4,178,988	4,178,663	4,178,923	4,179,003	4,178,830
4,178,732	4,179,049	4,178,683	4,178,974	4,179,008	4,178,873
4,178,738	4,179,066	4,178,742	4,179,032	4,179,055	4,178,894
4,178,865	4,179,105	4,178,763	4,179,043	4,179,094	4,178,904
4,178,866	4,179,108	4,178,768	4,179,056	4,179,098	4,178,934
4,178,881	4,179,145	4,178,772	4,179,058	4,179,099	4,178,962
4,178,925	4,179,185	4,178,789	4,179,100	4,179,153	4,179,029
4,178,960	4,179,187	4,178,834	4,179,141	4,179,233	4,179,060
4,178,963	4,179,208	4,178,843	4,179,176	4,179,247	4,179,074
4,179,096	4,179,209	4,178,933	4,179,177	4,179,255	4,179,168
4,179,124	4,179,215	4,178,948	4,179,240	4,179,282	4,179,379
4,179,139	4,179,226	4,178,957	4,179,250	4,179,311	4,179,676
4,179,173	4,179,228	4,178,978			
4,179,178	4,179,270	4,178,982			

DESIGN PATENTS

6 : 253,686	253,704	253,712	253,713	253,726	39 : 253,683
04 : 253,694	253,715	253,719	26 : 253,695	36 : 253,681	253,701
05 : 253,699	253,723	09 : 253,728	31 : 253,698	253,682	253,716
253,700	253,725	12 : 253,730	32 : 253,722	253,687	253,717
06 : 253,678	253,729	253,733	33 : 253,707	253,705	253,718
253,688	253,731	17 : 253,692	34 : 253,685	253,720	41 : 253,680
253,702	08 : 253,684	25 : 253,697	253,714	253,732	53 : 253,693

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OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

December 25, 1979

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

V 989 / 4 DEC 25 79 UMI

OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

December 25, 1979 Volume 989 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

July 3, 1979.

National Inventors' Day

The Patent and Trademark Office, along with the National Council of Patent Law Associations, will co-sponsor National Inventors Day in the Public Search Room on Saturday, February 9, 1980 from 1:00 p.m. to 5:00 p.m. and Sunday, February 10, 1980 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days and to attend the ceremony at 2:00 p.m. on Sunday, February 10, 1980, during which four inventors will be inducted into the National Inventors Hall of Fame.

In order to assemble the exhibits it will be necessary to close the Search Room on Friday, February 8, 1980 at 5:00 p.m. We would appreciate the cooperation of all users of the Search facilities by removing all personal property and items for the early closing.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

Nov. 27, 1979.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,395,585, Re. S.N. 074,138, Filed Sep. 7, 1979, Cl. 74/124, TIMER INDEXING MECHANISM, George Obermann, Owner of Record: *The Singer Company, New York, N.Y.,* Attorney or Agent: Bayard H. Michael, et al., Ex. Gp.: 352

3,451,161, Re. S.N. 071,183, Filed Aug. 31, 1979, Cl. 46/241, TOY TRACK AND VEHICLE THEREFOR, Jerome H. Lemelson, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 333

3,539,715, Re. S.N. 068,484, Filed Aug. 20, 1979, Cl. 358/102, INFORMATION STORAGE AND REPRODUCTION SYSTEM, Jerome H. Lemelson, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 233

3,731,414, Re. S.N. 080,487, Filed Oct. 1, 1979, Cl. 40/301, ANIMAL EARS TAGS AND APPLICATORS THEREFOR, Brian Egmont Murphy, et al., Owner of Record: *Delta Plastics Ltd., Palmerston, North, New Zealand,* Attorney or Agent: Roger W. Blakely, Jr., et al., Ex. Gp.: 333

3,811,291, Re. S.N. 082,422, Filed Oct. 5, 1979, Cl. 62/84, METHOD OF OPERATING A REFRIGERATION PLANT AND A PLANT FOR PERFORMING THE METHOD, Lauritz Benedictus Schibbye, Owner of Record: *Svenska Rotor Maskiner Aktiebolag, Nacka, Sweden,* Attorney or Agent: Stephen H. Frishauf, et al., Ex. Gp.: 344

4,033,358, Re. S.N. 074,390, Filed Sep. 10, 1979, Cl. 131/15 R, INTEGRAL CIGARETTE PAPER HOLDER ELEMENT, Duane E. Harrington, Owner of Record: *Inventor,* Attorney or Agent: Richard Esty Peterson, Ex. Gp.: 335

4,040,627, Re. S.N. 059,600, Filed Jul. 23, 1979, Cl. 272/133, FRICTION TYPE EXERCISING DEVICE WITH IMPROVED FRICTION SETTING MECHANISM, Ronald E. Useldinger, Owner of Record: *Inventor,* Attorney or Agent: Gerald L. Moore, Ex. Gp.: 334

4,046,376, Re. S.N. 072,335, Filed Sep. 4, 1979, Cl. 273/54 D, BOWLING PRACTICE DEVICE, Leslie E. Harvey, et al., Owner of Record: *Inventors,* Attorney or Agent: Warren M. Becker, Ex. Gp.: 334

4,049,033, Re. S.N. 076,691, Filed Sep. 18, 1979, Cl. 150/0.5, MOLDED COLLAPSIBLE SOLUTION CONTAINER, Philip G. Ralston, Jr., Owner of Record: *Baxter Laboratories, Inc., Morton Grove, Ill.,* Attorney or Agent: Paul C. Flattery, et al., Ex. Gp.: 241

4,053,564, Re. S.N. 083,890, Filed Oct. 11, 1979, Cl. 423/321 S, EXTRACTION PROCESS FOR PURIFICATION OF PHOSPHORIC ACID, James L. Bradford, et al., Owner of Record: *Occidental Petroleum Corporation, Los Angeles, Calif.,* Attorney or Agent: Robert L. Parker, et al., Ex. Gp.: 113

4,098,406, Re. S.N. 082,992, Filed Oct. 9, 1979, Cl. 206/601, POLYMER FILM HAVING LINEAR TEAR PROPERTIES, Norman J. Otten, et al., Owner of Record: *Tower Products Inc., Mundelein, Ill.,* Attorney or Agent: William M. Lee, et al., Ex. Gp.: 241

4,100,133, Re. S.N. 066,992, Filed Aug. 16, 1979, Cl. 260/45.9 L, AIR-DRY CURABLE COMPOSITIONS COMPRISING DICYCLOPENTENYL (METH) ACRYLATE COPOLYMERS AND NON-VOLATILE REACTIVE MONOMER, AND CURED COATINGS AND IMPREGNATIONS OBTAINED THEREFROM, William D. Emmons, et al., Owner of Record: *Rohm and Haas Company, Philadelphia, Pa.,* Attorney or Agent: Lester E. Johnson, et al., Ex. Gp.: 141

4,109,392, Re. S.N. 065,911, Filed Aug. 13, 1979, Cl. 123/143, POCKET LEVEL, Walter E. Streeter (deceased) by James R. Streeter (executor), Owner of Record: *Mayes Brothers Tool Manufacturing Co., Johnson City, Tenn.,* Attorney or Agent: Charles L. Lovercheck, Ex. Gp.: 342

4,110,472, Re. S.N. 077,197, Filed Sep. 20, 1979, Cl. 424/330, DERIVATIVES OF 1-(DISUBSTITUTED PHENOXY)-3 AMINO 2-HYDROXYPROPANES, Rudolf Hiltmann, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: Albert L. Jacobs, et al., Ex. Gp.: 125

4,111,323, Re. S.N. 076,732, Filed Sep. 18, 1979, Cl. 215/230, CROWN CLOSURE, Isao Ichinose, et al., Owner of Record: *Japan Crown Cork Co., Ltd., Tokyo, Japan,* Attorney or Agent: John E. Lind, et al., Ex. Gp.: 241

4,118,507, Re. S.N. 072,967, Filed Sep. 6, 1979, Cl. 424/278, BENZODIOXINCARBOXAMIDE LIPOGENESIS INHIBITORS, John B. Carr, Owner of Record: *Shell Oil Company, Houston, Tex.,* Attorney or Agent: Frank R. LaFontaine, et al., Ex. Gp.: 125

4,135,002, Re. S.N. 077,942, Filed Sep. 24, 1979, Cl. 426/482, METHOD OF STRIP CUTTING RAW POTATOES, Joseph L. Hodges, et al., Owner of Record: *Ore-Ida Foods, Inc., Boise, Id.,* Attorney or Agent: Philip A. Mallinckrodt, et al., Ex. Gp.: 173

4,138,585, Re. S.N. 083,646, Filed Oct. 11, 1979, Cl. 560/159, PROCESS FOR PREPARING N-ALKOXYCARBONYL-N-ALKYLCYANAMIDE, Charles DeWitt Adams, Owner of Record: *E. I. Du Pont de Nemours and Company, Wilmington, Del.,* Attorney or Agent: Charles E. Krukiel, Ex. Gp.: 126

4,139,002, Re. S.N. 080,706, Filed Oct. 1, 1979, Cl. 128/80 C, UNIVERSAL KNEE ORTHOSIS, Manuel J. Almeida, Owner of Record: *Inventor,* Attorney or Agent: Elliot A. Salter, et al., Ex. Gp.: 335

4,148,017, Re. S.N. 076,319, Filed Sep. 17, 1979, Cl. 340/365 S, DEVICE FOR DETECTING A KEY SWITCH OPERATION, Norio Tomisawa, Owner of Record: *Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka-ken, Japan,* Attorney or Agent: W. Robert Spensley, et al., Ex. Gp.: 234

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PATENT NOTICES

Certificates of Correction for the Week of Dec. 25, 1979

3,918,811	4,146,634	4,157,199	4,168,563
3,924,129	4,148,509	4,158,708	4,164,725
3,989,948	4,148,830	4,159,239	4,164,756
4,033,287	4,149,326	4,159,499	4,165,183
4,046,648	4,149,513	4,161,335	4,168,122
4,066,408	4,149,540	4,161,505	4,168,372
4,086,271	4,149,742	4,161,585	4,168,388
4,087,243	4,149,900	4,161,586	4,168,551
4,099,921	4,150,716	4,161,587	4,168,800
4,116,294	4,151,737	4,161,781	4,168,903
4,116,628	4,152,968	4,161,791	4,167,029
4,118,243	4,153,004	4,162,513	4,167,270
4,122,890	4,153,164	4,163,088	4,167,624
4,133,076	4,153,209	4,163,116	4,167,685
4,134,610	4,154,675	4,163,509	4,168,218
4,145,752	4,154,928	4,163,690	4,168,849
4,146,505	4,156,046	4,163,811	4,170,024
4,146,547	4,157,077	4,164,157	4,171,330
4,146,566	4,157,192	4,164,336	4,171,516
		4,164,464	

Disclaimers

3,912,513.—*Marcel Jacob Monbaliu*, Mortsel, *Gaston Jacob Benoy*, Edegem, *Raphaël Karel Van Poucke*, Berchem, Belgium, *Wolfgang Sauerteig*, Leverkusen, *Dieter Stieler*, Grobenzell, Germany, and *Arthur Henri De Cat*, Mortsel, Belgium. POLYMERIC COMPETING COUPLERS AND THEIR USE IN PHOTOGRAPHIC SILVER HALIDE COLOUR MATERIALS. Patent dated Oct. 14, 1975. Disclaimer filed Oct. 15, 1979, by the assignee, *Agfa-Gevaert, N.V.*

Hereby enters this disclaimer to all claims of said patent.

4,021,111.—*Shoji Kuroishi*, Yokohama, and *Manabu Mochizuki*, Kawasaki, Japan. DEVELOPING DEVICE IN ELECTROPHOTOGRAPHIC COPYING APPARATUS. Patent dated May 3, 1977. Disclaimer filed Nov. 6, 1979, by the assignee, *Ricoh Co., Ltd.*

Hereby enters this disclaimer to claims 1 and 6 and claims 3, 4, 5, 8 and 10.

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Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
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	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 736-0795
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Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
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	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
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	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
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	Houston: The Fondren Library. Rice University	(713) 527-8101 Ext. 2587
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Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 17, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-1-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	12-22-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	4-4-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-30-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	4-13-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	5-19-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-2-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-31-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-1-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-9-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-17-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	10-19-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	11-30-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-4-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	2-20-78

Expiration of patents: The patents within the range of numbers indicated below expire during November 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,061,833 to 3,066,301, inclusive
Plant Patents..... Numbers 2,189 to 2,197, inclusive

DEC 25 79 UMI

REISSUES

DECEMBER 25, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,175

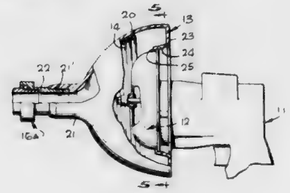
PLUMBERS TOOL

Mark F. Mier, Greenough, Mont., assignor to Lawrence F. Irwin, Sylmar, Calif.

Original No. 3,609,788, dated Oct. 5, 1971, Ser. No. 856,242, Aug. 11, 1969. Application for reissue Jul. 25, 1977, Ser. No. 818,985

Int. Cl.[2] **B08B** *9/02*

U.S. Cl. 15—104.3 SN **9 Claims**



1. In a plumbers' tool, a hollow container adapted to store a flexible plumbers' snake coiled therein and having an axially disposed neck at the front through which the snake extends and is movable, said container having an annular rear wall defining an opening, a motor having a shaft, an adapter shell mounted on the shaft of said motor, interengaging means on said shell and on said annular rear wall of said container for detachably securing said shell to said container *said interengaging means comprising a plurality of spaced apart slots provided in one of said shell and said annular rear wall and a plurality of spaced apart lugs provided on the other of said shell and said annular rear wall, said lugs being adapted to be receivable in said slots.*

Re. 30,176

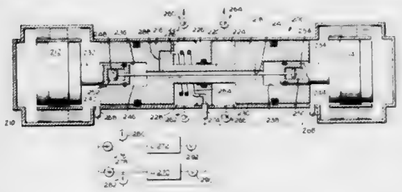
STIRLING CYCLE TYPE THERMAL DEVICE

William T. Beale, Athens, Ohio, assignor to Research Corporation, New York, N.Y.

Original No. 3,552,120, dated Jan. 5, 1971, Ser. No. 812,530, Mar. 5, 1969. Continuation-in-part of Ser. No. 613,272, Feb. 1, 1967, abandoned. Application for reissue Jun. 13, 1977, Ser. No. 806,312

Int. Cl.[2] **F02G** *1/04*

U.S. Cl. 60—520 **7 Claims**



6. [The invention defined in claim **4** including] *A Stirling cycle type device comprising a pair of opposed displacer pistons, a rigid rod interconnecting the displacer pistons for synchronous motion of said displacer pistons, a cylinder for each of said displacer pistons, a regenerator for each displacer cylinder through which a gaseous operating medium flows during reciprocation of each displacer piston in its displacer cylinder, a power piston operatively associated with each of the displacer pistons and mechanically free to move independently in respect to its associated displacer piston, a cylinder for each of the power pistons, means connecting the pair of power pistons for at least partial synchronous motion of said power pistons, means for adding heat to or removing heat from each end of the displacer cylinders and means providing a power coupling and cooperative connective movement between the displacer pistons and the power pistons associated with said displacer pistons, said last means consisting solely of fluid communication conductors between one end of one power cylinder and one end of the displacer cylinder associated therewith and between one end of the other power cylinder and one end of the displacer cylinder associated with said other power cylinder, means for removing power from or adding power to the power pistons, and* stop means for varying the length of travel of the displacer pistons in their cylinders.

Re. 30,177

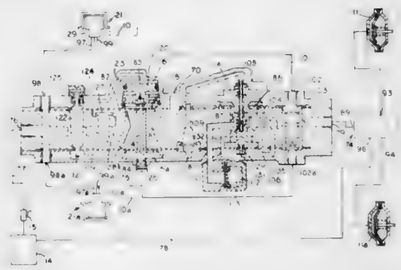
ANTI-SKID CONTROL DEVICE AND SYSTEM

Walter H. Morse, South Windsor, and Ira R. Ames, Jr., Salisbury, both of Conn., assignors to The Jacobs Manufacturing Company, West Hartford, Conn.

Original No. 3,969,003, dated Jul. 13, 1976, Ser. No. 566,761, Apr. 10, 1975. Division of Ser. No. 431,952, Jan. 9, 1974, Pat. No. 3,908,805. Application for reissue Jul. 10, 1978, Ser. No. 923,468

Int. Cl.[2] **B60T** *8/06*

U.S. Cl. 303—113 **67 Claims**



39. In a brake service air module (75), having a main inlet (76) connectible with a brake service air source (14), a main outlet (79) connectible with an air operable breaking mechanism (11), a main flow passage (85) connecting the main inlet (76) and the main outlet (79), and valve means responsive to the application of an air signal to prevent communication of the main inlet (76) with the main outlet (79) through the main flow passage (85), the improved valve means comprising:

a valve (87) movable within the main flow passage (85) between a first position, wherein communication is established between the main inlet (76) and the main outlet (79), and a second position, wherein such communication is prevented by the valve (87);

a second passage (119) having an outlet located adjacent the main flow passage (85);

means (111 and 111a) for increasing the air pressure in the second passage (119) when the valve (87) is in its second position and for preventing an increase in air pressure in the second passage (119) when the valve (87) is in its first position; and

means (83) located at the outlet of the second passage (119) for reducing the service air pressure, communicated by the brake

service air source (14) to the main outlet (79) through the main flow passage (85), in response to an increase in air pressure in the second passage (119), which develops when the valve (87) is in its second position.

Re. 30,178

FILM TRANSPORTING MECHANISM FOR STILL CAMERAS

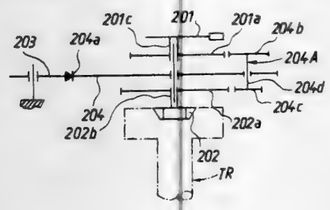
Gunter Fauth, Unterhaching, Fed. Rep. of Germany, assignor to AGFA-Gevaert A.G., Leverkusen, Fed. Rep. of Germany

Original No. 3,810,219, dated May 7, 1974, Ser. No. 314,277, Nov. 11, 1972. Application for reissue Apr. 27, 1977, Ser. No. 791,597

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1971, 2161078

Int. Cl.[2] **G03B** *1/62, 19/04*

U.S. Cl. 354—206 **15 Claims**



16. In a photographic apparatus for use with roll film which is collected by a rotary takeup member during forward transport to place successive film frames into a position for exposure to scene light, a combination comprising transmission means including input means movable from a starting position to an end position, first output means receiving motion from said input means to rotate the takeup member during a first stage of movement of said input means to said end position, and second output means receiving motion from said input means during a second stage of movement of said input means to said end position, one of said stages preceding the other of said stages; first arresting means including a scanning device which is arranged to track the film and to effect a termination of movement of said first output means in response to completion of film transport by the length of a frame so that said input means is free to move relative to said first output means during said second stage of movement to said end position; and second arresting means for holding said second output means against movement during said first stage of movement of said input means, including a locking portion which is moved by said scanning device in response to completed film transport by the length of the frame from a first position in which said locking portion blocks said second output means to a second position in which said locking portion permits said second output means to move in response to movement of said input means.

Re. 30,179

COMMON ION EFFECT TO ASSIST LM SEPARATION

Norman N. Li; Robert P. Cahn, both of Millburn, and Adam L. Shrier, Montclair, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Original No. 4,081,369, dated Mar. 28, 1978, Ser. No. 668,128, Mar. 18, 1976. Continuation-in-part of Ser. No. 404,716, Oct. 9, 1973, which is a division of Ser. No. 174,990, Aug. 25, 1971, Pat. No. 3,779,907, which is a continuation-in-part of Ser. No. 36,686, May 12, 1970, Pat. No. 3,637,488, which is a continuation-in-part of Ser. No. 28,094, Apr. 13, 1970, Pat. No. 3,617,546. Application for reissue Oct. 13, 1978, Ser. No. 951,078

The portion of the term of this patent subsequent to Jan. 25, 1989, has been disclaimed.

Int. Cl.[2] **B01D** *13/00;* **C02B** *1/46*

U.S. Cl. 210—22 R **10 Claims**

1. In a process for removing a soluble material from solution by contacting said solution with an emulsion, the external phase of which is immiscible with said solution and permeable to said soluble material and the internal phase contains a reagent which reacts with said permeable soluble material to form an insoluble precipitate, which is trapped in said internal phase, the improvement which comprises maintaining the concentration of said reagent in the internal phase of the emulsion at a level at which the concentration of said soluble material in the internal phase of the emulsion is suppressed by means of the common ion effect to a level below the level to which it is desired to remove said soluble material from solution.

Re. 30,180

PLURAL COPPER-LAYER TREATMENT OF COPPER FOIL AND ARTICLE MADE THEREBY

Adam M. Wolski, and Charles B. Yates, both of Edgewater Park, N.J., assignors to Yates Industries, Inc., Bordentown, N.J.

Original No. 3,918,926, dated Nov. 11, 1975, Ser. No. 187,923, Oct. 8, 1971. Application for reissue Oct. 5, 1976, Ser. No. 729,879

Int. Cl.[2] **C25D** *5/10, 3/58;* **B23P** *3/00*

U.S. Cl. 428—601 **44 Claims**

25. A process for improving the bond strength of copper foil through the electrochemical treatment of a surface thereof comprising subjecting said surface to a two-step electrochemical pretreatment prior to the application of said electrochemical treatment, the first step of said pretreatment comprising subjecting said surface to an electrolyte containing (1) copper and (2) arsenic, antimony, bismuth, selenium or tellurium under conditions such as to electrolytically deposit thereon a first copper layer which increases the bond strength of the raw foil; the second step of said pretreatment comprising subjecting said surface to a copper-containing electrolyte under conditions such as to electrolytically deposit thereon a second copper layer which substantially conforms to the configuration of the first layer and reduces the powder transfer characteristics of said first layer; and then giving said pretreated foil an electrochemical treatment in which said surface is subjected to a copper-containing electrolyte under conditions such as to electrolytically deposit thereon a third, copper-containing microcrystalline layer which further increases the bond strength of said foil.

35. Copper foil having on a face thereof three electrodeposited superposed layers, the layer closest to said face containing (1) copper and (2) arsenic, antimony, bismuth, selenium or tellurium, the intermediate layer being a copper electrodeposit which substantially conforms to the configuration of said closest layer and serves to reduce the powder transfer characteristics of said closest layer; the third outermost layer being copper-containing and microcrystalline, said third layer increasing the bond strength of said foil over and above the bond strength provided by said closest and intermediate layers.

37. A printed circuit board comprised of a dielectric substrate bonded to which is the copper foil of claim 35, the portion of said foil being closest to said substrate being said third layer.

Re. 30,181

METHOD AND MEANS FOR SUPPRESSING OZONE GENERATED BY ARC LAMPS

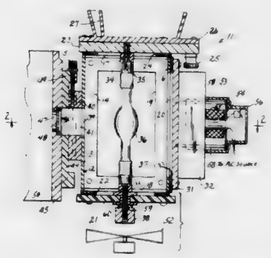
Charles Soodak, Silver Spring, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Original No. 3,949,258, dated Apr. 6, 1976, Ser. No. 530,052, Dec. 5, 1974. Application for reissue Jan. 25, 1978, Ser. No. 872,120

Int. Cl.[2] **H01J** *61/52*

U.S. Cl. 313—25 **18 Claims**

1. In combination, an apparatus including a lamp having a light output which generates ozone, and ozone-suppressing means comprising a substantially sealed enclosure containing oxygen surrounding said lamp and having a transparent exit window arranged to transmit light from the lamp to another portion of the apparatus, the enclosure being sufficiently large relative to the lamp so that ozone generated by said light output in the enclosure is circulated in the enclosure and is converted to stable oxygen by the heat of the lamp, and means



for cooling the enclosure [.]. *said air cooling means comprising a plurality of outwardly extending heat-radiating fins on the exterior of the enclosure.*

Re. 30,182

PRECODED TERNARY DATA TRANSMISSION

Robert D. Howson, Red Bank, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 3,679,977, dated Jul. 25, 1972, Ser. No. 835,984, Jun. 24, 1969. Application for reissue Jul. 22, 1974, Ser. No. 490,360

Int. Cl.[2] **D04B** *1/62;* **H04B** *1/66*

U.S. Cl. 325—42 **10 Claims**

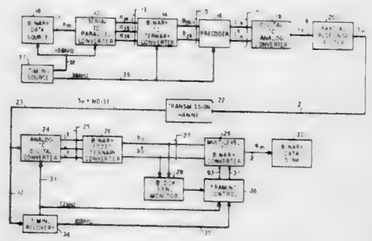
1. Apparatus for communicating a binary data signal over a transmission channel of bandwidth W at an effective binary bit rate that is a nonintegral multiple of the channel symbol rate, comprising

means for mapping each possible first block of binary digits taken m at a time into second blocks of n preassigned N-level digits such that 2^m is less than N^n and there exists at least one unassigned N-level block,

means for precoding N-level digits from said mapping means in accordance with the inverse of the impulse response of said channel such that precoded N-level digits can be decoded from single samples of the received signal,

means for exciting said channel with precoded digits from said precoding means at a signaling rate of 2W symbols per second such that channel signals occupy (2N–1) levels,

means for reconstructing said N-level digits from said channel signals,



means for monitoring N-level digits from said reconstructing means for the presence of said unassigned N-level block therein and producing a framing control signal,

means responsive to said framing control signal for partitioning reconstructed N-level digits into n-length blocks such that said unassigned block does not occur within partitioned blocks to be decoded, and

means under the control of said partitioning means for translating partitioned blocks of N-level digits into a serial train of binary digits.

V 9 8 9 / 4 DEC 25 79 UMI

PATENTS

GRANTED DEC. 25, 1979

ERRATA

For CLASS	See PATENT NO.
433–176	4,179,809
433–075	4,179,810
433–006	4,179,811
433–009	4,179,812
433–079	4,179,813
433–099	4,179,814
433–140	4,179,815
433–161	4,179,816
016–171	4,179,844
410–053	4,179,997
410–064	4,179,998
137–101.25	4,180,083
414–522	4,180,172
406–152	4,180,186
346–075	4,180,225
416–119	4,180,367
416–146 R	4,180,368
422–069	4,180,383
430–394	4,180,402
430–281	4,180,403
430–284	4,180,404
156–185	4,180,413
435–119	4,180,436
435–007	4,180,437
428–402	4,180,489
549–332.2 C	4,180,510
428–417	4,180,514
585–644	4,180,524
585–523	4,180,525
585–719	4,180,526
525–115	4,180,527
525–090	4,180,528
525–085	4,180,529
525–098	4,180,530
525–214	4,180,531

V 9 8 9 / 4 DEC 25 79 UMI

For CLASS	See PATENT NO.
528–112	4,180,607
528–289	4,180,612
525–437	4,180,652
528–391	4,180,653
260–244.4	4,180,668
562–600	4,180,681
250–227	4,180,702
250–237 G	4,180,703
250–237 G	4,180,704
367–007	4,180,790
367–007	4,180,792
367–137	4,180,793
358–016	4,180,825

PATENTS

GRANTED DECEMBER 25, 1979

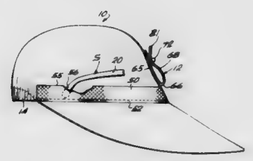
GENERAL AND MECHANICAL

4,179,752
PROTECTIVE SUIT
Peter Fackelmann, Am Haenisgraben 27, Dieburg D-6110, Fed. Rep. of Germany
Filed Feb. 27, 1978, Ser. No. 881,507
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1977, 7708471[U]
Int. Cl.[2] A41D *13/00*
U.S. Cl. 2—2 **7 Claims**



1. A protective suit comprising, in combination, an outer material; a lining; and a plurality of layers of protective material intermediate said outer material and said lining and lying upon each other with a low coefficient of friction between each of the layers, each of said layers having edges, said layers being connected only at their edges to each other and to said lining, said layers each having a high breaking elongation whereby when an individual layer of protective material is stretched after directly contacting a rough surface, another individual layer directly beneath it remains at least substantially unstressed due to the low coefficient of friction at least until the first-mentioned individual layer is worn away.

4,179,753
HEADGEAR WITH EYEGLASS SUPPORT
Sue Aronberg, 1865 NE. 117th Rd., North Miami, Fla. 33161, and Gail Fein, 3165 Pine Tree Dr., Miami Beach, Fla. 33140
Continuation-in-part of Ser. No. 859,836, Dec. 12, 1977, abandoned. Filed Apr. 10, 1978, Ser. No. 894,742
Int. Cl.[2] A42B *1/06*
U.S. Cl. 2—10 **22 Claims**



1. Headgear comprising a band adapted to encircle the head between a brim region and a crown region, the band having a front zone and opposite side zones, all of said zones being above the brim region, receptacle means on the band having an opening at each side zone for receiving corresponding temples of eyeglasses, and clip means on the band at the front zone for receiving and releasably closing about the nose piece of the eyeglasses, the clip means extending upwardly between the brim region and the crown region to encompass the nose piece with the lenses of the eyeglasses arranged upright at opposite sides thereof and with the temples extending rearwardly above the brim region and into the openings, respectively.

4,179,754
COMPETITION SWIMSUIT
Francis Denu, La Walk, France, assignor to ADIDAS, Fabrique de Chaussures de Sport, Landersheim, France
Filed Nov. 25, 1977, Ser. No. 854,679
Int. Cl.[2] A41D *5/00*
U.S. Cl. 2—67 **2 Claims**



1. A competition swimsuit comprising in combination a front part, and a back fastened to the front part along side seams, said back comprising, a lower part extending over the seat of the person wearing the suit, and an upper part extending across and overlapping a portion of said lower part near the waist of the wearer, said upper part and lower part having an unconnected space between them through which air and water can escape from the upper part, and wherein said lower part of the back comprises a panty portion covering the seat of the wearer, having an upper end terminating along the waist, and defining the rear of thigh openings of the suit, and said upper part of the back includes a curved concave lower portion with tips extending to the thigh openings near the side seams.

4,179,755
BELT WITHOUT BUCKLE
Edward J. Clark, Newhall, Calif., assignor to Tandy Brands, Inc., Fort Worth, Tex.
Filed May 30, 1978, Ser. No. 910,200
Int. Cl.[2] A41F *9/00*
U.S. Cl. 2—322 **5 Claims**

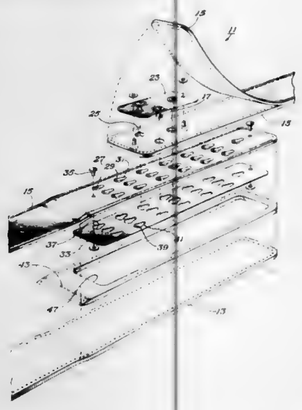
1. An apparel belt having inner and outer plies with improved fastening means for fastening the belt, comprising:

a plurality of pins protruding outward from the outer ply adjacent one end of the belt, each pin having a head and a neck of diameter less than the head;

the inner ply at the other end of the belt having a plurality of apertures positioned so as to mate with the pins to fasten the belt, the apertures being of a size sufficient for receiving the pins;

a metal plate fastened to the inside wall of the inner ply and having a plurality of apertures aligned with the apertures of the inner ply, each aperture of the plate having an enlarged portion of diameter sufficient to receive the head of one of the pins, and an adjoining reduced portion of a diameter sufficient to receive the neck of one of the pins, but not the head, for retaining the pins in the apertures while in the reduced portion, the area of the outer ply

adjacent the apertures in the plate being free of apertures to provide a smooth exterior; and



a spacer interposed between the inner and outer plies at the apertures to provide a clearance between the plate and the inside wall of the outer ply for the heads of the pins.

4,179,756

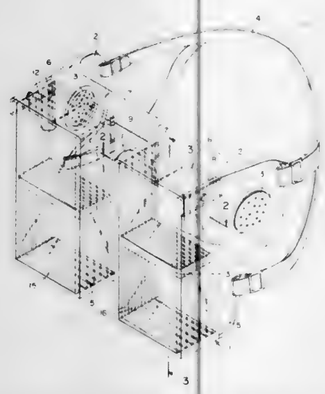
GOGGLES

Charles Lucas, 3769 Dianne St., Bethpage, N.Y. 11714

Filed Jul. 20, 1978, Ser. No. 926,532

Int. Cl.[2] A61F *9/02*

U.S. Cl. 2—434 **4 Claims**



1. An improved pair of goggles for protecting the users eyes from contamination of the type having a frame housing, a plurality of transparent slide down viewing lenses, a plurality of stationary lenses, means to keep contamination from entering the internal sections of the frame housing and lenses and means to keep the goggles on the users head wherein the improvement comprises;

(a) a plurality of guide slots so that the contaminated transparent slide down viewing lenses may be guided downward and out of view of the users view; and

(b) a snap-on cover to permit disassembly and reassembly of the transparent slide down viewing lenses to permit cleaning and replacement of the lenses.

4,179,757

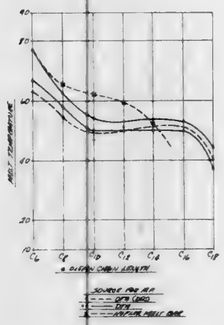
BIOCOMPATIBLE ARTICLES HAVING HIGH PERMEABILITY TO GASES DERIVED FROM POLYSULFONES

James E. Crawford, Adrian, Mich., and Don N. Gray, Sylvania, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 577,533, May 14, 1975, abandoned, which is a division of Ser. No. 328,972, Feb. 2, 1973, Pat. No. 3,928,294, which is a continuation-in-part of Ser. No. 279,877, Aug. 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 228,240, Feb. 22, 1972, abandoned. This application May 10, 1976, Ser. No. 684,683

Int. Cl.[2] A61F *1/24, 1/22;* **C08G** *75/22*

U.S. Cl. 3—1 **11 Claims**



1. The new use of a polysulfone polymer, the new use comprising the steps of:

(1) making an article adapted for biomedical surgical implantations of a highly-processable copolymer that is the reaction product of:

(a) an alpha-olefin having about 16 to 18 carbon atoms; and

(b) sulfur dioxide; and

(2) implanting the article of step (1) in a human body as a surgical implant,

said implanted article characterized by its biocompatibility with human blood.

11. An article of manufacture, a surgical implant for use biomedically in the human body and in contact with human blood and characterized by its biocompatibility therewith, said article made of a polysulfone copolymer that is a reaction product of:

(1) an alpha-olefin having 16 to 18 carbon atoms, and

(2) sulfur dioxide,

said surgical implant having a combination of additional properties making it useful in biomedical applications, including good tensile strength and elongation, non-thrombogenicity, oxygen transmission rate of about 1 to 4×10^{-4} CC MIL./IN^2 YR ATM. and a CO_2 transmission rate of about 4 to 17×10^{-4} CC MIL./IN^2 YR ATM.

4,179,758

FIXATION STEM FOR PROSTHETIC DEVICE

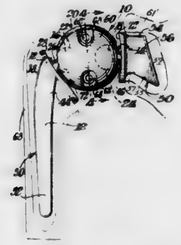
Anthony G. Gristina, Winston-Salem, N.C., assignor to Howmedica, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 757,559, Jan. 7, 1977, Pat. No. 4,040,131, which is a continuation-in-part of Ser. No. 681,805, Apr. 29, 1976, Pat. No. 4,003,095. This application Jul. 26, 1977, Ser. No. 819,233

Int. Cl.[2] A61F *1/24*

U.S. Cl. 3—1.91 **3 Claims**

1. A movable prosthetic device adapted for affixation to bony structure having a relatively strong bone plate like region comprising a substantially T-shaped stem, a substantially elongated base incorporated in the stem, a substantially narrow web incorporated in the stem connecting the substantially elongated base to the device, a flange on the device which is spaced from the base of the stem is adapted to be affixed to the bony structure by insertion of the base and web through a hole in the bone plate and into a mass of cement disposed under the



bone plate with the flange disposed in firm contact with the outside of the bone plate, the base is substantially flat, the base is disposed at an acute angle relative to the flange, the flange is substantially oval, the web has longer and shorter sides, and a portion of the longer side disposed adjacent the flange has a cutout to facilitate insertion of the base through the hole in the bone plate.

4,179,759

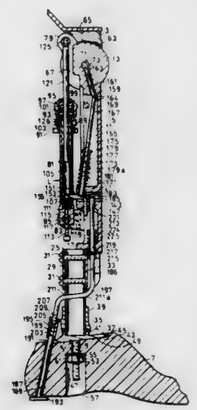
ARTIFICIAL LEG HAVING A LOCKABLE KNEE JOINT

James A. Smith, 411 S. Glencoe Rd., New Symrna Beach, Fla. 32069

Filed Feb. 16, 1978, Ser. No. 878,612

Int. Cl.[2] A61F *1/04, 1/08*

U.S. Cl. 3—24 **25 Claims**



25. An artificial leg comprising an upper limb portion, a lower limb portion, connecting means pivotally connecting the upper limb portion to the lower limb portion, a foot mounted on the lower end of the lower limb portion, locking means responsive to downward pressure on the upper limb portion with the foot resting on a support surface for locking the upper limb portion in position with respect to the lower limb portion, said connecting means comprising pivoting means positioned forward on the center line of gravity in the artificial leg and thereat establishing an axis for monocentric pivotal movements of the limb portions.

4,179,760

MARBLE-PATTERNED BATHTUB, BASIN OR SINK

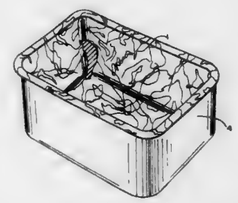
Yasuharu Nakagawa, Suita, Japan, assignor to Topla, Ltd., Osaka, Japan

Filed Nov. 12, 1975, Ser. No. 631,076

Claims priority, application Japan, Jun. 6, 1975, 50/68979

Int. Cl.[2] A47K *1/04;* **E03C** *1/18;* **B32B** *27/06;* **B44F** *9/04*

U.S. Cl. 4—166 **7 Claims**



1. A multi-layered article having a thermoformed contoured configuration and the appearance of natural marble which comprises a sheet of molded, transparent acrylic resin having a front side forming the interior surface of the article and a back side with photographic reproduction of marble applied to said back side thereof; a layer comprising an unsaturated polyester resin applied over the exposed side of said photographic reproduction and an outer layer forming an exterior surface of fiber glass reinforced polyester resin applied over said layer of unsaturated polyester resin.

4,179,761

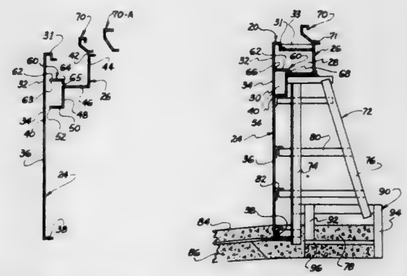
WALL CONSTRUCTION FOR SWIMMING POOLS

John F. Corna, 1542 N. Crest Ave., Columbus, Ohio 43220, and Marcel H. Blais, 8085 Manitou Dr., Westerville, Ohio 43081

Filed Jun. 26, 1978, Ser. No. 918,793

Int. Cl.[2] E04H *3/16, 3/18*

U.S. Cl. 4—172.19 **6 Claims**



1. A wall construction for swimming pools comprising, in combination, a plurality of wall forming sections, joined in edge to edge relationship to form the peripheral wall of the pool, each of the sections comprising a first sheet member serially including a horizontally extending top edge portion forming a gutter inlet, an upper first sheet portion, forming a gutter inner wall, an intermediate first sheet portion forming a conduit inner wall, a lower first sheet portion, and a bottom edge portion forming a wall seal portion; a second sheet member serially including a horizontally extending second sheet member serially including a horizontally extending second sheet top edge, a gutter outer wall, a gutter bottom wall, a conduit outer wall, and a horizontally extending second sheet, inner edge joined to the first sheet member at a lower inner welded junction; and a third sheet member serially including a

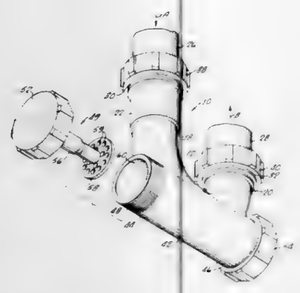
third sheet inner edge joined to the first sheet member at an upper inner welded junction, a horizontally extending third sheet portion forming a conduit top wall for a recirculating conduit and a portion of the gutter bottom wall, and a third sheet outer edge joined to the second sheet member at an upper outer welded junction, said lower and upper inner welded junctions being selectively positionable at various vertical locations on the first sheet member to vary the height of the gutter inner wall and thereby establish the capacity of the gutter.

4,179,762

TRAP AND SOLIDS REMOVAL ASSEMBLY FOR DRAINS

Kenneth O. Barnhardt, 3348 Harvard, Santa Ana, Calif. 92704, and Lawrence H. Morita, 20212 Big Bend La., Huntington Beach, Calif. 92646

Filed Aug. 24, 1978, Ser. No. 936,368
Int. Cl.[2] E03C *1/282*
U.S. Cl. 4—191 **9 Claims**



1. An improved drain trap assembly for use on plumbing lines comprising:
- a generally U-shaped tubular base portion having an inlet side and an outlet side,
- a cylindrical inlet leg integrally connected to the inlet side of said tubular base portion,
- a cylindrical outlet leg integrally connected to the outlet side of said tubular base portion,
- a cylindrical clean-out section, said clean-out section being integrally incorporated in said base portion and having its axis substantially in a common plane with the axis thereof, and
- sealing means for sealing each end of said cylindrical clean-out section, said sealing means at each of said ends being detachable for removal from said clean-out section to permit drainage and cleaning thereof.

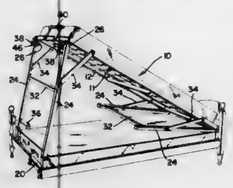
4,179,763

FOLDING BUNK BED UNIT

Luis A. Echavarren, 617 John Marshall Dr., NE., Vienna, Va. 22180, and Daniel Echavarren, 7106 Catlett St., Springfield, Va. 22151

Filed Jun. 23, 1978, Ser. No. 918,460
Int. Cl.[2] A47C *17/40*
U.S. Cl. 5—8 **12 Claims**

1. A folding bunk bed unit comprising a top frame movable between a lower, folded position and an upper, unfolded position, said top frame comprising parallel side rails and end rails; a bottom frame; a plurality of struts each having a free end and having an end which forms a pivotal connection with said bottom frame, said struts extending between said top and bottom frames when said top frame is in the unfolded position, and said free end being the upper end of said strut in the unfolded position and having a top surface that is separated from said top frame in the folded position; and a plurality of link means



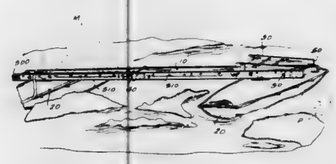
interconnecting said top frame and said struts, said link means forming gussets for said unit in the unfolded position.

4,179,764

LIFESAVING DEVICE

Roy W. Lindblade, 3349 W. 111th St., Chicago, Ill. 60658

Filed Feb. 8, 1978, Ser. No. 876,021
Int. Cl.[2] B63C *9/00*
U.S. Cl. 9—14 **11 Claims**



1. A lifesaving device for use on ice or in water comprising:
- a platform;
- a plurality of inflatable floatation devices each having means for inflation;
- each member of said plurality of inflation devices having means for removably affixing said member to said platform
- such that said platform will be held out of a water or ice einvironment when said floatation devices are placed therein and such that said inflatable floatation devices may be removed from said platform,
- said means for removably affixing including a plate fixedly attached to each said member of said plurality, each said plate having fixedly attached thereto a right angle member with a first and a second portion substantially perpendicular to one another with said first portion being positioned substantially adjacent to and selectively located with respect to said plate;
- said platform having a surface selectively located adjacent said second portion of said right angle member with said platform surface and said second portion each having a hole therethrough, selectively located thereon so that a removable means for linking said platform surface and said second portion rigidly together might be inserted therethrough.

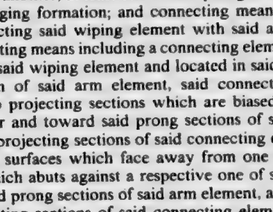
4,179,765

NUTATING DEVICE WITH PROVISION FOR UTILIZATION OF MOTIVE FLUID

Walter D. Teague, Jr., Tweed Blvd., Nyack, N.Y. 10960, and Arthur T. Sempliner, 37-04 Van Nostrand Pl., Douglaston, N.Y. 11363

Continuation-in-part of Ser. No. 827,625, Aug. 25, 1977, which is a continuation-in-part of Ser. No. 848,807, Nov. 7, 1977. This application Mar. 20, 1978, Ser. No. 888,137
Int. Cl.[2] A46B *13/06*
U.S. Cl. 15—22 R **18 Claims**

1. In a fluid-driven nutating action appliance including a motor housing and a wobble plate mounted in said motor housing for universal tilting movement within predetermined limits, means for diverting a portion of the motive fluid to a utilization device, which comprises
- (a) an output element carried by said wobble plate,
- (b) a utilization device associated with said output element,
- (c) flow passage means in said motor housing connected to a remote source of motive fluid and communicating with the interior of said motor housing to drive said wobble plate,



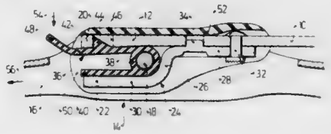
- (d) continuous passage-forming means arranged in said output element and said utilization device, and
- (e) a plurality of discharge ports arranged in said utilization device,
- (f) said passage-forming means communicating at one end thereof with said flow passage means and at the other end thereof with said discharge ports whereby a portion of the motive fluid is diverted through the passage-forming means and discharged through the ports directly to the working surface contacted by said utilization device.

4,179,766

WIPING ARRANGEMENT FOR WIPING A VEHICLE WINDOW

Paul Weiler, Kappelrodeck, and Dietmar Brummer, Buhlertal, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 4, 1978, Ser. No. 930,980
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1977, 2742021
Int. Cl.[2] B60S *1/40*
U.S. Cl. 15—250.32 **17 Claims**



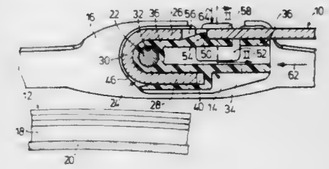
1. A wiping arrangement for wiping a vehicle window, comprising a wiping element; a driven arm element having a forked free end portion which includes two prong sections bounding a gap therebetween and having first surfaces facing toward one another, at least one of said prong sections having a first engaging formation; and connecting means for releasably connecting said wiping element with said arm element, said connecting means including a connecting element which is secured to said wiping element and located in said gap of said end portion of said arm element, said connecting element having two projecting sections which are biased apart from one another and toward said prong sections of said arm element, said projecting sections of said connecting element having second surfaces which face away from one another and each of which abuts against a respective one of said first surfaces of said prong sections of said arm element, at least one of said projecting sections of said connecting element having a second engaging formation arranged for engaging with said first engaging formation of said one prong section of said arm element whereby said connecting element and said wiping element secured thereto become connected with said arm element, said connecting means including a handle portion provided on said one projecting section of said connecting element, said handle portion extending outwardly beyond said prong sections of said arm element and arranged for urging said one projecting section of said connecting element toward the other projecting section thereof so that said engaging formations become disengaged from one another, whereby said connection of said connecting element and said wiping element with said arm element is interrupted and said wiping element can be withdrawn from said arm element without removing the latter from a vehicle window.

4,179,767

WIPING ARRANGEMENT FOR WIPING A VEHICLE WINDOW

Paul Weiler, Kappelrodeck, and Dietmar Brümmer, Bühlertal, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

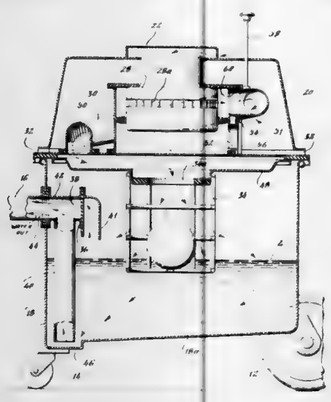
Filed Sep. 5, 1978, Ser. No. 939,372
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1977, 2742022
Int. Cl.[2] B60S *1/40*
U.S. Cl. 15—250.32 **17 Claims**



1. A wiping arrangement for wiping a vehicle window, comprising a wiping element; a driven arm element having an outer face which faces away from the vehicle window, and a hook-like end part which includes two arm sections connected with one another and bounding a gap therebetween, at least one of said arm sections having a first engaging formation; and a connecting element for releasably connecting said wiping element with said arm element, said connecting element being secured to said wiping element and located in said gap between said arm sections of said end part of said arm element, said connecting element having two projecting portions which are biased apart from one another and a second engaging formation arranged for engaging with said first engaging formation of said one arm section of said arm element whereby said connecting element and said wiping element secured thereto become connected with said arm element, said connecting element further having means for urging said one projecting portion toward the other projecting portion of said connecting element so that said engaging formations become disengaged from one another, whereby said connection of said connecting element and said wiping element with said arm element is interrupted and said wiping element can be withdrawn from said arm element, said means being arranged to be pressed by a user and extending outwardly beyond said outer face of said arm element in a direction away from the vehicle window and is not obstructed from outside, so that said means can be pressed by a user from outside at a side opposite to the vehicle window and thereby the withdrawal of said wiping element from said arm element can be performed without removing the latter from the vehicle window.

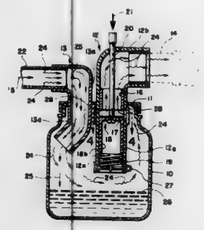
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4,179,768
VACUUM DUMPING ARRANGEMENT FOR A WET/DRY VACUUM CLEANER
Roderick Sawyer, Elkhart, Ind., assignor to Aktiebolaget Electrolux, Stockholm, Sweden
Continuation of Ser. No. 777,959, Mar. 16, 1977, abandoned. This application Aug. 21, 1978, Ser. No. 935,367
Int. Cl.² A47L *7/00*
U.S. Cl. 15—352 **7 Claims**



1. A wet/dry vacuum cleaner having a suction mode and a fluid pressurizing mode resulting in air and liquid discharge respectively comprising: a tank provided with an aperture and having an intake hose, a cover for said tank, one end of said hose being connected to said aperture for communication with the interior of said tank, a fan-motor, a separate enclosure for said fan-motor, said enclosure being provided with two spaced openings each of which are fluidly connected to one of the suction or pressure sides of said fan, one of said openings connecting the space between said cover and the enclosure of said fan-motor with the suction side of said fan, a flexible tube communicating said tank with either one of said openings, shifting means for one end of said tube from a connection to one of said openings to a connection to the other of said openings, said flexible tube being continually connected to at least one of said openings, the suction side of said fan having a suction level that can be controlled by misaligning the end of said flexible tube and suction opening to permit air from the space between the cover and enclosure to be bled into said fan, the pressure side of said fan being controlled by misaligning the end of said flexible tube and the discharge opening for controlling the discharge rate of the liquid discharge, said cover spaced from and surrounding said fan-motor enclosure, the latter having said internal space for said fan-motor, said cover also enclosing said shifting means and said flexible tube, vent means in said cover for permitting fluid communication between the atmosphere and said space; the suction mode having air which passes through said flexible tube, through the opening on the suction side of said fan, and through said vent means to the atmosphere; a liquid evacuating means connected to said intake hose, said liquid evacuating means having a pipe provided with one end connected to said intake hose and the other end being free and arranged to be submerged in the liquid solution accumulated in said tank and closely adjacent to the bottom of said tank, a one-way valve in said tank communicating with said intake hose; the fluid pressurizing mode having said flexible tube communicating with the other of said openings whereby air in the space between the cover and enclosure enters the suction side of the fan and passes through the pressure side of said fan, said flexible tube, and to said tank to close said one-way valve thus causing said air in the tank to be pressurized to an extent to pump the liquid solution in said tank out of said pipe and intake hose while said one-way valve is maintained in the closed condition.

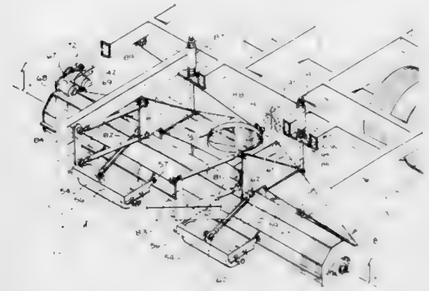
4,179,769
VACUUM CLEANER ATTACHMENT FOR VACUUMING LIQUIDS
Robert H. Lundquist, 1850 N. 500 East, Provo, Utah 84601
Filed Oct. 19, 1978, Ser. No. 952,640
Int. Cl.² A47L *7/00*
U.S. Cl. 15—353 **4 Claims**



1. A portable attachment for vacuum cleaners which permits pickup of liquids as well as solids with the aspirated air, said attachment comprising:
a portable container;
a removable cover on said container, said cover making a substantially air-tight connection with said container;
a pair of nozzles on said cover, said nozzles providing fluid flow communication between the inside and outside of said container;
means for attaching the suction hose of a vacuum cleaner to the first nozzle of said pair of nozzles;
valve means in combination with said first nozzle, said valve means being spring biased in the closed position so that fluid flow communication between the inside of said container and the suction hose of the vacuum cleaner is established only when the valve means is activated to its open position;
a scavenger hose adapted to convey a mixture of air and liquids; and
means for attaching one end of said scavenger hose to the second nozzle of said pair of nozzles.

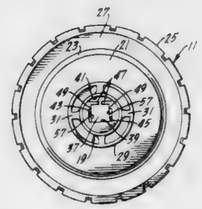
4,179,770
TURF GROOMING VEHICLE WITH DISCHARGEABLE RECEIVER
John F. Nunes, Jr., c/o Nunes Mfg. Co., 2006 Loquot Ave., Patterson, Calif. 95363
Division of Ser. No. 703,632, Jul. 8, 1976, abandoned. This application Mar. 17, 1978, Ser. No. 887,657
Int. Cl.² A47L *5/30*
U.S. Cl. 15—360 **1 Claim**

1. In a turf grooming vehicle, a mobile chassis of a type adapted to be moved across a field of turf, wheels supporting said chassis to cause said chassis to rise and fall in terrain-following movement with the vertical movement of the wheels, grooming means including a vacuum head assembly including vacuum means serving to apply vacuum to the turf for removing loose turf material therefrom, said assembly including means supporting said vacuum means to rise and fall in terrain-following movement substantially unaffected by the vehicle movements of said wheels while maintaining said vacuum means substantially at a predetermined spaced relation to said turf, said head assembly being coupled to be drawn by said chassis, said means supporting said vacuum means comprises rollers carried by said head assembly for engaging the turf and supporting said vacuum means in spaced relation therefrom, and means for adjusting the clearance of said vacuum means with respect to the turf comprising U-shaped mounting yokes carrying said rollers to roll in supporting engagement across the turf, the ends of said yokes being pivoted to said head



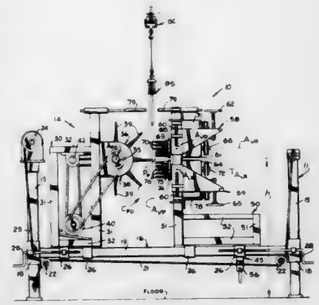
assembly, and a turn-buckle extending between said assembly and a portion of said yoke for adjusting the clearance beneath said head assembly.

4,179,771
KNOB
Paul Rankins, and Robert K. Howie, Jr., both of Decatur, Ill., assignors to The Grigoleit Company, Decatur, Ill.
Filed Mar. 13, 1978, Ser. No. 885,681
Int. Cl.² F16D *1/06*
U.S. Cl. 16—121 **5 Claims**



1. A molded knob of the type which frictionally engages and slips over the end of a shaft,
a hub formed as part of said knob,
a shaft receiving socket formed in said hub,
said socket having a flat wall adapted to engage a flat on said shaft,
elongated fingers formed as part of said hub and extending into said socket on the opposite side of said socket from said flat wall,
said fingers extending towards and in alignment with each other and being laterally deflectable in a direction away from said flat wall upon insertion of said shaft into said socket, and
at least one abutment formed as part of said hub and adapted to limit further deflection of said fingers beyond that caused by the insertion of said shaft into said socket, specifically when said further deflection is due to the application of torque to the shaft.

4,179,772
DRUM/DISK POULTRY PICKER
Grover S. Harben, Jr., Edgewater Ave., Gainesville, Ga. 30501
Filed Feb. 3, 1978, Ser. No. 874,844
Int. Cl.² A22C *21/02*
U.S. Cl. 17—47 **9 Claims**



1. A poultry picking machine through which poultry are conveyed successively along a picking path in a head lowermost position so that the poultry is suspended along a generally vertical axis and the vertical axis moves with the poultry along a generally vertical picking plane along the picking path comprising:
a disk type picking arrangement including a plurality of disk support members disposed along and adjacent one side of the picking path and the vertical picking plane, each of said disk support members rotating about disk axes oriented generally normal to said path; and a plurality of flexible disk picking fingers mounted on each of said disk support members and projecting toward said picking path so that said flexible picking fingers are rotated with said disk support members in circular paths concentric about said disk axes to engage and defeather poultry successively moving along said picking path; and
a drum type picking arrangement including a plurality of drum support members disposed along and adjacent the picking path on the opposite side of the vertical picking plane from said disk type picking arrangement, said drum support members rotating about a common drum axis generally parallel to and spaced outwardly of the picking path; and a plurality of flexible drum picking fingers mounted on each of said drum support members and movable with said drum support members about said common drum axis in a plane generally normal to the picking path and the vertical picking plane to engage the poultry in opposition to said disk picking fingers to defeather poultry passing along said picking path.

8. A method of defeathering poultry comprising the steps of:
successively conveying poultry along a picking path in a head lowermost position so that the poultry is suspended along a generally vertical axis and the vertical axis moves with the poultry along a generally vertical picking plane along the picking path;
engaging the poultry from one side of the picking path and the vertical picking plane with a plurality of sets of first resilient picking fingers rotating about a common rotational axis generally parallel to the picking path with each set of the first resilient picking fingers circumferentially spaced about and radially oriented with respect to the common rotational axis and with the sets of the first picking fingers axially spaced along the common rotational axis; and
simultaneously engaging the poultry from the opposite side of the picking path and the vertical picking plane in opposition to the first picking fingers across the vertical picking plane with a plurality of sets of second resilient picking

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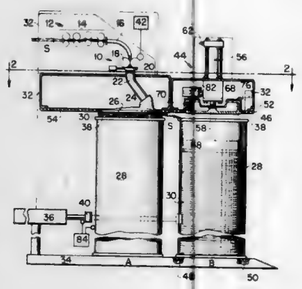
fingers rotating about a plurality of separate rotational axes axially spaced along the picking path and oriented generally normal to the picking path with each set of the second picking fingers arranged in a concentric circle about one of said separate rotational axes and with the second picking fingers in each set oriented generally parallel to the separate rotational axis.

4,179,773

MEANS FOR SEVERING AND COMPACTING COILED SLIVER

Richard J. Savageau, Seneca, S.C., assignor to Platt Saco Lowell Limited, United Kingdom

Filed Apr. 27, 1978, Ser. No. 900,559
Int. Cl.[2] D65H *54/84*
U.S. Cl. 19—159 A **5 Claims**



1. In combination with a conjoined coiler apparatus and an automatic can changer apparatus, respectively for filling a can with a strand of coiled sliver and for the replacement of said then-filled can with an empty one, means for compacting coils of said sliver strand within said filled can and for concurrently causing the parting in two through attenuation of that portion of said strand extending between said filled can and said coiler apparatus, said means including a compactor plate which is extendible into said filled can to compact said coils and is then withdrawable therefrom, and means for controlling and coordinating the said elements of the here-defined combination for their sequential and automatically repetitive operation in cycles of can filling, can changing, sliver compacting and sliver parting, said control means including

means for controlling the movement of said compactor plate within and above said filled can at a prescribable rate whereby expulsion of air from said sliver coils in turn is at a rate which precludes disruption of said sliver.

4,179,774

CABLE CLAMPS

Stanley A. Bradbury, London, England, assignor to Cable Supports Limited, Great Britain

Filed Jun. 22, 1978, Ser. No. 917,971
Int. Cl.[2] F16G *11/00*
U.S. Cl. 24—132 R **9 Claims**

1. A cable clamp having:

a base member;

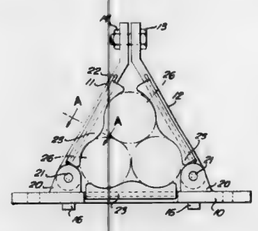
two arms, each defining two longitudinal grooves, one in each side edge of the respective arms;

first means for mounting one of the arms at one end thereof at a first location on said base member;

second means for mounting the other of the arms at one end thereof at a second location on said base member, said second location being spaced from said first location and at least one of the arms being pivotally attached to the base member;

means for securing the other ends of the arms together; and

a pad for each of said arms and base member for gripping a cable or group of cables in the region between the arms and base, each of the pads for the arms having projections for engaging in the grooves of their respective arms so



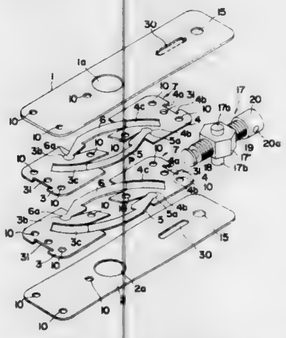
that the pads for the arms are slidable for at least limited longitudinal movement along their respective arms.

4,179,775

ADJUSTABLE CLAMPING DEVICE

Susumu Fujita, Kobe, Japan, assignor to Nittan Kohki Co., Ltd., Sakai, Japan

Filed Jul. 6, 1978, Ser. No. 922,424
Claims priority, application Japan, Jul. 11, 1977, 52-83232; Oct. 7, 1977, 52-121292
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—249 R **8 Claims**



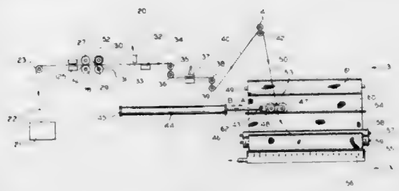
1. An adjustable clamping device for clamping a pipe or the like through peripheral clamping engagement, which comprises a first fixed slide member having first slot and a second slot, said first slide member having a first clamping portion between said first slot and said second slot, a second slide member having a third slot and a fourth slot, said second slide member having a second clamping portion between said third and said fourth slot, a pair of said third and said fourth slots being coplanar with a pair of said first and said second slots, a third slide member having a slide portion at one longitudinal end thereof slidably received in said second slot and a portion at the other longitudinal end thereof fitted in said fourth slot, said third slide member having a third clamping portion between said one end and said other end thereof, a fourth slide member having a slide portion at one longitudinal end thereof slidably received in said third slot and a portion at the other longitudinal end thereof fitted in said first slot, said fourth slide member having a fourth clamping portion between said one end and said other end thereof, means for mounting said first to fourth members for variable spacing therebetween along a preselected line of movement, and means for forcibly effecting relative movement of said first and second members toward each other along said line of movement.

4,179,776

METHOD AND APPARATUS FOR DEREGISTERING AND PROCESSING AN OPEN SYNTHETIC TOW INTO FIBER-FILLED ARTICLES

Harold Wortman, 5936 Monroe St., Morton Grove, Ill. 60053

Filed Sep. 19, 1977, Ser. No. 834,176
Int. Cl.[2] B65D *75/00*; D04H *3/00*; D02J *1/18*
U.S. Cl. 28—121 **11 Claims**



1. An improved method for producing and processing deregistered and disorientated synthetic tow for inclusion into fiber filled articles, said method comprising the steps of:

A. Feeding a substantially narrow crimped registered tow bundle into a nip formed between a first pair of rolls, each one of said first pair of rolls rotating oppositely to one another at a first speed so as to draw said tow bundle through and between said rolls, at least one of said first pair of rolls having smooth surfaces;

B. Deregistering said crimped registered tow by drawing said tow bundle from the back side of said first pair of rolls into a nip of a second pair of rolls, each one of said second pair of rolls rotating oppositely to one another at a second speed greater than said first speed, at least one of said second pair of rolls having a noncontinuous groove-threaded surface, thereby spreading the tow bundle outwardly into a wider configuration;

C. Dispersing and spreading said tow as it is processed at a position proximate to said first and second pair of rolls thereby additionally shaping said tow into a substantially dispersed web;

D. Collecting said dispersed and spread web for distribution into said fiber filled articles;

E. Distributing said web of disorientated and deregistered synthetic tow for envelopment into said fiber filled article;

F. Preliminarily enveloping said web of disorientated and deregistered synthetic tow between a plurality of article surface materials, said enveloping being accomplished through the steps of:

1. Depositing said collected web material directly onto the first layer of article surface material by cross-lapping said web material in a reciprocating motion onto said first layer of material as said first layer of material is drawn in a direction substantially normal to the direction of said reciprocating motion;
2. Attracting said deposited web into close compacted position on said first layer of surface material through vacuum suction means located directly below said first layer of article surface material;
3. Guiding said first layer of surface material and said deposited tow web in said direction into communication with a second layer of article surface material thereby sandwiching said tow web between said first and second layers of surface material; and
4. Guiding said sandwiched web and surface materials into means for attaching said first and second layers to one another for enclosing said deposited tow web between said first and second layers of surface material; and

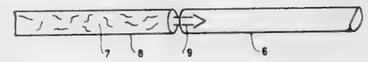
G. Finishing the fabrication of said fiber filled articles by enclosing and affixing said enveloped web between said plurality of article surface materials through the use of article attachment means comprising stitching and sewing.

4,179,777

METHOD OF PRODUCING A LOW-PRESSURE GAS DISCHARGE LAMP

Jan Hasker, and Cornelis Peters, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 7, 1977, Ser. No. 765,935
Claims priority, application Netherlands, Mar. 30, 1976, 7603285
Int. Cl.[2] H01J *9/18*
U.S. Cl. 29—25.13 **7 Claims**



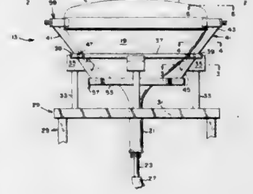
1. A method for producing a low-pressure gas discharge lamp having two electrodes which comprises: providing an elongated envelope; providing a quantity of thinly distributed filament wool; then preparing said filament wool into a mat having a length equal to or smaller than the distance between the electrodes; then rolling said mat to form a generally cylindrical member having an outer diameter substantially equal to the inner diameter of said envelope and a length substantially equal to the length of the mat; and then introducing said member into the elongated envelope to provide a substantially uniform distribution of said wool within essentially all of said envelope; said introducing step including the use of a gas stream.

4,179,778

MEANS FOR MINIMIZING PROCESSING IMPLOSIONS IN CRT MANUFACTURE

Robert M. Corson, Ottawa, Ohio, assignor to GTE Sylvania Incorporated, Stamford, Conn.

Division of Ser. No. 865,409, Dec. 29, 1977, Pat. No. 4,152,036. This application Nov. 22, 1978, Ser. No. 963,071
Int. Cl.[2] H01J *9/24*
U.S. Cl. 29—25.19 **7 Claims**



1. Means for applying external pressure to discrete peripheral areas of the panel portion of a cathode ray tube envelope in a manner substantially normal to the longitudinal axis thereof during ambient heat processing, said envelope being formed as an integration of panel, funnel and neck portions, said pressure application means being a device formed to spatially encompass portions of said tube envelope comprising: a plurality of spaced-apart support means fashioned to provide support seating for the funnel portion of said tube envelope, said support means being in a plane substantially normal to said axis; a first closed ring-like member fabricated of a material exhibiting a low coefficient of linear thermal expansion and oriented to rest upon said support means, said first member having a perimetric dimension greater than that of said funnel portion at the region of support, said first member having a plurality of spaced-apart pivot means located on the periphery thereof; a plurality of lever arms formed of low-expansive material and related in an angular manner with said first member, each of said arms having an upper and lower end with a respective attachment element thereat and a pivot point there-

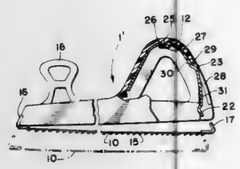
V.989/4 DEC 25 79 UMI

between, each of said pivot points being associated with a respective pivot means on said first member; a second closed ring-like member fabricated of a material exhibiting a high coefficient of linear thermal expansion and formed to have a perimetric dimension smaller than that of said first member, said second member having a plurality of spaced apart attachment means peripherally formed thereon to effect movable jointure affixation with the lower attachment elements of the respective lever arms; and a plurality of spaced-apart contact heads each being movably affixed to the upper attachment elements of the respective lever arms, each of said heads having a face portion oriented toward said axis and being formed with a contour shaped to fit a portion of the periphery of said panel.

4,179,779
HAND PLANE

Robert R. Hayes, Euclid, Ohio, assignor to Oatey Co., Cleveland, Ohio

Filed Aug. 14, 1978, Ser. No. 933,509
Int. Cl.[2] B23D *71/00, 71/04;* **B24D** *15/04*
U.S. Cl. 29—78 **12 Claims**



1. A planing tool comprising an elongated frame for supporting an elongated planer blade, said frame having a top wall and a pair of laterally spaced downwardly extending side walls, a beveled face at the forward end of said frame between said side walls for hooking engagement by a first mounting tab on the forward end of the blade, a handle extending upwardly adjacent the rear end of said frame, a recess in the rear end of said frame adapted to receive a second mounting tab on the rear end of the blade, and spring latch means adjacent the rear end of said frame for releasably engaging the second mounting tab and urging such second mounting tab rearwardly for securely retaining the blade on the bottom of said frame.

4,179,780
METHOD OF MAKING A CLUTCH THROW-OUT BEARING ASSEMBLY

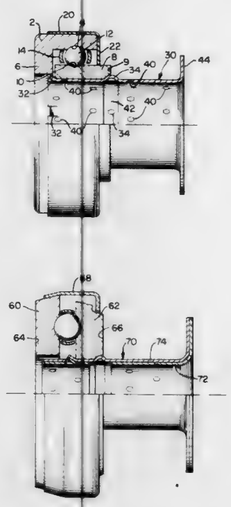
Eli M. Ladin, Ann Arbor, and Mark P. Reynolds, Birmingham, both of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Division of Ser. No. 711,753, Aug. 4, 1976, Pat. No. 4,117,917. This application Jun. 15, 1978, Ser. No. 915,698
Int. Cl.[2] B21D *53/10*
U.S. Cl. 29—149.5 R **4 Claims**

1. A method of making a clutch throw-out bearing assembly which includes an antifriction bearing with a bearing carrier inserted telescopically into the bore thereof and securing said bearing carrier to said antifriction bearing by staking or the like, the improvement comprising,

stamping said bearing carrier as a single unit from flat sheet metal stock including the steps of providing a flat sheet metal stock, embossing said flat sheet metal stock with a plurality of recesses on one face thereof, die-forming said sheet metal stock to impart at least one protuberance projecting from the other surface thereof, forming said flat sheet metal stock into a generally cylindrical tube with the embossed said one face defining the internal surface of said tube,

forming a radial flange on said tube by upsetting one end of said tube, slidably inserting the other end of said tube into the bore of said antifriction bearing in axial abutting contact with said protuberance and thereafter securing

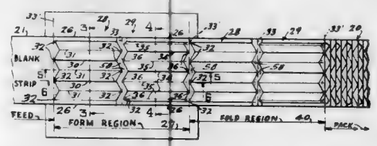


said bearing on said tube forming a clutch throw-out bearing assembly.

4,179,781
METHOD FOR FORMING A HEAT EXCHANGER CORE

Wesley A. Long, Sylvania, Ohio, assignor to Karen L. Beckmann, Toledo, Ohio

Continuation-in-part of Ser. No. 708,575, Jul. 26, 1976, Pat. No. 4,131,159. This application Sep. 16, 1977, Ser. No. 833,718
Int. Cl.[2] B23P *15/26*
U.S. Cl. 29—157.3 R **4 Claims**

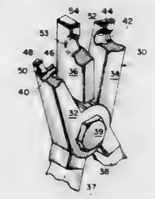


1. A method for forming a core for an indirect fluid-to-fluid heat exchanger comprising the steps of: forming an elongated sheet of metal to define a longitudinal series of closely spaced corrugated sections each having a plurality of parallel corrugations defining ridges and troughs terminating in triangular end reinforcements, such reinforcements having apexes, the apexes of the end reinforcements at the end of each section lying substantially along a line extending in a direction transverse to the elongated sheet; pleat folding said formed sheet along such lines between adjacent sections whereby alternating first and second fluid passages are defined by said folded sheet with said first passages lying on one side of said sheet and said second passages lying on the other side of said sheet; and sealing together adjacent edges of said sections to enclose ends of said first passages.

4,179,782
CABLE TERMINAL-FERRULE ATTACHING APPARATUS

Donald B. Forman, and Phillip Bradshaw, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 1, 1978, Ser. No. 902,013
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—268 **9 Claims**



1. Compression apparatus for connecting a snap ring between a pair of members, one member having a pair of spaced outer annular shoulders forming an outer groove and the other member being a ferrule having an annular bore groove, the snap ring being adapted to be positioned within said grooves comprising:

a pair of first and second jaws movably mounted together for compression of said members therebetween;

said first jaw having an opening extending therethrough for seating one of said members;

said second jaw having an opening extending therethrough for receiving the other said member;

said first jaw having a projecting portion coextensive with its respective opening for applying a pressure against said one member;

a third jaw positioned between said pair of jaws and having an opening extending therethrough of a size for receiving said first member;

the openings in said first, second, and third jaws being in longitudinal alignment;

means on said third jaw for radially compressing inwardly the snap ring;

whereby compression of the first and second jaws together will cause the snap ring to be cammed radially inwardly and positioned between the spaced terminal shoulders of said one member allowing said one member to be inserted into the said second member until the snap ring is captured between the grooves in the two members rotatably to secure them together.

4,179,783
HOLDING APPARATUS WITH ELASTIC MECHANISM

Tadao Inoyama, Yokohama; Yasuhide Matsumura, Hachioji, and Yukio Nagano, Chiba, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 640,702, Dec. 15, 1975, abandoned. This application Sep. 20, 1977, Ser. No. 834,897
Claims priority, application Japan, Dec. 16, 1974, 49/143413
Int. Cl.[2] B25B *27/14*
U.S. Cl. 29—281.5 **18 Claims**

1. A holding apparatus comprising:

(a) a holding mechanism for holding an assembly member;

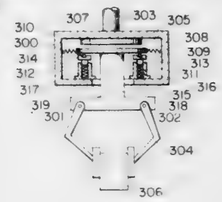
(b) a drive shaft and support means fixed to said drive shaft for resiliently supporting said holding mechanism, said support means including:

supporting structure,

axial coupling means for resiliently coupling said holding mechanism to said supporting structure in the axial direction of said drive shaft,

transverse coupling means including resilient means for resiliently coupling said holding mechanism to said supporting structure in a direction transverse to said axial direction,

first resilient means forming part of said axial coupling for enabling resilient displacement of said holding mechanism, and



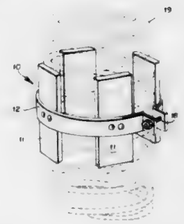
second means, forming part of said axial coupling between said holding mechanism and said first means, for minimizing operational interference between said transverse coupling and said first means; and

(c) detector means provided on said support means for detecting deflection of said holding mechanism relative to said drive shaft.

4,179,784
TOOL FOR INSTALLING VEHICULAR COIL SPRINGS

Florien J. Warren, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg. 233 Broadway, both of New York, N.Y. 10007

Filed Jan. 25, 1977, Ser. No. 762,316
Int. Cl.[2] B23Q *3/00*
U.S. Cl. 29—283 **2 Claims**



1. A tool for reinforcing compression coil springs during installation between opposite seats, the combination of a plurality of parallel spaced longitudinal plates, and a transverse flexible metal band having an inner surface, said plates being rigidly affixed at right angles to said inner surface of said band whereby said band fully circumscribes said plates when bent into curvate form including integral opposite ends of said bands extending outwardly at right angles to said band forming opposing spaced tabs, aligned openings through said tabs, a bolt adapted to fit through said openings when said tool is mounted around a compression coil spring periphery, said bolt including a nut mounted on said bolt engaging a tab thereby retaining the band in a curvate position with said plates engaging compressively said spring, thus preventing bulging of said spring.

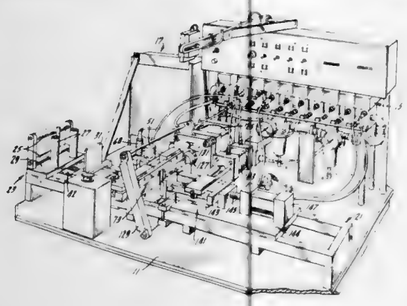
V 9894 DE 2579 UMI

4,179,785

TERMINAL FORMING AND INSTALLING APPARATUS

Maurice H. Brown, 11655 S. Mayfield, Worth, Ill. 60482

Division of Ser. No. 849,848, Nov. 9, 1977, Pat. No. 4,148,237, which is a continuation-in-part of Ser. No. 738,639, Nov. 3, 1976, Pat. No. 4,068,367. This application Nov. 27, 1978, Ser. No. 963,914
Int. Cl.[2] B23D *23/00*
U.S. Cl. 29—33 K 4 Claims



1. A wire shearing mechanism for forming at least one terminal from an elongated length of wire, said shearing mechanism including:

a blade having at least one wire passage formed therein,

a slidable insert having at least one wire passage formed therein and aligned with said wire passage in said blade in at least one position of said blade,

a face plate having at least one wire passage formed therein and aligned with said wire passages in said blade and said sliding insert in at least one aligned position of said blade and said sliding insert,

said blade being mounted for sliding movement relative to said slidable insert to sever at least one length of wire extending through said blade, said sliding insert and said face plate to form at least one wire terminal, and

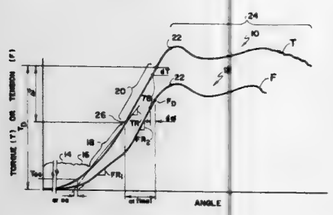
means to slide said slidable insert relative to said front plate after the wire terminal is withdrawn from said slidable insert to enable said slidable insert to function as a backing member for said terminal during embedding of said seated terminal in said plastic part.

4,179,786

TENSION CONTROL OF FASTENERS

Siavash Eshghy, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 712,554, Aug. 9, 1976, abandoned, and a continuation-in-part of Ser. No. 766,429, Feb. 7, 1977, Pat. No. 4,106,570. This application Jun. 2, 1978, Ser. No. 912,151
Int. Cl.[2] B23P *19/06*
U.S. Cl. 29—407 44 Claims



1. Apparatus for tightening seriatim a multiplicity of substantially identical joints having components including at least one threaded fastener to substantially the same final desired stress value, below the yield point of any component that can be correlated with stress, appearing in the fastener, comprising

a powered instructable tool, capable of terminating tightening in response to an instruction which varies from one fastener to the next, for applying torque to the fastener and tightening the same;

means for sensing the torque applied to the fastener at various angles of advance;

means responsive to the torque and angle sensings for determining, while tightening below the yield point of any joint component that can be correlated with stress, a tightening parameter value, variable from one fastener to the next, sufficient to tighten each fastener to the final desired stress value; and

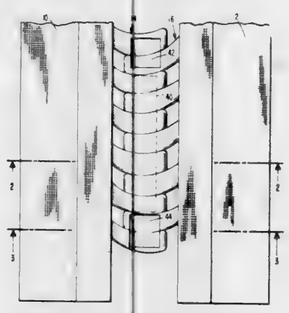
means for instructing the tool to terminate tightening of each fastener in response to the determined tightening parameter value.

4,179,787

METHOD OF FORMING A BOTTOM STOP ON A SLIDE FASTENER

Norman W. MacFee, Conneaut Lake, Pa., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 752,825, Dec. 20, 1976, Pat. No. 4,091,509. This application Apr. 12, 1978, Ser. No. 895,672
Int. Cl.[2] B21D *53/56;* B29D *5/00*
U.S. Cl. 29—408 3 Claims



1. A method of forming a bottom stop on a slide fastener which has meshing convolutions of a pair of coil coupling elements at the bottom thereof with portions of the central openings of the bottoms of both coil elements being in alignment, the method comprising the steps of

inserting an elongated member into the aligned portions of the central openings of both coil elements at the bottom of the slide fastener, and

deforming at least one convolution of the coil elements into said central openings so as to secure the elongated member in the aligned portions of the central openings.

4,179,788

METHOD OF FABRICATING A BUILDING

Gerald A. Kragt, Marne, Mich., assignor to Jer Manufacturing, Inc., Coopersville, Mich.

Division of Ser. No. 853,104, Nov. 21, 1977, Pat. No. 4,115,967. This application Jul. 21, 1978, Ser. No. 926,806
Int. Cl.[2] B23P *21/00;* B23Q *3/00*
U.S. Cl. 29—407 3 Claims

1. A method of fabricating a building having a pair of end panels connected by purlins for supporting roof panels, said method including the steps of:

placing a templet on a building panel, said templet defining a silhouette on said building panel of at least a portion of the end panel of the building and also defining the position of purlins to be secured to said panels;

tracing the outline of said templet on said building panel thereby defining said silhouette and also indicating the placement of the abutting ends of a plurality of purlins to be extended between the end panels on the building panel;

cutting the traced silhouette of the end panel from the building panel while retaining the definition of the position of the placement of said ends of said purlins,



attaching raised guide means to the building panel, said guide means being positioned in accordance with the said definition thereby being spaced from one another so that the indicated placement of the abutting purlin ends is established,

extending purlins between the end panels; and

attaching the purlins to the end panels at a position between said guide means; and

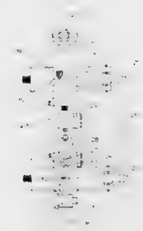
attaching the roof panels to adjacent purlins and between aligned guide means on opposing end panels of the building.

4,179,789

PROCESS FOR PRODUCING A PISTON-TYPE SAFETY LOCK DEVICE

Paul Lipschutz, Croissy, France, assignor to Neiman S.A., Courbevoie, France

Division of Ser. No. 767,584, Feb. 10, 1977, abandoned. This application Nov. 2, 1977, Ser. No. 847,955
Claims priority, application France, Mar. 1, 1976, 76 05707
Int. Cl.[2] B23P *15/00;* E05B *29/04*
U.S. Cl. 29—412 2 Claims



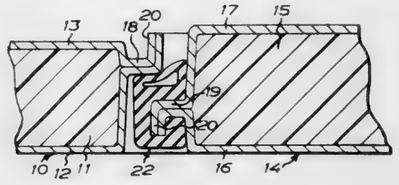
1. A process for producing a piston-type safety lock device of the type comprising a cylindrical rotor journalled in a cavity of a stator, said rotor containing a plurality of radially slidable pistons cooperating at their inner ends with the notches of a key for bringing their other ends flush with the periphery of said rotor, said other ends bearing against the inner surface of the cavity in which the rotor is journalled and, for one angular position of the rotor, against pistons slidable in the stator and elastically biased toward the rotor, the sum of the length of the piston in said rotor and that of a piston slidable in said stator with which said piston of said rotor cooperates in said one angular position, being a constant, and said two pistons constituting a matched pair of pistons wherein each said pair of pistons of the stator and rotor are formed from a single flat blanked member and said pistons are disposed respectively in a single slot of the stator and in a single slot of the rotor and have rectilinear and parallel lateral edges which are in contact with the lateral edges of an adjacent piston or with the end of said slot, said process comprising feeding a single flat blanked member relative to a device for blanking a flat blanked member by a displacement related to the depth of the notches to be made in the key notching said key, blanking said single flat blanked member to form a pair of pistons the lengths of which are in direct relation to the depth of the corresponding notch of the key and the sums of the lengths of which are equal to said constant, feeding said pistons into a stator and a rotor of a lock device, each of which is provided with a receiving slot, repeating the operation as many times as the key has notches, placing return springs for said pistons in position and mounting retaining means for said pistons.

4,179,790

PROCESS OF MANUFACTURING A WALL HAVING AN OPENING THEREIN, AND A DOOR OR COVER THEREFOR

Gosta T. I. Tornerfelt, Ljungby, Sweden, assignor to AB Trelleborgplast, Ljungby, Sweden

Filed Jun. 15, 1978, Ser. No. 915,696
Claims priority, application Sweden, Jun. 23, 1977, 7707315
Int. Cl.[2] B23P *17/00;* B29D *3/02, 9/00;* B29G *3/00*
U.S. Cl. 29—416 7 Claims



1. A process for making a wall (**10**) with an opening therein, and a closure (**14**) for the opening which is larger than the opening, comprising the steps of forming the wall (**10**) and the closure as one piece in a common tool, said forming step forming the wall and closure in laterally offset relationship so they lie in different planes; forming during said forming step a connecting flange (**20**) between an inner edge of the wall opening and an outer edge of the closure, said flange extending substantially transversely of said different planes, and severing the closure (**14**) from the wall (**10**) by cutting (at **21**) intermediate the connecting flange (**20**).

4,179,791

VARIABLE FIT FASTENER

Floyd G. Speraw, Cambridge, Ohio, assignor to NCR Corporation, Dayton, Ohio

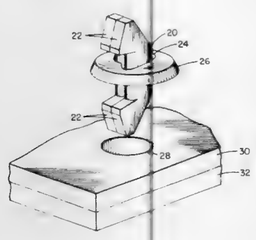
Filed Dec. 2, 1977, Ser. No. 856,823
Int. Cl.[2] F16B *19/00*
U.S. Cl. 29—526 R 22 Claims

1. A method of detachably fastening two co-planar work pieces together having mutually aligned apertures comprising the steps of:

folding an elastic fastener member having oppositely disposed engaging surfaces on itself along the long axis of the fastener member;

slidably mounting a ring member having a plurality of locking surfaces located therein on the elongated fastener member;

inserting the folded fastener member through said apertures to position said retainer ring between one work piece and one of said engaging surfaces; and
unfolding the fastener member to position opposite edges of



the fastener member within one of said locking surfaces of said ring member positioning the fastener member in one of a plurality of unfolded positions to lock the fastener member and the ring member in a fastening position with said work pieces.

4,179,792

LOW TEMPERATURE CMOS/SOS PROCESS USING DRY PRESSURE OXIDATION

Sidney Marshall, and Robert J. Zeto, both of Monmouth County, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 10, 1978, Ser. No. 894,784
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—571 **1 Claim**

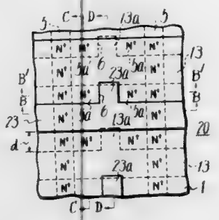
1. Method of making enhancement type, self-aligned silicon gate complementary metal oxide semiconductor/silicon on sapphire structures, said method consisting of:
(A) cleaning a silicon on sapphire substrate in an acid cleaning solution,
(B) oxidizing the silicon layer at 850° C. in dry oxygen at a pressure of one atmosphere to provide a silicon oxide film of 100 to 300 angstroms in thickness,
(C) depositing a silicon nitride film of about 1000 angstroms on the silicon oxide layer at a temperature of 700° C. to 750° C.,
(D) applying a layer of photoresist to the layer of silicon nitride and defining a pattern in the layer of photoresist,
(E) selectively etching the layer of silicon nitride in an RF generated plasma containing a fluorine species,
(F) removing the layer of photoresist in an oxygen plasma,
(G) oxidizing the silicon layer with dry oxygen under a pressure of about 500 atmospheres and at a temperature of about 825° C. to form islands of silicon isolated from one another by silicon oxide,
(H) removing the layer of silicon nitride in an RF generated plasma containing a fluorine species,
(I) removing the oxide film formed in (B) with hydrofluoric acid solution,
(J) recleaning the substrate with an acid cleaning solution,
(K) applying a layer of photoresist over the substrate and then removing the photoresist from selected islands of silicon,
(L) implanting boron into the exposed islands of silicon at 240 kilovolts at a dose rate of about one to 5×10^{11} atoms/cm^2,
(M) removing the photoresist in an oxygen plasma,
(N) annealing the substrate in dry oxygen at 900° C. for 60 minutes,
(O) cleaning the substrate with a gate oxide cleaning solution,
(P) oxidizing exposed silicon islands at 800° C. under a pressure of 150 atmospheres of dry oxygen to obtain a silicon oxide film of about 1000 angstroms in thickness,
(Q) depositing a layer of polycrystalline silicon of about 5000 angstroms in thickness on the substrate by chemical vapor deposition,
(R) applying a layer of photoresist over the film of polycrystalline silicon and defining a pattern in the layer of photoresist,
(S) removing the polycrystalline silicon by plasma etching from areas not protected by photoresist,
(T) removing the remaining photoresist in an oxygen plasma,
(U) applying a layer of photoresist over the substrate and then removing the photoresist from selected regions of the substrate,
(V) implanting boron into the exposed regions of the substrate at a voltage of 70 kilovolts and at a dose rate of about 1×10^{15} atoms/cm^2 into the exposed regions of the wafer,
(W) removing the photoresist in an oxygen plasma,
(X) cleaning the substrate with the acid cleaning solution,
(Y) applying a layer of photoresist to the substrate and then removing the photoresist from selected regions of the wafer,
(Z) implanting phosphorous into the exposed regions at 200 kilovolts and at a dose rate of about 4×10^{15} atoms/cm^2,
(AA) removing the layer of photoresist in an oxygen plasma,
(BB) annealing the substrate in dry nitrogen for about 60 minutes at a temperature no greater than 900° C.,
(CC) applying a layer of silicon oxide of about 2000 angstroms in thickness over the substrate by chemical vapor desposition,
(DD) applying a layer of photoresist over the substrate and defining a pattern in the photoresist,
(EE) opening windows in the chemically vapor deposited silicon oxide layer with a hydrofluoric acid etch,
(FF) removing the layer of photoresist in an oxygen plasma,
(GG) cleaning the substrate,
(HH) applying a metallic layer of about 10,000 angstroms in thickness over the substrate,
(II) applying a layer of photoresist over the metal layer and defining a pattern in the photoresist,
(JJ) etching the metal with an acid solution,
(KK) stripping the photoresist in an oxygen plasma, and
(LL) heat treating the metal layer at 500° C. for about 10 minutes in an atmosphere of nitrogen.

4,179,793

METHOD OF MAKING A CHARGE TRANSFER DEVICE

Yoshiaki Hagiwara, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 12, 1977, Ser. No. 841,551
Claims priority, application Japan, Oct. 14, 1976, 51-123189
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—578 **10 Claims**



1. A method of making a charge transfer device in which charge transfer portions, each having gate electrodes, are arranged, and an effective asymmetrical potential is produced in a carrier transfer direction in each of said charge transfer portions by an affect of potential of a channel stopper region upon carrier transfer, said method comprising the steps of:

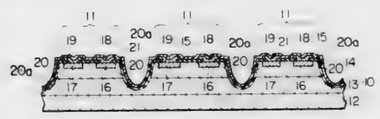
(a) forming channel stopper regions in a surface of a semiconductor substrate to define a charge transfer line therebetween;
(b) forming and shaping a first conductive layer electrically insulated from said substrate over said surface to provide a first set of gate electrodes;
(c) forming and shaping a second conductive layer electrically insulated from said first conductive layer to provide a second set of gate electrodes interleaves with said set but spaced therefrom adjacent said channel stopper regions; and
(d) forming a portion, which narrows a width of said charge transfer line and produces said asymmetrical potential, by selectively doping an impurity through said spaces between said first and said second sets of electrodes and into said substrate adjacent said channel stopper regions while using said first and second sets of electrodes as diffusion masks.

4,179,794

PROCESS OF MANUFACTURING SEMICONDUCTOR DEVICES

Masao Kosugi, and Takashi Ogata, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizvoka, Japan

Continuation of Ser. No. 705,461, Jul. 15, 1976, abandoned. This application Apr. 5, 1978, Ser. No. 893,275
Claims priority, application Japan, Jul. 23, 1975, 50-89193
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—580 **10 Claims**



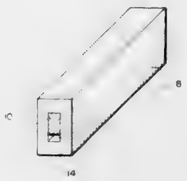
1. In a process of manufacturing a plurality of semiconductor devices, including the successive steps of:
(a) forming a number of semiconductor device units in mutually adjacent fashion, on top of a common semiconductor wafer;
(b) etching those portions of said semiconductor wafer located between the respective semiconductor device units to form recessed grooves between the peripheral regions of the respective semiconductor device units; and
(c) cutting apart said semiconductor wafer at the recessed groove portions into individual semiconductor devices,
the improvement of preventing damage and contamination of exposed portions of the semiconductor units comprising after step (b) and before step (c) conducting the successive steps of:
(d) forming a stain film having a thickness of the order of 0.05 micrometers by chemical oxidation of silicon on the entire surfaces of said recessed grooves immediately after the etching step (b), whereby the surfaces of the recessed grooves are protected from contamination, and the adhesion between the surfaces of the recessed grooves and a subsequently applied thermosetting resinous film is improved; and thereafter
(e) covering and adhering to said stain film on the recessed grooves a thermosetting resinous film, prior to the cutting of step (c).

4,179,795

METHOD FOR FORMING A DRIVE HOLE IN ARC PLASMA SPRAY FABRICATED FERRITE PHASORS

Richard W. Babbitt, Fair Haven, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 15, 1978, Ser. No. 915,638
Int. Cl.[2] H01F *41/02*
U.S. Cl. 29—602 R **14 Claims**



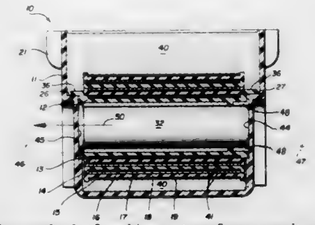
1. The method of making a drive wire hole in a ferrite toroid during the fabrication of said toroid wherein a ferrite powder is arc plasma spray deposited on a dielectric insert having a longitudinal surface, said method comprising the steps of:
bonding a slab of boron nitride on the longitudinal surface of the dielectric insert;
arc plasma spray depositing said ferrite powder on the composite structure of said slab of boron nitride bonded to the longitudinal surface of said dielectric insert within a temperature range wherein said boron nitride slab maintains its bond and original shape;
and annealing said composite structure of boron nitride bonded to the dielectric insert and bearing a coating of ferrite powder at temperatures wherein only said boron nitride slab is completely sublimated to form the drive wire hole.

4,179,796

METHOD OF MAKING A TRANSFORMER WITH AN IMPROVED INSULATION SYSTEM

Richard Allen, Richardson, Tex., assignor to Varo Semiconductor, Inc., Garland, Tex.

Filed Mar. 13, 1978, Ser. No. 886,125
Int. Cl.[2] H01F *41/12*
U.S. Cl. 29—605 **5 Claims**



1. The method of making a transformer unit which comprises the steps of: forming an electrically conductive transformer winding on a tubular bobbin; inserting a heat-expandable core pin into the tubular bobbin; locating the wound bobbin and core pin assembly in the interior of a casing; heating the casing and winding and thereby expanding the core pin to contact the casing; subjecting the heated casing interior and winding to a vacuum; introducing a liquid potting composition into the casing; causing the potting composition to flow between the core pin and bobbin so as to form an electrically

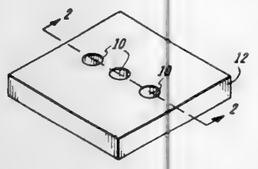
insulative coating inside the bobbin hollow; permitting the potting composition to solidify; and removing the core pin from the bobbin leaving a layer of potting compound inside the bobbin hollow and in substantial confluence with the potting compound inside the casing.

4,179,797

METHOD OF MAKING A RESISTOR ARRAY

Wendell C. Johnson, Topanga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 23, 1978, Ser. No. 889,796
Int. Cl.[2] H01L *21/84;* **H01C** *1/034, 17/02*
U.S. Cl. 29—610 R **3 Claims**



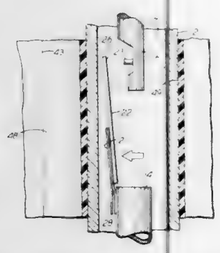
1. A process of making a resistor array comprising the steps of:
providing a plurality of voids in a substrate of electrically non-conductive material,
filling the voids completely with a flowable resistance material, said resistance material having a resistivity less than the resistivity of said material of said substrate, and
hardening said resistance material to thereby provide resistors within said substrate.

4,179,798

METHODS OF ADJUSTING SEALED CONTACT SWITCHES

Itamar B. Einbinder, Overland Park, Kans., and Albert A. Hamilton, Belton, Mo., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Apr. 12, 1978, Ser. No. 895,681
Int. Cl.[2] H01H *11/00, 65/00, 51/28*
U.S. Cl. 29—622 **7 Claims**



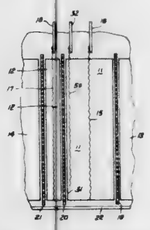
1. A method of adjusting a normally unoperated position of an armature with respect to a contact, the armature and the contact being located with an envelope of a sealed contact switch, the armature being resiliently hinged at one end by a reed spring to elastically deflect about the hinged end of the armature in a path between the unoperated position in which another end opposite the hinged end of the armature is located adjacent to and spaced from the contact and an operated position in which said another, opposite end of the armature becomes located against the contact, the method comprising:
determining the width of a gap between said another end opposite the hinged end of the armature and the contact when the armature is located in the normally unoperated position;
orienting the envelope with respect to a magnetic pole face such that the armature becomes positioned substantially perpendicular to the direction of the magnetic field, the path becomes substantially aligned with the direction of the magnetic field and the contact becomes located between the magnetic pole face and the armature when the gap width has been found to be greater than a desired value of the gap width, and the armature becomes located between the contact and the pole face when the gap width has been found to be less than the desired value of the gap width; and
magnetically pulling the armature toward the pole face to deflect the reed spring beyond its elastic limit of deflection to thereby permanently reposition the armature within the envelope when located in the normally unoperated position spaced from the contact, such that the value of the gap width deviates less from the desired value of the gap width than the width prior to magnetically pulling the armature.

4,179,799

METHOD OF MOLDING A DOUBLE CATHODE HAVING A SENSING GRID FOR A POROUS ELECTRODE PRIMARY BATTERY

David H. Fritts, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 844,162, Oct. 21, 1977, Pat. No. 4,126,735.
This application Apr. 17, 1978, Ser. No. 896,863
Int. Cl.[2] H01M *4/08*
U.S. Cl. 29—623.5 **1 Claim**



1. The method of molding a double cathode having a sensing grid for a porous electrode primary battery comprising:
a. placing a relatively thin first carbon slurry in a mold;
b. placing a charge sensing grid on the said first carbon slurry;
c. placing a second carbon slurry in the mold over the said sensing grid;
d. placing a current collecting grid on the said second slurry;
e. placing a third slurry over the said current collecting grid forming the said double cathode; and
f. curing the said double cathode.

4,179,800

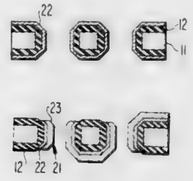
PRINTED WIRING BOARD COMPRISING A CONDUCTIVE PATTERN RETREATING AT LEAST PARTLY IN A THROUGH-HOLE

Toshio Takaba, and Toshimasa Kobayashi, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Division of Ser. No. 734,169, Oct. 20, 1976, abandoned. This application May 15, 1978, Ser. No. 906,166
Claims priority, application Japan, Oct. 20, 1975, 50/126170; Nov. 17, 1975, 50/138475
Int. Cl.[2] H05K *3/06*
U.S. Cl. 29—625 **1 Claim**

1. In a method of manufacturing a printed wiring board including the step of providing a substrate having a pair of

principal surfaces and a through-hole having, in turn, an inwardly directed surface and an outwardly flaring surface connecting said inwardly directed surface to one of said principal surfaces and being contiguous to said one principal surface along a boundary portion, the improvement comprising the steps of:
forming a metallized layer on said one principal surface, boundary portion and outwardly flaring and inwardly directed surfaces so that a first portion of said metallized layer is formed on said one principal surface and a second portion of said metallized layer is formed on said boundary portion;
applying a photoresist film on said first metallized layer portion to cover said through-hole and protrude in contact with said second metallized layer portion partly into said through-hole;
exposing said photoresist film to light by the use of a mask defining a first area narrower than a second area surrounded by said second metallized layer portion with said first area placed in substantial registry with said second area;



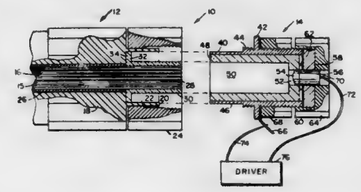
removing that first portion of said photoresist film which corresponds to said first area to uncover that third portion of said metallized layer which is surrounded as defined by said first area by said second metallized layer portion and is formed on said inwardly directed surface;
depositing an electrically conductive layer on said third metallized layer portion so as not to reach said first metallized layer portion wholly circumferentially of said second metallized layer portion;
removing that second portion of said photoresist film which does not correspond to said first area and has remained after said first photoresist film portion removing step throughout said conductive layer forming step; and
removing that portion of said metallized layer on which said conductive layer is not formed.

4,179,801

METHOD OF MAKING A MINIATURE FIBER OPTIC CONNECTOR

Ernest E. Hollis, Bedford, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Mar. 2, 1977, Ser. No. 773,453
Int. Cl.[2] H01R *43/00*
U.S. Cl. 29—626 **8 Claims**



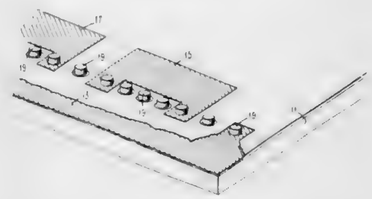
1. A method of modifying the female portion of a standard metal-bodied coaxial connector to accommodate an active electro-optical element adapted to be aligned with and coupled to a fiber optic element carried by the male portion of the connector, comprising the steps of:
removing the central electrical contact;
enlarging the hole left after removal;
providing a printed circuit board with a metalized layer on one surface thereof;
boring a hole through the printed circuit board of a size to accomodate the active electro-optical element;
punching out a portion of the printed circuit board surrounding the hole bored therethrough;
mounting an active element having laterally extending electrical contact tabs through the hole in the punched-out portion of the printed circuit board such that the tabs make electrical contact with the metalized layer; and,
mounting the printed circuit board at the end of the female connector such that said element is adjacent the enlarged hole and such that electrical contact is made between the metalized layer on the printed circuit board and the housing of the female portion of the coaxial connector, whereby the modification does not require the mounting of the device inside the female portion **20** of the connector.

4,179,802

STUDDED CHIP ATTACHMENT PROCESS

Kailash C. Joshi, Endwell, and Ronald N. Spaight, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,445
Int. Cl.[2] H05K *3/34*
U.S. Cl. 29—628 **8 Claims**



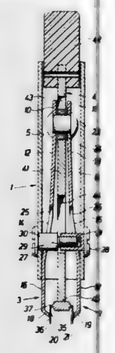
1. A method of bonding a first integrated circuit device having a number of connecting points to a second integrated circuit device having a like number of connecting pads, both first and second devices having approximately equal thermal expansion characteristics, said method comprising the steps of:
fabricating a metal stud at each of said connecting points of said first integrated circuit device, the top of each stud providing a bondable surface;
applying a amount of solder not exceeding 4×10^{-3} centimeters thick to each of said connecting pads of said second integrated circuit devices;
aligning said first and second integrated circuit devices so that each metal stud of said first device is positioned proximate its respective connecting pad of said second device; and
applying sufficient pressure and temperature to the studs and pads to bond each of said studs to its respective connecting pad.

4,179,803

DEVICE FOR HANDLING ELECTRICAL COMPONENTS

Per O. M. Wolkert, Kungsvagen 1, Trangsund, Stockholm, Sweden

Filed Oct. 25, 1977, Ser. No. 845,133
Claims priority, application Sweden, Oct. 21, 1976, 7611721
Int. Cl.² H05K *3/30, 13/04*
U.S. Cl. 29—741 **21 Claims**



1. A device for handling an electrical component having terminal pins extending in the same direction by engagement with such pins, comprising in combination: a body part; cooperating elongate gripping elements supported by said body part for longitudinal movement relative thereto between a first position corresponding to an 'engage' condition of the component, and a second position corresponding to a 'release' condition thereof, said gripping elements having respective component-engaging ends thereto which are less widely spaced in the 'engage' condition of the component than in its 'release' condition; cooperating means for varying the spacing of the component-engaging ends of the gripping elements on movement of said elements between said first and second positions; and an actuator operatively connected with the gripping elements for effecting controlled longitudinal displacement thereof relative to the body part between said first and second positions, said actuator being connected with the gripping elements for movement relative thereto in the longitudinal direction thereof within predetermined limits.

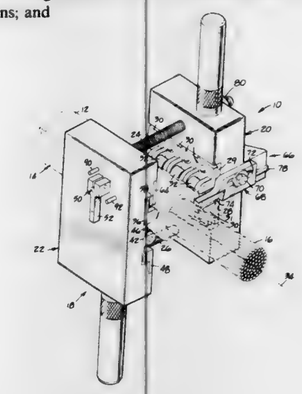
4,179,804

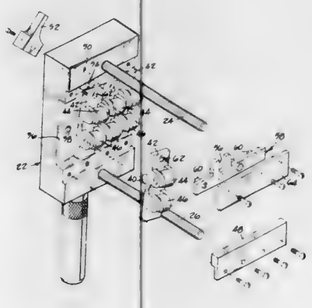
ADJUSTABLE ROLLER CABLE FEEDING AND STRIPPING TOOL

Walter J. Maytham, Los Altos, Calif., assignor to Speed Systems, Inc., Los Altos, Calif.

Filed May 23, 1978, Ser. No. 908,754
Int. Cl.² B21F *13/00*
U.S. Cl. 30—90.7 **7 Claims**

1. A cable insulation stripping tool comprising:
a body; and
roller means mounted to the body and adapted for contacting and supporting a cable which can be seated thereon, and means for changing the position of said roller means relative to said body to provide a plurality of angles as defined by the rotational axis of the roller means relative to the longitudinal axis of the cable seated on the roller means; and





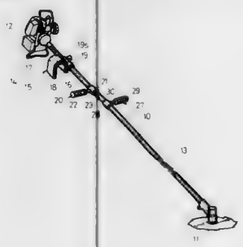
blade means mounted to the body and having a cutting edge, the blade means positioned relative to the body so as to engage insulation of the cable.

4,179,805

PORTABLE POWER OPERATED TOOL

Sakuji Yamada, Kobe, Japan, assignor to Yamada Machinery Industrial Co., Ltd., Kobe, Japan

Filed May 5, 1978, Ser. No. 903,084
Claims priority, application Japan, Jun. 7, 1977, 52-67643
Int. Cl.² A01D *55/18;* **B26B** *25/00*
U.S. Cl. 30—122 **18 Claims**



1. A portable power operated tool which comprises

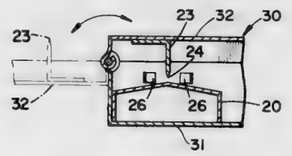
an elongated tubular housing,
an engine mounted to one end of said tubular housing,
a cutting implement mounted to the other end of said tubular housing,
a drive shaft which passes through said tubular housing for transmitting power from said engine to said cutting implement,
a fixing element for receiving and fixing a front part of an operator's arm,
said fixing element being located in position near said engine and along with one side of said elongated tubular housing,
a first handle located in front of and spaced from said fixing element,
a handle grip connected to said first handle and disposed on the same side with said fixing element, and
a second handle located in front of and spaced from said first handle.

4,179,806

PILL-SPLITTING IMPLEMENT WITH NON-CRUMBLING CHARACTERISTIC

Nathan S. Lieptz, 23506 Beachwood Blvd., Beachwood, Ohio 44122

Filed Jan. 3, 1978, Ser. No. 866,555
Int. Cl.² B26B *11/00*
U.S. Cl. 30—124 **5 Claims**



1. In a pill-dividing device, the combination of a first means providing a support surface for holding a pill in position to be split, second knife-edge means pivotally connected to said first means for arcuate movement into pill-dividing engagement, pill-positioning members associated with said first means for adjustably centering the pill on said support surface into a position of predetermined alignment with said pill-dividing movement of said second knife-edge means, and said pill-positioning members including a pair of spaced movable arms resiliently biased for pill-engaging movement toward each other in the diametrical plane of the supported pill, said arms being yieldably displaceable away from each other in response to knife-edge induced displacement of the divided pill portions.

4,179,807

HAND TOOL FOR CUTTING AN OPTICAL FIBRE

Bernard Allias, Brétigny sur Orge, and Charles Decaudin, Vigneux, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jun. 29, 1978, Ser. No. 920,895
Claims priority, application France, Jul. 13, 1977, 77 21695
Int. Cl.² B26B *17/02*
U.S. Cl. 30—124 **11 Claims**



1. A hand tool for precise severing of an optical fibre, said tool comprising:
two articulated legs having first, free ends at the same distance from their pivot point said first ends being close together in a rest position and being movable apart when the tool is operated;
a forming part for bending the optical fibre, said part having a convex profile and being installed at the first end of one of the legs so that its convex surface is perpendicular to the plane of the two legs and faces away from the pivot point of these legs;
one clip on each arm and installed on either side of the forming part, in the extension of the convex profile thereof, each arm being on the first end of the corresponding leg and said clips mounted for gripping the optical fibre on either side of the forming part;
a moveable knife disposed on the first end of one of the legs, facing the convex profile of the forming part and extending thereacross;
first resilient means for moving the first ends of the two legs apart;
second resilient means for tending to bring the knife towards the forming part;
a setting mechanism for moving the knife away from the forming part when the first ends of the two legs are moved towards each other;
a locking mechanism for keeping the first ends of the two legs close together when they are in the rest position and for keeping the knife away from the forming part; and
a double-action release mechanism which, when the tool is operated, firstly releases the first resilient means progressively and then also releases the second resilient means progressively.

4,179,808

CUTTING GUIDE TOOL FOR FABRICATION OF AIR DUCT TRANSITIONS AND METHOD OF ITS USE

Harvell M. Smith, Conifer, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed May 10, 1978, Ser. No. 904,662
Int. Cl.² G01B *3/14*
U.S. Cl. 30—293 **4 Claims**



1. A cutting guide for use with a flat rectangular sheet of fibrous board, said sheet having grooves extending across a major surface thereof and perpendicular to an edge thereof and for use with a cutting tool for cutting a wedge-shaped piece of material from said fibrous board comprising:
(a) a guide strip having a flat first major surface and a longitudinally extending straight-edged slot, said slot passing through said guide strip, and a second major surface having incremental markings thereon adjacent said slot;
(b) a cross-arm having a first surface adapted to contact said edge and a second surface having similar incremental markings extending in opposite directions from a central location, means for mounting said cross-arm in said slot at a first end portion of said guide strip such that said cross-arm first surface is generally perpendicular to said guide strip first major surface and said cross-arm second surface is generally facing in the same direction faced by said guide strip second major surface, and said cross-arm freely

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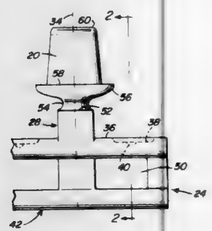
pivots about its midpoint on an axis perpendicular to said guide strip first major surface, and said mounting means slidably engages said slot for movement only along a limited extent of said slot, the incremental markings on said guide strip beginning on a reference line coinciding with the plane of said cross-arm first surface when said surface is in the position farthest from said first end of said guide strip and perpendicular to the lengthwise direction of said slot; and

(c) anchoring means mounted in said slot for movement over the incrementally marked extent of said slot and for being fixed at any point there along, and said anchoring means also having means for engaging said groove so as to be centrally located therein when said guide strip first major surface lies flatly adjacent said major surface of said fibrous sheet, and for providing a pivot point for rotation of said guide strip about an axis through said anchoring means perpendicular to said major surface of said fibrous sheet.

4,179,809
DENTAL IMPLANT

Maurice J. Fagan, Jr., and Maurice J. Fagan, III, both of 5360 Peachtree-Dunwoody Rd., NE., Atlanta, Ga. 30342

Continuation-in-part of Ser. No. 581,419, May 27, 1975, Pat. No. 4,050,157. This application Jun. 7, 1977, Ser. No. 804,383
Int. Cl.[2] A61C *8/00*
U.S. Cl. 433—176 **6 Claims**



1. A dental implant for anchoring an attachment to a jawbone, comprising an endosseous blade type of base having two spaced edge portions, a shank projecting from one of the edge portions on which the attachment is supported, said edge portions being elongated relative to the shank in a mesial-distal direction and endosseous stabilizer means adapted to be embedded with the base entirely within said jawbone, including a rounded cross-sectional enlargement of the base continuously along the other of the spaced edge portions.

4,179,810
DEVICE FOR MILLING SLOTS IN A JAWBONE FOR MOUNTING AN ENDOSSAL DEVICE

Axel Kirsch, Scharnhauser Str. 3, 7024 Bernhausen, Fed. Rep. of Germany

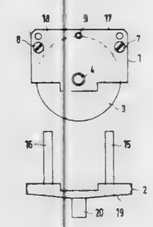
Filed Oct. 27, 1977, Ser. No. 845,819
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1977, 2714321
Int. Cl.[2] A61C *13/00;* **A61B** *17/32;* **A61F** *5/04;* **B26B** *7/00*
U.S. Cl. 433—75 **15 Claims**

1. A surgical tool for cutting a slot in a jawbone for implantation of an endossal implant to which a denture may be firmly fastened comprising, in combination:

(a) a housing-slide member comprising two parts, the second part of which has a bearing surface for bearing against a jawbone;

(b) a sawblade for cutting a precisely dimensioned slot in the jawbone rotatably mounted on the first part of the housing-slide member;

(c) guide means connecting the first and second parts of the housing-slide member which permits the parts to slide with respect to each other and further permits the sliding of the sawblade radially outwardly of the second part of the housing-slide member; and

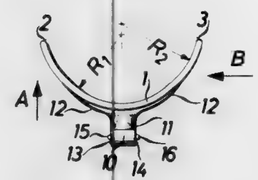


(d) means for maintaining the bearing surface of the second part of the housing-slide member at a site on the jawbone.

4,179,811
FRONTAL MOUTH PLATE FOR ORTHODONTIC PROPHYLAXIS AND EARLY TREATMENT OF DENTAL ANOMALIES

Rolf Hinz, Körnerstrasse 6, 4690 Herne, Fed. Rep. of Germany

Filed Jan. 27, 1975, Ser. No. 544,371
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1974, 7402919[U]
Int. Cl.[2] A61C *7/00*
U.S. Cl. 433—6 **2 Claims**



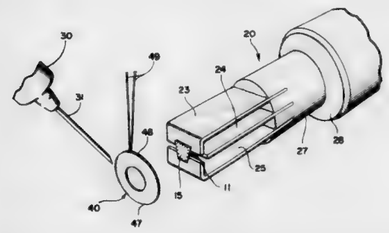
1. A frontal mouth plate for the early orthodontic prophylaxis of dental anomalies in infants, said plate being generally elongated with a middle portion separating a pair of end portions in the direction of elongation, said plate being elliptically curved in the direction of elongation, the radius of curvature (R_1) of the middle portion of the plate about its axis of curvature being proportioned to the radius of curvature (R_2) of the end portions about their axis of curvature as 3:4, said middle and end portions being uniformly merged together, said curved plate having a smooth, uninterrupted, concave inner surface which is parallel to said axes of curvature and abuttable with the exterior of the dental structure when the device is placed inside the lips and cheeks, said curved plate having a convex outer surface with an elongated post affixed to the middle portion thereof and extending outwardly therefrom for mounting a movable holder.

4,179,812
DENTAL BRACKET BONDING AGENT AND METHOD OF USE

Velton C. White, 17 N. Broadway, Des Plaines, Ill. 60016

Filed Sep. 6, 1977, Ser. No. 830,425
Int. Cl.[2] A61C *7/00;* **B32B** *31/00*
U.S. Cl. 433—9 **9 Claims**

1. A method of at least temporarily bonding an orthodontic device to a tooth, comprising the steps of: interposing an open-scrim envelope containing a quantity of a finely divided, inert, particulate filler material between the device and the tooth; infusing an alphacyanoacrylate resin throughout said filler material whereby the curing time of said resin is increased;



pressing the device toward the tooth to compress the matrix of filler material and resin between said device and said tooth; and retaining said device and matrix in place until said resin has cured.

4,179,813
DENTAL INSTRUMENT DELIVERY SYSTEM

Robert R. Runnells, Kaysville, and John C. Schmoegner, Kearns, both of Utah, assignors to MDT Instrument Company, Tualatin, Oreg.

Filed Mar. 20, 1978, Ser. No. 890,652
Int. Cl.[2] A61C *19/02*
U.S. Cl. 433—79 **25 Claims**



1. In a dental instrument delivery system including an instrument deck with an upper tray surface for loose articles, a hand piece storage structure at its front edge removably holding an array of hand pieces of various types, and approximately parallel lengths of flexible tubing with coiled memory suspended from the back and beneath said deck and connecting individual said hand pieces to utility sources such that each length may selectively be extended by moving the hand piece connected to it from the storage structure and the memory of said length will effect a retraction of said length when the hand piece is returned to the storage structure; the improvement comprising a bottom tray member secured beneath said deck to house and support said lengths of tubing, said bottom tray member having an opening proximate said recepticle structure such that each said length of tubing passes through said opening to connect to a said hand piece.

4,179,814
TOOTH CLEANING DEVICE

Louis P. Montanio, 2503 Prairie Creek Dr., Richardson, Tex. 75080

Filed Jan. 3, 1978, Ser. No. 866,759
Int. Cl.[2] A61C *1/08*
U.S. Cl. 433—99 **4 Claims**

1. A portable hand-held dental cleaning device, comprising:

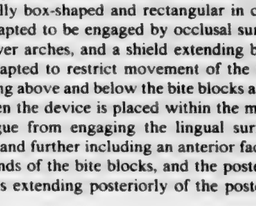
a housing adapted to fit the palm of the human hand and including a substantially flat back surface to fit adjacent a user's palm, with the flat surface blending into rounded top and side surfaces forming a generally oblate portion around which a user's fingers may fit for gripping;

a substantially frusto-conical protective shield removably mounted on the front of said housing such that said curved surfaces slope toward said shield, which includes an aperture whose axis is approximately central to said housing and substantially perpendicular to the portion of said back housing surface;

an electric motor means disposed within said housing and including a rotatable output shaft parallel to and spaced from the axis of the aperture of the protective shield;

a primary gear on the rotatable shaft of said electric motor;

a central geared shaft disposed in said housing and extending through the aperture of said protective shield such that the axis of said central geared shaft and the axis of said aperture substantially coincide, wherein said central geared shaft directly engages said primary gear;



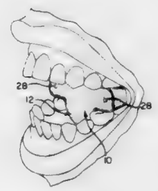
a depressible switch for selectively activating the electric motor and being mounted on one of the rounded side surfaces adjacent the top rounded surface in a position so that the switch is accessible for use with either hand by either the thumb on one hand or the index finger on the other hand; and

the end of said spaced shaft which extends outwardly of the housing including a connection for receiving a suitable tip for dental use.

4,179,815
DENTAL DEVICE

Carl S. Hoffman, Cheshire, Conn., assignor to TP Laboratories, Inc., LaPorte, Ind.

Filed Dec. 29, 1977, Ser. No. 865,526
Int. Cl.[2] A61C *5/14*
U.S. Cl. 433—140 **5 Claims**



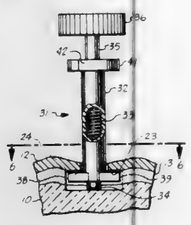
1. A dental device molded of thermal plastic material, natural or synthetic rubber, for holding open a patient's mouth and restricting tongue movement, which comprises a plurality of spaced generally box-shaped and rectangular in cross section bite blocks adapted to be engaged by occlusal surfaces of the upper and lower arches, and a shield extending between said bite blocks adapted to restrict movement of the tongue, said shield extending above and below the bite blocks and generally vertically when the device is placed within the mouth to prevent the tongue from engaging the lingual surfaces of the anterior teeth and further including an anterior face flush with the anterior ends of the bite blocks, and the posterior ends of the bite blocks extending posteriorly of the posterior face of the shield.

4,179,816

APPARATUS, METHODS AND INSTRUMENTS FOR REMOVING DENTAL RESTORATIONS

Grant W. Anderson, 932 Mullaghboy Rd., Glendora, Calif. 91740

Filed Sep. 21, 1977, Ser. No. 835,396
Int. Cl.[2] A61C *3/16*
U.S. Cl. 433—161 **18 Claims**



1. A method of removing a dental restoration from a tooth, comprising in combination the steps of:
providing an instrument with lateral projection means at a lower portion thereof;
providing an aperture in and through the restoration;
extending said aperture into an oblong shape in a face of the restoration by providing said aperture with a sufficient first width in said restoration for a reception of said projection means therethrough, and a second width extending in the same plane as said first width at an angle to said first width and being too small to receive said projection means;
establishing part of the restoration at the aperture as a shelf facing in the direction of the tooth by undercutting beneath the restoration at said aperture in extension of said second width;
inserting said lower portion of the instrument into said oblong aperture, with said lateral projection means being oriented in alignment with said first width of said oblong aperture and being inserted to below said dental restoration;
rotating said lateral projecting means for moving said lateral projection means to below said shelf;
establishing at the aperture with said lateral projection means a force acting on the shelf relative to and away from the tooth; and
removing the restoration from the tooth with said force.

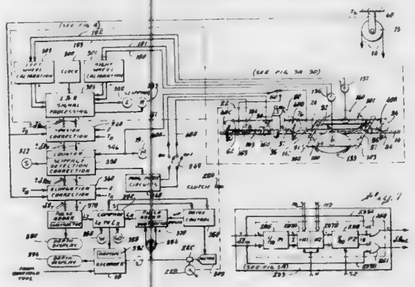
4,179,817

METHOD AND APPARATUS FOR PROVIDING REPEATABLE WIRELINE DEPTH MEASUREMENTS

Jean C. Lavigne, Chevreuse, and Gérard Ségéral, Orsay, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Jul. 16, 1976, Ser. No. 706,106
Claims priority, application France, Jul. 22, 1975, 75 22778
Int. Cl.[2] G01B *5/04*
U.S. Cl. 33—129 **28 Claims**

1. Apparatus for providing a repeatable signal representative of movement of a wireline used in logging boreholes and suitable for driving a recorder under varying wireline measurement conditions for depth recording measurements from a borehole tool lowered in said borehole on said wireline, comprising:
means for producing independent signals, comprising:
substantially identical wireline measurement wheels,
chassis for support and guidance of assemblies aligning said wheels in a generally horizontal plane along said wireline,
carriages for said wheels slidably mounted on opposite sides of said chassis, said slidable mounts providing for slidable movement of said carriages along two substantially parallel lines transverse to the direction of said wireline movement and rotation of said wheels in a plane generally parallel to a plane including said two parallel lines,
means for equally biasing said wheels to slide towards each other on said slidably mounted carriages and tangentially engage said wireline on opposite vertical sides of a single point with balanced contact pressures for mechanically coupling said wheels to said wireline in substantially the same manner to rotate said wheels with movement of said wireline,
means for pivotally supporting said slidable mounts and said carriages on said chassis and aligning the rotational plane of said wheels to include the path of said wireline at said



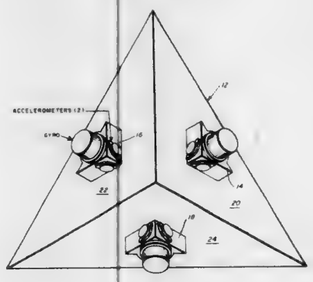
point, said slidably mounted carriages, biasing means and pivotal support means cooperating to yield to unbalanced lateral forces exerted on one of said wheels and maintain said coupling of said wheels to said wireline,
and low torque-load signal generators each responsive to the rotation of one wheel for generating said independent signals each of said signals corresponding to said wireline movement at generally the same point on said wireline and presumably corresponding to the same movement of said wireline under ideal measurement conditions; and
means for automatically utilizing said signals to provide a repeatable signal representative of said wireline movement when wireline measurement conditions are less than ideal.

4,179,818

TETRAHEDRAL REDUNDANT INERTIAL REFERENCE UNIT

Robert J. G. Craig, Malibu, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Oct. 7, 1976, Ser. No. 730,419
Int. Cl.[2] G01C *19/02*
U.S. Cl. 33—321 **10 Claims**



1. A symmetrical redundant inertial reference unit comprising:
(a) a plurality of gyroscopes included in said reference unit,

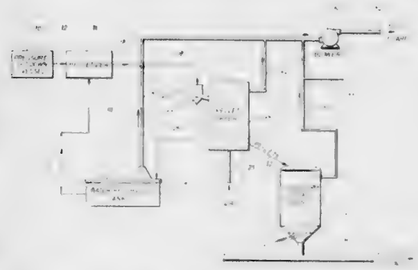
the gyroscopes of said reference unit consisting solely of four two-degree-of-freedom gyroscopes, each said gyroscope having its two sensitive axes substantially perpendicular to each other;
(b) means associated with each gyroscope for generating two output signals from each said gyroscope, one output signal being generated for each of said two sensitive axes, each signal representing rate of angular motion about one sensitive axes; and
(c) means for fixedly positioning each said gyroscope with respect to each other in a primary coordinate system with the two sensitive axes of each of said four gyroscopes defining a plane which intersects the planes defined by the two sensitive axes of each of the other three gyroscopes at substantially the same angle, whereby said unit is capable of providing correct coordinate information about three mutually orthogonal axes despite failure of up to two of said four gyroscopes.

4,179,819

METHOD FOR CONTROLLING EMISSIONS OF ETHYLENE TO THE ATMOSPHERE

Bodie C. Pryor, Port Arthur, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed May 1, 1978, Ser. No. 901,384
Int. Cl.[2] F26B *7/00*
U.S. Cl. 34—12 **1 Claim**



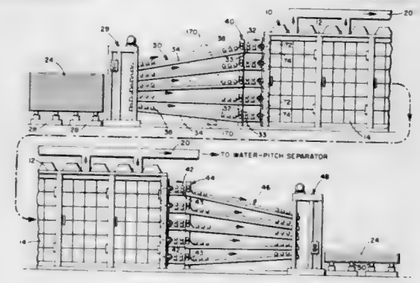
1. In a process in which:
(a) an ethylene polymer is prepared by a mass polymerization process carried out at an elevated temperature under superatmospheric pressure,
(b) the molten ethylene polymer and unpolymerized ethylene are discharged from the polymerization reactor and passed through at least one pressure let down zone to remove the bulk of the unpolymerized ethylene from the molten ethylene polymer,
(c) the molten ethylene polymer from step (b) is extruded, contacted with water to solidify the polymer, and chopped into pellets,
(d) the water and ethylene polymer pellets from step (c) are separated with the polymer pellets being fed to a pellet dryer and the water being fed to a water reservoir tank,
(e) the dried pellets from the dryer of (d) are transferred to storage bins, and
(f) water from the reservoir tank of (d) is recycled to cool additional ethylene polymer;
the improvement which consists essentially of:
(g) covering the water reservoir tank with a vent hood having an air outlet affixed thereto,
(h) providing an air inlet and an air outlet in the pellet dryer,
(j) providing an air inlet and an air outlet in the product storage bin,
(k) connecting the air outlets of the vent hood, the pellet dryer, and the product storage bin to the inlet of an air blower,
(l) operating the air blower to draw ethylene gas and air from the vent hood, the pellet dryer and the product storage bin, and
(m) feeding the air-ethylene output of the air blower to a flare stack gas burner.

4,179,820

APPARATUS FOR DRYING VENEER

Leslie M. Steffensen, Springfield; H. Gary Dutell, Eugene, and Robert A. Rydell, Corvallis, all of Oreg., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Division of Ser. No. 787,535, Apr. 14, 1977, Pat. No. 4,146,973.
This application Dec. 14, 1978, Ser. No. 969,499
Int. Cl.[2] F26B *13/30*
U.S. Cl. 34—92 **23 Claims**



1. Apparatus for drying sheets of veneer comprising:
a drying chamber;
means for establishing a vacuum condition in said drying chamber;
at least one inlet opening into said chamber and at least one outlet opening from said chamber;
means for sealing said inlet and outlet openings to maintain the vacuum condition in said chamber;
means for continuously introducing a succession of veneer sheets individually through said inlet opening into said chamber while maintaining the vacuum condition therein;
conveyor means in said chamber for continuously moving veneer sheets from said inlet opening along a path through said chamber to said outlet opening;
at least two radiant infrared emitters in said chambers in spaced relation to said path for exposing each individual veneer sheet to radiant energy of the long wave infrared spectrum; at least one radiant infrared emitter being located on each of the opposite sides of said path so that substantially the entire face of both sides of each individual veneer sheet is exposed as the sheet moves along said path;
means for controlling the level of said radiation to which the sheets moving through said chmber are exposed to raise the surface temperature of said sheets to a level sufficient to dry said sheets but insufficient to result in damage thereto, and
means for continuously withdrawing veneer sheets from said chamber through said outlet opening while maintaining the vacuum condition therein.

4,179,821

DISHWASHER VENT ARRANGEMENT

LeRoy J. Herbst, and Thomas E. Jenkins, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

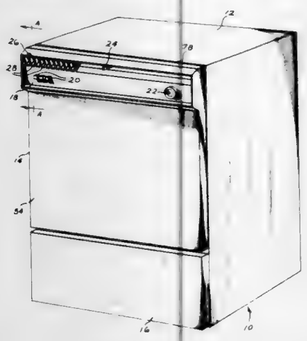
Filed Nov. 21, 1977, Ser. No. 853,699
Int. Cl.[2] F26B *25/06;* **B08B** *3/10;* **A47B** *81/00, 97/00*
U.S. Cl. 34—235 **14 Claims**

1. In a dishwasher of the type having an interior space for enclosing dish holding racks and further having heating means utilized in a drying cycle, heating the air within the interior

space, the improvement comprising a venting arrangement venting the relatively hot humid air from the interior chamber of said dishwasher during said dish drying cycle, said vent arrangement including:

vent duct means receiving heated air displaced from the interior chamber of said dishwasher;

a vent exit opening, directing heated air received from said vent duct means to the exterior of said dishwasher; and



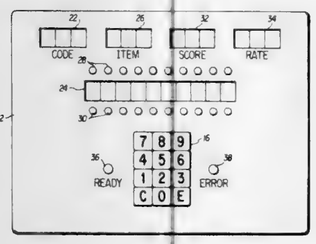
a plurality of vent exit ribs disposed across said vent exit opening, each of said vent exit ribs having a body portion extending across said vent exit opening, and at least one laterally projecting flange portion formed along the length of said body portion, whereby flow of said heated air about said vent ribs in passing through said vent exit opening is disrupted to minimize the formation of condensate thereon.

4,179,822

TESTING APPARATUS AND METHOD

Stephen C. Clark, III, 3900 16th St., NW., Washington, D.C. 20011

Filed Dec. 24, 1974, Ser. No. 536,257
Int. Cl.² G09B *7/06*
U.S. Cl. 35—9 B **13 Claims**



1. A method of administering a plural answer test comprising the steps of:

(a) providing a question;

(b) providing a first plurality of possible answers including a plurality of correct answers and a plurality of incorrect answers, the answers being automatically weighted consecutively in the order selected by the student;

(c) selecting a first plurality of answers equal in number to the plurality of correct answers;

(d) identifying the correct ones of the first plurality of answers selected by the student;

(e) selecting answers equal in number to the number of incorrect ones of the first plurality of answers selected by the student;

(f) identifying the correct ones of the most recently selected answers;

(g) summing the weights of the correct answers as automatically weighted by the order in which selected; and,

(h) subtracting from the sum the weights of the correct answers if selected in the correct sequence to thereby determine the departure of the student's response from a perfect score.

7. A console for administering multiple answers, electronically scored tests comprising:

(a) a housing;

(b) a plurality of manually operable keys carried by said housing for selective operation by the testee;

(c) a first plurality of manually readable, visual displays carried by said housing for identifying the operated ones of said plurality of keys, the number of said displays being equal to the number of correct answers to a given question and said displays being within the view of a testee while in position to manually operate said plurality of keys;

(d) first display means carried by said housing for indicating the correctness of the key identification displayed at each of said first plurality of displays;

(e) a second plurality of manually readable, visual displays carried by said housing for identifying the ones of said plurality of keys operated subsequent to the indication of the correctness of the key identification displayed at each of said first plurality of displays, said second plurality of displays being within the view of a testee while in position to manually operate said plurality of keys;

(f) second display means carried by said housing for indicating the correctness of the key identification displayed at each of said second plurality of displays; and,

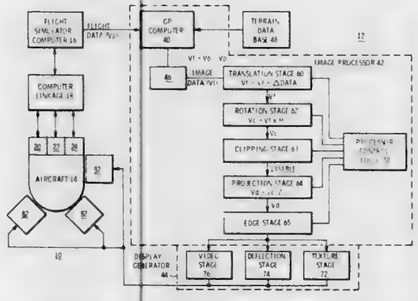
(g) a third plurality of manually readable, visual displays carried by said housing for indicating the test score to the testee, said third plurality of displays being within the view of a testee while in position to manually operate said plurality of keys.

4,179,823

REAL-TIME SIMULATION OF A POLYGON FACE OBJECT SYSTEM AS VIEWED BY A MOVING OBSERVER

John B. Sullivan, Santa Clara; David R. Marsh, Los Altos; Raymond C. Osofsky, San Jose; Steven R. Bryan, Campbell; William D. Fahey, Cupertino, and David E. Manners, Santa Clara, all of Calif., assignors to The Singer Company, Binghamton, N.Y.

Filed Jan. 13, 1978, Ser. No. 869,210
Int. Cl.² G09B *9/08;* **H04N** *7/18*
U.S. Cl. 35—10.24 **12 Claims**



1. An image data system responsive to observer position data and observer orientation data provided by a motion simulation computer, for providing raster display data to a raster type display device defining a bounded two dimensional perspective view of a three dimensional object system formed by polygon faces of that portion of an object coordinate system within the volume of vision of an observer in an observer coordinate system, comprising:

an object system data means for providing object position data defining the position within the object coordinate system of each of the vertices of the polygon faces, and for providing other object data which defines physical properties of the objects within the object system represented by the polygon faces;

an image data computer means for receiving the object data and adapted to receive at least the observer position data from the motion simulation computer, and for combining the data to form digital image data having a predetermined format with predetermined code bits for identifying the object position data and the other object data;

decoding means for receiving the formatted image data and decoding the code bits and storing object position data in a predetermined order;

translation means responsive to the observer position data for redefining the object position data relative to the observer coordinate system origin instead of the object coordinate system origin;

rotation means responsive to the observer orientation data for redefining the object position relative to a particular axis of vision within the observer coordinate system;

projection means responsive to the redefined object position data for converting the three dimensional position coordinates of each vertex of the polygon faces into two dimensional display coordinates to provide the bounded two dimensional view of the three dimensional object system;

slope determining means responsive to the two dimensional display coordinates for determining the slope of the polygon edges extending between adjacent vertices;

vertex sorting means responsive to the two dimensional display coordinates for determining the order in which the vertices appear within each display raster;

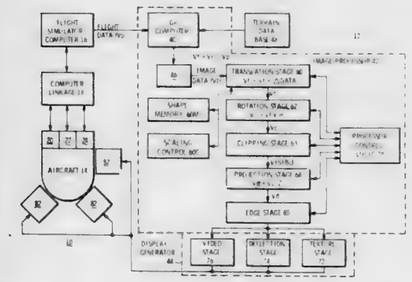
display generator means responsive to the display coordinates and to the slope of the polygon edges and to the other object data for providing the deflection and video signals required by the display device to provide the two dimensional perspective view of the three dimensional object system.

4,179,824

SIMULATION OF AN OBJECT SYSTEM FORMED BY POLYGON FACES HAVING A SERIES OF FUNDAMENTAL SHAPES AND DIMENSION

David R. Marsh, Los Altos, Calif., assignor to The Singer Company, Binghamton, N.Y.

Filed May 4, 1978, Ser. No. 902,622
Int. Cl.² G09B *9/08;* **H04N** *7/18*
U.S. Cl. 35—10.24 **16 Claims**



1. An image data system for providing a two dimensional perspective display of object items within a three dimensional object coordinate system formed by polygon faces, each face of which incorporates a fundamental object shape from a series of predetermined fundamental object shapes having various dimensions and orientations from a series of predetermined dimensions and orientations, and each face of which has an initial point, comprising:

data source means for providing image data in accordance with a predetermined data format including the following types of image data

initial position data for defining the position of the initial point for each polygon face with respect to the object coordinate system,

shape data for defining the relative positions of the vertices of each object shape of the series of predetermined fundamental object shapes, with respect to the initial point for faces incorporating that object shape, each fundamental object shape being formed by straight edges of predetermined dimensions and orientations extending between the vertices of that object shape,

shape data associated with each initial point for modifying the dimensions of the incorporated fundamental shape to provide the vertices of the face for that initial point, and

other data associated with the initial points for defining other visual parameters for the face thereof, the image data having codes bits associated therewith for distinguishing between the initial positional data and the shape data and the other data;

image data decoder means responsive to the code bits for processing each type of image data;

random access memory means for receiving shape data at predetermined address locations in response to the image data decoder means;

scalor means responsive to the shape data in the random access memory and to the scale data for changing the dimensions of the edges of the fundamental object shape incorporated by each face;

accumulator means which receives the initial position data for each initial point in response to the image data decoder means and receives the scaled shape data for that initial point from the scalor means in response to the image data decoder means for combining each initial point with the scaled shape data therefor to provide the position data of the remaining vertices of each object face;

image data processor means for providing two dimensional display coordinates for each face vertex which maintains the three dimensional perspective of the object faces; and

display means for receiving the display coordinates and generating a two dimensional visual display of the object face system in perspective.

4,179,825

APPARATUS FOR TEACHING NUMERICAL CONCEPTS

Noriaki Iwao, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Oct. 14, 1977, Ser. No. 842,111
Claims priority, application Japan, Oct. 15, 1976, 51-139171[U]
Int. Cl.² G09B *19/02*
U.S. Cl. 35—32 **15 Claims**

1. A teaching apparatus for use in teaching numerical concepts which comprises:

a housing having an interior and first and second display locations visible from the exterior of said housing,

a first display member having a series of indicia thereon,

a first mounting means movably supporting said first display member so that it can be moved relative to said first display location from a first position to a series of successive positions in each of which only one of said indicia on said first display member is visible from the exterior of said housing,

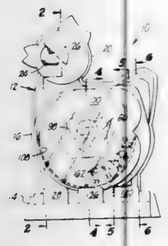
a second display member having a series of indicia thereon,

a second mounting means movably supporting said second display member so that it can be moved relative to said second display location from a first position to a series of successive positions in each of which a number of said

V 9894 DE 25 79 UMI

indicia corresponding to the number of times said second display member has been moved is visible from the exterior of said housing,

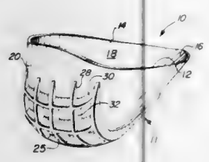
advancing means for concurrently moving said display members from said first positions to said successive positions, said advancing means including a lever pivotally



mounted on said housing, an actuator button on said lever, said actuator button extending outwardly from the exterior of said housing and mechanical linkage means connecting said lever with said display members,

a return means for causing the concurrent return of said first and second display members from any of said successive positions to said first positions.

4,179,826
FOOT CUSHIONING DEVICE
Murray R. Davidson, 5702 N. 19th Ave., Phoenix, Ariz. 85015
Filed Dec. 9, 1977, Ser. No. 859,123
Int. Cl.² A43B *7/32, 21/32*
U.S. Cl. 36—69 **8 Claims**

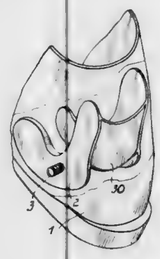


1. A foot cushioning device designed in view of the physiological and kinetic considerations of the foot comprising:

(a) a resilient body member having a medial side, a lateral side, bottom and rear walls defining a recess conforming to generally at least the os calcis portion of the foot, said rear wall adapted to extend along the plantar posterior portion of the heel to at least a location corresponding approximately to the vertical terminus of the os calcis;

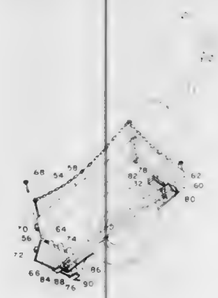
(b) resilient shock absorbing means extending from the outer surface of said body member from a first end on the posterior plantar portion of the rear wall to the second end at a location on the bottom wall of said body member, said shock absorbing means having the greatest depth in the heel strike area and tapering to said bottom and rear walls at said first and second ends, said shock absorbing means further extending from said body at said lateral and medial side walls whereby forces imposed by heel strikes are absorbed by deflection and deformation and antipronatory motion is induced to relieve stresses placed on the foot and leg by deflection of said shock absorbing means and whereby upon release of said shock from said shock absorber means returns substantially to its normal position.

4,179,827
FOOT CLAMPING DEVICE PARTICULARLY FOR SKI BOOTS
Franco Vaccari, Via Paleoveneti, 3/3, Montebelluna, Treviso, Italy
Filed Oct. 2, 1978, Ser. No. 947,988
Claims priority, application Italy, Oct. 13, 1977, 22489/77B[U]; Mar. 15, 1978, 21178/78B[U]
Int. Cl.² A43B *5/04, 21/36*
U.S. Cl. 36—119 **12 Claims**



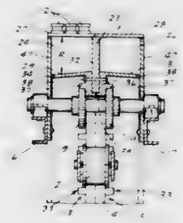
1. A foot clamping device, particularly for ski boots, comprising, inside the boot body, a presser member acting in a position corresponding with the foot heel region, there extending from said presser member a threaded peg which is rotatably engaged in a threaded bush associated with a boss on the outside of said body and which, when rotated, causes said presser member to traverse, characterized in that it comprises, for rotating said boss, a strap rigid at one end with said boss and constituting a closure element for said boot.

4,179,828
MULTI-PURPOSE LABOR SAVER HAND TOOL
Fred Brunty, Village Green-140, Princeton, W. Va. 24740
Filed Apr. 13, 1978, Ser. No. 895,732
Int. Cl.² E01H *5/02;* **A01D** *7/10*
U.S. Cl. 37—53 **4 Claims**



1. In a vehicle having a handle for manual propulsion, a frame attached to the handle, and wheel support for the frame, the improvement comprising: the frame including a left and a right side piece in laterally spaced relation, the wheel support comprising a single wheel, an axle mounting the single wheel between the left and right side pieces, the handle projecting at an upward angle rearwardly from the frame, a transverse attachment for material working, means detachably affixing a middle portion of the transverse attachment to the frame forward of the wheel, a load carrier over the wheel, first means detachably connecting the load carrier with the frame forward of the wheel, second means detachably connecting the load carrier with the frame rearward of the wheel, the load carrier having a body, a pair of forward legs projecting downwardly from the body respectively laterally of the first means, the downward projection of said pair of forward legs being below the frame for serving as supports in conjunction with the wheel, and the second means comprising a pin-in-hole attachment and having adjacent the lower end thereof a fixed cross member for pushing and for limiting sinking in soft ground when the load carrier is resting on the ground.

4,179,829
TRENCHING MACHINE
Franklin C. Kinkade, R.R. #4, Creston, Iowa 50801
Filed Dec. 12, 1977, Ser. No. 859,796
Int. Cl.² E02F *5/08*
U.S. Cl. 37—94 **3 Claims**



1. In an excavating machine including:

(a) a main frame,

(b) a digging unit mounted on the main frame for rotational movement including a rim structure with an outer peripherally extended spoil receiving section comprised of a pair of back to back channel members open to opposite sides of the digging unit with the leg sections thereof opposite each other transversely of said rim structure so that radially opposite portions of said leg sections are uniformly spaced radially of said rim structure over the circumferential length thereof,

(c) each outer peripheral leg section of a channel member formed with circumferentially spaced spoil receiving inlets,

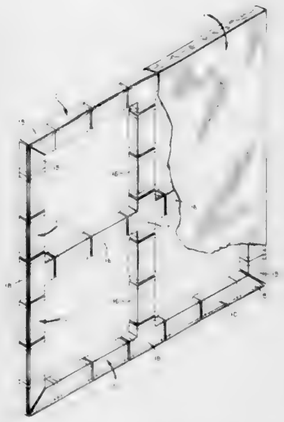
(d) digging means for each inlet secured to each outer peripheral leg section at the trailing end of the associated inlet so as to extend into the inlet toward the leading end thereof,

(e) said digging means having the leading end thereof spaced a distance from the leading edge of the inlet associated therewith a distance less than the radial spacing between the leg sections of said channel members and

(f) scraper elements mounted on said frame structure to remove spoil from said channel members on rotational movement of the digging unit.

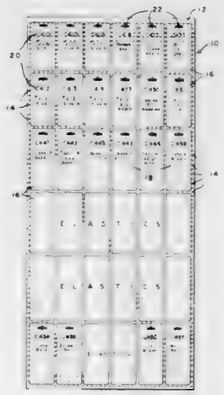
4,179,830
ADJUSTABLE FRAME FOR STRETCHING SHEET MATERIAL
Terrence R. Lamb, 3549 S St., NW., Washington, D.C. 20007
Continuation-in-part of Ser. No. 823,111, Aug. 9, 1977, Pat. No. 4,144,660. This application Jun. 6, 1978, Ser. No. 913,243
Int. Cl.² D06C *3/08*
U.S. Cl. 38—102.5 **11 Claims**

1. An adjustable framing device for stretching sheet material comprising: a plurality of hollow frame segment members having a front side over which a canvas is to be stretched; said frame segment members each having two side walls, connecting upper and lower walls which define a hollow interior and first and second ends; said framing device further comprising a pair of corner frame segment members for forming each corner of said frame, means for interconnecting one end of said frame segment members with one of said corner frame segment members to form a frame; each of said corner frame segments having two parallel upper and lower edges, a perpendicular edge adapted to mate with said one end of an adjacent frame segment member and being located at a remote position from



the corner of the frame, and a side edge nearest the corner, said side edge extending at a 45° angle with respect to said parallel upper and lower edges whereby said side edges which extend at said 45° angle mate with each other when said pair of corner segments are closed to form said frame and means for interconnecting and adjusting the separation of said pair of corner frame segments.

4,179,831
DISPLAY SET-UP PATTERN
Trix C. Cook, Hartsdale, N.Y., assignor to Textron Inc., Providence, R.I.
Filed Jul. 22, 1977, Ser. No. 818,269
Int. Cl.² G09F *3/18*
U.S. Cl. 40—19.5 **3 Claims**

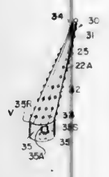


1. A display set-up pattern for use in arranging a retail perforated board display comprising

a single large sheet of material,

a plurality of package outlines printed on the sheet to indicate the locations of packages in the completed display,
indicia means associated with each package outline to identify the type of package associated with each package outline,
hook guide means formed on the sheet and associated with each package outline to indicate the proper location for insertion of a perforated board hook to support each package, and
a grid of black dots printed on the sheet and sized and spaced so as to align with the holes in the perforated board.

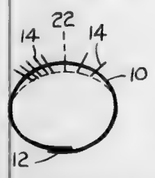
4,179,832
INFLATABLE DISPLAYS
Jerome H. Lemelson, 85 Rector, St, Metuchen, N.J. 08840
Filed Dec. 29, 1976, Ser. No. 755,144
Int. Cl.[2] G09F *13/00*
U.S. Cl. 40—540 **15 Claims**



1. A display comprising is combination:
an elongated inflatable enclosure,
an inflatable base secured to said inflatable enclosure for supporting said inflatable enclosure with the longitudinal axis thereof extending upright from a supporting surface,
said inflatable enclosure having a flexible side wall adapted to become erect and to extend upwardly from said base when said enclosure and said base are inflated and said base is disposed on said supporting surface,
electrical conducting means comprising at least one elongated flexible cable containing at least one wire pair for conducting electrical energy along the length of said cable,
means for flexibly supporting said electrical cable against said flexible side wall of said enclosure to permit the cable to extend longitudinally along most of the length of said inflatable enclosure,
a plurality of electric lamps electrically connected to said cable at different locations along the length of said cable and supported at different locations longitudinally along said flexible side wall of said inflatable enclosure, and
means for supplying electrical energy to the conducting elements of said cable for energizing said electric lamps connected thereto to provide a display formed of said plurality of electric lamps energized and emitting light at said different locations upwardly along said flexible side wall of said inflatable enclosure.

4,179,833
INFORMATION REMINDING DEVICE
Robert R. Knodel, P.O. Box 40339, Santa Barbara, Calif. 93103
Continuation of Ser. No. 769,897, Feb. 18, 1977, abandoned.
This application Sep. 5, 1978, Ser. No. 939,185
Int. Cl.[2] G09F *3/14*
U.S. Cl. 40—21 C **2 Claims**

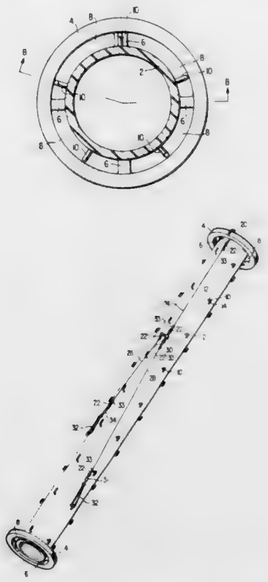
1. An information reminding device comprising
(a) an elastic strap-like body portion arranged to be supported on a person's wrist,
(b) mounting means on the ends of said body portion arranged to hold said device on the wrist in tensioned relation,
(c) a plurality of tabs mounted on said body portion having top and bottom edges,
(d) said tabs having a laterally extending opening receiving said body portion,
(e) said laterally extending opening being located between said top and bottom edges of said tabs,
(f) the tab portion above said openings having a surface area arranged to receive a reminding message thereon,



(g) the tab portion below said openings forming a tongue arranged to have bottom edge engagement with the wrist,
(h) said tabs being tiltable in one direction or the other by the forceful engagement of their bottom edges against the wrist as a result of the elasticity of said body portion whereby said tabs can be moved manually to one tilted position which may comprise an indicating position or the other tilted position which may comprise a non-indicating position.

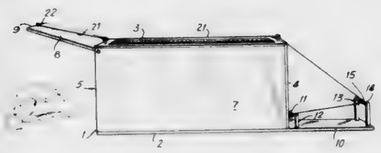
4,179,834
FISHERMAN'S LEADER CADDY
Harold A. Thomas, 363 Poplar Fork Rd., Scott Depot, W. Va. 25560, assignor to Harold A. McClung and Harold A. Thomas, both of Scott Depot, W. Va.
Filed Dec. 14, 1977, Ser. No. 860,481
Int. Cl.[2] A01K *97/06*
U.S. Cl. 43—57.5 R **5 Claims**

1. A fishing leader caddy for storing and transporting fishing leaders having multiple leader elements wherein at least one leader element includes a fishing hook and said multiple leader elements are connected to each other, said fishing caddy comprising:
an elongated cylindrical hollow tube having two ends,
flange means for attaching fishing hooks to said caddy, said flange means comprising a pair of annular flange members connected to respective ends of said tube, and plural radial connecting members connecting respective of said annular flange members to the respective tube ends, said flange members spaced apart from the respective tube ends by said radial connecting members such that said fishing hook can be hooked on said annular flange members,
a plurality of caddy hooks imbedded in said elongated tube, said caddy hooks disposed at predetermined intervals along the length and around the periphery of said hollow elongated tube, and



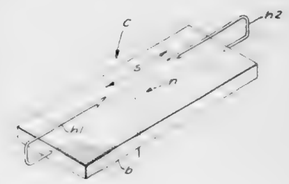
resilient fastening means for attaching said multiple leader elements to said caddy hooks, and for maintaining said leader elements taut.

4,179,835
SMALL ANIMAL TRAP
Robert F. Hunter, 119 Bowie St., Abbeville, S.C. 29620
Filed Sep. 21, 1978, Ser. No. 944,295
Int. Cl.[2] A01M *23/18*
U.S. Cl. 43—61 **1 Claim**



1. A small animal trap having a cage with a bottom, a top, a back, an open front and sides joining the top, bottom and back, said small animal trap comprising:
a trap door hingedly affixed to the top of the cage at the front thereof, said trap door having a front bottom edge;
a support member extending beyond the back of said cage substantially coplanarly with the bottom thereof;
a first pair of spaced parallel posts extending substantially perpendicularly from the support member at a predetermined distance from the back of the cage and a predetermined distance from each other;
a second pair of spaced parallel posts extending substantially perpendicularly from the support member at a greater distance from the back of the cage than the predetermined distance and having a cross bar affixed thereto and extending therebetween substantially parallel to said support member and spaced thereabove;
a lever pivotally mounted in the back of said cage at the center of the lever and balanced therein, said lever having a first end in the cage with a tray thereon for bait and a spaced opposite second end movably positioned between the first pair of posts;
a trip rod having a length longer than the predetermined distance between said firt pair of posts and resting on said lever between said posts and said cage; and
a cord having a first end affixed to the front bottom edge of said trap door and a spaced opposite second end affixed to the center of said trip rod, said cord being guided along the top of said cage and around said cross bar in a manner whereby said trap door is held open and when an animal depresses the first end of said lever by taking the bait, the second end of said lever moves upward and knocks said trip rod free thereby slackening the cord so that said trap door is released and closed.

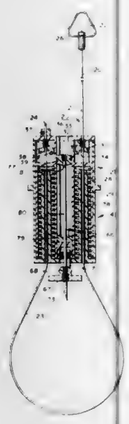
4,179,836
MOLE CATCHER
Herbert J. Clark, Midland, Mich., assignor to Thresher Institutes, Incorporated, Midland, Mich.
Continuation of Ser. No. 623,830, Oct. 20, 1975, abandoned.
This application Aug. 15, 1977, Ser. No. 824,946
Int. Cl.[2] A01M *23/30*
U.S. Cl. 43—77 **1 Claim**



1. As an article of manufacture, a device for catching moles and other vermin comprising:
(a) a generally rectangular and flat base;
(b) a pair of hooks secured on said base, each of said pair of hooks of hooks (b) being generally of the fish hook-sort; with each accordingly having
(c) a non-cutting shank portion; and
(d) a bent over-and-back hook portion extension of said shank portion (c) that is free from lateral cutting edges, with said hook portion terminating in and with
(e) a sharp-pointed and barbed tip at the free end of said hook portion (d), with
said hooks (b) thus being further generally characterized in being entirely free of any running edge surface(s) thereupon that are capable of cutting and slicing save for the pointed sharp end of said barbed tip portion (e) of each,
said pair of hooks (b) being respectively individually and separately fixed flatly one at each end of said base (a) with and by their respective shank portions (c) towards and on the respectively opposite narrow ends of the base (a);
each of said pair of hooks (b) being disposed on the base (a) with the hook portions (d) thereof raised upwardly over the base (a) and with their respective tips (e) opposed to and pointed towards one another and coincident therewith; so that
each of said hook tips (e) in said pair of hooks (b) extends outwardly from respective longitudinal ends of said base (a) so as to be postured with hook portion(s) (d) going up-and-over the end edge(s) of the base (a) then back-over the top of said base with non-cutting shank

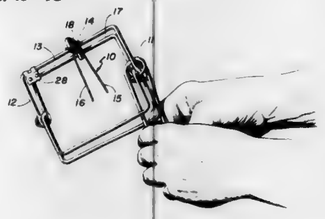
and non-cutting and -slicing curled-over hook portion(s) (d) exposed in elevation over said base; with
each of said barbed hook tips (e) also being respectively and individually pointed towards the central part of said base (a), in which direction
the shank portions (c) of the pair of hooks (b) are set upon the base (a) in a line that is at least approximately parallel with the longitudinal center line of said base (a) while standing upright with respect to said base; with
only said sharp-pointed barbed tips (e) of each of said pair of hooks (b) being capable of impaling and in any way cutting for catching objects moving thereon and thereagainst when said objects move in a path of travel coincident with the end-to-end longitudinal center line of said base (a) and in said path against the direction in which either of said barbed tips (e) are pointed:
said pair of hooks being so fixed on the base (a) that the hooking tips (e) of each of said pair of hooks (b) are so positioned and disposed that the tip-to-tip spacing between said oppositely-pointing pair of hooks (b) is between about 1½ and about 6 inches and,
in any given instance, on an order of spacing that is at least approximately half the length of said base (a); plus
(f) spike means adapted to anchor said device in and with ground when it is placed for use, said spike means (f) being nail-like appendages protruding downwardly from and fixed to said base (a).

4,179,837
ANIMAL TRAP
Henry E. Gummeringer, 8609 Lyndale Ave. South, Ste. 101A, Bloomington, Minn. 55420
Filed Jan. 11, 1978, Ser. No. 868,709
Int. Cl.² H01M *23/34*
U.S. Cl. 43—87 **14 Claims**



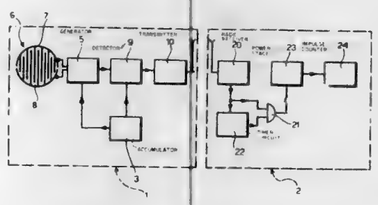
1. An animal trap comprising a snare housing assembly for connection to a snare cable which has first and second ends with an anchor portion at the first end and a snare portion at the second end, the assembly including a snare housing having a guide passage for sliding connection of the housing on the anchor portion of the cable, the snare housing also having a connection for the second end of the cable and thereby providing a snare loop in the cable between said second end connection and said guide passage with the snare housing serving as a slip knot during normal self-tightening of the snare, the snare housing also having a settable and releasable spring member movably mounted thereon together with mechanism for operatively connecting the spring member to the snare cable for quick tightening of the snare loop in response to release of the spring member, and said trap having a trigger device operatively connected to the spring member for releasing the spring member in response to actuation of the trigger by an animal.

4,179,838
TRIGGER FOR TRAP
Joseph C. Harvey, West Yarmouth, Mass., assignor to Woodstream Corporation, Lititz, Pa.
Filed Mar. 6, 1978, Ser. No. 883,800
Int. Cl.² A01M *23/24*
U.S. Cl. 43—92 **4 Claims**



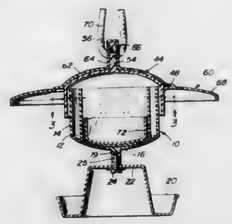
1. Trigger for use with an animal trap having first and second jaws and a dog for setting the trap, said dog being pivotally mounted on one of said jaws and being engagable with the other of said jaws to hold the trap in set condition, said trigger fitting onto said other of said jaws for releasing the dog when the trigger is moved by an animal, said trigger comprising a single piece of rod material shaped to define a pair of elongated legs and a head connecting said legs, said head including first and second arcuate portions ajoining the respective legs and a third portion connecting said first and second arcuate portions, said head fitting over said other of said trap jaws with said first and second arcuate portions on one side of the jaw, with said third portion on the opposite side of the jaw and with said dog when engaged with the jaw being located between said first and second arcuate portions, said head including contact points on said opposite sides of the jaw for engaging the dog when the trigger is moved to release the dog and spring the trap.

4,179,839
DEVICE FOR KEEPING UNDER CONTROL THE POPULATION OF SELECTED SPECIES OF INSECTS
Gianfranco Salotti, Avigliana; Elvio Ferrero, and Franco Grisotto, both of Turin, all of Italy, assignors to Fiat Societa per Azioni, Turin, Italy
Filed Apr. 12, 1978, Ser. No. 895,554
Claims priority, application Italy, Apr. 12, 1977, 67800 A/77
Int. Cl.² A01M *1/22*; G07C *11/00*
U.S. Cl. 43—112 **4 Claims**



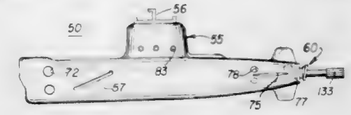
1. A device for use in keeping insect infestations under control, said device comprising:
at least one trap,
electrical conductor means on said at least one trap,
a high tension generator,
said electrical conductor means being connected across the output of said high tension generator and being so formed as to produce an electrical discharge when an insect above a given size comes into contact with the said electrical conductor means,
radio transmitter means,
discharge detector means operable to detect electrical discharges across said electrical conductor means and to enable, in response thereto operation of said radio transmitter means,
radio receiver means for receiving signals transmitted by said radio transmitter means, and
an impulse counter means connected to the output of said radio receiver means, said impulse counter means operating to count each time said transmitter means is operated, whereby to provide an indication, at a location remote from said trap, of the number of insects trapped thereby.

4,179,840
HANGING INSECTICIDE DRUM
Herbert G. Sandefur, Maud, Okla., assignor to Kenneth Kienzle, Jr.; Gary Jay; John L. Clifton and Joe B. Womack, all of Shawnee, Okla., part interest to each
Filed Jul. 6, 1977, Ser. No. 813,547
Int. Cl.² A01M *1/20*
U.S. Cl. 43—131 **3 Claims**



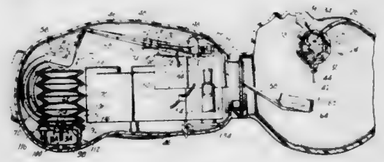
1. An insect attracting, insecticide containing and insect exterminating and disposing drum expressly adapted to be swingably hung and suspended from a suitable support, said drum comprising an upwardly opening cup-like receiver including upstanding peripheral wall portions and closed at its lower end by means of an upwardly opening perforated and partial spherical cotton wall extending between and formed integrally with said peripheral wall portions, the central portion of said bottom wall including a depending mounting shank, an internal upstanding tubular insecticide container disposed within said receiver, open at its upper and lower ends and including spaced peripheral wall portions spaced inwardly from opposing wall portions of said receiver for air circulation upwardly through said bottom wall, the spaces defined between opposing wall portions of said receiver and container, over the upper end of said container and downwardly through said container and the bottom wall inwardly of the receiver peripheral wall portions, a downwardly opening cover telescoped downwardly over the upper end of said receiver and removably anchored relative thereto, said cover including a top wall spaced above the upper end of said container, an upwardly opening insect and insecticide drop catching pan supported from the lower end of said stud, said pan including a bottom provided with a raised cental portion underlying at least the central portion of said bottom wall inwardly of said container peripheral portions, means removably anchoring said raised central portion to said stud with the lower end of said stud opposing said raised central portion, a downwardly opening shield having a central portion closely overlying, conforming to and supported from the upper surface of said cover and an outer peripheral portion extending about said shield central portion and projecting outwardly beyond all sides of said drum and said pan, said shield central portion including an upwardly projecting and downwardly opening hollow lug, said cover including an upwardly projecting hanger flange snugly removably received in said hollow lug, said hollow lug and hanger flange having registered rope accommodating horizontal openings formed therein.

4,179,841
TOY OBJECT THAT PROPELS FORWARD, SUBMERGES AND SURFACES
Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.
Filed Nov. 14, 1977, Ser. No. 850,948
Int. Cl.² A63H *23/04*
U.S. Cl. 46—94 **9 Claims**



1. A toy object comprising a body having a ballast chamber and a buoyant air chamber, said chambers being non-communicating with respect to each other and dimensioned such that normally said body floats in water with a portion of said body extending out of the water, said body being formed of separate substantially hollow nesting members with each member forming a portion of said ballast and buoyant chambers, said nesting members frictionally engaging one another to form said chambers, diving planes extending outwardly from said body angularly disposed to the horizontal when said body floats such that forward movement of said body through the water causes said body to submerge, and motor means associated with said body having a propeller extending outwardly of said body and having an energy storage device connected to said propeller for causing same to rotate, rotation of said propeller causing forward movement of said body through the water and simultaneous submerging of said toy object below the water surface until said propeller ceases to rotate when said body rises until said portion extends out of the water.

4,179,842
AUDIBLE SOUND EMITTING TOY
Thomas J. Fauls, West Orange, N.J., assignor to Mego Corp., New York, N.Y.
Filed Aug. 26, 1977, Ser. No. 827,933
Int. Cl.² A63H *5/00*
U.S. Cl. 46—117 **11 Claims**

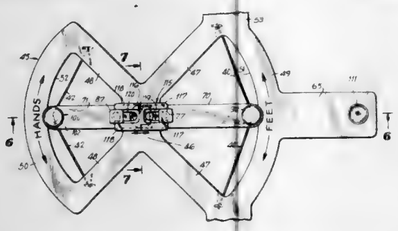


1. A doll capable of emitting different sounds in each of at least two orientations of which a first orientation of the doll is an upright vertical position and a second orientation of the doll is a reclining horizontal position comprising an enclosure constituting at least a portion of the doll and having a hollow interior and a foraminous portion communicating said interior with the exterior of the doll; means in said hollow interior for emitting sounds, including at least two sections each operative for emitting the sounds associated with one of the orientations; and means for controlling the operation of said emitting means in dependence on the orientation of the doll, including a weight so mounted in said hollow interior as to be gravitationally displaced toward a different position relative to said enclo-

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sure in each of the orientations, switch means including a control portion attached to said weight for movement therewith and operative for energizing a different one of said sections of said emitting means in each of said positions of said weight, and time-delay means for retarding the displacement of said weight toward at least one of said positions thereof and for delaying the energization of the corresponding section of the emitting means upon change of the orientation of the doll by a finite time interval, said emitting means simulating sounds of giggling when the doll is in the upright vertical position and crying when in the reclining horizontal position.

4,179,843
CONTROLLER WITH INDIVIDUALLY OR SIMULTANEOUSLY MOVABLE ARMS
Yin F. Ho, Kowloon, Hong Kong, assignor to Madison Ltd., Hackensack, N.J.
Filed Nov. 1, 1977, Ser. No. 847,562
Int. Cl.[2] A63H *7/00*
U.S. Cl. 46—126 **11 Claims**



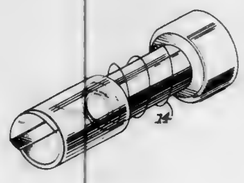
1. A puppet controller for a puppet having movable hands and feet, said controller comprising a frame for manual holding and manipulation, a first arm mounted on said frame for movement relative to the latter and connectible to the puppet feet for animating the same, a second arm mounted on said frame for movement relative to the latter independently of said first arm and connectible to the puppet hands for actuation thereof, constraining means mounted on said controller frame and selectively associated with said first and second arms to constrain each said arm to movement only with the other relative to said frame for simultaneous animation of said feet and hands.

4,179,844
HINGE
Paul R. Steuer, Cheltenham, Pa., assignor to Young Windows Inc., Conshohocken, Pa.
Filed Jun. 30, 1978, Ser. No. 920,651
Int. Cl.[2] E05D *1/06, 7/10*
U.S. Cl. 16—171 **3 Claims**



1. A hinge to be connected between two parts and provide for relative rotation of the same and to hold the parts so as to avoid rattle and at a predetermined rotational position to permit the parts to be separated, the hinge comprising:
a first elongated member having means for connecting the same to one of the parts to be rotated and having spring retaining means;
a second elongated member having means for connecting the same to the other of the parts to be rotated and having spring retaining means;
means on one member forming a semi-circular concave surface;
means on the other member forming a semi-circular convex surface, the surfaces slidingly engaging one another; and
wire-form spring means elongated and generally rectangular in shape and having a pair of spaced apart compression sections extending along the lengthwise direction of the spring means and having end sections respectively extending between the compression sections and closely adjacent opposite edges of said members and preventing axial separation of the members, one compression section engaging said spring retaining means on said first member and the other compression section engaging said spring retaining means on second member and the sections developing forces urging the convex and concave surface towards one another, said surfaces and said forces providing for the surfaces to tightly and slidingly engage without separation to thereby avoid rattle and for the members to relatively rotate over a predetermined arc without separation and for the surfaces to be separated by movement of the members in a radial direction at one end of the arc whereby to separate the members.

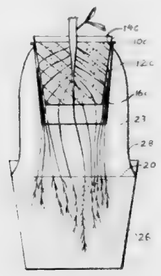
4,179,845
TUBE TYPE DIAPHRAGM GAME CALL
Bart M. Jacob, Box 2, Bondville, Vt. 05340
Filed Jul. 25, 1977, Ser. No. 818,924
Int. Cl.[2] G10K *9/02*
U.S. Cl. 46—178 **6 Claims**



1. A tube type diaphragm game call comprising
a first tube having a diaphragm end half closed off and a portion not closed off and an open end, and
a second tube having a portion located within and coaxial with said first tube,
said second tube having a first end within said first tube, said second tube being slidable within said first tube so that said first end may stop at said diaphragm end of said first tube,
said second tube having a second end projecting from said first tube for manipulation by the hand to slide said second tube within said first tube to vary the sound produced by said game call.

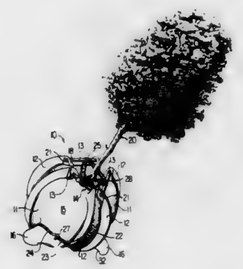
4,179,846
HORTICULTURAL DEVICES
Richard S. Carlisle, P.O. Box 307, Rye, N.Y. 10580
Filed Sep. 27, 1977, Ser. No. 836,978
Int. Cl.[2] A01G *31/00*
U.S. Cl. 47—59 **10 Claims**

1. The method of hydroponic plant culture, including steps of
planting a seed in particulate plant-growing material in a first container containing such material, said first container having a side wall and a bottom of yieldable fibrous material both of which accommodate root penetration and enlargement of root cross-section but which are essentially free of through openings penetrable by the particulate plant-growing material and the transverse dimensions of the first container being so limited in relation to the plant as to be readily accessible for penetration by laterally growing roots;
supporting said first container above hydroponic liquid in a hydroponic liquid container with the side wall of the first container spaced from surrounding root-confining means and with the bottom of the first container spaced above and freely exposed to nutritive hydroponic liquid in the hydroponic liquid container;
maintaining the space about the sides and bottom of the first container and above the liquid largely sealed for developing substantially 100% humidity in that space and maintaining the particulate material suitably moist while the



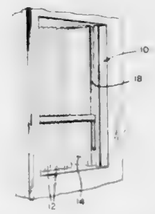
seed germinates and while the resulting seedling develops a stem having a downward extension in the particulate material for inducing development of roots extending downward and through the bottom of said first container and for additionally inducing development of roots sidewise from said downward extension projecting outward to and through said side wall of the first container at a range of depths in the particulate material starting just under the surface thereof, thereby to develop outward-extending anchored supports for the plant at a range of depths in the particulate material and through the side wall of the first container; and
after such root development has occurred, continuing the development of the plant hydroponically by utilizing said nutritive hydroponic liquid and said 100% humidity.

4,179,847
ROOT BALL CLAMP
Jean-Pierre F. Osterwalder, 812 Cottage St., Vienna, Va. 22180
Filed Jul. 20, 1978, Ser. No. 926,381
Int. Cl.[2] A01G *23/04, 23/06*
U.S. Cl. 47—76 **5 Claims**



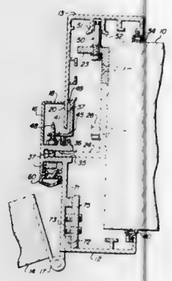
1. A root ball clamp system for protecting, surrounding and clamping the root ball portion of a tree, comprising:
a plurality of plate members, each of said plate members being curved inwardly from its top edge to its lower edge and also curved inwardly from its longitudinal sides, each plate member having a foot portion at the lower end thereof which extends outwardly and downwardly from the general plane of the plate member and which acts as a base in conjunction with similarly shaped foot portions of the other plate members, each plate member having a raised reinforcing rib extending outwardly on each longitudinal side of the plate member, each of said reinforcing ribs being substantially perpendicular to the general plane of the plate member and extending upwardly beyond the top edge of said plate member, a tie bar spaced from and extending laterally across the upper end of each plate member, said tie bar being attached at each end to one of said re-inforcing ribs which extend upwardly beyond the top edge of said plate member, means extending around the periphery of said plate members at the lower ends thereof for securing the lower ends of said plate members about the root ball portion of a tree, said securing means extending upwardly over the foot portion of each plate member, and means for connecting the tie bars of said plate members to secure the upper ends of said plate members about the root ball portion of the tree.

4,179,848
RESTRAINING APPARATUS FOR BOOKCASES
Richard F. Gauron, 26020 SE. 158th St., Issaquah, Wash. 98027
Continuation-in-part of Ser. No. 878,754, Feb. 17, 1978, abandoned. This application Sep. 27, 1978, Ser. No. 946,177
Int. Cl.[2] E06B *11/00*
U.S. Cl. 49—124 **10 Claims**



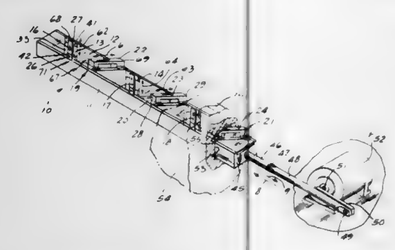
1. A restraining apparatus for an open access storage compartment in moving vehicles comprising in combination:
(a) a first and a second rail, each substantially vertically mounted at said associated compartment vertical sides adjacent said compartment access opening;
(b) a first and a second guiding member slidingly disposed in said first and said second rail member respectively;
(c) a restraining bar substantially horizontally located between said first and said second rail and connected at each end to said first and said second guiding member respectively; and
(d) a spring located inside of said restraining bar for providing a predetermined force to said first and said second guiding members, disposed in said first and said second rail, for obtaining a non-vibrating arrangement and a controlled sliding pressure inside of said first and said second rail, whereby said restraining bar is adapted to move manually horizontally upwards and upon manual release horizontally downwards in a speed controlled fashion.

4,179,849
DOOR FRAME ASSEMBLY
Reinhold O. Kuffner, Karlsruhe, Fed. Rep. of Germany, assignor to Kueffner Products, Inc., Phoenix, Ariz.
Filed Mar. 2, 1978, Ser. No. 882,935
Int. Cl.² E06B *1/04*
U.S. Cl. 49—505 **9 Claims**



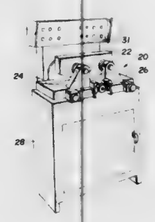
1. A door frame assembly including in combination:
a first elongated part of uniform generally L-shaped cross section and having anchor gripping means integrally formed therewith;
a second elongated part of uniform generally L-shaped cross section and having anchor gripping means integrally formed therewith;
one of said first and second parts having a door stop extension thereon adapted to overlap the other of said first and second parts when said parts are placed on opposite sides of a door opening and moved toward one another; and
an L-shaped clamping lever pivotally attached to said one of said first and second parts for engagement with said other of said first and second parts on the opposite side of said other of said parts from the side overlapped by the door stop extension of said one of said parts.

4,179,850
REACTION HONING TOOL FOR HONING A FLAT SURFACE
Robert H. Gillette, Angola, Ind., assignor to Brammall, Inc., Angola, Ind.
Filed Apr. 19, 1978, Ser. No. 897,937
Int. Cl.² B24B *7/00*
U.S. Cl. 51—59 R **26 Claims**



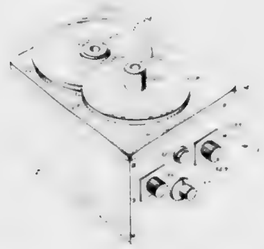
1. A reaction honing tool for honing a flat surface of a workpiece comprising:
a body member movable in a longitudinal direction; first means for honing mounted on said body member so as to move back and forth, relative to said body member, due to reaction forces, which result from a change of motion, from a first direction to an opposite direction, of the body member; said first means for honing being oriented at a first angle with respect to said first direction;
said first angle being between 0° and 90°.

4,179,851
APPARATUS FOR EDGING OPHTHALMIC LENSES
Boyd L. Neisler, and Joe D. Stith, both of Muskogee, Okla., assignors to Coburn Optical Industries, Inc., Muskogee, Okla.
Filed Jan. 24, 1978, Ser. No. 871,871
Int. Cl.² B24B *9/14, 1/00*
U.S. Cl. 51—101 LG **6 Claims**



1. An apparatus for grinding an edge configuration upon ophthalmic lenses comprising:
abrading wheel means mounted for rotation about a first horizontally extending axis;
means connected to said abrading wheel means for rotating said abrading wheel means about said first axis;
first means for rotatably mounting a first lens to be edge ground about a second horizontal axis extending parallel to said first axis, said first means for rotatably mounting including,
first means for translating said second parallel axis in a horizontal plane toward and away from said first axis for selectively engaging a peripheral portion of the first lens with a peripheral portion of said abrading wheel means said first means for translating including,
first head means mounted upon one side of said abrading wheel for translation in an X–Y coordinate horizontal plane toward and away from said axis of said abrading wheel means, and
a first lens chucking assembly for securely holding a first lens and being journaled at the ends thereof within a pair of opposing stanchion means mounted upon said first head means;
second means for rotatably mounting a second lens to be edge ground about a third horizontal axis extending parallel to said first axis, said second means for rotatably mounting including,
second means for translating said third parallel axis in a horizontal plane toward and away from said first axis for selectively engaging a peripheral portion of the second lens with another peripheral portion of said abrading wheel means said second means for translating including,
second head means mounted upon the other side of said abrading wheel for translation in an X–Y coordinate horizontal plane toward and away from said axis of said abrading wheel means, and
a second lens chucking assembly for securely holding a second lens and being journaled at the ends thereof within a pair of opposing stanchion means mounted upon said second head means;
first means for rotating the first lens about said second axis;
second means for rotating the second lens about said third axis;
motor means connected to said first and second head means for selectively translating said first and second head means in an X–Y horizontally planar coordinate toward and away from abrading wheel, said motor means includes means for biasing said first and second head means toward said abrading wheel and said first and second lenses into engagement with the periphery of said abrading wheel upon generally opposite sides of said abrading wheel; and
means operably connected to said first and second means for rotatably mounting said first and second lenses for controlling the angular orientation and radial position of the first and second lenses relative to said abrading wheel means in accordance with a desired peripheral configuration of the first and second lenses, said means for controlling including,
single pattern means mounted for rotation upon a fourth axis lying parallel to said first, second and third axis, first switch contact means mounted adjacent said pattern means,
means connecting said first switch contact means to said means for rotating said first lens for controlling rotation of said first lens upon engagement of said switch contact means with said pattern means,
second switch contact means mounted adjacent said pattern means, and
means connecting said second switch contact means to said means for rotating said second lens for controlling rotation of said second lens upon engagement of said switch contact means with said pattern means.

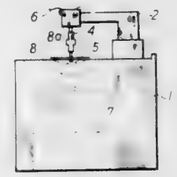
4,179,852
METHOD AND APPARATUS FOR POLISHING FLOPPY DISCS
David L. Barnett, Phoenix, Ariz., assignor to Three Phoenix Company, Phoenix, Ariz.
Filed Mar. 13, 1978, Ser. No. 885,625
Int. Cl.² B24B *5/00, 1/00*
U.S. Cl. 51—132 **21 Claims**



1. A method of polishing an annular region of the recording surface of an annular flexible recording element to improve the surface smoothness, said method comprising the steps of:
(a) supporting the recording element on a resilient surface capable of transmitting sufficient torque to said recording element to rotate said recording element about a first axis of rotation without significant slippage;
(b) supporting a flat, circular polishing disc by means of a disc-shaped platen such that the recording surface of said recording element is exposed to said polishing disc, the radius of said polishing disc exceeding the width of the annular region of said recording surface, said polishing disc having a second axis of rotation parallel to said first axis;
(c) moving a flat surface of said polishing disc into contact with the annular region of said recording element such that the contact is maintained by a predetermined force, the radial extent of the annular region being defined by the extent of the contact;
(d) rotating said recording element about said first axis and said polishing disc about said second axis in the same angular direction at first and second predetermined angular velocities, respectively, for a predetermined period of time, said first and second predetermined angular velocities being selected to produce approximately uniform relative velocity differences between points of the recording surface of said recording element and adjacent points of the flat surface of said polishing disc, said points of the recording surface lying along a line passing through the axes of rotation of the disc-shaped platen and the polishing disc; and
(e) moving said polishing disc away from said recording element to permit removal of said recording element from the resilient surface.

12. A machine for polishing an annular region of a recording surface of an annular flexible recording element to improve the surface smoothness, said machine comprising in combination:
(a) a resilient surface capable of transmitting sufficient torque to said recording element to rotate said recording element without significant slippage;
(b) first means for supporting the non-recording surface of the recording element on said resilient surface, said first means having a first axis of rotation;
(c) a flat, circular polishing disc;
(d) second means for supporting said polishing disc such that the recording surface of said recording element is exposed to said polishing disc, the radius of said polishing disc exceeding the width of the annular region of said recording surface, said second means having a second axis of rotation parallel to said first axis;
(e) third means for moving a flat surface of said polishing disc into overlapping contact with the annular region of said recording element such that the overlapping contact is maintained by a predetermined force, the radial extent of the annular region being defined by the extent of the overlapping contact;
(f) fourth means for rotating said first means and said second means so that said recording element and said polishing disc rotate in the same angular direction at first and second predetermined angular velocities, respectively, for a predetermined period of time, said first and second predetermined angular velocities being selected to produce approximately uniform relative velocities between points of the recording surface of said element and adjacent points of a flat surface of said polishing disc, said points of the recording surface lying along a line passing through said first and second axes of rotation, respectively; and
(g) fifth means for moving said burnishing disc away from said recording element to permit removal of the recording element from the resilient surface.

4,179,853
CONTROLLING DEVICE FOR GRINDING PIEZO-ELECTRIC ELEMENT
Nakanobu Moritani, Tokyo, Japan, assignor to Kabushiki Kaisha Seikosha, Japan
Filed Sep. 7, 1977, Ser. No. 831,275
Int. Cl.² B24B *49/10*
U.S. Cl. 51—165 R **4 Claims**



1. Controlling device for grinding piezo-electric elements comprising:
grinding apparatus for grinding a piezo-electric element to obtain a desired natural frequency,
two band-pass filters of which one has a central frequency of

the band which is lower than the desired natural frequency of said piezo-electric element and the other has a central frequency of the band which is higher than the desired natural frequency of said piezo-electric element, said filters having equal damping characteristics at the desired natural frequency of said piezo-electric element,

means for detecting an electric signal from the piezo-electric element being ground including as a frequency component the natural frequency of said element and feeding said signal to an input of each of said band-pass filters,

means for converting the output of each of said two band-pass filters to a dc voltage,

comparator means receiving said dc voltages from said converting means and detecting whether or not said dc voltages coincide, and

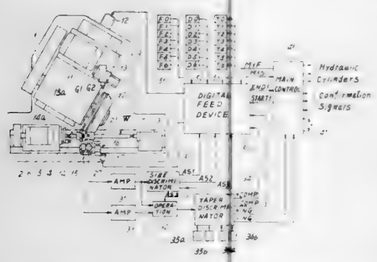
means for stopping the grinding of said piezo-electric crystal by said grinding apparatus in response to a predetermined signal from said comparator means.

4,179,854

GRINDING MACHINE WITH REST APPARATUS

Kenichi Munekata, Kariya; Takeshi Ohta, Aichi, and Susumu Ohshima, Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Aichi, Japan

Filed Jul. 18, 1978, Ser. No. 925,878
Int. Cl.[2] B24B *49/04*
U.S. Cl. 51—165.77 **5 Claims**



1. A grinding machine for grinding a workpiece comprising:

a bed;

means mounted on said bed for rotatably supporting said workpiece;

first drive means for rotating said workpiece;

a wheel head slidably mounted on said bed for rotatably supporting a grinding wheel thereon;

second drive means for rotating said grinding wheel;

a first servomotor for moving said wheel head so as to move said grinding wheel toward and away from said workpiece;

a rest apparatus comprising a pair of rest shoes movable toward said workpiece to support the same;

a second servomotor for moving said rest shoes;

means for measuring a diametral dimension of a workpiece during a grinding operation;

a main control circuit for sequentially enabling an automatic grinding operation;

first presetting means for digitally presetting variety of feed amounts;

second presetting means for digitally presetting a variety of feed speeds;

a digital feed device responsive to said measuring means and said main control circuit for selectively selecting one of the feed speeds preset in said first presetting means and one of the feed amounts preset in said second presetting means to cause one of said first and second servomotors to move one of said wheel head and said pair of rest shoes at a selected feed speed through a selected feed amount;

means for calculating a taper amount of a workpiece ground under the support of said rest shoes being positioned at their advanced positions at the time when said measuring means generates a signal for finishing a grinding operation on said workpiece; and

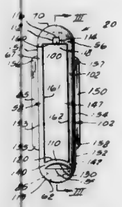
means responsive to said calculating means for compensating for advanced positions of said rest shoes for a next grinding operation.

4,179,855

INSERT FOR HONING TOOL

Robert H. Gillette, Angola, Ind., assignor to Brammall, Inc., Angola, Ind.

Filed Apr. 24, 1978, Ser. No. 898,924
Int. Cl.[2] B24B *33/00*
U.S. Cl. 51—204 **6 Claims**



1. An improved insert for a honing tool comprising: a one piece body,

said body having two parallel elongated side members in spaced relation to one another,

a top member joining said two parallel side members, a bottom member having a first and a second end and joining said two parallel side members;

said two parallel side members, said top member and said bottom member forming an aperture wherein a honing stone can be inserted;

a curved spring member molded into said body at a first end and a second end with said first end of said spring being molded to said body where said first end of said bottom member intersects a first of said two side members and with said second end of said spring being affixed to said body where said second end of said bottom member intersects a second of said two side members and having a central region that extends into said aperture;

said central region of said spring member being movable independently of said body and operable to clamp the honing stone within the aperture against said top member as that honing stone is slid within said insert by the tool; and retaining means operative to retain said insert in a tool into which it has been inserted.

4,179,856

SANDING SLEEVE ASSEMBLY

John H. Wheeler, Dallas, Tex., assignor to The Texacone Company, Dallas, Tex.

Continuation-in-part of Ser. No. 721,984, Sep. 10, 1976, Pat. No. 4,089,137. This application Dec. 29, 1977, Ser. No. 865,708
The portion of the term of this patent subsequent to May 16, 1995, has been disclaimed.
Int. Cl.[2] B24B *19/00*; B24D *3/22*
U.S. Cl. 51—241 S **21 Claims**

1. A sleeve assembly for sanding a piston rod in a hydraulic cylinder or the like having a stuffing box, which comprises:

an annular outer member comprised of a rigid material having first and second sections which engage to surround the piston rod;

an annular intermediate member comprised of an elastomeric material having first and second sections adhesively secured to the inner surfaces of the first and second sections of the outer member;

An annular abrasive inner member having first and second sections adhesively secured to the inner surfaces of the first and second sections of the intermediate member for interference contact with the piston rod;

the first and second sections of the annular members each having first and second end portions with opposed complementary non-axial configurations such that the sleeve assembly does not score the piston rod during axial movement therebetween while sanding the piston rod;

at least one hose clamp means surrounding the annular outer member for releasably engaging the first and second sections of each of said annular members;

the annular outer member including a like number of peripheral grooves each for receiving one of the hose clamps therein;



at least two chain means each having first and second ends for extending between the annular outer member and the stuffing box for releasably securing the sleeve assembly to the hydraulic cylinder whereby relative movement between the piston rod and the sleeve assembly is affected by translation of the piston rod;

at least two bracket means affixed to said annular outer member, each of said bracket means releasably receiving the first end of one of said chain means;

each of said brackets having a portion extending along the annular outer member and an end portion turned to engage a predetermined portion of the sanding sleeve assembly; and

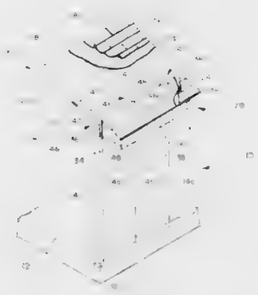
means for releasably affixing the second end of each of said chain means to the stuffing box.

4,179,857

HINGED EAVE ASSEMBLY FOR A STRUCTURE

Tiras J. Danford, Quitman, Ga., assignor to Harrington Manufacturing Company, Lewiston, N.C.

Filed Jun. 26, 1978, Ser. No. 919,169
Int. Cl.[2] E04B *7/16*
U.S. Cl. 52—71 **6 Claims**



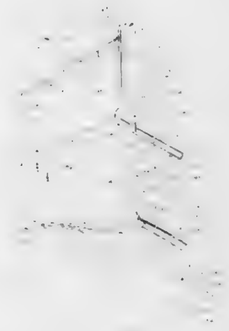
1. In a hinged eave-roof assembly of a structure of the type where the eave comprises a top, an inboard side and an outboard side and is movable between a transport position overlying the roof to a normal functional extended position where the eave appears to be a normal extension of the roof, the improvement comprising: a metal hinge for hingedly connecting said eave to the roof structure with the metal hinge being split longitudinally about one end thereof so as to divide one end of said hinge into two distinct sections, and wherein one of the split sections is bent so as to form an angle of less than 180 degrees with the other split section, and wherein opposite said split sections a roof attaching portion is defined and fastened to said roof while the bent split section lies adjacent to and is fastened to the inboard side of said eave and the other split section lies adjacent to and is fastened to the top of said eave, whereby said eave can be moved back and forth between said transport and extended positions by the bending and flexing of the metal hinge above an area between the roof attaching position and the split sections and wherein the eave is securedly held within the hinge by the two split sections and securedly held adjacent the roof structure by the interconnection formed by the hinge extending between said roof and eave.

4,179,858

BUILDING STRUCTURE AND METHOD OF CONSTRUCTION

Douglas L. Graham, R. R. 2, Auburn, Ind. 46706, and Mark L. Graham, 6912 Ludwig Cir., Fort Wayne, Ind. 46825

Filed Apr. 8, 1977, Ser. No. 785,875
Int. Cl.[2] E04B *1/00*; E04B *7/00*
U.S. Cl. 52—262 **23 Claims**



12. A building structure comprising a plurality of spaced-apart stud members, said stud members defining interstitial spaces therebetween each having a thickness generally equal to the width of said studs, said spaces each having a length generally equal to the length of said studs and a width generally equal to the spacing between said studs, said spaces each being filled with at least one generally rectangular block of self-supporting material thereby defining a column of said material between each adjacent pair of said studs having a shape generally corresponding to said spaces, means extending between alternate studs for connecting said studs and columns together into a load bearing structure, a foundation, means for connecting said studs to said foundation, said studs and said columns upstanding from said foundation thereby forming a wall, said wall having a roof support connected thereto, and a roof resting on said roof support and supported by said wall, said roof comprises a plurality of spaced-apart stud members, said stud members defining interstitial spaces therebetween each having a thickness generally equal to the width of said studs, said spaces each having a length generally equal to the length of said studs and a width generally equal to the spacing between said studs, said spaces each being filled with one or more

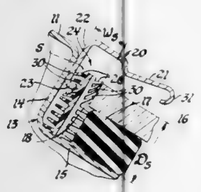
generally rectangular blocks of self-supporting material thereby defining a column of said material between each adjacent pair of said studs having a shape generally corresponding to said spaces, means extending between alternate studs for connecting said studs and columns together into a load bearing roof structure, said stud members comprise a pair of spaced-apart and generally parallel rods secured together at spaced-apart intervals by a plurality of spacers, said roof support comprises an angle member having two flanges disposed generally perpendicularly to each other, one of said flanges being supported by and resting on said spacers, the other of said flanges having spaced-apart apertures therein, the spacing of said apertures being generally the same as the spacing of said roof studs, one rod of each of said roof studs being positioned in each of said apertures.

4,179,859

MOLDING RETAINING CLIP

John J. Fricko, Harper Woods, and George M. Newton, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 8, 1978, Ser. No. 932,000
Int. Cl.² E04F *19/02*
U.S. Cl. 52—397 **3 Claims**



1. A molding retaining clip adapted to be inserted and self-retained within a space between a periphery of a window and an imperforate vehicle body flange supporting the window and defining the window opening, said molding clip comprising a waved strip formed of resilient material having a plurality of waves spaced along its length and extending across its width, a plurality of integral projections on opposite sides of said waved strip projecting from the concave side of each of said waves, said waved strip being squeezably insertable lengthwise into the space and then retained therein by the waves urging the ends of the projections on one strip side to grip the window periphery and the ends of the projections on the other strip side to grip the vehicle body flange and whereafter upon forceable insertion of a molding flange with a reverse bent end between said strip and the body flange opening, the projections on said other strip side after deflecting to permit the molding flange insertion then assume end gripping engagement with the molding flange and also provide a barrier to retraction of the reverse bent end while the projections on said one strip side retain their engagement with the window periphery.

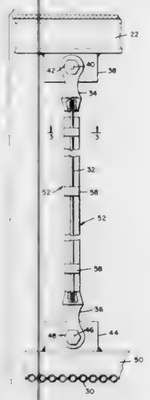
4,179,860

LATERAL STIFFENER FOR STRUT

Salvatore J. Reale, Wayne, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jan. 24, 1978, Ser. No. 871,899
Int. Cl.² E04C *3/30*
U.S. Cl. 52—732 **8 Claims**

1. Apparatus for preventing buckling of a narrow member which member is subjected to a compression load comprising a rigid bar of substantially the same length as said member, one end of said rigid bar being spaced away from a respective end of said narrow member such that said rigid bar is not subjected to axial loading, said bar including first and second angularly disposed legs, each of said legs being adapted to contact said member along the length of said legs, and means for maintaining said member in contact with said bar, said means including a tie bar connected between said legs of said rigid bar and adapted to engage said member at its outer surface at a point spaced apart from the points of contact of said member with



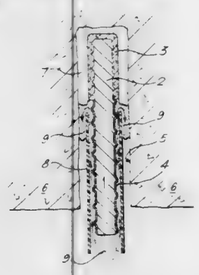
said legs, said rigid bar being adapted such that said member applies a load to said rigid bar or to said tie bar at said points of contact in a plane normal to the longitudinal axis of said member.

4,179,861

METHOD OF ANCHORING A BOREHOLE ANCHOR

John V. Brown, Aylesbury, England, assignor to Fosroc A.G., Switzerland

Filed Aug. 11, 1978, Ser. No. 932,980
Claims priority, application United Kingdom, Aug. 12, 1977, 33866/77
Int. Cl.² E04B *1/00*
U.S. Cl. 52—743 **7 Claims**



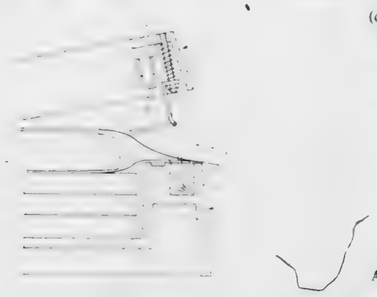
1. A method of anchoring an anchor element in a hole in a substrate, which comprise placing an end portion of the anchor element in the hole, locating about the element a sleeve dimensioned to leave an annular clearance between the element and the inner surface of the sleeve, securing the element in the hole and then supplying self-setting composition into the sleeve while withdrawing the sleeve from the hole so as to fill the annular clearance between the element and the wall of the hole with self-setting composition.

4,179,862

VACUUM PACKING MACHINE WITH BAG END RETRACTOR

Bruno Landolt, Herisau, Switzerland, assignor to Inauen Maschinen AG, Herisau, Switzerland

Filed Jun. 19, 1978, Ser. No. 916,998
Int. Cl.² B65B *31/02*
U.S. Cl. 53—86 **4 Claims**



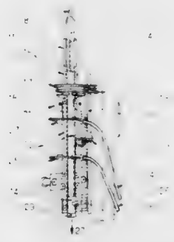
1. A vacuum packing machine having a vacuum chamber (**2**) defined by a housing (**1**), and a cover (**3**) for closing the chamber, characterized by: a recessed groove (**9**) defined in an edge (**7**) of the housing, and an elongated member (**10**) fastened to the cover (**3**) and disposed opposite the groove and generally parallel thereto when the cover is open for penetrating into the groove (**9**) when the cover is closed to automatically force end flaps (**6**) of a product bag projecting out beyond the housing edge into the groove, whereby the end flaps of the product bag are all drawn within the chamber to enable the subsequent vacuum evacuation of the bag.

4,179,863

APPARATUS FOR SECTIONING THERMOPLASTIC SHEATH AND PLACING RESULTING SLEEVES AROUND CONTAINERS

Jacques Fresnel, 15 Blvd. Lannes, Paris, France (75116)

Filed Aug. 1, 1978, Ser. No. 930,183
Claims priority, application France, Aug. 3, 1977, 77 23873; May 2, 1978, 78 12891
Int. Cl.² B65B *53/02, 61/00*
U.S. Cl. 53—295 **9 Claims**



1. An apparatus for automatic cutting at a programmed rate heat-shrinkable plastic sheaths into sleeves and placing the sleeves around containers, the sleeves being suitable for then being heat-shrunk around the containers, the apparatus comprising: a conveyor; a frame; means for heat-shrinking the sleeves; means on said frame for feeding a plastic sheath in flat form and for conveying it as a continuous web under predetermined tension conditions; at least one hollow mandrel; at least one vertical assembly means on said frame for cutting the sheath into sleeves and for supplying the sleeves around said hollow mandrel on which the continuous sheath is to be engaged, the assembly means including at least the following stations:

(a) means for removing pleats and fold lines on the flat sheath;

(b) means for cutting the sheath into the sleeves;

(c) staged means for automatically regulating height and rate of the cutting and at the same time for making it possible to keep said mandrel in its vertical position; and

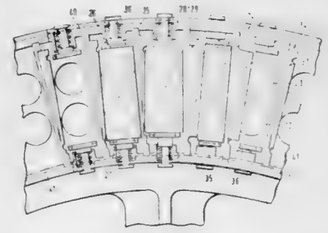
(d) means for guiding and ejecting the sleeves downward from said mandrel, these sleeves being automatically placed around the containers to be covered which are travelling on said conveyor, said conveyor being operatively associated with said means for heat-shrinking the sleeves around the containers.

4,179,864

APPARATUS FOR SETTING AND SHAPING GLUED CIGARETTE PACKS

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Pfuhl, Verden, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 816,068, Jul. 15, 1977, abandoned. This application May 9, 1978, Ser. No. 904,362
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1976, 2632968
Int. Cl.² B65B *51/14*
U.S. Cl. 53—388 **10 Claims**



1. An apparatus for setting glued flaps, tabs or the like of rectangular hinged lid cigarette packs folded from cardboard blanks and for simultaneously maintaining a predetermined configuration of the packs during the setting of the glued portions, comprising:

(a) a rotatable turret (**14**) having a plurality of forming and setting chambers (**15**) disposed around its outer periphery, each of said chambers being dimensioned to receive a single cigarette pack (**10**) and to maintain a predetermined configuration of said pack,

(b) each chamber being defined by:

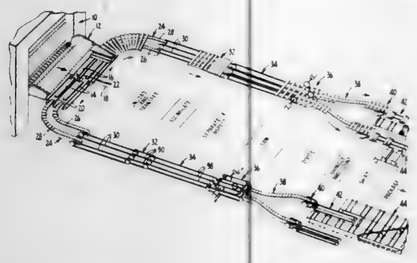
(1) a floor member (**21**) lying opposite an open entry and exit end of said chamber and having apertures (**22, 23**) therein for accommodating push rods (**16**) for ejecting a pack after its glued portions have set,

(2) inner and outer side walls (**26, 27**) lying opposite each other, and

(3) two wedge-shaped, spaced, radially oriented partition walls (**34**), each rectangular pack thus being engaged over five of its six planar faces when inserted in a chamber, and

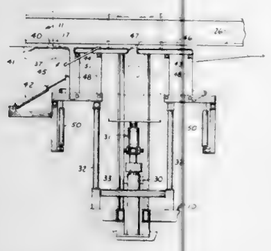
(c) the chambers being so oriented in the turret that their longitudinal axes lie parallel to the turret axis and define a cylindrical surface of revolution concentrically surrounding the turret axis.

4,179,865
PASTA NOODLE PACKAGING APPARATUS AND METHOD
Roy C. Pellaton, 2308 Virginia La., Stockton, Calif. 95204
Division of Ser. No. 827,736, Aug. 25, 1977, Pat. No. 4,147,081.
This application May 11, 1978, Ser. No. 904,928
Int. Cl.² B65B *35/44*
U.S. Cl. 53—435 **7 Claims**



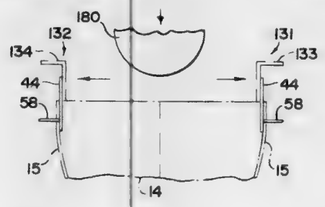
1. In combination with a stripper for stripping elongate pasta noodles from a high production pasta oven, an improved method for continuously packaging the output of the oven, said method comprising: dividing the output of the stripper into at least two components and directing said components along separate paths; conveying the respective components away from the stripper along separate paths with the elongate dimension of the noodles extending transversely of the direction of travel, said conveying step being carried out to first convey noodles away from the stripper at relatively high speed, then decrease the speed of conveyance to permit the noodles to accumulate and then increase the speed of conveyance to at least partially separate the noodles; separating the respective components into sub-components of a preselected number of noodles; and, individually packaging the sub-components.

4,179,866
CASE PACKER
Robert H. Graham, and Jerald R. McBride, both of Spokane, Wash., assignors to R. A. Pearson Company, Spokane, Wash.
Filed Apr. 3, 1978, Ser. No. 892,664
Int. Cl.² B65B *43/39, 5/06*
U.S. Cl. 53—468 **8 Claims**



6. A method of filling an open case having front, rear and side flaps depending downward along coplanar bottom fold lines joining the respective flaps to upright walls, comprising the following steps:
- conveying the open case along a longitudinal path transverse to its front and rear flaps;
- locating the case in a stationary condition at a packing station along said path;
- placing a load on a thin plate structure while at a first position elevationally beneath the packing station;
- moving the load and thin plate structure elevationally upward into the case at said packing station;
- folding and vertically supporting the front and rear flaps of the case beneath the thin plate structure while at said packing station;
- horizontally withdrawing the thin plate structure from the stationary case at the packing station by withdrawing the thin plate structure transversely to each side of the case;
- and subsequently imparting movement to the case and its contents outward from the packing station along said path.

4,179,867
PACKAGING MACHINE
William A. Bodolay, 5620 Live Oak Rd., Lakeland, Fla. 33803
Continuation of Ser. No. 470,331, May 15, 1974, abandoned.
This application Jan. 29, 1979, Ser. No. 7,297
Int. Cl.² B65B *9/06*
U.S. Cl. 53—568 **14 Claims**



1. A packaging machine of the type primarily designed to form containers from a folded web of material having an interior defined by opposing folded web portions, said machine comprising: frame means configured to define a flow path of travel and said web, web carrier means movably mounted on said frame and connected to said web along at least a portion of said flow path, said web carrier means at least partially disposed in supporting engagement with said web on the interior thereof, whereby fabrication of said web is performed as it travels along said flow path, said web carrier means including carrier belt means comprising at least two carrier belt elements, each of said carrier belt elements is mounted on the interior of opposite portions of said web, finger means affixed to the exterior surface of each of said carrier belt elements, said finger means of each of said carrier belt elements disposed in penetrating, supporting relation to the correspondingly positioned wall portions and outwardly from the interior of said wall portions, each of said carrier belt elements including a substantially continuous closed loop configuration, each of said carrier belt elements exposed to orient at least a portion of said closed loop configuration to travel along said flow path in substantially parallel relation to one another and in direct supporting engagement relative to said web.

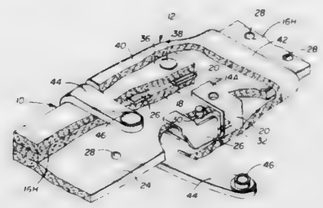
4,179,868
BAG FEEDING APPARATUS FOR POWDER MATERIAL PACKAGING
Angelo Raiteri, Ivrea, Italy, assignor to UNICEM-Unione Cementerie Marchino, Emiliane e di Augusta, S.p.A., Casale Monferrato and Andrea Doria, Ivrea, both of, Italy
Filed May 12, 1978, Ser. No. 905,321
Claims priority, application Italy, Jun. 10, 1977, 68352 A/77
Int. Cl.² B65B *43/26*
U.S. Cl. 53—571 **9 Claims**

1. A bag feeding apparatus for powder material packaging, in which the bags to be fed are each provided with a pair of flanges folded on two opposite edges of the bag, one of said flanges being provided with a valve; said apparatus including a magazine for holding a plurality of bags to be fed with each one standing substantially vertically on an edge of the bag

deprived of flange, a valve opening device having a substantially horizontal axis and adapted to receive the valve flange of the bag lying on said axis, mounting means for mounting said valve opening device so as to locate said horizontal axis substantially in the vertical plane in which the valve flange of said bags are standing in said magazine, a plurality of vacuum cups, for picking off said bags one at a time from said magazine, a rectilinear arm carrying said vacuum cup in an inline arrangement, a shaft for pivotally mounting said arm so that the various vacuum cups of said plurality have progressively increasing distances from said shaft, means for rocking said arm in said plane from a substantially vertical position where said cups engage said valve flange to a horizontal position where said valve flange lies on said horizontal axis, and means for telescopically extending said arm parallely to the line of cups to insert the valve flange of the picked off bag into said valve opening device.

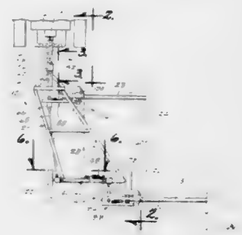


4,179,869
STIRRUP BUCKLE SHEATH
Thomas A. Horst, 2801 N. 111th St., Lafayette, Colo. 80026, and Charles L. Welton, Golden, Colo., assignors to Thomas A. Horst, Lafayette, Colo., a part interest
Filed May 22, 1978, Ser. No. 907,975
Int. Cl.² B68C *1/16*
U.S. Cl. 54—46 **6 Claims**



1. The sheath for removably encasing a two-part openable buckle on the overlapped ends of an adjustable stirrup-supporting belt which comprises: a sheet of leather shaped and closed to form a flattened tube open at both ends, said tube including a pocket intermediate its ends sized to accept the buckle in closed position and maintain same in such condition while housed therein, one of said ends being necked-down to a reduced size adapted to slidably receive the belt while remaining too small to pass over the buckle, at least one integrally-formed strap-forming flap depending from said other end of the tube, and fastener means carried by said flap cooperating therewith to define a belt-encircling collar, said collar being openable to pass over the buckle upon slidable movement of the pocket along the belt into buckle-receiving position, and said collar in closed position being effective to encircle said belt and prevent movement of the pocket therealong to a position where the buckle lies outside thereof.

4,179,870
TRAILING TANDEM MOWER
Dan D. Rowse, Burwell, Nebr., assignor to Rowse Hydraulic Rakes Company, Inc., Burwell, Nebr.
Filed Jul. 13, 1977, Ser. No. 815,096
Int. Cl.² A01D *75/30, 55/28*
U.S. Cl. 56—6 **20 Claims**



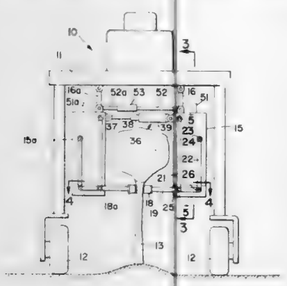
9. A tractor pulled tandem mower having cutting bars on a mower frame offset rearwardly and laterally to provide end-to-end cutting and including steering means for moving the mower between cutting and transport positions comprising,
- a generally rigid mower frame pivotally connected through a tongue to the drawbar of a tractor,
- a pair of cutting bars on said frame offset rearwardly and laterally and pivotable between a horizontal cutting position and a vertical transport position,
- a pair of steerable wheels connected to the rear end of said frame for pivotal steering movement about respective upright axes and
- means for steering said wheels about said respective axes in unison thereby to steer said mower between cutting and transport positions with said cutting bars in said cutting position extending perpendicular to the line of travel of said tractor and mower and in said transport position extending rearwardly of said perpendicular cutting position and with said mower in said transport position and said cutting bars in their raised transport position said frame and cutting bars being positioned substantially directly behind said tractor.

4,179,871
SUSPENSION SYSTEM FOR HARVESTER SHAKER MEMBER
Gerald L. Claxton, Fresno, Calif., assignor to Up-Right, Inc., Berkeley, Calif.
Filed Feb. 17, 1978, Ser. No. 878,921
Int. Cl.² A01D *46/00*
U.S. Cl. 56—330 **10 Claims**

1. A harvesting machine comprising:
- (a) a mobile inverted-U-shaped frame adapted to move longitudinally onto and straddle a plant,
- (b) a pair of opposed shaker elements disposed generally at the longitudinal centerline of said frame,
- (c) an elongated and generally horizontal support member associated with each of said shaker elements, each support member extending generally transverse of said frame and having opposed ends one of which is fixed to the shaker member with which it is associated and the other of which is spaced from said shaker element outwardly from said longitudinal centerline of said frame,
- (d) a pair of elongated and generally vertical suspension

members operatively associated with each of said support members, the first suspension member of each pair being longer than the second member of each pair,

(e) means pivotally connecting the upper end of the first suspension member of each pair to said frame and pivotally connecting the lower end of said first suspension member to an intermediate point on the support member with which said first suspension member is associated,



(f) means pivotally connecting the upper end of the second suspension member of each pair to said frame and pivotally connecting the lower end of said second suspension member to said other end of the support member with which said second suspension member is associated,

(g) means for reciprocating said opposed shaker elements in unison and transversely of said frame.

4,179,872

HAYMAKING MACHINE FOR CENTRAL TEDDING AND LATERAL WINDROWING

Frédéric Gerlinger, Ottersthal, France, assignor to Kuhn, S.A., Saverne, France

Filed Nov. 4, 1977, Ser. No. 848,592
Claims priority, application France, Nov. 5, 1976, 76 34064
Int. Cl.² A01D *81/00*
U.S. Cl. 56—366 **7 Claims**



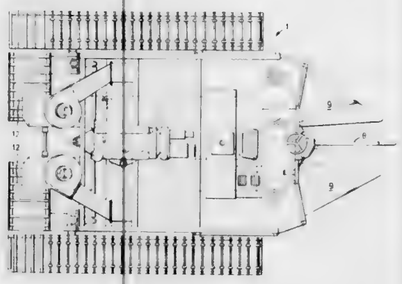
1. In a combined haymaking machine for central tedding and lateral windrowing, having at least two rotary rake heads carrying working tools, which are driven in rotation and are interconnected by means of a support chassis upon which at least one frame is pivotally mounted which extends forward in the direction of travel of the machine and permits the coupling of the machine to a propelling vehicle; the improvement comprising means carried by the chassis automatically to cause the reversal of the direction of rotation of at least one of the rotary rake heads when the relative position between the support chassis of the rotary rake heads and said frame beam permitting coupling of the machine to a propelling vehicle is modified, thereby to transpose the machine from the central tedding position into the lateral windrowing position and vice versa.

4,179,873

HARVESTERS FOR HARVESTING BERRIES

Roy Scudder, Marden, England, assignor to Edward Day, Marden, England

Filed May 16, 1977, Ser. No. 797,387
Claims priority, application United Kingdom, May 17, 1976, 20335/76
Int. Cl.² A01D *46/00*
U.S. Cl. 56—330 **5 Claims**



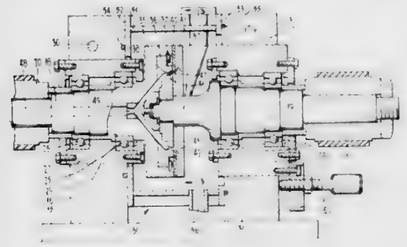
1. A harvester for bush grown crops such as currants adapted to operate in either of two entirely different discrete operating modes, a "mature bush" mode wherein each bush is split into halves and the two halves are spread apart and then shaken by applying shaking means to the inner side of each half, and a "young bush" mode wherein the bushes are shaken by applying shaking means to opposite outer sides of the bushes, said harvester comprising a carriage having a main frame, drive wheels, and a power means for driving the wheels such that the harvester is adapted to move longitudinally along a row of bushes in a bush straddling position, two laterally disposed sub-frames also straddling the bushes, two laterally disposed cylindrical shaker devices mounted for free rotation about their own axes on said respective sub-frames, said shaker devices having radially extending tines to engage the bushes, whereby, because of the relative movement between the bushes and shaker devices, said shaker devices are caused to rotate at a rate proportional to the velocity of said harvester, said shaker devices also including oscillatory means for superimposing an oscillatory increment upon the rotation of said shaker devices to thereby cause said tines to shake the bushes, bush divider means removably mounted on said main frame, and projecting downwardly and forwardly therefrom centrally and longitudinally of the harvester, for dividing the bushes into two halves and spreading the halves for operation in the "mature bush" mode, said removable mounting being applicable for detaching said divider means from said harvester for operation in the "young bush" mode, means for pivotally mounting a lower portion of each of said sub-frames on said main frame for angular movement about a longitudinally extending horizontal axis, means for selectively securing said sub-frames to said main frame in a selected one of two discrete relative angular positions associated respectively with said two discrete operating modes, in both of which positions the axes of said shaker devices diverge upwardly and outwardly from one another in a generally V shaped arrangement, in that one of which positions which is associated with the "mature bush" mode the axes of said shaker devices subtend a substantial angle with the vertical so that the laterally outer portions of the shaker devices are adapted to engage the inside portions of the spread mature bush halves, and in that one of which positions which is associated with the "young bush" mode the axes of said shaker devices are substantially vertical so that the laterally inner portions of the shaker devices are adapted to engage the laterally outer portions of the young bushes, laterally opposed crop catcher means disposed below said shaker devices, and conveyor means associated with said catcher means for transporting the crop to the rear of the harvester.

4,179,874

METHOD AND APPARATUS FOR THE SPINNING OF YARN

Alan N. Jacobsen, 14 Raheen Dr., Kew, Victoria, Australia

Filed Oct. 23, 1978, Ser. No. 953,345
Claims priority, application Australia, Oct. 21, 1977, 2148/77
Int. Cl.² D01H *1/12*
U.S. Cl. 57—58.89 **13 Claims**



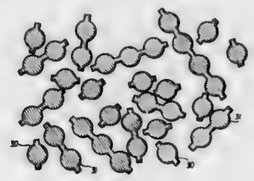
1. A method of spinning yarn comprising collecting fibres in an internal annular recess in a member rotating about the axis of the member, peeling a continuous assembly of fibres from said recess and delivering the assembly of fibres in a continuous stream to one axial end of a surface of revolution, drawing the assembly of fibres across said surface from said one axial end to an opposite axial end while simultaneously effecting movement between the assembly of fibres and said surface to cause the assembly of fibres to roll upon the surface whereby the fibres of the assembly are twisted together to form a yarn.

4,179,875

HIGH TENACITY, LOW DENIER POLY(ETHYLENE TEREPHTHALATE) FIBRILLATED TAPE YARN

John D. Gibbon, Charlotte, N.C., assignor to Fiber Industries, Inc., New York, N.Y.

Division of Ser. No. 633,758, Nov. 20, 1975, Pat. No. 4,036,003. This application Jun. 14, 1978, Ser. No. 915,628
Int. Cl.² D02G *3/06, 3/46*
U.S. Cl. 57—248 **5 Claims**



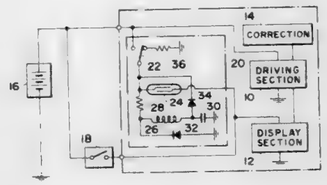
1. A low denier, high tenacity, loosely cohered, relatively uniformly fibrillated poly(ethylene terephthalate) tape yarn comprising filaments of individual unit cross-sections and filaments of multiple unit cross-sections, the cross-sections of said multiple unit cross-section filaments being a whole number multiple of said individual unit cross-section.

4,179,876

DIGITAL CLOCK FOR MOTOR VEHICLES

Masakazu Moriyama, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 12, 1977, Ser. No. 832,549
Claims priority, application Japan, Nov. 22, 1976, 51-140374; Feb. 10, 1977, 52-13645
Int. Cl.² G04C *17/00, 19/00, 23/00*
U.S. Cl. 58—50 R **2 Claims**



1. A motor vehicle digital display clock comprising:

a clock driving section having means for generating time signals and adapted to send out desired time signals;

a digital time display section having an electric current consuming type luminescent element performing prescribed digital time display in response to said time signals from said clock driving section;

a main switch means consisting of a main switch placed between said digital time display section and a battery, and performing the display action of said digital time display section by on and off action interlocked to an ignition key switching; and

an auxiliary switch means for actuating said display action of said digital display section by switching operation of an auxiliary switch connected in parallel with said main switch when said main switch is off, said auxiliary switch means comprising a manipulation switch, a switching element which is normally opened and connected in parallel with said main switch, and a timer circuit which comprises a counter which counts to a prescribed number of said time signals of said clock driving section and which closes said switching element during a prescribed period after a switching operation of said manipulation switch thereby said digital display section performs digital time display.

4,179,877

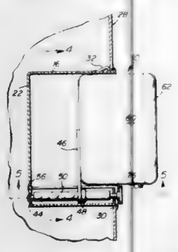
PORTABLE, VEHICLE-MOUNTED, SELF-CONTAINED ALARM CLOCK

Woodrow A. Wilson, Longview, Tex., and Herschel O. Koska, P.O. Box 5937, Longview, Tex. 75604, assignors to Herschel O. Koska, Longview, Tex., by said Woodrow A. Wilson

Filed May 26, 1977, Ser. No. 800,923
Int. Cl.² G04B *37/14*
U.S. Cl. 58—56 **4 Claims**

1. In combination, a self-contained, battery operated, portable, alarm clock, a vehicle dashboard panel having an opening therethrough capable of receiving said clock, and means securely and releasably mounting said clock in the panel opening to enable the clock to be supported in the vehicle dashboard panel and readily removed therefrom to enable it to be transported to a desired location for general utility, said clock including a casing receiving the clockworks and a time indicating means visible externally of the casing, said securing means including a mounting receptacle insertable into the panel opening and including an open portion accessible through the panel for telescopically receiving the clock casing, said clock casing and mounting receptacle including coacting recess and projecting means for releasably retaining the clock casing telescoped into the mounting receptacle, said projecting means supporting the clock on a supporting surface when removed

from said dashboard, said mounting receptacle including a peripheral flange defining the open portion with the flange projecting outwardly from the periphery of the mounting receptacle for engagement with one surface of the panel adjacent the opening therethrough, resilient retaining means mounted on said receptacle in opposed and closely spaced



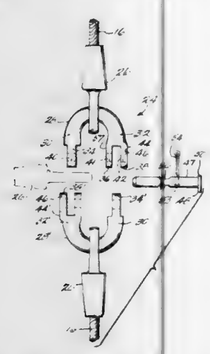
relation to the flange for engaging the opposite surface of the panel with respect to the flange for retaining the mounting receptacle in the opening with such resilient means being capable of inward movement to enable the mounting receptacle to be inserted through the opening in the panel from the side of the panel which is to be engaged by the flange.

4,179,878

IMPROVED COUPLING LINK

Rocco D. Albertini, Concordville, Pa., assignor to Baldt Incorporated, Chester, Pa.

Filed Aug. 8, 1977, Ser. No. 822,911
Int. Cl.[2] F16G 15/04
U.S. Cl. 59—85 **2 Claims**



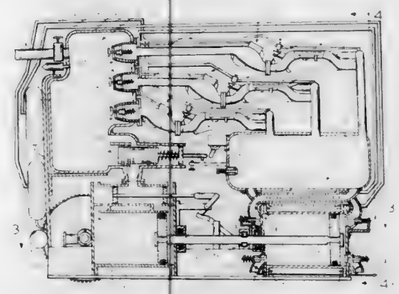
1. A coupling link comprising:
two similarly constructed generally U-shaped half links each having two legs with one leg terminating in a single pin receiving portion and the other leg terminating in a pair of pin receiving portions,
each of said pin receiving portions of each half link having a cylindrical bore extending therethrough with the axis thereof aligned with the axes of the other two bores,
the pair of pin receiving portions of each half link being spaced apart in an axial direction with respect to the common axis of said bores so as to provide an axially outward pin receiving portion having an axially outer surface and an axially inward pin receiving portion having an axially inner surface,
said half links being assembled with the single pin receiving portion of each half link fitted axially between the axially inward and outward pin receiving portions of the other half link and all of said bores in axial alignment,
the axially outer surface of each axially outward pin receiving portion having an annular recess therein surrounding the bore thereof,
a pin having a cylindrical shank engaged within said bores and an enlarged head on one end thereof disposed within the annular recess in the axially outward pin receiving portion of one half link, the opposite end of said pin being disposed axially inwardly of the axially outer surface of the other half link,
the cylindrical shank of said pin having a pair of parallel flat surfaces formed in the exterior periphery thereof in a position between the axially inward pin receiving portions of said half links and a transversely extending opening therethrough adjacent the axially inward surface of the axially inward pin receiving portion of said one pair, and
a cotter pin extending through said opening and disposed in operative engagement with the axially inner surface of the axially inward pin receiving portion of said one pair,
the arrangement being such that by engaging a turning tool with said parallel flat surfaces said cylindrical shank can be moved rotationally within said bores with respect to both of said half links and held into a position enabling said cotter pin to be readily removed from said opening and placed therein.

4,179,879

AUTOMATIC STEAM PRESSURE GENERATOR

Elmo Kincaid, Jr., 1160 Ashley Dr., Clarkston, Wash. 99403

Division of Ser. No. 678,987, Apr. 21, 1976, Pat. No. 4,079,588.
This application Feb. 9, 1978, Ser. No. 876,366
Int. Cl.[2] F02G 9/04
U.S. Cl. 60—39.09 R **2 Claims**



1. An automatic steam pressure generator comprising:
(a) compression means configured for compressing ambient air,
(b) power means operatively connected to the compression means and configured for powering thereof,
(c) heat exchanger means configured for receiving the compressed air from the compression means and transferring heat therefrom to preheat injection water,
(d) an air receiving tank joined to the compression means for receiving the compressed air after it leaves the heat exchanger means,
(e) a plurality of continuous combustion burner means connected to the air receiving tank and configured to burn fuel, supplied thereto with the compressed air, producing high pressure, high temperature combustion products,
(f) water injection means joined to the burner means and configured for injecting the preheated injection water into the combustion products providing a lower temperature mixture of steam and combustion products,
(g) steam storage means connected to the water injection means for storing the mixture of steam and combustion products,

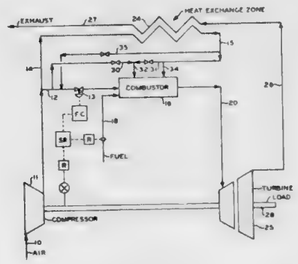
(h) each of said continuous combustion burner means including burner automatic control means, configured for activating its associated burner means and for controlling the amount of fuel and compressed air supplied to said burner means, for controlling the output of said burner means, the control means being responsive to the pressure in the air receiving tank, said burner automatic control means comprising:
(1) a cylinder open at one end to the air receiving tank, and having a port defined therein, said port opening to said burner means,
(2) a piston configured for free sliding fit within the cylinder, said piston being large enough to sealingly cover and close said port,
(3) a needle valve located within the burner means having a gear located on its terminal portion, and an orifice located at the end of the burner means in alignment with the needle valve,
(4) the needle valve being threaded into the burner means in a manner such that turning the needle valve causes it to be positionable in the burner means in a manner allowing opening and closing of the orifice,
(5) a piston rod extending from the piston and having gear teeth positioned in a manner that movement of the piston away from the air receiving tank causes the needle valve to rotate in a direction opening the orifice and movement of the piston toward the air receiving tank causes the needle valve to rotate in a direction closing the orifice,
(6) a spring normally urging the piston to a position wherein the piston covers the port and said gear teeth on the piston rod cause the needle valve to close said orifice,
(7) adjustment means engaging the spring in the cylinder in a manner allowing setting the spring tension for allowing the port and orifice to be opened at a predetermined pressure, and thereafter to be opened proportional to the pressure of the air in the air r ceiving tank, and
(8) ignition means associated with each of said burner means.

4,179,880

COMBUSTION PROCESS AND APPARATUS THEREFOR

Robert M. Schirmer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 422,316, Dec. 6, 1973, Pat. No. 3,986,347.
This application Aug. 31, 1976, Ser. No. 719,218
Int. Cl.[2] F02C 7/22
U.S. Cl. 60—39.23 **20 Claims**



1. An apparatus for producing and utilizing heat energy, comprising, in combination:
(a) an air supply conduit;
(b) a combustion means for burning a fuel to produce hot combustion gases containing heat energy, said combustion means comprising a primary combustion region, a secondary combustion region located downstream from said primary combustion region and a quench or dilution region located downstream from said secondary combustion region;
(c) a fuel inlet conduit means for introducing a fuel into said primary combustion region;
(d) a primary air conduit means connected to said air supply conduit and to said combustion means for introducing a stream of air comprising primary air into said primary combustion region;
(e) a heat exchange means;
(f) a quench air and heated secondary air conduit means connected to said air supply conduit, said heat exchange means, and said combustion means for delivering a stream of air from said air supply conduit, through said heat exchange means and into said secondary combustion region and said quench or dilution region at a temperature higher than the temperature of said primary air;
(g) a heat energy utilization means for utilizing a portion of said heat energy;
(h) an effluent conduit means for passing hot combustion gases from said combustion means to said heat energy utilization means;
(i) an exhaust conduit means connecting said heat energy utilization means and said heat exchange means for passing hot combustion gases from said heat utilization means and into heat exchange relationship with the air in said quench air and heated secondary conduit to heat said air and thereby utilize an additional portion of said heat energy;
(j) a control valve disposed in said primary air conduit;
(k) control means operatively connected to said control valve in said primary air conduit and operatively connected to at least one of (1) said fuel inlet means and (2) a shaft means in said heat utilization means for controlling the rate of introduction of said primary combustion air into said combustion means in accordance with at least one of (1) the rate of introduction of said fuel into said combustion means and (2) the speed of said shaft means; and
(l) an unheated secondary air conduit means connected to said primary air conduit upstream from said control valve and to said quench air and heated secondary air conduit means for introducing air from said primary air conduit into said quench air and heated secondary air conduit to adjust the temperature of the air therein.

4,179,881

PREMIX COMBUSTOR ASSEMBLY

Joseph E. Faucher, East Hartford; Robert W. Koucky, West Hartford, and William D. Roy, Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 336,578, Feb. 28, 1973, abandoned. This application Oct. 17, 1974, Ser. No. 515,789
Int. Cl.[2] F02C 7/22
U.S. Cl. 60—39.71 **15 Claims**



1. A combustor assembly for an axial flow gas turbine engine including a compressor forward of said assembly and a turbine rearward of said assembly, said combustor assembly comprising:

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casing means forming an annular space about the engine axis;
wall means disposed within said annular space forming an annular combustion chamber, said chamber including inner and outer walls defining a combustion zone at the upstream end of said chamber, said wall means forming an outlet at the downstream end of said chamber for directing combustion products into the turbine;
duct means within said annular space forming a premixing passage having an inlet and an outlet, said premixing passage being wholly forward of said passage outlet, said inlet adapted to receive, into said premixing passage, air being discharged from the compressor; and
fuel supply means disposed within said premixing passage for introducing fuel into said premixing passage, the flow of air within said premixing passage atomizing the fuel within the premixing passage, said premixing passage outlet being adjacent one of said walls of said chamber and being spaced from the other of said walls and being in gas communication with said combustion zone, said wall means including baffle means disposed across said outlet of said premixing passage, for directing the fuel-air mixture from said premixing passage radially across said combustion zone toward said other wall of said chamber, said baffle means having a plurality of openings therethrough which in combination comprise thirty to fifty percent of the baffle area, said wall means including means to impart a downstream velocity to said fuel-air mixture immediately upon its being directed radially toward said other wall, said baffle means including a downstream facing surface creating stabilization regions within said combustion zone immediately adjacent said downstream facing surface of said baffle means between adjacent openings, wherein said stabilization regions are a continuous ignition source for said combustion zone during operation.

4,179,882

APPARATUS FOR CONTROLLING THE AMOUNT OF SECONDARY AIR FED INTO AN INTERNAL COMBUSTION ENGINE

Tadao Mitsuda; Minoru Iwata, both of Susono; Masatoshi Sugiura; Shigetaka Takada, both of Obu, and Yukihiro Watanabe, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aisan Idustry Co., Ltd., both of Toyota, Japan

Filed Jun. 2, 1978, Ser. No. 912,007
Claims priority, application Japan, Oct. 15, 1977, 52-123002
Int. Cl.² F01N *3/10*
U.S. Cl. 60—276 **14 Claims**



1. An apparatus for controlling the amount of secondary air fed into an internal combustion engine, comprising:
means for generating a first electrical signal of a level which indicates an equivalent air-fuel ratio condition of said engine;
means including a secondary air flow control valve, having an initial position, for controlling the amount of secondary air to be fed into said engine, in accordance with a predetermined change in the level of an absolute pressure signal applied thereto;
a first applying means for applying an absolute pressure signal to said means for controlling the amount of secondary air, in response to a predetermined level of said first electrical signal;
means for generating a second electrical signal of a level which indicates that said air flow control valve is in the initial position, and;
a second applying means for rapidly applying an absolute pressure signal to said means for controlling the amount of secondary air, in response to both of said first electrical signal and said second electrical signal, said second applying means being constructed to be operated independently of said first applying means.

4,179,883

REED VALVE ASSEMBLY

Takahiko Nishiyama, Kamakura, and Kenji Haga, Fujisawa, both of Japan, assignors to Nippon Oil Seal Industry Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1977, Ser. No. 777,456
Claims priority, application Japan, Oct. 21, 1976, 51-142062
Int. Cl.² F01N *3/10*
U.S. Cl. 60—293 **1 Claim**



1. In a secondary-air exhaust gas recombustion system for internal combustion engines having noise-propagating passageways, a reed valve assembly comprising,
a reed valve case having a secondary-air supply port and a secondary-air outflow passage,
a valve seat surrounding said secondary-air supply port,
a reed secured in said reed valve case covering said valve seat,
a secondary-air supply means from said secondary air outflow passage to an exhaust gas recombustion means, and
a coating of gummous material applied to the interior surface of the noise-propagating passageways including said reed valve case,
said coating of gummous material being applied by the steps comprising,
spreading an adhesive on the interior surface, applying a large number of short fibers to the adhesive-spread surfaces, and
spraying the gummous coating material onto the fiber layer.

4,179,884

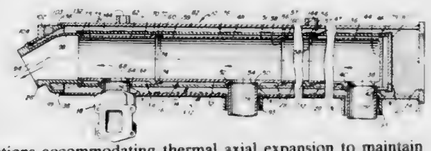
WATERCOOLED EXHAUST MANIFOLD AND METHOD OF MAKING SAME

Werner H. Koeslin, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 8, 1977, Ser. No. 822,846
Int. Cl.² F01N *7/06, 7/10*
U.S. Cl. 60—321 **12 Claims**

1. In an exhaust gas manifold for an internal combustion engine comprising a casing having axially spaced apart gas inlet apertures therethrough, in combination an internal exhaust conduit nested in said casing, said exhaust conduit comprising a plurality of sections, each section slidably interfitting with an adjoining section, radially disposed means between sections of the exhaust conduit and said casing to hold the sections in spaced relation from said casing and to form dead air spaces between said exhaust conduit and said casing, each

said section having an aperture aligned with one of the gas inlet apertures in said casing with said slidable interfit between said



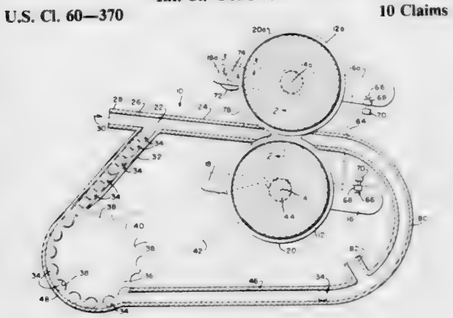
sections accommodating thermal axial expansion to maintain said alignment between the apertures in said casing and said sections.

4,179,885

TURBINE-WHEELED POWER DEVICE

Alvin S. Hopping, deceased, late of Lake Hopatcong, N.J., by Clifford A. Johnson, executor, Dover, N.J., assignors to Markley D. Fell, Hackettstown, N.J.

Filed Feb. 16, 1978, Ser. No. 878,328
Int. Cl.² F03G *3/00*
U.S. Cl. 60—370 **10 Claims**



1. A turbine-wheeled power device, comprising:
a plurality of journaled turbine wheels;
said turbine wheels of said plurality thereof each having a missile-impingement surface;
means disposing said surfaces in juxtaposition; and
means for addressing missiles to said surface to cause said turbine wheels to rotate.

4,179,886

METHOD AND APPARATUS FOR OBTAINING USEFUL WORK FROM WAVE ENERGY

Junjiro Tsubota, 2392, Jindaiji-Machi, Chofu-shi, Tokyo 182, Japan

Filed Nov. 8, 1977, Ser. No. 849,620
Int. Cl.² F03B *13/12*
U.S. Cl. 60—398 **10 Claims**

1. Apparatus for obtaining useful work from or with waves, comprising: a buoyant body having an upper surface and a leading edge and a trailing edge, and constructed to float at the surface of a body of water with the upper surface of the buoyant body disposed beneath the surface of the body of water, said trailing edge being convex and curving sharply downward, said buoyant body having width and length dimensions selected such that the smaller of said dimensions is not substantially greater than approximately one half of the wave length, the movement of water particles in the waves being active upon the buoyant body in both directions of pitching motion to efficiently impart energy force to the buoyant body in both directions of pitching motion as well as in heaving motion; and mechanical means associated with the buoyant body and connected therewith to be driven by at least one of the heaving and pitching motions of the buoyant body, said mechanical means including projecting means placed on said buoyant body to define a constricted open-ended water flow channel on said body and to protrude into an orbital range of rolling motion of water in the waves, said projecting means intercepting said



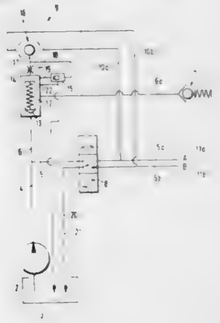
water and converting said rolling motion into substantially linear motion, and means connected to said body utilizing energy of said linear flow and of said pitching and heaving motions.

4,179,887

HYDRAULIC CONTROL WITH DELAY

Gerhard Ridder, and Wilhelm Schäfer, both of Witten-Bommern, Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Apr. 24, 1978, Ser. No. 899,067
Claims priority, application Fed. Rep. of Germany, May 25, 1977, 2724233
Int. Cl.² F15B *11/20*
U.S. Cl. 60—420 **7 Claims**



1. Hydraulic device for delayed pressurization of primary user of hydraulic fluid such as a clutch or brake while maintaining a reduced flow of fluid to an independently operating secondary user, comprising:
a pump for the fluid operating at an essentially constant flow rate by volume;
first conduit means connected to the pump to receive therefrom pressurized fluid;
second and third conduit means branching off the first conduit means, the primary user being connected to the second conduit means, the secondary user being connected to the third conduit means;
a control valve connected in the second conduit means for on-off control of hydraulic energization of the primary user;
a pressure controller including a differential piston in a corresponding piston chamber and being connected in the third conduit means, wherein a first piston of the differential piston operates under pressure as applied from the first

conduit means to open a pressure dependent fluid passage to the secondary user through the piston chamber;

fourth conduit means branching off the second conduit means between the control valve and the primary user and including a flow retaining throttle valve connected to a second portion of the differential piston to operate the differential piston in dependence upon the flow conditions of the throttle valve; and

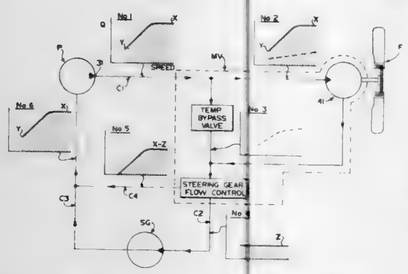
a check valve connected to the piston chamber and to a second piston, by-passing the throttle for rapid action venting of the piston chamber portion in which the second piston moves.

4,179,888

HYDRAULIC FAN DRIVE SYSTEM

Edward J. Goscenski, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 18, 1978, Ser. No. 907,064
Int. Cl.[2] F15B *11/16*
U.S. Cl. 60—420 **12 Claims**



1. A vehicle engine accessory drive system comprising:

(a) an engine driven pump including a pumping element operable to deliver fluid at a rate generally proportional to engine speed, and fluid inlet and outlet ports, said pump having a fluid delivery rate of Y at engine idle, said pump comprising the sole source of pressurized fluid for said system and including first flow control valve means operable to limit the fluid delivery rate of said pump to X at higher engine speeds, X being substantially greater than Y;

(b) a hydraulic fan motor having fluid inlet and outlet ports, said fluid inlet port being connected to said pump outlet port, said fan motor having a fan speed at engine idle corresponding to a fluid flow rate of approximately Y, and a fan peak speed corresponding to a fluid flow rate of approximately X;

(c) bypass valve means connected in parallel with said fan motor, operable to bypass said fan motor and being responsive to the need for cooling, said bypass valve means being capable of bypassing at least a major portion of X at a first relatively lower temperature and capable of substantially preventing bypass flow at a second relatively higher temperature;

(d) second flow control valve means having its inlet in fluid communication with said outlet port of said fan motor and with said bypass flow, said second flow control valve means having primary and secondary fluid outlets and being operable to communicate a fluid flow rate of approximately Z from said fluid inlet to said primary outlet over substantially the entire range of operating engine speeds and to communicate substantially all fluid flow in excess of Z from said inlet to said secondary outlet, Z being substantially less than X;

(e) an open-center steering gear mechanism having inlet and outlet ports, said inlet port being in fluid communication with said primary outlet of said second flow control valve means;

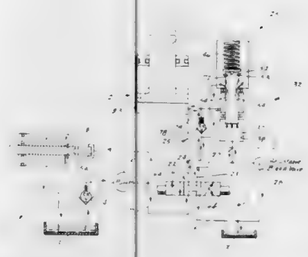
(f) said outlet port of said steering gear mechanism and said secondary outlet of said second flow control valve means being in fluid communication with said fluid inlet port of said pump.

4,179,889

CONTROL CIRCUIT FOR HYDRAULIC CYLINDER AND SHAFT ASSEMBLY

John T. Gondek, 1641 Innsbruk Cir. W., Minneapolis, Minn. 55421

Filed Feb. 22, 1978, Ser. No. 880,292
Int. Cl.[2] F15B *15/18*
U.S. Cl. 60—477 **13 Claims**



1. A control circuit for a hydraulic cylinder and shaft assembly to regulate movement of the shaft relative to one end of the cylinder, comprising:

(a) a variable pressure fluid supply means and a reservoir therefor; and

(b) metering valve means having:

(1) a first open passage means connected at one end to said one cylinder end and connectable at an opposite end to said fluid supply means to provide an open path for fluid flow from said supply means to said one cylinder end; and

(2) a second normally closed passage means connected at one end to said one cylinder end and connectable at an opposite end to said reservoir, said valve means actuable by a piloting pressure fluid from said variable fluid pressure supply means to adjustably open said normally closed passage means in response to the pressure of the fluid from said supply means; and

(c) said fluid supply means, in a first condition thereof, supplying fluid under a pressure through said first passage means to said one cylinder end to move said shaft from said one cylinder end, and in a second condition thereof, supplying pilot fluid under variable pressure to said metering valve means, to actuate said valve means and regulate fluid flow from said one cylinder end to said reservoir through said normally closed passage means to provide a precisely controlled movement of said shaft toward said one cylinder end.

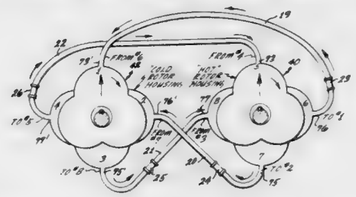
4,179,890

EPITROCHOIDAL STIRLING TYPE ENGINE

Goodwin Hanson, 4640 W. 118th St., #218, Hawthorne, Calif. 90205

Filed Apr. 4, 1978, Ser. No. 893,956
Int. Cl.[2] F02G *1/04*
U.S. Cl. 60—519 **9 Claims**

1. An engine having two epitrochoidal piston housings each having a plurality of lobes, a lobed rotary piston in each piston housing, a gas connection between each lobe of one piston housing and a lobe of the other piston housing for transfer of gas, shaft means for the rotary pistons, cam means associated with the shaft means and connected to the rotary pistons, the cam means being constructed for movement in a predetermined accurate orbit whereby the rotary pistons are constrained to the same accurate orbit within the respective piston housings.

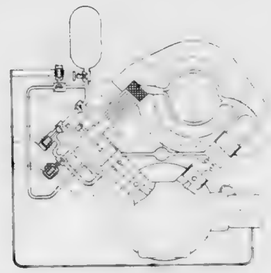


4,179,891

POWER CONTROL DEVICE FOR HOT GAS ENGINES

Karl O. R. Gronvall, Borensberg, Sweden, assignor to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Apr. 12, 1978, Ser. No. 895,586
Claims priority, application Sweden, May 7, 1977, 7707767
Int. Cl.[2] F02G *1/06*
U.S. Cl. 60—521 **4 Claims**



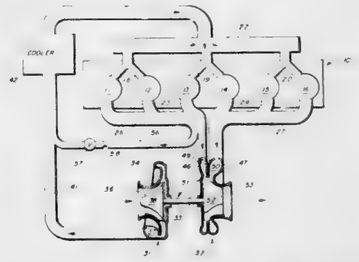
1. In a power control device for maintaining a predetermined speed of a hot gas engine irrespective of the engine load and of the type in which the power output from the engine is governed by adjusting the amount of working gas in the engine having a control system signalling as a function of speed change a set of solenoid valves for controlling the pumping of working gas in a conduit system between the engine and a reservoir, the improvement comprising, a gas compressor having a suction stroke and pumping stroke coupled to the engine and reservoir through a branched conduit including (a) a check valve connecting the compressor with the reservoir to pump gas under pressure from the compressor into the reservoir and (b) power control means operating a one-way flow check valve admitting gas to the compressor from the engine on the suction stroke under control of a solenoid for keeping it open for gas flow in both directions when the engine is running at a predetermined constant speed and permitting it to function as a one-way flow check valve so that the compressor will pump gas to said reservoir when the speed increases above said predetermined speed.

4,179,892

INTERNAL COMBUSTION ENGINE WITH EXHAUST GAS RECIRCULATION

Hans Heydrich, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 27, 1977, Ser. No. 864,811
Int. Cl.[2] F02B *37/00*
U.S. Cl. 60—605 **12 Claims**



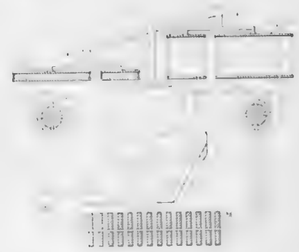
1. In an internal combustion engine including a plurality of cylinders and an intake manifold connected to supply air to said cylinders, the improvement comprising an exhaust manifold divided into first and second sections, said first section being connected to receive exhaust gases from a set of EGR pumping cylinders and said second section being connected to receive exhaust gases from the remaining set of cylinders, an EGR line connected to conduct exhaust gases from said first exhaust manifold section to said intake manifold, a turbine-compressor unit including a compressor connected to supply air to said intake manifold, and a turbine divided into first and second sections, said first turbine section being connected to receive exhaust gases from said first exhaust manifold section and said second turbine section being connected to receive exhaust gases from said second exhaust manifold section, and said first turbine section having a smaller flow area than said second turbine section and thereby increasing the pressure in said first manifold section to above the pressure in said intake manifold.

4,179,893

SOLAR ENGINE CALLED, BELLOWS SOLAR ENGINE

Louis R. O'Hare, 1041 Ponderosa #2, Fort Collins, Colo. 80521

Filed Jul. 11, 1977, Ser. No. 814,283
Int. Cl.[2] F02C *1/04*
U.S. Cl. 60—682 **5 Claims**



1. A constant pressure, variable volume thermodynamic cycle engine comprising:

(1) sealed and gas tight cooling means provided with inlet and outlet pressure tight ducting and,

(2) sealed and gas tight gas heating means provided with inlet and outlet pressure tight ducting and,

(3) gas pressure and gas force to mechanical energy conversion means in the form of sealed bellows capable of expansion and contraction by the respective filling and removal of heat pressurized gas such as air and,

(4) gas pressure distribution means providing alternately one then another set of routings of gas pressure, one of said set of routings providing a flow passage between a large expanding bellows connected to a lever on one side of a fulcrum and a smaller bellows connected to the lever arm on the opposite side of the fulcrum said gas flow passage having the gas heater means in the center of the gas flow between the large expanding bellows and the small contracting bellows, and the other routing of the first set of routings providing a gas flow communication between a smaller expanding bellows on the same side of the fulcrum as the large expanding bellows with a large contracting bellows on the opposite side of the fulcrum said flow communication thereby being routed through a cooling means in an intermediate position between said bellows, the second and alternate set of routings being provided by the alternate positioning of the gas distribution means providing for an exchange in the flow circuitry when the large expanding bellows has reached its maximum expansion, said exchange in the flow circuitry connecting said cooling means intermediate in the flow series between said expanded bellows and its opposite smaller bellows on the opposite side of the fulcrum, and the second routing of this alternate set providing a gas flow communication connecting heating means in the flow circuitry intermediate in series flow between the smaller expanded bellows (on the same side as the larger expanded bellows) and the large contracted bellows on the opposite side of the fulcrum, said alternations of the gas distribution means thereby providing separate flow channels between an expanded large bellows, a cooling means, and a small contracted bellows on the opposite side of the fulcrum on one hand and a channel between a small expanded bellows, said heating means and a large contracted bellows on the opposite side of the fulcrum and,

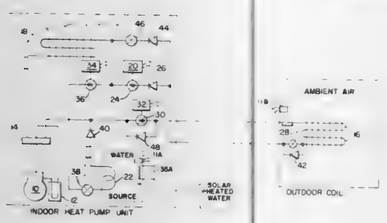
(5) mechanical energy directing means in the form of a lever pivoting on a fulcrum directing the energy of the expanding bellows on a first side of a pivot to compress bellows on the other, second side of the pivot and subsequently directing the energy of an expanding bellows on that second side of the pivot to compress a bellows on the first side, the reciprocating action of said lever thereby providing a means of extracting useful work energy.

4,179,894

DUAL SOURCE HEAT PUMP

Hugh M. Hughes, Fort Lauderdale, Fla., assignor to Wylain, Inc., Dallas, Tex.

Filed Dec. 28, 1977, Ser. No. 865,187
Int. Cl.² F25B *13/00*
U.S. Cl. 62—2 **20 Claims**



1. A heat pump system for either heating or cooling an enclosed area, comprising:

(a) a compressor means for compressing a refrigerant to be flowed through conduits of the system;

(b) a reversing means for selecting the direction of the refrigerant flow through the system depending upon whether the system is operating in either its heating or cooling mode;

(c) a first heat exchanger means located within the enclosed area for either heating or cooling the air to be circulated within said enclosed area;

(d) an outdoor heat exchanger means acting either as an evaporator or a condenser depending upon whether the system is operating in either its heating or cooling mode;

(e) a second indoor heat exchanger for providing an alternative source of heat to said outdoor heat exchanger means when the system is operating in its heating mode; and

(f) a temperature discriminator means for automatically selecting either the outdoor heat exchanger means or the second indoor heat exchanger means as the operative means for exchanging heat with a source depending upon which source will provide more efficient operation for the system.

4,179,895

COOLING SYSTEM USING LOW POTENTIAL AND HIGH POTENTIAL ENERGIES

Kenji Shimokawa, Cyofu; Muneshige Nagatomo, and Yasuo Tanaka, both of Tokyo, all of Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industries, both of Tokyo, Japan

Filed Feb. 3, 1978, Ser. No. 875,007
Int. Cl.² F25B *27/00, 15/00, 33/00*
U.S. Cl. 62—2 **11 Claims**



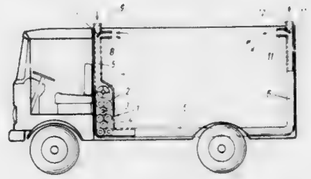
1. Cooling system comprising a coolant circuit having a portion disposed in an evaporating section for feeding a coolant through the section, a cooling agent circuit for feeding a cooling agent through said evaporating section so that the cooling agent is evaporated in said evaporating section whereby the coolant is cooled due to evaporation of the cooling agent, an occluding section adapted to receive the evaporated cooling agent from said evaporating section, an occlusive agent circuit for feeding an occlusive agent through the occluding section so that the evaporated cooling agent is occluded by the occlusive agent, means for collecting the occlusive agent which has occluded the cooling agent, a first recovery section provided with means for supplying low potential energy to said first recovery section, a second recovery section provided with means for supplying high potential energy to said second recovery section, means for feeding the occlusive agent which has occluded the cooling agent alternately to said first and second recovery sections so that the cooling agent in the occlusive agent is separated from the occlusive agent under the heat energy supplied to the sections, means for transferring the cooling agent separated from the occluding agent in said second recovery section through the first recovery section to the cooling agent circuit, means for transferring the occlusive agent in said second recovery section so that the occlusive agent is brought into a heat exchanging relationship with the cooling agent from the second recovery section for further separating the cooling agent still occluded in said occluding agent, means for transferring the cooling agent separated from the occluding agent in said first recovery section to said cooling agent circuit.

4,179,896

METHOD OF COOLING THE INTERIOR OF MOTOR VEHICLES (POWERED AT LEAST PARTLY BY HYDROGEN)

Helmut Buchner, Wendlingen, and Helmut Saeufferer, Esslingen-Liebersbronn, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft Stuttgart-Untertuerkheim, Fed. Rep. of Germany

Filed Jul. 12, 1977, Ser. No. 814,861
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1976, 2631359
Int. Cl.² F25B *19/00;* **B60H** *3/04;* **F25B** *27/00*
U.S. Cl. 62—7 **10 Claims**



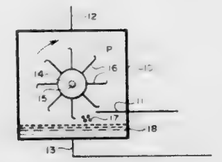
1. A method of cooling the interior of a motor vehicle comprising operating the engine of said motor vehicle at least in part on hydrogen liberated from at least one hydride capable of liberating hydrogen upon being heated, said hydride being a hydride of which the ΔH value is greater than 2 kcal/mole H_2 and of which the hydrogen dissociation pressure of 1 bar occurs at temperatures of from $+30°$ to $-25°$ C., supplying heat to said hydride to liberate the hydrogen and obtaining the heat so supplied to the hydride at least in part from the air circulating in the interior of the vehicle.

4,179,897

ISENTROPIC EXPANSION OF GASES VIA A PELTON WHEEL

Leonard J. Hvizdos, Emmaus; Richard E. Filippi, Allentown, and Richard E. Luybli, Hellertown, all of Pa., assignors to Air Products & Chemicals, Inc., Allentown, Pa.

Filed Aug. 25, 1975, Ser. No. 607,226
Int. Cl.² F25J *1/00*
U.S. Cl. 62—9 **6 Claims**



1. A process for liquefying a first gas which comprises the steps:

compressing said first gas to a pressure above its critical pressure and cooling to a temperature below its critical temperature;

isentropically expanding the first gas through a Pelton Wheel turbine, said Pelton Wheel turbine being mounted and enclosed in a sealed housing, said expanding being conducted under conditions such that

(a) substantially all of the critical fluid is converted to a liquid at its saturation temperature or at a temperature below its saturation temperature, and

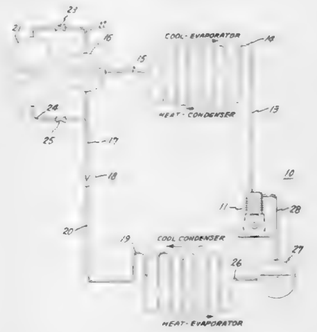
(b) a vapor environment is maintained in the housing and about the Pelton Wheel turbine by injecting a second gas into the housing, said second gas being at the saturation temperature or at a temperature above the saturation temperature of the liquefied first gas.

4,179,898

VAPOR COMPRESSION CYCLE DEVICE WITH MULTI-COMPONENT WORKING FLUID MIXTURE AND METHOD OF MODULATING ITS CAPACITY

Himanshu B. Vakil, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 31, 1978, Ser. No. 929,339
Int. Cl.² F25B *00/00*
U.S. Cl. 62—114 **8 Claims**



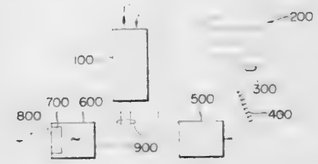
1. A method of modulating the capacity of a vapor compression cycle device which comprises compressing a multi-component working fluid mixture, condensing the mixture vapor, separating the vapor and liquid, storing the liquid under high pressure, condensing selectively the separated vapor and storing the condensed liquid under high pressure, controlling separately the flow rate of the stored condensed liquids, evaporating the liquid, storing the mixture under low pressure, and controlling the flow rate of compression by the density of the vapor of the mixture under low pressure.

4,179,899

REFRIGERATING SYSTEM

Naohiro Katayama, Tokyo, Japan, assignor to Sawafuji Electric Co. Ltd.. Tokyo, Japan

Filed Jun. 16, 1978, Ser. No. 916,066
Claims priority, application Japan, Jun. 24, 1977, 52-75142; Feb. 15, 1978, 53-16069; Feb. 15, 1978, 53-16070
Int. Cl.² F25B *31/02;* **F04B** *49/10*
U.S. Cl. 62—228 **13 Claims**

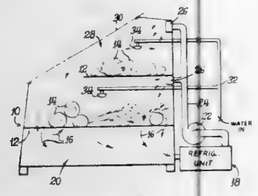


1. A refrigerating system having an electrical vibration type compressor powered by electric energy, a condenser to which refrigerant delivered by the compressor is fed, a capillary tube provided on the downstream side of the condenser, and an evaporator provided on the downstream side of the capillary tube, wherein electric energy to be supplied to the compressor

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is controlled in accordance with the ambient temperature of the refrigerating system to reduce the piston stroke of the compressor so that the compression level of the refrigerant is lowered in accordance with a drop in the ambient temperature.

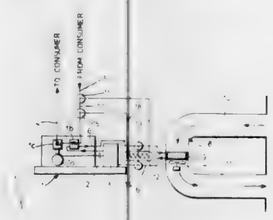
4,179,900
FRESH PRODUCE PRESERVATION
John E. Corrigan, 1134 Forest Ave., Evanston, Ill. 60202
Continuation-in-part of Ser. No. 704,362, Jul. 12, 1976, abandoned. This application Dec. 13, 1977, Ser. No. 860,175
Int. Cl.[2] F25B *19/00*
U.S. Cl. 62—231 **4 Claims**



1. A system for preserving fresh produce within a refrigerator display means having an opening accessible to the public for inspection and selective removal of produce therefrom, comprising, in combination:
- at least one fluid-permeable elongated shelf means having laterally spaced apart side edges for supporting fresh produce thereon;
- means providing a stream of relatively cool air circulating about said shelf means;
- a plurality of misting nozzle means centrally positioned from the lateral side edges of said shelf means and above said shelf means, said nozzle means being spaced from one another a select distance and along the length of said shelf means so that an atomized mist pattern from each nozzle means overlaps at least one adjacent atomized mist pattern;
- a water supply and control means connected with said plurality of misting nozzle means for providing relatively cool water at a pressure of at least about 30 p.s.i. to said nozzle means; and
- a timer means operationally connected to said control means to intermittently provide pressurized water to said nozzle means for relatively brief periods of time and to intermittently shut-off pressurized water to said nozzle means for relatively long periods of time.

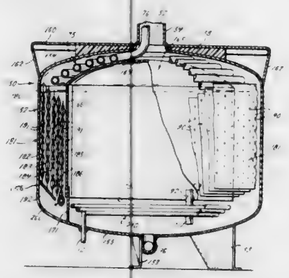
4,179,901
MOTOR-DRIVEN HEAT PUMP
Ernst Fiala; Peter Hofbauer; Harald Loeck; Edgard Grundmann, all of Wolfsburg, Fed. Rep. of Germany, and Herbert Heitland, Sao Paulo, Brazil, assignors to Volkswagenwerk AG, Wolfsburg, Fed. Rep. of Germany
Filed Jun. 20, 1978, Ser. No. 917,387
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728239
Int. Cl.[2] F25B *41/00, 27/02, 47/00*
U.S. Cl. 62—238 **5 Claims**

1. In a motor-driven heat pump arrangement including a motor; a refrigerant circuit; a compressor driven by the motor and connected in the refrigerant circuit; a condenser connected in the refrigerant circuit; an evaporator connected in the refrigerant circuit for withdrawing heat from an external, ambient medium; a heating medium circuit having a heating medium output line and a heating medium return line; a heat exchanger connected to the motor and to the heating medium circuit for transferring waste heat from the motor to the heating medium in the heating medium circuit; the heating medium circuit being connected to the condenser for transferring heat from the refrigerant to the heating medium; the condenser being arranged downstream of the heating medium return line and the heat exchanger being arranged upstream of the heating medium output line as viewed in the direction of flow of the heating medium; the improvement comprising
(a) a device for delivering evaporating heat from the heating medium to the refrigerant at a location situated upstream



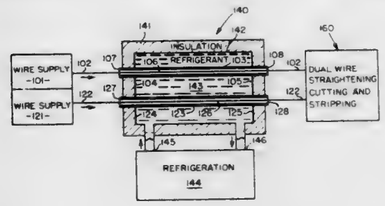
of said compressor as viewed in the direction of refrigerant flow;
(b) conduit means connected to said device for passing the heating medium therethrough; and
(c) switching means for operatively connecting said conduit means to or disconnecting it from said heating medium return line.

4,179,902
HOT WATER SYSTEM AND CONDENSING UNIT THEREFOR
Paul Mueller, and Ray A. Prine, both of Springfield, Mo., assignors to Paul Mueller Company, Springfield, Mo.
Division of Ser. No. 823,927, Aug. 12, 1977, Pat. No. 4,146,089. This application Jul. 21, 1978, Ser. No. 927,153
Int. Cl.[2] F25B *27/02;* **F28F** *1/14, 1/36*
U.S. Cl. 62—238 **12 Claims**



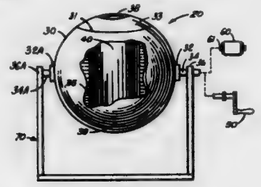
1. A hot water system utilizing heat of refrigerant in a refrigeration system for producing hot water at a predetermined temperature, said system comprising a refrigeration system including a water cooled condenser having a housing with a water inlet and a water outlet, a tubular coil within the housing defining a refrigerant passage therethrough, another coil within said housing, said other coil being of a sheet type having refrigerant passages formed therein which sheet is coiled to form a heat exchanged surface within said housing, said tubular coil being joined to said sheet type coil such that a refrigerant passes through both the tubular coil and sheet type coil from an inlet at one end of said combined coils to an outlet at the other end, said condenser having water passages therein between said water inlet and outlet for directing the flow of water over said combined tubular and sheet type coil, said hot water system further comprising a water storage tank having a hot water inlet and a cold water outlet, means connecting the hot water inlet of the tank to the water outlet of said condenser, and means connecting the cold water outlet of the tank to the water inlet of said condenser.

4,179,903
PREPARING INSULATED WIRE FOR CUTTING AND STRIPPING
Frederick H. Peabody, Jr., Newville, Pa., assignor to General Signal Corporation, Stamford, Conn.
Filed Dec. 22, 1977, Ser. No. 863,278
Int. Cl.[2] F25B *25/00*
U.S. Cl. 62—322 **12 Claims**



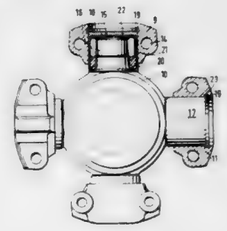
1. Apparatus for preparing an outer insulation covering on electrically conductive wire for removal of a selectively controlled portion of the insulation from the wire and comprising in combination:
(a) a cooling chamber for cooling the outer insulation below a predetermined threshold temperature at which the responsiveness of the insulation to deformation from tensile stress is reduced;
(b) an entrance port and an exit port of said cooling chamber for the entrance and exit, respectively, of insulated wire passed through said cooling chamber; and
(c) cutting and stripping means near said exit port to which the insulated wire is fed for cutting and stripping a selectively controlled portion of the insulation from the wire, while the insulation is below said predetermined temperature, by a circumferential cut through a part of the insulation followed by the application of a tensile force whereby the insulation remaining on the wire is subjected to minimal deformation in the vicinity wherein the selectively controlled portion was separated from the remaining portion during the cutting and stripping.

4,179,904
FREEZERS
Carl O. McClenny, 6154 Willer's Way, Houston, Tex. 77057
Continuation-in-part of Ser. No. 344,122, Mar. 23, 1973, abandoned. This application Apr. 5, 1977, Ser. No. 784,780
Int. Cl.[2] A23G *3/00*
U.S. Cl. 62—342 **2 Claims**



1. A freezing or cooling apparatus comprising:
a. an outer container having a sealable aperture therein;
b. first sealing means for sealing said aperture of said outer container thereby making said aperture impervious to a refrigerant which may be placed within said outer container;
c. a sealable food container having no movable elements therein, having a length or depth L, a diameter or width D, and an L/D ratio in the range of 0.5 to 2.5, and further, having at least one pair of substantially parallel walls, for receiving therein a liquid mixture, said food container being receivable through said aperture in said outer container, being completely enclosed by said outer container when said aperture of said outer container is sealed, and adapted to be in intimate contact with a refrigerant which may be placed within said outer container;
d. second sealing means for sealing said food container thereby preventing contamination or leakage of any liquid mixture therein; and,
e. means for rotating said food container in an end-over-end manner whereby the liquid within said food container is caused to slosh back and forth between said parallel walls of said food container.

4,179,905
BEARING SYSTEM IN A UNIVERSAL JOINT
Josef Schultenkämper, Essen, Fed. Rep. of Germany, assignor to Gelenkwellenbau GmbH, Essen, Fed. Rep. of Germany
Filed Feb. 21, 1978, Ser. No. 879,613
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715638
Int. Cl.[2] F16D *3/26, 3/33*
U.S. Cl. 64—17 A **2 Claims**



1. A bearing system for a universal joint comprising a cross trunnion bearing pins extending outwardly from said trunnion for journaling a joint member, a journal for each of said trunnion bearing pins, at least two of said journals mounted on said joint member for receiving one pair of axially aligned said bearing pins, projecting means carried on each of said journals for cooperative engagement with said joint member for preventing radial and lateral displacement of said journal with respect to said joint member, wherein the improvement comprises an axially elongated seating bore in each of said journals for receiving therein one of said trunnion bearing pins, said seating bore extending axially through said journal having an open first end and an open second end and with said seating bore having a uniform axial length around the circumference thereof, a thin-walled bearing bushing carried in each said seating bore and extending through said first end and spaced inwardly from said second end, said bushing having a bottom wall extending transversely across said seating bore between the front and second ends of said bore and forming a closure therefor and side walls extending from said bottom wall outwardly from said first end of said bore, roller bearings positioned within said bushing and located between the inside of said side walls of said bushing and said trunnion pin received therein, said roller bearings spaced inwardly from the end of said side walls extending outwardly from said first end of said bore in an annular groove in said seating bore, a removable guard ring seated in said annular groove and in engagement with the bottom wall of said bushing for retaining said bushing in its respective seating bore, said thin walled bearing bushing having said bottom wall thereof thicker than the side walls for absorbing forces generated during rotation of said joint, and a

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sealing ring located within said bushing and extending around said side walls from the end of said bushing located outwardly from said first end of said bore to said roller bearings.

4,179,906

KNITTING METHOD AND APPARATUS

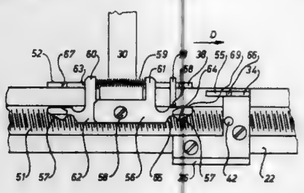
Michel Patthey, Couvet, Switzerland, assignor to Edouard Dubied & Cie. (Societe Anonyme), Couvet, Switzerland

Filed Mar. 14, 1978, Ser. No. 886,541

Claims priority, application Switzerland, Mar. 14, 1977, 3137/77

Int. Cl.[2] D04B *15/52, 15/56, 15/64*

U.S. Cl. 66—128 **9 Claims**



1. The method of knitting sections of predetermined contour and/or of a design of the Intarsia type of predetermined shape comprising the steps of moving a yarn guide member along a bank of needles in a knitting machine between a pair of carrier splicing blocks movably mounted in the machine for independent variable relative movement; selectively and independently varying the relative position and spacing of said splicing blocks in said machine, and releasably connecting said yarn guide to one of said splicing blocks during movement thereof to vary the starting position of the next knitted row.

4,179,907

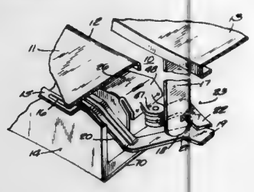
BIMETAL ACTUATED LOCKING DEVICE

Spencer C. Schantz, 5880 Anchorage Rd., Oconomowoc, Wis. 53066

Filed Mar. 15, 1978, Ser. No. 886,986

Int. Cl.[2] D06F *37/42*

U.S. Cl. 68—12 R **11 Claims**



1. A safety interlock device for use with an appliance including housing means, a motor, a component in said housing means driven by said motor, a movable door on said housing means which when closed and opened prohibits and permits access, respectively, to said component, said device comprising:

base means mounted on one of said housing means and said door,

projection means on the other of said housing means and said door,

a switch mounted on said base means and a switch operating arm mounted pivotally on said base means for moving in a first plane, said switch being caused to close when said projection means moves said arm in one direction due to closure of said door and said switch being caused to open when said projection means allows said arm to move in another direction due to opening of said door,

a latch lever mounted on said base means for pivoting in a second plane alternately into latching engagement with and disengagement from said projection means,

a first insulating member fastened to said latch lever,

a bimetal element comprised of a sequence of bimetal strips arranged adjacent and in substantial parallelism with each other and each having a first and second ends, the second ends of adjacent strips being interconnected and the first ends of alternate adjacent strips being interconnected and the first ends of a pair of strips most remote from each other being separated from adjacent strips and constituting the terminal ends of a series electric circuit through said bimetal element, said bimetal means deflecting in response to being heated by electric current passing through it,

a second insulating member on said base on which said bimetal element is fixedly supported from its first end,

said motor, said switch, and said bimetal element forming a series circuit for being connected across an electric power supply,

means extending from the second ends of said bimetal element for engaging said first insulating member to cause said latch lever to swing in response to deflection of said bimetal element so said latch lever will engage said projection means and prevent opening of said door when said bimetal element is heated by current flowing through said series circuit and will disengage said projection means and permit opening of said door when said bimetal element is cooled due to interruption of said current for a predetermined amount of time, and

insulation means covering part of said bimetal element to control the rate of cooling of said bimetal.

4,179,908

STEERING LOCK

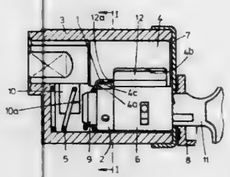
Günter Schaumburg, Radevormwald, Fed. Rep. of Germany, assignor to Neiman S.A., Courbenoie, France

Filed Jan. 5, 1978, Ser. No. 867,203

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1977, 2700581

Int. Cl.[2] E05B *65/12*

U.S. Cl. 70—185 **8 Claims**



1. A lock for a vehicle steering column having a steering shaft rotatable within a fixed tube, comprising:

(a) a lock reception housing for connection to the steering wheel tube, said reception housing being formed with first and second intercommunicating spaced bores, the axes of which are disposed parallel to each other,

(b) a locking bolt within said first bore arranged to move axially between a first position and a second position where the bolt enters an aperture in the steering shaft,

(c) an abutment surface on said locking bolt disposed transversely of the axis of said bolt,

(d) a cylinder housing within said second bore axially displaceable between a first position and a second position and drivably coupled with said locking bolt,

(e) a cylinder core, having a key entry aperture, rotatable within the cylinder housing,

(f) a locking recess formed in the internal surface of the reception housing, and

(g) a locking part connected to said cylinder core projecting

radially beyond the cylinder housing and capable of entry into said locking recess for securing the cylinder lock in its second position, wherein on axial movement of the cylinder housing into its second position rotation of the core is possible whereby the locking part projects with one portion thereof into the recess within the reception housing, the remaining portion being in engagement with the abutment surface on the locking bolt.

4,179,909

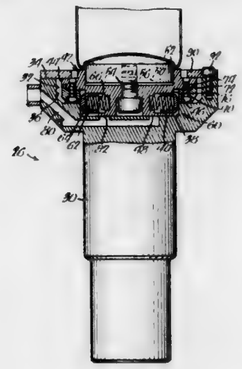
DOMER ASSEMBLY FOR IRONING MACHINE

Edward G. Maeder, Minnetonka, Minn., assignor to National Can Corporation, Chicago, Ill.

Filed Apr. 26, 1978, Ser. No. 900,270

Int. Cl.[2] B21B *45/02;* **B21D** *22/00*

U.S. Cl. 72—45 **10 Claims**



1. A domer assembly for use with a punch of an ironing machine to reform the end wall of an ironed container comprising a support having a recess with the base of the recess defining a support surface, a carrier element received in said recess and having a cooperating surface engaging said surface, said carrier element having a peripheral dimension which is less than the peripheral dimension of said recess, a domer element on said carrier element, means for supplying a bearing fluid between said surfaces, and biasing means between said support and carrier element normally maintaining said surfaces in a predetermined position with respect to each other and accommodating movement of said carrier element in all directions within said recess.

4,179,910

APPARATUS FOR MANUFACTURING DEFORMABLE EXPANSION BELLOWS FOR PIPE-WORK

Paul Mazier, Rillieux la Pape, France, assignor to S.F.Z. Souplesse Fonctionnelle Systematique, Chassieu, France

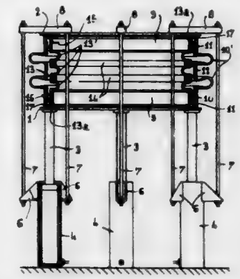
Filed Jan. 26, 1978, Ser. No. 872,494

Claims priority, application France, Apr. 2, 1977, 77 03696

Int. Cl.[2] B21D *15/06*

U.S. Cl. 72—59 **10 Claims**

1. Apparatus for the manufacture, by the technique of hydroforming, of deformable expansion bellows for pipe-work and similar assemblies, comprising means for supporting a deformable sheath from which the bellows is to be formed, means for supporting a sleeve within the sheath to define a generally annular space therebetween, means for introducing into the space a liquid under pressure to deform a portion of the sheath outwardly and to deform a portion of the sleeve inwardly, and means for applying axial thrust to the sheath and



sleeve locally during application of pressure to said space by the liquid, the thrust compressing the sheath and sleeve.

4,179,911

Y AND T-FINNED TUBES AND METHODS AND APPARATUS FOR THEIR MAKING

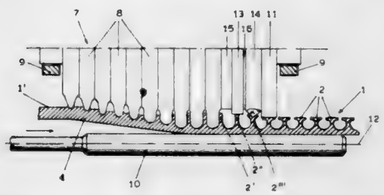
Manfred Saier, Wullenstetten; Hans-Werner Kästner, Vöhringen, and Robert Klöckler, Tiefenbach, all of Fed. Rep. of Germany, assignors to Wieland-Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 7, 1978, Ser. No. 922,888

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1977, 2735762; Dec. 28, 1977, 2758526; Dec. 28, 1977, 2758527

Int. Cl.[2] B21H *3/00;* **B21D** *53/06*

U.S. Cl. 72—78 **24 Claims**



1. Apparatus for forming fins on a tube outer side, which fins run circumferentially about the tube in a continuous fashion with the outer ends of the fins approaching the outer ends of adjacent fins forming a chamber between adjacent fins, including:

support means for said tube;

rolling disc means for forming a finned tube, said rolling disc means rotating relative to said tube and including a plurality of rolling discs of successively increasing diameters rotatting about an axis of said rolling disc means;

means for notching the upper surface of the formed fins.

4,179,912

APPARATUS AND METHODS FOR FORMING PANELS HAVING SCALLOPED CROSS-SECTIONS

William Culina, R.D. # 1, Box 74-A, Champion, Pa. 15622, and Charles Klus, 204 S. 6th St., Lowber, Pa. 15697

Filed Mar. 28, 1978, Ser. No. 891,150

Int. Cl.[2] B21D *13/04*

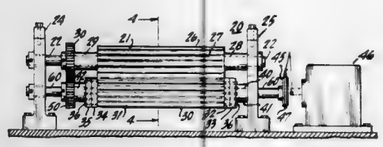
U.S. Cl. 72—196 **4 Claims**

1. A cold rolling apparatus for forming planar sheet material into panels having scalloped edge configurations, comprising:

(a) a first rotatable roller assembly manifesting a longitudinal cylindrical member having a major surface configuration

consisting of continuous arcuate projections and depressions to thus form a gear-like appearance along a major portion of the length of said cylindrical member, said first roller assembly having a first shaft section extending from one end and a second shaft section extending from said other end, said sections located relatively coaxial with the main axis of said cylindrical member, a first gear coupled to said second shaft section of said roller assembly,

(b) a second rotatable rod assembly of a length relatively equal to said major portion of said first roller assembly and consisting of a plurality of rods of equal diameter symmetrically positioned about a central reference point to form a circular cross-sectional array with the spacing between said rods selected according to the width of said projections on said roller assembly, said second rod assembly including a central shaft member of a larger diameter than said rods, said rods positioned about said shaft and centrally disposed thereabout to form said circular array, a second gear coupled to said central shaft of said rod assembly, said second rotatable rod assembly including a first and second end plate, each of a circular configuration, having a plurality of equidistant apertures located on a surface thereof with each separate rod directed at one



end into one associated aperture of said first plate and at said other end into an associated corresponding aperture in said second plate and rigidly secured in said apertures to prevent rotation of said rods when said assembly is rotated to thus form said circular cross-sectional array with said rods equally spaced about the periphery of said circle formed by said array, said plates each having a central aperture to accommodate said larger diameter central shaft,

(c) means for positioning said roller assembly with respect to said rod assembly such that the surfaces of said assemblies are located with respect to one another to enable insertion therebetween of said planar sheet, with said second gear coupled to said central shaft of said rod assembly coacting with said first gear coupled to said roller assembly and operative to drive said first gear to cause said roller assembly to rotate in an opposite direction to said rod assembly, and

(d) drive means coupled to said rod assembly for rotating the same with respect to said roller assembly to cause said sheet as emplaced and directed through said assemblies to assume a scalloped edge configuration due to said surface configurations of said first roller and said second rod assemblies.

4,179,913

METAL STRIP TENSIONING APPARATUS FOR USE IN CONTINUOUS STRIP REDUCTION COLD MILL AND METHOD

Judson W. Martt, Amsterdam, Ohio, assignor to National Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 737,019, Oct. 29, 1976, Pat. No. 4,086,689. This application Jan. 30, 1978, Ser. No. 873,364

Int. Cl.[2] B21B *1/28*

U.S. Cl. 72—205 **30 Claims**

1. A metal strip tensioning apparatus comprising

a plurality of metal strip engaging rolls for successive engagement with the metal strip, the plurality of rolls including a first roll relative to engagement with the metal strip, an intermediate roll and a final roll relative to engagement with the metal strip, the axes of rotation of the rolls being parallel and being disposed so that the metal strip engages more than 180° of the peripheral surface of the intermediate roll,

a roll supporting framework structure including journals on each side of the framework supporting the metal strip engaging rolls for rotation,

drag generator means operatively connected to at least the intermediate strip engaging roll to apply to the intermediate strip engaging roll a desired torque resistance to rotation of the strip engaging roll by the strip,

a stationary base structure for anchorage to a foundation,

vertical pivot means carried by the stationary base structure,



vertical pivot means carried by the roll supporting framework structure coacting with the vertical pivot means of the stationary base structure for pivotally mounting the roll supporting framework structure relative to the stationary base structure,

a plurality of roller means and coacting roller bearing surface means spaced from one another in a horizontal plane carried by the base structure and the framework structure,

each of the roller means and the vertical pivot means being spaced apart from one another in a horizontal plane, the roller means and the roller bearing surface means acting to form a plurality of rolling support points between the framework and the base structure, and

power means acting between the stationary base structure and the framework structure to pivot the framework structure around the pivot means.

4,179,914

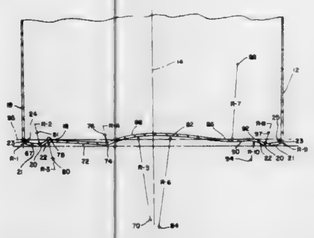
CONTAINER WITH OUTWARDLY FLEXIBLE BOTTOM END WALL HAVING INTEGRAL SUPPORT MEANS APPARATUS FOR MANUFACTURE THEREOF

Joseph F. Dulmaine, Wheatridge, and Michael E. Bagrosky, Arvada, both of Colo., assignors to Coors Container Company, Golden, Colo.

Division of Ser. No. 763,293, Jan. 27, 1977, Pat. No. 4,096,814, which is a division of Ser. No. 631,539, Nov. 13, 1975, Pat. No. 4,037,752. This application Jan. 25, 1978, Ser. No. 872,165

Int. Cl.[2] B21D *22/00*

U.S. Cl. 72—358 **5 Claims**



1. Apparatus for forming integral support structure in the bottom wall of a metallic container comprising:

first tool means for applying forming forces to one surface of the bottom wall;

a polygonally shaped cavity in said first tool means located centrally therein for receiving a central portion of the bottom wall;

at least three elongated linear edge surfaces on said first tool means defining said cavity and being engageable only with portions of the one surface of the bottom wall adjacent the central portion of the bottom wall;

second tool means for applying forming force to the opposite surface of the bottom wall; and

a protruding curved dome-like area centrally located on said second tool means for forming engagement with only the opposite surface of the central portion of the bottom wall and portions of the opposite surface of the bottom wall adjacent the central portion and being located in axial alignment with said cavity in said first tool means, said protruding curved dome-like area being dimensionally smaller than said cavity so as to be received therewithin without engagement of said dome-like area at the one surface of the bottom wall in the central portion of the bottom wall with said first tool means.

4,179,915

APPARATUS FOR THE EXTERNAL CALIBRATION (SIZING) OF TUBULAR ELEMENTS

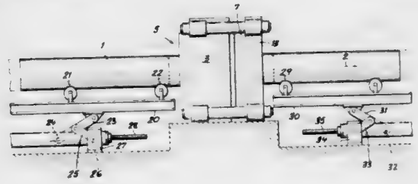
Eduard J. C. Huydts, Düsseldorf-Gerresheim, Fed. Rep. of Germany, assignor to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Nov. 3, 1977, Ser. No. 848,323

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1976, 2650691

Int. Cl.[2] B21D *41/00*

U.S. Cl. 72—402 **7 Claims**



1. An apparatus for the external calibration of tubular workpieces, comprising:

a support;

an outer ring mounted on said support and traversed by said workpiece;

an annular piston member received in said ring and defining an annular pressurizable chamber therewith whereby said ring forms an annular cylinder for said piston member, said piston member being axially displaceable upon pressurization of said chamber, said piston member being formed along its interior with a plurality of wedging faces inclined to the axis of said workpiece, said piston member, said chamber, said cylinder, and said ring being coaxial; and

a plurality of angularly spaced members including tool segments disposed inwardly of said piston member and biased inwardly against said workpiece by engagement of said wedging faces with complementary wedging surfaces upon axial displacement of said piston member, said piston member and each of said angularly spaced members being interconnected by complementary dovetail formations coupling said segments to said piston member, each of said angularly spaced members including a respective intermediate element between each of said segments and said piston member, said intermediate elements being formed with a respective said surface complementary to and slidably engaging a respective wedging face of said piston member, one such dovetail formation connecting each of said elements with said piston member and being provided with said wedging surface and face.

4,179,916

METHOD OF AND A DEVICE FOR MEASURING THE PRESSURE AND ABRASION SENSITIVITY OF GRANULAR MATERIAL (GRAIN LOTS) DUE TO MECHANICAL STRESS

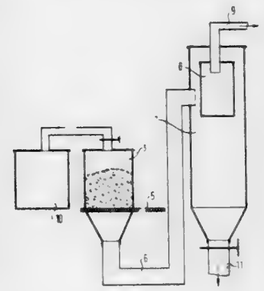
Wilhelm Konnerth, Otto-Flake-Str. 22, D-7570 Baden-Baden, Fed. Rep. of Germany

Filed Jan. 12, 1978, Ser. No. 868,910

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1977, 2701152

Int. Cl.[2] G01N *3/30, 3/56*

U.S. Cl. 73—7 **28 Claims**



1. A method of measuring the pressure and abrasion sensitivity of granular material in a closed mortar comprising exposing said material to a mechanical stress; and,

comparing the variation of the weight proportions of the individual grain-size fractions of said granular material due to said stress in comparison to corresponding initial values of a representative sample of granular material, by screening analyses, including producing said mechanical stress by an abrupt exposure of the grains of said representative sample in said closed mortar to a gas-pressure wave of high kinetic energy.

4,179,917

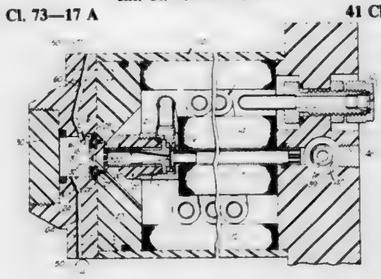
LOW PRESSURE DEW AND FROST POINT INDICATOR

Robert S. Sheldon, and Jan W. Rabek, both of Northridge, Calif., assignors to Air-Dry Corporation of America, Northridge, Calif.

Filed Dec. 16, 1977, Ser. No. 861,267

Int. Cl.[2] G01N *25/68*

U.S. Cl. 73—17 A **41 Claims**



1. In a low pressure dew and frost point indicator of the type in which a vortex tube directs a cold air stream against the back of a viewing mirror for observation of the initial forma-

tion of frost on the surface of the viewing mirror, the improvement comprising:

(a) means for centering and holding said viewing mirror in a fixed position with respect to said cold air output for maximum transmission of temperature change from said cold air stream to said mirror, said means comprising a tubular member extending rearwardly from said viewing mirror and fitting over the cold air output of said vortex tube, said tubular member being elongated and being formed integrally with said viewing mirror; and

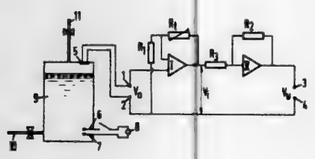
(b) a plastic adapter member extending around said cold air stream outlet, said tubular member of said viewing mirror being held between said adapter member and said cold stream output.

4,179,918

METHOD AND AN APPARATUS FOR MEASURING THE CARBON DIOXIDE CONTENT IN BEER

Johannes van Strien, Leiden, Netherlands, assignor to Heineken Technisch Beheer B.V., Netherlands

Filed Feb. 13, 1978, Ser. No. 877,090
Int. Cl.[2] G01N *33/14*
U.S. Cl. 73—19 **7 Claims**



1. The method of measuring the carbon dioxide content in beer comprising the steps of feeding a beer sample into a vessel to partially fill said vessel and create a carbon dioxide atmosphere above said beer, measuring the temperature of the beer to produce an electric signal which varies with temperature in a manner proportional to changes in a constant f with temperature wherein said constant varies substantially in accordance with the equation

$$f=-a+(b/T)$$

wherein:

f=Henry's constant
a=10.89232
b=2654.06,

measuring the pressure of said carbon dioxide atmosphere above said beer and producing an electrical signal proportional thereto and combining said signals to produce an output signal which is a direct measure of carbon dioxide content of said beer.

4,179,919

TERRAIN CONTOUR TRACKING SYSTEM

John C. McKechnie, Maitland, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 18, 1978, Ser. No. 943,406
Int. Cl.[2] G01B *13/08*
U.S. Cl. 73—37.5 **23 Claims**

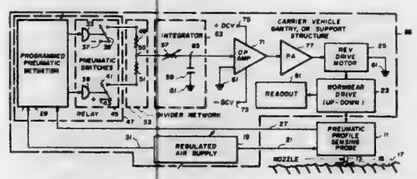
1. A terrain contour tracking system, comprising in combination:

a pneumatic probe adapted for effectively sensing the distance between itself and a surface whose profile is being tracked and measured, said pneumatic probe having a constant pressure pneumatic input, a mechanical input, a pneumatic nozzle output directed toward the aforesaid surface, and a pneumatic control output;

a pneumatic actuator having a constant air pressure input, a pneumatic control input, and a pair of pneumatic outputs, with the pneumatic input thereof connected to the pneumatic control output of the aforesaid pneumatic probe, with one of the outputs thereof capable of producing air at a predetermined pressure only when the air received at the aforesaid pneumatic control input thereof is less than a first preset pressure, with the other output thereof capable of producing air at a predetermined pressure only when the air received at the aforesaid pneumatic control input thereof is greater than a second preset pressure, and with neither output thereof capable of producing air under pressure when the pressure of the air received at the aforesaid pneumatic control input thereof falls between said first and second preset pressures;

a pair of pneumatically actuated, normally open switches connected to the outputs of said pneumatic actuator;

a negative direct current voltage connected to the movable arm of one of said pneumatically actuated, normally open switches;



a positive direct current voltage connected to the movable arm of the other of said pneumatically actuated, normally open switches;

a voltage divider network having a pair of input terminals and a center tap output, the input terminals of which are respectively connected to the open contacts of the aforesaid pair of pneumatically actuated, normally open switches;

an integrator connected to the center tap output of said voltage divider network; and

means effectively connected between the output of said integrator and the mechanical input of the aforesaid pneumatic probe for moving said pneumatic probe toward and away from the surface whose profile is being tracked and measured whenever the air supplied to the pneumatic control input of said pneumatic actuator by said pneumatic probe is less than said first preset pressure and greater than said second preset pressure, respectively.

4,179,920

CORROSION COUPON HOLDER APPARATUS

Ronald A. Schuller, and Robert I. Clarkson, both of Tulsa, Okla., assignors to Geosource, Inc., Tulsa, Okla.

Filed Feb. 23, 1978, Ser. No. 880,629
Int. Cl.[2] G01N *17/00*
U.S. Cl. 73—86 **10 Claims**

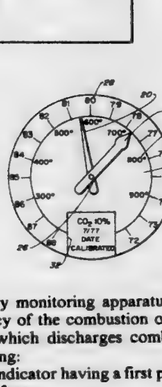
1. A pipeline corrosion coupon holder apparatus for large diameter pipelines comprising:

an elongated shaft housing assembly for inserting and retrieving a test coupon for a large diameter pipeline for detecting corrosion and wear of the pipeline;

said shaft housing assembly having a reciprocating shaft connecting with a coupon for inserting and retrieving the coupon and further having a first securing portion;

a coupon housing assembly having a second securing portion secured with the first securing portion of the elongated shaft housing assembly to position the elongated shaft housing assembly and coupon housing assembly on the same side of the pipeline and having a third securing portion for attaching to the large diameter pipeline;

said coupon housing assembly having a removable access plate to allow access to a coupon for removal and replacement at the coupon housing assembly without removal of the coupons through the elongated shaft



housing assembly and without detaching the first, second or third securing portions; and

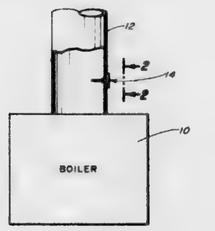
the coupon housing assembly having a guide bushing at the third securing portion to prevent jamming of the coupon during retrieving and inserting of the coupon.

4,179,921

COMBUSTION PROCESS EFFICIENCY INDICATOR

Charles C. Cook, 18609 Greenhaven St., Covina, Calif. 91722, and Harry R. Taplin, 1540 Kirk Ave., Thousand Oaks, Calif. 91360

Filed Mar. 6, 1978, Ser. No. 883,803
Int. Cl.[2] G01M *19/00*
U.S. Cl. 73—112 **6 Claims**



3. An efficiency monitoring apparatus to continuously record the efficiency of the combustion of an external heat exchange process which discharges combusted gases into the ambient comprising:

a temperature indicator having a first pointer movable across an indicator face;

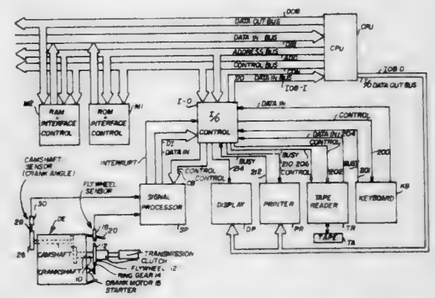
a scale located on said face, said scale including indicia to denote directly the efficiency of said combustion according to the position of said pointer, said indicia being based on the percentage of carbon dioxide in said combustion process and the type of fuel burned, there being available for selection any one of several different indicias to accommodate different types of external combustion heat exchange apparatuses, therefore, the position of said first pointer is to denote accurately the value for the efficiency of said combustion process for the ascertained temperature of the combusted gases to obtain a direct visible indication of combustion efficiency without having to resort to mathematical calculations or data manipulations.

4,179,922

DATA ACQUISITION FOR USE IN DETERMINING MALFUNCTIONS OF CYLINDERS OF AN INTERNAL COMBUSTION ENGINE

William M. Bouverie, Kings Park, and Spero G. Manas, Jamacia, both of N.Y., assignors to Harris Corporation, Cleveland, Ohio

Filed Mar. 25, 1977, Ser. No. 781,314
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—116 **5 Claims**



1. Apparatus for use in determining malfunctions of cylinders of an internal combustion engine, comprising:

means for providing a succession of electrical pulses respectively corresponding with successive crankshaft positions as the crankshaft of said engine rotates through at least one cycle, the time duration between successive said pulses corresponding with the time interval occurring as the crankshaft moves through the associated successive crankshaft positions, and wherein one engine cycle includes a plurality of power periods corresponding in number with the number of cylinders in the engine being tested and wherein each power period includes a plurality of said crankshaft positions;

time interval measuring means including counting means responsive to said pulses for measuring the time interval between successive said pulses such that N successive time interval measurements are made for each engine cycle having N successive crankshaft positions;

means for providing N successive time interval samples for each engine cycle wherein each said sample has a value corresponding with an associated measured time interval;

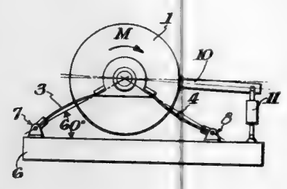
means for utilizing said interval samples for determining cylinder malfunctions of a said engine;

means for supplying clock pulses from a source of evenly time spaced clock pulses to said counting means to be counted thereby during each time period between successive said crankshaft position pulses; and

means for selectively supplying said clock pulses at a first clock rate or a second clock rate.

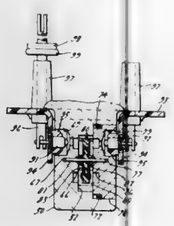
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4,179,923
CRADLE MOUNTED DYNAMOMETER
Hans-Walter Dodt, Darmstadt, Fed. Rep. of Germany, assignor to Carl Schenck AG, Darmstadt, Fed. Rep. of Germany
Filed Jul. 20, 1978, Ser. No. 926,251
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1978, 2809453
Int. Cl.[2] G01L *3/16*
U.S. Cl. 73—134 **5 Claims**



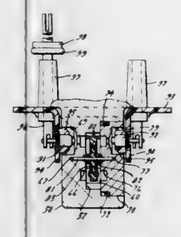
1. A cradle mounted dynamometer which is mounted through its axis on a foundation by at least two leaf springs, the leaf springs being firmly connected with the dynamometer and having planes passing through their unstressed length which intersect the axis of the dynamometer, characterized in that pivot joints connect the ends of the leaf springs remote from the dynamometer with the foundation, and the pivot joints have axes which are disposed parallel to the axis of the dynamometer whereby rotation and oscillations are absorbed in the pivot joints.

4,179,924
MOUNTING FOR PADDLEWHEEL PHOTOELECTRIC TRANSDUCER
Lawrence W. Tomczak, Rochester, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed Apr. 3, 1978, Ser. No. 892,622
Int. Cl.[2] G01F *1/06*
U.S. Cl. 73—229 **3 Claims**



1. A photoelectric transducer mounting for a fluid flowmeter comprising a housing having a body portion, a cylindrical cavity in and opening from one side of said body portion, a cover element closing said cavity and defining a fluid chamber therein between the interior of the cavity and the cover element, fluid inlet and outlet passages in said body portion communicating with said fluid chamber, a rotor element enclosed within and rotatable by fluid entering and exhausting from said fluid chamber, said housing and cover element having a pair of aligned apertures extending therethrough in a direction parallel to the center of the chamber and located adjacent the path of rotation of said rotor element, and a photoelectric transducer assembly including photo-emitting means and photo-responsive means; said mounting including a thin, yieldable U-shaped strip of electrically insulative material conforming generally to the cross-section of and partially surrounding the periphery of said flowmeter housing for mounting on the exterior of the body portion thereof, said mounting having a pair of integrally formed, inwardly extending hollow protuberances adjacent the opposite ends of the strip for snugly receiving a different one of said photo-emitting means and photo responsive means and a number of integrally formed mounting receptacles for reception of a number of electrical terminal connector means for connection to the elements of said transducer assembly, said protuberances shaped and dimensioned relative to said apertures so as to be pressed in and sealingly received in a respective one of said aligned apertures in said housing body portion and cover element and to be readily removable therefrom without dissasembly of said cover from said housing body portion, said photo-emitting means and photo responsive means further being readily insertable and removable from said mounting without dissasembly of the mounting strip.

4,179,925
FLOWMETER ROTOR MOUNTING
Kenneth A. Graham, Beverly Hills, Mich., assignor to Chrysler Corporation, HIghland Park, Mich.
Filed Apr. 3, 1978, Ser. No. 892,460
Int. Cl.[2] G01F *1/06*
U.S. Cl. 73—229 **10 Claims**



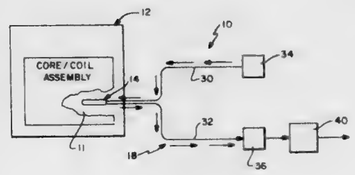
1. A paddle wheel flowmeter comprising in combination
a housing closed at one side thereof and having a stepped cylindrical cavity formed therein with an inner section of reduced diameter forming a fluid chamber in the housing and an outer section of enlarged diameter opening to the other side of the housing.
fluid inlet and outlet passages communicating with said fluid chamber in said housing,
a cylindrical cover closing the opening in said housing and having a shaft receiving aperture extending partly therethrough from one side of the cover facing the fluid chamber in said housing,
said housing having an aligned and similar shaft receiving aperture extending partly therethrough from the interior of the housing facing said fluid chamber therein,
a spindle shaft received at its opposite ends in said apertures in said housing and cover, and
a paddle wheel rotor member having an integrally formed, axially centrally located hub portion with a smooth internal cylindral bore therein of a diameter slightly greater than that of said spindle shaft and receiving said shaft therethrough such that a longitudinally axially extending curved upper peripheral portion of the spindle shaft is in supporting contact and surface engagement with an overlying portion of the curved wall of the bore and a lower peripheral portion is spaced from and out of contact with an underlying portion of the curved wall of the bore,
the entrance portion of each of said spindle shaft receiving apertures in said housing and cover being conically chamfered to present an enlarged countersunk entrance thereto facilitating self-centering of the spindle shaft therein and assembly of the paddle wheel and spindle shaft in the fluid chamber in the housing upon attachment of the cover thereto.

4,179,926
MULTIPLE SIGNAL THERMOPARTICULATING COATING
David C. Phillips; William M. Hickam, both of Pittsburgh, and James D. B. Smith, Turtle Creek, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Continuation-in-part of Ser. No. 568,218, Apr. 15, 1975. This application May 12, 1977, Ser. No. 796,242
Int. Cl.[2] C09K *3/00;* **G08B** *21/00;* **G01K** *13/00, 1/00, 3/04, 3/08*
U.S. Cl. 73—339 R **20 Claims**

1. A composition comprising at least two mutually non-reactive compounds which thermoparticulate at different temperatures between 60° and 200° C., at least 25° C. apart where the concentration of the compound which thermoparticulates at the lowest temperature is at least 33% less than the concentration of the compound which thermoparticulates at the next higher temperature, said composition including a solution of a resinous carrier curable at 60° C., stable at 60° C. when cured, and unreactive with any of said compounds which thermoparticulate, wherein the amount of said compounds total about 20 to about 250 phr and the amount of solvent in said solution is about 25 to about 75% (by weight based on the resinous carrier).

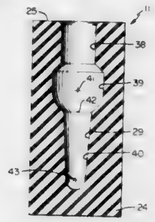
13. A thermoparticulating coating on a substrate comprising at least two solid layers one atop the other, each layer comprising at least one compound which thermoparticulates at a different temperature between 60° and 200° C. where the concentration of a compound which thermoparticulates at the next lower temperature than another compound is at least 33% less than the concentration of the other compound, at least one of said layers including a resinous carrier curable at 60° C. stable when cured, and unreactive with any of said compounds which thermoparticulate, wherein the amount of each of said compounds in a resinous carrier is about 20 to about 250 phr, said layers being arranged so that no layer thermoparticulates at a higher temperature than a layer which is between it and said substrate.

4,179,927
TEMPERATURE SENSING DEVICE
Elric W. Saaski, Richland, Wash., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.
Filed Sep. 28, 1977, Ser. No. 837,451
Int. Cl.[2] G01K *11/14, 11/18*
U.S. Cl. 73—350 **13 Claims**



1. A device for sensing temperature changes at an object, comprising:
(a) a sensor including electrically non-conductive temperature responsive media which changes in optical density with changes in temperature, said media including the combination of gaseous NO_2 and gaseous N_2O_4 the proportion of each depending upon the temperature at said sensor, said combination having constant total mass density, said sensor being adapted for positioning adjacent said object, whereby changes in temperature at said object changes the proportions of said gases and optical density of said media and therefore the light absorption characteristic of said media, and
(b) means for detecting changes in optical density of said temperature responsive media, thereby indicating changes in temperature at said object, said detecting means including
(i) first means for directing a predetermined amount of light from a light source into said temperature responsive media, and
(ii) second means for detecting the amount of light not absorbed by said temperature responsive media, whereby a change in temperature at said object will change the amount of light detected by said second means.

4,179,928
PUSH TYPE THERMAL DEVICE AND METHOD OF MAKING THE SAME AND A STEM SEAT THEREFOR AND METHOD OF MAKING THE SAME
Warren G. Williamson, Louisville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.
Filed Jun. 22, 1978, Ser. No. 918,069
Int. Cl.[2] G01K *5/32*
U.S. Cl. 73—368.3 **48 Claims**



1. In a push type thermal device having a resilient stem seat provided with an opening in one end thereof and receiving an actuating stem in said opening that is adapted to reciprocate in a longitudinal direction in said opening in response to the thermal expansion and contraction of a charge of material in said device and only operatively acting on the other end of said stem seat in said longitudinal direction, the improvement wherein said stem seat has means for substantially preventing wadding of said stem seat during the stroking of said stem by the expansion of said charge of material.

4,179,929
TRUCK SAMPLING SYSTEM
James A. Redding, 615 Washington Rd., Pittsburgh, Pa. 15228
Filed Jul. 21, 1978, Ser. No. 926,742
Int. Cl.[2] G01N *1/08*
U.S. Cl. 73—423 R **12 Claims**



1. A system for sampling a load of bulk material disposed on a stationary carrier, comprising, in combination:
(A) a supporting frame;
(B) core removal means vertically, reciprocally mounted on

the frame for gathering samples from a bulk material disposed below the core removal means; and

(C) processing means mounted on the frame for receiving samples from the core removal means and processing the samples for analysis of the quality of the material constituting the load;

wherein the core removal means includes, in combination:

(1) sample tube means mounted on the frame for reciprocating movement along a substantially vertical path of travel toward and away from a load of bulk material to be sampled; and

(2) conveyor means mounted on the frame for reciprocating movement in a substantially horizontal plane between a position extending from beneath the sample tube to the processing means, and a position to one side of the vertical path of travel of the sample tube so as to permit the sample tube to travel downwardly toward the load being sampled.

4,179,930

GRAIN PROBE

Lynn E. Chrisp, R.R.#1, Juniata, Nebr. 68955

Filed Dec. 5, 1978, Ser. No. 966,554
Int. Cl.² G01N *1/12*
U.S. Cl. 73—425.2 **5 Claims**



1. A grain sampling probe comprising:

an elongated, hollow body provided with an internal chamber;

means at the normally lower end of said body for facilitating penetration of the body in a longitudinal direction into a supply of grain to be sampled;

a lateral port in said body communicating said chamber with the exterior of the body;

a valve cover shiftable longitudinally along said body for opening and closing said port;

a first stop on the body in the path of travel of said valve cover for preventing said shifting of the valve cover in one direction beyond a closing position wherein the valve cover closes said port as the body is inserted into the grain supply; and

a second stop on the body spaced longitudinally from said first stop and disposed in the path of travel of said valve cover for preventing said shifting of the valve cover in the opposite direction beyond an opening position wherein the valve cover opens said port as the body is withdrawn from the grain supply, thereby permitting a sample of grain to enter said port and collect in said chamber,

said body comprising a tube,

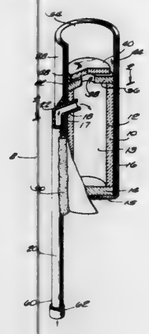
said penetration facilitating means comprising a tapered nose closing the normally lower end of said tube and provided with a radially outwardly projecting shoulder defining said second stop.

4,179,931

PNEUMATIC METAL SAMPLER

Kazuo Moriya, Tokyo, Japan, assignor to Richard A. Falk, Hartland, Wis.

Filed Sep. 15, 1978, Ser. No. 942,511
Int. Cl.² G01N *1/12*
U.S. Cl. 73—425.6 **5 Claims**



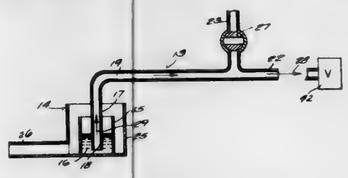
1. A molten metal sampler having cartridge wall means including a side wall and end walls defining a sample cavity for forming a sample for analysis, said side wall means having an aperture defining a side entry fill port for filling said cavity, said aperture being located intermediate the end walls, a fill tube having one end communicating with said fill port in said sampler and the other end remote from said fill port for immersion in a molten metal melt, vent means for said cavity, and pressure reducing apparatus in communication with said cavity through said vent means for reducing the pressure in said cavity and said fill tube to withdraw molten metal into said fill tube where it flows by gravity to fill the sample cavity and wherein said fill tube is secured to said housing by refractory cement.

4,179,932

SUPPLY APPARATUS

Hubert O. Ranger, 1535 E. Goodrich La., Milwaukee, Wis. 53217

Filed May 12, 1978, Ser. No. 905,317
Int. Cl.² B08B *5/00*; G01N *1/14*
U.S. Cl. 73—423 A **1 Claim**



1. A supply device for liquid analysis including,

a probe,

a liquid container,

said probe and said liquid container being relatively movable whereby said probe may be selectively disposed in said liquid container,

a takeoff conduit connected to the probe for conveying liquid from the liquid container,

a rinse fluid reservoir,

rinse fluid in said reservoir,

a movable valve in the takeoff conduit,

a secondary conduit connecting the reservoir and the valve,

vacuum means for drawing liquid from said liquid container through said probe and takeoff conduit when said valve is in a first position,

said rinse fluid flowing from said reservoir through said secondary conduit into the takeoff conduit when said valve is in a second position,

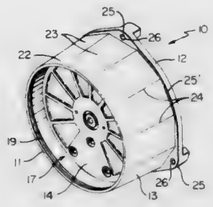
a portion of said rinse fluid flowing downstream from said valve toward said vacuum means and a portion of said rinse fluid flowing upstream from said valve toward and through said probe and into said liquid container when said valve is in said second position.

4,179,933

GAGE CONSTRUCTION AND CASING BODY THEREFOR

Larry V. Price, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 27, 1978, Ser. No. 881,353
Int. Cl.² G01D *11/24*
U.S. Cl. 73—431 **12 Claims**



1. In a gage construction having a substantially hollow casing body for containing gage components therein and being provided with a circular front face interconnected to a rear mounting flange by an annular side wall means disposed therebetween, said side wall means generally increasing radially outwardly from said front wall to said rear mounting flange, the improvement wherein said side wall means has a generally polygonal exterior surface portion adjacent said rear mounting flange and a generally frusto-conical exterior surface portion adjacent said front face, said surface portions blending together between said front face and said rear mounting flange.

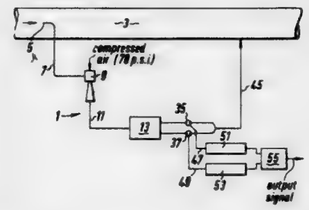
4,179,934

METHOD AND APPARATUS FOR MONITORING PARTICLE SIZES

Ladislav Svarovsky, Bradford, England, assignor to University of Bradford, Bradford, England

Filed May 15, 1978, Ser. No. 905,944
Claims priority, application United Kingdom, Jul. 6, 1977, 29950/77
Int. Cl.² G01N *15/02*
U.S. Cl. 73—432 PS **11 Claims**

1. Apparatus for monitoring particles entrained in a gas stream, said particles having an electrical noise associated therewith, the characteristic of said electrical noise being related to the size of said particle, comprising means for separating at least a portion of the particles in said gas stream into at least two fractions of relatively different average particles sizes



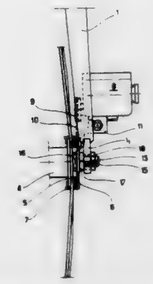
and means for comparing the electrical noise associated with the two or more fractions.

4,179,935

SPEEDOMETER FOR MOUNTING ON A CYCLE

Roger H. M. Huret, Nanterre, France, assignor to Etablissements Huret & Ses Fils, Nanterre, France

Filed Aug. 21, 1978, Ser. No. 935,593
Claims priority, application France, May 23, 1978, 78 15335
Int. Cl.² G01P *1/02*
U.S. Cl. 73—493 **8 Claims**



1. In combination a bicycle speedometer, a bicycle wheel for mounting on the fork of a bicycle and said bicycle wheel having an axle, axle securing means for securing said axle to said fork and means for operatively securing said speedometer to said axle for activation of said speedometer on rotation of said wheel, said means for operatively securing being independent of said axle securing means whereby said speedometer remains in operative relation to said wheel when said axle is disengaged from said fork.

4,179,936

ACOUSTIC IMAGE RECORDERS

Simon D. Bennett, and Eric A. Ash, both of London, England, assignors to National Research Development Corporation, London, England

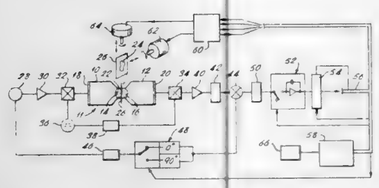
Filed May 18, 1978, Ser. No. 907,320
Claims priority, application United Kingdom, May 17, 1977, 20712/77
Int. Cl.² G01N *29/00*
U.S. Cl. 73—606 **12 Claims**

10. A method for sensing change in an object comprising:

irradiating the object with a focused beam of acoustic radiation excited by a first alternating electric signal;

receiving a beam of acoustic radiation modulated in phase and amplitude by the object in the vicinity of the focus and for deriving a second alternating electric signal therefrom;

providing a reference electric signal derived from the first alternating electric signal and at a known phase;
mixing coherently the second signal and the reference signal to derive an in-phase signal; and



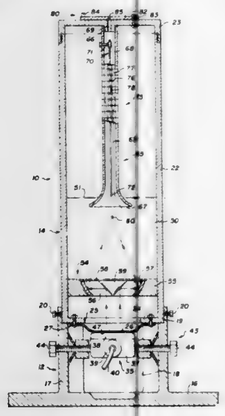
mixing the second signal and the reference signal altered in phase by between 80° and 100° to derive a quadrature signal.

4,179,937

SOUND MEASURING DEVICE

John N. Koblanski, Burnaby, Canada, assignor to Ocean Ecology Ltd., Edmonton, Canada

Filed Jun. 2, 1978, Ser. No. 912,112
Int. Cl.² G01H *3/10*
U.S. Cl. 73—646 **10 Claims**



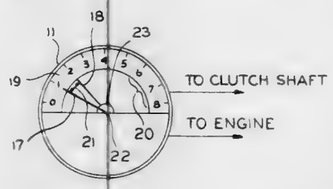
1. Apparatus for measuring the intensity of sound comprising;
a container having a peripheral wall and a bottom closure transparent to sound energy,
a body of liquid within the container, said body of liquid being partly supported by the bottom closure and having a top surface disposed intermediate the height of the peripheral wall,
a tube supported within the container above the body of liquid and having an open lower end disposed near the top surface,
mounting means for supporting a sound-generating transducer below the bottom closure and in vibrational contact therewith whereby vibrations generated by said transducer travel upwardly through the body of liquid as sound waves,
focusing means for concentrating the sound waves at a focal region located a predetermined distance below the top surface whereby to project a column of said liquid upwardly into the tube to a height proportionate to the output of the transducer, and
measuring means for indicating the height of the liquid column within the tube.

4,179,938

DUAL INDICATING TACHOMETER APPARATUS

Jack B. Schramm, 5218 Mulford, Skokie, Ill. 60076

Filed Apr. 6, 1978, Ser. No. 893,942
Int. Cl.² G01P *3/04*
U.S. Cl. 73—510 **3 Claims**



1. A dual-indicating tachometer apparatus for use with a vehicle to differentiate between the rotational speeds of an engine and clutch shaft of said vehicle, said apparatus comprising:
first tachometer sensing means operably attached to the engine of said vehicle for monitoring the rotational speed of said engine;
second tachometer sensing means operably attached to the clutch shaft of said vehicle for monitoring the rotational speed of said clutch shaft;
sensing joinder means at which both said first and second sensing means terminate for co-ordination between said sensing means as well as comparison of said respective rotating values;
said joinder means comprising concentric coupling device wherein one of said first or second sensing means is operably attached to an inner coupling portion while said other of said first or second sensing means is operably attached to an outer coupling portion;
said outer coupling portion freely rotatable about said inner coupling portion to permit the independent display of said respective rotational speeds through said rotation speed display means;
indicating means operably connected to said sensing joinder means for clearly and accurately displaying to a user of said vehicle the differences between the rotational speeds of said engine and clutch shaft thereby assisting and informing said user as to the efficiency of torque transmission from said engine to said clutch shaft for transmission shifting therebetween;
rotation speed display means for displaying the actual rotational speeds of both said engine and clutch shaft respectively thereby apprising said user of the respective speeds as well as the difference between speeds;
said rotation speed display means comprising a first indicator pointer means attached to said outer coupling portion and a second indicator pointer means attached to said inner coupling portion of said joinder means;
each of said first and second indicator pointer means being enclosed with said joinder means in an apparatus housing;
each of said first and second indicator pointer means positioned in front of a common calibrated dial, to represent the speeds of said engine and clutch shaft respectively,
said indicating means for displaying said differences in speeds comprising an exposed portion of said dial when said first and second indicator pointers are not in alignment and thus when the rotational speeds of said engine and clutch shaft speeds are unequal;
said indicating means further comprising spring loaded flag means operably interposed between said first and second indicator pointers,

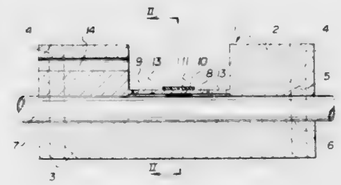
said flag means being increasingly exposed to said user as the difference between said engine and clutch shaft speeds increase to in turn increase the distance between said first and second pointers, and
said flag means alternatively capable of being springedly withdrawn as said first and second pointers approach alignment as said engine and clutch shaft rotation speeds approach one-another.

4,179,939

DIESEL FUEL PIPE TRANSDUCER

Ronald Price, Hazeldean, Canada, assignor to Goodwood Data Systems Ltd., Ontario, Canada

Filed Aug. 25, 1978, Ser. No. 936,800
Claims priority, application Canada, Nov. 10, 1977, 290636
Int. Cl.² G01L *7/02*
U.S. Cl. 73—730 **7 Claims**



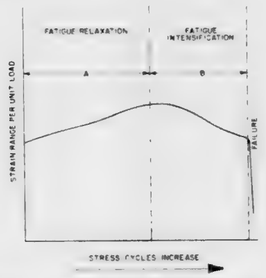
1. A transducer for monitoring dynamic variations in the diameter of a fuel injector pipe of a diesel engine, said transducer comprising: an elongate transducer body adapted to envelope a portion of said pipe and including an elongate passageway therein for placement of the pipe therethrough, means at least promixate either end of said body for securely connecting the body to the pipe, said body further including a thin and planar transverse bridge section located intermediate the ends of said body and wherein said bridge lies in a plane parallel to the longitudinal axis of said passageway, and a strain detecting element mounted on the exterior surface of said bridge.

4,179,940

STRUCTURAL FAILURE DETECTION METHOD

Donald H. Oertle, and Marvin L. Peterson, both of Ponca City, Okla., assignors to Conoco, Inc., Ponca City, Okla.

Filed Oct. 2, 1978, Ser. No. 947,809
Int. Cl.² G01N *3/32*
U.S. Cl. 73—808 **9 Claims**



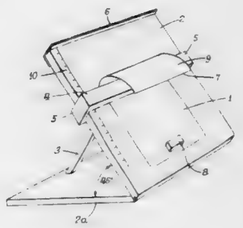
1. A method for monitoring imminent fatigue crack failure of metallic structural members comprising sensing strain on said structural member and monitoring said strain for fatigue relaxation and subsequent fatigue intensification, said crack initiation being of high probability when fatique intensification as determined by the measured strain range per unit load returns to near or below beginning measured strain values.

4,179,941

METHOD OF AND APPARATUS FOR MEASURING THE FLEXURAL STIFFNESS OF A SHEET LIKE SAMPLE

Alfred Walter, Schlieren, Switzerland, assignor to Alfred Walter AG, Schlieren, Switzerland

Filed Aug. 16, 1978, Ser. No. 933,997
Claims priority, application Switzerland, Aug. 22, 1977, 10285/77
Int. Cl.² G01N *3/20*
U.S. Cl. 73—854 **10 Claims**



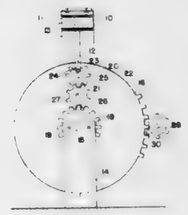
1. A method of measuring the flexural stiffness of a sheet like sample comprising placing the sample on an oblique surface with the upper edge being above a horizontal clamping line, pivoting the upper portion of the sample about the vertical so that the upper portion of the sample freely sags outward about the clamping line, and reducing the free clamping length measured between the top edge of the sample and the clamping line until the sample independently pivots back into the oblique surface, whereby the residual clamping length measured at the back pivoting is a measurement of the flexural stiffness of the sample.

4,179,942

VARIABLE RATIO CRANK ASSEMBLY

Leslie C. Matthews, 203-2033-11th Ave.SW., Calgary, Canada (T3C 0P2)

Filed Jan. 9, 1978, Ser. No. 867,874
Int. Cl.² F16H *21/18*
U.S. Cl. 74—43 **11 Claims**



1. In an internal combustion engine which includes supporting structure, at least one piston reciprocal within a cylinder and a connecting rod operatively connected by one end thereof to said piston and extending from said cylinder; the improvement comprising in combination a relatively large drive wheel, means to journal said drive wheel for rotation, means operatively connecting said drive wheel to said connecting rod, said means including a stationary gear concentric with said drive wheel and having a diameter less than the drive wheel, a relatively small connecting rod gear, means journal-

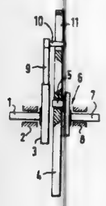
ling said connecting rod gear for rotation upon one face of said drive wheel in a position between the axis of said drive wheel and the perimeter thereof, said connecting rod being pivotally secured by the other end thereof to one side of said connecting rod gear in a position between the axis of said connecting rod gear and the perimeter thereof, and means operatively connecting said connecting rod gear with said stationary gear and means whereby the pivotal securement of said connecting rod to said connecting rod gear is nearest to the perimeter of the said drive wheel at top dead center and bottom dead center of said piston and nearest to the axis of said drive wheel at a position 90° of rotation from top dead center and bottom dead center.

4,179,943

MECHANICAL TORQUE CONVERTER

Vittorio Gamba, Calle Amboto, 5-4°B Algorta,, Vizcaya, Spain

Filed Jun. 3, 1977, Ser. No. 803,165
Claims priority, application Italy, Sep. 30, 1976, 27833 A/76
Int. Cl.[2] F16H *33/02*
U.S. Cl. 74—64 **19 Claims**



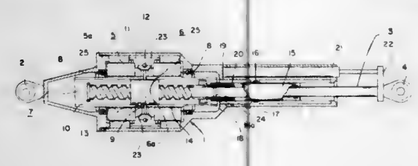
1. A mechanical torque converter of kinetic-inertial operation, comprising:
an input shaft to which a torque is applied;
at least one idly rotating mass; means driven by the input shaft and adapted to impress on said mass a periodic rotary motion in which the speed variations in the first quarter of the period of rotation are less than those in the last quarter, while the speed variations in the second quarter of the period of rotation are greater than those in the third;
means to which said mass transmits the reactions consequent on its motion; and
an output shaft on which the last-named means generate a torque, the intensity of which varies in inverse proportion to the instantaneous angular acceleration of the mass, and to the speed of rotation of said output shaft.

4,179,944

FAIL SAFE REDUNDANT ACTUATOR

Gary E. Conner, San Jose, Calif., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 27, 1977, Ser. No. 810,149
Int. Cl.[2] F16H *27/02, 29/02, 1/18*
U.S. Cl. 74—89.15 **2 Claims**



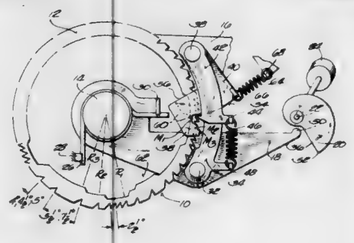
1. A fail-safe actuator comprising:
(a) an output shaft;
(b) a guide shaft receiving said output shaft;
(c) first delatchable coupling means connecting said output shaft and said guide shaft;
(d) power screw means for driving said guide shaft in a longitudinal direction, said power screw means comprising screw means comprising screw and nut components;
(e) rotor shaft means receiving said nut component;
(f) connecting means connecting said nut component to said rotor shaft means in rotationally fixed, translationally free relationship therewith;
(g) second delatchable coupling means preventing translational motion of said ball nut means within said rotor shaft;
(h) first and second reversable drive means for causing rotation of said rotor shaft, said first drive means being adapted to rotate said rotor means in a clockwise direction in normal operation and said second drive means being adapted to rotate said rotor shaft in a counter-clockwise direction in normal operation;
(i) means for delatching said second delatchable coupling means when either of said motors are operated in the reverse direction from normal operation; and
(j) means directing said ball nut into delatching engagement with said first delatching means after said second delatching means is delatched.

4,179,945

VARIABLE STEP SIZE IMPULSE DRIVE

George Obermann, Niles, Ill., assignor to The Singer Company, New York, N.Y.

Filed Sep. 5, 1978, Ser. No. 939,321
Int. Cl.[2] F16H *29/00*
U.S. Cl. 74—122 **10 Claims**



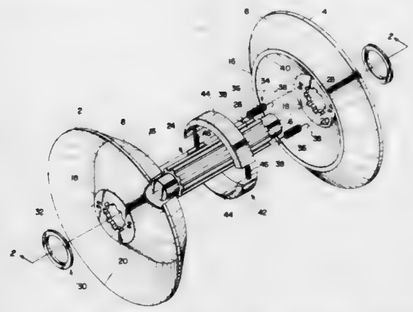
1. The combination with a timer of the type having a switching device rotated in a step-by-step manner, of
a ratchet mounted for rotation about its axis and including ratchet teeth,
a pivot,
a lever mounted on the pivot and including a cam follower,
a rotatable impulse cam having a slow-rise, fast-drop face,
spring means biasing the follower against the cam face,
a drive pawl pivoted on the lever,
said pawl being biased into engagement with the ratchet,
said cam actuating the pawl a fixed distance equivalent to a fixed angular relationship to said ratchet each time said follower drops down the fast-drop face,
said ratchet teeth having various angular spacings up to said fixed angular relationship,
means sensing the angular size of the step next to be taken and limiting engagement of the pawl with the ratchet accordingly.

4,179,946

VARIABLE RATIO DRIVE SYSTEM INCLUDING A COMPACT VARIABLE DIAMETER PULLEY

Steven J. Kanstoroom, 10516 Cascade Pl., Silver Spring, Md. 20902

Filed Dec. 19, 1977, Ser. No. 861,971
Int. Cl.[2] F16H *55/52, 55/56*
U.S. Cl. 74—230.17 E **8 Claims**



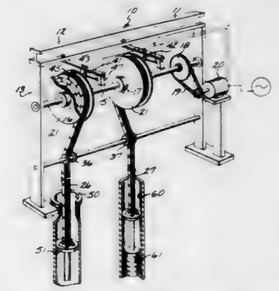
1. A speed responsive, variable ratio transmission, comprising
A. a V-belt;
B. a first variable diameter pulley for engagement with said V-belt, said first variable diameter pulley including:
(1) a first rotatably supported hub,
(2) first and second identically shaped pulley members, each said first and second pulley member including an outer frusto-conical surface, an inner frusto-conical surface spaced radially inwardly within the axial limits of said outer frusto-conical surface, a radial flange extending from the inner radial extremity of said inner frusto-conical surface toward said first central hub, and first connection means for connecting the inner radial extremity of said radial flange to said first central hub to prevent relative rotational movement therebetween and to permit axial movement on said first central hub to vary the effective diameter of said first variable diameter pulley by causing opposite sides of said V-belt to engage, respectively, said outer frusto-conical surfaces at a radial distance from the rotational axis of said first central hub dependent upon the axial spacing between said outer frusto-conical surfaces,
(3) first bias means connected with said radial flanges of said first and second pulley members for biasing said pulley members together into engagement with opposite sides of said V-belt, and
(4) second bias means for overcoming said first bias means to displace said pulley members apart axially by a distance which is proportional to the rotational speed of said members, said second bias means includes an inertial mass mounted radially inwardly of said outer frusto-conical surfaces within the axial space between said inner frusto-conical surfaces and in contact with said inner frusto-conical surfaces; and
C. a second variable diameter pulley rotatably linked with said first variable diameter pulley by said V-belt, said second variable diameter pulley including:
(1) a second rotatably supported central hub,
(2) a pair of identically shaped tension operated pulley members, each said tension operated pulley member including an outer frusto-conical surface, an inner frusto-conical surface spaced radially inwardly within the axial limits of said outer frusto-conical surface, a radial flange extending from the inner radial extremity of said inner frusto-conical surface toward said second central hub, and second connection means for connecting the inner radial extremity of said flange to said second central hub to prevent relative rotational movement therebetween and to permit axial movement on said second central hub to vary the effective diameter of said second variable diameter pulley by causing opposite sides of said V-belt to engage, respectively, said outer frusto-conical surfaces at a radial distance from the rotational axis of said second central hub dependent upon the axial spacing between said outer frusto-conical surfaces, each said tension operated pulley member being identical in shape with each of said first and second pulley members, and
(3) tensioning means connected with the radial flanges of said tension operated pulley members for biasing said tension operated pulley members together to cause the outer frusto-conical surfaces of said pair of tension operated pulley members to frictionally engage, respectively, the opposite sides of said V-belt and for allowing said tension operated pulley members to move axially relative to one another to vary the effective diameter of said second pulley in inverse proportion to variation in the effective diameter of said first pulley.

4,179,947

COUNTERBALANCED PUMPING SYSTEM

Robert G. James, 3509 Janene Way, Bakersfield, Calif. 93306

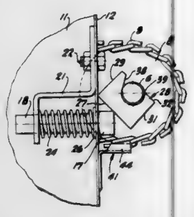
Filed Aug. 15, 1977, Ser. No. 824,346
Int. Cl.[2] F16H *29/02*
U.S. Cl. 74—89.2 **7 Claims**



1. Apparatus for articulating linearly reciprocal devices comprising:
a frame adapted for upright support placement;
a shaft mounted for rotation in said frame in substantially horizontal alignment;
motor means connected to assist in rotation of said shaft;
a first and second substantially circular mandrel secured in spaced relationship on said shaft;
a first sheave chain attached to said first mandrel and spirally wound upon itself in a first direction around the periphery thereof the free end of said first sheave chain being attached to said reciprocal device;
a second sheave chain attached to said second mandrel and spirally wound upon itself in a second direction around the periphery thereof; and
counterbalancing means connected to the free end of said second sheave chain, whereby the spiral windup of said first sheave chain is variably opposed by said second sheave chain according to said peripheries thereof to form an oscillary system.

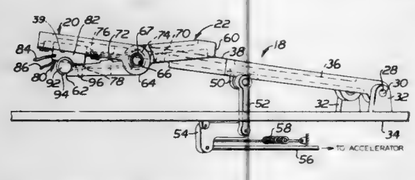
V 9 8 9 4 D E 2 5 7 9 UMI

4,179,948
SHAFT MOUNTING
Nils Lang-Ree, Los Altos, Calif., assignor to NPI Corporation, Burlingame, Calif.
Filed Mar. 27, 1978, Ser. No. 890,134
Int. Cl.[2] F16H 7/10
U.S. Cl. 74—242.15 R 9 Claims



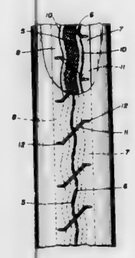
1. A shaft mounting comprising a frame including a planar strap having an opening therein, a shaft rotatable about an axis parallel to and spaced from the plane of said strap, a rotatable bearing block adapted to overlie said opening and having a groove therein of an extent adapted to engage less than a half-circumference of said shaft and defined by an arcuate surface the elements of which are parallel to said axis, said block having at least some flat bounding surfaces at right angles to each other and parallel to and at predetermined distances from said axis, means for supporting said block with one of said flat bounding surfaces parallel to said strap, and means for urging said one of said flat surfaces of said block away from said strap.

4,179,949
CONTROL PEDAL
Harold V. Hildebrecht, Cleveland, Ohio, assignor to Towmotor Corporation, Mentor, Ohio
Filed Jun. 28, 1978, Ser. No. 919,886
Int. Cl.[2] G01M 1/168; G01P 3/04; G01H 5/00
U.S. Cl. 74—474 7 Claims



1. In a vehicle (10) including a control pedal (18) having an accelerator portion (20), said accelerator portion (20) including a foot contact surface (38) and an underside surface (39), the improvement comprising:
- a switch (80) mounted adjacent the underside surface (39);
- a switch actuator (92); and
- means (22) for moving the switch actuator (92) relative to the switch (80), said means being connected to the accelerator portion (20) and having one end (62) including the switch actuator (92) adjacent the underside surface (39) and another end (60) adjacent the foot contact surface (38), said one end (62) movable toward the underside surface (39) adjacent the switch (80) in response to movement of the other end (60).

4,179,950
STEERING WHEEL COVER
James F. Valley, 6613 Hollis St., Emeryville, Calif. 94608
Filed May 31, 1978, Ser. No. 911,205
Int. Cl.[2] G05G 1/10; B65H 81/00
U.S. Cl. 74—558 7 Claims

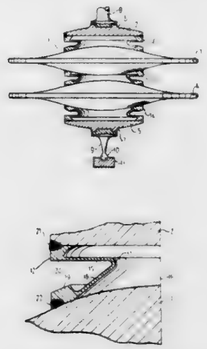


1. A steering wheel cover comprising:
- an annular band of soft flexible material having a length dimensioned for distension around a steering wheel rim and a width dimensioned for wrapping around said rim juxtaposing opposite side edges of said band;
- said band being formed with hems at and extending longitudinally of said side edges and being perforated to provide means for interlacing said side edges; and
- a nonelastic flexible cord mounted in and extending longitudinally of each of said hems between said perforations and said side edges, said cords and perforations being positioned for, and said cords having tensile strength requisite to thereby provide means for transmitting to said side edges the clamping action of said interlacing while relieving stress on the walls of said perforations, whereby, when said steering wheel cover is laced on a steering wheel through said perforations the force of stretching said cover is transmitted to said cords and tearing of said perforations is avoided.

4,179,951
FLYWHEEL ROTOR PARTICULARLY SUITABLE FOR ACCUMULATING ENERGY
Frederik H. Theyse, Bensberg-Herkenrath, Fed. Rep. of Germany, assignor to Stichting Energieonderzoek Centrum Nederland, The Hague, Netherlands
Filed Dec. 10, 1976, Ser. No. 749,270
Claims priority, application Netherlands, Dec. 18, 1975, 7514749
Int. Cl.[2] F16F 15/30; F16D 3/52, 3/56
U.S. Cl. 74—572 3 Claims

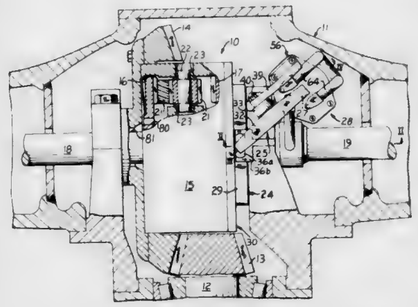
1. A flywheel rotor suitable for accumulating kinetic energy of rotation at high rotational speed, in which the rotor is assembled from at least two separate coaxial flywheel components which are interconnected by means of an elastic metallic link, said elastic metallic link having the form of a solid of revolution comprising one single, relatively thin-walled bellows fold facing the axis of rotation, the bellows fold having two fold walls which are connected to each other by a bent-over portion, the bellows fold also having end edges which are affixed to the flywheel components adjoining the elastic link, one of said end edges at the location of its attachment to the respective flywheel component being thickened relative to the thickness of the adjacent fold wall, one fold wall of the bellows fold having the form of a truncated cone, the other wall of the fold being flat and located in a plane surface perpendicular to the axis of rotation of the rotor, said fold being provided with a

number of narrow, closed radial slits penetrating from the extremity of the fold partially into both fold walls equally, the



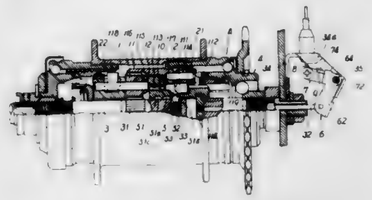
slits being uniformly distributed along the periphery of the fold.

4,179,952
LUBRICATION MEANS FOR A TORQUE PROPORTIONING DIFFERENTIAL
Frank E. Keske, Chillicothe, and David E. Hackett, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Apr. 24, 1975, Ser. No. 571,117
Int. Cl.[2] F16H 1/44; F01M 1/08
U.S. Cl. 74—710 28 Claims



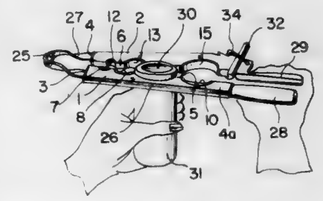
1. In a differential of the type comprising a pair of face gears, a rotatable carrier disposed between said face gears, pinion gear means rotatably mounted in bearing means on said carrier and meshing with said face gears for differentially permitting one face gear to rotate relative to the other face gear and lubrication means for supplying a lubricating and cooling fluid to said pinion gear means and said bearing means, the invention wherein said lubrication means comprises a double-acting pump means, inlet passage means for communicating fluid into each end of said pump means, outlet passage means for communicating fluid from each end of said pump means to said pinion gear means and said bearing means, actuating means operatively associated with each end of said pump means for drawing fluid into said pump means through said inlet passage means at one end thereof while simultaneously pumping fluid from the other end thereof to said outlet passage means and drive means for selectively actuating said actuating means.

4,179,953
GEAR TRANSMISSION CONTROL DEVICE FOR MULTIPLE-SPEED HUB FOR BICYCLES
Mitsugu Hanada, and Seiji Fukui, both of Sakai, Japan, assignors to Shimano Industrial Company, Limited, Osaka, Japan
Filed Apr. 14, 1977, Ser. No. 787,490
Claims priority, application Japan, Apr. 21, 1976, 51/45865
Int. Cl.[2] F16H 3/44
U.S. Cl. 74—750 B 4 Claims



1. A gear transmission control device for a multiple-speed hub for a bicycle, which hub houses the gear transmission within a hub shell and changes the driving force to be transmitted from a driving member to the hub shell by actuating a controller through a control wire, said device comprising:
- (a) a fixed member fixed to the bicycle frame,
- (b) an actuating arm pivotally supported to said fixed member through a pivot, said actuating arm swinging to actuate said controller, thereby changing the transmission,
- (c) a control arm pivotally supported to said fixed member through said pivot, said control arm being shiftable independently of said actuating arm, said control arm carrying at one end the control wire fixed thereto, and
- (d) an energy-storing spring insertably supported between said actuating arm and said control arm, said spring storing energy by swinging said control arm with respect to said actuating arm when said controller is, in the speed change, subjected to a resistance more than a prescribed value, said actuating arm being made swingable by the stored energy when the resistance is released, thereby moving said controller by said swinging.

4,179,954
JAR AND BOTTLE OPENER
Robert Whalen, 47-57 44th St., Woodside, N.Y. 11377
Filed Apr. 18, 1978, Ser. No. 897,556
Int. Cl.[2] B67B 7/00
U.S. Cl. 81—3.44 1 Claim



1. A jar and bottle opener, comprising
- first and second symmetrical elongated gripping members each having spaced opposite first and second ends, each of said gripping members having a first length-extending edge with a plurality of spaced substantially partially circular notches formed therein and an opposite second length-extending edge, the diameters of the notches varying from a minimum in the area of the first end to a maximum in the area of the second end;
- a joining member of substantially resilient material bent in a generally V-shape and having a pair of elongated arms

angularly disposed relative to each other, each of the arms being affixed to the second edge of a corresponding one of the gripping members in a manner whereby the first edges of said gripping members are angularly disposed in facing relation relative to each other with the minimum diameter notches thereof closer to each other than the maximum diameter notches thereof;

handles extending from the second ends of the gripping members to facilitate urging said second ends toward each other to grasp a lid of a container between corresponding notches of said gripping members; and

handle mounting means mounted on the second gripping member at the second end thereof for adjustably mounting the handle thereof for movement in directions transverse to the length of said gripping member.

4,179,955

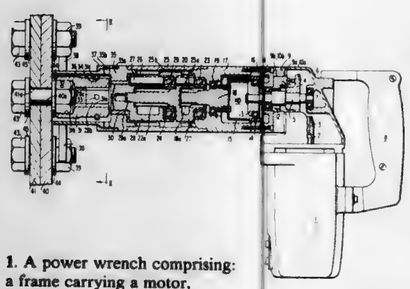
POWER WRENCH

Toshio Akiyoshi; Tsutomu Onishi, both of Fukuoka, and Shozo Haikawa, Kyoto, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo and Kabushiki Kaisha Terauchi Seisakusho, Kyoto, both of, Japan

Continuation-in-part of Ser. No. 683,874, May 6, 1976, abandoned, which is a continuation of Ser. No. 450,921, Mar. 13, 1974, abandoned. This application Aug. 1, 1978, Ser. No. 930,074

Int. Cl.² B25B *29/00*

U.S. Cl. 81—57.11 **4 Claims**



1. A power wrench comprising:

a frame carrying a motor,

a handle secured to said frame,

at least one speed reduction gear means having an input and an output, said input operatively coupled to said motor,

a case accommodating said speed reduction gear means,

a receptacle coupled to the output of said speed reduction gear means and projecting from one end of said case for engagement with a threaded rotatable workpiece element to be clamped and supported by a stationary element,

a sleeve mounted to one end of said case for rotation with said case and surrounding the periphery of said receptacle,

a bar-shaped anti-rotation member for rotation with said sleeve and projecting radially outwardly therefrom for engagement with said stationary element supporting said threaded rotatable workpiece, and

means for rotatably mounting said case to said frame under a predetermined frictional restraint at the input of said speed reduction gear means;

whereby, said anti-rotation member prevents rotation of the case due to clamping reaction force, but upon deformation or breaking of the anti-rotation member, said case rotates relative to said frame and said handle overcoming the frictional restraint to prevent clamping reaction torque transmission to the power wrench operator, and said power wrench further comprising means for mounting said sleeve for relative free rotation with respect to said case within a predetermined angle to permit said bar-shaped anti-rotation member to be rotated slightly during engagement of said receptacle to said threaded rotatable work piece without rotation of said case due to said predetermined frictional restraint and to thereby eliminate the necessity of rotating the handle to cause said anti-rotation member to move out of the way of a portion of the stationary element which would otherwise prevent said engagement.

4,179,956

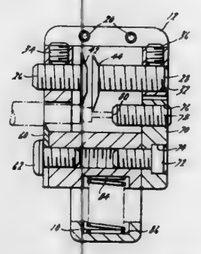
WIRE STRIPPING TOOL

Marshall J. Gooley, West Bloomfield, Mich., assignor to Daniels Manufacturing Corp., Bloomfield Hills, Mich.

Filed Jan. 16, 1978, Ser. No. 870,028

Int. Cl.² H02G *1/12*

U.S. Cl. 81—9.5 R **17 Claims**



1. A manually operable tool for stripping insulation from insulated wires comprising: a base structure; a cutter holding member mounted on said base structure and having at least one circular cutter blade adjustably mounted thereon eccentrically with respect to the center of said cutter blade, a cable supporting means mounted on said base structure, and means for spring biasing said cutter holding member and said cable supporting means toward each other.

4,179,957

APPARATUS FOR DAMPING NOISE IN BAR-FEEDING DEVICES OF SCREW-CUTTING MACHINES

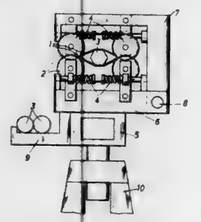
Wilhelm Sewing, Hagedorner Str. 151, D 4983 Kirchlengern 3, Fed. Rep. of Germany

Filed May 2, 1978, Ser. No. 902,049

Claims priority, application Fed. Rep. of Germany, May 3, 1977, 2719687

Int. Cl.² B23B *13/08, 25/00;* B23Q *3/00*

U.S. Cl. 82—38 A **4 Claims**



1. Apparatus for damping noise in bar-feeding devices of automatic screw-cutting machines, especially for bars with a polygonal profile, the apparatus comprising at least one group of rollers composed of an upper pair of laterally spaced upright rollers and a lower pair of laterally spaced upright rollers, means supporting all of the rollers with their axes parallel to one another, an endless belt extending around each pair of rollers, the lower length of the upper belt and the upper length of the lower belt being unsupported between the rollers and adapted to engage the top and bottom of a rotating and axially moving bar between them extending across the belts, whereby to support the rotating bar as it moves said lower and upper lengths of the belts in opposite directions, and resilient means urging the rollers in each pair laterally away from each other to maintain said belts taut.

4,179,958

METHOD FOR SHEARING HOT STRIPS AND DEVICE THEREFOR

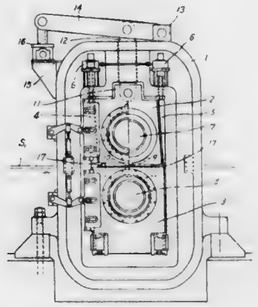
Susumu Nomura; Hiroyuki Okubo, both of Yokohama; Hiroshi Isozaki, Zushi; Tsutomu Hara, and Bunpei Masuda, both of Yokohama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1977, Ser. No. 791,048

Claims priority, application Japan, Apr. 30, 1976, 51-49613

Int. Cl.² B23D *25/12*

U.S. Cl. 83—37 **1 Claim**



1. A method for shearing a continuously traveling horizontally arranged hot strip into a plurality of successive sections, comprising the steps of:

(a) moving a horizontally arranged hot strip along its longitudinal axis;

(b) rotating a first horizontal blade about a horizontal parallel spaced axis above and transverse to the longitudinal axis of, said hot strip;

(c) rotating a second horizontal blade about a horizontal parallel spaced axis below, and transverse to the longitudinal axis of, said hot strip, the axes of said blades being initially contained in a common vertical plane; and

(d) progressively displacing the axis of one of said blades toward the other axis with the axis of said one blade being maintained horizontal, the path of movement of said one axis being contained in a plane that is arranged at an acute leading angle relative to said vertical plane in the direction of travel of the strip, whereby said one blade follows a non-circular locus during shearing and travels faster than the other blade in the direction of strip travel, thereby to eliminate the formation of needle-shaped burrs.

4,179,959

METHOD AND APPARATUS FOR THE CUTTING OF SPLIT TILES

Hans Lingl, Jr., Paris, Tenn., assignor to Lingl Corporation, Paris, Tenn.

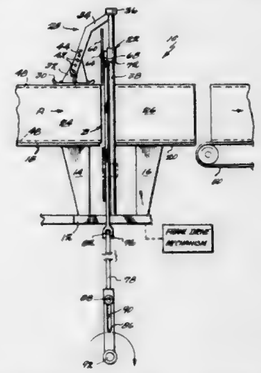
Filed Oct. 31, 1977, Ser. No. 846,938

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649409

Int. Cl.² B26D *1/56*

U.S. Cl. 83—37 **18 Claims**

2. Apparatus for cutting an extruded column of plastic material into segments comprising cutting means for cutting the extruded plastic column into segments without tearing the outer surface thereof, said cutting means arranged to move alternately back and forth with respect to said column between first and second positions with each alternate movement between said first and second positions comprising a cutting stroke, cutting drive means for moving said cutting means between said first and second positions, frame means for supporting said cutting means and at least that portion of said column adjacent the cut, frame drive means for moving said



frame and cutting means with respect to said column prior to and during each cutting stroke, wherein said cutting means includes a pair of cutting members, means for mounting each of said cutting members oppositely from one another so that each will cut into said column from opposite sides thereof during each cutting stroke, said mounting means being movably secured to said frame means and operatively connected to said cutting drive means.

4,179,960

FILM SPLICER

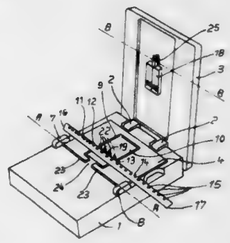
Rudolf Hanke, Monheim, Fed. Rep. of Germany, assignor to Hama Hamaphot K.G. Hanke & Thomas, Monheim, Fed. Rep. of Germany

Filed Jul. 31, 1978, Ser. No. 929,300

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1977, 2751240

Int. Cl.² G03D *15/04;* B26D *7/14*

U.S. Cl. 83—175 **2 Claims**



1. In a film splicer including a base and a lid hingedly connected to the base for movement between lid-opened and lid-closed positions relative to the base and a cutting blade depending from the lid for trimming the adjacent ends of the to-be-spliced film lengths as the lid is brought into lid-closed position, the improvement in the form of a mechanism for compensating for the gap resultant from the passage of the cutting blade through the film lengths following severance comprising:

a slotted support plate of resilient material for upwardly supporting the adjacent ends of the to-be-spliced film lengths,

aligning means projecting from the support plate for accommodating sprocket holes of the to-be-spliced film lengths and holding the film lengths relative to the support plate,

a plunger having a width greater than the normal width of the slot of the support plate and depending from the lid for passage into the slot in a slot-widening stroke as the lid is moved into lid-closed position and the cutting blade is concomitantly moved through the film lengths and into the widening slot,

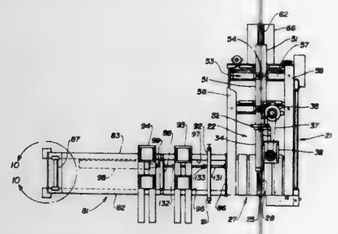
the support plate being returnable to initial position with concomitant movements of the film lengths on opposite sides of the slot toward each other following withdrawal of the plunger and cutting blade from the slot as the lid is retracted into lid-opened position.

4,179,961

VERTICAL BAND SAW AND FEED TABLE

Gerald R. Harris, 1230 Camelia Dr., Livermore, Calif. 94550

Division of Ser. No. 732,107, Oct. 13, 1976, Pat. No. 4,117,756.
This application Jul. 11, 1978, Ser. No. 923,557
Int. Cl.[2] B23D *55/04*
U.S. Cl. 83—206 **5 Claims**



1. A stabilization device for use in resisting backward tilting about a horizontal axis of a movable vise, said vise being formed for gripping of a work piece and mounted for reciprocation on viseways on a feed table to enable feeding of said work piece to a machine tool, such as a band saw, comprising:

a stabilizing bar formed to be rigidly secured to said vise and formed to extend a substantial distance from said vise in a direction away from said machine tool, said stabilizing bar being further formed for engagement with and bearing upon a portion of said feed table remotely of said vise to provide a pivot point for tilting of said vise at a substantial distance away from said vise.

4,179,962

COMBINED FLYING CUTOFF AND PUNCH

Hubert C. Crump, Galesburg, Ill., assignor to Butler Manufacturing Company, Kansas City, Mo.

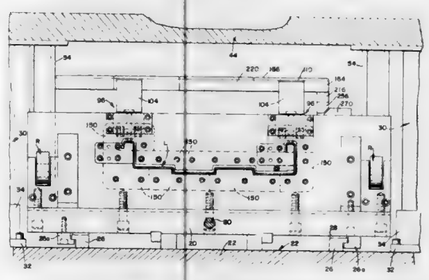
Filed Jun. 1, 1978, Ser. No. 911,684
Int. Cl.[2] B26D *1/56, 9/00*
U.S. Cl. 83—300 **20 Claims**

1. A flying panel cutoff and punch device comprising:

a slugless cutoff means and actuating means therefor for shearing panels of predetermined length from a continuous length of material;

a punch means on said slugless cutoff means for punching holes in a panel; and

punch actuating means on said cutoff means for actuating said punch while said cutoff means shears such panel from a length of material so that said punch means and said slugless cutoff means are actuated at the same time, said punch actuating means including a plurality of cams, said plurality of cams including a wedge block on the cutoff



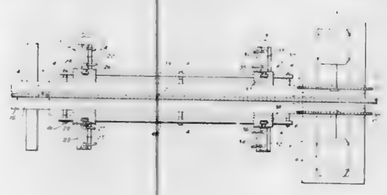
means and a retainer cam on a stationary member of the device.

4,179,963

SCRAG SAW MILL DOGGING SYSTEM

Lloyd E. Rhodes, 242 Lake St., Bellingham, Mass. 02019

Filed Jun. 8, 1978, Ser. No. 913,793
Int. Cl.[2] B27B *7/00, 29/04*
U.S. Cl. 83—409 **12 Claims**



1. A saw mill comprising:

(a) a pair of power driven saws;

(b) an elongated carrier for supporting a log to be passed through said saws;

(c) a pair of spiked dogs supported adjacent opposite sides of the position to be occupied by a log on said carrier;

(d) power operated means for driving each of said dogs toward said position along a path having a substantial component transverse to the longitudinal axis of the log, said path also having a substantial component directed toward said carrier, whereby, upon contact of said dogs with said log, the log will be locked against transverse motion and clamped against said carrier;

(e) independent driving means for engaging said log, so locked and clamped, and for propelling said log along a path extending through and beyond said saws;

(f) said dogs being supported on a carriage which is mounted to be moveable as the dogs are carried along by being locked to said log as it moves toward said saws;

(g) means for reversing the power supplied to said power operated means to reverse the direction in which said power operated means drives said dogs; and

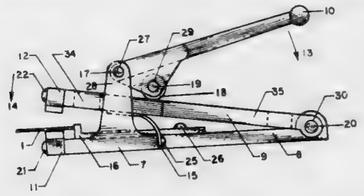
(h) means, responsive to said carriage reaching a predetermined position adjacent said saws, for energizing said reversing means to disengage said dogs from said log.

4,179,964

RIBBON CABLE SPLITTING DEVICE

James P. Kirkgasser, DeWitt, and Arthur C. Goldsmith, Lafayette, both of N.Y., assignors to K-G Devices Corporation, DeWitt, N.Y.

Continuation-in-part of Ser. No. 652,862, Jan. 27, 1976, abandoned. This application Mar. 7, 1977, Ser. No. 774,891
Int. Cl.[2] B26D *5/10;* H02G *1/12*
U.S. Cl. 83—599 **2 Claims**



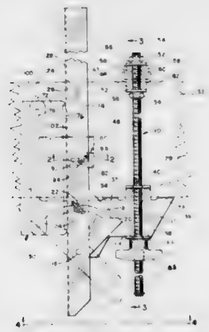
1. A device for separating and spacing conductive units of a ribbon-type electrical cable consisting of parallel insulated conductor units joined by a web of insulating material, said device comprising a pair of planar opposing engageable jaws each having a plurality of linear meshing teeth having longitudinal channel shaped cutting edges, said teeth being spaced to intermesh whereby said cutting edges shear the web between conductors without removal of insulating material from the conductors, the cutting and separating motion being substantially perpendicular to the length of the cable being cut, and one of said jaws being stationary and the other being movable to affect engagement and intermeshing of the teeth.

4,179,965

GUIDE FOR PORTABLE POWER TOOL

F. Walter Johnson, 2920 Floyd St., Sarasota, Fla. 33579

Filed Mar. 13, 1978, Ser. No. 885,975
Int. Cl.[2] B27B *9/04*
U.S. Cl. 83—745 **8 Claims**



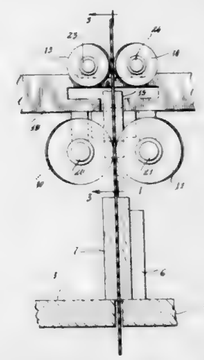
1. A guide for use with a portable tool having a cutter and a support shoe provided with a guiding edge, said guide comprising a support plate, a straight edge member having a guiding edge mounted on said support plate, and means for clamping said support plate to a workpiece comprising a pair of downwardly turned edge portions in said support plate, a pair of upwardly turned opposite coaxial ears in said support plate, aligned apertures in said ears, a single threaded rod passed through said aligned apertures, a clamping surface on a clamp member mounted on an end of said threaded rod, and a nut threading on said threaded rod and disposed such as to draw said clamping surfaces toward each other, said nut being of the type providing disengagement of its internally threaded bore with the thread of said threaded rod upon pivoting said nut with its axis at an angle to the axis of said single threaded rod.

4,179,966

SENSOR FOR DETERMINING BAND SAW DEFLECTION AND FOR GUIDING THE BAND SAW BLADE

Oscar Ginnow, and Roger Ginnow, both of 68 Hopbrook Rd., Bethany, Conn. 06525

Filed Jan. 30, 1978, Ser. No. 873,209
Int. Cl.[2] B27B *13/10;* B23D *55/08*
U.S. Cl. 83—820 **1 Claim**



1. A band saw of the type including a band saw blade, a work table and guide wherein the improvement comprises:

(a) a first carriage with a first and second axle in a first horizontal plane and a third and fourth axle in a second horizontal plane, said carriage located above said work table;

(b) a first correcting roller rotatably mounted on said first axle with the said first axle and first correcting roller making an angle with the saw blade of between 15° and 30° and with the first correcting roller contacting the front portion of the saw blade behind the set and gullet areas of the blade with more than one-half of the width of the blade behind the point where the correcting rollers contact the blade;

(c) a second correcting roller rotatably mounted on said second axle with the said second axle and said second correcting roller making an angle with the saw blade of between 15° and 30° and with the second correcting roller contacting the front portion of the saw blade behind the set and gullet areas of the blade with more than one-half of the width of the blade behind the point where the correcting rollers contact the blade;

(d) a correction limiting rollers including a third roller mounted on said third axle and a fourth roller mounted on said fourth axle, said rollers being arranged so as to be adjacent to the trailing edge of the blade;

(e) a thrust roller mounted on said first carriage and arranged so as to be in contact with the trailing edge of the band saw blade;

(f) a second carriage with a first and second axle and a first horizontal plane and a third and fourth axle in a second horizontal plane, said carriage located below the work table;

(g) a first correcting roller rotatably mounted on the first axle of said second carriage with the said first axle and first correcting roller making an angle with the saw blade of between 15° and 30° and with the first correcting rollers contacting the front portion of the saw blade behind the set and gullet area of the blade with more than one-half of the width of the blade behind the point where the correcting rollers contact the blade;

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(h) a second correcting roller rotatably mounted on the second axle of the second carriage with the said second axle and second correcting roller making an angle with the saw blade of between 15° and 30° and with the second correcting roller contacting the front portion of the saw blade behind the set and gullet areas of the blade with more than one-half of the width of the blade behind the point where the correcting roller contacts the blade;

(i) correction limiting rollers located on said second carriage including a third roller mounted on said third axle and a fourth roller mounted on said fourth axle with said rollers arranged so as to be adjacent to the trailing edge of the blade;

(j) a thrust roller mounted on said second carriage and arranged so as to be in contact with the trailing edge of the band saw blade whereby the edge of the correcting roller acts as a pivot for the blade so that the blade is steered in the direction from which the force comes so as to provide a smooth, clean cut.

4,179,967

VARIABLE TOOTH SAW BLADE

Calvin M. Clark, Bernardston, Mass., assignor to Stanadyne, Inc., Windsor, Conn.

Filed Aug. 28, 1978, Ser. No. 937,549
Int. Cl.² B23D *61/12*; B27B *33/02*
U.S. Cl. 83—846 **10 Claims**



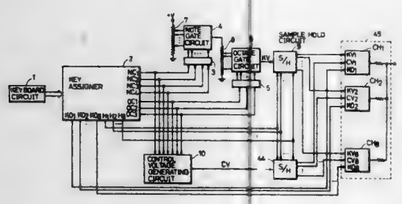
1. A saw blade having a toothed edge comprising a plurality of recurrent groups of teeth; each group including a series of teeth which are set angularly and alternately sidewise the same amount and which first decrease progressively in gullet depth and pitch and then increase progressively in gullet depth and pitch, said teeth having varying rake angles, the shorter teeth having a more positive rake angle than the longer teeth.

4,179,968

ELECTRONIC MUSICAL INSTRUMENT

Hideo Suzuki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 13, 1977, Ser. No. 841,717
Claims priority, application Japan, Oct. 18, 1976, 51-124528
Int. Cl.² G10H *1/00*
U.S. Cl. 84—1.01 **7 Claims**



1. An electronic musical instrument in which tone pitch determining voltages corresponding to respective tone pitches of a plurality of keys and key corresponding control voltages corresponding respectively to said keys are produced separately upon depression of the keys, and said instrument comprising:

musical tone generating elements in which the pitch of the generated tones are determined principally according to tone pitch determining voltages, and in which the operation of said elements is modified by said key corresponding control voltages correspondingly to modify the characteristics of the generated tones, together with means for forming said key corresponding control voltages comprising:

a voltage generating circuit for generating a plurality of voltages which are different in polarity and value from each other;

a voltage division circuit whose both input terminals are connected to a first plurality of gates;

a gate control circuit for selecting the outputs of said voltage generating circuit by controlling said first plurality of gates in accordance with one of two kinds of information both established by depression of said keys, one kind being related to groups of keys, the other kind being related to keys within said groups, so as to cause said outputs to be applied to the input terminals of said voltage division circuit; and

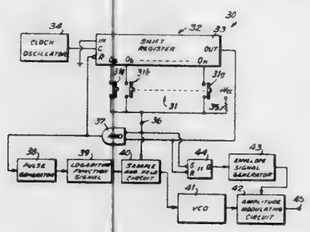
a second plurality of gates for gating out voltages produced by said voltage division circuit in accordance with the other of said two kinds of information thereby producing control voltages corresponding to the respective keys.

4,179,969

TONE GENERATOR FOR ELECTRICAL MUSIC INSTRUMENT

Osamu Hamada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 11, 1978, Ser. No. 941,061
Claims priority, application Japan, Sep. 12, 1977, 52-109632; Sep. 26, 1977, 52-115335
Int. Cl.² G10H *1/04, 5/00*
U.S. Cl. 84—1.01 **16 Claims**



1. A tone generating apparatus for an electrical music instrument comprising:

an array of switches corresponding to respective keys of a keyboard and which are selectively actuable by manipulation of the respective keys;

timing signal generating means having a repetitive operating cycle and being connected with said switches for providing timing signals in response to actuation of said switches, with each of said timing signals occurring at a time during said operating cycle which corresponds to the position in said array of the respective actuated switch;

exponential signal generating means for providing an exponential signal the value of which varies exponentially as a function of the length of time since the start of each said operating cycle of the timing signal generating means;

sample and hold means receiving said exponential signal and being operative to sample and hold a value of said exponential signal in dependence on the time of occurrence of one of said timing signals in said operating cycle; and

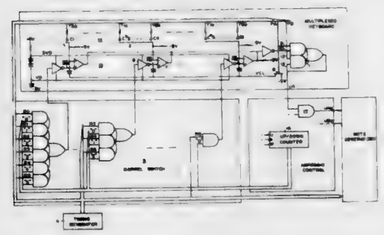
variable frequency oscillating means controlled in accordance with said value of the exponential signal which is sampled and held for providing an output oscillation having a frequency determined by a selectively actuated one of said switches.

4,179,970

AUTOMATIC ARPEGGIO FOR MULTIPLEXED KEYBOARD

Alfred H. Faulkner, 1324 Portesuello Ave., Santa Barbara, Calif. 93105

Filed Jun. 22, 1977, Ser. No. 808,768
Int. Cl.² G10F *1/00*; G10H *1/02*
U.S. Cl. 84—1.03 **4 Claims**



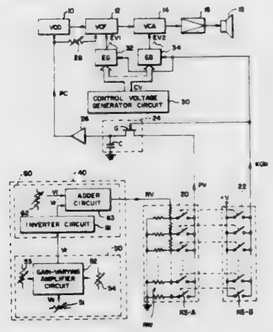
1. In a musical instrument of the type including a multiplexed keyboard and a multiplexed note generator system connected by a serial signal line to identify operated playing keys, an arpeggio system connected in circuit with the serial signal line and including a gating circuit operative cyclically at multiplex rate to pass a selected one of several multiplexed signals from a source in a group appearing on the serial signal line while blocking the remainder, and an automatic sequencing circuit operated to control said gating circuit in response to receipt of a multiplexed signal identifying a chord to selectively pass the multiplexed signals representing individual notes of the chord in ascending sequence.

4,179,971

PITCH BEND APPARATUS FOR ELECTRONIC MUSICAL INSTRUMENT

Toshiyuki Takahashi; Masahiko Koike, and Haruyuki Suzuki, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 21, 1978, Ser. No. 944,293
Claims priority, application Japan, Sep. 24, 1977, 52-114914; Sep. 24, 1977, 52-128623
Int. Cl.² G10H *1/02*
U.S. Cl. 84—1.24 **4 Claims**



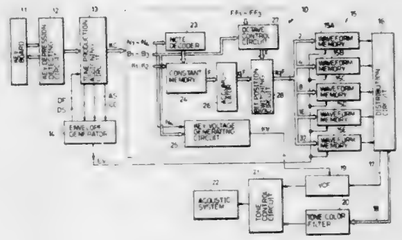
1. In an electronic musical instrument of the type wherein a pitch voltage that is different for each of the keys is generated, a voltage-controlled oscillator is controlled by means of a pitch voltage corresponding to a depressed key, and a musical tone signal of a pitch corresponding to said depressed key is synthesized, and which further comprises a pitch bend means; the combination of a gain-varying amplifier circuit to which input terminal is applied a reference voltage, a first variable resistor which is so connected in said amplifier circuit that the gain of said amplifier circuit is changed depending upon the position of a slider for operating the pitch bend means, and a second variable resistor which is so connected in said amplifier circuit that the gain of said amplifier circuit is variably set to determine the varying width of the pitch bend, each of said pitch voltage being formed based on an output voltage taken out from the output side of said amplifier circuit responsive to the change of resistances of said first and second variable resistors.

4,179,972

TONE WAVE GENERATOR IN ELECTRONIC MUSICAL INSTRUMENT

Teruo Hiyoshi; Akira Nakada; Tsutomu Suzuki; Eiichiro Aoki, and Takatoshi Okumura, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 13, 1977, Ser. No. 841,716
Claims priority, application Japan, Oct. 18, 1976, 51-124529
Int. Cl.² G10H *3/00*
U.S. Cl. 84—1.11 **10 Claims**



1. A note wave generator in a keyboard electronic musical instrument, which comprises:

memory means for storing constants corresponding to musical tone frequencies included in one out of a plurality of groups into which keys of said keyboard are divided separately on the octave basis;

accummulator means for repeatedly adding said constants read out of said memory means in response to depression of a selected key, said accumulator means providing the resultant accummulated data in parallel binary format; and

bit position switching means for shifting said parallel binary format data provided by said accumulator means by a number of bit positions corresponding to the octave range designated by said selected key so as to obtain data which varies repeatedly according to the frequency of the tone to be produced.

4,179,973

MUSICAL SHAKER

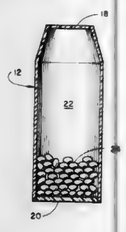
Wesley C. White, San Diego, Calif., assignor to Partee Products, San Diego, Calif.

Filed Feb. 10, 1978, Ser. No. 876,569
Int. Cl.² G10D *13/06*
U.S. Cl. 84—402 **4 Claims**

1. A sound generating device, comprising:

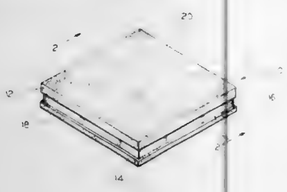
a generally tubular casing having first and second closed ends, said first closed end having a smaller diameter than said second closed end, said casing and said ends being

made from a hard plastic material and forming a cavity therewithin; and



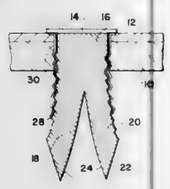
a plurality of popcorn kernels partially filling said cavity for generating an audible sound upon vibration of said device.

4,179,974
PERCUSSION ACCESSORY
Rick Trankle, 3717 N. Newland, Chicago, Ill. 60634
Filed Jul. 7, 1978, Ser. No. 922,555
Int. Cl.² G10D *13/08*
U.S. Cl. 84—411 P **4 Claims**



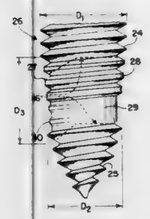
1. A practice percussion device which simulates the feel of a real cymbal or drum when struck, comprising: a first smooth rectangular layer of resilient material; a second layer of substantially heavier, rigid material slightly smaller in surface area than said first layer and affixed to the center of said first layer so that said first layer extends beyond said second layer on all sides; and a third rectangular layer of resilient material approximately equal in surface area to said first layer and affixed to said second layer so that said third layer extends beyond said second layer on all sides, wherein said device maintains a vertical position when balanced on one edge of said first and third layers and struck on the opposite edge with the ordinary force applied to a cymbal, and resists lateral movement when struck on said first layer while resting horizontally on a suitable surface.

4,179,975
ANCHORING NAIL
John Forcina, 7209 Myrtle Ave., Glendale, N.Y. 11227
Continuation of Ser. No. 765,925, Feb. 7, 1977, abandoned. This application Apr. 3, 1978, Ser. No. 893,192
Int. Cl.² F16B *15/04*
U.S. Cl. 85—23 **9 Claims**



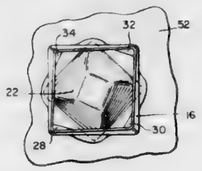
1. A self-anchoring nail, comprising a head portion and a spring steel shank portion integral therewith and depending therefrom, said shank portion forming a pair of separate leg members, said leg members having a pair of free ends, said pair of free ends being normally biased apart, each of said leg members having at least one inner planar side extending along the length thereof, said planar side defined by converging planes along the center of said shank, a first corrugated surface defined on at least a portion of the outer surface of said shank and on at least a portion of the outer surface of each of said leg members, a compressible collar having a second corrugated surface along at least a portion of the inner wall thereof and frictionally engaging said shank by cooperating with said first corrugated surface for urging said leg members towards each other disposing said converging planes into substantially parallel alignment when said collar and said shank is disposed in an undriven state, a third corrugated surface defined along at least a portion of the exterior surface of said compressible collar, one end of said collar being located adjacent said head portion, said one end having a flange-like portion extending radially outwardly from said inner wall, said flange-like portion having a lateral annular-like surface thereof extending normal to the longitudinal axis of said shank, said flange-like portion of said collar being disposed located intermediate said head portion and the free ends of said pair of leg members and whereby said second corrugated surface is disposed entirely covering said first corrugated surface when said collar and said shank are in said undriven state, said collar being disposed upwardly towards said head as said nail is driven into a work piece into a driven state whereby said collar is disposed along the length of said shank portion towards said head and uncovers at least a portion of said free ends of said leg members such that said at least a portion of said free ends of said leg members are free to be disposed apart and whereby said flange-like portion is disposed into touching engagement with said work piece and with said head and whereby said second corrugated surface uncovers a portion of said first corrugated surface disposing said third corrugated surface and said portion of said first corrugated surface in side by side co-axially aligned relationship with each other.

4,179,976
EXTRUDING AND TAPPING SCREW AND BLANK FOR MANUFACTURE OF SUCH SCREW
Henry A. Sygnator, Arlington, Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Mar. 3, 1978, Ser. No. 883,061
Int. Cl.² F16B *25/00*
U.S. Cl. 85—47 **6 Claims**



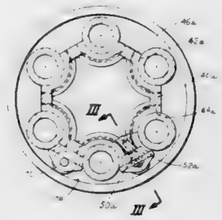
1. An extruding and thread-forming screw fastener including a shank with a head at one extremity and a leading end at the other extremity; the shank comprising three regions: a first, threaded, holding region adjacent the head with a substantially uniform crest diameter throughout its axial extent; a second point extremity region comprising a generally conical, threaded gimlet point at the leading end which is effective to create an initial thread pattern in an aperture wall of a workpiece, the maximum crest diameter of the gimlet point being less than the crest diameter of the first threaded region; and a third, thread-forming and extruding region intermediate the first and second regions, the third region comprising a pair of dissimilar, opposing peripheral segments, one of said peripheral segments configured so that at any given axial location along said third region said one peripheral segment extends a greater radial distance from the axis of the fastener than the opposing dissimilar segment, said one peripheral segment including a plurality of pitches of thread indentations which are partially formed as to depth of impression including a plurality of pitches which are both partially formed in regard to the circumferential extent and depth of impression, the partial thread indentations following the same helix as the thread formations on the first and second regions, the lowermost partial thread indentation being spaced from the associated uppermost thread convolution on the second region a distance not exceeding two pitches, the uppermost partial thread convolution being spaced from the associated lowermost thread convolution on the first region a distance substantially equal to the pitch of the thread on said first region, said partial threads being effective to reconfigure the initial thread pattern into partial threads by working and extruding the wall of the aperture, the other of said opposing dissimilar segments being substantially void of thread formations, said threadless segment being operative to a least partially wipe away the partial threads which have been formed by said opposing segment to further work and extrude the aperture wall, the radial outermost portions of said one peripheral segment being tapered downwardly toward the gimlet point at an angle not greater that 6° to the axis of the fastener, thereby forming a gimlet point fastener with a thread-forming and extruding section which minimizes the drive torque required to apply such a fastener to a workpiece.

4,179,977
ENCAPSULATED FASTENER
Harold S. van Buren, Jr., Lincoln, Mass., assignor to TRW Inc., Cleveland, Ohio
Filed Apr. 14, 1978, Ser. No. 896,522
Int. Cl.² F16B *13/06*
U.S. Cl. 85—81 **11 Claims**



1. A fastener for insertion and retention in an aperture in a panel and for receiving a threaded element that clamps an article to the panel, said fastener being formed as a unitary component comprising:
A. a relatively flat head portion
i. including first and second opposed major surfaces, and
ii. defining a through opening between said surfaces;
B. a shank portion
i. extending from the second major surface of said head portion,
ii. defining an interior hollow space and and an open end,
iii. having a cross sectional shape and size substantially matching that of the panel aperture in which the fastener is to be received,
iv. being resiliently inwardly flexible from its sides to allow its passage through the panel aperture, and
v. being resiliently expansible when said head portion engages the panel to retain said fastener in the aperture; and
C. a barrel portion
i. extending from the second major surface of said head portion within the interior hollow space defined by said shank portion,
ii. defining an interior, threaded element receiving bore communicating with the opening in said head portion,
iii. having a closed end,
iv. having a noncircular cross-sectional shape defining external corners that are normally spaced from the interior hollow space defining portions of said shank portion, and
v. being adapted to twist relative to said shank portion to cause the respective corners of said barrel portion to engage against the inside surface of said shank portion and bulge said shank portion outwardly responsive to the tightening of the threaded element into said bore to provide for further resistance to removal of said fastener from said aperture and secure clamping of the article to the panel.

4,179,978
CLAMP
Robert G. Kirkpatrick, Shelburne, and Ronald R. Snyder, Milton, both of Vt., assignors to General Electric Company, Burlington, Vt.
Filed Dec. 23, 1977, Ser. No. 863,986
Int. Cl.² F41D *7/04*
U.S. Cl. 89—12 **7 Claims**

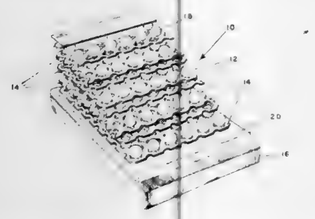


1. A rotating battery gun comprising:
a housing,
a barrel cluster journaled for rotation about a longitudinal axis with respect to said housing and including
a rotor,
a plurality of gun barrels, each respectively secured to said rotor, and extending longitudinally therefrom, each of said gun barrels having a respective longitudinal axis and having a respective plurality of transversely extending surfaces; and
clamp means secured to each of said plurality of gun barrels and pressing against said respective plurality of transversely extending surfaces to preclude rotation of said surfaces about the respective longitudinal axis of the respecitve barrel.

4,179,979
BALLISTIC ARMOR SYSTEM
Richard L. Cook, Phoenix, Ariz.; William J. Hampshire, Bellevue, Wash., and Robert V. Kolarik, North Canton, Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio
Filed May 10, 1967, Ser. No. 638,699
Int. Cl.² F41H *5/16*
U.S. Cl. 89—36 A **5 Claims**

1. In an armor system matrix, the combination of
a plurality of very hard substantially uniformly geometric shaped objects arranged in parallel layered patterns whereby each object is substantially in contact with those adjacent thereon on all sides, said objects being spherically shaped with larger spheres adjacent to the normally outward and exposed surface,
a material of great tensile strength interlaced between and

around adjacent objects to be in tension while supporting the objects in their aligned relation, and



an adhesive means to bond the objects and materials of the matrix into a solid and integral form.

4,179,980

HYDRAULIC BRAKE BOOSTER

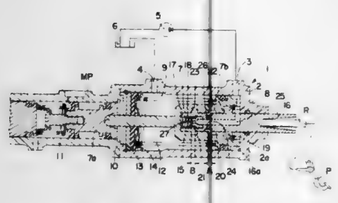
Masahiro Kito, Nagoyashi, and Yoshiharu Adachi, Gamagorishi, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 29, 1977, Ser. No. 782,436

Claims priority, application Japan, Apr. 3, 1976, 51-37394; Apr. 17, 1976, 51-44000

Int. Cl.² B60T *13/16*

U.S. Cl. 91—6 **4 Claims**



1. A hydraulic brake booster for actuating an actuating piston in a master cylinder comprising:

a cylinder, a power piston slidable within said cylinder and dividing the interior of said cylinder into a hydraulic fluid inlet chamber on one side of the power piston in open communication with a fluid source and a hydraulic fluid outlet chamber on the other side of the power piston in open communication with a fluid reservoir, the inlet and outlet chambers being normally in open fluid communication with each other,

a manually actuable input piston means slidably received in part within said power piston and connected to a brake pedal,

an output member extending from said power piston and adapted to be connected to the actuating piston in the brake master cylinder,

a reaction chamber defined by a portion of said power piston and an acting face of said input piston and being normally in open fluid communication with said outlet chamber,

means for establishing first and second fluid flow paths between said inlet chamber and said outlet chamber,

a first fluid control means for restricting fluid flow from said inlet chamber to said outlet chamber through said first flow path in proportion to a magnitude of displacement of said input piston relative to said power piston during a first stage of said relative displacement to thereby exert a pressure differential between said inlet and outlet chambers,

a second fluid control means for restricting fluid flow from said reaction chamber to said outlet chamber through a portion of said second flow path in proportion to a magnitude of displacement of said input piston relative to said power piston during a second stage of said relative displacement and with said first fluid flow path being substantially blocked, and

a pressure transmitting control means positioned in the second fluid flow path between said inlet chamber and said reaction chamber such that pressure within said reaction chamber is maintained lower than that within said inlet chamber by a predetermined magnitude throughout said first stage and until said second fluid flow path becomes substantially blocked by said second fluid control means in said second stage to minimize the reaction force exerted against the brake pedal during said first stage and thereby promote rapid depressing thereof by an operator.

4,179,981

DEVICE FOR SEQUENTIALLY SUPPLYING SEVERAL HYDRAULIC MOTORS

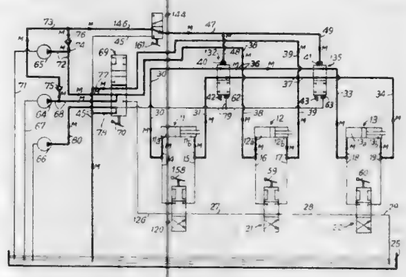
Victor Yeou, Meaux, France, assignor to Poclain, Le Plessis-Belleville, France

Division of Ser. No. 733,957, Oct. 19, 1976, abandoned. This application May 11, 1978, Ser. No. 905,362

Claims priority, application France, Oct. 30, 1975, 75 33215

Int. Cl.² F15B *13/04*

U.S. Cl. 91—33 **2 Claims**



1. A circuit for supplying fluid under pressure to fluid motors each having at least one drive chamber, the circuit comprising:

first, second and third fluid motors each having at least one drive chamber;

a fluid distributor;

connecting means for connecting the fluid distributor to a source of fluid under pressure;

a first conduit connecting a drive chamber of one of said motors to the fluid distributor, said fluid distributor being selectively operable to isolate said drive chamber or to connect said drive chamber to said connecting means;

a second conduit for connecting the first conduit to a second of said motors;

a third conduit for connecting the first conduit to the third of said motors;

a fourth conduit for connecting the fluid distributor to the first motor through a first distributor, the second motor through a second distributor, and the third motor through a third distributor, the first, second and third distributors having a closed position blocking said fourth conduit and at least one open position allowing flow through said fourth conduit;

first and second sequence valves interposed respectively in said second and third conduits, the first sequence valve being adapted to interrupt the second conduit when the pressure in the first conduit falls below a first predetermined value, and the second sequence valve being adapted to interrupt the third conduit when the pressure in the first conduit falls below a second predetermined value wherein each sequence valve is provided with a main fluid operated control device which is connected to the first conduit;

wherein said connecting means comprises first and second supply conduits adapted to be connected to respective sources of fluid under pressure;

said fluid distributor including means for selectively coupling one or both of said supply conduits to the first conduit;

a secondary fluid operated control device coupled to each sequence valve in opposition to the corresponding main fluid operated control device; and

said fluid distributor further includes means for connecting the secondary fluid operated control devices to a source of fluid under pressure when one only of the supply conduits is connected to the first conduit and said first, second and third distributors are in their open positions.

4,179,982

DEVICE FOR DETECTING POSITION OF HYDRAULIC CYLINDER

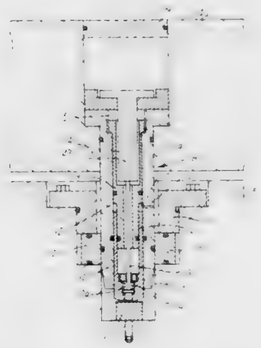
Shigeo Saotome, Yokohama, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1977, Ser. No. 837,436

Claims priority, application Japan, Oct. 5, 1976, 51/119583

Int. Cl.² F01B *31/12*

U.S. Cl. 92—5 R **6 Claims**



1. A hydraulic cylinder position detecting device wherein an outer cylinder is securely fitted into a cylinder body or a piston coaxially thereof and slidably extended into the piston or the cylinder body; an inner cylinder is slidably fitted over one end portion of said outer cylinder; and an inner cylinder biasing mechanism is provided for forcing a lower or upper end of said inner cylinder against a seat attached to the piston or cylinder body respectively.

4,179,983

HYDRAULIC PERCUSSIVE MACHINES

Trevor E. Wallace, Bryanston, South Africa, assignor to The Steel Engineering Company Limited, Roodepoort, South Africa

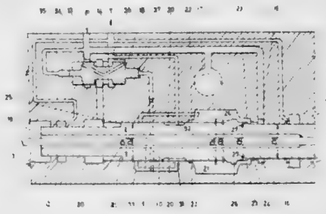
Filed Mar. 9, 1977, Ser. No. 775,992

Claims priority, application South Africa, Mar. 17, 1976, 76/1650

Int. Cl.² F01B *11/02*

U.S. Cl. 92—85 B **4 Claims**

1. In a hydraulic percussive machine comprising a cylinder, a piston arranged to reciprocate in the cylinder to perform a power stroke and a return stroke, an inlet for liquid at high pressure, said piston having opposed work and return stroke pressure responsive areas disposed, respectively, in first and second cylinder chambers, an outlet for liquid at low pressure, a first space in the cylinder connected to the inlet, a cushioning flange on the piston which moves with substantial clearance in the first space, a second space of lesser diameter than the first space and leading from the first space and into which the flange can move to close the second space on overtravel of the piston during the power stroke to trap fluid into the second space so that a dashpot action takes place, the flange moving out of the second space during said return stroke, the improvement comprising an annular timing groove on the piston, timing ports in the cylinder, the timing groove and ports being so disposed as to connect the first space to the outlet when the flange is in the second space, thereby to facilitate the return stroke of the piston, means to disconnect the first space from inlet when the flange is in the second space, and said second space defining a cushioning chamber interposed between said cushioning flange and said first space disconnect means.



4,179,984

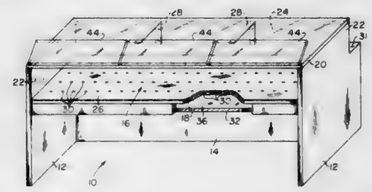
SLIDE MOUNTING WORK STATION

Raymond A. Gorcey, 131 Dean St., Hicksville, N.Y. 11801

Filed Sep. 5, 1978, Ser. No. 939,662

Int. Cl.² F23J *11/00*

U.S. Cl. 98—115 LH **14 Claims**



1. In an apparatus for use in carrying out slide mounting operations utilizing at least a substance producing toxic fumes,

a substantially horizontally disposed work surface,

wall means upstanding from said work surface about the periphery thereof,

cover means supportedly disposed on said wall means and spaced from said work surface to define a slide mounting work enclosure area bound by said work surface and cover means and by said wall means peripherally connecting and separating the same,

a chamber disposed beneath at least a portion of said work surface and connected with a source of negative pressure for applying a vacuum to said chamber,

a plurality of holes defined in and through said work surface and communicating with said chamber and the negative pressure applied thereto to enable withdrawal through said plural openings of toxic fumes present in said work enclosure area for removing therefrom and cleansing the environment therein of the toxic fumes,

and an opening defined in said upstanding wall means between said work surface and spaced cover means for providing such limited access into said work enclosure area that only a user's hands and arms are permitted to enter into the work enclosure area thereby protecting the

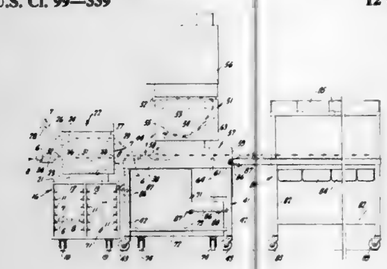
user's vulnerable upper body sensory portions from the toxic fumes within the work enclosure area by the interposition of said cover means between the toxic fumes and the upper body portions of the user.

4,179,985

SANDWICH COOKING AND ASSEMBLING UNIT

Edward D. Baker, San Francisco; Nils Lang-Ree, Los Altos, and John S. Brown, Half Moon Bay, all of Calif., assignors to NPI Corporation, Burlingame, Calif.

Filed Oct. 19, 1978, Ser. No. 952,631
Int. Cl.[2] A47J *37/04*
U.S. Cl. 99—339 **12 Claims**



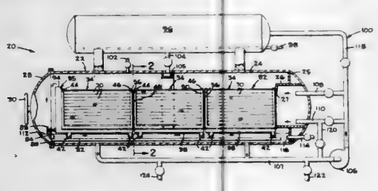
1. A sandwich cooking and assembling unit comprising a storage compartment for a tray carrying a bun heel and a bun crown, a bun grill disposed directly above said storage compartment and including a tray conveyor and a crown conveyor both advancing in a predetermined direction from an upstream end to a downstream end, a product conditioning tunnel having an entrance table at an upstream entrance and having an exit at a downstream end, means including a straddle frame for supporting said product conditioning tunnel with said table substantially even with and adjacent said downstream end, a freezer compartment having an access opening thereto and disposed beneath said straddle frame with said access opening adjacent said storage compartment, and a patty broiler including an inlet and an exit both on the upstream end of said patty broiler and arranged on and directly above said product conditioning tunnel.

4,179,986

LOW LIQUID VOLUME RETORT SYSTEM

Samuel A. Mencacci, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Dec. 16, 1976, Ser. No. 751,923
Int. Cl.[2] A23L *3/02, 3/10*
U.S. Cl. 99—359 **13 Claims**



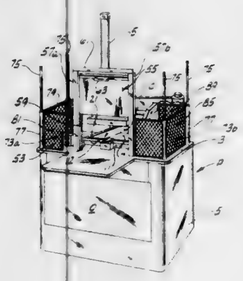
1. In a low liquid volume retort system including means defining a pressure vessel, closure means for selectively opening and closing said pressure vessel for loading and unloading containers therefrom, means defining a tunnel in said pressure vessel having an inlet end and an outlet end and within which the containers are supported during heat treatment, means for circulating at least a container heating heat treatment liquid from the inlet end to and through the outlet end of said tunnel, and means for introducing a gaseous medium into said pressure vessel for maintaining a superatmospheric pressure therein; the improvement which comprises overflow means at the outlet end of said tunnel having an overflow edge over which at least the container heating liquid in the tunnel is discharged, said overflow edge being disposed above the level of the uppermost containers in said tunnel for completely submerging all containers, and means for collecting the overflowing container heating liquid in a shallow pool in the bottom of said vessel and externally of said tunnel for recirculation through said tunnel.

4,179,987

SAFETY APPARATUS FOR A BACON PRESS OR THE LIKE

Daniel Dohm, Jr., University City, Mo., assignor to Cashin Systems Corp., Long Island, N.Y.

Filed May 22, 1978, Ser. No. 908,536
Int. Cl.[2] B30B *15/32*; F16P *7/00*
U.S. Cl. 100—53 **10 Claims**



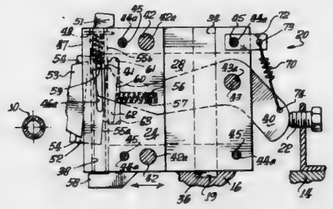
1. Safety apparatus for a press or other machine, said press having one or more parts movable during operation thereof, said movable parts being capable of causing injury to the operator of the press in the event the operator inadvertently leaves his hands or other parts of his body in position where they may be contacted by the movable parts of the machine during operation, said safety apparatus comprising a door positioned between the movable parts of the press and the operator when the latter is in his normal position while operating the press and being movable from an open position in which the operator has access to the movable parts of the press for placement or removal of work from the press to a closed position in which access to the movable parts of the press is blocked, and means actuable by the door upon the door being moved to its closed position for initiating operation of the press and actuable by movement of the door from its closed position for terminating operation of the press, said door having handle means toward the operator and being thereby manually movable by the operator downwardly to its closed position and upwardly from its closed position during the operation of the press, said means actuable by said door comprising a pair of electrical switches serially connected together, a first of said switches being at the upper end of the door when in its closed position, the second of said switches being at the lower end of the door when in its closed position, said safety apparatus further comprising means for raising the door upon completion of an operating cycle of the press.

4,179,988

STAMPING DEVICE FOR ROTATING WORKPIECES

Jack Rath, 9823 Kincardine Ave., Los Angeles, Calif. 90034

Filed Apr. 10, 1978, Ser. No. 894,930
Int. Cl.[2] B41F *17/22*
U.S. Cl. 101—7 **16 Claims**



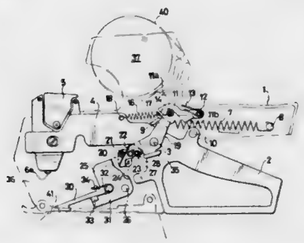
1. A stamping device adapted to be mounted on the tool slide of a machine such as a lathe or screw machine for imprinting characters or other insignia into the surface of a work piece held in the rotating chuck of said machine; said stamping device comprising a stamp element having raised characters on the outer surface thereof, means responsive to movement of the tool slide to its outermost position to move the stamp element to a relatively withdrawn position and to latch it in said withdrawn position, means to bias said stamp element from said withdrawn position, and means responsive to engagement of the stamp element with the peripheral surface of the rotating work piece upon inward movement of the tool slide to an innermost position to release said stamp element from said latched withdrawn position to permit said biasing means to move the surface of the stamp element tangentially with the rotating work piece to cause imprint of said raised characters or other insignia into the material of said work piece.

4,179,989

CONSTANT PRINTING PRESSURE MECHANISM FOR PORTABLE LABEL PRINTING AND APPLYING MACHINE, OR THE LIKE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan

Filed Apr. 15, 1977, Ser. No. 787,937
Claims priority, application Japan, Apr. 26, 1976, 51-46606
Int. Cl.[2] B41J *3/00, 5/00*; B41F *1/54*
U.S. Cl. 101—291 **10 Claims**



1. A constant printing pressure mechanism for a label printing machine:

said label printing machine comprising an operating lever movable between an operating condition and a released condition; a printing head attached to said operating lever and movable therewith toward a platen;

a platen disposed in opposition to said printing head so that a label on said platen may be imprinted by said printing head;

said constant printing pressure mechanism comprising:

platen raising means for raising said platen against said printing head, said platen raising means comprising an action lever movable with respect to said platen; said action lever including engageable means;

action lever engaging means normally in engagement with said engageable means for restraining motion of said action lever under the influence of a constant pressure spring;

a constant pressure spring connected with said action lever and adapted to be charged as said operating lever is being moved to its said operating condition, thereby to bias said action lever to move in one direction, which said movement of said action lever is restrained by said action lever engaging means;

release means connected with said operating lever for releasing the engagement between said action lever engaging means and said engageable means upon motion of said operating lever over a predetermined distance towards said operating condition, thereby releasing the charged said spring to discharge and to move said action lever in said one direction, and said predetermined distance is such that said printing head is in condition to be engaged by a label on said platen when said platen is raised;

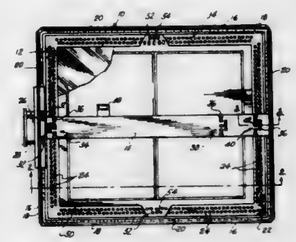
first impact means connected with said action lever to move therewith; second impact means connected with said platen; said first and said second impact means being so placed that after predetermined motion of said action lever in said one direction thereof under the influence of the discharging said spring, said first and said second impact means meet, and said platen and said impact means being so placed and so connected that upon such meeting of said first and said second impact means, said platen moves to said print head.

4,179,990

METHOD FOR MAKING LITHOGRAPHIC PRINTING PLATES

Frank J. Radencic, 7932 Haskell, Kansas City, Kans. 66109

Division of Ser. No. 631,038, Nov. 12, 1975, abandoned. This application Jan. 10, 1977, Ser. No. 758,011
Int. Cl.[2] B41C *1/10, 1/12*; G03F *3/04*
U.S. Cl. 101—467 **2 Claims**



1. The method of reproducing multi-color images by the lithographic printing process comprising the steps of:

(a) preparing a desired image upon a graphic arts medium, including the emplacement of linear register marks on said medium, said marks comprising at least two spaced segments of the horizontal bisector of said image and at least two spaced segments of the vertical bisector of said image;

(b) reproducing said image, and said register marks photographically, successively using a series of preselected light filters to thereby obtain a plurality of transparencies of the image and register marks wherein each transparency corresponds to a respective color in the printing process;

(c) circumscribing an area of preselected size and configura-

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tion on a transparency carrier while the latter is mounted within a precision register layout frame,

(d) marking a predetermined location for one of said transparencies within said circumscribed area on the carrier by using said frame as a measuring guide to draw single intersecting horizontal and vertical lines through the location midpoint,

(e) positioning said one transparency upon said carrier while the latter is under-lighted, aligning said register marks with said lines, and subsequently affixing said one transparency to said carrier,

(f) providing horizontal and vertical linear marks through the midpoint of said circumscribed area using said frame as a measuring guide;

(g) securing a second transparency, containing an image of two perpendicularly intersecting line segments, to said carrier at the midpoint of said circumscribed area after superimposing said segments over said marks,

(h) removing the portions of said carrier beneath said transparencies to form a complex exposure assembly;

(i) overlaying said exposure assembly on a photosensitive metallic plate and exposing the plate to a light source, thereby producing a one-color lithographic plate;

(j) successively repeating steps (c) through (i) for each transparency until lithographic plates corresponding to each of said transparencies are produced;

(k) printing a first color impression of the image contained on one of said plates including a first centrally located, perpendicular cross corresponding to said intersecting line segments;

(l) overprinting a second color impression on said first impression, said second impression being produced by a second of said plates and including a second centrally located perpendicular cross corresponding to said intersecting line segments, said overprinting step including superimposing said impressions such that said crosses coincide with one another; and

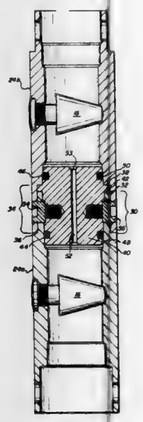
(m) repeating said step (l) for each of the remaining plates, thereby producing a full multicolor reproduction of the original image.

4,179,991

PERFORATING GUN BARREL

Robert B. Echols, and William J. Berry, both of Pampa, Tex., assignors to Titan Specialties, Inc., Pampa, Tex.

Filed May 26, 1978, Ser. No. 910,007
Int. Cl.[2] E21B *43/11, 43/116*
U.S. Cl. 102—21.6 **9 Claims**



9. In a perforating gun barrel where two tubular sections are adapted to carry explosive charges with one section positioned end-to-end with the other section in overlapping relation to define a coupling location; the combination comprising:

(a) a generally cylindrical coupling member at said coupling location disposed entirely internally of said tubular sections and having opposite ends slightly tapered with outwardly facing grooves, at least one at each end, to receive O-rings for establishing a pressure seal at each end of said coupling member and having a circumferential shoulder intermediate said grooves and

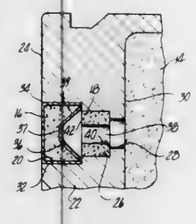
(b) at least one fastening means common to both said sections and said coupling member.

4,179,992

PRIMER-IGNITER FOR GUN PROPELLANTS

Jawaharlal Ramnarace, Dana Point, and William A. Wood, Newport Beach, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 4, 1978, Ser. No. 893,637
Int. Cl.[2] F42B *19/10, 5/00*
U.S. Cl. 102—45 **9 Claims**



1. In a small caliber ammunition cartridge casing having a base and a tubular side wall extending therefrom: an explosive train for igniting the main propellant in the cartridge, comprising a first large diameter cavity extending into the casing base from its external face, a second slightly smaller cavity extending axially from the inner limit of the first cavity, and a still smaller passage extending axially from the second cavity to the inner surface of the casing end wall; a percussion type primer seated in the first cavity for generating a flame and hot particles in the direction of the second cavity; and a shock-resistant booster charge of annular configuration in the second cavity for receiving the flame front generated by the primer; said booster charge having a central hole therethrough of a diameter slightly smaller than the aforementioned passage, whereby the generated flame impinges on the inner edge surface of the hole as said flame moves toward the passage.

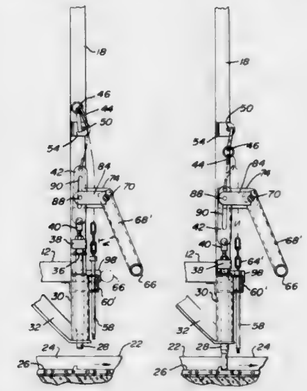
4,179,993

MATERIAL HANDLING VEHICLE

Craig Sleep, Bangor, Pa., assignor to SI Handling Systems, Inc., Easton, Pa.

Filed Jan. 18, 1978, Ser. No. 870,307
Int. Cl.[2] B61B *10/04*
U.S. Cl. 104—172 BT **9 Claims**

1. In a tow vehicle comprising a body mounted on wheels, a tow pin on said body and movable upwardly from an operative position wherein it can contact a conveyor to an inoperative position wherein it is out of contact with a conveyor, a bumper movably mounted on the body for movement between an extended position and a retracted position, said bumper being coupled to said tow pin for moving said tow pin from its operative position to its inoperative position as said bumper moves to its retracted position, means biasing said bumper to its extended position, means on said body independent of said bumper for elevating the tow pin to an elevation above said inoperative position including a link having an elongated slot, a member extending transversely through said slot and connected to said bumper, one end of said link is at an elevation above and pivotably connected to the upper end of said tow pin, said elevating means including a handle, said link being connected to said handle by way of a flexible chain or the like,



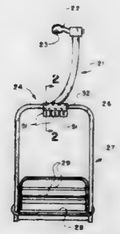
said link being connected to said tow pin so that said member can move the tow pin when it engages an end of said slot, said slot being sufficiently long so that said member remains in said slot in both the operative and inoperative positions of said tow pin and in both the extended and retracted positions of said bumper.

4,179,994

SUSPENDED ARTICULATED CHAIRLIFT MOUNTING ASSEMBLY

Jan K. Kunczynski, Boulder Cove, Box 256, Glenbrook, Nev. 89413

Filed Oct. 13, 1977, Ser. No. 841,813
Int. Cl.[2] B61B *7/12, 11/00;* **B61D** *33/00;* **F16D** *3/58*
U.S. Cl. 105—150 **9 Claims**



1. Chair assembly mounting apparatus for movably mounting a chair frame to a hanger arm including, a housing rigidly mounted to at least one of said arm and said frame, a resiliently displaceable rubber-like member positioned inside said housing, said housing and said rubber-like member being shaped for cooperative coupling of said frame to said arm, said housing being further shaped to apply a compressive load to said rubber-like member, and movement resisting means mounted to one of said frame and said arm and formed to displace said rubber-like member upon relative movement of said arm and said frame, wherein the improvement in said chair assembly mounting apparatus comprises:

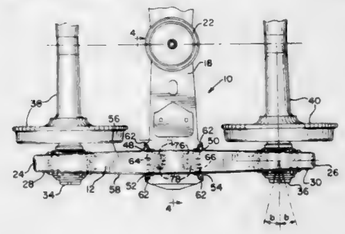
said rubber-like member being formed with a transversely extending opening therein, a portion of one of said arm and said frame being mounted to pass through said opening in said rubber-like member, and said portion being rotatably movable about the longitudinal axis of said opening to cause displacement of said rubber-like member by said movement resisting means in a manner resisting said relative movement.

4,179,995

SNUBBED RAILROAD CAR TRUCK

John C. Day, Hinsdale, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Continuation-in-part of Ser. No. 693,092, Jun. 4, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 849,027
Int. Cl.[2] B61F *5/12, 5/28, 5/46, 5/50*
U.S. Cl. 105—197 DB **3 Claims**



1. A truck for a railroad car comprising,

a pair of spaced side frames, each said side frame including,

a side frame window in part defined by spaced sidewalls, a top compression member, and a bottom tension member,

vertical ribs formed on an inner and an outer side of each said side frame, said ribs located one each adjacent to said side frame window sidewalls and defined in part by a flat vertical front surface and side surface, and

a pedestal jaw formed at ends of each said side frame, said jaw defined by spaced vertical sidewalls and a roof surface having a laterally concaved configuration,

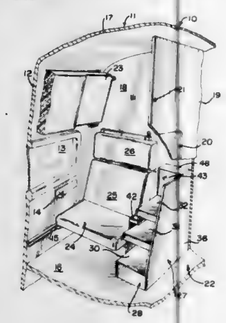
bearing adapter means disposed one each in said pedestal jaws to receive in a journaled relationship axle ends of wheelsets of said truck respectively, said adapter means having spaced vertical end walls positioned adjacent to and spaced from said pedestal jaw sidewalls sufficient distance to limit relative horizontal rotational movements between said wheelsets and said side frames to a position slightly out-of-square by interengaging contact between said adjacent pedestal jaw end walls and said adapter sidewalls, and a top surface having a convex configuration having a radius less than a radius of said concave roof surface of said pedestal jaw, said top surface of said adapter means and said roof surface of said pedestal jaw joining to form a rollable self-centering joint between said adapter and said side frame,

an elongated bolster positioned transversely to and between said spaced side frames with ends disposed one each in said side frame window and resiliently supported therein by spring means carried by said tension member of said window, each said bolster end including a front and a rear recess having a bolster pocket prepared to receive a snubbing device, offset vertical sidewalls located adjacent to and on each side of said bolster pocket, and opposing convex-shaped end walls, said front and said rear recesses forming a vertical guide for said sidewalls of said side frame window with said ribs engaging with said convex-shaped end walls of said bolster recess to form a rollable joint between said side frame and said bolster, and

snubbing means disposed one each in said bolster pockets to in part maintain said bolster and said side frame in a

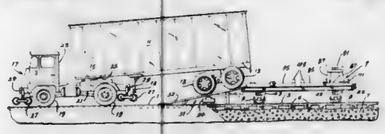
square relationship and to limit yaw movement therebetween.

4,179,996
FIXTURE FOR PASSENGER RAILWAY CAR COMPARTMENT
Jack E. Gutridge, Dyer, and Ronald W. Marsh, Michigan City, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.
Filed Dec. 12, 1977, Ser. No. 859,426
Int. Cl.[2] B61D *1/08, 31/00*
U.S. Cl. 105—345 **8 Claims**



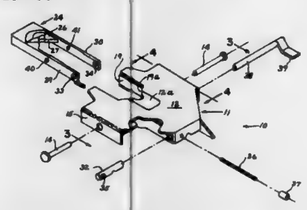
1. For a railway passenger car compartment including a floor, an outer car wall, inner longitudinally spaced partition walls, a divider wall connected to said partition walls, said divider wall extending substantially parallel to rail outer car wall and positioned adjacent to an access aisle,
- said compartment including a hinged bed supported on said outer wall,
- a convertible seat and passenger bed arrangement adjacent to one of said partition walls, the improvement comprising;
- a fixture including a base portion positioned adjacent to said seat and passenger bed and said divider wall,
- said base including a first shelf having a lower horizontal surface contiguous with and supported on said floor,
- a second shelf, supported on and above said first shelf,
- said second shelf having its terminal frontal portion spaced longitudinally inwardly with respect to a frontal portion of said first shelf,
- a third shelf supported on said base above said second shelf, said third shelf having a terminal frontal portion spaced longitudinally inwardly with respect to the frontal portion of said second shelf,
- an arm rest positioned between said second and third shelves and incorporated within outboard side panel means and adjacent to said convertible seat and passenger bed,
- said outboard side panel means including a first outboard side panel connecting outboard side edges of said first and second shelves and said arm rest, and a second outboard side panel connecting an inboard side edge of said arm rest and an outboard side edge of said third shelf,
- said first outboard side panel having a first edge portion extending between said first and second shelves and spaced inwardly with respect to the terminal frontal edge portion of said second shelf, said first outboard side panel having a second edge portion extending between said second shelf and said arm rest and spaced inwardly with respect to the terminal frontal edge portion of said third shelf, and
- said second outboard side panel having a third edge portion generally vertically aligned with said second edge portion of said first outboard side panel.

4,179,997
RAIL-HIGHWAY INTERMODAL FREIGHT CARRIER TRANSPORT SYSTEM
George B. Kirwan, Huntington, W. Va., assignor to Intermodal Concepts, Inc., Chambersburg, Pa.
Filed Dec. 23, 1977, Ser. No. 863,916
Int. Cl.[2] B61D *3/16;* **B61F** *3/12;* **B65J** *1/02, 1/22*
U.S. Cl. 410—53 **26 Claims**



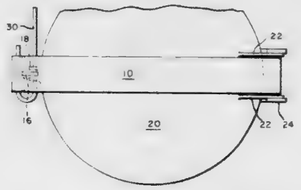
1. In a system for transporting freight carriers including highway semi-trailers by rail, a rail truck having at least two longitudinally spaced wheeled axles and a frame supported thereon, a central guideway extending longitudinally substantially from end to end of said truck frame, pedestal structure mounted in said guideway for movement lengthwise thereof substantially from end to end of said truck frame and supporting a fifth wheel, a pair of highway wheel supporting structures supported in end to end relation with each other lengthwise of said truck frame and each comprising a pair of transversely spaced longitudinally extending treadways spaced apart transversely a sufficient distance to receive said pedestal structure between them and a transverse member connecting the treadways of each wheel supporting structure to each other and extending beneath said longitudinal guideway, whereby to permit movement of said fifth wheel pedestal structure to selective positions alternately abreast of said highway wheel supporting structures and thereby accommodating the selective support of the rear highway wheels of a semi-trailer on either of said highway wheel supporting structures and the support of the front king pin of a second highway semi-trailer by said fifth wheel on the end portion of the truck frame carrying said other highway wheel supporting structure.

4,179,998
HEAD INSERT FOR RAILWAY TRAILER HITCH
Joseph F. Niggemeier, St. Charles, Mo., and Richard P. Yeates, Downers Grove, Ill., assignors to ACF Industries, Incorporated, New York, N.Y.
Division of Ser. No. 825,560, Aug. 18, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 914,313
Int. Cl.[2] B65J *1/22*
U.S. Cl. 410—64 **5 Claims**



1. In a trailer hitch to be mounted upon a railway flat car having a vertical strut and a diagonal strut in extended position supporting a hitch head adapted to engage and hold in place a kingpin of a trailer supported on said flat car, said hitch including a top plate having a given thickness having an opening including a generally semicircular kingpin engagement portion; a pair of movable jaws located below said top plate, a yoke engaging said movable jaws; a spring biasing said yoke and jaws into closed position; said jaws in closed position holding the kingpin captive in said head and adapted to engage said top plate, said kingpin applying horizontal loads to said kingpin engagement portion in transit, the improvement comprising:
- an insert made of wear resistant and crack resistant material mounted on said top plate within said opening and overlying substantially the entire vertical extent of said kingpin engagement portion and the thickness of said insert being at least equal to said given thickness; fastening means engaging said insert and said top plate to hold said insert in place overlying said kingpin engagement portion; said insert being easily and quickly removable from said top plate by disconnecting said fasteners from said top plate, whereby a new insert may be quickly inserted in place within said opening while said hitch remains in place on said flat car without taking said flat car out of service.

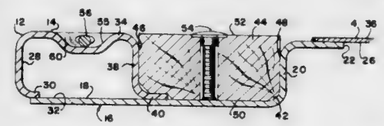
4,179,999
HATCH COVER CLOSURE SYSTEM
Soule E. Cotten, Orange, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Mar. 23, 1978, Ser. No. 889,206
Int. Cl.[2] B61D *39/00*
U.S. Cl. 105—377 **4 Claims**



1. In a hopper car having a hatch housing and a hatch cover which is hinged to the car, a closure device comprising:
- a resilient flexible strap having first and second ends,
- said first end of strap being hinged to the car at or about same location as the hatch cover is hinged,
- a floating link connecting said second end of the strap to the hatch cover, said link allowing for movement between the strap and cover, and
- a slide bolt for securing said second end of the strap to the hatch housing, said strap and housing having means for receiving the bolt when the cover is in place and the strap has been stressed

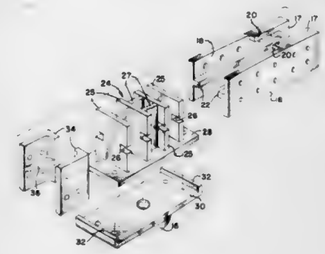
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4,180,000
FREIGHT CAR DOOR POST
Richard C. Snyder, Michigan City, Ind., assignor to Pullman Incorporated, Chicago, Ill.
Continuation of Ser. No. 606,822, Aug. 22, 1975, abandoned. This application Jun. 7, 1977, Ser. No. 804,213
Int. Cl.[2] B61D *19/00*
U.S. Cl. 105—409 **8 Claims**



1. A door post assembly for a freight vehicle having upper and lower sills comprising a hollow metal portion defining a doorway edge and a resilient nailable section disposed in laterally abutting relation to the metal portion,
- said metal portion comprising inner and outer vertical members,
- said inner member being U-shaped in cross-section and having transverse webs including means slidably seated against a longitudinal wall of the outer member and means securing the upper and lower ends thereof to the upper and lower sills of the vehicle, respectively, and
- said metal portion being laterally deflectable against said resilient nailable section for yieldably resisting lateral blows directed against said metal section.

4,180,001
CENTER FILLER FOR RAILWAY VEHICLE
George S. McNally, South Holland, Ill., assignor to Pullman Incorporated, Chicago, Ill.
Filed Dec. 22, 1977, Ser. No. 863,385
Int. Cl.[2] B61F *1/08, 5/16*
U.S. Cl. 105—420 **6 Claims**



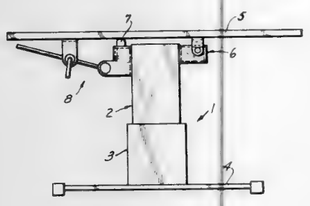
1. In a railway vehicle having an underframe with a draft sill with spaced side webs and spaced flanges with bottom surfaces located on a horizontal plane and said draft sill forming a connection with car body bolsters, the improvement comprising a modular rear draft lug and center filler arrangement including:
- draft lug means having extension means adjacent to the side webs and being continuous through the connection between the body bolsters and the draft sill;
- connection means on said draft lug means;
- means attaching the draft lug means to said side webs;
- center filler means with vertically disposed plate means abutting the draft lug means;
- said center filler means having means securing said center filler means with said connection means;
- said center filler means having a bottom cover plate;
- said bottom cover plate having a lower surface disposed in the same horizontal plane with the spaced flanges of the draft sill;
- center plate means;
- said center plate means having a skirt portion with upwardly extending flange means;
- said flange means being spaced apart a first distance to nestle about the bottom cover plate; and
- means attaching said skirt portion to said bottom cover plate.

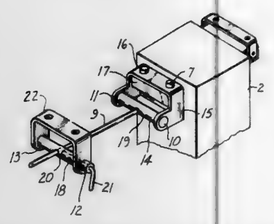
4,180,002
TILTABLE TABLE
David F. Huempfner, Kewaunee, Wis., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Jul. 12, 1978, Ser. No. 923,843
Int. Cl.[2] A47F *5/12;* **A61G** *13/00*
U.S. Cl. 108—6 **13 Claims**

1. A tiltable table with a top pivotally mounted to a base and having laterally spaced side edges, wherein the improvement comprises: a tilt lock mechanism that includes at least two laterally spaced pivot joints on the base; at least two laterally spaced pivot joints on the top; a connecting arm located approximately midway between the top's side edges and joined to the pivot joints; and a manipulable locking structure that simul-

V 989 4
DEC 25 79
UMI

taneously locks the connecting arm and laterally spaced pivot joints to rigidify the top, with the lateral distance between each





pair of pivot joints being substantially greater than the width of at least a portion of the connecting arm.

4,180,003

SHELF SUPPORT STRUCTURE

Joseph J. Clement, Bradenton, Fla., assignor to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 685,519, May 12, 1976. This application Nov. 14, 1977, Ser. No. 851,447

Int. Cl.[2] A47B *9/00*

U.S. Cl. 108—144 **6 Claims**



1. In a shelf support assembly, a shelf support post of unitary construction comprising web structure, a pair of generally parallel flange panels secured along corresponding edges to opposite edges of said web structure respectively, a pair of support strips secured respectively along corresponding side edges to the edges of said flange panels remote from said web structure and disposed at acute angles with respect to said flange panels respectively, and the portion of said web structure remote from said flange panels being disposed in close proximity to said support strips.

4,180,004

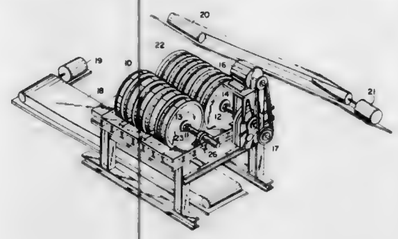
METHODS OF HANDLING WASTE INCLUDING RUBBER TIRES

Albert O. Johnson, Livingston, Tex., assignor to Tire-Gator, Inc., Houston, Tex.

Division of Ser. No. 770,002, Feb. 18, 1977. This application Mar. 1, 1978, Ser. No. 882,449

Int. Cl.[2] F23G *7/00*

U.S. Cl. 110—346 **8 Claims**







1. The process of reducing the volume to ash and disposal of bulk household or industrial waste garbage and trash including the steps of shredding simultaneously a mixture of rubber tires and diverse kinds of combustible materials, and incinerating said shredded mixture to convert the bulk waste to ash.

4,180,005

TILLER PLANTER WITH MODIFIED SOIL LEVELING AND PULVERIZING UNIT

Vincent J. Zumbahlen, R.R. #3, Newton, Ill. 62448

Continuation-in-part of Ser. No. 647,655, Jan. 8, 1976, Pat. No. 4,048,929. This application Sep. 19, 1977, Ser. No. 834,756

The portion of the term of this patent subsequent to Sep. 20, 1994, has been disclaimed.

Int. Cl.[2] A01C *5/00, 5/08*

U.S. Cl. 111—52 **17 Claims**

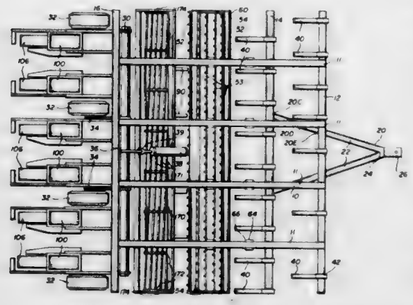
1. A machine for tilling and planting the surface of a field comprising:

a frame adapted for movement across a field, said frame adapted to be drawn by a prime mover tractor, the longitudinal attitude of said frame being adjustable from said tractor, whereby the operator of said tractor can independently adjust both the elevation of the front of said frame and the elevation of the rear of said frame;

a plow unit mounted below the forward portion of said frame, said plow unit comprising a plurality of chisel plows adapted to plow the soil as said frame is moved through the field;

a soil leveling and pulverizing unit flexibly mounted below said frame, to the rear of said plow unit, said soil leveling and pulverizing unit extending substantially the width of said plow unit, adapted to level and pulverize the soil, said soil leveling and pulverizing unit being biased downwardly but being limited as to downward movement and as to depth of soil penetration;

a seed bed finishing implement flexibly mounted below said frame to the rear of said soil leveling and pulverizing unit,



said seed bed finishing implement extending substantially the width of said plow unit, and adapted to finish the soil to prepare a seed bed as said frame is pulled through the field; and

a seed planting unit rigidly mounted on the rear of said main frame whereby the seed planting unit is raised from the ground when the rear of the main frame is elevated, said seed planting unit adapted to plant a plurality of rows of seeds as said frame is pulled through the field.

4,180,006

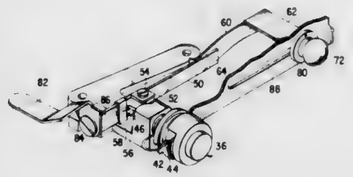
TENSION SELECTING MECHANISM FOR SEWING MACHINES

Roger J. Ross, Mont St-Gregoire, Canada, assignor to The Singer Company, New York, N.Y.

Filed Mar. 31, 1978, Ser. No. 892,066

Int. Cl.[2] D05B *47/02*

U.S. Cl. 112—254 **1 Claim**



1. An improved tension selecting mechanism for a sewing machine having a frame including a work supporting bed and a hol w upwardly open bracket arm overhanging said bed, an arm top cover to enclose said open bracket arm having a horizontal slot formed therein, an endwise reciprocating thread-carrying needle, a needle thread tension device including a first thread engaging disc and a second thread engaging disc carried on a supporting stud for applying frictional resistance to the movement of a needle thread between said first and said second discs, an axially shiftable rod for moving said first thread engaging disc toward and away from said second thread engaging disc, a lever having a supporting fulcrum and a free end, means on said lever spaced from said fulcrum for engaging said axially shiftable rod, leaf spring supported relatively to said sewing machine frame and having a contact point formed at one end thereof to impart a spring bias to a location along said lever between said free end and said fulcrum to apply a tension to said axially shiftable rod, wherein the improvement comprises an operator influenced clamp means for adjusting the point of contact between said lever and said leaf spring, said clamp means including a stud projecting from said leaf spring through said slot in said arm top cover, said stud being substantially perpendicular to the axis of said lever, means associated with said stud for frictionally resisting movement thereof along said slot, and a selecting knob on said stud slidably carried exteriorly of said arm top cover for slidably varying the point of contact between said lever and said leaf spring.

4,180,007

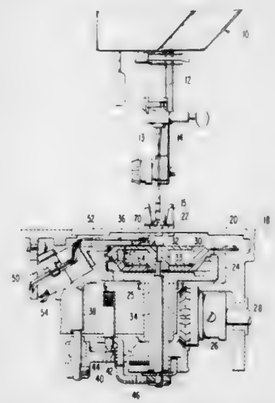
ELECTROMAGNETIC BOBBIN THREAD SUPPLY ALARM

Wesley R. Peterson, Bound Brook, and Wolfgang Jaffe, Roselle Park, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Jan. 15, 1979, Ser. No. 3,340

Int. Cl.[2] D05B *45/00*

U.S. Cl. 112—278 **3 Claims**



1. A locksmith sewing machine having a looptaker; a bobbin case supported in said looptaker against motion therewith; a lower thread carrying bobbin carried by said bobbin case, said bobbin having a hub supporting a pair of thread retaining flanges; and an arm overhanging said looptaker, bobbin case and bobbin with a portion thereof adjacent said hub of said bobbin; wherein the improvement comprises:

a sensor supported in said portion of said arm adjacent said hub of said bobbin;

a lever pivoted on said bobbin case for rotation between said flanges of said bobbin to said hub thereof, said lever having a pivoted end and a free end and carrying a stimulus for said sensor arranged thereon increasingly to stimulate said sensor as said free end of said pivoted lever approaches said hub;

means for yieldingly urging said lever alternately toward and away from said hub of said bobbin; and,

means responsive to a certain level of stimulation of said sensor for providing an indication of the approach of said free end of said lever to said hub and, thereby, of impending exhausting of bobbin thread.

V.989,414 DEC 25 79 UMI

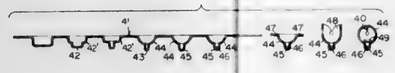
4,180,008

SOLDERLESS BELL AND METHOD OF FORMING A SOLDERLESS BELL

Kisaburo Nakamoto, 5-8, 1-chome, Matsue, Atsugi-shi, Kanagawa-ken, Japan

Filed Jul. 24, 1978, Ser. No. 927,604
Int. Cl.[2] G10K *1/06;* **B21D** *28/00*
U.S. Cl. 116—170 **27 Claims**





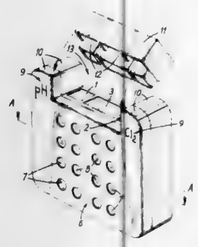
12. A seamless, solderless bell comprising:
(a) a container formed by stamping a blank of metal;
(b) a clapper located within said container;
(c) a single sound opening located at the bottom of said container; said opening consisting of a single longitudinal slit; and
(d) a crown stamped from said blank arranged on top of said container, said crown being integral with said container and protruding therefrom.

4,180,009

ION CONCENTRATION TESTING APPARATUS

Cay-Peter Voss, Hagen-Berchum, and Manfred Nowak, Lunen, both of Fed. Rep. of Germany, assignors to Tintometer GmbH, Westfalendamm, Fed. Rep. of Germany

Filed Nov. 17, 1977, Ser. No. 852,603
Claims priority, application Fed. Rep. of Germany, May 26, 1977, 2723723
Int. Cl.[2] G01N *31/22*
U.S. Cl. 116—206 **1 Claim**



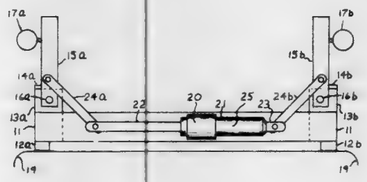
1. A device for simultaneously determining both the ph value and Cl_2 ion concentration of swimming pool water by admixture therewith of color forming reagents, said device comprising a casing formed with a row of three adjacent, transparent containers for separately receiving pool water, said containers spaced from the top of said casing, a first and second of said containers being for receiving reagents to produce color reactions respectively relating to the ph value and Cl_2 ion concentration of the pool water in the containers, the third container being a reference container free of color forming reagents, said containers having a common wall, and a fixed indicating screen situated in juxtaposition with the common wall, said screen having a plurality of differently tinted windows distributed over the height of the casing and aligned with the reference container, and a corresponding plurality of transparent windows aligned with the first and second containers, a lid for closing said containers, said lid including three adjacent downwardly projecting, transparent cap portions which fit into and seal said three adjacent containers when the casing is manually agitated to facilitate dissolving of the reagents, said lid fitting flush with the top of the casing when in closed position whereby said comparison of the colors viewed through the windows for the first and second containers with the colors viewed through the windows for the reference container, enable an absolute determination of color formation from reagent action and thus the ph values and Cl_2 ion concentrations associated therewith.

4,180,010

MOUNT FOR VEHICULAR WARNING LIGHTS

Julian A. McDermott, and Kevin McDermott, both of New York, N.Y.

Continuation of Ser. No. 641,908, Dec. 18, 1975, abandoned.
This application Jan. 9, 1978, Ser. No. 867,951
Int. Cl.[2] B60Q *7/00*
U.S. Cl. 116—209 **8 Claims**



1. In combination,
a mounting frame for mounting on a roof of a vehicle;
a pair of light mount bars, each said bar being pivotally mounted at an end thereof to said mounting frame;
an actuator for pivoting said mount bars between a horizontal position and a vertical position relative to said frame, said actuator having a body, a motion element mounted in said body for relative linear motion to one side of said body, and an arm connected to said body on a side opposite said one side;
a first force arm pivotally connected to said motion element and one of said mount bars; and
a second force arm pivotally connected to said actuator arm and the other of said mount bars.

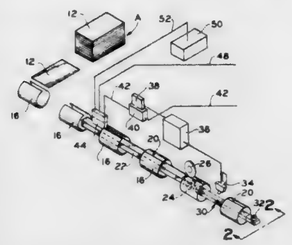
4,180,011

APPARATUS FOR SPRAYING A COATING ON THE INSIDE SURFACES OF LONGITUDINAL SEAMS ON CAN BODIES

Frank E. Halicki, Oak Lawn, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Sep. 12, 1977, Ser. No. 832,528
Int. Cl.[2] B05C *7/02*
U.S. Cl. 118—685 **6 Claims**

1. Apparatus for spraying a coating on the inside surfaces of longitudinal seams on can bodies or the like, said apparatus comprising: an elongated arm having a longitudinal axis and a terminal end portion; means for moving longitudinally seamed can bodies along said arm longitudinally with the longitudinal seams spaced vertically above said arm; an air spray nozzle of the type to which air and liquid coating material are separately supplied and the coating material is atomized and projected from the nozzle by the air; said air spray nozzle being mounted on said terminal end portion of said arm in a position for spraying a coating material vertically upwardly in a direction extending perpendicular to said longitudinal axis of said arm and radially of the longitudinal axis of the can bodies for applying a uniform layer of coating material against the inside surfaces of longitudinal seams on can bodies moving past said nozzle and minimizing overspray, splattering and dripping of the coating material; a needle valve carried by said arm for movement between open and closed positions for selectively starting and stopping flow of coating material to said nozzle; an air



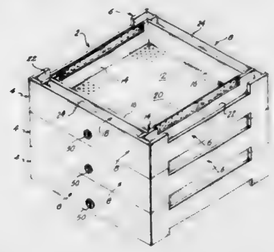
operated actuator for moving said needle valve between said open and closed positions independently of air supplied to said nozzle for atomizing the coating material; and, air supply means for supplying air to said actuator at a pressure greater than the pressure of the air supplied to said nozzle for providing rapid operation of said needle valve while maintaining relatively low pressure air spraying of the coating material to minimize splattering and overspray.

4,180,012

FISH EGG INCUBATOR WITH FRY RELEASE MEANS

Harold H. Zenger, Sr., P.O. Box 713, Juneau, Ak. 99802

Filed Dec. 12, 1977, Ser. No. 846,908
Int. Cl.[2] A01K *61/00*
U.S. Cl. 119—3 **16 Claims**



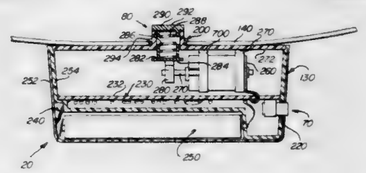
13. A fish egg incubator comprising a stack of relatively spaced liquid containers, each having an open-topped recess therein for the liquid and a quadrilateral frame in the recess which is spaced inwardly from the periphery of the recess on all sides thereof and defines a central basin for the container, there being a pair of inflow chambers formed in the recess on the opposite ends of the frame and a pair of outflow chambers formed in the recess on the opposite sides of the frame, said inflow chambers communicating with the basin through entry ports formed between the bottom of the container and the frame and said basin having a false bottom therein to support the fish eggs at a level below the top of the frame so that the fry are contained in the basin when the eggs hatch, said false bottom being apertured and forming a plenum therebelow which interconnects the ports with the basin so that when incubation liquid is introduced to the inflow chambers of the relatively upper container, to a level commensurate with the top of the frame on the aforesaid opposing sides thereof, the liquid flows downward through the ports, into the plenum and thence upwardly into the basin through the apertures in the false bottom thereof, and thereafter weirs over the tops of the aforesaid opposing sides of the frame into the outflow chambers of the relatively upper container, there being outlets in the outflow chambers to discharge the liquid therefrom and a pair of spigot-like conduit means connected with the outlets and depending from the relatively upper container independently of the bottom thereof and in the space between the containers to deliver the discharged liquid to points vertically above the inflow chambers of the relatively lower container so that the liquid is transmitted downward through the stack in the same pattern of flow from one container to the next.

4,180,013

ANIMAL BEHAVIORAL CONTROL DEVICE

Thomas M. Smith, 3445 Wadsworth Blvd., #7, Wheat Ridge, Colo. 80033

Filed Nov. 14, 1977, Ser. No. 851,517
Int. Cl.[2] A01K *15/00*
U.S. Cl. 119—29 **10 Claims**



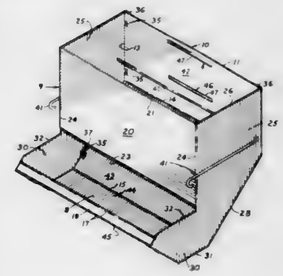
1. A device for controlling the behavior of an animal, said device further comprising:
means in said device releasably connectable to said animal for generating a signal in response to the start of a predetermined pattern of sound emitted by said animal, and
means releasably connectable around the neck of said animal operative only upon receipt of said signal for applying mechanical vibration to the area of said neck nearest to the vocal cords of said animal, said vibration being of sufficient intensity and duration to cause said animal to swallow and to cause the dog to be incapable of completing the emitted sound.

4,180,014

ANIMAL FEEDER

Donald C. Mathews, Rte. 1, Box 32 F, Newman Lake, Wash. 99025

Filed Jul. 11, 1977, Ser. No. 814,484
Int. Cl.[2] A01K *5/01, 39/014*
U.S. Cl. 119—52 R **6 Claims**



4. A feeder for animals, comprising:
an upwardly open feeding trough defined by a bottom wall having transverse front and rear edges, an upright front wall joined to the bottom wall along said front edge, and parallel

side walls each having a lower projecting portion joining said bottom wall and front wall, the lower projecting portions of the side walls and the upright front wall terminating along open edges located in a common lower plane, bounding a feeding area across the trough;

an upwardly open storage hopper in communication with the trough, the hopper being defined by an upright hopper front wall leading downwardly to the rear of the feeding trough and terminating along an open bottom edge slightly above said common plane bounding the feeding trough and spaced from the bottom wall, a rearwardly spaced upright back wall having a lower transverse edge, and transverse inclined wall leading downwardly and forwardly from the lower transverse edge of the back wall to the rear edge of the bottom wall;

said upright front wall, upright back wall and inclined wall being joined to said side walls at the respective side edges thereof;

said upright front wall, upright back wall and side walls defining open upper edges along a common upper plane, for receiving feed material;

wherein the upright hopper front wall and the side walls of the hopper and feeding trough are integral, being formed of a single first sheet of bendable stiff material;

wherein the upright front wall of the trough, the bottom wall, upright back wall of the hopper and the inclined wall are integral, being formed of a single second sheet of bendable stiff material; and

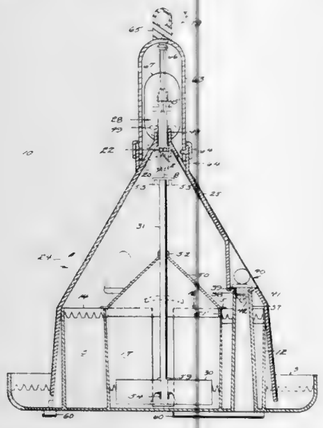
means for securing the first sheet to the second sheet to form the hopper and feeding trough.

4,180,015

FAIL SAFE SUSPENSION POULTRY DRINKER

Carl B. Dawson, Jr., 1637 Handley Ave., Winchester, Va. 22601

Filed Mar. 23, 1978, Ser. No. 889,504
Int. Cl.[2] A01K *7/04*
U.S. Cl. 119—78 **12 Claims**



1. A suspension or floor supported poultry drinker comprising a base member including an annular drinking trough around the periphery thereof,

said base member comprising means providing ballast to minimize movement of the drinker, said ballast providing means defining a water reservoir and said base member further comprising means defining a float chamber, said float chamber concentric with said annular trough, and said reservoir generally concentric with said float chamber and said trough;

a valve,

means for connecting said valve to a source of water,

means for supporting said valve so that said valve is in water communication with said reservoir;

a float disposed in said float chamber,

a float rod operatively connected to said float and extending from said float upwardly toward said valve,

means for providing communication between a top portion of said reservoir and said float chamber so that after water from said valve reaches a predetermined level in said reservoir it will overflow into said float chamber, and

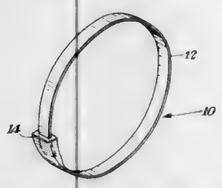
means for providing water communication between said float chamber and said trough so that the water level in said float chamber is directly proportional to the water level in said trough.

4,180,016

SAFETY PET COLLAR

William M. George, 550 Brickell Ave., Miami, Fla. 33129

Filed Dec. 19, 1977, Ser. No. 861,533
Int. Cl.[2] A01K *27/00*
U.S. Cl. 119—106 **2 Claims**



1. An improved safety flea collar for a domestic animal, comprising:

an elongated flexible strip having a pesticide embedded therein for killing fleas, ticks and the like, said strip having an end with a hollow chamber and an opposite free end, said end hollow chamber having a predetermined depth and being sized and shaped to be substantially the same size, contour and cross-section as said free end of said collar, said free end being insertable into said end hollow chamber, said free end when inserted in said end hollow chamber a selected depth to provide for, a predetermined frictional force for resisting disengagement of said free end and said chamber end.

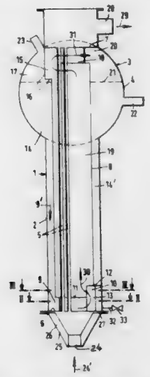
4,180,017

PIPE ASSEMBLY-HEAT EXCHANGER-STEAM DRUM UNIT

Witold Drobka, Berlin, Fed. Rep. of Germany, assignor to Borsig GmbH, Berlin, Fed. Rep. of Germany

Filed Jul. 20, 1978, Ser. No. 926,333
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1977, 2735064
Int. Cl.[2] F22B *1/06, 37/26*
U.S. Cl. 122—34 **9 Claims**

1. A pipe assembly heat exchanger-steam drum unit for a heat exchanger between media of relatively high differential pressure, which includes; a steam drum comprising a liquid receiving space with an inlet for liquid under pressure and also comprising a steam receiving space located above said liquid receiving space and provided with an outlet for releasing steam from said steam receiving space, a pipe-assembly-heat exchanger having inlet means and outlet means and having a first relatively thin bottom at one end and a second relatively thin bottom at its other end, said heat exchanger comprising pipes extending in the form of a nest of pipes transversely and substantially centrally through said steam drum and having one end located remote from said drum and connected to said first bottom while communicating with said inlet means for admitting a hot medium therethrough into said pipes, said pipes having another end connected to said second bottom while communicating with said outlet means for releasing said last mentioned medium after it has passed through said steam drum, said pipe assembly heat exchanger and said steam drum forming a unit with each other, and jacket means comprising a



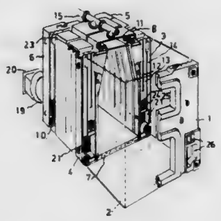
first mantle section surrounding said pipes from said steam drum to said first thin bottom and also comprising a second mantle section forming the outer wall of said steam drum and having a surface portion facing away from said inlet means.

4,180,018

HEATING BOILER

Bruno Larsson; Kurt Bohm; Janeric Strom, and Borje Aslund, all of Norrahammar, Sweden, assignors to Parca Norrahammar AB, Sweden

Filed Sep. 21, 1977, Ser. No. 835,308
Claims priority, application Sweden, Sep. 29, 1976, 7610772
Int. Cl.[2] F22B *25/00*
U.S. Cl. 122—225 R **8 Claims**



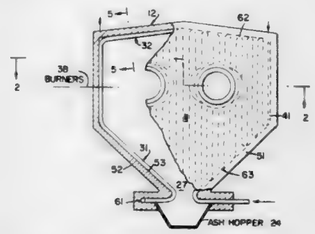
1. A boiler having a roof portion, a front wall, a rear wall, side walls, and a collecting duct extending in the longitudinal direction of the boiler, said front, rear, and side walls defining a combustion chamber; said side walls comprising alternating water chamber portions and convection portions; each of said convection portions comprising at least two vertical cylindrical substantially parallel flues, each having an inlet and an outlet, connected serially thereby providing upward or downward passages for flue gases, the inlet of the first being open to the combustion chamber and the outlet of the last being connected to said collecting duct; said at least two vertical flues of each convection portion being arranged in one transverse cross-sectional plane of the boiler; and the inlet to each flue having a tangential direction to the wall of the flue, substantially perpendicular to the longitudinal direction of the flue.

4,180,019

PROCESS HEATER

Thomas F. O'Sullivan, Montclair, N.J., and William H. Pollock, East Granby, Conn., assignors to The Lummus Company, Bloomfield, N.J.

Filed Mar. 1, 1978, Ser. No. 882,544
Int. Cl.[2] F22B *21/24*
U.S. Cl. 122—235 N **12 Claims**



1. A process heater, comprising:

a housing having walls, a roof and an ash receiving hopper bottom, said housing defining a front radiant section and a rear convection section, said housing walls in the radiant section including a downwardly and inwardly sloping bottom portion defining an elongated throat therebetween in communication with the ash receiving hopper;

a plurality of closely spaced vertically extending tubes arranged in a single row against the walls of the radiant section and co-extensive therewith a portion of the vertically extending tubes in the radiant section including bent portions to conform to the configuration of said downwardly and inwardly sloping bottom wall portion to provide a fluid cooled bottom for ash removal;

a plurality of closely spaced horizontally extending process tubes arranged in a single row against the roof of the radiant section and coextensive therewith, said horizontal tubes extending across the radiant section between the housing walls, vertical and horizontal tubes in the radiant section being interconnected to provide at least one process fluid coil having at least two fluid passes in the radiant section;

each vertical tube against the walls of the radiant section and each horizontal tube against the roof of the radiant section including fins covering the spaces between adjacent horizontal and vertical tubes to provide a fin tube wall construction covering the walls of the radiant section including the downwardly and inwardly sloping bottom, and covering the roof of the radiant section, said fin tube wall construction preventing build-up of ash behind the tubes;

a plurality of vertical convection tubes positioned in the convection section; and

at least one ash containing fuel fired burner in the front of the housing to heat process fluid.

4,180,020

PULSE SMOOTHING CIRCUIT FOR AN ELECTRONIC FUEL CONTROL SYSTEM

Junuthula N. Reddy, Troy, Mich., assignor to The Bendix Corporation, Southfield, Mich.

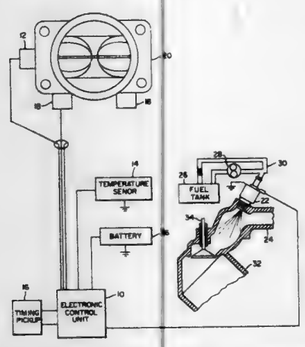
Filed Sep. 26, 1973, Ser. No. 400,996
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EA **8 Claims**

1. In a power producing engine fuel control system of the type driven by the voltage from a system voltage supply source and having sensor means responsive to engine conditions operative to provide signals indicative of engine operating parameters one of which is applied as a reference signal, including means responsive to engine triggering events, for providing accurately timed electrical signals for delivering

metered quantities of fuel to the engine, the improvement comprising:

means connected to the system supply source for sensing the level of the voltage therefrom;

means connected to the system and to the voltage level sensing means for adjusting the level of the reference



signal when the supply voltage is below a predetermined level to prevent regeneration of the fuel delivery signals; and

switching means for switching the reference signal level adjusting means in and out of the system as a function of the supply voltage and without interfering with the operation of the system.

4,180,021

METHOD OF INJECTING FUEL AND A FUEL INJECTION DEVICE OF AN INTERNAL COMBUSTION ENGINE

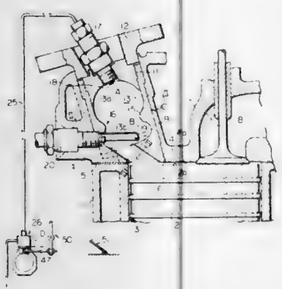
Hiromichi Yanagihara, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 20, 1977, Ser. No. 799,098

Claims priority, application Japan, Mar. 28, 1977, 52-33309

Int. Cl.[2] **F02B** *19/10*; **F02F** *3/28*

U.S. Cl. 123—32 ST **3 Claims**



1. A fuel injection device in an internal combustion engine comprising a main chamber, an auxiliary chamber having an axis and consisting of a first chamber and a second chamber, a connecting passage communicating said second chamber with said main chamber and being tangentially connected to an inner wall of said second chamber for creating a swirl motion of a suction gas in said auxiliary chamber at the time of the compression stroke, said second chamber having a recess at a position located opposite to said inner wall to which said connecting passage is tangentially connected with respect to the axis of said auxiliary chamber, a fuel injector in the end of said first chamber most remote from said second chamber for directing a rich air-fuel mixture toward said recess, and a spark plug having a spark gap located in the vicinity of said recess for igniting said rich air-fuel mixture, said fuel injection device comprising:

a housing having a cylinder bore;

a plunger reciprocally movable in said cylinder bore and having a pair of grooves extending along a circumferential wall of said plunger and spaced from each other for forming an inner circumferential wall for the plunger operation having a predetermined shape between said grooves;

a fuel feed port opening into said cylinder bore and arranged to cooperate with said inner circumferential wall for the plunger operation when said plunger moves upwards;

a fuel delivery port opening into said cylinder bore and connected to said fuel injector; and

a plunger actuating means for rotating said plunger about its axis in accordance with the level of the load of said engine, said inner circumferential wall for the plunger operation closing said fuel feed port for starting the injecting operation when said plunger moves upwards from a lowermost position thereof to reach a predetermined first position and when said level of the load of said engine is higher than a predetermined level, while said inner circumferential wall for the plunger operations opens said fuel feed port for stopping said injecting operation when said plunger moves upwards from said lowermost position to reach a predetermined second position which is higher than said predetermined first position and when said level of the load of said engine is lower than said predetermined level.

4,180,022

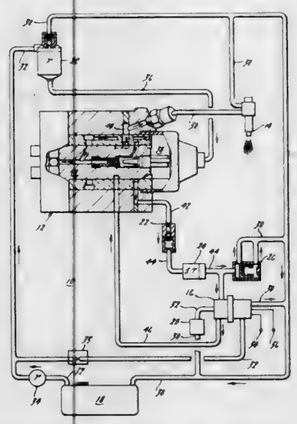
FUEL INJECTION SYSTEM AND CONTROL VALVE FOR MULTI-CYLINDER ENGINES

Magdi K. Khair, Birmingham, and Jay C. McCombie, West Bloomfield, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Oct. 31, 1977, Ser. No. 846,755

Int. Cl.[2] **F02B** *3/00*; **F02M** *39/00*

U.S. Cl. 123—32 AE **4 Claims**



1. In a fuel injection system a control valve adapted to control fuel flow to an injector mechanism comprising;

a valve body;

an inlet, outlet and drain port in said body, said outlet being connected to said injector mechanism, said inlet being connected to a source of high pressure fuel and said drain port being connected to a fuel reservoir;

a first fluid passage within said body between said inlet and said outlet;

a second fluid passage within said body connecting said outlet to said drain port;

a valving element disposed in said first passage to control flow therethrough, said valving element having a first and second position, said valving element blocking fluid flow through said first passage in said first position and blocking fluid flow through said second passage in said second position;

an electro expansive actuator disposed in said valve body for said valving element to move said valving element from said first to said second position;

an annular space in said valve body surrounding said actuator; and

a second inlet connected to a source of low pressure fuel and a second outlet connected to a return line to said fuel reservoir said low pressure fuel flowing continuously into and out of said annular space to maintain the electro-expansive actuator near ambient temperature and prevent the actuator's stroke from changing during operation.

4,180,023

ELECTRONICALLY-CONTROLLED FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE HAVING ODD NUMBERS OF CYLINDERS

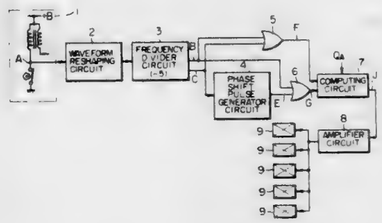
Akio Kobayashi, Kariya; Kunio Endo, Anjo, and Norio Omori, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 25, 1978, Ser. No. 927,820

Claims priority, application Japan, Jul. 29, 1977, 52/91540

Int. Cl.[2] **F02B** *5/00*

U.S. Cl. 123—32 EA **5 Claims**



1. An electronically-controlled fuel injection system for an internal combustion engine having odd numbers of cylinders, in which the quantity of fuel supplied to the engine cylinders is regulated by the duration of pulses of a fuel injection pulse signal applied to solenoid-operated fuel injection valves, and two fuel injection pulses are generated in each operating cycle of the engine, said system comprising:

a waveform reshaping circuit for reshaping the waveform of an ignition signal supplied from an ignition unit for the engine;

a frequency divider circuit connected to said waveform reshaping circuit for dividing the frequency of the output pulse signal of said waveform reshaping circuit by the number of cylinders of the engine thereby generating a first and a second pulse signals, the phase of each pulse in said second pulse signal lagging behind that of the corresponding pulse in said first pulse signal by n ignition pulse intervals where n is a multiple of the half of the number obtained by subtracting unity from the number of cylinders of the engine;

a phase shift pulse generator circuit connected to said frequency divider circuit for generating a third pulse signal in which the terminating or fall time of each pulse is delayed relative to that of the corresponding pulse in said second pulse signal by the half of one ignition pulse interval; and

computing means connected to said frequency divider circuit and said phase shift pulse generator circuit for generating the fuel injection pulse signal including a train of pulses each appearing in response to the termination of the corresponding pulses in said first and third pulse signals, said fuel injection pulse signal being applied to said solenoid-operated fuel injection valves which inject fuel into the cylinders of the engine.

4,180,024

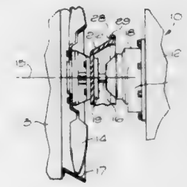
INTERNAL COMBUSTION ENGINE FAN ADAPTER

Fredrico Hernandez, P.O. Box 1376, Palmdale, Calif. 93550

Filed Jun. 28, 1978, Ser. No. 919,965

Int. Cl.[2] **F01P** *5/12*

U.S. Cl. 123—41.46 **12 Claims**



1. An adapter for attaching a radiator cooling fan to a water pump of an internal combustion engine for rotation therewith about an axis, comprising:

an adapter body having a rear wall to be connected to a flange of said water pump and having a front wall spaced forwardly of the rear wall and to which said fan is connectable;

said rear wall containing openings spaced circularly about said axis for reception of bolts securing the body to said water pump flange;

said body containing a rearwardly opening central pilot recess into which a pilot projection carried by said water pump flange projects in centering relation;

said front wall having a forwardly projecting centering boss receivable in centering relation within an opening in the fan;

said body containing a plurality of circularly spaced wrench receiving recesses which extend radially inwardly therein between said front and rear walls and are defined at their front and rear sides by said walls and into which a wrench can extend to engage and turn heads of said bolts securing said rear wall to the water pump flange;

said body forming a plurality of circularly spaced partitions which extend radially outwardly between said wrench receiving recesses and separate them one from another and which rigidly connect said front and rear walls together at circularly spaced locations.

4,180,025

FUEL INJECTION SYSTEM

Ulrich Steinbrenner, Stuttgart; Dieter Kirn, Asperg, and Hans Schnürle, Walheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 8, 1977, Ser. No. 766,639

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1976, 2605059

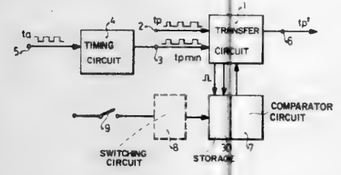
Int. Cl.[2] **F02B** *3/00*

U.S. Cl. 123—32 EA **21 Claims**

1. A fuel injection system for an internal combustion engine, comprising, in combination:

electromagnetic fuel injection valves associated with combustion cylinders of the engine;

means for generating primary fuel injection valve control pulses from trigger signals related to engine rpm and from signals related to the aspirated air flow rate;
storage means for storing electrical values related to engine data;
comparator circuit means for generating comparison pulses from said stored electrical values;



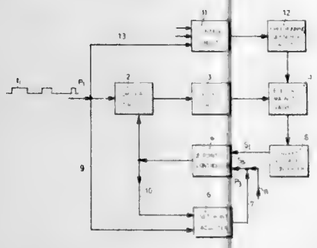
transfer circuit means, connected to accept information from said comparator circuit means for providing selective passage of said fuel injection valve control pulses to said fuel injection valves; and
timer means including a timing input circuit, actuated by rpm-related signals, for generating secondary fuel injection control pulses of minimum duration for passage to said transfer circuit means.

4,180,026

APPARATUS FOR CONTROLLING THE OPERATING CURRENT OF ELECTROMAGNETIC DEVICES

Peter Schülzke, Oberriexingen; Herbert Arnold, Eberdingen; Klaus Harsch, Ditzingen, and Peter Werner, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 28, 1977, Ser. No. 781,808
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612914; Feb. 16, 1977, 2706436
Int. Cl.[2] **F02M** *51/00;* **H01F** *7/18*
U.S. Cl. 123—32 EF **35 Claims**



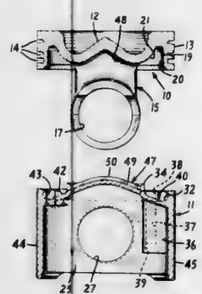
1. In an apparatus for controlling solely the actuation current supplied to an electrical device, in particular to one or more electromagnetic fuel injection valves having actuating coils which respond to fuel injection control pulses supplied by the fuel injection system of an internal combustion engine, the duration of said pulses being dependent substantially on engine air throughput and engine speed (rpm) and said duration of said pulses determining the amount of fuel admitted by said valves, said apparatus including positive and negative power supply lines;
an output circuit connected to the actuating coils of the fuel injection valves for providing actuation of said fuel injection valves, said output circuit having a fully conducting or a fully turned off state, said output circuit including:
a feedback-controlled driver and logic circuit for receiving said fuel injection control pulses from said fuel injection system; and
sensing means for sensing the actual magnitude of the actuation current in the actuating coils of said injection valves and for generating a control variable as a function thereof, the improvement comprising:
a feedback circuit including: a two-point controller circuit connected to said driver and logic circuit and to said sensing means for receiving the control variable from said sensing means; and a set-point switching circuit for receiving trigger pulses coincident with said fuel injection control pulses, said set-point switching circuit being connected to said two-point controller circuit for providing an increased set-point signal to said two-point controller circuit at the beginning of each fuel injection control phase, said two-point controller circuit serving to render said output circuit either fully conducting, at least when the beginning of a fuel injection control pulse is received by the feedback-controlled driver and logic circuit, or fully turned-off.

4,180,027

TWO-PIECE OIL-COOLED PISTON

Joe N. Taylor, Mercersburg, Pa., assignor to Mack Trucks, Inc., Allentown, Pa.

Filed Jul. 20, 1977, Ser. No. 817,348
Int. Cl.[2] **F01P** *3/06, 3/10*
U.S. Cl. 123—41.35 **22 Claims**



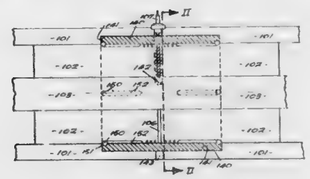
1. A two-piece piston comprising:
a one-piece integral head section having a crown and depending boss means, said boss means having a bore for receiving a pin, and the head section being formed with an annular undercrown recess adjacent the periphery of the crown; and
a one-piece integral skirt section for assembly with the head section, the skirt section having bores corresponding to and coaxial with the bore in the head section when the head and skirt sections are assembled together, and having an annular coolant-carrying tray in opposed spaced relation to the undercrown recess of the head section, so as to form a coolant chamber substantially continuous about the periphery of the piston when the head and skirt sections are assembled together, the tray having an inner wall portion extending toward and spaced from the undercrown surface of the head section to provide a passage for controlling the flow of coolant exiting said tray toward the center portion of said undercrown surface; and
said skirt section being formed with at least one passage communicating with the tray for introducing coolant under force into said tray from a reservoir disposed beneath said piston.

4,180,028

FLUID OPERATED DEVICE

Paul A. Richter, 1 Hammersley Pl., Fisher, Australia

Filed Jul. 9, 1976, Ser. No. 703,984
Claims priority, application Australia, Jul. 11, 1975, 2333; Nov. 7, 1975, 3883; Jan. 14, 1976, 10299
Int. Cl.[2] **F02B** *53/06;* **F01L** *7/04*
U.S. Cl. 123—45 A **10 Claims**



1. A fluid operated device comprising: a cylinder member, at least two mutually opposed piston members movable axially therein, a common working chamber within said cylinder member defined by opposing ends of said piston members and the inner wall of said cylinder member, said cylinder member being provided with inlet means and outlet means communicating with said working chamber for admission of working fluid to said chamber and for removal of spent working fluid from said chamber, respectively; a shaft member extending through said piston members and said cylinder member concentrically with said members, first coupling means coupling the piston members to one of the other mentioned members such that axial reciprocation of the piston members causes rotation of the piston members relative to said one of the other mentioned members; second coupling means coupling the piston members to the other one of the other mentioned members to prevent relative rotation of the piston members and said other one of the other mechanical members while permitting axial reciprocation of the piston members; and valve means in said working chamber operatively coaxially coupled to said shaft member for rotation with said shaft member relative to the cylinder member, said valve means comprising a substantially cylindrical ring member having an aperture therein which, on rotation of said valve means, selectively communicates with said inlet means and said outlet means in said cylindrical member to control movement of working fluid into and out of said working chamber through said inlet and outlet means.

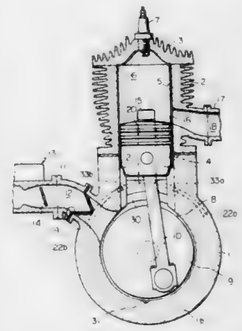
4,180,029

2-CYCLE ENGINE OF AN ACTIVE THERMOATMOSPHERE COMBUSTION

Sigeru Onishi, Kanazawa, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 19, 1977, Ser. No. 861,947
Claims priority, application Japan, Dec. 29, 1976, 51-158047; Oct. 11, 1977, 52-120895
Int. Cl.[2] **F02B** *25/20*
U.S. Cl. 123—73 A **35 Claims**

1. A method of combustion in a 2-cycle engine having a crank room, a combustion chamber and a scavenging passage communicating the crank room with the combustion chamber, said method comprising the steps of:
introducing a fresh combustible mixture into the crank room;
leading the fresh combustible mixture in the crank room into the scavenging passage;
flowing the fresh combustible mixture from the crank room at a first high speed for a long time in a first substantially long section of the scavenging passage remote from the combustion chamber for promoting the vaporization of the liquid fuel contained in the fresh combustible mixture;
flowing the fresh combustible mixture at a second speed slower than the first speed in a second section of the scavenging passage downstream of the first section and substantially shorter than it;
feeding the fresh combustible mixture from the second section into the combustion chamber at at most the lower speed while suppressing the flow and turbulence of the burned gas in the combustion chamber and preventing the dissipation of the heat of the burned gas in the combustion chamber for maintaining the residual burned gas in the combustion chamber at a high temperature;
creating an active thermoatmosphere in the combustion chamber at the beginning of the compression stroke;
continuing to maintain the active thermoatmosphere until the end of the compression stroke, and reforming the fresh combustible mixture; and
causing self-ignition of the fresh combustible mixture.

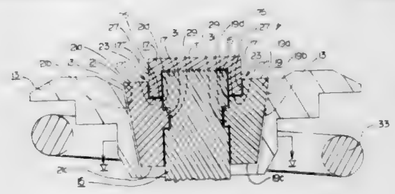


4,180,030

VALVE LOCK ASSEMBLY

John A. McWhirter, 2806 Hangar Rd., Memphis, Tenn. 38118

Filed Sep. 19, 1977, Ser. No. 834,819
Int. Cl.[2] **F01L** *3/10*
U.S. Cl. 123—90.67 **12 Claims**



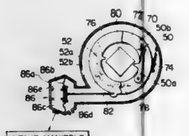
1. A valve lock means for locking a valve spring retainer having an inner wall to the distal end of a valve stem in a valve assembly of the type including a cup-shaped lash cap for placement over the tip of said distal end of said valve stem, said lash cap having a substantially larger outside diameter than the largest outside diameter of said distal end of said valve stem, said valve lock means comprising: wedged-shaped means, having an enlarged cavity-like portion at the upper end of said wedge-shaped means and having inner walls extending downwardly from said cavity-like portion over a major portion of the length of said wedge-shaped means adjacent said valve stem, for being wedged between said valve spring retainer and said valve stem to lock said valve spring retainer and said valve stem together and for receiving a portion of said lash cap in said enlarged cavity-like portion, said valve lock means extending above said inner wall of said valve spring retainer, and said enlarged cavity-like portion extending outwardly beyond

and being substantially larger than said inner walls of said wedge-shaped means.

4,180,031
METHOD AND SYSTEM FOR CONTROLLING IGNITION SPARK TIMING OF AN INTERNAL COMBUSTION ENGINE OF THE MULTIPLE PLUGS TYPE

Shigeo Muranaka, Yokohama; Kōkichi Ochiai, Fujisawa, and Makio Waku, Urawa, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed May 13, 1976, Ser. No. 686,083
Claims priority, application Japan, Jul. 2, 1975, 50-81540
Int. Cl.[2] F02P *7/00, 5/10, 15/02*
U.S. Cl. 123—117 A **7 Claims**





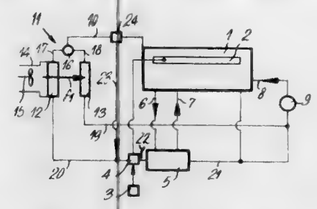
1. In an ignition timing control system for an internal combustion engine of the type wherein first and second spark plugs are disposed in each combustion chamber, the improvement comprising:
a breaker cam rotatably mounted in a casing;
first and second signal generators disposed in the casing and cooperating with and operable by said braker cam, said first and second signal generators being electrically connected to the first and second spark plugs, respectively, and including means for generating the first and second ignition signals at different timings with a predetermined phase difference when the positions of the first and second signal generators relative to said breaker cam are changed to cause the first and second spark plugs to ignite with the predetermined phase difference;
adjustment means for varying said phase difference by changing the positions of said first and second signal generators relative to said breaker cam; and
an actuating device operatively connected to the adjustment means to move the adjustment means in response to a suction prevailing in an induction passsage of an engine carburetor of a throttle valve.

4,180,032
DEVICE FOR THE REGULATION OF THE TEMPERATURE OF A SUPERCHARGED DIESEL ENGINE

Alain E. Plegat, Asnieres, France, assignor to Societe Anonyme des Usines Chausson, Asnieres, France

Filed Feb. 8, 1977, Ser. No. 766,794
Claims priority, application France, Feb. 10, 1976, 76 03646
Int. Cl.[2] F02B *33/44*
U.S. Cl. 123—119 CD **10 Claims**

1. A system for regulating the temperature of a supercharged diesel engine having parts lubricated by oil, a water cooling jacket having an input and an output, and a supercharging air supply, the system comprising:
a first water heat exchanging circuit having one input connected to the output of the water cooling jacket of the engine;
a second water heat exchanging circuit having one input connected to the output of the water cooling jacket of the engine;
a heat exchanging assembly comprising an air heat exchanging circuit means for cooling the supercharging air supply of the engine and an oil cooling heat exchanger means for cooling the oil lubricating the parts of the engine, said air heat exchanger means being connected to said oil cooling heat exchanger, and said heat exchanging assembly having one input connect to the output of said first heat exchanging circuit;
a circulation pump having one output connected to the input of the water cooling jacket of the engine, the input of said

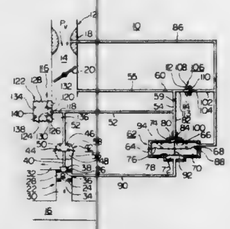


circulation pump being connected both to the output of the second heat exchanging circuit and to the output of said heat exchanging assembly;
a by-pass circuit means connected to the output of said water cooling jacket of the engine and to the input of said heat exchanging assembly for causing the water flowing from the water cooling jacket to bypass said first and second water heat exchanging circuits; and
a valve, said valve being sensitive to the temperature of the water coming from the water cooling jacket of the engine and provided to control the actuation of said by-pass circuit.

4,180,033
EXHAUST GAS RECIRCULATION CONTROL SYSTEM

Syunichi Aoyama, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Sep. 2, 1977, Ser. No. 830,343
Claims priority, application Japan, Sep. 3, 1976, 51-105972
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **9 Claims**



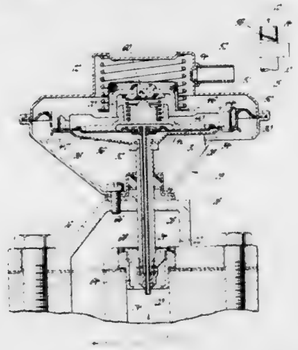
1. An exhaust gas recirculation (EGR) control system in combination with an intake combustion engine including
an intake passageway **14** providing communication between the atmosphere and the engine and having
a venturi **18** formed therein; and
an exhaust gas passageway providing communication between the engine and the atmosphere, said EGR control system **10, 142, 166** comprising
an EGR passageway **22** providing communication between the exhaust gas passageway and the intake passageway for recirculating thereinto exhaust gas emitted from the engine, said EGR passageway having provided therein

a restriction **24, 34** for restricting said EGR passageway;
an EGR control valve **38** which is disposed in said EGR passageway downstream of said restriction to define a first chamber **28** interposed between said restriction and said EGR control valve and is operable in opposite directions to increase and reduce the pressure of engine exhaust gas in said first chamber for controlling the flow of recirculated engine exhaust gas; and
an operating device **42, 62** for operating said EGR control valve in said opposite directions in accordance with a working pressure,
a pressure adjusting device **62** for adjusting said working pressure in accordance with said exhaust gas pressure in said first chamber and a vacuum in the venturi, and
an altitude correction device **116, 144, 168** for adjusting said working pressure in accordance with the atmospheric pressure.

4,180,034
EXHAUST GAS RECIRCULATION CONTROL

William A. Vogelsberg, Yale, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 25, 1978, Ser. No. 909,547
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **10 Claims**

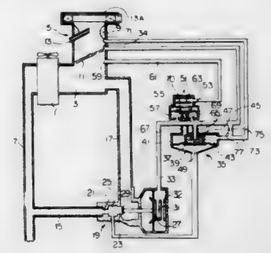


1. An exhaust gas recirculation control assembly for an engine having an induction passage for induction air flow and a recirculation passage for exhaust gas recirculation to said induction passage, said assembly comprising a control valve in said recirculation passage, an orifice in said recirculation passage upstream of said valve, and means for positioning said valve to provide exhaust gas recirculation at rates which maintain the control pressure in said passage between said orifice and said valve equal to a reference pressure, and wherein the improvement comprises means for varying said reference pressure inversely with the backpressure in said recirculation passage upstream of said orifice, whereby said control pressure is varied inversely with said backpressure and exhaust gas recirculation is provided as a proportion of induction air flow which varies directly with induction air flow.

4,180,035
INTERNAL COMBUSTION ENGINE WITH AN EXHAUST GAS RECIRCULATION SYSTEM

Junichi Saiki, Susono, and Teruo Kumai, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 23, 1978, Ser. No. 918,380
Claims priority, application Japan, Apr. 25, 1978, 53-48324
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **5 Claims**



1. An internal combustion engine with exhaust gas recirculation system comprising:
a valve device for controlling the exhaust gas recirculation which communicates an exhaust passage of said engine with an intake passage of said engine and which is provided with a diaphragm chamber, partitioned by a diaphragm, and a constant pressure chamber, partitioned by a valve body which is actuated by said diaphragm;
a modulator valve device for modulating a vacuum signal which is transmitted from a first port disposed at a position upstream of a throttle valve of a carburetor to said diaphragm chamber, said modulator valve device is provided with an upper diaphragm chamber, which is communicated with a second port disposed at a position nearer to a venturi portion of said carburetor than said first port, and a lower diaphragm chamber, which is communicated with said constant pressure chamber of said exhaust gas recirculation control valve device;
a vacuum control valve device for controlling the vacuum pressure in said upper diaphragm chamber of said modulator valve device in accordance with changes in intake vacuum of said engine, said vacuum control valve device is provided with an upper chamber, which is partitioned by a diaphragm and communicated with said intake passage of said engine, and a lower chamber, which is communicated with said upper diaphragm chamber of said modulator valve device and which has an opening for discharging vacuum therefrom formed on the wall thereof, and;
an orifice which communicates a first communicating pipe, which communicates said first port with said diaphragm chamber of said exhaust gas recirculation valve device, with another communicating pipe, which is communicated with a port disposed upstream of said first port.

4,180,036
FUEL TEMPERATURE CONTROL

Gil Wolf, 7412 Laramie, Skokie, Ill. 60076

Filed Jan. 23, 1978, Ser. No. 871,242
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—122 E **3 Claims**

1. In a preheating system for liquid diesel fuel being used in a diesel engine, such as for use in an automotive vehicle equipped with a liquid cooled engine and having radiator means for dissipating excess engine heat from the heated liquid coolant, wherein the preheating system includes heat exchanger means for transferring heat from liquid coolant to

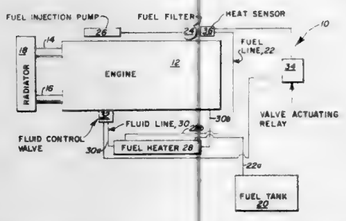
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diesel fuel that is being acted upon by a pump for effecting pressurized injection of liquid diesel fuel through injector means into the engine;

the improvement comprising, in combination:

a heat exchanger means including a liquid tight casing enclosing and partially bounding a flow space for diesel fuel, heat transfer tube means occupying a portion of the entire space enclosed by the casing and for carrying therethrough liquid coolant after the engine has been started and is running, and a selectively energizable auxiliary heating element positioned in said flow space for the diesel fuel;

means including a pump downstream of the heat exchanger means for causing diesel fuel to move only through said flow space that is exterior of said heat transfer tube means in the casing, so that the diesel fuel will contact, in direct heat transfer relation, the auxiliary heating element to preheat the fuel at such times when the temperature of the engine coolant liquid is insufficient to preheat the fuel, thereby permitting said pump to supply preheated liquid



diesel fuel to the engine to permit engine start-up at very low temperatures;

flow line means arranged for directing heated liquid coolant from the engine through the heat transfer tube means of the heat exchanger means after the engine has been started and after the selectively energizable heating element has been de-energized;

temperature sensing means for sensing the temperature of heated liquid diesel fuel being delivered downstream of the heat exchanger means to said downstream pump for injecting heated diesel fuel into the engine;

shut-off valve means operatively controlled by said temperature sensing means for either permitting, or shutting off, flow of liquid coolant from the engine to said heat transfer tube means; and

said temperature sensing means being operative to limit heating of the diesel fuel by heat transferred from said heated liquid coolant when the temperature of the heated liquid diesel fuel sensed exceeds about 180° F., so as to prevent scorching of the fuel injector means by heated liquid diesel fuel.

4,180,037

INJECTION PUMP CONTROL SYSTEM

Nobuhito Hobo, Inuyama; Yutaka Suzuki, Nishio; Takashi Naito, and Yoshimune Konishi, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 27, 1977, Ser. No. 846,018

Claims priority, application Japan, Dec. 26, 1976, 51-157278

Int. Cl.² F02M *63/02*

U.S. Cl. 123—139 E **3 Claims**

1. An injection pump control system comprising:

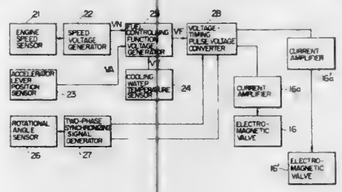
an injector pump rotor;

a plurality of mutually independent pressure feed means disposed in said rotor, each of said pressure feed means including at least a pair of inner cams and a pair of pump plungers;

a separate fuel inlet passage means provided for each of said pressure feed means;

an electromagnetic valve disposed in each of said fuel inlet passage means to open and close the same; and

an electric control circuit adapted for making the number of open-close operations of each electromagnetic valve equal



to the number of operations of each pressure feed means and for controlling the duration of opening of each electromagnetic valve in accordance with the operating conditions of an engine.

4,180,038

FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

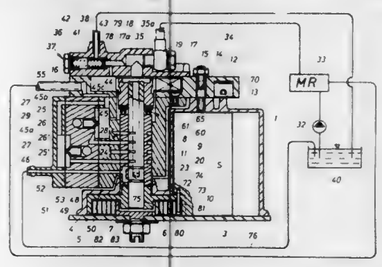
Johannes Steinwart, Obersulm-Willsbach; Gerhard Maurhoff; Armin Bauder, both of Neckarsulm; Gottlieb Wilmers, Neuenstadt, and Reiner Pischke, Jagstfeld, all of Fed. Rep. of Germany, assignors to Audi Nsu Auto Union Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 27, 1978, Ser. No. 872,948

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1977, 2703722

Int. Cl.² F02M *39/00;* **B01D** *47/00*

U.S. Cl. 123—139 AW **13 Claims**



1. A fuel injection system for a mixture-compressing internal-combustion engine with separate ignition and continuous fuel injection into the inlet duct, which incorporates an adjustable throttle butterfly valve and a baffle flap pivotally mounted at the side of the inlet duct to move in accordance with the air flow rate acting in opposition to a return force, the baffle flap being coupled to a damper blade and to a coaxial rotary control member of a fuel metering valve, comprising a control cylinder containing a relatively rotatable control piston arranged to meter the quantity of fuel delivered to one or more injection nozzles in proportion to the air flow rate, the control cylinder being stationary and mounted alongside the baffle flap outside the inlet duct, and the rotary control piston being connected outside the control cylinder adjacent one end to the baffle flap, and adjacent the other end to the damper blade, so as to rotate with the flap and the blade.

4,180,039

FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

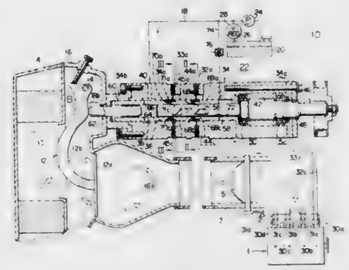
Masaaki Noguchi, Nagoya; Yukiyasu Tanaka, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 8, 1978, Ser. No. 903,658

Claims priority, application Japan, May 12, 1977, 52-54686

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 AW **7 Claims**



1. A fuel injection system for an internal combustion engine, comprising:

a plurality of sets of fuel injectors adapted to be mounted on the engine;

each of the fuel injectors of each set being associated with one of the engine cylinders so that each engine cylinder is provided with a plurality of injectors equal in number to the fuel injector sets;

a fuel source operative to supply a fuel under a predetermined pressure to said fuel injectors;

means for metering the fuel from said fuel source and distributing the metered fuel to said fuel injectors;

said fuel metering and distributing means including a housing defining therein a fuel inlet port connected to said fuel source and a plurality of sets of fuel outlet ports each connected to one of said fuel injectors;

the fuel outlet port sets being equal in number to said fuel injector sets;

said fuel metering and distributing means further including a rotor and means defining a plurality of sets of apertures;

the apertures of each set being equal in number to the engine cylinders;

the aperture sets being equal in number to said fuel outlet sets and thus to said fuel injector sets;

said rotor being mounted in said housing for rotation in timed relationship to the engine operation and defining a plurality of orifices equal in number to said aperture sets and operatively associated respectively with said aperture sets;

one of said rotor and said aperture defining means being disposed inside the other and defining a fuel passage always in communication with said fuel inlet port in said housing;

each of said apertures being substantially aligned with one of said fuel outlet ports;

the rotation of said rotor moving said orifices relative to said apertures in the circumferential direction of said rotor so that at least one of said orifices is brought into overlapping and communicating relationship with successive apertures of the corresponding set to allow the fuel to flow from said fuel passages through the overlapped and communicated orifice and apertures to the associated fuel outlet ports and thus to the associated fuel injectors;

means responsive to variation in the rate of engine intake air flow to cause relative movement between said aperture defining means and said rotor so that relative movement between said rotor and said sets of apertures is caused axially of said rotor, the arrangement being such that the number of the orifices brought into overlapping and communicating relationship to the apertures is increased to increase the fuel supply to respective cylinders as the engine intake air flow rate is increased, and vice versa.

4,180,040

REGULATOR FOR A FUEL INJECTION PUMP

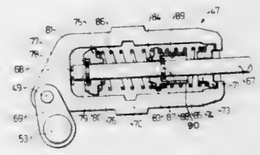
Gerald Höfer, Weissach-Flacht; Karl Konrath, Ludwigsburg; Manfred Schwarz, Gerlingen, and Helmut Laufer, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 21, 1977, Ser. No. 779,885

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612940

Int. Cl.² F02D *1/06;* **F02M** *39/00;* **F04B** *49/00*

U.S. Cl. 123—140 R **11 Claims**



1. In an r.p.m. regulator of a fuel injection pump for internal combustion engines, including a fuel supply quantity setting member, a control spring mechanism having a preloaded control spring, a control lever connected to the control spring mechanism and to the fuel supply quantity setting member for actuating said fuel supply quantity setting member, said control lever being pivotably mounted between its connected ends, a setting lever, said control spring mechanism being connected to said setting lever and to said control lever thereby applying the preload of said control spring to said control lever, and an r.p.m.-dependent force applying means engaging said control lever between its ends for applying thereto an r.p.m.-dependent force in opposition to the force exerted by said control spring, a first connecting member connected to said setting lever, a second connecting member connected to said control lever, both said connecting members being part of said control spring mechanism, the improvement comprising:

tandem springs axially aligned between said first and second connecting members and excursion limiting means interposed between at least two of said springs.

4,180,041

INTERNAL COMBUSTION ENGINE WITH INTAKE ARRANGEMENT TO PRODUCE SWIRL IN COMBUSTION CHAMBER

Hiroaki Miyazaki, Kamakura; Yasuo Sakai, Yokohama, and Tosimitu Matuoka, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Mar. 3, 1977, Ser. No. 774,038

Claims priority, application Japan, Mar. 5, 1976, 51-23154

Int. Cl.² F02M *29/00*

U.S. Cl. 123—141 **14 Claims**

1. An internal combustion engine comprising:

a cylinder with a cylinder axis;

a piston reciprocably slidable within said cylinder;

means defining an intake passageway having an intake port passage having an upstream end, with respect to the flow of a combustible charge passing through said intake port passage, and a downstream end opening to said cylinder, said downstream end of said intake port passage being positioned within a plane having an unit vector which is normal to said plane and has its origin placed at the middle

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of said downstream end, directed toward said piston and an area disposed in proximity of said cylinder axis; and

swirl means for causing the combustible charge passing through said intake passageway to swirl in said cylinder, said swirl means having a first flow restrictor means for restricting and directing and deflecting flow of the combustible charge passing through said intake passageway to urge the combustible charge to enter said cylinder in substantially a tangent direction to the cylinder wall;

said first restrictor means being disposed on that one of the two opposed inner wall portions of said intake passageway that is positioned nearer to said cylinder axis than the other wall portion;

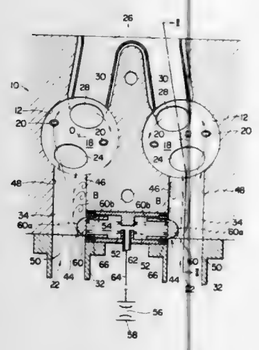
said first flow restrictor means protruding into said intake passage within an area disposed in the proximity of said upstream end of said intake port passage;

said swirl means comprising:

control means whereby said first flow restrictor means varies the effective flow area of said flow restrictor means in response to load on the engine;

and said control means comprising:

a carburetor with a venturi connected to said intake passageway;



a spring means yieldably biasing said first flow restrictor means in a direction in a sense to reduce the effective flow area of said first flow restrictor means; and

chamber means communicating with said venturi for urging, against the bias action of said spring means, said first flow restrictor means in the opposite direction in a sense to increase the effective flow area of said first flow restrictor means in response to vacuum at said venturi.

13. In an internal combustion engine the method of introducing air into a cylinder of the engine comprising the steps of:

introducing air into an intake passageway leading to said cylinder so that said air undergoes substantially laminar flow in said passageway;

projecting a projection into said passageway at a location upstream of said cylinder thus causing turbulent flow in the air flowing downstream and in the shadow of said projection;

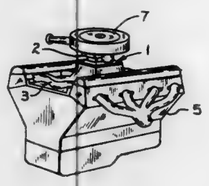
deflecting the portion of the air downstream of said projection which is undergoing laminar flow by using said projection and said air undergoing laminar flow, into said cylinder in a direction substantially tangential with respect to the cylinder wall, so that all of the air in said cylinder swirls therein.

4,180,042

FUEL-AIR MIXTURE REGULATOR FOR INTERNAL COMBUSTION ENGINES

David J. Lloyd, P.O. Box 1016, Blythe, Calif. 92225

Filed May 8, 1978, Ser. No. 903,881
Int. Cl.[2] F02M *29/00*
U.S. Cl. 123—141 **7 Claims**



1. In a four-cycle, multiple cylinder internal combustion engine including intake valves for the respective cylinders and an intake manifold having walls defining passages respectively extending from individual cylinder intake ports to a central passage communicating with the outlet of a carburetor, a fuel-air mixture regulator therefor comprising:

(a) a housing mounted between said carburetor and said manifold central passage, said housing having an inlet end communicating with said carburetor outlet and including walls extended into said central passage and spaced inwardly from said manifold walls;

(b) a plurality of elongate ports in said walls; and

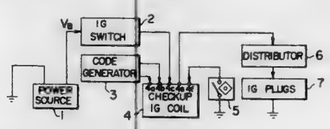
(c) a plurality of thin, elongate resilient reeds having one end secured to said walls adjacent a respective port and extending in overlying relation to said port, said reeds respectively having free ends variably movable away from said ports in response to differential pressures to open said ports and permit fuel-air mixture to flow therethrough and through said intake manifold, said reeds variably opening said ports during engine operation with the opening being less with less differential pressure to provide higher velocity between the reeds and the ports for fuel-air mixture drawn through said carburetor and said housing directed to the intake manifold passages for flow to respective cylinders.

4,180,043

CODE LOCK TYPE ENGINE CONTROL SYSTEM

Michio Kawamura, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 2, 1977, Ser. No. 802,864
Claims priority, application Japan, Jul. 1, 1976, 51-78571
Int. Cl.[2] B60R *25/04*
U.S. Cl. 123—146.5 B **4 Claims**



1. An engine control system having an input code checkup function comprising:

an electric power source;

electric actuating means coupled with an engine and available for rotating said engine during the energization thereof by said electric power source;

control means connected to said electric actuating means for generating a control signal in response to which said electric actuating means is allowed to be energized; and

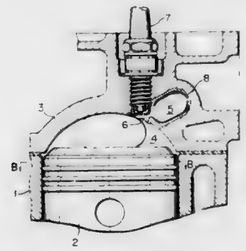
checkup means integrally packaged within said control means for comparing an input code signal with a predetermined constant code signal, said checkup means allowing said control means to generate said control signal only when said input code signal is detected to be identical with said constant code signal, said checkup means including a register for temporarily memorizing said input code signal upon each application thereof, a memory for constantly memorizing said constant code signal, and an identity detector, connected to said register and said memory, for generating an output signal when said input code signal is detected to be identical with said constant code signal, said output signal allowing said control means to generate said control signal.

4,180,044

TORCH IGNITION TYPE INTERNAL COMBUSTION ENGINE

Shougo Sanda, Okazaki; Noriniko Nakamura, Mishima, and Toshio Tanahashi, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 864,013, Dec. 23, 1977, abandoned, which is a continuation of Ser. No. 689,128, May 24, 1976, abandoned. This application Aug. 4, 1978, Ser. No. 931,293
Claims priority, application Japan, Nov. 10, 1975, 50-134133
Int. Cl.[2] F02B *19/16*
U.S. Cl. 123—191 S **3 Claims**



1. A torch ignition internal combustion engine of the type which has an auxiliary combustion chamber having a single opening which connects said auxiliary combustion chamber with a main combustion chamber, said engine comprising:

a cylinder;

a cylinder head;

a reciprocable piston in said cylinder, said piston having an end face;

said main combustion chamber defined between said cylinder head and the end face of said piston and equipped with intake and exhaust valves;

said auxiliary combustion chamber located in the cylinder head;

a passage directly fluidly interconnecting said main and auxiliary combustion chambers, said passage progressively increasing in transverse cross-sectional area in a direction from adjacent the auxiliary combustion chamber, where the passage is of smallest transverse cross-sectional area and of a ratio within the range of 0.009:1 to 0.023:1 with respect to the cross-sectional area of said end face of said piston; and

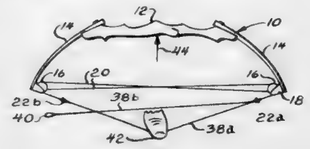
an ignition plug having sparking electrodes located in said passage in a region beyond that of smallest transverse cross-sectional area in a direction towards said main combustion chamber.

4,180,045

COMPOUND BOW STRINGING

Charles E. Kingsley, Evanston, Ill., assignor to Arens Controls, Inc., Evanston, Ill.

Filed May 11, 1978, Ser. No. 904,908
Int. Cl.[2] F41B *5/00*
U.S. Cl. 124—90 **5 Claims**



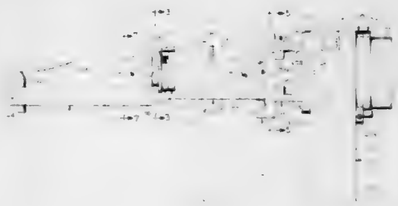
1. Structure for use in a compound bow of the type having cable means having spaced apart free ends, comprising an anchor on each of said free ends having a pair of like bow string receiving portions thereon for tensioning a bow string therebetween, there being a bow string of predetermined length and having anchor receiving loop portions adjacent opposite ends thereof tensioned between anchors and each anchor receiving loop portion being received on only one of each pair of bow string receiving portions, each of said anchors comprising an elongated body portion secured to a respective free cable end and having a longitudinal axis substantially in axial alignment with the adjacent portion of a respective cable, each bow string receiving portion having a narrow neck joined to said body and extending transversely thereof, and a bow string retainer joined to said neck and substantially coextensive therewith in the direction of said longitudinal axis, each said retainer substantially throughout its length being wider than the neck to which it is joined, each said retainer, neck and body forming a generally longitudinally extending channel-like recess to receive a bow string loop.

4,180,046

RADIUS AND ANGLE DRESSER

Ronald E. Kerner, 57 Grove St., Plainville, Conn. 06062

Continuation-in-part of Ser. No. 671,304, Mar. 29, 1976, abandoned. This application Jan. 12, 1978, Ser. No. 868,987
Int. Cl.[2] B24B *53/06*
U.S. Cl. 125—11 A **11 Claims**



1. A radius and angle dresser comprising:

A. A support member having a first cylindrical aperture extending therethrough;

B. a first shaft on said support member;

C. first mounting means on said first shaft mounting said first shaft in said first aperture for rotation, without axial movement, relative to said support member;

D. first shaft locking means operatively connected between said first shaft and said support member to selectively limit rotation of said first shaft from no rotation to limited rotary oscillation relative to said support member;

E. a mounting member secured to an end of said first shaft for rotation therewith about the axis of rotation of said

first shaft and having a linear track extending perpendicularly to said axis of rotation of said first shaft;

F. a slide member slidably mounted on said track for linear movement along said track perpendicularly of said axis of rotation of said first shaft;

G. means for limiting movement of said slide member along said track;

H. a slide block having a second cylindrical aperture extending therethrough and slidably mounted on said slide member for linear movement thereon perpendicularly to the longitudinal axis of said track and to said axis of rotation of said first shaft;

I. means for locking said slide block in a selected fixed position along said slide member;

J. a second shaft on said slide block, the axis of rotation of said second shaft being parallel to that of said first shaft and perpendicular to the longitudinal axis of said track;

K. second mounting means on said second shaft mounting said second shaft in said second aperture for rotation about the longitudinal axis of said second shaft, without axial movement, relative to said slide block, said second shaft being oscillatable in said second aperture independently of movement of said first shaft;

L. second shaft locking means operatively connected between said second shaft and said slide block to selectively limit rotation of said second shaft from no rotation to limited rotary oscillation relative to said slide block;

M. a tool support member mounted adjacent an end of said second shaft for movement perpendicularly to said axis of rotation of said second shaft;

N. means for locking said tool support member in a fixed position on said second shaft;

O. cutting tool mounting means on said tool support member for mounting a cutting tool to provide a cutting edge thereof angularly disposed relative to the axes of rotation of said shafts; and

P. means for oscillating said first shaft within said support member without effecting axial movement thereof to oscillate the entire subassembly supported thereon about its axis of rotation, said cutting tool support member being oscillatable on said second shaft about the axis of said second shaft independently of oscillation of said first shaft; said tool support member being moveable on said second shaft to move the cutting edge of the associated cutting tool between extreme positions on opposite sides of the axis of rotation of said second shaft, and said slide block being slidable on said slide member to move the cutting edge of the associated cutting tool between extreme positions on opposite sides of said axis of rotation of said first shaft;

whereby appropriate settings of said first and second shaft locking means may be employed to rotate said first shaft during operation of said dresser for rotation of said second shaft therewith to oscillate the associated cutting tool about the axis of rotation of said first shaft, and to rotate said second shaft during operation of said dresser independently of said first shaft to oscillate the associated cutting tool about the axis of rotation of the second shaft, each of said shafts thereby being independently oscillatable to effect oscillation of the cutting tool across the surface of a workpiece rotating in contact therewith.

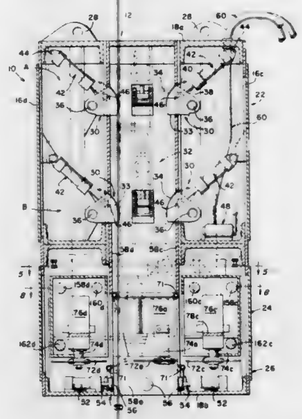
4,180,047

ABOVE AND BELOW WATER AND LAND PILE CUTTING APPARATUS AND METHOD

George H. Bertelson, R.D. 2, Box 112, Neshanic Station, N.J. 08853

Filed Jul. 6, 1978, Ser. No. 922,378
Int. Cl.² B28D *1/04*
U.S. Cl. 125—14 **10 Claims**

1. A pile cutting machine comprising a main frame said main frame being quadrangular in transverse cross-section and shaped to receive the pile to be cut in a passage extending through the center of the frame, a plurality of extensible pile-gripping clamp means carried by the upper portion of the main frame, a plurality of extensible pile gripping clamp means carried by the lower portion of the frame, a plurality of circular saw assemblies mounted between the upper and lower



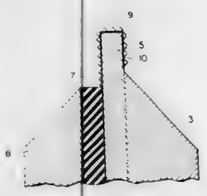
clamp means with the axis of rotation of each saw parallel to the axis of the pile to be cut, a carriage for each saw, means mounting each carriage for reciprocation in a plane normal to the axis of rotation of each saw assembly, means for swinging each saw toward and away from the pile to be cut and further means for reciprocating each saw carriage.

4,180,048

CUTTING WHEEL

Barrie F. Regan, 2260 Redington Rd., Hillsborough, Calif. 94010

Filed Jun. 12, 1978, Ser. No. 914,627
Int. Cl.² B28D *1/04*
U.S. Cl. 125—15 **1 Claim**
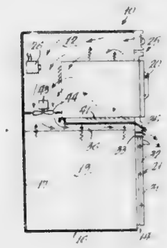


1. In a cutting blade for use in cutting siliceous materials consisting essentially of an electroformed matrix of abrasive particles in a nickel binder, having a blade thickness in the range about 0.0005 to 0.01 inch, having abrasive particles ranging in diameter from 4 to 30 microns and having a surface such that from 40 to 60 percent of the diameter of the exterior abrasive particles protrude from the surface of the nickel matrix, the improvement which comprises a thin layer of electrochemically deposited chromium on the surface of the nickel matrix ranging in thickness from 1/5 to 1/50 the diameter of the abrasive particles.

4,180,049

OVEN ASSEMBLY AIR CIRCULATION SYSTEM

Keith E. Carr, and Vance A. Kimball, both of Lincoln Township, Berrien County, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 9, 1978, Ser. No. 867,831
Int. Cl.² F24C *15/32*
U.S. Cl. 126—21 A **19 Claims**



1. In an oven structure having an upper oven defining a bottom, a rear, and a front, and a lower oven disposed subjacent said upper oven bottom and having a rear, a top, and and front, improved means for directing cooling air through said oven structure comprising:

air moving means; and

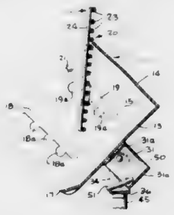
wall means defining a passage spaced below the bottom of said upper oven and open to the top of said lower oven and having an inlet at the rear of at least one of said ovens and an outlet at the front of at least one of said ovens, said air moving means being arranged to flow oven cooling air firstly in heat transfer association with the bottom of said upper oven and then to said inlet for flow through said passage for cooling said top of the lower oven.

4,180,050

OUTDOOR COOKING GRILL UNIT WITH TILTING FEATURE

Guy D. Sizemore, Pickaway, W. Va. 24964

Filed Oct. 21, 1977, Ser. No. 844,490
Int. Cl.² A47J *37/07*; **F24B** *3/00*
U.S. Cl. 126—25 A **6 Claims**



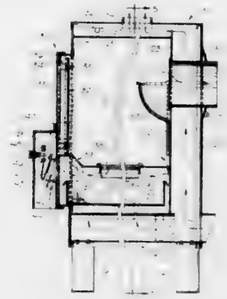
1. An outdoor cooking grill for charcoal cooking and the like, comprising a generally rectangular fire box having a normally generally horizontal rectangular bottom wall and a pair of vertical parallel end walls and a vertical rear wall joined together to define an upwardly and forwardly opening fire chamber, the pair of end walls each having a front slot and a rear slot extending generally vertically along parallel axes from near the bottom of the associated end wall toward the top thereof, the front slot of each end wall extending through the top edge of the end wall in upwardly opening relation and the rear slot in each end wall terminating below the top of the end wall whereby the rear slot is closed at its top, a grating member having a generally rectangular grid portion of spaced parallel rods extending across the fire chamber above the bottom wall thereof and having at each end a generally U-shaped handle permanently extending therefrom, each provided with a front leg and a rear leg extending through the front slot and rear slot of the adjacent end wall respectively, the rear leg of each of the U-shaped handles being captured in the rear slot against removal therefrom while the front legs are tiltable upwardly through the open tops of the front slots for upward swinging movement of the grating members about a horizontal axis extending through the rear handle legs, the slots each having a plurality of vertically spaced notches for receiving the handle legs and supporting the grating member at a plurality of vertically spaced adjustment positions, a generally vertically extending pedestal for said firebox, and a coupling assembly between said firebox and the uppermost end portion of said pedestal including swivel coupling means supporting the firebox for rotary movement about a vertical swivel axis extending through the pedestal, and said coupling assembly further including tilt coupling means supporting the firebox for tilting movement about a horizontal axis adjacent to the bottom wall of the firebox to accommodate forward and downward tilting movement of the firebox to dispose its bottom wall in a forwardly declining position at an angle of about 45 degrees from the horizontal, and said tilt coupling means having stop members for supporting said firebox at said forwardly declining position and for locating the firebox at a normal position disposing its bottom wall substantially horizontally.

4,180,051

FURNACE

Michael W. Maier, Beaver Dam, and James J. Polzin, Juneau, both of Wis., assignors to Malleable Iron Range Company, Beaver Dam, Wis.

Filed May 19, 1978, Ser. No. 907,837
Int. Cl.² F24C *1/14*
U.S. Cl. 126—77 **6 Claims**



1. A furnace, useful to burn wood or coal, which comprises:

a cabinet having a double-walled construction for its sides, top, bottom and rear to provide passageways between the pairs of spaced inner and outer walls for air to be heated by said furnace and having a front wall with at least one opening, said cabinet at its upper portion having aligned openings in one pair of said spaced inner and outer walls, and having an air inlet in one of said outer walls and a heated air outlet in one of said outer walls;

a grate mounted in a lower portion of the cabinet to provide a fire chamber defined by said grate, said inner walls of said sides, top, bottom and rear of said cabinet and said front wall of said cabinet;

door means mounted on said front wall of said cabinet, said door means at said front wall of said cabinet being constructed to provide an airtight closing of said front of said cabinet when said door means is in the closed position;

a damper including a damper pipe and a damper plate, said

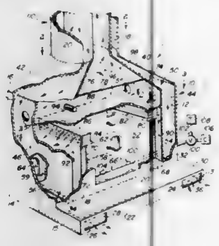
damper pipe being mounted on one of said door means and said front wall of said cabinet and said damper plate being pivotally mounted at its top on the front end of said pipe;
temperature sensing means;
means supporting said temperature sensing means in a manner to permit relative movement between said support means and said temperature sensing means, said support means being mounted on one of said door means and said front wall of said cabinet to support said temperature sensing means above said damper plate; and
means connecting said temperature sensing means and said bottom portion of said damper plate to raise said damper plate by movement of said temperature sensing means, said furnace including means whereby said temperature sensing means is separated from said fire chamber by said front wall of said cabinet and said door means that provides radiant energy toward said temperature sensing means, and said furnace including means to separate, at least almost entirely, said temperature sensing means from any flow of air that has moved through any of said passageways of said cabinet, thus providing means whereby the main thermal energy provided to said temperature sensing means is radiant energy from either said front wall or said door means, as the case may be, that separates it from said fire chamber.

4,180,052

FURNACE FIREPLACE APPARATUS HAVING SEPARATE COMBUSTION AND HEATING AIR SYSTEMS AND SETTLING CHAMBERS FOR PARTICULATE MATTER

Delbert H. Henderson, c/o General Delivery, Prescott Valley, Ariz. 86312

Filed Oct. 19, 1978, Ser. No. 952,714
Int. Cl.² F24H *3/00*; **F24C** *15/30*
U.S. Cl. 126—108 **47 Claims**



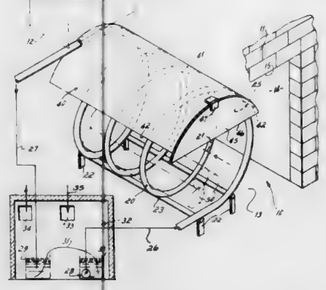
38. Apparatus for producing heat from burning fuel comprising, in combination:
combustion chamber means, including a front wall, a rear wall, a first and a second side wall, a floor, and a ceiling for burning fuel;
primary settling chamber means disposed adjacent the combustion chamber and communicating therewith for receiving a flow of combustion gases and products of combustion from the burning of fuel in the combustion chamber in which heavier unburned products settle out of the flow of combustion gases and products of combustion;
passage means extending between the combustion chamber means and the settling chamber means through which the combustion gases and products of combustion flow and disposed adjacent the ceiling of the combustion chamber for providing a vertically upward flow of the said gases and products from the combustion chamber and a vertically downward flow of the gases and products from the passage means into the primary settling chambers means;
secondary settling chamber means disposed adjacent and communicating with the primary settling chamber means for receiving the flow of combustion gases and products of combustion from the primary settling chamber means in which lighter unburned products of combustion settle out of the flow of combustion gases and products of combustion;
damper chamber means disposed above the secondary settling chamber means for receiving the flow of combustion gases and products of combustion from the secondary settling chamber means and comprising a tertiary settling chamber in which the lightest unburned products of combustion settle out of the flow of combustion gases and products of combustion, and including
a damper opening between the secondary settling chamber means and the damper chamber means, and
an adjustable damper adjacent the damper opening and movable to control the flow of combustion gases and products of combustion from the secondary settling chamber means to the damper chamber means;
chimney flue means communicating with the damper chamber means for receiving the flow of combustion gases and products of combustion from the damper chamber means and for conducting them out of the apparatus;
wall means disposed about the combustion chamber means and comprising a plurality of panels defining the outer walls of the apparatus; and
heated air chamber means disposed between the combustion chamber means and the wall means through which air flows for receiving heat from the combustion of fuel in the combustion chamber means.

4,180,053

FIREPLACE ENERGY RETRIEVER

Rashmikant Patel, 697 Yorkhaven Rd., Cincinnati, Ohio 45240

Filed Mar. 6, 1978, Ser. No. 883,699
Int. Cl.² F24B *7/00*
U.S. Cl. 126—132 **11 Claims**



1. Apparatus for installation in a domestic fireplace to recover waste heat from a fire therein, comprising,
a coil of tubing in the form of a spiral of several turns,
mounting structure for supporting the coil within said fireplace above the floor thereof, with the axis of the coil oriented horizontally and directed toward the front of the fireplace,
said coil presenting an opening at the front end thereof, of such diameter that fuel can be introduced through said opening into the interior of the coil from the front of the fireplace,
the lower portions of the turns of said coil constituting support means to hold said fuel for burning in the interior of said coil,
the upper portions of the turns of said coil passing above the lower portions thereof so that air heated by fuel burning within said coil rises to said upper portions,
means for circulating liquid through said coil, to be heated by the burning of said fuel, and
a semi-cylindrical hood,

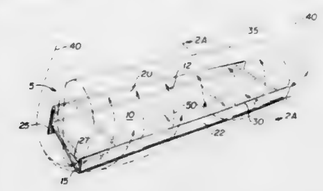
said hood being positioned closely above the upper portions of said turns to slow the movement of hot air from a fire in the interior of said coil, past the upper portions, said hood having a front end closure which extends downwardly across the upper part of said opening at the front end of said coil, thereby to block forward escape of smoke from within said hood,
the hood being open at the back of said coil to permit the escape of smoke thereunder to the rear of said fireplace.

4,180,054

TRAY FOR INCREASING WAX IMPREGNATED LOG BURNING LIFE

Frank Romero, and Joanne L. Gardiner-Romero, both of P.O. Box 4791, Hayward, Calif. 94540

Filed Nov. 3, 1978, Ser. No. 957,498
Int. Cl.² F23H *13/00*
U.S. Cl. 126—164 **10 Claims**



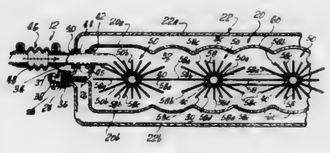
1. A device for increasing the burning life in a fireplace fire of an artificial log of the type having as part of its composition a wax material, comprising:
a sloping tray having an upper edge normally toward the rear of the fireplace and a lower edge normally toward the front of the fireplace and extending transversely from one end of the log to the other, the tray enabling the log to substantially maintain structural integrity during combustion;
means proximate the upper edge of the tray for diverting air away from the rear-facing portions of the log;
means proximate the lower edge of the tray for defining a region into which molten wax from combustion of the log may flow, and for maintaining an air space above the surface of the molten wax such that air deflected by the air deflection means enters the air space causing the log to burn primarily along front-facing and top-facing portions thereof, thereby extending the duration of the combustion and promoting complete combustion to reduce the amount of residue, smoke, and odor due to unburned wax.

4,180,055

SOLAR-HEAT COLLECTOR

Walter E. Hudnall, 2157 W. 236th Pl., Torrance, Calif. 90501

Filed Jan. 3, 1978, Ser. No. 866,619
Int. Cl.² F24J *3/02*
U.S. Cl. 126—446 **5 Claims**



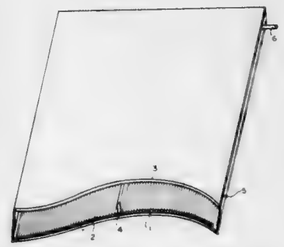
1. A solar-heat-collector device having a continuous conduit of a plurality of parallel, juxtaposed, longitudinal pipe sections for passage of fluid therethrough, said device comprising:
an inner, substantially sealed housing having said conduits positioned therein, said housing being formed to allow passage of solar radiation therethrough;
an outer, substantially sealed housing arranged to encapsulate said inner housing, and formed to allow passage of solar radiation therethrough;
a solar-heat-absorbing-collector member removably mounted to each elongated parallel length of pipe section, in order to transfer the solar heat into said pipe sections;
wherein said solar-heat-absorbing-collector member comprises a first half section of an elongated molder jacket, a second, matching, half section of an elongated molder jacket, wherein each jacket includes a plurality of longitudinally formed fin members radially disposed about the pipe, in order to absorb and transfer said solar radiation passing through said housings, wherein said molded jackets comprise a main, longitudinal, semicircular body having said elongated fin members integrally formed as part thereof, said fin members extending radially outward at different angular degrees, and wherein the width of each fin member varies according to the angular displacement thereof, and coupling means formed on said jackets and arranged to couple the half sections together, thus enclosing said elongated pipe sections therein;
an inlet and an outlet means connected to said continuous conduit to allow said flud flow to enter and discharge therefrom; and
sealing means disposed between said inner and outer housings, and between said housings and said conduit;
an insulation chamber interposed between said inner and outer housings;
said outer housing comprising a pair of oppositely positioned half-wall sections;
wherein said inner housing comprises a pair of oppositely positioned half-wall sections, said sealing means being interposed between each of said half-wall sections of both housings;
said half-wall sections of said inner housing including radiation-concentrating means to concentrate and focus radiation impinging on said fin members; and
securing means arranged to secure said wall sections and said sealing means together.

4,180,056

LAMINAR SOLAR ENERGY COLLECTING UNIT HAVING ABSORBER PLATES CONSISTING OF HOLLOW FIBERS

Roland Schnabel, Hofheim, and Eckart Hussmann, Oberolm, both of Fed. Rep. of Germany, assignors to JENAer Glaswerk Schott & Gen., Fed. Rep. of Germany

Filed Jan. 31, 1977, Ser. No. 764,228
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1976, 2618115
Int. Cl.² F24J *3/02*
U.S. Cl. 126—447 **16 Claims**



1. In a solar energy collecting unit comprising an absorber means for solar radiation, said absorber means comprising a plurality of hollow capillary tubes wherein said tubes have external diameters between 0.15 and 3 mm and internal diame-

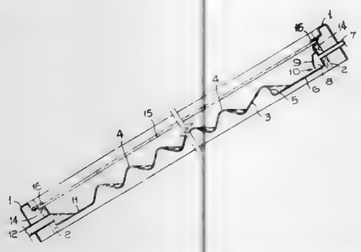
ters between 0.1 and 2.5 mm and said tubes simultaneously form a continuous absorbing surface of said collecting unit, and each of said hollow tubes have a heat-dissipating medium flowing therethrough.

4,180,057

CASCADE SOLAR FLUID HEATER

John Ward, Semaphore, Australia, assignor to Jessop Enterprises Pty. Ltd., Adelaide, Australia

Filed Sep. 16, 1977, Ser. No. 834,792
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—449 **10 Claims**



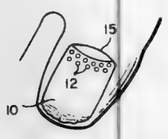
1. A solar water heater comprising a surround defining a substantially rectangular space and joining to a heat absorber surface which extends between the said surround to define an area through which water can flow over said surface when said surface is inclined in relation to a horizontal plane, an inlet to discharge water into a first trough at one edge portion of the said absorber surface, a baffle across the said inlet within said first trough, said baffle being arranged to discharge water across the width of the said first trough, said baffle terminating above the surface of the said first trough to form a transversely extending gap between it and the said surface to discharge water evenly across the width of the said trough, an outlet to receive water from a second trough at the opposite edge portion of the said absorber surface, a series of corrugations formed in said absorber transversely to the direction of flow of water from said first trough to the said second trough, and a cover over said absorber spaced therefrom which is selected to admit solar radiation to said absorber surface.

4,180,058

METHOD OF TREATING PATHOLOGICAL CONDITIONS OF THE NAIL

Jacob Brem, 11 Eaglehead Ter., Shrewsbury, Mass. 01545

Filed Aug. 15, 1978, Ser. No. 933,820
Int. Cl.[2] A61B *17/00*
U.S. Cl. 128—1 R **13 Claims**



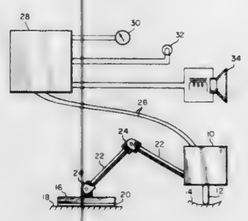
1. A method for the treatment of a pathological condition of the nail, said method comprising the steps of breaching the keratin of the nail to form an opening therein, placing a caustic-keratolytic agent in said opening to enlarge the opening, and treating the nail through said opening with a topical therapeutic agent for said pathological condition.

4,180,059

METHOD OF MEASURING INTRATHORACIC PRESSURE

Brian L. Tiep, Monrovia, Calif., assignor to City of Hope National Medical Center, Duarte, Calif.

Filed Feb. 3, 1978, Ser. No. 874,909
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—721 **2 Claims**



1. The method of obtaining a measurement corresponding to the intrathoracic pressure within the body of an individual which comprises the steps of:

mounting a transducer having a movable actuator so that said transducer is held in place and is supported by the skin immediately adjacent to the sternum and so that said movable actuator is located against the soft tissue of the suprasternal notch of the individual in a position in which variation of the surface tension of the skin occurring during breathing will be transmitted to the actuator and the transducer;

allowing the individual to breathe normally; and

monitoring the output of the transducer so as to obtain an output which corresponds to the intrathoracic pressure of an individual as the individual breathes.

4,180,060

DEVICE FOR STAINING BIOLOGICAL MATERIALS

Dolphe Kutter, Rue Beck, Luxembourg, assignor to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Continuation of Ser. No. 385,000, Aug. 2, 1973, abandoned. This application Aug. 8, 1977, Ser. No. 822,964
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1972, 2240672
Int. Cl.[2] A61B *5/14*
U.S. Cl. 128—760 **5 Claims**

1. Device for staining individual cells suspended in a biological fluid, consisting essentially of a thin tubelet and a solid coating of staining reagent for uniformly staining the suspended individual cells, which coating is applied to the inner wall of said tubelet and which is soluble in said fluid, whereby the uniform staining of the suspended individual cells for microscopic examination is effected upon removal of the reagent from the inner wall of said tubelet when dissolved in said fluid.

4,180,061

ELECTRONIC SPHYGMOMANOMETER

Shinobu Kamimura, and Hideki Yamamoto, both of Nagaokakyo, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Nov. 29, 1977, Ser. No. 855,716
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—681 **2 Claims**

1. An electronic sphygmomanometer comprising:

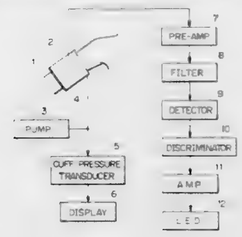
an inflatable cuff;

a pressure displaying means for displaying pressure in said cuff;

a microphone attached to said cuff;

an indicating means for indicating the appearance of Korotkov sounds; and,

an indicating signal producing means for supplying indicating signals to said indicating means, including a preamplifying circuit for amplifying output signals of said microphone, a bandpass filtering circuit receiving the output of said pre-amplifying circuit and passing Korotkov sound



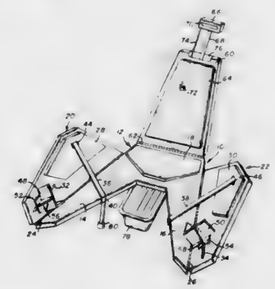
signals, said bandpass filtering circuit having a passband with a low cutoff frequency of 40 Hz and a high cutoff frequency of 90 Hz, a detecting circuit for detecting said Korotkov sound signals, a discriminating circuit for discriminating output signals of said detecting circuit, and an amplifying circuit for amplifying the output of said discriminating circuit.

4,180,062

PORTABLE CHILDBIRTH CHAIR WITH ELECTRONIC MONITORING APPARATUS

James Alberti, 106 Richardson Rd., Santa Cruz, Calif. 95066, and Helmut Schlosser, 1425 N. Rodeo Gulch Rd., Soquel, Calif. 95073

Filed Apr. 10, 1978, Ser. No. 894,901
Int. Cl.[2] A61N *5/04*
U.S. Cl. 128—698 **26 Claims**



1. A portable childbirth chair comprising:

a base having a seat portion and two outwardly extending leg portions:

a first leg support hingedly attached to one side of a first of said leg portions, and rotatable between a leg support position and a folded position;

first means for adjusting the inclination of said first leg support relative to said base when it is in its leg support position;

first footrest means;

first means for attaching said footrest means to said first leg rest;

a second leg support hingedly attached to one side of the second of said leg portions and rotatable between a leg support position and a folded position;

second means for adjusting the inclination of said second leg support relative to said base when it is in its leg support position;

second footrest means;

second means for attaching said second footrest means to said second leg support;

a backrest hingedly attached to the seat portion of said base and rotatable between a back support position and a folded position; and

third means for adjusting the inclination of said backrest relative said base when it is in its back support position;

whereby when the chair is in use, a woman undergoing labor may sit upon said seat portion, place her feet upon said footrests with her legs supported by said leg supports and recline against said backrest, and when said chair is not in use the leg supports and backrest may compactly fold over said base so that the chair may be more easily stored and transported.

24. A portable childbirth chair as recited in claim **1** further comprising:

an electronic monitoring apparatus; and

means for connecting said monitoring apparatus to a rearward portion of said backrest.

4,180,063

FOOT-OPERATED ROTARY MASSAGING DEVICE

Toshio Takeuchi, Kariya, Japan, assignor to Kabushiki Kaisha Oichi, Kariya, Japan

Filed Mar. 7, 1978, Ser. No. 884,243
Claims priority, application Japan, Dec. 29, 1977, 52-160386
Int. Cl.[2] A61H *1/02*
U.S. Cl. 128—25 B **10 Claims**



1. A foot-operated rotary massaging device comprising a horizontal shaft rotatable about its own axis, a pair of cranks each having one end secured to one end of said shaft, a pedal spindle having one end secured to the other end of said each crank at right angles thereto, a pedal rotatably mounted on each of said pedal spindles, at least one eccentric member having a rotatable annular outer peripheral portion and an axial hole eccentric to the center of said annular outer peripheral portion and mounted to each pedal spindle through said axial hole, wherein said eccentric member massages or stimulates the sole of a foot placed on said each pedal.

4,180,064

SYSTEM FOR DELIVERING AGENT TO ENVIRONMENT OF USE OVER PROLONGED TIME

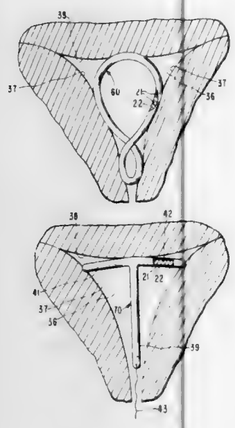
Jorge Heller, Palo Alto, Calif., and Richard W. Baker, Bend, Oreg., assignors to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 591,443, Jun. 30, 1975, Pat. No. 4,014,987, which is a continuation-in-part of Ser. No. 476,246, Jun. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 318,831, Dec. 27, 1972, abandoned. This application Dec. 15, 1976, Ser. No. 750,701

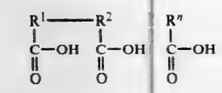
The portion of the term of this patent subsequent to May 21, 1991, has been disclaimed.

Int. Cl.[2] A61K *31/00, 31/56, 47/00, 9/02;* A61F *5/46;* A61M *31/00*

U.S. Cl. 128—130 4 Claims



1. An intrauterine device for the controlled and continuous local administration of uterine acceptable drug to the uterus consisting essentially of a body sized and shaped as an intrauterine device and formed of drug release rate controlling uterine acceptable material of a hydrophobic poly(acid) represented by the formula:



wherein the R's are organic radicals independently selected to provide, on average, from 8 to 22 total carbon atoms for each carboxylic hydrogen, said body of drug release rate controlling material containing a member selected from the group consisting of progestational drugs that have antifertility properties and estrogenic drugs that have antifertility properties dispersed therethrough, said sized and shaped device adapted for insertion and retention prolonged in the uterus, wherein the release rate controlling material erodes at a controlled and continuous rate over a prolonged period of time in response to the environment of the uterus, thereby releasing the dispersed antifertility drug to the uterus at a controlled and continuous rate over a prolonged period of time to produce the desired effect.

4,180,065

ANTI-EMBOLISM STOCKING

Omer J. Bowen, Fayetteville, Ak., assignor to Bear Brand Hosiery Co., Chicago, Ill.

Filed Jan. 23, 1978, Ser. No. 871,181

Int. Cl.[2] A61F *13/00*

U.S. Cl. 128—165 9 Claims



1. A rotary knitted one-piece anti-embolism stocking comprising a seamless tubular body integrally knitted with at least certain of the courses therein of elastomeric yarn so as to impart an elastic character to said body, said body including a foot portion and a calf portion and a knee portion and a lower thigh portion and an upper thigh portion, said body further including first and second transition portions connecting said calf portion respectively to said foot portion and said knee portion and a third transition portion connecting said knee portion to said lower thigh portion, said foot portion having a toe end disposable in use at the ball of the wearer's foot and said thigh portion having an upper end disposed away from said knee portion, said calf portion having a cross section greater than the cross section of said foot portion and less than the cross section of said lower thigh portion and said knee portion having a cross section greater than the cross section of said lower thigh portion and substantially equal to the cross section of said upper thigh portion, said first transition portion having a cross section which increases gradually from said foot portion to said calf portion and said second transition portion having a cross section which increases gradually from said calf portion to said knee portion and said third transition portion having a cross section which decreases gradually from said knee portion to said lower thigh portion, the variation in the cross section of said tubular body being such that in use on a wearer's leg said tubular body has a circumferential tension which decreases essentially uniformly from said toe end of said foot portion to said upper end of said thigh portion while said enlarged knee portion accommodates flexing of the wearer's knee, whereby said stocking applies to a wearer's leg a pressure which decreases essentially uniformly from the ball of the wearer's foot to the upper portion of the wearer's thigh.

4,180,066

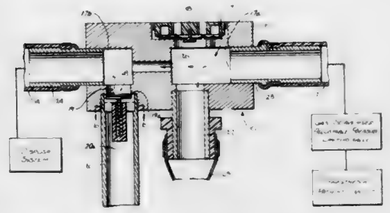
SAFETY INTERFACE AND VALVE FOR ANESTHESIA GAS SCAVENGING

Ralph A. Milliken, Spring Valley, N.Y.; Terence D. Wall, Hackensack, N.J., and Martin Boelens, Zaandam, Netherlands, assignors to Vital Signs, Inc., East Rutherford, N.J.

Filed Oct. 20, 1977, Ser. No. 844,045

Int. Cl.[2] A61M *16/00*

U.S. Cl. 128—205.24 8 Claims



1. A safety interface for connection between an anesthesia patient circuit and a disposal system, said interface comprising:

(a) a housing defining a passageway having an upstream end and a downstream end, said passageway having a restrictor between said upstream and downstream ends partially obstructing flow therethrough, said housing also defining a port extending from the downstream end of the passageway to an opening on the exterior of said housing, said housing including a raised ridge surrounding said opening;

(b) means for connecting the upstream end of said passageway to the waste anesthetic gas outlet of an anesthesia patient circuit;

(c) means for connecting the downstream end of said passageway to a disposal system;

(d) means for connecting a reservoir to the upstream end of said passageway;

(e) negative pressure relief valve means in communication with said passageway and responsive to a negative pressure therein;

(f) a chimney affixed to said housing and extending outwardly therefrom, so that the bore of said chimney is in communication with said opening;

(g) combined positive and negative pressure relief valve means responsive to positive and negative pressures in said passageway and constructed and arranged to interrupt the communication between said opening and the bore of said chimney said combined valve means including:

a spindle;

a first disc mounted on said spindle;

a spindle receptacle secured to the inside of said chimney and defining a pocket having an open end confronting said opening;

a coil spring seated in the pocket of said spindle receptacle and surrounding at least an end portion of said spindle in slidable relation therewith; and

a second disc having at least one aperture therein, said second disc slidably engaging said spindle and situated between said first disc and said spindle receptacle, said spring engaging said second disc and biasing said second disk towards said housing, said second disk being constructed and arranged for abuting engagement with said raised ridge, said first disk being constructed and arranged to be located within said opening and overly all of the apertures in said second disk, and

(h) said negative pressure relief valve means opening in response to a greater negative pressure than said negative pressure to which the negative pressure relief valve portion of said combined positive and negative pressure relief valve means is responsive.

4,180,067

APPARATUS FOR DELIVERING FLUIDS WITH CONTROLLED RATES OF FLOW

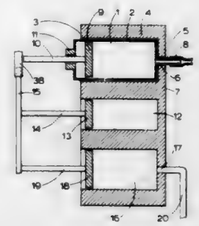
Michael L. Derlien, Wembley, England, assignor to Pye (Electronic Products) Limited, Cambridge, England

Filed Sep. 26, 1977, Ser. No. 836,790

Claims priority, application United Kingdom, Sep. 28, 1976, 40187/76

Int. Cl.[2] A61M *05/00*

U.S. Cl. 128—214 F 5 Claims



1. An apparatus for delivering fluid with controlled rates of gradual flow from a removable container placed in the apparatus, comprising

a frame having a cavity adapted for housing a removable storage container having a movable wall and an outlet tube, the volume of which container can be reduced by movement of the wall so as to supply fluid to the outlet tube;

at least one first cylinder arranged in the frame and closed at one end;

a first piston slidably disposed within and in sealed engagement with the first cylinder, the first cylinder being evacuated when the first piston is substantially at the open end of the first cylinder so that atmospheric pressure acts upon the first piston to drive it towards the closed end of the first cylinder, and

means for coupling said first piston to the movable wall of a storage container placed in the cavity for movement of the wall responsive to movement of the first piston toward the closed end of the first cylinder, so arranged that said piston movement produces a reduction of the volume of the storage container.

4,180,068

BI-DIRECTIONAL FLOW CATHETER WITH RETRACTABLE TROCAR/VALVE STRUCTURE

Stephen C. Jacobsen; Robert L. Stephen, and Peter Hansen, all of Salt Lake City, Utah, assignors to Motion Control, Incorporated, Salt Lake City, Utah

Filed Apr. 13, 1978, Ser. No. 895,858

Int. Cl.[2] A61M *5/00;* A61B *17/34*

U.S. Cl. 128—214 R 11 Claims

1. A bi-directional flow catheter comprising

an elongate primary tube having open rearward and forward ends, a side opening in one side thereof, and duct means located rearwardly of said side opening for enabling communication with the interior of the primary tube, and

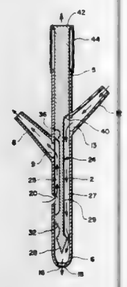
a trocar/valve member disposed in and slidable longitudinally within said primary tube between an insert position and a flow position, said member comprising

an elongate body, one end of which is tapered, said tapered end protruding from the open forward end of the primary tube when the trocar/valve member is in the insert position to facilitate puncture of tissue into which the catheter is inserted,

occluding means for preventing communication between the open forward end of the primary tube and said side opening,

first passage defining means for enabling communication

between said side opening and said duct means when the trocar/valve member is in the flow position, and



second passage defining means for enabling communication between the open forward end of the primary tube and a point located at the rearward end of said primary tube.

4,180,069

PLUNGER ROD AND PISTON FOR A SYRINGE

Ralph Walters, Perkiomenville, Pa., assignor to The West Company, Phoenixville, Pa.

Continuation of Ser. No. 691,902, Jun. 1, 1976, abandoned. This application Mar. 29, 1977, Ser. No. 782,562

Int. Cl.[2] A61M *5/315*

U.S. Cl. 128—218 P **10 Claims**

1. A plunger rod for a syringe assembly comprising an elongated stem and a tip at one end adapted to seat in a pocket in a piston, said tip being of generally truncated christmas tree shape and including a plurality of frusto-conical tip sections decreasing in cross wise dimension progressively from the base to the outer terminal end of the tip thereby defining a series of circumferentially extending axially spaced radially directed shoulders between adjacent tip sections, the included taper angle of the conical wall of the outermost tip section being greater than that of the remaining tip sections and the conical wall of the other tip sections decreasing progressively to the base of the tip.

4,180,070

DISPOSABLE DOUBLE VIAL SYRINGE
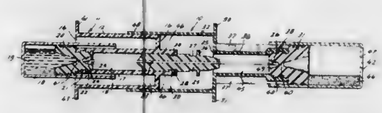
Joseph N. Genese, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Aug. 29, 1977, Ser. No. 828,686

Int. Cl.[2] A61M *5/00*

U.S. Cl. 128—218 M **17 Claims**

1. A prefilled, readily activated syringe comprising:
a first holding means defining a syringe barrel with an open end and a central passageway;
a first small volume container having a medicament or diluent therefor constructed and arranged to be engaged by said holding means in a sliding relationship;
a pierceable stopper in sealing and slidable engagement with said first container;
a double-pointed piercing cannula member having a hub portion disposed in said central passageway;
means operatively associated with said hub and said central passageway defining at least two frictional stop positions for said cannula hub;
an adapter housing constructed and arranged for movable engagement over said syringe barrel;
a first contact surface operatively associated with said cannula hub;
a second surface operatively associated with said adapter housing for engagement with said first contact surface;
a second holding means for a second small volume container extending from said adapter housing and having a passage therethrough for said cannula;
a second small volume container having a differing medicament or diluent from that in said first container, said container constructed and arranged to be engaged by said second holding means in a sliding relationship; and



a pierceable stopper in sealing and sliding engagement with said second container;
said first and second holding means constructed and arranged with respect to said containers to position said container stoppers out of contact with the piercing points of said cannula in one position and to afford piercing of both stoppers when said adapter housing is moved in a direction toward said first container so that said second container vial is pierced first and upon further movement of said adapter housing said first and second contact surfaces will engage to effect movement of said cannula hub with respect to said central passageway of said syringe barrel by means of said frictional stop positions to effect a piercing of said stopper in said first container whereby fluid communication is established between said containers to effect mixing of said medicament and said diluent with expulsion of said mixture from said syringe after removal of said adapter and said second container.

4,180,071

DEVICE FOR WITHDRAWING INJECTION SOLUTION

Shigeo Oiwa, No. 10-6, 2-chome, Nishimaiko, Tarumi-ku, Kobe, Japan

Filed Sep. 23, 1977, Ser. No. 835,955

Claims priority, application Japan, Oct. 1, 1976, 51-118755

Int. Cl.[2] A61M *5/00*

U.S. Cl. 128—218 N **4 Claims**



1. A device for withdrawing an injection solution comprising:
a tube, said tube having one open end which is adapted to be intimately fitted to the base portion of an injection needle and another open end which is oblique;
a filter medium packed into said tube adjacent said other end, said filter medium having pores of 3 to 5μ in diameter;
two internal projections on said tube, one adjacent either end of said filter medium whereby said projections maintain the position of said filter medium within said tube; and

the portion of said tube surrounding said filter medium having a lesser diameter than the remainder of said tube, said lesser diameter increasing the density of said filter medium.

4,180,072

DISPOSABLE SYRINGES

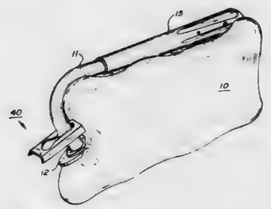
Vincent R. Sneider, 3422 Hallcrest Dr. N.E., Atlanta, Ga. 30319

Division of Ser. No. 724,724, Sep. 20, 1976, which is a division of Ser. No. 592,037, Jun. 30, 1975, Pat. No. 4,014,332, which is a continuation-in-part of Ser. No. 389,506, Aug. 20, 1973, abandoned. This application Dec. 21, 1977, Ser. No. 862,746

The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.

Int. Cl.[2] A61M *3/00*

U.S. Cl. 128—227 **8 Claims**



1. A syringe for vaginal douche and enemas and the like, said syringe including: (a) a flexible container; (b) a discharge tube connected to the container in a fluid-tight manner; (c) at least one of the component portions of a fluid mix to be used with said syringe container in this flexible container; (d) a manipulative cutoff valve associated with said discharge tube, said valve when open permitting the flow of fluid from the container, this manipulative cutoff valve being a keyhole-type clamp mounted on the tubing intermediate its ends, said clamp having a keyhole-type aperture in its midportion and the sides formed with bent edges which when urged toward each other tend to bend the midportion of the clamp and in which the midportion is weakened by score lines extending from the keyhole aperture to the longitudinal ends, these score lines assisting in the deliberate breaking of the clamp when the bent sides are urged toward each other, and (e) a discharge nozzle attachable to the outlet end of the discharge tube.

4,180,073

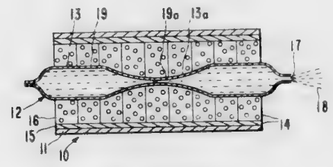
DEVICE FOR DELIVERING DRUG TO BIOLOGICAL ENVIRONMENT

Alan S. Michaels, San Francisco, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Aug. 29, 1977, Ser. No. 828,473

Int. Cl.[2] A61M *31/00*

U.S. Cl. 128—260 **8 Claims**



1. A drug delivery device comprising:
(a) a drug;
(b) a housing having a shape-retaining wall defining an internal space, said housing having at least one opening connecting the space with the exterior of the device;
(c) a container in the housing, said container having a collapsible wall surrounding a reservoir for storing the drug and a passageway for delivering drug from the container to the exterior of the device; and,
(d) a laminate in the housing surrounding the container comprising a lamina of an absorbent material and a lamina of a swellable hydrophilic cross-linked polymer, said laminate capable of imbibing fluid into the housing thereby causing the laminate to expand and exert pressure on the container which collapses said container and concomitantly pumps drug through the passageway from the device at a controlled rate over a prolonged period of time.

4,180,074

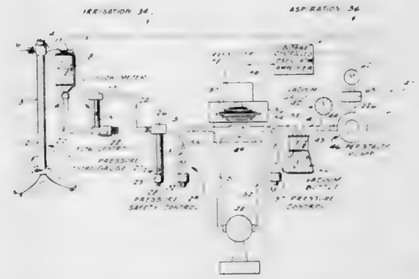
DEVICE AND METHOD FOR APPLYING PRECISE IRRIGATION, ASPIRATION, MEDICATION, ULTRASONIC POWER AND DWELL TIME TO BIOTISSUE FOR SURGERY AND TREATMENT

Edward J. Murry, Palos Park, and Joseph F. Brumbach, Niles, both of Ill., assignors to Fibra-Sonics, Inc., Chicago, Ill.

Filed Mar. 15, 1977, Ser. No. 777,582

Int. Cl.[2] A61M *1/00*

U.S. Cl. 128—276 **15 Claims**



1. An ultrasonic instrument comprising an ultrasonic generator, an operating handpiece with a hollow operating tool and an ultrasonic motor in said handpiece and connected to said ultrasonic generator for operating in bio-cavities, a subsidiary pressure balancing cavity, an irrigation fluid supply separate from and connected to said balancing cavity, a first tube and a second tube connected to said balancing cavity, said balancing cavity being substantially larger than a bio-cavity to be operated within, said first tube being connected at one end to said balancing cavity and at the other end to said hollow operating tool of said handpiece, said second tube being connected at one end to said balancing cavity and the other end being adapted to be placed in fluid communication with the interior of a bio-cavity to be operated within, automatic means for accurately controlling the input fluid pressure in said balancing cavity, means for removing fluid connected to said balancing cavity at a point spaced from said fluid supply connection, said first and second tubes being connected to said balancing cavity at points located between the connection points of said fluid supply and said means for removing fluid, and one of said tubes being connected at a point closer to the fluid supply connection point than the other of said tubes.

4,180,075

OPHTHALMOLOGICAL SURGICAL INSTRUMENT

Gerald P. Marinoff, 8 Rockford Dr., West Nyack, N.Y. 10994

Filed Apr. 5, 1977, Ser. No. 784,682

Int. Cl.[2] A61B *17/32*

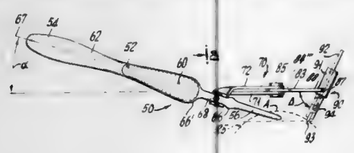
U.S. Cl. 128—305 **19 Claims**

1. A hand-held surgical instrument for performing ophthal-

mological incisions in the form of an arc of a circle centered on the cornea, said instrument comprising:

a fixation assembly having a pair of elongated arms which are fixed at one end thereof to each other, the other ends thereof being movable toward and away from each other, the pair of arms lying in common a plane which, when positioned for use, is at a minor angle to a plane tangent to the center of the cornea, a prong carried at said other end of each said elongated arms for insertion into the globe of the eye to fix the position of the arms, and finger grip means on said pair of arms so that the instrument may be held in one hand of the surgeon on one side of an eye to grip the eye therewith;

a linkage assembly connected to at least one of said arms of the fixation assembly and at a minor complementary angle to the fixation arm and, when positioned for use, extending therefrom above the eye in a plane approximately parallel to said plane tangent to the center of the cornea, the linkage assembly having a pivot point positioned equi-



distant from said prongs over the center of the cornea of the eye, the pivot point axis extending approximately perpendicular to said plane tangent to the center of the cornea; and

a knife assembly connected to said pivot point of the linkage assembly and extending to the side of the eye opposite the arms of the fixation assembly, said knife assembly comprising a knife blade holder adapted for manual manipulation, a knife blade removably carried by said knife holder, and a cutting edge carried at one end of said knife blade for making an incision in the eye, said knife assembly being pivotable about the pivot point on said linkage assembly so that said knife holder may be moved through an arc of a circle by the other hand of said surgeon and so that said cutting edge will penetrate the eye and describe an incision in the form of an arc of a circle when sufficient hand pressure is applied thereto, the operative field being substantially unobstructed by the surgical instrument when the field is viewed from above.

4,180,076

NASOGASTRIC CATHETERS

Victor M. Betancourt, Pedro Laplace No. 30 Apt. 3 Colonia Nueva Anzures, Mexico 5 D. F., Mexico

Filed Jan. 13, 1978, Ser. No. 869,206

Claims priority, application Mexico, May 6, 1977, 169032

Int. Cl.[2] A61M *25/00*

U.S. Cl. 128—349 B **6 Claims**

1. A nasogastric catheter comprising a tube of relatively flexible material defining a main duct extending from one end of the tube to the other end thereof, first and second inflatable vessels which are mounted at the exterior of said tube and through which said tube extends, said vessels being situated approximately three-quarters of the way along the tube from said one end to said other end thereof and being spaced from one another along said tube, and first and second subsidiary conduits extending within the tube from said one end and communicating with the first and second vessels respectively but being isolated from said main duct, said tube being formed with at least one lateral perforation between the first and second vessels and a plurality of lateral perforations after the



second vessel, the lateral perforations establishing communication between said main duct and the exterior of the tube.

4,180,077

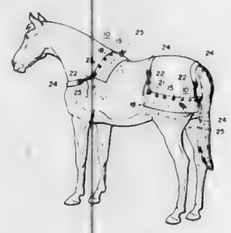
DEVICE FOR TREATING SWOLLEN SURFACE AREAS ON HORSES AND THE LIKE

Lida L. McCowan, 8370 N. 43rd St., Augusta, Mich. 49012

Filed Aug. 17, 1977, Ser. No. 825,309

Int. Cl.[2] A61F *7/00*

U.S. Cl. 128—402 **4 Claims**



1. Apparatus for treatment of swollen surface areas on larger animals such as horses comprising: an envelope-like receptacle effective to contain a liquid, the receptacle including first and second elongated panels of flexible sheet material forming oppositely facing sidewalls, each of the panels having a pair of opposite side edges and a pair of opposite end edges forming side and end edges of the receptacle, the panels being sealingly secured to each other along their corresponding edges in face to face relation; liquid inlet means for supplying liquid to the receptacle, the liquid inlet means being disposed in a first of the panels between said side edges and intermediate said end edges; a plurality of liquid outlet means for allowing liquid in the receptacle to flow therefrom, the liquid outlet means being disposed in a second of the panels longitudinally therealong between said end edges and intermediate said side edges; and means for applying the receptacle about or upon a portion of the anatomy of the animal with said second panel in facing relationship to the surface area to be treated effective to allow the outlet means to discharge liquid thereupon, the applying means including attaching means disposed adjacent said panel end edges and connectable together for attaching the receptacle about an animal's leg and suspending means disposed adjacent one of said panel side edges for suspending the receptacle from other portions of an animal's body either in conjunction with or independently of the attaching means.

4,180,078

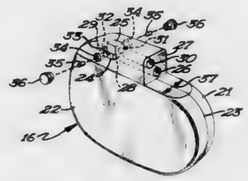
LEAD CONNECTOR FOR A BODY IMPLANTABLE STIMULATOR

Kenneth M. Anderson, Bloomington, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 7, 1978, Ser. No. 894,360

Int. Cl.[2] A61N *1/36*

U.S. Cl. 128—419 PG **16 Claims**



1. In a body implantable stimulator of the type having furcated lead means and a signal generator assembly including signal generator means and connector means for interconnecting said signal generator means and the lead means furculae, at least the lead means furculae being wrapped around said signal generator assembly on implantation, the improvement wherein said connector means comprises jack means for receiving said lead means furculae, said jack means comprising means for compensating for non-uniform spacing of said jack means from said signal generator means to facilitate the conformance of said furculae to the configuration of said signal generator assembly on wrapping of said furculae around said signal generator assembly.

4,180,079

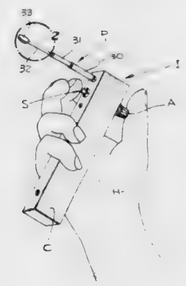
ELECTROACUPUNCTURE INSTRUMENT

Thomas W. Wing, 380 E. Baseline Rd., Claremont, Calif. 91711

Filed Mar. 16, 1978, Ser. No. 887,003

Int. Cl.[2] A61H *39/00*; A61N *1/36*

U.S. Cl. 128—422 **4 Claims**



1. An electroacupuncture instrument comprising, in combination:

metallic housing means of such size and configuration as to be conveniently grasped within one hand of the user and in surface-to-surface contact with at least about a square inch of the skin surface thereof;

a pulse generating circuit within said metallic housing means including a low-frequency oscillator adapted to produce essentially a square-wave output signal, a high frequency oscillator adapted to produce essentially a square-wave output signal, the output signal of said low-frequency oscillator being of substantially greater amplitude than the output signal of said high-frequency oscillator, one of the output terminals of each of said oscillators being connected together, and an output resistor connected between the other output terminals of said two oscillators so that the difference between said two output signals appears across said resistor;

selective means for selecting a portion of said resistor across which to derive a composite output signal of selected amplitude, said selective means having two output terminals, one of said output terminals being connected to said metallic housing means; and

probe means connected to the other of said output terminals for applying said composite output signal to the skin of a patient.

4,180,080

ELECTRODE ASSEMBLY FOR SENSING HEART ACTIVITY

John B. Murphy, West Roxbury, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 838,501, Oct. 3, 1977, Pat. No. 4,149,528. This application Apr. 24, 1978, Ser. No. 899,049

Int. Cl.[2] A61B *5/04*

U.S. Cl. 128—642 **10 Claims**



1. An electrode assembly for sensing heart activity from body tissue comprising:

a guide tube having proximal and distal ends;

an electrically conductive spiral retaining coil disposed in the proximal end of said guide tube and extendable from the proximal end;

a signal lead attached to said retaining coil and extending through said guide tube to the distal end thereof;

a handle disposed on the distal end of said guide tube in releasable engagement with said signal lead;

said handle being rotatable to rotate said retaining coil by rotating said signal lead;

said handle being movable along the longitudinal axis of said guide tube to permit disengagement of said handle from said signal lead; and

a spring disposed at the distal end of said guide tube biasing said handle away from the distal end to disengage said handle from said signal lead after selected rotation of said handle.

10. An electrode assembly for sensing heart activity from body tissue comprising:

a guide tube having proximal and distal ends;

a rotatable electrode holder disposed in said guide tube at the proximal end thereof;

an electrically conductive spiral retaining coil mounted on said electrode holder and extending toward the proximal end of said guide tube;

a signal lead attached to said retaining coil and extending through said guide tube to the distal end thereof;

a rotatable drive member coupled to said holder and extending through said guide tube to the distal end thereof;

a handle disposed at the distal end of said guide tube and coupled to said drive member for rotating said drive member to rotate said holder and the spiral retaining coil mounted thereon; and

a safety stop disposed at the proximal end of said guide tube for limiting the rotation of said retaining coil, said safety stop including a ring releasably disposed on said proximal end and having an internal thread engaging said spiral retaining coil to permit said retaining coil to be screwed into said ring, said ring being engagable with said elec-

V 9894 DEC 25 1979 UMI

trode holder upon predetermined rotation of said retaining coil to terminate rotation of said retaining coil;

said retaining coil having a decreasing outside diameter and said ring having a decreasing inside diameter along the longitudinal axes of said coil and said ring toward the distal end of said guide tube.

4,180,081

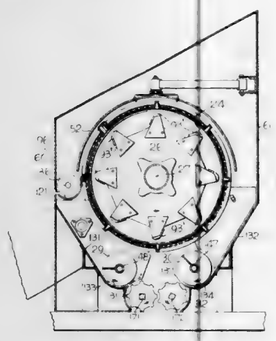
DISTRIBUTION AUGERS FOR AN AXIAL FLOW COMBINE

J. Lyle Shaver, Blue Springs, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 809,408, Jun. 23, 1977, abandoned. This application Oct. 2, 1978, Ser. No. 947,471

Int. Cl.[2] A01F *12/18*

U.S. Cl. 130—27 R **10 Claims**



1. In a combine having a header at its front end and a feeder for conveying harvested crop material from the header upwardly and rearwardly, the combination comprising:

a frame structure having walls defining a housing for a cylinder cage and a threshing cylinder, including front, rear, right and left side walls,

a generally cylindrical cage mounted on said frame structure within said housing and extending between said left and right side walls with a generally horizontal axis extending in transverse relation to said feeder including

a radially opening inlet adjacent one axial end of said cage through which said feeder discharges harvested crop radially inwardly into said cage and

an outlet at the other axial end of said cage through which crop material is discharged from said cage, said cage being of a substantially greater axial dimension than the transverse width of said feeder and having a plurality of radial openings in its periphery permitting passage of threshed material through substantially its entire periphery,

a threshing cylinder within said cage extending between said right and left walls and mounted on said frame for rotation on said horizontal transverse axis,

means causing harvested crop material to move axially within said cage from said inlet to said outlet during a harvesting operation,

said front and rear side walls of said housing being spaced from said cage to permit threshed material passing through the periphery of the cage to fall to the bottom of said housing,

a cleaning shoe assembly disposed generally below said cylinder cage, the width dimension of said shoe assembly being substantially less than the axial length dimension of said cage,

a transversely extending, downward opening feeding slot in said housing below said cage and above said cleaning shoe assembly, said slot extending transversely substantially coextensive with the width of said cleaning shoe assembly and

a conveying mechanism operatively disposed within and at the bottom of said housing operable to move threshed material deposited in the bottom of the portion of the housing extending laterally beyond said cleaning shoe assembly to said slot.

4,180,082

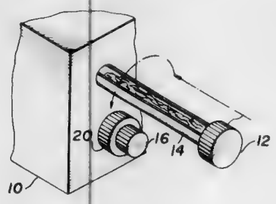
APPARATUS FOR MANUFACTURING CIGARETTES OR THE LIKE

Bernard Wachter, Kings Point, N.Y., assignor to Pyro Dynamics, Ltd., Hicksville, N.Y.

Filed May 30, 1978, Ser. No. 910,439

Int. Cl.[2] A24C *5/42*

U.S. Cl. 131—26 **13 Claims**



1. Apparatus for manufacturing cigarettes or the like, said apparatus comprising:

(a) a housing;

(b) a tray which is

(i) open on one side,

(ii) movable from a first position within said housing to a second position exterior of said housing, and

(iii) rotatable from a first orientation in which said tray is open upwardly to a second orientation in which said tray is open downwardly;

(c) a cylindrical form which is

(i) located beneath said tray,

(ii) movable from a first position within said housing to a second position exterior of said housing,

(iii) divided into two semi-cylindrical form components; and

(iv) hinged along its axial length between the semi-cylindrical form component to permit opening and closing of said form;

(d) first means for opening and closing said form

(i) along its axial hinge

(ii) so that said form is open upwardly, at which time it is positioned to receive a charge of tobacco or the like dropped from said tray onto a sheet of wrapping material located on said form, and closed around said charge of tobacco and sheet of wrapping material to form a cigarette; and

(e) second means for opening said form

(i) along its axial hinge

(ii) so that said form is open downwardly, at which time it is positioned to release the completed cigarette or the like.

4,180,083

SYSTEM FOR CONTROLLING FLOW RATE IN PIPELINES

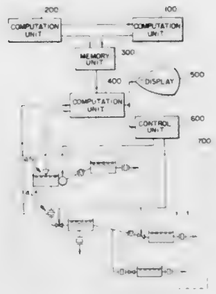
Shinichiro Miyaoka, Nishi-tama; Kuniaki Matsumoto, and Junichi Hatakeyama, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 18, 1977, Ser. No. 843,253

Claims priority, application Japan, Oct. 20, 1976, 51/124980

Int. Cl.[2] F04B *41/02*

U.S. Cl. 137—101.25 **11 Claims**



1. A system having pipelines, a plurality of reservoirs and means for controlling the flow of fluid through said pipelines to, from, and between said plurality of reservoirs, comprising:

valves and pumps installed in the pipelines for regulating the flow rate of fluid passing therethrough;

first means for calculating the amount of predicted water demand $Q_{jc}(t)$ which is supplied from any reservoir (j) to consummers and for producing an output signal representative thereof;

second means operatively associated with said first means for calculating flow rate $Q_{ij}(t)$ changing with time (t) of fluid flowing in a pipeline from a reservoir (i) to a reservoir (j), from fluid level $H_i(t)$, $H_j(t)$;

third means operatively associated with said first and second means for calculating fluid level $H(t+1)$ at the time $(t+1)$ of the reservoir (j) from the predicted demand $Q_{jc}(t)$ received from the first means, the amounts of inflow $Q_{ij}(t)$ and outflow $Q_j(t)$ thereof and the water level $H_j(t)$ at the time (t) of the reservoir (j); and

fourth means operatively associated with said first, second, and third means for controlling manipulatable variables of the pumps and valves when the water level $H_j(t+1)$ thus obtained is below a predetermined lower limitation LH_j or over an upper limitation UH_j so as to keep actual levels of fluid within said reservoirs between predetermined levels.

4,180,084

COSMETIC COMPOSITIONS CONTAINING POLYMERIC QUATERNARY AMMONIUM SALTS

Hans Wegmüller, Riehen, Switzerland; Ulrich Horn, Greenville, S.C.; Walter Hungerbühler, and Jaroslav Haase, both of Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

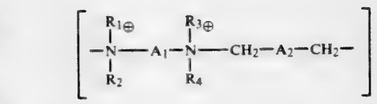
Filed Apr. 25, 1978, Ser. No. 899,940

Claims priority, application Switzerland, May 2, 1977, 5463/77

Int. Cl.[2] A45D *7/00*

U.S. Cl. 132—7 **15 Claims**

1. Hair-care compositions in the form of aqueous, alcoholic or aqueous alcoholic solutions, creams, gels, emulsions, or of aerosols which optionally contain a propellant, said compositions containing 0.01 to 10 percent by weight of at least one polymeric quaternary ammonium salt which contains cationic units of the formula



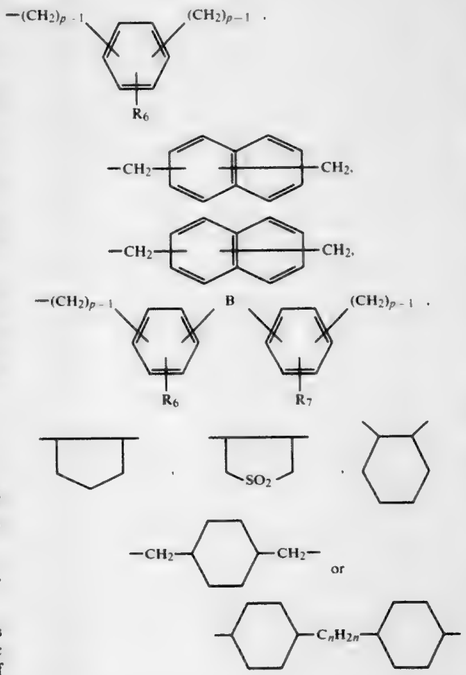
wherein

R_1, R_2, R_3 and R_4 are the same or different and represent unsubstituted or substituted alkyl, cycloalkyl or alkenyl of at most 20 carbon atoms, aryl or aralkyl, or (R_1 and R_2) and/or (R_3 and R_4) together with the nitrogen atom to which they are bonded, form an unsubstituted or substituted heterocyclic ring containing 3 to 6 ring members,

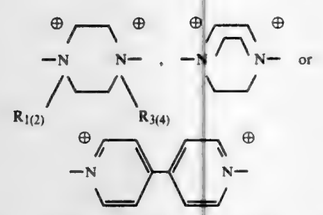
A_1 represents $-(CH_2)_m-$, wherein m is an integer from 1 to 20, which can be interrupted by at least one —S—,



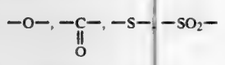
or —CH=CH— group or substituted by at least one member selected from the group consisting of hydroxyl, halogen, nitrile, alkyl, hydroxy- alkyl, alkoxy, carboxyl or carbalkoxy or by at least one unsubstituted or substituted aryl or aralkyl radical, or represents polyoxyalkylene, or a radical of the formulae



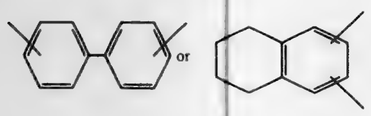
or together with the nitrogen atoms and at least one of the substituents bonded thereto A_1 represents a radical of the formulae



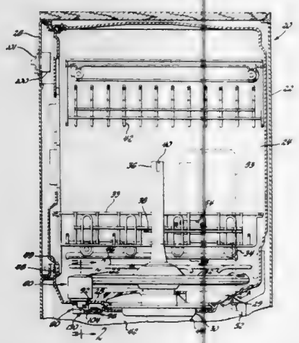
R_6 and R_7 represent hydrogen, alkyl, hydroxyl or haloalkyl of 1 to 4 carbon atoms, hydroxyl, halogen, carboxyl, carbalkoxy or phenyl,
B represents the direct bond,



or unsubstituted or substituted alkylene,
n is an integer from 1 to 6,
p is an integer from 1 to 3, and
A_2 represents a radical of the formula

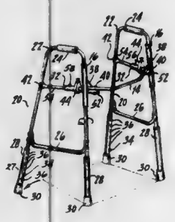


4,180,085
DISHWASHER FILL FLOAT
Jon F. Berges, Waynesville, and James M. Woolley, Dayton, both of Ohio, assignors to White Consolidated Industries, Inc., Cleveland, Ohio
Filed Nov. 3, 1978, Ser. No. 957,666
Int. Cl.² B08B *3/02*
U.S. Cl. 134—57 D **1 Claim**



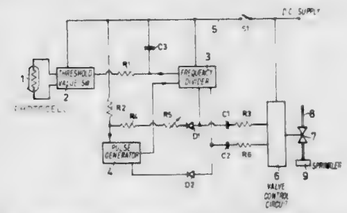
1. In an automatic dishwasher including a dishwashing chamber having a bottom wall portion forming a sump, an electrically-operated inlet valve for supplying liquid to the chamber to a predetermined normal-fill level in the sump, an electrical circuit including electrically-powered sequence control means for operating the dishwasher in accordance with a predetermined operational cycle, a switch electrically connected by said circuit to the inlet valve, said switch including an actuator normally being resiliently biased in a first position opening the circuit to prevent energization of said inlet valve, said actuator being movable to a second position closing the circuit to permit energization of said inlet valve, a float assembly for said fill valve including a float in the form of an inverted cup including a closed top with an elongated stem extending from said closed top on the principal axis of said float; said float operative to remain at a first lower rest position with said liquid at said normal-fill level, said float adapted to be buoyed upwardly upon the liquid level rising above said normal-fill level to a predetermined overfill level, a float support guide sleeve mounted on the bottom wall portion of said sump, said float stem dimensioned for slidable reception in said sleeve, said sleeve operative for guiding said float substantially in a predetermined linear path perpendicular to the liquid surface, the improvement comprising; cam means adjacent the free end of said stem operative to engage said guide sleeve to establish a float maximum elevated position upon said float being buoyed upwardly by the liquid level increasing above said normal fill level to said overfill level, said cam means including first and second cam portions, an actuator engaging element movably mounted on said switch, said first cam portion contoured to contact said element when said liquid level in said sump is at or below said normal-fill level for moving said element to a first position holding said actuator in its circuit closing position allowing the opening of said fill valve at predetermined selected intervals by said sequence control means during said operational cycle to supply liquid to said chamber, upon the liquid rising to said overfill level said float being raised to said elevated position causing said first cam portion to be moved out of contact for moving said element, whereby said actuator is free to move to its circuit opening position shutting off additional liquid flow to said chamber while permitting said sequence control means to operate said dishwasher through the remainder of its operational cycle, and wherein the movement of said actuator to its circuit opening position being operative to move said element to a second position preventing downward movement of said float, upon completion of said operation cycle said float being manually rotatable in a predetermined direction relative to said float support guide sleeve causing said second cam portion to contact said element and move same to its first position resulting in downward movement of said float to its first lower rest position, and whereby by virtue of said float being in said first lower rest position said element is again contacted by said first cam portion causing said actuator to be held in said second position closing said circuit to said valve.

4,180,086
HYPEREXTENDIBLE WALKER
Morton I. Thomas, Nyack, N.Y., assignor to Temco Products, Inc., Passaic, N.J.
Filed Aug. 31, 1978, Ser. No. 938,706
Int. Cl.² F16M *13/08*
U.S. Cl. 135—67 **10 Claims**



1. A hyperextendible walker apparatus comprising:
a first U-shaped side frame including a first front leg and a first rear leg;
a second U-shaped side frame including a second front leg and a second rear leg;
a crossed brace means for connecting said first and second U-shaped side frames together, said cross brace means being rotatably connected to said first and second front legs respectively;
a pair of normal open position locking means connected to said cross brace means and to said first and second U-shaped side frames respectively for locking said side frames in a normal open first position with respect to said cross brace means; and,
a hyperextendible locking means forming part of said normal position locking means for locking at least one of said side frames in a hyperextended second position which position is extended at least 10° more open than the same side frame when in the normal open first position.

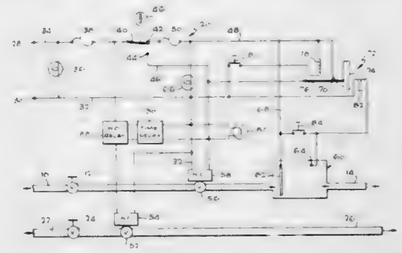
4,180,087
AUTOMATIC CONTROL FOR AN ADJUSTABLE MEMBER
Alfred Meisner, and Erich Gerum, both of Nuremberg, Fed. Rep. of Germany, assignors to Firma DIEHL, Nuremberg, Fed. Rep. of Germany
Filed Jul. 21, 1977, Ser. No. 817,740
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1976, 2632994
Int. Cl.² A01G *25/16;* **H01J** *39/12*
U.S. Cl. 137—78 **13 Claims**



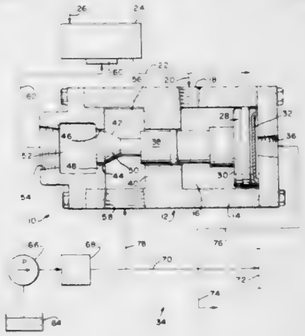
10. A switching arrangement for control of a valve in an automatic sprinkling system comprising:
a light sensitive switching means for delivering an enabling signal at dusk;
a delay circuit means for receiving an enabling signal from the light sensitive switching means and delivering an actuating signal a predetermined delay period after receipt of the enabling signal;
a control circuit for control of the valve, said control circuit receiving said actuating signal from the delay circuit means to open the valve; and
a switching circuit, responsive to the actuating signal, for establishing an input signal to the delay circuit means which causes the delay circuit means to transmit a deactuating signal to the control circuit to close the valve a predetermined actuation period after receipt of the actuating signal by the control circuit.

4,180,088
WATER SHUTOFF SYSTEM
Raymond H. Mallett, P.O. Box 479, Meeker, Colo. 81641
Filed Dec. 5, 1977, Ser. No. 857,085
Int. Cl.² F16K *31/02*
U.S. Cl. 137—87 **7 Claims**

1. A shutoff system for shutting off a fluid line in response to fluid flow through the line, said shutoff system comprising:
a normally closed electrically controlled valve for connection into the fluid line so that, upon non-energization and closing of said valve, fluid flow through the fluid line is prevented, and upon energization of said valve, said valve is opened in response to an electrical signal;
fluid flow sensing means for serial connection in the fluid line with said valve for sensing fluid flow, said sensing means producing an electrical signal in response to fluid flow through said sensing means; and
an electrical circuit having an automatic line, said automatic line interconnecting said sensing means and said valve, said automatic line having a latching relay connected to said sensing means and said valve so that when said latching relay is closed energization of said automatic line puts said automatic line in automatic mode so that the sensing of fluid flow by said fluid flow sensor causes unlatching of said latching relay and closing of said valve, said circuit also having a function line connected to said valve so that when said function line is energized by said circuit the sensing of fluid flow does not cause valve closing.



4,180,089
THRUST PISTON BIASING MEANS
Paul D. Webb, Tioga, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed Sep. 30, 1977, Ser. No. 838,074
Int. Cl.² G05D *11/00*
U.S. Cl. 137—115 **1 Claim**



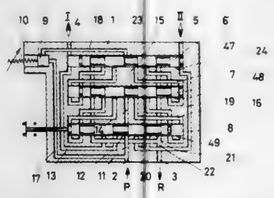
1. Means for controllingly biasing a thrust piston with oil pressure comprising:
a source of oil under pressure;
means for conducting oil from said source to a thrust piston for pressure biasing thereof;
pneumatic means coupled to said oil conducting means operative for attenuating the pressure of said oil; and
means coupled to said pressure-attenuating, pneumatic means for operating the latter; wherein
said pressure-attenuating, pneumatic means comprises means for shunting pressured oil away from said oil-conducting means;
said oil-conducting means comprises a first conduit; and
said pressure-attenuating, pnuematic means comprises a second conduit communicating with said first conduit for shunting pressured oil away from said first conduit; further including

a valve body;
a pair of ports opening into said body;
a passageway, formed in said body, communicating said pair of ports; and
a metering element movably disposed in said passageway for opening and constricting said passageway to oil conduct between said pair of ports said metering element being defined by an annular land providing a clearance with said passageway and a tapered surface tapering to its smaller dimension away from said annular land; wherein
said second conduit communicates with one port of said pair;
a second pair of ports opening into said body;
a chamber, formed in said body, communicating with said second pair of ports; and
a piston element disposed in said chamber for movement between said second pair of ports;
means communicating said source of oil with one of said second pair of ports, to urge said piston element in a first direction to increase the shunting of oil from said oil-conducting means;
a source of modulating pneumatic pressure;
means communicating said pneumatic pressure source with the other port of said second pair thereof, to urge said piston element in a second direction counter to said first direction to decrease the shunting of oil from said oil-conducting means; and
means coupling said piston element to said metering element.

4,180,090
4/2 WAY VALVE

Siegfried Bemba, Rommerskirchen, Fed. Rep. of Germany, assignor to De Limon Fluhme GmbH & Co., Dusseldorf, Fed. Rep. of Germany

Filed Oct. 5, 1977, Ser. No. 839,614
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2646290
Int. Cl.² F16N *25/02*
U.S. Cl. 137—119 **14 Claims**

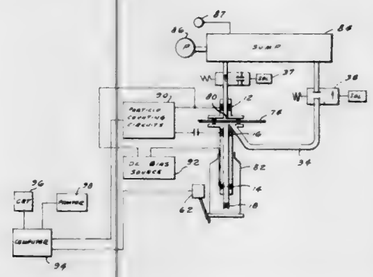


1. A pressure controlled 4/2 way valve, particularly for the alternate control of the feed conduits of two conduit—lubrication systems, comprising
a housing forming three at least substantially cylindrical spaces and a plurality of channels connecting said cylindrical spaces with one another,
a piston displaceably mounted in each of said three cylindrical spaces between two end positions of said piston, respectively, said pistons constituting means for the automatic control of a flow medium flowing through said channels and portions of said cylindrical spaces, one of said pistons constituting a control piston disposed in a first of said cylindrical spaces, another of said pistons constituting an auxiliary control piston disposed in a second of said cylindrical spaces, and a third of said pistons constituting a reception piston disposed in a third of said cylindrical spaces,
a first feed conduit connection and a second feed conduit connection communicating on both ends, respectively, of said third cylindrical space for said reception piston and adapted to be connected to a first and a second feed conduit, respectively,
a pressurized conduit connection communicating with said channels and adapted to be connected to a pressurized line,
a pressure relief valve means for hydraulic precontrol being disposed in one of said channels in a path of flow between said pressurized conduit connection and said third cylindrical space for said reception piston,
said channels include at least two end channels respectively constituting through-flow passages communicating on different sides with each end of each said cylindrical spaces adjacent the respective ends of said pistons, whereby said pistons are supplied on one side and exhausted on the other side of said cylindrical spaces respectively through said two end channels respectively.

4,180,091
PURGING MEANS FOR APERTURE OF BLOOD CELL COUNTER

John P. Hanley, West Paterson; Pasquale M. Petrucci, Morristown, and Stanley Pfeifer, Mendham, all of N.J., assignors to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Nov. 18, 1977, Ser. No. 852,953
Int. Cl.² G01N *27/00*
U.S. Cl. 137—238 **10 Claims**

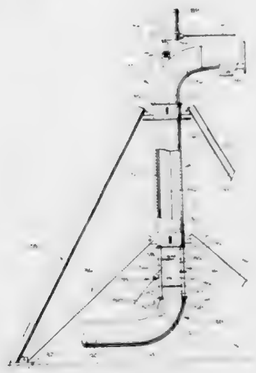


1. A purge system for a blood cell counter of the type including a support structure with an aperture therein positioned between sensing electrodes which detect the passage of a cell through said aperture, comprising:
a housing assembly;
a first conduit within said housing assembly having a downstream end terminating at an outer wall thereof;
an aperture and supporting structure therefor positioned near said downstream end of said first conduit, there being a gap defined between said supporting structure and said outer wall of said housing assembly, said aperture and said gap being in fluid communication with each other;
a second conduit in fluid communication with said gap such that a fluid is able to flow radially outwardly from said first conduit, through said gap, and into said second conduit, said first conduit and said second conduit both having relatively large cross-sectional areas in comparison with that of said gap such that the pressure drop per unit length of a liquid flowing through said conduits is less than the pressure drop per unit length of a liquid flowing through said gap;
a third conduit having an end terminating near said aperture and in fluid communication therewith, said terminal end of said third conduit positioned on the opposite side of said aperture and said support structure from said first conduit and adapted to receive liquid flowing through said aperture; and
means for applying negative pressure to said second conduit, whereby a relatively high velocity liquid stream may be provided within said gap and adjacent the upstream side of said aperture when negative pressure is applied to said second conduit, said stream being able to effectively flush debris into said second conduit.

4,180,092
CENTER PIVOT CONSTRUCTION FOR CENTER PIVOT SPRINKLER

Richard E. Hunter, Greeley, and Robert C. Shook, Kersey, both of Colo., assignors to Irrigation & Power Equipment, Inc., Greeley, Colo.

Filed Mar. 23, 1978, Ser. No. 889,224
Int. Cl.² B05B *3/12*; F16L *21/00*
U.S. Cl. 137—344 **13 Claims**

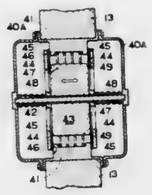


1. In a self-propelled center pivot irrigation system having one or more span units rotating about a center pivot on one or more wheeled power frames wherein the center pivot includes gasket means for allowing leak-proof rotation of a vertical pipe about an axis common to a fixed pipe supplying liquid under pressure to the rotating pipe, the improved center pivot comprising:
(a) a first pipe connectable on one end to a rotating span unit and terminating on the other end in a cylindrical segment;
(b) bearing and support means for rotatably holding said cylindrical segment of said first pipe concentric with a vertical axis of rotation;
(c) a second pipe connectable on one end to a source of liquid under pressure and terminating on the other end in a cylindrical segment;
(d) first spacer means connected between said bearing and support means and said second pipe for holding said cylindrical segment of said second pipe in concentric facings spaced relationship with said cylindrical segment of said first pipe;
(e) a casing adapted to mate in concentric sliding relationship with said cylindrical segment of said second pipe on one end and with said cylindrical segment of said first pipe on the other end, said first and second pipes being so spaced by said first spacer means and said cylindrical casing being of a length such that in a first position said casing is in overlapped mating relationship with both said first pipe and said second pipe, in a second position said casing is in overlapped mating relationship with said first pipe and in spaced end to end relationship with said second pipe, and in a third position said casing is in overlapped mating relationship with said second pipe and in spaced end to end relationship with said first pipe, said casing being slideable along said axis of rotation between said first, second and third positions;
(f) means for releasably holding said casing in said first position;
(g) a first gasket disposed between the overlapping surfaces of said casing and said first pipe; and,
(h) a second gasket disposed between the overlapping surfaces of said casing and said second pipe.

4,180,093
AIR PRESSURE CONTROL APPARATUS FOR A HOT OR COLD STORAGE CHAMBER

Masaaki Kamezaki, Tokyo, Japan, assignor to Taisei Kosan Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 717,346, Aug. 24, 1976, Pat. No. 4,116,213.
This application Jul. 18, 1978, Ser. No. 925,771
Int. Cl.² F16K *17/18*
U.S. Cl. 137—360 **3 Claims**



1. An air pressure control apparatus for a hot or cold storage chamber which comprises:
a damper disposed in a window provided in a panel or wall of said storage chamber defining an air passage around a periphery of said damper for ventilating air within said storage chamber therethrough;
a shaft extending horizontally within said window slidably supporting said damper along said shaft so as to be slidable both inwardly and outwardly in response to variation of air pressure within said chamber;
first and second slidable frames for airtightly closing said air passage extending thereover mounted on said shaft and contacting with peripheral surfaces of said window and said damper at inside and outside walls of said storage chamber;
wherein said frames have openings at central portions thereof through which said damper is exposed to the inside and outside of said storage chamber and being moveable together with said damper, whereby said damper and one of said frames may be shiftable either in an inside or outside direction of said chamber releasing the airtight sealing of said air passage in accordance with variation of air pressure within said chamber so as to establish air pressure equilibrium between the inside and outside of said chamber.

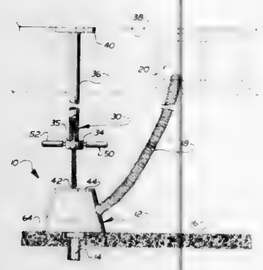
4,180,094
DRAIN COVER ASSEMBLY

Steve Viragh, 11716 Cromwell, Cleveland, Ohio 44120

Filed May 24, 1978, Ser. No. 909,113
Int. Cl.² E03F *5/12*; A47K *1/14*
U.S. Cl. 137—362 **4 Claims**

1. A drain cover assembly for use in venting a below grade floor drain under a building structure, said assembly comprising a hollow drain cap having a bottom rim dimensioned to cover the drain, resilient seal means for disposition between said rim and the floor surrounding the drain, a nipple extending from said cap and communicating with the hollow interior of said cap, flexible conduit means coupled to said nipple for conducting water from the hollow interior of said cap to a remote location, a jack screw having a threaded arm telescopically movable in a tubular shaft, a nut coacting between the one end of the shaft and the threaded arm for telescopically

moving the arm relative to the tubular shaft, and a load distributing plate at the free end of the shaft for engagement with the



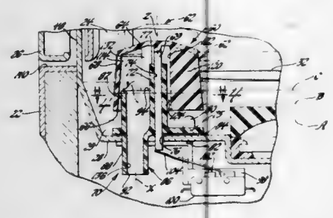
overlying building structure, the free end of the threaded arm being disposed in abutting engagement with the top of said cap.

4,180,095

DISHWASHER FLOAT SWITCH CONTROL ASSEMBLY

James M. Woolley, Dayton, and Jon F. Berges, Waynesville, both of Ohio, assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 853,318, Nov. 21, 1977, abandoned. This application Oct. 6, 1978, Ser. No. 949,210
Int. Cl.² F16K *31/18*
U.S. Cl. 137—387 **2 Claims**



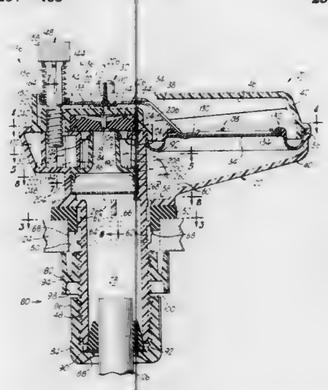
1. In combination with a dishwasher including a dishwashing chamber having a bottom wall portion forming a sump, fill valve means for filling said sump with liquid to a predetermined surface level, and means for circulating said liquid in said chamber, a switch assembly operatively connected to an electrical control circuit of the dishwasher, a float assembly for said fill valve means including a float adapted to float adjacent the surface of said liquid, a float support guide sleeve mounted on the bottom wall portion of said sump, said float having an elongated central stem extending on the principal axis of said float and dimensioned for slidable reception in said sleeve, said sleeve operative for guiding said float substantially in a predetermined linear path perpendicular to said liquid surface as the level of said liquid surface increases to said predetermined surface level, the improvement wherein said float support guide sleeve includes a hollow standpipe having upper and lower interconnected portions, said upper portion being partially defined by an external wall of said guide sleeve along a part of the axial height of said sleeve above said bottom wall portion, said standpipe lower portion formed on a vertical axis offset radially outwardly from the axis of said standpipe upper portion, said standpipe lower portion having its bottom open end located below said bottom wall portion and its upper open end located at a predetermined height above said predetermined surface level, said float in the form of an inverted cup including a closed top, a downwardly facing open bottom and a side wall; switch actuator means engaged with the free end of said stem operating said switch means as said float rises and falls with variations in the liquid level in said sump, wall sections depending from the closed top of said float intermediate said stem and float side wall dividing said float into a pair of opposed unequal sized cavities and a pair of opposed equal sized cavities, both of said equal sized cavities and one of said unequal sized cavities adapted to entrap air to provide buoyancy for said float, the other of said unequal sized cavities defining a combined float-damping and overflow cavity of a predetermined size to telescopically receive therein the upper portion of said hollow standpipe, said standpipe upper open end positioned at a predetermined height below said sleeve upper open end and about said predetermined liquid surface level, whereby under normal conditions said standpipe establishes an air-break path between said overflow cavity and atmosphere to provide a damping effect during the rise and fall of said float, and whereby upon liquid overflow conditions existing in said dishwashing chamber said standpipe provides a concealed liquid overflow path from said chamber allowing overflow liquid to be directed to a predetermined disposal area to obviate damage to operating components of said dishwasher.

4,180,096

FILL VALVE

Dwight N. Johnson, El Toro, Calif., assignor to J. H. Industries, Inc., Santa Ana, Calif.

Filed Jun. 23, 1977, Ser. No. 809,382
Int. Cl.² F16K *31/34*
U.S. Cl. 137—403 **25 Claims**



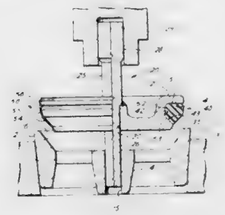
1. A valve assembly for controlling the liquid level in a tank and comprising in combination:
a housing including an inlet and an outlet;
a flow path in said housing between said inlet and outlet;
a valve including a valve member and a valve seat along said flow path, said valve member and seat being movable relative to one another between open and closed positions;
sensing means for detecting the level of liquid in said tank;
valve operating means coupled between said sensing means and said valve for opening said valve in response to liquid level changes to enable flow along said flow path; and
a flow impedance means formed in said flow path for dissipating fluid pressure along said flow path while minimizing fluid velocity increases;
said impedance means comprising a portion of said flow path between said valve and said outlet including spaced inner and outer interfacing walls curvilinear about said valve, said walls having a plurality of intermeshing baffles defining a series of sharp turns in said flow path portion.

4,180,097

MUD PUMP VALVE

James G. Sjoberg, Humble, Tex., assignor to Chromalloy American Corporation, St. Louis, Mo.

Filed Nov. 2, 1978, Ser. No. 957,105
Int. Cl.² F16K *15/06, 1/38*
U.S. Cl. 137—516.29 **2 Claims**



1. A mud pump valve, which comprises:
a seat ring adapted for insertion in said mud pump, said seat ring including an upwardly facing frustro-conical seating surface on the interior thereof;
a generally flat closure disc having a downwardly facing frustro-conical seating surface at the lower end thereof, said seating surface being engageable with said seating surface of said seat ring, said closure disc also having a groove around the periphery thereof above said seating surface thereof, said groove having a cross-section which includes a flat first side substantially parallel to the plane of said disc, a flat second side at a right angle to and extending downwardly from said first side, and a flat third side adjacent and at an angle greater than 90° to said second side and adjacent to said seating surface of said disc;
and an insert ring contained within said groove, said insert ring having a cross-section which includes a flat first side substantially parallel to the plane thereof and of a width less than the width of said first side of said groove, a flat second side adjacent and at a right angle to said first side and of a width equal to said second side of said groove, and a flat third side adjacent and at an angle greater than 90° to said second side and of a width equal to said third side of said groove, and said cross-section of said insert ring further including a fourth side adjacent to said third side of said insert, said fourth side also being adjacent to said seating surface of said disc and extending outwardly and upwardly at an angle greater than that of said seating surface, wherein the cross-sectional area of said insert ring is sized such that no part thereof is extruded outwardly of said first side of said groove;
and means for mounting said disc for reciprocal motion with respect to said seat ring between an open position and a closed position.

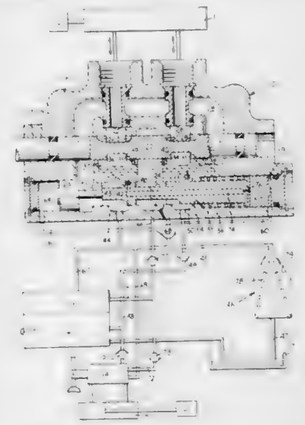
4,180,098

LOAD RESPONSIVE FLUID CONTROL VALVE

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation-in-part of Ser. No. 773,421, Feb. 28, 1977, Pat. No. 4,122,865, and a continuation-in-part of Ser. No. 655,561, Feb. 5, 1976, Pat. No. 4,099,379. This application May 12, 1978, Ser. No. 905,331
Int. Cl.² F15B *13/08*
U.S. Cl. 137—596.13 **18 Claims**

1. A valve assembly supplied with pressure fluid by a pump, said valve assembly comprising a housing having a fluid inlet chamber, a fluid supply chamber, first and second load chambers, and fluid exhaust means connected to reservoir means, first valve means for selectively interconnecting said fluid load chambers with said fluid supply chamber and said fluid exhaust means, first variable metering orifice means responsive to movement of said first valve means and operable to meter fluid flow between said fluid supply chamber and said load chambers, second variable metering orifice means responsive to movement of said first valve means and operable to meter fluid flow between said load chambers and said fluid exhaust means, second valve means having first fluid throttling means between said fluid inlet chamber and said fluid supply chamber, second fluid throttling means between said load chambers and said fluid exhaust means, and sequencing means connecting said first fluid throttling means and said second fluid throttling



means, first control means of said second valve means responsive to pressure differential across said first variable orifice means and operable to maintain said pressure differential across said first variable orifice means at a relatively constant level, and second control means of said second valve means responsive to pressure differential across said second variable orifice means and operable to maintain said pressure differential across said second variable orifice means at a relatively constant level.

4,180,099

FLUID FLOW CONTROLLER

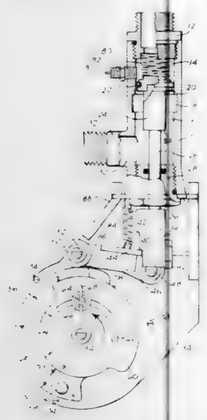
Donald J. Moore, 442 W. 15th, Eugene, Oreg. 97401

Filed Aug. 8, 1977, Ser. No. 822,411
Int. Cl.² F16K *31/528*
U.S. Cl. 137—624.2 **7 Claims**

1. A controller for the flow of fluid under pressure, comprising:
(a) a base,
(b) a hollow housing on the base defining a fluid inlet passageway having upstream and downstream end sections of equal diameter and an intermediate section of larger diameter, the upstream end section being arranged for communication with a source of fluid under pressure and the downstream end section being arranged for communication with a fluid pressure outlet,
(c) a piston valve reciprocative in the inlet passageway and dimensioned for fluid sealing engagement with said upstream and downstream end sections and for fluid passage around the valve when in said intermediate section,
(d) a piston rod extending through the housing, and
(e) timer-controlled drive means on the base engaging the outer end of the piston rod for moving the piston sequentially from the upstream section of the inlet passageway to the intermediate section thereof and thence to the downstream section, the timer-controlled drive means comprising:
(1) a stepped stop lock on the outer end of the piston rod providing a plurality of longitudinally spaced shoulders,
(2) a cam follower lever mounted pivotally on the base,

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(3) a cam follower on the lever,
(4) cam means mounted on the base for movement relative to the cam follower for effecting pivoting of the cam follower lever,



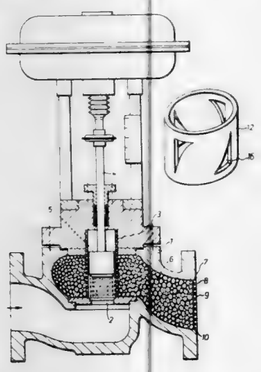
(5) a catch on the cam follower lever arranged to engage the shoulders on the stop block selectively in response to pivoting of the cam follower lever by the cam means, and
(6) timer-controlled power means engaging the cam means for moving the latter.

4,180,100

CONTROL VALVE HAVING A LOW NOISE THROTTLING DEVICE

Fritz Kolb, Odenthal; Silvan Fehlisch; Otto Ziegert, both of Dormagen; Hans Bender, Mannheim, and Manfred Schmitt, Boenheim-Roxheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 23, 1977, Ser. No. 799,614
Claims priority, application Fed. Rep. of Germany, May 22, 1976, 2623078
Int. Cl.[2] F16K *47/08*
U.S. Cl. 137—625.3 **2 Claims**



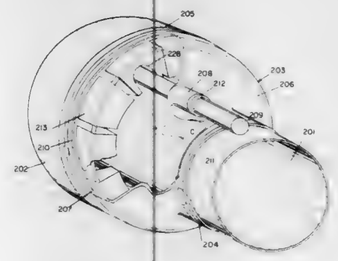
1. A control valve comprising a valve housing having a fluid inlet and a fluid outlet, a perforated cylindrical hollow body arranged centrally in the housing downstream of the inlet, a closure element disposed in the hollow body, regulating means for displacing the closure element, and a mass of small fluid-flow resisting bodies irregularly situated around the cylindrical hollow body and completely filling the inside of the housing around the hollow body and between the fluid inlet and the fluid outlet, wherein said bodies are unconnected sections of pipe having walls perforated with triangular apertures.

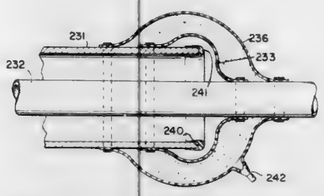
4,180,101

DEVICE FOR CLOSING-OFF THE SPACE DEFINED BETWEEN AN INNER PIPE AND AN OUTER SHIELD TUBE

Heinrich Wegge, Tegernsee, Fed. Rep. of Germany, assignor to Wegurit Gesellschaft mbH Pipelinebedarf & Co., Tegernsee, Fed. Rep. of Germany

Division of Ser. No. 751,783, Dec. 16, 1976, abandoned. This application Dec. 28, 1977, Ser. No. 865,154
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, 7540266[U]
Int. Cl.[2] F16L *57/00, 58/00*
U.S. Cl. 138—103 **9 Claims**





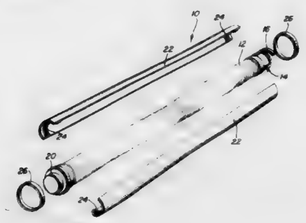
1. In combination, a pipe for conveying a product, a shield tube in which the pipe may be inserted with clearance, angle plates each having an axial portion extending over the exterior of the shield tube at one end thereof and a radial portion extending in use at least part of the way from said axial portion across said clearance between the shield tube and the pipe, and a sealing device for sealing the clearance between the pipe and the shield tube at said one end of the shield tube, the sealing device comprising a sleeve of flexible resilient material having a first end portion whose internal diameter is substantially equal to the external diameter of the pipe, a second end portion whose internal diameter is substantially equal to the external diameter of the shield tube, and an intermediate portion of substantially frusto-conical form joining the first and second end portions, and the sleeve also having a tubular appendix which is joined to the intermediate portion of the sleeve and extends in use substantially parallel to the axes of the pipe and shield tube for accommodating a signal-transmitting cable.

4,180,102

SEWER CONNECTOR

Derek J. Larkin, 1541 Morene Way, Modesto, Calif. 95355

Filed Dec. 14, 1978, Ser. No. 970,868
Int. Cl.[2] B65D *59/04*
U.S. Cl. 138—106 **7 Claims**



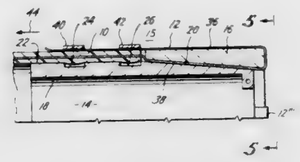
1. A connector device comprising in combination:
a flexible hose for carrying fluids therethrough, said hose being axially compressible and expandable for changing the working length of said hose; and
a housing comprising a pair of substantially semi-cylindrical housing halves for surrounding and protecting said hose, each housing half have a length which is substantially less than the extended length of said hose, engagement means disposed within and connected to said housing for engaging the outer periphery of said hose without causing injury to said hose by contact therewith, attachment means for providing a connection between the two housing halves for forming a firm engagement about said hose and forcing said engagement means into contact with said hose.

4,180,103

TERMINATION FIXTURE FOR A MARINE SEISMIC STREAMER CABLE

John C. Mollere, Nassau Bay, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

Filed Sep. 7, 1978, Ser. No. 940,420
Int. Cl.[2] F16L *55/00*
U.S. Cl. 138—109 **2 Claims**



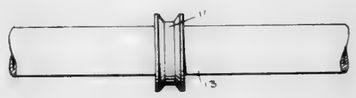
1. A termination fixture for a seismic marine streamer cable section that is to be towed underwater, said cable section being in the form of an elongated tubular plastic jacket for containing a plurality of hydrophones and electrical conductors, the jacket being reinforced along its length by a plurality of tapes braided from plastic fibers of high tensile strength that are embedded in the wall of said jacket, short lengths of said tapes being exposed by stripping away a part of the wall of the plastic jacket at an end thereof, the termination fixture comprising:
a cylindrical bulkhead having inner and outer walls, a first portion of said outer wall having a smooth inwardly tapered surface and a second portion of said outer wall being untapered, the untapered portion having a diameter to fit snugly inside an end portion of said jacket;
a cylindrical wedge for gripping the exposed lengths of said tapes between the tapered portion of said bulkhead and the interior of said cylindrical wedge;
said cylindrical wedge being a collar having an outer wall and a smoothly tapered inner wall that is mateable with the tapered outer wall portion of said bulkhead; and
means for doubling back said exposed lengths of said tapes over the outer wall of said collar and means for externally binding said doubled-back tapes and the end portion of said jacket to the untapered outer wall portion of said bulkhead.

4,180,104

OUT OF CONTACT HIGHLY GEOMETRICAL CRACK ARRESTOR

Donald M. Park, Calgary, Canada, and Robert J. Eiber, Columbus, Ohio, assignors to Northern Border Pipeline Company, Kansas City, Mo.

Filed Sep. 26, 1977, Ser. No. 836,358
Int. Cl.[2] F16L *9/14*
U.S. Cl. 138—172 **7 Claims**



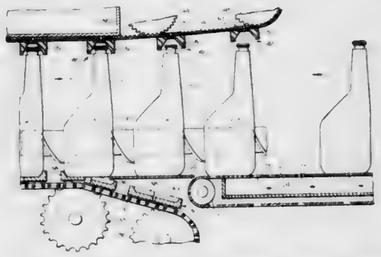
1. A method for reducing the extent of propagation of ductile fractures in a pressurized fluid pipeline of a type that undergoes expansion when the pressure of the fluid is increased from atmospheric to operating pressures comprising
(a) Forming one or more crack arresting bands having a non-convex polygonal rim cross-section and an approximately circular axial inner cross-section, and
(b) placing one or more of said crack arresting bands at intervals along the pipeline so that each encircles the pipeline, wherein the spacing between the pipeline and the arrestor is 1½ to 20 times the expansion of the pipeline due to the pressure of the contents of the pipeline at operating pressure.

4,180,105

ARTICLE INFLATING SYSTEM

Albert J. Harvey, Fairfield, Ohio, assignor to Diamond International Corporation, New York, N.Y.

Filed Oct. 27, 1978, Ser. No. 955,370
Int. Cl.[2] B65B *57/02*; B65C *3/26*; B65B *31/02*
U.S. Cl. 141—165 **12 Claims**



1. An article inflating system adapted to engage and inflate an open ended article being decorated at a decorating station which comprises
an air manifold for providing an air supply at a predetermined pressure suitable for inflating said article;
an endless belt disposed so as to pass in operative engage-

ment with said air manifold and having a plurality of spaced openings therein;

means for driving said endless belt;

a plurality of cup-shaped nozzles fastened to said endless belt, each of said nozzles having an opening extending therethrough and an article engaging surface to facilitate a sealing relationship with the open end of the article to be decorated; and

means for engaging said opening with said air manifold at the decorating station to facilitate the inflation of said article being decorated.

4,180,106

DEVICE FOR DISPENSING MEASURED QUANTITIES OF A LIQUID FROM A BOTTLE

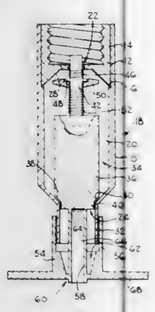
John C. Coetzee, P.O. Box 66160, Broadway, 2020, South Africa

Filed Sep. 5, 1978, Ser. No. 939,738

Claims priority, application South Africa, Sep. 6, 1977, 77/5345; Jul. 20, 1978, 78/4140

Int. Cl.² B65B *3/06*

U.S. Cl. 141—294 **16 Claims**



1. A dispensing and metering device comprising

attachment means for securing the device to the neck of a bottle;

a housing defining a chamber;

an inlet into said chamber adjacent said attachment means whereby the chamber can be filled through the inlet with liquid from a bottle secured to the device by the attachment means;

an outlet from the chamber whereby the chamber can be drained through the outlet;

valve means including first sealing means, second sealing means and an outlet nozzle means extending generally away from the outlet towards a bottom end furthest from the outlet and movable to control operation of said first and second sealing means;

the valve means being movable from a first condition in which said first sealing means closes the inlet and the outlet is open, through a second condition in which said first sealing means closes the inlet and the second sealing means closes the outlet, to a third condition in which at least said second sealing means closes the outlet and the inlet is open;

a liquid flow path defined at least partly by said outlet nozzle means through which path liquid from said chamber will primarily flow;

an air flow path defined at least partly within the outlet nozzle means and opening towards the bottom end of said outlet nozzle means for introducing air into the chamber via the outlet nozzle means and the outlet to replace liquid flowing from the outlet through the liquid flow path when the outlet is open; and

resilient means disposed within said housing and biasing the valve means resiliently to the third condition.

4,180,107

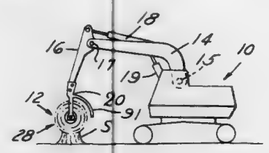
STUMP ERADICATOR

Ross D. Grover, Crystal, Mich., assignor to Ram Industries, Inc., Northville, Mich.

Continuation-in-part of Ser. No. 585,459, Jun. 10, 1975, Pat. No. 4,041,996. This application Jul. 14, 1977, Ser. No. 815,723

Int. Cl.² B27C *9/00*

U.S. Cl. 144—2 N **7 Claims**



1. Apparatus for eradicating tree stumps and the like comprising an axially rotatable drum, means supporting said drum for rotation and means for rotating said drum, a plurality of cutter teeth on the periphery of said drum adapted to cut wood fiber material, and a plurality of chipper teeth on the periphery of said drum adapted to hog out wood fiber material, both said cutter teeth and said chipper teeth projecting radially outwardly from said drum and having heads at their radially outer extremities, the heads of said teeth having cutting faces facing in the direction of intended drum rotation, the cutting faces of the heads of said cutter teeth having portions which are narrower than and project radially outwardly farther than the cutting faces of said chipper teeth.

4,180,108

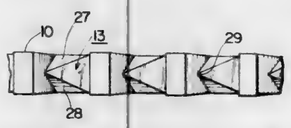
REMOVABLE MOUNTED TEETH IN BRUSH CLEARING SAW

Ralph E. Dove, Rte. No. 4, Sedalia, Mo. 65301

Filed Dec. 27, 1977, Ser. No. 864,741

Int. Cl.² A01G *23/08*

U.S. Cl. 144—34 F **2 Claims**



1. A saw blade assembly movable by a tractor as the tractor moves forward, comprising in combination, at least one substantially planar cutting assembly in the form of a blade having opposite surfaces and presenting a cutting edge, an attachment for holding the blade on the tractor front with the blade disposed horizontally to the ground with cutting edge outboard, a plurality of receptacle grooves disposed along and facing inboard on the cutting edge of said blade for receiving and supporting teeth therein, individual replaceable longitudinal teeth disposed and held snugly in said grooves along more than half of the their longitudinal length with the remainder of the tooth extending beyond the groove, and a space formed in the blade between adjacent said grooves by a bevelled portion of the blade adjacent the leading edge of the tooth whereat the blade contacts the leading tooth face at a reduced thickness apex portion thereby serving to produce a clearance channel in the blade body on both sides thereof carrying chips away from the spacing between the teeth by forces imposed during the forward motion of said tractor.

4,180,109

APPARATUS FOR TIMBER BARKING

Urho Heikkinen, Helsinki, Finland, assignor to Kone Osakeyhtio, Helsinki, Finland

Filed Oct. 6, 1977, Ser. No. 840,478

Claims priority, application Finland, Oct. 11, 1976, 762899

Int. Cl.² B27L *1/02*

U.S. Cl. 144—208 D **5 Claims**



1. In an apparatus for timber barking having a barking drum, timber bark pretreatment means adapted to receive and spot bark a plurality of timber pieces in their line of travel to said barking drum, conveying means for conveying said timber through said pretreatment means, said pretreatment means including patching means therein, the improvement which comprises:

said conveying means including a plurality of conveyors sequentially disposed along the longitudinal line of travel, one of said conveyors comprising a set of spreading and forwarding rolls having helices thereon, said spreading and forwarding rolls being adapted to spread longitudinally fed timber into the pretreatment means to form a uniform timber mat and to longitudinally advance said mat, a second conveyor comprised of a set of rotating rolls disposed at an angle to the longitudinal direction of timber travel for transporting the timber to said barking drum while at the same time rotating the same about their longitudinal axes.

4,180,110

HANDSAW WITH SPECIALIZED CUTTING TEETH

Heinrich E. Tauscher, Bergstrasse 7, 8441 Furth-Oberalteich, Fed. Rep. of Germany

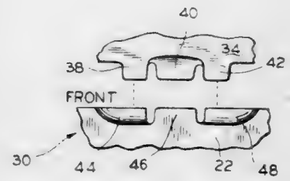
Filed Jun. 15, 1978, Ser. No. 915,589

Int. Cl.² B27B *21/00*

U.S. Cl. 145—31 R **11 Claims**

1. A handsaw comprising an elongated main blade means having one end shaped to form a first locking point which is no thicker than the main blade means and a handle at the other end, cutting blade means having a second locking point which is no thicker than the cutting blade at a first end, said second locking point being complementary to and fitting onto the first locking point, whereby said locking points pass freely through the kerf of the saw, clamp means on said handle for engaging a second end of said cutting blade means and drawing said cutting blade means taut between said locking point and said handle on said main blade, there being no longitudinal holding forces acting along the length of said blade between said locking point and said handle, and interlocking fingers on alternate sides of an edge of each of said main and cutting blade means along at least part of the length thereof, the fingers of one blade being sequentially, reversely positioned relative to the fingers of the other blade for preventing them from springing apart without effect upon the tautness of said cutting blade means, said interlocking fingers having only longitudinally spaced parallel contacting faces and reduced thicknesses so that the fingers on the main and cutting blade interfit face-to-face without wedging together, the combined cross-sectional thickness of said main and cutting blade means having the same cross-





sectional thickness, whereby said combined blades follow their own kerf.

4,180,111

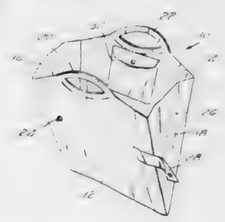
HANDBAG

Terri Davis, 4106 S. Harvard Blvd., Los Angeles, Calif. 90062

Filed Nov. 13, 1978, Ser. No. 959,925

Int. Cl.² A45C *3/04*

U.S. Cl. 150—1.7 **3 Claims**



1. A handbag comprising:

a thin sheet material front wall, said front wall having a first upper end and a first lower end;

a thin sheet material back wall, said back wall having a second upper end and a second lower end, said first lower end being secured to said second lower end;

a first side wall being integrally attached to an adjacent pair of sides of said front wall and said back wall;

a second side wall being integrally attached to the opposite adjacent pair of sides of said front wall and said back wall;

said front wall and said back wall and said side walls cooperating to form an enclosed container, said container assuming its largest size with said side walls being located sub-

stantially perpendicular to said front wall and said back wall, said container assuming a smaller size with said side walls being folded and located substantially parallel to said front wall and said back wall, releasable connecting means attached to both said front wall and said back wall to retain said container in said smaller size, said container assuming a closed size with said side walls in said folded position and lateral portions of said front and back walls being folded upon themselves and said releasable connecting means cooperating to retain the said container in said closed size.

4,180,112
BEACH BAG

Thomas Bovet, 221-226 Gloucester Rd., 13th Floor, Hyde Centre, Wanchai, Hong Kong

Filed Jan. 10, 1979, Ser. No. 2,169
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 7831317[U]
Int. Cl.² A45C *3/10*
U.S. Cl. 150—1.7 **5 Claims**



1. A bag comprising:

side panels each having opposite side edges and bottom edges, said panels being joined along said side and bottom edges,

carrying handles attached to said side panels,

releasable closure means for one side edge and said bottom edge of said side panels, said closure means closing the said one side edges and bottom edges of said panels when said bag is to function as a bag and being released when said bag is to function as a shield,

stiffening means for said other side edges of said side panels,

a triangular flap having three edges, two of said edges being joined to respective bottom edges of said side panels, and

an L-shaped reinforcing member for each said one side edge of said side panels, each reinforcing member having two arms, one arm of said member stiffening its respective one edge of said panel and the other arms stiffening a part of said third edge of said triangular flap.

4,180,113
HAMPER BAG COVER

Joel R. Liebling, 125 Hibiscus Dr., Rochester, N.Y. 14618

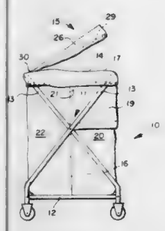
Filed Oct. 12, 1978, Ser. No. 950,865
Int. Cl.² B65D *29/00*
U.S. Cl. 150—7 **8 Claims**

1. A cover for a hamper bag supported on a hamper stand so a top opening of said hamper bag is held open around an upper region of said hamper stand by a top of said hamper bag being noosed around said upper region of said hamper stand, said cover comprising:

a. a cloth panel shaped to overlie said top opening and also fit around said upper region of said stand;

b. a cloth skirt extending downwardly from said panel around a perimeter of said panel to fit around the outside said upper region of said stand;

c. an elastic strip arranged around the bottom of said skirt



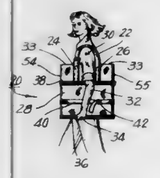
and dimensioned for stretching over and snapping in under said upper region of said stand for releasably holding said panel closed over said top opening of said hamper bag; and

d. said panel, said skirt, and said elastic strip all being secured to the inside of said hamper bag along a line spaced below said top of said hamper bag.

4,180,114
PORTFOLIO

Diane Katz, 251 W. 92nd St., New York, N.Y. 10025

Filed May 26, 1978, Ser. No. 909,612
Int. Cl.² A45C *3/00*
U.S. Cl. 150—28 R **29 Claims**



1. A flexible portfolio for flat planar objects such as works of art which comprises first and second substantially rectangular flexible panels, said panels being of substantially equal size and being in registration, means securing three edges of the first panel to the respective opposed three edges of the second panel, said three edges of each panel being two end edges and a middle edge, one end of each end edge being contiguous with an end of said middle edge, a zipper means, said zipper means having discrete first and second rectilinear stringers, said stringers being mateable when juxtaposed upon the deformation of the flexible panels into a cylindrical configuration, a first stringer of said zipper means being mounted to the first panel parallel to and spaced from the middle of said three edges of said first panel, a second stringer of said zipper means being mounted to the first panel by mounting means contiguous with the middle of said three edges of said first panel, and flexible linear strap means, said strap means being mounted to at least said first panel so that the portfolio is portable.

4,180,115
TIRE, TRACTION UNIT AND DEVICE FOR SHIFTING SAID TRACTION UNIT

Kesao Yamagishi, 4-18, Chuo 3-Chome, Ueda City, Nagano Prefecture, Japan

Filed Mar. 29, 1977, Ser. No. 782,442
Claims priority, application Japan, May 21, 1976, 51/57910; Sep. 27, 1976, 51/114689
Int. Cl.² B60C *27/00, 27/02*
U.S. Cl. 152—216 **6 Claims**



1. A tire which comprises a plurality of pairs of shallow and deep channels provided in close proximity with each other around said tire to extend transversely from the side walls thereof toward a tread portion, said pairs of the shallow and deep channels being uniformly spaced at intervals around the periphery of said tire, said shallow channel being of substantially the same shape as the deep channels, said deep channels receiving a traction unit in its inoperative position, and said shallow channels for receiving the traction unit in its operative position.

4,180,116
RADIAL TIRES

Luigi Maiocchi, Vernate - Fraz. Moncucco, Via Mazzini, 1 Milan, Italy

Filed Dec. 14, 1977, Ser. No. 860,573
Claims priority, application Italy, Dec. 20, 1976, 30602 A/76
Int. Cl.² B60C *15/04*
U.S. Cl. 152—362 R **5 Claims**

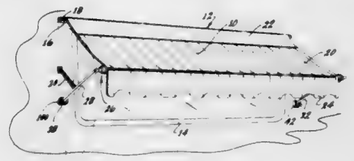


1. In a radial carcass tire having a section of a ratio H/C that is not greater than 0.7, and which is intended to be mounted onto a rim provided with bead-seats inclined at an angle of 15° with respect to the rotation axis, said tire presenting beads, each of which comprises a bead-wire core around which, from inside towards outside, the extremity of the carcass ply or plies is turned-up, said bead-wire cores being consitituted of rubberized metallic wires wound spirally to present a polygonal cross-section elongated in the axial direction, and in which the side constituting the bead-core base, is inclined at an angle of 15° with respect to the said rotation axis, the improvement wherein said polygonal cross-section has an irregular geometrical figure consisting of two associated polygons, said figure having its bary-center axially shifted to the outside, with respect to the line of the mid-plane of the bead-core base, between 7% and 30% of the axial width of the said bead-core base.

4,180,117
WINDOW AWNING

Bradley G. Greer, Long Beach, Calif., assignor to A & E Plastik Pak Co., Inc., Industry, Calif.

Filed Jun. 5, 1978, Ser. No. 912,190
Int. Cl.² E04F *10/06*
U.S. Cl. 160—67 **19 Claims**



1. An awning for a window, including,

a roll-up mechanism including a roller tube and an awning fabric, one end of the awning fabric being attached to the roller tube and then wound around the tube, the roll-up mechanism being constructed to provide tension in the awning fabric as the fabric is unrolled from the roller tube,

means for attaching the other end of the awning fabric above the window,

a pair of support arm assemblies each extending from an individual side of the window and coupled to an opposite end of the roll-up mechanism,

each assembly including,

a main support arm extending at one end from the side of the window and coupled at the other end to one end of the roll-up mechanism and rotatable through an angle of approximately 180° about the side of the window as a fulcrum,

a rafter arm extending at one end from the side of the window and rotatable through an angle of approximately 180° about the side of the window as a fulcrum and coupled at the other end to an associated one of the main support arms for sliding movement along the associated main support arm, during its rotation through an angle of approximately 180°, to a plurality of positions for providing different awning positions, and

means for locking the other end of the rafter arm to the main support arm at the individual ones of the different awning positions.

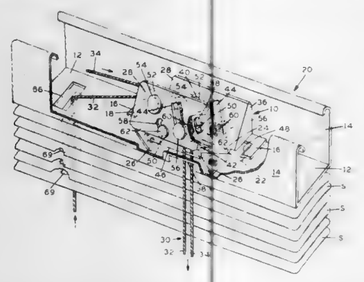
4,180,118
CORD LOCK MECHANISM FOR VENETIAN BLIND

Francis Vecchiarelli, River Edge, N.J., assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles

Filed Jul. 13, 1978, Ser. No. 924,309
Int. Cl.² E06B *9/38, 9/322*
U.S. Cl. 160—178 C **8 Claims**

1. A cord locking mechanism for a venetian blind comprising a lock housing, a flexible blind lifting and lowering member, a guide mounted in said housing for guiding said flexible member, a track in said housing, a locking pin mounted for movement in said track to and from a first position close to said guide and a second position remote from said guide, said flexible member extending between said guide and said locking pin, said pin when in said first position serving to grip said flexible member between said guide and said pin for preventing move-

ment of said flexible member in one direction, helper means mounted for movement in said housing toward and away from the second position of said pin for urging said flexible member into engagement with said pin when said pin is in said second



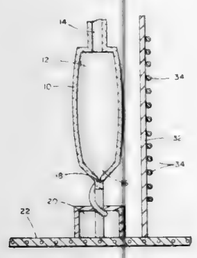
position and said helper means being so mounted as to move away from the second position of said pin upon movement of said flexible member away from said pin to raise or lower said blind.

4,180,119

MOLD FOR DIRECTIONALLY SOLIDIFIED SINGLE CRYSTAL CASTINGS AND METHOD FOR PREPARING SAME

Lamar Burd, Andover, and James K. Donnelly, Dover, both of N.J., assignors to Howmet Turbine Components Corporation, Muskegon, Mich.

Filed Sep. 18, 1978, Ser. No. 943,212
Int. Cl.[2] B22C *9/04;* **B22D** *25/06*
U.S. Cl. 164—34 **8 Claims**



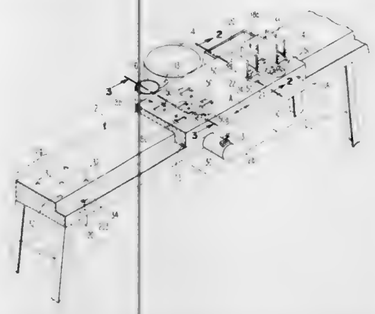
1. Apparatus for casting single crystal articles including a shell mold, a chill plate on which the shell mold is adapted to rest, said shell mold including one or more starter chambers at the lower end adapted to contact the chill plate, one or more mold cavities, each having an inlet at its upper end portion for the introduction of molten metal into the shell mold, and a helical passage communicating at its upper end with the mold cavity and extending downwardly to the starter chamber for selecting a single crystal to grow into the metal in the mold cavity during solidification, the improvement which comprises a rigid columnar support extending continuously alongside the helical passage down through the starter chamber.

4,180,120

CAST-ON METHOD AND APPARATUS FOR CASTING PARTS ONTO THE LUGS OF LEAD-ACID BATTERY PLATES STACKS

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 752,644, Dec. 20, 1976, which is a continuation-in-part of Ser. No. 880,017, Feb. 21, 1978, which is a division of Ser. No. 659,572, Feb. 19, 1976, Pat. No. 4,085,792, which is a continuation-in-part of Ser. No. 618,772, Oct. 2, 1975, Pat. No. 3,980,126, which is a continuation-in-part of Ser. No. 432,545, Jan. 11, 1974, Pat. No. 3,954,216, which is a continuation-in-part of Ser. No. 395,528, Sep. 10, 1973, Pat. No. 3,861,575, which is a division of Ser. No. 184,338, Sep. 28, 1971, abandoned. This application May 30, 1978, Ser. No. 910,944
Int. Cl.[2] B22D *19/00, 25/04*
U.S. Cl. 164—109 **37 Claims**



1. A cast-on apparatus for casting parts onto lugs of battery stacks, comprising:

(a) a base plate having at least one molten lead supply orifice defined therein at a casting portion defined therealong;

(b) a mold carriage means slidably engaging said base plate and having at least one work station formed therealong with at least one molding void defined through said carriage means at said work station, for selective movement of said work station into a position over said casting portion of said base plate, said position placing said molding void in fluid communication with said orifice said mold carriage means at said station comprising means for receiving said battery plate stacks for orienting at least a portion of said lugs within at least a portion of said molding void; and

(c) metal supply means for selectively supplying molten metal through said orifice to said void for casting said parts.

33. A method of casting lead parts onto the protruding positive and negative lug rows of a lead-acid battery stack comprising the steps of:

(a) providing a base plate having at least one molten lead supply orifice disposed in a top surface thereof;

(b) providing a mold carriage block having an undersurface which slidingly engages the top surface of said base plate;

(c) fitting at least one mold into a well defined through said mold carriage plate to define a mold cavity through said mold carriage plate;

(d) positioning said battery stack so at least a portion of one of the rows of said stack protrudes into at least a portion of said at least one mold cavity; and

(e) sliding said mold carriage plate at least between a position wherein said mold cavity is aligned over said at least one orifice to receive molten lead introduced therefrom, and at least one other position wherein portions of said mold carriage block seals said orifice with respect to the atmosphere.

4,180,121

LOW PRESSURE MOLTEN METAL CASTING DEVICE

Jean H. Lefebvre, Chaville, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Feb. 16, 1978, Ser. No. 878,459
Claims priority, application France, Mar. 1, 1977, 77 05933
Int. Cl.[2] B22D *17/32, 17/06*
U.S. Cl. 164—152 **13 Claims**



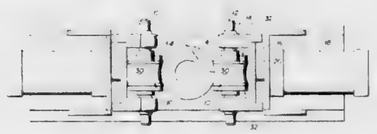
1. Device for casting low-pressure molten metal, which comprises a chamber provided with at least one inlet feed opening for at least one mould and a casting conduit connecting said chamber to a metal smelting furnace, said chamber being adapted to be connected in turn to a source of fluid under pressure for feeding molten metal to said chamber by raising the molten metal therein; a column disposed downstream of the furnace and upstream of said at least one inlet feed opening and extending upwards to a level higher than said chamber, said column constituting a buffer reservoir for the molten metal and a feed conduit for a neutral scavenging gas; and a level sensor provided in said column and adapted to co-act with means for controlling the molten metal pressure in the furnace in order to adjust a metallostatic pressure subordinate to a selected level, the level sensor being mounted for displacement down to a position lower than that of the at least one inlet feed opening, said level sensor being shifted at the end of a casting operation after venting fluid used for pressurizing the furnace and returning the metal to said furnace, in order to cause another rise of molten metal up to said lower position of the sensor before re-closing the at least one mould for a subsequent casting cycle.

4,180,122

COMPOSITE PINCH ROLL FOR CONTINUOUS VERTICAL CASTING

Gus Sevastakis, 5645 Angola Rd., Toledo, Ohio 43615

Filed May 10, 1978, Ser. No. 904,471
Int. Cl.[2] B22D *11/12*
U.S. Cl. 164—448 **11 Claims**



1. A pinch roll for use in a continuous vertical casting operation, the pinch roll comprising, a main body portion having a peripheral surface for engaging a bar to be cast, and a pair of opposite side portions removably fixed to the main body portion, each side portion having a peripheral bar contacting surface for engaging a bar in a double bar casting operation, said side portions each having a peripheral land located on one side of their peripheral bar contacting surfaces such that the distance between their peripheral bar contacting surfaces may be varied depending on whether the side portions are fixed to the main body portion in one position with the lands located adjacent the main body portion or in an alternative position, with the peripheral bar contacting surfaces located adjacent the main body portion.

4,180,123

MIXED-COMPONENT REFRIGERATION IN SHELL-TUBE EXCHANGER

Rolland E. Dixon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 14, 1977, Ser. No. 768,515
Int. Cl.[2] F28B *9/00*
U.S. Cl. 165—1 **11 Claims**



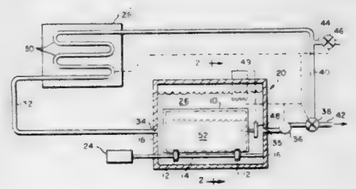
1. A method or operation for effecting heat exchange in a heat exchange zone between a liquid mixed-component material comprising under conditions of the operation a liquid component and a vapor or vapor-forming component and another fluid which comprises passing said material into and through said exchange zone in a manner, including a sufficiently rapid flow, to keep the portion of said zone through which said material is passed substantially completely liquid full, thereby preventing separation of a vapor phase which leaves behind, moving at a slower rate, if at all, a liquid which soon becomes ineffective for desirable heat exchange.

4,180,124

PROCESS AND APPARATUS FOR HEAT EXCHANGE

William A. Shurcliff, Cambridge, Mass., assignor to Broad Corporation, Boston, Mass.

Division of Ser. No. 735,418, Oct. 26, 1976, Pat. No. 4,117,882. This application Jul. 21, 1978, Ser. No. 926,809
Int. Cl.[2] F28D *21/00*
U.S. Cl. 165—1 **12 Claims**



1. A process for storing thermal energy for subsequent use which comprises:

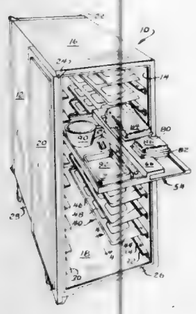
exposing a heat exchange liquid to heat to increase the thermal energy in said liquid,
passing the heated liquid into a first container in heat exchange relationship with a composition including a salt hydrate enclosed in at least one sealed container,
said salt hydrate having a heat of fusion of at least about 50 BTU/lb,
the volume ratio of the heat exchange liquid in said first container to salt hydrate being between about 1 to 20 and 2 to 1.
each sealed container being continually agitated to prevent or minimize supercooling and irreversible separation of said salt hydrate,
monitoring the pressure within at least one of said sealed containers thereby to determine the latent heat stored in the salt hydrate within said containers,
and periodically passing said heat exchange liquid from indirect heat exchange relationship with said salt hydrate to extract heat from said liquid.

4,180,125

APPARATUS FOR SELECTIVELY HEATING AN INDIVIDUAL FOOD ITEM IN A REFRIGERATED ENVIRONMENT

William J. Schulz, West Cornwall, Conn.; Ralph R. Pecoraro, Jacksonville, Fla., and Gerard T. Hogan, Winchester, Conn., assignors to UOP Inc., Des Plaines, Ill.

Filed Mar. 24, 1978, Ser. No. 889,763
Int. Cl.[2] F25B *29/00*
U.S. Cl. 165—48 R **11 Claims**



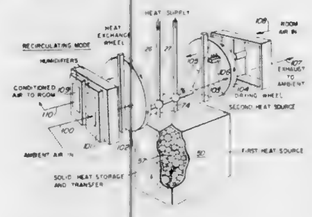
1. An apparatus for heating at least one covered container on a meal service tray while other items on the tray are refrigerated comprising an enclosed housing having a plurality of cooperative pairs of guide rails therein for supporting a first pair of opposed side edges of a plurality of trays; means for supplying a refrigerated atmosphere within said enclosure; a plurality of generally horizontal, thin, heater shelves extending from a side wall of said housing for less than one-half the width of the trays; a ramp surface on at least one end of each of said heater shelves; a plurality of trays, each of said trays having at least one pair of abutment portions integrally supported by said trays and extending transversely over a portion thereof relative to said first opposed pair of side edges, said abutment portions being located sufficiently far above the serving surface of the trays to permit end contact with said at least one covered container while allowing the trays to be slid along said cooperating pairs of guide rails so that said thin heater shelves will pass above the tray surfaces and beneath the abutment portions, the ramp surface on each of said heater shelves being adapted to lift a covered container located on said tray between said at least one pair of abutments and permit said heater shelf with which said container is frictionally engaged to pass under it as said container is restrained by one of said at least one pair of abutment portions.

4,180,126

AIR CONDITIONING APPARATUS AND METHOD

William F. Rush, Park Ridge; Jaroslav Wurm, N. Riverside, and Raymond J. Dufour, Wheaton, all of Ill., assignors to Gas Developments Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 583,522, Jun. 4, 1975, Pat. No. 4,081,024, which is a continuation-in-part of Ser. No. 415,323, Nov. 13, 1973, Pat. No. 3,889,742. This application Mar. 21, 1978, Ser. No. 888,740
The portion of the term of this patent subsequent to Jun. 17, 1992, has been disclaimed.
Int. Cl.[2] F24F *7/00*
U.S. Cl. 165—59 **11 Claims**



1. An open-cycle air conditioning apparatus for heating and cooling comprising:
an enclosure defining a treatment air passageway and a separate regenerative air passageway;
means for passing an air stream through each of said passageways;
a sensible heat exchanger means for transfer of thermal energy from one of said passageways to the other;
a desiccant means for transfer of moisture from the air treatment passageway to the regenerative air passageway and spaced toward the exhaust of the regenerative air stream from said heat exchanger means;
a first evaporative cooling means near the exit of the conditioned air passageway and a second evaporative cooling means near the entrance of the regenerative air passageway;
a first heater means in the regenerative air passageway between said sensible heat exchanger means and said desiccant means supplying heat to the entire regenerative air stream;
a second heater means in the regenerative air passageway between said first heater means and said desiccant means supplying regeneration heat to a portion of the regenerative air stream previously heated by said first heater means; and
a heat collector means and conduit means providing heat to said first heater means.

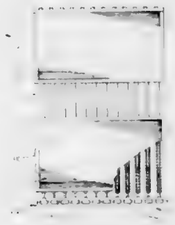
4,180,127

MULTIPLE HEAT PIPE HEAT EXCHANGER AND METHOD FOR MAKING

Dale E. Maxson, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Nov. 14, 1977, Ser. No. 850,865
Int. Cl.[2] F28D *15/00*
U.S. Cl. 165—76 **25 Claims**

1. A multiple heat pipe device adapted to be charged with heat transfer fluid comprising: a plurality of heat pipes having respective open ends and a header section comprising conduit means associated with said open ends, said conduit means comprising a plurality of looping tubes, each of said looping tubes having one end inserted in one of said open ends and another end inserted in another of said open ends, at least one



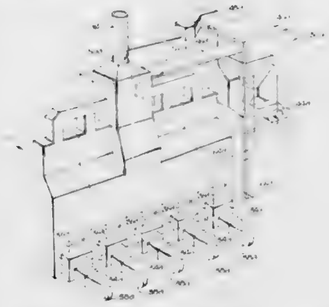
of said open ends having at least two looping tube ends inserted therein.

4,180,128

MULTIPLE FURNACE WASTE HEAT RECOVERY SYSTEM

John J. Fallon, Jr., 1330 Sugarloaf Dr., Pasadena, Calif. 91103; Joe B. Blair, Huntington Beach, Calif.; Donald R. Phelps, Glendale, Calif., and Robert P. Cabeen, III, Pasadena, Calif., assignors to John J. Fallon, Jr. and Donald Ritt, both of Sun Valley, Calif.

Division of Ser. No. 641,721, Dec. 18, 1975, Pat. No. 4,083,398. This application Jan. 16, 1978, Ser. No. 869,459
Int. Cl.[2] F28D *15/00*
U.S. Cl. 165—76 **24 Claims**



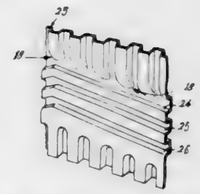
1. An apparatus adapted for coupling to a multiple furnace installation which comprises a plurality of burners, a corresponding plurality of inlet air plenums and a vertically disposed exhaust stack, for recovering the heat energy in waste gases produced in said burner and escaping through said stack, and for delivering said recovered waste heat to inlet air flowing through each of said inlet air plenums, said apparatus comprising:
(a) a vertically disposed, self-supporting, frame structure;
(b) an exhaust gas duct for carrying exhaust gas therethrough, said exhaust gas duct being mounted to an upper portion of said frame structure and being mechanically coupled to and in communication with said stack;
(c) a first heat exchanger means having an inlet and an outlet for receiving and discharging a heat transfer fluid, said first exchanger means being disposed within said exhaust gas duct for absorbing heat from said exhaust gas flowing therethrough;
(d) a plurality of inlet air ducts, corresponding to said plurality of burners and inlet air plenums, for carrying inlet air therethrough, each of said inlet air ducts being mechanically coupled to and in communication with said corresponding inlet air plenum;
(e) a corresponding plurality of second heat exchanger means, each having an inlet and an outlet for receiving and discharging said heat transfer fluid, each of said second exchanger means being disposed within said corresponding inlet air duct for heating the inlet air passing therethrough, the inlet of each of said second heat exchanger means being in communication with the outlet of said first heat exchanger means, and the outlet of each of said second heat exchanger means in communication with the inlet of said first heat exchanger means through conduit means so as to define a flow circuit for said heat transfer fluid;
(f) a reservoir for maintaining a reserve of said heat transfer fluid, said reservoir being mounted on said frame structure and being in communication with said flow circuit; and
(g) pumping means for circulating said heat transfer fluid through said flow circuit, said pumping means being mounted on said frame structure and being in communication with said flow circuit,
whereby, said apparatus may be brought to the site of said furnace installation, disposed adjacent thereto and inter-coupled to said exhaust stack and to said plurality of inlet air plenums without placing a structural load on said furnace installation.

4,180,129

PLATE TYPE CONDENSER

Hiroyuki Sumitomo, Takatsuki, Japan, assignor to Hisaka Works, Ltd., Osaka, Japan

Filed Sep. 8, 1977, Ser. No. 831,497
Claims priority, application Japan, Sep. 8, 1976, 51-108215; Sep. 8, 1976, 51-108216; Oct. 21, 1976, 51-127027; Oct. 21, 1976, 51-127028
Int. Cl.[2] F28B *9/08*
U.S. Cl. 165—110 **4 Claims**



1. In a plate type condenser comprising a plurality of heat transmitting plates assembled face to face to form therebetween passages for steam and cooling liquid alternately, each of said plates having
a condensate collecting and discharging means consisting of inclined grooves and vertical grooves arranged for each given region in a heat transmitting surface on the steam passage side thereof, and
a plurality of longitudinal grooves extending between the inclined grooves in the direction of the condensate stream and communicating at the lower end thereof with the inclined groove,
wherein the improvement which is characterized in that the longitudinal grooves are curved smoothly at their lower portions in the direction of the inclined groove.

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4,180,130

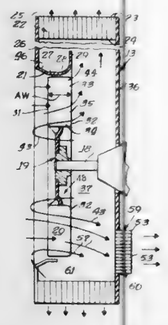
HEAT EXCHANGE APPARATUS INCLUDING A TOROIDAL-TYPE RADIATOR

Harold D. Beck, Downers Grove, and C. Paul Kolthoff, Jr., Naperville, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Division of Ser. No. 728,657, Oct. 1, 1976, Pat. No. 4,136,735, which is a continuation-in-part of Ser. No. 543,713, Jan. 24, 1975, abandoned, which is a continuation of Ser. No. 472,257, May 22, 1974, abandoned. This application Oct. 23, 1978, Ser. No. 954,057

Int. Cl.[2] F28F *9/22*

U.S. Cl. 165—124 **26 Claims**



1. A heat exchange apparatus comprising:

a heat exchanger means including a toroidal radiator structure, said toroidal radiator structure including a toroidal radiator core having a plurality of radially extending cooling air passageways formed therethrough, said toroidal radiator structure further including a first radially extending wall and a second radially extending wall axially spaced and substantially parallel with respect to said first wall, said first and second walls substantially defining the axial limits of said toroidal radiator core and an air-receiving plenum chamber disposed radially inwardly of said toroidal radiator core; a rotatable, axial flow fan having a plurality of circumferentially spaced, radially extending impeller blades; a generally annular fan shroud means supported within an opening formed through said first wall and encircling the fan, said fan shroud means including a generally cylindrical, axially extending throat section, an annular, generally radially xtending flat flange section, said flat flange section being spaced radially outwardly and axially in a direction downstream from said throat section and having a radial length substantially equal to the axial length of said cylindrical throat section, said fan shroud means being positioned with respect to said toroidal radiator structure whereby said flat flange section lies substantially in a plane spaced and parallel with respect to said first and second walls, and an annular intermediate section extending between and operatively interconnecting said throat section and said radial flat flange section, said throat section, intermediate section, and radial flat flange section being effective to produce a low pressure region between the air stream flowing over the surface thereof and said surface when the fan is in operation; and an auxiliary heat exchange means mounted on said toroidal radiator structure comprising, an auxiliary radiator structure including an auxiliary radiator core, said auxiliary radiator core having a plurality of cooling air passageways formed therethrough, said air passageways providing air communication between the exterior of said toroidal radiator structure and the interior of said plenum chamber.

4,180,131

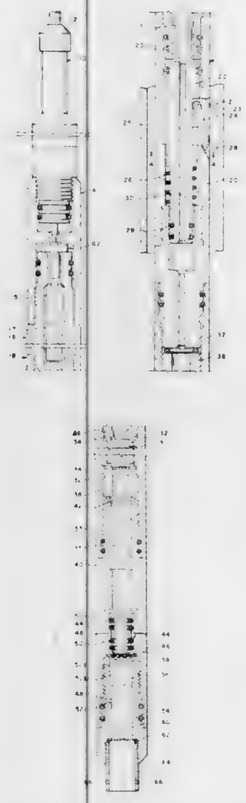
CHEMICAL CUTTING APPARATUS FOR USE IN WELLS

Edmond D. Chammas, Houston, Tex., assignor to Weatherford/DMC, Houston, Tex.

Continuation-in-part of Ser. No. 830,511, Sep. 6, 1977, Pat. No. 4,125,161. This application Oct. 20, 1978, Ser. No. 953,141

Int. Cl.[2] E21B *29/00*

U.S. Cl. 166—55 **18 Claims**



1. Apparatus for cutting an object within an earth bore, comprising a generally elongate, cylindrical structure including a first section and a depending second section, said first section having in one or more subs,

(a) means for suspending the apparatus within the bore,

(b) firing means for producing ignition temperatures,

(c) means for generating gas by ignition from the firing means (b),

(d) anchor means for maintaining the apparatus substantially stationary in axial relation to the earth bore during the cutting operation,

(e) chemical means releasably contained within the apparatus for incendiary cutting of the object within the earth bore upon release of said chemical means, and

(f) said second section including reactant and severing means for promoting reaction of and directing the chemical means toward the object to be cut within the earth bore, said reactant and severing means being integrally formed of a single sub member of a material that will not enter into the incendiary cutting reaction.

4,180,132

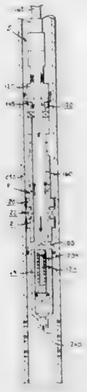
SERVICE SEAL UNIT FOR WELL PACKER

Carter R. Young, Lewisville, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Jun. 29, 1978, Ser. No. 920,284

Int. Cl.[2] E21B *33/128, 33/129*

U.S. Cl. 166—120 **6 Claims**



1. A service seal unit for hydraulically setting a well packer in a well bore and directing fluid flow through said packer into said well bore comprising: a body mandrel provided with first and second separate longitudinal flow passages for fluid circulation through said seal unit to and from said well bore below said packer; valve means on said body mandrel for communicating one of said flow passages with said well bore around said unit above said packer; valve means on said body mandrel for communicating the other of said flow passages with ports in said packer leading to said well bore below said packer; hydraulic means comprising an annular cylinder and piston assembly on said body mandrel for operating a setting sleeve of said well packer; a setting sleeve releasably connected on said annular piston engageable wih said setting sleeve of said packer for setting said packer; latch means on said body mandrel including radially movable lugs for engaging said packer setting sleeve internally for restraining said setting sleeve against premature setting while said packer is manipulated to a desired location for setting in said well bore and releasable from said packer setting sleeve upon movement of said annular piston toward said packer setting sleeve; and coupling means on said body mandrel for releasably coupling said unit with the body mandrel of said packer while said hydraulic means operates said setting sleeve of said packer.

4,180,133

GUIDANCE SYSTEM FOR TOWED VEHICLES

Thomas J. Collogan, Greenfield, Wis.; David C. Boeding, Princeton; Michael P. Hermanson, Story City, both of Iowa, and Stanley P. Wellman, Bakersfield, Calif., assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jan. 12, 1978, Ser. No. 869,007

Int. Cl.[2] A01B *69/00*

U.S. Cl. 172—26 **18 Claims**

1. In combination, a towed farm implement having first and second opposite sides with a tool bar extending therebetween and a tongue structure extending forwardly from said tool bar, and

a guidance system for said implement comprising,

a compensating hitch means pivotally secured at its rearward end to the forward end of said tongue structure and adapted to be connected at its forward end to the lower links of a three-point hitch of a prime mover,

control means for selectively adjusting the position of said hitch means with respect to the lower links of a three-point hitch of a prime mover to which it is attached,

means for marking a furrow in the ground as said implement is towed, said marking means extending from said sides of said implement,

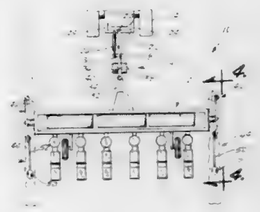
a follower extending from said implement to be operationally engaged by said furrow so that said implement is a predetermined distance from said furrow,

detecting means operatively connecting to said follower for electrically detecting the deviation of said implement from said predetermined distance from said furrow, and

an electronic circuit means electrically connecting said control means to said detecting means so that a predetermined deviation of said implement from said predetermined distance from said furrow activates said control means to adjust the position of said hitch means to align said implement at said predetermined distance from said furrow.

12. In combination with an implement having a tongue means rigidly connected thereto and extended forwardly therefrom, a compensating hitch means comprising,

an elongated swinging drawbar member having frontward and rearward ends and comprising a single rigid element extending from said frontward end to said rearward end,



said frontward end adapted for pivotal connection to a prime mover and said rearward end adapted for pivotal connection to said implement,

a hydraulic cylinder pivotally connected at one end to said drawbar member and adapted at the other end for pivotal connection to a prime mover, said drawbar member including hydraulic cylinder connecting means rigidly affixed to said rigid element, said one end of said hydraulic cylinder being directly connected to said connecting means such that the extension of the cylinder arm causes said drawbar to pivot in one transverse direction relative to said prime mover and the retraction of said arm causes said drawbar to pivot in the other transverse direction relative to said prime mover, and

means for controlling the extension and retraction of said cylinder arm,

said tongue means being directly pivotally connected to said rigid element at said rearward end of said elongated swinging drawbar member whereby said tongue means is transversely moved in unison with said rearward end of said elongated swinging drawbar member for direct corrective steering of said implement in response to pivotal movement of said drawbar member.

4,180,134

SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Dec. 14, 1977, Ser. No. 860,281

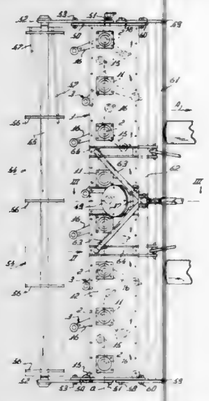
Claims priority, application Netherlands, Dec. 20, 1976, 7614117

Int. Cl.[2] A01B *19/06*

U.S. Cl. 172—59 **18 Claims**

1. A soil cultivating implement comprising a frame and a plurality of soil cultivating members rotatably mounted in a transverse row on an elongated hollow portion of said frame,

said frame portion extending transverse to the direction of travel and said members being rotatable about corresponding upwardly extending axes, driving means connected to oscillate said members about their axes and said driving means including eccentric drive means interconnected to said members, said drive means being housed within said frame portion and an input connected to transmit power to said driving means, said driving means comprising at least two eccentric mechanisms



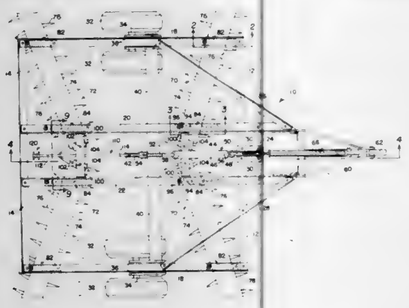
arranged one above the other on a common upwardly extending drive shaft that is located substantially centrally relative to said row of soil cultivating members when viewed from the rear, one eccentric mechanism being directly connected to a soil cultivating member and that member being adjacent one side of the midpoint of said frame portion, when viewed from the rear, said one mechanism also being directly connected to a further soil cultivating member that is second from the opposite side of said midpoint.

4,180,135

HYDRAULIC ANGLING MECHANISM FOR DISC HARROW GANGS

Eugen J. Birkenbach, Park Ridge, and Robert D. Woodworth, Clarendon Hills, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jul. 7, 1975, Ser. No. 593,511
Int. Cl.² A01B *21/02*
U.S. Cl. 172—407 **10 Claims**



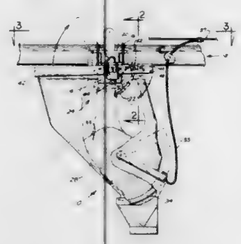
1. In a disc harrow of the type having a generally rectangular frame structure including a pair of spaced outside main longitudinal frame members and a pair of inside longitudinal intermediate frame members, pairs of front and rear disc gangs operatively associated with said frame structure on generally opposite sides of said intermediate frame members and having gang beams which are arranged in end-to-end relationship and carry disc blades designed for engagement with the ground, suspension means between said outside main longitudinal frame members and said gang beams providing a sliding pivot for the latter relative to the former, suspension means between said inside longitudinal intermediate frame member and said gang beams permitting sliding therebetween, a connector device extending between adjacent ends of the gang beams of each pair and adapted upon longitudinal shifting movement thereof to effect a change in angular relationship of the associated pair of disc gangs, a transverse pivot shaft mounted on said frame structure, having trailing wheel axle arms and a crank arm extending radially therefrom, said axle arms, pivot shaft and crank arm establishing, in effect, a bell crank arrangement whereby forward and rearward swinging movement of the crank arm will effect lowering and raising of the frame structure to bring the disc blades into and out of engagement with the ground, and an hydraulic cylinder effective between the frame structure and crank arm to swing the latter in opposite directions, the improvement which comprises: a floating link pivoted at one end to said crank arm and projecting slidingly through one of said connector devices, and an abutment member adapted for selective positioning lengthwise on said floating link forwardly and rearwardly of said one connector device and engageable therewith for longitudinal shifting thereof upon actuation of said cylinder, and cooperating means on said link and abutment member whereby the latter may be releasably mounted on the former in selected positions of longitudinal adjustment.

4,180,136

WEIGHT ACTUATED FEED DROP APPARATUS

Robert D. Jones, Oskaloosa, Iowa, assignor to Intraco, Inc., Oskaloosa, Iowa

Filed Sep. 15, 1978, Ser. No. 942,675
Int. Cl.² G01G *13/02, 13/18;* A01K *1/10*
U.S. Cl. 177—68 **11 Claims**



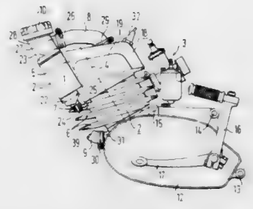
1. A weight actuated dispensing mechanism comprising:
a bracket means adapted to be attached to a conveyor system and having an inlet opening therein for receiving material from the conveyor system and an outlet opening for allowing said material to exit said bracket means by gravity;
a valve means pivotally attached along an axis to said bracket means for movement between a first position wherein said valve means closes said outlet opening of said bracket means and a second position wherein said valve means allows said outlet opening to be open;
a container means disposed below said bracket means for receiving material exiting said outlet opening;
a projection means on said valve means for automatically increasing the closing force on said valve as it closes; and
flexible line means attached to said valve means and extending over said projection means and being further attached to said container means and comprising a means for holding said container under said outlet opening.

4,180,137

LIQUID-COOLED ENGINE ARRANGEMENT FOR A TWO-WHEELED VEHICLE

Gerolf Wagner, Schwebheim, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 3, 1978, Ser. No. 883,325
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1977, 7707510[U]
Int. Cl.² B60K *11/04*
U.S. Cl. 180—229 **12 Claims**



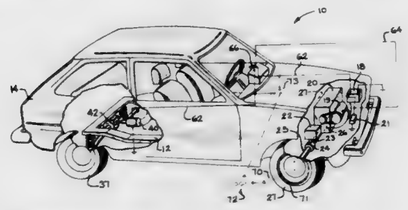
1. A liquid-cooled engine arrangement for a two-wheeled vehicle and the like including a frame, the arrangement comprising:
(a) a motor unit including a cylinder having an axis, a cylinder head fixedly fastened to one axially terminal portion of said cylinder and a crankcase fixedly fastened to the other axially terminal portion of said cylinder, said unit being formed with a recess therein;
(b) fastening means for fastening said motor unit to said frame;
(c) a radiator fixedly fastened to said unit in said recess and exposed to the ambient atmosphere during movement of said vehicle; and
(d) conduit means connecting said radiator to said cylinder for circulating a cooling liquid between said cylinder and said radiator.

4,180,138

VEHICLE HAVING AUXILIARY DRIVE MECHANISM

Dennis W. Shea, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Sep. 30, 1977, Ser. No. 838,283
Int. Cl.² B60L *11/14, 11/12*
U.S. Cl. 180—65 A **8 Claims**



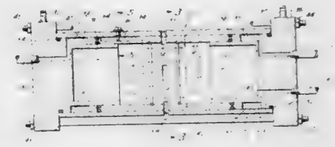
1. A vehicle comprising:
a first wheel and a first axle adapted for operative driving engagement with said first wheel;
an internal combustion engine adapted for operative driving engagement with said first axle;
generating means driven by said internal combustion engine;
a battery adapted to be charged by said generating means;
a second wheel, a second axle said second wheel being selectively rotatable relative to said second axle and means for selectively drivingly engaging said second axle with said second wheel;
an electric motor drivingly engaged with said second axle and selectively drivingly engageable with said second wheel through said second axle upon actuation of said electric motor, said electric motor drivingly connected to said battery; and
means for selectively actuating and deactuating said electric motor.

4,180,139

FLUID OPERATED SEISMIC GENERATOR

Garland H. Walker, Houston, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

Continuation-in-part of Ser. No. 804,116, Jun. 6, 1977, abandoned. This application May 12, 1978, Ser. No. 905,491
Int. Cl.² G01V *1/38*
U.S. Cl. 181—120 **15 Claims**



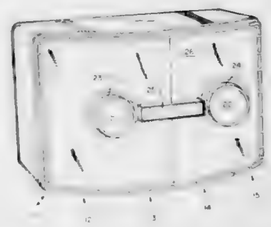
1. A seismic sound source for releasing gas under pressure into a body of water, comprising:
a chamber for containing the gas including an exhaust port through which the gas may be released;
a valve member mounted for motion within the chamber and positionable against the exhaust port in a plurality of sealing positions to block release of the gas from the chamber, the valve member including an orifice therethrough; and
an actuator for rapidly moving the valve member to and fro in a continuous linear motion from a first sealing position to a second different sealing position through an open position in which the orifice is aligned with the exhaust port to release some of the gas.

4,180,140

LOUDSPEAKER PORTING

Neal H. Marshall, Bolton, Mass., assignor to Bose Corporation, Framingham, Mass.

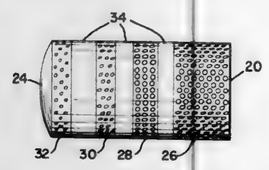
Filed Aug. 31, 1978, Ser. No. 938,404
Int. Cl.² H05K *5/00;* A47B *81/06*
U.S. Cl. 181—156 **3 Claims**



1. In a ported loudspeaker system having a cabinet with a baffle plate supporting a plurality of high compliance loudspeaker drivers thereon with port tube means mounted in openings therein and having a port tube mass for resonating with the cabinet compliance and damping means in said port tube means for reducing the Q of the resonant system comprising the cabinet compliance and the port tube mass, the improvement comprising,
means for detachably securing said damping means to said port tube means including snap cap means detachably

securing said damping means over an end of said port tube means normally inside said cabinet,
grill means adjacent said baffle plate for covering said loudspeaker drivers and formed with open area accommodating said port tube means,
grill retaining means engaging said grill means to urge the latter towards said loudspeaker drivers covered thereby and formed with an open area for accommodating said port tube means,
and fastening means engaging the end of said port tube means outside said cabinet and for urging said grill retaining means toward said grill means.

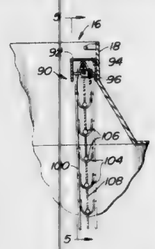
4,180,141
DISTRIBUTOR FOR GAS TURBINE SILENCERS
Frederick V. H. Judd, 1465 Strong Ave., Copiagne, N.Y. 11726
Continuation-in-part of Ser. No. 634,848, Nov. 24, 1975, Pat. No. 4,105,089. This application Jan. 27, 1978, Ser. No. 872,746
The portion of the term of this patent subsequent to Aug. 8, 1995, has been disclaimed.
Int. Cl.[2] F01N *1/08, 1/10*
U.S. Cl. 181—264 **3 Claims**



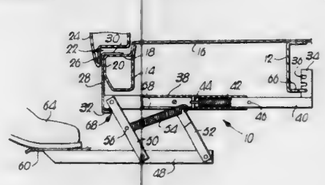
1. The combination of a gas flow distributor and a sound silencer for muffling the vibrations and sounds of a noisy turbulent exhaust gas stream emitted from a combustion gas turbine, said flow distributor comprising an elongated chamber, closed by cylindrical walls on all sides and a wall at one end, having an open inlet for connecting to a gas turbine exhaust, said chamber being sized to accommodate a turbulently noisy flowing stream of combustion gas exhausted from said turbine, means for solidly coupling the open end of said flow distributor chamber to the exhaust emitted from said turbine, perforations passing through and disposed about the walls of said flow distributor in number, size and spacing graduated from lower to greater gas flow restriction from said open end inlet to the lateral perforation outlets to emit the gas stream passing through said flow distributor in substantially even radial nonturbulent flow therefrom, shielding means deflecting the exhaust gas stream emitted by said flow distributor in flow radially therefrom through a splitter type noisy sound muffling means mounted to receive and split said radial exhaust gas flow into smaller parallel streams and muffle the noisy sound emitted by each of said streams in flow over the surfaces thereof, said splitter type muffling means comprising spaced parallel porous sound absorbing elements.

4,180,142
EMERGENCY ESCAPE OPENABLE SKYLIGHT
Richard Sevillano, 611 Reach St., and Rocco Bruno, Jr, 847 Foulkrod St., both of Philadelphia, Pa. 19111
Filed May 25, 1978, Ser. No. 909,733
Int. Cl.[2] E04F *11/04;* **E06B** *5/00*
U.S. Cl. 182—77 **1 Claim**

1. A skylight usable as an emergency escape route, comprising: a housing having sidewalls; a cover, a substantial area of said cover being constructed of a transparent material; a hinge attaching the cover to one of the sidewalls of said housing; means for resiliently biasing said cover to the open position; latch means for maintaining said cover in a normally closed position against the force of said resilient biasing means; shock absorber means mounted between said cover and said housing for dampening the motion of said cover; and retractable ladder means mounted at least partially to said housing, said retractable ladder means including a plurality of rigid ladder rungs supported in the extended position by a flexible ladder rung support means having ladder rung supports at predetermined ladder rung positions, said flexible ladder rung support means being comprised of a pair of flexible ladder rails, each ladder rail being comprised of a pair of parallel flexible straps, said rung supports being comprised of flexible straps interconnecting said parallel flexible straps, a pully arrangement in said retractable ladder means including ropes passing over the pulley arrangement for raising and lowering said flexible ladder rung support means, said retractable ladder means being maintained by ladder latching means in a normally retracted position and being openable to an extended position for emergency exit through the skylight when said cover is in the open position.

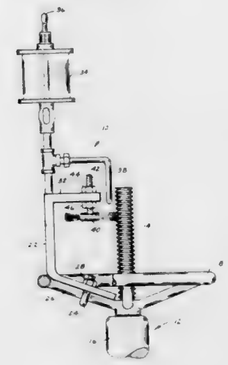


4,180,143
STEP FOR VEHICLES
George D. Clugston, R.R. #3, Box 203, Pittsburg, Kans. 66762
Filed Jul. 21, 1978, Ser. No. 926,864
Int. Cl.[2] B60R *3/02*
U.S. Cl. 182—91 **5 Claims**



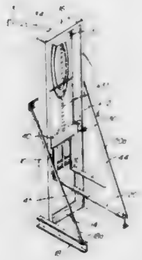
1. Step apparatus for vehicles, including:
parallel motion type mounting means having a normally upper member, means adapted for fastening said member to a vehicle, a normally lower arm, and swingable link means for suspending said arm from said member,
said mounting means being shiftable between a storage condition thereof in which said arm is disposed adjacent said member and a use condition in which said arm is disposed further from said member and said link means are disposed in a position inclined generally downwardly and away from vertical toward one extremity of said arm;
a step carried by said arm adjacent the other extremity thereof; and
means mounted on said upper member for blocking said link means against further swinging movement toward vertical when said mounting means is shifted from said storage condition thereof into said use condition thereof, whereby said link means are maintained by gravity in said inclined position thereof when said mounting means is in said use condition thereof and the weight of a user is applied atop said step, thereby automatically stabilizing and preventing shifting of said step when the latter is mounted by a user, without the need for a locking device.

4,180,144
VALVE STEM CLEANER AND LUBRICATOR
Harold R. Adams, St. Francisville, Ill. 62460
Filed Mar. 2, 1978, Ser. No. 882,557
Int. Cl.[2] F16N *11/00*
U.S. Cl. 184—1 R **11 Claims**



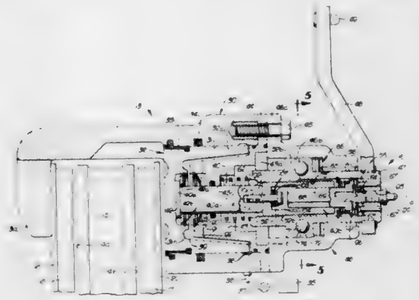
1. A device for cleaning threaded valve stems on valves having a valve housing comprising a brush, means for mounting said brush on the valve housing, said brush having bristle elements adapted to contact the threads in said valve stem, the brush being comprised of a ring-like brush holder, said holder being comprised of semi-circular members having first end portions pivotable together in order that the holder can be opened and fitted around the valve stem and means for connecting a second end of said members together in closed position.

4,180,145
STATIONARY FORKLIFT AND METHOD OF USE
Vidal D. Capps, 1601 S. Ivanhoe, Denver, Colo. 80224
Filed Jul. 17, 1978, Ser. No. 924,945
Int. Cl.[2] B66B *11/04*
U.S. Cl. 187—17 **6 Claims**



1. A stationary forklift device comprising:
(a) frame means including a pair of inwardly facing upright channels for supporting the running gear of a carriage, and lateral brace means mounted on the bottom of said channels against a load carried by a carriage;
(b) a carriage mounted in said inwardly facing channels, having extending lift fork tines over said brace means;
(c) running gear for said carriage including upper rollers secured to an upper portion of said carriage at about 45° directed into the forward corners of said upright channels and lower rollers secured to a lower portion of said carriage at about 45° directed into the rear corners of said upright channels, said rollers combining to counteract against movement of said carriage under a load on said lift forks and torque of a laterally uneven load; and,
(d) means for raising and lowering said carriage.

4,180,146
BRAKE ASSEMBLY WITH DUAL COMPENSATION ADJUSTMENT
Franklin B. Airheart, Northridge, Calif., assignor to Hurst Performance, Inc., Warminster, Pa.
Filed Mar. 13, 1978, Ser. No. 885,510
Int. Cl.[2] F16D *65/56*
U.S. Cl. 188—71.8 **15 Claims**



1. In a brake assembly, the combination comprising
(a) a carrier having a bore, and a piston slidable axially in the bore to transmit force of fluid pressure acting on the piston to a brake pad,
(b) shaft structure defining an axis and extending axially to transmit auxiliary thrust to the piston, said structure including first and second shaft sections having a first lost motion interconnection,
(c) a rotary actuator member rotatable about said axis,
(d) coupling means responsive to rotation of said member in one direction to effect axial advancement of the shaft structure toward the piston and responsive to rotation of said member in the opposite direction to allow axial retraction of the shaft structure,
(e) first wear compensation mechanism subject to adjustment to axially shift the shaft structure in response to fluid pressure produced axial displacement of the piston beyond a predetermined amount, and
(f) second wear compensation mechanism subject to rotary adjustment to axially shift the shaft structure in response to rotation of said member beyond a predetermined amount,
(g) said first and second compensation mechanisms being operatively interconnected via the shaft sections whereby shifting of the shaft structure by one of said compensation mechanisms serves to effect a corresponding compensating adjustment of the other of said wear compensating mechanisms,
(h) the first shaft section being coupled to the first compensating mechanism, and the second shaft section coupled to the second compensating mechanism, the second compensating mechanism including interengageable elements respectively associated with the second shaft section and said rotary actuator member to provide unidirectional rotary coupling which is releasable in response to rotation of said member in said opposite direction, there being a

second lost motion connection between the rotary actuator and one of said elements, and

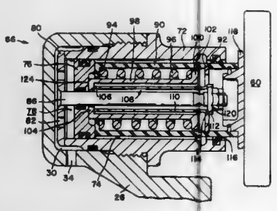
(i) said coupling means including a sleeve having threaded engagement with the shaft second section, whereby the sleeve may be displaced axially with the shaft structure to axially advance the shaft structure endwise toward the piston, the shaft second section also being rotatable relative to the sleeve in response to said rotary adjustment of the second wear compensation mechanism, thereby to axially advance the shaft second section relative to said sleeve, to compensate for brake wear.

4,180,147

INTEGRAL PISTON AND ADJUSTER FOR A BRAKE

Richard A. Tjarksen; Robert J. Keresztes, and Eugene E. Harnish, all of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Apr. 3, 1978, Ser. No. 892,448
Int. Cl.² F16D 65/54
U.S. Cl. 188—71.8 **4 Claims**



1. In a brake having a plurality of friction disc located between a pressure plate and a backing plate, an actuator mechanism for moving the pressure plate toward the backing plate in response to an operational brake signal, said actuator mechanism comprising:

a housing having a bore therein;

piston means located in said bore for establishing a chamber therein, said chamber being connected to a source of fluid;

a stem fixed to said housing and extending through said piston means into said bore, said stem providing a guide to maintain said piston means in axial alignment in said bore on movement of the piston means;

a first tube member having a first cylindrical body with a radially inwardly projecting lip extending from a first end for engaging said piston means and a second end, said first cylindrical body being located in said bore by a first bearing surface and constructed of an insulator material to reduce the transfer of thermal energy from said seond end to both the piston means and housing;

a spring concentrically positioned on the interior of said first tube member having a first end engaging said inwardly projecting lip of said first cylindrical body and a second end;

a second tube member having a second cylindrical body concentric to said first cylindrical body and having a radially inwardly projecting flange on a first end and a radially outwardly projecting flange on a second end, said outwardly projecting flange engaging said second end of said spring;

keeper means attached to said first cylindrical body for engaging said radially outwardly projecting flange to hold said spring in a caged position between said inwardly projecting lip on the first cylindrical body and said outwardly projecting flange on the second cylindrical body;

a third tube member having a third cylindrical body concentric to said second cylindrical body, said third cylindrical body having a first diameter section connected to a second diameter section by an annular ramp section, said first diameter section engaging said inwardly projecting flange on said second cylindrical body; and

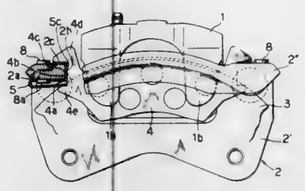
button means secured to said stem and engaging said second diameter and tapered sections of said third cylindrical tube to position said piston means in said bore to establish the size of said chamber and to establish an air gap between the second end of the first cylindrical member and the pressure plate, said piston means responding to a pressure of the fluid in said chamber corresponding to the operational brake signal by overcoming said spring and moving said first cylindrical body through said air gap and into engagement with said pressure plate while at the same time said piston means engaging said inwardly projecting flange on said second cylindrical body to form a solid link between said piston means and said button means through said third cylindrical body, said piston means thereafter simultaneously moving said first, second and third cylindrical bodies toward said pressure plate and said pressure plate toward said backing plate to compress the plurality of friction disc and effect a brake application, said friction disc creating thermal energy during said brake application, said button means elastically and plastically expanding said first diameter section upon movement of said third cylindrical body by said piston means to lock said button means in a fixed position with respect to said third cylindrical body and hold said third cylindrical body in a stationary position upon termination of fluid pressure in said chamber to allow said spring to return said piston means toward said chamber and reestablish substantially the same dimensional air gap after every brake application, said air gap forming a barrier to reduce the transfer of thermal energy between the pressure plate and said first cylindrical body, said insulator material of said first cylindrical body further reducing the transfer of thermal energy from said second end toward said first end to prevent said thermal energy from affecting the movement of said piston means in the bore and said third cylindrical body with respect to the button means.

4,180,148

ANTI-RATTLE SPRING MEMBER FOR A DISC BRAKE PAD

Teruo Souma, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 15, 1978, Ser. No. 933,747
Claims priority, application Japan, Aug. 24, 1977, 52-101332
Int. Cl.² F16D 65/02
U.S. Cl. 188—73.5 **6 Claims**



1. A disc brake having a disc axis, the brake comprising:

(a) a disc rotor rotatable about said disc axis;

(b) a stationary supporting member having a pair of circumferentially spaced torque receiving arms extending substantially parallel to said disc axis, said arms being provided with a pair of substantially radially extending pad-insert-slots formed on mutually confronting portions thereof;

(c) a pad assembly having, on each lateral end, a respective engaging-slot for slidably engaging with respective ones of said torque receiving arms, a respective ledge on the nearer side of each said engaging-slot to said disc axis, and a respective lip, protruding laterally beyond each said ledge, formed on the remoter sides of said engaging slots from said disc axis;

(d) an actuator for urging said pad assembly onto said disc rotor; and

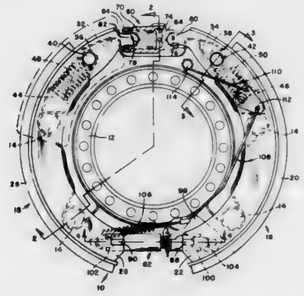
(e) a pair of anti-rattle springs made of stainless steel material, each of said anti-rattle springs being an integrally formed element with (1) an anti-rattling spring portion disposed between said pad assembly and respective ones of said torque receiving arms for biasing said pad assembly in a direction normal to said disc axis to prevent rattling of said pad assembly when the brake is in vibration, (2) an anti-friction-increasing shim portion extending from said anti-rattling spring portion to cover a contacting surface of the corresponding said torque receiving arm upon which said pad assembly engaging-slot is engageable, to prevent friction from increasing due to rust between said pad assembly and the corresponding said torque receiving arm, and (3) a covering portion extending from said anti-friction-increasing shim portion for covering an inner portion of the corresponding said pad-insert-slot so as to restrict the size of opening of the same such that the corresponding said ledge is allowed to pass through and the corresponding said lip is not allowed to pass thereby facilitating radial positioning of said pad assembly to said torque receiving arms.

4,180,149

DRUM BRAKE AND MOUNTING MEANS THEREFOR

Donald D. Johannesen, and Orla L. Holcomb, Jr., both of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 784,010, Apr. 4, 1977, abandoned. This application Jul. 19, 1978, Ser. No. 925,912
Int. Cl.² F16D 51/14
U.S. Cl. 188—340 **5 Claims**



1. A drum brake for a vehicle comprising:

a backing plate secured to a non-rotatable portion of the vehicle, said backing plate including a plurality of radially circumferentially spaced, extending lugs and a pair of radially extending flanges having recesses thereon;

at least a pair of brake shoes each having axial inner and outer webs engageable with said lugs to retain said brake shoes substantially axially fixed relative to said backing plate while allowing radial movement of said brake shoes during a braking application, said pair of brake shoes including portions between said webs extending into said recesses on said backing plate; and

resilient means biasing the portions of said pair of brake shoes into engagement with said backing plate recesses whereby said pair of brake shoes are movable radially during a braking application to move the portions out of engagement with the recesses in opposition to said resilient means;

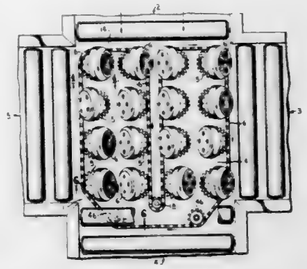
said axial inner and outer webs having an outer radial dimension and an inner radial dimension to define a radial width therebetween, said lugs and said flanges extending into the radial width between said webs and said resilient means being circumferentially disposed within the radial width between the axial inner and outer webs, said resilient means remaining entirely within said radial width between the axial inner and outer webs when said brake shoe portions are extended into said recesses on said backing plate.

4,180,150

MULTI-DIRECTIONAL TRANSFER DEVICE

Archie S. Moore, 3925 NE. 54th St., Kansas City, Mo. 64119

Filed Oct. 27, 1977, Ser. No. 845,876
Int. Cl.² B65G 47/00
U.S. Cl. 198—366 **5 Claims**



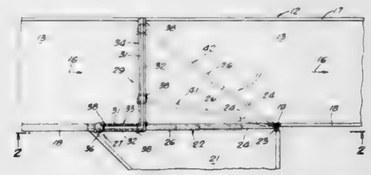
2. A transfer station for transferring articles from a conveyor, said transfer station comprising a field of single wheels that support said articles during the transfer thereof, each of said wheels being tilted at a non-vertical fixed angle from a horizontal plane and drivable, and steerable in a horizontal plane about an upwardly projecting axis, said field of single tilted wheels being positioned in a plurality of rows with individual wheels in a single row being tilted in opposite directions but driven for article movement in the same direction.

4,180,151

FLOW DIVERTING GATE FOR CONVEYORS

LeRoy E. Goertz, Upland, Calif., assignor to Sunkist Growers, Inc., Sherman Oaks, Calif.

Filed Jul. 24, 1978, Ser. No. 927,582
Int. Cl.² B65G 47/76
U.S. Cl. 198—367 **8 Claims**



1. A flow control assembly in combination with a longitudinal conveyor including longitudinal conveyor means and a sidewall disposed along one side thereof, the sidewall forming an opening along its length, the flow control assembly comprising an extendable and retractable gate having one end pivotably mounted adjacent one end of the opening in the sidewall and a guide unit operatively coupled with an unpivoted end of said gate, said guide unit including first guide means for extending said gate to a position to close the sidewall opening and for retracting said gate to form an opening therein, said guide unit including a second guide portion for

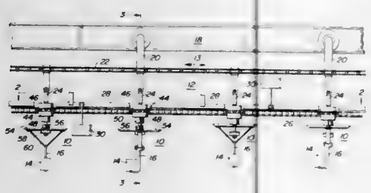
moving the unpivoted end of said gate across the conveyor means in order to selectively reduce the effective flow capacity of the conveyor.

4,180,152

LOAD BEARING PENDANT SYSTEM

Robert Sefcik, 3 Briar La., Cherry Hill, N.J. 08002

Filed Feb. 22, 1978, Ser. No. 880,200
Int. Cl.² B65G *17/32, 37/00*
U.S. Cl. 198—377 **10 Claims**



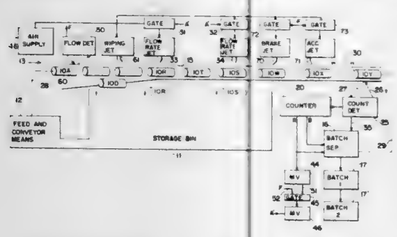
1. A load bearing pendant system comprising:
(a) means for displacing said load bearing pendant system in a linear direction substantially normal to a vertically directed axis line;
(b) a hanger assembly threadedly coupled to said displacement means adapted to releaseably capture objects mounted thereon; and,
(c) hanger drive means rotatively coupled to said displacement means and threadedly engageable with said hanger assembly for (1) rotatively displacing said hanger assembly about said vertically directed axis line when said hanger drive means is threadedly engaged to said hanger assembly, and (2) permitting said hanger assembly independent rotational displacement with respect to said hanger drive means when said hanger drive means is threadedly disengaged from said hanger assembly.

4,180,153

HIGH SPEED BATCH COUNTING APPARATUS

Ravi C. Krishnan, Bethesda, and Charles M. Blackburn, District Heights, both of Md., assignors to Sigma Systems, Inc., Capitol Heights, Md.

Filed Apr. 27, 1978, Ser. No. 900,729
Int. Cl.² B65G *47/28*
U.S. Cl. 198—425 **17 Claims**



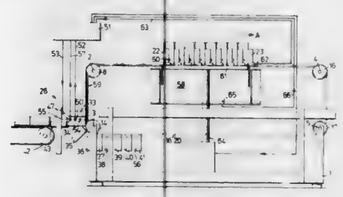
17. Batching apparatus for counting out batches of pieces flowing along a stream of continuously moving pieces including batch separating means receiving a counted number of pieces from said stream, means producing a greater gap separation between pieces of two successive batches in said stream at a position before the stream enters said batch separating means and means operable during said gap actuating said batch separating means.

4,180,154

DUAL INSIDE/OUTSIDE CONVEYORS WITH SEPARATE DRIVES

Claes-Göran Andersson, Göthenborg, Sweden, assignor to Wikings Mekaniska Verkstad AB, Göthenborg, Sweden

Filed Apr. 4, 1978, Ser. No. 893,380
Claims priority, application Sweden, May 17, 1977, 7705833
Int. Cl.² B65G *43/08*
U.S. Cl. 198—466 **4 Claims**



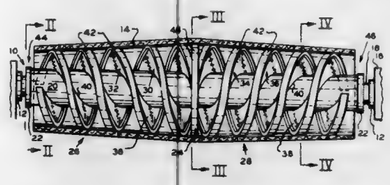
1. A conveying device for conveying groups of objects (29–32) from an infeed station (28) to an outfeed station (58) by means of two endless conveyors (18, 19; 20, 21), each of which carries at least one array of pick-up devices (33–41), characterized by: separate drive means (6, 7) arranged a) to individually move the two conveyors independently of one another in a direction from the infeed station to the outfeed station, b) to drive the respective conveyors stepwise to index the pick-up devices carried thereon through the infeed station for picking up at least one object during the dwell period between each movement step; and (c) to drive the respective conveyors in a continuous movement between the infeed station and the outfeed station, both of the conveyors traversing the same path during their respective moments.

4,180,155

MULTIPLE PITCH SELF-CLEANING BELT PULLEY

Ronald A. Stevick, Cement City, Mich., assignor to Industrial Service & Manufacturing Co., Clark Lake, Mich.

Continuation-in-part of Ser. No. 746,304, Dec. 1, 1976, abandoned. This application Mar. 13, 1978, Ser. No. 885,862
Int. Cl.² B65G *45/00*
U.S. Cl. 198—498 **5 Claims**



1. A pulley for a belt conveyor or the like adapted to primarily rotate in a given direction about a longitudinal axis and characterized by its self-cleaning and belt supporting ability comprising, in combination, a shaft defining an axis of rotation, said shaft including first and second ends and a central region intermediate said ends, a plurality of radially disposed webs formed of plate material helically circumscribing said shaft, said webs each including an inner edge disposed adjacent said shaft and an outer edge radially spaced from said shaft, at least two webs extending from said central region to said first end constituting a first web set and at least two webs extending from said central region to said second end constituting a second web set, the webs of a set being helically disposed about said shaft in a common direction and each web having an inner end located at said central region and an outer end located adjacent a common shaft end, said webs of a set being interspaced between each other defining a multiple helix wherein a
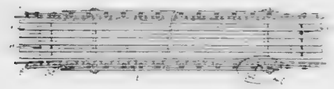
plane at right angles to said shaft axis intersecting a web set intersects at least two web outer edges, the webs of said first set being helically disposed about said shaft in a direction opposite to that of the webs of said second set and in such a direction relative to said given direction of pulley rotation that foreign matter within a web set is axially translated in a direction from said shaft central region toward a shaft end for discharge from the web at a shaft end, a circular disc affixed to said shaft central region lying in a plane substantially perpendicular to said shaft axis, said disc having an outer edge defining a diameter substantially equal to the diameter of said webs' inner ends constituting a belt supporting periphery and said webs' inner ends terminating at said disc, said webs' and disc's outer edges constituting a belt supporting periphery and being of an axial dimension greater than the thickness of the plate material forming said webs and disc.

4,180,156

DEVICE FOR HANDLING FLASKLESS MOULDS

Alexei I. Popov, ulitsa Geroev Truda, 29, kv. 267; Vladimir D. Pepenko, pereulok Maryanenko, 1, kv. 9; Jury G. Vinjukov, ulitsa Mayakovskogo, 11, kv. 15; Leonid I. Matjurin-Veretennikov, ulitsa Timurovtsev, 17, kv. 19; Vladimir M. Stepanov, Pavlovo-pole, 5 mikroraion, 75, kv. 14, and Viktor G. Grubman, ulitsa Dzerzhinskogo, 65, kv. 24, all of Kharkov, U.S.S.R.

Filed Jun. 20, 1977, Ser. No. 808,651
Int. Cl.² B65G *15/20*
U.S. Cl. 198—726 **6 Claims**



1. A device for handling flaskless moulds, comprising: a stationary bed adapted for arranging flaskless moulds assembled into a horizontal stack; and a means for moving a stack of flaskless moulds along said stationary bed comprising: two sprocket endless chains having upper and lower horizontal runs running along both sides of said stationary bed; grips mounted on each of said endless chains for retaining a stack of flaskless moulds during travel along said stationary bed, the grips on one chain always facing the grips on the other chain; guides associated with the upper horizontal runs for top horizontal portions of said endless chains, said guides being positioned so as to provide the drawing together of the top horizontal portions of said endless chains above said stationary bed so that the grips are brought smoothly to and from the stack of the flaskless moulds.

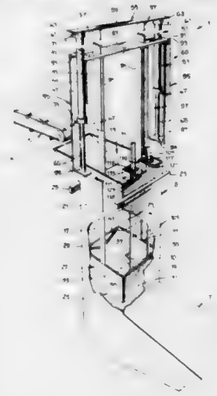
4,180,157

APPARATUS FOR HANDLING MANURE

Georges H. Bessette, 185, 15e Ave., Iberville, Québec, Canada

Filed Mar. 30, 1978, Ser. No. 891,841
Claims priority, application Canada, Feb. 22, 1978, 297538
Int. Cl.² B65G *25/04*; F04B *21/04*
U.S. Cl. 198—747 **8 Claims**

1. Apparatus for handling manure, comprising:
a passageway for receiving the manure through on inlet end;
plunger means slidable in the passageway for pushing manure through the passageway in a direction from the one inlet end toward the other end, said plunger means comprising a pair of swinging doors movable between a first position were they close the passageway and a second position where they open the passageway;
first moving means connected to the plunger means for moving the same in the passageway toward and away from the one inlet end; and
second moving means connected to the pair of swinging doors of the plunger means for moving the door to the first closed position when the plunger means moves away from the one inlet end, and for moving the doors to the



second position when the plunger moves toward the one inlet end.

4,180,158

CONVEYOR ASSEMBLY FOR USE IN CHECK OUT STANDS

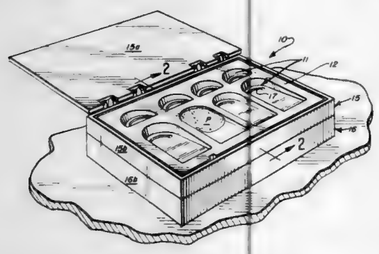
Roderick J. Frederick, 1205 6th Ave. South, Seattle, Wash. 98134

Filed Apr. 28, 1978, Ser. No. 901,150
Int. Cl.² B65G *15/02*; A47F *9/02*
U.S. Cl. 198—831 **14 Claims**



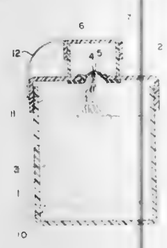
1. A conveyor assembly comprising a flexible disc shaped circular belt folded over under itself to form an upper product carrying run and a lower run, said upper run being substantially larger than said lower run and including the center of said circular belt, means confining said belt for rotation about a fixed vertical axis extending through said center, a stationary support underlying a substantial portion of said upper run, means drivingly engageable with said belt for imparting rotation to said belt about said axis, and guide means engageable along the folded portion of said belt connecting said upper and lower runs to maintain said belt in predetermined folded configuration during rotation thereof, said means confining said belt for rotation about said axis comprising a part secured to the upper run of the belt at the central region of said belt extending about said center.

4,180,159
MIXING TRAY ASSEMBLY
Asami Tanaka, 4840 Foster St., Skokie, Ill. 60077
Filed Apr. 13, 1978, Ser. No. 895,940
Int. Cl.[2] B65D *81/22;* **B67D** *3/00;* **B44D** *7/00*
U.S. Cl. 206—63.5 **7 Claims**



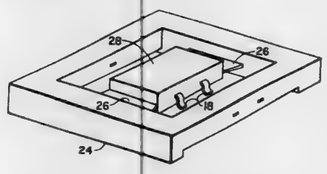
1. A tray assembly for use in mixing at least one ingredient with a liquid to form a product having a predetermined moisture content and maintaining the moisture content thereof while the product is disposed within the tray assembly; said tray assembly comprising a receptacle having a surface for mixing and supporting thereon the product and an elongated trough in said surface for delivering the liquid to a substantial part of the supported product, a reservoir for the liquid mounted in spaced subtending relation with respect to said receptacle, and an elongated wick having one end thereof disposed within said reservoir and adapted to be immersed within the liquid accommodated therein and a second end thereof disposed within said receptacle and communicating with said trough and the portion of said surface adjacent thereto whereby the moisture content of the product is replenished by capillary action of the liquid from the reservoir through the wick to the trough and product.

4,180,160
WET TISSUE CONTAINER
Kiyohisa Ogawa, Funabashi, and Seiji Eshima, Mitaka, both of Japan, assignors to Wakodo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 31, 1978, Ser. No. 929,720
Claims priority, application Japan, Aug. 10, 1977, 52-107297[U]
Int. Cl.[2] B65D *81/22, 83/00;* **B65H** *1/00;* **B65F** *3/00*
U.S. Cl. 206—210 **5 Claims**



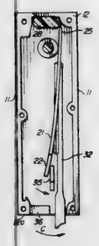
1. A wet tissue container comprising a receptacle for storing and dispensing a length of tissue strip having spaced perforation lines, a liquid in said receptacle, a cap removably connected to receptacle and provided with a wet tissue drawing member therein, said drawing member being dome-shaped and constituted of a material of high elasticity, and a tissue drawing hole in the apex of said drawing member having a fine diameter whereby when said wet tissue is drawn through said drawing hole excessive moistening liquid in said tissue is squeezed therefrom and returned to said receptacle.

4,180,161
CARRIER STRUCTURE INTEGRAL WITH AN ELECTRONIC PACKAGE AND METHOD OF CONSTRUCTION
David L. Henrickson, Phoenix; John J. Kaiser, Scottsdale, both of Ariz.; William C. Koehn, Pollockshields, Scotland, and David P. Raven, North Wales, Pa., assignors to Motorola, Inc., Schaumburg, Ill.
Division of Ser. No. 768,298, Feb. 14, 1977, Pat. No. 4,102,039.
This application May 4, 1978, Ser. No. 902,628
Int. Cl.[2] B65D *81/06, 85/30, 75/22*
U.S. Cl. 206—328 **4 Claims**



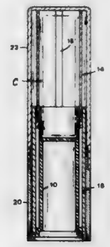
1. A carrier structure integral with an electronic component for protecting the electronic component comprising:
(a) a plastic encapsulated device;
(b) a plastic disposable packaging means disposed around said device; and
(c) frangible plastic tab means connected between said device and said package means for supporting said device in a fixed relationship to said disposable packaging means, and a pair of interfaces between said tab means and said device and said tab means and said packaging means being constituted by a continuous integral bond.

4,180,162
COMBINATION DISPENSER-DISPOSAL CARTRIDGE FOR A SURGICAL BLADE
Herbert C. Magney, 433 W. Linda La., Chandler, Ariz. 85224
Filed Dec. 4, 1978, Ser. No. 966,134
Int. Cl.[2] B65D *83/10*
U.S. Cl. 206—363 **1 Claim**



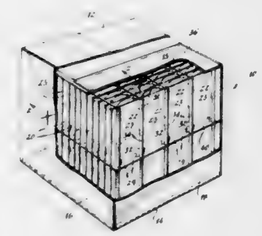
1. A combination dispenser-disposal cartridge for a surgical blade, specially adapted for machine-loading of said blade therein, comprising:
(a) means defining an elongate open-topped box portion including floor, side walls and end walls and having an aperture in one end wall thereof;
(b) blade-positioning means formed integrally with said box portion, including
(i) means defining a slot extending upwardly from the floor of said box along a side of said aperture, said slot being dimensioned to receive the shank end of a surgical blade, and
(ii) blade tip holding means comprising at least two members extending upwardly from the floor of said box and spaced apart to receive and frictionally engage the tip and at least a portion of the cutting edge of said blade therebetween,
said slot and blade tip holder cooperating to position said blade such that the shank portion thereof curvingly extends from the tip rearwardly to the shank portion thereof;
(c) a cover member for the open top of said box portion having downwardly projecting positioning studs which cooperate with mating recesses in the side walls of said box member to position said cover on the open top of said box member;
(d) blade stripping means for separating a used surgical blade from a scalpel handle, including
(i) a finger member extending upwardly from the floor of said box portion intermediate the side walls thereof for urging the shank end of said blade away from said scalpel handle and for stripping said blade from the boss thereof as said scalpel handle is withdrawn from said aperture, and
(ii) an abutment shoulder formed in the lower edge of said aperture for contacting the lower rear edge of said blade as it is stripped from said scalpel handle boss and for retaining said blade within said box portion when said scalpel handle is withdrawn therefrom.

4,180,163
CYLINDRICAL CONTAINER
Libero Grioni, Via San Francesco d'Assisi, 9, Trezzano Sul Naviglio (Milan), Italy
Filed Nov. 13, 1978, Ser. No. 959,615
Claims priority, application Italy, Nov. 18, 1977, 22769/77[U]
Int. Cl.[2] A45D *40/00*
U.S. Cl. 206—385 **5 Claims**



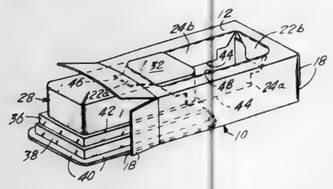
1. A cylindrical container particularly suitable for containing lip-sticks, cocoa-butter, shaving-soap or sticks and the like cosmetical products, characterized in that it consists of four coaxial hollow cylindrical members, inserted into one another and effective to mutually slide, in which:
the first cylindrical member, the innermost one, is provided, at the upper portion thereof, with a small cup for containing the lower portion of the product to be housed and, laterally, axially and all along the length thereof, with a projecting nose;
the second cylindrical member has an inner diameter greater than the outer diameter of the first cylindrical member thereby keying thereonto, and it is provided, on the inner surface thereof, axially and all along the length thereof, with a slot thereinto inserts and therethrough slides the projecting nose of the first cylindrical member and, on the outer surface thereof, diametrically and at the lower end thereof, with two projecting and slanted nose members;
the third cylindrical member has an inner diameter greater than the outer diameter of the second cylindrical member, thereby keying onto this latter, behind provided, on the inner surface thereof, which two helical slots crossing one another, in each slot inserting one of the two projecting nose members of said second cylindrical member, and
the fourth cylindrical member, acting as the handle of the container, having an inner diameter greater than the outer diameter of the third cylindrical member, and having a height lower than that of said cylindrical members and being fixed to the lower portion of the first cylindrical member.

4,180,164
PACKAGING ARRANGEMENT FOR U-SHAPED FLUORESCENT LAMPS
Andrew Durden, Trumbull, and Malcolm E. Sorrell, Norwalk, both of Conn., assignors to Voltarc Tubes, Inc., Fairfield, Conn.
Filed Oct. 25, 1978, Ser. No. 954,329
Int. Cl.[2] B65D *85/42, 85/62, 81/02*
U.S. Cl. 206—419 **8 Claims**



1. A packaging arrangement for housing a plurality of U-shaped fluorescent lamps having an outer corrugated container comprising in combination,
(a) a plurality of first corrugated inserts extending across a first dimension of said container having a plurality of aligned, spaced slots extending inward a predetermined distance from a first edge thereof and forming tongues therebetween,
(b) a plurality of tabs having inwardly extending opposed concave sides shaped to receive the legs of U-shaped fluorescent lamps spaced between said slots of said first insert and extending from the second edge thereof opposite said first edge, said tabs having score lines along a lower extremity thereof above said opposed concave sides adapted when bent along said score lines to extend between and receive in the opposed concave sides thereof the legs of a U-shaped fluorescent lamp,
(c) a plurality of second corrugated inserts extending across a second dimension of said container having a plurality of aligned, spaced slots which are complementary to the aligned, spaced slots of said first insert, and
(d) said first and second inserts being mounted on each other in said container with said slots being in alignment and said inserts between positioned orthogonally with respect to each other forming a plurality of rectangular compartments therein adapted to house U-shaped fluorescent bulbs therein which are received in each compartment by bending said shaped tabs of said first insert along said score lines which captivates the legs of the U-shaped lamp in the compartments and thereby limits movement therein.

4,180,165
BLISTER PACKAGE
Morris W. Kuchenbecker, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.
Filed Apr. 20, 1978, Ser. No. 898,453
Int. Cl.² B65D *25/54*
U.S. Cl. 206—461 **2 Claims**

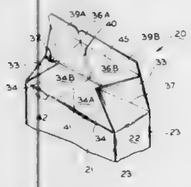


1. A package comprising a carton and an insert receivable within said carton, said insert including a blister element open at the bottom thereof and forming a cavity for receiving the packaged product, said blister element including a portion thereof extending outwardly and laterally from said cavity and forming a bearing surface; said carton comprising a multiplicity of interconnected panels including a first panel adapted to support said insert and a second panel adapted to overlie said insert, said second panel having an opening therewithin formed by one or more portions of said second panel being turned inwardly to form respective locking tabs depending generally downwardly from said second panel for bearing against said bearing surface thereby to hold said insert in place against said first panel, said portion of said blister element extending outwardly and laterally from said cavity includes a step portion extending peripherally around said cavity, and wherein said insert further includes a platform member received within said step portion.

4,180,166
PATCHING KIT WITH AGGREGATE AND TWO-PART EPOXY BINDER SYSTEM
Vernon H. Batdorf, Minneapolis, Minn., assignor to H. B. Fuller Company, St. Paul, Minn.
Filed Nov. 13, 1978, Ser. No. 959,510
Int. Cl.² B65D *81/32*
U.S. Cl. 206—568 **13 Claims**

1. A method for coating a surface with an epoxide mortar comprising the steps of:
(a) blending together the following substantially compatible components to form a curable epoxide binder material:
1. a substantially water insoluble curable vicinal epoxide composition including a polyglycidyl ether of a polyhydric phenol, said polyglycidyl ether having an epoxide functionality greater than 1 but less than about 3,
2. a substantially water insoluble polynuclear cycloaliphatic polyamine having a primary amine functionality greater than 1 but less than 4,
3. a hydrophobic agent, which agent includes a higher aliphatic group and a polar group;
(b) adding at least 200 parts by weight of aggregate and a lubricating amount of water to each 100 parts by weight of said curable epoxide binder material, thereby forming a curable epoxide mortar containing a substantially incompatible water phase generally uniformly distributed through said epoxide mortar;
(c) spreading a layer of said epoxide mortar onto a surface and permitting at least a portion of said substantially incompatible water phase to form a film of water on the top of said layer; and
(d) curing said curable epoxide binder material in said layer to a thermoset solid.

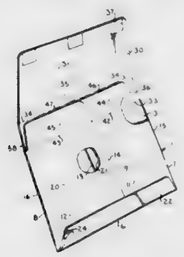
4,180,167
CARTON HAVING RECLOSABLE SPOUT
David R. Leavitt, Kirkland, and Gerald R. Pfieffer, Seattle, both of Wash., assignors to Container Corporation of America, Chicago, Ill.
Filed May 30, 1978, Ser. No. 910,490
Int. Cl.² B69D *5/74*
U.S. Cl. 206—622 **3 Claims**



1. In a carton formed from a cut and scored blank of paperboard or the like:
(a) major and minor pairs of sidewalls foldably interconnected to define a tube of rectangular cross-section with first and second end closure structures;
(b) each of said closure structures comprising:
(i) first and second minor closure flaps foldably connected to respective minor sidewalls, each of said first and second minor closure flaps including a pair of gusset elements foldably joined to each other;
(ii) a first major closure flap extending from one of said major sidewalls and foldable to a position underlying certain of said minor closure flaps when the latter are folded to closed position with respect to their related minor sidewalls;
(iii) a second major closure flap extending from the other of said major sidewalls and being connected along side edges thereof to said first and second minor closure flaps and being foldable to closed position overlying said minor closure flaps and said first major closure flap;
(iv) a glue flap extending from an edge of said second major closure flap and being foldable to closed position overlying and secured to a marginal area of said first major sidewall;
(c) said first end closure structure having a portion of said second major closure flap and a portion of said adjacent glue flap detachably connected along a line of weakness from the remaining portions of the second major closure flap and glue flap, respectively, so as to provide a dispensing opening in said closure structure whereby said portions and said first minor closure flap are erectable to form a dispensing opening.

4,180,168
TWO-WAY ENVELOPE
Walter L. Hiersteiner, Shawnee Mission, Kans., assignor to Tension Envelope Corporation, Kansas City, Mo.
Filed Jul. 13, 1978, Ser. No. 924,350
Int. Cl.² B65D *27/34, 27/06*
U.S. Cl. 206—626 **7 Claims**

1. A two-way envelope comprising:
(a) a body panel having an inner and an outer surface, upper and lower edges and side edges,
(b) a pair of opposed side flaps having outer edges and being integrally connected to said body panel and demarcated from said body panel side edges, said side flaps having an inner and an outer surface,
(c) a bottom flap integrally connected to said body panel and demarcated therefrom by a fold line along said body panel lower edge,
(d) a seal flap having an inner surface and an outer surface, said seal flap being integrally connected to said body panel and demarcated therefrom by a tear line along said body panel upper edge, a fold line extending along said seal flap which is spaced upwardly from said body panel upper edge, said seal flap extending upwardly beyond said seal flap fold line forming an upper portion thereabove, seal adhesive on said seal flap inner surface upper portion,
(e) a fold line extending along said respective side flaps and approximately colinear with said body panel upper edge, said side flaps each having an upper portion extending upwardly beyond said side flap fold lines and terminating in an upper edge below said seal flap fold line,
(f) said side flap upper portions having an inner side edge and seal adhesive on said side flap inner surfaces,



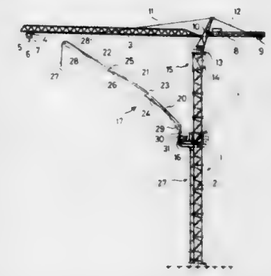
(g) said side flaps being folded along said body panel side edges over said body panel inner surface, said side flaps partially overlapping each other and being adhesively joined, said bottom flap being folded along said body panel lower edge and joined to at least one of said side flaps, said side flaps and bottom flap and body panel forming a pocket open between said seal flap and said side flap upper portions,
(h) said seal flap being folded along said seal flap fold line over said side flap upper portions to seal said pocket for a first trip, said seal flap being disconnected from said body panel along said seal flap tear line and said side flap upper portions being folded along said side flap fold lines to seal said pocket for a second trip.

4,180,169
WINDOW DISPLAY SUPPORT FOR FINGER RINGS
Fausto Michels, Pregassona, Switzerland, assignor to Laniere S.A., Crissier, Switzerland
Filed Nov. 21, 1977, Ser. No. 853,509
Claims priority, application Switzerland, Dec. 1, 1976, 15170/76
Int. Cl.² A47F *7/02*
U.S. Cl. 211—13 **2 Claims**



1. A window display support for finger rings including a base with a step and a riser on its upper surface and a flexible tongue secured to the upper portion of the riser and extending in its undeformed condition upwardly rearwardly from said riser a substantial distance from said step, said tongue being capable of being deformed into a U shape to form an elastic clip to hold the ring to be displayed on said step of the base.

4,180,170
ROTARY TOWER CRANE FOR CONSTRUCTION PURPOSES WITH A DISTRIBUTOR DEVICE FOR CONCRETE
Bernhard Meinken, Haltern, Fed. Rep. of Germany, assignor to Freiedrich Wilhem, Schwing GmbH, Fed. Rep. of Germany
Filed Mar. 10, 1978, Ser. No. 885,388
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1977, 2710366
Int. Cl.² B66C *23/00;* **F16L** *3/16*
U.S. Cl. 212—1 **6 Claims**

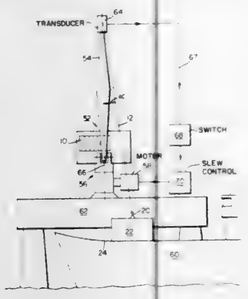


1. A rotary tower crane for construction purposes, comprising a non-rotating mast, a boom mounted at the head of the mast by a rotary connection so as to be swingable about the mast axis, a lifting device on the boom consisting of a hoisting rope which can be raised and lowered, and a distributor device for supplying and distributing concrete in the working area of the crane, which distributor device comprises a platform mounted on the mast below said rotary connection, and a distribution arm, serving as a carrier structure for a concrete conveyor pipe, formed in a plurality of sections connected together by power actuated connections and having a rotating mechanism located on the platform, the platform being mounted by a power actuated rotational coupling for swinging movement about an axis parallel to the axis of the crane mast, so as to provide an operational field for the platform which is limited by the extent of swing of the platform on both sides of the crane mast.

4,180,171
CRANES
Sinclair U. Cunningham; Donald Firth, and Douglas Jackson, all of East Kilbride, Scotland, assignors to Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England
Filed Aug. 29, 1977, Ser. No. 828,595
Claims priority, application United Kingdom, Sep. 1, 1976, 36244/76
Int. Cl.² B66D *1/50*
U.S. Cl. 212—61 **5 Claims**

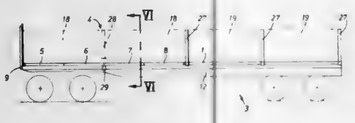
1. A crane having a crane rope; means for attaching a load to said crane rope; a crane winch having a drum on which said crane rope can be wound; a crane motor which can drive said crane winch for hauling in or letting out said crane rope; a measuring winch having a drum with a measuring line windable thereon of length sufficient to reach at least as far as the crane rope can reach; a measuring winch motor which can turn the measuring winch drum to wind in or out said measuring line; means for attaching the outer extremity of the measuring line, away from the drum, to one of a load to be lifted by said crane and a deck supporting said load; first transducer means operated by the measuring winch to provide a displacement signal proportional to any change, in relation to a predetermined value, and having regard to sign, of the length of mea-

suring line extending from the measuring winch drum to the said load; crane motor control means operable by said displacement signal to control the crane motor to haul in or let out the crane rope substantially in synchronism and to the same extent with any motion of the outer extremity of the measuring line; slewing means, to slew the crane about a vertical axis, including a slewing motor and slewing motor control means; and a



second transducer which produces an angle signal related in magnitude and sign to angular displacement of the crane rope, from a given angle, including zero, from the vertical, normal to its radial distance from the said vertical axis; and arranged so that any said angle signal is fed to said slewing motor control means to actuate the slewing motor and slew the crane so that any said angular displacement will be substantially counteracted.

4,180,172
LOAD CARRYING VEHICLE TRAILER
Axel G. Torneback, Box 12046, S-580 12 Linkoping, Sweden
Filed Feb. 15, 1977, Ser. No. 768,714
Claims priority, application Sweden, Feb. 18, 1976, 7601824; Apr. 5, 1976, 7600396
Int. Cl.[2] B60P *1/64*
U.S. Cl. 414—522 **14 Claims**



1. An assembly for a long load carrying vehicle, said assembly comprising:

(a) a loading surface means having a front part and a rear part and being disposed on a chassis,

(b) said loading surface means including first and second portions,

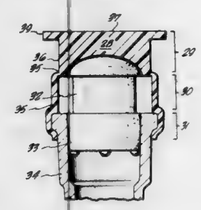
(c) said first portion being located in said rear part and slidably disposed to move in the direction of the longitudinal axis of the vehicle,

(d) said second portion being located in said front part and hingedly connected on one outer edge to said first portion and on the other outer edge to said chassis,

(e) said second portion having at least one pair of hinged sections effective to fold transversely to said longitudinal axis,

(f) said second portion being effective to fold outwardly from said loading surface means when said first portion moves in a direction toward said second portion and to subsequently straighten out when said first portion moves in a direction away from said second portion.

4,180,173
TAMPER-PROOF CLOSURE SYSTEM
Stephen H. Diaz, Los Altos Hills, Calif., assignor to Raychem Corporation, Menlo Park, Calif.
Filed Dec. 13, 1977, Ser. No. 860,196
Int. Cl.[2] B65D *1/04*
U.S. Cl. 215—6 **5 Claims**



1. In combination, a two-compartment mixing vial having a constriction between the two compartments, a removable plug disposed within the constriction to provide a liquid-tight barrier between the two compartments, the vial being closed at one end and having a neck at the other end thereof for defining an opening communicating with one of said compartments, said neck defining an annular rim adjacent the free end thereof in surrounding relationship to said opening, a primary closure attached to said vial for closing the opening in said neck, said primary closure including a resilient stopper having a nonprotuberant portion snugly and slidably disposed within the neck for closing said opening, said stopper also having a protuberant portion which is fixedly attached to said nonprotuberant portion and projects outwardly beyond the free end of said neck, said protuberant portion having a transverse dimension which is smaller than the transverse dimension of said opening, comprising the improvement wherein a hollow frangible secondary closure is disposed about the protuberant portion of the stopper and is fixedly connected to the neck of said vial, said secondary closure including:

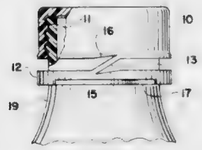
(1) a plunger having a top wall and upstanding sidewalls, which are displaced outwardly from said protuberant portion, said sidewalls having at least the lower edges thereof spaced upwardly from but substantially longitudinally aligned with the free end of said annular rim, whereby imposition of a longitudinally directed pushing force on said plunger causes it to axially slide toward said neck with the slidable displacement of said plunger being limited by engagement of the lower edges of said sidewalls with the free end of said annular rim;

(2) a lower collar in encircling engagement with the annular rim formed on the neck so as to fixedly connect said secondary closure to said vial while resisting non-destructive disengagement therebetween;

(3) a mid-portion integrally joining the lower edge of said plunger to said lower collar, said mid-portion extending longitudinally of said vial between said lower collar and said sidewalls in surrounding relationship to said protuberant portion, said mid-portion having a length in said longitudinal direction which is substantially greater than the radial thickness thereof, and said mid-portion having an interior transverse dimension which is greater than the exterior transverse dimension of that portion of the plunger defined by the sidewalls thereof so that said sidewalls can be telescopically received within said mid-portion as the plunger is slidably moved toward said annular rim; and

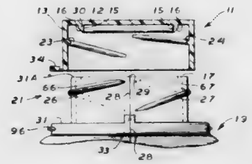
(4) an attenuated fracture zone about the lowermost periphery of the plunger sidewalls at the location where said sidewalls are joined to said mid-portion, whereby imposition of a pushing force on the plunger causes fracture along said zone so that the plunger telescopes into the mid-portion as the plunger is slidably urged toward the vial, the latter movement causing the plunger to engage and drive the stopper toward the closed end of the vial.

4,180,174
CHILD-RESISTANT CLOSURE
David R. Quinn, Pembroke Pines, Fla., assignor to The AFA Corporation, Miami Lakes, Fla.
Filed Nov. 16, 1978, Ser. No. 961,356
Int. Cl.[2] B65D *55/02, 85/56;* **H61H** *1/00*
U.S. Cl. 215—221 **11 Claims**



1. A child-resistant closure for closing a necked container with a screw thread formed on the neck, said closure including a top and a sidewall with the sidewall having an internal screw thread adapted to engage the screw thread of the container neck, said internal screw thread cut off at the lower edge of said sidewall in a plane perpendicular to the longitudinal central axis of the closure and a screw thread segment adapted to match said cut off thread and to move selectively from a matched first position to a second position away from but in parallel relationship to the cut off thread.

4,180,175
BLOW MOLDED PLASTIC BOTTLE AND ANTITAMPER CAP
John J. Virog, Jr., Massapequa Park, and Leo Von Hagel, North Massapequa, both of N.Y., assignors to Maxcap, Inc., New York, N.Y.
Continuation of Ser. No. 770,025, Feb. 18, 1977, Pat. No. 4,098,419. This application Jun. 30, 1978, Ser. No. 921,043
The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.
Int. Cl.[2] B65D *55/02*
U.S. Cl. 215—252 **11 Claims**



1. A combination of a blow molded plastic milk bottle and a plastic cap, comprising

(a) a neck at the mouth of said bottle, said neck having an external screw thread and an upper inwardly directed circumferential lip,

(b) said plastic cap adapted to be screwed onto said neck to cover said mouth and having an upper wall, a cylindrical side wall with an internal thread corresponding to said external thread, and a downwardly directed circular plug for engaging said lip when said cap is screwed onto said neck and to form an anti-leak seal by pressing against said lip,

(c) cooperating antitamper means on said cap and bottle and including a permanently deformable element, said antitamper means permitting said cap to be rotated in one direction to screw said cap onto said neck to bring said plug into sealing relation to said lip and then preventing rotation in an unscrewing direction unless said element is visibly deformed,

said threads being double-start threads comprising

a pair of external threads of identical pitch having effective portions substantially symmetrically disposed around the periphery of said neck and

a pair of internal threads of identical pitch having effective portions substantially symmetrically disposed around the internal periphery of said cap and each extending circumferentially for more than 150°,

said external threads being bends in the wall of said neck and said neck thus having corresponding internal grooves,

said effective portions of the two threads being at about 180° to each other,

the diameter of said neck being about 1 to 2 inches, the wall thicknesses of said neck and said lip being about 0.02 to 0.03 inch,

said plug having a circular outer surface for engaging said lip, said outer surface being tapered to increase in diameter upwardly and to exert an outward force on said lip and a corresponding inward force on said surface when said cap is screwed onto said neck,

said neck having a cylindrical portion having an axial height less than 0.8 inch and having a screw thread occupying an axial height less than 0.4 inch.

4,180,176
GRAVITY DUMP SHIPPING CRATE FOR POULTRY
Herbert W. Galer, Newnan, Ga., assignor to United States Steel Corporation, Pittsburgh, Pa.
Filed Nov. 9, 1978, Ser. No. 959,280
Int. Cl.[2] B65D *43/16*
U.S. Cl. 217—57 **4 Claims**



1. A readily dumped shipping crate comprising a container, a hinged cover therefor, and a latching panel on said hinged cover, said latching panel being pivotally mounted on the edge of the cover opposite the hinges thereof so that, in the open position it lies on said cover at least partially under a restraining means, and in the latched position it is suspended from its pivot in a position perpendicular to said cover.

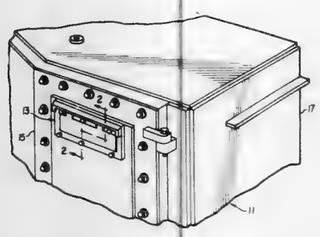
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4,180,177

PRESSURE VENT FOR EXPLOSION-PROOF ELECTRICAL ENCLOSURES

Robert J. Gunderman, Columbus; Keith Alcock, Upper Arlington; Charles S. Skinner, Northfield, and Michael W. Riley, Strongsville, all of Ohio, assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Apr. 4, 1979, Ser. No. 27,133
Int. Cl.[2] F16K *17/12;* **B65D** *25/00*
U.S. Cl. 220—88 A **7 Claims**

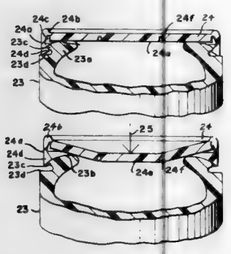


1. A pressure vent device, comprising:
(a) an enclosure for electrical apparatus,
(b) a vent opening extending from the interior to the exterior of the enclosure,
(c) flame arrestor means affixed in the opening for preventing flames from propagating through the opening in the event of an explosion of gases in the enclosure while permitting gas to vent through the opening at a predetermined pressure and a flow rate sufficient to preclude a pressure build-up,
(d) the enclosure including a seat surrounding the opening on the exterior side of the flame arrestor means,
(e) a cover sized and shaped to close the opening and fit against the seat for protecting the flame arrestor means,
(f) hinge means for connecting one edge portion of the cover to the enclosure while permitting an opposite edge portion to swing away from the seat,
(g) releasable latch means for holding said opposite edge portion against the seat until a predetermined pressure is reached in the enclosure,
(h) closing means for automatically returning said opposite edge portion into contact with the seat after the enclosure pressure drops below said predetermined pressure.

4,180,178

CONTAINER AND CLOSURE

Lloyd S. Turner, 50 Chestnut, Los Gatos, Calif. 95030
Continuation of Ser. No. 860,505, Sep. 24, 1969, abandoned. This application Dec. 26, 1974, Ser. No. 536,392
Int. Cl.[2] B65D *41/18, 41/10*
U.S. Cl. 220—281 **5 Claims**

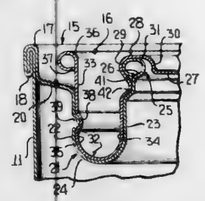


1. A container and a closure member therefor, said container comprising a mouth opening having a circumferential upper surface providing a fulcrum bearing and an outward projection extending circumferentially around the mouth opening, said closure member being formed of a pliable plastic material having a single normal configuration and comprising a cover panel having a flat top surface near the center thereof and having a circumferential skirt depending from the periphery thereof, said skirt of the closure member having an inward flange adapted to be pressed over the outward projection about the mouth of the container for securing the closure member upon said container, said cover panel of the closure member being formed with a hinge line encircling the flat surface in the center and disposed inside of the container mouth opening, said skirt of the closure member being normally operable to hold the inward flange in a secured position below the outward projection around the mouth opening of the container and being further operable axially to release the inward flange from the secured position when the flat central surface of the panel is depressed by external force to pivot the peripheral part of the cover panel about the hinge line and the fulcrum bearing of the upper surface of the container, said container having a planar surface extending outwardly below the skirt to prevent access to the bottom of the skirt whereby the closure member cannot be pried up from the container, an enlargement in the container spaced below the outward projection to form an annular groove therebetween, said inward flange of the skirt of the closure member normally extending into the annular groove in the secured position, the circumferential upper surface of the mouth opening of the container being positioned to abut against and provide a fulcrum bearing for the closure member, said fulcrum bearing being disposed circumferentially outside of the hinge, said closure member being operable to be deformed from the single normal configuration in response to the external force and pivot as a lever about said fulcrum bearing when the center is depressed to move the inward flange upwardly from the secured position in the annular groove and thereafter returns to the single normal configuration with the release of said force on the center, said hinge line being formed by a discontinuity in the thickness of the material forming the cover panel of the closure member, said flat central panel being formed of a thickness which is substantially less than the thickness of the peripheral parts of the cover panel, the parts being joined to form the hinge line with an abrupt change in material thickness.

4,180,179

BEADED SNAPLOCK CLOSURE

James R. Hoenig, Tinley Park, and Salvador C. Mallorca, Downers Grove, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.
Filed Aug. 31, 1978, Ser. No. 938,620
Int. Cl.[2] B65D *39/00*
U.S. Cl. 220—307 **10 Claims**



1. An end unit for a container comprising a ring and a detachable separately formed cover; said ring having a radially outer peripheral portion for forming a seam with a container body, a ring portion disposed radially inwardly of said outer peripheral portion, and a radially inner peripheral portion defining in cross section an axially outwardly opening U-shaped channel, said ring having an innermost free edge portion in the form of an annular hollow bead extending axially outwardly of said U-shaped channel, said U-shaped channel in cross section having generally parallel sides; said cover having a recessed central portion defined by an intermediate axially inwardly opening annular channel receiving said ring hollow bead and being seated thereon, said cover having a radially outer peripheral portion defining in cross section an axially outwardly opening U-shaped channel received in said ring U-shaped channel, said cover U-shaped channel and said intermediate channel each having a wall forming a continuation of one another, said cover having a radially outermost free edge portion in the form of an annular hollow bead overlying said ring; said end unit being characterized by the radially outermost one of said ring U-shaped channel walls having an intermediate annular radially inwardly projecting bead, and the radially outermost one of said cover U-shaped channel walls having a complementary intermediate annular radially inwardly projecting bead receiving said ring radially inwardly projecting bead in releasable interlocking relation.

4,180,180

APPARATUS AND METHOD FOR AUTOMATICALLY DISPENSING FLEXIBLE CONTAINERS

Carl Fries, Jr., Philadelphia, Pa., assignor to International Paper Company, New York, N.Y.
Filed Jan. 16, 1978, Ser. No. 869,505
Int. Cl.[2] B65G *59/10*
U.S. Cl. 221—1 **28 Claims**



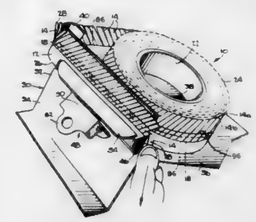
1. Apparatus for the dispensing of flexible, elastic flanged containers having non-vertical sides from the bottom of a nested stack of said containers, comprising:
(a) a base;
(b) first means on the base for supporting said nested stack of containers;
(c) compressive means on the base for creating a gap between the flanges of the bottommost and penultimate container by applying opposing compressive forces to the sidewalls of said bottommost container to cause the containers nested in the bottommost container to rise vertically;
(d) separating means on the base, said separating means being arranged and constructed for insertion into said gap created by said compressive means, said separating means also being arranged and constructed so that it may support the penultimate container and the remainder of the stack nested in the penultimate container; and
(e) means for releasing the bottommost container from said base and from the remainder of the containers in said nested stack.

4,180,181

TAPE SPLICING DEVICE AND DISPENSER THEREFOR

Arthur Brandwein, 147-37 77 Ave., Flushing, N.Y. 11367
Filed Aug. 11, 1978, Ser. No. 932,862
Int. Cl.[2] B65H *5/28*
U.S. Cl. 221—70 **4 Claims**

1. A dispenser for a tape splicing device comprised of a marginal portion, a plurality of individual tab members extending away from said marginal portion, said tab members being disposed side by side with respect to each other, a strip of adhesive tape adjoining one end of each said tab member and said marginal portion, each said tab member having an opposite free end remote from said marginal portion, said marginal portion and said tab members being wound around a core and having a release coating to permit detachment of said adhesive tape strips from said marginal portion when the free end of each said tab member is pulled away from said marginal portion so as to peel said strips from said marginal portion, said dispenser comprising a frame, means on said frame for permitting unwinding of said marginal portion and said tab members from said core, guide means on said frame for establishing a



predetermined path of movement for said marginal portion and said tab members during said unwinding, said guide means including a bearing surface on said frame over which said marginal portion is passed when it is unwound, and resilient clamping means for holding the marginal portion against said bearing surface to facilitate the pulling of said tab members and said adhesive strips from said marginal portion.

4,180,182

DISPENSING MAGAZINE

Leonard A. Fish, Chicago, and Duane M. Mills, Western Springs, both of Ill., assignors to Bank Computer Network Corporation, Schiller Park, Ill.
Filed Nov. 23, 1976, Ser. No. 744,381
Int. Cl.[2] G07F *11/36*
U.S. Cl. 221—75 **12 Claims**



1. In a magazine assembly for a dispensng machine, the combination comprising a screw having a helical thread, a plurality of separate articles hung by hangers from said screw, supporting means for supporting said screw at one end for rotation, with the opposite end of said screw located above an article receiving area, said thread having a first portion with a continuous thread in which adjacent convolutions of said thread are spaced apart by a first distance, and a second portion, coaxial said first portion and interposed between said first portion and said opposite end, said second portion having a thread which meets smoothly with the thread of said first portion and in which adjacent convolutions of the thread are spaced apart by a distance greater than said first distance, said thread having the same handedness in both said first and second portions, some of the convolutions of said second portion being flattened on one side to enable a separation of said hangers so that a maximum of one hanger resides between adjacent convolutions of said opposite end.

4,180,183

TRAP DOOR FOR VENDING MACHINE

Alois Muller, 138 Elvaston Dr., Toronto, Canada
Filed Apr. 10, 1978, Ser. No. 894,740
Int. Cl.[2] B65H *3/30;* **E06B** *7/00*
U.S. Cl. 221—194 **5 Claims**

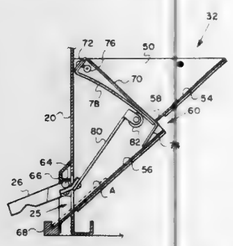
1. A self-closing chute for use in an article vending machine of the type having article storage and dispensing means, and

mechanism whereby an article may be dispensed and dropped downwardly under the influence of gravity, and comprising;

an article delivery chute located and arranged to catch a said article;

article opening means at the lower end of the chute, through which a said article may be retrieved;

moveable door means normally at least partially closing said article opening, and swingable relative thereto between an upwardly and outwardly open position, and a downwardly swung closed position;



chute closure means located inwardly with respect to said moveable means and swingably mounted, for movement between an inactive open position, and a rearwardly swung chute closing position, and,

operating means connecting between said door means and said closure means whereby when said door means is swung forwardly, said chute closure means is swung rearwardly.

4,180,184

FERTILIZER SPREADER

Richard H. Florer; Thomas E. Via, and James M. Weaver, all of Greenville, Ohio, assignors to Lambert Corporation, Dayton, Ohio

Filed Mar. 29, 1978, Ser. No. 891,064
Int. Cl.[2] A01C *15/06*
U.S. Cl. 222—41 **4 Claims**



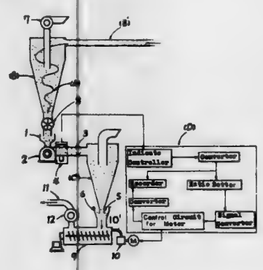
2. In a hand operated push-type fertilizer spreader which includes a wheeled hopper adapted to contain a quantity of fertilizer or the like for movement across the ground by means of a rearwardly extending handle, in which the rate of flow from the hopper is controlled by a shut-off and metering gate which is mounted at the bottom of the hopper and movable between a closed position and selected opened positions, and in which said handle terminates in a pair of outwardly extending hand grips, the improvement in control lever and flow indicating means comprising an operator lever pivoted on said handle and extending transversely to a position in normally forwardly inclined relation to one of said hand grips so that said one grip and lever may be grasped in common and squeezed together in abutment with each other, and metering means connecting said lever to operate said gate including a pull wire having one end connected in operative relation to said gate, an indicator dial pivoted on said lever, means connecting said pull wire to said dial, and adjustable coupling means connecting said dial to said lever whereby movement of said lever into abutment with said one grip causes a selective opening movement of said gate by said pull wire.

4,180,185

WEIGHT MEASURING METHOD OF POWDER IN AN AIR FLOW PROCESS AND APPARATUS THEREFOR

Teruo Yamamoto, Toyonaka; Fumikatsu Ishii, Takaishi, and Miyoji Fujiki, Kishiwada, all of Japan, assignors to Hokushin Gohan Kabushiki Kaisha, Motomachi, Japan

Filed Apr. 20, 1977, Ser. No. 789,840
Claims priority, application Japan, Dec. 13, 1976, 51-149571
Int. Cl.[2] B05B *17/00*
U.S. Cl. 222—57 **4 Claims**



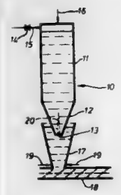
1. A method of measuring the weight of powder as the powder flows in air along a flow path, said method comprising providing a flow duct for said powder utilizing a constant speed, high pressure fan in communication with said flow duct to provide a continuous, uniform flow of the powder in said duct; utilizing a cyclone separator located at the output end of said duct to separate the powder; providing an opening to the ambient at both input and output ends of the flow path; defining a measuring region in the flow path within said flow duct; using a single radioactive beam transmitter and a single radioactive beam detector disposed on opposite sides of the wall of said duct to measure the density of the powder flow through said measuring region; utilizing the measurement produced by said radioactive beam transmitter and radioactive beam detector to determine the weight of the powder; and controlling the operation of a process in which said flow of powder is utilized, in accordance with the weight of the powder so determined.

4,180,186

HOPPER

Maurice Alphandary, Oxford, England, assignor to The United States of America as represented by the Administrator of the U.S. Environmental Protection Agency, Washington, D.C.

Filed Feb. 8, 1978, Ser. No. 876,099
Int. Cl.[2] B65D *83/06*
U.S. Cl. 406—152 **15 Claims**



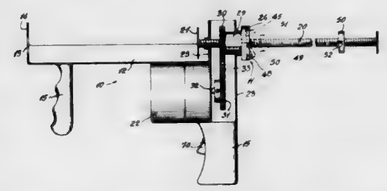
1. A hopper for use in feeding solids stored therein to a region beneath the hopper in which at least the bottom part is in the form of a hollow, substantially symmetrically right-conical frustum of maximum radius R at the widest (normally upper) end with a substantially circular discharge aperture of diameter D at the narrowest (normally bottom) end, there being at least two substantially V-shaped notches formed in the wall of the frustum substantially symmetrically around the wall of the frustum, the widest ends of the notches being of width b and open to the discharge aperture, and the apices of the notches being remote from the periphery of the aperture at a distance r therefrom, wherein the angle between the wall of the frustum and the axis thereof is no greater than the angle of repose of the solids to be contained in the hopper, r is at least equal to 0.3R and b is at least equal to 0.5D.

4,180,187

AUTOMATIC PISTON DRIVE MECHANISM FOR USE IN CAULKING GUN

Haim Ben-Haim, 4800 Cote St. Catherine Rd., Apt. 17, Montreal, Quebec, Canada

Filed Jun. 30, 1978, Ser. No. 921,046
Int. Cl.[2] B67D *5/46*
U.S. Cl. 222—326 **9 Claims**



1. An automatic piston drive mechanism for use in dispensing flowable compound material through a dispensing orifice of a housing in which said material is contained, said mechanism comprising:

a piston member having an elongated rod and a pusher head;

a drive motor;

a clutch member releasably and threadably connected to said rod, said clutch member having two hinged sections having displaceable abutting faces, a semi-circular channel in each of said faces extending transversely there-across and aligned with one another to constitute a circular bore when said abutting faces are juxtaposed, one of said channels having a thread engaging means in an inner face for threaded engagement with said rod;

said clutch member having a drive connection to said motor and rotatably driven by said motor to impart fixed rotation thereto to effect axial displacement of said rod by its connection whereby said pusher head will advance and apply pressure to said compound to push it through said dispensing orifice.

4,180,188

SEALING STRUCTURE FOR ROTARY VALVES

Tatuo Aonuma, Kashiwa; Michio Kiuchi, Nagereyama; Hirozi Watanabe, and Takeshi Akao, both of Noda, all of Japan, assignors to Kokkoman Shoyu Co., Ltd., Noda, Japan

Filed Nov. 10, 1976, Ser. No. 740,391
Claims priority, application Japan, Nov. 18, 1975, 50-137794; Dec. 2, 1975, 50-160983
Int. Cl.[2] G01F *11/10*
U.S. Cl. 222—368 **2 Claims**

1. A sealing structure for a rotary valve, comprising:

a rotary member provided with a plurality of pockets opening toward the outer periphery of said rotary member;

a casing enclosing the outer periphery of said rotary member;

sealing members provided between the outer periphery of said rotary member and the inner periphery of said casing;

said sealing members being formed to be adjustably projectable in the radial direction;

radial blades partitioning and separating said plurality of pockets provided in said rotary member;

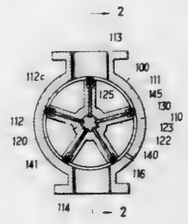
cavities in the outer tips of said blades;

said sealing members being slidably fitted in said cavities to be pressed to project outwardly in the radial direction of said rotary member;

a supporting shaft for said rotary member;

a rod member disposed in one end of said supporting shaft;

a hole formed in the axial direction at the center of said rotary member;



an adjusting member slidably fitted in said hole and advanced and retreated in the axial direction by said rod member advanced and retreated as operated from outside at said one end of said supporting shaft of said rotary member;

said cavities being connected with said hole through passages provided radially within said blades; and

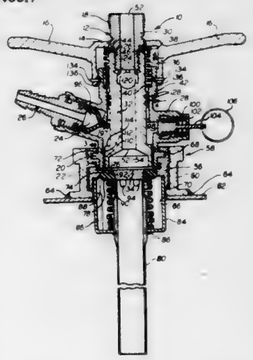
pushing members slidably fitted in said passages to be in contact at one end thereof with the back surface side of said sealing member and at the other end thereof with said adjusting member so that the sealing members may be projected by said pushing members through the sliding of said adjusting member.

4,180,189

SINGLE VALVE DISPENSING TUBE

David Zurit, Tenafly, N.J.; Vincent Cerrato, Pomona, and James Hines, Port Jervis, both of N.Y., assignors to Vending Components, Inc., Hackensack, N.J.

Filed Jan. 11, 1978, Ser. No. 868,492
Int. Cl.[2] B65D *83/00;* **B67D** *1/04*
U.S. Cl. 222—400.7 **12 Claims**



1. Beer distributing apparatus including in combination a probe fitting that fits into an opening in a keg fitting secured to

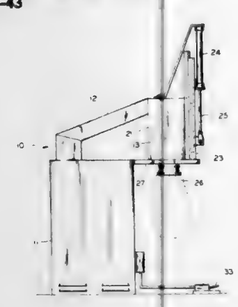
a beer keg or the like, projections extending outward from the probe fitting for engaging cam slots inside the keg fitting for connecting the probe fitting with the outlet through the keg fitting, a probe located within the probe fitting and having up and down movement with respect to both fittings, the probe having a passage for beer opening through the lower end of the probe and extending upward to a hose connection at an upper part of the probe, a gas passage on one side of the probe fitting and opening into the interior of the probe fitting, clearance between confronting cylindrical faces on the inside of a lower portion of the probe fitting and the outside of the probe for flow of gas along said clearance between said cylindrical faces, a seal carried by one of said confronting cylindrical faces and contacting with the other confronting cylindrical face to shut off flow of gas through said clearance when the probe is in a raised position, and a shoulder providing a step on the cylindrical face that confronts the face that carries the seal, said shoulder being in position that is beyond the seal and that leaves said gas passage and said channel unsealed when the probe is in a lowered position, biasing means on the probe fitting for biasing the probe to a shutting raised position off the gas flow when not connected with a keg, and means for moving the probe downward against the bias of the biasing means into said lowered position for operating a keg valve when the probe fitting is connected with a keg.

4,180,190

VACUUM BAG PROCESS AND APPARATUS

Dennis M. Flaum, 1 E. Schiller, Chicago, Ill. 60610, and Herman L. Fleishman, 6518 N. Kenton, Lincolnwood, Ill. 60645

Filed May 13, 1977, Ser. No. 796,756
Int. Cl.[2] A41H *43/00*
U.S. Cl. 223—43 **2 Claims**



1. Apparatus for reversing panelized bag structures, said device comprising:

an enclosed chamber having a bottom panel, a top panel, a front panel, a rear panel, and side panels,

said bottom panel having a passage formed therethrough communicating the interior of said enclosed chamber with the atmosphere;

an upstanding collar,

said collar positioned at said passage on the exterior of said bottom panel;

an access door,

said access door positioned on said front panel to selectively allow access to said enclosed chamber;

means for selectively establishing a partial vacuum within said chamber;

a vacuum duct,

said duct communicating said vacuum means with said chamber; and

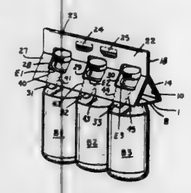
structure to automatically control the opening and closing of said access door and the establishment of said vacuum in a sequence to first close said access door, establish the vacuum, and open said access door at selectable time intervals.

4,180,191

BOTTLE CARRIER

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Jul. 26, 1978, Ser. No. 926,858
Int. Cl.[2] B65D *71/00*
U.S. Cl. 224—45 BA **4 Claims**



1. A carrier for bottles having flanged neck portions, said carrier comprising an elongated tubular structure including a bottom wall (**1**) having a plurality of neck receiving apertures (**3,4,5**) therein for respectively receiving the necks of a plurality of bottles, a pair of inwardly tapered side walls foldably joined along their bottom edges to the side edges of said bottom wall, each side wall being formed of inner and outer panels (**8,10,14,27**) secured together in face contacting relation over at least a substantial portion of the side walls thereof, a plurality of bottle flange receiving apertures (**11-13, 15-17**) formed in the upper portions of said side walls and in transversely aligned relationship with said neck receiving apertures respectively, a plurality of single ply downwardly projecting pull tabs (**31,32,33**) struck from said neck receiving apertures respectively and disposed in coplanar relation with the inner panel of one of said side wall panels (**8**), a pair of weakened severance lines (**34-39**) formed in said inner panel of said one of said side wall panels and in general alignment with the side edges of each of said pull tabs, and a pair of weakened severance lines (**40-45**) formed in the outer panel of said one of said side wall panels (**27**) associated with said inner panel of said one of said side wall panels and in substantial alignment with each said pair of severance lines formed in said inner panel of said one of said side wall panels so that upward displacement of at least one of said pull tabs severs the material between the severance lines of the outer and inner side wall panels thereby to accommodate removal of a selected bottle.

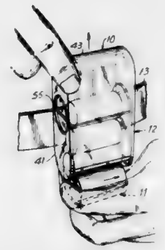
4,180,192

STORAGE AND DISPENSING DEVICE FOR FILM CARTRIDGES OR THE LIKE

Steven M. Breslau, Cranford, N.J., assignor to Pace Photographic Products, Inc., Union, N.J.

Filed May 25, 1978, Ser. No. 909,379
Int. Cl.[2] B65D *42/20, 83/38*
U.S. Cl. 224—235 **8 Claims**

1. Storage and dispensing device for film cartridges or the like comprising an upright magazine for containing a stack of film rolls, said magazine having an upper opening for receiving an uppermost roll and having a lower opening for discharging a lowermost roll, and a cover mounted externally on said magazine for up and down sliding movement between respective open and closed positions to selectively provide access to and block said upper and lower openings, an external protrusion on said magazine, said cover having a cutout opening downardly and slidably receiving therethrough said protrusion on said cover movement, and snap engageable interfitting formations on said protrusion and cover for releasably retaining the latter in said positions, and mounting means carried by said protrusion for mounting said magazine to a person.

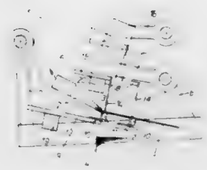


4,180,193

APPARATUS FOR REMOVING THE FORWARD MARGIN OF A SHEET

Franz Hennig, Dusseldorf, Fed. Rep. of Germany, assignor to Jagenberg-Werke Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,661
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1977, 2708510
Int. Cl.[2] B26F *3/02*
U.S. Cl. 225—101 **11 Claims**



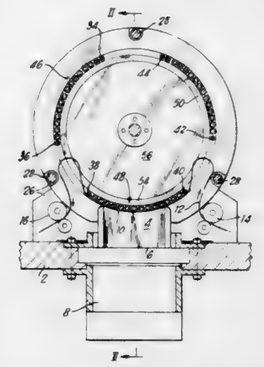
1. In an apparatus for separating the forward margin of a sheet which is joined to the forward margin along a parting line only by webs and is held at the forward margin by grippers of a transport and having upper and lower separating tools disposed above and below the parting line and movable with respect to one another, wherein the improvement comprises: an anvil disposed at the underside of the sheet to be separated and means mounting the anvil for movement with respect to the lower separating tool and for co-action with the upper separating tool to form a pair of gripper jaws for the sheet which is movable with the gripped sheet with respect to the lower separating tool during the separating action comprising means mounting the anvil and the lower separating tool commonly on a beam and a double crank for carrying the beam to move the anvil and the lower separating tool into and out of the path of movement of the grippers.

4,180,194

WEB TRANSPORT MECHANISM AND METHOD

Alan K. McCombie, and Stephen Temple, both of Cambridge, England, assignors to Cambridge Consultants of Bar Hill, Cambridge, England

Filed Dec. 30, 1977, Ser. No. 866,003
Int. Cl.[2] B65H *17/42*
U.S. Cl. 226—113 **42 Claims**



18. A mechanism for transporting a web through a work zone and holding successive portions of said web stationary in said work zone during intermittent work periods, comprising:

(a) a support member having a web support surface in said work zone;

(b) clamping means having a clamping surface and at least one gap therein;

(c) means for moving said clamping means around an endless path so that said clamping surface said clamping surface traversing said support surface during said work periods and said gap traversing said support surface during intervening periods and said gap alternately traverse said support surface, said clamping surface being adapted when traversing said support surface to cooperate with said support surface to clamp a portion of the web therebetween to thereby hold said web portion stationary with respect to said support surface, said clamping surface having a length in the direction of movement of the clamping member not less than the length of said work zone in said direction so that said clamping is effective throughout each of said work periods;

(d) supply means for supplying web to an input zone upstream of said support surface for forming a first loop of said web in said input zone, said clamping means being arranged to receive said first loop in said gap as said gap approaches said support surface and to transfer said loop across said support surface so that the portion of web previously clamped in said work zone is transferred to an input zone downstream of said support surface in the form of a second loop and web from said first loop is transferred into said work zone; and

(e) take-up means for removing web from said second loop.

4,180,195

RIVET DELIVERY AND LOCATING APPARATUS

Kenneth E. Caley, Seattle, and Brian R. Trethewy, Snohomish, both of Wash., assignors to The Boeing Company, Seattle, Wash.

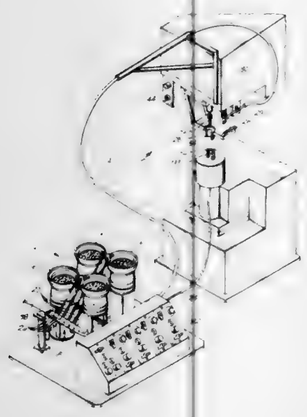
Filed Jan. 16, 1978, Ser. No. 869,966
Int. Cl.[2] B27F *7/04*
U.S. Cl. 227—51 **21 Claims**

1. In a riveting apparatus including supply means for providing orientated rivets each having both a head portion and a

shank portion and means for performing a heading operation on said rivets; improved means for delivering and locating said rivets for said heading operation, said improved means comprising:

a delivery tube including a discharge end and defining a conduit through which rivets received from said supply means are propelled to said discharge end;

gripping means for receiving said rivets from said discharge end and gripping said rivets, said gripping means including a plurality of gripping surfaces and operable to a



receiving mode with said surfaces spaced apart a distance sufficient to admit the shank portion but not the head portion of an individual rivet therebetween and a gripping mode with said surfaces biased into gripping contact against said shank portion;

operating means for operating said gripping means to said receiving mode prior to said individual rivet leaving said discharge end and to said gripping mode after said individual rivet has been received by said gripping means; and

means for positioning said gripping means for locating said individual rivet for said heading operation.

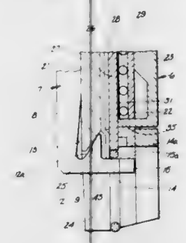
4,180,196

ANVIL ATTACHMENT FOR A SURGICAL STAPLING INSTRUMENT

J. Charles Hueil, Loveland, Ohio; Robert G. Rothfuss, Bellevue, Ky., and Terry A. Boothby, Cincinnati, Ohio, assignors to Senco Products, Inc., Cincinnati, Ohio

Filed Aug. 5, 1977, Ser. No. 822,049
Int. Cl.[2] B25C *5/02*
U.S. Cl. 227—109 **9 Claims**

1. An anvil attachment for the nose portion of a surgical stapling instrument of the type utilizing a replaceable cartridge of surgical staples, said anvil attachment having a first leg configured to lie along and to be attached to said surgical stapling instrument nose and a second leg extending from said first leg at an angle thereto, said second leg having two or more anvil portions about which said surgical staples are formed, each anvil portion being of a width equal to the inside crown dimension of a fully formed staple, and each of said anvil portions having an upper surface comprising a anvil surface



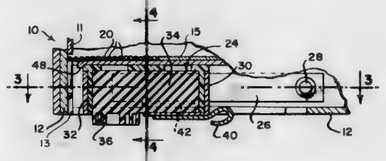
adapted to abut and support the crown of a surgical staple during a staple forming operation.

4,180,197

STAPLING AND MARKING DEVICE

Ernest M. Raasch, Alpine, N.J., and Nathaniel M. Olney, New York, N.Y., assignors to Swingline, Inc., Long Island City, N.Y.

Filed Mar. 6, 1978, Ser. No. 883,864
Int. Cl.[2] B25C *5/02, 7/00*
U.S. Cl. 227—120 **7 Claims**



1. A stapling and marking device, comprising:

(a) anvil means;

(b) a housing having a front portion disposed over said anvil means;

(c) staple supporting means disposed in said housing for supporting a plurality of staples;

(d) means for urging said staples toward the front of said housing;

(e) means for driving said staples into a workpiece;

(f) marking means for marking a workpiece during stapling of the same; and

(g) means for supporting said marking means within said housing underneath and within said staple supporting means.

4,180,198

APPARATUS FOR INSERTING STICKS INTO ARTICLES

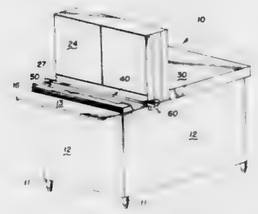
Thomas F. Lowrance, 3601 Security St., Garland, Tex. 75040

Filed Mar. 13, 1978, Ser. No. 886,269
Int. Cl.[2] B27F *7/00;* **B23Q** *7/10*
U.S. Cl. 227—120 **8 Claims**

1. In apparatus for inserting elongated sticks into articles, wherein the apparatus includes: an article holder having means for retaining a plurality of articles in spaced side-by-side relation; a stick box having a plurality of elongated stick feed grooves disposed in spaced, parallel side-by-side relation, in generally horizontal longitudinal alignment with the respective article retaining means of said article holder, and means for supporting sticks overlying each feed groove for sequential feeding into each feed groove; means for pushing sticks disposed in said feed grooves longitudinally out of said grooves and partially into said article retaining means; and a stick

holder comprising an elongated body removably positionable between said stick box and said article holder, said stick holder having a plurality of stick passage means disposed in side-by-side relation for generally horizontal alignment with respective feed grooves of said stick box and with respective retaining means of said article holder; said stick holder having stick clamping means for clamping sticks in said passage means; and a support surface for said stick holder adjacent to said stick box; the improvement comprising:

at least one leg mounted on said stick holder body and projecting transversely therefrom adjacent to one end; a



guide block mounted on said apparatus providing a horizontal support surface for said leg; said guide block support surface and said projecting leg defining means for preventing rotation of said stick holder about its longitudinal axis;

coacting means on said apparatus and on said stick holder for limiting forward and rearward movement of said stick holder relative to said apparatus;

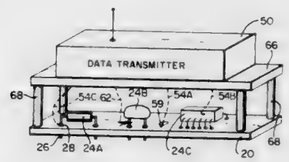
and coating means on said apparatus and on said stick holder for limiting lateral movement of said stick holder relative to said apparatus.

4,180,199

MASS SOLDERING CONTROL SYSTEM

Harold T. O'Rourke, Milford, and Warren G. Abbott, Londonberry, both of N.H., assignors to Hollis Engineering, Inc., Nashua, N.H.

Filed Feb. 27, 1978, Ser. No. 881,435
Int. Cl.[2] H05K *3/34;* **B23K** *3/00*
U.S. Cl. 228—102 **22 Claims**



1. In combination with a mass soldering machine having a solder base adapted to contain a mass of molten solder and conveyor means for transporting a circuit board past said solder base whereby to contact said circuit board at least in part with molten solder in said base, a data sensor and wireless transmitter for carrying on top of the circuit board, said data sensor being adapted to provide a signal as a function of the dwell time said board or a component carried on said board is in contact with said molten solder, and a remote receiver tuned to the frequency of said transmitter.

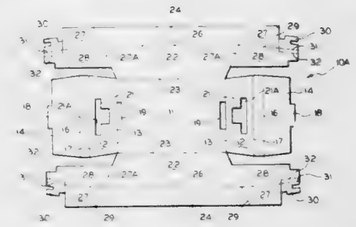
12. In a method of monitoring a component carrying printed circuit board through a mass soldering operation in contact with a mass of molten solder, the steps of: (1) providing (A) a data sensor and a wireless transmitter for carrying on a board being processed, and (B) a remote receiver tuned to the frequency of said transmitter; (2) attaching said data sensor to said board or a component carried on said board; (3) generating a signal as a function of the dwell time said board or said component is in contact with said molten solder, and (4) wireless transmitting said signal to said remote receiver.

4,180,200

LOCKABLE TRAY

James R. Wilkinson, Sr., Abingdon, Md., assignor to Container Corporation of America, Chicago, Ill.

Filed Nov. 30, 1978, Ser. No. 965,032
Int. Cl.[2] B65D *5/22*
U.S. Cl. 229—32 **2 Claims**



1. A tray formed from a cut and scored blank of paperboard or the like comprising:

(a) a rectangular bottom;

(b) a pair of opposed end walls foldably connected to opposite ends of said bottom including an inner and an outer end wall panel foldable with respect to each other and into a locking engagement with said bottom;

(c) a pair of opposed side walls having side panels foldably connected to opposite edges of said bottom and including a rim flange foldable with respect to each side wall panel into a position along the outer face of said side wall panel;

(d) flaps foldably connected to each end of said rim flange and said side wall panel and foldable into position against said end walls;

(e) a hand receiving opening formed in said end walls and including locking slots extending therefrom;

(f) a locking tab hinged to an edge of at least one of said flaps at each of said rim flange and folded against said outer end wall panel and extending into said locking slots to secure said side walls to said end walls.

4,180,201

PACK AND BLANK FOR MAKING THE PACK AND WEB OF PACKING MATERIAL FOR MAKING THE BLANKS

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Pfuhl, Verden, Fed. Rep. of Germany

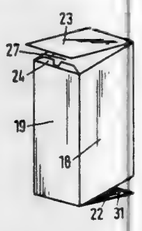
Division of Ser. No. 744,359, Nov. 23, 1976, Pat. No. 4,072,263.
This application Nov. 8, 1977, Ser. No. 849,582
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1976, 2600822
Int. Cl.[2] B65D *5/72*
U.S. Cl. 229—37 R **12 Claims**

1. A block shaped package formed from a blank having four laterally edge joined sidewalls defining two opposed pair of sidewalls, said blank also having opposed end walls, said end walls being made up by terminal flaps integral with and extending from respective sidewalls, said terminal flaps being of of unequal length and being folded into the plane of the end walls, said package blank thereby having two inside sidewalls and outside sidewalls on opposite sides thereof, one terminal flap situated on the outside, covering up the entire end of said pack, the improvement wherein:

both end walls of the package are developed essentially equal,

all terminal flaps are of rectangular shape, and

the terminal flaps of both end walls are attached to the sidewalls at respective ends thereof and are dimensioned in such a way, that as a result of the dovetailed position of the terminal flaps of one blank with the terminal flaps of



two adjacent blanks, the latter are cut without waste from one web of the packaging material, and

the terminal flaps constituting cover flaps of one blank and correspondingly the connecting strips corresponding thereto are disposed at opposite sidewalls.

4,180,202

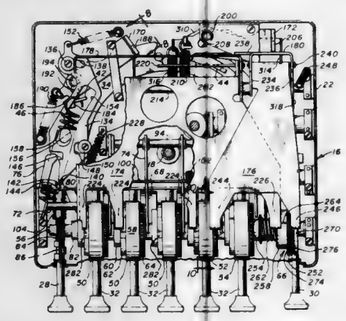
PRESETTABLE COUNTER MECHANISM

Bruno S. Smilgys, Hartford, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

Continuation-in-part of Ser. No. 576,241, May 12, 1975, Pat. No. 3,988,576. This application Oct. 21, 1976, Ser. No. 734,601

Int. Cl.[2] G06C *15/42*

U.S. Cl. 235—132 R **18 Claims**



1. In a counter operated control mechanism comprising a rotatable control member, means urging said control member in a first angular direction, release means movable between a first position releasably latching said control member against movement in said first angular direction and a second position permitting its rotation in said direction, a counter controlling movement of said release means, and shiftable trip means for permitting movement of said release means to said second position in response to a reference count on said counter, the combination wherein said release means includes first and second release latches respectively movable between first operative and second withdrawn positions, said first release latch being operative in its said first operative position to latch said rotatable control member at a first angular position thereof and in its said second withdrawn position to permit rotation of said control member in said first angular direction, said second release latch being operative in its said first operative position to latch said rotatable control member at a second position angularly spaced in said first angular direction from said first angular position and in its said second withdrawn position to permit rotation of said control member in said first angular direction; said counter including first and second cam assemblies having trip controlling cam surfaces, said shiftable trip means including separate first and second shiftable trip members having cam followers for engaging said cam surfaces, said first trip member cam follower operatively engaging said first cam surface while said first release latch is in its first operative position and being shiftable in response to said first cam surface to permit movement of said first release latch to its said withdrawn position upon said counter reaching a first reference count and said separate second trip member cam follower operatively engaging said second cam surface upon movement of said first release latch out of its first operative position and being shiftable in response to said second cam surface to permit movement of said second release latch to its said withdrawn position upon said counter reaching a second referenced count.

4,180,203

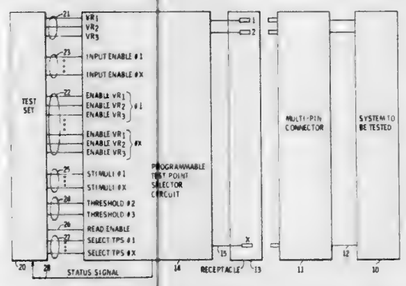
PROGRAMMABLE TEST POINT SELECTOR CIRCUIT

Harvey M. Masters, Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1977, Ser. No. 838,262

Int. Cl.[2] G06F *11/04*; G01R *31/00*

U.S. Cl. 235—302 **2 Claims**



1. A programmed circuit for selectively coupling a multi-bit digital signal to a plurality of circuit nodes and for determining the status of signals present at said nodes; comprising:

(a) a plurality of input circuits, each of said input circuits selecting which ones of said nodes the bits of said digital signal will be coupled to and generating a bit of said digital signal, each of said input circuit comprising a first plurality of two input AND gate circuits having their respective output terminals coupled to a plurality of voltage sources by a first plurality of resistors;

(b) a first plurality of diodes each having first and second polarity terminals, said first plurality of diodes having their first polarity terminals connected in parallel and to one of said nodes, said second polarity terminal of each of said diodes being coupled to the output terminal of separate ones of said first plurality of two input AND gates;

(c) a plurality of two input NAND gates each having its output coupled directly to said one and only one of said nodes;

(d) a threshold detector circuit;

(e) a second plurality of diodes each having first and second polarity terminals, said second plurality of diodes having their second like polarity terminals connected in parallel and to the input of said threshold detector;

(f) a second plurality of resistors each having first and second terminals, each of said second plurality of resistors having its first terminal coupled to one and only one of said terminals of said first polarity of said second plurality of diodes, said second terminal of each of said second plurality of resistors being coupled to one and only one of said nodes;

(g) a second plurality of two input AND gates, each of said second plurality of AND gates having its output terminal coupled to the junction formed by separate ones of said second plurality of diodes and said second plurality of resistors, with the inputs of said first and second plurality of AND gates and the input to said NAND gate coupled to receive a digital program signal which specifies to which ones of said circuit nodes the bits of said digital signal will be coupled and which one of said nodes will be coupled to the input of said detector to determine the status of the signal thereon.

4,180,204

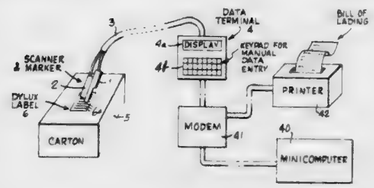
AUTOMATIC INVENTORYING SYSTEM

Richard W. Koenig, Menomonee Falls; Philip R. Girard, Shorewood, and Alfred J. Neuhauser, Wales, all of Wis., assignors to The J. C. Penney Corporation, Inc., New York, N.Y.

Filed Nov. 8, 1978, Ser. No. 958,879

Int. Cl.[2] G06F *15/84*; G06K *7/12, 19/06*

U.S. Cl. 235—385 **22 Claims**



1. A method for providing a visible verification of the performance of an inventory operation on an item comprising the steps of:

disposing on the surface of an item to be inventoried information relating to said item in combination with a photosensitive material which undergoes a visible change upon being irradiated with appropriate light;

performing an inventory operation on said item by recording the information relating to said item; and

upon the completion of the recordation of said information, producing a visible change in the photosensitive material by irradiating said material with said appropriate light to verify the performance of the recording step on the item.

4,180,205

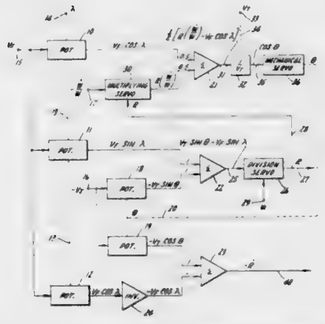
PSEUDO RANGE AND RANGE RATE DEVICE

Arnold Schwartz, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 9, 1962, Ser. No. 179,529

Int. Cl.[2] F41G *7/00*

U.S. Cl. 235—411 **10 Claims**



1. An electrical circuit for the simultaneous solution of three equations comprising:

three ganged potentiometers coupled to receive a common first voltage signal and to be driven by a first angular driving means;

a pair of ganged potentiometers coupled to receive a common second voltage signal and to be driven by a second angular driving means;

summing networks coupled to the outputs of each of two of said three ganged potentiometers and an output of each of said pair of said ganged potentiometers, respectively, to produce first and second sum voltage signals on outputs thereof, and a summing network coupled to the output of one of said three ganged potentiometers and the output of one of said first and second summing networks to produce a third sum voltage signal on an output thereof;

attenuating means coupled to attenuate said third sum voltage signal in accordance with a third angular driving means, the attenuated third sum voltage signal output of said attenuating means coupled to control said second angular driving means whereby the first, second, and third angular drive means and the various voltage signal inputs coupled and arranged aforesaid provide three simultaneous equations of analog voltages in said three potentiometers and summing networks to produce said first and second sum voltage signal outputs as the solution in analog voltages.

4,180,206

MERCHANDISE SALES CONTROL SYSTEM

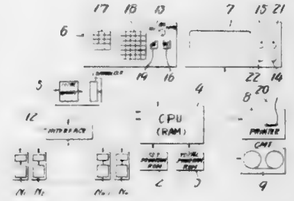
Yasuyoshi Takahashi; Shigeo Sekiguchi, and Teruyoshi Sato, all of Tagata, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jun. 28, 1977, Ser. No. 811,124

Claims priority, application Japan, Jun. 30, 1976, 51-78350

Int. Cl.[2] G06K *15/00, 15/02*

U.S. Cl. 235—419 **10 Claims**



1. A merchandise sales control system comprising a plurality of memory cassettes each having at least a recording section composed of a unit-price setting section and a sales data section, a unit-price writing device able to removably connect to said memory cassettes and to preset a number of commodity unit prices in the unit-price setting section of each of said memory cassettes, a plurality of electronic cash registers able to removably connect to said memory cassettes, and a totalling device able to removably connect to said memory cassettes, wherein said memory cassettes are connected to said unit-price writing device which presets a number of commodity unit prices in the unit-price setting section of said memory cassettes, then the memory cassettes are connected to said electronic cash registers respectively to perform sales registration so that sales data based on the commodity unit prices stored in said unit-price setting section are registered in said sales data section, and then said memory cassettes in which the sales data are registered are removed from said electronic cash registers and are connected to said totalling device which totals the sales data stored in said electronic cash registers.

V 9 8 9 4 D E 2 5 7 9 UMI

4,180,207

SECURITY MATERIAL AND SECURE DOCUMENT SYSTEM USING SAID MATERIAL

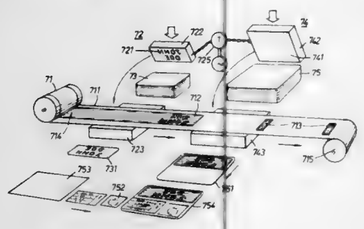
Cyril A. Lee, Littlewick Green, England, assignor to E M I Limited, Hayes, England

Filed Dec. 9, 1977, Ser. No. 859,234

Claims priority, application United Kingdom, Dec. 10, 1976, 51628/76; Apr. 27, 1977, 17499/77

Int. Cl.² G06K *19/08;* **G09F** *3/02;* **G06K** *7/08;* **G11B** *11/10*

U.S. Cl. 235—493 **19 Claims**



1. A method of applying security material to a support in a form which represents information including

providing a source of selectively releasable security material having a security feature of a detectable pattern of a magnetic material property,

applying a data recording element to the security material source to release material from the source in the form of said element,

securely bonding at least one of the released material form and the matching remaining material form in the source to a respective support,

thereby to produce a secure document having data securely represented by the material form on the support, the material itself including said security feature.

4,180,208

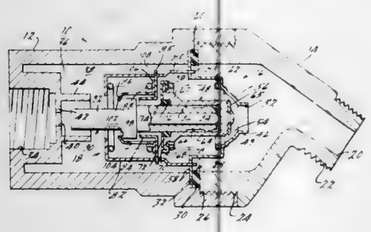
TEMPERATURE LIMITING SHOWER CONTROL VALVE

Frank E. Obermaier, Bartlett, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 778,634, Mar. 17, 1977, abandoned. This application Sep. 5, 1978, Ser. No. 939,520

Int. Cl.² G05D *23/12*

U.S. Cl. 236—93 B **5 Claims**



1. A valve assembly for limiting the temperature of fluid passing therethrough and adapted to be carried in a housing fluidly intermediate an inlet port and an outlet port thereof, the valve assembly comprising:

(a) bracket means adapted to be secured to said housing, said bracket means including,

(i) a valve seat means defining a first self centering surface,

(ii) retainer means defining a second self centering surface, said second self centering surface being substantially axially aligned with said first self centering surface;

said retainer means being movable with respect to said bracket means;

(b) poppet means disposed adjacent said valve seat, said poppet means having a valve surface thereon;

(c) temperature sensitive means mounted within said bracket means and having an actuator extending therefrom and connected to said poppet means and a reaction surface thereof seated against said second self centering surface, said temperature sensitive means being operative to move said poppet means in response to a predetermined fluid temperature value from an open position in which said valve surface is spaced from said valve seat for permitting flow therethrough to a closed position in which said valve surface of said poppet means contacts said first self centering surface of said valve seat for substantially blocking flow therethrough;

(d) first biasing means for biasing said poppet means toward said open position, said first biasing means urging said temperature sensitive means toward said second self centering surface; and

(e) said retainer means further including second biasing means for maintaining said second self centering surface stationary relative to said housing as said temperature sensitive means moves said poppet means between said open and closed positions, said second biasing means permitting further movement of said temperature sensitive means as fluid temperatures above said predetermined value are sensed.

4,180,209

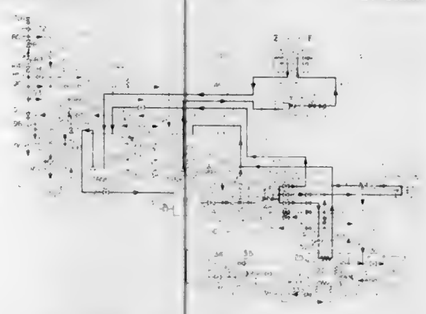
SOLAR ENERGY OPERATED SYSTEM AND METHOD

Joseph R. Frissora, Corning, N.Y., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sep. 28, 1977, Ser. No. 837,495

Int. Cl.² F24J *3/02*

U.S. Cl. 237—1 A **20 Claims**



1. A solar energy operated system comprising

a solar energy collector apparatus including inlet and outlet thereto,

a fluid media for absorbing solar energy as heat in the collector apparatus,

a first storage tank for high temperature fluid media,

a heat utilization device operable by heat obtained from high temperature fluid media at a predetermined operating temperature,

a separate second storage tank for low temperature fluid media separated from said first tank,

a first fluid media circuit for flow of high temperature fluid media from the output of said collector apparatus to said first tank,

a second fluid media circuit for flow of high temperature fluid media from said first tank through the heat utilization device and to said second tank,

a third fluid media circuit from said second tank to the inlet of said collector apparatus and connected to the first fluid media circuit through said collector apparatus, and

a pump means in the system operable to circulate high temperature fluid media at said predetermined operating temperature from said first tank to the heat utilization device for operating the latter, and from the heat utilization device at reduced temperature to said second tank, said pump means also being operable for moving low temperature fluid media from said second tank to the inlet of the collector apparatus and displacing high temperature fluid media in said collector apparatus into said first circuit for flow to said first tank.

4,180,210

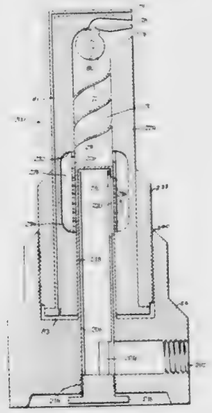
WATER SPRINKLER

Robert E. DeWitt, 49 Sherwick Rd., Oswego, Ill. 60543

Filed Apr. 5, 1978, Ser. No. 893,268

Int. Cl.² B05B *3/00*

U.S. Cl. 239—97 **34 Claims**



1. A water sprinkler for distributing water in a predetermined pattern, comprising:

an inlet port for receiving water;

a rotatable outlet port;

a flow regulator disposed to receive water from said inlet port and pass a regulated flow of water to said outlet port, said flow regulator including:

means defining a plurality of vertically spaced, circularly extending, pattern-defining apertures for passing a flow of water therethrough, a first of said pattern-defining apertures being contoured to develop a first pattern of water coverage, and at least a second of said pattern-defining apertures being contoured to develop, in combination with said first pattern-defining aperture, a second composite pattern of water coverage, and

sampling means defining at least one pattern-sampling aperture contoured to permit simultaneous communication with a plurality of said pattern-defining apertures, said pattern-defining apertures and said sampling aperture being disposed such that at least a substantial portion of the water from said inlet port is constrained to flow through at least a selected one of said pattern-defining apertures and said sampling aperture in route to said outlet port;

means for effecting relative motion between said pattern-sampling apertures and said pattern-defining aperture to sample successive portions of said selected pattern-defining apertures in synchronism with the rotation of said outlet port; and

vertically movable pattern selection means for modifying the pattern of water coverage from a condition wherein water from the inlet port flows through said pattern-sampling aperture and said first pattern-defining aperture to a condition wherein water flows from the inlet port through said pattern-sampling aperture and said first and second pattern-defining apertures,

whereby the sampling of successive portions of said selected pattern-defining apertures by said sampling aperture causes the flow of water from the exit port to develop a water pattern coverage related to the patterns of said selected pattern-defining apertures, and the pattern of water coverage is variable between the first pattern and the second composite pattern.

4,180,211

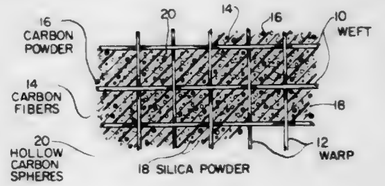
HIGH TEMPERATURE COMPRESSIBLE SUPPORT AND GASKET MATERIAL

Eugene L. Olcott, Falls Church, Va., and Edwin F. Abrams, Silver Spring, Md., assignors to Versar, Inc., Springfield, Va.

Filed May 30, 1974, Ser. No. 474,399

Int. Cl.² B64C *15/06*

U.S. Cl. 239—265.43 **6 Claims**



1. A high-temperature gasket material for filling and sealing a volume-limited space, the gasket material being crushable under high loading without requiring the exit of material from said space, comprising:

(a) a binder material of a type which pyrolyzes to leave a carbonaceous char which retains substantial strength, the binder material comprising 15 to 30% by weight of the gasket material and the binder material being selected from a group including phenolics, polyimides and furanes;

(b) crushable filler material in said binder comprising hollow carbon microspheres whose diameters fall within the range of 5 to 150 microns and whose wall thicknesses approximate several microns; and

(c) other filler materials in said binder and fully occupying the interstices between the microspheres so that substantially the only voids in the uncrushed gasket material are within the microspheres.

4,180,212

HIGH SPEED ROTARY KNIFE AND BLADE INSERT ASSEMBLY THEREFOR

Walter R. Witte, Des Plaines, Ill., assignor to Speco, Inc., Schiller Park, Ill.

Filed Aug. 21, 1978, Ser. No. 935,531

Int. Cl.² B02C *18/18*

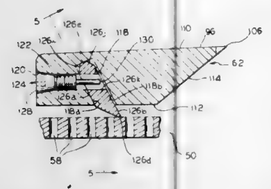
U.S. Cl. 241—89.4 **16 Claims**

1. In a high speed rotary knife adapted in operation to rotate adjacent to a perforated plate for severing foodstuff projecting from the plate perforations, said knife including a holder component and a blade held thereby, said holder component defining an arcuate-bottom slot, said blade having a longitudinally extending cutting edge and a longitudinally arcuate base, said slot receiving said blade seated therein with its base at the bottom of the slot in conformity thereto, said base being adjustable on said holder component by rotational sliding movement on its base for leveling its cutting edge with respect to said

plate, and said blade traversing said plate with said cutting edge thereagainst in operation, improved means for mounting said blade comprising:

means defining a hole extending transversely in said blade from a side thereof,

an arbor extending into said hole from said side, said arbor fitting loosely in said hole for retaining said blade in said



slot while enabling the blade to rock about a transverse axis for automatically leveling the blade with respect to said plate during assembly with the plate and operation, and

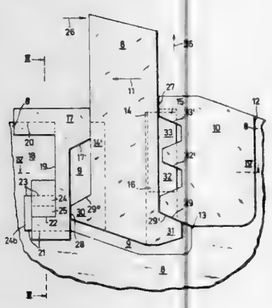
means for mounting said arbor on said holder component while enabling the arbor to be withdrawn from said hole sufficiently to release said blade for replacement thereof.

4,180,213

ROTOR OF A COARSE-REDUCTION IMPACT CRUSHER

Makoto Endo, Yokohama, Japan, assignor to Matsuzaka Company Ltd., Japan

Filed Apr. 12, 1978, Ser. No. 895,596
Int. Cl.[2] B02C *13/28*
U.S. Cl. 241—192 **12 Claims**



1. A rotor for a coarse reduction impact crusher with exchangeable blow bars comprising in combination:

a rotor disk to be driven in rotation having a plurality of radially facing recesses on the periphery;

a supporting element on the trailing side of said recesses secured to the rotor;

a circumferentially rearwardly extending projection on the leading side of said recesses;

a removable shoe in said recess embracing said projection on both lateral sides and on the radially inwardly facing side;

clamping keys securing said shoe to said disk; and

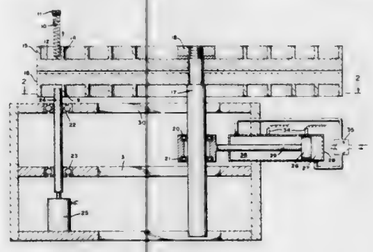
a blow bar in said recesses clamped therein between shoe and said supporting element so that the shoe can be removed by removal of said clamping keys for removal and replacement of said bar.

4,180,214

CARTRIDGE TAKEUP APPARATUS

Hsin L. Li, Parsippany; Hendrikus J. Oswald, Morristown, and Robin B. Mumford, Colts Neck, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 6, 1978, Ser. No. 966,987
Int. Cl.[2] B65H *54/76*
U.S. Cl. 242—47 **9 Claims**



1. A takeup apparatus for packaging yarn plugs comprising:

(a) a cartridge adapted for receiving yarn plugs from a yarn texturizer and having a storage groove formed by a spiral wall;

(b) a support for the base of said cartridge, said support having a spiral wall extending downward, the shape of said support spiral wall corresponding substantially to the shape of said cartridge spiral wall;

(c) a shaft upon which said support is mounted;

(d) means for driving said support around said shaft by contacting the spiral wall of said support with a driving means;

(e) means for applying a lateral force to said shaft to hold the spiral wall of said support in non-slip contact with said driving means;

(f) means for sensing the lateral position of said support; and

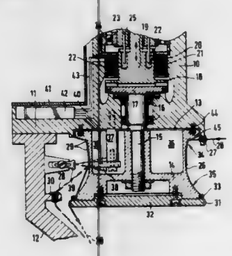
(g) means for changing reversibly the direction of said lateral force such that the contact point of the driving means shifts from a point on the inside of the support spiral wall to a point on the outside of the support spiral wall.

4,180,215

THREAD STORAGE AND SUPPLY ARRANGEMENT FOR TEXTILE MACHINES

Siegfried Nürk, Albstadt, Fed. Rep. of Germany, assignor to Sipra Patententwicklungs- und Beteiligungsgesellschaft mbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 21, 1978, Ser. No. 944,376
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1977, 2743749
Int. Cl.[2] B65H *51/20*
U.S. Cl. 242—47.01 **8 Claims**



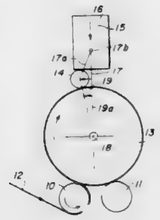
1. In a thread storage and supply arrangement for textile machines, in combination, a storage drum having a peripheral thread storage surface onto which is to be wound a succession of adjoining turns of thread, the thread storage surface comprising a thread infeed region at one axial end of the storage surface and a thread outfeed region at the other axial end; thread infeed means located at the thread infeed region for feeding onto the peripheral storage surface a succession of adjoining turns of thread; thread outfeed means located at the thread outfeed region for feeding off the storage surface thread which is to be pulled off the storage drum, the peripheral storage surface at the thread infeed region thereof curving radially inward in the direction from the infeed region to the outfeed region and at the outfeed region thereof curving radially outward in the direction from the infeed region to the outfeed region, the diameter of the peripheral storage surface being greater at the part of the thread outfeed region remote from the infeed region than at the thread infeed region; controllable drive means operative when activated for effecting rotation of the storage drum relative to the infeed and outfeed means; and electrooptical control means operative for activating and deactivating-the drive means in dependence upon the extent to which thread is wound about the peripheral storage surface of the storage drum.

4,180,216

WINDER WITH HORIZONTAL RIDER ROLL ADJUSTMENT

Carl B. Dahl, Rockton, Ill., and Jere W. Crouse, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed Apr. 12, 1978, Ser. No. 895,598
Int. Cl.[2] B65H *17/12*
U.S. Cl. 242—66 **7 Claims**



1. In a winder for winding a continuous traveling web, the combination comprising:

first and second cylindrical winder drums rotatable in the same direction on horizontal parallel axes for supporting a roll being wound thereon;

a rider roll initially positioned centrally above the winder drums for engaging the surface of the wound roll and applying a generally downwardly directed force thereto;

a stationary beam means for supporting the rider roll above said roll to be wound at a fixed distance from said beam means and applying the downward force;

and means for continuously changing the location of said rider roll circumferentially relative to the wound roll axis during winding to compensate for the changing spring constant of the wound roll and reducing the vibration thereof,

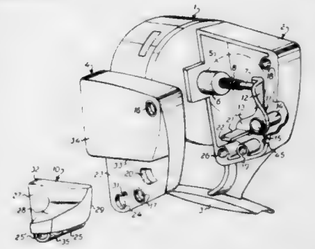
said location changing means being supported on said beam and maintaining the rider roll centrally located with respect to the drums at the beginning of the winding operation and moving the rider roll laterally relative to the beam along the surface of the wound roll to a final position at an angle from the center of the wound roll as the size of the wound roll increases.

4,180,217

FISHING REELS FOR RETAINING THE LINE DURING CASTING

Kurt J. S. Harre, Karlshamn, and Kent A. Tufvesson, Asarum, both of Sweden, assignors to ABU Aktiebolag, Svangsta, Sweden

Continuation of Ser. No. 759,357, Jan. 14, 1978, abandoned. This application Jul. 10, 1978, Ser. No. 923,431
Claims priority, application Sweden, Jan. 22, 1976, 7600629
Int. Cl.[2] A01K *89/01*
U.S. Cl. 242—84.2 A **5 Claims**



1. A fishing reel having forward and rear portions with a line spool at the forward portion and a foot at the bottom of the fishing reel connecting the fishing reel to a fishing rod, and comprising

a gear casing at the rear portion of the fishing reel connected to the line spool;

transmission elements in said gear casing;

a thumb-operable knob having an operating surface and a hollow portion and pivotally mounted on said gear casing on a pivot having its pivot axis located at a level between the longitudinal axis of the line spool and the location of the foot and said pivot axis located near the bottom of said knob;

said transmission elements including

a push rod slidably guided in the fishing reel between a position toward the forward portion of the reel and a position toward the rear portion of the reel,

bell crank means pivotally mounted in said casing and having two arms with one of said arms positioned to actuate said push rod into a forward position by application of pressure on said push rod in the longitudinal direction thereof,

a projection on the other of said arms extending into said hollow portion of said knob and positioned below said operating surface of said knob for operation thereon by said knob to pivot said bell crank means against said push rod by pivoting of said knob about is pivot axis by application of thumb pressure to its said operating surface in a same direction as the direction of movement of a point of contact between said knob and said bell crank means,

and in the forward position of said push rod, a straight line between said pivot axis of said thumb-operable knob and the pivot axis of said bell crank mens forming an angle of approximately 90° in relation to a straight line between the pivot axis of said bell crank means and a point of application of pressure by said one of said arms of said bell crank means on said push rod.

4,180,218

CREEL

David R. Jacobs, New Canaan, Conn., assignor to Abram N. Spanel, Princeton, N.J.

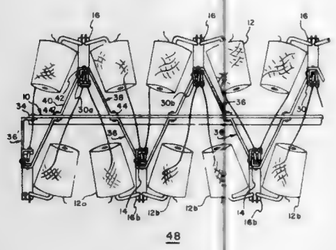
Filed Feb. 14, 1978, Ser. No. 877,632
Int. Cl.[2] B65H *49/02*
U.S. Cl. 242—131 **21 Claims**

1. A creel for yarn bobbins, comprising:

a plurality of support members disposed in at least two adjacent rows;

means for mounting at least one bobbin on each side of said support member;

means on at least one of said support members in the first row for receiving and guiding yarn from at least one of said bobbins mounted on said support members in the second row; and,



48

means on at least one of said support members in the second row for receiving and guiding yarn from at least one of said bobbins mounted on said support members in the first row.

4,180,219

LAP CREEL COMPRISING ROD SHAPED CARRIER ELEMENTS

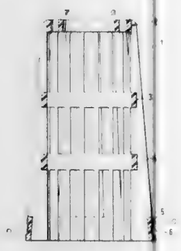
Josef Becker; Hubert Becker, and Matthias Becker, all of Niederforstbacher Str. 80-84, 5100 Aachen-Brand, Fed. Rep. of Germany

Filed Jun. 29, 1978, Ser. No. 920,546

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1977, 2730876

Int. Cl.[2] **B65H** *75/20, 75/28*

U.S. Cl. 242—118.1 **6 Claims**



1. A lap creel comprising rod shaped carrier elements (**1**) each having a cross-section with a long axis of given length and a short axis of a length less than said given length of said long axis, and holding means (**2, 3, 4, 5**) for said carrier elements (**2**) to form with said carrier elements a cage having a longitudinal, central axis from which said long cross-section axes extend radially, said carrier elements (**1**) having a substantially right-angled triangular shape and radially outwardly facing longitudinal edges forming the hypotenuse of the respective triangle whereby these edges extend at an acute angle relative to said central axis of said cage whereby the latter has a conical outer configuration and a cylindrical inner configuration, said lap creel having one end of largest diameter and an opposite end of smallest diameter, said holding means comprising at least one first holding element (**5**) at said largest diameter end and at least one second holding element (**2**) at said smallest diameter end, said first and second holding elements (**5, 2**) being so positioned that said carrier elements extend radially inwardly at said largest diameter end in the area of the respective first holding element (**5**) and radially outwardly at said smallest diameter end in the area of the respective second holding element, whereby said lap creel is insertable coaxially into another lap creel of the same construction to a definite proportion of its height.

4,180,220

TAPE CASSETTE

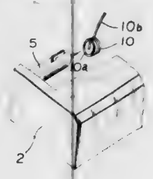
Haruo Shiba, and Takateru Sato, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1978, Ser. No. 933,580

Claims priority, application Japan, Oct. 28, 1977, 52-144801[U]

Int. Cl.[2] **G03B** *1/04*

U.S. Cl. 242—199 **4 Claims**



1. In a tape cassette having a cover for covering a wound tape which comprises a polar member mounted on a wall of the cover and a spring fitted to the polar member, an improvement characterized in that the polar member has a narrow width slit at the free end and a wide width slit adjacent to the narrow width slit at the side of the fixed end and one end of the spring is inserted into the wide width slit and the other end of the spring is contacted with a case body.

4,180,221

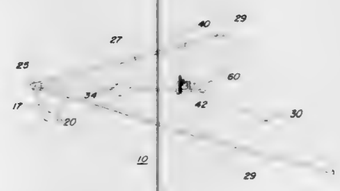
SELF PROPELLED KITE

Donald E. Harris, Star Route, Payette, Id. 83661

Filed Jan. 16, 1978, Ser. No. 869,695

Int. Cl.[2] **B64C** *39/00*

U.S. Cl. 244—13 **4 Claims**



1. Self propelled kite apparatus comprising:

a frame including a nose piece, a stringer backwardly extending from the nose piece and two spars attached to the nose piece, equidistant and upwardly and outwardly diverging from the stringer;

a fairing connected to and extending between the spars beneath said stringer, said fairing being fabricated from flexible sheeting material including a pair of longitudinally extending, divergent ducts, each duct adjacent an outer terminal edge of said fairing and adapted to receive one of the spars;

propulsion means mounted to the stringer above the fairing and said fairing defining at least one air intake port forward of said propulsion means;

4,180,222

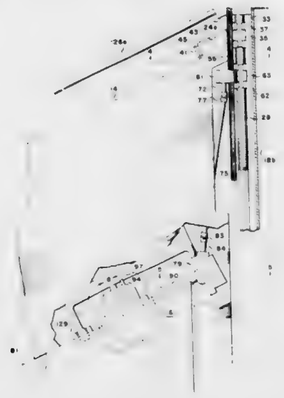
AILERON SEGMENT CONTROL FOR A FLAPERON SYSTEM

Francis L. Thornburg, Canoga Park, CA, assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Dec. 27, 1976, Ser. No. 754,823

Int. Cl.[2] **B64C** *9/06, 9/12*

U.S. Cl. 244—75 R **20 Claims**



1. In an aircraft wing flaperon system comprising a flap, flap power means and means driven thereby to extend and retract the flap, flap guide means mounted in the wing to support and guide the flap, and an aileron segment contained within, defining a portion of and attached to the flap for rotation relative to the flap about an axis of rotation, an improved aileron segment control system comprising:

aileron segment rotation power means connected to receive pilot inputs;

a first power transfer means having an output shaft for controlling the aileron segment, said first power transfer means connected to and adapted to be supported and guided by the flap guide means in a generally translational mode along the wing, said transfer means attached to and caused to move with the flap by the means to extend and retract, and connected to both said aileron segment rotation power means and said output shaft such that said output shaft is driven responsive to pilot inputs;

a second power transfer means fixed to and movable with the flap and having an input shaft attached to receiver power from said first power transfer means and a power output means attached to the aileron segment for rotating the aileron segment about is axis of rotation; and

flexible drive means connecting said output shaft of said first power transfer means to said input shaft of said second power transfer means for driving said power output means of said second transfer means in rotation.

4,180,223

LIMITED-SLIP BRAKE CONTROL SYSTEM

Robert L. Amberg, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 28, 1977, Ser. No. 865,181

Int. Cl.[2] **B64C** *25/46*

U.S. Cl. 244—111 **26 Claims**

18. In a limited-slip brake control system controlling brake force to be developed by a braking means for a wheel of an aircraft, the wheel being supported by a lightly-damped landing gear strut assembly, the limited-slip brake control system being operative to compare measured deceleration of the wheel with a reference deceleration to obtain a deceleration error signal, and to integrate the deceleration error signal to obtain a brake control signal representing a desired level of brake force, an improvement for compensating the brake control signal for oscillation therein resulting from low-frequency oscillation in the measured wheel deceleration that is produced by the landing gear strut assembly when brake force is developed by the wheel, the improvement comprising a dynamic compensation circuit responsive to measured wheel deceleration for providing a compensating brake control signal having



a 90° or greater phase lead for a range of frequencies in the measured wheel deceleration surrounding the expected frequency of oscillation produced by the landing gear strut assembly in the measured wheel deceleration, and a lesser phase lead for all other frequencies in the measured wheel deceleration; and, means for combining said compensating brake control signal with said brake control signal to compensate said brake control signal for said oscillation.

4,180,224

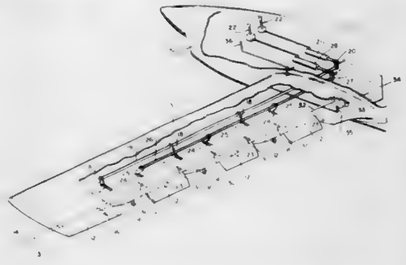
AERIAL DISPERSAL SYSTEM

Dallas M. Ryle, Jr., Marietta, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Apr. 6, 1978, Ser. No. 894,163

Int. Cl.[2] **B64D** *1/18*

U.S. Cl. 244—136 **5 Claims**



1. An aerial dispersal system for the distribution of chemicals from an aircraft having a pair of fixed wings comprising:

a segmented trailing edge on at least one of said wings, the individual segments of which are hinged at and along a common line;

a nozzle mounted on and carried by said at least one wing at each of the adjacent edges of said segments, each said nozzle being located forward of said common hinge line and facing in an aft direction;

a source of dispersant;

ducting between said dispersant source and each said nozzle;

a control connected in said ducting and operable in the alternate to permit and to prevent the flow of dispersant from said source to each said nozzle; and

an actuator connected to each said segment and operable to move each alternate segment in opposite directions to generate turbulence in the air flow passing said at least one wing during flight of the aircraft at each junction of said

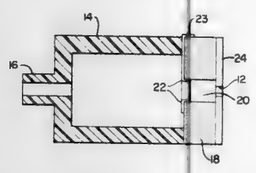
segments which turbulence sheds in the wake of said aircraft whereby dispersant when ejected by each said nozzle is entrained by the turbulence created by the associated segments.

4,180,225

INK JET RECORDING APPARATUS

Takahiro Yamada, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 5, 1977, Ser. No. 857,707
Claims priority, application Japan, Dec. 6, 1976, 51/145576
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **17 Claims**



1. A recording head assembly for ink jet recorders comprising:
- a hollow member having an inlet opening for supply of pressurized ink at one end thereof,
- and end plate made of an electrical insulator having at least one outlet opening and being attached to the other end of the hollow member as an end wall thereof to form an ink reservoir in cooperation with the hollow member;
- at least one inner electrode disposed on the end plate around said outlet opening on the inside of the ink reservoir;
- at least one outer electrode attached to the end plate on the outside of the ink reservoir and having an orifice aligned with said outlet opening, said at least one inner electrode and said at least one outer electrode being arranged for receiving an electric signal indicative of character information applied therebetween.

4,180,226

ELECTRICAL OUTLET BOX SUPPORT

Jacques R. Matte, 187 Rue Thompson, Gatineau, Quebec, Canada (J8P 6L9)

Filed May 4, 1978, Ser. No. 902,644
Int. Cl.[2] G12B *9/00*
U.S. Cl. 248—27.1 **6 Claims**



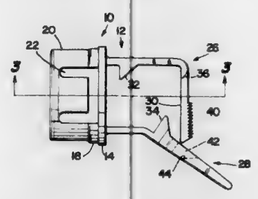
1. A support for mounting an electrical outlet box in an aperture in a building panel, said support comprising: a U-shaped yoke having a base portion, a pair of legs substantially normal to the base portion and a support foot extending outwardly from each leg substantially parallel to the base portion and adapted to overlie an area of the front of the building panel adjacent the aperture when the yoke is inserted in the aperture, each leg having an array of slots intermediate the base portion and the foot; and a clamping member for association with each leg of the yoke, each clamping member having a support surface adapted to overlie an area of the back of the building panel opposite the area of the front of the building panel to be overlaid by the foot of the associated leg, a tab member extending from said support surface and adapted to extend through a slot of the array of slots of the associated leg of the yoke and then be bent over to interconnect the clamping member to the associated leg of the yoke, and a clamping arm extending from the support surface on each side of the tab member, each arm being bendable to a first position extending out of the aperture in the building panel in a direction substantially normal to the front of the building panel and bendable to a second position when an electrical outlet box is positioned in the aperture in the building panel, over the edge of the electrical outlet box to secure the electrical outlet box in position.

4,180,227

NON-METALLIC SHEATHED CABLE CONNECTOR

Thomas J. Gretz, Stow, Ohio, assignor to The Scott & Fetzer Company, Bedford Heights, Ohio

Filed Feb. 6, 1978, Ser. No. 875,236
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—56 **8 Claims**



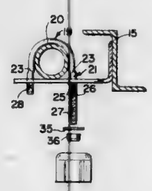
1. A one-piece plastic sheath cable connector including a bushing portion, means on the bushing portion for locking it in an aperture, an axially extending opening in the bushing portion through which a cable may be received, first and second strain relief gripping members on opposite sides of the central opening and initially extending generally axially from one end of the bushing, the first gripping member then extending transaxially substantially across a projection of the bushing member with the free end of the first gripping member being engageable in latching relationship with the second gripping member, a window in the transaxially extending portion of the first gripping member for receiving the cable, three cable-gripping teeth distributed along the axial direction, the two endmost gripping teeth being associated with one gripping member and the intermediate gripping tooth being associated with the other gripping member.

4,180,228

PIPE CLAMP

Richard C. Snyder, Michigan City, Ind., and Donald C. Bodinger, Pelham, Ala., assignors to Pullman Incorporated, Chicago, Ill.

Filed Mar. 29, 1978, Ser. No. 891,418
Int. Cl.[2] F16L *3/04*
U.S. Cl. 248—74 R **4 Claims**



1. In a railway car having an underframe and members such as pipes for carrying brake lines and the like, a clamp comprising:
- a generally U-shaped bolt including a bend portion and substantially parallel first and second legs;
- bracket means mounted on the underframe;

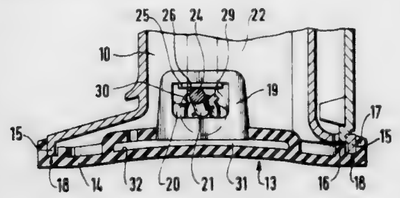
- said bracket means having holes through which the legs of the U-bolt extend thereby entrapping the pipe between the bend portion and the bracket;
- said first leg having a grooved portion, a recessed portion and a threaded severable end portion;
- said severable end portion being severable at the recessed portion at predetermined force on the leg;
- a collar for permanently fastening the U-bolt at the grooved portion of the first leg;
- said second leg being initially unsecured, and adapted to receive a threaded fastener so that the collar on the first leg can be cut off and the U-bolt secured by means of said threaded fastener;
- said bend portion having a substantially semi-circular flat surface in contact with the pipe thereby minimizing stress on the pipe and insuring a snug fit;
- said first and second legs each being connected to the bend portion by an outwardly flared portion;
- said first and second legs being spaced from and offset with respect to the outside diameter of the pipe, thereby facilitating installation and preventing damage to the threaded and grooved portions of the legs during installation of the bolt; and
- the hole through which the second leg extends includes an inner peripheral surface radially spaced a predetermined distance from said second leg sufficient to permit axial positioning of the second leg therethrough and accommodating limited stress attenuating deflection of said second leg when unsecured, and said second leg being reactively engageable against said inner peripheral surface to abate excessive movement of said second leg attendant to predetermined dynamic loading on the pipe during high speed rail operations thereby preventing substantial deflection of said second leg from a generally perpendicular disposition relative to the plane of said bracket hole.

4,180,229

SUCTION-ATTACHABLE KITCHEN APPLIANCE

Rolf G. Schüllein, Singhofen, Fed. Rep. of Germany, assignor to Leifheit International Günter Leifheit GmbH, Nassau, Fed. Rep. of Germany

Filed Oct. 7, 1977, Ser. No. 840,172
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1976, 2645248
Int. Cl.[2] A45D *42/14*
U.S. Cl. 248—363 **17 Claims**



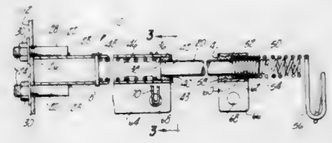
1. An appliance, particularly a kitchen appliance, comprising a housing having a bottom; first means for supporting said housing on and attaching the same to a support surface, including a suction plate of an elastically yieldable material and capable of adhering to the support surface; and second means mounted in said housing for actuating said suction plate to thereby attach said housing to said support surface, said second means being displaceable between a first position in which said suction plate is in a first released condition, a second position in which said suction plate is actuated so as to attach said housing to the support surface, and a third position in which said suction plate is in a second released position and in which said second means can be readily withdrawn from said housing.

4,180,230

HANGER FOR VEHICLE MUD FLAPS

Nash P. Sogoian, 1417 21st St., Detroit, Mich. 48216

Filed Mar. 13, 1978, Ser. No. 885,362
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—573 **12 Claims**



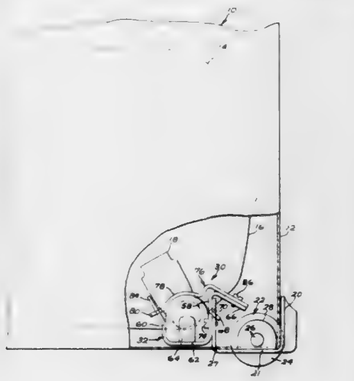
1. A hanger for a vehicular mud flap comprising:
- an elongated first support member,
- means carried at one end of said first support member for mounting said first support member to a vehicle,
- a second elongated support member,
- means for telescopically mounting said second support member relative to said first support member,
- resilient means for urging said second support member toward a telescopically extended position with respect to said first support member,
- a lateral deflection means secured to and extending outwardly from the free end of said second support member said lateral deflection means comprising at least one resilient member adapted to be deflected laterally in a manner to urge said second support member toward a telescopically retracted position, and
- means for securing a mud flap onto said support members so that said mud flap hangs downwardly from said support members.

4,180,231

VIBRATION DAMPENING SUPPORT

Lowell C. Burnham, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

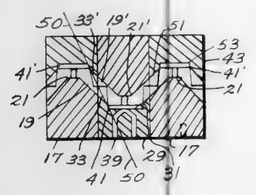
Filed Aug. 30, 1978, Ser. No. 938,166
Int. Cl.[2] F16F *15/04*
U.S. Cl. 248—632 **17 Claims**



1. A vibration dampening support for mounting a structure horizontally comprising:
- (a) a stationary mounting bracket having an inside U-shape configuration as viewed in lateral cross section and an inwardly projecting lug,
- (b) an elastomeric bushing having a top, sides, bottom back and front walls located in the mounting bracket with the back wall abutting the lug, said bushing including;

(i) a top and bottom section which are connected to each other at the back wall by a hinge that is perpendicular to the longitudinal axis of the bushing,
(ii) a cavity through the front wall to receive the structure for mounting,
(iii) the bottom section having an outside configuration complimentary to the inside U-shape configuration of the mounting bracket, and
(c) a strap secured to the mounting bracket and engaging the top section of the bushing.

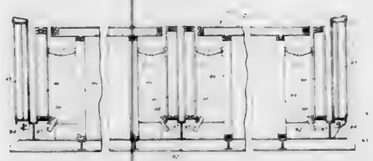
4,180,232
TRUSS PANEL MOLD
James S. Hardigg, Baptist Hill, Conway, Mass. 01341
Filed Jan. 13, 1977, Ser. No. 759,233
Int. Cl.² B28B *7/34*
U.S. Cl. 249—60 **7 Claims**



1. A mold for forming an integrated truss structure comprising:
a plurality of male mold members, each of said male mold members having a top surface, and a plurality of open grooves formed in said top surface and sloping away therefrom,
a plurality of female mold members, each of said female mold members having a recessed cavity therein, said cavity having a generally flat surface and a plurality of open grooves formed in each of said female mold members and sloping away from said surface of said cavity;
said male and female mold members being positioned opposite one another with said open grooves in said male and female mold members being aligned to define strut beam chambers and said top surfaces of said male mold members being aligned with said recessed cavities in said female mold members to define junction chambers, one of said male mold members being positioned adjacent each female mold member, and vice versa, to thereby define alternate symmetrical upper and lower junction chambers interconnected by said strut beam chambers, and
means in at least one of said mold members for permitting the injection of a moldable material into said strut beam chambers and said junction chambers.

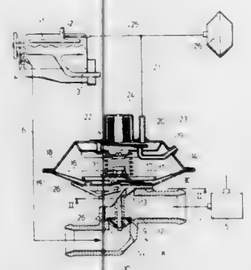
4,180,233
BUILDING CONSTRUCTION SYSTEM
James H. Johnson, Rochester, N.Y., assignor to Housing Systems, Inc., Penfield, N.Y.
Continuation-in-part of Ser. No. 712,961, Aug. 9, 1976, abandoned, and a continuation-in-part of Ser. No. 146,904, May 26, 1971, abandoned, and Ser. No. 809,071, Mar. 21, 1969, abandoned. This application Oct. 18, 1978, Ser. No. 952,517
Int. Cl.² B28B *7/30*
U.S. Cl. 249—144 **11 Claims**

1. A building construction system comprising:
(a) a mold to receive hardenable casting material such as concrete or the like, having a base supporting an internal portion and an external portion to receive such casting material to form a building, said external portion including outside mold walls positionable to define outside faces of external building walls and said internal portion including inside form sections;
(b) means connecting said outside mold walls to said base for positioning said outside mold walls adjacent inside form sections to define external building walls, and for moving said outside mold walls into molding configuration toward said internal portion and out of molding configuration away from said inside form sections; and
(c) said internal portion comprising:
(1) inside form sections defining at least one mold section for at least one interior building partition, and



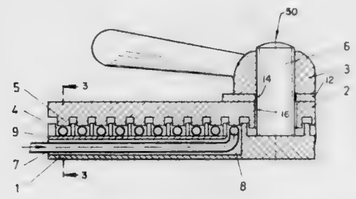
(2) inside form sections facing said outside mold walls to define exterior building walls,
(3) means for supporting said inside form sections on said base for motion relative to said base to release a casting upon lifting from said mold; and
(4) said supporting means including means for bracing said walls against inward motion from a lowermost position of said walls and means permitting inward motion of said inside form sections thereby releasing said casting material after hardening thereof as said walls are raised from said lowermost position.

4,180,234
PNEUMATICALLY OPERATED VALVE WITH A MANUALLY OPERATED BACK-UP DISPLACING MECHANISM
Wilhelm Hertfelder, Steinenbronn, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Aug. 26, 1977, Ser. No. 828,228
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1976, 2642305
Int. Cl.² F16K *31/42, 31/524*
U.S. Cl. 251—14 **8 Claims**



1. A device for regulating the flow of a heat-exchange medium through a circuit of an arrangement for controlling the climate inside a motor vehicle, comprising a flow-control valve interposed in the circuit and displaceable between a closed and an open position, said valve including a valve housing and a valve member within said valve housing and displaceable relative thereto between said positions, and a sealing diaphragm connected to said valve housing to delimit a control space in the latter; pneumatically operated means for displacing said valve between said positions thereof, including an actuator housing and an actuating diaphragm connected to said actuator housing to delimit an actuating space in the latter and arranged with a spacing from said sealing diaphragm, and an actuating rod connected to said actuating diaphragm and to said valve member and passing through said sealing diaphragm; and an auxiliary mechanism operative for displacing said valve toward said open position thereof in the event of malfunction of said pneumatically operated means so as to permit the arrangement to control the climate even in such an event, said mechanism including a rocker-arm lever tiltably mounted on said valve housing and operatively connected to said valve member, and wherein said lever is arranged in said spacing between said diaphragm and acts on said actuating diaphragm to displace said valve member toward said open position thereof.

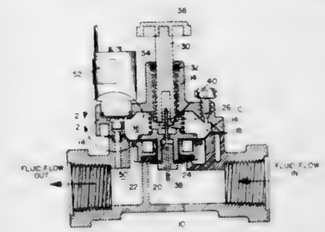
4,180,235
THROTTLING DEVICE FOR FLUIDS
Adalbert Pasternack, Bad Schwartau, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany
Filed Jan. 3, 1978, Ser. No. 866,237
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1977, 2700491
Int. Cl.² F16K *7/06*
U.S. Cl. 251—8 **5 Claims**



1. A throttling device for fluids, comprising a flexible tube in which the fluid is conveyed, having a compressible wall to vary the cross section thereof, a base plate having a continuous spiral channel in which said tube is accommodated, a cover plate overlying said base plate and having a projecting surface of a complementary spiral of a dimension and location such that it projects into said channel to engage and compress said tube therein, and control means for displacing said cover and said base plate relatively for selectively advancing and retracting the projecting surface and groove relatively for varying the flow cross section of said tube.

4,180,236
NORMALLY-OPEN VALVE ASSEMBLY WITH SOLENOID-OPERATED PILOT
Myrl J. Saarem, Carson City, Nev., and Dale F. Soukup, Meadow Vista, Calif., assignors to Richdel, Inc., Carson City, Nev.
Filed May 24, 1976, Ser. No. 689,155
Int. Cl.² F16K *31/385, 31/40*
U.S. Cl. 251—30 **3 Claims**

1. A normally-open valve assembly for controlling fluid flow, said valve assembly including: a casing defining a primary valve chamber and an auxiliary valve chamber communicating with said primary valve chamber, said auxiliary valve chamber having a discharge port providing an outlet from said auxiliary valve chamber, and at least one of the auxiliary and primary valve chambers having a bleed port providing an inlet into said valve chambers; a valve actuator movable in said primary valve chamber between a first position in which the valve is open and a second position in which the valve is closed; a manually operated handle threaded into said casing in position to engage said valve actuator to move said valve actuator towards its second position to limit the movement of the valve actuator; a valve seat included in said discharge port; a normally-open solenoid-operated valve positioned in said auxiliary valve chamber and having a plunger extending into said discharge port beyond said seat; a member attached to the distal end of the plunger having a diameter greater than the diameter of said plunger; a spring normally biasing said plunger to an open position in said discharge port in which said member attached to the distal end of the plunger is displaced

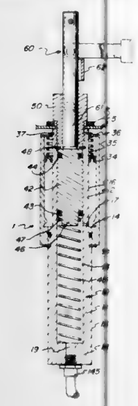


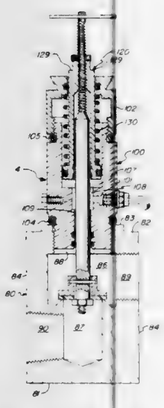
from said seat so as to permit the discharge of fluid from the auxiliary valve chamber and from the primary valve chamber when the solenoid is de-energized so that there is insufficient pressure exerted on the valve actuator to hold the valve actuator at its second position whereby said valve actuator is established at its first position, said solenoid-operated valve drawing said member at the distal end of said plunger against said seat to close said discharge port when the solenoid is energized to block the flow of fluid through said discharge port so as to cause a build-up of pressure in said primary valve chamber causing said valve actuator to move to its second position.

4,180,237
HYDRAULIC VALVE SYSTEM
Clyde C. Wolf, 4100 E. 60th Ave., Commerce City, Colo. 80022
Filed Jun. 6, 1977, Ser. No. 803,621
Int. Cl.² F16K *31/143, 31/122*
U.S. Cl. 251—57 **1 Claim**

1. A remote control for an hydraulic fluid flow valve for a pressurized vessel fluid outlet comprising:
(a) master hydraulic cylinder means arranged to be mounted in a general vertical condition for operation and having a fluid outlet at one end and a closure at the opposite end and a small bore intermediate thereof;
(b) free piston means reciprocably mounted in said cylinder, said free piston being elongated and including an O-ring seal adjacent each end for sealing hydraulic fluid between said free piston and said fluid outlet;
(c) plunger means reciprocably mounted through said closure in contact with said free piston;
(d) pivoted lever means arranged to depress and release said plunger means;
(e) coil spring means in said cylinder means biasing said free piston means toward said closure;
(f) annular, concentric, tubular reservoir means around said cylinder means, said annular reservoir extending only substantially midway along the length of said cylinder and being sealed to said cylinder by means of an O-ring; and a small passageway providing communication between said reservoir means and said cylinder means, whereby said spring normally biases said piston means adjacent said closure means opening said reservoir to said cylinder means and depression of said plunger forces hydraulic fluid to the hydraulic fluid flow valve for opening the same;
(g) an annular seal mounted in said annular reservoir in the

end opposite said small passageway, and coil spring means biasing said annular seal toward said small passageway,





and means in said annular reservoir for preventing movement of said annular seal over said small passageway.

4,180,238

VALVE ACTUATOR HAVING A ROTARY BI-DIRECTIONAL APPARATUS WITH A DUAL RATCHET MECHANISM

John D. Muchow, Long Beach, Calif., assignor to Valve Concepts International, Inc., Torrance, Calif.

Filed Aug. 22, 1978, Ser. No. 935,767
Int. Cl.[2] F16K *31/52, 31/16*
U.S. Cl. 251—58 **5 Claims**

1. A bi-directional valve actuator with a ratchet mechanism for use in combination with a control valve which includes a stem which, when turned, adjusts the flow through the control valve, said bi-directional valve actuator comprising:

a. a frame which is mechanically coupled to the control valve adjacent to the outer end of the stem thereof;

b. a shaft disposed within said frame and rotatably coupled thereto, said shaft is mechanically coupled to the stem of the control valve so that it can turn the stem thereof;

c. a first ratchet wheel which is coaxially aligned with said shaft and which is fixedly coupled thereto;

d. a second ratchet wheel which is coaxially aligned with said shaft and which is fixedly coupled thereto;

e. a first pawl having a first end and a second end;

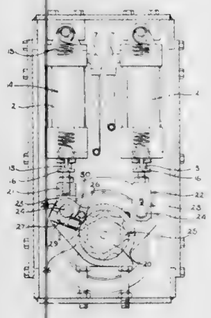
f. coupling means for coupling said first end of said first pawl to said first ratchet wheel during a forward stroke of said first pawl and for uncoupling said first end of said first pawl from said first ratchet wheel during a backward stroke of said first pawl;

g. a first hydraulic cylinder which is mechanically coupled to said frame and which has a piston which is mechanically coupled to said second end of said first pawl in order to drive it forward;

h. a first elongated member with two arms which is mechanically coupled to said piston of said first hydraulic cylinder adjacent to said first pawl and which is disposed orthogonally to said piston and aligned coaxially therewith;

i. a first pair of springs which are disposed parallelly to said first hydraulic cylinder and each of which is mechanically coupled to said frame and to one of said two arms of said first elongated member whereby said piston of said first hydraulic cylinder and said first pair of springs interact to provide a reciprocal and incremental force on said first pawl in order to drive said first pawl;

j. a second pawl having a first end and a second end;



k. coupling means for coupling said first end of said second pawl to said second ratchet wheel during a forward stroke of said second pawl and for uncoupling said first end of said second pawl from said second ratchet wheel during a backward stroke of said second pawl;

l. a second hydraulic cylinder which is mechanically coupled to said frame and which has a piston which is mechanically coupled to said second end of said second pawl in order to drive it forward;

m. a second elongated member with two arms which is mechanically coupled to said piston of said second hydraulic cylinder adjacent to said second pawl and which is disposed orthogonally to said piston and aligned coaxially therewith; and

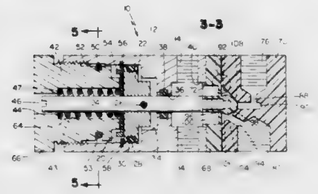
n. a second pair of springs which are disposed parallelly to said second hydraulic cylinder and each of which is mechanically coupled to said frame and to one of said two arms of said second elongated member whereby said piston of said second hydraulic cylinder and said second pair of springs interact to provide a reciprocal and incremental force on said second pawl in order to drive said second pawl.

4,180,239

METERING VALVES

Robert W. Valukis, Sherborn, Mass., assignor to Electron Fusion Devices Inc., East Providence, R.I.

Continuation of Ser. No. 805,799, Jun. 13, 1977, abandoned.
This application Nov. 6, 1978, Ser. No. 958,137
Int. Cl.[2] F16K *31/122, 1/52*
U.S. Cl. 251—60 **2 Claims**



1. A metering valve comprising

a fluid passage member,

said fluid passage member comprising

a fluid inlet passage,

a conical valve seat portion, and

a fluid outlet passage,

said conical valve seat portion being intermediate said fluid inlet passage and said fluid outlet passage,

a valving element,

said valving element comprising

an outer annular portion,

an inner annular portion,

a conical valving surface, and

drive rod connection means,

said inner annular portion being integral and coaxial with said outer annular portion and said conical valving surface and flexible to permit movement axially of said conical valving surface longitudinally into and out of engagement with said conical valve seat portion,

a piston,

a drive rod,

a valve body,

said valve body comprising

an abutment surface for abutting said valving element around said outer annular portion,

a relieved portion adapted to sealingly permit longitudinal reciprocation therein of said drive rod,

an inner cylindrical surface to sealingly permit longitudinal reciprocating of said piston, and

a screw-threaded portion at its end longitudinally spaced from said abutment surface,

a plug screw-threadedly engaging said screw-threaded portion,

said drive rod being secured at one end in said drive rod connection means and being secured intermediately to said piston for reciprocation therewith,

biasing means engaging said plug to bias said drive rod toward said valve body, and

a vibration element comprising a frictional element engaging said plug around an outer diameter thereof and said valve body at discontinuous spaced locations around an inner diameter thereof,

said fluid passage member, valving element, and valve body being secured in longitudinal and abutting relationship,

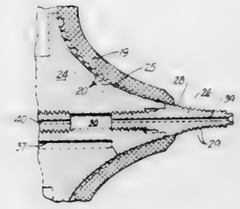
whereby said plug may be adjusted like a micrometer to provide delicately controlled valving surface stroke within a small range permitted by the flexibility of said inner annular portion of said valving element.

4,180,240

LOW NOISE LEVEL CONTROL VALVE

Robert S. Sheldon, and Jan W. Rabek, both of Northridge, Calif., assignors to Air-Dry Corporation of America, Northridge, Calif.

Filed Dec. 16, 1977, Ser. No. 861,266
Int. Cl.[2] F16K *47/02, 25/00*
U.S. Cl. 251—127 **20 Claims**



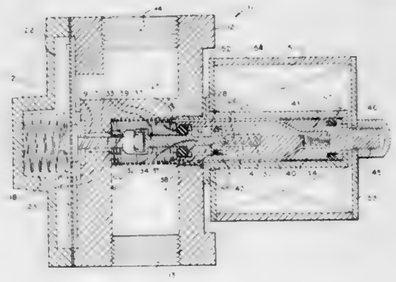
1. A low noise level control valve comprising (i) an inlet and (ii) an outlet, (iii) a poppet mounted for movement on a given line with respect to a valve seat between open and closed positions to control the flow of fluid from said inlet to said outlet, (iv) means defining a plurality of spaced orifices disposed between the periphery of said poppet and said valve seat, said orifices being constructed and arranged so that they are of progressively increasing diameter and progressively more transverse to the direction of movement of said poppet in relation to their distance away from said inlet, and (v) a balancing chamber disposed on the opposite side of said poppet from said inlet, a passage extending through said poppet to connect said balancing chamber to a point adjacent to approximately the mid-portion of said means defining said orifices to provide pressure in said chamber to counter-balance the opening movement of said poppet.

4,180,241

SOLENOID OPERATED VALVE AND SHUT-OFF DEVICE

Frank Fiedler, Jr., 2429 Agostino Dr., Rowland Heights, Calif. 91748

Filed May 31, 1978, Ser. No. 911,274
Int. Cl.[2] F16K *31/02*
U.S. Cl. 251—130 **9 Claims**



1. A combined solenoid operated valve and shut-off device comprising:

a valve housing means defining a fluid inlet, a fluid outlet and a valve seat therebetween;

a valve closure means movable between a closed position against said valve seat and an open position away therefrom, said closure means preventing fluid flow between

said inlet and outlet when in said closed position and permitting said fluid flow when in said open position;

a valve operator means coupled to said valve closure means and operative to produce movement thereof between said open and closed positions, said valve operator means comprising electromagnetic means for cycling said valve closure means between said open and closed positions in response to an electrical signal input, and said valve operator means further comprising shut-off means activatable to move said valve closure means to said closed position and to lock said closure means therein in response to a predetermined fluid pressure at said inlet; and

manual reset means for returning said valve closure means to said open position after activation of said shut-off means.

4,180,242

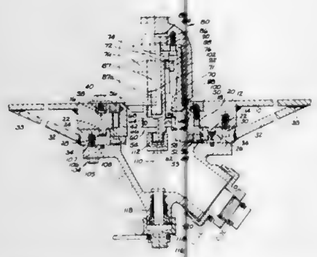
BOTTOM OPERABLE TANK CAR LADING VALVE WITH MINIMUM SKID PROTECTION FOR RETROFIT

Charles E. Reedy, Bridgeton, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 834,655, Sep. 19, 1977. This application Nov. 8, 1978, Ser. No. 958,867

Int. Cl.[2] F16K *35/00*

U.S. Cl. 251—144 **4 Claims**



1. A separately removable skid and valve seat for a bottom operable tank lading valve assembly comprising:

a generally cylindrical universal flange welded to the tank bottom; a lading valve seat located radially within said universal flange; said valve seat being cylindrical including an opening for lading flow and a seat for a valve closure; said lading valve seat having a valve seat flange located below said universal flange; valve seat fasteners extending vertically through said valve seat flange and into said universal flange; a valve closure movable between open and closed position relative to said valve seat; a tank car skid extending longitudinally of the tank and upwardly from said universal flange and abutting the tank bottom at its end portion; said skid having a skid flange located below said universal flange; skid fasteners extending vertically into said skid flange and said universal flange holding said skid flange in engagement with said universal flange; an operator retainer having a retainer flange portion engaging a lower surface of said valve seat; operator retainer fastening means extending through said retainer and into said lading valve seat and holding said retainer in place; said operator retainer extending radially inwardly from said valve seat to maintain a lading valve operator spaced from the walls of said lading valve seat and vertically fixed; an outlet chamber including an opening for lading flow and at least one unloading spout extending below said skid flange and said retainer flange and attached to said skid flange with outlet chamber fasteners extending into said skid flange defining a shear plane, whereby said outlet chamber can be removed by removing said outlet chamber fasteners; said skid can be removed separately from said valve seat by removing said skid fasteners, and whereby said retainer and said valve operator can be removed separately from said skid by removal of said retainer fasteners, and whereby said retainer and said valve operator can be removed separately from said lading valve closure and lading valve seat with lading in the tank.

4,180,243

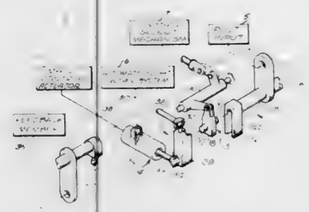
AUTOMATIC AND MANUAL LINEAR REVERSION CONTROL MECHANISM

William W. Hsu, Burbank, and Robert McPherson, Valencia, both of Calif., assignors to Textron Inc., Providence, R.I.

Filed Oct. 14, 1976, Ser. No. 732,266

Int. Cl.[2] F16K *31/44;* **G05G** *11/00*

U.S. Cl. 251—234 **5 Claims**



1. A mechanism for linearly transferring the control over an apparatus connected to said mechanism between manual control and automatic control comprising:

manual input means for providing a manual input signal, to said mechanism;

automatic input means for providing an automatic input signal to said mechanism;

selector means having first and second limit positions including pin means slidably connected to both said manual input means and said automatic input means via linear transfer coupling means; and

means for shifting said pin means between said first and second limit positions to provide linear transfer of control over said apparatus from being totally controlled by said manual input means when said selector means is in said first limit position and totally controlled by said automatic input means when said selector means is in said second limit position and controlled partially by each of said manual and automatic input means when said selector means is in any position other than said limit positions.

4,180,244

STOPCOCK FORMED OF SHEET METAL

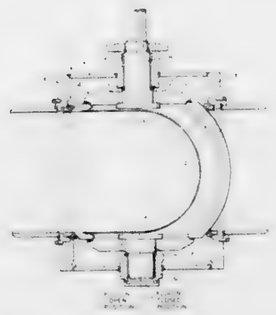
Johann Rosenitsch, Vienna, Austria, assignor to Hübner-Vamag Aktiengesellschaft & Co. Kommanditgesellschaft, Vienna, Austria

Filed May 23, 1977, Ser. No. 799,403

Int. Cl.[2] F16K *5/06*

U.S. Cl. 251—309 **7 Claims**

1. Stopcock comprising a welded housing and a ball-shaped plug, said plug including two ball-shaped half shells each pressed from a sheet metal blank, wherein the improvement comprises that said housing includes a sheet metal blank formed into a unitary tubular shell having a pair of opposite open ends with the axis of said tubular shell extending through the open ends, a planar annular ring disk positioned at each open end of said tubular shell with each said ring disk cut from a sheet metal blank and welded around the radially outer circumferential periphery thereof to the open end of said housing at which it is positioned so that each said ring disk forms an opening into the tubular shell for providing a flow of fluid therethrough, said plug having a pair of first apertures formed therethrough, with said first apertures aligned opposite one another and disposed approximately perpendicularly to the axis of said tubular housing, an annular disk-shaped core welded into each of said first apertures, said plug including a drive shaft and a bearing journal in axial alignment with one another and each extending radially outwardly from an opposite side of said plug and each extending through a different one of said disk-shaped cores, said housing having a pair of second apertures aligned opposite one another on opposite sides of said tubular shell and aligned with said first apertures in said plug said ball-shaped half shells having a pair of first openings alignable with the open ends of said housing, an axially extending tubularly shaped first plate having a first pair



and a second pair of oppositely disposed axially aligned openings is located within said ball-shaped half shells with the first pair of openings aligned with the pair of first openings formed by said half shells with said tubularly shaped first plate forming a passage for affording flow through said plug between said first pair of openings, the second pair of openings in said first plate being aligned with the first apertures formed by said half shells and providing access for insertion of said shaft and said journal into said bearings during assembly of the stopcock, and a pair of second plates each insertable into a different one of the second pair of openings in said first plate for effecting a tight closure of the second openings.

4,180,245

MECHANICAL FENCING MACHINE

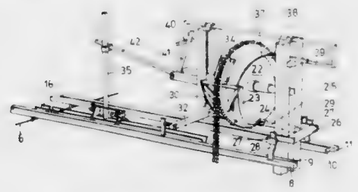
Colin C. Anderson, 6 Montrose Pl., Beaumont, Australia (5066)

Filed Apr. 18, 1978, Ser. No. 897,258

Claims priority, application Australia, Apr. 19, 1977, PC9798

Int. Cl.[2] B66F *3/00*

U.S. Cl. 254—64 **9 Claims**



1. A fencing machine for producing a fence along a fence line, said machine being adapted to be moved along the fence line and including means for feeding at least a plurality of wires from reels of wire, said free ends of the wires being attached to anchor means at the begining of the fence line, means for tension said wires, means for presenting posts having offset slots to the wires, and means for deflecting the tensioned wires to enable the wires to enter into and be locked into the slots.

4,180,246

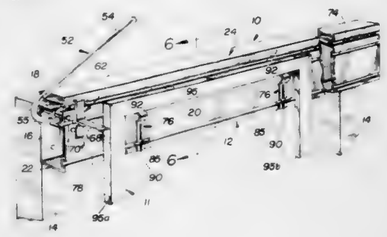
APPARATUS FOR STRETCHING CANVAS AND LIKE MATERIALS

Richard Guy, 27752 Torija, Mission Viejo, Calif. 92691

Filed Oct. 30, 1978, Ser. No. 956,076

Int. Cl.[2] B66F *19/00*

U.S. Cl. 254—77 **10 Claims**



1. An apparatus for stretching and mounting canvas and like materials to a frame structure, wherein the apparatus comprises:

an elongated structural-beam member adapted to be horizontally mounted to a support structure;

a clamping-bar member hingedly connected to said beam member throughout the length thereof;

keeper means disposed between said clamping bar and said beam member to releasably secure a free edge of said canvas therein;

a lever-actuating means positioned adjacent one end of said apparatus to control the opening and closing of said clamping bar;

spring-biasing means disposed between said clamping bar and said beam member, whereby a biasing force is equally applied throughout the length of said clamping bar;

hinge means interconnecting said clamping bar and said beam member whereby said clamping bar is movable relative to said beam member; and

frame-positioning means adjustably mounted to said beam member wherein said frame structure is positioned and supported on said apparatus so as to allow said canvas to be secured thereto in a tightly stretched manner.

4,180,247

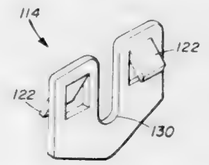
CHAIN LINK FABRIC ATTACHING SYSTEM

Walter L. Pfarr, Jr., Towson, Md., assignor to Anchor Post Products, Inc., Baltimore, Md.

Filed May 20, 1977, Ser. No. 798,749

Int. Cl.[2] E044 *17/02;* **B21F** *27/00*

U.S. Cl. 256—54 **3 Claims**



1. A holding system for attaching chain link fabric to a framework structure, comprising:

a plurality of flexible formed clips, each said clip consisting of two arms with a portion of each arm being parallel to one another and permanently linked together at the adjacent end by a continuation of one arm to become the other opposite arm, said arms continuing from the point where permanently linked to each other to their respective distal ends, a protrusion is extending from one surface of each of

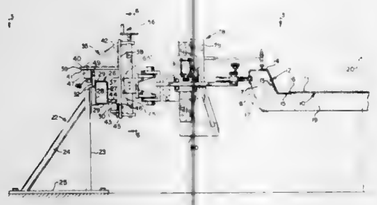
said two arms, said flexible formed clips attaching said chain link fabric to said framework structure by looping each said flexible formed clip over a wire member of said chain link fabric and inserting said two arms of said flexible formed clip into one or more apertures in said frame work structure and so that said protrusions lock on opposite sides of said aperture, said two arms being formed from a relatively thin flat plate and so arranged as to provide an open central slot between them, said flat plate having a plurality of rectangular apertures therein on opposite sides of said open central slot so that a portion of said apertures is in one of said two arms, and the other apertures are in the other of said two arms, and wherein displaced material of said rectangular aperture is disconnected from said flat plate on three sides only and is bent outwardly forming said protrusion at a slight angle from the side of said rectangular aperture from which displaced material is not disconnected, the side of said aperture not disconnected being the side adjacent to and parallel with the distal end of said arms, said bent protrusions being deformed so that a portion of said protrusions extend from both sides of said flat plate, a portion of said protrusions being in each of said two arms.

4,180,248

FLAME CUTTING MACHINE FOR MODIFICATION OF RAILWAY CAR SIDE SILLS

John M. Benko, Munster, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Apr. 24, 1978, Ser. No. 899,428
Int. Cl.² B23K *7/02*
U.S. Cl. 266—67 **11 Claims**



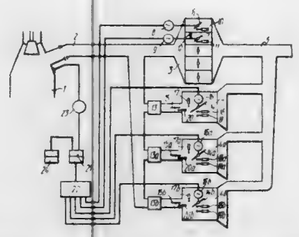
1. A flame cutting machine positionable adjacent a railway track for trimming laterally extending plate members on the longitudinally extending side sills of a railway vehicle which support the plate members, comprising:
- a plurality of longitudinally spaced support members positionable adjacent the track;
- a longitudinally extending beam carried by said support members;
- carriage support means on the beam;
- a carriage supportably carried on the carriage support means and movable longitudinally thereon;
- said carriage including adjustment means and a frame support member on the adjustment means;
- a cutting torch frame supported on the frame support member;
- cutting torch means on the frame;
- means guiding said cutting torch means on said frame for flame cutting portions from said plate members; and
- said adjustment means being adapted for selectively vertically positioning said cutting torch frame relative to the side sills of the car.

4,180,249

INSTALLATION FOR CONTROLLING PRESSURE OF GAS UNDER SHAFT TOP IN SUPER-CAPACITY BLAST FURNACE

Miriam A. Agranovskaya, Koptevskaya ulitsa, 30, kv. 24, Moscow; Vladimir A. Babich, ulitsa Stachek, 25, kv. 33, Sverdlovsk; Felix A. Ratner, Zanevsky prospekt, 28, kv. 30, Leningrad; Alexandr S. Rozenoer, ulitsa Chekhova, 3, kv. 39, Leningrad, and Moisei I. Ryvkin, prospekt Kosmonavtov, 19, korpus 1, kv. 163, Leningrad, all of U.S.S.R.

Continuation of Ser. No. 668,591, Mar. 19, 1976, abandoned.
This application Jul. 14, 1978, Ser. No. 924,730
Claims priority, application U.S.S.R., Mar. 27, 1975, 2113551
Int. Cl.² C21B *7/00*
U.S. Cl. 266—78 **9 Claims**



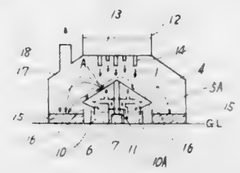
1. An installation for controlling the gas pressure under the shaft top of a super-capacity blast furnace comprising:
- a throttle assembly built in an outlet gas pipe of said blast furnace having at least two control throttles arranged in parallel with respect to the gas flow and having separate drives for turning said control throttles;
- at least two utility gas turbines connected to said outlet gas pipe of said blast furnace in parallel to each other and to said throttle assembly, each of said gas turbines having a control diaphragm and a stop diaphragm with separate drives for turning said diaphragms; a blast furnace gas heater mounted before each of said gas turbines for preheating the blast furnace gas fed to said gas turbines to a predetermined value;
- first switches mounted on said drives for turning each control throttle of said throttle assembly and being actuatable upon closure of said control throttles;
- second switches mounted on said drives for turning said control diaphragms of said gas turbines and being actuatable upon closure of said control diaphragms to a predetermined extent corresponding to a minimum flow rate of blast furnace gas through said gas turbine at which the gas preheating in said preheater is not cut off automatically;
- third switches mounted on said drives for turning each control throttle, with the exception of a first control throttle, and each control diaphragm of said gas turbines operating when said control throttles and control diaphragms are completely open;
- a pressure regulator having a sensor for measuring the pressure of said blast furnace gas under the shaft top and having a setter, said regulator being electrically connected to all said drives for turning said control throttles and control diaphragms, said regulator generating a signal to said drives to open said control throttles and control diaphragms when said blast furnace gas pressure under the shaft top exceeds a predetermined value, said regulator generating a signal to said drives to close said control throttles and control diaphragms when the pressure under the shaft top drops down below a specified limit; and
- an electrical control device which includes all contacts of said first, second and third switches and which transmits said signals from said pressure regulator to said separate drives for moving said control throttles and control diaphragms in a specified order, said pressure regulator acting on only one separate drive at any instant of time.

4,180,250

APPARATUS FOR GRANULATION OF MOLTEN SLAGS

Nobuhisa Ujiie, Tokyo, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Ote, Japan

Filed Aug. 9, 1978, Ser. No. 932,163
Claims priority, application Japan, Aug. 16, 1977, 52-98505
Int. Cl.² F27D *15/02*
U.S. Cl. 266—137 **5 Claims**



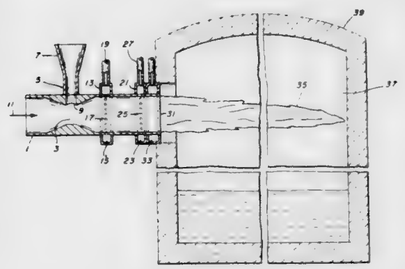
1. An apparatus for the self granulation of molten slags by a non-wetting bounce technique, comprising:
- (a) a conical target having a vertical axis,
- (b) the surface of said target being made of a hard material finished to a high degree of smoothness and having a high degree of heat resistance and a high coefficient of thermal conductivity,
- (c) a tundish bath containing molten slags disposed above said target, and
- (d) a plurality of outlet nozzles mounted in openings in the bottom of said bath for gravationally forming an equal plurality of individual discharge jets of molten slag,
- (e) said nozzles having vertical axes parallel to the axis of said conical target and being oriented to direct the slag jets onto the conical target surface at circumferentially spaced positions therearound.

4,180,251

APPARATUS FOR RECOVERING LEAD FROM BATTERY MUD

Louis H. Jaquay, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Division of Ser. No. 781,112, Mar. 25, 1977, Pat. No. 4,102,676.
This application Apr. 24, 1978, Ser. No. 899,551
Int. Cl.² C22B *13/02*
U.S. Cl. 266—172 **1 Claim**



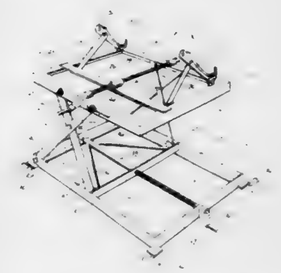
1. A burner for the direct reduction of finely divided dried battery mud comprising:
- a straight conduit through which air is introduced, said conduit having a venturi in an intermediate portion thereof;
- a feed tube through which the finely divided dried battery mud is fed, said feed tube communicating with the said conduit at the veni contracta of said venturi;
- a gaseous fuel manifold having an annular chamber therein surrounding said conduit downstream of the venturi, said conduit having a plurality of apertures angularly distributed around the wall thereof which communicate with the annular chamber of the fuel manifold and through which gaseous fuel from the fuel manifold is introduced into said conduit to create a fuel rich mixture; and
- an oxygen manifold having an annular chamber surrounding the conduit downstream of the fuel manifold, said conduit having a plurality of second apertures angularly distributed about the wall thereof which communicate with the conduit and through which oxygen is introduced into the conduit, to produce a layer adjacent the inner wall of the conduit which burns with a high propagation rate and a high temperature that provides a stable flame envelope for maintaining reducing reactions in the central part of the flame, whereby
- finely divided dried battery mud introduced into the feed tube is entrained in the air in the conduit and is reduced by the flame produced by the reducing gas and the oxygen.

4,180,252

VEHICLE DOOR AND BUMPER LIFT

James D. Cushenbery, 207 S. Buckner, Derby, Kans. 67037

Filed Dec. 22, 1978, Ser. No. 972,235
Int. Cl.² B23Q *3/00*
U.S. Cl. 269—17 **7 Claims**



1. A vehicle door and bumper lift, the lift comprising:
- a wheel mounted lower frame;
- a lower cross arm slidably mounted on said lower frame;
- a first pair of pinned scissor arms, said arms crossed and pivotally pinned together intermediate an upper end portion and a lower end portion of said arms, one lower end portion of said arms pivotally pinned to said lower frame, the other lower end portion of said arms attached to said lower cross arm;
- an upper frame disposed above said lower frame and parallel thereto, said upper frame pivotally pinned to one upper end portion of said arms and slidably attached to the other upper end portion of said arms;
- means for raising and lowering said scissor arms attached to said lower frame and threadably attached to said lower cross arm;
- a J-shaped hook having an upper end portion and a lower end portion, the lower end portion of said J-shaped hook pivotally pinned to said upper frame;
- a hook arm having one end pivotally pinned to the upper end portion of said hook;
- an upper cross arm slidably mounted on said upper frame, said cross arm attached to the other end of said hook arm; and
- means for raising and lowering said hook arm attached to

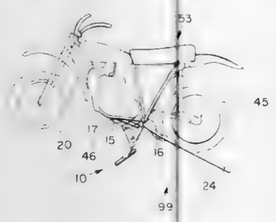
said upper frame and threadably attached to said upper cross arm.

4,180,253

SUPPORT FOR A MOTORCYCLE

Michael S. Ivers, and Rory B. Ivers, both of 911 Los Molinos Way, Sacramento, Calif. 95825

Filed May 5, 1978, Ser. No. 902,926
Int. Cl.[2] B66F 3/00
U.S. Cl. 269—296 **18 Claims**



1. A motorcycle support device adapted to embrace the frame structure of a motorcycle when supported on a supporting surface comprising;

an elongated main support rod adapted to rest on a supporting surface;

a second support rod spaced from said main support rod extending generally parallel thereto;

a pair of side bars interconnecting said main support rod and said second support rod forming a generally rectangular framework;

said side bars extending upwardly past said second support rod, and, each terminating in an upwardly extending U-shaped bracket;

at least one first support bar extending in a direction generally normal to the plane of said framework, said at least one first support bar having means thereon for embracing the frame of a motorcycle; and

an elongated handle member extending in a direction opposite that of said at least one support bar and outwardly from one of said side bars to a point spaced from and rearwardly of said main support rod.

4,180,254

SURGICAL APPARATUS

Alan J. C. Lee, Exeter, and Robin S. M. Ling, Teignmouth, both of England, assignors to National Research Development Corporation, London, England

Filed Apr. 3, 1978, Ser. No. 893,603
Claims priority, application United Kingdom, Apr. 1, 1977, 13867/77
Int. Cl.[2] A61G 13/00
U.S. Cl. 269—328 **8 Claims**



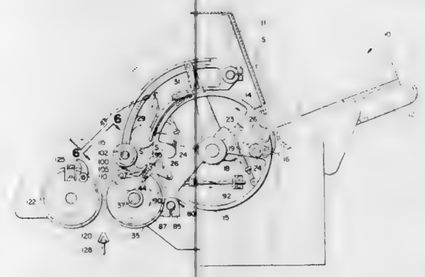
1. Surgical apparatus for locating a patient lying on his side comprising a first platform part to support the lower hip of the patient, two first posts upstanding from respectively opposite sides of said first platform part to engage about the rear and front of his pelvis, a second platform part extending from the first such part to support the lower leg of the patient, at least one second post upstanding from said second platform part, and a third platform part connected to said second post in superposed disposition above said second platform part to support the upper leg of the patient.

4,180,255

WIPER SYSTEM INSERTER

Ronald G. Himmel, Parma, Ohio, assignor to Harris Corporation, Cleveland, Ohio

Filed Dec. 27, 1977, Ser. No. 864,325
Int. Cl.[2] B65H 39/10
U.S. Cl. 270—54 **6 Claims**



1. A sheet material handling device comprising a rotatable extractor drum for gripping and carrying a signature from a stack of signatures in a first signature path about the periphery of said extractor drum, stop means for providing a stop position for the signature moved by said extractor drum, a rotatable transfer drum for moving the signature from said stop position through a second signature path, the signature having a lower edge which extends toward said transfer drum when the signature is disposed in the stop position, gripper means rotatable with said transfer drum for gripping the lower edge of the signature as the transfer drum is rotated and when the signature is in said stop position, a dipper, dipper mounting means for supporting said dipper for oscillation toward and away from the lower edge of the signature, a wiper vane, said wiper vane and dipper having respective surfaces engageable with opposite surface portions of the lower edge of the signature to position the lower edge of the signature in a position to be gripped by said gripper means, and means for rotating said wiper vane in a path adjacent said dipper to a location spaced away from said second signature path to locate said wiper vane out of engagement with the signature as the signature is moved through at least part of said second signature path and back into a location to engage a surface portion of another signature being handled.

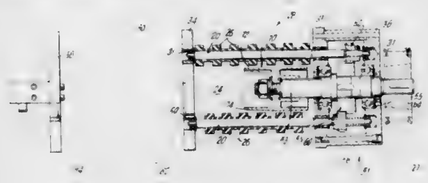
4,180,256

HIGH SPEED BAG FOLDING MACHINE

John B. Coast, Baton Rouge, La., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jun. 28, 1978, Ser. No. 920,051
Int. Cl.[2] B65H 45/18
U.S. Cl. 270—83 **7 Claims**

1. In a machine for producing folded flexible sheet material, such as plastic bags, having rolling means for rolling the material into a roll and means for removing the rolled material from said rolling means in a flattened condition, wherein said rolling means comprises; a rolling section arranged in an arc circumscribing at least 270° of a circle for forming a cul-de-sac having a moving curved surface through at least a substantial portion of said 270° and an entrance opening into which said material is fed, with said rolling section being divided into at least two laterally disposed sub-sections of substantially equal width spaced apart along a common longitudinal axis so as to provide a predetermined unobstructed opening therebetween and means for driving each sub-section; at a common speed sufficient to cause said material to wind about said moving curved surface into said roll, the improvement which comprises: a rotatable mandrel extending a predetermined distance within



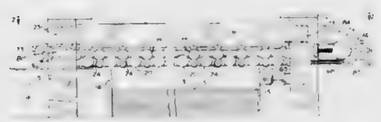
the cul-de-sac of each sub-section and having a periphery of predetermined geometry which maintains a minimum narrow free space between each mandrel and the moving curved surface of each sub-section; and means for rotating each mandrel at a peripheral speed about equal to the peripheral speed of said moving curved surface such that the rolling material is confined to said narrow free space.

4,180,257

MAGNETIC SHEET CONVEYOR

Dario Buccicone, Crown Point, Ind., assignor to Bucciconi Engineering Co., Gary, Ind.

Filed Jan. 30, 1978, Ser. No. 873,372
Int. Cl.[2] B65H 29/30
U.S. Cl. 271—193 **9 Claims**



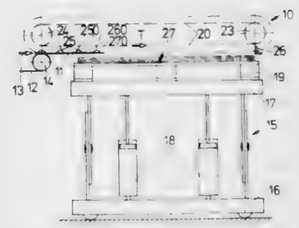
1. Conveying apparatus for magnetizable sheet material which comprises an elongate supporting frame member having mounted thereon magnetic roll units, each of which includes a coil having a core extending transversely of the frame member and secured between a pair of pole pieces in the form of plate members of substantial thickness which are disposed in fixed relation in generally parallel vertical planes on opposite ends of said core, said pole pieces being arranged so as to provide corresponding bottom edge surfaces of substantial dimension extending in a direction normal to the axis of the core, said bottom edge surfaces defining a relatively wide magnetic flux path extending between the pair thereof and transversely of said frame member, short shaft forming members of magnetizable material secured on outboard faces of said pole pieces with their axes extending transversely of said frame and roll members of magnetizable material rotatably mounted on said shaft members, adjacent the outboard faces of said pole pieces, means for driving said roll members, said roll members having peripheral surfaces of substantial width rotating in a vertical plane so that a sheet is drawn into engagement with them and advanced in a predetermined generally horizontal path which is spaced only a short distance below the pole piece bottom surfaces and in said wide magnetic flux path.

4,180,258

APPARATUS FOR TRANSPORTING AND DEPOSITING PANELS

Emil Wildförster, Weilheim, Fed. Rep. of Germany, assignor to Zarges Leichtbau GmbH, Weilheim, Fed. Rep. of Germany

Filed May 2, 1978, Ser. No. 902,037
Claims priority, application Fed. Rep. of Germany, May 4, 1977, 2720030
Int. Cl.[2] B65H 29/32
U.S. Cl. 271—196 **11 Claims**



1. An apparatus for transporting and depositing panels with smooth surfaces, comprising a conveyor having substantially horizontally oriented endless belt means, said belt means being guided over horizontal reversing rollers, a plurality of suction holding means carried by said belt means, each of said suction holding means having a body attached to said belt means and being provided with a suction cup being arranged at the free end of said body, some adjacent suction holding means being pressed against one of said surfaces of one of said panels to adhere firmly by suction thereto in the picking up of said panel, each of said suction holding means being further provided with a venting valve which is opened for depositing said panel at a depositing position, each of said suction cups being displaceable parallel with the transport direction in relation to the zone of attachment of its body to said belt means, and stop means being provided at said depositing position in the transport path of said panels, which stop means on arrival of one of said panels displaces all those adjacent suction cups holding said panel contrarily to said transport direction, which displacement opens the venting valves of all those adjacent individual suction holding means holding said panel.

4,180,259

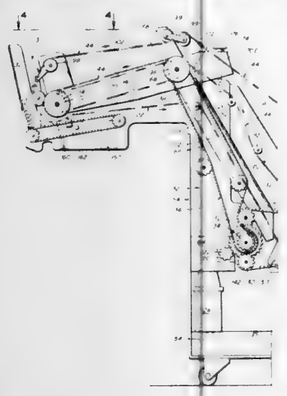
VARYING THE DROP OF SHEETS INTO A HOPPER

Elmer Bewersdorf, Downers Grove; James F. Cosgrove, Western Springs; Thomas R. Flavin, Mokena; Edward Gallagher, Oak Lawn; Willam B. Mc Cain, Hinsdale; Ronald W. Weller, Oak Lawn, and Lawrence J. Werstler, Evergreen Park, all of Ill., assignors to McCain Manufacturing Co., Chicago, Ill.

Division of Ser. No. 771,657, Feb. 24, 1977. This application Mar. 21, 1978, Ser. No. 888,776
Int. Cl.[2] B65H 29/14
U.S. Cl. 271—200 **2 Claims**

1. In a machine where signatures or like sheets stacked at a supply station are fed therefrom sequentially in overla ped relation to a receiving hopper: transfer means for transfe rring the overlapped signatures in a stream to said hopper and including, an upper pair of feed belts located above the hopper, an upright fixed support, an elongated substantially horizontally extending cantilever frame defined by a pair of arms extending forwardly from said support, said arms supporting a lower pair of feed belts opposed to the upper pair of feed belts to clamp between them the signatures for a forward run toward said hopper, said upper and lower feed belts terminating in a delivery bite at the front end of the frame from which the signatures are fed to drop edgewise into said hopper, a shaft supported by said support and in turn pivotally supporting said frame intermediate the ends thereof on said upright support for

up and down positional movement of said bite relative to said shaft, said shaft also supporting rollers for said lower pair of feed belts, and means including an adjustment screw carried by



said frame and coacting with a fixed nut on the machine to adjust the vertical position of the bite thereby to vary the drop height of the signatures into the hopper.

4,180,260

EXERCISE DEVICE

Fred Slagle, 1701 Mentor Ave., Painesville, Ohio 44077

Filed Sep. 22, 1977, Ser. No. 835,803

Int. Cl.[2] A63B *69/18*

U.S. Cl. 272—97 **4 Claims**



1. A balance training device for a skier comprising a support leg configured to rest on a support surface,

a balance board,

means to support one end portion of said balance board on said support leg above said support surface at a plurality of positions thereon, with the other end on the support surface permitting limited lateral rocking motion of the board with respect to said support leg and the support surface, said means including a through slot formed in said one end portion of the board configured to slide over said leg, and peg means to support the board on said leg, said leg including a plurality of holes arranged for different vertical and horizontal positions of said peg means with respect to said board, and said peg means removably replaceable in said holes to vary the position of support of said board,

means to interconnect said board and said leg to prevent collapse,

and foot engaging means on said board.

4,180,261

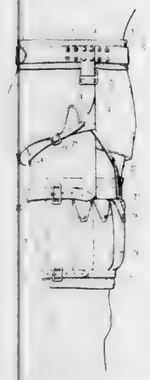
EXERCISING DEVICE FOR RUNNERS

Leigh E. Kolka, R.R. #2, Box 145A, Fox Rr. Dr., Plano, Ill. 60545

Filed Jun. 23, 1978, Ser. No. 918,590

Int. Cl.[2] A63B *23/04*

U.S. Cl. 272—119 **5 Claims**



1. An exercising device for runners comprising a support belt adapted to encircle the waist of a runner, a pair of side substantially vertical adjustable length suspension straps dependingly secured to opposite sides of the support belt adjacent to the hips, and thigh weight assemblies secured supportingly to said side suspension straps and being flexible circumferentially of the thighs and adapted to extend about the fronts of the thighs, and thigh girth adjusting means on said thigh weight assemblies whereby the assemblies can be made to adhere snugly to the thighs during running while receiving primary support through said side suspension straps from said support belt.

4,180,262

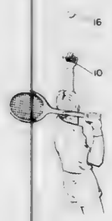
TENNIS SERVING TOSS AID

Pericles Gabrielidis, 13643 Hatteras St., Van Nuys, Calif. 91401

Filed Feb. 16, 1978, Ser. No. 878,303

Int. Cl.[2] A63B *69/38*

U.S. Cl. 273—29 A **5 Claims**



1. A tennis serving toss aid comprising:

a ring;

interior wall defining a circular interior opening, said opening being two-and-three-quarters inches in diameter to closely receive a tennis ball and prevent wobble of said ball within said ring and to permit a tennis ball to extend down through the opening so as to rest upon the palm of the hand and initially guide said ball during its release; and said ring further including an exterior surface means for holding in the tossing hand of a tennis player, said external surface being for holding the fingers in a tennis serving toss position in which the fingers are positioned like a cup and out of engagement with a tennis ball while the tennis ball rests on the palm of the hand.

4,180,263

TENNIS RACQUETS

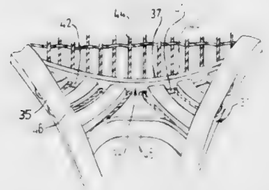
Robert C. Haines, Huddersfield, England, assignor to Dunlop Limited, London, England

Filed Feb. 8, 1978, Ser. No. 876,049

Claims priority, application United Kingdom, Feb. 17, 1977, 06597/77; Apr. 21, 1977, 16556/77

Int. Cl.[2] A63B *49/00*

U.S. Cl. 273—73 G **17 Claims**



1. A throat piece for a tennis racquet having a frame defining an open throat, the throat piece having two generally parallel major faces bounded by a top edge, a bottom edge and two side edges, the side edges being shaped complementary to said frame to fit in the throat area of said racquet so that the top edge of the throat piece completes the stringing area of the racquet, said throat piece having a series of indentations across its width, said indentations defining substantially parallel ridges and depressions on each of the two major faces of the throat piece, said indentations having ends facing toward said top edge and following generally curved paths extending downwardly and aligned to receive longitudinal strings of the racquet and to divert them from the longitudinal direction into the racquet frame, and wherein said ridges on one of said major faces constitute said depressions on the other major face and vice versa.

4,180,264

RACKET HANDLE AND METHOD OF MAKING SAME

Mark L. Robinson, Andover, Mass., assignor to Acro, Inc., Stoneham, Mass.

Filed Apr. 25, 1977, Ser. No. 790,552

Int. Cl.[2] A63B *49/08*

U.S. Cl. 273—73 J **7 Claims**



1. A method of making handles for game rackets comprising,

inserting a stretchable handle grip covering into a cavity of a mold corresponding substantially to the size and shape of the desired handle,

filling said covering inside said cavity with expandable plastic material,

inserting the handle extremity of the racket into said covering,

causing said plastic material to expand and stretch the covering to the shape of the mold,

allowing the plastic to harden into a handle around said handle extremity bonded to and covered by said covering with the hardened plastic filling all the region between the handle extremity and the surrounding covering which covering forms the outer surface of said handle,

and disengaging said mold from said handle and grip covering assembly.

5. In a game racket having a frame, a plastic handle having flat intersecting surfaces and finished shape conforming to that of a mold in which the handle was molded and made of foam-in-place plastic bonded to a stretchable grip surrounding the hardened expanded foam-in-place plastic and bonded thereto by the expanding and hardening of said foam-in-place plastic,

said stretchable grip prior to expansion of said foam-in-place plastic having a shape different from said finished shape and after expansion corresponding substantially to said finished shape and being the outer surface of said handle,

the extremeties of said frame being seated in said foam-in-place plastic which plastic fills essentially the entire region between said extremeties and said stretchable grip.

4,180,265

IMPLEMENT FOR STRIKING A BALL

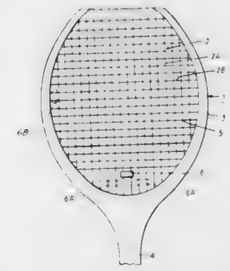
Adolf Staufer, Ried im Innkreis, Austria, assignor to Fischer Gesellschaft m.b.H., Ried, Austria

Filed Jul. 15, 1977, Ser. No. 816,032

Claims priority, application Austria, Mar. 31, 1977, 2263/77

Int. Cl.[2] A63B *51/00*

U.S. Cl. 273—73 D **11 Claims**



1. An implement for striking a ball, comprising a handle, a head member connected to the handle and defining a hoop having sides, and a striking surface enclosed by said hoop and constituted by parallel longitudinal strings and parallel transverse strings, the longitudinal and transverse strings intersecting in a region spaced from the sides of the hoop, and preformed vibration-absorbing means insertable between two parallel strings for mechanically interlocking at least two of said parallel strings in a region between the intersecting strings and the sides of the hoop, the vibration absorbing means being spaced from the sides of the hoop.

4,180,266

RING TOSS GAME

Fernand Morin, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

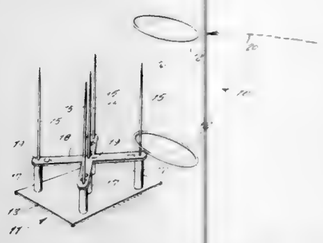
Filed Jan. 25, 1977, Ser. No. 762,314

Int. Cl.[2] A63B *67/06*

U.S. Cl. 273—100 **4 Claims**

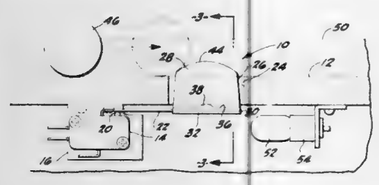
1. A ring toss game comprising a base with a flat upper surface having secured thereto and extending at right angles to said base spaced spikes in combination with a member comprising spaced cross arms having holes therethrough adapted to slidably receive said spikes, in further combination with sleeves mounted loosely about each spike and bearing against said

surface at a lower end and supporting said member at an upper end, in combination with a plurality of rings of diameter to



encompass at least two spikes, whereby said rings will be supported about a spike on said member spaced from the base when tossed thereon.

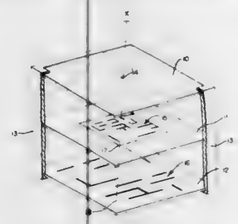
4,180,267
BALL ROLLOVER SWITCH ASSEMBLY
Geoffrey A. J. Harrop, Saratoga, Calif., assignor to Atari, Inc., Sunnyvale, Calif.
Filed Jan. 11, 1978, Ser. No. 868,672
Int. Cl.[2] A63B *71/00*
U.S. Cl. 273—127 R **4 Claims**



4. An amusement game having means defining a playfield over which balls are rolled, the playfield having a slot therein, the combination with said playfield defining means of a switch mounted below the playfield and having an operating blade which is movable between raised and lowered positions and projects across said slot, an actuator body having an enlarged base formed with a horizontally extending channel, said actuator body being mounted on the blade with the blade secured within the channel, said body having a vertically elongate nose which extends upwardly through the slot of the playfield, said nose having an arcuate, upwardly-convex rim which projects above the upper surface of the playfield when the blade is in its raised position, said rim forming a camming surface which is contacted by a ball moving across the playfield for depressing the actuator body and moving the blade toward its lowered position, said body being formed of a material transmissive to light, and light source means mounted below the playfield for directing light through the body to illuminate the nose portion as viewed from the above playfield.

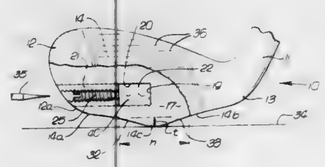
4,180,268
MAZE GAME
Nathaniel E. Brooks, 8901 Seneca La., Bethesda, Md. 20034
Filed Mar. 21, 1978, Ser. No. 888,747
Int. Cl.[2] A63F *9/06*
U.S. Cl. 273—153 R **5 Claims**

1. A three-dimensional amusement device comprising at least three substantially planar elements, means for maintaining said substantially panar elements in substantially parallel spaced relationship, said at least three elements including first and second spaced elements and at least one intermediate element spaced from said first and second elements and disposed therebetween, one of said first, second and intermediate elements being provided thereon with indicia in the form of a sighting point representing an object to be visually moved through a maze pattern of open and closed passageways and the others of said first, second and intermediate elements being



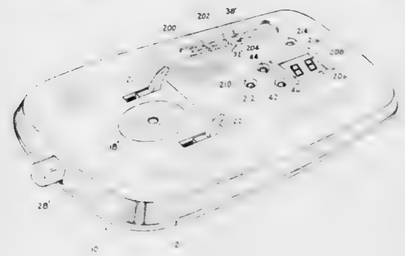
each provided thereon with indicia forming at least a portion of the maze pattern and cooperating to delimit a total maze pattern, said first, second and intermediate elements being arranged for being viewed by a player so as to represent a sighting point disposed within an apparent total maze pattern formed by the other elements.

4,180,269
WEIGHT ADJUSTMENT OF GOLFING IRON HEADS
Stanley C. Thompson, 7851 Talbert St., Apt. 1, Playa Del Rey, Calif. 90271
Filed May 8, 1978, Ser. No. 903,813
Int. Cl.[2] A63B *53/04*
U.S. Cl. 273—171 **3 Claims**



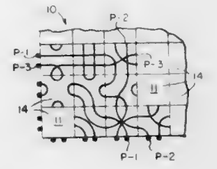
1. In a golf iron,
(a) a metallic head having a toe and heel, a front face to strike a golf ball, a rear side, the head having an elongated base portion extending between the toe and heel,
(b) an opening formed in the base portion and elongated intermediate the toe and the heel, the opening having an inner end wall and a bore wall,
(c) a tubular plug received in said opening with gripping engagement with head metal about the opening to retain the plug in position, there being a space between the plug and said inner end wall, the plug containing a through port to pass head weighting material from the exterior through the plug and into said space after the plug is in place, said material being comminuted,
(d) and insert means threadably received in said port to close said port, the insert means having an innermost end,
(e) said space generally centrally located between the toe and heel,
(f) the plug defining an interior annular shoulder against which an end portion of the insert means is jammed to locate said innermost end proximate the inner end of the plug.

4,180,270
GOLF PUTTING TRAINING APPARATUS
Steven K. Long, 17151 Almaden Rd., San Jose, Calif. 95120
Filed Sep. 19, 1977, Ser. No. 834,183
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—186 R **4 Claims**



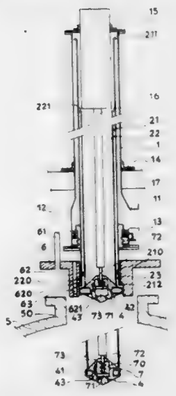
1. A golf putting training apparatus comprising:
a housing;
a first detector for developing a club toe detect signal when the club crosses a first point located on a first side of an intended line of club travel over said housing and including first switch means mounted within said housing and having a first pivotable actuating member extending through a first opening in said housing, said first actuating member being engageable be said club and movable between a first switch position and a second switch position;
a second detector for developing a club heel detect signal when the club crosses a second point located on the other side of said intended line of travel, and including second switch means mounted within said housing and having a second pivotable actuating member extending through a second opening in said housing, said second actuating member being engageable by said club and movable between a first switch position and a second switch position, said first and second points being disposed along a line transverse to said intended line of club travel;
a third detector for developing a third club detect signal where the club crosses a third point positioned so as to be crossed by the club after it has crossed said first and second points;
reset means disposed within said housing and having an actuating projection extending through a third opening in said housing for engagement by the foot of a user, said actuating projection being movable between a rest position and a reset position and operable to move said first and second actuating members from said second switch positions to said first switch positions when said actuating projection is moved from said rest position to said reset position;
circuit means connected to said first and second detectors for receiving said first and second club detect signals and for generating a first display driving signal which is commensurate with the difference between a predetermined characteristic of said first club detect signal and a corresponding characteristic of said second club detect signal, said circuit means being further connected to said third detector for receiving said third club detect signal and for generating a second display driving signal which is proportional to the time delay between the passing of the club head over one of said first and second points and said third point;
display means connected to said circuit means for receiving said first display driving signal and for providing a numerical indication of the degree of misalignment of the club head relative to said transverse line as it crosses thereover, said display means further receiving said second display driving signal and providing in response thereto an indication of the club head speed as it crosses said transverse line.

4,180,271
SQUIGGLE GAME
Thomas McMurchie, 11148 Forest Edge Dr., Reston, Va. 22090
Filed Jul. 10, 1978, Ser. No. 923,312
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—275 **7 Claims**



1. A game comprising:
a game board having a quadrangular playing area that is divided into a plurality of equal sized quadrangles and having a border between the outer edges of the game board and said quadrangular playing area;
a plurality of start marks located on said border adjacent each one of the outer ones of said plurality of equal sized quadrangles;
a plurality of playing cards, each one of said plurality of playing cards being of equal size and shape to the size and shape of each one of said plurality of equal sized quadrangles and having a plurality of line segments imprinted on one surface thereof, each one of said line segments having both of its ends terminate at an edge of the said playing card on which that line segment is imprinted; and
a plurality of individually distinguishable playing pieces.

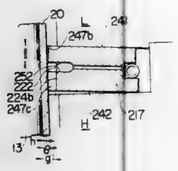
4,180,272
SEAL FOR SEALING BETWEEN TWO TELESCOPIC TUBES AND SEALING DEVICE USING SUCH SEAL
Pierre Heitz, Puteaux, France, assignor to Compagnie d'Etudes et de Realisations de Cybernetique, Fontenay-Sous-Bois, France
Filed Sep. 15, 1978, Ser. No. 942,907
Int. Cl.[2] B65B *3/04*; **F16J** *15/00*
U.S. Cl. 277—28 **6 Claims**



1. A sealing device for sealing between two tubes which are slidable one in the other and are movable to a position in which

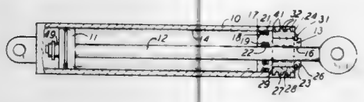
one said tube rests on the other said tube, comprising: an inflatable seal disposed in an annular space provided between said two tubes; means for supplying fluid to said seal for inflating and applying said seal under pressure against the walls of said tubes; and means for controlling said means for inflating said seal directly by the force arising from the resting of said one tube on said other tube.

4,180,273
SEALING DEVICE FOR ROTOR SHAFT OF FLUID MACHINE
Nobuho Takagi; Muneo Maegawa, and Katsutoshi Nii, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 4, 1978, Ser. No. 948,549
Claims priority, application Japan, Oct. 7, 1977, 52-119918
Int. Cl.² F16J *9/08, 15/24*
U.S. Cl. 277—154 **16 Claims**



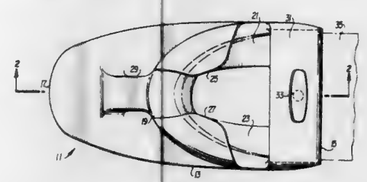
1. A sealing device for the rotor shaft of a fluid machine, comprising an annular sealing box extending circumferentially around said rotor shaft, and an annular solid packing received in and supported by the sealing box, said solid packing including a plurality of circumferentially spaced segments, wherein each of said segments comprises:
two opposing surfaces spaced axially of said rotor, one of said surfaces being disposed adjacent to the low pressure side of said fluid machine, while the other is disposed adjacent to the high pressure side of said fluid machine;
side surfaces spaced circumferentially of said rotor shaft; and
a sliding surface defined by radially inner edges of said opposing surfaces and said side surfaces and adapted to be kept in a sliding contact with the surface of said rotor shaft, said sliding surface having two axial half regions, one of said two axial half regions being adjacent to said one of said opposing surfaces and the other axial half region being adjacent to said the other of said opposing surfaces;
at least an axial portion of said one axial half region, extending between said side surfaces, being adapted to be in an initial sliding contact with said rotary shaft.

4,180,274
CYLINDER ASSEMBLY WITH SPLIT RING RETAINER
Frank J. Tucek, Wausau, Wis., assignor to J. I. Case Company, Racine, Wis.
Filed Apr. 14, 1978, Ser. No. 896,462
Int. Cl.² F16J *15/18*
U.S. Cl. 277—192 **7 Claims**



1. A cylinder assembly with split ring retainer, comprising a hollow cylinder, a piston snugly slidable in said cylinder, a piston rod extending into said cylinder and attached with said piston, a cylinder head attached to one end of said cylinder and surrounding said rod for slidably supporting said rod, a split ring having radial segments and being located at least at one of the connections between said piston and said rod and between said cylinder head and said cylinder for effecting the connection thereat, said one of said rod and said cylinder each having a plurality of radially faced tongues-and-grooves extending therealong in side-by-side relation, said split ring being of an axial length to extend across all said tongues-and-grooves and having its own tongues-and-grooves nested with the first-mentioned said tongues-and-grooves to thereby form an interengaged connection for releasably effecting at least one of said connections, and a member included in said assembly and releasably engaged with said split ring for radially restricting said split ring in its aforesaid position of connection.

4,180,275
SKI ATTACHMENT
Allan Montoya, 345 W. 58th St. #5M, New York, N.Y. 10019
Filed Aug. 16, 1978, Ser. No. 934,274
Int. Cl.² A63C *11/00*
U.S. Cl. 280—11.37 E **5 Claims**



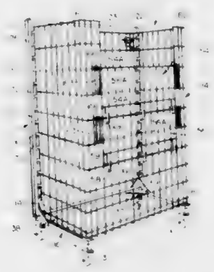
1. A removable ski extender for attachment to a ski tip comprising
an arcuate snowfoil curved at one end thereof;
an arcuate platform secured to the other end thereof and extending above said snowfoil and in the direction of said curved end, said platform having substantially the same curvature as said ski tip;
means attached to said arcuate platform for retainably mating with the edges of said ski tip;
a bridge extending laterally across said other end of said snowfoil; and
means in said bridge for removably securing said ski tip to said arcuate platform.

4,180,276
BACK-TO-FACE REVERSIBLE PUSH HANDLE OF A BABY CARRIAGE
Kenzou Kassai, Higashishimizu, Japan, assignor to Kassai Kabushiki Kaisha, Osaka, Japan
Filed May 2, 1977, Ser. No. 792,988
Claims priority, application Japan, Jun. 23, 1976, 51-83355[U]
Int. Cl.² B62B *3/02*
U.S. Cl. 280—47.36 **4 Claims**

1. A baby carriage frame with a reversible push handle comprising:
a front leg;
a rear leg pivotally connected to said front leg, wherein said front and rear legs cross each other at the point of pivotal connection;
a handle rod, rotatably connected to said front and rear legs at the same location said front and rear legs are pivotally connected;
a leg and rod supporting means, connected to said handle rod, for supporting said rear leg and said handle rod parallel to each other when said handle rod is positioned parallel to said rear leg, and for disengaging from said rear leg when said handle rod is pivoted toward the top of said front leg, out of parallel alignment with said rear leg, and for supporting said front leg and said handle rod parallel to each other when said handle rod is positioned parallel to said front leg, and for disengaging from said front leg when said handle rod is pivoted toward the top of said rear leg, out of parallel alignment with said front leg;
a turning lock means, connected to said leg and rod supporting means, for locking and unlocking said handle rod and rear leg in parallel alignment in said leg and rod supporting means when said handle rod and said rear leg are in parallel alignment supported by said leg and rod supporting means, and for locking and unlocking said handle rod and said front leg in parallel alignment in said leg and rod supporting means when said handle rod and said front leg are in parallel alignment supported by said leg and rod supporting means.

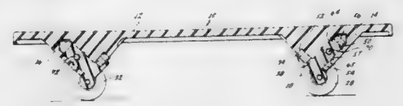


4,180,277
MOVABLE STORAGE AND/OR DISPLAY APPARATUS
Victor R. Romero, Sheridan Township, Calhoun County, Mich., assignor to Eagle Picher Industries, Inc., Cincinnati, Ohio
Filed Apr. 7, 1978, Ser. No. 894,429
Int. Cl.² B62B *3/02*
U.S. Cl. 280—79.3 **13 Claims**



1. A movable apparatus for storing and/or displaying objects, comprising:
wheeled base means adapted to be moved along a support surface;
a pair of upright posts mounted on said base means and extending upwardly therefrom, said posts being parallel and being spaced a selected distance apart;
a basket mounted on said base means and extending frontwardly thereon relative to said posts, said basket comprising a bottom wall, a front wall, a pair of side walls and a rear wall which define a rectangular compartment for holding objects, said side walls and said bottom wall of said basket being hingedly connected to said front wall so that said side walls and said bottom wall can be unfolded from a storage position in which said walls are substantially parallel to each other to an erected position in which said walls define the bottom, front and sides of the rectangular compartment, said rear wall being separate from said bottom wall, said side walls and said front wall, and releasable latch means for releasably securing said rear wall to the rear edges of the side walls of the basket in the erected condition thereof;
and connecting means on said posts for releasably engaging said basket.

4,180,278
SKATEBOARD
Clifford C. Gottlieb, Sherman Oaks, Calif., assignor to Sport-Fun, Inc., Los Angeles, Calif.
Filed Jun. 5, 1978, Ser. No. 912,434
Int. Cl.² A63C *17/00*
U.S. Cl. 280—87.04 A **17 Claims**



7. A skateboard including
a platform made from a plastic material and including integral flange members extending downwardly from the bottom surface of the platform at opposite ends of the platform,
each of the flange members including an opening extending upwardly through the flange member toward the platform,
wheel support members made from a plastic material, each of the wheel support members including an integral post extending upwardly into the opening in an associated one of the flange members in an interlocking relationship with the flange member for mounting the wheel support member on the flange member,
means for interlocking the posts within the openings in the flange members, and
shock absorbing material supported by each of the flange members and the associated wheel support member at a position removed from to the post.

4,180,279
BICYCLE HITCH FOR CONNECTION TO A TRAILER
Joseph W. Belliveau, Sr., 3701 SW. 88 Ct., Miami, Fla. 33165
Filed May 30, 1978, Ser. No. 910,376
Int. Cl.² B62K *27/12*
U.S. Cl. 280—204 **5 Claims**



1. For a two wheeled bicycle type vehicle having a single rear wheel and rear axle, a trailer hitch, said hitch comprising a vertical fork of a length greater than the radius of the rear wheel and said fork having a lower end and an upper end, said lower end being adapted for attachment to the rear wheel axle of a bicycle and said upper end comprising an upstanding vertical turning stem;
means to mount the fork to the rear axle;
a first sleeve about the turning stem;
a rigid elongate member having a first end and a second end and having a longitudinal axis, said rigid elongate member

extending rearwardly and downwardly from the first sleeve at an angle between the vertical of between 64 and 65 degrees and of a length sufficient to extend beyond the vertical tangent to the rear bicycle wheel, said member being rigidly attached to said first sleeve at the first end;
an elongate second sleeve about the member, said second sleeve being of a length shorter than said member and rotatable and slidable along the rigid member, said second sleeve having a front and rear end, stop means to limit sliding movement along the member of said second sleeve;
a depending hitch member having a vertical portion connected rigidly to the second sleeve rearwardly of the bicycle wheel and adjacent the rear end and of a length extending to the centerline of the bicycle wheels for attachment to a draw bar of a trailer; and
means to anchor the fork in a vertical attitude.

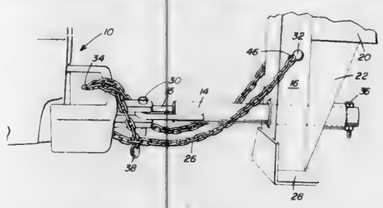
4,180,280
FRONT-WHEEL SUSPENSION FOR TWO- OR THREE-WHEELED VEHICLES
Carlo Doveri, Pontedera, Italy, assignor to Piaggio & C. S.p.A., Genoa, Italy
Filed Sep. 27, 1977, Ser. No. 837,382
Claims priority, application Italy, Feb. 10, 1977, 20164 A/77
Int. Cl.² B62K *21/02*
U.S. Cl. 280—277 **5 Claims**



1. In a wheel suspension system a device for imparting steering movement to a wheel, said wheel being rotatably mounted on a single rigid arm for rotation relative to said arm about the axis of the wheel and said arm extending in a plane normal to said wheel axis; means pivoting said arm at a location spaced from said wheel axis to said steering device so that said arm can swing in said plane; a telescopic leg extending substantially perpendicular to said arm, said leg including resilient means biasing said leg toward an extended position, said leg having an upper end pivoted to said steering device for movement about an axis parallel to said wheel axis and said leg having a lower end pivoted to said arm for movement about an axis which is parallel to said wheel axis and which coincides with the pivot axis between said wheel and said arm, the pivot axes of said upper and lower ends being normal to and intersecting the longitudinal axis of said leg and said wheel axis intersecting a straight line joining said pivot axes; and a wheel-braking assembly rigidly connected to said leg.

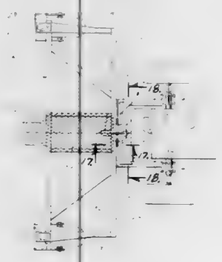
4,180,281
SAFETY CHAIN ARRANGEMENT FOR TOWED VEHICLES
Christian T. Tertinek, Canandaigua, N.Y., assignor to Stone Construction Equipment, Inc., Honeoye, N.Y.
Filed Apr. 20, 1978, Ser. No. 898,525
Int. Cl.² B60D *1/12*
U.S. Cl. 280—457 **10 Claims**

1. In a safety arrangement for securing a towing vehicle to a towed vehicle having a front post attached to a main beam, a tow pole attached to said front post, and hitching means connecting said towing vehicle to said tow pole, the improvement comprising a safety chain, in combination with attaching means on the towed vehicle, wherein the attaching means



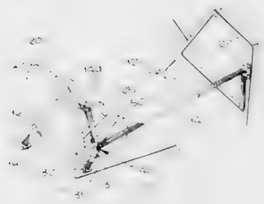
includes the front post, the post being compartmented and having lateral keyholes, said keyholes having their slots angled forward and downward and adapted for receiving said chain.

4,180,282
FRONT MOUNTED GROUND SUPPORTED TRACTOR ATTACHMENT
James Henning, R.R. 1, Hennepin, Ill. 61327
Continuation-in-part of Ser. No. 712,099, Aug. 5, 1976, Pat. No. 4,106,795. This application May 24, 1978, Ser. No. 908,812
Int. Cl.² B60D *3/00*
U.S. Cl. 280—481 **10 Claims**



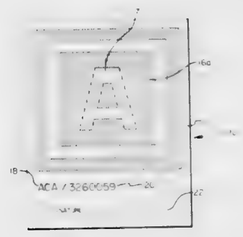
1. A front mounted vehicle attachment steerable with and pushed by a vehicle comprising:
a portable frame positionable forwardly of the vehicle,
a pair of caster wheels,
means for supporting the caster wheels on the frame at transversely spaced positions relative to the vehicle,
a drive linkage between the frame and vehicle,
means for providing a swivel connection between the drive linkage and frame for pivotal movement of the frame about a generally longitudinal axis relative to the vehicle, and
means for providing a pivotal connection between the vehicle and drive linkage for pivotal movement of the frame about a generally transverse axis relative to the vehicle,
said drive linkage being engaged against said portable frame whereby pushing force of the vehicle is transmitted to the portable frame by the drive linkage substantially independently of said swivel connection means, and
said swivel connection means securing said frame and drive linkage in longitudinally spaced-apart relation for pivotal movement of the frame free of obstruction with said drive linkage.

4,180,283
CHILD SAFETY SEAT RESTRAINT ADAPTER MEANS
Avraham Ziv, Sepulveda, Calif., assignor to American Safety Equipment Corporation, San Fernando, Calif.
Filed May 17, 1978, Ser. No. 906,880
Int. Cl.² B60R *21/10*
U.S. Cl. 280—802 **5 Claims**



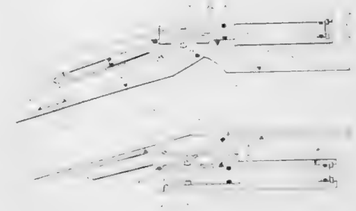
1. A child safety restraint adapter means for restraining a child safety seat on a vehicle seat in association with a preinstalled passive diagonal torso safety belt anchored at one end outboard of the vehicle seat on the vehicle door, extending across the vehicle seat and being anchored at an opposite end inboard of the vehicle seat, said adapter means comprising:
an auxiliary safety belt buckle and means for anchoring said buckle outboard of said vehicle seat;
an auxiliary tongue plate means for releasable engagement with said auxiliary buckle; and
connector means for connecting said tongue plate means in a fixed relation to said preinstalled diagonal torso safety belt intermediate its ends whereby said child safety seat may be restrained on said vehicle seat by passing portions of said safety belt inboard of said connector means over said child seat, when positioned on the passenger seat, and engaging said auxiliary tongue plate means with said auxiliary buckle.

4,180,284
TAG FOR IDENTIFYING LUGGAGE AND METHOD OF USING SAME
James E. Ashley, 19626 SE. 395th Ave., Sandy, Oreg. 97055
Filed Nov. 9, 1977, Ser. No. 849,807
Int. Cl.² G09F *3/00*
U.S. Cl. 283—20 **2 Claims**



1. A kit for marking, identifying and controlling transport of luggage comprising:
(a) a tag including a planar label, means for attaching said label to a piece of luggage, said label having one of a selected group of distinctive geometrical shapes defined thereon, said geometrical shape being sufficiently large to be identifiable from a location separate from said piece of luggage, said geometrical shape being colored in one of a selected group of colors, and an alphanumeric character displayed on said label within the border of said geometrical shape;
(b) a user card having indicated thereon the same geometrical shape, color, alphanumeric character and identifying letters as said tag; and
(c) a postcard, addressed for return to its predetermined supplier, having imprinted thereon the same identifying letters as on the tag, and containing spaces for placement of the user's personal identification.

4,180,285
ARTICULATED BALL CONNECTOR FOR USE WITH PIPELINE
Bobby J. Reneau, P.O. Box 11625, Houston, Tex. 77016
Filed May 11, 1978, Ser. No. 904,785
Int. Cl.² F16L *27/04*
U.S. Cl. 285—261 **7 Claims**



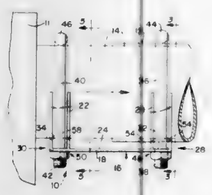
1. An apparatus for connecting two pipes together, comprising:
(a) a spherical ball having an axial passage therethrough and adapted to be joined in fluid communication with a first pipe;
(b) a receptacle means having an axial passage therethrough and formed of a female cavity having a surface matching that of said ball which surface is less than a hemisphere and which encircles said ball by at least 180 degrees, said receptacle means adapted to be joined in fluid communication with a second pipe;
(c) clamping means for holding said ball in said receptacle means and aligning the axial passages thereof to enable fluid communication between the first and second pipes;
(d) said clamping means securing said ball in said receptacle means by clamping said ball on its outer surface at a location on said ball on the exposed side opposite the hemisphere in said receptacle means and wherein said clamping means includes:
(1) a circular first ring around said ball having a diameter enabling it to contact said ball without passing over said ball,
(2) an external protruding lip on said receptacle means, and
(3) means for locking said ring to said lip wherein said locking means comprises
(4) an encircling second ring having a pair of spaced, internally directed shoulders which are spaced to encircle and abut said first ring and said lip in a side-by-side relationship

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4,180,286
EXHAUST PIPE SAFETY CLAMP ASSEMBLY AND COMBINATION
Tom Ginter, Jr., Box 193, Clearfield, Ky. 40313
Filed May 12, 1978, Ser. No. 905,608
Int. Cl.² F16L *13/14*
U.S. Cl. 285—328 **6 Claims**

1. A clamp assembly for securing two pipe portions of an

automobile exhaust system together in overlapping relationship with each other, said assembly comprising in combination a rigid bracket having a rigid base plate of substantially constant width with two pairs of rigid upstanding flanges extending from one side thereof, each of said flanges being substantially fully coextensive with said plate for the entire lateral width of said base plate and each of said flanges having a generally concave cut-out for reception of an approximately semi-circular portion of a pipe element, one of said pairs of flanges being disposed adjacent one end of said base plate, the other of said pairs of flanges being disposed adjacent the end of said base plate opposite from said one end, said base plate



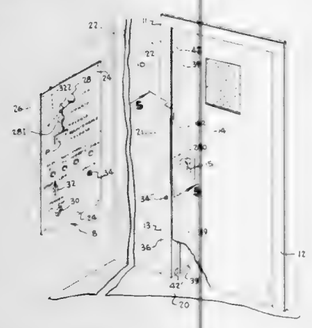
having a first pair of holes located between said one pair of flanges and a second pair of holes located between the other of said pairs of flanges, a first U-shaped bolt disposed between said one pair of flanges and having ends thereof extending through said first pair of holes, a second U-shaped bolt disposed between the other of said pairs of flanges and having ends thereof extending through said second pair of holes, said first and second U-shaped bolts each having a bight portion adapted to embrace a side of a pipe element opposite from the side that would be received on the concave cut-out of the upstanding flanges, and means for applying pressure to and securing said U-shaped bolts at the ends thereof.

4,180,287

CELL LOCKING SYSTEM

David H. Youngblood, and Quentin H. Young, both of San Antonio, Tex., assignors to Southern Steel Company, San Antonio, Tex.

Filed Apr. 6, 1978, Ser. No. 894,129
Int. Cl.² E05C *1/08*
U.S. Cl. 292—144 **62 Claims**



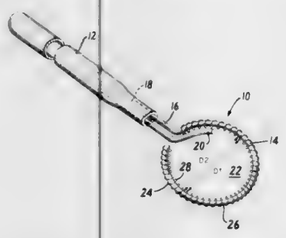
1. A door control system including:
a door frame;
a door mounted in said door frame;
a dead bolt mounted in said door frame for movement between an extended door locking position in which one end of the dead bolt extends into a mating opening in the door and a retracted unlocking position;
a lock bolt mounted in the door frame for movement between an extended door locking position in which the lock bolt extends into a mating opening in the door and a retracted unlocking position;
a control station spaced from said door frame;
control effecting connection means extending between said control station and said door frame;
selectively operable dead bolt actuator means in said door frame for actuating said dead bolt to effect movement of said dead bolt to either its extended position or its retracted position;
selectively operable lock bolt positioning means mounted in said door frame unit for moving said lock bolt to its retracted position;
a manually operable lever member mounted in said control station for selective movement to a first position, a second position and a third position;
a movable bolt release and control member mounted in said door frame for movement to first, second, and third positions;
said latch control effecting connection means being connected to said bolt control actuator member and including mechanical connector means extending between said manually operable lever member and said bolt release and control member for positioning said bolt release and control member in its first, second or third positions in response to the positioning of said manually operable lever member respectively in its first, second or third positions;
dead bolt release means engageable with means on said bolt release and control member for moving said dead bolt to its retracted position in response to movement of said bolt release and control member to its third position;
lock bolt release means responsive to movement of said bolt release and control member to its third position for moving said lock bolt to its retracted position;
lock bolt biasing means for urging said lock bolt toward its extended latching position; and
lock bolt drive override means responsive to the positioning of said dead bolt in its extended door latching position for preventing operation of said lock bolt positioning means.

4,180,288

GOLF BALL RETRIEVER

Paul T. Sievers, 986 Fenworth Blvd., Franklin Square, N.Y. 11010

Filed Feb. 21, 1978, Ser. No. 879,394
Int. Cl.² B66F *11/00*
U.S. Cl. 294—19 A **7 Claims**



1. A ball retriever for retrieving a ball comprising:
(a) an elongated shaft;
(b) a generally circular loop having an effective inner diameter smaller than the diameter of said ball;
(c) means for connecting said loop to said shaft;
(d) resilient means for permitting the enlargement of said inner diameter by the passage of said ball partly through said loop, said resilient means partially closing about said ball after the passage of the widest part thereof through said loop;
(e) the plane of said loop and the axis of said shaft being substantially parallel;
(f) at least one finger means for stopping and holding said ball after its diamater has passed through said loop but before the entire ball has passed through said loop; and
(g) said at least one finger means extending at least part way across said loop.

4,180,289

GARDENING TOOL

Eric N. Faine, 63 Hill St., Northgate, Australia

Filed Jun. 28, 1978, Ser. No. 920,063
Claims priority, application Australia, Oct. 6, 1977, 1963/77
Int. Cl.² A01B *1/00*
U.S. Cl. 294—53.5 **3 Claims**



1. A gardening tool having a substantially straight and normally upright handle, a pedal connected to the normally lower end of the handle, a tool head, pivot means interconnecting said handle and the tool head whereby the tool head may be pivoted about an axis transverse with respect to said handle and tool head, and a torsion spring having a first part thereof fixed to the handle and a second part thereof fixed to the tool head with an intermediate part associated with the pivot means, the interconnection between the tool head and the handle by said pivot means being such that the tool head cannot be pivoted past a first position wherein the handle is in substantial alignment with the tool head and a second position wherein the tool head is at an obtuse angle to said handle, said torsion spring urging said handle toward the first position.

4,180,290

PROPELLED APPARATUS HAVING SURFACE MEANS FOR DEVELOPING INCREASED PROPULSION EFFICIENCIES

Hilbert F. P. Drews, 5640 S. 76th St., Greendale, Wis. 53219

Continuation-in-part of Ser. No. 631,703, Nov. 13, 1975, abandoned. This application May 16, 1977, Ser. No. 798,417
Int. Cl.² B64C *1/38*; B62D *35/00*
U.S. Cl. 296—1 S **6 Claims**



1. In a craft adapted to be moved through a fluid and having a forward wall portion moving through and parting the fluid as the craft moves through the fluid and having a trailing portion, said forward wall portion of the craft defining a fluid impacting surface, said surface including a substantial plurality of adjacent and parallel waveshaped elongated flutes, each of said flutes extending as an elongated flute with a constant cross-section along said forward wall portion, each of said flutes having an essentially similar cross-section to that of the other flutes and having a trough portion extending upwardly and rearwardly to a crest portion developing an outwardly directed air stream, the crest portion of each flute overlying the trough portion of the flute rearwardly adjacent thereto to define a fluid pocket beneath the crest portion, said flutes being connected by a thin mounting base member, said flutes and base member being formed as an integral molded plastic element, and an adhesive attachment means securing said plastic element to said forward wall portion.

4,180,291

MINERAL MINING INSTALLATION

Armin Löbbe, Lünen, and Hans-Jürgen Penzek, Oberaden, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Filed Dec. 12, 1977, Ser. No. 859,483
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1976, 2656792
Int. Cl.² E21C *27/32*
U.S. Cl. 299—34 **24 Claims**



1. A mineral mining installation for winning material in a "stable-hole" region of a longwall face, the installation comprising a guide, a base slidably mounted on the guide, at least one tool carrier pivotally mounted on the base, lost reciprocating motion linkage affixed to each tool carrier, drive means engaging the lost reciprocating motion linkage for reciprocating the base along the guide and for pivoting each carrier between an operating position and a non-operating position, the drive means having a working stroke which initially pivots each carrier from its non-operating position to its operating position and then causes the base and carrier(s) to execute a working stroke along the guide, and the driving means having a return stroke which initially causes each carrier to pivot from its operating position to its non-operating position and then causes the base and carrier(s) to execute a return stroke along the guide.

4,180,292

ROCK MILLING CUTTER TONGUE AND SLOT CONNECTED

Erik A. Persson, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Filed Feb. 27, 1978, Ser. No. 881,603
Int. Cl.² E21C *35/18*
U.S. Cl. 299—92 **5 Claims**



1. An assembly of a milling cutter head and cutter tool holders for a rock drilling machine, each holder mounted by a tongue and groove connection comprising:

an outwardly open groove formed in said cutter head, said groove including opposite side walls each extending from a front end to a rear end of said groove, one of said side walls being substantially straight along its height, said other side wall including a first projection extending laterally toward said one side wall,

said first projection including a first contact surface forming therebeneath an undercut portion of said groove extending in a front-to-rear direction,

said first projection terminating short of said front end of said groove to define an enlarged opening,

said cutter head including a second contact surface spaced outwardly of said first contact surface and extending at an angle relative thereto, and

a tongue comprising an extension of said tool holder, said extension including opposite side walls spaced by a distance less than the distance between said first projection and said one side wall of said groove, one of said side walls of said extension extending substantially straight to the end of said extension, the other of said side walls of said extension including a second projection extending laterally in a direction away from said one side of said extension, said second projection including a third contact surface,

said tool holder including a fourth contact surface spaced from said third contact surface and extending at an angle relative thereto, which spacing and angle corresponds substantially to that defined by said first and second contact surfaces,

said enlarged opening to said groove being sized to receive said extension and said second projection such that upon movement of said tool holder toward said rear end of said groove, said extension travels between said first projection and said one wall of said groove and said second projection travels along said undercut portion of said groove, with said first and third contact surfaces and said second and fourth contact surfaces contacting one another to wedgingly secure said tool holder to said cutter head.

4,180,293

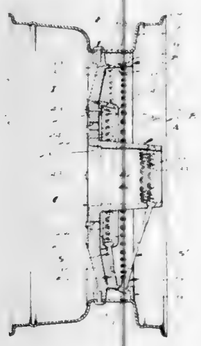
SIMULATED SPOKE WHEEL STRUCTURE

Curtis Norris, 502 W. Aurora, Santa Ana, Calif. 92707, and Delmer D. Scott, Montecito, Calif., assignors to Curtis Norris, Santa Ana, Calif.

Filed Aug. 28, 1978, Ser. No. 937,484

Int. Cl.² B60B 1/00

U.S. Cl. 301—54 **10 Claims**



1. An automobile wheel including an elongate outer annular tire engaging rim with front and rear ends and an axially extending annular, radially inwardly disposed wheel center mounting surface intermediate its ends, a cast metal wheel center with a flat, radially extending central disc with front and rear surfaces and an annular radially extending outer portion, said disc has a central axially extending dust-cap receiving aperture, a plurality of axially extending mounting stud openings in radial and circumferential spaced relationship about the aperture and a forwardly projecting tubular cone radially inward of the stud openings and communicating with the aperture; said cone has an open front end and an annular series of radially extending front spoke openings spaced axially forward of said disc, said outer portion has a forwardly projecting outwardly opening channel portion with an axially extending inner wall and a radially extending front wall about the perimeter of said outer portion inward of and opposing said wheel center mounting surface; said inner wall has annular series of radially extending front and rear spoke openings; an annular spoke mounting ring with an annular series of radially extending rear spoke openings is on and projects forwardly from the wheel center in radial spaced relationship between the stud openings and the channel portion and spaced axially rearward of said channel portion and the forward portion of said cone, an annular rear series of circumferentially spaced and circumferentially inclined rear spokes extending between the ring and the channel portion with inner and outer ends extending through the rear spoke openings and an annular front series of circumferentially spaced radially and circumferentially inclined front spokes extends between the cone and the channel portion with inner and outer ends extending through the front spoke openings.

4,180,294

FLUID PRESSURE CONTROL VALVE FOR VEHICLE BRAKING SYSTEMS

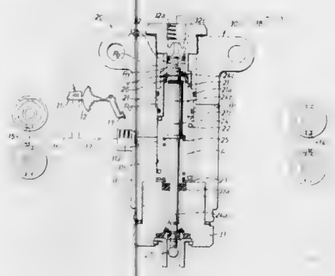
Hidetoshi Shimizu, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 19, 1978, Ser. No. 971,198

Claims priority, application Japan, Dec. 28, 1977, 52-160512

Int. Cl.² B60T 13/00

U.S. Cl. 303—6 C **5 Claims**



1. In a fluid pressure control valve unit for a vehicle braking system incorporated between a master cylinder and rear-wheel brake cylinders, comprising:

a housing provided with an inlet port for connection to said master cylinder, an outlet port for connection to said brake cylinders, and a stepped cylindrical bore including small and large diameter portions in open communication with said inlet and outlet ports respectively;

a stepped sleeve member slidably disposed within said cylindrical bore and engaged at one end thereof with the inner end-wall of said housing to enclose said outlet port, said sleeve member having small and large pressure receiving areas exposed within the small and large diameter portions of said bore and subdividing said bore into a first chamber in communication with said inlet port and a second chamber in the form of an annular chamber normally isolated from said outlet port and communicated with said first chamber therethrough;

a first spring for loading said sleeve member in the direction toward a usual position in which said second chamber is isolated from said outlet port;

a differential piston axially reciprocable within said sleeve member to provide a third chamber in open communication with said outlet port, said piston having small and large effective piston areas whereby opposing displacement forces may be provided on said piston respectively in the directions toward and away from said outlet port;

valve means including a valve seat provided within said sleeve member and a valve part of said piston cooperable with said valve seat for controlling intercommunication between said first and third chambers in dependence upon the displaced position of said piston; and

a second spring for loading said piston in the direction toward a usual position in which said valve means opens to permit fluid communication between said first and third chambers.

4,180,295

BRAKE PROPORTIONING MEANS

Hiroshi Takeshita, Chiryu; Hiroyuki Kondo, Toyokawa; Takaaki Ohta, Okazaki; Yoshihisa Nomura, and Tomoyuki Nogami, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kogyo Kabushiki Kaisha, both of Aichi, Japan

Filed Mar. 23, 1978, Ser. No. 889,214

Claims priority, application Japan, Mar. 24, 1977, 52-32491

Int. Cl.² B60T 8/22

U.S. Cl. 303—22 R **8 Claims**



1. Device for use on vehicles equipped with hydraulic brakes and dual master cylinders for separate hydraulic circuits to front and rear brakes, the device adapted to vary the braking force on the vehicle wheels depending upon the vehicle load as well as shifting of weight of the vehicle, characterized by the following combination:

(a) a pressure varying device secured to one of at least two vehicle masses separated by means of a suspension system, the pressure varying device comprising a cylinder and a piston movable therein which subdivides the cylinder inside into two chambers, toward which it exposes faces differing in area, spring means biasing the piston in the cylinder, a normally open valve controlling intercommunication of the said two chambers which are connected to one of the master cylinders and the braking circuit to the rear brake, respectively, and said valve intercepting the said intercommunication upon a predetermined value of the pressure transmitted by said one of the master cylinders after the piston which is spring-biased by the spring means has started its movement,

(b) the pressure varying device having associated therewith means comprising a resilient member interposed between the piston and the other one of the above mentioned vehicle masses separated by the suspension means, the said piston having a rod extending within one of the chambers therebeyond and engaging said resilient member so as to be subjected to a thrust from said resilient member, the resilient member forming at least a part of the said spring means biasing the piston of the pressure varying device, so that the effect of the pressure varying device is at least partially controlled by the position of the two vehicles masses separated by the suspension system and hence by the vehicle load,

(c) the pressure varying device further having therewith associated means for blockading the said starting of the piston in response to failure of the front brakes so that the said interception by the said valve is prevented and unrestrained passage of fluid through the pressure varying device is thereafter permitted for compensating the failure of the front brakes, said blockading means comprising a locking member to lock the piston in a position prior to the said starting and said locking member comprising a sleeve surrounding the rod and having opposed end faces each of which is exposed against the fluid pressure in the circuit to the rear wheel brakes and differing in area, thus forming a stepped external surface adapted to define in a slidably fitting cooperation with one of said two chambers an annular chamber connected to the circuit to the front brakes.

4,180,296
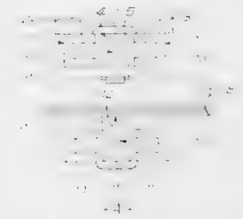
AXIAL ELECTROMAGNETIC BEARING FOR A SHAFT ROTATING AT HIGH SPEED

Helmut Habermann, Vernon, France, assignor to Societe Europeenne de Propulsion, Puteaux, France

Filed Jan. 6, 1978, Ser. No. 867,381

Int. Cl.² F16C 39/00

U.S. Cl. 308—10 **6 Claims**



1. An axial electromagnetic bearing for supporting the end of a shaft rotating at high speed comprising an armature in the form of a disc attached to the shaft and an annular fixed armature located, in relation to the former, a short distance therefrom to define a small axial air gap therebetween, the said fixed armature comprising excitation windings and a ferromagnetic core, and the bearing being characterized in that radial grooves are provided in the peripheral portion of the disc armature facing the fixed armature, the spacing of said radial grooves being effective to reduce eddy currents when said shaft is rotated at high speed.

4,180,297

SEALING GROMMET IN A REFRIGERATOR CABINET

Donald W. Abrams, Atlanta, Ga., assignor to General Electric Company, Louisville, Ky.

Filed Sep. 22, 1977, Ser. No. 835,946

Int. Cl.² F25D 23/08; H01B 17/58; H02G 3/22

U.S. Cl. 312—214 **8 Claims**

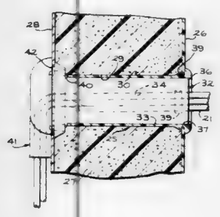
1. In combination, a refrigerator cabinet having inner and outer walls, insulation between the inner and outer walls, an opening in each of the inner and outer walls, the insulation having a passage to provide communication between the openings in the inner and outer walls, a grommet disposed in the passage in the insulation, said grommet comprising:

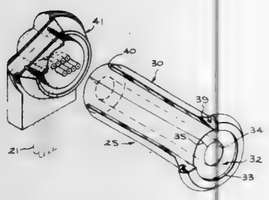
a longitudinal, hollow body of a relatively rigid material having a single longitudinal passage extending therethrough;

a core of a relatively flexible material disposed within said

longitudinal passage in said body for support by said body and in air sealing relation with said body, said core having a longitudinal passage extending therethrough;

each of said body and said core being slit longitudinally to enable said passage of said core to receive at least one article therein for passage therethrough;





mounting means secured to one end of said body and attaching said body to one of the inner and outer walls of the refrigerator cabinet in air sealing relation therewith;

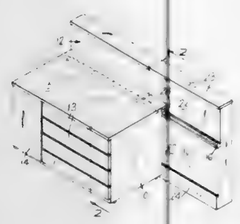
and said core being in air sealing relation with the other of the inner and outer walls of the refrigerator cabinet to prevent any contact of the insultion with any article passing through said passage of said core.

4,180,298

RELOCATABLE FURNITURE SYSTEM

Newton H. Borgerson, Jr., Anthony Ct., Bethany, Conn. 06525

Filed Apr. 10, 1978, Ser. No. 894,721
Int. Cl.[2] A47B *67/02*
U.S. Cl. 312—242 **11 Claims**



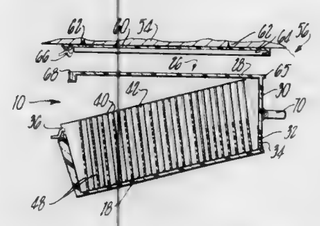
1. A relocatable furniture system comprising, at lease one piece of furniture, a wall mounted horizontal support rail, said rail extending from a wall and having elongated leading and trailing inclined surfaces, said surfaces defining a first ridge therebetween spaced from the wall, said piece of furniture having front and rear rollable support casters and having a rear extension toward the top thereof, a member having a depending ridge on said extension at a height which abuts said leading surface and which will depend behind said first ridge in contact with said trailing surface whereby said cabinet may be moved on its casters against said support rail and said member will ride up said inclined leading surface and said depending ridge will depend behind said first ridge so that the rear of said piece of furniture is releasably captured by said rail and supported thereon with the rear casters above the floor, said front casters being adjustable in height to level said piece of furniture.

4,180,299

CARRIER

Lawrence E. Tolerson, 3319 Barth, Flint, Mich. 48504

Filed Apr. 17, 1978, Ser. No. 896,972
Int. Cl.[2] A47B *81/06;* **B65D** *85/672*
U.S. Cl. 312—242 **20 Claims**



1. A carrier for removable mounting within a vehicle, said vehicle having a passenger compartment, said carrier comprising:

a housing, said housing being open on the top;

said housing defining a compartment accessible through the open top of said housing;

means for pivotally mounting said housing to the vehicle and within the passenger compartment, said housing being pivotal between a first position in which the top of the housing and said housing compartment is openly accessible to the interior of the vehicle compartment and a second position in which the top of the housing is closed so that said housing compartment is inaccessible to the interior of the vehicle compartment; and

means for detachably securing said housing to the vehicle, wherein said pivotal means further comprises a lid pivotally connected to said housing about a pivotal axis fixed with respect to said housing and said lid, and extending laterally of said housing, and

wherein said means for securing said housing to the vehicle comprises means for securing the lid to the vehicle passenger compartment,

wherein when said lid is secured to the vehicle passenger compartment, said housing is pivotable between a position in which the top of said housing is openly accessible to the interior of the vehicle passenger compartment and a position in which the top of said housing is closed by said lid so that it is inaccessible to the interior of the vehicle passenger compartment.

4,180,300

DOUBLE RING AND RADIAL CONDUCTOR ASSEMBLY FOR LARGE HOLLOW SHAFTS

Emil M. Fort, Murrysville, Pa., and Jacques E. Albaric, Nimes, France, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 5, 1977, Ser. No. 857,480
Int. Cl.[2] H01R *39/00*
U.S. Cl. 339—5 R **6 Claims**

1. An elastic fluid turbine apparatus comprising:

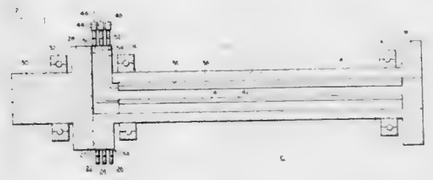
a hollow, rotatable shaft having an exterior and an interior surface with a radial opening connecting them;

a first conductive ring insulatively secured to said shaft's exterior surface through an interference fit therewith, said ring having a radial opening therethrough;

an electrically conductive lead extending through said ring's opening and through the shaft's opening, said conductor lead being insulated from the shaft;

means for electrically connecting said electrically conductive lead and said first ring; and

a second conductive ring attached to the outer periphery of said first ring, said attachment being through an interfer-



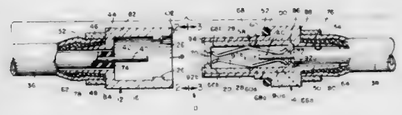
ence fit, said second ring having an electrical contact surface for receiving electrical energy supplied thereto and for conducting it through said first ring and conductive lead to said shaft's interior.

4,180,301

COAXIAL CABLE CONNECTOR

Harold G. Hutter, Brookfield, Conn., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Mar. 15, 1978, Ser. No. 886,854
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—90 C **23 Claims**



1. A connector for joining ends of a pair of cables comprising:

first and second connector members each having a mating end, said mating end of said first connector member having an opening to receive said mating end of said second connector member, said opening being defined by a generally cylindrical inner surface portion of said first connector member and said mating end of said second connector member being defined by a generally cylindrical outer surface portion;

means associated with said mating ends of said first and second connector members for orienting said connector members for mating engagement, said orienting means including a shoulder located on said inner surface portion of said first connector member and a longitudinally extending circumferential interruption located on said outer surface portion of said second connector member;

means associated with said mating ends of said first and second connector members for securing said connector members in locked engagement, said securing means including said shoulder on said inner surface of said first connector member and an annularly extending circumferential groove in said outer surface portion of said second connector member; and

means associated with said mating end of one of said connector members providing an environmental seal, said sealing means including a resilient retaining member resisting forces tending to move said connector members out of locked engagement;

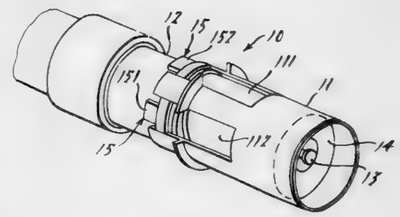
said circumferential interruption providing an entryway for said shoulder leading to said circumferential groove to permit locked engagement of said connector members with said shoulder disposed in said circumferential groove following mating engagement of said shoulder with said circumferential interruption.

4,180,302

CONNECTOR PLUG FOR VEHICLE ELECTRICAL TESTER

Thomas C. Gordon, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 18, 1978, Ser. No. 970,787
Int. Cl.[2] H01R *19/18;* **G01R** *31/02*
U.S. Cl. 339—143 T **7 Claims**



1. A connector plug for connecting a test apparatus used for testing a vehicle electrical system to the socket of a cigar lighter of a vehicle, said connector plug comprising:

a first contact adapted for connecting a signal processing component to the vehicle, said first contact being adapted to contact a portion of the cigar lighter socket carrying a positive battery voltage;

a second contact, spaced from said first contact adapted for connecting a power supply means for the test apparatus to the portion of the cigar lighter socket carrying a positive battery voltage, said first and second contacts being connected to substantially the same electrical point;

a static shield means relatively movable with respect to said first contact and biased to extend beyond said first contact so as to strike the cigar lighter socket before said first contact strikes the cigar lighter socket when inserting said connector plug into said cigar lighter socket so as to discharge static electricity from the test apparatus; and

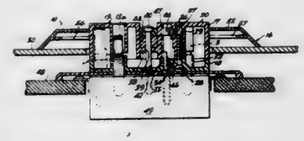
a ground terminal for completing the circuit of said first and second contacts, and adapted to be connected to ground potential of the vehicle when said connector plug is connected to the cigar lighter socket.

4,180,303

PLUG-IN ELECTRICAL RECEPTACLE EXTENDER

Arnold Damsky, 821 83rd St., Miami Beach, Fla. 33141

Division of Ser. No. 798,771, May 20, 1977, Pat. No. 4,090,769.
This application May 18, 1978, Ser. No. 907,204
Int. Cl.[2] H01R *13/20, 13/46*
U.S. Cl. 339—166 R **2 Claims**



1. In a plug-in electrical receptacle extender for use in association with an existing electrical receptacle having an electrically insulating housing, a plurality of contact prong receiving openings in the front surface of the housing and a cover plate of electrically insulating material; wherein said extender comprises an electrically insulating housing member having in the face thereof a plurality of contact-prong-receiving openings having the same relative disposition as the contact prong openings in the existing electrical receptacle, a plurality of electrical plug contactors behind said contactor openings projecting outwardly of said housing for plug-in reception in the original electrical receptacle, a cover plate for said receptacle extender,

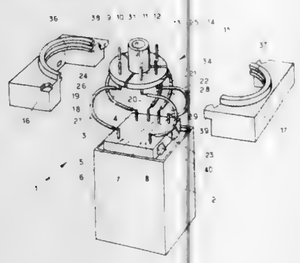
and through openings in said extender cover plate and housing member for permitting the passage therethrough of cover plate attachment screw means adapted to be received in the cover plate screw receiving opening in the original electrical receptacle whereby said outer cover plate is retained in covering relation with respect to the electrical receptacle extender; the improvement comprising at least one spacer element having an aperture therethrough said spacer element being adapted to be positioned between said extender cover plate and said housing member with the aperture of said spacer element being juxtaposed with the through openings in said extender cover plate and said housing member.

4,180,304

DISSEMBLABLE MULTI-PART ELECTRICAL CONNECTOR

Gerard Lerude, Poitiers, France, assignor to La Telemecanique Electrique, France

Filed Dec. 2, 1977, Ser. No. 856,933
Claims priority, application France, Dec. 3, 1976, 76 36636
Int. Cl.[2] H01R *13/46, 33/80*
U.S. Cl. 339—196 M **4 Claims**



1. A connecting device for an electrical appliance, said electrical appliance having a body provided with electrical connecting pieces, the said connecting device comprising:

(a) an insulating plug provided with output terminals which are spaced regularly and each of which includes a connecting extremity

(b) flexible electric conductors connecting the connecting pieces and the connecting extremities of the output terminals, and

(c) connecting devices for securing the plug to the said body, wherein:

(i) said plug is constituted by a plurality of elements of insulating material

(ii) each said plug element carries a plurality of output terminals

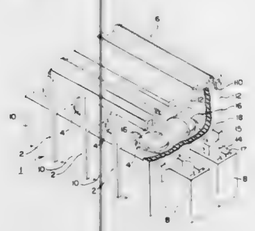
(iii) the flexible electrical conductors attached to two neighboring connecting extremities of respective output terminals carried by the same plug element run parallel to each other up to the said body and have such a length and such a flexibility that the plug elements can be moved into a first position in which said plug elements are separated out and lie flat substantially in the same plane as the flexible conductors, and into a second position in which said flexible electrical conductors are folded and the plug elements are disposed in contact with each other in a further plane and are held together by said connecting devices.

4,180,305

SECTIONAL ELECTRICAL TERMINAL BLOCK

George Ustin, Croton-on-Hudson, and Andrew P. Soltis, Yonkers, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Apr. 17, 1978, Ser. No. 896,734
Int. Cl.[2] H01R *9/10, 9/16*
U.S. Cl. 339—198 H **21 Claims**



1. A sectional terminal block comprising a plurality of sections and at least one contact element having two arms, wherein

a first section includes a longitudinally projecting portion having a pair of contact arm slots for receiving the arms of said contact element inserted transversely to said portion,

a second section includes recess means for receiving said projecting portion and positioning said sections transversely with respect to each other, and a contact slot for receiving one arm of said contact element inserted transversely to said portion, and

said contact element is arranged so that said one arm passes through the slot in the second section and is locked in one slot in said projecting portion and the other arm is locked in the other slot of said projecting portion to lock said sections longitudinally with respect to each other.

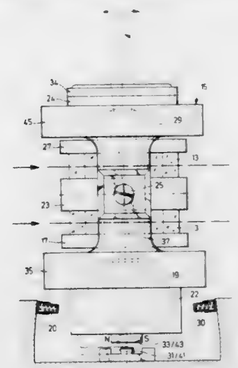
4,180,306

METHOD OF AND DEVICE FOR SCANNING THERMOGRAPHIC PICTURES

Jens Dührkoop, Neckargemund, and Günter Pusch, Neckargemund-Dilsberg, both of Fed. Rep. of Germany, assignors to Industrie Automation GmbH & Co., Heidelberg, Fed. Rep. of Germany

Filed Aug. 9, 1976, Ser. No. 712,788
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1975, 2535394
Int. Cl.[2] G02B *27/17*
U.S. Cl. 350—6.4 **8 Claims**

1. A method of scanning thermographic pictures by means of a scanning device comprising a rotating polygonal prism which includes the steps of scanning the respective picture in a first direction by rotating said polygonal prism of the scanning device about its axis of rotation, and scanning said respective picture in a second direction perpendicular to said first direction by oscillating said axis of rotation about an axis extending perpendicular to said axis of rotation and in parallel to the polygon surfaces being momentarily in the beam path



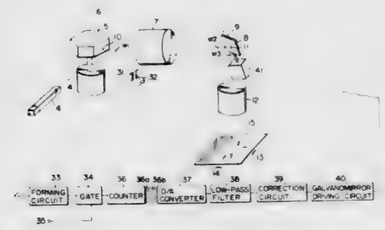
when said surfaces have assumed a position in which the optical axis impinges at right angles on said surfaces.

4,180,307

TWO-DIMENSIONAL SCANNING APPARATUS WITH CONSTANT SPEED SCAN

Masamichi Tateoka; Takao Tsuji, both of Kawasaki; Setsuo Minami; Kazuya Matsumoto, both of Yokohama; Naoto Kawamura, Inagi, and Kazuo Minoura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1978, Ser. No. 931,927
Claims priority, application Japan, Aug. 12, 1977, 52/96719
Int. Cl.[2] G02B *27/17*
U.S. Cl. 350—6.5 **4 Claims**



1. A two-dimensional scanning optical system comprising:

a first deflector for deflecting a light beam in a determined direction;

a second deflector for deflecting a light beam received from said first deflector, said deflection being performed in a plane perpendicular to the deflecting plane of said first deflector;

a scanning plane subjected to a two-dimensional scanning by a light beam emergent from said second deflector;

an afocal optical system provided between said first and second deflectors; and

an imaging lens system provided between said second deflector and said scanning plane;

wherein a first optical system composed of said first deflector, afocal optical system and imaging lens system comprising an optical means for causing the light beam to displace at a constant speed in a first direction on said scanning plane; and

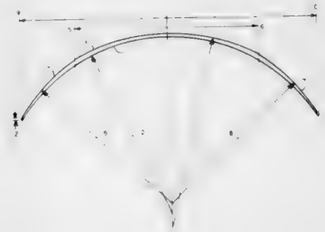
a second optical system composed of said second deflector and said imaging lens comprising an optical means for causing the light beam to displace at a constant speed in a second direction orthogonal to said first direction on said scanning plane.

4,180,308

CONTACT LENS

William L. Mancini, Framingham; Donald R. Korb, Boston, and Miguel F. Refojo, Lexington, all of Mass., assignors to Syntex (USA) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 685,996, May 13, 1976, Pat. No. 4,056,496, which is a continuation-in-part of Ser. No. 451,906, Mar. 18, 1974, Pat. No. 3,957,362, which is a continuation-in-part of Ser. No. 294,019, Oct. 2, 1972, abandoned. This application Oct. 28, 1976, Ser. No. 736,555
Int. Cl.[2] G02C *7/04;* **C08L** *00/00*
U.S. Cl. 351—160 H **25 Claims**



1. A soft minus prescription hydrogel contact lens, said lens having a maximum cross-sectional thickness at any point not exceeding 0.15 mm and being of a hydrogel sufficiently rigid so as not to irreversibly deform during blinking and sufficiently flexible so as to conform to the curvature of the eye.

4,180,309

FOCAL POINT DETECTING DEVICE FOR SLR CAMERA

Katsuhiko Miyata, Omiya; Seijiro Tokutomi, Tokyo, and Kazuo Nakamura, Asaki, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1977, Ser. No. 798,718
Claims priority, application Japan, May 22, 1976, 51-59480
Int. Cl.[2] G03B *13/18*
U.S. Cl. 354—25 **16 Claims**



1. In a single lens reflex camera including a pair of oppositely inclined wedge prisms, a two row array of photoelectric conversion elements disposed optically beyond the prisms, and means for directing light rays from a photographic object onto the prisms, whereby the prisms split the object image into two halves whose relative lateral displacement on the array element rows and level of contrast is a function of the degree of correct image focus, means for detecting the correct image focus characterized by:

(a) means for differentially comparing the outputs of paired, laterally offset elements in the two array rows, said paired elements being laterally offset by equal amounts in two opposite directions parallel to the array rows,

V 9894 D E25 79 UMI

(b) means for summing the results of said differential comparisons, and

(c) means for detecting when said summed results exceed a predetermined threshold level indicative of correct image focus.

4,180,310

PHOTOMETRIC CIRCUIT

Masahiro Kawasaki, and Yoshio Sawada, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 679,587, Apr. 23, 1976, Pat. No. 4,106,035. This application Mar. 17, 1978, Ser. No. 887,914

Claims priority, application Japan, Apr. 25, 1975, 50-50470

The portion of the term of this patent subsequent to Aug. 8, 1995, has been disclaimed.

Int. Cl.[2] G03B *7/08*

U.S. Cl. 354—24 **3 Claims**



1. A photometric circuit for electronically determining proper exposure time based on scene brightness, film sensitivity and aperture settings, said circuit being of the type having a photoelectric transducer for developing a current dependent upon scene brightness, a first transistor having its collector connected to said photoelectric transducer and its base connected to its collector by a high input impedance collector-to-base feedback circuit for developing a base-to-emitter voltage related to the apex indication value B_v of the brightness B of the scene, a pair of variable resistors for setting the film speed and aperture values into the circuit, respectively, and a second transistor for developing an exposure control current at its collector in dependance upon the voltage applied between its base and emitter, the improvement comprising,

said variable resistors being connected in series with each other and in the feedback circuit between collector and base of the first transistor, constant current source means connected to said series connection of said variable resistors for providing a constant current to said variable resistors having a value which causes the voltage across said resistors to be related to the apex indication values S_v and A_v, respectively, and said second transistor having its base-emitter circuit connected in a circuit loop with said variable resistors and said base-emitter circuit of said first transistor.

4,180,311

INTERLOCKING DEVICE FOR INDICATION IN THE FINDER OF A SINGLE-LENS REFLEX CAMERA

Fumio Urano, Omiya, and Akihiro Arai, Urawa, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1978, Ser. No. 906,805

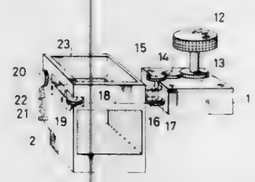
Claims priority, application Japan, May 31, 1977, 52-70195[u]

Int. Cl.[2] G03B *17/20, 19/12*

U.S. Cl. 354—53 **3 Claims**

1. In a camera having removable optical components and an indicating device mounted on a first camera component and extending into the optical path of the camera viewfinder, said indication device controlled by a first element which is mounted on a second camera component and rotatable by the camera operator, the improvement comprising:

a second rotatable element operatively coupled to said indication device and mounted on said first camera component, said second rotatable element being coupled to said first rotatable element and transmitting the rotation of said first rotatable element to said indication device when said



first and second camera components are assembled, said first and second rotatable elements being easily disengagable for removal of said first camera component; and

locking means for securing the rotatable position of said second rotatable element to prevent free rotation thereof when said first and second rotatable elements are disengaged.

4,180,312

PHOTOGRAPHIC CAMERA WITH THROUGH THE LENS EXPOSURE METER

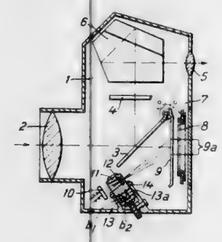
Ewald Schmidt, Braunfels, and Willi Wiessner, Wetzlar, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jan. 30, 1978, Ser. No. 873,608

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1977, 2705300

Int. Cl.[2] G03B *7/00*

U.S. Cl. 354—59 **13 Claims**



1. In a photographic camera having a through the lens exposure metering system with an exposure meter comprising a silicon-, or gallium-arsenide-phosphorus-diode, light passing through an objective of said system, said diode mounted in a space behind said objective and receiving said light, and having means for switching said exposure metering system between an integrating measurement and a selective measurement, the improvement comprising:

said integrating measurement comprising a first optical system guiding said light from substantially the entire object space onto said diode, said selective measurement comprising a second optical system, guiding said light from a restricted sector of said object space onto said diode, means for alternatively bringing said first and second optical systems into said light and in front of said diode, and a light intensity attenuator operably connected with said first optical system, said attenuator movable into said light together with said first optical system, said attenuator serving to achieve equal illumination intensities on said diode for both said integrating and selective measurements.

4,180,313

STEREOSCOPIC CAMERA

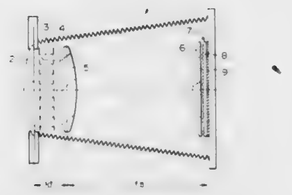
Masafumi Inuiya, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 7, 1978, Ser. No. 884,354

Claims priority, application Japan, Mar. 11, 1977, 52-26755

Int. Cl.[2] G03B *35/00;* **G02B** *17/00*

U.S. Cl. 354—112 **4 Claims**



1. A stereoscopic camera for taking a picture of a three dimensional object on a photosensitive material having a lenticular film thereon, said camera comprising a positive objective having a focal length of 1.0 to 4.0 m, an image inverting optical means located immediately behind the positive objective for inverting an image with respect to right and left, a taking lens located immediately behind the image inverting optical means for focusing an image of an object of the camera, means for supporting a photosensitive material at a position separated from said taking lens therebehind by a distance equal to the focal length of the taking lens and a field lens located immediately in front of said photosensitive material supporting means so that the field lens is located in front of the photosensitive material, said field lens having a focal length equal to or longer than that of said taking lens.

4,180,314

APPARATUS FOR VARYING PICTURE SIZE BEFORE OR AFTER FILM ADVANCE

Carl Koch, Im Santenbuhl, Stetten, and Rolf Meyer, Hohlenbaumstrasse 81, Schaffhausen, both of Switzerland

Filed Feb. 2, 1978, Ser. No. 874,577

Claims priority, application Switzerland, Feb. 7, 1977, 1442/77

Int. Cl.[2] G03B *1/42*

U.S. Cl. 354—159 **21 Claims**

1. Device for use in making photographic exposures on a strip-shaped light-sensitive material comprising a housing having a light-path opening, a picture area limiting frame enclosing the light-path opening, means for guiding the strip-shaped light-sensitive material behind the picture area limiting the frame and the light-path opening, a transport arrangement for the forward transport of the strip-shaped material in steps in its longitudinal direction, at least one adjustable mask for covering portions of the light-path opening thereby forming a picture window smaller than the picture area limiting frame, the portions of the light-path opening which can be covered by the mask adjoining opposite edges of the light-path opening that are at right angles to the longitudinal direction of the strip-shaped material so that a first edge of the picture window as well as a second edge of the picture window as seen in reference to the forward transport direction of the strip-shaped material are alterable in position by displacement of the mask, control means for the automatic limitation of the steps of forward transport caused by the transport arrangement of the strip-shaped material in adaptation to the size of the picture window defined by the mask, means for selecting a desired picture window and unidirectional linking means interconnected between the means for selecting the picture window and the transport arrangement for the strip-shaped material such that each adjustment of the means for selecting the picture window, which calls for a position change of the second



edge of the picture window in the forward transport direction of the strip-shaped material automatically produces a a forward correction transport of the strip-shaped material at least equal to said position change.

4,180,315

AUTOMATIC FILM WINDING APPARATUS FOR USE WITH CAMERAS

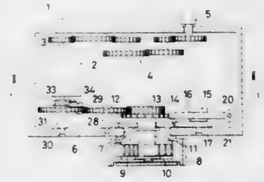
Shiyozo Nozawa; Saburo Hokari, both of Kawasaki, and Shigeru Yamaga, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jun. 27, 1978, Ser. No. 919,628

Claims priority, application Japan, Jun. 28, 1977, 52-77009

Int. Cl.[2] G03B *1/18*

U.S. Cl. 354—170 **8 Claims**



1. An automatic film winding apparatus for use with cameras, said apparatus comprising:

main driving means comprising an electric motor and an output shaft therefor;

sub-driving means comprising a spring motor;

a connecting member which is to be connected to a film winding mechanism of a camera and which is connected to said output shaft;

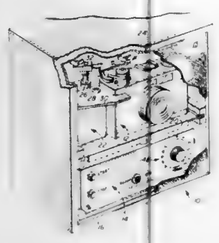
connecting means for connecting said sub-driving means to said main driving means, said connecting means comprising a one-way rotation transmission mechanism which allows transmission of rotation only from said sub-driving means to said output shaft; and

switching means for selectively actuating said connecting means to transmit power from said sub-driving means to said output shaft to drive said connecting member.

4,180,316
LOW NOISE AUTOMATIC CAMERA ADVANCE MECHANISM

Louis D. Della-Calce, Phoenix, Ariz., assignor to Crimeye Inc., Phoenix, Ariz.

Filed May 8, 1978, Ser. No. 903,802
Int. Cl.² G03B *1/12*
U.S. Cl. 354—173 **10 Claims**



1. A mechanism for automatically advancing film and depressing an exposure button of a camera having a film winding lever and exposure button collar means attached to a surface of said camera, said exposure button extending through said exposure button collar means, said mechanism comprising in combination:

a. motor means mounted in fixed relationship to said camera for rotating a shaft;

b. first means, rotatably connected to said exposure button collar means, for engaging said film winding lever during rotation of said first means in a counterclockwise direction with respect to said surface through an angle sufficient to advance the film of said camera, said first means then rotating in a direction clockwise with respect to said suface to an initial position, causing said film winding lever to return to an initial position, said clockwise and said counterclockwise rotation occurring in response to and at a rate determined by said rotation of said shaft;

c. Second means responsive to said rotation of said shaft for engaging said first means to produce said counterclockwise and clockwise rotation of said first means; and

d. exposure button depressing means coupled to said second means for depressing said exposure button during said clockwise rotation of said first means in response to said second means.

4,180,317
APPARATUS FOR DEVELOPING SHEETS OF DIAZOTYPE COPYING MATERIAL BY THE SEMI-DRY PROCESS

Herbert Schroter, Taunusstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 3, 1978, Ser. No. 957,446
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1977, 2749627
Int. Cl.² G03D *5/06*
U.S. Cl. 354—318 **4 Claims**

1. In an apparatus for developing sheets of diazotype copying material by the semi-dry process comprising an arrangement of at least two rolls, each of which is rotatable about an axis, means biasing two rolls together with a gap between them through which said sheets of diazotype material to be developed are adapted to pass, means for exerting an additional force upon at least one of said two rolls, and means for applying and spreading liquid developer on one of said two rolls,

the improvement comprising that said means for exerting an additional force transfers a plane of deflection of one of said rolls to a position outside of a principal plane in which said roll axes are located in a manner such that a first line of intersection between said plane of deflection and the shell of said one roll, starting from which line of intersection the deflection is directed toward said roll axis, extends in front of said gap, when viewed in the rotational direction of said roll,

first guide means adapted to bring said sheets of diazotype copying material into contact with said roll at a first transition line between said first line of intersection and said gap,

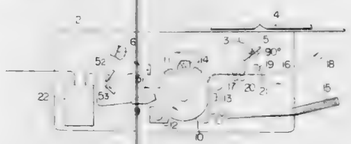


and second guide means adapted to lift said sheets off of said roll behind said gap at a second transition line located before a second line of intersection between said plane of deflection and said shell of said roll, starting from which second line of intersection the deflection is directed away from said roll axis.

4,180,318
MULTI-COPYING METHOD AND MULTI-COPYING APPARATUS

Fuyuhiko Matsumoto, Tokyo, and Toshiyuki Inokuchi, Yokohama, both of Japan, assignors to Ricoh Company, Ltd.

Filed May 26, 1978, Ser. No. 909,809
Claims priority, application Japan, May 31, 1977, 52/62755
Int. Cl.² G03G *15/00*
U.S. Cl. 355—11 **12 Claims**

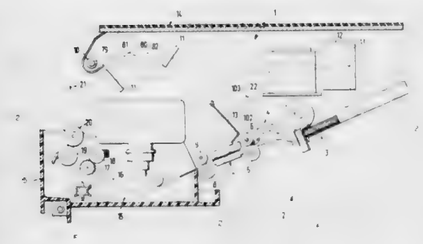


1. An electrophotographic multi-copying apparatus comprising, in combination, a recording material operable to have an image to be copied recorded thereon, an optical system operable to project said image onto said recording material, a mirror rotatable between first and second positions and, in the first position, transmitting an image of an original document to be copied to said optical system and, in the second position, transmitting an image of each copy made by said electrophotographic multi-copying apparatus to said optical system, before each copy is discharged from said electrophotographic multi-copying apparatus, said mirror continuously maintaining said second position after the first copy is made, until a desired number of identical copies are made from the respective preceding copies.

4,180,319
COPYING ARRANGEMENT

Heinrich Kaufmann, Stuttgart, and Kurt Moser, Gerlingen, both of Fed. Rep. of Germany, assignors to Fa. Develop KG, Dr. Eisgein & Co., Fed. Rep. of Germany

Filed Feb. 18, 1977, Ser. No. 770,071
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1976, 2606458
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 R **84 Claims**



80. A copying arrangement, which includes a housing means, a paper feeder means for feeding a sheet of copying paper upon which an image is to be transferred, a corona discharge means, an exposure station means associated with an optical system for transferring an image of an original arranged on an exposure carriage means, and a developing means arranged downstream of the exposure station means, characterized in that said housing means includes an upper housing section and a lower housing section, said lower housing section is open toward the top and accommodates at least the paper feeding means, the corona discharge means, the exposure station means and the developing means, the upper housing section accommodates at least the exposure carriage means and the optical system with said upper housing section being removable so as to uncover the entire flow path of the copying paper, and in that the corona discharge means includes a U-shaped corona housing means for accommodating wires connected to a voltage source, and a baffle means connected to ground arranged oppositely to an open side of said U-shaped corona housing means.

4,180,320
PHOTOGRAPHIC APPARATUS FOR USE IN MAKING PRINTING PLATES

John D. McCollough, Los Angeles, Calif., assignor to Delta Microfilm, Los Angeles, Calif.

Continuation-in-part of Ser. No. 798,123, May 18, 1977, Pat. No. 4,105,325. This application May 15, 1978, Ser. No. 906,121
Int. Cl.² G03B *27/44*
U.S. Cl. 355—54 **19 Claims**



1. An apparatus for use in making printing plates including a plurality of pages arranged in a predetermined format comprising:

a support;

hanger means for holding a sheet of photosensitive material;

track means for attaching said hanger means to said support while permitting horizontal and vertical movement thereof;

first transport means comprising a fluid-actuated cylinder for moving said hanger means along said track means a predetermined distance in a first direction upon actuation thereof;

second transport means comprising a fluid-actuated cylinder for moving said hanger means along said track means a predetermined distance in a second direction perpendicular to said first direction upon actuation thereof, whereby said hanger means and said sheet are capable of assuming at least four predetermined exposure positions in response to actuation of said first and second transport means;

control switch means for actuating said first and second transport means;

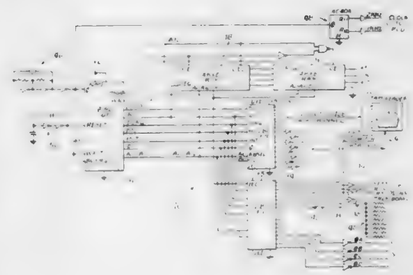
projection means for projecting a pre-recorded image from a transparency onto an exposure area of said sheet; and

positioning means for adjustably positioning said transparency with respect to said projection means to obtain proper registration of said image on said sheet.

4,180,321
CONTROL SYSTEM FOR PHOTOGRAPHIC FILM PRINTER

Larry L. Langrehr, Chicago, and Charles J. Watson, Elgin, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jun. 19, 1978, Ser. No. 916,621
Int. Cl.² G03B *27/78*
U.S. Cl. 355—83 **14 Claims**



1. A control unit for controlling the operation of a photographic printer comprising:

means including a single tape reading head for reading digital information punched on a tape;

means including a memory for storing information read by said reading head; and

control means coupled to said memory and to said reading means for rendering said reading means operative to read information from said tape and for rendering said memory operative to store said information, said control means including output means for reading the information stored in said memory and for providing an output signal for controlling the operation of said printer in response to the information stored in said memory.

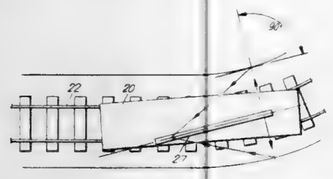
4,180,322
INTERIOR MEASUREMENT OF ENCLOSED SPACES

Michel Farcinade, Geneva, Switzerland, assignor to Alcyon Equipment S.A., Renens, Switzerland

Filed May 1, 1978, Ser. No. 901,865
Int. Cl.² G01C *3/00*; **E01B** *35/02*
U.S. Cl. 356—1 **12 Claims**

1. A device for the measurement of interior profiles of an

elongated enclosed space in which, as said device is moved longitudinally along said enclosed space on a transport means, an image analyser is optically coupled to a light source via the profile to be measured in a manner to assure a predetermined proportionality between the dimensions of a projected image on the image analyser and those of the profiles to be measured, said light source being associated with a first means adapted to



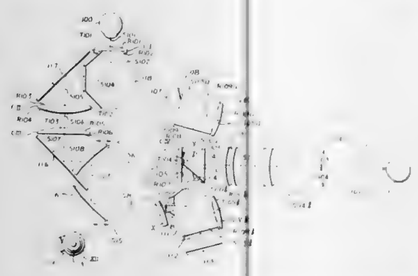
project a continuous collimated band of light toward said profile and second means in association with said first means adapted to change the horizontal angular position of said first means relative to said transport means whereby said collimated band maintains a substantially constant angle of incidence with said profile as said transport means moves along said elongated enclosed space.

4,180,323

ALIGNMENT SYSTEM AND OPHTHALMIC INSTRUMENT INCORPORATING THE SAME

Staffan B. Persson, Danielson, Conn., and Rato Buhler, Spencer, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Sep. 30, 1977, Ser. No. 838,177
Int. Cl.² G01C *3/00*; A61B *3/02*
U.S. Cl. 356—3 **12 Claims**



1. An optical system having an alignment axis for observing an object and positioning a member in a chosen three-dimensional relationship to said object which comprises, in alignment and sequence along the alignment axis,

a stationary portion of said optical system having first and second lenses,

a movable portion of said optical system being movable with said member, said movable portion having a third lens, an image centering means, and a ranging means for observing the relationship of said member to a chosen spacing from said object, said centering means being constructed for observing the location of said member relative to said object in a plane containing the remaining two dimensions, and said second and third lenses cooperating to provide a zone of parallel light therebetween

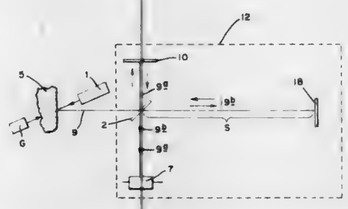
whereby an observer's head may remain stationary while observing movement of an image of the member.

4,180,324

METHOD AND APPARATUS FOR MEASURING DEFORMATION OF A WORKPIECE SURFACE RESPONSIVE TO ULTRASONIC ENERGY

Erik Primbsch, Cologne, Fed. Rep. of Germany, assignor to Krautkramer-Branson, Inc., Stratford, Conn.

Filed Oct. 4, 1977, Ser. No. 839,168
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1977, 2709686
Int. Cl.² G01B *9/02*
U.S. Cl. 356—35.5 **2 Claims**



1. The method of sensing by optical interference the deformation of a workpiece surface resulting from acoustic energy in the workpiece comprising:

applying wave energy to a workpiece for causing surface deformation of such workpiece;

transmitting a coherent beam of light from a multimode laser upon the surface of the workpiece for sensing such deformation;

splitting said beam after reflection at said workpiece surface into a measuring beam portion and a reference beam portion;

transmitting said measuring beam portion to photoelectric sensing means, and

transmitting said reference beam portion over a delay path and thereafter bringing said reference beam to coincidence with said measuring beam portion at said photoelectric means, said delay path being dimensioned to cause its optical length to be a multiple integer of the optical length of the resonator of said laser.

4,180,325

LENS METER WITH AUTOMATED READOUT

William E. Humphrey, San Leandro, Calif., assignor to Humphrey Instruments, Inc., San Leandro, Calif.

Filed Jul. 5, 1977, Ser. No. 813,211
Int. Cl.² G01B *9/00*
U.S. Cl. 356—127 **38 Claims**



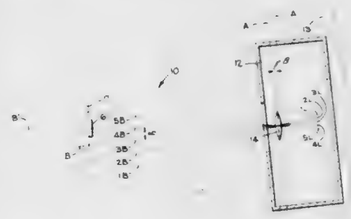
1. In the combination of a suspect optical system for measurement of deflection, at least one light source emanating at least three spaced apart discrete beams passed to said suspect optical system and deflected by said suspect optical system to a deviated beam path for measurement within a preselected area of excursion; and, means for measurement of said deviated path, the improvement in said means for measurement of said deviated path comprising: a moving boundary locus placed in a known plane at a preselected distance from said suspect optical system; said moving boundary locus arranged for sweeping movement along a predetermined path within said known plane, said boundary locus including a first portion, a second portion and at least two boundaries therebetween of distinctly different shape with each of said boundaries sweeping at differing angularities with respect to the predetermined path of said moving boundary locus to provide a single unambiguous point of boundary intersection; means for sweeping said moving boundary locus along said predetermined path producing occultation of each said beam by said boundaries; one of said portions including equal intervals between said boundaries with respect to the path of sweep of said locus whereby said portion occupies the interval between said light source and detector for equal interval of sweeping movement at all positions of excursion of each said beam and the other portion of said locus including changing intervals between said boundaries with respect to the path of sweep of said locus whereby said other portion occupies the interval between said light source and detector for differing intervals of sweeping movement at differing positions of excursion of each said beam; said differing intervals being proportional to the displacement of said beams with respect to the path of sweep of said locus; at least one photosensitive detector aligned to receive each said beam; means for identification of each said beam from all other beams; means for measuring the position of said moving boundary locus when said detector detects produced occultation of each said beam at said boundaries of said moving boundary locus whereby at least one measurement of each of said moving boundaries of said moving boundary locus at the time of detector detection of occultation of each said beam measures the excursion of said beam due to deflection of said suspect optics.

4,180,326

ANGLE MEASURING APPARATUS

Andrew K. Chang, Malibu, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Sep. 19, 1977, Ser. No. 834,636
Int. Cl.² G01B *11/26*
U.S. Cl. 356—152 **18 Claims**



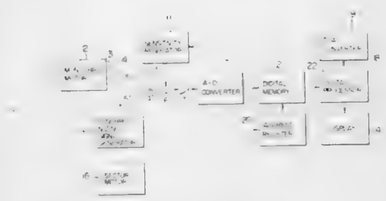
1. Angle measuring apparatus to determine the angle between reference axes on two members comprising a plurality of energy sources mounted on one of said members in fixed relation to the reference axis of said one member to cast beams in a predetermined diverging pattern from a defined plane toward the other member, a detector mounted on said other member in a predetermined position thereon relative to said reference axis thereof, the relative widths of the beams at the detector and the spacing thereof being such that at least two beams will strike the detector in a given position of the two members within the measuring range of the apparatus, and means to energize said sources sequentially until the beams from at least two of said sources strike said detector.

4,180,327

SPECTROPHOTOMETERS WITH DIGITAL PROCESSING

Yoshio Maeda; Koichi Matsumoto, and Seigo Kamitake, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 20, 1977, Ser. No. 843,790
Claims priority, application Japan, Oct. 22, 1976, 51-126201
Int. Cl.² G01J *3/42*
U.S. Cl. 356—320 **7 Claims**



1. A spectrophotometer comprising:

a light source for emitting continuous spectra,

a photodetector for converting light impinging thereon into an electric signal, said photodetector being adapted to detect light from a sample disposed between said light source and said photodetector,

means disposed between said photodetector and said light source for producing two types of lights,

first monochromator means disposed between said light source and said photodetector for deriving monochromatic light ray,

an analog-to-digital converter for converting electric signal from said photodetector into a digital signal,

a digital memory for storing separately digital signals from said analog-to-digital converter corresponding, respectively, to said two types of light,

means for controlling so that signal value of one of said digital signals stored in said digital memory lies in a fixed range, and

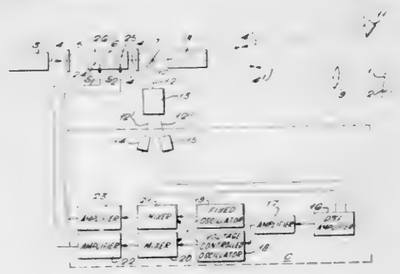
a digital processor unit for reading out said two digital signals from said digital memory and arithmetically determining ratio between said digital signals.

4,180,328

INTERFEROMETER WHICH CORRECTS FOR SPURIOUS VIBRATIONS

Leslie E. Drain, Goring-on-Thames, England, assignor to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 708,385, Jul. 6, 1976, abandoned. This application Oct. 10, 1978, Ser. No. 949,567
Int. Cl.² G01B *9/02*
U.S. Cl. 356—349 **21 Claims**



1. A metrological interferometer for investigating vibrations of a structure, comprising a reference arm and a measuring arm

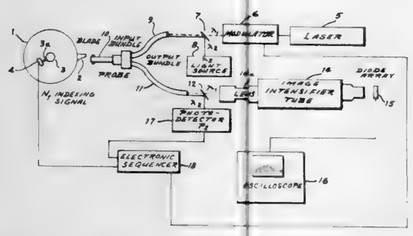
including a reflector adapted to form part of the structure, an electro-optical device adapted to produce from an input beam of monochromatic light two beams of light one of which has the same frequency and phase as the input beam and the other of which has a different frequency, the difference in frequency being governed by control signals, means for causing light of the orginal frequency to traverse one arm of the interferometer, means for causing light of the other frequency to traverse the other arm of the interferometer, a control loop comprising means for detecting cyclic changes in the optical path length of the measuring arm relative to that of the reference arm, means for producing a primary signal indicative of those changes within a predetermined frequency range, and means responsive to the primary signal to produce control signals such as to cause the electro-optical device to produce a frequency change in the beam of light of altered frequency such as to effectively vary the phase of the light traversing the reference arm so as to compensate for the effects of the said cyclic changes within the said frequency range.

4,180,329

SINGLE BLADE PROXIMITY PROBE

James R. Hildebrand, Palm Beach Gardens, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 23, 1978, Ser. No. 889,795
Int. Cl.² G01B 11/14
U.S. Cl. 356—375 **2 Claims**



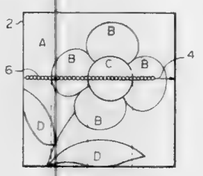
1. A single blade proximity system comprised of an operative engine rotor having an outer rim, a blade attached to said outer rim, said blade having a tip, an extending member attached to said rotor and rotating therewith to provide a voltage therefrom, an electrical proximity probe positioned to be activated by said rotating extension at each rotation to provide an indexing signal therefrom, a laser providing an output light of frequency λ_1, a modulator passing the output light of frequency λ_1, said modulator also receiving an input signal for the control thereof, a source of light of frequency λ_2, a first beam splitter receiving the modulated light of frequency λ_1, and said light of frequency λ_2 for mixing, an optical input bundle receiving the mixed lights of frequencies λ_1 and λ_2, an optical probe receiving the mixed lights of frequencies λ_1 and λ_2 from said optical input bundle for direction to said blade tip, an output optical bundle receiving reflected mixed lights of frequencies λ_1 and λ_2 from said blade tip, a second beam splitter receiving the output from said output optical bundle, said second beam splitter being selective to subtract the reflected mixed light of frequency λ_2 from λ_1 an image intensifier tube, a lens operating as an input to said image intensifier tube, the light of frequency λ_1 from said second beam splitter entering said lens for passage through said image intensifier tube to provide an output therefrom, an oscilloscope having a display face thereupon, a diode array receiving the output from said image intensifier and providing an electrical representative signal for display on the face of said oscilloscope, a photo detector receiving from said second beam splitter a light of frequency λ_2, and an electronic sequencer receiving two inputs, one of said inputs being said index signal and the second the output from said photo detector, the output of said electronic sequencer serving as said input to said modulator for triggering purposes to allow the output light of frequency λ_1 from said laser passage through said modulator.

4,180,330

METHOD OF AND A SYSTEM FOR COLOR SEPARATION

Hiroaki Kotera; Hiroyoshi Tsuchiya; Ryuzo Itabashi; Kunio Yoshida; Tsutomu Shibata; Yukifumi Tsuda; Yoshimitsu Kanno; Heijiro Hayami, and Haruko Sugita, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 18, 1977, Ser. No. 798,010
Claims priority, application Japan, May 19, 1976, 51/58369
Int. Cl.² G01J 3/46; H04N 1/46
U.S. Cl. 356—425 **8 Claims**



1. A method of color separation of colored patterns on a subject copy, which comprises the following steps:
scanning the subject copy by means of light beams;
detecting color borders each of which is between two consecutive different colored patterns, scanned by said light beams; and
discriminating a color of a predetermined scanned portion following each of the detected color borders and determining the sensed color as a color between the detected and adjacent color borders.

4,180,331

METHOD AND APPARATUS FOR SAMPLING AND MEASURING A CHARACTERISTIC OF FLOWING GRANULAR MATERIAL

John W. Lundstrom, Glendora, Calif., assignor to Bindicator Company, Port Huron, Mich.

Filed Apr. 19, 1976, Ser. No. 678,149
Int. Cl.² G01N 21/48, 1/00, 21/26
U.S. Cl. 356—445 **12 Claims**



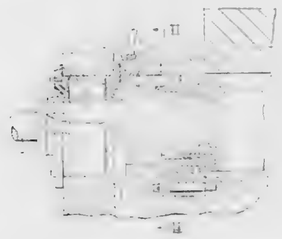
5. A system for optically measuring a selected characteristic of granular material flowing vertically in a bulk material stream comprising means adapted to be disposed in said bulk material stream and including first surface means for providing an optical window through which said characteristic may be measured and second surface means disposed downstream of said first surface means adjacent thereto at an angle projecting into said material stream and in a direction opposed to flow of material such that a deposit of flowing material accumulates and is held stationary by gravity against said second means covering said window while the remainder of the flowing material in said bulk stream continues to flow past said first and second surface means, and means disposed externally of said material stream for detecting said material characteristic by directing a light beam through said window onto said material deposit and measuring reflections therefrom.

4,180,332

DUST STOP

Ernest F. Twist, Leigh, England, assignor to USM Corporation, Farmington, Conn.

Filed Sep. 11, 1978, Ser. No. 941,228
Claims priority, application United Kingdom, Sep. 9, 1977, 37660/77
Int. Cl.² B01F 7/02
U.S. Cl. 366—279 **5 Claims**



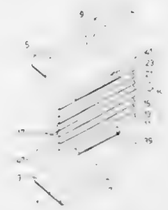
1. A mixing machine comprising:
a mixing chamber;
a mixing rotor mounted for rotation about an axis in said mixing chamber, said mixing rotor comprising a shaft which extends beyond said mixing chamber through an aperture in a wall of said chamber;
sealing means sealing between the wall of the mixing chamber and the rotor; said sealing means comprising a collar through which the shaft extends and which is mounted for movement axially of the shaft to engage a generally axially facing annular sealing surface of the rotor;
pressing means operable to urge the collar axially of the shaft to maintain the collar in contact with the sealing surface, the pressing means comprising a pressure block which has a plurality of piston chambers formed therein extending in directions generally axially of the rotor and spaced apart about the axis of rotation of the rotor, and a piston mounted in each of said piston chambers; and
means whereby the piston chambers are fillable with a pressurizable fluid, the pistons being arranged to urge the collar against the sealing surface of the rotor upon pressurization of any fluid in said piston chambers;
said pressure block only partially surrounding said shaft of said rotor permitting easy removal thereof from said rotor by raidally directed movement from said rotor.

4,180,333

BEARING FOR THE PRINTING HEAD OF A MATRIX PRINTER, AND PRINTING HEAD COMPRISING SUCH A BEARING

Uno K. E. Linder, Stockholm, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,793
Claims priority, application Sweden, Mar. 15, 1977, 7702881
Int. Cl.² B41J 3/12
U.S. Cl. 400—124 **5 Claims**



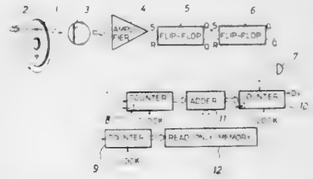
1. A matrix printer assembly which comprises: a printing head, a plurality of slidable printing pins which are journalled in the printing head and whose printing ends are situated in the vicinity of each other on a straight line which extends transversely of the direction of a line to be printed, means for axially displacing each of said printing pins, and a bearing which can be inserted into the printing head and which comprises an individual, substantially straight guide channel for each printing pin, each printing pin being guided near the printing end thereof, said bearing having a first portion made of a first material and a second portion made of a second material which is harder than said first material,
wherein said first portion has at least two substantially straight insert channels formed therein parallel to the guide channels and also disposed on said straight line, viewed in a cross-section of the guide channels, and
said second portion includes at least two pin-shaped inserts manufactured of said second material and two insert channels in which said two pin-shaped inserts are respectively disposed, one of the pin-shaped inserts substantially adjoining one outer printing pin, and the other pin-shaped insert substantially adjoining the other outer printing pin, each pin-shaped insert not being connected to said means for axially displacing each of said printing pins.

4,180,334

DOT PRINTER

Akinori Watanabe, and Katsumasa Shinozuka, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 773,832, Mar. 3, 1977, abandoned. This application Jul. 13, 1978, Ser. No. 924,172
Claims priority, application Japan, Mar. 10, 1976, 51-24984
Int. Cl.² B41J 3/12
U.S. Cl. 400—124 **9 Claims**



1. For a dot matrix type printer comprising a print head with print elements for accomplishing print functions by depositing

dots in columns selectively as the print head moves across a paper on which printing is effected, an improvement comprising

a control system for controlling the timing for said print elements to deposit successive columns of ink dots,

said control system comprising

means to measure the time of travel of said print elements between successive columns of dots to form a measured time,

means to store predetermined corrective time amounts corresponding to respective columns of ink dots,

means to combine said measured time and a respective one of said corrective amounts for controlling the time of activation of said print elements.

4,180,335

HIGH SPEED SERIAL PRINTER

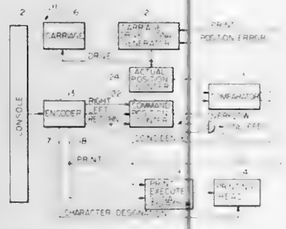
Kunihiro Yamada, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 30, 1976, Ser. No. 746,262

Claims priority, application Japan, Nov. 30, 1975, 50-143181

Int. Cl.[2] B41J *19/00, 5/30*

U.S. Cl. 400—320 **15 Claims**



1. A serial printer comprising:

a carriage supporting a printing head for printing characters;

drive means for positioning the printing head;

encoder means for producing print signal comprising character print instructions and drive signals comprising carriage space instructions;

first computing means for deriving a resultant drive signal from drive signals produced prior to any print signal;

second computing means for sensing an actual position of the printing head;

comparator means for comparing the actual position of the printing head with a command position of the printing head designated by the resultant drive signal and producing a coincidence signal when the actual position coincides with the command position and a position error signal when the actual position is unequal to the command position; and

control means for applying the position error signal to the drive means in response to the print signal and applying the print signal to the printing head in response to the coincidence signal;

whereby the printing head is directly moved from the actual position to the command position while skipping all of carriage spaces between the actual position and the command position and stopped to print a character only when the character print instructions are produced, and the printing head is physically stationary when the carriage space instructions only are produced.

4,180,336

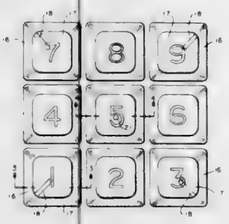
TOUCH CHECKING KEY TOPS FOR KEYBOARD

Alice Lonsdale, Berkeley, Calif., assignor to Safeway Stores, Incorporated, Oakland, Calif.

Filed Nov. 25, 1977, Ser. No. 854,626

Int. Cl.[2] B41J *5/08*

U.S. Cl. 400—491.3 **5 Claims**



1. In touch checking key tops for a keyboard for use on a cash register, a plurality of nine keys arranged in a generally square matrix with the digits 1 through 9 being assigned thereto, the keys being arranged in three spaced apart parallel rows, the keys also being arranged in three rows extending in a direction at substantially right angles to the spaced apart parallel three rows so that there are three keys forming each side of the square matrix with a key in the center and one key on each of the four corners of the square matrix, each of said four corner keys in the matrix having diagonally disposed raised portions formed on the keys and serving as tactile indicators to the operator, the center key of the matrix having a raised portion different from the diagonally disposed raised portions on said four keys and serving as a tactile indicator to the operator, the remaining keys of said nine keys being free of tactile indicators.

4,180,337

KEYBOARD ARRANGEMENT

Flem B. Otey, III, and Yoshiko S. Otey, both of 2230 Morena St., Nashville, Tenn. 37208

Continuation-in-part of Ser. No. 667,871, Mar. 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 485,914, Jul. 5, 1974, abandoned. This application Oct. 26, 1977, Ser. No. 845,586

Int. Cl.[2] B41J *5/10*

U.S. Cl. 400—486 **1 Claim**



1. A keyboard arrangement comprising a keyboard in which each letter of the alphabet of a language is represented by an individual key, the keys being arranged in five primary columns or rows, with each primary row beginning with a vowel-representing key, and followed by consonant-representing keys in alphabetical order, the vowel-representing keys being arranged in alphabetical order in a column along one edge or side of the keyboard, a portion of the alphabet-representing keys being respectively employed to also represent numerals in a manner that locates zero on the o key and numeral one on the i key, the numeral keys zero, one, four and seven being in numerical order in the vowel column of keys, with the remaining number-representing keys following the one, four and seven in numerical order.

4,180,338

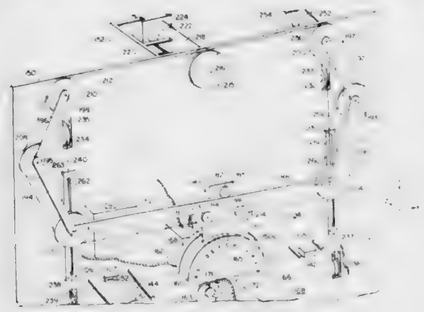
AUTOMATIC EMBOSSING SYSTEM WITH DOCUMENT TRANSFER

Richard J. LaManna, Whippany; Jacob H. Drillick, Hawthorne, both of N.J., and Michael D. Polad, Mendota, Minn., assignors to Data Card Corporation, Minneapolis, Minn.

Division of Ser. No. 720,071, Sep. 2, 1976, Pat. No. 4,088,216. This application Sep. 21, 1977, Ser. No. 835,406

Int. Cl.[2] B41J *11/50*

U.S. Cl. 400—582 **10 Claims**



1. A document transfer mechanism for transporting a document from an input means to an output means and to selected positions with respect to a reference position intermediate said input and output means, comprising

a main support,

a horizontal support rail,

first and second support arms each with two pivotally connected first and second portions, said arms being pivotally connected at first ends thereof to corresponding, opposite ends of said horizontal support rail and pivotally connected at the opposite, second ends thereof to said main support, said pivotal connections of said second ends to said main support being vertically aligned with, and spaced apart by the distance of the spacing of, the pivotal connections of said first ends to said horizontal support rail,

vertical transport means for selectively raising and lowering said horizontal support rail, and

horizontal transport means including a carriage mounted on said horizontal support rail for selective movement therealong, first and second pulleys connected to said horizontal support rail, at respective ones of said pivotal connections thereto, to respective ones of said pivotal connections of said first and second portions of each of said arms, and fifth and sixth pulleys connected to respective ones of said pivotal connections of said arms to said main support, a cable of fixed length engaging said pulleys, and means for engaging and selectively driving said cable thereby to move said carriage to selected positions along said horizontal support rail,

said carriage includes resilient engagement means, normally disposed to an engaged position,

means adjacent said input means for actuating said resilient engagement means to an opened disengaged position to receive a document therein from said input means and thereafter deactuating same to said engaged position for engaging said document received therein, and

means adjacent said output means to actuate said resilient engagement means to said disengaged position to release said engaged document, and

control means for controlling selective driving means of said horizontal and vertical transport means for lowering said horizontal support rail and moving said carriage to said input means to receive and engage a document, to transport said document to said reference position thereafter and to desired predetermined positions with respect to said reference position, and to transport said document from said reference position to said output means.

4,180,339

MECHANICAL PENCIL WITH AUTOMATIC LEAD FEED

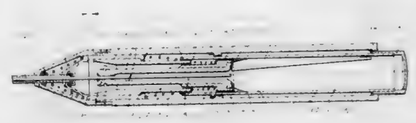
Otto Katz, Schwabach, Fed. Rep. of Germany, assignor to A. W. Faber-Castell, Stein bei Nürnberg, Fed. Rep. of Germany

Filed Jun. 28, 1978, Ser. No. 919,950

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1977, 2729320

Int. Cl.[2] B43K *21/02*

U.S. Cl. 401—67 **24 Claims**



1. In a mechanical pencil with automatic lead feed, a combination comprising tubular housing means having opposite ends; a tubular lead magazine coaxially guided in said housing means moveable between a retracted and an extended position in which one end of the tubular lead magazine projects further beyond one end of said housing means than in said retracted position; a lead guide tube coaxially guided in said housing means in the region of the other end of the latter movable between a first and a second position in which one end of said tubular guide projects through a smaller distance beyond said other end of said housing means than in said first position; first spring means cooperating with said lead guide tube for biasing the latter to said first position; means for feeding a lead from said lead magazine into said lead guide tube and comprising tubular means coaxially guided in said housing means between two end positions and having at one end adjacent said other end of said housing means an inner conical guide face having a large diameter at said one end of said tubular means and tapering from said large diameter toward the axis of said tubular means, clamping means extending longitudinally through said tubular means and comprising a pair of resilient clamping arms having front ends adjacent said conical guide face and biased to move toward the latter and rolling elements carried by said front ends and engaging said conical guide face, said clamping means being movable relative to said tubular means between a rear clamping position in which said rolling elements are spaced from said one end of said tubular means to clampingly engage with clamping faces thereof a lead located therebetween and a forward releasing position, and second spring means between said tubular means and said clamping means and biasing the latter to said clamping position; third spring means between said housing means and said tubular lead magazine for biasing the latter to said extended position and to yieldably couple said tubular lead magazine to said tubular means, whereby during movement of said tubular lead magazine from said extended toward said retracted position, said tubular means is moved from one to its other end position; cooperating means on said tubular magazine and said clamping means for moving the latter together with said tubular means during movement of said tubular means to said other end position while said clamping means remain in said clamping position so as to feed a lead clamped therebetween toward said lead guide tube until said tubular means reaches its other end position, whereby during further movement of said tubular lead magazine to said retracted position said clamping means is moved relative to said tubular means so that said rolling elements move toward said large diameter of said conical guide

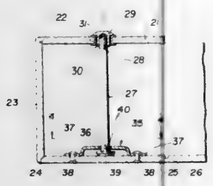
face causing thereby disengagement of said clamping faces from a lead therebetween; and entrainment means on said lead guide tube constructed to exert on a lead extending through said lead guide tube during movement relative to the tube into said housing means a greater friction force than during movement of the lead relative to the tube in the opposite direction.

4,180,340

BINDER POST CONNECTION

Billy Q. Cosby, Dalton, Ga., assignor to National Service Industries, Inc., Atlanta, Ga.

Filed Oct. 11, 1978, Ser. No. 950,471
Int. Cl.[2] B42F *13, 14*
U.S. Cl. 402—63 **7 Claims**



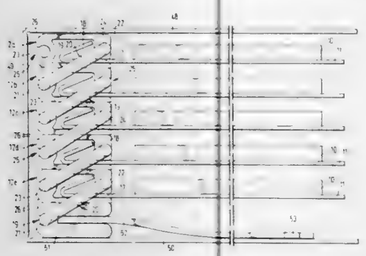
1. In a binder opposing binder sections adapted to receive between them elements to be bound, one binder section having an aperture, an anchor secured to the interior of the opposing binder section and having a raised portion spaced somewhat from the opposing binder section and being generally aligned with said aperture, said raised portion having a slot including generally right angular communicating slot portions, a binder post having a threaded end for passage through said aperture, a nut engageable with said threaded end and bearing on said one binder section, and a head on the far end of said post insertable through said slot to a position below said raised portion and also removable through said slot, and at least one lug joined to said post and head and entering one portion of the slot and resisting rotation of the post relative to said anchor around the axis of the post.

4,180,341

HINGED BINDER ASSEMBLY FOR SAMPLE CARDS

Carsten Langhorst, Einstmannstr. 33, 2804 Lilienthal, Fed. Rep. of Germany

Filed Mar. 29, 1978, Ser. No. 891,248
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1977, 2713736; Sep. 28, 1977, 2743558; Oct. 26, 1977, 2747931
Int. Cl.[2] G09F *3/00*
U.S. Cl. 402—80 R **9 Claims**



1. A hinged binder assembly for a plurality of stacked planar cards on which rug samples or the like may be mounted, and including a plurality of generally rectangular, hollow rail members individually receiving and holding one end of a sample card, with said rail members lying adjacent to and one above the other when the binder assembly is in a closed position, comprising:

(a) cylindrical lateral channels defined in and extending through respective front and rear walls of each rail member,

(b) a plurality of U-shaped stirrups each including a pair of parallel cylindrical arms and a connecting web, and

(c) a pair of stirrups being connectingly disposed on opposite sides of each adjacent set of upper and lower rail members with one arm of each stirrup rotatably engaged in a rear wall channel of a lower rail member and the other arm rotatably engaged in a front wall channel of an upper rail member, with the web of each stirrup thus lying at an inclined angle between adjacent rail members,

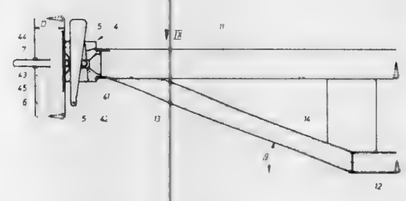
(d) whereby the sample bearing cards may be turned over one at a time in the manner of book pages, or pulled out in a translational manner into a partially overlapping stepped configuration wherein portions of all samples are exposed for viewing.

4,180,342

ARRANGEMENT FOR CONNECTING STRUCTURAL MEMBERS

Eberhard Layher, D-1729 Guglingen-Eibensbach Wurtt., Fed. Rep. of Germany

Filed Jul. 11, 1978, Ser. No. 923,648
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 2737859
Int. Cl.[2] E04G *7/00;* **F16B** *7/00*
U.S. Cl. 403—24 **15 Claims**



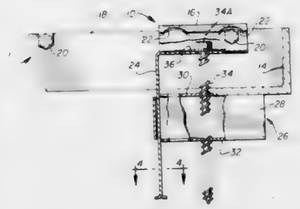
1. An arrangement for connecting structural members, particularly members of a frame or scaffold, comprising a first elongated member having two end portions, at least one of said end portions being provided with an elongated recess having one open end and a first throughgoing passage extending substantially transversely to the elongation of said recess; a second elongated member to be connected with said first elongated member; a third member fixedly mounted on said second member and extending outwardly away from the second member, said third member being adapted to be received in said recess when said first and second members are connected to each other, said third member being provided with at least one second throughgoing passage so arranged on said third member as to communicate and bound with said first passage an uninterrupted channel; a fourth member closely receivable in said channel so as to arrest said second member on said first member to thereby prevent any movement of said first and second members relative to one another; and a fifth member fixedly spaced from said first member and having first and second portions, an intermediate portion spaced from said first member and extending substantially parallel thereto, said first and second end portions being bent relative to said intermediate portion in direction towards said first member and being rigidly connected thereto.

4,180,343

GRATING FASTENER

Glenn Finlay, P.O. Box 306, Daingerfield, Tex. 75638

Filed Jul. 13, 1978, Ser. No. 924,244
Int. Cl.[2] F16B *2/12*
U.S. Cl. 403—24 **10 Claims**



1. For use in combination with an externally threaded member, a fastener assembly for securing grating to an underlying support, which comprises:

clip means for engaging the top surface of the grating;

said clip means having an aperture for receiving one end of the externally threaded member;

leg means connected at one end to the clip means and spaced from said aperture and and extending downwardly therefrom through the grating; and

foot means extending outwardly from the leg means and captively supported on by said leg means for slidable linear movement therealong between engaging and non-engaging positions relative to the support;

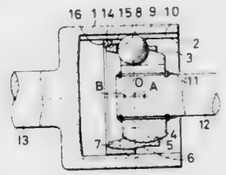
said foot means having at least one aperture therein coaxial with the aperture in the clip means for threadedly receiving the other end of the externally threaded member.

4,180,344

SLIDABLE TYPE CONSTANT VELOCITY UNIVERSAL JOINT

Nobuyuki Otsuka, Kawagoe; Seiichi Hirai, Sayama, and Motoshige Sogabe, Asaki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1978, Ser. No. 951,607
Claims priority, application Japan, Feb. 13, 1978, 53-1407153; Mar. 13, 1978, 53-3085453
Int. Cl.[2] F16D *3/00*
U.S. Cl. 403—57 **2 Claims**



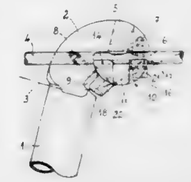
1. A slidable type constant velocity universal joint having an outer member, said outer member being formed of an inner cylindrical surface, and provided therein with an inner member having an outer spherical surface; a cage member; said cage member being mounted on the inner member and having an inner spherical surface and an outer spherical surface respectively; each being eccentric with respect to each other; a plurality of balls provided in said cage member, being mounted in respective windows; guide grooves formed in mutually facing surfaces of said outer member and the inner member; said respective balls being in engagement with corresponding respective pairs of longitudinal directed guide grooves; wherein: an annular guide member means an annular guide member means disposed between said cage member and said outer member, said guide member means having an outer cylindrical surface in proximity to said outer member and an inner part-spherical surface in proximity to said cage member for permitting slidable engagement between said outer member and said inner member.

4,180,345

SADDLE SUPPORT FOR BICYCLES AND THE LIKE

Jean-Paul Routens, 8, Cours Berriat, Grenoble (Isere), France

Filed Jun. 20, 1978, Ser. No. 917,160
Int. Cl.[2] F16C *11/00*
U.S. Cl. 403—84 **6 Claims**



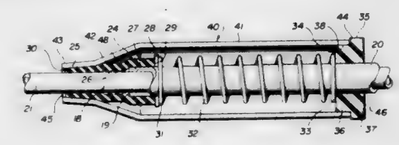
1. A saddle support for bicycles and the like, of the type constituted by a saddle stem terminating in a head comprising means for adjusting the longitudinal position and the inclination of a saddle frame to be supported by the head, wherein the head of the saddle stem comprises, on each of two side faces, a projection formed with a groove whose base, directed downwards, has a substantially arcuate shape, and a cradle adapted to be fixed below the head of the saddle stem by means of two screws located one in front of the other and both ahead of said stem, said cradle having on each side, two recesses having upwardly directed coaxial cylindrical bases, each of two longitudinal members of the saddle frame being intended to be introduced and clamped in a groove in the head of the saddle stem and in the two corresponding recesses of the cradle, located on either side of the groove.

4,180,346

COUPLING FOR TELESCOPING MEMBERS

William J. Blake, Lombard, Ill., assignor to Robert L. Swanson, Lombard, Ill., a part interest

Filed Mar. 13, 1978, Ser. No. 885,963
Int. Cl.[2] F16B *7/10*
U.S. Cl. 403—109 **12 Claims**



1. In combination, an outer tubular member, an inner member telescopically slidable within said outer tubular member, and a coupling assembly for said members, said coupling assembly comprising:

a tubular locking element having a first portion located around the outside of said outer tubular member adjacent one end of the outer tubular member;

said tubular locking element having a second portion extending axially from said first portion and encompassing the untelescoped part of said inner member adjacent said one end of the outer tubular member;

said tubular locking element having a pair of opposite ends and comprising a plurality of elongated ridges extending

longitudinally on the outside of the tubular locking element between said opposite ends;
gripping means, on said second portion of the tubular locking element, actuable between operative and inoperative dispositions thereof;
a tubular actuating element located around the outside of said locking element;
means on said actuating element for engaging said elongated ridges on the locking element to actuate said gripping means into an operative disposition in which said gripping means grips said inner member to hold the latter against movement in an axial direction relative to the locking element and the outer tubular member;
said plurality of longitudinal ridges on said locking element comprising means, responsive to said engagement of said ridges by said means on said actuating element, for providing radially inwardly directed compressive forces on said gripping means from a plurality of regularly spaced angles around the periphery of the locking element;
and means normally urging said gripping means to its inoperative disposition.

4,180,347
FOUR BRANCH SPRING STEEL JAM FASTENER CLIP FOR ASSEMBLY OF OPEN EXTRUSIONS
Maurice Piget, Boisset les Prevanches, 27120 Pacy sur Eure, France
Filed Sep. 15, 1978, Ser. No. 942,731
Int. Cl.[2] B25G *3/00*; F16B *5/06*
U.S. Cl. 403—405 **6 Claims**



1. A jam fastener for assembling together two elongated members, one of which has a sharp cornered U-shaped cross-section with an inturned edge on one of its arms, comprising:
(a) a spring steel wire clip having four distinct continuous branches each being bent at an angle with respect to its adjacent branch or branches,
(b) the first three branches lying in a common bending plane,
(c) the third and fourth branches defining a dihedral plane which forms a predetermined angle with the bending plane,
(d) the fourth branch forming an acute angle with the third branch, and
(e) the length of the fourth branch being slightly greater than the internal width of the desired profile member assembly.

4,180,348
SUBSURFACE IRRIGATION AND DRAINAGE SYSTEM
Richard H. Taylor, Rte. 1, Box 97, Como, N.C. 27818
Filed Nov. 22, 1978, Ser. No. 964,806
Int. Cl.[2] E02B *11/00, 13/00*
U.S. Cl. 405—39 **19 Claims**



1. An irrigation and drainage system for cultivated fields, croplands and the like for supplying and extracting water and similar liquids through a subsurface conduit network automatically responsive to the ground water table occurring above or below a predetermined subsurface reference level near the depth of the conduit network, comprising a plurality of elongated subsurface perforated conduit lines at spaced apart locations throughout the field each extending along a horizontal path at a uniform depth below ground along a predetermined reference ground elevation contour line for a chosen ground elevation for outflow of water from said conduit lines through said perforations into the adjacent subsoil when the ground water level is below said reference level and for inflow of ground water through the perforations into said conduit lines when the ground water level is above said reference level, a distribution box for the conduit lines for each different reference ground elevation contour line having a main water collection compartment for holding water at a selected water level therein communicating said water level with the contour lines served thereby for liquid egress and ingress to and from the contour lines, means for supplying water to the main water collection compartments of said distribution boxes from a water supply source located at a higher elevation than the conduit lines, weir means in each distribution box defining an overflow compartment for overflow of excess water from said main water collecting compartment exceeding said selected water level, and excess water conduit means interconnecting the overflow compartments of said distribution boxes with the water collecting compartments of other of said distribution boxes in a predetermined order.

4,180,349
PILE FORGING
Bernard H. van Bilderbeek, Ventura, Calif., assignor to Vetco, Inc., Ventura, Calif.
Filed Jan. 30, 1978, Ser. No. 873,357
Int. Cl.[2] E02D *5/54*
U.S. Cl. 405—224 **1 Claim**



1. The method of anchoring a frame structure on the floor of a body of water comprising: disposing a pile in a pile housing in the frame structure with the pile extending from the housing and into the earth below the floor, said housing having a circumferential recess therein; lowering from the surface of the water a rotatable pipe string having a fluid pressure expansible forge tool at the lower end of the pipe string; positioning said forge tool on said pipe string in said pile and with respect to said recess; centering said forge tool in said pile on a swivel seated on said pile, applying fluid pressure through said pipe string to expand said forge tool while rotating said pipe string and said forge tool in said swivel and deforming said pile into said recess; contracting said forge tool and removing said forge tool and said swivel on said pipe string from said pile.

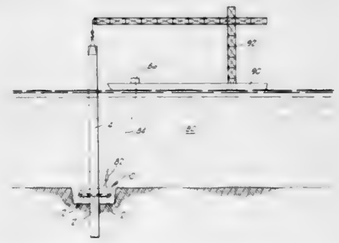
4,180,350
METHOD FOR FORMING FOUNDATION PIERS
James P. Watts, Scottsdale, Ariz., assignor to Early California Industries, Inc., Los Angeles, Calif.
Filed Mar. 30, 1978, Ser. No. 891,633
Int. Cl.[2] E02D *5/30*
U.S. Cl. 405—233 **4 Claims**



1. In the method of forming foundation piers including drilling holes in the earth,
providing lateral support for the side walls of said holes using a slurry of earth support material above said drill as drilling progresses, and
injecting a plastic concrete mixture into said holes to displace said slurry upwardly, thereby filling the holes with said concrete mixture which hardens to form said foundation piers,
the improvement comprising the step of:
(a) mixing said slurry under high shear mixing conditions whereby uniformly consistent slurries of preselected variable densities are provided to lend lateral support to the sides of said holes, and
(b) varying the density of the slurry injected into said hole as drilling progresses.

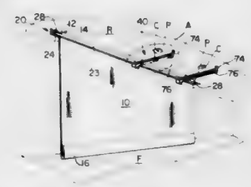
4,180,351
METHODS AND APPARATUS FOR SEVERING REINFORCED CONCRETE PILINGS
Larry M. Orrill, Arlington, and John A. Regalbuto, Fort Worth, both of Tex., assignors to Jet Research Center, Inc., Arlington, Tex.
Filed May 25, 1978, Ser. No. 909,584
Int. Cl.[2] E02B *1/00*
U.S. Cl. 405—303 **12 Claims**

1. A method of severing a concrete piling containing two or more longitudinally extending reinforcing rods comprising the steps of:
positioning at least two projectile guns around said piling in a plane transverse to said reinforcing rods at a point thereon where it is desired to sever said piling, each of said projectile guns being positioned in alignment with one of said reinforcing rods,
clamping said projectile guns together and to said piling,
said projectile guns including an elongated barrel, a projectile positioned within said barrel of a size and shape capable of penetrating said piling and severing said reinforcing rods upon striking said piling and explosive means attached to said barrel for propelling said projectile through said barrel and into contact with said piling; and



simultaneously detonating said explosive means whereby said projectile is caused to penetrate said piling and sever said reinforcing rods.

4,180,352
EXTENSIBLE BRATTICE AND CANTILEVERED ROOF MOUNTED SUPPORT SYSTEM THEREFOR
Edward F. Divers, Pittsburgh, Pa.; D. Randolph Berry, Sudbury, and David A. Monaghan, Newtonville, both of Mass., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.
Filed Nov. 7, 1978, Ser. No. 958,578
Int. Cl.[2] E21F *1/00, 3/00*
U.S. Cl. 405—303 **10 Claims**



1. A cantilevered support system for an extensible mine ventilation brattice which is adapted to cooperate with roof bolts in the mine, the system comprising:
support means to which the brattice is mounted, and which defines a track; and
mounting means for suspending said support means from at least one of the roof bolts, said mounting means comprising:
coupling means connected to said support means in sliding engagement with said track so as to allow displacement of said support means, and hence extension of the brattice, relative to said mounting means;
an elongate member connected to said coupling means;
an upstanding leg member connected to said elongate member at a location longitudinally spaced from said coupling means, and such that the distal end of said leg member abuts the mine roof when said elongate member is in the operative position thereof; and
connecting means for connecting said elongate member in depending relation to the at least one of the roof bolts at a position on said elongate member intermediate said coupling means and said leg member.

4,180,353

PISTON PUMP FOR USE IN GASIFYING FINE GRAINED AND DUST-LIKE SOLID FUELS

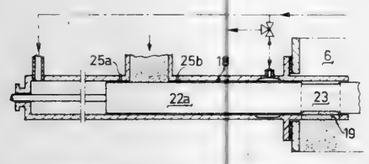
Ulrich Geldies, Waltrop, Fed. Rep. of Germany, assignor to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Feb. 17, 1978, Ser. No. 878,747

Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722931

Int. Cl.[2] **B65G** *65/58*

U.S. Cl. 406—74 **6 Claims**



1. A solids pump for use in pumping fine grained and dust-like fuel by way of a pressurized lock basin into a gasifier operating at an elevated pressure,

the said pump comprising

an outer cylinder;

a piston movable in said cylinder and terminating rearwardly short of the end of said cylinder;

an inlet opening for said fuel in the top of said cylinder;

a hollow space in said piston for receiving said fuel, the said hollow space being open at the top and bottom;

a port in said top wall of the cylinder for a gaseous medium under pressure;

an outlet passage for said fuel in the bottom of said cylinder;

valve means for controlling the flow of said pressure gas through said port;

means for moving said piston in said cylinder so as to bring said hollow space, in a first position, into alignment with said fuel inlet opening to receive said fuel, then, in a second position, to bring the piston into alignment with said pressure gas port so as to cause the pressure gas to respectively enter and exit the fuel filled hollow space and, in a third position, to bring the piston in alignment with said fuel outlet passage so as to discharge the fuel into the lock basin; and

additional valve means for passing pressure gas through said port into the space behind the piston to at least assist the movement of the piston.

4,180,354

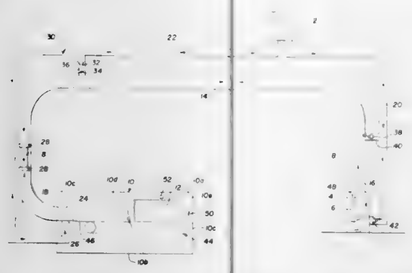
PNEUMATIC TRANSMISSION SYSTEM

Harold R. Greene, 2617 Tarna, Dallas, Tex. 75229

Filed Dec. 15, 1977, Ser. No. 860,744

Int. Cl.[2] **B65G** *51/34*

U.S. Cl. 406—112 **5 Claims**



1. A free delivery transmission system to move a carrier comprising: a closed terminal adapted to receive a carrier; a reversible blower adapted to supply pressurized air to an outlet and draw a partial vacuum at an inlet; a transmission line having a first end connected to the closed terminal and a second open end spaced from said closed terminal; a first air line extending between the outlet of the blower and the closed terminal; a second air line extending between inlet of the blower and the transmission line adjacent the open end of the transmission line; adjustable valve means positioned in said second air line to adjust the flow of air between the transmission line and the second air line; a conduit extending between a position spaced from the open end of the transmission line and the second air line; and a check valve in said conduit means adapted to release pressurized air from the transmission line to the second air line as the carrier nears the end of the transmission line such that the rate of deceleration of the carrier is controlled by the flow of air through the second air line.

4,180,355

DETACHABLE BLADE FOR CUTTING TOOL

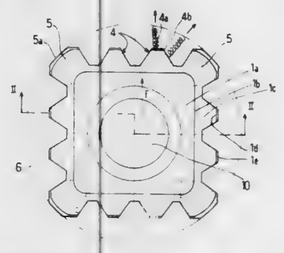
Antoine Nanini, Vougy-Bonneville, France, assignor to Societe Igman, Bonneville, France

Filed May 22, 1978, Ser. No. 908,290

Claims priority, application France, Jun. 2, 1977, 77 16859

Int. Cl.[2] **B26D** *1/00*

U.S. Cl. 407—113 **3 Claims**



1. A detachable blade for cutting tool, said blade having the form of a straight prism of small height, of square cross section and with side faces having trapezoidal teeth, wherein each of the front faces of the blade presents a hollow portion in the form of a frustum of a pyramid with a square base, the large base of which is substantially connected to the edges of the front face.

4,180,356

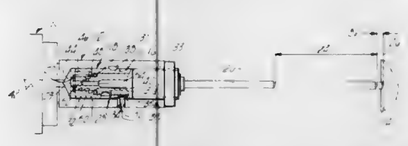
BROKEN TOOL DETECTOR

Norman J. Hoch, 13760 LaBelle, Oak Park, Mich. 48237

Filed Aug. 3, 1978, Ser. No. 930,699

Int. Cl.[3] **B23B** *39/04, 39/00*

U.S. Cl. 408—8 **14 Claims**



1. A detecting apparatus for a machine tool comprising; a head member, a spindle assembly supported by said head member, means for rotating said spindle assembly and moving it axially from an initial position through a full cycle including an approach phase in which said spindle assembly and a workpiece are moved relative to each other and a feed phase during which work is done on said workpiece, a tool supported by said spindle for rotation therewith and limited axial movement relative thereto, means biasing said tool and spindle to an axially extended position and resisting relative axial movement

with a predetermined force when said tool engages an obstacle, means associated with said spindle and being responsive to relative axial movement of said spindle and said tool to generate a signal, a timer activated for a predetermined period of time in a selected one of said phases, said timer being responsive to the presence of said generated signal in said feed phase to continue said cycle and being responsive to said generated signal in said approach phase to discontinue said cycle.

4,180,357

APPARATUS AND METHOD FOR PERFORATING TUBING AND METHOD OF PRODUCING PART OF SUCH APPARATUS

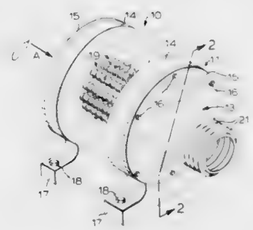
Gerd P. H. Lupke, 46 Stornoway Crescent, and Manfred A. A. Lupke, 35 Ironshield Crescent, both of Thornhill, Ontario, Canada

Filed Feb. 27, 1978, Ser. No. 881,417

Claims priority, application Canada, Mar. 18, 1977, 274316

Int. Cl.[2] **B23C** *3/00;* **B26D** *3/06*

U.S. Cl. 409—131 **26 Claims**



1. Apparatus for perforating tubing, the apparatus comprising:

drive means for advancing the tubing along an axial path thereof,

at least one pair of cutters mounted for rotation about respective fixed axes spaced from and substantially parallel to said axial path of the tubing,

the cutters of each pair being mounted for rotation through complete revolutions about said fixed axes along fixed circular paths which intersect the tubing for intermittent intersection of the tubing by the cutters at discrete points on the tubing, and

means for rotating the cutters of each pair in synchronism in opposite directions for substantially simultaneous intersection with the tubing,

whereby the cutters support the tubing to restrain it against rotation during operative intersection of the tubing by the cutters.

4,180,358

PIPE BEVELING ATTACHMENT FOR A POWER TOOL

Charles E. Uribe, Rte. 1, Box 11-B, Milton-Freewater, Oreg. 97862

Continuation-in-part of Ser. No. 848,991, Nov. 7, 1977, abandoned, and a continuation-in-part of Ser. No. 769,921, Feb. 18, 1977, abandoned. This application Jan. 30, 1978, Ser. No. 873,501

Int. Cl.[2] **B23C** *1/20*

U.S. Cl. 409—179 **9 Claims**

5. A pipe beveling attachment for a power tool having a rotary cutter, comprising:

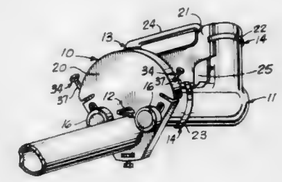
a base member;

support means on the base member for mounting a power tool thereto with the rotary cutter facing the base member;

an opening formed through the base member for receiving the rotary cutter of the power tool;

a freely rotatable core engaging roller;

core roller adjusting means on the base member mounting the core engaging roller to the base plate for selective movement of the core engaging roller in relation to the opening;



outside roller means to each side of said core engaging roller for engaging and rolling over the outside surface of a pipe end whose inner surface is engaged by the core engaging roller to thereby guide the cutting tool in an arcuate path relative to the axis of the pipe end;

said support means being movably adjustable relative to said outer roller means.

4,180,359

MACHINE TOOL FOR MACHINING OF SHAFTS, ESPECIALLY CRANKSHAFTS

Karlheinz Schmid, Neckartenzlingen, Fed. Rep. of Germany, assignor to Gebrueder Heller Maschinenfabrik GmbH, Nuertingen, Fed. Rep. of Germany

Filed Dec. 19, 1977, Ser. No. 861,542

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658970

Int. Cl.[2] **B23C** *3/08*

U.S. Cl. 409—197 **4 Claims**



1. A machine tool for milling crankshaft (**17**) having a longitudinal axis (**24**), comprising a machine bed (**10**), crankshaft clamping means (**12, 12'**) including chuck means (**11, 11'**) operatively supported on said machine bed (**10**), two milling units (**13, 13'**) also operatively supported on said machine bed for displacement along the machine bed in parallel to said longitudinal axis (**24**) of said crankshaft, each milling unit (**13, 13'**) comprising respective tool drum means (**25**) arranged substantially coaxially relative to said longitudinal crankshaft axis (**24**), said machine tool further comprising crankshaft supporting means (**16, 16'**) each carried by the respective milling unit (**13, 13'**), at least one of said crankshaft supporting means (**16**) being movably carried by the respective milling unit (**13**), and drive means (**34, 35**) operatively connected to said one crankshaft supporting means (**16**) for moving the respective crankshaft supporting means back and forth in parallel to said longitudinal crankshaft axis (**24**) independently of any movement of the respective milling unit between a working position and a rest position so that said crankshaft supporting means may support the crankshaft in the working position directly adjacent to the respective one of said tool drum means and so that said crank-

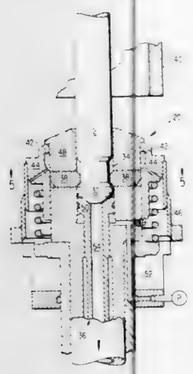
shaft supporting means may take up said rest position around the respective tool drum means, whereby pairs of crankshaft bearing surfaces having a common axis may be machined simultaneously even if said bearing surfaces are located adjacent to each other.

4,180,360

BROACH PULLING MECHANISM

James W. Dopp, Rochester, Mich., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Apr. 26, 1978, Ser. No. 900,442
Int. Cl.[2] B23B *41/04*
U.S. Cl. 409—287 **6 Claims**



1. A puller mechanism for pulling a broach through a workpiece comprising:

a support for mounting a workpiece thereon;

a broach having a circumferential groove near the end thereof mounted with respect to said support to be movable through the workpiece; and

broach pulling means movably mounted with respect to said support including a series of movable puller jaws and further including piston means located in said broach pulling means and axially spaced from said puller jaws to support said broach in a position which aligns the circumferential groove of said broach with respect to the puller jaws when said broach is initially inserted into said broach pulling means and means for actuating said piston means axially toward said jaws to clamp the end of said broach between said puller jaws and said piston means whenever said jaws are moved into said circumferential groove of the broach to allow the broach to be pulled through the workpiece without any drop of the broach with respect to the broach pulling means during any part of the movement of the broach through the workpiece.

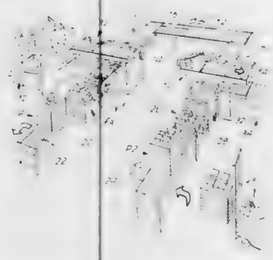
4,180,361

PLANT FOR HANDLING CEMENT TILES AND SIMILAR ARTICLES THAT REQUIRE A SEASONING AND SUBSEQUENT WORKINGS

Enrico Longinotti, Via Timoteo Bertelli 2, Firenze, Italy

Filed Mar. 31, 1978, Ser. No. 892,134
Claims priority, application Italy, Apr. 15, 1977, 9413 A/77
Int. Cl.[2] B65G *60/00*
U.S. Cl. 414—32 **7 Claims**

1. An apparatus for handling articles of manufacture such as tiles and the like for transporting said articles sequentially through a plurality of operating stations comprising: a first conveying means, a charging station disposed adjacent said first conveying means, a plurality of trays adapted to be disposed on said first conveying means whereby said first conveyor means advances said trays seriation toward said charging station, said charging station including means for stacking said articles onto the trays in said charging station, a tray piling station disposed downstreamwise of said charging station, said tray piling station having means for stacking a plurality of trays containing said stacked articles one upon the other as the respective trays pass through said charging station, a second conveyor means adapted having an end portion adapted to receive a plurality of stacked trays containing subsequently processed articles, a tray unpiling station associated with said



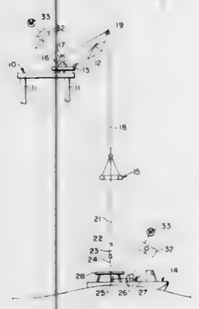
second conveyor means, an article pick up station disposed downstreamwise from said unpiling station whereby the processed articles are removed from said unpiled trays, said tray unpiling station including means for sequentially removing said trays from said stacked trays whereby said unstacked trays are sequentially advanced toward said pick-up station to effect the removal of the articles from said trays, and said emptied trays being recycled to said first conveyor means on an interconnecting conveyor for advancement toward said charging station.

4,180,362

SYSTEM TO TRANSFER CARGO OR PASSENGERS BETWEEN PLATFORMS WHILE UNDERGOING RELATIVE MOTION

Leslie D. Stair, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 5, 1978, Ser. No. 903,372
Int. Cl.[2] B65G *67/58*
U.S. Cl. 414—139 **12 Claims**



1. Apparatus to control the rate of closure or separation and the landing site for cargo or personnel during transfer between first and second platforms while subject to vertical or lateral motion, one with respect to the other, said apparatus including the combination of:

a constant tension winch on said first platform, said constant tension winch including means to establish a first constant tension level in the winch cable extending from said first platform,

a variable constant tension winch on said second platform, said variable constant tension winch including means to establish second and third constant tension levels in the winch cable extending from said second platform, said second constant tension level being essentially less than said first constant tension level and said third constant tension level being essentially greater than said first constant tension level,

engagement means to connect together the cables of said constant tension winch and said variable constant tension winch,

carrier means coupled for movement by said cables while connected together by said engagement means, and

control means operative to select one of said second and third constant tension levels for establishing the direction of movement of said carrier means between said first platform and said second platform by the relative tension differential between said first constant tension level and the selected second or third constant tension level.

4,180,363

ATTACHMENT DEVICE FOR A FORK LIFT

Douglass W. Steiger, and Clifton E. Johnson, both of R.R. 2, Red Lake Falls, Minn. 56750

Filed Mar. 30, 1978, Ser. No. 891,495
Int. Cl.[2] B60P *1/64*
U.S. Cl. 414—347 **8 Claims**



1. An attachment device for a fork lift and a support structure, such as a truck bed, having an elevated flat upper surface and having a rear edge, the fork lift including a body having ground engaging wheels, a fixed frame on the front of the body, a vertically shiftable lift frame on the fixed frame movable between raised and lowered portions,

an elongated track on the elevated support surface,

a carriage engaging said track and being movable therealong,

a carriage-engaging member mounted on the lift frame and being vertically movable therewith, said carriage-engaging member being engageable with the carriage when the lift frame and carriage-engaging member are shifted vertically downwardly from a raised portion, whereby the fork lift upon further downward shifting movement of the lift frame the fork lift will be elevated and supported by the carriage so that the ground engaging wheels will be positioned at the same level as the elevated upper surface, and means on said carriage-engaging member engaging the upper support surface and impelling the fork lift along said upper support surface until the ground engaging wheels are supported on the support surface.

4,180,364

PONTOON LAUNCHING

James P. Fitzgerald-Smith, Ossemsley nr. New Milton, and Derek I. Knight, Bournemouth, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 22, 1978, Ser. No. 879,989
Claims priority, application United Kingdom, Feb. 23, 1977, 07734/77
Int. Cl.[2] B60P *1/04*
U.S. Cl. 414—350 **12 Claims**



1. A launch vehicle for nestable slideable pontoons, the vehicle comprising:

(a) a platform to support two or more pontoons when stacked, by nesting each pontoon within another, in a substantially vertical stack,

(b) anchoring means to separately anchor each of the pontoons to the platform,

(c) tilting means to tilt the platform, and

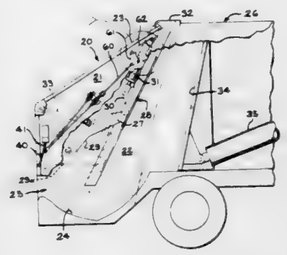
(d) releasing means, co-operable with said anchoring means, to release separately each pontoon in a sequence from the uppermost to the lowermost of the pontoons, whereby, in use, the released pontoons slide downwardly of the tilted platform to clear the vehicle.

4,180,365

HYDRAULIC SYSTEM FOR A REFUSE TRUCK

William A. Herpich, and George W. Palmer, both of Galion, Ohio, assignors to Peabody International Corporation, Galion, Ohio

Filed May 3, 1978, Ser. No. 902,338
Int. Cl.[2] B65F *3/20*
U.S. Cl. 414—525 **10 Claims**



1. A refuse compacting apparatus comprising, in combination,

(a) a compaction chamber defined by at least a floor, two side walls and a barrier extending across between said side walls which defines an end of said chamber,

(b) a refuse accumulating zone communicating with the other end of said chamber,

(c) a packer blade,

(d) means mounting said packer blade for movement through a closed path from a refuse confining position closing the other end of said chamber for confining refuse in said chamber, to a remote position beyond said zone, and through said zone toward such confining position for

moving refuse into said chamber and compacting the same against said barrier,

(e) an hydraulic system comprising

(1) a pump for supplying fluid to said system at a predetermined maximum system pressure,

(2) a hydraulic, double acting cylinder and piston for moving said packer blade,

(3) a supply line to the power side of said cylinder including a valve that is manually movable from neutral to a power position for directing fluid to said cylinder, and

(4) means responsive to pressure in said supply line less than maximum system pressure for causing said valve to shift to neutral,

(f) manually activated control means for holding said valve in power setting, and

(g) position responsive means responsive to the position of said packer blade for de-activating said control means when said packer blade reaches a refuse confining position.

4,180,366

LIFT ASSEMBLY FOR TRANSIT VEHICLES

Carl W. Roth, Barrington, Ill.; Hugh F. Groth, Brecksville, Ohio, and G. B. Kirby Meacham, Cohasset, Mass., assignors to Vapor Corporation, Chicago, Ill.

Filed Dec. 7, 1977, Ser. No. 857,745
Int. Cl.² B60P *1/44*
U.S. Cl. 414—540 **13 Claims**



1. In a vehicle, a lift assembly for lifting wheelchairs and the like from ground level to a floor level of the vehicle comprising:

a main frame secured to a doorway of said vehicle that defines an envelope in which said lift assembly is positioned;

means defining at least first and second steps including pivot means for pivotally connecting said first and second steps;

at least one side linkage member pivotally secured to said first and second steps;

at least one side frame member to which said linkage member is pivotally connected and supported thereby;

at least one scissors linkage member pivotally and slideably connected to said main frame and to said side frame member;

means for pivoting said step means relative to said side frame member to form a platform extending from said vehicle; and

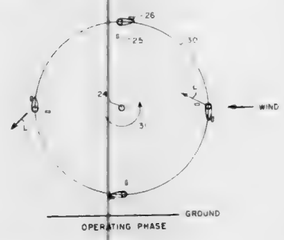
means for pivoting said scissors linkage to and through the center of said scissors linkage to reverse the position of said scissors linkage and move said side frame member and said platform from said floor level to said ground level.

4,180,367

SELF-STARTING WINDMILL ENERGY CONVERSION SYSTEM

Herman M. Drees, Box 7, Marstons Mills, Mass. 02648

Filed Feb. 10, 1975, Ser. No. 548,435
Int. Cl.² F03D *3/06*
U.S. Cl. 416—119 **15 Claims**



1. A wind turbine apparatus comprising

movable means for producing rotary motion;

a plurality of air-foil shaped wind responsive elements pivotally mounted on said movable means for exposure to the wind, each said responsive element having a wind responsive surface at least a portion of which is substantially parallel to said rotary motion;

means for maintaining said wind responsive elements at pivotal positions such as to provide a drag force in one direction on a wind responsive surface of at least one of said elements in response to said wind when the speed of said rotary motion is below a predetermined level and to prevent the imposition of a drag force in a different direction on the others of said elements, the drag force in said one direction thereby providing a driving force for said movable means to produce said rotary motion below said predetermined level; and

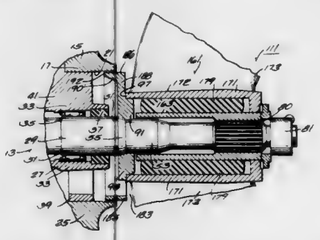
means for maintaining said wind responsive elements at pivotal positions such as to provide a substantial lift force in said one direction on a wind responsive surface of at least one of said elements in response to said wind when the speed of said rotary motion is above said predetermined level, the lift force in said one direction thereby providing a driving force for said movable means to produce said rotary motion above said predetermined level.

4,180,368

MARINE PROPELLER FISH LINE AND WEED CUTTER

Donald A. Henrich, Lake Villa, and Edgar Rose, Glencoe, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 16, 1978, Ser. No. 878,323
Int. Cl.² B63H *1/26*
U.S. Cl. 416—146 R **18 Claims**



1. A marine propulsion device comprising a lower unit

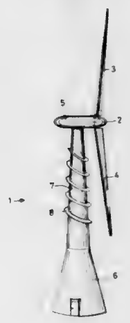
including a gear case including a hollow interior having at the rearward end thereof an inwardly extending inner circular surface defining an opening through which exhaust gases and engine cooling water are discharged from said lower unit, a propeller shaft rotatably journalled in said gear case and including a portion extending rearwardly of said gear case, a propeller including an inner part mounted on said propeller shaft rearward portion for common rotation of said inner part with said propeller shaft, an outer part having an outer circular surface with a diameter materially less than the diameter of said inner circular surface of said gear case, a blade extending radially outwardly from said outer part, and resilient means connecting said inner and outer parts, and a thrust washer carried by said propeller shaft in forward thrust transmitting engagement therewith and in forward thrust receiving engagement with said outer part, and means on said thrust washer extending into the area between said inner circular surface of said gear case and said outer circular surface of said outer part of said propeller and including an annular sleeve extending adjacent to said inner circular surface of said gear case and rearwardly from said gear case toward said propeller.

4,180,369

WIND MILLS

Gert O. Ottosen, Frederikssundsvej 25, 3. to, 2400 Copenhagen NV, Denmark

Filed Feb. 2, 1978, Ser. No. 874,619
Claims priority, application Denmark, Feb. 4, 1977, 477/77
Int. Cl.² F03D *1/04*
U.S. Cl. 415—2 **11 Claims**



1. A wind mill, comprising

(a) a vertical rigid tower (6,7);

(b) a wind turbine (5) connected with the upper end of said tower for rotation about a vertical axis;

(c) a propeller (2) connected with the wind turbine for rotation about a horizontal axis, said propeller having at least two blades; and

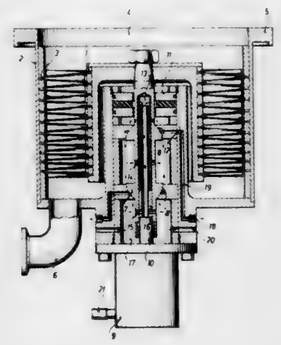
(d) strip means (8) generally rectangular cross-sectional configuration extending generally helically about at least the upper portion of said tower, the longitudinal edges of said strip means being adjacent and remote from said tower, respectively, thereby to reduce the effects of the wind on the tower and on the propeller blades.

4,180,370

TURBOMOLECULAR PUMP

Karl-Heinz Klatt, Jülich, and Eckard Kussel, Duren, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 669,264, Mar. 22, 1976, abandoned. Filed Dec. 19, 1977, Ser. No. 861,546
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1975, 2512828
Int. Cl.² F01D *1/36*
U.S. Cl. 415—90 **4 Claims**



1. A high speed turbomolecular pump pneumatically driven and pneumatically journalled having a housing and a vacuum chamber, which includes in combination: a turbine stator stationarily arranged in said housing, a turbine rotor likewise arranged within said housing for cooperation with said turbine stator, a rotor shaft operable at rotary speeds within a range of approximately 10,000 rpm having said turbine rotor connected thereto for rotating said turbine rotor relative to said turbine stator, a pressure gas turbine having an output shaft drivingly connected to said rotor shaft for rotating the latter, said rotor shaft having one end portion located remote from its driving connection with said pressure gas turbine and in the vicinity of said vacuum chamber, pneumatic bearing means arranged in said pump housing and rotatably journalling said rotor shaft, duct insert means arranged vacuum tight in said pump housing and sealingly surrounding said end portion of said rotor shaft relative to said vacuum chamber and relative to said pneumatic bearing means, said duct insert means having filled thereagainst a magnetic sealing liquid with low vapor pressure, magnetic means associated with said magnetic sealing liquid for retaining the latter in its sealing position both during operation of the turbomolecular pump and also during standstill precluding entry of air into the vacuum chamber when the pump is off, and means establishing communication between said pneumatic bearing means and an area within the region of said duct insert means for cooling said duct insert means by the gaseous medium from said pneumatic bearing means.

4,180,371

COMPOSITE METAL-CERAMIC TURBINE NOZZLE

Theodore Ivanko, Fairfield, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Mar. 22, 1978, Ser. No. 888,922
Int. Cl.² F01D *5/18, 5/28*
U.S. Cl. 415—115 **5 Claims**

1. A turbine nozzle comprising:

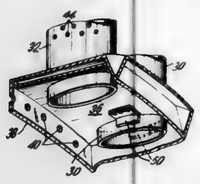
an outer casing, said outer casing being of a predetermined metal composition with means to affix its location;

an inner case of similar metal, said inner casing having a passageway therethrough and also having means to affix its location;

a first array of vanes, also of similar metal as said outer and

inner casing, said metallic vanes connecting said inner and outer casing and supporting said inner casing to said outer casing, each metallic vane having a hollowed interior open to the passage of the inner casing and adapted to be air cooled;

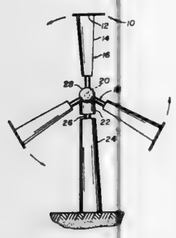
a second array of vanes made of a solid, ceramic material, said second array of ceramic vanes alternating with the



first array of metallic vanes, each of said ceramic vanes extending between said outer casing and said inner casing; and

spring clips affixed to the outer and inner casing for frictionally locating the ceramic vanes such that the ceramic vanes do not absorb radial excursions of the outer casing and the inner casing during flow of high temperature fluid.

4,180,372
WIND ROTOR AUTOMATIC AIR BRAKE
Joseph Lippert, Jr., Locust Valley, N.Y., assignor to Grumman Corporation, Bethpage, N.Y.
Filed Mar. 2, 1977, Ser. No. 773,538
Int. Cl.² F03D *7/04*
U.S. Cl. 416—23 **13 Claims**



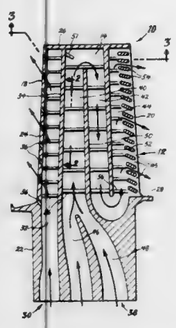
1. In a wind-driven motor having a rotor supported for rotation about an axis, an aerodynamic brake mounted on the tip of each blade of said rotor, each of said brakes comprising:

a brake plate pivotally attached to the tip of said blade for relative pivotal deployment therewith;

means responsive to centrifugal forces resulting from overspeed conditions of said rotor for pivotally deploying said plate between a stowed position in which the planform surfaces thereof are substantially parallel to the circumference generated by said blade tip to various deployed positions which extend greater surface areas of said plate into the relative airstream to create levels of drag proportional to said centrifugal forces whereby the rotational speed of said rotor is affected thereby such that the rotor overspeed condition is remedied, said means responsive to centrifugal forces comprising a brake plate weight distribution in which the greater mass is forward of the pivot hinge line of said plate and in the direction of rotation of said rotor blade; and

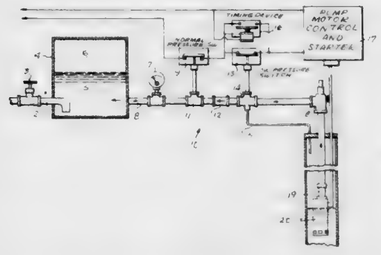
means for restoring said plate from said deployed positions to said stowed position in response to reductions in said centrifugal forces.

4,180,373
TURBINE BLADE
William A. Moore, Durham, Conn., and Hans R. Przirembel, Jupiter, Fla., assignors to United Technologies Corporation, Hartford, Conn.
Filed Dec. 28, 1977, Ser. No. 865,171
Int. Cl.² F01D *5/18*
U.S. Cl. 416—97 R **4 Claims**



1. A turbine blade having a hollow elongated body including a root portion at one end and a blade portion extending from said root portion and terminating at a closed tip at the other end of said body, said body including opposing side walls and longitudinally extending leading and trailing edges and having a plurality of generally longitudinally extending wall ribs therein extending between said side walls and partially defining two distinct fluid passageway systems within said body, said passageway systems including a first passageway system having a substantially straight longitudinally extending blind first fluid passage opening through said one end and extending through said root portion into said blade portion and along said leading edge and terminating within said blade portion generally adjacent said tip, said first passageway system having a plurality of transversely spaced rows of longitudinally spaced first outlet passages extending through said leading edge of said blade portion and communicating with said first fluid passage, each of said first outlet passages being inclined to the longitudinal axis of said turbine blade and extending outwardly through said leading edge and in a direction away from said one end, said second fluid passageway system having a three-pass fluid passage including a plurality of generally longitudinally extending and series connected passage sections defining a reversing flow path through the remainder of said body portion, said passage sections including a first passage section in said blade portion and two branch passages in said root portion opening through said one end and merging with each other and with said first passage section at the junction of said root and blade portions, said first passage section and said two brach passages being separated from said first fluid passage by a first one of said wall ribs extending from said one end to said tip and partially defining said first fluid passage, a second passage section adjacent said first section and connected thereto at an outer turning region at said tip end, said second passage section being separated from said first passage section and from said two branch passages by a second one of said wall ribs connected to said root portion at the junction between said root and blade portions and extending toward said tip end in generally parallel relation to said first wall rib and terminating in spaced relation to said closed tip at said outer turning region, and a third passage section connected to said second passage section at an inner turning region proximate the junction of said root and said blade portions and extending within the region of said trailing edge and generally adjacent said second passage section, said third passage section being separated from said second passage section by a third one of said wall ribs extending from said closed tip toward said one end in generally parallel relation to said second wall rib and terminating in spaced relation to said root portion at said inner turning region, said third passage section terminating within said blade portion and adjacent said closed tip, said second fluid passageway system including a longitudinally spaced series of elongated pedestal members disposed between said side walls adjacent said trailing edge and defining a longitudinally spaced series of pedestal slots communicating with said third passage section and opening through said trailing edge, said pedestal slots being inclined to the longitudinal axis of said turbine blade and extending outwardly through said trailing edge and in a direction away from said other end, said side walls having longitudinally spaced and transversely extending trip strips formed thereon, said trip strips projecting from said side walls and into said passageways.

4,180,374
WELL PUMP PROTECTION SYSTEM
Elliott R. Bristow, P.O. Box 292, Grass Valley, Calif. 95945
Filed Mar. 7, 1978, Ser. No. 884,244
Int. Cl.² F04B *49/02, 49/06*
U.S. Cl. 417—12 **5 Claims**



1. A well pump protection system comprising a water outlet, a valve within said outlet, a storage tank having water and air connecting serially to said outlet, a pressure gauge connected to said pressure tank remote from said water outlet, and serially upstream, a normal pressure switch having means for allowing water to pass downstream, a low pressure switch provided with means to stop water flow downstream, a timing device connected in parallel to said low pressure switch to act as a time lag sequencing device, a bleeder line disposed proximate to said low pressure switch valve connecting said conduit to a well, a check valve disposed between the normal pressure switch and the low pressure switch permitting fluid flow solely in a downstream direction, a pressure pop off valve located upstream from said low pressure switch, a check valve located upstream from said pressure pop off valve allowing water to only flow downstream, and a submersible motor pump disposed in the well, and a pump motor control and starter connected in series to said low pressure switch and said timing device to activate said motor and pump.

4,180,375
LIQUID CHROMATOGRAPHY PUMP
Haakon T. Magnussen, Jr., Pinole, Calif., assignor to Altex Scientific, Inc., Berkeley, Calif.
Continuation-in-part of Ser. No. 761,433, Jan. 21, 1977, Pat. No. 4,131,393. This application Jun. 7, 1978, Ser. No. 913,359
Int. Cl.² F04B *49/00*
U.S. Cl. 417—22 **4 Claims**

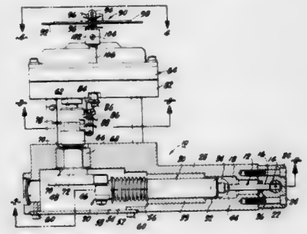
1. A liquid chromatography pump comprising:

a. piston, at least a portion of which is reciprocative within a chamber having a fluid inlet and a fluid outlet, said piston having a first end portion and a second end portion, said first end portion contacting the fluid, said piston being capable of filling and emptying said chamber;

b. motive means for reciprocating said piston within said chamber at a selected substantially constant speed, said substantially constant speed determined by constant speed setting means for fixing said motive means at a substantially constant speed, said motive means contacting said second end portion of said piston;

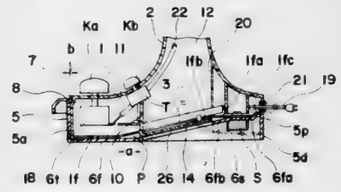
c. valve means for permitting the filling and emptying of said chamber coordinated with the pressure exerted by said piston within said chamber, said piston, motive means, and valve means cooperating to produce a fluid flow during a particular time period, from said piston chamber relative to said selected substantially constant speed;

d. control means for changing the speed of said motive means at a preselected portion of the time period of said reciprocation of said piston within said chamber, said control means including means for changing the speed of



said motive means at the termination of the chamber emptying stroke of said piston, and returning said motive means to said predetermined constant speed after a certain distance of travel of said piston during its subsequent emptying stroke, said motive means speed changing means including pressure measuring means for measuring and signaling the pressure at said piston chamber; and detection means for detecting and signaling the termination of said chamber emptying stroke of said piston, said motive means speed changing means activated upon receipt of said chamber emptying stroke termination signal from said detection means, said motive means returning to said substantially constant speed upon receipt of said pressure signal from said pressure measuring means.

4,180,376
ELECTRIC FAN
Hiroshi Iwaki, and Masaaki Nakamura, both of Kasai, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Dec. 29, 1977, Ser. No. 865,687
Claims priority, application Japan, Feb. 23, 1977, 52/22837[U]; Apr. 5, 1977, 52/43379
Int. Cl.² F04B *35/00;* **F16M** *7/00, 9/00*
U.S. Cl. 417—360 **7 Claims**



1. An electric fan comprising a casing of rectangular cubic configuration for accomodating therein electrical components, said casing being integrally formed with a supporting arm extending upwardly therefrom for supporting a motor and blade assembly, and a base portion having a longitudinal recess formed therein the shape of said longitudinal recess being

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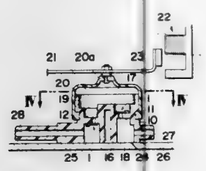
complementary to the shape of said casing and a first engaging portion provided at a forward end of said longitudinal recess for engagement with a corresponding forward end of said casing, said longitudinal recess being formed, in its rear wall at a rear end thereof, with a second engaging portion, and said casing being provided, at its rear lower edge corresponding to said second engaging portion, with a stepped portion which rides over said second engaging portion, at least one of said second engaging portion and said stepped portion being provided with a tapering face, the highest portion of the rear wall of said longitudinal recess being lower than the highest portion of the side walls thereof, wherein when said casing is positioned in said longitudinal recess, said casing is guided by said tapering face and is moved forward into said longitudinal recess for ensuring engagement between said engaging portion at the forward end of said recess and said corresponding forward end of said casing such that substantially all of said casing is positioned within said recess.

4,180,377

VALVE ELEMENT FOR AN AIR PUMP

Tsuyoshi Itakura, Tokyo, Japan, assignor to Itakura Soki Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1977, Ser. No. 833,582
Claims priority, application Japan, Dec. 14, 1976, 51-167612
Int. Cl.[2] F04B 43/04
U.S. Cl. 417—413 **4 Claims**



1. In a valve element for an air pump having a cylindrical casing, a resilient membrane connected to one side of said casing, a cover member connected to the other side of said casing and an electromagnetic device for vibrating said membrane,

said casing having beds for securing the valve element on one surface thereof, holes at said beds for an air-flow and inlet and outlet nozzles, and cylindrical holes in said beds for the fixing of said valve elements,

an improvement of said valve element wherein said valve element has a body portion, a tongue portion and a plurality of cylindrical legs formed integral with said body portion and parallel to each other, said legs being uniform cross-sectional cylinders without a flange-holding groove,

said legs each having a longitudinal hole which starts at one side of the body portion to form an opening of said hole and is closed at the end of said leg, said hole having a depth such that the hole terminates at a level substantially horizontal to the other surface of said beds when said valve element is assembled within said casing, said legs being force-fitted into engagement with the sidewalls of said cylindrical holes.

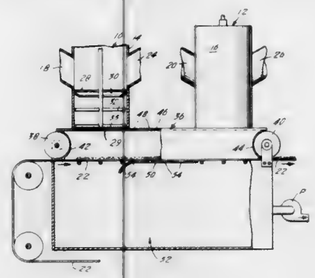
4,180,378

APPARATUS FOR THE DEPOSITION OF DRY FIBERS ON A FORAMINOUS FORMING SURFACE

Dennis L. Mielke, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Jun. 15, 1978, Ser. No. 915,866
Int. Cl.[2] B29B 1/00
U.S. Cl. 425—83.1 **3 Claims**

1. An apparatus for depositing a uniform web of dry fibers on a foraminous wire belt, the combination comprising: at least a pair of fiber distributors having bottom openings disposed in spaced relationship; foraminous screens extending over said openings through which fibers may pass from said distributors; means defining a tunnel extending beneath said openings, in air flow communication therewith, and including a horizontal upper wall portion extending between said distributors; a movable foraminous wire belt disposed within said tunnel for travel therethrough in the direction of spacing of said openings; means for introducing dry fibers to said distributors for discharge through said screens onto said foraminous wire belt as it is moved therepast; means for sealing the ends of said tunnel aginst air leakage while accommodating movement of said belt therethrough; means for producing a partial vacuum below said belt; and means defining perforations in said upper horizontal wall portion of said tunnel for accommodating air flow from outside said tunnel onto the underlying portion of said belt and fibers thereon.

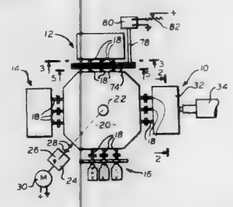


4,180,379

BLOW MOLDING MACHINE WITH ROTATING CORE RODS

Dewey Rainville, Westfield, N.J., assignor to Rainville Company Inc., Middlesex, N.J.

Filed Mar. 15, 1978, Ser. No. 886,798
Int. Cl.[2] B29C 17/07
U.S. Cl. 425—526 **11 Claims**



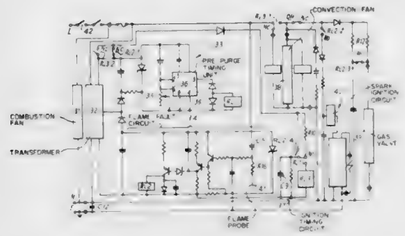
1. Blow molding apparatus including an injection station, a blow station, and a stripping station angularly spaced around a substantially vertical axis, a core rod support that rotates about said axis, core rods carried by the support and extending generally horizontally from the support into molds at the respective stations, and means for moving the core rods intermittently and successively from one station to the next, characterized by a treatment station located between the injection station and the blow station, said treatment station including a housing with a chamber open at both ends and into which a core rod and its parison extend, the chamber being longer than the parison and extending axially of the parison between said open ends, means for controlling the temperature of the parison on the core rod at said treatment station to obtain a parison temperature that is in the orientation range, or just above it, for the particular material of which the parison is made, said means for controlling the temperature including a passage communicating with said chamber intermediate the ends thereof and including also means for blowing heat controlling fluid through the chamber via the passage and open ends, the core rod being rotatable about its axis, and means for rotating the core rod while at the treatment station to reduce sagging of the material of the parison to the underside of the core rod.

4,180,380

ELECTRICAL CONTROLS FOR HEATING APPLIANCES

Ronald W. Davies, Birkenhead, England, assignor to United Gas Industries Limited, London, England

Filed Apr. 1, 1977, Ser. No. 783,810
Claims priority, application United Kingdom, Apr. 13, 1976, 14998/76; Dec. 2, 1976, 50250/76
Int. Cl.[2] F23H 5/00
U.S. Cl. 431—31 **4 Claims**



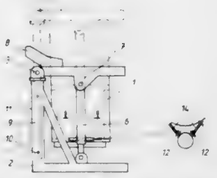
1. A gas or oil-fired appliance having a combustion air fan, and electrically-operated fuel valve, an ignition device and a control circuit comprising a plurality of electrical sub-circuits each adapted to carry out and/or monitor part of a start-up sequence of a timed purge period followed by a timed ignition period followed either by normal operation or by a close-down operation if a flame is not detected, each said sub-circuit having a relay connected to operate switching devices for effecting the appropriate part of the start-up sequence, and one of said sub-circuits having timing means for timing the ignition period and comprising an ignition timer relay and a capacitor connected to discharge through said relay until the capacitor is discharged, the said switching devices for said one sub-circuit being connected to be operated by said ignition timer relay and to maintain the fuel valve open and the ignition device operative during said ignition period, a second one of said sub-circuits having means for detecting the occurrence of a flame and including a flame-detector relay connected to operate the said switching devices for said second sub-circuit, one of which switching devices connects an alternative power supply to maintain said ignition timer relay operated after said ignition period when a flame is detected, and said combustion fan being connected to be energized on start-up independently of any of said relay-operated switching devices of the control circuit.

4,180,381

MEANS FOR TILTING CRUCIBLE FURNACES

Yngve Caisander, Helsingborg, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Feb. 23, 1978, Ser. No. 880,541
Claims priority, application Sweden, Feb. 28, 1977, 7702148
Int. Cl.[2] F27B 14/02
U.S. Cl. 432—157 **4 Claims**



1. A tilting device for tilting a crucible furnace, comprising:

a stand with supporting means for carrying the crucible furnace;

a yoke for mounting said crucible furnace to said stand and being pivotable about a shaft extending transverse to the opening of said crucible furnace;

movable guide tubes supporting said shaft and respectively mounted within upstanding members of said stand;

means for lifting said crucible and yoke;

means for releasably locking said movable guide tubes within said upstanding members whereby operation of said means for lifting causes said crucible and yoke to rotate about said shaft; and

release of said locking means causes said crucible and yoke to be lifted from said stand with operation of said lifting means and movement of said guide tubes within said upstanding members.

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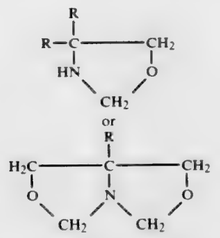
4,180,382

DURABLE PRESS FINISHING WITH OXAZOLIDINE CATALYSTS

Jerry H. Hunsucker, Terre Haute, Ind., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Jul. 1, 1977, Ser. No. 812,079
Int. Cl.² D06M *13/34*
U.S. Cl. 8—185 **18 Claims**

1. In the process of preparing wrinkle resistant textile fabrics containing cellulosic fiber wherein said fabrics are impregnated with an N-methylol durable press resin and cured, the improvement comprising adding to the durable press resin an oxazolidine or mixture of oxazolidines having the general formula



or

wherein R is selected from the group consisting of H, methyl, ethyl, hydroxymethyl and hydroxyethyl.

4,180,383

CHAMBER HOLDER FOR IMMOBILIZED IMMUNOADSORBENT

Lavell R. Johnson, Salt Lake City, Utah, assignor to Becton, Dickinson and Company, E. Rutherford, N.J.

Division of Ser. No. 565,848, Apr. 7, 1975, Pat. No. 4,095,685. This application May 31, 1977, Ser. No. 801,867
Int. Cl.² G01N *33/16*
U.S. Cl. 422—69 **14 Claims**



1. A chamber holder for an immobilized immunoadsorbent wherein said chamber holder is used in a radioimmunoassay procedure for accurate determination of the amount of an antigen and wherein said chamber holder is repeatedly reused in such a procedure for subsequent assays of said antigens by show of a mixture of radioactive labelled and unlabelled antigen through said chamber holder, followed by a stoichiometric release of the portion of said mixture which is bound to said immobilized immunoadsorbent; and release of said chamber holder, comprising:

means forming a supporting structure;

means defining a chamber in said supporting structure;

an immobilized immunoadsorbent positioned within said chamber;

said immunoadsorbent including a substrate stable against dehydration and collapse;

said substrate having associated therewith antibodies for binding a specific antigen; and

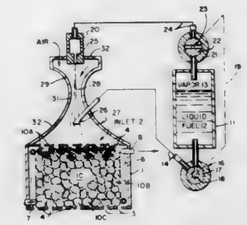
means cooperating with said chamber to support said immobilized immunoadsorbent in said chamber.

4,180,384

CATALYTIC FUEL COMBUSTION APPARATUS AND METHOD

Richard E. Rice, Arlington, Mass., assignor to Comstock & Wescott, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 561,591, Mar. 24, 1975, abandoned. This application Sep. 12, 1977, Ser. No. 832,109
Int. Cl.² C10L *1/00*
U.S. Cl. 44—52 **12 Claims**



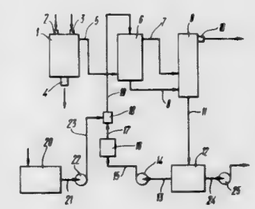
1. A fuel supply for spontaneous catalytic ignition on a platinum family catalyst, characterized by one or more pressure sustaining means containing a lower alcohol fuel plus at least one second fuel selected from the group consisting of alkanes and alkenes having less than 5 atoms or carbon, dimethyl ether and methyl ethyl ether, the supply comprising a gas volume filled predominantly with the second fuel and a liquid volume containing the major portion of the alcohol fuel, whereby the fuels may be selectively discharged from the containing means in liquid phase to initiate spontaneous combustion ignition on a platinum family catalyst or in gaseous phase for sustaining catalytic combustion.

4,180,385

FUEL COMPOSITION AND PROCESS FOR PRODUCING SAME

Vitaly I. Chikul, ulitsa Panferova, 8, kv. 170; Boris I. Tyagunov, ulitsa Panferova, 8, kv. 22, both of Moscow; Yalmar S. Ulanen, ulitsa Kuuze, 3, kv. 3; Olga S. Chikul, ulitsa Uus, 13, kv. 5, both of Estonskaya SSR, Kiviyli; Karl E. Zeger, Michurinsky prospekt, 54, korpus 3, kv. 148, Moscow; Lev Z. Tamarkin, Ulansky pereulok, 24, kv. 9, Moscow; Robert A. Petrosian, ulitsa Planernaya, 16, korpus 3, kv. 67, Moscow; Vadim E. Chmovzh, ulitsa F. Poletaeva, 19, korpus 1, kv. 194, Moscow; Alexandr S. Smirnov, Leninsky prospekt, 73/8, kv. 149, Moscow; Valentina I. Polyakovskaya, Chernomorsky bulvar, 17, korpus 2, kv. 92, Moscow, and Pavel A. Trufanov, ulitsa Piri, 9, kv. 3, Estonskaya SSR, Kiviyli, all of U.S.S.R.

Filed Nov. 30, 1976, Ser. No. 746,006
Int. Cl.² C10L *1/28*
U.S. Cl. 44—62 **8 Claims**



1. a fuel composition comprising a high-boiling petroleum

fuel and an additive consisting essentially of an ash-containing resin containing compounds of elements selected from the group consisting of Si, Ca, Mg, Al, Fe, and Mn, said additive employed in amounts sufficient to reduce the corrosive effect of said fuel upon combustion, and wherein said ash-containing resin is obtained from the thermal processing of a solid fuel.

4,180,386

HEXACOORDINATED TRANSITION METAL COMPOUNDS CONTAINING AT LEAST ONE POLYFLUOROALKYL SUBSTITUENT

William B. McCormack, and Charles A. Sandy, both of Wilmington, Del., assignors to E. I. du pont de Nemours & Company, Wilmington, Del.

Filed May 19, 1978, Ser. No. 907,875
Int. Cl.² C07F *15/00, 15/04, 15/06*
U.S. Cl. 44—63 **30 Claims**

1. A compound having the structure

$$(L_1)—M—(L_3)$$
$$|$$
$$(L_2)$$

wherein

M is a divalent metal selected from the group Mn, Fe, Co and Ni,

L_1 and L_2 are the same or different chelate-forming β-diketone groups having from 5 to 20 carbon atoms, one or both of L_1 and L_2 having at least one polyfluoroalkyl group, $—CF_2X$, adjacent to the carbonyl group,

X is selected from the group H, F, Cl, phenyl, C_1-C_6 alkyl and $C_nF_{2n}Y$,

n is 1 to 6,

Y is H, F, or Cl,

L_3 is a ligand having the structure, A-Z-B,

wherein

A and B are the same or different members of the group $—NH_2$, $—NHR_5$, $—NR_5R_6$, OH, OR_5, SH, SR_5 and PR_5R_6,

R_5 and R_6 are the same or different members of the group C_1 to C_4 alkyl, and

Z is a divalent hydrocarbyl group having 2 to 10 carbon atoms selected from a member of the group alkylene, phenylene and cycloalkylene, each member providing 2 or 3 carbon atoms between A and B, with the proviso that when Z is phenylene, the number of carbon atoms between A and B is 2.

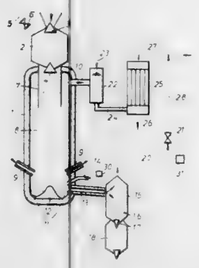
4,180,387

PROCESS FOR REMOVING SLAG DURING PRESSURE GASIFICATION OF SOLID FUELS

Paul Rudolph, Bad Homburg, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 28, 1978, Ser. No. 929,137
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1977, 2738932
Int. Cl.² C10J *3/08*
U.S. Cl. 48—206 **2 Claims**

1. In the pressure gasification of granular solid fossil fuel in a reactor wherein the fuel forms a fixed bed moving from top to bottom of the reactor under gravity, oxygen-containing gases and water vapor are fed as gasifying agents into the fuel bed through nozzles in the lower portion of the reactor, molten slag at a temperature of about 1350° to 1500° C. is discharged through a conduit which is inclined to the horizontal, and product gas is withdrawn from the reactor above the fuel bed, the improvement which comprises by auxiliary burner means positioned below said nozzles feeding oxygen gas separately and independently from said gasifying agents into the reactor adjacent to the inlet of the slag discharge conduit and directed from above onto the molten slag, thereby burning part of the product gas and forming a combustion gas which mixes with additional product gas to form a leakage gas at a temperature of at least about 1500° C. which leakage gas is withdrawn through the slag discharge conduit co-current with the slag into a lock chamber, the temperature of the leakage gas exceeding the temperature of the molten slag throughout the



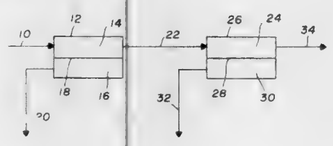
length of the slag discharge conduit and measuring the temperature or the composition of the leakage gas in the slag discharge conduit and using the measurement for controlling the rate at which the leakage gas is withdrawn and for determining the proportion of the combustion gas from the auxiliary burner in the leakage gas.

4,180,388

PROCESSES

Tommy E. Graham, and Donald L. MacLean, both of Raleigh, N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 20, 1978, Ser. No. 888,105
Int. Cl.² B01D *53/22*
U.S. Cl. 55—16 **17 Claims**



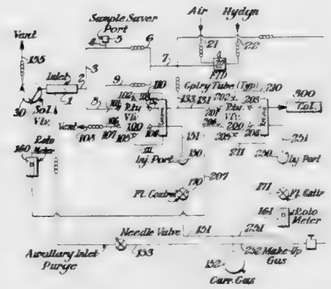
1. A process for separating at least one gas from a gaseous feed mixture containing at least one other gas comprising passing the gaseous feed mixture to at least two permeator stages in series, each permeator stage comprising a separation membrane exhibiting selectivity to the permeability of said at least one gas as compared to the permeability of said at least one other gas in the gaseous feed mixture and having a feed side and a permeate exit side in which the permeate exit side is at a lower total pressure than the total pressure on the feed side, wherein between permeator stages, the non-permeating gas from the feed side of one permeator stage is passed to the feed side of the next permeator stage; and wherein at least one permeator stage has a lower ratio of total pressure on the feed side to total pressure on the permeate exit side than the ratio of total pressure on the feed side to total pressure on the permeate exit side of at least one subsequent permeator stage, and the total pressure on said permeate exit side of said at least one subsequent permeator stage is lower than the total pressure on said permeate exit side of said at least one permeator stage.

4,180,389

ISOLATION AND CONCENTRATION OF SAMPLE PRIOR TO ANALYSIS THEREOF

Donald G. Paul, Landenberg, Pa., assignor to Envirochem Inc., Kemblesville, Pa.

Filed Nov. 13, 1978, Ser. No. 959,638
Int. Cl.² B01D *15/08*
U.S. Cl. 55—28 **19 Claims**



1. A method for increasing the ratio of solute to carrier gas in a gaseous stream containing a carrier gas and a sample comprising solute, which method comprises:

(a) forming a first gaseous stream comprising said sample;

(b) passing at least an aliquot portion of the first gaseous stream into a first adsorbent-containing trap and therein trapping said solute; and, thereafter

(c) simultaneously heating and backflushing said first trap with a first carrier gas to form a second gaseous stream comprising first carrier gas and the solute;

(d) passing said second gaseous stream from said first trap to a second adsorbent-containing trap and therein trapping said solute; and, thereafter

(e) simultaneously heating and backflushing said second trap with a second carrier gas to form a third gaseous stream comprising a carrier gas and said solute wherein the ratio of solute to carrier gas is greater than the ratio of solute to carrier gas in said second gaseous stream.

4,180,390

TEXTILE MACHINE INCLUDING AIR CLEANING APPARATUS

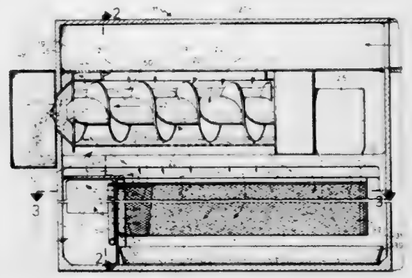
Joachim Furstenberg, Aichwald, Fed. Rep. of Germany, assignor to LTG Lufttechnische GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 4, 1978, Ser. No. 904,126
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1978, 2812743
Int. Cl.² B01D *46/04*
U.S. Cl. 55—272 **11 Claims**

1. A textile machine having a textile processing unit in combination with air transport and cleaning means for aspirating air from a source of air for use by said textile processing unit and for thereafter cleaning said air of textile and fiber remnants as well as of airborne dust particles, said air transport and cleaning means including:

a housing,

a fiber separator including a rotatable conveyor screw rotatably supported in said housing, a filter at least partially surrounding said conveyor screw in closely spaced relationship therewith, said fiber separator being provided with stationary means for preventing co-rotation of the filtered remnants in said fiber separator with said conveyor screw, said air transport means being arranged to supply said fiber separator with dirty air containing fibers and dust, said dirty air passing across said conveyor screw and through said filter so that trapped fiber remnants are conveyed axially by said conveyor screw toward one end thereof, said fiber separator further including a flexible trap at one end of said conveyor screw, said flexible trap having a central opening which may be enlarged by the pressure of accumulating fiber remnants being transported by said conveyor screw thereby permitting said remnants to be expelled therethrough; and



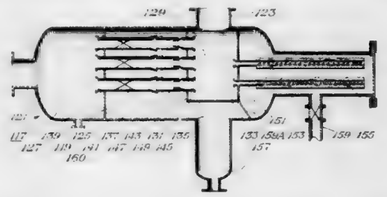
a dust separator in said housing, means in said housing for directing air from said fiber separator into said dust separator after passage through said filter, said dust separator including at least one dust filter bag for removing dust from the air, said dust separator further including means for applying periodic bursts of compressed air to said at least one dust filter bag to dislodge accumulated dust therefrom.

4,180,391

GAS PARTICULATE SEPARATOR WITH SCAVENGING GAS SEPARATION DEVICE

Marney D. Perry, Jr., Mineral Wells, Tex., and Robert A. Graff, Suwannee County, Fla., assignors to Perry Equipment Co., Mineral Wells, Tex.

Filed Jun. 13, 1977, Ser. No. 805,848
Int. Cl.² B01D *50/00*
U.S. Cl. 55—324 **6 Claims**



1. A separator for removing from a gas stream suspended particulates present in the gas stream, comprising:

a scavenging gas plenum defined by wall structure, said wall structure including wall means defining an outlet plenum in fluid communication with an outlet,

an inlet means for receiving gas from a gas stream,

said inlet conduit means extending into said scavenging gas plenum and having a downstream end located in said scavenging gas plenum,

gas swirl means for imparting a swirling motion to the gas entering said inlet conduit means,

conduit means axially aligned with said inlet conduit means and having an upstream end located relative to said downstream end of said inlet conduit means defining an annular ejection port in said scavenging gas plenum for the removal of suspended particulates that have separated from the gas stream due to the swirling motion imparted to the gas entering said inlet conduit means, and for the dis-

charge of a portion of the gas into said scavenging gas plenum,

said conduit means axially aligned with said inlet conduit means, having an outlet end extending from said scavenging gas plenum through said wall means to said outlet plenum,

a conduit having an outlet end extending from said scavenging gas plenum through said wall means to said outlet plenum providing a flow path from said scavenging gas plenum to said outlet plenum for the flow of gas from said scavenging gas plenum to said outlet plenum,

separation means for separating particulates from the gas flowing from said scavenging gas plenum to said outlet plenum by way of said conduit,

said outlet ends of said conduit means and of said conduit generally facing each other in said outlet plenum, and

means for removing separated particulates from said scavenging gas plenum.

4,180,392

METHOD FOR PRODUCING ORGANIC FERTILIZERS

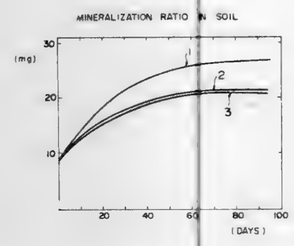
Hiroaki Ishibashi; Shizuo Tanoue, both of Minamatashi; Masakuni Kudo, Kohzushi, and Isamu Harada, Iwakunishi, all of Japan, assignors to Chissō Corporation, Osaka and Sanyo Kokusaku Pulp Co Ltd, Tokyo, both of, Japan

Filed Mar. 10, 1978, Ser. No. 885,413

Claims priority, application Japan, Mar. 24, 1977, 52-32520

Int. Cl.² C05F *7/00, 11/00*

U.S. Cl. 71—25 **3 Claims**



1. A method of producing organic-type fertilizer from the spent liquors of sulfite pulp, which method comprises:

(a) adjusting the solid matter concentration of said spent liquors to 20–45% by weight,

(b) reacting said spent liquor with

(1) 15–31 mols of ammonia per 1 Kg of said solid matter, and

(2 oxygen or an oxygen-containing gas

(c) carrying out the reaction of step (b) at a temperature of 90°–120° C. and under a pressure of greater than or equal to 4 Kg/cm^2 but less than 10 Kg/cm^2.

4,180,393

COMPOSITION FOR CONTROLLING PLANT GROWTH IN VITICULTURE

Fritz Amann, Ober-Ramstadt, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Jul. 10, 1978, Ser. No. 923,458

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1977, 2737454

Int. Cl.² A01N *11/00*

U.S. Cl. 71—78 **3 Claims**

1. The method of eliminating the wild shoots on grape vines without damaging the stems of the vines which comprises applying to the vines an aqueous solution containing a growth suppressing amount of cyanamide.

4,180,394

DERIVATIVES OF N-TRIFLUOROACETYL-N-PHOSPHONOMETHYL-GLYCINATES AND THE HERBICIDAL USE THEREOF

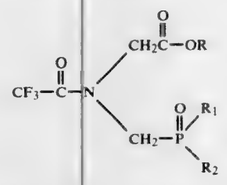
John E. Franz, Crestwood, and Robert J. Kaufman, University City, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jul. 10, 1978, Ser. No. 922,930

Int. Cl.² A01N *9/36*; C07F *9/40, 9/44*

U.S. Cl. 71—86 **27 Claims**

19. A herbicidal method which comprises contacting a plant or the plant growth medium with a herbicidally effective amount of a compound of the formula



wherein R is alkyl of from 1 to 10 carbon atoms or chlorinated C_1–C_6 alkyl, R is a member of the group consisting of C_1–C_6 alkoxy, C_1–C_6 alkylthio, phenoxy, phenylthio, phenoxy or phenylthio substituted with one or two members of the group consisting of halo, cyano, nitro or trifluoromethyl, C_1–C_6 alkylamino, C_1–C_6 dialkylamino, morpholino and N-piperidinoamino and R_2 is a member of the group consisting of C_1–C_6 alkylthio, phenoxy, phenylthio, phenoxy or phenylthio substituted with one or two members of the group consisting of halo, cyano, nitro or trifluoromethyl, C_1–C_6 alkylamino, C_1–C_6 dialkylamino, alkenylamino, dialkenylamino, alkynylamino, dialkynylamino, wherein each alkenyl and alkynyl group contains up to six carbon atoms, morpholino and N-piperidinoamino with the proviso that R_1 and R_2 cannot represent the same group.

4,180,395

6-FLUORO-3,5-DIHALO-2-PYRIDYLOXY COMPOUNDS

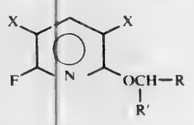
Howard Johnston, Walnut Creek, Calif., and Herman O. Senkbeil, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 765,190, Feb. 3, 1977, abandoned, which is a continuation of Ser. No. 568,339, Apr. 15, 1975, abandoned, which is a continuation-in-part of Ser. No. 460,010, Apr. 11, 1974, abandoned. This application Apr. 11, 1977, Ser. No. 786,702

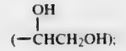
Int. Cl.² A01N *9/22*; C07D *213/89*

U.S. Cl. 71—94 **43 Claims**

1. A compound corresponding to the formula

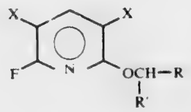


wherein X represents chloro, bromo or iodo; R′ represents hydrogen or methyl and R represents alkanoyloxymethyl ($—CH_2OCOR^2$ wherein R^2 represents alkyl of 1 to 4 carbon atoms); (2,2-dichloropropionyloxy)methyl ($—CH_2OCOC(Cl)_2CH_3$); alkoxymethyl ($—CH_2OR^2$); phenoxymethyl ($—CH_2O\phi$); (2-alkoxyethoxy) methyl ($—CH_2OCH_2CH_2OR^2$); hydroxyalkyl ($—R^3OH$ wherein R^3 represents alkylene of from 1 to 6 carbon atoms); 3-hydroxy-1-propenyl ($—CH{=}CHCH_2OH$); 1,2-dihydroxyethyl

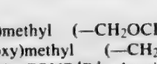


1-(2-hydroxy-ethoxy)methyl ($—CH_2—O—CH_2CH_2OH$); (2-(2-hydroxyethoxy) -ethoxy)methyl ($—CH_2OCH_2CH_2OCH_2CH_2OH$); carbamoyl ($—CONR^4R^4$ wherein each R^4 independently represents hydrogen or alkyl of 1 to 8 carbon atoms); (carboxymethyl)carbamoyl ($—CONHCH_2COOH$) or (2-hydroxyethyl)carbamoyl ($—CONR^4CH_2CH_2OH$) or (carbamoyloxy)-methyl $—CH_2OCONHR^5$ wherein R^5 is alkyl of 1 to 4 carbon atoms or phenyl).

35. A method for inhibiting the growth of undesirable plant species which comprises applying to plants, plant parts or their habitats a growth-inhibiting amount of at least one compound corresponding to the formula



wherein X represents chloro, bromo or iodo; R′ represents hydrogen or methyl and R represents alkanoyloxymethyl ($—CH_2OCOR^2$ wherein R^2 represents alkyl of 1 to 4 carbon atoms); (2,2-dichloropropionyloxy)methyl ($—CH_2OCOC(Cl)_2CH_3$); alkoxymethyl ($—CH_2OR^2$); phenoxymethyl ($—CH_2O\phi$); (2-alkoxyethoxy)methyl ($—CH_2OCH_2CH_2OR^2$); hydroxyalkyl ($—R^3OH$ wherein R^3 represents alkylene of from 1 to 6 carbon atoms); 3-hydroxy-1-propenyl ($—CH{=}CHCH_2OH$); 1,2-dihydroxyethyl



1-(2-hydroxyethoxy)methyl ($—CH_2OCH_2CH_2OH$); (2-(2-hydroxyethoxy)ethoxy)methyl ($—CH_2OCH_2CH_2OCH_2CH_2OH$); carbamoyl ($—CONR^4R^4$ wherein each R^4 independently represents hydrogen or alkyl of 1 to 8 carbon atoms); (carboxymethyl)carbamoyl ($—CONHCH_2COOH$) or (2-hydroxyethyl)carbamoyl ($—CONR^4CH_2CH_2OH$) or (carbamoyloxy)methyl ($—CH_2OCONHR^5$ wherein R^5 is alkyl of 1 to 4 carbon atoms or phenyl) in admixture with an inert carrier therefor.

4,180,396

METHOD OF ALLOYING AND/OR INOCULATING AND/OR DEOXIDIZING CAST IRON MELTS PRODUCED IN A CUPOLA FURNACE

Karl-Heinz Caspers, Nüremberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nüremberg, Fed. Rep. of Germany

Filed Nov. 25, 1977, Ser. No. 854,687

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1976, 2653341

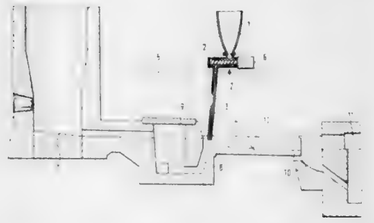
Int. Cl.² C21C *7/06*

U.S. Cl. 75—53 **5 Claims**

1. A method for use in connection with alloying, inoculating, as well as deoxidizing cast iron melts produced having an accurate composition setting in a cupola furnace arrangement having a siphon and a channel, which includes the steps of:

transferring clean molten iron from said siphon to said channel;

continuously adding controlled quantities of additive in fine granular form to the upper surface of said clean molten iron in said channel, said additive addition occurring at a rate between 0.1 and 0.6 percent by weight; and



continuously imparting a turbulence to said clean molten iron in said channel.

4,180,397

MACHINABLE STEEL

David Naylor, Rotherham, England, assignor to British Steel Corporation, London, England

Filed Sep. 12, 1978, Ser. No. 941,600

Claims priority, application United Kingdom, Sep. 15, 1977, 38550/77

Int. Cl.² C21C *7/02*

U.S. Cl. 75—58 **8 Claims**

1. A method of producing a resulphurized steel having a sulphur content of between 0.05% and 0.20% by weight in the form of isolated, globular sulfide inclusions which comprises forming a melt of a steel having between 0.05% and 0.20% by weight of sulphur and adding to the melt an alkali earth metal having a high affinity for sulphur in an amount within the range of about 0.02% and 0.20% by weight to produce in the steel when solidified isolated, globular sulphide inclusions.

4,180,398

MODIFICATION OF LEADED BRASSES TO IMPROVE HOT WORKABILITY

Prakash D. Parikh, Hamden, assignor to Olin Corporation, New Haven, Conn.

Filed Jun. 22, 1978, Ser. No. 918,333

Int. Cl.² C22C *9/04*

U.S. Cl. 75—157.5 **2 Claims**

1. An alloy which exhibits high resistance to edge cracking during hot working, said alloy consisting essentially of 10 to 40% by weight zinc, 0.1 to 5% by weight lead, 0.03 to 0.75% by weight chromium, 0.005 to 0.05% by weight antimony, 0.005 to 0.05% by weight bismuth, balance copper.

4,180,399

MOLYBDENUM BASE COMPOSITE MATERIALS REINFORCED WITH CONTINUOUS SILICON CARBIDE FIBERS AND A METHOD FOR PRODUCING THE SAME

Chiaki Asada; Makoto Saito, both of Nagoya, and Hisashi Kajima, Asahi, all of Japan, assignors to The Foundation: The Research Institute for Special Inorganic Materials, Asahi, Japan

Filed Sep. 19, 1977, Ser. No. 834,341

Claims priority, application Japan, Sep. 28, 1976, 51/115378

Int. Cl.² B22F *3/00*; C22C *29/00*

U.S. Cl. 75—229 **4 Claims**

1. Molybdenum base composite materials reinforced with silicon carbide fibers obtained by incorporating silicon fibers containing 0.01–20% by weight of free carbon into a molybdenum base metallic matrix containing no less than 40% by weight of molybdenum as an alloy element in a volume fraction of 2–80%; and wherein the silicon carbide fibers are made by a process which comprises the following steps:

(a) preparing a spinning solution from at least one organosili-

V 9 8 9 1 4 D E 2 5 7 9 UMI

con high molecular weight compound having a softening point of higher than 50° C., in which silicon and carbon are the main skeleton components, and spinning said spinning solution into fibers,

(b) preliminarily heating the spun fibers at a temperature of 350°–800° C. under vacuum to volatilize low molecular weight compunds contained therein, and

(c) baking the thus treated fibers at a temperature of 1,000°–2,000° C. under vacuum or at least one non-oxidizing atmosphere selected from the group consisting of an inert gas, CO gas and hydrogen gas, to form silicon carbide fibers.

4. Molybdenum base composite materials reinforced with silicon carbide fibers obtained by incorporating a volume fraction of 2–80% of silicon carbide fibers containing 0.01–20% by weight of free carbon into molybdenum base alloy consisting of not less than 40% by weight of molybdenum and not more than 60% by weight in total of at least one of the following metal groups (1)–(5).

(1) 8–40% by weight of Ru or 8–55% by weight of Re,

(2) 0.02–8% by weight of Co or Ni,

(3) 0.01–5% by weight of Ti, Zr, Nb, Ta, V, Hf, or U,

(4) not more than 20% by weight of W,
not more than 10% by weight of Cr,
not more than 5% by weight of Si,
not more than 10% by weight of Mn,
not more than 1% by weight of Be,
not more than 0.5% by weight of B or
not more than 2% by weight of Cu and

(5) not more than 0.05% by weight of Al, Ca, Mg, Y or at least one of rare earth metals; and wherein the silicon carbide fibers are made by a process which comprises the following steps:

(a) subjecting polysilanes having a Si—Si bond and which have no halogen atoms to polycondensation reaction by at least one process of addition of a polycondensation catalyst, irradiation and heating to produce polycarbosilanes containing no halogen atoms,

(b) reducing the content of low molecular weight compounds contained in said polycarbosilanes by treating the above described polycarbosilanes with at least one treatment of a solvent, aging said polycarbosilanes at a temperature of 50°–700° C. and distilling said polycarbosilanes at a temperature of 100°–500° C., to produce the polycarbosilanes having a softening point of higher than 50° C.,

(c) dissolving the thus treated polycarbosilanes in a solvent or melting said polycarbosilanes to prepare spinning solution or spinning melt, and spinning said spinning solution or spinning melt into filaments, and

(d) baking the thus treated filaments at a temperature of 1,000°–2,000° C., under vacuum or at least one non-oxidizing atmosphere selected from the group consisting of an inert gas, CO gas and hydrogen gas to form silicon carbide fibers.

4,180,400

COATED CEMENTED CARBIDE BODY AND METHOD OF MAKING SUCH A BODY

Ulf K. H. Smith, Huddinge; Jan N. Lindstrom, Norsborg, and Harold Mantle, Hauterive, all of Switzerland, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Filed Jun. 6, 1978, Ser. No. 913,035

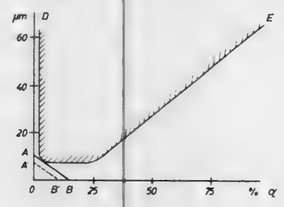
Claims priority, application Sweden, Jun. 9, 1977, 7706706

Int. Cl.² B22F 5/00

U.S. Cl. 75—235 **10 Claims**

1. Sintered cemented carbide body containing at least one metal carbide and a binder metal, on which body there is applied at least one thin, wear resistant surface layer consisting essentially of aluminum oxide, characterized in that at least 85% of the aluminum oxide consists of the kappa form, the remainder if any, which mainly constitutes the alpha form, being formed as surface portions or spots having a size of at the most 10 μm, the size and the occurrence of the surface portions being so adjusted that they lie within the area AOB in FIG. 1 of the attached drawing.

10. A method of making an aluminum-oxide coated cemented carbide body wherein a cemented carbide substrate is contacted with a gas containing an aluminum halide and a



reducing agent at high temperature, characterized in that a dopant addition of tetravalent titanium, zirconium and/or hafnium ions is added to the gas in an amount of 0.03–0.5% of the totally supplied amount of gas whereby the cemented carbide substrate is coated with aluminum oxide, at least 85% of which is in the kappa form.

4,180,401

SINTERED STEEL ALLOY

Fritz Frehn, Krefeld, Fed. Rep. of Germany, assignor to Thyssen Edelstahlwerke Aktiengesellschaft, Krefeld, Fed. Rep. of Germany

Filed Jun. 28, 1977, Ser. No. 810,731

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1976, 2630266

Int. Cl.² B22F 3/00; C22C 29/00

U.S. Cl. 75—236 **8 Claims**

1. A sintered steel alloy by weight consisting essentially of from 12 to 60% TiC and from 40 to 88% of steel consisting essentially of:

0 to 0.10%	C
12. to 25. %	Mo
8. to 26. %	Ni
10. to 20. %	Co
0.2 to 2. %	Ti
0 to 1.0 %	Al
0 to 2.0 %	Cu
0 to 2.0 %	Mn
0 to 0.08%	B
Remainder	Fe

4,180,402

PROCESS FOR OBTAINING HALF-TONE PICTURE OF IRREGULAR STRUCTURE

Jury S. Andreev; Olga V. Pyasetskaya, and Galina G. Leonova, all of Moscow, U.S.S.R., assignors to Vsesojuzny Gosudarstvenny Nauchno-Issiedovatelsky I Proekthyinstitut Khimo-Forograficheskoi Promyshlennosti, U.S.S.R.

Filed Nov. 28, 1977, Ser. No. 855,783

Int. Cl.² G03F 7/02; G03C 5/30, 1/02

U.S. Cl. 430—394 **1 Claim**

1. Method of producing a printed half-tone picture of irregular structure, which comprises exposing a coarse-grained silver halide material with an average linear size of silver halide microcrystals of 4 to 6 microns, developing the thus exposed material in an infectious lith-type developer, printing the resulting picture on a high-contrast photosensitive material, and developing the exposed high-contrast photosensitive material, thereby obtaining a high quality half tone picture with the optical densities of the original being highly reproducible.

4,180,403

PHOTOHARDENABLE FILMS HAVING HIGH RESOLUTION CONTAINING NITROSO DIMERS

George R. Nacci, Wilmington, and José F. Pazos, Claymont, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 697,947, Jun. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 554,228, Feb. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 423,989, Dec. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 324,877, Jan. 18, 1973, abandoned. This application Dec. 7, 1977, Ser. No. 858,350

Int. Cl.² G03C 1/68

U.S. Cl. 430—281 **11 Claims**

1. A photohardenable film consisting essentially of:

(a) a substantially solid organic composition comprising an addition-polymerizable, nongaseous ethylenically unsaturated compound capable of forming a high polymer by free-radical initiated chain-propagating addition polymerization, and a macromolecular organic polymeric binder,

(b) 0.04–3% by weight, based on the total film material, of solvent-soluble nitroso dimer which is a noninhibitor of free-radical polymerization but dissociates to nitroso monomer which is an inhibitor of free-radical polymerization, contains a dinitroso group, and is characterized by a dissociation constant of 10^{-2}–10^{-10} in solution at 25° C. and a rate of dissociation having a half-life of at least 0.5 minute in solution at 25° C., and

(c) 1.0–10% by weight, based on the total film material, of an organic, radiation-sensitive free-radical generating system based on a 2,4,5-triarylimidazolyl dimer and a free-radical producing electron doner system, with the proviso that the weight ratio of nitroso dimer to free-radical generating system is no greater than 2:1, said free-radical generating system being proportioned to give said film at its particular thickness a mean optical density of 0.02–1.25 to radiation in the spectral region in which the free-radical generating system absorbs radiation.

4,180,404

HEAT RESISTANT PHOTORESIST COMPOSITION AND PROCESS FOR PREPARING THE SAME

Kaoru Ohmura; Ichiro Shibasaki; Takeo Kimura, and Muneaki Kimura, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 16, 1978, Ser. No. 961,534

Claims priority, application Japan, Nov. 17, 1977, 52-137256; Dec. 28, 1977, 52-157481

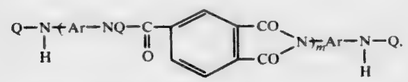
Int. Cl.² G03C 1/72; C08G 18/00

U.S. Cl. 430—284 **6 Claims**

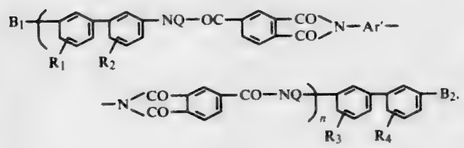
1. A heat resistant photoresist composition comprising:

(1) 100 parts by weight of a polymer selected from the group consisting of

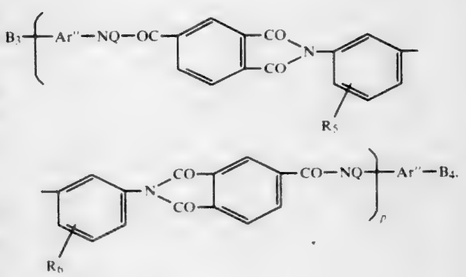
a polymer (α) of the general formula



a polymer (β) of the general formula



a polymer (γ) of the general formula

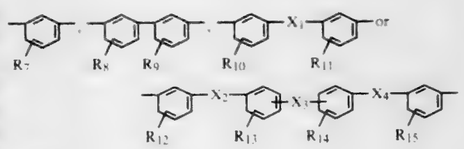


and mixtures thereof

wherein

R_1 to R_6 are the same or different and each represent a hydrogen atom, a (C_1–C_4) alkyl group or a halogen atom,

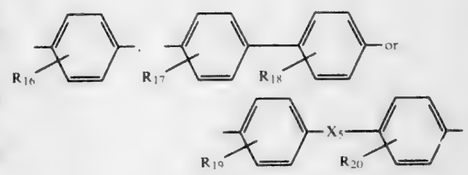
Ar represents



wherein

R_7 to R_{15} are the same or different and each have the same meaning as defined with respect to R_1 to R_6 and X_1 to X_4 are the same or different and each represent —O—, —SO_2—, —CH_2—, —CO—, —COO—, —$C(CH_3)_2$—, —S— or —$(CH_2)_2$—,

Ar' represents



wherein

R_{16} to R_{20} are the same or different and each have the same meaning as defined with respect to R_1 to R_6 and X_5 has the same meaning as defined with respect to X_1 to X_4,

Ar'' has the same meaning as defined with respect to Ar or Ar',

B_1 to B_4 are the same or different and each represent —NCO or a substituent (A) formed by the reaction of —NCO with cinnamic acid or cinnamyl alcohol,

Q represents a hydrogen atom and a substituent (A'), provided that each of the rates of substituent introduction into the molecules of the polymers (α), (β) and (γ) as defined by the formulae

$$\frac{\text{number of substituent (A') in the molecule}}{m+2} \times 100,$$

$$\frac{\text{number of substituents (A) + (A') in the molecule}}{2 \times n + 2} \times 100 \text{ and}$$

$$\frac{\text{number of substituents (A) + (A') in the molecule}}{2 \times p + 2} \times 100$$

with respect to the polymer (α), the polymer (β) and the polymer (γ), respectively, is 0.1 to 50%, said substituent (A') being a member selected from residual groups of cinnamoyl chloride and glycidyl cinnamate, said residual groups being introduced alone or in combination, and

m, n and p are integers corresponding to reduced viscosities of 0.1 to 2.0 with respect to the polymer (α) the polymer (β) and the polymer (γ), respectively; and

(2) 0.01 to 20 parts by weight of a photosensitizer.

4,180,405

HEAT-SENSITIVE RECORDING COMPOSITION WITH MIXED COLOR PRECURSORS

William R. Lawton, Orchard Park, N.Y., assignor to Graphic Controls Corporation, Buffalo, N.Y.

Continuation-in-part of Ser. No. 772,084, Feb. 25, 1977, and Ser. No. 774,210, Mar. 7, 1977. This application Mar. 4, 1977, Ser. No. 774,385

Int. Cl.² C09K *3/00*

U.S. Cl. 106—14.5 **12 Claims**

1. A mixture of heat-sensitive color precursors comprising

(a) a cyclic polyketo compound reactive with amines and amides at elevated temperatures to form a color; and

(b) a chromogenic compound selected from the group consisting of lactone type leuco dyes and spiropyran type leuco dyes, said chromogenic compound being reactive with phenols at elevated temperatures to form a color.

4,180,406

POST TREATING ZINC SURFACES

Yasushi Miyazaki, Ichikawa; Masanori Suzuki, and Hideaki Kaneko, both of Tokyo, all of Japan, assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Jul. 22, 1977, Ser. No. 818,259

Int. Cl.² C09D *5/08*

U.S. Cl. 106—14.15 **12 Claims**

1. An aqueous composition useful in the post-treatment of zinc or zinc alloy surfaces having a zinc phosphate conversion coating thereon comprising a thiourea compound and a vegetable tannin compound in a weight ratio of thiourea compound:vegetable tannin compound in the range of 10:1 to 1:10.

4,180,407

INK FOR APPLICATION TO UNGLAZED PAPER SURFACES

Donald M. Gibson, 1175 Clarendon Cres., Oakland, Calif. 94610, and Donald C. Pierce, 59 Reposa Vista, Novato, Calif. 94947

Continuation of Ser. No. 783,500, Mar. 28, 1977, abandoned. This application Sep. 15, 1978, Ser. No. 942,824

Int. Cl.² C09D *11/20, 11/14, 11/08, 11/04*

U.S. Cl. 106—26 **15 Claims**

1. An ink for ruling pens for direct use on unglazed paper surface including cardboard picture mats, consisting essentially of the following components:

(a) from 2.8 to 13.7% by weight of opaque water-insoluble pigment of particles passing through a 325 mesh sieve and said particles being of from 0.1 to 5.0 micron size in at least one dimension,

(b) from 2.5 to 4% by weight of an organic binder, adapted to bind said particles together and to said surfaces and to form a flexible film upon drying,

(c) a small but effective amount of a surfactant sufficient to effect wetting of the pigment by water and dispersion therein,

(d) a small but effective amount of fungicide sufficient to prevent bacterial degradation of said organic binder, and

(e) water to make 100% by weight and to form said ink having a surface tension of from 50 to 60 dynes per cm, to provide an opaque ink,

(f) the viscosity of said ink being adjusted so that the pigment holds in said pen while the ink is being used; and the surface tension and viscosity being so adjusted as to determine the rheological properties of said ink so that an adequate charge of said ink will hold in the pen without dripping out while the ink will flow out of said pen readily when a line is being drawn; and said ink will not spread and feather out when applied to a porous paper surface.

4,180,408

POLYVALENT METAL SALTS OF OXIDIZED AND AMIDIFIED WAXES

Joseph O. Bienvenu, and Ashvinkumar N. Jagtap, both of Longview, Tex., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Feb. 6, 1978, Ser. No. 875,358

Int. Cl.² C09D *11/12, 11/06*

U.S. Cl. 106—31 **21 Claims**

1. A polyvalent metal salt of an oxidized and amidified non-benzenoid hydrocarbon wax obtained by the process consisting essentially of the steps of (b) oxidizing a non-benzenoid hydrocarbon wax (a), (c) thereafter amidifying the oxidized wax of step (b) with ammonia or an amine containing amino hydrogen and an additional isocyanate reactible active hydrogen, and finally (d) forming a polyvalent metal salt of the previously amidified product of step (c).

4,180,409

THERMALLY STABLE QUARTZ GLASS

Manfred Mansmann, Krefeld, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 702,835, Jul. 6, 1976, Pat. No. 4,104,045. This application Mar. 16, 1978, Ser. No. 887,683

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1975, 2530808

Int. Cl.² C03C *13/00, 3/22, 3/04*

U.S. Cl. 106—39.6 **10 Claims**

1. Homogeneous quartz glass fibers containing at least one of chromium and manganese in about 0.05 to 20% by weight of the SiO_2 expressed as Cr_2O_3 and Mn_2O_3, and no more than traces of alkali and alkaline earth metal oxides, the glass being stable up to about 1400° C. with a controlled tendency toward cristobalite formation up to an average crystallite size of about 100 to 500 Å.

4,180,410

METHOD FOR PRODUCING A SILICON NITRIDE BASE SINTERED BODY

Hideyuki Masaki, Nagoya, Japan, assignor to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya, Japan

Filed May 15, 1978, Ser. No. 905,912

Claims priority, application Japan, May 14, 1977, 52-55705

Int. Cl.² C04B *35/58*

U.S. Cl. 106—73.2 **24 Claims**

1. A method for producing a silicon nitride base sintered body of high strength and density comprising the steps of

combining essentially 65 to 96 mol % of silicon nitride powder and 4 to 35 mol % of metal oxides powder composed of yttrium oxide and cerium oxide, the mol ratio of said yttrium oxide to said cerium oxide ranging from 3:7 to 7:3,

mixing said combined powdered materials,

forming said powdered materials into a green compact and sintering said green compact in a non-oxidizing atmosphere without applying pressure.

4,180,411

MICROCRYSTALLINE CELLULOSE AS EXTRUSION AID/COMBUSTIBLE FILLER FOR ALUMINA

Robert H. Whitman, and William A. Barber, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 815,341, Jul. 13, 1977, Pat. No. 4,119,474. This application Jul. 28, 1978, Ser. No. 929,150

Int. Cl.² C04B *21/06, 35/10*

U.S. Cl. 106—41 **7 Claims**

1. A method for preparing a low-density alumina substrate comprising mixing 60–90 percent by weight of a rehydratable alumina with 10–40 percent by weight of microcrystalline cellulose with sufficient water to yield a 45 to 70 percent solids mixture, extruding the mixture, curing the resultant extrudates, and calcining the extrudates at a temperature of from 1700° to 2000° F.

4,180,412

METHOD FOR MANUFACTURING GLUE FOR A BINDING AGENT IN MANUFACTURE OF CHIPBOARD OR OTHER CELLULOSE PRODUCTS

C. Karl Bunnig, Am Denkmal 9, 3252 Bad Münder 1, Fed. Rep. of Germany

Filed Mar. 30, 1978, Ser. No. 891,684

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1977, 2715501

Int. Cl.² C08L *89/00*

U.S. Cl. 106—124 **6 Claims**

1. A method for manufacturing a glue from physico-chemically changed animal blood or physico-chemically changed blood components, for use a: binding agent for manufacturing cellulose-containing chipboard or panels covered with wood veneer, comprising the steps of: adding to whole blood a substance inhibiting coagulation; adding for acidification a single additive in the form of a monobasic organic acid in an amount resulting in a pH value between 3.0 and 4.0 and wetting of said blood components, said second step immediately preceding mixing of said glue with cellulose-containing particles, and optimizing the mixing ratio of blood solids to said additive.

4,180,413

ICE HOCKEY STICK

David A. Diederich, Chaska, Minn., assignor to The Northland Group, Inc., Chaska, Minn.

Division of Ser. No. 742,017, Nov. 15, 1976, Pat. No. 4,134,587. This application Jun. 12, 1978, Ser. No. 914,427

Int. Cl.² B65H *81/00*

U.S. Cl. 156—185 **14 Claims**



1. A method of making an ice hockey stick having a handle including a body and sheet members and blade having opposite sides, a lower edge and a heel portion comprising: attaching the blade to the handle, shaping the blade and handle, attaching elongated sheet members having elongated fibers with all of the fibers oriented along the length of the sheet members to opposite sides of the body, attaching a first reinforcing fabric with plastic resin to opposite sides of the blade, wrapping a second reinforcing fabric around the first reinforcing fabric, the blade, and at least the lower edge of the heel portion of the blade, said plastic resin bonding the sides of the second fabric to the first fabric, and applying a wear strip to the second fabric adjacent the lower edge of the heel portion of the blade and the lower edge of the heel portion of the blade.

4,180,414

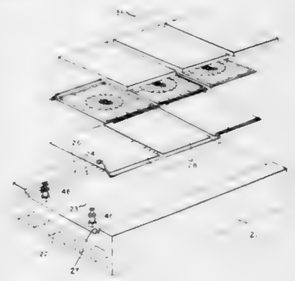
CONCENTRATOR SOLAR CELL ARRAY MODULE

Ronald M. Diamond, Shadow Hills; Ku S. Ling, Glendora, and Allen G. Winterer, La Habra, all of Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Jul. 10, 1978, Ser. No. 923,091

Int. Cl.² H01L *31/04*

U.S. Cl. 136—89 PC **8 Claims**



1. In a concentrator solar cell array module, a metallic substrate serving as a heat sink and having a planar mounting surface, a semiconductor spacer having opposed front and back surfaces with an insulating layer formed on said back surface, a thermally conductive adhesive for securing said spacer to said mounting surface of said substrate with the insulating layer of the spacer facing the mounting surface, a semiconductor solar cell having top and bottom sides, solder connecting said bottom side of the solar cell and said front surface of the spacer, and leads connected to the solar cell.

3. A module as in claim 1 wherein there are a plurality of spacers and solar cells together with U-shaped braided wires connecting said solar cells to connect the same in an electrical series connection.

4,180,415

HOT-JUNCTION ELECTRODE MEMBERS FOR COPPER/SILVER CHALCOGENIDES

Edward F. Hampl, Jr., Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

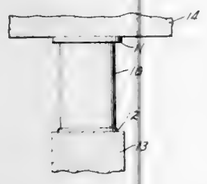
Continuation of Ser. No. 526,598, Nov. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 321,222, Jan. 5, 1973, Pat. No. 3,853,632, which is a continuation of Ser. No. 635,948, Apr. 20, 1967, abandoned, which is a continuation-in-part of Ser. No. 463,148, Jun. 11, 1965, abandoned, and a continuation-in-part of Ser. No. 242,219, Apr. 7, 1972, Pat. No. 3,852,118, which is a continuation of Ser. No. 36,145, May 11, 1970, abandoned, and a continuation-in-part of Ser. No. 291,938, Sep. 25, 1972, Pat. No. 3,873,370. This application Aug. 29, 1977, Ser. No. 828,567

Int. Cl.² H01L *35/16, 35/04*

U.S. Cl. 136—205 **2 Claims**

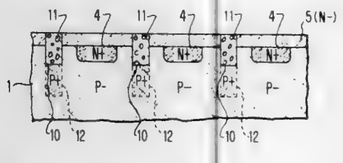
1. In a thermoelectric generator that includes at least a length of thermoelectric leg consisting essentially of metal ingredients selected from copper and silver and chalcogen ingredients selected from selenium and tellurium; the ingredi-

ents of said length of thermoelectric leg being within the following proportions:
for tellurium compositions,
(a) 32.5 atomic percent≦tellurium≦33.7 atomic percent
(b) 27 atomic percent≦copper≦67 atomic percent
(c) 0 atomic percent<silver≦40 atomic percent
for selenium compositions,
(a) 32.5 atomic percent≦selenium≦33.7 atomic percent
(b) 60 atomic percent≦copper≦67 atomic percent
(c) 0 atomic percent<silver≦7 atomic percent; and
a member that engages the hot end of said length of thermoelectric leg to make electrical and thermal contact with said length of leg and consists essentially of electrically conductive metal which comprises at least 50 weight-percent tungsten and in addition rhenium.



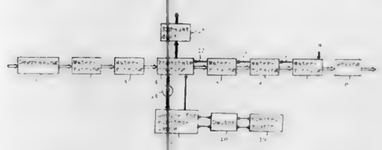
2. In a thermoelectric generator that includes at least a length of thermoelectric leg consisting essentially of metal ingredients selected from copper and silver and chalcogen ingredients selected from selenium and tellurium; the ingredients of said length of thermoelectric leg being within the following proportions:
(a) 32.5 atomic percent≦tellurium≦33.7 atomic percent
(b) 27 atomic percent≦copper≦67 atomic percent
(c) 0 atomic percent<silver≦40 atomic percent
for selenium compositions,
(a) 32.5 atomic pressure≦selenium≦33.7 atomic percent
(b) 60 atomic percent≦copper≦67 atomic percent
(c) 0 atomic percent<silver≦7 atomic percent; and
a member that engages the hot end of said length of thermoelectric leg to make electrical and thermal contact with said length of leg and consists essentially of tungsten.

4,180,416
THERMAL MIGRATION-POROUS SILICON TECHNIQUE FOR FORMING DEEP DIELECTRIC ISOLATION
Geoffrey E. Brock, Mount Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 27, 1978, Ser. No. 946,007
Int. Cl.² H01L *21/228;* **C25F** *3/00*
U.S. Cl. 148—1.5 **13 Claims**



1. The method for forming dielectric isolation comprising:
providing a body of monocrystalline silicon semiconductor,
depositing metal on the surface of said body in a desired pattern of isolation regions for the said monocrystalline silicon body,
heating the body and the deposited metal to form a melt of a metal-rich semiconductor material therein,
migrating each melt of metal-rich semiconductor material as a molten zone into said body of semiconductor material to form regions having substantially uniform impurity concentration of a type determined by the impurity type of said metal,
converting at least a portion of said regions into a porous silicon substance by anodic treatment, and providing an atmosphere to convert said porous silicon substance into a dielectric isolating material.

4,180,417
PHOSPHATING OF METALLIC SUBSTRATE
Shoji Oka, Ando; Ryoichi Murakami, Osaka, and Akiko Sueyoshi, Onodai, all of Japan, assignors to Nippon Paint Co., Ltd., Japan
Filed Oct. 12, 1978, Ser. No. 950,620
Claims priority, application Japan, Oct. 12, 1977, 52-122856
The portion of the term of this patent subsequent to Sep. 12, 1995, has been disclaimed.
Int. Cl.² C23F *7/10*
U.S. Cl. 148—6.15 Z **13 Claims**



1. In a method for phosphating the surface of a metallic substrate by treatment with a phosphating solution comprising nitrite ions and nitrate ions in an aqueous acidic medium, the improvement wherein the supply of the nitrite ions to the phosphating solution is carried out by electrolytic reduction of the nitrate ions therein by passing a direct current between an electrode as the cathode and an electrode as the anode dipped in the phosphating solution while changing the direction of the current flow at an interval of from 10 seconds to 30 minutes.

4,180,418
METHOD OF MAKING A STEEL WIRE ADAPTED FOR COLD DRAWING
Hans Paulitsch, Salzgitter-Lebenstedt; Alfred Babilon, Salzgitter; Gerhard Kiefer; Kurt Koerfer, both of Salzgitter-Lebenstedt; Constantin Vlad, Wolfenbüttel, and Ullrich Koch, Salzgitter-Lebenstedt, all of Fed. Rep. of Germany, assignors to Stahlwerke Peine-Salzgitter A.G., Peine, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 683,783, May 6, 1976, abandoned, which is a continuation of Ser. No. 503,815, Sep. 6, 1974, abandoned. This application Sep. 1, 1977, Ser. No. 829,815
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1973, 2345738
Int. Cl.² C21D *9/52*
U.S. Cl. 148—12.4 **11 Claims**

1. A process of making a steel wire of high strength and good cold drawing properties, the said process comprising
(a) after hot rolling the wire bringing it to a temperature between about 850° and 910° C. so as to obtain a fine grain austenite structure in the wire;
(b) thereafter quenching the wire to cool it to a temperature of about 500° C.;
(c) coiling the wire after said quench and finally cooling it to room temperature,
the said quench being carried out in a manner that a transformation to martensite occurs which is limited to the outer surface of the wire not to exceed 33 percent of the cross sectional area of the wire,
the still substantially higher temperature of the core after the quench causing a substantially isothermal transformation of the austenite of the core to pearlite with only a small fraction of ferrite and further causing a tempering of the martensite surface portion,
whereby a product with a martensite outer surface of the said maximum diameter and an inner core of pearlite is obtained having a temper gradient from the surface to the core.

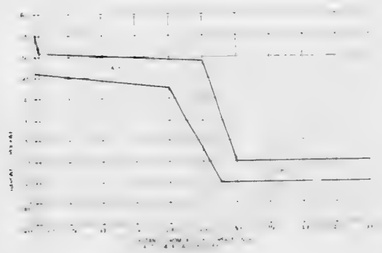
4,180,419
SOLDER FLUX
Floyd A. Thompson, Jr., North Carver, Mass., assignor to M. W. Dunton Company, Providence, R.I.
Filed May 23, 1978, Ser. No. 908,702
Int. Cl.² B23K *35/34*
U.S. Cl. 148—23 **22 Claims**

1. A composition of fluxing agent with a water soluble carrier wherein the fluxing agent consists essentially of a phosphoric ester which is the reaction product of stochiometric amounts of phosphoric acid and a polyhydric alcohol, the alcohol having a molecular weight of about 200.

4,180,420
RAZOR BLADES
Suri A. Sastri, Stow, and Ben H. Alexander, Weston, both of Mass., assignors to The Gillette Company, Boston, Mass.
Filed Dec. 1, 1977, Ser. No. 856,732
Int. Cl.² C22C *38/22*
U.S. Cl. 148—37 **2 Claims**

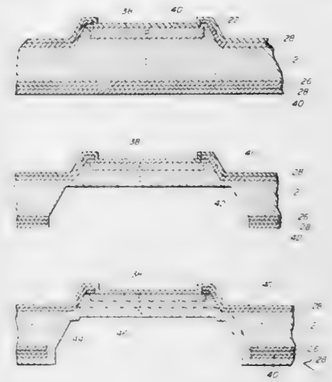
1. A martensitic stainless steel razor blade; said blade comprising 0.30% to 0.45% carbon; 11% to 16% chromium; 0 to 2.5% molybdenum; 0 to 4% tungsten; 0 to 0.70% silicon; 0 to 1.5% manganese, and the balance iron with incidental impurities and said blade having a fine carbide microstructure comprising about 200 to 500 carbides per 100 square microns.

4,180,421
TORSION BAR AND METHOD OF FORMING THE SAME
George L. Joseph, Morgan Hill, Calif., and Charles A. Brolin, Cedar Rapids, Iowa, assignors to FMC Corporation, San Jose, Calif.
Division of Ser. No. 863,558, Dec. 22, 1977, Pat. No. 4,131,491. This application Sep. 21, 1978, Ser. No. 944,421
Int. Cl.² C21D *9/28, 9/30*
U.S. Cl. 148—150 **10 Claims**



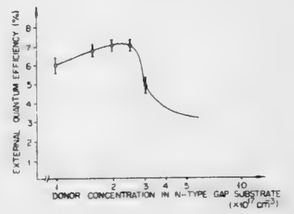
1. A method of forming a torsion bar or the like having an outer case and a core from a steel alloy bar of the desired size and shape and with a medium carbon content, or from a steel bar having similar hardenability characteristics; comprising the steps of through hardening the bar to a predetermined hardness of about Rockwell C 30 to C 40, case hardening the bar for transforming austenite in the case into martensite which expands inducing a high compressive stress near the surface of the bar with the compressive stresses diminishing radially inward to the center of the bar, and retaining the core at a temperature below the transformation temperature for resisting expansion of both the case and the core and for inducing hoop and axial compressive stresses and radial tensile stresses in the case.

4,180,422
METHOD OF MAKING SEMICONDUCTOR DIODES
Warren C. Rosvold, Sunnyvale, Calif., assignor to Raytheon Company, Lexington, Mass.
Division of Ser. No. 255,284, May 19, 1972, abandoned, which is a division of Ser. No. 86,960, Nov. 4, 1970, Pat. No. 3,746,587, which is a continuation of Ser. No. 795,977, Feb. 3, 1969, abandoned. This application Dec. 6, 1973, Ser. No. 422,396
The portion of the term of this patent subsequent to Jan. 21, 1986, has been disclaimed.
Int. Cl.² H01L *21/306, 21/76*
U.S. Cl. 148—175 **15 Claims**



1. The method of forming a semiconductor structure comprising the steps of:
(a) etching into a surface of a layer of silicon material, such surface lying in a <100> crystallographic plane of such material, to form walls in such material with sides parallel to a <111> crystallographic plane of such material;
(b) forming a layer of insulating material over the walls; and,
(c) forming a layer of conductive material over the layer of insulating material.

4,180,423
METHOD OF MANUFACTURING RED LIGHT-EMITTING GALLIUM PHOSPHIDE DEVICE
Makoto Naito, Kamakura, and Akinobu Kasami, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan
Continuation-in-part of Ser. No. 514,747, Oct. 15, 1974, abandoned. This application Aug. 24, 1976, Ser. No. 717,505
Claims priority, application Japan, Jan. 31, 1974, 49-12218; Jan. 31, 1974, 49-12219
Int. Cl.² H01L *33/00*
U.S. Cl. 148—171 **4 Claims**



1. A method of manufacturing a red light-emitting gallium phosphide device comprising the steps of forming by liquid phase epitaxial growth an n-type gallium phosphide layer whose donor concentration at the p-n junction ranges between 2×10^{17} cm^{-3} and 5.5×10^{17} cm^{-3} on an n-type gallium phos-

phide substrate whose donor concentration ranges between 1×10^{17} cm^{-3} and 3×10^{17} cm^{-3}: and forming by liquid phase epitaxial growth of a cooling rate ranging between 0.2° and 3° C./min. a p-type gallium phosphide layer whose net acceptor concentration ranges between 1×10^{17} cm^{-3} and 3×10^{17} cm^{-3} in the portion at a distance of not more than 20 microns from the p-n junction.

4,180,424

CONTROL OF BURNING RATE AND BURNING RATE EXPONENT BY PARTICLE SIZE IN GUN PROPELLANTS

Russell Reed, Jr., Ridgecrest, Calif.; John A. Peterson, Brigham City, Utah, and Raymond M. Price, Hollister, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 668,455, Mar. 17, 1976, which is a continuation of Ser. No. 324,451, Jan. 17, 1973, abandoned. This application Jul. 11, 1977, Ser. No. 814,574

Int. Cl.² C06B *45/10*

U.S. Cl. 149—19.4 **7 Claims**

1. A method for controlling the burning rate exponent of a gun propellent comprising a solid binder and an oxidizer consisting essentially of cyclotetramethylenetetranitramine and devoid of coolant and inorganic oxidizers, which comprises reducing the average mean particle diameter of at least the cyclotetramethylenetetranitramine to less than 60 microns sufficient to provide said propellant a burning rate exponent n, as defined by the equation $R=ap^n$, between about 0.9 and 1.3 at a pressure between 10,000 and 50,000 psi.

4,180,425

GELATINE EXPLOSIVE COMPOSITIONS

Bidhan C. Ghosh; Gopal M. Chopra, and Soumendra N. Sen, all of Bihar, India, assignors to Indian Explosives Limited, Bengal, India

Filed Jul. 21, 1978, Ser. No. 926,610

Int. Cl.² C06B *25/30*

U.S. Cl. 149—95 **16 Claims**

1. In a gelatin explosive composition with a marked reduction in the quantities of liquid nitric esters and blasting soluble nitrocotton content, comprising mixtures of liquid nitric esters, blasting soluble nitrocotton, oxidizing salts and fuels, the improved gelatin explosive composition containing at least one dispersing agent.

4,180,426

PROCESS AND APPARATUS FOR MAKING MULTIPLY SHEETS

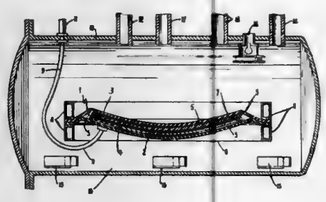
Georges Oustin, and Helmut Krumm, both of Aix-la-Chapelle, Fed. Rep. of Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation of Ser. No. 10,911, Feb. 12, 1970, abandoned. This application Jul. 11, 1974, Ser. No. 487,618

Claims priority, application France, Feb. 17, 1969, 69.03831

Int. Cl.² B32B *17/04*

U.S. Cl. 156—104 **1 Claim**



1. A method of making a multi-ply sheet which comprises assembling an interlayer of thermoplastic adhesive between superposed plies of the sheet to form an assembly, enclosing the assembly within a porous cover, enclosing the assembly and cover within a gas-impermeable flexible sack, enclosing the assembly-and-cover-containing sack within an evacuable container, reducing the gas pressures within said sack and said container to subatmospheric levels while maintaining the pressure level within the container less than the pressure level in the sack, thereafter increasing the temperature and pressure within said container while maintaining a subatmospheric pressure within said sack to seal the edges of said assembly, and thereafter further increasing the pressure in said container above atmospheric pressure and producing a temperature therein to bond said interlayer to the adjacent plies of said assembly.

4,180,427

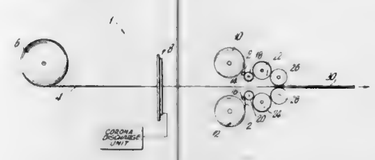
FOAMED THERMOPLASTIC MATERIAL LAMINATED WITH A SHEET-LIKE COVERING MATERIAL

Paul J. Bertsch, Riverdale, N.J., assignor to Primex Plastics Co., Oakland, N.J.

Filed Dec. 16, 1977, Ser. No. 861,562

Int. Cl.² B29C *19/02;* **B65C** *9/25;* **B29H** *7/20*

U.S. Cl. 156—272 **12 Claims**



1. A process for laminating a sheet of covering material onto a surface of a layer of foamed thermoplastic material comprising the steps of cooling and aging for at least 24 hours the layer of foamed thermoplastic material, moving the layer of cooled and aged foamed thermoplastic material along a path of travel, bombarding the surface to receive the sheet of covering material as it moves along the path of travel with a continuous plasma of ionized particles for burning away impurities on the surface and breaking up the film of residual monomer thereon, heating the sheet of covering material to a temperature above the melting point of the thermoplastic material, and applying the heated sheet directly to the bombarded surface of the layer of thermoplastic material as it continues along the path of travel for adhering the sheet and the foamed material and forming a laminated member.

4,180,428

METHOD FOR MAKING HOT-PRESSED FIBER-REINFORCED CARBIDE-GRAPHITE COMPOSITE

Robert E. Riley, and Terry C. Wallace Sr., both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 23, 1978, Ser. No. 918,258

Int. Cl.² B32B *31/12;* **C01B** *31/30*

U.S. Cl. 156—281 **5 Claims**

1. An improved method for making a hot pressed, fiber-reinforced carbide-graphite composite being 15 to 40 volume percent Ta carbide, said improvement comprising:

(a) contacting multiple layers of filaments of a graphite cloth with a gas having the following range of composition by volume percent

(I) 0.5 to 5.0-tantalum pentachloride

(II) 0 to 25-hydrogen chloride (gas)

(III) 50 to 95-hydrogen and

(IV) 0 to 50-inert gas,

(b) the said gas reacting with the filaments to form a coating, said coating being formed in a temperature range of 650° to 900° C.,

(c) at a pressure of 0.01 to 0.3 atmosphere,

(d) the coating time dependent on the amount of Ta carbide formed in the composite, and then,

(e) hot pressing multiple layers of filaments at a temperature of about 3000° C., a pressure of about 3000 psi, for a period of about 10 minutes.

4,180,429

APPARATUS FOR MANUFACTURING THIN-WALLED PLASTIC HOSES

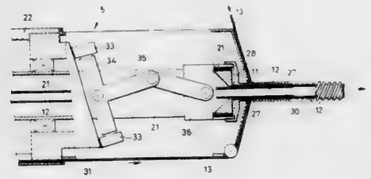
Tassilo Alber, Steinbach, Fed. Rep. of Germany, assignor to Vohran Kunststofferzeugnisse GmbH, Steinbach, Fed. Rep. of Germany

Filed Dec. 29, 1977, Ser. No. 865,388

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1977, 2700056

Int. Cl.² B31C *13/00*

U.S. Cl. 156—425 **13 Claims**



1. An apparatus for continuously manufacturing thin-walled flexible hoses having helican reinforcement members which are relatively strong in relation to the hose walls comprising:

supply means for continuously supplying and advancing a hose core along a predetermined path;

means for supplying compressed gas to the interior of said hose core to create an internal pressure therein;

counterpressure means containing compressed gas disposed along said path for substantially equalizing the pressure difference on the wall of the advancing hose core;

means disposed along said path for coiling a reinforcement member comprising:

fixed tube means for passing therethrough the advancing hose core coming from the supply means;

reel means for mounting the reinforcement member thereon;

a hollow shaft means rotatably mounted on said tube means for rotatably mounting said reel means; and

means for driving said reel means and said shaft means to pay out and coil said reinforcement member;

fixed guide means disposed at the exit of said fixed tube means and the coiling point of said cooling means for guiding the reinforcement member to the hose core, said guide means projecting with an axial length corresponding to the thickness of several turns of the reinforcement member beyond the coiling point such that a plurality of said turns are accumulated along the external surface of said guide means; and

ram means for applying an intermittent pressure in an axial direction against the respective last turn of said plurality for axially displacing said turns of the reinforcement member on the guide means to successively supply the first turn thereon to the surface of said hose core.

4,180,430

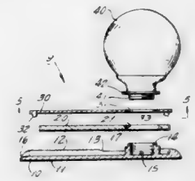
ENVELOPE SEALING DEVICE

Charles S. Gelman, 1477 E. 10th St., Brooklyn, N.Y. 11230

Filed Jan. 17, 1979, Ser. No. 4,033

Int. Cl.² B29H *9/00;* **B05C** *11/00*

U.S. Cl. 156—441.5 **4 Claims**



1. An envelope sealing device of the type adapted to be moved across an unsealed envelope to moisten the flap of the envelope and then moved back over the flap to press the flap into sealing engagement with the remainder of the envelope consisting of a moistening pad and three assembled parts,

a first of said parts being a base portion having curvilinear shape, a smooth uninterrupted bottom, a peripheral rim extending upwardly from the bottom providing a thin chamber adapted to hold a moistening pad, a threaded tubular projection extending upwardly from said chamber and containing a small orifice connecting the interior of said tubular projection to the thin chamber, said peripheral rim being connected to the periphery of the bottom by a smooth convex curvilinear surface and said rim containing two opposed smoothly curved depressions therein,

said moistening pad having a shape and thickness approximately matching the shape and depth of the thin chamber formed by the rim of the first part and containing an opening therein adapted to fit over the threaded tubular projection in said chamber,

the second of said parts consisting of a cover means adapted to fit over and cover the moistening pad, said cover means containing an opening adapted to fit over the projecting tubular portion to aid in positioning the cover over the moistening pad, said cover also containing a downwardly extending arcuate bead in the area between the two opposed depressions of said rim where the cover is in place over the pad, said cover also containing a downwardly extending stud in the area opposite the bead to limit rotation of the cover with respect to the tubular projection in one direction when the cover is not pressed against said pad,

said third part comprising a decorative outer surface with an internal hollow chamber and a threaded tubular projecting portion adapted to match the threads of said projection from the base, said hollow chamber being closed except for the opening to said tubular projection, said chamber part being adapted to press against said cover part when screwed onto said tubular projection, the length of said tubular projection being adjusted and arranged so as to leave the orifice in said tubular projection open to the hollow chamber.

4,180,431

TAPE SPLICING DEVICE

Anthony L. Gelardi, Box 127, Cape Porpoise, Me. 04104

Filed Jan. 10, 1979, Ser. No. 2,468

Int. Cl.² B31F *5/00*

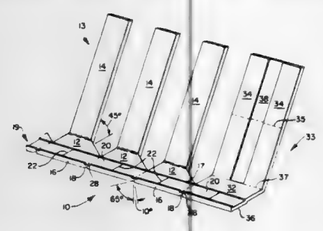
U.S. Cl. 156—505 **10 Claims**

1. A tape splicing device comprising:

an elongated bar member having as a part thereof means for positioning and supporting abutting ends of a tape to be spliced, and

said elongated bar member also having as a part thereof at least two detachable splice sticks each with a head portion

having and supporting a short section of splicing tape thereon and a handle portion for use in manipulating the



head portion to apply the short section of splicing tape to the ends of recording tape to be spliced.

4,180,432

PROCESS FOR ETCHING SiO_2 LAYERS TO SILICON I A MODERATE VACUUM GAS PLASMA

Harold A. Clark, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1977, Ser. No. 861,796

Int. Cl.² B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—643 **4 Claims**

1. A process for etching a layer of silicon dioxide in contact with silicon comprising forming a silicon nitride mask on the surface of the silicon dioxide, said mask having apertures through which the silicon dioxide layer is etched, and exposing the silicon dioxide to a gas plasma formed from a mixture of CF_4 and oxygen, wherein the mixture comprises above about 5 to about 15 percent by volume of CF_4 and the remainder oxygen, to etch the silicon dioxide down to the silicon surface.

4,180,433

PRODUCTION OF IMPROVED CHRYSOTILE ASBESTOS FIBRES

Roger W. Glass, Oakville, and Richard A. Kuntze, Mississauga, both of Canada, assignors to Ontario Research Foundation, Sheridan Park, Canada

Continuation-in-part of Ser. No. 682,854, May 3, 1976, abandoned. This application Aug. 15, 1977, Ser. No. 824,929

Int. Cl.² D21B *1/02*

U.S. Cl. 162—3 **11 Claims**

1. A method for the production of chrysotile asbestos fibres having improved filtration properties in asbestos-cement uses, which comprises heating chrysotile asbestos fibres selected from Group 4 and Group 5 chrysotile asbestos fibres having a filtration rate in asbestos cement uses of about 11 to about 12 ml/sec in an ambient atmosphere having a substantially uniform temperature of about 400° to about 600° C. for a time from about 1 to about 5 hours sufficient to increase the filtration rate of said fibres in asbestos cement uses to at least about 19 ml/sec and insufficient to result in a loss of water of crystallization of the fibres of greater than about 2% by weight of the total weight of water of crystallization in the fibres, whereby said improved filtration properties are obtained without any significant overall fibre strength loss.

4,180,434

MICA PAPER CONTAINING CELLULOSE

Jean A. Ciani, Valdoie, France; Ernst Diehl, and Berno Haberthür, both of Breitenbach, Switzerland, assignors to Schweizerische Isola-Werke, Breitenbach, Switzerland

Continuation-in-part of Ser. No. 652,781, Jan. 27, 1976, abandoned. This application Dec. 15, 1977, Ser. No. 862,272

Int. Cl.² D21H *3/66*

U.S. Cl. 162—138 **4 Claims**

1. An electrically insulating mica paper containing cellulose, but no binding agent and having a tensile strength and a porosity higher than those of pure mica paper, the tensile strength being sufficiently high for the mica paper to be processed without a backing, characterized in that the mica paper contains (i) at least about 50% by weight of platelets of natural mica produced without using chemicals other than water, said mica platelets having diameters in the range of 0.025 to 1 mm and a thickness in the range of 1,000–30,000 Angstrom units and (ii) about 10 to 50% by weight of cellulose fibres, said mica paper has an impregnatability according to ASTM 202-73 in the range of about 35 to 50 seconds, and a porosity according to Bekk in the range of about 6 to 15 seconds per 10 milliliters.

4,180,435

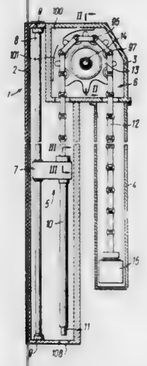
REFUELLING MACHINE FOR NUCLEAR REACTOR

Evgeny P. Shumyakin, ulitsa Petra Smorodina, 8, kv. 58; Konstantin I. Sabir-de-Ribas, Piskarevsky prospekt, 39, kv. 256; Isaak A. Druzhinsky, Moskovsky prospekt, 184, kv. 12; Gennady P. Shishov, ulitsa Kurchatova, 4, kv. 89, and Boris I. Andreichikov, Chkalovsky prospekt, 36, kv. 27, all of Leningrad, U.S.S.R.

Filed May 25, 1977, Ser. No. 800,289

Int. Cl.² G21C *19/20*; B66C *17/08*

U.S. Cl. 176—30 **20 Claims**



1. A manipulating means of a refuelling machine for a nuclear reactor having fuel assemblies in its core, comprising:
walls defining a sealed housing;
a gripping means for applying forces to a fuel assembly to be handled, having an end face and arranged in said housing:
a drive coupled to said gripping means for transmitting force thereto, said drive comprising an electromotor having an output shaft, a driving member coupled to said output shaft, a sprocket kinematically coupled to said driving member, an axle installed in the walls of said sealed housing with a predetermined amount of radial clearance between the walls and the axle and having first and second ends extending from said sealed housing, said sprocket being mounted on said axle, a chain in contact with said sprocket and having a first end and second end, the chain carrying said gripping means at its second end, a counterweight attached to the first end of said chain;
means for regulating forces applied to said gripping means comprising a first force sensing transducer mounted on said sealed housing and having a sensitive element connected to the first of the two ends of said axle extending outside said sealed housing, said first force sensing transducer sensing translatory movement of said first end, a second force sensing transducer mounted on said sealed housing and having a sensitive element connected to the second of the two ends of said axle extending outside said sealed housing, said second force sensing transducer sensing translatory movement of said second end, and circuit means responsive to said first and second force sensing transducers for controlling said electromotor so that forces applied to said gripping means by said drive and forces applied by said gripping means on said fuel assembly are controlled; and
a spring suspension member installed in said gripping means for absorbing a predetermined amount of force applied by said drive to said gripping means when the fuel assembly being handled encounters an obstacle to its movement.

4,180,436

ANTIBACTERIAL COMPOUNDS AND PROCESS FOR PRODUCTION THEREOF

Gakuzo Tamura, and Kenichi Shimizu, both of Tokyo, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

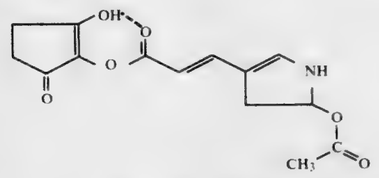
Filed Feb. 17, 1978, Ser. No. 878,776

Claims priority, application Japan, Feb. 18, 1977, 52-16068

Int. Cl.² L12D *9/00*

U.S. Cl. 435—119 **2 Claims**

1. A process for producing compound S551-II represented by the formula



which comprises culturing a microorganism having the identifying characteristics of *Streptomyces griseorubiginosus* FERM-P No. 3836, NRRL 11,268 in a nutrient medium until said compound is accumulated in the culture liquor and recovering said compound from said culture liquor.

4,180,437

PURIFICATION OF ANTISERUM FOR THROMBOSIS TEST

Désiré J. Collen, Winksele, Belgium, assignor to Leuven Research & Development V.Z.W., Leuven, Belgium

Filed Mar. 1, 1977, Ser. No. 773,308

Claims priority, application Netherlands, Mar. 8, 1976, 7602422

Int. Cl.² C07G *7/00*; G01N *31/00, 31/14*

U.S. Cl. 435—7 **14 Claims**

1. A method for purifying an antiserum which has been generated against an enzyme-inhibitor-complex, said complex being part of the activated blood-coagulation-or fibrinolytic system in bloodplasma, comprising the steps of:
(a) immunoprecipitating a freshly generated antiserum with fresh human bloodplasma and thereby forming a precipitate and a remaining fluid; and
(b) subjecting the said remaining fluid to chromatographic separation over an insolubilized enzyme-inhibitor-complex, said complex corresponding to the enzyme-inhibitor-complex against which the antiserum has been generated, in order to separate a purified antiserum from said remaining fluid.

4,180,438

PROCESS FOR THE PREPARATION OF SUMP PRODUCT

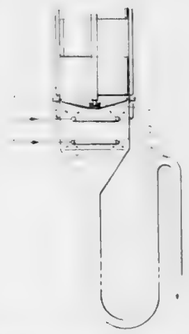
Hans-Walter Brandt, Odenthal; Ludwig Deibele, Cologne; Kurt Toepffer, and Karl-Heinz Steinacker, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 596,706, Jul. 17, 1975, abandoned. This application Sep. 16, 1976, Ser. No. 724,052

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1974, 2438290

Int. Cl.² B01D *1/22*

U.S. Cl. 203—89 **7 Claims**



1. In the distillation of a solution comprising an organic substance, and non-volatile material which is precipitated as solid in the distillation, in a thin layer evaporator, comprising the steps of distilling the solution in the thin layer evaporator to evaporate the organic substance as overhead distillate product of the distillation and precipitate the non-volatile material as solids, collecting the precipitated solids as sump products, and adding a solvent which is at a lower temperature than the walls of the evaporator to the sump to take up the precipitated solids and removing the solvent containing the solids from the sump, the improvement which comprises introducing the solvent from outside the evaporator directly into the sump and providing a vapor lock adjacent to and above the level of the introduction of the solvent by injecting a stream of inert vapor through a first spray ring obliquely and upwardly and opposite the direction of the solvent to prevent condensation of distillate vapors by the solvent.

4,180,439

ANODIC ETCHING METHOD FOR THE DETECTION OF ELECTRICALLY ACTIVE DEFECTS IN SILICON

John L. Deines, Pleasant Valley; Michael R. Poponiak, Newburgh, and Robert O. Schwenker, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

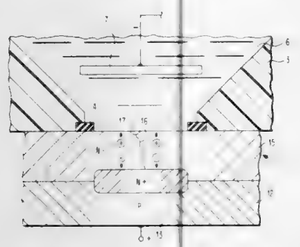
Continuation of Ser. No. 667,232, Mar. 15, 1976, abandoned. This application Jul. 25, 1977, Ser. No. 818,476

Int. Cl.² G01N *27/46*

U.S. Cl. 204—1 T **4 Claims**

1. The method comprising
providing an N^- type silicon wafer containing active device regions of known depth below a surface of said wafer,
mounting said wafer on an electrically conductive member so as to expose said surface of said wafer, and to cover the entire opposite surface of said wafer,
contacting said surface of said wafer with a hydrofluoric acid solution of concentration less than about 15%,
applying a potential difference between said solution and said member making said solution negative with respect to said member, and

setting the amplitude of said potential difference solely in accordance with the desired depth of the depletion region created thereby so that said depletion region is created below said surface of said wafer having a depth no greater



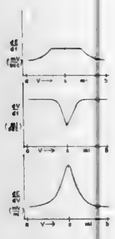
than said depth of said active device regions, whereby etch pits are formed in said surface of said wafer overlying electrically active defects within said active device regions.

4,180,440

VARIABLE ENDPOINT ANALYZER

Dennis A. Gibboney, Mt. Pleasant; John T. Schneider, Apollo, and Jerry C. Premus, Scottdale, all of Pa., assignors to Fisher Scientific Company, Pittsburgh, Pa.

Filed May 15, 1978, Ser. No. 905,572
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—1 T **19 Claims**



1. In the method of potentiometrically titrating a sample to an unknown endpoint or endpoints including: delivering a titrant to the sample until an endpoint or endpoints are reached; continuously monitoring the volume of the titrant delivered to the sample; and continuously monitoring the potential of the sample during titration, the improvement comprising accurately determining said endpoint or endpoints by the steps of:

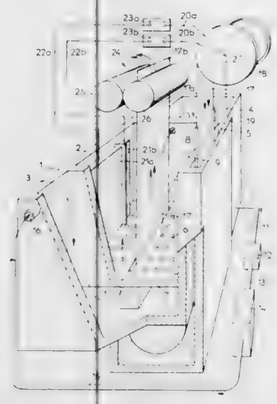
(a) generating a first signal proportional to the rate of change with respect to time in sample potential during titration;
(b) generating a second signal proportional to the titrant delivery rate with respect to time during titration;
(c) dividing said first signal by said second signal to produce a third signal proportional to the change in potential with respect to the change in volume; and
(d) monitoring said third signal to identify a signal corresponding to said endpoint or endpoints.

4,180,441

PROCESS FOR MAKING NEGATIVE ELECTRODES FOR ELECTROCHEMICAL GENERATORS, AND THE NEGATIVE ELECTRODES THUS OBTAINED

Bernard Stiker, Paris, and Fernand Jolas, Rueil Malmaison, both of France, assignors to Societe les Piles Wonder, France

Filed May 23, 1978, Ser. No. 908,783
Claims priority, application France, May 24, 1977, 77 15843
Int. Cl.[2] C25C *5/02, 1/16*
U.S. Cl. 204—2.1 **7 Claims**



1. A manufacturing process for a material coated with an active material deposit for making negative electrodes for electrochemical generators, wherein a powdery layer relatively little adherent and fragile is being deposited on a continuous metallic tape by passing said metallic tape continuously, negatively polarized, through an electrolytic bath containing ions of the active metal to be deposited, the bath being disposed in an electrolysis vat containing an electrode of said active metal, and said powdery layer being consolidated by subjecting said tape coated with a powdery layer, at the outlet of said bath, to a calendering operation, characterized in that there is provided a laminar flow of the bath in the whole area of the vat comprising said tape and the electrode which is positively polarized, and by the fact that said vat comprises also a non-active metal electrode which is also positively polarized, the ratio between the anodic current at the active metal electrode and the total anodic current applied to the two electrodes being substantially equal to the electrodeposition efficiency of the active metal of the tape in the vat.

4,180,442

ELECTRODEPOSITION OF COATINGS ON METALS TO ENHANCE ADHESIVE BONDING

Norman R. Byrd, Villa Park, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jun. 14, 1978, Ser. No. 915,319
Int. Cl.[2] C25D *9/04, 9/06*
U.S. Cl. 204—14 N **32 Claims**

1. A process for enhancing adhesive bonding of a metal substrate and permitting spot welding thereof, which comprises passing an electric current through a non-aqueous electrolyte in which a metal substrate is the anode, the metal of said substrate being active and capable of forming an organometallic compound, said electrolyte containing an organic compound selected from the classes consisting of (a) carboxyl substituted aminosilanes, (b) butylamine reaction products with phthalic anhydride, decylamine reaction products with phthalic anhydride, and carboxyl terminated butadiene-acrylonitrile copolymer, and (c) phenyl phosphonic acid, and

dimethyl phosphite, as their triethylamine salts, and sulfonic acid compounds.

4,180,443

METHOD FOR COLORING ALUMINUM

George R. Darrow, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 920,057, Jun. 28, 1978, abandoned. This application Dec. 26, 1978, Ser. No. 972,928
Int. Cl.[2] C25D *11/22*
U.S. Cl. 204—35 N **13 Claims**

1. In a process for electrolytically coloring articles of aluminum or aluminum alloys, wherein an alternating current is passed between an electrode system comprising a previously anodized aluminum article and a counterelectrode immersed in an acidic bath containing salts of metals capable of coloring the anodized layer, the improvement which comprises,

anodizing said aluminum article prior to coloring in an aqueous acid electrolyte comprising from about 12–24 weight percent sulfuric acid, and from 1–4% by volume of a polyhydric alcohol of from 3 to 6 carbon atoms and 1–4% by volume of an organic carboxylic acid containing at least one reactive group in the alpha-position wherein said reactive group is a hydroxy, amino, keto or carboxyl group, and carrying out the anodizing at a temperature of from 65°–85° F. at a current density of from 24–36 amperes/sq. ft., so as to obtain an anodized layer of from about 0.6 to 1.1 mils.

4,180,444

ELECTROLYTIC METHODS EMPLOYING GRAPHITIC CARBON CATHODES AND INORGANIC COMPLEXES PRODUCED THEREBY

George G. Merkl, Haworth, N.J., assignor to Merkl Technology, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 795,979, May 11, 1977, abandoned. This application Apr. 17, 1978, Ser. No. 896,372
Int. Cl.[2] C25B *1/00*
U.S. Cl. 204—90 **24 Claims**

1. An electrolytic method for producing water-soluble inorganic complexes containing graphitic carbon which comprises passing an electric current between

(a) a graphitic carbon cathode; and
(b) a sacrificial graphite carbon anode, the current being passed through
(c) an electrolyte comprising an aqueous solution of a compound capable of reduction or hydrogenation to a hydride species at the graphitic carbon cathode,

whereby said compound is converted to a hydride species at the graphitic carbon cathode and the hydride species reacts with the sacrificial graphitic carbon anode to form the water-soluble, inorganic complex containing graphitic carbon.

4,180,445

OXYGEN SELECTIVE ANODE

John E. Bennett, and Joseph E. Elliott, both of Painesville, Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Mar. 27, 1978, Ser. No. 890,374
Int. Cl.[2] C25B *1/02, 11/16*
U.S. Cl. 204—129 **4 Claims**

1. A method of electrolysis comprising passing an electric current through an aqueous electrolyte containing chloride ions between an anode and a cathode whereby oxygen gas is formed at the anode and the cation is reacted at the cathode along with the evolution of hydrogen gas, the anode comprising an electrically conductive substrate bearing on at least a portion of the surface thereof an amorphous manganese dioxide coating.

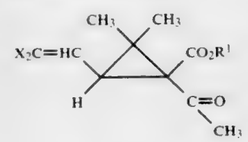
4,180,446

METHOD OF PREPARING DIHALOGEN VINYL CYCLOPROPANECARBOXYLIC ACID ESTERS

Hans-Georg Schmidt, Niederkassel, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

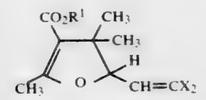
Filed Aug. 28, 1978, Ser. No. 937,622
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1977, 2740479; Mar. 23, 1978, 2812672; Mar. 23, 1978, 2812673; Jun. 9, 1978, 2825363
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—158 R **8 Claims**

1. A method of preparing a dihalogn vinyl cyclopropane carboxylic acid ester of the formula



I

wherein R^1 is a straight-chain or branched alkyl radical and X represents chlorine or bromine which comprises subjecting a dihalogen vinyl dihydrofuran of the formula



II

wherein R^1 and X have the meanings given above to exposure to ultraviolet light or light having an ultraviolet content.

4,180,447

PROCESS FOR THE PRODUCTION OF HARD PLASTIC FOAMS USING A POLYVINYLCHLORIDE BASE

Drago Sencar, Steinhausen, Switzerland, assignor to Lonza Ltd., Gampel, Switzerland

Continuation-in-part of Ser. No. 758,131, Jan. 10, 1977, abandoned. This application Sep. 11, 1978, Ser. No. 941,208
Int. Cl.[2] C08F *8/00*
U.S. Cl. 204—159.17 **11 Claims**

1. A process for the production of hard plastic foam, using a polyvinylchloride base, from a mixture of polyvinylchloride, at least one temporary softener and at least one expansion agent, wherein the mixture is heated, cooled and expanded, the improvement consisting of using at least one polymerizable ethylenically unsaturated monomer having at least one double linkage as a softener and conducting the polymerization of said polymerizable monomer, after completion of the expansions, by means of ionizing rays, the dosage of the ionizing rays being between 3 and 15 megarads.

4,180,448

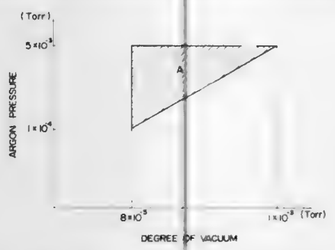
PROCESS FOR PREPARATION OF PLASTIC MOLDED ARTICLES HAVING METAL FILM

Yoshikazu Soshiki; Hiroshi Sugiura, both of Okazaki; Kouzi Onizawa, Anjyo; Toshikatsu Togawa, Aichi; Minoru Kojima, Inuyama; Tsukio Morikawa, Aichi; Naohiko Kurimoto, Yokohama, and Hiromitu Katou, Kasugai, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo; Sakae Riken Kogyo Co., Ltd., Aichi and Dai Nippon Toryo Co., Ltd., Osaka, all of, Japan

Filed Dec. 13, 1978, Ser. No. 969,000
Claims priority, application Japan, May 22, 1978, 53-61194
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—192 C **6 Claims**

1. A process for the preparation of plastic molded articles

having a metal film, which comprises the steps of (a) coating an ultraviolet-curing acrylic resin undercoating paint on the surface of a plastic molded article and irradiating the coated surface with ultraviolet rays to form a base coat layer, (b) forming on the base coat layer a metal film of chromium or stainless steel by the sputtering process under conditions of a



degree of vacuum of 6×10^{-5} to 1×10^{-3} Torr, an argon pressure of 1×10^{-4} to 5×10^{-3} Torr, a voltage of 200 to 600 V and a cathode current density of 0.2 to 5 A/dm^2, and (c) coating on the metal film a top coating paint comprising as main components an acryl polyol having an OH value of 10 to 200 and an acid value of 1 to 12 and a non-yellowing polyisocyanate and curing the coated paint to form a top coat layer.

4,180,449

BONDED ASBESTOS DIAPHRAGMS AND MATS

Henrik R. Heikel, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 18, 1978, Ser. No. 943,020
Int. Cl.^{2} C25B *13/00, 13/06, 13/08*
U.S. Cl. 204—296 **30 Claims**

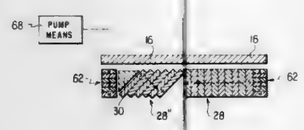
1. A porous, fibrous asbestos-containing mat characterized by having the asbestos fibers bonded to one another by the pyrolysis products of a hydrolyzed organic titanate.

4,180,450

PLANAR MAGNETRON SPUTTERING DEVICE

Charles F. Morrison, Jr., Boulder, Colo., assignor to Vac-Tec Systems, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 935,358, Aug. 21, 1978. This application Sep. 27, 1978, Ser. No. 946,370
Int. Cl.^{2} C23C *15/00*
U.S. Cl. 204—298 **30 Claims**



1. In a planar magnetron sputtering device including a cathode of target material having a planar sputtering surface, at least a portion of which is disposed about a center line perpendicular to said surface, an anode adapted for establishing an accelerating electric field between said anode and cathode, and magnetic means for establishing a magnetic field adjacent the planar sputtering surface of said cathode for lengthening the path traveled by electrons removed from said cathode, and wherein the lines of force of the magnetic field extend over the sputtering surface of said cathode and pass through the cathode in the vicinity of said center line,

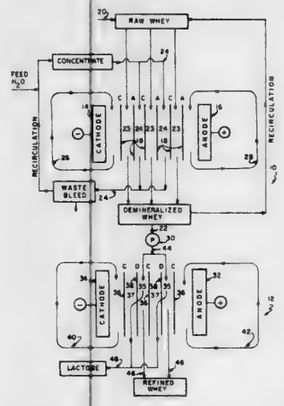
the improvement where said magnetic means includes first magnet means for causing a majority of said magnetic lines of force to pass through said cathode in the vicinity of said center line at angles of 45° or less with respect to said planar surface to thereby enhance the uniformity of cathode erosion and where said magnetic means includes further magnet means for causing the magnetic lines of force to be substantially perpendicular to said sputtering surface of the cathode at the approximate periphery thereof.

4,180,451

APPARATUS FOR TREATING WHEY

Wayne A. McRae, Pelham, N.H., assignor to Ionics Inc., Watertown, Mass.

Division of Ser. No. 897,834, Apr. 19, 1978, Pat. No. 4,146,455. This application Jan. 2, 1979, Ser. No. 454
Int. Cl.^{2} B01D *13/02*
U.S. Cl. 204—301 **3 Claims**



1. Apparatus for the treatment of liquids comprising an electrodialysis membrane cell for desalting said liquid having substantially alternating desalting and concentrating chambers in combination with a forced flow electrophoresis membrane cell having substantially alternating feed and permeate chambers with conduit means for passing the said resulting desalted liquid from said electrodialysis cell into the said feed chambers of said electrophoresis cell while said desalted liquid is under hydraulic pressure means.

4,180,452

METHOD FOR HYDROGENATION OF COAL

Jerry E. Sinor, Longmont, Colo., assignor to Cameron Engineers, Inc., Denver, Colo.

Filed Aug. 22, 1977, Ser. No. 826,731
Int. Cl.^{2} C10G *1/04, 1/08*
U.S. Cl. 208—8 LE **8 Claims**

1. A method for hydrogenating coal comprising the steps of:

pulverizing and drying the coal;

saturating the dried, pulverized coal with methanol;

slurrying the methanol saturated coal in benzene to form a coal-benzene slurry;

exposing the coal-benzene slurry to microwave energy for a period of time sufficient to effect hydrogenation of the coal; and

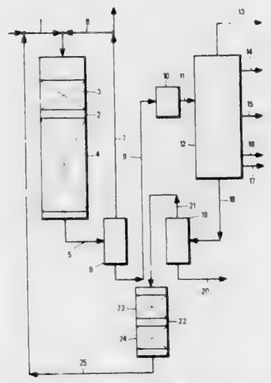
collecting and separating the hydrogenation products.

4,180,453

PROCESS FOR THE STEAM-CRACKING OF HEAVY FEEDSTOCKS

Jean-Pierre Franck, Bougival; Edouard Freund; Jean-François Le Page, both of Rueil Malmaison, and Jean Miquel, Paris, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Feb. 10, 1978, Ser. No. 876,825
Claims priority, application France, Feb. 11, 1977, 77 04151
Int. Cl.^{2} C10G *37/00*
U.S. Cl. 208—57 **5 Claims**



1. A process for treating a hydrocarbon charge of initial boiling point higher than about 150° C., selected from the atmospheric gas oils, vacuum gas oils and deasphalted residues, the charge containing at least 10% by weight selected from monocyclic and polycyclic aromatic hydrocarbons, comprising the steps of:

(a) passing a mixture of said hydrocarbon charge with a recycle fraction as hereinafter defined through a catalyst bed in the presence of hydrogen to hydrogenate olefins present in said mixture, at a temperature between 280° and 400° C., said temperature being lower than the hydrotreating of step (b), said catalyst bed containing at least one sulfide of a metal from group VI B and at least one sulfide of a metal from group VIII of the periodic classification of the elements, and a carrier having an acidity corresponding to a heat of ammonia absorption lower than $\Delta H=0.06$, measured at a pressure of 10^{-4} mm Hg;

(b) subjecting resultant effluent from step (a) to a hydrotreatment to separate nitrogen and sulfur and to hydrogenate the monocyclic and polycyclic aromatic hydrocarbons therein, at 340°–420° C., in the presence of hydrogen gas and a catalyst comprising 1–30% by weight of at least one sulfide of a metal selected from tungsten and molybdenum, and at least one sulfide of a metal selected from cobalt and nickel, and an acidic carrier selected from aluminas, alumina-silicas, boron-aluminas, fluorinated aluminas and magnesia-silicas;

(c) subjecting at least a portion of resultant effluent from the hydrotreatment of step (b) to a steam-cracking step;

(d) withdrawing from the steam-cracking step a gas oil fraction distilling at about 150°–400° C., light hydrocarbons and a gasoline fraction;

(e) subjecting at least a portion of said gas oil fraction from step (d) to hydrogenation at 150°–260° C. under a pressure of 30 to 130 bars, at a L.H.S.V. of from 1 to 5, in the presence of a catalyst selected from a platinum group metal or at least one sulfided metal from group VI B and VIII of the periodic classification of elements, and a carrier selected from the group consisting of alumina and silica having a specific surface of between 10 and 100 m^2/g, said hydrogenation effecting a decrease of the total content of alkenylaromatic hydrocarbons and indenes in said gas oil fraction to less than 1% by weight; and

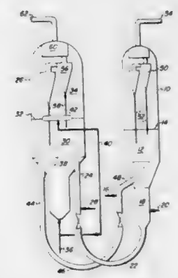
(f) admixing resultant effluent from step (e) as said recycle fraction with said hydrocarbon charge to form said mixture which is passed through said catalyst bed of step (a), the amount of said admixed recycle fraction being at least 10% by weight of said hydrocarbon charge.

4,180,454

METHOD FOR COMBUSTING CARBON MONOXIDE IN A FLUID CATALYTIC CRACKING PROCESS

Edward C. Luckenbach, Mountainside, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 3, 1978, Ser. No. 866,497
Int. Cl.^{2} C10G *11/04;* **B01J** *8/24, 23/94*
U.S. Cl. 208—113 **7 Claims**



1. In a fluidized catalytic cracking process which comprises contacting a hydrocarbon feedstock with a cracking catalyst in a reaction zone under cracking conditions to produce cracked hydrocarbon vapors and coke contaminated catalyst, wherein said coke contaminated catalyst is regenerated in a regeneration zone under regeneration conditions by contact with an oxygen-containing regeneration gas thereby forming a regenerated catalyst and a flue gas containing carbon monoxide, the catalyst in the regeneration zone being fluidized by the upward flow of said regeneration gas to form a dense phase catalyst bed and a dilute catalyst phase which are separated by an interface, the improvement which comprises passing a portion of said regeneration gas into a gas distribution means located at about the interface between said dense phase catalyst bed and said dilute catalyst phase to thereby combust at about the interface at least a portion of the carbon monoxide in said flue gas.

4,180,455

PROCESS FOR THERMAL CRACKING A HEAVY HYDROCARBON

William Taciuk, Calgary, Canada, assignor to Alberta Oil Sands Technology and Research Authority, Edmonton, Canada

Division of Ser. No. 828,119, Sep. 26, 1977. This application Dec. 23, 1977, Ser. No. 864,087
Int. Cl.^{2} C10G *9/20*
U.S. Cl. 208—126 **1 Claim**

1. A process for upgrading heavy hydrocarbons, such process employing direct thermal treatment effected in an apparatus having horizontal, concentric, radially spaced inner and outer rotatable tubes in which one axial end is the feed end and the opposite axial end is the product end, said inner tube forming an open cylindrical vapor zone, said tubes forming between them an open annular space having a combustion zone, comprising:

continuously advancing hot particulate solids through the inner tube from the feed end to the product end and back through the annular space;

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spraying the hydrocarbons as a liquid into the vapor zone onto the hot solids;
cascading and mixing the solids and hydrocarbons as they advance through the vapor zone to achieve beneficial heat transfer and thereby vaporize hydrocarbons and form carbon on the solids;
removing by suction the hydrocarbon vapors produced in the inner tube;
transferring carbon-coated solids from the product end of the inner tube into the combustion zone in the annular space;



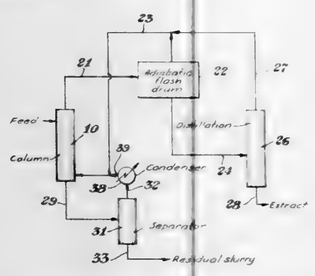
cascading and repeatedly raising and dropping the carbon-coated solids in the combustion zone while introducing oxygen-containing gas thereinto to burn at least part of the carbon and heat the remainder of the solids;
transferring burned hot solids from the feed end of the annular space into the feed end of the inner tube;
removing by suction vapors produced in the combustion zone; and
maintaining seals against gaseous flow between the combustion zone and the vapor zone by a combination of maintaining substantially equal pressures in said zones and blocking gaseous flow with the solids being transferred.

4,180,456

PROCESS FOR RECOVERING A PREMIUM OIL FROM A SLURRY PRODUCED BY HIGH TEMPERATURE HYDROGENATION OF A SOLID, HYDROCARBONACEOUS FUEL

Norman G. Moll, Sanford, and George J. Quarderer, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 809,958, Jun. 27, 1977, abandoned. This application Jun. 19, 1978, Ser. No. 916,674
Int. Cl.[2] C10G *21/14*
U.S. Cl. 208—177 **7 Claims**



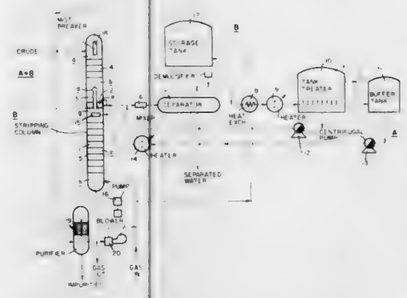
1. An improved process for separating a feed slurry produced by high temperature hydrogenation of a solid hydrocarbonaceous fuel and comprising fine solids, polar liquids and premium liquid oil, into a first fraction comprising the premium liquid oil and a second fraction comprising the fine solids and polar liquids, the process comprising:
(a) contacting the feed slurry with a nonpolar liquid solvent selected from the group consisting of (1) C_5–C_9 aliphatic hydrocarbon, (2) C_5–C_9 alicyclic hydrocarbon and (3) naphthenic or paraffinic fraction of a coal liquefaction product containing less than about 10 weight percent aromatic compounds, said contacting conducted in a vertical column defining an upper settling zone, a contacting zone and a lower collection zone, that portion of the column defining the collection zone having a column wall which is at a temperature at least about 20° C. above the temperature of the column wall defining said contacting zone the settling and contacting zones being operated at a temperature between about 100° C. and about 250° C. and at a pressure sufficient to maintain both the feed slurry and solvent in a liquid state but less than about 450 psi, the feed slurry being introduced into the column at or near the top of the contacting zone and the solvent introduced into the column at or near the bottom of the contacting zone, the solvent and feed slurry being contacted at a solvent:slurry weight ratio of at least about 0.5:1 and contacted in such a manner that the solvent:
(1) passes up and through the column while the feed slurry passes down and through the column;
(2) is in intimate contact with the feed slurry as they simultaneously pass through the column; and
(3) extracts from the feed slurry as they simultaneously pass through the column the premium liquid oil;
(b) recovering from the settling zone of the column as an overflow said first fraction; and
(c) recovering from the collection zone of the column as a viscous slurry underflow said second fraction.

4,180,457

PROCESS FOR DESALTING AND DEHYDRATION OF CRUDE OIL INCLUDING HOT WATER WASHING AND GAS STRIPPING

Valer V. Popp; Ion Suditu; Petre Neagu, all of Cimpina; Leonida Fotescu, Ploiesti; Ion Mihalache, Bucharest, and Dumitru Tirboiu, Cimpina, all of Romania, assignors to Trustul Petrolului Bolintin, Comuna Bolintin din Vale, Romania

Filed Jan. 17, 1978, Ser. No. 870,105
Int. Cl.[2] C10G *33/04, 31/08*
U.S. Cl. 208—188 **2 Claims**



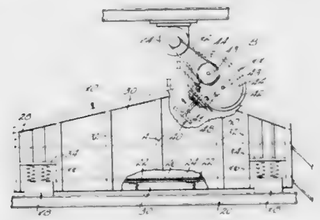
1. A process for desalting and dehydrating a crude oil, comprising the steps of:
(a) washing crude oil obtained from the upper compartment of a stripping column, as hereinafter delineated, with hot water containing a demulsifier thereby producing a mixture of the crude oil and the hot water containing said demulsifier;
(b) separating free water from the mixture produced in step (a) to thereby leave a washed crude oil;
(c) adding to said washed crude oil from step (b) an optimum quantity of a demulsifier and thereafter heating the washed crude oil containing the demulsifier;
(d) settling the heated washed crude oil containing demulsifier and water and separating said water therefrom to leave a treated crude oil and produce water containing demulsifier;
(e) recirculating the water-containing demulsifier from step (d) to step (a);
(f) stripping the treated crude oil of step (d) with a gas to remove volatile hydrocarbons and water in vapor phase from said treated crude oil in countercurrent contact with said gas in a lower portion of a stripping column, thereby recovering crude oil which is stored;
(g) passing the stripping gas containing volatile components and water vapor from the lower portion of said column through an upper compartment of said column to condense the volatile components and the water vapor in said gas by contacting said stripping gas with crude oil prior to passing said oil to washing step (a);
(h) recovering cold stripping gas from step (g); and
(i) recirculating to step (f) at least a portion of the recovered cold stripping gas of step (h) to said lower portion of said column.

4,180,458

VIBRATORY SCREEN HAVING NOISE LEVEL REDUCTION BY ISOLATION

James E. Shahan, Bolingbrook, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Feb. 16, 1979, Ser. No. 12,883
Int. Cl.[2] B07B *1/42*
U.S. Cl. 209—326 **8 Claims**



1. A vibrating screen comprising, in combination, a screen body for moving particulate material and being mounted for vibratory movement, rotatable eccentric mass drive means for vibrating said screen body at a substantially constant frequency which is substantially higher than the natural vibration frequency of said screen body and means for resiliently mounting said drive means on said screen body so that vibratory forces emanating at approximately the fundamental component of said constant frequency from said drive means are transmitted unrestrained to said screen body and vibratory forces which are at harmonics of the fundamental component of said constant frequency are substantially attenuated, said mounting means constituting substantially the sole connection between said drive means and said screen body and the natural vibratory frequency of said resilient mounting means being approximately equal to said constant frequency divided by $\sqrt{2}$.

4,180,459

PROCESS OF MAKING AGRICULTURAL PRODUCT FROM ORGANIC SEWAGE SLUDGE

James F. Zievers, LaGrange, Ill., assignor to Industrial Filter & Pump Mfg. Co., Cicero, Ill.

Filed Dec. 16, 1977, Ser. No. 861,292
Int. Cl.[2] C02C *1/02;* **B01D** *5/00;* **C05F** *3/00*
U.S. Cl. 210—10 **7 Claims**

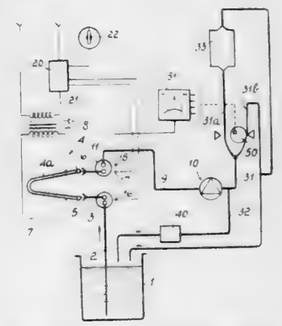
1. A process for dewatering organic sewage sludge to provide an acidic dewatered sludge, comprising the steps of
(a) adding ferric chloride to the organic sludge to lower the pH thereof to about 3.5 or less,
(b) then adding an amount of calcium carbonate to said organic sludge to increase the pH level thereof to a value greater than 3.5 but less than 5.7, and
(c) then dewatering said organic sludge by a mechanical dewatering process,
whereby the resulting dewatered sludge has a pH less than 5.7.

4,180,460

PORTABLE MACHINE FOR REGENERATIVE DIALYSIS

Alessandro Calari, Mirandola, Italy, assignor to Bellco S.p.A., Mirandola, Italy

Filed Dec. 11, 1978, Ser. No. 968,586
Claims priority, application Italy, Jan. 20, 1978, 19480 A/78
Int. Cl.[2] B01D *13/00, 31/00*
U.S. Cl. 210—182 **8 Claims**



1. A portable machine for regenerative dialysis, characterized in that it comprises a reservoir for the dialyzing liquid, a suction duct immersed in said reservoir, a heating element connected to said suction duct, a first element sensing the temperature of the dialyzing liquid interposed between said suction duct and said heating element, a pump with the suction side thereof connected to said heating element, a second element sensing the temperature of the dialyzing liquid interposed between said pump and said heating element, a first and second delivery ducts of said pump opening into said reservoir, a dialyzer element interposed in said first delivery duct, a dialyzing liquid regenerating cartridge interposed in said second delivery duct, a first and second thermal probes respectively associated with said first and second temperature sensing elements, and a temperature adjusting member controlling said heating element and driven by said first and second thermal probes.

4,180,461

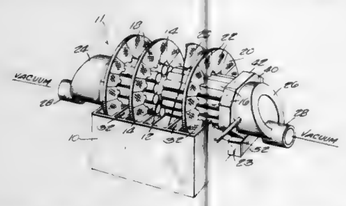
VACUUM SEPARATOR HAVING STAGGERED FILTRATE TUBES

Sigmund C. Langvik, Nesoeya, Norway, assignor to Scanmec A/S, Norway

Filed Apr. 4, 1978, Ser. No. 893,509
Int. Cl.[2] B01C *33/02*
U.S. Cl. 210—333 A **14 Claims**

1. A vacuum separator comprising:
an air pressure source,
a pair of filter discs, each filter disc including a plurality of filter sectors, and
means for alternately connecting said air pressure source first to one of said filter sectors of one of said filter discs and subsequently to one of said filter sectors of the other of said filter discs, said connecting means including a pair of sets of parallel fluid conduits, said filter sectors of one of said filter discs being connected in fluid communication to respective ones of said fluid conduits of one of said sets of

conduits and said filter sectors of said other filter disc being connected in fluid communication to respective ones of said fluid conduits of the other of said sets of fluid conduits, and means for alternately connecting said air



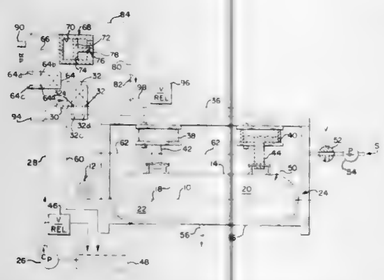
pressure source first to at least one of said conduits of said one of said pair of sets of conduits and subsequently to at least one of said conduits of the other of said pair of sets of conduits.

4,180,462

METHOD AND MEANS FOR FILTERING LIQUIDS

John A. Bos, Garden City, Mich., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Division of Ser. No. 881,379, Feb. 27, 1978, Pat. No. 4,137,175.
This application Dec. 26, 1978, Ser. No. 972,811
Int. Cl.[2] B01D *35/00*
U.S. Cl. 210—351 **2 Claims**



1. In a filtering system for removing particulate from a filtrate flow wherein said filtrate enters a filter cavity defined by a fixed shell portion, a movable shell portion and a replaceable filter media interfacing between said portions, the improvement therein comprising,

main pumping means having an intake connected to a reservoir providing storage for a fluid,

a first four-way valving means having a first, second, third and fourth port, said first valving means having a first state providing a flow path between said first and second ports and between said third and fourth ports respectively, and a second state providing a flow path between said first and fourth ports and between said second and third ports respectively, said first port connected to a discharge of said pumping means and said third port connected to said reservoir,

first check valve means connected between said pumping means and said first port of said four-way valving means to allow a flow of said fluid from said pumping means to said valving means and to prevent an opposite flow, and

operative means connected to said movable shell portion, said means having a first portion to selectively maintain said shell portion in a sealed relationship and a second portion to selectively place said shell portion in an unsealed relationship to allow an indexing of said filter media, said first portion connected to said second port and said second portion connected to said fourth port of said first four-way valving means,

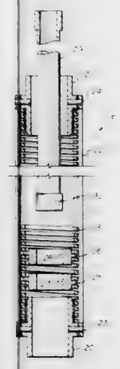
wherein said pumping means supplies said fluid to said first portion of said operative means with said first four-way valve being in said first state and said shell portions being maintained in said sealed relationship by said fluid being trapped between said operative means and said first check valve means, and said pumping means supplies said fluid to said second portion of said operative means with said first four-way valve being in said second state to place said shell portions in said unsealed relationship.

4,180,463

SELF-CLEANING HELICAL SPRING FILTER AND METHODS

Reynaldo Calderon, Houston, Tex., assignor to Reynaldo Calderon, White Plains, N.Y.

Filed Sep. 22, 1978, Ser. No. 944,952
Int. Cl.[2] B01D *35/16*
U.S. Cl. 210—415 **5 Claims**



1. A self-cleaning helical spring filter comprising,

(a) helical spring means connected at each end to an elongated perforated sleeve means for spacing apart the spring convolutions by a predetermined distance for forming a filter,

(b) cleaning means positioned between two spring convolutions at one end of said spring,

(c) axially movable elongated rotatable rod means having a bar portion and a head portion for contacting said cleaning means,

(d) means for attaching said rod means to means to rotate, and vertical displacement means,

(e) said cleaning means being engageable with said means to rotate by said head portion in response to said vertical displacement means, so as to rotate said cleaning means between all of the spring convolutions to said spring means other end for scraping off all foreign material from between said spaced apart spring convolutions, and

(f) said cleaning means being disengageable from said rod means by said bar portion in response to said vertical displacement means, so as to allow said rod means to pass axially through said cleaning means and to rotate therein without rotating said cleaning means.

4,180,464

METHOD OF COVERING CORRUGATED DRAINAGE TUBES

Frank T. Beane, Rte. 4, Highway 49, Concord, N.C. 28025

Continuation of Ser. No. 626,630, Oct. 29, 1975, abandoned, which is a division of Ser. No. 483,391, Jun. 25, 1974, Pat. No. 3,976,578. This application Jan. 31, 1977, Ser. No. 764,162
Int. Cl.[2] B01D *29/14*
U.S. Cl. 210—497 R **2 Claims**



1. In the subsurface drainage of water from land wherein corrugated drainage pipe having alternating peaks and valleys and a plurality of openings in selected valleys arranged along the longitudinal axis of the pipe is buried beneath the surface of the ground, the method of preventing the pipe and its openings in selected valleys from becoming clogged with gravel, rock, mud, dirt and the like which comprises providing a length of pipe of the type described having a desired maximum diameter, providing a length of tubular knit fabric corresponding in length with the length of said pipe and having a maximum diameter in the relaxed condition less than said desired maximum diameter of the pipe, installing said tubular knit fabric on said pipe, and permitting the tubular knit fabric to relax into snug, tight engagement with the peaks of the pipe with intervening undulations of the tubular knit fabric extending inwardly toward the axis of the pipe in correspondence with the location of said openings as the tubular knit fabric spans the valleys of the pipe.

4,180,465

FLUID COLLECTION DEVICE WITH PHASE SEPARATION MEANS

Vabilisetti S. Murty, Creve Coeur, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Dec. 19, 1975, Ser. No. 642,514
Int. Cl.[2] B01D *21/26*
U.S. Cl. 210—516 **19 Claims**



1. A fluid collection device comprising:

(1) a container for receiving a specimen of a fluid separable into relatively lighter and heavier phases under centrifugation; and,

(2) a phase separation means in said container comprising:

(a) a gel-like material having a specific gravity intermediate the specific gravities of the separate phases

(b) said gel-like material being flowable from an initial position when said container with the fluid therein is subjected to centrifugation to a final position between the separate phases to form a substantially non-flowable partition between the separate phases,

(c) said gel-like material being such that it does not substantially contaminate the separated lighter phase,

(d) said gel-like material comprising a mixture of polybutene and a powdered filler with the mixture having a specific gravity ranging from 1.035 to 1.065.

12. A fluid collection device comprising:

(1) a container for receiving a specimen of a fluid separable into relatively lighter and heavier phases under centrifugation; and,

(2) a phase separation means in said container comprising:

(a) a gel-like material having a specific gravity intermediate the specific gravities of the separate phases,

(b) said gel-like material being flowable from an initial position when said container with the fluid therein is subjected to centrifugation to a final position between the separate phases to form a substantially non-flowable partition between the separate phases,

(c) said gel-like material being such that it does not substantially contaminate the separated lighter phase,

(d) said gel-like material comprising a mixture of liquid butyl rubber and a powdered filler with the mixture having a specific gravity ranging from 1.035 to 1.065.

13. A fluid collection device comprising:

(1) a container for receiving a specimen of a fluid separable into relatively lighter and heavier phases under centrifugation; and,

(2) a phase separation means in said container comprising:

(a) a gel-like material having a specific gravity intermediate the specific gravities of the separate phases,

(b) said gel-like material being flowable from an initial position when said container with the fluid therein is subjected to centrifugation to a final position between the separate phases to form a substantially non-flowable partition between the separate phases,

(c) said gel-like material being such that it does not substantially contaminate the separated lighter phase,

(d) said gel-like material comprising a mixture of liquid polybutadiene and a powdered filler with the mixture having a specific gravity ranging from 1.035 to 1.065.

14. A blood collection device comprising:

(1) a tube for receiving a sample of blood adapted to be centrifically separated into relatively lighter and heavier phases while in said tube,

(2) means closing one end of said tube,

(3) a stopper sealingly closing the opposite end of said tube,

(4) a negative pressure in said tube and maintained by said stopper,

(5) blood phase partitioning means disposed in said tube,

(6) said stopper being pierceable by a needle for drawing whole blood into said tube for centrifugation with said partitioning means,

(7) said partitioning means comprising a gel-like material having a specific gravity between that of the lighter phase of blood and that of the heavier phase of blood and being flowable during centrifugation of the blood from an initial position in said tube to a position between said phases upon separation of said phases,

(8) said material being substantially non-flowable after separation of said phases under normal handling conditions to form a barrier contact in the inner walls of said tube to sealingly separate said phases from each other,

(9) said gel-like material being such that it does not substantially contaminate the separated lighter phase, and

(10) the gel-like material comprising a mixture of polybutene and a powder filler with the mixture having a specific gravity ranging from about 1.035 to 1.065.

19. A blood collection device comprising:

(1) a tube for receiving a sample of blood adapted to be centrifugally separated into relatively lighter and heavier phases while in said tube,

(2) means closing one end of said tube,

(3) a stopper sealingly closing the opposite end of said tube,

(4) a negative pressure in said tube and maintained by said stopper,
(5) blood phase partitioning means disposed in said tube,
(6) said stopper being pierceable by a needle for drawing whole blood into said tube for centrifugation with said partitioning means,
(7) said partitioning means comprising a gel-like material having a specific gravity between that of the lighter phase of blood and that of the heavier phase of blood and being flowable during centrifugation of the blood from an initial position in said tube to a position between said phases upon separation of said phases,
(8) said material being substantially non-flowable after separation of said phases under normal handling conditions to form a barrier contact in the inner walls of said tube to sealingly separate said phases from each other,
(9) said gel-like material being such that it does not substantially contaminate the separated lighter phase, and
(10) the gel-like material comprising a mixture of liquid polybutadiene and a powder filler with the mixture having a specific gravity ranging from about 1.035 to 1.065.

4,180,466

METHOD OF LUBRICATION OF A CONTROLLED-SLIP DIFFERENTIAL

Thomas D. Newingham, Broomall; Alexander D. Recchuite, Boothwyn, both of Pa.; John Q. Griffith, III, Claymont, Del., and Marcus W. Haseltine, Jr., Brookhaven, Pa., assignors to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 116,985, Feb. 19, 1971, Pat. No. 3,825,495. This application Jul. 17, 1974, Ser. No. 489,216
The portion of the term of this patent subsequent to Jul. 23, 1991, has been disclaimed.
Int. Cl.[2] C10M *1/38;* **C07G** *17/00*
U.S. Cl. 252—48.6 **5 Claims**

1. In the process of lubricating a controlled-slip differential with a lubricating composition, the improvement wherein the lubricating composition comprises major amounts of a hydrocarbon base stock and friction improving amounts of synthetic sulfurized oil consisting essentially of a co-sulfurized blend of a triglyceride and an acyclic C_2–C_{128} monoolefin.

4,180,467

STABLE DENTURE SOAK PRODUCT

Jordan B. Barth, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 441,588, Feb. 11, 1974, abandoned, which is a continuation of Ser. No. 187,524, Oct. 7, 1971, abandoned, which is a continuation of Ser. No. 829,133, May 29, 1969, abandoned. This application Jan. 20, 1976, Ser. No. 650,600
Int. Cl.[2] A61K *7/20;* **C11D** *7/18*
U.S. Cl. 252—99 **3 Claims**

1. A stable water-soluble solid composition with sustained carbon dioxide effervescence and of substantially neutral pH when dissolved in an aqueous solution consisting essentially of 20 to 43% by weight of at least one solid water-soluble inorganic peroxygen salt, 35 to 50% by weight of sodium or potassium bicarbonate compound, 15 to 25% by weight of a solid water-soluble organic acid selected from the group consisting of tartaric, citric, malic, maleic, fumaric and succinic acids and 5 to 10% by weight of a solid water-soluble acid anhydride capable of hydrolyzing and reacting with the said carbonate to evolve carbon dioxide when said composition is dissolved in water and selected from the group consisting of boric, succinic, adipic, fumaric, tartaric, citric, malic and maleic anhydrides.

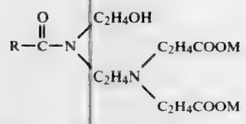
4,180,468

DISUBSTITUTED ALIPHATIC CARBOXYLAMIDOAMINES AS WELL AS DETERGENTS AND TOILETRY COMPOSITIONS CONTAINING SAME

Susumu Tomidokoro, Funabashi; Toshiyuki Ukigai, Yachiyo; Toshio Takahashi, Narashino, and Daini Saika, Chiba, all of Japan, assignors to The Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1977, Ser. No. 855,056
Claims priority, application Japan, Dec. 1, 1976, 51/144356
Int. Cl.[2] C09F *5/00;* **C11D** *9/30;* **A61K** *7/06*
U.S. Cl. 252—117 **15 Claims**

1. A disubstituted aliphatic carboxylamidoamine of the general formula:



wherein R stands for an aliphatic hydrocarbyl group with 7–17 carbon atoms and M for a hydrogen atom or an alkali metal atom.

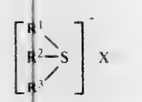
4,180,469

DITHIOCARBAMATE SULFONIUM SALT INHIBITOR COMPOSITION

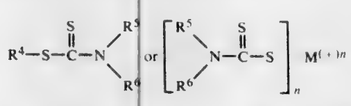
James D. Anderson, Ambler, Pa., assignor to Amchem Products, Inc., New York, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,052
Int. Cl.[2] C11G *1/06*
U.S. Cl. 252—149 **5 Claims**

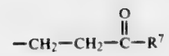
1. A process for cleaning industrial equipment, having water scale or other undesirable water insoluble deposits, with an aqueous hydrochloric acid cleaning solution wherein said acid solution is inhibited from attacking the basis metal of the industrial equipment by including in said cleaning solution an inhibitor combination consisting essentially of:
(a) a compound of the formula:



wherein R^1, R^2, and R^3 are each a hydrocarbon radical or substituted hydrocarbon radical selected from the group consisting of methyl, ethyl, propyl, nonyl, dodecyl, isobutyl, phenyl, hydroxyphenyl, dodecylphenyl, benzyl, 4-hydroxy-3,5-dimethylphenyl and p-chlorophenyl and wherein X is an anion selected from the group consisting of chloride, bromide, iodide and sulfate; and,
(b) a compound of the formula:



wherein R^4, R^5 and R^6 are each hydrogen or a hydrocarbon or substituted hydrocarbon radical selected from the group consisting of methyl, ethyl, isopropyl, octadecyl, dodecyl, decyl, benzyl, phenyl, naphthyl, cyclopentyl, cyclohexyl, thiozolyl, abietyl, pyridyl, quinolyl and



wherein R^7 is lower alkyl, and M is a cation selected from the group consisting of sodium, potassium, ammonium, lead, zinc, cadmium and antimony and wherein n is 1 to 3, said inhibitor combination being present in an amount sufficient to produce effective inhibition of basis metal attack by said acid solution with the proviso that from 0.1 to about 2.0 parts by weight of component (b) be present per part by weight of component (a).

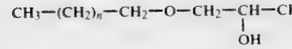
4,180,470

METHOD FOR IMPROVED ACYL ISETHIONATE DETERGENT BARS

Richard Tokosh, Saddle Brook, and Arno Cahn, Pearl River, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 782,698, Mar. 20, 1977, abandoned. This application Jan. 25, 1978, Ser. No. 872,298
Int. Cl.[2] C11D *10/04, 1/28, 1/14*
U.S. Cl. 252—121 **11 Claims**

1. A method for reducing the wear rate of an acyl isethionate detergent bar having an unesterified water-soluble alkali metal isethionate as a bar processing aid, without adversely affecting the lathering properties of the bar, which comprises incorporating into said bar:
(a) from about 2% to 6% by weight of an alkoxy hydroxy propane sulfonate having the formula:



wherein n is an integer from 6 to 18; and M is sodium, potassium, calcium, magnesium or ammonium; and
(b) less than 1.2% by weight of sodium chloride;
the percentages being based on the total weight of the acyl isethionate detergent bar produced.

4,180,471

PRODUCTION OF BLENDS OF CRYSTALLINE ZEOLITE AND SODIUM TRIPHOSPHATE

Klaus Schrödter, Cologne; Joachim Kandler, Erfstadt, and Hasso Spott, Kerpen-Balkhausen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 960,240
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1977, 2751354
Int. Cl.[2] C01B *33/28;* **C02B** *1/44;* **C11D** *11/00, 11/02*
U.S. Cl. 252—140 **4 Claims**

1. A process for making blends of one or more crystalline zeolites and sodium triphosphate which comprises: spray-drying a zeolite suspension jointly with an aqueous sodium orthophosphate solution or suspension, in which the molar ratio of Na to P necessary to produce zeolite-free sodium triphosphate containing Na and P in a theoretical ratio of 1.66 is reduced by decrements of 0.01% per each 10% by weight proportion of zeolite in the blend; the zeolite suspension being sprayed separately from the orthophosphate solution or suspension at a separation necessary for the resulting zeolite particles to dry superficially and for the resulting phosphate particles to undergo at least partial condensation; and contacting the superficially dry particles with the at least partially condensed particles.

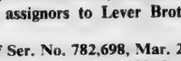
4,180,472

DETERGENT COMPOSITIONS FOR EFFECTIVE OILY SOIL REMOVAL

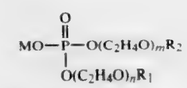
Sharon J. Mitchell, and Rodney M. Wise, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 3, 1977, Ser. No. 838,788
Int. Cl.[2] C11D *7/24*
U.S. Cl. 252—162 **10 Claims**

1. An oily soil dissolving agent for removing oily soil from fabrics in an aqueous washing medium consisting essentially of:
(a) from about 20% to about 97% by weight of a water-insoluble solvent selected from the group consisting of:
(i) alkanes and alkenes having a flash point not lower than about 65° C. (Tag closed cup), an initial boiling point not lower than about 130° C., a solidification point not above about 20° C. and a carbon chain length from about 10 to about 18; and
(ii) fatty acid esters of the formula



in which R_1 is an alkyl group with from about 7 to about 17 carbon atoms and R_2 is an alkyl group with from 1 to about 10 carbon atoms, the sum of carbon atoms in R_1 and R_2 being from about 8 to about 23;
(b) from about 3% to about 30% by weight of a water-in-oil emulsifier soluble in said solvent, said emulsifier having an HLB value of from about 2 to about 12 and consisting essentially of from about 25% to 100% of emulsifier compounds with at least two alkyl groups each having from about 9 to about 20 carbon atoms and selected from the group consisting of:
(i) dialkyl sulfosuccinic acid and alkali metal, alkaline earth metal, ammonium, and mono-, di-, and tri- C_{1-4} alkyl and alkanol ammonium salts of dialkyl sulfosuccinic acid, said alkyl groups each containing from about 9 to about 20 carbon atoms;
(ii) quaternary ammonium compounds with more than one long chain alkyl group selected from the group consisting of di- C_{9-20} alkyl ammonium chloride, bromide, methyl sulfate, nitrate and acetate and di- C_{9-20} alkyl imadazolinium quaternary ammonium compounds;
(iii) alkyl or alkyl ethoxy diesters of phosphoric acid having the formula



in which both R_1 and R_2 are alkyl groups containing from about 9 to about 20 carbon atoms, n and m are from zero to about 8 and M is hydrogen or a salt forming cation, and
(iv) mixtures thereof;
(c) from 0% to about 77% water; and
(d) from 0% to about 77% detergency builders selected from the group consisting of water soluble orthophosphates, polyphosphates, phosphonates, carbonates, bicarbonates, polyhydroxysulfonates, silicates, carboxylates and polycarboxylates, water-insoluble aluminosilicates and mixtures thereof.

8. A method of removing oily soil from fabrics comprising:
(1) contacting said fabrics with an aqueous washing medium consisting essentially of:
(a) from about 0.1% to about 3% by weight of a water-insoluble solvent selected from the group consisting of:
(i) alkanes and alkenes having a flash point not lower than about 65° C. (Tag closed cup), an initial boiling point not lower than about 130° C., a solidification

point not above about 20° C. and a carbon chain length from about 10 to about 18; and

(ii) fatty acid esters of the formula



in which R_1 is an alkyl group with from about 7 to about 17 carbon atoms and R_2 is an alkyl group with from 1 to about 10 carbon atoms, the sum of carbon atoms in R_1 and R_2 being from about 8 to about 23;

(b) from about 3% to about 30% by weight of a water-in-oil emulsifier soluble in said solvent, said emulsifier having an HLB value of from about 2 to about 12 and consisting essentially of from about 25% to 100% of emulsifier compounds with at least two alkyl groups each having from about 9 to about 20 carbon atoms and selected from the group consisting of:

(i) dialkyl sulfosuccinic acid and alkali metal, alkaline earth metal, ammonium, and mono-, di-, and tri- C_{1-4} alkyl and alkanol ammonium salts of dialkyl sulfosuccinic acid, said alkyl groups each containing from about 9 to about 20 carbon atoms;

(ii) quaternary ammonium compounds with more than one long chain alkyl group selected from the group consisting of di- C_{9-20} alkyl ammonium chloride, bromide, methyl sulfate, nitrate and acetate and di-C_{9-20} alkyl imadazolinium quaternary ammonium compounds;

(iii) alkyl or alkyl ethoxy diesters of phosphoric acid having the formula



in which Both R_1 and R_2 are alkyl groups containing from about 9 to about 20 carbon atoms, n and m are from zero to about 8 and M is hydrogen or a salt forming cation, and

(iv) mixtures thereof; and

(c) from about 90% to about 99.6% water; and

(2) allowing said fabrics to remain in contact with said washing medium for at least 30 seconds.

4,180,473

METHOD OF TRANSPORTING METAL IONS

Gerald L. Maurer, Fairfield, and Sudhir K. Shringarpurey, Avon Lake, both of Ohio, assignors to National Research Laboratories, Cincinnati, Ohio

Continuation-in-part of Ser. No. 719,813, Sep. 1, 1976, Pat. No. 4,129,509, which is a continuation-in-part of Ser. No. 597,756, Jul. 21, 1975, Pat. No. 4,055,655. This application Oct. 21, 1977, Ser. No. 844,280

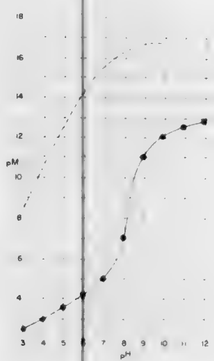
The portion of the term of this patent subsequent to Oct. 25, 1994, has been disclaimed.

Int. Cl.² C09K *3/00;* **C02B** *5/06*

U.S. Cl. 252—182 **15 Claims**

1. A method of transporting metal ions in a medium containing a moiety demanding said metal ions by introducing into said medium in an effective amount a metal complex of a metal ion and a polyfunctional organic ligand, said complex having an aqueous proton induced dissociation property represented by a sigmoidally-shaped curve on a cartesian coordinate plot of the negative log of the metal ion concentration versus the negative log of the hydrogen ion concentration, said dissociation property causing the controlled release of metal ions upon demand of said moiety.

7. The method of claim **1** wherein said complex is a dialkali-metal monoheavymetal chelate of an alpha-hydroxy polycarboxylic acid.



8. The method of claim **7** wherein said chelate is dialkali-metal monocopper(II) citrate.

4,180,474

RADIATION-HARDENABLE DILUENTS FOR RADIATION-HARDENABLE COMPOSITIONS

Karl-Ernst Schuster, Kerken; Hans J. Rosenkranz, Krefeld; Karl Furh, Krefeld, and Hans Rüdolph, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 7, 1977, Ser. No. 849,089

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1976, 2651507

Int. Cl.² C09K *3/00;* **G03C** *1/68*

U.S. Cl. 252—188.3 R **5 Claims**

1. A radiation-crosslinkable diluent for radiation-hardenable compositions comprising a mixture of triacrylates of a reaction product of trimethylol propane and ethylene oxide with an average degree of ethoxylation of from 2.5 to 4, the ethoxylated trimethylol propane being substantially free from trimethylol propane and having the following distribution:

4 to 5% by weight of monoethoxylation product;

14 to 16% by weight of diethylation product;

20 to 30% by weight of triethoxylation product;

20 to 30% by weight of tetraethoxylation product;

16 to 18% by weight of pentaethoxylation product; and

6 to 8% by weight of hexaethoxylation product.

3. A radiation-hardenable composition comprising a binder and a radiation-crosslinkable diluent as claimed in claim **1**.

4,180,475

LIQUID CRYSTAL MIXTURES

Martin Schadt, Seltisberg; Hanspeter Scherrer, Therwil, and Arthur Boller, Binningen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 18, 1977, Ser. No. 769,999

Claims priority, application Switzerland, Feb. 26, 1976, 2372/76; Jul. 9, 1976, 8832/76; Dec. 20, 1976, 15995/76

Int. Cl.² C09K *3/34;* **G02F** *1/13*

U.S. Cl. 252—299 **27 Claims**

1. A nematic liquid crystal mixture having positive anisotropy of the dielectric constants which comprises a nematogenic mixture with a clearing point above 60° C. and one or more solvents individually selected from the group consisting of a straight-chain alkane of 8–16 carbon atoms, an alkyl halide of 6–16 carbon atoms, a dialkyl ether of 4–8 carbon atoms in each alkyl radical, a dialkyl carbonate of 2–7 carbon atoms in each alkyl radical, an alkanecarboxylic acid alkyl ester the alkyl radicals of which together contain 6–16 carbon atoms

p-xylene, 1-phenylheptane, p-octylbenzoic acid methyl ester, and p-hexylbenzaldehyde.

4,180,476

PROCESS FOR THE EXTRACTION OF FISSION PRODUCTS

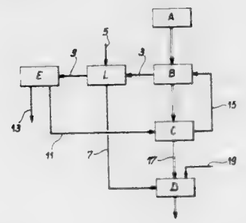
Maurice Anav, Villemoisson sur Orge; André Chesne, Le Vesinet; André Leseur, Fontenay-aux-Roses; Pierre Miquel, Chatillon sous Bagneux, and Roger Pascard, Saint Remy les Chevreuse, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 14, 1977, Ser. No. 860,452

Claims priority, application France, Dec. 30, 1976, 76 39569; Oct. 10, 1977, 77 30371

Int. Cl.² G21F *9/30*

U.S. Cl. 252—301.1 W **17 Claims**



1. A process for the extraction of fission products from irradiated nuclear fuel elements which have been subject to a temperature of at least 1200° C. during their irradiation, comprising the steps of:

(a) mechanically treating said irradiated fuel elements in order to decan and/or cut them;

(b) contacting the mechanically treated fuel elements with water to obtain an aqueous solution containing soluble fission products;

(c) separating the treated fuel elements from the thus obtained solution; and

(d) recovering at least one of said fission products from the separated solution.

4,180,477

LUMINESCENT MATERIALS

Roderick G. L. Barnes, Royston, England, assignor to Johnson, Matthey & Co., Limited, London, England

Filed Jan. 17, 1978, Ser. No. 870,248

Claims priority, application United Kingdom, Jan. 19, 1977, 02109/77

Int. Cl.² C09K *11/46*

U.S. Cl. 252—301.4 R **2 Claims**

2. A luminescent material comprising an aluminum garnet host material activated by trivalent terbium having a composition of the formula:

$$RE_{(3-x)}Tb_xAl_{(5-z)}Ga_zO_{12}(RE_2O_3)_w$$

in which RE is one or more of the elements yttrium, gadolinium, lutetium and bismuth, z has a value in the range of $0 \leqq z \leqq 5$, w has a value in the range of $0.02 \leqq w \leqq 0.05$ and x lies between 0.01 and 0.5, said luminescent material having enhanced brightness when compared to the corresponding material without the RE_2O_3.

4,180,478

ALKALINE EARTH HALIDE-RARE EARTH FLUORIDE PHOSPHOR

Tadao Omi, Yokohama; Minoru Watanabe, Kawasaki, and Toshio Nishimura, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 10, 1978, Ser. No. 885,346

Claims priority, application Japan, Mar. 14, 1977, 52-26960

Int. Cl.² C09K *11/46*

U.S. Cl. 252—301.4 H **4 Claims**

1. A phosphor having the formula:

$$nLaF_3.mAFCl:Eu_x$$

wherein:

A is at least one element selected from the group consisting of Ba, Sr and Ca, the Eu being present in the divalent state,

x is from 1×10^{-4} to 1, and

n/m is from 1×10^{-3} to 7×10^{-1}.

3. A phosphor having a general formula:

$$nLaF_3.mAFCl:Eu_x.Sm_y$$

wherein:

A is at least one element selected from the group consisting of Ba, Sr and Ca, the Eu being present in the divalent state,

x is from 1×10^{-4} to 1,

n/m is from 1×10^{-3} to 7×10^{-1}, and

y is from 1×10^{-4} to 1×10^{-1}.

4,180,479

STILBENE COMPOUNDS

Adolf E. Siegrist, Basel; Jean-Paul Pauchard, Fribourg, and Bernardo De Sousa, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

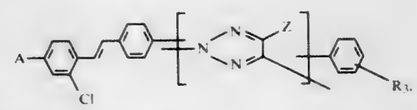
Filed Nov. 14, 1977, Ser. No. 850,864

Claims priority, application Luxembourg, Mar. 25, 1977, 77027

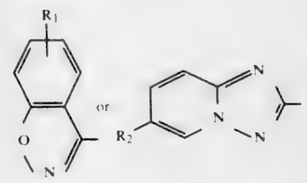
Int. Cl.² C07D *413/10*

U.S. Cl. 252—301.24 **12 Claims**

1. A stilbene compound of the formula



in which A is the radical



in which R_1 is hydrogen or chlorine and R_2 is hydrogen or alkyl having 1 to 4 C atoms, Z is hydrogen, chlorine or phenyl and R_3 is hydrogen, alkyl having 1 to 4 C atoms or chlorine.

4,180,480

CATALYTICALLY ACTIVE COMPOSITIONS FROM PRECIOUS METAL COMPLEXES

Melvin N. Jameson, St. Marys, and Gerald A. Krulik, Washington, both of W. Va., assignors to McGean Chemical Company, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 622,789, Oct. 15, 1975, abandoned. This application Dec. 21, 1978, Ser. No. 971,683

Int. Cl.² B01J *31/02;* **C09D** *5/00*

U.S. Cl. 252—429 R **24 Claims**

1. A concentrated, catalytically active composition suitable for initiating electroless deposition of metal consisting essentially of the reaction product of a molten tin salt, said tin salt being selected from the group consisting of stannous chloride dihydrate and mixtures of stannous chloride dihydrate with at least one other compatible stannous salt, the melting point of said mixture being below about 140° C.; and the complex formed by reacting a soluble palladium salt, an effective amount of a halide salt from the group consisting of bromide and chloride salts compatible with said tin and palladium salts to render said composition catalytically active when added to an aqueous working bath, and a metal complexing agent capable of forming a complex with palladium.

4,180,481

MANUFACTURE OF A SUPPORTED CHROMIUM OXIDE CATALYST FOR OLEFIN POLYMERIZATION

Kurt Schulze, Wesseling, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 31, 1978, Ser. No. 929,702

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1977, 2734928

Int. Cl.² B01J *27/06, 29/00*

U.S. Cl. 252—441 **2 Claims**

1. A process for the manufacture of a supported chromium oxide catalyst from a catalyst precursor—which in turn comprises a finely divided carrier consisting of, or based on, silica, homogeneously charged with a chromium compound, which consists of chromium trioxide or a chromium compound which is converted to chromium trioxide under the conditions of stage (1), in the weight ratio of carrier: chromium compound, calculated as chromium trioxide, of from 100:0.1 to 100:10—by

(1) treating the catalyst precursor—with addition of a promoter in the weight ratio of catalyst precursor: promoter of from 100:0.1 to 100:10—at an elevated temperature with an oxygen-containing gas and then

(2) treating the product obtained from stage (1) with from 150 to 400 mole percent of carbon monoxide, based on the chromium dioxide content of the product, wherein, in both stages (1) and (2), the solid is in the form of a fluidized bed maintained by means of a stream of carrier gas, and wherein furthermore, in stage (1), the treatment with oxygen is carried out at from 530° to 1200° C. for a period of at least 30 minutes, using an anhydrous carrier gas which comprises from 10 to 100% by volume of oxygen, the remainder consisting of from 90 to 0% by volume of nitrogen, and in stage (2) the carbon monoxide treatment is carried out at from 270° to 450° C. for a period of from 0.5 to 3 hours using an anhydrous and oxygen-free carrier gas consisting of nitrogen to which a total of from 100 to 1,000 mole %, based on the chromium trioxide content of the product obtained from stage (1), of carbon monoxide is added uniformly over the total period of the carbon monoxide treatment.

2. The process of claim **1**, wherein the promoter is ammonium silico fluoride.

4,180,482

SELF-CLEANING CATALYTIC COATING

Atsushi Nishino; Kazunori Sonetaka; Kunio Kimura, and Yoshihiro Watanabe, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 13, 1978, Ser. No. 915,260

Claims priority, application Japan, Aug. 24, 1977, 52/102116

Int. Cl.² B01J *29/06;* **A21B** *1/00*

U.S. Cl. 252—455 R **20 Claims**

1. In an article to be heated during use having a self-cleaning coating formed on a surface thereof that decomposes oils and greases spattered thereon to gaseous substances by catalytic oxidation, in which said self-cleaning coating comprises a porous matrix layer of an inorganic binder containing a matting agent which affords a matte surface to said matrix layer; a catalyst in the form of particles dispersed uniformly in said matrix layer, said catalyst comprising an oxidation catalyst that catalyzes oxidative decomposition of fatty acids at elevated temperatures and that has a tendency to undergo a change in color as the result of its cata'vtic action; the improvement comprising said coating containing a double oxide which is in the form of particles dispersed uniformly in said matrix layer and has such a color with stability that said change in color of said oxidation catalyst is concealed, whereby said self-cleaning coating scarcely exhibits a perceptible discoloration on the occurrence of said change in color.

4,180,483

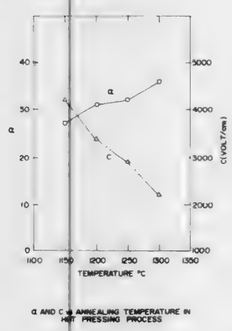
METHOD FOR FORMING ZINC OXIDE-CONTAINING CERAMICS BY HOT PRESSING AND ANNEALING

Shih M. Ho, Pittsburgh, and Tapan K. Gupta, Monroeville, both of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 755,774, Dec. 30, 1976, Pat. No. 4,111,852. This application Dec. 21, 1977, Ser. No. 862,734

Int. Cl.² H01B *1/08*

U.S. Cl. 252—518 **9 Claims**



α AND C vs ANNEALING TEMPERATURE IN HOT PRESSING PROCESS

1. A method for forming a homogeneous electrically non-linear ceramic body comprising the steps of

(a) simultaneously heating and pressing a mixture of zinc oxide powder and a single phase additive mixed oxide glass powder including at least bismuth oxide to form a consolidated ceramic body of electrical linearity, and

annealing said ceramic body under conditions to control grain size and promote diffusion of the zinc oxide and the additive glass in order to transform it to a body of electrical non-linearity.

4,180,484

CERAMIC COMPONENT FOR ELECTRODES

David D. Marchant, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 14, 1978, Ser. No. 915,419

Int. Cl.² H01B *1/08*

U.S. Cl. 252—521 **6 Claims**

1. An electrode for use in a MHD generator comprising: HfO_2 and a minor amount of Tb_4O_7, the Tb_4O_7 being present in an amount effective to stabilize at least 60 volume percent of the HfO_2 into the cubic structure.

4,180,485

SPRAY-DRIED DETERGENT COMPOSITIONS

Ramon A. Llenado, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 2, 1977, Ser. No. 847,983

Int. Cl.² C11D *3/08, 3/12, 3/34, 11/02*

U.S. Cl. 252—532 **9 Claims**

1. A granular detergent composition comprising:

(a) from about 5% to about 40% of a water-soluble organic surface active agent selected from the group consisting of linear alkyl benzene sulfonate, alkyl sulfate, alkyl ethoxy ether sulfate, and mixtures thereof, said alkyl groups containing from about 10 to about 20 carbon atoms and said alkyl ethoxy ether sulfate having an average degree of ethoxylation of from about 1 to about 4 moles of ethylene oxide per mole of alkyl sulfate;

(b) from about 10% to about 60% of a finely divided water-insoluble aluminosilicate ion exchange material selected from the group consisting of:

(1) crystalline aluminosilicate material of the formula

$$Na_z[(AlO_2)_z\cdot(SiO_2)_y]\cdot xH_2O$$

wherein z and y are at least 6, the molar ratio of z to y is from 1.0 to 0.5 and x is from 10 to 264, said material having a particle size diameter of from about 0.1 micron to about 10 microns, a calcium ion exchange capacity of at least about 200 mg. $CaCO_3$ eq./g. and a calcium ion exchange rate of at least about 2 grains Ca^{++}/gallon/minute/gram;

(2) amorphous hydrated aluminosilicate material of the empirical formula $M_z(zAlO_2\cdot ySiO_2)$ wherein M is sodium, potassium, ammonium, or substituted ammonium, z is from about 0.5 to about 2, y is 1, said material having a particle size diameter of less than about 100 microns, a magnesium ion exchange capacity of at least about 50 milligrams equivalent of $CaCO_3$ hardness per gram of anhydrous aluminosilicate and a Mg^{++} exchange rate of at least about 1 grain/gallon/minute/gram/gallon and

(3) mixtures thereof;

(c) from about 5% to about 30% of an alkali metal oxide silicate solid having a weight ratio of SiO_2:alkali metal oxide of about 1.6, and

(d) from about 0.5 to about 20% of a water-soluble salt of acetic acid,

said granular detergent having been prepared by mixing the above components with water to form a slurry, and then removing water from the slurry by drying.

6. A process for producing crisp, free-flowing detergent granules comprising the steps of:

(1) forming an aqueous slurry comprising:

(a) from about 3.5% to about 30% of a water-soluble organic surface active agent selected from the group consisting of linear alkyl benzene sulfonate, alkyl sulfate, alkyl ethoxy ether sulfate, and mixtures thereof, said alkyl groups containing from about 10 to about 20 carbon atoms and said alkyl ethoxy ether sulfate having an average degree of ethoxylation of from about 1 to about 4 moles of ethylene oxide per mole of alkyl sulfate;

(b) from about 7% to about 45% of a finely divided water-insoluble aluminosilicate ion exchange material selected from the group consisting of:

(1) crystalline aluminosilicate material of the formula:

$$Na_z[(AlO_2)_z\cdot(SiO_2)_y]\cdot xH_2O$$

wherein z and y are at least 6, the molar ratio of z to y is from 1.0 to 0.5 and x is from 10 to 264, said material having a particle size diameter of from about 0.1 micron to about 10 microns, a calcium ion exchange capacity of at least about 200 mg. $CaCO_3$ eq./g. and a calcium ion exchange rate of at least about 2 grains Ca^{++}/gallon/minute/gram; and

(2) amorphous hydrated aluminosilicate material of the empirical formula $M_z(zAlO_2\cdot ySiO_2)$ wherein M is sodium, potassium, ammonium, or substituted ammonium, z is from about 0.5 to about 2, y is 1 and said material having a particle size diameter of less than about 100 microns, a magnesium ion exchange capacity of at least about 50 milligrams equivalent of $CaCO_3$ hardness per gram of anhydrous aluminosilicate and a Mg^{++} exchange rate of at least about 1 grain/gallon/minute/gram/gallon and

(3) mixtures thereof;

(c) from about 3.5% to about 20% of an alkali metal oxide silicate solid having a weight ratio of SiO_2:alkali metal oxide of about 1.6;

(d) from about 0.4% to about 15% of a water-soluble salt of acetic acid; and

(e) from about 25% to about 50% water;

(2) drying the slurry to form crisp, free-flowing detergent granules.

4,180,486

MOLDING COMPOSITIONS AND PROCESS FOR PREPARING SAME

Edward F. Tokas, West Hatfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 16, 1978, Ser. No. 951,493

Int. Cl.² C08F *12/08;* **C08K** *5/01;* **C08L** *7/00, 25/06*

U.S. Cl. 260—4 AR **4 Claims**

1. A molding composition comprising a blend of a styrenic polymer containing at least about 10 weight percent based on total polymer weight of polymerized styrene and about 0.005 to about 2 percent by weight based on the weight of the polymer of a myrcene compound.

4,180,487

EPOXY CURABLE RESIN COMPOSITION

Don E. Floyd, Minneapolis, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed May 4, 1978, Ser. No. 902,581

Int. Cl.² C08G *59/50, 73/02*

U.S. Cl. 260—18 N **18 Claims**

1. An epoxy curable resin composition comprising an adduct of:

(a) at least about three equivalents of a polyamine resin substantially free of polyamide groups containing at least two primary amine groups, and one secondary or tertiary amine group said polyamine resin having a fatty tail, and;

(b) one equivalent per three equivalents of component (a) of a polyfunctional acrylic compound which is an ester of a member selected from the group consisting of acrylic acid and methacrylic acid and mixtures thereof and at least an equivalent amount of a polyol.

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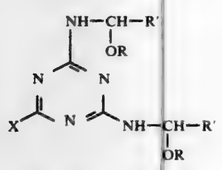
4,180,488

STORAGE-STABLE LACQUER RESINS

Gerhard Stern, and Wilhelm Dobrannysl, both of Linz, Austria, assignors to Chemie Linz Aktiengesellschaft, Linz, Austria

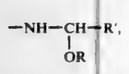
Filed Aug. 15, 1978, Ser. No. 933,926
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 2737984
Int. Cl.[2] C09D 3/52, 3/66, 3/81
U.S. Cl. 260—21 7 Claims

1. In a process for the preparation of a storage-stable lacquer resin which can be baked without yellowing and which has a high reactivity, a good solubility in organic solvents and a low viscosity in solution and is based on the reaction product of an alkyd resin, acrylic resin or epoxy resin with a bis- or tris-alkoxyalkylamino-s-triazine, the improvement which comprises using a bis- or tris-alkoxyalkylamino-s-triazine which has been obtained from a triazine derivative of the general formula:



(I)

wherein X is an alkyl group having one to four carbon atoms, a phenyl group or the group



and each of R and R′ is an unbranched or branched alkyl group having up to six carbon atoms, by heating for a period of 3 to 300 minutes at a temperature of 100° to 200° C., up to a weight loss of 3% to 25%, relative to the dry weight of the triazine starting compound.

4,180,489

COATING COMPOSITION

Malcolm S. Andrew, Hazlemere, and Alan J. Backhouse, South Ascot, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 17, 1978, Ser. No. 897,173
Claims priority, application United Kingdom, Apr. 25, 1977, 17122/77
Int. Cl.[2] C08L 91/00
U.S. Cl. 428—402 10 Claims

1. A coating composition suitable for spray application to a substrate which comprises (A) a film-forming polymer, (B) a volatile organic liquid diluent in which the polymer (A) is carried; (C) polymer microparticles having a diameter of from 0.01 to 10 microns which are insoluble in the combination of the film-forming polymer (A) and the diluent (B) and are maintained in a substantially deflocculated, sterically stabilized state of dispersion therein as a consequence of their having been prepared by a method involving two essential stages, namely (i) the polymerization of monomer, from which the microparticles are to be derived, in an inert liquid in which the resulting polymer is insoluble and under conditions such that the polymer is obtained in a state of stable dispersion, and (ii) the subsequent polymerization, in the same inert liquid and in the presence of the microparticles formed in the first stage, of monomer giving rise to a second polymer which is compatible with the film-forming polymer (A) and soluble in the combination of polymer (A) and diluent (B), and (D) metallic pigmentation also dispersed in the combination of polymer (A) and diluent (B).

4,180,490

ANTIBLOCK SYSTEM AND PROCESS AID FOR VULCANIZED VINYL ACETATE ETHYLENE COPOLYMERS

Robert D. Maclean, Wooster, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 835,762, Sep. 22, 1977, abandoned. This application Aug. 7, 1978, Ser. No. 931,715
Int. Cl.[2] C08L 91/00
U.S. Cl. 260—23 R 8 Claims

1. A vinylacetate-ethylene elastomeric copolymer vulcanizate containing an anti-blocking and processing release effective amount of an anti-blocking, processing release system comprising stearic acid, paraffin wax and a polyethylene having an average molecular weight of from about 1500 to about 4000, said processing release system being substantially uniformly distributed in said vulcanizate.

4,180,491

NONIONIC POLYURETHANE THICKENER WITH SURFACTANT COTHICKENER AND ORGANIC DILUENT, CLEAR CONCENTRATES, AQUEOUS PRINT PASTES, COLORING COMPOSITIONS, METHODS OF MAKING AND PRINTING

Samuel S. Kim, Huntingdon Valley, and Travis E. Stevens, Ambler, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 1, 1976, Ser. No. 746,449
Int. Cl.[2] C08L 75/08; C09B 67/00; C09D 11/10
U.S. Cl. 260—29.2 TN 16 Claims

1. A clear concentrate composition for use in print pastes, comprising a mixture of about 5–50% by weight of (1) a primary thickener comprising a nonionic water soluble or water solulizable polyurethane, (2) a surfactant cothickener different from (1), in an amount providing a weight ratio of (1) to (2) of about 1:0.01 to about 1:10, (3) about 5–35% by weight of a non-aqueous, inert organic diluent, and (4) 0 to about 65% by weight of water, said polyurethane having a molecular weight of at least 10,000 and at least three hydrophobic branching groups, the hydrophobic groups containing a total of at least 20 carbon atoms and being linked through hydrophilic polyether segments of at least 1500 molecular weight each; wherein the polyurethane thickener is selected from the following reaction products wherein reactant (a) is at least one water soluble polyether polyol containing at least three hydroxyl groups, reactant (b) is at least one water insoluble organic diisocyanate, reactant (c) is at least one water insoluble organic polyisocyanate containing at least three isocyanate groups, reactant (d) is at least one hydrophobic organic monofunctional active hydrogen compound, reactant (e) is at least one hydrophobic organic monoisocyanate, and reactant (f) is at least one polyhydric alcohol or polyhydric alcohol ether containing three or more hydroxyl groups:

(I) reaction products of reactant (a) and (e),
(II) reaction products of reactants (a), (c) and (d),
(III) reaction products of reactants (a), (b), (d) and (f),
(IV) reaction products of reactants (a), (b), (e) and (f),
(V) reaction products of reactants (a), (b), (c) and (d),
(VI) reaction products of reactants (b), (e) and (f),
(VII) reaction products of reactants (a), (c) and (e),
(VIII) reaction products of reactants (b), (d) and (f).

4,180,492

THIODIGLYCOL DIBEHENATE AND METHOD OF USE

Jean Boussely, Paris; Marie-Madeleine Chandavoine; Michel Chignac, both of Sisteron; Claude Grain, Volonne, and Charles Pigerol, Saint-Ouen, all of France, assignors to Fevrier-Decoisy-Champion, Paris, France

Continuation of Ser. No. 829,866, Sep. 1, 1977, abandoned, which is a continuation of Ser. No. 683,416, May 5, 1976, abandoned. This application Jun. 26, 1978, Ser. No. 918,849
Claims priority, application France, May 7, 1975, 75 14358
Int. Cl.[2] C08K 5/37
U.S. Cl. 260—30.8 R 2 Claims

1. A method of use of thiodiglycol dibehenate as lubricating agent for thermoplastic materials, which method consists in incorporating the said thiodiglycol dibehenate as internal lubricating agent in a formula of thermoplastic material containing a known external lubricating agent.

2. A method of use of thiodiglycol dibehenate as lubricating agent for thermoplastic material which method consists in incorporating the said thiodiglycol dibehenate as external lubricating agent in a formula of thermoplastic material containing a known internal lubricating agent.

4,180,493

COATING COMPOSITIONS FOR POLYCARBONATES

Harald Selbeck; Rolf Dhein, both of Krefeld, and Wolfgang Cohnen, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 14, 1978, Ser. No. 896,172
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1977, 2717164
Int. Cl.[2] C08K 5/05, 5/07; C08L 61/28, 61/32
U.S. Cl. 260—32.8 N 4 Claims

1. A coating composition for polycarbonate surfaces comprising a solvent having little effect on polycarbonate and dissolved therein a mixture of:

(A) 86% to 98% by weight of copolymer having a hydroxyl number of from 30 to 80 and a weight average molecular weight of from 10,000 to 60,000 comprising copolymerized units of:
  (a) 20% to 32% by weight of at least one aromatic vinyl monomer,
  (b) 8% to 18% by weight of at least one hydroxylalkyl ester of acrylic or methacrylic acid containing from 2 to 12 carbon atoms in the alkyl group, and
  (c) 50 to 70% by weight of at least one acrylic or methacrylic acid ester of a saturated aliphatic monoalcohol having 1 to 8 carbon atoms; and
(B) 2 to 14% by weight of at least one melamine resin.

4,180,494

THERMOPLASTIC POLYESTERS

Harry C. Fromuth, Trevose, Pa., and Kenneth M. Shell, Delran, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 824,674, Aug. 15, 1977, abandoned. This application Sep. 20, 1978, Ser. No. 944,112
Int. Cl.[2] C08K 3/40; C08L 67/02
U.S. Cl. 260—40 R 10 Claims

1. A composition having high impact and solvent resistance comprising

A. about 25 to 95 percent by weight of an aromatic polyester;
B. about 1 to 8 percent by weight of an aromatic polycarbonate;
C. the balance to make 100% of a core-shell polymer polymerized from monomers comprising butadiene.

4,180,495

POLYESTER RESINS FLAME RETARDED BY POLY(METAL PHOSPHINATE)S

Stanley R. Sandler, Springfield, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 13, 1978, Ser. No. 895,839
Int. Cl.[2] C08K 5/53; C08G 63/68, 63/76
U.S. Cl. 260—45.75 K 8 Claims

1. The flame retarded resin compositions comprising a polyester and a flame retardant amount, namely 2.5 to 20 parts by weight per 100 parts by weight of polyester of at least one poly(metal phosphinate)s having one, two, three of four phosphinate groups per coordination center and selected from the respective formulae:

(a) MX, MaX, Ma_2X, Ma_3X, M(AA)X, $M(AA)_2X$,
(b) MX_2, MaX_2, Ma_2X_2, $MabX_2$, $M(AA)X_2$,
(c) MX_3, MaX_3, Ma_2X_3, $MabX_3$, $M(AA)X_3$, or
(d) MX_4

wherein

M is a metal selected from the group consisting of beryllium, magnesium, calcium, strontium, barium, titanium, zirconium, antimony, bismuth, chromium, molybdenum, tungsten, manganese, iron, ruthenium, cobalt, rhodium, iridium, nickel, palladium, platinum, copper, silver, zinc, cadmium, mercury, aluminum, tin, lead and mixtures thereof;

X is a disubstituted phosphinate group having the structure



wherein

R and R_1 are independently selected from the group consisting of an aliphatic group of 1 to 20 carbons, a cycloaliphatic group of 3 to 20 carbons, an aromatic group of 6 to 12 carbons and said aliphatic, cycloaliphatic or aromatic groups can have substituted thereon, the substituted group being selected from the class consisting of a halogen, ether, hydroxyl, alkoxy, ketone and ester;

a and b are independent unidentate groups selected from the class consisting of oxy, alkoxy, hydroxyl and halide; and

AA is a bidentate ligand selected from the group consisting of acetylacetonate, picolinate, 8-hydroxyquinolinate, dimethylglyoximate and glycinate.

4,180,496

MELAMINE CYANURATE AS A FLAME RETARDANT AGENT

Akira Yanagimoto, Tokyo; Shunichi Kumazawa, Ichihara, and Yasuo Takakuwa, Fuchumachi, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed Jan. 3, 1978, Ser. No. 866,379
Claims priority, application Japan, Jan. 17, 1977, 52-3828
Int. Cl.[2] C08K 5/34
U.S. Cl. 260—45.8 NT 7 Claims

1. A flameproof resin composition, which comprises: the admixture of 3 to 30 wt. % of an adduct of 2,4,6-triamino-1,3,5-triazine and 2,4,6-trihydroxy-1,3,5-triazine and/or a tautomer thereof with a linear polyester.

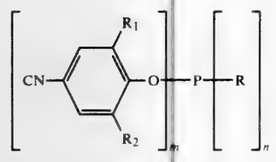
4,180,497

HINDERED PHENYL PHOSPHITES

John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 710,063, Jul. 30, 1976, Pat. No. 4,094,855. This application May 8, 1978, Ser. No. 904,060
Int. Cl.[2] C07F 9/08; C08K 5/52
U.S. Cl. 260—45.8 NT 10 Claims

1. A compound of the formula



wherein
R_1 and R_2 are independently lower alkyl or hydrogen, provided that only one of R_1 and R_2 is hydrogen,
m and n are each 1 or 2, the values of m and n being such that the trivalent state of p is satisfied,
R is
(a) halogen,
(b) hydroxyl, provided that m is 2 and n is 1 when R is hydroxyl,
(c) $-XR_5$ wherein X is S or O and R_5 is alkyl of 1 to 24 carbon atoms, phenyl, alkyl substituted phenyl.

2. A composition of matter comprising an organic polymeric synthetic material normally subject to thermal, oxidative and ultraviolet degradation stabilized with
(a) 0.005% to 5% of a stabilizing compound according to claim **1**,
(b) 0 to 5% of a phenolic antioxidant,
(c) 0 to 5% of a thio co-stabilizer,
(d) 0 to 5% of a UV absorber, and
(e) 0 to 5% of a light stabilizer.

9. A composition according to claim **2** consisting essentially of
(i) polyolefin,
(ii) a stabilizing compound (a), and
(iii) 0.05 to 5% of a phenolic antioxidant selected from tetrakis[methylene 3-(3',5'-di-tert-butyl-4'-hydroxyphenyl)-propionate]methane, octadecyl 3-(3',5'-di-tert-butyl-4'-hydroxyphenyl)propionate, di-n-octadecyl-3,5-di-tert-butyl-4-hydroxybenzyl phosphonate, 2,6-di-t-butyl-4-methylphenol, and tris-2,4,6-(3,5-di-t-butyl-4-hydroxybenzyl)isocyanurate.

4,180,499

CARCINOEMBRYONIC ANTIGENS

Hans J. Hansen, Allendale, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 770,000, Feb. 18, 1977, Pat. No. 4,086,217, which is a division of Ser. No. 663,405, Mar. 3, 1976, abandoned, which is a division of Ser. No. 469,197, May 13, 1974, Pat. No. 3,956,258, which is a division of Ser. No. 252,700, May 12, 1972, Pat. No. 3,867,363, which is a continuation-in-part of Ser. No. 133,404, Apr. 12, 1971, Pat. No. 3,697,638, which is a continuation-in-part of Ser. No. 110,288, Jan. 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 42,526, Jun. 1, 1970, abandoned. This application Jan. 9, 1978, Ser. No. 867,997

Int. Cl.[2] **C07G** *7/00*

U.S. Cl. 260—112 R **1 Claim**

1. A process for producing human carcinoembryonic antigen component B which comprises
(a) homogenizing human meconium in a glycoprotein solvent;
(b) separating the precipitate and solid particles from the homogenate;
(c) dialyzing the supernatant against a polyethylene glycol with an average molecular weight of about 15,000 to 20,000 and a softening point at 60° C.;
(d) dissolving the retentate in an aqueous buffer of about pH 7;
(e) separating the resulting precipitate;
(f) subjecting the resulting supernatant to sequential chromatography on two different gel columns, the first of which is a hydrophilic water-insoluble cross-linked dextran polymer gel and the second of which is an agarose gel having about 6% by weight agarose and a particle size of from 40 to 210 microns;
(g) collecting and concentrating the eluates which have a spectrophotometric absorption peak of wave length of 280 mμ and a molecular weight of about 200,000 to 500,000.

4,180,500

POLYPEPTIDES RELATED TO SOMATOSTATIN

Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

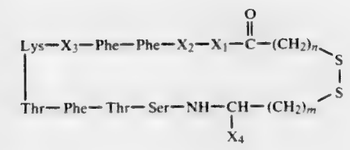
Filed Nov. 16, 1977, Ser. No. 851,928

The portion of the term of this patent subsequent to Mar. 7, 1995, has been disclaimed.

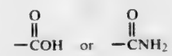
Int. Cl.[2] **C07C** *103/52*; **A61K** *37/00*

U.S. Cl. 260—112.5 S **7 Claims**

1. A chemical compound of the formula:



wherein:
X_1 is Arg or His;
X_2 is His, Tyr, or Glu;
X_3 is Trp or D-Trp; or 6-F-D-Trp
X_4 is



n is 1, 2, 3, or 4; and
m is 1 or 2;
or the reduced linear form thereof; or a non-toxic pharmaceutically acceptable acid addition salt thereof.

4,180,501

BIS (POLYPEPTIDE) DERIVATIVES OF ENKEPHALIN

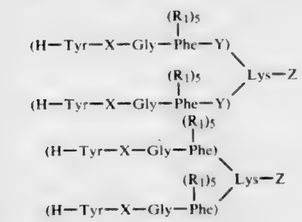
David H. Coy, 4319 Perrier St., New Orleans, La. 65115, and Abba J. Kastin, 4400 Morales St., Metairie, La. 70002

Filed Jun. 16, 1978, Ser. No. 915,981

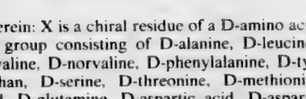
Int. Cl.[2] **C07C** *103/52*; **A61K** *37/00*

U.S. Cl. 260—112.5 R **15 Claims**

1. A polypeptide of the formulae



(I)



(II)

wherein: X is a chiral residue of a D-amino acid selected from the group consisting of D-alanine, D-leucine, D-isoleucine, D-valine, D-norvaline, D-phenylalanine, D-tyrosine, D-tryptophan, D-serine, D-threonine, D-methionine, D-glutamic acid, D-glutamine, D-aspartic acid, D-asparagine, D-lysine, D-proline, D-histidine and D-arginine; Y is methionine or leucine and Z is selected from the group consisting of hydroxy, amino, loweralkylamino, diloweralkylamino and loweralkoxy; and the pharmaceutically acceptable salts thereof; R_1 is hydrogen or fluorine.

4,180,502

MANUFACTURE OF CONCENTRATED SOLUTIONS, HAVING A LOW SALT CONTENT, OF COBALT AND CHROMIUM 1:2 COMPLEX DYES WHICH ARE FREE FROM SULFONIC ACID GROUPS

Otto Kaufmann, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

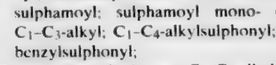
Continuation of Ser. No. 811,464, Jun. 30, 1977, abandoned. This application Oct. 2, 1978, Ser. No. 947,586

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634512

Int. Cl.[2] **C09B** *45/06, 45/10, 45/16, 45/20*

U.S. Cl. 260—145 A **9 Claims**

1. A process for the manufacture of a solution, which has a low salt content, of a sulfonic acid group-free o,o'-dihydroxy- or o,o'-hydroxycarboxy-azo dye cobalt or chromium 1:2 complex, which process comprises:
metallizing the azo dye with a metallizing agent to complex said dye with chromium or cobalt, the metallizing being carried out in water and a solvent consisting essentially of an organic compound of the formula:



I

in which A is hydrogen or methyl, m is zero or 1, n is an integer of from 1 to 3 and R and R' are, each independently, hydrogen or alkyl of 1 to 4 carbon atoms, and in the presence of at least one water-soluble salt selected from the group consisting of alkali metal and magnesium salts, and
separating the resulting two-phase system whereby the aqueous phase takes up the salts while the organic phase results in a concentrated solution, of low salt content, of the metal complex dye.

4,180,503

ACID DISAZO DYESTUFFS CONTAINING A SUBSTITUTED THIOPHENE MIDDLE COMPONENT

Dieter vor der Brück, Cologne, and Gerhard Wolfrum, Bergisch-Neukirchen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

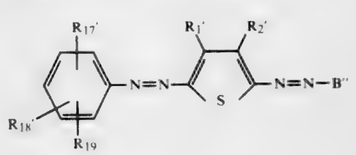
Filed Sep. 11, 1975, Ser. No. 612,318

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1974, 2443485

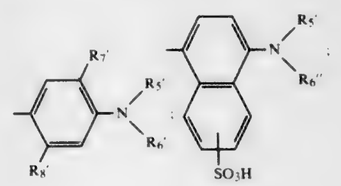
Int. Cl.[2] **C09B** *31/14, 31/04, 31/06, 31/08*

U.S. Cl. 260—152 **5 Claims**

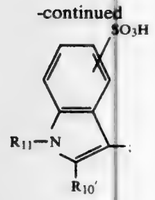
1. Acid disazo dyestuff of the formula

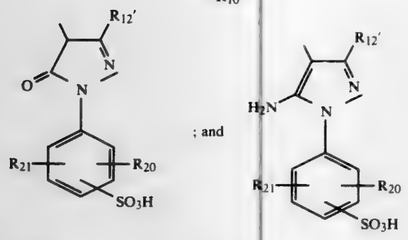


wherein
R_1' represents hydrogen, methyl, ethyl, carbo-C_1-C_4-alkoxy, phenyl, or phenyl substituted by Cl or NO_2;
R_2' represents carbo-C_1-C_4-alkoxy, cyano, $CONH_2$, $CON(CH_3)_2$ or $CON(C_2H_5)_2$;
R_{17}' and R_{18}' represent hydrogen; chlorine; bromine; cyano; C_1-C_2-alkyl; C_1-C_2-alkoxy; C_2-C_4-carboalkoxy; carbamoyl; carbamoyl mono- or di-substituted by C_1-C_3-alkyl; sulphamoyl; sulphamoyl mono- or disubstituted by C_1-C_3-alkyl; C_1-C_4-alkylsulphonyl; phenylsulphonyl; or benzylsulphonyl;
R_{19} represents hydrogen, C_1-C_4-alkyl, CF_3, Cl, or Br;
B'' is a radical of a coupling component selected from the group consisting of:



-continued





; and

wherein

R_5' represents hydrogen, C_1–C_4-alkyl, or benzyl;

R_6' represents C_1–C_4-alkyl, CH_2—CH_2—SO_3H, or 3-sulphobenzyl;

R_6'' represents hydrogen, C_1–C_4-alkyl, benzyl, or 2-phenylethyl;

R_7' represents hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, or C_1–C_4-alkylsulphonyl;

R_8' represents hydrogen, CH_3, C_2H_5, OCH_3, OC_2H_5, Cl, or NH—CO—$(CH_2)_n$—H with n = 1, 2 or 3,

R_{10}' represents methyl, ethyl or phenyl;

R_{11} represents hydrogen; C_1–C_4-alkyl; or C_1–C_4-alkyl substituted by halogen, cyano, hydroxyl, or C_1–C_4-alkoxy;

R_{12}' represents hydrogen, methyl, phenyl, carbomethoxy or carboethoxy; and

R_{20} and R_{21} represent hydrogen, C_1–C_4-alkyl, Cl, or Br.

4,180,504

METHOD FOR THE PREPARATION OF ESTERS

Bertil Hansen, Helsingborg, and Krister Holmberg, Molndal, both of Sweden, assignors to Aktiebolaget Leo, Sweden

Filed Dec. 21, 1977, Ser. No. 863,058

Claims priority, application United Kingdom, Dec. 31, 1976, 54544/76

Int. Cl.[2] C07J *17/00*

U.S. Cl. 260—239.55 D **22 Claims**

1. In a process for the preparation of a carboxylic acid ester of high purity and in improved yield, comprising reacting in solution a carboxylic acid, a hydroxyl compound selected from the group consisting of alcohols and phenols, and a carbodiimide, in the presence of pyridine or a 3- or 4-lower-alkylpyridine, the improvement which comprises the step of including in the reaction mixture a strong acid.

4,180,505

NOVEL STEROIDSPIROOXAZOLIDINES AND PROCESS FOR THEIR PREPARATION

Sándor S. L. Toldy; Katalin Szilágyi née Faragó; Inge Schäfer; Eleonóra Szondy; János Borvendég, and Ilona Hermann née Szente, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszet, Gyar RT, Budapest, Hungary

Filed Mar. 14, 1978, Ser. No. 886,349

Claims priority, application Hungary, Mar. 14, 1977, GO 1364

Int. Cl.[2] C07J *21/00*

U.S. Cl. 260—239.55 R **10 Claims**

1. Oestr-4-en-3-one-17S-spiro-5'-(2'-oxo-3'-methyloxazolidine).

4,180,506

6β-BROMO PENICILLANIC ACID

Rex Pratt, 16 Brooks La., Portland, Conn. 06480

Filed Jan. 18, 1978, Ser. No. 870,398

Int. Cl.[2] C07D *277/04*

U.S. Cl. 260—245.2 **1 Claim**

1. 6-β-Bromo penicillanic acid.

4,180,507

4-OXA 2,6 DIAZABICYCLOHEPTANE DERIVATIVES

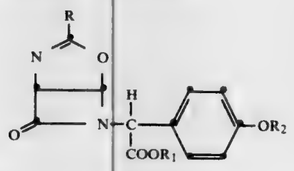
Robin D. G. Cooper; Gary A. Koppel, and Lawrence J. McShane, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 775,240, Mar. 7, 1977, Pat. No. 4,127,568. This application Aug. 15, 1978, Ser. No. 933,707

Int. Cl.[2] C07D *498/08*

U.S. Cl. 260—245.4 **3 Claims**

1. The compound of the formula



wherein R is C_1–C_3 alkyl, phenyl or benzyl;

R_1 is methyl, benzyl, 4-methoxybenzyl, or diphenylmethyl; and

R_2 is benzyl, 4-methoxybenzyl, or diphenylmethyl.

4,180,508

INDUSTRIAL BIOCIDES

Frank C. Becker, Gurnee, and Jorge P. Li, Libertyville, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 843,610, Oct. 19, 1977, Pat. No. 4,141,905. This application Nov. 13, 1978, Ser. No. 960,314

Int. Cl.[2] C07D *207/40*

U.S. Cl. 260—326.5 C **4 Claims**

1. The method to prepare N-(2-methyl-1-naphthyl)maleimide consisting essentially in heating equimolar amounts of 2-methyl-1-naphthylamine with maleic anhydride in the presence of lower fatty acid to a temperature between 100° C. and the boiling point of the reaction mixture for a period of 1–10 hours.

4. The method to prepare N-(2-methyl-1-naphthyl)-maleimide consisting essentially in heating equimolar amounts of 2-methyl-1-naphthylamine with maleic anhydride in the absence of a solvent to a temperature of 130°–190° C. for at least one hour.

4,180,509

α-ETHYNYL TRYPTOPHANES

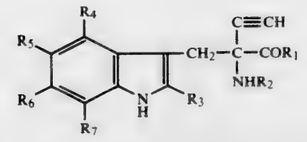
Brian W. Metcalf, Strasbourg, and Michel Jung, Illkirch Graffenstaden, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Filed Jul. 1, 1977, Ser. No. 812,052

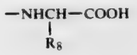
Int. Cl.[2] C07D *209/20*; A61K *31/405*

U.S. Cl. 260—326.14 T **8 Claims**

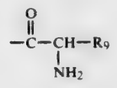
1. A compound of the formula



wherein R_1 is hydroxy, a straight or branched alkoxy group of from 1 to 8 carbon atoms, —NYY' wherein each of Y and Y' is hydrogen or a straight or branched lower alkyl of from 1 to 4 carbon atoms, or



wherein R_8 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; R_2 is hydrogen, alkylcarbonyl wherein the alkyl moiety has from 1 to 4 carbon atoms and is straight or branched, alkoxycarbonyl wherein the alkoxy moiety has from 1 to 4 carbon atoms and is straight or branched or



wherein R_9 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; R_3 is hydrogen or methyl; R_4, R_5, R_6 and R_7 have the meanings defined in Table I wherein R_{10} is hydrogen, a straight or branched alkyl group of from 1 to 8 carbon atoms, alkylcarbonyl wherein the alkyl moiety has from 1 to 6 carbon atoms and is straight or branched, benzoyl or phenylalkylenecarbonyl wherein the alkylene moiety has from 1 to 6 carbon atoms and is straight or branched, and halo is chlorine, fluorine, bromine or iodine;

TABLE I

R_4	R_5	R_6	R_7
H	H	H	H
H	OR_{10}	OR_{10}	H
OR_{10}	H	H	H
H	OR_{10}	H	H
OR_{10}	H	OR_{10}	H
H	H	OR_{10}	H
OR_{10}	OR_{10}	H	H
CF_3	H	H	H
H	H	CF_3	H
H	halo	H	H
H	H	halo	H
H	halo	halo	H
halo	H	H	CH_3
OR_{10}	H	H	CH_3
H	OR_{10}	H	CH_3
H	H	OR_{10}	CH_3
H	H	H	halo
H	halo	H	halo
H	H	halo	halo
halo	H	H	halo
H	H	OR_{10}	halo
H	OR_{10}	H	halo
OR_{10}	H	H	halo
H	H	H	CF_3
H	OR_{10}	H	CF_3
H	H	halo	OR_{10}
H	OR_{10}	H	OR_{10}
H	halo	H	OR_{10}
OR_{10}	H	H	OR_{10}
halo	H	H	OR_{10}

or a pharmaceutically acceptable salt and individual optical isomers thereof.

4,180,510

METHOD FOR PREPARING THIENYLACETIC ACIDS

Yves Le Guen, Cour Couronne, and Georges Thiault, Nogent sur Marne, both of France, assignors to Produits Chimiques Auxiliaires et de Synthese, P.C.A.S., Paris, France

Filed Jan. 12, 1978, Ser. No. 868,909

Claims priority, application France, Jan. 12, 1977, 77 00678

Int. Cl.[2] C07D *333/24, 333/38*

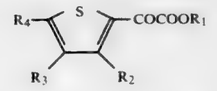
U.S. Cl. 549—79 **4 Claims**

1. A method for the preparation of α-thienylacetic acid comprising:

condensing a thiophene compound of the formula:



wherein R_2, R_3 and R_4 are each hydrogen, halogen, or lower alkyl of 1 to 5 carbon atoms or are each lower alkyl or halogen, with a monochloride-monoester of oxalic acid in a solvent of methylene chloride or 1,2-dichloroethane in the presence of titanium tetrachloride, thereby forming a glyoxalic acid ester of the formula:



wherein R_1 is lower alkyl of 1 to 5 carbon atoms and R_2, R_3 and R_4 are as defined above; and

forming said α-thienylacetic acid by reducing said glyoxalic acid ester with hydrazine; and thereafter

reacting said reduced ester obtained with an aqueous potash solution.

4,180,511

ASCORBIC ACID PROCESS

Thomas C. Crawford, Norwich, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Sep. 22, 1978, Ser. No. 945,034

Int. Cl.[2] C07D *307/62*

U.S. Cl. 260—343.7 **10 Claims**

1. In a process for the preparation of a compound selected from ascorbic acid and erythorbic acid which includes the steps of (a) reducing a compound selected from 2,5-diketogluconic acid, an n-alkyl ester of said acid wherein the alkyl group has from 1 to 4 carbon atoms and a salt of said acid selected from an alkali metal salt, an alkaline earth metal salt, an ammonium salt and a tetraalkylammonium salt having from 1 to 4 carbon atoms in each alkyl group, to form a reaction product containing borate impurities and, when said compound is selected from 2,5-diketogluconic acid and said salts of said acid, esterifying said reaction product; and (b) heating the product of step (a) in the presence of a base, the improvement which comprises the step of removing said borate impurities prior to said heating step.

4,180,512

PYRAN ANALOGS OF 4,5,13,14-TETRADEHYDRO-PGI$_1$ COMPOUNDS

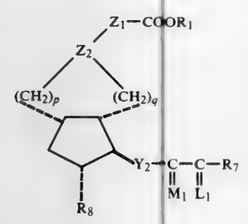
Herman W. Smith, Kalamazoo Township , Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 821,536, Aug. 3, 1977. This application Jun. 14, 1978, Ser. No. 915,440

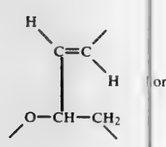
Int. Cl.^{2} C07D 311/02

U.S. Cl. 260—345.2 **73 Claims**

1. A prostacyclin analog of the formula

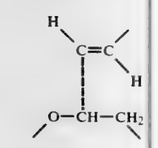


wherein Y_2 is $-C\equiv C-$;
wherein Z_2 is



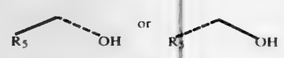
(1)

or

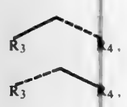


(2)

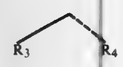
wherein one of p and q is one and the other is zero;
wherein Z_1 is
(1) $-(CH_2)_g-CH_2-CH_2-$, or
(2) $-(CH_2)_g-CH_2-CF_2-$,
wherein g is the integer zero, one, or 2;
wherein R_8 is hydrogen, hydroxy, or hydroxymethyl;
wherein M_1 is



wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive,
wherein L_1 is



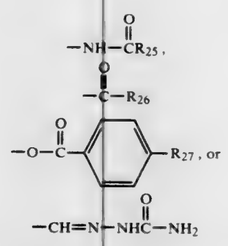
or a mixture of



and

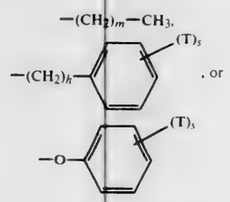


wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein R_1 is hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, two or three chloro or alkyl of one to 3 carbon atoms; phenyl substituted in the para position by



(a) (b) (c) (d)

wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $-NH_2$; R_{26} is methyl, phenyl, $-NH_2$, or methoxy; and R_{27} is hydrogen or acetamido; phenacyl; phenacyl substituted in the para position by chloro, bromo, phenyl, or benzamido; or a pharmacologically acceptable cation;
wherein R_7 is



(1) (2) (3)

wherein m is the integer one to 5, inclusive, h is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two T's are other than alkyl.

4,180,513

METHOD FOR SYNTHESIZING ACID BLUE 104

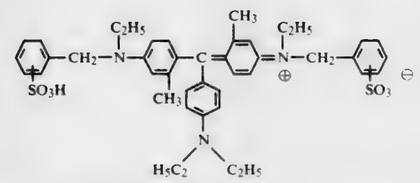
Yunn H. Chiang, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 17, 1978, Ser. No. 925,220

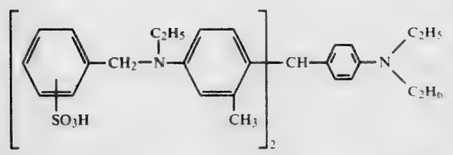
Int. Cl.^{2} C09B 11/18

U.S. Cl. 260—392 **5 Claims**

1. A method for synthesizing Acid Blue Dye 104 which is represented by the formula



which comprises the steps of:
(a) reacting N-benzyl-N-ethyl-toluidinesulfonic acid with p-diethylaminobenzaldehyde in an aqueous oxalic acid solution having a pH of about 1.5 or less to form an intermediate which is represented by the formula



(b) isolating said intermediate and removing impurities therefrom by treatment with an organic solvent;
(c) providing a homogeneous aqueous buffer solution having at least about 3.5 weight percent of oxalic acid and at least about 35 weight percent of acetic acid based on the volume of said solution;
(d) dissolving said intermediate in said homogeneous buffer solution at a ratio of at least about 20 liters of buffer solution per mole of said intermediate;
(e) adding aqueous sodium dichromate solution to said solution of said intermediate at a temperature of from about −5° C. to about −10° C. and intimately mixing said solutions in about 60 seconds or less to form said Acid Blue Dye 104;
(f) isolating said Acid Blue Dye 104; and
(g) purifying said Acid Blue Dye 104 by dissolution in sulfuric acid and partially neutralizing the solution with a base.

4,180,514

ADHESION PROMOTER AND METHOD OF PREPARATION

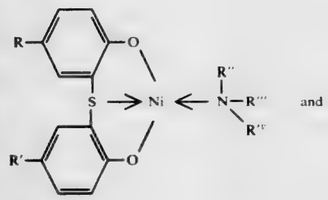
Richard C. Doss, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 9, 1978, Ser. No. 876,437

Int. Cl.^{2} C08K 5/36

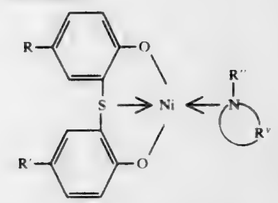
U.S. Cl. 428—417 **32 Claims**

29. An article of manufacture which is subjected to an aqueous environment, said article having adhering to at least a part thereof a sealant composition comprising:
(a) a base material selected from the group consisting of rubbery polymers and resinous polymers;
(b) a nickel amine complex of 2,2'-thiobis (p-alkylphenol) selected from the group consisting of the materials having the formulas



and

-continued



wherein R and R' are selected from the group consisting of hydrogen and alkyl and cycloalkyl groups containing 1 to about 18 carbon atoms, wherein R'', R''', and R'^{v} are selected from the group consisting of hydrogen and alkyl, cycloalkyl, aromatic, alkyl-substituted aromatic, and heterocyclic hydrocarbon groups which contain 1 to about 18 carbon atoms, wherein R^{v} and N form a cyclic structure and wherein R^{v} contains from 2 to about 12 carbon atoms.

4,180,515

ORGANOSILICON COMPOUNDS WITH FUNCTIONAL GROUPS

Michel Bargain, Lyon, and Marcel Lefort, Caluire, both of France, assignors to Rhone-Poulenc Industries, Paris, France

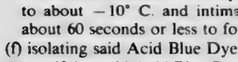
Filed Jul. 20, 1977, Ser. No. 817,241

Claims priority, application France, Aug. 17, 1976, 76 25534

Int. Cl.^{2} C07F 7/08

U.S. Cl. 260—448.2 Q **4 Claims**

1. Organosilicon compounds corresponding to the general formula:



(1)

wherein R represents a monovalent aliphatic hydrocarbon or halocarbon radical having up to 10 carbon atoms and containing a carbon-carbon double bond; R_1 represents a member selected from the group consisting of a monovalent hydrocarbon radical having up to 10 carbon atoms and the halo and cyano derivatives thereof; G represents a divalent carbocyclic aromatic radical; Y represents a functional group selected from the group consisting of Cl, COOH, COOM, $COOR_2$ and COCl, in which M represents an atom of sodium, potassium or lithium and R_2 represents a linear or branched alkyl radical having up to 4 carbon atoms; and, n is an integer equal to 1 or 2.

4,180,516

CONVERSION OF SYNTHESIS GAS TO AROMATIC HYDROCARBONS

Clarence D. Chang, Princeton, and William H. Lang, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 18, 1977, Ser. No. 825,622

Int. Cl.^{2} C07C 1/04

U.S. Cl. 260—449 R **8 Claims**

1. In the process of converting synthesis gas, comprising carbon monoxide and hydrogen, to an aromatic hydrocarbon product by contacting the synthesis gas at about 500° to 900° F. with a heterogenous catalyst comprising as a first component a carbon monoxide reduction catalyst and as a second component an aromatizing crystalline aluminosilicate zeolite having a silica to alumina ratio of at least 12 and a constraint index of about 1 to 12; the improvement which comprises utilizing as

the carbon monoxide reducing catalyst component a mixed catalyst selected from the groups consisting of ZnO-Cr_2O_3 having a Zn:Cr atomic ratio less than about 4:1 alone or in admixture with a binder selected from the group consisting of alumina, zirconia, silica, titania and magnesia and thereby substantially increasing the conversion of said synthesis gas to aromatic hydrocarbon products.

4,180,517

CATALYST AND PROCESS FOR PRODUCING POLYHYDRIC ALCOHOLS AND DERIVATIVES

Jose L. Vidal, Charleston, and Wellington E. Walker, Sissonville, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 880,080, Feb. 2, 1978, abandoned. This application Nov. 7, 1978, Ser. No. 958,383

Int. Cl.[2] **C07C** *27/06, 31/06*

U.S. Cl. 260—449 L **17 Claims**

1. A process of producing an alkane polyol(s) which comprises reacting in a homogeneous liquid phase a mixture of hydrogen and oxides of carbon in the presence of a rhodium carbonyl phosphido cluster compound at a pressure between about 1,000 to about 50,000 pounds per square inch absolute and at a temperature of between about 210° C. and about 320° C., wherein the rhodium carbonyl phosphido cluster compound possesses an infrared spectrum which is characterized by two significant infrared bands between about plus and minus 15 cm^{-1} of about 2010 cm^{-1} and about 1815 cm^{-1}.

4,180,518

PEROXY COMPOUNDS

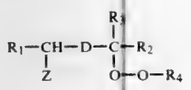
Orville L. Mageli, Kenmore, N.Y., and William A. Swarts, Dover, N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 596,778, Jul. 17, 1975, Pat. No. 4,129,700. This application Aug. 28, 1978, Ser. No. 937,657

Int. Cl.[2] **C07C** *69/96*

U.S. Cl. 260—453 RZ **4 Claims**

1. A peroxy compound of the formula:

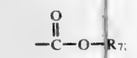


where:

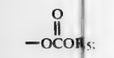
(a) R_1 is hydrogen or an alkyl of 1–4 carbons;

(b) R_2 and R_3 are an alkyl of 1–4 carbons;

(c) R_4 is t-alkyl of 4–10 carbons, t-aralkyl of 9–16 carbons, t-cycloalkyl of 6–12 carbons or



(d) Z is



(e) R_5 and R_7 are independently an alkyl of 1–8 carbons; and

(f) D is ethynyl diradical, diethynyl diradical or alkyl diradical having 1–8 carbons.

4,180,519

PROCESS FOR OBTAINING AND PRODUCT ACRYLIC MONOMERS USEFUL IN THE PREPARATION OF CATIONIC FLOCCULANTS

Jean Neel, and Robert Violand, both of Lyon, France, assignors to Rhone-Poulenc Industries, Paris, France

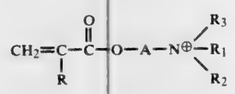
Continuation of Ser. No. 603,173, Aug. 8, 1975, abandoned. This application Apr. 11, 1977, Ser. No. 786,559

Claims priority, application France, Aug. 23, 1974, 74 20460

Int. Cl.[2] **C07C** *141/10, 93/193*

U.S. Cl. 260—459 A **18 Claims**

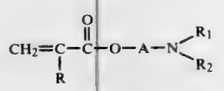
1. A process for preparing a highly concentrated aqueous quaternary acrylic ester monomer solution which is directly polymerizable to form hard, transparent, water-soluble, high molecular weight cationic acrylic polymers and which comprises a major content of a salt of a monomeric compound of formula I



(I)

wherein R represents hydrogen or methyl, A represents an alkylene group containing 1 to 3 carbon atoms, R_1 and R_2 are the same or different and each represents an alkyl group containing 1 to 4 carbon atoms, and R_3 represents a lower alkyl or benzyl group, said process comprising the steps of:

(a) reacting an aqueous mixture containing about 50 to about 90% of a compound of formula II



(II)

wherein R_1, R_2, R and A are as defined above, with a quaternizing agent of formula R_3X, wherein R_3 is as defined above and X is halogen or the $—CH_3SO_4$ group at a temperature of between about 10° and about 70° C. whereby a crude aqueous solution of a salt of a compound of formula I is obtained;

(b) treating said crude aqueous solution with a water-insoluble solvent in order to obtain a mixture comprising a purified aqueous phase containing the salt of the compound of formula I and being substantially free of impurities of unreacted starting materials and of impurities which induce the formation of water-insoluble polymers, and an organic phase containing the water-insoluble solvent and said impurities;

(c) separating the organic base of said mixture from the purified aqueous phase; and,

(d) further purifying said purified aqueous phase and recovering therefrom a highly concentrated clear aqueous solution of the salt of the compound of formula I sufficiently free of said impurities and organic solvents said aqueous solution being directly polymerizable into a hard, transparent, water-soluble, high molecular weight cationic acrylic polymer.

4,180,520

PREPARATION OF NITRILES

Pieter A. Verbrugge, and Petrus A. Kramer, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

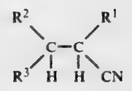
Division of Ser. No. 806,034, Jun. 13, 1977, Pat. No. 4,132,728. This application Sep. 5, 1978, Ser. No. 939,749

Claims priority, application United Kingdom, Aug. 16, 1976, 33969/76; Aug. 16, 1976, 33970/76

Int. Cl.[2] **C07C** *121/16, 121/66*

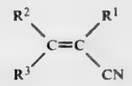
U.S. Cl. 260—465 R **14 Claims**

1. A process for the preparation of a nitrile of formula IV



IV

wherein R^1 represents an aryl group containing up to 12 carbon atoms or a hydrogen atom, and R^2 and R^3 each represents an alkyl group containing from 1 to 6 carbon atoms or a hydrogen atom, which process comprises reacting a nitrile of formula I



I

wherein R^1, R^2 and R^3 have the same meaning as in formula IV with an alkanol containing from 1 to 4 carbon atoms and magnesium in the presence of an ammonium salt in a molar ratio of ammonium salt to magnesium of at least 0.002.

4,180,521

PROCESS FOR THE PREPARATION OF NAPHTHALENE-1,3,6-TRISULPHONIC ACID

Horst Behre, Odenthal; Rolf Pütter, Duesseldorf, and Guido Steffan, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 15, 1978, Ser. No. 886,696

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2716029

Int. Cl.[2] **C07C** *143/30*

U.S. Cl. 260—505 C **11 Claims**

1. Process for the preparation of naphthalene-1,3,6-trisulphonic acid by sulphonating naphthalene with sulphuric acid and oleum, characterized in that naphthalene and most of the oleum are simultaneously metered over a period of about 10 to 200 minutes into sulphuric acid or oleum of low concentration, which has been initially introduced, at about 140° to 240° C., all of the naphthalene being added by the end of the simultaneous metering, the temperature is kept at about 140° to 240° C. for some time, the remainder of the oleum is then added at about 140° to 240° C., the time between the end of the first addition of oleum and the beginning of the second addition of oleum being about 0.25 to 10 hours, and the mixture is then further stirred for some time.

4,180,522

N-(2-DIMETHYLAMINOALKYL)-3',4'-DICHLOROANILIDES

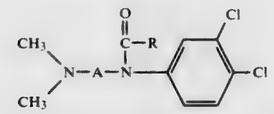
Michael P. Kane, and Jacob Szmuszkovicz, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 838,767, Oct. 3, 1977, abandoned, which is a continuation of Ser. No. 746,863, Dec. 2, 1976, abandoned. This application Aug. 16, 1978, Ser. No. 934,239

Int. Cl.[2] **C07C** *103/375*

U.S. Cl. 260—562 R **10 Claims**

1. A compound of the formula



wherein A is alkylene of two to 3 carbon atoms, inclusive; wherein R is ethyl, cyclopropyl or vinyl, or the pharmacologically acceptable acid addition salts thereof.

4,180,523

MANUFACTURE OF N-[3,4-DIMETHYLPHENYL]-D-RIBAMINE

Herbert Scholz, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

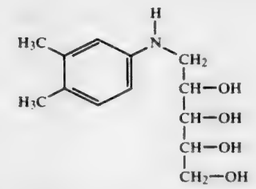
Continuation of Ser. No. 745,433, Nov. 26, 1976, abandoned. This application Jul. 11, 1978, Ser. No. 923,537

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558515; Dec. 24, 1975, 2558516

Int. Cl.[2] **C07C** *91/40*

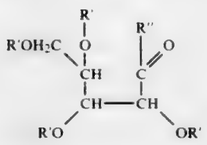
U.S. Cl. 260—573 **5 Claims**

1. A process for the manufacture of N-[3,4-dimethylphenyl]-D-ribamine of the formula I



I

which comprises: catalytically hydrogenating 3,4-dimethylaniline or 3,4-dimethylnitrobenzene and a D-ribonic acid derivative of the formula II



II

where each R' is hydrogen or one of the R's together with R'' is a single bond, R'' is hydroxyl, OR''' or, together with R', a single bond, and R''' is a hydrocarbon radical of 1 to 10 carbon atoms which may or may not be substituted by one or more hydroxyl groups in an inert solvent at from 125° C. to 155° C. using an effective amount of catalyst which contains copper oxide, copper or mixtures thereof.

4,180,524

DISPROPORTIONATION/DOUBLE-BOND ISOMERIZATION OF OLEFINS

Robert E. Reusser, and William B. Hughes, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 16, 1978, Ser. No. 878,537

Int. Cl.[2] **C07C** *11/02, 15/09*

U.S. Cl. 585—644 **23 Claims**

1. A process for the treatment of an olefinic hydrocarbon which comprises contacting said olefinic hydrocarbon under effective double bond isomerization and disproportionation conditions with an activated calcined homogeneous catalyst compositions consisting essentially of support/uranium/at least one of molybdenum, tungsten, and rhenium, containing about 0.1 to 25 weight percent total of uranium, molybdenum, tungsten, and rhenium, each calculated as the metal, and a proportion of uranium:molybdenum, tungsten, or rhenium of about 2:1 to 0.1:1, prepared by forming a homogenous composite of support, uranium, and at least one of molybdenum, tungsten, and rhenium, calcining said homogenous composite at elevated temperatures in a molecular-oxygen containing atmosphere, and thereafter activating at elevated temperature in a reducing atmosphere, thereby preparing said activated catalyst composition.

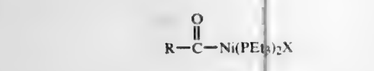
4,180,525

TRANS-HALO(ACYL)BIS(TRIETHYLPHOSPHINE) NICKEL(II) COMPLEXES

Darryl R. Fahey, and John E. Mahan, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 739,763, Nov. 8, 1976, Pat. No. 4,123,447.
This application Aug. 3, 1978, Ser. No. 930,615
Int. Cl.[2] C07C *3/21*
U.S. Cl. 585—523 10 Claims

1. A process for oligomerizing monoolefins comprising contacting under suitable reaction conditions at least one said monoolefin with a catalyzing amount of a catalyst system comprising (1) at least one organoaluminum halide compound having the formula $R''_nALX_{3-n'}$ wherein each R'' is a hydrocarbyl radical having from 1 to 20 carbon atoms; each X is a halogen; and n is 1, 1.5, or 2; and (2) at least one acyl nickel complex having the formula



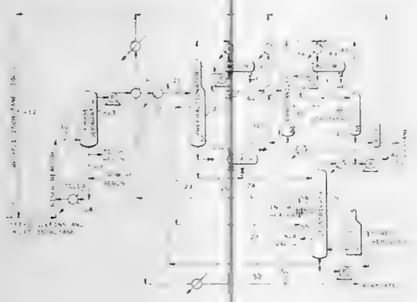
wherein X is a halogen; PEt_3 is triethylphosphine; and R is selected from the group consisting of alkyl hydrocarbon radicals containing 6 to 12 carbon atoms; substituted aryl radicals containing 6 to 12 carbon atoms and having as the only nonhydrocarbon substituents 1 or 2 halogens selected from fluorine, chlorine, and bromine bonded to the aromatic portion of the aryl radical; and substituted aralkyl radicals containing 7 to 12 carbon atoms and having as the only nonhydrocarbon substituents one or more halogens selected from fluorine, chlorine and bromine bonded to the aromatic portion of the aralkyl radical.

4,180,526

ALKYLATION PROCESS UTILIZING SIDE DRAW VAPOR AS HEAT SOURCE IN ISOSTRIPPER

Charles C. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 7, 1978, Ser. No. 922,916
Int. Cl.[2] C07C *3/54*
U.S. Cl. 585—719 6 Claims



1. An alkylation process comprising the steps of:
contacting an olefin and isoparaffin with an acid alkylation catalyst under alkylation conditions to form an alkylate-containing alkylation effluent,
passing said effluent to a phase separation zone and settling said effluent into a hydrocarbon phase and an acid catalyst phase,
passing said hydrocarbon phase to a prefractionation zone wherein the hydrocarbon phase is separated into at least three fractions with one fraction being an overhead vapor fraction, another being a bottoms liquid fraction, and the third being a side draw vapor stream, changing said bottom liquid fraction to an isostripper, and
passing said side draw vapor stream from the prefractionation zone in indirect heat exchange relationship with the interheater of said isostripper to thereby provide the majority of heat energy required for the isostripper.

4,180,527

PROCESS FOR THE MANUFACTURE OF CRYSTALLINE, CROSSLINKED, ELASTOMERIC EPOXIDE RESINS

Rolf Schmid, Gelterkinden, and Ursula Kreibich, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 680,265, Apr. 26, 1976, abandoned. This application Aug. 29, 1977, Ser. No. 828,442
Claims priority, application Switzerland, Apr. 28, 1975, 5443/75
The portion of the term of this patent subsequent to Jul. 18, 1995, has been disclaimed.
Int. Cl.[2] C08L *63/00*
U.S. Cl. 525—115 21 Claims

1. Process for the manufacture of crystalline, crosslinked, elastomeric epoxide resins, characterised in that epoxide compounds, containing two or more epoxide groups, are reacted
(a) with polyester-polycarboxylic acids A which essentially contain segments of the formula I

$$-[O-(CH_2)_n-O.CO-(CH_2)_m-CO]_p- \quad (I)$$

in which n and m are identical or different and denote 2 or a higher number than 2, and to which the condition n+m=6 to 30 applies, and in which p denotes a number from 2 to 40 which, however, is sufficiently large that the segment contains at least 30 $-CH_2-$ groups, and
(b) with polyester-polycarboxylic acids B which essentially contain segments of the formula II

$$-[O-R^1-O.CO-R^2-CO]_q- \quad (II)$$

in which R^1 and R^2 are identical or different and denote an alkylene radical with at least 2 C atoms in the chain and in which, per O bridge, an average of at least 3.5 and at most 30 C atoms, without taking into account the C atoms of the —CO-.O— radicals, are present in the chain, and wherein the radicals R^1 and R^2 together contain at least one alkyl group as a substituent for one H atom, and in which q denotes a number from 2 to 40, which, however, is sufficiently large that the segment contains at least 30 C atoms, without taking into account the C atoms of the —CO.O— radicals, in the chain, and
(c) if appropriate, with curing agents C, and, if appropriate, in the presence of accelerators, in a ratio such that 0.5 to 1.2 equivalents of polyester-polycarboxylic acid are present per equivalent of epoxide compound, that 1/10 to 9/10 of these 0.5 to 1.2 equivalents are attributable to the polyester-polycarboxylic acid A and the remaining 9/10 to 1/10 to the polyester-polycarboxylic acid B, and that up to 0.6 equivalent of curing agent C is present per equivalent of epoxide compound, with the proviso that, in the cases in which only difunctional epoxide compounds and difunctional polyester-polycarboxylic acids A and B are employed, the epoxide groups must be present in excess and the reaction with a curing agent C is essential.

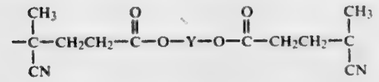
4,180,528

BLOCK COPOLYMER COMPOSED OF AN ADDITION POLYMER AND A LINEAR SATURATED POLYESTER

David R. Fagerburg, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 26, 1978, Ser. No. 919,208
Int. Cl.[2] C08G *81/02*; C08L *67/00*
U.S. Cl. 525—70 2 Claims

1. An A-B-A type block copolymer having a molecular weight of at least 5,000 wherein
the A- block is the monovalent radical remaining after removal of a terminal hydrogen atom from an addition polymer selected from the group consisting of polyethylene, polypropylene, polyacrylonitrile, polyvinyl chloride, polymethylmethacrylate, and polystyrene, and
the -B- block is a divalent radical which is soluble to at least one weight percent in chloroform and has the structure



where Y is the divalent radical remaining after removal of the terminal hydroxy groups from a linear saturated polyester having a molecular weight of at least 1500 selected from the group consisting of
a polyester prepared from
a dicarboxylic acid which can be terephthalic acid, isophthalic acid, 1,4-cyclohexanedicarboxylic acid or adipic acid, and
a diol which can be ethylene glycol, 1,4-butanediol, 1,4-cyclohexanedimethanol, neopentyl glycol, 2,2,4,4-tetramethyl-1,3-cyclobutanediol, diethylene glycol or 1,6-hexanediol, and
a copolyester of caprolactone and a material selected from the group consisting of terephthalic acid, isophthalic acid, 1,4-cyclohexanedicarboxylic acid, adipic acid, ethylene glycol, 1,4-butanediol, 1,4-cyclohexanedimethanol, neopentyl glycol, 2,2,4,4-tetramethyl-1,3-cyclobutanediol, diethylene glycol and 1,6-hexanediol and mixtures thereof.

4,180,529

ACRYLIC MULTISTAGE GRAFT COPOLYMER PRODUCTS AND PROCESSES

George H. Hofmann, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 858,887, Dec. 8, 1977, abandoned. This application Jan. 12, 1979, Ser. No. 3,089
Int. Cl.[2] C08L *33/08, 33/10, 33/12*
U.S. Cl. 525—85 14 Claims

1. A resilient, acrylic, multi-stage, sequentially produced polymer characterized by
(a) an elastomeric first stage comprising about 1–20% by weight of the polymer and having a glass transition temperature of between about −60° C. and 25° C., which is polymerized from a monomer mixture of 50 to 100 weight percent of at least one alkyl acrylate wherein the alkyl group contains 1 to 8 carbon atoms, 0 to 50 weight percent of another copolymerizable monoethylenically unsaturated monomer, 0 to 5 weight percent of a copolymerizable polyfunctional crosslinking monomer and 0 to 5 weight percent of a copolymerizable graftlinking monomer;
(b) a nonelastomeric, relatively hard second stage comprising about 15–65% by weight of the polymer and having a glass transition temperature greater than 25° C., which is polymerized in the presence of the first stage product from a monomer mixture of 70 to 100 weight percent of at least one alkyl methacrylate wherein the alkyl group has 1 to 4 carbon atoms, 0 to 30 weight percent of another copolymerizable monoethylenically unsaturated monomer, 0 to 5 weight percent of a copolymerizable polyfunctional crosslinking monomer and 0 to 5 weight percent of a copolymerizable graftlinking monomer;
(c) an elastomeric third stage, comprising about 30–75% by weight of the polymer and having a glass transition temperature of between about −60° and 25° C., which is polymerized in the presence of the first and second stage product from a monomer mixture of 50 to 100 weight percent of at least one alkyl acrylate wherein alkyl group contains 1 to 8 carbon atoms, 0 to 50 weight percent of another copolymerizable monoethylenically unsaturated monomer, 0 to 5 weight percent of a copolymerizable polyfunctional crosslinking monomer and 0 to 5 weight percent of a copolymerizable graftlinking monomer;
(d) a nonelastomeric, relatively hard fourth stage comprising about 5–40% by weight of the polymer and having glass transition temperature greater than 25° C. which is polymerized in the presence of the first, second and third stage product from a monomer mixture of 70 to 100 weight percent of at least one alkyl methacrylate wherein the alkyl group has 1 to 4 carbon atoms, 0 to 30 weight percent of another copolymerizable monoethylenically unsaturated monomer, 0 to 5 weight percent of a copolymerizable polyfunctional crosslinking monomer and 0 to 5 weight percent of a copolymerizable graftlinking monomer; said first and third stage combined comprising at least 40 percent by weight of the polymer.

4,180,530

CLEAR IMPACT RESISTANT THERMOPLASTIC STAR-BLOCK COPOLYMERS

Le-Khac Bi, Pittsburgh, and Ralph Milkovich, Murrysville, both of Pa., assignors to ARCO Polymers, Inc., Philadelphia, Pa.

Filed Feb. 5, 1979, Ser. No. 9,708
Int. Cl.[2] C08F *297/04*
U.S. Cl. 525—98 5 Claims

1. Star-block copolymers, of from 60 to 95% by weight of a monovinyl aromatic compound and 40 to 5% by weight of a conjugated diene of 4 to 8 carbon atoms, which have an average structure of the general formula $(A—B/A'-B')_mX—B-'—A'/B)_n$ where A is a non-elastomeric polymer segment based on the monovinyl aromatic compound, A'/B or B/A' is an elastomeric polymer segment based on a random copolymer of the monovinyl aromatic compound and the conjugated diene, B' is an elastomeric polymer segment based on the conjugated diene, m and n are integers whose sum is between 3 and 20, and X is the radical of a polyfunctional coupling agent by means of which the linear polymer segments (A—B-/A'—B') and (B/A'—B') are chemically bonded to form the star-block copolymers, wherein said segment A contains 80 to 90% by weight of the total monovinyl aromatic compound, segment B' contains 20 to 40% by weight of the total conjugated diene, and segment B/A' contains no significant blocks of either monovinyl aromatic compound or conjugated diene.

4,180,531

PROCESSIBLE AND VULCANIZABLE POLAR POLYMERS

Dominic Alia, 1609 Sheridan St., Williamsport, Pa. 17701

Filed Nov. 16, 1976, Ser. No. 742,398
Int. Cl.[2] C08L *23/08, 23/28, 23/34*
U.S. Cl. 525—214 14 Claims

1. A processible composition consisting essentially of
(i) a saturated polar polymer selected from the group consisting of chlorinated polyethylene, chlorosulfonated polyethylene or poly(vinyl chloride);
(ii) at least one ethylene copolymer, solid at 25° C., containing at least 50% by weight of ethylene and up to 50% by weight of one or more organic compounds which are interpolymerizable with ethylene containing a >C=C< ethylene linkage wherein the ethylene copolymer has a density between 0.92 and 0.96 as per ASTM D-792-60T

and a Melt Index of 0.2 to 200 g/10 min. as per ASTM D-1238-62T and

(iii) at least one peroxide vulcanizing agent, said composition comprising by weight to 100 parts of saturated polar polymer (i), about 10 to 400 parts by weight of ethylene copolymer (ii) and about 0.1 to 10 parts by weight of peroxide vulcanizing agent (iii), and said composition having a crosslinking half-life of about 0.2 to 1.5 minutes at 205° C.

4,180,532

PHOSPHORIC ACID ESTERS OF POLY(2-10)ETHYLENEOXY N BUTANE 1,4-DIOLS

Paritosh M. Chakrabarti, and Mohammed M. Hashem, both of Wayne, N.J., assignors to GAF Corporation, New York, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,439
Int. Cl.² C07F 9/09
U.S. Cl. 260—953 **8 Claims**

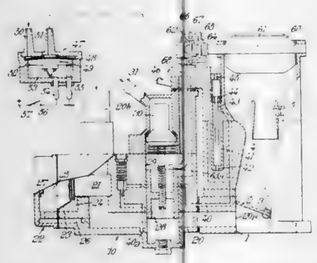
1. Compounds and mixtures of phosphoric acid esters poly(-2-10) ethyleneoxy n butane 1,4 diol.

4,180,533

CARBURETOR FOR INTERNAL COMBUSTION ENGINES

Michael Bonse, Dusseldorf, Fed. Rep. of Germany, assignor to Societe Industrielle de Brevets et d'Etudes S.I.B.E., Neuilly sur Seine, France

Filed Jan. 23, 1978, Ser. No. 871,540
Claims priority, application France, Feb. 8, 1977, 77 03487
Int. Cl.² F02M 1/06
U.S. Cl. 261—39 A **8 Claims**



1. A carburetor for an internal combustion engine, having:

an induction passage,

operator actuatable main throttle means in said induction passage,

a main fuel delivery system opening into said induction passage upstream of said throttle means, and

an auxiliary starting device for delivering an additional flow of fuel and air to the induction passage during starting and cold running, said starting device comprising:

duct means opening into the induction passage downstream of the throttle means,

means for supplying fuel and air to said duct means,

a closure valve in said duct,

temperature responsive means for maintaining said closure valve in open condition until the temperature of said engine has reached a first predetermined value,

means, separate from the temperature responsive means, for decreasing the flow of fuel entering said duct means upon the engine becoming self operative,

a flap located in said induction passage upstream of the opening of the main fuel delivery system, said flap being arranged to be biased toward opening by the air flow around it,

return means for resiliently biasing the flap toward closure, with a force which decreases as the temperature of the engine increases, and

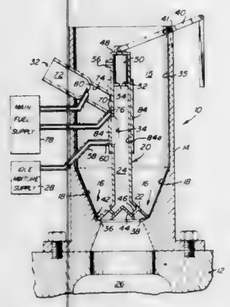
variable temperature-responsive stop means associated with the flap and preventing it from moving toward closure beyond a position of partial opening even under cold-start conditions.

4,180,534

APPARATUS FOR DISPENSING A FUEL-AIR MIXTURE IN AN AIRSTREAM

Alan B. Cutler, Missoula, Mont., assignor to Revas, Inc., Denver, Colo.

Filed Sep. 14, 1977, Ser. No. 833,013
Int. Cl.² F02M 11/00
U.S. Cl. 261—41 B **8 Claims**



1. Apparatus for mixing fuel in an airflow and supplying the fuel and air mixture in an intake opening of an engine, comprising:

a main body member defining a substantially hollow cylindrical and axially extending interior portion and a frustroconically-shaped constricted portion converging inwardly from the cylindrical interior portion, the constricted portion terminating inwardly at a circular-shaped orifice, the orifice directly communicating with the intake opening of the engine;

an elongated throttle tube member defining a middle portion with a substantially hollow interior, a first end portion closing the hollow interior at one end of the middle portion, and a second fuel dispensing hollow end portion opening from the other end of the hollow interior of the middle portion, the second end portion having an outer frustroconically-shaped surface diverging outwardly from the middle portion, the hollow interior of the second end portion being defined by an inner frustroconically-shaped surface diverging outwardly from the hollow interior of the middle portion, the outward divergence of the frustroconically-shaped inner and outer surfaces terminating at a circular edge, the circular edge being of diameter at least equal to the diameter of the orifice, the middle portion further defining a primary intake opening formed therein and communicating with the hollow interior of the middle portion;

a positioning member attached to said main body member and having a center opening formed therein in axial alignment with the orifice of said main body member, the center opening adapted to receive the middle portion of said throttle tube member and to allow axial movement of said throttle tube member within the center opening;

the middle portion of said throttle tube member being received within the center opening of the positioning member with the second end portion of the throttle tube member generally within the constricted portion of the main body member and with the hollow interior of the second end portion opening into the orifice;

means for axially moving said throttle tube member from a closed position in which the circular edge of the second end portion substantially closes the orifice of the main body portion to an open position in which the circular edge is axially spaced from the orifice and transversely spaced from the constricted portion of said main body member;

a primary delivery port defined in said positioning member at a predetermined location to communicate with the primary intake opening of said throttle tube member upon movement of said throttle tube member to a predetermined open position, the predetermined location also substantially preventing communication of the primary delivery port with the primary intake opening upon movement of said throttle tube member to the closed position;

boost venturi means for operatively mixing fuel with air to form a primary fuel and air mixture, said boost venturi means operatively connected for supplying the primary fuel and air mixture directly to the primary delivery port; and

said primary intake opening being of predetermined configuration to expose increasing cross sectional amounts of the primary delivery port to the hollow interior middle portion in predetermined relation with increasing axial movement of said throttle tube member from the closed position toward the open position.

4,180,535

METHOD OF BONDING PROPELLANTS CONTAINING MOBILE CONSTITUTENTS

Richard G. Rhoades, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 5, 1978, Ser. No. 939,760
Int. Cl.² C06B 21/00
U.S. Cl. 264—3 R **7 Claims**

1. A method of bonding propellants containing mobile constituents to a substrate to achieve the formation of an element of a strong bond system which additionally functions as a barrier to migration of said mobile constituents, said method comprising:

(i) providing a substrate material selected from the group of substrate materials consisting of a composite case of the fiber/resin type for a rocket motor, insulation material bonded to a composite case of the fiber/resin type for a rocket motor, and a liner material bonded to insulation material which is bonded to a composite case of the fiber/resin type for a rocket motor;

(ii) forming a metallic film of a metal by flame spraying or vapor depositing said metal on said substrate material onto which an uncured propellant is to be subsequently cast;

(iii) abrading said metallic film to provide a roughened surface to promote bonding of propellant to be cast onto said metallic film;

(iv) casting onto said metallic film an uncured propellant composition containing mobile constituents selected from the group consisting of carboranes, ferrocenes, and nitroglycerin; and

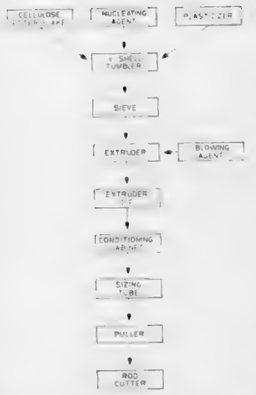
(v) curing said cast propellant composition to form a propellant grain that is bonded to said metallic film which serves as an element of a strong bond system and a barrier to migration of said mobile constituents to said substrate material.

4,180,536

PROCESS FOR EXTRUDING PLASTICIZED OPEN CELL FOAMED CELLULOSE ACETATE FILTERS

Carl J. Howell, Jr., Charlotte, N.C.; David W. Trott, Fort Mill, S.C., and Jesse L. Riley, Charlotte, N.C., assignors to Celanese Corporation, Charlotte, N.C.

Filed Mar. 13, 1978, Ser. No. 886,201
Int. Cl.² B29D 27/00
U.S. Cl. 264—53 **11 Claims**



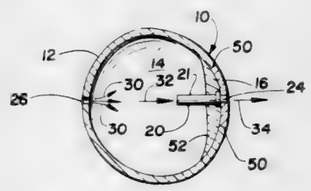
1. A process for the preparation of a plasticized, open cell, foamed cellulose acetate filter rod, said process comprising melt extruding through an elliptical or circular orifice of a screw extruder a mixture of cellulose acetate, a nontoxic, taste compatible thermally stable plasticizer having a boiling point of not less than 180° C., a blowing agent which is at least a partial solvent for cellulose acetate and a nucleating agent, said melt being substantially free of entrained air, and the extrusion pressure profile being such as to prevent said blowing agent from backing up in said screw extruder.

4,180,537

METHOD OF MAKING CERAMIC, SOUND-PRODUCING, ORNAMENTAL ARTICLE

Cessare M. Danova, 1760 Franklin Ave., Santa Monica, Calif. 90404

Filed Jun. 28, 1978, Ser. No. 910,148
Int. Cl.² C04B 37/00
U.S. Cl. 264—62 **4 Claims**



1. A method of forming an ornamental sound-producing article consisting of a clay material comprising the steps of:

providing a mold having a predetermined-shape cavity;

forming a shell housing portion and an insert wall section of said clay in said cavity, said housing defining a chamber;
removing said housing and insert wall section from said mold;
forming a first hole in said housing;
forming a second hole in said insert wall section;
securing a sound-producing means to said insert wall over said second hole thereof; and
affixing said insert wall to said housing wherein said sound-producing means is disposed in said chamber.

4,180,538

METHOD OF MAKING CERAMIC SHAPED ARTICLE FROM INORGANIC RAW MATERIAL POWDER BY EXTRUSION MOLDING

Akira Morikawa; Yoshinori Narita, both of Nagoya, and Junichi Mizutani, Kuwana, all of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 570,803, Apr. 23, 1975, which is a continuation-in-part of Ser. No. 486,759, Jul. 9, 1974, abandoned. This application Jan. 17, 1977, Ser. No. 759,812
Claims priority, application Japan, Feb. 21, 1975, 50-22074
Int. Cl.² C04B *33/64*
U.S. Cl. 264—63 **7 Claims**

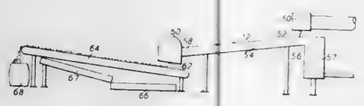
1. A method of making a honeycomb-shaped ceramic article by extrusion molding, comprising the steps of kneading an inorganic ceramic raw material powder with a plasticizer formed of a resin which is a water insoluble synthetic resin dissolved in a water soluble solvent, to form a kneaded body, the volume ratio of said inorganic raw material to said plasticizer being in the range of 100:50 to 100:200, and shaping a honeycomb-shaped ceramic article by extruding said kneaded body through a shaped orifice and then into water for hardening the honeycomb-shaped ceramic article without deformation or strain.

4,180,539

EXTRUSION PROCESS FOR AUTOMATICALLY THREADING LACES

Kenneth Clarke, Knebworth, England, assignor to Automatik Apparate-Maschinenbau H. Hench GmbH, Grossostheim, Fed. Rep. of Germany

Continuation of Ser. No. 653,149, Jan. 28, 1976, abandoned, which is a continuation of Ser. No. 473,269, May 24, 1974, abandoned, which is a continuation of Ser. No. 242,367, Apr. 10, 1972, abandoned. This application Nov. 28, 1977, Ser. No. 855,458
Claims priority, application United Kingdom, Apr. 14, 1971, 9350/71; Feb. 22, 1972, 8108/72
Int. Cl.² B29F *3/00*
U.S. Cl. 264—143 **2 Claims**



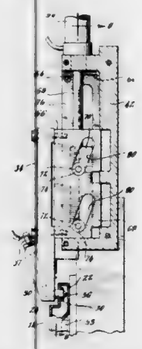
1. A method of granulating a thermoplastics material comprising extruding a melt of the thermoplastics material into a plurality of laces in side-by-side relationship through an air gap into the upper end of an inclined unsubmerged stationary cooling trough, providing a flow of water down the entire length of said trough so that the laces are carried down said trough by the water in side-by-side relationship and are quenched, passing the laces and water flow directly from the lower end of the trough to a lace cutting machine and cutting said laces to form granules in the lace cutting machine, the rate of flow of water being such that it exceeds the initial linear rate of extrusion of the laces and causes both any lace ends formed as a result of breakage of the lace or on commencement of extrusion and established laces to pass automatically down the trough and to be fed automatically with the water to the lace cutting machine.

4,180,540

METHOD OF MAKING A REINFORCED BEARING APERTURE IN THERMOPLASTIC SHEET MATERIAL

Peter T. Schurman, Woodbridge, Conn., assignor to The Plastic Forming Company, Inc., Woodbridge, Conn.

Filed Jan. 2, 1979, Ser. No. 25
Int. Cl.² B29C *17/00;* **B29F** *5/00*
U.S. Cl. 264—156 **5 Claims**



1. Method of forming a bearing aperture in thermoplastic sheet material of given thickness, which comprises:
supporting a sheet of said material in fixed position and penetrating said thickness with a heated punch pin of size approximating that of the desired finished aperture;
maintaining said heated punch pin in penetrating position in said material long enough to produce plastic flow of the displaced material resulting from said penetration, thereby causing said displaced material to assume a collar-like formation about said aperture, said collar formation having an axial thickness greater than said given thickness of the starting sheet material;
withdrawing said heated punch pin from the aperture thus formed and promptly inserting a cool punch pin therein of a size corresponding to that of the desired finished aperture, and maintaining said cool punch pin in penetrating position in said material long enough to inhibit further plastic flow in said collar-like formation; and
withdrawing said cool punch pin from said aperture.

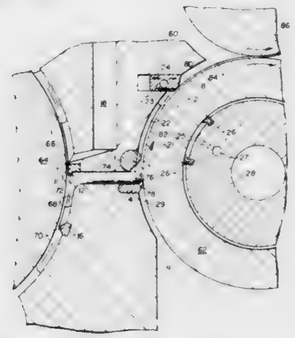
4,180,541

METHOD OF EXTRUDING EMPLOYING AN EXTRUSION DEVICE HAVING INTERMEDIATE EXTRUDER

Ernesto Gabrielli, P.za Giovanni XXIII, Montale (PT), Italy

Continuation of Ser. No. 722,525, Sep. 13, 1976, abandoned. This application Jan. 30, 1978, Ser. No. 873,392
Claims priority, application Italy, Sep. 17, 1975, 45513 A/75
Int. Cl.² B29D *7/14*
U.S. Cl. 264—171 **2 Claims**

1. A method of extruding pasty and thermoplastic material comprising the steps of:
directing the material into contact with a second rotating rotor (**64**);
carrying the material on the second rotor past a control extrusion device (**70**) and into a feed space to cause the material to form into a first layer on the second rotor;
moving said first layer on the second rotor past an opposite adjustable extrusion device (**72**) which extends into the feed space more than the control device to form an infeed material mass (**68**);
said infeed material mass being formed by the opposite adjustable extrusion device by a boundary layer breaking up of said first layer;
directing said infeed material mass through a first passage (**74**) and toward a first rotating rotor (**62**);
providing a first adjustable extrusion device (**76**) at the end of said first passage and at a position spaced from said first rotating rotor;
feeding said infeed material mass between said first adjustable extrusion device and said first rotating rotor to form a second layer on said first rotor;
moving said second layer on said first rotor into an extrusion passage (**22**);



providing a second adjustable extrusion device at an end of said extrusion passage spaced from said first rotor a distance less than the spacing between said first adjustable extrusion device and said first rotor;
moving said second layer past said second adjustable extrusion device to form a third layer which is thinner than said second layer and to cause an accumulation of material behind said extrusion device and effect a boundary layer break-up of said first layer; and
providing a leakage of material out of said extrusion passage in a position in said extrusion passage adjacent said second adjustable extrusion device to prevent a filling up of the extrusion passage in the area between said first and second extrusion devices due to said accumulation of material.

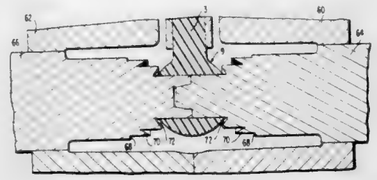
4,180,542

METHODS FOR MAKING MOLDED PLUG AND PLUG VALVE

Thomas J. Wrasman, Louisville, Ky., assignor to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 641,181, Dec. 16, 1975, abandoned, which is a division of Ser. No. 548,157, Feb. 2, 1977, Pat. No. 3,961,770, which is a continuation-in-part of Ser. No. 394,037, Sep. 4, 1973, abandoned. This application May 11, 1978, Ser. No. 904,868
Int. Cl.² B29F *1/00;* **B29D** *3/00*
U.S. Cl. 264—242 **9 Claims**

1. A method of molding a rotary plug for use in a plug valve having a housing with seating faces, said plug being rotatably mountable within the housing and including a curved exterior surface which is engageable with the seating faces, said method comprising the steps of:
providing a pair of mold halves having cavity walls which form a first exterior surface portion of said plug to be substantially symmetrical about a turning axis of the plug;
placing a pair of core sections end-to-end for forming a through passageway through the plug, said cores having annular flange faces which form second exterior surface portions of said plug, defining annular seat-engaging surface areas which surround outer edges of both ends of the passageway to be formed and which are to engage inner ends of the seating faces in an open position of the plug; and
introducing molten molding material into the mold around said core and against said annular flange faces and hardening said material to form said plug with first mold parting lines on opposite sides of the plug lying in a plane containing the axis



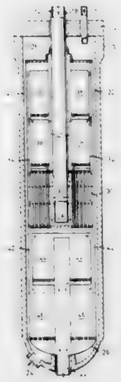
of the through passageway except at said annular seat-engaging surface areas where second parting lines between the mold cavity halves and the flange faces of said cores define a closed curve symmetrical about the axis of the through passageway, so that when said rotary plug is disposed within the valve housing, said inner ends of said seating faces avoid contact with mold parting lines in both the open and closed positions of said plug.

4,180,543

AMMONIA SYNTHESIS REACTOR HAVING PARALLEL FEED TO PLURAL CATALYST BEDS

Stanley A. Ward, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 29, 1978, Ser. No. 891,385
Claims priority, application United Kingdom, Apr. 18, 1977, 15943/77
Int. Cl.² B01J *1/14, 3/04, 7/00, 8/04*
U.S. Cl. 422—148 **10 Claims**



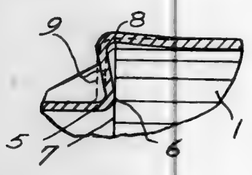
1. An ammonia synthesis reactor comprising
(a) a cylindrical outer shell, having at least one gas inlet substantially concentric with said shell, and at least one gas outlet; said outer shell being capable of sustaining pressure in the range of about 100 to 500 atm. abs.;
(b) at least two axial catalyst bed sets, including an upstream bed set and a downstream bed set; each bed set consisting of a plurality of adiabatic catalyst beds; each bed having an inlet and an outlet mutually separated in a direction axial of said cylindrical outer shell, in combination with inlet header means disposed to feed the catalyst beds in

parallel and with outlet header means disposed to receive gas from the catalyst beds in parallel;
(c) a heat exchanger having a cold side in flow communication with said at least one gas inlet of the outer shell and having a hot side in flow communication with the outlet of the upstream bed set and the inlet of the downstream bed set; and
(d) a flow connection from the downstream bed set to a gas outlet of the outer shell.

4,180,544
CATALYTIC CONVERTER HAVING MONOLITH MOUNTING MEANS THEREIN

Enrique Santiago, Diedorf, Fed. Rep. of Germany, assignor to Zeuna-Stärker GmbH & Co. KG, Augsburg, Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,446
Claims priority, application Fed. Rep. of Germany, May 25, 1977, 2723532
Int. Cl.[2] F01N 3/15, 7/18
U.S. Cl. 422—179 **2 Claims**



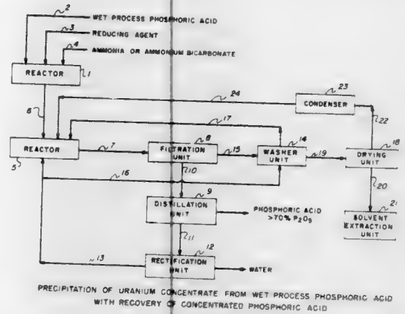
1. A device for the detoxification of the exhaust gases of combustion engines in motor vehicles comprising a monolithic metallic catalyst body, and a housing enclosing said catalyst body in a shock-resistant manner in its interior, said housing and catalyst body permitting flow-through of exhaust gases in an axial direction, said catalyst body having a circumferential surface, parallel to said flow-through direction, and resting against the interior of said housing, and said housing having at least one nose projecting inwardly against each facing end of said catalyst body said device being characterized by the following characteristics:
(a) the housing is a sheet-metal housing, in which said noses are formed as impressions in said sheet metal;
(b) said noses extend only in the vicinity of the circumferential edges of the catalyst body and project, each, axially toward the appropriate facing end, so that their heads rests against said facing ends;
(c) each impression that forms a nose is shaped in such a way, that the housing wall, opposed to the circumferential surface of the catalyst body is also slightly extended.

4,180,545
URANIUM RECOVERY FROM WET-PROCESS PHOSPHORIC ACID

John F. McCullough; John F. Phillips, Jr., and Leslie R. Tate, all of Florence, Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation of Ser. No. 781,216, Mar. 25, 1977, now Defensive Publication No. T970,007. This application Aug. 25, 1977, Ser. No. 827,517
Int. Cl.[2] C01G 43/00
U.S. Cl. 423—8 **5 Claims**

1. A process for recovering uranium in a concentrated form from wet-process phosphoric acid by the use of ammonia or an ammonium salt, or both, a reducing agent, and a water-miscible solvent, which comprises the steps of:
A. mixing wet-process phosphoric acid with an ammonium salt or ammonia, or both, while maintaining the temperature of the reaction mixture between about 20° C. and about 100° C. for a period of time necessary to dissolve said ammonium salt or ammonia, or both, and reducing agent, wherein for each mole of orthophosphoric acid in said acid, about 0.05 to about 0.20 mole of ammonium salt or ammonia, or both, are used, and for each gram atom of iron present in said wet-process acid, one gram equivalent weight of reducing agent is used;
B. mixing a miscible solvent into the reaction mixture from step A supra while maintaining the temperature between 50° C. and reflux temperatures wherein for each pound of orthophosphate in said reaction mixture, about 1.93 to about 3.15 pounds of miscible solvent are used;
C. separating solids from liquid in said reaction slurry from step B, supra;



D. washing said solids from step C supra with sufficient miscible solvent to remove phosphoric acid from the precipitate;
E. recycling said miscible solvent wash mixture from step D supra to later-mentioned step K;
F. drying washed solids from step D, supra;
G. condensing offgas from step F, supra, and returning said condensate back to step B, supra;
H. dissolving said solids from step F supra in mineral acid;
I. recovering uranium in the solution from step H, supra, by solvent extraction;
J. distilling water and miscible solvent from the filtrate from step C supra; and
K. rectifying miscible solvent and water from step J, supra, discarding water, and returning miscible solvent back to step B, supra.

4,180,546
PROCESS FOR REMOVING PHOSPHORUS FROM PHOSPHORUS-CONTAINING FLUORITE

Toshiyuki Shibata; Hiroshi Ono, both of Ube, and Kenji Isoyama, Onoda, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

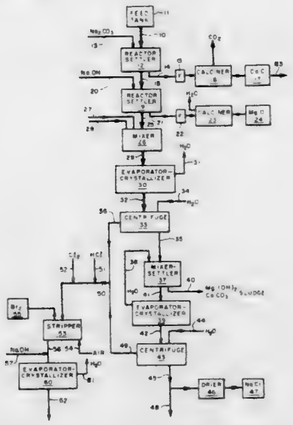
Filed Jul. 19, 1978, Ser. No. 926,016
Claims priority, application Japan, Jul. 21, 1977, 52/86621
Int. Cl.[2] C01F 11/22
U.S. Cl. 423—178 **7 Claims**

1. A process for removing a phosphorus impurity from fluorite, the process comprising adding powder of fluorite containing the phosphorus impurity to an aqueous solution of an inorganic acid having an acid concentration of from 1.0 to 20 Wt% in an inorganic acid/phosphorus ratio of above 25:1 by mole to give a slurry, agitating the slurry at a temperature below 50° C., and collecting the powder from the slurry.

4,180,547
PROCESS FOR RECOVERY OF CHEMICALS FROM SALINE WATER

Anthony N. Chirico, Short Hills, N.J., assignor to Ecodyne, Lincolnshire, Ill.

Filed Nov. 25, 1977, Ser. No. 854,811
Int. Cl.[2] C01D 3/06
U.S. Cl. 423—197 **33 Claims**



30. A process for the recovery of chemicals from saline water, comprising:
converting the sulfates in the saline water to sodium sulfate, and separating essentially all of the magnesium and calcium from the saline water to form a magnesium and calcium depleted first solution;
mixing the first solution with recycled sodium chloride to form a sodium chloride fortified second solution;
crystallizing and then separating sodium chloride crystals from the second solution to form a third solution;
crystallizing sodium chloride and sodium sulfate crystals from the third solution to form a fourth solution;
separating the sodium chloride and the sodium sulfate crystals in the fourth solution from each other;
separating the sodium sulfate crystals from solution; and
mixing the sodium chloride crystals separated from the fourth solution with the first solution.

4,180,548
PROCESS FOR SELECTIVE REMOVAL OF CYCLIC UREA FROM HINDERED AMINE GAS TREATING SOLUTION

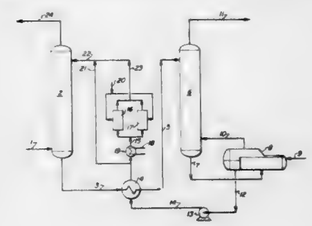
Geoffrey R. Say; James R. Hays, Sr., both of Baton Rouge, La., and Jagannathan N. Iyengar, Morris Plains, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 22, 1978, Ser. No. 972,500
Int. Cl.[2] B01D 53/34
U.S. Cl. 423—223 **7 Claims**

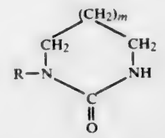
1. An acid gas scrubbing process providing for the selective removal of a cyclic urea reaction product which forms as a by-product of the acid gas removal, said process comprising:
a. contacting an acid gas mixture with an aqueous solution in an absorption zone, said aqueous solution comprising a basic alkali salt, or metal hydroxide selected from the group consisting of alkali metal bicarbonates, carbonates, hydroxides, borates, phosphates and their mixtures, and an activator for said basic salt comprising at least one sterically hindered amine having the generic formula:

$$R—NH—(CH_2)_m—NH_2$$

where R is a secondary or tertiary alkyl or cycloalkyl hydrocarbon having 4–20 carbon atoms and m is 2–5, at elevated



temperatures and pressures such that there is formed a cyclic urea reaction product having the formula:

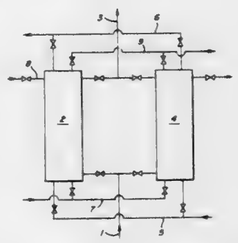


where R is a secondary or tertiary alkyl or cycloalkyl hydrocarbon having 4–20 carbon atoms and m is 0–3;
b. passing said acid gas rich aqueous solution to a regeneration zone where it is contacted with steam to remove the acid gas impurities therefrom;
c. cooling a portion of the lean solution exiting from said regeneration zone to a temperature ranging from 180–120° F. to selectively precipitate the cyclic urea from said lean solution;
d. passing said lean solution containing said precipitated cyclic urea to a separation zone to remove at least a portion of the cyclic urea from said lean solution.

4,180,549
DESULFURIZATION OF HOT REDUCING GAS

Robert G. Olsson, Edgewood Borough, and Ethem T. Turkdogan, Pittsburgh, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 27, 1976, Ser. No. 718,257
Int. Cl.[2] B01D 53/34
U.S. Cl. 423—230 **23 Claims**



1. In a process for desulfurizing hot reducing gas by contacting said gas with a desulfurizing agent, then regenerating the spent desulfurizing agent, and then reusing the regenerated desulfurizing agent for desulfurizing hot reducing gas, the improvement wherein the desulfurizing agent comprises a bed of sintered porous pellets comprising more than about 50% by weight manganese oxide and less than about 50% by weight of a nonreactive porous metal oxide wherein said pellets were sintered at a temperature between about 1000° C. and about

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1400° C., and wherein the spent desulfurizing agent is regenerated by contacting said bed with an oxidizing gaseous atmosphere and wherein the temperature of the bed is maintained between about 500° C. and about 1300° C. in the desulfurization step and the regeneration step.

4,180,550

PROCESS FOR PURIFYING A SULFUR DIOXIDE CONTAINING GAS BY WASHING WITH AN AMMONIA AQUEOUS SOLUTION

André Deschamps, Noisy le Roi; Sigismond Franckowiak, Rueil-Malmaison, and Philippe Renault, Noisy le Roi, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Sep. 20, 1977, Ser. No. 835,085
Claims priority, application France, Sep. 20, 1976, 76 28409
Int. Cl.[2] C01B *17/00*; C01C *1/02*; C01B *17/50*
U.S. Cl. 423—242 **14 Claims**

1. In a process for purifying a sulfur dioxide containing gas, by washing with an ammonium aqueous solution, comprising the following steps:

(a) contacting a sulfur dioxide containing gas with either ammonia or ammonium sulfite or both in the presence of water, to form a solution containing either ammonium bisulfite or ammonium sulfite or both;

(b) reacting at least a portion of the solution obtained in step (a) with ammonium bisulfite, so as to decompose the ammonium bisulfite and sulfite and to obtain ammonium sulfate as an aqueous solution and gaseous sulfur dioxide;

(c) recovering the sulfur dioxide;

(d) heating the aqueous solution obtained in step (b) for vaporizing at least a portion of the water;

(e) heating the product from step (d) to convert the ammonium sulfate to ammonium bisulfate and gaseous ammonia;

(f) separating the gaseous ammonia obtained in step (e) and feeding it to step (a) either as such or as ammonium sulfite; and

(g) feeding to step (b) the ammonium bisulfate obtained in step (e) either as such or after dissolution in water;

the improvement which comprises heating at least a portion of either the ammonium sulfate or the ammonium bisulfate or both from step (e) with a catalytic quantity of either a molybdenum compound or a tungsten compound or a mixture thereof which favors the decomposition of said portion of either said ammonium sulfate or said bisulfate or both to sulfur dioxide and ammonia while strongly inhibiting the decomposition reaction resulting in sulfur trioxide, thereby avoiding an undesirable accumulation of either sulfate or bisulfate.

4,180,551

MODIFIED ZIRCONIUM PHOSPHATES

Abraham Clearfield, Athens, Ohio, assignor to Texas A&M University System, College Station, Tex.

Division of Ser. No. 494,579, Aug. 5, 1974, Pat. No. 4,059,679, which is a continuation of Ser. No. 132,569, Apr. 8, 1971, abandoned. This application Sep. 6, 1977, Ser. No. 830,937
Int. Cl.[2] C01F *13/00*; C01B *15/16, 25/26*
U.S. Cl. 423—249 **7 Claims**

1. A process for modifying the interlayer spacing of an inorganic compound of the formula

$$M(OH)_z(HQO_4)_{2-z/2} \cdot xS$$

to produce a product of the formula

$$M(OH)_zY_{t/m^+}(QO_4)_{2-z/2}$$

wherein M is zirconium S is water or a non-aqueous solvent, Q is phosphorus z is a number from 0 to 2 including fractional values, x is an integer of from 0 to 8, Y is a cation of groups IA-IVA, IB-VIIB, VIII, including lanthanide and actinide series, or ammonium, mt is an integer corresponding to the charge of a cation Y, and t is a number such that mt equals 2-z/2, wherein at least 10 mole percent of said inorganic compound is converted to said product;

said method comprising mixing said inorganic compound in finely divided dry form with a finally divided solid salt of cation Y, which is other than M; and

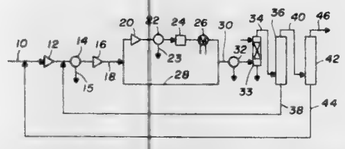
heating said mixture at an elevated temperature for a time sufficient to incorporate said salt cation Y into said inorganic compound by displacing at least some of the replaceable hydrogen ions to produce said product and thereby modify the interlayer spacing while retaining the crystalline nature of the compound structure.

4,180,552

PROCESS FOR HYDROGEN RECOVERY FROM AMMONIA PURGE GASES

Tommy E. Graham, and Donald L. MacLean, both of Raleigh, N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 20, 1978, Ser. No. 888,103
Int. Cl.[2] C01C *1/04*
U.S. Cl. 423—359 **17 Claims**



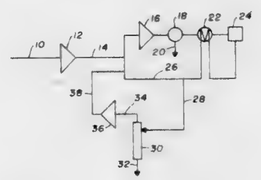
1. In a process for synthesizing ammonia from hydrogen and nitrogen comprising introducing a synthesis feed gas comprising nitrogen, hydrogen and at least one of methane and argon as an inert contaminant at substantially a superatmospheric synthesis pressure into an ammonia synthesis loop, reacting hydrogen and nitrogen in the ammonia synthesis loop at a superatmospheric synthesis pressure to produce ammonia in an ammonia synthesis reaction zone, removing ammonia from the ammonia synthesis loop, and removing a purge stream from the ammonia synthesis loop in an amount sufficient to maintain the concentration of inert contaminants less than about 25 percent wherein the purge stream is passed to a permeator comprising a separation membrane having a feed side and a permeate exit side and exhibiting selectivity to the permeability of hydrogen as compared to the permeability of each of methane and argon, a permeating gas is recovered at the permeate exit side of the separation membrane and is recycled to the ammonia synthesis reaction zone, the improvement wherein the permeator comprises at least two permeator stages in series, each permeator stage having a feed side and a permeate exit side in which the permeate exit side is at a lower total pressure than the total pressure on the feed side, wherein between permeator stages, the non-permeating gas from the feed side of one permeator stage is passed to the feed side of the next permeator stage; wherein at least one permeator stage has a lower ratio of total pressure on the feed side to total pressure on the permeate exit side than the ratio of total pressure on the feed side to total pressure on the permeate exit side of at least one subsequent permeator stage; and wherein the permeating gas from at least one permeator stage is recycled to the ammonia synthesis reaction zone.

4,180,553

PROCESS FOR HYDROGEN RECOVERY FROM AMMONIA PURGE GASES

Harold R. Null, Creve Coeur, and Eli Perry, Olivette, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 20, 1978, Ser. No. 888,256
Int. Cl.[2] C01C *1/04*
U.S. Cl. 423—359 **12 Claims**



1. A process for synthesizing ammonia from hydrogen and nitrogen comprising:

a. introducing to and reacting in an ammonia synthesis reaction zone a nitrogen and hydrogen containing reactor feed gas at a superatmospheric synthesis pressure to produce ammonia said reactor feed gas comprising inert contaminants;

b. withdrawing an ammonia-containing reaction effluent from said ammonia synthesis reaction zone and recycling said reaction effluent to said ammonia synthesis reaction zone in an ammonia synthesis loop;

c. introducing a synthesis feed gas into said ammonia synthesis loop, said synthesis feed gas being at substantially said superatmospheric synthesis pressure and comprising nitrogen, hydrogen, and at least one of methane and argon;

d. removing ammonia from the reaction effluent in said ammonia synthesis loop;

e. removing a purge stream containing ammonia from said ammonia synthesis loop in an amount sufficient to maintain the concentration of inert contaminants in the reactor feed gas less than about 25 volume percent and being at substantially said superatmospheric synthesis pressure;

f. contacting said purge stream containing at least about 0.5% volume percent ammonia with a separation membrane, said purge stream when contacted with the separation membrane being at a superatmospheric pressure, said separation membrane having a feed side and a permeate exit side at a lower total pressure and exhibiting selective permeation of each of hydrogen and ammonia as compared to the permeation of each of methane and argon;

g. permeating through and recovering from the permeate exit side of said separation membrane a permeating gas comprising at least about 20 percent of the hydrogen and at least about 20 percent of the ammonia in the purge stream containing the separation membrane;

h. removing from the feed side of said separation membrane a non-permeating gas containing a lesser amount by weight of ammonia than the amount of ammonia in the purge stream contacting the separation membrane; and

i. recycling said permeating gas to said ammonia synthesis reaction zone.

4,180,554

METHOD FOR REMOVAL OF SULFUR DEPOSITED ON A CLAUS CATALYST

Clifton S. Goddin, Jr., and John W. Palm, both of Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 14, 1978, Ser. No. 933,370
Int. Cl.[2] C01B *17/04*
U.S. Cl. 423—574 R **3 Claims**

1. In a process for removal of sulfur from a gaseous stream containing hydrogen sulfide involving first recovering sulfur noncatalytically by burning said gaseous stream in a furnace followed by a waste heat boiler, and then further recovering sulfur catalytically by passing the effluent from the waste heat boiler through a series of Claus reactors with associated liquid sulfur condensers wherein one or more of the lead Claus reactors is operated in a so-called conventional temperature range which is higher than the sulfur dewpoint of the reacting gas and one or more of the following Claus reactors operates in a lower temperature range in which sulfur is strongly adsorbed on the catalyst, and wherein the temperature of the first Claus reactor is maintained sufficiently high to hydrolyze COS and CS_2 and wherein the resulting effluent from the final conventional Claus reactor passes through a low temperature Claus step involving at least two interchangeable reactors, and wherein said conventional Claus effluent at all times passes through at least one of said interchangeable, low temperature reactors to further convert the reactants and condense the sulfur for an interval during which the other said interchangeable, low temperature reactor catalyst is regenerated by vaporization of the deposited sulfur followed by cooling of the sulfur-denuded catalyst, the improvement comprising:

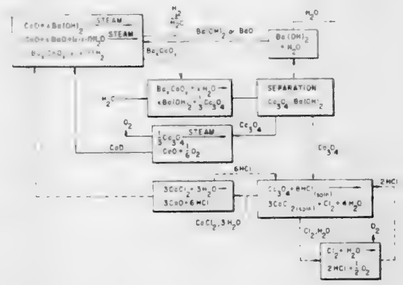
introducing initially into said interchangeable, low temperature Claus reactor about to be regenerated by removal of deposited sulfur a portion of the gaseous effluent from said first Claus reactor at a temperature of about 600° to 650° F. such as to heat the low temperature Claus catalyst and remove said deposited sulfur, and then having raised the temperature of said catalyst to about 600° to 650° F. introducing a hot gaseous stream into said interchangeable, low-temperature Claus reactor being regenerated such as to elevate the temperature of said regenerating catalyst bed to a value of about 700° F. prior to cooling and returning said interchangeable, low temperature Claus reactor to the adsorption mode.

4,180,555

PROCESS FOR PRODUCING HYDROGEN FROM WATER USING COBALT AND BARIUM COMPOUNDS

Carlos E. Bamberger, Oak Ridge, Tenn., and Donald M. Richardson, deceased, late of Oak Ridge, Tenn. (by Elizabeth B. Richardson, executrix), assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 17, 1978, Ser. No. 934,768
Int. Cl.[2] C01B *1/09, 1/00*
U.S. Cl. 423—657 **8 Claims**



1. A process for producing hydrogen comprising the step of (a) reacting CoO with BaO or $Ba(OH)_2$ in the presence of steam at a temperature above about 500° C. to produce H_2 and a double oxide of Ba and Co.

4,180,556

PRETREATMENT METHOD FOR CARCINOEMBRYONIC ANTIGEN ASSAY

Yung D. Kim, Lindenhurst; Joseph T. Tomita, and Jay R. Schenck, both of Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 776,019, Mar. 9, 1977, abandoned. This application Jun. 16, 1978, Ser. No. 916,381

Int. Cl.[2] G01N *33/16;* **A61K** *39/00*

U.S. Cl. 424—1 **8 Claims**

1. In a method of measuring the level of carcinoembryonic antigen (CEA) in a specimen by pretreating with perchloric acid to dissociate the CEA material from binding proteins by precipitating said binding proteins, separating said precipitate from the CEA-containing supernatant, and measuring the level of CEA wherein the improvement comprises eliminating the necessity of dialysis to purify the perchloric acid treated specimen by:

(a) adding to said CEA-containing supernatant a buffered source of potassium ions to precipitate potassium perchlorate; and

(b) separating said potassium perchlorate precipitate to yield a CEA-containing supernatant ready for assay.

4,180,557

METHOD FOR DETOXIFYING PHOSPHIDE CONTAINING PESTICIDES

Werner Praxl, Rimbach, and Reiner Ehret, Weinheim, both of Fed. Rep. of Germany, assignors to Dr. Werner Freyberg, Laudenbach, Fed. Rep. of Germany

Filed Oct. 19, 1977, Ser. No. 843,420

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1977, 2648335

Int. Cl.[2] A01N *17/02;* **C01B** *25/08;* **A01N** *11/00*

U.S. Cl. 424—10 **12 Claims**

1. A method of detoxifying residues from phosphide containing phosphides of earth metals and alkaline earth metals which comprises treating such residues with water to which sufficient alkaline reagent has been added to produce a pH of at least 8.

4,180,558

UNIT DOSAGE FORMS

Arthur H. Goldberg, Montclair, and Michael L. Franklin, Parsippany, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 21, 1978, Ser. No. 935,274

Int. Cl.[2] A61K *9/70;* **B32B** *31/18*

U.S. Cl. 424—16 **3 Claims**

1. In a solid pharmaceutical unit dosage form comprising a laminate composed of a plurality of layers of an edible, therapeutically inert web, at least one of said layers having one or more medicaments loaded on to one or more surfaces, said layers of web arranged in said laminate so that substantially no medicament is loaded to an outer surface thereof, said laminate being sealed only at the edges so as to completely internalize said medicament, the improvement which comprises controlling the dissolution rate of said laminate by including therein at least one web of an improved paper composition formed from an aqueous alcholic fibrous slurry and consisting essentially of water-soluble carboxymethylcellulose fibers and water-insoluble, water-swellable, cross-linked carboxymethylcellulose fibers, said web by not greater than 20% soluble in water, the rate of disolution of said laminate being directly related to the density of said web of improved paper composition.

4,180,559

COATED 1-(2-CHLORODIBENZO[b,f]OXEPIN-10-YL)-4-METHYL-PIPERAZINE COMPOSITIONS

Harold E. Huber, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Continuation-in-part of Ser. No. 867,167, Jan. 5, 1978, abandoned. This application Dec. 1, 1978, Ser. No. 964,008

Int. Cl.[2] A61K *9/36*

U.S. Cl. 424—35 **5 Claims**

1. A coated, duodenal soluble, pharmaceutical composition suitable for oral ingestion comprising a core having from 6 to 33% by weight of 1-(2-chlorodibenzo[b,f]oxepin-10-yl)-4-methylpiperazine or a pharmaceutically acceptable salt thereof, and from 67 to 94% by weight of an inert pharmaceutical carrier; and a duodenal soluble coating having from 7 to 15% by weight of said core of hydroxypropyl methylcellulose phthalate, said coating having a thickness of from 0.1 to 0.2 mm and which dissolves at a pH of about 5.0 to 5.5.

4,180,560

INERT CORE IMPLANT PELLET

Martin Katz, Los Altos Hills, and John S. Kent, Palo Alto, both of Calif., assignors to Syntex Corporation, Palo Alto, Calif.

Continuation of Ser. No. 735,727, Oct. 26, 1976, Pat. No. 4,096,239, which is a continuation-in-part of Ser. No. 572,031, Apr. 28, 1975, abandoned. This application May 5, 1978, Ser. No. 903,284

The portion of the term of this patent subsequent to Jun. 27, 1995, has been disclaimed.

Int. Cl.[2] A61K *9/22, 9/24*

U.S. Cl. 424—21 **4 Claims**

1. A solid, spherical, subcutaneously implantable pellet for producing a greater than normal weight gain in ruminants, which implantable pellet exhibits a substantially constant rate of release of active agent over a given time period and an abrupt termination of drug release at the end of said time period, said pellet comprising

(a) a biocompatible, inert, spherical core having a diameter of about 2 mm to about 10 mm and

(b) at least one biocompatible, biosoluble coating having a substantially uniform thickness of about 0.05 mm to about 1.0 mm intimately adhering to and completely covering said inert core, the composition of said coating comprising a substantially homogeneous mixture of (i) about 5% weight to about 90% weight of estradiol, estradiol benzoate, or mixtures thereof as the sole active agent(s), and (ii) about 10% weight to about 95% weight of a pharmaceutically suitable carrier which is solely a polyethylene glycol having a molecular weight of about 3000 to about 20,000, said inert, spherical core being at at least half the diameter of said spherical, implantable pellet.

4,180,561

HAIR PRESSING COMPOSITION

William L. Vinson, 6145 Vine St., Philadelphia, Pa. 19139

Filed Jan. 21, 1977, Ser. No. 761,044

Int. Cl.[2] A61K *7/09*

U.S. Cl. 424—71 **12 Claims**

1. In a hair pressing composition having a base comprising a mixture of petrolatum and lanolin, the improvement comprising an effective amount to hold hair in a styled condition and to impart a non-greasy feel and appearance to hair to which said composition is applied of a mixture of weeping willow extract prepared by placing split willow twigs in water, boiling said twigs and said water to form a solution of weeping willow juices in said water, and removing the twigs from said water, said solution being said weeping willow extract, and an extract from mustard greens and corn prepared by mixing together mustard greens with corn kernels, grinding said mustard greens and corn kernels and squeezing the extract from the ground mixture.

4,180,562

GLUTARALDEHYDE POLYMERIZED RAGWEED ANTIGEN E PREPARATION FOR TREATMENT OF ALLERGIC PATIENTS SENSITIVE TO RAGWEED POLLEN

Roy Patterson, Wilmette, Ill., and Floyd C. McIntire, Denver, Colo., assignors to Northwestern University, Evanston and Abbott Laboratories, North Chicago, both of, Ill.

Continuation-in-part of Ser. No. 788,049, Apr. 15, 1977, abandoned, Continuation of Ser. No. 358,223, May 8, 1973, abandoned. This application Feb. 21, 1978, Ser. No. 879,966

Int. Cl.[2] A61K *39/36*

U.S. Cl. 424—91 **2 Claims**

1. A preparation for treatment of allergic patients sensitive to ragweed pollen, comprising ragweed antigen E polymerized with glutaraldehyde and being composed essentially of water-soluble polymers thereof of molecular weights from 200,000 to 20,000,000, said preparation being substantially free of unpolymerized ragweed antigen E and polymers thereof having molecular weights of less than 200,000.

4,180,563

IMMUNOSTIMULANT AGENT FROM *SALMONELLA TYPHIMURIUM* OR *LISTERIA MONOCYTOGENES* BACTERIAL CELLS AND PHARMACEUTICAL COMPOSITION

Robert Fauve, Sevres, France, assignor to Institut Pasteur, Paris, France

Division of Ser. No. 573,925, May 2, 1975, Pat. No. 4,076,801, which is a continuation of Ser. No. 317,022, Dec. 20, 1972, abandoned. This application Feb. 23, 1978, Ser. No. 880,511

Claims priority, application France, Dec. 24, 1971, 71.46520

Int. Cl.[2] A61K *39/02*

U.S. Cl. 424—92 **13 Claims**

1. An immunostimulant agent from bacterial cells of *Salmonella typhimurium* or *Listeria monocytogenes*, which immunostimulant promotes non-specific resistance to pathogens, and is

(a) soluble in chloroform;

(b) insoluble in water;

(c) free of the bacterial cell fractions which are not soluble in a solvent mixture of a halogenated hydrocarbon and an alcohol;

(d) a stimulant for the non-specific resistance of a human or animal host organism to a pathogen which has no antigenic relationship to the immunostimulant;

(e) capable of causing an increase of macrophages and lymphocytes of a host organism;

(f) effective against *Salmonella typhirium* in blood of so injected mice;

(g) effective against *Listeria monocytogenes* in liver and spleen of so injected mice;

(h) is effective against 10 times the LD_{50} of *Listeria monocytogenes* and 20 times the LD_{50} of *Salmonella typhimurium;*

(i) virtually free of toxicity; and

(j) is not capable of increasing the sensitivity of mice to bacterial endotoxins.

4,180,564

A-38533 ANTIBIOTICS AND PROCESS FOR PRODUCTION THEREOF

Otis W. Godfrey, Greenwood; Ronald D. Johnson, and Ralph E. Kastner, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 25, 1978, Ser. No. 909,582

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—117 **11 Claims**

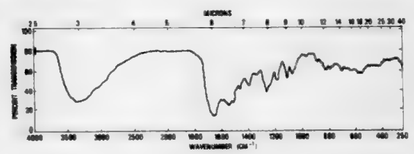
1. Antibiotic A-38533 factor A_1 which is a non-crystalline white powder having the following characteristics:

(a) an approximate elemental composition of 53.3–54.9 percent carbon, 5.5–5.7 percent hydrogen, 12.4–12.7 percent nitrogen, 24.3–25.6 percent oxygen and 3.3–3.8 percent sulfur;

(b) a molecular weight of about 840, as determined by mass spectrometry;

(c) a molecular formula of $C_{37}H_{44}N_8O_{13}S$;

(d) an infrared absorption spectrum in KBr pellet with significant absorption maxima at the following frequencies (cm^{-1}): 3363, 1665, 1593, 1552, 1518, 1465, 1396, 1363, 1268, 1185, 1112, 1073, 964, 887, 822, 792, 708, 635, 582, 555, and 490;



(e) five titratable groups in 66 percent aqueous dimethylformamide with pK_a values of approximately 5.93–6.02, 7.71–7.88, 10.80–10.90, 12.0–12.6, and greater than 13.0;

(f) ultraviolet absorption spectra, in acidic or neutral methanol, with absorption maxima at 256 nm (ε 21,500) and 222 nm (ε 28,500) and, in basic methanol, absorption maxima at 290 nm (ε 7,500), 260 nm (ε 22,400), and 242 nm (ε 35,500);

(g) is soluble in water, methanol, dimethyl sulfoxide, dimethylformamide, and in alcohol-water and tetrahydrofuran-water mixtures;

(h) gives the following color reactions:

Biuret	–
Folin	–
Anthrone	–
Dragendorff	–
Molish	+
Ehrlich	+
Sakaguchi	–
Ninhydrin	–
$FeCl_3$	–
Pauly	+

(i) contains (1) uracil and (2) hydroxyl and/or amino groups which are capable of acylation by standard procedures;

(j) an R_f value of approximately 0.55 on thin-layer chromatography using reverse-phase plates with fluorescent indicator (254 nm) and a 0.5 M citrate buffer (pH 4):methanol (1:1) solvent system;

or the acid addition or cationic salt of A-38533 factor A_1.

4,180,565

1-N-SUBSTITUTED DERIVATIVES OF 4,6-DI-O-(AMINOGLYCOSYL)-1,3-DIAMINOCYCLITOLS

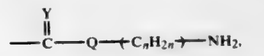
Alan K. Mallams, West Orange, N.J., and David H. Davies, Macclesfield, England, assignors to Schering Corporation, Kenilworth, N.J.

Filed May 25, 1978, Ser. No. 909,339

Int. Cl.[2] A61K *31/71;* **C07H** *15/22*

U.S. Cl. 424—180 **17 Claims**

1. A 1-N-X derivative of a 4,6-di-O-(aminoglycosyl)-1,3-diaminocyclitol, wherein X is



wherein

Y is O, S;

Q is O, NH;

n is 2–6;

with the provisos that:

(a) when Y is S, Q must be NH;

(b) Q and the NH_2 functional group cannot be attached to the same carbon atom;

and the pharmaceutically acceptable acid addition salts thereof.

16. The method of eliciting an antibacterial response in a warm-blooded animal having a susceptible bacterial infection which comprises administering to said animal a non-toxic, antibacterially effective amount of a compound of claim **1**.

4,180,566

SILICA GEL METHOD OF REDUCING BLOOD LIPID CONCENTRATION

Milton E. Winyall, and Kamal M. Abdo, both of Columbia, Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed May 15, 1978, Ser. No. 906,284
Int. Cl.[2] A61K *33/00*
U.S. Cl. 424—127 **11 Claims**

1. A method of reducing the lipid concentration in the blood of a patient in need of same which comprises orally administering to the patient silica gel in a lipid reducing effective amount of at least about 0.2 grams per kilogram of body weight.

4,180,567

IRON PREPARATIONS AND METHODS OF MAKING AND ADMINISTERING THE SAME

John R. Herb, Bethlehem, Pa., assignor to Pharmachem Corporation, Bethlehem, Pa.

Filed Sep. 2, 1977, Ser. No. 830,035
Int. Cl.[2] A61K *31/70*
U.S. Cl. 424—180 **5 Claims**

1. In a process for preparing an iron complex from a polymeric polyhydric compound selected from the group consisting of dextran, depolymerized dextran, dextrin, carboxyalkyl dextran, carboxyalkyl cellulose and alginates and a solution of an iron compound in a basic medium and at a temperature of 75°–100° C., the improvement which comprises activating said polyhydric compound by pretreatment with a base at a basic pH for about 0.5 to 1.0 hours and at a temperature of 85°–100° C., and then admixing said activated polyhydric compound with an aqueous solution of an iron compound consisting essentially of dialyzed iron.

5. A stable injectable iron dextran solution which is prepared by pretreating dextran in an aqueous solution with a base at a basic pH for about 0.5 to 1.0 hours at a temperature of 85°–100° C., so as to activate the dextran, adding to said solution a dialyzed aqueous solution of ferric hydroxide and then heating the mixture to a temperature between 95°–100° C., at a basic pH whereby a solution of an iron-dextran complex is obtained that can be utilized without further treatment.

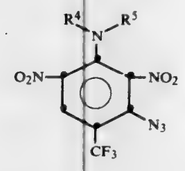
4,180,568

CONTROL OF PHYTOPATHOGENS WITH CERTAIN 2,6-DINITROANILINES

James R. Beck, Indianapolis, and Joseph A. Yahner, New Palestine, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 719,299, Aug. 31, 1976, Pat. No. 4,091,096, which is a continuation-in-part of Ser. No. 668,360, Mar. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 589,312, Jun. 23, 1975, abandoned. This application Feb. 16, 1978, Ser. No. 878,370
Int. Cl.[2] A01N *9/20*
U.S. Cl. 424—226 **7 Claims**

1. A method for reducing the incidence and severity of grape downy mildew which comprises applying to the foliage of the host plant a fungicidally-effective amount of a dinitroaniline compound having one of the following formulae:



(II)

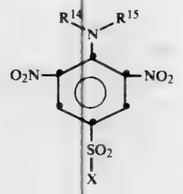
wherein

R^4 is H or C_1–C_3 alkyl;

when R^4 is H, R^5 is $N(R^6)_2$, C_1–C_7 normal or branched alkyl containing no tertiary carbon atoms, C_3–C_4 alkenyl or N-methyl-2-propionamido;

when R^4 is C_1–C_3 alkyl, R^5 is C_1–C_4 alkyl or C_3–C_4 alkenyl; and

each R^6 is independently C_1–C_3 alkyl;



(V)

wherein

X is N_3;

R^{14} is H, C_3–C_4 alkenyl or C_1–C_4 alkyl;

when R^{14} is H, R^{15} is C_3–C_7 secondary alkyl; and

when R^{14} is not H, R^{15} is C_1–C_5 alkyl, cyclopropylmethyl, C_5–C_6 cycloalkyl, C_3–C_4 alkenyl, halo C_2–C_3 alkyl or halo C_3–C_4 alkenyl.

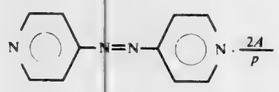
4,180,569

SEED TREATMENT FUNGICIDES FOR CONTROL OF SEED-BORNE DISEASES

Steven J. Goddard, West Grove, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 757,227, Jan. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 705,151, Jul. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 660,034, Feb. 20, 1976, abandoned. This application Jun. 28, 1978, Ser. No. 920,079
Int. Cl.[2] A01N *9/20*
U.S. Cl. 424—226 **5 Claims**

1. A method for controlling fungi which infest seeds comprising applying to the seeds a fungicidally effective amount of a compound selected from the group consisting of 4,4′-azodipyridine and 4,4′-azodipyridinium acid salts of the formula



wherein

A is an acid having an acidic dissociation constant greater than 1×10^{-6}; and

p is equal to the number of hydrogens on the acid A which have an acidic dissociation constant greater than 1×10^{-6}.

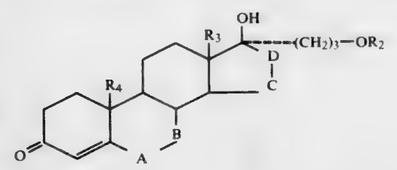
4,180,570

17β-HYDROXY-4-ANDROSTEN-3-ONES AND PROCESS FOR THE PREPARATION THEREOF

Rudolf Wiechert; Dieter Bittler; Ulrich Kerb; Jorge Casals-Stenzel, and Wolfgang Losert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed May 10, 1978, Ser. No. 904,694
Claims priority, application Fed. Rep. of Germany, May 16, 1977, 2722705; May 16, 1977, 2722706
Int. Cl.[2] C07J *1/00*
U.S. Cl. 424—243 **28 Claims**

1. A 17β-Hydroxy-4-androsten-3-one of Formula I



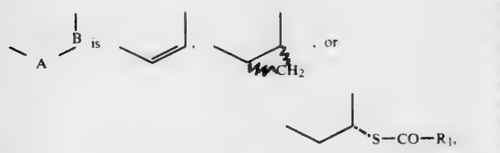
(I).

wherein

R_2 is hydrogen or the monovalent acyl radical of a monobasic or dibasic hydrocarbon carboxylic acid of up to 18 carbon atoms;

R_3 is methyl or ethyl;

R_4 is hydrogen or methyl;



wherein R_1 is lower alkyl; and



and when R_2 is the acyl radical of a dibasic acid, the physiologically acceptable salts thereof with the free acid moiety of the R_2 group.

28. A method of reversing the effect of desoxycorticosterone on the elimination of potassium and sodium which comprises administering a diuretically effective amount of a compound of claim **1**.

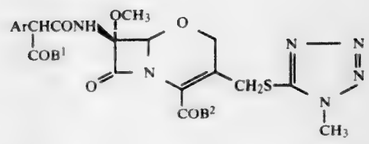
4,180,571

ARYLMALONAMIDO-1-OXADETHIACEPHALOSPORINS

Masayuki Narisada, Ibaraki, and Wataru Nagata, Nishinomiya, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

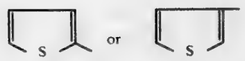
Division of Ser. No. 780,183, Mar. 22, 1977, Pat. No. 4,138,486. This application Nov. 13, 1978, Ser. No. 959,784
Int. Cl.[2] A61K *31/41*; C07D *498/00*
U.S. Cl. 424—248.52 **36 Claims**

1. A compound selected from the group consisting of (a) a compound of the formula



wherein

Ar is



COB^1 and COB^2 each is carboxy, methosycarbony, ethoxycarbonyl, isopropoxycarbonyl, n-butoxycarbonyl, t-butoxycarbonyl, pentyloxycarbonyl, cyclopropylmethoxycarbonyl, monohydroxy-t-butoxycarbonyl, 2, 2, 2-trichloroethoxycarbonyl, chloromethoxycarbonyl, cyanomethoxycarbonyl, methanesulfonylethoxycarbonyl, acetylmethoxycarbonyl, acetosymethoxycarbonyl, acetoxyethoxycarbonyl, propionyloxymethoxycarbonyl, propionyloxyethoxycarbonyl, pivaloyloxymethoxycarbonyl, benzoyloxymethoxycarbonyl, methoxymethoxycarbonyl, phenoxymethoxycarbonyl, methylthiomethoxycarbonyl, phenylthiomethoxycarbonyl, tetrahydropyranyloxycarbonyl, phthaliminomethosycarbonyl, α, α-dimethylpropargyloxycarbonyl, methoxycarbonyloxyethoxycarbonyl, ethoxycarbonylethoxycarbonyl, methoxycarbonyloxypropoxycarbonyl, allyloxycarbonyl, benzyloxycarbonyl, phenethyloxycarbonyl, tolylmethoxycarbonyl, dimethylbenzyloxycarbonyl, nitrobenzyloxycarbonyl, halobenzyloxycarbonyl, methoxybenzyloxycarbonyl, phthalidyloxycarbonyl, p-hydroxy-di-t-butylenzyloxycarbonyl, diphenylmethoxycarbonyl, trityloxycarbonyl, phenacyloxycarbonyl, chlorophenacyloxycarbonyl, bromophenacyloxycarbonyl, nitrophenacyloxycarbonyl, methylphenacyloxycarbonyl, trimethylsilyloxcarbonyl, dimethylmethoxysilyloxycarbonyl, trimethylstannyloxycaronyl, phenoxycarbony, naphthyloxycrbonyl, tolyloxycarbonyl, dimethylphenoxycarbonyl, nitrophenoxycarbonyl, methoxyphenoxycarbonyl, methanesulfonylphenoxycarbonyl, chlorophenoxycarbonyl, pentachlorophenoxycarbonyl, indanyloxycarbonyl, pyridyloxycarbonyl, sodiooxycarbonyl, potassiooxycarbonyl, magnesiooxycarbonyl, calciooxycarbonyl, or a sat of carboxy group with procain, xylocain, triethylamine, or dicyclohexylamine;

and (b) when at least one of COB^1 and COB^2 is carboxy, a pharmaceutically acceptable salt thereof.

16. A bactericidal composition comprising a bactericidally effective amount of a compound according to claim **1** and a pharmaceutical carrier.

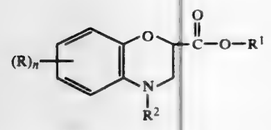
4,180,572

LIPOGENESIS CONTROL BY ESTERS OF BENZOXAZINECARBOXYLIC ACIDS

John B. Carr, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 791,758, Apr. 28, 1977, abandoned. This application . ug. 25, 1978, Ser. No. 937,031
Int. Cl.[2] A61K *27/00*
U.S. Cl. 424—248.55 **9 Claims**

1. A method of inhibiting lipogenesis in a mammal, which comprises administering, to a mammal in need of such treatment, orally or parenterally an effective amount of a compound of the formula:



wherein n is zero, one or two, with the following provisos: (1) when n is one, r is middle halogen, nitro, amino, methylsulfonylamino, trifluoromethyl, phenyl, or alkyl or alkoxy of from one to six carbon atoms, bonded to a carbon atom in the 6-, 7-, or 8- position of the molecule; (2) when n is two, (a) R is nitro or middle halogen, bonded to carbon atoms in the 6- and 7- positions of the molecule; or is, 6-nitro, 8-chloro; R^1 is alkyl of from one to four carbon atoms, and R^2 is hydrogen or phenalkyl.

4,180,573

1-PIPERAZINO-6-PHENYL-4H-S-TRIAZOLO[3,4-c]THIENO[2,3-e]1,4-DIAZEPINES

Karl-Heinz Weber; Adolf Langbein, both of Gau-Algesheim; Claus Schneider, Ingelheim am Rhein; Erich Lehr, Waldalgesheim; Karin Böke, Ingelheim am Rhein, and Franz J. Kuhn, Bingen, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

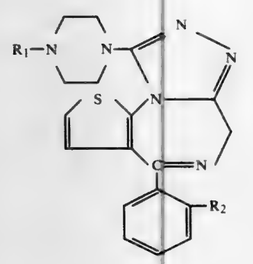
Filed Jul. 13, 1978, Ser. No. 924,149

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2732921; Jul. 21, 1977, 2732943

Int. Cl.[2] A61K *31/495;* **C07D** *295/16, 295/08*

U.S. Cl. 424—250 **10 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, lower alkyl, halo-lower alkyl, hydroxy-lower alkyl, di(lower alkyl)amino-lower alkyl, phenyl, tolyl, methoxy-phenyl, nitro-phenyl, halo-phenyl, pyridyl, pyrimidinyl or —CO—R_4, where R_4 is hydrogen, alkyl or 1 to 17 carbon atoms, alkoxy of 1 to 2 carbon atoms, phenyl, tolyl, methoxy-phenyl, halo-phenyl, nitro-phenyl or pyridyl;

R_2 is hydrogen, fluorine, chlorine, or bromine; and

R_3 is chlorine, bromine or lower alkyl;

or, when R_1 is hydrogen, lower alkyl, hydroxy-lower alkyl, halo-lower alkyl or di(lower alkyl)amino-lower alkyl, a non-toxic, pharmacologically acceptable acid addition salt thereof.

9. An anxiolytic, tranquilizing, sedative or neuroleptic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective anxiolytic, tranquilizing, sedative or neuroleptic amount of a compound of claim **1**.

4,180,574

CERTAIN OVICIDAL PIPERAZINES

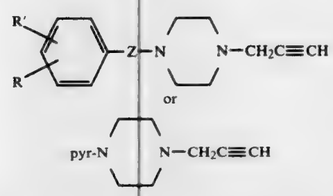
Robert G. Stein, Kenosha, Wis., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 26, 1978, Ser. No. 973,355

Int. Cl.[2] A01N *9/22*

U.S. Cl. 424—250 **9 Claims**

1. A method of combating the hatching of eggs of crop-damaging insects consisting essentially in applying to the habitat of said eggs an ovicidal amount of a compound of the formula



wherein "pyr" stands for 2-, 3-, or 4-pyridyl; Z is CO or $(CH_2)_n$; n is 0, 1 or 2; R is hydrogen, halogen, loweralkyl loweralkyloxy, nitro, or hydroxymethyl; and R' is hydrogen or halogen, and simple acid addition salts thereof, together with an agriculturally acceptable carrier.

4,180,575

TRIAZOLIDINO-PYRIDAZINE-DIONES

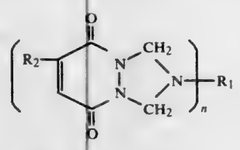
Hans Röchling, Bad Soden am Taunus; Burkhard Sachse, Kelkheim, and Hans Gattner, Bad Nenndorf, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 22, 1977, Ser. No. 780,244

Int. Cl.[2] C07D *487/04;* **A01N** *9/22;* **A61K** *31/50*

U.S. Cl. 424—250 **8 Claims**

1. A triazolidino-pyridazine-dione of the formula



wherein n is an integer from 1 to 3,

R_2 is hydrogen or methyl, and wherein

(1) if n is 1, R_1 is an alkyl group having 1 to 18 carbon atoms, a cycloalkyl or methylcycloalkyl group having 5 to 8 carbon atoms, or a norbornylmethyl, hydroxyalkyl, alkoxyalkyl, or alkylmercaptoalkyl group each having 2 to 8 carbon atoms, or a phenyl, benzyl, or phenyl or benzyl group mono-substituted or di-substituted by a halogen, halogenalkyl, nitro, cyano, $(C_1–C_4)$-alkyl or $(C_1–C_4)$-alkoxy group; or

(2) if n is 2, R_1 is a bivalent saturated aliphatic hydrocarbon group having 1 to 36 carbon atoms or a bivalent saturated aliphatic hydrocarbon group having 1 to 36 carbon atoms mono-substituted or di-substituted by halogen or by $(C_1–C_4)$-hydroxyalkyl, $(C_1–C_4)$-alkoxyalkyl, or $(C_1–C_4)$-alkylmercaptoalkyl groups, or R_1 is a bivalent saturated cycloaliphatic hydrocarbon group having 5 to 8 carbon atoms or a bivalent saturated cycloaliphatic hydrocarbon group having 5 to 8 carbon atoms mono-substituted or di-substituted by a $(C_1–C_4)$-alkyl group, or R_1 is phenylene or phenylene monosubstituted or di-substituted by a $(C_1–C_4)$-hydroxyalkyl, $(C_1–C_4)$-halogenalkyl, $(C_1–C_4)$-alkoxyalkyl, $(C_1–C_4)$-alkylmercaptoalkyl, $(C_1–C_4)$-alkyl, nitro, cyano, or halogen group; or

(3) if n is 3, R_1 is a trivalent saturated aliphatic hydrocarbon group having 3 to 36 carbon atoms or a trivalent saturated aliphatic hydrocarbon group having 3 to 36 carbon atoms mono-substituted or di-substituted by halogen, or by a $(C_1–C_4)$-hydroxyalkyl, $(C_1–C_4)$-alkoxyalkyl, or $(C_1–C_4)$-alkylmercaptoalkyl group, or R_1 is a trivalent saturated cycloaliphatic hydrocarbon group having 5 to 8 carbon atoms or a trivalent saturated cycloaliphatic hydrocarbon group having 5 to 8 carbon atoms mono-substituted or di-substituted by a $(C_1–C_4)$-alkyl group, or R_1 is a trivalent benzene ring or a trivalent benzene ring mono-substituted or di-substituted by a $(C_1–C_4)$-hydroxyalkyl, $(C_1–C_4)$-halogenoalkyl, $(C_1–C_4)$-alkoxyalkyl, $(C_1–C_4)$-alkylmercaptoalkyl, $(C_1–C_4)$-alkyl, nitro, cyano, or halogen group.

4,180,576

PURINES USEFUL FOR THE POTENTIATION OF ANTIBIOTICS

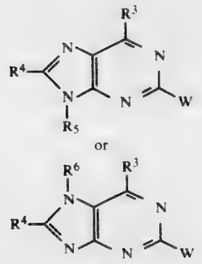
Geoffrey W. Grigg, Sydney, and Desmond J. Brown, Canberra, both of Australia, assignors to Commonwealth Scientific Industrial Research Organization, Sydney, Australia

Continuation-in-part of Ser. No. 613,879, Sep. 16, 1975, abandoned. This application Aug. 29, 1977, Ser. No. 828,875

Int. Cl.[2] A61K *31/505, 31/52;* **C07D** *473/36*

U.S. Cl. 424—251 **13 Claims**

1. A compound of the general formula:



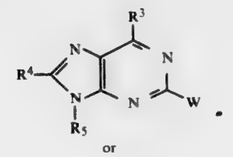
I

or

II

wherein: W is selected from the group consisting of —SR-CONR[1]R[2], —SCRN, and —SRCOR[1]; in which R is selected from the group consisting of —$(CH_2)_n$—, wherein n is an integer from 1 to 5, having at least one side chain alkyl group containing from 1 to 5 carbon atoms; wherein R^1 and R^2 are the same or different, and selected from the group consisting of hydrogen, a straight chain alkyl group containing from 1 to 5 carbon atoms, and a branched chain alkyl group containing from 1 to 5 carbon atoms; and wherein R^3, R^4, R^5 and R^6, are the same or different, and selected from groups consisting of a hydrogen, a straight chain alkyl group containing from 1 to 5 carbon atoms and a branched chain alkyl group containing from 1 to 5 carbon atoms; or a non-toxic salt thereof.

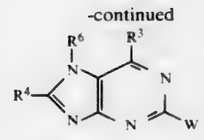
11. A method of treatment of tumors and bacterial infections which are normally responsive to the action of phleomycin, bleomycin, and mixtures thereof in an animal which comprises administering to the animal an effective amount of a compound selected from the group consisting of phleomycin, bleomycin, and mixtures thereof, prior to, simultaneous with or following administration of an amplifying amount of a compound of the formula:



I

or

-continued



II

wherein: W is selected from the group consisting of —SR-CONR[1]R[2], —SCRN, and —SRCOR[1]; in which R is selected from the group consisting of —$(CH_2)_n$—, where n is an integer from 1 to 5, and —$(CH_2)_n$—, wherein n is an integer from 1 to 5, having at least one side chain alkyl group containing from 1 to 5 carbon atoms; wherein R^1 and R^2 are the same or different, and selected from the group consisting of hydrogen, a straight chain alkyl group containing from 1 to 5 carbon atoms, and a branched chain alkyl groups having from 1 to 5 carbon atoms; and wherein R^3, R^4, R^5 and R^6, are the same or different and selected from the group consisting of a hydrogen, a straight chain alkyl group containing from 1 to 5 carbon atoms and a brached chain alkyl group containing from 1 to 5 carbon atoms; or a non-toxic salt thereof.

4,180,577

FURO[2,3d]PYRIMIDINE DERIVATIVES AND ANTI-ULCER CONTAINING THE SAME

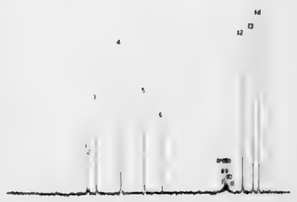
Sachiyuki Hamano, Tokyo, and Takaharu Nakamura, Chiba, both of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 829,862, Sep. 1, 1977, abandoned, which is a continuation of Ser. No. 739,449, Nov. 5, 1976, abandoned, which is a continuation of Ser. No. 557,889, Mar. 12, 1975, abandoned. This application May 2, 1978, Ser. No. 902,833

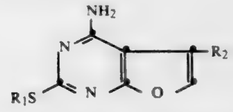
Claims priority, application Japan, Mar. 14, 1974, 49-28628

Int. Cl.[2] A61K *31/505;* **C07D** *491/04*

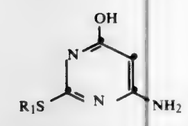
U.S. Cl. 424—251 **18 Claims**



1. A member selected from the group consisting of (a) a compound of the formula:



wherein R_1 represents lower alkyl of 1 to 4 carbon atoms, lower alkenyl of 2 to 4 carbon atoms, benzyl, phenethyl, or phenylpropyl and R_2 represents lower alkyl of 1 to 4 carbon atoms, unsubstituted phenyl or phenyl mono-substituted by carboxyl, methylsulfonyl, methoxycarbonyl or nitro, and (b) a corresponding pharmacologically acceptable acid-addition salt thereof, said compound being produced by the process which comprises the steps of reacting with heating up to reflux conditions a 2-substituted-mercapto-4-amino-6-hydroxy-pyrimidine of the formula:

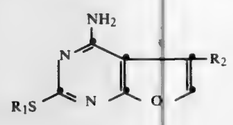


wherein R_1 has the same meaning as defined above, with an ω-haloketone of the formula:

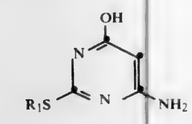
$$X—CH_2CO—R_2$$

wherein X represents halogen and R_2 has the same meaning as defined above, and if desired converting the resulting compound into its pharmacologically acceptable acid-addition salt.

2. A pharmaceutical composition as anti-ulcer, comprising a member selected from the group consisting of (a) a compound of the formula:



wherein R_1 represents lower alkyl of 1 to 4 carbon atoms, lower alkenyl of 2 to 4 carbon atoms, benzyl, phenethyl, or phenylpropyl, and R_2 represents lower alkyl of 1 to 4 carbon atoms, unsubstituted phenyl or phenyl mono-substituted by carboxyl, methylsulfonyl, methoxycarbonyl or nitro, and (b) a corresponding pharmacologically acceptable acid-addition salt thereof, said compound being produced by the process which comprises the steps of reacting with heating up to reflux conditions a 2-substituted-mercapto-4-amino-6-hydroxy-pyrimidine of the formula:



wherein R_1 has the same meaning as defined above, with an ω-haloketone of the formula:

$$X—CH_2CO—R_2$$

wherein X represents halogen and R_2 has the same meaning as defined above, and if desired converting the resulting compound into its pharmacologically acceptable acid-addition salt, and a pharmaceutical carrier.

4,180,578

2,4-DIAMINO-5-(4'-METHYLTHIO)BENZYLPYRIMIDENES, COMPOSITIONS AND METHOD OF USE

Edgar Fritschi, Rothenbach; Walter Liebenow, Nuremberg, and Jaroslav Prikryl, Erlangen-Bruck, all of Fed. Rep. of Germany, assignors to Ludwig Heumann, & Co. GmbH, Nuremberg, Fed. Rep. of Germany

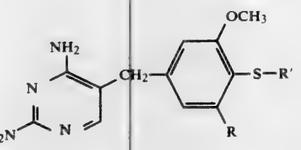
Filed Mar. 29, 1978, Ser. No. 891,266

Claims priority, application Fed. Rep. of Germany, May 9, 1977, 2720771

Int. Cl.[2] **C07D** *239/48;* **A61K** *31/505*

U.S. Cl. 424—251 **9 Claims**

1. A compound selected from a 2,4-diamino-5-thiobenzyl-pyrimidine of the formula:



in which R is selected from hydrogen, lower alkyl, lower alkoxy, and halogen, and R' is lower alkyl; and pharmacologically acceptable acid addition salts thereof.

9. A method for treating a bacterial infection in a patient which comprises administering an effective amount of a compound as claimed in claim **1** in combination with a sulphonamide.

4,180,579

2-SUBSTITUTED-1H-BENZ[de]-ISOQUINOLINE-1,3(2H)-DIONES

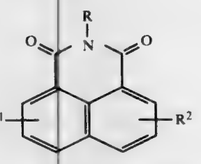
Peter C. Wade, Pennington, N.J., and Berthold R. Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 812,886, Jul. 5, 1977, Pat. No. 4,115,555, which is a division of Ser. No. 727,836, Sep. 9, 1976, Pat. No. 4,051,246. This application Jul. 12, 1978, Ser. No. 924,039

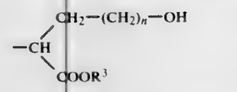
Int. Cl.[2] **C07D** *217/24;* **A61K** *31/47*

U.S. Cl. 424—258 **8 Claims**

1. A compound of the formula:



wherein R^1 and R^2 are independently selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halogen, lower alkylthio, nitro, cyano, and trifluoromethyl; and R is



wherein n is 1 or 2 and R^3 is hydrogen, an alkali metal ion or an alkaline earth metal ion.

8. The method of treating inflammation in a mammalian specie comprising administering a composition containing a pharmaceutically acceptable carrier and as the active ingredient from about 1 mg./kg. to about 30 mg./kg. of a compound or mixture of compounds of claim **1**.

4,180,580

FURO(3,4-B)QUINOLINES

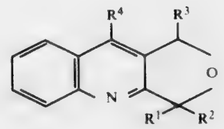
Christopher A. Demerson, Montreal, and Leslie G. Humber, Dollard des Ormeaux, both of Canada, assignors to American Home Products Corp., New York, N.Y.

Division of Ser. No. 739,779, Nov. 8, 1976, Pat. No. 4,108,998. This application May 3, 1978, Ser. No. 902,463

Int. Cl.[2] **C07D** *405/02;* **A61K** *31/47*

U.S. Cl. 424—258 **11 Claims**

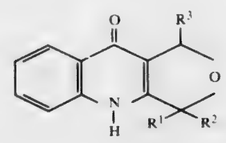
1. A compound of formula I



(I)

in which R^1 is lower alkyl; R^2 is lower alkyl; R^3 is hydrogen or lower alkyl; and R^4 is chloro, bromo, p-toluenesulfonyl or a radical of formula Y—X wherein Y is O and X is lower alkyl, phenyl, or a radical of formula Z—R^9 wherein Z is lower alkylene or hydroxy(lower)alkylene and R^9 is phenyl, or a therapeutically acceptable salt thereof.

6. A compound of formula VI



(VI)

in which R^1 is lower alkyl; R^2 is lower alkyl or a radical of formula



wherein m is an integer from 1 to 5 and R^5 and R^6 each is lower alkyl; and R^3 is hydrogen, lower alkyl or a radical of formula $(CH_2)_nNR^7R^8$ wherein n is an integer from 1 to 6 and R^7 and R^8 each is lower alkyl.

10. A method for treating microbial infections in a mammal which comprises administering to said mammal an effective antimicrobial amount of a compound of claim **1**, or a therapeutically acceptable salt thereof.

4,180,581

N-9,10-DIHYDROLYSERGYL-M-AMINOBENZOIC ACID AMIDE DERIVATIVE

Paul Stadler, Biel-Benken, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

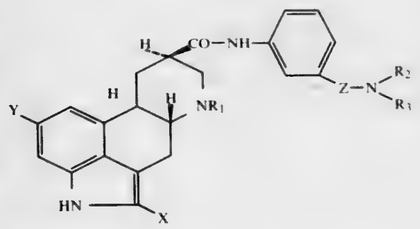
Filed Jan. 26, 1978, Ser. No. 872,639

Claims priority, application Switzerland, Jan. 28, 1977, 1070/77

Int. Cl.[2] **C07D** *457/06;* **A61K** *31/48*

U.S. Cl. 424—261 **21 Claims**

1. A compound of formula I,



I

wherein

X is hydrogen, chlorine or bromine and

Y is hydrogen or bromine, with the proviso that when X is chlorine Y is hydrogen,

Z is carbonyl or sulphonyl,

R_1 is alkyl of 1 to 4 carbon atoms, and

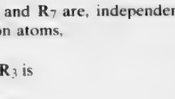
either (i)

R_2 is hydrogen or alkyl of 1 to 5 carbon atoms, and

R_3 is hydrogen, alkyl of 1 to 5 carbon atoms, or phenyl,

or (ii)

R_2 together with R_3 is



wherein R_4, R_5, R_6 and R_7 are, independently, hydrogen or alkyl of 1 to 4 carbon atoms,

or (iii)

R_2 together with R_3 is

$$—(CH_2)_2—A—(CH_2)_2—$$

wherein A is a bond,

or a pharmaceutically acceptable acid addition salt thereof

2. A pharmaceutical composition useful in the treatment of orthostatic hypotension or migraine comprising a therapeutically effective amount of a compound of claim **1** in association with a pharmaceutical carrier of diluent.

4,180,582

6-N-PROPYL-8-METHOXY-METHYL OR METHYLMERCAPTOMETHYLERGOLINES AND RELATED COMPOUNDS AS PROLACTIN INHIBITORS AND TO TREAT PARKINSON'S SYNDROME

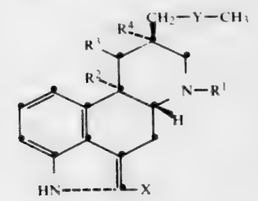
Edmund C. Kornfeld, and Nicholas J. Bach, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 875,978, Feb. 8, 1978. This application Jan. 11, 1979, Ser. No. 2,515

Int. Cl.[2] **A61K** *31/48*

U.S. Cl. 424—261 **3 Claims**

1. A process for inhibiting the secretion of prolactin in mammals which comprises administering to a mammal in which there is an excess of prolactin being secreted a prolactin-lowering dose of a compound of the formula



wherein Y is O, SO, SO_2 or S. R^1 is ethyl, n-propyl, or allyl, X is H, Cl or Br and R^2, R^3 and R^4 when taken singly are hydrogen, and R^2 and R^3, and R^3 and R^4, when taken together with the carbon atoms to which they are attached, form a double bond, and pharmaceutically-acceptable acid addition salts thereof.

4,180,583

OLEFINIC 4-SUBSTITUTED PIPERIDINO DERIVATIVES AS THERAPEUTICS

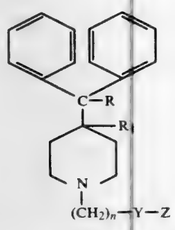
Albert A. Carr, Cincinnati, and C. Richard Kinsolving, Terrace Park, both of Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Division of Ser. No. 538,504, Jan. 6, 1975, abandoned, which is a continuation of Ser. No. 221,820, Jan. 28, 1972, Pat. No. 3,862,173. This application Apr. 3, 1978, Ser. No. 892,636

Int. Cl.[2] **A61K** *27/00, 31/40, 31/445, 31/495*

U.S. Cl. 424—267 **12 Claims**

1. A method of treating the symptoms of an allergic reaction in a patient comprising administering to said patient from about 0.01 to 20 milligrams per kilogram of body weight of the patient of a compound selected from a base of the formula



werein R and R_1 each represent hydrogen; or R and R_1 together from a second bond between the carbon atoms bearing R and R_1; n is a positive whole integer of from 1 to 3; Y is selected from the group consisting of —CH=CH— and



with the proviso that when each of R and R_1 represents hydrogen, Y represents —CH=CH—, n is equal to 1 or 2; Z is selected from the group consisting of thienyl, phenyl, and substituted phenyl wherein the substituents on the substituted phenyl may be attached at the ortho, meta, or para positions of the substituted phenyl ring and are selected from the group consisting of a halogen atom, a straight or branched lower alkyl chain of from 1 to 4 carbon atoms, a lower alkoxy group of from 1 to 4 carbon atoms, a di(lower)alkylamino group, and a saturated monocyclic heterocyclic ring selected from the group consisting of pyrrolidino, piperidino, morpholino and N-(lower)alkylpiperazino; or a pharmaceutically acceptable acid addition salt thereof and a significant amount of a pharmaceutically acceptable carrier.

4,180,584

4-PYRROLIDINO-CYCLOHEXANONE KETALS

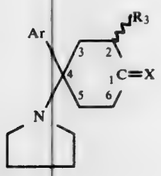
Daniel Lednicer, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 692,589, Jun. 3, 1976, Pat. No. 4,065,573. This application Oct. 11, 1977, Ser. No. 840,861

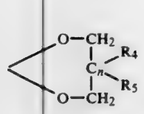
Int. Cl.[2] **C07D** *295/08, 295/10;* **H61K** *31/40*

U.S. Cl. 424—274 **6 Claims**

1. A compound of the formula:



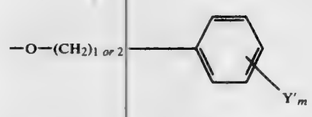
wherein X is



wherein n is zero or one and R_4 is hydrogen or methyl; R_5 is hydrogen, phenyl, —CH_2-alkenyl wherein alkenyl is of 2 to 4 carbon atoms, inclusive, or methyl; aryl is thiophene, or

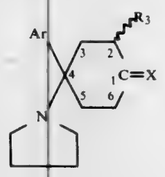


wherein m is zero, one or two, and Y is halogen, CF_3, alkyl of 1 to 4 carbon atoms, inclusive, alkoxy of 1 to 4 carbon atoms, inclusive, hydroxy, cycloalkyloxy of 3 to 6 carbon atoms, inclusive, alkanoyloxy of 2 to 4 carbon atoms, inclusive, alkylthio of 1 to 4 carbon atoms, inclusive, or

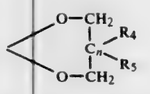


where Y′ is halogen, CF_3, alkyl of 1 to 4 carbon atoms, inclusive, or alkoxy of 1 to 4 carbon atoms, inclusive; R_3 is hydrogen, alkyl of 1 to 5 carbon atoms, inclusive, and the acid addition salts thereof.

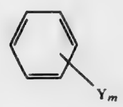
2. A pharmaceutical composition in unit dosage form comprising as an active ingredient an effective amount of a compound of the formula:



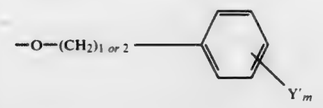
wherein X is



wherein n is zero or one and R_4 is hydrogen or methyl; R_5 is hydrogen, phenyl, —CH_2-alkenyl wherein alkenyl is of 2 to 4 carbon atoms, inclusive, or methyl; aryl is thiophene, or

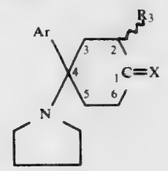


wherein m is zero, one or two, and Y is halogen, CF_3, alkyl of 1 to 4 carbon atoms, inclusive, alkoxy of 1 to 4 carbon atoms, inclusive, hydroxy, cycloalkyloxy of 3 to 6 carbon atoms, inclusive, alkanoyloxy of 2 to 4 carbon atoms, inclusive, alkylthio of 1 to 4 carbon atoms, inclusive, or

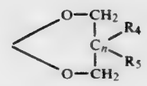


where Y′ is halogen, CF_3, alkyl of 1 to 4 carbon atoms, inclusive, or alkoxy of 1 to 4 carbon atoms, inclusive; R_3 is hydrogen, alkyl of 1 to 5 carbon atoms, inclusive, and the acid addition salts thereof, in association with a pharmaceutical carrier.

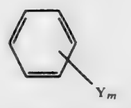
3. A process for inducing analgesia in humans and animals comprising the administration of an analgetic amount of a compound of the formula:



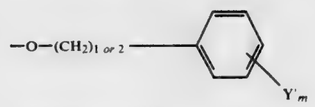
wherein X is



wherein n is zero or one and R_4 is hydrogen or methyl; R_5 is hydrogen, phenyl, —CH_2-alkenyl wherein alkenyl is of 2 to 4 carbon atoms, inclusive, or methyl; aryl is thiophene, or



wherein m is zero, one or two, and Y is halogen, CF_3, alkyl of 1 to 4 carbon atoms, inclusive, alkoxy of 1 to 4 carbon atoms, inclusive, hydroxy, cycloalkyloxy of 3 to 6 carbon atoms, inclusive, alkanoyloxy of 2 to 4 carbon atoms, inclusive, alkylthio of 1 to 4 carbon atoms, inclusive, or



where Y′ is halogen, CF_3, alkyl of 1 to 4 carbon atoms, inclusive, or alkoxy of 1 to 4 carbon atoms, inclusive; R_3 is hydrogen, alkyl of 1 to 5 carbon atoms, inclusive, and the acid addition salts thereof, to a human or animal subject.

4,180,585

PHARMACOLOGICALLY ACTIVE ENOL ESTERS

Alexander C. Goudie, Harlow, England, assignor to Beecham Group Limited, England

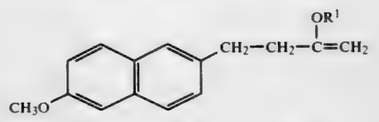
Filed Oct. 26, 1976, Ser. No. 735,738

Claims priority, application United Kingdom, Oct. 29, 1975, 44530/75

Int. Cl.[2] **A61K** *31/22;* **C07C** *69/145*

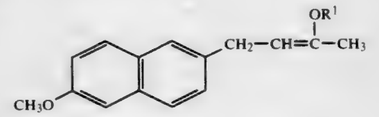
U.S. Cl. 424—311 **17 Claims**

1. An enol acylate of the formula



(II)

or



(III)

in which R^1 is alkanoyl of 2–4 carbon atoms.

4,180,586

3,4-DIPIVALYL-α-[METHYLAMINO)METHYL]BENZYL ALCOHOL AS AN ADJUNCT IN THE TREATMENT OF CIRCULATORY SHOCK

Stuart P. Eriksen, Santa Ana, Calif., assignor to Interx Research Corporation, Lawrence, Kans.

Filed Jan. 10, 1977, Ser. No. 758,354

Int. Cl.[2] **A61K** *31/22*

U.S. Cl. 424—311 **6 Claims**

1. A method for treating circulatory shock in a warm-blooded animal suffering from same which comprises parenterally administering thereto, a sympathomimetic effective amount of the compound, 3,4-Dipivalyl-α-[(methylamino)methyl]benzyl alcohol or a nontoxic pharmaceutically acceptable acid addition salt thereof.

4,180,587

UREYLENE PHENYLENE ANIONIC NAPHTHALENESULFONIC ACIDS AS COMPLEMENT INHIBITORS

Gerald J. Siuta, Yonkers; Ransom B. Conrow, Pearl River; John F. Poletto, Nanuet, and Seymour Bernstein, New City, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

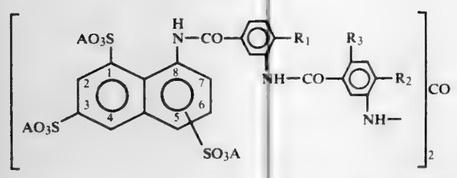
Filed Jul. 11, 1978, Ser. No. 923,743

Int. Cl.[2] **A61K** *31/185;* **C07C** *143/30*

U.S. Cl. 424—315 **24 Claims**

1. A method of inhibiting the complement system in a body fluid which comprises subjecting said body fluid to the action of an effective complement inhibiting amount of a compound of the formula:

V 9 8 9 4 DEC 25 79 UMI



wherein R_1, R_2, and R_3 are selected from the group consisting of hydrogen and methyl; with the proviso that R_1, R_2 and R_3 may not all be hydrogen; with the second proviso that when R_1 is methyl, then either R_2 or R_3 must also be methyl; and A is a pharmaceutically acceptable salt cation.

4,180,588

IMMUNOSUPPRESSANT

Takenori Mori, Takarazuka; Haruhisa Shirahama, Sapporo, and Tadashi Kurokawa, Sendai, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Feb. 27, 1978, Ser. No. 881,238

Claims priority, application Japan, Mar. 9, 1977, 52/25698

Int. Cl.² A61K *31/195*

U.S. Cl. 424—319 **5 Claims**

1. A solid pharmaceutical composition in dosage unit form which comprises an immunosuppressively effective amount of N-(p-hydroxyphenyl)-L-glutamine or a pharmaceutically acceptable acid addition salt thereof and a pharmaceutically acceptable adjuvant.

4,180,589

PREPARATION OF A BLAND BEER

Etzer Chicoye, Milwaukee, Wis.; J. Raymond Helbert, Waukegan, Ill., and James F. Rice, Milwaukee, Wis., assignors to Miller Brewing Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 750,509, Dec. 14, 1976, Pat. No. 4,068,005, which is a continuation-in-part of Ser. No. 622,001, Oct. 14, 1975, abandoned. This application Dec. 28, 1977, Ser. No. 865,358

The portion of the term of this patent subsequent to Jan. 10, 1995, has been disclaimed.

Int. Cl.² C12C *11/04*

U.S. Cl. 426—11 **3 Claims**

1. A method of preparing a lager beer having a mild, bland, less aromatic character which comprises placing beer wort in a fermentation vessel and fermenting the wort in said vessel for about 60 to about 200 hours at an elevated temperature of 60° F. to about 85° F. while maintaining the dissolved CO_2 concentration in the fermenting wort at about 2.1 to about 4.0 cc per cc of the fermenting wort by use of a CO_2 overpressure in the vessel of about 5 to about 40 psig.

4,180,590

METHOD OF PRODUCING SOY SAUCE

Yamashita Kazuo, Yotsukaichi; Kuroyanagi Koji, and Matsuo Naoki, both of Suzuka, all of Japan, assignors to Shono Denpun Kabushiki Kaisha, Suzuka, Japan

Filed Jul. 26, 1977, Ser. No. 819,203

Claims priority, application Japan, Oct. 28, 1976, 51-129758

Int. Cl.² A23L *1/238*

U.S. Cl. 426—18 **9 Claims**

1. A method for producing a seasoning liquor comprising the steps of: saccharifying starch contained in the raw material of a corn protein aqueous solution or dispersion by adding amylolytic enzyme to said corn protein aqueous solution or dispersion and performing said saccharification at 50°–60° C. for 20–50 hours.

performing lactic fermentation by adding lactic acid bacteria to adjust the pH of said raw material liquid to 4.0–5.0, deactivating said enzyme and pasteurizing said bacteria by heat treatment, and performing then the decomposition of protein and starch and alcohol fermentation at 25°–33° C. for 25–35 days in the presence of sodium chloride by adding koji and yeast, said koji containing the substrates of at least two members selected from the group consisting of corn starch, wheat, wheat bran and soybean, the amount of koji added being between about 1 to,3 times as much as the weight of protein contained in the liquid to which it is added, and the concentration of sodium chloride in the liquid is from 5–6% after the koji has been added.

4,180,591

METHOD OF PRODUCING A SOY SAUCE

Yamashita Kazuo, Yotsukaichi; Kuroyanagi Koji, Suzuka; Minamikawa Yoshitsugu, Suzuka, and Tanabe Yasuhiro, Suzuka, all of Japan, assignors to Shono Denpun Kabushiki Kaisha, Suzuka, Japan

Filed Jul. 26, 1977, Ser. No. 819,204

Claims priority, application Japan, Oct. 28, 1976, 51-129759

Int. Cl.² A23L *1/238*

U.S. Cl. 426—18 **7 Claims**

1. A method for producing a light-colored seasoning liquor of high nitrogen and alcohol contents comprising the steps of: performing lactic fermentation by adding lactic acid bacteria to the main raw material of a corn protein aqueous solution or dispersion containing starch to convert the pH of said raw material liquid to 4.0 to 5.0, then pasteurizing said raw material liquid by heat treatment, and performing the decomposition of protein and starch for 24–48 hours by adding a concentrated enzyme solution to the product of said lactic fermentation, and further performing decomposition of protein and starch and alcohol fermentation at 20°–30° C. for 20–35 days by adding yeast to the product, said concentrated enzyme solution being prepared by extracting the enzyme contained in koji soaking the koji in 2–4 fold quantity of 20–30 wt.% saline solution at 0°–5° C. for at least 24 hours, repeating said extraction at least twice, and concentrating thus obtained extract liquids by ultrafiltration to ½–¼ volume.

4,180,592

FOOD PROTEIN PRODUCT

Keith Buckley, Melton Mowbray; Alan Vernon, Nottingham, and Philip J. Lowe, Bramcote, all of England, assignors to Mars Limited, London, England

Filed Aug. 1, 1977, Ser. No. 820,890

Claims priority, application United Kingdom, Aug. 2, 1976, 32169/76

Int. Cl.² A23J *1/06*; A23L *1/31*

U.S. Cl. 426—32 **13 Claims**

1. A process of making a food product from whole blood or blood derivatives containing red cells or animal tissue containing such blood comprising the steps of:

treating said blood or derivative or tissue with an oxidizing agent in excess of the amount necessary for complete decolorizing reaction with said blood or derivative or tissue; and

decomposing the residual oxidizing agent remaining after said decolorizing reaction by adding whole blood or red blood derivatives or blood-containing animal tissue to the reacted mixture of said first mentioned blood or derivative or tissue and oxidizing agent.

4,180,593

PROCESS FOR PRODUCING ROUND SPHERICAL FREE FLOWING BLOWN BEAD FOOD PRODUCTS OF CONTROLLED BULK DENSITY

Allan N. Cohan, 1143 Wright Dr., Huntingdon Valley, Pa. 19006

Filed Apr. 29, 1977, Ser. No. 792,384

Int. Cl.² A23L *1/30*; F26D *3/12*

U.S. Cl. 426—72 **16 Claims**



1. A process for producing food product in the form of round spherical free flowing blown beads which comprises:

A. providing sprayable, flowable composition containing an edible film forming food product, liquid in an amount sufficient to render the composition flowable, and a blowing agent; said blowing agent being present in said composition prior to the spraying step (B) below;

B. spraying said composition to atomize said composition to form beads;

C. subjecting said beads to a heated zone to therefore expand said beads by expansion of gases within the interior of said beads and to dry said beads; and

D. subjecting the expanding beads to a cooling zone to quench cool said beads to thereby stop the expansion of said beads and aid in the control of their bulk density

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4,180,594

CEREAL-BASED PRODUCT AND PROCESS FOR ITS PRODUCTION

Manfred P. Graf, Blonay, Switzerland, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Feb. 1, 1978, Ser. No. 874,351

Claims priority, application Switzerland, Feb. 7, 1977, 1450/77

Int. Cl.² A23L *1/164*

U.S. Cl. 426—560 **2 Claims**

1. A process for the production of a hard, granulated cereal-based product, comprising the steps of:

(a) dry mixing from 40 to 70% by weight cereal flakes, from 5 to 25% by weight sugar and from 10 to 20% by weight whey powder;

(b) working the mixture in a continuous malaxator with blades with addition of from 5 to 10% by weight edible oil and from 3 to 10% moisture at a temperature of from 110° to 150° C. to produce hard fragments;

(c) cooling the fragments obtained; and

(d) breaking said fragments into granulates.

4,180,595

NUTRITIVE SEAMOSS COMPOSITION AND METHOD FOR PREPARING SAME

Bernier Lauredan, 224-02 Linden Blvd., Cambria Hgts., N.Y. 11411

Filed Jun. 29, 1978, Ser. No. 919,503

Int. Cl.² A23L *1/04, 2/00*

U.S. Cl. 426—575 **6 Claims**

1. An edible seamoss composition which comprises in combination, water, gum arabic, dry linseed, seamoss, a sweetening agent and a flavoring agent, wherein the seamoss is Irish moss present in an amount of about 1.0 parts to about 1.6 parts by weight per 100 parts water, gum arabic is present in an amount from about 0.5 to about 0.8 parts by weight per 100 parts water, dry linseed is present in an amount from about 0.5 to about 0.8 parts by weight per 100 parts water, milk is additionally added in an amount of about 10 to about 40 parts by weight per 100 parts of water, the sweetening agent is added in an amount from about 1.5 to about 1.6 parts by weight per 100 parts water, and the flavoring agent is added in an amount of about 5 to 20 parts by weight per 100 parts by weight water.

4,180,596

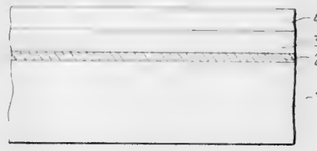
METHOD FOR PROVIDING A METAL SILICIDE LAYER ON A SUBSTRATE

Billy L. Crowder, Putnam Valley, and Stanley Zirinsky, Bronx, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,914

Int. Cl.² C23C *11/08, 11/00*

U.S. Cl. 427—42 **23 Claims**



1. A method for preparing metal silicide interconnections in an integrated circuit which comprises providing a layer of a metal silicide on a substrate wherein said metal is selected from the group consisting of molybdenum, tantalum, tungsten, rhodium, and mixtures thereof, by coevaporating said metal and silicon onto the desired substrate and then heat treating the coated substrate for a time sufficient for reacting deposited metal and deposited silicon to thereby obtain said metal silicide interconnections and wherein said interconnections are provided on the same side of the substrate as are electrically active devices.

4,180,597

MANUFACTURE OF MAGNETIC RECORDING MEDIA

Herbert Motz, Beindersheim; Norbert Schneider, Mutterstadt; Hans-Joerg Hartmann, Freinsheim, and Reinhold Baur, Offenburg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

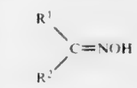
Filed Sep. 8, 1978, Ser. No. 940,462

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1977, 2741341

Int. Cl.² H01F *10/02*

U.S. Cl. 427—48 **10 Claims**

1. A process for the manufacture of a magnetic recording medium which comprises forming a dispersion of finely divided particulate anisotropic magnetic material in a solution of polymeric binder in an organic solvent, the dispersion containing from 0.05% to 5% by weight, based on the amount of the magnetic material, of a compound of the formula (I)



(I)

wherein R^1 is methyl, straight-chain or branched alkyl of 2 to 10 carbon atoms, cycloalkyl of 6 to 10 carbon atoms or aralkyl of 7 to 14 carbon atoms and R^2 is hydrogen, methyl, straight-chain or branched alkyl of 2 to 10 carbon atoms, cycloalkyl of 6 to 10 carbon atoms or aralkyl of 7 to 14 carbon atoms; applying a layer of the dispersion to a non-magnetizable base; and

V 9 8 9 4 4 D E C 2 5 7 9 UMI

thereafter drying the layer of dispersion and magnetically orienting the particles of anisotropic magnetic material of said dispersion, said drying and orienting steps being effected in any order provided that the magnetic layer has not solidified prior to orientation of the particles.

4,180,598

RADIATION-CURABLE COATING COMPOSITIONS AND METHOD OF COATING METAL SUBSTRATES THEREWITH

William D. Emmons, Huntingdon Valley, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 924,263, Jul. 13, 1978, abandoned. This application Aug. 11, 1978, Ser. No. 933,010

Int. Cl.[2] B05D *3/06*

U.S. Cl. 427—44 **22 Claims**

1. A readiation-curable composition, characterized by improved adhesion to metal substrates, having a film-forming binder consisting essentially of:

(A) At least one ethylenically unsaturated monomer selected from the group consisting of isobornyl acrylate, 2-ethylhexyl acrylate, ethoxyethoxyethyl acrylate, dicyclopentenyloxyethyl acrylate and dicyclopentenyloxyethyl methacrylate, and

(B) At least one acrylated oligomeric condensation or addition product having at least two terminal or pendant acryloxy groups of the formula

$$H_2C{=}C(H)C(O)O{-},$$

and about 1% to 15% by weight, based on the total weight of (A) and (B), of 3-acryloxypropionic acid.

10. A method for coating a metal substrate, which comprises preparing a radiation-curable composition as defined in claim 1, applying a thin film of the composition to the surface of a substrate, and then subjecting the film to actinic radiation for a length of time sufficient to cure the film.

4,180,599

CROSSLINKING PHOTOINITIATORS OF ACRYLIC BENZOPHENONETETRACARBOXYLATES

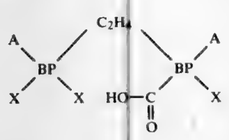
Stephen M. Wolpert, Detroit, and Gustav J. Nerath, Canton, both of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 25, 1978, Ser. No. 937,681

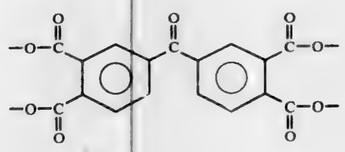
Int. Cl.[2] B05D *3/06*

U.S. Cl. 427—54.1 **1 Claim**

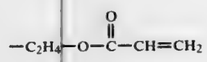
1. A method of forming an acrylic polymeric coating on a substrate comprising the steps of (1) formulating an acrylic monomer coating material to include as the sole reactive cross-linking ingredient and as the sole photosensitizing catalyst, an acrylic benzophonenetetracarboxylate derivative, (2) forming a film of said coating material on the substrate, and (3) subjecting said film to ultraviolet light so that the acrylic moieties in said carboxylate derivative are permitted to form network cross linkages after catalytic initiation by the benzophenone moiety; the acrylic benzophenonetetracarboxylate derivative having the formula:



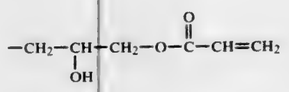
where BP is



and A is



and X is



4,180,600

PROCESS USING ACTIVATED ELECTROLESS PLATING CATALYSTS

Nathan Feldstein, 63 Hemlock Cir., Princeton, N.J. 08540, assignor to Nathan Feldstein, Princeton, N.J.

Continuation-in-part of Ser. No. 820,904, Aug. 1, 1977, Pat. No. 4,131,699, which is a continuation of Ser. No. 625,326, Oct. 23, 1975, Pat. No. 4,048,354. This application Sep. 11, 1978, Ser. No. 941,044

The portion of the term of this patent subsequent to Sep. 13, 1994, has been disclaimed.

Int. Cl.[2] C23C *3/02*

U.S. Cl. 427—97 **31 Claims**

1. A process for electroless or chemical plating onto a nonconductor substrate comprising the step of contacting said substrate with an activated colloidal dispersion wherein said colloidal dispersion comprises a metal which in one of its oxidation states is capable of electroless or chemical plating initiation and wherein said metal may be in an elemental state or alloy or compound and mixtures thereof and further wherein said activated colloidal dispersion comprises at least one primary stabilizer which alone renders the dispersion weakly active and at least one reactivity modifier and wherein said primary stabilizer and said reactivity modifier are inherently colloid stabilizers however they are different materials.

4,180,601

METHOD OF APPLYING LIQUID TO SOLID SURFACES

Floyd B. Kopis, 330 Interstate Rd., Addison, Ill. 60101

Continuation of Ser. No. 506,355, Sep. 16, 1974, abandoned. This application May 9, 1977, Ser. No. 794,810

Int. Cl.[2] B05D *7/22*

U.S. Cl. 427—238 **2 Claims**

1. A method of applying a liquid to an inner surface of an opening having an up and down orientation in an object, said method comprising:

providing an elongated tubular applicator having a completely exposed exterior surface and an interior return passage extending longitudinally in said applicator,

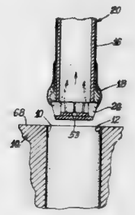
positioning said applicator with an up and down orientation,

supplying a layer of the liquid continuously to said exposed exterior surface and thereby causing the liquid layer to flow downwardly solely by gravity along said exposed exterior surface with one side of said liquid layer retained on said exposed exterior surface solely by adhesion between said liquid and said exposed exterior surface and with the other side of said liquid layer completely exposed to the outside,

outwardly deflecting the downwardly flowing liquid layer along said exposed exterior surface and thereby forming an outwardly projecting annular bead of the liquid,

sucking excess liquid from said exposed exterior surface and into said interior passage in said applicator below said bead to prevent dripping of the liquid from said applicator,

inserting said applicator into said opening to bring said bead of liquid into contact with said inner surface of said opening,



producing relative longitudinal movement between said applicator and said inner surface while maintaining said bead of liquid in contact with said inner surface to apply the liquid thereon,

said exposed exterior surface of said applicator being maintained out of contact with said inner surface of said opening,

and reversing said relative longitudinal movement to cause withdrawal of said applicator from said opening.

4,180,602

ELECTROLESS PLATING OF POLYVINYLIDENE FLUORIDE

Lawrence M. Schiavone, Howell, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 31, 1978, Ser. No. 892,107

Int. Cl.[2] C23C *3/02*

U.S. Cl. 427—306 **9 Claims**

1. A process for electroless plating a substrate comprising the steps of exposing said substrate first to a pretreatment, then to a sensitizer and finally to a plating solution CHARACTERIZED IN THAT said substrate. is polyvinylidene fluoride, said pretreatment is a nonoxidizing solvent for said substrate and said sensitizer is elemental silver.

4,180,603

COATING BATH COMPOSITION AND METHOD

John K. Howell, Jr., Rochester, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Filed Jan. 31, 1977, Ser. No. 764,120

Int. Cl.[2] B05D *1/18, 3/02;* **C08J** *3/00;* **C08L** *00/00*

U.S. Cl. 427—353 **9 Claims**

1. The method of applying a bonded organic coating to a ferrous substrate comprising the steps of:

(1) combining an epoxy resin, a cross linking resin, a resin-miscible water-immiscible solvent and at least one emulsifying agent wherein the weight ratio of epoxy resin: cross linking resin is from about 1:1 to about 9:1;

(2) adding sufficient water and hydrogen peroxide to the combination of step 1 to yield an emulsion having a solids content of from about 5 to about 500 grams per liter and containing from about 1 to about 5 grams per liter of hydrogen peroxide as an oxidizing agent;

(3) adding sufficient acid or base, if necessary, to adjust the pH value of the emulsion to from about 2 to about 4;

(4) immersing a ferrous substrate into the coating bath to form a coating thereon; and

(5) heat curing the coating.

4,180,604

TWO LAYER RESIST SYSTEM

Bai-Cwo Feng, Wappingers Falls, and George C. Feng, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1977, Ser. No. 865,814

Int. Cl.[2] B05D *1/36;* **G03C** *1/74*

U.S. Cl. 430—270 **8 Claims**



1. A method for forming a composite layer of resist materials comprising:

providing first and second resist materials, each resist material being a sensitized organic polymer capable of forming a patterned resist mask to protect the underlying portions of a substrate;

saturating said second resist material with a dilutant which does not dissolve said first resist material;

applying said first resist material atop said substrate; and

applying said saturated resist material atop said first material, thereby forming said composite layer.

4,180,605

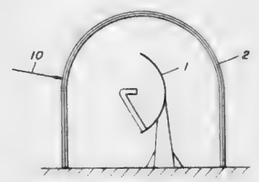
MULTILAYER RADOME

Daniel E. Gilbert, Maple Valley; James R. Lee, Seattle, and Ted J. Kramer, Auburn, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 8, 1978, Ser. No. 931,660

Int. Cl.[2] G21F *1/06, 1/12*

U.S. Cl. 428—76 **4 Claims**



1. A radome for protection of antennas subject to damage from incident irradiation which comprises a plurality of boron nitride layers in spaced relation with spaces between the layers evacuated.

4,180,606

FABRICS HAVING FLOCKED CORDUROY RIBS

Charles M. Hance, Woodruff, and Charles D. Martin, Greer, both of S.C., assignors to M. Lowenstein & Sons, Inc., New York, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,457

Int. Cl.[2] B32B *33/00*

U.S. Cl. 428—88 **17 Claims**



10. A textile fabric comprising a flexible substrate sheet, a plurality of substantially parallel, closely spaced, raised ribs of adhesive material extending along and secured to one surface of said sheet, each of said ribs being defined in transverse cross-section by opposed side surfaces sloping upwardly and inwardly from said sheet surface to the top of the rib, and a plurality of closely spaced, discrete fibers of predetermined

length adhesively embedded in and extending outwardly from the overall exposed surface of each of said ribs of adhesive, with surface portions of said sheet between said ribs of adhesive being substantially free of adhesive and said fibers to provide an appearance in said fabric substantially similar to woven corduroy.

4,180,607

EPOXY RESIN COMPOSITION AND METHOD FOR CURING THE EPOXY RESIN COMPOSITION

Ichiro Sasaki; Hiroshi Itatani, and Mikito Kashima, all of Chiba, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Aug. 31, 1978, Ser. No. 938,526
Claims priority, application Japan, Jul. 7, 1978, 53-81943
Int. Cl.² C08G *59/42*
U.S. Cl. 528—112 **24 Claims**

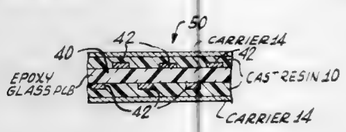
1. An epoxy resin composition comprising at least one epoxy resin and a curing agent which comprises, as an essential curing component, 2,3,3',4'-biphenyltetracarboxylic dianhydride.

4,180,608

PROCESS FOR MAKING MULTI-LAYER PRINTED CIRCUIT BOARDS, AND THE ARTICLE RESULTING THEREFROM

Joseph A. Del, 16326 Barneston St., Granada Hills, Calif. 91344

Continuation of Ser. No. 757,753, Jan. 7, 1977, abandoned. This application Jul. 7, 1978, Ser. No. 922,758
Int. Cl.² B32B *7/06, 31/00*
U.S. Cl. 428—196 **9 Claims**



1. A process for making a multi-layer printed circuit board (PCB) which includes, in sequence, the steps of:
first laminating at least one side of a PCB provided with circuitry details, to a cast thermosetting resin layer, of about 3–6 mil thickness, carried on a release-coated carrier sheet, said cast thermosetting resin layer comprising essentially a first, B-staged, epoxy resin system solid at room temperatures, said first laminating step proceeding at temperatures and/or times substantially below curing conditions of said cast thermosetting resin layer to form a prefilled PCB laminate including said release-coated carrier sheet wherein said cast thermosetting resin layer remains B-staged;
second, removing said release-coated carrier sheet;
third, assemblying at least one of said prefilled PCB laminates with prepreg layers, each prepreg layer comprising glass cloth impregnated by a second B-staged epoxy resin system compatible with said first B-staged epoxy resin system of said cast thermosetting resin layer, said prepreg layer having a resin flow, under standard conditions, that is less than the resin flow of said cast thermosetting resin layer; and
fourth, laminating each of said prefilled PCB laminates and said prepreg layers, under curing conditions, to cure the B-staged thermosetting resins in said prefilled PCB laminates and prepreg layers and form a fully cured essentially void-free multi-layer PCB.

5. In the process for making a multi-layer printed circuit board (PCB) the improvement which comprises the steps of:
laminating at least one side of a PCB, which is provided with circuitry details, to a cast thermosetting resin layer, of about 3–6 mil thickness, carried on a release-coated carrier sheet, said thermosetting resin layer comprising essentially a B-staged, epoxy resin system having a resin flow, under curing conditions, greater than a prepreg layer containing glass cloth impregnated by said B-staged resin, said laminating step proceeding at temperatures and/or times substantially below curing conditions to form a prefilled PCB laminate including said release-coated carrier sheet wherein the cast resin layer remains B-staged, and prior to the lamination of multiple PCB layers; and removing said release-coated carrier sheet.
7. The product formed by the process of claim 1.

4,180,609

ARTICLE COATED WITH FLUOROPOLYMER FINISH WITH IMPROVED SCRATCH RESISTANCE

Eustathios Vassiliou, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 701,746, Jun. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 595,175, Jul. 11, 1975, abandoned. This application Feb. 27, 1978, Ser. No. 881,668
Int. Cl.² B32B *7/00;* **C08L** *27/18;* **B32B** *27/00*
U.S. Cl. 428—212 **17 Claims**

1. An article bearing a basecoat derived from a composition comprising:
(a) a particulate polymer polymerized or copolymerized from monomers selected from one or more monoethylenically unsaturated hydrocarbon monomers and hydrocarbon ether monomers, said monomers being completely substituted with fluorine atoms or a combination of fluorine atoms and chlorine atoms;
(b) mica particles, mica particles coated with pigment, or metal flake; and
(c) a liquid carrier;
overlaid with a topcoat finish derived from a composition comprising (a), (b) and (c), with the concentration of (b) in the topcoat being from 10% to 90% of the concentration of (b) in the basecoat.

17. A method for improving the apparent scratch resistance of an article bearing a basecoat derived from a composition comprising:
(a) a particulate polymer polymerized or copolymerized from monomers selected from one or more monoethylenically unsaturated hydrocarbon monomers and hydrocarbon ether monomers, said monomers being completely substituted with fluorine atoms or a combination of fluorine atoms or chlorine atoms;
(b) mica particles, mica particles coated with pigment, or metal flake;
(c) a polymer of monoethylenically unsaturated monomers which depolymerizes and whose depolymerization products vaporize in the temperature range of about 150° C. below the fusion temperature of (a) to about the decomposition temperature of (a); and
(d) a liquid carrier;
the method comprising topcoating the basecoat with a composition comprising (a), (b), (c) and (d), wherein the concentration of (b) in the topcoat is from 10% to 90% of the concentration of (b) in the basecoat, and then fusing the coatings.

4,180,610

ARTICLE COATED WITH A WATER BASED ALKYD RESIN PRIMER

Monica H. Verma, Troy, Mich., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 858,183, Dec. 7, 1977, Pat. No. 4,116,904, and a continuation-in-part of Ser. No. 738,855, Nov. 4, 1976, abandoned. This application May 15, 1978, Ser. No. 905,968
Int. Cl.² B32B *9/04*
U.S. Cl. 428—216 **8 Claims**

1. An article comprising a substrate coated with a 0.1–5 mil thick layer of the dried coalesced primer composition wherein the primer is from an aqueous composition comprising 5–50% by weight of a film-forming binder and 50–90% by weight of an aqueous medium; wherein the binder consists essentially of
an alkyd resin which is the esterification product of soya oil fatty acids, phthalic acid, trimellitic anhydride and trimethylol propane having an acid number of 20-100; and
the composition contains pigment in a pigment to binder weight ratio of about 300/100 to 10/100 in which the pigment is a mixture of talc, barytes and zinc/calcium molybdate and
about 0.05–1.0% by weight, based on the weight of the composition, of an anionic polyelectrolyte dispersant;
the composition containing sufficient ammonia or an amine to provide the composition with a pH of 6.5–8.5.

4,180,611

SMOOTH-SURFACED NONWOVEN FABRIC

Wolfram Schultheiss, Birkenau, and Klaus Schmidt, Hirschberg, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Hohnerweg, Fed. Rep. of Germany

Filed Dec. 1, 1977, Ser. No. 856,564
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1976, 2655024
Int. Cl.² B32B *5/16, 27/02*
U.S. Cl. 428—288 **4 Claims**

1. A nonwoven fabric having a smooth surface, especially for use as a support material for a semipermeable membrane, comprising a support mat having at least one surface into which there has been calendered an open structured porous covering layer of fine flat fibers having a thickness of less than about 30×10^{-6} m, the covering layer having a specific weight of about 1 to 200 g/m² and having been formed by electrostatically spinning the fibers directly onto the support mat, the support mat extending over the entire width of the fabric.

4. In a system for filtration using a semipermeable membrane, the improvement which comprises using said membrane supported on a nonwoven fabric according to claim 1.

4,180,612

HYDANTOIN-POLYESTER COATING COMPOSITIONS

Denis R. Pauzé, Scotia, N.Y., and Donald G. Pucci, West Lafayette, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 447,624, Mar. 4, 1974, abandoned. This application Jan. 13, 1975, Ser. No. 540,633
Int. Cl.² C08G *18/64, 63/68, 63/70, 73/16*
U.S. Cl. 528—289 **15 Claims**

1. A coating composition comprising a polyester hydantoin containing free carboxyl groups, at least part of the free carboxyl groups in the polyester moiety being neutralized with a compound selected from the group consisting of an amine, ammonia, and ammonium hydroxide

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4,180,613

CRAZE-RESISTANT POLYSILOXANE RESIN COATINGS AND COATING COMPOSITIONS CONTAINING A DISCONTINUOUS PHASE

Eustathios Vassiliou, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 829,824, Sep. 1, 1977. This application Mar. 31, 1978, Ser. No. 892,299
Int. Cl.² B32B *5/16, 27/00;* **B05D** *3/02*
U.S. Cl. 428—327 **21 Claims**

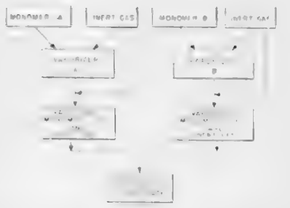
1. A coated substrate having a coating consisting essentially of a continuous phase of a cross-linked polysiloxane resin which has dispersed throughout it about 5–30% by weight of a discontinuous particulate phase of an organic modifier, based on the combined weight of the resin and the modifier,
wherein the modifier has an average particle size in the range of 0.1–15 μm, the modifier is tougher than the coating, and the modifer has a higher static coefficient of friction against the polysiloxane resin than does polytetrafluoroethylene, and wherein the polysiloxane resin has a degree of elongation not greater than about 4%.

4,180,614

GAS-BARRIER COATED FILMS, SHEETS OR FOILS AND METHOD OF PREPARATION

Rudolph J. Angelo; Richard N. Blomberg, both of Wilmington; Fritz P. Boettcher, Newark, all of Del.; Richard M. Ikeda, Chadds Ford, Pa., and Michael R. Samuels, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 630,996, Nov. 12, 1975, Pat. No. 4,104,438, which is a continuation-in-part of Ser. No. 542,237, Jan. 20, 1975, abandoned. This application Dec. 16, 1977, Ser. No. 861,567
Int. Cl.² B32B *27/34, 27/28, 27/36, 27/08*
U.S. Cl. 428—336 **57 Claims**



1. A process for forming a gas-barrier coating on a film, sheet or foil, said coating being an aromatic polyamide, polyimide, polyamide-imide, polyhydrazide, polyamidehydrazide or polyazomethine formed by the direct vapor-phase condensation polymerization of their respective monomers, which process comprises vaporizing said monomers, mixing said vaporized monomers in the presence of an inert diluent gas and reacting said mixed monomers in a reaction zone, in the presence of said film, sheet or foil maintained above the critical minimum deposition temperature of said monomers but below about 300° C., and forming the condensation polymer on the surface of said film to a thickness between about 0.01 and about 0.6 mil.

28. A film, sheet or foil having a gas-barrier coating thereon of an aromatic polyamide, polyimide, polyamide-imide, polyhydrazide, polyamide-hydrazide or polyazomethine formed onto said film by the direct vapor-phase condensation polymerization of their respective monomers mixed in the vapor state and reacted in the presence of said film, sheet or foil maintained above the critical minimum deposition temperature of said monomers but below about 300° C., said coating having a thickness between about 0.01 and about 0.6 mil

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4,180,615

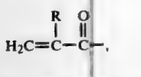
VINYL TILE AND PRODUCTION THEREOF

Philip S. Bettoli, Martinsville, N.J., assignor to GAF Corporation, New York, N.Y.

Continuation of Ser. No. 848,898, Nov. 7, 1977, abandoned, Division of Ser. No. 347,480, Apr. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 215,197, Jan. 3, 1972, abandoned. This application May 19, 1978, Ser. No. 907,726
Int. Cl.² B05D *3/06*
U.S. Cl. 428—339 **21 Claims**

1. A continuous process for producing an improved vinyl tile comprising:
(a) calendering a uniform mix comprising filler, vinyl chloride polymer and plasticizer to form a continuous vinyl sheet having a thickness of from about 1/16" to about ¼", said continuous sheet being discharged from the calendering zone at a travel rate of at least about 80 ft./min.;
(b) coating the thus-formed continuous vinyl sheet traveling

essentially at said travel rate with a layer between about 1 and about 5 mils thick of a substantially solvent free fluid coating composition having a volatility of less than about 2percent and comprising urethane compound having at least two photo-polymerizable ethylenically unsaturated groups of the general structure:



where R is either H or CH_3, said layer of coating composition being capable of curing upon exposure to ultraviolet light to form a hard, clear layer adherent to said vinyl sheet;

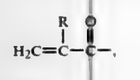
(c) exposing the thus-coated sheet traveling essentially at said rate of at least about 80 ft/min. to ultraviolet light having wavelengths within the range of from about 2500 Å to about 4000 Å at a temperature of from about 110° F. to about 220° F., the radiation intensity level being sufficient to initiate the desired curing of the coating within an ultraviolet exposure time of from about 0.2 sec. to about 15 sec. and

(d) passing the thus-treated sheet traveling essentially at said rate to a cutting zone and therein cutting the thus-coated and treated sheet at a temperature of not less than about 120° F. to form individual tiles having a clear wear layer thereon.

6. An improved vinyl tile comprising:

(a) thermoplastic base tile comprising filler, vinyl chloride, polymer and plasticizer; and

(b) a clear, durable wear layer adhering to the surface of said base tile and having a thickness of from about 1 to about 5 mils, said wear layer comprising urethane compound photo-polymerized by an exposure to ultraviolet light at from about 110° F. to about 220° F. for from about 0.2 to about 15 sec., said wear layer being photo-polymerized from a fluid coating composition having a volatility of less than about 2 percent and comprising urethane compound having at least two photo-polymerizable ethylenically unsaturated groups of the general structure:



where R is either H or CH_3.

4,180,616

SOFT SOLDERING

David G. Lovering, and James H. Turnbull, both of Swindon, England, assignors to Multicore Solders Limited, Hertfordshire, England

Filed Nov. 25, 1977, Ser. No. 854,702

Claims priority, application United Kingdom, Nov. 25, 1976, 49284/76

Int. Cl.[2] **B23K** *35/34*

U.S. Cl. 428—389 **7 Claims**

1. A soldering composition for use in soft soldering processes, the composition comprising (a) a soft solder alloy and (b) a flux composition comprising as an essential active flux material at least one compound containing a perhydro-1,2-cyclopentanophenanthrene ring system.

4,180,617

HYGROSCOPIC FIBERS AND FILAMENTS

Ulrich Reinehr, Dormagen; Hermann-Josef Jungverdorben, Grevenbroich, and Toni Herbertz, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 746,727, Dec. 2, 1976. This application Jul. 29, 1977, Ser. No. 820,240

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1975, 2554124; Apr. 28, 1977, 2719019

Int. Cl.[2] **D02G** *3/00*

U.S. Cl. 428—398 **10 Claims**



1. A hydroscopic filament or fiber of a fiber-forming synthetic polymer having a water permeable sheath and a microporous core in which both the sheath and the core contain voids, the voids in the core forming an interconnected system open to liquids through voids in the sheath, and in which the average size of the voids in the core is at most 10,000 A and is significantly larger than the size of the voids in the sheath; a water retention capacity of at least 10%; a porosity of at least 10%; and a fiber swellability of at most 10% which is lower than the water retention capacity.

4,180,618

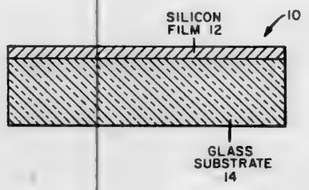
THIN SILICON FILM ELECTRONIC DEVICE

James W. Alpha, Corning, and William H. Dumbaugh, Jr., Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jul. 27, 1977, Ser. No. 819,264

Int. Cl.[2] **B32B** *17/06;* **B05D** *5/12*

U.S. Cl. 428—428 **6 Claims**



1. In an electronic device wherein a thin film of silicon is deposited on a substrate, the improvement wherein the substrate is an aluminosilicate glass having a linear coefficient of thermal expansion over the temperature range of 0°–300° C. of between $32–42\times10^{-7}$/°C., an annealing temperature in excess of 800° C., and a viscosity at the liquidus temperature of at least about 100,000 poises, said glass consisting essentially, in percent by weight as calculated from the glass batch on an oxide basis, of 55 to 75% SiO_2, 5 to 25% Al_2O_3, and at least one alkaline earth metal oxide selected from the group consisting of 9 to 15% CaO, 14 to 20% SrO, 18 to 26% BaO, and a mixture of such oxides wherein the total alkaline earth metal oxide content is equivalent on a molar basis to 9 to 15% CaO.

4,180,619

CROSSLINKED ACRYLIC POLYMER MICROPARTICLES

Joseph M. Makhlouf, Mars, and Samuel Porter, Jr., Tarentum, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 805,679, Jun. 13, 1977, which is a continuation-in-part of Ser. No. 559,949, Mar. 19, 1975, abandoned. This application Aug. 16, 1978, Ser. No. 934,109

Int. Cl.[2] **C08F** *220/06*

U.S. Cl. 526—202 **12 Claims**

1. Crosslinked acrylic polymer microparticles having a particle size of from 0.1 to 10 microns, which crosslinked acrylic polymer particles may be produced by free radical addition copolymerizing from 0.5 to 15 percent of alpha, beta-ethylenically unsaturated monocarboxylic acid, from 70 to 99 percent of at least one other copolymerizable monoethylenically unsaturated monomer and from 0.5 to 15 percent of crosslinking monomer selected from the group consisting of (1) epoxy group-containing compound and (2) a mixture of alkylenimine and organoalkoxysilane, wherein:

a. said epoxy group-containing compound is monoepoxide compound which additionally contains ethylenic unsaturation,

b. said organoalkoxysilane is selected from the group consisting of acrylatoalkoxysilane, methacrylatoalkoxysilane and vinylalkoxysilane, and

c. said monomer percentages are based on the weight of monomers used in the copolymerization process,

in the presence of hydrocarbon dispersing liquid which is a solvent for the polymerizable monomers but a non-solvent for the resultant polymer, and polymeric dispersion stabilizer containing at least two segments of which one segment is solvated by said dispersing liquid and a second segment is of different polarity than said first segment and is relatively insoluble in said dispersing liquid, wherein the reaction is carried out at elevated temperature such that the dispersion polymer first forms and then is crosslinked.

4,180,620

PLASTICIZED POLYVINYL BUTYRAL SHEETING WITH A DIVALENT METAL SALT OF NEO DECANOIC ACID ADHESION CONTROL AGENT

Harold K. Inskip, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 2, 1978, Ser. No. 874,612

Int. Cl.[2] **B32B** *27/42, 17/10*

U.S. Cl. 428—524 **3 Claims**

1. In plasticized polyvinyl butyral sheeting having incorporated therein an adhesion control agent, the improvement which comprises an adhesion control agent consisting essentially of about from 0.01–0.5 wt. percent, based on plasticized polyvinyl butyral, of a divalent metal salt of neo decanoic acid wherein the metal is selected from the group consisting of magnesium, calcium, zinc and lead.

4,180,621

PRESSURE-SENSITIVE DUPLICATING STENCIL

Michael Maynard, London, and Walter Jones, Harlow, both of England, assignors to Gestetner Limited, London, England

Filed Dec. 3, 1973, Ser. No. 421,263

Claims priority, application United Kingdom, Dec. 4, 1972, 55968/72

Int. Cl.[2] **B32B** *29/00;* **B41N** *1/24;* **B05C** *17/06*

U.S. Cl. 428—535 **9 Claims**

1. In a pressure-sensitive duplicating stencil comprising (1) a sheet of stencil tissue impregnated with a typable stencilisable ink-impervious main plastics coating comprising film-forming material and non-solvent plasticising oil and (2) a backing sheet, the improvement comprising providing, between the impregnated stencil tissue and backing sheet, (3) a typably stencilisable, substantially continuous laminating plastics coating comprising film-forming material and non-solvent plasticising oil the said coating serving to temporarily adhere the impregnated stencil tissue to the backing sheet over substantially the whole of their contacting surfaces, thereby providing a stencil unit in the form of a single sheet.

4,180,622

WEAR RESISTANT COATING FOR THE WORKING FACE OF DISC-SHAPE MACHINE PARTS MADE OF ALUMINUM OR ALUMINUM ALLOYS

Kurt Burkhard, Schaffhausen, and Peter Kunzmann, Flurlingen, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jul. 21, 1978, Ser. No. 926,810

Claims priority, application Switzerland, Sep. 7, 1977, 10987/77

Int. Cl.[2] **B22F** *7/00*

U.S. Cl. 428—564 **13 Claims**

1. A thermally applied wear resistant coating for the working faces of disc-shaped machine parts made of aluminum or aluminum alloys, said coating comprising a cermet coating wherein the metallic component thereof contains aluminum.

10. A wear resistant coating according to claim **1** wherein the said coating is penetrated by holes which do not have a disadvantageous effect on the disc-shaped machine parts, and which are spaced at least 6 mm apart, wherein a straight line joining any two holes makes an angle of at least 30° to the radius drawn through one of the holes.

4,180,623

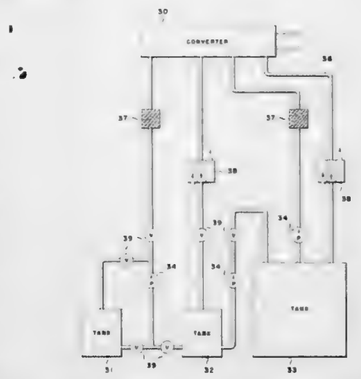
ELECTRICALLY RECHARGEABLE BATTERY

George B. Adams, Cupertino, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 861,535, Dec. 19, 1977, abandoned. This application Jul. 28, 1978, Ser. No. 928,785

Int. Cl.[2] **H01M** *8/18*

U.S. Cl. 429—21 **11 Claims**



1. An electrically rechargeable battery consisting essentially of at least one inert cathode, at least one zinc anode, a circulating alkaline catholyte in which said cathode is immersed, said catholyte containing a soluble alkali metal ferricyanide salt during electrical charge and a corresponding alkali metal ferrocyanide salt during electrical discharge, and a circulating alkaline anolyte in which said anode is immersed, said catholyte and anolyte permitting, during electrical discharge, electro oxidation of zinc to soluble zincate ions at said anode which are transported by the circulating anolyte to a first storage tank and electro reduction of soluble ferricyanide ions to the corresponding soluble ferrocyanide ions at said cathode which are transported by the circulating catholyte to a second storage tank and, during electrical charge, electrodeposition of zinc

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metal on said anode and electro oxidation of soluble ferrocyanide salt to the corresponding ferricyanide salt at said cathode.

4,180,624

STORAGE BATTERY WITH AQUEOUS ELECTROLYTE AND RECOMBINER

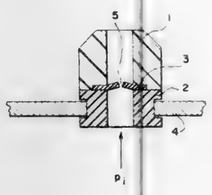
August Winsel, Kelkheim, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jan. 24, 1979, Ser. No. 6,098

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1978, 2804583

Int. Cl.[2] **H01M** *2/12*

U.S. Cl. 429—54 **6 Claims**



1. A storage battery having an aqueous electrolyte and a recombination catalyst for recombining of hydrogen and oxygen evolving during charging or self-discharge, said storage battery comprising

a communicating gas-tight housing for the storage battery and the recombiner, and

two valves in said housing, one of said valves opening in response to a predetermined overpressure relative to the ambient outer atmosphere and the other of said valves opening in response to the falling below a predetermined underpressure.

4,180,625

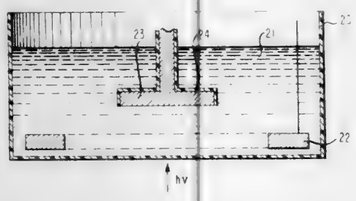
SEMICONDUCTOR LIQUID JUNCTION PHOTOCELL USING A $CuInS_2$ ELECTRODE

Sigurd Wagner, Evergreen, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 21, 1978, Ser. No. 935,661

Int. Cl.[2] **H01M** *6/30, 6/36*

U.S. Cl. 429—111 **5 Claims**



1. A photocell containing a photovoltaic junction between a semiconductor and a liquid electrolyte, said electrolyte containing a redox couple consisting of sulfide and polysulfide anions having a concentration of at least 0.1 molar;

characterized in that

said semiconductor consists essentially of n-type $CuInS_2$.

4,180,626

PROCESS FOR MANUFACTURING CITRIC ACID FROM OLEFINS BY FERMENTATION

Takeo Nagata, Yokohama; Seisuke Satoh, and Takao Matsumoto, both of Tokyo, all of Japan, assignors to Showa Oil Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1977, Ser. No. 865,397

Claims priority, application Japan, Feb. 25, 1977, 52-19285; Feb. 25, 1977, 52-19286

Int. Cl.[2] **C12D** *1/04*

U.S. Cl. 435—144 **7 Claims**

1. A process for producing citric acid by fermentation which comprises:

culturing olefin assimilable microorganisms comprising *Candida tropicalis* under aerobic conditions at a temperature from about 25° C. to about 40° C. and at a pH from about 3 to about 10 in an aqueous nutrient medium containing olefins, selected from the group consisting of normal olefins having from 8 to 40 carbon atoms and combinations thereof, as the main carbon source together with less than 1,000 g/l of a vitamin selected from the group consisting of biotin or biotin and thiamine-hydrochloric acid.

4,180,627

PROCESS FOR IN VIVO TRANSFER OF CELL-MEDIATED IMMUNITY IN MAMMALS WITH ALCOHOLIC PRECIPITATES OF BOVINE TRANSFER FACTOR

Phillip H. Klesius, Auburn, Ala., and Herman H. Fudenberg, Charleston, S.C., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 17, 1978, Ser. No. 934,289

Int. Cl.[2] **C07G** *7/00;* **A61K** *39/00*

U.S. Cl. 435—262 **4 Claims**

1. An improved process for the preparation of a more efficient Bovine Transfer Factor which is useful in immunizing mammals by the transfer of cell-mediated immunity to *Eimeria bovis* antigen, purified protein derivative, and keyhole limpet hemocyanin and other antigens from pathogenic microbes or malignant tissues, the process comprising . . .

(a) grinding a quantity of mesenteric, thoracic, submandibular, cervical, auxillary, prefemoral and popiteal lymphatic nodes from donor cattle,

(b) incubating the material in Hank's salt solution for about 4 hours at 37° C.,

(c) centrifuging the material to separate the desired liquid portion from the solids, which are discarded,

(d) dialyzing the liquid to water for about from 16 to 18 hours at 4° C., to get rid of the unwanted materials, and retain an "unfractionated" Transfer Factor,

(e) lyophilizing the TF to get rid of water,

(f) adding dropwise a quantity of 95% alcohol at 4° C. until a fibrous interphase layer begins to develop,

(g) allowing the interphase development to proceed undisturbed for about 1 hour, then stirring and centrifuging the mixture to separate precipitate Fraction I, which is insoluble in alcohol but soluble in water, from the liquid which is soluble in alcohol,

(h) lyophilizing the precipitate to obtain final Fraction I,

(i) repeating step (f) with the liquid of step (g),

(j) repeating (g) and (h) to obtain precipitate Fraction II, which is soluble in water, and a liquid which is set aside, and

(k) dissolving the precipitate in water and lyophilizing to obtain final precipitate Fraction II.

4,180,628

RESIN FOR SORPTION OF TUNGSTEN

Wayne N. Marchant, and Parkman T. Brooks, both of Salt Lake City, Utah, assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jul. 18, 1978, Ser. No. 925,672

Int. Cl.[2] **B01J** *1/08;* **C08G** *14/06*

U.S. Cl. 521—39 **6 Claims**

1. A method for preparation of a resin suitable for sorption of tungsten from aqueous solution comprising copolymerizing at a temperature of about 35° to 75° C. (1) 8-hydroxyquinoline, (2) about 0.1 to 0.5 moles of a polyamine from the group consisting of ethylenediamine, diethylenetriamine, triethylenetetramine and tetraethylenepentamine per mole of the 8-hydroxyquinoline, (3) about 0.8 to 1.5 moles of resorcinol per mole of the 8-hydroxyquinoline and (4) about 6 to 9 moles of formaldehyde per mole of the 8-hydroxyquinoline, the polymerization being carried out in aqueous media containing sufficient base to provide a pH of about 12 to 14, for a time sufficient to form a firm gel of the copolymer, and subsequently curing said gel at a temperature of about 80° to 115° C. for a time sufficient to complete the polymerization reaction.

4,180,629

POLYMERS CONTAINING A REACTIVE AROMATIC SYSTEM BASED ON P-PHENYLENEDIAMINE DERIVATIVES

Miroslav Bleha, and Zdeněk Plichta, both of Prague, Czechoslovakia, assignors to Ceskoslovenska Akademie ved, Prague, Czechoslovakia

Division of Ser. No. 625,317, Oct. 23, 1975, Pat. No. 4,127,732. This application Jun. 29, 1978, Ser. No. 920,236

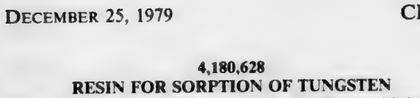
Claims priority, application Czechoslovakia, Oct. 30, 1974, 7412-74; Oct. 30, 1974, 7413-74; Oct. 30, 1974, 7414-74

Int. Cl.[2] **C08F** *220/06, 220/56, 226/02*

U.S. Cl. 521—65 **12 Claims**

1. Polymers containing a reactive aromatic system in the side chain which consist of structural units of the general formula IV:

IV.



where

R^1 is hydrogen or CH_3,

R^2 is alkyl containing 1 to 6 carbon atoms,

R^3 is an acyl or sulfonic group,

Ar is a bifunctional aromatic residue, and

x=1 to 4.

4,180,630

PHOSPHORUS-NITROGEN-SILICA COMPOSITION AS A FLAME RETARDANT

Fawzy G. Sherif, Spring Valley, and Mazin R. Irani, Tarrytown, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 748,430, Dec. 8, 1976, Pat. No. 4,137,178. This application Sep. 11, 1978, Ser. No. 941,602

Int. Cl.[2] **C08G** *22/44, 21/56*

U.S. Cl. 521—106 **6 Claims**

1. A flame retardant, epoxy composition containing an effective amount of an insoluble phosphorus-nitrogen-silica composition consisting essentially of:

30–70 weight % of P_2O_5

1–15 weight % N

15–50 weight % SiO_2

wherein said insoluble composition exhibits X-ray diffraction pattern main identifying peaks as follows:

X-Ray Diffraction Data (Copper K alpha radiation)

2θ	dA°	I/Io
13.13	6.7371	48
13.60	6.5053	58
16.02	5.5276	100
16.90	5.2417	44
21.80	4.0734	32
24.40	3.6449	38
26.18	3.4010	44

4,180,631

FLAME-AND SMOKE-RESISTANT FLEXIBLE POLYURETHANE FOAM AND COMPRESSED FOAM SHEET

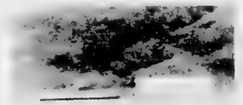
Toshio Yukuta, Kodaira; Takashi Ohashi, Iruma; Minoru Kojima, Ohme, and Masumi Saito, Tanashi, all of Japan, assignors to Bridgestone Tire Company, Limited, Tokyo, Japan

Filed Mar. 16, 1977, Ser. No. 778,282

Claims priority, application Japan, Mar. 17, 1976, 51-28948

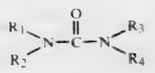
Int. Cl.[2] **C08G** *18/32;* **B29D** *27/00*

U.S. Cl. 521—164 **20 Claims**



1. A flame-and smoke-resistant flexible polyurethane foam obtained by reacting a composition consisting essentially of a polyhydroxyl compound and a polyisocyanate with a urea derivative selected from the group consisting of

a. a compound represented by the general formula



wherein at least one of R_1, R_2, R_3, and R_4 represents hydroxyalkyl-, alkoxyalkyl-, alkyl- and aryl-group and the remainder represents hydrogen atom; and

b. a urea-formaldehyde condensation product prepared by reacting 1 mole of urea with 1 to 4 moles of formaldehyde in the presence of an alkali catalyst, said reacting with a. or b. being in the presence of a catalyst for the production of the polyurethane foam, a surfactant and a blowing agent, wherein the polyisocyanate is used in an amount corresponding to an isocyanate index of 80–130 and the urea derivative is used in an amount of 2–50 parts by weight based on 100 parts by weight of the polyhydroxyl compound

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4,180,632

POLYAMINOESTERS AND FOAMS MADE THEREFROM

Casmir S. Ilenda, Croydon, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 25, 1977, Ser. No. 855,102

Int. Cl.[2] **C08J** *9/00*

U.S. Cl. 521—184 **18 Claims**

1. Composition comprising solid polyaminoester polymers of one or more esters of acrylic acid monomers having an

average acrylate functionality of at least 2.5 and one or more low molecular weight aliphatic amines having an average amine hydrogen functionality of at least 3 and an amine hydrogen equivalent weight of less than about 100, the equivalents ratio of acrylate to amine hydrogen being about 0.5 to 2.0.

4,180,633

PREPARATION OF INSOLUBLE POLYVINYLPYRROLIDONE

Kenneth W. Dixon, Sewickley, Pa., assignor to GAF Corporation, New York, N.Y.

Division of Ser. No. 809,943, Jun. 24, 1977, Pat. No. 4,139,688. This application Aug. 23, 1978, Ser. No. 936,019

Int. Cl.[2] C08F *8/18, 8/20*

U.S. Cl. 525—359 **9 Claims**

1. A process for the preparation of insoluble homopolymers or copolymers of vinylpyrrolidone which comprises refluxing uncross-linked polyvinylpyrrolidone or an uncross-linked copolymer of vinylpyrrolidone with an acid chloride selected from the group consisting of phosgene, and oxalyl chloride in a liquid medium at a temperature between about 75° and about 140° C., to obtain a precipitate of cross-linked polyvinylpyrrolidone or of a cross-linked copolymer of vinylpyrrolidone.

4,180,634

POLYMERIZING VINYL CHLORIDE WITH LOWERING OF SCALE FORMATION

Shunichi Koyanagi; Toshihide Shimizu, both of Ibaragi, and Kenji Fushimi, Tokyo, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 705,021, Jul. 14, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 888,166

Claims priority, application Japan, Jul. 18, 1975, 50/87975

Int. Cl.[2] C08F *2/18, 18/08, 14/06*

U.S. Cl. 526—62 **9 Claims**

1. A method of polymerizing vinyl chloride or a monomer mixture containing vinyl chloride as a main component, in an aqueous suspension in a polymerization reactor, which comprises adding at least one additive selected from the group consisting of iodine salts of alkali metals and alkaline earth metals to a polymerization mixture in said reactor.

4,180,635

CONTINUOUS MANUFACTURE OF UNSATURATED POLYESTERS

Hermann Fischer, Limburgerhof; Richard Thoma, Battenberg; Hanshelmut Kaeppel, Weinheim; Ernst Kochendoerfer, Ludwigshafen, and Werner Lagaly, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 29, 1978, Ser. No. 891,204

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714898

Int. Cl.[2] C08G *63/52, 63/22*

U.S. Cl. 526—68 **10 Claims**

1. A process for the continuous manufacture of an unsaturated polyester by polycondensation of one or more ethylenically unsaturated dicarboxylic acids, with or without dicarboxylic acid(s) free from olefinic unsaturation, and/or their anhydrides,

with one or more diols, with or without monohydric and/or higher polyhydric alcohol(s), in a stirred kettle cascade, wherein

(a) in a first reaction stage, the dicarboxylic acid or acids and/or its anhydride or their anhydrides are condensed with the alcohol(s) in the molar ratio COOH or ½ $(CO)_2O$:OH of from 1:1.0 to 1:1.1, at from 190° to 250° C., with the proviso that the reaction mixture is boiling, the water of condensation is separated, from the vapors which distil off, by means of a vapor column, and the unconverted distilled-off or sublimed starting materials are recycled to the reaction mixture, the vapor column used being a two-part distillation column

(i) in the upper part of which, at from 95° to 135° C., the diol/water of condensation mixture is separated by spraying it in counter-current with water of condensation, the spray density being from 0.5 to 5 m^3/m^2 per hour and

(ii) in the lower part of the column, at from 110° to 180° C., unconverted dicarboxylic acid(s) and/or anhydride(s) and part of the alcohol are absorbed, partially esterified and washed out by spraying in counter-current, at a spray density of from 20 to 80 m^3/m^2 per hour, with a mixture of refluxing alcohol, freshly fed-in alcohol and circulated reaction medium, and are recycled to the reaction mixture, and

(b) in a second stage of the reaction, the condensation of the resulting reaction mixture is completed at from 190° to 250° C.

4,180,636

PROCESS FOR POLYMERIZING OR CO-POLYMERIZING PROPYLENE

Kiwami Hirota; Hideki Tamano, and Shintaro Inazawa, all of Oita, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1977, Ser. No. 809,873

Claims priority, application Japan, Jun. 24, 1976, 51-73830; Jun. 28, 1976, 51-75427; Jun. 30, 1976, 51-76533; Jul. 6, 1976, 51-79455; Jul. 27, 1976, 51-88708; Aug. 9, 1976, 51-93948; Aug. 10, 1976, 51-94440

Int. Cl.[2] C08F *4/02, 10/06*

U.S. Cl. 526—125 **30 Claims**

1. A process for polymerizing or copolymerizing propylene in the presence of a catalyst consisting essentially of

(A) a solid catalyst component prepared by contacting

(1) a copulverized material obtained by copulverizing a magnesium dihalide together with an aromatic acyl halide with

(2) a mixture or addition-reaction product of a tetravalent titanium compound containing at least one halogen atom with at least one electron donor compound selected from the group consisting of organic compounds containing a P—O bond, organic compounds containing an Si—O bond, ether compounds, nitrite ester compounds, sulfite ester compounds, alcohol compounds, phenol compounds and naphthol compounds,

(B) a trialkyl aluminum compound, and

(C) an aromatic carboxylic acid ester compound, where the amount of the aromatic acyl halide is 0.01 to 2 moles per mole of the magnesium dihalide, the amount of the titanium compound is 0.1 to 50 moles per mole of the electron donor compound, the amount of the aforesaid mixture or addition-reaction product (as titanium atoms) is 0.001 to 1 mole per mole of the trialkyl aluminum compound and the amount of the aromatic carboxylic acid ester compound is 0.02 to 1 mole per mole of the trialkyl aluminum compound.

4,180,637

PROCESS FOR THE PREPARATION OF LOW MOLECULAR WEIGHT ANHYDRIDE INTERPOLYMERS

Syamalarao Evani, and Russell J. Raymond, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 7, 1977, Ser. No. 849,281

Int. Cl.[2] C08F *2/38, 222/02, 222/04, 222/06*

U.S. Cl. 526—204 **16 Claims**

1. In a process for preparing a low molecular weight polymer comprising polymerizing at least one unsaturated dicarboxylic acid anhydride monomer with at least one copolymerizable monomer in an organic solvent in which the monomers and the polymer are soluble and in the presence of a free radical catalyst, the improvement which comprises polymerizing the monomers in the presence of the hydroxide or a nucleophilic salt of a monovalent cation selected from the group consisting of ammonium, quaternary ammonium cations and alkali metal cations.

4,180,638

STORABLE POLYCHLOROPRENE ADHESIVES AND A PROCESS FOR THEIR PRODUCTION EMPLOYING XANTHOGEN DISULPHIDES

Manfred Dollhausen, Odenthal; Gerhard Hohmann, Leverkusen, and Winfried Behr, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

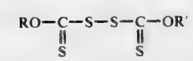
Filed Oct. 28, 1976, Ser. No. 736,308

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1975, 2549150

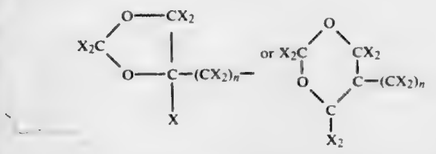
Int. Cl.[2] C08F *2/38, 4/40, 136/18;* **C08J** *3/08*

U.S. Cl. 526—204 **8 Claims**

1. A process for producing a storable polychloroprene adhesive which comprises polymerizing 50 to 100 parts by weight of chloroprene monomer and 0 to 50 parts by weight of a monomer copolymerizable with chloroprene in an aqueous, alkaline emulsion in the presence of a radical initiator, an emulsifier containing an alkali metal salt of disproportionated resinic acid and a condensation product of a napthalene sulphonic acid and formaldehyde and a molecular weight regulator at a temperature of from 0° to 70° C., said molecular weight regulator being used in an amount of from 0.1 to 5.0 parts by weight per 100 parts by weight of a total monomer and being a dialkyl xanthogen disulphide of the formula



wherein R and R′ are the same or different and are alkyl having one to four carbon atoms or are



wherein each X is the same or different and is hydrogen, alkyl having one to six carbon atoms, phenyl, napthyl, benzyl, chlorine, bromine or iodine and n is from 1 to 20; discontinuing polymerization when 50 to 90% of total monomer is reacted and dissolving resultant polymer in sufficient organic solvent to obtain a polychloroprene adhesive having a viscosity of from 10 to 100 poises measured at 20° C. with a Brookfield LVT viscosimeter.

4,180,639

FLUOROSULPHONYL OXAFLUOROALKANES, FLUOROSULPHONYL OLEFINES, THEIR COPOLYMERS AND PROCESSES FOR PREPARATION

Gerardo Caporiccio; Gianangelo Bargigia, and Giampiero Guidetti, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

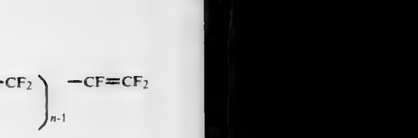
Filed Aug. 3, 1977, Ser. No. 821,394

Claims priority, application Italy, Aug. 6, 1976, 26116 A/76; Mar. 2, 1977, 20831 A/77

Int. Cl.[2] C07C *143/16*

U.S. Cl. 526—243 **2 Claims**

1. Fluorinated olefines of the formula:



wherein m is zero or a number between 1 and 2, n is a whole number between 1 and 10, X is F, CF_3 or Cl, Z is F, OH, OM wherein M is a cation or OR wherein R is an alkyl containing from 1 to 8 carbon atoms or an aryl, all having an average molecular weight between 400 and 800.

4,180,640

ACCELERATOR FOR CURABLE ACRYLIC ESTER COMPOSITIONS

David P. Melody; Daniel A. Doherty; John F. O'Grady, all of Dublin, Ireland, and Richard D. Rich, Avon, Conn., assignors to Loctite Corporation, Newington, Conn.

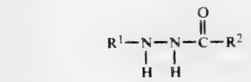
Filed Oct. 31, 1977, Ser. No. 846,871

Claims priority, application Ireland, Nov. 8, 1976, 2477/76

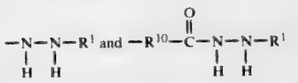
Int. Cl.[2] B32B *7/12;* **C08F** *20/20, 20/36;* **C09J** *3/00*

U.S. Cl. 526—323.1 **60 Claims**

1. A curable adhesive and sealant composition comprising: (a) a room temperature polymerizable acrylate ester; (b) a peroxy free radical initiator in an amount sufficient to initiate polymerization of said ester; (c) as a polymerization accelerator, a compound having the formula



wherein R^1 is selected from the group consisting of alkyl, cycloalkyl, aryl, alkenyl, cycloalkenyl and R^2 is selected from the group consisting of hydrogen, alkyl, cycloalkyl, alkenyl, cycloalkenyl, aryl, alkoxy, aryloxy, carbonyl group connected to an unreactive lower alkyl group of 1 to 4 carbons, amino, and the following groups:



wherein R^{10} is selected from the group consisting of alkyl groups containing one to about 10 carbon atoms, alkenyl groups containing two to about 10 carbon atoms, and aryl groups containing up to about 10 carbon atoms, said accelerator being present in an amount sufficient to accelerate the polymerization at room temperature; and (d) as co-accelerator, an acid having a pK_a at room temperature of about 1 to about 6.

4,180,641

BISPIPERAZIDO PHOSPHORUS POLYAMIDES

Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

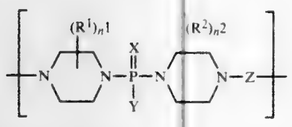
Division of Ser. No. 628,262, Nov. 3, 1975, Pat. No. 4,098,768. This application Jun. 26, 1978, Ser. No. 919,106

Claims priority, application United Kingdom, May 21, 1975, 21974/75

Int. Cl.[2] C08G *77/26*

U.S. Cl. 528—27 **12 Claims**

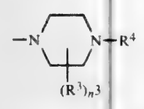
1. A solid polymer consisting essentially of repeating units of the formula:



wherein

(i) X is absent or represents oxygen or sulphur or =N—R;

(ii) Y represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group; or —OR or —NR_2; or —NR_2 in which the two R groups, together with the nitrogen atom to which they are attached, represent an N-containing heterocyclic ring; or a group of the formula:



wherein R, R^1, R^2, and R^3 represent hydrogen, or an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group;

(iii) R^4 represents hydrogen or an aliphatic group, a cycloaliphatic group, an N-containing heterocyclic group, an acyl group, a sulfonyl group, or an unsubstituted carbamoyl group;

(iv) n^1, n^2, and n^3 each represent zero or an integer;

(v) Z represents OC—R^5—SiR_2^6—

(vi) R^5 and R^6 represent an aliphatic, cycloaliphatic or aromatic hydrocarbon radical, or a heterocyclic radical.

4,180,642

ROOM TEMPERATURE CURABLE ORGANOPOLYSILOXANE COMPOSITIONS

Toshio Takago, Annaka, Japan, assignor to Shin-Etsu Chemical Company, Tokyo, Japan

Filed Jun. 21, 1978, Ser. No. 917,660

Claims priority, application Japan, Jun. 29, 1977, 52-77590

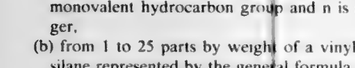
Int. Cl.[2] **C08G** *77/12*

U.S. Cl. 528—32 **9 Claims**

1. A room temperature curable organopolysiloxane composition which comprises

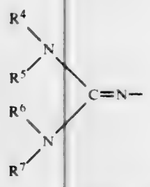
(a) 100 parts by weight of a diorganopolysiloxane terminated at both chain ends with hydroxy groups, represented by the general formula HO—$(R_2Si—O)_nH$ where R is a monovalent hydrocarbon group and n is a positive integer,

(b) from 1 to 25 parts by weight of a vinyloxy-containing silane represented by the general formula



where R^1 is a substituted or unsubstituted monovalent hydrocarbon group, R^2 and R^3 are each a hydrogen atom or a substituted or unsubstituted monovalent hydrocarbon group and m is 3 or 4, or a partial hydrolysis-condensation product, and

(c) from 0.01 to 10 parts by weight of an organosilane or an organopolysiloxane having in a molecule at least one monovalent group represented by the general formula



(II)

where R^4, R^5, R^6 and R^7 are each a hydrogen atom or a monovalent hydrocarbon group and the group represented by formula II is bonded to the silicon atom by a divalent group.

4,180,643

ACRYLAMIDE OR METHACRYLAMIDE QUATERNARY COMPOUNDS

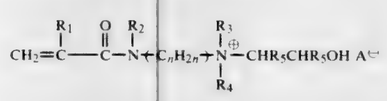
Philip H. Moss, and Edward C. Y. Nieh, both of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.

Filed Nov. 16, 1978, Ser. No. 961,178

Int. Cl.[2] **C07C** *103/58*

U.S. Cl. 528—52 **5 Claims**

1. An acrylamide or methacrylamide quaternary characterized by the following structural formula:



where R_1, R_2 and R_5 are hydrogen or methyl, R_3 and R_4 are lower alkyl, n is an integer ranging from 1 to 6 and A represents an anion.

4,180,644

POLYURETHANE CHAIN-EXTENDERS

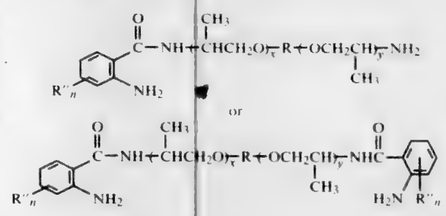
Edward T. Marquis, and Ernest L. Yeakey, both of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.

Filed Jul. 31, 1978, Ser. No. 929,756

Int. Cl.[2] **C08G** *18/32*

U.S. Cl. 528—68 **2 Claims**

1. A polyurethane composition prepared by reacting an organic polyisocyanate with a polymeric polyhydroxy compound and a chain-extending agent having the following structural formula:



where R'' is selected from a group consisting of hydrogen, alkyl, nitro, halo, hydroxy, amine and cyano and n is a number of from 1 to 4, and R is

$+CH_2+_r$ or $+CH_2+_r$ $+O+CH_2+_s]_z+CH_2+_t$

where x and y are numbers from 1 to 10, r, s, and t, are numbers of from 1 to 6 and z is a number of from 4 to 50.

4,180,645

POLYURETHANE COATING COMPOSITIONS FROM DICYCLOPENTENYL ACRYLATE AND/OR METHACRYLATE

William D. Emmons, Huntingdon Valley; Kayson Nyi, Sellersville, and Peter R. Sperry, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed May 22, 1978, Ser. No. 908,426

Int. Cl.[2] **C08G** *18/30, 18/22;* **C08L** *27/00, 75/04*

U.S. Cl. 528—73 **12 Claims**

1. A composition having a film-forming binder comprising:

(a) a member selected from the group consisting of an organic polyisocyanate, a urethane oil, and a uralkyd;

(b) at least one non-volatile reactive liquid monomer selected from the group consisting of dicyclopentenyl acrylate and dicyclopentenyl methacrylate; and

(c) an effective amount of a polyvalent metalcontaining complex or salt that catalyzes the curing of (a) and (b), compound (b) being 5 to 95% by weight of the binder

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4,180,646

NOVEL ORTHOESTER POLYMERS AND ORTHOCARBONATE POLYMERS

Nam S. Choi, Seoul, Rep. of Korea, and Jorge Heller, Palo Alto, Calif., assignors to Alza Corporation, Palo Alto, Calif.

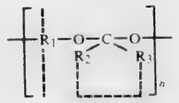
Division of Ser. No. 544,808, Jan. 28, 1975, Pat. No. 4,093,709.

This application Mar. 3, 1978, Ser. No. 883,123

Int. Cl.[2] **C08G** *65/28, 65/34*

U.S. Cl. 528—153 **55 Claims**

1. A polymer of the general formula:



wherein R_1 is the member selected from the group of divalent, trivalent and tetravalent radicals consisting of alkylene of 2 to 10 carbons; alkenylene of 2 to 10 carbons; alkyleneoxy of 2 to 6 carbons; cycloalkylene of 3 to 7 carbons; cycloalkylene of 3 to 7 carbons substituted with an alkyl of 1 to 7 carbons, an alkoxy of 1 to 7 carbons, an alkylene of 1 to 10 carbons, and and alkenyl of 2 to 7 carbons; cycloalkenylene of 4 to 7 carbons; cycloalkenylene of 4 to 7 carbons substituted with an alkyl of 1 to 7 carbons, an alkoxy of 1 to 7 carbons, an alkylene of 1 to 10 carbons, and an alkenyl of 2 to 7 carbons; arylene; and arylene substituted with an alkyl of 1 to 7 carbons, an alkoxy of 1 to 7 carbons, an alkylene of 1 to 10 carbons, and an alkenyl of 2 to 7 carbons; R_2 and R_3 are selected from the group consisting of alkyl of 1 to 7 carbons; alkenyl of 2 to 7 carbons; alkoxy of 1 to 7 carbons; alkenyloxy of 2 to 7 carbons; alkylene of 2 to 6 carbons; alkenylene of 3 to 6 carbons; alkyleneoxy of 2 to 6 carbons; alkenyleneoxy of 3 to 6 carbons; arylene; aryloxy and aralkyleneoxy of 8 to 12 carbons intramolecularyl covalently bonded to each other; aralkenyleneoxy of 8 to 12 carbons; aralkylenedioxy of 8 to 12 carbons; aralkenylenedioxy of 8 to 12 carbons; oxa; OR_1O with R_1 as defined above; a heterocyclic ring of 5 to 8 atoms formed when R_2 and R_3 are taken together; a heterocyclic ring of 5 to 8 atoms substituted with an alkyl of 1 to 7 carbons; an alkoxy of 1 to 7 carbons and an alkenyl of 2 to 7 carbons formed when R_2 and R_3 are taken together; a fused polycyclic ring of 8 to 12 atoms formed when R_2 and R_3 are taken together; a fused polycyclic ring of 8 to 12 atoms substituted with an alkyl of 1 to 7 carbons, an alkoxy of 1 to 7 carbons and an alkenyl of 2 to 7 carbons; and wherein at least one of said member R_2 and R_3 is selected from the group consisting of alkoxy, alkenyloxy and OR_1O, and when R_2 and R_3 are independently alkoxy and alkenyloxy and the other member of said R_2 and R_3 is selected from the group consisting of alkyl, alkenyl, alkoxy, alkenyloxy, alkylene, alkenylene, alkyleneoxy and oxa; and when R_2 and R_3 are taken together, a member selected from the group of heterocyclic and fused polycyclic rings; and n is greater than 10

4,180,647

POLYPHOSPHAZENE COPOLYMERS CONTAINING MALONONITRILE AND SUBSTITUTED MALONONITRILE SUBSTITUENTS

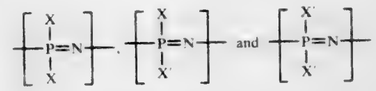
William J. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 8, 1978, Ser. No. 941,117

Int. Cl.[2] **C08G** *79/06*

U.S. Cl. 528—168 **10 Claims**

1. A polyphosphazene copolymer containing randomly distributed units represented by the formulas:



wherein X is —$CR(CN)_2$ in which R is selected from the group consisting of H, a branched chain, a straight chain, or cyclic alkyl group containing from 1 to 12 carbon atoms and an aryl group or mixtures thereof, and where X' is selected from the group consisting of substituted and unsubstituted alkoxy, alkenyloxy, aryloxy, alkenylaryloxy, amino and mercapto groups or mixtures thereof.

4,180,648

CRYSTALLINE POLYIMIDES

Terry L. St. Clair, and Anne K. St. Clair, both of Poquoson, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 15, 1978, Ser. No. 906,299

Int. Cl.[2] **C08G** *73/10*

U.S. Cl. 528—207 **4 Claims**

1. A crystalline polyimide formed as the reaction product of 4,4'-bis-(3,4-dicarboxyphenoxy)diphenylsulfide dianhydride and p-phenylenediamine.

4,180,649

HOMOPOLYMERIZABLE ACETYLENE-TERMINATED TETRAIMINES AND PROCESS FOR MAKING SAME

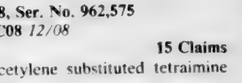
Norman Bilow, Encino, and William B. Austin, Gardena, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 20, 1978, Ser. No. 962,575

Int. Cl.[2] **C08** *12/08*

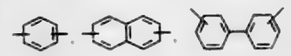
U.S. Cl. 528—245 **15 Claims**

1. A homopolymerizable acetylene substituted tetraimine oligomer having the structure:

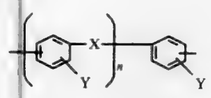


where:

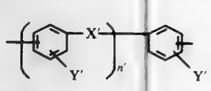
R is a moiety whose structure is selected from the group consisting of



-continued



wherein; n may range from 0 to about 4, X may be O, S, SO_2, CH_2, CF_2, C_3F_6, C_2F_4, —CH=CH—, —CH_2—CH_2— a bond or NH and Y may be —CH_3, —C_2H_5, —C_6H_5, —CF_3 or Cl; Ar is a moiety selected from the group consisting of



wherein n' may range from 0 to 2, X' may be O, S, SO_2, CF_2, C_2F_4, C_3F_6, $C_{10}H_6$ or —C_6H_4—C_6H_4— and Y' may be aryl, alkyl, arylakyl, alkylaryl or halogen substituted analogues; and where Ar' may be the same as, but need not be identical to, Ar within the same molecule.

14. A process for preparing a homopolymerizable acetylene terminated tetraimine oligomer comprising the steps of first reacting aryldicarboxaldehydes with an aryldiamine to form a dicarboxaldehyde terminated diamine and subsequently reacting said dicarboxaldehyde terminated diamine with aminoarylacetylenes thereby forming said acetylene terminated tetraimine.

4,180,650

NITROTHIOPHENE-ACCELERATED LACTAM POLYMERIZATION

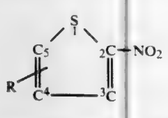
Henry Y. Lew, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 21, 1978, Ser. No. 898,604

Int. Cl.[2] C08G 69/20

U.S. Cl. 528—313 **25 Claims**

1. A process for polymerizing a lactam to a polylactam, capable of being formed into filaments, films, or other shaped articles, which comprises polymerizing a lactam, selected from the group consisting of 2-pyrrolidone and epsiloncaprolactam, under substantially anhydrous conditions in the presence of an anionic catalyst, a polymerization activator, and a catalytically effective amount of an accelerator selected from the group consisting of nitrothiophene compounds having the formula



wherein R is hydrogen or lower alkyl having 1 through 4 carbon atoms;

and mixtures thereof.

4,180,651

POLYCARBONATE COMPOSITION HAVING RESISTANCE TO HIGH HEAT DISTORTION

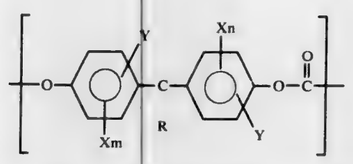
Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Feb. 28, 1978, Ser. No. 882,241

Int. Cl.[2] C08G 63/62

U.S. Cl. 528—202 **11 Claims**

1. A high molecular weight aromatic polycarbonate having resistance to high heat distortion, said polycarbonate having an I.V. of about 0.40–1.0 dl/g. and being represented by the general formula



wherein Xm and Xn can each independently be a halogen and mixtures thereof; m and n are each 0.0 to about 2.5 with the proviso that m+n equal at least 0.1, but no more than about 2.5; Y is a C_1–C_4 alkyl, hydrogen, and mixtures thereof; and R is a C_3–C_9 alkylene.

4,180,652

POLYESTER TYPE POWDER COATING COMPOSITION

Sumitaka Nogami, Fujisawa; Yoshio Matsumoto, Nobeoka; Keiichi Waki, Nobeoka, and Tooru Okada, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

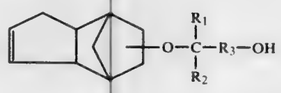
Filed Feb. 16, 1978, Ser. No. 878,445

Claims priority, application Japan, Feb. 24, 1977, 52/18656; Oct. 7, 1977, 52/120124

Int. Cl.[2] C08G 63/76

U.S. Cl. 525—437 **9 Claims**

1. A polyester type powder coating composition comprising a polyester comprising as main ester-constituting monomer units, (1) at least one polycarboxylic acid component containing at least 10 mole %, based on the polycarboxylic acid component, of at least one aromatic polycarboxylic acid component (A) and (2) at least one polyhydric alcohol component, said polyester having in its main chain at least one terminal blocked with a monofunctional unsaturated alicyclic compound component (B) which is a monohydric alcohol component of a compound represented by the following formula and/or its derivative wherein at least one hydrogen atom of its tricyclodecene ring is substituted with an alkyl group having 1 to 3 carbon atoms or halogen:



wherein R_1 and R_2 each stand for a hydrogen atom or an alkyl group having 1 to 3 carbon atoms and R_3 stands for a straight-chain or branched alkylene group having 1 to 10 carbon atoms or a divalent residue having at least one member selected from an ether linkage, an ester linkage, an urethane linkage, amide linkage, thioether linkage and sulfone linkage, and a straight-chain or branched alkylene group having 1 to 10 carbon atoms and/or phenylene group, and the total of the carbon atoms of R_1, R_2 and R_3 is 0 to 19, and said polyester having a softening point of 30° to 150° C.

4,180,653

BISPIPERAZIDO PHOSPHORUS POLYAMIDES

Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

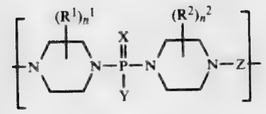
Division of Ser. No. 628,262, Nov. 3, 1975, Pat. No. 4,098,768. This application Jun. 23, 1978, Ser. No. 918,247

Claims priority, application United Kingdom, May 21, 1975, 21974/75

Int. Cl.[2] C08G 75/18, 75/20

U.S. Cl. 528—391 **11 Claims**

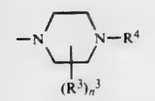
1. A solid polymer consisting essentially of repeating units of the formula:



wherein

(i) X is absent or represents oxygen or sulphur or =N—R;

(ii) Y represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group; or —OR or —NR_2; or —NR_2 in which the two R groups, together with the nitrogen atom to which they are attached, represent an N-containing heterocyclic ring; or a group of the formula:

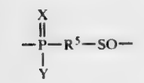


wherein R, R^1, R^2, and R^3 represent hydrogen, or an aliphatic, cycloaliphatic, or aromatic hydrocarbon group or an N-containing heterocyclic group;

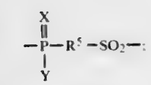
(iii) R^4 represents hydrogen or an aliphatic group, a cycloaliphatic group an N-containing heterocyclic group, acyl group, a sulfonyl group, or an unsubstituted carbamoyl group;

(iv) n^1, n^2, and n^3 each represent zero or an integer;

(v) Z represents



or



and

(vi) R^5 represents an aliphatic, cycloaliphatic, or aromatic hydrocarbon radical, or a heterocyclic radical.

4,180,654

4″-DEOXY-4″-ACYLAMIDO DERIVATIVES OF OLEANDOMYCIN, ERYTHROMYCIN AND ERYTHROMYCIN CARBONATE

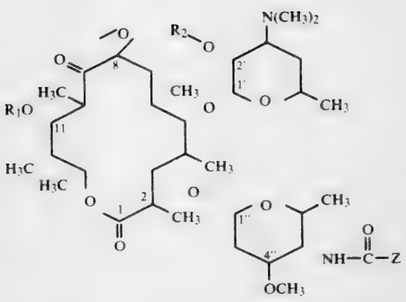
Frank C. Sciavolino, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 866,722, Jan. 3, 1978, abandoned. This application Aug. 29, 1978, Ser. No. 937,640

Int. Cl.[2] C07H 17/08

U.S. Cl. 536—9 **41 Claims**

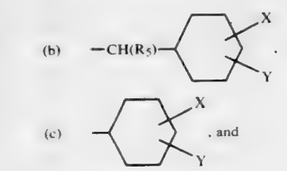
1. A compound having the formula



wherein each of R_1 and R_2 is selected from the group consisting of hydrogen and alkanoyl having from two to three carbon atoms;

Z is selected from the group consisting of

(a) —$(CH_2)_m$—$C(CH_3)_3$,



(d) —$(CH_2)_m$-heterocyclyl;

m is 0 or 1;

R_5 is selected from the group consisting of hydrogen, chloro, hydroxy, methyl, amino and alkoxy having from one to four carbon atoms;

X is selected from the group consisting of hydrogen, chloro, bromo, fluoro, alkyl having from one to four carbon atoms, alkoxy having from one to four carbon atoms;

Y is selected from the group consisting of X, trifluoromethyl and carbalkoxy having from two to five carbon atoms;

heterocyclyl is selected from the group consisting of thienyl, pyrazinyl, pyridyl, furyl, imidazolyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, pyrrolyl, thiadiazolyl and monomethyl derivatives of said heterocyclyls;

and the pharmaceutically acceptable acid addition salts thereof.

4,180,655

NITROSOUREA DERIVATIVES

Tetsuo Suami, 5-8, 3-chome, Nakamachi, Musashino-shi, Tokyo, Japan; Tomoya Machinami, Shiraoka, and Takashi Hisamatsu, Yokohama, both of Japan, assignors to Tetsuo Suami, Musashino, Japan

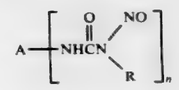
Division of Ser. No. 600,206, Jul. 30, 1975, Pat. No. 4,086,415. This application Jan. 20, 1978, Ser. No. 870,884

Claims priority, application Japan, Aug. 8, 1974, 49-90266

Int. Cl.[2] C07H 15/20

U.S. Cl. 536—17 R **5 Claims**

1. Nitrosourea of the formula:



wherein A represents a hydroxy-substituted cyclohexyl when n=1 or A represents a tetravalent residue of ribostamycin

from which the four amino groups have been removed when n=4 and R represents a halo-substituted lower alkyl.

4,180,656

AZOMETHINE COMPOUNDS

Robert Garner, Bury, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

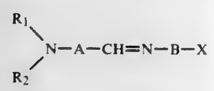
Filed Apr. 15, 1977, Ser. No. 787,806

Claims priority, application United Kingdom, Apr. 27, 1976, 17023/76

Int. Cl.[2] **C07C** *119/00*

U.S. Cl. 542—423 **4 Claims**

1. An azomethine compound of the general formula



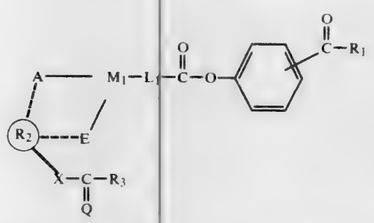
(1)

or its (5E) isomer, wherein R_1 is alkyl of one to 4 carbon atoms, inclusive, with the proviso that when R_1 is tert-butyl the group



is only in the 4-position.

12. An acid ester of a prostacyclin analog of the formula

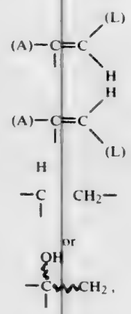


wherein A is (1) —O—(oxa) or, when E is $—CH_2—$, (2) $—CH_2—O—$, with $—CH_2$ bonded to (R), wherein E is $—CH_2—$ or $—CH_2CH_2—$, wherein L_1 is

(1) $—(CH_2)_n—$ wherein n is one to 5, inclusive,

(2) $—(CH_2)_p—CF_2—$ wherein p is 2, 3, or 4, or

(3) $—(CH_2)_v—CH=CH—$ wherein v is 1, 2, or 3, wherein M_1 is



(1)

(2)

(3)

or

(4)

where ~ indicates attachment in alpha or beta configuration,

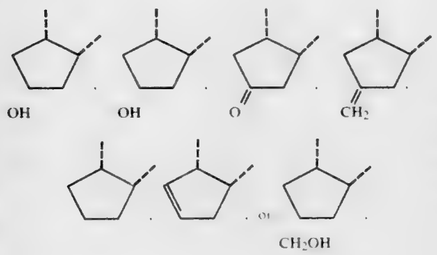
wherein Q is



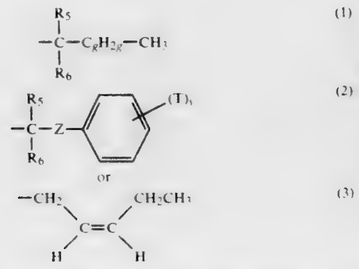
wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,

wherein R_1 is alkyl of one to 4 carbon atoms, inclusive, with the proviso that when R_1 is tert-butyl the $—C(O)—R_1$ group is in the 4-position,

wherein R_2 is



wherein R_3 is



(1)

(2)

or

(3)

wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $—CR_5R_6—$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—);

wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between $CR_5R_6—$ and the phenyl ring;

wherein T is alkyl of one to 4 carbon atoms; inclusive, fluoro, chloro, trifluoromethyl, or $—OR_7—$ wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2 or 3, with the proviso that not more than two T's are other thn alkyl and when s is 2 or 3 the T's are either the same or different, and

wherein X is

(1) trans-CH=CH—

(2) cis-CH=CH—

(3)—C≡C— or

(4) $—CH_2CH_2—$

with the proviso that said formula does not include prostacyclin or its (5E) isomer.

4,180,657

ACYL-SUBSTITUTED PHENYL ESTERS OF PROSTACYCLIN-TYPE COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 14, 1978, Ser. No. 933,329

Int. Cl.[2] **C07D** *307/93, 311/94*

U.S. Cl. 542—426 **63 Claims**

1. An acid ester of prostacyclin of the formula

4,180,658

7[-2-ALKOXYAMINO(ACETAMIDO)]CEPHALOSPORIN DERIVATIVES

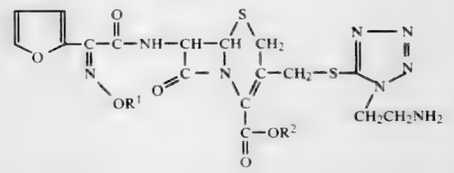
Murray A. Kaplan, Syracuse; Alphonse P. Granatek, Baldwinsville, and Solomon J. Nachfolger, Syracuse, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 24, 1978, Ser. No. 880,836

Int. Cl.[2] **C07D** *501/36*

U.S. Cl. 544—27 **8 Claims**

1. A compound having the formula



wherein R^1 is alkyl of 1–4 carbon atoms and R^2 is hydrogen or a conventional, pharmaceutically acceptable, easily hydrolyzed ester forming group; or a nontoxic, pharmaceutically acceptable salt thereof, said compound being at least 75% by weight in the form of its syn isomer.

4,180,659

COUMARIN DERIVATIVES TO PRODUCE 8-METHOXYPSORALEN

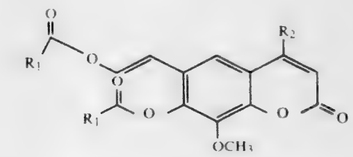
Pasquale N. Confalone; Elizabeth D. Lollar, both of Bloomfield; Giacomo Pizzolato, Belleville, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 823,257, Aug. 10, 1977, Pat. No. 4,130,568, which is a continuation-in-part of Ser. No. 723,116, Sep. 14, 1976, abandoned. This application Sep. 29, 1978, Ser. No. 947,131

Int. Cl.[2] **C07D** *311/16, 405/12*

U.S. Cl. 542—427 **3 Claims**

1. A compound of the formula



wherein R_2 is selected from the group consiting of hydrogen, lower alkyl, phenyl, pyridyl, furyl, halo or lower alkyl substituted phenyl, benzyl and alkoxy, halo, nitro or lower alkyl substituted benzyl and R_1 is selected from the group consisting of lower alkyl, phenyl, pyridyl, furyl, halo or lower alkyl substituted phenyl, benzyl and alkoxy, halo, nitro or lower alkyl substituted benzyl.

4,180,660

CEPHALOSPORIN DERIVATIVES

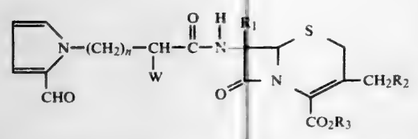
Abraham Nudelman, Rehovot, and Abraham Patchornik, Ness Ziona, both of Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Division of Ser. No. 839,165, Oct. 4, 1977, Pat. No. 4,122,260. This application Sep. 1, 1978, Ser. No. 938,844

Int. Cl.[2] **C07D** *501/20*

U.S. Cl. 544—28 **12 Claims**

1. A compound selected from the base of the formula



wherein n is 0, 1, 2 or 3; W is hydrogen, a straight or branched alkyl group of from 1 to 4 carbon atoms, a sulfonic acid group, or a $-(CH_2)_p-CO_2R_4$ group wherein p has a value of 0 or an integer of from 1 to 10 and R_4 is hydrogen, a pharmaceutically acceptable non-toxic cation selected from the alkali metal group, the alkaline earth metal group, ammonium, or organic ammonium compounds derived from a primary, a secondary or a tertiary amine, a straight or branched alkyl group of from 1 to 4 carbon atoms; R_1 is hydrogen or methoxy; R_2 is hydrogen or alkanoyloxy in which the alkanoyl group contains from 2 to 5 carbon atoms; R_3 is hydrogen, a pharmaceutically acceptable non-toxic cation; a straight or branched alkyl group of from 1 to 4 carbon atoms, an alkanoyloxymethyl group in which the alkanoyl portion is straight or branched and has from 2 to 5 carbon atoms, an alkanoylaminomethyl group in which the alkanoyl portion is straight or branched and has from 2 to 5 carbon atoms and the amine nitrogen may be substituted with a straight or branched alkyl group having 1 to 4 carbon atoms, an alkoxycarbonylaminomethyl group in which the alkoxy portion is straight or branched and has from 1 to 4 carbon atoms and the amine nitrogen may be substituted with a straight or branched alkyl group of from 1 to 4 carbon atoms, p-(alkanoyloxy)benzyl groups in which the alkanoyl portion is straight or branched and has from 2 to 5 carbon atoms, an aminoalkanoyloxymethyl group in which the alkanoyl portion has from 2 to 15 carbon atoms and the amino nitrogen may be mono- or di-substituted with a straight or branched alkyl group having from 1 to 4 carbon atoms; with the proviso that when R_3 is other than hydrogen or a cation and W is $-(CH_2)_p-CO_2R_4$ with p being from 1 to 10, then R_4 is other than hydrogen or a cation; and pharmaceutically acceptable salts thereof.

4,180,661

7-[(SUBSTITUTED-ISOTHIOUREAMETHYL)PHENYL]-ACETAMIDOCEPHALOSPORIN DERIVATIVES

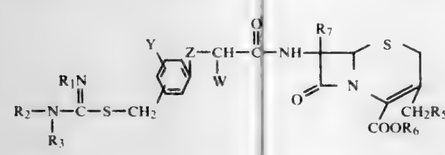
Fortuna Haviv, Wheeling, Ill.; Abraham Nudelman, Rehovot, and Abraham Patchornik, Ness-Ziyona, both of Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Division of Ser. No. 854,668, Nov. 25, 1977, Pat. No. 4,125,715. This application Jul. 17, 1978, Ser. No. 925,099

Int. Cl.[2] **C07D** *501/20*

U.S. Cl. 544—29 **5 Claims**

1. A compound of the formula



wherein Y is selected from the group consisting of hydrogen, chlorine, bromine, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, or an alkoxy group of from 1 to 4 carbon atoms; Z is a bond, oxygen or sulfur; W is selected from the group consisting of hydrogen, methyl, amino, hydroxy, $-SO_3H$ or $COOR_4$ wherein R_4 is hydrogen or 5-indanyl with the proviso that when Z is oxygen or sulfur, W is other than hydroxy; R_7 is selected from the group consisting of hydrogen or methoxy; each of R_1, R_2, R_3 is selected from the group consisting of hydrogen, amino, formylamino, guanylamino, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, wherein R_1 and R_2 are a concatenated chain of methylene groups having from 3 to 6 methylenes, with the proviso that when R_1 and R_2 are hydrogen or lower alkyl, R_3 is amino, formylamino or guanylamino; R_5 is hydrogen or acetoxy; R_6 is selected from the group consisting of hydrogen, a cation of an alkali metal or an alkaline earth metal, ammonium, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, an alkanoyloxymethyl group in which the alkanoyl moiety has from 2 to 5 carbon atoms and is straight or branched, an alkanoylaminomethyl group in which the alkanoyl moiety is straight or branched and has from 2 to 5 carbon atoms and the amine nitrogen may be substituted with hydrogen or a straight or branched lower alkyl group having 1 to 4 carbon atoms, an alkoxycarbonylaminomethyl group in which the alkoxy moiety is straight or branched and has from 1 to 4 carbon atoms and the amine nitrogen may be substituted with hydrogen or a straight or branched lower alkyl group of from 1 to 4 carbon atoms, a p-(alkanoyloxy)benzyl group in which the alkanoyl moiety is straight or branched and has from 2 to 5 carbon atoms, an aminoalkanoyloxymethyl group in which the aminoalkanoyl moiety has from 2 to 15 carbon atoms and the amino nitrogen may be hydrogen or mono- or di-substituted with a straight or branched lower alkyl group having from 1 to 4 carbon atoms; and pharmaceutically acceptable salts and individual optical isomers thereof.

4,180,662

THIAZINE DERIVATIVES

Rudolf Pfister, Basel; Paul Zeller, Allschwil, both of Switzerland; Dieter Binder, and Otto Hromatka, both of Vienna, Austria, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

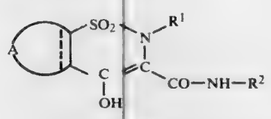
Filed Aug. 31, 1978, Ser. No. 938,274

Claims priority, application Luxembourg, Sep. 6, 1977, 78083; Switzerland, Jul. 21, 1978, 7908/78

Int. Cl.[2] **C07D** *513/04*

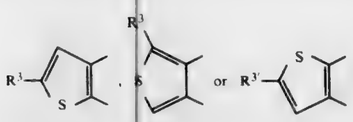
U.S. Cl. 544—48 **17 Claims**

1. A compound of the formula



I

wherein A together with the two carbon atoms forms the group



and the dotted line indicates the double bond present in the first and last thieno structures above, R^1 is lower alkyl, R^2 is selected from the group consisting of 2-thiazolyl, 4-methyl-2-thiazolyl, 4,5-dimethyl-2-thiazolyl, 5-methyl-1,3,4-thiadiazolyl, 2-pyrazinyl, 2-pyrimidinyl, 1,2,4-triazine-3-yl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 3-methyl-2-pyridyl, 4-methyl-2-pyridyl, 5-methyl-2-pyridyl, 6-methyl-2-pyridyl, 4,6-dimethyl-2-pyridyl, 5-isoxazolyl, 5-methyl-3-isoxazolyl, 3,4-dimethyl-5-isoxazolyl, 2,6-dimethyl-4-pyrimidinyl, 1,2,3,4-tetrazol-5-yl or a phenyl radical optionally substituted by halogen, hydroxy, lower alkyl, trifluoromethyl or lower alkoxy, R^3 is halogen and $R^{3'}$ is hydrogen or halogen,

or a pharmaceutically acceptable salt thereof.

4,180,663

METHINE DYE SYNTHESIS

Mark D. Frishberg, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 820,959, Aug. 1, 1977, abandoned. This application Mar. 12, 1979, Ser. No. 19,677

Int. Cl.[2] **C07C** *121/22;* **C07D** *215/12, 265/34*

U.S. Cl. 544—105 **8 Claims**

1. Process for the preparation of a disperse methine dye containing at least one dicyanomethylidene group comprising the steps of

(A) preparing an anhydrous solution of an aldehyde formed by contacting an aromatic amine, 1,2,3,4-tetrahydroquinoline or benzomorpholine compound capable of undergoing the Vilsmeier-Haack reaction with $POCl_3$ and a dialkylformamide wherein the alkyl moiety is 1–4 carbon atoms;

(B) subsequently adding to said solution at about 15° C. to about 40° C., at least one equivalent of cyanoacetamide based on the equivalents of aldehyde formed in (A), thereby forming a reaction mixture of aldehyde and in situ generated malonitrile; and

(C) adjusting the pH of the solution to a point sufficient for the condensation of the aldehyde and in situ generated malononitrile to occur thereby producing a disperse methine dye.

4,180,664

PROCESS FOR IMPROVING THE COLOR YIELD AND FASTNESS PROPERTIES OF DYEINGS PRODUCED WITH ANIONIC DYES ON CELLULOSE FIBRE MATERIAL AND CATIONIC FIBRE-REACTIVE COMPOUNDS

Pierre Perrin, Basel; Gert Hegar, Schönenbuch; Gérald Siegrist; Herbert Seiler, both of Riehen, and Ulrich Horn, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

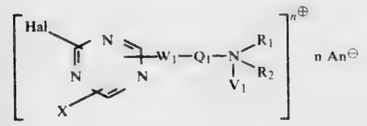
Filed Jun. 9, 1977, Ser. No. 805,208

Claims priority, application Switzerland, Jun. 16, 1976, 7674/76

Int. Cl.[2] **C07D** *251/50, 251/42, 251/22*

U.S. Cl. 544—194 **15 Claims**

1. A cationic compound of the formula

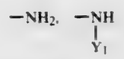


(1)

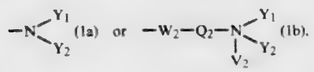
wherein

Hal is a reactive halogen atom,

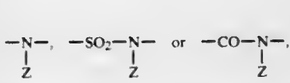
x is halogen, lower alkoxy, lower alkylthio, phenoxy, phenylthio,



or the group of the formula



each of W_1 and W_2 independently are the direct bond,



Z is hydrogen, lower alkyl or hydroxy-lower alkyl,

each of Q_1 and Q_2 independently are an aliphatic or cycloaliphatic radical, selected from the group consisting of alkylene of 2 to 4 carbon atoms and cyclohexylene,

each of R_1, R_2, V_1, V_2, Y_1 and Y_2 independently are lower alkyl or benzyl or lower alkyl or benzyl each of which is substituted by halogen, hydroxyl or cyano,

$An^{\ominus}$ is the anion of an organic or inorganic acid, and n is 1 or 2.

4,180,665

SUBSTITUTED 3-BENZ(CD)INDOL-2-(1H)-YLIDENE-FURO[2,3-b]QUINOXALIN-2(3H)ONE DYESTUFFS

Hansrudolf Schwander, Riehen, and Christian Zickendraht, Binningen, both of Switzerland, assignors to Ciba-Geigy Aktiengesellschaft, Basel, Switzerland

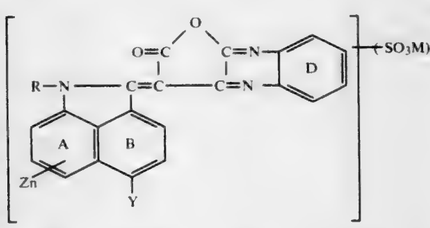
Filed May 13, 1977, Ser. No. 796,588

Claims priority, application Switzerland, Jun. 1, 1976, 6861/76

Int. Cl.[2] **C09B** *17/00, 57/00;* **D06P** *3/24, 3/52*

U.S. Cl. 544—345 **11 Claims**

1. A dyestuff of the formula (I)



(I),

in which R represents C_1–C_5-alkyl, C_1–C_5-alkenyl, C_5–C_6-cycloalkyl, C_6–C_9-aralkyl, C_6–C_9-aryl or hydrogen, M represents hydrogen or a cation, Y represents —COOH, —CN, —COCl, $-CONR_1R_2$ or $-COOR_2$ wherein R_1 and R_2 are independently C_1–C_{18} alkyl which is unsubstituted or substituted by C_1–C_4-alkoxy, hydroxy, chloro, bromo, cyano, carboxy C_1–C_4-alkoxy carbonyl, sulfo, carboxamido or acetoxy; cyclopentyl, methyl cyclohexyl, trimethylcyclohexyl or cyclohexyl; or phenyl, benzyl or phenethyl, which are unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy or halo; and R_1 also represents hydrogen, Z is C_1–C_4-alkoxy, Cl, Br, NO_2, C_1–C_4-alkyl-S-, cyano, $CONH_2$, and n represents 0, 1 or 2 and ring D is unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halo, cyano, carbo-C_1–C_4-alkoxy, cyclohexyl, phenyl-C_1–C_3-alkyl, phenyl, ethoxyethoxy or acetyloxyethoxy and if n represents 0, D is also substituted by C_1–C_4-alkylsulphonyl, phenylsulphonyl and sulphonamido which is unsubstituted or substituted by 1 or 2 C_1–C_4-alkyl groups.

4,180,666

3,9-DIHYDRO-3,9-DIOXO-2H-INDENO(2,1-C)-PYRIDINE-4-(CARBONITRILES/CARBOXAMIDES)

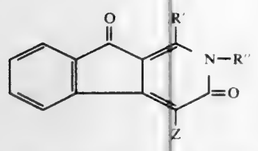
Robert J. Chorvat, Arlington Heights, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Dec. 26, 1978, Ser. No. 973,518

Int. Cl.[2] **C07D** *221/04*

U.S. Cl. 546—111 **12 Claims**

1. A compound of the formula



wherein R′ represents hydrogen, alkyl containing fewer than 4 carbons, or phenyl; R″ represents hydrogen or alkyl containing fewer than 4 carbons; and Z represents cyano or carbamoyl.

4,180,667

2-AZABICYCLO[2.2.2]OCT-5-ENES

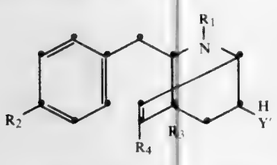
William F. Michne, Poestenkill, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 741,227, Nov. 12, 1976, Pat. No. 4,100,164, which is a continuation-in-part of Ser. No. 695,977, Jun. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 576,313, May 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 471,571, May 20, 1974, Pat. No. 3,932,422. This application Feb. 13, 1978, Ser. No. 877,166

Int. Cl.[2] C07D *221/22*

U.S. Cl. 546—112 **24 Claims**

1. A compound having the formula



where R_1 is hydrogen, lower-alkyl, cycloalkyl-lower-alkyl containing from three to seven ring carbon atoms, 2-or 3-furylmethyl, or such 2- or 3-furylmethyl substituted on the unsubstituted ring carbon atoms by from one to three methyl groups, or phenyl-lower-alkyl; R_2 is hydrogen, hydroxy or lower-alkoxy; R_3 is hydrogen or lower-alkyl; R_4 is lower-alkyl, lower-alkoxy-lower-alkyl or halo-lower-alkyl, or R_3 and R_4 together are divalent lower-alkylene, $-(CH_2)_n-$, where n is one of the integers 3 or 4; and Y′ is carboxy, cyano, carbo-lower-alkoxy or lower-alkanoyl, or an acid addition salt thereof.

4,180,668

PIPERIDINO-4H-S-TRIAZOLO[4,3-a][1,4]BENZODIAZEPINES

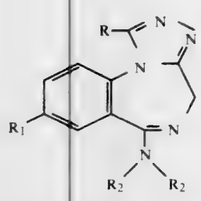
Jackson B. Hester, Jr., Comstock Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jun. 8, 1977, Ser. No. 804,627

Int. Cl.[2] C07D *487/04*

U.S. Cl. 260—244.4 **2 Claims**

1. A compound of the formula



wherein R is C_1 to C_3-alkyl, R_1 is a halogen having an atomic number of from 9 to 35, and the two R_2 groups are taken together with the nitrogen to which they are bonded to complete a piperidino group, or a pharmacologically acceptable salt thereof.

4,180,669

2-(N-PHENETHYL-4-PIPERIDINO)-5-PENTYL RESORCINOL

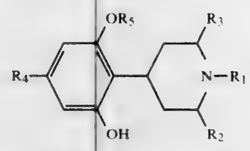
Martin Winn, Deerfield, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 749,634, Dec. 13, 1976, abandoned. This application Mar. 27, 1978, Ser. No. 890,154

Int. Cl.[2] C07D *211/22*

U.S. Cl. 546—240 **1 Claim**

1. A compound of the formula



wherein R_1 is phenethyl; each of R_2, R_3 and R_5 is H; R_4 is n-pentyl.

4,180,670

AMINO PYRIDINE DERIVATIVES

Edwin T. Edington, Maidenhead, and Alan C. White, Windsor, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

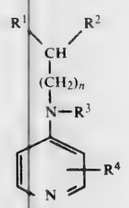
Filed Jan. 30, 1978, Ser. No. 873,192

Claims priority, application United Kingdom, Feb. 2, 1977, 4354/77; Jul. 9, 1977, 28879/77

Int. Cl.[2] C07D *213/38*

U.S. Cl. 546—284 **9 Claims**

1. A compound selected from those having the formula



and their pharmaceutically acceptable acid addition salts, wherein one of R^1 and R^2 is selected from phenyl; naphthyl; phenyl substituted by one or two substituents selected from halogen, lower alkyl, lower alkoxy, lower alkylenedioxy and trifluoromethyl; thienyl; and pyridyl and the other one of R^1 and R^2 is selected from phenyl; naphthyl; phenyl substituted by one or two substituents selected from halogen, lower alkyl, lower alkoxy, lower alkylenedioxy, trifluoromethyl; thienyl; and pyridyl R^3 and R^4 are independently selected from hydrogen and lower alkyl and n is selected from 0 and 1.

4,180,671

DIBENZ[c,f]IMIDAZO [1.2-a] [1]AZEPIN-9-OLS

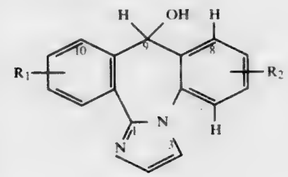
William J. Houlihan, Mt. Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed May 22, 1978, Ser. No. 907,951

Int. Cl.[2] C07D *487/04*

U.S. Cl. 548—324 **6 Claims**

1. A compound of the formula



(I)

where

R_1 represents H, mono or dichloro, or mono or difluoro,

R_2 represents H, chloro, fluoro, alkyl of 1–3 carbon atoms, alkoxy of 1–3 carbon atoms or trifluoromethyl.

4,180,672

2-ORGANOTHIO-2-CYCLOPENTENONES, ORGANOTHIO-CYCLOPENTANES DERIVED THEREFROM

Seizi Kurozumi; Takeshi Toru; Makiko Kobayashi, all of Hino, and Yoshinobu Hashimoto, Fuzisawa, all of Japan, assignors to Teijin Limited, Osaka, Japan

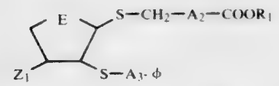
Filed Mar. 7, 1977, Ser. No. 775,119

Claims priority, application Japan, Aug. 13, 1976, 51-96107; Aug. 13, 1976, 51-96108; Aug. 13, 1976, 51-96109; Nov. 19, 1976, 51-138380; Dec. 1, 1976, 51-143294

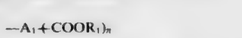
Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—15 **3 Claims**

1. Organodithiocyclopentanes having the formula



wherein A_1, E, A_2 and R_1 are as defined above, A_3 represents a saturated divalent aliphatic hydrocarbon group containing 1 to 5 carbon atoms which may contain, as a substituent, a hydroxyl group or a protected hydroxyl group; and ϕ represents a phenyl group, cyclohexyl group or cyclopentyl group, which groups may optionally contain one or two trifluoromethyl groups, an hydroxyl group or a halogen atom, or a group of the formula



wherein R_1 is as defined above, A_1 represents a divalent saturated or unsaturated aliphatic hydrocarbon group containing 1 to 3 carbon atoms; and, n is 0 to 1, and when n is 0, $+COOR_1)_n$ represents a hydrogen atom.

4,180,673

ELECTRON BEAM SENSITIVE MONOMER

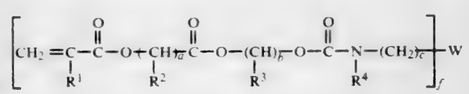
Mario D. Burguette, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 10, 1976, Ser. No. 685,118

Int. Cl.[2] C07C *101/44*

U.S. Cl. 560—26 **4 Claims**

1. A monomer polymerizable under the influence of electron-beam represented by the structure



wherein a=1 or 2, b=2 to 4, c=0 or 1, f=2 or 3;

W is divalent or trivalent aliphatic, cycloaliphatic or aromatic hydrocarbyl group of 6–13 carbon atoms;

R^1 is H, CH_3 or Cl;

Each R^2 and each R^3 is independently H or alkyl of 1 to 4 carbon atoms pendent from an alkylene group, the sum of the carbon atoms in the pendent alkyl groups on one alkylene group being no greater than 4 and

Each R^4 is independently H or alkyl of 1 to 4 carbon atoms.

4,180,674

PROCESS FOR PREPARING BUTYL-P-BENZOYLBENZOATES

James M. Photis, Ridgefield, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

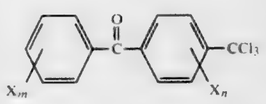
Filed Jul. 18, 1977, Ser. No. 816,772

Int. Cl.[2] C07C *69/78*

U.S. Cl. 560—52 **5 Claims**

1. A one step process for preparing butyl-p-benzoylbenzoates comprising:

reacting a 4-(trichloromethyl) benzophenone having the formula:



where each X is an independently selected halogen and m and n are independently selected integers from 0 to 3, with a butanol selected from the group consisting of n-butanol and iso-butanol in the presence of a catalytic amount of a strong mineral acid.

4,180,675

15-CYCLOALKYL-PROSTAGLANDIN DERIVATIVES

Masaki Hayashi; Seiji Kori, both of Takatsuki; Isao Ohyama, Osaka; Sadahiko Iguchi, Tsuzuki, and Takanori Okada, Osaka, all of Japan, assignors to Warner-Lambert Company, Morris Plains, N.J.

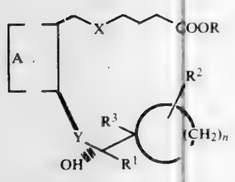
Division of Ser. No. 703,158, Jul. 7, 1976, Pat. No. 4,087,620. This application Dec. 5, 1977, Ser. No. 857,341

Claims priority, application United Kingdom, Jul. 17, 1975, 30072/75; May 6, 1976, 18651/76

Int. Cl.[2] C07C *177/00*

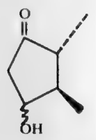
U.S. Cl. 560—118 **13 Claims**

1. Prostaglandin analogues of the formula:



VII

wherein A represents a grouping of the formula:



VIIIB,

X represents ethylene, Y represents ethylene or trans-vinylene, R represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 12 carbon atoms, R^1 represents a hydrogen atom or a methyl or ethyl group, R^2 represents a straight- or branched-chain alkyl group containing from 2 to 8 carbon atoms, R^3 represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 3 carbon atoms, and n represents 4 or 5, and cyclodextrin clathrates of such acids and esters and, when R represents a hydrogen atom, non-toxic salts thereof.

4,180,676

CONVERSION OF CONJUGATED DIOLEFINS TO DIACYLOXY OLEFINS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Ohio

Filed Aug. 25, 1977, Ser. No. 827,631
Int. Cl.[2] C07C 67/05
U.S. Cl. 560—246 **25 Claims**

1. A process for the production of diacyloxy olefins which comprises:

reacting at least one conjugated diolefin with molecular oxygen and an acidic reactant media employing a catalyst system consisting essentially of a uranium compound, an alkali metal-containing compound, and a halide-containing compound, optionally further a dihalobutene adjuvant, thereby preparing said diacyloxy olefin,

wherein said uranium compound is selected from the group consisting of uranium oxides, halides, carboxylates, nitrates, complex uranyl ions, and mixtures;

said alkali metal-containing compound is selected from the group consisting of lithium, sodium, potassium, cesium, and mixtures, of the halides, nitrates, carboxylates, oxides, hydroxides, and mixtures;

and said halide-containing compound is selected from the group consisting of uranium halides, alkali metal halides, alkaline earth metal halides, or mixtures;

wherein said halide is selected from the group consisting of chloride, bromide, iodide, and mixtures;

wherein said acidic reactant media is at least one mono- or dicarboxylic aliphatic, cycloaliphatic, or arylaromatic acid or admixture thereof with an alkyl, cycloalkyl, or arylmono- or dicarboxylic acid anhydride, and

wherein said conjugated diolefin is acyclic or cyclic and can be substituted with halogen, cyano, —COOR', or hydrocarbyl radicals, wherein R' is hydrogen or an alkyl radical.

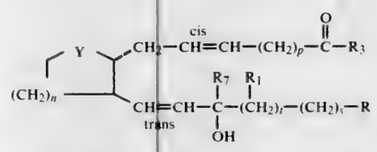
4,180,677

NOVEL PROSTAGLANDINS

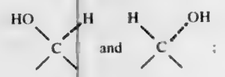
Robert E. Schaub, Upper Saddle River, N.Y., and Martin J. Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 719,650, Sep. 1, 1976, abandoned, which is a division of Ser. No. 555,219, Mar. 4, 1975, Pat. No. 3,993,674, which is a division of Ser. No. 353,152, Apr. 20, 1973, Pat. No. 3,884,969. This application Oct. 28, 1977, Ser. No. 846,487
Int. Cl.[2] C07C 177/00
U.S. Cl. 562—500 **47 Claims**

1. An optically active compound of the formula:

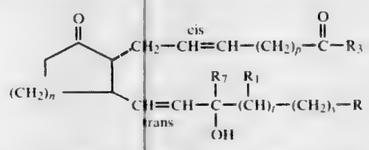


or a racemic compound of that formula and the mirror image thereof wherein n is the integer 1 or 2; Y is a divalent radical selected from the group consisting of those of the formulae:



p is an integer from 2 to 6, inclusive; R_1 is an alkyl group having up to 3 carbon atoms; R_3 is selected from the group consisting of hydroxy and alkoxy having from one to twelve carbon atoms; R_7 is selected from the group consisting of hydrogen and a lower alkyl group having up to 3 carbon atoms; s is zero or an integer from one to five inclusive; t is zero or one; and R is selected from the group consisting of cycloalkyl having from three to nine carbon atoms, cycloalkenyl having from five to nine carbon atoms, mono- or di-lower alkyl substituted cycloalkyl having from three to eight carbon atoms in the ring, and mono- or di-lower alkyl substituted cycloalkenyl having from five to eight carbon atoms in the ring; with the proviso that only one double bond or cyclopropyl group can be immediately adjacent to C_{15}; and the pharmaceutically acceptable cationic salts thereof when R_3 is hydroxy.

38. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof wherein n is the integer 1 or 2; p is an integer from 2 to 6 inclusive, R_1 is an alkyl group having up to 3 carbon atoms; R_3 is selected from the group consisting of hydroxy and alkoxy having from one to twelve carbon atoms; R_7 is selected from the group consisting of hydrogen and a lower alkyl group having up to 3 carbon atoms; s is zero or an integer from one to five inclusive; t is zero or one; and R is selected from the group consisting of cycloalkyl having from three to nine carbon atoms, cycloalkenyl having from five to nine carbon atoms, mono- or di-lower alkyl substituted cycloalkyl having from three to eight carbon atoms in the ring, and mono- or di-lower alkyl substituted cycloalkenyl having from five to eight carbon atoms in the ring; with the proviso that only one double bond or cyclopropyl group can be immediately adjacent to C_{15}; and the pharmaceutically acceptable cationic salts thereof when R_3 is hydroxy.

4,180,678

PROCESS FOR PREPARING METHACRYLIC ACID

Masahiro Wada; Michio Ueshima, both of Nishinomiya; Isao Yanagisawa, Ikeda, and Michikazu Ninomiya, Kobe, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co. Ltd., Osaka, Japan

Filed Dec. 27, 1974, Ser. No. 536,864
Claims priority, application Japan, Dec. 29, 1973, 483630
Int. Cl.[2] C07C 51/32. 57/04
U.S. Cl. 562—534 **8 Claims**

1. A process for preparing methacrylic acid which comprises carrying out the catalytic vapor phase oxidation of methacrolein with a molecular oxygen-containing gas in the presence of a catalytic oxide consisting essentially of molybdenum, vanadium, phosphorus, at least one metallic element Y selected from the group consisting of copper, cobalt, zirconium, bismuth, antimony and aresenic, and at least one alkali metal element selected from the group consisting of sodium, potassium, rubidium and cesium, at an atomic ratio of molybdenum to vanadium to phosphorus to the metallic element Y to the alkali metal element to oxygen of 12:0.1-10:0.1-10:a:b:f, wherein "a" is a positive number up to and including 10, "b" is a positive number up to and including 10 and "f" is a value that is determined by the valences and atomic ratios of the other elements present, wherein the vanadium component of said catalytic oxide is in the form of a complex prepared by reacting vanadium pentoxide and orthophosphoric acid.

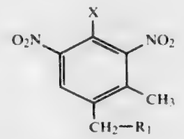
4,180,679

NOVEL SUBSTITUTED DINITROTOLUENES AND METHODS FOR PREPARING THE SAME

Inder P. Kapoor, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 22, 1978, Ser. No. 935,820
Int. Cl.[2] C07C 43/20
U.S. Cl. 568—583 **10 Claims**

1. A compound of the formula:



wherein X is halogen; R_1 is a member selected from the group consisting of bromine and OR_2; R_2 is a member selected from the group consisting of alkyl C_1–C_4, hydroxyalkyl C_1–C_4 and phenyl.

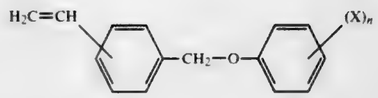
4,180,680

PREPARATION OF HALOPHENYLVINYLBENZYL ETHERS

Kent S. Dennis, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

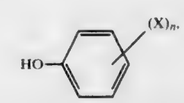
Filed Jul. 28, 1978, Ser. No. 928,663
Int. Cl.[2] C07C 41/04
U.S. Cl. 568—647 **7 Claims**

1. A process for the preparation of a vinylbenzylhalophenyl ether having the formula:



wherein X is chlorine or bromine and n is an integer 4 or 5, comprising the steps of:

(a) reacting by contacting an alkali metal, alkaline earth metal or ammonium ion salt of a halophenol, which corresponds to the formula:



wherein X and n have the aforesaid meanings, with a vinylbenzyl chloride in a liquid reaction medium consisting essentially of an aqueous solution of from about 68 to about 90 weight percent of at least one C_1 or C_2 alkanol with a remaining amount of water and wherein said contact occurs at a pH from about 7 to about 11 and a temperature less than about 65° C.; and

(b) separating the vinylbenzylhalophenyl ether from the liquid reaction medium.

4,180,681

PREPARATION AND RECOVERY OF METHACRYLIC ACID FROM AN AQUEOUS SODIUM METHACRYLATE SOLUTION

John J. Leonard, Springfield, and Harold Shalit, Bala Cynwyd, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 17, 1978, Ser. No. 934,766
Int. Cl.[2] C07C 57/04
U.S. Cl. 562—600 **2 Claims**

1. A process for the recovery of methacrylic acid from an aqueous sodium methacrylate solution derived from the silver catalyzed oxidation reaction of methacrolein in an aqueous solution of sodium hydroxide which comprises the steps of:

contacting the aqueous sodium methacrylate solution at a temperature of from about 0° C. to 30° C. with liquid carbon dioxide at its equilibrium vapor pressure to form a methacrylic acid-containing liquid carbon dioxide phase, an aqueous phase and a precipitated sodium bicarbonate phase;

separating the methacrylic acid-containing liquid carbon dioxide phase from the aqueous phase and the precipitated sodium bicarbonate;

lowering the pressure of the liquid carbon dioxide to form gaseous carbon dioxide;

releasing the gaseous carbon dioxide; and

recovering the methacrylic acid.

4,180,682

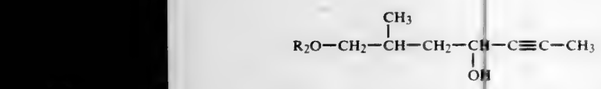
UNSATURATED ALCOHOLS HAVING AN ETHER PROTECTED GROUP

Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 796,929, May 16, 1977, Pat. No. 4,107,183, which is a division of Ser. No. 638,722, Dec. 8, 1975, Pat. No. 4,041,058, which is a continuation-in-part of Ser. No. 544,154, Jan. 27, 1975, abandoned. This application May 12, 1978, Ser. No. 905,254
Int. Cl.[2] C07C 43/27
U.S. Cl. 568—662 **7 Claims**

1. A compound of the formula:

(d) fractionating, in a debutanizing zone, said separated



wherein R_2 is t-butyl, tetrahydropyranyl, benzyl, benzhydryl, trityl, methoxymethyl, dimethyl t-butylsilyl.

4,180,683

PROCESS FOR RECOVERING 2,2-BIS(4-HYDROXYPHENYL)PROPANE FROM DISTILLATION RESIDUES FROM THE PREPARATION THEREOF

Lawrence C. Mitchell, Mount Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 23, 1977, Ser. No. 863,668

Int. Cl.² C07C *37/44, 37/38*

U.S. Cl. 568—724 **6 Claims**

1. A process for the production of 2,2-bis(4-hydroxyphenyl) propane from the tarry residue or isomer by-product residue which remains after purification distillation of 2,2-bis(4-hydroxyphenyl) propane produced by the condensation of phenol and acetone, said process comprising:

(i) adding phenol to said residue and forming a warm mixture of said residue and added phenol in the substantial absence of an acidic reagent;

(ii) cooling said mixture to precipitate a crystalline adduct of 2,2-bis(4-hydroxyphenyl) propane and phenol;

(iii) separating the adduct; and

(iv) subsequently recovering said 2,2-bis(4-hydroxyphenyl) propane therefrom.

4,180,684

PROCESS FOR THE PRODUCTION OF 4,4-ISOPROPYLIDENE-BIS'(2,6-DIBROMOPHENOL)

Peter Kleinschmit; Eberhard Walter, both of Hanau; Helmut Mechler, Hofheim; Günter Theis, Hanau, and Brigitte Meiners, Kahl, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Jan. 14, 1977, Ser. No. 759,548

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1976, 2601681

Int. Cl.² C07C *37/00*

U.S. Cl. 568—726 **14 Claims**

1. A process for the production of pure 4,4'-isopropylidene-bis (2,6-dipromophenol) comprising reacting 4,4'-isopropylidene diphenol with a brominating agent selected from the group consisting of (1) hydrogen bromide and (2) hydrogen bromide containing up to 1 mole of free bromine per mole of hydrogen bromide and at least about 1.0 mole of hydrogen peroxide for each mole total of hydrogen bromide and free bromine in the presence of water and an inert ogranic solvent which has limited miscibility with water so that two liquid phases are present, one phase being a water phase and the other an organic solvent phase, separating the water phase from the organic solvent phase, precipitating 4,4'-isopropylidene-bis (2,6-dibromophenol) from the organic phase to leave a mother liquor and recycling the mother liquor for use as water immiscible solvent in making another batch of 4,4'-isopropylidene-bis (2,6-dibromophenol).

4,180,685

DEHYDROCHLORINATION OF A DIHYDROXYDIPHENYL TRICHLOROETHANE

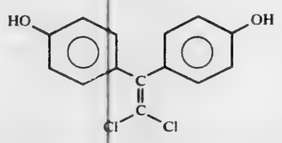
Michael R. MacLaury, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 17, 1979, Ser. No. 4,050

Int. Cl.² C07C *37/00*

U.S. Cl. 568—726 **6 Claims**

1. The process for dehydrohalogenating 1,1,1-trichloro-2,2-bis(4-hydroxyphenyl)ethane to form 1,1-dichloro-2,2-bis(4-hydroxyphenyl)ethylene of the formula



which process comprises treating the aforesaid trichloroethane with liquid methyl amine substantially free of solvent.

4,180,686

OXIDATIVE COUPLING OF ALKYLPHENOLS

John R. Dodd, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

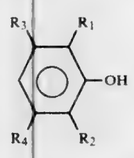
Filed Jan. 25, 1979, Ser. No. 6,419

Int. Cl.² C07C *37/00*

U.S. Cl. 568—730 **12 Claims**

1. A method of preparing carbon-carbon coupled condensation products of an alkylphenol, wherein said method comprises contacting said alkylphenol with an effective amount of oxygen or an oxygen-containing gas in the presence of an effective amount of palladium acetate catalyst in a polar solvent which solubilizes palladium acetate under reaction-promoting conditions, said process being characterized further in that:

(A) the alkylphenol is in the group represented by the formula



wherein R_1, R_2, R_3 and R_4 are hydrogen or C_1–C_4 alkyl, with at least two alkyls being present one of which is R_3 or R_4, and

(B) the amounts of materials are as follows, on a molar basis: phenol—1.0; oxygen—about 2.5 to about 100; polar solvent—about 2 to about 30, and palladium acetate—about 0.001 to about 0.5.

4,180,687

REACTION OF FORMALDEHYDE IN BUTYNEDIOL

Harry O. Burrus, and Donald I. Garnett, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 24, 1978, Ser. No. 899,297

Int. Cl.² C07C *29/24, 33/04*

U.S. Cl. 568—856 **6 Claims**

1. In a process for the production of crude butynediol containing 0.5–10 weight percent of formaldehyde by the reaction of aqueous formaldehyde and acetylene in the presence of a cuprous acetylide complex the improvement comprising reacting the formaldehyde in the crude butynediol with 0.05 to 1.0 mols of alkali metal hydroxide or carbonate per mol of formaldehyde at a temperature of 140° to 180° C. for a period of time until the formaldehyde is converted into a polymeric substance.

4,180,688

METHOD FOR CONTINUOUSLY PRODUCING TERT-BUTYL ALCOHOL

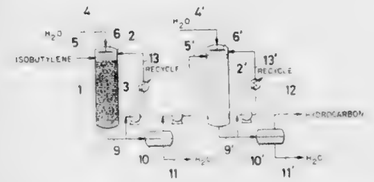
Masao Imaizumi, Tokyo; Mitsuo Yasuda, Kawasaki; Ko Sakata, Tokyo, and Noboru Hirano, Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1978, Ser. No. 928,294

Claims priority, application Japan, Jul. 29, 1977, 52/91092; Aug. 8, 1977, 52/94798; Aug. 10, 1977, 52/96232

Int. Cl.² C07C *29/04*

U.S. Cl. 568—899 **10 Claims**



1. In a method of continuously producing tert-butyl alcohol by reacting water with isobutylene in the presence of a strongly acidic cation exchange resin as a catalyst, the improvement which comprises continuously bringing water and liquid C_4 hydrocarbon mixture containing 20–50% isobutylene into contact with each other and a bed of said catalyst particles in a reactor at a temperature of 50°–150° C. under conditions such that said liquid C_4 hydrocarbon mixture is the continuous phase in the gaps between the catalyst particles in said bed said continuous phase being obtained by filling the reactor with a liquid C_4 hydrocarbon mixture and the water flows along the surface of the catalyst particles at an average linear velocity of at least 1.0 m/hr (based on the empty reactor) and continuously withdrawing reaction mixture from the reactor.

4,180,689

PROCESS FOR CONVERTING C_3–C_{12} HYDROCARBONS TO AROMATICS OVER GALLIA-ACTIVATED ZEOLITE

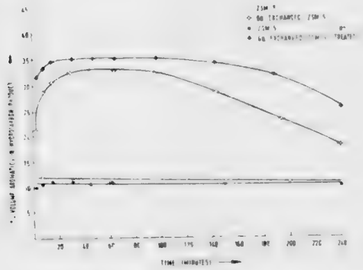
Evan E. Davies, Woking, and Alexander J. Kolombos, Thames Ditton, both of England, assignors to The British Petroleum Company Limited, London, England

Division of Ser. No. 856,668, Dec. 2, 1977. This application Dec. 11, 1978, Ser. No. 968,402

Claims priority, application United Kingdom, Dec. 20, 1976, 53012/76

Int. Cl.² C07C *15/02*; B01J *23/08*; C01B *29/28*

U.S. Cl. 585—407 **11 Claims**



1. A process for producing aromatic hydrocarbons comprising bringing into contact at an elevated temperature a C_3–C_{12} hydrocarbon feedstock with a catalyst composition comprising an aluminosilicate having gallium deposited thereon or an aluminosilicate in which cations have been exchanged with gallium ions, said aluminosilicate having silica to alumina in a molar ratio of between 20:1 and 70:1.

4,180,690

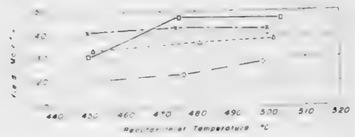
OXYDEHYDROGENATION OF ALKYLAROMATIC HYDROCARBONS AND CATALYTIC COMPOSITE THEREFOR

Tamotsu Imai, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 19, 1977, Ser. No. 862,071

Int. Cl.² C07C *15/00*

U.S. Cl. 585—443 **9 Claims**



1. A method for oxydehydrogenating an aromatic input hydrocarbon having at least one dehydrogenatable alkyl group substituent to produce an alkenyl-substituted aromatic product hydrocarbon which comprises contacting the input hydrocarbon, steam and oxygen at oxydehydrogenation conditions, including an inlet reactor temperature of about 470° C. to about 550° C., with a catalytic composite consisting essentially of a combination of cobalt oxide, chromium oxide, alumina and magnesium oxide with a silica carrier material in amounts sufficient to result in a mole ratio of chromium oxide to cobalt oxide of about 0.2:1 to about 2:1, of alumina to cobalt oxide of about 0.05:1 to about 0.5:1 and of magnesium oxide to cobalt oxide of about 0.05:1 to about 0.5:1

4,180,691

ALKYLATION OF AROMATIC HYDROCARBONS FOR DETERGENT PRECURSORS

George E. Illingworth, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 4, 1978, Ser. No. 931,048

Int. Cl.² C07C *3/54*

U.S. Cl. 585—455 **5 Claims**

1. In a process for the production of detergent alkylate by the acid-catalyzed liquid-phase reaction of a C_7 to C_{20} monoolefin and benzene, resulting in a detergent alkylate having an objectionable 2-phenyl isomer content, the method of reducing said 2-phenyl isomer content of the alkylate which comprises performing said olefin-benzene reaction in the presence of a surfactant.

4,180,692

METHOD FOR REACTING ORGANIC HALIDES

Michael F. Farona, Cuyahoga Falls, and James F. White, Akron, both of Ohio, assignors to The University of Akron, Akron, Ohio

Division of Ser. No. 339,637, Mar. 9, 1973, Pat. No. 3,832,403, which is a continuation-in-part of Ser. No. 119,908, Mar. 1, 1971, abandoned. This application Apr. 11, 1974, Ser. No. 459,897

Int. Cl.² C07C *3/52*

U.S. Cl. 585—457 **2 Claims**

1. A process for producing an alkylation reaction product from an alkylatable aromatic hydrocarbon and an alkyl halide which comprises contacting said alkylatable aromatic hydrocarbon with said alkyl halide at alkylation conditions, in the presence of a catalyst selected from the group consisting of benzene molybdenum tricarbonyl, toluene molybdenum tricarbonyl, o-xylene molybdenum tricarbonyl, m-xylene molybdenum tricarbonyl, p-xylene polybdenum tricarbonyl, cumene molybdenum tricarbonyl, and mesitylene molybdenum tricarbonyl.

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4,180,693

NEW PREPARATION PROCESS OF A CATALYST FOR CONVERTING AROMATIC HYDROCARBONS

Christian Marcilly, Houilles, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Division of Ser. No. 842,132, Oct. 14, 1977. This application Nov. 30, 1978, Ser. No. 965,466

Claims priority, application France, Oct. 15, 1976, 76 31320; Dec. 22, 1976, 76 39015

Int. Cl.[2] C07C 3/62

U.S. Cl. 585—475 **11 Claims**

1. In a process for dismutation and transalkylation of alkyl aromatic hydrocarbons in the presence of a catalyst, the improvement comprises employing as said catalyst a mordenite containing less than 0.5% by weight of sodium, wherein the molar ration SiO_2/Al_2O_3 is in the range from 10 to 100, the mordenite further containing at least one metal selected from cobalt, nickel, silver and palladium, said catalyst having been produced by a process comprising eliminating the major portion of sodium from a mordenite in the sodium form; said mordenite having a molar ratio SiO_2/Al_2O_3 of about 10, said catalyst being obtained by incorporating said metal to said mordenite and drying of the resulting catalyst mass at about 50° to 150° C., and subjecting the resultant dried catalyst to a dry calcination between 300 and 700° C., in the presence of an inert or oxidizing dry gas containing less than 1% by volume of steam and then subjecting resultant calcined catalyst to a wet calcination between 250° and 700° C., in the presence of at least one gas selected from steam, an inert gas and an oxidizing gas, the inert or oxidizing gas containing by volume at least 3% of steam.

4,180,694

PRODUCTION OF 1,7-OCTADIENE FROM BUTADIENE

Kenzie Nozaki, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 24, 1978, Ser. No. 927,692

Int. Cl.[2] C07C 11/12

U.S. Cl. 585—511 **16 Claims**

1. The process of hydrodimerizing butadiene to 1,7-octadiene which comprises contacting the butadiene with a formate of an alkali metal or ammonia, a palladium catalyst, a tertiary phosphine, a solvent selected from the group consisting of dialkyl sulfoxides, N,N-dialkylalkanamides, alkyl substituted and unsubstituted pyridines and sulfolanes and about at least 1 moles of water per mole of formate salt.

4,180,695

ISOPARAFFIN ALKYLATION PROCESS USING AN UNSUPPORTED PERFLUORINATED POLYMER CATALYST

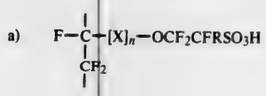
James D. McClure, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 663,897, Mar. 4, 1976, Pat. No. 4,022,847. This application Dec. 20, 1976, Ser. No. 752,359

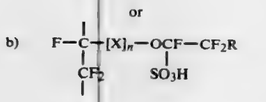
Int. Cl.[2] C07C 3/54

U.S. Cl. 585—730 **5 Claims**

1. A liquid phase alkylation process which comprises contacting a C_4 to C_6 isoparaffin or mixtures thereof with an olefin selected from the group consisting of C_3 to C_5 monoolefins or mixtures thereof at a reaction temperature of between about 80° C. and about 225° C. in the presence of an unsupported solid perfluorinated polymer catalyst wherein said catalyst contains a repeating structure selected from the group of:

a) 

or

b) 

where n is 0, 1 or 2; R is a radical selected from the group consisting of fluorine and perfluoroalkyl radicals having from 1 to 10 carbon atoms; and X is selected from the group consisting of:

$[O(CF_2)_m]$, $[OCF_2CFY]$ or $[OCFYCF_2]$

where m is an integer from 2 to 10 and Y is a radical selected from the class consisting of fluorine and the trifluoromethyl radical.

4,180,696

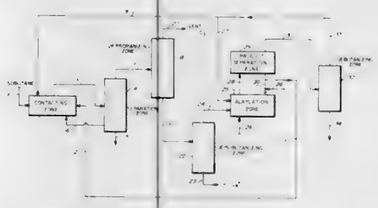
CONVERTING REACTIVE IMPURITIES IN ISOBUTANE CHARGE STREAM WITH CATALYST PHASE IN SULFURIC ACID ALKYLATION

Charles T. Lewis, Jr., Houston, and Gerald F. Prescott, Bridge City, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 23, 1978, Ser. No. 953,382

Int. Cl.[2] C07C 3/54

U.S. Cl. 585—717 **3 Claims**



1. In a sulfuric acid catalyzed alkylation process wherein isobutane is contacted in an alkylation zone with propylene and/or butylene in the liquid phase, in the presence of a sulfuric acid containing alkylation catalyst, under alkylation conditions, and with agitation sufficient to form an emulsion of reactant hydrocarbons and catalyst, wherein propylene and/or butylene charge to said process contains C_3–C_4 range normal paraffin diluent hydrocarbons, wherein fresh isobutane charge to said process contains C_3–C_4 range normal paraffin diluents, and impurities reactive with sulfuric acid; the improvement which comprises:

(a) reacting, in an alkylation reaction zone, an isobutane stream substantially free of normal paraffin hydrocarbon and impurities which are reactive with sulfuric acid with an olefin stream comprising propylene and/or butylenes and containing C_3–C_4 normal paraffin diluents in the presence of a sulfuric acid alkylation catalyst for production of alkylated hydrocarbons;

(b) separating in a product separation zone, the reaction effluent from said alkylation reaction zone into a hydrocarbon phase essentially free of sulfuric acid catalyst and into a catalyst phase;

(c) recycling a major portion of said catalyst phase from said product separation zone to said alkylation reaction zone for said reacting step (a);

hydrocarbon phase into a C_5 and heavier alkylated hydrocarbon product fraction and a recycle hydrocarbon fraction comprising isobutane with minor amounts of normal paraffin hydrocarbons and water;

(e) contacting, in a contacting zone, a minor portion of said catalyst phase from said product separation zone with a fresh isobutane charge stream containing C_3–C_4 normal paraffin diluents, water and impurities reactive with sulfuric acid and with said recycle hydrocarbon fraction from step (d) for conversion of said reactive impurities into compounds soluble in said catalyst phase and for absorption of water into said catalyst phase;

(f) separating, in a separation zone, the effluent from said contacting zone into a catalyst phase containing conversion products of said reactive impurities and absorbed water and into an isobutane phase containing normal paraffin impurities and substantially free of said reactive impurities and water;

(g) fractionating, in a depropanizing zone, said separated isobutane phase into a C_1–C_3 normal paraffin fraction and a depropanizing bottoms fraction comprising isobutane and n-butane;

(h) fractionating, in a deisobutanizing zone, said depropanizing zone bottoms fraction into a butane fraction comprising normal butane and any heavier hydrocarbons, and into an isobutane stream substantially free of normal paraffins, water, and reactive impurities; and

(i) charging said isobutane stream from said deisobutanizing zone to said alkylation reaction zone as the isobutane stream of step (a).

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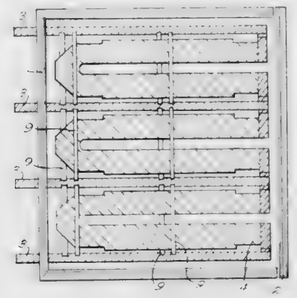
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4,180,697

VACUUM OVEN WITH GRAPHITE HEATING

Erwin Schumann, Bruchkobel, and Oskar Bohländer, Grosskrotzenburg, both of Fed. Rep. of Germany, assignors to Deutsche Gold- and Silber-Scheideanstalt Vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Oct. 12, 1977, Ser. No. 841,582
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1976, 2646890
Int. Cl.² H05B 3/10
U.S. Cl. 13—25 6 Claims



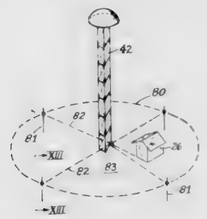
1. In a vacuum furnace provided with graphite heating means and consisting essentially of the furnace body and heating means the improvement comprising said heating means comprising flexible thin graphite solid sheets having a thickness of 0.5–3 mm.

4,180,698

SYSTEM AND EQUIPMENT FOR ATMOSPHERICS CONDITIONING

Roy B. Carpenter, Jr., 17001 Bracewood Dr., Hacienda Heights, Calif. 91745

Continuation-in-part of Ser. No. 651,922, Jan. 23, 1976, abandoned. This application Aug. 5, 1977, Ser. No. 822,218
Int. Cl.² H02G 13/00; H05F 3/00
U.S. Cl. 174—2 3 Claims



1. A system and equipment for atmospherics conditioning of objects located on the earth's surface to protect them from the effects of atmospherics which are to include but not be limited to such phenomena as lightning, electrostatic fields, electromagnetic fields, field transients, static charge, hail and any other related phenomena

comprising:

at least one discrete ionizer structure rising above the earth's surface and the to be protected objects, selectively, extending upwardly to a specific elevation calculable for the at least one specific intended area of protection provided by a said discrete ionizer structure under a uniform field shape, avoiding field reinforcing at any point,

an endless ground current collector structure having at least one downwardly extending grounded charge collecting rod and disposed horizontally about the base of said discrete ionizer structure and contiguous to the earth's surface, so as to surround the to be protected objects on the earth's surface and thereby establishing an electrically floating island having the area of said calculable intended protection and

a plurality of service wires connecting the base of a said discrete ionizer structure with operationally significant points of said ground collector structure and those of objects on the earth's surface and located within the perimeter of said endless ground current collector structure, selectively.

4,180,699

SHIELDED ELECTRICALLY CONDUCTOR

William A. Hochella, Warren, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jun. 19, 1978, Ser. No. 917,425
Int. Cl.² H01B 5/02
U.S. Cl. 174—126 CP 5 Claims

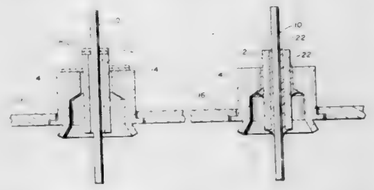
1. A fine magnetically shielded conductor wire consisting of a conductive copper core and a magnetically soft alloy metallic sheath metallurgically secured to said conductive core, said sheath consisting essentially of about 2 to about 5 percent by weight molybdenum, about 15 to about 23 percent by weight iron and about 75 to about 85 percent by weight nickel.

4,180,700

ALLOY COMPOSITION AND BRAZING THEREWITH, PARTICULARLY FOR CERAMIC-METAL SEALS IN ELECTRICAL FEEDTHROUGHS

Robert E. Kraska, Minneapolis, and Joseph F. Lessar, Anoka, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 13, 1978, Ser. No. 885,489
Int. Cl.² H01B 17/26; C03C 27/04; C22C 5/02
U.S. Cl. 174—152 GM 15 Claims



1. An article comprised of at least two members joined together by a thin alloy layer consisting essentially of vanadium, a constituent selected from the group consisting of yttrium, scandium, and mixtures thereof, the balance being gold and minor amounts of incidental impurities, if any.

4,180,701

PHASE LOCK LOOP FOR DATA DECODER CLOCK GENERATOR

Kenneth Louth, Menlo Park, and Luigi C. Gallo, Redwood City, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Jan. 28, 1977, Ser. No. 763,793
Int. Cl.² H04L 7/02
U.S. Cl. 178—69.1 6 Claims

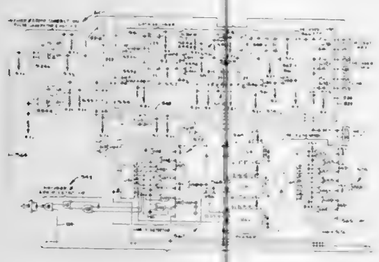
1. Apparatus for phase locking a clock signal to a self clocking data stream having data distributed in regularly occurring data cell intervals, said data defined by a data pulse occurring in the data cell interval with the data pulse interval less than the cell interval, said apparatus comprising:

an oscillator for generating said clock signal, said oscillator responsive to control signals to generate a clock signal of

a frequency and phase varying in accordance with the control signal applied thereto;

first means coupled to said oscillator for supplying said control signal in response to a current being applied thereto;

second means for supplying a predetermined level of current to said first means, said second means responsive to said data stream to supply said predetermined level of current when data pulses are absent from said data stream, said first means responsive to said predetermined level of current to supply a control signal to said oscillator that maintains the frequency of said clock signal substantially at a predetermined rate, said second means rendered inoperative in response to the presence of said data pulses in said data stream; and



third means for supplying a variable interval of current to said first means in response to the occurrence of said data pulses and said clock signal, said third means enabled to supply current to said first means in response to the occurrence of data pulses and disabled from supplying current to said first means in response to the occurrence of a selected signal transition of said clock signal during the interval of said data pulse, the interval of current supplied by said third means varying with the time of occurrence of said selected signal transition during said data pulse interval, said first means responsive to the interval of current supplied by said third means to supply another control signal to said oscillator that maintains the frequency and phase of said clock signal so that said selected signal transition of said clock signal is maintained at the midpoint of said data pulse interval, said third means rendered inoperative in response to the absence of said data pulses.

4,180,702

PHOTO ELECTRIC LIGHT DETECTION DEVICES

Erwin Sick, Icking; Klaus Hartmann, Munich, and Heinz Henneberger, Stockdorf, all of Fed. Rep. of Germany, assignors to Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Nov. 22, 1977, Ser. No. 853,889

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1976, 2654464

Int. Cl.[2] G02B 5/14

U.S. Cl. 250—227 **28 Claims**

1. A photoelectric light detection device suitable for being disposed at one end face of a light conducting rod and comprising an array of photodiodes, the array of photodiodes being subdivided into at least first and second sub-arrays of photodiodes and the photodiodes of each sub-array being connected together in parallel to a respective current voltage transformer and the outputs of the current voltage transformers being passed to a summing amplifier, there being provided a positive feedback from the output of each current voltage transformer to the photodiodes of the associated sub-array whereby the



capacitive effect of each photodiode sub-array is at least partially compensated.

4,180,703

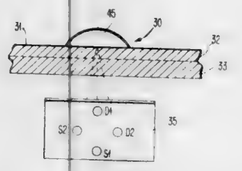
BI-DIRECTIONAL, SELF IMAGING GRATING DETECTION APPARATUS

David R. Cialone, Longmont, Colo., and Donald L. West, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1978, Ser. No. 920,305

Int. Cl.[2] G01D 5/34

U.S. Cl. 250—237 G **18 Claims**



1. A bi-directional, self-imaging grating detection apparatus comprising:

a grating comprising a strip of transparent material having first and second sets of light interrupting opaque lines thereon, said first set of lines being positioned above said second set of opaque lines and laterally offset therefrom;

a source-detector assembly comprising first and second pairs of light source and detection devices, each of said pairs comprising a light source means and a light detection means, and positioned on one side of said grating;

at least one of said devices of one of said pairs being aligned with said first set of light interrupting opaque lines and the other of said devices of said pair being aligned with the other set of light interrupting opaque lines;

an imaging reflective surface on the opposite side of said strip having a central axis which passes through a point mid way between the light source means and light detection means of each of said pairs of light source and detection devices,

means for effecting relative movement between said grating and said source-detector assembly whereby the images detected in the moving system by the detectors are offset to thereby effect a signal output by said detectors of a different phase relation.

4,180,704

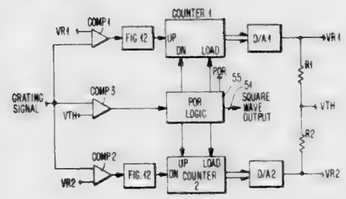
DETECTION CIRCUIT FOR A BI-DIRECTIONAL, SELF-IMAGING GRATING DETECTOR

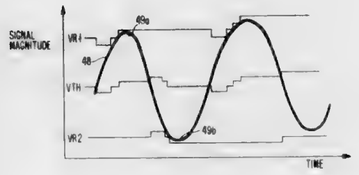
John W. Pettit, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1978, Ser. No. 920,306

Int. Cl.[2] H01J 3/14

U.S. Cl. 250—237 G **16 Claims**





10. In a bi-directional, self-imaging grating detection apparatus comprising:

a grating comprising a strip of transparent material having first and second sets of light interrupting opaque lines thereon, said first set of lines being positioned above said second set of opaque lines and laterally offset therefrom;

a source-detector assembly comprising first and second pairs of light source and detection devices, each of said pairs comprising a light source means and a light detection means, and positioned on one side of said grating;

at least one of said devices of one of said pairs being aligned with said first set of light interrupting opaque lines and the other of said devices of said pair being aligned with the other set of light interrupting opaque lines;

an imaging reflective surface on the opposite side of said strip having a central axis which passes through a point mid way between the light source means and light detection means of each of said pairs or light source and detection devices;

means for effecting relative movement between said grating and said source-detector assembly whereby the images detected in the moving system by the detectors are offset to thereby effect a signal output by said detectors of a different phase relation;

an improved signal detection circuit comprising: first and second channels each having its input connected to a light detection means output and for providing a predetermined signal output having a predetermined relation to the signal input from said detectors, each of said channels comprising:

means for generating a first voltage reference level for following the peak of the signal waveform;

second means for generating a second voltage reference level for following the valley of the signal waveform;

means for comparing said first and second voltage reference levels with said signal for altering said reference levels until said first and second voltage levels embrace the signal swing of one complete cycle of said signal;

means for continuously deriving from said voltage references a threshold level detection voltage which varies with said first and second voltage references; and

means for continuously comparing said threshold level detection voltage with said signal waveform to create said predetermined signal output therefrom.

4,180,705

ARRANGEMENT FOR THE AUTOMATIC RESYNCHRONIZATION OF A DATA TRANSMISSION RECEIVER

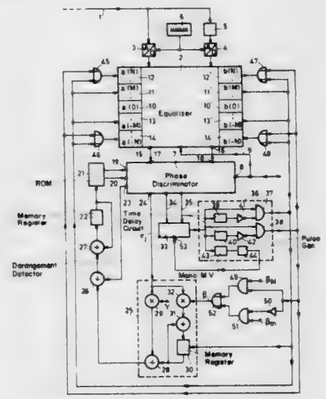
Loic B. Y. Guidoux, and Jean-Louis Renaudat, both of Le'Plessis-Robinson, France, assignors to Telecommunications Radioelectriques et Telephoniques TRT, Paris, France

Filed Oct. 3, 1977, Ser. No. 838,633

Claims priority, application France, Oct. 6, 1976, 76 30034

Int. Cl.[2] H03H 7/36

U.S. Cl. 178—69.1 **1 Claim**



1. An arrangement for the automatic resynchronization of a receiver in a system for data transmission by means of modulating a carrier, the receiver comprising an auto-adaptive equalizer using a predetermined number of adjustable filter coefficients during the transmission, a phase discriminator coupled to said equalizer and having a means for generating a local carrier, a control loop means for locking the local carrier phase on a received carrier, an integrating circuit having a predetermined time constant during the transmission, a memory, and an input means coupled to said discriminator for receiving a phase error signal, a derangement detector having an input coupled to said discriminator and an output means for supplying a derangement indication signal indicating a synchronization loss of the receiver, means coupled to said detector for forming a first and a second command pulse occurring simultaneously with said derangement indication signal and having such a predetermined maximum duration that the duration of the second command pulse exceeds that of the first command pulse and for also forming a brief third command pulse which occurs a predetermined time after the end of the maximum duration of the second command pulse, means for using the first command pulse to make the adjustable filter coefficients of the equalizer and a signal present in the memory of the integrating circuit equal to zero, means for using the second command pulse to make a reduced number of adjustable filter coefficients of the equalizer operative after the end of the first command pulse and to reduce the time constant of the integrating circuit, and means for using the third command pulse to reset the derangement detector.

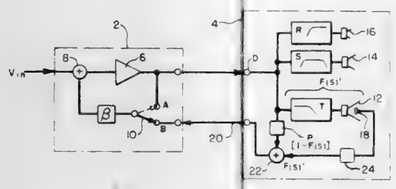
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4,180,706

LOUDSPEAKER MOTIONAL FEEDBACK SYSTEM

Knud E. Bakgaard, Struer, Denmark, assignor to Bang & Olufsen A/S, Struer, Denmark

Filed May 2, 1977, Ser. No. 792,554
Int. Cl.[2] H04R *3/00*
U.S. Cl. 179—1 F **59 Claims**



20. A motional feedback sound reproduction system comprising:

amplifier means for producing an audio signal output;

loudspeaker means responsive to the output of the amplifier and having at least one driver speaker;

transducer means associated with and responsive to one of said at least one driver speaker for providing an output signal indicative of the output of the driver associated with said transducer means;

filter means responsive to the output of the amplifier and adapted to have a transfer function corresponding to the desired transfer function of the driver speaker associated with said transducer means, said filter means providing a reference signal which is a function of said transfer function; and

comparator means responsive to said transducer output signal and said reference signal for providing a differential signal indicative of the difference between said transducer output signal and said reference signal, said differential signal being provided to the amplifier as a feedback signal.

26. An audio signal producing apparatus for use in a motional feedback sound reproduction system having loudspeaker means and external feedback signal providing means, comprising:

amplifier means for providing an audio signal output to the loudspeaker means and operable to provide said audio signal output to a conventional loudspeaker system over the entire audio frequency range, said amplifier means further including feedback input means for receiving an external feedback signal;

feedback coupling means coupled between the feedback signal providing means and said feedback input means for providing to said amplifier means a feedback signal generated by the feedback signal providing means by differencing the measured output of the loudspeaker means with a signal which is a function of the desired output of the loudspeaker means, said feedback signal having a transfer function defined by the expression $1+\Delta F(s)$, wherein $\Delta F(s)$ is the transfer function of the difference between the output of the loudspeaker means and the desired output of the loudspeaker means.

4,180,707

DISTORTION SOUND EFFECTS CIRCUIT

Robert A. Moog, East Aurora, N.Y., assignor to Norlin Industries, Inc., Lincolnwood, Ill.

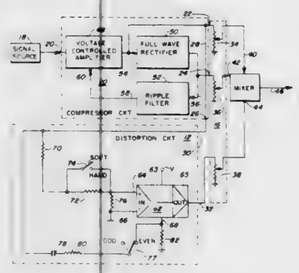
Filed Jun. 21, 1977, Ser. No. 808,503
Int. Cl.[2] G10D *5/00;* **G10H** *1/02*
U.S. Cl. 179—1 M **24 Claims**

1. A distortion sound effects circuit for introducing distortion to an audio signal applied to an input terminal thereof, comprising:

a low-gain semiconductor amplifier having an input and an output, the output from said amplifier not exceeding a predetermined maximum amplitude output level regardless of the input applied to the amplifier;

means for generating a modified signal, the amplitude of which is proportional to said audio input signal;

a distortion control circuit, said modified signal being applied through said distortion control circuit to the input of said amplifier;



said means for generating a modified signal and said distortion control circuit being normally operative, over the full amplitude range of the audio signal, to maintain the amplitude of the input signal to the amplifier at a level high enough to slightly overload the amplifier, but not high enough to cause the amplifier to clip its output at the amplifier's maximum amplitude output level;

whereby soft type distortion is obtained from the circuit.

4,180,708

FAULT-PROOF SYSTEM FOR MOBILE RADIO COMMUNICATION

Shoshichi Yamaguchi, Hakodate; Sadaatsu Okasaka, Yokohama, and Yoshikazu Takayama, Tokyo, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation and Nippon Electric Co., Ltd., both of Tokyo, Japan

Filed Aug. 30, 1977, Ser. No. 829,110
Claims priority, application Japan, Aug. 30, 1976, 51-102611
Int. Cl.[2] H04B *7/26;* **H04Q** *7/04*
U.S. Cl. 179—2 EB **4 Claims**



1. In a mobile radio communication system of the type having a composite service area established as an assembly of small zones formed by service areas of a plurality of base stations, respectively, each base station having a radio transmitter installed for its respective small zone, and a control station for sending control signals from said control station through a wire transmission line to allow said respective base stations to modulate carrier waves of one common frequency by said control signals which are mutually in-phase to transmit the modulated carrier waves to mobile units; the improvement comprises in a base station, first means for detecting a phase irregularity of said control signal to produce a first pulse and

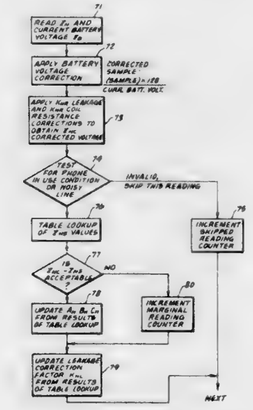
second means responsive to said first pulse for interrupting the operation of the radio transmitter of said base station.

4,180,709

DATA COLLECTION SYSTEM USING TELEPHONE LINES

John D. Cosgrove, Playa Del Rey, Calif.; Charles D. Pettis, Panaca, Nev., and Charles E. Mullett, Playa Del Rey, Calif., assignors to International Tel Data Corporation, Las Vegas, Nev.

Filed Feb. 13, 1978, Ser. No. 877,104
Int. Cl.[2] H04M *11/00*
U.S. Cl. 179—2 AM **15 Claims**



1. Apparatus for sensing at a central location events occurring at a plurality of remote sites comprising:

one or several switches at each remote site, each switch adapted to change state at the occurrence of an event to be recorded;

resistors associated with said switches for developing a resistance which is a function of said switch settings;

telephone lines coupling said switches and resistors to said central location;

a multiplexer for sequentially selecting each pair of telephone lines;

a means for reading the electrical signal on the selected pair of telephone lines; and

a computer for

(1) computing from said signal the selected line impedance;

(2) adding to said line impedance an impedance correction factor equivalent to the telephone line impedance deviation from nominal, resulting in a computed resistance which is a function of the switched resistance;

(3) using large changes in said computed resistance as a data input; and

(4) using small changes in said computed resistance to improve said impedance correction factor, thereby correcting for the change in telephone line impedance.

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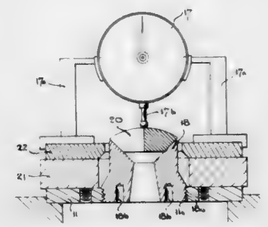
ADJUSTABLY POSITIONED PHASING PLUG

Paul B. Spranger, Fullerton, Calif., assignor to Altec Corporation, Anaheim, Calif.

Filed Aug. 24, 1978, Ser. No. 936,484
Int. Cl.[2] H04R *9/06, 31/00*
U.S. Cl. 179—115.5 H **5 Claims**

1. In a horn type loudspeaker having a driver unit which includes a centrally positioned magnetic pole piece, a phasing plug fixedly mounted on said pole piece, a magnet unit and top and back plates forming a centrally apertured unitary assembly mounted in external concentricity with said pole piece to form a magnetic gap therebetween, and a diaphragm-voice coil assembly fixedly attached to said unitary assembly having a voice coil mounted in said magnetic gap, the improvement comprising:

means for axially adjusting the position of the phasing plug relative to the diaphragm including a threaded portion of



said pole piece and an apertured portion in said unitary assembly in external concentricity with said threaded portion of the pole piece which threadably engages said cylindrical threaded pole piece portion,

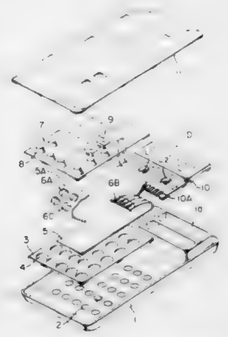
whereby the phasing plug is moved axially relative to the mounted position of the diaphragm with relative rotation between the pole piece and the unitary assembly.

4,180,711

DESK-TOP CALCULATOR KEYBOARD SWITCH

Osamu Hirata, and Yuji Harada, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 14, 1977, Ser. No. 833,344
Claims priority, application Japan, Sep. 14, 1976, 52-110046
Int. Cl.[2] H01H *13/70, 1/02;* **G06F** *15/02;* **H05K** *1/00*
U.S. Cl. 200—5 A **6 Claims**



1. A miniature electronic calculator including digit displaying means, operational means and key input means, said key input means comprising:

a casing for the calculator having first electrical contacts disposed on the inner surface thereof, said first contacts being formed of an electrically conductive material containing carbon particles;

an insulating flexible plate having a first electrically conductive layer carried on a surface thereof facing the inner surface of said casing, portions of a surface of said first layer being coated with a second electrically conductive layer of material containing carbon particles to form second electrical contacts for cooperation with said first contacts; and

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an insulating layer intervening between said first layer and said casing for covering that portion of the surface of said first layer which is not coated with said second layer.

5. A key input assembly for use in miniature electronic apparatus comprising:

first contact means formed of an electrically conductive material containing carbon particles, said first contact means including a plurality of contacts arranged separately from each other so as to form a matrix;

second contact means including a first electrically conductive layer formed of conductive paint containing silver particles, a second conductive layer of electrically conductive material containing carbon particles overlying portions of a surface of said first layer for making electrical contact with said first contact means, and an insulating layer for covering those portions of the surface of said first layer which are not overlaid with said second layer; and

means for making an electrical contact between said first and second contact means;

the portions of said first layer which are overlaid with said second layer of said second contact means being formed as pairs of contacts, the remaining portions of said first layer, which are covered with said insulating layer, including wiring conductors associated with the pair of contacts.

4,180,712

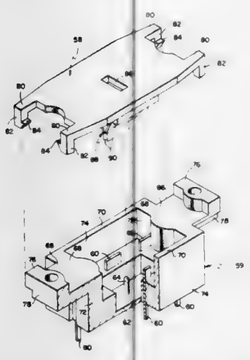
SLIDE SWITCH

Kurt Lutzenberger, Arlington Heights; James R. Bailey, Chicago, and James M. Hybl, Riverside, all of Ill., assignors to Switchcraft, Inc., Chicago, Ill.

Filed Jul. 13, 1978, Ser. No. 924,278

Int. Cl.[2] H01H *15/02*

U.S. Cl. 200—16 D **3 Claims**



1. An electrical slide switch comprising two-piece casing including a base, and an actuator, a plurality of fixed electrically conducting terminals mounted in said base and extending into the interior of said casing, said actuator being slidably mounted on the upper surface of said base, an electrical conductor blade carried by said actuator and movable therewith into contact with selected terminals, yieldable detent means for retaining said actuator in a selected rest position comprising a rigid element carried by said base interiorly of the casing and projecting upwardly toward said actuator, and control means carried by said actuator and in engagement with said element, said base having a boxlike shape with the upper end surfaces of its walls lying in a common plane, said base having mounting means comprising longitudinally protruding end portions extending beyond the end walls thereof, said end portions having upper surfaces lying substantially in the plane of the upper surface of the base, said portions further having upstanding barriers thereon, said upstanding barriers having upper surfaces disposed in the plane of the upper surface of the actuator, and resilient means carried by said actuator for yieldably retaining said actuator in assembled relation with the casing comprising integral end portions on said actuator having means for yieldably interlocking with end portions of said casing.

4,180,713

SWITCH CONTROL UNIT FOR AUTOMOBILE VEHICLE

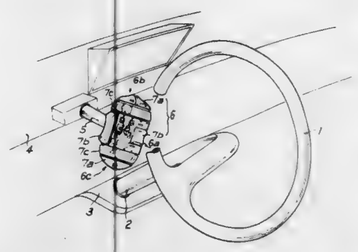
Boris Gonzales, Issy-les-Moulineaux, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Continuation of Ser. No. 698,680, Jun. 22, 1976, abandoned. This application Jan. 23, 1978, Ser. No. 871,750

Claims priority, application France, Jun. 25, 1975, 75 19965

Int. Cl.[2] H01H *9/00;* **B60K** *37/06;* **B60R** *18/00;* **H01H** *25/06*

U.S. Cl. 200—52 R **7 Claims**



1. In an automobile vehicle provided with a steering wheel, with electrical means for controlling and checking the operation of various accessories of said vehicle and with a control unit constituted by a compact box located near said steering wheel and comprising a central part and two ends, a support attached to a fixed member of said vehicle and orientable and extendable with respect to said fixed member, said box being laterally connected to said support, said control means being constituted by hand-operated switches electrically connected by wires to said accessories and located and borne by said central part and said ends of said box, an improvement of said control unit in which said central part is substantially cylindrical and at least one of said switches is borne on said box to have rotatable direction of actuation about the axis of said cylindrical central part.

4,180,714

PRESSURE-DEPENDENT ELECTRIC SWITCHING DEVICE

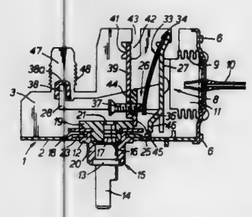
Peter R. Hansen, Nordborg, and Niels P. Thorsen, Sonderborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Jun. 2, 1978, Ser. No. 911,882

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1977, 2726608

Int. Cl.[2] H01H *35/32*

U.S. Cl. 200—81 R **17 Claims**



1. A pressure responsive electric switching assembly, comprising, a one piece sheet metal carrier having a base wall and two parallel sidewalls extending therefrom, an insulated housing containing an enclosed switching system and having an aperture through which said switching system can be actuated, said housing being connected to said carrier, a bell crank plate pivoted to said carrier and having an actuating element extending through said housing aperture for actuating said switching system, a pressure influenced operating element biasing said actuating element in one direction, spring means biasing said actuating element in the other direction, a rotary servo-element mounted on said carrier and having means for adjusting the spring tension of said spring means, a pair of vertically extending lug elements formed by said sidewalls, said insulated housing having wall means with grooves which receive said lug elements in press fitting relation for connecting said housing to said carrier.

4,180,715

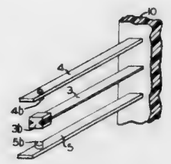
VITAL MOVABLE ELECTRICL CONTACT ARRANGEMENT

William J. Lichtenberger, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 5, 1978, Ser. No. 903,272

Int. Cl.[2] H01H *1/24, 1/26, 1/28*

U.S. Cl. 200—246 **11 Claims**



11. A fail-safe transfer switching assembly comprising, a plurality of movable heel and stationary front and back leaf spring contact members, a molded insulative contact block for retaining said leaf spring contact members in spaced relationship with each other, a plug-in terminal portion formed on one end of each of said leaf spring contact members, a silver contact button rivoted to the other end of each of said front and back leaf spring contact members, a silver impregnated carbon contact block soldered to a bifurcation formed on the other end of said movable heel leaf spring contact member for preventing welding of said silver contact buttons of said front anb back leaf spring contact members.

4,180,716

SWITCH HAVING LOCK-OFF AND LOCK-ON

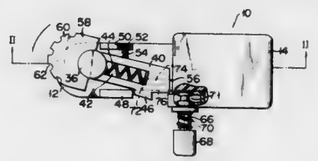
Hideo Suzuki, Yokohama, Japan, assignor to Fujisoku Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 9, 1978, Ser. No. 959,092

Claims priority, application Japan, Nov. 15, 1977, 52-153184[U]

Int. Cl.[2] H01H *3/20, 13/08*

U.S. Cl. 200—320 **8 Claims**



1. A locking switch comprising a switch case, a compression spring disposed in the switch case and a slider which is urged outwardly from the switch case by the compression spring and which can be locked in off-position, said switch further comprising:

a lock plate rotatably disposed on the slider and having a projection at one side thereof and a hole elongated along the length of the lock plate;

a pin secured to the slider and loosely inserted in the elongated hole of the lock plate to rotatably retain the lock plate;

first biasing means disposed in the elongated hole and between the pin and one end of the elongated hole for urging the lock plate toward the switch case;

a stopper engageable with the projection of the lock plate for stopping the slider; and

second biasing means disposed at the other side of the lock plate for urging the projection into engagement with the stopper thereby to prevent a pulling of the slider.

4,180,717

INDUCTIVELY HEATABLE GODET WITH INSULATING MEANS

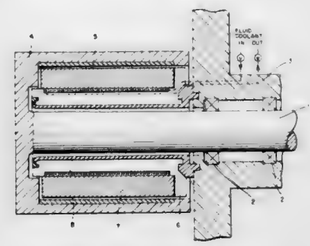
Erich Lenk, and Karl Bauer, both of Remscheid, Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid-Lennep, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 842,521

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1976, 2647540

Int. Cl.[2] H05B *5/08*

U.S. Cl. 219—10.49 A **2 Claims**



1. An improved inductively heated godet of the type wherein a drive shaft drives a rotatable hollow casing which is secured to the end of the drive shaft and a heating device is located between the drive shaft and casing on the machine frame, the heating device comprising an induction coil placed about a magnetic core formed by a laminated pack, the improvement comprising:

an elastic intermediate piece having a hose-like hollow chamber located between the laminated pack and said coil and extending over the length of said laminated pack, said hose being expandable when filled with a fluid coolant to secure said coil about said laminated pack; and

inlet and outlet means to circulate a fluid coolant through the expandable hose under pressure.

4,180,718

APPARATUS AND SYSTEM FOR PROCESSING OIL SHALE

Lester Hanson, 1903 Princeton Ave., Salt Lake City, Utah 84108

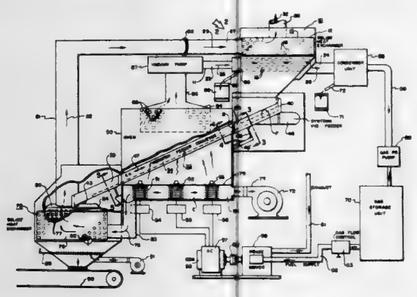
Division of Ser. No. 721,946, Sep. 10, 1976, Pat. No. 4,065,361. This application Oct. 31, 1977, Ser. No. 847,058

Int. Cl.[2] H05B *9/06*

U.S. Cl. 219—10.55 A **9 Claims**

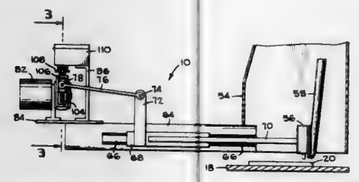
1. In combination, an oil-shale processing microwave oven having opposed openings, a reciprocating conveyor having a feed end and a discharge end and disposed in and through said

oven at said openings, said conveyor sloping downwardly from said feed end to said discharge end and comprising a rigid, unitary, homogeneous, ceramic, elongate, vibrating member and a pair of metallic supports facing said openings, receiving opposite ends of said vibrating member, and support-



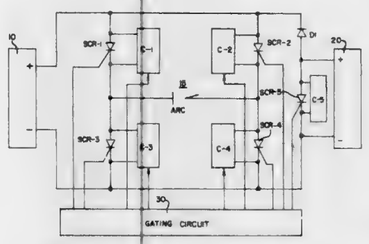
ingly connected to said oven, and means for vibrating said member coupled thereto, and wherein said vibrating member comprises an upwardly open channel having vertically depending structural cooling fins disposed solely between said supports.

4,180,719
TUNGSTEN CARBIDE IMPREGNATOR
Kenneth V. Lutz, P.O. Box 1467, Roseville, Calif. 95678
Filed Dec. 12, 1977, Ser. No. 859,797
Int. Cl.[2] B23K *9/30*; **F16H** *35/08*
U.S. Cl. 219—125.12 **9 Claims**



1. A continuous welding machine having a mechanism for oscillating the welding head across the weld area, said machine including a slide connected to said welding head and a drive arm connected to said slide, the improvement comprising:
(a) an adjustment shaft with an axis;
(b) carrier means supporting said adjustment shaft for rotation about the axis of said adjustment shaft and against displacement in the axial direction of said adjustment shaft;
(c) drive means connected to said carrier means for imparting rotation to said adjustment shaft about a drive axis;
(d) rotatable means mounted on said adjustment shaft in fixed relation thereto and having an axis coincident with the axis of said adjustment shaft;
(e) abutment means engaging said rotatable means to turn said adjustment shaft about its axis,
(f) a connector carried by said adjustment shaft for rotation therewith about said drive axis and movable along the axis of said adjustment shaft in response to said adjustment shaft turning about its axis through the engagement of said abutment means with said rotatable means;
(g) drive linkage means pivotally connected to said connector to be driven over an eccentric path in response to the rotation of said adjustment shaft about said drive axis, the displacement of said drive linkage means over its eccentric path being controlled by the location of said connector along the axis of said adjustment shaft; and
(h) actuating means selectively operated for moving said abutment means into and out of engagement with said rotatable means.

4,180,720
WELDING POWER SUPPLY
Ralph E. Barhorst, Troy, Ohio, assignor to Hobart Brothers Company, Troy, Ohio
Filed Jun. 15, 1978, Ser. No. 915,813
Int. Cl.[2] B23K *9/10*
U.S. Cl. 219—130.51 **4 Claims**

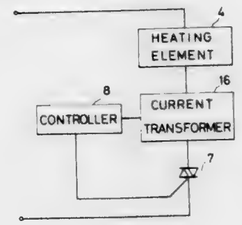


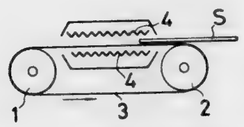
1. A welding power supply system for supplying square wave welding current to an arc circuit comprising
first power source having an adjustable controlled direct current output,
switching circuit means connected between the output of said first power source and the arc circuit for controlling the polarity of the current applied thereto,
control circuit means connected to said switching circuit means for controlling the polarity and duration of the current to said arc circuit,
second power source having a substantially constant direct current output connected to said arc circuit,
shorting means connected across the output of said second power source and being responsive to said control circuit means whereby the current from said second power source is added to the arc circuit only during one polarity of the square wave current applied thereto, and
means for isolating the shorting means from the arc circuit while the output of said second power source is short circuited.

4,180,721
METHOD OF CONTROLLING FIXING TEMPERATURE OF POWDER IMAGE IN ELECTROPHOTOGRAPHIC COPYING MACHINE
Tsutomu Watanabe, Tokyo; Nobuyuki Yanagawa, Chigasaki, and Masao Hosaka, Sagamihara, all of Japan, assignors to Ricoh Company, Ltd., Japan
Filed Sep. 12, 1977, Ser. No. 832,744
Claims priority, application Japan, Sep. 22, 1976, 51-114076
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—216 **6 Claims**

1. A method of controlling the fixing temperature of a heating element contained in a fixing unit to maintain the fixing temperature constant despite fluctuations in the voltage of a power source supplying the heating element, the method comprising the steps of detecting the current supplied to the heating element using a current transformer to detect the power supplied from the power source to the heating element to provide an output control signal corresponding to the power supplied to the heating element; and utilizing such output

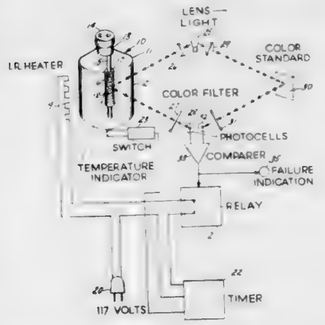
control signal to modulate the power supplied to the heating element to maintain constant the supply power to maintain the





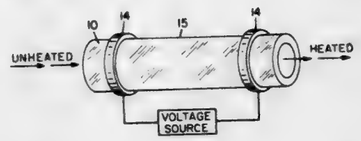
fixing temperature constant despite fluctuations of the voltage of the power source.

4,180,722
LIQUID HEATING DEVICE
Bonnie Clewans, 214-05 23rd Ave., Bay Terrace, N.Y. 11360
Filed Jul. 7, 1977, Ser. No. 813,640
Int. Cl.[2] H05B *1/02*
U.S. Cl. 219—502 **4 Claims**



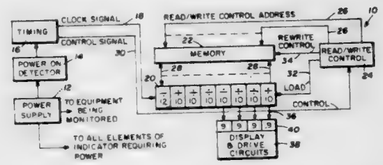
1. As a new article of manufacture, a transparent bottle for containing surgical dialysate and similar fluids comprising: a main body defining a cavity for the holding of said fluid, a neck portion communicating with said cavity, a stopper selectively engageable within said necked portion, an air inlet tube supported by said stopper, a hollow transparent sleeve carried by a segment of said air inlet tube, and a color variable temperature sensitive means including a quantity of temperature sensitive liquid crystals carried by said sleeve and visible through said body.

4,180,723
ELECTRICAL CONTACTS FOR ELECTRICALLY CONDUCTIVE CARBON GLASSES
Raymond E. Szupillo, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Mar. 28, 1977, Ser. No. 781,771
Int. Cl.[2] H05B *3/08*
U.S. Cl. 219—541 **17 Claims**



1. A high-use-temperature electrical contact for carbon-containing glass which comprises:
(a) a continuous layer of a soft glass-adherent metal positioned on the carbon-containing glass and in contact with a conductive carbon phase therein, the layer providing electrical contact with the carbon phase; and
(b) a metallic compression electrode positioned over the layer of soft, glass-adherent metal and in electrical contact therewith, the compression electrode being adapted to maintain compressive stress between the layer and the carbon-containing glass at temperatures up to and including the use temperature of the electrical contact.

4,180,724
SOLID STATE DIGITAL RUNNING TIME INDICATOR
Clyde L. Councilman, and Harry D. Shearer, both of St. Petersburg, Fla., assignors to E-Systems, Inc., Dallas, Tex.
Filed Mar. 31, 1978, Ser. No. 892,129
Int. Cl.[2] G07C *1/02*
U.S. Cl. 235—92 T **16 Claims**



1. An electrically energizable solid state running time indicator for accumulating and storing for outputting the total time a monitored event is energized, comprising;
means for simultaneously energizing said indicator and said monitored event;
means for detecting the energization of said indicator and said monitored event;
means for enabling a timing circuit in response to said detecting means indicating the energization of said indicator and said monitored event;
said timing circuit including means for generating a clock pulse signal of predetermined constant frequency;
counters for counting up the clock pulse signals generated by said timing circuitry and applied to said counters for accumulating the time said monitored event is energized, the contents of said counters corresponding to the total running time said monitored event is energized;
memory means interconnected with said counters for storing the total running time said monitored event is energized, said memory means having the capability of retaining stored information when the running time indicator is de-energized;
control circuitry for initially loading the accumulated running time stored in said memory means into said counters

in response to a signal generated by said timing circuitry when said indicator is initially energized;

said control circuitry including means for writing the total running time from said counter into said memory means after each predetermined increment of time measured by said predetermined clock pulse signal for continually updating said memory means with the current accumulated running time of the monitored event; and

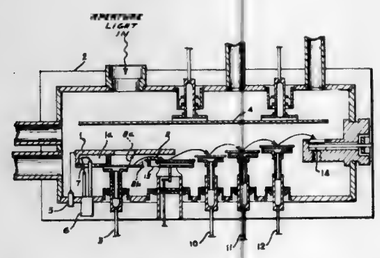
means for outputting the total running time in said counters when said indicator is energized.

4,180,725

GATING APPARATUS FOR STATIC CROSSED FIELD PHOTOMULTIPLIERS

Wayne G. Abraham, Los Altos Hills; Richard S. Enck, Jr., San Jose, both of Calif.; Ronald H. Goehner, Wayne, N.J., and Robert V. Brick, Sunnyvale, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 11, 1978, Ser. No. 904,965
Int. Cl.[2] H01J *39/12*
U.S. Cl. 250—207 **4 Claims**



1. In a static crossed field photomultiplier, apparatus for periodically gating at RF frequency the cathode current therein comprising a cathode, an output collector spaced from said cathode, a series of dynodes arranged between said cathode and said output collector, the first of said dynodes positioned on one side of said cathode, said first dynode having a hole therethrough, a gating electrode placed along a constant voltage field line in said crossed static field photomultiplier and also positioned on the other side of said cathode, and Rf drive means for said gating electrode operating so that without RF gating drive input the cathode current is unaffected and said series of dynodes amplifies said cathode current and upon introduction of said RF gating drive input the cathode current alternately flows through said hole in said first dynode to cut off the collector output and then strikes said first dynode for amplification in the remaining dynodes and to provide a collector output.

4,180,726

SYSTEM FOR MEASURING CHARACTERISTICS OF AN OBJECT'S MOTION

Ronald DeCrescent, 17613 Sunburst St., Northridge, Calif. 91325

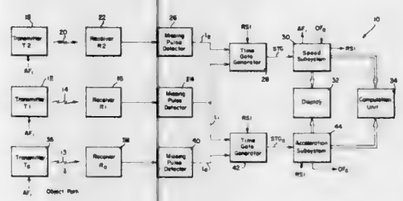
Filed Feb. 1, 1978, Ser. No. 874,110
Int. Cl.[2] G01D *21/04*
U.S. Cl. 250—222 R **16 Claims**

1. A measurement system adapted for measuring characteristics of an object's motion through a preselected zone, said system comprising:

transmitter means for transmitting first and second substantially parallel, synchronously pulsed beams of infrared energy such that said preselected zone is defined by said beams, and each beam has a predetermined fixed time interval between its energy pulses;

receiver means disposed for receiving, in the absence of beam interruptions, a portion of the transmitted energy in said first and second beams, and for providing output signals indicative thereof;

missing pulse detector and time gate generator means, responsive to said output signals from said receiver means, for producing a time gate signal which commences during the interpulse interval following the first missing pulse in



the received energy from the first beam and which terminates during the interpulse interval following the first missing pulse in the received energy from the second beam; and

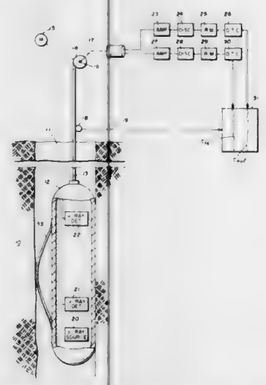
speed subsystem means, responsive to said time gate signal, for producing a first speed signal indicative of the speed of the object as it passes through said zone.

4,180,727

GAMMA-GAMMA DENSITY LOGGING METHOD

Wyatt W. Givens, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 20, 1977, Ser. No. 843,909
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—264 **5 Claims**



1. A method of measuring the density of radioactive ore-bearing formations surrounding a borehole employing a logging sonde having a gamma-ray source and a pair of gamma-ray detectors, comprising the steps of:

(a) determining a proportionality constant K relating the count rate of one of said pair of gamma-ray detectors to the other of said gamma-ray detectors when both detectors are measuring natural gamma rays from the same radioactive formation, and

(b) logging the formations surrounding the borehole by:

(i) advancing the logging sonde through the borehole while irradiating the formations with gamma rays,

(ii) producing a first count-rate signal by detecting only natural gamma rays with a first of said detectors,

(iii) producing a second count-rate signal by detecting both scattered gamma rays and natural gamma rays with a second of said detectors,

(iv) modifying said first count-rate signal by the proportionality constant K, and

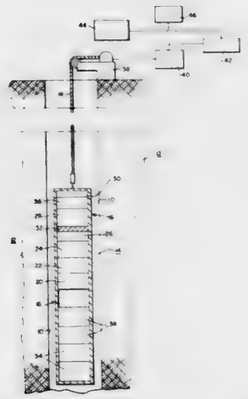
(v) correcting said second count-rate signal by said modified first count-rate signal to produce a density log of the formations surrounding the borehole.

4,180,728

NEUTRON ACTIVATION PROBE FOR MEASURING THE PRESENCE OF URANIUM IN ORE BODIES

Norman P. Goldstein, Murrysville, and Richard C. Smith, O'Hara Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 11, 1978, Ser. No. 895,323
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—264 **10 Claims**



1. A neutron activation probe for assaying the amount of uranium isotopes in an ore body comprising:

a casing;

drive means located above ground and attached to said casing for moving said casing through a borehole in said ore body;

neutron source means disposed in said casing for emitting neutrons for fissioning fissionable isotopes within said ore body and consequently emitting delayed neutrons;

a plurality of delayed neutron detectors arranged colinearly in said casing below said neutron source means for detecting said delayed neutrons;

a NaI (T1) counter disposed in said casing for detecting the 2.62 MeV line emitted by the naturally occurring thorium in said ore body;

neutron monitoring means disposed in said casing for monitoring said neutron source means; and

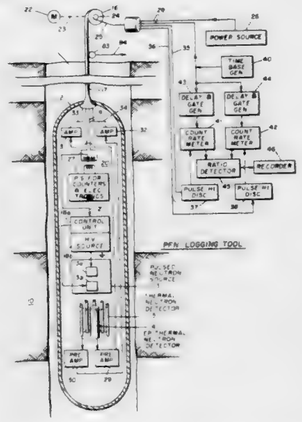
control means for controlling the pulsing of said neutron source means, for registering the signals from said delayed neutron detectors and said counter between pulses of said neutron source means, for delaying the signal of each of said delayed neutron detectors by an amount sufficient to correspond each of said signals with the same ore zone of said ore body and for adding each of said signals so delayed, and for processing the signal from said counter and subtracting the processed signal from said counter from the sum of the signals from said delayed neutron detectors for each section of ore zone and displaying the result with the result being indicative of the amount of uranium present in the ore body without being influenced by the amount of thorium present therein.

4,180,729

URANIUM LOGGING IN EARTH FORMATIONS

Wyatt W. Givens, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 785,624, Apr. 7, 1977, abandoned. This application Jan. 12, 1978, Ser. No. 868,947
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—265 **14 Claims**



1. A method for determining uranium ore grade comprising the steps of:

(a) irradiating a known concentration of uranium with a steady source of fast neutrons,

(b) determining the ratio of epithermal to thermal neutron fluxes in said known concentration of uranium in response to the irradiation of step (a),

(c) irradiating an unknown concentration of uranium with a steady source of fast neutrons,

(d) determining the ratio of epithermal to thermal neutron fluxes in said unknown concentration of uranium in response to the irradiation of step (c),

(e) irradiating said unknown concentration of uranium with repetitive bursts of fast neutrons,

(f) determining the ratio of epithermal to thermal neutron fluxes in said unknown concentration of uranium in response to the irradiation of step (e) during the period of time that prompt neutrons are being produced from neutron fission of said unknown concentration of uranium, and

(g) comparing the ratios determined in steps (b), (d), and (f) as an indication of the ore grade of said unknown concentration of uranium.

4,180,730

LOGGING TECHNIQUE FOR ASSAYING FOR URANIUM IN EARTH FORMATIONS

Wyatt W. Givens, and William R. Mills, Jr., both of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

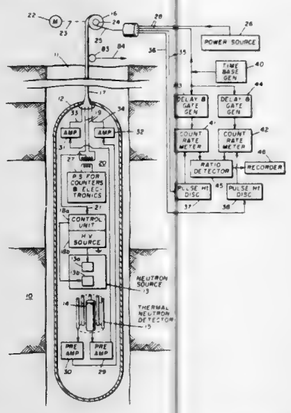
Continuation-in-part of Ser. No. 759,929, Jan. 17, 1977, abandoned. This application Jan. 12, 1978, Ser. No. 868,948
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—265 **13 Claims**

1. A method of assaying for uranium in formations traversed by a borehole, comprising the steps of:

(a) cyclically irradiating a formation of interest suspected of containing uranium with bursts of fast neutrons,

(b) measuring the thermal and the epithermal neutron fluxes within each cycle of operation when prompt neutrons

resulting from neutron fission of uranium are expected to be detected, and



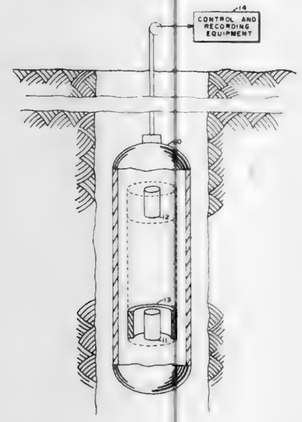
(c) comparing the measurements of the thermal and epithermal neutron fluxes as an indication of the concentration of uranium.

4,180,731

RADIOACTIVE LOGGING SONDE INCLUDING MEANS FOR MONITORING NEUTRON SOURCE OUTPUT

Wyatt W. Givens, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 23, 1978, Ser. No. 871,266
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—270 **8 Claims**



1. A method of monitoring the output of a radioactivity borehole logging tool having a pulsed neutron source and a gamma-ray detector, comprising the steps of:

(a) positioning a material susceptible to neutron activation about the neutron source,

(b) operating said neutron source during a time period sufficient to activate said material,

(c) moving said material to a position about the gamma-ray detector, and

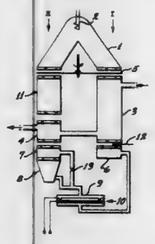
(d) monitoring the output of said gamma-ray detector as it is irradiated with gamma rays from said material as a measure of the output of said neutron source.

4,180,732

NONDISPERSIVE INFRARED GAS ANALYZER

Walter Fabinski, Hattersheim, and Udo Deptolla, Ober-Olm, both of Fed. Rep. of Germany, assignors to Hartmann & Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 23, 1978, Ser. No. 953,639
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1977, 2748089
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—344 **6 Claims**



1. A two beam infrared gas analyzer having means for providing two radiation beams which are periodically intercepted for intensity modulation, further having pressure differential sensing means connected to two absorption chamber means and including a capacitor responsive to a differential chamber as between the two absorption chamber means to provide an electrical signal representing a difference in absorption by the two chamber means, there being an additional absorption chamber filled with the same kind of sample gas to be detected and being disposed in the path of one of the beams, the improvement comprising:

a first cell being passed through by the gas to be analyzed and disposed in the path of the other one of the two radiation beams as modulated but optically in front of one of the two absorption chamber means; and

a second cell also being passed through by gas to be analyzed, and being shorter than the first cell in direction of beam propagation and being disposed in the path of the one beam in front of the other absorption chamber means.

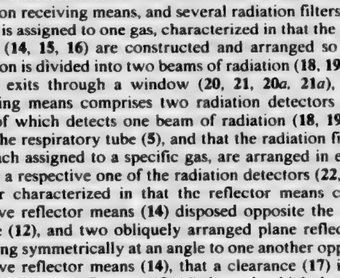
4,180,733

INFRARED RAY GAS ANALYZING APPARATUS

Shinya Ueda, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Jun. 2, 1978, Ser. No. 912,144
Claims priority, application Japan, Jun. 2, 1977, 52-70714[U]
Int. Cl.[2] G01N *21/26*
U.S. Cl. 250—345 **2 Claims**

1. An infrared ray gas analyzing apparatus of the type having a first cell irradiated by a first light beam of infrared rays, a second cell irradiated by a second light beam of infrared rays, a gas supply means for supplying a sample gas to said first cell during a first period of time and a reference gas to said first cell during a second period of time, a detector for receiving and comparing said first and second light beams passed through said first and second cells and providing an output signal, and a signal process circuit having a first output signal holding circuit for storing the output of said detector during said first period of time, a second output signal holding circuit for storing the output of said detector during said second period of time and a differential amplifier to which the outputs of said first and second signal holding circuits are applied, said amplifier providing the analyzer output signal, wherein the improvement comprises:



said gas supply means supplying said reference gas to said second cell during said first period of time and supplying said sample gas to said second cell during said second period of time.

4,180,734

GAS ANALYZER

Andras Gedeon, Täby, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 26, 1978, Ser. No. 872,449
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1977, 2707090
Int. Cl.[2] G01J *1/00, 1/42*
U.S. Cl. 250—345 **2 Claims**

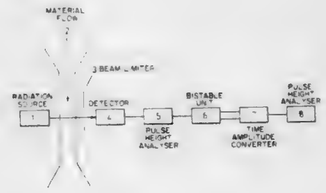
2. A gas analyzer having a respiratory tube through which the respiratory gas flows for analysis, a radiation source which radiates through the respiratory tube, radiation receiving means, reflector means which direct the radiation onto the radiation receiving means, and several radiation filters, each of which is assigned to one gas, characterized in that the reflector means (**14, 15, 16**) are constructed and arranged so that the radiation is divided into two beams of radiation (**18, 19**) each of which exits through a window (**20, 21, 20*a*, 21*a***), that the receiving means comprises two radiation detectors (**22, 23**), each of which detects one beam of radiation (**18, 19**) issuing from the respiratory tube (**5**), and that the radiation filters (**24, 25**), each assigned to a specific gas, are arranged in each case before a respective one of the radiation detectors (**22, 23**), and further characterized in that the reflector means comprises concave reflector means (**14**) disposed opposite the radiation source (**12**), and two obliquely arranged plane reflectors (**15, 16**) lying symmetrically at an angle to one another opposite the concave reflector means (**14**), that a clearance (**17**) is left between the plane reflectors (**15, 16**) through which the radiation of the radiation source (**12**) is focused to a beam of radiation striking the concave reflector means (**14**) and that the angle of inclination of the plane reflectorv (**15, 16**) is selected so that they each reflect a portion of the beam of radiation after reflection at the concave reflector means (**14**), in each case through a window (**20, 21**), and further characterized in that the obliquely arranged reflectors (**15, 16**) are reflective on both sides, that the radiation of the radiation source (**12**) is also aligned directly onto the side of the reflectors (**15, 16**) which is facing the radiation source (**12**), and the reflectors (**15, 16**) are aligned so that they direct this primary radiation in separate beams of radiation (**26, 27**) via the filters (**24, 25**) onto the detectors (**22, 23**) so that each detector (**22, 23**) is struck by a beam of radiation (**26, 27**) via the assigned filter (**24, 25**), and that a radiation interrupter (**28, 29**) is disposed before each detector (**22, 23**) which alternately interrupts the two beams of radiation (**18, 19,** and **26, 27**) striking the detectors (**22, 23**).

4,180,735

METHOD AND DEVICE FOR MEASURING THE PARTICLE SIZE IN A SLURRY OR A FLOW OF MATERIAL

Heikki J. Sipilä, and Seppo J. Uusitalo, both of Espoo, Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Sep. 1, 1977, Ser. No. 829,959
Claims priority, application Finland, Sep. 8, 1976, 762578
Int. Cl.[2] G01N *23/00, 21/24*
U.S. Cl. 250—358 R **2 Claims**



1. A method for determining the particle size distribution in a flow of material which includes particles capable of absorbing X-rays dispersed in a medium through which X-rays pass freely, comprising the steps of causing the material to flow as a thin stream at a constant velocity transversely through a narrow X-ray beam consisting of quanta which are absorbed when such quanta encounter the particles in said stream; limiting the thickness of said stream and limiting the thickness of said beam for generally precluding the presence of several of said particles in said beam at any given time, whereby absorption of quanta generally represents passage of single particles through the beam; measuring the time interval distribution of radiation quanta which have passed through the stream to obtain measurements representing absorption of quanta by particles, which measurements carry information about particle size distribution; subtracting from said measurements the values of a Poisson distribution known to represent the time interval distribution of quanta in the beam prior to passage of the beam through the stream; and determining particle size distribution arithmetically on the basis of the difference in said known and measured time interval distributions.

4,180,736

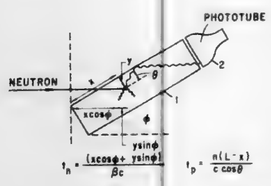
USE OF A LARGE TIME-COMPENSATED SCINTILLATION DETECTOR IN NEUTRON TIME-OF-FLIGHT MEASUREMENTS

Charles D. Goodman, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 25, 1978, Ser. No. 945,375
Int. Cl.[2] G01T *1/20, 3/00*
U.S. Cl. 250—363 R **3 Claims**

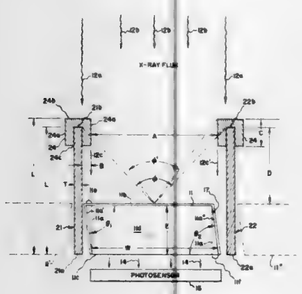
1. A method for providing time compensation in a cylindrical scintillator, which is serially connected to a phototube and a counter, utilized in neutron time-of-flight measurements of a neutron beam striking said scintillator thereby creating photons at points of scintillations within said scintillator, and pro-

viding adequate time resolution in said measurements, comprising the steps of: orienting the axis of said scintillator at a desired tilt angle with respect to said neutron beam as a function of the energy of said neutron beam such that the sum of the transit times of said neutrons and said photons in said scintillator are substantially independent of the points of scintillations,



thus achieving said time compensation; and utilizing extrapolated zero timing in said counter to provide compensation for both variable amplitudes and for variable rise-times of said photons, thus achieving said adequate time resolution; whereby the volume of said scintillator can be increased by a factor of 10–20 with a corresponding increase in the data rate of said measurements.

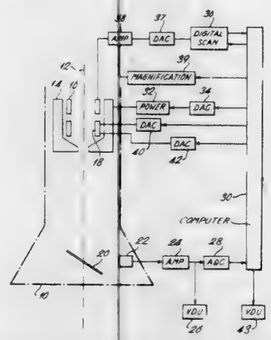
4,180,737
X-RAY DETECTOR
Jack D. Kingsley, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Feb. 6, 1978, Ser. No. 875,146
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—367 **15 Claims**



10

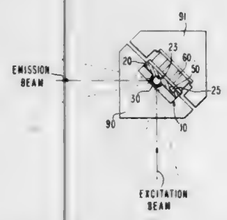
1. A detector for x-ray flux, comprising:
scintillator means for converting quanta of x-rays indident thereon to optical fluorescence quanta and including a scintillator member having a generally rectangular parallelopiped shape with at least one lateral side surface;
photosensor means adjacent the scintillator means for detecting the optical fluorescense quanta;
a pair of plates each extending forward of, and substantially perpendicular to, a front surface of said scintillator member and generally toward the source of said x-ray flux for collimating the x-ray flux impingent upon said scintillator means; and
means cooperating with said collimating means and positioned to shadow said lateral side surface of said scintillator member for substantially preventing impingement of x-ray quanta upon at least said lateral side surface of said scintillator member.

4,180,738
ASTIGMATISM IN ELECTRON BEAM PROBE INSTRUMENTS
Kenneth C. A. Smith, Cambridge, and William J. Tee, Bishops Stortford, both of England, assignors to National Research Development Corporation, London, England
Filed Jul. 27, 1978, Ser. No. 928,620
Claims priority, application United Kingdom, Jul. 30, 1977, 32084/77
Int. Cl.[2] G21K *1/08*
U.S. Cl. 250—396 ML **10 Claims**



1. In an electron beam probe instrument a method for investigating and correcting astigmatism comprising a sequence of automatic operations, namely: scanning an array of points on a specimen; setting the excitation of the objective lens to enable a focused image of the specimen to be produced; resetting the lens excitation in turn to a first value below the setting for focus and to a second value above the setting for focus; determining for the first and second values of lens excitation the directional derivatives of intensity in a plurality of directions for each point of the array; deriving the difference between the respective sums for all points of the array of the derivative in each direction, for the first value of excitation and the derivative in each corresponding direction for the second value of excitation; determining the sum of such differences, the sum, denoted by S, being a measure of the astigmatism; and operating astigmatism compensation means to minimise the value of S.

4,180,739
THERMOSTATABLE FLOW CELL FOR FLUORESCENCE MEASUREMENTS
Ahmad Abu-Shumays, Los Altos, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.
Filed Dec. 23, 1977, Ser. No. 864,137
Int. Cl.[2] G01N *21/38*
U.S. Cl. 250—461 R **12 Claims**

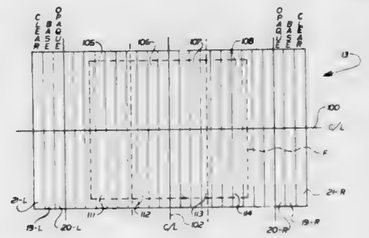


1. A flow cell assembly for fluorescence measurements, including means for obtaining temperature equilibration of a liquid sample in less than 15 seconds, including cavity forming means having a volume less than 20 microliters for containing a fluid sample to be analyzed, said cavity forming means comprising a first wall portion that is metallic and a second wall portion that is transparent to electromagnetic radiation, said first wall portion comprising a surface region on a metallic block, said second wall portion being affixed to said metallic block, said second wall portion being of a size sufficient to enable entry of a flux of exciting radiation into said cavity and observation of fluorescence emissions caused in said fluid sample by said exciting radiation;
a temperature sensing means affixed to said metallic block; and
means responsive to said temperature sensing means for driving a thermoelectric device so as to maintain, in operation, the temperature of said sample within said cavity at a desired value.

4,180,740
X-RAY INTENSIFYING SCREENS
André R. Suys, Hove, and Willy K. Van Landeghem, Sint-Gillis-Waas, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium
Filed Jun. 30, 1978, Ser. No. 920,665
Claims priority, application United Kingdom, Jul. 20, 1977, 30497/77; Belgium, Aug. 31, 1977, 56201
Int. Cl.[2] G01M *21/38*
U.S. Cl. 250—483 **9 Claims**

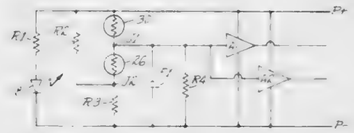
1. An X-ray image intensifying screen comprising in dispersed form in a binder layer:
(1) halide-containing phosphor particles that are admixed, combined in contact with, or have reacted with one or more organic substances being capable of reacting with hydrogen chloride and/or with labile halogen, whereby the fluorescence power of said particles is less prone to be reduced by moisture, and
(2) non-hygroscopic halide-free phosphor particles in such a ratio by weight of (1) to (2) that the ratio of the intensification factor of said screen to that of an identical screen containing, however, no non-hygroscopic phosphor particles (2) is not smaller than 1:4.

4,180,741
APPARATUS FOR DETERMINING IMAGE AREAS FOR PRINTING WITH CALIBRATION
Roland T. Palmatier, Westerly, R.I.; Barry P. Green, Waterford, Conn.; Leonard R. Reinhart, Melbourne Beach, Fla.; Francis J. Sciulli, and Jon E. Holmes, both of Palm Bay, Fla., assignors to Harris Corporation, Cleveland, Ohio
Filed Jun. 7, 1978, Ser. No. 913,465
Int. Cl.[2] G01N *21/30*
U.S. Cl. 250—559 **9 Claims**



1. Apparatus for determining the relative image area in each column of an image member divided into ink key columns corresponding to those in which ink is controlled in a printing cylinder comprising support means divisible into ink key columns for supporting said image member at positions thereon corresponding to the column positions on said printing cylinder at which the image on said image member is to be printed, light source means for directing light on said columns of said support means, means for sensing light from said columns and providing signals indicating the amount of light received, means on said support means defining a fully imaged area and an unimaged area of said image member, means for obtaining data representative of light from said unimaged area, said fully imaged area and said image member, and means for utilizing said data from said unimaged and said fully imaged areas to calibrate and normalize said data from said image member.

4,180,742
DETECTOR WITH SUPERVISORY SIGNAL FROM MONITOR CELL
William J. Malinowski, Pembroke, Mass., assignor to Chloride Incorporated, Tampa, Fla.
Filed Mar. 27, 1978, Ser. No. 890,064
Int. Cl.[2] G01N *21/26*
U.S. Cl. 250—574 **6 Claims**



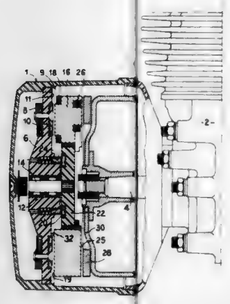
1. A detector for providing a signal when a medium to be detected reaches a predetermined concentration, comprising a light source, a first photo-resistive device positioned to receive substantially only light from the light source reflected from the medium, a second photo-resistive device positioned to receive light directly from the light source, power leads and a signal lead, said first and second photo-resistive device being connected in series through a first junction, said second photo-resistive devices being connected in series through a second junction with a resistor, the photo-resistive devices and the resistor being connected across the power leads, the signal lead being connected to the first junction, and means maintaining said second junction at a voltage which is a predetermined percentage of the power lead voltage, whereby a stand-by voltage appears at the first junction when said second photo-resistive device is illuminated the electrical characteristics of the components being such that said stand-by voltage is appreciably different in value from the voltage appearing at the first junction when the first photo-resistive device is exposed to light reflected from the medium at said predetermined concentration.

4,180,743
INERTIA-ACTUATED STARTER FOR AN EXPLOSION ENGINE
Bernard Lacroix, Montbeliard, France, assignor to Cycles Peugeot, Valentigney, France
Filed May 8, 1978, Ser. No. 904,118
Claims priority, application France, May 12, 1977, 77 14543
Int. Cl.[2] H02K *7/00*
U.S. Cl. 290—38 B **6 Claims**

1. An inertia-actuated starter for starting an engine having a crankshaft, the starter comprising an electric motor having an armature and an inductor, a flywheel connected to be rotated by the electric motor, an electromagnetic clutch including an armature and an inductor for rendering the flywheel rigid with said crankshaft, the flywheel carrying on one side thereof the armature of the motor and on an opposite side thereof the inductor of the clutch, a flat disc parallel to the flywheel and carrying the inductor of the motor and defining a planar airgap of the motor, and the flywheel comprising a part which is common to the magnetic circuit of the armature of the motor and of the inductor of the clutch which has sufficient section to

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permit the circulation of the magnetic flux of the motor or of the clutch but which is saturated by the circulation of the flux



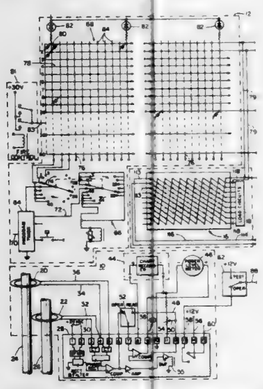
of the motor so that a remanent flux of the clutch will be cancelled out instantaneously when the magnetic flux of the motor is produced.

4,180,744

ENERGY MANAGEMENT SYSTEM

William F. Helwig, Jr., Downers Grove, Ill., assignor to Avtec Industries, Inc., Downers Grove, Ill.

Filed Aug. 8, 1977, Ser. No. 822,543
Int. Cl.[2] H02J *3/14*
U.S. Cl. 307—39 **22 Claims**



1. An energy management system for limiting continuously instantaneous permissible power levels of a plurality of controllable loads on a non-priority basis comprising:

transducer means for continuously measuring instantaneous power demands of a plurality of controllable loads;

means for pre-setting an instantaneous permissible power level;

means for generating an output signal when the measured power demand exceeds the pre-set power level;

means responsive to the output signal to disconnect a sufficient number of said plurality of controllable loads in a sequential pre-determined order from an initial load to be disconnected until the measured instantaneous power demand is reduced below the pre-set permissible power level;

switching means responsive to the output signal to select the initial load to be disconnected and to randomly vary the initial load of the plurality of controllable loads that is to be selected and disconnected;

said switching means having a plurality of stationary contacts each of which is coupled to one of said plurality of controllable loads and a movable contact coupled to the output signal and movable relative to the plurality of contacts at a pre-determined rate to contact said plurality of contacts in the sequential pre-determined order; and

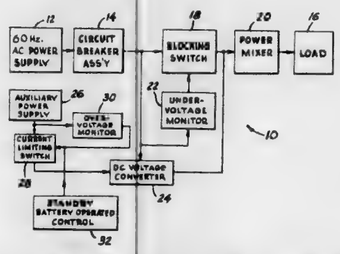
said initial load to be disconnected being dependent on the position of said movable contact with respect to one of said stationary contacts.

4,180,745

POWER REGULATING SUPPLY SYSTEM FOR AC ELECTRICAL LOADS

Frank Bartlett, 4815 E. Platte, Colorado Springs, Colo. 80916, and Allen R. Franks, P.O. Box 1552, Rockport, Tex. 78382

Filed Oct. 19, 1977, Ser. No. 843,572
Int. Cl.[2] H02J *3/46*
U.S. Cl. 307—45 **9 Claims**



1. In combination with an AC power network adapted to apply AC line voltage to an AC load substantially at rated current and frequency, and an auxiliary power source independent of said AC power network from which a DC voltage is obtained, a power control system comprising converting means connected to the auxiliary power source for converting the DC voltage from the auxiliary source into a pulsating voltage at said rated frequency and in phase with the line voltage, power mixing means operatively coupling the AC power network and the converting means to the AC load for operation thereof by either or both of said AC line and pulsating voltages under rated conditions, switch means connecting the auxiliary power source to the converting means for supply of current thereto in a signal controlled mode of operation of the converting means, sensing means connected to the auxiliary power source for detecting an overvoltage condition of the DC voltage, and gate means connecting the sensing means to the switch means for opening thereof in response to said detection of the over-voltage condition.

4,180,746

INTERLOCKED BATTERY JUMPER CABLE ASSEMBLY

William E. Giuffra, 1111 Buena Vista Dr., Jackson, Calif. 95642

Filed Nov. 6, 1978, Ser. No. 957,752
Int. Cl.[2] H02J *7/34;* **H01R** *3/02;* **H02H** *11/00*
U.S. Cl. 307—127 **10 Claims**

1. A jumper cable assembly for directly interconnecting a pair of a given type storage battery only in parallel with each other comprising:

(a) a support member;

(b) a first normally open switch element mounted on said support member having first, second and third electrical terminals and responsive to the normal voltage of said given type of storage battery when applied between said first and third electrical terminals to interconnect said first and second electrical terminals;

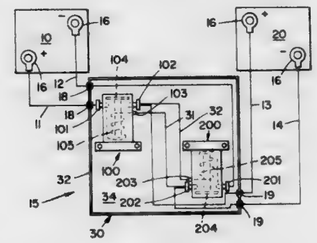
(c) a second normally open switch element mounted on said support member having first, second and third electrical terminals and responsive to the normal voltage of said given type of storage battery when applied between said first and third electrical terminals to interconnect said first and second electrical terminals;

(d) electrically conductive means electrically interconnecting said second electrical terminal of said first switch element and said third electrical terminal of said second switch element;

(e) electrically conductive means electrically interconnecting said second electrical terminal of said second switch element and said third electrical terminal of said first switch element;

(f) first and second lengths of jumper cable mounted with respect to said support member to define a pair with one end of each of said first and second lengths of jumper cable having means thereon for making removable electrical connection to a pole of a battery of said given type, the other end of said first length of jumper cable being electrically connected to said first electrical terminal of said first switch element and the other end of said second length of jumper cable being electrically connected to said first electrical terminal of said second switch element; and

(g) third and fourth lengths of jumper cable mounted with respect to said support member to define a pair with one end of each of said third and fourth lengths of jumper cable having means thereon for making removable electrical connection to a pole of a battery of said given type, the other end of said third length of jumper cable being electrically connected to said second electrical terminal of said first switch element and the other end of said fourth length of jumper cable being electrically connected to said second electrical terminal of said second switch element.

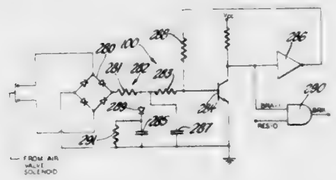


4,180,747

SWITCHING CIRCUIT FOR ELIMINATING THE EFFECTS OF CONTACT BOUNCE

John F. Zettler, Stow, Mass., assignor to Xenex Corporation, Birmingham, Mich.

Division of Ser. No. 724,059, Sep. 16, 1976, Pat. No. 4,048,886.
This application Jul. 11, 1977, Ser. No. 814,508
Int. Cl.[2] A03K *17/26;* **H03K** *17/56*
U.S. Cl. 307—247 A **3 Claims**



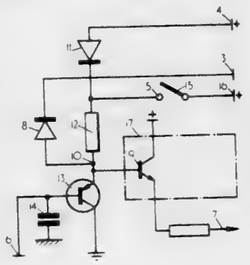
1. In a control circuit, a movable contact switch for applying a control voltage to a signal generating circuit, said switch being adapted for connection with a voltage source whereby the control voltage is alternately positive going and negative going upon actuation of the switch between open and closed positions, said movable contact switch being subject to contact bounce whereby a momentary voltage pulse is produced upon closure of said contacts, said signal generating circuit including a transistor switch having an input for control thereof and having an output for producing an output signal which is in a first or second state according to the voltage applied to the input, coupling means connected between said movable contact switch and the input of the transistor switch and including a time constant circuit having a different value of time constant for a positive going control voltage than for a negative going control voltage, the time constant being greater for a control voltage of the same polarity as said momentary pulse whereby said transistor switch is prevented from responding to said momentary pulse.

4,180,748

ELECTRONIC SOLID STATE SWITCHING DEVICE

Eric J. Gargini, West Drayton, England, assignor to Communications Patents Limited, London, England

Filed Oct. 21, 1977, Ser. No. 844,466
Claims priority, application United Kingdom, Nov. 10, 1976, 46865/76
Int. Cl.[2] H03K *17/74*
U.S. Cl. 307—253 **5 Claims**



1. A solid state switching circuit comprising in combination, a diode, an output transistor with base and collector and emitter, a signal path input terminal directly connected at a junction to the base of said transistor through the diode, an ouput terminal of the switching circuit connected to the emitter of said transistor, and a solid state device connected for selectively controlling the potential of the connection junction between the diode and the transistor in an operating mode to render both the diode and the transistor simultaneously either conductive or non-conductive, with the switching circuit exhibiting a very high off impedance to the input circuit means by serial connection solely through said diode and the transistor base impedance, and a very low on impedance to the transistor base when the diode is conducting.

4,180,749

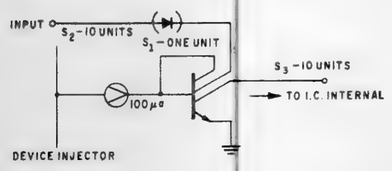
INPUT BUFFER FOR INTEGRATED INJECTION LOGIC CIRCUITS

Benjamin J. Sloan, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 18, 1977, Ser. No. 816,408
Int. Cl.[2] H03K *19/08*
U.S. Cl. 307—299 B **7 Claims**

1. A circuit for achieving compatibility between first and second systems operating at different voltage levels, comprising an inverted multiple-collector transistor wherein a first collector thereof is electrically common with the base thereof, a second collector including a Schottky barrier is connected to

receive a relatively high-voltage signal from said first system, and a third collector is connected as the input to a second



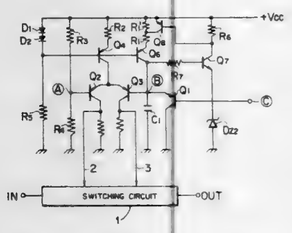
system and provides a lower-voltage signal compatible with said second system.

4,180,750

TRANSISTOR SWITCHING CIRCUIT WITH SHORTE``ED RESPONSE TIME

Akio Ozawa; Masaharu Sakamoto, and Hideo Ito, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 15, 1978, Ser. No. 886,701
Claims priority, application Japan, Mar. 15, 1977, 52-13017[U]
Int. Cl.² H03K *5/153*
U.S. Cl. 307—362 **5 Claims**



1. In a transistor switching circuit including first switching means comprising at least one switching transistor, a capacitor having a first terminal connected to the base of said transistor and a second terminal connected to ground, a first source of constant current for charging said capacitor, and second switching means for controlling the application of said charging current to said capacitor, whereby the conduction state of said transistor is reversed when the potential on said capacitor reaches a first threshold level, the improvement characterized by:

(a) third switching means for controlling said first constant current source, comprising:

means for providing a second threshold level lower than said first threshold level;

means connected between the means for providing the second threshold level and said capacitor for comparing the potential on said capacitor with the second threshold level; and

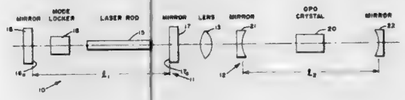
means actuated by the comparing means for increasing the magnitude of said charging current when the charge on said capacitor reaches said second threshold level.

4,180,751

MODE-LOCKED OPTICAL PARAMETRIC OSCILLATOR APPARATUS

Eugene O. Ammann, Los Altos, Calif., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sep. 8, 1978, Ser. No. 940,530
Int. Cl.² H03F *7/00*
U.S. Cl. 307—428 **9 Claims**



1. Apparatus for producing mode-locked optical parametric oscillations comprising

a pump laser having a cavity with an effective length l_p and an output with a frequency f_p,

means to mode lock said pump laser output, and

an optical parametric oscillator (OPO) adapted to receive the mode-locked pump laser output comprising

a nonlinear crystal, and

first and second mirrors on opposite sides of said crystal with an effective spacing l_o between said mirrors substantially less than l_p,

said pump output interacting with said crystal for producing parametrically generated outputs having a signal frequency (f_s) and an idler frequency (f_i) which satisfy the relationship

$$f_p = f_s + f_i,$$

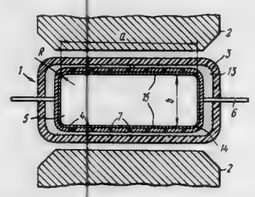
said mirrors being highly reflective at the frequency of one of said crystal outputs and being highly transmissive at said pump output frequency and at the frequency of the other of said crystal outputs.

4,180,752

MAGNETOHYDRODYNAMIC DEVICE

Samuil M. Gorlin; Grigory A. Ljubimov; Valentin A. Bitjurin; Valentin I. Kovbasjuk; Vladilen I. Maximenko; Stanislav A. Medin, and Alexandr E. Barshak, all of Moscow, U.S.S.R., assignors to Institut Vysokikh Temperatur Akademii Nauk SSSR, Moscow

Filed Dec. 28, 1977, Ser. No. 865,340
Claims priority, application U.S.S.R., Dec. 29, 1976, 2435698
Int. Cl.² H02N *4/02*
U.S. Cl. 310—11 **1 Claim**



1. A magnetohydrodynamic device, comprising: a magnetic system; a duct located in said magnetic system and adapted for a conducting gas to flow at an angle with the direction of the induction vector of said magnetic field; a plurality of electrodes electrically interacting with said gas; a cross-sectional shape of the working space of said duct bounded by a convex curve inscribed into a rectangle with its sides $a \leqq b$; a minimum radius R of curvature of said curve being related to a distance 'x' from entry of said duct to the cross-section under consideration by the following formula:

$$\frac{a}{2} > R \geqq 5\,(10^{-2} \text{ to } 10^{-4}) \cdot \left[1 + \frac{P_o}{4S_o}\, x\right]^{\alpha} \frac{4S_o}{P_o},$$

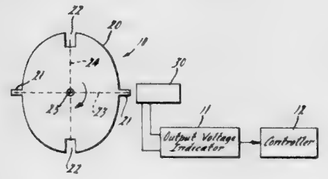
where P_o and S_o stand, respectively, for the perimeter and cross-sectional area of the duct at the entry thereof and $0.5 \leqq \alpha \leqq 1$.

4,180,753

APPARATUS FOR GENERATING ELECTRICALLY DISTINGUISHABLE BIPOLAR SIGNALS USING A MAGNETIC SENSOR AND AN OVAL WHEEL WITH TEETH AND NOTCHES IN ITS MINOR AND MAJOR AXIS

James C. Cook, II, Lincoln Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 30, 1978, Ser. No. 920,762
Int. Cl.² H02K *21/26*
U.S. Cl. 310—168 **6 Claims**



1. Pulse generating means for providing electrically distinguishable signals, said signals occurring as a function of position of a relatively movable element, said pulse generating means comprising:

a transducer means located on said relatively movable element for generating the electrically distinguishable signals;

a transducer receiving means located in energy transfer coupling with respect to said transducer means for providing the electrically distinguishable signals in response to passage of said transducer means past said transducer receiving means;

said transducer means including teeth means for projecting toward said transducer receiving means for generating an electrical signal of a first shape and notch means for receding away from said transducer receiving means for generating an electrical signal of a second shape, distinguishable from said first shape, each of said teeth means and notch means being sufficiently sized to be detected by said transducer receiving means;

said transducer means including a generally oval disc of a magnetic material having a major and a minor diameter, said projections for said teeth means extending outward from said disc along said minor diameter, said notch for said notch means extending radially inward along said major diameter, said notch and said projection having a generally rectangular shape and the periphery of said oval between an adjacent pair of notch means and teeth means being a continuous curve; and including two teeth, one tooth being opposite from the other, and further including two notches, one notch being opposite from the other notch and each notch being positioned midway around the circumference of said oval between said two teeth; and

said transducer receiving means including a permanent magnet, an electrical pickup means coupled to said magnet for detecting changes in the magnetic flux, and said magnet being sufficiently close to a path of rotation for said teeth means and said notch means that movement of said teeth means and said notch means past said transducer receiver means causes a change of magnetic flux within pickup means

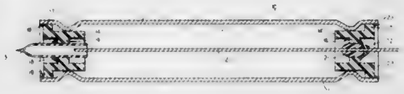
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4,180,754

GEIGER-MUELLER TUBE WITH A RE-ENTRANT INSULATOR AT OPPOSING SEALED ENDS THEREOF

Stephen Levy, Monmouth County, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 6, 1978, Ser. No. 883,552
Int. Cl.² H01J *17/04, 17/18, 5/20*
U.S. Cl. 313—93 **5 Claims**



1. A Geiger-Mueller tube within which a geiger discharge is produced comprising:

a tubular cylindrical cathode,

an elongated metal anode coaxially disposed within said cathode along the longitudinal axis of said cathode,

a gaseous medium disposed in the space between said cathode and said anode,

a dielectric support member at each end of said cathode, each including an axially extending tubular body portion, a first projecting portion adjacent one end of said body portion and extending radially outward from said body portion and a second projecting portion extending radially inward from said body portion and spaced from the end of said body portion remote from said first projecting portion,

first dielectric sealing means for sealing said first projecting portion of said member to said cathode adjacent the corresponding end of said cathode,

the other ends of each of said members removed from said corresponding first projecting portion forming a longitudinal boundary of the geiger discharge region of the tube,

second dielectric sealing means for sealing said second projecting portion of one of said members to a region of said anode juxtaposed to said second projecting portion which is disposed outside the longitudinal boundaries of said geiger discharge region,

the outer surface of each of said body portions in the region of said longitudinal boundary being spaced from said cathode to shield the geiger discharge from distorted electric fields occurring at the interface of the corresponding first projecting portion and said cathode, and

the inner surface of the body portion of said one member in the region of said longitudinal boundary defined by said other end of said one member being spaced from said anode to shield the geiger discharge from the distorted electric field occurring at the interfaces of said second dielectric sealing means and said anode.

4,180,755

SEALED BEAM LAMP INCLUDING FILAMENT LOCATING MEANS

Roy A. Nixon, Jr., Greenville, Ohio, assignor to Corning Glass Works, Corning, N.Y.

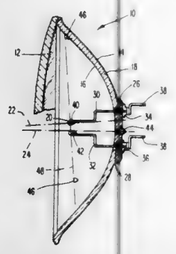
Division of Ser. No. 749,450, Dec. 10, 1976, Pat. No. 4,125,890.
This application Sep. 15, 1978, Ser. No. 942,602
Int. Cl.² H01K *1/18, 1/32*
U.S. Cl. 313—113 **6 Claims**

1. A sealed beam incandescent lamp, comprising:

a lens member for refracting a beam of light emanating from within the lamp;

a generally concave reflector member attached to said lens member to form a lamp envelope, said reflector member exhibiting a substantially parabolic transverse section;

a filament assembly fixedly attached to said reflector member, and including a filament member disposed approximately in the latus rectum of the parabola; and



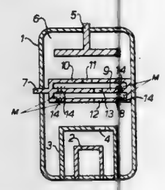
at least three discrete bosses formed in the inner surface of said reflector member, said bosses defining a plane substantially perpendicular to the axis of said parabola such that said bosses enable the accurate mounting of the filament at the latus rectum of the lamp.

4,180,756

THYRATRONS

Robert J. Wheldon, Chelmsford, and Christopher V. Neale, Hatfield Peverel, both of England, assignors to English Electric Valve Company Limited, Chelmsford, England

Filed Jul. 10, 1978, Ser. No. 923,349
Int. Cl.² H01J 61/00
U.S. Cl. 313—193 **8 Claims**



1. A gas filled thyratron for switching the current in a discharge circuit, said thyratron having a thermionic cathode and an anode and, therebetween, at least one grid which in operation may be grounded, said grid comprising at least three electrically and mechanically united apertured baffle electrodes occurring in sequence in the thermionic cathode-to-anode path of the thyratron, the baffle electrodes on the cathode side of the final baffle electrode forming at least one re-entrant hollow non-thermionic cathode which is capable of conducting the full discharge current without degradation, the discharge current path being short and of low impedance.

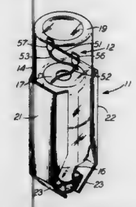
4,180,757

INCANDESCENT LAMP WITH VIBRATION-PROTECTED FILAMENT MOUNT

Jack E. Distler, Indianapolis, Ind.; Albert A. Hamilton, Belton, Mo., and Everett R. King, Fort Lauderdale, Fla., assignors to Western Electric Co., Inc. and Bell Laboratories, Inc., both of New York, N.Y.

Filed Feb. 23, 1978, Ser. No. 880,392
Int. Cl.² H01K 1/14
U.S. Cl. 313—315 **4 Claims**

1. An incandescent lamp comprising:
an envelope having a substantially cylindrical center portion, a base at one end of the center portion and a lens at the other end thereof;
a pair of terminals, each terminal having a contact surface located opposite the other on the outer surface of the center portion, adjacent the base and centered on a plane including the cylindrical axis of the center portion;
a pair of posts spaced from each other and mounted in the base, each post being adjacent one of the terminals, each of the posts being electrically coupled to its adjacent terminal, the posts extending within the envelope from the base toward the lens, the posts being skewed with respect to the cylindrical axis; and



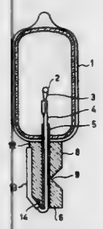
a filament spanning a gap between the two posts in a direction substantially perpendicular to the plane on which the terminals are centered, whereby a mechanical shock applied to the lamp in a direction substantially perpendicular to the plane is received by the filament in a direction coinciding generally with its longitudinal extent.

4,180,758

CAPLESS ELECTRIC INCANDESCENT LAMP

Victor R. Notelteirs, and Josephus F. Rijckaert, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 20, 1977, Ser. No. 834,953
Claims priority, application Netherlands, Oct. 1, 1976, 7610860
Int. Cl.² H01J 5/48
U.S. Cl. 313—318 **5 Claims**



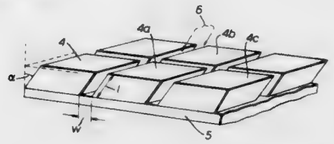
1. A capless electric incandescent lamp having: a light-pervious lamp envelope sealed by means of a flat pinch having first and second opposed major faces, a filament disposed in said envelope, two current supply conductors connected to said filament extending through said flat pinch and emanating from said lamp envelope at the end of said pinch remote from said envelope, said conductors being bent backwards along the surface of said first major face of said pinch in the direction of said filament, said first major face being provided with means for preventing contact between the portions of said current supply conductors extending along said first major face, said second major face of said pinch having position fixing means for cooperating with a fixing member in a lampholder, said position fixing means comprising a V-shaped groove extending across said second major face.

4,180,759

THERMAL CAMERA TUBES

Jeffrey J. Harris, Colchester, and Brian W. Rampling, Maldon, both of England, assignors to English Electric Valve Company Limited, Chelmsford, England

Filed Oct. 21, 1977, Ser. No. 844,179
Claims priority, application United Kingdom, Aug. 20, 1977, 35045/77
Int. Cl.² H01J 29/45
U.S. Cl. 313—388 **8 Claims**



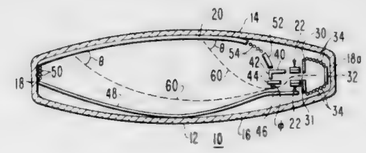
1. A pyroelectric target plate for a thermal camera tube comprising, in combination:
a supporting layer of low thermal conductivity; and
an array of pyroelectric target elements on one surface of said supporting layer, said elements being disposed in regularly spaced relation in a plurality of columns and a plurality of rows thereof whereby to define channels between the elements, at least a majority of said elements completely overhanging channels adjacent thereto, thereby tending to restore the reduction in responsivity which would otherwise be experienced by virtue of there being no pyroelectric material within the channels themselves.

4,180,760

FLAT CATHODE RAY TUBE HAVING MAGNETICALLY COLLIMATED ELECTRON BEAM DEVICE

Kern K. N. Chang, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 9, 1978, Ser. No. 868,230
Int. Cl.² H01J 31/08
U.S. Cl. 313—422 **8 Claims**



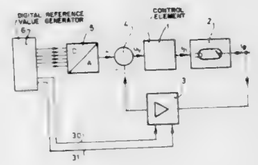
1. An image display device comprising:
an evacuated envelope having front and rear walls and a plurality of side walls between the front and rear walls;
a cathodoluminescent screen on the front wall;
a magnet structure extending longitudinally along and spaced from one side wall and having two poles spaced from one another, the magnet structure generating a uniform magnetic field between the two poles;
an electron gun for generating and directing an electron beam into the space between the one side wall and the magnet structure;
a first deflection means for deflecting said electron beam in a substantially parabolic trajectory so that it will pass between the poles of the magnet structure at various points along the magnet's length while maintaining a constant angle of incidence at which the electron beam enters the space between the magnet poles; and
a second deflection means for deflecting the electron beam toward the screen in a substantially parabolic trajectory after it passes between the poles of the magnet structure so that the beam impinges upon the screen at a substantially constant angle of incidence.

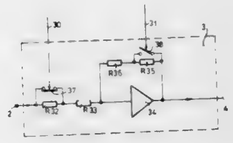
4,180,761

CONTROL DEVICE, PARTICULARLY FOR CONTROLLING THE EMISSION CURRENT OF AN X-RAY TUBE

Rudolf Ochmann, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 781,935
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1976, 2613997
Int. Cl.² G05F 1/00; H05B 37/02, 39/04, 41/36
U.S. Cl. 315—292 **14 Claims**





1. A control device for controlling the emission current of an X-ray tube comprising, a digital reference value generator having a plurality of binary positions, a digital-to-analog converter having an input coupled to receive a digital value signal supplied by the reference value generator and an output at which a corresponding analog reference value signal is produced, only a part of the binary positions of the digital reference value generator being coupled to the input of the digital-to-analog converter, a comparison device for comparing the analog reference value signal with a signal representing the actual value of the emission current and for controlling, in the event of a deviation therebetween, the emission current so as to reduce the deviation, an amplifier circuit for amplifying at least one of the compared signals, and means coupling the remainder of the binary positions of the digital reference value generator to a control input of the amplifier circuit to control the amplification thereof so that if the emission current increases, the quotient of the reference value signal and the actual value signal at the input of the comparison device is step-wise is to be increased.

4,180,762

DRIVER CIRCUITRY FOR PLASMA DISPLAY PANEL

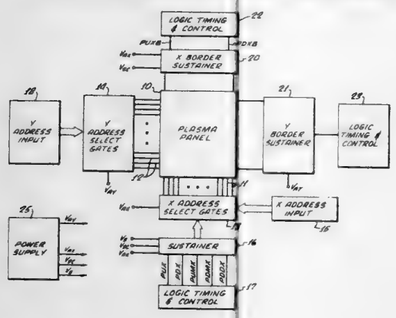
Larry F. Weber, Urbana, Ill., assignor to Interstate Electronics Corp., Anaheim, Calif.

Filed May 5, 1978, Ser. No. 903,126
Int. Cl.² H05B 37/00, 39/00, 41/00
U.S. Cl. 315—169.4 **13 Claims**

1. A sustainer drive system for an AC plasma panel, said panel having plural electrodes respectively forming the X and Y axes thereof, said drive system comprising:
means for supplying a sustainer waveform across the panel comprising a single sustainer circuit;
means for coupling said single sustainer circuit to those panel electrodes which form only one of said axes;
said single sustainer circuit including:
an NPN pull-high output transistor connected in series

with an NPN pull-down output transistor between a high voltage and ground, with the sustainer drive signal being produced at the node common to both transistors, the base of said pull-high transistor floating up and down at a high voltage close to the panel voltage;

low voltage base drive circuits coupled to, but isolated from said NPN pull-high and pull-low output transistors by respective first and second isolating capacitors;



means coupled to said pull-high transistor for preventing ringing thereof when said transistor is turned on and off; and

means coupled to said pull-high and pull-low output transistors for insuring that both of said transistors are not driven on simultaneously.

4,180,763

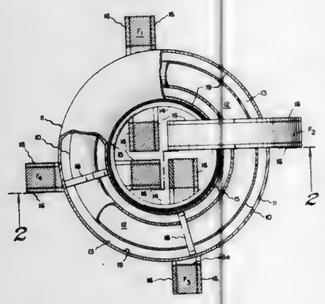
HIGH INTENSITY DISCHARGE LAMP GEOMETRIES

John M. Anderson, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 25, 1978, Ser. No. 872,153

Int. Cl.² H05B *41/16, 41/24*

U.S. Cl. 315—248 **39 Claims**



1. A high intensity discharge, solenoidal electric field lamp comprising:

an inner toroidal shaped discharge tube containing a suitable ionizable gaseous medium which emits visible wavelength radiation when a current traverses said ionizable medium, said medium being at a pressure of between approximately 200 torr and approximately one atmosphere;

an outer toroidal shaped transparent protective tube wholly surrounding said discharge tube;

means for centrally spacing said inner discharge tube within said outer protective tube, so that the surfaces of neither come in contact;

a plurality of toroidal shaped ferrite cores disposed in a substantially regular manner circumferentially about the inner discharge tube and the outer protective tube in the form of interlocking rings; and

means to couple the ferrite cores to a radio frequency power source.

4,180,764

CONTROL CIRCUIT FOR AN A.C. DISCHARGE LAMP

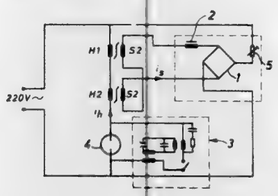
Poul Mørup, Vaerløse, Denmark, assignor to Alex Grosman A/S, Herlev, Denmark

Filed May 8, 1978, Ser. No. 903,883

Claims priority, application Denmark, Nov. 16, 1977, 5084/77

Int. Cl.² H05B *41/36*

U.S. Cl. 315—283 **3 Claims**



1. A control circuit for an A.C. discharge lamp (4) comprising a series transductor having control windings (S1, S2) coupled between the A.C. source and the lamp (4), the control windings (S1, S2) of the series transductor being connected to the A.C. source through a filter (2) and a full-wave rectifier (1), and a substantially capacitive variable impedance (5) in the control winding circuit.

4,180,765

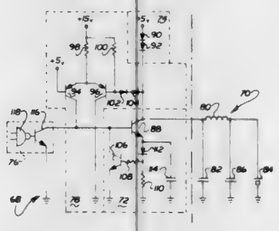
HIGH SPEED DEFLECTION YOKE DRIVER CIRCUIT

Charles M. White, Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed May 24, 1978, Ser. No. 909,219

Int. Cl.² H01J *29/70, 29/76*

U.S. Cl. 315—408 **8 Claims**



1. Apparatus comprising:

current switching means controllable to limit the level of current passing therethrough;

clamping means for preventing saturation of said current switching means by preventing the voltage across said current switching means from dropping below a fixed limiting voltage level, greater than the saturation voltage of said current switching means;

means for causing said current switching means to switch between a first state, wherein substantially no current flows through said current switching means, and a second state, wherein a controlled current flow passes through said current switching means and the voltage across said current switching means is at said limiting voltage level;

circuit means coupled to said current switching means such that the operation of said current switching means influences the operation of said circuit means; and

means for controlling said current switching means so as to control the current flow therethrough when said current switching means is in said second state, to limit current flow through said clamping means so that said current flow through said clamping means does not exceed a limiting current level, independently of variations in the amount of current passing between said circuit means and said current switching means, wherein said limiting current level is selected to be substantially smaller than the maximum current level which is expected will pass between said circuit means and said current switching means.

4,180,766

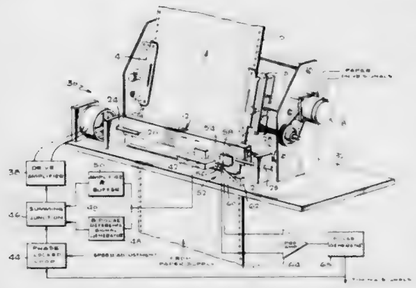
RECIPROCATING LINEAR DRIVE MECHANISM

Jerry Matula, Culver City, Calif., assignor to Printronix, Inc., Irvine, Calif.

Filed Feb. 4, 1977, Ser. No. 765,873

Int. Cl.² H02K *33/00*

U.S. Cl. 318—128 **3 Claims**



1. A reciprocating linear drive mechanism comprising:

reciprocable means;

linear magnetic actuator means coupled to said reciprocable means;

resilient means defining opposite limit positions along the travel of the reciprocable means and operative to be impacted by the reciprocable means to reverse the direction thereof at each of the opposite limit positions and to cause the reciprocable means to rebound from the resilient means;

means coupled to said linear actuator means for controlling the velocity of said reciprocable means between the limit positions, said means including means responsive to each rebounding of the reciprocable means from the resilient means for providing an energizing signal to the linear magnetic actuator means to insure to and maintenance of the reciprocable means at a desired velocity, a tachometer for generating a signal representing the velocity of the reciprocable means, means for providing a reference signal representing desired velocity of the reciprocable means, and means for energizing the magnetic actuator in accordance with any difference between the signal representing the velocity of the reciprocable means and the reference signal; and

means responsive to the reciprocable means for generating pulses in response to increments of movement of the reciprocable means;

the means for providing a reference signal including means for providing a clocking signal of selected frequency and means responsive to the generated pulses and to the clocking signal for generating a signal representing the difference in frequency between the generated pulses and the clocking signal.

4,180,767

CLOSED-LOOP REGULATING AND OVERHAULING LOAD ENERGY DISSIPATING CHOPPER TYPE CURRENT CONTROL SYSTEM FOR D.C. MOTORS

Robert L. Risberg, Milwaukee, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Continuation of Ser. No. 877,923, Nov. 10, 1969, abandoned, which is a continuation of Ser. No. 637,530, May 10, 1967, abandoned. This application Jul. 29, 1971, Ser. No. 167,453

Int. Cl.² H02P *5/00*

U.S. Cl. 318—308 **11 Claims**

1. The combination with a rectifier A.C. to D.C. supply source having high and low potential D.C. output buses, a D.C. motor, a tapped inductor, a pair of controlled electronic devices having their main conducting paths connected respectively between the opposite ends of said inductor and said output buses and arranged to afford current flow from high to low potential, a second inductor connected from the tap of said tapped inductor in series with the armature of said motor to the low potential bus, pairs of parallel connected capacitors and diodes connected between the tap of said tapped inductor and said buses with the diodes poled for current flow opposite to that of said electronic devices and means in circuit with said electronic devices for effecting alternate conduction of the latter, of energy absorbing means in circuit with the motor armature circuit and control means responsive to a predetermined increase in the potential between said buses during overhauling motor operation to bypass motor armature current through said energy absorbing means until the electronic device connected to the low potential bus is thereafter rendered conducting.

4,180,768

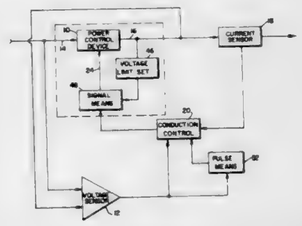
ENERGY LIMITING FOLDBACK CIRCUIT FOR POWER SUPPLY

Angelo Ferraro, Ballston Lake, N.Y., assignor to Tele/-Resources, Incorporated, Armonk, N.Y.

Filed Jul. 20, 1978, Ser. No. 926,504

Int. Cl.² G05F *1/58*

U.S. Cl. 323—9 **6 Claims**



1. An energy limiting foldback circuit for a power supply having a power control device in the output thereof, the energy limiting foldback circuit comprising:

(a) voltage sensing means for sensing the potential drop between the input and output of the power control device,

(b) current sensing means for sensing the current through the power control device,

(c) conduction control means responsive to predetermined combined range of output levels of the voltage sensing means and the current sensing means for controlling the operating conduction through the power control device whereby controlled conduction is permitted during a threshold range of said output levels and zero conduction is achieved when said output levels exceed said threshold range, and

(d) timing control means associated with said voltage sensing means and said conduction control means for allowing an excessive voltage condition to exist across the power

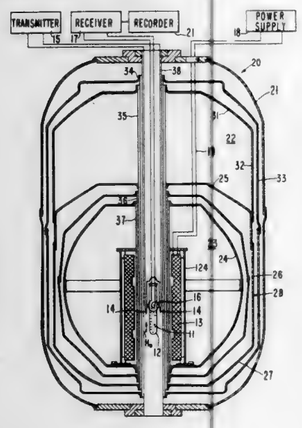
control device for a predetermined amount of time before said conduction control means becomes operative.

4,180,769

SUPERCONDUCTING SOLENOID WITH COMPENSATION FOR AXIAL GRADIENTS

Robert E. Gang, Sunnyvale, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Feb. 21, 1978, Ser. No. 879,298
Int. Cl.[2] G01R *33/08*
U.S. Cl. 324—319 **14 Claims**



1. A superconducting solenoid coil having compensation for axial gradients of orders 1–7 comprising

a superconducting wire, said wire being wound as a solenoid having a longitudinal axis and multiple helical layers, adjacent ones of said layers having faces that substantially abut against each other, and being pitched in opposite directions,

said solenoid coil including:

a main solenoid winding portion having a longitudinal axis, a transverse centrally located axis, first and second opposite end portions, and a central portion, said main winding portion including a substantially equal number of turns on opposite sides of the transverse axis and producing a longitudinal magnetic field within the interior of the solenoid,

first and second auxiliary solenoid winding portions coaxial with the main winding portion, said first and second auxiliary portions being substantially aligned with the first and second end portions of the main winding portion, said auxiliary winding portions being wound, connected and positioned to increase the magnetic field of the main winding portion in the vicinity of the end portions, said first and second auxiliary winding portions having substantially the same number of turns and being positioned along the longitudinal axis at approximately equal distances from the transverse axis;

first and second supplemental winding portions coaxial with the main winding portion, said first and second supplemental winding portions being respectively and substantially aligned with the first and second end portions of the main winding portion, said supplemental winding portions being wound, positioned and connected to increase the magnetic field of the main winding portion in the vicinity of the end portions, said first and second supplemental winding portions having substantially the same number of turns and being positioned along the longitudinal axis at approximately equal distances from the transverse axis;

the auxiliary and supplemental winding portions compensating for the second and fourth order gradients of the main winding portion;

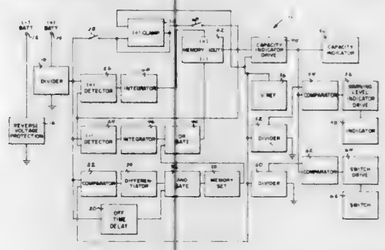
and a further winding portion coaxial with the main winding portion and aligned with the central portion of the main winding portion, said further winding portion having an axial extent such that no part thereof is aligned with any part of the auxiliary winding portion or the supplemental winding portion, said further winding portion having a substantially equal number of turns on opposite sides of the transverse axis, said further winding portion being positioned, wound and connected to increase the magnetic field of the main winding portion in the vicinity of the center portion of the main winding portion.

4,180,770

METHOD AND APPARATUS FOR DETERMINING THE CAPACITY OF LEAD ACID STORAGE BATTERIES

Richard L. Eby, Marshfield, Mass., assignor to Anderson Power Products, Inc., Boston, Mass.

Filed Mar. 1, 1978, Ser. No. 882,323
Int. Cl.[2] G01N *27/42, 27/46*
U.S. Cl. 324—429 **17 Claims**



1. A method for determining the capacity of a lead acid storage battery, said method comprising the steps of:

(1) sensing an initial open circuit voltage of the battery when no current flows through the battery;

(2) storing the value of said initial open circuit voltage;

(3) sensing the voltage of the battery while current flows through the battery in a first direction;

(4) comparing the value of the sensed voltage with the value of the stored initial open circuit voltage to produce a difference value representing the rate of current flow through the battery in said first direction;

(5) adjusting said stored initial open circuit voltage value as a function of said difference value to produce a first direction current flow, adjusted, stored voltage value; and,

(6) utilizing said first direction current flow, adjusted, stored voltage value, said value representing the then capacity of the battery while current flows therethrough in said first direction.

4,180,771

CHEMICAL-SENSITIVE FIELD-EFFECT TRANSISTOR

Henry Guckel, Madison, Wis., assignor to Airco, Inc., Montvale, N.J.

Filed Dec. 2, 1977, Ser. No. 856,935
Int. Cl.[2] G01N *27/56, 31/04;* **A61B** *5/05*
U.S. Cl. 324—71 SN **10 Claims**

1. A field-effect transistor device for measuring a chemical property of a substance to which the device is exposed, comprising:

a semiconductor substrate;

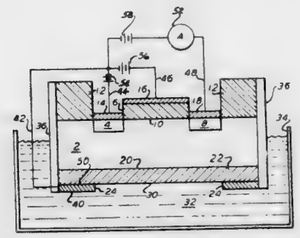
a source region in contact with the substrate and located near a first surface of the substrate;

a drain region in contact with the substrate, located near the first surface of the substrate and spaced apart from the source region;

a gate insulator which overlies a first area of the first surface of the substrate between the source and drain regions;

three electrodes for providing a separate electrical connection to the source region, drain region, and gate insulator; and

a layer of chemically sensitive material which overlies a second area of the substrate separate from the first area



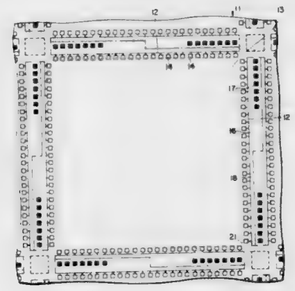
and which has an active surface for exposure to the substance, said chemically sensitive material connected in series with the substrate and located on the opposite side of the substrate from the gate insulator, said second area located sufficiently near the source and drain regions so that exposure of the chemically sensitive material to the substance results in a change of the electrical conductance between the source and drain regions.

4,180,772

LARGE-SCALE INTEGRATED CIRCUIT WITH INTEGRAL BI-DIRECTIONAL TEST CIRCUIT

Fred K. Buelow, Los Altos Hills, and John J. Zasio, Sunnyvale, both of Calif., assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 31, 1977, Ser. No. 801,906
Int. Cl.[2] G01R *15/12*
U.S. Cl. 324—73 PC **10 Claims**



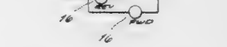
1. In a large scale integrated circuit, a semiconductor body having a surface, said large scale integrated circuit formed in said semiconductor body through said surface and comprising a large number of interconnected circuit elements and a large number of input and output pads connected to the circuit elements and disposed near the outer perimeter of the semiconductor body, at least one integrated test circuit having interconnected circuit elements formed in the semiconductor body and extending through said surface, said integrated test circuit having a plurality of probe pads carried by the semiconductor body and connected to the test circuit, said integrated test circuit being formed external of but in relatively close proximity to said large scale integrated circuit, said integrated test circuit including bi-directional driver means directionally selectable for writing data into or for reading data from said large scale integrated circuit, said bi-directional driver means including write means responsive to write signals for selecting said bi-directional driver means in a direction to write data into said large scale integrated circuit and including read means responsive to read signals for selecting said bi-directional drive means in a direction to read data from said large scale integrated circuit, said bi-directional driver means connected between one of said probe pads and a plurality of said input and output pads whereby access can be obtained to said large scale integrated circuit through probing of said probe pads.

4,180,773

VOLTAGE PHASE TESTING AND INDICATING DEVICE

Monley M. Y. Shiao, c/o George Spector 3615 Woolworth Bldg. 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed May 26, 1977, Ser. No. 800,612
Int. Cl.[2] G01R *25/00, 19/16*
U.S. Cl. 324—86 **1 Claim**



1. A electrical testing device, comprising in combination, a small case containing six resistor elements and two capacitors in an electric circuit connected to three leads extending outward of said small case forming line side connections said leads connected to said circuit between successive pairs of resistor elements said circuit also being connected through four terminals to a pair of neon lamps each of which is connected to two of said terminals, said resistors being in series said capacitors being in series with each other and in parallel with said resistors, said terminals being connected to conductors connecting resistors and capacitors, wherein two terminals are connected to the circuit between two resistors and two other terminals connected between a resistor and capacitor, wherein said small case is removably mounted inside a larger case having a line side and load side connections and terminals and leads being connected to said terminals of larger case and said two lamps are mounted on a removable cover of said larger case, wherein said small case is comprised of three units a first of which contains said six resistor elements and said capacitors in said circuit, said leads connected to said circuit, and a pair of prong receptacles having separate contacts wired to said circuit, a second of said units including a block with said terminals each connected to a half ring formed around two openings receiving a pair of prongs therethrough which are mounted on a third of said units, said prongs each comprising two contacts engaging said lamps which are mounted on said third unit, said prongs, passing through said second unit, engaging said prong receptacles of said first unit.

4,180,774

REGENERATIVE METHOD AND APPARATUS TO CONTROL AN ELASTIC RESET TORQUE IN MOVABLE APPARATUS

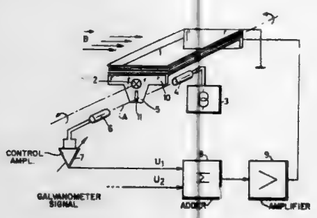
Giovanni Odone, Saint-Sulpice, and Roland Cochard, Morges, both of Switzerland, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 24, 1978, Ser. No. 908,981

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1977, 2724811

Int. Cl.² G01R *1/30, 1/38;* **H03F** *1/40*

U.S. Cl. 324—125 **5 Claims**



1. In an elastic suspension system for a positioning element, positioned under control of a positioning signal,

a method of compensation for elastic restoring torque upon deflection of the system

comprising the steps of

generating a beam of light (A,A') projected in an optical path from a light source (**4**) to a photo detector (**6**);

interrupting at least in part said beam of light by a blocking element (**5, 11**) directly coupled to the positioning element and located at least in part in said optical path;

deriving a deflection signal from the photo detector representative of change of the blocking position of the blocking element in said path upon mechanical deflection of the positioning element;

and combining said deflection signal, as a restoring torque compensation signal with the positioning signal.

4,180,775

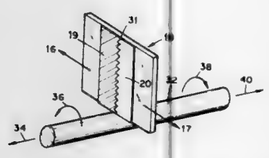
MAGNETIC THIN-FILM SPLIT-DOMAIN CURRENT SENSOR-RECORDER

Edmund J. Hsieh, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 16, 1977, Ser. No. 778,275

Int. Cl.² G01R *33/02, 19/04*

U.S. Cl. 324—249 **12 Claims**



1. A passive nuclear-radiation hard current sensing and recording system including a magnetic thin film split-domain sensor-recorder, said system comprising:

a current path;

a substrate; and

a unaxial anisotropic magnetic thin film on said substrate, said film having first and second opposing pairs of outer edges, said film including a first portion initially magnetized in a first direction to form a first domain and a second portion initially magnetized in a second direction to form a second domain, said first and second differently magnetized domains having contiguous interior edges forming an initial magnetic boundary in a predetermined location that is parallel to said second pair of edges, said film being oriented with one edge of said first opposing pair of outer edges adjacent said current path, said domains being formed prior to placement of said film adjacent said current path, said domains and boundary being movable in response to the magnetic field of an electric current along said current path to a second location representative of the peak strength and direction of the field and therefore of the peak amplitude and direction of the current, one of said domains, being at least partially switched during the boundary movement so that at least a portion of said film is magnetically uniform between said second pair of edges, said uniformity extending from said one outer edge adjacent said current path towards the opposite edge of said first edge pair a distance that is proportional to the peak strength of the current.

4,180,776

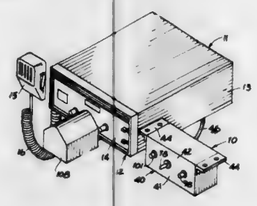
AUTOMATIC CHANNEL SCANNING ATTACHMENT FOR MANUAL CB RADIO TRANSCEIVER

Philip J. Lindemann, P.O. Box 1665, Omak, Wash. 98841

Filed Apr. 27, 1978, Ser. No. 900,413

Int. Cl.² H04B *1/40*

U.S. Cl. 325—25 **6 Claims**



1. A universal automatic channel scanning attachment for a wide variety of manual channel selector CB radio transceivers adapted to be responsive to squelch circuits that produce squelch signals of positive or negative polarity when the transceivers are not tuned to active channels to enable each transceiver with an attachment to automatically scan the CB frequency channels and tune the transceiver in an active channel; said attachment comprising:

a chassis separated from the CB radio transceiver;

an input electrical wire mounted to the chassis and adapted for extending to the CB radio transceiver and electrically connecting to the transceiver squelch circuit to transmit the squelch signal to the chassis;

a signal polarity network mounted to the chassis and electrically coupled to the input electrical wire for generating a process signal in response to the receipt of the positive or negative squelch signal;

a scanning control network mounted in the chassis and electrically coupled to the signal polarity network for generating a channel scanning signal in response to the squelch signal; and

channel selector actuating means electrically coupled to the scanning control network and adapted to be operatively connected to the manual channel selector of the CB radio transceiver for actuating the manual channel selector to automatically scan the CB channels when the channel scanning signal is generated.

4,180,777

TUNING METER FOR USE WITH A PULSE COUNT FM DEMODULATION CIRCUIT

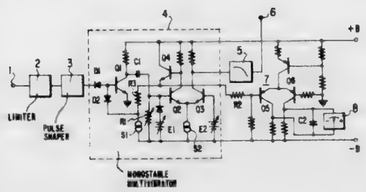
Tsuneo Yamada, and Yukihiko Miyamoto, both of Tokyo, Japan, assignors to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1977, Ser. No. 859,538

Claims priority, application Japan, Dec. 28, 1976, 51-159460

Int. Cl.² H04B *1/16*

U.S. Cl. 325—363 **6 Claims**



1. A tuning meter circuit for use with an FM demodulator comprising

means including a monostable multivibrator responsive to a frequency modulated input signal for generating at the output of said monostable multivibrator a train of pulses of substantially constant width, the number of which per unit time interval varies in accordance with the frequency modulation of said input signal;

a difference amplifier responsive to said pulse train, said difference amplifier having a threshold level at which it changes state; and

a tuning meter responsive to said difference amplifier the duty cycle of said monostable multivibrator and the threshold level of said difference amplifier being so related that said tuning indicator indicates said FM receiver is tuned when a signal of exact intermediate frequency is applied to said FM demodulator.

4,180,778

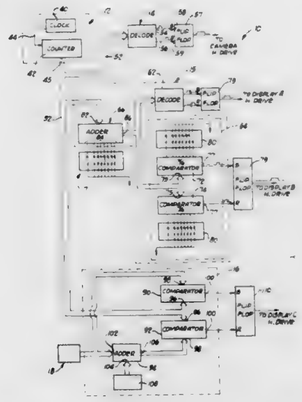
DIGITAL SIGNAL PHASE SHIFTING SYSTEM

James C. Worthington, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Jan. 18, 1978, Ser. No. 870,272

Int. Cl.² H03K *5/15, 5/153, 5/159;* **H04N** *5/04*

U.S. Cl. 328—155 **13 Claims**



1. A system for producing multiple cyclic output signals occurring at intervals which are adjustably variable comprising:

(a) a timing signal generator having an output producing cyclic digitalized timing signals;

(b) a first system output signal generator having an input connected to said timing signal generator output and at least one output forming a first system output, said first system output signal generator producing at least a first system output signal in response to the occurrences of a predetermined timing signal generator output;

(c) a second system output signal generator having a first input receiving said timing signal generator output, a second input, and a plurality of outputs defining second system outputs; and

(d) setting means connected to said second input of said second system output signal generator, said setting means producing an adjustable setting signal conditioning said second output signal generator to produce said plurality of second system output signals in response to occurrences of a timing signal generator output signal bearing a selected temporal relationship to said predetermined timing signal generator output signal.

4,180,779

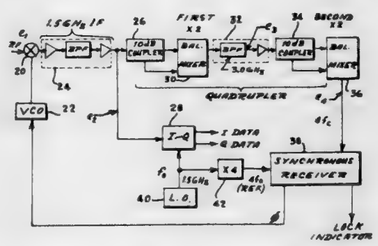
QPSK DEMODULATOR WITH TWO-STEP QUADRUPLER AND/OR TIME-MULTIPLEXING QUADRUPLING

William R. Hook, Los Angeles, and Ronald P. Hilberg, Redondo Beach, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 21, 1978, Ser. No. 944,440

Int. Cl.² H04L *27/22*

U.S. Cl. 329—50 **7 Claims**



1. A quadrupler demodulator apparatus comprising in combination:

a first doubler unit to receive an input signal, said input signal having a center frequency with a predetermined bandwidth, said first doubler unit doubling said input signal to provide a first bi-phase output signal, said first bi-phase output signal being centered at twice the center frequency of said input signal and having substantially the same predetermined bandwidth as said input signal,

a bandpass filter unit receiving said first bi-phase output signal, said bandpass filter unit having the same bandwidth as said predetermined bandwidth of said input signal, said bandpass filter unit filtering out and removing any undesired cross products, said bandpass filter unit recovering and maintaining said first bi-phase output signal, said bandpass filter unit providing said first bi-phase output signal as an output,

a second doubler unit connected to said bandpass filter unit to receive said first bi-phase output signal as an input signal, said doubler unit doubling said first bi-phase output signal to provide a CW output signal, said CW output signal being centered at four times the center frequency of said input signal, and

a phase lock loop connected between the output of said second doubler unit and the input of said first doubler unit, said phase lock loop receiving said CW output signal, said

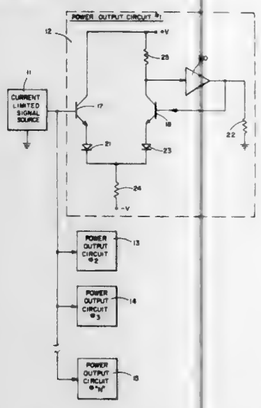
phase lock loop generating a reference signal which has a frequency of four times the center frequency of said input signal, said phase lock loop generating a phase error signal which is responsive to the relationship between said CW output signal and said reference signal.

4,180,780

INPUT DECOUPLING CIRCUIT FOR TRANSISTOR DIFFERENTIAL AMPLIFIER

Paul S. Rumbaugh, Garden Grove, Calif., assignor to Altec Corporation, Anaheim, Calif.

Filed Oct. 2, 1978, Ser. No. 947,629
Int. Cl.² H03F 3/45
U.S. Cl. 330—252 **5 Claims**



1. In a power amplifier system comprising a plurality of output circuits having separate output loads and receiving their inputs from a common signal source, at least one of said output circuits including a transistor differential amplifier, the improvement being means for providing decoupling between the output of said one of said circuits and the output of said signal source to prevent a short circuit in the output of said one of said circuits from loading down the output of said signal source, comprising:

diode means connected in the emitter circuits of said one of said transistor differential amplifiers, said diode means having a reverse breakdown voltage greater in magnitude than the maximum peak to peak value of the output of said signal source.

4,180,781

BIASING AND DRIVE CIRCUITRY FOR QUASI-LINEAR TRANSISTOR AMPLIFIERS

Leonard A. Kaplan, Fords, N.J., assignor to RCA Corporation, New York, N.Y.

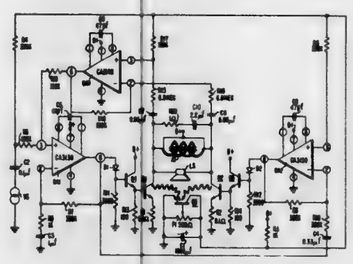
Filed Jun. 5, 1978, Ser. No. 912,331
Int. Cl.² H03F 3/26
U.S. Cl. 330—272 **7 Claims**

1. In an amplifier including a first transistor means with base and emitter and collector electrodes; means connecting said first transistor means for operation in a first common-emitter amplifier configuration including a connection of its emitter electrode to a point of reference potential; and bias potential supply means sensitive to the temperature of said first transistor means for supplying a bias potential, a temperature-compensated component of which if applied via direct coupling to the base of said first transistor means would result in substantially invariant collector idling current despite change in the temperature of said first transistor means, the improvement comprising:

a first high-gain differential-input amplifier having a non-inverting input terminal to which said bias potential is applied, having an inverting input terminal, and having an output terminal;

a first resistance with first and second ends respectively connected to the output terminal of said first differential input amplifier and to its inverting input terminal for maintaining its inverting input terminal at substantially the same quiescent potential as at its non-inverting input terminal and thereby referring the quiescent potential at its output terminal to the bias potential applied to its non-inverting input terminal;

first direct coupling means for direct coupling the output terminal of said first differential-input amplifier to the base electrode of said first transistor means;



means for superimposing an input signal on the quiescent potential at one of the input terminals of said first differential-input amplifier; and

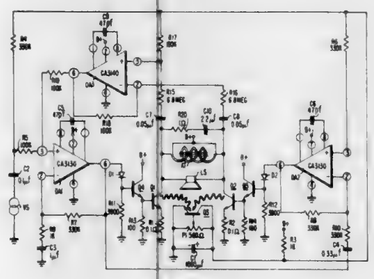
a second resistance with a first end connected to the inverting input terminal of said first differential input amplifier and with a second end connected for dividing the signal variations fed back from the output terminal of said first differential-input amplifier to its inverting input terminal via said first resistance, for causing a response to said input signal to be superimposed on the quiescent potential at the output terminal of said first differential-input amplifier, which response is proportionally related to said input signal by a factor dependent on the values of said first and second resistances.

4,180,782

PHANTOM FULL-BRIDGE AMPLIFIER

Leonard A. Kaplan, Fords, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,394
Int. Cl.² H03F 3/26
U.S. Cl. 330—276 **4 Claims**



1. A phantom full-bridge amplifier for supplying oppositely-phased push-pull drives to first and second ends of a load, for

permitting the first and second ends of said load to be driven sufficiently to provide an output voltage across said load with a range substantially at least four times as large as a restricted difference available between reference and operating potentials, said phantom full-bridge amplifier comprising:

first and second supply terminals for receiving said operating and reference potentials, respectively;

first and second load terminals for connection to the first and second ends, respectively, of said load;

first and second transistor means of the same conductivity type each having respective input and output and common electrodes;

means for maintaining the common electrodes of said first and second transistor means substantially at said reference potential, including

first direct current conductive means connecting the common electrode of said first transistor means to said second supply terminal, and

second direct current conductive means connecting the common electrode of said second transistor means to said second supply terminal;

push-pull driver means responsive to an input signal for supplying push-pull signals to the input electrodes of said first and second transistor means, said push-pull driver means being of a type such that said push-pull signals are developed responsive to said input signal by transformerless means for avoiding phase shift through said push-pull driver means such that excursions of said input signal in a first sense render said first transistor means more conductive and said second transistor means less conductive, such that sufficiently large excursions of input signal in said first sense render said second transistor means non-conductive, such that excursions of input signal in a second sense opposite to the first sense render said first transistor means less conductive and said second transistor means more conductive, such that sufficiently large excursions of input signal in said second sense render said first transistor means nonconductive; and

means responsive substantially solely to the currents flowing through the output electrodes of said first and second transistor means for providing oppositely-phased push-pull drives at said first and second load terminals, respectively, essentially consisting of

a step-up autotransformer winding having a first half connected between said first load terminal and said first supply terminal, having a second half connected between said second load terminal and said first supply terminal, and having the output electrodes of said first and second transistor means respectively connected to points in its first and second halves equally remote from their connections to said first supply terminal and sufficiently so that the self inductance thereof is sufficient for producing an output voltage of said range substantially free of phase distortion.

4,180,783

PHASE LOCK LOOP DATA TIMING RECOVERY CIRCUIT

Jacob R. Khalifa, Mt. Laurel, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 6, 1977, Ser. No. 830,855
Int. Cl.² H03B 3/04
U.S. Cl. 331—2 **4 Claims**

1. A phase locked loop, comprising

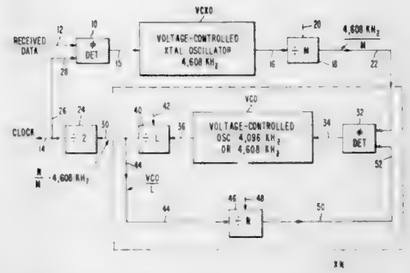
a phase detector having a signal input and a reference input,

a voltage-controlled oscillator responsive to the output of said phase detector,

a feedback loop from said oscillator to the reference input of said phase detector,

a divider in said feedback loop to divide the frequency by an integer, and

a programmable multiplier in said feedback loop to multiply the frequency by an integer, said programmable multiplier



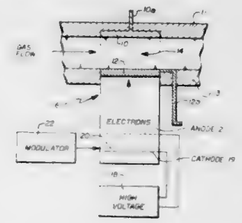
consisting of a phase locked loop including a divider in its feedback path.

4,180,784

FREQUENCY MODULATED ELECTRICAL DISCHARGE LASER

Donald J. Nelson, Seattle; Denis J. Pistoresi, Kent, and Michael F. Weisbach, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 19, 1977, Ser. No. 834,289
Int. Cl.² H01S 3/097
U.S. Cl. 331—94.5 PE **10 Claims**



1. In a laser in which the inversion population is enhanced by a factor or factors other than the input power applied to the laser, such as by molecular collisions in a gas laser, wherein the improvement comprises:

means for modulating the input power applied to the laser, which has a given amplitude, by a modulating signal having a modulation frequency and a modulation amplitude; and

control means establishing the modulation frequency and modulation amplitude at levels such that the average power output of the laser increases for the given amplitude of input power.

4,180,785

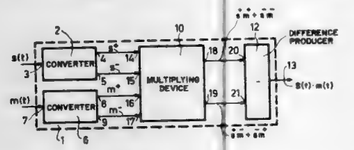
MODULATOR FOR FORMING THE PRODUCT OF TWO INPUT SIGNALS

Johannes O. Voorman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 27, 1978, Ser. No. 900,711
Claims priority, application Netherlands, Jun. 7, 1977, 7706237
Int. Cl.² H03C 1/52
U.S. Cl. 332—9 T **6 Claims**

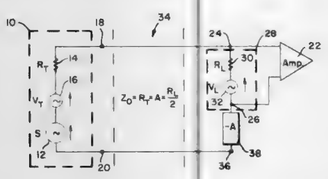
1. A modulator for amplitude modulation of a first input signal having positive and negative excursions relative to a

reference level with a second input signal also having positive and negative excursions relative to a reference level, said input signals being suppressed during the modulator process and only the product terms being obtained as an output signal, wherein the modulator comprises a first converter circuit for converting said first input signal into a first and a second signal current of one polarity relative to a datum level, the value of the first signal current corresponding to that of the first input signal for the positive excursions of the first input signal and being substantially equal to the datum level for the negative excursions of the first input signal, the value of the second signal current corresponding to that of the first input signal for the negative excursions of the first input signal and being substantially equal to the datum level for the positive excursions of the first input signal, a second converter circuit for converting said second input signal into a third and a fourth signal current of one polarity relative to said datum level, the value of the third signal current corresponding to that of the



second input signal for the positive excursions of said second input signal and being substantially equal to said datum level for the negative excursions of said second input signal and the value of the fourth signal current corresponding to that of the second input signal for the negative excursions of said second input signal and being substantially equal to said datum level for the positive excursions of said second input signal, and a multiplying device coupled to the first and to the second converter circuits and having first and second outputs, said multiplying device supplying in response to the first second third and fourth signal currents derived from the two converter circuits the sum of the products of the first and third and of the second and fourth signal currents at said first output and supplying the sum of the products of the first and fourth and of the second and third signal currents at said second output, and a difference producer coupled to the first and second outputs of the multiplying device and having an output for producing the desired modulated output signal.

4,180,786
IMPEDANCE-MATCHING CIRCUIT USING NEGATIVE LOW-NOISE RESISTANCE
Robert L. Forward, Oxnard, and Gary D. Thurmond, Calabasas, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed Jul. 31, 1978, Ser. No. 929,582
Int. Cl.² H03H 7/38
U.S. Cl. 333—32 **6 Claims**



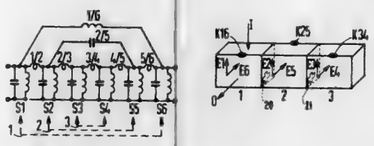
1. A circuit for impedance matching electrical signal-processing circuitry having first and second input terminals to a source of electrical signals having first and second output terminals and a given characteristic source resistance comprising:

means coupled between said first and second input terminals for providing a load resistance approximately equal to twice said source resistance;

means coupled between said second input terminal and said second output terminal for providing a negative low-noise resistance approximately equal in magnitude to said source resistance; and

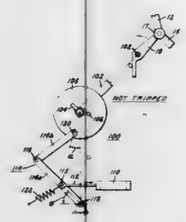
means for intercoupling said first output terminal and said first input terminal.

4,180,787
FILTER FOR VERY SHORT ELECTROMAGNETIC WAVES
Gerhard Pfitzenmaier, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Filed Nov. 21, 1977, Ser. No. 853,530
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1976, 2654283
Int. Cl.² H01P 7/06, 1/20, 1/16
U.S. Cl. 333—212 **6 Claims**



1. A micro-wave filter comprising: a plurality of sequentially connected filter circuits; a plurality of resonators, each resonator operating as two of said filter circuits, said resonators operating in a dual mode; individual resonators of said plurality being arranged next to one another in a row; the filter circuits all being coupled in a predetermined sequential mode of electrical operation; first and last filter circuits being provided with connection line means for input and output of micro-waves, respectively; all sequentially adjacent resonators having coupling means therebetween for coupling the micro-waves therebetween without mode change; and at least one resonator providing two filter circuits which are not directly adjacent in the sequential mode of electrical operation and are coupled via an additional coupling.

4,180,788
VACUUM CIRCUIT BREAKER WITH DELAYED TRIP OPERATION
Philip Barkan, Stanford, Calif., assignor to General Electric Company, Philadelphia, Pa.
Filed Jul. 3, 1978, Ser. No. 921,938
Int. Cl.² H01H 3/42
U.S. Cl. 335—190 **21 Claims**



1. In combination with an electric circuit breaker, means for providing a predetermined delay between the initiation of a command pulse and the mechanical operation of an element of the circuit breaker in response to the command pulse, which comprises:

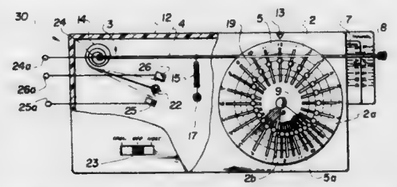
(a) axial shaft means mechanically coupled to said element of said circuit breaker which is to be operated wherein a preselected rotation of said shaft means causes said mechanical operation of said element, said axial shaft means including impact receiving means extending radially from said shaft means;

(b) flywheel means rotatable about said axial shaft means, said flywheel means including impact imposing means extending generally axially outward from a major face of said flywheel means;

(c) an electric solenoid having a translatable armature for rotating said flywheel means, said electric solenoid receiving said command pulse; and

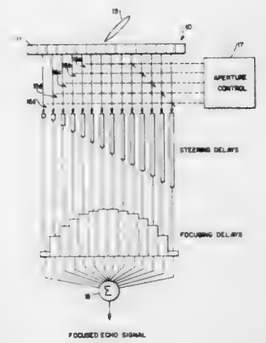
(d) coupling means mechanically coupling said translatable armature to an eccentrically located point on said flywheel means wherein translation of said armature causes said flywheel means to rotate through said predetermined delay from a first position not operating said element of said circuit breaker to a second position operating said element wherein at said second position said impact imposing means of said flywheel means engages said impact receiving means of said shaft means and causes said preselected rotation of said shaft means and said operating of said element.

4,180,789
TIME VARIABLE THERMOSTAT
Frank Martucci, 360 Tom Hunter Rd., Fort Lee, N.J. 07024
Filed Jul. 10, 1978, Ser. No. 923,067
Int. Cl.² H01H 37/62
U.S. Cl. 337—301 **9 Claims**



1. A time variable thermostat for controlling a heater comprising, a temperature actuated switch connected to the heater for actuating the heater at a selected temperature having a movable contact and at least one fixed contact, said movable contact being moved out of engagement with said fixed contact when the selected temperature is reached to deactivate the heater and being movable into engagement with the fixed contact to activate the heater when a selected temperature has not been reached, a temperature selection arm connected to said movable contact for selecting the temperature at which said movable contact is out of engagement with said fixed contact, a clock motor having a shaft rotatable once in 24 hours associated with said temperature selection arm, a temperature selection disc connected to said shaft having a plurality of radially extending slots, at least one arm engagement pin slidably mounted within each of said slots and engageable with said temperature selection arm, each of said arm engagement pins being radially positionable along said associated slot which corresponds to a selected temperature, and biassing means biassing said temperature selection arm against at least one of said arm engagement pins.

4,180,790
DYNAMIC ARRAY APERTURE AND FOCUS CONTROL FOR ULTRASONIC IMAGING SYSTEMS
Charles E. Thomas, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Dec. 27, 1977, Ser. No. 864,597
Int. Cl.² G01S 9/66
U.S. Cl. 367—7 **6 Claims**



1. An ultrasonic imaging system with improved lateral resolution comprising:

a linear array of transducer elements which are selectively operative during alternate transmission and echo reception periods to sequentially generate pulses of ultrasound for scanning an object region and to generate received echo electrical signals,

a plurality of transmitting channels for producing excitation pulses for selected array elements, and a plurality of receiving channels connected to the array elements for delaying the echo signals for variable predetermined time delays to focus the received echoes,

aperture control means for increasing the number of active array elements and receiving channels as a function of range during each echo reception period such that a central group of receiving channels are initially active and thereafter pairs of receiving channels, one on either side, are additionally rendered active whereby the array aperture is increased by steps at least during the interval the range does not exceed the maximum aperture,

means for adjusting the receiving channel time delays at least once during each echo reception period to dynamically focus the received echoes at a plurality of focal points at different ranges, and

means for summing the delayed echo signals from all active receiving channels to thereby generate a focused echo signal.

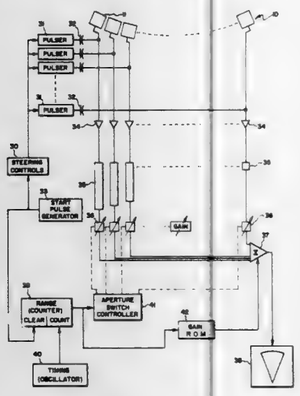
4,180,791
SIMPLIFIED SECTOR SCAN ULTRASONIC IMAGING SYSTEM
Jerome J. Tiemann, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Mar. 9, 1978, Ser. No. 884,951
Int. Cl.² G01S 9/66, 9/68; G01N 29/00
U.S. Cl. 367—105 **12 Claims**

1. A sector scan ultrasonic imaging system comprising: a transducer array assembly including a row of transducer elements at physical locations such that there are equal time delays for sound propagating from a focus to all elements of the array, said array elements being selectively operable during alternate transmission and echo reception periods to generate angulated beams of ultrasound for scanning an object region and to generate received echo electrical signals,

a plurality of transmitting channels for producing array

element excitation pulses in time sequence, and a plurality of receiving channels for variably delaying the received echo signals to focus the echoes,

aperture control means for increasing the number of active array elements and receiving channels as a function of range during each echo reception period such that a central group of receiving channels are initially active and



thereafter pairs of receiving channels, one on either side, are additionally rendered active to change the array aperture by steps between the minimum range and a specified fraction of maximum range, the full aperture being maintained thereafter out to maximum range, and

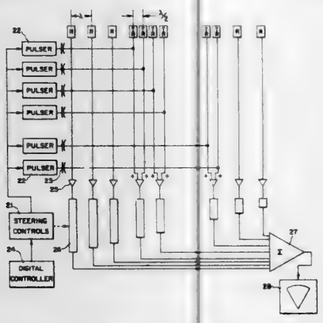
means for summing the delayed echo signals from all active receiving channels to generate a focused echo signal.

4,180,792

TRANSMIT-RECEIVE TRANSDUCER ARRAY AND ULTRASONIC IMAGING SYSTEM

Frank L. Lederman, and Jerome J. Tiemann, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 9, 1978, Ser. No. 884,952
Int. Cl.[2] G01S 9/66
U.S. Cl. 367—7 **10 Claims**



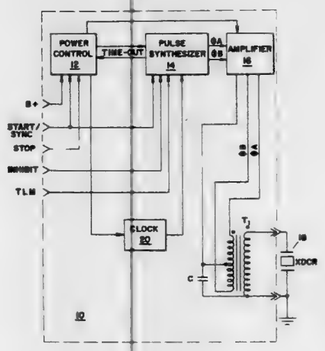
1. A transmit-receive transducer array for steered beam ultrasonic imaging systems including a single row of electroacoustic transducer elements comprised of a shorter transmit array of equally spaced transmit elements that is approximately centered within a longer receive array of equally spaced unit receive elements, the spacing between said transmit elements being substantially less than the spacing between said unit receive elements so that the grating side lobe upon transmission is at a substantially greater angle from the main beam than is the grating side lobe upon reception and the product of side lobe sensitivities is small, the center portion of said row of transducer elements being comprised solely of transmit-receive elements and either end portion of said row being comprised of receive-only elements, said receive-only elements being unit receive elements, and means for electrically coupling together adjacent transmit-receive elements by groups during reception such that each group functions as a unit receive element.

4,180,793

PSK PULSE SYNTHESIZER

Alan L. Lindstrum, Bainbridge Island, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 26, 1978, Ser. No. 900,211
Int. Cl.[2] H04B 1/02, 11/00
U.S. Cl. 367—137 **10 Claims**



1. A PSK pulse synthesizer to generate a PSK message for transmission by an underwater acoustic transmitter comprising:

(a) means for providing independent timing for said PSK pulse synthesizer which is synchronized with an external standard time period;

(b) means for selecting a unique identification code;

(c) means for generating a PSK pulse wave train; and

(d) means for selectively modulating said PSK pulse wave train by said unique identification code and by status and telemetry data.

4,180,794

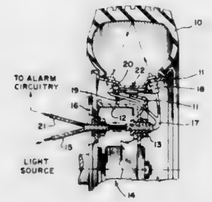
TIRE DEFLECTION SENSING METHOD AND APPARATUS

William E. Claxton, Mogadore, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Nov. 7, 1978, Ser. No. 958,477
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—58 **22 Claims**

1. Apparatus for determining the degree of deflection of a pneumatic tire comprising a light source, means for transmitting the light from said light source to a position internally of the tire to reflect the same off an internal surface of the tire,

circuit means for providing an indication of the deflection of the tire, and means for transmitting the reflected light to said



circuit means, said circuit means translating the quantity of reflected light into an indication of the deflection of the tire.

4,180,795

ALARM DEVICE FOR INFORMING REDUCTION OF PNEUMATIC PRESSURE OF TIRE

Akira Matsuda, Higashi-Murayama; Makoto Tanaka; Junichi Murata, both of Kodaira; Shigeo Yasuda, and Hiroshi Nishino, both of Musashino, all of Japan, assignors to Bridgestone Tire Company, Limited, Tokyo and Mitaka Instrument Company Limited, Musashino, both of, Japan

Filed Dec. 12, 1977, Ser. No. 859,517
Claims priority, application Japan, Dec. 14, 1976, 51-150235
Int. Cl.[2] B60C 23/02
U.S. Cl. 340—58 **5 Claims**

1. An alarm device for informing reduction of pneumatic pressure of a tire by converting an abnormal change of the pneumatic pressure into an electric signal and generating an alarm, the device comprising:

at least one oscillator means having an oscillation coil fixed on a chassis side of a vehicle and changing its oscillation state of electromagnetic waves in accordance with an abnormal change of the pneumatic pressure;

a resonator means fixed to the peripheral portion of a wheel having a tire adjacent the oscillation coil and consisting of a resonance coil and a capacitor capable of resonating with the electromagnetic wave radiated from said oscillation coil and a pressure sensing switch for sensing an abnormal change of the pneumatic pressure;

a signal processing device provided for each oscillator and including a detector means for detecting the output of the oscillator, a comparator means for comparing the present output of the detector with a preceding output of the detector to generate an output pulse, an integrator means for integrating the output pulse of the comparator, and a logic circuit means for logically operating the output of the integrator; and

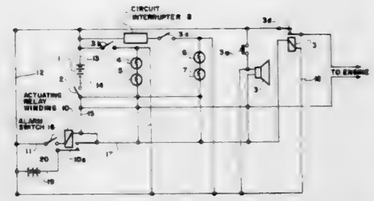
an alarm means for generating a warning signal in accordance with the output of the signal processing device.

4,180,796

VEHICULAR BURGLAR ALARM SYSTEM

Jose L. Palafox, P.O. Box 74, Dunlap, Calif. 93621

Filed May 22, 1978, Ser. No. 907,935
Int. Cl.[2] B60R 25/10
U.S. Cl. 340—64 **2 Claims**



1. A vehicular burglar alarm system for an automotive vehicle having an engine, a battery, an ignition circuit including an ignition switch and the battery for operating the engine, a horn circuit including a horn, a horn actuating switch and the battery, a headlight circuit including headlights, a headlight energizing switch and the battery, and an emergency light circuit including emergency lights, an emergency light energizing switch and the battery, said vehicular burglar alarm system comprising

an auxiliary ignition circuit switch connected in the ignition circuit and being normally closed;

a control relay having a control relay energizing winding and a plurality of control relay contact switches controlled in operation by said control relay energizing winding including the horn actuating switch, the headlight energizing switch, the emergency light energizing switch and the auxiliary ignition circuit switch;

an actuating relay having an actuating relay energizing winding and an actuating relay contact switch controlled in operation by said actuating relay energizing winding;

an alarm switch;

an auxiliary battery;

first circuit means having electrical conductors electrically connecting the battery of the vehicle, the ignition switch, the actuating relay energizing winding and the alarm switch in circuit whereby when the ignition switch is closed by a thief after the alarm switch is closed by the owner of the vehicle the actuating relay energizing winding is energized; and

second circuit means having electrical conductors electrically connecting the auxiliary battery, the actuating relay contact switch and the control relay energizing winding in circuit whereby when the actuating relay energizing winding is energized it closes the actuating relay contact switch and energizes the control relay energizing winding, said control relay energizing winding when energized closing the horn actuating switch to sound the horn, closing the headlight energizing switch to energize the headlights, closing the emergency light energizing switch to energize the emergency lights and opening the auxiliary ignition switch to cut off the engine.

4,180,797

DIGITAL COMPARATOR CONSTRUCTED OF IIL

Ryushi Shimokawa, Fuchu, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 23, 1978, Ser. No. 936,136
Claims priority, application Japan, Sep. 7, 1977, 52-106590
Int. Cl.[2] G06F 7/04
U.S. Cl. 340—146.2 **6 Claims**

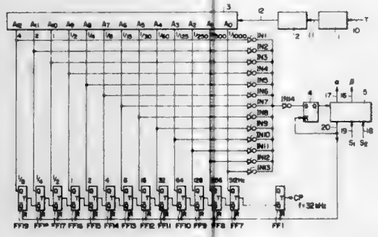
1. A digital comparator comprising:

an information output circuit which has a plurality of output terminals and which represents a predetermined informa-

tion with a digital signal appearing at a selected one of the output terminals, said information output circuit including switching transistors at an output stage respectively connected to said output terminals;

a reference signal generator circuit which has a plurality of output terminals disposed in correspondence with those of said information output circuit and which sequentially impresses reference signals on the respective output terminals, said reference signal generator circuit including switching transistors at an output stage with their respective collectors connected to said output terminals;

wired AND circuits which are made up of connection lines



respectively connecting collectors of the output-stage switching transistors of said information output circuit and the output-stage switching transistors of said reference signal generator circuit corresponding thereto, and output lines disposed for the respective connection lines;

a NOR circuit which is made up of inverter circuits constructed of integrated injection logic (IIL) and incorporated in the respective output lines of said wired AND circuits, and a common connection line for electrically connecting outputs of said inverter circuits in common; and

a memory circuit which is driven by an output of said NOR circuit.

4,180,798

CHARACTER RECOGNITION AND COMMUNICATION SYSTEM

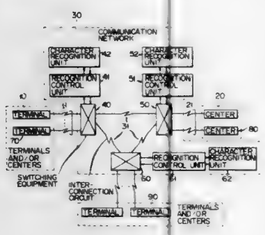
Kazuaki Komori, Yokosuka, and Hirofumi Kaiyoh, Kanagawa, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Feb. 3, 1978, Ser. No. 874,827

Claims priority, application Japan, Feb. 9, 1977, 52-13298

Int. Cl.[2] G06K *9/00*

U.S. Cl. 340—146.3 H **7 Claims**



1. A character recognition communication system comprising:

a plurality of terminals, each terminal including a general-purpose facsimile unit having a scanning means for transmitting characters on a document medium as image signals;

at least one center for receiving a message which includes character codes to thereby effect output processing and data processing; and

a communication network connected between said message receiving center and said terminals for receiving the image signals from the terminals, recognizing characters, constructing a message according to the result of character recognition and transmitting said message to the message receiving center designated by an address data included in the result of character recognition, said communication network comprising:

a switching device for switching the image signals from said terminals and transmitting the same to said message receiving center;

a character recognition unit coupled to said switching device for recognizing characters;

a recognition control unit coupled between said switching device and said character recognition unit for controlling said character recognition unit to recognize characters from the individual image signals from said terminals, said recognition control unit comprising:

an image signal receiving unit for receiving said image signals from said terminals and for delivering image signals and control signals necessary to achieve character recognition;

an image signal converting unit for converting the image signals from said image signal receiving unit to binary output signals, the values of which are controlled by said control signals from said image signal receiving unit, said image signal converting unit generating a completion signal representing completion of conversion of said image signals;

a memory having addresses any one of which stores said output signals of said image signal converting unit as an image pattern;

a communication control unit for causing, in response to said completion signal from said image signal converting unit, said character recognition unit to recognize the image pattern stored in an address of said memory, storing the result of image pattern recognition to thereby construct the message, and transmitting the message to the message receiving center designated by an address data included in the result of image pattern recognition; and

transmitting and receiving means for operating said switching device to connect said recognition control unit to said terminals or to said message receiving center by means of an interconnecting line.

4,180,799

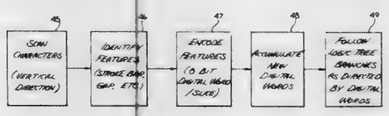
APPARATUS AND METHOD FOR RECOGNIZING CHARACTERS

William R. Smith, Mountain View, Calif., assignor to Caere Corporation, Los Gatos, Calif.

Filed Apr. 21, 1978, Ser. No. 898,822

Int. Cl.[2] G06K *9/12*

U.S. Cl. 340—146.3 AC **20 Claims**



1. An apparatus for recognizing characters such as alphanumeric characters comprising:

scanning means for viewing a character and for providing video signals representative of generally parallel slices of such character;

feature extraction means, coupled to receive said video signals from said scanning means, for detecting features from said signals as they are received and for assigning predetermined codes to said detected features, said feature extraction means providing a sequence of coded signals representing said detected features for said generally parallel slices of such character;

logic tree means, coupled to receive said coded signals from said feature extraction means each time a change occurs in said coded signals, for logically evaluating each of said coded signals to determine the possible characters having features corresponding to said coded signals, such tree means narrowing such possible characters as said coded signals are evaluated until such character is identified;

whereby characters are identified without storage of video data.

4,180,800

CHARACTER READING SYSTEM

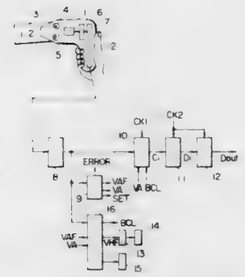
Isao Isshiki; Akihiro Ohoka, and Koji Sato, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 6, 1978, Ser. No. 922,415

Claims priority, application Japan, Jul. 7, 1977, 52-81179; Jul. 7, 1977, 52-81180; Jul. 7, 1977, 52-81181

Int. Cl.[2] G06K *9/12*

U.S. Cl. 340—146.3 SY **12 Claims**



1. A method of reading characters of the type including the steps of scanning a character with a sensor having an array of photosensitive elements so that the illuminated or nonilluminated elements in said array correspond to segments of said character which collectively form an image of said character and processing the output signals from said elements to thereby identify the scanned character, wherein the improvement is characterized by said processing step comprising:

determining the character area of said array in which said image is formed;

analyzing the output signals from each row or column of the elements within said character area and assigning a true classification value to each row or column representative of the pattern of illuminated and non-illuminated elements therein;

analyzing the sequence of at least some of said true classification values in order to identify said character; and

detecting the presence or absence of a character segment in a column of elements near one side of said character area to thereby determine the direction of movement of said scanner relative to said character.

4,180,801

SYSTEM FOR SUPERVISING CONNECTION POINTS

Philippe Cailloux, Chatenay-Malabry, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

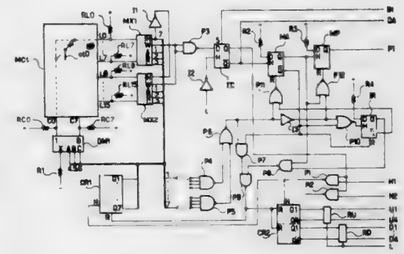
Filed Oct. 7, 1977, Ser. No. 840,458

Claims priority, application France, Oct. 13, 1976, 76 30743

Int. Cl.[2] H04Q *3/00*; G08B *19/00*

U.S. Cl. 340—147 R **5 Claims**

1. A system for supervising connection points and for indicating changes of state among the supervised connection points; the system comprising cyclic electronic scanners, each scanner scanning a field of connection points for detecting and identifying such a change of state, and comprising means for detecting the states of their supervised points and means for making a change of state with a drive signal which is maintained until the occurrence of at least one scanning cycle without detection of any change of state in said field of connection



points, the system further comprising a control unit having means for cyclically observing the scanners, means for stopping the cyclic observation when encountering a marked change of state, means for displaying change of state at least temporarily and means for testing the drive signal of the scanner which has caused the interruption of the control unit to maintain the control unit in observation on the same scanner until the said drive signal has disappeared.

4,180,802

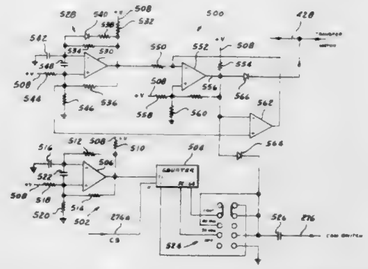
RANDOM AUTOPLAY

Gerard J. Oosterhouse, Grand Rapids, Mich., assignor to Rowe International, Inc., Whippany, N.J.

Filed Mar. 13, 1978, Ser. No. 885,572

Int. Cl.[2] G11B *19/08*; G06F *11/00*; H04Q *9/14*

U.S. Cl. 340—162 **15 Claims**



1. In a system having a user-actuated selector means for selecting one of a plurality of musical recordings, a memory having locations corresponding to said recordings, means responsive to said selector means for storing a signal in the memory location corresponding to said selected recording, means for searching said memory for a location containing said signal, and means responsive to said searching means for playing the recording corresponding to said location, the improvement comprising means independent of said memory for playing a randomly selected one of said recordings.

4,180,803

REMOTE CONTROL SYSTEM WITH PULSE ADDRESSING, AND SAFETY WARNING INDICATION

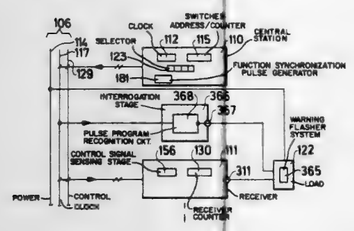
Jürgen Wesemeyer, Nuremberg, and Georg Haubner, Berg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 7, 1977, Ser. No. 840,487

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 2647823

Int. Cl.² H04Q *11/04*

U.S. Cl. 340—164 R **10 Claims**



1. Remote control system for selection of at least one of a plurality of selectrively switchable loads (122) from a central station (110) connected together by a bus system (106),

wherein the bus system includes a power bus (114), a clock bus (117), and a control bus (129);

wherein said central station (110) includes

a clock source (112),

timing means (115, 181) selecting a first time interval corresponding to a predetermined number of clock pulses to define a selection cycle of clock pulses, and a second time interval to define a control signal separating sequential selection cycles, the timing means (115, 181) being connected to said bus system (106) and and include means to, selectively and successively, connect

(a) the clock pulses to the clock bus (117) during said first time interval forming the selection cycle and

(b) the clock pulses to the control bus (129) during pulse gaps or pauses of clock pulses on a clock bus (117) and defining the control signal, and forming function synchronization pulses;

and wherein each load (122) includes

a receiver (111) connected to said bus system (106) and responsive to clock pulses, the control signal, and address control pulses on the bus system to cause an operating function to occur at a specifically addressed receiver,

said system comprising, in accordance with the invention,

a pulse interrogation stage (366, 366') connected to the clock bus (117) and to the control bus (129 of the bus system (106) and responsive to pulses on the respective buses of the bus system, and sensing continuing recurrence of pulses on said bus system;

and alarm warning means (365) connected to and controlled by said pulse interrogation stage to provide an output signal upon failure of detection of pulses on either one of the buses of said bus system (106).

4,180,804

REMOTE CONTROL DEVICE FOR AN AMPLIFIER TRAP CIRCUIT

Masakatsu Watanabe, Tokyo; Minoru Nakada, Tokorozawa, and Takeshi Takeuchi, Yokohama, all of Japan, assignors to Hochiki Corporation, Tokyo, Japan

Filed Jun. 2, 1978, Ser. No. 912,155

Claims priority, application Japan, Jun. 2, 1977, 52-72016[U]

Int. Cl.² H04B *1/10*

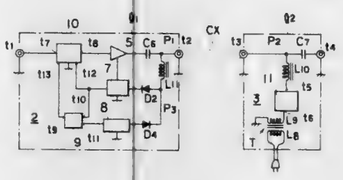
U.S. Cl. 340—310 R **11 Claims**

1. A remote control device for a trap circuit in an amplifier which is inserted in a signal transmission line in the vicinity of a television community receiving system antenna and is energized through said signal transmission line by a power supply unit in a subscriber's house, comprising:

a first diode in said power supply unit for supplying a first half cycle of an A.C. power supply signal to said amplifier;

a second diode in said power supply unit for supplying the second half cycle of said A.C. power supply signal to said amplifier when connected to said A.C. signal;

a switch in the subscriber's home for connecting and disconnecting said second diode from said A.C. power signal;



a D.C. power supply section in said amplifier which receives the first half cycle from said first diode and supplies said first half signal as an amplifier power signal to an amplifier section; and

a trap circuit switch means in said amplifier which is controlled by the presence and absence of said second half cycle from said second diode to enable and disable said trap circuit.

4,180,805

SYSTEM FOR DISPLAYING CHARACTER AND GRAPHIC INFORMATION ON A COLOR VIDEO DISPLAY WITH UNIQUE MULTIPLE MEMORY ARRANGEMENT

David C. Burson, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 6, 1977, Ser. No. 785,006

Int. Cl.² G06F *3/14*

U.S. Cl. 340—709 **10 Claims**

1. A system for displaying character or other graphic information on a color video display comprising:

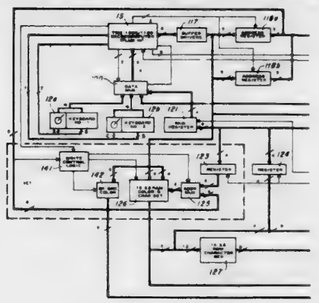
(a) digital processor means for generating a display image in digital-coded form;

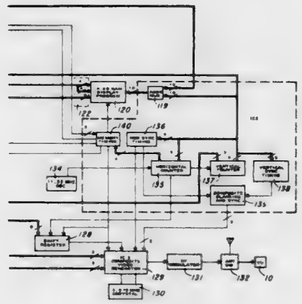
(b) first random access display memory means coupled to said digital processor means for storing said display image in said digital coded format, each memory word of said display memory being partitioned into at least first and second bytes;

(c) second addressable character table memory means being coupled to said first memory means, said second memory means being addressed by the first byte of memory words read from said first memory means, each word of said second memory means being partitioned into at least first and second bytes;

(d) third addressable character generator memory means having stored therein a plurality of characters or other graphic information in display-coded format, said first and second memory means being coupled to said third memory means with said third memory means being addressed by the second byte of said first memory means and the second byte of said second memory means to select a character or other graphic information to be displayed, the first byte of the second memory means being indicative of the color of the selected character; and

(e) video signal generator means coupled to said second and third memories and responsive to the first byte of said second memory means and to the character or other graphic information stored in the addressed location of said third memory means to produce a color image of the selected character or other graphic information on said color video display.





4,180,806

ARRANGEMENT, IN PARTICULAR AN ANALOG-DIGITAL CONVERTER AND METHOD OF OPERATION THEREOF

Kurt Hoffmann, Taufkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

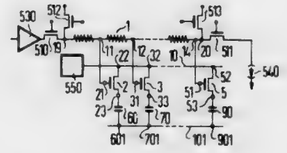
Division of Ser. No. 612,570, Sep. 11, 1975, Pat. No. 4,091,378.

This application Sep. 19, 1977, Ser. No. 834,786

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1974, 2445142

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 AD **1 Claim**



1. A method of operating an analog-digital converter having a resistance line and a plurality of voltage comparators, each comprising a transistor and a load element in the form of a capacitor, in which the control electrode of each transistor forms a first comparator input which is connected to a respective point on the resistance line, with the cooperable load element connected to one of the two remaining transistor terminals, one of which also simultaneously forms the output of such voltage comparator, the other transistor terminal forming the second comparator input for such voltage comparator, respective transistor switches disposed at each end of the resistance line, one of which is operative to connect the signals to be converted to the resistance line, the second operative to connect a current generator to the other end of the resistance line, and each end of the resistance line having a respective switching transistor connected thereto comprising third and fourth transistors, for selectively connecting a voltage source across the resistance line, comprising the steps of placing the free ends of the load elements on a fixed potential, applying impulses to the second comparator inputs, operating the first and second transistors alternately with the third and fourth transistors whereby the first and second are conductive while the third and fourth are blocked and vice versa, applying said impulses to the second comparator inputs when said second and fourth transistors are conductive, and rendering such transistors nonconductive prior to the termination of the corresponding impulse, with the digital signals simultaneously appearing in parallel at the outputs of the voltage comparators.

4,180,807

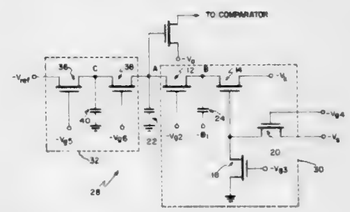
CHARGE TRANSFER CIRCUIT WITH VOLTAGE THRESHOLD COMPENSATING MEANS

Charles W. Eichelberger, Schenectady, and Walter J. Butler, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 17, 1977, Ser. No. 852,234

Int. Cl.² H03K *13/20*

U.S. Cl. 340—347 AD **5 Claims**



5. An analog to digital converter comprising:

means comprising a first capacitor for storing charge;

first charge supply means for supplying a succession of first packets of charge to said charge storage means, said first charge supply means including first and second MOSFETs having substantially similar electrical characteristics; another means comprising a second capacitor for storing charge; said first MOSFET being coupled between said first and second capacitors and said second MOSFET being coupled between said second capacitor and a potential well; and first biasing means for biasing said first MOSFET into a "shelf" transistor mode of operation during a first portion of each of a first one of two integration periods, said first biasing means biasing said first MOSFET in such a manner that the voltage across said second capacitor defines the source of said first MOSFET and said second capacitor charges through a value which is the function of the gate voltage of a first MOSFET less its threshold voltage; and second biasing means for biasing said second MOSFET into a "shelf" mode of operation during a second portion of each of a first of two integration periods, said second biasing means biasing said second MOSFET in such manner that the voltage across said second capacitor defines the sources of said MOSFET and said second capacitor charges to a level which is a function of the gate voltage of said second MOSFET

less the threshold voltage thereof, whereby said first and second MOSFETs cooperate to remove a discrete packet of charge from said first capacitor, with the magnitude of said first charge packets varying from a value proportional to the magnitude of an analog signal to be converted as a function of the difference between said threshold voltages of said first and second MOSFETs;

second charge supply means for supplying a succession of second packets of charge to said charge storage means, the magnitude of said second packets of charge being a constant, predetermined value, and the polarity of said second packets of charge being opposite to that of said first packets of charge;

control means for causing said first charge supply means to supply said succession of first packets of charge to said charge storage means during one of two integration periods wherein the charge stored in said charge storage means changes from a first to a second value, said control means also for causing a second charge supply means to supply said charge storage means with said succession of second charge packets during the other of said two integration periods wherein the charge stored in said charge storage means changes from said second to said first value; and

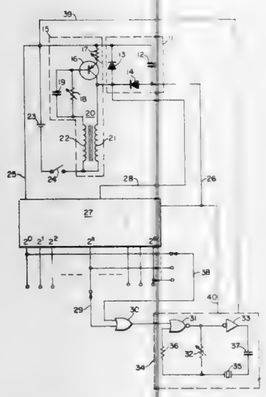
means for generating a digital signal which is the function of the ratio between the number of said first charge packets required to change the voltage across said charge storage means from said first to said second value and the number of said second charge packets required to change the voltage across said charge storage means from said second to said first value.

4,180,808

ALARM CIRCUIT

Jean-Philippe Lebet, Les Geneveys-sur-Coffrane, and Jean-Claude Droz, Neuchatel, both of Switzerland, assignors to The Gillette Company, Boston, Mass.

Filed Dec. 12, 1977, Ser. No. 859,343
Int. Cl.² G08B 3/00
U.S. Cl. 340—384 E **5 Claims**



1. An acoustical alarm circuit comprising:

circuit means including a DC source for providing a low source of voltage and a self-starting voltage multiplier circuit, including a capacitor, for providing a higher source of voltage and for generating an input frequency signal;

counter means electrically connected to said circuit means and powered by said higher source of voltage for receiving said input frequency signal from said circuit means and for providing a plurality of fractional frequency outputs;

logic circuitry electrically connected to at least two of the fractional frequency outputs of said counter means for generating a modulated complex signal; and

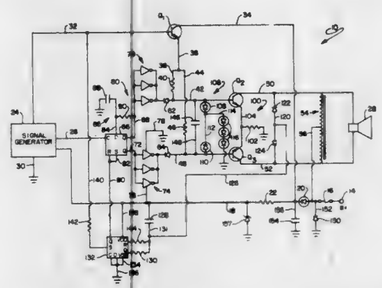
gated oscillator means including a sound generating transducer electrically connected to said circuit means and powered by said higher source of voltage and electrically connected to said modulated complex signal for providing an audible output signal.

4,180,809

ELECTRONIC SIREN

Robert S. Feldstein, Pelham Manor, N.Y., assignor to Abex Corporation, New York, N.Y.

Filed Jun. 16, 1978, Ser. No. 916,155
Int. Cl.² G08B 5/00
U.S. Cl. 340—384 E **20 Claims**



1. In an electronic siren of a variety including a sound reproducing device representing a reactive load, first and second output transistor stages responsive to forward bias input signals for providing a square wave drive to said load and signal generating means for providing pulse train input signals, the improvement comprising:

solid state switching means for asserting said forward bias input signals at said first and second power transistor stages to effect a saturated on condition thereof; and

control network means coupled with said first and second output transistor stages, and with said signal generating means and responsive to said pulse train input signals for alternately diverting said forward bias input signals through a low impedance path from said first and second output transistor stages to effect said square wave drive, whereby thermally induced leakage currents are diverted in conjunction with said forward bias input signals.

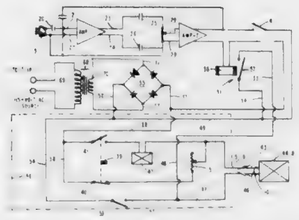
4,180,810

SILENT AWAKENING SYSTEM

Hrand M. Muncheryan, 1735 N. Morningside St., Orange, Calif. 92667

Filed Jan. 16, 1978, Ser. No. 869,797
Int. Cl.² G08B 1/08
U.S. Cl. 340—407 **13 Claims**

1. A silent awakening system, comprising: a first means adapted to receive an acoustic signal and to convert said acoustic signal into an electrical signal, an electric amplifying means connected to said first means and having an electric circuit therein to amplify and transmit said electrical signal to an electric relay means for operation thereof, a second means, in electrical connection with said first means, receiving an alternating current from an external source and adapted to convert said alternating current into a direct current for energization of said first means, and a third electric circuit means connected to said second means to receive therefrom a direct current through said electric relay means therein to electrically process said direct current; said third electric circuit means having in the current-processing circuit thereof a current-interrupting means, a variable current control means disposed therein in electrically parallel relation to said current-interrupting means, and a current-switching means, connected between the electrically parallel sections comprising said current-interrupting means and said variable current control means, to channel the direct current supplying said electrically parallel section into



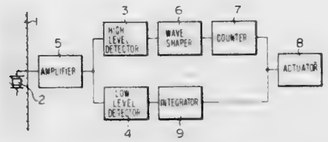
one or the other of said electrically parallel sections; and, an awakening module in electrical connection with said third electric circuit means through said current outlet means to receive an electric current therefrom for operation of said awakening module by the actuation of said electric relay means upon reception of an acoustic signal by said first means.

4,180,811

DETECTING DEVICE FOR DESTRUCTIVE VIBRATION OF STRUCTURES

Tadashi Yoshimura, Tsu; Tohru Hanahara, Hirakata; Toshio Abiko, Daito, and Kazuhiro Matsuoka, Shijonawate, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 1, 1977, Ser. No. 802,580
Claims priority, application Japan, Oct. 22, 1976, 51-127488
Int. Cl.² G08B 13/04
U.S. Cl. 340—566 **2 Claims**



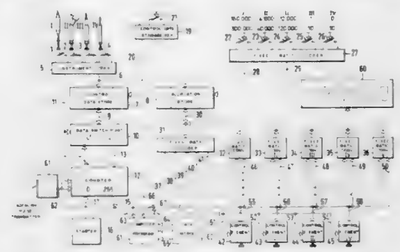
1. A detecting device for detecting vibration of structures comprising: a detecting element for detecting any vibration of the structure, an amplifier for amplifying output pulses from said detecting element, a high level detector for detecting and amplifying high level outputs of the output pulses from said amplifier, a counter which generates an output when a predetermined number of high level outputs from said high level detector are counted, a wave form shaping circuit including a time constant circuit inserted between said amplifier and said counter for shaping the outputs from the high level detector into a predetermined shape recognizable by the counter, a low level detector for detecting low level outputs of the output pulses from the amplifier, an integrating circuit to which an output of said low level detector is presented, an alarming circuit to which outputs of said integrating circuit and counter are presented; and a condenser charged by an output of said wave shaping circuit for releasing said counter from a reset state for a fixed time, said condenser being grounded when said alarming circuit receives an input signal so that the counter will be arbitrarily reset by a relay in said alarming circuit.

4,180,812

DENTAL TREATMENT APPARATUS

Kurt Kaltenbach, Biberach; Martin Saupe, Mittelbiberach; Stefan Beier, Biberach; Hermann Gmeinder, Biberach, and Hartmut Braetsch, Biberach, all of Fed. Rep. of Germany, assignors to Kaltenbach & Voight GmbH & Co., Biberach an der Riss, Fed. Rep. of Germany

Filed Mar. 31, 1978, Ser. No. 892,274
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715798
Int. Cl.² G06K 15/18
U.S. Cl. 340—706 **13 Claims**



1. A dental treatment apparatus having a dental instrument, and a control and display arrangement for controlling the operation of the dental instrument and for displaying the magnitude of an operating parameter of the dental instrument, said control and display arrangement comprising:

a control data store for storing a pre-determined fixed control datum value for said operating parameter of the dental instrument;

a display device operable to display the magnitude of said operating parameter of the dental instrument;

control means connected to said control data store and operable to vary the pre-determined fixed control datum value to a further instantaneous value as desired, said instantaneous value being stored in the data store as a further value;

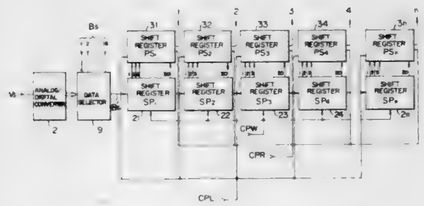
and a data converter connected to said control means and to said display device for converting the instantaneous value stored in the data store to a corresponding service datum instantaneous value to be displayed by said display device.

4,180,813

LIQUID CRYSTAL DISPLAY DEVICE USING SIGNAL CONVERTER OF DIGITAL TYPE

Yutaka Yoneda, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Jul. 26, 1977, Ser. No. 819,408
Int. Cl.² G06K 15/18
U.S. Cl. 340—784 **3 Claims**



1. A liquid crystal display device for displaying a video signal, comprising:

(a) a liquid crystal display panel in which liquid crystal

picture elements are located at intersections of plural rows of scanning electrodes and plural columns of signal electrodes arranged in a matrix configuration, the transmissivity of said liquid crystal picture elements being selectively controlled when the associated scanning and signal electrodes are energized;

(b) a control circuit for generating a first, a second, and a third clock signal;

(c) ring counter means for producing a scanning signal in response to said first clock signal;

(d) means for energizing selected ones of said scanning electrodes in response to said scanning signal;

(e) a signal electrode drive circuit including a plurality of drivers, each of said drivers being connected to one of said electrodes for energizing the same; and

(f) a signal converting circuit including:

an analog-to-digital converter for converting a video signal to be displayed for one horizontal period into a plurality of time-serial binary-coded signals each corresponding to an amplitude of a corresponding part of said video signal;

means for converting said plurality of time-serial binary-coded signals into a plurality of time-serial pulse trains in accordance with said second clock signal, each train including a number of pulses determined by the corresponding binary-coded signal;

a plurality of first shift registers connected in series for storing said plurality of time-serial pulse trains; and

a plurality of second shift registers, each first shift register being connected to one of said second shift registers, for storing the contents of said first shift registers at a time in response to said first clock signal and, each of said second shift registers being connected to one of said drivers correspondingly and respectively, for supplying said time-serial pulse trains to the same in accordance with said third clock signal.

4,180,814

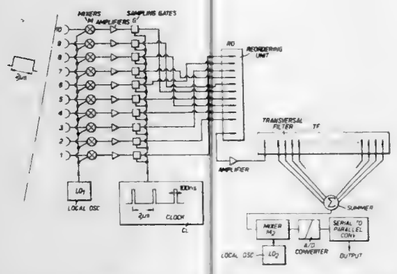
MULTIPLE BEAM RECEIVING ARRAY SIGNAL PROCESSOR

Paul Barton, Bishops Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,607

Int. Cl.² G01S 3/14, 9/02

U.S. Cl. 343—5 DP **5 Claims**



1. A signal processor for a multiple element radar receiving antenna array of N-1 spaced antenna elements, comprising:

N-1 mixers each discretely responsive to the received signal on a corresponding one of said antenna elements, said mixers operating against a local oscillator frequency offset by a predetermined amount from the radio frequency of said received signals to generate N-1 intermediate frequency signals;

means for sampling said N-1 intermediate frequency signals periodically and simultaneously to provide N-1 sample signals;

a phase weighted transversal filter and means for transferring said sample signals serially to said filter in a sequence which is a reordering of the linear phase sequence of said antenna elements according to the prime number transform algorithm $p=g^i$ modulo N, where i is the original sequence, p is the reordered sequence, and g is the primitive root of a prime number N;

means within said transversal filter comprising a tapped delay line with the outputs of successive taps thereof being individually phase weighted corresponding to the reordered sequence of said sampled signals;

and means for summing the phase weighted taps of said delay line to effect a convolution of the input signal sequence and the phase weighting sequence.

4,180,815

RADIO IDENTIFICATION SYSTEMS

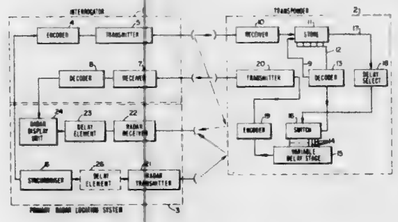
Orvin G. Hill, Malvern, England, assignor to The Secretary of State for Defence in her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, United Kingdom

Filed Jan. 20, 1978, Ser. No. 871,002

Claims priority, application United Kingdom, Jan. 24, 1977, 2751/77

Int. Cl.² G01S 9/56

U.S. Cl. 343—6.5 R **8 Claims**



1. A transponder for use in a radio identification system comprising:

a receiver for receiving interrogating signals transmitted from an interrogating station;

processing means for processing the received interrogating signals to produce reply signals in response thereto;

a transmitter for transmitting said reply signals;

storage means for temporarily storing a new interrogating signal received while the processing means is occupied in processing a previously received interrogating signal, at least until the processing means is capable of independently processing the new interrogating signal; and

variable delay means arranged to delay the transmission of the reply signal to each received interrogating signal by an amount inversely dependent upon the length of any delay introduced by storage of the interrogating signal in the said storage means, so that the overall delay between the reception of an interrogating signal and the transmission of a reply signal thereto is substantially constant for any interrogating signal.

4,180,816

TESTING CIRCUIT FOR RADAR-OPERATED VEHICLE SAFETY ASSURANCE SYSTEMS

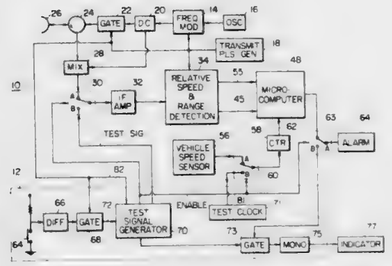
Hiroshi Endo, Yokosuka, and Norio Fujiki, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 29, 1978, Ser. No. 937,763

Claims priority, application Japan, Aug. 29, 1977, 52-102642

Int. Cl.² G01S 7/40

U.S. Cl. 343—7 VM **9 Claims**



1. A testing circuit for a radar-operated safety assurance system for a roadway vehicle including means for transmitting a train of microwave burst energy and receiving a return signal from a target, means for mixing the return signal with a locally generated signal to derive an intermediate frequency return signal, means for sensing the roadway speed of said vehicle, relative speed detecting means for deriving the speed of said vehicle relative to said target from said intermediate frequency return signal, range detecting means for deriving the range of said target from said intermediate frequency return signal, and a decision making circuit responsive to said sensed vehicle roadway speed, said derived relative vehicle speed and said derived range of the target to determine a safety distance to said target, comprising:

means for generating an artificial intermediate frequency return signal from a hypothetical target, said artificial return signal comprising a train of intermediate frequency burst signals which occur at intervals that decrease as a function of time;

means for generating a signal indicative of a predetermined vehicle roadway speed;

means for switching said radar system in response to a manual command from a normal operating mode to an under-test mode in which said relative speed detecting means and said range detecting means are receptive of said generated artificial intermediate frequency return signal and said decision making circuit is receptive of said generated predetermined vehicle roadway speed indicative signal, whereby said decision making circuit determines a safety distance to said hypothetical target and generates an output signal when the instantaneous value of the distance to said hypothetical target derived by said range detecting means corresponds to said determined safety distance to said hypothetical target; and

means for determining whether said output signal from said decision making circuit occurs within a predetermined time interval.

4,180,817

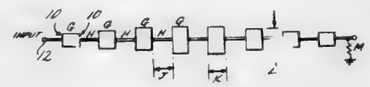
SERIALLY CONNECTED MICROSTRIP ANTENNA ARRAY

Gary G. Sanford, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed May 4, 1976, Ser. No. 683,203

Int. Cl.² H01Q 1/38, 3/26

U.S. Cl. 343—700 MS **35 Claims**



1. A microstrip antenna array of radiating slot apertures comprising:

an electrically conductive reference surface;

a layer of dielectric material overlying said reference surface;

a plurality of electrically conductive radiator surfaces overlying said dielectric material and spaced apart along a predetermined path,

each of said radiator surfaces defining at least one radiating slot aperture between an edge thereof and the underlying reference surface,

each of said radiator surfaces having an effective substantially one-half wavelength dimension transverse to said radiating slot aperture at the anticipated antenna operating frequency,

said radiating slot apertures extending along the edges of the radiator surfaces being disposed transversely of said predetermined path,

strip transmission line means overlying said dielectric material and interconnecting said radiator surfaces in series along said predetermined path so as to conduct radio frequency energy to/from said radiating slot apertures and a common feed point for the antenna array.

4,180,818

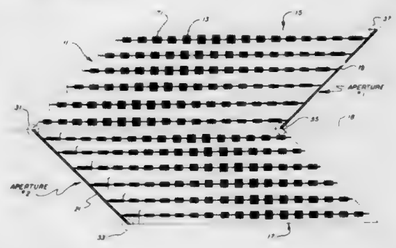
DOPPLER NAVIGATION MICROSTRIP SLANTED ANTENNA

Leonard Schwartz, Montville, N.J.; Edward Chin, New York, and Emile J. Deveau, Pleasantville, both of N.Y., assignors to The Singer Company, Little Falls, N.J.

Filed Feb. 13, 1978, Ser. No. 876,973

Int. Cl.² H01Q 1/28

U.S. Cl. 343—700 MS **9 Claims**



1. In a planar antenna, adapted for use in Doppler navigation, the antenna aperture slanted such as to obtain a beam shape which essentially eliminates over-water shift, the antenna being made up of two groups of arrays, the first of which is adapted to generate one set of diagonal beams forward and to the left and aft and to the right and the second of which is adapted to generate another set of diagonal beams forward to the right and aft and to the left, a method of providing fore-aft frequency compensation comprising constructing each array in

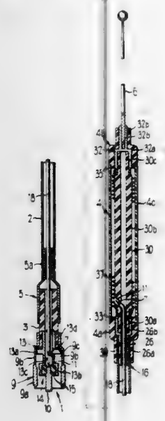
said first group of arrays from a plurality of elements in series, said elements electrically spaced apart in such a manner so as to obtain phase shifts therebetween which will result in an array which has a beam pointing in the direction in which input energy is fed to form forward firing arrays and constructing the arrays of said second group of arrays from a plurality of elements in series electrically spaced apart so as to establish a phase difference between successive elements which will result in generating a beam which points in a direction opposite to the direction in which energy is fed to said arrays to thereby establish backward firing arrays.

4,180,819

DIPOLE ANTENNA STRUCTURE

Masao Nakano, Tokyo, Japan, assignor to General Research of Electronics, Inc., Tokyo, Japan

Filed Jul. 5, 1977, Ser. No. 812,572
Int. Cl.[2] H01Q *9/16*
U.S. Cl. 343—792 **4 Claims**



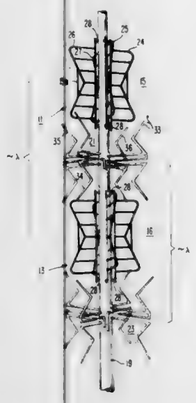
1. A vertical dipole antenna structure comprising, in combination: a vertically extending connector at the bottom of the structure and having a pair of downwardly extending connector elements adapted to interfit with complementary upwardly extending connector elements of a support for the antenna structure, a vertically extending insulating sleeve having its bottom portion rigidly connected to the upper end of said connector and its upper portion rigidly connected to the bottom portion of a vertically extending dipole element-forming sleeve, an insulating housing secured to the upper end of said dipole element-forming sleeve, a conductive dipole element-forming rod anchored at the upper portion of said housing and extending vertically upwardly therefrom, a pair of signal carrying conductors having their lower ends respectively connected to said pair of connector elements and passing through said dipole element-forming sleeve in insulated relation thereto, signal coupling means coupling the other end of said pair of conductors respectively to the inner ends of said dipole element-forming sleeve and rod, said insulating housing having bottom and intermediate portions and a cap portion, a coil support bobbin in said housing on the outside of which bobbin are coils of wire forming said signal coupling means, the bobbin terminating in a conductive end portion at the bottom end thereof to which the upper end of said dipole element-forming sleeve and said coils are physically and electrically connected, the upper end of said bobbin having a conductive end portion thereon to which said dipole element-forming rod and coils are physically and electrically connected, and said cap portion being threadedly securable at the upper portion of said bobbin so as to hold together the assembly of said bobbin and the bottom and intermediate portions of said housing.

4,180,820

CIRCULARLY POLARIZED ANTENNA SYSTEM USING A COMBINATION OF HORIZONTAL AND BENT VERTICAL DIPOLE RADIATORS

McKinley R. Johns, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 28, 1977, Ser. No. 837,157
Int. Cl.[2] H01Q *21/26*
U.S. Cl. 343—798 **6 Claims**



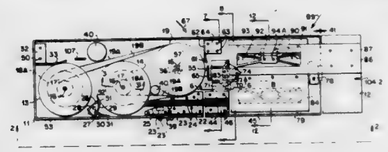
1. A circularly polarized antenna system comprising:
a vertically oriented support mast,
a first system of four horizontal radiating elements mounted about the mast at 90° intervals with the elements extending from the mast and configured to excite horizontally polarized fields,
means for feeding signal energy to said four horizontal radiating elements in relative phase rotation of 0°, 90°, 180° and 270°,
a second system of four vertically oriented dipoles mounted to the mast a given vertical distance from said first system, said vertically oriented dipoles being electrically substantially greater than a half wavelength and being configured to present the aperture of a half wavelength dipole, said vertically oriented dipoles each comprising a pair of vertically extending dipole arms with each arm having a bend near the midpoint of said arm for reducing unwanted radiation above and below said dipole,
means for feeding signal energy to each of said four vertically oriented dipoles in relative phase rotation of 0°, 90°, 180° and 270°, said second system of four vertically oriented dipoles being spaced from each other and fed in amplitude and phase relationship with respect to said first system of four horizontal radiating elements to cause the horizontal pattern of the vertically polarized field associated with the vertical dipoles to be of similar shape and magnitude and in phase quadrature to the horizontal pattern of the horizontally polarized field associated with the four horizontal radiating elements.

4,180,821

MOTION TAPE RECORDER

Richard H. Prewitt, Jr., P.O. Box 532, Lexington, Ky. 40501, and Richard H. Prewitt, 1634 N. Broadway, Lexington, Ky. 40505

Filed Oct. 14, 1975, Ser. No. 622,230
Int. Cl.[2] G01D *9/00, 15/16, 15/24;* **G03B** *1/04*
U.S. Cl. 346—7 **22 Claims**



1. A mechanical tape recording instrument having a first and second support means; a tape; a first and second tape support reel mounted for moving said tape perpendicular to the plane of said first and second support means; a tape guide mounted on said first support means; a marking point engaging said tape and mounted to move in a substantial transverse plane relative to the movement between said first and second support means, and flat spring member means activated by movement between said first and second support means for rotating said second tape support reel.

4,180,822

OPTICAL SCANNER AND RECORDER

Kenneth C. Hudson, Philadelphia, Pa., and Donald G. Herzog, Collingswood, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 13, 1978, Ser. No. 896,034
Int. Cl.[2] G01D *15/14*
U.S. Cl. 346—108 **7 Claims**



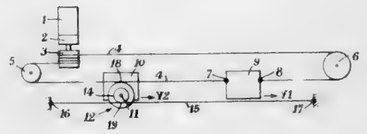
1. An optical scanner, comprising
means in a light beam path including an acoustooptic light deflector/modulator and a deflector to cause a light beam to scan a line on a target,
an electrical oscillator having an amplitude modulation input and a frequency modulation input and producing electrical oscillations coupled to said light deflector/modulator,
a photo-electric cell positioned to receive a portion of the light in the beam, and having an electrical output coupled to the amplitude modulation input of said light deflector/modulator to effect an automatic brightness control of the beam,
an array of photo-electric cells positioned to receive light from the scanned beam, and
an electrical circuit responsive to the outputs of the array of photo-electric cells and having an output coupled to the frequency modulation input of the light deflector/modulator to effect an automatic line scan spacing control of the beam.

4,180,823

CONTROL DEVICE FOR CONTROLLING THE MOVEMENTS OF TWO CARRIAGES OF A DUPLEX RECORDER

Pierre Guyot, Franconville; Alain Coty, Sagy, and Paul Delfau, Les Puits la Marliere-Villiers le Bel, all of France, assignors to Societe Commerciale Chauvin Arnoux Societe Anonyme Francaise, Paris, France

Filed Nov. 29, 1978, Ser. No. 964,748
Claims priority, application France, Dec. 2, 1977, 77 36258
Int. Cl.[2] G03D *15/16*
U.S. Cl. 346—139 B **6 Claims**



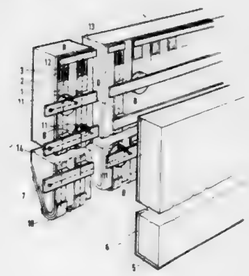
1. A control device for controlling the movements of first and second recording means support-carriages of a two-carriage duplex recorder, comprising a flexible elongated traction means connected to said first carriage, and drive means associated with said traction means for moving said first carriage selectively in two opposite directions, wherein coaxial first and second wheels are mounted for rotation as a unit on said second carriage about an axis at right angles to said two opposite directions, said first wheel being in driving relationship with said traction means so as to be rotatively driven thereby, and an elongated fixed reaction member extending in a parallel direction to said two opposite directions and being in engagement with said second wheel to cause the latter and said second carriage to move along said reaction member upon rotation of said first and second wheels.

4,180,824

HEAD FOR ELECTRICALLY PRINTING AN IMAGE

Marcel Yvard, Ollainville; Jean-Claude Decuyper, Elancourt, and Michel Beduchaud, Villebon sur Yvette, all of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jun. 9, 1978, Ser. No. 914,179
Claims priority, application France, Jun. 13, 1977, 77 18012
Int. Cl.[2] G01D *15/06;* **G03G** *15/044;* **B41J** *3/04;* **H04N** *1/22*
U.S. Cl. 346—154 **6 Claims**



1. A bar for printing an image on a sensitive paper by scan-

ning the paper along successive lines, comprising a plurality of printing styli aligned along the length of the scan line, and comprising n square matrices for addressing the styli, the matrices being formed by a first network of electrically conductive tapes which are insulated from one another and are divided into n identical sets of conductors and each of which has one end connected to a respective stylus, and by a second network of electrically conductive tapes perpendicular to the first network and having as many tapes as there are conductive tapes in each set of the first network and selectively connected to the conductive tape of the first network to form the said n matrices, characterized in that the first network and the second network of conductive tapes (**1**, **7**) are formed respectively on a first insulative plate (**3**,**4**) and on a second insulative plate (**6**), and are disposed on the interior faces of the plates when assembled together and are isolated from each other at the intersections between conductive tapes except for the selective connections for forming each of the said matrices and in that for each matrix (**21**):

the conductive tapes of the first network (**1**), referred to as the columns of the said matrix, are fed from a first feed terminal (**17**) attributed to the said matrix, via respective resistances (R) each of which is formed by a layer of resistive material (**12**) deposited on one of the plates and connecting each of the columns of the matrix to a common conductive strip (**13**) formed on the other plate and insulated from the tapes of the said other plate and electrically connected to the said first terminal,

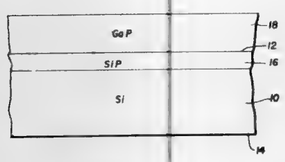
the conductive tapes of the second network (**7**), referred to as the rows of each matrix, are individually controlled from respective second feed terminals (**14**) and are selectively connected to the columns via diodes (D) each formed by a pellet of semi-conductive material (**11**) which is mounted on one of the two plates defining the row and the column in question at their intersection.

4,180,825

HETEROEPITAXIAL DEPOSITION OF GAP ON SILICON SUBSTRATES

Donald R. Mason, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 833,935, Sep. 19, 1977, Pat. No. 4,120,706.
This application May 31, 1978, Ser. No. 911,557
Int. Cl.² H01L *29/161*
U.S. Cl. 357—16 **7 Claims**



1. A semiconductor structure comprising:

a silicon substrate having a first and second surface in the (111) plane;

said first surface being silicon phosphide to a depth in the range of 2 to 8 microns; and

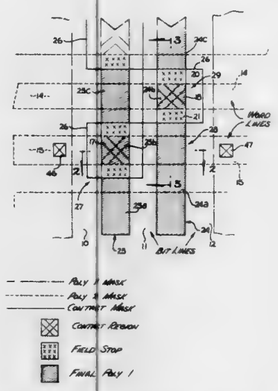
an epitaxial layer of gallium phosphide on said first surface having a thickness of up to eight microns without cracks.

4,180,826

MOS DOUBLE POLYSILICON READ-ONLY MEMORY AND CELL

Joseph Shappir, San Jose, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed May 19, 1978, Ser. No. 907,557
Int. Cl.² H01L *27/04*
U.S. Cl. 357—41 **11 Claims**



1. MOS memory cells for a read-only memory which store binary data, said cells formed on a silicon substrate, comprising:

a pair of spaced-apart, elongated doped regions formed in said substrate, said doped regions forming source and drain regions for said cells;

a first line of polysilicon insulated from said substrate extending generally between said doped regions, said first line including discontinuities forming isolated sections of said line for cells which store one binary state, said first line being continuous for cells which store the other binary state;

a plurality of second lines of polysilicon disposed above said first line, said second lines generally transverse to said first line;

said second lines associated with said cells which store said one binary state contacting said isolated sections of said first line to provide contact to said isolated sections, the others of said second lines insulated from said first line;

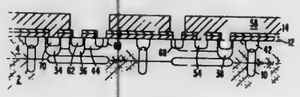
whereby memory cells are formed, some programmed with said one binary state and the other cells with the other binary state.

4,180,827

NPN/PNP FABRICATION PROCESS WITH IMPROVED ALIGNMENT

Harlan R. Gates, Reston, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1977, Ser. No. 830,222
Int. Cl.² H01L *27/02*
U.S. Cl. 357—44 **2 Claims**



1. A lateral PNP bipolar transistor structure, comprising:

an epitaxial layer of a first conductivity type over a buried sub-base region of said first conductivity type;

a collector region of a second conductivity type formed in the surface of said epitaxial layer over said buried sub-base region;

a base region of said first conductivity type formed over said collector region through a mask window and projecting through said collector region into said epitaxial layer and electrically contacting said sub-base region;

an emitter region of said second conductivity type formed within said base region through said mask window, defining an intrinsic lateral base region between the lateral sides of the emitter region and the base region;

a base contact on the surface of said epitaxial layer for making electrical contact with said base region;

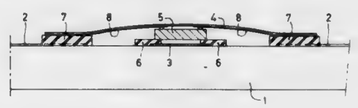
whereby a lateral PNP is formed with a reduced collector to base capacitance.

4,180,828

HYBRID CIRCUIT HAVING A SEMICONDUCTOR CIRCUIT

Gijsbertus J. H. Schermer; Hubertus H. A. Winters; Willem C. Hildering, and Karl F. Nicki von Nikelsberg, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,070
Claims priority, application Netherlands, Feb. 5, 1977, 7704773
Int. Cl.² H01L *23/42*
U.S. Cl. 357—79 **4 Claims**



1. A hybrid circuit comprising

an insulating substrate having a plurality of conductors formed on a surface thereof,

a semiconductor circuit provided on said substrate surface and including a semiconductor element and an insulating flexible foil connected to said semiconductor element at a side remote from said substrate, said foil having conductor tracks associated with said substrate conductors,

spacers including first spacers on said substrate surface with said semiconductor element bearing thereon, and second spacers provided between adjacent ones of said substrate conductors with side edges of said foil bearing thereon,

connecting material filling the space between said semiconductor element and said substrate surface, and

conducting material filling the spaces between said second spacers to connect said foil conductor tracks and said substrate conductors.

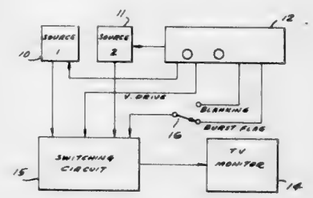
4,180,829

TELEVISION SIGNAL PHASE MATCHING APPARATUS AND METHOD

H. George Pires, Parlin, N.J., assignor to Crosspoint Latch Corp., Summit, N.J.

Filed Nov. 25, 1977, Ser. No. 855,006
Int. Cl.³ H04N *9/62*
U.S. Cl. 358—10 **15 Claims**

1. In a television system having means for furnishing a first and second television signal each having video information signals adapted for display as a sequence of successive fields and each having synchronizing signals, and display means for furnishing a display having predetermined characteristic varying as a function of the phase of signals applied to said display means, a method for furnishing a visual indication of phase difference between said synchronizing signals of said first and second television signals, comprising, in combination, the steps of applying said synchronizing signals of said first television signal to said display means during a first predetermined part of each of a plurality of sequential time intervals; and blocking the application of said synchronizing signals of said first television signal to said display and applying instead the synchronizing signals of said second television signal during a second predetermined part of each of said time intervals, said sequential time intervals having a duration such that changes of said predetermined characteristic of said display caused by changing from said synchronizing signals of said first to said synchronizing signals of said second television signal cause visible changes in said display.

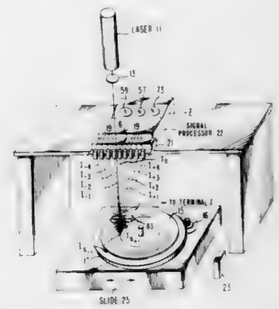


4,180,830

DEPTH ESTIMATION SYSTEM USING DIFFRACTIVE EFFECTS OF THE GROOVES AND SIGNAL ELEMENTS IN THE GROOVES

William R. Roach, Rocky Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 28, 1977, Ser. No. 810,735
Int. Cl.² G01N *21/32*; **G11B** *11/00*; **H04N** *5/76*
U.S. Cl. 358—128 **11 Claims**



1. Apparatus, for use with a flat surface which is regularly grooved with groove segments of substantially sinusoidal cross-sectional shape, for estimating groove depth; said apparatus comprising:

means for illuminating a region of the grooved surface, the illuminated region being sufficiently large to span a plurality of groove segments; the structure of the groove segments in the surface region illuminated serving as a diffraction grating for diffracting light reflected from said illuminated region to form respectively separated diffraction order beams of light;

means for detecting the light power contained in each of a plurality of said diffraction order beams of light;

means, coupled to the output of said detecting means, for deriving a groove depth estimate as a ratio of the square root of the light power of an nth order diffraction beam multiplied by 2n over the sum of the square roots of the light powers of respective n − 1th and n + 1th order diffraction beams.

10. Apparatus, for use with a flat surface which is regularly

grooved with groove segments and which is provided with successively spaced apart depressions of a given cross-sectional shape formed in the grooves, for estimating depression depth; said apparatus comprising:

means for illuminating a region of the grooved surface, the illuminated region being sufficiently large to span a plurality of groove segments;

the structure of the depressions in the surface region illuminated serving as a diffraction grating for diffracting light reflected from said illuminated region to form respectively separated diffraction order sprays of light;

means for detecting the light power contained in at least two of said diffraction order sprays of light; and

means, responsive to the output of said detecting means, for deriving an estimate of depression depth for the given cross-sectional shape of the depression.

4,180,831

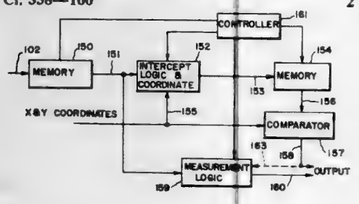
IMAGE ANALYSIS DATA EXTRACTION

Roger R. A. Morton, Penfield, and Cornelius J. D. McCarthy, Fairport, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Division of Ser. No. 580,392, May 23, 1975, Pat. No. 4,115,804. This application Aug. 3, 1977, Ser. No. 821,368

Int. Cl.[2] H04N *5/14*

U.S. Cl. 358—160 **2 Claims**



1. An image analysis system for extracting data from an image by scanning a field of view, comprising:

keyboard control means having keys for controlling the operation of the system by a key sequence of operation whereby when keys, of said keys for controlling, are keyed sequentially, an image analysis data extracting operation, to be carried out by the image analysis system as a function of the keys keyed and the sequence of keying, is prescribed; and

display means associated with the keyboard control means for identifying the function of the keyed keys which function is determined by the keys and the sequence.

4,180,832

VIDEO RECORDING AND REPRODUCING APPARATUS HAVING VARIABLE REPRODUCTION SPEEDS

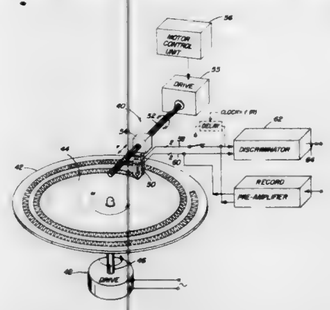
James A. Bixby, San Diego, Calif., assignor to Eastman Technology, Inc., Rochester, N.Y.

Filed Feb. 23, 1978, Ser. No. 880,674

Int. Cl.[2] H04N *5/78*; **G11B** *5/012, 21/08*

U.S. Cl. 360—10 **16 Claims**

1. A television video signal recording and reproduction system for use with a magnetic storage medium comprising first and second magnetic head means for recording said television signal on said storage medium and for reproducing said recording signal, means for rotating said storage medium at a rate such that one video image is recorded during one rotation of said storage medium, means for simultaneously moving said head means during recording relative to said storage medium such that said first head means records said video signal in a track formed as a continuous spiral on said storage medium and having a substantially unrecorded portion continuously adjacent said recorded track and for simultaneously moving both said head means during reproduction such that both said head means may register with different parts of said recorded track, whereby said head means reproduce discrete signals corresponding to those portions of said recorded track in registration therewith, and means connected to said head means for selecting portions of said signals to form therefrom an output signal representing said recorded television video signal.



4,180,833

APPARATUS AND METHOD FOR REPRODUCING VIDEO SIGNALS

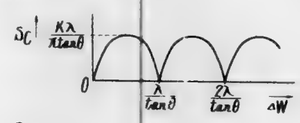
Masaru Nishikawa, Kounosu; Toshihiko Numakura, Kamakura, and Jun Hirai, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 15, 1978, Ser. No. 877,867

Claims priority, application Japan, Feb. 24, 1977, 52-19479

Int. Cl.[2] G11B *5/02*; **H04N** *5/78*

U.S. Cl. 360—21 **5 Claims**



1. An apparatus for reproducing video signals recorded on a record medium in successive parallel record tracks which abut along their longitudinal edges and in which the recorded video signals include information and synchronizing signal portion modulating a carrier, a first set of said record tracks being comprised of every other one of the latter and having video signals recorded therein at a first azimuth angle which is different from a second azimuth angle with which video signals are recorded in the remaining tracks constituting a second set of record tracks, and said synchronizing signal portions of the video signals, as recorded in adjacent tracks, are out of alignment with each other; said apparatus comprising:

first and second magnetic heads for sequentially scanning tracks of said first and second sets of tracks, respectively, said first and second magnetic heads having azimuth angles corresponding to said first and second azimuth angles of the respective tracks to be scanned thereby, and each of said heads being dimensioned and guided in the direction transverse to that along the track being scanned so as to span the full width of the track being scanned and to overlap an adjacent track by a distance $\Delta W = n\lambda/\tan\theta$ ($n = 1, 2, \ldots$), wherein λ is the wavelength of the carrier as modulated by said synchronizing signal portions of the video signals in said adjacent track and θ is the difference between said first and second azimuth angles of said heads, so as to substantially attenuate the most troublesome of the cross-talk from said adjacent track.

4,180,834

HEAD MOUNTING DEVICE FOR TAPE RECORDER

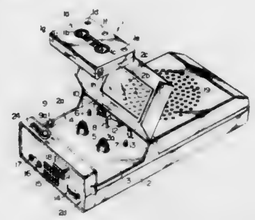
Akira Osanai, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Division of Ser. No. 794,065, May 5, 1977. This application Sep. 1, 1977, Ser. No. 829,594

Claims priority, application Japan, May 11, 1976, 51/59249

Int. Cl.[2] G11B *5/56*

U.S. Cl. 360—109 **3 Claims**



1. A magnetic head mounting device for adjusting the position of a magnetic head of a small size tape recorder wherein record and playback are performed by moving a surface of the magnetic head into a tape cassette disposed in a cassette receiving region of the tape recorder, said tape recorder including operating buttons, a head support plate having a planar portion within a segment thereof cut away to form a notch, means for pivotally mounting said head support plate for rotation by actuating said operating buttons, a head mounting plate having a planar portion in which one end is fixedly mounted on said head support plate and the opposite end formed to define an outwardly extending portion parallel to said last-mentioned planar portion, said magnetic head fixedly mounted on said planar portion of said head mounting plate for adjustment therewith, and means cooperating with said head support plate and said extending portion for adjusting the position of said head mounting plate with said magnetic head relative to and into said notch to adjust the azimuth of the magnetic head relative to a magnetic tape of said tape cassette whereby the range of adjustment of said magnetic head is increased by at least the thickness of said notch.

4,180,835

MAGNETIC ERASING HEAD WITH GAPS UTILIZING HIGH FLUX DENSITY AND HIGH PERMEABILITY

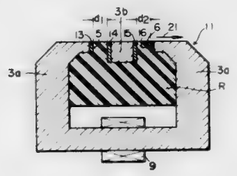
Haruhiko Okumura, Miyagi, and Masanori Kanaya, Tagajyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 5, 1978, Ser. No. 912,832

Claims priority, application Japan, Jun. 9, 1977, 52-68317

Int. Cl.[2] G11B *5/251, 5/27*

U.S. Cl. 360—118 **5 Claims**



1. A magnetic erasing head for erasing recorded signals on a magnetic recording medium which is facing to the front surface of said magnetic erasing head, comprising:

(A) first, second and third core elements made of ferrite;

(B) first and second gaps formed between said first and second core elements, and between said second and third core elements, respectively, facing toward said magnetic recording medium;

(C) one or more magnetic material layers having higher magnetic flux density and higher permeability than the magnetic flux density of said ferrite core elements mounted in said first and second gaps, respectively, said layers having magnetic flux density B_{10} of more than 5000 gauss, permeability μ of more than 5000, and thicknesses of 5 to 30μ in the lengthwise direction of said gaps; and

(D) a winding provided around at least one of said core elements to generate magnetic flux in said core elements by an application of AC current.

4,180,836

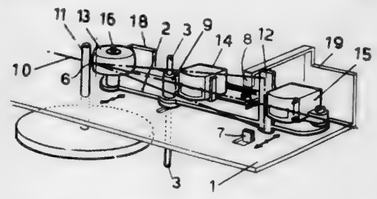
POSITIONING DEVICE OF PLAY-BACK HEADS AND PRESSING DEVICES IN PLAY-BACK AND/OR RECORDING APPARATUS

Rodolfo Cicatelli, Gandria, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 720,400, Sep. 3, 1976, abandoned. This application May 30, 1978, Ser. No. 910,324

Int. Cl.[2] G11B *15/29*

U.S. Cl. 360—130.32 **7 Claims**



1. A device for positioning play-back heads and pressing devices (pressure rollers) in a band (tape) play-back and/or recording apparatus having a frame, said device comprising:

at least one play-back head and at least one pressure roller affixed on a rigid support which is movable into a working (play) position with respect to said frame, wherein said pressure roller contacts a capstan shaft with tape being driven therebetween in said working position;

said support being movable relative to first block elements which are fixed with respect to said frame, said first block elements determining the working position for said support carrying said play-back head and said pressure roller by forming three points of contact with second elements that are rigidly affixed to said support, said contact points corresponding to the vertices of a triangular configuration, two of said three points of contact effectively forming a hinge axis for said support about which said support can rotate as it is moved into its working position;

a pin which is located between said two vertices forming said hinge axis and the third vertex, said pin being coupled to and movable with said support and permitting free movement of said support about said pin; and

means coupled to said pin for moving said pin and said support into said working position in a trajectory substantially orthogonal to the plane of movement of the band (tape).

V 9894 DE 25 79 UMI

4,180,837

MAGNETIC CODING METHOD

André Michaud, Chatenay Malabry, France, assignor to Transac - Compagnie pour le Developpement des Transactions Automatiques, Paris, France

Filed Mar. 22, 1978, Ser. No. 889,083
Claims priority, application France, Mar. 25, 1977, 77 08963
Int. Cl.² G11B *5/02;* **G06K** *19/06;* **G11B** *5/09, 25/04*
U.S. Cl. 360—18 **3 Claims**



1. A method of coding and recording two independent messages on a single magnetic track of polymerizable ink having particles with a privileged direction of magnetization corresponding to their largest dimension, each message being in the form of a binary number; the method comprising the following steps:

recording the first message by subdividing the track into successive zones of length a or a/2 chosen according to the bits of the message, imparting one of two different magnetic orientations to the particles of the polymerizable ink in alternate zones, and immobilizing the oriented particles by polymerizing the ink; and

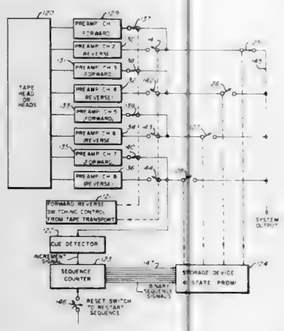
recording the second message in terms of magnetic moment having a usable component parallel to the axis of the track on said oriented particles in a double frequency code at a frequency such that one binary digit is written in each of the zones of length a/2 of the track and two binary digits are written in each of the zones of length a.

4,180,838

METHOD AND APPARATUS FOR PRODUCING PROGRAMMABLE SELECTION OF MUSIC

William Fehrenkamp, 8826 Bissonnet, Houston, Tex. 77074

Continuation-in-part of Ser. No. 866,779, Jan. 3, 1978, abandoned. This application Apr. 10, 1978, Ser. No. 894,920
Int. Cl.² G11B *15/12*
U.S. Cl. 360—63 **14 Claims**



1. Apparatus for producing programmable selections of music, comprising:

a prerecorded media having a plurality of channels recorded thereon and having program breakpoint alignment;

means for detecting and reproducing musical selections recorded in each of said plurality of channels and having multiple output capability;

means for providing motion of said media past said detecting means said motion providing means being dynamically operable at essentially only a single preselected speed of motion;

a plurality of gating means connected to said detecting and reproducing means for selecting a channel for output, said gating means being responsive to a selection signal;

cue detecting means for detecting a cueing condition and for generating an output signal in response thereto; and

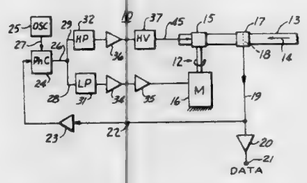
selection signal generating means including a programmable memory means having a predetermined number of memory locations, said locations having contents at least equal to the number of said plurality of channels, so as to generate a selection signal upon receipt of said output signal from said cue detecting means and for supplying said selection signal to said gating means; said locations having contents at least equal to the number of said plurality of channels, so as to generate whereby said programmable memory means selects for output one of said plurality of channels.

4,180,839

INFORMATION REPRODUCING APPARATUS

Joseph J. Neff, deceased, late of Pasadena, Calif., and by Lucille D. Neff, executrix, Arcadia, Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Apr. 5, 1977, Ser. No. 784,759
Int. Cl.² G11B *15/18, 17/00, 21/02*
U.S. Cl. 360—71 **24 Claims**



1. In apparatus for reproducing information from an information carrying tape, the improvement comprising in combination:

means including a tape capstan having an annular layer of piezoelectric material for advancing said tape;

means for reproducing information from said advancing tape;

means connected to said reproducing means for detecting a flutter component in reproduced information; and

means connected to said detecting means and operatively associated with said layer of piezoelectric material for varying the diameter of said annular layer of piezoelectric material in response to said detected flutter component in the sense of a reduction of said flutter component.

4,180,840

CLEANING DISK ASSEMBLY FOR OPPOSITELY-ORIENTED, DUAL-COMPONENT MAGNETIC TRANSDUCERS

James C. Allan, Kinnesswood, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 9, 1978, Ser. No. 914,113
Claims priority, application United Kingdom, Mar. 29, 1978, 12162/78
Int. Cl.² G11B *5/41, 25/04*
U.S. Cl. 360—128 **2 Claims**

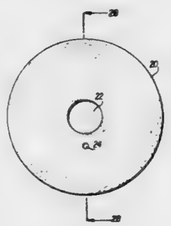
1. In a flexible disk information storage system having an access arm which includes two oppositely-oriented transducer and pressure pad pairs, where each pair includes both a magnetic transducer for writing and reading information on one side of the disk and a pressure pad applied to the other side of the disk for increasing the loading of the corresponding transducer against the normally-flexible surface, and where the engagement with the disk surface by each transducer and associated pressure pad is selectively controlled by signals

generated within the storage system, apparatus for separately cleaning both of the magnetic transducers comprising:

A. cleaning disk means, for providing an abrasive first surface on which each transducer can be cleaned, and for providing a non-abrasive second surface as a standard operational substrate onto which the corresponding pressure pad can be applied without pad damage while each transducer is being cleaned;

B. disk cartridge means, for enclosing said cleaning disk means, for enabling said cleaning disk means to be reversibly mounted in the disk drive unit of the information storage system, and for enabling the drive unit to engage and rotate said cleaning disk means in either of its reversible orientations;

C. movement-free abrasion-orientation means, located in said disk cartridge means, for enabling said information



storage system to automatically determine, for either orientation of said cartridge means, the side of said cartridge means on which said abrasive surface is located, so that, regardless of the cartridge means orientation, said system can command only the transducer which is adjacent said abrasive surface to engage said surface; and

D. arm access means, located in said disk cartridge means, for enabling, upon appropriate command from said storage system, each transducer and the corresponding pressure pad to pass through said disk cartridge means and make contact with said abrasive first surface and with said non-abrasive second surface respectively, when said cartridge means is mounted in the information storage system;

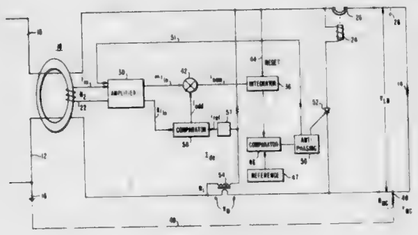
whereby either transducer can be cleaned on said abrasive surface without danger of damaging either of the pressure pads by loading them onto said abrasive surface.

4,180,841

GROUND FAULT CIRCUIT INTERRUPTER WITH GROUNDED NEUTRAL PROTECTION

Joseph C. Engel, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 21, 1977, Ser. No. 853,370
Int. Cl.² H02H *3/28*
U.S. Cl. 361—45 **16 Claims**



1. A ground fault protective apparatus for use on an AC electrical circuit having a line conductor and a neutral conductor grounded at a power source, comprising:

means for sensing current imbalance on said line and neutral conductors, said sensing means providing an output signal proportional to said imbalance;

means for integrating said output signal and for providing a trip indication whenever said signal integration value exceeds a predetermined reference level;

means for inducing a test voltage on said neutral conductor, whereby a current imbalance is produced between said line and neutral conductors which is proportional to the neutral-to-ground conductance;

means for providing a reference current proportional to said test voltage;

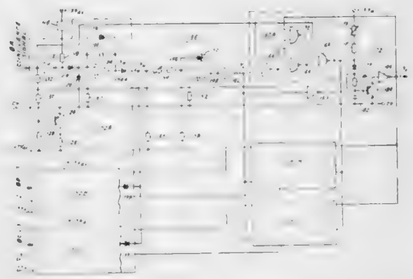
means connected to the input of said integrating means for comparing said reference current to the output signal of said sensing means, said comparing means supplying a signal current to the input of said integrator whenever the output signal of said sensing means rises above said reference current, said signal current being of sufficient amplitude to cause said integrator means to produce a trip indication.

4,180,842

TIMER CIRCUIT FOR USE IN PROTECTIVE RELAYING APPLICATIONS

Marvin F. Keeney, Springfield, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed May 12, 1978, Ser. No. 905,603
Int. Cl.² H02H *3/26*
U.S. Cl. 361—85 **19 Claims**



1. In a protective relay circuit employing phase comparator operation, the circuit including coincidence circuit means for producing a first output signal representative of the phase coincidence of at least two input signals thereto and timer circuit means for producing a timer output signal when the first output signal is of a predetermined duration, the timer output signal continuing as long as the phase coincidence continues and for a predetermined dropout time after the phase coincidence terminates, wherein the timer circuit means comprises:

(a) ramping circuit means for producing a substantially linear ramping voltage output signal;

(b) control circuit means for controlling said ramping circuit means wherein said ramping voltage output signal is caused to ramp with a positive slope or with a negative slope, or to truncate, said control circuit means coupled to the coincidence circuit means to receive the first output signal representative of the phase coincidence;

(c) level detector circuit means coupled to said ramping circuit means to receive said ramping voltage output signal, said level detector circuit means producing a level detector output signal when said ramping voltage output signal is of a predetermined threshold value, said level detector output signal continuing as long as the phase coincidence continues; said level detector circuit means coupled to said control circuit means wherein the pres-

ence of said level detector output signal develops a truncating signal which causes said ramping voltage signal to truncate; and

(d) output circuit means coupled to said level detector circuit means to receive said level detector output signal, said output circuit means producing the timer output signal, the timer output signal continuing as long as said level detector output signal continues and for the predetermined dropout time after the phase coincidence terminates.

4,180,843

DEVICE FOR PROTECTING ELECTRIC SYSTEMS, PARTICULARLY TELECOMMUNICATION SYSTEMS, AGAINST OVERVOLTAGE PULSES

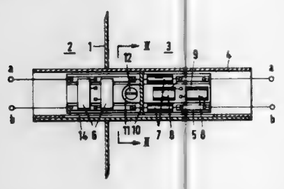
Rijnder Hagedoorn, Leidschendam, and Ernest J. E. Koenderink, The Hague, both of Netherlands, assignors to De Staat der Nederlanden, te dezen vertegenwoordigd door de directeur-generaal der Posterijen, Telegrafie en Telefonie, The Hague, Netherlands

Filed Dec. 22, 1977, Ser. No. 863,410

Claims priority, application Netherlands, Dec. 22, 1976, 7614273

Int. Cl.² H02H *3/22*

U.S. Cl. 361—119 **7 Claims**



1. An assembly for protecting against overvoltage at least one electric circuit, particularly of a telecommunication system, at a place where the circuit passes through a wall of a building defining a boundary between an exposed part of the circuit and another part of the circuit that is less exposed and more sensitive to overvoltage, comprising in combination:

a tube of conducting material surrounding a connection between said exposed circuit part and said other circuit part and providing a passage for said connection through said wall;

an overvoltage protection circuit interposed in said connection and mounted on a printed circuit board located in said tube comprising at least two diverting components connected in such a way that an overvoltage peak can be diverted step by step thereby, and

a transverse partition of conducting material provided between the respective locations of said two diverting components, said printed circuit board and said partition being firmly mounted in said tube.

4,180,844

POWDER SPRAY APPARATUS AND METHOD FOR COATING INTERIOR SURFACE OF CONTAINERS

Richard O. Peck, Lakewood, Colo., assignor to Coors Container Company, Golden, Colo.

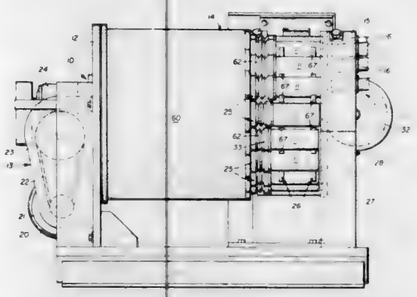
Filed Apr. 1, 1976, Ser. No. 672,591

Int. Cl.² B05B *5/00*

U.S. Cl. 361—226 **26 Claims**

1. An improved powder coating machine for applying a powder coating to the interior of ungrounded metallic container bodies having an open end, wherein the machine is of the kind having container positioning means conveying an array of said containers through an area for spray coating, said container positioning means including a shielding mask plate having a plurality of apertures aligned with openings in the container bodies; a series of plungers disposed opposite each of said apertures for resiliently pressing the container bodies against said mask plate; and a powder spray gun positioned adjacent to the mask plate for spraying charged powder through said apertures to coat the inside surface of the container bodies; the improvement comprising:

(a) non-conductive pad means on said plungers for directly



contacting said container bodies and preventing grounding of the container bodies to the plungers;

(b) said mask plate being constructed of non-conductive material for minimizing interference with charged powder from said powder spray gun and maintaining the container bodies in an ungrounded condition; and

(c) said powder spray gun being a tribo-electric-gas-dynamic powder coating gun.

4,180,845

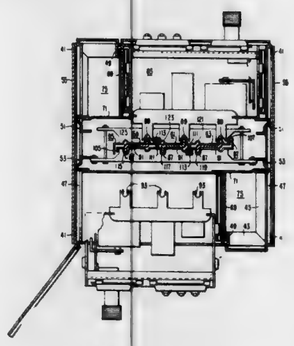
CONTROL CENTER WITH BUS BAR INSULATORS

Sadiq A. Shariff, Palos Park; Brij M. Bharteey, Bolingbrook, and Neal E. Rowe, Oak Forest, all of Ill., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 9, 1977, Ser. No. 831,718

Int. Cl.² H02B *1/04*

U.S. Cl. 361—334 **3 Claims**



1. A control center for distributing electric power from a power supply source to power consuming devices, comprising a cabinet having a plurality of vertically spaced compartments on the front side of the cabinet, a plurality of vertical, horizontally spaced, bus bars in said cabinet, insulating means mounting the bus bars with the surfaces of each bus bar being in surface-to-surface contact with the insulating means, the insulating means comprising a sheet-like member on each side of the spaced bus bars which members have interfitting portions including a flange-receiving groove in one member and a flange in the other member and said interfitting portions extending between each pair of adjacent bus bars, a circuit interrupter structure in at least one compartment and movable transversely into and out of position adjacent to the bus bars, each bus bar comprising a portion disposed in a plane aligned with the direction of movement of the circuit interrupter, said structure comprising a contact member engaging a bus bar, each sheet-like member also comprising wall means forming horizontally spaced vertical ribs extending away from the other sheet-like member, the vertical ribs in one sheet-like member being aligned with the vertical ribs of the other member, each pair of aligned ribs forming a vertical chamber receiving said bus bar portion, and said bus bar portion in at least one of said ribs wherein one rib of a pair of aligned ribs extend further on one side of one sheet-like member than the other rib of said pair extends on the opposite side of the other sheet-like member, and whereby said ribs on said sheet-like members can accomodate bus bars of many different shapes.

4,180,846

VERTICAL BUS BARS FOR MOTOR CONTROL CENTER

John R. Wilson, Darien, and Jerome C. Wolski, Downers Grove, both of Ill., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 612,526, Sep. 11, 1975, abandoned. This application May 9, 1977, Ser. No. 794,910

Int. Cl.² H02B *1/04*

U.S. Cl. 361—357 **4 Claims**

1. A control center structure for distributing electric power from a power supply source to power consuming devices, comprising a cabinet forming a compartment and having front and rear sides, a plurality of vertical bus bars in the cabinet, each bus bar having an intermediate planar portion and one single leg extending toward the front side from the planar portion and providing a stab-type terminal at said front side, another single leg extending toward the rear side from the planar portion and providing a stab-type terminal at said rear side, at least one circuit interrupter in the cabinet comprising a clip-type contact member engaging the front extending leg of a bus bar, another circuit interrupter in the cabinet comprising a clip-type contact member engaging the rear extending leg of a bus bar, the circuit interrupters being movable toward and away from the bus bars to effect engagement and disengagement of the clip-type contact members with said terminals, said terminals being substantially aligned with the direction of movement of the circuit interrupters.

4,180,847

LIGHTING DISPLAY INSENSITIVE TO EXTRANEOUS LIGHT

Joseph V. Cresko, Tunkhannock, and John A. Moore, South Montrose, both of Pa., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Sep. 1, 1978, Ser. No. 939,150

Int. Cl.³ G01D *11/28*

U.S. Cl. 362—30 **7 Claims**

1. Lighting display apparatus insensitive to extraneous light comprising:

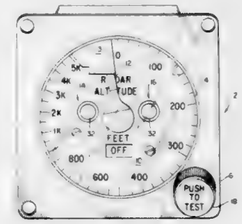
a housing;

means disposed in the housing and arranged to be energized for emitting light;

light transmitting means arranged in the housing and including a viewing surface having a matte finish and a highly polished surface opposite the viewing surface;

means arranged in the housing intermediate the light emitting means and the opposite surface of the light transmitting means for carrying the light emitted by the light emitting means to the light transmitting means for transmission therethrough; and

the matte finish of the viewing surface of the light transmitting means being effective for diffusing extraneous light so as to minimize such light entering the display apparatus and reflected in the direction of the viewer, and the highly polished opposite surface of the light transmitting means



being effective for efficiently transmitting light through said means.

4,180,848

HYDRAULIC APPARATUS FOR THE AUTOMATIC CORRECTION OF THE INCLINATION OF THE HEADLIGHTS OF A MOTOR VEHICLE

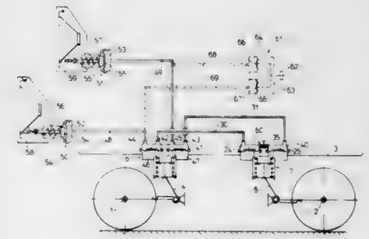
Inge Schwerin, Möglingen; Ulrich Zillgitt, Stuttgart; Steffen Schneider, Möglingen; Hellmut Kegel, Gerlingen; Hans-Rudolf Bodensieck, Gerlingen; Helmut Zauft, Gerlingen; Reinhold Poglitsch, Reutlingen, and Kurt Grabow, Feucht, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

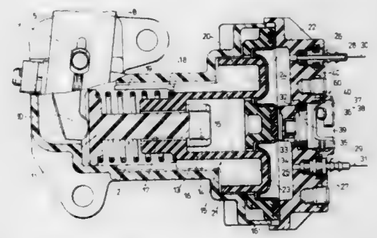
Filed Oct. 17, 1977, Ser. No. 842,997

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1976, 2654015

Int. Cl.² B60Q *1/10*

U.S. Cl. 362—71 **8 Claims**





1. In a hydraulic apparatus having means for automatically adjusting the positions of the headlights of a motor vehicle as a dependent function of the load on the axles, in which the movement of the front and rear axles relative to the sprung motor vehicle body are oppositely sensed by means of a metering piston of a level sensor installed in proximity to each vehicle axle and are transmitted by means of positioning elements

to the headlight housings, the further improvement wherein each metering piston in said level sensors includes a fork piece forming a pair of parallel and adjacently disposed positioning pistons and a pair of working chambers each adjacent one of said positioning pistons, two separate hydraulic lines each arranged to connect one of said pair of working chambers in said rear axle level sensor to one of said pair of working chambers in said front axle level sensor and two separate hydraulic lines each arranged to connect one of said pair of working chambers in said front axle level sensor to said means for adjusting the positions of a respective one of said headlights.

4,180,849

PEDAL CYCLE HEADLAMP

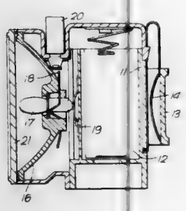
Sidney J. Parkin, London, England, assignor to The Ever Ready Company (Great Britain) Limited, London, England

Filed Aug. 18, 1977, Ser. No. 825,741

Claims priority, application United Kingdom, Aug. 18, 1976, 34510/76

Int. Cl.² F21V *33/00*

U.S. Cl. 362—72 **11 Claims**



11. A battery operated pedal cycle headlamp comprising a light source emitting a parallel beam of light, a lens positioned in the path of said parallel beam of light, said lens comprising a transparent member adapted to fit the front of a cycle headlamp for impingement by said parallel beam of light, said member having formed thereon a first set of elongated prisms arranged to extend horizontally and to thereby modify the transmitted light distribution in the vertical direction and a second set of elongated prisms arranged to extend vertically and to thereby modify the transmitted light distribution in the horizontal direction, said second set of prisms comprising two groups of prisms symmetrically arranged on opposite sides of a central vertical axis of the lens, being spaced apart and remote from the center of the lens, and said first set of prisms being offset vertically from the center of the lens, thereby providing a central region of the lens through which light passes unmodified by said prisms, such that said lens when impinged upon by a parallel beam of light produces a predetermined pattern of luminous intensity values in both the horizontal and vertical planes with said first set of prisms deviating by refraction and reflection said parallel beam of light to near horizontal, and with said second set of prisms deviating by refraction said parallel beam of light to form an emergent beam of increased horizontal spread to the right and left of said central region of the lens.

4,180,850

RETRACTABLE LIGHT FIXTURE

Jon A. Bivens, Upland, Calif., assignor to The Toro Company, Riverside, Calif.

Filed Jun. 29, 1978, Ser. No. 920,407

Int. Cl.² F21V *19/02*

U.S. Cl. 362—285 **14 Claims**

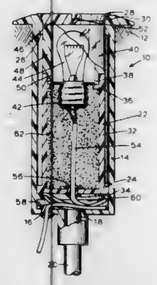
1. A retractable light fixture comprising:

(a) a hollow body having an opening into said body;

(b) a movable member disposed within said opening and adapted to slide through said opening between a first position retracted into said body and a second position at least partially extended out of said body, said movable member being biased toward said first position;

(c) hydraulic means having an inlet adapted for connection to a source of fluid under pressure for moving said movable member to said second position against said bias when fluid under pressure is applied to said inlet;

(d) a light bulb carried by said member; and,



(e) an electrical connector operably connected to said light bulb on one end and adapted on the other end for connection to an appropriate source of electrical energy for illuminating said bulb, said connector being disposed to allow said member to move between said positions and passing from said bulb through said body to the exterior of said body.

4,180,851

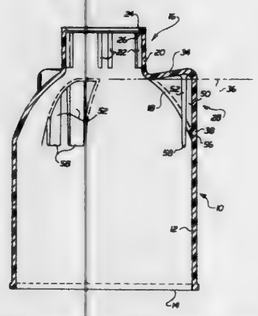
VENTILATED LAMP GUARD

John E. Ericson, Jr., Willoughby, Ohio, assignor to Ericson Manufacturing Company, Willoughby, Ohio

Filed Oct. 31, 1977, Ser. No. 847,246

Int. Cl.² F21V *11/12, 17/04*

U.S. Cl. 362—378 **8 Claims**



1. In a lamp bulb guard having a generally cylindrical, hollow body adapted to enshroud a lamp bulb therein to protect said bulb from contact with liquid and solid objects, said hollow body including an inwardly flared portion terminating in an axially extending generally circular tubular neck portion adapted to circumvallate an electrical socket for said lamp bulb, and means for attaching said neck portion to the electrical socket, the improvement which comprises a plurality of circumferentially spaced ventilating towers projecting from said flared portion, each of said towers including a generally radially extending top portion, a front wall portion extending between the top portion and said hollow body, and side wall portions extending between said top and portion and said inwardly flared portion, at least one axially extending slot in each of said towers to provide for ventilation of said lamp bulb guard when in use, and an axially extending baffle adjacent said at least one slot and positioned within said tower near but radially inwardly of said front wall portion, said baffle having an axial length greater than the axial length of said slot, and a width less than the circumferential width of said tower.

4,180,852

CONTROL CIRCUIT FOR USE IN A SWITCHING-TYPE REGULATOR

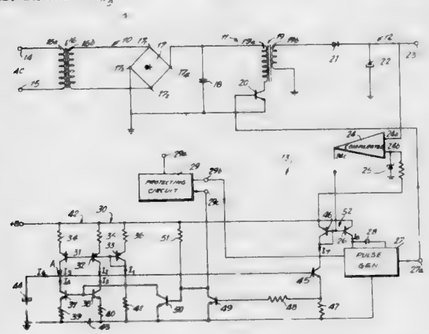
Akio Koizumi, Tokyo; Hiroshi Nakazawa, Kawagoe, and Mitsuo Ohsawa, Chigasaki, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 24, 1978, Ser. No. 927,549

Claims priority, application Japan, Jul. 25, 1977, 52-88933

Int. Cl.² H02P *13/22*

U.S. Cl. 363—49 **10 Claims**



1. For use in a switching type regulator which includes a source of unregulated DC voltage, a switching circuit for interrupting said unregulated DC voltage to produce an AC voltage having a duty cycle which is a function of the operation of said switching circuit, a converter for converting said AC voltage to a regulated DC voltage, a controllable pulse generator for supplying pulses of controllable duration to said switching circuit thereby determining the duty cycle of said AC voltage, feedback means responsive to variations in said regulated DC voltage for controlling the duration of said generated pulses to maintain said regulated DC voltage at a desired level, and means for selectively limiting the operation of said pulse generator, a control circuit for resetting said last-mentioned means to an initial state and for gradually changing the duration of said pulses generated by said pulse generator in response to a predetermined condition, said control circuit comprising voltage generating means for generating a control voltage having a first rate of change with respect to time; reset means for resetting said means for selectively limiting the operation of said pulse generator when said control voltage attains a first level; means for changing the rate at which said control voltage changes once said means for selectively limiting the operation of said pulse generator is reset such that said control voltage then changes at a second rate of change with respect to time, said second rate of change being slower than said first rate of change; and means for using said control voltage at said second rate of change to correspondingly change the duration of said pulses generated by said pulse generator, whereby the level of said regulated DC voltage gradually changes.

4,180,853

TWO-STAGE COMMUTATION CIRCUIT FOR AN INVERTER

Clifford A. Scorso, Jr., Bolton, and Gordon J. Messer, Tolland, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 23, 1978, Ser. No. 936,277

Int. Cl.² H02M *7/515*

U.S. Cl. 363—96 **12 Claims**



1. An inverter for converting DC electrical energy from a DC source into an output waveform having at least a fundamental sinusoidal component, said DC source having a voltage range which varies as a function of load current, comprising:

an input means for receiving electrical energy from a DC source, the voltage level of which varies within a range;

semiconductor switch means coupled to said input means which can be rendered conductive at a rate related to the fundamental sinusoidal component of the output waveforms;

commutation means connected to said semiconductor switch means including a first stage which is operable when the input parameters are within a first predetermined range and a second stage which is operable when the input parameters are within a second predetermined range; and

discriminator means connected to said commutation means for enabling both said first stage at said commutation means and said second stage of said commutation means depending on the input voltage level within said voltage range of said DC source.

4,180,854

PROGRAMMABLE CALCULATOR HAVING STRING VARIABLE EDITING CAPABILITY

Jack M. Walden; William D. Eads; Ray J. Cozzens; John L. Bidwell; Robert A. Jewett; Martin S. Wilson; Daniel J. Griffin; Robert E. Kuseski, and Louis T. Schulte, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 29, 1977, Ser. No. 837,771

Int. Cl.² G06F *3/02, 3/14*

U.S. Cl. 364—200 **2 Claims**

1. An electronic calculator comprising:

keyboard input means for entering alphanumeric program and data information, including string variables, into the calculator;

processing means for executing alphanumeric programs;

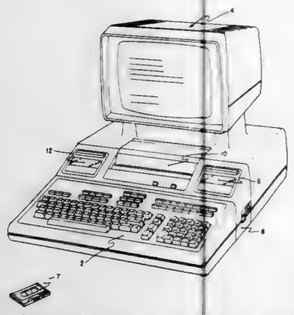
memory means for storing routines and subroutines of instructions to be selectively performed by the calculator and for storing a program and data, including a string variable, entered into the calculator; and

display means for displaying at least one line of alphanumeric program and data information;

said keyboard input means including means for entering a string variable modification statement into the calculator specifying a string variable, stored in said memory means, to be modified and further including program execution control means for controlling the execution of a program stored in said memory means, and editing means for en-

abling the user to alter alphanumeric information displayed by said display means;

said processing means being responsive to a string variable modification statement encountered during execution of a program stored in said memory means for interrupting execution of that program and for causing the value of the specified string variable stored in said memory means to be displayed on said display means, and being further



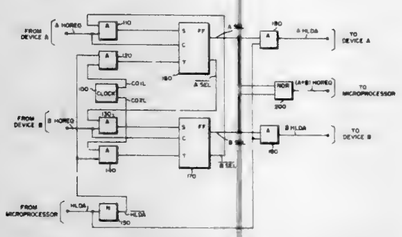
responsive to selective actuation by the user of said editing means for selectively altering the displayed value of the string variable, and being further responsive to actuation of said program execution control means following alteration of the value of the string variable for replacing the value of the string variable stored in said memory means with the altered value and for resuming execution of the program at the point at which interruption occurred.

4,180,855

DIRECT MEMORY ACCESS EXPANDER UNIT FOR USE WITH A MICROPROCESSOR

Charles K. Buedel, Wood Dale, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Apr. 7, 1978, Ser. No. 894,223
Int. Cl.² G06F *13/00*
U.S. Cl. 364—200 **8 Claims**



1. A direct memory access unit for use in a microprocessor including a central processing unit operable to transmit only a single hold acknowledge signal, a memory connected to said central processing unit and a clock circuit operated to generate first and second phase output signals, said direct memory access unit operable to control a plurality of associated peripheral devices, at least one of said peripheral devices, requiring direct access to said memory via said central processing unit, each operated to transmit a memory request signal, said direct memory access unit including one direct memory access circuit comprising:

first gating means connected to at least one of said peripheral devices and connected to said clock circuit of said central processing unit, operated in response to said memory request signal, to said single hold acknowledge signal and in response to said first and second phase output signals of said clock circuit in order to produce a plurality of signals representing the memory access status of each of said connected peripheral devices;

a plurality of latching means each connected to a corresponding peripheral device and to said first gating means, operated in response to said operation of said first gating means to produce a plurality of output signals each indicating the memory access status of a corresponding peripheral device;

second gating means for combining said latching means output signals, connected to said latching means and to said microprocessor, operated in response to said latching means output signals to generate a single output signal for transmission to said microprocessor; and

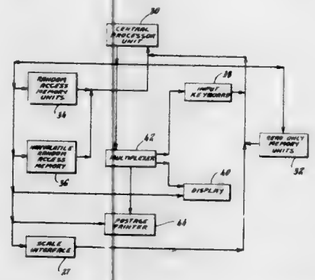
third gating means connected to a corresponding one of said plurality of peripheral devices and to said latching means, whereby in response to said latching means output signals and said single hold acknowledge signal transmitted by said microprocessor, a device acknowledge signal is transmitted to the requesting one of said plurality of peripheral devices.

4,180,856

ELECTRONIC POSTAGE METERING SYSTEM

Frank T. Check, Jr., Orange; Alton B. Eckert, Jr., Norwalk, and Joseph R. Warren, Stamford, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 820,058, Jul. 29, 1977, abandoned, which is a continuation-in-part of Ser. No. 715,914, Aug. 19, 1976. This application Jan. 26, 1978, Ser. No. 918,784
Int. Cl.² G06F *15/02;* **G01G** *19/413*
U.S. Cl. 364—466 **17 Claims**



1. For use in setting postage in a meter, a system comprising:

(a) input means for generating weight-representing signals;

(b) input means for providing signals representing a destination zip code;

(c) means for generating a destination zone signal as a function of the destination zip code;

(d) means for computing the proper postage as a function of a weight-representing signal and a destination zone signal, said means for computing comprising:

(1) means for selecting a sequence consisting of a minimum postage amount and incremental postage amounts as a function of the destination zone signal;

(2) means for decrementing weight-representing signals by predetermined amounts during each of successive operations;

(3) means responsive after each decrementing operation for producing a first type of signal if the decremented result is greater than a predetermined number and a second type of signal if the decremented result is less than or equal to the predetermined number;

(4) means responsive to an initial one of said first type of signal to increase the minimum postage amount by a first incremental postage amount, said means being

responsive to each subsequently occurring first type of signal to further increase the result of previous incrementing operations by subsequent incremental postage amounts in the selected sequence; and

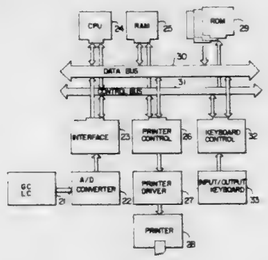
(e) a meter setting means for translating postage-representing signals for setting the postage into said meter.

4,180,857

APPARATUS FOR PROCESSING CHROMATOGRAPH DATA

Touhachi Yoshihara; Koji Nishiwaki, and Kiwao Seki, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 28, 1977, Ser. No. 811,139
Claims priority, application Japan, Jun. 30, 1976, 51-76348
Int. Cl.² G06F *15/20;* **G06K** *15/10*
U.S. Cl. 364—497 **6 Claims**



6. A data processing apparatus for printing a chromatogram having a plurality of reduced graphs comprising:

means for converting to digital signals an analog signal which is generated by a chromatograph apparatus and varies with time;

arithmetic means for subjecting said digital signals to an arithmetic operation according to a stored program to calculate the component concentrations from the chromatograph;

memory means for storing the result of said arithmetic operation, said memory means including a print buffer memory which successively stores in its plural bit locations the digital signals as a figure in general corresponding to said analog signals, said memory means including means for obtaining plural attenuated digital signals by attenuating each of said digital signals every time it is received according to plural attenuating factors before said digital signals have been transferred to said print buffer memory;

dot printer means for printing out on paper input signals in the form of plural dots, said printer means including a print head carrying thereon a plurality of print segments; and

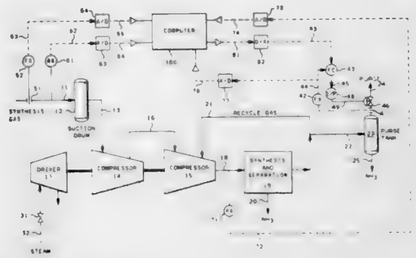
means for controlling said printer means to act in a manner so that after said bit locations of said buffer memory has been filled with the attenuated digital signals as a figure in general corresponding to said analog signals, the attenuated digital signals filling said bit locations are displayed as a plurality of reduced graphs corresponding to said figure in the form of plural dots on said paper by successively actuating all the print segments as the print head is moved in one direction across the paper, and that component concentrations are printed out as characters in rows each being in dot matrix form.

4,180,858

PURGE CONTROL FOR AMMONIA SYNTHESIS PROCESS

Larry D. Gaines, Bartlesville, Okla., and Richard F. Giles, Pinch, Va., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 30, 1978, Ser. No. 938,188
Int. Cl.² G06G *7/58;* **G05B** *17/00*
U.S. Cl. 364—502 **12 Claims**



7. A method for controlling an ammonia synthesis process comprising the steps of:

passing a stream of fresh synthesis gas, containing hydrogen, nitrogen and a small percentage of inert gases, based on the total volume of said fresh synthesis gas, into a compression zone to compress said fresh synthesis gas to a suitably high pressure;

separating ammonia from the compressed synthesis gas;

passing the compressed synthesis gas to a synthesis zone and therein forming ammonia from part of said synthesis gas;

passing at least a portion of the unreacted, compressed synthesis gas and ammonia gas as recycle gas to said compression zone to be combined with said fresh synthesis gas;

purging a portion of said recycle gas;

establishing a first signal representative of a generally continuous estimate of the concentration of the inert gases in said recycle gas;

establishing a second signal representative of the actual concentration of the inert gases in said recycle gas, said second signal being updated periodically every T seconds;

utilizing said first signal for feed forward control of said purging of a portion of said recycle gas; and

utilizing said second signal for feedback control of said purging of a portion of said recycle gas.

4,180,859

SYSTEM FOR MEASURING THE SPEED OF ROTATION OF A SYNCHRO BY MEANS OF A SAMPLING TECHNIQUE

Pierre L. V. Breant, Clamart, and Alain C. Fresnel, Plaisir, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 20, 1978, Ser. No. 898,471
Claims priority, application France, Apr. 20, 1977, 77 11874
Int. Cl.² G06F *15/20*
U.S. Cl. 364—565 **9 Claims**

1. A system for generating a signal which is representative of the speed of rotation of a synchro using a first digital signal which is proportional to the sine of the angle of rotation of the shaft of the synchro and a second digital signal which is proportional to the cosine of said angle, comprising:

means for a first sampling of said sine signal;

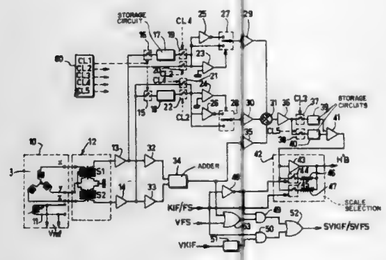
means for a first sampling of said cosine signal;

means for a second sampling of said sine signal after a predetermined period of time has elapsed after said first sampling of the sine signal;

means for a second sampling of said cosine signal after a predetermined period of time has elapsed after said first sampling operation of the cosine signal;

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means for multiplying said second sampled sine signal by said first sampled cosine signal for forming a first product;
means for multiplying said first sample sine signal by said second sample cosine signal for forming a second product;
means for squaring said sine and cosine signals;
means for adding said squared sine and cosine signals for forming a first sum;



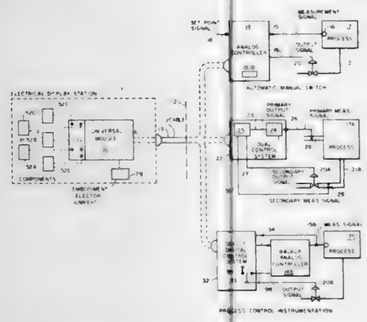
means for dividing said first product by said first sum for forming first quotient;
means for dividing said second product by said first sum for forming a second quotient; and
means for subtracting said second quotient from said first quotient for producing a signal which is representative of the speed of rotation of the said synchro.

4,180,860

DISPLAY STATION HAVING UNIVERSAL MODULE FOR INTERFACE WITH DIFFERENT SINGLE LOOP CONTROLLERS

Richard O. Driscoll, Mansfield; William E. Jordan, Norton, and Richard L. McAllister, Canton, all of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Jun. 21, 1977, Ser. No. 809,148
Int. Cl.[2] G06F *3/14, 15/46*
U.S. Cl. 364—900 **16 Claims**



1. In an industrial process control system for use with complex processes having a number of conditions the values of which are sensed to produce measurement signals used to develop corresponding control signals for elements such as valves and the like; each combination of measured value and corresponding signal defining a process control loop, each loop including an individual analog controller arranged to compare the measurement signal with a preselected set point signal and to produce a corresponding control signal responsive to the difference between the measurement and set point signals; said analog controller being any one of a number of different functional types, such as for primary analog control or cascade control and the like, according to the particular process control requirement of each loop; each loop further including signal display means to present visual indications of selected operational information such as measurement signal or control signal levels;

apparatus providing improved means cooperable with any selected analog controller of said different functional types comprising:

(1) a display station remotely positioned from said selected analog controller and having a front panel with signal-controllable display means arranged to present to an operator a visual image indicating the value of at least one analog signal level respecting a single corresponding process control loop;

(2) transmission circuit means providing a number of individual signal circuits, said transmission circuit means connecting said display station with said selected analog controller and providing for transmission therebetween in both directions;

(3) universal module circuit means located at said display station and coupled to said transmission circuit means, said universal module circuit means comprising logic circuit means to receive information signals from said selected analog controller and to control the operation of said display means to present a visual indication of at least one of said received information signals, said logic circuits means including a plurality of sets of signal paths for effectuating display control operations respecting each of said different functional types;

(4) manually-shiftable selector means coupled to said logic circuit means and operable to condition said logic circuit means into any one of a number of different operating modes by selectively actuating predetermined ones from said sets of signal paths, each one of such different operating modes providing correspondingly different display arrangements for preselected information signals to conform with the type of analog controller coupled to the other end of said transmission circuit means; and

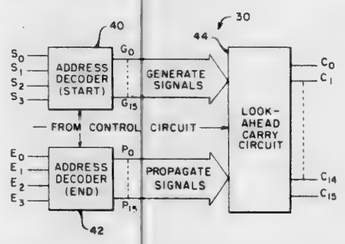
(5) said logic circuit means being conditioned by said selector means into a dedicated operating mode to control said display means to provide for the display of the particular analog signals delivered by said selected controller in accordance with the type of said analog controller.

4,180,861

SELECTIVELY OPERABLE MASK GENERATOR

Rolfe D. Armstrong, Escondido, and Charles R. Lang, Jr., Woodland Hills, both of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 31, 1978, Ser. No. 892,064
Int. Cl.[2] G06F *7/00*
U.S. Cl. 364—900 **6 Claims**



1. A mask generator for generating a mask having a plurality of bits at the mask generator output and having a selective number of inhibiting bits of a predetermined value in said plurality of output bits, comprising:

decoder means for receiving a first set of address signals representing the beginning inhibiting bit of the mask and for receiving a second set of address signals representing the address of the end inhibiting bit of the mask, and for converting said first and second set of address signals to a generate signal corresponding to each of said output bits, including an enabled generate signal, and to a propagate signal corresponding to each of said output bits, including an enabled propagate signal; and

look-ahead carry circuit means for receiving said generate and propagate signals and for producing said output bits, said outputs bits including said inhibiting bits beginning with an inhibiting bit corresponding to said enabled generate signal and continuing up to an inhibiting bit corresponding to said enabled propagate signal, said look-ahead carry circuit means including:

first gate means associated with each one of said output bits for receiving the generate signal corresponding to each of any output bits preceding its associated one of said output bits and for receiving the propagate signal corresponding to each of any output bits preceding its associated one of said output bits and the propagate signal corresponding to its associated one of said output bits; and

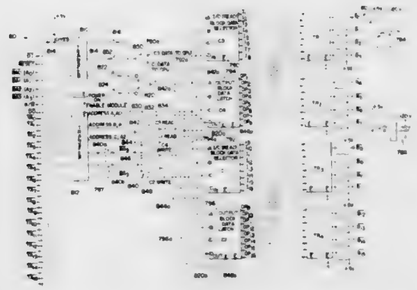
second gate means associated with each one of said output bits for receiving the output of the first gate means associated with its associated one of said output bits and the generate signal corresponding to its associated one of said output bits.

4,180,862

PROGRAMMABLE CONTROLLER USING MICROPROCESSOR

William H. Seipp, Bettendorf, Iowa, assignor to Gulf & Western Industries, Inc., New York, N.Y.

Division of Ser. No. 701,858, Jul. 1, 1976, Pat. No. 4,107,785.
This application Jun. 12, 1978, Ser. No. 914,525
Int. Cl.[2] G06F *3/00*
U.S. Cl. 364—900 **3 Claims**



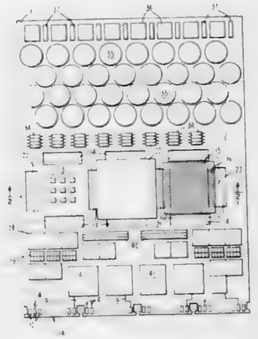
1. In an input/output circuit for a programmable controller of the type including a data line for receiving selected binary logic, first logic means for directing binary logic from said data line to a selected one of a plurality of external logic terminals and second logic means for directing binary logic from a selected one of said external logic terminals to said data line, the improvement comprising: said first logic means includes a memory device having output terminals selectable by distinct addresses each address corresponding to one of said external logic terminals; an output lead means for connecting each of said output terminals to selected external terminals whereby logic from said output terminals of said memory device is directed to said external terminals in accordance with stored logic at said output terminals; and, means for selectively storing logic from said data line at said output terminals.

4,180,863

MAGNETIC DOMAIN DEVICE MODULAR ASSEMBLY

Kailash C. Joshi, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1978, Ser. No. 920,927
Int. Cl.[2] G11C *19/08, 5/04*
U.S. Cl. 365—2 **11 Claims**



1. Field accessed magnetic domain device modular assembly apparatus comprising:

a substrate having at least one surface with a predetermined circuitized pattern thereon,

plural groups of magnetic domain devices mounted on said substrate and electrically connected to said circuitized pattern, each of said groups having at least one of said magnetic domain devices,

plural rectangular patterns of non-open ended slots disposed through said substrate, each of said groups being circumscribed by four of said slots arranged in one of said rectangular patterns,

plural rotational magnetic field coil drive systems, each of said drive systems having orthogonal first and second coils of plural turns each and coacting with a mutually exclusive particular one of said groups of magnetic domain devices, the turns of said first coil of each system encompassing said particular one of said groups through two opposing slots circumscribing said particular one of said groups, the turns of said second coil of each system encompassing said first coil and said particular one of said groups encompassed by said first tab through the other two opposing slots circumscribing said particular one of said groups, and

plural closed magnetic bias field systems, each of said bias field systems coacting with a mutually exclusive one of said groups of magnetic domain devices and the latter's said encompassing drive system, each of said bias field systems having means for enclosing the lastmentioned said one of said groups and its said encompassing drive system, said means being extended through the slots circumscribing said lastmentioned one of said groups and being resiliently engageable with said last mentioned slots.

4,180,864

BUBBLE MEMORY COIL DRIVE CIRCUIT

Sidney J. Schwartz, Vista, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sep. 5, 1978, Ser. No. 939,347
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—6 **9 Claims**

1. Circuitry in which a alternating current wave form is generated in drive coil means of a bubble memory for providing the rotating in-plane magnetic field for propogating magnetic bubbles in said memory and for matching the magnetic

field to the magnetic relationship between the magnetic bubbles and propogate elements, comprising:

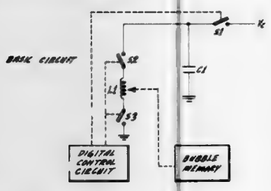
voltage source means and a reference voltage source means;

at least one coil means for providing said in-plane magnetic field;

energy storage means which in conjunction with the coil means determines the current wave form connected by means of switches in a parallel arrangement with said coil means between said voltage and reference source means;

a first switching means connected in series with said voltage source means and said parallel arrangement of said coil means and energy storage means;

a second switching means connected between said energy storage means and said coil means;



a third switching means connected between said coil means and said reference source means;

digital control means;

said first, second and third switching means connected to said digital control means whereby said first switching means is momentarily closed each desired cycle to connect said voltage supply means to said energy storage means to supply energy thereto, and

wherein said second and third switching means are actuated by said digital control means after energy has been supplied to said energy storage means to connect and disconnect said energy storage means with said coil means to control the flow of current from said energy storage means through said coil means.

4,180,865

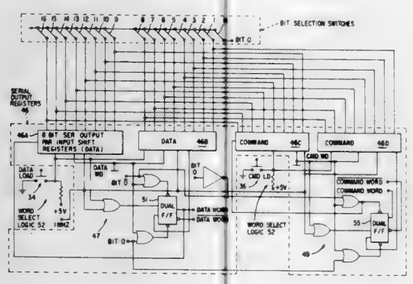
PORTABLE MULTIPLEX BUS EXERCISER

Jay L. Richman, Montville, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Sep. 27, 1978, Ser. No. 946,286

Int. Cl.[2] **G11C** *13/00*

U.S. Cl. 365—63 **7 Claims**



1. An exerciser for exercising a digital communications multiplex bus, comprising:

bit selection means operator-operable for selecting digital bits to provide digital word patterns;

register means connected to the bit selection means for receiving the digital word patterns therefrom;

word select means associated with the register means and operator-operable for rendering the register means operable for receiving the digital word patterns therefrom;

timing means for providing timing signals;

the word select means connected to the timing means and responsive to particular timing signals therefrom for shifting the selected digital word patterns from the register means to the timing means which synchronizes the selected shifted digital word patterns;

a plurality of output channels connected to the timing means for receiving the synchronized digital word patterns therefrom; and

control means connected to the timing means and to the plurality of output channels and responsive to other particular signals from the timing means for selecting at least one of the output channels to provide output signals for exercising the digital communications multiplex bus.

4,180,866

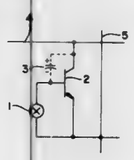
SINGLE TRANSISTOR MEMORY CELL EMPLOYING AN AMORPHOUS SEMICONDUCTOR THRESHOLD DEVICE

Roy R. Shanks, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 1, 1977, Ser. No. 820,869

Int. Cl.[2] **H01L** *45/00;* **G11C** *11/24*

U.S. Cl. 365—186 **7 Claims**



1. A single transistor cell memory array comprising:

at least one single transistor cell having a transistor and a threshold switch;

said transistor being formed with a collector region, a base region, and an emitter region, there being a base-collector capacitance associated with said base and collector regions;

said threshold switch having a conductive state and a nonconductive state, said switch being electrically coupled to said base region, said switch being formed of a layer of a tellurium base chalcogenide, and said switch normally residing in a nonconducting state;

means coupled between said emitter and said collector regions for charging said base-collector capacitance to place said single transistor cell in a first memory state;

means coupled to said threshold switch and one of said emitter and collector regions to apply a signal to switch said threshold switch to its conductive state to discharge said base-collector capacitance to place said single transistor cell in a second memory state; and

means coupled between said emitter and said collector regions to determine the charge condition of said base-collector capacitance to determine the memory state of said single transistor cell.

DESIGN PATENTS

GRANTED DEC. 25, 1979

ERRATA

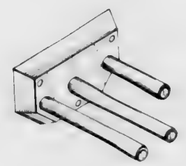
For CLASS	See PATENT NO.
D13-012	253,768
D19-065	253,773
D21-149	253,784
D21-150	253,785
D21-032	253,786
D21-234	253,788

V 9 8 9 / 4 DEC 25 79 UMI

253,736
TOOTHBRUSH HOLDER OR SIMILAR ARTICLE
Joseph J. Guarino, 26431 Rim Rd., Hemet, Calif. 92343
Filed May 1, 1978, Ser. No. 901,972
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—94



253,737
SKI EQUIPMENT HOLDER
Ronald H. Brink, Ogdensburg, N.Y., assignor to Northern Manufacturers, Canton, N.Y.
Filed Feb. 17, 1978, Ser. No. 878,929
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—125



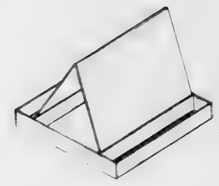
253,738
DISPLAY RACK
Allan H. Willinger, New York, N.Y., assignor to Willinger Bros., Inc., New York, N.Y.
Filed Jul. 15, 1977, Ser. No. 816,100
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—157



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TABLE
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Nov. 28, 1977, Ser. No. 855,248
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



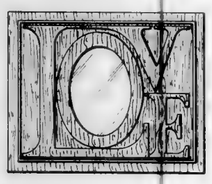
253,740
STACKABLE ART EASEL
Dorothea L. Dubler, 250 N. Stetson Park Dr., Deland, Fla. 32720
Filed Aug. 24, 1977, Ser. No. 827,382
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—180



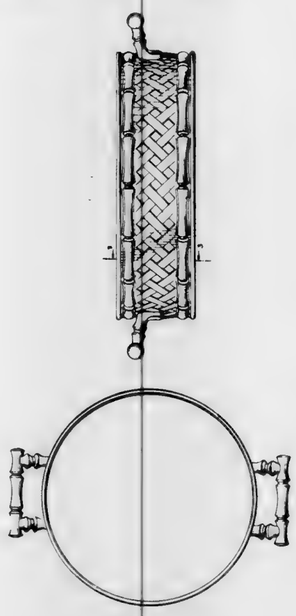
253,741
ETAGERE
Nicholas A. Ungaro, Louisville, Ky., assignor to Peters-Revington Corporation, Delphi, Ind.
Filed Aug. 10, 1977, Ser. No. 823,293
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186



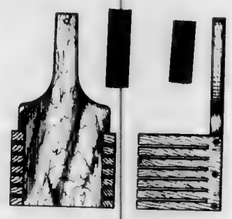
253,742
PICTURE FRAME
Joseph R. English, 1168 Oakleigh Dr., East Point, Ga. 30344
Filed Dec. 12, 1977, Ser. No. 859,286
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—236



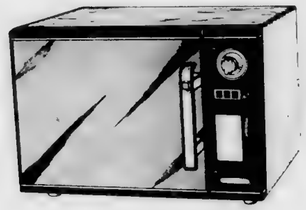
253,743
PIE PLATE HOLDER
Stuart A. Young, Meriden, Conn., assignor to International Silver Company
Filed Jun. 29, 1977, Ser. No. 811,156
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—39



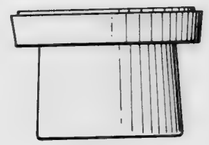
253,744
BREAD SLICING GUIDE
Gary L. Davis, 736 E. 650 South, Centerville, Utah 84014
Filed Mar. 30, 1978, Ser. No. 891,739
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—46



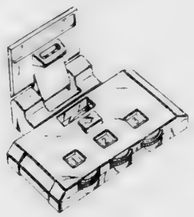
253,745
MICROWAVE OVEN OR SIMILAR ARTICLE
Torio Hida; Katsuyoshi Sato, and Takashi Kojima, all of Kawasaki, Japan, assignors to The General Corporation
Filed Oct. 21, 1977, Ser. No. 844,501
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128



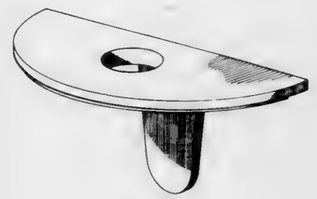
253,746
PRESSURE COOKER REGULATOR
Melvin H. Boldt, Glenview; Thurber H. Morrison, Evanston, and James P. Stevens, Oak Park, all of Ill., assignors to National Presto Industries, Inc., Eau Claire, Wis.
Continuation-in-part of Ser. No. 774,581, Mar. 7, 1977. This application Apr. 10, 1978, Ser. No. 895,284
Term of patent 14 years
Int. Cl. D7—*02*; D10—*04*
U.S. Cl. D7—129



253,747
COMBINATION LOCK
Edward M. Stolarz, Yorktown Heights, N.Y., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc., Garfield, N.J.
Filed Oct. 12, 1977, Ser. No. 841,642
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—338



253,748
TRACK BASE FOR COLUMNAR CURTAINS
Alex S. Kovacs, 2431 E. 34 Ave., Vancouver, British Columbia, Canada (V5R 2S6)
Filed May 9, 1978, Ser. No. 904,249
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—363



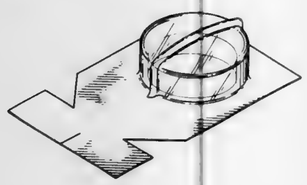
253,749
DOOR KNOCKER OR THE LIKE
Rudolph Paulich, Mercer Island, Wash., assignor to Columbia Specialty Co., Inc., Seattle, Wash.
Filed Jun. 17, 1977, Ser. No. 807,387
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D8—401



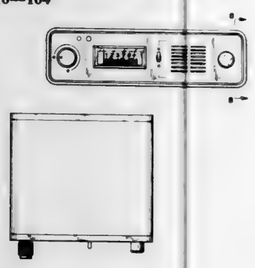
253,750
LIQUID CONTAINER
Tim M. Uyeda, South San Gabriel, Calif., assignor to Flambeau Products Corporation
Filed May 24, 1977, Ser. No. 800,089
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—175



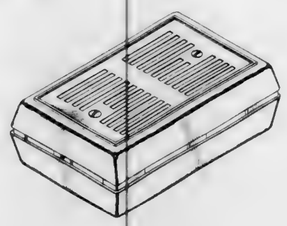
253,751
PHARMACEUTICAL BLISTER PACKAGE
Eugene J. Meierhoefer, Hackettstown, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed May 27, 1977, Ser. No. 801,285
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—192



253,752
RADAR WARNING RECEIVER
Robert E. Dilgard, Jr., Cincinnati, Ohio, assignor to Cincinnati Microwave, Inc.
Filed Jul. 13, 1978, Ser. No. 924,460
Term of patent 14 years
Int. Cl. D10—*05*; D13—*03*
U.S. Cl. D10—104



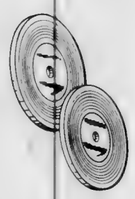
253,753
HOUSING FOR SMOKE DETECTOR OR SIMILAR ARTICLE
John L. Poesl, 1118 Cabot St., Peterborough, Ontario, Canada
Filed Jan. 6, 1978, Ser. No. 868,128
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



253,754
PENDANT
Joe B. Hill, 4930 Spokane, Detroit, Mich. 48204
Filed Jan. 6, 1977, Ser. No. 757,306
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—53



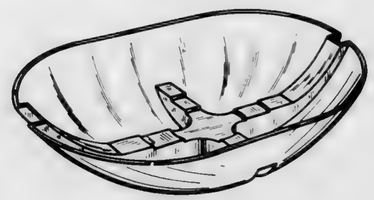
253,755
PENDANT OR SIMILAR ARTICLE
Gary E. Minassian, 465 S. Ranchview Cir., Apt. 50, Anaheim, Calif. 92807
Filed Oct. 18, 1977, Ser. No. 843,352
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—81



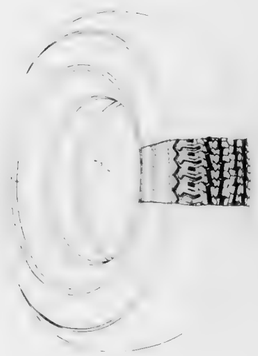
253,756
CHRISTMAS ORNAMENT
William B. Campbell, deceased, late of Saint Paul, Minn. (by Doris B. Campbell, administratrix), assignor to Ball Corporation, Muncie, Ind.
Filed Jan. 17, 1978, Ser. No. 870,259
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—128



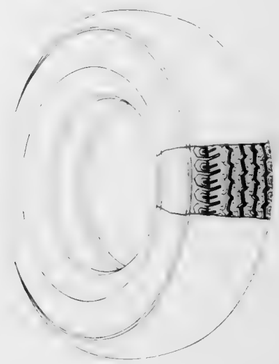
253,757
PLANT RESERVOIR
Richard E. Cone, 249 Bowman Dr., Kent, Ohio 44240
Filed May 10, 1978, Ser. No. 904,629
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—164



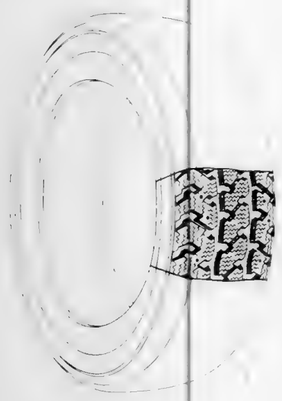
253,758
TIRE
Jean-Claude Péron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Feb. 13, 1978, Ser. No. 877,397
Claims priority, application France, Sep. 21, 1977, 541
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142



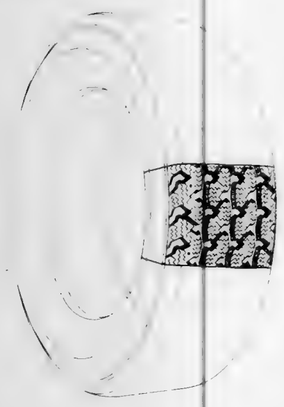
253,759
TIRE
Jean-Claude Péron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Feb. 13, 1978, Ser. No. 877,398
Claims priority, application France, Sep. 21, 1977, 541
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142



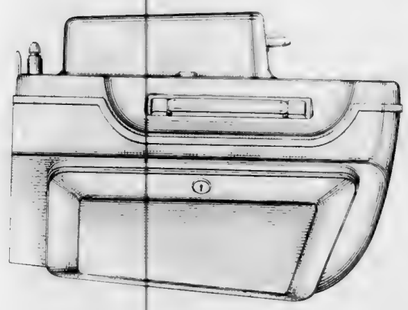
253,760
TIRE
Michel R. de Saint-Michel, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed May 15, 1978, Ser. No. 905,776
Claims priority, application France, Dec. 14, 1977, 548
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147

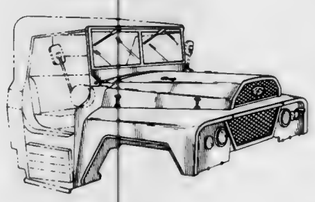


253,761
TIRE
Michel R. de Saint-Michel, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed May 15, 1978, Ser. No. 905,775
Claims priority, application France, Dec. 9, 1977, 547
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



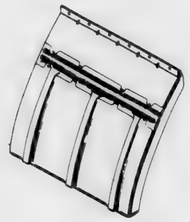
253,762
MOTORCYCLE ARTICLE CARRIER
Craig W. Vetter, and Charles Perethian, both of San Luis Obispo, Calif., assignors to Vetter Fairing Company, San Luis Obispo, Calif.
Filed May 1, 1978, Ser. No. 901,323
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158



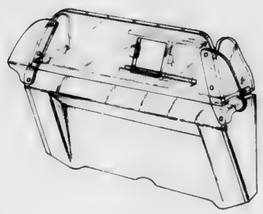


253,763
COMBINED HOOD, WINDSHIELD, FENDERS, HEADLIGHTS AND GRILLE UNIT
Paul E. R. Legueu, 85 Avenue de Mazy-44380, Pornichet, France
Filed Mar. 22, 1978, Ser. No. 889,071
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—164

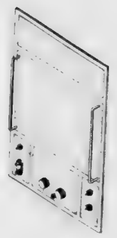
253,764
VEHICLE FENDER GUARD
James R. Lockwood, Wapakoneta; Joseph A. Ferrante, Toledo, both of Ohio; James P. Olszewski, Temperance, Mich., and John A. Semelka, Maumee, Ohio, assignors to Lancaster Colony Corporation, Columbus, Ohio
Filed Oct. 27, 1977, Ser. No. 846,265
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—185



253,765
PROTECTIVE VEHICLE PARTITION
Sam Roggin, 23091 Rosewood, Oak Park, Mich. 48237
Filed Oct. 13, 1977, Ser. No. 841,963
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—195



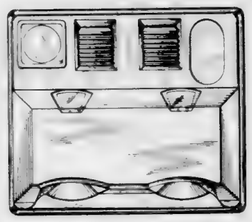
253,766
INSTRUMENT PANEL
Norman Dusanek, 8116 Deering Ave., Canoga Park, Calif. 91304
Filed Aug. 26, 1977, Ser. No. 828,173
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12



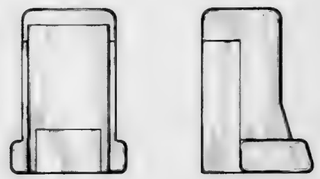
253,767
HAND MICROPHONE
Donald W. Peterson, Conneaut, Ohio, assignor to The Astatic Corporation, Conneaut, Ohio
Filed Jan. 24, 1979, Ser. No. 6,283
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—12



253,768
CONTROL PANEL
Harry Weitz, New Hyde Park, N.Y., assignor to Instrument Systems Corporation
Filed Mar. 10, 1978, Ser. No. 885,404
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12

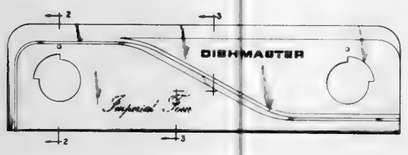


253,769
ADAPTER FOR TELEPHONE CRADLE PROTUBERANCE
Thomas L. Marks, P.O. Box 746, Fordyce, Ark. 71742
Filed Aug. 22, 1977, Ser. No. 826,888
Term of patent 14 years
Int. Cl. 14—*03*
U.S. Cl. D14—65

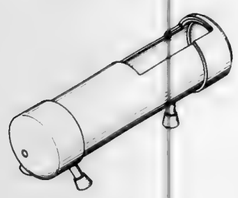


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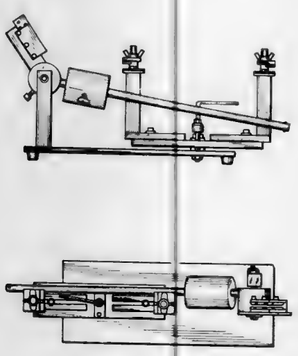
253,770
NAMEPLATE FOR A DISHWASHER CONTROL PANEL
Eugene R. Flynn, Farmington Hills, and Harlan E. Kifer, Birmingham, both of Mich., assignors to Manville Mfg. Co., Pontiac, Mich.
Filed Aug. 15, 1977, Ser. No. 824,501
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—36



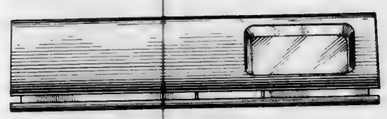
253,771
CAN RECYCLING PRESS
Alton W. Hubbard, Fortuna, and Pete A. Johnson, Eureka, both of Calif., assignors to Jahs Enterprises, Inc., Eureka, Calif.
Filed Apr. 11, 1977, Ser. No. 786,123
Term of patent 14 years
Int. Cl. D23—*02*; D15—*99*
U.S. Cl. D15—123

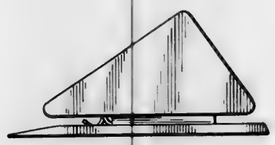


253,772
MACHINE FOR STRINGING RACQUETS
Donald A. Chartier, 88 Walnut St., Nashua, N.H. 03060, and Richard Janes, 4E Pine Isle Dr., Derry, N.H. 03038
Filed Jul. 25, 1977, Ser. No. 818,619
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—199

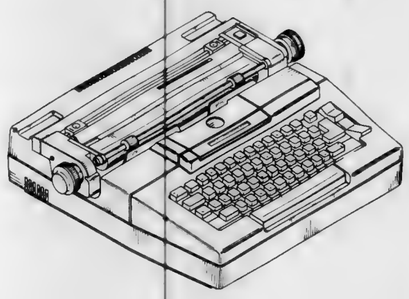


253,773
COMBINED MESSAGE HOLDER AND SIGNAL
Walter I. Bieger, St. Paul, Minn., assignor to Arthur Salm Inc., St. Paul, Minn.
Filed May 19, 1977, Ser. No. 798,435
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—65





253,774
TYPEWRITER
James J. Beinkowski, Cazenovia, N.Y., assignor to SCM Corporation, New York, N.Y.
Filed Mar. 24, 1978, Ser. No. 889,992
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—1



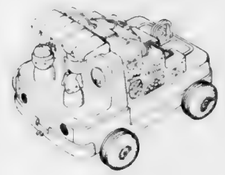
253,775
COPY HOLDER FOR A TYPEWRITER OR SIMILAR ARTICLE
Barry J. Lar Rieu, P.O. Box 752, Menlo Park, Calif. 94025
Filed Sep. 21, 1977, Ser. No. 836,176
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—91



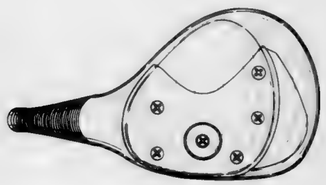
253,776
PINWHEEL
Lester V. Molenaar, Willmar, Minn., assignor to James Industries, Inc., Hollidaysburg, Pa.
Filed Dec. 30, 1977, Ser. No. 868,282
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—93



253,777
COMBINED TOY VEHICLE AND STACKED, REMOVABLE ARTICLES
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Kazuo Nagata, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed May 10, 1977, Ser. No. 795,592
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—137



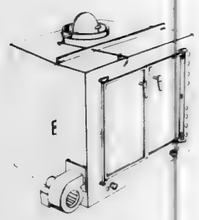
253,778
GOLF CLUB HEAD
Theodore N. Madison, 49 Winthrop Rd., Windsor, Conn. 06095
Filed Jan. 27, 1977, Ser. No. 763,064
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—214



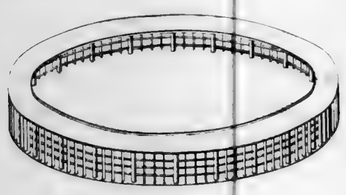
253,779
GOLFER'S TOOL
Boris Kralevich, 4868 Beacon Hill Dr., Castro Valley, Calif. 94546
Filed Mar. 16, 1978, Ser. No. 887,453
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234



253,780
WOOD AND COAL BURNING STOVE
Larry A. Schwartz, 67 Hess Ave., Warwick, R.I. 02889, and Charles E. Spalt, 376 N. Main St., Cohasset, Mass. 02025
Filed Nov. 28, 1977, Ser. No. 856,021
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



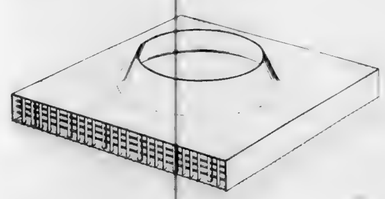
253,781
WATER INJECTED COOLING TOWER
John Engalitcheff, Jr., Gibson Island, Md., assignor to Baltimore Aircoil Company, Inc., Jessup, Md.
Filed Jul. 12, 1977, Ser. No. 814,825
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—139



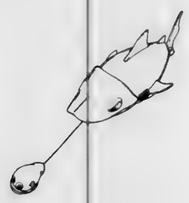
253,782
WATER INJECTED COOLING TOWER
John Engalitcheff, Jr., Gibson Island, Md., assignor to Baltimore Aircoil Company, Inc., Jessup, Md.
Filed Jul. 12, 1977, Ser. No. 815,035
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—139



253,783
WATER INJECTED COOLING TOWER
John Engalitcheff, Jr., Gibson Island, Md., assignor to Baltimore Aircoil Company, Inc., Jessup, Md.
Filed Jul. 12, 1977, Ser. No. 815,036
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—139



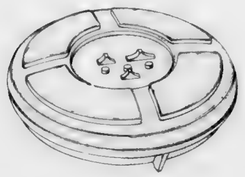
253,784
FIGURE TOY
Shigeru Saitoh, 6-4, 2-chome, Kuramae, Taito-ku, Tokyo, Japan
Filed Apr. 20, 1976, Ser. No. 674,846
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—149



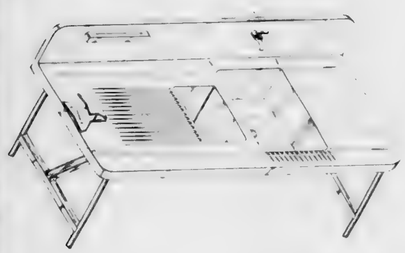
253,785
TOY WORM
Louis V. Cook, 2207 Irondale Rd., Libertyville, Ill. 60048
Filed Jul. 5, 1977, Ser. No. 813,118
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150



253,786
ELECTRONIC GAME HOUSING
Douglas P. Montague, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Apr. 13, 1978, Ser. No. 895,993
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—32



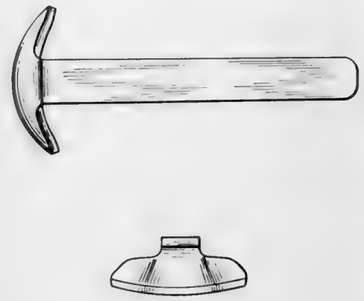
253,787
COMBINED SINK AND TABLE
Albert L. Kinsey, 10810 Burbank Dr., Potomac, Md. 20854
Filed Dec. 28, 1977, Ser. No. 865,265
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—61



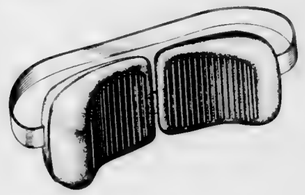
253,788
GOLFER'S TOOL
Boris Kralevich, 4868 Beacon Hill Dr., Castro Valley, Calif. 94546
Filed Apr. 26, 1978, Ser. No. 900,284
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234



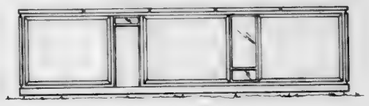
253,789
TONGUE CLEANER
Subhash R. Gupta, 31 Queen St., Worcester, Mass. 01602
Filed Feb. 3, 1978, Ser. No. 874,838
Term of patent 3½ years
Int. Cl. D24—*02*
U.S. Cl. D24—23



253,790
BACK MASSAGER ATTACHMENT
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc.
Filed Aug. 17, 1977, Ser. No. 825,299
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64



253,791
BUILDING UNIT
Franklyn L. Whitney, R.D. 1, Box 447-A, Stockton, N.J. 08559
Filed Nov. 14, 1977, Ser. No. 851,544
Term of patent 3½ years
Int. Cl. D25—*03*
U.S. Cl. D25—33



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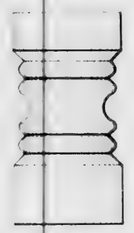
253,792
PEDICURE INSTRUMENT
Dennis R. Phair, 2429 Launcelot Ct., Colorado Springs, Colo. 80904
Filed Jun. 27, 1977, Ser. No. 810,154
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—59



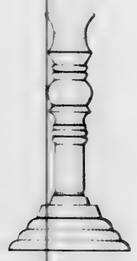
253,793
MIRROR
Ernest L. Peterson, 204 N. Third St., Selah, Wash. 98942
Filed Mar. 21, 1978, Ser. No. 888,550
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—70



253,794
CANDLESTICK
David R. Hilgeman, 2805 Hartmetz Ave., Evansville, Ind. 47712
Filed Apr. 7, 1978, Ser. No. 894,575
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2



253,795
CANDLESTICK
David R. Hilgeman, 2805 Hartmetz Ave., Evansville, Ind. 47712
Filed Apr. 10, 1978, Ser. No. 894,908
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF DECEMBER, 1979

NOTE —Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A & E Plastik Pak Co., Inc.: *See—*
Greer, Bradley G., 4,180,117, Cl. 160-67.000.
A. W. Faber-Castell: *See—*
Katz, Otto, 4,180,339, Cl. 401-67.000.
AB Trelleborgplast: *See—*
Tornerfelt, Gosta T. I., 4,179,790, Cl. 29-416.000.
Abbott Laboratories: *See—*
Becker, Frank C.; and Li, Jorge P., 4,180,508, Cl. 260-326.50C.
Genese, Joseph N., 4,180,070, Cl. 128-218.00M.
Kim, Yung D.; Tomita, Joseph T.; and Schenck, Jay R., 4,180,556, Cl. 424-1.000.
Patterson, Roy; and McIntire, Floyd C., 4,180,562, Cl. 424-91.000.
Stein, Robert G., 4,180,574, Cl. 424-250.000.
Winn, Martin, 4,180,669, Cl. 546-240.000.
Abbott, Warren G.: *See—*
O'Rourke, Harold T.; and Abbott, Warren G., 4,180,199, Cl. 228-102.000.
Abdo, Kamal M.: *See—*
Winyall, Milton E.; and Abdo, Kamal M., 4,180,566, Cl. 424-127.000.
Abex Corporation: *See—*
Feldstein, Robert S., 4,180,809, Cl. 340-384.00E.
Abiko, Toshio: *See—*
Yoshimura, Tadashi; Hanahara, Tohru; Abiko, Toshio; and Matsuoka, Kazuhiro, 4,180,811, Cl. 340-566.000.
Abraham, Wayne G.; Enck, Richard S., Jr.; Goehner, Ronald H.; and Brick, Robert V., to United States of America, Air Force. Gating apparatus for static crossed field photomultipliers. 4,180,725, Cl. 250-207.000.
Abrams, Donald W., to General Electric Company. Sealing grommet in a refrigerator cabinet. 4,180,297, Cl. 312-214.000.
Abrams, Edwin F.: *See—*
Olcott, Eugene L.; and Abrams, Edwin F., 4,180,211, Cl. 239-265.430.
ABU Aktiebolag: *See—*
Harre, Kurt J. S.; and Tufvesson, Kent A., 4,180,217, Cl. 242-84.20A.
Abu-Shumays, Ahmad, to Varian Associates, Inc. Thermostatable flow cell for fluorescence measurements. 4,180,739, Cl. 250-461.00R.
ACF Industries, Incorporated: *See—*
Niggemeier, Joseph F.; and Yeates, Richard P., 4,179,998, Cl. 410-64.000.
Reedy, Charles E., 4,180,242, Cl. 251-144.000.
Acro, Inc.: *See—*
Robinson, Mark L., 4,180,264, Cl. 273-73.00J.
Adachi, Yoshiharu: *See—*
Kito, Masahiro; and Adachi, Yoshiharu, 4,179,980, Cl. 91-6.000.
Adams, George B., to Lockheed Missiles & Space Company, Inc. Electrically rechargeable battery. 4,180,623, Cl. 429-21.000.
Adams, Harold R. Valve stem cleaner and lubricator. 4,180,144, Cl. 184-1.00R.
ADIDAS, Fabrique de Chaussures de Sport: *See—*
Denu, Francis, 4,179,754, Cl. 2-67.000.
AFA Corporation, The: *See—*
Quinn, David R., 4,180,174, Cl. 215-221.000.
Agency of Industrial Science and Technology: *See—*
Shimokawa, Kenji; Nagatomo, Muneshige; and Tanaka, Yasuo, 4,179,895, Cl. 62-2.000.
AGFA-GEVAERT N.V.: *See—*
Suys, Andre R.; and Van Landeghem, Willy K., 4,180,740, Cl. 250-483.000.
Agranovskaya, Miriam A.; Babich, Vladimir A.; Ratner, Felix A.; Rozenoer, Alexandr S.; and Ryvkin, Moisei I. Installation for controlling pressure of gas under shaft top in super-capacity blast furnace. 4,180,249, Cl. 266-78.000.
Air-Dry Corporation of America: *See—*
Sheldon, Robert S.; and Rabek, Jan W., 4,179,917, Cl. 73-17.00A.
Sheldon, Robert S.; and Rabek, Jan W., 4,180,240, Cl. 251-127.000.
Air Products & Chemicals, Inc.: *See—*
Hvizdos, Leonard J.; Filippi, Richard E.; and Luybli, Richard E., 4,179,897, Cl. 62-9.000.
Airco, Inc.: *See—*
Guckel, Henry, 4,180,771, Cl. 324-71.0SN.
Airheart, Franklin B., to Hurst Performance, Inc. Brake assembly with dual compensation adjustment. 4,180,146, Cl. 188-71.800.
Aisan Idustry Co., Ltd.: *See—*
Mitsuda, Tadao; Iwata, Minoru; Sugiura, Masatoshi; Takada, Shigetaka; and Watanabe, Yukihiro, 4,179,882, Cl. 60-276.000.
Aisin Seiki Kabushiki Kaisha: *See—*
Kito, Masahiro; and Adachi, Yoshiharu, 4,179,980, Cl. 91-6.000.
Takeshita, Hiroshi; Kondo, Hiroyuki; Ohta, Takaaki; Nomura, Yoshihisa; and Nogami, Tomoyuki, 4,180,295, Cl. 303-22.00R.
Akao, Takeshi: *See—*
Aonuma, Tatuo; Kiuchi, Michio; Watanabe, Hirozi; and Akao, Takeshi, 4,180,188, Cl. 222-368.000.
Akiyoshi, Toshio; Onishi, Tsutomu; and Haikawa, Shozo, to Mitsubishi Denki Kabushiki Kaisha; and Kabushiki Kaisha Terauchi Seisakusho. Power wrench. 4,179,955, Cl. 81-57.110.
Aktiebolaget Electrolux: *See—*
Sawyer, Roderick, 4,179,768, Cl. 15-352.000.
Aktiebolaget Leo: *See—*
Hansen, Bertil; and Holmberg, Krister, 4,180,504, Cl. 260-239.55D.
Albaric, Jacques E.: *See—*
Fort, Emil M.; and Albaric, Jacques E., 4,180,300, Cl. 339-5.00R.
Alber, Tassilo, to Vohran Kunststofferzeugnisse GmbH. Apparatus for manufacturing thin-walled plastic hoses. 4,180,429, Cl. 156-425.000.
Alberta Oil Sands Technology and Research Authority: *See—*
Taciuk, William, 4,180,455, Cl. 208-126.000.
Alberti, James; and Schlosser, Helmut. Portable childbirth chair with electronic monitoring apparatus. 4,180,062, Cl. 128-698.000.
Albertini, Rocco D., to Baldt Incorporated. Improved coupling link. 4,179,878, Cl. 59-85.000.
Alcock, Keith: *See—*
Gunderman, Robert J.; Alcock, Keith; Skinner, Charles S.; and Riley, Michael W., 4,180,177, Cl. 220-88.00A.
Alcyon Equipment S.A.: *See—*
Farcinade, Michel, 4,180,322, Cl. 356-1.000.
Alex Grosman A/S: *See—*
Morup, Poul, 4,180,764, Cl. 315-283.000.
Alexander, Ben H.: *See—*
Sastri, Suri A.; and Alexander, Ben H., 4,180,420, Cl. 148-37.000.
Alfred Walter AG: *See—*
Walter, Alfred, 4,179,941, Cl. 73-854.000.
Alia, Dominic. Processible and vulcanizable polar polymers. 4,180,531, Cl. 525-214.000.
Allan, James C., to Burroughs Corporation. Cleaning disk assembly for oppositely-oriented, dual-component magnetic transducers. 4,180,840, Cl. 360-128.000.
Allen, Richard, to Varo Semiconductor, Inc. Method of making a transformer with an improved insulation system. 4,179,796, Cl. 29-605.000.
Allias, Bernard; and Decaudin, Charles, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Hand tool for cutting an optical fibre. 4,179,807, Cl. 30-124.000.
Allied Chemical Corporation: *See—*
Li, Hsin L.; Oswald, Hendrikus J.; and Mumford, Robin B., 4,180,214, Cl. 242-47.000.
Allis-Chalmers Corporation: *See—*
Shahan, James E., 4,180,458, Cl. 209-326.000.
Shaver, J. Lyle, 4,180,081, Cl. 130-27.00R.
Alpha, James W.; and Dumbaugh, William H., Jr., to Corning Glass Works. Thin silicon film electronic device. 4,180,618, Cl. 428-428.000.
Alphandary, Maurice, to United States of America, U.S. Environmental Protection Agency. Hopper. 4,180,186, Cl. 406-152.000.
Altec Corporation: *See—*
Rumbaugh, Paul S., 4,180,780, Cl. 330-252.000.
Spranger, Paul B., 4,180,710, Cl. 179-115.50H.
Altex Scientific, Inc.: *See—*
Magnussen, Haakon T., Jr., 4,180,375, Cl. 417-22.000.
Alza Corporation: *See—*
Choi, Nam S.; and Heller, Jorge, 4,180,646, Cl. 528-153.000.
Heller, Jorge; and Baker, Richard W., 4,180,064, Cl. 128-130.000.
Michaels, Alan S., 4,180,073, Cl. 128-260.000.
Amann, Fritz, to SKW Trostberg Aktiengesellschaft. Composition for controlling plant growth in viticulture. 4,180,393, Cl. 71-78.000.
Amberg, Robert L., to Boeing Company, The. Limited-slip brake control system. 4,180,223, Cl. 244-111.000.
Amchem Products, Inc.: *See—*
Anderson, James D., 4,180,469, Cl. 252-149.000.
American Can Company: *See—*
Kuchenbecker, Morris W., 4,180,165, Cl. 206-461.000.
Mielke, Dennis L., 4,180,378, Cl. 425-83.100.
American Cyanamid Company: *See—*
Kapoor, Inder P., 4,180,679, Cl. 568-583.000.
Schaub, Robert E.; and Weiss, Martin J., 4,180,677, Cl. 562-500.000.
Siuta, Gerald J.; Conrow, Ransom B.; Poletto, John F.; and Bernstein, Seymour, 4,180,587, Cl. 424-315.000.
Whitman, Robert H.; and Barber, William A., 4,180,411, Cl. 106-41.000.
American Home Products Corp.: *See—*
Demerson, Christopher A.; and Humber, Leslie G., 4,180,580, Cl. 424-258.000.
Sarantakis, Dimitrios, 4,180,500, Cl. 260-112.50S.

American Hospital Supply Corporation: *See*—
Huempfner, David F., 4,180,002, Cl. 108-6.000.
American Optical Corporation: *See*—
Persson, Staffan B.; and Buhler, Rato, 4,180,323, Cl. 356-3.000.
American Safety Equipment Corporation: *See*—
Ziv, Avraham, 4,180,283, Cl. 280-802.000.
Ammann, Eugene O., to GTE Sylvania Incorporated. Mode-locked optical parametric oscillator apparatus. 4,180,751, Cl. 307-428.000.
Ampex Corporation: *See*—
Louth, Kenneth; and Gallo, Luigi C., 4,180,701, Cl. 178-69.100.
AMSTED Industries Incorporated: *See*—
Bos, John A., 4,180,462, Cl. 210-351.000.
Day, John C., 4,179,995, Cl. 105-197.0DB.
Anav, Maurice; Chesne, Andre; Leseur, Andre; Miquel, Pierre; and Pascard, Roger, to Commissariat a l'Energie Atomique. Process for the extraction of fission products. 4,180,476, Cl. 252-301.10W.
Anchor Post Products, Inc.: *See*—
Pfarr, Walter L., Jr., 4,180,247, Cl. 256-54.000.
Anderson, Colin C. Mechanical fencing machine. 4,180,245, Cl. 254-64.000.
Anderson, Grant W. Apparatus, methods and instruments for removing dental restorations. 4,179,816, Cl. 433-161.000.
Anderson, James D., to Amchem Products, Inc. Dithiocarbamate sulfonium salt inhibitor composition. 4,180,469, Cl. 252-149.000.
Anderson, John M., to General Electric Company. High intensity discharge lamp geometries. 4,180,763, Cl. 315-248.000.
Anderson, Kenneth M., to Medtronic, Inc. Lead connector for a body implantable stimulator. 4,180,078, Cl. 128-419.0PG.
Anderson Power Products, Inc.: *See*—
Eby, Richard L., 4,180,770, Cl. 324-429.000.
Andersson, Claes-Goran, to Wikings Mekaniska Verkstad AB. Dual inside/outside conveyors with separate drives. 4,180,154, Cl. 198-466.000.
Andreev, Jury S.; Pyasetskaya, Olga V.; and Leonova, Galina G., to Vsesojuzny Gosudarstvenny Nauchno-Issiedovatelsky I Proekthyinstitut Khimo-Forograficheskoi Promyshlennosti. Process for obtaining half-tone picture of irregular structure. 4,180,402, Cl. 430-394.000.
Andreichikov, Boris I.: *See*—
Shumyakin, Evgeny P.; Sabir-de-Ribas, Konstantin I.; Druzhinsky, Isaak A.; Shishov, Gennady P.; and Andreichikov, Boris I., 4,180,435, Cl. 176-30.000.
Andrew, Malcolm S.; and Backhouse, Alan J., to Imperial Chemical Industries Limited. Coating composition. 4,180,489, Cl. 428-402.000.
Angelo, Rudolph J.; Blomberg, Richard N.; Boettcher, Fritz P.; Ikeda, Richard M.; and Samuels, Michael R., to Du Pont de Nemours, E. I., and Company. Gas-barrier coated films, sheets or foils and method of preparation. 4,180,614, Cl. 428-336.000.
Aoki, Eiichiro: *See*—
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Okumura, Takatoshi, 4,179,972, Cl. 84-1.110.
Aonuma, Tatuo; Kiuchi, Michio; Watanabe, Hirozi; and Akao, Takeshi, to Kokkoman Shoyu Co., Ltd. Sealing structure for rotary valves. 4,180,188, Cl. 222-368.000.
Aoyama, Syunichi, to Nissan Motor Company, Limited. Exhaust gas recirculation control system. 4,180,033, Cl. 123-119.00A.
Arai, Akihiro: *See*—
Urano, Fumio; and Arai, Akihiro, 4,180,311, Cl. 354-53.000.
ARCO Polymers, Inc.: *See*—
Bi, Le-Khac; and Milkovich, Ralph, 4,180,530, Cl. 525-98.000.
Arens Controls, Inc.: *See*—
Kingsley, Charles E., 4,180,045, Cl. 124-90.000.
Armstrong, Rolfe D.; and Lang, Charles R., Jr., to NCR Corporation. Selectively operable mask generator. 4,180,861, Cl. 364-900.000.
Arnold, Herbert: *See*—
Schulzke, Peter; Arnold, Herbert; Harsch, Klaus; and Werner, Peter, 4,180,026, Cl. 123-32.0EF
Aronberg, Sue; and Fein, Gail. Headgear with eyeglass support. 4,179,753, Cl. 2-10.000.
Asada, Chiaki; Saito, Makoto; and Kajima, Hisashi, to Foundation: The Research Institute for Special Inorganic Materials. The. Molybdenum base composite materials reinforced with continuous silicon carbide fibers and a method for producing the same. 4,180,399, Cl. 75-229.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Nogami, Sumitaka; Matsumoto, Yoshio; Waki, Keiichi; and Okada, Tooru, 4,180,652, Cl. 525-437.000.
Ohmura, Kaoru; Shibasaki, Ichiro; Kimura, Takeo; and Kimura, Muneaki, 4,180,404, Cl. 430-284.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Kawasaki, Masahiro; and Sawada, Yoshio, 4,180,310, Cl. 354-24.000.
Miyata, Katsuhiko; Tokutomi, Seijiro; and Nakamura, Kazuo, 4,180,309, Cl. 354-25.000.
Urano, Fumio; and Arai, Akihiro, 4,180,311, Cl. 354-53.000.
ASEA Aktiebolag: *See*—
Caisander, Yngve, 4,180,381, Cl. 432-157.000.
Ash, Eric A.: *See*—
Bennett, Simon D.; and Ash, Eric A., 4,179,936, Cl. 73-606.000.
Ashley, James E. Tag for identifying luggage and method of using same. 4,180,284, Cl. 283-20.000.
Aslund, Borje: *See*—
Larsson, Bruno; Bohm, Kurt; Strom, Janeric; and Aslund, Borje, 4,180,018, Cl. 122-225.00R.
Atari, Inc.: *See*—
Harrop, Geoffrey A. J., 4,180,267, Cl. 273-127.00R.
Atlantic Richfield Company: *See*—
Leonard, John J.; and Shalit, Harold, 4,180,681, Cl. 562-600.000.
Audi Nsu Auto Union Aktiengesellschaft: *See*—
Steinwart, Johannes; Mauthoff, Gerhard; Bauder, Armin; Wilmers, Gottlieb; and Pischke, Reiner, 4,180,038, Cl. 123-139.0AW.
Austin, William B.: *See*—
Bilow, Norman; and Austin, William B., 4,180,649, Cl. 528-245.000.
Automatik Apparate-Maschinenbau H. Hench GmbH: *See*—
Clarke, Kenneth, 4,180,539, Cl. 264-143.000.
Avco Corporation: *See*—
Ivanko, Theodore, 4,180,371, Cl. 415-115.000.
Avtec Industries, Inc.: *See*—
Helwig, William F., Jr., 4,180,744, Cl. 307-39.000.
Babbitt, Richard W., to United States of America, Army. Method for forming a drive hole in arc plasma spray fabricated ferrite phasors. 4,179,795, Cl. 29-602.00R.
Babcock & Wilcox Company, The: *See*—
Dopp, James W., 4,180,360, Cl. 409-287.000.
Babich, Vladimir A.: *See*—
Agranovskaya, Miriam A.; Babich, Vladimir A.; Ratner, Felix A.; Rozenoer, Alexandr S.; and Ryvkin, Moisei I., 4,180,249, Cl. 266-78.000.
Babilon, Alfred: *See*—
Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,180,418, Cl. 148-12.400.
Bach, Nicholas J.: *See*—
Kornfeld, Edmund C.; and Bach, Nicholas J., 4,180,582, Cl. 424-261.000.
Backhouse, Alan J.: *See*—
Andrew, Malcolm S.; and Backhouse, Alan J., 4,180,489, Cl. 428-402.000.
Bagrosky, Michael E.: *See*—
Dulmaine, Joseph F.; and Bagrosky, Michael E., 4,179,914, Cl. 72-358.000.
Bailey, James R.: *See*—
Lutzenberger, Kurt; Bailey, James R.; and Hybl, James M., 4,180,712, Cl. 200-16.00D.
Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., to NPI Corporation. Sandwich cooking and assembling unit. 4,179,985, Cl. 99-339.000.
Baker, Richard W.: *See*—
Heller, Jorge; and Baker, Richard W., 4,180,064, Cl. 128-130.000.
Bakgaard, Knud E., to Bang & Olufsen A/S. Loudspeaker motional feedback system. 4,180,706, Cl. 179-1.00F.
Baldt Incorporated: *See*—
Albertini, Rocco D., 4,179,878, Cl. 59-85.000.
Ball Corporation: *See*—
Sanford, Gary G., 4,180,817, Cl. 343-700.0MS.
Bamberger, Carlos E.; and Richardson, Donald M., deceased (by Richardson, Elizabeth B., executrix), to United States of America, Energy. Process for producing hydrogen from water using cobalt and barium compounds. 4,180,555, Cl. 423-657.000.
Bang & Olufsen A/S: *See*—
Bakgaard, Knud E., 4,180,706, Cl. 179-1.00F.
Bank Computer Network Corporation: *See*—
Fish, Leonard A.; and Mills, Duane M., 4,180,182, Cl. 221-75.000.
Barber-Colman Company: *See*—
Maxson, Dale E., 4,180,127, Cl. 165-76.000.
Barber, William A.: *See*—
Whitman, Robert H.; and Barber, William A., 4,180,411, Cl. 106-41.000.
Bargain, Michel; and Lefort, Marcel, to Rhone-Poulenc Industries. Organosilicon compounds with functional groups. 4,180,515, Cl. 260-448.20Q.
Bargigia, Gianangelo: *See*—
Caporiccio, Gerardo; Bargigia, Gianangelo; and Guidetti, Giampiero, 4,180,639, Cl. 526-243.000.
Barhorst, Ralph E., to Hobart Brothers Company. Welding power supply. 4,180,720, Cl. 219-130.510.
Barkan, Philip, to General Electric Company. Vacuum circuit breaker with delayed trip operation. 4,180,788, Cl. 335-190.000.
Barmag Barmer Maschinenfabrik AG: *See*—
Lenk, Erich; and Bauer, Karl, 4,180,717, Cl. 219-10.49A.
Barnes, Roderick G. L., to Johnson, Matthey & Co., Limited. Luminescent materials. 4,180,477, Cl. 252-301.40R.
Barnett, David L., to Three Phoenix Company. Method and apparatus for polishing floppy discs. 4,179,852, Cl. 51-132.000.
Barnhardt, Kenneth O.; and Morita, Lawrence H. Trap and solids removal assembly for drains. 4,179,762, Cl. 4-191.000.
Barshak, Alexandr E.: *See*—
Gorlin, Samuil M.; Ljubimov, Grigory A.; Bitjurin, Valentin A.; Kovbasjuk, Valentin I.; Maximenko, Vladilen I.; Medin, Stanislav A.; and Barshak, Alexandr E., 4,180,752, Cl. 310-11.000.
Barth, Jordan B., to Colgate-Palmolive Company. Stable denture soak product. 4,180,467, Cl. 252-99.000.
Bartlett, Frank; and Franks, Allen R. Power regulating supply system for AC electrical loads. 4,180,745, Cl. 307-45.000.
Barton, Paul, to International Standard Electric Corporation. Multiple beam receiving array signal processor. 4,180,814, Cl. 343-5.0DP.
BASF Aktiengesellschaft: *See*—
Fischer, Hermann; Thoma, Richard; Kaeppel, Hanshelmut; Kochendoerfer, Ernst; and Lagaly, Werner, 4,180,635, Cl. 526-68.000.
Kaufmann, Otto, 4,180,502, Cl. 260-145.00A.

Motz, Herbert; Schneider, Norbert; Hartmann, Hans-Joerg; and Baur, Reinhold, 4,180,597, Cl. 427-48.000.
Scholz, Herbert, 4,180,523, Cl. 260-573.000.
Schulze, Kurt, 4,180,481, Cl. 252-441.000.
Batdorf, Vernon H., to H. B. Fuller Company. Patching kit with aggregate and two-part epoxy binder system. 4,180,166, Cl. 206-568.000.
Bauder, Armin: *See*—
Steinwart, Johannes; Maurhoff, Gerhard; Bauder, Armin; Wilmers, Gottlieb; and Pischke, Reiner, 4,180,038, Cl. 123-139.0AW.
Bauer, Karl: *See*—
Lenk, Erich; and Bauer, Karl, 4,180,717, Cl. 219-10.49A
Baur, Reinhold: *See*—
Motz, Herbert; Schneider, Norbert; Hartmann, Hans-Joerg; and Baur, Reinhold, 4,180,597, Cl. 427-48.000.
Bausch & Lomb Incorporated: *See*—
Morton, Roger R. A.; and McCarthy, Cornelius J. D., 4,180,831, Cl. 358-160.000.
Bayer Aktiengesellschaft: *See*—
Behre, Horst; Putter, Rolf; and Steffan, Guido, 4,180,521, Cl. 260-505.00C
Brandt, Hans-Walter; Deibele, Ludwig; Toepffer, Kurt; and Stemacker, Karl-Heinz, 4,180,438, Cl. 203-89.000
Dollhausen, Manfred; Hohmann, Gerhard; and Behr, Winfried, 4,180,638, Cl. 526-204.000.
Kolb, Fritz; Fehlsch, Silvan; Ziegert, Otto; Bender, Hans; and Schmitt, Manfred, 4,180,100, Cl. 137-625.300
Mansmann, Manfred, 4,180,409, Cl. 106-39.600.
Reinehr, Ulrich; Jungverdorben, Hermann-Josef; and Herbertz, Toni, 4,180,617, Cl. 428-398.000.
Schuster, Karl-Ernst; Rosenkranz, Hans J.; Furh, Karl; and Rudolph, Hans, 4,180,474, Cl. 252-188.30R.
Selbeck, Harald; Dhein, Rolf; and Cohnen, Wolfgang, 4,180,493, Cl. 260-32.80N
vor der Bruck, Dieter; and Wolfrum, Gerhard, 4,180,503, Cl. 260-152.000.
Beane, Frank T. Method of covering corrugated drainage tubes 4,180,464, Cl. 210-497.00R.
Bear Brand Hosiery Co.: *See*—
Bowen, Omer J., 4,180,065, Cl. 128-165.000.
Beck, Harold D.; and Kolthoff, C. Paul, Jr., to International Harvester Company. Heat exchange apparatus including a toroidal-type radiator 4,180,130, Cl. 165-124.000
Beck, James R.; and Yahner, Joseph A., to Eli Lilly and Company. Control of phytopathogens with certain 2,6-dinitroanilines. 4,180,568, Cl. 424-226.000
Becker, Frank C.; and Li, Jorge P., to Abbott Laboratories. Industrial biocides. 4,180,508, Cl. 260-326.50C
Becker, Hubert: *See*—
Becker, Josef, Becker, Hubert; and Becker, Matthias, 4,180,219, Cl. 242-118.100
Becker, Josef; Becker, Hubert; and Becker, Matthias. Lap creel comprising rod shaped carrier elements. 4,180,219, Cl. 242-118.100
Becker, Matthias: *See*—
Becker, Josef, Becker, Hubert; and Becker, Matthias, 4,180,219, Cl. 242-118.100
Beckmann, Karen L.: *See*—
Long, Wesley A., 4,179,781, Cl. 29-157.30R
Becton, Dickinson and Company: *See*—
Hanley, John P., Petrucci, Pasquale M., and Pfeifer, Stanley, 4,180,091, Cl. 137-238.000
Johnson, Lavell R., 4,180,383, Cl. 422-69.000
Beduchaud, Michel: *See*—
Yvard, Marcel; Decuyper, Jean-Claude; and Beduchaud, Michel, 4,180,824, Cl. 346-154.000
Beecham Group Limited: *See*—
Goudie, Alexander C., 4,180,585, Cl. 424-311.000
Behr, Winfried: *See*—
Dollhausen, Manfred, Hohmann, Gerhard; and Behr, Winfried, 4,180,638, Cl. 526-204.000
Behre, Horst; Putter, Rolf; and Steffan, Guido, to Bayer Aktiengesellschaft. Process for the preparation of naphthalene-1,3,6-trisulphonic acid. 4,180,521, Cl. 260-505.00C
Beier, Stefan: *See*—
Kaltenbach, Kurt; Saupe, Martin, Beier, Stefan, Gmeinder, Hermann; and Braetsch, Hartmut, 4,180,812, Cl. 340-706.000
Bell & Howell Company: *See*—
Langrehr, Larry L.; and Watson, Charles J., 4,180,321, Cl. 355-83.000.
Neff, Joseph J., deceased; and Neff, Lucille D., executrix, 4,180,839, Cl. 360-71.000
Bell Laboratories, Inc.: *See*—
Distler, Jack E.; Hamilton, Albert A.; and King, Everett R., 4,180,757, Cl. 313-315.000
Bell Telephone Laboratories, Incorporated: *See*—
Schiavone, Lawrence M., 4,180,602, Cl. 427-306.000
Wagner, Sigurd, 4,180,625, Cl. 429-111.000.
Bellco S.p.A.: *See*—
Calari, Alessandro, 4,180,460, Cl. 210-182.000.
Belliveau, Joseph W., Sr. Bicycle hitch for connection to a trailer 4,180,279, Cl. 280-204.000
Belott Corporation: *See*—
Dahl, Carl B.; and Crouse, Jere W., 4,180,216, Cl. 242-66.000
Bemba, Siegfried, to De Limon Fluhme GmbH & Co. 4/2 Way valve. 4,180,090, Cl. 137-119.000.
Ben-Haim, Haim. Automatic piston drive mechanism for use in caulking gun. 4,180,187, Cl. 222-326.000.
Bender, Hans: *See*—
Kolb, Fritz; Fehlsch, Silvan; Ziegert, Otto; Bender, Hans; and Schmitt, Manfred, 4,180,100, Cl. 137-625.300.
Bendix Corporation, The: *See*—
Cresko, Joseph V.; and Moore, John A., 4,180,847, Cl. 362-30.000.
Johannesen, Donald D.; and Holcomb, Orla L., Jr., 4,180,149, Cl. 188-340.000.
Reddy, Junuthula N., 4,180,020, Cl. 123-32.0EA
Richman, Jay L., 4,180,865, Cl. 365-63.000.
Tjarksen, Richard A.; Keresztes, Robert J.; and Harnish, Eugene E., 4,180,147, Cl. 188-71.800.
Benko, John M., to Pullman Incorporated. Flame cutting machine for modification of railway car side sills. 4,180,248, Cl. 266-67.000
Bennett, John E.; and Elliott, Joseph E., to Diamond Shamrock Corporation. Oxygen selective anode. 4,180,445, Cl. 204-129.000.
Bennett, Simon D.; and Ash, Eric A., to National Research Development Corporation. Acoustic image recorders. 4,179,936, Cl. 73-606.000
Berges, Jon F.; and Woolley, James M., to White Consolidated Industries, Inc. Dishwasher fill float. 4,180,085, Cl. 134-57.00D.
Berges, Jon F.: *See*—
Woolley, James M.; and Berges, Jon F., 4,180,095, Cl. 137-387.000.
Bernstein, Seymour: *See*—
Siuta, Gerald J.; Conrow, Ransom B.; Poletto, John F.; and Bernstein, Seymour, 4,180,587, Cl. 424-315.000.
Berry, D. Randolph: *See*—
Divers, Edward F.; Berry, D. Randolph; and Monaghan, David A., 4,180,352, Cl. 405-303.000
Berry, William J.: *See*—
Echols, Robert B.; and Berry, William J., 4,179,991, Cl. 102-21.600
Bertelson, George H. Above and below water and land pile cutting apparatus and method. 4,180,047, Cl. 125-14.000.
Bertsch, Paul J., to Primex Plastics Co. Foamed thermoplastic material laminated with a sheet-like covering material. 4,180,427, Cl. 156-272.000
Bessette, Georges H. Apparatus for handling manure. 4,180,157, Cl. 198-747.000
Betancourt, Victor M. Nasogastric catheters. 4,180,076, Cl. 128-349.00B
Bettoli, Philip S., to GAF Corporation. Vinyl tile and production thereof. 4,180,615, Cl. 428-339.000
Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; Mc Cain, William B.; Weller, Ronald W.; and Werstler, Lawrence J., to McCain Manufacturing Co. Varying the drop of sheets into a hopper. 4,180,259, Cl. 271-200.000
Bhartecy, Brij M.: *See*—
Shariff, Sadiq A.; Bhartecy, Brij M.; and Rowe, Neal E., 4,180,845, Cl. 361-334.000
Bi, Le-Khac; and Milkovich, Ralph, to ARCO Polymers, Inc. Clear impact resistant thermoplastic star-block copolymers. 4,180,530, Cl. 525-98.000.
Bidwell, John L.: *See*—
Walden, Jack M.; Eads, William D.; Cozzens, Ray J.; Bidwell, John L.; Jewett, Robert A.; Wilson, Martin S.; Griffin, Daniel J.; Kuseski, Robert E.; and Schulte, Louis T., 4,180,854, Cl. 364-200.000.
Bienvenu, Joseph O.; and Jagtap, Ashvinkumar N., to Petrolite Corporation. Polyvalent metal salts of oxidized and amidified waxes. 4,180,408, Cl. 106-31.000.
Bilow, Norman; and Austin, William B., to Hughes Aircraft Company. Homopolymerizable acetylene-terminated tetramines and process for making same. 4,180,649, Cl. 528-245.000
Binder, Dieter: *See*—
Pfister, Rudolf, Zeller, Paul; Binder, Dieter; and Hromatka, Otto, 4,180,662, Cl. 544-48.000.
Bindicator Company: *See*—
Lundstrom, John W., 4,180,331, Cl. 356-445.000.
Birkenbach, Eugen J.; and Woodworth, Robert D., to International Harvester Company. Hydraulic angling mechanism for disc harrow gangs. 4,180,135, Cl. 172-407.000
Bitjurin, Valentin A.: *See*—
Gorlin, Samuil M.; Ljubimov, Grigory A.; Bitjurin, Valentin A.; Kovbasjuk, Valentin I.; Maximenko, Vladilen I.; Medin, Stanislav A.; and Barshak, Alexandr E., 4,180,752, Cl. 310-11.000
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Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Casals-Stenzel, Jorge; and Losert, Wolfgang, 4,180,570, Cl. 424-243.000.
Bivens, Jon A., to Toro Company, The. Retractable light fixture. 4,180,850, Cl. 362-285.000.
Bixby, James A., to Eastman Technology, Inc. Video recording and reproducing apparatus having variable reproduction speeds. 4,180,832, Cl. 360-10.000
Blackburn, Charles M.: *See*—
Krishnan, Ravi C.; and Blackburn, Charles M., 4,180,153, Cl. 198-425.000.
Blair, Joe B.: *See*—
Fallon, John J., Jr.; Blair, Joe B.; Phelps, Donald R.; and Cabeen, Robert P., III, 4,180,128, Cl. 165-76.000.
Blais, Marcel H.: *See*—
Corna, John F.; and Blais, Marcel H., 4,179,761, Cl. 4-172.190.
Blake, William J., to Swanson, Robert L., a part interest. Coupling for telescoping members. 4,180,346, Cl. 403-109.000.
Bleha, Miroslav; and Plichta, Zdenek, to Ceskoslovenska Akademie ved. Polymers containing a reactive aromatic system based on p-phenylenediamine derivatives. 4,180,629, Cl. 521-65.000.

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Blomberg, Richard N.: *See—*
Angelo, Rudolph J.; Blomberg, Richard N.; Boettcher, Fritz P.; Ikeda, Richard M.; and Samuels, Michael R., 4,180,614, Cl. 428-336.000.

Bodensieck, Hans-Rudolf: *See—*
Schwerin, Inge; Zillgitt, Ulrich; Schneider, Steffen; Kegel, Hellmut; Bodensieck, Hans-Rudolf; Zauft, Helmut; Poglitsch, Reinhold; and Grabow, Kurt, 4,180,848, Cl. 362-71.000.

Bodinger, Donald C.: *See—*
Snyder, Richard C.; and Bodinger, Donald C., 4,180,228, Cl. 248-74.00R.

Bodolay, William A. Packaging machine. 4,179,867, Cl. 53-568.000.

Boeding, David C.: *See—*
Collogan, Thomas J.; Boeding, David C.; Hermanson, Michael P.; and Wellman, Stanley P., 4,180,133, Cl. 172-26.000.

Boehringer Ingelheim GmbH: *See—*
Weber, Karl-Heinz; Langbein, Adolf; Schneider, Claus; Lehr, Erich; Boke, Karin; and Kuhn, Franz J., 4,180,573, Cl. 424-250.000.

Boehringer Mannheim GmbH: *See—*
Kutter, Dolphe, 4,180,060, Cl. 128-760.000.

Boeing Company, The. *See—*
Amberg, Robert L., 4,180,223, Cl. 244-111.000.
Caley, Kenneth E.; and Trethewy, Brian R., 4,180,195, Cl. 227-51.000.
Gilbert, Daniel E.; Lee, James R.; and Kramer, Ted J., 4,180,605, Cl. 428-76.000.
Nelson, Donald J.; Pistoresi, Denis J.; and Weisbach, Michael F., 4,180,784, Cl. 331-94.5PE.
Stair, Leslie D., 4,180,362, Cl. 414-139.000.

Boelens, Martin: *See—*
Milliken, Ralph A.; Wall, Terence D.; and Boelens, Martin, 4,180,066, Cl. 128-205.240.

Boettcher, Fritz P.: *See—*
Angelo, Rudolph J.; Blomberg, Richard N.; Boettcher, Fritz P.; Ikeda, Richard M.; and Samuels, Michael R., 4,180,614, Cl. 428-336.000.

Bohlander, Oskar: *See—*
Schumann, Erwin; and Bohlander, Oskar, 4,180,697, Cl. 13-25.000.

Bohm, Kurt: *See—*
Larsson, Bruno; Bohm, Kurt; Strom, Janeric; and Aslund, Borje, 4,180,018, Cl. 122-225.00R.

Boke, Karin: *See—*
Weber, Karl-Heinz; Langbein, Adolf; Schneider, Claus; Lehr, Erich; Boke, Karin; and Kuhn, Franz J., 4,180,573, Cl. 424-250.000.

Boller, Arthur: *See—*
Schadt, Martin; Scherrer, Hanspeter; and Boller, Arthur, 4,180,475, Cl. 252-299.000.

Bonse, Michael, to Societe Industrielle de Brevets et d'Etudes S.I.B.E. Carburetor for internal combustion engines. 4,180,533, Cl. 261-39.00A.

Boothby, Terry A.: *See—*
Hueil, J. Charles; Rothfuss, Robert G.; and Boothby, Terry A., 4,180,196, Cl. 227-109.000.

Borgerson, Newton H., Jr. Relocatable furniture system. 4,180,298, Cl. 312-242.000.

Borsig GmbH: *See—*
Drobka, Witold, 4,180,017, Cl. 122-34.000.

Borvendeg, Janos: *See—*
Toldy, Sandor S. L.; Szilagyi nee Farago, Katalin; Schafer, Inge; Szondy, Eleonora; Borvendeg, Janos; and Hermann nee Szente, Ilona, 4,180,505, Cl. 260-239.55R.

Bos, John A., to AMSTED Industries Incorporated. Method and means for filtering liquids. 4,180,462, Cl. 210-351.000.

Bose Corporation: *See—*
Marshall, Neal H., 4,180,140, Cl. 181-156.000.

Boussely, Jean; Chandavoine, Marie-Madeleine; Chignac, Michel; Grain, Claude; and Pigerol, Charles, to Fevrier-Decoisy-Champion. Thiodiglycol dibehenate and method of use. 4,180,492, Cl. 260-30.80R.

Bouverie, William M.; and Manas, Spero G., to Harris Corporation. Data acquisition for use in determining malfunctions of cylinders of an internal combustion engine. 4,179,922, Cl. 73-116.000.

Bovet, Thomas. Beach bag. 4,180,112, Cl. 150-1.700.

Bowen, Omer J., to Bear Brand Hosiery Co. Anti-embolism stocking. 4,180,065, Cl. 128-165.000.

Bradbury, Stanley A., to Cable Supports Limited. Cable clamps. 4,179,774, Cl. 24-132.00R.

Bradshaw, Phillip: *See—*
Forman, Donald B.; and Bradshaw, Phillip, 4,179,782, Cl. 29-268.000.

Braetsch, Hartmut: *See—*
Kaltenbach, Kurt; Saupe, Martin; Beier, Stefan; Gmeinder, Hermann; and Braetsch, Hartmut, 4,180,812, Cl. 340-706.000.

Brammall, Inc.: *See—*
Gillette, Robert H., 4,179,850, Cl. 51-59.00R.
Gillette, Robert H., 4,179,855, Cl. 51-204.000.

Brandt, Hans-Walter; Deibele, Ludwig; Toepffer, Kurt; and Steinacker, Karl-Heinz, to Bayer Aktiengesellschaft. Process for the preparation of sump product. 4,180,438, Cl. 203-89.000.

Brandwein, Arthur. Tape splicing device and dispenser therefor. 4,180,181, Cl. 221-70.000.

Breant, Pierre L. V.; and Fresnel, Alain C., to U.S. Philips Corporation. System for measuring the speed of rotation of a synchro by means of a sampling technique. 4,180,859, Cl. 364-565.000.

Brem, Jacob. Method of treating pathological conditions of the nail. 4,180,058, Cl. 128-1.00R.

Breslau, Steven M., to Pace Photographic Products, Inc. Storage and dispensing device for film cartridges or the like. 4,180,192, Cl. 224-235.000.

Brick, Robert V.: *See—*
Abraham, Wayne G.; Enck, Richard S., Jr.; Goehner, Ronald H.; and Brick, Robert V., 4,180,725, Cl. 250-207.000.

Bridgestone Tire Company, Limited: *See—*
Matsuda, Akira; Tanaka, Makoto; Murata, Junichi; Yasuda, Shigeo; and Nishino, Hiroshi, 4,180,795, Cl. 340-58.000.
Yukuta, Toshio; Ohashi, Takashi; Kojima, Minoru; and Saito, Masumi, 4,180,631, Cl. 521-164.000.

Bristol-Myers Company: *See—*
Kaplan, Murray A.; Granatek, Alphonse P.; and Nachfolger, Solomon J., 4,180,658, Cl. 544-27.000.

Bristow, Elliott R. Well pump protection system. 4,180,374, Cl. 417-12.000.

British Petroleum Company Limited, The: *See—*
Davies, Evan E.; and Kolombos, Alexander J., 4,180,689, Cl. 585-407.000.

British Steel Corporation: *See—*
Naylor, David, 4,180,397, Cl. 75-58.000.

Broad Corporation: *See—*
Shurcliff, William A., 4,180,124, Cl. 165-1.000.

Brock, Geoffrey E., to International Business Machines Corporation. Thermal migration-porous silicon technique for forming deep dielectric isolation. 4,180,416, Cl. 148-1.500.

Brolin, Charles A.: *See—*
Joseph, George L.; and Brolin, Charles A., 4,180,421, Cl. 148-150.000.

Brooks, Nathaniel E. Maze game. 4,180,268, Cl. 273-153.00R.

Brooks, Parkman T.: *See—*
Marchant, Wayne N.; and Brooks, Parkman T., 4,180,628, Cl. 521-39.000.

Brown, Desmond J.: *See—*
Grigg, Geoffrey W.; and Brown, Desmond J., 4,180,576, Cl. 424-251.000.

Brown, John S.: *See—*
Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., 4,179,985, Cl. 99-339.000.

Brown, John V., to Fosroc A.G. Method of anchoring a borehole anchor. 4,179,861, Cl. 52-743.000.

Brown, Maurice H. Terminal forming and installing apparatus. 4,179,785, Cl. 29-33.00K.

Brumbach, Joseph F.: *See—*
Murry, Edward J.; and Brumbach, Joseph F., 4,180,074, Cl. 128-276.000.

Brummer, Dietmar: *See—*
Weiler, Paul; and Brummer, Dietmar, 4,179,766, Cl. 15-250.320.
Weiler, Paul; and Brummer, Dietmar, 4,179,767, Cl. 15-250.320.

Bruno, Rocco, Jr.: *See—*
Sevillano, Richard; and Bruno, Rocco, Jr, 4,180,142, Cl. 182-77.000.

Brunty, Fred. Multi-purpose labor saver hand tool. 4,179,828, Cl. 37-53.000.

Bryan, Steven R.: *See—*
Sullivan, John B.; Marsh, David R.; Osofsky, Raymond C.; Bryan, Steven R.; Fahey, William D.; and Manners, David E., 4,179,823, Cl. 35-10.240.

Buccicone, Dario, to Bucciconi Engineering Co. Magnetic sheet conveyor. 4,180,257, Cl. 271-193.000.

Bucciconi Engineering Co.: *See—*
Buccicone, Dario, 4,180,257, Cl. 271-193.000.

Buchner, Helmut; and Saeufferer, Helmut, to Daimler-Benz Aktiengesellschaft Stuttgart-Untertuerkheim. Method of cooling the interior of motor vehicles (powered at least partly by hydrogen). 4,179,896, Cl. 62-7.000.

Buckley, Keith; Vernon, Alan; and Lowe, Philip J., to Mars Limited. Food Protein Product. 4,180,592, Cl. 426-32.000.

Budzich, Tadeusz. Load responsive fluid control valve. 4,180,098, Cl. 137-596.130.

Buedel, Charles K., to GTE Automatic Electric Laboratories Incorporated. Direct memory access expander unit for use with a microprocessor. 4,180,855, Cl. 364-200.000.

Buelow, Fred K.; and Zasio, John J., to Fujitsu Limited. Large-scale integrated circuit with integral bi-directional test circuit. 4,180,772, Cl. 324-73.0PC.

Buhler, Rato: *See—*
Persson, Staffan B.; and Buhler, Rato, 4,180,323, Cl. 356-3.000.

Bunker Ramo Corporation: *See—*
Hutter, Harold G., 4,180,301, Cl. 339-90.00C.

Bunnig, C. Karl. Method for manufacturing glue for a binding agent in manufacture of chipboard or other cellulose products. 4,180,412, Cl. 106-124.000.

Burd, Lamar; and Donnelly, James K., to Howmet Turbine Components Corporation. Mold for directionally solidified single crystal castings and method for preparing same. 4,180,119, Cl. 164-34.000.

Burguette, Mario D., to Minnesota Mining and Manufacturing Company. Electron beam sensitive monomer. 4,180,673, Cl. 560-26.000.

Burkhard, Kurt; and Kunzmann, Peter, to Swiss Aluminium Ltd. Wear resistant coating for the working face of disc-shape machine parts made of aluminum or aluminum alloys. 4,180,622, Cl. 428-564.000.

Burnham, Lowell C., to General Electric Company. Vibration dampening support. 4,180,231, Cl. 248-632.000.

Burroughs Corporation: *See—*
Allan, James C., 4,180,840, Cl. 360-128.000.
Schwartz, Sidney J., 4,180,864, Cl. 365-6.000.
Shanks, Roy R., 4,180,866, Cl. 365-186.000.

Burrus, Harry O.; and Garnett, Donald I., to Du Pont de Nemours, E. I., and Company. Reaction of formaldehyde in butynediol. 4,180,687, Cl. 568-856.000.

Burson, David C., to Texas Instruments Incorporated. System for displaying character and graphic information on a color video display with unique multiple memory arrangement. 4,180,805, Cl. 340-709.000.

Butler Manufacturing Company: *See—*
Crump, Hubert C., 4,179,962, Cl. 83-300.000.

Butler, Walter J.: *See—*
Eichelberger, Charles W.; and Butler, Walter J., 4,180,807, Cl. 340-347.0AD.

Byrd, Norman R., to McDonnell Douglas Corporation. Electrodeposition of coatings on metals to enhance adhesive bonding. 4,180,442, Cl. 204-14.00N.

Cabeen, Robert P., III: *See—*
Fallon, John J., Jr.; Blair, Joe B.; Phelps, Donald R., and Cabeen, Robert P., III, 4,180,128, Cl. 165-76.000.

Cable Supports Limited: *See—*
Bradbury, Stanley A., 4,179,774, Cl. 24-132.00R.

Caere Corporation: *See—*
Smith, William R., 4,180,799, Cl. 340-146.3AC

Cahn, Arno: *See—*
Tokosh, Richard; and Cahn, Arno, 4,180,470, Cl. 252-121.000.

Cailloux, Philippe, to Compagnie Industrielle des Telecommunications Cit-Alcatel. System for supervising connection points. 4,180,801, Cl. 340-147.00R.

Caisander, Yngve, to ASEA Aktiebolag. Means for tilting crucible furnaces. 4,180,381, Cl. 432-157.000

Calari, Alessandro, to Bellco S.p.A. Portable machine for regenerative dialysis. 4,180,460, Cl. 210-182.000.

Calderon, Reynaldo, to Reynaldo Calderon. Self-cleaning helical spring filter and methods. 4,180,463, Cl. 210-415.000

Caley, Kenneth E.; and Trethewy, Brian R., to Boeing Company, The. Rivet delivery and locating apparatus. 4,180,195, Cl. 227-51.000

Cambridge Consultants of Bar Hill: *See—*
McCombie, Alan K.; and Temple, Stephen, 4,180,194, Cl. 226-113.000.

Cameron Engineers, Inc.: *See—*
Sinor, Jerry E., 4,180,452, Cl. 208-8.0LE.

Canon Kabushiki Kaisha: *See—*
Hirata, Osamu; and Harada, Yuji, 4,180,711, Cl. 200-5.00A.
Tateoka, Masamichi; Tsuji, Takao; Minami, Setsuo; Matsumoto, Kazuya; Kawamura, Naoto; and Minoura, Kazuo, 4,180,307, Cl. 350-6.500.

Caporiccio, Gerardo; Bargigia, Gianangelo; and Guidetti, Giampiero, to Montedison S.p.A. Fluorosulphonyl oxafluoroalkanes, fluorosulphonyl olefines, their copolymers and processes for preparation. 4,180,639, Cl. 526-243.000

Capps, Vidal D. Stationary forklift and method for use. 4,180,145, Cl. 187-17.000.

Carl Freudenberg, Firma: *See—*
Schultheiss, Wolfram; and Schmidt, Klaus, 4,180,611, Cl. 428-288.000.

Carl Schenck AG: *See—*
Dodt, Hans-Walter, 4,179,923, Cl. 73-134.000.

Carlisle, Richard S. Horticultural devices. 4,179,846, Cl. 47-59.000.

Carpenter, Roy B., Jr. System and equipment for atmospherics conditioning. 4,180,698, Cl. 174-2.000.

Carr, Albert A.; and Kinsolving, C. Richard, to Richardson-Merrell Inc. Olefinic 4-substituted piperidino derivatives as therapeutics. 4,180,583, Cl. 424-267.000.

Carr, John B., to Shell Oil Company. Lipogenesis control by esters of benzoxazinecarboxylic acids. 4,180,572, Cl. 424-248.550.

Carr, Keith E.; and Kimball, Vance A., to Whirlpool Corporation. Oven assembly air circulation system. 4,180,049, Cl. 126-21.00A

Casals-Stenzel, Jorge: *See—*
Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Casals-Stenzel, Jorge; and Losert, Wolfgang, 4,180,570, Cl. 424-243.000.

Cashin Systems Corp.: *See—*
Dohm, Daniel, Jr., 4,179,987, Cl. 100-53.000

Caspers, Karl-Heinz, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Method of alloying and/or inoculating and/or deoxidizing cast iron melts produced in a cupola furnace. 4,180,396, Cl. 75-53.000.

Caterpillar Tractor Co.: *See—*
Keske, Frank E.; and Hackett, David E., 4,179,952, Cl. 74-710.000.
Koeslin, Werner H., 4,179,884, Cl. 60-321.000.

Celanese Corporation: *See—*
Howell, Carl J., Jr.; Trott, David W.; and Riley, Jesse L., 4,180,536, Cl. 264-53.000.
Wrasman, Thomas J., 4,180,542, Cl. 264-242.000.

Central Glass Company, Limited: *See—*
Shibata, Toshiyuki; Ono, Hiroshi; and Isoyama, Kenji, 4,180,546, Cl. 423-178.000.

Cerrato, Vincent: *See—*
Zurit, David; Cerrato, Vincent; and Hines, James, 4,180,189, Cl. 222-400.700.

Ceskoslovenska Akademie ved: *See—*
Bleha, Miroslav; and Plichta, Zdenek, 4,180,629, Cl. 521-65.000.

Chakrabarti, Paritosh M.; and Hashem, Mohammed M., to GAF Corporation. Phosphoric acid esters of poly(2-10)ethyleneoxy n butane 1,4-diols. 4,180,532, Cl. 260-953.000.

Chammas, Edmond D., to Weatherford/DMC. Chemical cutting apparatus for use in wells. 4,180,131, Cl. 166-55.000.

Chandavoine, Marie-Madeleine: *See—*
Boussely, Jean; Chandavoine, Marie-Madeleine; Chignac, Michel; Grain, Claude; and Pigerol, Charles, 4,180,492, Cl. 260-30.80R.

Chang, Andrew K., to FMC Corporation. Angle measuring apparatus. 4,180,326, Cl. 356-152.000

Chang, Clarence D.; and Lang, Wilham H., to Mobil Oil Corporation. Conversion of synthesis gas to aromatic hydrocarbons. 4,180,516, Cl. 260-449.00R.

Chang, Kern K. N., to RCA Corporation. Flat cathode ray tube having magnetically collimated electron beam device. 4,180,760, Cl. 313-422.000.

Chapman, Charles C., to Phillips Petroleum Company. Alkylation process utilizing side draw vapor as heat source in isostripper. 4,180,526, Cl. 585-719.000.

Check, Frank T., Jr.; Eckert, Alton B., Jr.; and Warren, Joseph R., to Pitney Bowes Inc. Electronic postage metering system. 4,180,856, Cl. 364-466.000.

Chemie Linz Aktiengesellschaft: *See—*
Stern, Gerhard; and Dobramysl, Wilhelm, 4,180,488, Cl. 260-21.000.

Chesne, Andre: *See—*
Anav, Maurice; Chesne, Andre; Leseur, Andre; Miquel, Pierre; and Pascard, Roger, 4,180,476, Cl. 252-301.10W.

Chevron Research Company: *See—*
Lew, Henry Y., 4,180,650, Cl. 528-313.000

Chiang, Yunn H., to Polaroid Corporation. Method for synthesizing acid blue 104. 4,180,513, Cl. 260-392.000

Chicoye, Etzer; Helbert, J. Raymond; and Rice, James F., to Miller Brewing Company. Preparation of a bland beer. 4,180,589, Cl. 426-11.000.

Chignac, Michel: *See—*
Boussely, Jean; Chandavoine, Marie-Madeleine; Chignac, Michel; Grain, Claude; and Pigerol, Charles, 4,180,492, Cl. 260-30.80R.

Chikul, Olga S.: *See—*
Chikul, Vitaly I.; Tyagunov, Boris I.; Ulanen, Yalmar S.; Chikul, Olga S.; Zeger, Karl E.; Tamarkin, Lev Z.; Petrosian, Robert A.; Chmovzh, Vadim E.; Smirnov, Alexandr S.; Polyakovskaya, Valentina I.; and Trufanov, Pavel A., 4,180,385, Cl. 44-62.000.

Chikul, Vitaly I.; Tyagunov, Boris I.; Ulanen, Yalmar S.; Chikul, Olga S.; Zeger, Karl E.; Tamarkin, Lev Z.; Petrosian, Robert A.; Chmovzh, Vadim E.; Smirnov, Alexandr S.; Polyakovskaya, Valentina I.; and Trufanov, Pavel A. Fuel composition and process for producing same. 4,180,385, Cl. 44-62.000

Chin, Edward: *See—*
Schwartz, Leonard; Chin, Edward; and Deveau, Emile J., 4,180,818, Cl. 343-700.0MS

Chirico, Anthony N., to Ecodyne. Process for recovery of chemicals from saline water. 4,180,547, Cl. 423-197.000.

Chisso Corporation: *See—*
Ishibashi, Hiroaki; Tanoue, Shizuo; Kudo, Masakuni; and Harada, Isamu, 4,180,392, Cl. 71-25.000.

Chloride Incorporated: *See—*
Malinowski, William J., 4,180,742, Cl. 250-574.000.

Chmovzh, Vadim E.: *See—*
Chikul, Vitaly I.; Tyagunov, Boris I.; Ulanen, Yalmar S.; Chikul, Olga S.; Zeger, Karl E.; Tamarkin, Lev Z.; Petrosian, Robert A.; Chmovzh, Vadim E.; Smirnov, Alexandr S.; Polyakovskaya, Valentina I.; and Trufanov, Pavel A., 4,180,385, Cl. 44-62.000

Choi, Nam S.; and Heller, Jorge, to Alza Corporation. Novel orthoester polymers and orthocarbonate polymers. 4,180,646, Cl. 528-153.000.

Chopra, Gopal M.: *See—*
Ghosh, Bidhan C.; Chopra, Gopal M.; and Sen, Soumendra N., 4,180,425, Cl. 149-95.000.

Chorvat, Robert J., to G. D. Searle & Co. 3,9-Dihydro-3,9-dioxo-2H-indeno(2,1-c)-pyridine-4-(carbonitriles/carboxamides). 4,180,666, Cl. 546-111.000.

Chrisp, Lynn E. Grain probe. 4,179,930, Cl. 73-425.200.

Chromalloy American Corporation: *See—*
Sjoberg, James G., 4,180,097, Cl. 137-516.290.

Chrysler Corporation: *See—*
Graham, Kenneth A., 4,179,925, Cl. 73-229.000
Khair, Magdi K.; and McCombie, Jay C., 4,180,022, Cl. 123-32.0AE.
Tomczak, Lawrence W., 4,179,924, Cl. 73-229.000.

Cialone, David R.; and West, Donald L., to International Business Machines Corporation. Bi-directional, self imaging grating detection apparatus. 4,180,703, Cl. 250-237.00G.

Ciani, Jean A.; Diehl, Ernst; and Haberthur, Berno, to Schweizerische Isola-Werke. Mica paper containing cellulose. 4,180,434, Cl. 162-138.000.

Ciba-Geigy Aktiengesellschaft: *See—*
Schwander, Hansrudolf; and Zickendraht, Christian, 4,180,665, Cl. 544-345.000.

Ciba-Geigy Corporation: *See—*
Garner, Robert, 4,180,656, Cl. 542-423.000.
Perrin, Pierre; Hegar, Gert; Siegrist, Gerald; Seiler, Herbert; and Horn, Ulrich, 4,180,664, Cl. 544-194.000.
Schmid, Rolf; and Kreibich, Ursula, 4,180,527, Cl. 525-115.000.
Siegrist, Adolf E.; Pauchard, Jean-Paul; and De Sousa, Bernardo, 4,180,479, Cl. 252-301.240.
Spivack, John D., 4,180,497, Cl. 260-45.8NT.

Spivack, John D., 4,180,498, Cl. 260-45.8NT.
Wegmuller, Hans; Horn, Ulrich; Hungerbuhler, Walter; and Haase, Jaroslav, 4,180,084, Cl. 132-7.000.
Cicatelli, Rodolfo, to Motorola, Inc. Positioning device of play-back heads and pressing devices in play-back and/or recording apparatus. 4,180,836, Cl. 360-130.320.
City of Hope National Medical Center: *See*—
Tiep, Brian L., 4,180,059, Cl. 128-721.000.
Clark, Calvin M., to Stanadyne, Inc. Variable tooth saw blade. 4,179,967, Cl. 83-846.000.
Clark, Edward J., to Tandy Brands, Inc. Belt without buckle. 4,179,755, Cl. 2-322.000.
Clark, Harold A., to International Business Machines Corporation. Process for etching SiO_2 layers to silicon in a moderate vacuum gas plasma. 4,180,432, Cl. 156-643.000.
Clark, Herbert J., to Thresher Institutes, Incorporated. Mole catcher. 4,179,836, Cl. 43-77.000.
Clark, Stephen C., III. Testing apparatus and method. 4,179,822, Cl. 35-9.00B.
Clarke, Kenneth, to Automatik Apparate-Maschinenbau H. Hench GmbH. Extrusion process for automatically threading laces. 4,180,539, Cl. 264-143.000.
Clarkson, Robert I.: *See*—
Schuller, Ronald A.; and Clarkson, Robert I., 4,179,920, Cl. 73-86.000.
Claxton, Gerald L., to Up-Right, Inc. Suspension system for harvester shaker member. 4,179,871, Cl. 56-330.000.
Claxton, William E., to Firestone Tire & Rubber Company, The. Tire deflection sensing method and apparatus. 4,180,794, Cl. 340-58.000.
Clearfield, Abraham, to Texas A&M University System. Modified zirconium phosphates. 4,180,551, Cl. 423-249.000.
Clement, Joseph J., to Mead Corporation, The. Shelf support structure. 4,180,003, Cl. 108-144.000.
Clewans, Bonnie. Liquid heating device. 4,180,722, Cl. 219-502.000.
Clifton, John L.: *See*—
Sandefur, Herbert G., 4,179,840, Cl. 43-131.000.
Clugston, George D. Step for vehicles. 4,180,143, Cl. 182-91.000.
Coast, John B., to Union Carbide Corporation. High speed bag folding machine. 4,180,256, Cl. 270-83.000.
Coburn Optical Industries, Inc.: *See*—
Neisler, Boyd L.; and Stith, Joe D., 4,179,851, Cl. 51-101.0LG
Cochard, Roland: *See*—
Odone, Giovanni; and Cochard, Roland, 4,180,774, Cl. 324-125.000
Coetzee, John C. Device for dispensing measured quantities of a liquid from a bottle. 4,180,106, Cl. 141-294.000
Cohan, Allan N. Process for producing round spherical free flowing blown bead food products of controlled bulk density. 4,180,593, Cl. 426-72.000.
Cohen, Noal; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Unsaturated alcohols having an ether protected group. 4,180,682, Cl. 568-662.000.
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Selbeck, Harald; Dhein, Rolf; and Cohnen, Wolfgang, 4,180,493, Cl. 260-32.80N.
Colgate-Palmolive Company: *See*—
Barth, Jordan B., 4,180,467, Cl. 252-99.000.
Collen, Desire J., to Leuven Research & Development V.Z.W. Purification of antiserum for thrombosis test. 4,180,437, Cl. 435-7.000.
Collogan, Thomas J.; Boeding, David C.; Hermanson, Michael P., and Wellman, Stanley P., to Iowa State University Research Foundation, Inc. Guidance system for towed vehicles. 4,180,133, Cl. 172-26.000.
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Anav, Maurice; Chesne, Andre; Leseur, Andre; Miquel, Pierre; and Pascard, Roger, 4,180,476, Cl. 252-301.10W.
Commonwealth Scientific Industrial Research Organization: *See*—
Grigg, Geoffrey W.; and Brown, Desmond J., 4,180,576, Cl. 424-251.000.
Communications Patents Limited: *See*—
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Compagnie d'Etudes et de Realisations de Cybernetique: *See*—
Heitz, Pierre, 4,180,272, Cl. 277-28.000.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Allias, Bernard; and Decaudin, Charles, 4,179,807, Cl. 30-124.000.
Cailloux, Philippe, 4,180,801, Cl. 340-147.00R.
Yvard, Marcel; Decuyper, Jean-Claude; and Beduchaud, Michel, 4,180,824, Cl. 346-154.000.
Comstock & Wescott, Inc.: *See*—
Rice, Richard E., 4,180,384, Cl. 44-52.000.
Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. Coumarin derivatives to produce 8-methoxypsoralen. 4,180,659, Cl. 542-427.000.
Conner, Gary E., to United Technologies Corporation. Fail safe redundant actuator. 4,179,944, Cl. 74-89.150.
Conoco, Inc.: *See*—
Dodd, John R., 4,180,686, Cl. 568-730.000.
Oertle, Donald H.; and Peterson, Marvin L., 4,179,940, Cl. 73-808.000.
Conrow, Ransom B.: *See*—
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Container Corporation of America: *See*—
Leavitt, David R.; and Pfieffer, Gerald R., 4,180,167, Cl. 206-622.000.
Wilkinson, James R., Sr., 4,180,200, Cl. 229-32.000.
Continental Group, Inc., The: *See*—
Hoenig, James R.; and Mallorca, Salvador C., 4,180,179, Cl. 220-307.000.
Cook, Charles C.; and Taplin, Harry R. Combustion process efficiency indicator. 4,179,921, Cl. 73-112.000.
Cook, James C., II, to Ford Motor Company. Apparatus for generating electrically distinguishable bipolar signals using a magnetic sensor and an oval wheel with teeth and notches in its minor and major axis. 4,180,753, Cl. 310-168.000.
Cook, Richard L.; Hampshire, William J.; and Kolarik, Robert V., to Goodyear Aerospace Corporation. Ballistic armor system. 4,179,979, Cl. 89-36.00A.
Cook, Trix C., to Textron Inc. Display set-up pattern. 4,179,831, Cl. 40-19.500.
Cooper, Robin D. G.; Koppel, Gary A.; and McShane, Lawrence J., to Eli Lilly and Company. 4-Oxa 2,6 diazabicycloheptane derivatives. 4,180,507, Cl. 260-245.400.
Coors Container Company: *See*—
Dulmaine, Joseph F.; and Bagrosky, Michael E., 4,179,914, Cl. 72-358.000.
Peck, Richard O., 4,180,844, Cl. 361-226.000.
Corna, John F.; and Blais, Marcel H. Wall construction for swimming pools. 4,179,761, Cl. 4-172.190.
Corning Glass Works: *See*—
Alpha, James W.; and Dunbaugh, William H., Jr., 4,180,618, Cl. 428-428.000.
Nixon, Roy A., Jr., 4,180,755, Cl. 313-113.000.
Szupillo, Raymond E., 4,180,723, Cl. 219-541.000.
Corrigan, John E. Fresh produce preservation. 4,179,900, Cl. 62-231.000.
Corson, Robert M., to GTE Sylvania Incorporated. Means for minimizing processing implosions in CRT manufacture. 4,179,778, Cl. 29-25.190.
Cosby, Billy Q., to National Service Industries, Inc. Binder post connection. 4,180,340, Cl. 402-63.000.
Cosgrove, James F.: *See*—
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Cosgrove, John D.; Pettis, Charles D.; and Mullett, Charles E., to International Tel Data Corporation. Data collection system using telephone lines. 4,180,709, Cl. 179-2.0AM.
Cotten, Soule E., to Du Pont de Nemours, E. I., and Company. Hatch cover closure system. 4,179,999, Cl. 105-377.000.
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Guyot, Pierre; Coty, Alain; and Delfau, Paul, 4,180,823, Cl. 346-139.00B.
Councilman, Clyde L.; and Shearer, Harry D., to E-Systems, Inc. Solid state digital running time indicator. 4,180,724, Cl. 235-92.00T
Coy, David H.; and Kastin, Abba J. Bis (polypeptide) derivatives of enkephalin. 4,180,501, Cl. 260-112.50R.
Cozzens, Ray J.: *See*—
Walden, Jack M.; Eads, William D.; Cozzens, Ray J.; Bidwell, John L.; Jewett, Robert A.; Wilson, Martin S.; Griffin, Daniel J.; Kuseski, Robert E.; and Schulte, Louis T., 4,180,854, Cl. 364-200.000.
Craig, Robert J. G., to Litton Systems, Inc. Tetrahedral redundant inertial reference unit. 4,179,818, Cl. 33-321.000
Crawford, James E.; and Gray, Don N., to Owens-Illinois, Inc. Biocompatible articles having high permeability to gases derived from polysulfones. 4,179,757, Cl. 3-1.000
Crawford, Thomas C., to Pfizer Inc. Ascorbic acid process. 4,180,511, Cl. 260-343.700.
Cresko, Joseph V.; and Moore, John A., to Bendix Corporation, The. Lighting display insensitive to extraneous light. 4,180,847, Cl. 362-30.000.
Crimeye Inc.: *See*—
Della-Calce, Louis D., 4,180,316, Cl. 354-173.000.
Crosspoint Latch Corp.: *See*—
Pires, H. George, 4,180,829, Cl. 358-10.000.
Crouse, Jere W.: *See*—
Dahl, Carl B.; and Crouse, Jere W., 4,180,216, Cl. 242-66.000.
Crowder, Billy L.; and Zirinsky, Stanley, to International Business Machines Corporation. Method for providing a metal silicide layer on a substrate. 4,180,596, Cl. 427-42.000.
Crump, Hubert C., to Butler Manufacturing Company. Combined flying cutoff and punch. 4,179,962, Cl. 83-300.000.
Culina, William; and Klus, Charles. Apparatus and methods for forming panels having scalloped cross-sections. 4,179,912, Cl. 72-196.000.
Cummins Engine Company, Inc.: *See*—
Heydrich, Hans, 4,179,892, Cl. 60-605.000.
Cunningham, Sinclair U.; Firth, Donald; and Jackson, Douglas, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Industry in Her Britannic Majesty's Government of the. Cranes. 4,180,171, Cl. 212-61.000.
Cushenbery, James D. Vehicle door and bumper lift. 4,180,252, Cl. 269-17.000.
Cutler, Alan B., to Revas, Inc. Apparatus for dispensing a fuel-air mixture in an airstream. 4,180,534, Cl. 261-41.00B.
Cutler-Hammer, Inc.: *See*—
Risberg, Robert L., 4,180,767, Cl. 318-308.000.
Cycles Peugeot: *See*—
Lacroix, Bernard, 4,180,743, Cl. 290-38.00B.
Dahl, Carl B.; and Crouse, Jere W., to Beloit Corporation. Winder with horizontal rider roll adjustment. 4,180,216, Cl. 242-66.000.

Dai Nippon Toryo Co., Ltd.: *See*—
Soshiki, Yoshikazu; Sugiura, Hiroshi; Onizawa, Kouzi; Togawa, Toshikatsu; Kojima, Minoru; Morikawa, Tsukio; Kurimoto, Naohiko; and Katou, Hiromitu, 4,180,448, Cl. 204-192.00C.
Daimler-Benz Aktiengesellschaft Stuttgart-Untertuerkheim: *See*—
Buchner, Helmut; and Saeufferer, Helmut, 4,179,896, Cl. 62-7.000.
Damsky, Arnold. Plug-in electrical receptacle extender. 4,180,303, Cl. 339-166.00R.
Dana Corporation: *See*—
Shea, Dennis W., 4,180,138, Cl. 180-65.00A.
Danford, Tiras J., to Harrington Manufacturing Company. Hinged eave assembly for a structure. 4,179,857, Cl. 52-71.000.
Danfoss A/S: *See*—
Hansen, Peter R.; and Thorsen, Niels P., 4,180,714, Cl. 200-81.00R.
Daniels Manufacturing Corp.: *See*—
Gooley, Marshall J., 4,179,956, Cl. 81-9.50R.
Danova, Cessare M. Method of making ceramic, sound-producing, ornamental article. 4,180,537, Cl. 264-62.000.
Darrow, George R., to Reynolds Metals Company. Method for coloring aluminum. 4,180,443, Cl. 204-35.00N.
Data Card Corporation: *See*—
LaManna, Richard J.; Drillick, Jacob H.; and Polad, Michael D., 4,180,338, Cl. 400-582.000.
Davidson, Murray R. Foot cushioning device. 4,179,826, Cl. 36-69.000.
Davies, David H.: *See*—
Mallams, Alan K.; and Davies, David H., 4,180,565, Cl. 424-180.000.
Davies, Evan E.; and Kolombos, Alexander J., to British Petroleum Company Limited, The. Process for converting C_3-C_{12} hydrocarbons to aromatics over gallia-activated zeolite. 4,180,689, Cl. 585-407.000.
Davies, Ronald W., to United Gas Industries Limited. Electrical controls for heating appliances. 4,180,380, Cl. 431-31.000.
Davis, Terri. Handbag. 4,180,111, Cl. 150-1.700.
Dawson, Carl B., Jr. Fail safe suspension poultry drinker. 4,180,015, Cl. 119-78.000.
Day, Edward: *See*—
Scudder, Roy, 4,179,873, Cl. 56-330.000.
Day, John C., to AMSTED Industries Incorporated. Snubbed railroad car truck. 4,179,995, Cl. 105-197.0DB.
De Limon Fluhme GmbH & Co.: *See*—
Bemba, Siegfried, 4,180,090, Cl. 137-119.000.
De Staat der Nederlanden, te dezen vertegenwoordigd door de directeur-generaal der Posterijen, Telegrafie en Telefonie: *See*—
Hagedoorn, Rijnder; and Koenderink, Ernest J. E., 4,180,843, Cl. 361-119.000.
Decaudin, Charles: *See*—
Allias, Bernard; and Decaudin, Charles, 4,179,807, Cl. 30-124.000.
DeCrescent, Ronald. System for measuring characteristics of an object's motion. 4,180,726, Cl. 250-222.00R.
Decuyper, Jean-Claude: *See*—
Yvard, Marcel; Decuyper, Jean-Claude; and Beduchaud, Michel, 4,180,824, Cl. 346-154.000.
Deibele, Ludwig: *See*—
Brandt, Hans-Walter; Deibele, Ludwig; Toepffer, Kurt; and Steinacker, Karl-Heinz, 4,180,438, Cl. 203-89.000.
Deines, John L.; Poponiak, Michael R.; and Schwenker, Robert O., to International Business Machines Corporation. Anodic etching method for the detection of electrically active defects in silicon. 4,180,439, Cl. 204-1.00T.
Del, Joseph A. Process for making multi-layer printed circuit boards, and the article resulting therefrom. 4,180,608, Cl. 428-196.000.
Delfau, Paul: *See*—
Guyot, Pierre; Coty, Alain; and Delfau, Paul, 4,180,823, Cl. 346-139.00B.
Della-Calce, Louis D., to Crimeye Inc. Low noise automatic camera advance mechanism. 4,180,316, Cl. 354-173.000.
Delta Microfilm: *See*—
McCollough, John D., 4,180,320, Cl. 355-54.000.
Demerson, Christopher A.; and Humber, Leslie G., to American Home Products Corp. Furo(3,4-b)quinolines. 4,180,580, Cl. 424-258.000.
Dennis, Kent S., to Dow Chemical Company, The. Preparation of halophenylvinylbenzyl ethers. 4,180,680, Cl. 568-647.000.
Denu, Francis, to ADIDAS, Fabrique de Chaussures de Sport. Competition swimsuit. 4,179,754, Cl. 2-67.000.
Deptolla, Udo: *See*—
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Derlien, Michael L., to Pye (Electronic Products) Limited. Apparatus for delivering fluids with controlled rates of flow. 4,180,067, Cl. 128-214.00F.
Deschamps, Andre; Franckowiak, Sigismond; and Renault, Philippe, to Institut Francais du Petrole. Process for purifying a sulfur dioxide containing gas by washing with an ammonia aqueous solution. 4,180,550, Cl. 423-242.000.
De Sousa, Bernardo: *See*—
Siegrist, Adolf E.; Pauchard, Jean-Paul; and De Sousa, Bernardo, 4,180,479, Cl. 252-301.240.
Deutsche Gold- and Silber-Scheideanstalt Vormals Roessler: *See*—
Schumann, Erwin; and Bohlander, Oskar, 4,180,697, Cl. 13-25.000.
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Kleinschmit, Peter; Walter, Eberhard; Mechler, Helmut; Theis, Gunter; and Meiners, Brigitte, 4,180,684, Cl. 568-726.000.
Deveau, Emile J.: *See*—
Schwartz, Leonard; Chin, Edward; and Deveau, Emile J., 4,180,818, Cl. 343-700.0MS.
DeWitt, Robert E. Water sprinkler. 4,180,210, Cl. 239-97.000
Dhein, Rolf: *See*—
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Diamond International Corporation: *See*—
Harvey, Albert J., 4,180,105, Cl. 141-165.000.
Diamond, Ronald M.; Ling, Ku S.; and Winterer, Allen G., to Optical Coating Laboratory, Inc. Concentrator solar cell array module. 4,180,414, Cl. 136-89.0PC.
Diamond Shamrock Corporation: *See*—
Bennett, John E.; and Elliott, Joseph E., 4,180,445, Cl. 204-129.000.
Diaz, Stephen H., to Raychem Corporation. Tamper-proof closure system. 4,180,173, Cl. 215-6.000.
Diederich, David A., to Northland Group, Inc., The. Ice hockey stick. 4,180,413, Cl. 156-185.000.
DIEHL, Firma: *See*—
Meisner, Alfred; and Gerum, Erich, 4,180,087, Cl. 137-78.000.
Diehl, Ernst: *See*—
Ciani, Jean A.; Diehl, Ernst; and Haberthur, Berno, 4,180,434, Cl. 162-138.000.
Distler, Jack E.; Hamilton, Albert A.; and King, Everett R., to Western Electric Co., Inc.; and Bell Laboratories, Inc. Incandescent lamp with vibration-protected filament mount. 4,180,757, Cl. 313-315.000.
Divers, Edward F.; Berry, D. Randolph; and Monaghan, David A., to United States of America, Interior. Extensible brattice and cantilevered roof mounted support system therefor. 4,180,352, Cl. 405-303.000.
Dixon, Kenneth W., to GAF Corporation. Preparation of insoluble polyvinylpyrrolidone. 4,180,633, Cl. 525-359.000.
Dixon, Rolland E., to Phillips Petroleum Company. Mixed-component refrigeration in shell-tube exchanger. 4,180,123, Cl. 165-1.000.
Dobramysl, Wilhelm: *See*—
Stern, Gerhard; and Dobramysl, Wilhelm, 4,180,488, Cl. 260-21.000.
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Dodd, John R., to Conoco, Inc. Oxidative coupling of alkylphenols. 4,180,686, Cl. 568-730.000.
Dodt, Hans-Walter, to Carl Schenck AG. Cradle mounted dynamometer. 4,179,923, Cl. 73-134.000.
Doherty, Daniel A.: *See*—
Melody, David P.; Doherty, Daniel A.; O'Grady, John F.; and Rich, Richard D., 4,180,640, Cl. 526-323.100.
Dohm, Daniel, Jr., to Cashin Systems Corp. Safety apparatus for a bacon press or the like. 4,179,987, Cl. 100-53.000.
Dollhausen, Manfred; Hohmann, Gerhard; and Behr, Winfried, to Bayer Aktiengesellschaft. Storable polychloroprene adhesives and a process for their production employing xanthogen disulphides. 4,180,638, Cl. 526-204.000.
Donnelly, James K.: *See*—
Burd, Lamar; and Donnelly, James K., 4,180,119, Cl. 164-34.000.
Dopp, James W., to Babcock & Wilcox Company, The. Broach pulling mechanism. 4,180,360, Cl. 409-287.000.
Doria, Andrea: *See*—
Raiteri, Angelo, 4,179,868, Cl. 53-571.000.
Doss, Richard C., to Phillips Petroleum Company. Adhesion promoter and method of preparation. 4,180,514, Cl. 428-417.000.
Dove, Ralph E. Removable mounted teeth in brush clearing saw. 4,180,108, Cl. 144-34.00F.
Doveri, Carlo, to Piaggio & C. S.p.A. Front-wheel suspension for two- or three-wheeled vehicles. 4,180,280, Cl. 280-277.000.
Dow Chemical Company, The: *See*—
Dennis, Kent S., 4,180,680, Cl. 568-647.000.
Evani, Syamalarao; and Raymond, Russell J., 4,180,637, Cl. 526-204.000.
Heikel, Henrik R., 4,180,449, Cl. 204-296.000.
Johnston, Howard; and Senkbeil, Herman O., 4,180,395, Cl. 71-94.000.
Moll, Norman G.; and Quarderer, George J., 4,180,456, Cl. 208-177.000.
Dragerwerk Aktiengesellschaft: *See*—
Pasternack, Adalbert, 4,180,235, Cl. 251-8.000.
Drain, Leslie E., to United Kingdom Atomic Energy Authority. Interferometer which corrects for spurious vibrations. 4,180,328, Cl. 356-349.000.
Dravo Corporation: *See*—
Jaquay, Louis H., 4,180,251, Cl. 266-172.000.
Drees, Herman M. Self-starting windmill energy conversion system. 4,180,367, Cl. 416-119.000.
Drews, Hilbert F. P. Propelled apparatus having surface means for developing increased propulsion efficiencies. 4,180,290, Cl. 296-1.00S.
Drillick, Jacob H.: *See*—
LaManna, Richard J.; Drillick, Jacob H.; and Polad, Michael D., 4,180,338, Cl. 400-582.000.
Driscoll, Richard O.; Jordan, William E.; and McAllister, Richard L., to Foxboro Company, The. Display station having universal module for interface with different single loop controllers. 4,180,860, Cl. 364-900.000.
Drobka, Witold, to Borsig GmbH. Pipe assembly-heat exchanger-steam drum unit. 4,180,017, Cl. 122-34.000.
Droz, Jean-Claude: *See*—
Lebet, Jean-Philippe; and Droz, Jean-Claude, 4,180,808, Cl. 340-384.00E.

Druzhinsky, Isaak A.: *See—*
Shumyakin, Evgeny P.; Sabir-de-Ribas, Konstantin I.; Druzhinsky, Isaak A.; Shishov, Gennady P.; and Andreichikov, Boris I., 4,180,435, Cl. 176-30.000.

Dufour, Raymond J.: *See—*
Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., 4,180,126, Cl. 165-59.000.

Duhrkoop, Jens; and Pusch, Gunter, to Industrie Automation GmbH & Co. Method of and device for scanning thermographic pictures. 4,180,306, Cl. 350-6.400.

Dulmaine, Joseph F.; and Bagrosky, Michael E., to Coors Container Company. Container with outwardly flexible bottom end wall having integral support means apparatus for manufacture thereof. 4,179,914, Cl. 72-358.000.

Dumbaugh, William H., Jr.: *See—*
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Dunlop Limited: *See—*
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Du Pont de Nemours, E. I., and Company: *See—*
Angelo, Rudolph J.; Blomberg, Richard N.; Boettcher, Fritz P.; Ikeda, Richard M.; and Samuels, Michael R., 4,180,614, Cl. 428-336.000.
Burrus, Harry O.; and Garnett, Donald I., 4,180,687, Cl. 568-856.000.
Cotten, Soule E., 4,179,999, Cl. 105-377.000.
Goddard, Steven J., 4,180,569, Cl. 424-226.000.
Hofmann, George H., 4,180,529, Cl. 525-85.000.
Inskip, Harold K., 4,180,620, Cl. 428-524.000.
McCormack, William B.; and Sandy, Charles A., 4,180,386, Cl. 44-63.000.
Nacci, George R.; and Pazos, Jose F., 4,180,403, Cl. 430-281.000.
Vassiliou, Eustathios, 4,180,609, Cl. 428-212.000.
Vassiliou, Eustathios, 4,180,613, Cl. 428-327.000.
Verma, Monica H., 4,180,610, Cl. 428-216.000.

Durden, Andrew; and Sorrell, Malcolm E., to Voltarc Tubes, Inc. Packaging arrangement for U-shaped fluorescent lamps. 4,180,164, Cl. 206-419.000.

Dutell, H. Gary: *See—*
Steffensen, Leslie M.; Dutell, H. Gary; and Rydell, Robert A., 4,179,820, Cl. 34-92.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Schmidt, Hans-Georg, 4,180,446, Cl. 204-158.00R.

E M I Limited: *See—*
Lee, Cyril A., 4,180,207, Cl. 235-493.000.

E. R. Squibb & Sons, Inc.: *See—*
Wade, Peter C.; and Vogt, Berthold R., 4,180,579, Cl. 424-258.000.

E-Systems, Inc.: *See—*
Councilman, Clyde L.; and Shearer, Harry D., 4,180,724, Cl. 235-92.00T.

Eads, William D.: *See—*
Walden, Jack M.; Eads, William D.; Cozzens, Ray J.; Bidwell, John L.; Jewett, Robert A.; Wilson, Martin S.; Griffin, Daniel J.; Kuseski, Robert E.; and Schulte, Louis T., 4,180,854, Cl. 364-200.000.

Eagle Picher Industries, Inc.: *See—*
Romero, Victor R., 4,180,277, Cl. 280-79.300.

Early California Industries, Inc.: *See—*
Watts, James P., 4,180,350, Cl. 405-233.000.

Eastman Kodak Company: *See—*
Fagerburg, David R., 4,180,528, Cl. 525-70.000.
Frishberg, Mark D., 4,180,663, Cl. 544-105.000.

Eastman Technology, Inc.: *See—*
Bixby, James A., 4,180,832, Cl. 360-10.000.

Eaton Corporation: *See—*
Goscenski, Edward J., Jr., 4,179,888, Cl. 60-420.000.
Obermaier, Frank E., 4,180,208, Cl. 236-93.00B.

Eberle, William J., to General Battery Corporation. Cast-on method and apparatus for casting parts onto the lugs of lead-acid battery plates stacks. 4,180,120, Cl. 164-109.000.

Eby, Richard L., to Anderson Power Products, Inc. Method and apparatus for determining the capacity of lead acid storage batteries. 4,180,770, Cl. 324-429.000.

Echavarren, Daniel: *See—*
Echavarren, Luis A.; and Echavarren, Daniel, 4,179,763, Cl. 5-8.000.

Echavarren, Luis A.; and Echavarren, Daniel. Folding bunk bed unit. 4,179,763, Cl. 5-8.000.

Echols, Robert B.; and Berry, William J., to Titan Specialties, Inc. Perforating gun barrel. 4,179,991, Cl. 102-21.600.

Eckert, Alton B., Jr.: *See—*
Check, Frank T., Jr.; Eckert, Alton B., Jr.; and Warren, Joseph R., 4,180,856, Cl. 364-466.000.

Ecodyne: *See—*
Chirico, Anthony N., 4,180,547, Cl. 423-197.000.

Edington, Edwin T.; and White, Alan C., to John Wyeth & Brother Limited. Amino pyridine derivatives. 4,180,670, Cl. 546-284.000.

Edouard Dubied & Cie. (Societe Anonyme): *See—*
Patthey, Michel, 4,179,906, Cl. 66-128.000.

Ehret, Reiner: *See—*
Praxl, Werner; and Ehret, Reiner, 4,180,557, Cl. 424-10.000.

Eiber, Robert J.: *See—*
Park, Donald M.; and Eiber, Robert J., 4,180,104, Cl. 138-172.000.

Eichelberger, Charles W.; and Butler, Walter J., to General Electric Company. Charge transfer circuit with voltage threshold compensating means. 4,180,807, Cl. 340-347.0AD.

Einbinder, Itamar B.; and Hamilton, Albert A., to Western Electric Co., Inc. Methods of adjusting sealed contact switches. 4,179,798, Cl. 29-622.000.

Eisai Co., Ltd.: *See—*
Hamano, Sachiyuki; and Nakamura, Takaharu, 4,180,577, Cl. 424-251.000.

Electric Power Research Institute, Inc.: *See—*
Ho, Shih M.; and Gupta, Tapan K., 4,180,483, Cl. 252-518.000.
Saaski, Elric W., 4,179,927, Cl. 73-350.000.

Electron Fusion Devices Inc.: *See—*
Valukis, Robert W., 4,180,239, Cl. 251-60.000.

Eli Lilly and Company: *See—*
Beck, James R.; and Yahner, Joseph A., 4,180,568, Cl. 424-226.000.
Cooper, Robin D. G.; Koppel, Gary A.; and McShane, Lawrence J., 4,180,507, Cl. 260-245.400.
Godfrey, Otis W.; Johnson, Ronald D.; and Kastner, Ralph E., 4,180,564, Cl. 424-117.000.
Kornfeld, Edmund C.; and Bach, Nicholas J., 4,180,582, Cl. 424-261.000.

Elliott, Joseph E.: *See—*
Bennett, John E.; and Elliott, Joseph E., 4,180,445, Cl. 204-129.000.

Emmons, William D., to Rohm and Haas Company. Radiation-curable coating compositions and method of coating metal substrates therewith. 4,180,598, Cl. 427-44.000.

Emmons, William D.; Nyi, Kayson; and Sperry, Peter R., to Rohm and Haas Company. Polyurethane coating compositions from dicyclopentenyl acrylate and/or methacrylate. 4,180,645, Cl. 528-73.000.

Enck, Richard S., Jr.: *See—*
Abraham, Wayne G.; Enck, Richard S., Jr.; Goehner, Ronald H.; and Brick, Robert V., 4,180,725, Cl. 250-207.000.

Endo, Hiroshi; and Fujiki, Norio, to Nissan Motor Company, Limited. Testing circuit for radar-operated vehicle safety assurance systems. 4,180,816, Cl. 343-7.0VM.

Endo, Kunio: *See—*
Kobayashi, Akio; Endo, Kunio; and Omori, Norio, 4,180,023, Cl. 123-32.0EA.

Endo, Makoto, to Matsuzaka Company Ltd. Rotor of a coarse-reduction impact crusher. 4,180,211, Cl. 241-192.000.

Engel, Joseph C., to Westinghouse Electric Corp. Ground fault circuit interrupter with grounded neutral protection. 4,180,841, Cl. 361-45.000.

English Electric Valve Company Limited: *See—*
Harris, Jeffrey J.; and Rampling, Brian W., 4,180,759, Cl. 313-388.000.
Wheldon, Robert J.; and Neale, Christopher V., 4,180,756, Cl. 313-193.000.

Envirochem Inc.: *See—*
Paul, Donald G., 4,180,389, Cl. 55-28.000.

Ericson, John E., Jr., to Ericson Manufacturing Company. Ventilated lamp guard. 4,180,851, Cl. 362-378.000.

Ericson Manufacturing Company: *See—*
Ericson, John E., Jr., 4,180,851, Cl. 362-378.000.

Eriksen, Stuart P., to Interx Research Corporation. 3,4-Dipivalyl-α-[methylamino)methyl]benzyl alcohol as an adjunct in the treatment of circulatory shock. 4,180,586, Cl. 424-311.000.

Ernst Leitz Wetzlar GmbH: *See—*
Schmidt, Ewald; and Wiesner, Willi, 4,180,312, Cl. 354-59.000.

Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik: *See—*
Sick, Erwin; Hartmann, Klaus; and Henneberger, Heinz, 4,180,702, Cl. 250-227.000.

Eshghy, Siavash, to Rockwell International Corporation. Tension control of fasteners. 4,179,786, Cl. 29-407.000.

Eshima, Seiji: *See—*
Ogawa, Kiyohisa; and Eshima, Seiji, 4,180,160, Cl. 206-210.000.

Etablissements Huret & Ses Fils. *See—*
Huret, Roger H. M., 4,179,935, Cl. 73-493.000.

Evani, Syamalarao; and Raymond, Russell J., to Dow Chemical Company, The. Process for the preparation of low molecular weight anhydride interpolymers. 4,180,637, Cl. 526-204.000.

Ever Ready Company (Great Britain) Limited, The: *See—*
Parkin, Sidney J., 4,180,849, Cl. 362-72.000.

Exxon Research & Engineering Co.: *See—*
Luckenbach, Edward C., 4,180,454, Cl. 208-113.000.
Say, Geoffrey R.; Hays, James R., Sr.; and Iyengar, Jagannathan N., 4,180,548, Cl. 423-223.000.

Fa. Develop KG, Dr. Eisgein & Co.: *See—*
Kaufmann, Heinrich; and Moser, Kurt, 4,180,319, Cl. 355-3.00R.

Fabinski, Walter; and Deptolla, Udo, to Hartmann & Braun Aktiengesellschaft. Nondispersive infrared gas analyzer. 4,180,732, Cl. 250-344.000.

Fackelmann, Peter. Protective suit. 4,179,752, Cl. 2-2.000.

Fagan, Maurice J., Jr.; and Fagan, Maurice J., III. Dental implant. 4,179,809, Cl. 433-176.000.

Fagan, Maurice J., III: *See—*
Fagan, Maurice J., Jr.; and Fagan, Maurice J., III, 4,179,809, Cl. 433-176.000.

Fagerburg, David R., to Eastman Kodak Company. Block copolymer composed of an addition polymer and a linear saturated polyester. 4,180,528, Cl. 525-70.000.

Fahey, Darryl R.; and Mahan, John E., to Phillips Petroleum Company. Trans-halo(acyl)bis(trethylphosphine) nickel(II) complexes. 4,180,525, Cl. 585-523.000.

Fahey, William D.: *See—*
Sullivan, John B.; Marsh, David R.; Osofsky, Raymond C.; Bryan, Steven R.; Fahey, William D.; and Manners, David E., 4,179,823, Cl. 35-10.240.

Faine, Eric N. Gardening tool. 4,180,289, Cl. 294-53.500.

Falk, Richard A.: *See—*
Moriya, Kazuo, 4,179,931, Cl. 73-425.600.

Fallon, John J., Jr.; Blair, Joe B.; Phelps, Donald R.; and Cabeen, Robert P., III, to Fallon, John J., Jr.; and Ritt, Donald. Multiple furnace waste heat recovery system. 4,180,128, Cl. 165-76.000

Farcinade, Michel, to Alcyon Equipment S.A. Interior measurement of enclosed spaces. 4,180,322, Cl. 356-1.000.

Farona, Michael F.; and White, James F., to University of Akron, The. Method for reacting organic halides. 4,180,692, Cl. 585-457.000.

Faucher, Joseph E.; Koucky, Robert W.; and Roy, William D., to United Technologies Corporation. Premix combustor assembly. 4,179,881, Cl. 60-39.710.

Faulkner, Alfred H. Automatic arpeggio for multiplexed keyboard. 4,179,970, Cl. 84-1.030.

Fauls, Thomas J., to Mego Corp. Audible sound emitting toy. 4,179,842, Cl. 46-117.000.

Fauve, Robert, to Institut Pasteur. Immunostimulant agent from *Salmonella typhimurium* or *Listeria monocytogenes* bacterial cells and pharmaceutical composition. 4,180,563, Cl. 424-92.000.

Federal-Mogul Corporation: *See—*
Ladin, Eli M., and Reynolds, Mark P., 4,179,780, Cl. 29-149.50R

Fehlisch, Silvan: *See—*
Kolb, Fritz; Fehlisch, Silvan; Ziegert, Otto; Bender, Hans; and Schmitt, Manfred, 4,180,100, Cl. 137-625.300.

Fehrenkamp, William. Method and apparatus for producing programmable selection of music. 4,180,838, Cl. 360-63.000

Fein, Gail: *See—*
Aronberg, Sue; and Fein, Gail, 4,179,753, Cl. 2-10.000.

Feldstein, Nathan, to Feldstein, Nathan. Process using activated electroless plating catalysts. 4,180,600, Cl. 427-97.000

Feldstein, Robert S., to Abex Corporation. Electronic siren. 4,180,809, Cl. 340-384.00E.

Fell, Markley D.: *See—*
Hopping, Alvin S., deceased; and Johnson, Clifford A., executor, 4,179,885, Cl. 60-370.000

Feng, Bai-Cwo, and Feng, George C., to International Business Machines Corporation. Two layer resist system. 4,180,604, Cl. 430-270.000.

Feng, George C.: *See—*
Feng, Bai-Cwo; and Feng, George C., 4,180,604, Cl. 430-270.000.

Ferraro, Angelo, to Tele/Resources, Incorporated. Energy limiting foldback circuit for power supply. 4,180,768, Cl. 323-9.000

Ferrero, Elvio: *See—*
Salotti, Gianfranco; Ferrero, Elvio; and Grisotto, Franco, 4,179,839, Cl. 43-112.000

Fevrier-Decoisy-Champion: *See—*
Boussely, Jean; Chandavoine, Marie-Madeleine; Chignac, Michel; Grain, Claude; and Pigerol, Charles, 4,180,492, Cl. 260-30.80R.

Fiala, Ernst; Hofbauer, Peter; Loeck, Harald; Grundmann, Edgard; and Heitland, Herbert, to Volkswagenwerk AG. Motor-driven heat pump. 4,179,901, Cl. 62-238.000.

Fiat Societa per Azioni: *See—*
Salotti, Gianfranco; Ferrero, Elvio; and Grisotto, Franco, 4,179,839, Cl. 43-112.000.

Fiber Industries, Inc.: *See—*
Gibbon, John D., 4,179,875, Cl. 57-248.000

Fibra-Sonics, Inc.: *See—*
Murry, Edward J.; and Brumbach, Joseph F., 4,180,074, Cl. 128-276.000.

Fichtel & Sachs AG: *See—*
Wagner, Gerolf, 4,180,137, Cl. 180-33.00R.

Fiedler, Frank, Jr. Solenoid operated valve and shut-off device. 4,180,241, Cl. 251-130.000.

Filippi, Richard E.: *See—*
Hvizdos, Leonard J.; Filippi, Richard E.; and Luybli, Richard E., 4,179,897, Cl. 62-9.000

Finlay, Glenn. Grating fastener. 4,180,343, Cl. 403-24.000.

Firestone Tire & Rubber Company, The: *See—*
Claxton, William E., 4,180,794, Cl. 340-58.000
Hergenrother, William J.; and Halasa, Adel F., 4,180,647, Cl. 528-168.000.

Firth, Donald. *See—*
Cunningham, Sinclair U.; Firth, Donald; and Jackson, Douglas, 4,180,171, Cl. 212-61.000.

Fischer Gesellschaft m.b.H.: *See—*
Staufer, Adolf, 4,180,265, Cl. 273-73.00D.

Fischer, Hermann; Thoma, Richard; Kaeppel, Hanshelmut; Kochendoerfer, Ernst; and Lagaly, Werner, to BASF Aktiengesellschaft. Continuous manufacture of unsaturated polyesters. 4,180,635, Cl. 526-68.000.

Fish, Leonard A.; and Mills, Duane M., to Bank Computer Network Corporation. Dispensing magazine. 4,180,182, Cl. 221-75.000

Fisher Scientific Company: *See—*
Gibboney, Dennis A.; Schneider, John T.; and Premus, Jerry C., 4,180,440, Cl. 204-1.00T

Fitzgerald-Smith, James P.; and Knight, Derek I., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Pontoon launching. 4,180,364, Cl. 414-350.000

Flaum, Dennis M.; and Fleishman, Herman L. Vacuum bag process and apparatus. 4,180,190, Cl. 223-43.000.

Flavin, Thomas R.: *See—*
Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; Mc Cain, Willam B.; Weller, Ronald W.; and Werstler, Lawrence J., 4,180,259, Cl. 271-200.000.

Fleishman, Herman L.: *See—*
Flaum, Dennis M.; and Fleishman, Herman L., 4,180,190, Cl. 223-43.000.

Florer, Richard H.; Via, Thomas E.; and Weaver, James M., to Lambert Corporation. Fertilizer spreader. 4,180,184, Cl. 222-41.000.

Floyd, Don E., to Henkel Corporation. Epoxy curable resin composition. 4,180,487, Cl. 260-18.00N

FMC Corporation: *See—*
Chang, Andrew K., 4,180,326, Cl. 356-152.000.
Joseph, George L.; and Brolin, Charles A., 4,180,421, Cl. 148-150.000.
Mencacci, Samuel A., 4,179,986, Cl. 99-359.000.

Focke, Heinz, to Focke & Pfuhl. Apparatus for setting and shaping glued cigarette packs. 4,179,864, Cl. 53-388.000.

Focke, Heinz, to Focke & Pfuhl. Pack and blank for making the pack and web of packing material for making the blanks. 4,180,201, Cl. 229-37.00R.

Focke & Pfuhl. *See—*
Focke, Heinz, 4,179,864, Cl. 53-388.000.
Focke, Heinz, 4,180,201, Cl. 229-37.00R

Forcina, John. Anchoring nail. 4,179,975, Cl. 85-23.000.

Ford Motor Company: *See—*
Cook, James C., II, 4,180,753, Cl. 310-168.000
Gordon, Thomas C., 4,180,302, Cl. 339-143.00T.

Forenade Fabriksverken: *See—*
Gronvall, Karl O. R., 4,179,891, Cl. 60-521.000.

Forman, Donald B.; and Bradshaw, Phillip, to United States of America, Navy, Cable terminal-ferrule attaching apparatus. 4,179,782, Cl. 29-268.000.

Fort, Emil M.; and Albaric, Jacques E., to Westinghouse Electric Corp. Double ring and radial conductor assembly for large hollow shafts. 4,180,300, Cl. 339-5.00R.

Forward, Robert L.; and Thurmond, Gary D., to Hughes Aircraft Company. Impedance-matching circuit using negative low-noise resistance. 4,180,786, Cl. 333-32.000.

Fosroc A.G.: *See—*
Brown, John V., 4,179,861, Cl. 52-743.000

Foster Wheeler Energy Corporation: *See—*
Reale, Salvatore J., 4,179,860, Cl. 52-732.000

Fotescu, Leonida: *See—*
Popp, Valer V.; Suditu, Ion; Neagu, Petre; Fotescu, Leonida; Mihalache, Ion; and Tirboiu, Dumitru, 4,180,457, Cl. 208-188.000.

Foundation: The Research Institute for Special Inorganic Materials, The. *See—*
Asada, Chiaki; Saito, Makoto; and Kajima, Hisashi, 4,180,399, Cl. 75-229.000

Foxboro Company, The: *See—*
Driscoll, Richard O.; Jordan, William E.; and McAllister, Richard L., 4,180,860, Cl. 364-900.000.

Franck, Jean-Pierre; Freund, Edouard; Le Page, Jean-Francois; and Miquel, Jean, to Institut Francais du Petrole. Process for the steam-cracking of heavy feedstocks. 4,180,453, Cl. 208-57.000.

Franckowiak, Sigismond: *See—*
Deschamps, Andre; Franckowiak, Sigismond; and Renault, Philippe, 4,180,550, Cl. 423-242.000

Franklin, Michael L.: *See—*
Goldberg, Arthur H.; and Franklin, Michael L., 4,180,558, Cl. 424-16.000.

Franks, Allen R.: *See—*
Bartlett, Frank; and Franks, Allen R., 4,180,745, Cl. 307-45.000.

Franz, John E.; and Kaufman, Robert J., to Monsanto Company. Derivatives of N-trifluoroacetyl-N-phosphonomethylglycinates and the herbicidal use thereof. 4,180,394, Cl. 71-86.000.

Frederick, Roderick J. Conveyor assembly for use in check out stands. 4,180,158, Cl. 198-831.000

Frehn, Fritz, to Thyssen Edelstahlwerke Aktiengesellschaft. Sintered steel alloy. 4,180,401, Cl. 75-236.000.

Freiedrich Wilhem, Schwing GmbH: *See—*
Meinken, Bernhard, 4,180,170, Cl. 212-1.000.

Fresnel, Alain C.: *See—*
Breant, Pierre L. V.; and Fresnel, Alain C., 4,180,859, Cl. 364-565.000

Fresnel, Jacques. Apparatus for sectioning thermoplastic sheath and placing resulting sleeves around containers. 4,179,863, Cl. 53-295.000.

Freund, Edouard: *See—*
Franck, Jean-Pierre; Freund, Edouard; Le Page, Jean-Francois; and Miquel, Jean, 4,180,453, Cl. 208-57.000

Fricko, John J.; and Newton, George M., to General Motors Corporation. Molding retaining clip. 4,179,859, Cl. 52-397.000.

Fries, Carl, Jr., to International Paper Company. Apparatus and method for automatically dispensing flexible containers. 4,180,180, Cl. 221-1.000.

Frishberg, Mark D., to Eastman Kodak Company. Methine dye synthesis. 4,180,663, Cl. 544-105.000

Frissora, Joseph R., to Owens-Illinois, Inc. Solar energy operated system and method. 4,180,209, Cl. 237-1.00A.

Fritsch, Edgar; Liebenow, Walter; and Prikryl, Jaroslav, to Ludwig Heumann, & Co. GmbH. 2,4-Diamino-5-(4'-methylthio)benzyl-pyrimidenes, compounds, compositions and method of use. 4,180,578, Cl. 424-251.000

Fritts, David H., to United States of America, Air Force. Method of molding a double cathode having a sensing grid for a porous electrode primary battery. 4,179,799, Cl. 29-623.500.
Fromuth, Harry C.; and Shell, Kenneth M., to Rohm and Haas Company. Thermoplastic polyesters. 4,180,494, Cl. 260-40.00R.
Fudenberg, Herman H.: *See*—
Klesius, Phillip H.; and Fudenberg, Herman H., 4,180,627, Cl. 435-262.000.
Fuji Electric Co., Ltd.: *See*—
Ueda, Shinya, 4,180,733, Cl. 250-345.000.
Fuji Photo Film Co., Ltd.: *See*—
Inuiya, Masafumi, 4,180,313, Cl. 354-112.000.
Fujiki, Miyoji: *See*—
Yamamoto, Teruo; Ishii, Fumikatsu; and Fujiki, Miyoji, 4,180,185, Cl. 222-57.000.
Fujiki, Norio: *See*—
Endo, Hiroshi; and Fujiki, Norio, 4,180,816, Cl. 343-7.0VM.
Fujisoku Electric Co., Ltd.: *See*—
Suzuki, Hideo, 4,180,716, Cl. 200-320.000.
Fujita, Susumu, to Nittan Kohki Co., Ltd. Adjustable clamping device. 4,179,775, Cl. 24-249.00R.
Fujitsu Limited: *See*—
Buelow, Fred K.; and Zasio, John J., 4,180,772, Cl. 324-73.0PC.
Fukui, Seiji: *See*—
Hanada, Mitsugu; and Fukui, Seiji, 4,179,953, Cl. 74-750.00B.
Furh, Karl: *See*—
Schuster, Karl-Ernst; Rosenkranz, Hans J.; Furh, Karl; and Rudolph, Hans, 4,180,474, Cl. 252-188.30R.
Furstenberg, Joachim, to LTG Lufttechnische GmbH. Textile machine including air cleaning apparatus. 4,180,390, Cl. 55-272.000.
Fushimi, Kenji: *See*—
Koyanagi, Shunichi; Shimizu, Toshihide; and Fushimi, Kenji, 4,180,634, Cl. 526-62.000.
G. D. Searle & Co.: *See*—
Chorvat, Robert J., 4,180,666, Cl. 546-111.000.
G. Siempelkamp GmbH & Co.: *See*—
Huydts, Eduard J. C., 4,179,915, Cl. 72-402.000.
Gabrielidis, Pericles. Tennis serving toss aid. 4,180,262, Cl. 273-29.00A.
Gabrielli, Ernesto. Method of extruding employing an extrusion device having intermediate extruder. 4,180,541, Cl. 264-171.000.
GAF Corporation: *See*—
Bettoli, Philip S., 4,180,615, Cl. 428-359.000.
Chakrabarti, Paritosh M.; and Hashem, Mohammed M., 4,180,532, Cl. 260-953.000.
Dixon, Kenneth W., 4,180,633, Cl. 525-359.000.
Gaines, Larry D.; and Giles, Richard F., to Phillips Petroleum Company. Purge control for ammonia synthesis process. 4,180,858, Cl. 364-502.000.
Galer, Herbert W., to United States Steel Corporation. Gravity dump shipping crate for poultry. 4,180,176, Cl. 217-57.000.
Gallagher, Edward: *See*—
Bewersdorf, Elmer; Cosgrove, James F.; Flavin, Thomas R.; Gallagher, Edward; Mc Cain, Willam B.; Weller, Ronald W.; and Werstler, Lawrence J., 4,180,259, Cl. 271-200.000.
Gallo, Luigi C.: *See*—
Louth, Kenneth; and Gallo, Luigi C., 4,180,701, Cl. 178-69.100.
Gamba, Vittorio. Mechanical torque converter. 4,179,943, Cl. 74-64.000.
Gang, Robert E., to Varian Associates, Inc. Superconducting solenoid with compensation for axial gradients. 4,180,769, Cl. 324-319.000.
Gardiner-Romero, Joanne L.: *See*—
Romero, Frank; and Gardiner-Romero, Joanne L., 4,180,054, Cl. 126-164.000.
Gargini, Eric J., to Communications Patents Limited. Electronic solid state switching device. 4,180,748, Cl. 307-253.000.
Garner, Robert, to Ciba-Geigy Corporation. Azomethine compounds. 4,180,656, Cl. 542-423.000.
Garnett, Donald I.: *See*—
Burrus, Harry O.; and Garnett, Donald I., 4,180,687, Cl. 568-856.000.
Gas Developments Corporation: *See*—
Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., 4,180,126, Cl. 165-59.000.
Gates, Harlan R., to International Business Machines Corporation. NPN/PNP Fabrication process with improved alignment. 4,180,827, Cl. 357-44.000.
Gattner, Hans: *See*—
Rochling, Hans; Sachse, Burkhard; and Gattner, Hans, 4,180,575, Cl. 424-250.000.
Gauron, Richard F. Restraining apparatus for bookcases. 4,179,848, Cl. 49-124.000.
Gebrueder Heller Maschinenfabrik GmbH: *See*—
Schmid, Karlheinz, 4,180,359, Cl. 409-197.000.
Gedeon, Andras, to Siemens Aktiengesellschaft. Gas analyzer. 4,180,734, Cl. 250-345.000.
Geidies, Ulrich, to Krupp-Koppers GmbH. Piston pump for use in gasifying fine grained and dust-like solid fuels. 4,180,353, Cl. 406-74.000.
Gelardi, Anthony L. Tape splicing device. 4,180,431, Cl. 156-505.000.
Gelenkwellenbau GmbH: *See*—
Schultenkamper, Josef, 4,179,905, Cl. 64-17.00A.
Gelman, Charles S. Envelope sealing device. 4,180,430, Cl. 156-441.500.
General Battery Corporation: *See*—
Eberle, William J., 4,180,120, Cl. 164-109.000.
General Electric Company: *See*—
Abrams, Donald W., 4,180,297, Cl. 312-214.000.
Anderson, John M., 4,180,763, Cl. 315-248.000.
Barkan, Philip, 4,180,788, Cl. 335-190.000.
Burnham, Lowell C., 4,180,231, Cl. 248-632.000.
Eichelberger, Charles W.; and Butler, Walter J., 4,180,807, Cl. 340-347.0AD.
Herbst, LeRoy J.; and Jenkins, Thomas E., 4,179,821, Cl. 34-235.000.
Keeney, Marvin F., 4,180,842, Cl. 361-85.000.
Kingsley, Jack D., 4,180,737, Cl. 250-367.000.
Kirkpatrick, Robert G.; and Snyder, Ronald R., 4,179,978, Cl. 89-12.000.
Lederman, Frank L.; and Tiemann, Jerome J., 4,180,792, Cl. 367-7.000.
MacLaury, Michael R., 4,180,685, Cl. 568-726.000.
Mark, Victor, 4,180,651, Cl. 528-202.000.
Mitchell, Lawrence C., 4,180,683, Cl. 568-724.000.
Pauze, Denis R.; and Pucci, Donald G., 4,180,612, Cl. 528-289.000.
Thomas, Charles E., 4,180,790, Cl. 367-7.000.
Tiemann, Jerome J., 4,180,791, Cl. 367-105.000.
Vakil, Himanshu B., 4,179,898, Cl. 62-114.000.
General Motors Corporation: *See*—
Fricko, John J.; and Newton, George M., 4,179,859, Cl. 52-397.000.
Vogelsberg, William A., 4,180,034, Cl. 123-119.00A.
General Research of Electronics, Inc.: *See*—
Nakano, Masao, 4,180,819, Cl. 343-792.000.
General Signal Corporation: *See*—
Peabody, Frederick H., Jr., 4,179,903, Cl. 62-322.000.
Genese, Joseph N., to Abbott Laboratories. Disposable double vial syringe. 4,180,070, Cl. 128-218.00M.
George, William M. Safety pet collar. 4,180,016, Cl. 119-106.000.
Georgia-Pacific Corporation: *See*—
Steffensen, Leslie M.; Durell, H. Gary; and Rydell, Robert A., 4,179,820, Cl. 34-92.000.
Geosource, Inc.: *See*—
Schuller, Ronald A.; and Clarkson, Robert I., 4,179,920, Cl. 73-86.000.
Gerlinger, Frederic, to Kuhn, S.A. Haymaking machine for central tedding and lateral windrowing. 4,179,872, Cl. 56-366.000.
Gerum, Erich: *See*—
Meisner, Alfred; and Gerum, Erich, 4,180,087, Cl. 137-78.000.
Gestetner Limited: *See*—
Maynard, Michael; and Jones, Walter, 4,180,621, Cl. 428-535.000.
Gewerkschaft Eisenhutte Westfalia: *See*—
Lobbe, Armin; and Penzek, Hans-Jurgen, 4,180,291, Cl. 299-34.000.
Ghosh, Bidhan C.; Chopra, Gopal M.; and Sen, Soumendra N., to Indian Explosives Limited. Gelatine explosive compositions. 4,180,425, Cl. 149-95.000.
Gibbon, John D., to Fiber Industries, Inc. High tenacity, low denier poly(ethylene terephthalate) fibrillated tape yarn. 4,179,875, Cl. 57-248.000.
Gibboney, Dennis A.; Schneider, John T.; and Premus, Jerry C., to Fisher Scientific Company. Variable endpoint analyzer. 4,180,440, Cl. 204-1.00T.
Gibson, Donald M.; and Pierce, Donald C. Ink for application to unglazed paper surfaces. 4,180,407, Cl. 106-26.000.
Gilbert, Daniel E.; Lee, James R.; and Kramer, Ted J., to Boeing Company, The. Multilayer radome. 4,180,605, Cl. 428-76.000.
Giles, Richard F.: *See*—
Gaines, Larry D.; and Giles, Richard F., 4,180,858, Cl. 364-502.000.
Gillette Company, The: *See*—
Lebet, Jean-Philippe; and Droz, Jean-Claude, 4,180,808, Cl. 340-384.00E.
Sastri, Suri A.; and Alexander, Ben H., 4,180,420, Cl. 148-37.000.
Gillette, Robert H., to Brammall, Inc. Reaction honing tool for honing a flat surface. 4,179,850, Cl. 51-59.00R.
Gillette, Robert H., to Brammall, Inc. Insert for honing tool. 4,179,855, Cl. 51-204.000.
Ginnow, Oscar; and Ginnow, Roger. Sensor for determining band saw deflection and for guiding the band saw blade. 4,179,966, Cl. 83-820.000.
Ginnow, Roger: *See*—
Ginnow, Oscar; and Ginnow, Roger, 4,179,966, Cl. 83-820.000.
Ginter, Tom, Jr. Exhaust pipe safety clamp assembly and combination. 4,180,286, Cl. 285-328.000.
Girard, Philip R.: *See*—
Koenig, Richard W.; Girard, Philip R.; and Neuhauser, Alfred J., 4,180,204, Cl. 235-385.000.
Giuffra, William E. Interlocked battery jumper cable assembly. 4,180,746, Cl. 307-127.000.
Givens, Wyatt W., to Mobil Oil Corporation. Gamma-gamma density logging method. 4,180,727, Cl. 250-264.000.
Givens, Wyatt W., to Mobil Oil Corporation. Uranium logging in earth formations. 4,180,729, Cl. 250-265.000.
Givens, Wyatt W.; and Mills, William R., Jr., to Mobil Oil Corporation. Logging technique for assaying for uranium in earth formations. 4,180,730, Cl. 250-265.000.
Givens, Wyatt W., to Mobil Oil Corporation. Radioactive logging sonde including means for monitoring neutron source output. 4,180,731, Cl. 250-270.000.
Glass, Roger W.; and Kuntze, Richard A., to Ontario Research Foundation. Production of improved chrysotile asbestos fibres. 4,180,433, Cl. 162-3.000.
Gmeinder, Hermann: *See*—
Kaltenbach, Kurt; Saupe, Martin; Beier, Stefan; Gmeinder, Hermann; and Braetsch, Hartmut, 4,180,812, Cl. 340-706.000.

Goddard, Steven J., to Du Pont de Nemours, E. I., and Company. Seed treatment fungicides for control of seed-borne diseases. 4,180,569, Cl. 424-226.000.
Goddin, Clifton S., Jr.; and Palm, John W., to Standard Oil Company (Indiana). Method for removal of sulfur deposited on a Claus catalyst. 4,180,554, Cl. 423-574.00R.
Godfrey, Otis W.; Johnson, Ronald D.; and Kastner, Ralph E., to Eli Lilly and Company. A-38533 Antibiotics and process for production thereof. 4,180,564, Cl. 424-117.000.
Goehner, Ronald H.: *See*—
Abraham, Wayne G.; Enck, Richard S., Jr.; Goehner, Ronald H.; and Brick, Robert V., 4,180,725, Cl. 250-207.000.
Goertz, LeRoy E., to Sunkist Growers, Inc. Flow diverting gate for conveyors. 4,180,151, Cl. 198-367.000.
Goldberg, Arthur H.; and Franklin, Michael L., to Hoffmann-La Roche Inc. Unit dosage forms. 4,180,558, Cl. 424-16.000.
Goldsmith, Arthur C.: *See*—
Kirkgasser, James P.; and Goldsmith, Arthur C., 4,179,964, Cl. 83-599.000.
Goldstein, Norman P.; and Smith, Richard C., to Westinghouse Electric Corp. Neutron activation probe for measuring the presence of uranium in ore bodies. 4,180,728, Cl. 250-264.000.
Gondek, John T. Control circuit for hydraulic cylinder and shaft assembly. 4,179,889, Cl. 60-477.000.
Gonzales, Boris, to Societe Anonyme Automobiles Citroen. Switch control unit for automobile vehicle. 4,180,713, Cl. 200-52.00R.
Goodman, Charles D., to United States of America, Energy. Use of a large time-compensated scintillation detector in neutron time-of-flight measurements. 4,180,736, Cl. 250-363.00R.
Goodwood Data Systems Ltd.: *See*—
Price, Ronald, 4,179,939, Cl. 73-730.000.
Goodyear Aerospace Corporation: *See*—
Cook, Richard L.; Hampshire, William J.; and Kolarik, Robert V., 4,179,979, Cl. 89-36.00A.
Gooley, Marshall J., to Daniels Manufacturing Corp. Wire stripping tool. 4,179,956, Cl. 81-9.50R.
Gorcey, Raymond A. Slide mounting work station. 4,179,984, Cl. 98-115.0LH.
Gordon, Thomas C., to Ford Motor Company. Connector plug for vehicle electrical tester. 4,180,302, Cl. 339-143.00T.
Gorlin, Samuil M.; Ljubimov, Grigory A.; Bityurin, Valentin A.; Kovbasjuk, Valentin I.; Maximenko, Vladilen I.; Medin, Stanislav A.; and Barshak, Alexandr E., to Institut Vysokikh Temperatur Akademii Nauk SSSR. Magnetohydrodynamic device. 4,180,752, Cl 310-11.000.
Goscenski, Edward J., Jr., to Eaton Corporation. Hydraulic fan drive system. 4,179,888, Cl. 60-420.000.
Gottheb, Clifford C., to Sport-Fun, Inc. Skateboard. 4,180,278, Cl 280-87.04A.
Goudie, Alexander C., to Beecham Group Limited. Pharmacologically active enol esters. 4,180,585, Cl. 424-311.000.
Grabow, Kurt: *See*—
Schwerin, Inge; Zillgitt, Ulrich; Schneider, Steffen; Kegel, Hellmut; Bodensieck, Hans-Rudolf; Zauft, Helmut; Poglitsch, Reinhold; and Grabow, Kurt, 4,180,848, Cl. 362-71.000.
Graf, Manfred P., to Societe d'Assistance Technique pour Produits Nestle S.A. Cereal-based product and process for its production. 4,180,594, Cl. 426-560.000.
Graff, Robert A.: *See*—
Perry, Marney D., Jr.; and Graff, Robert A., 4,180,391, Cl. 55-324.000.
Graham, Douglas L.; and Graham, Mark L. Building structure and method of construction. 4,179,858, Cl. 52-262.000.
Graham, Kenneth A., to Chrysler Corporation. Flowmeter rotor mounting. 4,179,925, Cl. 73-229.000.
Graham, Mark L.: *See*—
Graham, Douglas L.; and Graham, Mark L., 4,179,858, Cl. 52-262.000.
Graham, Robert H.; and McBride, Jerald R., to R. A. Pearson Company. Case packer. 4,179,866, Cl. 53-468.000.
Graham, Tommy E.; and MacLean, Donald L., to Monsanto Company. Processes. 4,180,388, Cl. 55-16.000.
Graham, Tommy E.; and MacLean, Donald L., to Monsanto Company. Process for hydrogen recovery from ammonia purge gases. 4,180,552, Cl. 423-359.000.
Grain, Claude: *See*—
Boussely, Jean; Chandavoine, Marie-Madeleine; Chignac, Michel; Grain, Claude; and Pigerol, Charles, 4,180,492, Cl. 260-30.80R.
Granatek, Alphonse P.: *See*—
Kaplan, Murray A.; Granatek, Alphonse P.; and Nachfolger, Solomon J., 4,180,658, Cl. 544-27.000.
Graphic Controls Corporation: *See*—
Lawton, William R., 4,180,405, Cl. 106-14.500.
Gray, Don N.: *See*—
Crawford, James E.; and Gray, Don N., 4,179,757, Cl. 3-1.000.
Green, Barry P.: *See*—
Palmatier, Roland F.; Green, Barry P.; Reinhart, Leonard R.; Sciulli, Francis J.; and Holmes, Jon E., 4,180,741, Cl. 250-559.000.
Greene, Harold R. Pneumatic transmission system. 4,180,354, Cl 406-112.000.
Greer, Bradley G., to A & E Plastik Pak Co., Inc. Window awning. 4,180,117, Cl. 160-67.000.
Gretz, Thomas J., to Scott & Fetzer Company, The. Non-metallic sheathed cable connector. 4,180,227, Cl. 248-56.000.
Griffin, Daniel J.: *See*—
Walden, Jack M.; Eads, William D.; Cozzens, Ray J.; Bidwell, John L.; Jewett, Robert A.; Wilson, Martin S.; Griffin, Daniel J.; Kuseski, Robert E.; and Schulte, Louis T., 4,180,854, Cl. 364-200.000.
Griffith, John Q., III: *See*—
Newingham, Thomas D.; Recchuite, Alexander D.; Griffith, John Q., III; and Haseltine, Marcus W., Jr., 4,180,466, Cl. 252-48.600.
Grigg, Geoffrey W.; and Brown, Desmond J., to Commonwealth Scientific Industrial Research Organization. Purines useful for the potentiation of antibiotics. 4,180,576, Cl. 424-251.000.
Grigoleit Company, The: *See*—
Rankins, Paul; and Howie, Robert K., Jr., 4,179,771, Cl. 16-121.000.
Grioni, Libero. Cylindrical container. 4,180,163, Cl. 206-385.000.
Grisotto, Franco: *See*—
Salotti, Gianfranco; Ferrero, Elvio; and Grisotto, Franco, 4,179,839, Cl. 43-112.000.
Gristina, Anthony G., to Howmedica, Inc. Fixation stem for prosthetic device. 4,179,758, Cl. 3-1.910.
Gronvall, Karl O. R., to Forenade Fabriksverken. Power control device for hot gas engines. 4,179,891, Cl. 60-521.000.
Groth, Hugh F.: *See*—
Roth, Carl W.; Groth, Hugh F.; and Meacham, G. B. Kirby, 4,180,366, Cl. 414-540.000.
Grover, Ross D., to Ram Industries, Inc. Stump eradicator. 4,180,107, Cl. 144-2.00N.
Grubman, Viktor G.: *See*—
Popov, Alexei I.; Pepenko, Vladimir D.; Vinjukov, Jury G.; Matjurin-Veretennikov, Leonid I.; Stepanov, Vladimir M.; and Grubman, Viktor G., 4,180,156, Cl. 198-726.000.
Grumman Corporation: *See*—
Lippert, Joseph, Jr., 4,180,372, Cl. 416-23.000.
Grundmann, Edgard: *See*—
Fiala, Ernst; Hofbauer, Peter; Loeck, Harald; Grundmann, Edgard; and Heitland, Herbert, 4,179,901, Cl. 62-238.000.
GTE Automatic Electric Laboratories Incorporated: *See*—
Buedel, Charles K., 4,180,855, Cl. 364-200.000.
GTE Sylvania Incorporated: *See*—
Ammann, Eugene O., 4,180,751, Cl. 307-428.000.
Corson, Robert M., 4,179,778, Cl. 29-25.190.
Hochella, William A., 4,180,699, Cl. 174-126.0CP.
Guckel, Henry, to Airco, Inc. Chemical-sensitive field-effect transistor 4,180,771, Cl. 324-71.0SN.
Guidetti, Giampiero: *See*—
Caporiccio, Gerardo; Bargigia, Gianangelo, and Guidetti, Giampiero, 4,180,639, Cl. 526-243.000.
Guidoux, Loic B. Y.; and Renaudat, Jean-Louis, to Telecommunications Radioelectriques et Telephoniques TRT. Arrangement for the automatic resynchronization of a data transmission receiver. 4,180,705, Cl. 178-69.100.
Gulf Oil Corporation: *See*—
Pryor, Bodie C., 4,179,819, Cl. 34-12.000.
Gulf & Western Industries, Inc.: *See*—
Seipp, William H., 4,180,862, Cl. 364-900.000.
Gummeringer, Henry E. Animal trap. 4,179,837, Cl. 43-87.000.
Gunderman, Robert J.; Alcock, Keith; Skinner, Charles S.; and Riley, Michael W., to United States of America, Interior. Pressure vent for explosion-proof electrical enclosures. 4,180,177, Cl. 220-88.00A.
Gupta, Tapan K.: *See*—
Ho, Shih M.; and Gupta, Tapan K., 4,180,483, Cl. 252-518.000.
Gutridge, Jack E.; and Marsh, Ronald W., to Pullman Incorporated. Fixture for passenger railway car compartment. 4,179,996, Cl. 105-345.000.
Guy, Richard. Apparatus for stretching canvas and like materials. 4,180,246, Cl. 254-77.000.
Guyot, Pierre; Coty, Alain; and Delfau, Paul, to Societe Commerciale Chauvin Arnoux Societe Anonyme Francaise. Control device for controlling the movements of two carriages of a duplex recorder. 4,180,823, Cl. 346-139.00B.
H. B. Fuller Company: *See*—
Batdorf, Vernon H., 4,180,166, Cl. 206-568.000.
Haase, Jaroslav: *See*—
Wegmuller, Hans; Horn, Ulrich; Hungerbuhler, Walter; and Haase, Jaroslav, 4,180,084, Cl. 132-7.000.
Habermann, Helmut, to Societe Europeenne de Propulsion. Axial electromagnetic bearing for a shaft rotating at high speed. 4,180,296, Cl. 308-10.000.
Haberthur, Berno: *See*—
Ciani, Jean A.; Diehl, Ernst; and Haberthur, Berno, 4,180,434, Cl. 162-138.000.
Hackett, David E.: *See*—
Keske, Frank E.; and Hackett, David E., 4,179,952, Cl. 74-710.000.
Haga, Kenji: *See*—
Nishiyama, Takahiko; and Haga, Kenji, 4,179,883, Cl. 60-293.000.
Hagedoorn, Rijnder; and Koenderink, Ernest J. E., to De Staat der Nederlanden, te dezen vertegenwoordigd door de directeur-generaal der Posterijen, Telegrafie en Telefonie. Device for protecting electric systems, particularly telecommunication systems, against overvoltage pulses. 4,180,843, Cl. 361-119.000.
Hagiwara, Yoshiaki, to Sony Corporation. Method of making a charge transfer device. 4,179,793, Cl. 29-578.000.
Haikawa, Shozo: *See*—
Akiyoshi, Toshio; Onishi, Tsutomu; and Haikawa, Shozo, 4,179,955, Cl. 81-57.110.
Haines, Robert C., to Dunlop Limited. Tennis racquets. 4,180,263, Cl. 273-73.00G.

Halasa, Adel F.: *See*—
Hergenrother, William J.; and Halasa, Adel F., 4,180,647, Cl. 528-168.000.

Halicki, Frank E., to Sherwin-Williams Company, The. Apparatus for spraying a coating on the inside surfaces of longitudinal seams on can bodies. 4,180,011, Cl. 118-685.000.

Hama Hamaphot K.G. Hanke & Thomas: *See*—
Hanke, Rudolf, 4,179,960, Cl. 83-175.000.

Hamada, Osamu, to Sony Corporation. Tone generator for electrical music instrument. 4,179,969, Cl. 84-1.010.

Hamano, Sachiyuki; and Nakamura, Takaharu, to Eisai Co., Ltd. Furo[2, 3d]pyrimidine derivatives and anti-ulcer containing the same. 4,180,577, Cl. 424-251.000.

Hamilton, Albert A.: *See*—
Distler, Jack E.; Hamilton, Albert A.; and King, Everett R., 4,180,757, Cl. 313-315.000.
Einbinder, Itamar B.; and Hamilton, Albert A., 4,179,798, Cl. 29-622.000.

Hampl, Edward F., Jr., to Minnesota Mining and Manufacturing Company. Hot-junction electrode members for copper/silver chalcogenides. 4,180,415, Cl. 136-205.000.

Hampshire, William J.: *See*—
Cook, Richard L.; Hampshire, William J.; and Kolarik, Robert V., 4,179,979, Cl. 89-36.00A.

Hanada, Mitsugu; and Fukui, Seiji, to Shimano Industrial Company, Limited. Gear transmission control device for multiple-speed hub for bicycles. 4,179,953, Cl. 74-750.00B.

Hanahara, Tohru: *See*—
Yoshimura, Tadashi; Hanahara, Tohru; Abiko, Toshio; and Matsuoka, Kazuhiro, 4,180,811, Cl. 340-566.000.

Hance, Charles M.; and Martin, Charles D., to M. Lowenstein & Sons, Inc. Fabrics having flocked corduroy ribs. 4,180,606, Cl. 428-88.000.

Hanke, Rudolf, to Hama Hamaphot K.G. Hanke & Thomas. Film splicer. 4,179,960, Cl. 83-175.000.

Hanley, John P.; Petrucci, Pasquale M.; and Pfeifer, Stanley, to Becton, Dickinson and Company. Purging means for aperture of blood cell counter. 4,180,091, Cl. 137-238.000.

Hansen, Bertil; and Holmberg, Krister, to Aktiebolaget Leo. Method for the preparation of esters. 4,180,504, Cl. 260-239.55D.

Hansen, Hans J., to Hoffmann-La Roche Inc. Carcinoembryonic antigens. 4,180,499, Cl. 260-112.00R.

Hansen, Peter: *See*—
Jacobsen, Stephen C.; Stephen, Robert L.; and Hansen, Peter, 4,180,068, Cl. 128-214.00R.

Hansen, Peter R.; and Thorsen, Niels P., to Danfoss A/S. Pressure-dependent electric switching device. 4,180,714, Cl. 200-81.00R.

Hanson, Goodwin. Epitrochoidal Stirling type engine. 4,179,890, Cl. 60-519.000.

Hanson, Lester. Apparatus and system for processing oil shale. 4,180,718, Cl. 219-10.55A.

Hara, Tsutomu: *See*—
Nomura, Susumu; Okubo, Hiroyuki; Isozaki, Hiroshi; Hara, Tsutomu; and Masuda, Bunpei, 4,179,958, Cl. 83-37.000.

Harada, Isamu: *See*—
Ishibashi, Hiroaki; Tanoue, Shizuo; Kudo, Masakuni; and Harada, Isamu, 4,180,392, Cl. 71-25.000.

Harada, Yuji: *See*—
Hirata, Osamu; and Harada, Yuji, 4,180,711, Cl. 200-5.00A.

Harben, Grover S., Jr. Drum/disk poultry picker. 4,179,772, Cl. 17-47.000.

Hardigg, James S. Truss panel mold. 4,180,232, Cl. 249-60.000.

Harnish, Eugene E.: *See*—
Tjarksen, Richard A.; Keresztes, Robert J.; and Harnish, Eugene E., 4,180,147, Cl. 188-71.800.

Harre, Kurt J. S.; and Tufvesson, Kent A., to ABU Aktiebolag. Fishing reels for retaining the line during casting. 4,180,217, Cl. 242-84.20A.

Harrington Manufacturing Company: *See*—
Danford, Tiras J., 4,179,857, Cl. 52-71.000.

Harris Corporation: *See*—
Bouverie, William M.; and Manasi, Spero G., 4,179,922, Cl. 73-116.000.
Himmel, Ronald G., 4,180,255, Cl. 270-54.000.
Mason, Donald R., 4,180,825, Cl. 357-16.000.
Palmatier, Roland T.; Green, Barry P.; Reinhart, Leonard R.; Sciulli, Francis J.; and Holmes, Jon E., 4,180,741, Cl. 250-559.000.
White, Charles M., 4,180,765, Cl. 315-408.000.

Harris, Donald E. Self propelled kite. 4,180,221, Cl. 244-13.000.

Harris, Gerald R. Vertical band saw and feed table. 4,179,961, Cl. 83-206.000.

Harris, Jeffrey J.; and Rampling, Brian W., to English Electric Valve Company Limited. Thermal camera tubes. 4,180,759, Cl. 313-388.000.

Harrop, Geoffrey A. J., to Atari, Inc. Ball rollover switch assembly. 4,180,267, Cl. 273-127.00R.

Harsch, Klaus: *See*—
Schulzke, Peter; Arnold, Herbert; Harsch, Klaus; and Werner, Peter, 4,180,026, Cl. 123-32.0EF.

Hartmann & Braun Aktiengesellschaft: *See*—
Fabinski, Walter; and Deptolla, Udo, 4,180,732, Cl. 250-344.000.

Hartmann, Hans-Joerg: *See*—
Motz, Herbert; Schneider, Norbert; Hartmann, Hans-Joerg; and Baur, Reinhold, 4,180,597, Cl. 427-48.000.

Hartmann, Klaus: *See*—
Sick, Erwin; Hartmann, Klaus; and Henneberger, Heinz, 4,180,702, Cl. 250-227.000

Harvey, Albert J., to Diamond International Corporation. Article inflating system. 4,180,105, Cl. 141-165.000.

Harvey, Joseph C., to Woodstream Corporation. Trigger for trap. 4,179,838, Cl. 43-92.000.

Haseltine, Marcus W., Jr.: *See*—
Newingham, Thomas D.; Recchuite, Alexander D.; Griffith, John Q., III; and Haseltine, Marcus W., Jr., 4,180,466, Cl. 252-48.600.

Hashem, Mohammed M.: *See*—
Chakrabarti, Paritosh M.; and Hashem, Mohammed M., 4,180,532, Cl. 260-953.000.

Hashimoto, Yoshinobu: *See*—
Kurozumi, Seizi; Toru, Takeshi; Kobayashi, Makiko; and Hashimoto, Yoshinobu, 4,180,672, Cl. 560-15.000.

Hasker, Jan; and Peters, Cornelis, to U.S. Philips Corporation. Method of producing a low-pressure gas discharge lamp. 4,179,777, Cl. 29-25.130.

Hatakeyama, Junichi: *See*—
Miyaoka, Shinichiro; Matsumoto, Kuniaki; and Hatakeyama, Junichi, 4,180,083, Cl. 137-101.250.

Haubner, Georg: *See*—
Wesemeyer, Jurgen; and Haubner, Georg, 4,180,803, Cl. 340-164.00R.

Haviv, Fortuna; Nudelman, Abraham; and Patchornik, Abraham, to Yeda Research and Development Co. Ltd. 7-[(Substituted-isothioureamethyl)phenyl]-acetamidocephalosporin derivatives. 4,180,661 Cl. 544-29.000.

Hayami, Heijiro: *See*—
Kotera, Hiroaki; Tsuchiya, Hiroyoshi; Itabashi, Ryuzo; Yoshida, Kunio; Shibata, Tsutomu; Tsuda, Yukifumi; Kanno, Yoshimitsu; Hayami, Heijiro; and Sugita, Haruko, 4,180,330, Cl. 356-425.000.

Hayashi, Masaki; Kori, Seiji; Ohyama, Isao; Iguchi, Sadahiko; and Okada, Takanori, to Warner-Lambert Company. 15-Cycloalkyl-prostaglandin derivatives. 4,180,675, Cl. 560-118.000.

Hayes, Robert R., to Oatey Co. Hand plane. 4,179,779, Cl. 29-78.000.

Hays, James R., Sr.: *See*—
Say, Geoffrey R.; Hays, James R., Sr.; and Iyengar, Jagannathan N., 4,180,548, Cl. 423-223.000.

Hegar, Gert: *See*—
Perrin, Pierre; Hegar, Gert; Siegrist, Gerald; Seiler, Herbert; and Horn, Ulrich, 4,180,664, Cl. 544-194.000.

Heikel, Henrik R., to Dow Chemical Company, The. Bonded asbestos diaphragms and mats. 4,180,449, Cl. 204-296.000.

Heikkinen, Urho, to Kone Osakeyhtio. Apparatus for timber barking. 4,180,109, Cl. 144-208.00D.

Heineken Technisch Beheer B.V.: *See*—
van Strien, Johannes, 4,179,918, Cl. 73-19.000.

Heitland, Herbert: *See*—
Fiala, Ernst; Hofbauer, Peter; Loeck, Harald; Grundmann, Edgard; and Heitland, Herbert, 4,179,901, Cl. 62-238.000.

Heitz, Pierre, to Compagnie d'Etudes et de Realisations de Cybernetique. Seal for sealing between two telescopic tubes and sealing device using such seal. 4,180,272, Cl. 277-28.000.

Helbert, J. Raymond: *See*—
Chicoye, Etzer; Helbert, J. Raymond; and Rice, James F., 4,180,589, Cl. 426-11.000.

Heller, Jorge; and Baker, Richard W., to Alza Corporation. System for delivering agent to environment of use over prolonged time. 4,180,064, Cl. 128-130.000.

Heller, Jorge: *See*—
Choi, Nam S.; and Heller, Jorge, 4,180,646, Cl. 528-153.000

Helwig, William F., Jr., to Avtec Industries, Inc. Energy management system. 4,180,744, Cl. 307-39.000.

Henderson, Delbert H. Furnace fireplace apparatus having separate combustion and heating air systems and settling chambers for particulate matter. 4,180,052, Cl. 126-108.000.

Henkel Corporation: *See*—
Floyd, Don E., 4,180,487, Cl. 260-18.00N.

Henneberger, Heinz: *See*—
Sick, Erwin; Hartmann, Klaus; and Henneberger, Heinz, 4,180,702, Cl. 250-227.000.

Hennig, Franz, to Jagenberg-Werke Aktiengesellschaft. Apparatus for removing the forward margin of a sheet. 4,180,193, Cl. 225-101.000

Henning, James. Front mounted ground supported tractor attachment. 4,180,282, Cl. 280-481.000.

Henrich, Donald A.; and Rose, Edgar, to Outboard Marine Corporation. Marine propeller fish line and weed cutter. 4,180,368, Cl. 416-146.00R.

Henrickson, David L.; Kaiser, John J.; Koehn, William C.; and Raven, David P., to Motorola, Inc. Carrier structure integral with an electronic package and method of construction. 4,180,161, Cl. 206-328.000.

Herb, John R., to Pharmachem Corporation. Iron preparations and methods of making and administering the same. 4,180,567, Cl. 424-180.000.

Herbertz, Toni: *See*—
Reinehr, Ulrich; Jungverdorben, Hermann-Josef; and Herbertz, Toni, 4,180,617, Cl. 428-398.000.

Herbst, LeRoy J.; and Jenkins, Thomas E., to General Electric Company. Dishwasher vent arrangement. 4,179,821, Cl. 34-235.000.

Hergenrother, William J.; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Polyphosphazene copolymers containing malononitrile and substituted malononitrile substituents. 4,180,647, Cl. 528-168.000.

Hermann nee Szente, Ilona: *See*—
Toldy, Sandor S. L.; Szilagyi nee Farago, Katalin; Schafer, Inge; Szondy, Eleonora; Borvendeg, Janos; and Hermann nee Szente, Ilona, 4,180,505, Cl. 260-239.55R.

Hermans, Johny C., to s.a. Texaco Belgium n.v. Bispiperazido phosphorus polyamides. 4,180,641, Cl. 528-27.000.

Hermans, Johny C., to s.a. Texaco Belgium n.v. Bispiperazido phosphorus polyamides. 4,180,653, Cl. 528-391.000.

Hermanson, Michael P.: *See*—
Collogan, Thomas J.; Boeding, David C.; Hermanson, Michael P.; and Wellman, Stanley P., 4,180,133, Cl. 172-26.000.

Hernandez, Fredrico. Internal combustion engine fan adapter. 4,180,024, Cl. 123-41.460.

Herpich, William A.; and Palmer, George W., to Peabody International Corporation. Hydraulic system for a refuse truck. 4,180,365, Cl. 414-525.000.

Hertfelder, Wilhelm, to Robert Bosch GmbH. Pneumatically operated valve with a manually operated back-up displacing mechanism. 4,180,234, Cl. 251-14.000.

Herzog, Donald G.: *See*—
Hudson, Kenneth C.; and Herzog, Donald G., 4,180,822, Cl. 346-108.000.

Hester, Jackson B., Jr., to Upjohn Company, The. Piperidino-4H-s-triazolo[4,3-a][1,4]benzodiazepines. 4,180,668, Cl. 260-244.400.

Hewlett-Packard Company: *See*—
Murphy, John B., 4,180,080, Cl. 128-642.000.
Walden, Jack M.; Eads, William D.; Cozzens, Ray J.; Bidwell, John L.; Jewett, Robert A.; Wilson, Martin S.; Griffin, Daniel J.; Kuseski, Robert E.; and Schulte, Louis T., 4,180,854, Cl. 364-200.000.

Heydrich, Hans, to Cummins Engine Company, Inc. Internal combustion engine with exhaust gas recirculation. 4,179,892, Cl. 60-605.000.

Hickam, William M.: *See*—
Phillips, David C.; Hickam, William M.; and Smith, James D. B., 4,179,926, Cl. 73-339.00R.

Hierstetner, Walter L., to Tension Envelope Corporation. Two-way envelope. 4,180,168, Cl. 206-626.000.

Hilberg, Ronald P.: *See*—
Hook, William R.; and Hilberg, Ronald P., 4,180,779, Cl. 329-50.000.

Hildebrand, James R., to United States of America, Air Force. Single blade proximity probe. 4,180,329, Cl. 356-375.000.

Hildebrecht, Harold V., to Towmotor Corporation. Control pedal. 4,179,949, Cl. 74-474.000.

Hildering, Willem C.: *See*—
Schermer, Gijsbertus J. H.; Winters, Hubertus H. A.; Hildering, Willem C.; and Nicki von Nikelsberg, Karl F., 4,180,828, Cl. 357-79.000.

Hill, Orvin G., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in her Britannic Majesty's Government of the. Radio identification systems. 4,180,815, Cl. 343-6.50R.

Himmel, Ronald G., to Harris Corporation. Wiper system inserter. 4,180,255, Cl. 270-54.000.

Hines, James: *See*—
Zurit, David; Cerrato, Vincent; and Hines, James, 4,180,189, Cl. 222-400.700.

Hinz, Rolf. Frontal mouth plate for orthodontic prophylaxis and early treatment of dental anomalies. 4,179,811, Cl. 433-6.000.

Hirai, Jun: *See*—
Nishikawa, Masaru; Numakura, Toshihiko; and Hirai, Jun, 4,180,833, Cl. 360-21.000.

Hirai, Seiichi: *See*—
Otsuka, Nobuyuki; Hirai, Seiichi; and Sogabe, Motoshige, 4,180,344, Cl. 403-57.000.

Hirano, Noboru: *See*—
Imaizumi, Masao; Yasuda, Mitsuo; Sakata, Ko; and Hirano, Noboru, 4,180,688, Cl. 568-899.000.

Hirata, Osamu; and Harada, Yuji, to Canon Kabushiki Kaisha. Desk-top calculator keyboard switch. 4,180,711, Cl. 200-5.00A.

Hirota, Kiwami; Tamano, Hideki; and Inazawa, Shintaro, to Showa Denko Kabushiki Kaisha. Process for polymerizing or co-polymerizing propylene. 4,180,636, Cl. 526-125.000.

Hisaka Works, Ltd.: *See*—
Sumitomo, Hiroyuki, 4,180,129, Cl. 165-110.000.

Hisamatsu, Takashi: *See*—
Suami, Tetsuo; Machinami, Tomoya; and Hisamatsu, Takashi, 4,180,655, Cl. 536-17.00R.

Hitachi, Ltd.: *See*—
Inoyama, Tadao; Matsumura, Yasuhide; and Nagano, Yukio, 4,179,783, Cl. 29-281.500.
Maeda, Yoshio; Matsumoto, Koichi; and Kamitake, Seigo, 4,180,327, Cl. 356-320.000.
Miyaoka, Shinichiro; Matsumoto, Kuniaki; and Hatakeyama, Junichi, 4,180,083, Cl. 137-101.250.
Shimokawa, Ryushi, 4,180,797, Cl. 340-146.200.
Takagi, Nobuho; Maegawa, Muneo; and Nii, Katsutoshi, 4,180,273, Cl. 277-154.000.
Yamada, Takahiro, 4,180,225, Cl. 346-75.000.
Yoneda, Yutaka, 4,180,813, Cl. 340-784.000.
Yoshihara, Touhachi; Nishiwaki, Koji; and Seki, Kiwao, 4,180,857, Cl. 364-497.000.

Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Okumura, Takatoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Tone wave generator in electronic musical instrument. 4,179,972, Cl. 84-1.110.

Ho, Shih M.; and Gupta, Tapan K., to Electric Power Research Institute, Inc. Method for forming zinc oxide-containing ceramics by hot pressing and annealing. 4,180,483, Cl. 252-518.000.

Ho, Yin F., to Madison Ltd. Controller with individually or simultaneously movable arms. 4,179,843, Cl. 46-126.000.

Hobart Brothers Company: *See*—
Barhorst, Ralph E., 4,180,720, Cl. 219-130.510.

Hobo, Nobuhito; Suzuki, Yutaka; Natto, Takashi; and Konishi, Yoshimune, to Nippondenso Co., Ltd. Injection pump control system. 4,180,037, Cl. 123-139.00E.

Hoch, Norman J. Broken tool detector. 4,180,356, Cl. 408-8.000.

Hochelia, William A., to GTE Sylvania Incorporated. Shielded electrically conductor. 4,180,699, Cl. 174-126.0CP.

Hochiki Corporation: *See*—
Watanabe, Masakatsu; Nakada, Minoru; and Takeuchi, Takeshi, 4,180,804, Cl. 340-310.00R.

Hoechst Aktiengesellschaft: *See*—
Rochling, Hans; Sachse, Burkhard; and Gattner, Hans, 4,180,575, Cl. 424-250.000.
Schrodter, Klaus; Kandler, Joachim; and Spott, Hasso, 4,180,471, Cl. 252-140.000.
Schroter, Herbert, 4,180,317, Cl. 354-318.000.

Hoenig, James R.; and Mallorca, Salvador C., to Continental Group, Inc., The. Beaded snaplock closure. 4,180,179, Cl. 220-307.000.

Hofbauer, Peter: *See*—
Fiala, Ernst; Hofbauer, Peter; Loeck, Harald; Grundmann, Edgard; and Heitland, Herbert, 4,179,901, Cl. 62-238.000.

Hofer, Gerald; Konrath, Karl; Schwarz, Manfred; and Laufer, Helmut, to Robert Bosch GmbH. Regulator for a fuel injection pump. 4,180,040, Cl. 123-140.00R.

Hoffman, Carl S., to TP Laboratories, Inc. Dental device. 4,179,815, Cl. 433-140.000.

Hoffmann, Kurt, to Siemens Aktiengesellschaft. Arrangement, in particular an analog-digital converter and method of operation thereof. 4,180,806, Cl. 340-347.0AD.

Hoffmann-La Roche Inc.: *See*—
Cohen, Noal; and Saucy, Gabriel, 4,180,682, Cl. 568-662.000.
Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,180,659, Cl. 542-427.000.
Goldberg, Arthur H.; and Franklin, Michael L., 4,180,558, Cl. 424-16.000.
Hansen, Hans J., 4,180,499, Cl. 260-112.00R.
Pfister, Rudolf; Zeller, Paul; Binder, Dieter; and Hromatka, Otto, 4,180,662, Cl. 544-48.000.

Hofmann, George H., to Du Pont de Nemours, E. I., and Company. Acrylic multistage graft copolymer products and processes. 4,180,529, Cl. 525-85.000.

Hogan, Gerard T.: *See*—
Schulz, William J.; Pecoraro, Ralph R.; and Hogan, Gerard T., 4,180,125, Cl. 165-48.000.

Hohmann, Gerhard: *See*—
Dollhausen, Manfred; Hohmann, Gerhard; and Behr, Winfried, 4,180,638, Cl. 526-204.000.

Hokari, Saburo: *See*—
Nozawa, Shiyozo; Hokari, Saburo; and Yamaga, Shigeru, 4,180,315, Cl. 354-170.000.

Hokushin Gohan Kabushiki Kaisha: *See*—
Yamamoto, Teruo; Ishii, Fumikatsu; and Fujiki, Miyoji, 4,180,185, Cl. 222-57.000.

Holcomb, Orla L., Jr.: *See*—
Johannesen, Donald D.; and Holcomb, Orla L., Jr., 4,180,149, Cl. 188-340.000.

Hollis Engineering, Inc.: *See*—
O'Rourke, Harold T.; and Abbott, Warren G., 4,180,199, Cl. 228-102.000.

Hollis, Ernest E., to Sanders Associates, Inc. Method of making a miniature fiber optic connector. 4,179,801, Cl. 29-626.000.

Holmberg, Krister: *See*—
Hansen, Bertil; and Holmberg, Krister, 4,180,504, Cl. 260-239.55D.

Holmes, Jon E.: *See*—
Palmatier, Roland T.; Green, Barry P.; Reinhart, Leonard R.; Sciulli, Francis J.; and Holmes, Jon E., 4,180,741, Cl. 250-559.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Otsuka, Nobuyuki; Hirai, Seiichi; and Sogabe, Motoshige, 4,180,344, Cl. 403-57.000.

Hook, William R.; and Hilberg, Ronald P., to United States of America, Air Force. QPSK Demodulator with two-step quadrupler and/or time-multiplexing quadrupling. 4,180,779, Cl. 329-50.000.

Hopping, Alvin S., deceased; and by Johnson, Clifford A., executor, to Fell, Markley D. Turbine-wheeled power device. 4,179,885, Cl. 60-370.000.

Horn, Ulrich: *See*—
Perrin, Pierre; Hegar, Gert; Siegrist, Gerald; Seiler, Herbert; and Horn, Ulrich, 4,180,664, Cl. 544-194.000.
Wegmuller, Hans; Horn, Ulrich; Hungerbuhler, Walter; and Haase, Jaroslav, 4,180,084, Cl. 132-7.000.

Horst, Thomas A.; and Welton, Charles L., to Horst, Thomas A., a part interest. Stirrup buckle sheath. 4,179,869, Cl. 54-46.000.

Hosaka, Masao: *See*—
Watanabe, Tsutomu; Yanagawa, Nobuyuki; and Hosaka, Masao, 4,180,721, Cl. 219-216.000.

Houlihan, William J., to Sandoz, Inc. Dibenz[c,f]imidazo [1,2-a] [1]azepin-9-ols. 4,180,671, Cl. 548-324.000.

Housing Systems, Inc.: *See*—
Johnson, James H., 4,180,233, Cl. 249-144.000.

Howell, Carl J., Jr.; Trott, David W.; and Riley, Jesse L., to Celanese Corporation. Process for extruding plasticized open cell foamed cellulose acetate filters. 4,180,536, Cl. 264-53.000.
Howell, John K., Jr., to Oxy Metal Industries Corporation. Coating bath composition and method. 4,180,603, Cl. 427-353.000.
Howie, Robert K., Jr.: *See*—
Rankins, Paul; and Howie, Robert K., Jr., 4,179,771, Cl. 16-121.000.
Howmedica, Inc.: *See*—
Gristina, Anthony G., 4,179,758, Cl. 3-1.910.
Howmet Turbine Components Corporation: *See*—
Burd, Lamar; and Donnelly, James K., 4,180,119, Cl. 164-34.000.
Hromatka, Otto: *See*—
Pfister, Rudolf; Zeller, Paul; Binder, Dieter; and Hromatka, Otto, 4,180,662, Cl. 544-48.000.
Hsieh, Edmund J., to United States of America, Energy. Magnetic thin-film split-domain current sensor-recorder. 4,180,775, Cl. 324-249.000.
Hsu, William W.; and McPherson, Robert, to Textron Inc. Automatic and manual linear reversion control mechanism. 4,180,243, Cl. 251-234.000.
Huber, Harold E., to Richardson-Merrell Inc. Coated 1-(2-chlorodibenzo[b,f]oxepin-10-yl)-4-methylpiperazine compositions. 4,180,559, Cl. 424-35.000.
Hubner-Vamag Aktiengesellschaft & Co. Kommanditgesellschaft: *See*—
Rosenitsch, Johann, 4,180,244, Cl. 251-309.000.
Hudnall, Walter E. Solar-heat collector. 4,180,055, Cl. 126-446.000.
Hudson, Kenneth C.; and Herzog, Donald G., to RCA Corporation. Optical scanner and recorder. 4,180,822, Cl. 346-108.000.
Hueil, J. Charles; Rothfuss, Robert G.; and Boothby, Terry A., to Senco Products, Inc. Anvil attachment for a surgical stapling instrument. 4,180,196, Cl. 227-109.000.
Huempfner, David F., to American Hospital Supply Corporation. Tiltable table. 4,180,002, Cl. 108-6.000.
Hughes Aircraft Company: *See*—
Bilow, Norman; and Austin, William B., 4,180,649, Cl. 528-245.000.
Forward, Robert L.; and Thurmond, Gary D., 4,180,786, Cl. 333-32.000.
Hughes, Hugh M., to Wylain, Inc. Dual source heat pump. 4,179,894, Cl. 62-2.000.
Hughes, William B.: *See*—
Reusser, Robert E.; and Hughes, William B., 4,180,524, Cl. 585-644.000.
Humber, Leslie G.: *See*—
Demerson, Christopher A.; and Humber, Leslie G., 4,180,580, Cl. 424-258.000.
Humphrey Instruments, Inc.: *See*—
Humphrey, William E., 4,180,325, Cl. 356-127.000.
Humphrey, William E., to Humphrey Instruments, Inc. Lens meter with automated readout. 4,180,325, Cl. 356-127.000.
Hungerbuhler, Walter: *See*—
Wegmuller, Hans; Horn, Ulrich; Hungerbuhler, Walter; and Haase, Jaroslav, 4,180,084, Cl. 132-7.000.
Hunsucker, Jerry H., to International Minerals & Chemical Corp. Durable press finishing with oxazolidine catalysts. 4,180,382, Cl. 8-185.000.
Hunter Douglas International N.V.: *See*—
Vecchiarelli, Francis, 4,180,118, Cl. 160-178.00C.
Hunter, Richard E.; and Shook, Robert C., to Irrigation & Power Equipment, Inc. Center pivot construction for center pivot sprinkler. 4,180,092, Cl. 137-344.000.
Hunter, Robert F. Small animal trap. 4,179,835, Cl. 43-61.000.
Huret, Roger H. M., to Etablissements Huret & Ses Fils. Speedometer for mounting on a cycle. 4,179,935, Cl. 73-493.000.
Hurst Performance, Inc.: *See*—
Airheart, Franklin B., 4,180,146, Cl. 188-71.800.
Hussmann, Eckart: *See*—
Schnabel, Roland; and Hussmann, Eckart, 4,180,056, Cl. 126-447.000.
Hutter, Harold G., to Bunker Ramo Corporation. Coaxial cable connector. 4,180,301, Cl. 339-90.00C.
Huydts, Eduard J. C., to G. Siempelkamp GmbH & Co. Apparatus for the external calibration (sizing) of tubular elements. 4,179,915, Cl. 72-402.000.
Hvizdos, Leonard J.; Filippi, Richard E.; and Luybli, Richard E., to Air Products & Chemicals, Inc. Isentropic expansion of gases via a pelton wheel. 4,179,897, Cl. 62-9.000.
Hybl, James M.: *See*—
Lutzenberger, Kurt; Bailey, James R.; and Hybl, James M., 4,180,712, Cl. 200-16.00D.
Iguchi, Sadahiko: *See*—
Hayashi, Masaki; Kori, Seiji; Ohyama, Isao; Iguchi, Sadahiko; and Okada, Takanori, 4,180,675, Cl. 560-118.000.
Ikeda, Richard M.: *See*—
Angelo, Rudolph J.; Blomberg, Richard N.; Boettcher, Fritz P.; Ikeda, Richard M.; and Samuels, Michael R., 4,180,614, Cl. 428-336.000.
Ilenda, Casmir S., to Rohm and Haas Company. Polyaminoesters and foams made therefrom. 4,180,632, Cl. 521-184.000.
Illingworth, George E., to UOP Inc. Alkylation of aromatic hydrocarbons for detergent precursors. 4,180,691, Cl. 585-455.000.
Illinois Tool Works Inc.: *See*—
Sygnator, Henry A., 4,179,976, Cl. 85-47.000.
Imai, Tamotsu, to UOP Inc. Oxydehydrogenation of alkylaromatic hydrocarbons and catalytic composite therefor. 4,180,690, Cl. 585-443.000.
Imaizumi, Masao; Yasuda, Mitsuo; Sakata, Ko; and Hirano, Noboru, to Nippon Oil Co., Ltd. Method for continuously producing tert-butyl alcohol. 4,180,688, Cl. 568-899.000.
Imperial Chemical Industries Limited: *See*—
Andrew, Malcolm S.; and Backhouse, Alan J., 4,180,489, Cl. 428-402.000.
Ward, Stanley A., 4,180,543, Cl. 422-148.000.
Inauen Maschinen AG: *See*—
Landolt, Bruno, 4,179,862, Cl. 53-86.000.
Inazawa, Shintaro: *See*—
Hirota, Kiwami; Tamano, Hideki; and Inazawa, Shintaro, 4,180,636, Cl. 526-125.000.
Indian Explosives Limited: *See*—
Ghosh, Bidhan C.; Chopra, Gopal M.; and Sen, Soumendra N., 4,180,425, Cl. 149-95.000.
Industrial Filter & Pump Mfg. Co.: *See*—
Zievers, James F., 4,180,459, Cl. 210-10.000.
Industrial Service & Manufacturing Co.: *See*—
Stevick, Ronald A., 4,180,155, Cl. 198-498.000.
Industrie Automation GmbH & Co.: *See*—
Duhrkoop, Jens; and Pusch, Gunter, 4,180,306, Cl. 350-6.400.
Ingersoll-Rand Company: *See*—
Webb, Paul D., 4,180,089, Cl. 137-115.000.
Inokuchi, Toshiyuki: *See*—
Matsumoto, Fuyuhiko; and Inokuchi, Toshiyuki, 4,180,318, Cl. 355-11.000.
Inoyama, Tadao; Matsumura, Yasuhide; and Nagano, Yukio, to Hitachi, Ltd. Holding apparatus with elastic mechanism. 4,179,783, Cl. 29-281.500.
Inskip, Harold K., to Du Pont de Nemours, E. I., and Company. Plasticized polyvinyl butyral sheeting with a divalent metal salt of neo decanoic acid adhesion control agent. 4,180,620, Cl. 428-524.000.
Institut Francais du Petrole: *See*—
Deschamps, Andre; Franckowiak, Sigismond; and Renault, Philippe, 4,180,550, Cl. 423-242.000.
Franck, Jean-Pierre; Freund, Edouard; Le Page, Jean-Francois; and Miquel, Jean, 4,180,453, Cl. 208-57.000.
Marcilly, Christian, 4,180,693, Cl. 585-475.000.
Institut Pasteur: *See*—
Fauve, Robert, 4,180,563, Cl. 424-92.000.
Institut Vysokikh Temperatur Akademii Nauk SSSR: *See*—
Gorlin, Samuil M.; Ljubimov, Grigory A.; Bitjurin, Valentin A.; Kovbasjuk, Valentin I.; Maximenko, Vladilen I.; Medin, Stanislav A.; and Barshak, Alexandr E., 4,180,752, Cl. 310-11.000.
Intel Corporation: *See*—
Shappir, Joseph, 4,180,826, Cl. 357-41.000.
Intermodal Concepts, Inc.: *See*—
Kirwan, George B., 4,179,997, Cl. 410-53.000.
International Business Machines Corporation: *See*—
Brock, Geoffrey E., 4,180,416, Cl. 148-1.500.
Cialone, David R.; and West, Donald L., 4,180,703, Cl. 250-237.00G.
Clark, Harold A., 4,180,432, Cl. 156-643.000.
Crowder, Billy L.; and Zirinsky, Stanley, 4,180,596, Cl. 427-42.000.
Deines, John L.; Poponiak, Michael R.; and Schwenker, Robert O., 4,180,439, Cl. 204-1.00T.
Feng, Bai-Cwo; and Feng, George C., 4,180,604, Cl. 430-270.000.
Gates, Harlan R., 4,180,827, Cl. 357-44.000.
Joshi, Kailash C.; and Spaight, Ronald N., 4,179,802, Cl. 29-628.000.
Joshi, Kailash C., 4,180,863, Cl. 365-2.000.
Pettit, John W., 4,180,704, Cl. 250-237.00G.
International Harvester Company: *See*—
Beck, Harold D.; and Kolthoff, C. Paul, Jr., 4,180,130, Cl. 165-124.000.
Birkenbach, Eugen J.; and Woodworth, Robert D., 4,180,135, Cl. 172-407.000.
International Minerals & Chemical Corp.: *See*—
Hunsucker, Jerry H., 4,180,382, Cl. 8-185.000.
International Paper Company: *See*—
Fries, Carl, Jr., 4,180,180, Cl. 221-1.000.
International Standard Electric Corporation: *See*—
Barton, Paul, 4,180,814, Cl. 343-5.0DP.
International Tel Data Corporation: *See*—
Cosgrove, John D.; Pettis, Charles D.; and Mullett, Charles E., 4,180,709, Cl. 179-2.0AM.
Interstate Electronics Corp.: *See*—
Weber, Larry F., 4,180,762, Cl. 315-169.400.
Interx Research Corporation: *See*—
Eriksen, Stuart P., 4,180,586, Cl. 424-311.000.
Intraco, Inc: *See*—
Jones, Robert D., 4,180,136, Cl. 177-68.000.
Inuiya, Masafumi, to Fuji Photo Film Co., Ltd. Stereoscopic camera. 4,180,313, Cl. 354-112.000.
Ionics Inc.: *See*—
McRae, Wayne A., 4,180,451, Cl. 204-301.000.
Iowa State University Research Foundation, Inc.: *See*—
Collogan, Thomas J.; Boeding, David C.; Hermanson, Michael P.; and Wellman, Stanley P., 4,180,133, Cl. 172-26.000.
Irani, Mazin R.: *See*—
Sherif, Fawzy G.; and Irani, Mazin R., 4,180,630, Cl. 521-106.000.
Irrigation & Power Equipment, Inc.: *See*—
Hunter, Richard E.; and Shook, Robert C., 4,180,092, Cl. 137-344.000.

Ishibashi, Hiroaki; Tanoue, Shizuo; Kudo, Masakuni; and Harada, Isamu, to Cnisso Corporation; and Sanyo Kokusaku Pulp Co Ltd. Method for producing organic fertilizers. 4,180,392, Cl. 71-25.000.
Ishii, Fumikatsu: *See*—
Yamamoto, Teruo; Ishii, Fumikatsu; and Fujiki, Miyoji, 4,180,185, Cl. 222-57.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Nomura, Susumu; Okubo, Hiroyuki; Isozaki, Hiroshi; Hara, Tsutomu; and Masuda, Bunpei, 4,179,958, Cl. 83-37.000
Saotome, Shigeo, 4,179,982, Cl. 92-5.00R
Ujiie, Nobuhisa, 4,180,250, Cl. 266-137.000.
Isoyama, Kenji: *See*—
Shibata, Toshiyuki; Ono, Hiroshi; and Isoyama, Kenji, 4,180,546, Cl. 423-178.000.
Isozaki, Hiroshi: *See*—
Nomura, Susumu; Okubo, Hiroyuki; Isozaki, Hiroshi; Hara, Tsutomu; and Masuda, Bunpei, 4,179,958, Cl. 83-37.000
Isshiki, Isao; Ohoka, Akihiro; and Sato, Koji, to Sumitomo Electric Industries, Ltd. Character reading system. 4,180,800, Cl. 340-146.3SY.
Itabashi, Ryuzo: *See*—
Kotera, Hiroaki; Tsuchiya, Hiroyoshi; Itabashi, Ryuzo; Yoshida, Kunio; Shibata, Tsutomu; Tsuda, Yukifumi; Kanno, Yoshimitsu; Hayami, Heijiro; and Sugita, Haruko, 4,180,330, Cl. 356-425.000.
Itakura Soki Co., Ltd.: *See*—
Itakura, Tsuyoshi, 4,180,377, Cl. 417-413.000.
Itakura, Tsuyoshi, to Itakura Soki Co., Ltd. Valve element for an air pump. 4,180,377, Cl. 417-413.000.
Itatani, Hiroshi: *See*—
Sasaki, Ichiro; Itatani, Hiroshi; and Kashima, Mikito, 4,180,607, Cl. 528-112.000.
Ito, Hideo: *See*—
Ozawa, Akio; Sakamoto, Masaharu; and Ito, Hideo, 4,180,750, Cl. 307-362.000.
Ivanko, Theodore, to Avco Corporation. Composite metal-ceramic turbine nozzle. 4,180,371, Cl. 415-115.000.
Ivers, Michael S.; and Ivers, Rory B. Support for a motorcycle. 4,180,253, Cl. 269-296.000.
Ivers, Rory B.: *See*—
Ivers, Michael S.; and Ivers, Rory B., 4,180,253, Cl. 269-296.000.
Iwaki, Hiroshi; and Nakamura, Masaaki, to Sanyo Electric Co., Ltd. Electric fan. 4,180,376, Cl. 417-360.000.
Iwao, Noriaki, to Tomy Kogyo Co., Inc. Apparatus for teaching numerical concepts. 4,179,825, Cl. 35-32.000.
Iwata, Minoru: *See*—
Mitsuda, Tadao; Iwata, Minoru; Sugiura, Masatoshi; Takada, Shigetaka; and Watanabe, Yukihiro, 4,179,882, Cl. 60-276.000.
Iyengar, Jagannathan N.: *See*—
Say, Geoffrey R.; Hays, James R., Sr.; and Iyengar, Jagannathan N., 4,180,548, Cl. 423-223.000.
J. C. Penney Corporation, Inc., The: *See*—
Koenig, Richard W.; Girard, Philip R.; and Neuhauser, Alfred J., 4,180,204, Cl. 235-385.000
J. H. Industries, Inc.: *See*—
Johnson, Dwight N., 4,180,096, Cl. 137-403.000
J. I. Case Company: *See*—
Tucek, Frank J., 4,180,274, Cl. 277-192.000
Jackson, Douglas: *See*—
Cunningham, Sinclair U.; Firth, Donald; and Jackson, Douglas, 4,180,171, Cl. 212-61.000
Jacob, Bart M. Tube type diaphragm game call. 4,179,845, Cl. 46-178.000
Jacobs, David R., to Spanel, Abram N. Creel. 4,180,218, Cl. 242-131.000.
Jacobsen, Alan N. Method and apparatus for the spinning of yarn. 4,179,874, Cl. 57-58.890.
Jacobsen, Stephen C.; Stephen, Robert L.; and Hansen, Peter, to Motion Control, Incorporated. Bi-directional flow catheter with retractable trocar/valve structure. 4,180,068, Cl. 128-214.00R
Jaffe, Wolfgang: *See*—
Peterson, Wesley R.; and Jaffe, Wolfgang, 4,180,007, Cl. 112-278.000.
Jagenberg-Werke Aktiengesellschaft: *See*—
Hennig, Franz, 4,180,193, Cl. 225-101.000.
Jagtap, Ashvinkumar N.: *See*—
Bienvenu, Joseph O.; and Jagtap, Ashvinkumar N., 4,180,408, Cl. 106-31.000.
James, Robert G. Counterbalanced pumping system. 4,179,947, Cl. 74-89.200
Jameson, Melvin N.; and Kruhk, Gerald A., to McGean Chemical Company, Inc. Catalytically active compositions from precious metal complexes. 4,180,480, Cl. 252-429.00R.
Jaquay, Louis H., to Dravo Corporation. Apparatus for recovering lead from battery mud. 4,180,251, Cl. 266-172.000.
Jay, Gary: *See*—
Sandefur, Herbert G., 4,179,840, Cl. 43-131.000
JENAer Glaswerk Schott & Gen.: *See*—
Schnabel, Roland; and Hussmann, Eckart, 4,180,056, Cl. 126-447.000
Jenkins, Thomas E.: *See*—
Herbst, LeRoy J.; and Jenkins, Thomas E., 4,179,821, Cl. 34-235.000.
Jer Manufacturing, Inc.: *See*—
Kragt, Gerald A., 4,179,788, Cl. 29-407.000.
Jessop Enterprises Pty. Ltd.: *See*—
Ward, John, 4,180,057, Cl. 126-449.000.
Jet Research Center, Inc.: *See*—
Orrill, Larry M.; and Regalbuto, John A., 4,180,351, Cl. 405-303.000.
Jewett, Robert A.: *See*—
Walden, Jack M.; Eads, William D.; Cozzens, Ray J.; Bidwell, John L.; Jewett, Robert A.; Wilson, Martin S.; Griffin, Daniel J.; Kuseski, Robert E.; and Schulte, Louis T., 4,180,854, Cl. 364-200.000.
Johannesen, Donald D.; and Holcomb, Orla L., Jr., to Bendix Corporation, The. Drum brake and mounting means therefor. 4,180,149, Cl. 188-340.000.
John Wyeth & Brother Limited: *See*—
Edington, Edwin T.; and White, Alan C., 4,180,670, Cl. 546-284.000.
Johns-Manville Corporation: *See*—
Smith, Harvell M., 4,179,808, Cl. 30-293.000.
Johns, McKinley R., to RCA Corporation. Circularly polarized antenna system using a combination of horizontal and bent vertical dipole radiators. 4,180,820, Cl. 343-798.000.
Johnson, Albert O., to Tire-Gator, Inc. Methods of handling waste including rubber tires. 4,180,004, Cl. 110-346.000.
Johnson, Clifford A., executor: *See*—
Hopping, Alvin S., deceased; and Johnson, Clifford A., executor, 4,179,885, Cl. 60-370.000.
Johnson, Clifton E.: *See*—
Steiger, Douglass W.; and Johnson, Clifton E., 4,180,363, Cl. 414-347.000.
Johnson, Dwight N., to J. H. Industries, Inc. Fill valve. 4,180,096, Cl. 137-403.000.
Johnson, F. Walter. Guide for portable power tool. 4,179,965, Cl. 83-745.000.
Johnson, James H., to Housing Systems, Inc. Building construction system. 4,180,233, Cl. 249-144.000.
Johnson, Lavell R., to Becton, Dickinson and Company. Chamber holder for immobilized immunoadsorbent. 4,180,383, Cl. 422-69.000.
Johnson, Matthey & Co., Limited: *See*—
Barnes, Roderick G. L., 4,180,477, Cl. 252-301.40R
Johnson, Ronald D.: *See*—
Godfrey, Otis W.; Johnson, Ronald D.; and Kastner, Ralph E., 4,180,564, Cl. 424-117.000.
Johnson, Wendell C., to Xerox Corporation. Method of making a resistor array. 4,179,797, Cl. 29-610.00R
Johnston, Howard; and Senkbeil, Herman O., to Dow Chemical Company, The. 6-Fluoro-3,5-dihalo-2-pyridyloxy compounds. 4,180,395, Cl. 71-94.000.
Jolas, Fernand: *See*—
Stiker, Bernard; and Jolas, Fernand, 4,180,441, Cl. 204-2.100.
Jones, Robert D., to Intraco, Inc. Weight actuated feed drop apparatus. 4,180,136, Cl. 177-68.000.
Jones, Walter: *See*—
Maynard, Michael; and Jones, Walter, 4,180,621, Cl. 428-535.000.
Jordan, William E.: *See*—
Driscoll, Richard O.; Jordan, William E.; and McAllister, Richard L., 4,180,860, Cl. 364-900.000.
Joseph, George L.; and Brolin, Charles A., to FMC Corporation. Torsion bar and method of forming the same. 4,180,421, Cl. 148-150.000.
Joshi, Kailash C.; and Spaight, Ronald N., to International Business Machines Corporation. Studded chip attachment process. 4,179,802, Cl. 29-628.000.
Joshi, Kailash C., to International Business Machines Corporation. Magnetic domain device modular assembly. 4,180,863, Cl. 365-2.000.
Judd, Frederick V. H. Distributor for gas turbine silencers. 4,180,141, Cl. 181-264.000.
Jung, Michel: *See*—
Metcalf, Brian W.; and Jung, Michel, 4,180,509, Cl. 260-326.14T
Jungverdorben, Hermann-Josef: *See*—
Reinehr, Ulrich; Jungverdorben, Hermann-Josef; and Herbertz, Toni, 4,180,617, Cl. 428-398.000.
K-G Devices Corporation: *See*—
Kirkgasser, James P.; and Goldsmith, Arthur C., 4,179,964, Cl. 83-599.000.
Kabushiki Kaisha Oichi: *See*—
Takeuchi, Toshio, 4,180,063, Cl. 128-25.00B
Kabushiki Kaisha Sato Kenkyusho: *See*—
Sato, Yo, 4,179,989, Cl. 101-291.000.
Kabushiki Kaisha Seikosha: *See*—
Moritani, Nakanobu, 4,179,853, Cl. 51-165.00R
Kabushiki Kaisha Terauchi Seisakusho: *See*—
Akiyoshi, Toshio; Onishi, Tsutomu; and Haikawa, Shozo, 4,179,955, Cl. 81-57.110
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Masaki, Hideyuki, 4,180,410, Cl. 106-73.200.
Kaeppel, Hanshelmut: *See*—
Fischer, Hermann; Thoma, Richard; Kaeppel, Hanshelmut; Kochendoerfer, Ernst; and Lagaly, Werner, 4,180,635, Cl. 526-68.000
Kaiser, John J.: *See*—
Henrickson, David L.; Kaiser, John J.; Koehn, William C.; and Raven, David P., 4,180,161, Cl. 206-328.000
Kaiyoh, Hirofumi: *See*—
Komori, Kazuaki; and Kaiyoh, Hirofumi, 4,180,798, Cl. 340-146.3QH
Kajima, Hisashi: *See*—
Asada, Chiaki; Saito, Makoto; and Kajima, Hisashi, 4,180,399, Cl. 75-229.000.

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Kaltenbach, Kurt; Saupe, Martin; Beier, Stefan; Gmeinder, Hermann; and Braetsch, Hartmut, to Kaltenbach & Voight GmbH & Co. Dental treatment apparatus. 4,180,812, Cl. 340-706.000.

Kaltenbach & Voight GmbH & Co.: *See*—
Kaltenbach, Kurt; Saupe, Martin; Beier, Stefan; Gmeinder, Hermann; and Braetsch, Hartmu', 4,180,812, Cl. 340-706.000.

Kamezaki, Masaaki, to Taisei Kosan Kabushiki Kaisha. Air pressure control apparatus for a hot or cold storage chamber. 4,180,093, Cl. 137-360.000.

Kamimura, Shinobu; and Yamamoto, Hideki, to Omron Tateisi Electronics Co. Electronic sphygmomanometer. 4,180,061, Cl. 128-681.000.

Kamitake, Seigo: *See*—
Maeda, Yoshio; Matsumoto, Koichi; and Kamitake, Seigo, 4,180,327, Cl. 356-320.000.

Kanaya, Masanori: *See*—
Okumura, Haruhiko; and Kanaya, Masanori, 4,180,835, Cl. 360-118.000.

Kandler, Joachim: *See*—
Schrodter, Klaus; Kandler, Joachim; and Spott, Hasso, 4,180,471, Cl. 252-140.000.

Kane, Michael P.; and Szmuszkovicz, Jacob, to Upjohn Company, The. N-(2-Dimethylaminoalkyl)-3',4'-dichloroanilides. 4,180,522, Cl. 260-562.00R.

Kaneko, Hideaki: *See*—
Miyazaki, Yasushi; Suzuki, Masanori; and Kaneko, Hideaki, 4,180,406, Cl. 106-14.150.

Kanno, Yoshimitsu: *See*—
Kotera, Hiroaki; Tsuchiya, Hiroyoshi; Itabashi, Ryuzo; Yoshida, Kunio; Shibata, Tsutomu; Tsuda, Yukifumi; Kanno, Yoshimitsu; Hayami, Heijiro; and Sugita, Haruko, 4,180,330, Cl. 356-425.000.

Kanstoroom, Steven J. Variable ratio drive system including a compact variable diameter pulley. 4,179,946, Cl. 74-230.17E.

Kaplan, Leonard A., to RCA Corporation. Biasing and drive circuitry for quasi-linear transistor amplifiers. 4,180,781, Cl. 330-272.000.

Kaplan, Leonard A., to RCA Corporation. Phantom full-bridge amplifier. 4,180,782, Cl. 330-276.000.

Kaplan, Murray A.; Granatek, Alphonse P.; and Nachfolger, Solomon J., to Bristol-Myers Company. 7[-2-Alkoxyamino(acetamido)]cephalosporin derivatives. 4,180,658, Cl. 544-27.000.

Kapoor, Inder P., to American Cyanamid Company. Novel substituted dinitrotoluenes and methods for preparing the same. 4,180,679, Cl. 568-583.000.

Kasami, Akinobu: *See*—
Naito, Makoto; and Kasami, Akinobu, 4,180,423, Cl. 148-171.000.

Kashima, Mikito: *See*—
Sasaki, Ichiro; Itatani, Hiroshi; and Kashima, Mikito, 4,180,607, Cl. 528-112.000.

Kassai Kabushiki Kaisha: *See*—
Kassai, Kenzou, 4,180,276, Cl. 280-47.360.

Kassai, Kenzou, to Kassai Kabushiki Kaisha. Back-to-face reversible push handle of a baby carriage. 4,180,276, Cl. 280-47.360.

Kastin, Abba J.: *See*—
Coy, David H.; and Kastin, Abba J., 4,180,501, Cl. 260-112.50R.

Kastner, Hans-Werner: *See*—
Saier, Manfred; Kastner, Hans-Werner; and Klockler, Robert, 4,179,911, Cl. 72-78.000.

Kastner, Ralph E.: *See*—
Godfrey, Otis W.; Johnson, Ronald D.; and Kastner, Ralph E., 4,180,564, Cl. 424-117.000.

Katayama, Naohiro, to Sawafuji Electric Co. Ltd. Refrigerating system. 4,179,899, Cl. 62-228.000.

Katou, Hiromitu: *See*—
Soshiki, Yoshikazu; Sugiura, Hiroshi; Onizawa, Kouzi; Togawa, Toshikatsu; Kojima, Minoru; Morikawa, Tsukio; Kurimoto, Naohiko; and Katou, Hiromitu, 4,180,448, Cl. 204-192.00C.

Katz, Diane. Portfolio. 4,180,114, Cl. 150-28.00R.

Katz, Martin; and Kent, John S., to Syntex Corporation. Inert core implant pellet. 4,180,560, Cl. 424-21.000.

Katz, Otto, to A. W. Faber-Castell. Mechanical pencil with automatic lead feed. 4,180,339, Cl. 401-67.000.

Kaufman, Robert J.: *See*—
Franz, John E.; and Kaufman, Robert J., 4,180,394, Cl. 71-86.000.

Kaufmann, Heinrich; and Moser, Kurt, to Fa. Develop KG, Dr. Eisgein & Co. Copying arrangement. 4,180,319, Cl. 355-3.00R.

Kaufmann, Otto, to BASF Aktiengesellschaft. Manufacture of concentrated solutions, having a low salt content, of cobalt and chromium 1:2 complex dyes which are free from sulfonic acid groups. 4,180,502, Cl. 260-145.00A.

Kawamura, Michio, to Nippondenso Co., Ltd. Code lock type engine control system. 4,180,043, Cl. 123-146.50B.

Kawamura, Naoto: *See*—
Tateoka, Masamichi; Tsuji, Takao; Minami, Setsuo; Matsumoto, Kazuya; Kawamura, Naoto; and Minoura, Kazuo, 4,180,307, Cl. 350-6.500.

Kawasaki, Masahiro; and Sawada, Yoshio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Photometric circuit. 4,180,310, Cl. 354-24.000.

Kazuo, Yamashita; Koji, Kuroyanagi; and Naoki, Matsuo, to Shono Denpun Kabushiki Kaisha. Method of producing soy sauce. 4,180,590, Cl. 426-18.000.

Kazuo, Yamashita; Koji, Kuroyanagi; Yoshitsugu, Minamikawa; and Yasuhiro, Tanabe, to Shono Denpun Kabushiki Kaisha. Method of producing a soy sauce. 4,180,591, Cl. 426-18.000.

Keeney, Marvin F., to General Electric Company. Timer circuit for use in protective relaying applications. 4,180,842, Cl. 361-85.000.

Kegel, Hellmut: *See*—
Schwerin, Inge; Zillgitt, Ulrich; Schneider, Steffen; Kegel, Hellmut; Bodensieck, Hans-Rudolf; Zauft, Helmut; Poglitsch, Reinhold; and Grabow, Kurt, 4,180,848, Cl. 362-71.000.

Kent, John S.: *See*—
Katz, Martin; and Kent, John S., 4,180,560, Cl. 424-21.000.

Kerb, Ulrich: *See*—
Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Casals-Stenzel, Jorge; and Losert, Wolfgang, 4,180,570, Cl. 424-243.000.

Keresztes, Robert J.: *See*—
Tjarksen, Richard A.; Keresztes, Robert J.; and Harnish, Eugene E., 4,180,147, Cl. 188-71.800.

Kerner, Ronald E. Radius and angle dresser. 4,180,046, Cl. 125-11.00A.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Klatt, Karl-Heinz; and Kussel, Eckard, 4,180,370, Cl. 415-90.000.

Keske, Frank E.; and Hackett, David E., to Caterpillar Tractor Co. Lubrication means for a torque proportioning differential. 4,179,952, Cl. 74-710.000.

Khair, Magdi K.; and McCombie, Jay C., to Chrysler Corporation. Fuel injection system and control valve for multi-cylinder engines. 4,180,022, Cl. 123-32.0AE.

Khalifa, Jacob R., to RCA Corporation. Phase lock loop data timing recovery circuit. 4,180,783, Cl. 331-2.000.

Kiefer, Gerhard: *See*—
Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,180,418, Cl. 148-12.400.

Kienzle, Kenneth, Jr.: *See*—
Sandefur, Herbert G., 4,179,840, Cl. 43-131.000.

Kim, Samuel S.; and Stevens, Travis E., to Rohm and Haas Company. Nonionic polyurethane thickener with surfactant cothickener and organic diluent, clear concentrates, aqueous print pastes, coloring compositions, methods of making and printing. 4,180,491, Cl. 260-29.2TN.

Kim, Yung D.; Tomita, Joseph T.; and Schenck, Jay R., to Abbott Laboratories. Pretreatment method for carcinoembryonic antigen assay. 4,180,556, Cl. 424-1.000.

Kimball, Vance A.: *See*—
Carr, Keith E.; and Kimball, Vance A., 4,180,049, Cl. 126-21.00A.

Kimura, Kunio: *See*—
Nishino, Atsushi; Sonetaka, Kazunori; Kimura, Kunio; and Watanabe, Yoshihiro, 4,180,402, Cl. 252-455.00R.

Kimura, Muneaki: *See*—
Ohmura, Kaoru; Shibasaki, Ichiro; Kimura, Takeo; and Kimura, Muneaki, 4,180,404, Cl. 430-284.000.

Kimura, Takeo: *See*—
Ohmura, Kaoru; Shibasaki, Ichiro; Kimura, Takeo; and Kimura, Muneaki, 4,180,404, Cl. 430-284.000.

Kincaid, Elmo, Jr. Automatic steam pressure generator. 4,179,879, Cl 60-39.09R.

King, Everett R.: *See*—
Distler, Jack E.; Hamilton, Albert A.; and King, Everett R., 4,180,757, Cl. 313-315.000.

Kingsley, Charles E., to Arens Controls, Inc. Compound bow stringing. 4,180,045, Cl. 124-90.000.

Kingsley, Jack D., to General Electric Company. X-ray detector. 4,180,737, Cl. 250-367.000.

Kinkade, Franklin C. Trenching machine. 4,179,829, Cl. 37-94.000.

Kinsolving, C. Richard: *See*—
Carr, Albert A.; and Kinsolving, C. Richard, 4,180,583, Cl. 424-267.000.

Kirkgasser, James P.; and Goldsmith, Arthur C., to K-G Devices Corporation. Ribbon cable splitting device. 4,179,964, Cl. 83-599.000.

Kirkpatrick, Robert G.; and Snyder, Ronald R., to General Electric Company. Clamp. 4,179,978, Cl. 89-12.000.

Kirn, Dieter: *See*—
Steinbrenner, Ulrich; Kirn, Dieter; and Schnurle, Hans, 4,180,025, Cl. 123-32.0EA.

Kirsch, Axel. Device for milling slots in a jawbone for mounting an endossal device. 4,179,810, Cl. 433-75.000.

Kirwan, George B., to Intermodal Concepts, Inc. Rail-highway intermodal freight carrier transport system. 4,179,997, Cl. 410-53.000.

Kito, Masahiro; and Adachi, Yoshiharu, to Aisin Seiki Kabushiki Kaisha. Hydraulic brake booster. 4,179,980, Cl. 91-6.000.

Kiuchi, Michio: *See*—
Aonuma, Tatuo; Kiuchi, Michio; Watanabe, Hirozi; and Akao, Takeshi, 4,180,188, Cl. 222-368.000.

Klatt, Karl-Heinz; and Kussel, Eckard, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Turbomolecular pump. 4,180,370, Cl. 415-90.000.

Kleinschmit, Peter; Walter, Eberhard; Mechler, Helmut; Theis, Gunter; and Meiners, Brigitte, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of 4,4-isopropylidene-bis'(2,6-dibromophenol). 4,180,684, Cl. 568-726.000.

Klesius, Phillip H.; and Fudenberg, Herman H., to United States of America, Agriculture. Process for in vivo transfer of cell-mediated immunity in mammals with alcoholic precipitates of Bovine Transfer factor. 4,180,627, Cl. 435-262.000.

Klockler, Robert: *See*—
Saier, Manfred; Kastner, Hans-Werner; and Klockler, Robert, 4,179,911, Cl. 72-78.000.

Klus, Charles: *See*—
Culina, William; and Klus, Charles, 4,179,912, Cl. 72-196.000.

Knight, Derek I.: *See*—
Fitzgerald-Smith, James P.; and Knight, Derek I., 4,180,364, Cl. 414-350.000.

Knodel, Robert R. Information reminding device. 4,179,833, Cl. 40-21.00C.

Kobayashi, Akio; Endo, Kunio; and Omori, Norio, to Nippondenso Co., Ltd. Electronically-controlled fuel injection system for internal combustion engine having odd numbers of cylinders. 4,180,023, Cl. 123-32.0EA.

Kobayashi, Makiko. *See*—
Kurozumi, Seizi; Toru, Takeshi; Kobayashi, Makiko; and Hashimoto, Yoshinobu, 4,180,672, Cl. 560-15.000.

Kobayashi, Toshimasa: *See*—
Takaba, Toshio; and Kobayashi, Toshimasa, 4,179,800, Cl. 29-625.000.

Koblanski, John N., to Ocean Ecology Ltd. Sound measuring device. 4,179,937, Cl. 73-646.000.

Koch, Carl; and Meyer, Rolf. Apparatus for varying picture size before or after film advance. 4,180,314, Cl. 354-159.000.

Koch, Ullrich: *See*—
Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,180,418, Cl. 148-12.400.

Kochendoerfer, Ernst: *See*—
Fischer, Hermann; Thoma, Richard; Kaeppel, Hanshelmut; Kochendoerfer, Ernst; and Lagaly, Werner, 4,180,635, Cl. 526-68.000.

Koehn, William C.: *See*—
Henrickson, David L.; Kaiser, John J.; Koehn, William C.; and Raven, David P., 4,180,161, Cl. 206-328.000.

Koenderink, Ernest J. E.: *See*—
Hagedoorn, Rijnder; and Koenderink, Ernest J. E., 4,180,843, Cl. 361-119.000.

Koenig, Richard W.; Girard, Philip R.; and Neuhauser, Alfred J., to J C. Penney Corporation, Inc., The. Automatic inventorying system. 4,180,204, Cl. 235-385.000.

Koerfer, Kurt: *See*—
Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,180,418, Cl. 148-12.400.

Koeslin, Werner H., to Caterpillar Tractor Co. Watercooled exhaust manifold and method of making same. 4,179,884, Cl. 60-321.000.

Koike, Masahiko: *See*—
Takahashi, Toshiyuki, Koike, Masahiko; and Suzuki, Haruyuki, 4,179,971, Cl. 84-1.240.

Koizumi, Akio; Nakazawa, Hiroshi; and Ohsawa, Mitsuo, to Sony Corporation. Control circuit for use in a switching-type regulator 4,180,852, Cl. 363-49.000.

Koji, Kuroyanagi: *See*—
Kazuo, Yamashita; Koji, Kuroyanagi; and Naoki, Matsuo, 4,180,590, Cl. 426-18.000.
Kazuo, Yamashita; Koji, Kuroyanagi; Yoshitsugu, Minamikawa; and Yasuhiro, Tanabe, 4,180,591, Cl. 426-18.000.

Kojima, Minoru: *See*—
Soshiki, Yoshikazu; Sugiura, Hiroshi; Onizawa, Kouzi; Togawa, Toshikatsu; Kojima, Minoru; Morikawa, Tsukio; Kurimoto, Naohiko; and Katou, Hiromitu, 4,180,448, Cl. 204-192.00C
Yukuta, Toshio; Ohashi, Takashi; Kojima, Minoru; and Saito, Masumi, 4,180,631, Cl. 521-164.000.

Kokkoman Shoyu Co., Ltd.: *See*—
Aonuma, Tatuo; Kiuchi, Michio; Watanabe, Hirozi; and Akao, Takeshi, 4,180,188, Cl. 222-368.000.

Kolarik, Robert V.: *See*—
Cook, Richard L.; Hampshire, William J.; and Kolarik, Robert V., 4,179,979, Cl. 89-36.00A.

Kolb, Fritz; Fehlisch, Silvan; Ziegert, Otto; Bender, Hans; and Schmitt, Manfred, to Bayer Aktiengesellschaft. Control valve having a low noise throttling device. 4,180,100, Cl. 137-625.300.

Kolka, Leigh E. Exercising device for runners. 4,180,261, Cl. 272-119.000.

Kolombos, Alexander J.: *See*—
Davies, Evan E.; and Kolombos, Alexander J., 4,180,689, Cl. 585-407.000.

Kolthoff, C. Paul, Jr.: *See*—
Beck, Harold D.; and Kolthoff, C. Paul, Jr., 4,180,130, Cl 165-124.000.

Komori, Kazuaki; and Kaiyoh, Hirofumi, to Nippon Telegraph & Telephone Public Corporation. Character recognition and communication system. 4,180,798, Cl. 340-146.30H.

Kondo, Hiroyuki: *See*—
Takeshita, Hiroshi; Kondo, Hiroyuki; Ohta, Takaaki; Nomura, Yoshihisa; and Nogami, Tomoyuki, 4,180,295, Cl. 303-22.00R.

Kone Osakeyhtio: *See*—
Heikkinen, Urho, 4,180,109, Cl. 144-208.00D.

Konishi, Yoshimune: *See*—
Hobo, Nobuhito; Suzuki, Yutaka; Naito, Takashi; and Konishi, Yoshimune, 4,180,037, Cl. 123-139.00E.

Konnerth, Wilhelm. Method of and a device for measuring the pressure and abrasion sensitivity of granular material (grain lots) due to mechanical stress. 4,179,916, Cl. 73-7.000.

Konrath, Karl: *See*—
Hofer, Gerald; Konrath, Karl; Schwarz, Manfred; and Laufer, Helmut, 4,180,040, Cl. 123-140.00R.

Kopis, Floyd B. Method of applying liquid to solid surfaces. 4,180,601, Cl. 427-238.000.

Koppel, Gary A.: *See*—
Cooper, Robin D. G.; Koppel, Gary A.; and McShane, Lawrence J., 4,180,507, Cl. 260-245.400.

Korb, Donald R.: *See*—
Mancini, William L.; Korb, Donald R.; and Refojo, Miguel F., 4,180,308, Cl. 351-160.00H.

Kori, Seiji: *See*—
Hayashi, Masaki; Kori, Seiji; Ohyama, Isao; Iguchi, Sadahiko; and Okada, Takanori, 4,180,675, Cl. 560-118.000.

Kornfeld, Edmund C.; and Bach, Nicholas J., to Eli Lilly and Company. 6-n-Propyl-8-methoxy-methyl or methylmercaptomethylergolines and related compounds as prolactin inhibitors and to treat Parkinson's syndrome. 4,180,582, Cl. 424-261.000.

Koska, Herschel O.: *See*—
Wilson, Woodrow A.; and Koska, Herschel O. (said Woodrow A. Wilson assors. to), 4,179,877, Cl. 58-56.000.

Kosugi, Masao; and Ogata, Takashi, to Nippon Gakki Seizo Kabushiki Kaisha. Process of manufacturing semiconductor devices. 4,179,794, Cl. 29-580.000.

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Faucher, Joseph E.; Koucky, Robert W.; and Roy, William D., 4,179,881, Cl. 60-39.710.

Kovbasjuk, Valentin I.: *See*—
Gorlin, Samuil M.; Ljubimov, Grigory A., Bityurin, Valentin A.; Kovbasjuk, Valentin I.; Maximenko, Vladilen I.; Medin, Stanislav A.; and Barshak, Alexandr E., 4,180,752, Cl 310-11.000

Kovanagi, Shunichi; Shimizu, Toshihide; and Fushimi, Kenji, to Shin-Etsu Chemical Co., Ltd. Polymerizing vinyl chloride with lowering of scale formation. 4,180,634, Cl. 526-62.000.

Kragt, Gerald A., to Jer Manufacturing, Inc. Method of fabricating a building. 4,179,788, Cl. 29-407.000.

Kramer, Petrus A.: *See*—
Verbrugge, Pieter A.; and Kramer, Petrus A., 4,180,520, Cl. 260-465.00R.

Kramer, Ted J.: *See*—
Gilbert, Daniel E.; Lee, James R.; and Kramer, Ted J., 4,180,605, Cl. 428-76.000.

Kraska, Robert E.; and Lessar, Joseph F., to Medtronic, Inc. Alloy composition and brazing therewith, particularly for ceramic-metal seals in electrical feedthroughs. 4,180,700, Cl. 174-152.0GM.

Krautkramer-Branson, Inc.: *See*—
Primbsch, Erik, 4,180,324, Cl. 356-35.500.

Kreibich, Ursula: *See*—
Schmid, Rolf; and Kreibich, Ursula, 4,180,527, Cl. 525-115.000.

Krishnan, Ravi C.; and Blackburn, Charles M., to Sigma Systems, Inc High speed batch counting apparatus. 4,180,153, Cl. 198-425.000

Krulik, Gerald A.: *See*—
Jameson, Melvin N.; and Krulik, Gerald A., 4,180,480, Cl. 252-429.00R.

Krumm, Helmut: *See*—
Oustin, Georges; and Krumm, Helmut, 4,180,426, Cl. 156-104.000.

Krupp-Koppers GmbH: *See*—
Geidies, Ulrich, 4,180,353, Cl. 406-74.000.

Kuchenbecker, Morris W., to American Can Company. Blister package. 4,180,165, Cl. 206-461.000.

Kudo, Masakuni: *See*—
Ishibashi, Hiroaki; Tanoue, Shizuo; Kudo, Masakuni; and Harada, Isamu, 4,180,392, Cl. 71-25.000

Kueffner Products, Inc.: *See*—
Kuffner, Reinhold O., 4,179,849, Cl. 49-505.000

Kuffner, Reinhold O., to Kueffner Products, Inc. Door frame assembly. 4,179,849, Cl. 49-505.000.

Kuhn, Franz J.: *See*—
Weber, Karl-Heinz; Langbein, Adolf; Schneider, Claus; Lehr, Erich; Boke, Karin; and Kuhn, Franz J., 4,180,573, Cl. 424-250.000

Kuhn, S.A.: *See*—
Gerlinger, Frederic, 4,179,872, Cl. 56-366.000.

Kumai, Teruo: *See*—
Saiki, Junichi; and Kumai, Teruo, 4,180,035, Cl. 123-119.00A

Kumazawa, Shunichi: *See*—
Yanagimoto, Akira; Kumazawa, Shunichi; and Takakuwa, Yasuo, 4,180,496, Cl. 260-45.8NT

Kunczynski, Jan K. Suspended articulated chairlift mounting assembly 4,179,994, Cl. 105-150.000.

Kuntze, Richard A.: *See*—
Glass, Roger W.; and Kuntze, Richard A., 4,180,433, Cl. 162-3.000.

Kunzmann, Peter: *See*—
Burkhard, Kurt; and Kunzmann, Peter, 4,180,622, Cl. 428-564.000.

Kupperman, Dennis: *See*—
Kupperman, Sam; and Kupperman, Dennis, 4,179,841, Cl. 46-94.000.

Kupperman, Sam; and Kupperman, Dennis, to R B Toy Development Co. Toy object that propels forward, submerges and surfaces. 4,179,841, Cl. 46-94.000.

Kurimoto, Naohiko: *See*—
Soshiki, Yoshikazu; Sugiura, Hiroshi; Onizawa, Kouzi; Togawa, Toshikatsu; Kojima, Minoru; Morikawa, Tsukio; Kurimoto, Naohiko; and Katou, Hiromitu, 4,180,448, Cl. 204-192.00C.

Kurokawa, Tadashi: *See*—
Mori, Takenori; Shirahama, Haruhisa; and Kurokawa, Tadashi, 4,180,588, Cl. 424-319.000.

Kurozumi, Seizi; Toru, Takeshi; Kobayashi, Makiko; and Hashimoto, Yoshinobu, to Teijin Limited. 2-Organothio-2-cyclopentenones, organothio-cyclopentanes derived therefrom. 4,180,672, Cl. 560-15.000.

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Kuseski, Robert E.: *See—*
Walden, Jack M.; Eads, William D.; Cozzens, Ray J.; Bidwell, John L.; Jewett, Robert A.; Wilson, Martin S.; Griffin, Daniel J.; Kuseski, Robert E.; and Schulte, Louis T., 4,180,854, Cl. 364-200.000.

Kussel, Eckard: *See—*
Klatt, Karl-Heinz; and Kussel, Eckard, 4,180,370, Cl. 415-90.000.

Kutter, Dolphe, to Boehringer Mannheim GmbH. Device for staining biological materials. 4,180,060, Cl. 128-760.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Tamura, Gakuzo; and Shimizu, Kenichi, 4,180,436, Cl. 435-119.000.

La Telemecanique Electrique: *See—*
Lerude, Gerard, 4,180,304, Cl. 339-196.00M.

Lacroix, Bernard, to Cycles Peugeot. Inertia-actuated starter for an explosion engine. 4,180,743, Cl. 290-38.00B.

Ladin, Eli M.; and Reynolds, Mark P., to Federal-Mogul Corporation. Method of making a clutch throw-out bearing assembly. 4,179,780, Cl. 29-149.50R.

Lagaly, Werner: *See—*
Fischer, Hermann; Thoma, Richard; Kaeppel, Hanshelmut; Kochendoerfer, Ernst; and Lagaly, Werner, 4,180,635, Cl. 526-68.000.

LaManna, Richard J.; Drillick, Jacob H.; and Polad, Michael D., to Data Card Corporation. Automatic embossing system with document transfer. 4,180,338, Cl. 400-582.000.

Lamb, Terrence R. Adjustable frame for stretching sheet material. 4,179,830, Cl. 38-102.500.

Lambert Corporation: *See—*
Florer, Richard H.; Via, Thomas E.; and Weaver, James M., 4,180,184, Cl. 222-41.000.

Landolt, Bruno, to Inauen Maschinen AG. Vacuum packing machine with bag end retractor. 4,179,862, Cl. 53-86.000.

Lang, Charles R., Jr.: *See—*
Armstrong, Rolfe D.; and Lang, Charles R., Jr., 4,180,861, Cl. 364-900.000.

Lang-Ree, Nils, to NPI Corporation. Shaft mounting. 4,179,948, Cl. 74-242.15R.

Lang-Ree, Nils: *See—*
Baker, Edward D.; Lang-Ree, Nils; and Brown, John S., 4,179,985, Cl. 99-339.000.

Lang, William H.: *See—*
Chang, Clarence D.; and Lang, William H., 4,180,516, Cl. 260-449.00R.

Langbein, Adolf: *See—*
Weber, Karl-Heinz; Langbein, Adolf; Schneider, Claus; Lehr, Erich; Boke, Karin; and Kuhn, Franz J., 4,180,573, Cl. 424-250.000.

Langhorst, Carsten. Hinged binder assembly for sample cards. 4,180,341, Cl. 402-80.00R.

Langrehr, Larry L.; and Watson, Charles J., to Bell & Howell Company. Control system for photographic film printer. 4,180,321, Cl. 355-83.000.

Langvik, Sigmund C., to Scanmec A/S. Vacuum separator having staggered filtrate tubes. 4,180,461, Cl. 210-333.00A.

Laniere S.A.: *See—*
Michels, Fausto, 4,180,169, Cl. 211-13.000.

Larkin, Derek J. Sewer connector. 4,180,102, Cl. 138-106.000.

Larsson, Bruno; Bohm, Kurt; Strom, Janeric; and Aslund, Borje, to Parca Norrahammar AB. Heating boiler. 4,180,018, Cl. 122-225.00R.

Laufer, Helmut: *See—*
Hofer, Gerald; Konrath, Karl; Schwarz, Manfred; and Laufer, Helmut, 4,180,040, Cl. 123-140.00R.

Lauredan, Bernier. Nutritive seamoss composition and method for preparing same. 4,180,595, Cl. 426-575.000.

Lavigne, Jean C.; and Segeral, Gerard, to Schlumberger Technology Corporation. Method and apparatus for providing repeatable wireline depth measurements. 4,179,817, Cl. 33-129.000.

Lawton, William R., to Graphic Controls Corporation. Heat-sensitive recording composition with mixed color precursors. 4,180,405, Cl. 106-14.500.

Layher, Eberhard. Arrangement for connecting structural members. 4,180,342, Cl. 403-24.000.

Leavitt, David R.; and Pfieffer, Gerald R., to Container Corporation of America. Carton having reclosable spout. 4,180,167, Cl. 206-622.000.

Lebet, Jean-Philippe; and Droz, Jean-Claude, to Gillette Company, The. Alarm circuit. 4,180,808, Cl. 340-384.00E.

Lederman, Frank L.; and Tiemann, Jerome J., to General Electric Company. Transmit-receive transducer array and ultrasonic imaging system. 4,180,792, Cl. 367-7.000.

Lednicer, Daniel, to Upjohn Company, The. 4-Pyrrolidino-cyclohexanone ketals. 4,180,584, Cl. 424-274.000.

Lee, Alan J. C.; and Ling, Robin S. M., to National Research Development Corporation. Surgical apparatus. 4,180,254, Cl. 269-328.000.

Lee, Cyril A., to E M I Limited. Security material and secure document system using said material. 4,180,207, Cl. 235-493.000.

Lee, James R.: *See—*
Gilbert, Daniel E.; Lee, James R.; and Kramer, Ted J., 4,180,605, Cl. 428-76.000.

Lefebvre, Jean H., to Regie Nationale des Usines Renault. Low pressure molten metal casting device. 4,180,121, Cl. 164-152.000.

Lefort, Marcel: *See—*
Bargain, Michel; and Lefort, Marcel, 4,180,515, Cl. 260-448.20Q.

Le Guen, Yves; and Thault, Georges, to Produits Chimiques Auxiliaires et de Synthese, P.C.A.S. Method for preparing thienylacetic acids. 4,180,510, Cl. 549-79.000.

Lehr, Erich: *See—*
Weber, Karl-Heinz; Langbein, Adolf; Schneider, Claus; Lehr, Erich; Boke, Karin; and Kuhn, Franz J., 4,180,573, Cl. 424-250.000.

Leifheit International Gunter Leifheit GmbH: *See—*
Schulein, Rolf G., 4,180,229, Cl. 248-363.000.

Lemelson, Jerome H. Inflatable displays. 4,179,832, Cl. 40-540.000.

Lenk, Erich; and Bauer, Karl, to Barmag Barmer Maschinenfabrik AG. Inductively heatable godet with insulating means. 4,180,717, Cl. 219-10.49A.

Leonard, John J.; and Shalit, Harold, to Atlantic Richfield Company. Preparation and recovery of methacrylic acid from an aqueous sodium methacrylate solution. 4,180,681, Cl. 562-600.000.

Leonova, Galina G.: *See—*
Andreev, Jury S.; Pyasetskaya, Olga V.; and Leonova, Galina G., 4,180,402, Cl. 430-394.000.

Le Page, Jean-Francois: *See—*
Franck, Jean-Pierre; Freund, Edouard; Le Page, Jean-Francois; and Miquel, Jean, 4,180,453, Cl. 208-57.000.

Lerude, Gerard, to La Telemecanique Electrique. Dissemblable multipart electrical connector. 4,180,304, Cl. 339-196.00M.

Leseur, Andre: *See—*
Anav, Maurice; Chesne, Andre; Leseur, Andre; Miquel, Pierre; and Pascard, Roger, 4,180,476, Cl. 252-301.10W.

Lessar, Joseph F.: *See—*
Kraska, Robert E.; and Lessar, Joseph F., 4,180,700, Cl. 174-152.0GM.

Leuven Research & Development V.Z.W.: *See—*
Collen, Desire J., 4,180,437, Cl. 435-7.000.

Lever Brothers Company: *See—*
Tokosh, Richard; and Cahn, Arno, 4,180,470, Cl. 252-121.000.

Levy, Stephen, to United States of America, Army. Geiger-Mueller tube with a re-entrant insulator at opposing sealed ends thereof. 4,180,754, Cl. 313-93.000.

Lew, Henry Y., to Chevron Research Company. Nitrothiophene-accelerated lactam polymerization. 4,180,650, Cl. 528-313.000.

Lewis, Charles T., Jr.; and Prescott, Gerald F., to Texaco Inc. Converting reactive impurities in isobutane charge stream with catalyst phase in sulfuric acid alkylation. 4,180,696, Cl. 585-717.000.

Li, Hsin L.; Oswald, Hendrikus J.; and Mumford, Robin B., to Allied Chemical Corporation. Cartridge takeup apparatus. 4,180,214, Cl. 242-47.000.

Li, Jorge P.: *See—*
Becker, Frank C.; and Li, Jorge P., 4,180,508, Cl. 260-326.50C

Lichtenberger, William J., to Westinghouse Air Brake Company. Vital movable electricl contact arrangement. 4,180,715, Cl. 200-246.000.

Liebenow, Walter: *See—*
Fritschi, Edgar; Liebenow, Walter; and Prikryl, Jaroslav, 4,180,578, Cl. 424-251.000.

Liebling, Joel R. Hamper bag cover. 4,180,113, Cl. 150-7.000.

Lieptz, Nathan S. Pill-splitting implement with non-crumbling characteristic. 4,179,806, Cl. 30-124.000.

Lindblade, Roy W. Lifesaving device. 4,179,764, Cl. 9-14.000.

Lindemann, Philip J. Automatic channel scanning attachment for manual CB radio transceiver. 4,180,776, Cl. 325-25.000.

Linder, Uno K. E., to U.S. Philips Corporation. Bearing for the printing head of a matrix printer, and printing head comprising such a bearing. 4,180,333, Cl. 400-124.000.

Lindstrom, Jan N.: *See—*
Smith, Ulf K. H.; Lindstrom, Jan N.; and Mantle, Harold, 4,180,400, Cl. 75-235.000.

Lindstrum, Alan L., to United States of America, Navy. PSK pulse synthesizer. 4,180,793, Cl. 367-137.000.

Ling, Ku S.: *See—*
Diamond, Ronald M.; Ling, Ku S.; and Winterer, Allen G., 4,180,414, Cl. 136-89.0PC.

Ling, Robin S. M.: *See—*
Lee, Alan J. C.; and Ling, Robin S. M., 4,180,254, Cl. 269-328.000.

Lingl Corporation: *See—*
Lingl, Hans, Jr., 4,179,959, Cl. 83-37.000.

Lingl, Hans, Jr., to Lingl Corporation. Method and apparatus for the cutting of split tiles. 4,179,959, Cl. 83-37.000.

Lion Fat & Oil Co., Ltd., The: *See—*
Tomidokoro, Susumu; Ukigai, Toshiyuki; Takahashi, Toshio; and Saika, Daini, 4,180,468, Cl. 252-117.000.

Lippert, Joseph, Jr., to Grumman Corporation. Wind rotor automatic air brake. 4,180,372, Cl. 416-23.000.

Lipschutz, Paul, to Neiman S.A. Process for producing a piston-type safety lock device. 4,179,789, Cl. 29-412.000.

Litton Systems, Inc.: *See—*
Craig, Robert J. G., 4,179,818, Cl. 33-321.000.

Ljubimov, Grigory A.: *See—*
Gorlin, Samuil M.; Ljubimov, Grigory A.; Bitjurin, Valentin A.; Kovbasjuk, Valentin I.; Maximenko, Vladilen I.; Medin, Stanislav A.; and Barshak, Alexandr E., 4,180,752, Cl. 310-11.000.

Llenado, Ramon A., to Procter & Gamble Company, The. Spray-dried detergent compositions. 4,180,485, Cl. 252-532.000.

Lloyd, David J. Fuel-air mixture regulator for internal combustion engines. 4,180,042, Cl. 123-141.000.

Lobbe, Armin; and Penzek, Hans-Jurgen, to Gewerkschaft Eisenhutte Westfalia. Mineral mining installation. 4,180,291, Cl. 299-34.000.

Lockheed Aircraft Corporation: *See—*
Thornburg, Francis L., 4,180,222, Cl. 244-75.00R.

Lockheed Corporation: *See—*
Ryle, Dallas M., Jr., 4,180,224, Cl. 244-136.000.

Lockheed Missiles & Space Company, Inc.: *See—*
Adams, George B., 4,180,623, Cl. 429-21.000.

Loctite Corporation: *See—*
Melody, David P.; Doherty, Daniel A.; O'Grady, John F.; and Rich, Richard D., 4,180,640, Cl. 526-323.100.

Loeck, Harald: *See—*
Fiala, Ernst; Hofbauer, Peter; Loeck, Harald; Grundmann, Edgard; and Heitland, Herbert, 4,179,901, Cl. 62-238.000.

Lollar, Elizabeth D.: *See—*
Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,180,659, Cl. 542-427.000.

Long, Steven K. Golf putting training apparatus. 4,180,270, Cl. 273-186.00R.

Long, Wesley A., to Beckmann, Karen L. Method for forming a heat exchanger core. 4,179,781, Cl. 29-157.30R.

Longinotti, Enrico. Plant for handling cement tiles and similar articles that require a seasoning and subsequent workings. 4,180,361, Cl. 414-32.000.

Lonsdale, Alice, to Safeway Stores, Incorporated. Touch checking key tops for keyboard. 4,180,336, Cl. 400-491.300.

Lonza Ltd.: *See—*
Sencar, Drago, 4,180,447, Cl. 204-159.170.

Losert, Wolfgang: *See—*
Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Casals-Stenzel, Jorge; and Losert, Wolfgang, 4,180,570, Cl. 424-243.000.

Louth, Kenneth; and Gallo, Luigi C., to Ampex Corporation. Phase lock loop for data decoder clock generator. 4,180,701, Cl. 178-69.100.

Lovering, David G.; and Turnbull, James H., to Multicore Solders Limited. Soft soldering. 4,180,616, Cl. 428-389.000.

Lowe, Philip J.: *See—*
Buckley, Keith; Vernon, Alan; and Lowe, Philip J., 4,180,592, Cl. 426-32.000.

Lowrance, Thomas F. Apparatus for inserting sticks into articles. 4,180,198, Cl. 227-120.000.

LTG Luftechnische GmbH: *See—*
Furstenberg, Joachim, 4,180,390, Cl. 55-272.000.

Lucas, Charles. Goggles. 4,179,756, Cl. 2-434.000.

Luckenbach, Edward C., to Exxon Research & Engineering Co. Method for combusting carbon monoxide in a fluid catalytic cracking process. 4,180,454, Cl. 208-113.000.

Ludwig Heumann, & Co. GmbH: *See—*
Fritschi, Edgar; Liebenow, Walter; and Prikryl, Jaroslav, 4,180,578, Cl. 424-251.000.

Lummus Company, The: *See—*
O'Sullivan, Thomas F.; and Pollock, William H., 4,180,019, Cl. 122-235.00N.

Lundquist, Robert H. Vacuum cleaner attachment for vacuuming liquids. 4,179,769, Cl. 15-353.000.

Lundstrom, John W., to Bindicator Company. Method and apparatus for sampling and measuring a characteristic of flowing granular material. 4,180,331, Cl. 356-445.000.

Lupke, Gerd P. H.; and Lupke, Manfred A. A. Apparatus and method for perforating tubing and method of producing part of such apparatus. 4,180,357, Cl. 409-131.000.

Lupke, Manfred A. A.: *See—*
Lupke, Gerd P. H.; and Lupke, Manfred A. A., 4,180,357, Cl. 409-131.000.

Lutz, Kenneth V. Tungsten carbide impregnator. 4,180,719, Cl. 219-125.120.

Lutzenberger, Kurt; Bailey, James R.; and Hybl, James M., to Switchcraft, Inc. Slide switch. 4,180,712, Cl. 200-16.00D

Luybli, Richard E.: *See—*
Hvizdos, Leonard J.; Filippi, Richard E.; and Luybli, Richard E., 4,179,897, Cl. 62-9.000.

M. Lowenstein & Sons, Inc.: *See—*
Hance, Charles M.; and Martin, Charles D., 4,180,606, Cl. 428-88.000.

M. W. Dunton Company: *See—*
Thompson, Floyd A., Jr., 4,180,419, Cl. 148-23.000.

MacFee, Norman W., to Textron Inc. Method of forming a bottom stop on a slide fastener. 4,179,787, Cl. 29-408.000.

Machinami, Tomoya: *See—*
Suami, Tetsuo; Machinami, Tomoya; and Hisamatsu, Takashi, 4,180,655, Cl. 536-17.00R.

Mack Trucks, Inc.: *See—*
Taylor, Joe N., 4,180,027, Cl. 123-41.350.

MacLaury, Michael R., to General Electric Company. Dehydrochlorination of a dihydroxydiphenyl trichloroethane. 4,180,685, Cl. 568-726.000.

MacLean, Donald L.: *See—*
Graham, Tommy E.; and MacLean, Donald L., 4,180,388, Cl. 55-16.000.
Graham, Tommy E.; and MacLean, Donald L., 4,180,552, Cl. 423-359.000.

Maclean, Robert D., to National Distillers and Chemical Corporation. Antiblock system and process aid for vulcanized vinyl acetate ethylene copolymers. 4,180,490, Cl. 260-23.00R.

Madison Ltd.: *See—*
Ho, Yin F., 4,179,843, Cl. 46-126.000.

Maeda, Yoshio; Matsumoto, Koichi; and Kamitake, Seigo, to Hitachi, Ltd. Spectrophotometers with digital processing. 4,180,327, Cl. 356-320.000.

Maeder, Edward G., to National Can Corporation. Domer assembly for ironing machine. 4,179,909, Cl. 72-45.000.

Maegawa, Muneo: *See—*
Takagi, Nobuho; Maegawa, Muneo; and Nii, Katsutoshi, 4,180,273, Cl. 277-154.000.

Mageli, Orville L.; and Swarts, William A., to Pennwalt Corporation. Peroxy compounds. 4,180,518, Cl. 260-453.0RZ.

Magney, Herbert C. Combination dispenser-disposal cartridge for a surgical blade. 4,180,162, Cl. 206-363.000.

Magnussen, Haakon T., Jr., to Altex Scientific, Inc. Liquid chromatography pump. 4,180,375, Cl. 417-22.000.

Mahan, John E.: *See—*
Fahey, Darryl R.; and Mahan, John E., 4,180,525, Cl. 585-523.000.

Maier, Michael W.; and Polzin, James J., to Malleable Iron Range Company. Furnace. 4,180,051, Cl. 126-77.000.

Maiocchi, Luigi Radial tires. 4,180,116, Cl. 152-362.00R.

Makhlouf, Joseph M.; and Porter, Samuel, Jr., to PPG Industries, Inc. Crosslinked acrylic polymer microparticles. 4,180,619, Cl. 526-202.000.

Malinowski, William J., to Chloride Incorporated. Detector with supervisory signal from monitor cell. 4,180,742, Cl. 250-574.000.

Mallams, Alan K.; and Davies, David H., to Schering Corporation. 1-N-substituted derivatives of 4,6-di-O-(aminoglycosyl)-1,3-diaminocyclitols. 4,180,565, Cl. 424-180.000.

Malleable Iron Range Company: *See—*
Maier, Michael W.; and Polzin, James J., 4,180,051, Cl. 126-77.000.

Mallett, Raymond H. Water shutoff system. 4,180,088, Cl. 137-87.000.

Mallorca, Salvador C.: *See—*
Hoenig, James R.; and Mallorca, Salvador C., 4,180,179, Cl. 220-307.000.

Manas, Spero G.: *See—*
Bouverie, William M.; and Manas, Spero G., 4,179,922, Cl. 73-116.000.

Mancini, William L.; Korb, Donald R.; and Refojo, Miguel F., to Syntex (USA) Inc. Contact lens. 4,180,308, Cl. 351-160.00H.

Manners, David E.: *See—*
Sullivan, John B.; Marsh, David R.; Osofsky, Raymond C.; Bryan, Steven R.; Fahey, William D.; and Manners, David E., 4,179,823, Cl. 35-10.240.

Mannesmann Aktiengesellschaft: *See—*
Ridder, Gerhard; and Schafer, Wilhelm, 4,179,887, Cl. 60-420.000.

Mansmann, Manfred, to Bayer Aktiengesellschaft. Thermally stable quartz glass. 4,180,409, Cl. 106-39.600.

Mantle, Harold: *See—*
Smith, Ulf K. H.; Lindstrom, Jan N.; and Mantle, Harold, 4,180,400, Cl. 75-235.000.

Marchant, David D., to United States of America, Energy. Ceramic component for electrodes. 4,180,484, Cl. 252-521.000.

Marchant, Wayne N.; and Brooks, Parkman T., to United States of America, Interior. Resin for sorption of tungsten. 4,180,628, Cl. 521-39.000.

Marcilly, Christian, to Institut Francais du Petrole. New preparation process of a catalyst for converting aromatic hydrocarbons. 4,180,693, Cl. 585-475.000.

Marinoff, Gerald P. Ophthalmological surgical instrument. 4,180,075, Cl. 128-305.000.

Mark, Victor, to General Electric Company. Polycarbonate composition having resistance to high heat distortion. 4,180,651, Cl. 528-202.000.

Marquis, Edward T.; and Yeakey, Ernest L., to Texaco Development Corp. Polyurethane chain-extenders. 4,180,644, Cl. 528-68.000.

Mars Limited: *See—*
Buckley, Keith; Vernon, Alan; and Lowe, Philip J., 4,180,592, Cl. 426-32.000.

Marsh, David R., to Singer Company, The. Simulation of an object system formed by polygon faces having a series of fundamental shapes and dimension. 4,179,824, Cl. 35-10.240.

Marsh, David R.: *See—*
Sullivan, John B.; Marsh, David R.; Osofsky, Raymond C.; Bryan, Steven R.; Fahey, William D.; and Manners, David E., 4,179,823, Cl. 35-10.240.

Marsh, Ronald W.: *See—*
Gutridge, Jack E.; and Marsh, Ronald W., 4,179,996, Cl. 105-345.000.

Marshall, Neal H., to Bose Corporation. Loudspeaker porting. 4,180,140, Cl. 181-156.000

Marshall, Sidney; and Zeto, Robert J., to United States of America, Army. Low temperature CMOS/SOS process using dry pressure oxidation. 4,179,792, Cl. 29-571.000.

Martin, Charles D.: *See—*
Hance, Charles M.; and Martin, Charles D., 4,180,606, Cl. 428-88.000.

Martt, Judson W., to National Steel Corporation. Metal strip tensioning apparatus for use in continuous strip reduction cold mill and method. 4,179,913, Cl. 72-205.000.

Martucci, Frank. Time variable thermostat. 4,180,789, Cl. 337-301.000.

Masaki, Hideyuki, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Method for producing a silicon nitride base sintered body. 4,180,410, Cl. 106-73.200.

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Caspers, Karl-Heinz, 4,180,396, Cl. 75-53.000.

Mason, Donald R., to Harris Corporation. Heteroepitaxial deposition of GaP on silicon substrates. 4,180,825, Cl. 357-16.000.

Masters, Harvey M., to Westinghouse Electric Corp. Programmable test point selector circuit. 4,180,203, Cl. 235-302.000.

Masuda, Bunpei: *See—*
Nomura, Susumu; Okubo, Hiroyuki; Isozaki, Hiroshi; Hara, Tsutomu; and Masuda, Bunpei, 4,179,958, Cl. 83-37.000.

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Mathews, Donald C. Animal feeder. 4,180,014, Cl. 119-52.00R.
Matjurin-Veretennikov, Leonid I.: *See*—
Popov, Alexei I.; Pepenko, Vladimir D.; Vinjukov, Jury G.; Matjurin-Veretennikov, Leonid I.; Stepanov, Vladimir M.; and Grubman, Viktor G., 4,180,156, Cl. 198-726.000.
Matsuda, Akira; Tanaka, Makoto; Murata, Junichi; Yasuda, Shigeo; and Nishino, Hiroshi, to Bridgestone Tire Company, Limited; and Mitaka Instrument Company Limited. Alarm device for informing reduction of pneumatic pressure of tire. 4,180,795, Cl. 340-58.000.
Matsumoto, Fuyuhiko; and Inokuchi, Toshiyuki, to Ricoh Company, Ltd. Multi-copying method and multi-copying apparatus. 4,180,318, Cl. 355-11.000.
Matsumoto, Kazuya: *See*—
Tateoka, Masamichi; Tsuji, Takao; Minami, Setsuo; Matsumoto, Kazuya; Kawamura, Naoto; and Minoura, Kazuo, 4,180,307, Cl. 350-6.500.
Matsumoto, Koichi: *See*—
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Matsumoto, Kuniaki: *See*—
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Matsumoto, Takao: *See*—
Nagata, Takeo; Satoh, Seisuke; and Matsumoto, Takao, 4,180,626, Cl. 435-144.000.
Matsumoto, Yoshio: *See*—
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Matsumura, Yasuhide: *See*—
Inoyama, Tadao; Matsumura, Yasuhide; and Nagano, Yukio, 4,179,783, Cl. 29-281.500.
Matsuoka, Kazuhiro: *See*—
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Matsushita Electric Industrial Co., Ltd.: *See*—
Kotera, Hiroaki; Tsuchiya, Hiroyoshi; Itabashi, Ryuzo; Yoshida, Kunio; Shibata, Tsutomu; Tsuda, Yukifumi; Kanno, Yoshimitsu; Hayami, Heijiro; and Sugita, Haruko, 4,180,330, Cl. 356-425.000.
Nishino, Atsushi; Sonetaka, Kazunori; Kimura, Kunio; and Watanabe, Yoshihiro, 4,180,482, Cl. 252-455.00R.
Matsushita Electric Works, Ltd.: *See*—
Yoshimura, Tadashi; Hanahara, Tohru; Abiko, Toshio; and Matsuoka, Kazuhiro, 4,180,811, Cl. 340-566.000.
Matsuzaka Company Ltd.: *See*—
Endo, Makoto, 4,180,213, Cl. 241-192.000.
Matte, Jacques R. Electrical outlet box support. 4,180,226, Cl. 248-27.100.
Matthews, Leslie C. Variable ratio crank assembly. 4,179,942, Cl. 74-43.000.
Matula, Jerry, to Printronix, Inc. Reciprocating linear drive mechanism. 4,180,766, Cl. 318-128.000.
Matuoka, Tosimitu: *See*—
Miyazaki, Hiroaki; Sakai, Yasuo; and Matuoka, Tosimitu, 4,180,041, Cl. 123-141.000.
Maurer, Gerald L.; and Shringarpurey, Sudhir K., to National Research Laboratories. Method of transporting metal ions. 4,180,473, Cl. 252-182.000.
Maurhoff, Gerhard: *See*—
Steinwart, Johannes; Maurhoff, Gerhard; Bauder, Armin; Wilmers, Gottlieb; and Pischke, Reiner, 4,180,038, Cl. 123-139.0AW.
Maxcap, Inc.: *See*—
Virog, John J., Jr.; and Von Hagel, Leo, 4,180,175, Cl. 215-252.000.
Maximenko, Vladilen I.: *See*—
Gorlin, Samuil M.; Ljubimov, Grigory A.; Bitjurin, Valentin A.; Kovbasjuk, Valentin I.; Maximenko, Vladilen I.; Medin, Stanislav A.; and Barshak, Alexandr E., 4,180,752, Cl. 310-11.000.
Maxson, Dale E., to Barber-Colman Company. Multiple heat pipe heat exchanger and method for making. 4,180,127, Cl. 165-76.000.
Maynard, Michael; and Jones, Walter, to Gestetner Limited. Pressure-sensitive duplicating stencil. 4,180,621, Cl. 428-535.000.
Maytham, Walter J., to Speed Systems, Inc. Adjustable roller cable feeding and stripping tool. 4,179,804, Cl. 30-90.700.
Mazier, Paul, to S.F.Z. Souplesse Fonctionnelle Systematique. Apparatus for manufacturing deformable expansion bellows for pipe-work. 4,179,910, Cl. 72-59.000.
McAllister, Richard L.: *See*—
Driscoll, Richard O.; Jordan, William E.; and McAllister, Richard L., 4,180,860, Cl. 364-900.000.
McBride, Jerald R.: *See*—
Graham, Robert H.; and McBride, Jerald R., 4,179,866, Cl. 53-468.000.
McCain Manufacturing Co.: *See*—
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Mc Cain, Willam B.: *See*—
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McCarthy, Cornelius J. D.: *See*—
Morton, Roger R. A.; and McCarthy, Cornelius J. D., 4,180,831, Cl. 358-160.000.
McClenny, Carl O. Freezers. 4,179,904, Cl. 62-342.000.
McClung, Harold A.: *See*—
Thomas, Harold A., 4,179,834, Cl. 43-57.50R.
McClure, James D., to Shell Oil Company. Isoparaffin alkylation process using an unsupported perfluorinated polymer catalyst. 4,180,695, Cl. 585-730.000.
McCollough, John D., to Delta Microfilm. Photographic apparatus for use in making printing plates. 4,180,320, Cl. 355-54.000.
McCombie, Alan K.; and Temple, Stephen, to Cambridge Consultants of Bar Hill. Web transport mechanism and method. 4,180,194, Cl. 226-113.000.
McCombie, Jay C.: *See*—
Khair, Magdi K.; and McCombie, Jay C., 4,180,022, Cl. 123-32.0AE.
McCormack, William B.; and Sandy, Charles A., to Du Pont de Nemours, E. I., and Company. Hexacoordinated transition metal compounds containing at least one polyfluoroalkyl substituent. 4,180,386, Cl. 44-63.000.
McCowan, Lida L. Device for treating swollen surface areas on horses and the like. 4,180,077, Cl. 128-402.000.
McCullough, John F.; Phillips, John F., Jr.; and Tate, Leslie R., to Tennessee Valley Authority. Uranium recovery from wet-process phosphoric acid. 4,180,545, Cl. 423-8.000.
McDermott, Julian A.; and McDermott, Kevin. Mount for vehicular warning lights. 4,180,010, Cl. 116-209.000.
McDermott, Kevin: *See*—
McDermott, Julian A.; and McDermott, Kevin, 4,180,010, Cl. 116-209.000.
McDonnell Douglas Corporation: *See*—
Byrd, Norman R., 4,180,442, Cl. 204-14.00N.
McGean Chemical Company, Inc.: *See*—
Jameson, Melvin N.; and Krulik, Gerald A., 4,180,480, Cl. 252-429.00R.
McIntire, Floyd C.: *See*—
Patterson, Roy; and McIntire, Floyd C., 4,180,562, Cl. 424-91.000.
McKechnie, John C., to United States of America, Navy. Terrain contour tracking system. 4,179,919, Cl. 73-37.500.
McMurchie, Thomas. Squiggle game. 4,180,271, Cl. 273-275.000.
McNally, George S., to Pullman Incorporated. Center filler for railway vehicle. 4,180,001, Cl. 105-420.000.
McPherson, Robert: *See*—
Hsu, William W.; and McPherson, Robert, 4,180,243, Cl. 251-234.000.
McRae, Wayne A., to Ionics Inc. Apparatus for treating whey. 4,180,451, Cl. 204-301.000.
McShane, Lawrence J.: *See*—
Cooper, Robin D. G.; Koppel, Gary A.; and McShane, Lawrence J., 4,180,507, Cl. 260-245.400.
McWhirter, John A. Valve lock assembly. 4,180,030, Cl. 123-90.670.
MDT Instrument Company: *See*—
Runnells, Robert R.; and Schmoegner, John C., 4,179,813, Cl. 433-79.000.
Meacham, G. B. Kirby: *See*—
Roth, Carl W.; Groth, Hugh F.; and Meacham, G. B. Kirby, 4,180,366, Cl. 414-540.000.
Mead Corporation, The: *See*—
Clement, Joseph J., 4,180,003, Cl. 108-144.000.
Wood, Prentice J., 4,180,191, Cl. 224-45.0BA.
Mechler, Helmut: *See*—
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Medin, Stanislav A.: *See*—
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Medtronic, Inc.: *See*—
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Mego Corp.: *See*—
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Meiners, Brigitte: *See*—
Kleinschmit, Peter; Walter, Eberhard; Mechler, Helmut; Theis, Gunter; and Meiners, Brigitte, 4,180,684, Cl. 568-726.000.
Meinken, Bernhard, to Friedrich Wilhem, Schwing GmbH. Rotary tower crane for construction purposes with a distributor device for concrete. 4,180,170, Cl. 212-1.000.
Meisner, Alfred; and Gerum, Erich, to DIEHL, Firma. Automatic control for an adjustable member. 4,180,087, Cl. 137-78.000.
Melody, David P.; Doherty, Daniel A.; O'Grady, John F.; and Rich, Richard D., to Loctite Corporation. Accelerator for curable acrylic ester compositions. 4,180,640, Cl. 526-323.100.
Mencacci, Samuel A., to FMC Corporation. Low liquid volume retort system. 4,179,986, Cl. 99-359.000.
Merkl, George G., to Merkl Technology, Inc. Electrolytic methods employing graphitic carbon cathodes and inorganic complexes produced thereby. 4,180,444, Cl. 204-90.000.
Merkl Technology, Inc.: *See*—
Merkl, George G., 4,180,444, Cl. 204-90.000.
Merrell Toraude et Compagnie: *See*—
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Metallgesellschaft Aktiengesellschaft: *See*—
Rudolph, Paul, 4,180,387, Cl. 48-206.000.
Metcalf, Brian W.; and Jung, Michel, to Merrell Toraude et Compagnie. α-Ethynyl tryptophanes. 4,180,509, Cl. 260-326.14T.

Meyer, Rolf: *See*—
Koch, Carl; and Meyer, Rolf, 4,180,314, Cl. 354-159.000.
Michaels, Alan S., to Alza Corporation. Device for delivering drug to biological environment. 4,180,073, Cl. 128-260.000.
Michaud, Andre, to Transac - Compagnie pour le Developpement des Transactions Automatiques. Magnetic coding method. 4,180,837, Cl. 360-18.000.
Michels, Fausto, to Lamere S.A. Window display support for finger rings. 4,180,169, Cl. 211-13.000.
Michne, William F., to Sterling Drug Inc. 2-Azabicyclo[2.2.2]oct-5-enes. 4,180,667, Cl. 546-112.000.
Mielke, Dennis L., to American Can Company. Apparatus for the deposition of dry fibers on a foraminous forming surface. 4,180,378, Cl. 425-83.100.
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Milliken, Ralph A., Wall, Terence D.; and Boelens, Martin, to Vital Signs, Inc. Safety interface and valve for anesthesia gas scavenging, 4,180,066, Cl. 128-205.240.
Mills, Duane M.: *See*—
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Mills, William R., Jr.: *See*—
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Hampl, Edward F., Jr., 4,180,415, Cl. 136-205.000.
Minoura, Kazuo: *See*—
Tateoka, Masamichi; Tsuji, Takao; Minami, Setsuo; Matsumoto, Kazuya; Kawamura, Naoto; and Minoura, Kazuo, 4,180,307, Cl. 350-6.500.
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Mitaka Instrument Company Limited: *See*—
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Mitchell, Lawrence C., to General Electric Company. Process for recovering 2,2-bis(4-hydroxyphenyl)propane from distillation residues from the preparation thereof. 4,180,683, Cl. 568-724.000.
Mitchell, Sharon J.; and Wise, Rodney M., to Procter & Gamble Company, The. Detergent compositions for effective oily soil removal. 4,180,472, Cl. 252-162.000.
Mitsubishi Chemical Industries, Ltd.: *See*—
Mori, Takenori; Shirahama, Haruhisa; and Kurokawa, Tadashi, 4,180,588, Cl. 424-319.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Akiyoshi, Toshio; Omishi, Tsutomu; and Haikawa, Shozo, 4,179,955, Cl. 81-57.110.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Soshiki, Yoshikazu; Sugiura, Hiroshi; Onizawa, Kouzi; Togawa, Toshikatsu; Kojima, Minoru; Morikawa, Tsukio; Kurimoto, Naohiko; and Katou, Hiromitu, 4,180,448, Cl. 204-192.00C.
Mitsuda, Tadao; Iwata, Minoru; Sugiura, Masatoshi; Takada, Shigetaka; and Watanabe, Yukihiro, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Idustry Co., Ltd. Apparatus for controlling the amount of secondary air fed into an internal combustion engine. 4,179,882, Cl. 60-276.000.
Miyamoto, Yukihiko: *See*—
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Miyaoka, Shinichiro; Matsumoto, Kuniaki; and Hatakeyama, Junichi, to Hitachi, Ltd. System for controlling flow rate in pipelines. 4,180,083, Cl. 137-101.250.
Miyata, Katsuhiko; Tokutomi, Seijiro; and Nakamura, Kazuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Focal point detecting device for SLR camera. 4,180,309, Cl. 354-25.000.
Miyazaki, Hiroaki; Sakai, Yasuo; and Matuoka, Tosimitu, to Nissan Motor Company, Limited. Internal combustion engine with intake arrangement to produce swirl in combustion chamber. 4,180,041, Cl. 123-141.000.
Miyazaki, Yasushi; Suzuki, Masanori; and Kaneko, Hideaki, to Oxy Metal Industries Corporation. Post treating zinc surfaces. 4,180,406, Cl. 106-14.150.
Mizutani, Junichi: *See*—
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Givens, Wyatt W., 4,180,729, Cl. 250-265.000.
Givens, Wyatt W.; and Mills, William R., Jr., 4,180,730, Cl. 250-265.000.
Givens, Wyatt W., 4,180,731, Cl. 250-270.000.
Moll, Norman G.; and Quarderer, George J., to Dow Chemical Company, The. Process for recovering a premium oil from a slurry produced by high temperature hydrogenation of a solid, hydrocarbonaceous fuel. 4,180,456, Cl. 208-177.000.
Mollere, John C., to Western Geophysical Co. of America. Termination fixture for a marine seismic streamer cable. 4,180,103, Cl. 138-109.000.
Monaghan, David A.: *See*—
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Monsanto Company: *See*—
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Graham, Tommy E.; and MacLean, Donald L., 4,180,388, Cl. 55-16.000.
Graham, Tommy E.; and MacLean, Donald L., 4,180,552, Cl. 423-359.000.
Null, Harold R.; and Perry, Eli, 4,180,553, Cl. 423-359.000.
Tokas, Edward F., 4,180,486, Cl. 260-4.0AR.
Montanio, Louis P. Tooth cleaning device. 4,179,814, Cl. 433-99.000.
Montedison S.p.A.: *See*—
Caporiccio, Gerardo; Bargigia, Gianangelo; and Guidetti, Giampiero, 4,180,639, Cl. 526-243.000.
Montoya, Allan. Ski attachment. 4,180,275, Cl. 280-11.37E.
Moog, Robert A., to Norlin Industries, Inc. Distortion sound effects circuit. 4,180,707, Cl. 179-1.00M.
Moore, Archie S. Multi-directional transfer device. 4,180,150, Cl. 198-366.000.
Moore, Donald J. Fluid flow controller. 4,180,099, Cl. 137-624.200.
Moore, John A.: *See*—
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Moore, William A., and Przirembel, Hans R., to United Technologies Corporation. Turbine blade. 4,180,373, Cl. 416-97.00R.
Mori, Takenori; Shirahama, Haruhisa; and Kurokawa, Tadashi, to Mitsubishi Chemical Industries, Ltd. Immunosuppressant. 4,180,588, Cl. 424-319.000.
Morikawa, Akira; Narita, Yoshinori; and Mizutani, Junichi, to NGK Spark Plug Co., Ltd. Method of making ceramic shaped article from inorganic raw material powder by extrusion molding. 4,180,538, Cl. 264-63.000.
Morikawa, Tsukio: *See*—
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Morin, Fernand; and Spector, George. Ring toss game. 4,180,266, Cl. 273-100.000.
Morita, Lawrence H.: *See*—
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Moritani, Nakanobu, to Kabushiki Kaisha Seikosha. Controlling device for grinding piezo-electric element. 4,179,853, Cl. 51-165.00R.
Moriya, Kazuo, to Falk, Richard A. Pneumatic metal sampler. 4,179,931, Cl. 73-425.600.
Moriyama, Masakazu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Digital clock for motor vehicles. 4,179,876, Cl. 58-50.00R.
Morrison, Charles F., Jr., to Vac-Tec Systems, Inc. Planar magnetron sputtering device. 4,180,450, Cl. 204-298.000.
Morton, Roger R. A.; and McCarthy, Cornelius J. D., to Bausch & Lomb Incorporated. Image analysis data extraction. 4,180,831, Cl. 358-160.000.
Morup, Poul, to Alex Grosman A/S. Control circuit for an A.C. discharge lamp. 4,180,764, Cl. 315-283.000.
Moser, Kurt: *See*—
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Moss, Philip H.; and Nieh, Edward C. Y., to Texaco Development Corp. Acrylamide or methacrylamide quaternary compounds. 4,180,643, Cl. 528-52.000.
Motion Control, Incorporated: *See*—
Jacobsen, Stephen C.; Stephen, Robert L.; and Hansen, Peter, 4,180,068, Cl. 128-214.00R.
Motorola, Inc.: *See*—
Cicatelli, Rodolfo, 4,180,836, Cl. 360-130.320.
Henrickson, David L.; Kaiser, John J.; Koehn, William C.; and Raven, David P., 4,180,161, Cl. 206-328.000.
Motz, Herbert; Schneider, Norbert; Hartmann, Hans-Joerg; and Baur, Reinhold, to BASF Aktiengesellschaft. Manufacture of magnetic recording media. 4,180,597, Cl. 427-48.000.
Muchow, John D., to Valve Concepts International, Inc. Valve actuator having a rotary bi-directional apparatus with a dual ratchet mechanism. 4,180,238, Cl. 251-58.000.
Mueller, Paul; and Prine, Ray A., to Paul Mueller Company. Hot water system and condensing unit therefor. 4,179,902, Cl. 62-238.000.
Muller, Alois. Trap door for vending machine. 4,180,183, Cl. 221-194.000.
Mullett, Charles E.: *See*—
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Multicore Solders Limited: *See*—
Lovering, David G.; and Turnbull, James H., 4,180,616, Cl. 428-389.000.

Mumford, Robin B.: *See*—
Li, Hsin L.; Oswald, Hendrikus J.; and Mumford, Robin B., 4,180,214, Cl. 242-47.000.

Muncheryan, Hrand M. Silent awakening system. 4,180,810, Cl. 340-407.000.

Munekata, Kenichi; Ohta, Takeshi; and Ohshima, Susumu, to Toyoda Koki Kabushiki Kaisha. Grinding machine with rest apparatus. 4,179,854, Cl. 51-165.770.

Murakami, Ryoichi: *See*—
Oka, Shoji; Murakami, Ryoichi; and Sueyoshi, Akiko, 4,180,417, Cl. 148-6.15Z.

Muranaka, Shigeo; Ochiai, Kokichi; and Waku, Makio, to Nissan Motor Company, Limited. Method and system for controlling ignition spark timing of an internal combustion engine of the multiple plugs type. 4,180,031, Cl. 123-117.00A.

Murata, Junichi: *See*—
Matsuda, Akira; Tanaka, Makoto; Murata, Junichi; Yasuda, Shigeo; and Nishino, Hiroshi, 4,180,795, Cl. 340-58.000.

Murphy, John B., to Hewlett-Packard Company. Electrode assembly for sensing heart activity. 4,180,080, Cl. 128-642.000.

Murry, Edward J.; and Brumbach, Joseph F., to Fibra-Sonics, Inc. Device and method for applying precise irrigation, aspiration, medication, ultrasonic power and dwell time to biotissue for surgery and treatment. 4,180,074, Cl. 128-276.000.

Murty, Vabilisetti S., to Sherwood Medical Industries Inc. Fluid collection device with phase separation means. 4,180,465, Cl. 210-516.000.

Nacci, George R.; and Pazos, Jose F., to Du Pont de Nemours, E. I., and Company. Photohardenable films having high resolution containing nitroso dimers. 4,180,403, Cl. 430-281.000.

Nachfolger, Solomon J.: *See*—
Kaplan, Murray A.; Granatek, Alphonse P.; and Nachfolger, Solomon J., 4,180,658, Cl. 544-27.000.

Nagano, Yukio: *See*—
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Nagata, Takeo; Satoh, Seisuke; and Matsumoto, Takao, to Showa Oil Co., Ltd. Process for manufacturing citric acid from olefins by fermentation. 4,180,626, Cl. 435-144.000.

Nagata, Wataru: *See*—
Narisada, Masayuki; and Nagata, Wataru, 4,180,571, Cl. 424-248.520.

Nagatomo, Muneshige: *See*—
Shimokawa, Kenji; Nagatomo, Muneshige; and Tanaka, Yasuo, 4,179,895, Cl. 62-2.000.

Naito, Makoto; and Kasami, Akinobu, to Tokyo Shibaura Electric Co., Ltd. Method of manufacturing red light-emitting gallium phosphide device. 4,180,423, Cl. 148-171.000.

Naito, Takashi: *See*—
Hobo, Nobuhito; Suzuki, Yutaka; Naito, Takashi; and Konishi, Yoshimune, 4,180,037, Cl. 123-139.00E.

Nakada, Akira: *See*—
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Okumura, Takatoshi, 4,179,972, Cl. 84-1.110

Nakada, Minoru: *See*—
Watanabe, Masakatsu; Nakada, Minoru; and Takeuchi, Takeshi, 4,180,804, Cl. 340-310.00R.

Nakagawa, Yasuharu, to Topla, Ltd. Marble-patterned bathtub, basin or sink. 4,179,760, Cl. 4-166.000.

Nakamoto, Kisaburo. Solderless bell and method of forming a solderless bell. 4,180,008, Cl. 116-170.000.

Nakamura, Kazuo: *See*—
Miyata, Katsuhiko; Tokutomi, Seijiro; and Nakamura, Kazuo, 4,180,309, Cl. 354-25.000.

Nakamura, Masaaki: *See*—
Iwaki, Hiroshi; and Nakamura, Masaaki, 4,180,376, Cl. 417-360.000.

Nakamura, Noriniko: *See*—
Sanda, Shougo; Nakamura, Noriniko; and Tanahashi, Toshio, 4,180,044, Cl. 123-191.00S.

Nakamura, Takaharu: *See*—
Hamano, Sachiyuki; and Nakamura, Takaharu, 4,180,577, Cl. 424-251.000.

Nakano, Masao, to General Research of Electronics, Inc. Dipole antenna structure. 4,180,819, Cl. 343-792.000.

Nakazawa, Hiroshi: *See*—
Koizumi, Akio; Nakazawa, Hiroshi; and Ohsawa, Mitsuo, 4,180,852, Cl. 363-49.000.

Nanini, Antoine, to Societe Igman. Detachable blade for cutting tool. 4,180,355, Cl. 407-113.000.

Naoki, Matsuo: *See*—
Kazuo, Yamashita; Koji, Kuroyanagi; and Naoki, Matsuo, 4,180,590, Cl. 426-18.000.

Narisada, Masayuki; and Nagata, Wataru, to Shionogi & Co., Ltd. Arylmalonamido-1-oxadethiacephalosporins. 4,180,571, Cl. 424-248.520.

Narita, Yoshinori: *See*—
Morikawa, Akira; Narita, Yoshinori; and Mizutani, Junichi, 4,180,538, Cl. 264-63.000.

National Can Corporation: *See*—
Maeder, Edward G., 4,179,909, Cl. 72-45.000.

National Distillers and Chemical Corporation: *See*—
Maclean, Robert D., 4,180,490, Cl. 260-23.00R.

National Research Development Corporation: *See*—
Bennett, Simon D.; and Ash, Eric A., 4,179,936, Cl. 73-606.000.
Lee, Alan J. C.; and Ling, Robin S. M., 4,180,254, Cl. 269-328.000.
Smith, Kenneth C. A.; and Tee, William J., 4,180,738, Cl. 250-396.0ML.

National Research Laboratories: *See*—
Maurer, Gerald L.; and Shringarpurey, Sudhir K., 4,180,473, Cl. 252-182.000.

National Service Industries, Inc.: *See*—
Cosby, Billy Q., 4,180,340, Cl. 402-63.000.

National Steel Corporation: *See*—
Martt, Judson W., 4,179,913, Cl. 72-205.000.

Naylor, David, to British Steel Corporation. Machinable steel. 4,180,397, Cl. 75-58.000.

NCR Corporation: *See*—
Armstrong, Rolfe D.; and Lang, Charles R., Jr., 4,180,861, Cl. 364-900.000.
Speraw, Floyd G., 4,179,791, Cl. 29-526.00R.

Neagu, Petre: *See*—
Popp, Valer V.; Suditu, Ion; Neagu, Petre; Fotescu, Leonida; Mihalache, Ion; and Tirboiu, Dumitru, 4,180,457, Cl. 208-188.000.

Neale, Christopher V.: *See*—
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Neel, Jean; and Violland, Robert, to Rhone-Poulenc Industries. Process for obtaining and product acrylic monomers useful in the preparation of cationic flocculants. 4,180,519, Cl. 260-459.00A.

Neff, Joseph J., deceased; and by Neff, Lucille D., executrix, to Bell & Howell Company. Information reproducing apparatus. 4,180,839, Cl. 360-71.000.

Neff, Lucille D., executrix: *See*—
Neff, Joseph J., deceased; and Neff, Lucille D., executrix, 4,180,839, Cl. 360-71.000.

Neiman S.A.: *See*—
Lipschutz, Paul, 4,179,789, Cl. 29-412.000.
Schaumburg, Gunter, 4,179,908, Cl. 70-185.000.

Neisler, Boyd L.; and Stith, Joe D., to Coburn Optical Industries, Inc. Apparatus for edging ophthalmic lenses. 4,179,851, Cl. 51-101.0LG.

Nelson, Donald J.; Pistorese, Denis J.; and Weisbach, Michael F., to Boeing Company, The. Frequency modulated electrical discharge laser. 4,180,784, Cl. 331-94.5PE.

Nerath, Gustav J.: *See*—
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Newingham, Thomas D.; Reechuite, Alexander D., Griffith, John Q., III; and Haseltine, Marcus W., Jr., to Sun Ventures, Inc. Method of lubrication of a controlled-slip differential. 4,180,466, Cl. 252-48.600.

Newton, George M.: *See*—
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NGK Spark Plug Co., Ltd.: *See*—
Morikawa, Akira; Narita, Yoshinori; and Mizutani, Junichi, 4,180,538, Cl. 264-63.000.

Nickl von Nikelsberg, Karl F.: *See*—
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Nieh, Edward C. Y.: *See*—
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Niggemeier, Joseph F.; and Yeates, Richard P., to ACF Industries, Incorporated. Head insert for railway trailer hitch. 4,179,998, Cl. 410-64.000.

Nii, Katsutoshi: *See*—
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Ninomiya, Michikazu: *See*—
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Nippon Electric Company, Ltd.: *See*—
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Nippon Gakki Seizo Kabushiki Kaisha: *See*—
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Nippon Oil Co., Ltd.: *See*—
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Nippon Oil Seal Industry Co., Ltd.: *See*—
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Nippon Paint Co., Ltd.: *See*—
Oka, Shoji; Murakami, Ryoichi; and Sueyoshi, Akiko, 4,180,417, Cl. 148-6.15Z.

Nippon Shokubai Kagaku Kogyo Co. Ltd.: *See*—
Wada, Masahiro; Ueshima, Michio; Yanagisawa, Isao; and Ninomiya, Michikazu, 4,180,678, Cl. 562-534.000.

Nippon Soken, Inc.: *See*—
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Nippon Telegraph & Telephone Public Corporation: *See*—
Komori, Kazuaki; and Kaiyoh, Hirofumi, 4,180,798, Cl. 340-146.30H.

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Nippondenso Co., Ltd.: *See*—
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Kobayashi, Akio; Endo, Kunio; and Omori, Norio, 4,180,023, Cl. 123-32.0EA.

Nishikawa, Masaru; Numakura, Toshihiko; and Hirai, Jun, to Sony Corporation. Apparatus and method for reproducing video signals. 4,180,833, Cl. 360-21.000.

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Nishiwaki, Koji: *See*—
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Nishiyama, Takahiko; and Haga, Kenji, to Nippon Oil Seal Industry Co., Ltd. Reed valve assembly. 4,179,883, Cl. 60-293.000.

Nissan Chemical Industries Ltd.: *See*—
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Nissan Motor Company, Limited: *See*—
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Endo, Hiroshi; and Fujiki, Norio, 4,180,816, Cl. 343-7.0VM
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Nixon, Roy A., Jr., to Corning Glass Works. Sealed beam lamp including filament locating means. 4,180,755, Cl. 313-113.000

Nogami, Sumitaka; Matsumoto, Yoshio; Waki, Keiichi; and Okada, Tooru, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyester type powder coating composition. 4,180,652, Cl. 525-437.000

Nogami, Tomoyuki: *See*—
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Noguchi, Masaaki; Tanaka, Yukiyasu; and Tanaka, Taro, to Nippon Soken, Inc. Fuel injection system for an internal combustion engine 4,180,039, Cl. 123-139.0AW

Nomura, Susumu; Okubo, Hiroyuki; Isozaki, Hiroshi; Hara, Tsutomu; and Masuda, Bunpei, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Method for shearing hot strips and device therefor. 4,179,958, Cl. 83-37.000

Nomura, Yoshihisa: *See*—
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Norlin Industries, Inc.: *See*—
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Norris, Curtis; and Scott, Delmer D., to Norris, Curtis. Simulated spoke wheel structure. 4,180,293, Cl. 301-54.000.

North American Philips Corporation: *See*—
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Northland Group, Inc., The: *See*—
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Notelteirs, Victor R.; and Rijckaert, Josephus F., to U.S. Philips Corporation. Capless electric incandescent lamp. 4,180,758, Cl. 313-318.000.

Nowak, Manfred: *See*—
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Nozaki, Kenzie, to Shell Oil Company. Production of 1,7-octadiene from butadiene. 4,180,694, Cl. 585-511.000.

Nozawa, Shiyozo; Hokari, Saburo; and Yamaga, Shigeru, to Ricoh Company, Ltd. Automatic film winding apparatus for use with cameras. 4,180,315, Cl. 354-170.000.

NPI Corporation: *See*—
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Nudelman, Abraham; and Patchornik, Abraham, to Yeda Research and Development Co. Ltd. Cephalosporin derivatives. 4,180,660, Cl. 544-28.000.

Nudelman, Abraham: *See*—
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Null, Harold R.; and Perry, Eli, to Monsanto Company. Process for hydrogen recovery from ammonia purge gases. 4,180,553, Cl. 423-359.000.

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Obermaier, Frank E., to Eaton Corporation. Temperature limiting shower control valve. 4,180,208, Cl. 236-93.00B

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Ochmann, Rudolf, to U.S. Philips Corporation. Control device, particularly for controlling the emission current of an X-ray tube. 4,180,761, Cl. 315-292.000.

Odone, Giovanni; and Cochard, Roland, to Robert Bosch GmbH. Regenerative method and apparatus to control an elastic reset torque in movable apparatus. 4,180,774, Cl. 324-125.000

Oertle, Donald H.; and Peterson, Marvin L., to Conoco, Inc. Structural failure detection method. 4,179,940, Cl. 73-808.000.

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Oiwa, Shigeo. Device for withdrawing injection solution. 4,180,071, Cl. 128-218.00N

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Okada, Takanori: *See*—
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Oki Electric Industry Co., Ltd.: *See*—
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Okumura, Haruhiko; and Kanaya, Masanori, to Sony Corporation. Magnetic erasing head with gaps utilizing high flux density and high permeability. 4,180,835, Cl. 360-118.000.

Okumura, Takatoshi: *See*—
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Olsson, Robert G.; and Turkdogan, Ethem T., to United States Steel Corporation. Desulfurization of hot reducing gas. 4,180,549, Cl. 423-230.000.

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Onishi, Sigeru, to Toyota Jidosha Kogyo Kabushiki Kaisha. 2-Cycle engine of an active thermoatmosphere combustion. 4,180,029, Cl. 123-73.00A.

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Osanai, Akira, to Olympus Optical Company Ltd. Head mounting device for tape recorder. 4,180,834, Cl. 360-109.000.

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Otsuka, Nobuyuki; Hirai, Seiichi; and Sogabe, Motoshige, to Honda Giken Kogyo Kabushiki Kaisha. Slidable type constant velocity universal joint. 4,180,344, Cl. 403-57.000.

Ottosen, Gert O. Wind mills. 4,180,369, Cl. 415-2.000.

Oustin, Georges; and Krumm, Helmut, to Saint-Gobain Industries. Process and apparatus for making multiply sheets. 4,180,426, Cl. 156-104.000.

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Parikh, Prakash D., to Olin Corporation. Modification of leaded brasses to improve hot workability. 4,180,398, Cl. 75-157.500.

Park, Donald M.; and Eiber, Robert J., to Northern Border Pipeline Company. Out of contact highly geometrical crack arrestor. 4,180,104, Cl. 138-172.000.

Parkin, Sidney J., to Ever Ready Company (Great Britain) Limited, The. Pedal cycle headlamp. 4,180,849, Cl. 362-72.000.

Partee Products: *See*—
White, Wesley C., 4,179,973, Cl. 84-402.000.

Pascard, Roger: *See*—
Anav, Maurice; Chesne, Andre; Leseur, Andre; Miquel, Pierre; and Pascard, Roger, 4,180,476, Cl. 252-301.10W.

Pasternack, Adalbert, to Dragerwerk Aktiengesellschaft. Throttling device for fluids. 4,180,235, Cl. 251-8.000.

Patchornik, Abraham: *See*—
Haviv, Fortuna; Nudelman, Abraham; and Patchornik, Abraham, 4,180,661, Cl. 544-29.000.
Nudelman, Abraham; and Patchornik, Abraham, 4,180,660, Cl. 544-28.000.

Patel, Rashmikant. Fireplace energy retriever. 4,180,053, Cl. 126-132.000.

Patterson, Roy, and McIntire, Floyd C., to Northwestern University; and Abbott Laboratories. Glutaraldehyde polymerized ragweed antigen E preparation for treatment of allergic patients sensitive to ragweed pollen. 4,180,562, Cl. 424-91.000.

Patthey, Michel, to Edouard Dubied & Cie. (Societe Anonyme). Knitting method and apparatus. 4,179,906, Cl. 66-128.000.

Pauchard, Jean-Paul: *See*—
Siegrist, Adolf E.; Pauchard, Jean-Paul; and De Sousa, Bernardo, 4,180,479, Cl. 252-301.240.

Paul, Donald G., to Envirochem Inc. Isolation and concentration of sample prior to analysis thereof. 4,180,389, Cl. 55-28.000.

Paul Mueller Company: *See*—
Mueller, Paul; and Prine, Ray A., 4,179,902, Cl. 62-238.000.

Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, to Stahlwerke Peine-Salzgitter A.G. Method of making a steel wire adapted for cold drawing. 4,180,418, Cl. 148-12.400.

Pauze, Denis R.; and Pucci, Donald G., to General Electric Company. Hydantoin-polyester coating compositions. 4,180,612, Cl. 528-289.000.

Pazos, Jose F.: *See*—
Nacci, George R.; and Pazos, Jose F., 4,180,403, Cl. 430-281.000.

Peabody, Frederick H., Jr., to General Signal Corporation. Preparing insulated wire for cutting and stripping. 4,179,903, Cl. 62-322.000.

Peabody International Corporation: *See*—
Herpich, William A.; and Palmer, George W., 4,180,365, Cl. 414-525.000.

Peck, Richard O., to Coors Container Company. Powder spray apparatus and method for coating interior surface of containers. 4,180,844, Cl. 361-226.000.

Pecoraro, Ralph R.: *See*—
Schulz, William J.; Pecoraro, Ralph R.; and Hogan, Gerard T., 4,180,125, Cl. 165-48.000.

Pellaton, Roy C. Pasta noodle packaging apparatus and method. 4,179,865, Cl. 53-435.000.

Pennwalt Corporation: *See*—
Mageli, Orville L.; and Swarts, William A., 4,180,518, Cl. 260-453.0RZ.
Sandler, Stanley R., 4,180,495, Cl. 260-45.75K.

Penzek, Hans-Jurgen: *See*—
Lobbe, Armin; and Penzek, Hans-Jurgen, 4,180,291, Cl. 299-34.000.

Pepenko, Vladimir D.: *See*—
Popov, Alexei I.; Pepenko, Vladimir D.; Vinjukov, Jury G.; Matjurin-Veretennikov, Leonid I.; Stepanov, Vladimir M.; and Grubman, Viktor G., 4,180,156, Cl. 198-726.000.

Perrin, Pierre; Hegar, Gert; Siegrist, Gerald; Seiler, Herbert; and Horn, Ulrich, to Ciba-Geigy Corporation. Process for improving the color yield and fastness properties of dyeings produced with anionic dyes on cellulose fibre material and cationic fibre-reactive compounds. 4,180,664, Cl. 544-194.000.

Perry, Eli: *See*—
Null, Harold R.; and Perry, Eli, 4,180,553, Cl. 423-359.000.

Perry Equipment Co.: *See*—
Perry, Marney D., Jr.; and Graff, Robert A., 4,180,391, Cl. 55-324.000.

Perry, Marney D., Jr.; and Graff, Robert A., to Perry Equipment Co. Gas particulate separator with scavenging gas separation device. 4,180,391, Cl. 55-324.000.

Persson, Erik A., to Sandvik Aktiebolag. Rock milling cutter tongue and slot connected. 4,180,292, Cl. 299-92.000.

Persson, Staffan B.; and Buhler, Rato, to American Optical Corporation. Alignment system and ophthalmic instrument incorporating the same. 4,180,323, Cl. 356-3.000.

Peters, Cornelis: *See*—
Hasker, Jan; and Peters, Cornelis, 4,179,777, Cl. 29-25.130.

Peterson, John A.: *See*—
Reed, Russell, Jr.; Peterson, John A.; and Price, Raymond M., 4,180,424, Cl. 149-19.400.

Peterson, Marvin L.: *See*—
Oertle, Donald H.; and Peterson, Marvin L., 4,179,940, Cl. 73-808.000.

Peterson, Wesley R.; and Jaffe, Wolfgang, to Singer Company, The. Electromagnetic bobbin thread supply alarm. 4,180,007, Cl. 112-278.000.

Petrolite Corporation: *See*—
Bienvenu, Joseph O.; and Jagtap, Ashvinkumar N., 4,180,408, Cl. 106-31.000.

Petrosian, Robert A.: *See*—
Chikul, Vitaly I.; Tyagunov, Boris I.; Ulanen, Yalmar S.; Chikul, Olga S.; Zeger, Karl E.; Tamarkin, Lev Z.; Petrosian, Robert A.; Chmovzh, Vadim E.; Smirnov, Alexandr S.; Polyakovskaya, Valentina I.; and Trufanov, Pavel A., 4,180,385, Cl. 44-62.000.

Petrucci, Pasquale M.: *See*—
Hanley, John P.; Petrucci, Pasquale M.; and Pfeifer, Stanley, 4,180,091, Cl. 137-238.000.

Pettis, Charles D.: *See*—
Cosgrove, John D.; Pettis, Charles D.; and Mullett, Charles E., 4,180,709, Cl. 179-2.0AM.

Pettit, John W., to International Business Machines Corporation. Detection circuit for a bi-directional, self-imaging grating detector. 4,180,704, Cl. 250-237.00G.

Pfarr, Walter L., Jr., to Anchor Post Products, Inc. Chain link fabric attaching system. 4,180,247, Cl. 256-54.000.

Pfeifer, Stanley: *See*—
Hanley, John P.; Petrucci, Pasquale M.; and Pfeifer, Stanley, 4,180,091, Cl. 137-238.000.

Pfieffer, Gerald R.: *See*—
Leavitt, David R.; and Pfieffer, Gerald R., 4,180,167, Cl. 206-622.000.

Pfister, Rudolf; Zeller, Paul; Binder, Dieter; and Hromatka, Otto, to Hoffmann-La Roche Inc. Thiazine derivatives. 4,180,662, Cl. 544-48.000.

Pfitzenmaier, Gerhard, to Siemens Aktiengesellschaft. Filter for very short electromagnetic waves. 4,180,787, Cl. 333-212.000.

Pfizer Inc.: *See*—
Crawford, Thomas C., 4,180,511, Cl. 260-343.700.
Sciavolino, Frank C., 4,180,654, Cl. 536-9.000.

Pharmachem Corporation: *See*—
Herb, John R., 4,180,567, Cl. 424-180.000.

Phelps, Donald R.: *See*—
Fallon, John J., Jr.; Blair, Joe B.; Phelps, Donald R.; and Cabeen, Robert P., III, 4,180,128, Cl. 165-76.000.

Phillips, David C.; Hickam, William M.; and Smith, James D. B., to Westinghouse Electric Corp. Multiple signal thermoparticulating coating. 4,179,926, Cl. 73-339.00R.

Phillips, John F., Jr.: *See*—
McCullough, John F.; Phillips, John F., Jr.; and Tate, Leslie R., 4,180,545, Cl. 423-8.000.

Phillips Petroleum Company: *See*—
Chapman, Charles C., 4,180,526, Cl. 585-719.000.
Dixon, Rolland E., 4,180,123, Cl. 165-1.000.
Doss, Richard C., 4,180,514, Cl. 428-417.000.
Fahey, Darryl R.; and Mahan, John E., 4,180,525, Cl. 585-523.000.
Gaines, Larry D.; and Giles, Richard F., 4,180,858, Cl. 364-502.000.
Reusser, Robert E.; and Hughes, William B., 4,180,524, Cl. 585-644.000.
Schirmer, Robert M., 4,179,880, Cl. 60-39.230.
Stapp, Paul R., 4,180,676, Cl. 560-246.000.

Photis, James M., to Stauffer Chemical Company. Process for preparing butyl-p-benzoylbenzoates. 4,180,674, Cl. 560-52.000.

Piaggio & C. S.p.A.: *See*—
Doveri, Carlo, 4,180,280, Cl. 280-277.000.

Pierce, Donald C.: *See*—
Gibson, Donald M.; and Pierce, Donald C., 4,180,407, Cl. 106-26.000.

Pigerol, Charles: *See*—
Boussely, Jean; Chandavoine, Marie-Madeleine; Chignac, Michel; Grain, Claude; and Pigerol, Charles, 4,180,492, Cl. 260-30.80R.

Piget, Maurice. Four branch spring steel jam fastener clip for assembly of open extrusions. 4,180,347, Cl. 403-405.000.

Pioneer Electronic Corporation: *See*—
Ozawa, Akio; Sakamoto, Masaharu; and Ito, Hideo, 4,180,750, Cl. 307-362.000.

Pires, H. George, to Crosspoint Latch Corp. Television signal phase matching apparatus and method. 4,180,829, Cl. 358-10.000.

Pischke, Reiner: *See*—
Steinwart, Johannes; Maurhoff, Gerhard; Bauder, Armin; Wilmers, Gottlieb; and Pischke, Reiner, 4,180,038, Cl. 123-139.0AW.

Pistoresi, Denis J.: *See*—
Nelson, Donald J.; Pistoresi, Denis J.; and Weisbach, Michael F., 4,180,784, Cl. 331-94.5PE.

Pitney Bowes Inc.: *See*—
Check, Frank T., Jr.; Eckert, Alton B., Jr.; and Warren, Joseph R., 4,180,856, Cl. 364-466.000.

Pizzolato, Giacomo: *See*—
Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,180,659, Cl. 542-427.000.

Plastic Forming Company, Inc., The: *See*—
Schurman, Peter T., 4,180,540, Cl. 264-156.000.

Platt Saco Lowell Limited: *See*—
Savageau, Richard J., 4,179,773, Cl. 19-159.00A.

Plegat, Alain E., to Societe Anonyme des Usines Chausson. Device for the regulation of the temperature of a supercharged diesel engine. 4,180,032, Cl. 123-119.0CD.

Plichta, Zdenek: *See*—
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Poclain: *See*—
Yeou, Victor, 4,179,981, Cl. 91-33.000.

Poghitsch, Reinhold: *See*—
Schwerin, Inge; Zillgitt, Ulrich; Schneider, Steffen; Kegel, Hellmut; Bodensieck, Hans-Rudolf; Zauft, Helmut; Poghitsch, Reinhold; and Grabow, Kurt, 4,180,848, Cl. 362-71.000.

Polad, Michael D.: *See*—
LaManna, Richard J.; Drillick, Jacob H.; and Polad, Michael D., 4,180,338, Cl. 400-582.000.

Polaroid Corporation: *See*—
Chiang, Yunn H., 4,180,513, Cl. 260-392.000.

Poletto, John F.: *See*—
Siuta, Gerald J.; Conrow, Ransom B.; Poletto, John F.; and Bernstein, Seymour, 4,180,587, Cl. 424-315.000.

Pollock, William H.: *See*—
O'Sullivan, Thomas F.; and Pollock, William H., 4,180,019, Cl. 122-235.00N.

Polyakovskaya, Valentina I.: *See*—
Chikul, Vitaly I.; Tyagunov, Boris I.; Ulanen, Yalmar S.; Chikul, Olga S.; Zeger, Karl E.; Tamarkin, Lev Z.; Petrosian, Robert A.; Chmovzh, Vadim E.; Smirnov, Alexandr S.; Polyakovskaya, Valentina I.; and Trufanov, Pavel A., 4,180,385, Cl. 44-62.000.

Polzin, James J.: *See*—
Maier, Michael W.; and Polzin, James J., 4,180,051, Cl. 126-77.000.

Poponiak, Michael R.: *See*—
Deines, John L.; Poponiak, Michael R.; and Schwenker, Robert O., 4,180,439, Cl. 204-1.00T.

Popov, Alexei I.; Pepenko, Vladimir D.; Vinjukov, Jury G.; Matjurin-Veretennikov, Leonid I.; Stepanov, Vladimir M.; and Grubman, Viktor G. Device for handling flaskless moulds. 4,180,156, Cl. 198-726.000.

Popp, Valer V.; Suditu, Ion; Neagu, Petre; Fotescu, Leonida; Mihalache, Ion; and Tirboiu, Dumitru, to Trustul Petrolului Bolintin. Process for desalting and dehydration of crude oil including hot water washing and gas stripping. 4,180,457, Cl. 208-188.000.

Porter, Samuel, Jr.: *See*—
Makhlouf, Joseph M.; and Porter, Samuel, Jr., 4,180,619, Cl. 526-202.000.

PPG Industries, Inc.: *See*—
Makhlouf, Joseph M.; and Porter, Samuel, Jr., 4,180,619, Cl. 526-202.000.

Pratt, Rex. 6β-Bromo penicillanic acid. 4,180,506, Cl. 260-245.200.

Praxl, Werner; and Ehret, Reiner, to Dr. Werner Freyberg. Method for detoxifying phosphide containing pesticides. 4,180,557, Cl. 424-10.000.

Premus, Jerry C.: *See*—
Gibboney, Dennis A.; Schneider, John T.; and Premus, Jerry C., 4,180,440, Cl. 204-1.00T.

Prescott, Gerald F.: *See*—
Lewis, Charles T., Jr.; and Prescott, Gerald F., 4,180,696, Cl. 585-717.000.

Prewitt, Richard H.: *See*—
Prewitt, Richard H., Jr.; and Prewitt, Richard H., 4,180,821, Cl. 346-7.000.

Prewitt, Richard H., Jr.; and Prewitt, Richard H. Motion tape recorder. 4,180,821, Cl. 346-7.000.

Price, Larry V., to Robertshaw Controls Company. Gage construction and casing body therefor. 4,179,933, Cl. 73-431.000.

Price, Raymond M.: *See*—
Reed, Russell, Jr.; Peterson, John A.; and Price, Raymond M., 4,180,424, Cl. 149-19.400.

Price, Ronald, to Goodwood Data Systems Ltd. Diesel fuel pipe transducer. 4,179,939, Cl. 73-730.000.

Prikryl, Jaroslav: *See*—
Fritschi, Edgar; Liebenow, Walter; and Prikryl, Jaroslav, 4,180,578, Cl. 424-251.000.

Primbsch, Erik, to Krautkramer-Branson, Inc. Method and apparatus for measuring deformation of a workpiece surface responsive to ultrasonic energy. 4,180,324, Cl. 356-35.500.

Primex Plastics Co.: *See*—
Bertsch, Paul J., 4,180,427, Cl. 156-272.000.

Prine, Ray A.: *See*—
Mueller, Paul; and Prine, Ray A., 4,179,902, Cl. 62-238.000.

Printronix, Inc.: *See*—
Matula, Jerry, 4,180,766, Cl. 318-128.000.

Procter & Gamble Company, The: *See*—
Llenado, Ramon A., 4,180,485, Cl. 252-532.000.
Mitchell, Sharon J.; and Wise, Rodney M., 4,180,472, Cl. 252-162.000.

Produits Chimiques Auxiliaires et de Synthese, P.C.A.S.: *See*—
Le Guen, Yves; and Thault, Georges, 4,180,510, Cl. 549-79.000.

Pryor, Bodie C., to Gulf Oil Corporation. Method for controlling emissions of ethylene to the atmosphere. 4,179,819, Cl. 34-12.000.

Przirembel, Hans R.: *See*—
Moore, William A.; and Przirembel, Hans R., 4,180,373, Cl. 416-97.00R.

Pucci, Donald G.: *See*—
Pauze, Denis R.; and Pucci, Donald G., 4,180,612, Cl. 528-289.000.

Pullman Incorporated: *See*—
Benko, John M., 4,180,248, Cl. 266-67.000.
Gutridge, Jack E.; and Marsh, Ronald W., 4,179,996, Cl. 105-345.000.
McNally, George S., 4,180,001, Cl. 105-420.000.
Snyder, Richard C., 4,180,000, Cl. 105-409.000.
Snyder, Richard C.; and Bodinger, Donald C., 4,180,228, Cl. 248-74.00R.

Pusch, Gunter: *See*—
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Putter, Rolf: *See*—
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Pyasetskaya, Olga V.: *See*—
Andreev, Jury S.; Pyasetskaya, Olga V.; and Leonova, Galina G., 4,180,402, Cl. 430-394.000.
Pye (Electronic Products) Limited: *See*—
Derlien, Michael L., 4,180,067, Cl. 128-214.00F.
Pyro Dynamics, Ltd.: *See*—
Wachter, Bernard, 4,180,082, Cl. 131-26.000.
Quarderer, George J.: *See*—
Moll, Norman G.; and Quarderer, George J., 4,180,456, Cl. 208-177.000.
Quinn, David R., to AFA Corporation, The. Child-resistant closure. 4,180,174, Cl. 215-221.000.
R. A. Pearson Company: *See*—
Graham, Robert H.; and McBride, Jerald R., 4,179,866, Cl. 53-468.000.
Raasch, Ernest M.; and Olney, Nathaniel M., to Swingline, Inc. Stapling and marking device. 4,180,197, Cl. 227-120.000.
Rabek, Jan W.: *See*—
Sheldon, Robert S.; and Rabek, Jan W., 4,179,917, Cl. 73-17.00A.
Sheldon, Robert S.; and Rabek, Jan W., 4,180,240, Cl. 251-127.000.
Radencic, Frank J. Method for making lithographic printing plates. 4,179,990, Cl. 101-467.000.
Rainville Company Inc.: *See*—
Rainville, Dewey, 4,180,379, Cl. 425-526.000.
Rainville, Dewey, to Rainville Company Inc. Blow molding machine with rotating core rods. 4,180,379, Cl. 425-526.000.
Raiteri, Angelo, to UNICEM-Unione Cementerie Marchino, Emiliane e di Augusta, S.p.A.; and Doria, Andrea. Bag feeding apparatus for powder material packaging. 4,179,868, Cl. 53-571.000.
Ram Industries, Inc.: *See*—
Grover, Ross D., 4,180,107, Cl. 144-2.00N.
Ramnarace, Jawaharlal; and Wood, William A., to United States of America, Army. Primer-igniter for gun propellants. 4,179,992, Cl. 102-45.000.
Rampling, Brian W.: *See*—
Harris, Jeffrey J.; and Rampling, Brian W., 4,180,759, Cl. 313-388.000.
Ranger, Hubert O. Supply apparatus. 4,179,932, Cl. 73-423.00A.
Rankins, Paul; and Howie, Robert K., Jr., to Grigolett Company, The. Knob. 4,179,771, Cl. 16-121.000.
Rath, Jack. Stamping device for rotating workpieces. 4,179,988, Cl. 101-7.000.
Ratner, Felix A.: *See*—
Agranovskaya, Miriam A.; Babich, Vladimir A.; Ratner, Felix A.; Rozenoer, Alexandr S.; and Ryvkin, Moisei I., 4,180,249, Cl. 266-78.000.
Raven, David P.: *See*—
Henrickson, David L.; Kaiser, John J.; Koehn, William C.; and Raven, David P., 4,180,161, Cl. 206-328.000.
Raychem Corporation: *See*—
Diaz, Stephen H., 4,180,173, Cl. 215-6.000.
Raymond, Russell J.: *See*—
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Raytheon Company: *See*—
Rosvold, Warren C., 4,180,422, Cl. 148-175.000.
RB Toy Development Co.: *See*—
Kupperman, Sam; and Kupperman, Dennis, 4,179,841, Cl. 46-94.000.
RCA Corporation: *See*—
Chang, Kern K. N., 4,180,760, Cl. 313-422.000.
Hudson, Kenneth C.; and Herzog, Donald G., 4,180,822, Cl. 346-108.000.
Johns, McKinley R., 4,180,820, Cl. 343-798.000.
Kaplan, Leonard A., 4,180,781, Cl. 330-272.000.
Kaplan, Leonard A., 4,180,782, Cl. 330-276.000.
Khalifa, Jacob R., 4,180,783, Cl. 331-2.000.
Roach, William R., 4,180,830, Cl. 358-128.000.
Reale, Salvatore J., to Foster Wheeler Energy Corporation. Lateral stiffener for strut. 4,179,860, Cl. 52-732.000.
Recchuite, Alexander D.: *See*—
Newingham, Thomas D.; Recchuite, Alexander D.; Griffith, John Q., III; and Haseltine, Marcus W., Jr., 4,180,466, Cl. 252-48.600.
Redding, James A. Truck sampling system. 4,179,929, Cl. 73-423.00R.
Reddy, Junuthula N., to Bendix Corporation, The. Pulse smoothing circuit for an electronic fuel control system. 4,180,020, Cl. 123-32.0EA.
Reed, Russell, Jr.; Peterson, John A.; and Price, Raymond M., to United States of America, Army. Control of burning rate and burning rate exponent by particle size in gun propellants. 4,180,424, Cl. 149-19.400.
Reedy, Charles E., to ACF Industries, Incorporated. Bottom operable tank car lading valve with minimum skid protection for retrofit. 4,180,242, Cl. 251-144.000.
Refojo, Miguel F.: *See*—
Mancini, William L.; Korb, Donald R.; and Refojo, Miguel F., 4,180,308, Cl. 351-160.00H.
Regalbuto, John A.: *See*—
Orrill, Larry M.; and Regalbuto, John A., 4,180,351, Cl. 405-303.000.
Regan, Barrie F. Cutting wheel. 4,180,048, Cl. 125-15.000.
Regie Nationale des Usines Renault: *See*—
Lefebvre, Jean H., 4,180,121, Cl. 164-152.000.
Reinehr, Ulrich; Jungverdorben, Hermann-Josef; and Herbertz, Toni, to Bayer Aktiengesellschaft. Hygroscopic fibers and filaments. 4,180,617, Cl. 428-398.000.
Reinhart, Leonard R.: *See*—
Palmatier, Roland T.; Green, Barry P.; Reinhart, Leonard R.; Sciulli, Francis J.; and Holmes, Jon E., 4,180,741, Cl. 250-559.000.
Renaudat, Jean-Louis: *See*—
Guidoux, Loic B. Y.; and Renaudat, Jean-Louis, 4,180,705, Cl. 178-69.100.
Renault, Philippe: *See*—
Deschamps, Andre; Franckowiak, Sigismond; and Renault, Philippe, 4,180,550, Cl. 423-242.000.
Reneau, Bobby J. Articulated ball connector for use with pipeline. 4,180,285, Cl. 285-261.000.
Reusser, Robert E.; and Hughes, William B., to Phillips Petroleum Company. Disproportionation/double-bond isomerization of olefins. 4,180,524, Cl. 585-644.000.
Revas, Inc.: *See*—
Cutler, Alan B., 4,180,534, Cl. 261-41.00B.
Reynaldo Calderon: *See*—
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Reynolds, Mark P.: *See*—
Ladin, Eli M.; and Reynolds, Mark P., 4,179,780, Cl. 29-149.50R.
Reynolds Metals Company: *See*—
Darrow, George R., 4,180,443, Cl. 204-35.00N.
Rhoades, Richard G., to United States of America, Army. Method of bonding propellants containing mobile constitutents. 4,180,535, Cl. 264-3.00R.
Rhodes, Lloyd E. Scrag saw mill dogging system. 4,179,963, Cl. 83-409.000.
Rhone-Poulenc Industries: *See*—
Bargain, Michel; and Lefort, Marcel, 4,180,515, Cl. 260-448.20Q.
Neel, Jean; and Violland, Robert, 4,180,519, Cl. 260-459.00A.
Rice, James F.: *See*—
Chicoye, Etzer; Helbert, J. Raymond; and Rice, James F., 4,180,589, Cl. 426-11.000.
Rice, Richard E., to Comstock & Wescott, Inc. Catalytic fuel combustion apparatus and method. 4,180,384, Cl. 44-52.000.
Rich, Richard D.: *See*—
Melody, David P.; Doherty, Daniel A.; O'Grady, John F.; and Rich, Richard D., 4,180,640, Cl. 526-323.100.
Richardson, Donald M., deceased: *See*—
Bamberger, Carlos E.; and Richardson, Donald M., deceased, 4,180,555, Cl. 423-657.000.
Richardson, Elizabeth B., executrix: *See*—
Bamberger, Carlos E.; and Richardson, Donald M., deceased, 4,180,555, Cl. 423-657.000.
Richardson-Merrell Inc.: *See*—
Carr, Albert A.; and Kinsolving, C. Richard, 4,180,583, Cl. 424-267.000.
Huber, Harold E., 4,180,559, Cl. 424-35.000.
Richdel, Inc.: *See*—
Saarem, Myrl J.; and Soukup, Dale F., 4,180,236, Cl. 251-30.000.
Richman, Jay L., to Bendix Corporation, The. Portable multiplex bus exerciser. 4,180,865, Cl. 365-63.000.
Richter Gedeon Vegyeszet, Gyar RT: *See*—
Toldy, Sandor S. L.; Szilagyi nee Farago, Katalin; Schafer, Inge; Szondy, Eleonora; Borvendeg, Janos; and Hermann nee Szente, Ilona, 4,180,505, Cl. 260-239.55R.
Richter, Paul A. Fluid operated device. 4,180,028, Cl. 123-45.00A.
Ricoh Company, Ltd.: *See*—
Matsumoto, Fuyuhiko; and Inokuchi, Toshiyuki, 4,180,318, Cl. 355-11.000.
Nozawa, Shiyozo; Hokari, Saburo; and Yamaga, Shigeru, 4,180,315, Cl. 354-170.000.
Watanabe, Tsutomu; Yanagawa, Nobuyuki; and Hosaka, Masao, 4,180,721, Cl. 219-216.000.
Yamada, Kunihiro, 4,180,335, Cl. 400-320.000.
Ridder, Gerhard; and Schafer, Wilhelm, to Mannesmann Aktiengesellschaft. Hydraulic control with delay. 4,179,887, Cl. 60-420.000.
Rijckaert, Josephus F.: *See*—
Notelteirs, Victor R.; and Rijckaert, Josephus F., 4,180,758, Cl. 313-318.000.
Riley, Jesse L.: *See*—
Howell, Carl J., Jr.; Trott, David W.; and Riley, Jesse L., 4,180,536, Cl. 264-53.000.
Riley, Michael W.: *See*—
Gunderman, Robert J.; Alcock, Keith; Skinner, Charles S.; and Riley, Michael W., 4,180,177, Cl. 220-88.00A.
Riley, Robert E.; and Wallace Sr., Terry C., to United States of America, Energy. Method for making hot-pressed fiber-reinforced carbide-graphite composite. 4,180,428, Cl. 156-281.000.
Risberg, Robert L., to Cutler-Hammer, Inc. Closed-loop regulating and overhauling load energy dissipating chopper type current control system for D.C. Motors. 4,180,767, Cl. 318-308.000.
Ritt, Donald: *See*—
Fallon, John J., Jr.; Blair, Joe B.; Phelps, Donald R.; and Cabeen, Robert P., III, 4,180,128, Cl. 165-76.000.
Roach, William R., to RCA Corporation. Depth estimation system using diffractive effects of the grooves and signal elements in the grooves. 4,180,830, Cl. 358-128.000.
Robert Bosch GmbH: *See*—
Hertfelder, Wilhelm, 4,180,234, Cl. 251-14.000.
Hofer, Gerald; Konrath, Karl; Schwarz, Manfred; and Laufer, Helmut, 4,180,040, Cl. 123-140.00R.
Odone, Giovanni; and Cochard, Roland, 4,180,774, Cl. 324-125.000.
Schulzke, Peter; Arnold, Herbert; Harsch, Klaus; and Werner, Peter, 4,180,026, Cl. 123-32.0EF.

Schwerin, Inge; Zillgitt, Ulrich; Schneider, Steffen; Kegel, Hellmut; Bodensieck, Hans-Rudolf; Zauft, Helmut; Poglitsch, Reinhold; and Grabow, Kurt, 4,180,848, Cl. 362-71.000.
Steinbrenner, Ulrich; Kirn, Dieter; and Schnurle, Hans, 4,180,025, Cl. 123-32.0EA.
Weiler, Paul; and Brummer, Dietmar, 4,179,766, Cl. 15-250.320.
Weiler, Paul; and Brummer, Dietmar, 4,179,767, Cl. 15-250.320.
Wesemeyer, Jurgen; and Haubner, Georg, 4,180,803, Cl. 340-164.00R.
Robertshaw Controls Company: *See*—
Price, Larry V., 4,179,933, Cl. 73-431.000.
Williamson, Warren G., 4,179,928, Cl. 73-368.300.
Robinson, Mark L., to Acro, Inc. Racket handle and method of making same. 4,180,264, Cl. 273-73.00J.
Rochling, Hans; Sachse, Burkhard; and Gattner, Hans, to Hoechst Aktiengesellschaft. Triazolidino-pyridazine-diones. 4,180,575, Cl. 424-250.000.
Rockwell International Corporation: *See*—
Eshghy, Siavash, 4,179,786, Cl. 29-407.000.
Rohm and Haas Company: *See*—
Emmons, William D., 4,180,598, Cl. 427-44.000.
Emmons, William D.; Nyi, Kayson; and Sperry, Peter R., 4,180,645, Cl. 528-73.000.
Fromuth, Harry C.; and Shell, Kenneth M., 4,180,494, Cl. 260-40.00R.
Ilenda, Casmir S., 4,180,632, Cl. 521-184.000.
Kim, Samuel S.; and Stevens, Travis E., 4,180,491, Cl. 260-29.2TN.
Romero, Frank; and Gardiner-Romero, Joanne L. Tray for increasing wax impregnated log burning life. 4,180,054, Cl. 126-164.000.
Romero, Victor R., to Eagle Picher Industries, Inc. Movable storage and/or display apparatus. 4,180,277, Cl. 280-79.300.
Rose, Edgar: *See*—
Henrich, Donald A.; and Rose, Edgar, 4,180,368, Cl. 416-146.00R.
Rosenitsch, Johann, to Hubner-Vamag Aktiengesellschaft & Co. Kommanditgesellschaft. Stopcock formed of sheet metal. 4,180,244, Cl. 251-309.000.
Rosenkranz, Hans J.: *See*—
Schuster, Karl-Ernst; Rosenkranz, Hans J.; Furh, Karl; and Rudolph, Hans, 4,180,474, Cl. 252-188.30R.
Ross, Roger J., to Singer Company, The. Tension selecting mechanism for sewing machines. 4,180,006, Cl. 112-254.000.
Rosvold, Warren C., to Raytheon Company. Method of making semiconductor diodes. 4,180,422, Cl. 148-175.000.
Roth, Carl W.; Groth, Hugh F.; and Meacham, G. B. Kirby, to Vapor Corporation. Lift assembly for transit vehicles. 4,180,366, Cl. 414-540.000.
Rothfuss, Robert G.: *See*—
Hueil, J. Charles; Rothfuss, Robert G.; and Boothby, Terry A., 4,180,196, Cl. 227-109.000.
Routens, Jean-Paul. Saddle support for bicycles and the like. 4,180,345, Cl. 403-84.000.
Rowe International, Inc.: *See*—
Oosterhouse, Gerard J., 4,180,802, Cl. 340-162.000.
Rowe, Neal E.: *See*—
Shariff, Sadiq A.; Bharteey, Brij M.; and Rowe, Neal E., 4,180,845, Cl. 361-334.000.
Rowse, Dan D., to Rowse Hydraulic Rakes Company, Inc. Trailing tandem mower. 4,179,870, Cl. 56-6.000.
Rowse Hydraulic Rakes Company, Inc.: *See*—
Rowse, Dan D., 4,179,870, Cl. 56-6.000.
Roy, William D.: *See*—
Faucher, Joseph E.; Koucky, Robert W.; and Roy, William D., 4,179,881, Cl. 60-59.710.
Rozenoer, Alexandr S.: *See*—
Agranovskaya, Miriam A.; Babich, Vladimir A.; Ratner, Felix A.; Rozenoer, Alexandr S.; and Ryvkin, Moisei I., 4,180,249, Cl. 266-78.000.
Rudolph, Hans: *See*—
Schuster, Karl-Ernst; Rosenkranz, Hans J.; Furh, Karl; and Rudolph, Hans, 4,180,474, Cl. 252-188.30R.
Rudolph, Paul, to Metallgesellschaft Aktiengesellschaft. Process for removing slag during pressure gasification of solid fuels. 4,180,387, Cl. 48-206.000.
Rumbaugh, Paul S., to Altec Corporation. Input decoupling circuit for transistor differential amplifier. 4,180,780, Cl. 330-252.000.
Runnells, Robert R.; and Schmoegner, John C., to MDT Instrument Company. Dental instrument delivery system. 4,179,813, Cl. 433-79.000.
Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., to Gas Developments Corporation. Air conditioning apparatus and method. 4,180,126, Cl. 165-59.000.
Rydell, Robert A.: *See*—
Steffensen, Leslie M.; Dutell, H. Gary; and Rydell, Robert A., 4,179,820, Cl. 34-92.000.
Ryle, Dallas M., Jr., to Lockheed Corporation. Aerial dispersal system. 4,180,224, Cl. 244-136.000.
Ryvkin, Moisei I.: *See*—
Agranovskaya, Miriam A.; Babich, Vladimir A.; Ratner, Felix A.; Rozenoer, Alexandr S.; and Ryvkin, Moisei I., 4,180,249, Cl. 266-78.000.
S.F.Z. Souplesse Fonctionnelle Systematique: *See*—
Mazier, Paul, 4,179,910, Cl. 72-59.000.
Saarem, Myrl J., and Soukup, Dale F., to Richdel, Inc. Normally-open valve assembly with solenoid-operated pilot. 4,180,236, Cl. 251-30.000.
Saaski, Elric W., to Electric Power Research Institute, Inc. Temperature sensing device. 4,179,927, Cl. 73-350.000.
Sabir-de-Ribas, Konstantin I.: *See*—
Shumyakin, Evgeny P.; Sabir-de-Ribas, Konstantin I.; Druzhinsky, Isaak A.; Shishov, Gennady P.; and Andreichikov, Boris I., 4,180,435, Cl. 176-30.000.
Sachse, Burkhard: *See*—
Rochling, Hans; Sachse, Burkhard; and Gattner, Hans, 4,180,575, Cl. 424-250.000.
Saeufferer, Helmut: *See*—
Buchner, Helmut; and Saeufferer, Helmut, 4,179,896, Cl. 62-7.000.
Safeway Stores, Incorporated: *See*—
Lonsdale, Alice, 4,180,336, Cl. 400-491.300.
Saier, Manfred; Kastner, Hans-Werner; and Klockler, Robert, to Wieland-Werke Aktiengesellschaft. Y and T-finned tubes and methods and apparatus for their making. 4,179,911, Cl. 72-78.000.
Saika, Daini: *See*—
Tomidokoro, Susumu; Ukigai, Toshiyuki; Takahashi, Toshio; and Saika, Daini, 4,180,468, Cl. 252-117.000.
Saiki, Junichi; and Kumai, Teruo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine with an exhaust gas recirculation system. 4,180,035, Cl. 123-119.00A.
St. Clair, Anne K.: *See*—
St. Clair, Terry L.; and St. Clair, Anne K., 4,180,648, Cl. 528-207.000.
St. Clair, Terry L.; and St. Clair, Anne K., to United States of America, National Aeronautics and Space Administration. Crystalline polyimides. 4,180,648, Cl. 528-207.000.
Saint-Gobain Industries: *See*—
Oustin, Georges; and Krumm, Helmut, 4,180,426, Cl. 156-104.000.
Saito, Makoto: *See*—
Asada, Chiaki; Saito, Makoto; and Kajima, Hisashi, 4,180,399, Cl. 75-229.000.
Saito, Masumi: *See*—
Yukuta, Toshio; Ohashi, Takashi; Kojima, Minoru; and Saito, Masumi, 4,180,631, Cl. 521-164.000.
Sakae Riken Kogyo Co., Ltd.: *See*—
Soshiki, Yoshikazu; Sugiura, Hiroshi; Onizawa, Kouzi; Togawa, Toshikatsu; Kojima, Minoru; Morikawa, Tsukio; Kurimoto, Naohiko; and Katou, Hiromitu, 4,180,448, Cl. 204-192.00C.
Sakai, Yasuo: *See*—
Miyazaki, Hiroaki; Sakai, Yasuo; and Matuoka, Tosimitu, 4,180,041, Cl. 123-141.000.
Sakamoto, Masaharu: *See*—
Ozawa, Akio; Sakamoto, Masaharu; and Ito, Hideo, 4,180,750, Cl. 307-362.000.
Sakata, Ko: *See*—
Imaizumi, Masao; Yasuda, Mitsuo; Sakata, Ko; and Hirano, Noboru, 4,180,688, Cl. 568-899.000.
Salotti, Gianfranco; Ferrero, Elvio; and Grisotto, Franco, to Fiat Societa per Azioni. Device for keeping under control the population of selected species of insects. 4,179,839, Cl. 43-112.000.
Samuels, Michael R.: *See*—
Angelo, Rudolph J.; Blomberg, Richard N.; Boettcher, Fritz P.; Ikeda, Richard M.; and Samuels, Michael R., 4,180,614, Cl. 428-336.000.
Sanda, Shougo; Nakamura, Noriniko; and Tanahashi, Toshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Torch ignition type internal combustion engine. 4,180,044, Cl. 123-191.00S.
Sandefur, Herbert G., to Kienzle, Kenneth, Jr.; Jay, Gary; Clifton, John L.; and Womack, Joe B., part interest to each. Hanging insecticide drum. 4,179,840, Cl. 43-131.000.
Sanders Associates, Inc.: *See*—
Hollis, Ernest E., 4,179,801, Cl. 29-626.000.
Sandler, Stanley R., to Pennwalt Corporation. Polyester resins flame retarded by poly(metal phosphinate)s. 4,180,495, Cl. 260-45.75K.
Sandoz, Inc.: *See*—
Houlihan, William J., 4,180,671, Cl. 548-324.000.
Sandoz Ltd.: *See*—
Stadler, Paul, 4,180,581, Cl. 424-261.000.
Sandvik Aktiebolag: *See*—
Persson, Erik A., 4,180,292, Cl. 299-92.000.
Smith, Ulf K. H.; Lindstrom, Jan N.; and Mantle, Harold, 4,180,400, Cl. 75-235.000.
Sandy, Charles A.: *See*—
McCormack, William B.; and Sandy, Charles A., 4,180,386, Cl. 44-63.000.
Sanford, Gary G., to Ball Corporation. Serially connected microstrip antenna array. 4,180,817, Cl. 343-700.0MS.
Santiago, Enrique, to Zeuna-Starker GmbH & Co. KG. Catalytic converter having monolith mounting means therein. 4,180,544, Cl. 422-179.000.
Sanyo Electric Co., Ltd.: *See*—
Iwaki, Hiroshi; and Nakamura, Masaaki, 4,180,376, Cl. 417-360.000.
Sanyo Kokusaku Pulp Co Ltd: *See*—
Ishibashi, Hiroaki; Tanoue, Shizuo; Kudo, Masakuni; and Harada, Isamu, 4,180,392, Cl. 71-25.000.
Saotome, Shigeo, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Device for detecting position of hydraulic cylinder. 4,179,982, Cl. 92-5.00R.
Sarantakis, Dimitrios, to American Home Products Corporation. Polypeptides related to somatostatin. 4,180,500, Cl. 260-112.50S.
Sasaki, Ichiro; Itatani, Hiroshi; and Kashima, Mikito, to Ube Industries, Ltd. Epoxy resin composition and method for curing the epoxy resin composition. 4,180,607, Cl. 528-112.000.

Sastri, Suri A.; and Alexander, Ben H., to Gillette Company, The. Razor blades. 4,180,420, Cl. 148-37.000.
Sato, Koji: *See*—
Isshiki, Isao; Ohoka, Akihiro; and Sato, Koji, 4,180,800, Cl. 340-146.3SY.
Sato, Takateru: *See*—
Shiba, Haruo; and Sato, Takateru, 4,180,220, Cl. 242-199.000.
Sato, Teruyoshi: *See*—
Takahashi, Yasuyoshi; Sekiguchi, Shigeo; and Sato, Teruyoshi, 4,180,206, Cl. 235-419.000.
Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Constant printing pressure mechanism for portable label printing and applying machine, or the like. 4,179,989, Cl. 101-291.000.
Satoh, Seisuke: *See*—
Nagata, Takeo; Satoh, Seisuke; and Matsumoto, Takao, 4,180,626, Cl. 435-144.000.
Saucy, Gabriel: *See*—
Cohen, Noal; and Saucy, Gabriel, 4,180,682, Cl. 568-662.000.
Saupe, Martin: *See*—
Kaltenbach, Kurt; Saupe, Martin; Beier, Stefan; Gmeinder, Hermann; and Braetsch, Hartmut, 4,180,812, Cl. 340-706.000.
Savageau, Richard J., to Platt Saco Lowell Limited. Means for severing and compacting coiled sliver. 4,179,773, Cl. 19-159.00A.
Sawada, Yoshio: *See*—
Kawasaki, Masahiro; and Sawada, Yoshio, 4,180,310, Cl. 354-24.000.
Sawafuji Electric Co. Ltd.: *See*—
Katayama, Naohiro, 4,179,899, Cl. 62-228.000.
Sawyer, Roderick, to Aktiebolaget Electrolux. Vacuum dumping arrangement for a wet/dry vacuum cleaner. 4,179,768, Cl. 15-352.000.
Say, Geoffrey R.; Hays, James R., Sr.; and Iyengar, Jagannathan N., to Exxon Research & Engineering Co. Process for selective removal of cyclic urea from hindered amine gas treating solution. 4,180,548, Cl. 423-223.000.
Scanmec A/S: *See*—
Langvik, Sigmund C., 4,180,461, Cl. 210-333.00A.
Schadt, Martin; Scherrer, Hanspeter; and Boller, Arthur. Liquid crystal mixtures. 4,180,475, Cl. 252-299.000.
Schafer, Inge: *See*—
Toldy, Sandor S. L.; Szilagyi nee Farago, Katalin; Schafer, Inge; Szondy, Eleonora; Borvendeg, Janos; and Hermann nee Szente, Ilona, 4,180,505, Cl. 260-239.55R.
Schafer, Wilhelm: *See*—
Ridder, Gerhard; and Schafer, Wilhelm, 4,179,887, Cl. 60-420.000.
Schantz, Spencer C. Bimetal actuated locking device. 4,179,907, Cl. 68-12.00R.
Schaub, Robert E.; and Weiss, Martin J., to American Cyanamid Company. Novel prostaglandins. 4,180,677, Cl. 562-500.000.
Schaumburg, Gunter, to Neiman S.A. Steering lock. 4,179,908, Cl. 70-185.000.
Schenck, Jay R.: *See*—
Kim, Yung D.; Tomita, Joseph T.; and Schenck, Jay R., 4,180,556, Cl. 424-1.000.
Schering Aktiengesellschaft: *See*—
Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Casals-Stenzel, Jorge; and Losert, Wolfgang, 4,180,570, Cl. 424-243.000.
Schering Corporation: *See*—
Mallams, Alan K.; and Davies, David H., 4,180,565, Cl. 424-180.000.
Schermer, Gijsbertus J. H.; Winters, Hubertus H. A.; Hildering, Willem C.; and Nickl von Nikelsberg, Karl F., to U.S. Philips Corporation. Hybrid circuit having a semiconductor circuit. 4,180,828, Cl. 357-79.000.
Scherrer, Hanspeter: *See*—
Schadt, Martin; Scherrer, Hanspeter; and Boller, Arthur, 4,180,475, Cl. 252-299.000.
Schiavone, Lawrence M., to Bell Telephone Laboratories, Incorporated. Electroless plating of polyvinylidene fluoride. 4,180,602, Cl. 427-306.000.
Schirmer, Robert M., to Phillips Petroleum Company. Comb...stion process and apparatus therefor. 4,179,880, Cl. 60-39.230.
Schlosser, Helmut: *See*—
Alberti, James; and Schlosser, Helmut, 4,180,062, Cl. 128-698.000.
Schlumberger Technology Corporation: *See*—
Lavigne, Jean C.; and Segeral, Gerard, 4,179,817, Cl. 33-129.000.
Schmid, Karlheinz, to Gebrueder Heller Maschinenfabrik GmbH. Machine tool for machining of shafts, especially crankshafts. 4,180,359, Cl. 409-197.000.
Schmid, Rolf; and Kreibich, Ursula, to Ciba-Geigy Corporation. Process for the manufacture of crystalline, crosslinked, elastomeric epoxide resins. 4,180,527, Cl. 525-115.000.
Schmidt, Ewald; and Wiessner, Willi, to Ernst Leitz Wetzlar GmbH. Photographic camera with through the lens exposure meter. 4,180,312, Cl. 354-59.000.
Schmidt, Hans-Georg, to Dynamit Nobel Aktiengesellschaft. Method of preparing dihalogen vinyl cyclopropanecarboxylic acid esters. 4,180,446, Cl. 204-158.00R.
Schmidt, Klaus: *See*—
Schultheiss, Wolfram; and Schmidt, Klaus, 4,180,611, Cl. 428-288.000.
Schmitt, Manfred: *See*—
Kolb, Fritz; Fehlisch, Silvan; Ziegert, Otto; Bender, Hans; and Schmitt, Manfred, 4,180,100, Cl. 137-625.300.
Schmoegner, John C.: *See*—
Runnells, Robert R.; and Schmoegner, John C., 4,179,813, Cl. 433-79.000.
Schnabel, Roland; and Hussmann, Eckart, to JENAer Glaswerk Schott & Gen. Laminar solar energy collecting unit having absorber plates consisting of hollow fibers. 4,180,056, Cl. 126-447.000.
Schneider, Claus: *See*—
Weber, Karl-Heinz; Langbein, Adolf; Schneider, Claus; Lehr, Erich; Boke, Karin; and Kuhn, Franz J., 4,180,573, Cl. 424-250.000.
Schneider, John T.: *See*—
Gibboney, Dennis A.; Schneider, John T.; and Premus, Jerry C., 4,180,440, Cl. 204-1.00T.
Schneider, Norbert: *See*—
Motz, Herbert; Schneider, Norbert; Hartmann, Hans-Joerg; and Baur, Reinhold, 4,180,597, Cl. 427-48.000.
Schneider, Steffen: *See*—
Schwerin, Inge; Zillgitt, Ulrich; Schneider, Steffen; Kegel, Hellmut; Bodensieck, Hans-Rudolf; Zauft, Helmut; Poglitsch, Reinhold; and Grabow, Kurt, 4,180,848, Cl. 362-71.000.
Schnurle, Hans: *See*—
Steinbrenner, Ulrich; Kirn, Dieter; and Schnurle, Hans, 4,180,025, Cl. 123-32.0EA.
Scholz, Herbert, to BASF Aktiengesellschaft. Manufacture of N-[3,4-dimethylphenyl]-D-ribamine. 4,180,523, Cl. 260-573.000.
Schramm, Jack B. Dual indicating tachometer apparatus. 4,179,938, Cl. 73-510.000.
Schrodter, Klaus; Kandler, Joachim; and Spott, Hasso, to Hoechst Aktiengesellschaft. Production of blends of crystalline zeolite and sodium triphosphate. 4,180,471, Cl. 252-140.000.
Schroter, Herbert, to Hoechst Aktiengesellschaft. Apparatus for developing sheets of diazotype copying material by the semi-dry process. 4,180,317, Cl. 354-318.000.
Schulein, Rolf G., to Leifheit International Gunter Leifheit GmbH. Suction-attachable kitchen appliance. 4,180,229, Cl. 248-363.000.
Schuller, Ronald A.; and Clarkson, Robert I., to Geosource, Inc. Corrosion coupon holder apparatus. 4,179,920, Cl. 73-86.000.
Schulte, Louis T.: *See*—
Walden, Jack M.; Eads, William D.; Cozzens, Ray J.; Bidwell, John L.; Jewett, Robert A.; Wilson, Martin S.; Griffin, Daniel J.; Kuseski, Robert E.; and Schulte, Louis T., 4,180,854, Cl. 364-200.000.
Schultenkamper, Josef, to Gelenkwellenbau GmbH. Bearing system in a universal joint. 4,179,905, Cl. 64-17.00A.
Schultheiss, Wolfram; and Schmidt, Klaus, to Carl Freudenberg, Firma. Smooth-surfaced nonwoven fabric. 4,180,611, Cl. 428-288.000.
Schulz, William J.; Pecoraro, Ralph R.; and Hogan, Gerard T., to UOP Inc. Apparatus for selectively heating an individual food item in a refrigerated environment. 4,180,125, Cl. 165-48.000.
Schulze, Kurt, to BASF Aktiengesellschaft. Manufacture of a supported chromium oxide catalyst for olefin polymerization. 4,180,481, Cl. 252-441.000.
Schulzke, Peter; Arnold, Herbert; Harsch, Klaus; and Werner, Peter, to Robert Bosch GmbH. Apparatus for controlling the operating current of electromagnetic devices. 4,180,026, Cl. 123-32.0EF
Schumann, Erwin; and Bohlander, Oskar, to Deutsche Gold- and Silber-Scheideanstalt Vormals Roessler. Vacuum oven with graphite heating. 4,180,697, Cl. 13-25.000.
Schurman, Peter T., to Plastic Forming Company, Inc., The. Method of making a reinforced bearing aperture in thermoplastic sheet material. 4,180,540, Cl. 264-156.000.
Schuster, Karl-Ernst; Rosenkranz, Hans J.; Furh, Karl; and Rudolph, Hans, to Bayer Aktiengesellschaft. Radiation-hardenable diluents for radiation-hardenable compositions. 4,180,474, Cl. 252-188.30R.
Schwander, Hansrudolf; and Zickendraht, Christian, to Ciba-Geigy Aktiengesellschaft. Substituted 3-benz(cd)indol-2-(1H)-ylidene-furo[2,3-b]quinoxalin-2(3H)one dyestuffs. 4,180,665, Cl. 544-345.000.
Schwartz, Arnold, to United States of America, Navy. Pseudo range and range rate device. 4,180,205, Cl. 235-411.000.
Schwartz, Leonard; Chin, Edward; and Deveau, Emile J., to Singer Company, The. Doppler navigation microstrip slanted antenna. 4,180,818, Cl. 343-700.0MS.
Schwartz, Sidney J., to Burroughs Corporation. Bubble memory coil drive circuit. 4,180,864, Cl. 365-6.000.
Schwarz, Manfred: *See*—
Hofer, Gerald; Konrath, Karl; Schwarz, Manfred; and Laufer, Helmut, 4,180,040, Cl. 123-140.00R.
Schweizerische Isola-Werke: *See*—
Ciani, Jean A.; Diehl, Ernst; and Haberthur, Berno, 4,180,434, Cl. 162-138.000.
Schwenker, Robert O.: *See*—
Deines, John L.; Poponiak, Michael R.; and Schwenker, Robert O., 4,180,439, Cl. 204-1.00T.
Schwerin, Inge; Zillgitt, Ulrich; Schneider, Steffen; Kegel, Hellmut; Bodensieck, Hans-Rudolf; Zauft, Helmut; Poglitsch, Reinhold; and Grabow, Kurt, to Robert Bosch GmbH. Hydraulic apparatus for the automatic correction of the inclination of the headlights of a motor vehicle. 4,180,848, Cl. 362-71.000.
Sciavolino, Frank C., to Pfizer Inc. 4''-Deoxy-4''-acylamido derivatives of oleandomycin, erythromycin and erythromycin carbonate. 4,180,654, Cl. 536-9.000.
Sciulli, Francis J.: *See*—
Palmatier, Roland T.; Green, Barry P.; Reinhart, Leonard R.; Sciulli, Francis J.; and Holmes, Jon E., 4,180,741, Cl. 250-559.000.
Scorso, Clifford A., Jr.; and Messer, Gordon J., to United Technologies Corporation. Two-stage commutation circuit for an inverter. 4,180,853, Cl. 363-96.000.

Scott, Delmer D.: *See*—
Norris, Curtis; and Scott, Delmer D., 4,180,293, Cl. 301-54.000
Scott & Fetzer Company, The: *See*—
Gretz, Thomas J., 4,180,227, Cl. 248-56.000.
Scudder, Roy, to Day, Edward. Harvesters for harvesting berries. 4,179,873, Cl. 56-330.000.
Sefcik, Robert. Load bearing pendant system. 4,180,152, Cl. 198-377.000.
Segeral, Gerard: *See*—
Lavigne, Jean C.; and Segeral, Gerard, 4,179,817, Cl. 33-129.000.
Seiler, Herbert: *See*—
Perrin, Pierre; Hegar, Gert; Siegrist, Gerald; Seiler, Herbert; and Horn, Ulrich, 4,180,664, Cl. 544-194.000.
Seipp, William H., to Gulf & Western Industries, Inc. Programmable controller using microprocessor. 4,180,862, Cl. 364-900.000.
Seki, Kiwao: *See*—
Yoshihara, Touhachi; Nishiwaki, Koji; and Seki, Kiwao, 4,180,857, Cl. 364-497.000.
Sekiguchi, Shigeo: *See*—
Takahashi, Yasuyoshi; Sekiguchi, Shigeo; and Sato, Teruyoshi, 4,180,206, Cl. 235-419.000.
Selbeck, Harald; Dhein, Rolf; and Cohnen, Wolfgang, to Bayer Aktiengesellschaft. Coating compositions for polycarbonates. 4,180,493, Cl. 260-32.80N.
Sempliner, Arthur T.: *See*—
Teague, Walter D., Jr.; and Sempliner, Arthur T., 4,179,765, Cl. 15-22.00R.
Sen, Soumendra N.: *See*—
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Swanson, Robert L.: *See*— Blake, William J., 4,180,346, Cl. 403-109.000.

Swarts, William A.: *See*— Mageli, Orville L.; and Swarts, William A., 4,180,518, Cl. 260-453.0RZ.

Swingline, Inc.: *See*— Raasch, Ernest M.; and Olney, Nathaniel M., 4,180,197, Cl. 227-120.000.

Swiss Aluminium Ltd.: *See*— Burkhard, Kurt; and Kunzmann, Peter, 4,180,622, Cl. 428-564.000.

Switchcraft, Inc.: *See*— Lutzenberger, Kurt; Bailey, James R.; and Hybl, James M., 4,180,712, Cl. 200-16.00D.

Sygnator, Henry A., to Illinois Tool Works Inc. Extruding and tapping screw and blank for manufacture of such screw. 4,179,976, Cl. 85-47.000.

Syntex Corporation: *See*— Katz, Martin; and Kent, John S., 4,180,560, Cl. 424-21.000.

Syntex (USA) Inc.: *See*— Mancini, William L.; Korb, Donald R.; and Refojo, Miguel F., 4,180,308, Cl. 351-160.00H.

Szilagyi nee Farago, Katalin: *See*— Toldy, Sandor S. L.; Szilagyi nee Farago, Katalin; Schafer, Inge; Szondy, Eleonora; Borvendeg, Janos; and Hermann nee Szente, Ilona, 4,180,505, Cl. 260-239.55R.

Szmuszkovicz, Jacob: *See*— Kane, Michael P.; and Szmuszkovicz, Jacob, 4,180,522, Cl. 260-562.00R.

Szondy, Eleonora: *See*— Toldy, Sandor S. L.; Szilagyi nee Farago, Katalin; Schafer, Inge; Szondy, Eleonora; Borvendeg, Janos; and Hermann nee Szente, Ilona, 4,180,505, Cl. 260-239.55R.

Szupillo, Raymond E., to Corning Glass Works. Electrical contacts for electrically conductive carbon glasses. 4,180,723, Cl. 219-541.000.

Taciuk, William, to Alberta Oil Sands Technology and Research Authority. Process for thermal cracking a heavy hydrocarbon. 4,180,455, Cl. 208-126.000.

Taisei Kosan Kabushiki Kaisha: *See*— Kamezaki, Masaaki, 4,180,093, Cl. 137-360.000.

Takaba, Toshio; and Kobayashi, Toshimasa, to Nippon Electric Company, Ltd. Printed wiring board comprising a conductive pattern retreating at least partly in a through-hole. 4,179,800, Cl. 29-625.000.

Takada, Shigetaka: *See*— Mitsuda, Tadao; Iwata, Minoru; Sugiura, Masatoshi; Takada, Shigetaka; and Watanabe, Yukihiro, 4,179,882, Cl. 60-276.000.

Takagi, Nobuho; Maegawa, Muneo; and Nii, Katsutoshi, to Hitachi, Ltd. Sealing device for rotor shaft of fluid machine. 4,180,273, Cl. 277-154.000.

Takago, Toshio, to Shin-Etsu Chemical Company. Room temperature curable organopolysiloxane compositions. 4,180,642, Cl. 528-32.000.

Takahashi, Toshio: *See*— Tomidokoro, Susumu; Ukigai, Toshiyuki; Takahashi, Toshio; and Saika, Daimi, 4,180,468, Cl. 252-117.000.

Takahashi, Toshiyuki; Koike, Masahiko; and Suzuki, Haruyuki, to Nippon Gakki Seizo Kabushiki Kaisha. Pitch bend apparatus for electronic musical instrument. 4,179,971, Cl. 84-1.240.

Takahashi, Yasuyoshi; Sekiguchi, Shigeo; and Sato, Teruyoshi, to Tokyo Electric Co., Ltd. Merchandise sales control system. 4,180,206, Cl. 235-419.000.

Takakuwa, Yasuo: *See*— Yanagimoto, Akira; Kumazawa, Shunichi; and Takakuwa, Yasuo, 4,180,496, Cl. 260-45.8NT.

Takayama, Yoshikazu: *See*— Yamaguchi, Shoshichi; Okasaka, Sadaatsu; and Takayama, Yoshikazu, 4,180,708, Cl. 179-2.0EB.

Takeshita, Hiroshi; Kondo, Hiroyuki; Ohta, Takaaki; Nomura, Yoshihisa; and Nogami, Tomoyuki, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Brake proportioning means. 4,180,295, Cl. 303-22.00R.

Takeuchi, Takeshi: *See*— Watanabe, Masakatsu; Nakada, Minoru; and Takeuchi, Takeshi, 4,180,804, Cl. 340-310.00R.

Takeuchi, Toshio, to Kabushiki Kaisha Oichi. Foot-operated rotary massaging device. 4,180,063, Cl. 128-25.00B.

Tamano, Hideki: *See*— Hirota, Kiwami; Tamano, Hideki; and Inazawa, Shintaro, 4,180,636, Cl. 526-125.000.

Tamarkin, Lev Z.: *See*— Chikul, Vitaly I.; Tyagunov, Boris I.; Ulanen, Yalmar S.; Chikul, Olga S.; Zeger, Karl E.; Tamarkin, Lev Z.; Petrosian, Robert A.; Chmovzh, Vadim E.; Smirnov, Alexandr S.; Polyakovskaya, Valentina I.; and Trufanov, Pavel A., 4,180,385, Cl. 44-62.000.

Tamura, Gakuzo; and Shimizu, Kenichi, to Kyowa Hakko Kogyo Co., Ltd. Antibacterial compounds and process for production thereof. 4,180,436, Cl. 435-119.000.

Tanahashi, Toshio: *See*— Sanda, Shougo; Nakamura, Noriniko; and Tanahashi, Toshio, 4,180,044, Cl. 123-191.00S.

Tanaka, Asami. Mixing tray assembly. 4,180,159, Cl. 206-63.500.

Tanaka, Makoto: *See*— Matsuda, Akira; Tanaka, Makoto; Murata, Jumehi; Yasuda, Shigeo, and Nishino, Hiroshi, 4,180,795, Cl. 340-58.000.

Tanaka, Taro: *See*— Noguchi, Masaaki; Tanaka, Yukiyasu; and Tanaka, Taro, 4,180,039, Cl. 123-139.0AW.

Tanaka, Yasuo: *See*— Shimokawa, Kenji; Nagatomo, Muneshige; and Tanaka, Yasuo, 4,179,895, Cl. 62-2.000.

Tanaka, Yukiyasu: *See*— Noguchi, Masaaki; Tanaka, Yukiyasu; and Tanaka, Taro, 4,180,039, Cl. 123-139.0AW.

Tandy Brands, Inc.: *See*— Clark, Edward J., 4,179,755, Cl. 2-322.000.

Tanoue, Shizuo: *See*— Ishibashi, Hiroaki; Tanoue, Shizuo; Kudo, Masakuni; and Harada, Isamu, 4,180,392, Cl. 71-25.000.

Taplin, Harry R.: *See*— Cook, Charles C.; and Taplin, Harry R., 4,179,921, Cl. 73-112.000.

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Tate, Leslie R.: *See—*
McCullough, John F.; Phillips, John F., Jr.; and Tate, Leslie R., 4,180,545, Cl. 423-8.000.
Tateoka, Masamichi; Tsuji, Takao; Minami, Setsuo; Matsumoto, Kazuya; Kawamura, Naoto; and Minoura, Kazuo, to Canon Kabushiki Kaisha. Two-dimensional scanning apparatus with constant speed scan. 4,180,307, Cl. 350-6.500.
Tauscher, Heinrich E. Handsaw with specialized cutting teeth. 4,180,110, Cl. 145-31.00R.
Taylor, Joe N., to Mack Trucks, Inc. Two-piece oil-cooled piston. 4,180,027, Cl. 123-41.350.
Taylor, Richard H. Subsurface irrigation and drainage system. 4,180,348, Cl. 405-39.000.
TDK Electronics Co., Ltd.: *See—*
Shiba, Haruo; and Sato, Takateru, 4,180,220, Cl. 242-199.000.
Teague, Walter D., Jr.; and Sempliner, Arthur T. Nutating device with provision for utilization of motive fluid. 4,179,765, Cl. 15-22.00R.
Tee, William J.: *See—*
Smith, Kenneth C. A.; and Tee, William J., 4,180,738, Cl. 250-396.0ML.
Teijin Limited: *See—*
Kurozumi, Seizi; Toru, Takeshi; Kobayashi, Makiko; and Hashimoto, Yoshinobu, 4,180,672, Cl. 560-15.000.
Tele/Resources, Incorporated: *See—*
Ferraro, Angelo, 4,180,768, Cl. 323-9.000.
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Guidoux, Loic B. Y.; and Renaudat, Jean-Louis, 4,180,705, Cl. 178-69.100.
Temco Products, Inc.: *See—*
Thomas, Morton I., 4,180,086, Cl. 135-67.000.
Temple, Stephen: *See—*
McCombie, Alan K.; and Temple, Stephen, 4,180,194, Cl. 226-113.000.
Tennessee Valley Authority: *See—*
McCullough, John F.; Phillips, John F., Jr.; and Tate, Leslie R., 4,180,545, Cl. 423-8.000.
Tension Envelope Corporation: *See—*
Hiersteiner, Walter L., 4,180,168, Cl. 206-626.000.
Tertinek, Christian T., to Stone Construction Equipment, Inc. Safety chain arrangement for towed vehicles. 4,180,281, Cl. 280-457.000.
Texaco Development Corp.: *See—*
Marquis, Edward T.; and Yeakey, Ernest L., 4,180,644, Cl. 528-68.000.
Moss, Philip H.; and Nieh, Edward C. Y., 4,180,643, Cl. 528-52.000.
Texaco Inc.: *See—*
Lewis, Charles T., Jr.; and Prescott, Gerald F., 4,180,696, Cl. 585-717.000.
Texacone Company, The: *See—*
Wheeler, John H., 4,179,856, Cl. 51-241.00S.
Texas A&M University System: *See—*
Clearfield, Abraham, 4,180,551, Cl. 423-249.000.
Texas Instruments Incorporated: *See—*
Burson, David C., 4,180,805, Cl. 340-709.000.
Sloan, Benjamin J., 4,180,749, Cl. 307-299.00B.
Textron Inc.: *See—*
Cook, Trix C., 4,179,831, Cl. 40-19.500.
Hsu, William W.; and McPherson, Robert, 4,180,243, Cl. 251-234.000.
MacFee, Norman W., 4,179,787, Cl. 29-408.000.
Theis, Gunter: *See—*
Kleinschmit, Peter; Walter, Eberhard; Mechler, Helmut; Theis, Gunter; and Meiners, Brigitte, 4,180,684, Cl. 568-726.000.
Theyse, Frederik H., to Stichting Energieonderzoek Centrum Nederland. Flywheel rotor particularly suitable for accumulating energy. 4,179,951, Cl. 74-572.000.
Thiault, Georges: *See—*
Le Guen, Yves; and Thiault, Georges, 4,180,510, Cl. 549-79.000.
Thoma, Richard: *See—*
Fischer, Hermann; Thoma, Richard; Kaeppel, Hanshelmut; Kochendoerfer, Ernst; and Lagaly, Werner, 4,180,635, Cl. 526-68.000.
Thomas, Charles E., to General Electric Company. Dynamic array aperture and focus control for ultrasonic imaging systems. 4,180,790, Cl. 367-7.000.
Thomas, Harold A., to McClung, Harold A.; and Thomas, Harold A. Fisherman's leader caddy. 4,179,834, Cl. 43-57.50R.
Thomas, Morton I., to Temco Products, Inc. Hyperextendible walker. 4,180,086, Cl. 135-67.000.
Thompson, Floyd A., Jr., to M. W. Dunton Company. Solder flux. 4,180,419, Cl. 148-23.000.
Thompson, Stanley C. Weight adjustment of golfing iron heads. 4,180,269, Cl. 273-171.000.
Thornburg, Francis L., to Lockheed Aircraft Corporation. Aileron segment control for a flaperon system. 4,180,222, Cl. 244-75.00R.
Thorsen, Niels P.: *See—*
Hansen, Peter R.; and Thorsen, Niels P., 4,180,714, Cl. 200-81.00R.
Three Phoenix Company: *See—*
Barnett, David L., 4,179,852, Cl. 51-133.000.
Thresher Institutes, Incorporated: *See—*
Clark, Herbert J., 4,179,836, Cl. 43-77.000.
Thurmond, Gary D.: *See—*
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Thyssen Edelstahlwerke Aktiengesellschaft: *See—*
Frehn, Fritz, 4,180,401, Cl. 75-236.000.
Tiemann, Jerome J., to General Electric Company. Simplified sector scan ultrasonic imaging system. 4,180,791, Cl. 367-105.000.
Tiemann, Jerome J.: *See—*
Lederman, Frank L.; and Tiemann, Jerome J., 4,180,792, Cl. 367-7.000.
Tiep, Brian L., to City of Hope National Medical Center. Method of measuring intrathoracic pressure. 4,180,059, Cl. 128-721.000.
Tintometer GmbH: *See—*
Voss, Cay-Peter; and Nowak, Manfred, 4,180,009, Cl. 116-206.000.
Tirboiu, Dumitru: *See—*
Popp, Valer V.; Suditu, Ion; Neagu, Petre; Fotescu, Leonida; Mihalache, Ion; and Tirboiu, Dumitru, 4,180,457, Cl. 208-188.000.
Tire-Gator, Inc.: *See—*
Johnson, Albert O., 4,180,004, Cl. 110-346.000.
Titan Specialties, Inc.: *See—*
Echols, Robert B.; and Berry, William J., 4,179,991, Cl. 102-21.600.
Tjarksen, Richard A.; Keresztes, Robert J.; and Harnish, Eugene E., to Bendix Corporation, The. Integral piston and adjuster for a brake. 4,180,147, Cl. 188-71.800.
Toepffer, Kurt: *See—*
Brandt, Hans-Walter; Deibele, Ludwig; Toepffer, Kurt; and Steinacker, Karl-Heinz, 4,180,438, Cl. 203-89.000.
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Tokas, Edward F., to Monsanto Company. Molding compositions and process for preparing same. 4,180,486, Cl. 260-4.0AR.
Tokosh, Richard; and Cahn, Arno, to Lever Brothers Company. Method for improved acyl isethionate detergent bars. 4,180,470, Cl. 252-121.000.
Tokutomi, Seijiro: *See—*
Miyata, Katsuhiko; Tokutomi, Seijiro; and Nakamura, Kazuo, 4,180,309, Cl. 354-25.000.
Tokyo Electric Co., Ltd.: *See—*
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Tokyo Shibaura Electric Co., Ltd.: *See—*
Naito, Makoto; and Kasami, Akinobu, 4,180,423, Cl. 148-171.000.
Omi, Tadao; Watanabe, Minoru; and Nishimura, Toshio, 4,180,478, Cl. 252-301.40H.
Toldy, Sandor S. L.; Szilagyi nee Farago, Katalin; Schafer, Inge; Szondy, Eleonora; Borvendeg, Janos; and Hermann nee Szente, Ilona, to Richter Gedeon Vegyeszet, Gyar RT. Novel steroidspiroox-azolidines and process for their preparation. 4,180,505, Cl. 260-239.55R.
Tolerson, Lawrence E. Carrier. 4,180,299, Cl. 312-242.000.
Tomczak, Lawrence W., to Chrysler Corporation. Mounting for paddlewheel photoelectric transducer. 4,179,924, Cl. 73-229.000.
Tomidokoro, Susumu; Ukigai, Toshiyuki; Takahashi, Toshio; and Saika, Daini, to Lion Fat & Oil Co., Ltd., The. Disubstituted aliphatic carboxylamidoamines as well as detergents and toiletry compositions containing same. 4,180,468, Cl. 252-117.000.
Tomita, Joseph T.: *See—*
Kim, Yung D.; Tomita, Joseph T.; and Schenck, Jay R., 4,180,556, Cl. 424-1.000.
Tomy Kogyo Co., Inc.: *See—*
Iwao, Noriaki, 4,179,825, Cl. 35-32.000.
Topla, Ltd.: *See—*
Nakagawa, Yasuharu, 4,179,760, Cl. 4-166.000.
Torneback, Axel G. Load carrying vehicle trailer. 4,180,172, Cl. 414-522.000.
Tornerfelt, Gosta T. I., to AB Trelleborgplast. Process of manufacturing a wall having an opening therein, and a door or cover therefor. 4,179,790, Cl. 29-416.000.
Toro Company, The: *See—*
Bivens, Jon A., 4,180,850, Cl. 362-285.000.
Toru, Takeshi: *See—*
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Towmotor Corporation: *See—*
Hildebrecht, Harold V., 4,179,949, Cl. 74-474.000.
Toyoda Koki Kabushiki Kaisha: *See—*
Munekata, Kenichi; Ohta, Takeshi; and Ohshima, Susumu, 4,179,854, Cl. 51-165.770.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Mitsuda, Tadao; Iwata, Minoru; Sugiura, Masatoshi; Takada, Shigetaka; and Watanabe, Yukihiro, 4,179,882, Cl. 60-276.000
Moriyama, Masakazu, 4,179,876, Cl. 58-50.00R.
Onishi, Sigeru, 4,180,029, Cl. 123-73.00A.
Saiki, Junichi; and Kumai, Teruo, 4,180,035, Cl. 123-119.00A
Sanda, Shougo; Nakamura, Norimiko; and Tanahashi, Toshio, 4,180,044, Cl. 123-191.00S.
Shimizu, Hidetoshi, 4,180,294, Cl. 303-6.00C.
Souma, Teruo, 4,180,148, Cl. 188-73.500.
Takeshita, Hiroshi; Kondo, Hiroyuki; Ohta, Takaaki; Nomura, Yoshihisa; and Nogami, Tomoyuki, 4,180,295, Cl. 303-22.00R.
Yanagihara, Hiromichi, 4,180,021, Cl. 123-32.0ST.
TP Laboratories, Inc.: *See—*
Hoffman, Carl S., 4,179,815, Cl. 433-140.000.
Trankle, Rick. Percussion accessory. 4,179,974, Cl. 84-411.00P.
Transac - Compagnie pour le Developpement des Transactions Automatiques: *See—*
Michaud, Andre, 4,180,837, Cl. 360-18.000.

Trethewy, Brian R.: *See—*
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Yamada, Tsuneo; and Miyamoto, Yukihiko, 4,180,777, Cl. 325-363.000.
Trott, David W.: *See—*
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Trustul Petrolului Bolintin: *See—*
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TRW Inc.: *See—*
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Tsubota, Junjiro. Method and apparatus for obtaining useful work from wave energy. 4,179,886, Cl. 60-398.000.
Tsuchiya, Hiroyoshi: *See—*
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Tsuji, Takao: *See—*
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Tucek, Frank J., to J. I. Case Company. Cylinder assembly with split ring retainer. 4,180,274, Cl. 277-192.000.
Tufvesson, Kent A.: *See—*
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Turkdogan, Ethem T.: *See—*
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Turnbull, James H.: *See—*
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Turner, Lloyd S. Container and closure. 4,180,178, Cl. 220-281.000.
Twist, Ernest F., to USM Corporation. Dust stop. 4,180,332, Cl. 366-279.000.
Tyagunov, Boris I.: *See—*
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Ube Industries, Ltd.: *See—*
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Ueda, Shinya, to Fuji Electric Co., Ltd. Infrared ray gas analyzing apparatus. 4,180,733, Cl. 250-345.000.
Ueshima, Michio: *See—*
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Ujiie, Nobuhisa, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Apparatus for granulation of molten slags. 4,180,250, Cl. 266-137.000.
Ukigai, Toshiyuki: *See—*
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Ulanen, Yalmar S.: *See—*
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UNICEM-Unione Cementerie Marchino, Emiliane e di Augusta, S.p.A.: *See—*
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Union Carbide Corporation: *See—*
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Drain, Leslie E., 4,180,328, Cl. 356-349.000.
United Kingdom of Great Britain and Northern Ireland, Secretary of State for Industry in Her Britannic Majesty's Government of the: *See—*
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Fitzgerald-Smith, James P.; and Knight, Derek I., 4,180,364, Cl. 414-350.000.
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Air Force: *See—*
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Reed, Russell, Jr.; Peterson, John A.; and Price, Raymond M., 4,180,424, Cl. 149-19.400.
Rhoades, Richard G., 4,180,535, Cl. 264-3.00R.
Wolpert, Stephen M.; and Nerath, Gustav J., 4,180,599, Cl. 427-54.100.
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Hsieh, Edmund J., 4,180,775, Cl. 324-249.000.
Marchant, David D., 4,180,484, Cl. 252-521.000.
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Breant, Pierre L. V.; and Fresnel, Alain C., 4,180,859, Cl. 364-565.000.
Hasker, Jan; and Peters, Cornelis, 4,179,777, Cl. 29-25.130.
Linder, Uno K. E., 4,180,333, Cl. 400-124.000.
Notelteirs, Victor R.; and Rijckaert, Josephus F., 4,180,758, Cl. 313-318.000.
Ochmann, Rudolf, 4,180,761, Cl. 315-292.000.
Schermer, Gijsbertus J. H.; Winters, Hubertus H. A.; Hildering, Willem C.; and Nickl von Nikelsberg, Karl F., 4,180,828, Cl. 357-79.000.
Voorman, Johannes O., 4,180,785, Cl. 332-9.00T.
United States Steel Corporation: *See—*
Galer, Herbert W., 4,180,176, Cl. 217-57.000.
Olsson, Robert G.; and Turkdogan, Ethem T., 4,180,549, Cl. 423-230.000.
United Technologies Corporation: *See—*
Conner, Gary E., 4,179,944, Cl. 74-89.150.
Faucher, Joseph E.; Koucky, Robert W.; and Roy, William D., 4,179,881, Cl. 60-39.710.
Moore, William A.; and Przirembel, Hans R., 4,180,373, Cl. 416-97.00R.
Scorso, Clifford A., Jr.; and Messer, Gordon J., 4,180,853, Cl. 363-96.000.
University of Akron, The: *See—*
Farona, Michael F.; and White, James F., 4,180,692, Cl. 585-457.000.
University of Bradford: *See—*
Svarovsky, Ladislav, 4,179,934, Cl. 73-432.0PS.
UOP Inc.: *See—*
Illingworth, George E., 4,180,691, Cl. 585-455.000.
Imai, Tamotsu, 4,180,690, Cl. 585-443.000.
Schulz, William J.; Pecoraro, Ralph R.; and Hogan, Gerard T., 4,180,125, Cl. 165-48.000.
Up-Right, Inc.: *See—*
Claxton, Gerald L., 4,179,871, Cl. 56-330.000.
Upjohn Company, The: *See—*
Hester, Jackson B., Jr., 4,180,668, Cl. 260-244.400.
Kane, Michael P.; and Szmuszkovicz, Jacob, 4,180,522, Cl. 260-562.00R.
Lednicer, Daniel, 4,180,584, Cl. 424-274.000.
Sih, John C., 4,180,657, Cl. 542-426.000.
Smith, Herman W., 4,180,512, Cl. 260-345.200.
Urano, Fumio; and Arai, Akihiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Interlocking device for indication in the finder of a single-lens reflex camera. 4,180,311, Cl. 354-53.000.
Uribe, Charles E. Pipe beveling attachment for a power tool. 4,180,358, Cl. 409-179.000.

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Uskokovic, Milan R.: *See—*
Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,180,659, Cl. 542-427.000.
USM Corporation: *See—*
Twist, Ernest F., 4,180,332, Cl. 366-279.000.
Ustin, George; and Soltis, Andrew P., to North American Philips Corporation. Sectional electrical terminal block. 4,180,305, Cl. 339-198.00H.
Uusitalo, Seppo J.: *See—*
Sipila, Heikki J.; and Uusitalo, Seppo J., 4,180,735, Cl. 250-358.00R.
Vac-Tec Systems, Inc.: *See—*
Morrison, Charles F., Jr., 4,180,450, Cl. 204-298.000.
Vaccari, Franco. Foot clamping device particularly for ski boots. 4,179,827, Cl. 36-119.000.
Vakil, Himanshu B., to General Electric Company. Vapor compression cycle device with multi-component working fluid mixture and method of modulating its capacity. 4,179,898, Cl. 62-114.000.
Valley, James F. Steering wheel cover. 4,179,950, Cl. 74-558.000.
Valukis, Robert W., to Electron Fusion Devices Inc. Metering valves. 4,180,239, Cl. 251-60.000.
Valve Concepts International, Inc.: *See—*
Muchow, John D., 4,180,238, Cl. 251-58.000.
van Bilderbeek, Bernard H., to Vetco, Inc. Pile forging. 4,180,349, Cl. 405-224.000.
van Buren, Harold S., Jr., to TRW Inc. Encapsulated fastener. 4,179,977, Cl. 85-81.000.
van der Lely, Cornelis. Soil cultivating implements. 4,180,134, Cl. 172-59.000.
Van Landeghem, Willy K.: *See—*
Suys, Andre R.; and Van Landeghem, Willy K., 4,180,740, Cl. 250-483.000.
van Strien, Johannes, to Heineken Technisch Beheer B.V. Method and an apparatus for measuring the carbon dioxide content in beer. 4,179,918, Cl. 73-19.000.
Vapor Corporation: *See—*
Roth, Carl W.; Groth, Hugh F.; and Meacham, G. B. Kirby, 4,180,366, Cl. 414-540.000.
Varian Associates, Inc.: *See—*
Abu-Shumays, Ahmad, 4,180,739, Cl. 250-461.00R.
Gang, Robert E., 4,180,769, Cl. 324-319.000.
Varo Semiconductor, Inc.: *See—*
Allen, Richard, 4,179,796, Cl. 29-605.000.
Varta Batterie Aktiengesellschaft: *See—*
Winsel, August, 4,180,624, Cl. 429-54.000.
Vassiliou, Eustathios, to Du Pont de Nemours, E. I., and Company. Article coated with fluoropolymer finish with improved scratch resistance. 4,180,609, Cl. 428-212.000.
Vassiliou, Eustathios, to Du Pont de Nemours, E. I., and Company. Craze-resistant polysiloxane resin coatings and coating compositions containing a discontinuous phase. 4,180,613, Cl. 428-327.000.
Vecchiarelli, Francis, to Hunter Douglas International N.V. Cord lock mechanism for venetian blind. 4,180,118, Cl. 160-178.00C.
Veeder Industries, Inc.: *See—*
Smilgys, Bruno S., 4,180,202, Cl. 235-132.00R.
Vending Components, Inc.: *See—*
Zurit, David; Cerrato, Vincent; and Hines, James, 4,180,189, Cl. 222-400.700.
Verbrugge, Pieter A.; and Kramer, Petrus A., to Shell Oil Company. Preparation of nitriles. 4,180,520, Cl. 260-465.00R.
Verma, Monica H., to Du Pont de Nemours, E. I., and Company. Article coated with a water based alkyd resin primer. 4,180,610, Cl. 428-216.000.
Vernon, Alan: *See—*
Buckley, Keith; Vernon, Alan; and Lowe, Philip J., 4,180,592, Cl. 426-32.000.
Versar, Inc.: *See—*
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Vetco, Inc.: *See—*
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Via, Thomas E.: *See—*
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Vidal, Jose L.; and Walker, Wellington E., to Union Carbide Corporation. Catalyst and process for producing polyhydric alcohols and derivatives. 4,180,517, Cl. 260-449.00L.
Vinjukov, Jury G.: *See—*
Popov, Alexei I.; Pepenko, Vladimir D.; Vinjukov, Jury G.; Matjurin-Veretennikov, Leonid I.; Stepanov, Vladimir M.; and Grubman, Viktor G., 4,180,156, Cl. 198-726.000.
Vinson, William L. Hair pressing composition. 4,180,561, Cl. 424-71.000.
Violland, Robert: *See—*
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Viragh, Steve. Drain cover assembly. 4,180,094, Cl. 137-362.000.
Virog, John J., Jr.; and Von Hagel, Leo, to Maxcap, Inc. Blow molded plastic bottle and antitamper cap. 4,180,175, Cl. 215-252.000.
Vital Signs, Inc.: *See—*
Milliken, Ralph A.; Wall, Terence D.; and Boelens, Martin, 4,180,066, Cl. 128-205.240.
Vlad, Constantin: *See—*
Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,180,418, Cl. 148-12.400.
Vogelsberg, William A., to General Motors Corporation. Exhaust gas recirculation control. 4,180,034, Cl. 123-119.00A.
Vogt, Berthold R.: *See—*
Wade, Peter C.; and Vogt, Berthold R., 4,180,579, Cl. 424-258.000.
Vohran Kunststofferzeugnisse GmbH: *See—*
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Volkswagenwerk AG: *See—*
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Voltarc Tubes, Inc.: *See—*
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Von Hagel, Leo: *See—*
Virog, John J., Jr.; and Von Hagel, Leo, 4,180,175, Cl. 215-252.000.
Voorman, Johannes O., to U.S. Philips Corporation. Modulator for forming the product of two input signals. 4,180,785, Cl. 332-9.00T.
vor der Bruck, Dieter; and Wolfrum, Gerhard, to Bayer Aktiengesellschaft. Acid disazo dyestuffs containing a substituted thiophene middle component. 4,180,503, Cl. 260-152.000.
Voss, Cay-Peter; and Nowak, Manfred, to Tintometer GmbH. Ion concentration testing apparatus. 4,180,009, Cl. 116-206.000.
Vsesojuzny Gosudarstvenny Nauchno-Issiedovatelsky I Proekthyinstitut Khimo-Forograficheskoi Promyshlennosti: *See—*
Andreev, Jury S.; Pyasetskaya, Olga V.; and Leonova, Galina G., 4,180,402, Cl. 430-394.000.
W. R. Grace & Co.: *See—*
Winyall, Milton E.; and Abdo, Kamal M., 4,180,566, Cl. 424-127.000.
Wachter, Bernard, to Pyro Dynamics, Ltd. Apparatus for manufacturing cigarettes or the like. 4,180,082, Cl. 131-26.000.
Wada, Masahiro; Ueshima, Michio; Yanagisawa, Isao; and Ninomiya, Michikazu, to Nippon Shokubai Kagaku Kogyo Co. Ltd. Process for preparing methacrylic acid. 4,180,678, Cl. 562-534.000.
Wade, Peter C.; and Vogt, Berthold R., to E. R. Squibb & Sons, Inc. 2-Substituted-1H-benz[de]-isoquinoline-1,3(2H)-diones. 4,180,579, Cl. 424-258.000.
Wagner, Gerolf, to Fichtel & Sachs AG. Liquid-cooled engine arrangement for a two-wheeled vehicle. 4,180,137, Cl. 180-33.00R.
Wagner, Sigurd, to Bell Telephone Laboratories, Incorporated. Semiconductor liquid junction photocell using a $CuInS_2$ electrode. 4,180,625, Cl. 429-111.000.
Waki, Keiichi: *See—*
Nogami, Sumitaka; Matsumoto, Yoshio; Waki, Keiichi; and Okada, Tooru, 4,180,652, Cl. 525-437.000.
Wakodo Kabushiki Kaisha: *See—*
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Walden, Jack M.; Eads, William D.; Cozzens, Ray J.; Bidwell, John L.; Jewett, Robert A.; Wilson, Martin S.; Griffin, Daniel J.; Kuseski, Robert E.; and Schulte, Louis T., to Hewlett-Packard Company. Programmable calculator having string variable editing capability. 4,180,854, Cl. 364-200.000.
Walker, Garland H., to Western Geophysical Co. of America. Fluid operated seismic generator. 4,180,139, Cl. 181-120.000.
Walker, Wellington E.: *See—*
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Wall, Terence D.: *See—*
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Wallace Sr., Terry C.: *See—*
Riley, Robert E.; and Wallace Sr., Terry C., 4,180,428, Cl. 156-281.000.
Wallace, Trevor E., to Steel Engineering Company Limited, The. Hydraulic percussive machines. 4,179,983, Cl. 92-85.00B.
Walter, Alfred, to Alfred Walter AG. Method of and apparatus for measuring the flexural stiffness of a sheet like sample. 4,179,941, Cl. 73-854.000.
Walter, Eberhard: *See—*
Kleinschmit, Peter; Walter, Eberhard; Mechler, Helmut; Theis, Gunter; and Meiners, Brigitte, 4,180,684, Cl. 568-726.000.
Walters, Ralph, to West Company, The. Plunger rod and piston for a syringe. 4,180,069, Cl. 128-218.00P.
Ward, John, to Jessop Enterprises Pty. Ltd. Cascade solar fluid heater. 4,180,057, Cl. 126-449.000.
Ward, Stanley A., to Imperial Chemical Industries Limited. Ammonia synthesis reactor having parallel feed to plural catalyst beds. 4,180,543, Cl. 422-148.000.
Warner-Lambert Company: *See—*
Hayashi, Masaki; Kori, Seiji; Ohyama, Isao; Iguchi, Sadahiko; and Okada, Takanori, 4,180,675, Cl. 560-118.000.
Warren, Florien J.; and Spector, George. Tool for installing vehicular coil springs. 4,179,784, Cl. 29-283.000.
Warren, Joseph R.: *See—*
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Watanabe, Akinori; and Shinozuka, Katsumasa, to Oki Electric Industry Co., Ltd. Dot printer. 4,180,334, Cl. 400-124.000.
Watanabe, Hirozi: *See—*
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Watanabe, Masakatsu; Nakada, Minoru; and Takeuchi, Takeshi, to Hochiki Corporation. Remote control device for an amplifier trap circuit. 4,180,804, Cl. 340-310.00R.

Watanabe, Minoru: *See—*
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Watanabe, Tsutomu; Yanagawa, Nobuyuki; and Hosaka, Masao, to Ricoh Company, Ltd. Method of controlling fixing temperature of powder image in electrophotographic copying machine. 4,180,721, Cl. 219-216.000.
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Weatherford/DMC: *See—*
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Webb, Paul D., to Ingersoll-Rand Company. Thrust piston biasing means. 4,180,089, Cl. 137-115.000.
Weber, Karl-Heinz; Langbein, Adolf; Schneider, Claus; Lehr, Erich; Boke, Karin; and Kuhn, Franz J., to Boehringer Ingelheim GmbH. 1-Piperazino-6-phenyl-4H-s-triazolo[3,4-c]thieno[2,3-e]1,4-diazepines. 4,180,573, Cl. 424-250.000
Weber, Larry F., to Interstate Electronics Corp. Driver circuitry for plasma display panel. 4,180,762, Cl. 315-169.400
Wegge, Heinrich, to Wegurit Gesellschaft mbH Pipelinebedarf & Co. Device for closing-off the space defined between an inner pipe and an outer shield tube. 4,180,101, Cl. 138-103.000.
Wegmuller, Hans; Horn, Ulrich; Hungerbuhler, Walter; and Haase, Jaroslav, to Ciba-Geigy Corporation. Cosmetic compositions containing polymeric quaternary ammonium salts. 4,180,084, Cl. 132-7.000.
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Weiler, Paul; and Brummer, Dietmar, to Robert Bosch GmbH. Wiping arrangement for wiping a vehicle window. 4,179,766, Cl. 15-250.320
Weiler, Paul; and Brummer, Dietmar, to Robert Bosch GmbH. Wiping arrangement for wiping a vehicle window. 4,179,767, Cl. 15-250.320.
Weisbach, Michael F.: *See—*
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Wellman, Stanley P.: *See—*
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Wesemeyer, Jurgen; and Haubner, Georg, to Robert Bosch GmbH. Remote control system with pulse addressing, and safety warning indication. 4,180,803, Cl. 340-164.00R.
West Company, The: *See—*
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West, Donald L.: *See—*
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Western Electric Co., Inc.: *See—*
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Einbinder, Itamar B.; and Hamilton, Albert A., 4,179,798, Cl. 29-622.000.
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Wilson, John R.; and Wolski, Jerome C., 4,180,846, Cl. 361-357.000
Whalen, Robert. Jar and bottle opener. 4,179,954, Cl. 81-3.440.
Wheeler, John H., to Texacone Company, The. Sanding sleeve assembly. 4,179,856, Cl. 51-241.00S
Wheldon, Robert J.; and Neale, Christopher V., to English Electric Valve Company Limited. Thyratrons. 4,180,756, Cl. 313-193.000.
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White, Velton C. Dental bracket bonding agent and method of use. 4,179,812, Cl. 433-9.000
White, Wesley C., to Partee Products. Musical shaker. 4,179,973, Cl. 84-402.000.
Whitman, Robert H.; and Barber, William A., to American Cyanamid Company. Microcrystalline cellulose as extrusion aid/combustible filler for alumina. 4,180,411, Cl. 106-41.000.
Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Casals-Stenzel, Jorge; and Losert, Wolfgang, to Schering Aktiengesellschaft. 17β-Hydroxy-4-androsten-3-ones and process for the preparation thereof. 4,180,570, Cl. 424-243.000.
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Saier, Manfred; Kastner, Hans-Werner; and Klockler, Robert, 4,179,911, Cl. 72-78.000
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Wildforster, Emil, to Zarges Leichtbau GmbH. Apparatus for transporting and depositing panels. 4,180,258, Cl. 271-196.000.
Wilkinson, James R., Sr., to Container Corporation of America. Lockable tray. 4,180,200, Cl. 229-32.000
Williamson, Warren G., to Robertshaw Controls Company. Push type thermal device and method of making the same and a stem seat therefor and method of making the same. 4,179,928, Cl. 73-368.300.
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Wilson, John R.; and Wolski, Jerome C., to Westinghouse Electric Corp. Vertical bus bars for motor control center. 4,180,846, Cl. 361-357.000
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Wilson, Woodrow A.; and Koska, Herschel O., to Koska, Herschel O., by said Woodrow A. Wilson. Portable, vehicle-mounted, self-contained alarm clock. 4,179,877, Cl. 58-56.000.
Wing, Thomas W. Electroacupuncture instrument. 4,180,079, Cl. 128-422.000
Winn, Martin, to Abbott Laboratories. 2-(N-phenethyl-4-piperidino)-5-pentyl resorcinol. 4,180,669, Cl. 546-240.000
Winsel, August, to Varta Batterie Aktiengesellschaft. Storage battery with aqueous electrolyte and recombiner. 4,180,624, Cl. 429-54.000.
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Winyall, Milton E.; and Abdo, Kamal M., to W. R. Grace & Co. Silica gel method of reducing blood lipid concentration. 4,180,566, Cl. 424-127.000.
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Witte, Walter R., to Speco, Inc. High-speed rotary knife and blade insert assembly therefor. 4,180,212, Cl. 241-89.400.
Wolf, Clyde C. Hydraulic valve system. 4,180,237, Cl. 251-57.000.
Wolf, Gil. Fuel temperature control. 4,180,036, Cl. 123-122.00E.
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Wolkert, Per O. M. Device for handling electrical components. 4,179,803, Cl. 29-741.000
Wolpert, Stephen M.; and Nerath, Gustav J., to United States of America, Army. Crosslinking photoinitiators of acrylic benzophenonetetracarboxylates. 4,180,599, Cl. 427-54.100
Wolski, Jerome C.: *See—*
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Berges, Jon F.; and Woolley, James M., 4,180,085, Cl. 134-57.00D.
Worthington, James C., to Singer Company, The. Digital signal phase shifting system. 4,180,778, Cl. 328-155.000.
Wortman, Harold. Method and apparatus for deregistering and processing an open synthetic tow into fiber-filled articles. 4,179,776, Cl. 28-121.000.
Wrasman, Thomas J., to Celanese Corporation. Methods for making molded plug and plug valve. 4,180,542, Cl. 264-242.000.
Wurm, Jaroslav: *See*—
Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., 4,180,126, Cl. 165-59.000.
Wylain, Inc.: *See*—
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Yamada, Kunihiro, to Ricoh Company, Ltd. High speed serial printer. 4,180,335, Cl. 400-320.000.
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Yamada, Takahiro, to Hitachi, Ltd. Ink jet recording apparatus. 4,180,225, Cl. 346-75.000.
Yamada, Tsuneo; and Miyamoto, Yukihiko, to Trio Kabushiki Kaisha. Tuning meter for use with a pulse count FM demodulation circuit. 4,180,777, Cl. 325-363.000.
Yamaga, Shigeru: *See*—
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Yamagishi, Kesao. Tire, traction unit and device for shifting said traction unit. 4,180,115, Cl. 152-216.000.
Yamaguchi, Shoshichi; Okasaka, Sadaatsu; and Takayama, Yoshikazu, to Nippon Telegraph & Telephone Public Corporation; and Nippon Electric Co., Ltd. Fault-proof system for mobile radio communication. 4,180,708, Cl. 179-2.0EB.
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Yamamoto, Teruo; Ishii, Fumikatsu; and Fujiki, Miyoji, to Hokushin Gohan Kabushiki Kaisha. Weight measuring method of powder in an air flow process and apparatus therefor. 4,180,185, Cl. 222-57.000.
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Yanagihara, Hiromichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of injecting fuel and a fuel injection device of an internal combustion engine. 4,180,021, Cl. 123-32.0ST.
Yanagimoto, Akira; Kumazawa, Shunichi; and Takakuwa, Yasuo, to Nissan Chemical Industries Ltd. Melamine cyanurate as a flame retardant agent. 4,180,496, Cl. 260-45.8NT
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Yeou, Victor, to Poclain. Device for sequentially supplying several hydraulic motors. 4,179,981, Cl. 91-33.000.
Yoneda, Yutaka, to Hitachi, Ltd. Liquid crystal display device using signal converter of digital type. 4,180,813, Cl. 340-784.000.
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Yoshihara, Touhachi; Nishiwaki, Koji; and Seki, Kiwao, to Hitachi, Ltd. Apparatus for processing chromatograph data. 4,180,857, Cl. 364-497.000.
Yoshimura, Tadashi; Hanahara, Tohru; Abiko, Toshio; and Matsuoka, Kazuhiro, to Matsushita Electric Works, Ltd. Detecting device for destructive vibration of structures. 4,180,811, Cl. 340-566.000.
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Young Windows Inc.: *See*—
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Yukuta, Toshio; Ohashi, Takashi; Kojima, Minoru; and Saito, Masumi, to Bridgestone Tire Company, Limited. Flame-and smoke-resistant flexible polyurethane foam and compressed foam sheet. 4,180,631, Cl. 521-164.000.
Yvard, Marcel; Decuyper, Jean-Claude; and Beduchaud, Michel, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Head for electrically printing an image. 4,180,824, Cl. 346-154.000.
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Zasio, John J.: *See*—
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Zenger, Harold H., Sr. Fish egg incubator with fry release means. 4,180,012, Cl. 119-3.000.
Zeto, Robert J.: *See*—
Marshall, Sidney; and Zeto, Robert J., 4,179,792, Cl. 29-571.000.
Zettler, John F., to Xenex Corporation. Switching circuit for eliminating the effects of contact bounce. 4,180,747, Cl. 307-247.00A.
Zeuna-Starker GmbH & Co. KG: *See*—
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Zickendraht, Christian: *See*—
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Zievers, James F., to Industrial Filter & Pump Mfg. Co. Process of making agricultural product from organic sewage sludge. 4,180,459, Cl. 210-10.000.
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Ziv, Avraham, to American Safety Equipment Corporation. Child safety seat restraint adapter means. 4,180,283, Cl. 280-802.000.
Zumbahlen, Vincent J. Tiller planter with modified soil leveling and pulverizing unit. 4,180,005, Cl. 111-52.000.
Zurit, David; Cerrato, Vincent; and Hines, James, to Vending Components, Inc. Single valve dispensing tube. 4,180,189, Cl. 222-400.700.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF DECEMBER, 1979

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Soodak, Charles, Re. 30,181, Cl. 313-25.000.
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Bell Telephone Laboratories, Incorporated: *See*—
Howson, Robert D., Re. 30,182, Cl. 325-42.000.
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Exxon Research & Engineering Co.: *See*—
Li, Norman N.; Cahn, Robert P.; and Shrier, Adam L., Re. 30,179, Cl. 210-22.00R.
Fauth, Gunter, to AGFA-Gevaert A.G. Film transporting mechanism for still cameras. Re. 30,178, Cl. 354-206.000.
Howson, Robert D., to Bell Telephone Laboratories, Incorporated. Precoded ternary data transmission. Re. 30,182, Cl. 325-42.000.
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Jacobs Manufacturing Company, The: *See*—
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Li, Norman N.; Cahn, Robert P.; and Shrier, Adam L., to Exxon Research & Engineering Co. Common ion effect to assist LM separation. Re. 30,179, Cl. 210-22.00R
Mier, Mark F., to Irwin, Lawrence F. Plumbers tool. Re. 30,175, Cl. 15-104.3SN.
Morse, Walter H.; and Ames, Ira R., Jr., to Jacobs Manufacturing Company, The. Anti-skid control device and system. Re. 30,177, Cl. 303-113.000.
Research Corporation: *See*—
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Soodak, Charles, to Baxter Travenol Laboratories, Inc. Method and means for suppressing ozone generated by arc lamps. Re. 30,181, Cl. 313-25.000.
Wolski, Adam M.; and Yates, Charles B., to Yates Industries, Inc. Plural copper-layer treatment of copper foil and article made thereby. Re. 30,180, Cl. 428-601.000.
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Cone, Richard E. Plant reservoir. 253,757, 12-25-79, Cl. D11-164.000.
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Davis, Gary L. Bread slicing guide. 253,744, 12-25-79, Cl. D7-46.000.
de Saint-Michel, Michel R., to Compagnie Generale des Etablissements Michelin. Tire. 253,760, 12-25-79, Cl. D12-147.000.
de Saint-Michel, Michel R., to Compagnie Generale des Etablissements Michelin. Tire. 253,761, 12-25-79, Cl. D12-147.000.
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Hilgeman, David R. Candlestick. 253,795, 12-25-79, Cl. D48-2.000.
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Lar Rieu, Barry J. Copy holder for a typewriter or similar article. 253,775, 12-25-79, Cl. D19-91.000.
Legueu, Paul E. R. Combined hood, windshield, fenders, headlights and grille unit. 253,763, 12-25-79, Cl. D12-164.000.
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Presto Lock Company, Division of Walter Kidde & Company, Inc.: *See*—
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Roggin, Sam. Protective vehicle partition. 253,765, 12-25-79, Cl. D12-195.000.
Saitoh, Shigeru. Figure toy. 253,784, 12-25-79, Cl. D21-149.000.
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ISSUED DECEMBER 25, 1979

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185 4,180,382

CLASS 9

14 4,179,764

CLASS 13

25 4,180,697

CLASS 15

22 R 4,179,765
104.3 SN Re 30,175
250.32 4,179,766
4,179,767
352 4,179,768
353 4,179,769
360 4,179,770

CLASS 16

121 4,179,771
171 4,179,844

CLASS 17

47 4,179,772

CLASS 19

159 A 4,179,773

CLASS 24

132 R 4,179,774
249 R 4,179,775

CLASS 28

121 4,179,776

CLASS 29

25.13 4,179,777
25.19 4,179,778
33 K 4,179,785
78 4,179,779
149.5 R 4,179,780
157.3 R 4,179,781
4,179,782
281.5 4,179,783
283 4,179,784
407 4,179,786
4,179,788
408 4,179,787
412 4,179,789
416 4,179,790
526 R 4,179,791
571 4,179,792
578 4,179,793
580 4,179,794
602 R 4,179,795
605 4,179,796
610 R 4,179,797
622 4,179,798
623.5 4,179,799
625 4,179,800
626 4,179,801
628 4,179,802
741 4,179,803

CLASS 30

90.7 4,179,804
122 4,179,805
124 4,179,806
4,179,807
293 4,179,808

CLASS 33

129 4,179,817
321 4,179,818

CLASS 34

12 4,179,819
92 4,179,820
235 4,179,821

CLASS 35

9 B 4,179,822
10.24 4,179,823
4,179,824
32 4,179,825

CLASS 36

69 4,179,826
119 4,179,827

CLASS 37

53 4,179,828
94 4,179,829

CLASS 38

102.5 4,179,830

CLASS 40

19.5 4,179,831
21 C 4,179,833
540 4,179,832

CLASS 43

57.5 R 4,179,834
61 4,179,835
4,179,836
4,179,837
92 4,179,838
112 4,179,839
131 4,179,840

CLASS 44

52 4,180,384
62 4,180,385
63 4,180,386

CLASS 46

94 4,179,841
117 4,179,842
126 4,179,843
178 4,179,845

CLASS 47

59 4,179,846
76 4,179,847

CLASS 48

206 4,180,387

CLASS 49

124 4,179,848
505 4,179,849

CLASS 51

59 R 4,179,850
101 LG 4,179,851
132 4,179,852
165 R 4,179,853
165.77 4,179,854
204 4,179,855
241 S 4,179,856

CLASS 52

71 4,179,857
262 4,179,858
397 4,179,859
732 4,179,860
743 4,179,861

CLASS 53

86 4,179,862
295 4,179,863
388 4,179,864
435 4,179,865
468 4,179,866
568 4,179,867
571 4,179,868

CLASS 54

46 4,179,869

CLASS 55

16 4,180,388
28 4,180,389
272 4,180,390
324 4,180,391

CLASS 56

6 4,179,870
330 4,179,871
4,179,873
366 4,179,872

CLASS 57

58.89 4,179,874
248 4,179,875

CLASS 58

50 R 4,179,876
56 4,179,877

CLASS 59

85 4,179,878

CLASS 60

39.09 R 4,179,879
39.23 4,179,880
39.71 4,179,881
276 4,179,882
293 4,179,883
321 4,179,884
370 4,179,885
398 4,179,886
420 4,179,887
4,179,888
477 4,179,889
519 4,179,890
520 Re 30,176
521 4,179,891
605 4,179,892
682 4,179,893

CLASS 62

2 4,179,894
4,179,895
4,179,896
9 4,179,897
114 4,179,898
228 4,179,899
231 4,179,900
238 4,179,901
4,179,902
322 4,179,903
342 4,179,904

CLASS 64

17 A 4,179,905

CLASS 66

128 4,179,906

CLASS 68

12 R 4,179,907

CLASS 70

185 4,179,908

CLASS 71

25 4,180,392
78 4,180,393
86 4,180,394
93 4,180,395

CLASS 72

45 4,179,909
59 4,179,910
78 4,179,911
196 4,179,912
205 4,179,913
358 4,179,914
402 4,179,915

CLASS 73

7 4,179,916
17 A 4,179,917
19 4,179,918
17.5 4,179,919
86 4,179,920
112 4,179,921
116 4,179,922
134 4,179,923
229 4,179,924
4,179,925
339 R 4,179,926
350 4,179,927
368.3 4,179,928
423 A 4,179,932
423 R 4,179,929
425.2 4,179,930
425.6 4,179,931
431 4,179,933
432 PS 4,179,934
493 4,179,935
510 4,179,938
606 4,179,936
646 4,179,937
730 4,179,939
808 4,179,940
854 4,179,941

CLASS 74

43 4,179,942
64 4,179,943
89.15 4,179,944
89.2 4,179,947
122 4,179,945
230.17 E 4,179,946
242.15 R 4,179,948
474 4,179,949
558 4,179,950
572 4,179,951
710 4,179,952
750 B 4,179,953

CLASS 75

53 4,180,396
58 4,180,397
157.5 4,180,398
229 4,180,399
235 4,180,400
236 4,180,401

CLASS 81

3.44 4,179,954
9.5 R 4,179,956
57.11 4,179,955

CLASS 82

38 A 4,179,957

CLASS 83

37 4,179,958
4,179,959
175 4,179,960
206 4,179,961
300 4,179,962
409 4,179,963
599 4,179,964
745 4,179,965
820 4,179,966
846 4,179,967

CLASS 84

1.01 4,179,968
4,179,969
1.03 4,179,970
1.11 4,179,972
1.24 4,179,971
402 4,179,973
411 P 4,179,974

CLASS 85

23 4,179,975
47 4,179,976
81 4,179,977

CLASS 89

12 4,179,978
36 A 4,179,979

CLASS 91

6 4,179,980
33 4,179,981

CLASS 92

5 R 4,179,982
85 B 4,179,983

CLASS 98

115 LH 4,179,984

CLASS 99

339 4,179,985
359 4,179,986

CLASS 100

53 4,179,987

CLASS 101

7 4,179,988
291 4,179,989
467 4,179,990

CLASS 102

21.6 4,179,991
45 4,179,992

CLASS 104

172 BT 4,179,993

CLASS 105

150 4,179,994
197 DB 4,179,995
345 4,179,996
377 4,179,999
409 4,180,000
420 4,180,001

CLASS 106

14.15 4,180,406
14.5 4,180,405
26 4,180,407
31 4,180,408
39.6 4,180,409
41 4,180,411
73.2 4,180,410
124 4,180,412

CLASS 108

6 4,180,002
144 4,180,003

CLASS 110

346 4,180,004

CLASS 111

52 4,180,005

CLASS 112

254 4,180,006
278 4,180,007

CLASS 116

170 4,180,008
206 4,180,009
209 4,180,010

CLASS 118

685 4,180,011

CLASS 119

3 4,180,012
29 4,180,013
52 R 4,180,014
78 4,180,015
106 4,180,016

CLASS 122

34 4,180,017
225 R 4,180,018
235 N 4,180,019

CLASS 123

32 AE 4,180,022
32 EA 4,180,020
4,180,023
4,180,025
32 EF 4,180,026
32 ST 4,180,021
41.35 4,180,027
41.46 4,180,024
45 A 4,180,028
73 A 4,180,029
90.67 4,180,030
117 A 4,180,031
119 A 4,180,033
4,180,034
4,180,035
119 CD 4,180,032
122 E 4,180,036
139 AW 4,180,038
4,180,039
139 E 4,180,037
140 R 4,180,040
141 4,180,041
4,180,042
146.5 B 4,180,043
191 S 4,180,044

CLASS 124

90 4,180,045

CLASS 125

11 A 4,180,046
14 4,180,047
15 4,180,048

CLASS 126

21 A 4,180,049
25 A 4,180,050
77 4,180,051
108 4,180,052
132 4,180,053
164 4,180,054
446 4,180,055
447 4,180,056
449 4,180,057

CLASS 128

1 R 4,180,058
25 B 4,180,063
130 4,180,064
165 4,180,065
205.24 4,180,066
214 F 4,180,067
214 R 4,180,068
218 M 4,180,070
218 N 4,180,071
218 P 4,180,069
227 4,180,072
260 4,180,073
276 4,180,074
305 4,180,075
349 B 4,180,076
402 4,180,077
419 PG 4,180,078
422 4,180,079
642 4,180,080
681 4,180,061
698 4,180,062
721 4,180,059
760 4,180,060

CLASS 130

27 R 4,180,081

CLASS 131

26 4,180,082

CLASS 132

7 4,180,084

CLASS 134

57 D 4,180,085

CLASS 135

67 4,180,086

CLASS 136

89 PC 4,180,414
205 4,180,415

CLASS 137

78 4,180,087
87 4,180,088
101.25 4,180,083
115 4,180,089
119 4,180,090
238 4,180,091
344 4,180,092
360 4,180,093
362 4,180,094
387 4,180,095
403 4,180,096
516.29 4,180,097
596.13 4,180,098
624.2 4,180,099
625.3 4,180,100

CLASS 138

103 4,180,101
106 4,180,102
109 4,180,103
172 4,180,104

CLASS 141

165 4,180,105
294 4,180,106

CLASS 144

2 N 4,180,107
34 F 4,180,108
208 D 4,180,109

CLASS 145

31 R 4,180,110

CLASS 148

1.5 4,180,416
6.15 Z 4,180,417
12.4 4,180,418
23 4,180,419
37 4,180,420
150 4,180,421
171 4,180,423
175 4,180,422

CLASS 149

19.4 4,180,424

95 4,180,425

CLASS 150

1.7 4,180,111
4,180,112
7 4,180,113
28 R 4,180,114

CLASS 152

216 4,180,115
362 R 4,180,116

CLASS 156

104 4,180,426
185 4,180,413
272 4,180,427
281 4,180,428
425 4,180,429
441.5 4,180,430
505 4,180,431
643 4,180,432

CLASS 160

67 4,180,117
178 C 4,180,118

CLASS 162

3 4,180,433
138 4,180,434

CLASS 164

34 4,180,119
109 4,180,120
152 4,180,121
448 4,180,122

CLASS 165

1 4,180,123
4,180,124
48 4,180,125
59 4,180,126
76 4,180,127
4,180,128
110 4,180,129
124 4,180,130

CLASS 166

55 4,180,131
120 4,180,132

CLASS 172

26 4,180,133
59 4,180,134
407 4,180,135

CLASS 174

2 4,180,698
126 CP 4,180,699
152 GM 4,180,700

CLASS 176

30 4,180,435

CLASS 177

68 4,180,136

CLASS 178

69.1 4,180,701
4,180,705

CLASS 179

1 F 4,180,706
1 M 4,180,707
2 AM 4,180,709
2 EB 4,180,708
115.5 H 4,180,710

CLASS 180

33 R 4,180,137
65 A 4,180,138

CLASS 181

120 4,180,139
156 4,180,140
264 4,180,141

CLASS 182

77 4,180,142
91 4,180,143

CLASS 184

1 R 4,180,144

CLASS 187

17 4,180,145

CLASS 188

71.8 4,180,146
4,180,147
73.5 4,180,148
340 4,180,149

CLASS 198

366 4,180,150
367 4,180,151
377 4,180,152
425 4,180,153
466 4,180,154
498 4,180,155
726 4,180,156

747 4,180,157
831 4,180,158

CLASS 200

5 A 4,180,711
16 D 4,180,712
52 R 4,180,713
81 R 4,180,714
246 4,180,715
320 4,180,716

CLASS 203

89 4,180,438

CLASS 204

1 T 4,180,439
4,180,440
2.1 4,180,441
14 N 4,180,442
35 N 4,180,443
90 4,180,444
129 4,180,445
158 R 4,180,446
159.17 4,180,447
192 C 4,180,448
296 4,180,449
298 4,180,450
301 4,180,451

CLASS 206

63.5 4,180,159
210 4,180,160
328 4,180,161
363 4,180,162
385 4,180,163
419 4,180,164
461 4,180,165
568 4,180,166
622 4,180,167
626 4,180,168

CLASS 208

8 LE 4,180,452
57 4,180,453
113 4,180,454
126 4,180,455
177 4,180,456
188 4,180,457

CLASS 209

326 4,180,458

CLASS 210

10 4,180,459
22 R Re 30,179
182 4,180,460
333 A 4,180,461
351 4,180,462
415 4,180,463
497 R 4,180,464
516 4,180,465

CLASS 211

13 4,180,169

CLASS 212

1 4,180,170
61 4,180,171

CLASS 215

6 4,180,173
221 4,180,174
252 4,180,175

CLASS 217

57 4,180,176

CLASS 219

10.49 A 4,180,717
10.55 A 4,180,718
125.12 4,180,719
130.51 4,180,720
216 4,180,721
502 4,180,722
541 4,180,723

CLASS 220

88 A 4,180,177
281 4,180,178
307 4,180,179

CLASS 221

1 4,180,180
70 4,180,181
75 4,180,182
194 4,180,183

CLASS 222

41 4,180,184
57 4,180,185
326 4,180,187
368 4,180,188
400.7 4,180,189

CLASS 223

43 4,180,190

CLASS 224

45 BA 4,180,191

235 4,180,192

CLASS 225

101 4,180,193

CLASS 226

113 4,180,194

CLASS 227

51 4,180,195
109 4,180,196
120 4,180,197
4,180,198

CLASS 228

102 4,180,199

CLASS 229

32 4,180,200
37 R 4,180,201

CLASS 235

92 T 4,180,724
132 R 4,180,202
302 4,180,203
385 4,180,204
411 4,180,205
419 4,180,206
493 4,180,207

CLASS 236

93 B 4,180,208

CLASS 237

1 A 4,180,209

CLASS 239

97 4,180,210
265.43 4,180,211

CLASS 241

89.4 4,180,212
192 4,180,213

CLASS 242

47 4,180,214
47.01 4,180,215
66 4,180,216
84.2 A 4,180,217
118.1 4,180,219
131 4,180,218
199 4,180,220

CLASS 244

13 4,180,221
75 R 4,180,222
111 4,180,223
136 4,180,224

CLASS 248

27.1 4,180,226
56 4,180,227
74 R 4,180,228
363 4,180,229
573 4,180,230
632 4,180,231

CLASS 249

60 4,180,232
144 4,180,233

CLASS 250

207 4,180,725
222 R 4,180,726
227 4,180,702
237 G 4,180,703
4,180,704
264 4,180,727
4,180,728
4,180,729
4,180,730
270 4,180,731
344 4,180,732
345 4,180,733
4,180,734
358 R 4,180,735
363 R 4,180,736
367 4,180,737
396 ML 4,180,738
461 R 4,180,739
483 4,180,740
559 4,180,741
574 4,180,742

CLASS 251

8 4,180,235
14 4,180,234
30 4,180,236
57 4,180,237
58 4,180,238
60 4,180,239
127 4,180,240
130 4,180,241
144 4,180,242
234 4,180,243
309 4,180,244

CLASS 252

48.6 4,180,466

99 4,180,467
117 4,180,468
121 4,180,470
140 4,180,471
149 4,180,469
162 4,180,472
182 4,180,473
188.3 R 4,180,474
299 4,180,475
301.1 W 4,180,476
301.24 4,180,479
301.4 H 4,180,478
301.4 R 4,180,477
429 R 4,180,480
441 4,180,481
455 R 4,180,482
518 4,180,483
521 4,180,484
532 4,180,485

CLASS 254

64 4,180,245
77 4,180,246

CLASS 256

54 4,180,247

CLASS 260

4 AR 4,180,486
18 N 4,180,487
21 4,180,488
23 R 4,180,490
29.2 TN 4,180,491
30.8 R 4,180,492
32.8 N 4,180,493
40 R 4,180,494
45.75 K 4,180,495
45.8 NT 4,180,496
4,180,497
4,180,498
112 R 4,180,499
112.5 R 4,180,501
112.5 S 4,180,500
145 A 4,180,502
152 4,180,503
239.55 D 4,180,504
239.55 R 4,180,505
244.4 4,180,668
245.2 4,180,506
245.4 4,180,507
326.14 T 4,180,509
326.5 C 4,180,508
343.7 4,180,511
345.2 4,180,512
392 4,180,513
448.2 Q 4,180,515
449 L 4,180,517
449 R 4,180,516
453 RZ 4,180,518
459 A 4,180,519
465 R 4,180,520
505 C 4,180,521
562 R 4,180,522
573 4,180,523
953 4,180,532

CLASS 261

39 A 4,180,533
41 B 4,180,534

CLASS 264

3 R 4,180,535
53 4,180,536
62 4,180,537
63 4,180,538
143 4,180,539
156 4,180,540
171 4,180,541
242 4,180,542

CLASS 266

67 4,180,248
78 4,180,249
137 4,180,250
172 4,180,251

CLASS 269

17 4,180,252
296 4,180,253
328 4,180,254

CLASS 270

54 4,180,255
83 4,180,256

CLASS 271

193 4,180,257
196 4,180,258
200 4,180,259

CLASS 272

97 4,180,260
119 4,180,261

CLASS 273

29 A 4,180,262
73 D 4,180,265

73 G 4,180,263
73 J 4,180,264
100 4,180,266
127 R 4,180,267
153 R 4,180,268
171 4,180,269
186 R 4,180,270
275 4,180,271

CLASS 277

28 4,180,272
154 4,180,273
192 4,180,274

CLASS 280

11.37 E 4,180,275
47.36 4,180,276
79.3 4,180,277
87.06 A 4,180,278
204 4,180,279
277 4,180,280
457 4,180,281
481 4,180,282
802 4,180,283

CLASS 283

20 4,180,284

CLASS 285

261 4,180,285
328 4,180,286

CLASS 290

38 B 4,180,743

CLASS 292

144 4,180,287

CLASS 294

19 A 4,180,288
53.5 4,180,289

CLASS 296

1 S 4,180,290

CLASS 299

34 4,180,291
92 4,180,292

CLASS 301

54 4,180,293

CLASS 303

6 C 4,180,294
22 R 4,180,295
113 Re 30,177

CLASS 307

4,180,744
4,180,745
4,180,746
4,180,747
4,180,748
299 B 4,180,749
362 4,180,750
428 4,180,751

CLASS 308

10 4,180,296

CLASS 310

11 4,180,752
168 4,180,753

CLASS 312

214 4,180,297
242 4,180,298
4,180,299

CLASS 313

25 Re 30,181
93 4,180,754
113 4,180,755
193 4,180,756
315 4,180,757
318 4,180,758
388 4,180,759
422 4,180,760

CLASS 315

169.4 4,180,762
248 4,180,763
283 4,180,764
292 4,180,761
408 4,180,765

CLASS 318

128 4,180,766
308 4,180,767

CLASS 323

9 4,180,768

CLASS 324

71 SN 4,180,771
73 PC 4,180,772
86 4,180,773
125 4,180,774
249 4,180,775
319 4,180,769

429 4,180,770

CLASS 325

25 4,180,776
42 Re 30,182
363 4,180,777

CLASS 328

155 4,180,778

CLASS 329

50 4,180,779

CLASS 330

252 4,180,780
272 4,180,781
276 4,180,782

CLASS 331

2 4,180,783
94.5 PE 4,180,784

CLASS 332

9 T 4,180,785

CLASS 333

32 4,180,786
212 4,180,787

CLASS 335

190 4,180,788

CLASS 337

301 4,180,789

CLASS 339

5 R 4,180,300
90 C 4,180,301
143 T 4,180,302
166 R 4,180,303
196 M 4,180,304
198 H 4,180,305

CLASS 340

58 4,180,794
4,180,795
64 4,180,796
146.2 4,180,797
146.3 AC 4,180,799
146.3 H 4,180,798
146.3 SY 4,180,800
147 R 4,180,801
162 4,180,802
164 R 4,180,803
310 R 4,180,804
347 AD 4,180,806
4,180,807
384 E 4,180,808
4,180,809
407 4,180,810
566 4,180,811
706 4,180,812
709 4,180,805
784 4,180,813

CLASS 343

5 DP 4,180,814
6.5 R 4,180,815
7 VM 4,180,816
700 MS 4,180,817
4,180,818
792 4,180,819
798 4,180,820

CLASS 346

7 4,180,821
75 4,180,225
108 4,180,822
139 B 4,180,823
154 4,180,824

CLASS 350

6.4 4,180,306
6.5 4,180,307

CLASS 351

160 H 4,180,308

CLASS 354

24 4,180,310
25 4,180,309
53 4,180,311
59 4,180,312
112 4,180,313
159 4,180,314
170 4,180,315
173 4,180,316
206 Re 30,178
318 4,180,317

CLASS 355

3 R 4,180,319
11 4,180,318
54 4,180,320
83 4,180,321

CLASS 356

1 4,180,322

3 4,180,323
35.5 4,180,324
127 4,180,325
152 4,180,326
320 4,180,327
349 4,180,328
375 4,180,329
425 4,180,330
445 4,180,331

CLASS 357

16 4,180,825
41 4,180,826
44 4,180,827
79 4,180,828

CLASS 358

10 4,180,829
128 4,180,830
160 4,180,831

CLASS 360

10 4,180,832
18 4,180,837
21 4,180,833
63 4,180,838
71 4,180,839
109 4,180,834
118 4,180,835
128 4,180,840
130.32 4,180,836

CLASS 361

45 4,180,841
85 4,180,842
119 4,180,843
226 4,180,844
334 4,180,845
357 4,180,846

CLASS 362

30 4,180,847
71 4,180,848
72 4,180,849
285 4,180,850
378 4,180,851

CLASS 363

49 4,180,852
96 4,180,853

CLASS 364

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